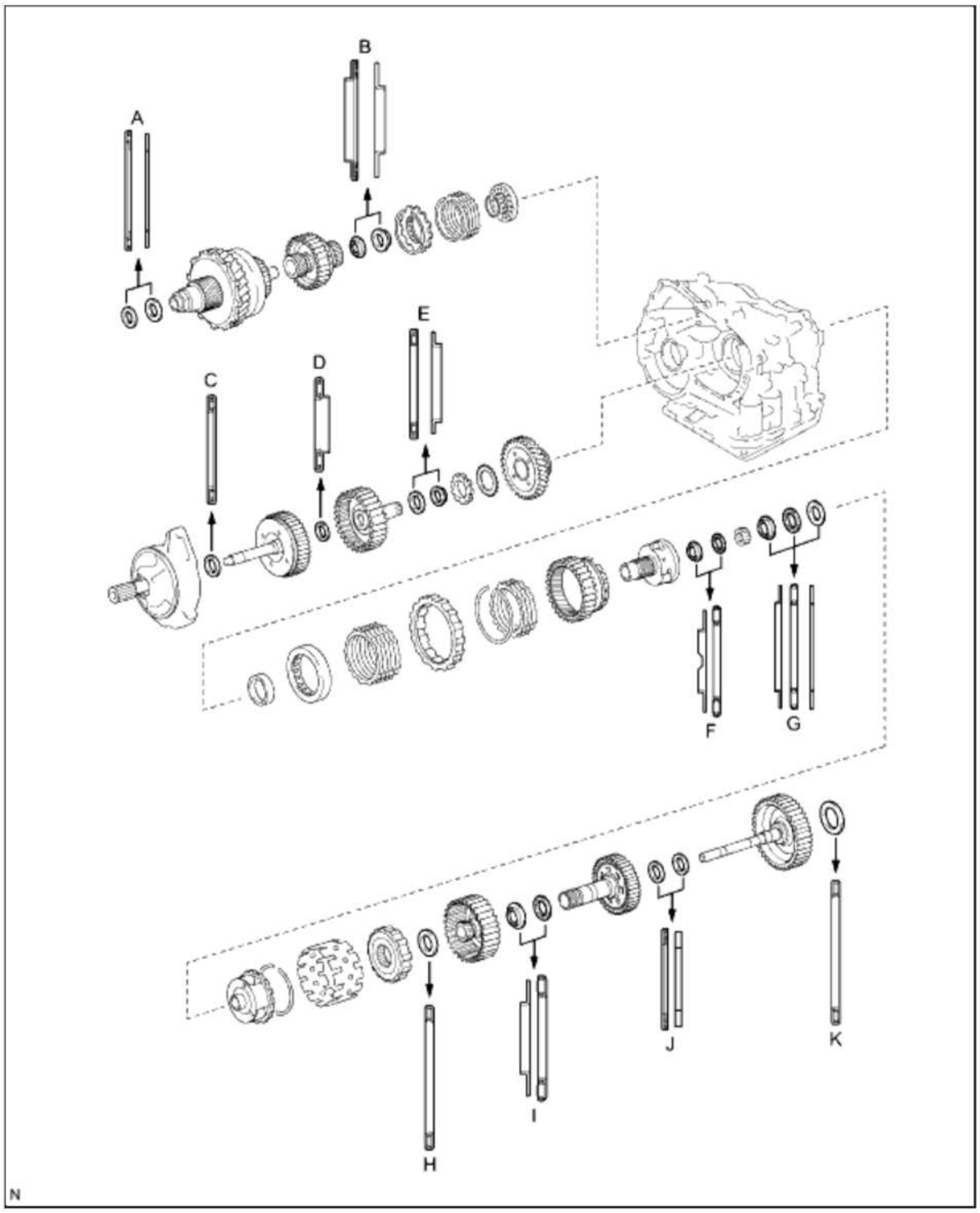
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YXA025X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. BEARING POSITION

Check each bearing position and installation direction.

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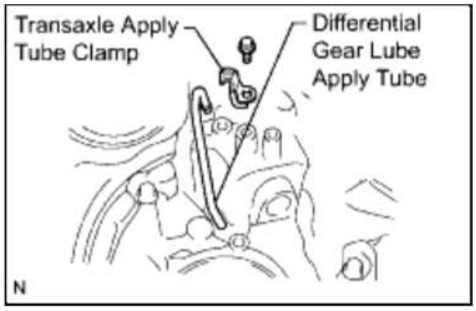


MARK	FRONT RACE DIAMETER INSIDE / OUTSIDE (MM (IN.))	THRUST BEARING DIAMETER INSIDE / OUTSIDE (MM (IN.))	REAR RACE DIAMETER INSIDE / OUTSIDE (MM (IN.))
A	-	53.0 (2.087) / 78.2 (3.079)	52.1 (2.051) / 75.5 (2.972)
B	-	37.73 (1.4854) / 58.0 (2.284)	29.9 (1.177) / 55.5 (2.185)

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MARK	FRONT RACE DIAMETER INSIDE / OUTSIDE (MM (IN.))	THRUST BEARING DIAMETER INSIDE / OUTSIDE (MM (IN.))	REAR RACE DIAMETER INSIDE / OUTSIDE (MM (IN.))
C	-	33.85 (1.3327) / 52.2 (2.055)	-
D	-	23.5 (0.925) / 44.0 (1.732)	-
E	-	36.3 (1.429) / 52.2 (2.055)	34.5 (1.358) / 48.5 (1.909)
F	34.5 (1.358) / 56.82 (2.2370)	32.4 (1.276) / 56.62 (2.2291)	-
G	40.3 (1.587) / 58.0 (2.284)	38.6 (1.520) / 60.0 (2.362)	38.6 (1.520) / 58.0 (2.284)
H	-	53.6 (2.110) / 69.6 (2.740)	-
I	33.1 (1.303) / 45.4 (1.787)	31.85 (1.2539) / 45.2 (1.780)	-
J	-	25.0 (0.984) / 39.5 (1.555)	23.6 (0.929) / 37.0 (1.457)
K	-	55.9 (2.201) / 76.0 (2.992) or 76.6 (3.016)	-

2. INSTALL DIFFERENTIAL GEAR LUBE APPLY TUBE



(a) Install the differential gear lube apply tube and transaxle apply tube clamp to the transaxle housing with the bolt.

Torque: 9.8 N·m (100 kgf·cm, 87in·lbf)

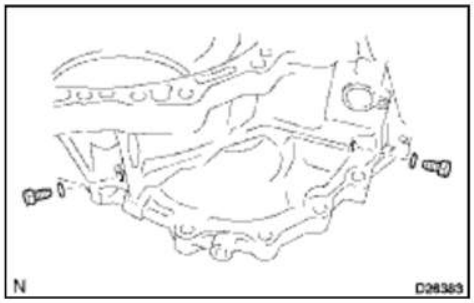
NOTICE:

Make sure to insert the pipe to the stopper.

3. INSTALL NO. 1 TRANSAXLE CASE PLUG

(a) Install a new O-ring to each No. 1 transaxle case plugs.

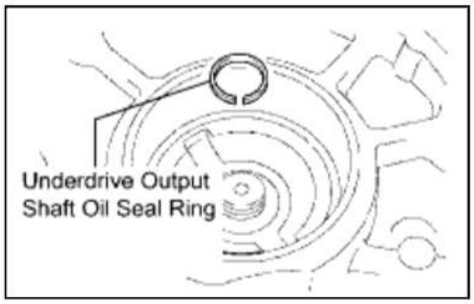
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(b) Install the 2 No. 1 transaxle case plugs to the transaxle rear housing.

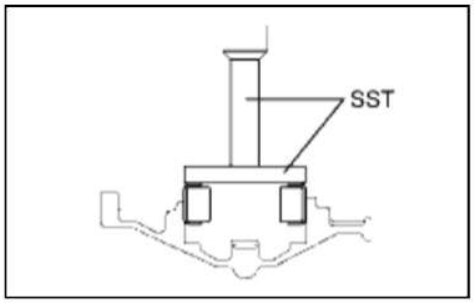
Torque: 7.4 N·m (75 kgf·cm, 65in·lbf)

4. INSTALL UNDERDRIVE OUTPUT SHAFT OIL SEAL RING



(a) Coat a new oil seal ring with ATF and install it to the transaxle housing.

5. INSTALL UNDERDRIVE CYLINDRICAL ROLLER BEARING



(a) Coat the underdrive cylindrical roller bearing with ATF.

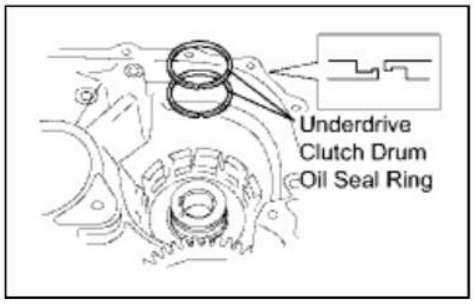
(b) Using SST and a press, install the underdrive cylindrical roller bearing.

SST: 09950-60020
SST: 09950-70010
09951-00780
09951-07100

NOTICE:
Do not apply excessive pressure to it.

6. INSTALL UNDERDRIVE CLUTCH DRUM OIL SEAL RING

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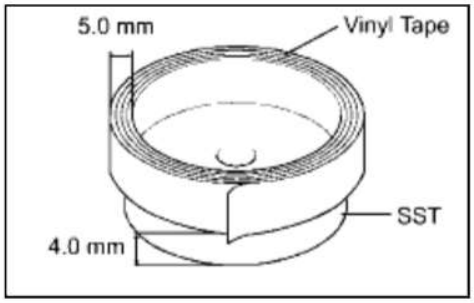


(a) Coat 2 new oil seal rings with ATF, and install them to the transaxle rear cover.

NOTICE:

- Do not expand the gap of the oil seal ring excessively.
- Securely engage the hooks. Confirm that the rings rotate smoothly.

7. INSTALL NEEDLE ROLLER BEARING

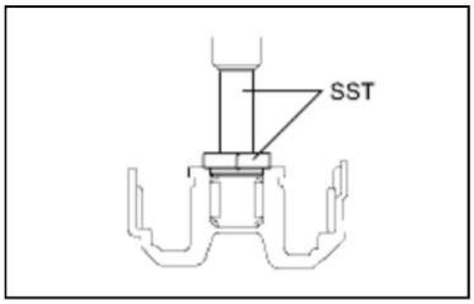


(a) Wrap vinyl tape around SST 4.0 mm (0.157 in.) above the bottom end until the thickness of the wrapped tape is about 5.0 mm (0.197 in.).

NOTICE:

Clean SST to remove deposited oil before wrapping the vinyl tape.

(b) Coat a new needle roller bearing with ATF.



(c) Using SST and a press, install the needle roller bearing to the transaxle case.

SST: 09950-60010

09951-00320

SST: 09950-70010

09951-07100

NOTICE:

When the wrapped vinyl tape contacts the transaxle case, stop the press.

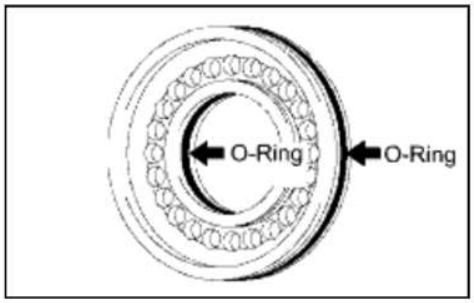
8. INSTALL UNDERDRIVE BRAKE PISTON

(a) Coat 2 new O-rings with ATF, and install them to the underdrive brake piston.

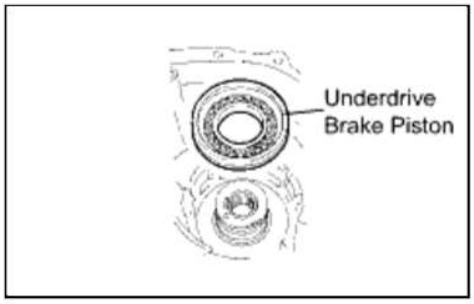
NOTICE:

- Install the O-rings carefully so that they are not twisted or pinched.
- Apply sufficient ATF to the O-rings prior to installation.

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(b) Coat the underdrive brake piston with ATF.

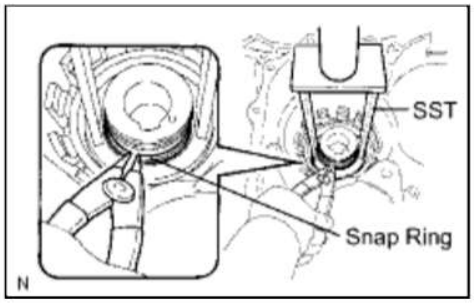


(c) Install the underdrive brake piston to the transaxle case.

NOTICE:

Be careful not to damage the O-rings.

9. INSTALL UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY



(a) Place SST on the return spring and compress the return spring with a press.

SST: 09387-00020

(b) Using a snap ring expander, install the snap ring to the transaxle case.

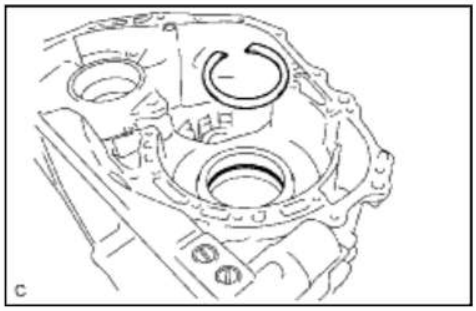
NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring seat from being deformed.
- Do not expand the snap ring excessively.
- After installing the spring sub-assembly, check all of the springs are fitted in the piston correctly.
- The snap ring should be securely engaged in the groove of the transaxle case.

10. INSTALL COUNTER DRIVE GEAR BEARING

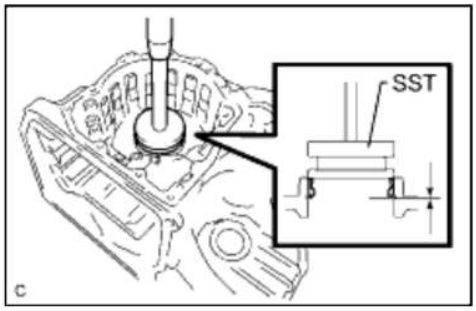
(a) Install the snap ring to the transaxle case.

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(b) Using SST and a press, install the bearing outer race (rear side) to the transaxle case.

SST: 09316-12010
SST: 09950-60020
09951-00810
SST: 09950-70010
09951-07150

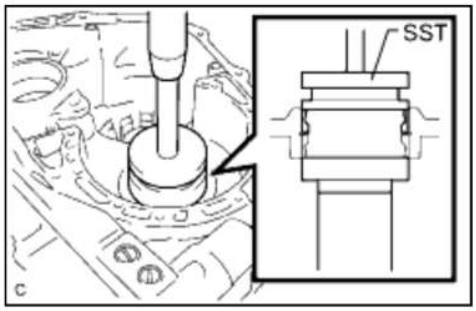


NOTICE:

- Ensure that the snap ring is securely installed.
- Do not apply excessive pressure to the bearing outer race.

(c) Using SST and a press, install the bearing outer race (front side) to the transaxle case.

SST: 09316-12010
SST: 09502-24010
SST: 09523-36010
SST: 09950-60020
09951-00810
SST: 09950-70010
09951-07150



NOTICE:

- Do not apply excessive pressure to the bearing outer race.
- Install the bearing outer race with a press while holding the bearing outer race with SST (09502-24010, 09523-36010).

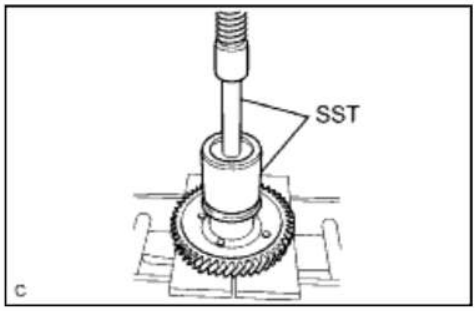
(d) Install the 2 angular balls to the transaxle case.

11. INSTALL COUNTER DRIVE GEAR

(a) Coat the counter drive gear with ATF.

(b) Using SST and a press, install the tapered roller bearing

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inner race (front side) to the counter drive gear.

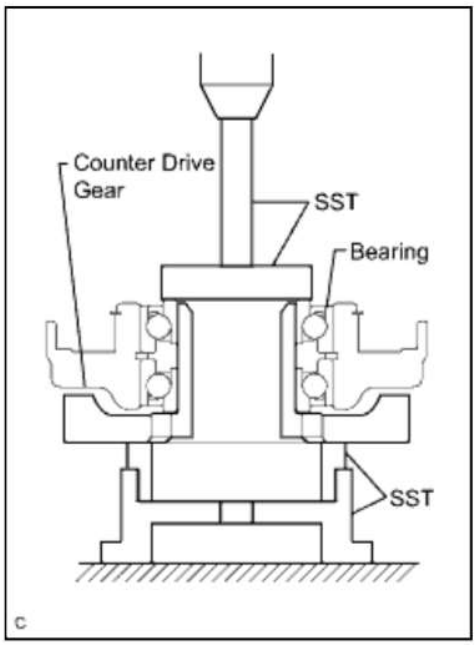
SST: 09649-17010

SST: 09950-70010

09951-07150

NOTICE:

Do not apply excessive pressure to the bearing inner race.



(c) Using SST and a press, install the counter drive gear and bearing inner race (rear side) to the transaxle case.

SST: 09223-15030

SST: 09527-17011

SST: 09950-60020

09951-00720

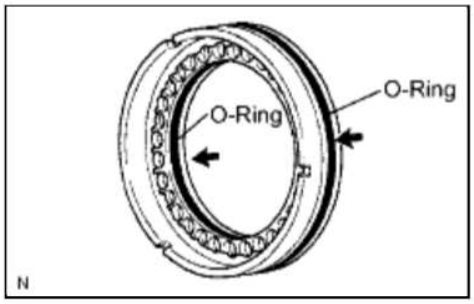
SST: 09950-70010

09951-07150

NOTICE:

Do not apply excessive pressure to the counter drive gear and bearing inner race.

12. INSTALL 1ST AND REVERSE BRAKE PISTON



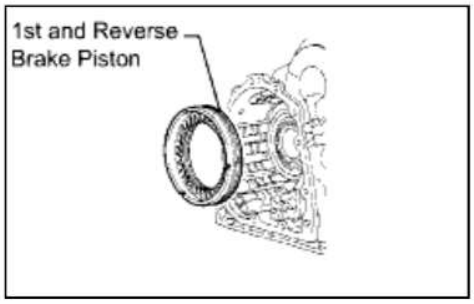
(a) Coat 2 new O-rings with ATF.

(b) Install the 2 O-rings to the 1st and reverse brake piston.

NOTICE:

- Install the O-rings carefully so that they are not twisted or pinched.
- Apply sufficient ATF to the O-rings prior to installation.

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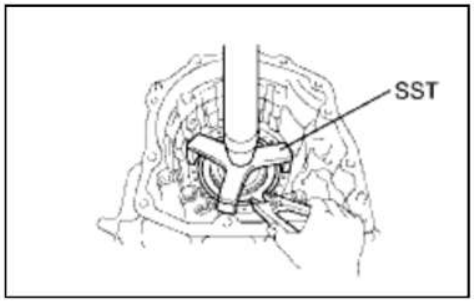
(c) Coat the 1st and reverse brake piston with ATF, and install it to the transaxle case.

NOTICE:

Be careful not to damage the O-rings.

13. INSTALL 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

(a) Install the return spring.



(b) Place SST on the return spring and compress the return spring with a press.

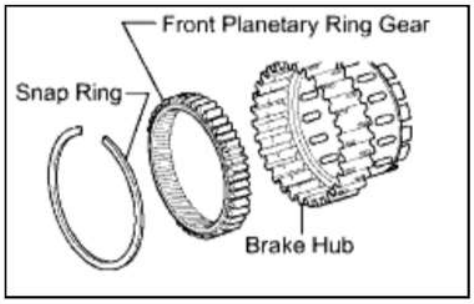
SST: 09387-00070

(c) Using a snap ring expander, install the snap ring to the transaxle case.

NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring seat from being deformed.
- Do not expand the snap ring excessively.
- After installing the spring sub-assembly, check all of the springs are fitted in the piston correctly.
- The snap ring should be securely engaged in the groove of the cylinder.

14. INSTALL FRONT PLANETARY RING GEAR



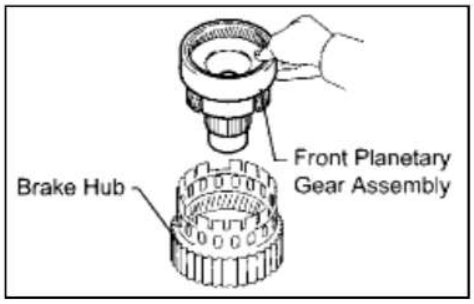
(a) Using a screwdriver, install the front planetary ring gear and snap ring to the brake hub.

NOTICE:

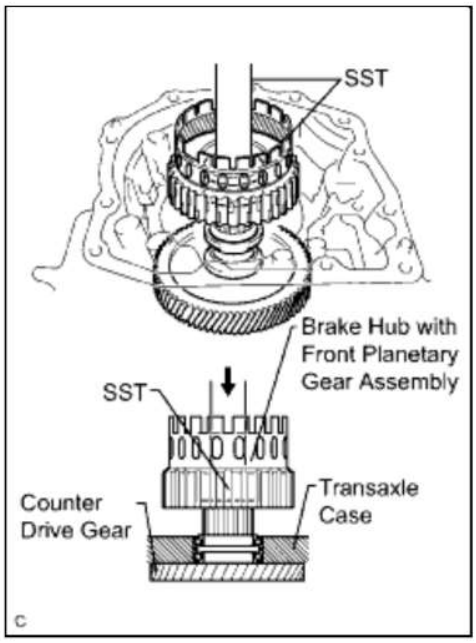
Confirm that the snap ring is engaged in the groove of the brake hub correctly.

15. INSTALL FRONT PLANETARY GEAR ASSEMBLY

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(a) Install the front planetary gear assembly to the brake hub.



(b) Using SST and a press, press-fit the front planetary gear assembly.

SST: 09950-60010

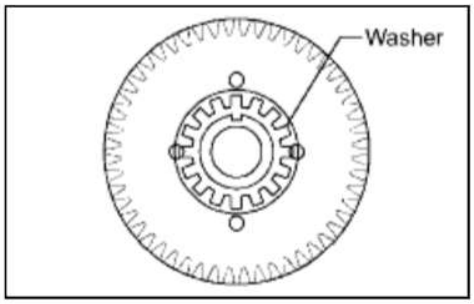
09951-00500

SST: 09950-70010

09951-07100

NOTICE:

- Do not apply excessive pressure to the front planetary gear assembly.
- Press the inner race of the counter drive angular ball bearing (front side), counter drive gear, and front planetary gear assembly to the position where no pre-load is applied to each tapered roller bearing (left and right).



(c) Install a new washer as shown in the illustration.

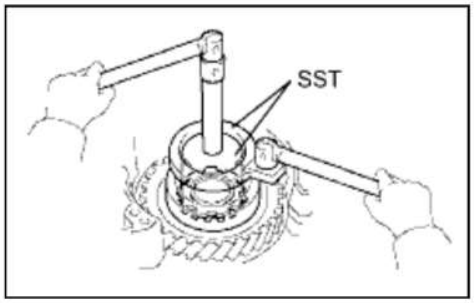
(d) Using SST, install the nut.

SST: 09387-00030

SST: 09387-00080

Torque: 185 N·m (1886 kgf·cm, 136ft·lbf)

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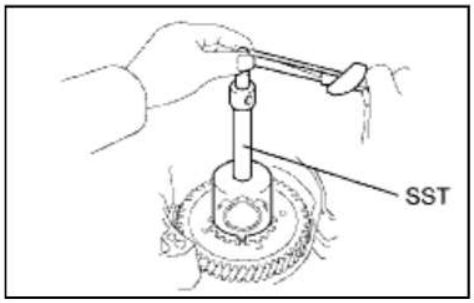
(e) Using SST and a torque wrench, measure the turning torque of the bearing while rotating SST at 60 rpm. If the measured value is not within the specified range, gradually tighten the nut until the turning torque falls within the specified range.

SST: 09387-00080

Torque: 350 N·m (3569 kgf·cm, 258ft·lbf)(a limit)

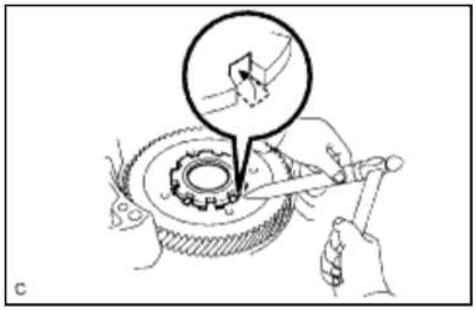
Bearing Turning Torque:

0.19 to 0.4 N*m (1.9 to 4.1 kgf*cm, 1.7 to 3.5 in.*lbf)



HINT:

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.) to measure the turning torque.

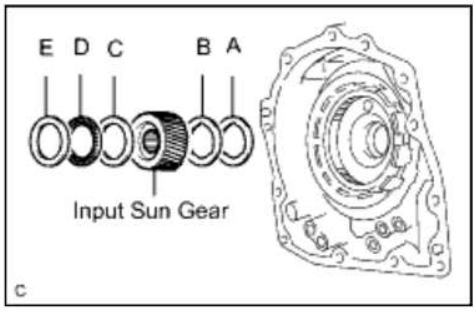


(f) Using a chisel and hammer, stake the front lock washer.

16. INSTALL INPUT SUN GEAR

(a) Coat the 2 thrust bearings with ATF.

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(b) Install the input sun gear, 2 thrust needle roller bearings, 2 No. 2 thrust bearing races, and No. 3 thrust bearings to the transaxle case.

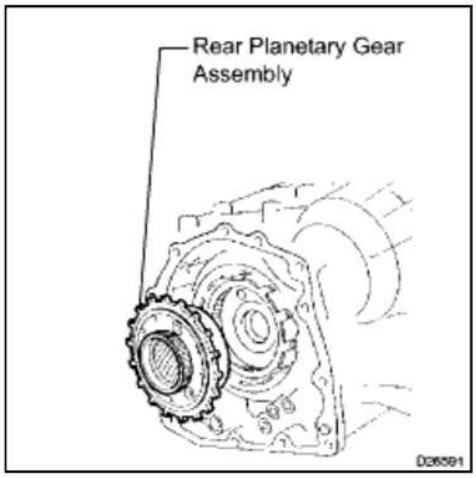
NOTICE:

Ensure that the parts are installed in the correct order and direction.

Thrust Bearing and Bearing Race Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing Race, A	34.5 (1.358)	56.82 (2.2370)
Thrust Bearing, B	32.4 (1.276)	56.62 (2.2291)
Bearing Race, C	40.3 (1.587)	58.0 (2.284)
Thrust Bearing, D	38.6 (1.520)	60.0 (2.362)
Bearing Race, E	38.6 (1.520)	58.0 (2.284)

17. INSTALL REAR PLANETARY GEAR ASSEMBLY

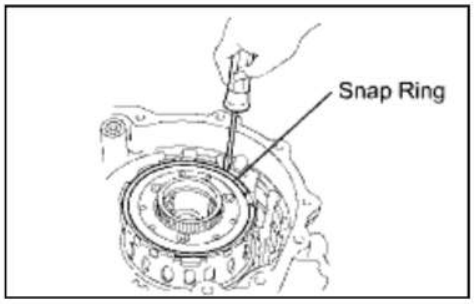


(a) Install the rear planetary gear assembly to the brake hub.

(b) Using a screwdriver, install the snap ring.

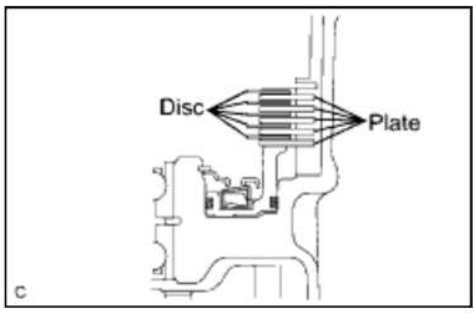
NOTICE:

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Confirm that the snap ring is engaged in the groove of the 1st and reverse brake hub correctly.

18. INSTALL 1ST AND REVERSE BRAKE DISC



(a) Coat the 5 discs with ATF.

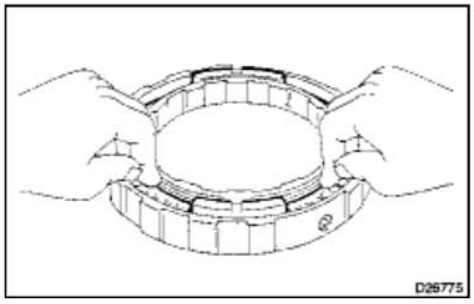
(b) Install the 5 plates and 5 discs.

NOTICE:

Be sure to install the plates and disks in the correct order.

19. INSPECT PACK CLEARANCE OF 1ST AND REVERSE BRAKE INFO

20. INSTALL 2ND BRAKE PISTON



(a) Coat the 2nd brake piston with ATF, and install it to the 2nd brake cylinder.

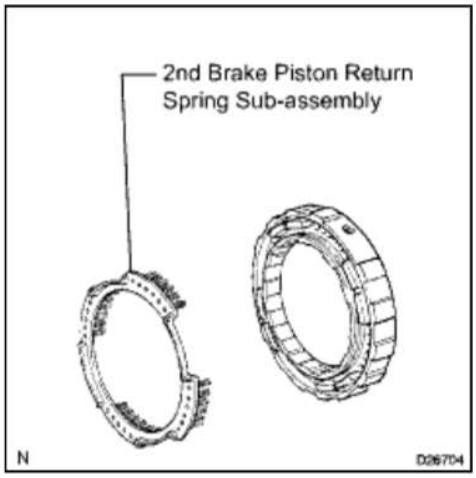
21. INSTALL 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

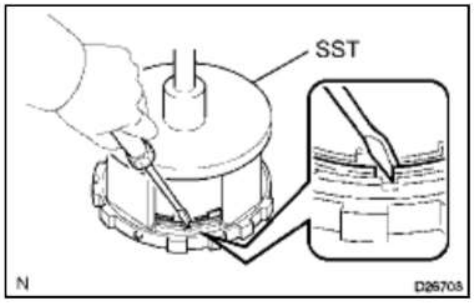
(a) Install the 2nd brake piston return spring sub-assembly.

NOTICE:

Ensure that all springs are fitted in the piston correctly.

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(b) Place SST on the piston return spring, and compress it with a press.

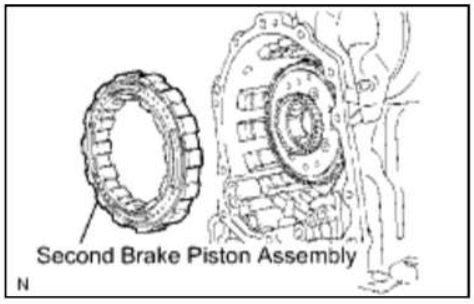
SST: 09387-00060

(c) Using a screwdriver, install the snap ring.

NOTICE:

Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.

22. INSTALL 2ND BRAKE PISTON ASSEMBLY

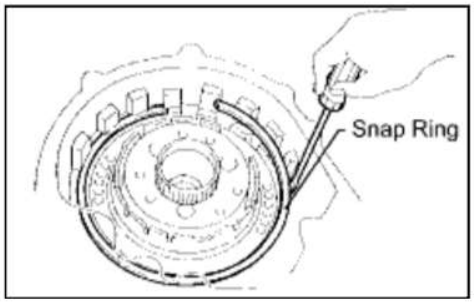


(a) Install the 2nd brake piston assembly to the transaxle case.

(b) Install the snap ring and measure the inside diameter.

Inside diameter:
More than 172 mm (6.77 in.)

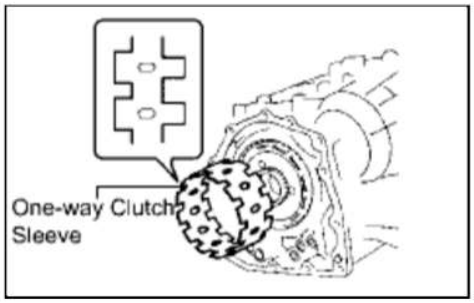
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NOTICE:

- Make sure to install the tapered snap ring in the correct direction.
- If the diameter does not meet the specified value, replace the snap ring with a new one.
- After installing the snap ring, confirm that there is no clearance between the 2nd brake cylinder and the contact surface of the cylinder in the transaxle case.

23. INSTALL ONE-WAY CLUTCH SLEEVE

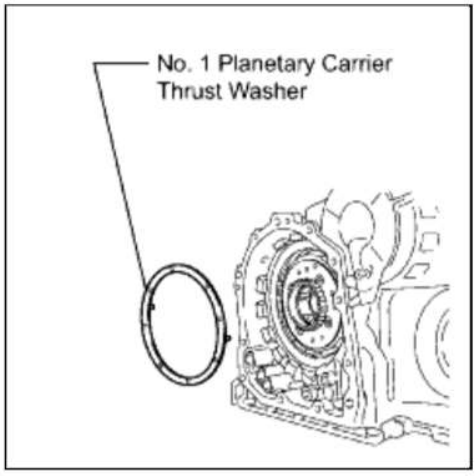


(a) Install the one-way clutch sleeve to the 2nd brake cylinder assembly.

NOTICE:

Check the positioning direction of the outer sleeve.

24. INSTALL NO. 1 PLANETARY CARRIER THRUST WASHER



(a) Coat the No. 1 planetary carrier thrust washer with ATF, and install it onto the planetary sun gear assembly.

NOTICE:

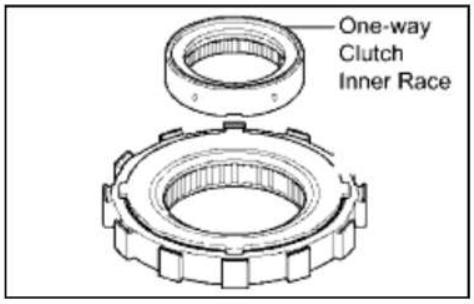
After installing the washer, confirm that the projections on the washer are securely fitted in the holes of the planetary sun gear assembly.

25. INSTALL ONE-WAY CLUTCH ASSEMBLY

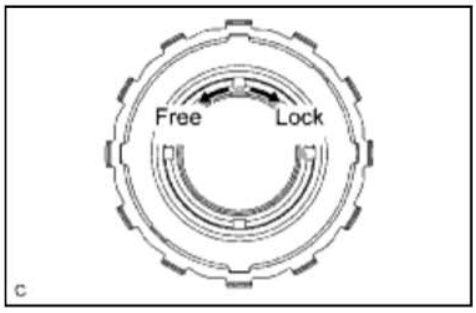
(a) Install the one-way clutch inner race to the one-way clutch.

NOTICE:

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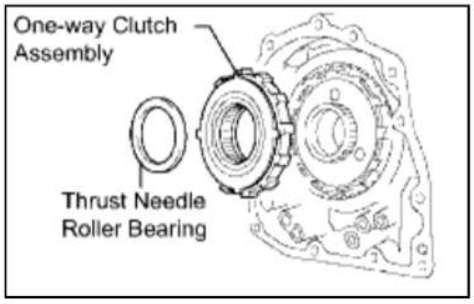


- Check the direction of the inner race.
- Confirm that the identification mark can be seen.



(b) Make sure that the one way clutch turns freely counterclockwise and locks when turned clockwise.

(c) Install the one-way clutch and thrust needle roller bearing to the one-way clutch sleeve outer.



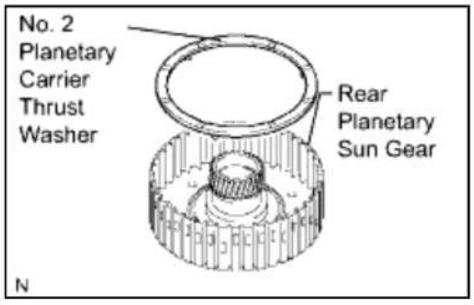
Bearing Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing	53.6 (2.110)	69.6 (2.740)

NOTICE:

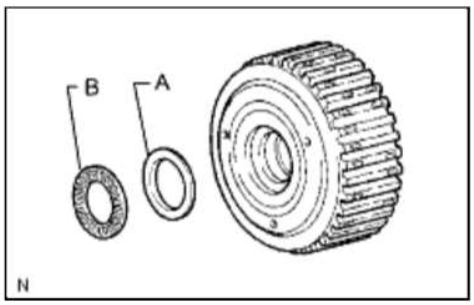
Install the thrust bearing properly so that uncolored race will be visible.

26. INSTALL REAR PLANETARY SUN GEAR ASSEMBLY



(a) Coat the No. 2 planetary carrier thrust washer with ATF, and install it onto the rear planetary sun gear.

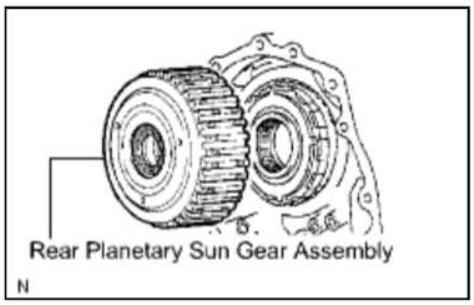
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(b) Coat the bearing with petroleum jelly, and install it onto the rear planetary sun gear.

Bearing Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Race, A	33.1 (1.303)	45.4 (1.787)
Bearing, B	31.85 (1.254)	45.2 (1.78)

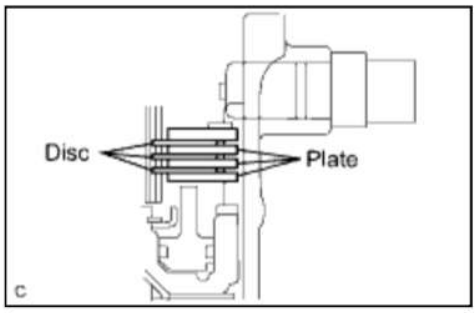


(c) Install the rear planetary sun gear assembly to the rear planetary gear.

NOTICE:

After installing the rear planetary sun gear assembly, confirm that the B1 discs engage.

27. INSTALL 2ND BRAKE CLUTCH DISC



(a) Coat the 3 discs with ATF.

(b) Install the 3 discs and 3 plates to the transaxle case.

(c) Install the snap ring.

28. INSPECT PACK CLEARANCE OF 2ND BRAKE INFO

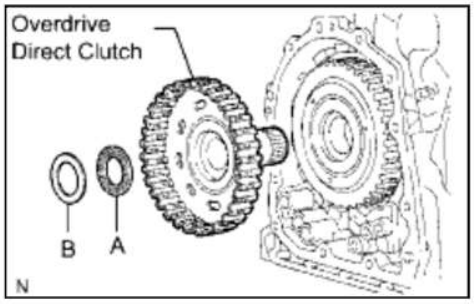
29. INSTALL OVERDRIVE DIRECT CLUTCH HUB SUB-ASSEMBLY

(a) Install the direct clutch hub to the planetary gear assembly.

NOTICE:

Be careful not to damage the bushing inside the overdrive

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clutch hub during installation.

(b) Coat the thrust bearing with ATF.

(c) Install the bearing race and the thrust bearing to the direct clutch hub.

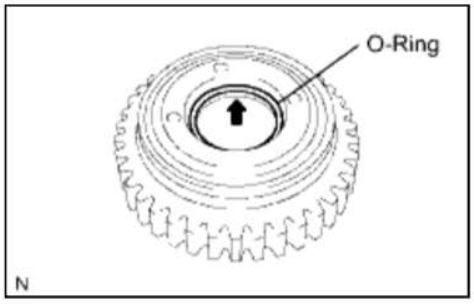
NOTICE:

When installing the bearing, hold the side of the overdrive clutch hub.

Bearing and Race Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing, A	25.0 (0.984)	39.5 (1.555)
Race, B	23.6 (0.929)	37.0 (1.457)

30. INSTALL OVERDRIVE DIRECT CLUTCH O-RING

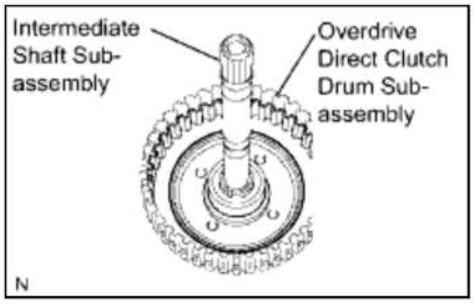


(a) Coat a new O-ring with ATF, and install it to the direct clutch drum.

NOTICE:

Ensure that the O-ring is not twisted or pinched.

31. INSTALL OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY



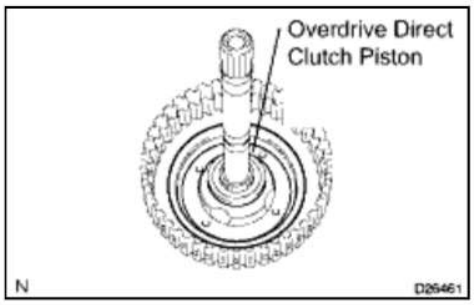
(a) Coat the direct clutch drum with ATF, and install it to the intermediate shaft.

NOTICE:

- Be careful not to damage the O-ring.
- Be careful not to damage the lip seal of the direct clutch drum.

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32. INSTALL OVERDRIVE DIRECT CLUTCH PISTON

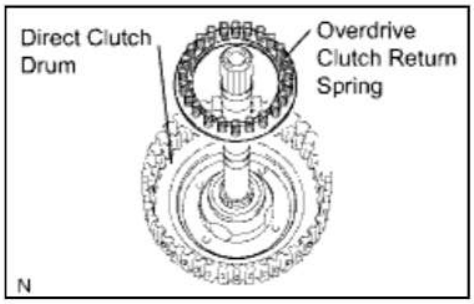


(a) Coat the overdrive direct clutch piston with ATF, and install it to the overdrive direct clutch drum sub-assembly.

NOTICE:

Be careful not to damage the lip seal of the direct clutch piston.

33. INSTALL OVERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY

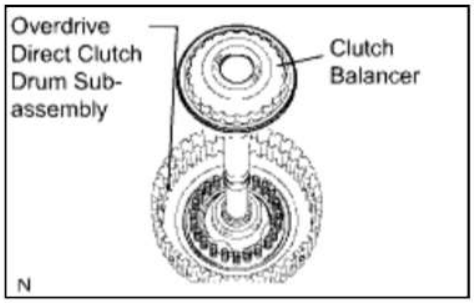


(a) Install the overdrive clutch return spring sub-assembly to the overdrive direct clutch drum sub-assembly.

NOTICE:

When installing the spring sub-assembly, ensure that all springs are fitted in the piston correctly.

(b) Coat the clutch balancer with ATF.



(c) Install the clutch balancer to the overdrive direct clutch drum sub-assembly.

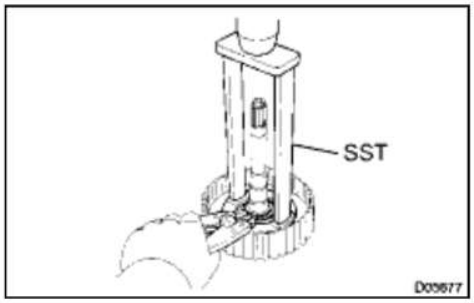
NOTICE:

- Be careful not to damage the lip seal of the direct clutch balancer.
- Ensure that the clutch balancer is not pinched and there are no other defects at the sealing lip.
- Apply enough ATF to the sealing lip prior to installation.

(d) Place SST on the clutch balancer and compress the piston return spring with a press.

SST: 09387-00020

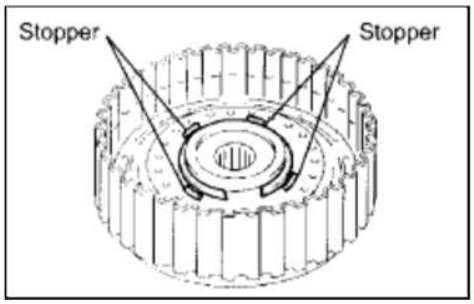
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(e) Using a snap ring expander, install the snap ring to the direct clutch drum.

NOTICE:

- Stop the press when the spring seat is lowered to the place 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.
- Do not expand the snap ring excessively.

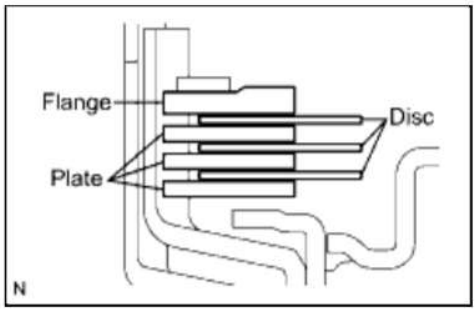


(f) Position the end gap of the snap ring in the piston as shown in the illustration.

NOTICE:

Ensure that the end gap of the snap ring is not aligned with any of the stoppers.

34. INSTALL OVERDRIVE DIRECT CLUTCH DISC



(a) Coat the 3 discs with ATF.

(b) Install the 3 plates, 3 discs and flange to the intermediate shaft.

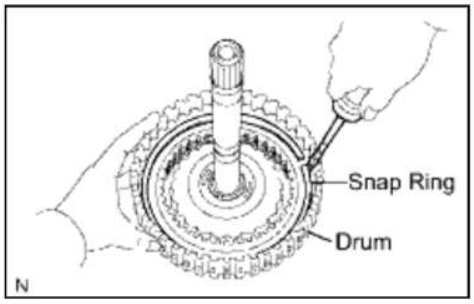
NOTICE:

Be sure to install the plates, disks and flange in the correct order.

(c) Using a screwdriver, install the snap ring.

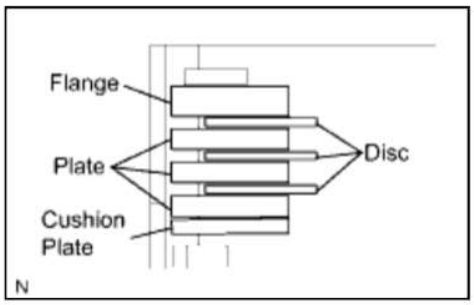
NOTICE:

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The snap ring should be securely engaged in the groove of the drum.

35. INSTALL DIRECT MULTIPLE DISC CLUTCH DISC

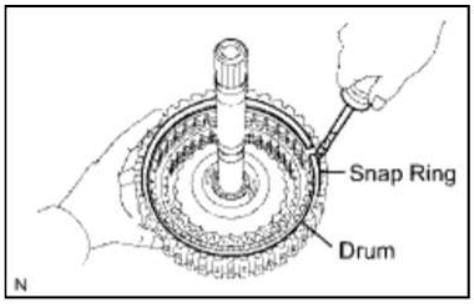


(a) Coat the 3 discs with ATF.

(b) Install the cushion plate, 3 plates, 3 discs and flange to the intermediate shaft.

NOTICE:

- Install the cushion plate with the mark on the white surface facing the plate.
- Be sure to install the cushion plate, plates, disks and flange in the correct order.



(c) Using a screwdriver, install the snap ring.

NOTICE:

The snap ring should be securely engaged in the groove of the drum.

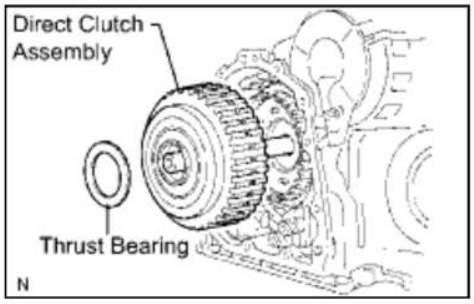
36. INSPECT PACK CLEARANCE OF DIRECT CLUTCH INFO

37. INSPECT PACK CLEARANCE OF OVERDRIVE CLUTCH INFO

38. INSTALL DIRECT CLUTCH ASSEMBLY

(a) Coat the thrust bearing with ATF.

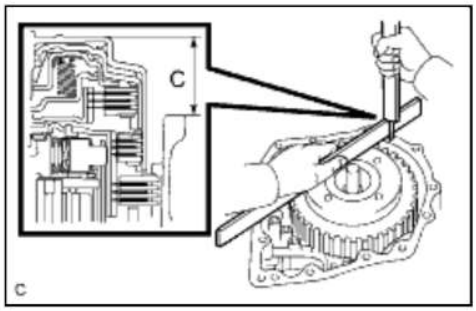
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(b) Install the direct clutch assembly and thrust bearing to the rear planetary sun gear assembly.

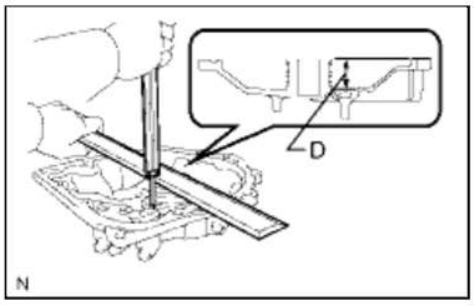
NOTICE:

The disc in the direct clutch should be completely matched with the hub attached outside the rear planetary sun gear. Otherwise, the rear cover cannot be installed.



(c) Clean the contact surfaces of the transaxle case and the rear cover.

(d) As shown in the illustration, place a straightedge on the direct clutch drum and measure the distance between the transaxle case and the straightedge using a vernier caliper (Dimension C).



(e) Using a vernier caliper and a simple straightedge, measure the dimension shown in the illustration.

(f) Calculate the end play value using the following formula. Select a thrust bearing which satisfies the specified end play value and install it.

End play:
0.199 to 0.970 mm (0.00783 to 0.0382 in.)

NOTICE:

Make sure that the uncolored race side is facing the direct clutch assembly.

HINT:

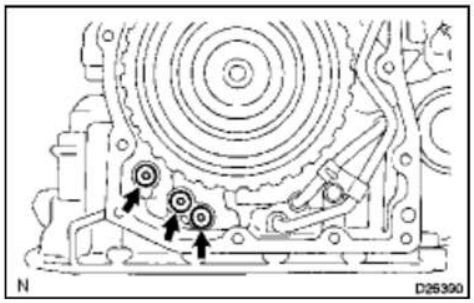
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End play = Dimension D - Dimension C

Bearing Thickness and Diameter

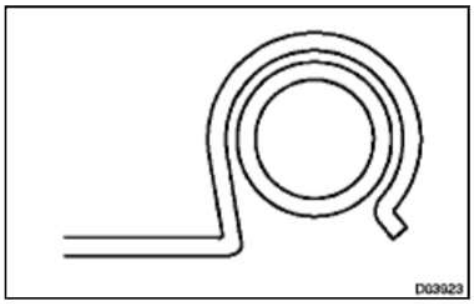
THICKNESS	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
3.6 (0.142)	55.9 (2.201)	76.0 (2.992)
3.9 (0.154)	55.9 (2.201)	76.6 (3.016)

39. INSTALL NO. 1 GOVERNOR APPLY GASKET



(a) Install 3 new No. 1 governor apply gaskets to the transaxle case.

40. INSTALL BRAKE APPLY TUBE

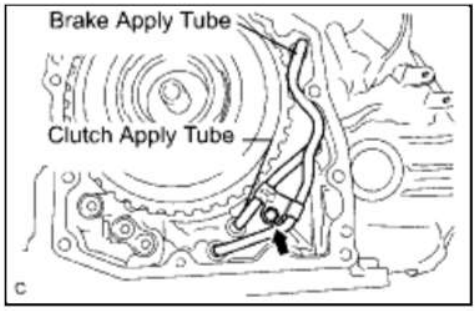


(a) Install the clamp to the brake apply tube.

NOTICE:

Make sure to install the clamp to the apply tube before installing the apply tube to the transaxle case. This prevents the apply tube from being deformed or damaged.

(b) Install the clutch apply tube.



(c) Install the brake apply tube to the transaxle case with the bolt.

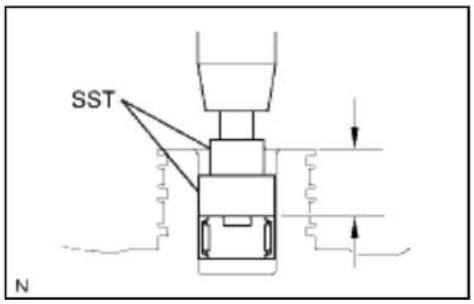
Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

NOTICE:

Each pipe should be securely inserted until it reaches the stopper.

41. INSTALL NEEDLE ROLLER BEARING

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(a) Using SST and a press, install the needle roller bearing to the transaxle rear cover.

SST: 09950-60010

09951-00230

09952-06010

09951-00360

Press fit depth:

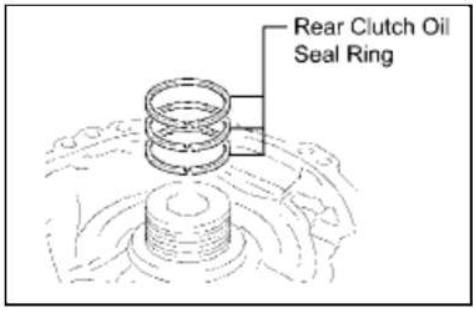
20.55 to 21.25 mm (0.8091 to 0.8366 in.)

NOTICE:

- Face the inscribed side of the bearing race up.
- Keep pressing until the specified value is obtained.

(b) Coat the needle roller bearing with ATF.

42. INSTALL REAR CLUTCH OIL SEAL RING

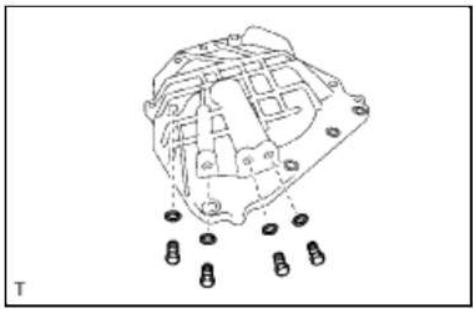


(a) Coat 3 new rear clutch oil seal rings with ATF, and install them to the transaxle rear cover.

NOTICE:

The rear clutch oil seal rings should be securely engaged in the grooves of the drum.

43. INSTALL NO. 1 TRANSAXLE CASE PLUG



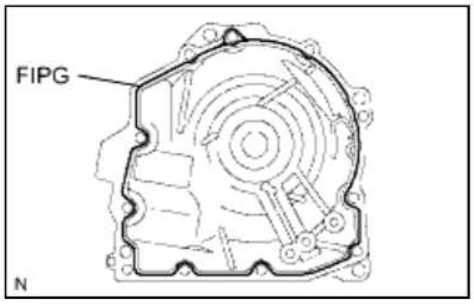
(a) Install a new O-ring to each No. 1 transaxle case plug.

(b) Install the 4 No. 1 transaxle case plugs to the transaxle rear cover.

Torque: 7.4 N·m (75 kgf·cm, 65in·lbf)

44. INSTALL TRANSAXLE REAR COVER SUB-ASSEMBLY

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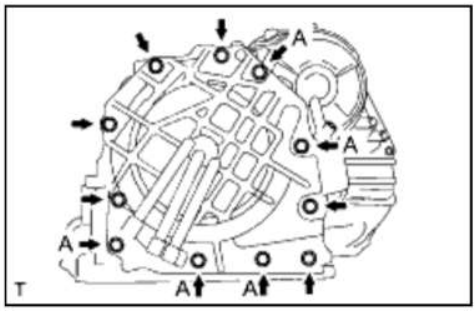
(a) Remove any packing material and keep the contact surfaces of the transaxle rear cover and the transaxle case away from oil.

(b) Apply FIPG to the cover.

FIPG:
Toyota Genuine Seal Packing 1281, Three Bond 1281 or Equivalent

NOTICE:

Apply FIPG in a continuous bead (width 1.2 mm (0.0472 in.)) along the sealing surface.



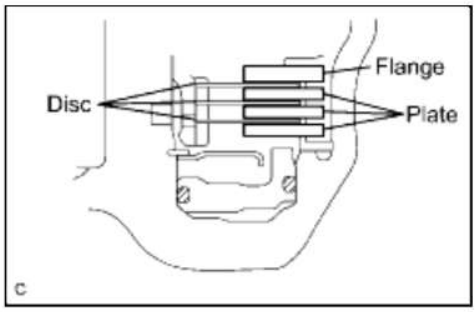
(c) Apply adhesive to the threads of bolt A.

Sealant:
Toyota Genuine Adhesive 1344, Three Bond 1344 or Equivalent

(d) Install the 11 bolts.

Bolt A - Torque: 19 N·m (190 kgf·cm, 14ft·lbf)
Other bolts - Torque: 25 N·m (250 kgf·cm, 18ft·lbf)

45. INSTALL NO. 2 UNDERDRIVE CLUTCH DISC



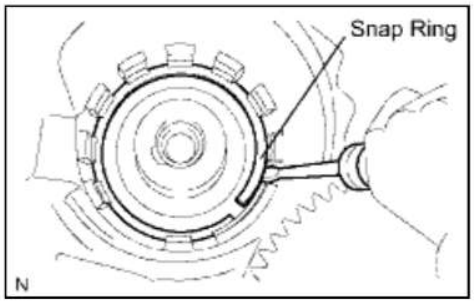
(a) Coat the 3 discs with ATF.

(b) Install the 3 discs, 3 plates and flange to the transaxle case.

NOTICE:

Be sure to install the disks, plates and flange in the correct order.

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(c) Using a screwdriver, install the snap ring.

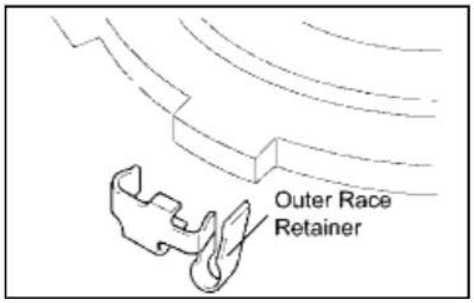
NOTICE:

The snap ring should be securely engaged in the groove of the drum.

46. INSPECT PACK CLEARANCE OF UNDERDRIVE BRAKE INFO

47. INSPECT UNDERDRIVE ONE-WAY CLUTCH ASSEMBLY INFO

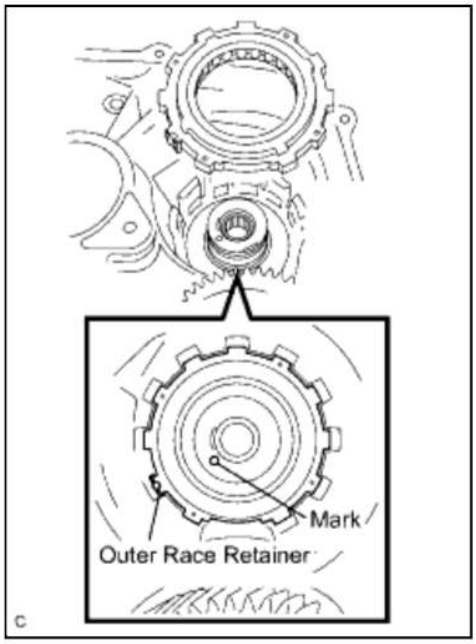
48. INSTALL UNDERDRIVE ONE-WAY CLUTCH ASSEMBLY



(a) Install the outer race retainer to the one-way clutch.

NOTICE:

Securely install the outer race retainer onto the tooth of the one-way clutch.

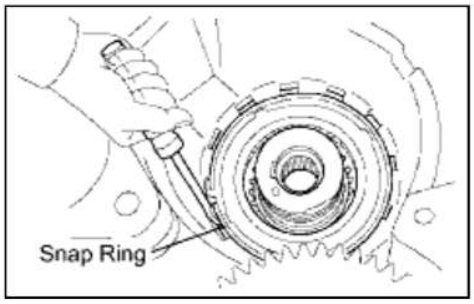


(b) Install the one-way clutch to the transaxle case.

NOTICE:

Ensure that the outer race retainer and the mark on the transaxle case are aligned.

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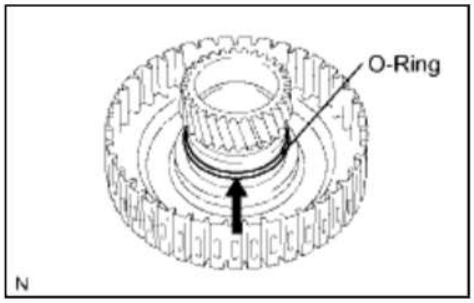


(c) Using a screwdriver, install the snap ring to the transaxle case.

NOTICE:

The snap ring should be securely engaged in the groove of the transaxle case.

49. INSTALL UNDERDRIVE CLUTCH DRUM O-RING

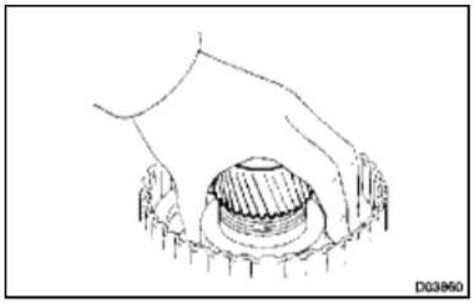


(a) Coat a new O-ring with ATF, and install it to the underdrive clutch drum.

NOTICE:

Install the O-ring carefully so that it is not twisted or pinched.

50. INSTALL UNDERDRIVE CLUTCH PISTON SET



(a) Coat the underdrive clutch piston with ATF, and install it to the underdrive clutch piston drum.

NOTICE:

- Be careful not to damage the O-ring.
- Be careful not to damage the lip seal of the piston.

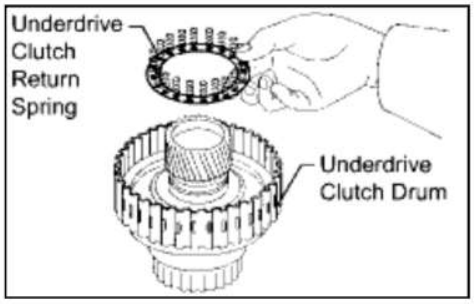
51. INSTALL UNDERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY

(a) Install the return spring to the underdrive clutch drum.

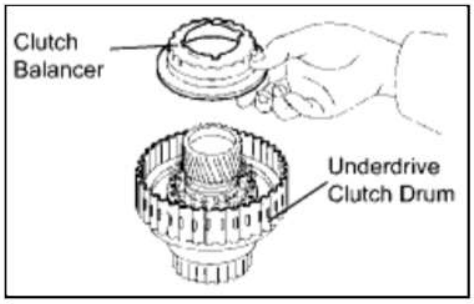
NOTICE:

After installing the spring sub-assembly, check all of the springs are fitted in the piston correctly.

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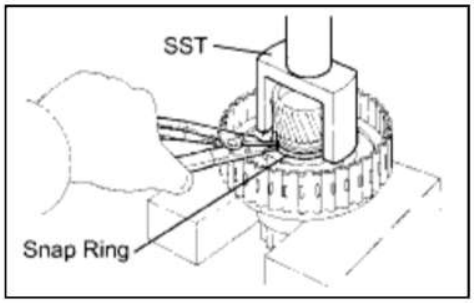
(b) Coat the clutch balancer with ATF.



(c) Install the clutch balancer to the underdrive clutch drum.

NOTICE:

Be careful not to damage the lip seal of the clutch balancer.



(d) Place SST on the clutch balancer and compress the piston return spring with a press.

SST: 09350-32014

09351-32070

(e) Using a snap ring expander, install the snap ring to the underdrive clutch drum.

NOTICE:

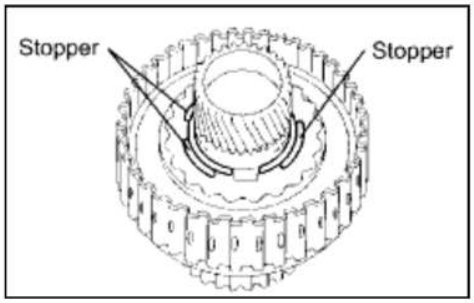
- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.
- Do not expand the snap ring excessively.

(f) Position the end gap of the snap ring in the underdrive clutch drum as shown in the illustration.

NOTICE:

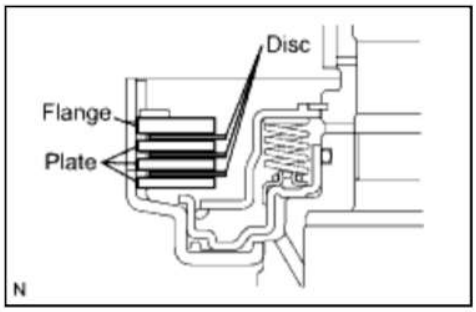
The end gap of the snap ring should not be aligned with any of the stoppers.

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52. INSTALL NO. 1 UNDERDRIVE CLUTCH DISC

(a) Coat the 3 discs with ATF.

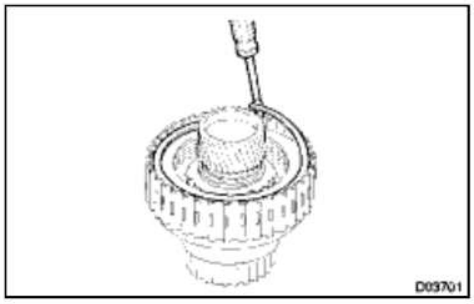


(b) Install the 3 plates, 3 discs, and flange to the underdrive clutch drum.

NOTICE:

Be careful about the order of discs, plates, and flange.

53. INSTALL NO. 2 UNDERDRIVE CLUTCH FLANGE HOLE SNAP RING



(a) Using a screwdriver, install the No. 2 underdrive clutch flange hole snap ring.

(b) Check that the end gap of the snap ring is not aligned with one of the cutouts.

NOTICE:

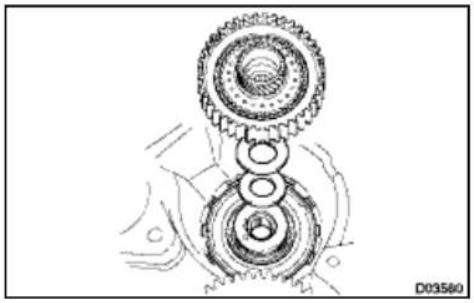
The snap ring should be securely engaged in the groove of the drum.

54. INSTALL UNDERDRIVE CLUTCH ASSEMBLY

(a) Coat the bearing and bearing race with ATF, and install them onto the underdrive clutch.

Bearing and Bearing Race Diameter

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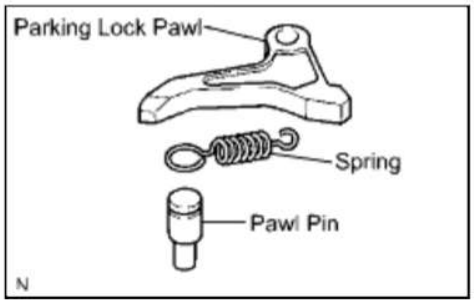
	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing	37.73 (1.4854)	58.0 (2.284)
Race	29.9 (1.177)	55.5 (2.185)

(b) Install the underdrive clutch assembly to the transaxle case.

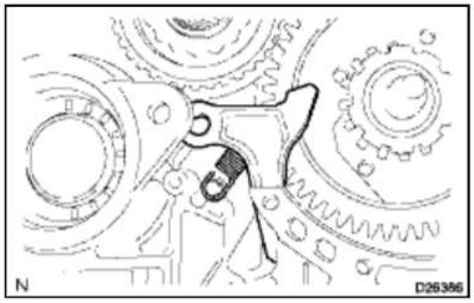
NOTICE:

When installing the underdrive clutch drum sub-assembly, do not damage the oil seal ring.

55. INSTALL PARKING LOCK PAWL



(a) Install the pawl pin and spring to the parking lock pawl.



(b) Temporarily install the parking lock pawl, pin and spring to the transaxle case as shown in the illustration.

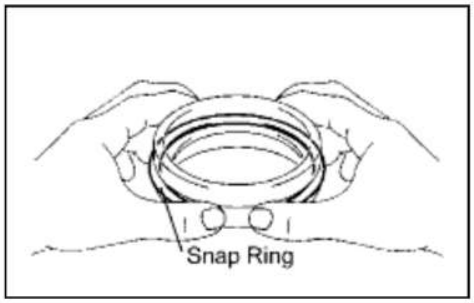
56. INSTALL UNDERDRIVE PLANETARY RING GEAR

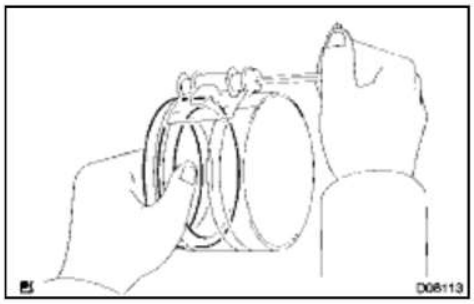
(a) Install a new snap ring to the outer race of the tapered roller bearing.

HINT:

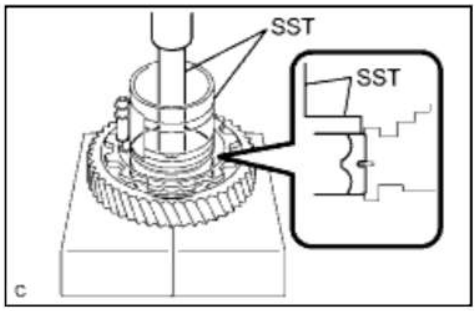
If replacing the bearing, also replace the counter driven gear with a new one.

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(b) Using a piston ring compressor, squeeze the snap ring.



(c) Using SST and a press, press in the outer race of the angular ball bearing.

SST: 09950-60020

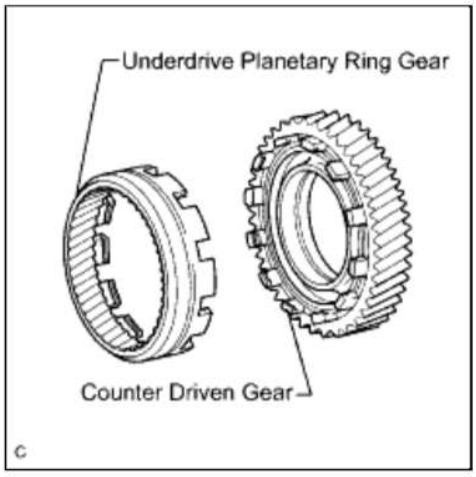
09951-00890

SST: 09950-70010

09951-07100

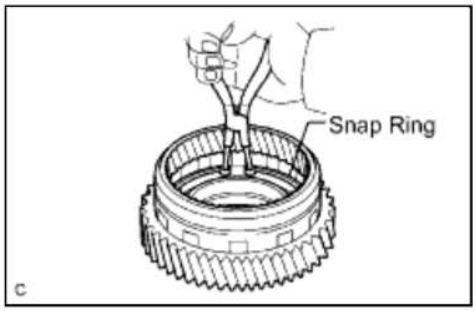
NOTICE:

Do not damage the snap ring during installation of the outer race.



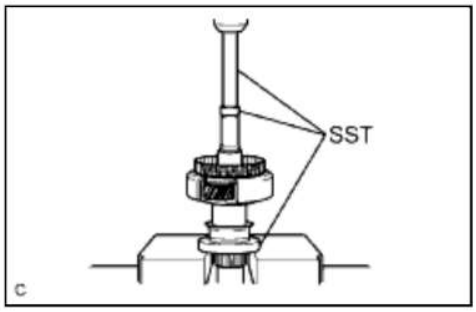
(d) Install the underdrive planetary ring gear to the counter driven gear.

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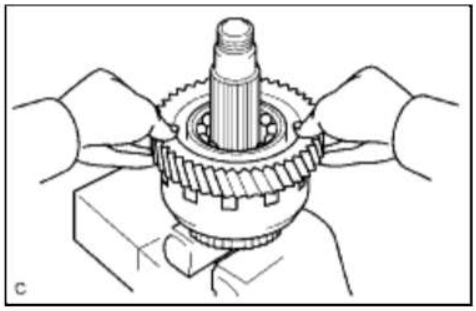
(e) Using snap ring pliers, install the snap ring.

57. INSTALL UNDERDRIVE PLANETARY GEAR ASSEMBLY

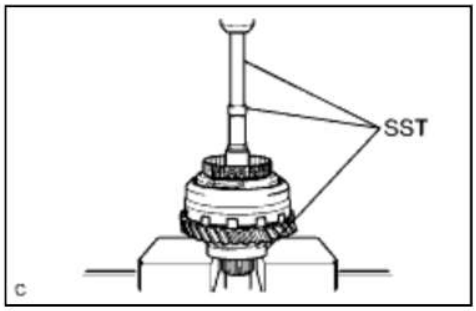


(a) Using a press, press the angular ball bearing inner race (rear side) into the underdrive planetary gear.

SST: 09726-40010
SST: 09950-60010
09951-00260
SST: 09950-70010
09951-07100



(b) Install the counter driven gear with planetary ring gear to the underdrive planetary gear.

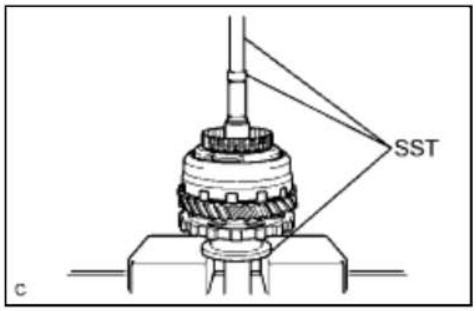


(c) Using SST and a press, press in the angular ball bearing inner race (front side).

SST: 09726-40010
SST: 09950-60010
09951-00260
SST: 09950-70010
09951-07100

NOTICE:
Press the counter driven gear while rotating it.

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(d) Using a press, press in the parking lock gear.

SST: 09316-20011

SST: 09950-60010

09951-00260

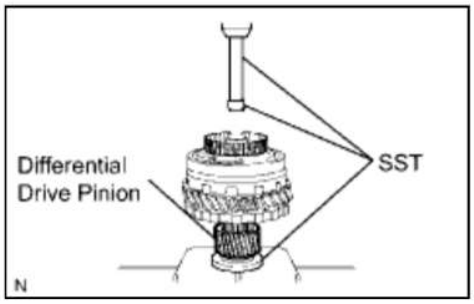
SST: 09950-70010

09951-07100

NOTICE:

Press the counter driven gear while rotating it.

58. INSTALL DIFFERENTIAL DRIVE PINION



(a) Using a press, press in the differential drive pinion.

SST: 09726-40010

SST: 09950-60010

09951-00260

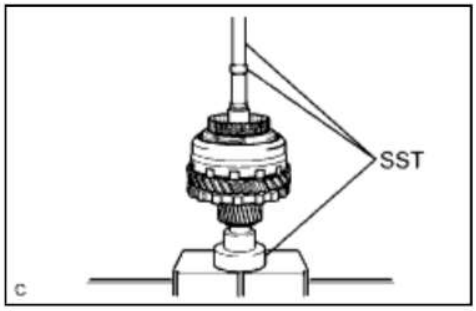
SST: 09950-70010

09951-07100

NOTICE:

Press the counter driven gear while rotating it.

59. INSTALL CYLINDRICAL ROLLER BEARING RACE INNER



(a) Using a press, press in the cylindrical roller bearing race inner.

SST: 09515-21010

SST: 09950-60010

09951-00260

SST: 09950-70010

09951-07100

NOTICE:

Press the counter driven gear while rotating it.

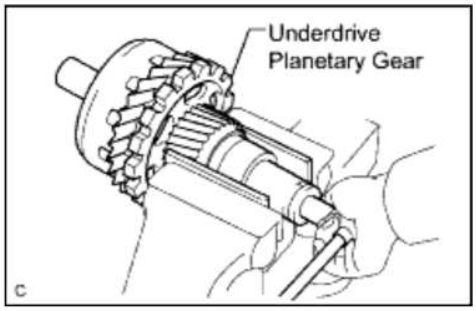
60. INSTALL FRONT PLANETARY GEAR NUT

(a) Clamp the underdrive planetary gear in a soft jaw vise.

NOTICE:

Be careful not to damage the differential drive pinion.

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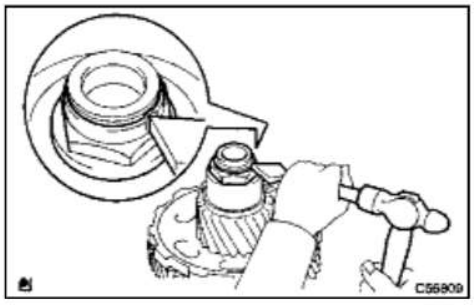


(b) Using a socket wrench, install a new gear nut.

Torque: 280 N·m (2855 kgf·cm, 207ft·lbf)

HINT:

Use a torque wrench with a fulcrum length of 750 mm (29.53 in.).

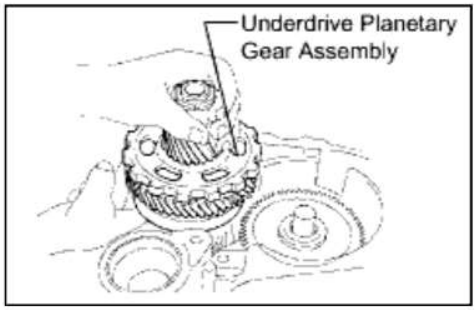


(c) Using a chisel and hammer, stake the gear nut.

CAUTION:

Be sure that there are no cracks on the nut.

61. INSTALL UNDERDRIVE PLANETARY GEAR ASSEMBLY



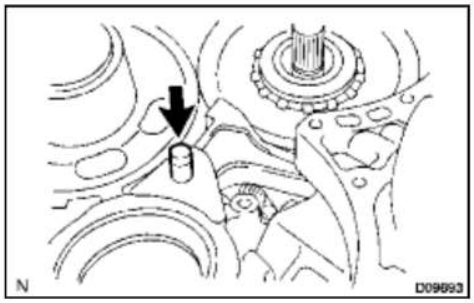
(a) Install the underdrive planetary gear assembly to the transaxle case.

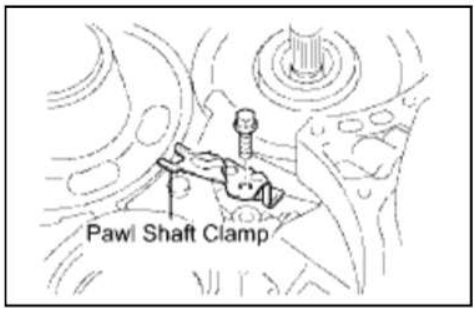
NOTICE:

Firmly engage all the discs of the underdrive clutch with the hub splines of the underdrive planetary gear assembly and securely assemble them.

(b) Install the parking lock pawl shaft.

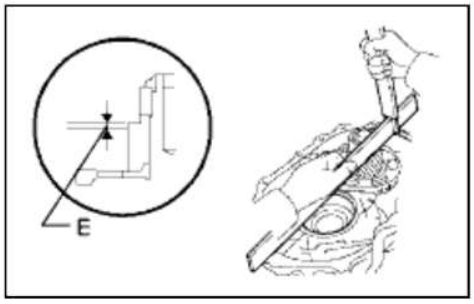
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(c) Install the pawl shaft clamp with the bolt.

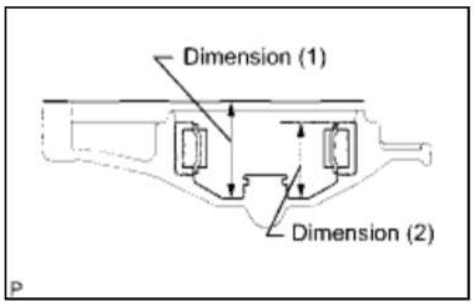
Torque: 9.8 N·m (100 kgf·cm, 87in·lbf)



(d) Using a straightedge and a vernier caliper as shown in the illustration, measure the gap between the top of the differential drive pinion in the underdrive planetary gear and contact surface of the transaxle case and housing (Dimension E).

NOTICE:

Take a note of dimension E because it is necessary for the following process.



(e) As shown in the illustration, measure the 2 places of the transaxle housing, and calculate dimension F using the following formula.

NOTICE:

Take a note of dimension F because it is necessary for the following process.

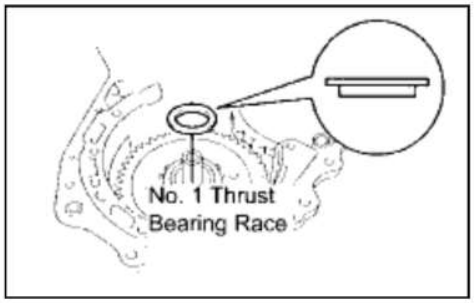
HINT:

Dimension F = Dimension (1) - Dimension (2)

62. INSTALL MULTIPLE DISC CLUTCH HUB

(a) Install the No. 1 thrust bearing race to the transaxle case

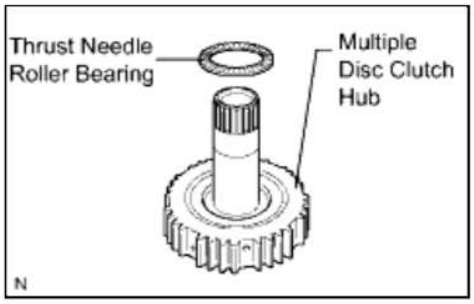
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while checking its direction.

Bearing Race Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing Race	34.5 (1.359)	48.5 (1.909)

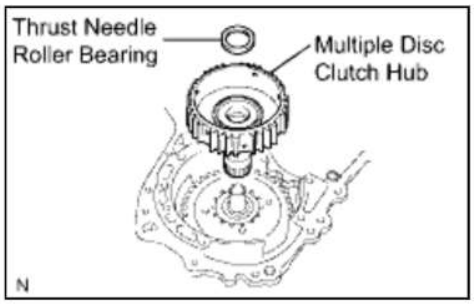


(b) Coat the thrust needle roller bearing and race with ATF, and install them onto the multiple disc clutch hub.

Thrust Bearing and Race Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Thrust Bearing	36.3 (1.429)	52.2 (2.055)

(c) Coat the needle roller bearing with ATF.



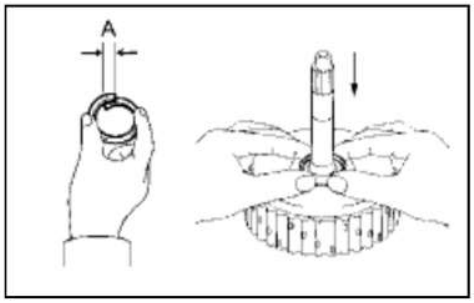
(d) Install the needle roller bearing to the multiple disc clutch hub.

Bearing Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing	23.5 (0.925)	44.0 (1.732)

(e) Install the multiple disc clutch hub to the transaxle case.

63. INSTALL INPUT SHAFT OIL SEAL RING



(a) Compress a new input shaft oil seal ring from both sides to adjust dimension A.

Dimension A:
5 mm (0.197 in.)

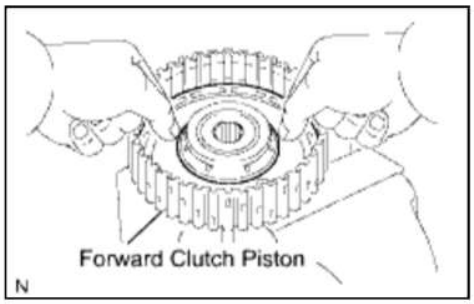
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(b) Coat the oil seal ring with ATF and install it to the input shaft.

NOTICE:

Do not expand the gap of the oil seal ring too much. Securely engage the hooks.

64. INSTALL FORWARD CLUTCH PISTON SUB-ASSEMBLY

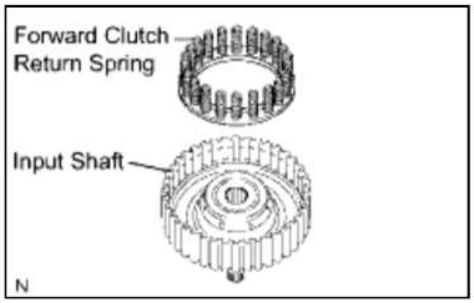


(a) Coat the forward clutch piston with ATF, and install it to the input shaft.

NOTICE:

Be careful not to damage the lip seal of the forward clutch piston.

65. INSTALL FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

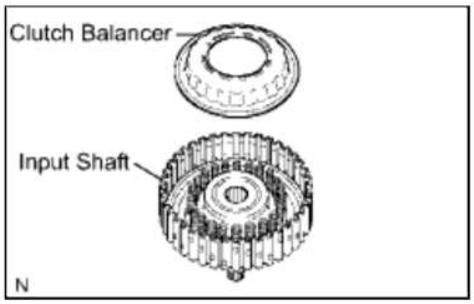


(a) Install the return spring to the input shaft.

NOTICE:

After installing the spring sub-assembly, check that all of the springs are fitted to piston correctly.

(b) Coat the clutch balancer with ATF.



(c) Install the clutch balancer to the input shaft.

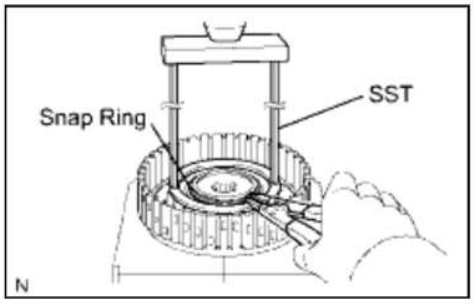
NOTICE:

- Be careful not to damage the lip seal of the forward clutch balancer.
- Install the clutch balancer carefully not to pinch or damage at the sealing lip.
- Apply sufficient ATF to the sealing lip prior to installation.

(d) Place SST on the clutch balancer, and compress the clutch balancer with a press.

SST: 09387-00020

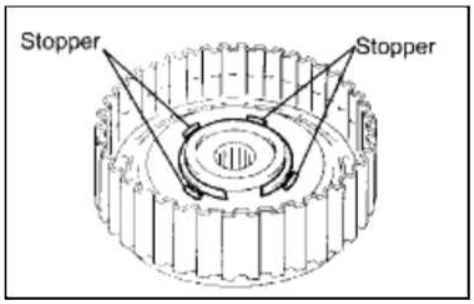
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(e) Install the snap ring with a snap ring expander.

NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.
- Do not expand the snap ring excessively.



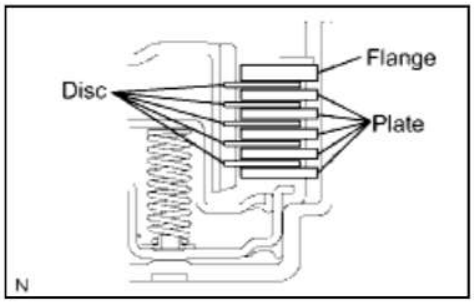
(f) Position the end gap of the snap ring in the piston as shown in the illustration.

NOTICE:

The end gap of the snap ring should not be aligned with any of the stoppers.

66. INSTALL FORWARD MULTIPLE DISC CLUTCH DISC

(a) Coat the 5 discs with ATF.



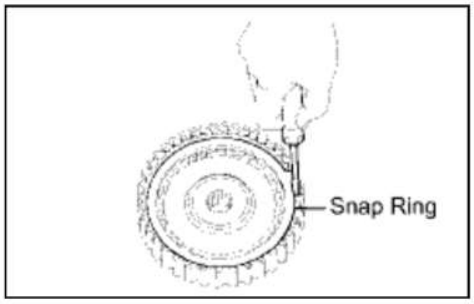
(b) Install the 5 plates, 5 discs, and flange to the input shaft.

NOTICE:

Be careful about the order of discs, plates, and flange.

(c) Using a screwdriver, install the snap ring.

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(d) Check that the end gap of the snap ring is not aligned with one of the cutouts.

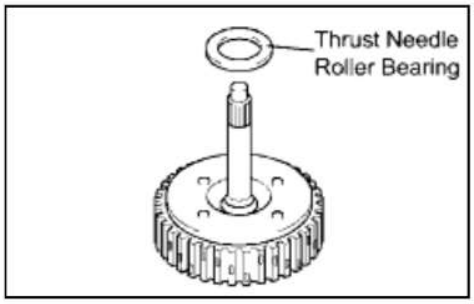
NOTICE:

The snap ring should be securely engaged in the groove of the drum.

67. INSPECT PACK CLEARANCE OF FORWARD CLUTCH INFO

68. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC INFO

69. INSTALL FORWARD CLUTCH ASSEMBLY



(a) Coat the thrust needle roller bearing with ATF.

(b) Install the thrust needle roller bearing to the forward clutch.

Thrust Bearing Diameter

	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Thrust Bearing	33.85 (1.3327)	52.2 (2.0551)

NOTICE:

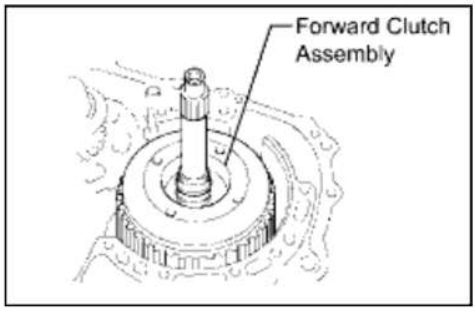
Install the thrust bearing properly so that the tempered side of the race will be visible.

(c) Install the forward clutch to the forward clutch assembly.

NOTICE:

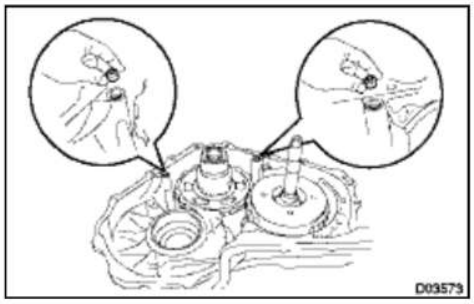
- Align the splines of all discs in the forward clutch with those of the multiple clutch hub to assemble them securely.
- Be careful not to damage the bush inside the forward clutch

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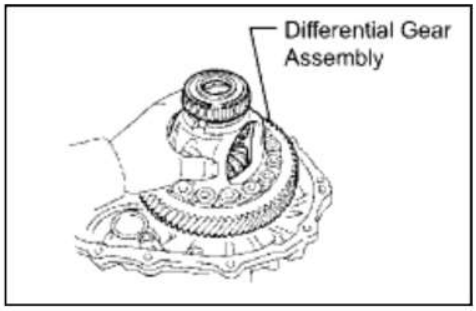
hub during installation.

70. INSTALL OVERDRIVE BRAKE GASKET



(a) Install 2 new overdrive brake gaskets.

71. INSTALL DIFFERENTIAL GEAR ASSEMBLY

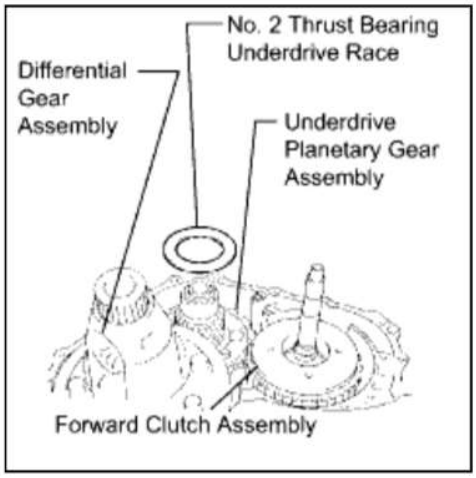


(a) Install the differential gear assembly to the transaxle case.

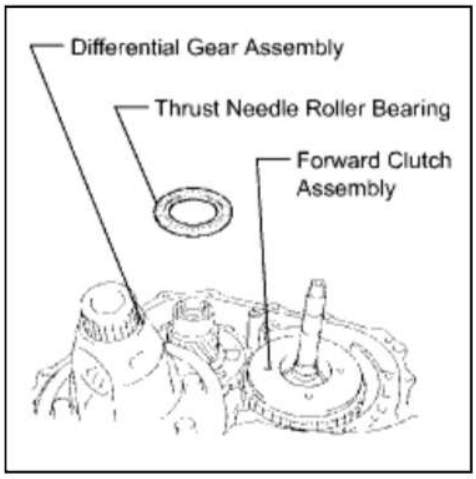
72. INSTALL NO. 2 THRUST BEARING UNDERDRIVE RACE

(a) Install the No. 2 thrust bearing underdrive race to the underdrive planetary gear assembly.

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73. INSTALL THRUST NEEDLE ROLLER BEARING



(a) Coat the thrust needle roller bearing with ATF.

(b) Calculate the end play value using the following formula and values of Dimensions E and F that ware measured when installing the cylindrical roller bearing and underdrive planetary gear. Select an appropriate No. 2 underdrive planetary gear thrust bearing race which satisfies the specified end play value, and install it.

End play:
0.198 to 0.693 mm (0.00779 to 0.02728 in.)

HINT:

End play = Dimension F - Dimension E - Thrust bearing thickness 2.5 mm (0.0984 in.) - No. 2 underdrive thrust bearing race thickness.

Race Thickness: mm (in.)

F - E (MM (IN.))	THICKNESS (MM (IN.))
Less than 7.339 (0.28894)	3.5 (0.138)

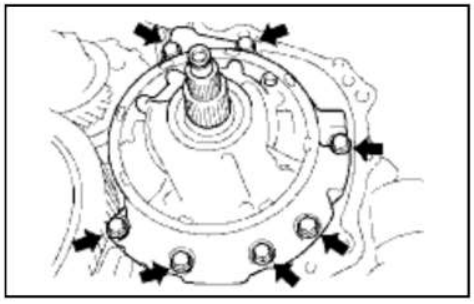
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F - E (MM (IN.))	THICKNESS (MM (IN.))
7.339 (0.28894) or more	3.9 (0.154)

Bearing and Bearing Race Diameter

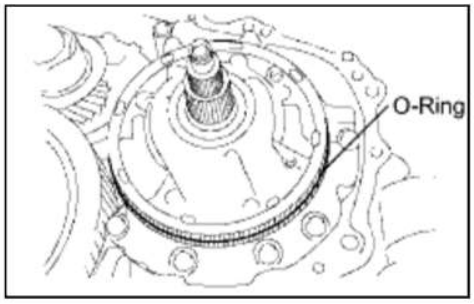
	INSIDE (MM (IN.))	OUTSIDE (MM (IN.))
Bearing	53.0 (2.087)	78.2 (3.079)
Bearing race	52.1 (2.051)	75.5 (2.972)

74. INSTALL OIL PUMP ASSEMBLY



(a) Install the oil pump to the transaxle case with the 7 bolts.

Torque: 22 N·m (225 kgf·cm, 16ft·lbf)

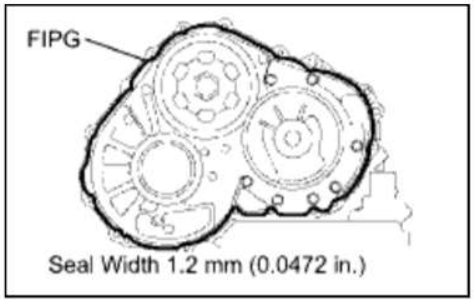


(b) Coat the O-ring of the oil pump with ATF.

NOTICE:

Confirm that the input shaft rotates smoothly by hand after installing the oil pump.

75. INSTALL TRANSAXLE HOUSING



(a) Remove any FIPG material and keep the contact surfaces of the transaxle case and transaxle housing away from oil.

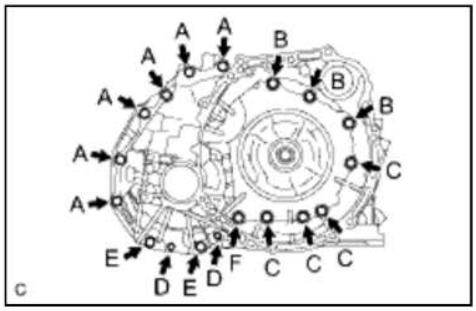
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(b) Apply FIPG to the transaxle case.

FIPG:
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

(c) Install the transaxle housing to the transaxle case with the 18 bolts.

Bolt A - Torque: 29 N·m (296 kgf·cm, 21ft·lbf)
Bolt B - Torque: 29 N·m (296 kgf·cm, 21ft·lbf)
Bolt C - Torque: 22 N·m (225 kgf·cm, 16ft·lbf)
Bolt D - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)
Bolt E - Torque: 33 N·m (336 kgf·cm, 24ft·lbf)
Bolt F - Torque: 25 N·m (255 kgf·cm, 18ft·lbf)



HINT:

Apply seal packing or equivalent to bolts C and F.

Seal packing:
Toyota Genuine Seal Packing 1344, Three Bond 1344 or equivalent

Bolt length

Bolt B, C, D, F

50 mm (1.969 in.)

Bolt A, E

42 mm (1.654 in.)

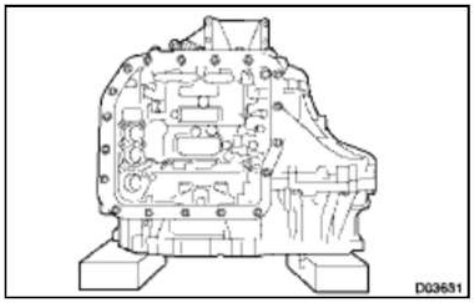
NOTICE:

Apply seal packing to new bolts and tighten them within 10 minutes of application.

76. INSPECT INPUT SHAFT END PLAY

INFO

77. SECURE AUTOMATIC TRANSAXLE ASSEMBLY

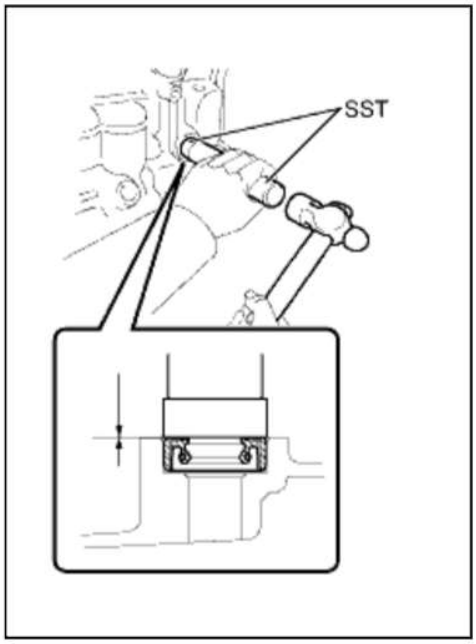


(a) Secure the transaxle assembly onto wooden blocks.

78. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

(a) Coat a new oil seal with MP grease.

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(b) Using SST and hammer, install the oil seal to the transaxle case.

SST: 09950-60010

09951-00230

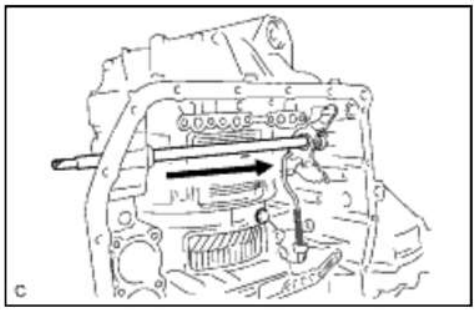
SST: 09950-70010

09951-07100

Oil seal drive in depth:

-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

79. INSTALL PARKING LOCK ROD SUB-ASSEMBLY



(a) Install the parking lock rod to the manual valve lever.

HINT:

Align the dial with the notches on the manual valve lever and turn the dial 90° to install the parking lock rod.

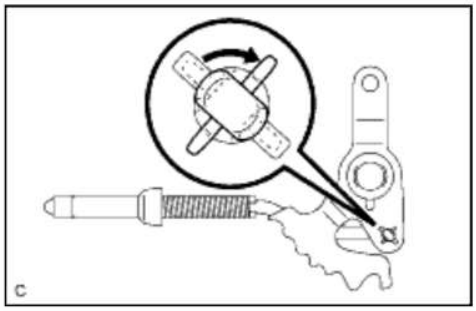
80. INSTALL MANUAL VALVE LEVER SUB-ASSEMBLY

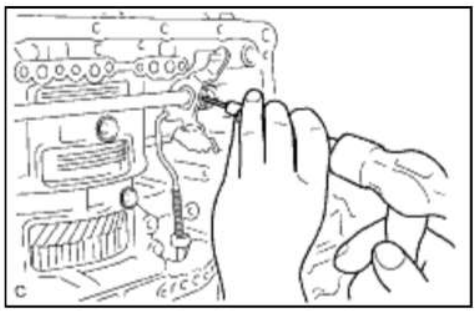
(a) Install a new spacer and the manual valve lever shaft to the transaxle case.

NOTICE:

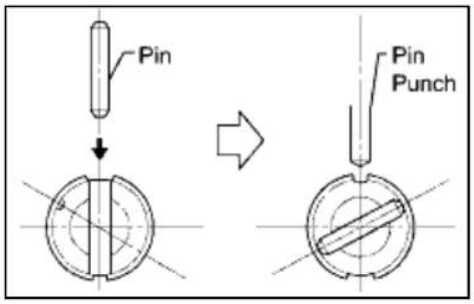
Do not damage the oil seal while installing the shaft to the transaxle case.

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(b) Using a pin punch and hammer, drive in a new pin.

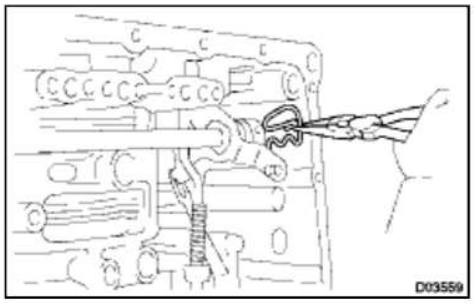


(c) Turn the spacer and the lever shaft to align the smaller hole of the spacer with the staking position mark on the lever shaft.

(d) Using a pin punch, stake the spacer through the small hole.

(e) Check that the spacer does not turn.

81. INSTALL MANUAL VALVE LEVER SHAFT RETAINER SPRING



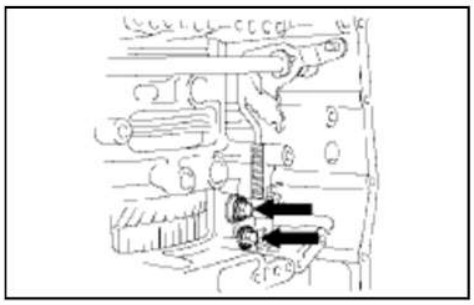
(a) Using needle-nose pliers, install the retainer spring.

NOTICE:

Securely attach the spring onto the shaft.

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82. INSTALL PARKING LOCK PAWL BRACKET



(a) Install the parking lock pawl bracket with the 2 bolts.

Torque: 20 N·m (205 kgf·cm, 15ft·lbf)

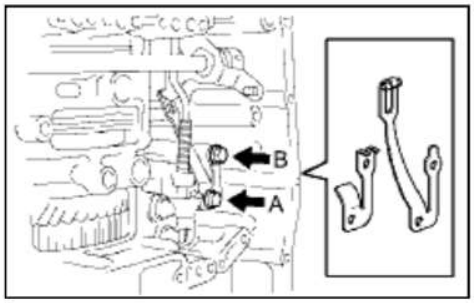
Bolt length:

25 mm (0.984 in.)

NOTICE:

Be sure the parking rod is placed between the parking pawl and the guide of the parking bracket after the parking bracket is installed.

83. INSTALL MANUAL DETENT SPRING SUB-ASSEMBLY



(a) Install the manual detent spring sub-assembly with the 2 bolts.

NOTICE:

Make sure to install the manual detent spring and cover in this order.

HINT:

Tighten bolt A first, then B.

Bolt A - Torque: 20 N·m (205 kgf·cm, 15ft·lbf)

Bolt B - Torque: 12 N·m (120 kgf·cm, 9ft·lbf)

Bolt length:

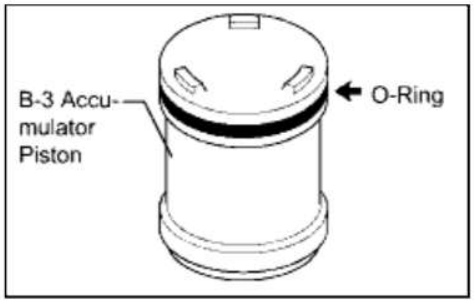
Bolt A

27 mm (1.06 in.)

Bolt B

16 mm (0.630 in.)

84. INSTALL B-3 ACCUMULATOR PISTON



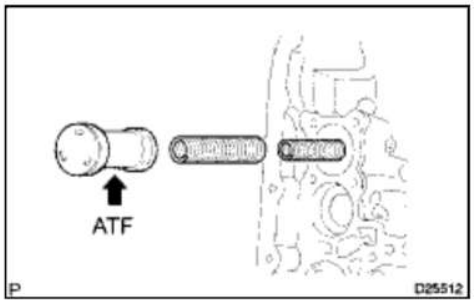
(a) Coat a new O-ring with ATF, and install it to the B-3 accumulator piston.

NOTICE:

Install the O-ring to the accumulator piston, being careful not to twist or pinch it. Apply enough ATF to the O-ring prior to installation. Be sure to confirm the installation position.

(b) Coat the piston and springs with ATF, and install them to the transaxle case.

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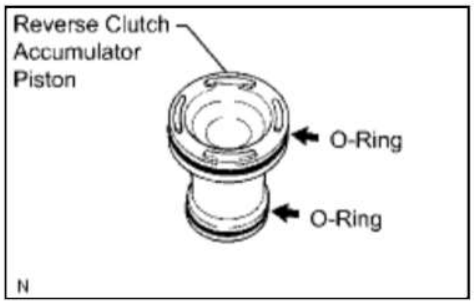
NOTICE:

Install the correct springs to the B-3 accumulator piston after confirming the color and dimension of the springs.

Accumulator Spring

FREE LENGTH / OUTER DIAMETER (MM (IN.))	COLOR
Inner: 62.00 (2.4409) / 15.50 (0.610)	Purple
Outer: 74.23 (2.9224) / 21.70 (0.854)	Purple

85. INSTALL REVERSE CLUTCH ACCUMULATOR PISTON

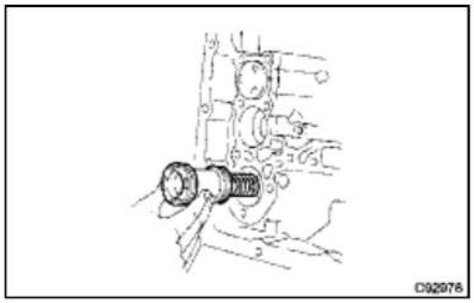


(a) Coat 2 new O-rings with ATF, and install them to the reverse clutch accumulator piston.

NOTICE:

Install the O-rings to the accumulator piston, being careful not to twist or pinch it. Apply enough ATF to the O-rings prior to installation. Be sure to confirm the installation positions.

(b) Coat the piston and spring with ATF, and install them to the transaxle case.



NOTICE:

Install the correct spring to the reverse clutch accumulator piston after confirming the color or dimension of the spring.

Accumulator Spring

FREE LENGTH / OUTER DIAMETER (MM (IN.))	COLOR
60.96 (2.3999) / 14.10 (0.555)	Yellow

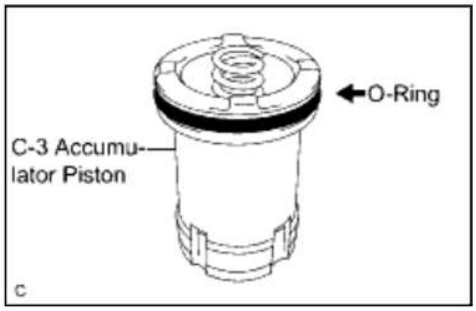
86. INSTALL C-3 ACCUMULATOR PISTON

(a) Coat a new O-ring with ATF, and install it to the C-3 accumulator piston.

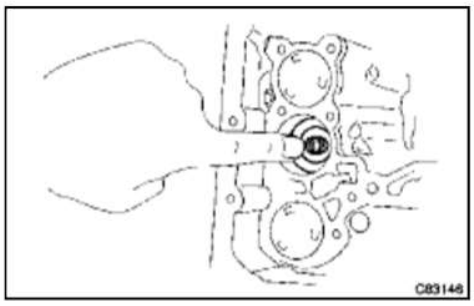
NOTICE:

Install the O-ring to the accumulator piston, being careful not to twist or pinch it. Apply enough ATF to the O-ring prior to

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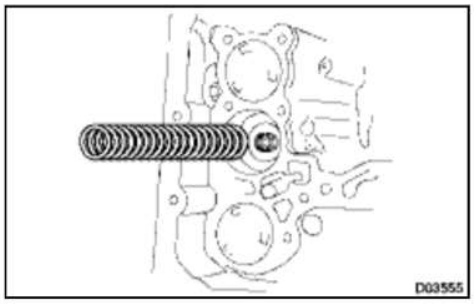


installation. Be sure to confirm the installation position.



(b) Coat the piston with ATF, and install it to the transaxle case.

(c) Install the spring to the C-3 accumulator piston.



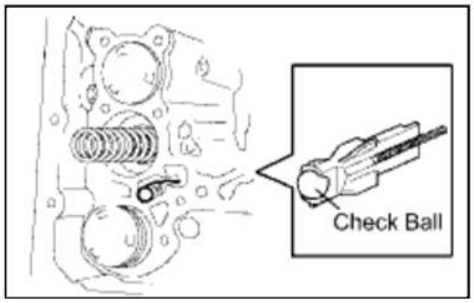
NOTICE:

Install the correct spring to the C-3 accumulator piston after confirming the color and dimension of the spring.

Accumulator Spring

FREE LENGTH / OUTER DIAMETER (MM (IN.))	COLOR
72.20 (2.8425) / 19.0 (0.748)	No color

87. INSTALL CHECK BALL BODY



(a) Coat the check ball body with ATF.

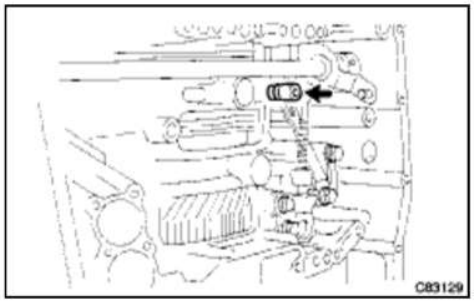
(b) Install the check ball body and spring.

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NOTICE:

Regarding the installation of the spring and the check ball body, be sure to place the spring into ball body. Be sure to install the parts in the correct direction.

88. INSTALL BRAKE DRUM GASKET

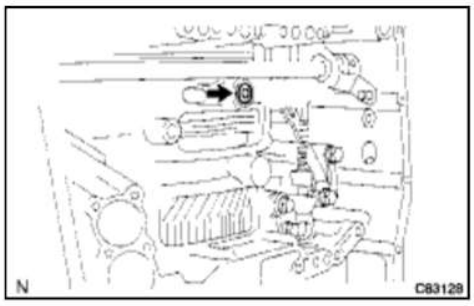


(a) Coat a new brake drum gasket with ATF, and install it to the transaxle case.

NOTICE:

Do not damage the lip portion of the brake drum gasket when inserting the gasket to the case. Apply sufficient ATF to the gasket prior to installation. Be sure to install the parts in the correct direction.

89. INSTALL TRANSAXLE CASE 2ND BRAKE GASKET

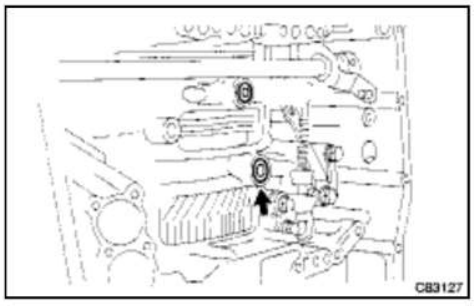


(a) Coat a new transaxle case 2nd brake gasket with ATF, and install it to the transaxle case.

NOTICE:

Do not damage the lip portion of the transaxle case 2nd brake gasket when inserting the gasket to the case. Apply sufficient ATF to the gasket prior to installation. Be sure to install the parts in the correct direction.

90. INSTALL NO. 1 GOVERNOR APPLY GASKET



(a) Coat a new No. 1 governor apply gasket with ATF, and install it to the transaxle case.

NOTICE:

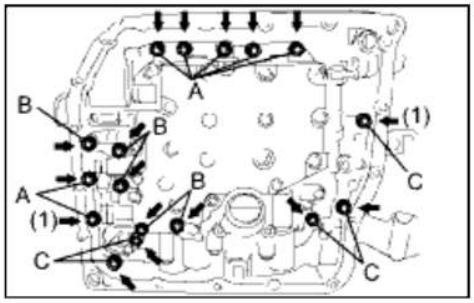
Do not damage the lip portion of the No. 1 governor apply gasket when inserting the gasket to the case. Apply sufficient ATF to the gasket prior to installation. Be sure to install the parts in the correct direction.

91. INSTALL TRANSMISSION VALVE BODY ASSEMBLY

(a) Check the manual valve lever position. Install the valve body to the transaxle case with the 17 bolts.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

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Bolt length:

Bolt A

25 mm (0.984 in.)

Bolt B

57 mm (2.244 in.)

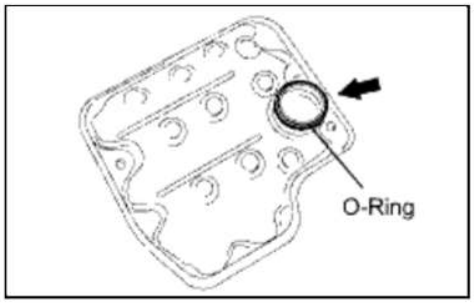
Bolt C

41 mm (1.614 in.)

NOTICE:

- Push the valve body against the accumulator piston spring and the check ball body to install it.
- When installing the valve body to the transaxle case, do not hold the solenoids.
- Temporarily tighten the bolts marked by (1) in the illustration first because they are positioning bolts.

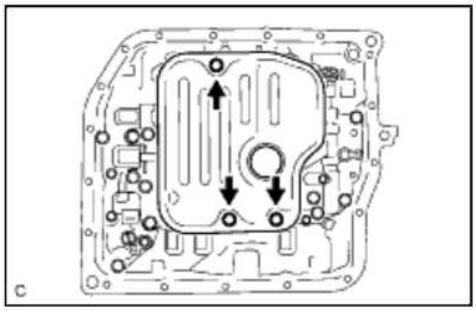
92. INSTALL VALVE BODY OIL STRAINER ASSEMBLY



(a) Coat a new O-ring with ATF, and install it to the oil strainer.

NOTICE:

Install the O-ring carefully to avoid twists or pinches. Apply sufficient ATF to the O-ring prior to installation.



(b) Install the oil strainer to the valve body with the 3 bolts.

Torque: 11 N·m (110 kgf·cm, 8ft·lbf)

NOTICE:

Apply ATF to the bolts prior to installation.

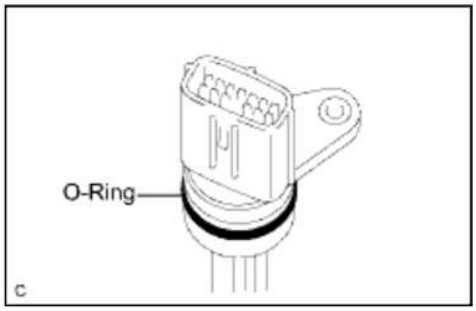
93. INSTALL TRANSMISSION WIRE

(a) Coat a new O-ring with ATF, and install it to the transmission wire.

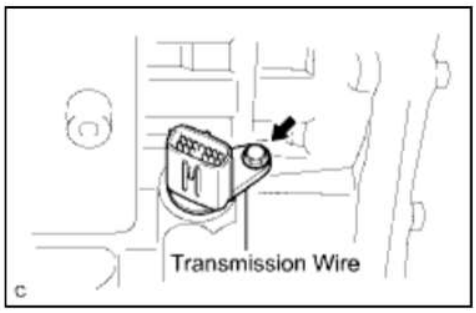
NOTICE:

Install the O-ring carefully to avoid twists or pinches. Apply

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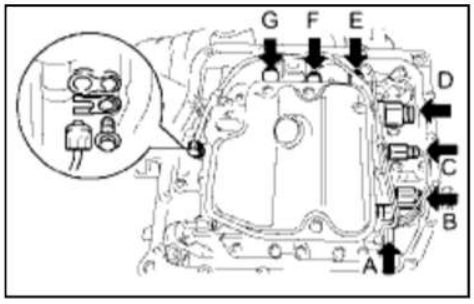
enough ATF to the O-ring prior to installation.



(b) Install the transmission wire retaining bolt.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

94. CONNECT TRANSMISSION WIRE



(a) Coat the ATF temperature sensor O-ring with ATF.

(b) Install the ATF temperature sensor with the lock plate and bolt.

Torque: 6.6 N·m (67 kgf·cm, 58in·lbf)

(c) Connect the 7 solenoid connectors.

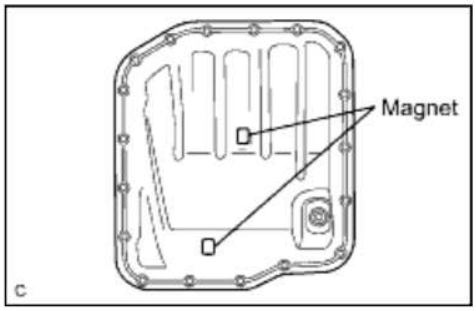
NOTICE:

- Connect the connectors to A, B, C, D, E, F and G, starting with shorter connectors first.
- Apply ATF to the bolt prior to installation.

95. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY

(a) Install the 2 magnets to the oil pan.

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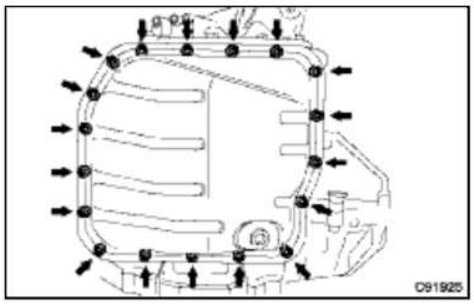


(b) Apply seal packing or equivalent to the 18 bolts.

Seal packing:
Toyota Genuine Seal Packing 1344, Three Bond 1344 or Equivalent

NOTICE:

- Apply seal packing to new bolts and tighten them within 10 minutes of application.
- Completely remove any oil or grease from the gasket contact surface of the transaxle case and the oil pan before installing the oil pan to the case.



(c) Install a new oil pan gasket and the oil pan to the transaxle case with the 18 bolts.

Torque: 7.8 N·m (80 kgf·cm, 69in·lbf)

NOTICE:

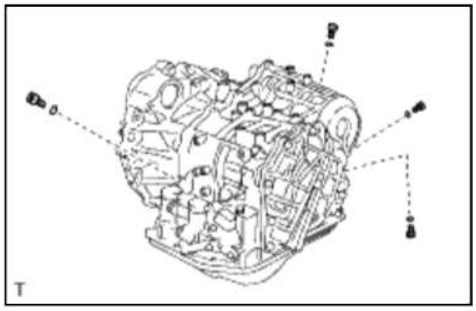
- Apply seal packing to new bolts and tighten them within 10 minutes of application.
- Completely remove any oil or grease from the gasket contact surface of the transaxle case and the oil pan before installing the oil pan to the case.

(d) Install a new gasket to the drain plug.

(e) Install the drain plug.

Torque: 49 N·m (500 kgf·cm, 36ft·lbf)

96. INSTALL NO. 1 TRANSAXLE CASE PLUG



(a) Coat 4 new O-rings with ATF, and install them to the 4 No. 1 transaxle case plugs.

(b) Install the 4 No. 1 transaxle case plugs to the transaxle case.

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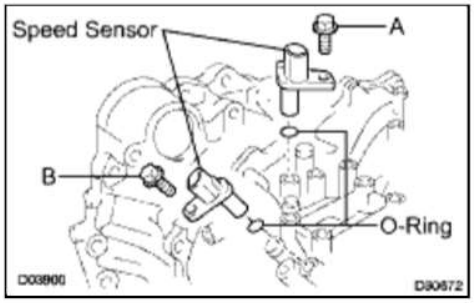
Torque: 7.4 N·m (75 kgf·cm, 65in·lbf)

97. INSTALL SPEED SENSOR

(a) Coat 2 new O-rings with ATF, and install them to the 2 speed sensors.

(b) Apply adhesive to the bolts threads.

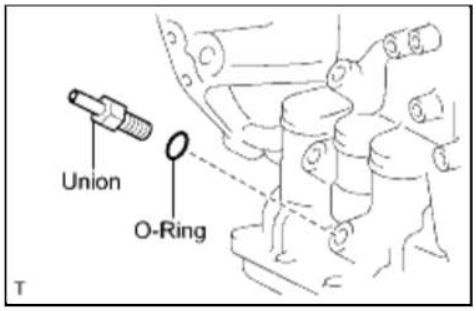
Sealant:
Toyota Genuine Adhesive 1344, Three Bond 1344 or Equivalent



(c) Install the 2 speed sensors to the transaxle case with the 2 bolts.

Bolt A - Torque: 8.8 N·m (90 kgf·cm, 78in·lbf)
Bolt B - Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

98. INSTALL OIL COOLER TUBE UNION (OUTLET OIL COOLER UNION)

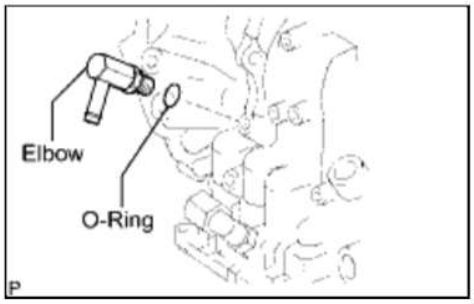


(a) Coat a new O-ring with ATF, and install it to the union.

(b) Install the union to the transaxle case.

Torque: 27 N·m (275 kgf·cm, 20ft·lbf)

99. INSTALL OIL COOLER TUBE ELBOW (INLET OIL COOLER ELBOW)



(a) Coat a new O-ring with ATF, and install it to the elbow.

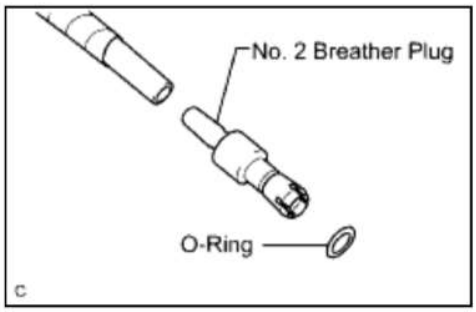
(b) Install the elbow to the transaxle case.

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Torque: 27 N·m (275 kgf·cm, 20ft·lbf)

100. INSTALL NO. 2 BREATHER PLUG

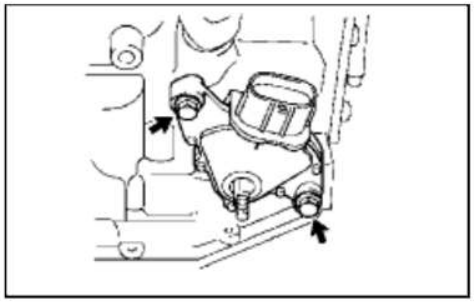
(a) Coat a new O-ring with ATF.



(b) Install the hose and the O-ring to the breather plug.

(c) Install the No. 2 breather plug hose to the transaxle case.

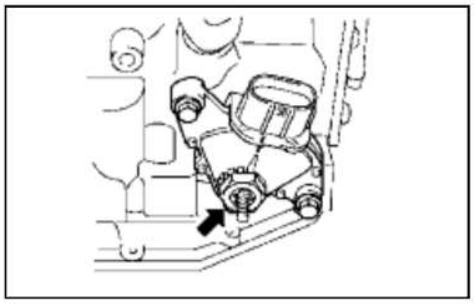
101. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY



(a) Install the park/neutral position switch onto the manual valve lever shaft and temporarily install the 2 adjusting bolts.

(b) Install a new nut stopper and nut.

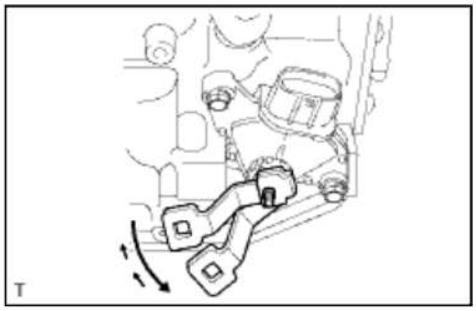
Torque: 6.9 N·m (70 kgf·cm, 61in·lbf)



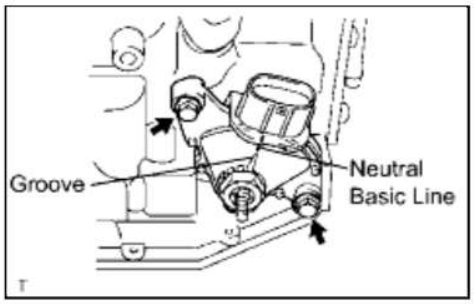
(c) Temporarily install the control shaft lever.

(d) Turn the lever counterclockwise until it stops, and then turn it clockwise 2 notches.

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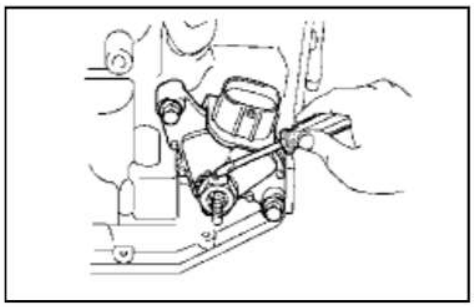
(e) Remove the control shaft lever.



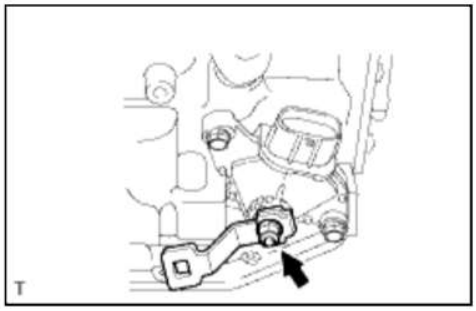
(f) Align the groove with the neutral basic line.

(g) Hold the switch in that position and tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)



(h) Using a screwdriver, stake the nut with the nut stopper.



(i) Install the control shaft lever, washer and nut.

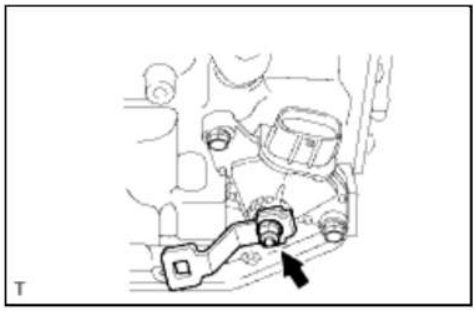
Torque: 13 N·m (130 kgf·cm, 9ft·lbf)

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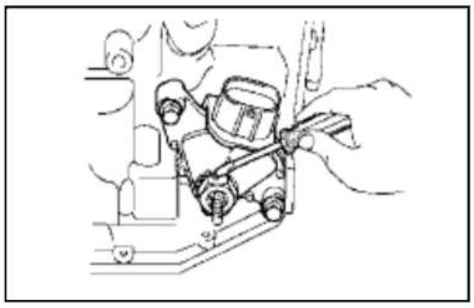
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YX9025X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

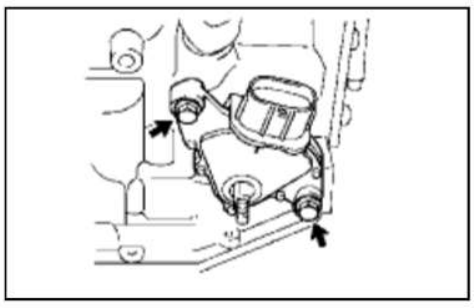
1. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY



(a) Remove the nut, washer and control shaft lever.



(b) Using a screwdriver, unstake the lock plate, and remove the lock nut and nut stopper.

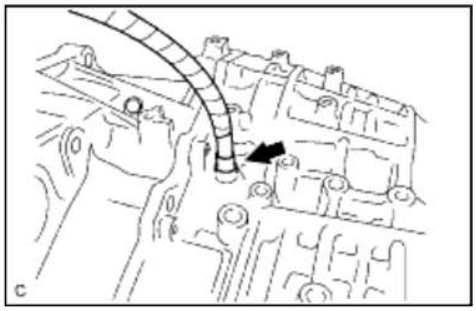


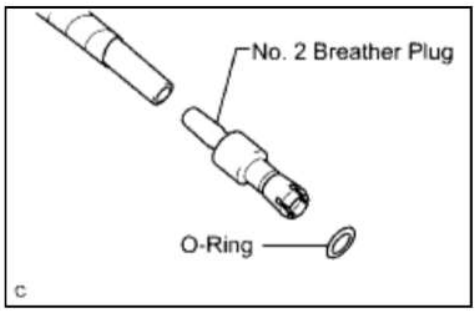
(c) Remove the 2 bolts and pull out the park/neutral position switch.

2. REMOVE NO. 2 BREATHER PLUG

(a) Remove the No. 2 breather plug from the transaxle case.

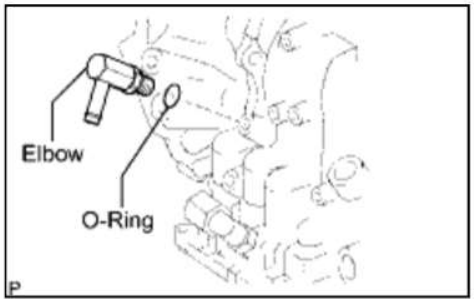
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(b) Remove the hose and O-ring from the No. 2 breather plug.

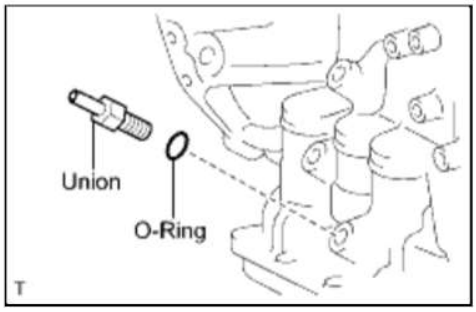
3. REMOVE OIL COOLER TUBE ELBOW (INLET OIL COOLER ELBOW)



(a) Remove the elbow.

(b) Remove the O-ring from the elbow.

4. REMOVE OIL COOLER TUBE UNION (OUTLET OIL COOLER UNION)

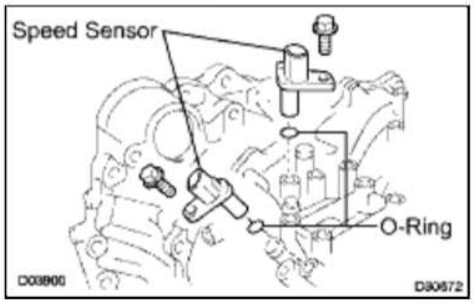


(a) Remove the union.

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(b) Remove the O-ring from the union.

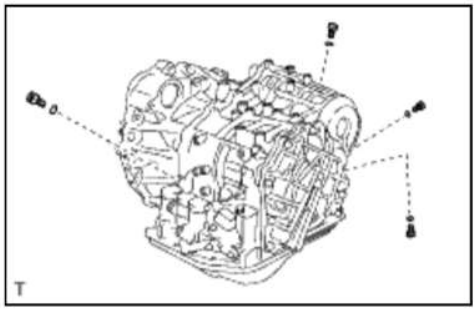
5. REMOVE SPEED SENSOR



(a) Remove the 2 bolts and the 2 speed sensors from the transaxle assembly.

(b) Remove the 2 O-rings from the 2 speed sensors.

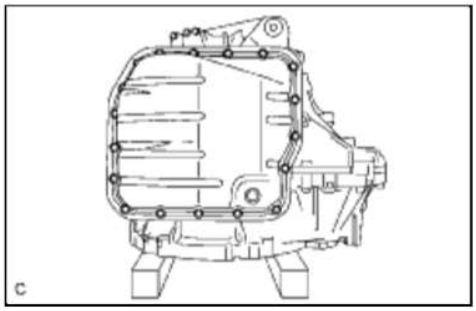
6. REMOVE NO. 1 TRANSAXLE CASE PLUG



(a) Remove the 4 No. 1 transaxle case plugs from the transaxle case.

(b) Remove the O-ring from each No. 1 transaxle case plug.

7. SECURE AUTOMATIC TRANSAXLE ASSEMBLY

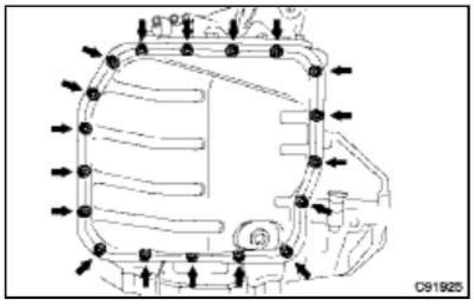


(a) Secure the transaxle assembly onto wooden blocks.

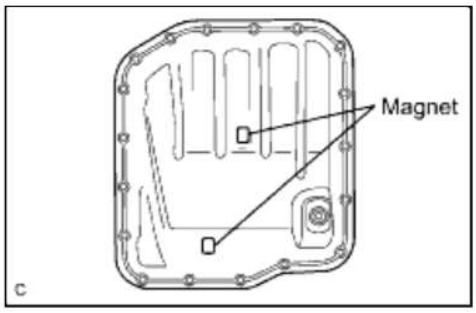
8. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY

(a) Remove the drain plug and drain plug gasket from the oil pan.

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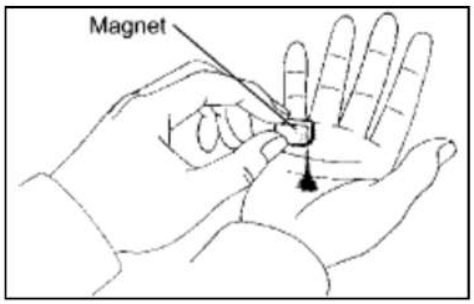


(b) Remove the 18 bolts, oil pan and gasket.



(c) Remove the 2 transmission oil cleaner magnets from the oil pan.

9. INSPECT TRANSMISSION OIL CLEANER MAGNET



(a) Remove the magnets and use them to collect any steel chips. Examine the chips and particles in the pan and on the magnet to determine what type of wear has occurred in the transaxle.

Result:

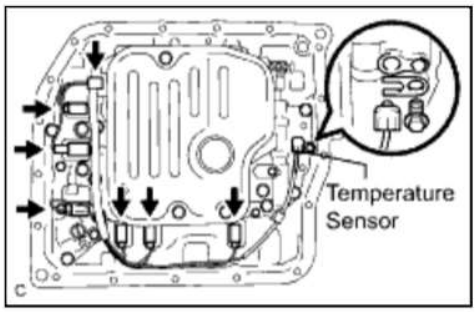
Steel (magnetic)

bearing, gear, and plate wear

Brass (non-magnetic)

bushing wear

10. DISCONNECT TRANSMISSION WIRE

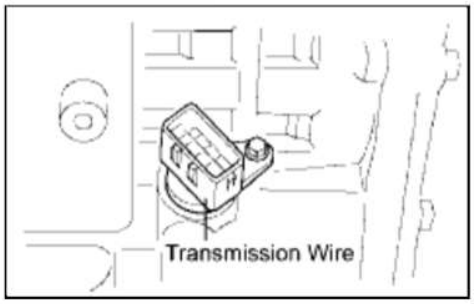


(a) Disconnect the 7 connectors from the shift solenoid valves.

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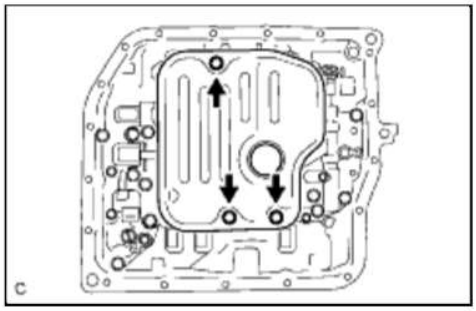
(b) Remove the bolt, lock plate, and ATF temperature sensor.

11. REMOVE TRANSMISSION WIRE

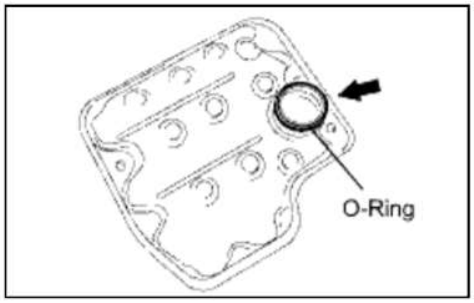


(a) Remove the bolt and transmission wire from the transaxle case.

12. REMOVE VALVE BODY OIL STRAINER ASSEMBLY



(a) Remove the 3 bolts and oil strainer.

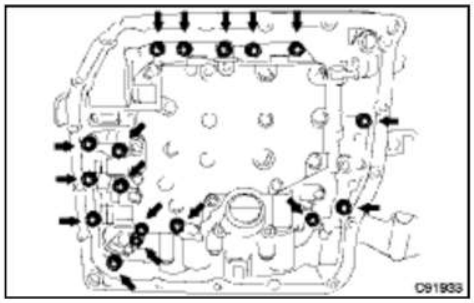


(b) Remove the O-ring from the oil strainer.

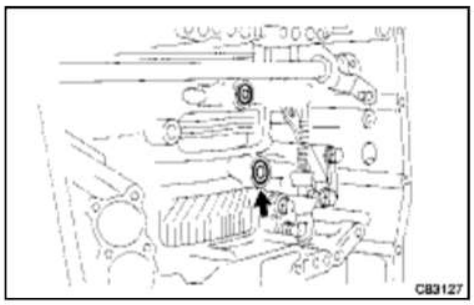
13. REMOVE TRANSMISSION VALVE BODY ASSEMBLY

(a) Support the valve body assembly and remove the 17 bolts and valve body assembly.

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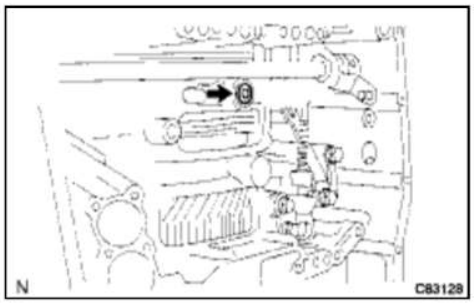


14. REMOVE NO. 1 GOVERNOR APPLY GASKET



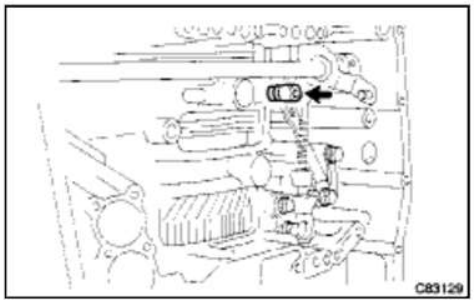
(a) Remove the No. 1 governor apply gasket from the transaxle case.

15. REMOVE TRANSAXLE CASE 2ND BRAKE GASKET



(a) Remove the transaxle case 2nd brake gasket from the transaxle case.

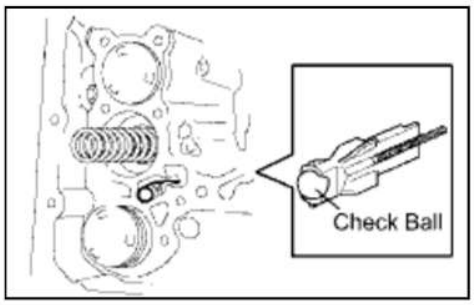
16. REMOVE BRAKE DRUM GASKET



(a) Remove the brake drum gasket from the transaxle case.

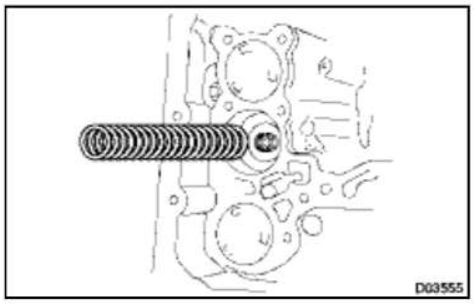
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17. REMOVE CHECK BALL BODY

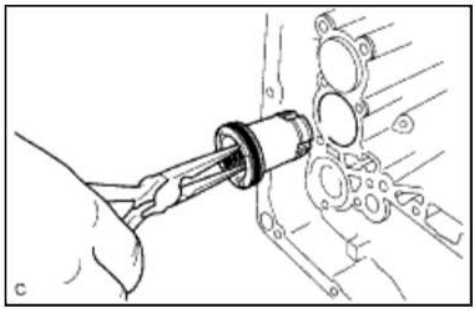


(a) Remove the check ball body and spring from the transaxle case.

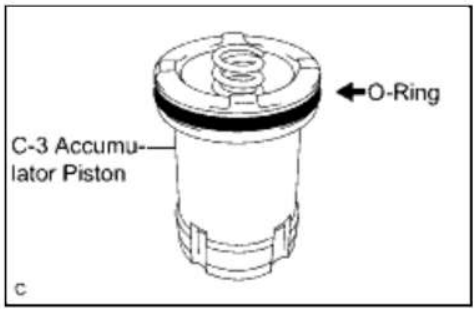
18. REMOVE C-3 ACCUMULATOR PISTON



(a) Remove the spring from the C-3 accumulator piston.



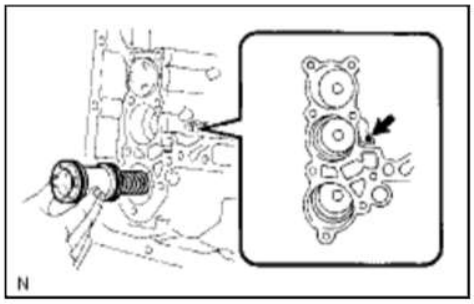
(b) Using needle-nose pliers, remove the C-3 accumulator piston from the transaxle case.



(c) Remove the O-ring from the C-3 accumulator piston.

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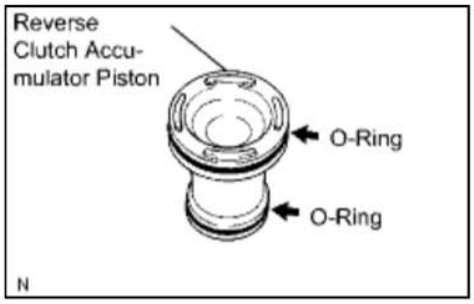
19. REMOVE REVERSE CLUTCH ACCUMULATOR PISTON



(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the oil hole and remove the reverse accumulator piston and spring.

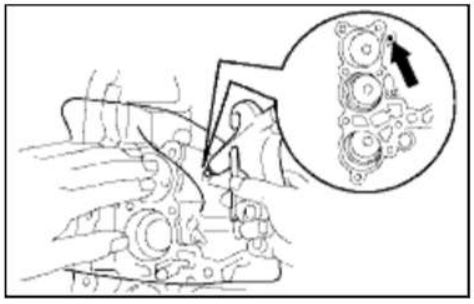
NOTICE:

- Applying compressed air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Take care not to splash ATF when applying compressed air.



(b) Remove the 2 O-rings from the reverse clutch accumulator piston.

20. REMOVE B-3 ACCUMULATOR PISTON



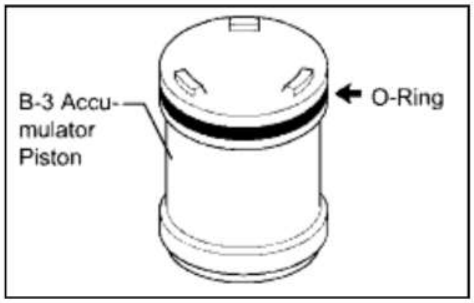
(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the oil hole and remove the B-3 accumulator piston and 2 springs.

NOTICE:

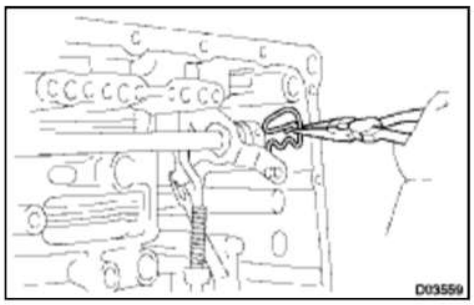
- Applying compressed air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Take care not to splash ATF when applying compressed air.

(b) Remove the O-ring from the B-3 accumulator piston.

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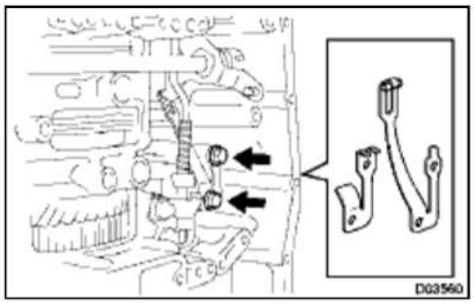


21. REMOVE MANUAL VALVE LEVER SHAFT RETAINER SPRING



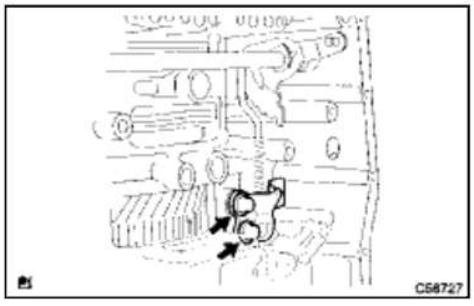
(a) Using needle-nose pliers, remove the manual valve lever shaft retainer spring.

22. REMOVE MANUAL DETENT SPRING SUB-ASSEMBLY



(a) Remove the 2 bolts and manual detent spring sub-assembly.

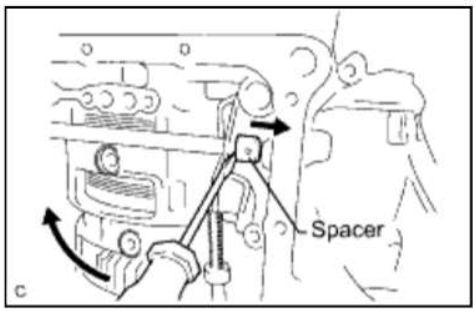
23. REMOVE PARKING LOCK PAWL BRACKET



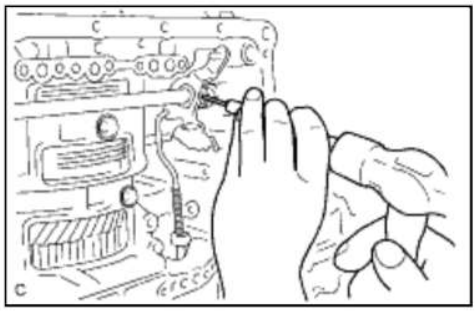
(a) Remove the 2 bolts and parking lock pawl bracket.

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24. REMOVE MANUAL VALVE LEVER SUB-ASSEMBLY



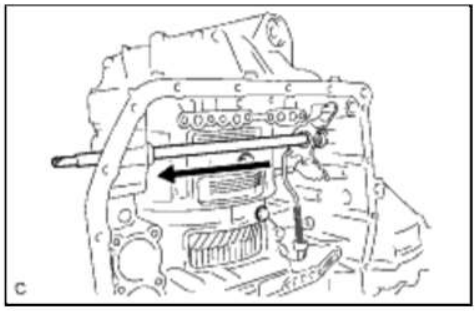
(a) Using a screwdriver, slide the spacer.



(b) Using a pin punch (φ3 mm) and hammer, drive out the pin.

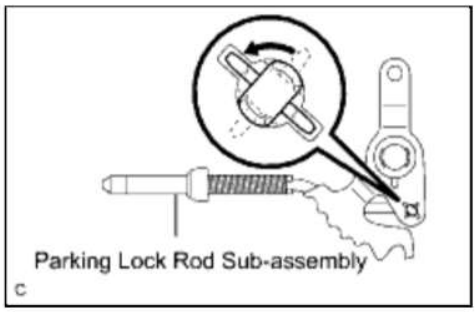
HINT:

Slowly drive out the pin so that it will not fall into the transaxle case.



(c) Remove the manual valve lever shaft, manual valve lever and spacer.

25. REMOVE PARKING LOCK ROD SUB-ASSEMBLY



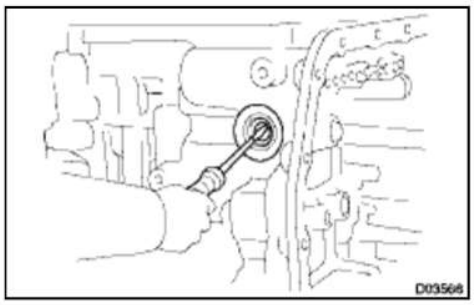
(a) Remove the parking lock rod sub-assembly from the manual valve lever sub-assembly.

HINT:

Align the dial with the notches on the manual valve lever sub-assembly to remove the parking lock rod sub-assembly.

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26. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL



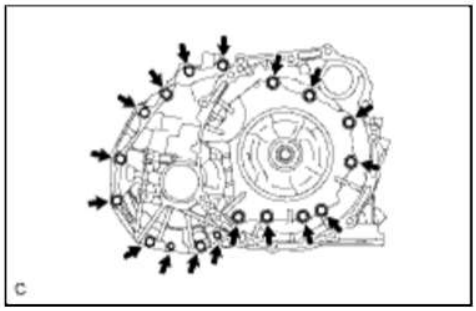
(a) Using a screwdriver, remove the oil seal from the transaxle case.

27. SECURE AUTOMATIC TRANSAXLE ASSEMBLY

(a) Secure the transaxle case with the oil pump facing up.

28. INSPECT INPUT SHAFT END PLAY INFO

29. REMOVE TRANSAXLE HOUSING



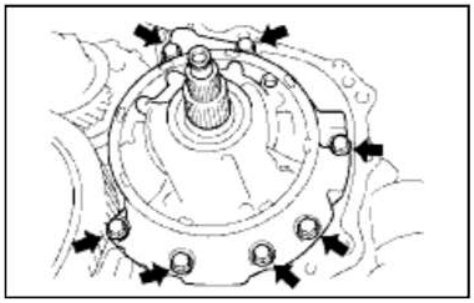
(a) Remove the 18 bolts.

(b) Tap on the circumference of the transaxle housing with a plastic hammer to remove the transaxle housing from the transaxle case.

NOTICE:

The differential may be accidentally removed when the transaxle housing is removed.

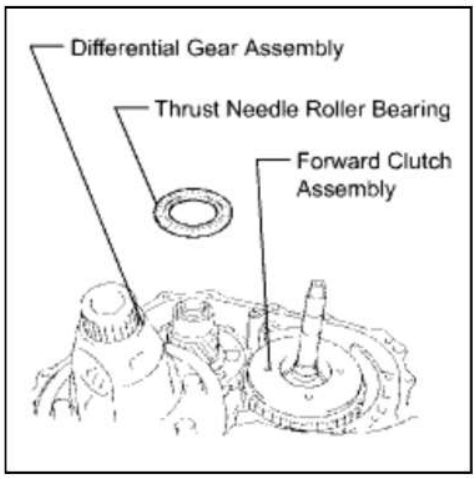
30. REMOVE OIL PUMP ASSEMBLY



(a) Remove the 7 bolts and oil pump from the transaxle case.

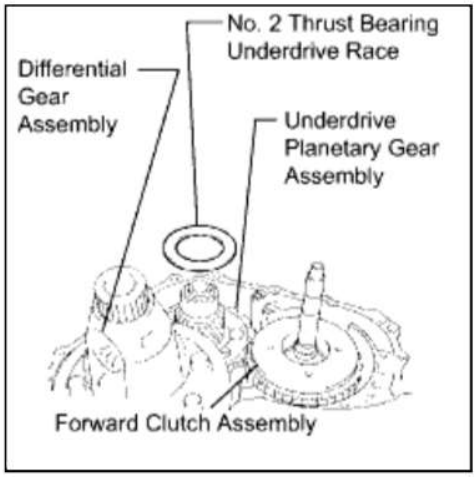
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31. REMOVE THRUST NEEDLE ROLLER BEARING



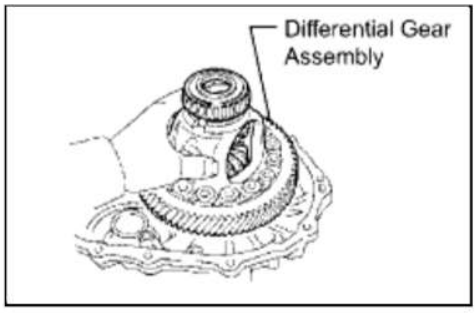
(a) Remove the thrust needle roller bearing from the underdrive planetary gear assembly.

32. REMOVE NO. 2 THRUST BEARING UNDERDRIVE RACE



(a) Remove the No. 2 thrust bearing underdrive race from the underdrive planetary gear assembly.

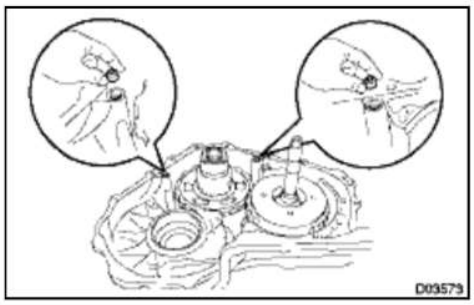
33. REMOVE DIFFERENTIAL GEAR ASSEMBLY



(a) Remove the differential gear assembly from the transaxle case.

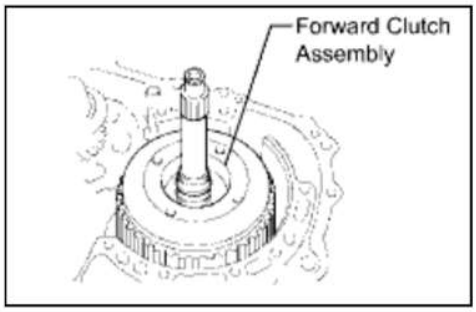
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34. REMOVE OVERDRIVE BRAKE GASKET

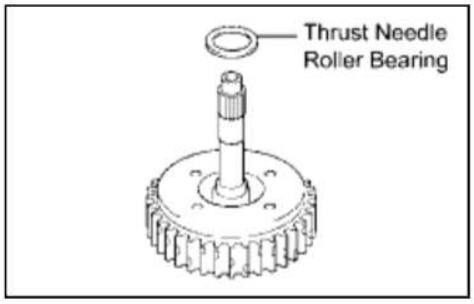


(a) Remove the 2 overdrive brake gaskets from the transaxle case.

35. REMOVE FORWARD CLUTCH ASSEMBLY



(a) Remove the forward clutch assembly from the transaxle case.



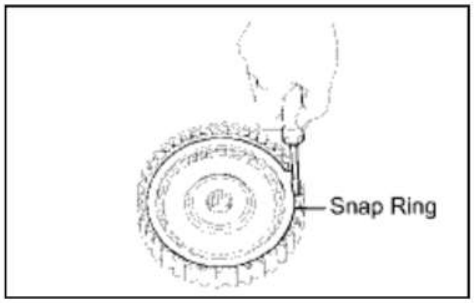
(b) Remove the thrust needle roller bearing from the forward clutch.

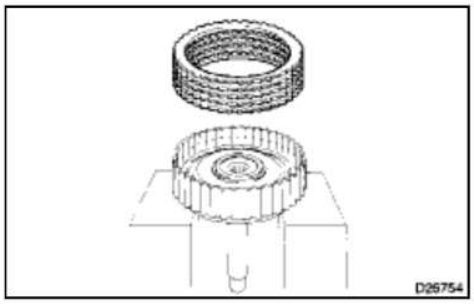
36. INSPECT PACK CLEARANCE OF FORWARD CLUTCH INFO

37. REMOVE FORWARD MULTIPLE DISC CLUTCH DISC

(a) Using a screwdriver, remove the snap ring.

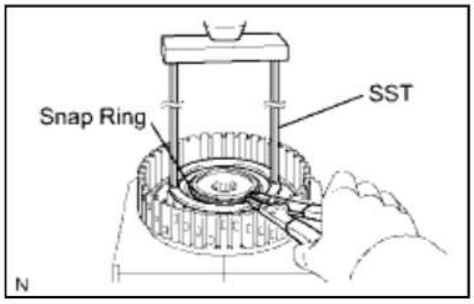
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(b) Remove the flange, 5 discs and 5 plates from the input shaft assembly.

38. REMOVE FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Place SST on the spring retainer and compress the return spring with a press.

SST: 09387-00020

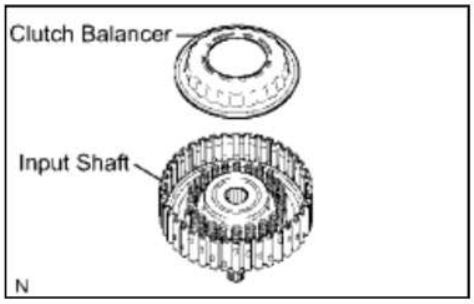
(b) Using a snap ring expander, remove the snap ring.

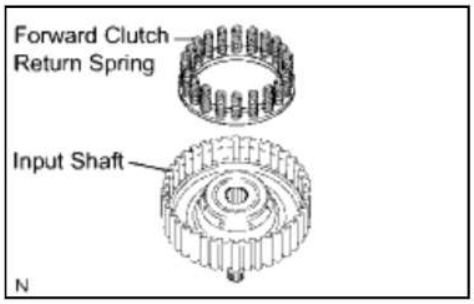
NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.
- Do not expand the snap ring excessively.

(c) Remove the clutch balancer from the input shaft.

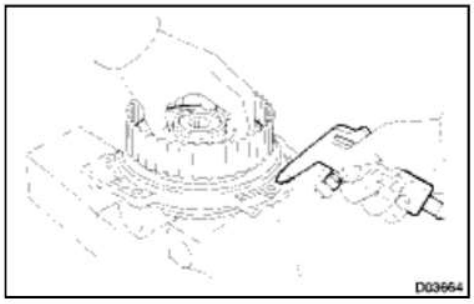
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(d) Remove the forward clutch return spring from the input shaft.

39. REMOVE FORWARD CLUTCH PISTON SUB-ASSEMBLY



(a) Place the forward clutch drum onto the oil pump.

(b) Holding the forward clutch piston by hand, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil pump to remove the forward clutch piston.

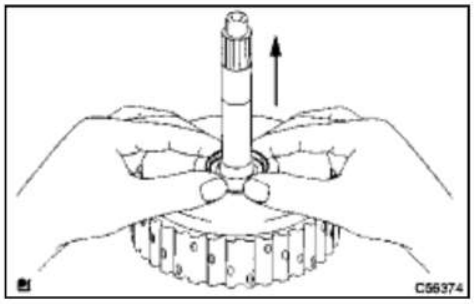
HINT:

If the piston is slanted and cannot be removed, either blow air again with the protruding side pushed, or remove the piston using needle nose pliers with the tips taped.

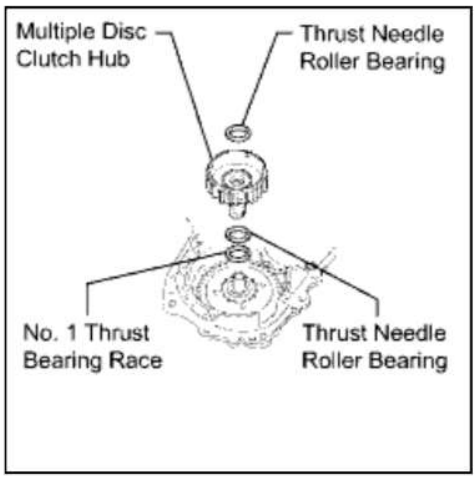
40. REMOVE INPUT SHAFT OIL SEAL RING

(a) Remove the input shaft oil seal ring from the input shaft.

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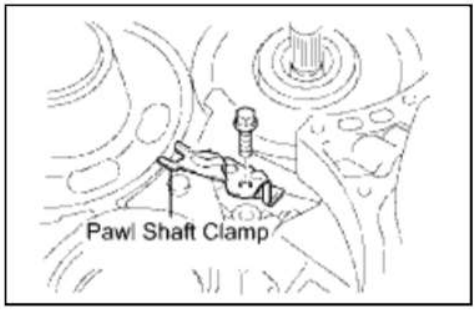
41. REMOVE MULTIPLE DISC CLUTCH HUB



(a) Remove the thrust needle roller bearing, multiple disc clutch hub, thrust needle roller bearing and No. 1 thrust bearing race from the transaxle case.

42. INSPECT MULTIPLE DISC CLUTCH HUB INFO

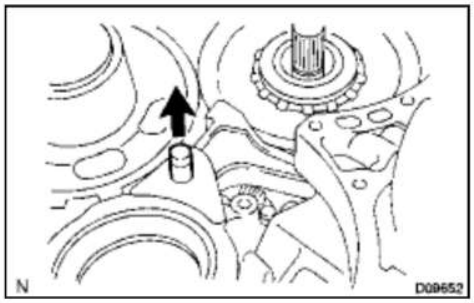
43. REMOVE UNDERDRIVE PLANETARY GEAR ASSEMBLY

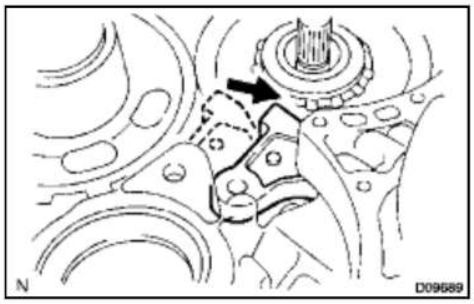


(a) Remove the bolt and pawl shaft clamp from the transaxle case.

(b) Remove the parking lock pawl shaft from the transaxle case.

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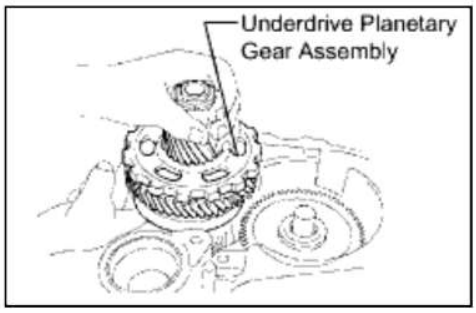




(c) Push the parking lock pawl.

HINT:

Failure to do so will cause interference when the underdrive planetary gear is removed.

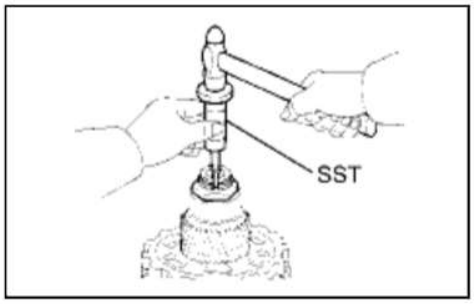


(d) Remove the underdrive planetary gear assembly from the transaxle case.

NOTICE:

Do not drop the underdrive planetary gear assembly.

44. REMOVE FRONT PLANETARY GEAR NUT



(a) Using SST and a hammer, loosen the staked part of the gear nut.

SST: 09930-00010

09931-00010

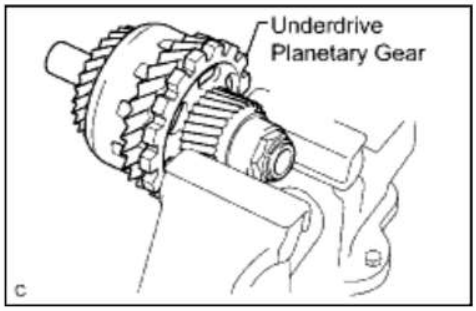
09931-00020

SST: 09387-00050

SST: 09495-65040

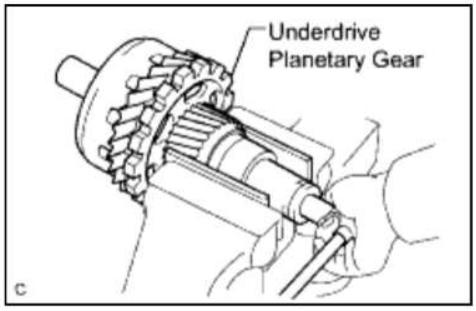
(b) Clamp the underdrive planetary gear in a soft jaw vise.

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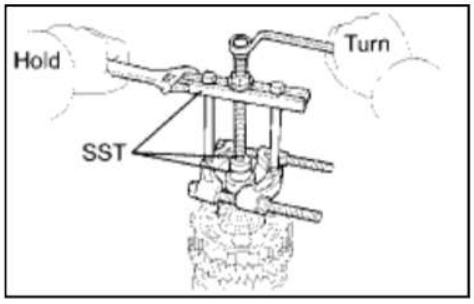
NOTICE:

Be careful not to damage the differential drive pinion.



(c) Using a socket wrench, remove the gear nut.

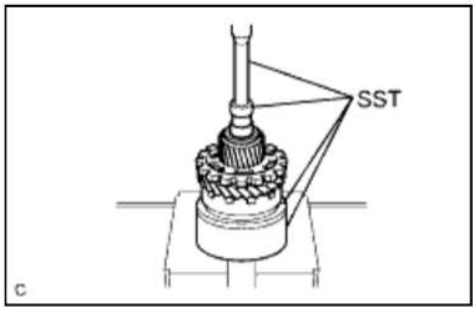
45. REMOVE CYLINDRICAL ROLLER BEARING RACE INNER



(a) Using SST, remove the cylindrical roller bearing race inner.

SST: 09950-00020
SST: 09950-00030
SST: 09950-40011
09957-04010
SST: 09950-60010
09951-00320

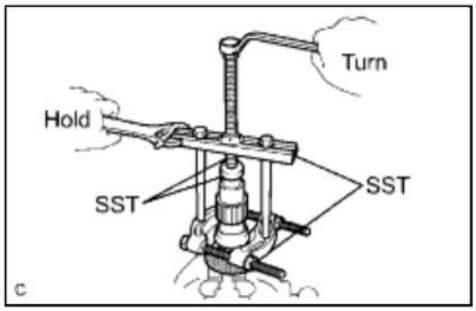
46. REMOVE UNDERDRIVE PLANETARY GEAR ASSEMBLY



(a) Using SST and a press, remove the differential drive pinion, parking lock gear, counter driven gear with underdrive planetary ring gear, and angular ball bearing.

SST: 09387-00050
SST: 09495-65040
SST: 09950-60010
09951-00320
SST: 09950-70010
09951-07100

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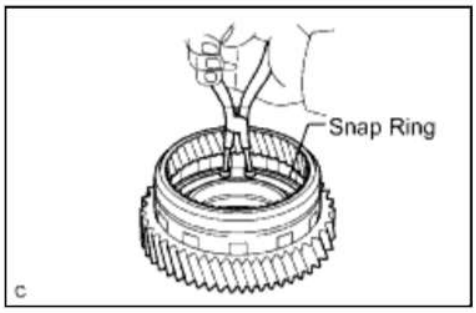


(b) Clamp the underdrive planetary gear in a soft jaw vise.

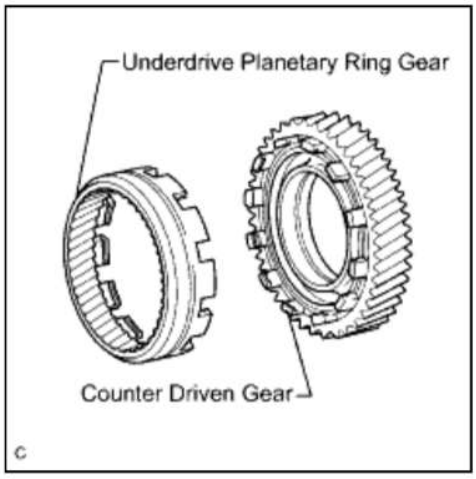
(c) Using SST, remove the rear angular ball bearing from the underdrive planetary gear.

SST: 09950-00020
SST: 09950-00030
SST: 09950-40011
09957-04010
SST: 09950-60010
09951-00320

47. REMOVE UNDERDRIVE PLANETARY RING GEAR



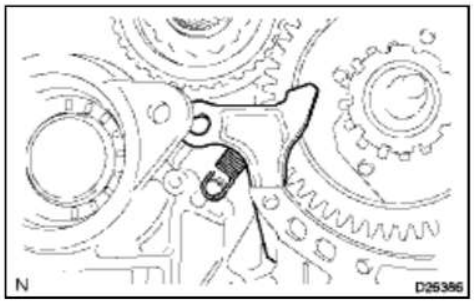
(a) Using snap ring pliers, remove the snap ring.



(b) Remove the underdrive planetary ring gear from the counter driven gear.

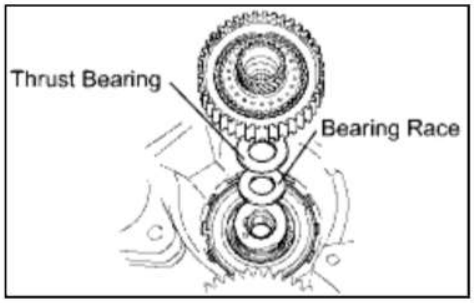
48. REMOVE PARKING LOCK PAWL

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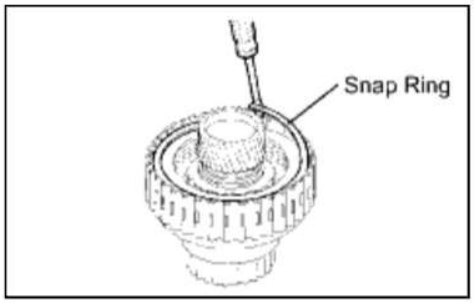
(a) Remove the spring, pawl pin and parking lock pawl.

49. REMOVE UNDERDRIVE CLUTCH ASSEMBLY



(a) Remove the underdrive clutch assembly, thrust bearing, and bearing race from the transaxle case.

50. REMOVE NO. 2 UNDERDRIVE CLUTCH FLANGE HOLE SNAP RING

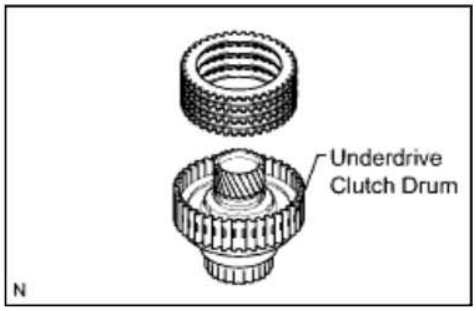


(a) Using a screwdriver, remove the No. 2 underdrive clutch flange hole snap ring.

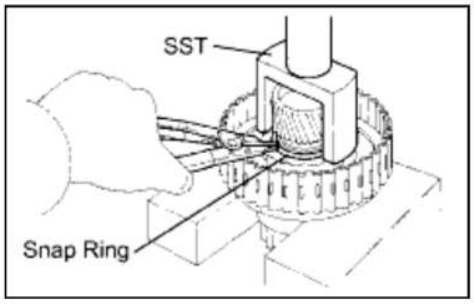
51. REMOVE NO. 1 UNDERDRIVE CLUTCH DISC

(a) Remove the flange, 3 discs, and 3 plates from the underdrive clutch drum.

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52. REMOVE UNDERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Place SST on the clutch balancer and compress the spring with a press.

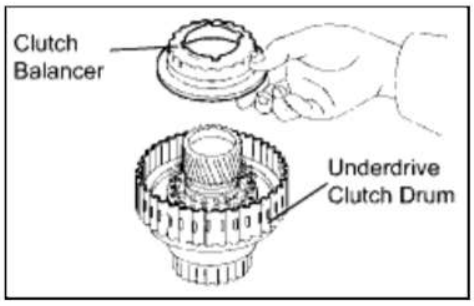
SST: 09350-32014

09351-32070

(b) Using a snap ring expander, remove the snap ring.

NOTICE:

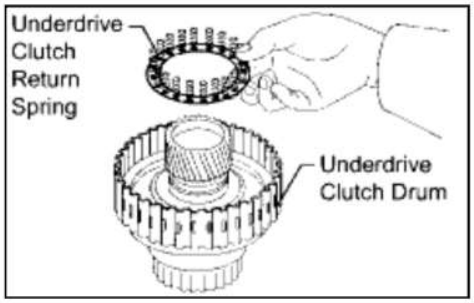
- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.
- Do not expand the snap ring excessively.



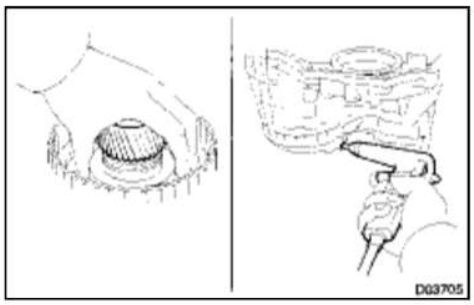
(c) Remove the clutch balancer from the underdrive clutch drum.

(d) Remove the return spring from the underdrive clutch drum.

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53. REMOVE UNDERDRIVE CLUTCH PISTON SET



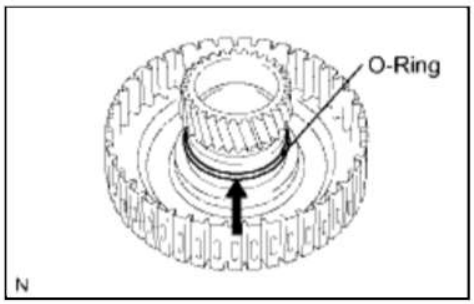
(a) Remove the underdrive clutch from the transaxle case.

NOTICE:

Be careful not to damage the oil seal ring.

(b) Holding the underdrive clutch piston by hand, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the transaxle case to remove the underdrive clutch piston.

54. REMOVE UNDERDRIVE CLUTCH DRUM O-RING

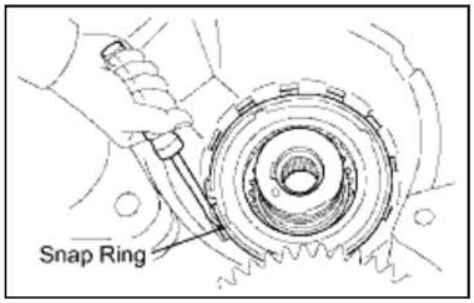


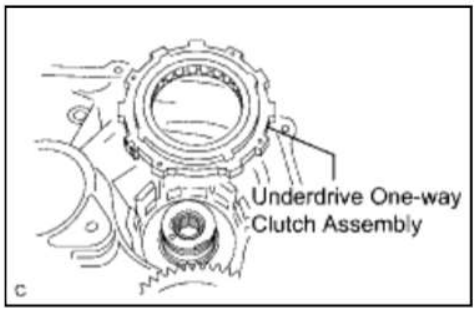
(a) Using a screwdriver, remove the O-ring from the underdrive clutch drum.

55. REMOVE UNDERDRIVE ONE-WAY CLUTCH ASSEMBLY

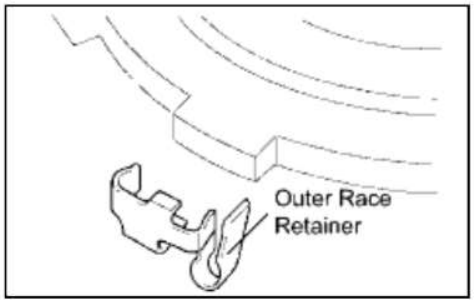
(a) Using a screwdriver, remove the snap ring from the transaxle case.

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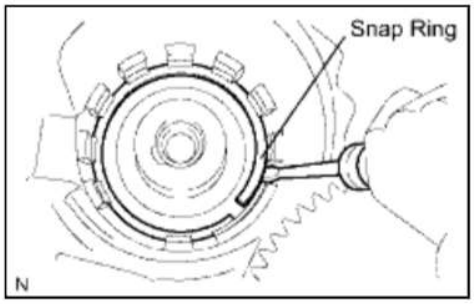


(b) Remove the underdrive one-way clutch from the transaxle case.



(c) Remove the outer race retainer from the one-way clutch.

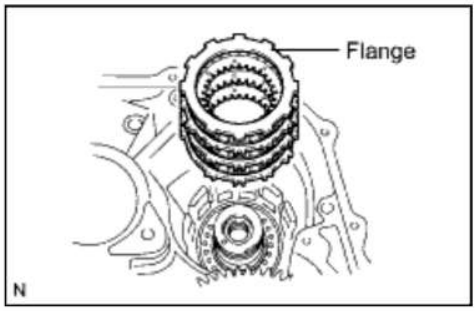
56. REMOVE NO. 2 UNDERDRIVE CLUTCH DISC



(a) Using a screwdriver, remove the snap ring.

(b) Remove the flange, 3 discs and 3 plates from the

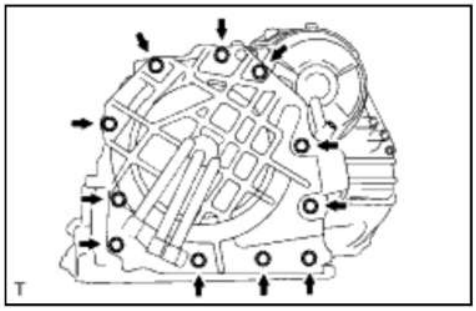
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transaxle case.

57. INSPECT NO. 2 UNDERDRIVE CLUTCH DISC INFO

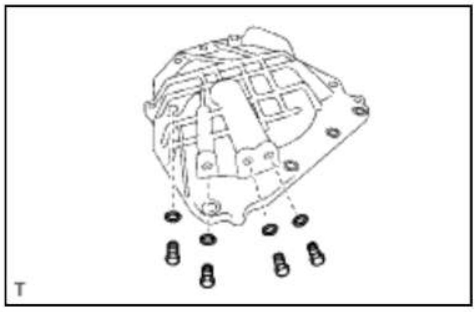
58. REMOVE TRANSAXLE REAR COVER SUB-ASSEMBLY



(a) Remove the 11 bolts.

(b) Tap on the circumference of the rear cover with a plastic hammer to remove the transaxle rear cover from the transaxle case.

59. REMOVE NO. 1 TRANSAXLE CASE PLUG



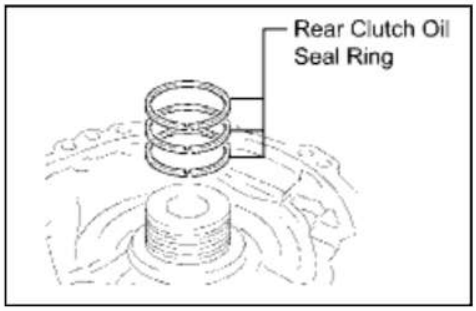
(a) Remove the 4 No. 1 transaxle case plugs from the transaxle rear cover.

(b) Remove the O-ring from each No. 1 transaxle case plug.

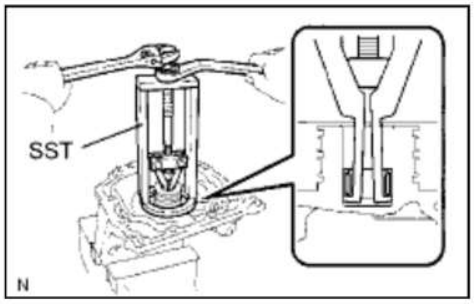
60. REMOVE REAR CLUTCH OIL SEAL RING

(a) Remove the 3 rear clutch oil seal rings from the transaxle rear cover.

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61. REMOVE NEEDLE ROLLER BEARING



(a) Using SST, remove the needle roller bearing from the transaxle rear cover.

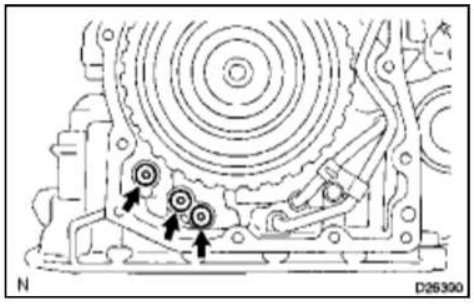
SST: 09387-00041

09387-01021

09387-01030

09387-01040

62. REMOVE NO. 1 GOVERNOR APPLY GASKET

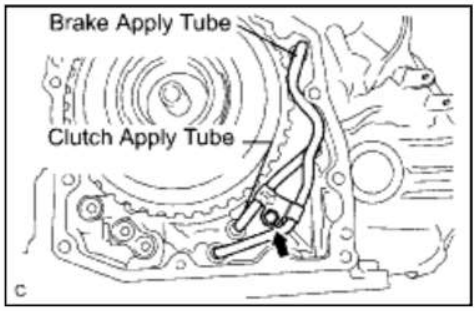


(a) Using a screwdriver, remove the 3 apply gaskets.

63. REMOVE BRAKE APPLY TUBE

(a) Remove the bolt, clamp and brake apply tube.

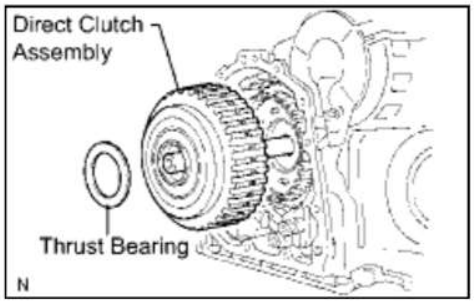
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(b) Remove the clutch apply tube.

(c) Remove the brake apply tube from the clamp.

64. REMOVE DIRECT CLUTCH ASSEMBLY

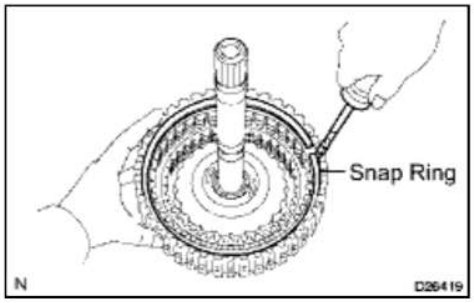


(a) Remove the thrust bearing and the direct clutch assembly from the transaxle case.

65. INSPECT PACK CLEARANCE OF DIRECT CLUTCH INFO

66. INSPECT PACK CLEARANCE OF OVERDRIVE CLUTCH INFO

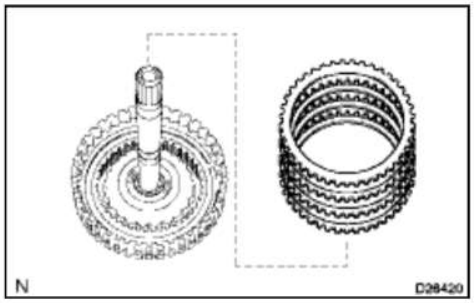
67. REMOVE DIRECT MULTIPLE DISC CLUTCH DISC



(a) Using a screwdriver, remove the snap ring from the intermediate shaft.

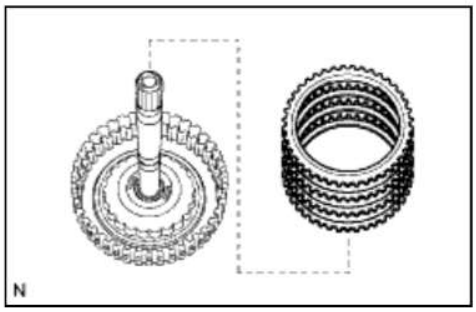
(b) Remove the flange, 3 discs, 3 plates and cushion plate from the intermediate shaft.

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68. INSPECT DIRECT MULTIPLE DISC CLUTCH DISC INFO

69. REMOVE OVERDRIVE DIRECT CLUTCH DISC

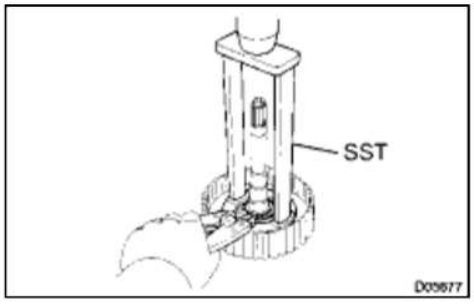


(a) Using a screwdriver, remove the snap ring from the intermediate shaft.

(b) Remove the flange, 3 discs and 3 plates from the intermediate shaft.

70. INSPECT OVERDRIVE DIRECT CLUTCH DISC INFO

71. REMOVE OVERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Place SST on the clutch balancer and compress the spring with a press.

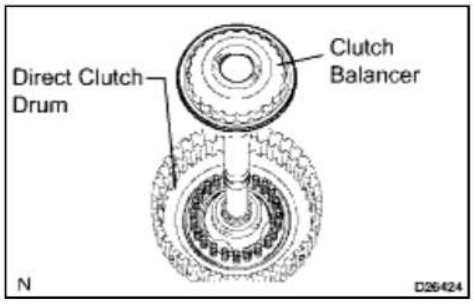
SST: 09387-00020

(b) Using a snap ring expander, remove the snap ring from the direct clutch drum.

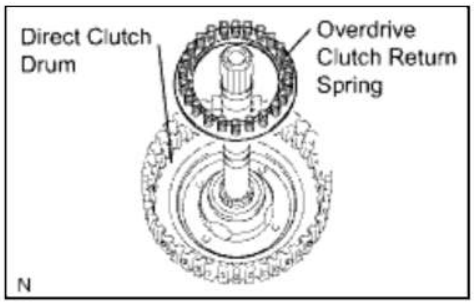
NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove. This prevents the spring seat from being deformed.
- Do not expand the snap ring excessively.

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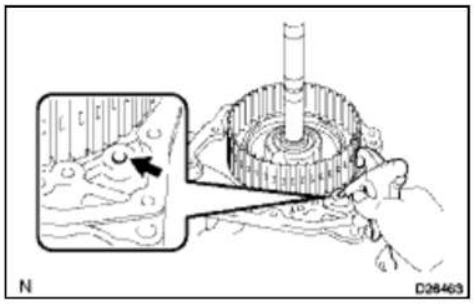
(c) Remove the clutch balancer from the overdrive direct clutch drum.



(d) Remove the overdrive clutch return spring from the overdrive direct clutch drum.

72. INSPECT OVERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY INFO

73. REMOVE OVERDRIVE DIRECT CLUTCH PISTON



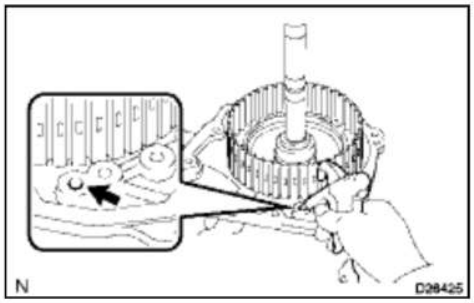
(a) Install the intermediate shaft on the transaxle rear cover.

(b) Holding the direct clutch piston by hand, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the transaxle rear cover to remove the direct clutch piston.

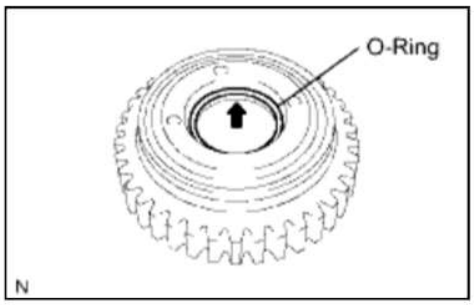
74. REMOVE OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY

(a) Holding the direct clutch drum by hand, apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the transaxle rear cover to remove the direct clutch drum.

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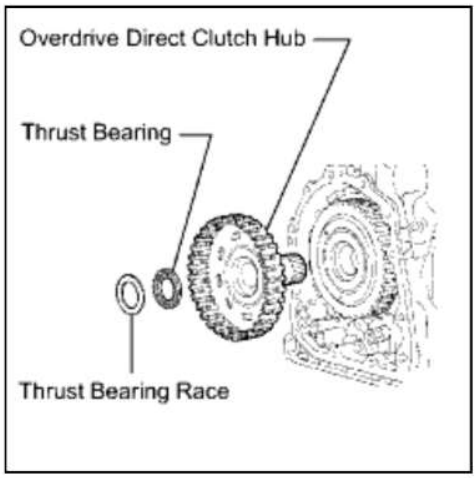


75. REMOVE OVERDRIVE DIRECT CLUTCH O-RING



(a) Using a screwdriver, remove the O-ring from the direct clutch drum.

76. REMOVE OVERDRIVE DIRECT CLUTCH HUB SUB-ASSEMBLY

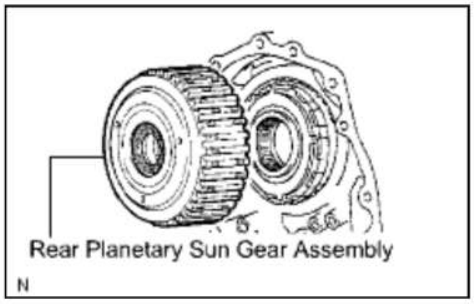


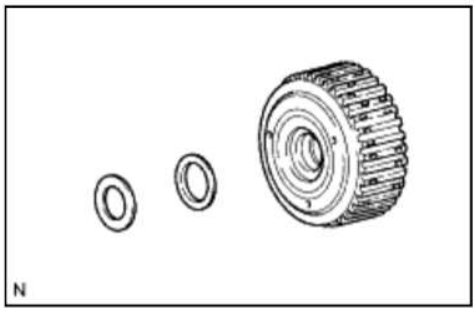
(a) Remove the thrust bearing race, thrust bearing, and overdrive direct clutch hub from the planetary gear assembly.

77. REMOVE REAR PLANETARY SUN GEAR ASSEMBLY

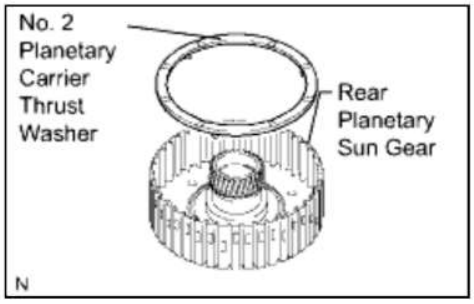
(a) Remove the rear planetary sun gear assembly from the transaxle case.

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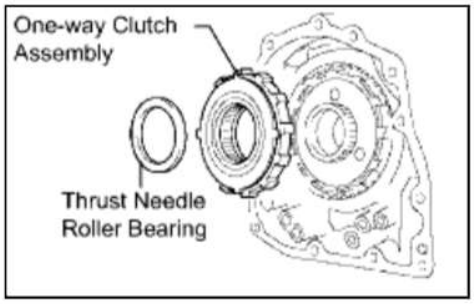


(b) Remove the thrust needle roller bearing and thrust bearing race from the rear planetary sun gear assembly.



(c) Remove the No. 2 planetary carrier thrust washer from the rear planetary sun gear assembly.

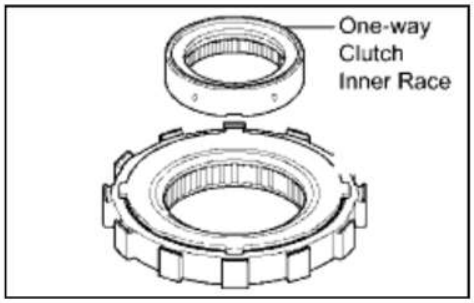
78. REMOVE ONE-WAY CLUTCH ASSEMBLY



(a) Remove the one-way clutch assembly and the thrust needle roller bearing from the transaxle case.

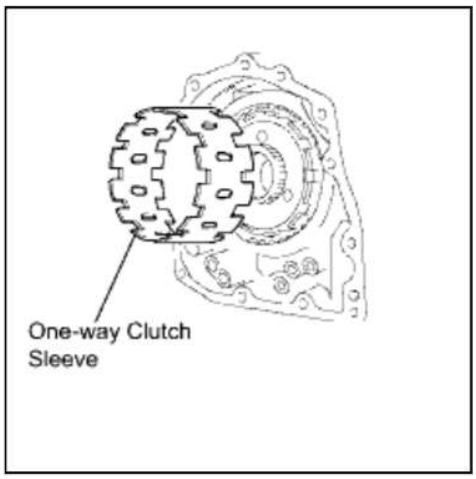
(b) Remove the one-way clutch inner race from the one-way

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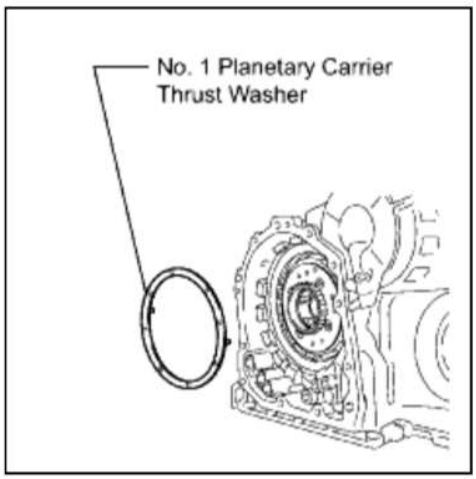
clutch assembly.

79. REMOVE ONE-WAY CLUTCH SLEEVE



(a) Remove the one-way clutch sleeve from the transaxle case.

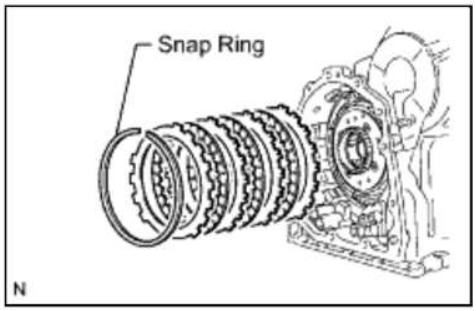
80. REMOVE NO. 1 PLANETARY CARRIER THRUST WASHER



(a) Remove the No. 1 planetary carrier thrust washer from the planetary gear assembly.

81. REMOVE 2ND BRAKE DISC

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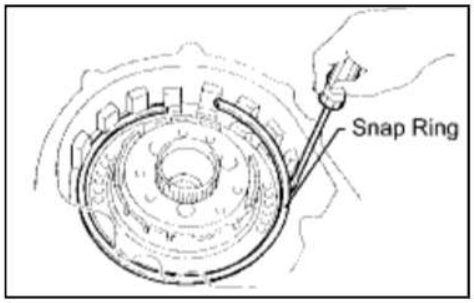


(a) Using a screwdriver, remove the snap ring.

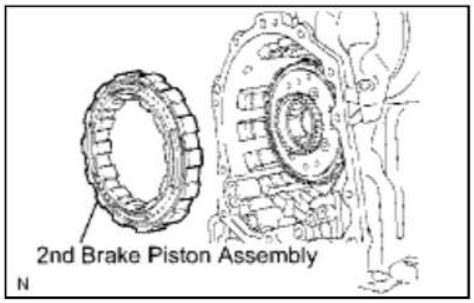
(b) Remove the flange, 3 discs and 3 plates from the transaxle case.

82. INSPECT 2ND BRAKE DISC INFO

83. REMOVE 2ND BRAKE PISTON ASSEMBLY



(a) Using a screwdriver, remove the snap ring.



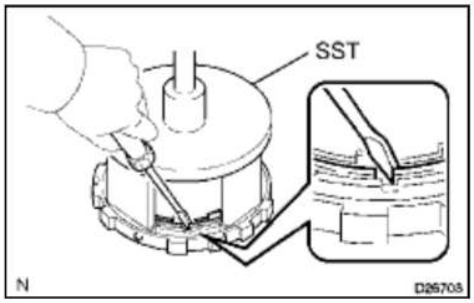
(b) Remove the 2nd brake piston assembly from the transaxle case.

84. REMOVE 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

(a) Place SST on the return spring and compress it with a press.

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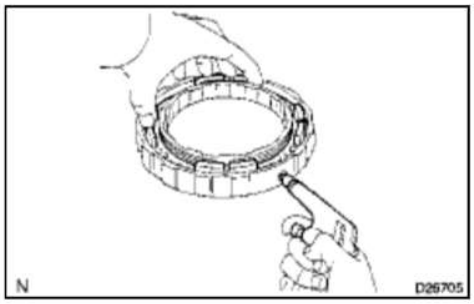
(b) Using a screwdriver, remove the snap ring.



(c) Remove the 2nd brake piston return spring sub-assembly.

85. INSPECT 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY INFO

86. REMOVE 2ND BRAKE PISTON

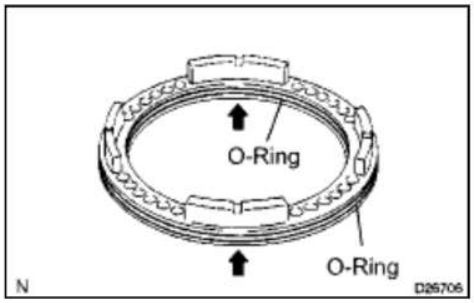


(a) Hold the 2nd brake piston and apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the 2nd brake cylinder to remove the 2nd brake piston.

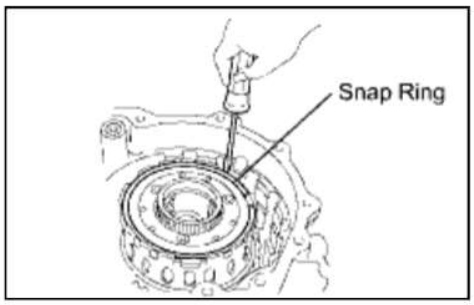
87. REMOVE 2ND BRAKE PISTON O-RING

(a) Remove the 2 O-rings from the 2nd brake piston.

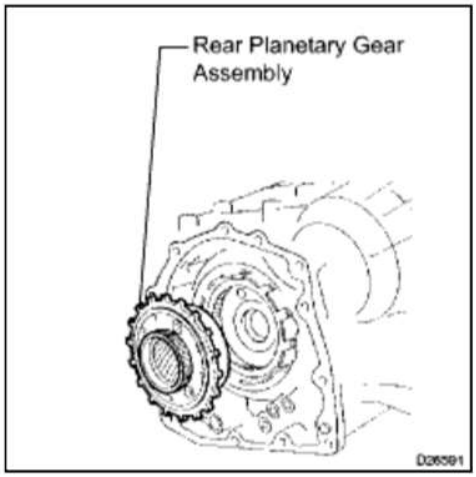
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88. REMOVE REAR PLANETARY GEAR ASSEMBLY



(a) Using a screwdriver, remove the snap ring.

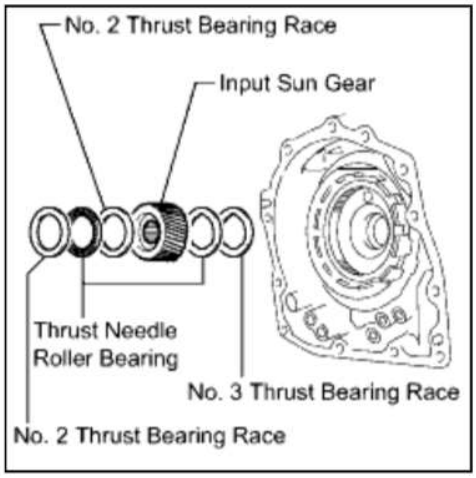


(b) Remove the rear planetary gear assembly from the transaxle case.

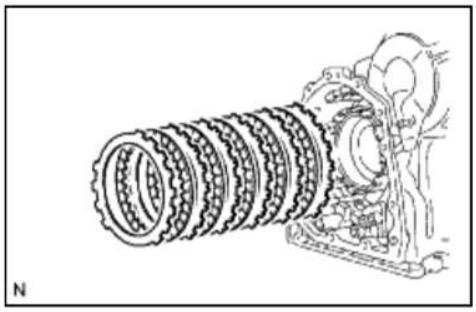
89. REMOVE INPUT SUN GEAR

(a) Remove the 2 thrust needle roller bearings, No. 2 thrust bearing races, No. 3 thrust bearing race, and input sun gear from the transaxle case.

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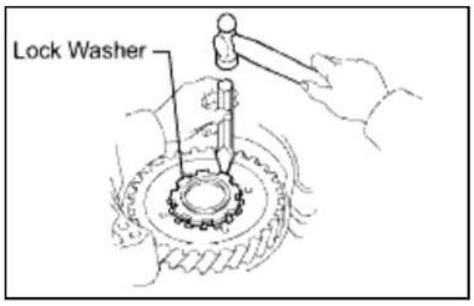
90. REMOVE 1ST AND REVERSE BRAKE DISC



(a) Remove the flange, 5 discs and 5 plates from the transaxle case.

91. INSPECT 1ST AND REVERSE BRAKE DISC INFO

92. REMOVE FRONT PLANETARY GEAR ASSEMBLY



(a) Using a chisel and hammer, unstake the lock washer.

NOTICE:

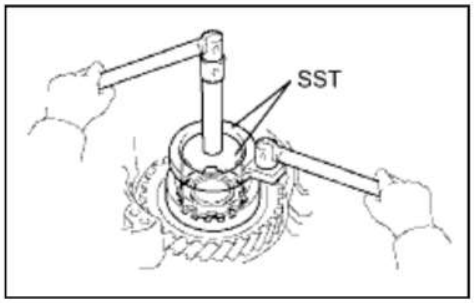
Push down all claws of the washer. If the claws are not pushed down, SST cannot be fully pressed against the nut, and the nut cannot be loosened.

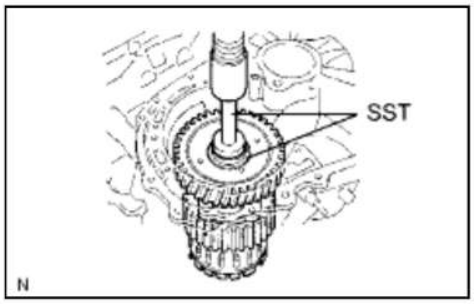
(b) Using SST, remove the nut and washer.

SST: 09387-00030

SST: 09387-00080

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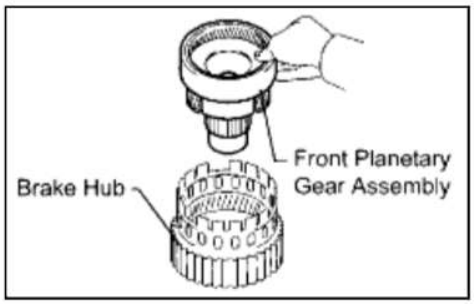
(c) Using SST and a press, remove the front planetary gear assembly from the counter drive gear.

SST: 09950-60010

09951-00450

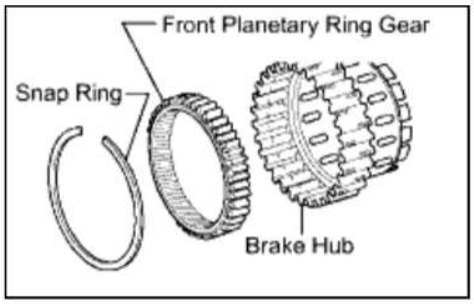
SST: 09950-70010

09951-07100



(d) Remove the front planetary gear assembly from the brake hub.

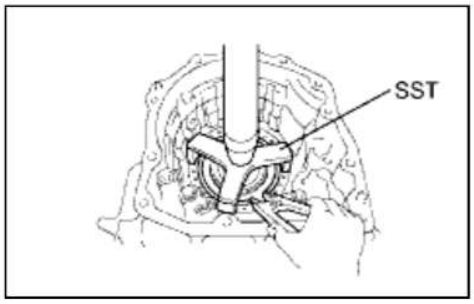
93. REMOVE FRONT PLANETARY RING GEAR



(a) Using a screwdriver, remove the snap ring and front planetary ring gear from the brake hub.

94. REMOVE 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

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(a) Place SST on the return spring, and compress the return spring with a press.

SST: 09387-00070

(b) Using a snap ring expander, remove the snap ring.

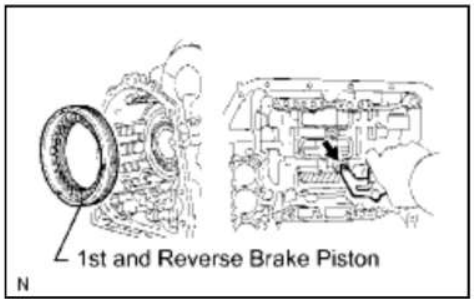
NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring seat from being deformed.
- Do not expand the snap ring excessively.

(c) Remove the return spring.

95. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

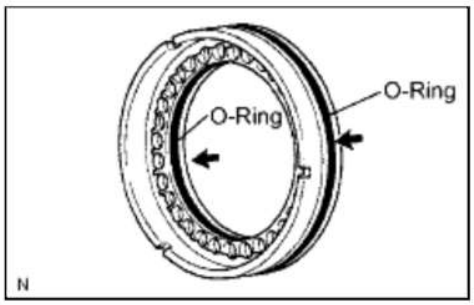
96. REMOVE 1ST AND REVERSE BRAKE PISTON



(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the transaxle case to remove the 1st and reverse brake piston.

NOTICE:

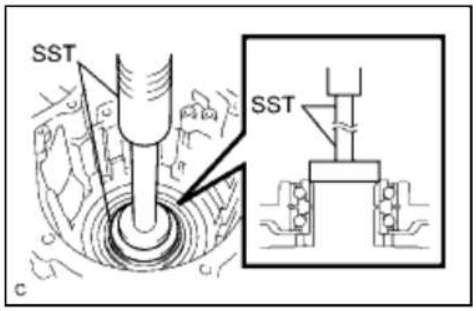
- Applying compressed air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Take care not to splash ATF when applying compressed air.



(b) Remove the 2 O-rings from the 1st and reverse brake piston.

97. REMOVE COUNTER DRIVE GEAR BEARING

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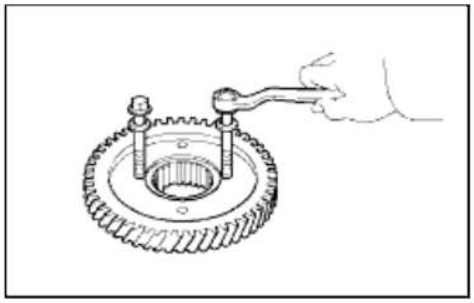
(a) Using SST and a press, remove the counter drive gear from the transaxle case.

SST: 09950-60010

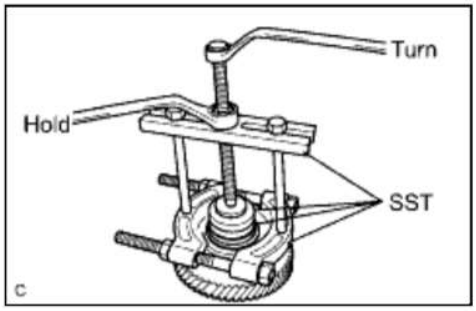
09951-00590

SST: 09950-70010

09951-07100



(b) Tighten the 2 bolts evenly and make a clearance of approximately. 20.0 mm (0.797 in.) between the counter drive gear and the inner race.



(c) Using SST, remove the tapered roller bearing inner race.

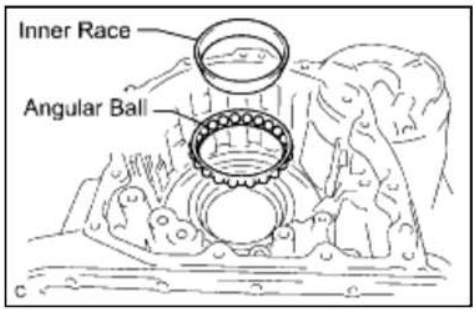
SST: 09950-00020

SST: 09950-00030

SST: 09950-60010

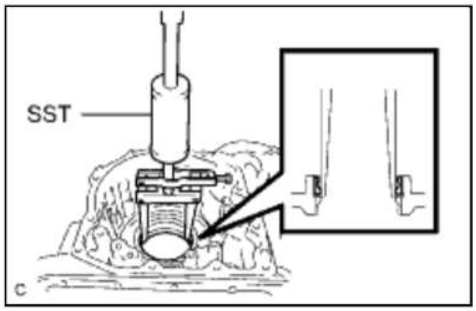
09951-00590

98. REMOVE COUNTER DRIVE ANGULAR BALL BEARING



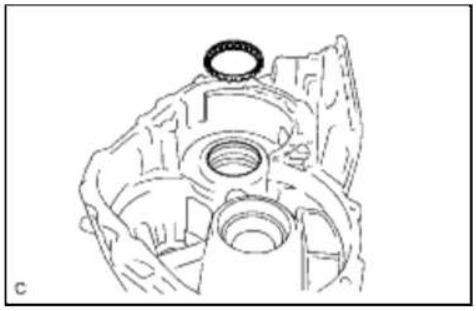
(a) Remove the bearing inner race (rear side) and angular ball (rear side).

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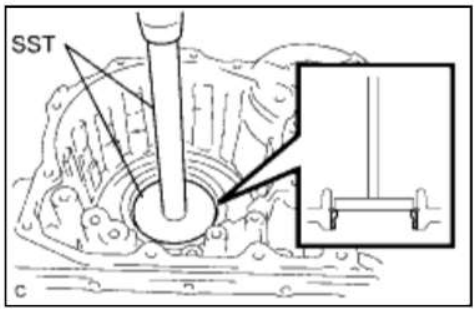


(b) Using SST, remove the bearing outer race (rear side) from the transaxle case.

SST: 09308-00010



(c) Remove the angular ball (front side).



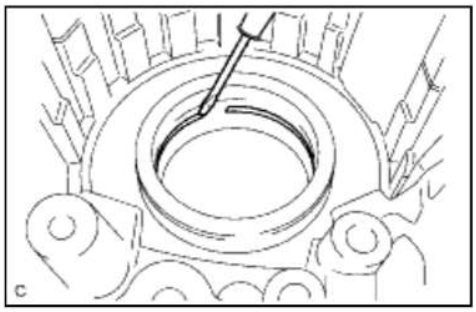
(d) Using SST and a press, remove the bearing outer race (front side) from the transaxle case.

SST: 09950-60020

09951-00810

SST: 09950-70010

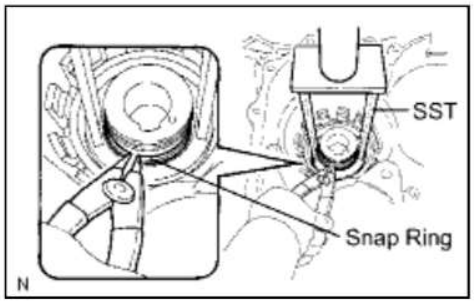
09951-07200



(e) Using a screwdriver, remove the snap ring from the transaxle case.

99. REMOVE UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

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(a) Place SST on the return spring, and compress the return spring with a press.

SST: 09387-00020

(b) Using a snap ring expander, remove the snap ring.

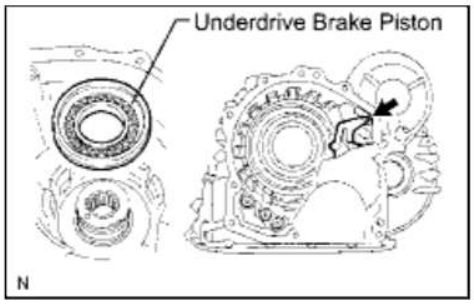
NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring seat from being deformed.
- Do not expand the snap ring excessively.

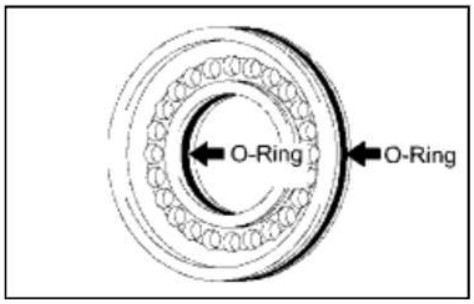
(c) Remove the return spring.

100. INSPECT UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY INFO

101. REMOVE UNDERDRIVE BRAKE PISTON



(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the transaxle case to remove the underdrive brake piston.

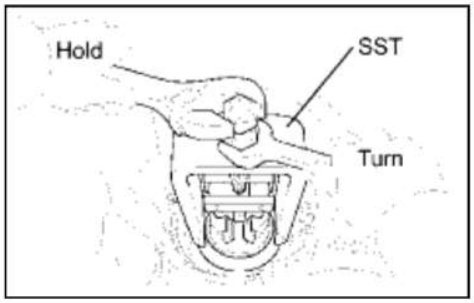


(b) Remove the 2 O-rings from the underdrive brake piston.

102. REMOVE NEEDLE ROLLER BEARING

(a) Using SST, remove the needle roller bearing from the

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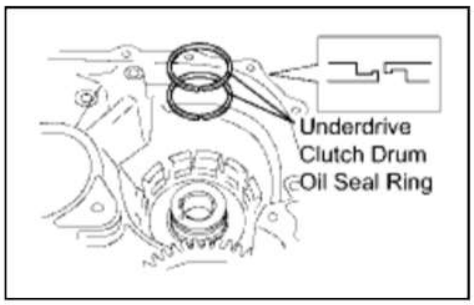


transaxle case.

SST: 09387-00041

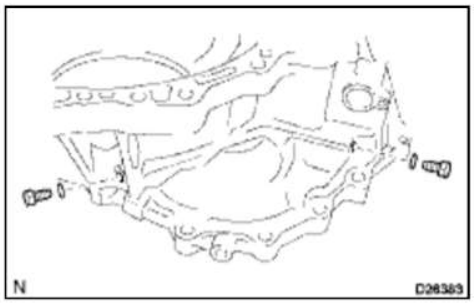
09387-01010
09387-01030
09387-01040

103. REMOVE UNDERDRIVE CLUTCH DRUM OIL SEAL RING



(a) Remove the 2 oil seal rings from the transaxle case.

104. REMOVE NO. 1 TRANSAXLE CASE PLUG



(a) Remove the 2 No. 1 transaxle case plugs.

(b) Remove the O-ring from each No. 1 transaxle case plug.

105. REMOVE UNDERDRIVE CYLINDRICAL ROLLER BEARING

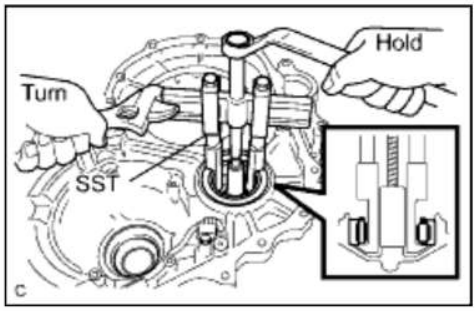
(a) Using SST, remove the underdrive cylindrical roller bearing from the transaxle case.

SST: 09820-00031

SST: 09950-40011

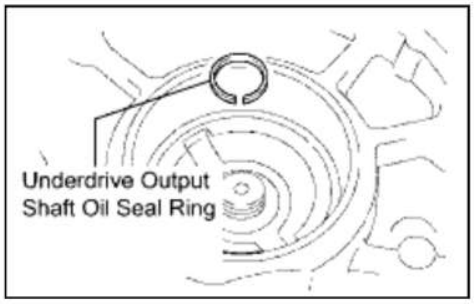
09952-04010
09954-04010
09955-04061

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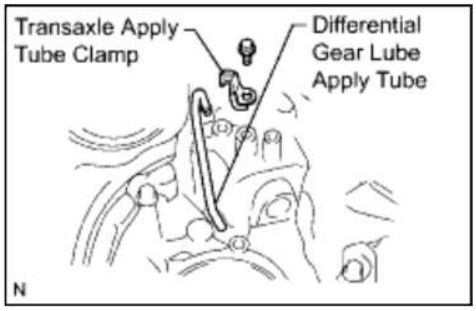
09957-04010
SST: 09950-50013
09951-05010
09953-05020

106. REMOVE UNDERDRIVE OUTPUT SHAFT OIL SEAL RING



(a) Remove the oil seal ring from the transaxle housing.

107. REMOVE DIFFERENTIAL GEAR LUBE APPLY TUBE



(a) Remove the bolt, transaxle apply tube clamp and differential gear lube apply tube from the transaxle housing.

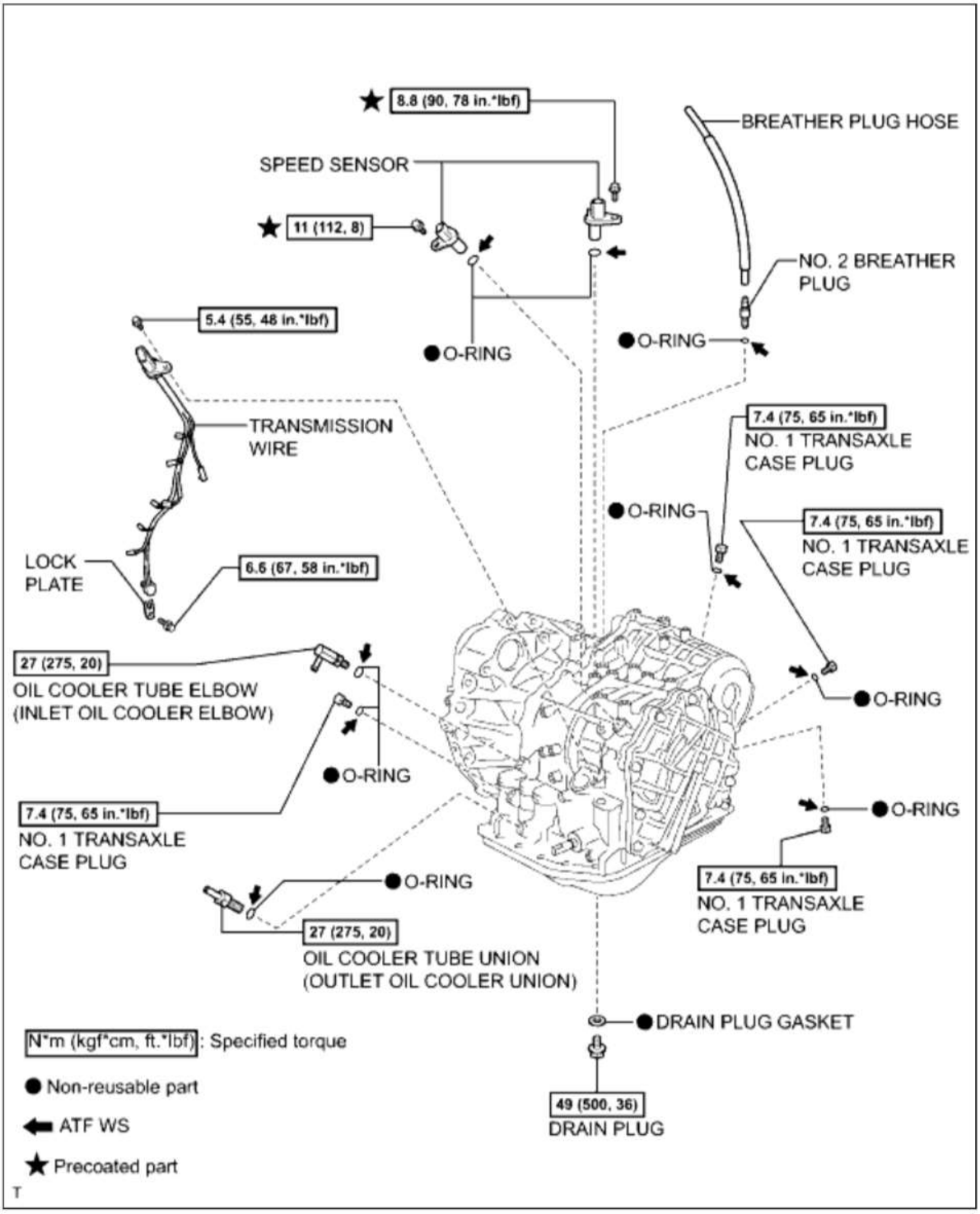
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Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003DGB004X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: COMPONENTS (2010 Corolla)		

COMPONENTS

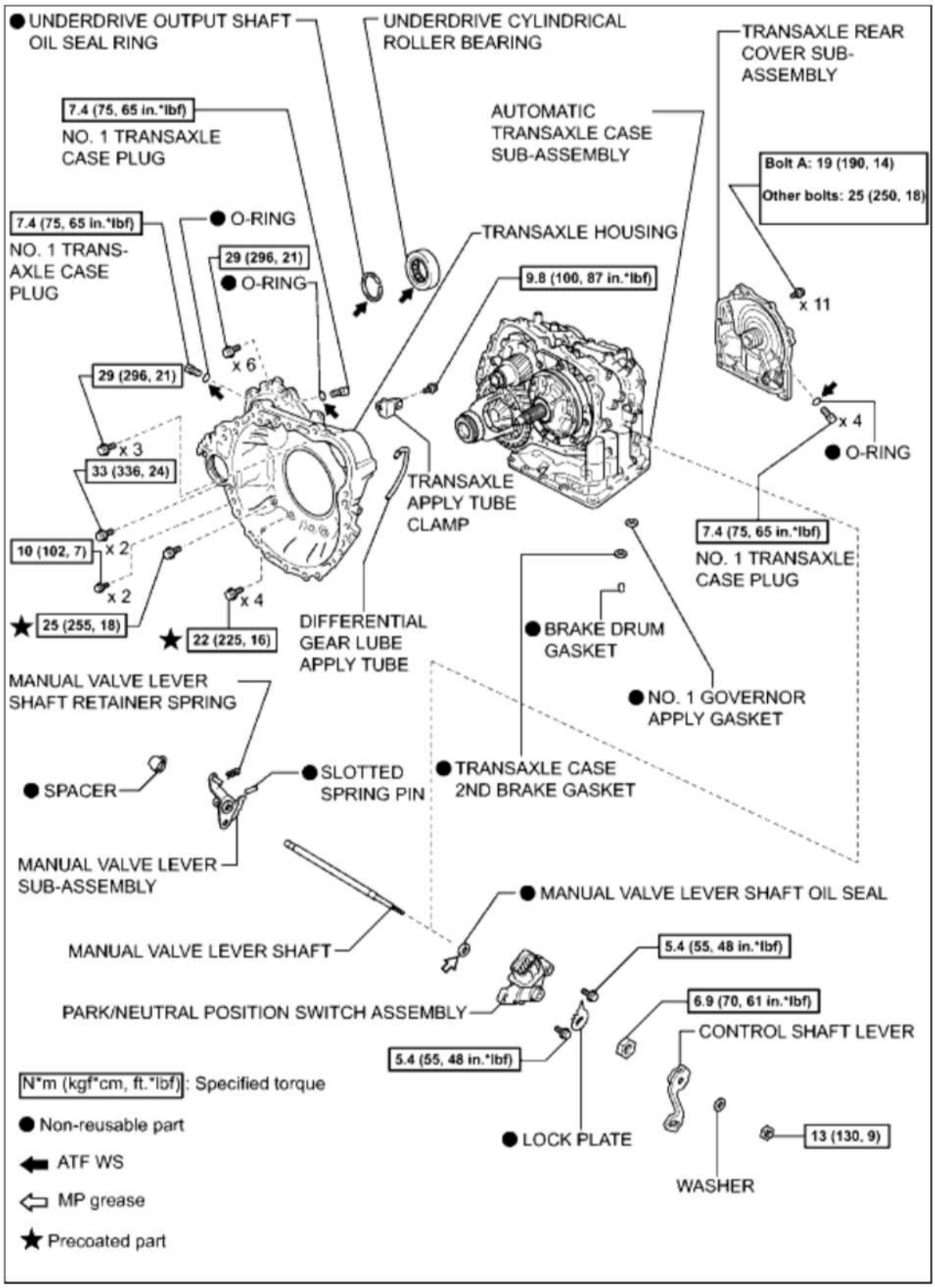
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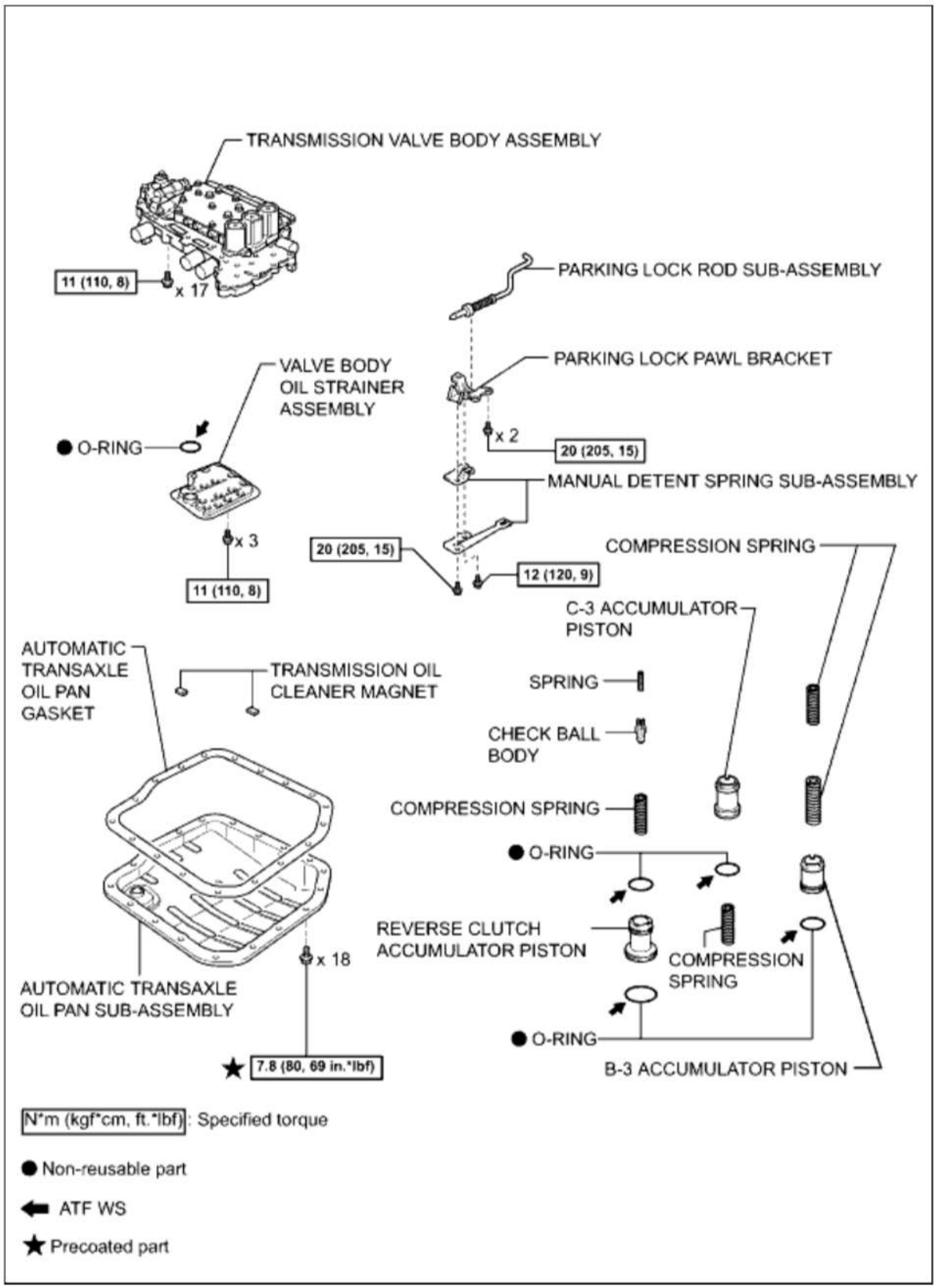
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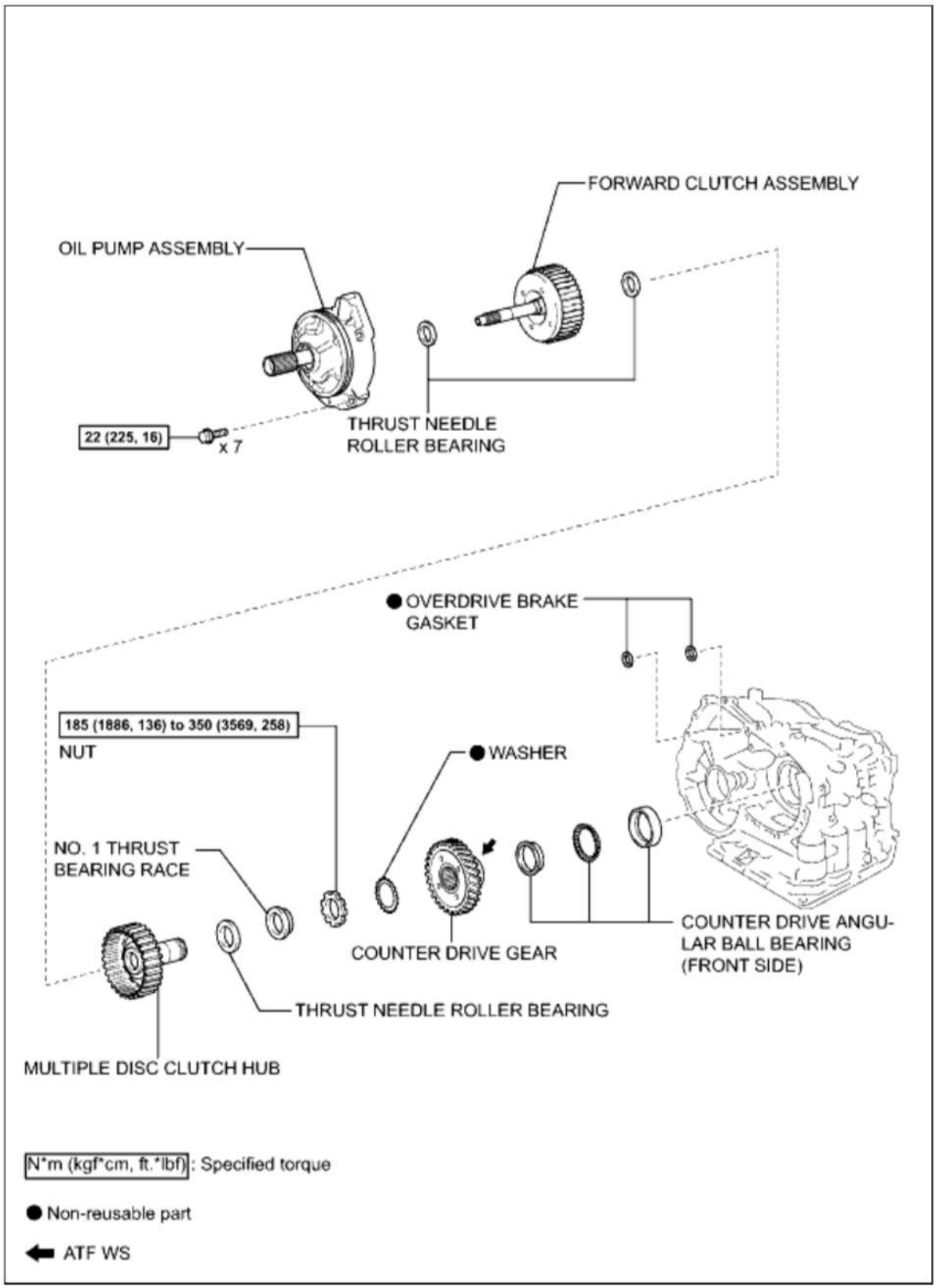
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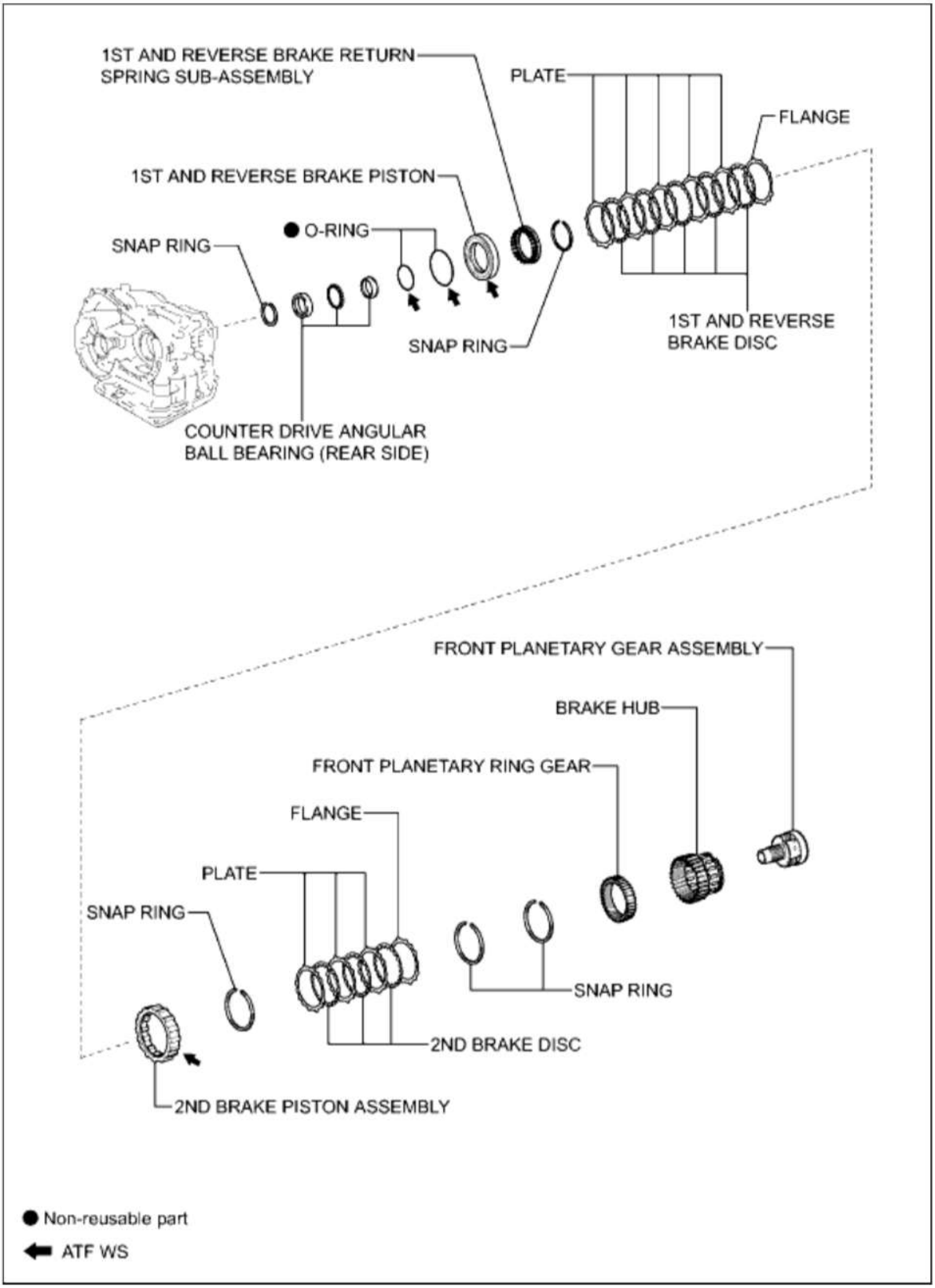
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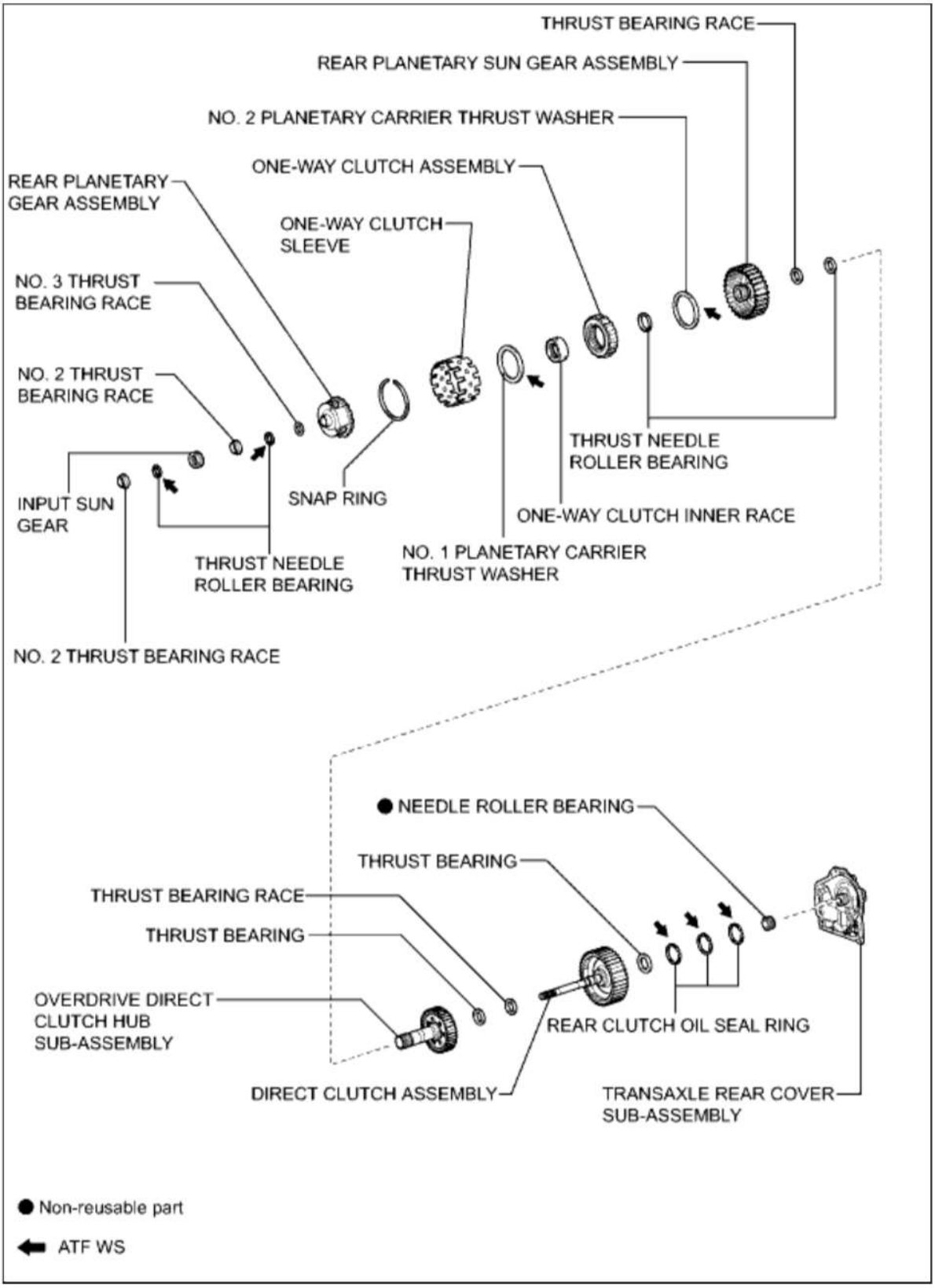
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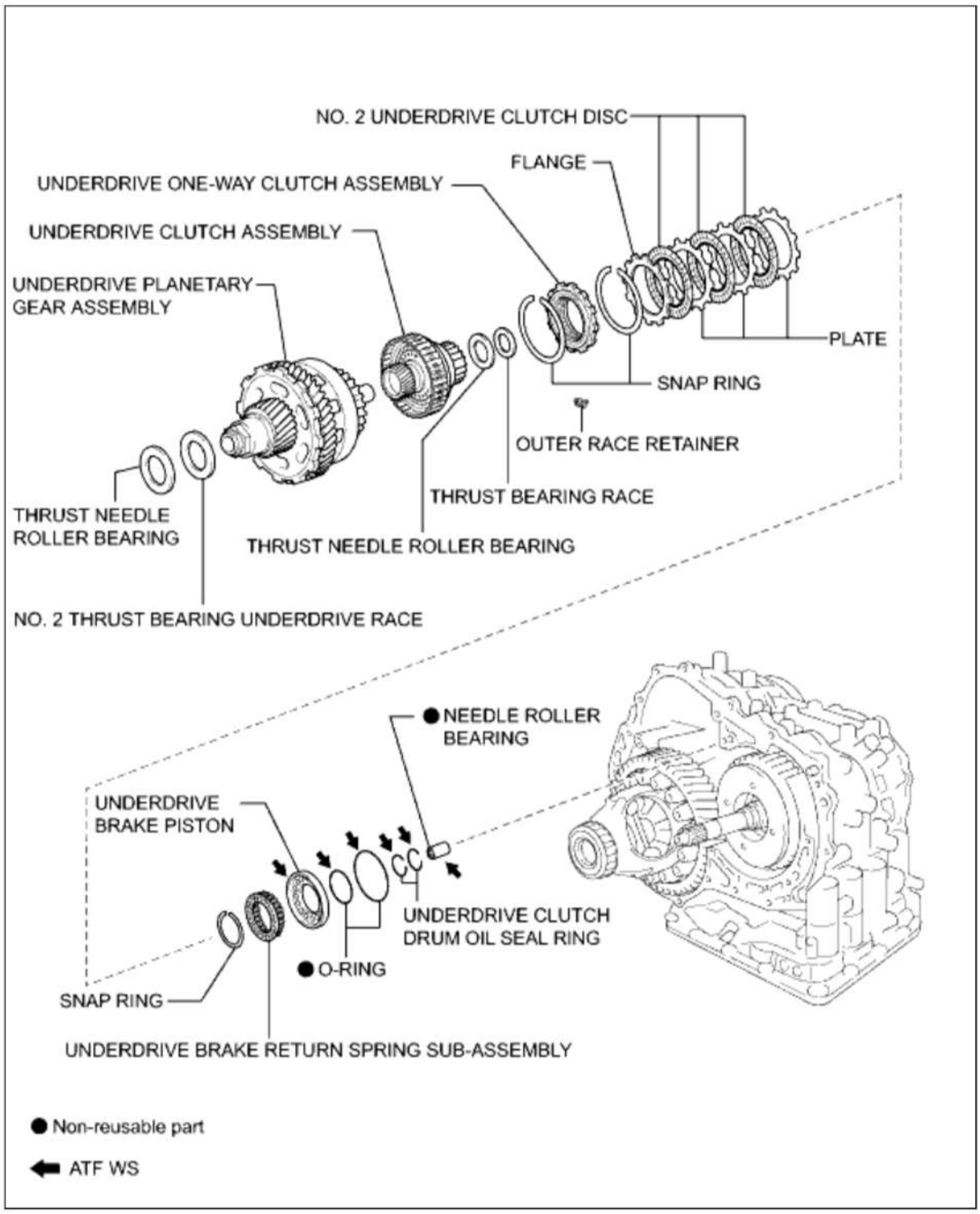
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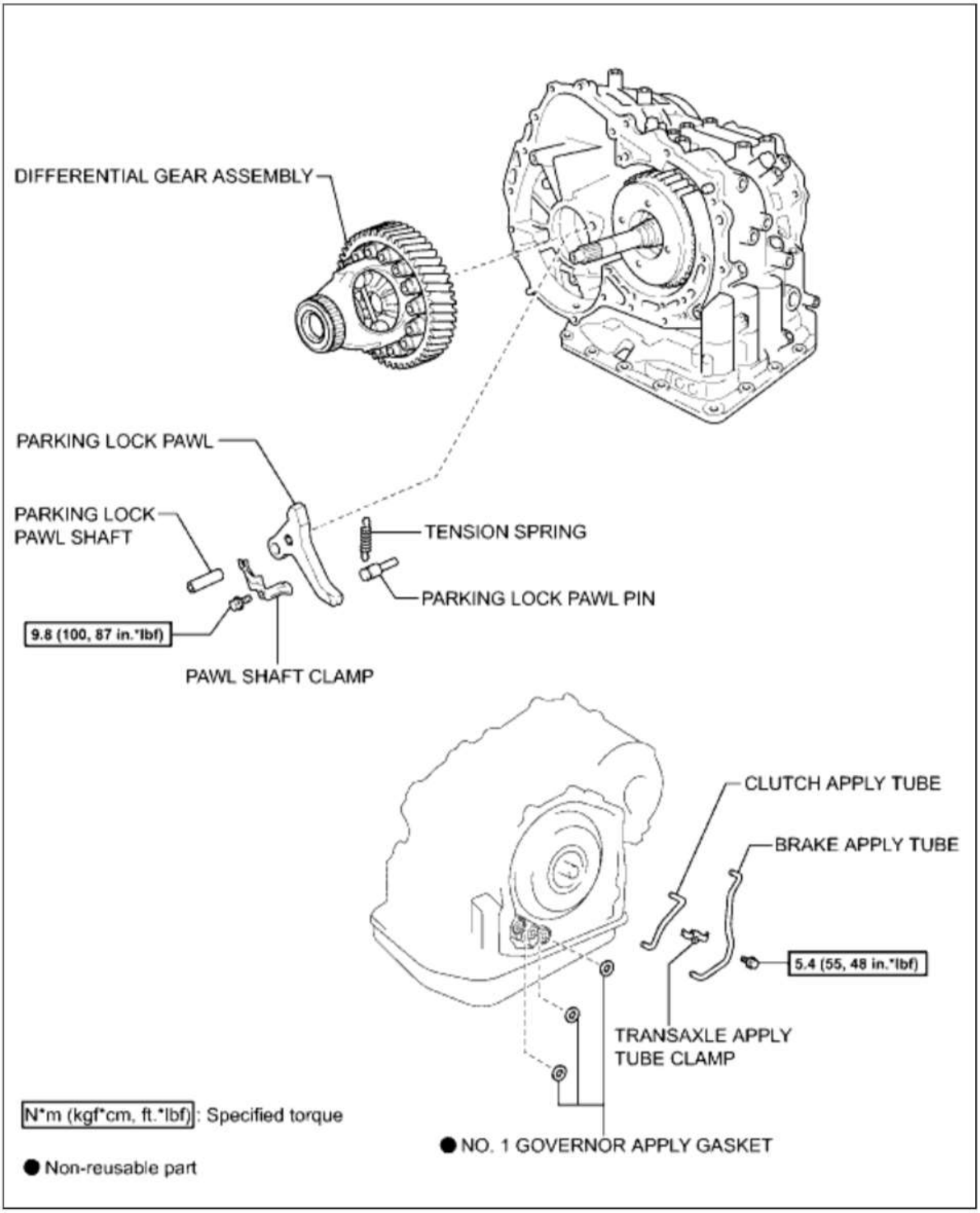
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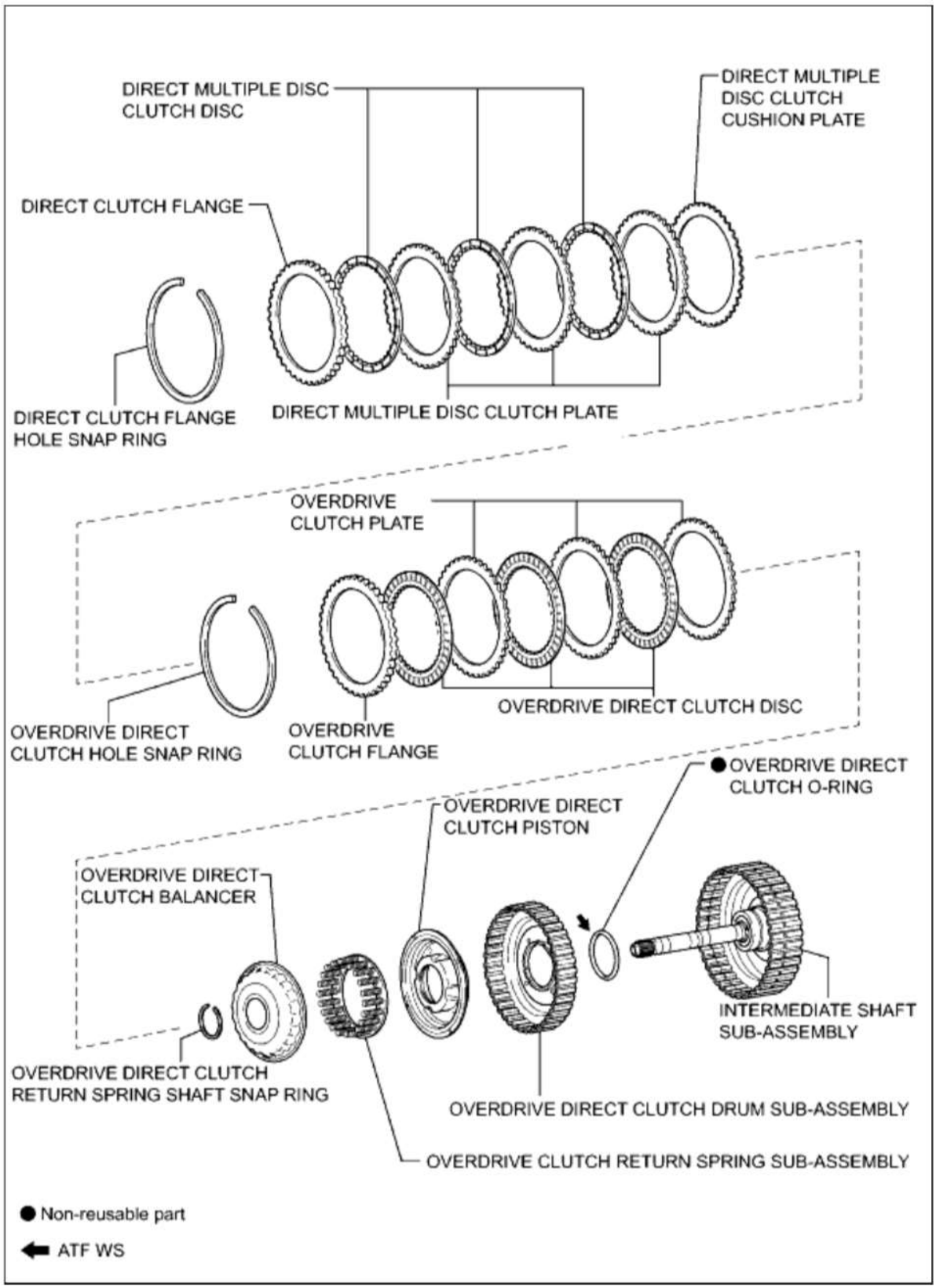
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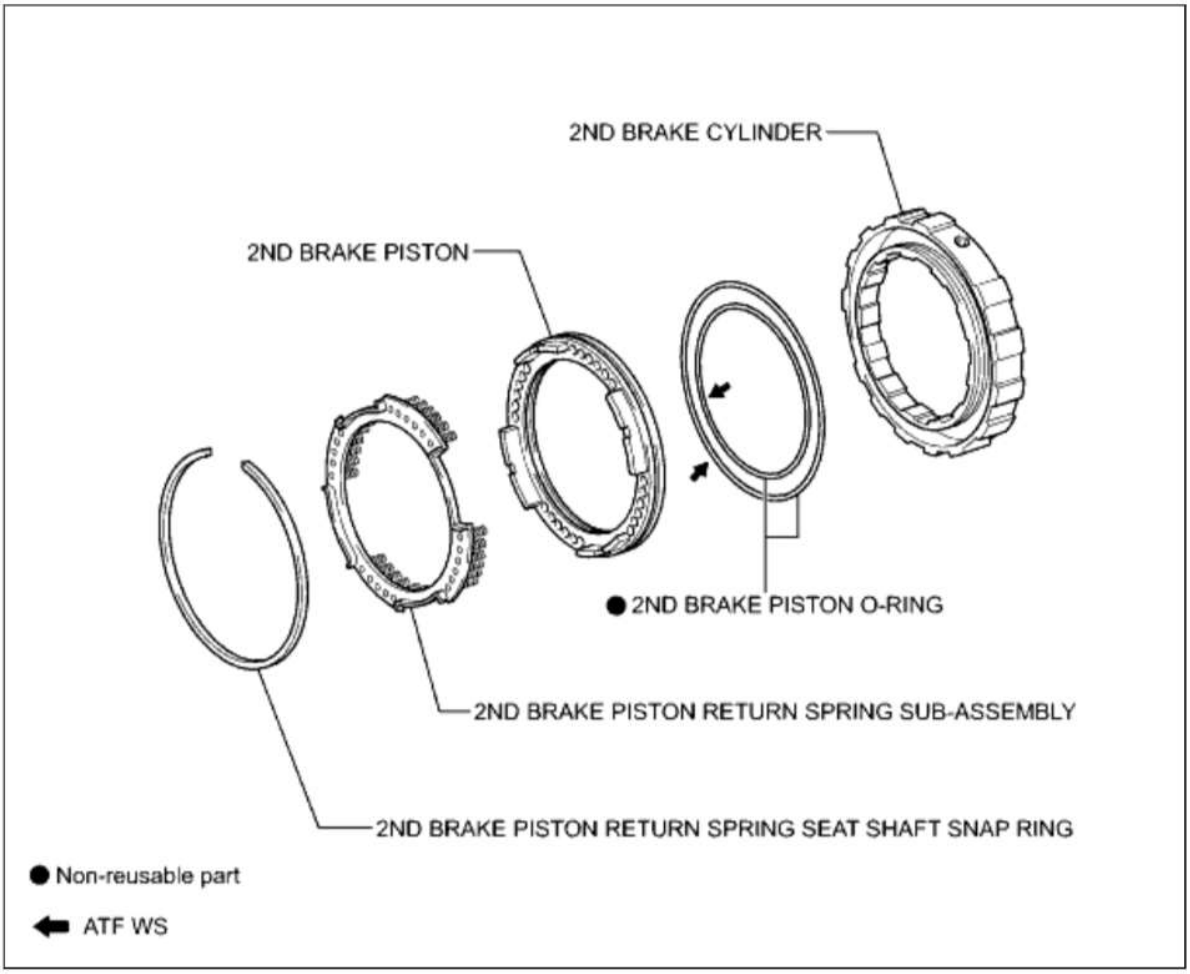
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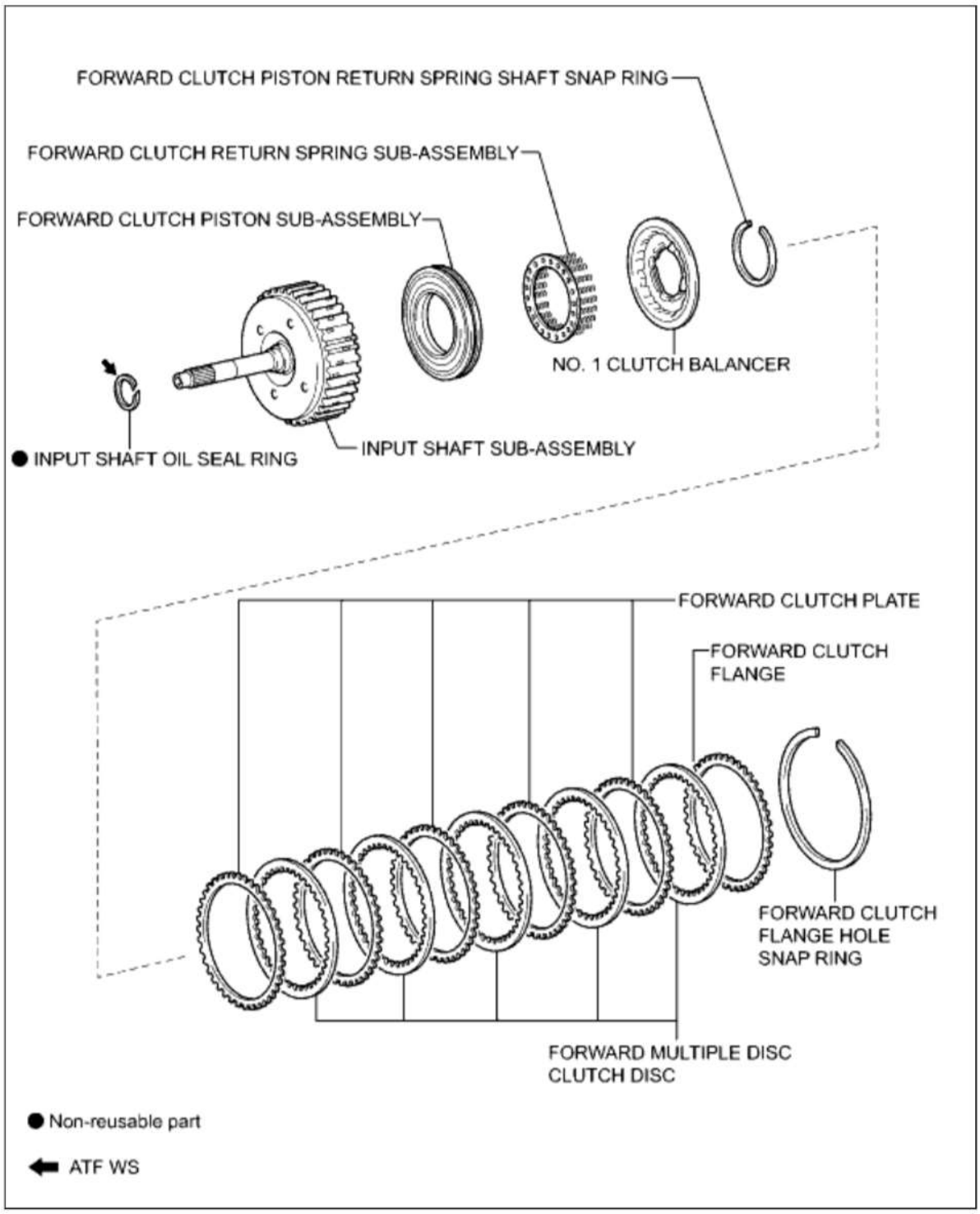
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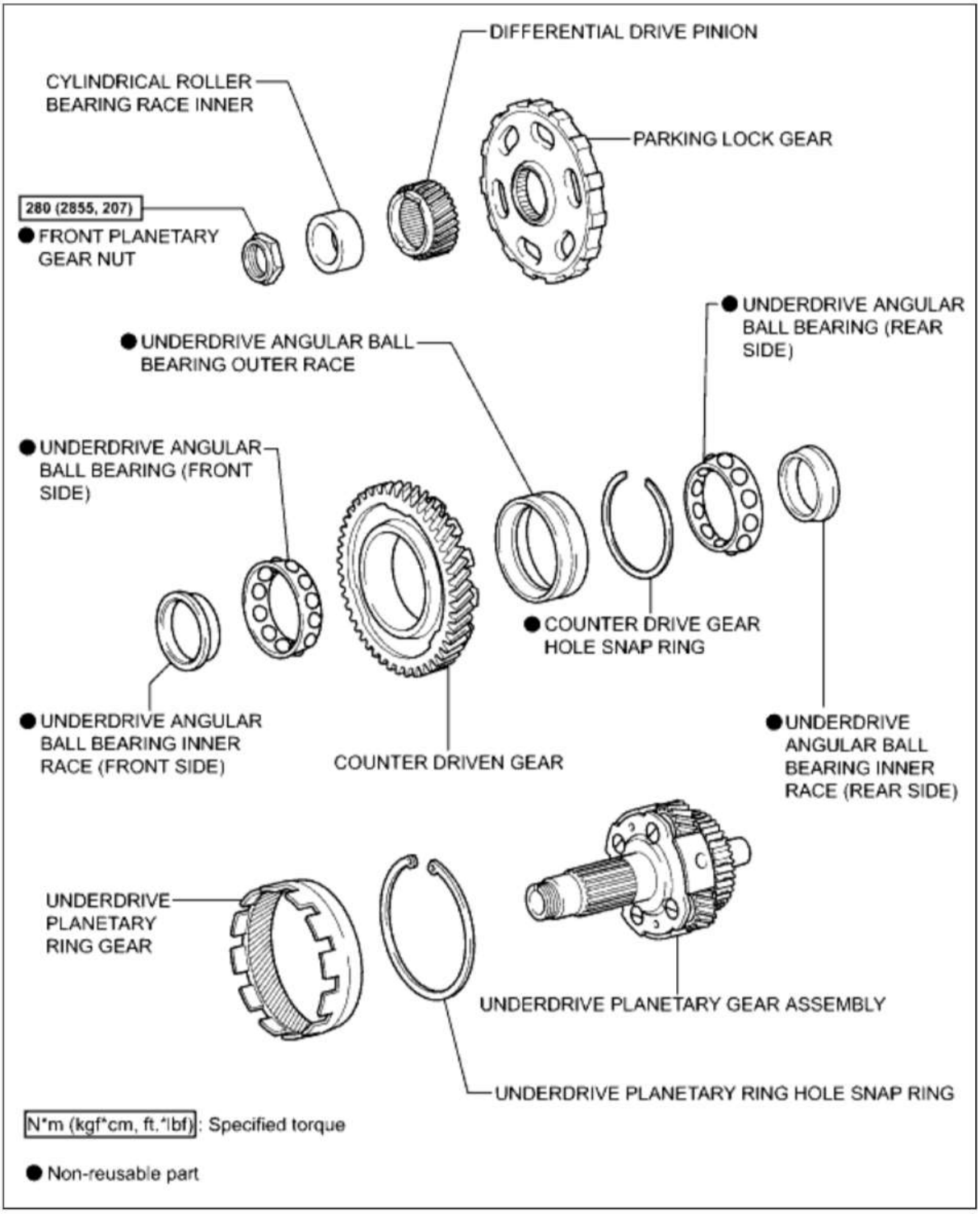
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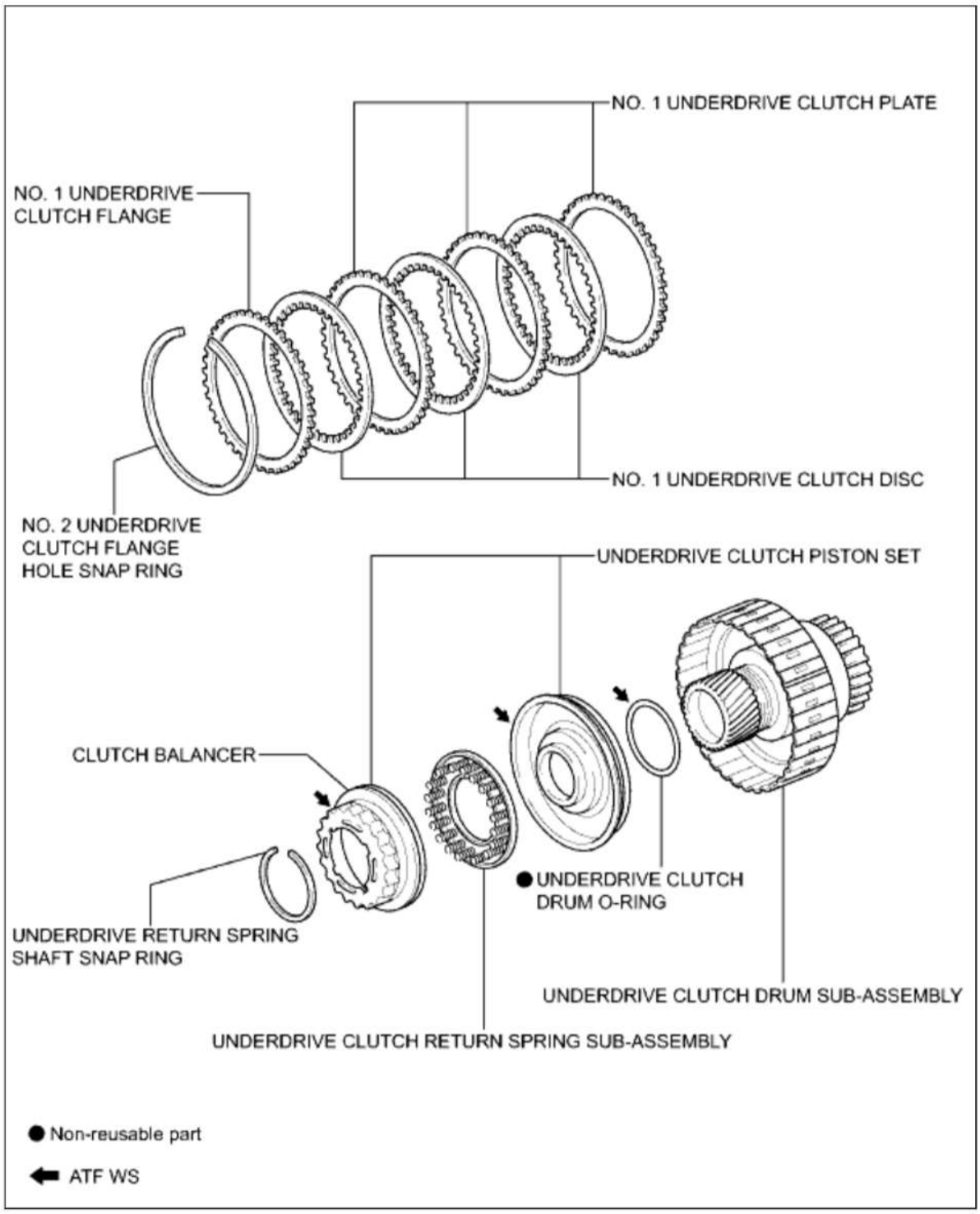
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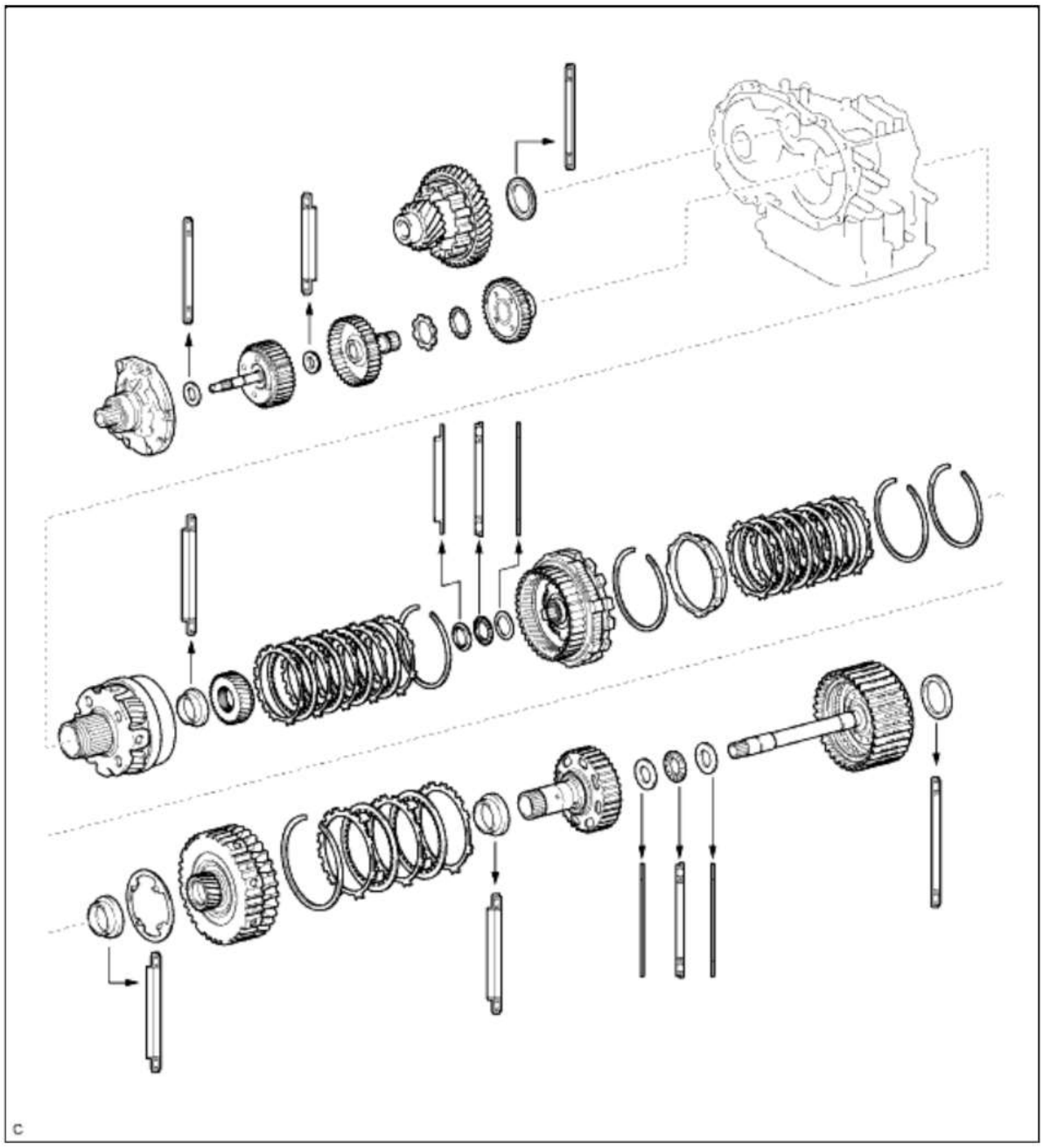
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Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000192I018X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. BEARING POSITION

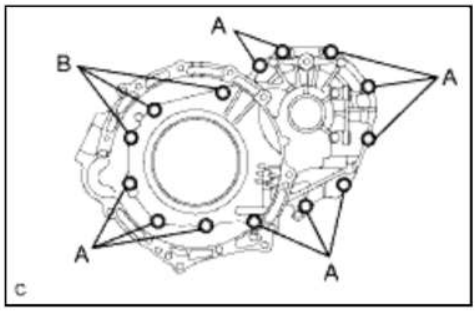
(a) Check each bearing position and installation direction.



2. INSPECT DIFFERENTIAL CASE TAPERED ROLLER BEARING PRELOAD

(a) Coat the front differential case and bearing with ATF and install them to the transaxle case.

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(b) Install the transaxle housing with the 14 bolts.

Bolt A - Torque: 29 N·m (296 kgf·cm, 21ft·lbf)

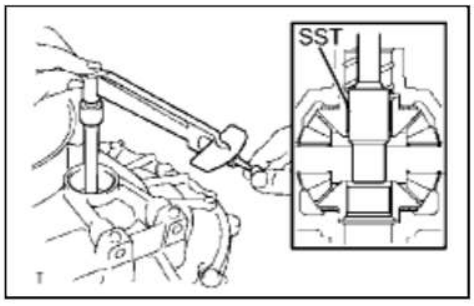
Bolt B - Torque: 22 N·m (224 kgf·cm, 16ft·lbf)

(c) Using SST and a small torque wrench, measure the preload of the differential gear.

Preload:

BEARING	STANDARD
New	0.98 to 1.57 N*m (10.0 to 16.0 kgf*cm, 8.7 to 13.9 in.*lbf)
Used	0.49 to 0.78 N*m (5.0 to 8.0 kgf*cm, 4.3 to 6.9 in.*lbf)

If the preload is not within the specifications, remove the differential from the transaxle case.



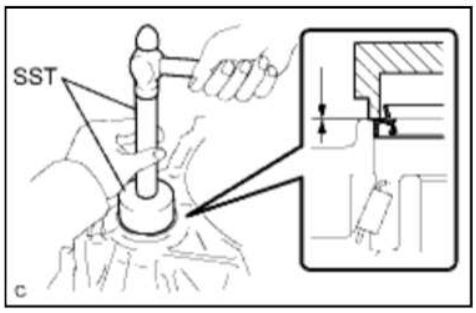
Select a new transaxle case side adjusting shim in accordance with the following table.

Adjusting Shim Thickness:

MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
01	1.90 (0.0748)	11	2.40 (0.0945)
02	1.95 (0.0768)	12	2.45 (0.0965)
03	2.00 (0.0787)	13	2.50 (0.0984)
04	2.05 (0.0807)	14	2.55 (0.1004)
05	2.10 (0.0827)	15	2.60 (0.1024)
06	2.15 (0.0846)	16	2.65 (0.1043)
07	2.20 (0.0866)	17	2.70 (0.1063)
08	2.25 (0.0885)	18	2.75 (0.1083)
09	2.30 (0.0906)	19	2.80 (0.1102)
10	2.35 (0.0925)		

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3. INSTALL NO. 1 TRANSAXLE CASE OIL SEAL



(a) Coat the lip of a new No. 1 transaxle case oil seal with MP grease.

(b) Using SST and a hammer, drive in the No. 1 transaxle case oil seal.

SST: 09387-00010

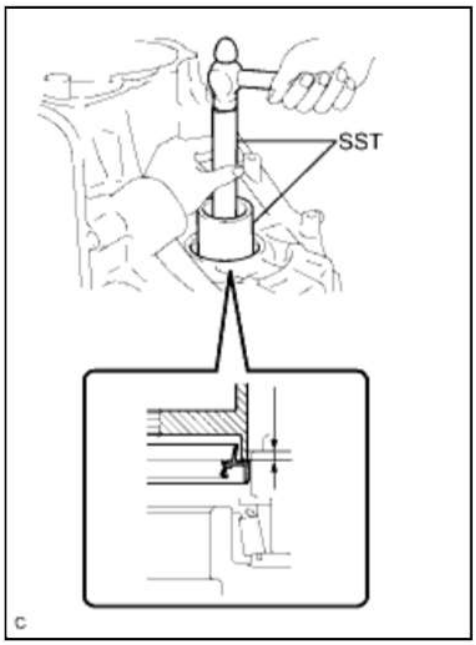
SST: 09950-70010

09951-07100

Oil seal driven in depth:

-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

4. INSTALL NO. 2 TRANSAXLE CASE OIL SEAL



(a) Coat the lip of a new No. 2 transaxle case oil seal with MP grease.

(b) Using SST and a hammer, drive in the No. 2 transaxle case oil seal.

SST: 09726-27012

09726-02041

SST: 09950-70010

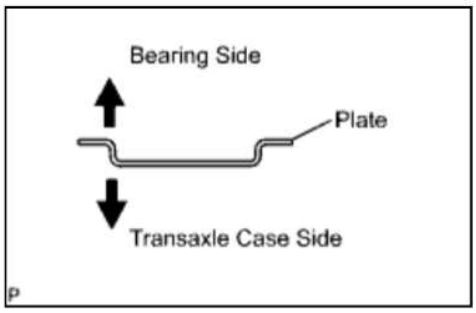
09951-07150

Oil seal driven in depth:

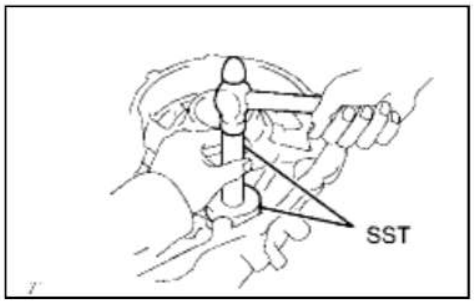
2.2 to 3.2 mm (0.0866 to 0.126 in.)

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5. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING



(a) Install the No. 1 transaxle case plate onto the transaxle case.



(b) Using SST and a hammer, install a new front drive pinion rear tapered roller bearing to the transaxle case.

SST: 09950-60010

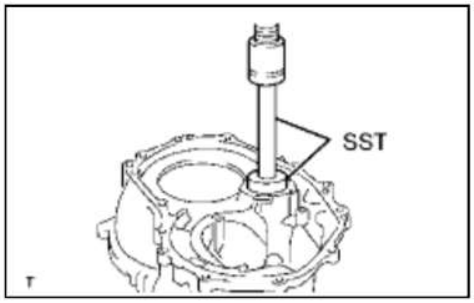
09951-00610

SST: 09950-70010

09951-07150

6. INSTALL FRONT DRIVE PINION FRONT TAPERED ROLLER BEARING

(a) Install the thrust bearing to the transaxle housing.



(b) Using SST and a press, install a new front drive pinion front tapered roller bearing to the transaxle housing.

SST: 09950-60010

09951-00650

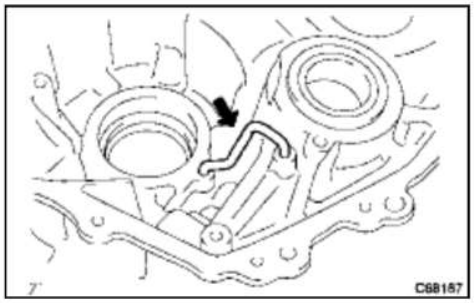
SST: 09950-70010

09951-07150

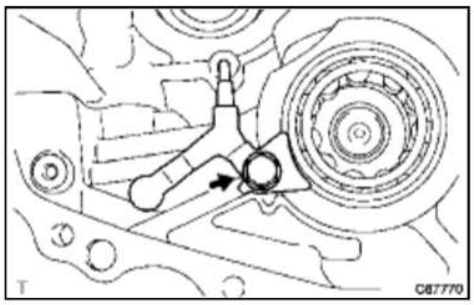
7. INSTALL DIFFERENTIAL GEAR LUBE APPLY TUBE

(a) Install the differential gear lube apply tube to the transaxle housing.

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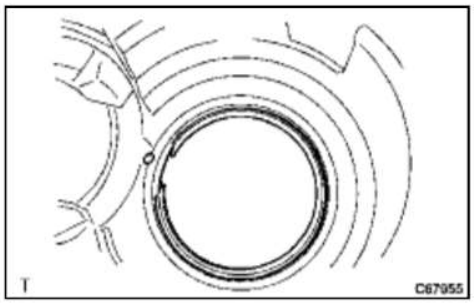
8. INSTALL BEARING LOCK PLATE



(a) Install the bearing lock plate to the transaxle housing with the bolt.

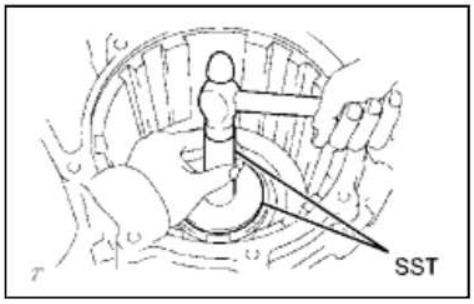
Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

9. INSTALL COUNTER DRIVE GEAR HOLE SNAP RING



(a) Using a screwdriver, install the counter drive gear hole snap ring to the transaxle case.

10. INSTALL COUNTER DRIVE GEAR BEARING LH



(a) Using SST and a hammer, install the counter drive gear bearing outer race LH to the transaxle case.

SST: 09950-60020

09951-00890

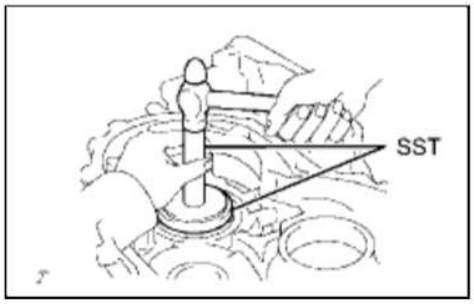
SST: 09950-70010

09951-07150

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(b) Install the counter drive gear bearing inner race LH and angular ball to the transaxle case.

11. INSTALL COUNTER DRIVE GEAR BEARING RH



(a) Using SST and a hammer, install the counter drive gear bearing outer race RH to the transaxle case.

SST: 09950-60020

09951-00890

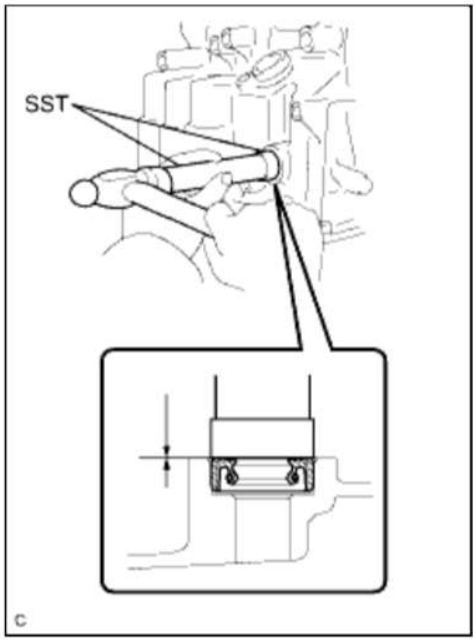
SST: 09950-70010

09951-07150

(b) Install the counter drive gear bearing RH to the transaxle case.

12. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

(a) Coat the lip of a new manual valve lever shaft oil seal with MP grease.



(b) Using SST and a hammer, install the new manual valve lever shaft oil seal.

SST: 09950-60010

09951-00220

SST: 09950-70010

09951-07100

Oil seal driven in depth:
-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

13. INSTALL DIFFERENTIAL DRIVE PINION

(a) Using SST and a press, install the differential drive pinion to the counter driven gear.

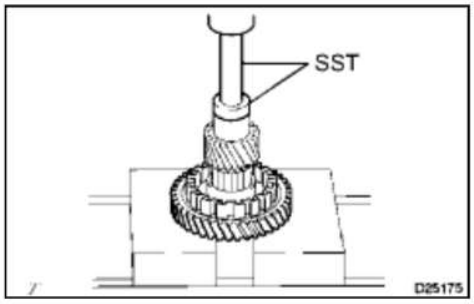
SST: 09950-60010

09951-00350

SST: 09950-70010

09951-07150

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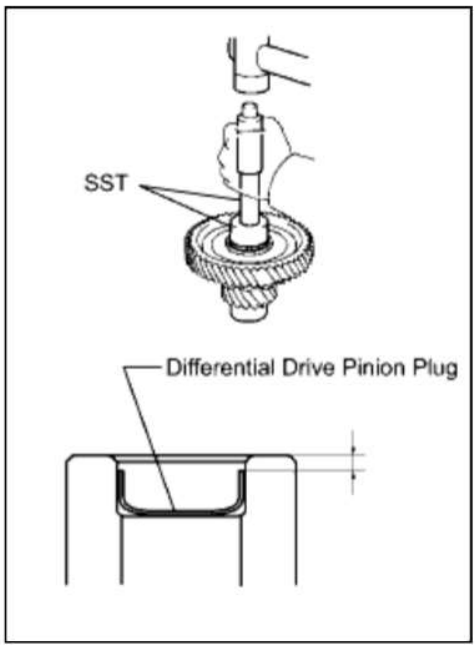


NOTICE:

When replacing the counter driven gear, replace the counter drive gear in the transaxle case as well.

Press in the differential drive pinion until it comes into contact with the counter driven gear.

14. INSTALL DIFFERENTIAL DRIVE PINION PLUG



(a) Using SST and a plastic hammer, install a new differential drive pinion plug to the differential drive pinion.

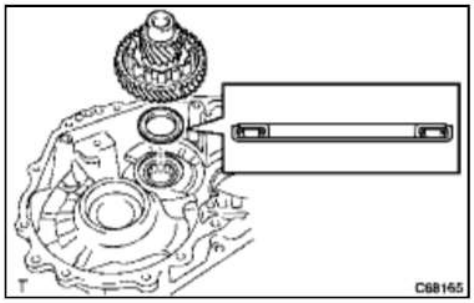
SST: 09221-25026

09221-00071

Standard clearance:

2.5 to 3.5 mm (0.0984 to 0.137 in.)

15. INSTALL COUNTER DRIVEN GEAR

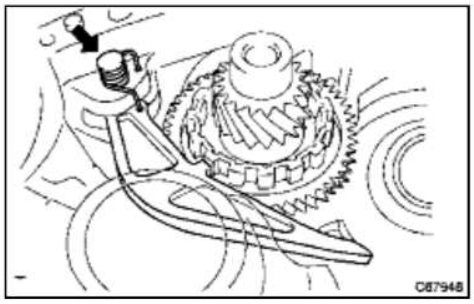


(a) Install the counter driven gear and drive pinion thrust bearing LH to the transaxle case.

16. INSTALL PARKING LOCK PAWL

(a) Coat the parking lock pawl shaft with ATF.

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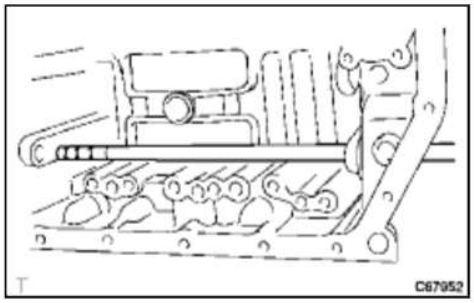


(b) Install the parking lock pawl, parking lock pawl shaft torsion spring and parking lock pawl shaft to the transaxle case.

NOTICE:

Check that the parking lock pawl moves smoothly.

17. INSTALL MANUAL VALVE LEVER SHAFT

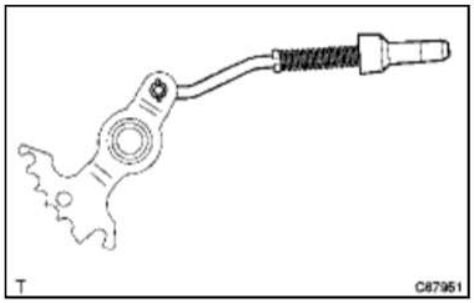


(a) Install the manual valve lever shaft to the transaxle case.

NOTICE:

Do not damage the oil seal lip.

18. INSTALL PARKING LOCK ROD SUB-ASSEMBLY



(a) Install the parking lock rod to the manual valve lever.

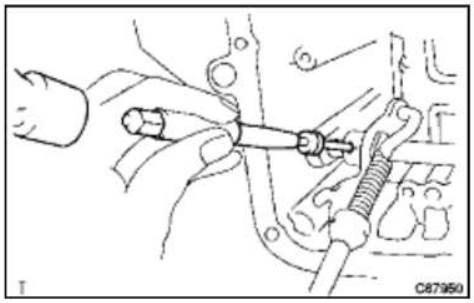
19. INSTALL MANUAL VALVE LEVER SUB-ASSEMBLY

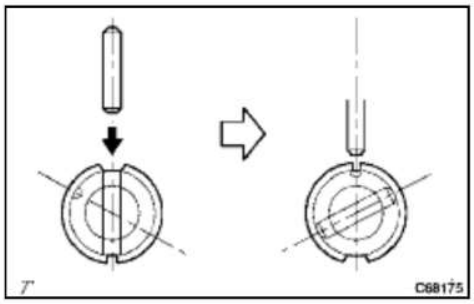
(a) Coat the manual valve lever sub-assembly with ATF.

(b) Install the manual valve lever and a new manual valve lever spacer to the manual valve lever shaft.

(c) Using a pin punch and hammer, drive in the pin.

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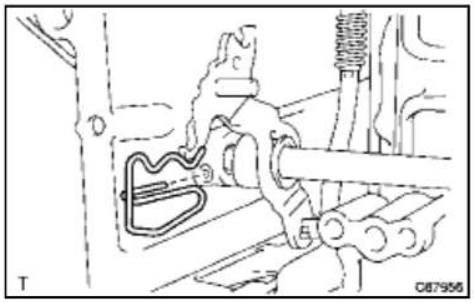


(d) Turn the spacer and lever shaft to align the small hole for locating the staking position mark on the lever shaft.

(e) Using a pin punch, stake the spacer through the small hole.

(f) Check that the spacer does not turn.

20. INSTALL MANUAL VALVE LEVER SHAFT RETAINER SPRING



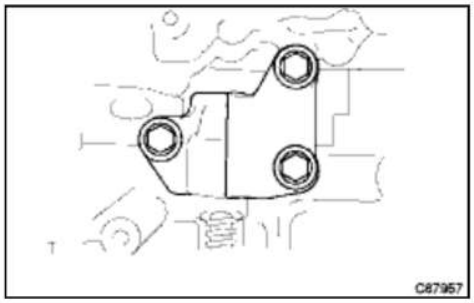
(a) Install the manual valve lever shaft retainer spring to the manual valve lever shaft.

21. INSTALL PARKING LOCK PAWL BRACKET

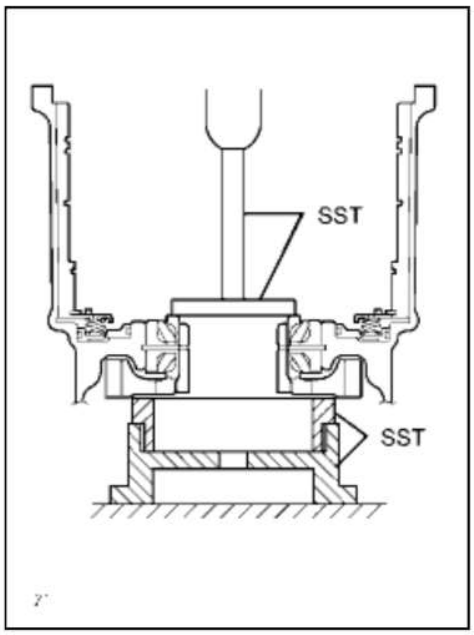
(a) Install the parking lock pawl bracket, parking lock rod and cam guide sleeve to the transaxle case with the 3 bolts.

Torque: 20 N·m (204 kgf·cm, 15ft·lbf)

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22. INSTALL COUNTER DRIVE GEAR



(a) Using SST and a press, install the counter drive gear to the transaxle case.

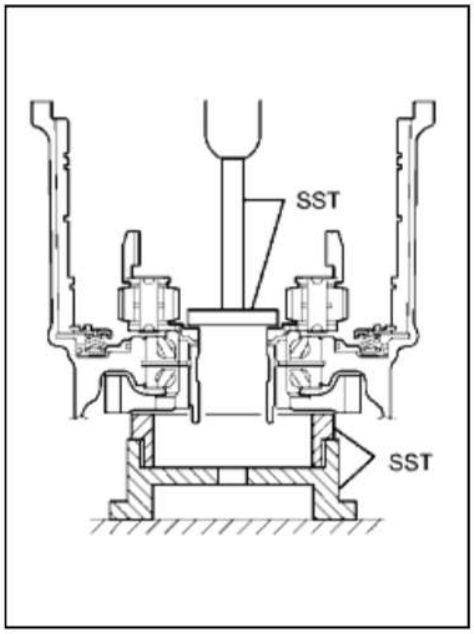
SST: 09223-15030
SST: 09527-17011
SST: 09950-60010
09951-00650
SST: 09950-70010
09951-07150

23. INSTALL PLANETARY GEAR ASSEMBLY

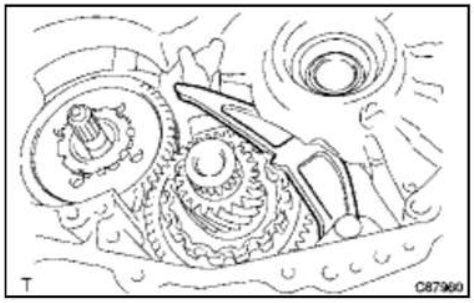
(a) Using SST and a press, install the planetary gear assembly to the transaxle case.

SST: 09950-60010
09951-00480
SST: 09223-15030
SST: 09527-17011
SST: 09950-70010
09951-07150

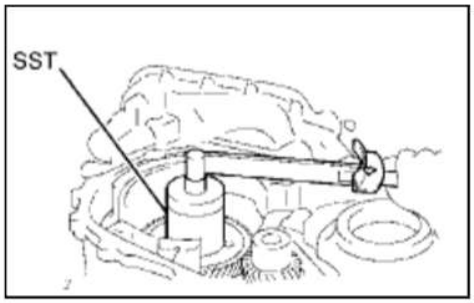
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24. INSTALL COUNTER DRIVE GEAR NUT



(a) Secure the counter driven gear with the parking lock pawl.



(b) Using SST, install a new lock washer and nut.

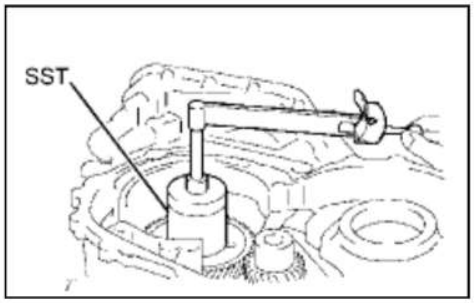
SST: 09387-00120

Torque: 280 N·m (2855 kgf·cm, 207ft·lbf)

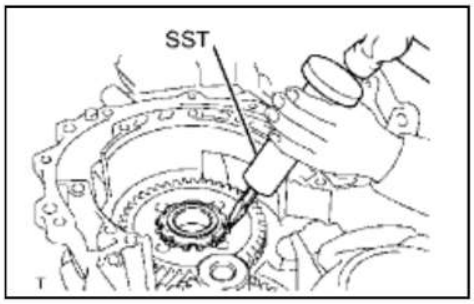
(c) Using SST and a small torque wrench, measure the rotating torque while turning the counter drive gear at 60 turns per minute.

SST: 09387-00120

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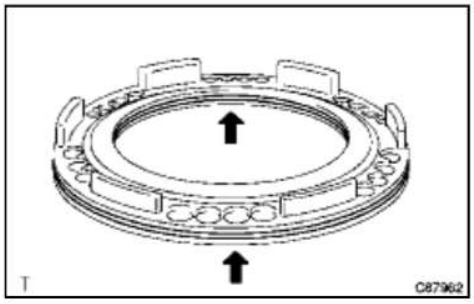
Rotating torque:
0.20 to 0.49 N*m (2.0 to 5.0 kgf*cm, 1.8 to 4.3 in.*lbf)



(d) Using SST and a hammer, stake the lock nut washer.

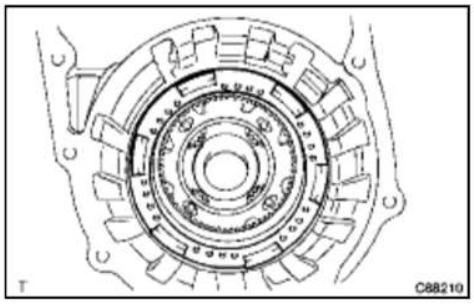
SST: 09930-00010

25. INSTALL NO. 2 1ST AND REVERSE BRAKE PISTON O-RING



(a) Coat 2 new No. 2 1st and reverse brake piston O-rings with ATF, and install them to the No. 2 1st and reverse brake piston.

26. INSTALL NO. 2 1ST AND REVERSE BRAKE PISTON



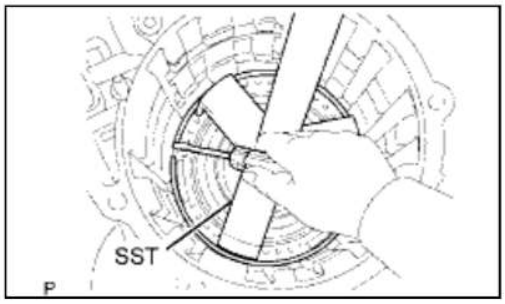
(a) Coat the No. 2 1st and reverse brake piston with ATF, and install it to the transaxle case.

NOTICE:

Do not damage the oil seal lip.

27. INSTALL 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

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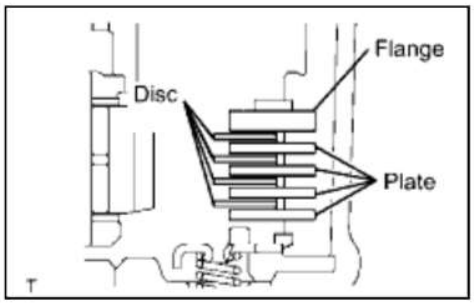


(a) Install the 1st and reverse brake return spring sub-assembly to the transaxle case.

(b) Using SST, a press and a screwdriver, install the snap ring.

SST: 09387-00070

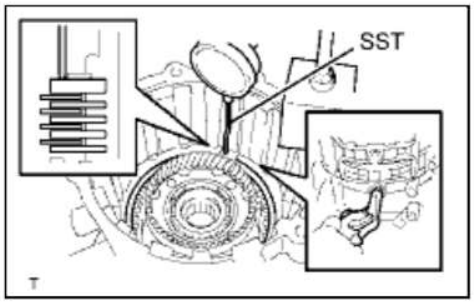
28. INSTALL 1ST AND REVERSE BRAKE DISC



(a) Install the 4 plates, 4 discs and flange to the transaxle case.

(b) Using a screwdriver, install the snap ring.

29. INSPECT PACK CLEARANCE OF 1ST AND REVERSE BRAKE



(a) Using SST and a dial indicator, measure the 1st and reverse brake clearance while pressing the discs and plates from the rear side.

SST: 09350-36010

09350-06110

Pack clearance:

0.81 to 1.20 mm (0.0318 to 0.0472 in.)

NOTICE:

If the clearance is not within the specified range, select a new brake flange.

HINT:

There are 4 different thicknesses of flanges available.

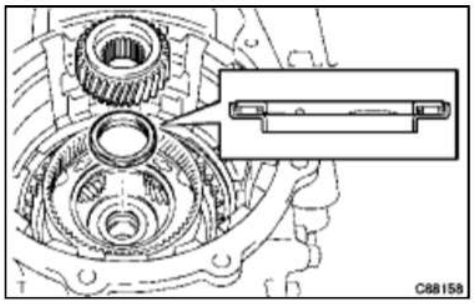
Flange Thickness:

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MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
-	3.4 (0.134)	2	3.8 (0.150)
1	3.6 (0.142)	3	4.0 (0.157)

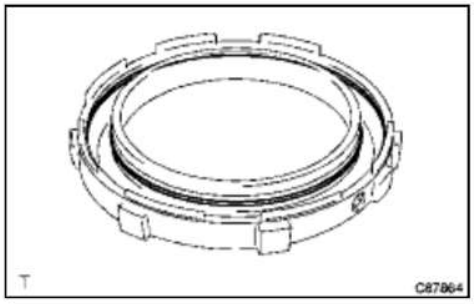
(b) Check that the 1st and reverse brake piston moves when compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) is applied to the oil hole.

30. INSTALL FRONT PLANETARY SUN GEAR



(a) Install the planetary sun gear and needle roller bearing to the planetary gear assembly.

31. INSTALL 2ND BRAKE CYLINDER O-RING



(a) Coat 2 new 2nd brake cylinder O-rings with ATF, and install them into the 2nd brake cylinder.

NOTICE:

Do not damage the O-rings.

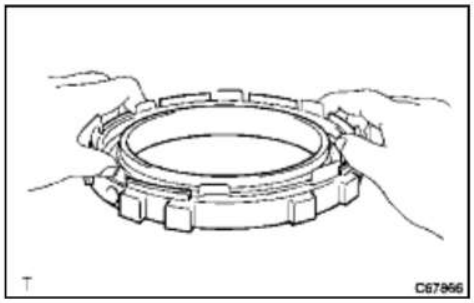
32. INSTALL 2ND BRAKE PISTON

(a) Coat the 2nd brake piston with ATF, and install it into the 2nd brake cylinder.

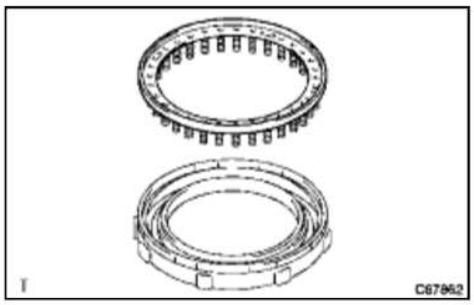
CAUTION:

Do not damage the O-rings when pressing the 2nd brake piston into the 2nd brake cylinder by hand.

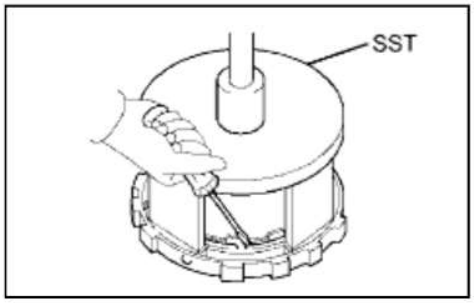
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33. INSTALL 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY



(a) Install the piston return spring.



(b) Place SST on the piston return spring, and compress the piston return spring with a press.

SST: 09387-00060

(c) Using a screwdriver, install the snap ring.

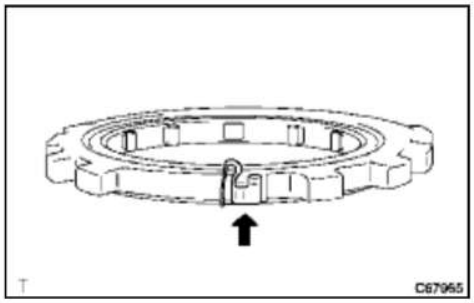
NOTICE:

Make sure that the end gap of the snap ring is not aligned with the piston return spring claw.

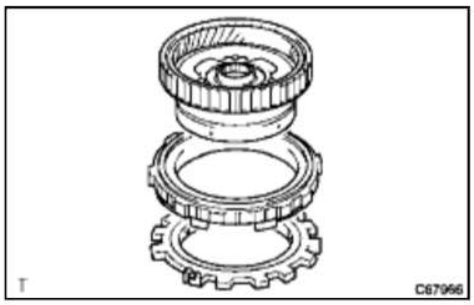
34. INSTALL OUTER RACE RETAINER

(a) Install the outer race retainer to the No. 2 one-way clutch.

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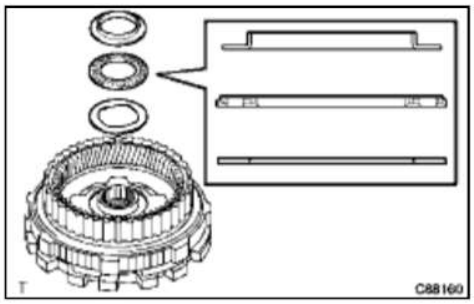


35. INSTALL NO. 2 ONE-WAY CLUTCH



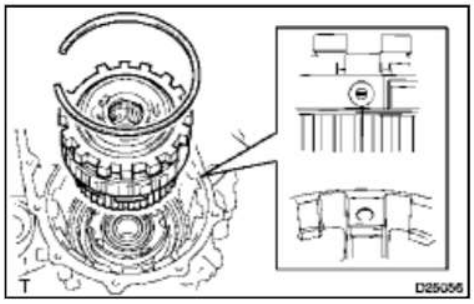
(a) Install the No. 2 one-way clutch and 2nd brake piston assembly to the rear planetary gear assembly.

36. INSTALL REAR PLANETARY GEAR THRUST NEEDLE ROLLER BEARING



(a) Install the No. 2 thrust bearing race, the planetary gear thrust needle roller bearing and thrust bearing race to the rear planetary gear assembly.

37. INSTALL REAR PLANETARY GEAR ASSEMBLY

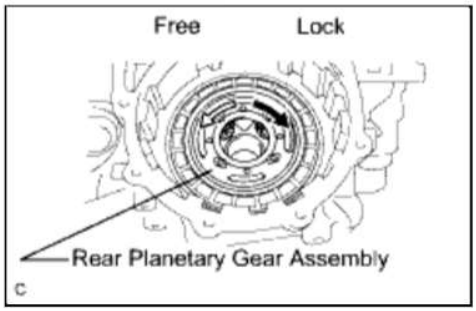


(a) Install the rear planetary gear assembly to the transaxle case.

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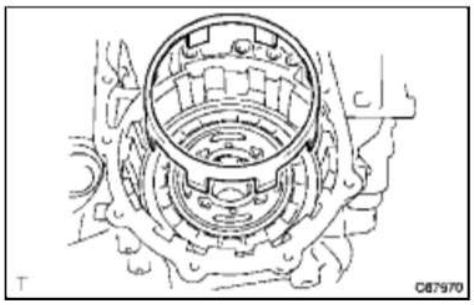
(b) Using a screwdriver, install the snap ring.

38. INSPECT NO. 2 ONE-WAY CLUTCH



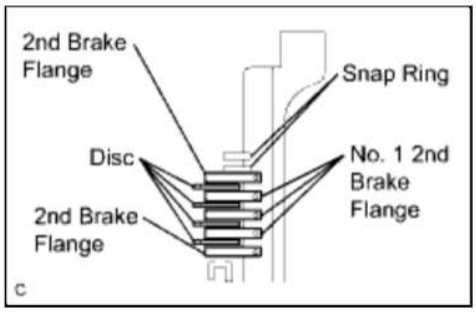
(a) Check that the rear planetary gear assembly turns freely counterclockwise and locks when turned clockwise.

39. INSTALL 2ND BRAKE PISTON SLEEVE



(a) Install the 2nd brake piston sleeve to the transaxle case.

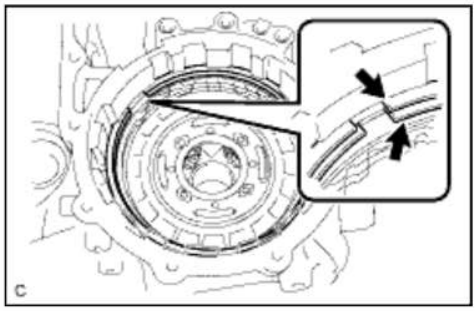
40. INSTALL 2ND BRAKE DISC



(a) Install the 4 discs, 3 No. 1 2nd brake flanges and 2 2nd brake flanges to the transaxle case.

(b) Using a screwdriver, install the 2 snap rings to the transaxle case.

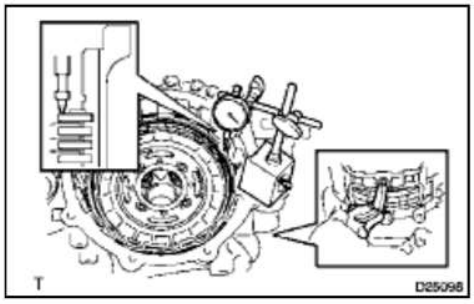
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41. INSPECT PACK CLEARANCE OF 2ND BRAKE

(a) Using a dial indicator, measure the 2nd brake pack clearance while applying and releasing compressed air (392 to 785 kPa, 4.0 to 8.0 kgf/cm2, 57 to 114 psi).

Pack clearance:
0.85 to 1.24 mm (0.0334 to 0.0488 in.)



NOTICE:

If the clearance is not within the specified range, select a new brake flange.

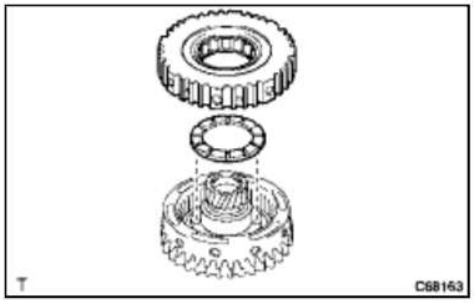
HINT:

There are 4 different thicknesses of flanges available.

Flange Thickness:

MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
-	3.0 (0.118)	2	3.4 (0.134)
1	3.2 (0.126)	3	3.6 (0.142)

42. INSTALL ONE-WAY CLUTCH ASSEMBLY

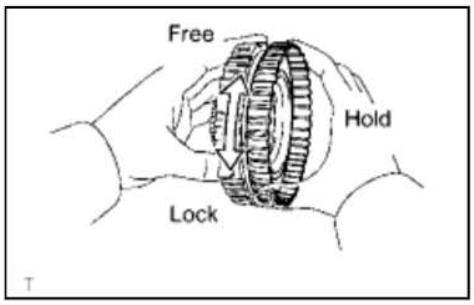


(a) Install the No. 2 thrust washer to the rear planetary gear assembly.

(b) Install the one-way clutch assembly to the rear planetary sun gear assembly.

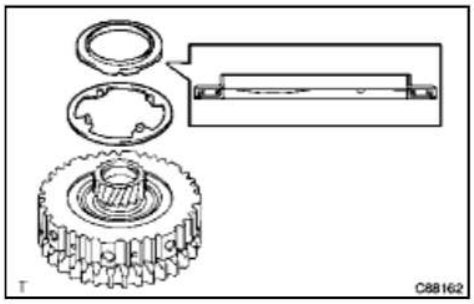
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43. INSPECT ONE-WAY CLUTCH ASSEMBLY



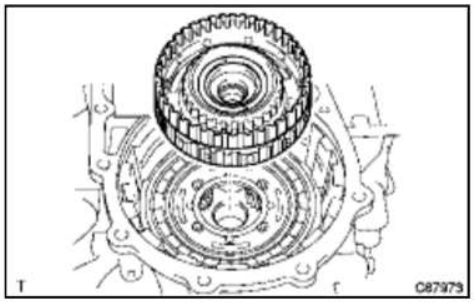
(a) Hold the rear planetary sun gear, turn the one-way clutch and check that the one-way clutch turns freely counterclockwise and locks when turned clockwise.

44. INSTALL REAR PLANETARY SUN GEAR THRUST NEEDLE ROLLER BEARING



(a) Install the thrust needle roller bearing and the washer to the rear planetary sun gear.

45. INSTALL REAR PLANETARY SUN GEAR ASSEMBLY

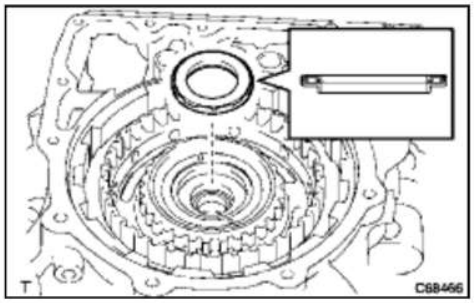


(a) Install the rear planetary sun gear assembly.

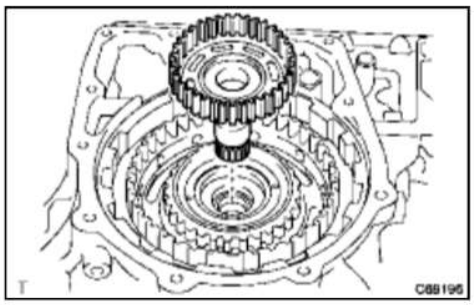
46. INSTALL REAR NO. 2 PLANETARY SUN GEAR THRUST NEEDLE ROLLER BEARING

(a) Install the rear No. 2 planetary sun gear thrust needle roller bearing to the rear planetary sun gear.

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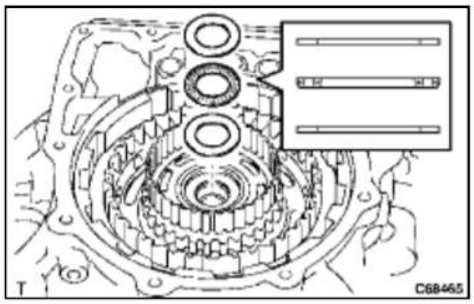


47. INSTALL DIRECT CLUTCH HUB



(a) Install the direct clutch hub.

48. INSTALL THRUST NEEDLE ROLLER BEARING

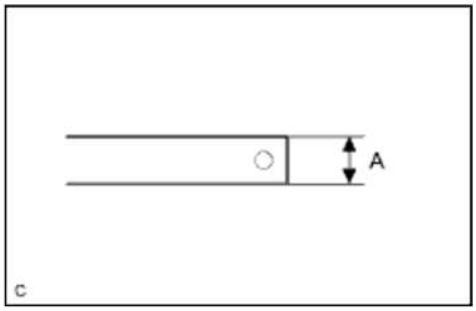


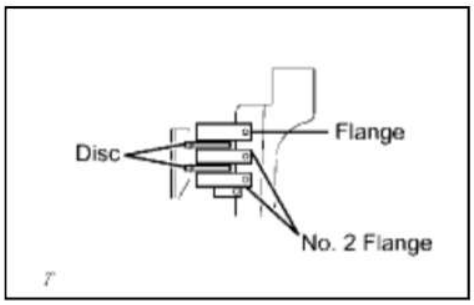
(a) Install the No. 3 thrust bearing race, the thrust needle roller bearing and the C-2 hub thrust bearing race to the direct clutch hub.

49. INSTALL 2ND COAST AND OVERDRIVE BRAKE DISC

(a) Measure the flange thickness. (Dimension A)

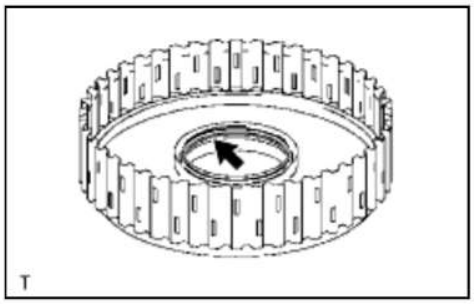
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(b) Install the 2 discs, 2 No. 2 flanges and flange to the transaxle case.

50. INSTALL DIRECT CLUTCH DRUM O-RING

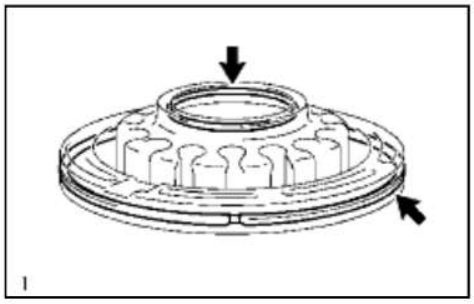


(a) Coat a new O-ring with ATF and install it to the direct clutch drum.

NOTICE:

Do not damage the O-ring.

51. INSTALL DIRECT CLUTCH PISTON O-RING



(a) Coat 2 new O-rings with ATF and install them to the direct clutch piston.

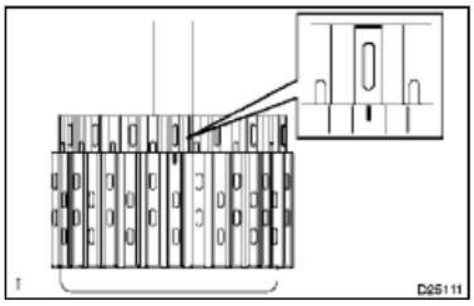
NOTICE:

Do not damage the O-rings.

52. INSTALL DIRECT CLUTCH DRUM SUB-ASSEMBLY

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(a) Coat the direct clutch drum with ATF.

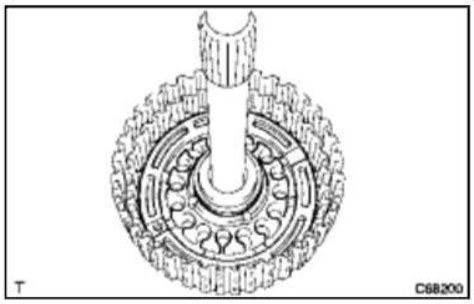


(b) Align a cutout on the intermediate shaft assembly with the matchmark on the direct clutch drum and install the direct clutch drum to the intermediate shaft assembly.

NOTICE:

Do not damage the O-ring or the lip of the clutch drum.

53. INSTALL DIRECT CLUTCH PISTON SUB-ASSEMBLY

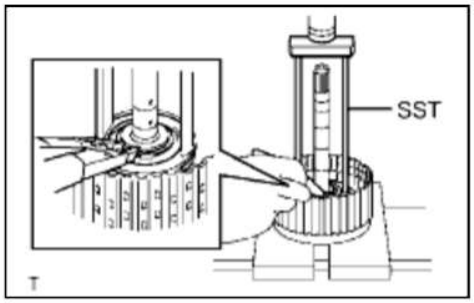


(a) Coat the direct clutch piston with ATF and install it to the intermediate shaft.

NOTICE:

Do not damage the O-ring or the direct clutch piston.

54. INSTALL DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Install the direct clutch return spring onto the direct clutch piston.

(b) Place SST on the piston return spring and compress the springs with a press.

SST: 09387-00020

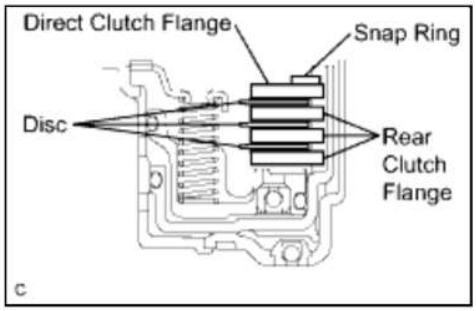
(c) Using snap ring pliers, install the snap ring to the direct clutch drum.

NOTICE:

- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring seat from being deformed.
- Do not expand the snap ring excessively.

55. INSTALL DIRECT CLUTCH DISC

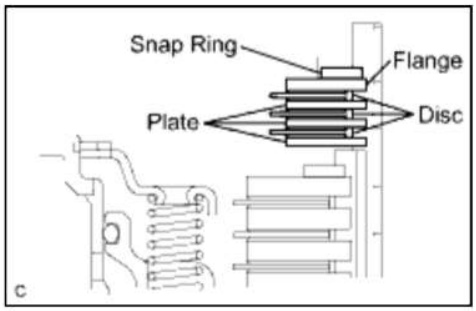
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(a) Coat the 3 rear clutch flanges, 3 discs and direct clutch flange with ATF and install them to the intermediate shaft.

(b) Install the snap ring to the intermediate shaft.

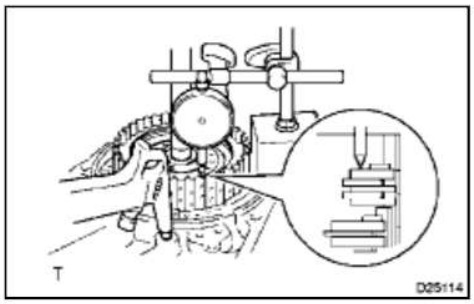
56. INSTALL REVERSE CLUTCH DISC



(a) Coat the 3 plates, 3 discs and flange with ATF, and install them to the intermediate shaft.

(b) Install the snap ring to the intermediate shaft.

57. INSPECT PACK CLEARANCE OF REVERSE CLUTCH



(a) Install the intermediate shaft and thrust needle roller bearing to the rear transaxle cover.

(b) Using a dial indicator, measure the reverse clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Pack clearance:
0.62 to 1.16 mm (0.0244 to 0.0456 in.)

NOTICE:

If the clearance is not within the specified range, select a new clutch flange.

HINT:

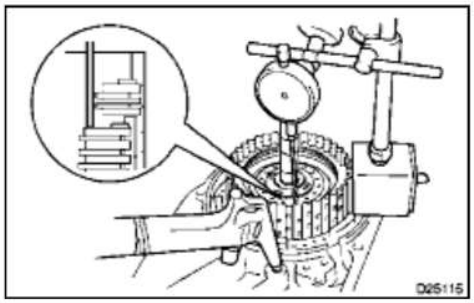
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There are 4 different thicknesses of flanges available.

Flange Thickness:

NO.	THICKNESS (MM (IN.))	NO.	THICKNESS (MM (IN.))
-	3.0 (0.118)	2	3.4 (0.134)
1	3.2 (0.126)	3	3.6 (0.142)

58. INSPECT PACK CLEARANCE OF DIRECT CLUTCH



(a) Install the intermediate shaft and thrust needle roller bearing to the transaxle rear cover.

(b) Using a dial indicator and measuring terminal (SST), measure the forward clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

SST: 09350-36010

09350-06110

HINT:

The direct and reverse clutch will come out as compressed air is applied.

Therefore, while performing the check, press on the input shaft of the direct and reverse clutch using a press or the equivalent so that the pressure is not applied to the direct and reverse clutch.

Pack clearance:
0.62 to 1.02 mm (0.0244 to 0.0402 in.)

NOTICE:

If the clearance is not within the specified range, select a new clutch flange.

HINT:

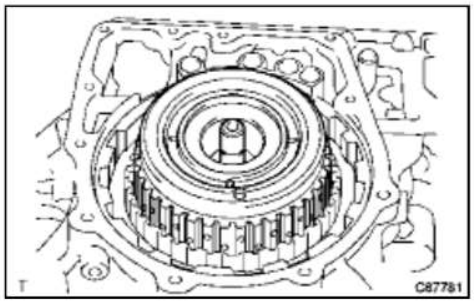
There are 4 different flange thicknesses.

Flange Thickness:

NO.	THICKNESS (MM (IN.))	NO.	THICKNESS (MM (IN.))
-	3.0 (0.118)	2	3.4 (0.134)
1	3.2 (0.126)	3	3.6 (0.142)

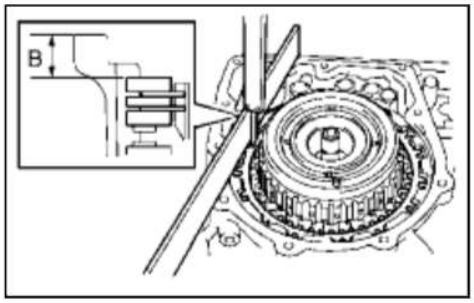
59. INSTALL INTERMEDIATE SHAFT ASSEMBLY

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(a) Install the intermediate shaft assembly to the transaxle case.

60. INSPECT 2ND COAST AND OVERDRIVE BRAKE CLEARANCE

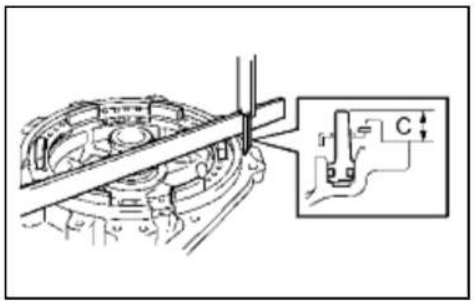


(a) As shown in the illustration, place a straightedge on the transaxle case and measure the distance between the 2nd coast and overdrive brake flange and the straightedge using a vernier caliper. (Dimension B)

(b) As shown in the illustration, place a straightedge on the overdrive brake piston and measure the distance between the transaxle rear cover and straightedge using a vernier caliper. (Dimension C)

Calculate the piston stroke value using the following formula.

Formula:
(Dimension A + Dimension B) - Dimension C
Pack clearance:
2.10 to 2.49 mm (0.0826 to 0.0980 in.)



NOTICE:

If the clearance is not within the specified range, select a new brake flange.

HINT:

There are 4 different thicknesses of flanges available.

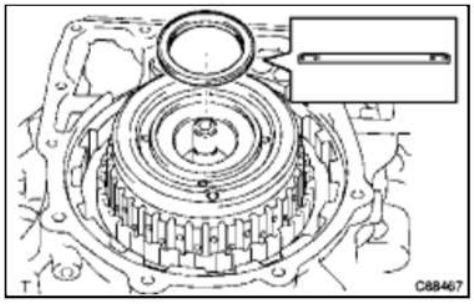
Flange Thickness:

MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
4	4.0 (0.1575)	6	4.4 (0.1732)

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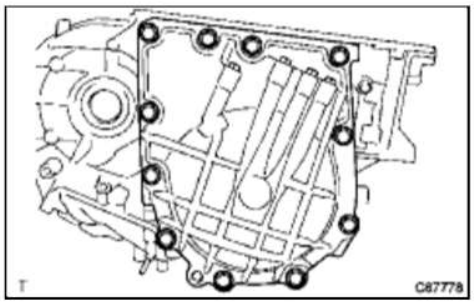
5	4.2 (0.1654)	7	4.6 (0.1811)

61. INSTALL REAR CLUTCH DRUM THRUST NEEDLE ROLLER BEARING



(a) Install the bearing to the intermediate shaft.

62. INSPECT INTERMEDIATE SHAFT ASSEMBLY



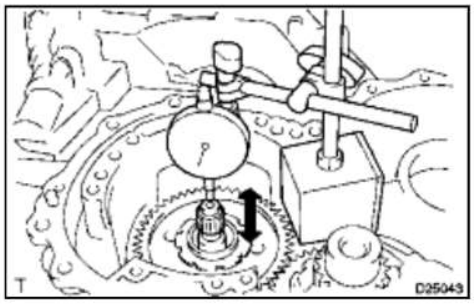
(a) Install the rear transaxle cover with the 11 bolts.

Torque: 25 N·m (255 kgf·cm, 18ft·lbf)

(b) Using a dial indicator, measure the intermediate shaft end play.

End play:
0.21 to 0.96 mm (0.00826 to 0.0377 in.)

If the end play is not as specified, select and replace the rear clutch drum thrust needle roller bearing.



HINT:

There are 2 different thicknesses of trust needle roller bearings available.

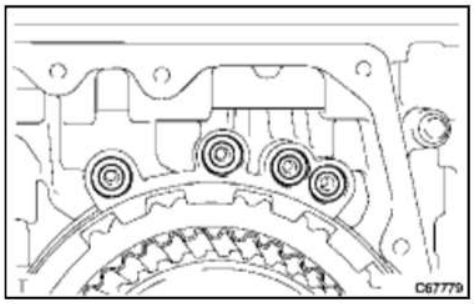
COLOR	THICKNESS (MM (IN.))
Brown	0.785 (0.0309)

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Black	1.1 (0.0433)

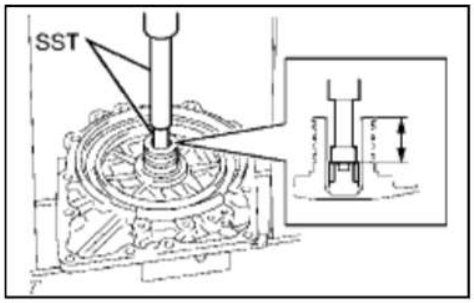
(c) Remove the 11 bolts and the rear transaxle cover.

63. INSTALL TRANSAXLE CASE GASKET



(a) Install 4 new gaskets to the transaxle case.

64. INSTALL REAR TRANSAXLE COVER NEEDLE ROLLER BEARING



(a) Coat a new needle roller bearing with ATF.

(b) Using SST and a press, install the needle roller bearing into the rear transaxle cover.

SST: 09950-60010

09951-00190

09952-06010

SST: 09950-70010

09951-07100

Standard clearance:

25.1 mm (0.988 in.)

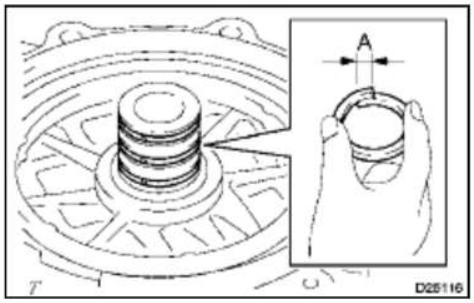
65. INSTALL CLUTCH DRUM OIL SEAL RING

(a) Compress the 3 oil seal rings from both sides to reduce dimension A.

Dimension A:

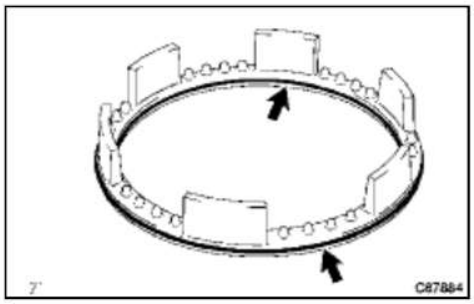
5.0 mm (0.197 in.)

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(b) Coat 3 oil seal rings with ATF and install them to the rear transaxle cover.

66. INSTALL 2ND COAST AND OVERDRIVE O-RING

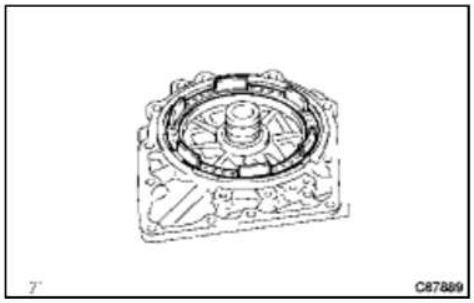


(a) Coat 2 new O-rings with ATF and install them to the 2nd coast and overdrive brake piston.

NOTICE:

Do not damage the O-rings.

67. INSTALL 2ND COAST AND OVERDRIVE BRAKE PISTON



(a) Coat the piston with ATF and install it to the rear transaxle cover.

NOTICE:

Do not damage the O-rings.

68. INSTALL OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

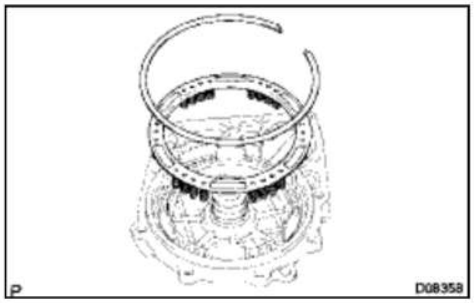
(a) Using SST and a press, install the overdrive brake return spring and snap ring to the rear transaxle cover.

SST: 09387-00070

NOTICE:

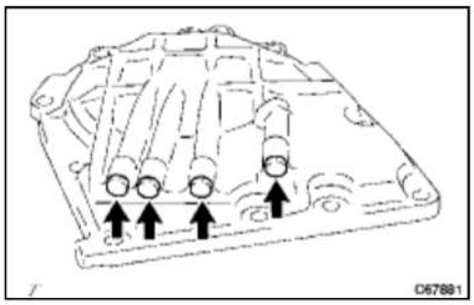
- Stop the press when the spring seat is lowered 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring seat from being deformed.

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- Do not expand the snap ring excessively.

69. INSTALL REAR TRANSAXLE COVER PLUG



(a) Coat 4 new O-rings with ATF, and install them to the 4 rear transaxle cover plugs.

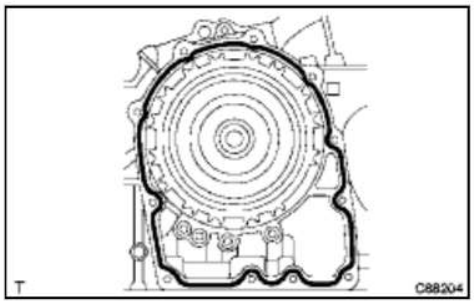
(b) Install the 4 rear transaxle cover plugs to the rear transaxle cover.

Torque: 7.4 N·m (76 kgf·cm, 66in·lbf)

NOTICE:

Do not damage the O-rings.

70. INSTALL REAR TRANSAXLE COVER ASSEMBLY



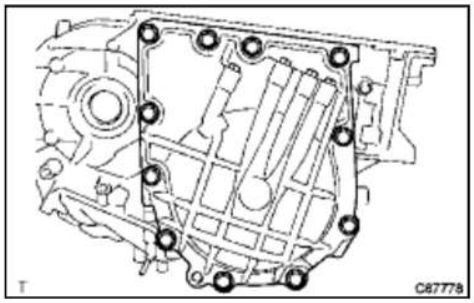
(a) Apply seal packing to the transaxle case.

Seal packing:
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

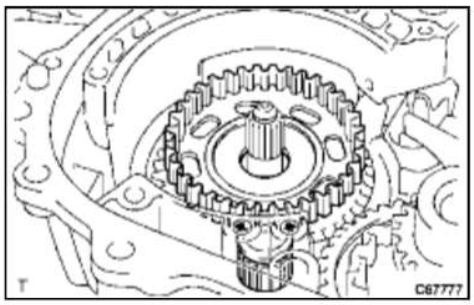
(b) Install the rear transaxle cover with the 11 bolts.

Torque: 25 N·m (255 kgf·cm, 18ft·lbf)

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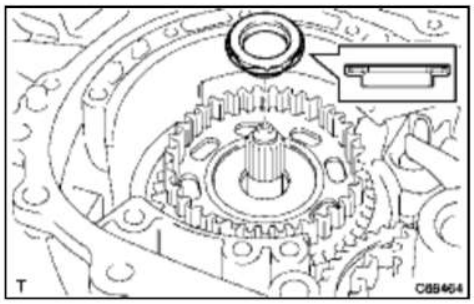


71. INSTALL FORWARD CLUTCH HUB SUB-ASSEMBLY



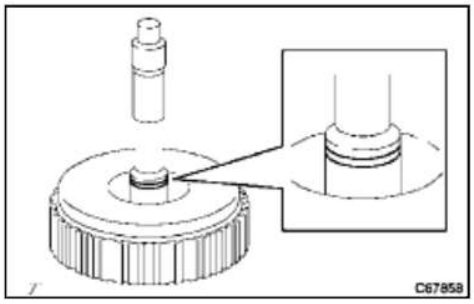
(a) Install the forward clutch hub sub-assembly onto the transaxle case.

72. INSTALL FORWARD CLUTCH HUB THRUST NEEDLE ROLLER BEARING



(a) Install the bearing to the forward clutch hub.

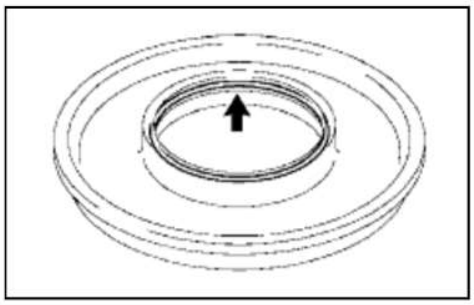
73. INSTALL INPUT SHAFT OIL SEAL RING



(a) Coat a new input shaft oil seal ring with ATF, and install it to the input shaft.

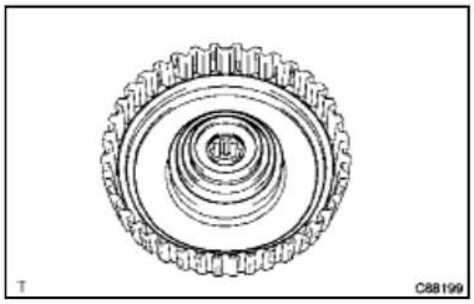
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74. INSTALL FORWARD CLUTCH PISTON O-RING



(a) Coat a new clutch piston O-ring with ATF, and install it to the forward clutch piston.

75. INSTALL FORWARD CLUTCH PISTON

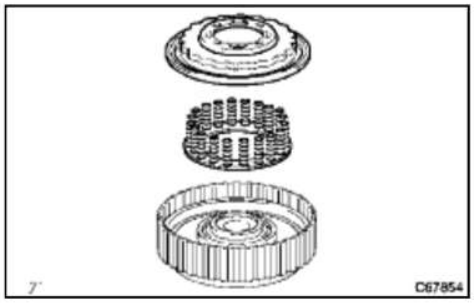


(a) Install the forward clutch piston to the input shaft.

NOTICE:

Do not damage the O-ring.

76. INSTALL FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

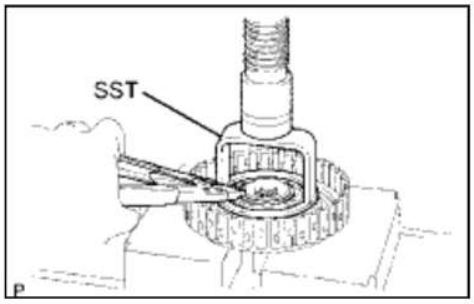


(a) Install the return spring and clutch balancer to the input shaft.

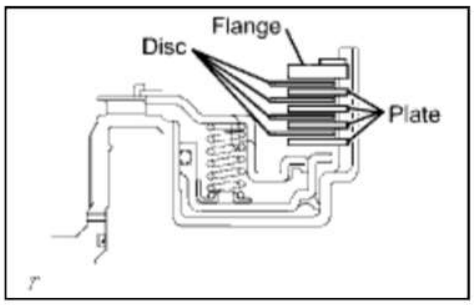
(b) Using SST, a press and snap ring pliers, install the snap ring to the input shaft.

SST: 09320-89010

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77. INSTALL FRONT CLUTCH DISC



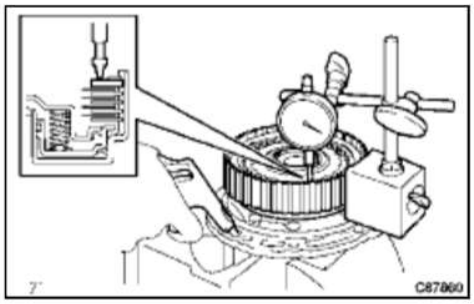
(a) Install the 4 plates, 4 discs and flange.

(b) Using a screwdriver, install the snap ring to the input shaft.

78. INSPECT PACK CLEARANCE OF FORWARD CLUTCH

(a) Using a dial indicator, measure the pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm2, 57 psi).

Pack clearance:
1.41 to 1.80 mm (0.0555 to 0.0708 in.)



NOTICE:

If the clearance is not within the specified range, install a new brake flange.

HINT:

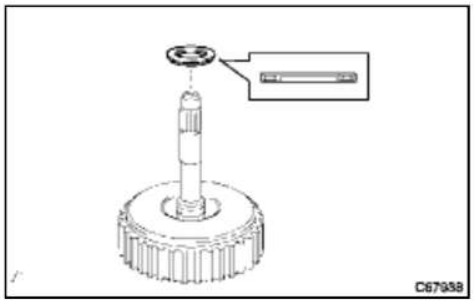
There are 4 different thicknesses of flanges available.

Flange Thickness:

NO.	THICKNESS (MM (IN.))	NO.	THICKNESS (MM (IN.))
-	3.0 (0.118)	2	3.4 (0.134)
1	3.2 (0.126)	3	3.6 (0.142)

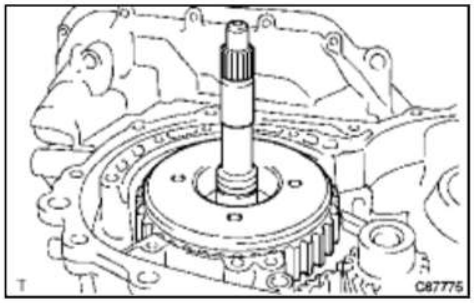
79. INSTALL STATOR SHAFT THRUST NEEDLE ROLLER BEARING

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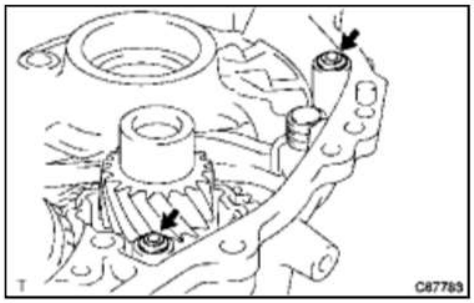
(a) Install the bearing to the input shaft assembly.

80. INSTALL INPUT SHAFT ASSEMBLY



(a) Install the input shaft assembly to the transaxle case.

81. INSTALL OVERDRIVE BRAKE GASKET

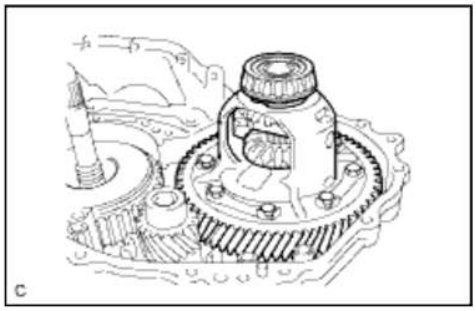


(a) Install 2 new gaskets to the transaxle case.

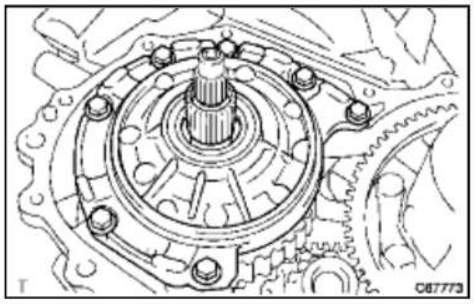
82. INSTALL DIFFERENTIAL GEAR ASSEMBLY

(a) Install the differential gear assembly to the transaxle case.

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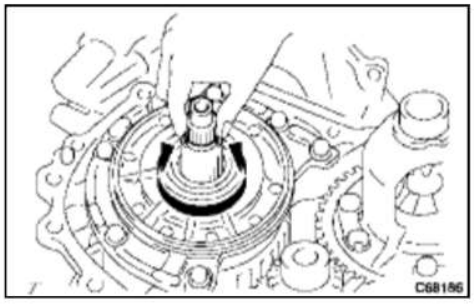
83. INSTALL OIL PUMP ASSEMBLY



(a) Install the oil pump with the 7 bolts.

Torque: 22 N·m (224 kgf·cm, 16ft·lbf)

84. INSPECT INPUT SHAFT ASSEMBLY



(a) Make sure that the input shaft turns smoothly.

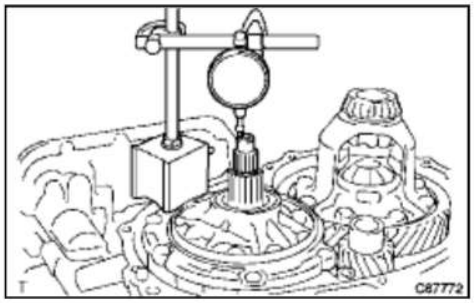
85. INSPECT INPUT SHAFT END PLAY

(a) Measure the end play in the axial direction.

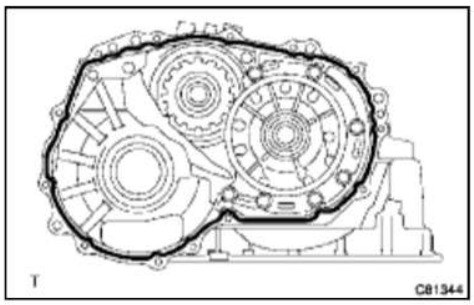
End play:
0.38 to 1.29 mm (0.0149 to 0.0507 in.)

If the end play is not as specified, replace the forward clutch hub thrust needle roller bearing and the stator shaft thrust needle bearing.

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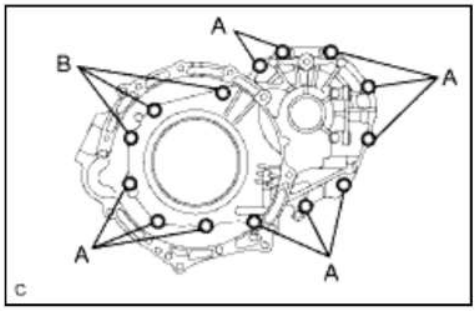


86. INSTALL TRANSAXLE HOUSING



(a) Apply seal packing to the transaxle case.

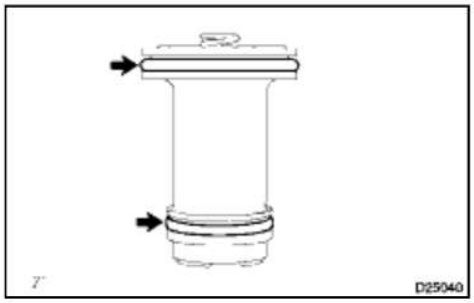
Seal packing:
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent



(b) Install the transaxle housing with the 14 bolts.

Bolt A - Torque: 29 N·m (296 kgf·cm, 21ft·lbf)
Bolt B - Torque: 22 N·m (224 kgf·cm, 16ft·lbf)

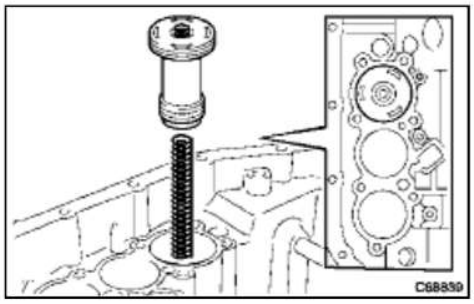
87. INSTALL C-2 ACCUMULATOR PISTON



(a) Coat 2 new O-rings with ATF and install them to the C-2 accumulator piston.

NOTICE:
Do not damage the O-rings.

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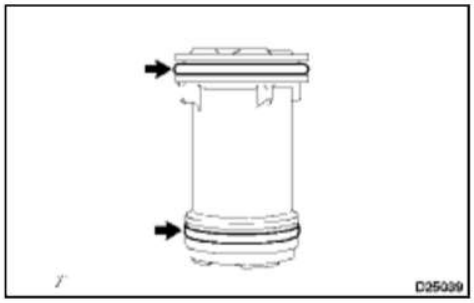


(b) Install the spring and C-2 accumulator piston.

Accumulator Spring:

SPRING	FREE LENGTH/ OUTER DIAMETER (MM (IN.))	COLOR
C-2	66.20 to 67.60 (2.606 to 2.661) 17.20 (0.677)	-

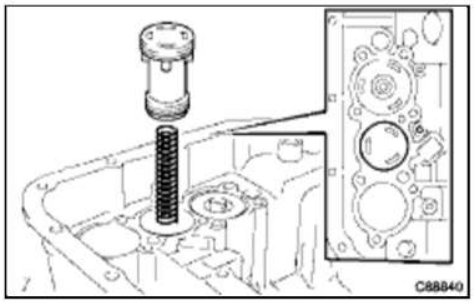
88. INSTALL C-3 ACCUMULATOR PISTON



(a) Coat 2 new O-rings with ATF and install them to the C-3 accumulator piston.

NOTICE:

Do not damage the O-rings.

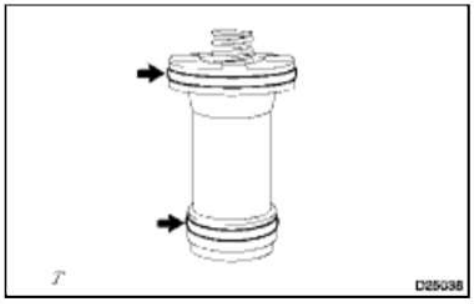


(b) Install the spring and C-3 accumulator piston.

Accumulator Spring:

SPRING	FREE LENGTH/ OUTER DIAMETER (MM (IN.))	COLOR
C-3	87.30 (3.437) 18.70 (0.736)	Orange

89. INSTALL B-2 ACCUMULATOR PISTON

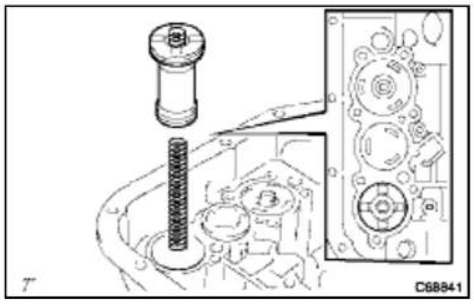


(a) Coat 2 new O-rings with ATF and install them to the B-2 accumulator piston.

NOTICE:

Do not damage the O-rings.

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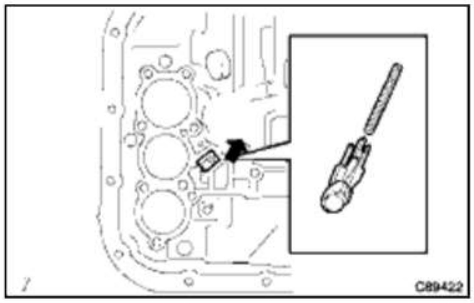


(b) Install the spring and B-2 accumulator piston.

Accumulator Spring:

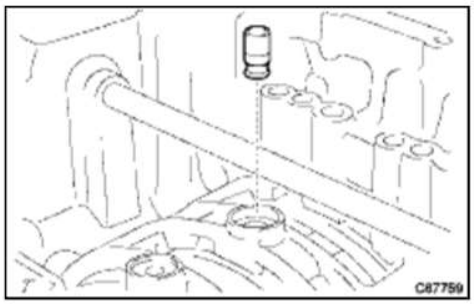
SPRING	FREE LENGTH/ OUTER DIAMETER (MM (IN.))	COLOR
B-2	66.90 (2.633) 15.50 (0.610)	White

90. INSTALL CHECK BALL BODY



(a) Install the spring and check ball body.

91. INSTALL BRAKE DRUM GASKET

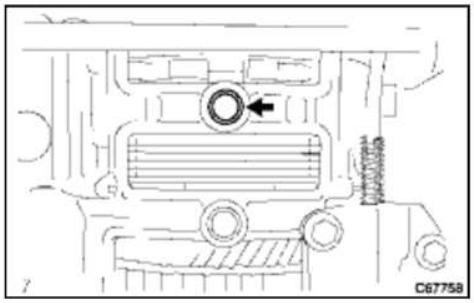


(a) Install a new brake drum gasket.

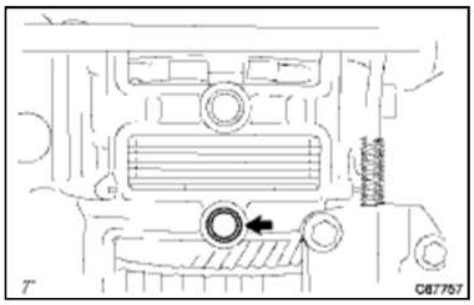
92. INSTALL TRANSAXLE CASE GASKET

(a) Coat a new transaxle case gasket with ATF, and install it to the transaxle case.

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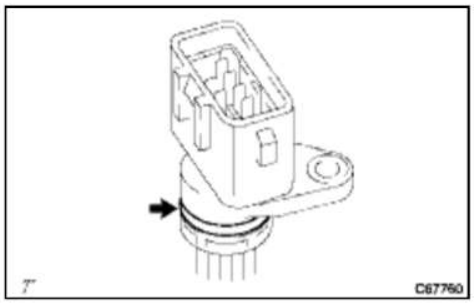


93. INSTALL TRANSAXLE CASE 2ND BRAKE GASKET

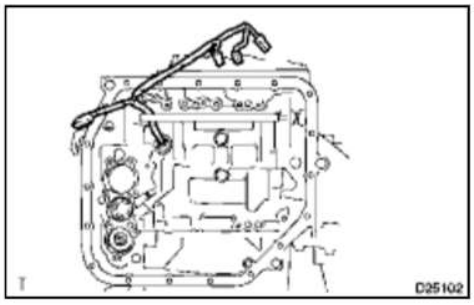


(a) Coat a new transaxle case 2nd brake gasket with ATF, and install it to the transaxle case.

94. INSTALL TRANSMISSION WIRE



(a) Coat a new O-ring with ATF, and install it into the transmission wire.



(b) Insert the transmission wire to the transaxle.

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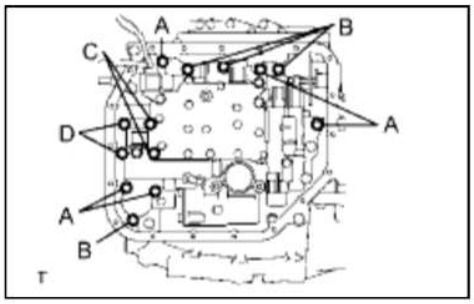


(c) Install the transmission wire with the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

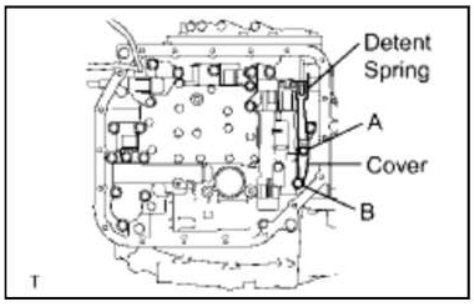
95. INSTALL TRANSMISSION VALVE BODY ASSEMBLY

(a) Align the groove of the manual valve with the pin of the manual valve lever.



(b) Temporarily install the valve body with the 13 bolts.

Bolt length:
Bolt A: 32 mm (1.26 in.)
Bolt B: 22 mm (0.866 in.)
Bolt C: 55 mm (2.17 in.)
Bolt D: 45 mm (1.77 in.)



(c) Temporarily install the detent spring and detent spring cover with the 2 bolts.

Bolt length:
Bolt A: 14 mm (0.551 in.)
Bolt B: 45 mm (1.77 in.)

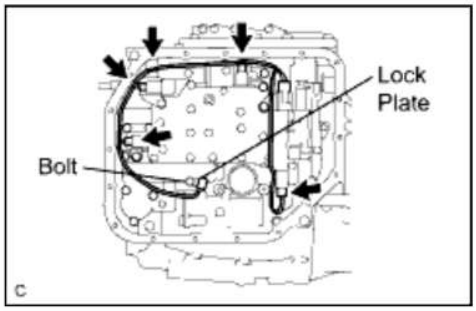
(d) Check that the manual valve lever is in contact with the center of the roller at the tip of the detent spring.

(e) Tighten the 15 bolts.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

(f) Connect the 5 solenoid connectors.

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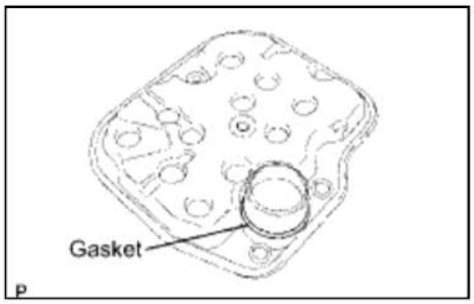
(g) Install the ATF temperature sensor with the lock plate and bolt.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

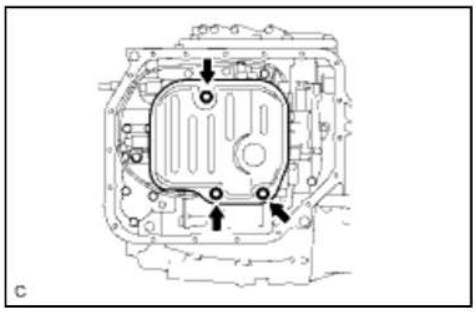
Bolt length:

55 mm (2.17 in.)

96. INSTALL VALVE BODY OIL STRAINER ASSEMBLY



(a) Coat a new gasket with ATF, and install it to the oil strainer.



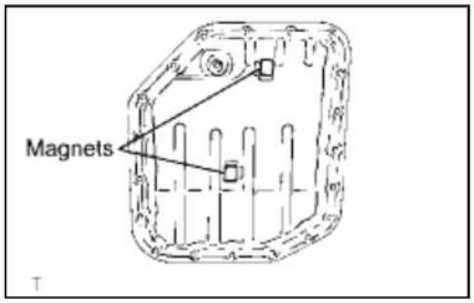
(b) Install the valve body oil strainer assembly to the automatic transaxle with the 3 bolts.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

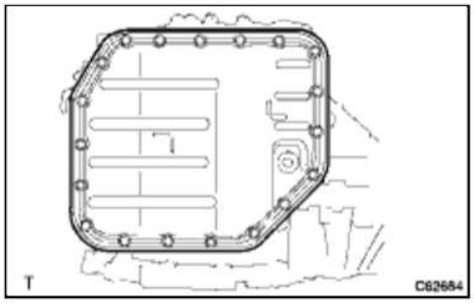
97. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY

(a) Install the 2 magnets to the oil pan.

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(b) Install a new oil pan gasket to the oil pan.



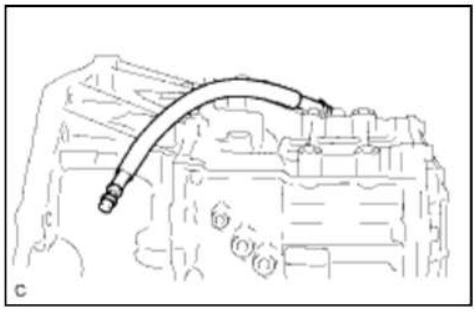
(c) Install the oil pan with the 19 bolts.

Torque: 7.8 N·m (80 kgf·cm, 69in·lbf)

98. INSTALL BREATHER PLUG

(a) Install the breather plug to the transaxle case.

99. INSTALL BREATHER PLUG HOSE



(a) Install the breather plug hose to the breather plug.

100. INSTALL NO. 1 TRANSAXLE CASE PLUG

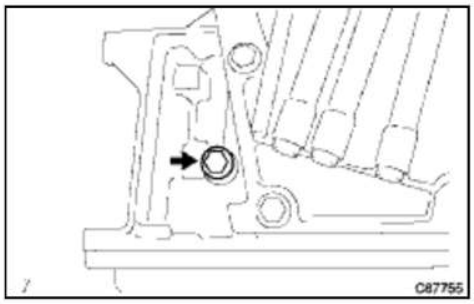
(a) Coat 5 new O-rings with ATF, and install them to the 5 No. 1 transaxle case plugs.

(b) Install the 4 No. 1 transaxle case plugs to the transaxle housing and transaxle case.

Torque: 7.4 N·m (76 kgf·cm, 66in·lbf)

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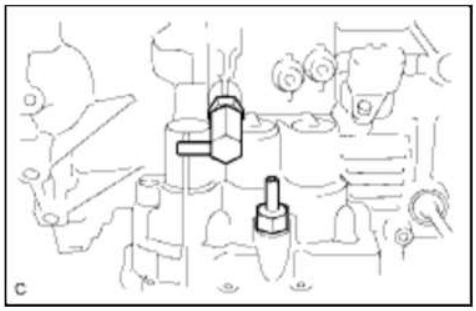


(c) Install the No. 1 transaxle case plug to the transaxle case.

Torque: 7.4 N·m (76 kgf·cm, 66in·lbf)

101. INSTALL OIL COOLER TUBE UNION

(a) Coat 2 new O-rings with ATF, and install them into the 2 oil cooler tube unions.



(b) Install the 2 oil cooler tube unions to the transaxle case.

Torque: 27 N·m (275 kgf·cm, 20ft·lbf)

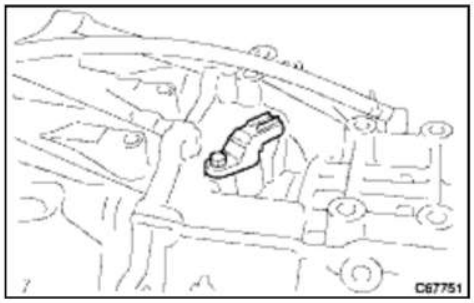
102. INSTALL SPEED SENSOR

(a) Coat a new O-ring with ATF, and install it to the speed sensor.

(b) Install the speed sensor to the transaxle case with the bolt.

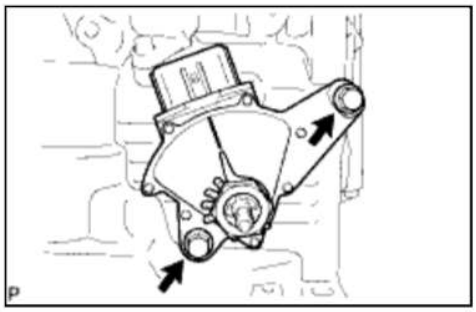
Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

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103. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Install the park/neutral position switch assembly to the automatic transaxle.

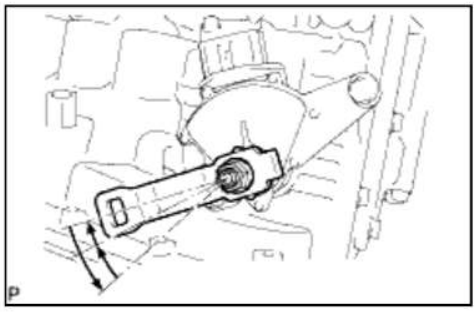


(b) Temporarily install the 2 bolts.

(c) Replace the lock plate with a new one and tighten the manual valve shaft nut.

Torque: 6.9 N·m (70 kgf·cm, 61in·lbf)

(d) Temporarily install the control shaft lever.

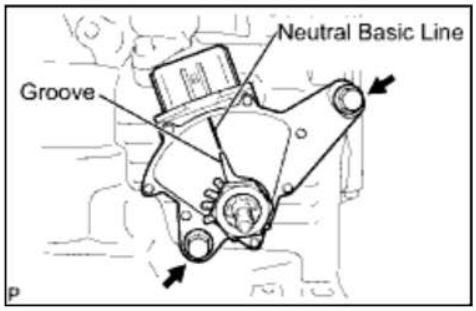


(e) Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.

(f) Remove the control shaft lever.

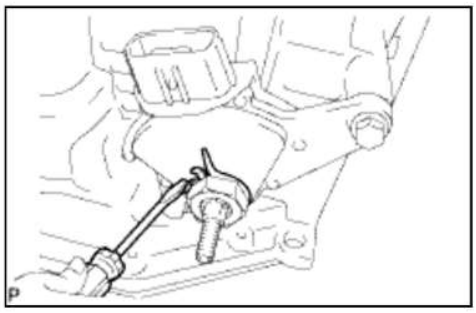
(g) Align the groove with the neutral basic line.

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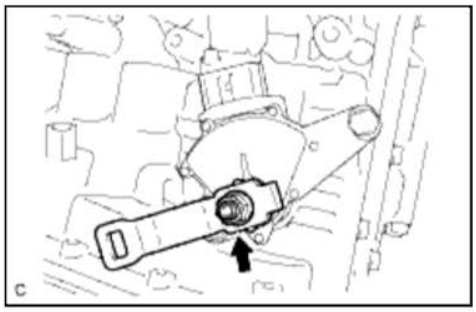


(h) Hold the switch in this position and tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)



(i) Using a screwdriver, stake the nut with the lock plate.



(j) Install the control shaft lever with the nut and washer.

Torque: 13 N·m (133 kgf·cm, 10ft·lbf)

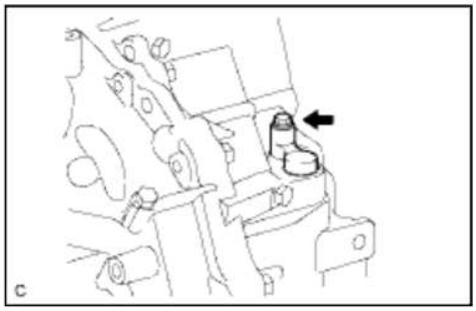
104. INSTALL SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY

(a) Coat a new O-ring with ATF and install it to the speedometer driven hole cover sub-assembly.

(b) Install the speedometer driven hole cover sub-assembly to the transaxle housing.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

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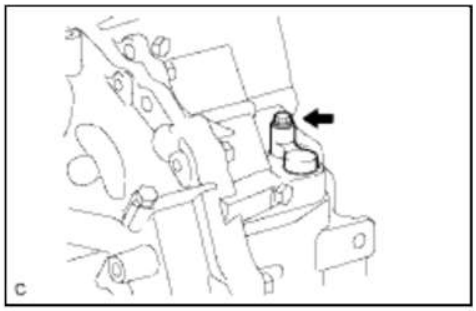


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192H018X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

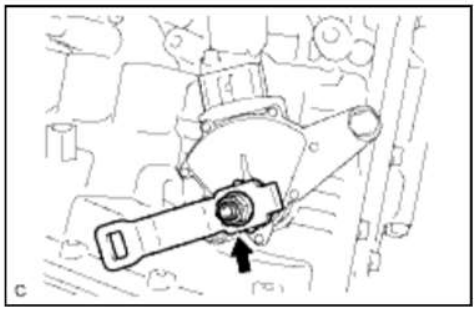
1. REMOVE SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY



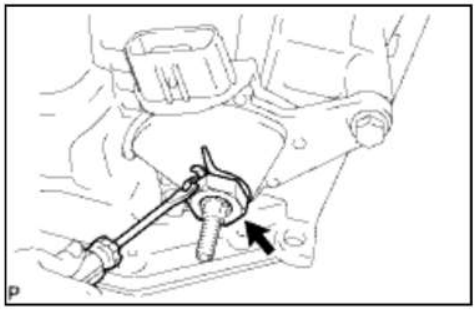
(a) Remove the bolt and speedometer driven hole cover sub-assembly from the transaxle housing.

(b) Remove the O-ring from the speedometer driven hole cover sub-assembly.

2. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY



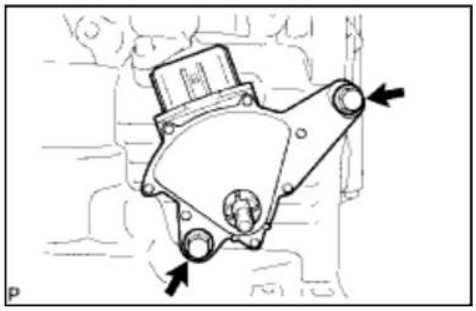
(a) Remove the nut and washer and remove the control shaft lever.



(b) Using a screwdriver, pry out the lock plate and remove the manual valve shaft nut.

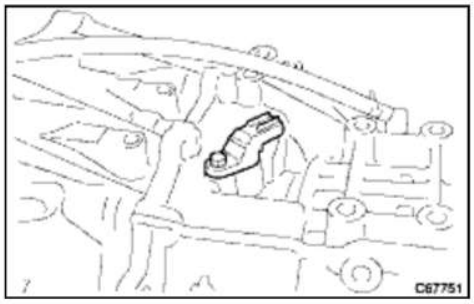
(c) Remove the 2 bolts and pull out the park/neutral position

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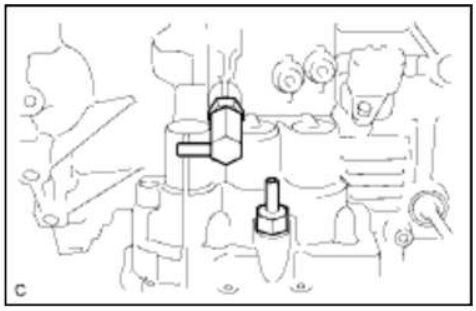
switch assembly.

3. REMOVE SPEED SENSOR



(a) Remove the bolt and speed sensor from the transaxle case.

4. REMOVE OIL COOLER TUBE UNION



(a) Remove the 2 oil cooler tube unions from the transaxle case.

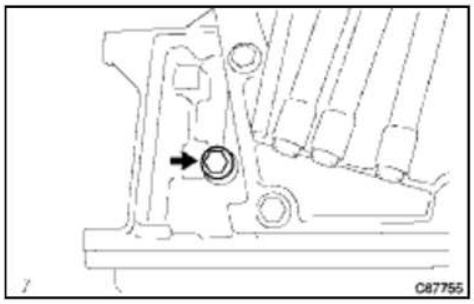
(b) Remove the O-ring from oil cooler tube union.

5. REMOVE NO. 1 TRANSAXLE CASE PLUG

(a) Remove the 4 No. 1 transaxle case plugs from the transaxle housing and transaxle case.

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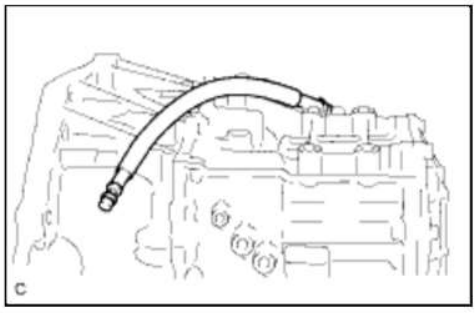




(b) Remove the No. 1 transaxle case plug from the transaxle case.

(c) Remove the O-ring from No. 1 transaxle case plug.

6. REMOVE BREATHER PLUG HOSE



(a) Remove the breather plug hose from the breather plug.

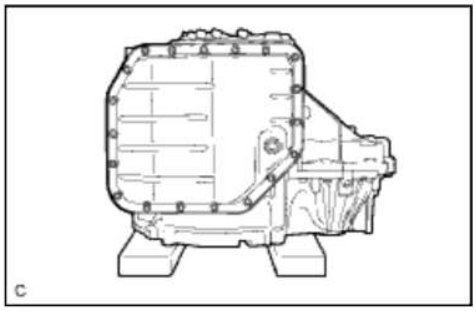
7. REMOVE BREATHER PLUG

(a) Remove the breather plug from the transaxle case.

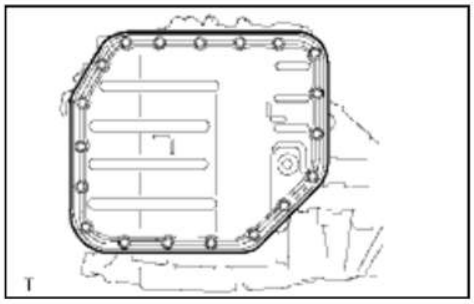
8. SECURE AUTOMATIC TRANSAXLE ASSEMBLY

(a) Secure the transaxle onto wooden blocks.

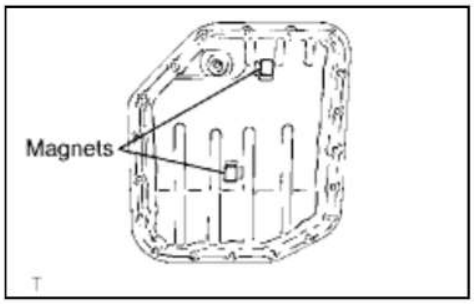
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9. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY



(a) Remove the 19 bolts and remove the oil pan and oil pan gasket.



(b) Remove the 2 oil cleaner magnets from the oil pan.

(c) Examine the particles in the oil pan.

(1) Collect any steel chips with the removed magnets.

Carefully look at the foreign matter and particles in the oil pan and on the magnets to predict the type of wear which might be found in the transaxle.

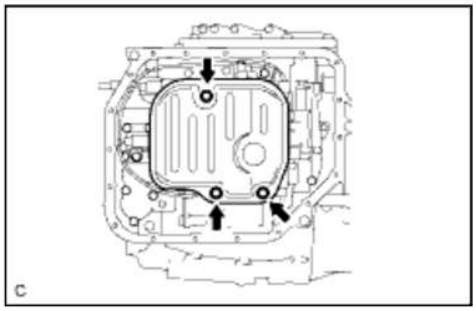
Steel (magnetic): bearing, gear and clutch plate wear

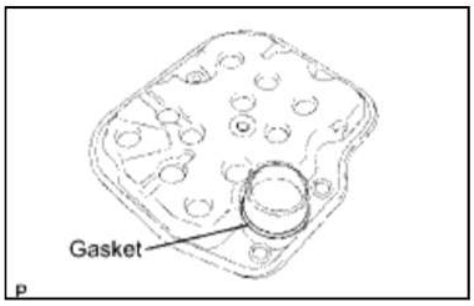
Brass (non-magnetic): bearing wear

10. REMOVE VALVE BODY OIL STRAINER ASSEMBLY

(a) Remove the 3 bolts and remove the oil strainer assembly.

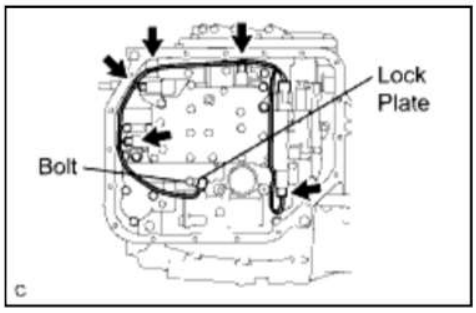
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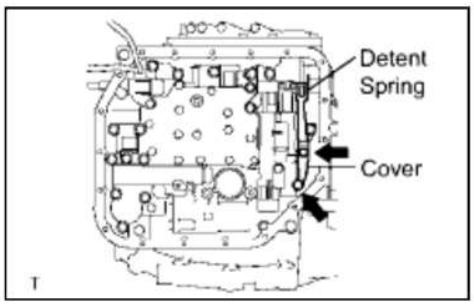
(b) Remove the oil strainer gasket from the oil strainer assembly.

11. REMOVE TRANSMISSION VALVE BODY ASSEMBLY



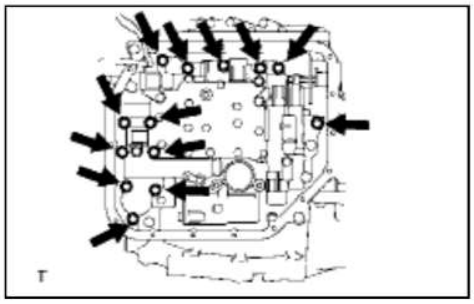
(a) Disconnect the 5 solenoid connectors.

(b) Remove the bolt and lock plate and remove the ATF temperature sensor.



(c) Remove the 2 bolts and remove the detent spring cover and detent spring.

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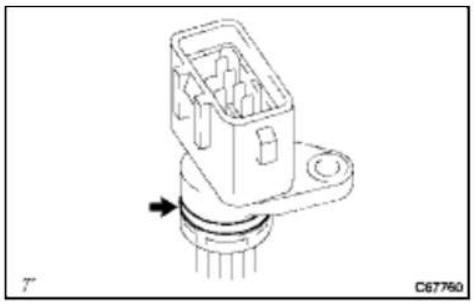


(d) Remove the 13 bolts and the valve body assembly from the transaxle case.

12. REMOVE TRANSMISSION WIRE

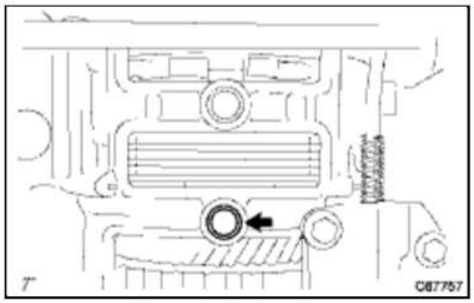


(a) Remove the bolt and the transmission wire from the transaxle case.



(b) Remove the O-ring from the transmission wire.

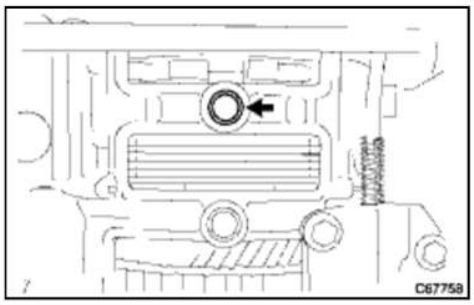
13. REMOVE TRANSAXLE CASE 2ND BRAKE GASKET



(a) Remove the transaxle case 2nd brake gasket from the transaxle case.

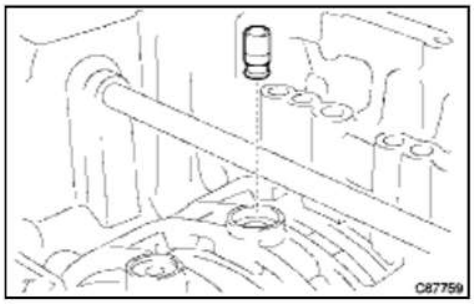
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14. REMOVE TRANSAXLE CASE GASKET



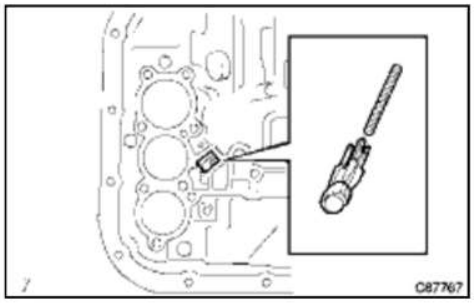
(a) Remove the transaxle case gasket from the transaxle case.

15. REMOVE BRAKE DRUM GASKET



(a) Remove the brake drum gasket from the transaxle case.

16. REMOVE CHECK BALL BODY



(a) Remove the check ball body and spring from the transaxle case.

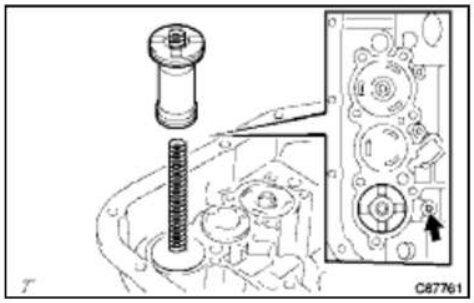
17. REMOVE B-2 ACCUMULATOR PISTON

(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the oil hole and remove the B-2 accumulator piston and spring.

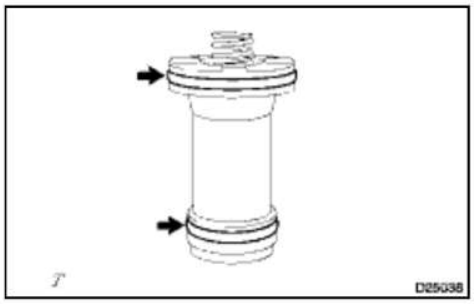
NOTICE:

- Blowing air may cause the piston to jump out. When

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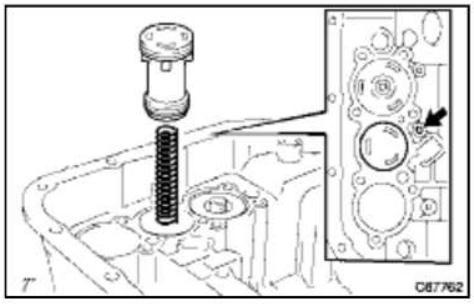


removing the piston, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.



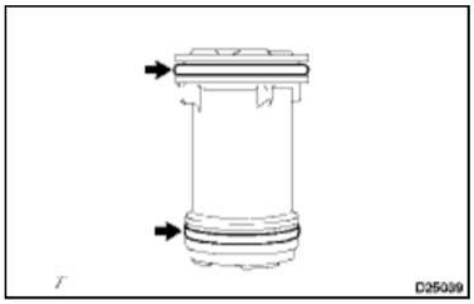
(b) Remove the 2 O-rings from the B-2 accumulator piston.

18. REMOVE C-3 ACCUMULATOR PISTON



(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the oil hole and remove the C-3 accumulator piston and spring.

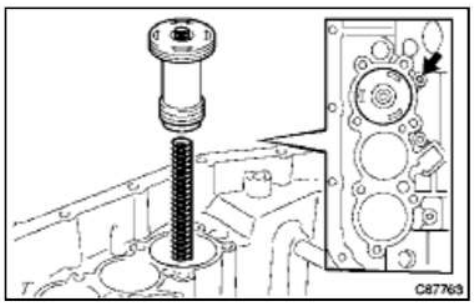
NOTICE:
- Blowing air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.



(b) Remove the 2 O-rings from the C-3 accumulator piston.

19. REMOVE C-2 ACCUMULATOR PISTON

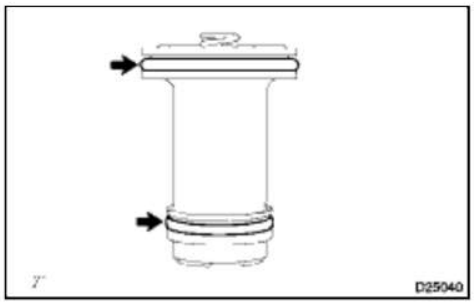
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(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the oil hole and remove the C-2 accumulator piston and the spring.

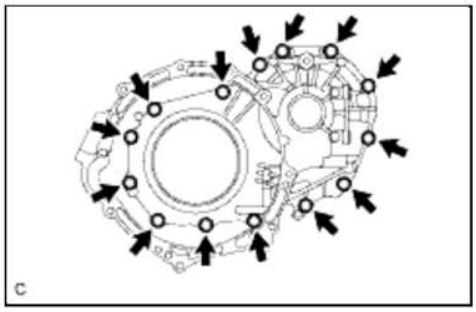
NOTICE:

- Blowing air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.



(b) Remove the 2 O-rings from the C-2 accumulator piston.

20. REMOVE TRANSAXLE HOUSING



(a) Remove the 14 bolts.

(b) Tap around the circumference of the transaxle housing with a plastic hammer to remove the transaxle housing from the transaxle case.

NOTICE:

The differential gear assembly may be accidentally removed when the transaxle housing is removed.

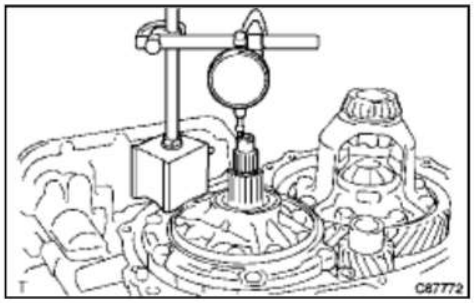
21. INSPECT INPUT SHAFT END PLAY

(a) Measure the end play in the axial direction.

End play:
0.38 to 1.29 mm (0.0149 to 0.0507 in.)

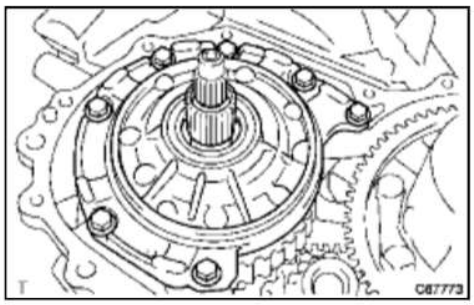
If the end play is not as specified, replace the stator shaft thrust needle roller bearing and the forward clutch hub

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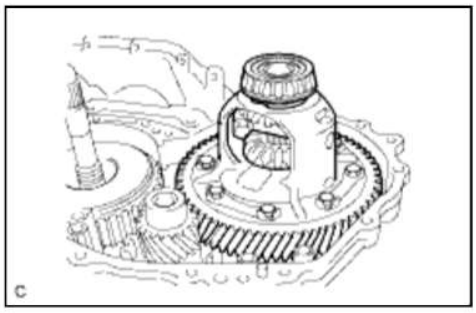
thrust needle roller bearing.

22. REMOVE OIL PUMP ASSEMBLY



(a) Remove the 7 bolts and the oil pump assembly from the transaxle case.

23. REMOVE DIFFERENTIAL GEAR ASSEMBLY

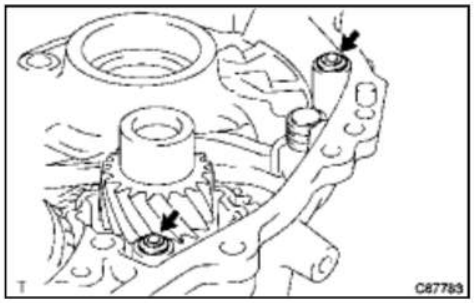


(a) Remove the differential gear assembly from the transaxle case.

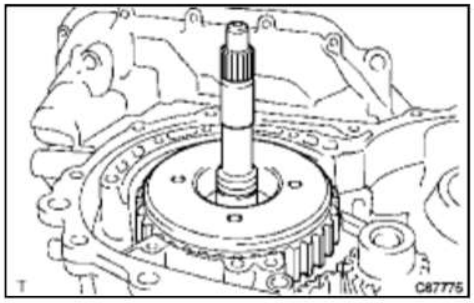
24. REMOVE OVERDRIVE BRAKE GASKET

(a) Using a screwdriver, remove the 2 overdrive brake gaskets from the transaxle case.

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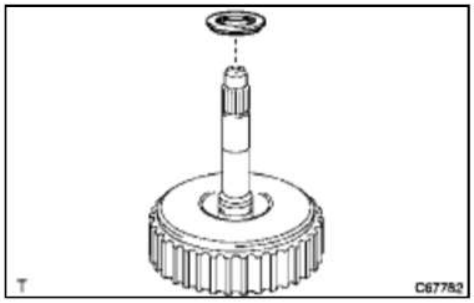


25. REMOVE INPUT SHAFT ASSEMBLY



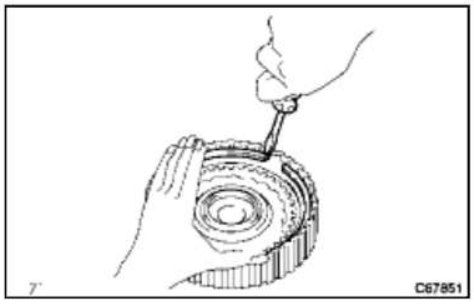
(a) Remove the input shaft assembly from the transaxle case.

26. REMOVE STATOR SHAFT THRUST NEEDLE ROLLER BEARING



(a) Remove the stator shaft thrust needle roller bearing from the input shaft.

27. REMOVE FRONT CLUTCH DISC

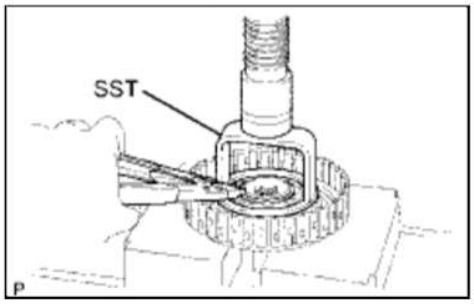


(a) Using a screwdriver, remove the snap ring.

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(b) Remove the flange, 4 discs and 4 plates from the input shaft.

28. REMOVE FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY



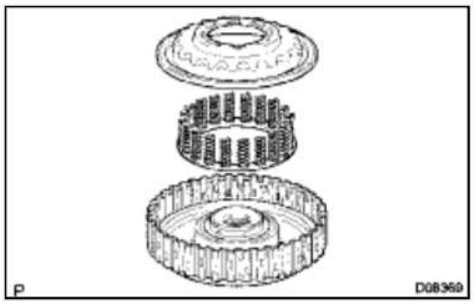
(a) Using SST on the clutch balancer, compress the return spring with a press.

SST: 09320-89010

NOTICE:

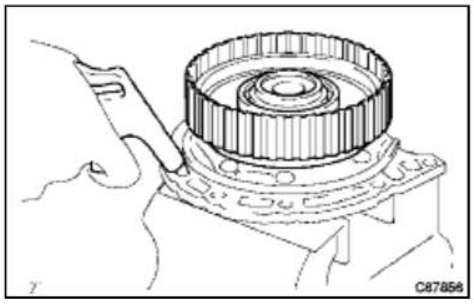
Do not compress the return spring excessively.

(b) Using a snap ring expander, remove the snap ring.



(c) Remove the clutch balancer and piston return spring.

29. REMOVE FORWARD CLUTCH PISTON



(a) Place the input shaft onto the oil pump.

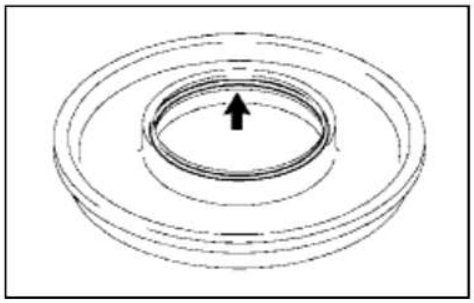
(b) Holding the forward clutch piston by hand, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil pump to remove the forward clutch piston.

HINT:

If the piston cannot be removed because it is tilted, either apply compressed air again while keeping the piston level or remove the piston using needle-nose pliers with their tips wrapped in protective tape.

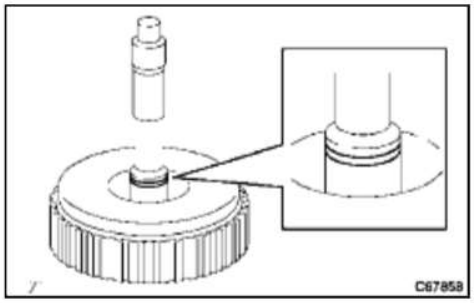
30. REMOVE FORWARD CLUTCH PISTON O-RING

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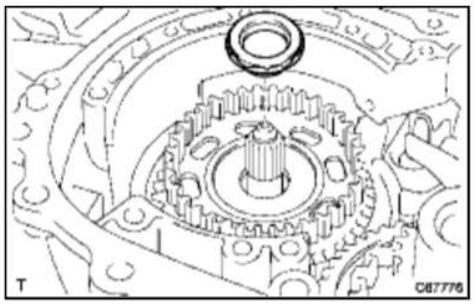
(a) Using a screwdriver, remove the clutch piston O-ring from the forward clutch piston.

31. REMOVE INPUT SHAFT OIL SEAL RING



(a) Using a screwdriver, remove the input shaft oil seal ring from the input shaft.

32. REMOVE FORWARD CLUTCH HUB THRUST NEEDLE ROLLER BEARING



(a) Remove the forward clutch hub thrust needle roller bearing from the forward clutch hub.

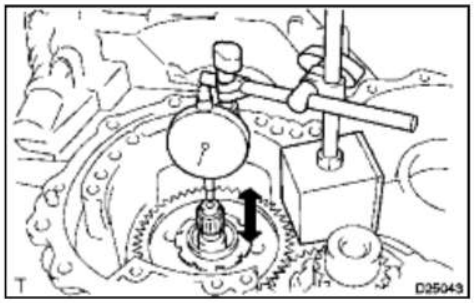
33. INSPECT INTERMEDIATE SHAFT ASSEMBLY

(a) Using a dial indicator, measure the intermediate shaft end play.

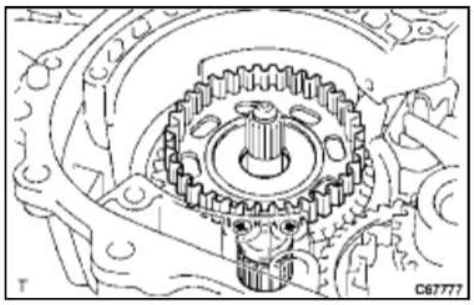
End play:
0.21 to 0.96 mm (0.00826 to 0.0377 in.)

If the end play is not as specified, select and replace the rear clutch drum thrust needle roller bearing.

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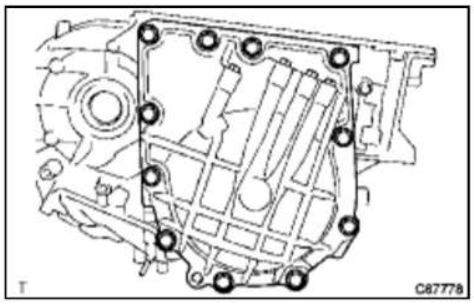


34. REMOVE FORWARD CLUTCH HUB SUB-ASSEMBLY



(a) Remove the forward clutch hub from the transaxle case.

35. REMOVE REAR TRANSAXLE COVER ASSEMBLY



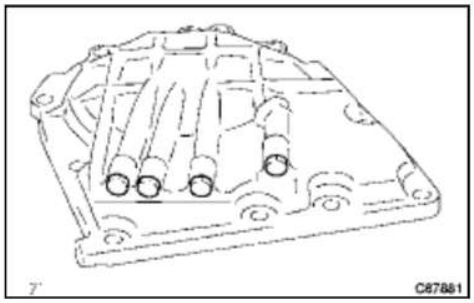
(a) Remove the 11 bolts.

(b) Tap around the circumference of the rear transaxle cover with a plastic hammer to remove the rear transaxle cover from the transaxle case.

36. REMOVE REAR TRANSAXLE COVER PLUG

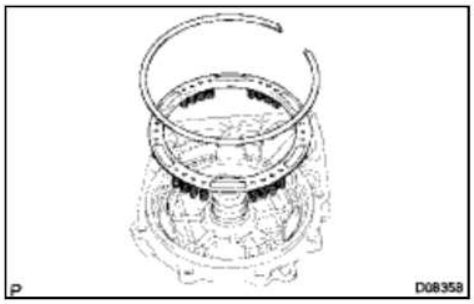
(a) Remove the 4 rear transaxle cover plugs from the rear transaxle cover.

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(b) Using a screwdriver, remove the O-ring from each rear transaxle cover plug.

37. REMOVE OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY



(a) Using SST, a press and a screwdriver, remove the snap ring.

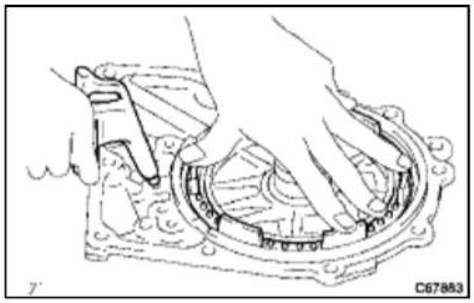
SST: 09387-00070

NOTICE:

Stop the press when the overdrive brake piston is lowered 1 to 2 mm (0.0394 to 0.0787 in.) from the snap ring groove to prevent the overdrive brake piston from being deformed.

(b) Remove the overdrive brake return spring from the rear transaxle cover.

38. REMOVE 2ND COAST AND OVERDRIVE BRAKE PISTON



(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the rear transaxle cover to remove the overdrive brake piston.

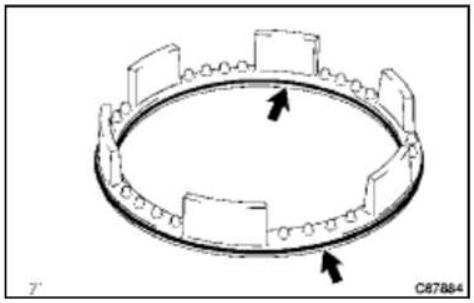
NOTICE:

- Blowing air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.

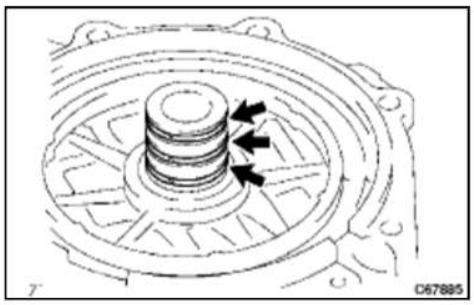
39. REMOVE 2ND COAST AND OVERDRIVE O-RING

(a) Using a screwdriver, remove the 2 O-rings from the 2nd coast and overdrive brake piston.

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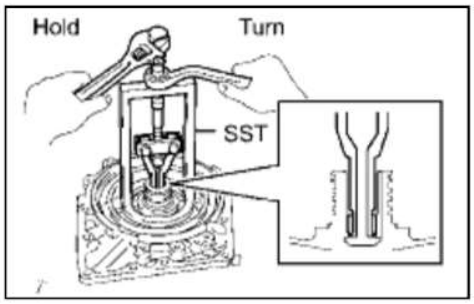


40. REMOVE CLUTCH DRUM OIL SEAL RING



(a) Remove the 3 oil seal rings from the rear transaxle cover.

41. REMOVE REAR TRANSAXLE COVER NEEDLE ROLLER BEARING

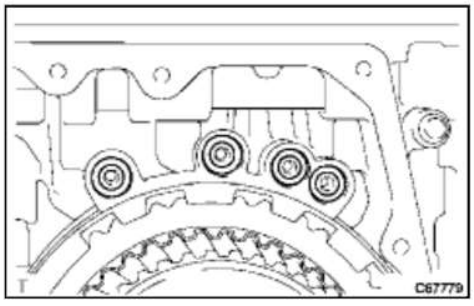


(a) Using SST, remove the bearing from the rear transaxle cover.

SST: 09387-00041

09387-01021

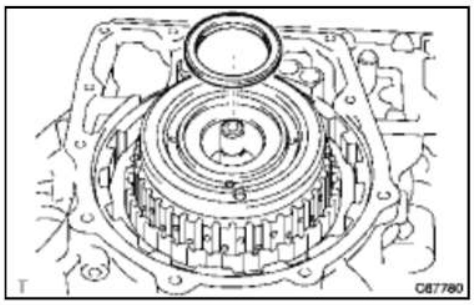
42. REMOVE TRANSAXLE CASE GASKET



(a) Remove the 4 transaxle case gaskets.

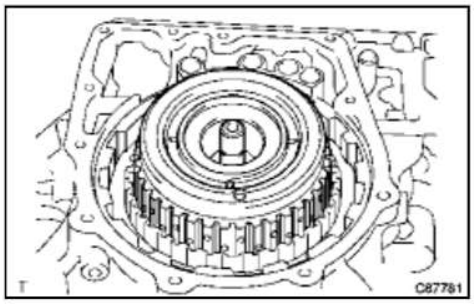
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43. REMOVE REAR CLUTCH DRUM THRUST NEEDLE ROLLER BEARING



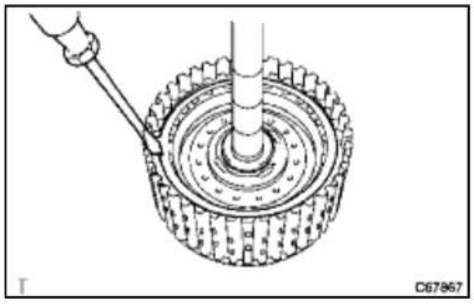
(a) Using a magnetic pick-up tool, remove the rear clutch drum thrust needle roller bearing.

44. REMOVE INTERMEDIATE SHAFT ASSEMBLY



(a) Remove the intermediate shaft assembly from the transaxle case.

45. REMOVE REVERSE CLUTCH DISC



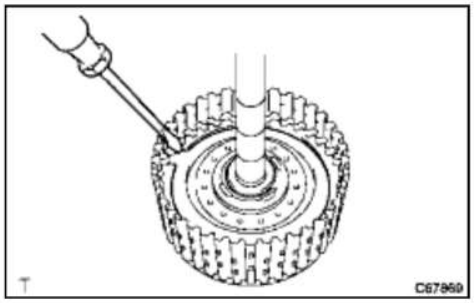
(a) Using a screwdriver, remove the snap ring.

(b) Remove the flange, 3 discs and 3 plates.

46. REMOVE DIRECT CLUTCH DISC

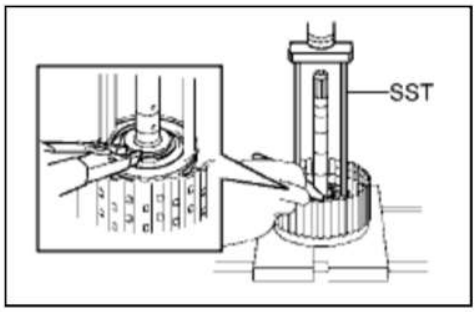
(a) Using a screwdriver, remove the snap ring.

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(b) Remove the direct clutch flange, 3 discs and 3 rear clutch flanges.

47. REMOVE DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



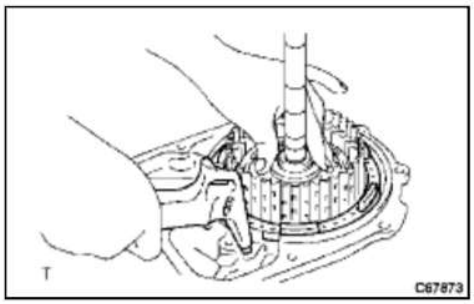
(a) Using SST and a press.

SST: 09387-00020

(b) Using snap ring pliers, remove the snap ring.

(c) Remove the direct clutch return spring sub-assembly from the intermediate shaft.

48. REMOVE DIRECT CLUTCH PISTON SUB-ASSEMBLY



(a) Install the intermediate shaft onto the rear transaxle cover.

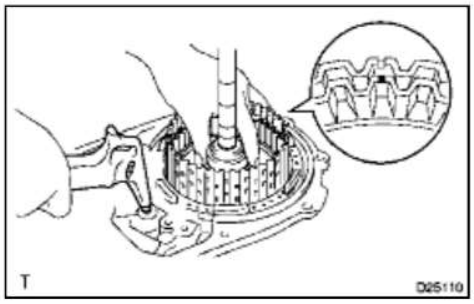
(b) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil hole shown in the illustration and remove the direct clutch piston from the intermediate shaft.

NOTICE:

- Blowing air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.

49. REMOVE DIRECT CLUTCH DRUM SUB-ASSEMBLY

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(a) Install the intermediate shaft onto the rear transaxle cover.

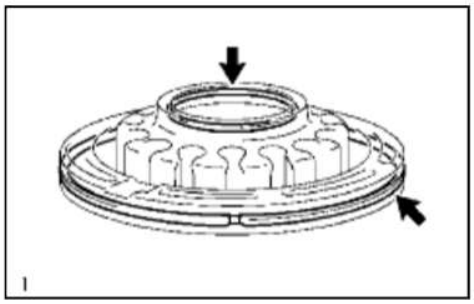
(b) Put a matchmark on the direct clutch drum in the same position as the cutout of the intermediate shaft assembly.

(c) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil hole shown in the illustration and remove the direct clutch drum from the intermediate shaft.

NOTICE:

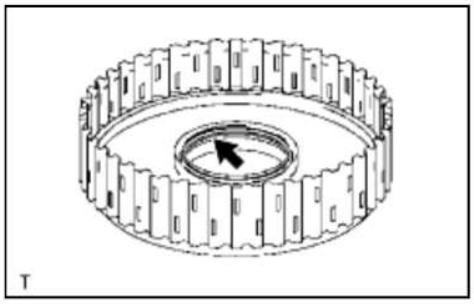
- Blowing air may cause the drum to jump out. When removing the drum, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.

50. REMOVE DIRECT CLUTCH PISTON O-RING



(a) Using a screwdriver, remove the 2 piston O-rings from the direct clutch piston.

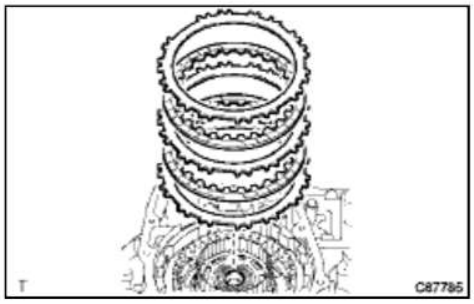
51. REMOVE DIRECT CLUTCH DRUM O-RING



(a) Using a screwdriver, remove the direct clutch drum O-ring from the direct clutch drum.

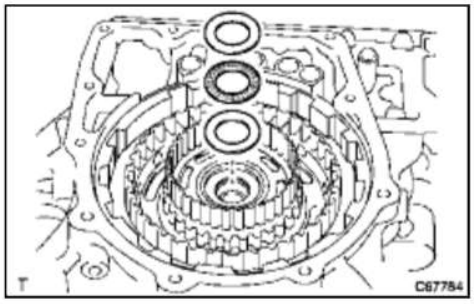
52. REMOVE 2ND COAST AND OVERDRIVE BRAKE DISC

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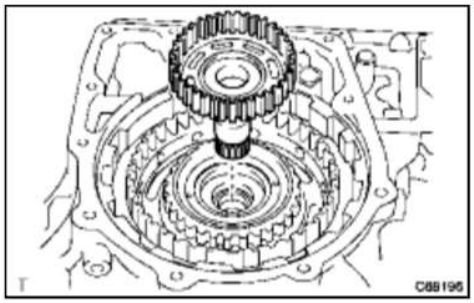
(a) Remove the flange, 2 discs and 2 No. 2 flanges from the transaxle.

53. REMOVE THRUST NEEDLE ROLLER BEARING



(a) Using a magnetic pick-up tool, remove the C-2 hub thrust bearing race, the thrust needle roller bearing and the No. 3 thrust bearing race from the direct clutch hub.

54. REMOVE DIRECT CLUTCH HUB

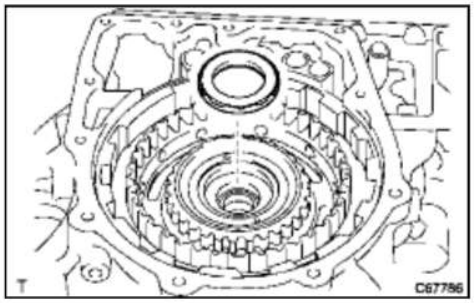


(a) Remove the direct clutch hub from the transaxle case.

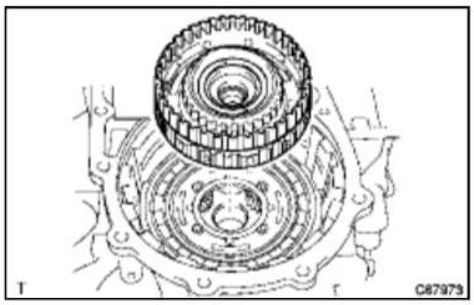
55. REMOVE REAR NO. 2 PLANETARY SUN GEAR THRUST NEEDLE ROLLER BEARING

(a) Using a magnetic pick-up tool, remove the rear No. 2 planetary sun gear thrust needle roller bearing from the rear planetary sun gear assembly.

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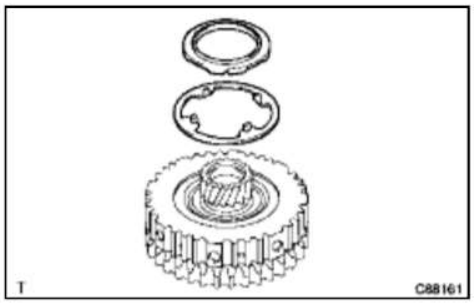


56. REMOVE REAR PLANETARY SUN GEAR ASSEMBLY



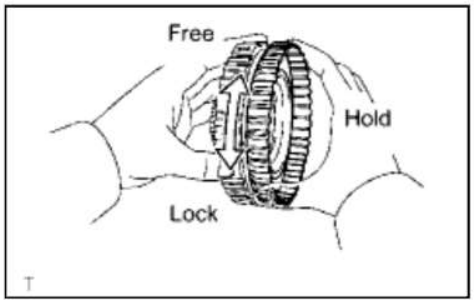
(a) Remove the rear planetary sun gear from the transaxle case.

57. REMOVE REAR PLANETARY SUN GEAR THRUST NEEDLE ROLLER BEARING



(a) Remove the rear planetary sun gear thrust needle roller bearing and No. 1 planetary carrier thrust washer from the one-way clutch assembly.

58. INSPECT ONE-WAY CLUTCH ASSEMBLY

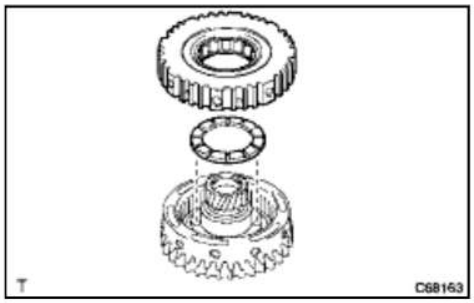


(a) Hold the rear planetary sun gear and turn the one-way clutch.

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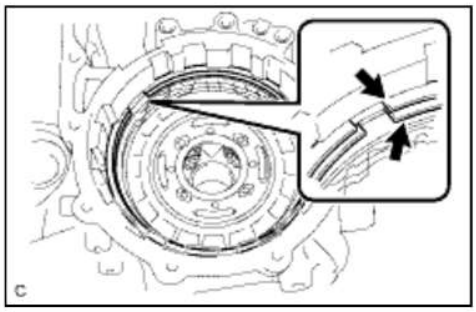
(b) Make sure that the one-way clutch turns freely counterclockwise and locks when turned clockwise.

59. REMOVE ONE-WAY CLUTCH ASSEMBLY



(a) Remove the one-way clutch assembly and No. 2 planetary carrier thrust washer from the rear planetary sun gear.

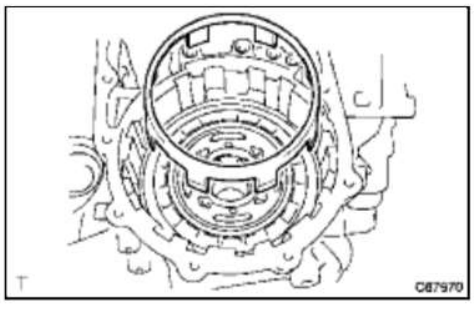
60. REMOVE 2ND BRAKE DISC



(a) Using a screwdriver, remove the 2 snap rings.

(b) Remove the 2 flanges, 4 discs and 3 flanges from the transaxle.

61. REMOVE 2ND BRAKE PISTON SLEEVE

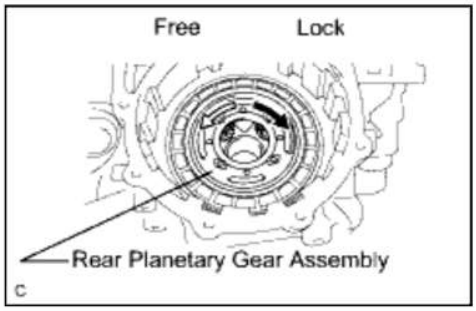


(a) Remove the 2nd brake piston sleeve from the transaxle case.

62. INSPECT NO. 2 ONE-WAY CLUTCH

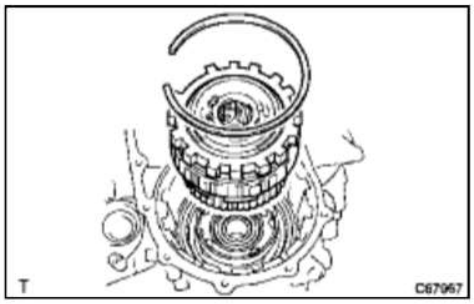
(a) Turn the rear planetary gear assembly.

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(b) Make sure that the rear planetary gear assembly turns freely counterclockwise and locks when turned clockwise.

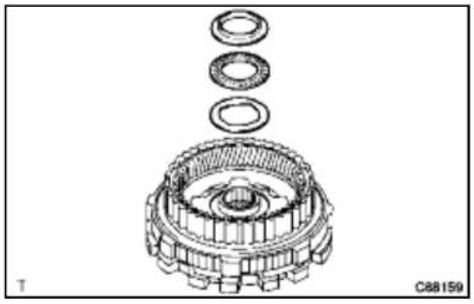
63. REMOVE REAR PLANETARY GEAR ASSEMBLY



(a) Using a screwdriver, remove the snap ring.

(b) Remove the rear planetary gear assembly from the transaxle case.

64. REMOVE REAR PLANETARY GEAR THRUST NEEDLE ROLLER BEARING

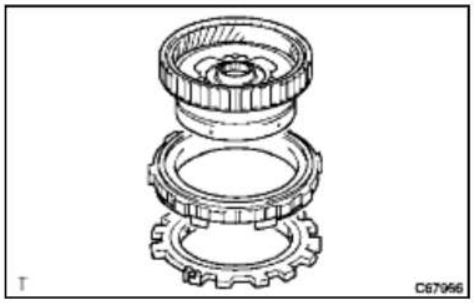


(a) Remove the thrust needle roller bearing and 2 bearing races from the rear planetary gear assembly.

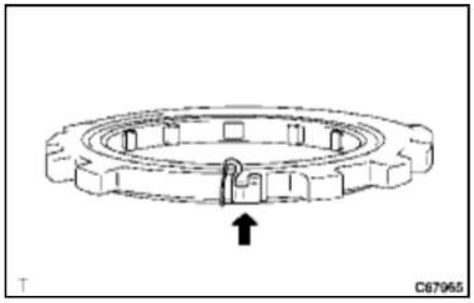
65. REMOVE NO. 2 ONE-WAY CLUTCH

(a) Separate the 2nd brake assembly, No. 2 one-way clutch and the rear planetary gear.

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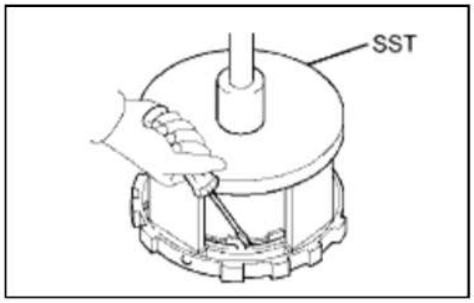


66. REMOVE OUTER RACE RETAINER



(a) Remove the retainer from the No. 2 one-way clutch.

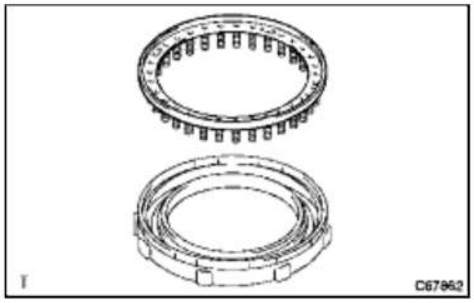
67. REMOVE 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY



(a) Using SST and a press, remove the snap ring from the 2nd brake piston.

SST: 09387-00060

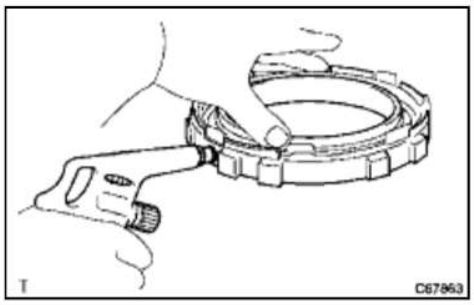
(b) Remove the 2nd brake return spring from the 2nd brake cylinder.



(c) Remove the 2nd brake piston return spring sub-assembly from the 2nd brake cylinder.

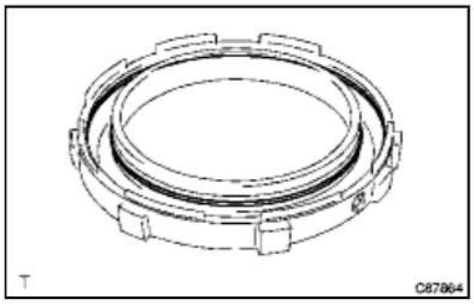
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68. REMOVE 2ND BRAKE PISTON



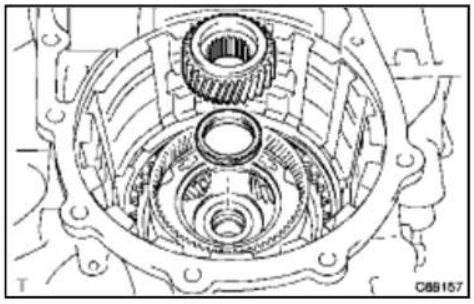
(a) Hold the 2nd brake piston and apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the 2nd brake cylinder to remove the 2nd brake piston.

69. REMOVE 2ND BRAKE CYLINDER O-RING



(a) Using a screwdriver, remove the 2 O-rings from the 2nd brake cylinder.

70. REMOVE FRONT PLANETARY SUN GEAR

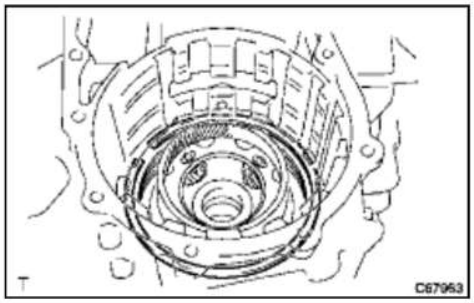


(a) Remove the front planetary sun gear and thrust needle roller bearing from the transaxle case.

71. REMOVE 1ST AND REVERSE BRAKE DISC

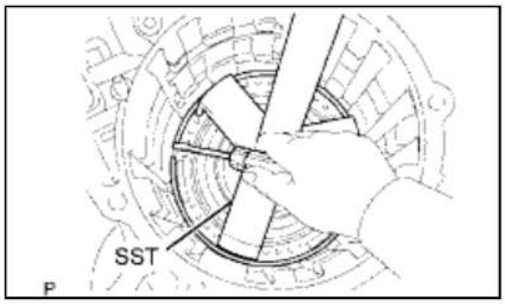
(a) Using a screwdriver, remove the snap ring.

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(b) Remove the flange, 4 discs and 4 plates from the transaxle case.

72. REMOVE 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

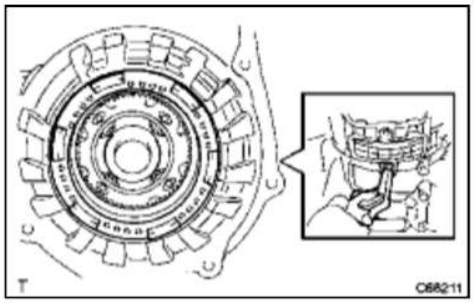


(a) Using SST, a press and a screwdriver, remove the snap ring.

SST: 09387-00070

(b) Remove the 1st and reverse brake return spring sub-assembly.

73. REMOVE NO. 2 1ST AND REVERSE BRAKE PISTON



(a) Apply compressed air (392 kPa, 4.0 kgf/cm2, 57 psi) to the transaxle case to remove the No. 2 1st and reverse brake piston.

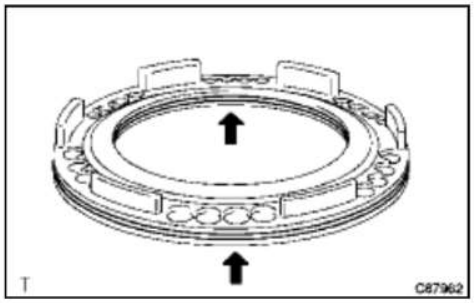
NOTICE:

- Blowing air may cause the piston to jump out. When removing the piston, hold it by hand using a piece of cloth.
- Do not splash ATF with compressed air.

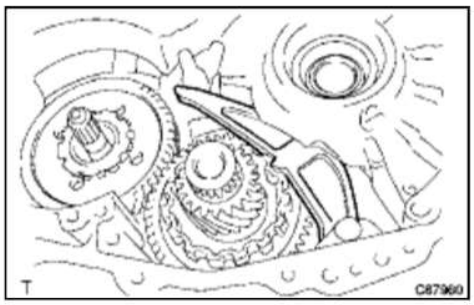
74. REMOVE NO. 2 1ST AND REVERSE BRAKE PISTON O-RING

(a) Remove the 2 O-rings from the No. 2 1st and reverse brake piston.

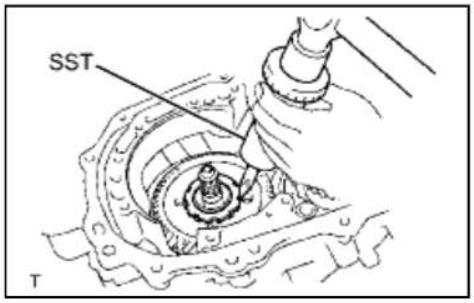
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75. REMOVE COUNTER DRIVE GEAR NUT

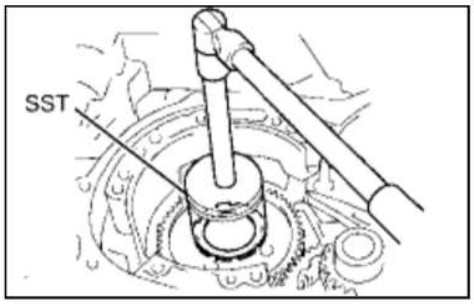


(a) Secure the counter driven gear with the parking lock pawl.



(b) Using SST and a hammer, release the lock nut washer.

SST: 09930-00010

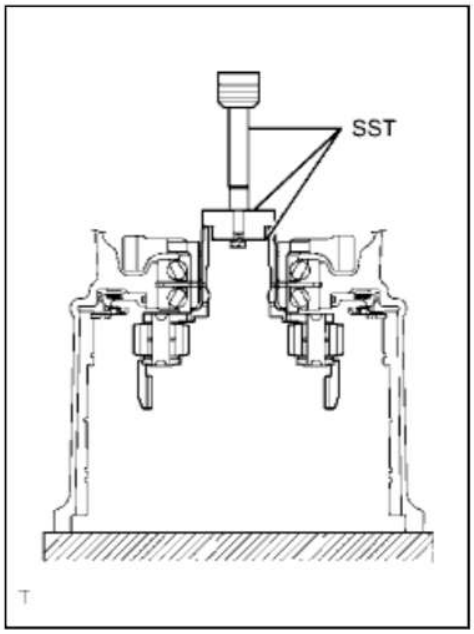


(c) Using SST, remove the nut and lock nut washer.

SST: 09387-00120

76. REMOVE PLANETARY GEAR ASSEMBLY

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(a) Using SST and a press, remove the planetary gear assembly from the transaxle case.

SST: 09950-60010

09951-00400

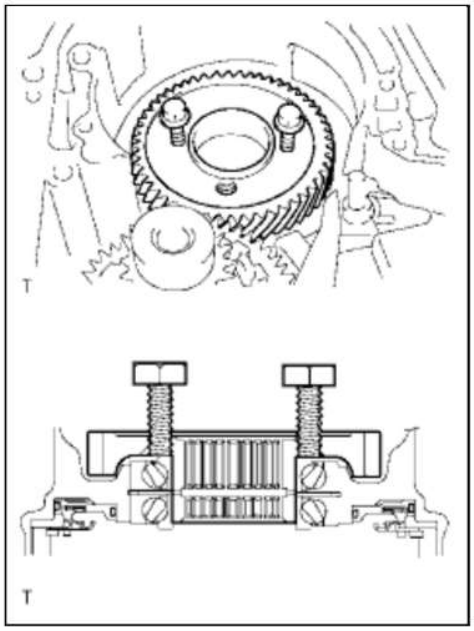
09951-00320

09952-06010

SST: 09950-70010

09951-07100

77. REMOVE COUNTER DRIVE GEAR



(a) Install the 2 bolts to the counter drive gear.

Bolt (M6):
Length = 40 to 80 mm (1.57 to 3.15 in.)
Pitch = 1.0 mm (0.0394 in.)

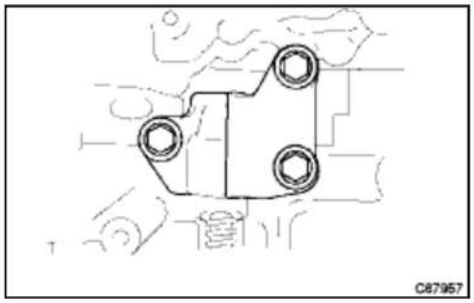
(b) Rotate the 2 bolts and remove the counter drive gear and front planetary sun gear.

(c) Remove the 2 radial ball bearings from the counter drive gear and front planetary sun gear.

78. REMOVE PARKING LOCK PAWL BRACKET

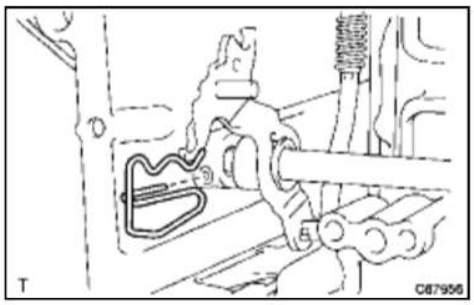
(a) Remove the 3 bolts, cam guide and bracket from the

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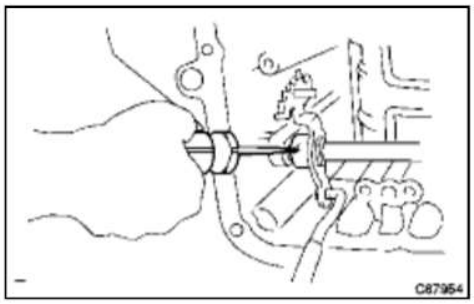
transaxle case.

79. REMOVE MANUAL VALVE LEVER SHAFT RETAINER SPRING

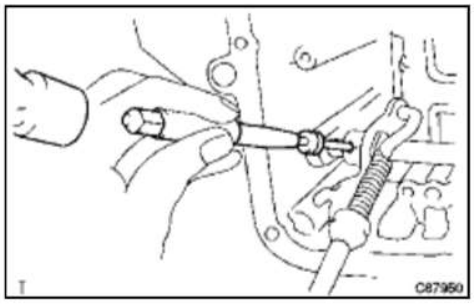


(a) Remove the manual valve lever shaft retainer spring from the manual valve lever shaft.

80. REMOVE MANUAL VALVE LEVER SUB-ASSEMBLY



(a) Using a screwdriver, release and remove the spacer.

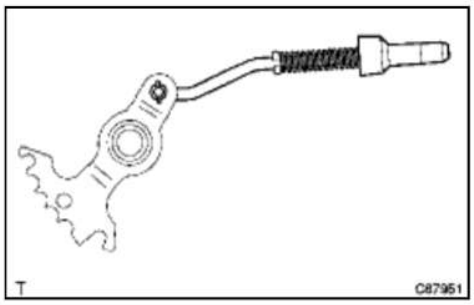


(b) Using a pin punch and hammer, drive out the manual valve lever shaft spring pin.

(c) Remove the manual valve lever shaft and manual valve lever.

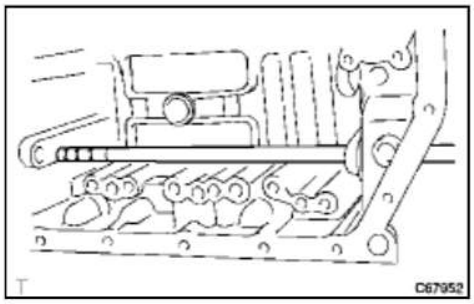
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81. REMOVE PARKING LOCK ROD SUB-ASSEMBLY



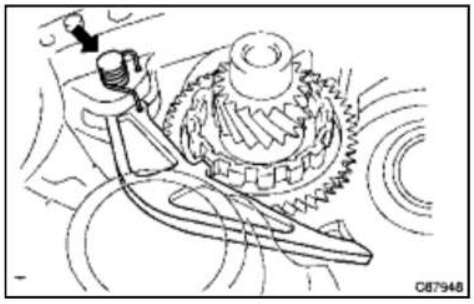
(a) Remove the parking lock rod from the manual valve lever.

82. REMOVE MANUAL VALVE LEVER SHAFT



(a) Remove the manual valve lever shaft from the transaxle case.

83. REMOVE PARKING LOCK PAWL



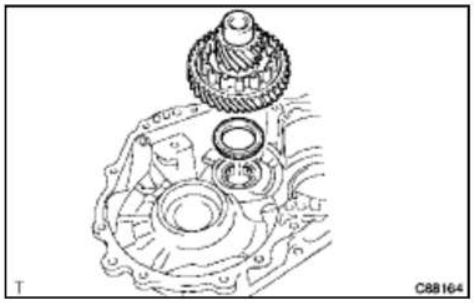
(a) Using a screwdriver, remove the parking lock pawl shaft from the transaxle case.

(b) Remove the parking lock pawl torsion spring and parking lock pawl from the transaxle case.

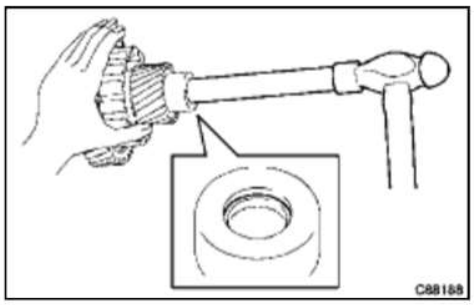
84. REMOVE COUNTER DRIVEN GEAR

(a) Remove the counter driven gear, drive pinion and drive pinion thrust bearing LH from the transaxle case.

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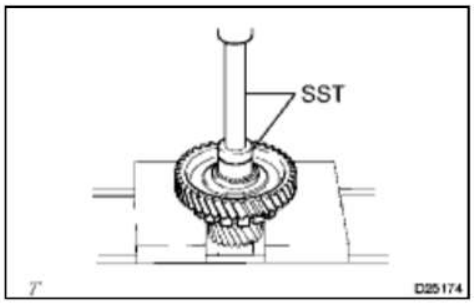


85. REMOVE DIFFERENTIAL DRIVE PINION PLUG



(a) Using a brass bar and a hammer, remove the differential drive pinion plug.

86. REMOVE DIFFERENTIAL DRIVE PINION



(a) Using SST and a press, remove the differential drive pinion from the counter driven gear.

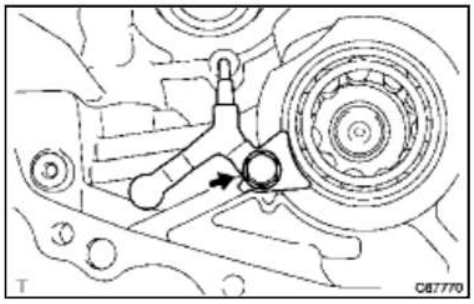
SST: 09950-60010

09951-00350

SST: 09950-70010

09951-07150

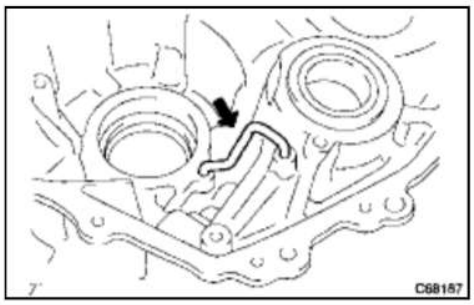
87. REMOVE BEARING LOCK PLATE



(a) Remove the bolt and the bearing lock plate.

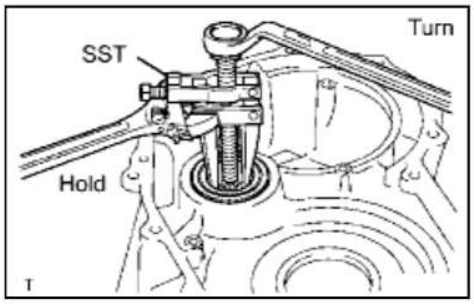
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88. REMOVE DIFFERENTIAL GEAR LUBE APPLY TUBE



(a) Remove the differential gear lube apply tube from the transaxle housing.

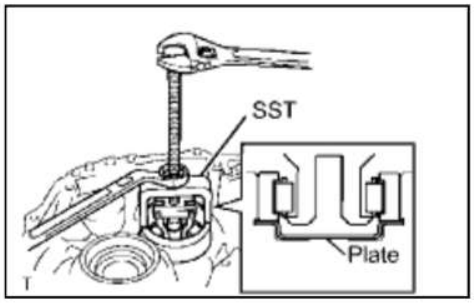
89. REMOVE FRONT DRIVE PINION FRONT TAPERED ROLLER BEARING



(a) Using SST, remove the front drive pinion front tapered roller bearing from the transaxle housing.

SST: 09308-10010

90. REMOVE FRONT DRIVE PINION REAR TAPERED ROLLER BEARING



(a) Using SST, remove the front drive pinion rear tapered roller bearing from the transaxle case.

SST: 09612-65014

09612-01040

(b) Remove the No. 1 transaxle case plate from the transaxle case.

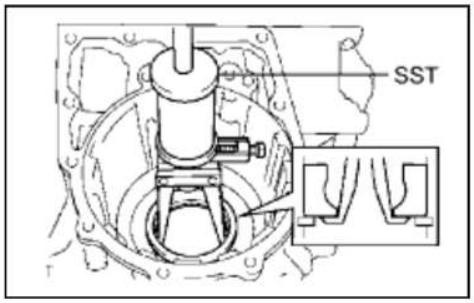
91. REMOVE COUNTER DRIVE GEAR BEARING LH

(a) Remove the counter drive gear bearing inner race LH and angular ball from the transaxle case.

(b) Using SST, remove the counter drive gear bearing outer race LH from the transaxle case.

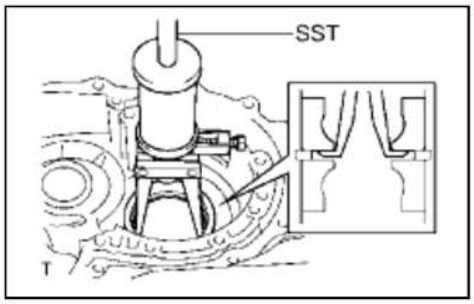
SST: 09308-00010

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92. REMOVE COUNTER DRIVE GEAR BEARING RH

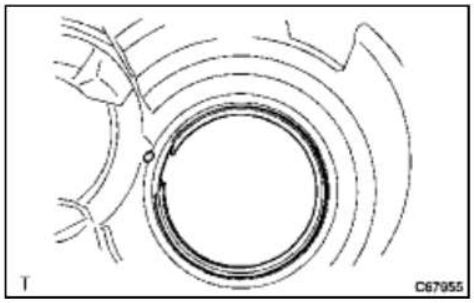
(a) Remove the counter drive gear bearing RH from the transaxle case.



(b) Using SST, remove the counter drive gear bearing outer race RH from the transaxle case.

SST: 09308-00010

93. REMOVE COUNTER DRIVE GEAR HOLE SNAP RING

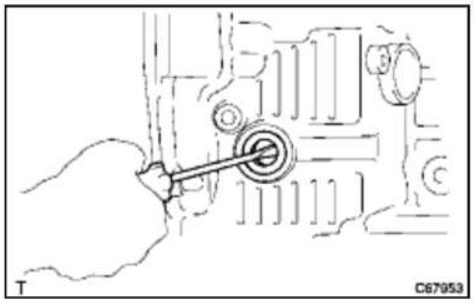


(a) Using a screwdriver, remove the counter drive gear hole snap ring from the transaxle case.

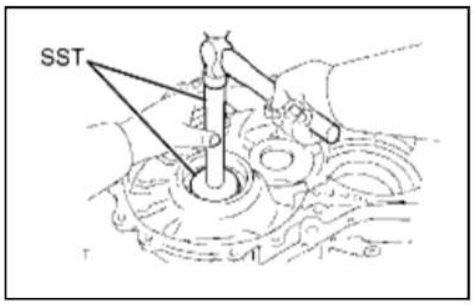
94. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL

(a) Using a screwdriver, remove the manual valve lever shaft oil seal from the transaxle case.

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95. REMOVE NO. 2 TRANSAXLE CASE OIL SEAL



(a) Using SST and a hammer, remove the No. 2 transaxle case oil seal from the transaxle case.

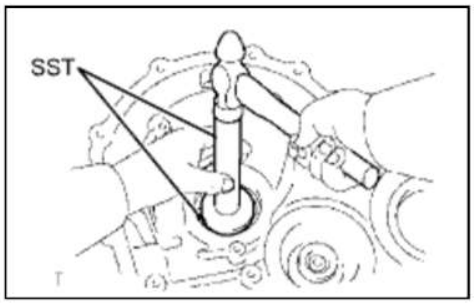
SST: 09950-60010

09951-00550

SST: 09950-70010

09951-07100

96. REMOVE NO. 1 TRANSAXLE CASE OIL SEAL



(a) Using SST and a hammer, remove the No. 1 transaxle case oil seal from the transaxle housing.

SST: 09950-60010

09951-00530

SST: 09950-70010

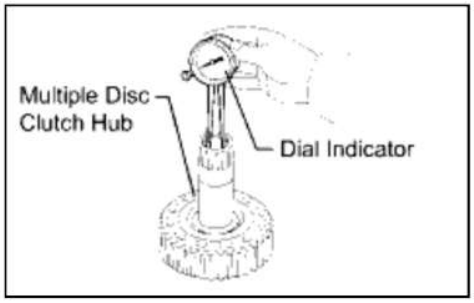
09951-07100

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003DEZ005X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT MULTIPLE DISC CLUTCH HUB



(a) Using a dial indicator, measure the inside diameter of the multiple disc clutch hub bushing.

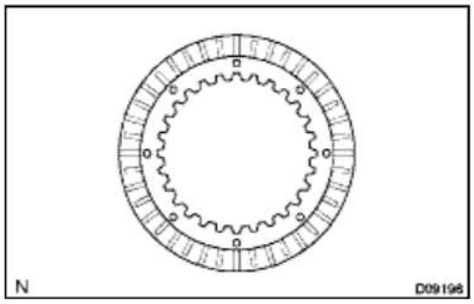
Standard inside diameter:
23.025 to 23.046 mm (0.9065 to 0.9073 in.)
Maximum inside diameter:
23.09 mm (0.9091 in.)

If the diameter is greather than the maximum, replace the multiple disc clutch hub with a new one.

NOTICE:

Check the contact surface of the bushing in the direct clutch shaft. If any scratches or discoloration is found, replace the direct clutch sub-assembly with a new one.

2. INSPECT NO. 2 UNDERDRIVE CLUTCH DISC



(a) Check if the sliding surfaces of the discs, plates and flange are worn or burnt.

If necessary, replace them.

NOTICE:

- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

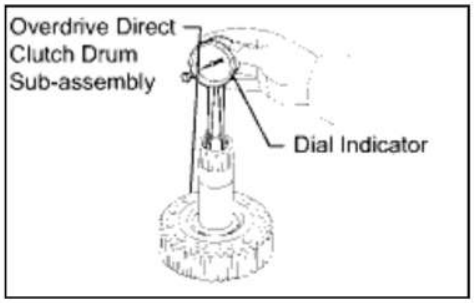
3. INSPECT OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY

(a) Using a dial indicator, measure the inside diameter of the overdrive direct clutch drum sub-assembly bushing.

Standard inside diameter:
23.025 to 23.046 mm (0.9065 to 0.9073 in.)
Maximum inside diameter:
23.09 mm (0.9091 in.)

If the diameter is greather than the maximum, replace the overdrive direct clutch drum sub-assembly.

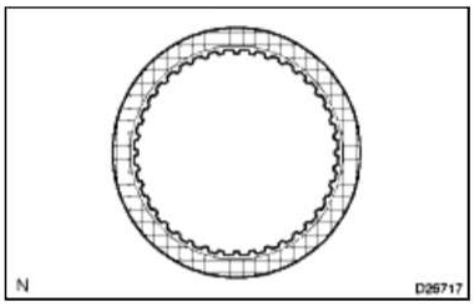
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NOTICE:

Check the contact surface of the bushing in the direct clutch shaft. If any scratches or discoloration is found, replace the direct clutch sub-assembly with a new one.

4. INSPECT 2ND BRAKE DISC



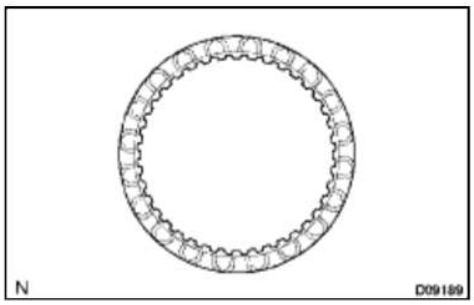
(a) Check if the sliding surfaces of the discs, plates and flange are worn or burnt.

If necessary, replace them.

NOTICE:

- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

5. INSPECT 1ST AND REVERSE BRAKE DISC



(a) Check if the sliding surfaces of the discs, plates and flange are worn or burnt.

If necessary, replace them.

NOTICE:

- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

6. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

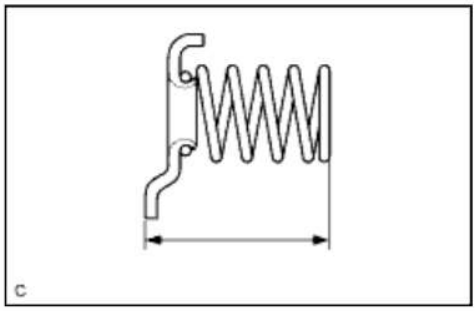
(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

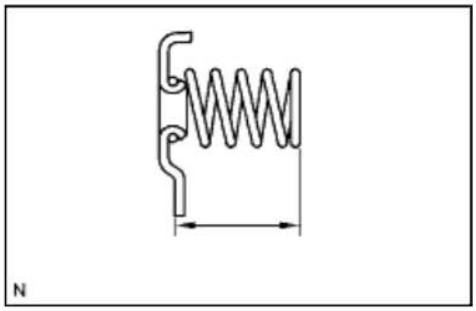
17.63 mm (0.6941 in.)

If the free length is shorter than the standard free length, replace the 1st and reverse brake return spring sub-assembly.

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7. INSPECT UNDERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

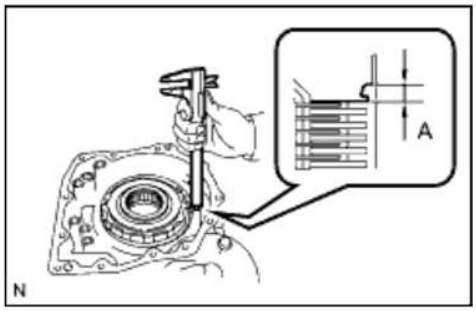


(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
13.24 mm (0.5213 in.)

If the free length is shorter than the standard free length, replace the underdrive brake return spring sub-assembly.

8. INSPECT PACK CLEARANCE OF 1ST AND REVERSE BRAKE



(a) Using a vernier caliper, measure the distance between the disc surface and the contact surface of the 2nd brake cylinder and transaxle case (Dimension A).

(b) Select an appropriate flange so that the pack clearance will be within the specified range.

Pack clearance:
0.745 to 1.21 mm (0.0293 to 0.0476 in.)

HINT:

Piston stroke = Dimension A - Flange thickness

Flange Thickness

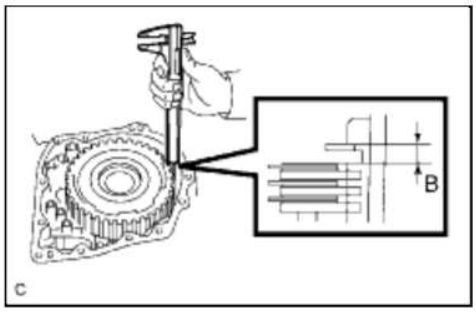
MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))

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MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
1	1.8 (0.0708)	5	2.2 (0.0866)
2	1.9 (0.0748)	6	2.3 (0.0906)
3	2.0 (0.0787)	7	2.4 (0.0945)
4	2.1 (0.0827)	8	2.5 (0.0984)

(c) Install the flange.

9. INSPECT PACK CLEARANCE OF 2ND BRAKE



(a) Using a vernier caliper, measure the distance between the disc surface and snap ring surface (Dimension B).

(b) Select an appropriate flange so that the pack clearance will be within the specified range.

Pack clearance:
0.53 to 0.91 mm (0.0209 to 0.0358 in.)

HINT:

Piston stroke = Dimension B - Flange thickness - Snap ring thickness 1.6 mm (0.0630 in.)

Flange Thickness

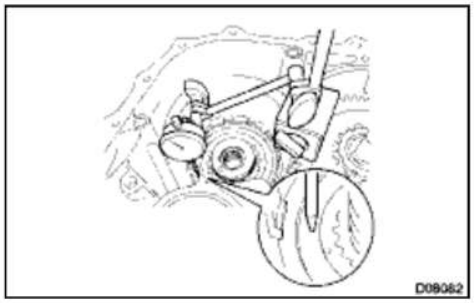
MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
0	2.9 (0.114)	5	3.4 (0.134)
1	3.0 (0.118)	6	3.5 (0.138)
2	3.1 (0.122)	7	3.6 (0.142)
3	3.2 (0.126)	8	3.7 (0.146)
4	3.3 (0.130)	-	-

(c) Install the flange.

10. INSPECT PACK CLEARANCE OF UNDERDRIVE BRAKE

(a) Using a dial indicator, measure the underdrive clutch pack clearance while applying and releasing compressed air

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(392 kPa, 4.0 kgf/cm2, 57 psi).

Pack clearance:
1.81 to 2.20 mm (0.0713 to 0.0866 in.)

(b) Select an appropriate flange from the table below so that the pack clearance will be within the specified range.

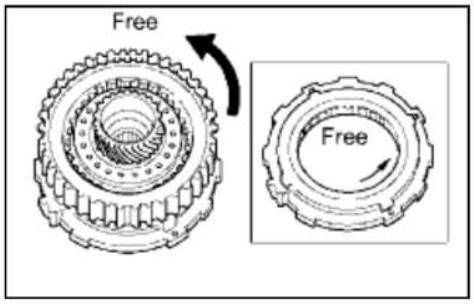
Flange Thickness

MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
Y	2.8 (0.110)	C	3.4 (0.134)
A	3.0 (0.118)	D	3.6 (0.142)
B	3.2 (0.126)	-	-

(c) Temporarily remove the snap ring and attach the flange to the transaxle case.

(d) Reinstall the snap ring to the transaxle case.

11. INSPECT UNDERDRIVE ONE-WAY CLUTCH ASSEMBLY



(a) Install the underdrive clutch assembly to the one-way clutch.

(b) Make sure that the underdrive one-way clutch turns freely counterclockwise and locks when turned clockwise.

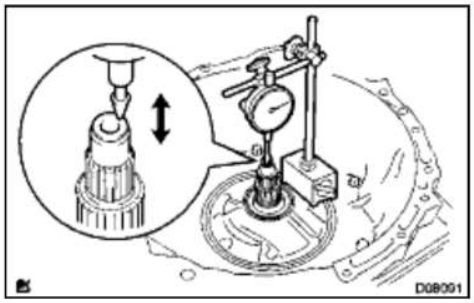
(c) Remove the underdrive clutch assembly from the one-way clutch.

12. INSPECT INPUT SHAFT END PLAY

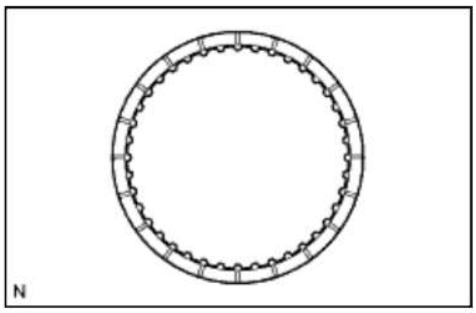
(a) Using a dial indicator, measure the input shaft end play.

End play:
0.262 to 1.249 mm (0.0103 to 0.0492 in.)

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13. INSPECT DIRECT MULTIPLE DISC CLUTCH DISC



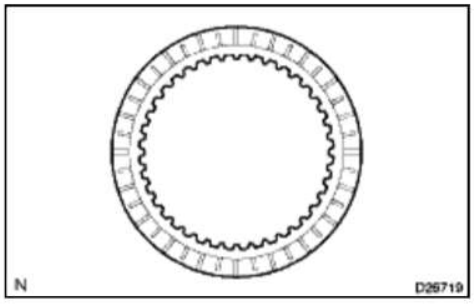
(a) Check if the sliding surfaces of the discs, plates, and flange are worn or burnt.

If necessary, replace them.

NOTICE:

- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

14. INSPECT OVERDRIVE DIRECT CLUTCH DISC



(a) Check if the sliding surfaces of the discs, plates, and flange are worn or burnt. If necessary, replace them.

NOTICE:

- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

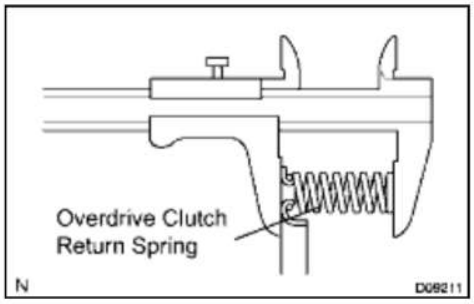
15. INSPECT OVERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY

(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

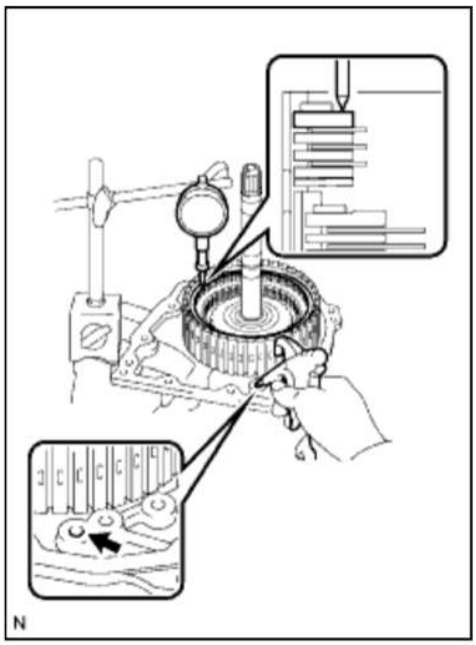
Standard free length:
25.91 mm (1.0201 in.)

If the free length is shorter than the standard free length, replace the overdrive clutch return spring sub-assembly.

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16. INSPECT PACK CLEARANCE OF DIRECT CLUTCH



(a) Install the intermediate shaft and needle roller bearing on the transaxle rear cover.

NOTICE:

Be careful not to damage the oil seal ring outers.

(b) Using a dial indicator, measure the direct clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Pack clearance:
1.05 to 1.47 mm (0.04134 to 0.05787 in.)

If the pack clearance is not as specified, inspect the discs, plates and flange.

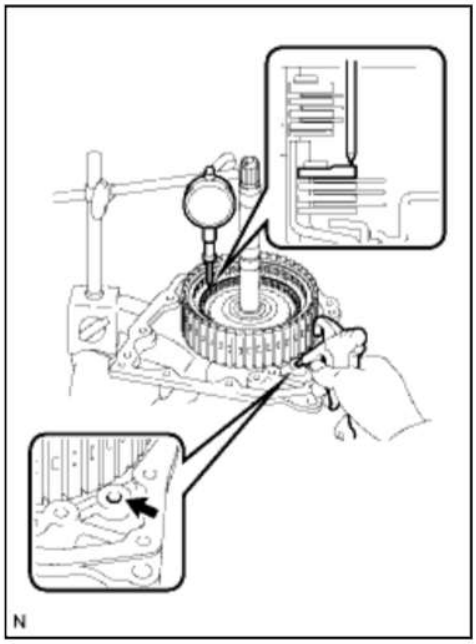
17. INSPECT PACK CLEARANCE OF OVERDRIVE CLUTCH

(a) Using a dial indicator, measure the overdrive clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm2, 57 psi).

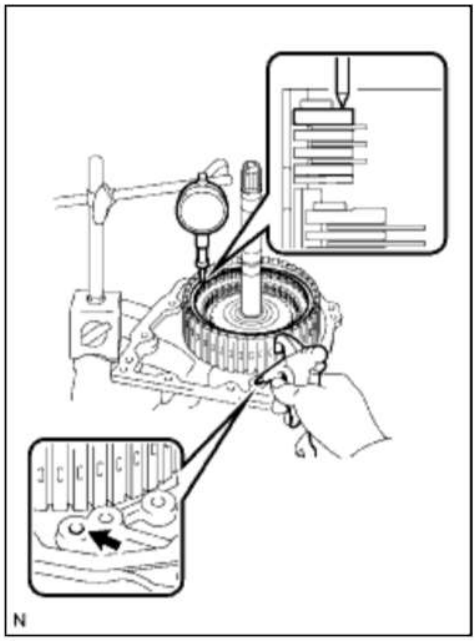
Pack clearance:
0.61 to 0.83 mm (0.02402 to 0.03268 in.)

If the pack clearance is not as specified, inspect the discs, plates and flange.

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18. INSPECT PACK CLEARANCE OF DIRECT CLUTCH



(a) Install the intermediate shaft on the transaxle rear cover.

(b) Using a dial indicator, measure the direct clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Pack clearance:

1.05 to 1.47 mm (0.04134 to 0.05787 in.)

If the pack clearance is less than the minimum, the parts may have been assembled incorrectly, so check and reassemble them.

If the clearance is not as specified, select another flange.

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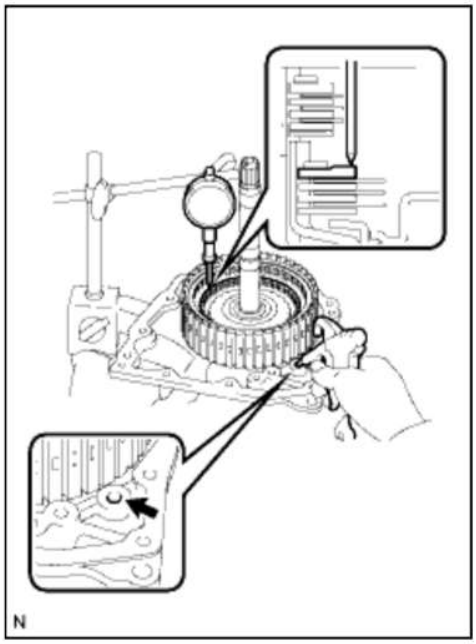
HINT:

There are 8 different thicknesses of flanges available.

Flange Thickness

MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
0	2.9 (0.114)	4	3.3 (0.130)
1	3.0 (0.118)	5	3.4 (0.134)
2	3.1 (0.122)	6	3.5 (0.138)
3	3.2 (0.126)	7	3.6 (0.142)

19. INSPECT PACK CLEARANCE OF OVERDRIVE CLUTCH



(a) Using a dial indicator, measure the overdrive clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm2, 57 psi).

Pack clearance:
0.61 to 0.83 mm (0.02402 to 0.03268 in.)

If the pack clearance is less than the minimum, the parts may have been assembled incorrectly, so check and reassemble them.

If the clearance is not as specified, select another flange.

HINT:

There are 7 different thicknesses of flanges available.

Flange Thickness

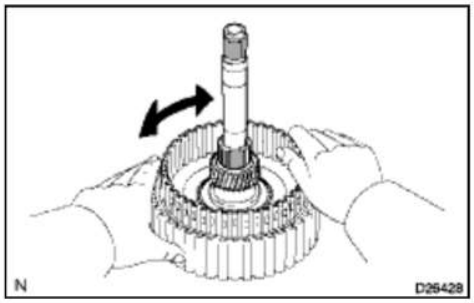
MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
0	2.5 (0.0984)	4	2.9 (0.114)
1	2.6 (0.102)	5	3.0 (0.118)
2	2.7 (0.106)	6	3.1 (0.122)
3	2.8 (0.110)	-	-

(b) Check that the disc rotates after inserting the rear planetary sun gear.

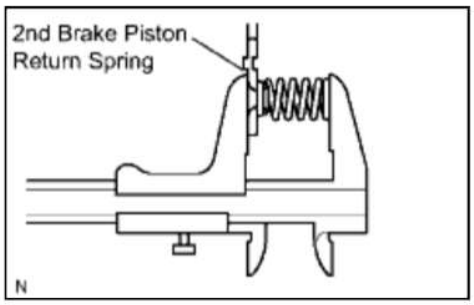
NOTICE:

Do not place the rear planetary sun gear in a vise.

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20. INSPECT 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY



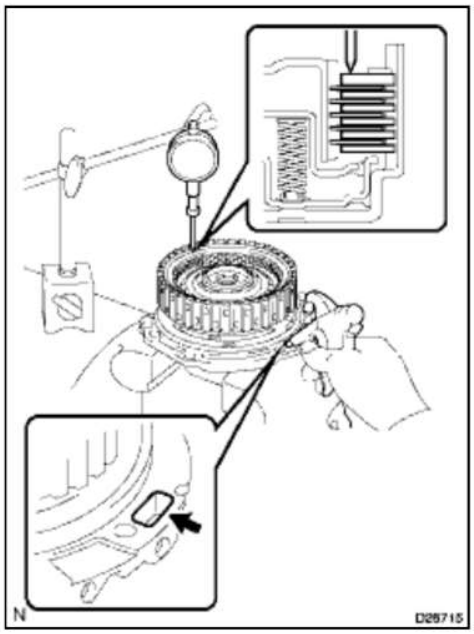
(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

16.61 mm (0.6539 in.)

If the free length is shorter than the standard free length, replace the 2nd brake piston return spring sub-assembly.

21. INSPECT PACK CLEARANCE OF FORWARD CLUTCH



(a) Install the forward clutch on the oil pump.

NOTICE:

Be careful not to damage the oil seal ring of the oil pump.

(b) Using a dial indicator, measure the forward clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Pack clearance:

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1.00 to 1.25 mm (0.0394 to 0.0492 in.)

If the clearance is not within the standard, inspect the discs, plates and flange.

If the piston stroke is less than the minimum, the parts may have been assembled incorrectly. Check and reassemble them again.

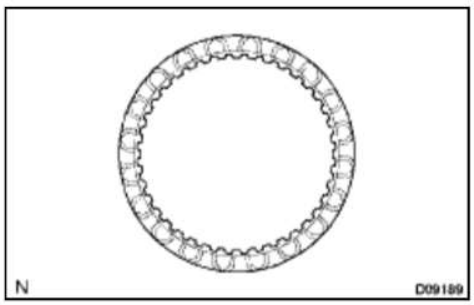
HINT:

- As the opening is large, cover it with a piece of cloth or shop rag to prevent the compressed air from being released.
- There are 7 different thicknesses of flanges available.

Flange Thickness:

NO.	THICKNESS (MM (IN.))	NO.	THICKNESS (MM (IN.))
0	2.85 (0.1122)	4	3.45 (0.1358)
1	3.00 (0.1181)	5	3.60 (0.1417)
2	3.15 (0.1240)	6	3.75 (0.1476)
3	3.30 (0.1299)	-	-

22. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC



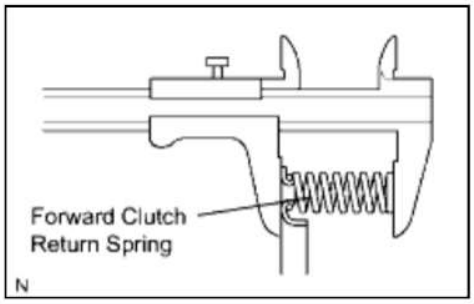
(a) Check if the sliding surfaces of the discs, plates, and flange are worn or burnt.

If necessary, replace them.

HINT:

- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

23. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY



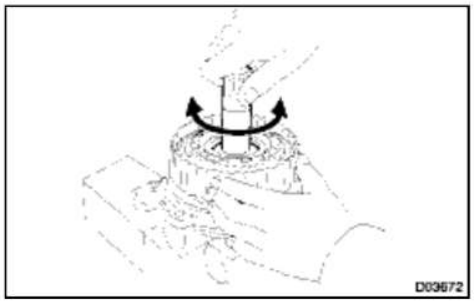
(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
26.74 mm (1.0528 in.)

If the free length is shorter than the standard free length, replace the forward clutch return spring sub-assembly.

24. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC

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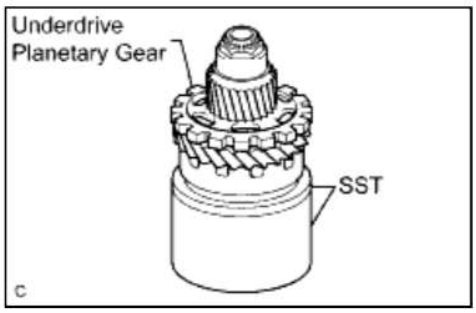


(a) Check if the disc rotates when lightly rotating the forward clutch assembly after inserting the multiple disc clutch.

NOTICE:

Do not place the forward clutch assembly in a vise.

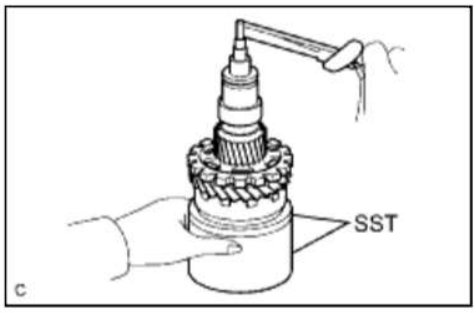
25. INSPECT UNDERDRIVE PLANETARY GEAR PRELOAD



(a) Using SST, fix the underdrive planetary gear assembly.

SST: 09387-00050

SST: 09495-65040



(b) Using SST and a torque wrench, measure the turning torque of the underdrive planetary gear assembly while turning the torque wrench at 60 rpm.

SST: 09387-00050

SST: 09495-65040

Turning torque at 60 rpm:

0.28 to 0.89 N*m (2.9 to 9.1 kgf*cm, 2.5 to 7.9 in.*lbf)

HINT:

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).

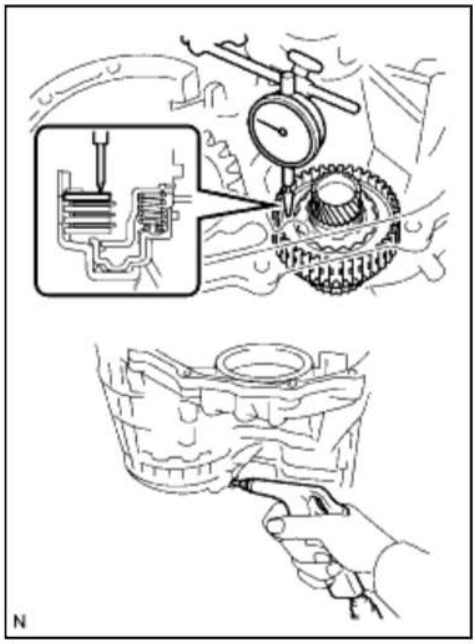
26. INSPECT UNDERDRIVE PACK CLEARANCE

(a) Install the underdrive clutch to the transaxle case.

NOTICE:

Be careful not to damage the oil seal rings.

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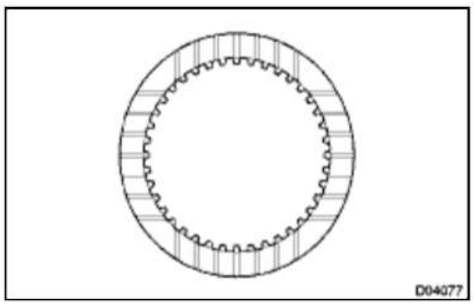
(b) Install a dial indicator as shown in the illustration.

(c) Measure the underdrive clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Pack clearance:
1.51 to 1.71 mm (0.0594 to 0.0673 in.)

If the pack clearance is not within the specified range, inspect the discs, plates, and flange.

27. INSPECT NO. 1 UNDERDRIVE CLUTCH DISC



(a) Check if the sliding surfaces of the discs, plates and flange are worn or burnt.

If necessary, replace them.

HINT:

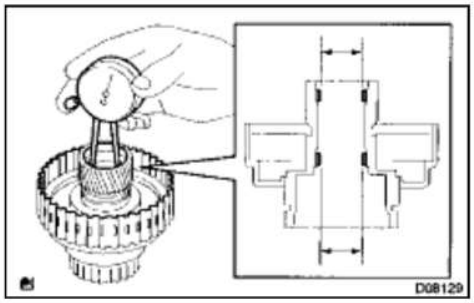
- If the linings of a disc is peeled off or discolored, or even if a part of the groove is damaged, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

28. INSPECT UNDERDRIVE CLUTCH DRUM SUB-ASSEMBLY

(a) Using a dial indicator, measure the inside diameter of the underdrive clutch drum bushing.

Standard inside diameter:
32.56 to 32.58 mm (1.2818 to 1.2826 in.)
Maximum inside diameter:

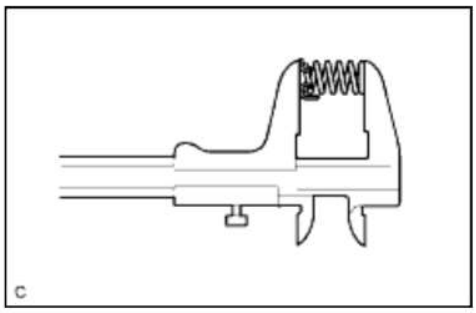
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32.63 mm (1.2846 in.)

If the inside diameter is greater than the maximum, replace the underdrive clutch drum.

29. INSPECT UNDERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
17.14 mm (0.6748 in.)

If the free length is shorter than the standard free length, replace the underdrive clutch return spring sub-assembly.

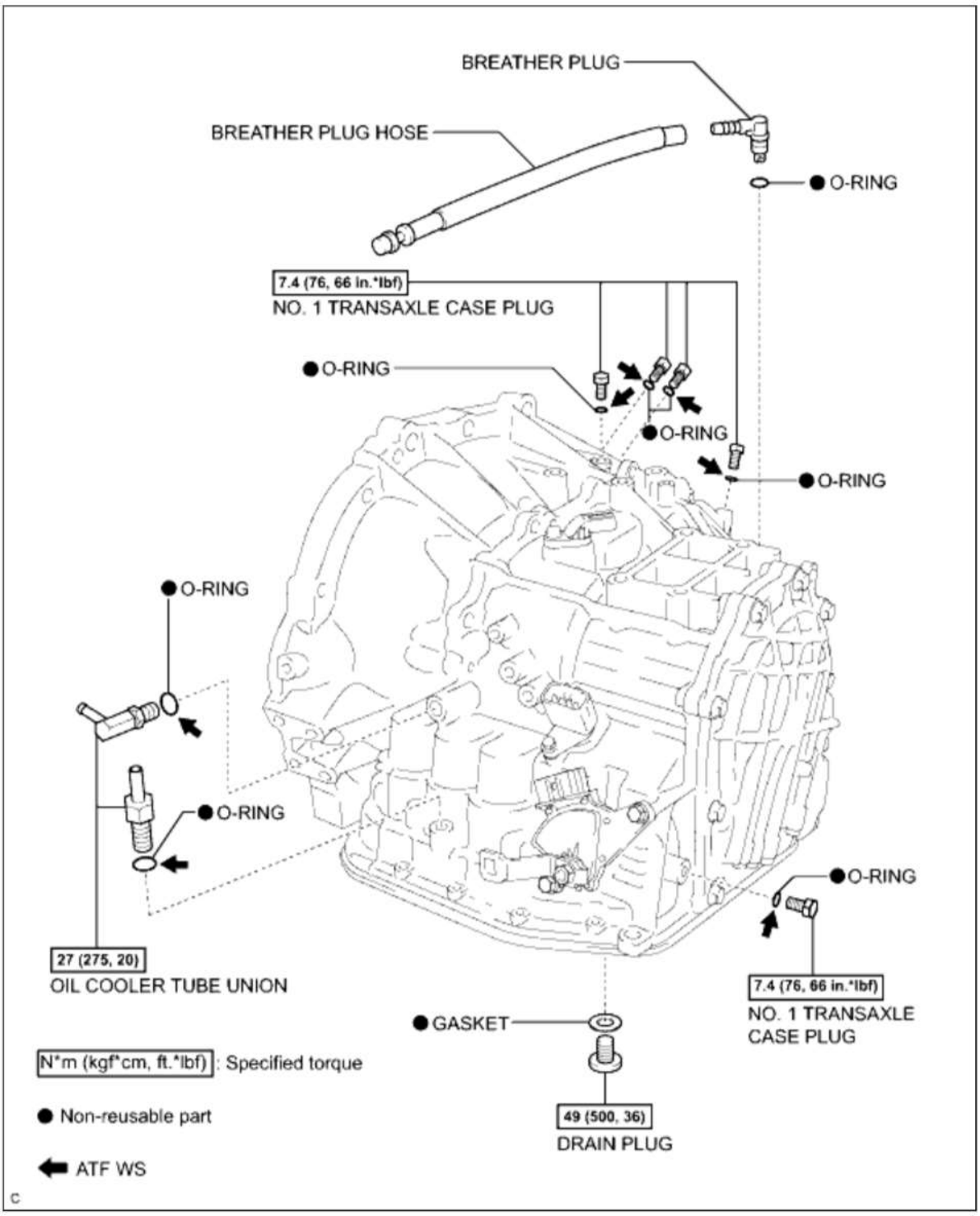
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192G018X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: COMPONENTS (2010 Corolla)		

COMPONENTS

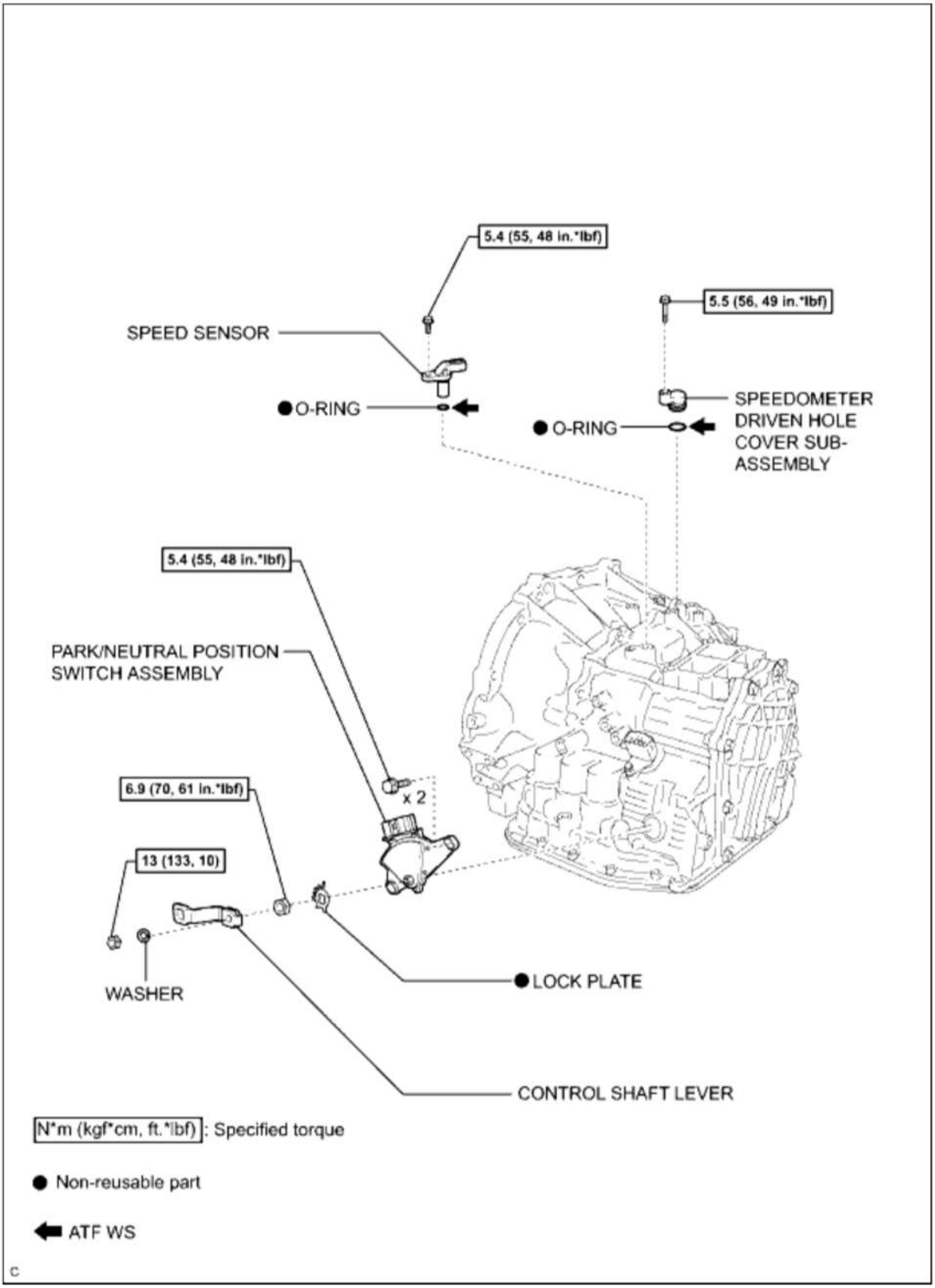
ILLUSTRATION

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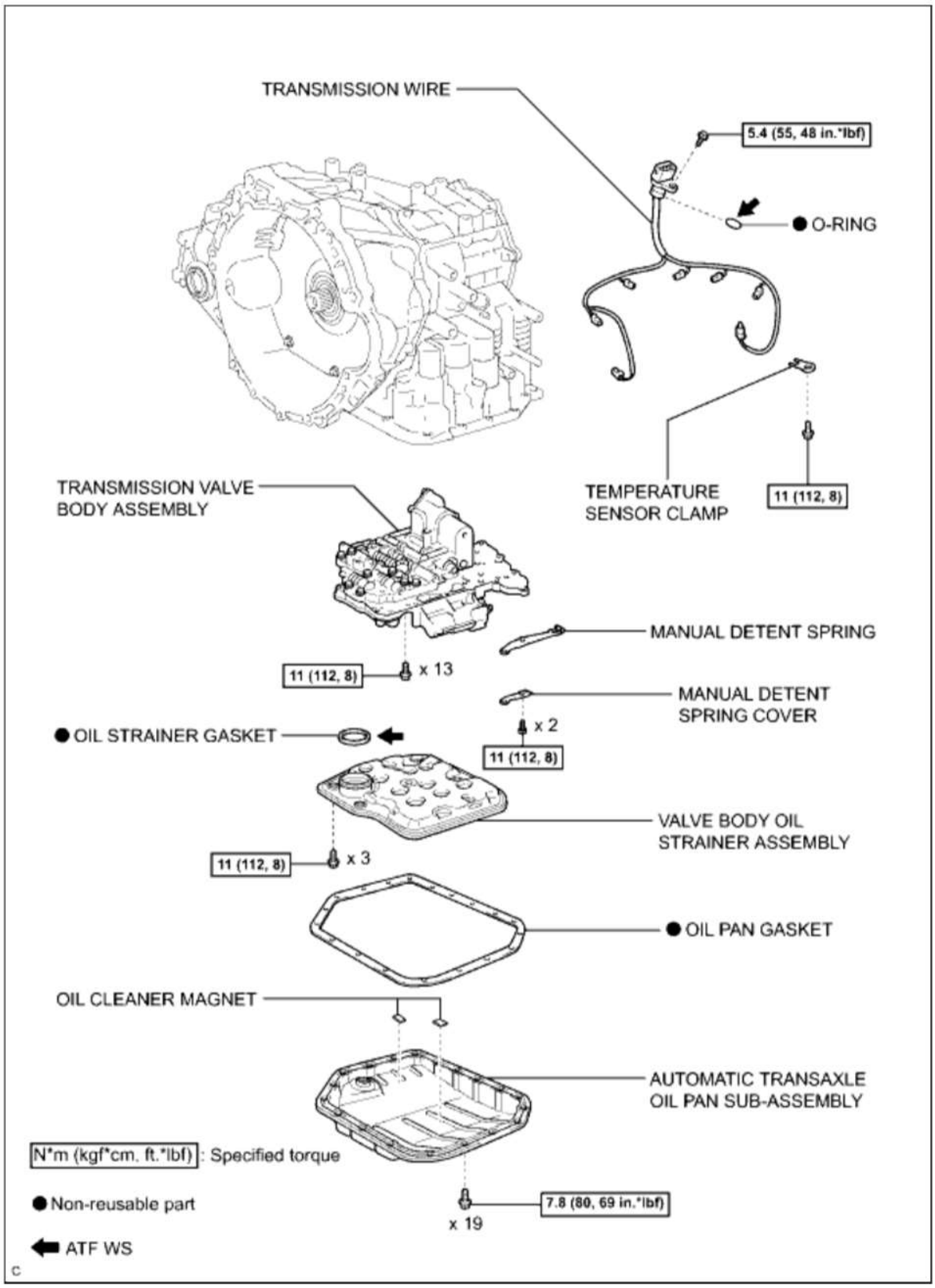
ILLUSTRATION

cardiagn.com



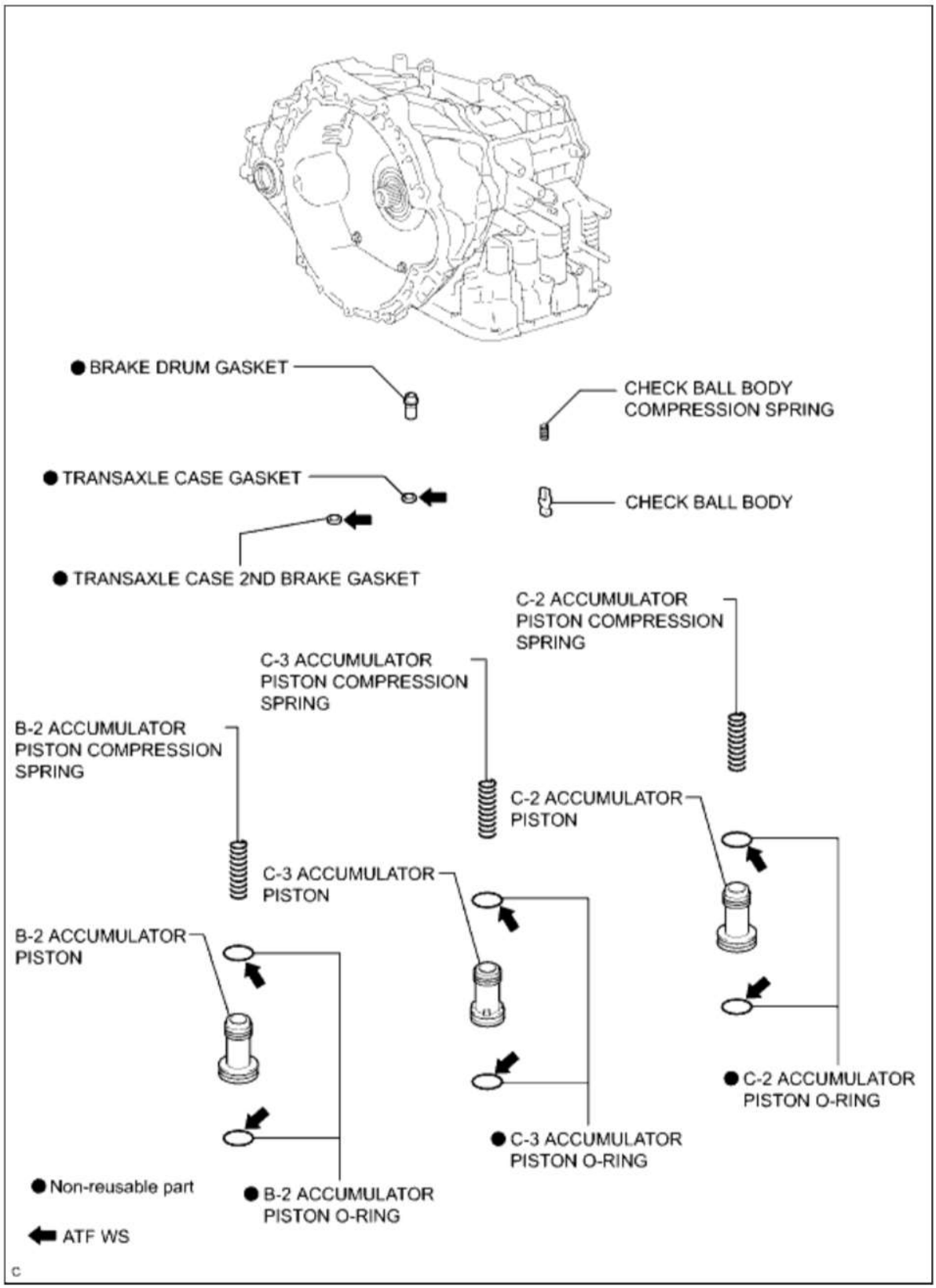
ILLUSTRATION

cardiagn.com



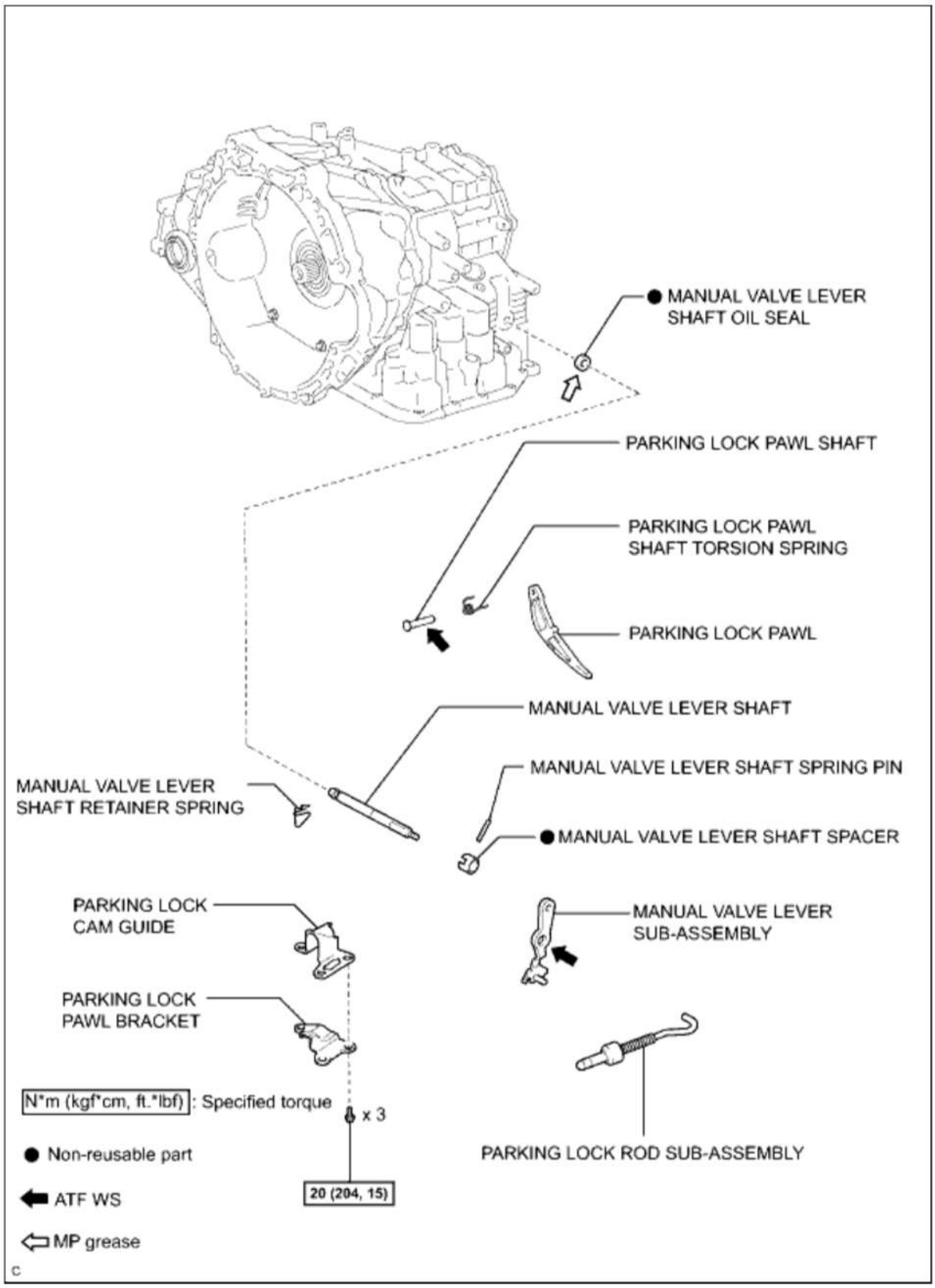
ILLUSTRATION

cardiagn.com



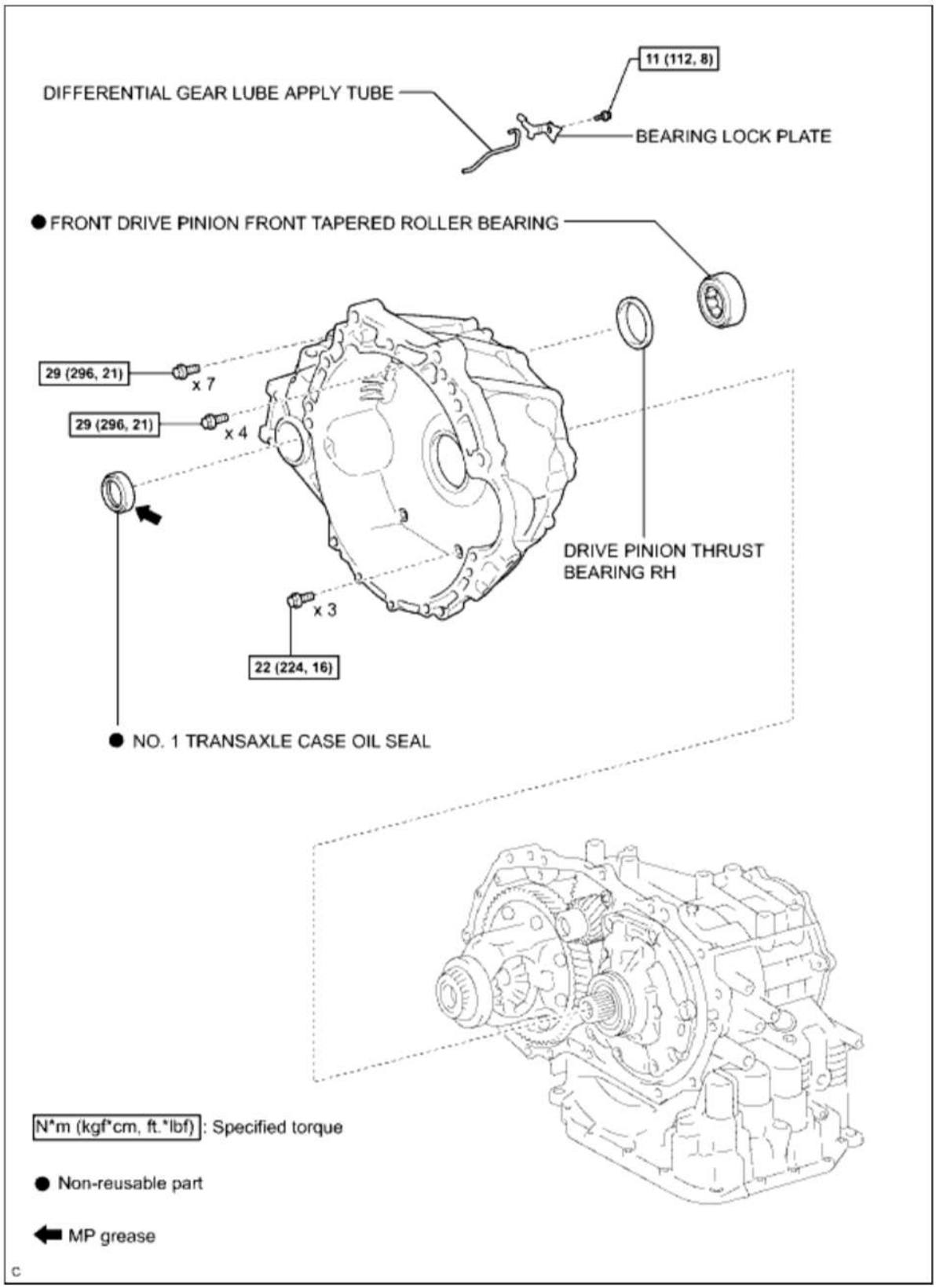
ILLUSTRATION

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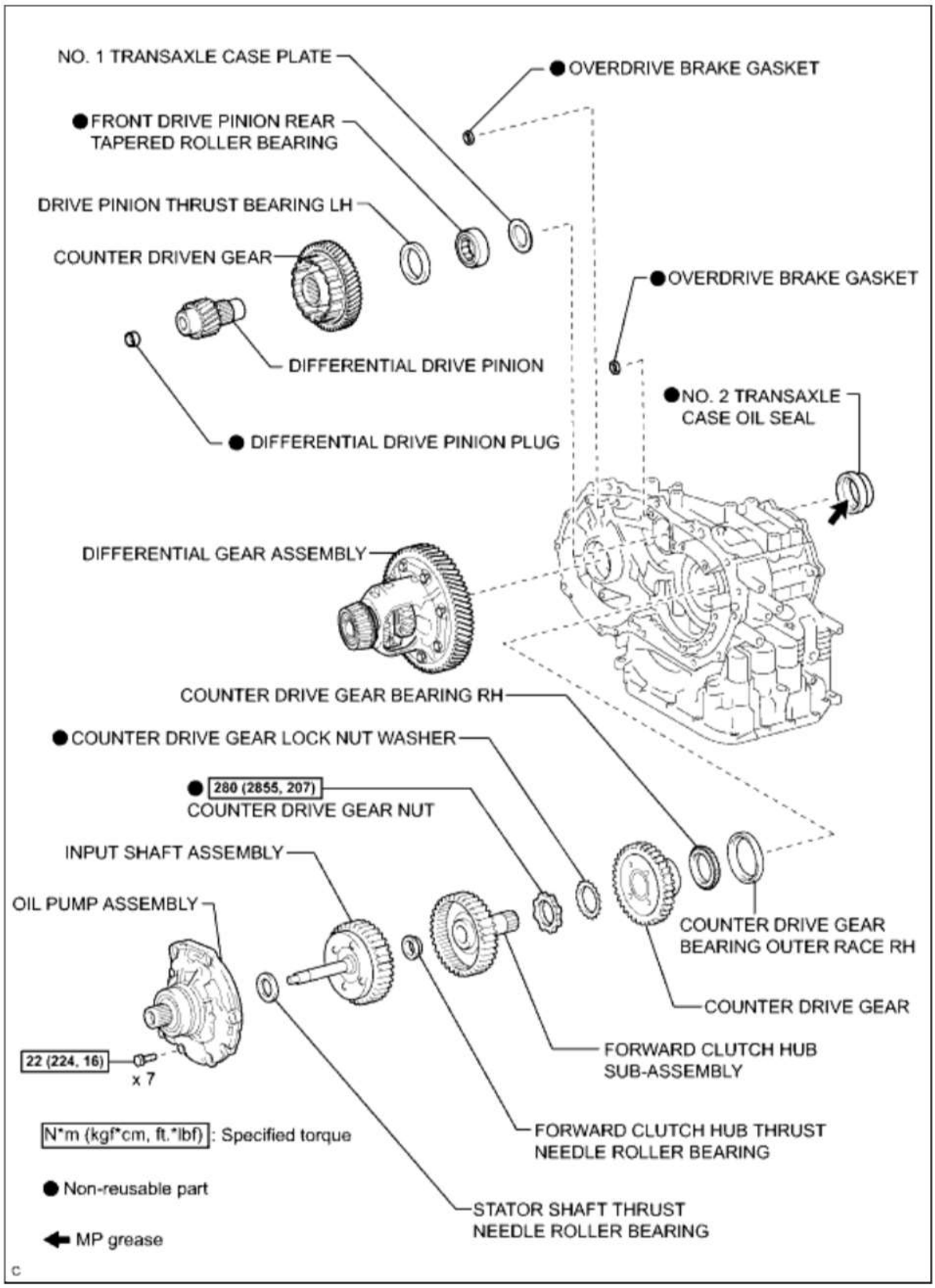
ILLUSTRATION

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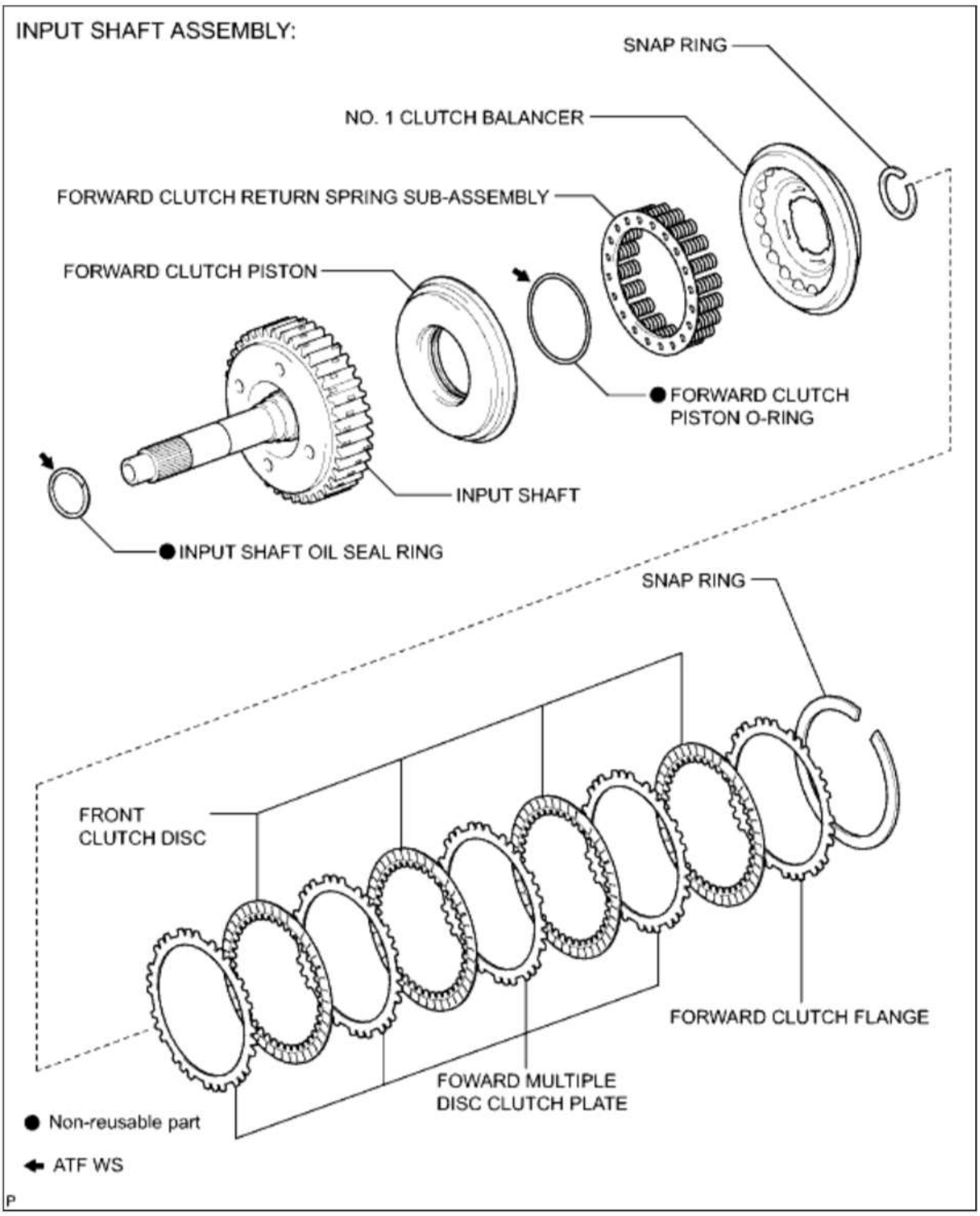
ILLUSTRATION

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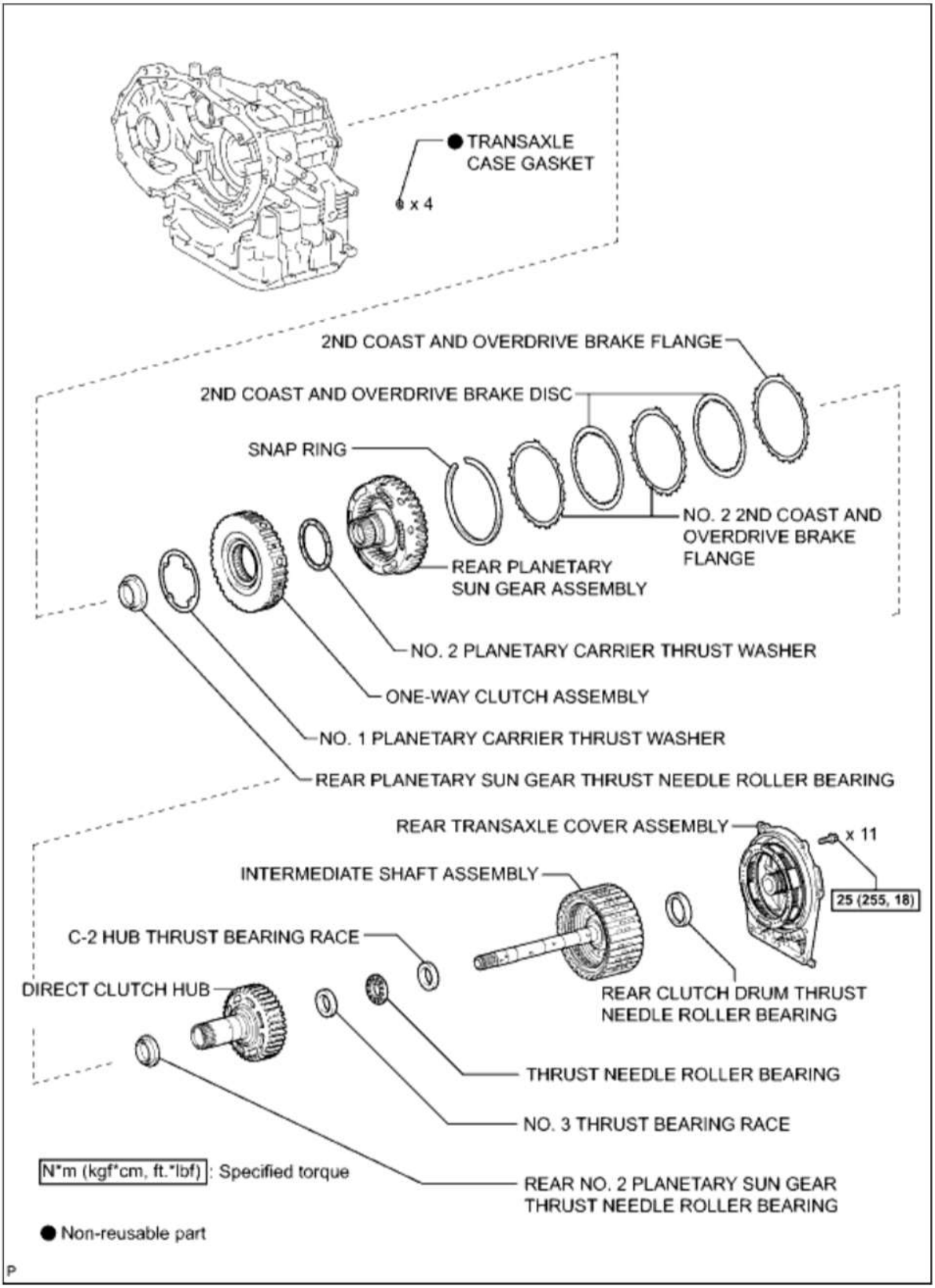
ILLUSTRATION

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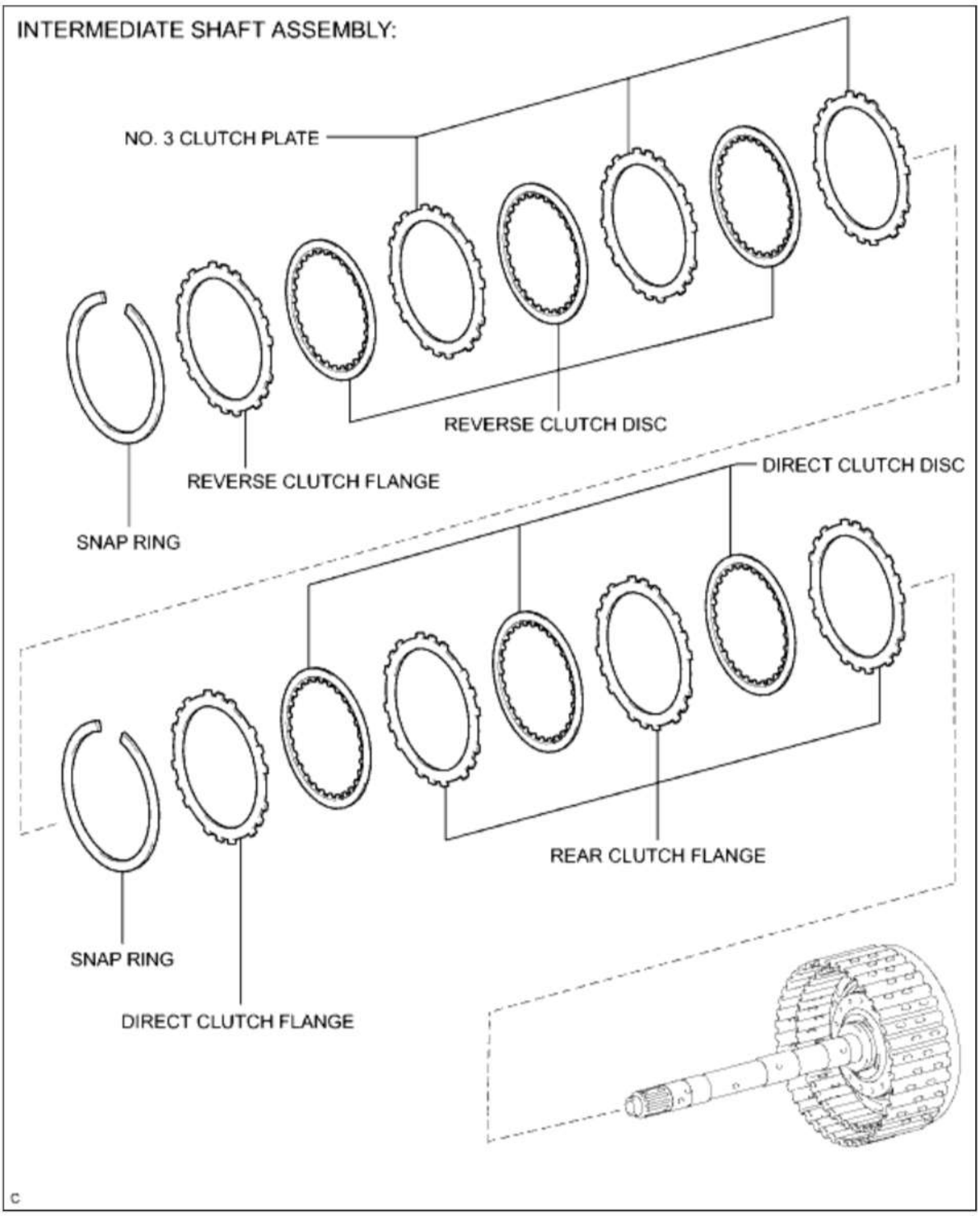
ILLUSTRATION

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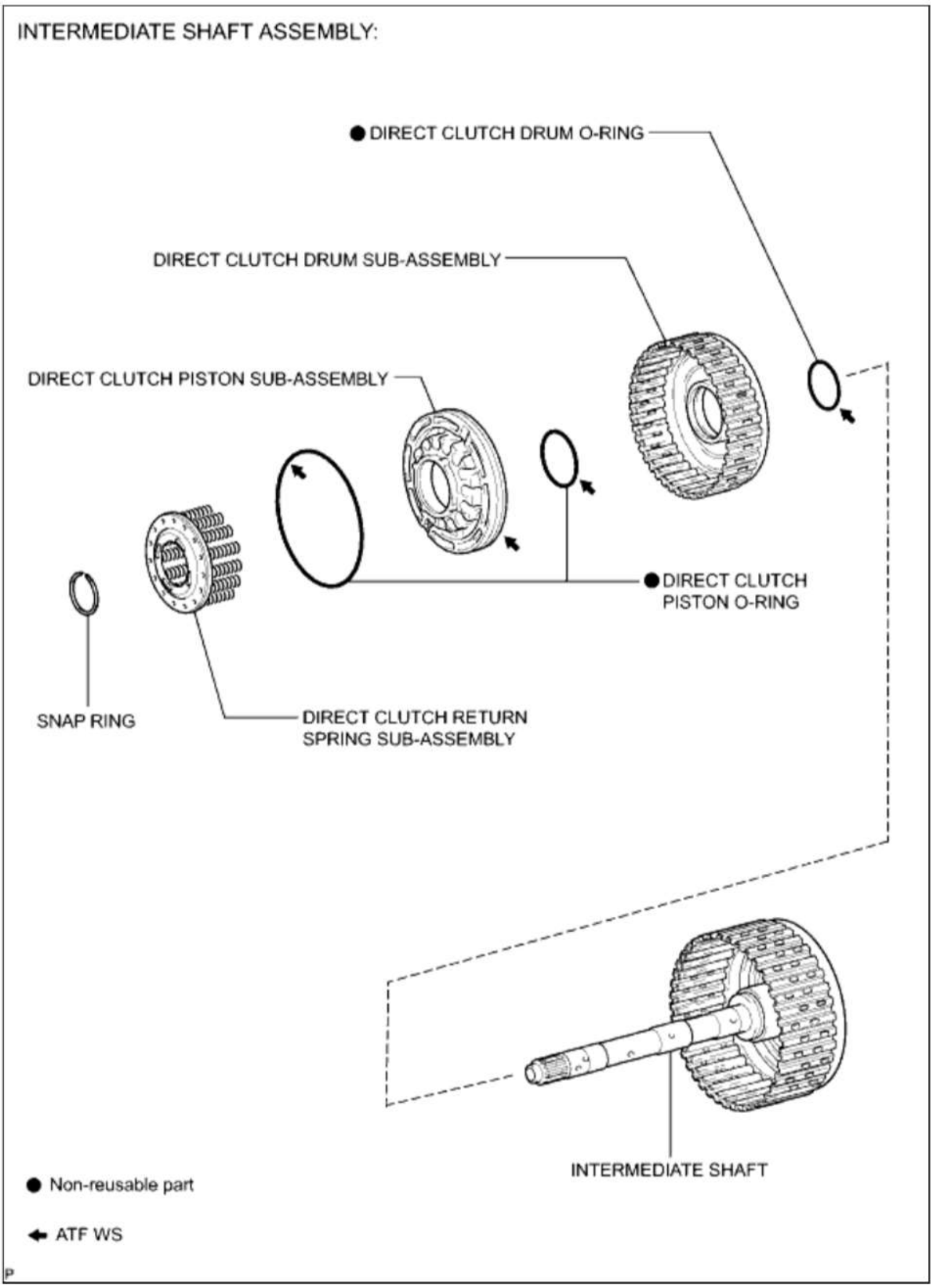
ILLUSTRATION

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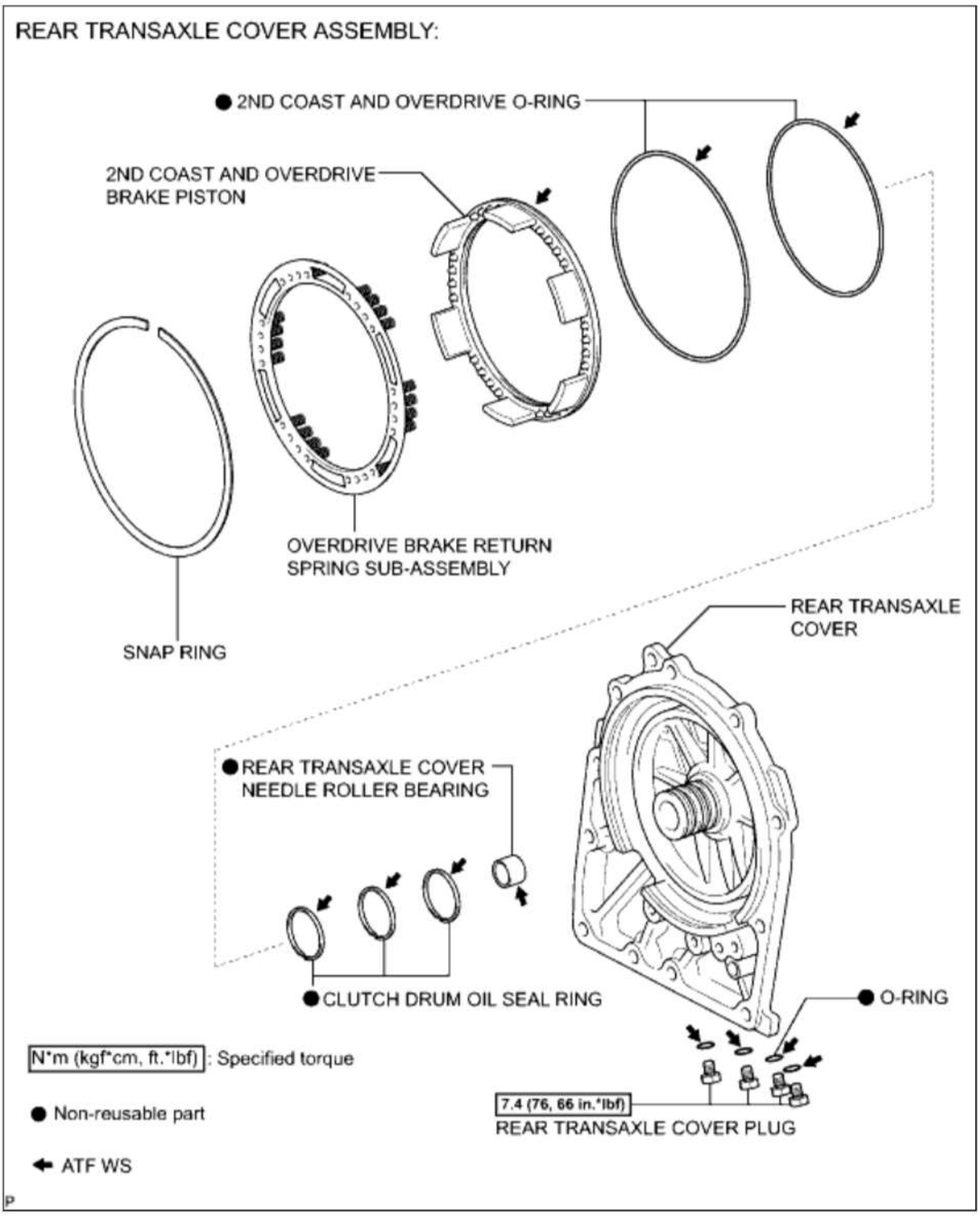
ILLUSTRATION

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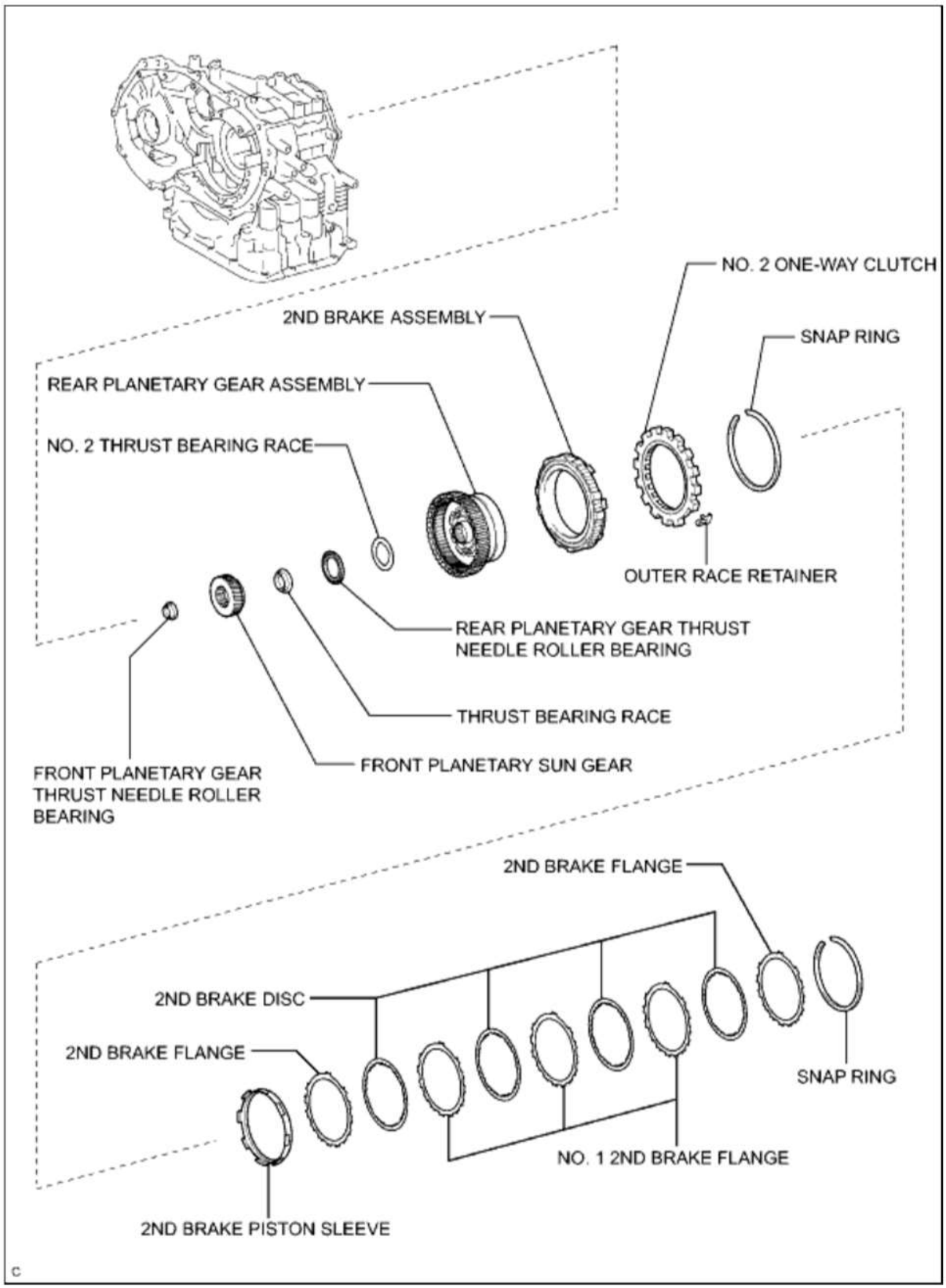
ILLUSTRATION

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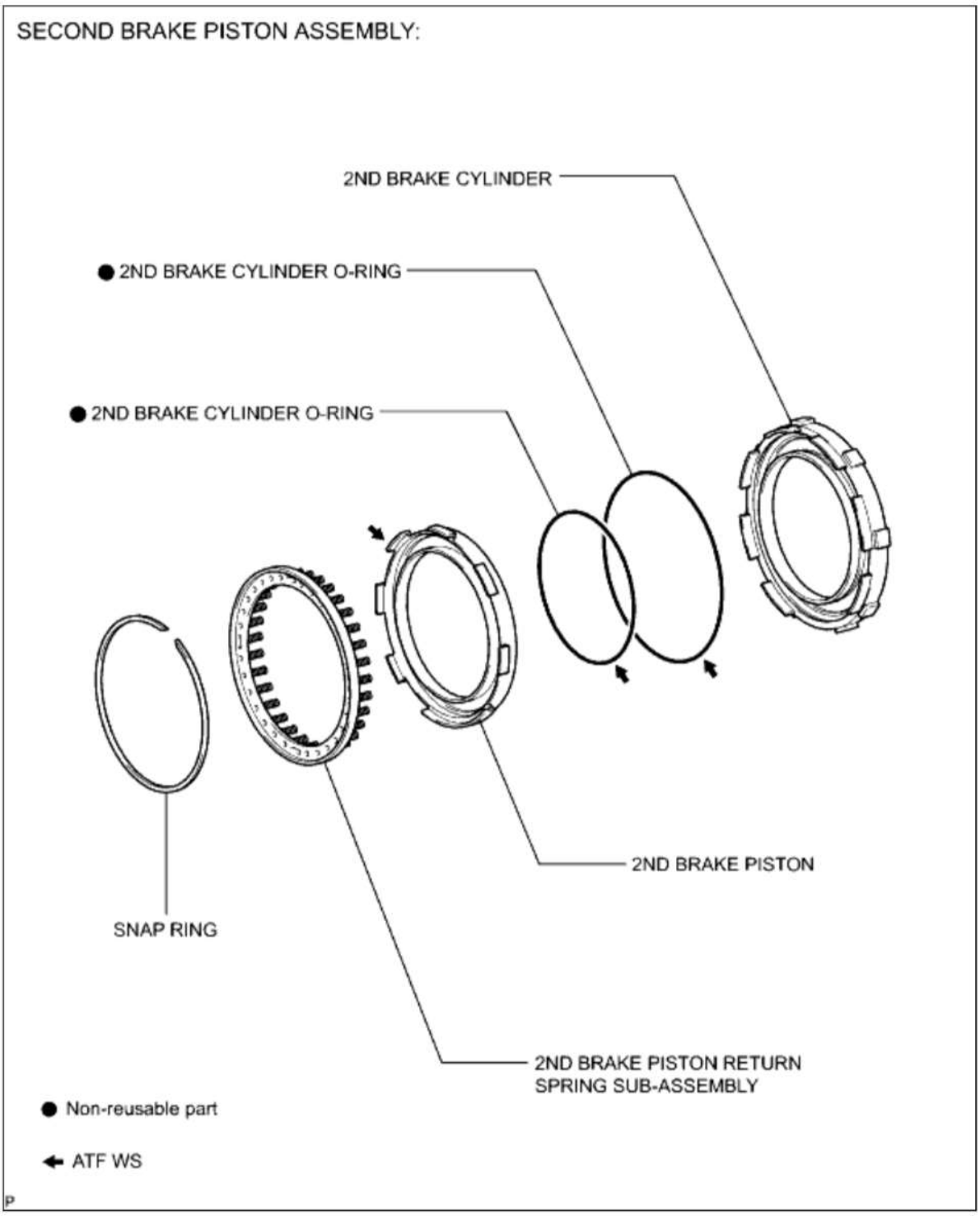
ILLUSTRATION

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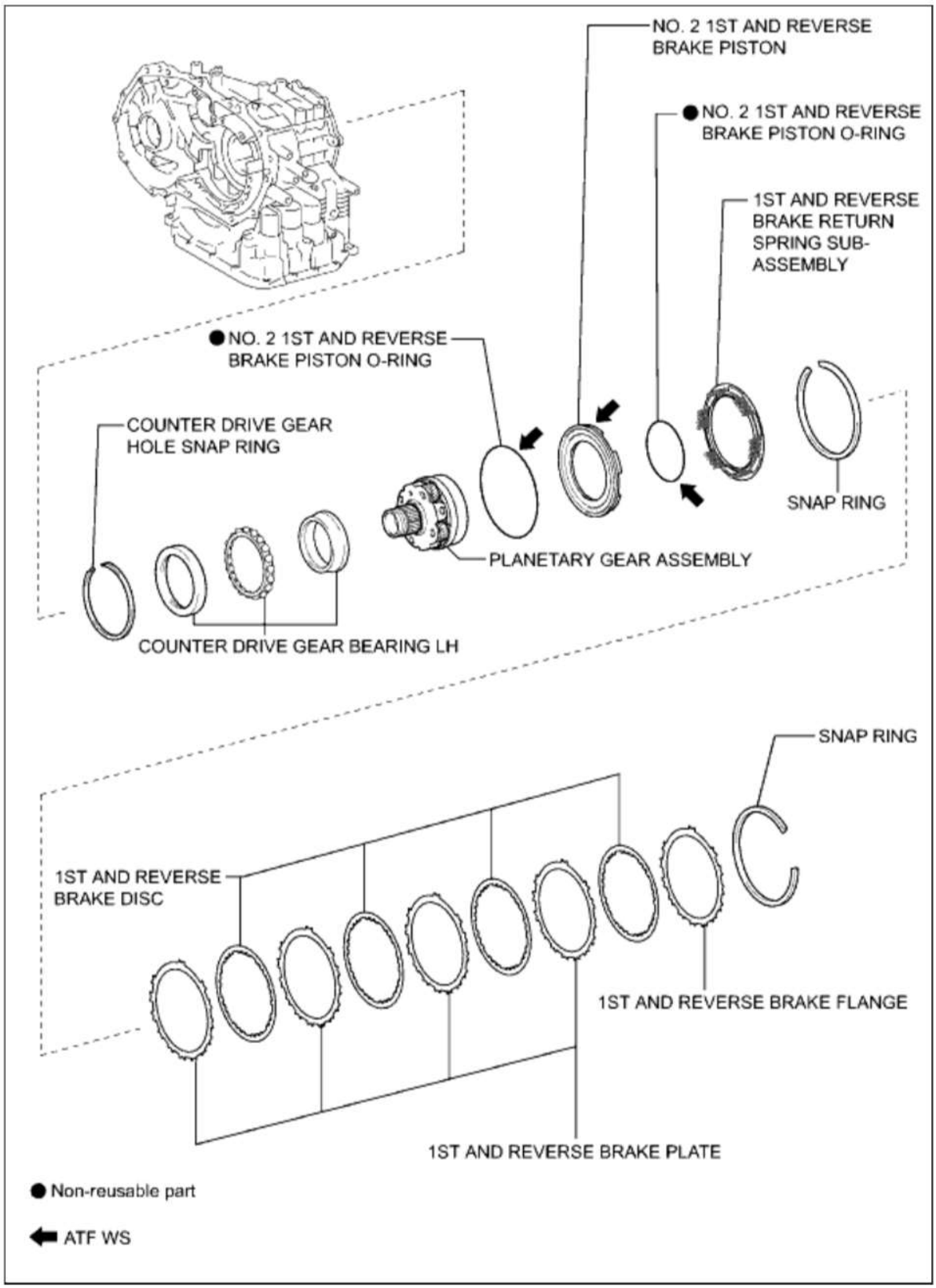
ILLUSTRATION

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ILLUSTRATION

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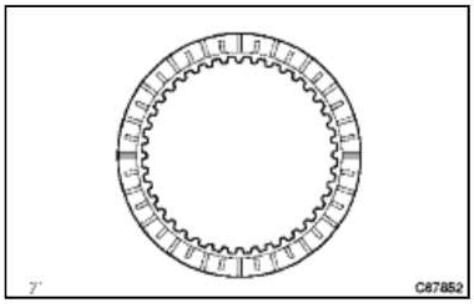


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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192F018X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE UNIT: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT FRONT CLUTCH DISC



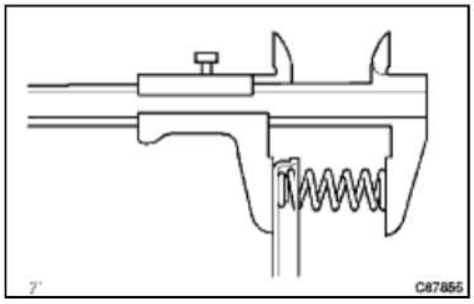
(a) Check whether the sliding surfaces of the discs, plates and flanges are worn or burnt.

If necessary, replace them.

NOTICE:

- If the lining of any disc is peeled off or discolored, or even if part of the printed number is damaged, replace all the discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

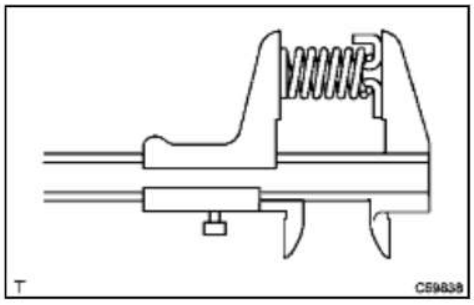
2. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
21.69 mm (0.853 in.)

3. INSPECT OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

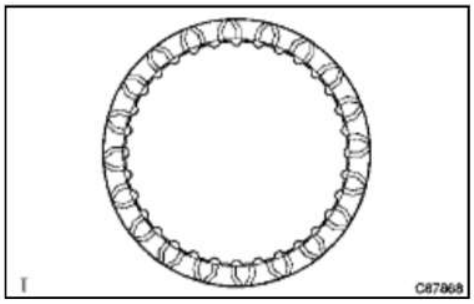


(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
17.88 mm (0.703 in.)

4. INSPECT REVERSE CLUTCH DISC

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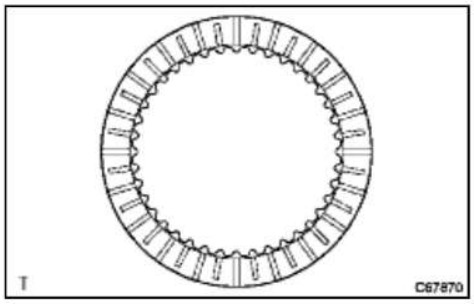
(a) Check whether the sliding surfaces of the discs, plates and flanges are worn or burnt.

If necessary, replace them.

NOTICE:

- If the lining of any disc is peeled off or discolored, or even if part of the printed mark is damaged, replace all the discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

5. INSPECT DIRECT CLUTCH DISC



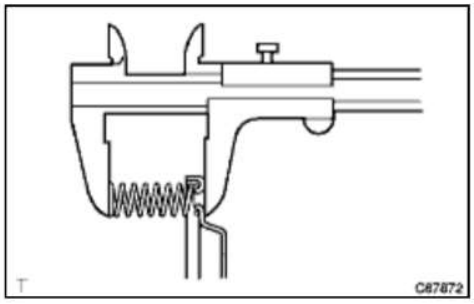
(a) Check whether the sliding surfaces of the discs, plates and flanges are worn or burnt.

If necessary, replace them.

NOTICE:

- If the lining of any disc is peeled off or discolored, or even if part of the printed mark is damaged, replace all the discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

6. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



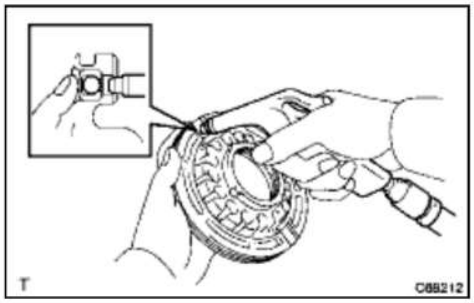
(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
31.7 mm (1.248 in.)

7. INSPECT DIRECT CLUTCH PISTON SUB-ASSEMBLY

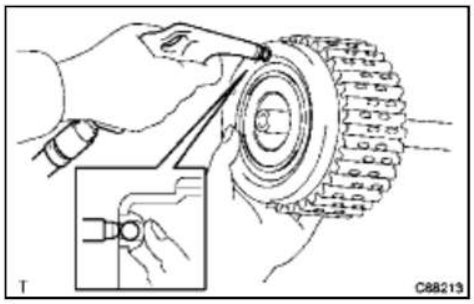
(a) Shake the direct clutch pin and confirm that the check ball is not stuck.

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(b) Apply low pressure compressed air to the check ball and confirm that there is no air leaks.

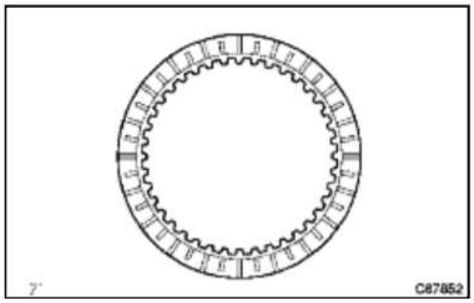
8. INSPECT INTERMEDIATE SHAFT SUB-ASSEMBLY



(a) Shake the direct clutch pin and confirm that the check ball is not stuck.

(b) Apply low pressure compressed air to the check ball and confirm that there is no air leaks.

9. INSPECT 2ND COAST AND OVERDRIVE BRAKE DISC



(a) Check whether the sliding surfaces of the discs, plates and flanges are worn or burnt.

If necessary, replace them.

NOTICE:

- If the lining of any disc is peeled off or discolored, or even if part of the printed number is damaged, replace all the discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

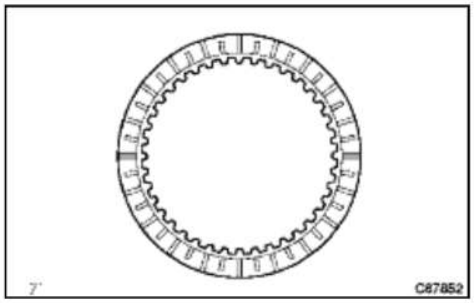
10. INSPECT 2ND BRAKE DISC

(a) Check whether the sliding surfaces of the discs, plates and flanges are worn or burnt.

If necessary, replace them.

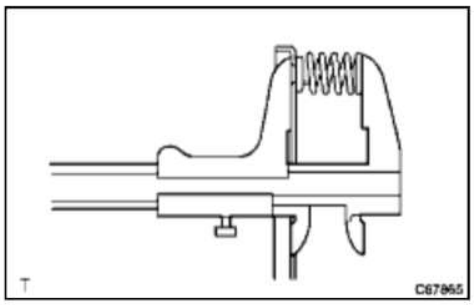
NOTICE:

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- If the lining of any disc is peeled off or discolored or even if part of the printed mark is damaged, replace all the discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

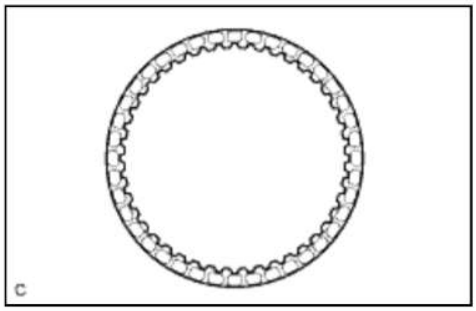
11. INSPECT 2ND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY



(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
14.65 mm (0.576 in.)

12. INSPECT 1ST AND REVERSE BRAKE DISC



(a) Check whether the sliding surfaces of the discs, plates and flanges are worn or burnt.

If necessary, replace them.

NOTICE:

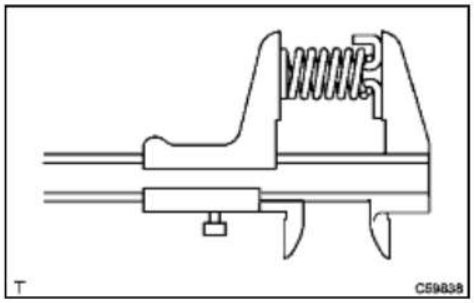
- If the lining of any disc is peeled off or discolored, or even if part of the printed mark is damaged, replace all the discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

13. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:
13.96 mm (0.549 in.)

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TOYOTA

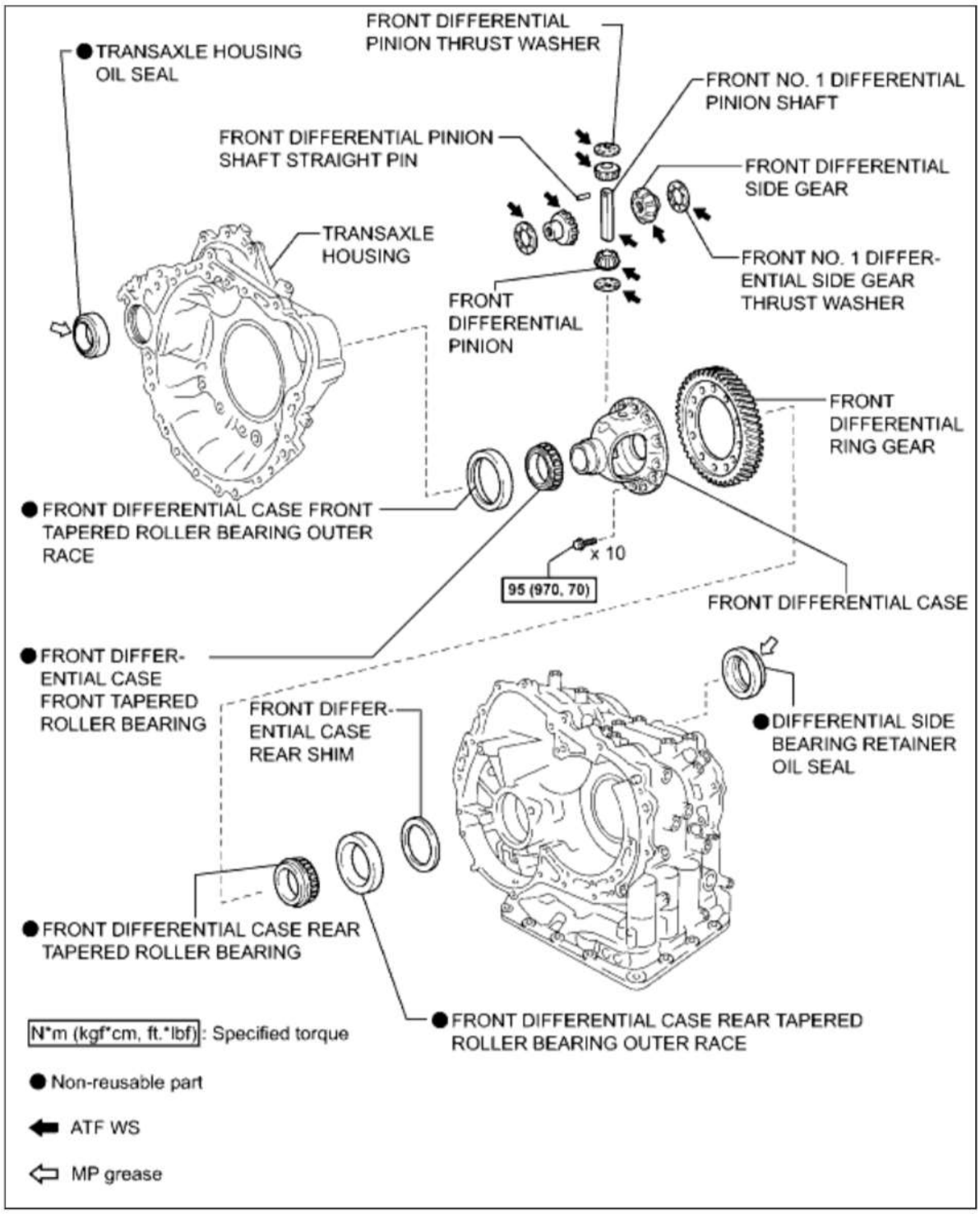
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001CVI00HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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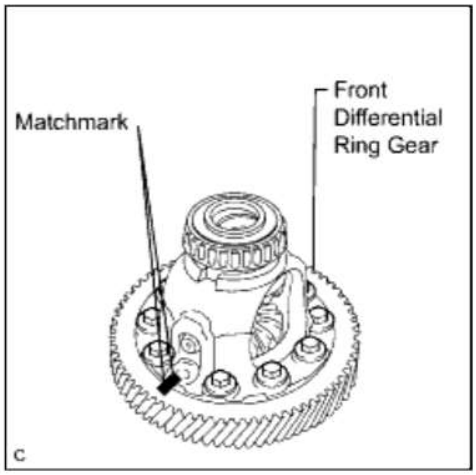


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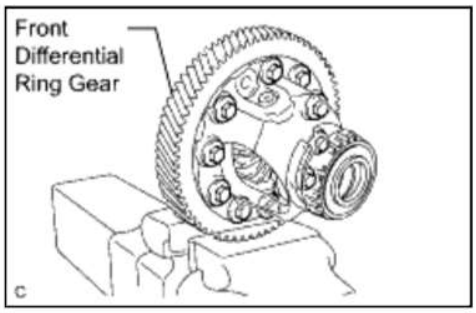
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000018KN01YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

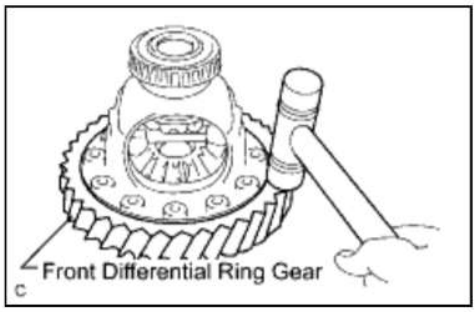
1. REMOVE FRONT DIFFERENTIAL RING GEAR



(a) Put matchmarks on the front differential ring gear and differential case.



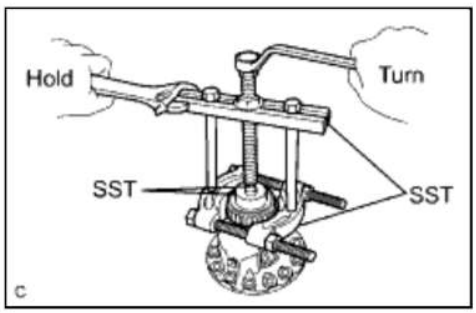
(b) Remove the 10 bolts.



(c) Using a plastic hammer, tap on the front differential ring gear to remove it from the case.

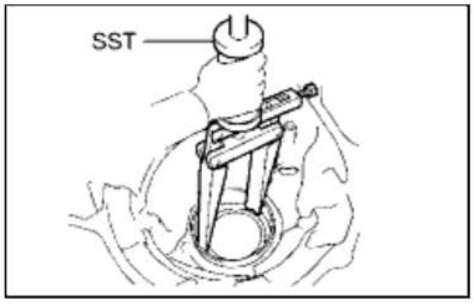
2. REMOVE FRONT DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING

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(a) Using SST, remove the front differential case front tapered roller bearing from the differential case.

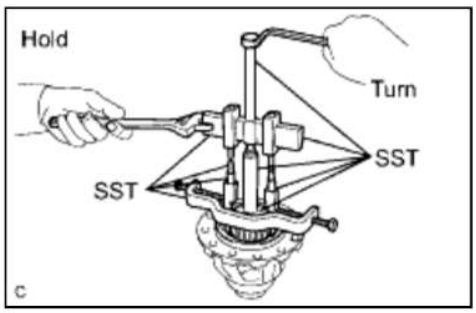
SST: 09950-00020
SST: 09950-00030
SST: 09950-40011
09957-04010
SST: 09950-60010
09951-00480



(b) Using SST, remove the front differential case front tapered roller bearing outer race.

SST: 09308-00010

3. REMOVE FRONT DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING

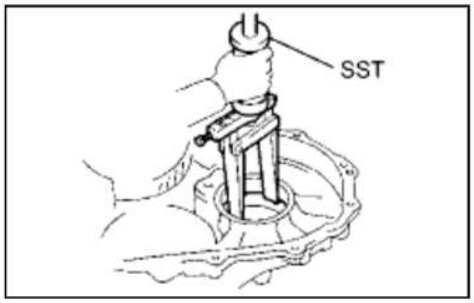


(a) Using SST, remove the front differential case rear tapered roller bearing from the differential case.

SST: 09950-00020
SST: 09950-00030
SST: 09950-40011
09955-04061
09957-04010
09958-04011
SST: 09950-50013
09951-05010
09952-05010
09953-05020
09954-05021
09955-05010
SST: 09950-60010
09951-00480
SST: 09950-70010
09951-07100

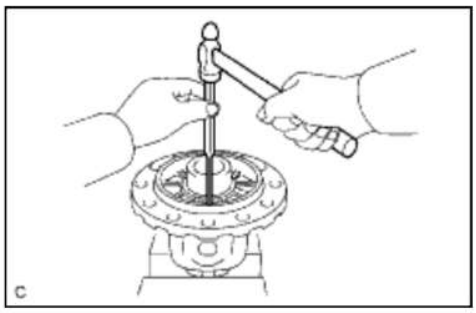
(b) Using SST, remove the front differential case rear tapered roller bearing outer race.

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SST: 09308-00010

4. REMOVE FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN

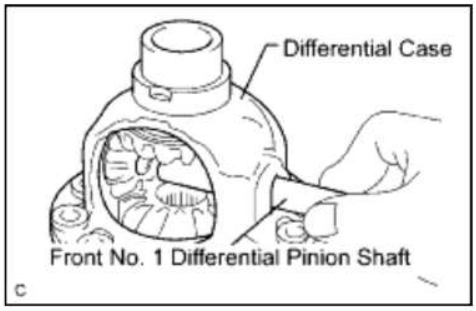


(a) Using a pin punch and hammer, remove the straight pin.

NOTICE:

Before removing the straight pin, unstake it with a pin punch.

5. REMOVE FRONT NO. 1 DIFFERENTIAL PINION SHAFT

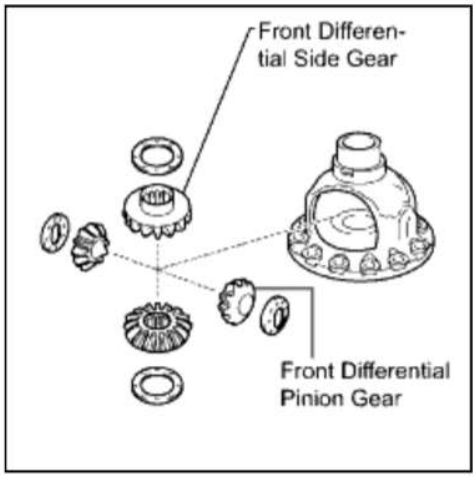


(a) Remove the front No. 1 differential pinion shaft from the differential case.

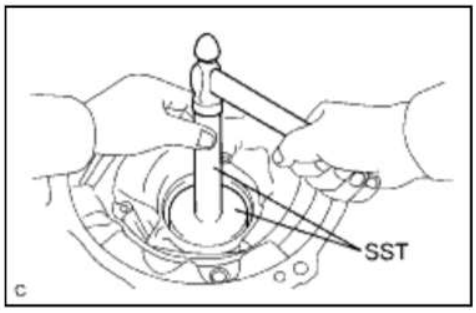
6. REMOVE FRONT DIFFERENTIAL SIDE GEAR

(a) Remove the 2 front differential pinions, 2 pinion thrust washers, 2 front differential side gears and 2 side gear thrust washers from the differential case.

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7. REMOVE TRANSAXLE HOUSING OIL SEAL



(a) Using SST and a hammer, remove the oil seal.

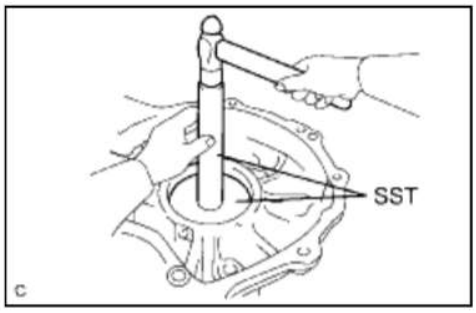
SST: 09950-70010

09951-07200

SST: 09950-60010

09951-00630

8. REMOVE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL



(a) Using SST and a hammer, remove the oil seal.

SST: 09950-70010

09951-07100

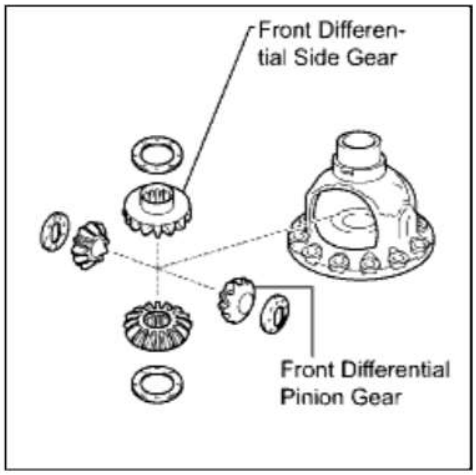
SST: 09608-10010

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000018KO01YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: REASSEMBLY (2010 Corolla)		

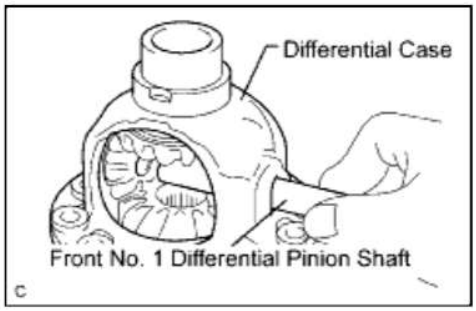
REASSEMBLY

1. INSTALL FRONT DIFFERENTIAL SIDE GEAR



(a) Coat the 2 front differential side gears, 2 side gear thrust washers, 2 front differential pinions and 2 pinion thrust washers with ATF and install them to the differential case.

2. INSTALL FRONT NO. 1 DIFFERENTIAL PINION SHAFT

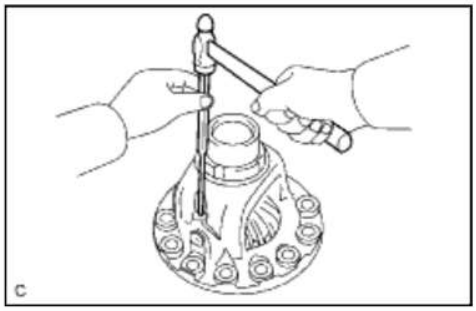


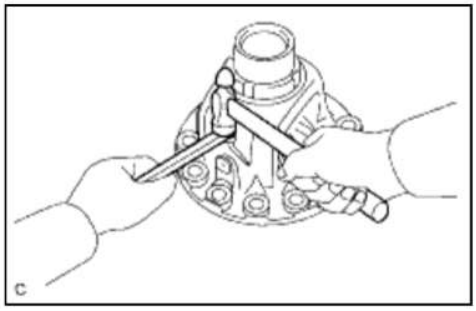
(a) Coat the front No. 1 differential pinion shaft with ATF, and install it to the differential case.

3. INSTALL FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN

(a) Using a pin punch and hammer, install the pinion shaft straight pin.

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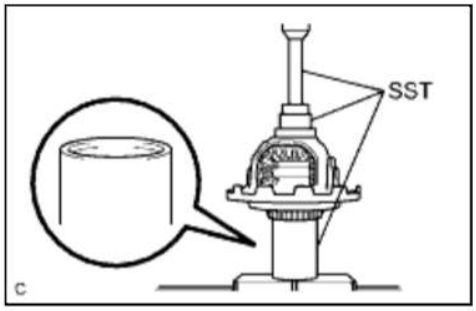


(b) Using a chisel and hammer, stake the differential case.

NOTICE:

Stake it after adjusting the backlash INFO **.**

4. INSTALL FRONT DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING



(a) Using SST and a press, install the front differential case front tapered roller bearing to the differential case.

SST: 09550-60010

09951-00480

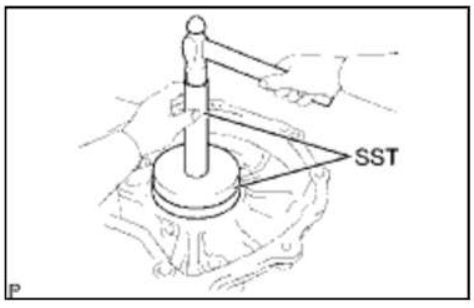
SST: 09950-70010

09951-07100

SST: 09710-04081

NOTICE:

Do not damage the bearing cage during installation of the bearing inner race.



(b) Using SST and a hammer, install the front differential case front tapered roller bearing outer race to the transaxle housing.

SST: 09950-60020

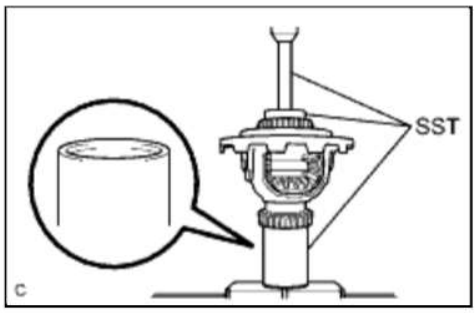
09951-00750

SST: 09950-70010

09951-07200

5. INSTALL FRONT DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING

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(a) Using SST and a press, install the front differential case rear tapered roller bearing to the differential case.

SST: 09710-04081

SST: 09550-60010

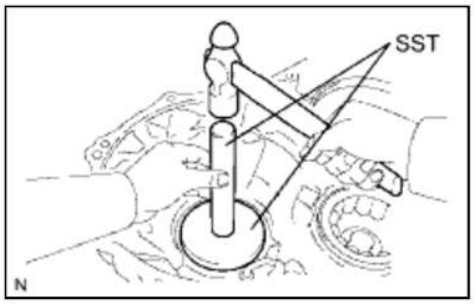
09951-00480

SST: 09950-70010

09951-07100

NOTICE:

Do not damage the bearing when installing the bearing inner race.



(b) Using SST and a hammer, install the front differential case rear tapered roller bearing outer race to the transaxle housing.

SST: 09550-60010

09951-00790

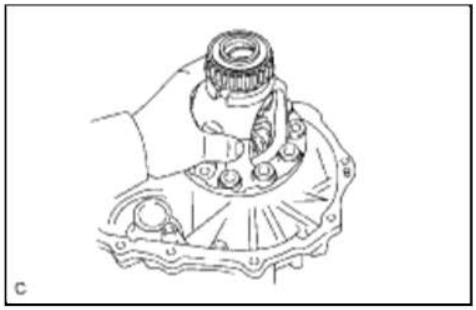
SST: 09950-70010

09951-00710

NOTICE:

Make sure that there is no clearance between the bearing and transaxle housing.

6. ADJUST DIFFERENTIAL SIDE BEARING PRELOAD



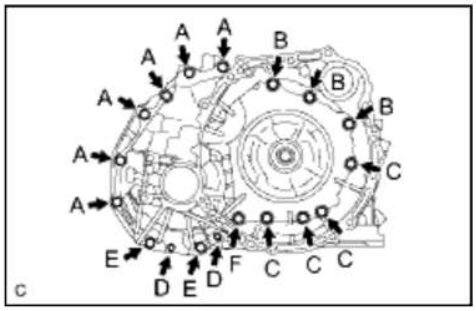
(a) Install the differential assembly to the transaxle case.

(b) Clean the contact surfaces of the transaxle case and transaxle housing.

(c) Install the transaxle housing to the transaxle case and tighten the 18 bolts.

Bolt A - Torque: 29 N·m (296 kgf·cm, 21ft·lbf)
Bolt B - Torque: 29 N·m (296 kgf·cm, 21ft·lbf)
Bolt C - Torque: 22 N·m (224 kgf·cm, 16ft·lbf)
Bolt D - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)
Bolt E - Torque: 33 N·m (336 kgf·cm, 24ft·lbf)

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Bolt F - Torque: 25 N·m (255 kgf·cm, 18ft·lbf)

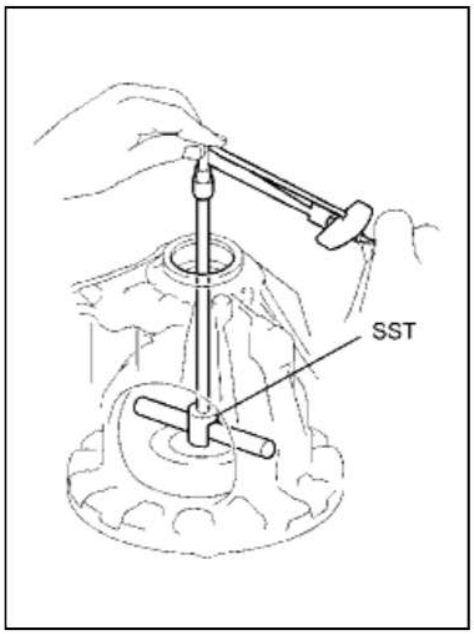
Bolt length:

Bolt B, C, D, F

50 mm (1.969 in.)

Bolt A, E

42 mm (1.654 in.)



(d) Using SST, turn the differential assembly right and left 2 or 3 times to settle the bearing.

SST: 09564-32011

(e) Using SST and a torque wrench, measure the rotating torque of the differential.

SST: 09564-32011

Rotating torque at 60 rpm:

New bearing

0.20 to 1.0 N*m (2.0 to 10.2 kgf*cm, 1.8 to 8.9 in.*lbf)

Used bearing

0.10 to 0.50 N*m (1.0 to 5.1 kgf*cm, 0.9 to 4.4 in.*lbf)

HINT:

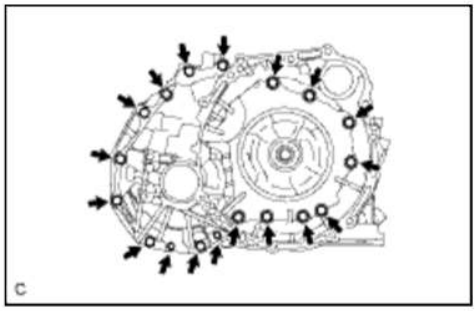
If the rotating torque is not within the specified range, refer to the table below to select a thrust washer so that the rotating torque is within the specified range.

Flange Thickness

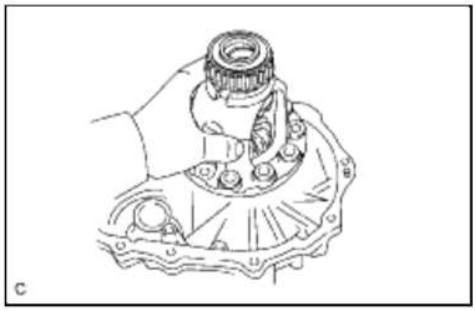
MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
0	1.90 (0.0748)	A	2.40 (0.0945)
1	1.95 (0.0768)	B	2.45 (0.0965)

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MARK	THICKNESS (MM (IN.))	MARK	THICKNESS (MM (IN.))
2	2.00 (0.0787)	C	2.50 (0.0984)
3	2.05 (0.0807)	D	2.55 (0.1004)
4	2.10 (0.0827)	E	2.60 (0.1024)
5	2.15 (0.0846)	F	2.65 (0.1043)
6	2.20 (0.0866)	G	2.70 (0.1063)
7	2.25 (0.0886)	H	2.75 (0.1083)
8	2.30 (0.0906)	J	2.80 (0.1102)
9	2.35 (0.0925)	-	-



(f) Remove the 18 bolts and the transaxle housing.



(g) Remove the differential assembly.

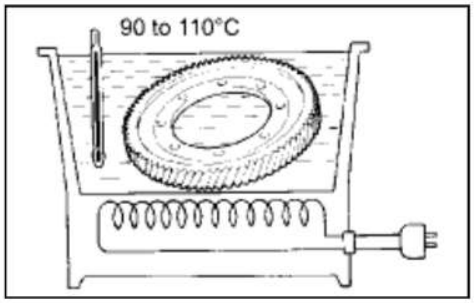
7. INSTALL FRONT DIFFERENTIAL RING GEAR

(a) Using ATF and a heater, heat the front differential ring gear to 90 to 110°C (194 to 230°F).

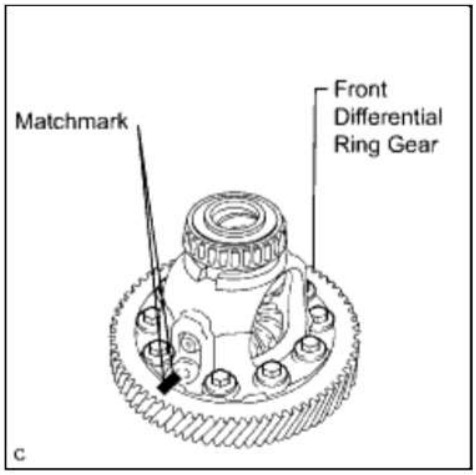
NOTICE:

Do not heat the ring gear to over 110°C (230°F).

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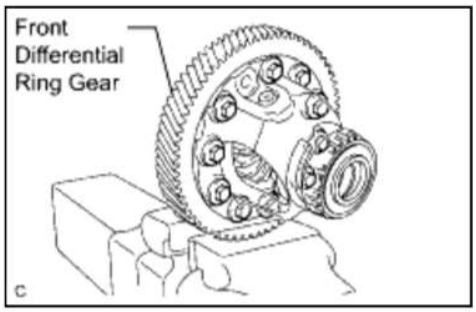
(b) Clean the contact surface of the front differential case.



(c) Align the matchmarks, and install the front differential ring gear case quickly.

NOTICE:

Do not install the bolts while the ring gear is hot.



(d) Tighten the 10 bolts.

Torque: 95 N·m (970 kgf·cm, 70ft·lbf)

NOTICE:

Tighten the bolts one at a time in diagonal order.

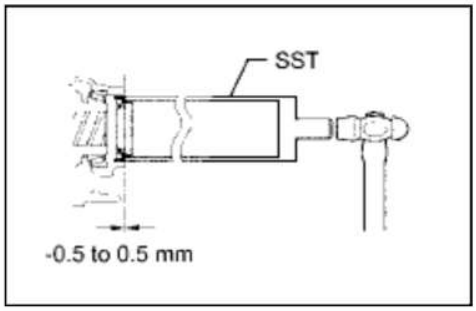
8. INSTALL TRANSAXLE HOUSING OIL SEAL

(a) Using SST and a hammer, drive in a new oil seal.

SST: 09316-60011

09316-00011

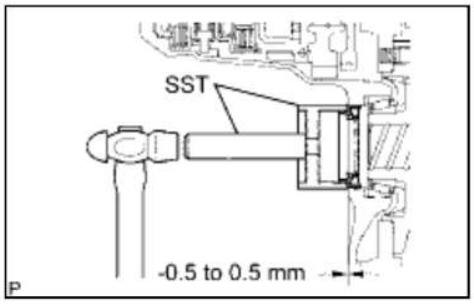
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(b) Coat the lip of the oil seal with a small amount of MP grease.

Oil seal drive in depth:
-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

9. INSTALL DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL



(a) Using SST and a hammer, drive in a new oil seal.

SST: 09649-17010

SST: 09950-70010

09951-07150

(b) Coat the lip of the oil seal with a small amount of MP grease.

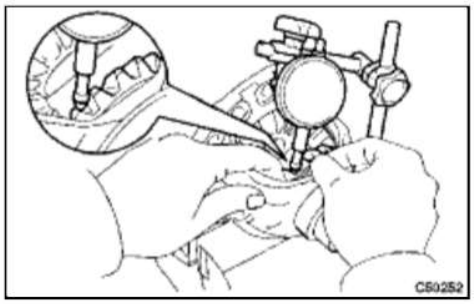
Oil seal drive in depth:
-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000018KM01YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT BACKLASH



(a) Using a dial indicator, inspect the backlash of the side gear.

Standard backlash:
0.05 to 0.20 mm (0.00197 to 0.00787 in.)

Thrust Washer Thickness

MARK	THICKNESS (MM (IN.))
1	1.000 (0.0394)
2	1.100 (0.0433)
3	1.200 (0.0472)
4	1.300 (0.0512)

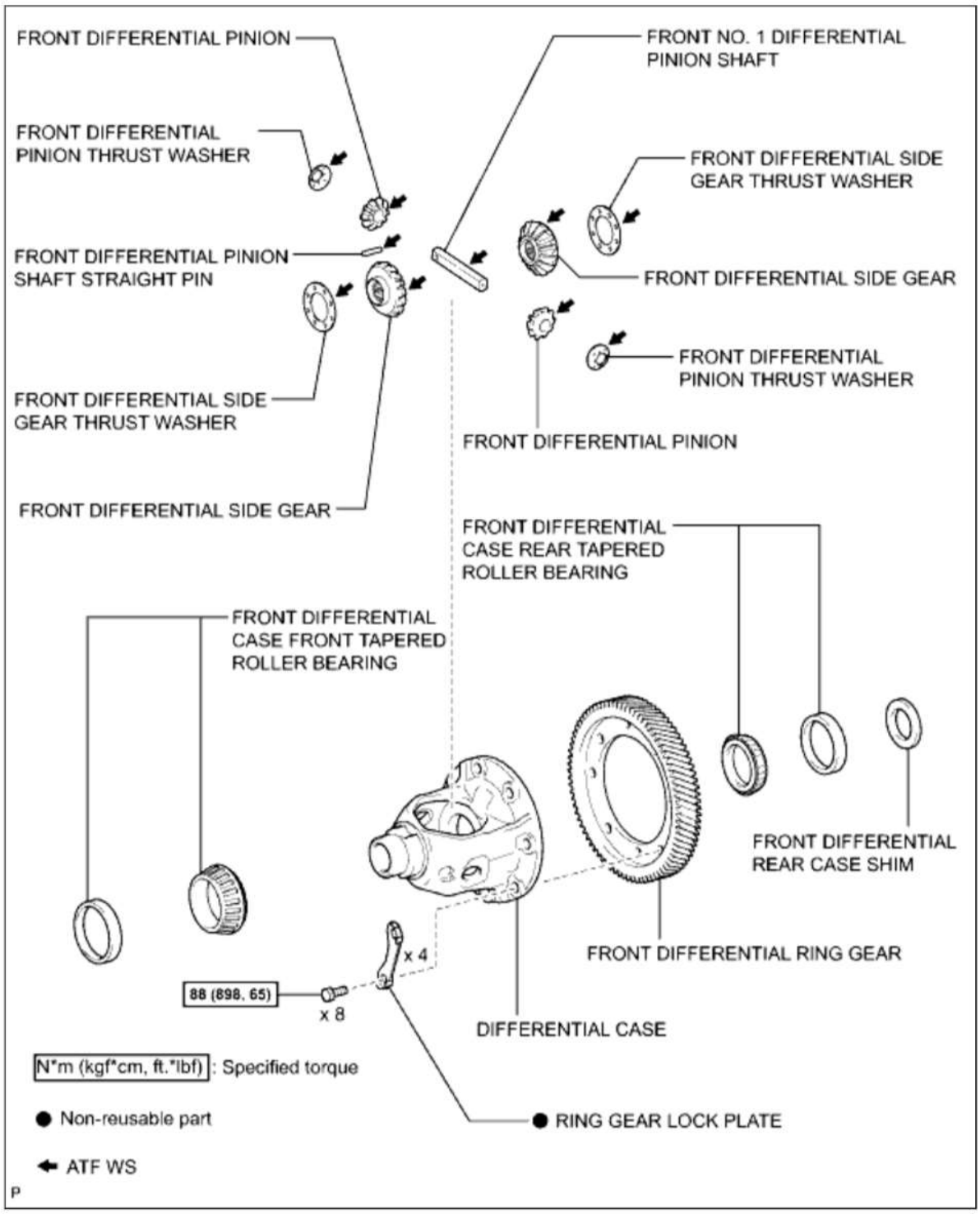
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000193301AX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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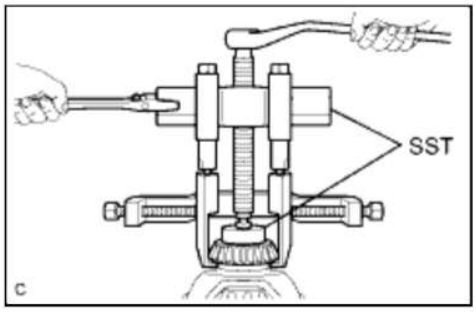


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000193401AX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

1. REMOVE FRONT DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING



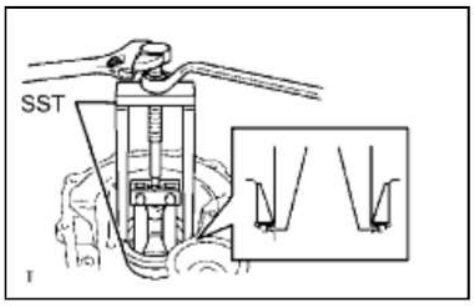
(a) Using SST, remove the front differential case front tapered roller bearing from the differential case.

SST: 09950-40011

09951-04010
09952-04010
09953-04030
09954-04010
09955-04061
09957-04010
09958-04011

SST: 09950-60010

09951-00390

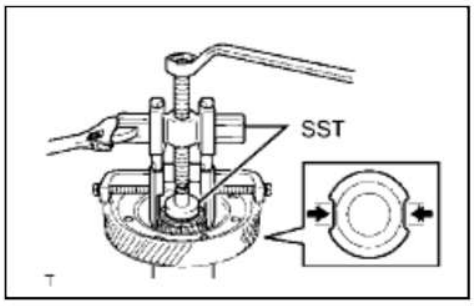


(b) Using SST, remove the front differential case front tapered roller bearing outer race from the transaxle housing.

SST: 09387-00041

09387-02020
09387-02010

2. REMOVE FRONT DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING



(a) Using SST, remove the front differential case rear tapered roller bearing from the differential case.

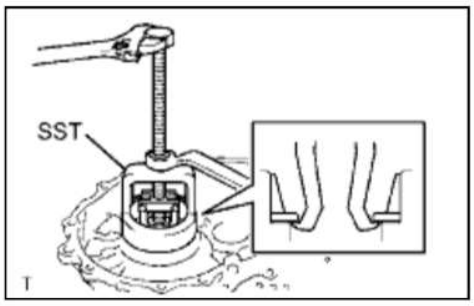
SST: 09950-40011

09951-04010
09952-04010
09953-04020
09954-04010
09955-04061
09957-04010
09958-04011

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SST: 09950-60010

09951-00430

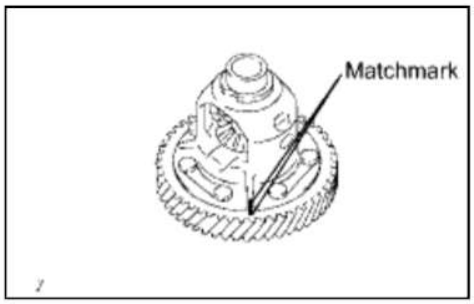


(b) Using SST, remove the front differential case rear tapered roller bearing outer race from the transaxle case.

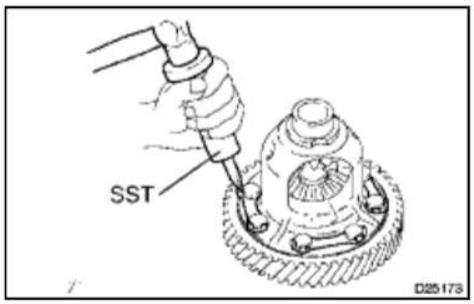
SST: 09612-65014

09612-01010

3. REMOVE FRONT DIFFERENTIAL RING GEAR



(a) Place matchmarks on the front differential ring gear and differential case.

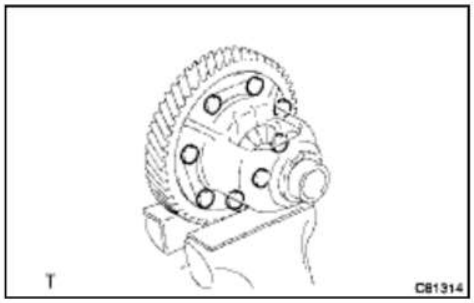


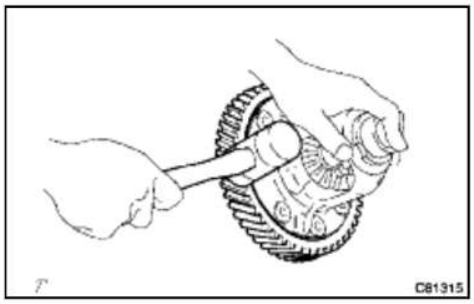
(b) Using SST and a hammer, release the lock plate.

SST: 09930-00010

(c) Remove the 8 bolts and the 4 ring gear lock plates.

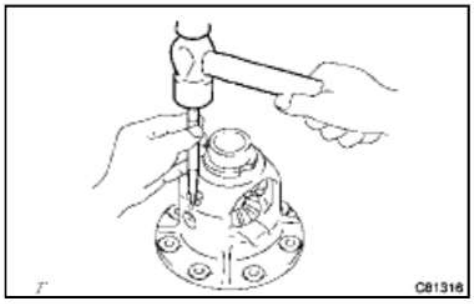
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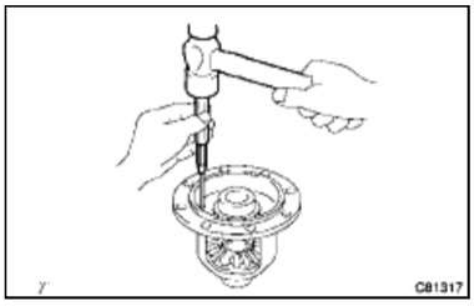


(d) Using a plastic hammer, remove the front differential ring gear from the differential case.

4. REMOVE FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN



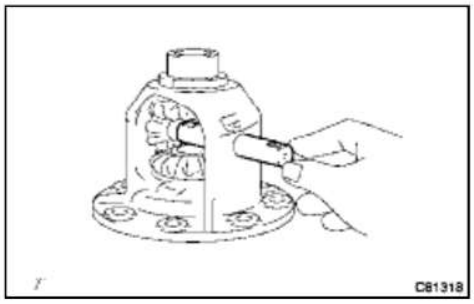
(a) Using a punch and a hammer, release the differential case.



(b) Using a pin punch and a hammer, remove the straight pin.

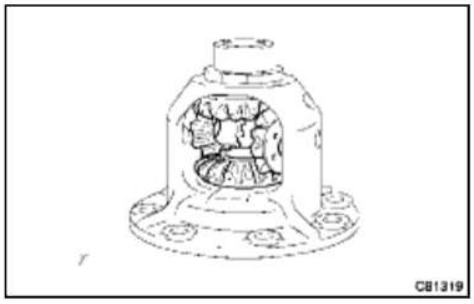
5. REMOVE FRONT NO. 1 DIFFERENTIAL PINION SHAFT

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(a) Remove the front No. 1 differential pinion shaft from the front differential case.

6. REMOVE FRONT DIFFERENTIAL SIDE GEAR



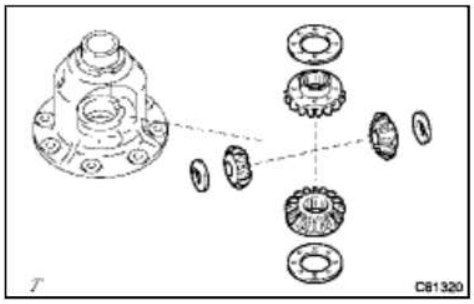
(a) Remove the 2 front differential pinions, 2 front differential pinion thrust washers, 2 front differential side gears and 2 front differential side gear thrust washers from the front differential case.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000193501AX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. INSTALL FRONT DIFFERENTIAL SIDE GEAR

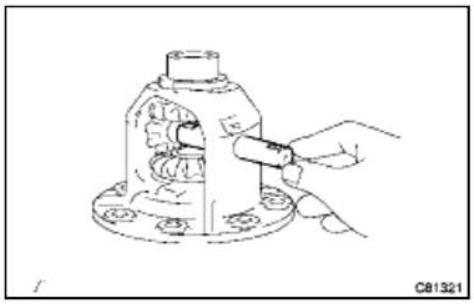


(a) After applying ATF to the 2 front differential side gears, 2 front differential side gear thrust washers, 2 front differential pinions and 2 front differential pinion thrust washers, install them to the front differential case.

HINT:

When installing them, set the alignment of the front differential pinions perpendicular to that of the side gear and rotate them so that their holes are aligned with the holes in the differential case.

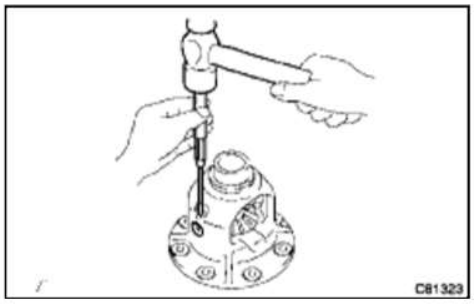
2. INSTALL FRONT NO. 1 DIFFERENTIAL PINION SHAFT



(a) Install the front No. 1 differential pinion shaft so as to align the lock pin holes in the pinion shaft and front differential case.

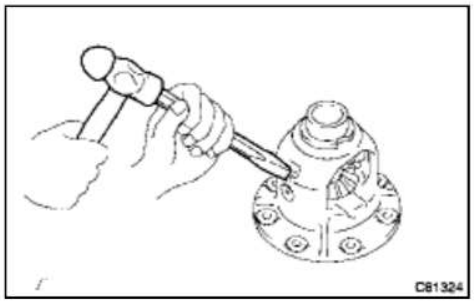
3. INSPECT DIFFERENTIAL SIDE GEAR BACKLASH INFO

4. INSTALL FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN



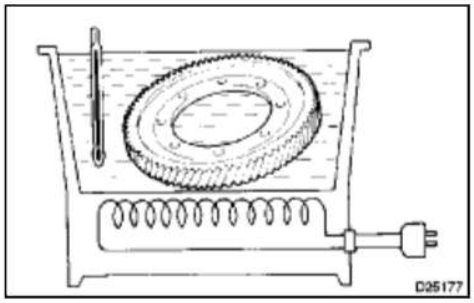
(a) Using a pin punch and a hammer, install the pinion shaft straight pin.

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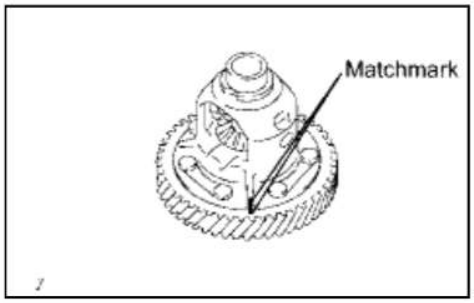
(b) Using a chisel and a hammer, stake the differential case.

5. INSTALL FRONT DIFFERENTIAL RING GEAR



(a) Using ATF and a heater, heat the front differential ring gear to 90 to 110°C (194 to 230°F).

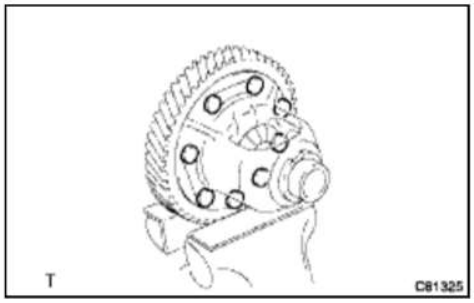
(b) Clean the contact surface of the front differential case.



(c) Align the matchmarks, and install the front differential ring gear case quickly.

NOTICE:

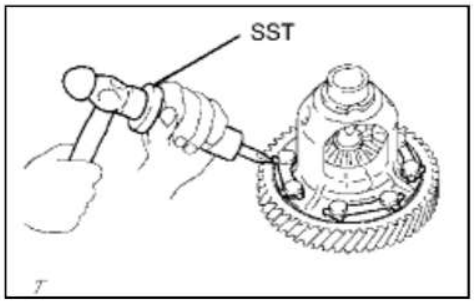
Do not install the bolts while the ring gear is hot.



(d) Install 4 new ring gear lock plates with the 8 bolts.

Torque: 88 N·m (898 kgf·cm, 65ft·lbf)

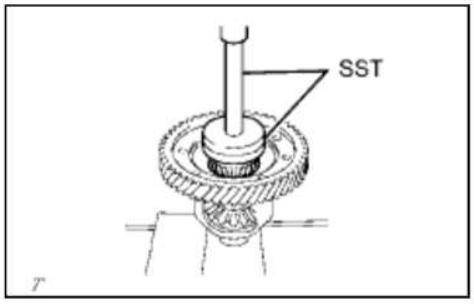
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(e) Using SST, stake the ring gear lock plate.

SST: 09930-00010

6. INSTALL FRONT DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING

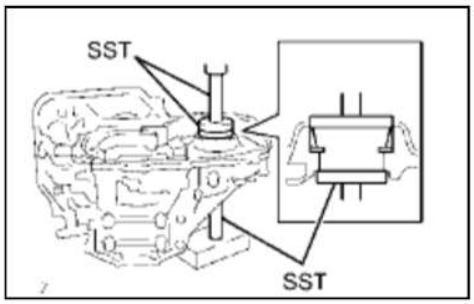


(a) Using SST and a press, install the front differential case rear tapered roller bearing inner race to the differential case.

SST: 09726-40010

SST: 09950-60020

09951-00790



(b) Using SST and a press, install the shim and bearing outer race to the transaxle case.

SST: 09950-60020

09951-00720

SST: 09950-60010

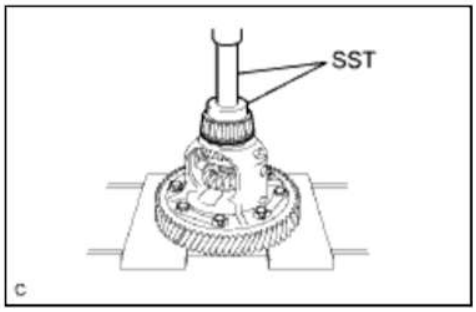
09951-00650

SST: 09950-70010

09951-07100

09951-07200

7. INSTALL FRONT DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING



(a) Using SST and a press, install the front differential case front tapered roller bearing inner race to the differential case.

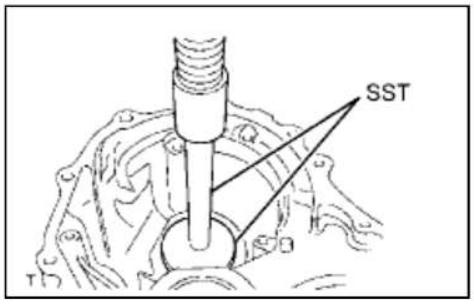
SST: 09950-60010

09951-00460

SST: 09950-70010

09951-07100

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(b) Using SST and a press, install the front differential case front tapered roller bearing to the transaxle housing.

SST: 09950-70010

09951-07150

SST: 09950-60020

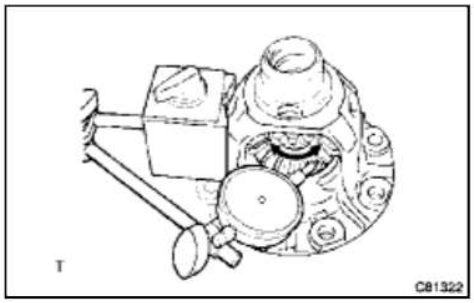
09951-00680

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003DSK003X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL CASE: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT DIFFERENTIAL SIDE GEAR BACKLASH



(a) Measure the differential side gear backlash while holding 1 pinion gear toward the case.

Standard backlash:
0.05 to 0.20 mm (0.00196 to 0.00787 in.)

If the backlash is not within the specified range, install the correct thrust washer to the side gear.

(b) Referring to the table below, select thrust washers which will ensure that the backlash is within the specified range for both sides.

Thrust Washer Thickness:

THICKNESS MM (IN.)	THICKNESS (MM (IN.))
0.95 (0.0374)	1.10 (0.0433)
1.00 (0.0394)	1.15 (0.0453)
1.05 (0.0413)	1.20 (0.0472)

If the backlash is not within the specified range, install a thrust washer of a different thickness.

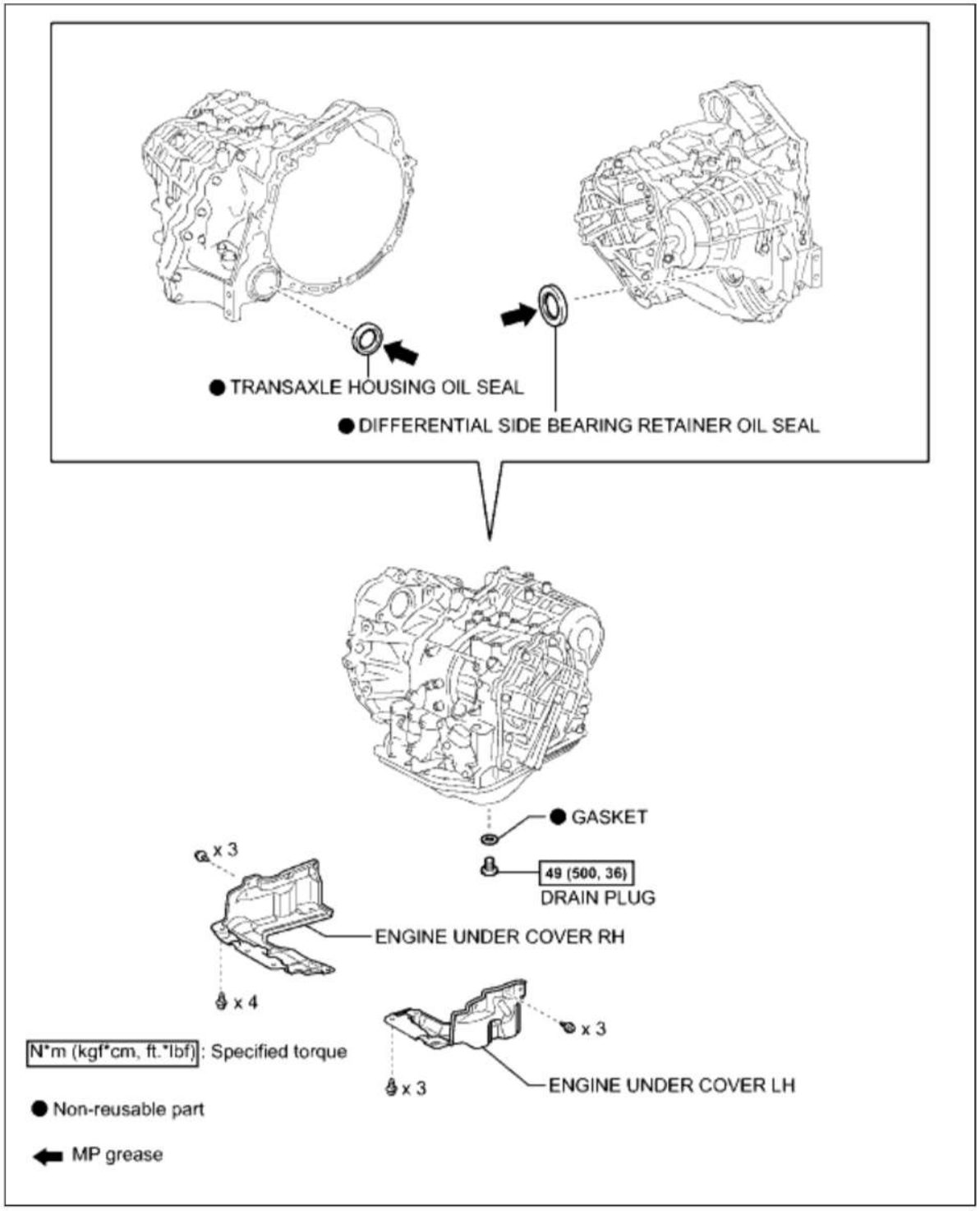
cardiagn.com

Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000016E802JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL OIL SEAL: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003DXL004X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL OIL SEAL: REPLACEMENT (2010 Corolla)		

REPLACEMENT

1. REMOVE ENGINE UNDER COVER LH

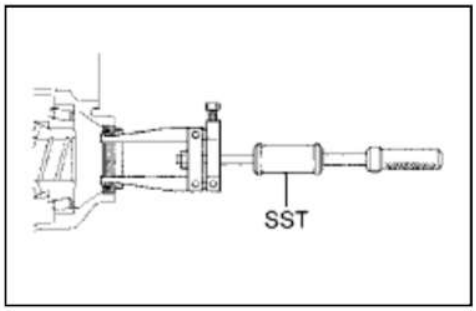
2. REMOVE ENGINE UNDER COVER RH

3. DRAIN AUTOMATIC TRANSAXLE FLUID INFO

4. REMOVE FRONT DRIVE SHAFT ASSEMBLY

INFO

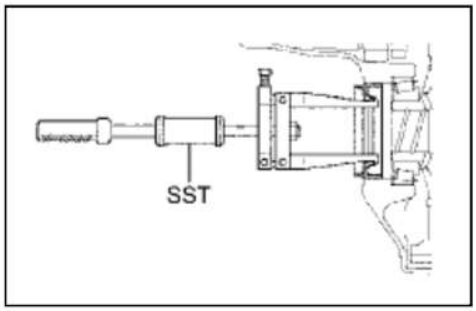
5. REMOVE TRANSAXLE HOUSING OIL SEAL



(a) Using SST, pull out the oil seal.

SST: 09308-00010

6. REMOVE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL



(a) Using SST, pull out the oil seal.

SST: 09308-00010

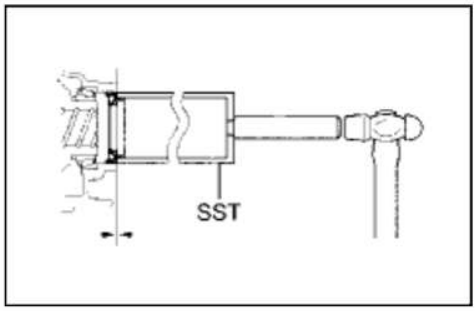
7. INSTALL TRANSAXLE HOUSING OIL SEAL

(a) Using SST and a hammer, install a new oil seal.

SST: 09316-60011

09316-00011

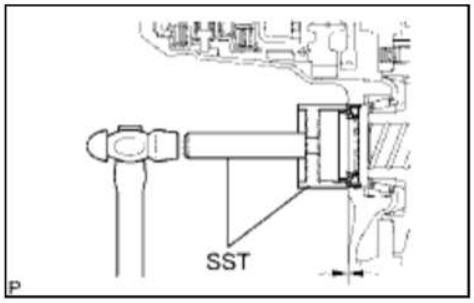
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Oil seal installation depth:
-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

(b) Coat the lip of the oil seal with MP grease.

8. INSTALL DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL



(a) Using SST and a hammer, install a new oil seal.

SST: 09649-17010

SST: 09950-70010

09951-07150

Oil seal installation depth:
-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

(b) Coat the lip of the oil seal with MP grease.

9. INSTALL FRONT DRIVE SHAFT ASSEMBLY

INFO

10. ADD AUTOMATIC TRANSAXLE FLUID

11. INSPECT TRANSAXLE FLUID LEVEL INFO

12. INSTALL ENGINE UNDER COVER LH

13. INSTALL ENGINE UNDER COVER RH

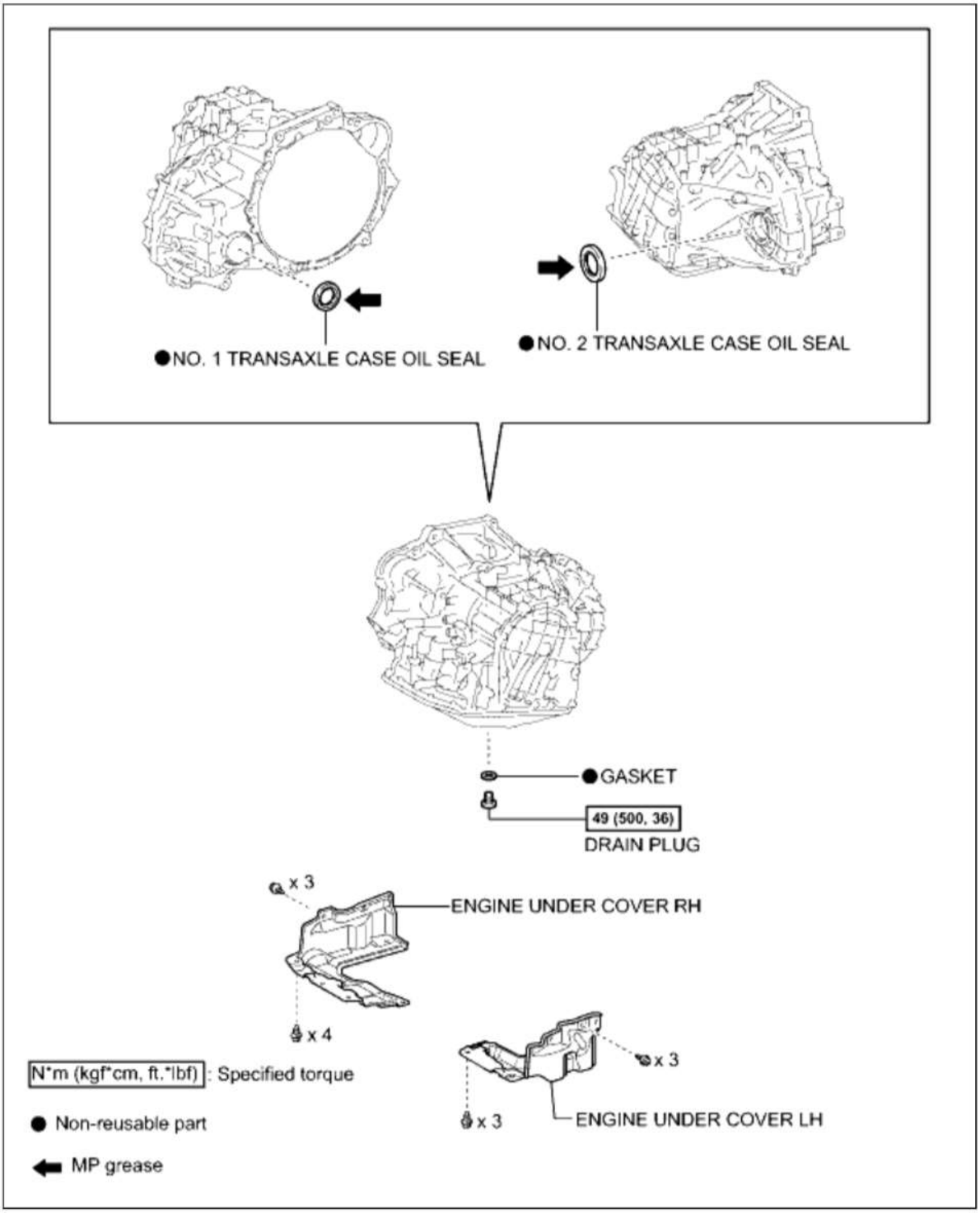
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001920010X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL OIL SEAL: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000032JA00TX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: DIFFERENTIAL OIL SEAL: REPLACEMENT (2010 Corolla)		

REPLACEMENT

1. REMOVE ENGINE UNDER COVER LH

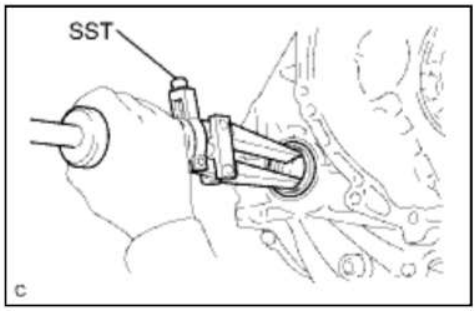
2. REMOVE ENGINE UNDER COVER RH

3. DRAIN AUTOMATIC TRANSAXLE FLUID INFO

4. REMOVE FRONT DRIVE SHAFT ASSEMBLY

INFO

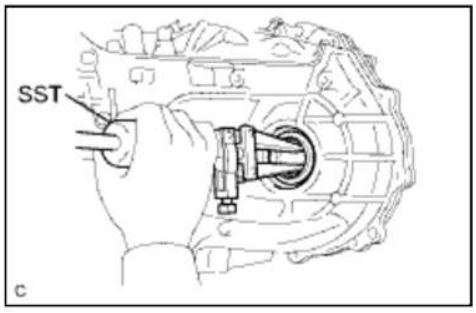
5. REMOVE NO. 1 TRANSAXLE CASE OIL SEAL



(a) Using SST, remove the No. 1 transaxle case oil seal from the transaxle case.

SST: 09308-00010

6. REMOVE NO. 2 TRANSAXLE CASE OIL SEAL



(a) Using SST, remove the No. 2 transaxle case oil seal from the transaxle housing.

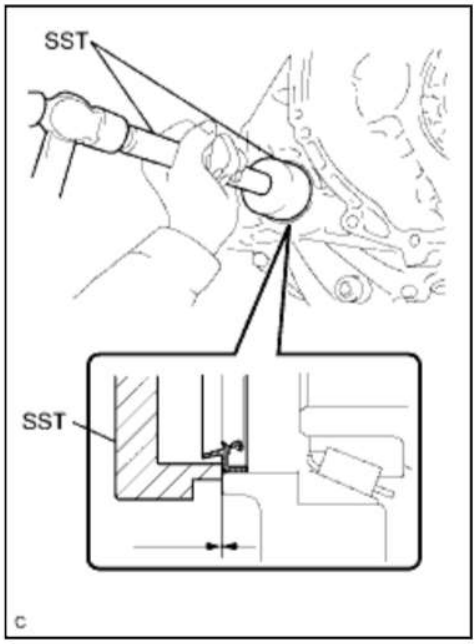
SST: 09308-00010

7. INSTALL NO. 1 TRANSAXLE CASE OIL SEAL

(a) Using SST and a hammer, install a new oil seal to the transaxle case.

SST: 09387-00010

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SST: 09950-70010

09951-07200

Standard depth:

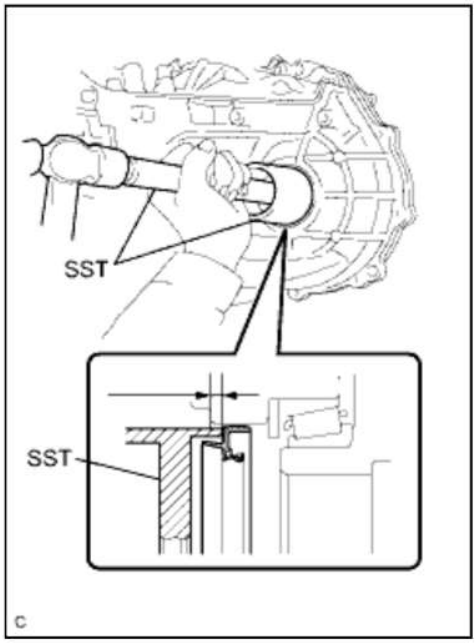
-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)

NOTICE:

Do not damage the oil seal lip.

(b) Coat the lip of the oil seal with MP grease.

8. INSTALL NO. 2 TRANSAXLE CASE OIL SEAL



(a) Using SST and a hammer, install a new oil seal to the transaxle housing.

SST: 09726-27012

09726-02041

SST: 09950-70010

09951-07200

Standard depth:

2.2 to 3.2 mm (0.0866 to 0.126 in.)

NOTICE:

Do not damage the oil seal lip.

(b) Coat the lip of the oil seal with MP grease.

9. INSTALL FRONT DRIVE SHAFT ASSEMBLY

INFO

10. ADD AUTOMATIC TRANSAXLE FLUID

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11. INSPECT TRANSAXLE FLUID LEVEL INFO

12. INSTALL ENGINE UNDER COVER LH

13. INSTALL ENGINE UNDER COVER RH

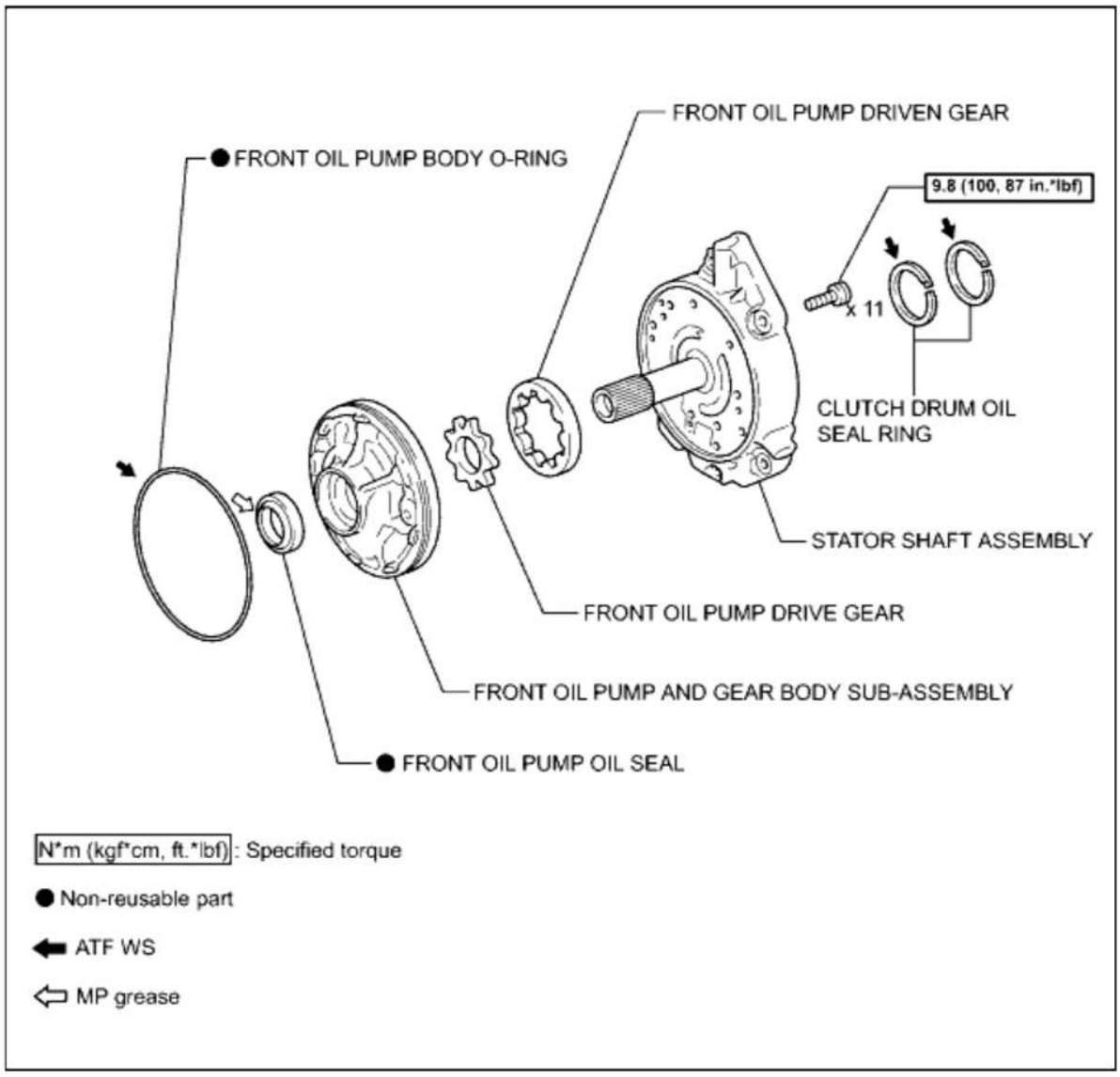


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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001CUO00HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



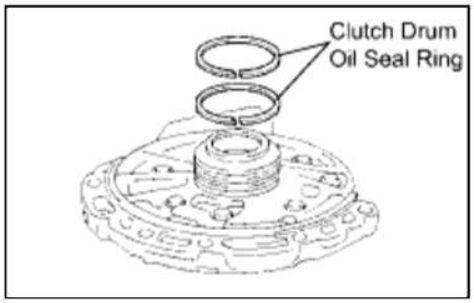
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YXC026X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

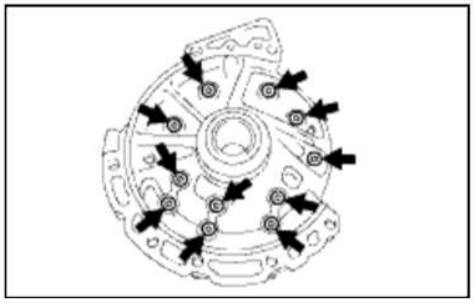
1. INSPECT OIL PUMP ASSEMBLY INFO

2. REMOVE CLUTCH DRUM OIL SEAL RING



(a) Remove the 2 clutch drum oil seal rings.

3. REMOVE STATOR SHAFT ASSEMBLY



(a) Using a "TORX" socket (T30), remove the 11 bolts and stator shaft.

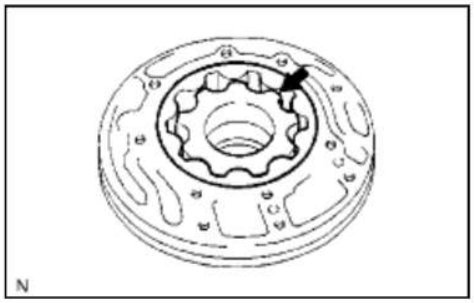
(b) Keep the bolts in the order removed.

4. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY INFO

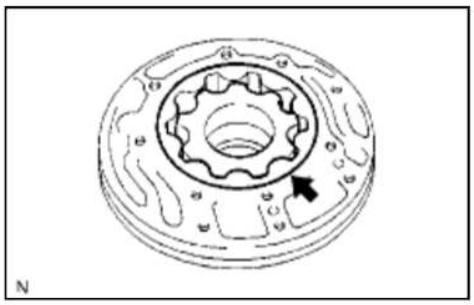
5. REMOVE FRONT OIL PUMP DRIVE GEAR

(a) Remove the front oil pump drive gear.

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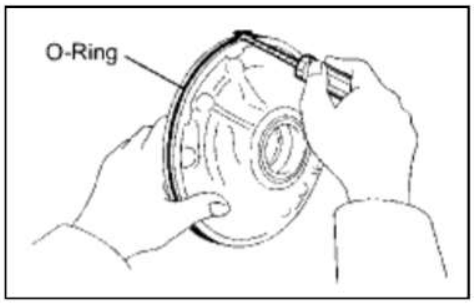


6. REMOVE FRONT OIL PUMP DRIVEN GEAR



(a) Remove the front oil pump driven gear.

7. REMOVE FRONT OIL PUMP BODY O-RING

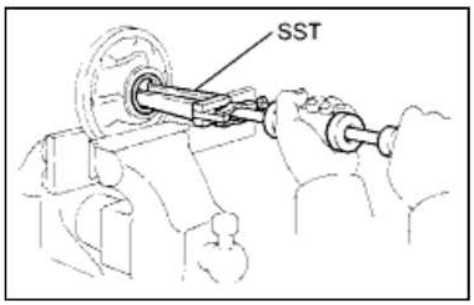


(a) Using a screwdriver, remove the O-ring.

HINT:

Tape the screwdriver tip before use.

8. REMOVE FRONT OIL PUMP OIL SEAL



(a) Mount the oil pump in a soft jaw vise.

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(b) Using SST, remove the oil seal from the oil pump body.

SST: 09308-00010

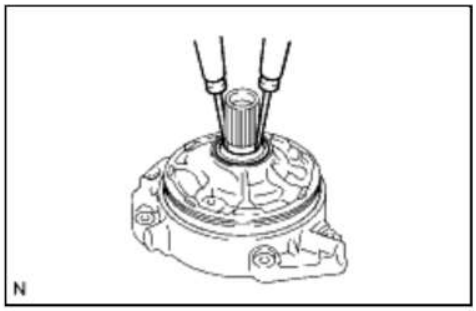


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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YXB026X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT OIL PUMP ASSEMBLY

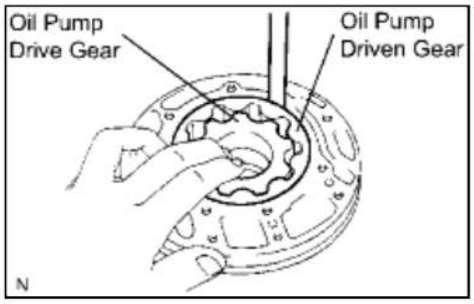


(a) Turn the drive gear with 2 screwdrivers and make sure that it rotates smoothly.

NOTICE:

Be careful not to damage the oil seal lip.

2. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY



(a) Push the driven gear to one side of the body.

(b) Using a feeler gauge, measure the clearance.

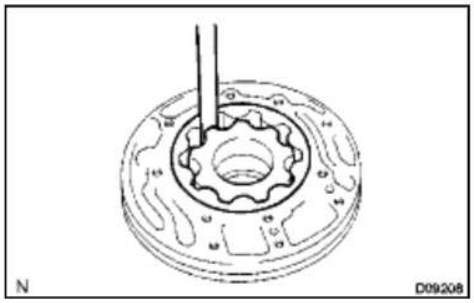
Standard body clearance:
0.10 to 0.17 mm (0.00394 to 0.00669 in.)
Side clearance:
0.02 to 0.05 mm (0.000787 to 0.00197 in.)
Maximum body clearance:
0.17 mm (0.00669 in.)

If the body clearance is greater than the maximum, replace the oil pump body sub-assembly.

(c) Using a feeler gauge, measure the tip clearance between the driven gear teeth and drive gear teeth.

Standard tip clearance:
0.07 to 0.15 mm (0.00276 to 0.00591 in.)

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Maximum tip clearance

0.15 mm (0.00591 in.)

If the tip clearance is greater than the maximum, replace the oil pump body sub-assembly.

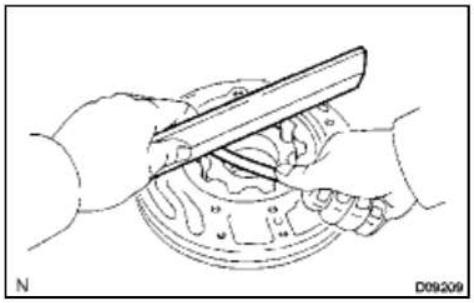
(d) Using a straightedge and feeler gauge, measure the side clearance of both gears.

Standard side clearance:
0.02 to 0.05 mm (0.000787 to 0.00197 in.)

Maximum side clearance

0.05 mm (0.00197 in.)

Drive Gear Thickness



MARK	THICKNESS (MM (IN.))
A	11.690 to 11.699 (0.4602 to 0.4606)
B	11.700 to 11.709 (0.4606 to 0.4610)
C	11.710 to 11.720 (0.4610 to 0.4614)
D	11.721 to 11.730 (0.4615 to 0.4618)
E	11.731 to 11.740 (0.4619 to 0.4622)

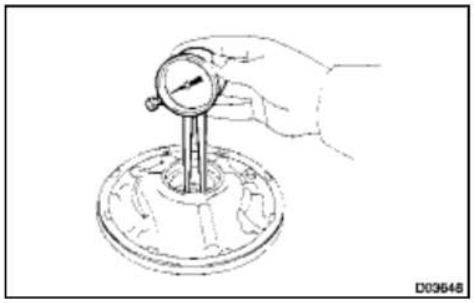
Driven Gear Thickness

MARK	THICKNESS (MM (IN.))
A	11.690 to 11.699 (0.4602 to 0.4606)
B	11.700 to 11.709 (0.4606 to 0.4610)
C	11.710 to 11.720 (0.4610 to 0.4614)
D	11.721 to 11.730 (0.4615 to 0.4618)
E	11.731 to 11.740 (0.4619 to 0.4622)

3. INSPECT FRONT OIL PUMP AND GEAR BODY SUB-ASSEMBLY

(a) Using a dial indicator, measure the inside diameter of the

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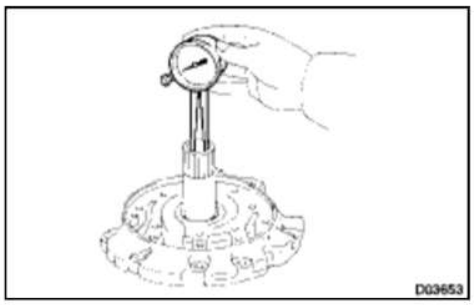
oil pump body bushing.

Standard inside diameter:
38.113 to 38.138 mm (1.50051 to 1.50149 in.)

Maximum inside diameter
38.188 mm (1.50346 in.)

If the inside diameter is greater than the maximum, replace the oil pump and gear body sub-assembly.

4. INSPECT STATOR SHAFT ASSEMBLY



(a) Using a dial indicator, measure the inside diameter of the stator shaft.

Standard inside diameter:
21.500 to 21.526 mm (0.84646 to 0.84748 in.)

Maximum inside diameter
21.57 mm (0.8492 in.)

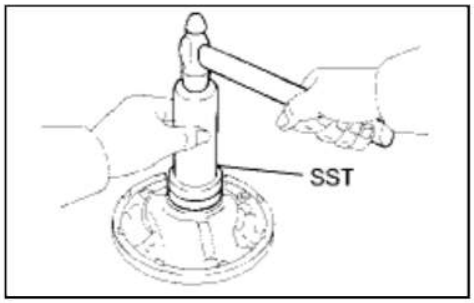
If the inside diameter is greater than the maximum, replace the stator shaft.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YXD026X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. INSTALL FRONT OIL PUMP OIL SEAL



(a) Using SST and a hammer, install a new oil seal to the oil pump body.

SST: 09350-32014

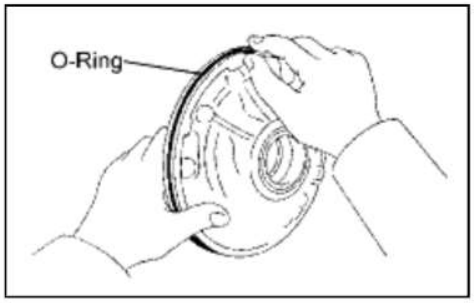
09351-32140

HINT:

The seal end should be flush with the outer edge of the oil pump.

(b) Coat the lip of the oil seal with MP grease.

2. INSTALL FRONT OIL PUMP BODY O-RING

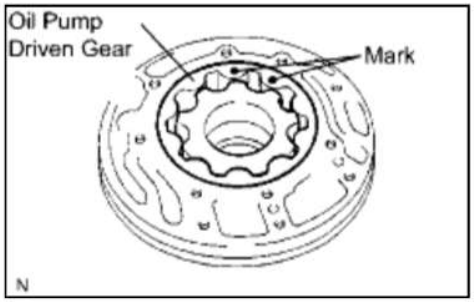


(a) Coat a new O-ring with ATF, and install it to the oil pump body.

NOTICE:

- Install the O-ring carefully to avoid twists or pinches.
- Apply sufficient ATF to the O-ring prior to installation.

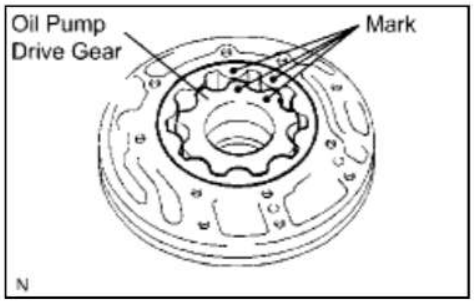
3. INSTALL FRONT OIL PUMP DRIVEN GEAR



(a) Coat the front oil pump driven gear with ATF, and install it to the oil pump body with the marked side up.

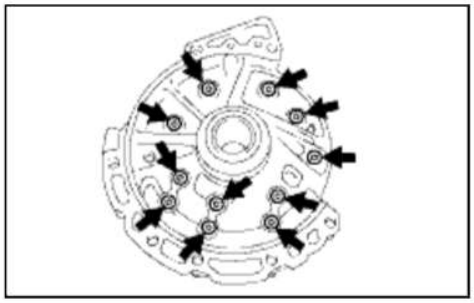
4. INSTALL FRONT OIL PUMP DRIVE GEAR

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(a) Coat the front oil pump drive gear with ATF, and install it to the oil pump body with the marked side up.

5. INSTALL STATOR SHAFT ASSEMBLY

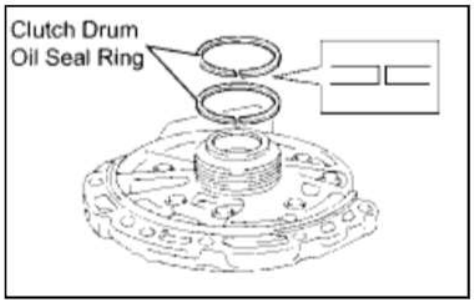


(a) Align the bolt holes in the stator shaft assembly with those in the front oil pump and gear body sub-assembly.

(b) Using a "TORX" socket (T30), install the 11 bolts.

Torque: 9.8 N·m (100 kgf·cm, 87in·lbf)

6. INSTALL CLUTCH DRUM OIL SEAL RING



(a) Coat 2 new clutch drum oil seal rings with ATF.

(b) Install the 2 clutch drum oil seal rings.

NOTICE:

Do not expand the ring ends excessively.

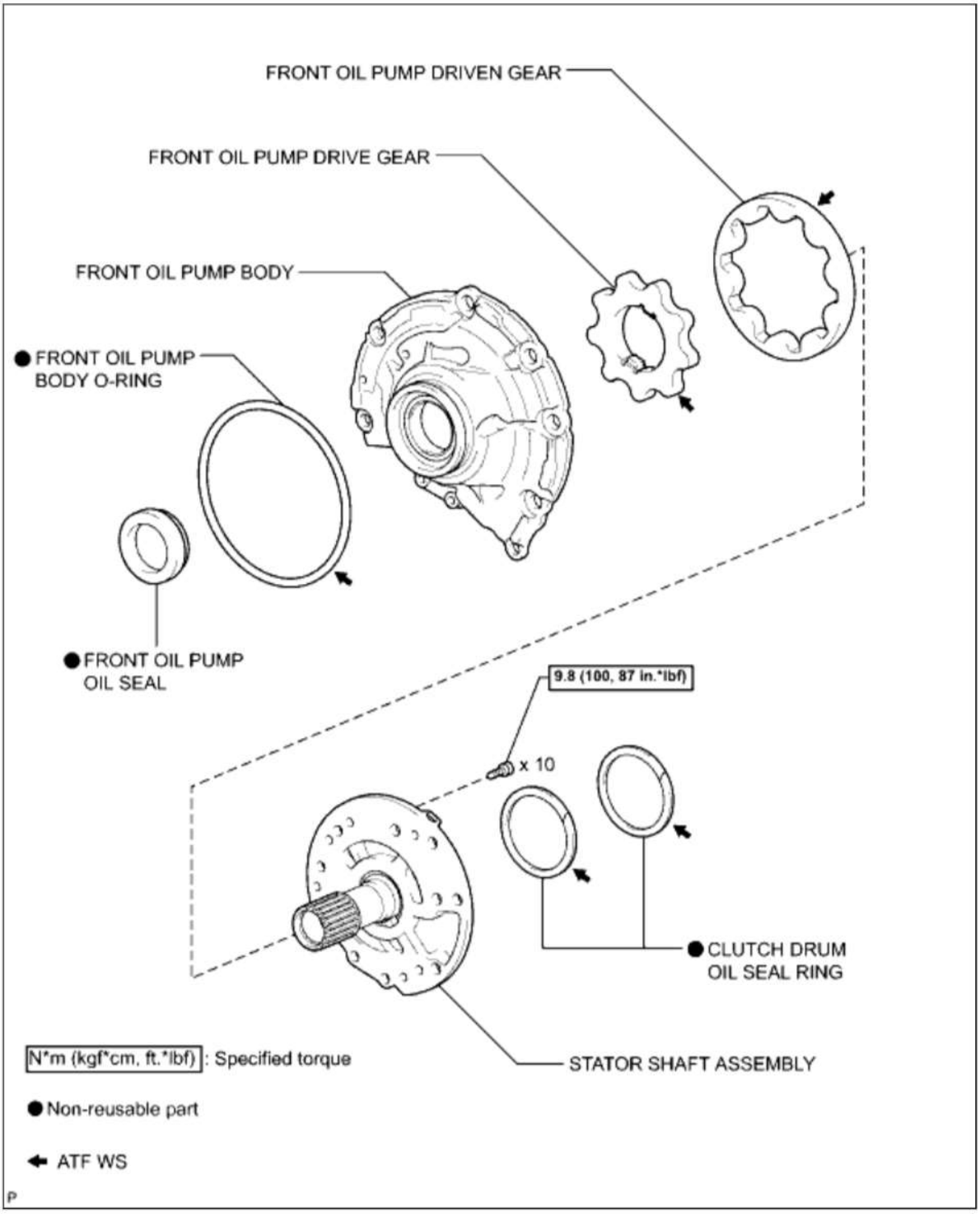
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192K019X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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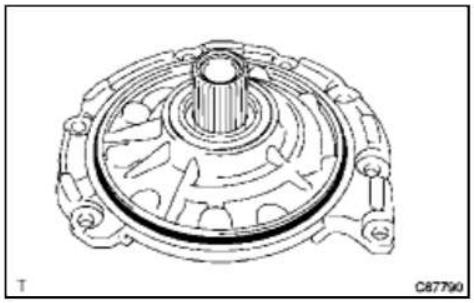


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192L019X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: DISASSEMBLY (2010 Corolla)		

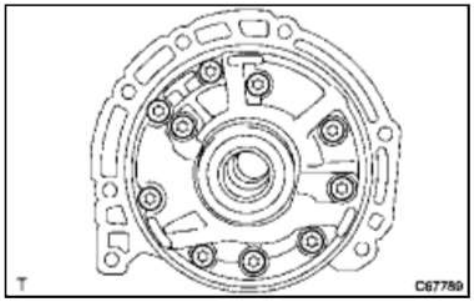
DISASSEMBLY

1. REMOVE FRONT OIL PUMP BODY O-RING



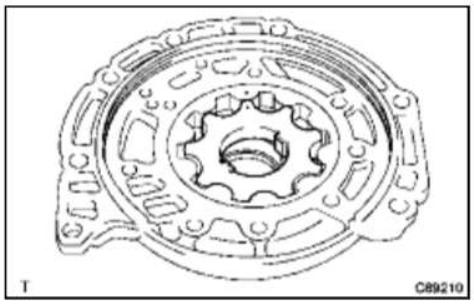
(a) Remove the front oil pump body O-ring from the oil pump.

2. REMOVE STATOR SHAFT ASSEMBLY



(a) Using a "TORX" socket wrench T30, remove the 10 "TORX" screws.

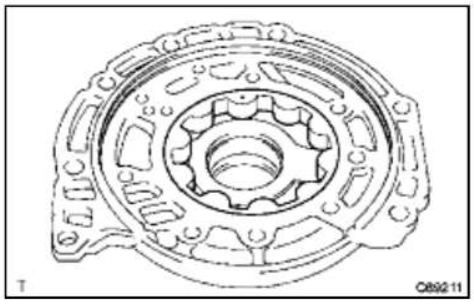
3. REMOVE FRONT OIL PUMP DRIVE GEAR



(a) Remove the front oil pump drive gear from the oil pump body.

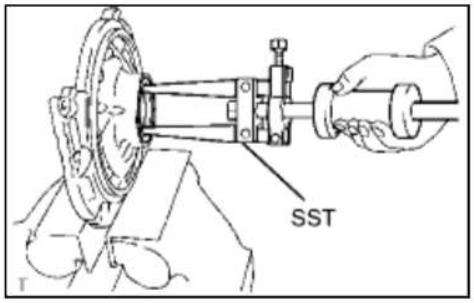
4. REMOVE FRONT OIL PUMP DRIVEN GEAR

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(a) Remove the front oil pump driven gear from the oil pump body.

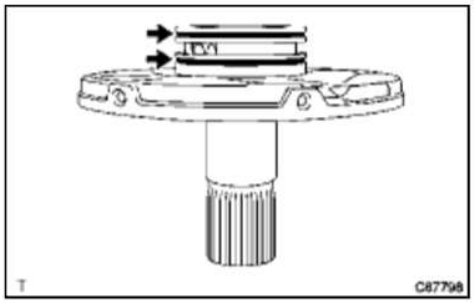
5. REMOVE FRONT OIL PUMP OIL SEAL



(a) Using SST, remove the front oil pump oil seal from the oil pump body.

SST: 09308-00010

6. REMOVE CLUTCH DRUM OIL SEAL RING



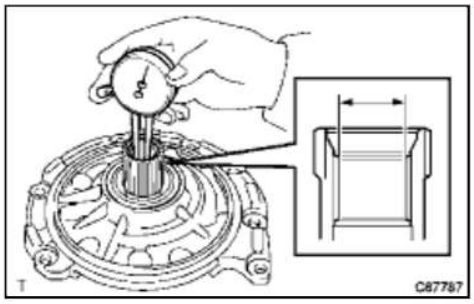
(a) Using a screwdriver, remove the 2 clutch drum oil seal rings from the stator shaft assembly.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001 92J019X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: INSPECTION (2010 Corolla)		

INSPECTION

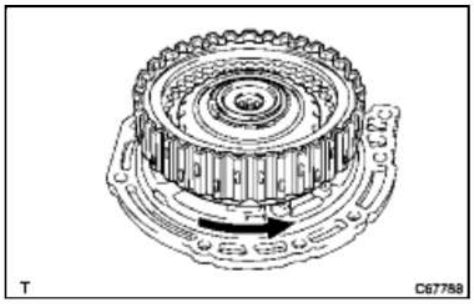
1. INSPECT STATOR SHAFT ASSEMBLY



(a) Using a dial indicator, measure the inside diameter of the stator shaft bushings.

Standard inside diameter:
21.50 to 21.52 mm (0.846 to 0.847 in.)
Maximum inside diameter:
21.52 mm (0.847 in.)

If the inside diameter is greater than the maximum, replace the stator shaft.



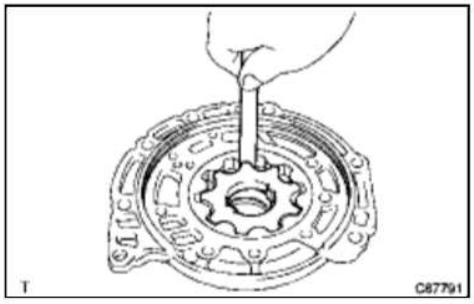
(b) Install the input shaft assembly onto the stator shaft assembly and check that the input shaft assembly turns smoothly.

NOTICE:

Replace the stator assembly with a new one if it moves roughly or makes unusual noise.

Inspect the input shaft's contact surface with the bearing when replacing, and replace the input shaft with a new one if any damage or discoloration is found.

2. INSPECT OIL PUMP GEAR CLEARANCE



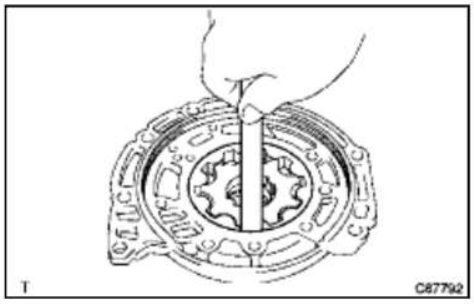
(a) Using a feeler gauge, measure the clearance between the tips of the driven gear teeth and the drive gear teeth.

Standard tip clearance:
0.07 to 0.15 mm (0.00275 to 0.00590 in.)
Maximum tip clearance:
0.15 mm (0.00590 in.)

If the tip clearance is greater than the maximum, replace the oil pump body sub-assembly.

(b) Push the driven gear to one side of the body. Using a feeler gauge, measure the clearance.

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Standard body clearance:
0.10 to 0.15 mm (0.00393 to 0.00590 in.)
Maximum body clearance:
0.15 mm (0.00590 in.)

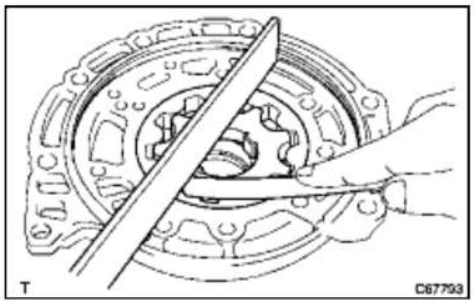
If the body clearance is greater than the maximum, replace the oil pump body sub-assembly.

(c) Using a steel straightedge and feeler gauge, measure the side clearance of both gears.

Standard side clearance:
0.02 to 0.05 mm (0.000787 to 0.00196 in.)
Maximum side clearance:
0.05 mm (0.00196 in.)

If the side clearance is greater than the maximum, replace the drive gear, driven gear or pump body.

Drive Gear Thickness:



NO.	THICKNESS (MM (IN.))
1	9.440 to 9.449 (0.3717 to 0.3720)
2	9.450 to 9.459 (0.3720 to 0.3724)
3	9.460 to 9.470 (0.3724 to 0.3728)
4	9.471 to 9.480 (0.3729 to 0.3732)
5	9.481 to 9.490 (0.3733 to 0.3736)

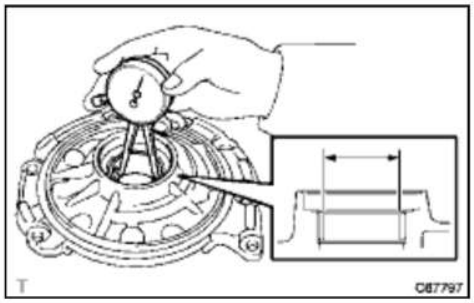
Driven Gear Thickness:

NO.	THICKNESS (MM (IN.))
1	9.440 to 9.449 (0.3717 to 0.3720)
2	9.450 to 9.459 (0.3720 to 0.3724)
3	9.460 to 9.470 (0.3724 to 0.3728)
4	9.471 to 9.480 (0.3729 to 0.3732)
5	9.481 to 9.490 (0.3733 to 0.3736)

3. INSPECT FRONT OIL PUMP BODY SUB-ASSEMBLY

(a) Using a dial indicator, measure the inside diameter of the oil pump body bushing.

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Standard inside diameter:
38.12 to 38.13 mm (1.500 to 1.501 in.)
Maximum inside diameter:
38.13 mm (1.501 in.)

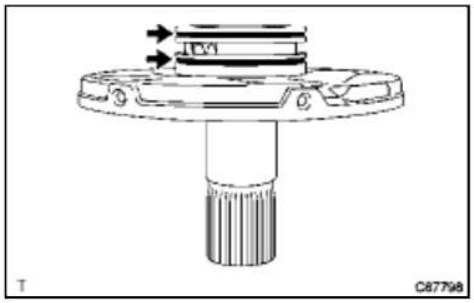
If the inside diameter is greater than the maximum, replace the oil pump body sub-assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192M019X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: REASSEMBLY (2010 Corolla)		

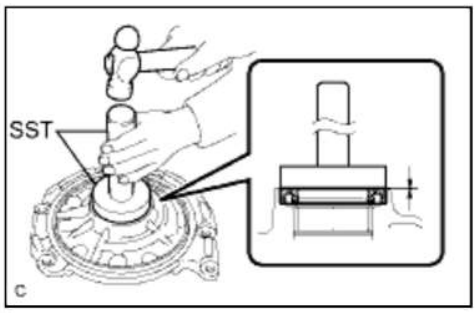
REASSEMBLY

1. INSTALL CLUTCH DRUM OIL SEAL RING



(a) Coat 2 new clutch drum oil seal rings with ATF, and install them to the stator shaft.

2. INSTALL FRONT OIL PUMP OIL SEAL



(a) Using SST and a hammer, install a new front oil pump oil seal to the oil pump body.

SST: 09950-60010

09951-00550

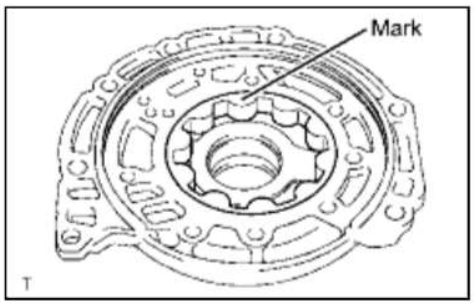
SST: 09950-70010

09951-07100

Oil seal driven in depth:

-0.15 to 0.15 mm (-0.00590 to 0.00590 in.)

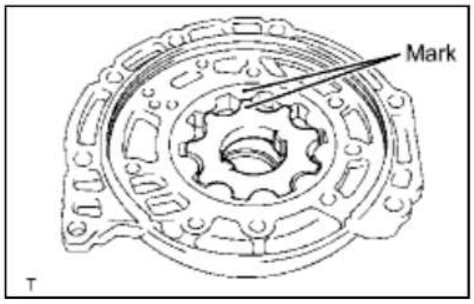
3. INSTALL FRONT OIL PUMP DRIVEN GEAR



(a) Coat the front oil pump driven gear with ATF, and install it to the oil pump body with the marked side facing upward.

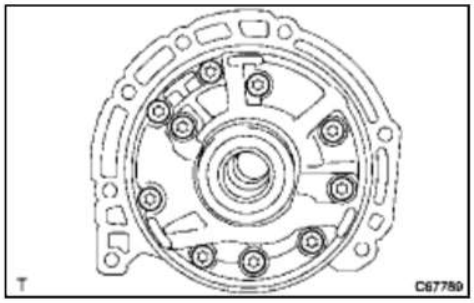
4. INSTALL FRONT OIL PUMP DRIVE GEAR

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(a) Coat the front oil pump drive gear with ATF, and install it to the oil pump body with the marked side facing upward.

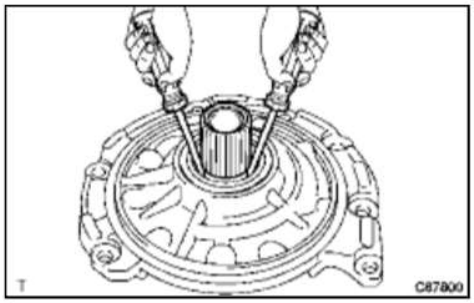
5. INSTALL STATOR SHAFT ASSEMBLY



(a) Using a "TORX" socket wrench T30, install the stator shaft assembly with the 10 "TORX" screws.

Torque: 9.8 N·m (100 kgf·cm, 87in·lbf)

6. INSPECT OIL PUMP ASSEMBLY



(a) Turn the drive gear with 2 screwdrivers and make sure that it rotates smoothly.

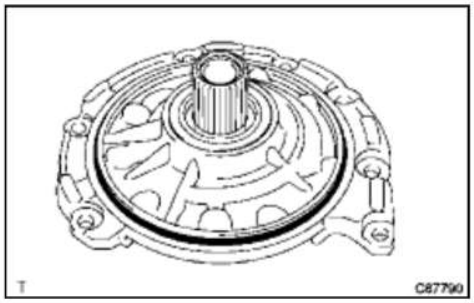
NOTICE:

Do not damage the oil seal lip.

7. INSTALL FRONT OIL PUMP BODY O-RING

(a) Coat a new front oil pump body O-ring with ATF, and install it to the oil pump.

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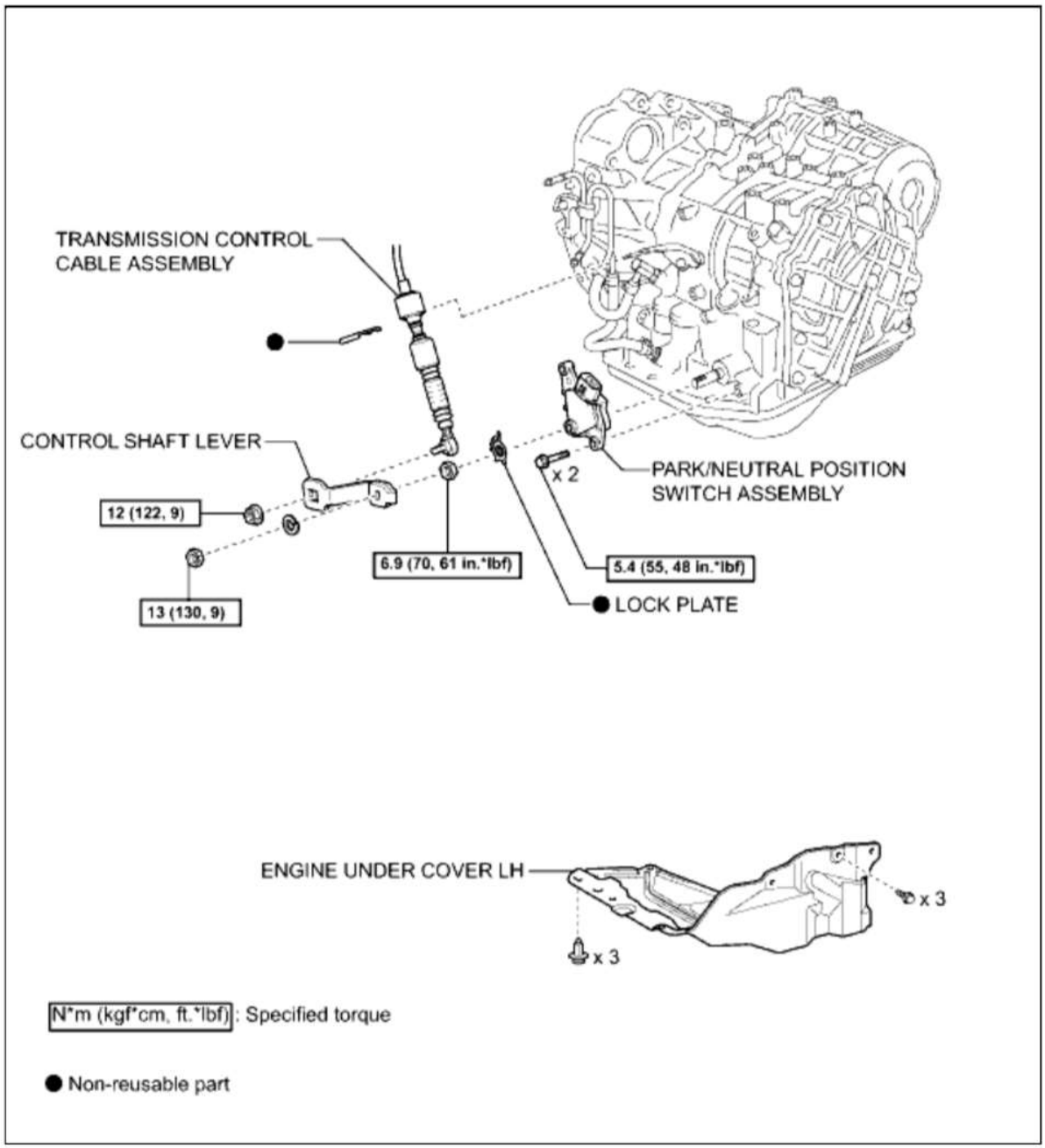


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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001CUJ00KX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000003D8Z004X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Apply the parking brake.

(b) Turn the ignition switch to ON.

(c) Depress the brake pedal and check that the engine starts when the shift lever is in N or P, but does not start in the other positions.

(d) Check that the reverse lights illuminate when the shift lever is in R, but do not function in the other positions.

If a malfunction or failure is found, check the park/ neutral position switch for continuity.

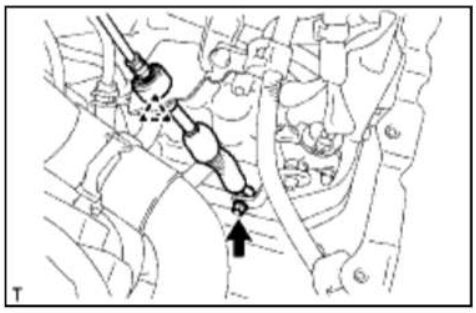
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWR00YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE ENGINE UNDER COVER LH

2. SEPARATE TRANSMISSION CONTROL CABLE ASSEMBLY



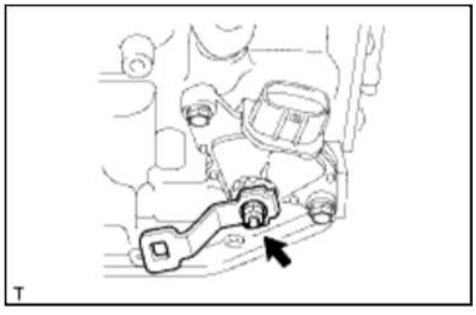
(a) Remove the nut and disconnect the control cable assembly from the control shaft lever.

(b) Remove the clip and disconnect the transmission control cable assembly from the control cable bracket.

3. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY

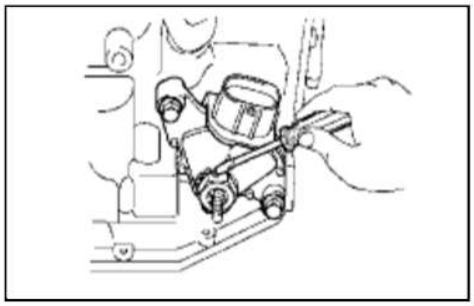


(a) Disconnect the park/neutral position switch connector.

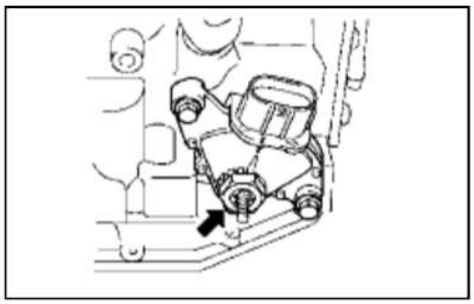


(b) Remove the nut, washer and control shaft lever.

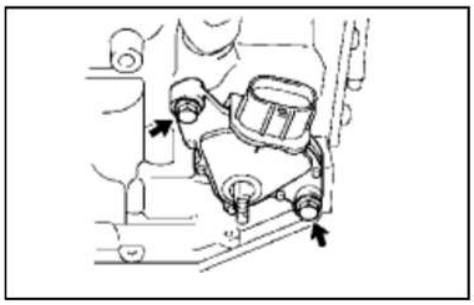
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(c) Using a screwdriver, pry up the lock plate.



(d) Remove the lock nut and the lock plate.



(e) Remove the 2 bolts and pull out the park/neutral position switch.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWQ00OX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSPECTION (2010 Corolla)		

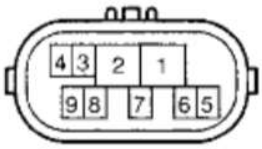
INSPECTION

1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

Component without harness connected:
(Park/Neutral Position Switch)



TESTER CONNECTION	CONDITION	SPECIFIED CONNECTION
2 - 6 and 4 - 5	P	Below 1 Ω
	Except P	10 kΩ or higher
2 - 1	R	Below 1 Ω
	Except R	10 kΩ or higher
2 - 9 and 4 - 5	N	Below 1 Ω
	Except N	10 kΩ or higher
2 - 7	D and S	Below 1 Ω
	Except D and S	10 kΩ or higher

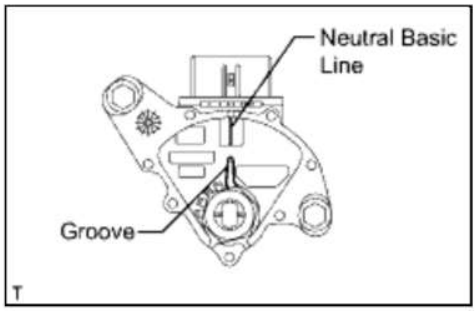
If the result is not as specified, replace the park/neutral position switch.

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Last Modified: 3-10-2010	6.4 N	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWO00OX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ADJUSTMENT (2010 Corolla)		

ADJUSTMENT

1. ADJUST PARK/NEUTRAL POSITION SWITCH ASSEMBLY



(a) Loosen the 2 bolts of the park/neutral position switch and move the shift lever to N.

(b) Align the groove with the neutral basic line.

(c) Hold the switch in that position and tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

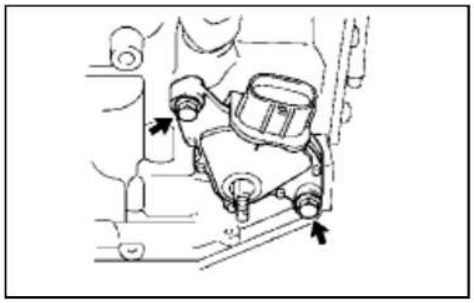
(d) After adjustment, perform the switch inspection INFO .

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWP00YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSTALLATION (2010 Corolla)		

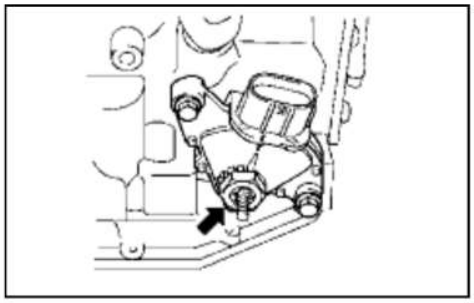
INSTALLATION

1. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY



(a) Install the park/neutral position switch to the manual valve shaft.

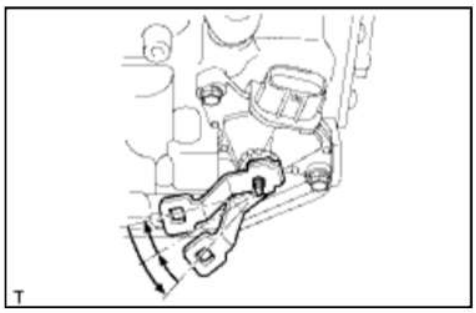
(b) Temporarily install the 2 bolts.



(c) Install a new lock plate and tighten the nut.

Torque: 6.9 N·m (70 kgf·cm, 61in·lbf)

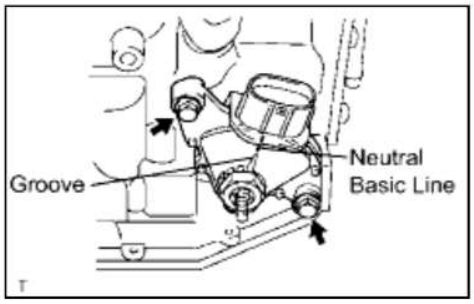
(d) Temporarily install the control shaft lever.



(e) Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.

(f) Remove the control shaft lever.

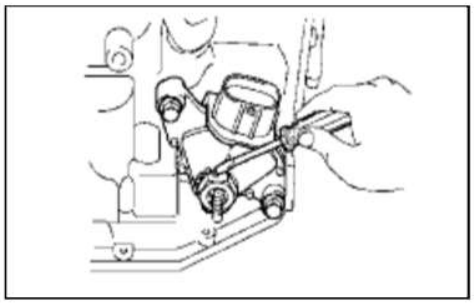
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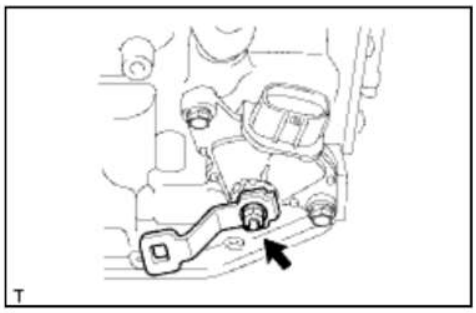
(g) Align the groove with the neutral basic line.

(h) Hold the switch in that position and tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

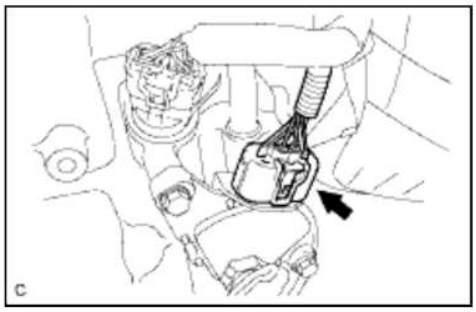


(i) Using a screwdriver, stake the nut with the lock plate.



(j) Install the control shaft lever with the washer and nut.

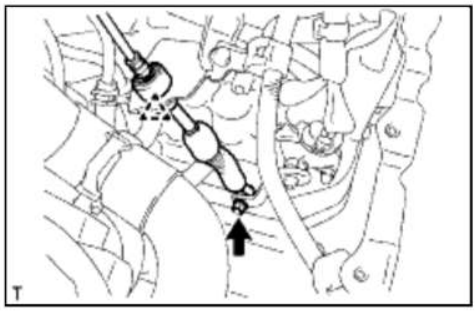
Torque: 13 N·m (130 kgf·cm, 9ft·lbf)



(k) Connect the park/neutral position switch connector.

2. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

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(a) Connect the transmission control cable to the bracket with a new clip.

(b) Connect the transmission control cable assembly to the control shaft lever with the nut.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

3. INSTALL ENGINE UNDER COVER LH

4. INSPECT SHIFT LEVER POSITION INFO

5. ADJUST SHIFT LEVER POSITION INFO

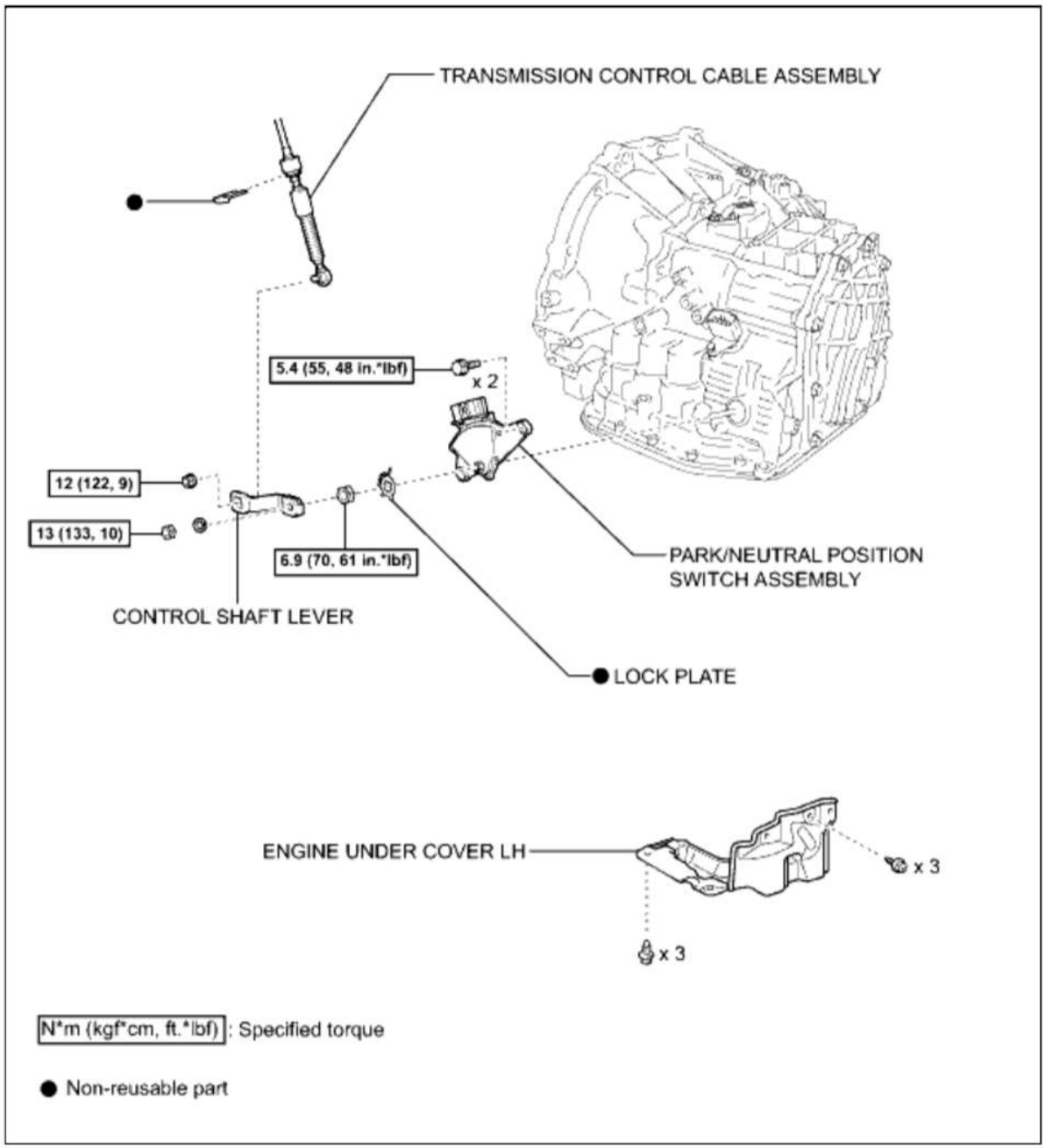
6. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191C015X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191E01TX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Apply the parking brake and turn the ignition switch to ON.

(b) Depress the brake pedal and check that the engine starts with the shift lever in N or P, but does not start in the other positions.

(c) Check that the back-up light illuminates with the shift lever in R, but does not function in the other positions.

If a malfunction or failure is found, check the park/neutral position switch for continuity.

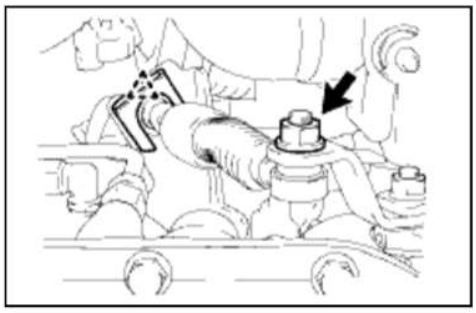
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191D01LX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE ENGINE UNDER COVER LH

2. SEPARATE TRANSMISSION CONTROL CABLE ASSEMBLY

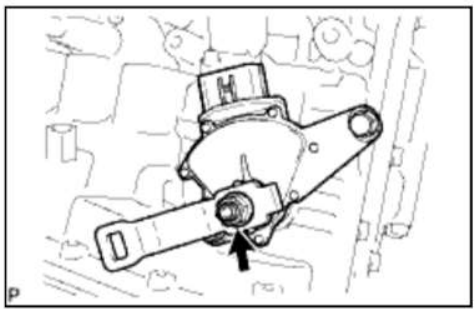


(a) Remove the nut and disconnect the control cable assembly from the control shaft lever.

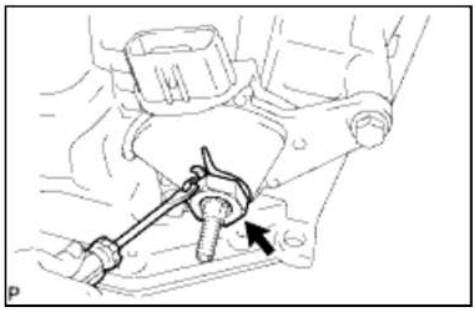
(b) Remove the clip and disconnect the control cable assembly from the control cable bracket.

3. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Disconnect the connector from the park/neutral position switch assembly.

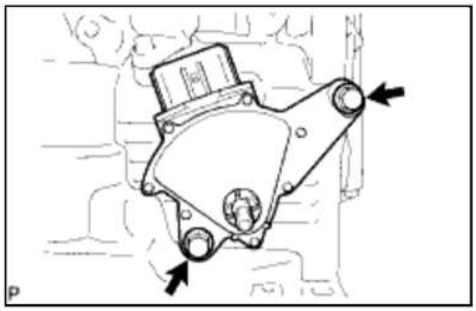


(b) Remove the nut, washer and control shaft lever.



(c) Pry out the lock plate and remove the manual valve shaft nut.

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(d) Remove the 2 bolts and pull out the park/neutral position switch assembly.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191B01LX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSPECTION (2010 Corolla)		

INSPECTION

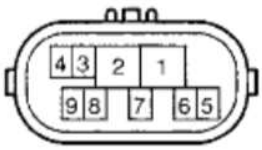
1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Disconnect the park/neutral position switch connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

Component without harness connected:
(Park/Neutral Position Switch)



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 - 6 and 4 - 5	P position	Below 1 Ω
	Except P position	10 kΩ or higher
2 - 1	R position	Below 1 Ω
	Except R position	10 kΩ or higher
2 - 9 and 4 - 5	N position	Below 1 Ω
	Except N position	10 kΩ or higher
2 - 7	D position and 3 position	Below 1 Ω
	Except D position and 3 position	10 kΩ or higher
2 - 3	2 position	Below 1 Ω
	Except 2 position	10 kΩ or higher
2 - 8	L position	Below 1 Ω
	Except L position	10 kΩ or higher

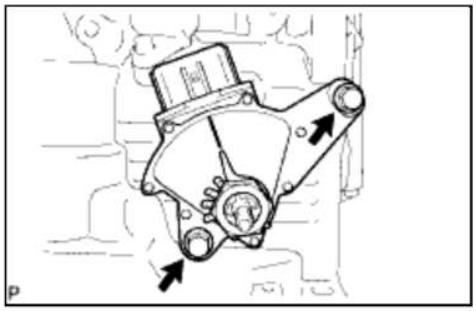
If the result is not as specified, replace the park/neutral position switch.

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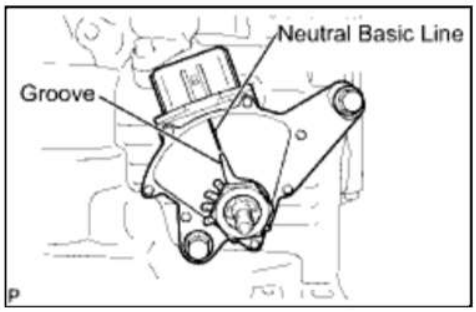
Last Modified: 3-10-2010	6.4 N	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191901BX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ADJUSTMENT (2010 Corolla)		

ADJUSTMENT

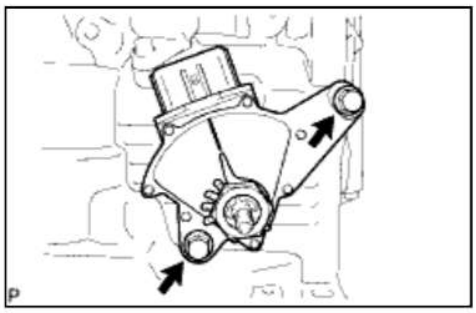
1. ADJUST PARK/NEUTRAL POSITION SWITCH ASSEMBLY



(a) Loosen the bolts of the park/neutral position switch and move the shift lever to N.



(b) Align the groove with the neutral basic line.



(c) Hold the switch in place and tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

(d) After the adjustment, perform the switch operation check INFO .

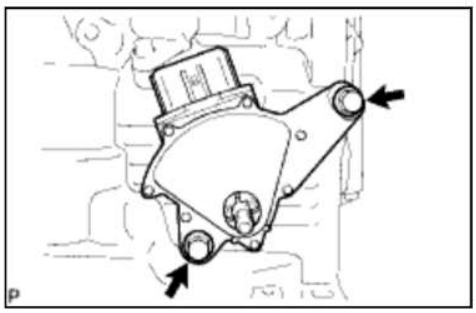
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191A01NX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSTALLATION (2010 Corolla)		

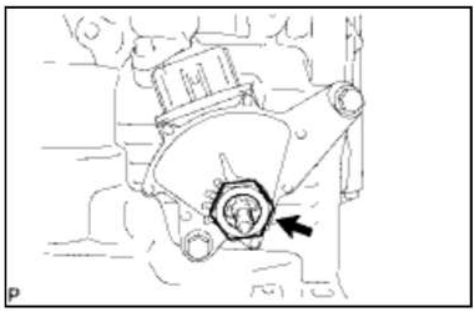
INSTALLATION

1. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Install the park/neutral position switch assembly to the automatic transaxle.



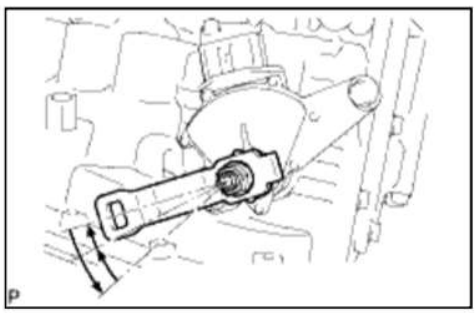
(b) Temporarily install the 2 bolts.



(c) Replace the lock plate with a new one and tighten the manual valve shaft nut.

Torque: 6.9 N·m (70 kgf·cm, 61in·lbf)

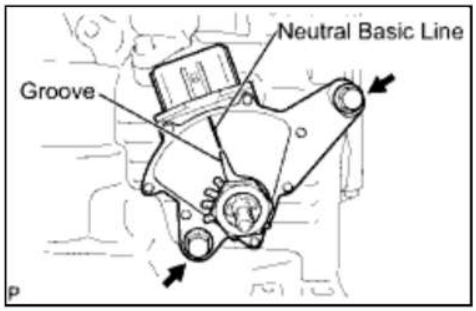
(d) Temporarily install the control shaft lever.



(e) Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.

(f) Remove the control shaft lever.

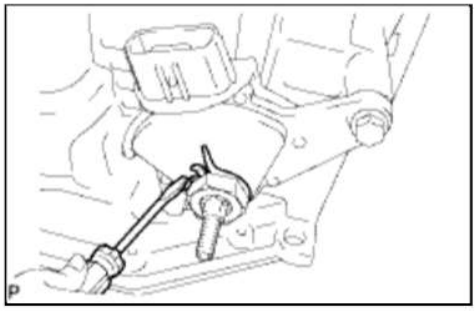
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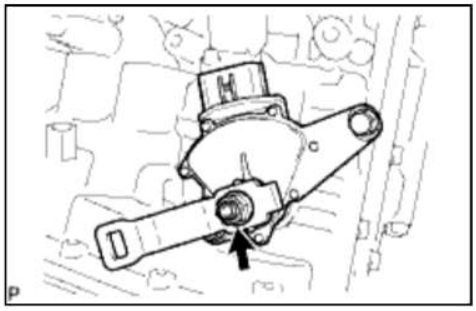
(g) Align the groove with the neutral basic line.

(h) Hold the switch in place and tighten the 2 bolts.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)



(i) Using a screwdriver, stake the nut with the lock plate.



(j) Install the control shaft lever with the nut and washer.

Torque: 13 N·m (133 kgf·cm, 10ft·lbf)

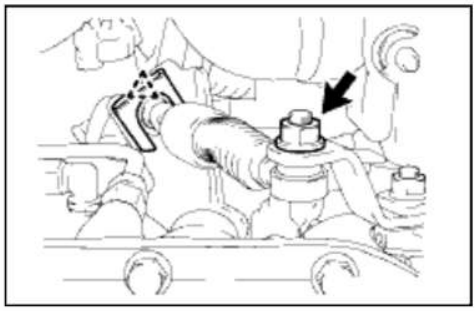
(k) Connect the connector to the park/neutral position switch assembly.

2. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Install the transmission control cable assembly to the control shaft lever with the nut.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

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(b) Install the transmission control cable assembly to the bracket with a new clip.

3. ADJUST SHIFT LEVER POSITION INFO

4. INSPECT SHIFT LEVER POSITION INFO

5. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY INFO

6. INSTALL ENGINE UNDER COVER LH

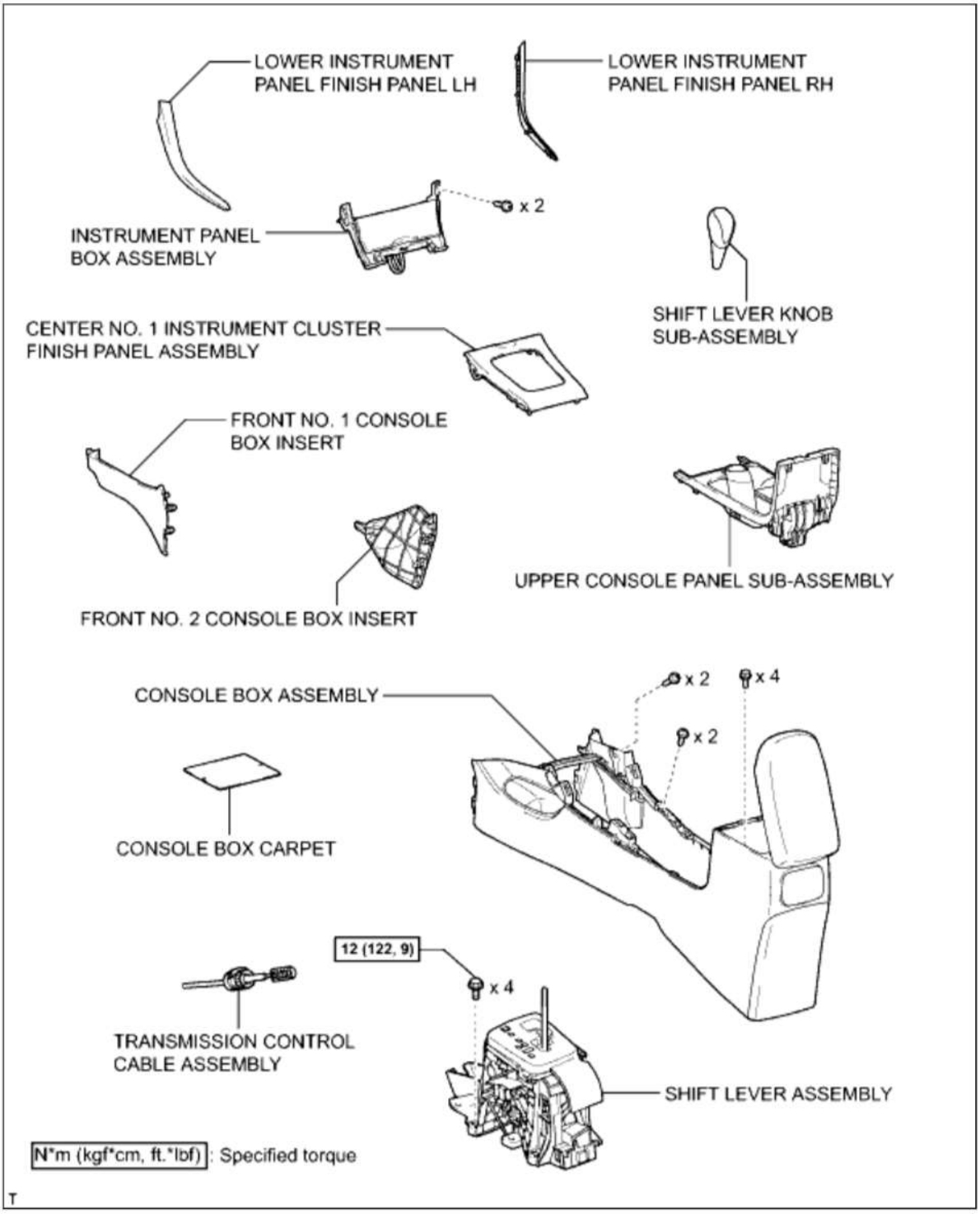
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U601JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: COMPONENTS (2010 Corolla)		

COMPONENTS

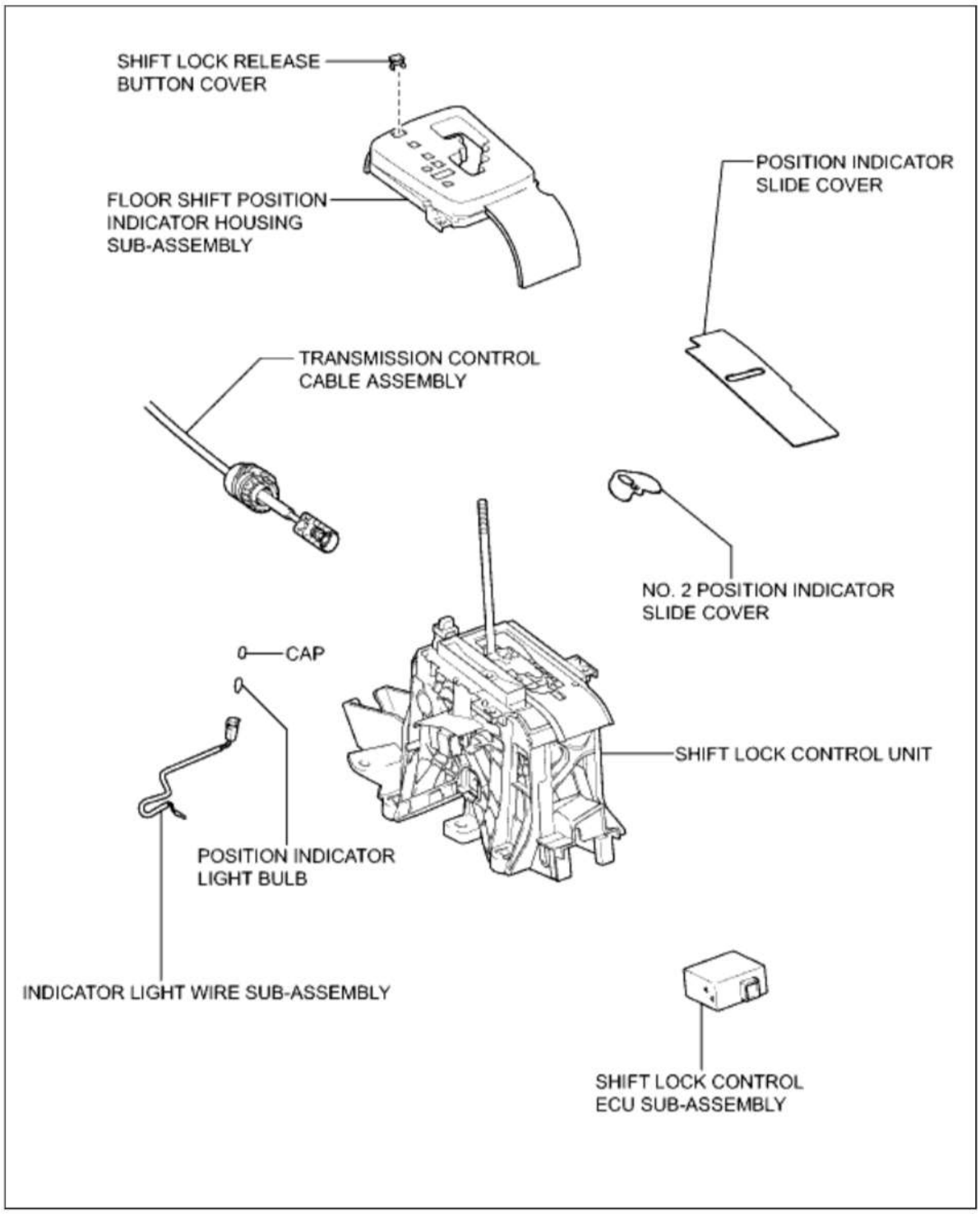
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000023CF01JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY

(a) Inspect the shift lock operation.

(1) Move the shift lever to P.

(2) Turn the ignition switch off.

(3) Check that the shift lever cannot be moved from P to any other position.

(4) Turn the ignition switch to ON, depress the brake pedal, and check that the shift lever can be moved to another position.

If operation cannot be done as specified, inspect the shift lock control unit.

(b) Inspect the shift lock release button operation.

(1) When moving the shift lever with the shift lock release button pressed, check that the shift lever can be moved from P to any other position.

(c) Check the key interlock operation.

(1) Turn the ignition switch to ON.

(2) Depress the brake pedal and move the shift lever to any position other than P.

(3) Check that the ignition key cannot be turned to LOCK.

(4) Move the shift lever to P, turn the ignition key to LOCK and check that the ignition key can be removed.

If operation cannot be done as specified, inspect the shift lock control unit.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U701LX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

2. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

3. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY INFO

4. REMOVE CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

5. REMOVE INSTRUMENT PANEL BOX ASSEMBLY INFO

6. REMOVE FRONT NO. 1 CONSOLE BOX INSERT INFO

7. REMOVE FRONT NO. 2 CONSOLE BOX INSERT INFO

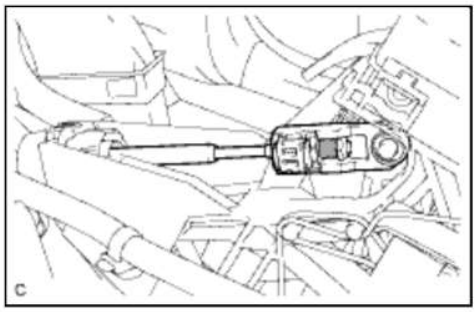
8. REMOVE UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

9. REMOVE CONSOLE BOX CARPET INFO

10. REMOVE CONSOLE BOX ASSEMBLY INFO

11. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Move the shift lever to N.



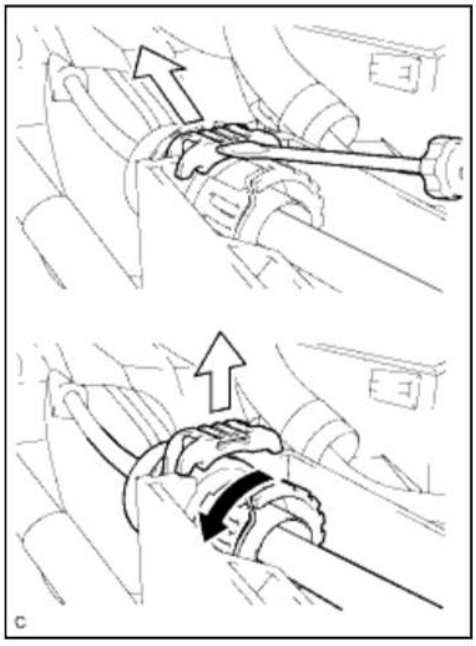
(b) Disconnect the end of the transmission control cable assembly from the shift lever assembly.

(c) Using a screwdriver, pull out the stopper of the transmission control cable.

NOTICE:

Do not remove the stopper. If the stopper is removed, reinstall it to its original position.

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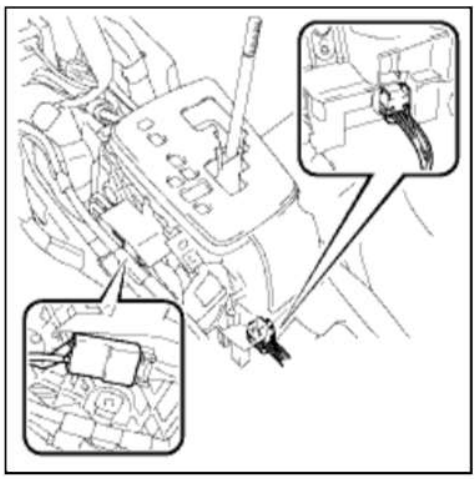


(d) Rotate the nut counterclockwise approximately 180°, and while holding the nut in place, disconnect the transmission control cable from the shift lever retainer.

NOTICE:

Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.

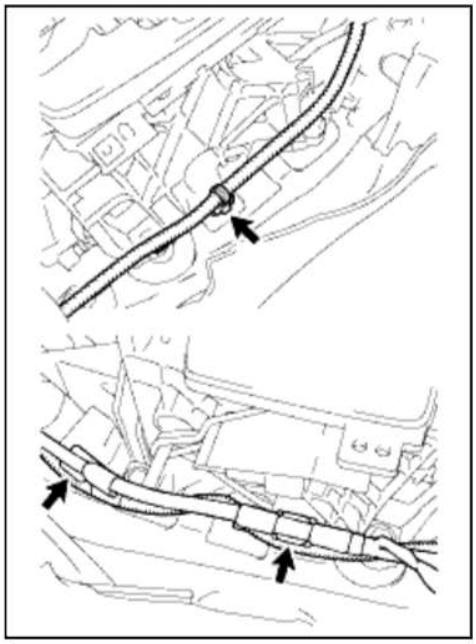
12. REMOVE SHIFT LEVER ASSEMBLY

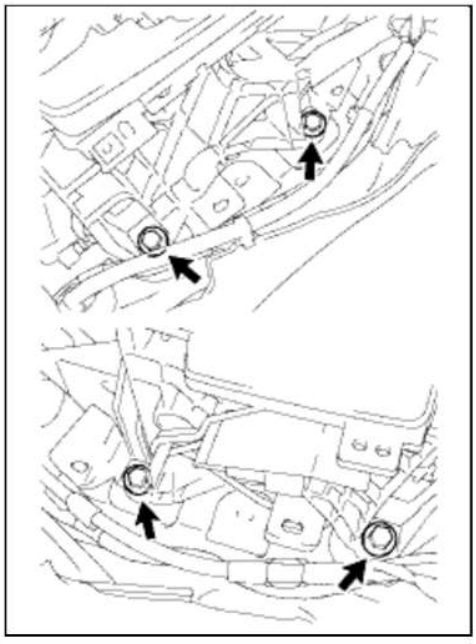


(a) Disconnect the 2 connectors from the shift lever assembly.

(b) Separate the 3 wire harness clamps from the shift lever assembly.

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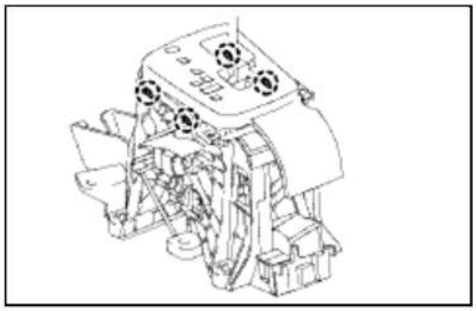
(c) Remove the 4 bolts and shift lever assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U801JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

1. REMOVE FLOOR SHIFT POSITION INDICATOR HOUSING SUB-ASSEMBLY



(a) Disengage the 4 claws and remove the position indicator housing sub-assembly from the shift lock control unit.

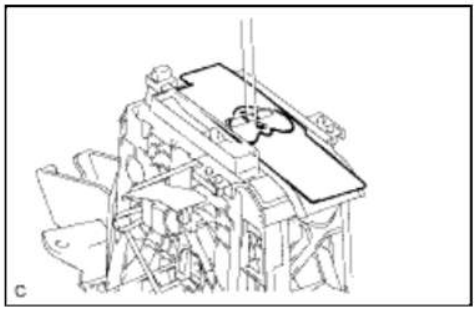
NOTICE:

Do not damage the floor shift position indicator housing sub-assembly.

2. REMOVE SHIFT LOCK RELEASE BUTTON COVER

(a) Remove the shift lock release button cover from the position indicator housing sub-assembly.

3. REMOVE POSITION INDICATOR SLIDE COVER

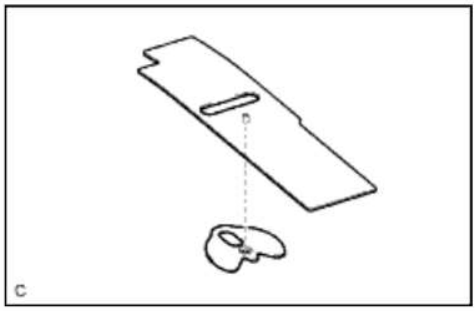


(a) Remove the position indicator slide cover with the No. 2 position indicator slide cover from the shift lock control unit.

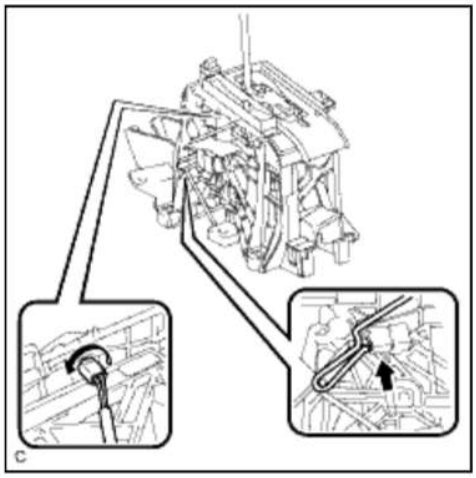
4. REMOVE NO. 2 POSITION INDICATOR SLIDE COVER

(a) Remove the No. 2 position indicator slide cover from the position indicator slide cover.

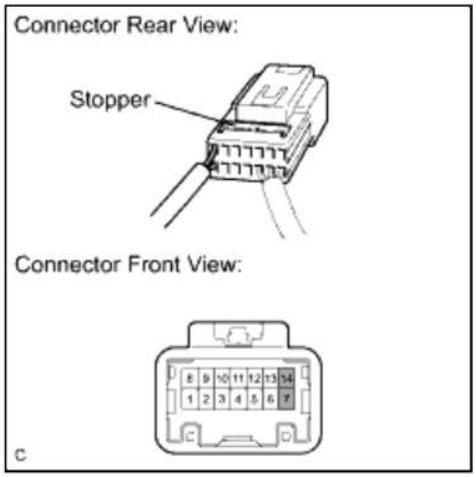
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5. REMOVE INDICATOR LIGHT WIRE SUB-ASSEMBLY



(a) Separate the position indicator light wire socket and connector from the shift lock control unit.



(b) Using a screwdriver, release the stopper.

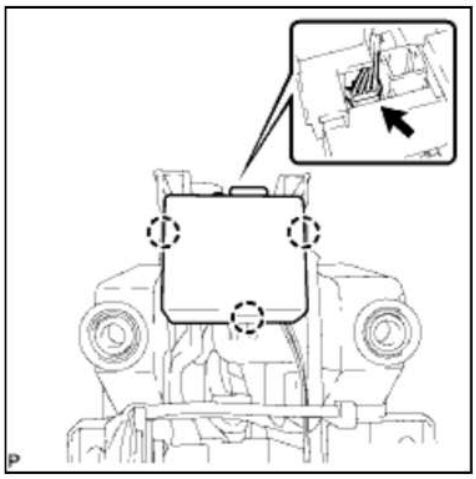
(c) Using a screwdriver, disengage the locking lug of terminals 7 and 14, and pull the terminals out from the rear of the connector.

6. REMOVE POSITION INDICATOR LIGHT BULB

(a) Remove the bulb and cap from the indicator light wire socket.

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7. REMOVE SHIFT LOCK CONTROL ECU SUB-ASSEMBLY



(a) Separate the connector from the shift lock control ECU sub-assembly.

(b) Disengage the 3 claws and the shift lock control ECU sub-assembly from the shift lock control unit.

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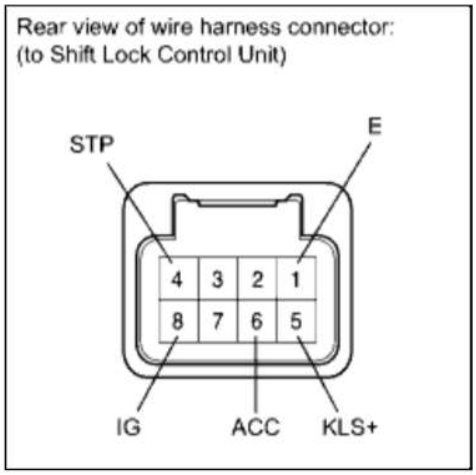
Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000023CE01YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY

(a) Measure the voltage according to the value(s) in the table below.

Standard Voltage:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
6 (ACC) - 1 (E)	Ignition switch ON	11 to 14 V
6 (ACC) - 1 (E)	Ignition switch ACC	11 to 14 V
6 (ACC) - 1 (E)	Ignition switch off	Below 1 V
4 (STP) - 1 (E)	Brake pedal depressed	11 to 14 V
4 (STP) - 1 (E)	Brake pedal released	Below 1 V
5 (KLS+) - 1 (E)	Ignition switch ACC and shift lever P	Below 1 V
	Ignition switch ACC and shift lever except P (Within approx. 1 second)	7.5 to 11 V
	Ignition switch ACC and shift lever except P (After approx. 1 second)	6 to 9.5 V
8 (IG) - 1 (E)	Ignition switch ON	11 to 14 V
8 (IG) - 1 (E)	Ignition switch off	Below 1 V

NOTICE:

Do not disconnect the shift lock control unit assembly connector.

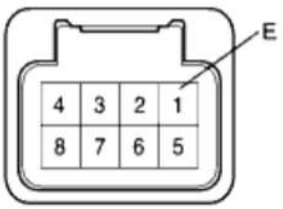
(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER	CONDITION	SPECIFIED

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Rear view of wire harness connector:
(to Shift Lock Control Unit)



CONNECTION		CONDITION
1 (E) - Body ground	Always	Below 1 Ω

NOTICE:

Do not disconnect the shift lock control unit assembly connector.

If the result is not as specified, replace the shift lock control ECU sub-assembly.

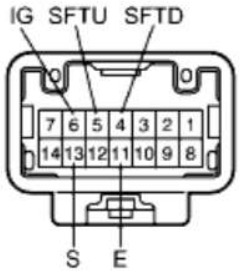
2. INSPECT TRANSMISSION CONTROL SWITCH

(a) Disconnect the transmission control switch connector of the shift lock control unit assembly.

(b) Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard Resistance:

Component without harness connected:
(Transmission Control Switch)



P

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
6 (IG) - 13 (S)	S, "+" and "-"	Below 1 Ω
5 (SFTU) - 11 (E)	Continuously shift to "+" (Up-shift)	Below 1 Ω
4 (SFTD) - 11 (E)	Continuously shift to "-" (Down-shift)	Below 1 Ω
6 (IG) - 13 (S)	Not on S "+" and "-"	10 kΩ or higher
5 (SFTU) - 11 (E)	S	10 kΩ or higher
4 (SFTD) - 11 (E)	S	10 kΩ or higher

If the result is not as specified, replace the shift lock control unit assembly.

3. INSPECT SHIFT LOCK SOLENOID

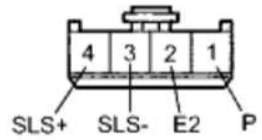
(a) Disconnect the shift lock solenoid connector.

(b) Measure the resistance according to the value(s) in the

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table below when the shift lever is moved to each position.

Front view of wire harness connector:
(to Shift Lock Solenoid)



Standard Resistance:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
1 (P) - 2 (E2)	P	10 kΩ or higher
1 (P) - 2 (E2)	Except P	Below 1 Ω

If the result is not as specified, replace the shift lock control unit assembly.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (SLS-) - 4 (SLS+)	Always	112 Ω

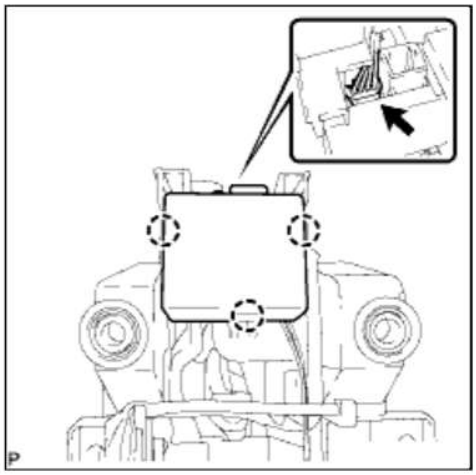
If the result is not as specified, replace the shift lock control unit assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U901JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. INSTALL SHIFT LOCK CONTROL ECU SUB-ASSEMBLY



(a) Engage the 3 claws and install the shift lock control ECU sub-assembly to the shift lock control unit.

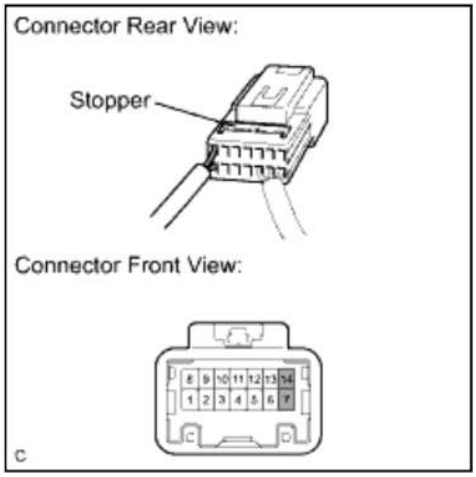
(b) Connect the shift lock solenoid connector to the shift lock control ECU sub-assembly.

2. INSTALL POSITION INDICATOR LIGHT BULB

(a) Install the cap to the bulb.

(b) Install the bulb to the position indicator light wire socket.

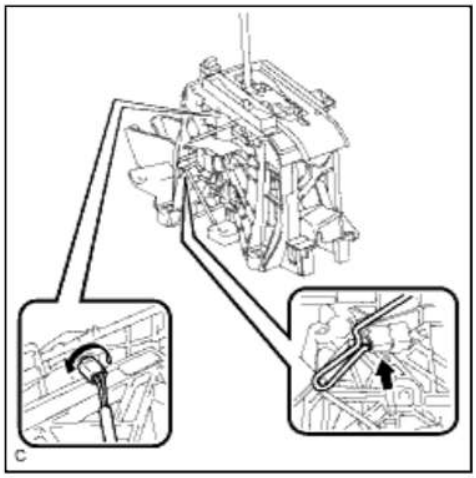
3. INSTALL INDICATOR LIGHT WIRE SUB-ASSEMBLY



(a) Connect terminals 7 and 14 to the connector as shown in the illustration.

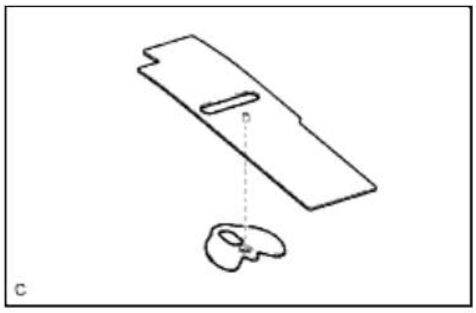
(b) Push in the stopper.

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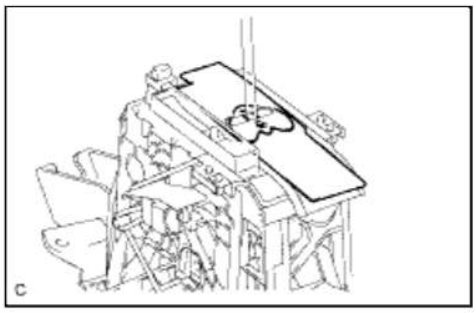
(c) Install the position indicator light wire socket and connector to the shift lock control unit.

4. INSTALL NO. 2 POSITION INDICATOR SLIDE COVER



(a) Install the No. 2 position indicator slide cover to the position indicator slide cover.

5. INSTALL POSITION INDICATOR SLIDE COVER



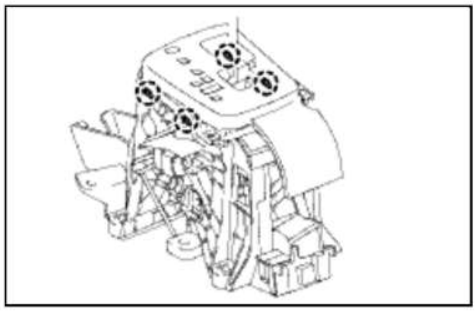
(a) Install the position indicator slide cover with the No. 2 position indicator slide cover to the shift lock control unit.

6. INSTALL SHIFT LOCK RELEASE BUTTON COVER

(a) Install the shift lock release button cover to the position indicator housing sub-assembly.

7. INSTALL FLOOR SHIFT POSITION INDICATOR HOUSING SUB-ASSEMBLY

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(a) Engage the 4 claws and install the floor shift position indicator housing sub-assembly to the shift lock control unit.

NOTICE:

Make sure that the claws are firmly engaged.

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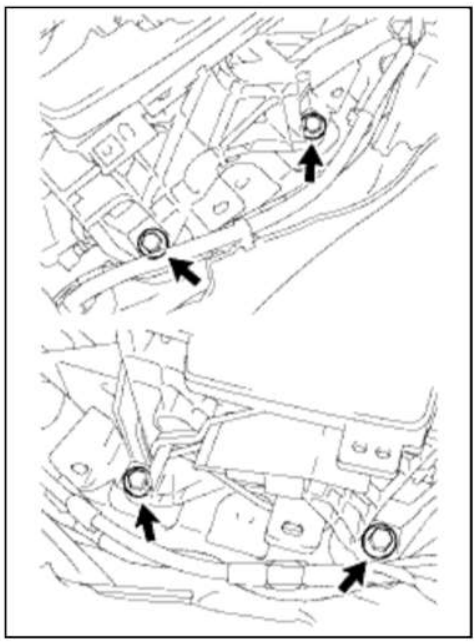
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U501LX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL SHIFT LEVER ASSEMBLY

NOTICE:

Check that the park/neutral position switch and the shift lever are in N.

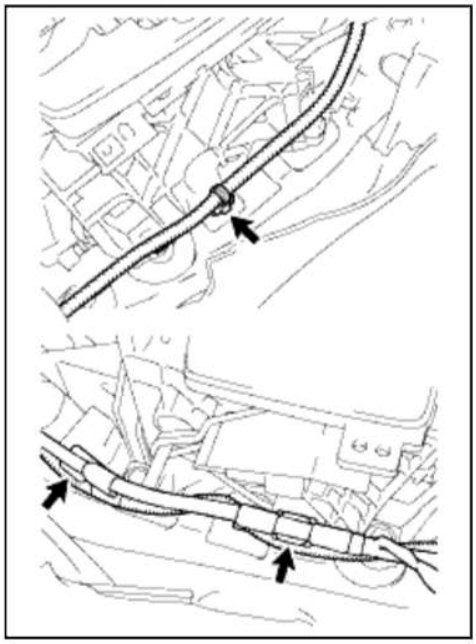


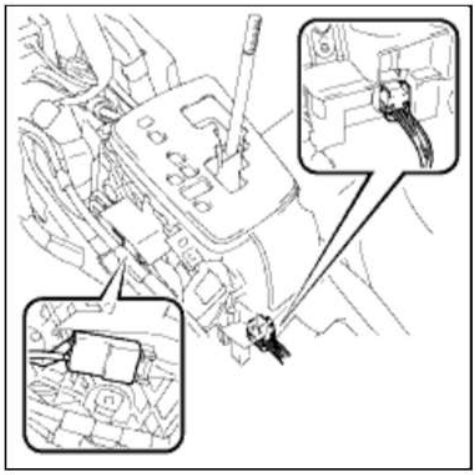
(a) Install the shift lever assembly with the 4 bolts.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

(b) Install the 3 wire harness clamps to the shift lever assembly.

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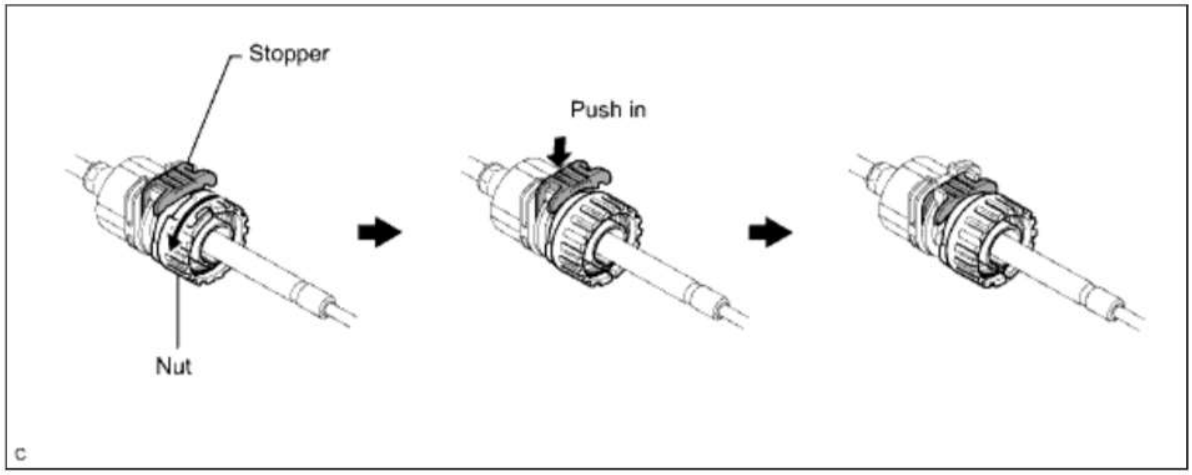


(c) Connect the 2 connectors to the shift lever assembly.

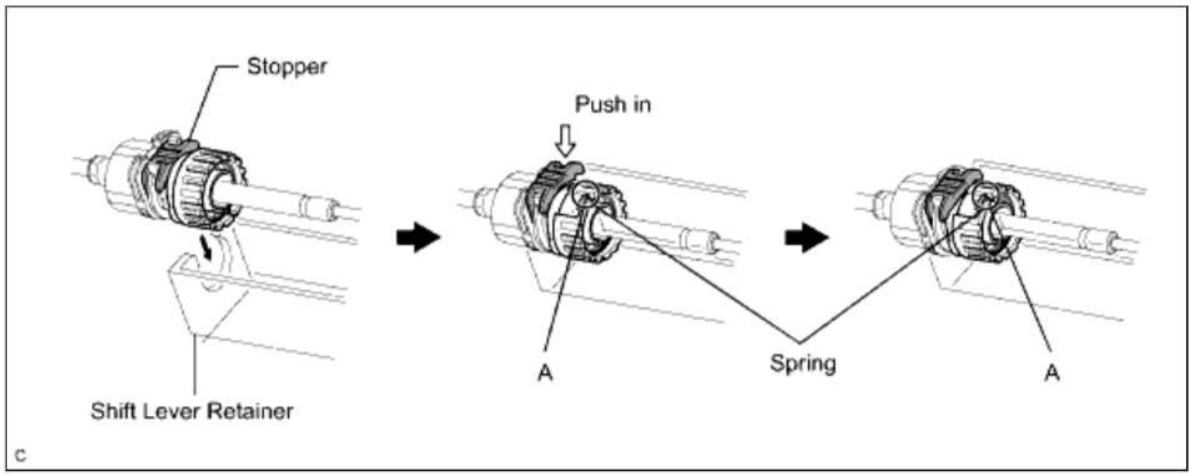
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2. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Turn the nut of the transmission control cable 180° counterclockwise. While holding the nut in place, push in the stopper until the stopper clicks twice.



(b) Install the outer part of the transmission control cable to the shift lever retainer. Check that the spring is positioned at "A" and push in the stopper.

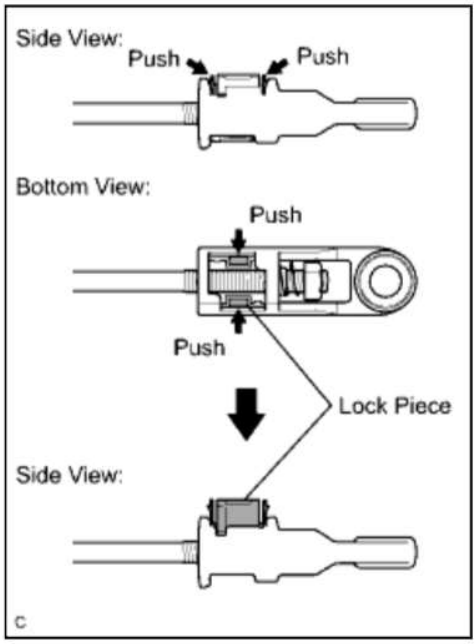


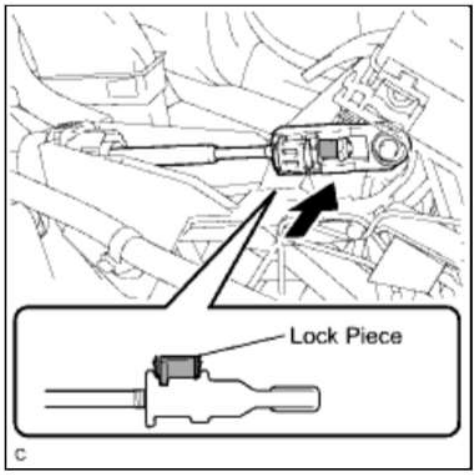
HINT:

If the stopper cannot be pushed in, slightly turn the nut clockwise and then push in the stopper again.

(c) Push the two claws together at the top of the transmission control cable lock piece. While holding the two claws together, push the two lugs on the bottom of the lock piece toward each other and upward to pull out the lock piece.

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(d) Install the cable end to the shift lever assembly.

NOTICE:

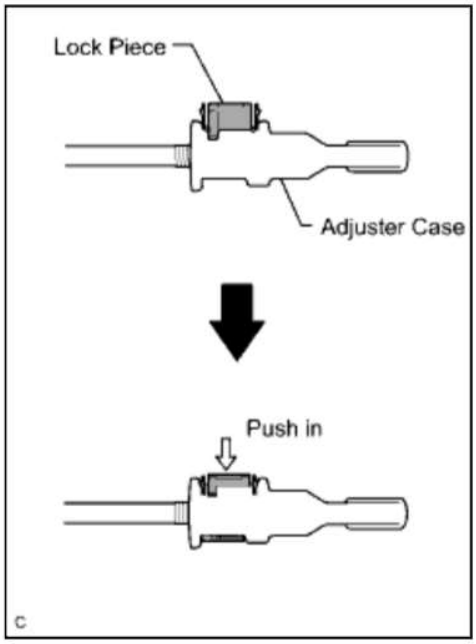
- Check that the lock piece is pulled up.
- Install the cable end all the way to the base of the pin.

(e) Push the lock piece into the adjuster case.

NOTICE:

Securely push in the lock piece until it locks.

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3. INSTALL CONSOLE BOX ASSEMBLY INFO

4. INSTALL CONSOLE BOX CARPET INFO

5. INSTALL UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

6. INSTALL FRONT NO. 1 CONSOLE BOX INSERT INFO

7. INSTALL FRONT NO. 2 CONSOLE BOX INSERT INFO

8. INSTALL INSTRUMENT PANEL BOX ASSEMBLY INFO

9. INSTALL CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

10. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY INFO

11. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

12. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

13. INSPECT SHIFT LEVER POSITION INFO

14. ADJUST SHIFT LEVER POSITION INFO

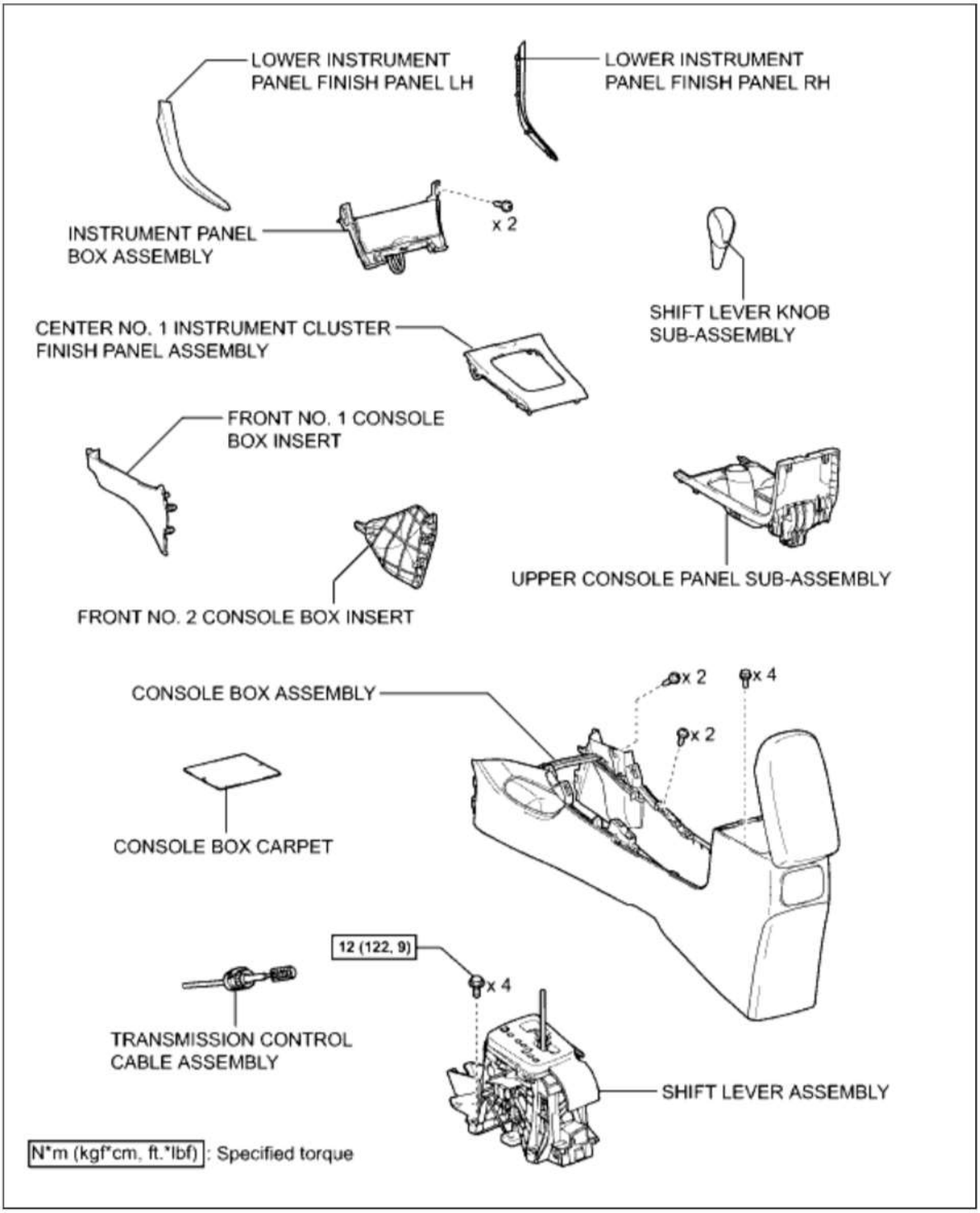
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U601IX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: COMPONENTS (2010 Corolla)		

COMPONENTS

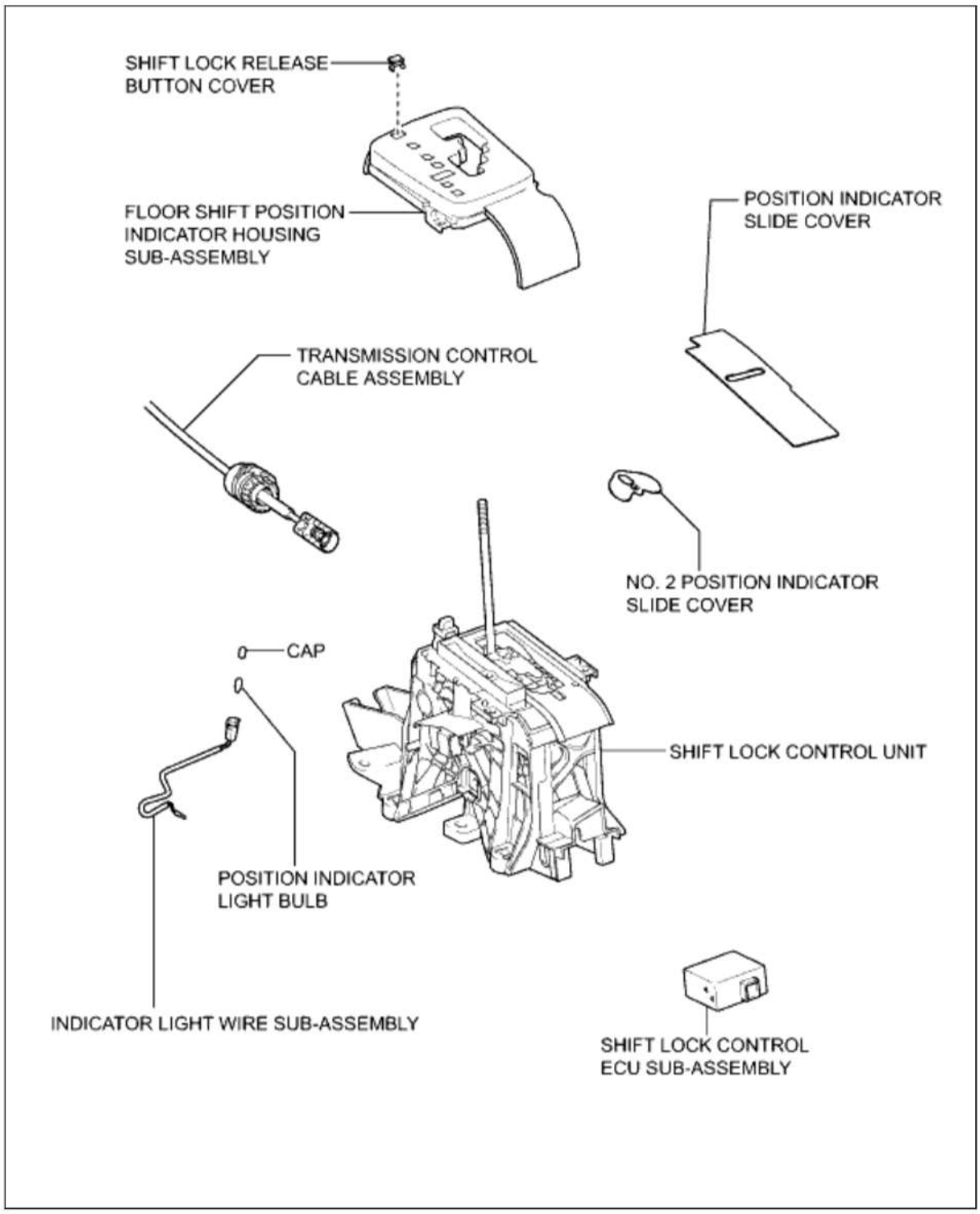
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000023CF01IX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ON-VEHICLE INSPECTION (2010 Corolla)		

ON-VEHICLE INSPECTION

1. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY

(a) Inspect the shift lock operation.

(1) Move the shift lever to P.

(2) Turn the ignition switch off.

(3) Check that the shift lever cannot be moved from P to any other position.

(4) Turn the ignition switch to ON, depress the brake pedal, and check that the shift lever can be moved to another position.

If operation cannot be done as specified, inspect the shift lock control unit.

(b) Inspect the shift lock release button operation.

(1) When moving the shift lever with the shift lock release button pressed, check that the shift lever can be moved from P to any other position.

(c) Check the key interlock operation.

(1) Turn the ignition switch to ON.

(2) Depress the brake pedal and move the shift lever to any position other than P.

(3) Check that the ignition key cannot be turned to LOCK.

(4) Move the shift lever to P, turn the ignition key to LOCK and check that the ignition key can be removed.

If operation cannot be done as specified, inspect the shift lock control unit.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U701KX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

2. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

3. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY INFO

4. REMOVE CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

5. REMOVE INSTRUMENT PANEL BOX ASSEMBLY INFO

6. REMOVE FRONT NO. 1 CONSOLE BOX INSERT INFO

7. REMOVE FRONT NO. 2 CONSOLE BOX INSERT INFO

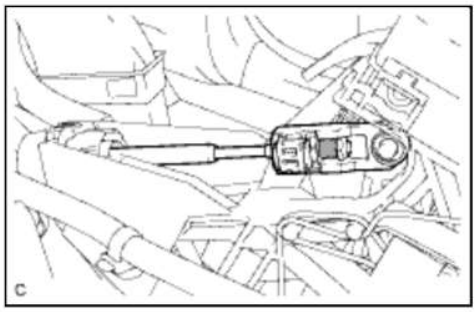
8. REMOVE UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

9. REMOVE CONSOLE BOX CARPET INFO

10. REMOVE CONSOLE BOX ASSEMBLY INFO

11. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Move the shift lever to N.



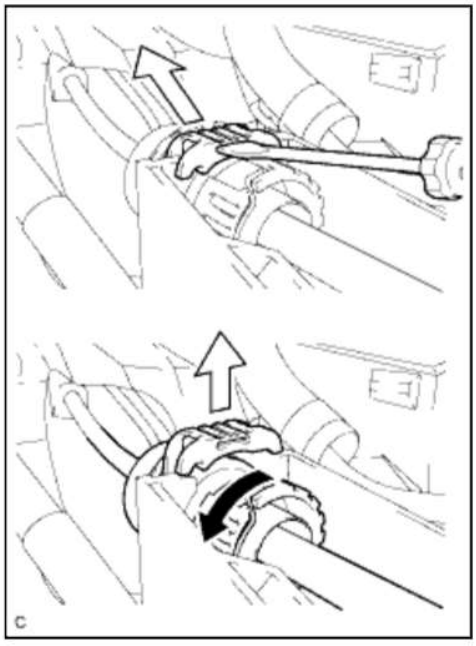
(b) Disconnect the end of the transmission control cable assembly from the shift lever assembly.

(c) Using a screwdriver, pull out the stopper of the transmission control cable.

NOTICE:

Do not remove the stopper. If the stopper is removed, reinstall it to its original position.

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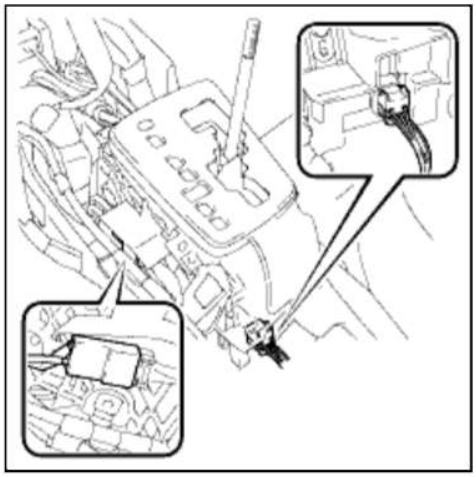


(d) Rotate the nut counterclockwise approximately 180°, and while holding the nut in place, disconnect the transmission control cable from the shift lever retainer.

NOTICE:

Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.

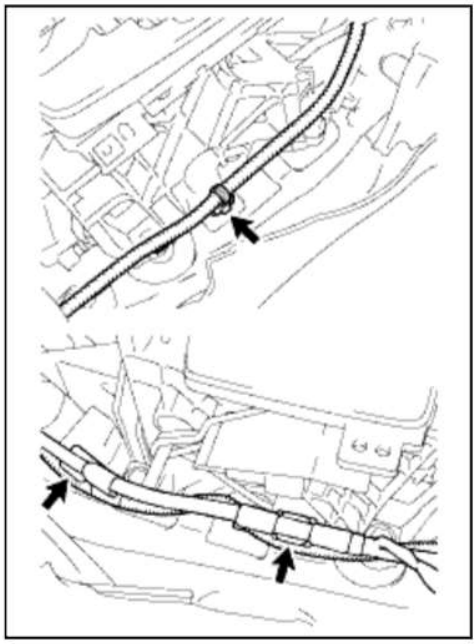
12. REMOVE SHIFT LEVER ASSEMBLY

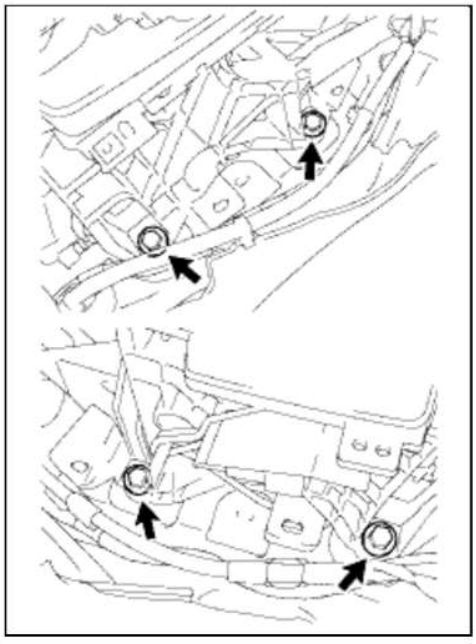


(a) Disconnect the 2 connectors from the shift lever assembly.

(b) Separate the 3 wire harness clamps from the shift lever assembly.

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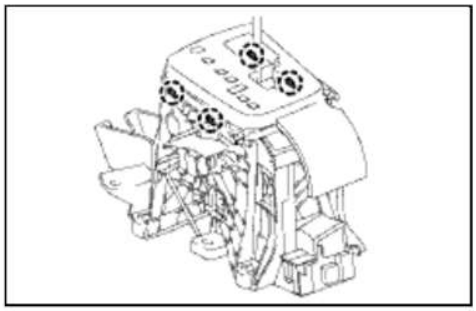
(c) Remove the 4 bolts and shift lever assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U801IX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

1. REMOVE FLOOR SHIFT POSITION INDICATOR HOUSING SUB-ASSEMBLY



(a) Disengage the 4 claws and remove the position indicator housing sub-assembly from the shift lock control unit.

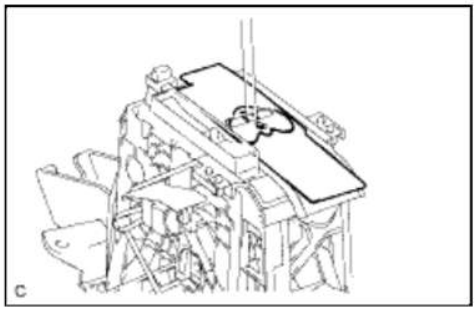
NOTICE:

Do not damage the floor shift position indicator housing sub-assembly.

2. REMOVE SHIFT LOCK RELEASE BUTTON COVER

(a) Remove the shift lock release button cover from the position indicator housing sub-assembly.

3. REMOVE POSITION INDICATOR SLIDE COVER

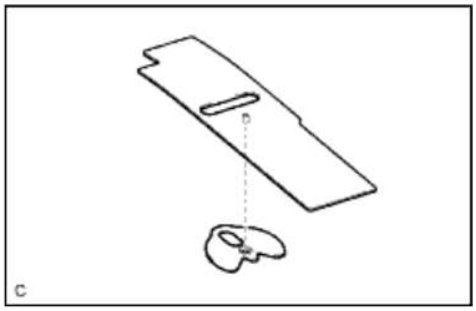


(a) Remove the position indicator slide cover with the No. 2 position indicator slide cover from the shift lock control unit.

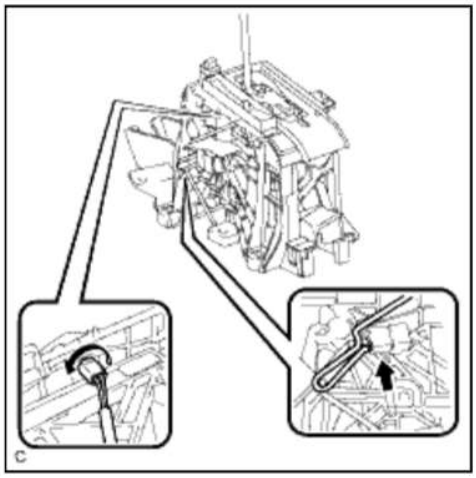
4. REMOVE NO. 2 POSITION INDICATOR SLIDE COVER

(a) Remove the No. 2 position indicator slide cover from the position indicator slide cover.

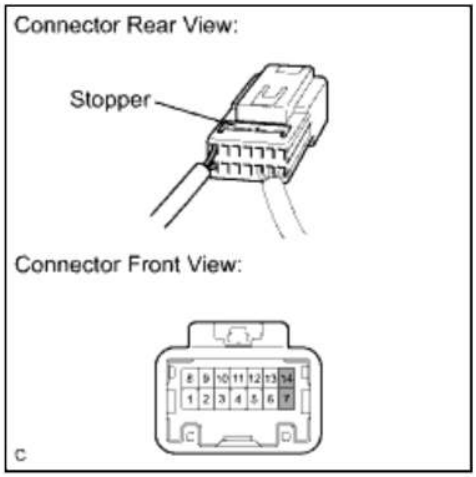
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5. REMOVE INDICATOR LIGHT WIRE SUB-ASSEMBLY



(a) Separate the position indicator light wire socket and connector from the shift lock control unit.



(b) Using a screwdriver, release the stopper.

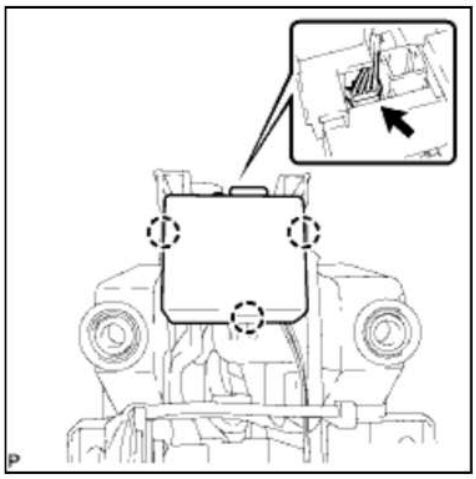
(c) Using a screwdriver, disengage the locking lug of terminals 7 and 14, and pull the terminals out from the rear of the connector.

6. REMOVE POSITION INDICATOR LIGHT BULB

(a) Remove the bulb and cap from the indicator light wire socket.

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7. REMOVE SHIFT LOCK CONTROL ECU SUB-ASSEMBLY



(a) Separate the connector from the shift lock control ECU sub-assembly.

(b) Disengage the 3 claws and the shift lock control ECU sub-assembly from the shift lock control unit.

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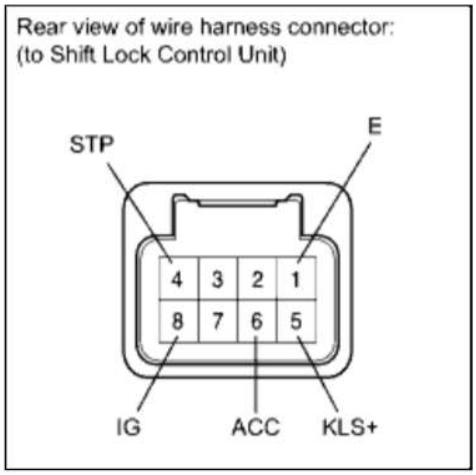
Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000023CE01XX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY (w/o Smart Key System)

(a) Measure the voltage according to the value(s) in the table below.

Standard Voltage:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
6 (ACC) - 1 (E)	Ignition switch ON	11 to 14 V
6 (ACC) - 1 (E)	Ignition switch ACC	11 to 14 V
6 (ACC) - 1 (E)	Ignition switch off	Below 1 V
4 (STP) - 1 (E)	Brake pedal depressed	11 to 14 V
4 (STP) - 1 (E)	Brake pedal released	Below 1 V
5 (KLS+) - 1 (E)	Ignition switch ACC and shift lever P	Below 1 V
	Ignition switch ACC and shift lever except P (Within approx. 1 second)	7.5 to 11 V
	Ignition switch ACC and shift lever except P (After approx. 1 second)	6 to 9.5 V
8 (IG) - 1 (E)	Ignition switch ON	11 to 14 V
8 (IG) - 1 (E)	Ignition switch off	Below 1 V

NOTICE:

Do not disconnect the shift lock control unit assembly connector.

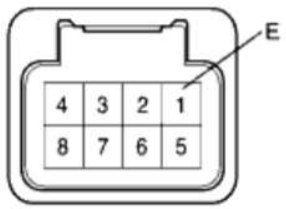
(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER	CONDITION	SPECIFIED

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Rear view of wire harness connector:
(to Shift Lock Control Unit)



CONNECTION		CONDITION
1 (E) - Body ground	Always	Below 1 Ω

NOTICE:

Do not disconnect the shift lock control unit assembly connector.

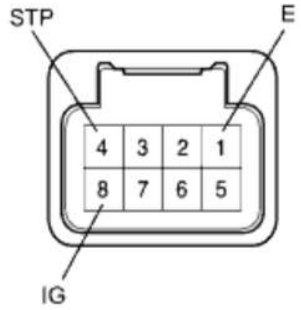
If the result is not as specified, replace the shift lock control ECU sub-assembly.

2. INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY (w/ Smart Key System)

(a) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

Rear view of wire harness connector:
(to Shift Lock Control Unit)



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
8 (IG) - 1 (E)	Engine switch on (IG)	11 to 14 V
8 (IG) - 1 (E)	Engine switch off	Below 1 V
4 (STP) - 1 (E)	Brake pedal depressed	11 to 14 V
4 (STP) - 1 (E)	Brake pedal released	Below 1 V

NOTICE:

Do not disconnect the shift lock control unit assembly connector.

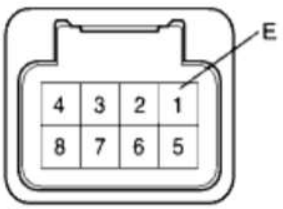
(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (E) - Body ground	Always	Below 1 Ω

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Rear view of wire harness connector:
(to Shift Lock Control Unit)



NOTICE:

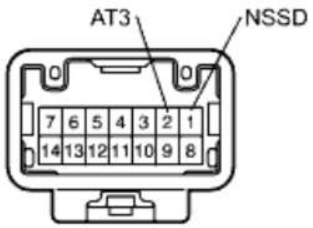
Do not disconnect the shift lock control unit assembly connector.

If the result is not as specified, replace the shift lock control ECU sub-assembly.

3. INSPECT TRANSMISSION CONTROL SWITCH

(a) Disconnect the transmission control switch connector of the shift lock control unit assembly.

Component without harness connected:
(Transmission Control Switch)



(b) Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard Resistance:

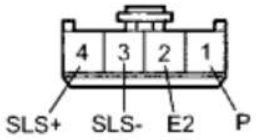
TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
1 (NSSD) - 2 (AT3)	3 and 2	Below 1 Ω
1 (NSSD) - 2 (AT3)	Except 3 and 2	10 kΩ or higher

If the result is not as specified, replace the shift lock control unit assembly.

4. INSPECT SHIFT LOCK SOLENOID

(a) Disconnect the shift lock solenoid connector.

Front view of wire harness connector:
(to Shift Lock Solenoid)



(b) Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard Resistance:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
1 (P) - 2 (E2)	P	10 kΩ or higher
1 (P) - 2 (E2)	Except P	Below 1 Ω

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If the result is not as specified, replace the shift lock control unit assembly.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (SLS-) - 4 (SLS+)	Always	112 Ω

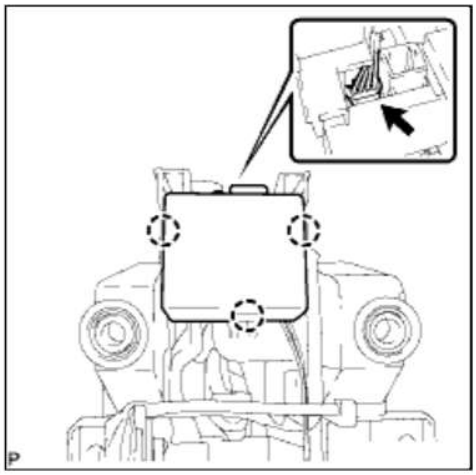
If the result is not as specified, replace the shift lock control unit assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U901IX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. INSTALL SHIFT LOCK CONTROL ECU SUB-ASSEMBLY



(a) Engage the 3 claws and install the shift lock control ECU sub-assembly to the shift lock control unit.

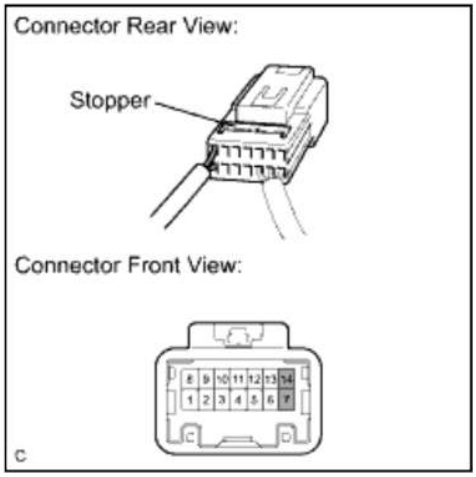
(b) Connect the shift lock solenoid connector to the shift lock control ECU sub-assembly.

2. INSTALL POSITION INDICATOR LIGHT BULB

(a) Install the cap to the bulb.

(b) Install the bulb to the position indicator light wire socket.

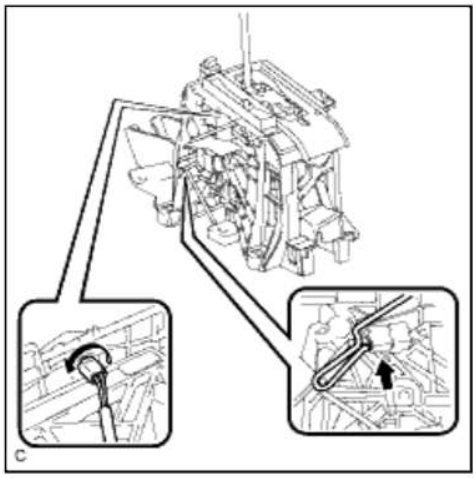
3. INSTALL INDICATOR LIGHT WIRE SUB-ASSEMBLY



(a) Connect terminals 7 and 14 to the connector as shown in the illustration.

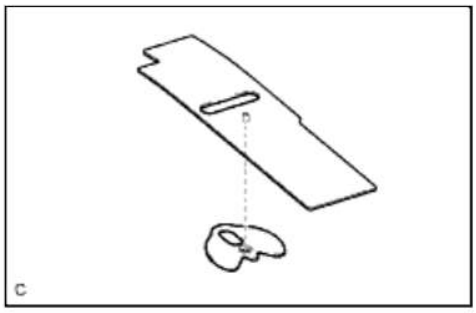
(b) Push in the stopper.

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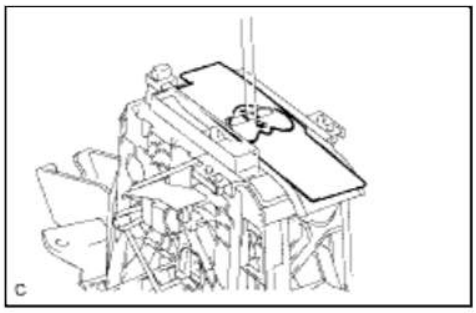
(c) Install the position indicator light wire socket and connector to the shift lock control unit.

4. INSTALL NO. 2 POSITION INDICATOR SLIDE COVER



(a) Install the No. 2 position indicator slide cover to the position indicator slide cover.

5. INSTALL POSITION INDICATOR SLIDE COVER



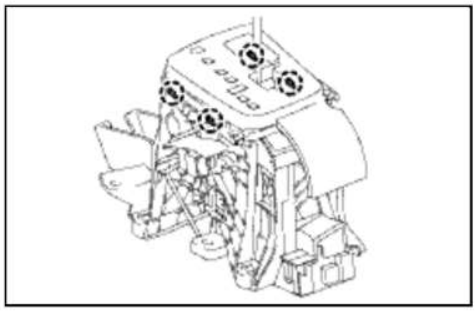
(a) Install the position indicator slide cover with the No. 2 position indicator slide cover to the shift lock control unit.

6. INSTALL SHIFT LOCK RELEASE BUTTON COVER

(a) Install the shift lock release button cover to the position indicator housing sub-assembly.

7. INSTALL FLOOR SHIFT POSITION INDICATOR HOUSING SUB-ASSEMBLY

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(a) Engage the 4 claws and install the floor shift position indicator housing sub-assembly to the shift lock control unit.

NOTICE:

Make sure that the claws are firmly engaged.

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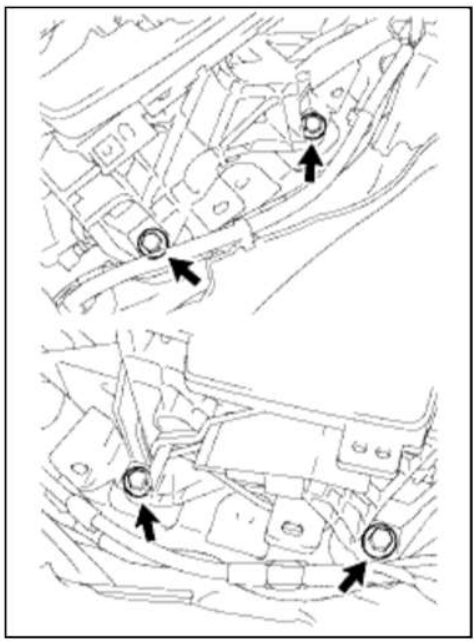
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U501KX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL SHIFT LEVER ASSEMBLY

NOTICE:

Check that the park/neutral position switch and the shift lever are in N.

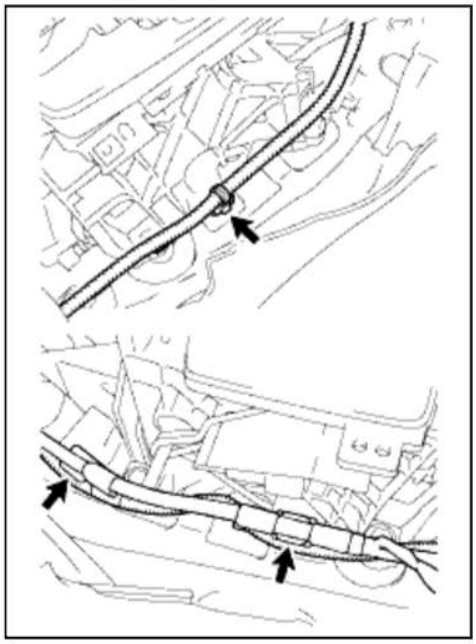


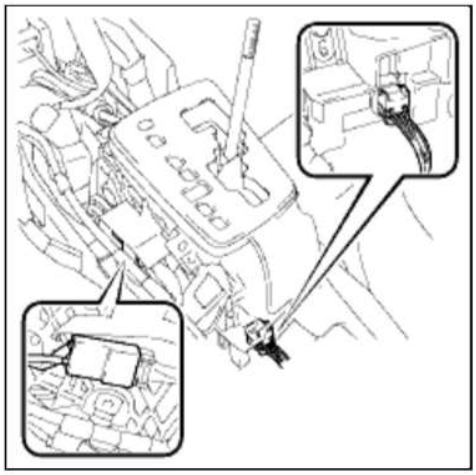
(a) Install the shift lever assembly with the 4 bolts.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

(b) Install the 3 wire harness clamps to the shift lever assembly.

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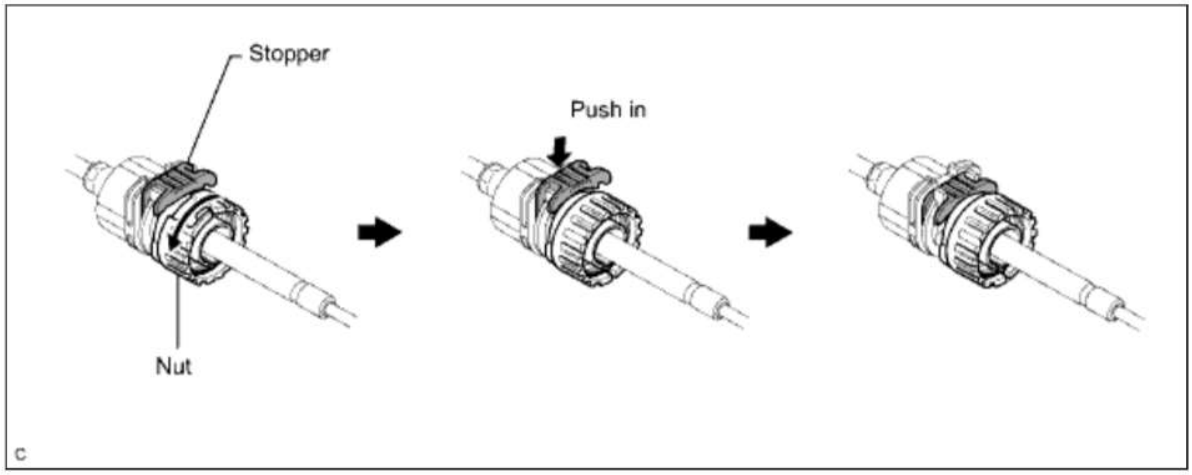


(c) Connect the 2 connectors to the shift lever assembly.

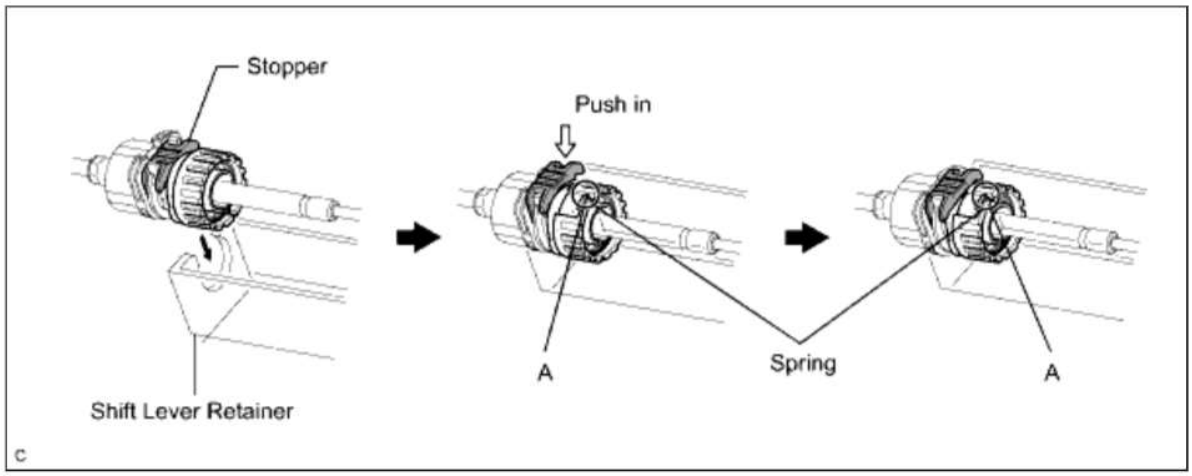
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2. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Turn the nut of the transmission control cable 180° counterclockwise. While holding the nut in place, push in the stopper until the stopper clicks twice.



(b) Install the outer part of the transmission control cable to the shift lever retainer. Check that the spring is positioned at "A" and push in the stopper.

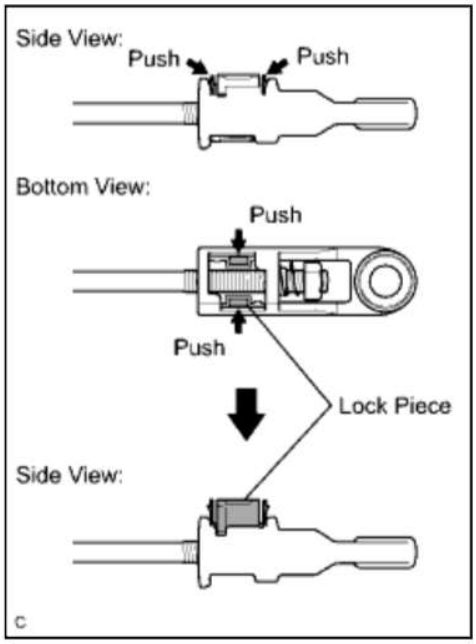


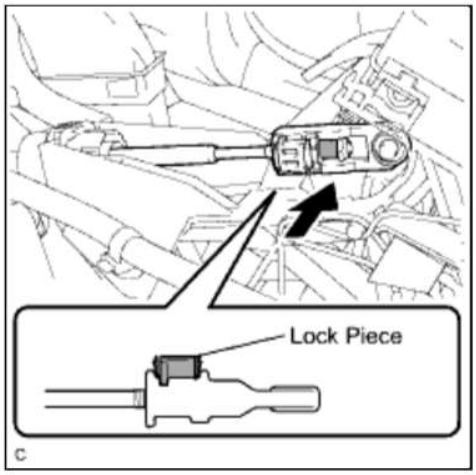
HINT:

If the stopper cannot be pushed in, slightly turn the nut clockwise and then push in the stopper again.

(c) Push the 2 claws together at the top of the transmission control cable lock piece. While holding the 2 claws together, push the 2 lugs on the bottom of the lock piece toward each other and upward to pull out the lock piece.

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(d) Install the cable end to the shift lever assembly.

NOTICE:

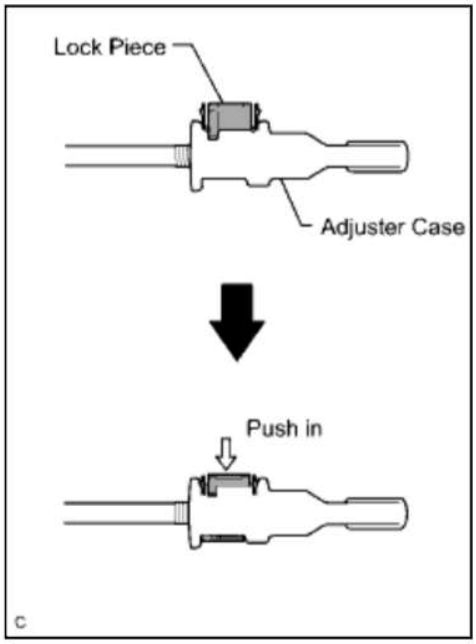
- Check that the lock piece is pulled up.
- Install the cable end all the way to the base of the pin.

(e) Push the lock piece into the adjuster case.

NOTICE:

Securely push in the lock piece until it locks.

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3. INSTALL CONSOLE BOX ASSEMBLY INFO

4. INSTALL CONSOLE BOX CARPET INFO

5. INSTALL UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

6. INSTALL FRONT NO. 1 CONSOLE BOX INSERT INFO

7. INSTALL FRONT NO. 2 CONSOLE BOX INSERT INFO

8. INSTALL INSTRUMENT PANEL BOX ASSEMBLY INFO

9. INSTALL CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

10. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY INFO

11. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

12. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

13. INSPECT SHIFT LEVER POSITION INFO

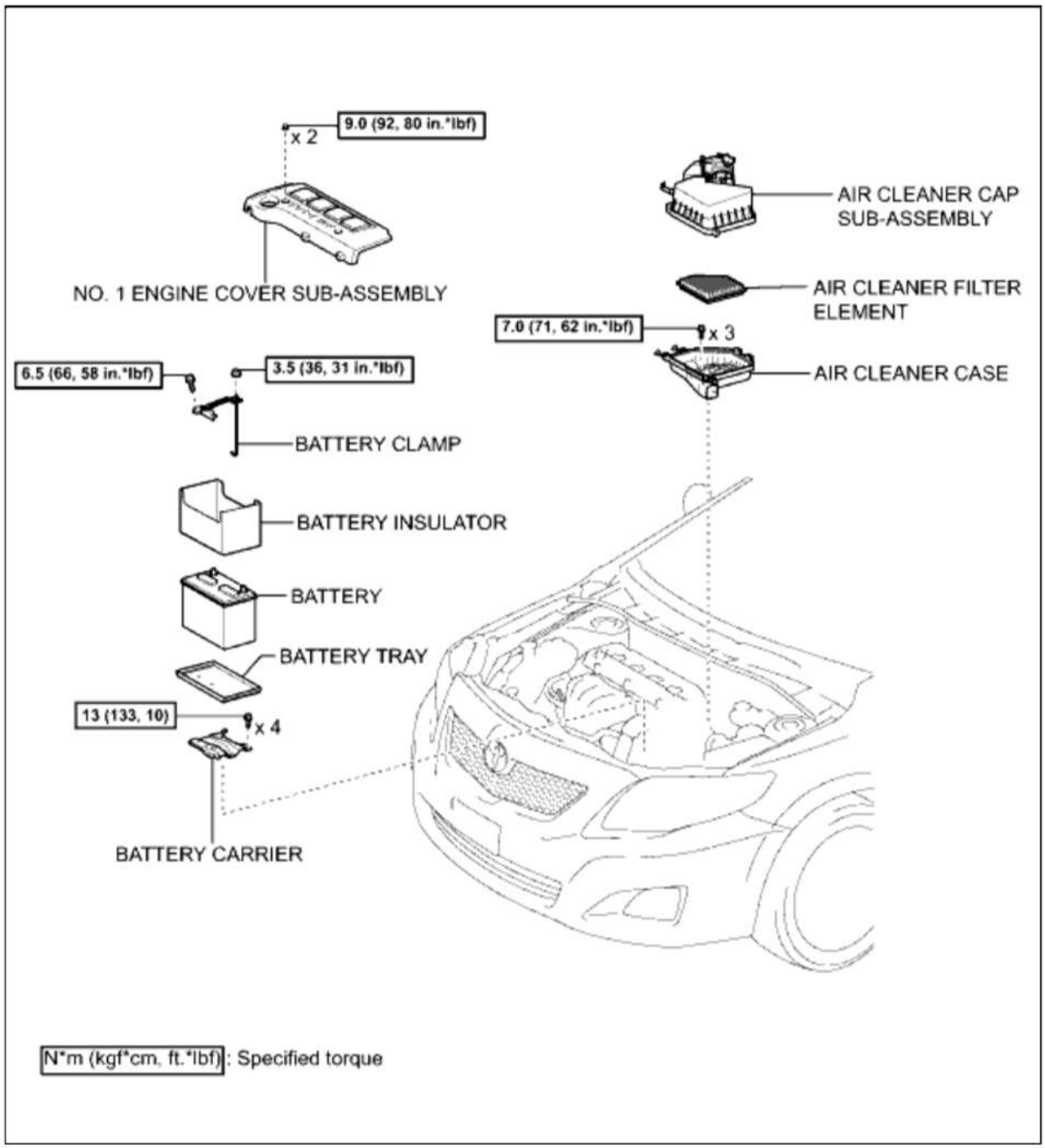
14. ADJUST SHIFT LEVER POSITION INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000U9T01ZX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: COMPONENTS (2010 Corolla)		

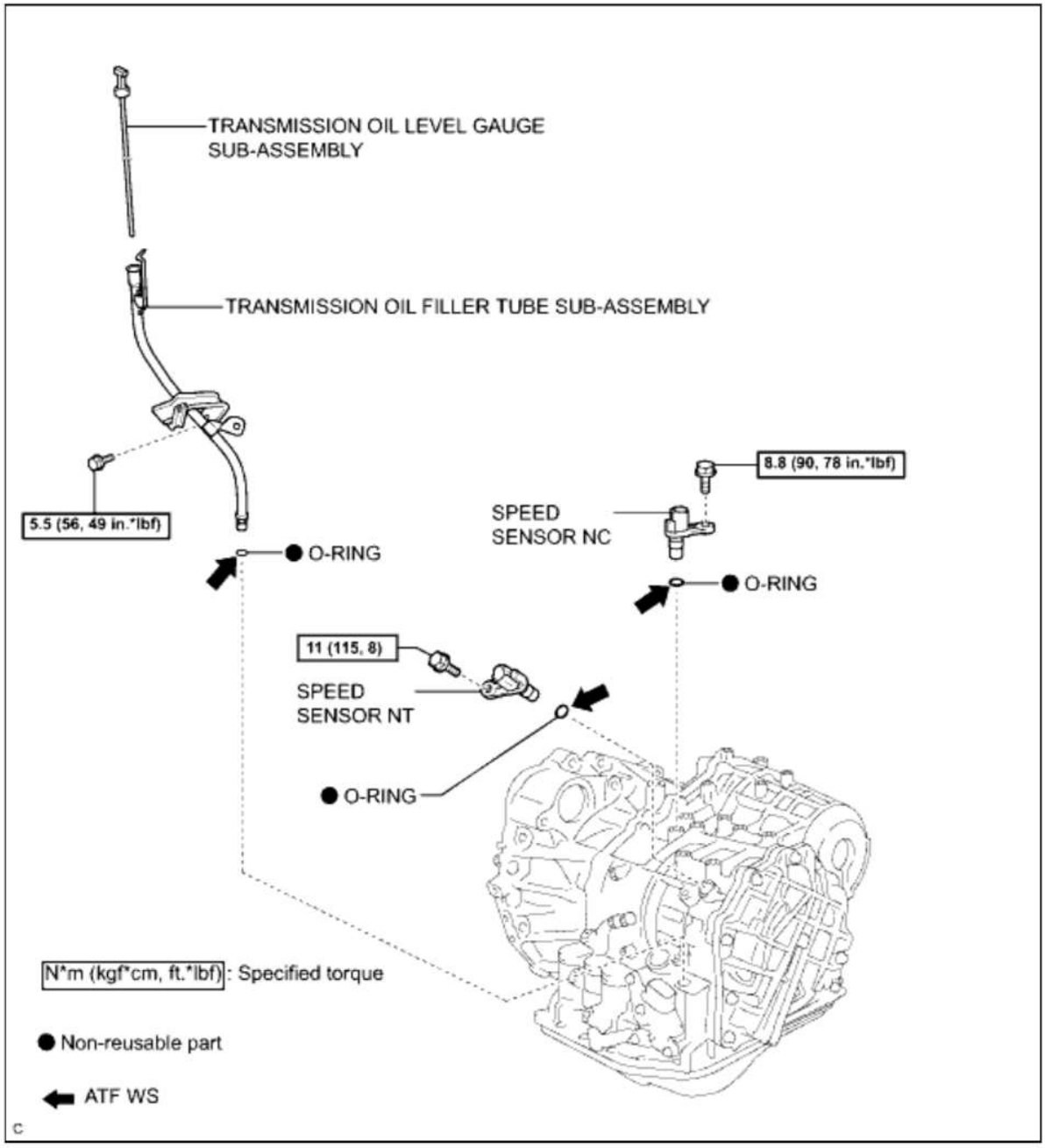
COMPONENTS

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000OE402EX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: REMOVAL (2010 Corolla)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO .

2. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

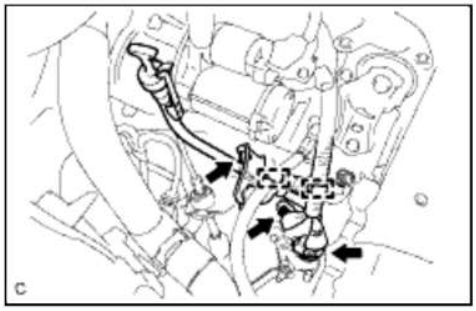
3. REMOVE AIR CLEANER CAP SUB-ASSEMBLY INFO

4. REMOVE AIR CLEANER CASE INFO

5. REMOVE BATTERY INFO

6. REMOVE BATTERY CARRIER INFO

7. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY



(a) Remove the transmission oil level gauge sub-assembly.

(b) Disconnect the transmission wire connector, park/neutral position switch connector and 2 wire harness clamps.

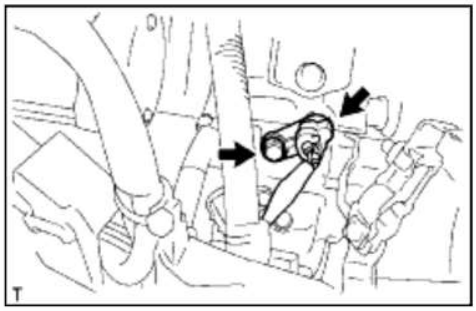
(c) Remove the bolt and transmission oil filler tube sub-assembly.

(d) Remove the O-ring from the transmission oil filler tube sub-assembly.

8. REMOVE SPEED SENSOR NT

(a) Disconnect the speed sensor connector.

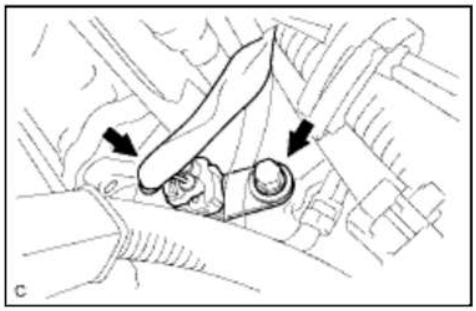
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(b) Remove the bolt and speed sensor.

(c) Remove the O-ring from the speed sensor.

9. REMOVE SPEED SENSOR NC



(a) Disconnect the speed sensor connector.

(b) Remove the bolt and speed sensor.

(c) Remove the O-ring from the speed sensor.

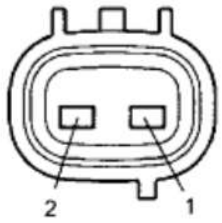
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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000UKF021X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT SPEED SENSOR NT

Component without harness connected:
(Speed Sensor)



(a) Measure the resistance according to the value(s) in the table below.

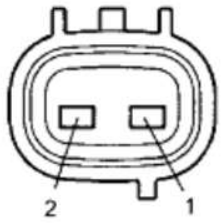
Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

If the resistance value is not as specified, replace the speed sensor.

2. INSPECT SPEED SENSOR NC

Component without harness connected:
(Speed Sensor)



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

If the resistance value is not as specified, replace the speed sensor.

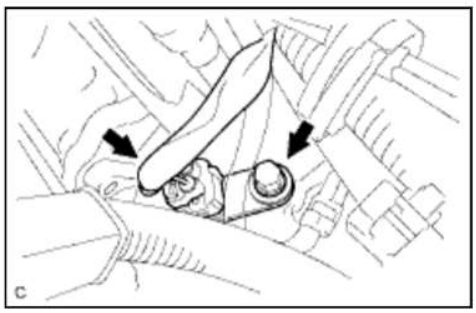
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000OE202EX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL SPEED SENSOR NC

(a) Coat a new O-ring with ATF WS and install it to the speed sensor.



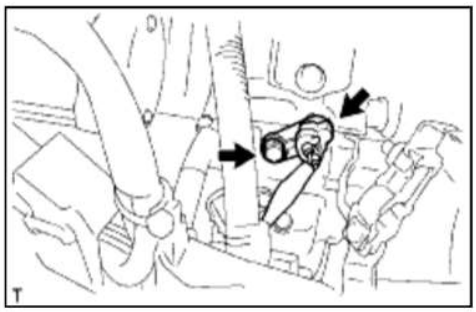
(b) Install the speed sensor with the bolt.

Torque: 8.8 N·m (90 kgf·cm, 78in·lbf)

(c) Connect the speed sensor connector.

2. INSTALL SPEED SENSOR NT

(a) Coat a new O-ring with ATF WS and install it to the speed sensor.



(b) Install the speed sensor with the bolt.

Torque: 11 N·m (115 kgf·cm, 8ft·lbf)

(c) Connect the speed sensor connector.

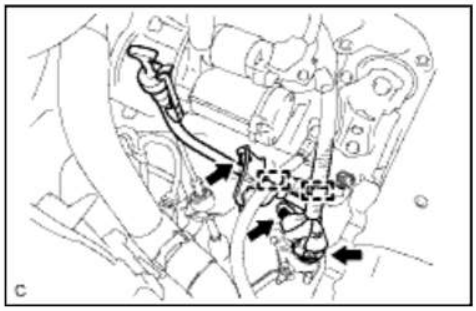
3. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY

(a) Apply ATF to a new O-ring, and install it to the transmission oil filler tube sub-assembly.

(b) Install the transmission oil filler tube sub-assembly to the automatic transaxle with the bolt.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

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(c) Connect the transmission wire connector, park/neutral position switch connector and 2 wire harness clamps.

(d) Install the transmission oil level gauge sub-assembly to the transmission oil filler tube sub-assembly.

4. INSTALL BATTERY CARRIER INFO

5. INSTALL BATTERY INFO

6. INSTALL AIR CLEANER CASE INFO

7. INSTALL AIR CLEANER CAP SUB-ASSEMBLY INFO

8. INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

9. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO .

TOYOTA

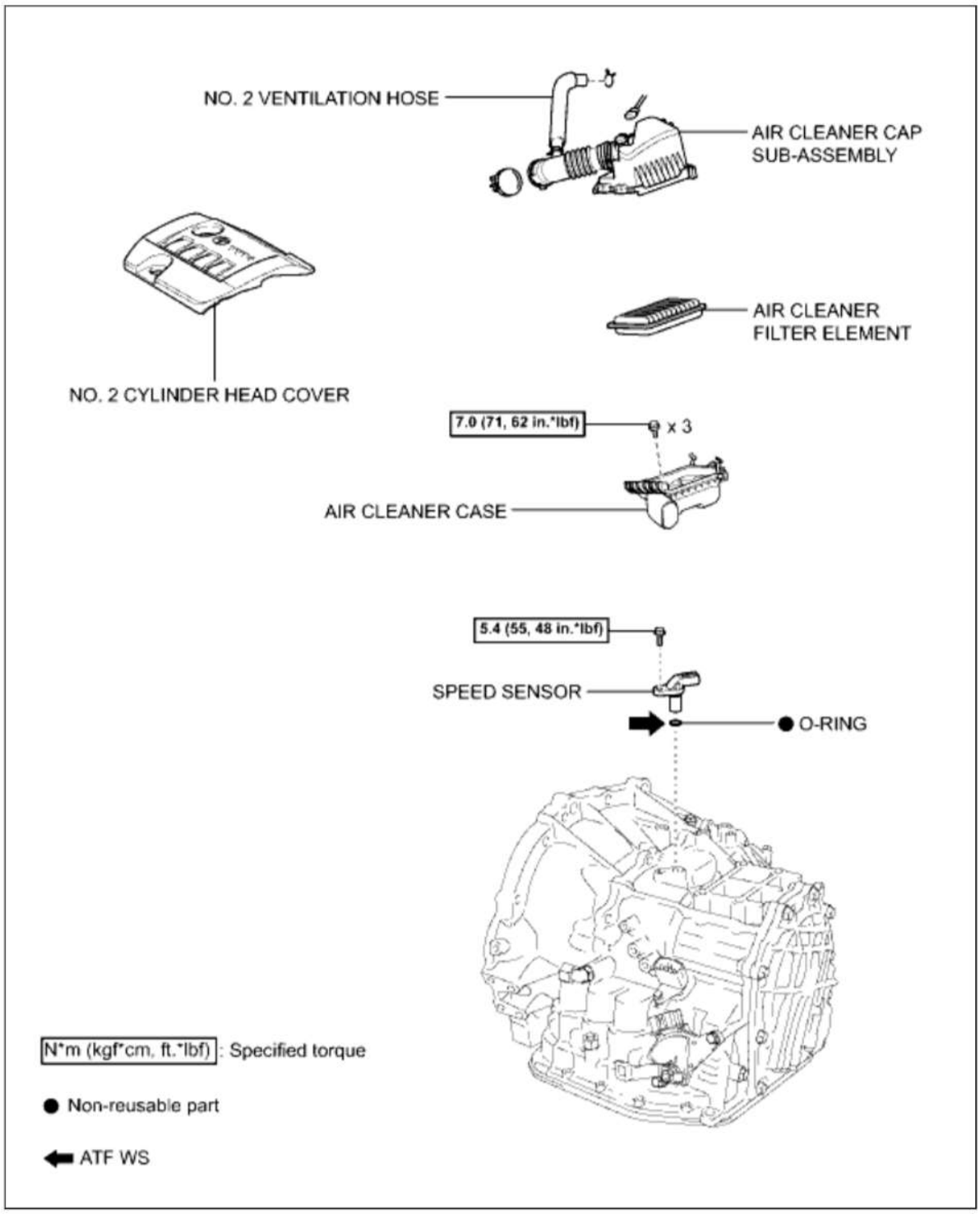
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000U9T01YX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: COMPONENTS (2010 Corolla)		

COMPONENTS

ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000OE402DX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: REMOVAL (2010 Corolla)		

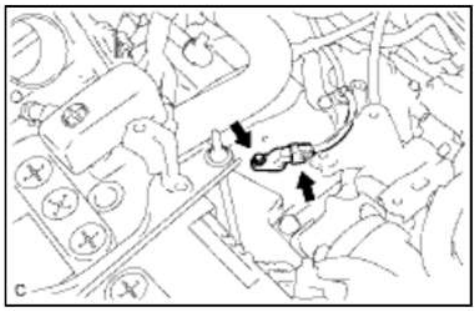
REMOVAL

1. REMOVE NO. 2 CYLINDER HEAD COVER INFO

2. REMOVE AIR CLEANER CAP SUB-ASSEMBLY INFO

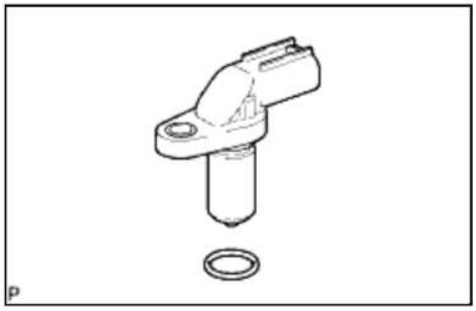
3. REMOVE AIR CLEANER CASE INFO

4. REMOVE SPEED SENSOR



(a) Disconnect the speed sensor connector.

(b) Remove the bolt and speed sensor.



(c) Remove the O-ring from the speed sensor.

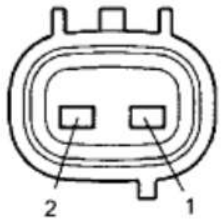
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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000UKF020X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT SPEED SENSOR

Component without harness connected:
(Speed Sensor)



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

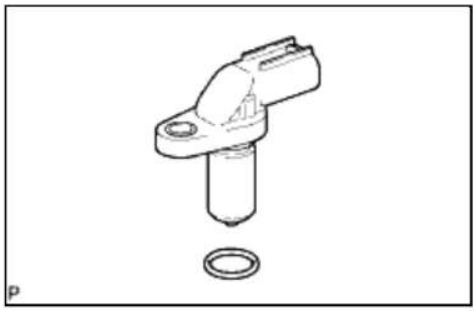
If the resistance value is not as specified, replace the speed sensor.

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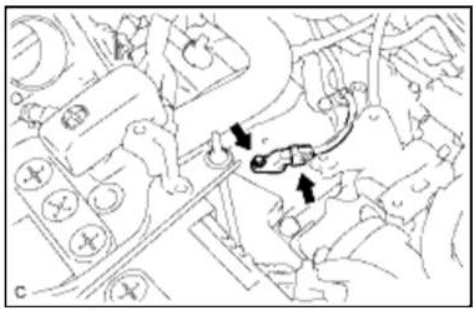
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000OE202DX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL SPEED SENSOR



(a) Coat a new O-ring with ATF and install it to the speed sensor.



(b) Install the speed sensor with the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

(c) Connect the speed sensor connector.

2. INSTALL AIR CLEANER CASE INFO

3. INSTALL AIR CLEANER CAP SUB-ASSEMBLY INFO

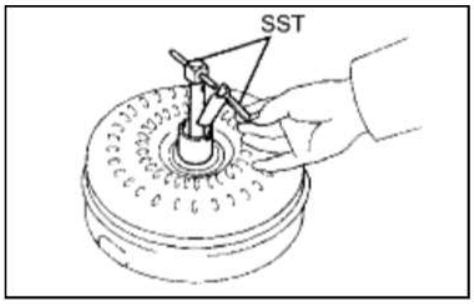
4. INSTALL NO. 2 CYLINDER HEAD COVER INFO

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YXK02NX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TORQUE CONVERTER CLUTCH AND DRIVE PLATE: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY



(a) Inspect the one-way clutch.

(1) Install SST onto the inner race of the one-way clutch.

SST: 09350-32014

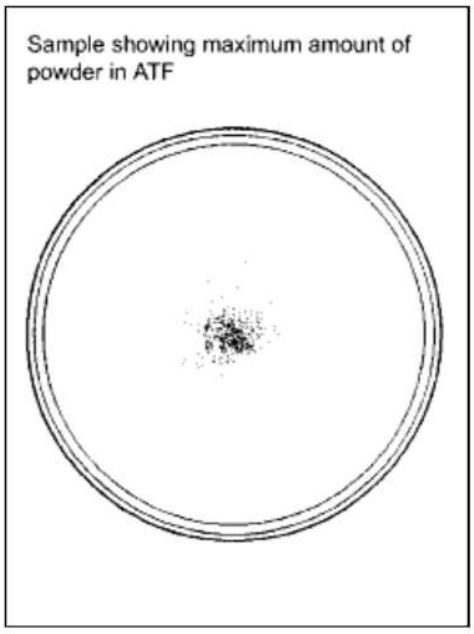
09351-32010

(2) Set SST so that it fits in the notch of the converter hub and in the outer race of the one-way clutch.

SST: 09350-32014

09351-32020

(3) With the torque converter standing on its side, check that the clutch locks when SST is turned counterclockwise and rotates freely and smoothly when turned clockwise. If the results are not as specified, clean the converter and recheck the one-way clutch. If the results still are not as specified, replace the converter.



(b) Determine the condition of the torque converter clutch.

(1) Check that the following conditions are met:

- During the stall test or when the shift lever is in N, metallic sounds are not emitted from the torque converter clutch.
- The one-way clutch turns clockwise and locks when turned counterclockwise.
- The amount of powder in the ATF is not greater than the sample shown in the illustration.

If the results are not as specified, replace the torque converter clutch assembly.

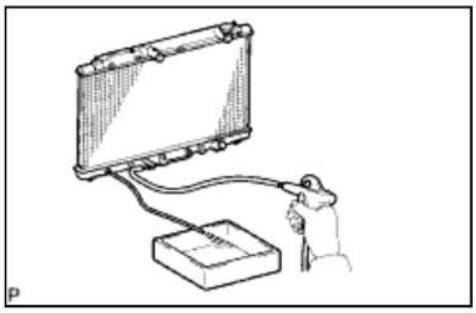
HINT:

The sample illustration shows approximately 0.25 liters (0.26 US qts, 0.22 Imp. qts) of the ATF taken from a removed torque converter clutch.

(c) Replace the ATF in the torque converter clutch.

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(1) If the ATF is discolored and/or has a foul odor, completely stir the ATF in the torque converter clutch and drain it.



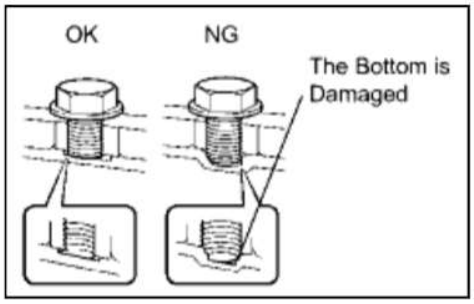
(d) Clean and check the oil cooler and oil pipe line.

(1) If the torque converter clutch is inspected or the ATF is replaced, clean the oil cooler and oil lines.

HINT:

- Spray compressed air of 196 kPa (2 kgf/cm^2, 28 psi) into inlet hose.
- If there is a large amount of fine powder in the ATF, add new ATF using a bucket pump and clean it again.

(2) If the ATF is cloudy, inspect the oil cooler (radiator).



(e) Avoid damaging the torque converter clutch and the oil pump gear.

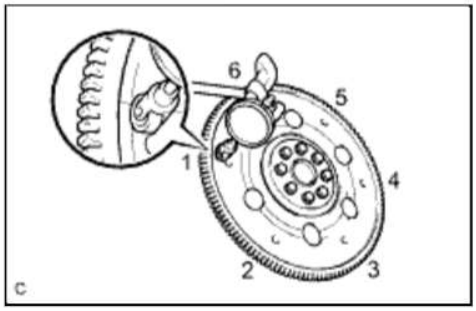
(1) If there is any damage to the end of the bolt for the torque converter clutch and to the bottom of the bolt hole, replace the bolt and the torque converter clutch.

(2) All of the bolts must be the same length.

(3) Bolts with washers must be used.

2. INSPECT DRIVE PLATE & RING GEAR SUB-ASSEMBLY

(a) Check the drive plate for damage.



(b) Set up a dial indicator and measure the run out of the 6 portions around the torque converter fitting surface.

Maximum runout:
0.30 mm (0.0118 in.)

If the runout is not within the specification or the drive plate is damaged, replace the drive plate.

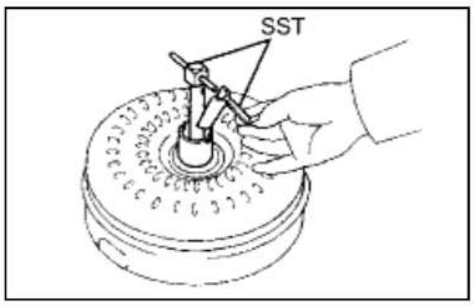
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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192E01KX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TORQUE CONVERTER CLUTCH AND DRIVE PLATE: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

(a) Inspect the one-way clutch.

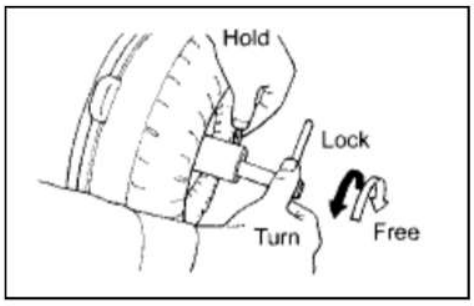


(1) Set SST so that it fits into the notch of the converter hub and the notch of the outer race of the one-way clutch.

SST: 09350-32014

09351-32010

09351-32020



(2) Stand the torque converter up and turn the SST.

Check that it rotates smoothly when turned clockwise and locks up when turned counterclockwise.

SST: 09350-32014

09351-32010

09351-32020

If necessary, clean the converter and check the one-way clutch.

Replace the converter if the one-way clutch still does not operate as specified.

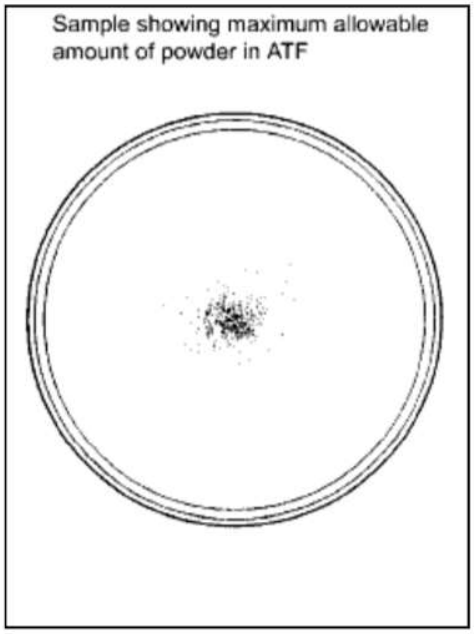
(b) Determine the condition of the torque converter clutch assembly.

(1) Check that the following conditions are met:

- During the stall test or when the shift lever is in N, metallic sounds are not emitted from the torque converter clutch.
- The one-way clutch turns in one direction and locks in the other direction.
- The amount of powder in the ATF is not greater than the sample shown in the illustration.

HINT:

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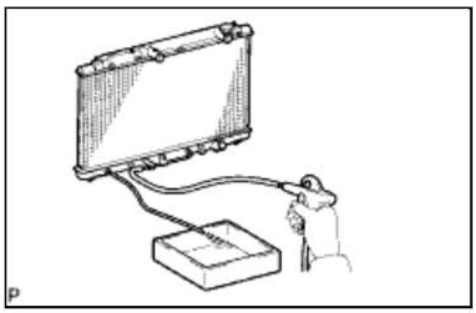


The sample illustration shows approximately 0.25 liters (0.26 US qts, 0.22 Imp. qts) of the ATF taken from a removed torque converter clutch.

(c) Replace the ATF in the torque converter clutch.

(1) If the ATF is discolored and/or has a foul odor, rock the torque converter to move the fluid around inside it. Drain the ATF with the mounting surface of the converter facing upward.

(d) Clean and check the oil cooler and oil pipe line.

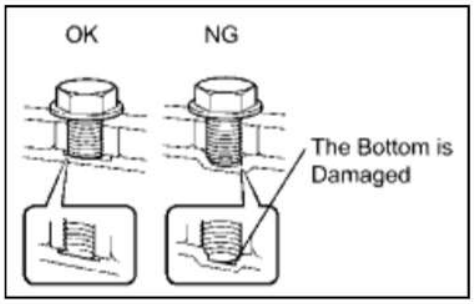


(1) If the torque converter clutch is inspected or the ATF is changed, clean the oil cooler and oil pipe line.

HINT:

- Spray compressed air of 196 kPa (2 kgf/cm^2, 28 psi) from the inlet hose.
- If excessive fine powder is found in the ATF, add new ATF using a bucket pump and clean it again.

(2) If the ATF is cloudy, inspect the oil cooler (radiator).



(e) Prevent deformation of the torque converter clutch and damage to the oil pump gear.

(1) When any marks due to interference are found on the end of the bolt for the torque converter clutch and on the bottom of the bolt hole, replace the bolt and the torque converter clutch.

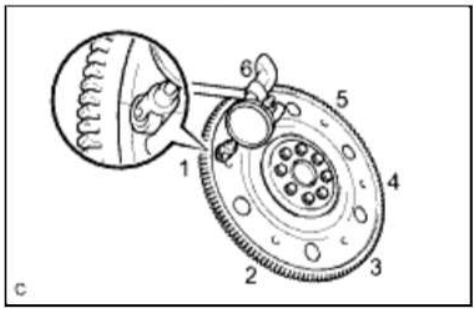
(2) All of the bolts must be the same length.

(3) Washers must be used with the bolts.

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2. INSPECT DRIVE PLATE AND RING GEAR

(a) Check the drive plate for damage.



(b) Set up a dial indicator and measure the run out of the 6 portions around the torque converter fitting surfaces.

Maximum runout:

0.30 mm (0.0118 in.)

If the runout is not within the specification or drive plate is damaged, replace the drive plate.

TOYOTA

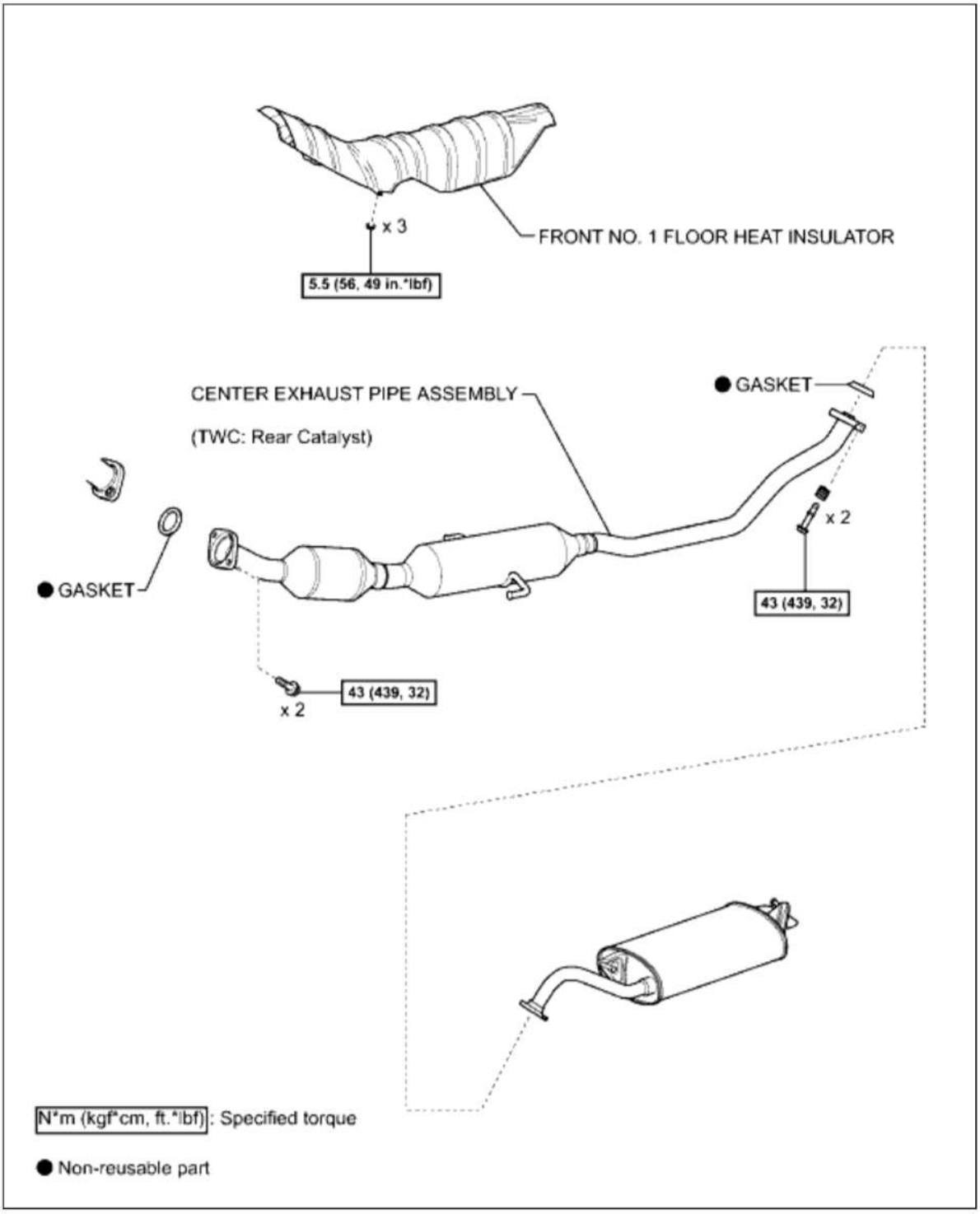
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020UB01FX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: COMPONENTS (2010 Corolla)		

COMPONENTS

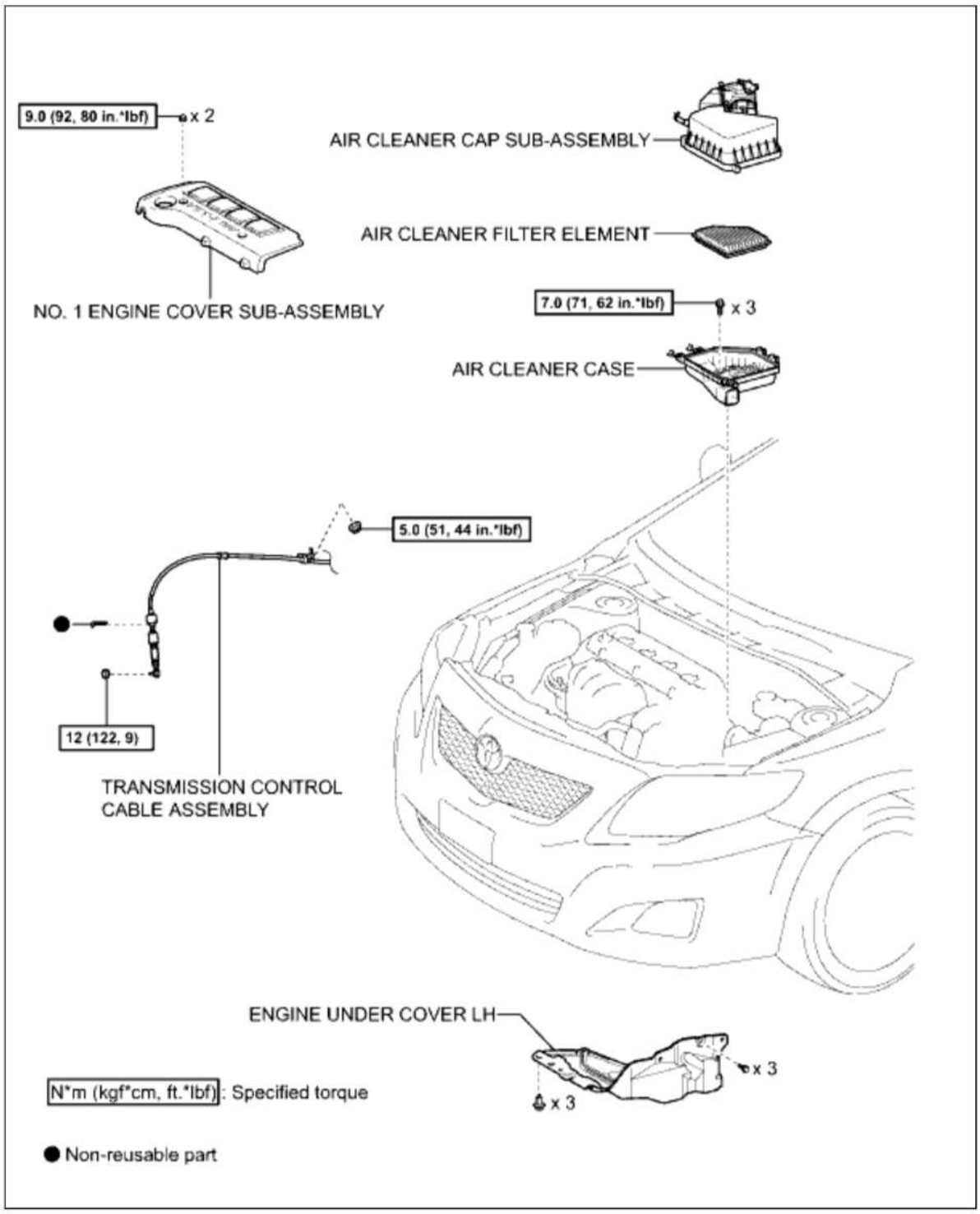
ILLUSTRATION

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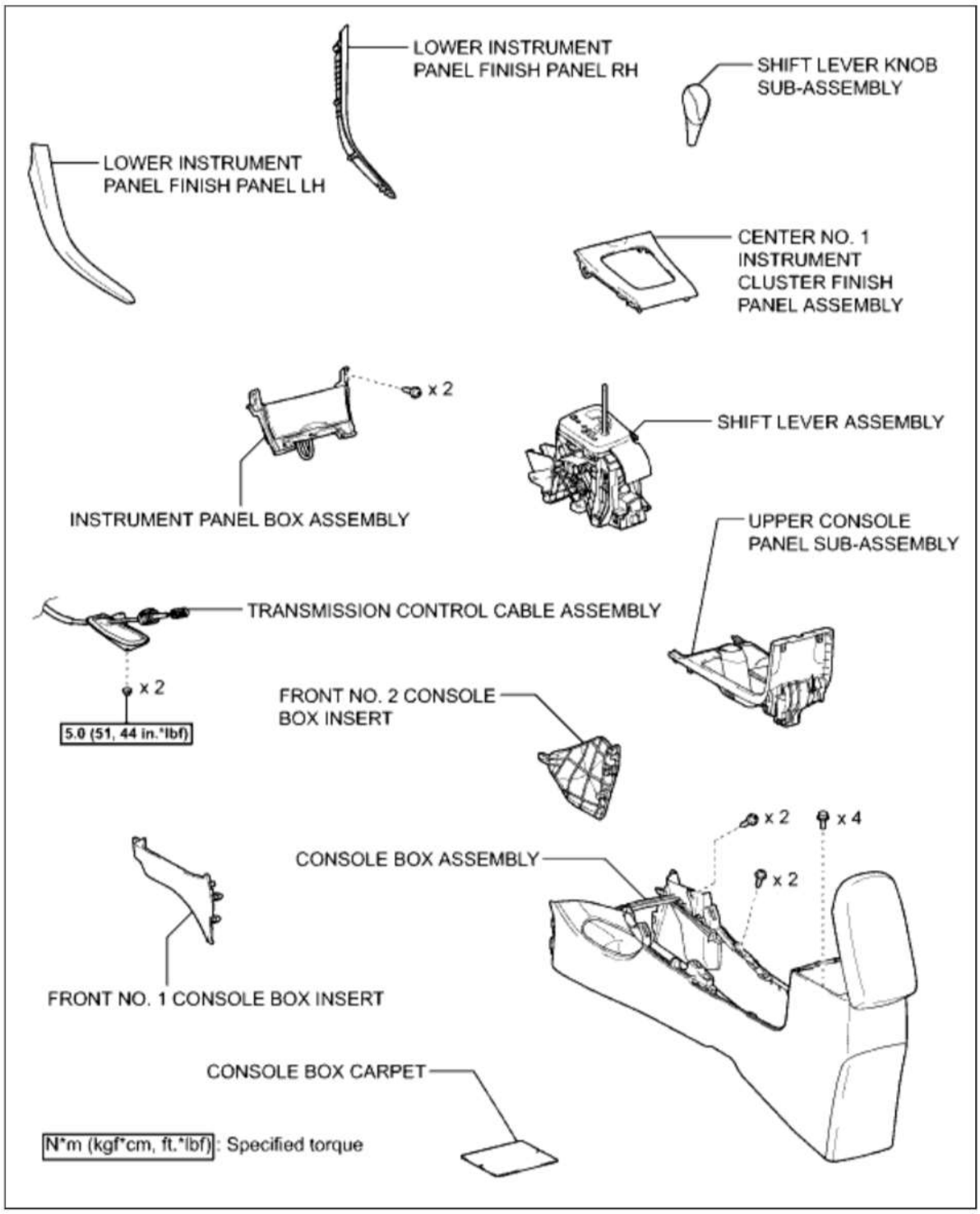
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020UC01GX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

2. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

3. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY INFO

4. REMOVE CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

5. REMOVE INSTRUMENT PANEL BOX ASSEMBLY INFO

6. REMOVE FRONT NO. 1 CONSOLE BOX INSERT INFO

7. REMOVE FRONT NO. 2 CONSOLE BOX INSERT INFO

8. REMOVE UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

9. REMOVE CONSOLE BOX CARPET INFO

10. REMOVE CONSOLE BOX ASSEMBLY INFO

11. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

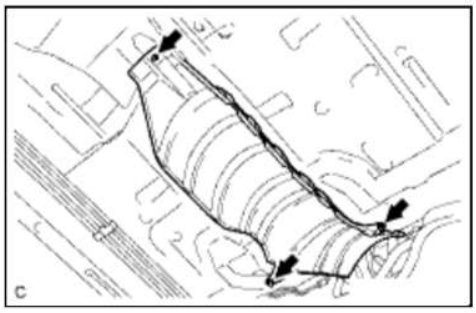
12. REMOVE AIR CLEANER CAP SUB-ASSEMBLY INFO

13. REMOVE AIR CLEANER CASE INFO

14. REMOVE ENGINE UNDER COVER LH

15. REMOVE CENTER EXHAUST PIPE ASSEMBLY INFO

16. REMOVE FRONT NO. 1 FLOOR HEAT INSULATOR

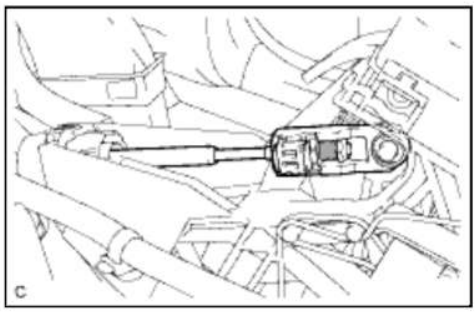


(a) Remove the 3 nuts and the front No. 1 floor heat insulator.

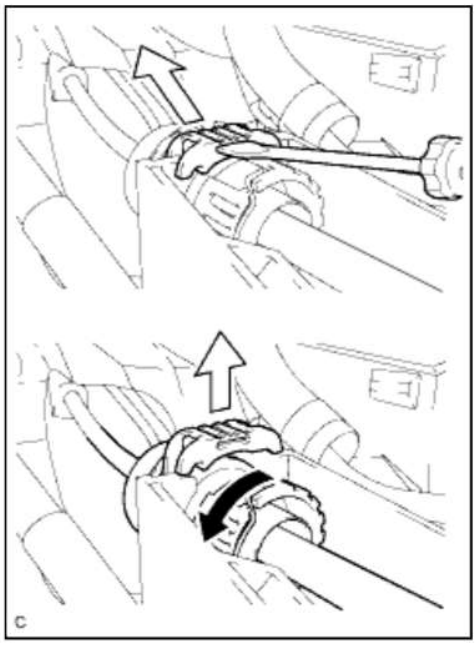
17. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY

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(a) Move the shift lever to N.



(b) Disconnect the end of the transmission control cable assembly from the shift lever assembly.



(c) Using a screwdriver, pull out the stopper of the transmission control cable.

NOTICE:

Do not remove the stopper. If the stopper is removed, reinstall it to its original position.

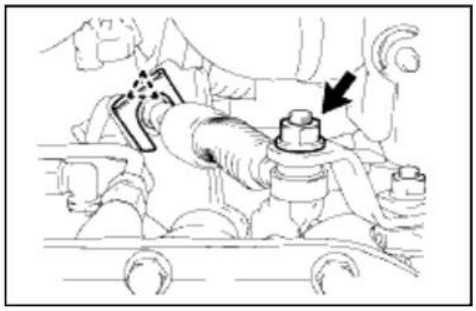
(d) Rotate the nut counterclockwise approximately 180°, and while holding the nut in place, disconnect the transmission control cable from the shift lever retainer.

NOTICE:

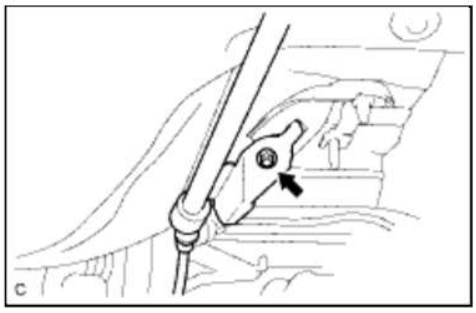
Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.

(e) Remove the clip and disconnect the transmission control cable assembly from the control cable bracket.

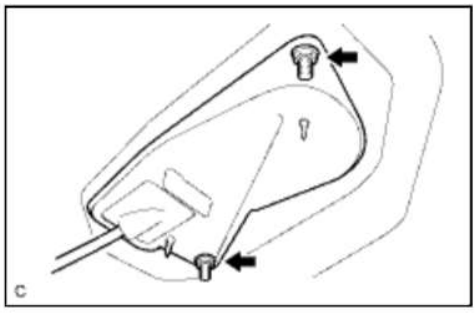
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(f) Remove the nut and transmission control cable assembly from the control shaft lever.



(g) Remove the nut and separate the transmission control cable assembly support from the rear engine mounting insulator.



(h) Remove the 2 nuts and separate the transmission control cable assembly from the body.

(i) Pull out the transmission control cable assembly from the body.

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Last Modified: 3-10-2010	6.4 N	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U401VX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: ADJUSTMENT (2010 Corolla)		

ADJUSTMENT

1. INSPECT SHIFT LEVER POSITION

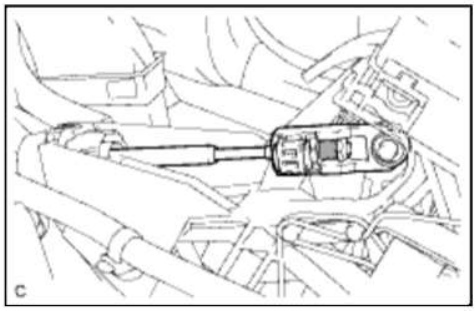
(a) When moving the shift lever from P to R with the ignition switch ON and the brake pedal depressed, make sure that the shift lever moves smoothly and correctly into position.

(b) Start the engine and make sure that the vehicle moves forward when moving the shift lever from N to D and moves rearward when moving the shift lever to R. If the operation cannot be performed as specified, inspect the park/neutral position switch assembly and check the shift lever assembly installation condition.

2. ADJUST SHIFT LEVER POSITION

(a) Apply the parking brake and move the shift lever to N.

(b) Remove the console box assembly INFO .



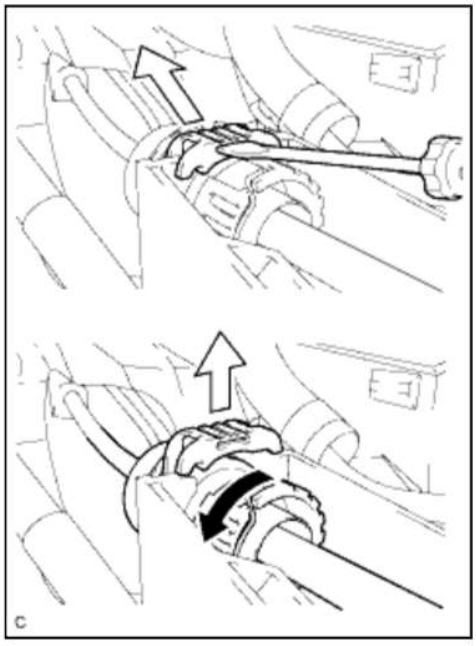
(c) Disconnect the end of the transmission control cable assembly from the shift lever assembly.

(d) Using a screwdriver, pull out the stopper of the transmission control cable.

NOTICE:

Do not remove the stopper. If the stopper is removed, reinstall it to its original position.

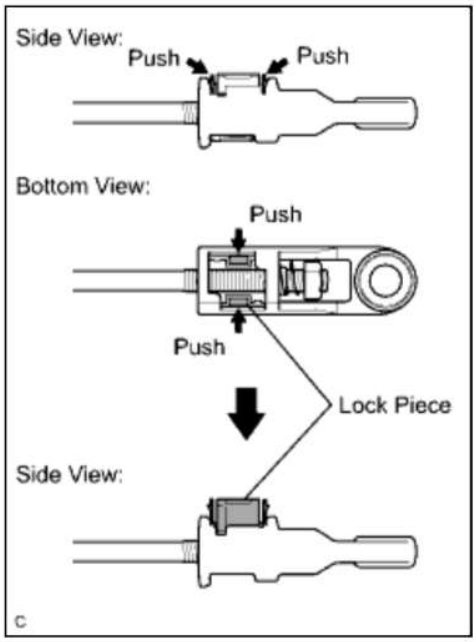
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(e) Rotate the nut counterclockwise approximately 180°, and while holding the nut in place, disconnect the transmission control cable from the shift lever retainer.

NOTICE:

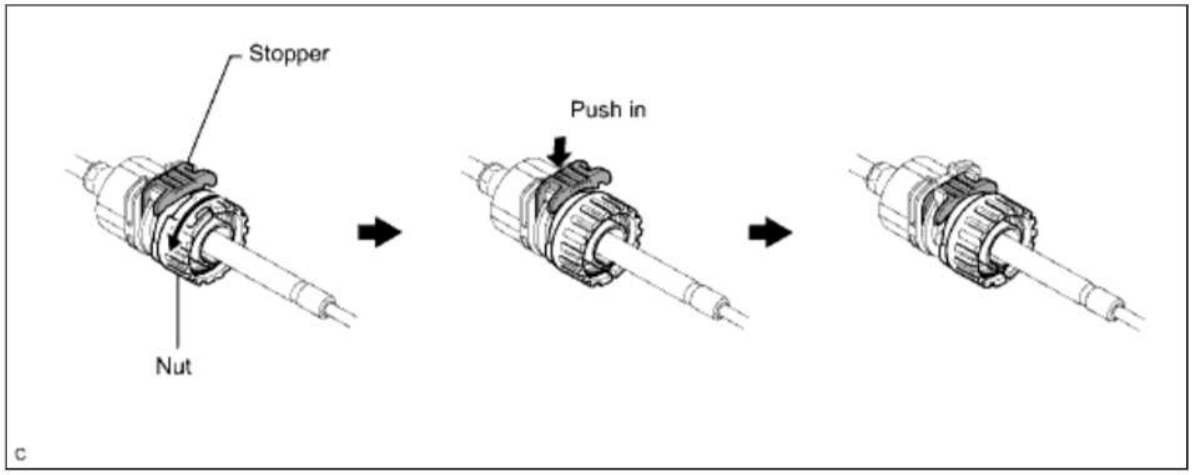
Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.



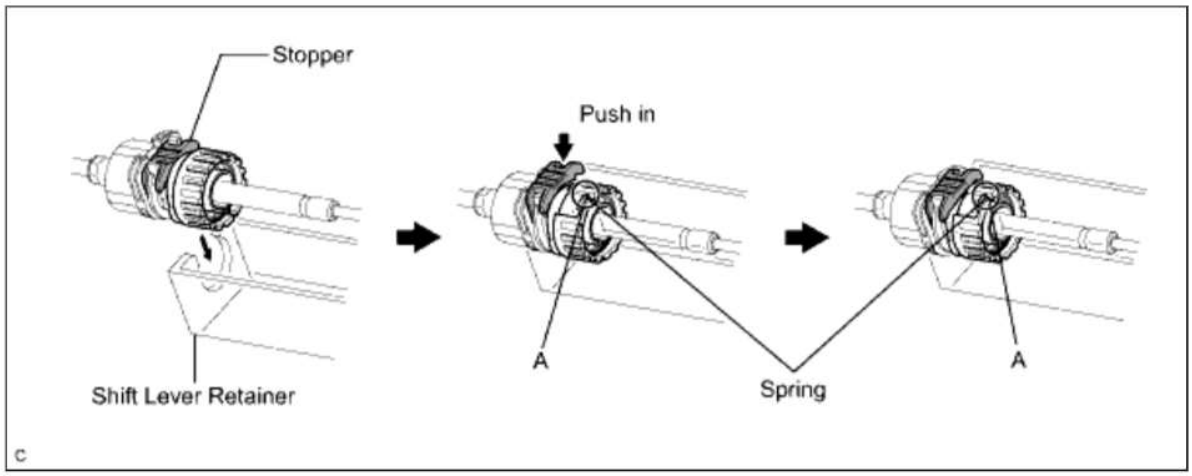
(f) Push the two claws together at the top of the transmission control cable lock piece. While holding the two claws together, push the two lugs on the bottom of the lock piece toward each other and upward to pull out the lock piece.

(g) Turn the nut of the transmission control cable 180° counterclockwise. While holding the nut in place, push in the stopper until the stopper clicks twice.

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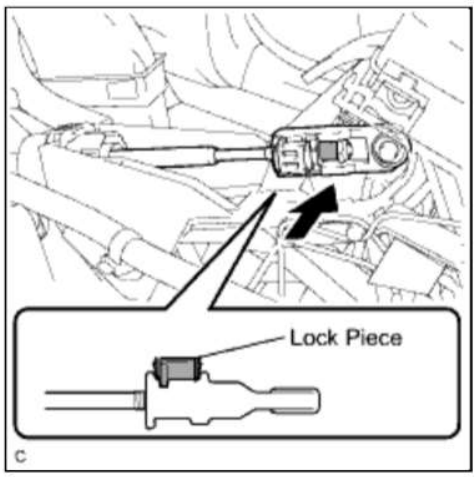


(h) Install the outer part of the transmission control cable to the shift lever retainer. Check that the spring is positioned at "A" and push in the stopper.



HINT:

If the stopper cannot be pushed in, slightly turn the nut clockwise and then push in the stopper again.

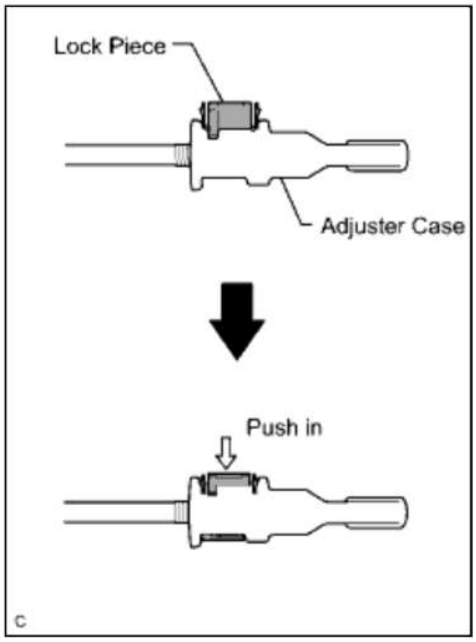


(i) Install the cable end to the shift lever assembly.

NOTICE:

- Check that the lock piece is pulled up.
- Install the cable end all the way to the base of the pin.

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(j) Push the lock piece into the adjuster case.

NOTICE:

Securely push in the lock piece until it locks.

(k) After adjusting the shift lever position, check the operation and function of the shift lever. If there is a problem, adjust the position again.

(l) Install the console box assembly INFO .

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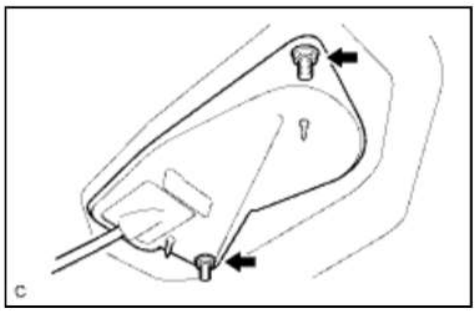
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020UA01GX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

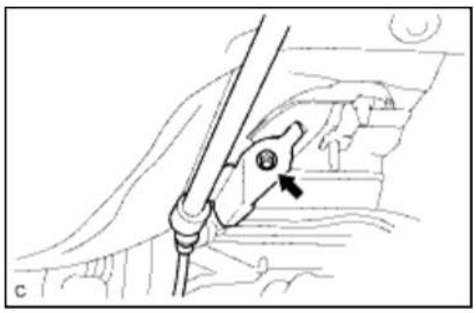
NOTICE:

Before installing the transmission control cable assembly, check that the park/neutral position switch and the shift lever are in N.



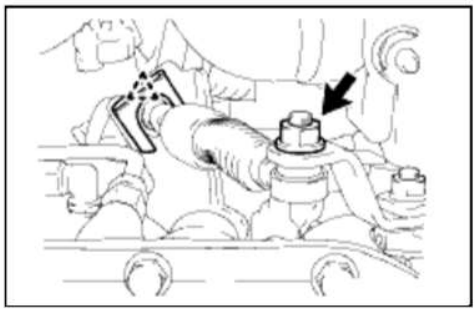
(a) Put the transmission control cable into the cabin and connect the transmission control cable with the 2 nuts.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)



(b) Install the transmission control cable bracket to the rear engine mounting insulator with the nut.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)



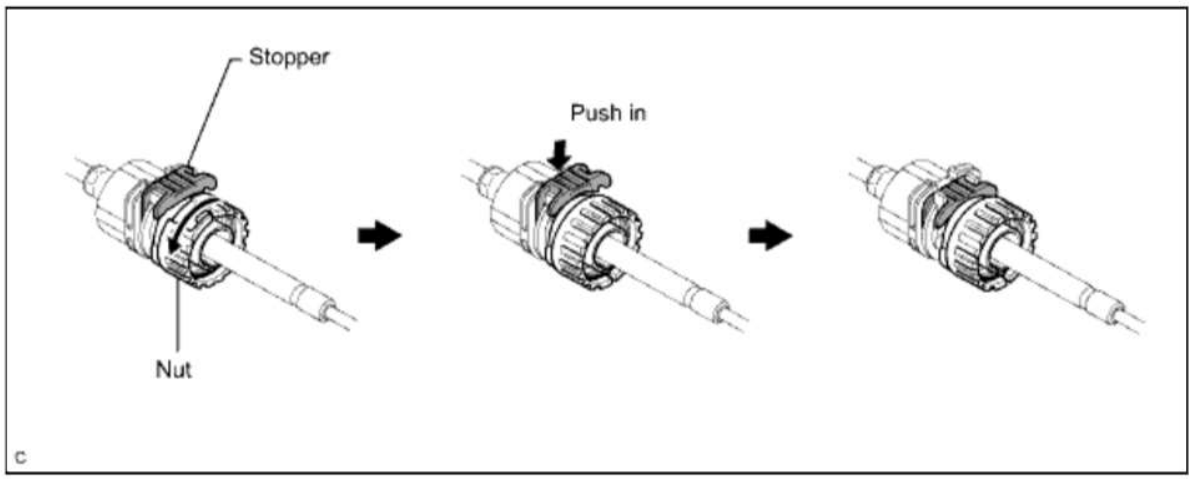
(c) Connect the transmission control cable to the transmission control cable bracket with a new clip.

(d) Connect the transmission control cable to the control shaft lever with the nut.

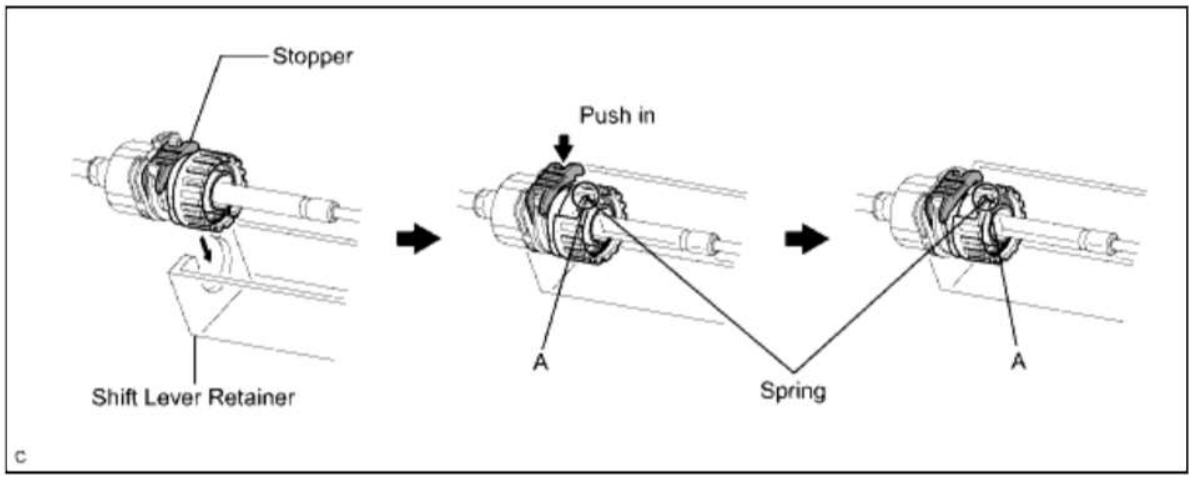
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

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(e) Turn the nut of the transmission control cable 180° counterclockwise. While holding the nut in place, push in the stopper until the stopper clicks twice.



(f) Install the outer part of the transmission control cable to the shift lever retainer. Check that the spring is positioned at "A" and push in the stopper.



HINT:

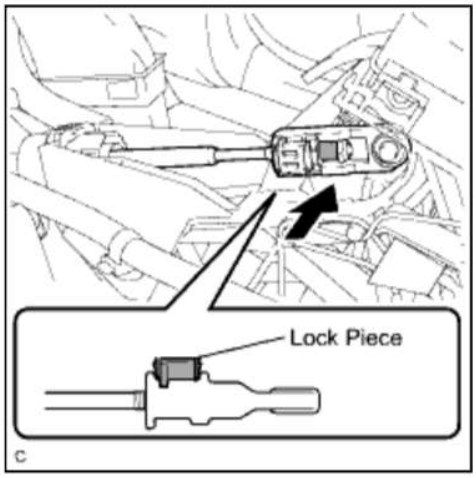
If the stopper cannot be pushed in, slightly turn the nut clockwise and then push in the stopper again.

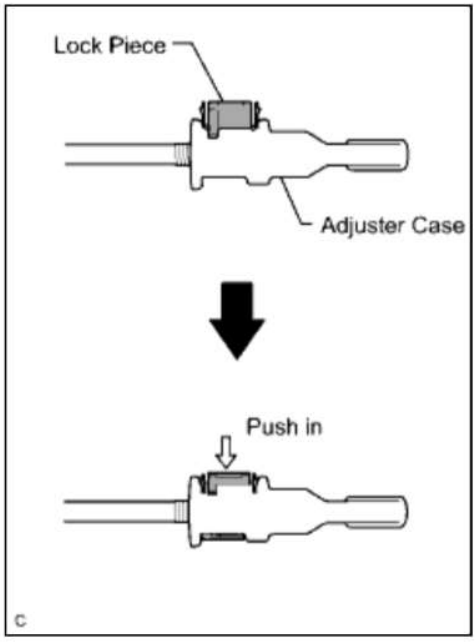
(g) Install the cable end to the shift lever assembly.

NOTICE:

- Check that the lock piece is pulled up.
- Install the cable end all the way to the base of the pin.

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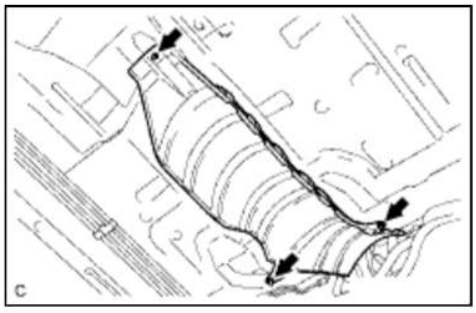


(h) Push the lock piece into the adjuster case.

NOTICE:

Securely push in the lock piece until it locks.

2. INSTALL FRONT NO. 1 FLOOR HEAT INSULATOR



(a) Install the front No. 1 floor heat insulator with the 3 nuts.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

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3. INSTALL CENTER EXHAUST PIPE ASSEMBLY INFO

4. INSTALL ENGINE UNDER COVER LH

5. INSTALL AIR CLEANER CASE INFO

6. INSTALL AIR CLEANER CAP SUB-ASSEMBLY INFO

7. INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY INFO

8. INSTALL CONSOLE BOX ASSEMBLY INFO

9. INSTALL CONSOLE BOX CARPET INFO

10. INSTALL UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

11. INSTALL FRONT NO. 1 CONSOLE BOX INSERT INFO

12. INSTALL FRONT NO. 2 CONSOLE BOX INSERT INFO

13. INSTALL INSTRUMENT PANEL BOX ASSEMBLY INFO

14. INSTALL CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

15. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY INFO

16. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

17. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

18. INSPECT SHIFT LEVER POSITION INFO

19. ADJUST SHIFT LEVER POSITION INFO

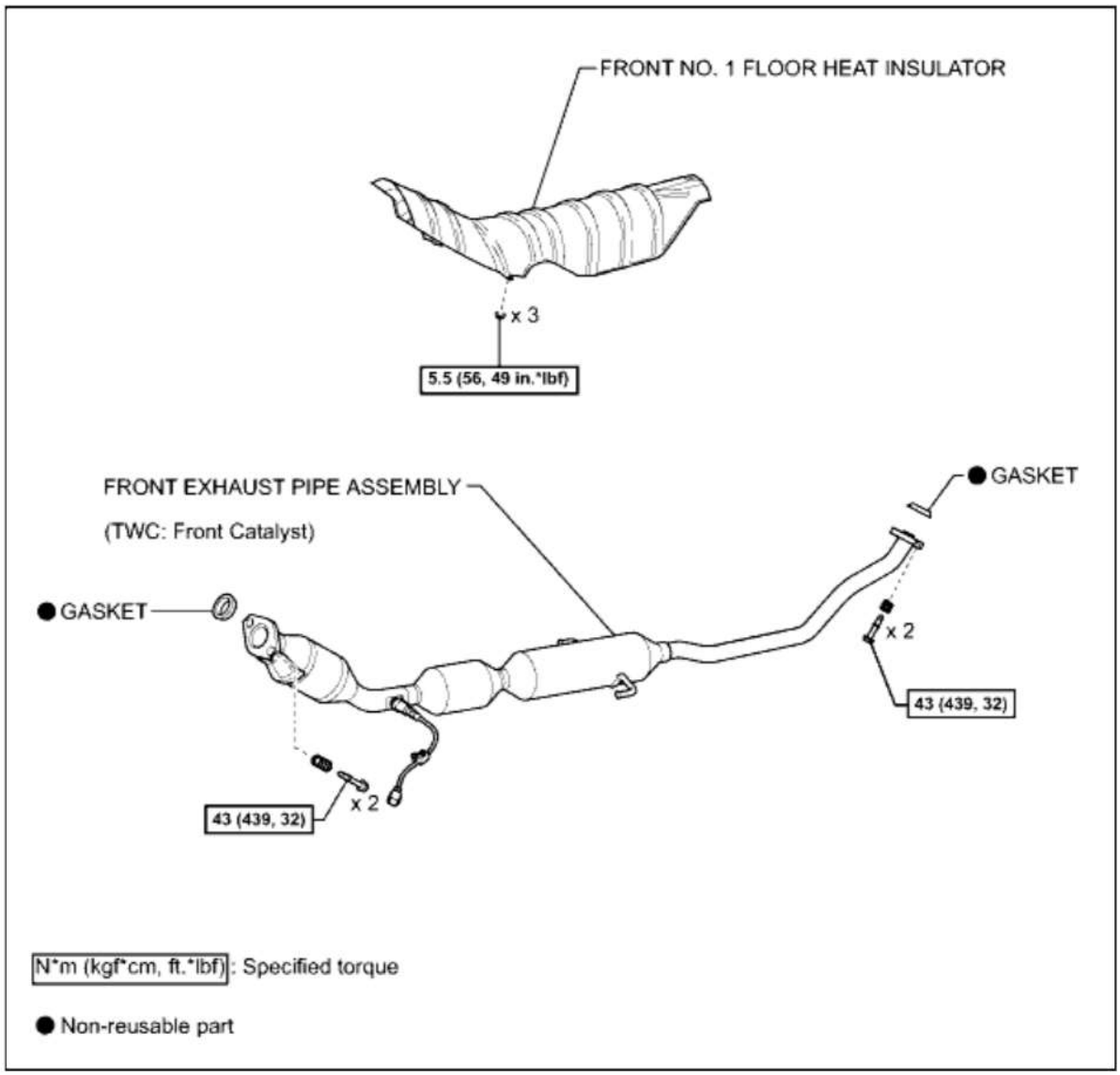


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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020UB01EX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: COMPONENTS (2010 Corolla)		

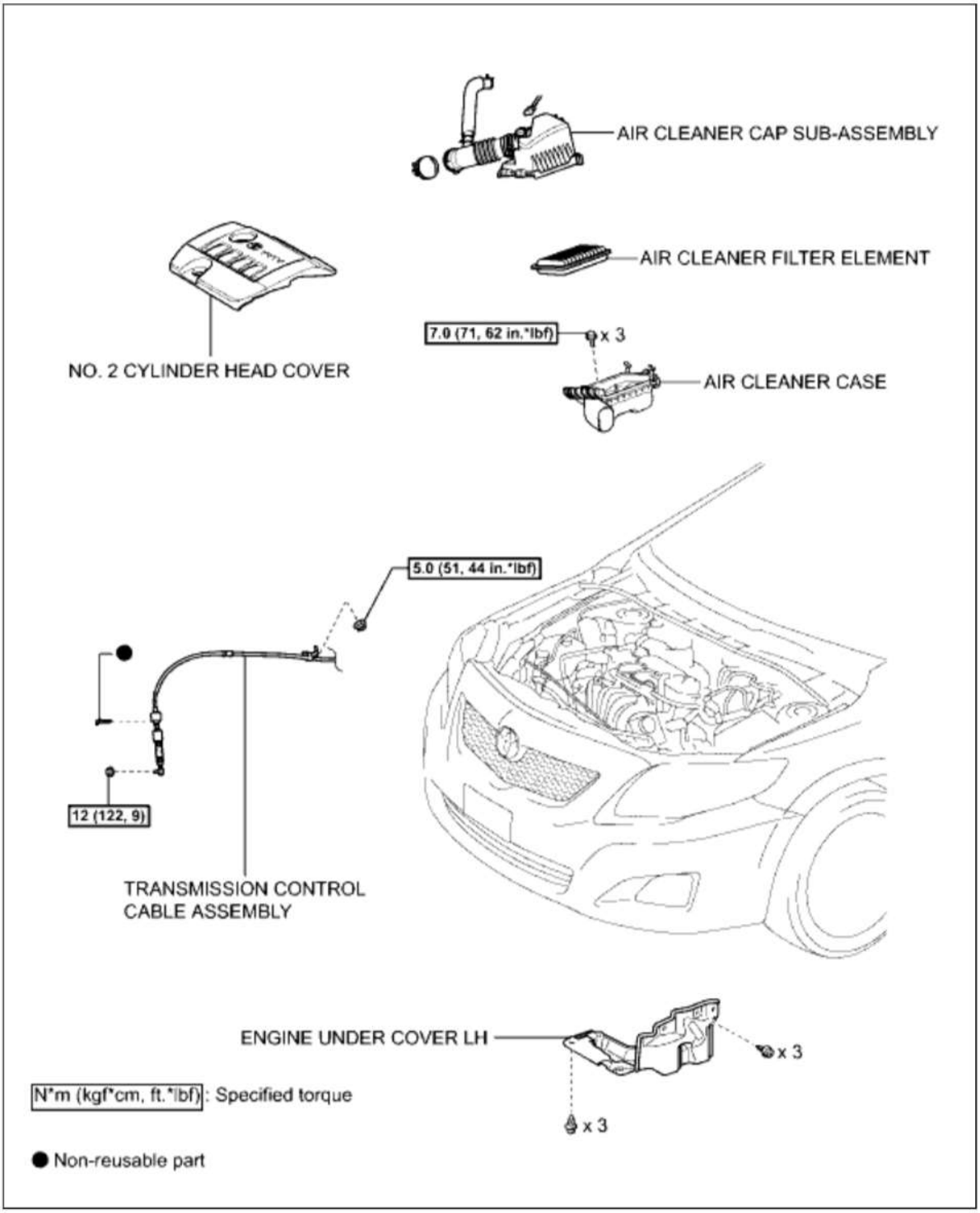
COMPONENTS

ILLUSTRATION



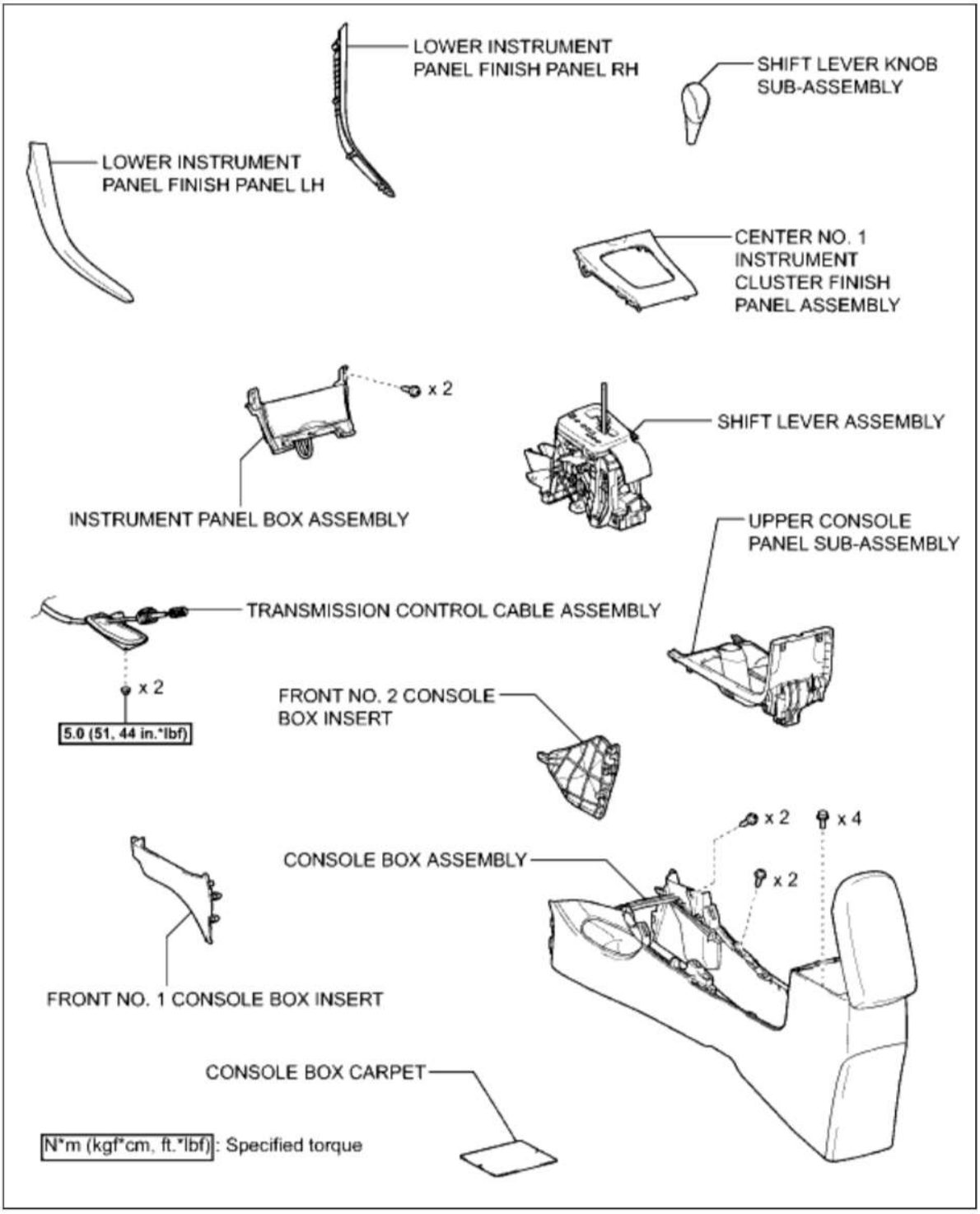
ILLUSTRATION

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ILLUSTRATION

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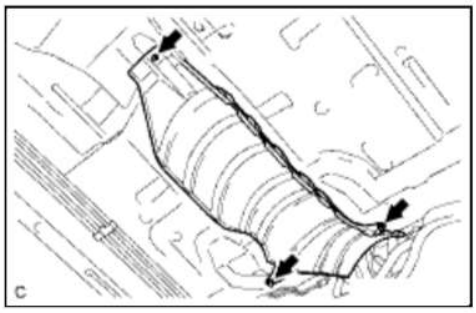


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020UC01FX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL LH INFO
2. REMOVE LOWER INSTRUMENT PANEL FINISH PANEL RH INFO
3. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY INFO
4. REMOVE CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO
5. REMOVE INSTRUMENT PANEL BOX ASSEMBLY INFO
6. REMOVE FRONT NO. 1 CONSOLE BOX INSERT INFO
7. REMOVE FRONT NO. 2 CONSOLE BOX INSERT INFO
8. REMOVE UPPER CONSOLE PANEL SUB-ASSEMBLY INFO
9. REMOVE CONSOLE BOX CARPET INFO
10. REMOVE CONSOLE BOX ASSEMBLY INFO
11. REMOVE NO. 2 CYLINDER HEAD COVER INFO
12. REMOVE AIR CLEANER CAP SUB-ASSEMBLY INFO
13. REMOVE AIR CLEANER CASE INFO
14. REMOVE ENGINE UNDER COVER LH
15. REMOVE FRONT EXHAUST PIPE ASSEMBLY INFO
16. REMOVE FRONT NO. 1 FLOOR HEAT INSULATOR

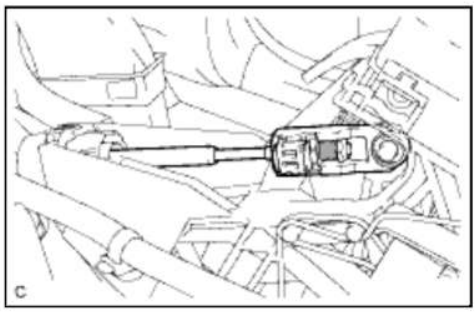


(a) Remove the 3 nuts and front No. 1 floor heat insulator.

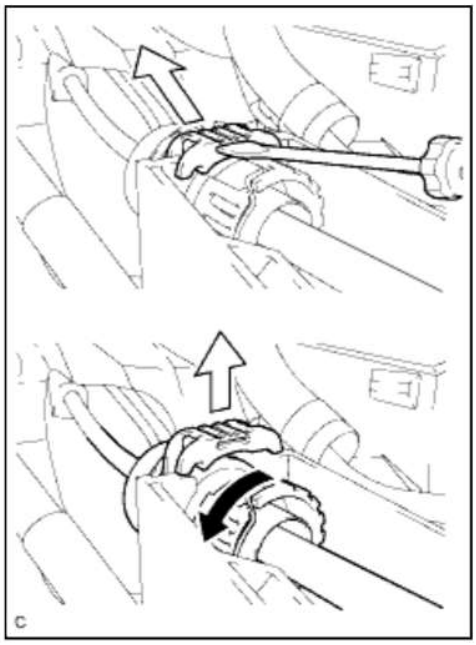
17. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY

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(a) Move the shift lever to N.



(b) Disconnect the end of the transmission control cable assembly from the shift lever assembly.



(c) Using a screwdriver, pull out the stopper of the transmission control cable.

NOTICE:

Do not remove the stopper. If the stopper is removed, reinstall it to its original position.

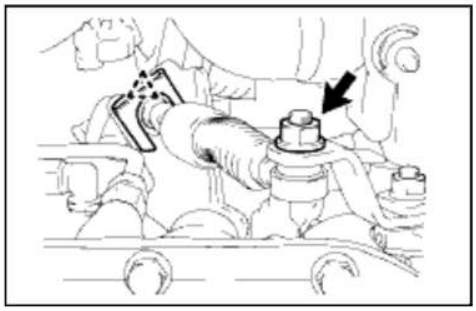
(d) Rotate the nut counterclockwise approximately 180°, and while holding the nut in place, disconnect the transmission control cable from the shift lever retainer.

NOTICE:

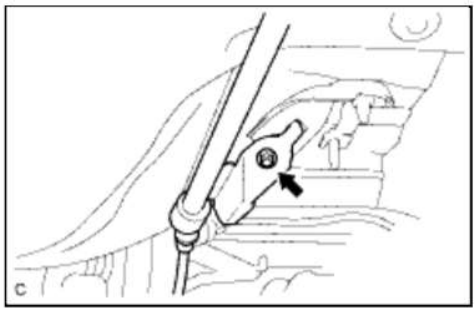
Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.

(e) Remove the clip and disconnect the transmission control cable assembly from the control cable bracket.

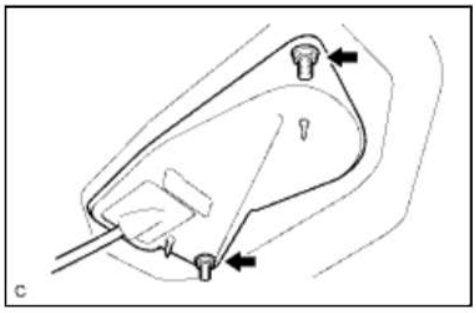
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(f) Remove the nut and transmission control cable assembly from the control shaft lever.



(g) Remove the nut and separate the transmission control cable assembly support from the rear engine mounting insulator.



(h) Remove the 2 nuts and separate the transmission control cable assembly from the body.

(i) Pull out the transmission control cable assembly from the body.

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Last Modified: 3-10-2010	6.4 N	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020U401UX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: ADJUSTMENT (2010 Corolla)		

ADJUSTMENT

1. INSPECT SHIFT LEVER POSITION

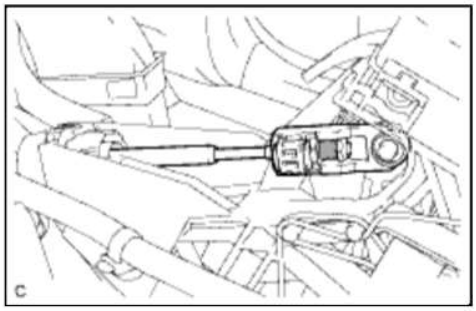
(a) When moving the shift lever from P to R with the ignition switch ON and the brake pedal depressed, make sure that the shift lever moves smoothly and correctly into position.

(b) Start the engine and make sure that the vehicle moves forward when moving the shift lever from N to D and moves rearward when moving the shift lever to R. If the operation cannot be performed as specified, inspect the park/neutral position switch assembly and check the shift lever assembly installation condition.

2. ADJUST SHIFT LEVER POSITION

(a) Apply the parking brake and move the shift lever to N.

(b) Remove the console box assembly INFO .



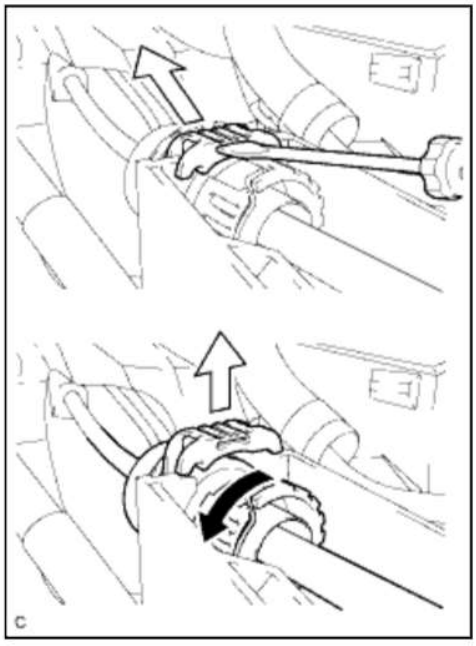
(c) Disconnect the end of the transmission control cable assembly from the shift lever assembly.

(d) Using a screwdriver, pull out the stopper of the transmission control cable.

NOTICE:

Do not remove the stopper. If the stopper is removed, reinstall it to its original position.

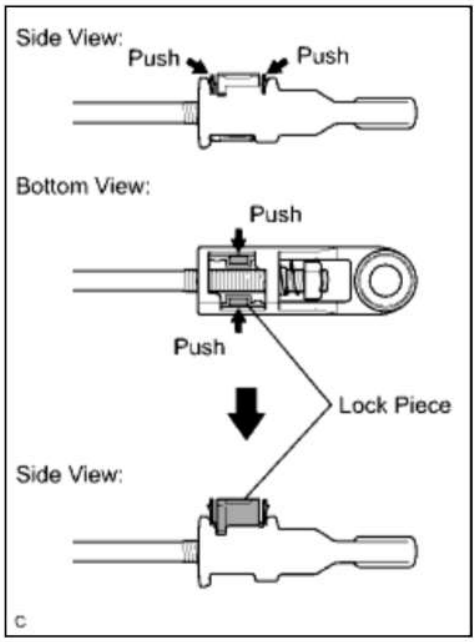
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(e) Rotate the nut counterclockwise approximately 180°, and while holding the nut in place, disconnect the transmission control cable from the shift lever retainer.

NOTICE:

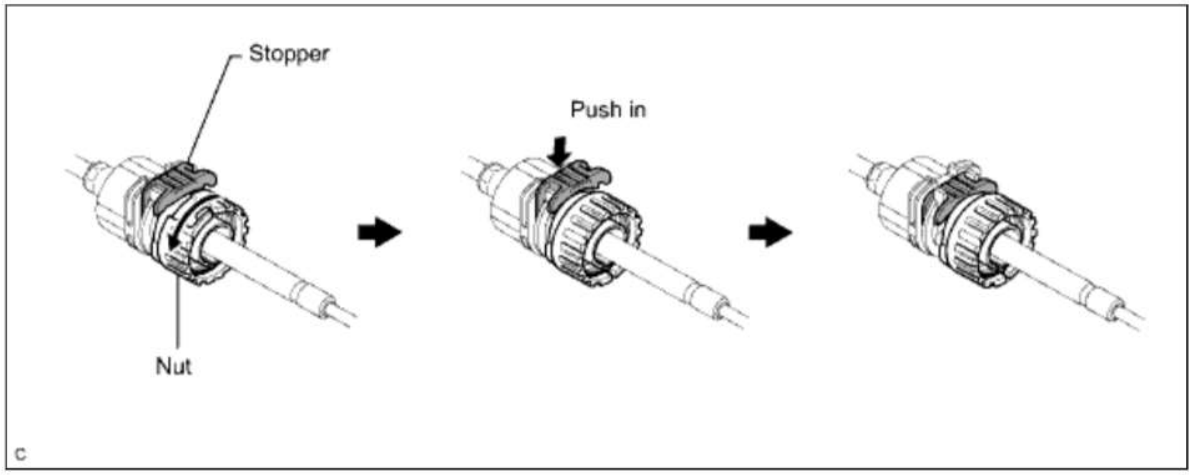
Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.



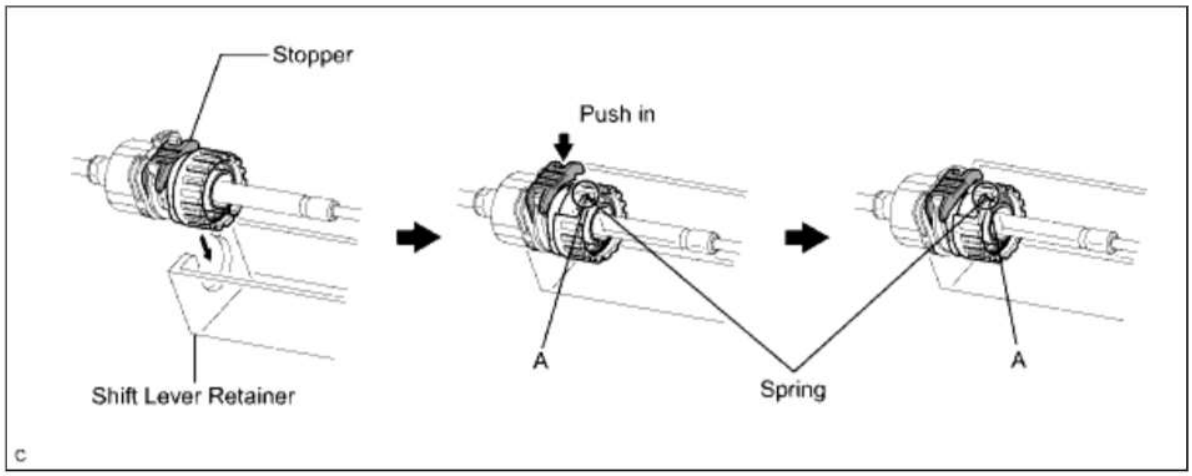
(f) Push the 2 claws together at the top of the transmission control cable lock piece. While holding the 2 claws together, push the 2 lugs on the bottom of the lock piece toward each other and upward to pull out the lock piece.

(g) Turn the nut of the transmission control cable 180° counterclockwise. While holding the nut in place, push in the stopper until the stopper clicks twice.

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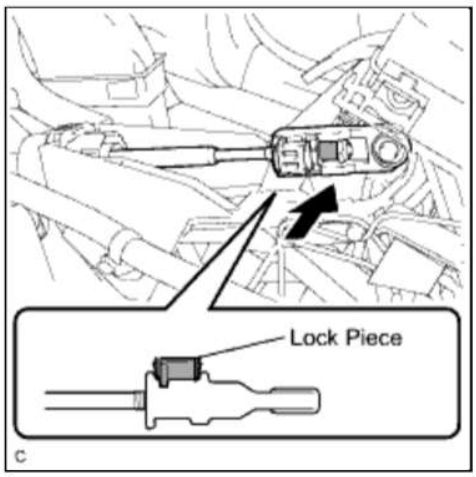


(h) Install the outer part of the transmission control cable to the shift lever retainer. Check that the spring is positioned at "A" and push in the stopper.



HINT:

If the stopper cannot be pushed in, slightly turn the nut clockwise and then push in the stopper again.

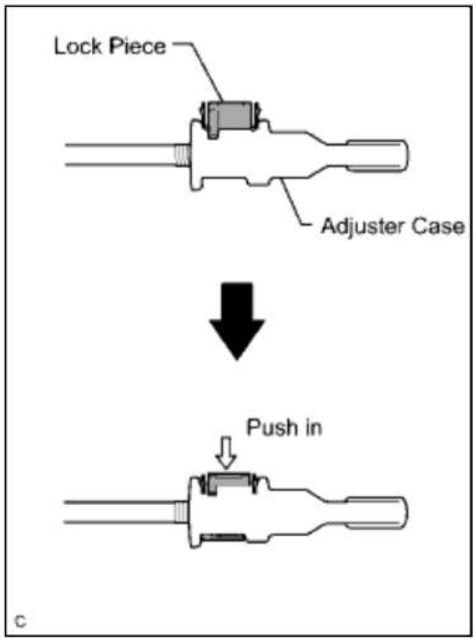


(i) Install the cable end to the shift lever assembly.

NOTICE:

- Check that the lock piece is pulled up.
- Install the cable end all the way to the base of the pin.

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(j) Push the lock piece into the adjuster case.

NOTICE:

Securely push in the lock piece until it locks.

(k) After adjusting the shift lever position, check the operation and function of the shift lever. If there is a problem, adjust the position again.

(l) Install the console box assembly INFO .

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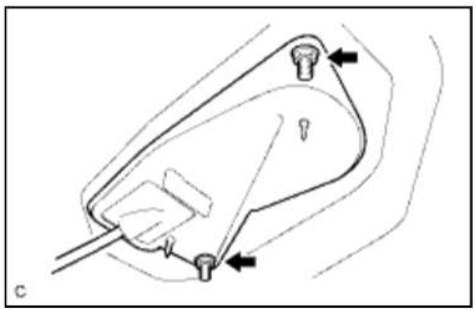
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000020UA01FX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

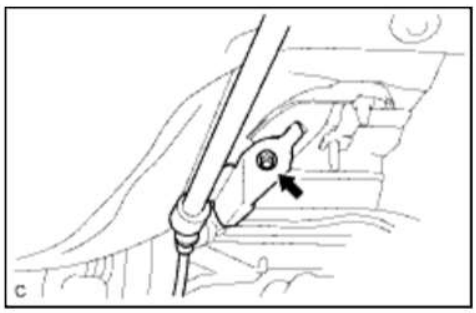
NOTICE:

Before installing the transmission control cable assembly, check that the park/neutral position switch and the shift lever are in N.



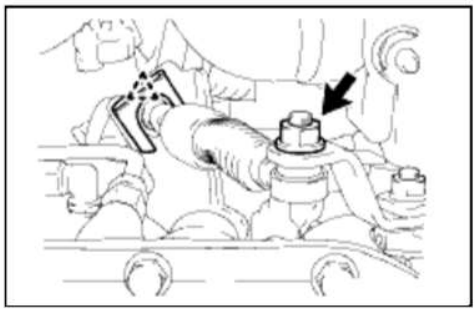
(a) Put the transmission control cable into the cabin and connect the transmission control cable with the 2 nuts.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)



(b) Install the transmission control cable bracket to the rear engine mounting insulator with the nut.

Torque: 5.0 N·m (51 kgf·cm, 44in·lbf)



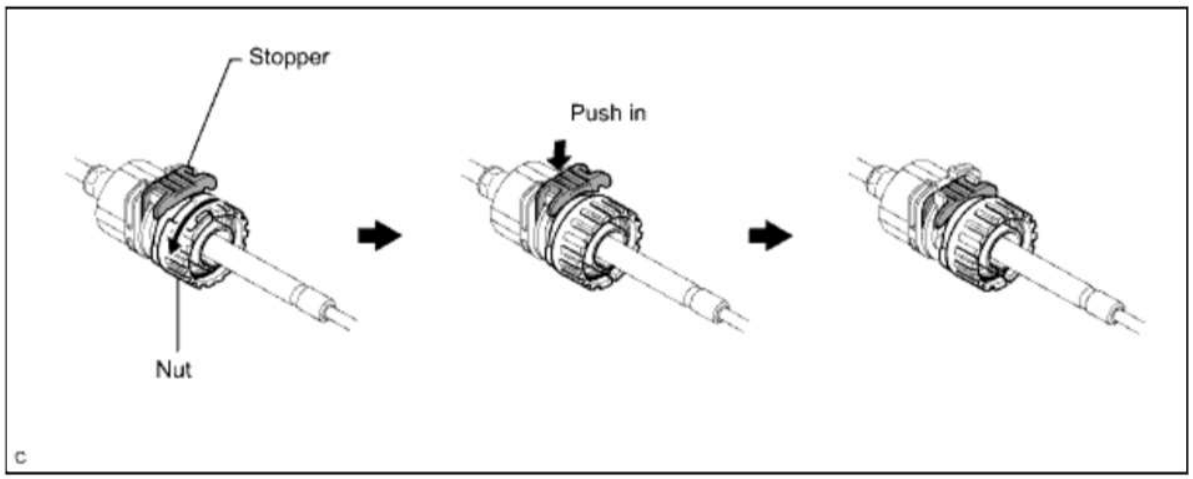
(c) Connect the transmission control cable to the transmission control cable bracket with a new clip.

(d) Connect the transmission control cable to the control shaft lever with the nut.

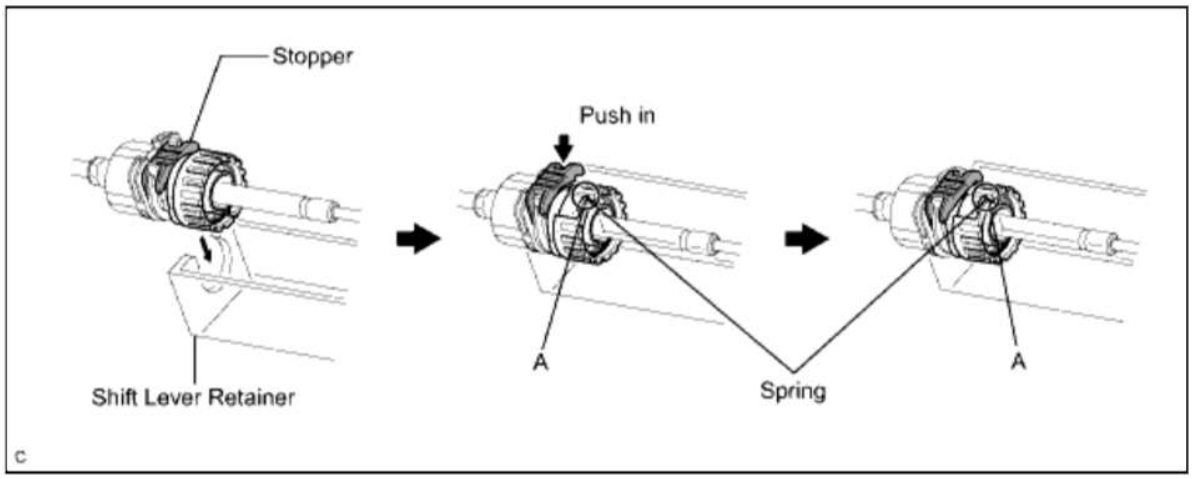
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

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(e) Turn the nut of the transmission control cable 180° counterclockwise. While holding the nut in place, push in the stopper until the stopper clicks twice.



(f) Install the outer part of the transmission control cable to the shift lever retainer. Check that the spring is positioned at "A" and push in the stopper.



HINT:

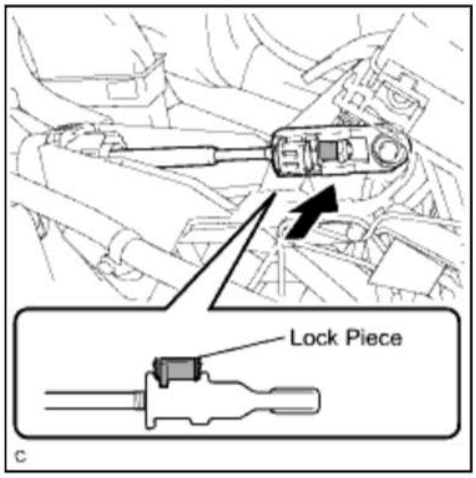
If the stopper cannot be pushed in, slightly turn the nut clockwise and then push in the stopper again.

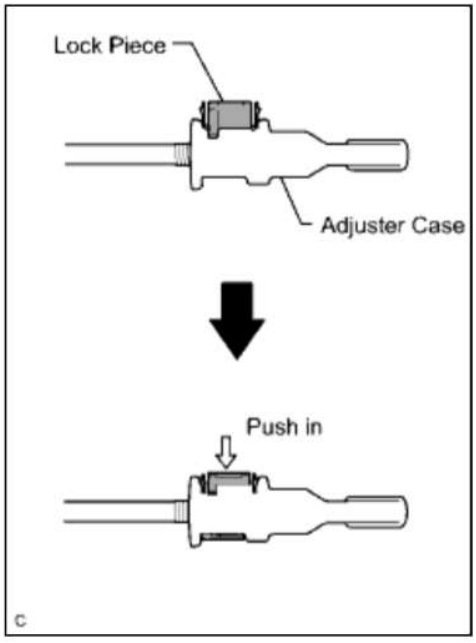
(g) Install the cable end to the shift lever assembly.

NOTICE:

- Check that the lock piece is pulled up.
- Install the cable end all the way to the base of the pin.

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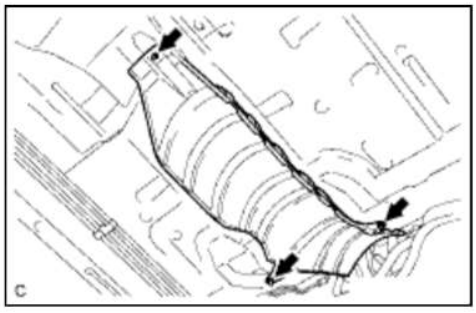


(h) Push the lock piece into the adjuster case.

NOTICE:

Securely push in the lock piece until it locks.

2. INSTALL FRONT NO. 1 FLOOR HEAT INSULATOR



(a) Install the front No. 1 floor heat insulator with the 3 nuts.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

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3. INSTALL FRONT EXHAUST PIPE ASSEMBLY INFO

4. INSTALL ENGINE UNDER COVER LH

5. INSTALL AIR CLEANER CASE INFO

6. INSTALL AIR CLEANER CAP SUB-ASSEMBLY INFO

7. INSTALL NO. 2 CYLINDER HEAD COVER INFO

8. INSTALL CONSOLE BOX ASSEMBLY INFO

9. INSTALL CONSOLE BOX CARPET INFO

10. INSTALL UPPER CONSOLE PANEL SUB-ASSEMBLY INFO

11. INSTALL FRONT NO. 1 CONSOLE BOX INSERT INFO

12. INSTALL FRONT NO. 2 CONSOLE BOX INSERT INFO

13. INSTALL INSTRUMENT PANEL BOX ASSEMBLY INFO

14. INSTALL CENTER NO. 1 INSTRUMENT CLUSTER FINISH PANEL ASSEMBLY INFO

15. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY INFO

16. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL LH INFO

17. INSTALL LOWER INSTRUMENT PANEL FINISH PANEL RH INFO

18. INSPECT SHIFT LEVER POSITION INFO

19. ADJUST SHIFT LEVER POSITION INFO

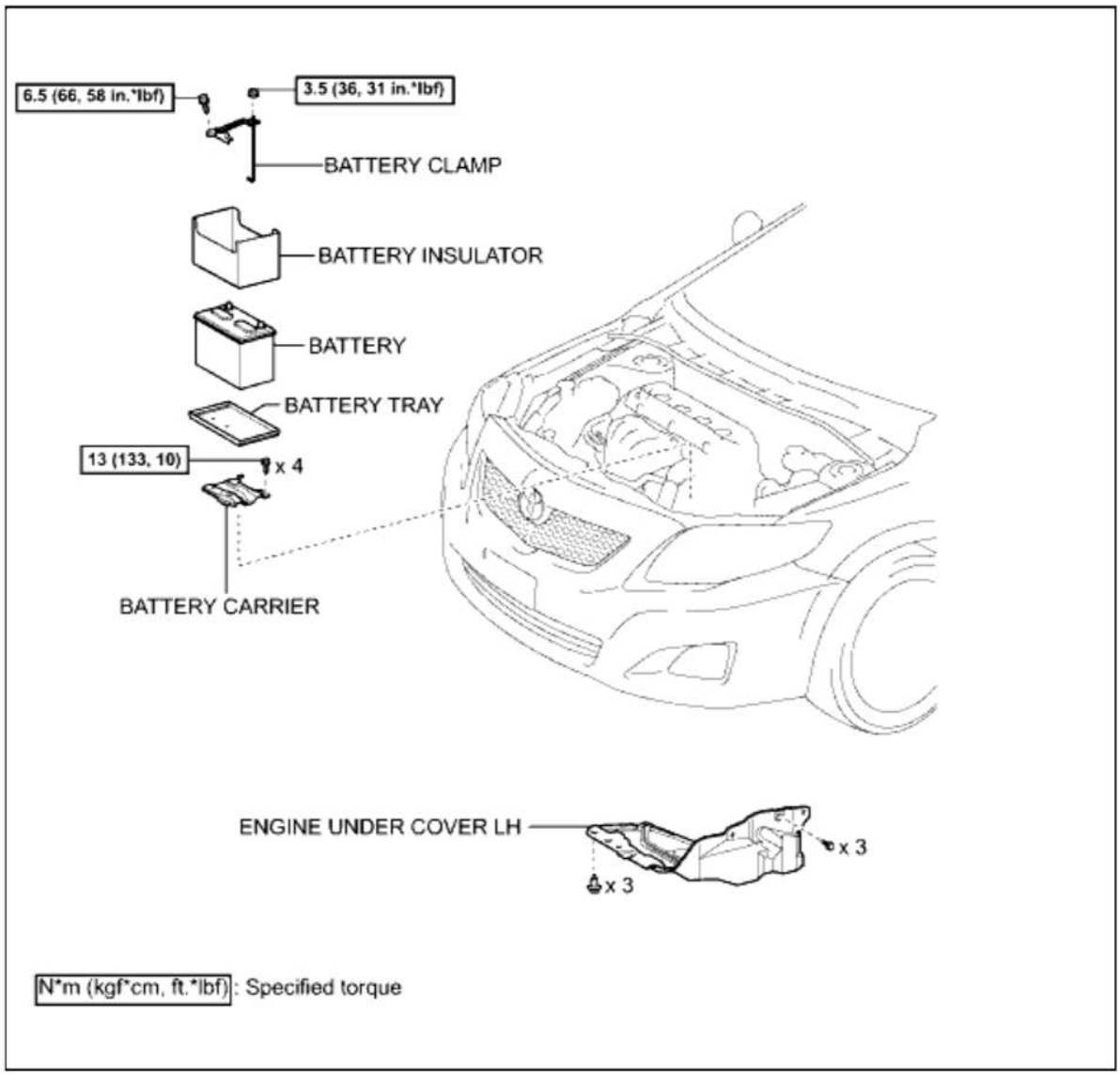


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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001CUK00KX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: COMPONENTS (2010 Corolla)		

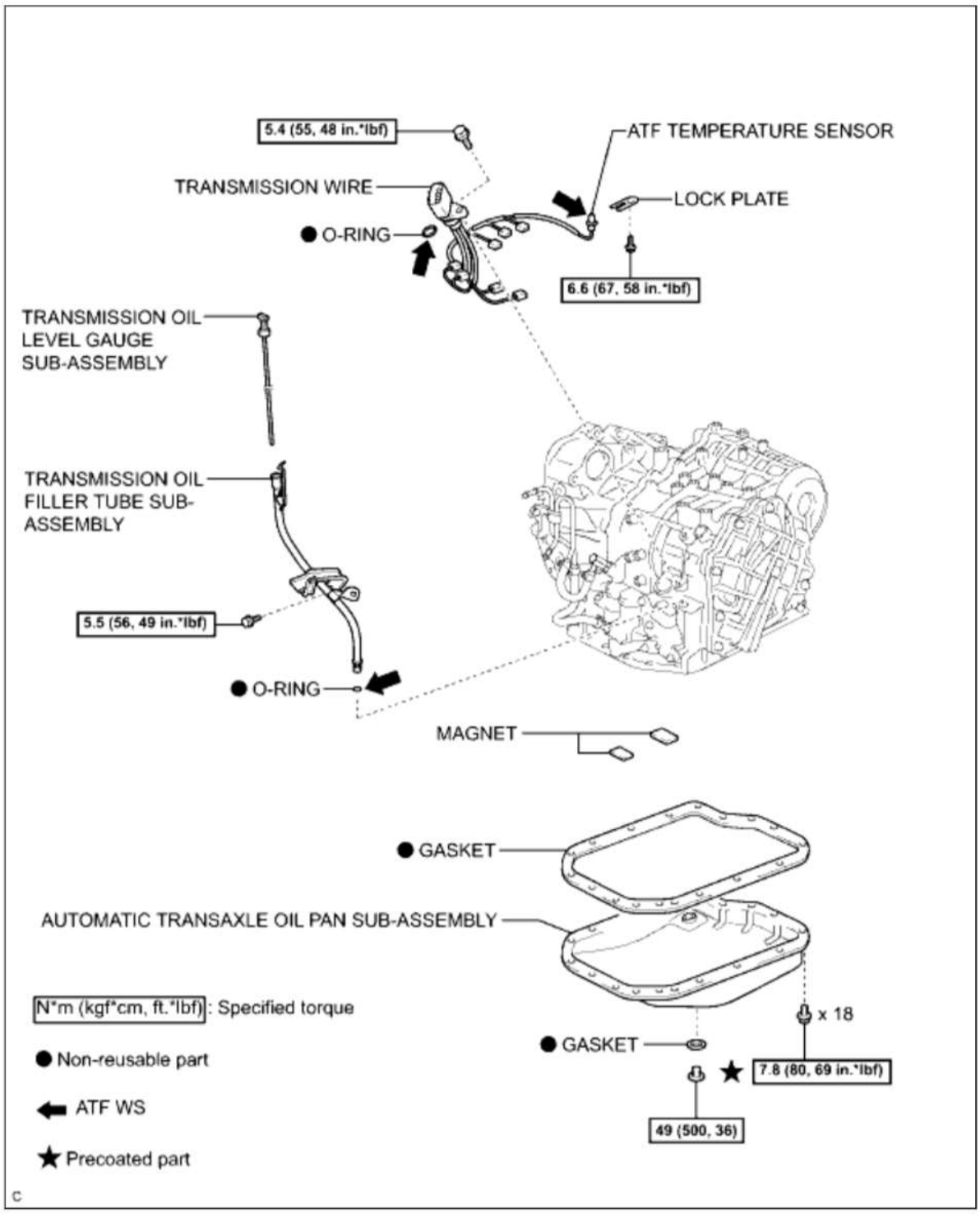
COMPONENTS

ILLUSTRATION



ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWZ00YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: REMOVAL (2010 Corolla)		

REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO .

2. DRAIN AUTOMATIC TRANSAXLE FLUID

(a) Remove the drain plug and gasket to drain the ATF.

(b) Install a new gasket and the drain plug.

Torque: 49 N·m (500 kgf·cm, 36ft·lbf)

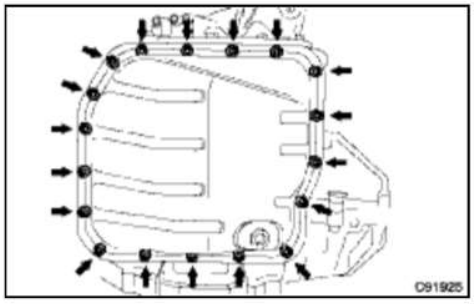
3. REMOVE BATTERY INFO

4. REMOVE BATTERY CARRIER INFO

5. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY INFO

6. REMOVE ENGINE UNDER COVER LH

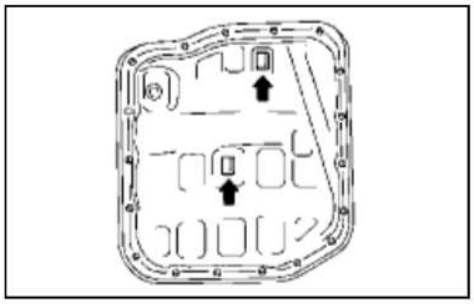
7. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY



(a) Remove the 18 bolts, oil pan and gasket.

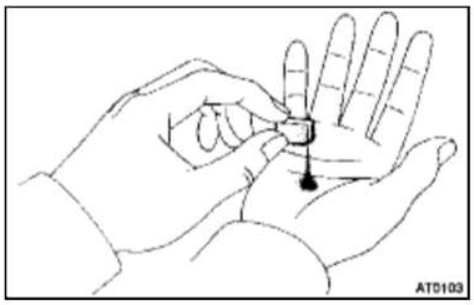
NOTICE:

Some fluid will remain in the oil pan. Remove all the pan bolts, and carefully remove the oil pan assembly.



(b) Remove the 2 magnets from the oil pan.

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(c) Examine particles in the pan.

(1) Collect any steel chips with the removed magnets. Look carefully at the chips and particles in the pan and on the magnets to see the type of wear which might be found in the transaxle.

Result:

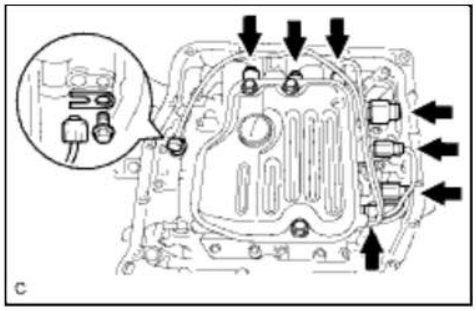
Steel (magnetic)

bearing, gear and plate wear

Brass (non-magnetic)

bushing wear

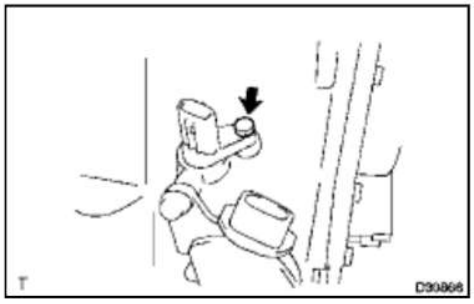
8. DISCONNECT TRANSMISSION WIRE



(a) Disconnect the 7 shift solenoid valve connectors.

(b) Remove the bolt and lock plate to disconnect the ATF temperature sensor.

9. REMOVE TRANSMISSION WIRE

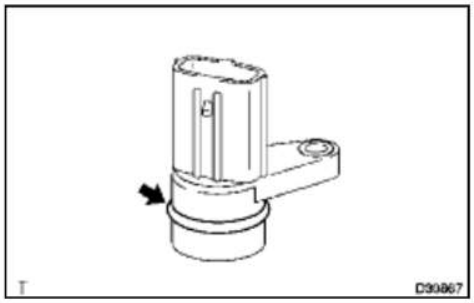


(a) Disconnect the transmission wire connector.

(b) Remove the bolt and transmission wire.

(c) Remove the O-ring from the transmission wire.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001STZ013X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSPECTION (2010 Corolla)		

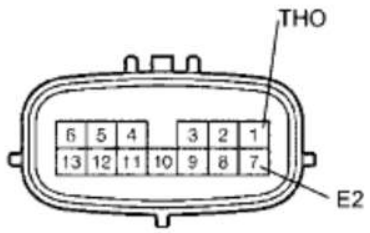
INSPECTION

1. INSPECT TRANSMISSION WIRE

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

Component without harness connected:
(Transmission Wire)



TESTER CONNECTION	ATF TEMPERATURE	SPECIFIED CONDITION
1 (THO) - 7 (E2)	10°C (50°F)	5 to 8 kΩ
1 (THO) - 7 (E2)	25°C (77°F)	2.5 to 4.5 kΩ
1 (THO) - 7 (E2)	110°C (230°F)	0.22 to 0.28 kΩ

HINT:

If the resistance is out of the specified range with the ATF temperature shown in the table above, the driveability of the vehicle may decrease.

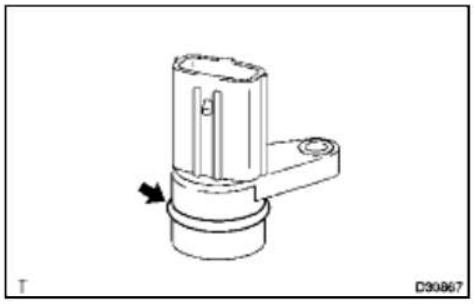
If the resistance value is not as specified, replace the transmission wire.

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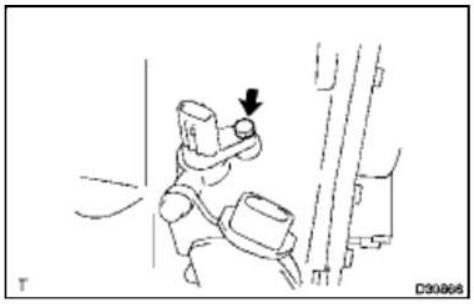
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWY00YX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL TRANSMISSION WIRE



(a) Coat a new O-ring of the transmission wire connector with ATF WS and install it to the transmission wire.

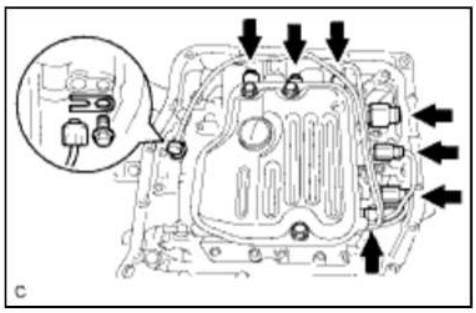


(b) Install the transmission wire with the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

(c) Connect the transmission wire connector.

2. CONNECT TRANSMISSION WIRE



(a) Coat the O-ring of the ATF temperature sensor with ATF WS.

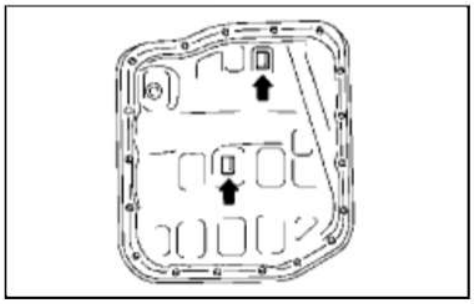
(b) Install the ATF temperature sensor with the lock plate and bolt.

Torque: 6.6 N·m (67 kgf·cm, 58in·lbf)

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(c) Connect the 7 shift solenoid valve connectors.

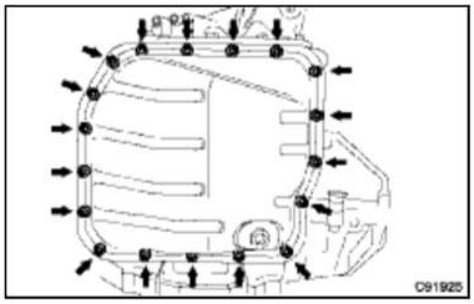
3. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY



(a) Install the 2 magnets in the oil pan.

(b) Apply adhesive or equivalent to the 18 bolts.

Adhesive:
Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent



(c) Using a new gasket, install the oil pan to the transaxle case with the 18 bolts.

Torque: 7.8 N·m (80 kgf·cm, 69in·lbf)

NOTICE:

Since the bolts should be seal bolts, apply adhesive to the bolts and tighten them within 10 minutes of application.

4. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY INFO

5. INSTALL BATTERY CARRIER INFO

6. INSTALL BATTERY INFO

7. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO .

8. INSTALL ENGINE UNDER COVER LH

9. ADD AUTOMATIC TRANSAXLE FLUID

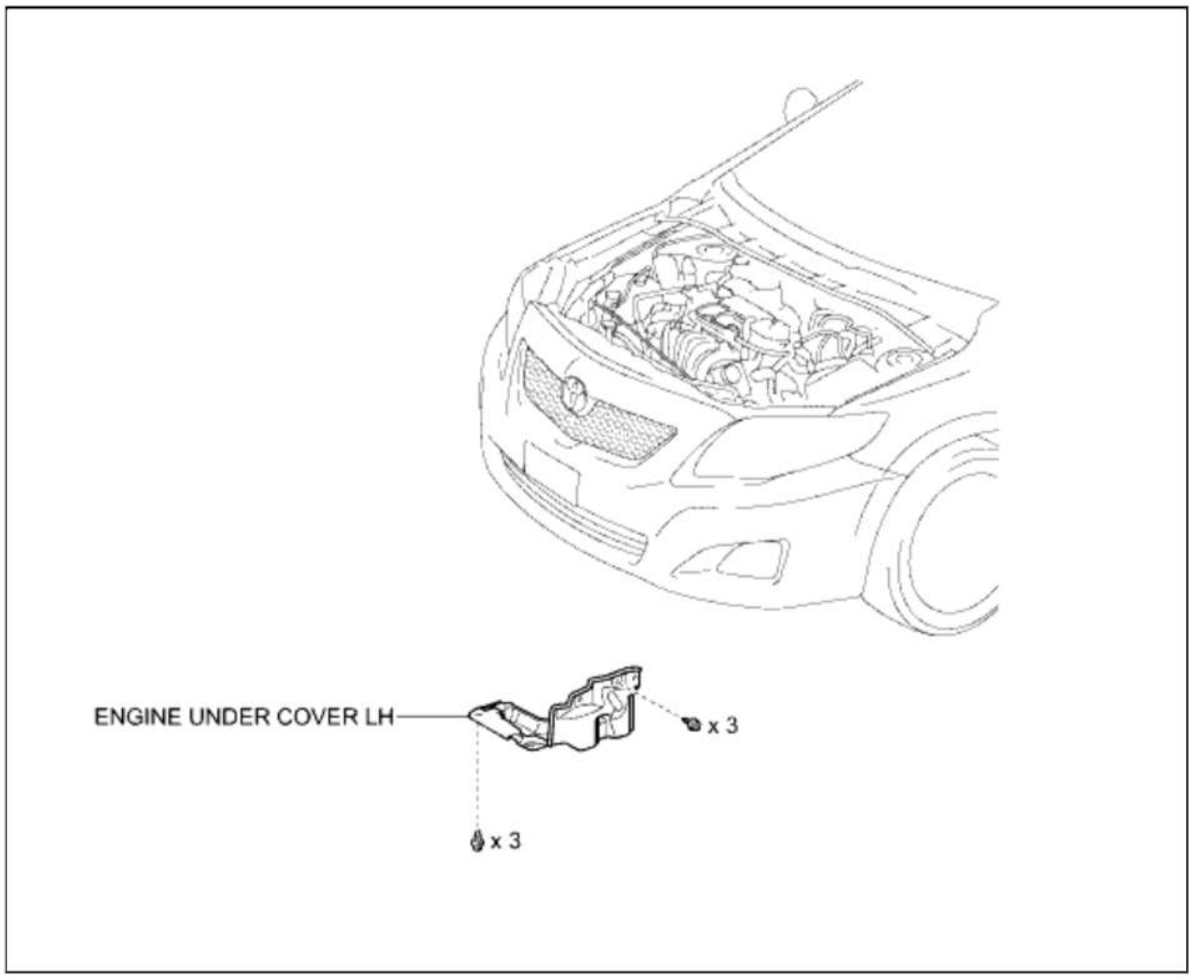
10. INSPECT TRANSAXLE FLUID LEVEL INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191H010X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: COMPONENTS (2010 Corolla)		

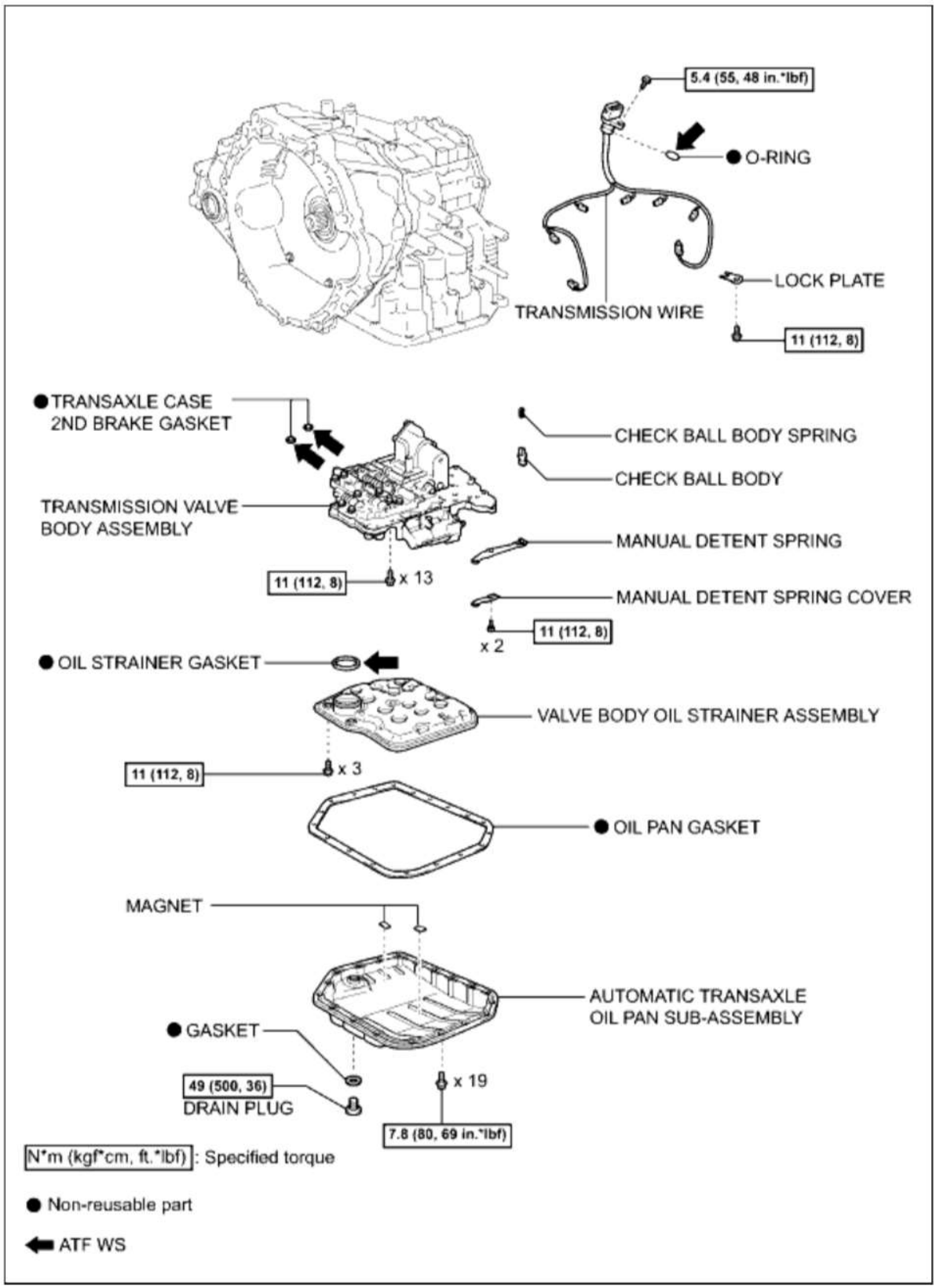
COMPONENTS

ILLUSTRATION



ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000191I01FX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE ENGINE UNDER COVER LH

2. DRAIN AUTOMATIC TRANSAXLE FLUID INFO

3. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY INFO

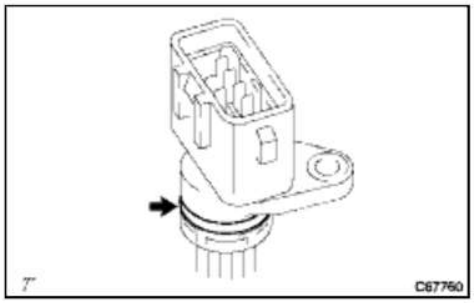
4. REMOVE VALVE BODY OIL STRAINER ASSEMBLY INFO

5. REMOVE TRANSMISSION VALVE BODY ASSEMBLY INFO

6. REMOVE TRANSMISSION WIRE



(a) Remove the bolt and transmission wire from the transaxle case.



(b) Remove the O-ring from the transmission wire.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191G01NX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSPECTION (2010 Corolla)		

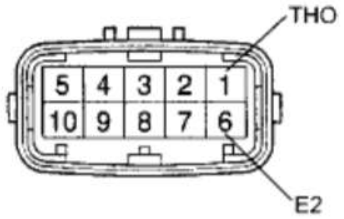
INSPECTION

1. INSPECT TRANSMISSION WIRE

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

Component without harness connected:
(Transmission Wire)



TESTER CONNECTION	ATF TEMPERATURE	SPECIFIED CONDITION
1 (THO) - 6 (E2)	10°C (50°F)	5 to 8 kΩ
1 (THO) - 6 (E2)	25°C (77°F)	2.5 to 4.5 kΩ
1 (THO) - 6 (E2)	110°C (230°F)	0.22 to 0.28 kΩ

HINT:

If the resistance is out of the specified range with the ATF temperature shown in the table above, the driveability of the vehicle may decrease.

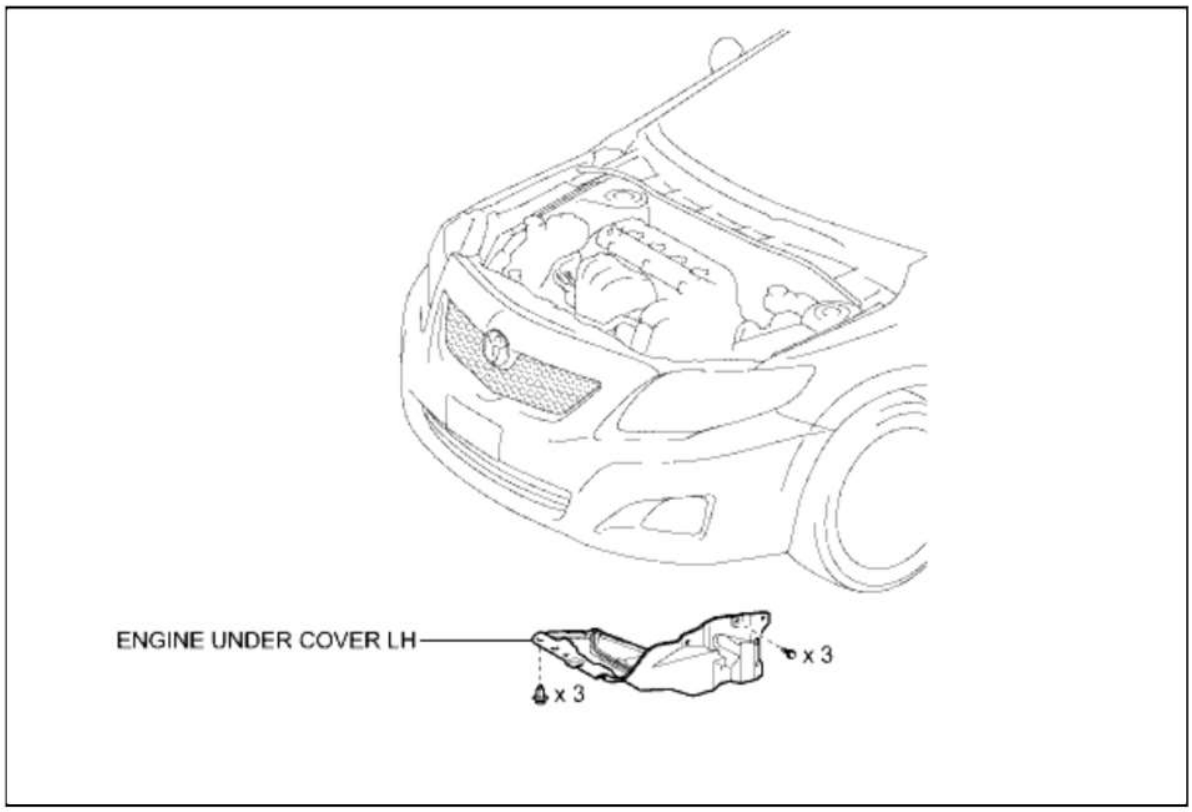
If the resistance value is not as specified, replace the transmission wire.

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001CUL00HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: COMPONENTS (2010 Corolla)		

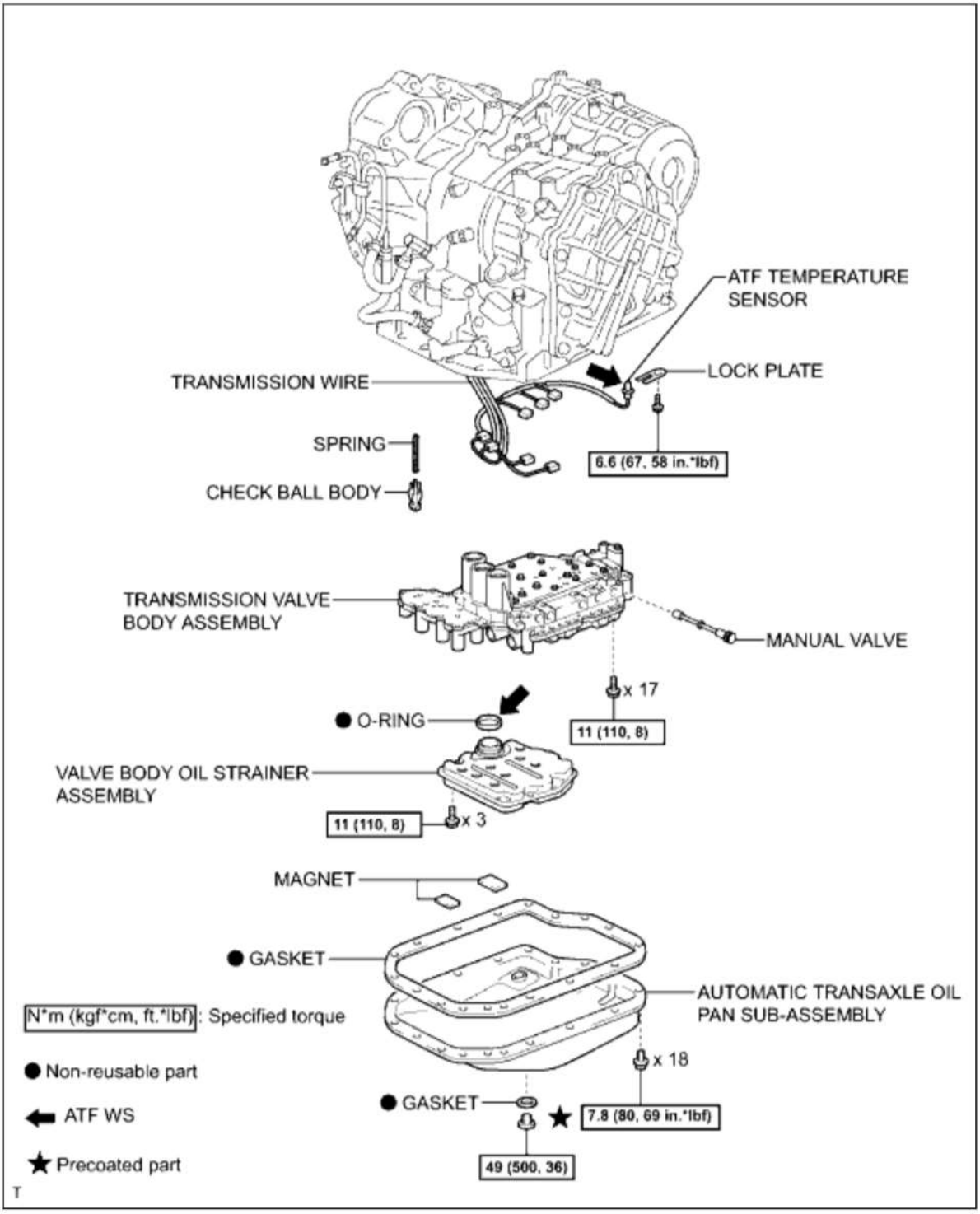
COMPONENTS

ILLUSTRATION



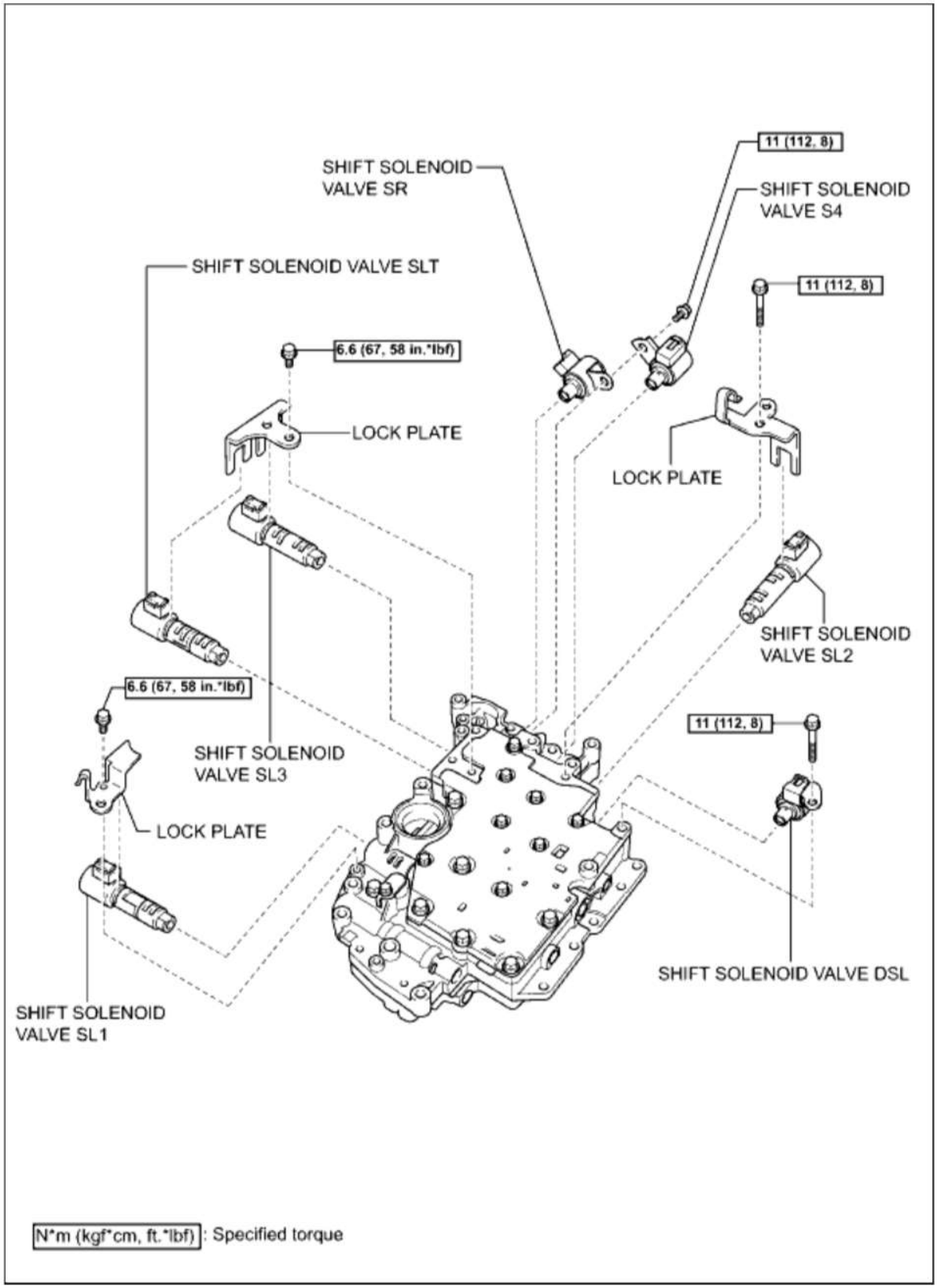
ILLUSTRATION

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ILLUSTRATION

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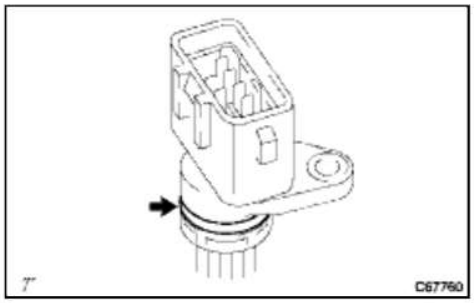


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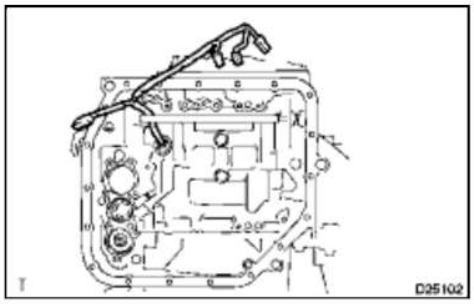
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191F01FX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSTALL TRANSMISSION WIRE



(a) Coat a new O-ring with ATF and install it to the transmission wire.



(b) Pass the transmission wire through the transaxle.



(c) Install the transmission wire with the bolt.

Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)

2. INSTALL TRANSMISSION VALVE BODY ASSEMBLY INFO

3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY INFO

4. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY INFO

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5. ADD AUTOMATIC TRANSAXLE FLUID

6. INSPECT TRANSAXLE FLUID LEVEL INFO

7. INSTALL ENGINE UNDER COVER LH



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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWX01GX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REMOVAL (2010 Corolla)		

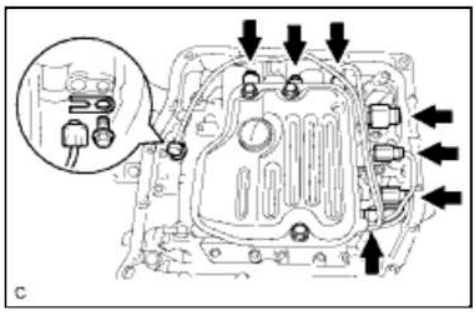
REMOVAL

1. REMOVE ENGINE UNDER COVER LH

2. DRAIN AUTOMATIC TRANSAXLE FLUID INFO

3. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY INFO

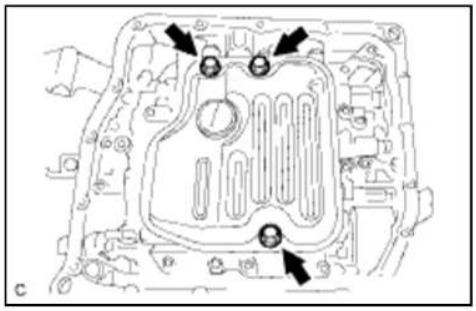
4. DISCONNECT TRANSMISSION WIRE



(a) Disconnect the 7 shift solenoid valve connectors.

(b) Remove the bolt and lock plate to disconnect the ATF temperature sensor.

5. REMOVE VALVE BODY OIL STRAINER ASSEMBLY



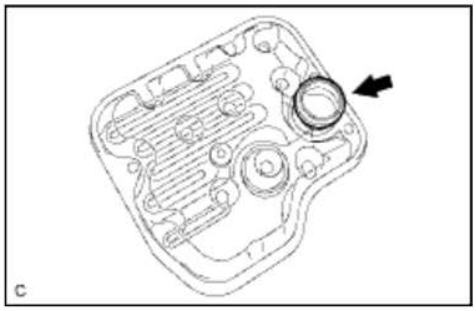
(a) Remove the 3 bolts and oil strainer.

NOTICE:

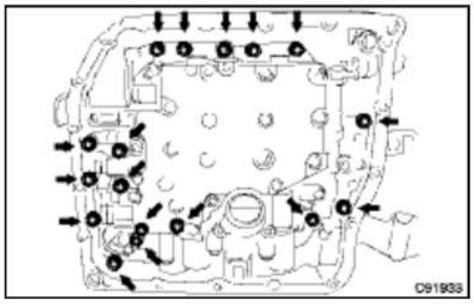
Be careful as some fluid will come out of the oil strainer.

(b) Remove the O-ring from the oil strainer.

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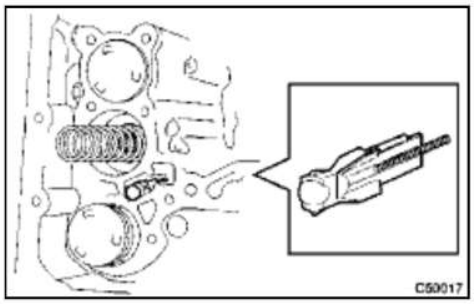
6. REMOVE TRANSMISSION VALVE BODY ASSEMBLY



(a) Support the valve body assembly and remove the 17 bolts and the valve body assembly.

NOTICE:

Be careful not to drop the check ball, spring or accumulator piston.



(b) Remove the check ball body and spring.

7. REMOVE MANUAL VALVE

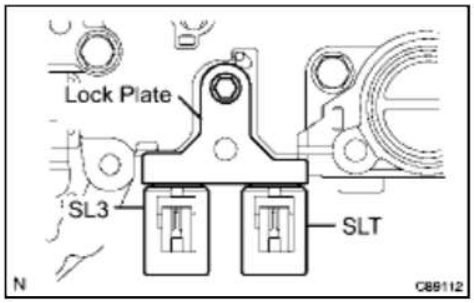
(a) Remove the manual valve from the valve body assembly.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000010 9S00TX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: DISASSEMBLY (2010 Corolla)		

DISASSEMBLY

1. REMOVE SHIFT SOLENOID VALVE SL3



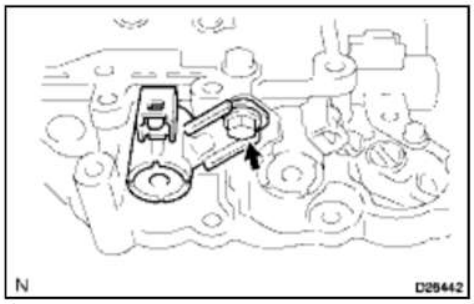
(a) Remove the bolt and lock plate from the valve body assembly.

(b) Remove the shift solenoid valve SL3 from the valve body assembly.

2. REMOVE SHIFT SOLENOID VALVE SLT

(a) Remove the shift solenoid valve SLT from the valve body assembly.

3. REMOVE SHIFT SOLENOID VALVE S4

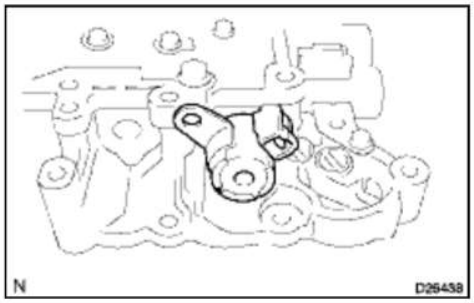


(a) Remove the bolt and shift solenoid valve S4 from the valve body assembly.

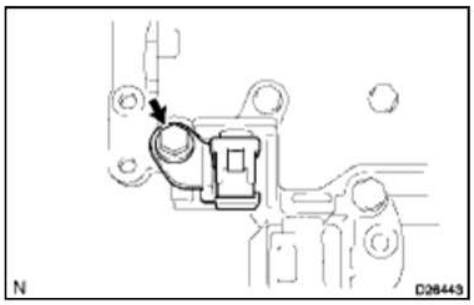
4. REMOVE SHIFT SOLENOID VALVE SR

(a) Remove the shift solenoid valve SR from the valve body assembly.

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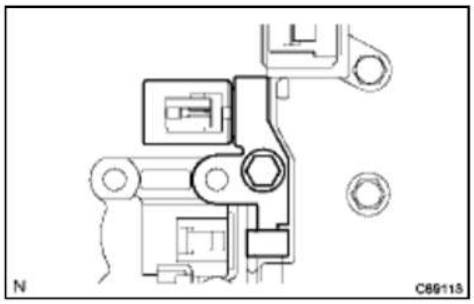


5. REMOVE SHIFT SOLENOID VALVE DSL



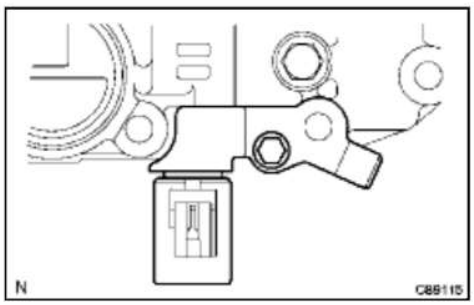
(a) Remove the bolt and shift solenoid valve DSL from the valve body assembly.

6. REMOVE SHIFT SOLENOID VALVE SL2



(a) Remove the bolt, lock plate and shift solenoid valve SL2 from the valve body assembly.

7. REMOVE SHIFT SOLENOID VALVE SL1



(a) Remove the bolt, lock plate and shift solenoid valve SL1 from the valve body assembly.

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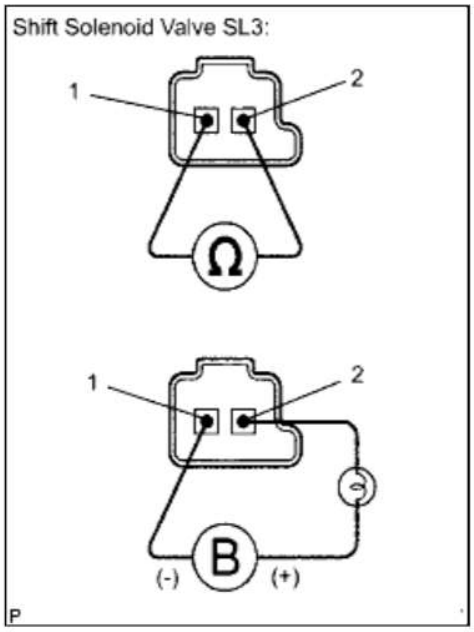


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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002D1F00MX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT SHIFT SOLENOID VALVE SL3



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

If the value is not as specified, replace the shift solenoid valve SL3.

(b) Connect a positive (+) battery lead with a 21 W bulb to terminal 2 and a negative (-) battery lead to terminal 1 of the solenoid valve connector, then check the operation of the valve.

OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve SL3.

2. INSPECT SHIFT SOLENOID VALVE SLT

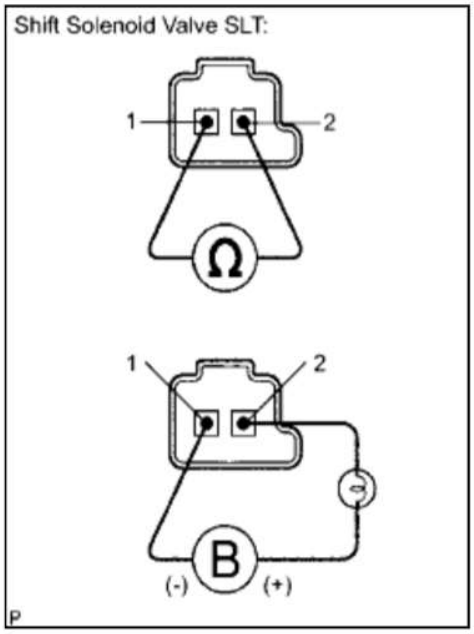
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

If the value is not as specified, replace the shift solenoid

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valve SLT.

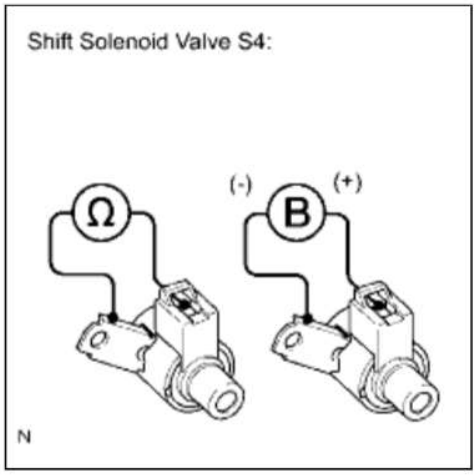
(b) Connect a positive (+) battery lead with a 21 W bulb to terminal 2 and a negative (-) battery lead to terminal 1 of the solenoid valve connector, then check the operation of the valve.

OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve SLT.

3. INSPECT SHIFT SOLENOID VALVE S4



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S4) - Solenoid Body (S4)	20°C (68°F)	11 to 15 Ω

If the value is not as specified, replace the shift solenoid valve S4.

(b) Connect a positive (+) battery lead to the terminal of the solenoid connector, and a negative (-) battery lead to the solenoid body, then check the operation of the valve.

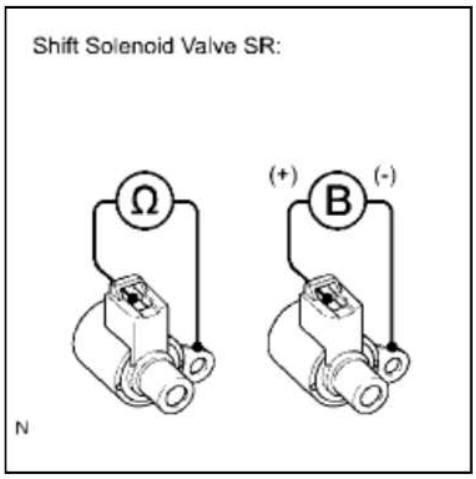
OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve S4.

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4. INSPECT SHIFT SOLENOID VALVE SR



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (SR) - Solenoid Body (SR)	20°C (68°F)	11 to 15 Ω

If the value is not as specified, replace the shift solenoid valve SR.

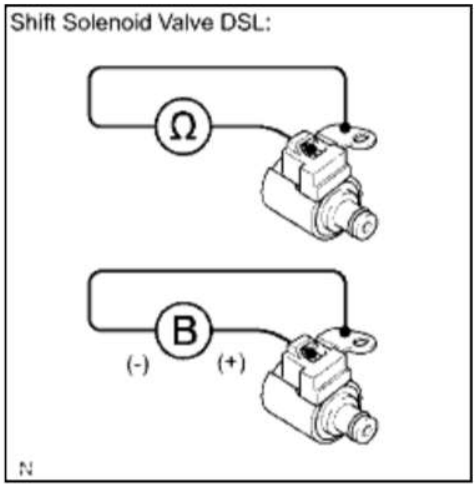
(b) Connect a positive (+) battery lead to the terminal of the solenoid connector, and a negative (-) battery lead to the solenoid body, then check the operation of the valve.

OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve SR.

5. INSPECT SHIFT SOLENOID VALVE DSL



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (DSL) - Solenoid Body (DSL)	20°C (68°F)	11 to 13 Ω

If the value is not as specified, replace the shift solenoid valve.

(b) Connect a positive (+) battery lead to the terminal of the solenoid connector, and a negative (-) battery lead to the solenoid body DSL, then check the operation of the valve.

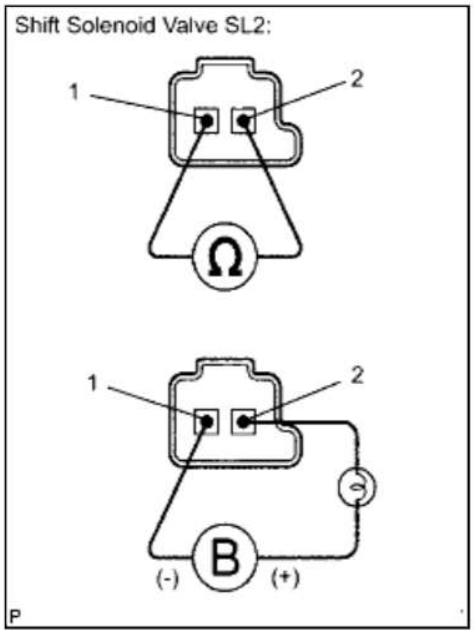
OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve DSL.

6. INSPECT SHIFT SOLENOID VALVE SL2

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(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

If the value is not as specified, replace the shift solenoid valve SL2.

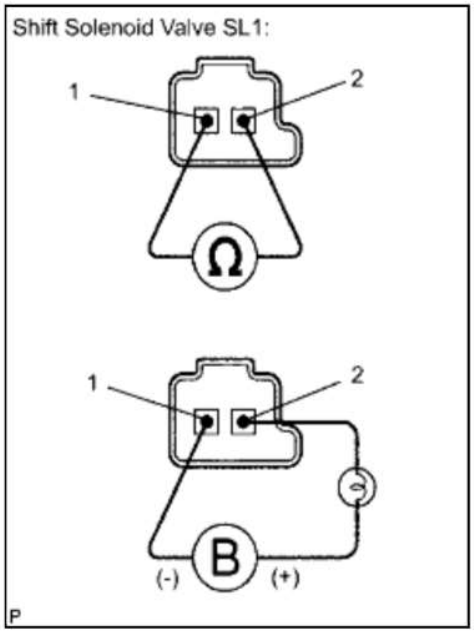
(b) Connect a positive (+) battery lead with a 21 W bulb to terminal 2 and a negative (-) battery lead to terminal 1 of the solenoid valve connector, then check the operation of the valve.

OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve SL2.

7. INSPECT SHIFT SOLENOID VALVE SL1



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

If the value is not as specified, replace the shift solenoid valve SL1.

(b) Connect a positive (+) battery lead with a 21 W bulb to terminal 2 and a negative (-) battery lead

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to terminal 1 of the solenoid valve connector, then check the operation of the valve.

OK:

The solenoid valve makes an operating sound.

If the result is not as specified, replace the shift solenoid valve SL1.

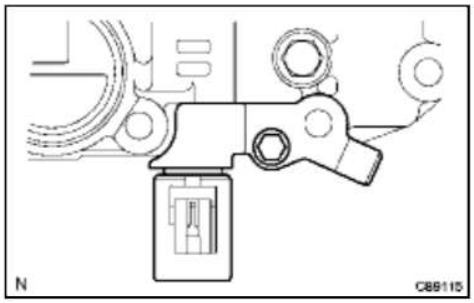


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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000109T00TX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REASSEMBLY (2010 Corolla)		

REASSEMBLY

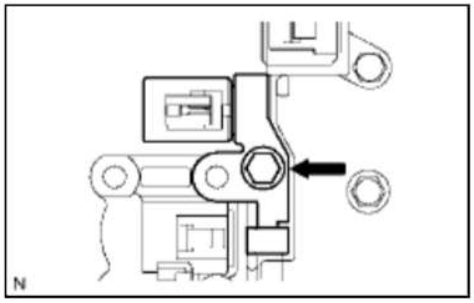
1. INSTALL SHIFT SOLENOID VALVE SL1



(a) Install the shift solenoid valve SL1 and lock plate to the valve body assembly with the bolt.

Torque: 6.6 N·m (67 kgf·cm, 58in·lbf)

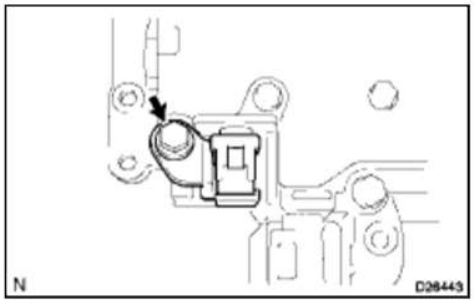
2. INSTALL SHIFT SOLENOID VALVE SL2



(a) Install the shift solenoid valve SL2 and lock plate to the valve body assembly with the bolt.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

3. INSTALL SHIFT SOLENOID VALVE DSL

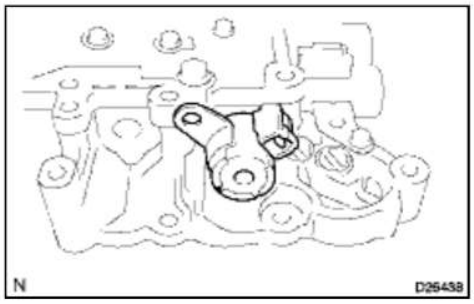


(a) Install the shift solenoid valve DSL to the valve body assembly with the bolt.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

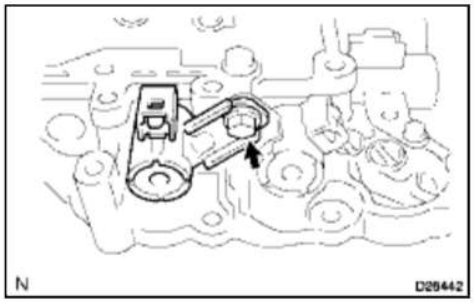
4. INSTALL SHIFT SOLENOID VALVE SR

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(a) Install the shift solenoid valve SR to the valve body assembly.

5. INSTALL SHIFT SOLENOID VALVE S4



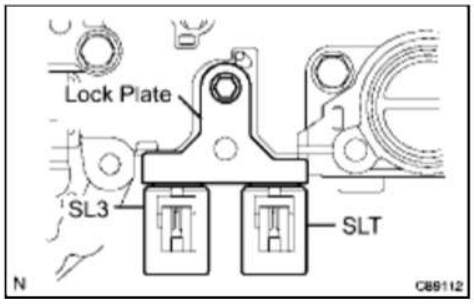
(a) Install the shift solenoid valve S4 to the valve body assembly with the bolt.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

6. INSTALL SHIFT SOLENOID VALVE SL3

(a) Install the shift solenoid valve SL3 to the valve body assembly.

7. INSTALL SHIFT SOLENOID VALVE SLT



(a) Install the shift solenoid valve SLT and lock plate to the valve body assembly with the bolt.

Torque: 6.6 N·m (67 kgf·cm, 58in·lbf)

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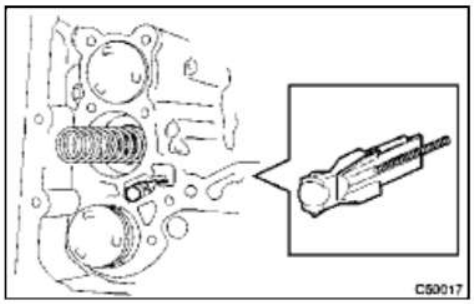
Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWW01GX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSTALLATION (2010 Corolla)		

INSTALLATION

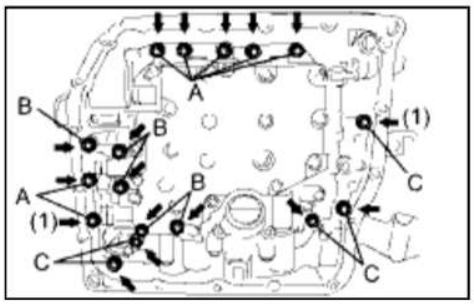
1. INSTALL MANUAL VALVE

(a) Install the manual valve to the valve body assembly.

2. INSTALL TRANSMISSION VALVE BODY ASSEMBLY



(a) Install the spring and check ball body.



(b) Align the groove of the manual valve with the pin of the lever.

(c) Install the valve body with the 17 bolts.

Torque: 11 N·m (110 kgf·cm, 8ft·lbf)

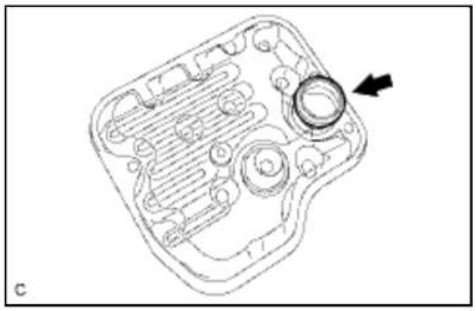
NOTICE:

- Push the valve body against the accumulator piston spring and the check ball body to install it.
- First, temporarily tighten the bolts marked by (1) in the illustration because they are positioning bolts.

Bolt length:
Bolt A: 25 mm (0.984 in.)
Bolt B: 57 mm (2.24 in.)
Bolt C: 41 mm (1.61 in.)

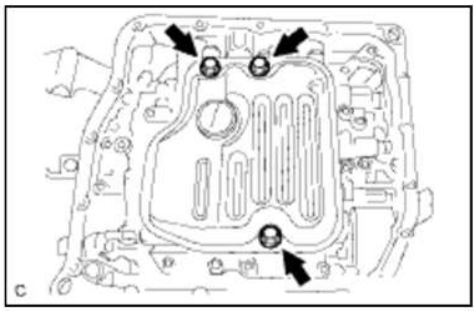
3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY

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(a) Coat a new O-ring with ATF WS.

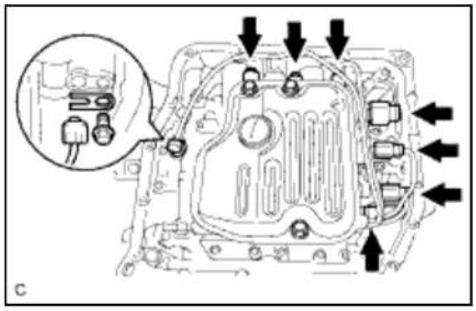
(b) Install the O-ring to the oil strainer.



(c) Install the oil strainer with the 3 bolts.

Torque: 11 N·m (110 kgf·cm, 8ft·lbf)

4. INSTALL TRANSMISSION WIRE



(a) Coat the O-ring with ATF WS.

(b) Install the ATF temperature sensor with the lock plate and bolt.

Torque: 6.6 N·m (67 kgf·cm, 58in·lbf)

(c) Connect the 7 shift solenoid valve connectors.

5. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY INFO

6. INSTALL ENGINE UNDER COVER LH

7. ADD AUTOMATIC TRANSAXLE FLUID

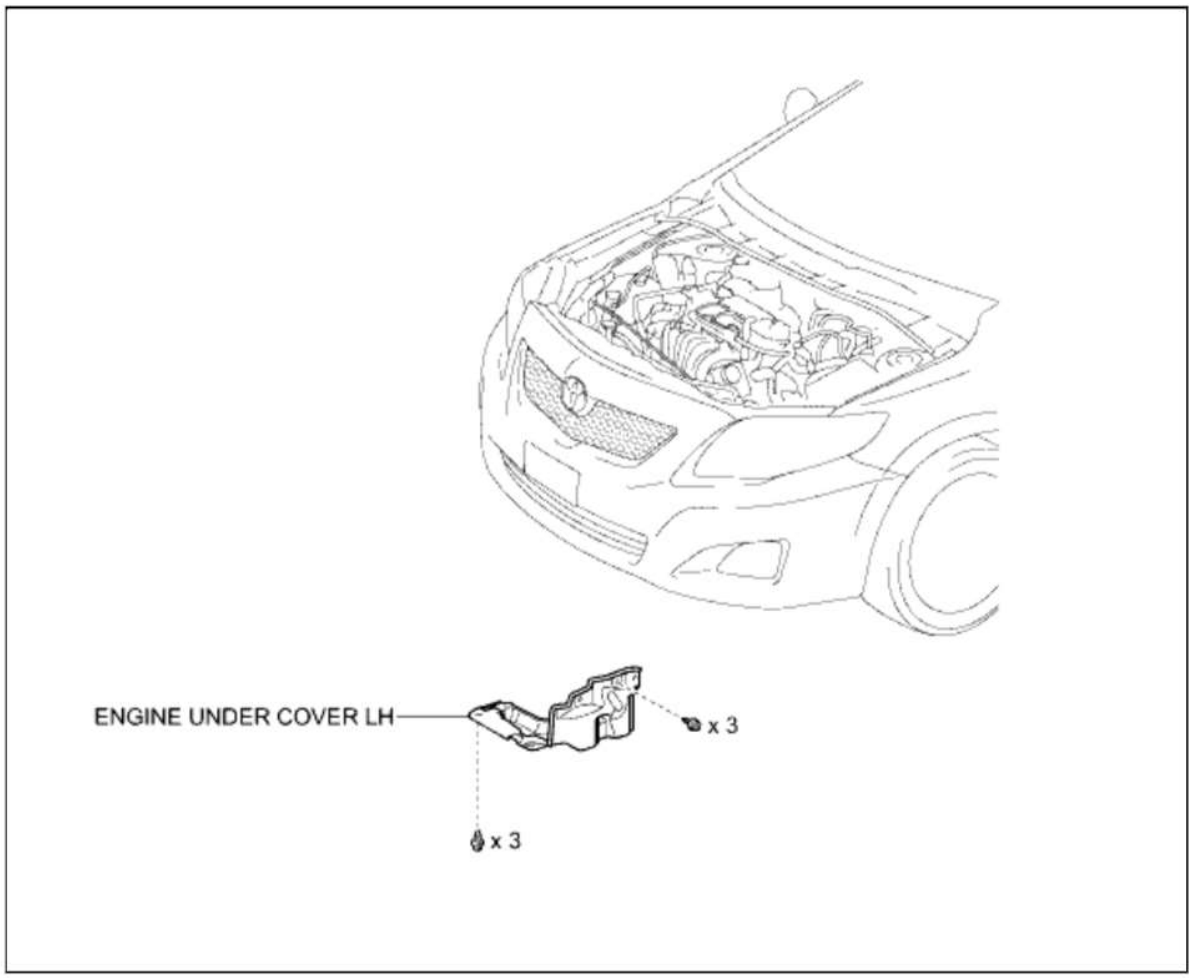
8. INSPECT TRANSAXLE FLUID LEVEL INFO

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191K00ZX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: COMPONENTS (2010 Corolla)		

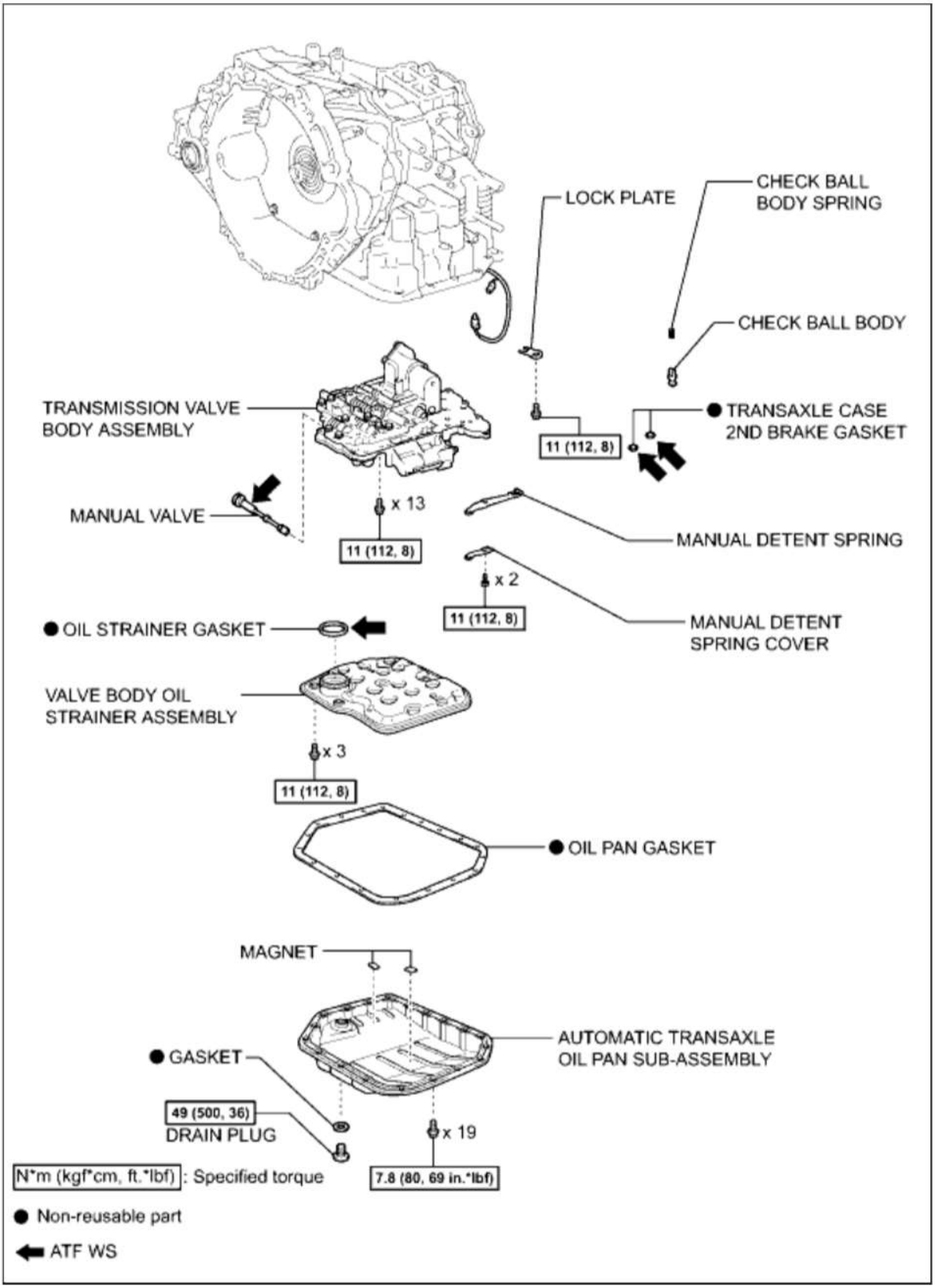
COMPONENTS

ILLUSTRATION



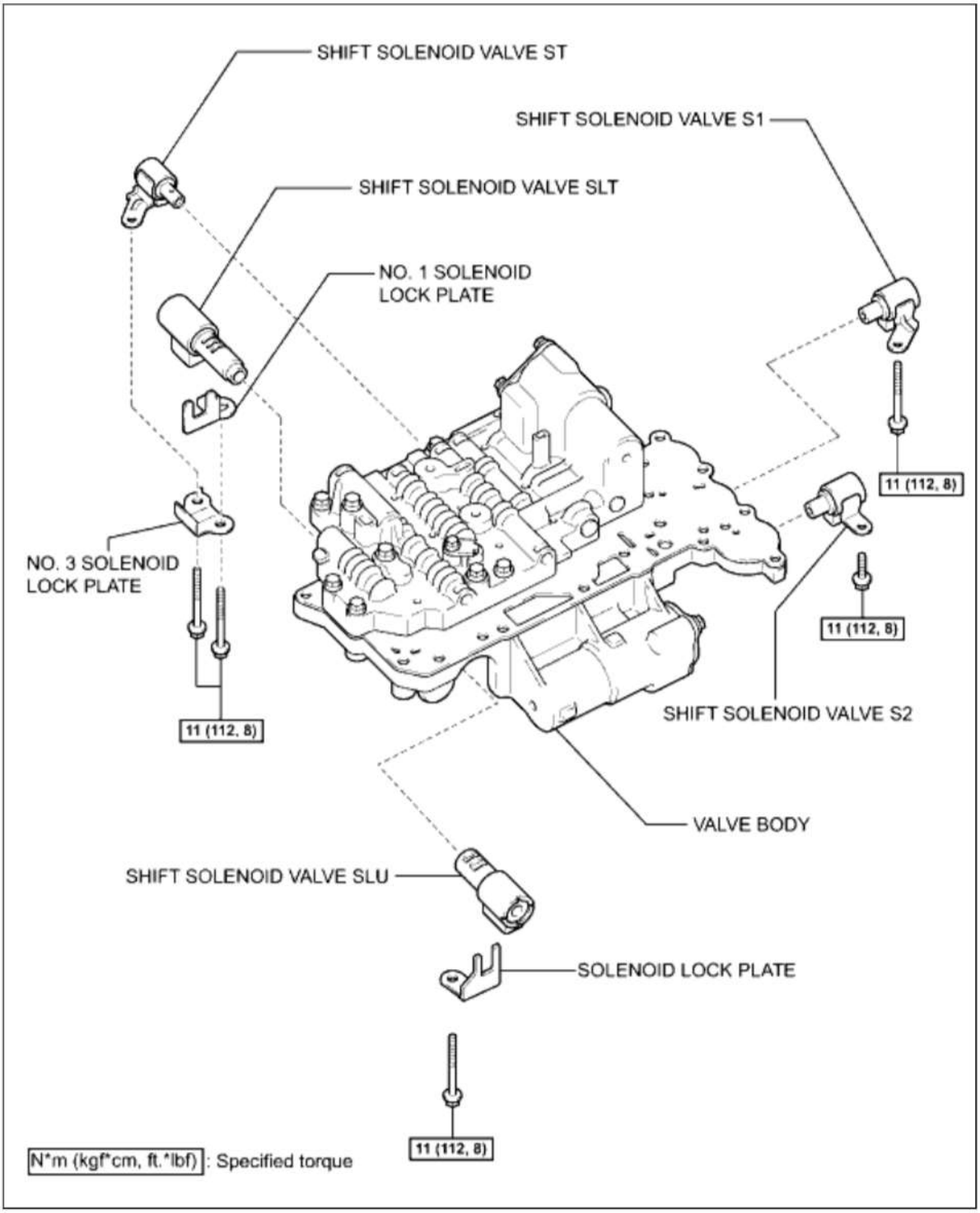
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000191L01DX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REMOVAL (2010 Corolla)		

REMOVAL

1. REMOVE ENGINE UNDER COVER LH

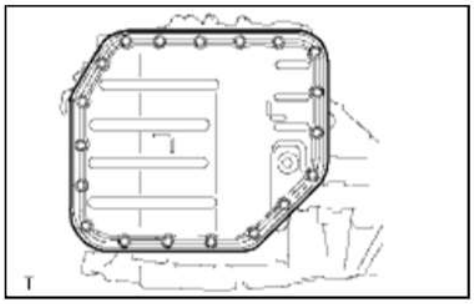
2. DRAIN AUTOMATIC TRANSAXLE FLUID

(a) Remove the drain plug and gasket, and drain ATF.

(b) Install a new gasket and the drain plug.

Torque: 49 N·m (500 kgf·cm, 36ft·lbf)

3. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY

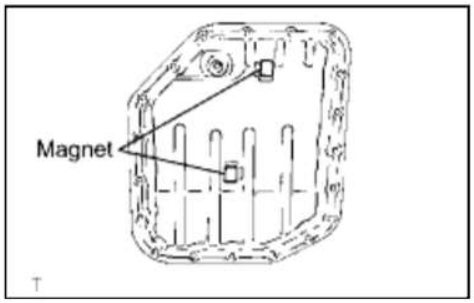


(a) Remove the 19 bolts, oil pan and oil pan gasket.

NOTICE:

Some fluid will remain in the oil pan.

Remove all the oil pan bolts, and carefully remove the oil pan sub-assembly.



(b) Remove the 2 magnets from the oil pan.

(c) Examine the particles in the oil pan.

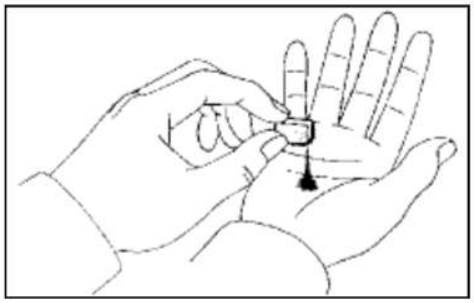
(1) Collect any steel chips with the removed magnets. Look carefully at the chips and particles in the pan and on the magnets to see the type of wear which might be found in the transaxle.

Result:

Steel (magnetic)

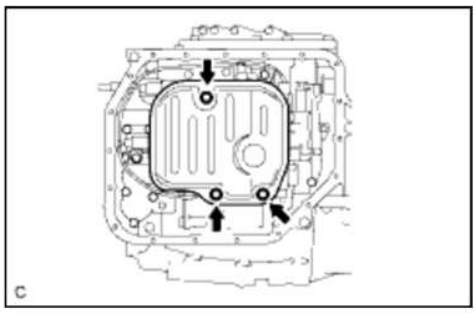
bearing, gear and plate wear

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Brass (non-magnetic)
bushing wear

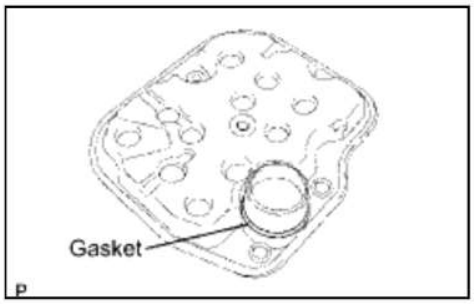
4. REMOVE VALVE BODY OIL STRAINER ASSEMBLY



(a) Remove the 3 bolts and oil strainer.

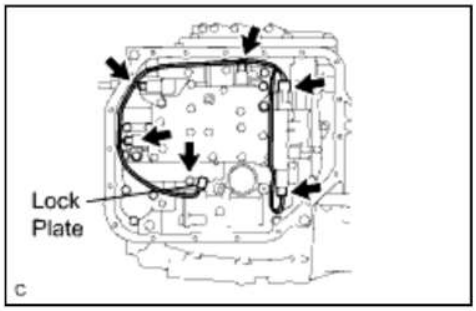
NOTICE:

Perform the operation carefully as some fluid will come out from the oil strainer.



(b) Remove the oil strainer gasket from the oil strainer.

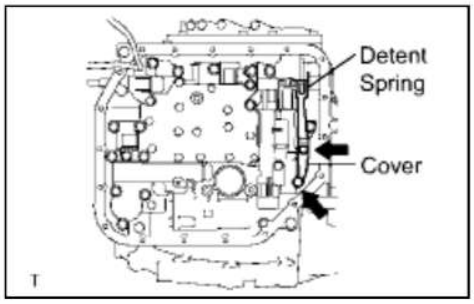
5. REMOVE TRANSMISSION VALVE BODY ASSEMBLY



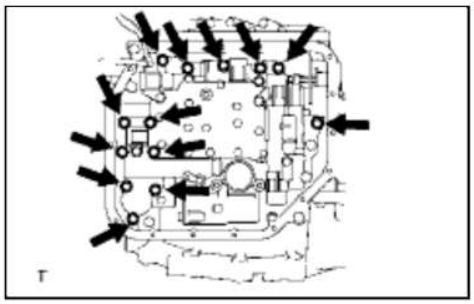
(a) Disconnect the 5 connectors.

(b) Remove the bolt, lock plate and ATF temperature sensor.

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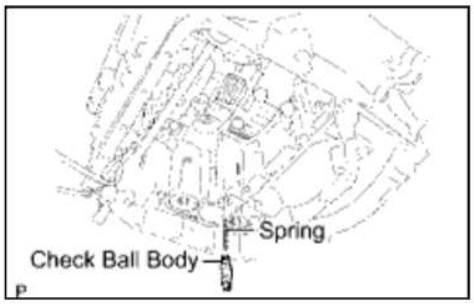
(c) Remove the 2 bolts, manual detent spring cover and manual detent spring.



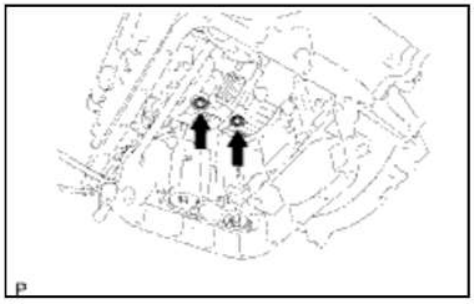
(d) Remove the 13 bolts and valve body assembly.

NOTICE:

Do not drop the check ball body, check ball body spring or accumulator piston.



(e) Remove the check ball body and check ball body spring.

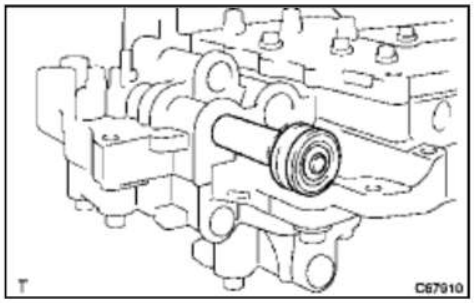


(f) Remove the 2 transaxle case 2nd brake gaskets.

6. REMOVE MANUAL VALVE

(a) Remove the manual valve from the valve body.

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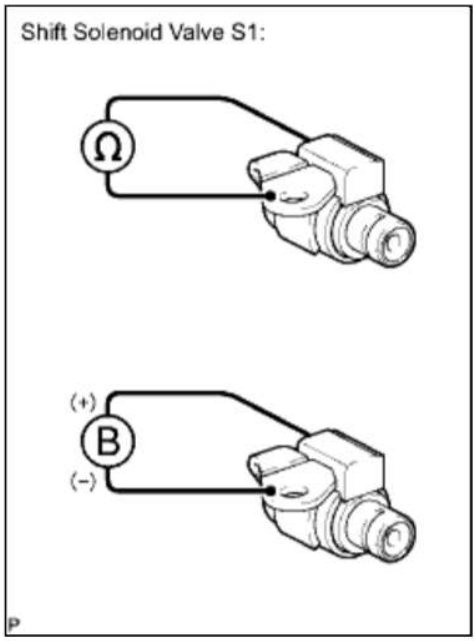
TOYOTA

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000192Z01WX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSPECTION (2010 Corolla)		

INSPECTION

1. INSPECT SHIFT SOLENOID VALVE S1



(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S1) - Solenoid Body (S1)	15 to 25°C (59 to 77°F)	11 to 15 Ω

If the value is not as specified, replace the shift solenoid valve S1.

(b) Connect a positive (+) battery lead to the terminal of the solenoid connector, and a negative (-) battery lead to the solenoid body, and check the operation of the valve.

NOTICE:

When using battery voltage during this inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

OK:

The solenoid makes an operating sound.

If the operation cannot be done as specified, replace the shift solenoid valve S1.

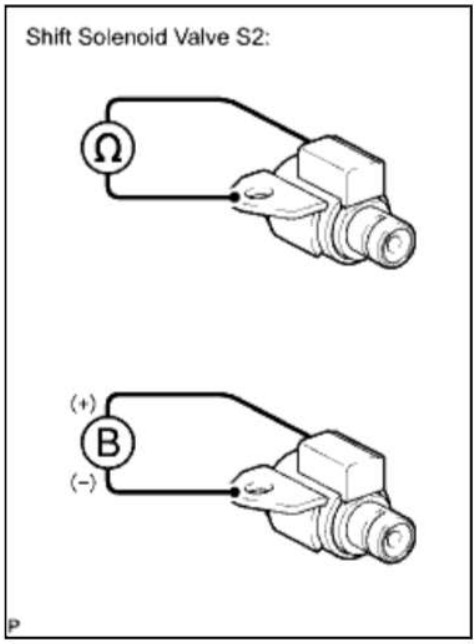
2. INSPECT SHIFT SOLENOID VALVE S2

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION

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Solenoid Connector (S2) - Solenoid Body (S2)	15 to 25°C (59 to 77°F)	11 to 15 Ω

If the value is not as specified, replace the shift solenoid valve S2.

(b) Connect a positive (+) battery lead to the terminal of the solenoid connector, and a negative (-) battery lead to the solenoid body, and check the operation of the valve.

NOTICE:

When using battery voltage during this inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

OK:

The solenoid makes an operating sound.

If the operation cannot be done as specified, replace the shift solenoid valve S2.

3. INSPECT SHIFT SOLENOID VALVE ST

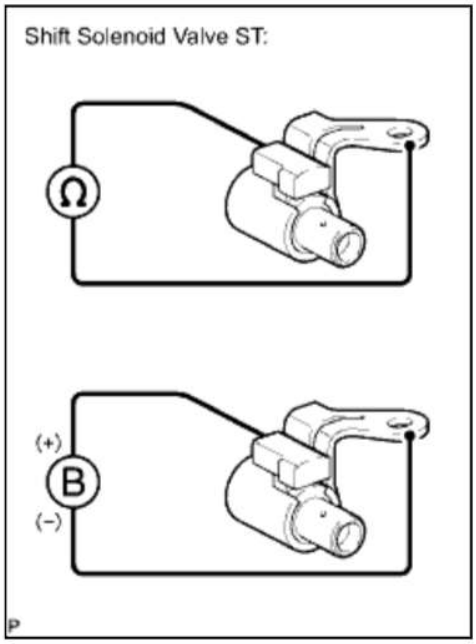
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (ST) - Solenoid Body (ST)	15 to 25°C (59 to 77°F)	11 to 15 Ω

If the value is not as specified, replace the shift solenoid valve ST.

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(b) Connect a positive (+) battery lead to the terminal of the solenoid connector, and a negative (-) battery lead to the solenoid body, and check the operation of the valve.

NOTICE:

When using battery voltage during this inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

OK:

The solenoid makes an operating sound.

If the operation cannot be done as specified, replace the shift solenoid valve ST.

4. INSPECT SHIFT SOLENOID VALVE SLT

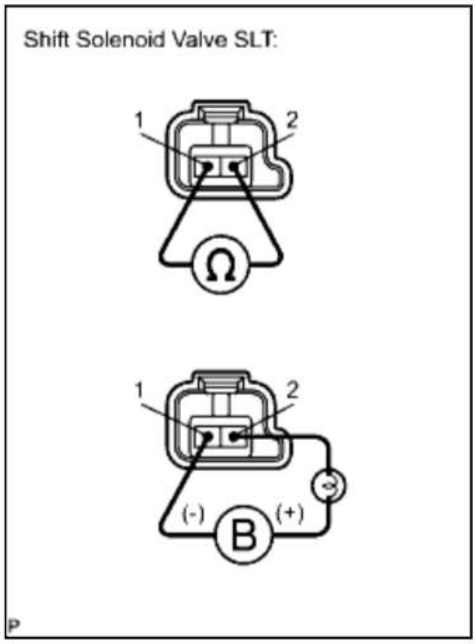
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

If the value is not as specified, replace the shift solenoid valve SLT.

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(b) Connect a positive (+) battery lead with a 21 W bulb to terminal 2 and a negative (-) battery lead to terminal 1 of the solenoid valve connector, and check the operation of the valve.

NOTICE:

When using battery voltage during this inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

OK:

The solenoid makes an operating sound.

If the operation cannot be done as specified, replace the shift solenoid valve SLT.

5. INSPECT SHIFT SOLENOID VALVE SLU

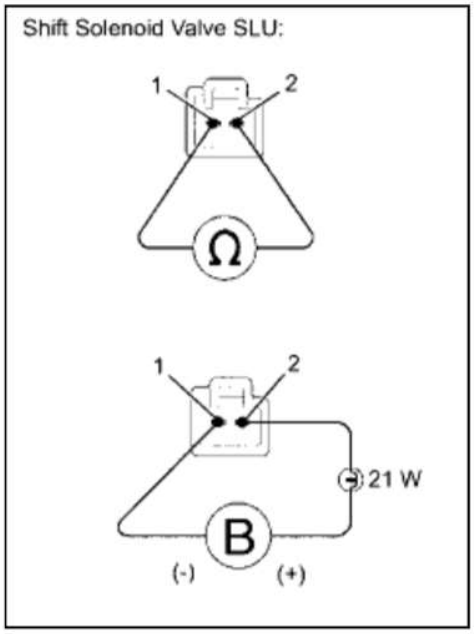
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

If the value is not as specified, replace the shift solenoid valve SLU.

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(b) Connect a positive (+) battery lead with a 21 W bulb to terminal 2 and a negative (-) battery lead to terminal 1 of the solenoid valve connector, and check the operation of the valve.

NOTICE:

While using battery voltage during this inspection, do not bring the positive and negative tester probes too close to each other as a short circuit may occur.

OK:

The solenoid makes an operating sound.

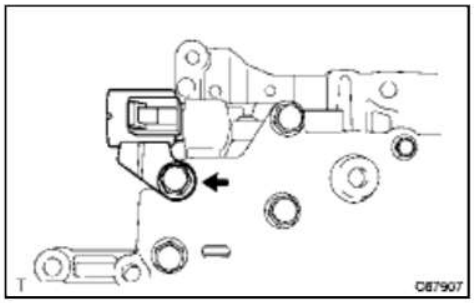
If the operation cannot be done as specified, replace the shift solenoid valve SLU.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001931010X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: DISASSEMBLY (2010 Corolla)		

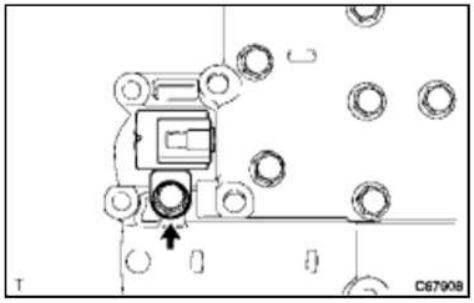
DISASSEMBLY

1. REMOVE SHIFT SOLENOID VALVE S1



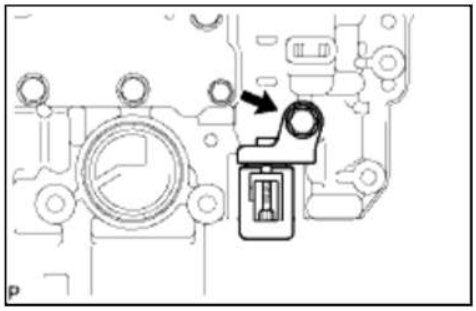
(a) Remove the bolt and pull out the shift solenoid valve S1.

2. REMOVE SHIFT SOLENOID VALVE S2



(a) Remove the bolt and pull out the shift solenoid valve S2.

3. REMOVE SHIFT SOLENOID VALVE SLU

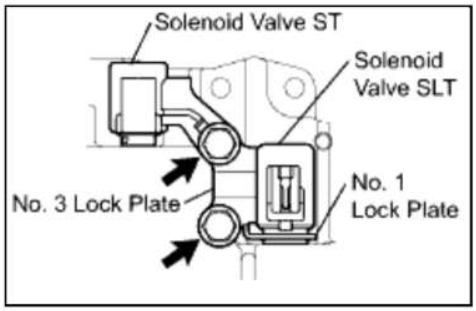


(a) Remove the bolt and solenoid lock plate.

(b) Pull out the shift solenoid valve SLU.

4. REMOVE NO. 3 SOLENOID LOCK PLATE

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(a) Remove the 2 bolts and No. 3 solenoid lock plate from the valve body.

(b) Pull out the shift solenoid valve ST from the valve body.

(c) Remove the No. 1 solenoid lock plate from the shift solenoid valve SLT.

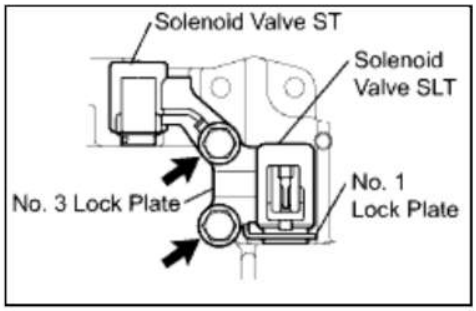
(d) Pull out the shift solenoid valve SLT from the valve body.

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000001932010X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REASSEMBLY (2010 Corolla)		

REASSEMBLY

1. INSTALL NO. 3 SOLENOID LOCK PLATE



(a) Install the shift solenoid valve SLT to the valve body.

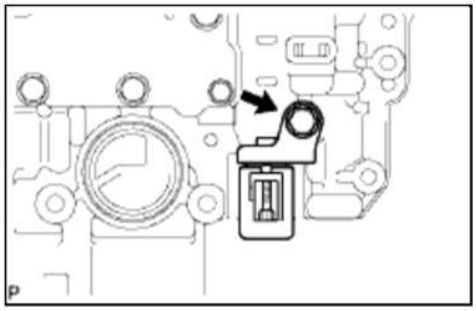
(b) Install the No. 1 solenoid lock plate to the shift solenoid valve SLT.

(c) Install the shift solenoid valve ST to the valve body.

(d) Install the No. 3 solenoid lock plate to the valve body with the 2 bolts.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

2. INSTALL SHIFT SOLENOID VALVE SLU



(a) Install the shift solenoid valve SLU onto the valve body.

(b) Install the solenoid lock plate with the bolt.

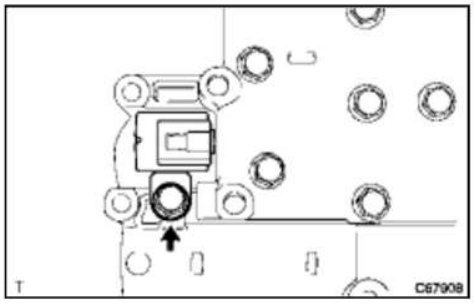
Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

3. INSTALL SHIFT SOLENOID VALVE S2

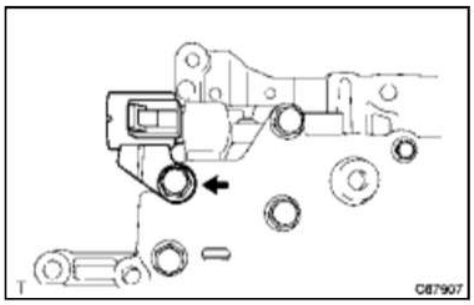
(a) Install the shift solenoid valve S2 to the valve body with the bolt.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

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4. INSTALL SHIFT SOLENOID VALVE S1



(a) Install the shift solenoid valve S1 to the valve body with the bolt.

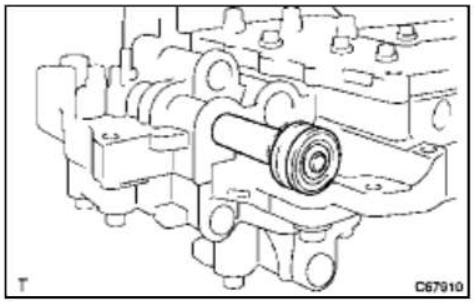
Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000191J01DX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSTALLATION (2010 Corolla)		

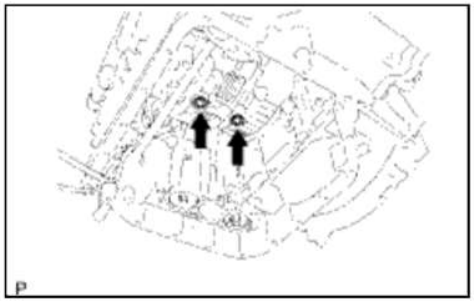
INSTALLATION

1. INSTALL MANUAL VALVE

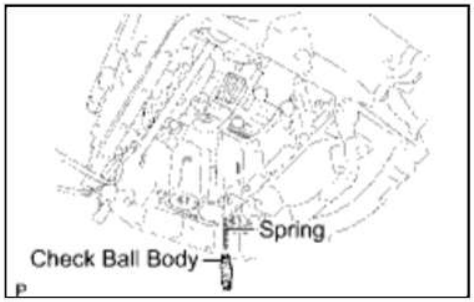


(a) Coat the manual valve with ATF WS, and install it to the valve body.

2. INSTALL TRANSMISSION VALVE BODY ASSEMBLY



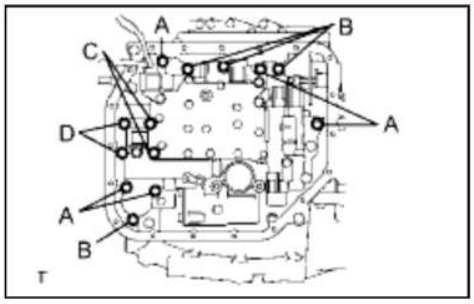
(a) Coat 2 new transaxle case 2nd brake gaskets with ATF WS, and install them to the transaxle case.



(b) Install the check ball body spring and check ball body.

(c) Align the groove of the manual valve with the pin of the manual valve lever.

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(d) Temporarily install the valve body with the 13 bolts.

Bolt length:

Bolt A

32 mm (1.26 in.)

Bolt B

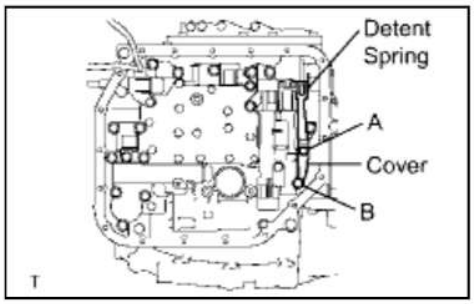
22 mm (0.866 in.)

Bolt C

55 mm (2.17 in.)

Bolt D

45 mm (1.77 in.)



(e) Temporarily install the manual detent spring and manual detent spring cover with the 2 bolts.

Bolt length:

Bolt A

14 mm (0.551 in.)

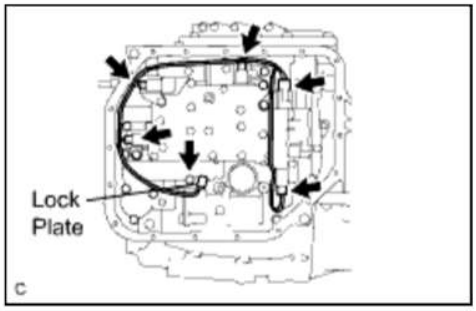
Bolt B

45 mm (1.77 in.)

(f) Check that the manual valve lever comes into contact with the center of the roller at the tip of the manual detent spring.

(g) Tighten the 15 bolts.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)



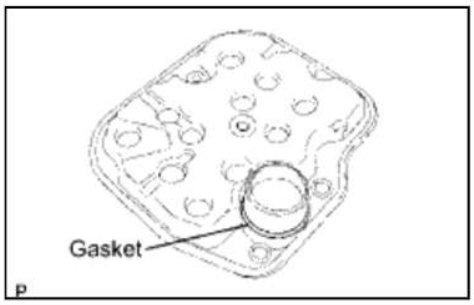
(h) Install the ATF temperature sensor with the lock plate and bolt.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

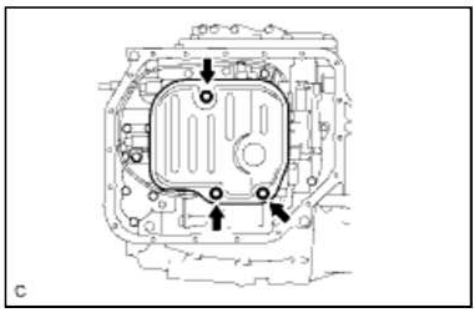
(i) Connect the 5 shift solenoid valve connectors.

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3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY



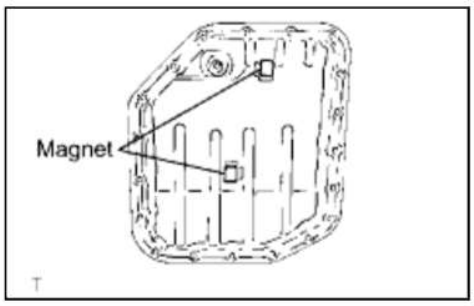
(a) Coat a new oil strainer gasket with ATF WS and install it to the oil strainer.



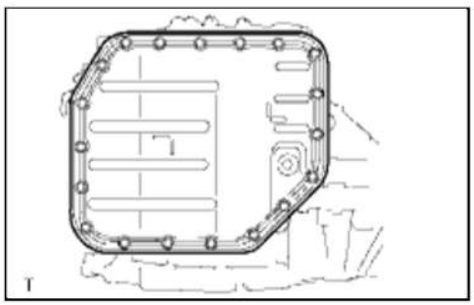
(b) Install the oil strainer with the 3 bolts.

Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

4. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSEMBLY



(a) Install the 2 magnets to the oil pan, as shown in the illustration.



(b) Install the oil pan and a new gasket with the 19 bolts.

Torque: 7.8 N·m (80 kgf·cm, 69in·lbf)

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5. ADD AUTOMATIC TRANSAXLE FLUID

6. INSPECT TRANSAXLE FLUID LEVEL INFO

7. INSTALL ENGINE UNDER COVER LH



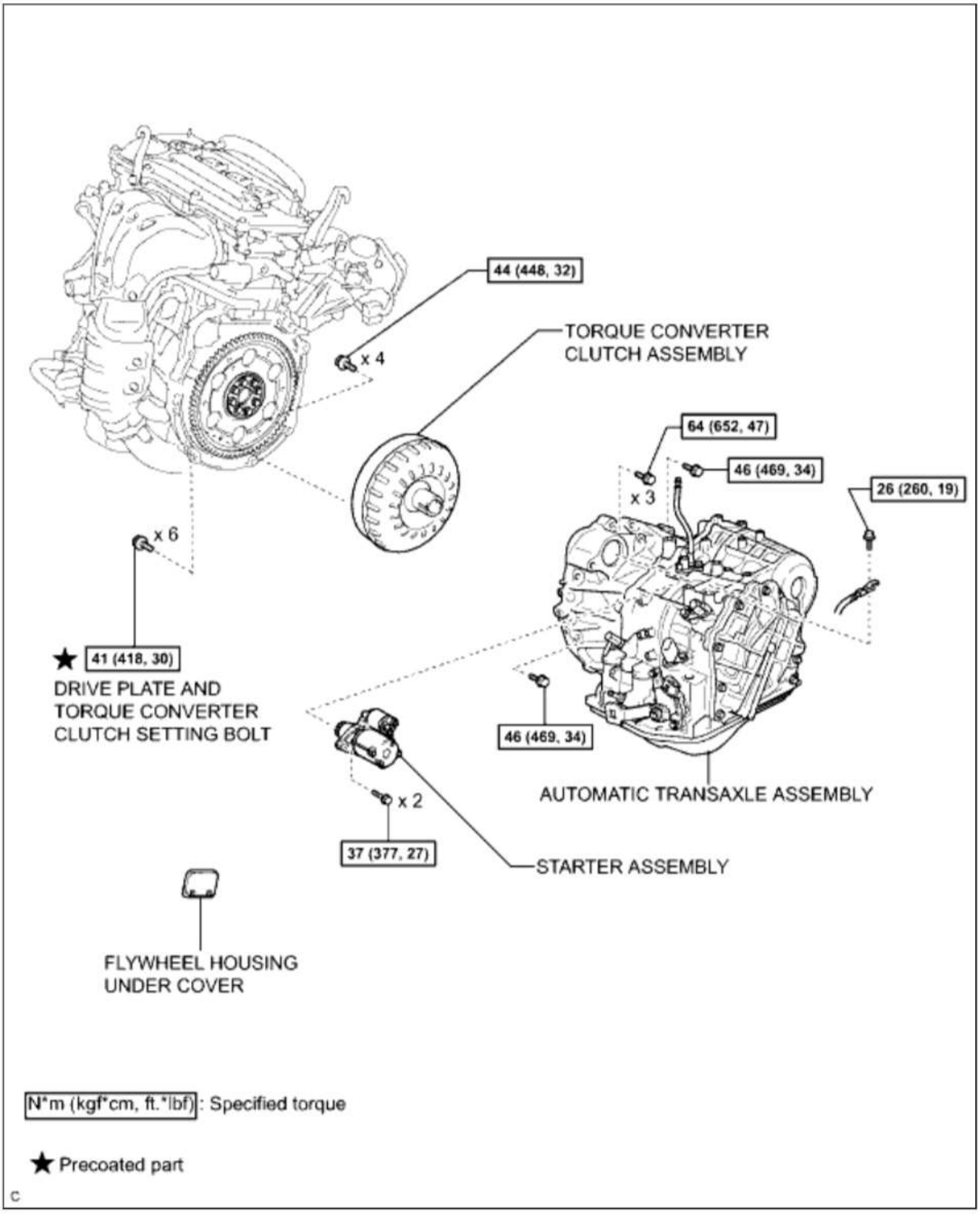
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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWU01UX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE ASSEMBLY: COMPONENTS (2010 Corolla)		

COMPONENTS

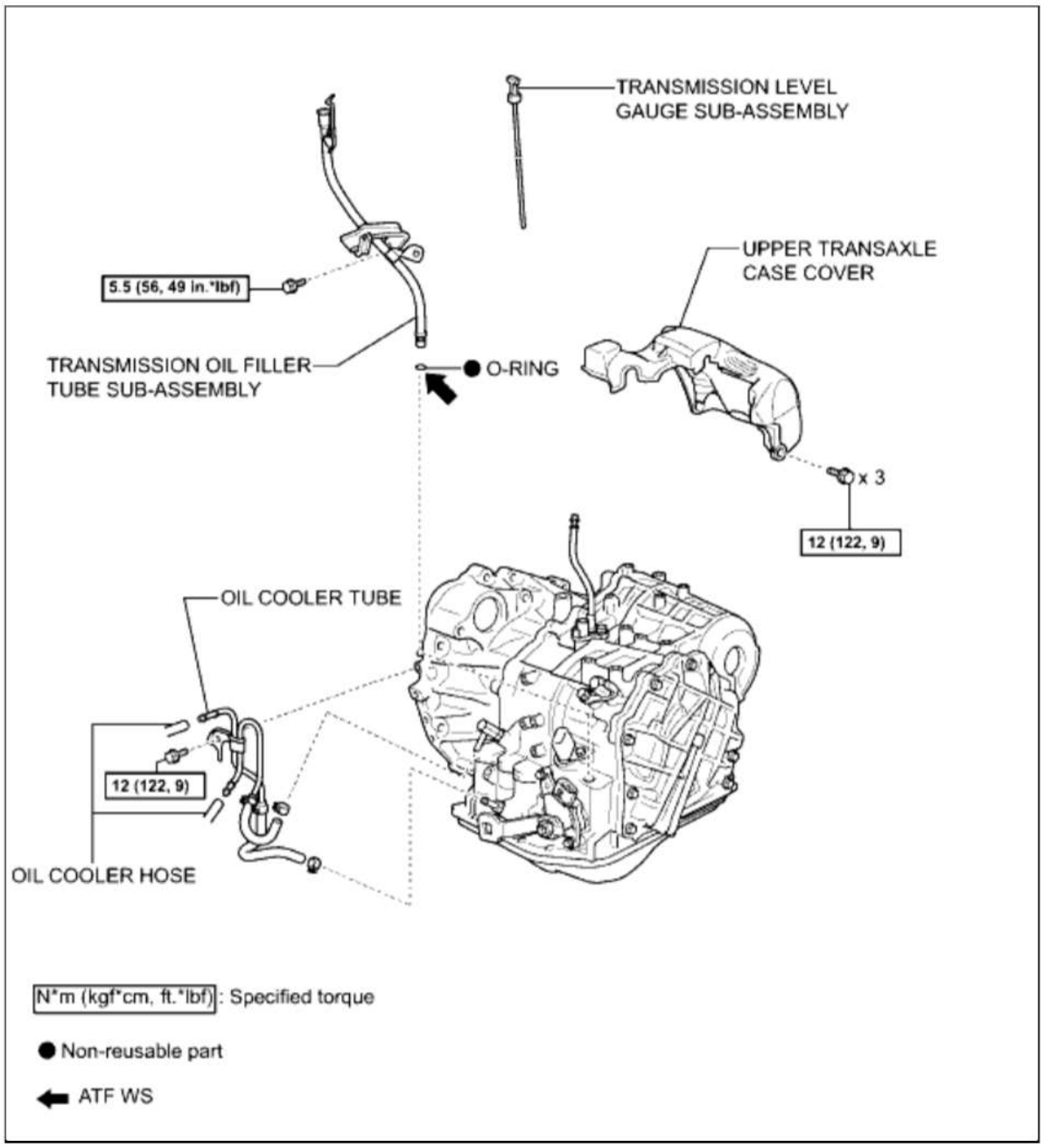
ILLUSTRATION

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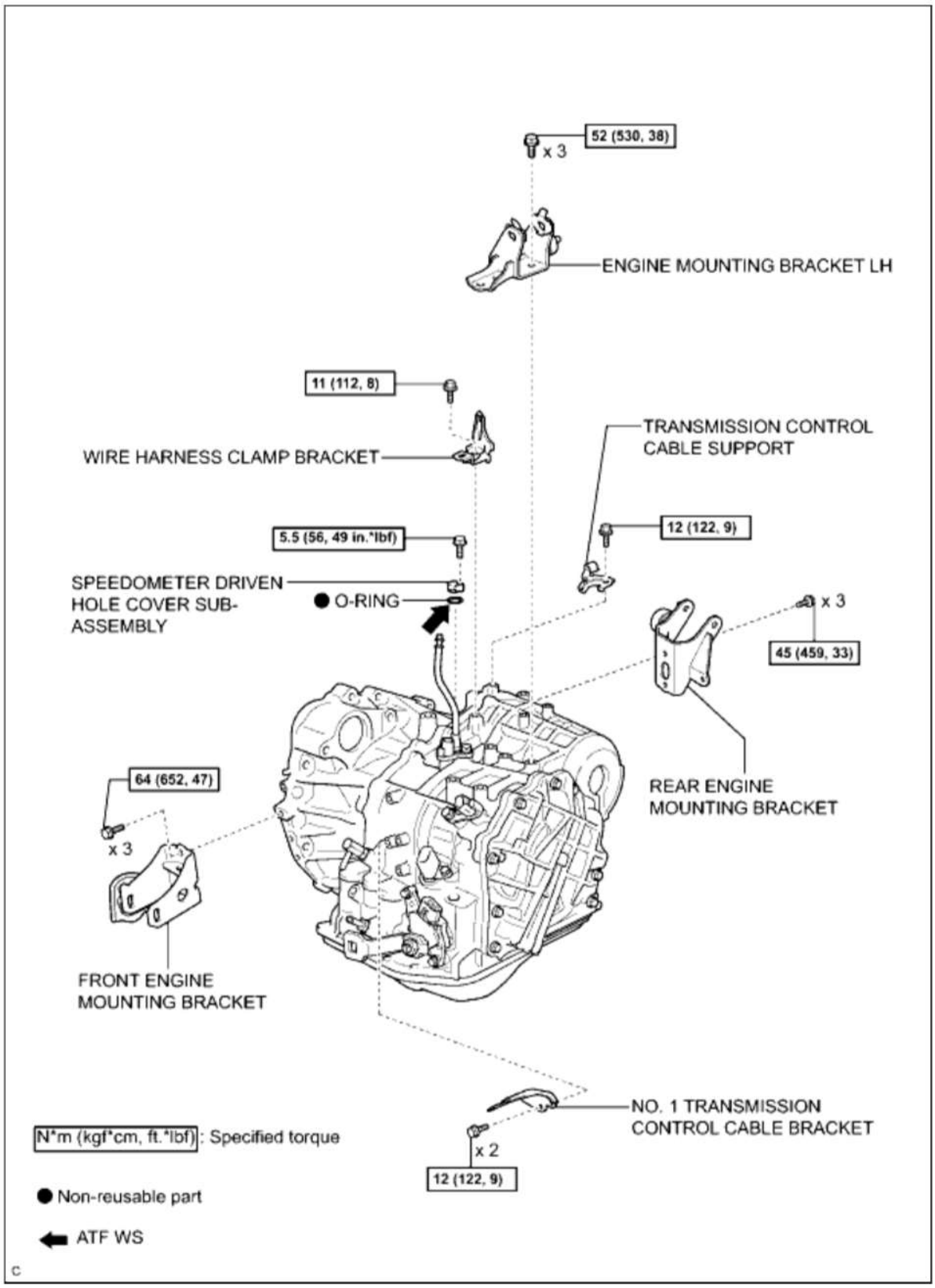
ILLUSTRATION

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ILLUSTRATION

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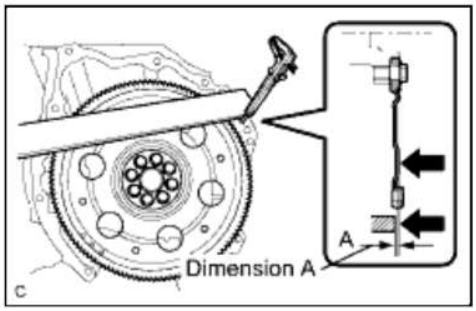
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWS026X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE ASSEMBLY: INSTALLATION (2010 Corolla)		

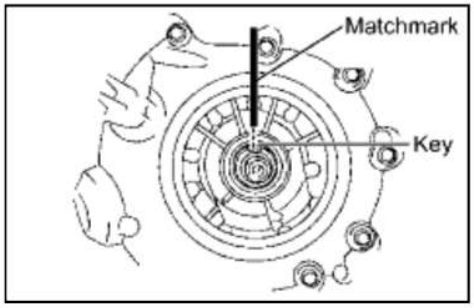
INSTALLATION

1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

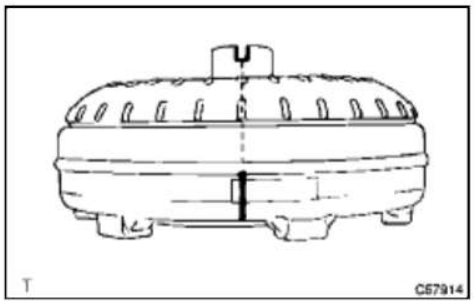
2. INSTALL TORQUE CONVERTER CLUTCH ASSEMBLY



(a) Using a vernier caliper and a straightedge, measure dimension "A" between the transaxle fitting surface of the engine and the converter fitting surface of the drive plate. (#1)



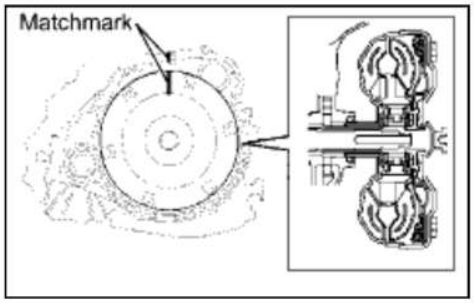
(b) Set the key of the front oil pump drive gear to the top and put a mark on the housing.

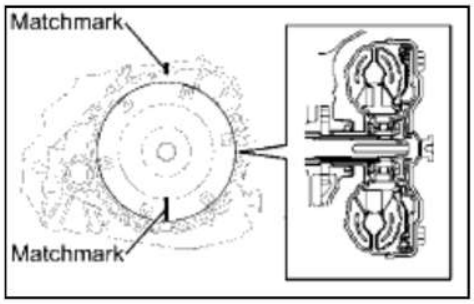


(c) Put a mark on the torque converter clutch so that its groove can be clearly indicated.

(d) Align the 2 marks on the transaxle case and torque converter clutch and fit the spline part of the input shaft to the spline part of the turbine runner.

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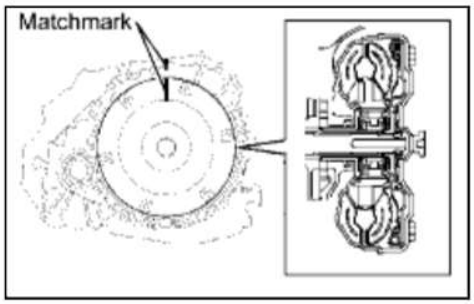




(e) Rotating the torque converter clutch, fit the spline part of the stator shaft to the spline part of the stator.

HINT:

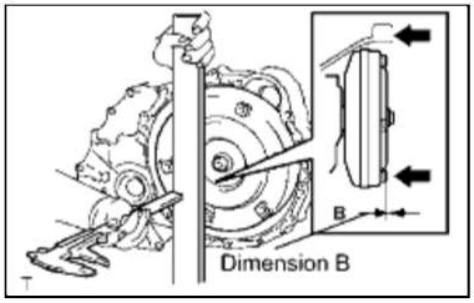
Rotate the torque converter clutch about 180°.



(f) Rotating the torque converter clutch, align the 2 marks on the case and the torque converter clutch again and fit the key of the oil pump drive gear into the key way of the torque converter clutch.

CAUTION:

When rotating the torque converter clutch, do not rotate it with excessive force.



(g) Using a vernier caliper and a straightedge, measure dimension "B" shown in the illustration and check that "B" is greater than "A" (measured in step (#1)).

Standard:

A + 1 mm (0.0394 in.) or more

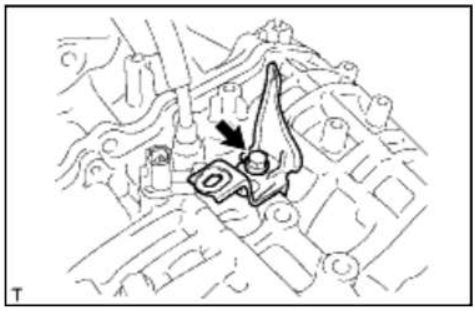
NOTICE:

Remember to subtract the thickness of the straightedge.

3. INSTALL WIRE HARNESS CLAMP BRACKET

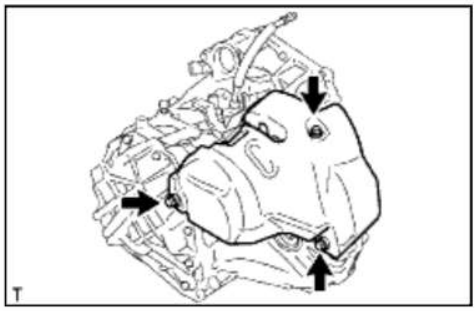
(a) Install the bracket with the bolt.

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Torque: 11 N·m (112 kgf·cm, 8ft·lbf)

4. INSTALL UPPER TRANSAXLE CASE COVER

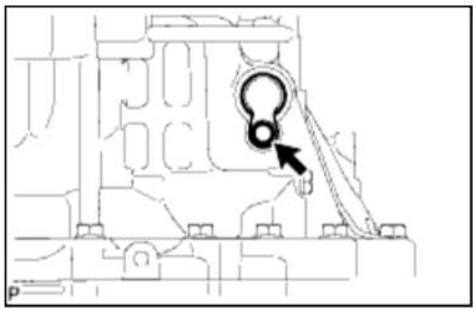


(a) Install the upper transmission case cover with the 3 bolts.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

5. INSTALL SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY

(a) Coat a new O-ring with ATF WS, and install it to the hole cover.



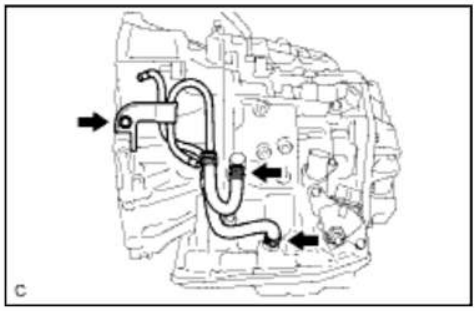
(b) Install the hole cover to the transaxle case with the bolt.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

6. INSTALL OIL COOLER TUBE

(a) Connect the 2 oil cooler hoses to the 2 unions with the 2 hose clamps.

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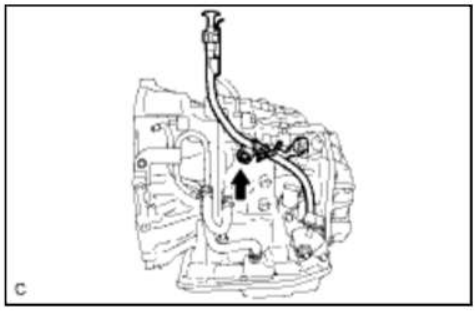


(b) Install the oil cooler tube sub-assembly to the automatic transaxle with the bolt.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

7. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY

(a) Coat a new O-ring with ATF WS, and install it to the oil filler tube.

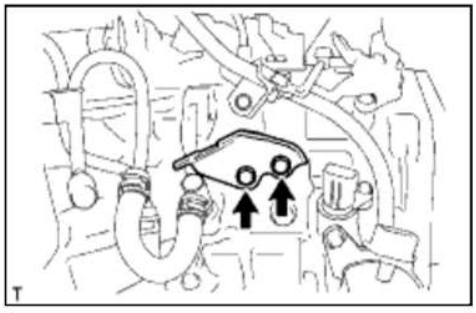


(b) Install the oil filler tube to the automatic transaxle with the bolt.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

(c) Install the transmission oil level gauge sub-assembly.

8. INSTALL NO. 1 TRANSMISSION CONTROL CABLE BRACKET



(a) Install the No. 1 transmission control cable bracket with the 2 bolts.

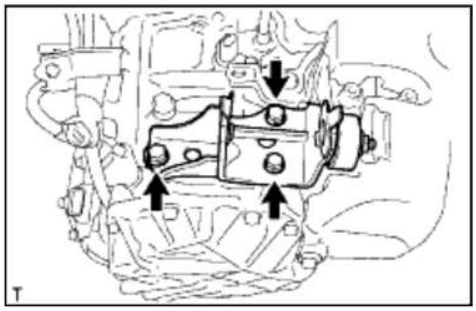
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

9. INSTALL ENGINE MOUNTING BRACKET LH

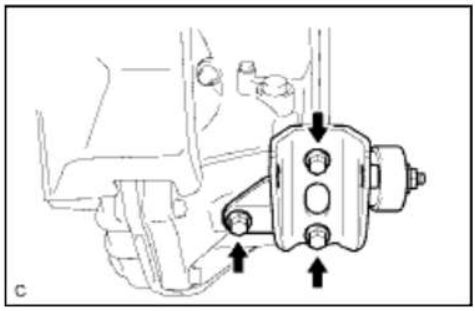
(a) Install the engine mounting bracket LH to the automatic transaxle with the 3 bolts.

Torque: 52 N·m (530 kgf·cm, 38ft·lbf)

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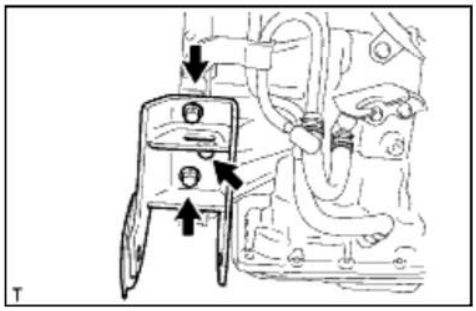
10. INSTALL REAR ENGINE MOUNTING BRACKET



(a) Install the rear engine mounting bracket to the automatic transaxle with the 3 bolts.

Torque: 45 N·m (459 kgf·cm, 33ft·lbf)

11. INSTALL FRONT ENGINE MOUNTING BRACKET



(a) Install the front engine mounting bracket to the automatic transaxle with the 3 bolts.

Torque: 64 N·m (652 kgf·cm, 47ft·lbf)

12. INSTALL AUTOMATIC TRANSAXLE ASSEMBLY

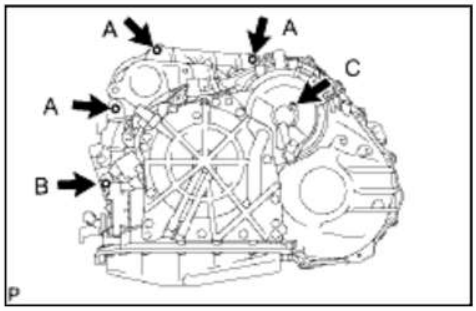
NOTICE:

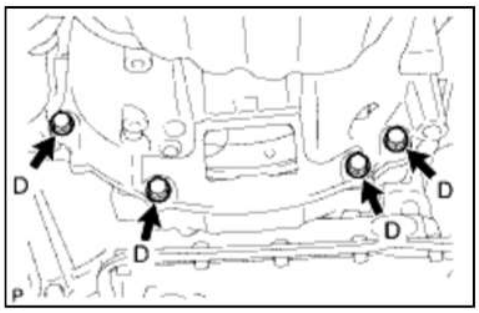
Make sure the knock pins are fully engaged and the transaxle securely fitted to the engine before tightening the bolts.

(a) Install the automatic transaxle to the engine with the 5 bolts.

Bolt A - Torque: 64 N·m (652 kgf·cm, 47ft·lbf)
Bolt B - Torque: 46 N·m (469 kgf·cm, 34ft·lbf)
Bolt C - Torque: 46 N·m (469 kgf·cm, 34ft·lbf)

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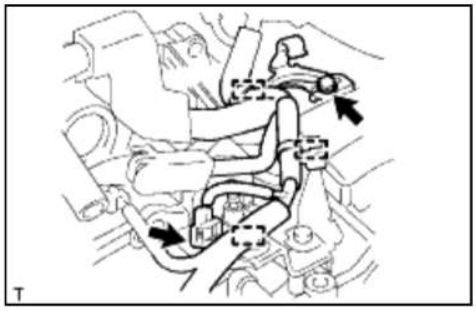




(b) Install the 4 lower side mounting bolts.

Bolt D - Torque: 44 N·m (448 kgf·cm, 32ft·lbf)

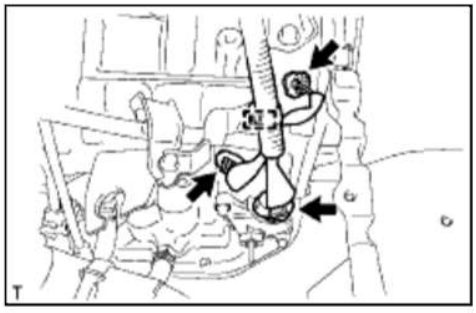
13. INSTALL WIRE HARNESS AND CONNECTOR



(a) Install the 3 engine wire clamps and speed sensor connector.

(b) Install the transmission control cable support with the bolt.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

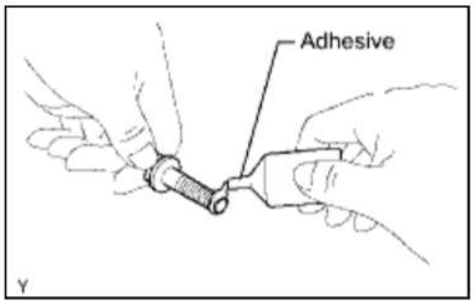


(c) Install the engine wire clamp, speed sensor connector, park/neutral position switch connector and transmission wire connector.

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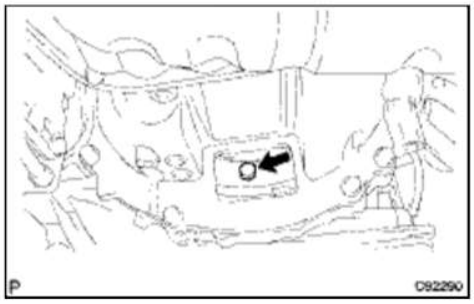
14. INSTALL STARTER ASSEMBLY INFO

15. INSTALL DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



(a) Apply a few drops of adhesive to 2 or 3 threads of the 6 torque converter clutch mounting bolts tip.

Adhesive:
Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent.

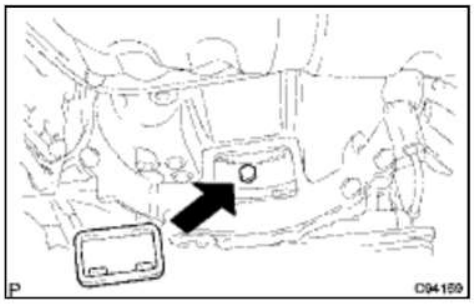


(b) Install the 6 torque converter clutch mounting bolts.

Torque: 41 N·m (418 kgf·cm, 30ft·lbf)

NOTICE:

Install the black colored bolt first, and then the silver colored 5 bolts.



(c) Install the flywheel housing under cover.

16. TEMPORARILY TIGHTEN FRONT ENGINE MOUNTING INSULATOR INFO

17. TEMPORARILY TIGHTEN REAR ENGINE MOUNTING INSULATOR INFO

18. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE

HINT:

See the steps from "Install Engine Assembly with Transaxle" through "Check ABS Speed Sensor Signal" INFO .

19. RESET MEMORY

HINT:

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Perform Reset Memory (AT initialization) when replacing the automatic transaxle assembly INFO .



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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000YWV024X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE ASSEMBLY: REMOVAL (2010 Corolla)		

REMOVAL

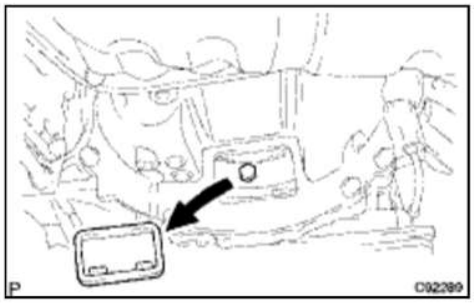
1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

HINT:

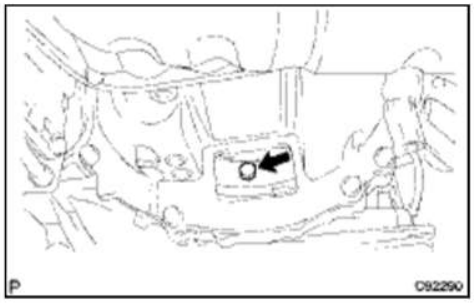
See the steps from "Discharge Fuel System Pressure" through "Remove Engine Assembly with Transaxle" INFO

.

2. REMOVE DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



(a) Remove the flywheel housing under cover.



(b) Turn the crankshaft to gain access and remove the 6 bolts while holding the crankshaft pulley bolt with a wrench.

NOTICE:

One of the 6 bolts has a different color than the other ones.

3. INSTALL ENGINE HANGERS INFO

4. REMOVE FRONT ENGINE MOUNTING INSULATOR INFO

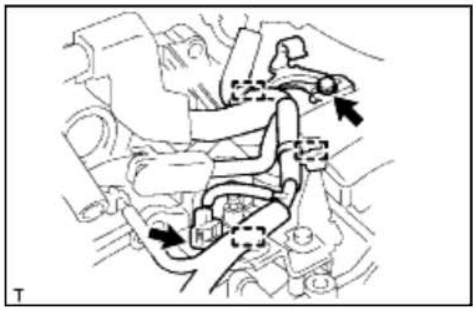
5. REMOVE REAR ENGINE MOUNTING INSULATOR INFO

6. REMOVE STARTER ASSEMBLY INFO

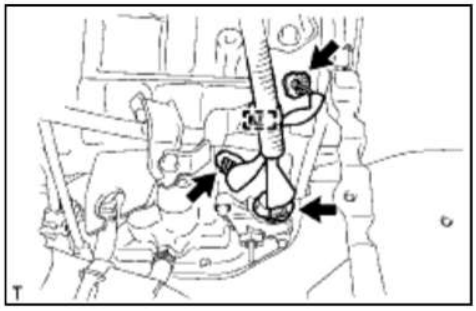
7. DISCONNECT WIRE HARNESS AND CONNECTOR

(a) Remove the bolt, disconnect the 3 engine wire clamps and

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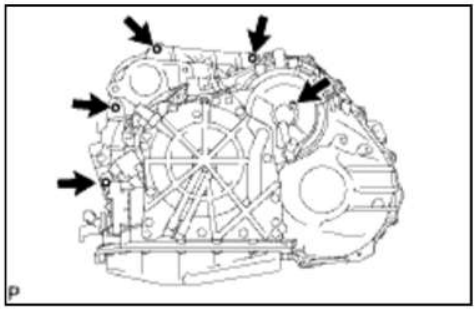


speed sensor connector.

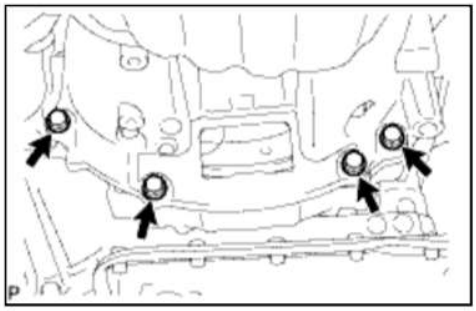


(b) Disconnect the engine wire clamp, speed sensor connector, park/neutral position switch connector and transmission wire connector.

8. REMOVE AUTOMATIC TRANSAXLE ASSEMBLY



(a) Remove the 5 bolts.

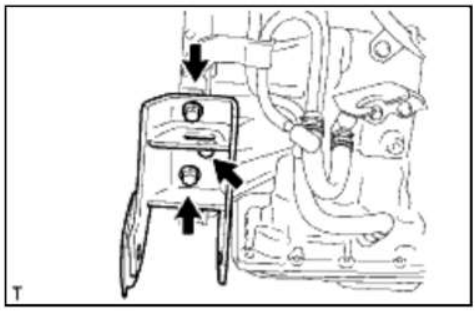


(b) Remove the 4 lower side mounting bolts.

(c) Separate and remove the automatic transaxle.

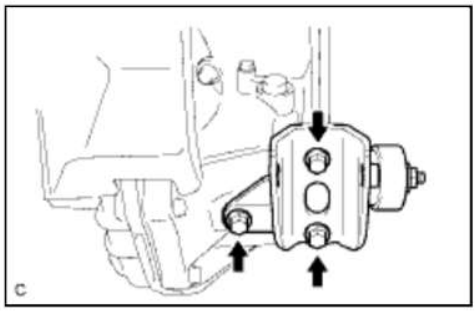
9. REMOVE FRONT ENGINE MOUNTING BRACKET

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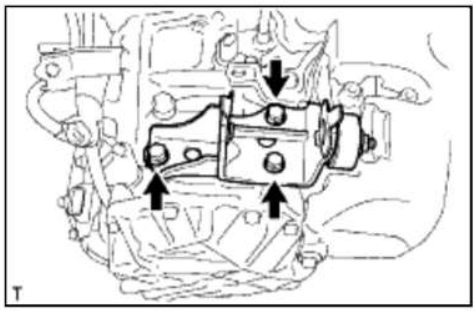
(a) Remove the 3 bolts and front engine mounting bracket.

10. REMOVE REAR ENGINE MOUNTING BRACKET



(a) Remove the 3 bolts and rear engine mounting bracket.

11. REMOVE ENGINE MOUNTING BRACKET LH

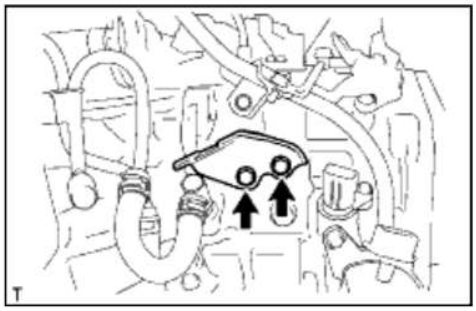


(a) Remove the 3 bolts and engine mounting bracket LH.

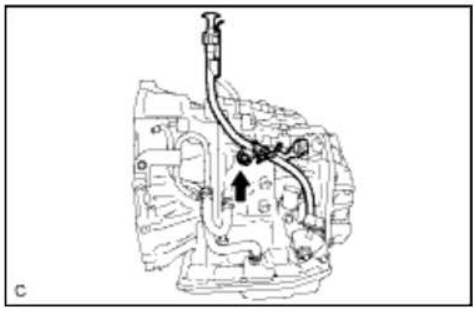
12. REMOVE NO. 1 TRANSMISSION CONTROL CABLE BRACKET

(a) Remove the 2 bolts and No. 1 transmission control cable bracket.

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13. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY

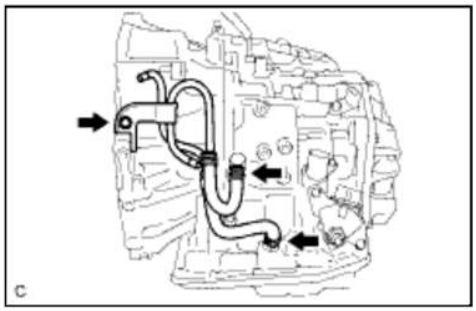


(a) Remove the transmission oil level gauge sub-assembly.

(b) Remove the bolt and remove the transmission oil filler tube sub-assembly.

(c) Remove the O-ring from the transmission oil filler tube sub-assembly.

14. REMOVE OIL COOLER TUBE

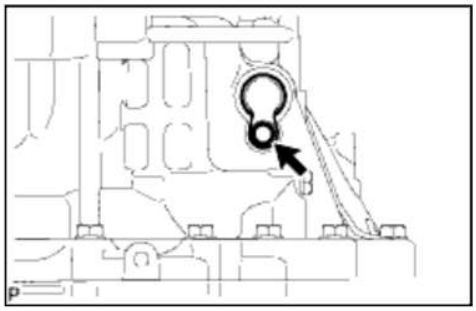


(a) Remove the 2 hose clamps, bolt and oil cooler tube sub-assembly.

15. REMOVE SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY

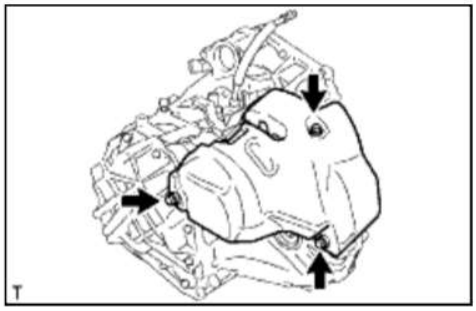
(a) Remove the bolt and hole cover from the transaxle case.

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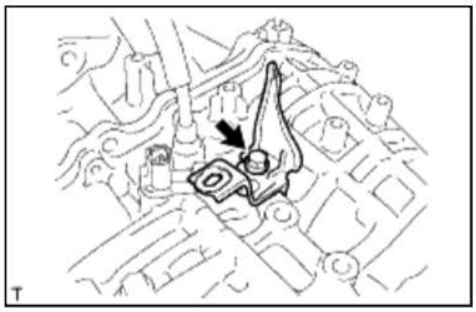
(b) Remove the O-ring from the hole cover.

16. REMOVE UPPER TRANSAXLE CASE COVER



(a) Remove the 3 bolts and upper transaxle case cover.

17. REMOVE WIRE HARNESS CLAMP BRACKET



(a) Remove the bolt and wire harness clamp bracket.

18. REMOVE TORQUE CONVERTER CLUTCH ASSEMBLY

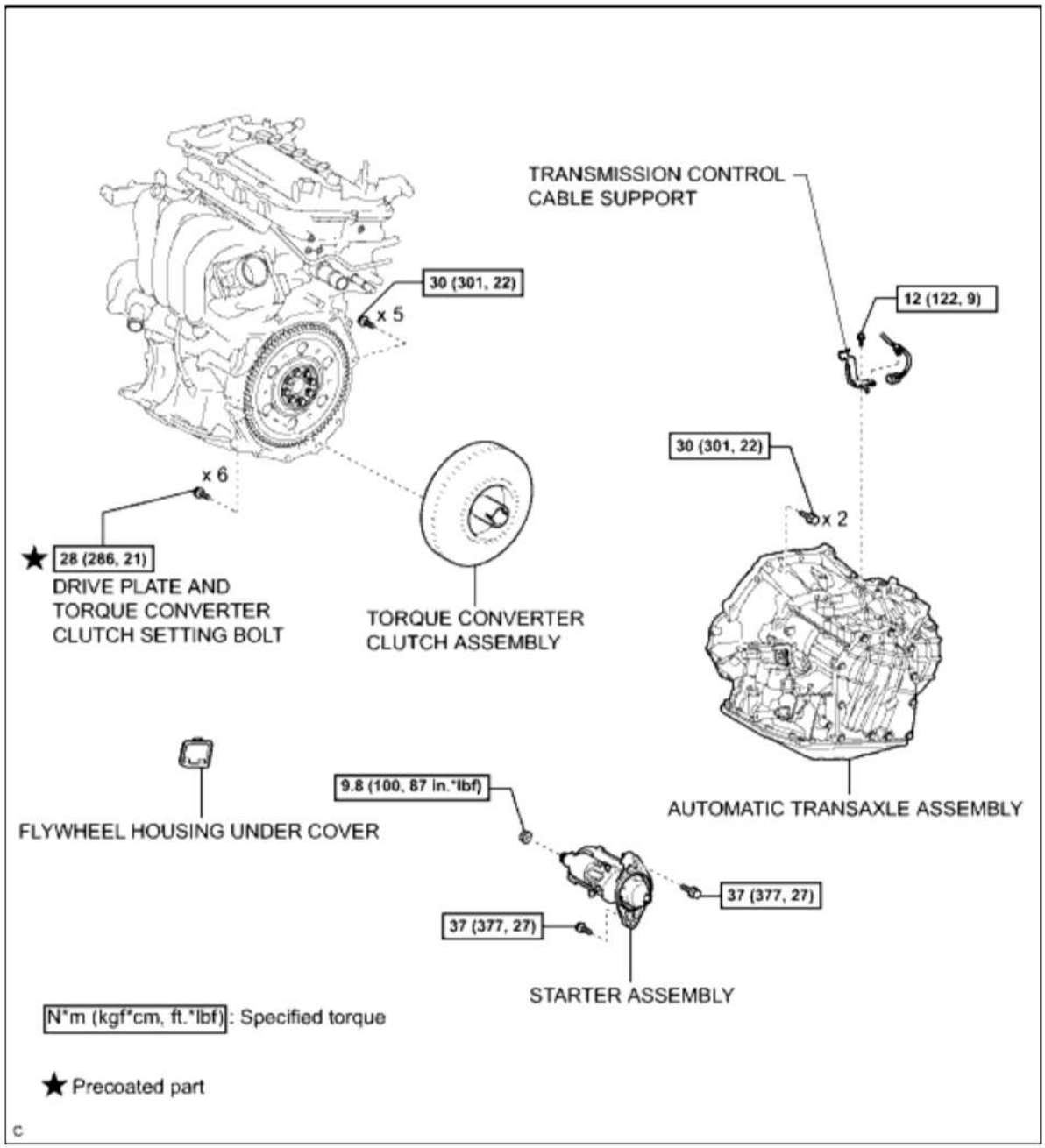
(a) Remove the torque converter clutch from the automatic transaxle.

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Last Modified: 3-10-2010	6.4 K	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192C01UX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE ASSEMBLY: COMPONENTS (2010 Corolla)		

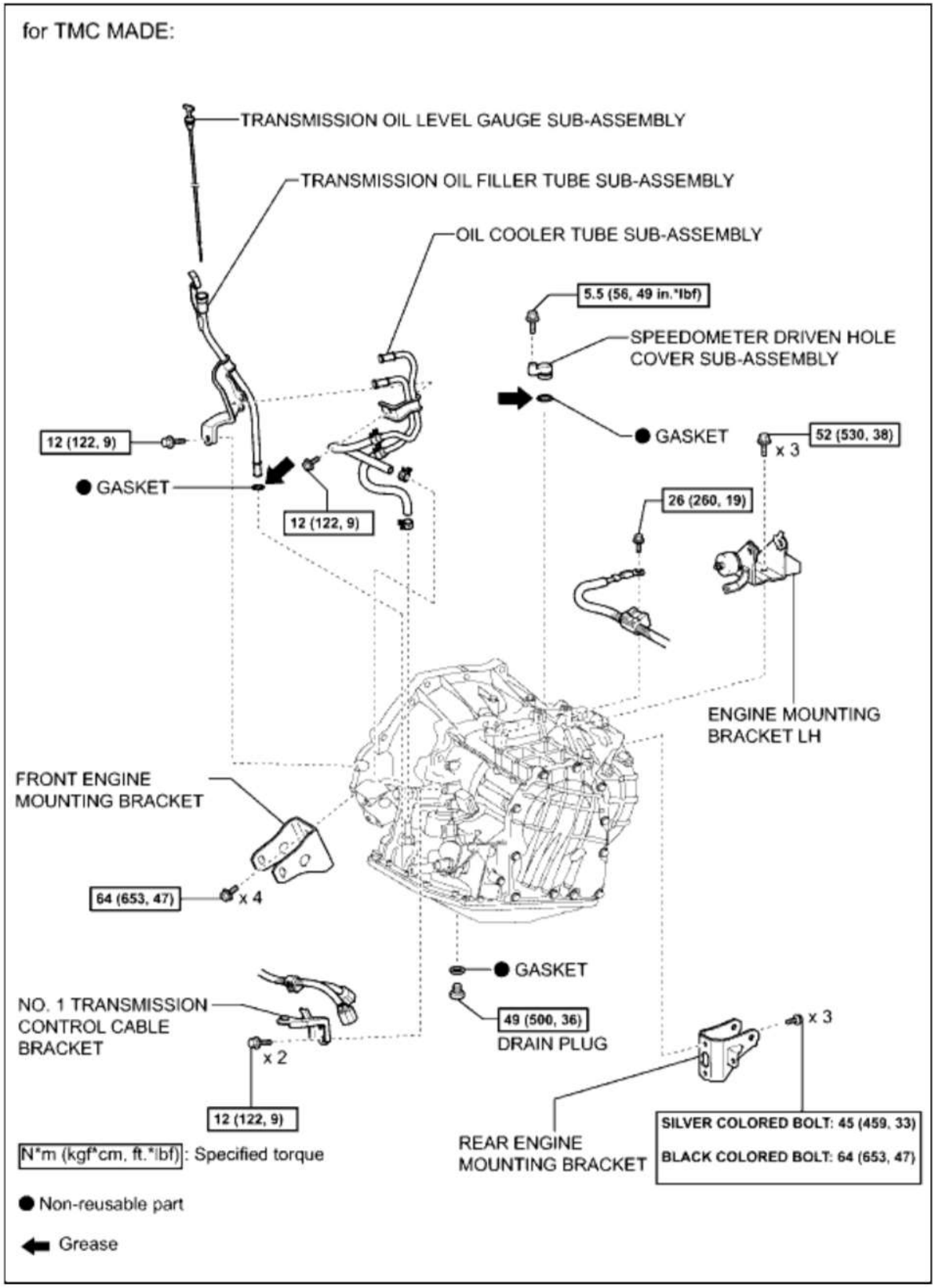
COMPONENTS

ILLUSTRATION



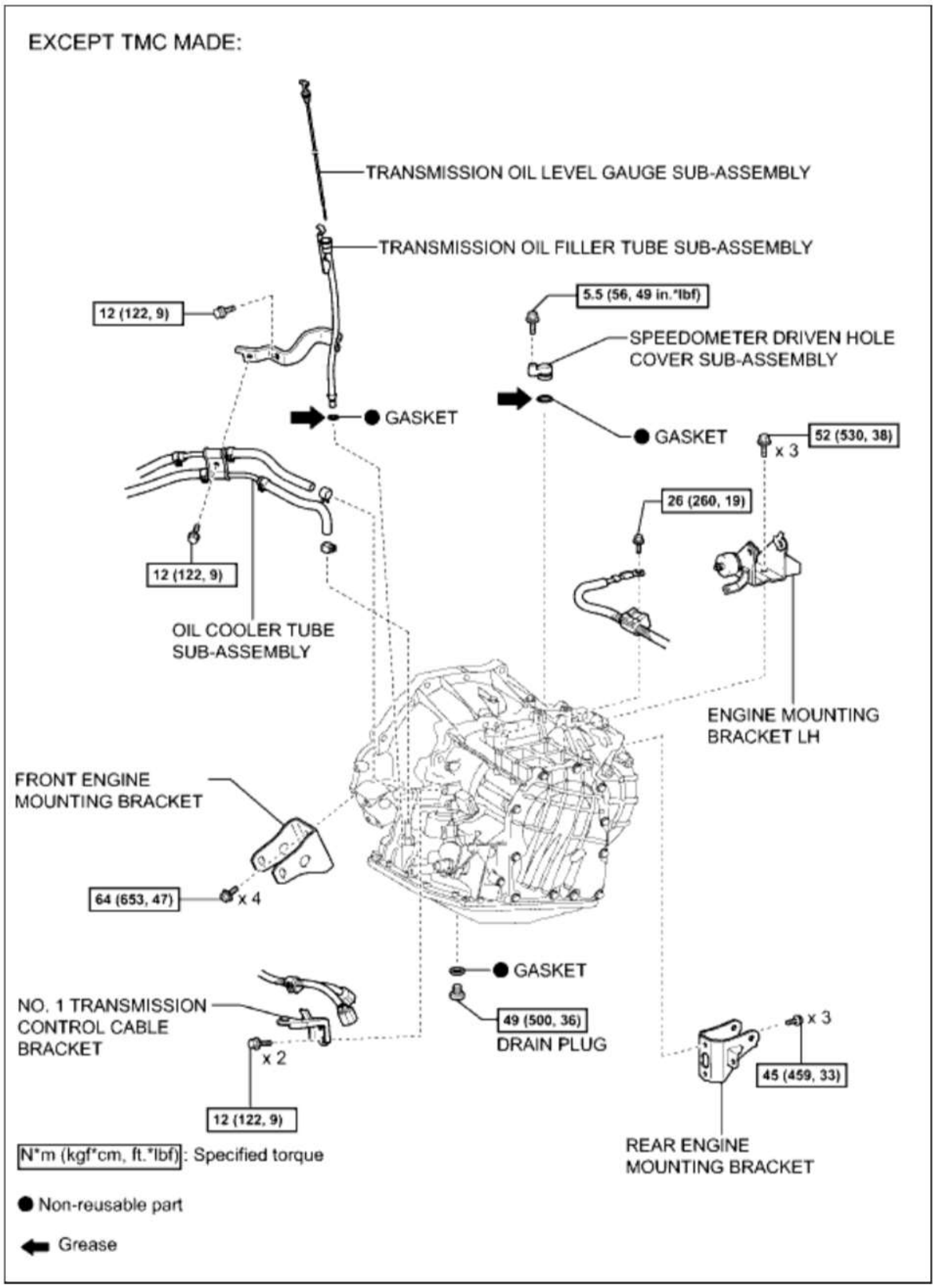
ILLUSTRATION

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ILLUSTRATION

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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192D020X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE ASSEMBLY: REMOVAL (2010 Corolla)		

REMOVAL

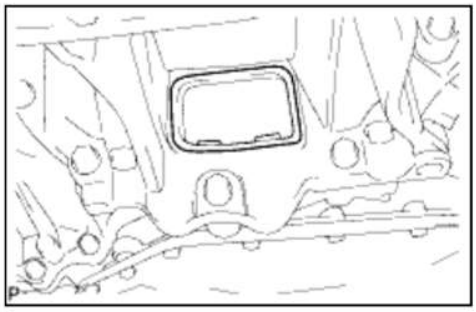
1. REMOVE ENGINE ASSEMBLY WITH TRANSAXLE

HINT:

See the steps from "Discharge Fuel System Pressure" through "Remove Engine Assembly with Transaxle" INFO

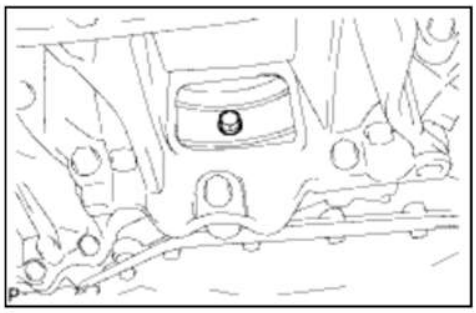
.

2. REMOVE FLYWHEEL HOUSING UNDER COVER



(a) Remove the flywheel housing under cover.

3. REMOVE DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



(a) Remove the 6 torque converter clutch setting bolts while holding the crankshaft pulley bolt with a wrench.

NOTICE:

One of the 6 bolts has a different color than the other ones.

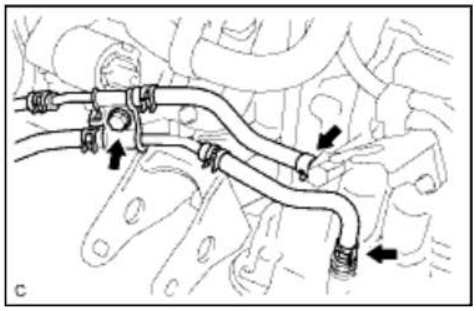
4. REMOVE FRONT ENGINE MOUNTING INSULATOR INFO

5. REMOVE REAR ENGINE MOUNTING INSULATOR INFO

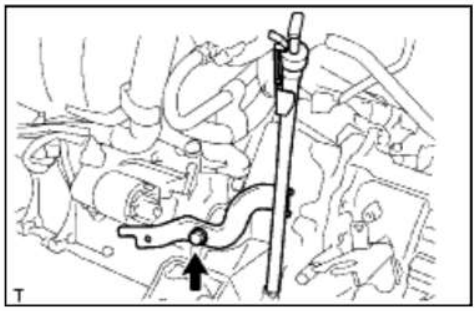
6. REMOVE OIL COOLER TUBE SUB-ASSEMBLY (except TMC Made)

(a) Remove the 2 hose clamps and bolt, and disconnect the oil cooler.

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7. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY (except TMC Made)



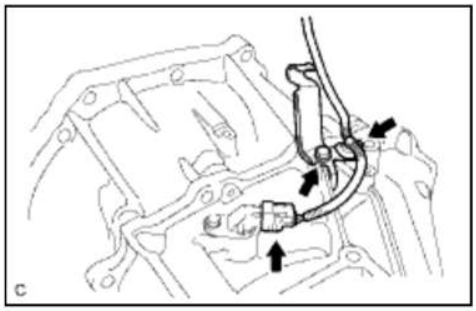
(a) Remove the transmission oil level gauge sub-assembly.

(b) Remove the bolt and transmission oil filler tube sub-assembly.

(c) Remove the O-ring from the transmission oil filler tube sub-assembly.

8. REMOVE STARTER ASSEMBLY INFO

9. SEPARATE TRANSMISSION CONTROL CABLE SUPPORT



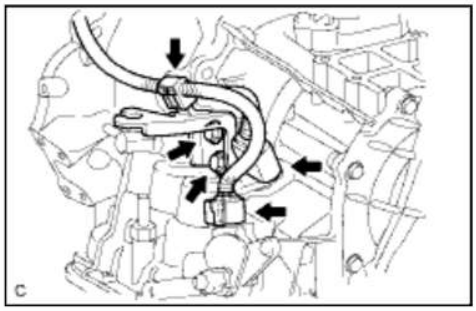
(a) Separate the speed sensor connector and wire harness clamp.

(b) Remove the bolt and transmission control cable bracket from the automatic transaxle.

10. REMOVE NO. 1 TRANSMISSION CONTROL CABLE BRACKET

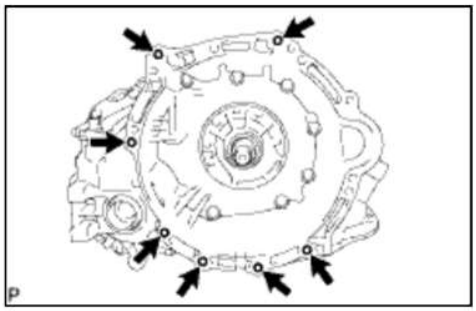
(a) Separate the 2 connectors and wire harness clamp.

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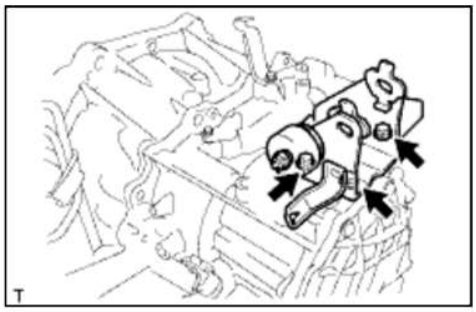
(b) Remove the 2 bolts and remove the No. 1 transmission control cable bracket from the automatic transaxle.

11. REMOVE AUTOMATIC TRANSAXLE ASSEMBLY



(a) Remove the 7 bolts and automatic transaxle from the engine.

12. REMOVE ENGINE MOUNTING BRACKET LH

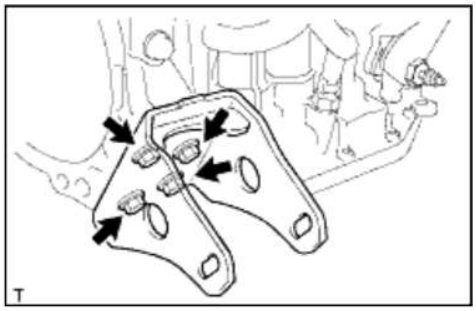


(a) Remove the 3 bolts and engine mounting bracket LH from the automatic transaxle.

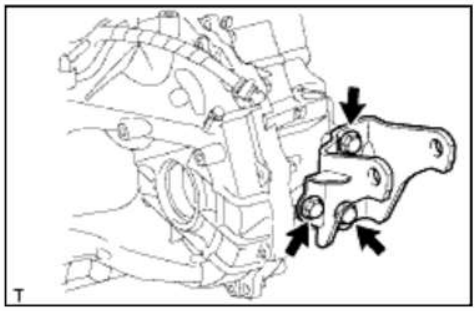
13. REMOVE FRONT ENGINE MOUNTING BRACKET

(a) Remove the 4 bolts and front engine mounting bracket from the automatic transaxle.

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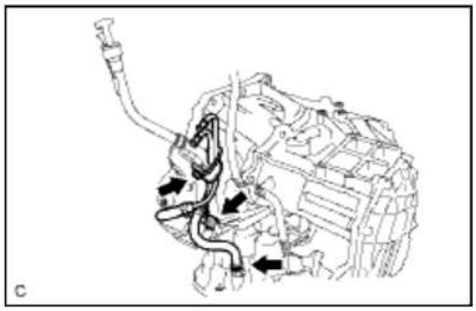


14. REMOVE REAR ENGINE MOUNTING BRACKET



(a) Remove the 3 bolts and rear engine mounting bracket from the automatic transaxle.

15. REMOVE OIL COOLER TUBE SUB-ASSEMBLY (for TMC Made)

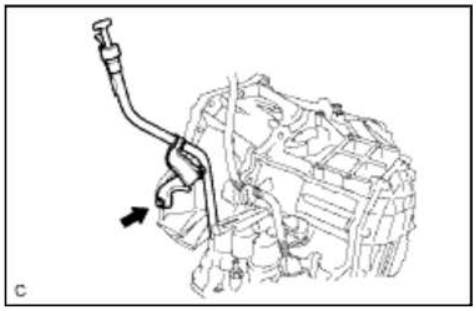


(a) Remove the 2 hose clamps, bolt and oil cooler tube sub-assembly.

16. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY (for TMC Made)

(a) Remove the transmission oil level gauge sub-assembly.

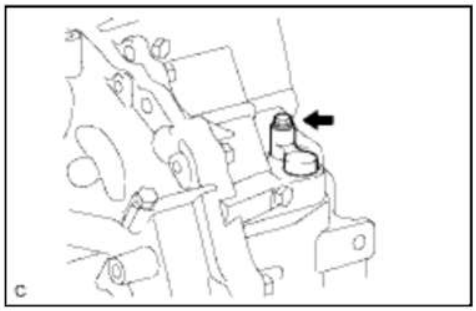
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(b) Remove the bolt and transmission oil filler tube sub-assembly.

(c) Remove the O-ring from the transmission oil filler tube sub-assembly.

17. REMOVE SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY



(a) Remove the bolt and speedometer driven hole cover sub-assembly.

18. REMOVE TORQUE CONVERTER CLUTCH ASSEMBLY

(a) Remove the torque converter clutch from the automatic transaxle.

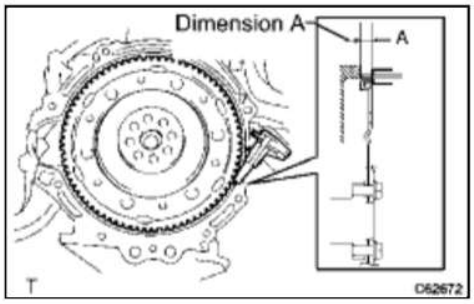
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Last Modified: 3-10-2010	6.4 A	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM00000192B020X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE ASSEMBLY: INSTALLATION (2010 Corolla)		

INSTALLATION

1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

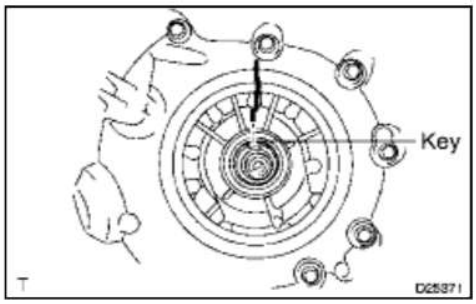
2. INSTALL TORQUE CONVERTER CLUTCH ASSEMBLY



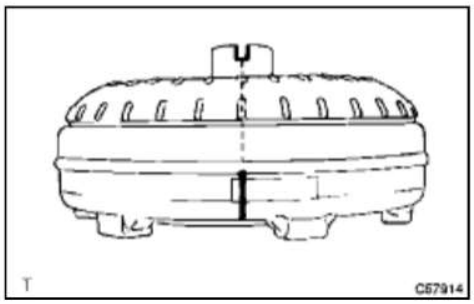
(a) Using a vernier caliper, measure dimension A between the transaxle fitting surface of the engine and the converter fitting surface of the drive plate. (#1)

HINT:

The ring gear side surface and the converter fitting surface are same level.



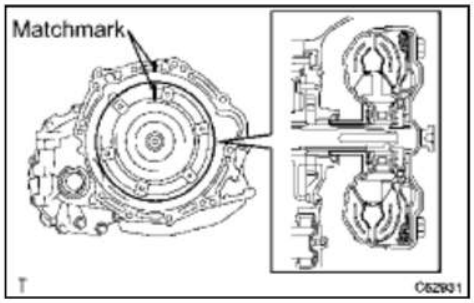
(b) Set the key at the top of the front oil pump drive gear and put a matchmark on the housing.

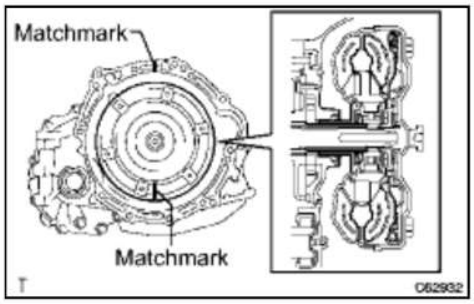


(c) Put a matchmark on the torque converter so that its groove is clearly indicated.

(d) Align the matchmarks on the case with the one on the converter and fit the spline of the input shaft to the spline of the turbine runner.

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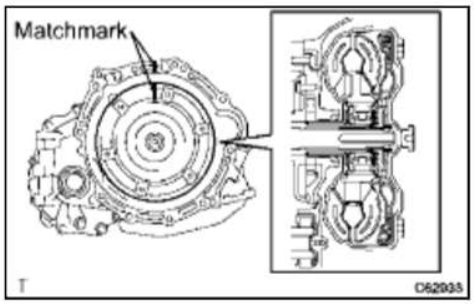




(e) Rotating the converter, fit the spline of the stator shaft with that of the stator.

HINT:

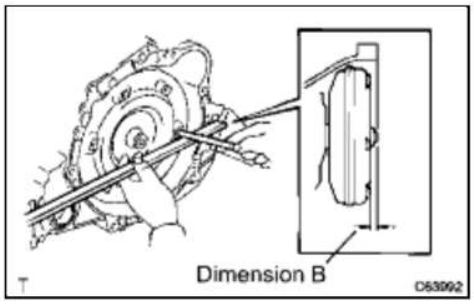
Rotate the converter approximately 180°.



(f) Rotating the converter, align the mark on the case with the one on the converter again and fit the key of the oil pump drive gear into the keyway of the converter.

NOTICE:

Do not push the converter excessively when rotating it.



(g) Using a vernier caliper and a straightedge, measure dimension B shown in the illustration and check that dimension B is greater than dimension A, which was measured in step #1.

Standard:

A + 1 mm (0.0394 in.) or more

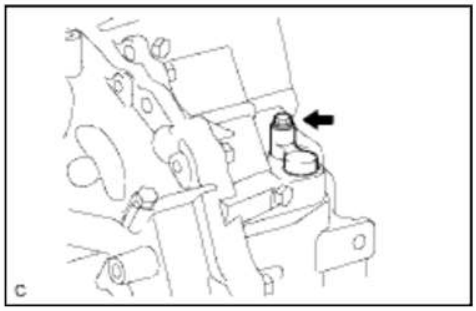
NOTICE:

Subtract the thickness of the straightedge from the measured value to gain dimension B.

3. INSTALL SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY

(a) Install the speedometer driven hole cover sub-assembly

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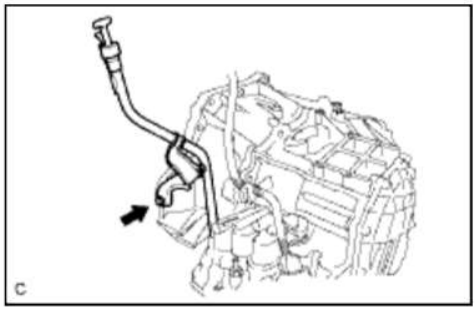


to the automatic transaxle with the bolt.

Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)

4. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY (for TMC Made)

(a) Apply ATF to a new O-ring, and install it to the transmission oil filler tube sub-assembly.

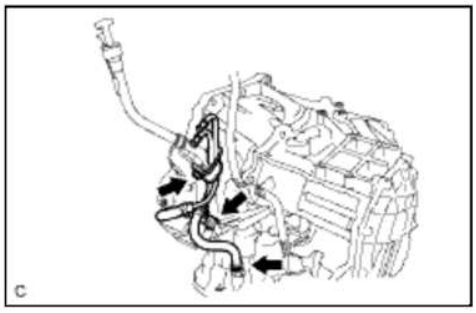


(b) Install the transmission oil filler tube sub-assembly to the automatic transaxle with the bolt.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

(c) Install the transmission oil level gauge sub-assembly.

5. INSTALL OIL COOLER TUBE SUB-ASSEMBLY (for TMC Made)



(a) Connect the 2 oil cooler hoses to the 2 unions with the 2 hose clamps.

(b) Install the oil cooler tube sub-assembly to the automatic transaxle with the bolt.

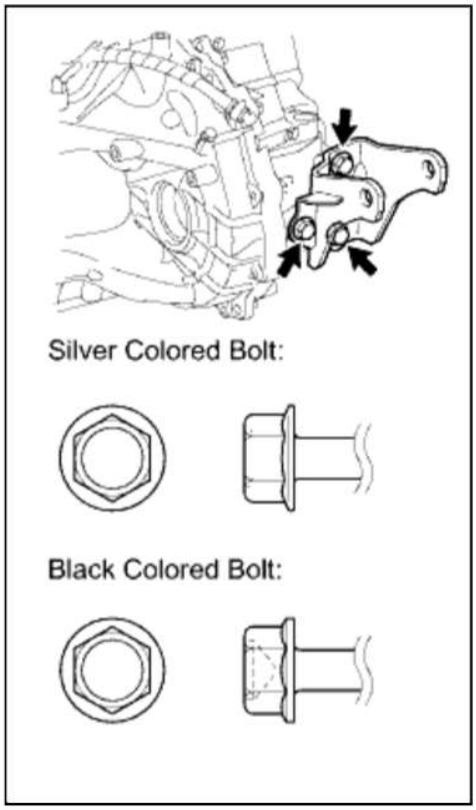
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

6. INSTALL REAR ENGINE MOUNTING BRACKET (for TMC Made)

(a) Install the rear engine mounting bracket to the automatic transaxle with the 3 bolts.

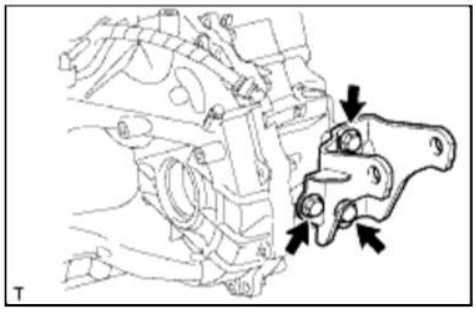
Silver Colored Bolt - Torque: 45 N·m (459 kgf·cm, 33ft·lbf)

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Black Colored Bolt - Torque: 64 N·m (653 kgf·cm, 47ft·lbf)

7. INSTALL REAR ENGINE MOUNTING BRACKET (except TMC Made)



(a) Install the rear engine mounting bracket to the automatic transaxle with the 3 bolts.

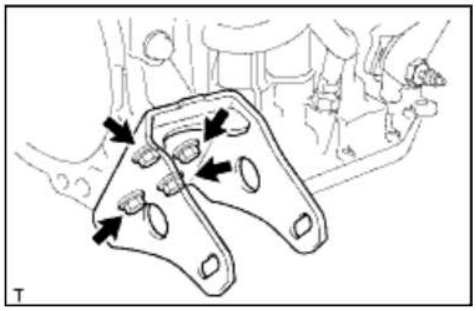
Torque: 45 N·m (459 kgf·cm, 33ft·lbf)

8. INSTALL FRONT ENGINE MOUNTING BRACKET

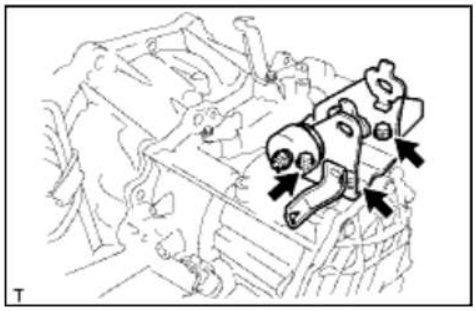
(a) Install the front engine mounting bracket to the automatic transaxle with the 4 bolts.

Torque: 64 N·m (653 kgf·cm, 47ft·lbf)

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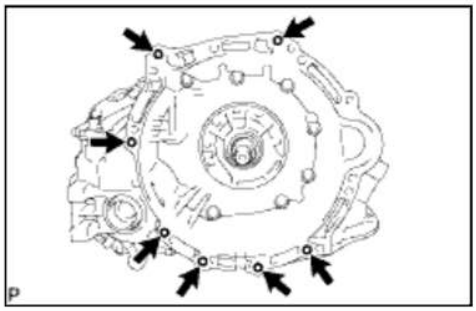
9. INSTALL ENGINE MOUNTING BRACKET LH



(a) Install the engine mounting bracket LH to the automatic transaxle with the 3 bolts.

Torque: 52 N·m (530 kgf·cm, 38ft·lbf)

10. INSTALL AUTOMATIC TRANSAXLE ASSEMBLY



(a) Install the automatic transaxle to the engine with the 7 bolts.

Torque: 30 N·m (301 kgf·cm, 22ft·lbf)

NOTICE:

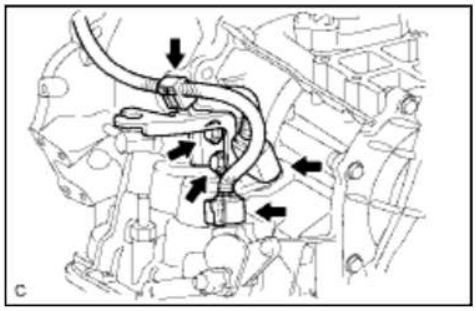
Make sure the knock pins are fully engaged and the transaxle securely fitted to the engine before tightening the bolts.

11. INSTALL NO. 1 TRANSMISSION CONTROL CABLE BRACKET

(a) Install the No. 1 transmission control cable bracket to the automatic transaxle with the 2 bolts.

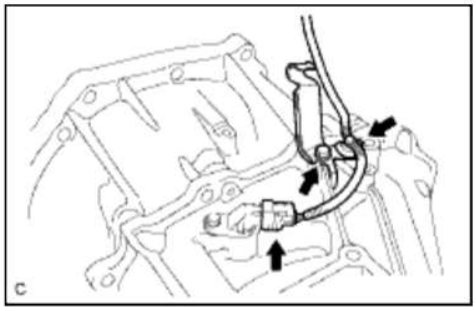
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

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(b) Connect the 2 connectors and wire harness clamp.

12. INSTALL TRANSMISSION CONTROL CABLE SUPPORT



(a) Install the transmission control cable support with the bolt.

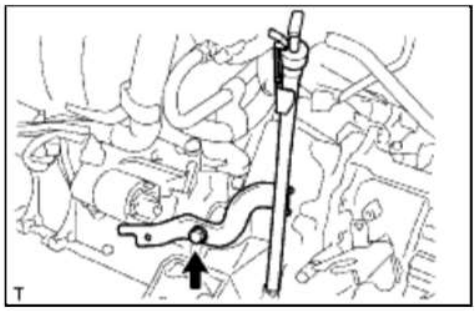
Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

(b) Connect the wire harness clamp and speed sensor connector.

13. INSTALL STARTER ASSEMBLY INFO

14. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY (except TMC Made)

(a) Apply ATF WS to a new O-ring, and install it to the transmission oil filler tube sub-assembly.



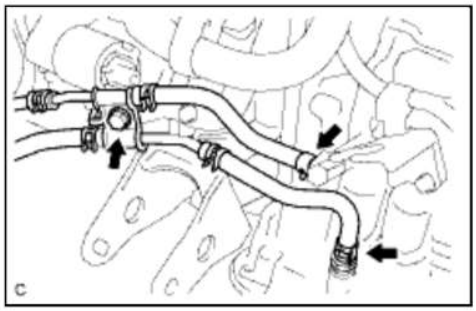
(b) Install the transmission oil filler tube sub-assembly to the automatic transaxle with the bolt.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

(c) Install the transmission oil level gauge sub-assembly to the transmission oil filler tube sub-assembly.

15. INSTALL OIL COOLER TUBE SUB-ASSEMBLY (except TMC Made)

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(a) Connect the 2 oil cooler hoses to the 2 unions with the 2 hose clamps.

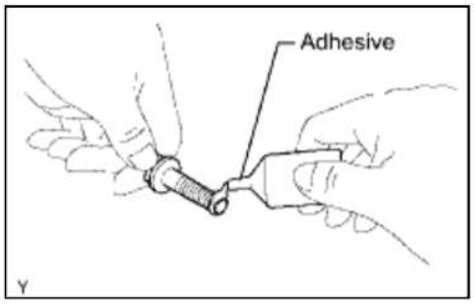
(b) Install the oil cooler tube to the automatic transaxle with the bolt.

Torque: 12 N·m (122 kgf·cm, 9ft·lbf)

16. INSTALL FRONT ENGINE MOUNTING INSULATOR INFO

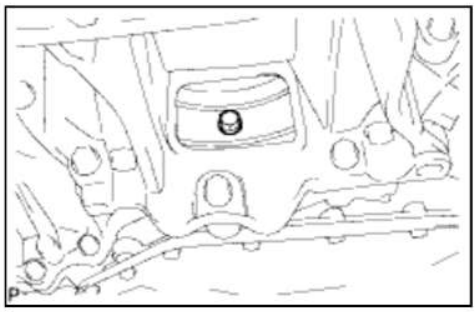
17. INSTALL REAR ENGINE MOUNTING INSULATOR INFO

18. INSTALL DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



(a) Apply a few drops of adhesive to 2 or 3 threads of the 6 torque converter clutch setting bolts tip.

Adhesive:
Toyota Genuine Adhesive 1324, Three Bond 1324 or equivalent



(b) Install the 6 torque converter clutch setting bolts while holding the crankshaft pulley bolt with a wrench.

Torque: 28 N·m (286 kgf·cm, 21ft·lbf)

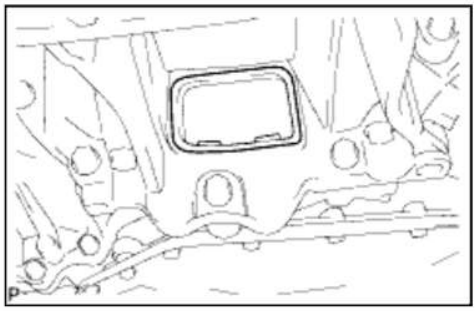
NOTICE:

Install the black colored bolt first, and then the silver colored 5 bolts.

19. INSTALL FLYWHEEL HOUSING UNDER COVER

(a) Install the flywheel housing under cover to the automatic transaxle.

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20. INSTALL ENGINE ASSEMBLY WITH TRANSAXLE

HINT:

See the steps from "Install Engine Assembly with Transaxle" through "Check ABS Speed Sensor Signal" INFO .

21. RESET MEMORY

HINT:

Perform Reset Memory (AT initialization) when replacing the automatic transaxle assembly INFO .

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000016SC02SX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE FLUID: ON-VEHICLE INSPECTION (2010 Corolla)		

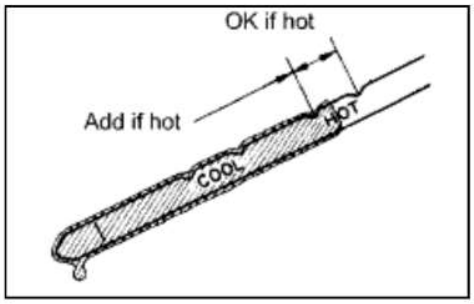
ON-VEHICLE INSPECTION

1. CHECK TRANSAXLE FLUID LEVEL

HINT:

Drive the vehicle so that the engine and transaxle are at normal operating temperature.

Fluid temperature:
70 to 80°C (158 to 176°F)



(a) Park the vehicle on a level surface and set the parking brake.

(b) With the engine idling and the brake pedal depressed, move the shift lever to all positions from P to S. Then return it to P.

(c) Pull out the dipstick and wipe it clean.

(d) Push the dipstick back fully into the pipe.

(e) Pull the dipstick out again and check that the fluid level is within the HOT range. If the fluid level is below the HOT range, add new fluid and recheck the fluid level. If the fluid level exceeds the HOT range, drain the fluid once, add a proper amount of new fluid and recheck the fluid level.

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Last Modified: 3-10-2010	6.4 G	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000016SC02RX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE FLUID: ON-VEHICLE INSPECTION (2010 Corolla)		

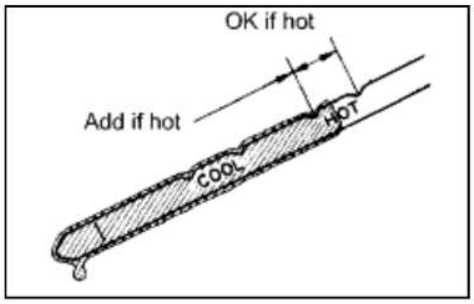
ON-VEHICLE INSPECTION

1. CHECK FLUID LEVEL

HINT:

Drive the vehicle so that the engine and transaxle are at normal operating temperature.

Fluid temperature:
70 to 80°C (158 to 176°F)



(a) Park the vehicle on a level surface and set the parking brake.

(b) With the engine idling and the brake pedal depressed, move the shift lever to all positions from P to L. Then return it to P.

(c) Pull out the dipstick and wipe it clean.

(d) Push the dipstick back fully into the pipe.

(e) Pull the dipstick out again and check that the fluid level is within the HOT range. If the fluid level is below the HOT range, add new fluid and recheck the fluid level. If the fluid level exceeds the HOT range, drain the fluid once, add a proper amount of new fluid and recheck the fluid level.

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Last Modified: 3-10-2010	6.4 L	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000U9U07XX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: PRECAUTION (2010 Corolla)		

PRECAUTION

NOTICE:

- Perform the RESET MEMORY (AT initialization) when replacing the automatic transaxle assembly, engine assembly or ECM INFO .
- Perform the REGISTRATION (VIN registration) when replacing the ECM INFO .

HINT:

RESET MEMORY can not be completed by only disconnecting the battery cable.

1. EXPRESSIONS OF IGNITION SWITCH

(a) The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

SWITCH TYPE		IGNITION SWITCH (POSITION)	ENGINE SWITCH (CONDITION)
Expression	Ignition switch off	LOCK	Off
	Ignition switch ON	ON	On (IG)
	Ignition switch ACC	ACC	On (ACC)
	Engine start	START	Start

2. REMOVAL AND INSTALLATION PROCEDURE PRECAUTIONS

(a) The automatic transaxle is composed of highly precision-finished parts which need careful inspection before reassembly. Even a small nick could cause fluid leakage or affect the performance. The instructions here are organized so that you work on only one component group at a time. This will help avoid confusion caused by similar-looking parts of different sub-assemblies being on your workbench at the same time. The component groups are inspected and repaired from the converter housing side. Complete the inspection, repair and reassembly before proceeding to the next component group as much as possible. If a defect is found in a certain component group during reassembly, inspect and repair this group immediately. If a component group cannot be assembled because some parts are being ordered, be sure to keep all parts of the group in a separate container while proceeding with disassembly, inspection, repair and reassembly of other component groups. Recommended: Toyota Genuine ATF WS

(b) All disassembled parts should be washed clean and any fluid passages and holes should be blown through with compressed air.

(c) Dry all parts with compressed air. Never use a shop rag or a piece of cloth to dry them.

(d) When using compressed air, always aim away from yourself to prevent accidentally spraying ATF or kerosene in your face.

(e) Only recommended automatic transaxle fluid or kerosene should be used for cleaning.

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(f) After cleaning, the parts should be arranged in the correct order for efficient inspection, repair, and reassembly.

(g) New discs for the brakes and clutches that are to be used for replacement must be soaked in ATF for at least 15 minutes before reassembly.

(h) All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with ATF prior to reassembly.

(i) All gaskets and rubber O-rings should be replaced with new ones.

(j) Do not apply adhesive cements to gaskets and similar parts.

(k) Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.

(l) When replacing a worn bushing, the sub-assembly containing the bushing must also be replaced.

(m) Check thrust bearings and races for wear or damage. Replace them as necessary.

(n) When working with FIPG material, you must observe the following:

- Using a razor blade and a gasket scraper, remove all the old packing (FIPG) material from the gasket surface.
- Thoroughly clean all components to remove any loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Parts must be reassembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7I0BOX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DEFINITION OF TERMS (2010 Corolla)		

DEFINITION OF TERMS

TERM	DEFINITION
Monitor description	Description of what the ECM monitors and how it detects malfunctions (monitoring purpose and its details).
Related DTCs	Diagnostic code
Typical enabling condition	Preconditions that allow the ECM to detect malfunctions. With all preconditions satisfied, the ECM sets the DTC when the monitored value(s) exceeds the malfunction threshold(s).
Sequence of operation	The priority order that is applied to monitoring, if multiple sensors and components are used to detect the malfunction. While another sensor is being monitored, the next sensor or component will not be monitored until the previous monitoring has concluded.
Required sensor/components	The sensors and components that are used by the ECM to detect malfunctions.
Frequency of operation	The number of times that the ECM checks for malfunctions per driving cycle. "Once per driving cycle" means that the ECM detects malfunction only one time during a single driving cycle. "Continuous" means that the ECM detects malfunction every time when enabling condition is met.
Duration	The minimum time that the ECM must sense a continuous deviation in the monitored value(s) before setting a DTC. This timing begins after the "typical enabling conditions" are met.
Malfunction thresholds	Beyond this value, the ECM will conclude that there is a malfunction and set a DTC.
MIL operation	MIL illumination timing after a defect is detected. "Immediately" means that the ECM illuminates MIL the instant the ECM determines that there is a malfunction. "2 driving cycle" means that the ECM illuminates MIL if the same malfunction is detected again in the 2nd driving cycle.
Component operating range	Normal operation range of sensors and solenoids under normal driving conditions. Use these ranges as a reference. They cannot be used to judge if a sensor or solenoid is defective or not.

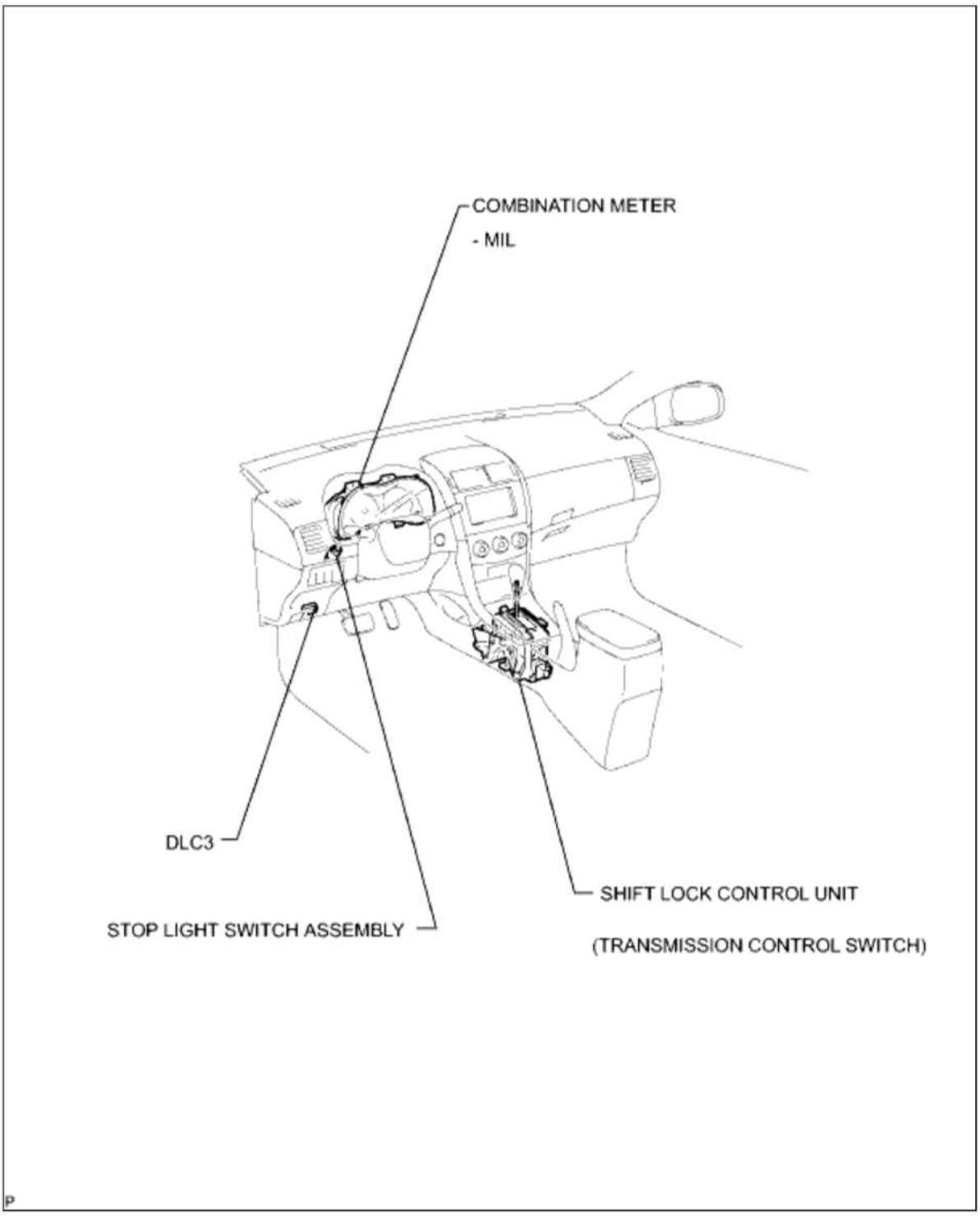
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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W720AKX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

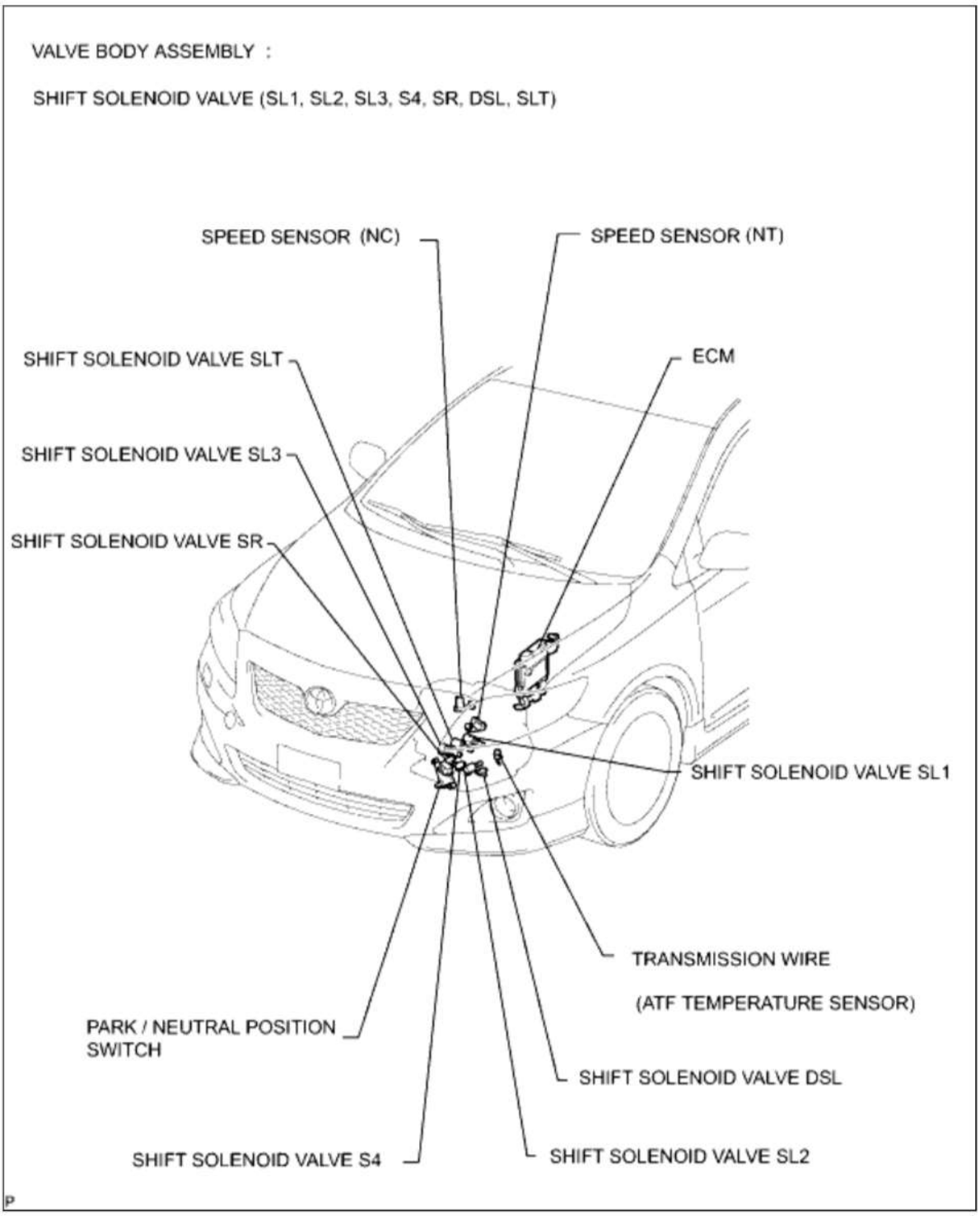
ILLUSTRATION

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ILLUSTRATION

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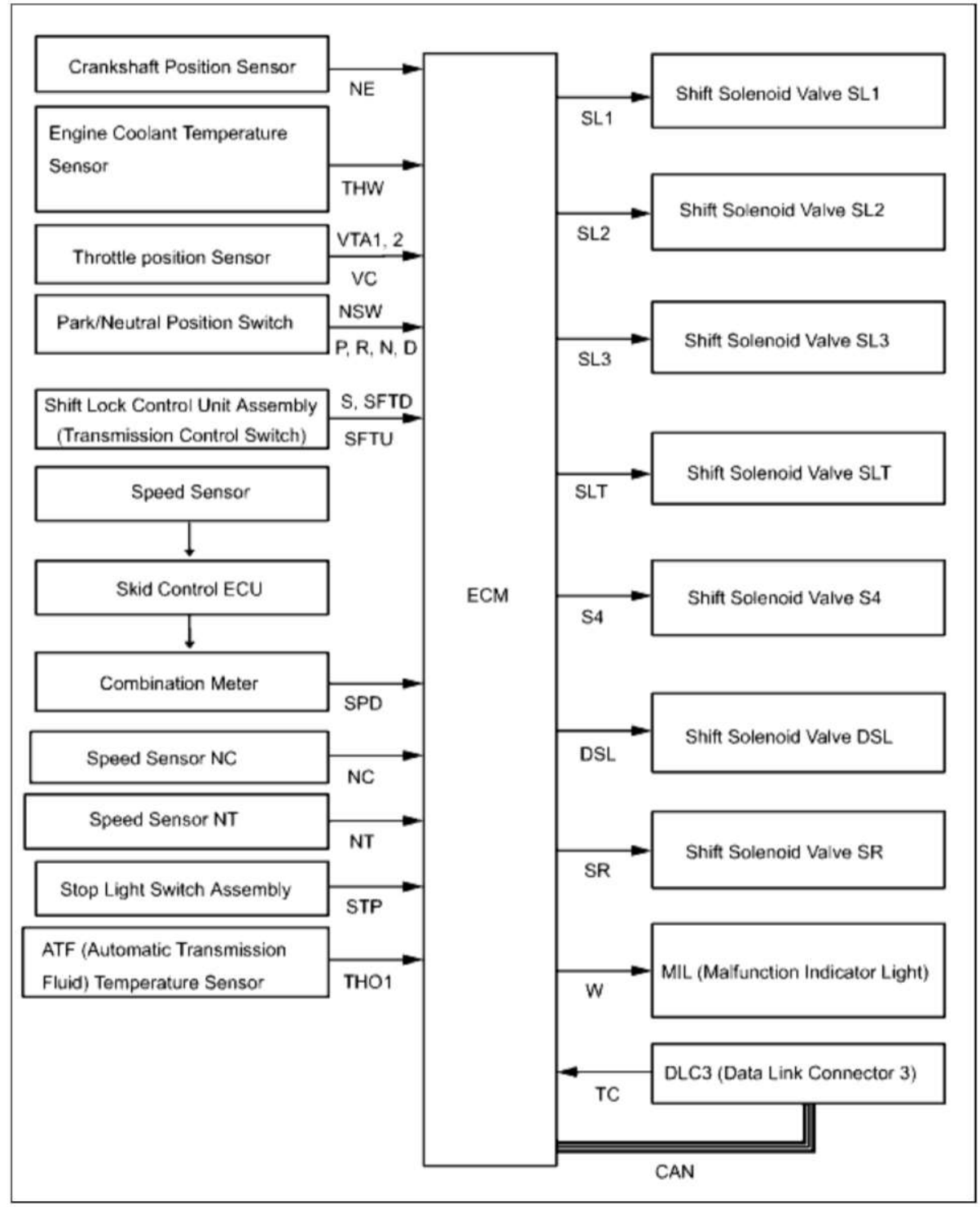
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7D09HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM

The configuration of the electronic control system in the U250E automatic transaxle is as shown in the following chart.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W6Z0DJX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- The ECM of this system is connected to the CAN and multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the CAN and multiplex communication systems.
- *: Use Techstream

1.	**Vehicle Brought to Workshop**

NEXT

2.	**Customer Problem Analysis**

NEXT

3.	**Connect Techstream to the DLC3***

NEXT

4.	**Check and Clear DTCs and Freeze Frame Data***

HINT: INFO .

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NEXT

5.	Visual Inspection

NEXT

6.	Setting the Check Mode Diagnosis*

HINT:2 INFO .

NEXT

7.	Problem Symptom Confirmation

HINT:2 INFO .

▶ Symptom does not occur: Go to step 8

▶ Symptom occurs: Go to step 9

8.	Symptom Simulation

HINT:2 INFO .

NEXT

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9.	DTC Check*

HINT:2 INFO .

▶ DTC is not output: Go to step 10

▶ DTC is output: Go to step 17

10.	Basic Inspection

HINT:2 INFO ,2 INFO and2 INFO).

NG ▶ Go to step 19

OK
▼

11.	Mechanical System Test

HINT:2 INFO .

NG ▶ Go to step 16

OK
▼

12.	Hydraulic Test

HINT:2 INFO .

NG ▶ Go to step 16

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OK

13.	**Manual Shifting Test**

HINT:2 INFO .

NG ▶ **Go to step 15**

OK

14.	**Problem Symptoms Table Chapter 1**

HINT:2 INFO .

NG ▶ **Go to step 18**

OK

15.	**Problem Symptoms Table Chapter 2**

HINT:2 INFO .

NEXT

16.	**Part Inspection**

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Go to step 19

17.	DTC Chart

HINT:2 INFO .

NEXT

18.	Circuit Inspection

NEXT

19.	Repair or Replace

NEXT

20.	Confirmation Test

NEXT End

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W750BMX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

1. SYSTEM DESCRIPTION

(a) The ECT (Electronic controlled automatic transmission/transxle) is an automatic transmission/transaxle that electronically controls shift timing using the ECM. The ECM detects electrical signals that indicate engine and driving conditions, and controls the shift point, based on driver habits and road conditions. As a result, fuel efficiency and power transmission performance are improved.

Shift shock has been reduced by controlling the engine and transmission simultaneously.

In addition, the ECT has features such as follows:

- Diagnostic function.
- Fail-safe function when a malfunction occurs.



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W790AXX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: ROAD TEST (2010 Corolla)		

ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

(a) Based on the result of the customer problem analysis, try to reproduce the symptoms. If the problem is that the transaxle does not shift up, shift down, or the shift point is too high or too low, conduct the following road test referring to the automatic shift schedule and simulate the problem symptoms.

2. ROAD TEST

NOTICE:

Preform the test at the ATF (Automatic Transmission Fluid) temperature 50 to 80 °C (122 to 176 °F) in the normal operation.

(a) D position test:

Shift into the D position and fully depress the accelerator pedal and check the following points.

(1) Check up-shift operation.

Check that 1 → 2, 2 → 3, 3 → 4 and 4 → 5th up-shifts take place, and that the shift points conform to the automatic shift schedule INFO .

HINT:

5th Gear Up-shift Prohibition Control

- Engine coolant temperature is 55°C (131°F) or less and vehicle speed is at 70km/h (43 mph) or less.
- ATF temperature is -2°C (28°F) or less.

5th and 4th Gear Lock-up Prohibition Control

- Brake pedal is depressed.
- Accelerator pedal is released.
- Engine coolant temperature is 60°C (140°F) or less.

(2) Check for shift shock and slip.

Check for shock and slip at the 1 → 2, 2 → 3, 3 → 4, and 4→ 5th up-shifts.

(3) Check for abnormal noise and vibration.

Check for abnormal noise and vibration when up-shifting from 1 → 2, 2 → 3, 3 → 4, and 4→ 5 while driving with the shift lever in the D position, and also check while driving in the lock-up condition.

HINT:

The check for the cause of abnormal noise and vibration must be done thoroughly as it could also be due to loss of balance in the differential, torque converter clutch, etc.

(4) Check kick-down operation.

Check vehicle speeds when the 2nd to 1st, 3rd to 2nd, 4th to 3rd, and 5th to 4th kick-downs

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take place while driving with the shift lever in the D position. Confirm that each speed is within the applicable vehicle speed range indicated in the automatic shift schedule INFO .

(5) Check for abnormal shock and slip at kick-down.

(6) Check the lock-up mechanism.

- Drive in the D position (5th gear), at a steady speed (lock-up ON).
- Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

HINT:

- There is no lock-up function in the 1st, 2nd and 3rd gears.
- If there is a big jump in engine speed, there is no lock-up.

(b) S position test

Shift to the S position, depress the accelerator pedal and check the following points:

(1) Check shift operation.

- While driving in the D position and 5th gear, shift into the S position and back to the D position. Check that the gear change 5 → 4 down-shift and 4 → 5 up-shift can be performed.
- With the shift lever in the S position (while the vehicle is stopped), shift into the "+" position to check that the shift position on the combination meter changes as follows: 1 → 2, 2 → 3, 3 → 4, and 4 → 5.
- While driving in the 4 (S) position and 4th gear (at a vehicle speed of approximately 40 to 50 km/h (25 to 31 mph)), shift into the "-" position and check if the 3rd gear down-shift occurs and the engine brake performs properly.
- While driving in the 3 (S) position and 3rd gear (at a vehicle speed of approximately 30 to 40 km/h (19 to 25 mph)), shift into the "-" position and check if the 2nd gear down-shift occurs and the engine brake performs properly.
- While driving in the 2 (S) position and 2nd gear (at a vehicle speed of approximately 20 to 30 km/h (12 to 19 mph)), shift into the "-" position and check if the 1st gear down-shift occurs and the engine brake performs properly.

HINT:

Manual shift (S position) is prohibited under either of the following conditions:

- Down-shifting may cause engine overrun.
- The driver continuously down-shifts. (Down-shifting to 1st gear may not be performed.)

(c) R position test:

Shift into the R position, lightly depress the accelerator pedal, and check that the vehicle moves backward without any abnormal noise or vibration.

CAUTION:

Before conducting this test ensure that the test area is free from people and obstruction.

(d) P position test:

Stop the vehicle on a grade (more than 5°) and after shifting into the P position, release the parking brake. Then, check that the parking lock pawl holds the vehicle in place.

(e) Uphill/downhill control function:

(1) Check that the gear does not up-shift to the 4th or 5th gear while the vehicle is driving uphill.

(2) Check that the gear automatically down-shifts from the 5th to 4th or from the 4th to 3rd gear

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when brake is applied while the vehicle is driving downhill.

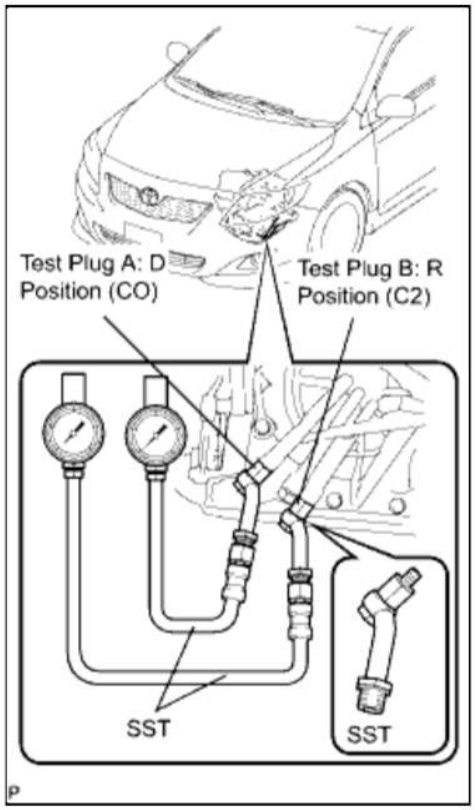
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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7B0BXX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: HYDRAULIC TEST (2010 Corolla)		

HYDRAULIC TEST

1. PERFORM HYDRAULIC TEST

(a) Measure the line pressure.



NOTICE:

- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature: 50 to 80°C (122 to 176°F).
- The line pressure test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is performing the test.
- Be careful to prevent SST hose from interfering with the exhaust pipe.
- This Check must be conducted after checking and adjusting engine.
- Perform under condition that A/C is OFF.
- When conducting stall test, do not continue more than 10 seconds.

(1) Warm up the ATF (Automatic Transmission Fluid).

(2) Lift the vehicle up.

(3) Remove the engine under cover.

(4) Connect Techstream to the DLC3.

(5) Remove the test plug A on the transaxle case front left side and install the SST.

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SST: 09992-00095

09992-00231

09992-00271

NOTICE:

There is a difference in installation point between D position and R position.

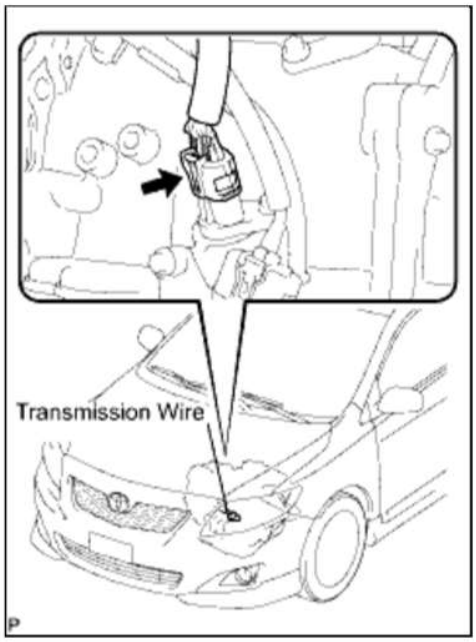
(6) Start the engine.

(7) Using Techstream, shift to D position and hold 3rd gear by active test, and measure the line pressure in idling.

Specified line pressure:

CONDITION	D POSITION KPA (KGF / CM^2, PSI)
Idling	372 to 412 kPa (3.8 to 4.2 kgf/cm^2, 54 to 60 psi)

(8) Turn the ignition switch off.



(9) Disconnect the connector of the transmission wire.

HINT:

Disconnect the connector only when performing the D position stall test.

(10) Start the engine.

(11) Firmly depress the brake pedal, shift to the D position, depress the accelerator pedal all the way down and check the line pressure while the stall test is performed.

Specified line pressure:

CONDITION	D POSITION KPA (KGF / CM^2, PSI)
Stall test	931 to 1031 kPa (9.5 to 10.5 kgf/cm^2, 135 to 150 psi)

(12) Turn the ignition switch off.

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(13) Remove the SST, install the test plug A.

(14) Remove the test plug B, install the SST and start engine.

SST: 09992-00095

09992-00231, 09992-00271

(15) Connect the transmission wire connector, depress the brake pedal firmly, shift to the R position and check that the line pressure while the engine is idling and during the stall test.

Specified line pressure:

CONDITION	R POSITION KPA (KGF / CM^2, PSI)
Idling	672 to 742 kPa (6.9 to 7.6 kgf/cm^2, 97 to 108 psi)
Stall test	1768 to 1968 kPa (18.0 to 20.1 kgf/cm^2, 256 to 285 psi)

(16) Remove the SST, install the test plug B.

(17) Clear the DTC.

Evaluation:

PROBLEM	POSSIBLE CAUSE
Measured values are higher than specified in all positions	• Shift solenoid valve (SLT) defective • Regulator valve defective
Measured values are lower than specified in all positions	• Shift solenoid valve (SLT) defective • Regulator valve defective • Oil pump defective • U/D (Underdrive) direct clutch defective
Pressure is low in the D position only	• D position circuit fluid leak • Forward clutch defective
Pressure is low in the R position only	• R position circuit fluid leak • Reverse clutch defective • 1st and reverse brake defective

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7A0C7X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: MECHANICAL SYSTEM TESTS (2010 Corolla)		

MECHANICAL SYSTEM TESTS

1. PERFORM MECHANICAL SYSTEM TESTS

(a) Measure the stall speed.

The object of this test is to check the overall performance of the transaxle and engine by measuring the stall speeds in the D position.

NOTICE:

- Driving test should be done on a paved road (a nonskid road).
- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature 50 to 80°C (122 to 176°F).
- Do not continuously run this test for longer than 10 seconds.
- To ensure safety, do this test in a wide, clear level area which provides good traction.
- The stall test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is doing the test.

(1) Chock the 4 wheels.

(2) Connect Techstream to the DLC3.

(3) Fully apply the parking brake.

(4) Keep your left foot pressed firmly on the brake pedal.

(5) Start the engine.

(6) Shift into the D position. Press all the way down on the accelerator pedal with your right foot.

(7) Quickly read the stall speed at this time.

Stall speed:
2310 +- 150 rpm

Evaluation:

PROBLEM	POSSIBLE CAUSE
(a) Stall engine speed is low in D position	• Engine power output may be insufficient • Stator one-way clutch not operating properly **HINT:** **If the value is less than the specified value by 600 rpm or more, the torque converter could be faulty.**
(b) Stall engine speed is high in D position	• Line pressure is too low • Forward clutch slipping • U/D (Underdrive) brake slipping • U/D (Underdrive) one-way clutch is not operating properly • No.1 one-way clutch not operating properly

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PROBLEM	POSSIBLE CAUSE
	• Improper fluid level

(b) Measure the time lag.

(1) When the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before the shock can be felt. This is used for checking the condition of the clutch and brake.

NOTICE:

- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature: 50 to 80°C (122 to 176°F).
- Be sure to allow 1 minute interval between tests.
- Perform the test three times, and measure the time lags. Calculate the average value of the three time lags.

(2) Connect Techstream to the DLC3.

(3) Fully apply the parking brake.

(4) Start and warm up the engine and check idle speed.

Idle speed:
approx. 700 rpm (In N position and A/C OFF)

(5) Shift the lever from N to D position. Using a stop watch, measure the time from when the lever is shifted until the shock is felt.

Time lag:
N → D less than 1.2 seconds

(6) In the same way, measure the time lag for N → R.

Time lag:
N → R less than 1.5 seconds

Evaluation (If N → D or N → R time lag is longer than the specified):

PROBLEM	POSSIBLE CAUSE
N → D time lag is longer	• Line pressure is too low • Forward clutch worn • No.1 one-way clutch is not operating properly • U/D (Underdrive) one-way clutch is not operating • U/D (Underdrive) brake worn
N → R time lag is longer	• Line pressure is too low • Reverse clutch worn • 1st and reverse brake worn • U/D (Underdrive) brake worn

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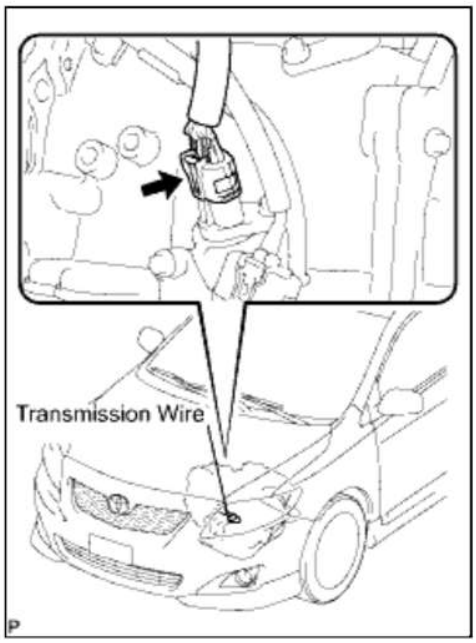
Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7C0CXX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: MANUAL SHIFTING TEST (2010 Corolla)		

MANUAL SHIFTING TEST

1. PERFORM MANUAL SHIFTING TEST

HINT:

- With this test, it can be determined whether the trouble occurs in the electrical circuit or is a mechanical problem in the transaxle.
- If any abnormalities are found in the following test, the problem is in the transaxle itself.



(a) Disconnect the connector of the transmission wire.

(b) Drive with the transmission wire disconnected.

Shifting the shift lever to the D position to check whether the shifting condition changes the table below.

SHIFT POSITION	SHIFTING CONDITION
D	No Shift (Not Change)

HINT:

When driving with the transmission wire disconnected, the gear position will be as follows:

- When the shift lever is in the D position, the gear is held in the 4th position.
- When the shift lever is in the R or the P position, the gear is also in the R or the P position respectively.

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(c) Connect the connector of the transmission wire.

(d) Clear the DTC INFO .



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7F0B2X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: INITIALIZATION (2010 Corolla)		

INITIALIZATION

1. RESET MEMORY

NOTICE:

- Perform the RESET MEMORY (AT initialization) when replacing the automatic transaxle assembly, engine assembly or ECM.
- The RESET MEMORY can be performed only with Techstream.

HINT:

The ECM memorizes the condition that the ECT controls the automatic transaxle assembly and engine assembly according to those characteristics. Therefore, when the automatic transaxle assembly, engine assembly, or ECM has been replaced, it is necessary to reset the memory so that the ECM can memorize the new information.

Reset procedure is as follows.

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON and the Techstream main switch on.

(d) Enter the following menu: Powertrain / Engine and ECT / Utility / Reset Memory. Then, press "Next".

CAUTION:

After performing the RESET MEMORY, be sure to perform the ROAD TEST  **described earlier.**

HINT:

The ECM is learned by performing the ROAD TEST.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7K0BPX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: MONITOR DRIVE PATTERN (2010 Corolla)		

MONITOR DRIVE PATTERN

1. MONITOR DRIVE PATTERN FOR ECT TEST

(a) Perform this drive pattern as one method to simulate the detection conditions of the ECT malfunctions. (The DTCs may not be detected due the actual driving conditions. And some codes may not be detected through this drive pattern.)

HINT:

Preparation for driving

- Warm up the engine sufficiently. (Engine coolant temperature is 60°C (140°F) or higher)
- Drive the vehicle when the atmospheric temperature is -10°C (14°F) or higher. (Malfunction is not detected when the atmospheric temperature is less than -10°C (14°F))

Driving note

- Drive the vehicle through all gears.

  Stop → 1st → 2nd → 3rd → 4th → 5th → 5th (lock-up ON).
- Perform engine brake test in the S position.

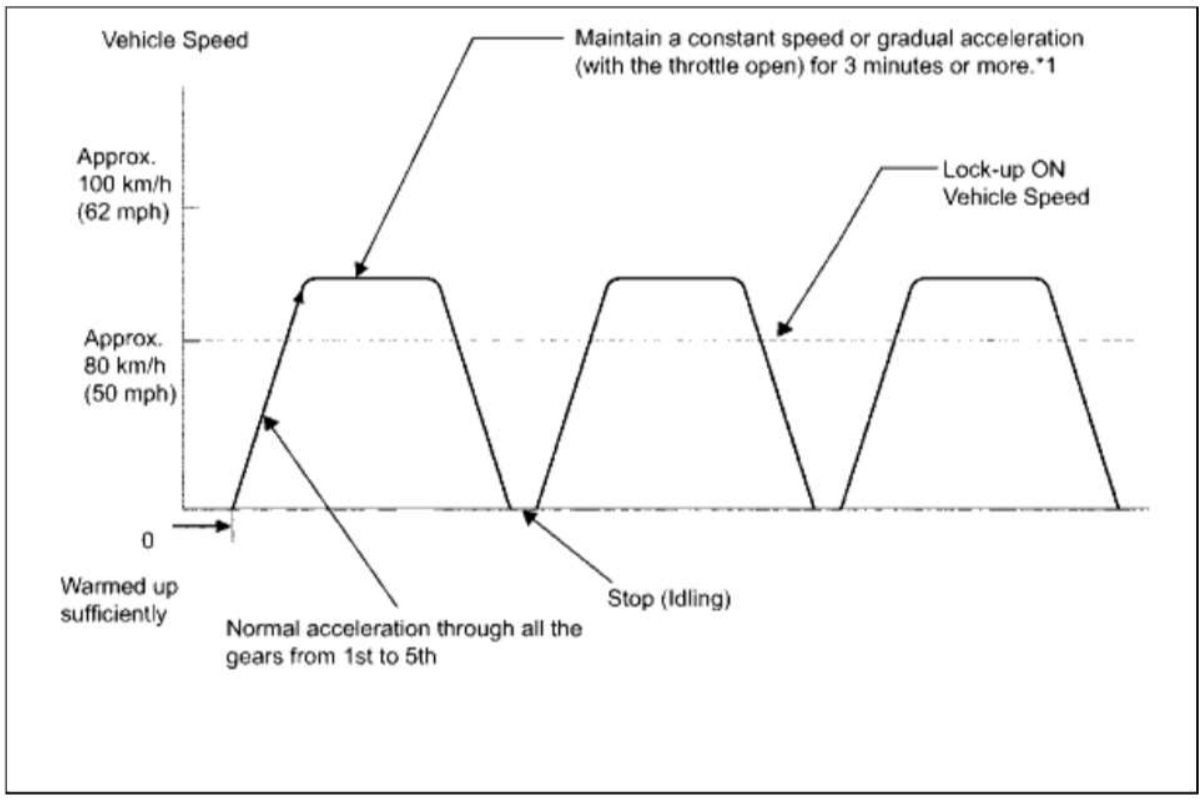
  While driving in the 5(S) position and 5th gear lock-up, shift into the "-" position and down-shift from 5th to 4th, 4th to 3rd, 3rd to 2nd, 2nd to 1st.

  Check that the engine brake performs properly whenever down-shift takes place.
- Repeat the above driving pattern three times or more.

NOTICE:

- The monitor status can be checked using Techstream. When using Techstream, monitor status can be found in the "Powertrain / Engine and ECT / Data List".
- In the event that the drive pattern must be interrupted (possibly due to traffic conditions or other factors), the drive pattern can be resumed and, in most cases, the monitor can be completed.
- Perform this drive pattern on a level road as much as possible and strictly observe the posted speed limits and traffic laws while driving.

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HINT:

***1: Drive at such a speed in the uppermost gear, to engage lock-up. The vehicle can be driven at a speed lower than that in the above diagram under the lock-up condition.**

NOTICE:

If necessary to drive the vehicle for approximately 30 minutes to detect DTC P0711 (ATF temperature sensor malfunction).

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Last Modified: 3-10-2010	6.4 T	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W730DEX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Corolla)		

PROBLEM SYMPTOMS TABLE

HINT:

- If a normal code is displayed during the diagnostic trouble code check although the trouble still occurs, check the electrical circuits for each symptom in the order given in the charts on the following pages and proceed to the page given for troubleshooting.
- The Matrix Chart is divided into 2 chapters.
- When the circuit on which mark *1 is attached is a malfunction, DTC could be output.

Chapter 1:

Refer to the table below when the trouble cause is considered to be electrical. If the instruction PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE is given in the flowchart of each circuit, inspect the suspected areas in descending order for each symptom. If the trouble still occurs even though there are no abnormalities in the inspections listed for the symptoms, check and replace the ECM.

Chapter 1: Electronic Circuit Matrix Chart

SYMPTOM	SUSPECTED AREA	SEE PAGE
No down-shift (A particular gear, from 1st to 4th gear, is not down-shifted)	ECM	INFO
No down-shift (5th -> 4th)	Park/neutral position switch circuit *1	INFO
	Shift solenoid valve (S4) circuit *1	INFO
	ECM	INFO
No up-shift (A particular gear, from 1st to 4th gear, is not up-shifted)	ECM	INFO
No up-shift (4th -> 5th)	ECM	INFO
No lock-up	Engine coolant temp. sensor circuit *1 (for 2AZ-FE)	INFO
	ECM	INFO
No lock-up off	ECM	INFO
Shift point too high or too low	Throttle position sensor circuit *1 (for 2AZ-FE)	INFO
	ECM	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
Up-shift to 5th from 4th while engine is cold	Engine coolant temp. sensor circuit *1 (for 2AZ-FE)	INFO
	ECM	INFO
No gear change by shifting into "+" or "-" while the shifting lever is in the S position	Transmission control switch circuit	INFO
	ECM	INFO
Harsh engagement (N -> D)	Shift solenoid valve (SL1) circuit *1	INFO
	ECM	INFO
Harsh engagement (Lock-up)	ECM	INFO
Harsh engagement (Any driving position)	ECM	INFO
Poor acceleration	ECM	INFO
No kick-down	ECM	INFO
Engine stalls when starting off or stopping	ECM	INFO
Malfunction in shifting	Transmission control switch circuit	INFO
	ECM	INFO

Chapter 2: On-Vehicle Repair and Off-Vehicle Repair

SYMPTOM	SUSPECTED AREA	SEE PAGE
Vehicle does not move in any forward position and in reverse positions	Valve body assembly	INFO
	U/D brake (B3)	INFO
	Torque converter clutch	INFO
Vehicle does not move in R position	Valve body assembly	INFO
	Reverse clutch (C2)	INFO
	1st and reverse brake (B2)	INFO
No up-shift (1st -> 2nd)	Valve body assembly	INFO
	2nd and O/D brake (B1)	INFO
No up-shift (2nd -> 3rd)	Valve body assembly	INFO
	Direct and O/D clutch (C0)	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
No up-shift (3rd -> 4th)	Valve body assembly	INFO
	2nd and O/D brake (B1)	INFO
No up-shift (4th -> 5th)	Shift solenoid valve (S4)	INFO
	Valve body assembly	INFO
	U/D clutch (C3)	INFO
No down-shift (5th -> 4th)	Shift solenoid valve (S4)	INFO
	Valve body assembly	INFO
No down-shift (4th -> 3rd)	Valve body assembly	INFO
No down-shift (3rd -> 2nd)	Valve body assembly	INFO
No down-shift (2nd -> 1st)	Valve body assembly	INFO
No lock-up or No lock-up off	Shift solenoid valve (DSL)	INFO
	Valve body assembly	INFO
	Torque converter clutch	INFO
Harsh engagement (N -> D)	Shift solenoid valve (SL1)	INFO
	Valve body assembly	INFO
	C1 accumulator	INFO
	Forward clutch (C1)	INFO
	One-way clutch No. 1 (F1)	INFO
	U/D one-way clutch (F2)	INFO
Harsh engagement (Lock-up)	Shift solenoid valve (SL2)	INFO
	Valve body assembly	INFO
	Torque converter clutch	INFO
Harsh engagement (N -> R)	Valve body assembly	INFO
	C2 accumulator	INFO
	Reverse clutch (C2)	INFO
	1st and reverse brake (B2)	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
Harsh engagement (1st -> 2nd -> 3rd -> 4th -> 5th)	Shift solenoid valve (SLT)	INFO
	Valve body assembly	INFO
Harsh engagement (1st -> 2nd)	Valve body assembly	INFO
	2nd and O/D brake (B1)	INFO
Harsh engagement (2nd -> 3rd)	Valve body assembly	INFO
	C0 accumulator	INFO
	Direct and O/D clutch (C0)	INFO
Harsh engagement (3rd -> 4th)	Valve body assembly	INFO
	2nd and O/D brake (B1)	INFO
Harsh engagement (4th -> 5th)	Valve body assembly	INFO
	C3 accumulator	INFO
	U/D clutch (C3)	INFO
Harsh engagement (5th -> 4th)	Valve body assembly	INFO
	B3 accumulator	INFO
Slip or shudder (Forward and reverse: After warm-up)	Valve body assembly	INFO
	Oil strainer	INFO
	Direct and O/D clutch (C0)	INFO
	Forward clutch (C1)	INFO
	U/D clutch (C3)	INFO
	2nd and brake (B1)	INFO
	U/D brake (B3)	INFO
	One-way clutch No. 1 (F1)	INFO
	U/D one-way clutch (F2)	INFO
	Torque converter clutch	INFO
Slip or shudder (Particular position: Just after engine starts)	Torque converter clutch	INFO
Slip or shudder (R position)	Reverse clutch (C2)	INFO

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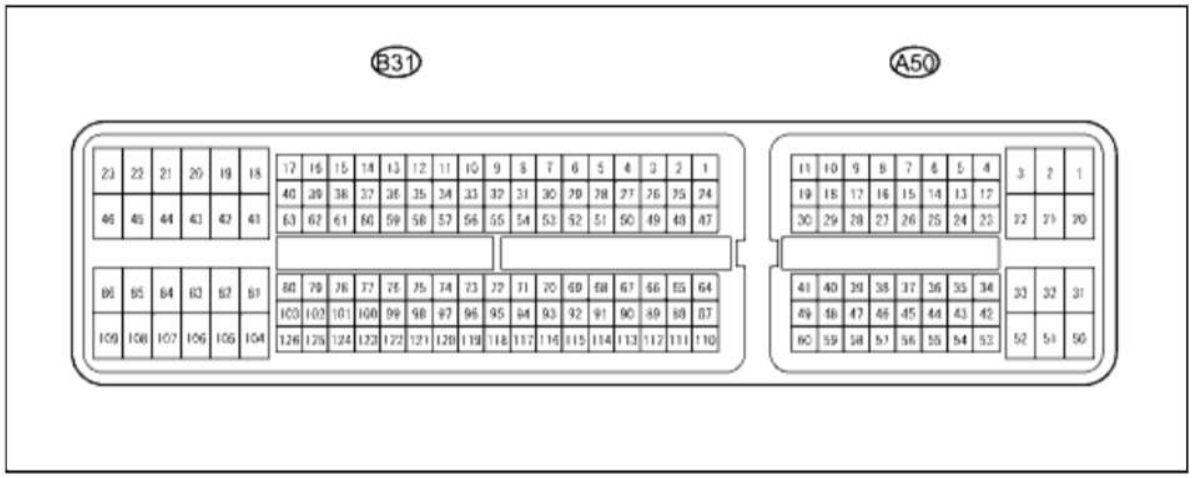
SYMPTOM	SUSPECTED AREA	SEE PAGE
	1st and reverse brake (B2)	INFO
Slip or shudder (1st)	Forward clutch (C1)	INFO
	One-way clutch No. 1 (F1)	INFO
	U/D one-way clutch (F2)	INFO
Slip or shudder (2nd)	2nd and O/D brake (B1)	INFO
Slip or shudder (3rd)	Direct and O/D clutch (C0)	INFO
Slip or shudder (4th)	2nd and O/D brake (B1)	INFO
Slip or shudder (5th)	U/D clutch (C3)	INFO
Shift position too high or too low	Shift solenoid valve (SLT)	INFO
No engine braking (1st +- 4th: D position)	U/D brake (B3)	INFO
No engine braking (1st: L (1) position)	Valve body assembly	INFO
	1st and reverse brake (B2)	INFO
No engine braking (2nd: 2 position)	Valve body assembly	INFO
	2nd and O/D brake (B1)	INFO
No engine braking (3rd: 3 position)	U/D brake (B3)	INFO
No kick-down	Valve body assembly	INFO
Poor acceleration (All positions)	Shift solenoid valve (SLT)	INFO
	Torque converter clutch	INFO
Poor acceleration (5th)	U/D clutch (C3)	INFO
	U/D planetary gear unit	INFO
Engine stalls when starting off or stopping	Shift solenoid valve (DSL)	INFO
	Torque converter clutch	INFO

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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W740A2X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: TERMINALS OF ECM (2010 Corolla)		

TERMINALS OF ECM

1. ECM



HINT:

Each ECM terminal's standard voltage is shown in the table below.

In the table, first follow the information under "Condition". Look under "Terminal No. (Symbols)" for the terminals to inspected. The standard voltage between the terminals is shown under "Specific Condition".

Use the illustration above as a reference for the ECM terminals.

TERMINALS NO. (SYMBOLS)	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
B31-56 (D) - B31-104 (E1)	D shift position switch signal	Ignition switch ON and shift lever D and S position	11 to 14 V
		Ignition switch ON and shift lever except D and S position	Below 1 V
B31-53 (R) - B31-104 (E1)	R shift position switch signal	Ignition switch ON and shift lever R position	11 to 14 V
		Ignition switch ON and shift lever except R position	Below 1 V
A50-8 (SPD) - B31-104 (E1)	Speed signal	Vehicle speed 20 km/h (12mph)	Pulse generation (See waveform 8)
A50-36 (STP) - B31-104 (E1)	Stop light switch signal	Brake pedal is depressed	7.5 to 14 V
		Brake pedal is released	Below 1.5 V

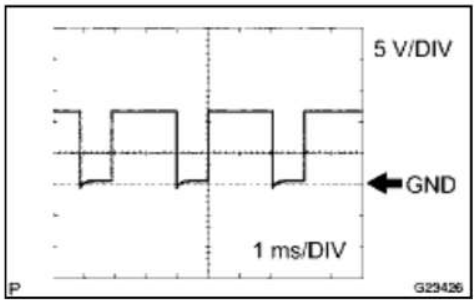
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TERMINALS NO. (SYMBOLS)	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-51 (SFTD) - B31-104 (E1)	Down shift switch signal	Ignition switch ON and shift lever S position	11 to 14 V
		Ignition switch ON and shift lever "-" position (Down shift)	Below 1 V
A50-16 (SFTU) - B31-104 (E1)	Up shift switch signal	Ignition switch ON and shift lever S position	11 to 14 V
		Ignition switch ON and shift lever "+" position (Up shift)	Below 1 V
B31-74 (S) - B31-104 (E1)	S shift position switch signal	Ignition switch ON and shift lever S position	11 to 14 V
		Ignition switch ON and shift lever except S position	Below 1 V
B31-73 (P) - B31-104 (E1)	Park position switch signal	Ignition switch ON and shift lever P position	11 to 14 V
		Ignition switch ON and shift lever except P position	Below 1 V
B31-54 (N) - B31-104 (E1)	Neutral position switch signal	Ignition switch ON and shift lever N position	11 to 14 V
		Ignition switch ON and shift lever except N position	Below 1 V
B31-52 (NSW) - B31-104 (E1)	Park neutral switch signal	Ignition switch ON and shift lever P and N position	Below 2 V
		Ignition switch ON and shift lever except P and N position	11 to 14 V
B31-79 (DSL) - B31-104 (E1)	DSL solenoid signal	Vehicle speed 65 km/h (40mph), lock-up (ON to OFF)	Pulse generation (See waveform 2)
B31-80 (SR) - B31-104 (E1)	SR solenoid signal	Ignition switch ON	Below 1 V
		3rd, 4th or 5th gear	11 to 14 V
		1st or 2nd gear	Below 1 V
B31-78 (S4) - B31-104 (E1)	S4 solenoid signal	Ignition switch ON	Below 1 V
		5th gear	11 to 14 V
		Except 5th gear	Below 1 V
B31-60 (SL3+) - B31-61 (SL3-)	SL3 solenoid signal	Engine idle speed	Pulse generation (See waveform 3)
B31-58 (SL2+) - B31-59 (SL2-)	SL2 solenoid signal	Engine idle speed	Pulse generation (See waveform 4)

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TERMINALS NO. (SYMBOLS)	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
B31-57 (SL1+) - B31-77 (SL1-)	SL1 solenoid signal	Engine idle speed	Pulse generation (See waveform 5)
B31-101 (NC+) - B31-102 (NC-)	Speed sensor (NC) signal	Vehicle speed 30 km/h (19mph): (3rd gear) Engine speed 1,400 rpm	Pulse generation (See waveform 6)
B31-125 (NT+) - B31-124 (NT-)	Speed sensor (NT) signal	Vehicle speed 20 km/h (12mph)	Pulse generation (See waveform 7)
B31-76 (SLT+) - B31-75 (SLT-)	SLT solenoid signal	Engine idle speed	Pulse generation (See waveform 1)
B31-72 (THO1) - B31-95 (ETHO)	ATF temperature sensor signal	ATF temperature: 115°C (239°F) or more	Below 1.5 V

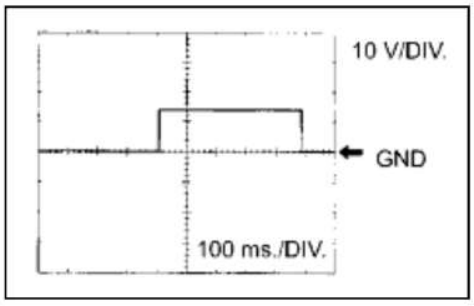
(a) Waveform 1



Reference:

Terminal	SLT+ - SLT-
Tool setting	5 V/DIV, 1ms/DIV
Vehicle condition	Engine idle speed

(b) Waveform 2



Reference:

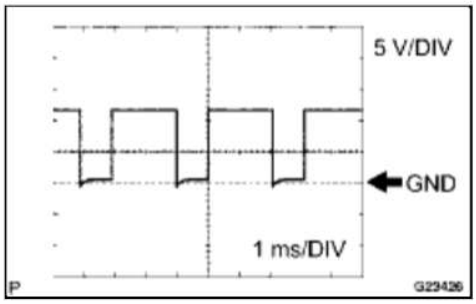
Terminal	DSL - E1
Tool setting	10 V/DIV, 100ms/DIV
Vehicle condition	Vehicle speed 65 km/h (40 mph), lock-up (ON to OFF)

(c) Waveform 3

Reference:

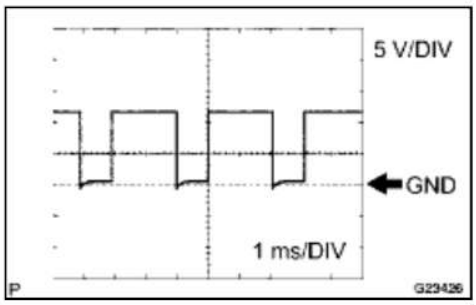
Terminal	SL3+ - SL3-

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Tool setting	5 V/DIV, 1ms/DIV
Vehicle condition	Engine idle speed

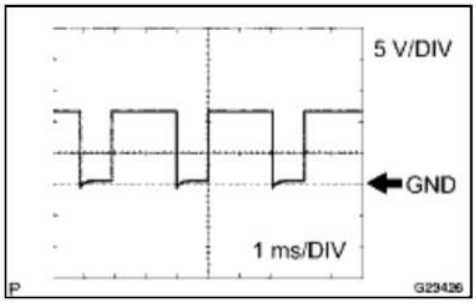
(d) Waveform 4



Reference:

Terminal	SL2+ - SL2-
Tool setting	5 V/DIV, 1ms/DIV
Vehicle condition	Engine idle speed

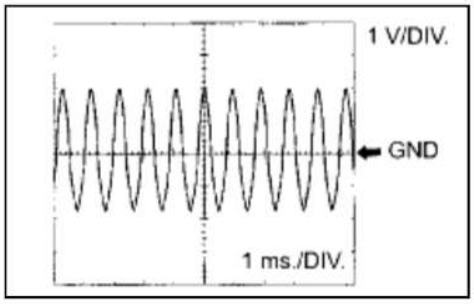
(e) Waveform 5



Reference:

Terminal	SL1+ - SL1-
Tool setting	5 V/DIV, 1ms/DIV
Vehicle condition	Engine idle speed

(f) Waveform 6



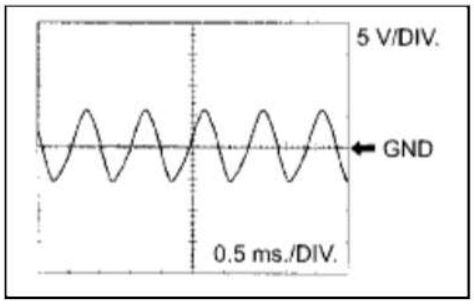
Reference:

Terminal	NC+ - NC-
Tool setting	1 V/DIV, 1ms/DIV
Vehicle condition	Vehicle speed 30 km/h (19 mph): (3rd gear) Engine speed 1.400 rpm

(g) Waveform 7

Reference:

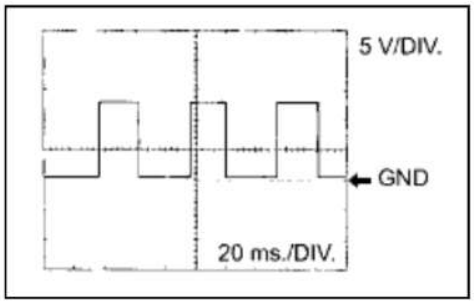
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Terminal	NT+ - NT-
Tool setting	5 V/DIV, 0.5ms/DIV
Vehicle condition	Vehicle speed 20 km/h (12 mph)

(h) Waveform 8

Reference:



Terminal	SPD - E1
Tool setting	5 V/DIV, 20ms/DIV
Vehicle condition	Vehicle speed 20 km/h (12 mph)

HINT:

Depending on the vehicle, the output waveform voltage, influenced by optionally installed systems, may become 5V.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W770CMX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DTC CHECK / CLEAR (2010 Corolla)		

DTC CHECK / CLEAR

NOTICE:

When the diagnosis system is changed from normal mode to check mode or vice versa, all DTCs and freeze frame data recorded in normal mode are cleared. Before changing modes, always check and make a note of DTCs and freeze frame data.

HINT:

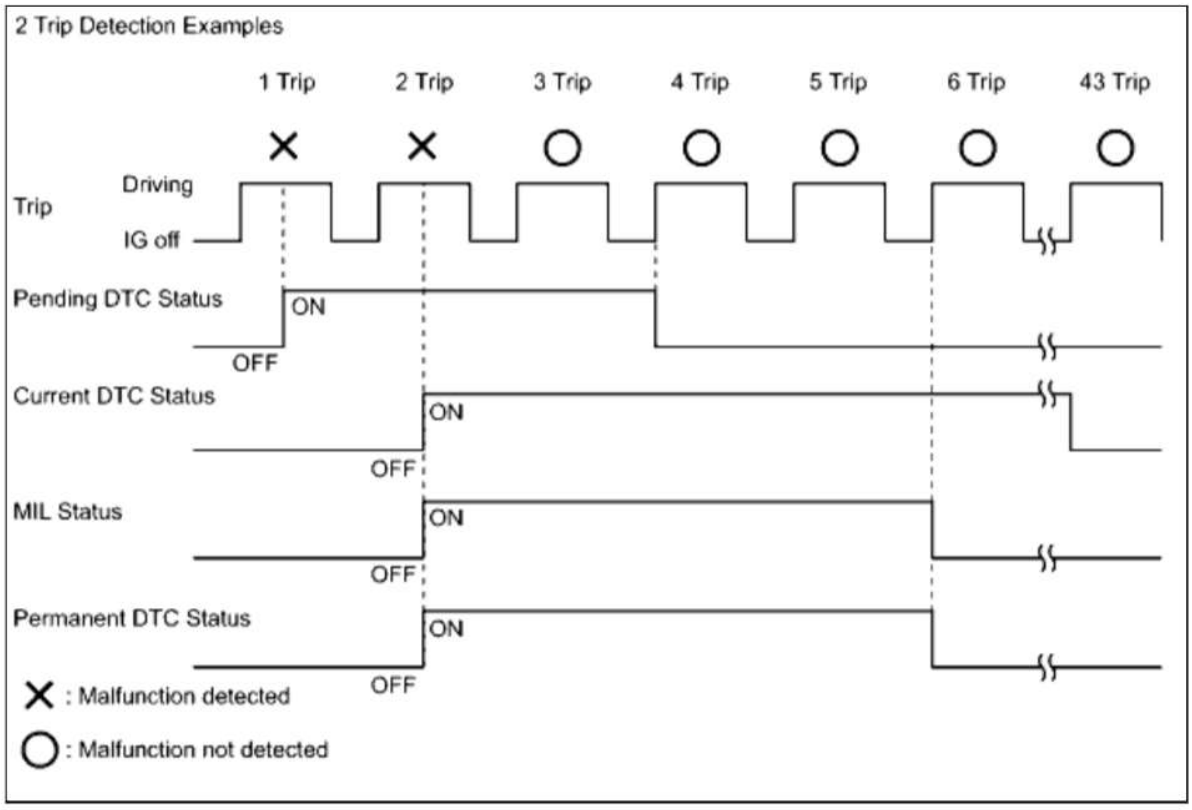
- DTCs which are stored in the ECM can be displayed on the Techstream. The Techstream can display the current, pending and permanent DTCs.
- If a malfunction is detected during the current driving cycle, current and permanent DTCs are stored.
- Some DTCs are not stored if the ECM does not detect the same malfunction again during a second consecutive driving cycle. However, such malfunctions, detected on only one occasion, are stored as pending DTCs.
- Current and pending DTCs can be cleared by using the Techstream or by disconnecting the cable from the negative battery terminal. However, permanent DTCs cannot be cleared using either of these two methods.
- After clearing current DTCs using the Techstream (or by disconnecting the cable from the negative battery terminal), permanent DTCs can be cleared when the system is determined to be normal for the relevant DTCs and then the universal trip is performed.

2 Trip Detection Examples

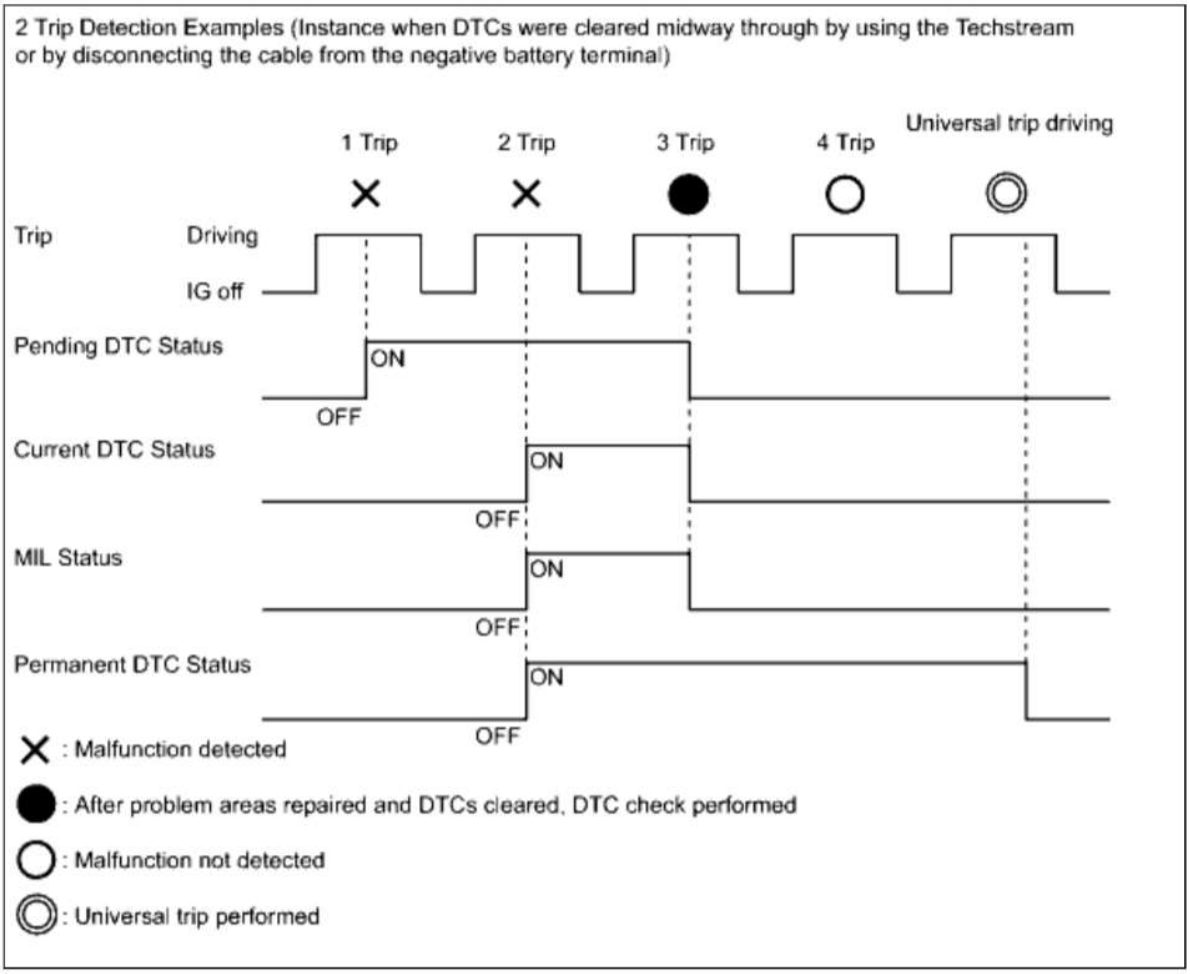
Pending DTC	Store condition	Malfunction detected
	Clear condition	System determined to be normal or DTCs cleared using Techstream or Cable disconnected from negative battery terminal
Current DTC	Store condition	Malfunction detected (2nd trip)
	Clear condition	No malfunctions in 40 driving cycles or DTCs cleared using Techstream or Cable disconnected from negative battery terminal
Permanent DTC	Store condition	Malfunction detected (2nd trip)
	Clear condition	Ignition switch turned to ON after no malfunction is detected in 3 consecutive driving cycles or

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		After DTCs cleared using Techstream or cable disconnected from negative battery terminal, malfunction not detected when universal trip driving performed
MIL	ON	Malfunction detected (2nd trip)
	OFF	Ignition switch turned to ON after no malfunction is detected in 3 consecutive driving cycles or DTCs cleared using Techstream or Cable disconnected from negative battery terminal



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1. CHECK DTC

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(e) Check the DTC(s) and freeze frame data, and then write them down.

(f) Check the details of the DTC(s) INFO .

2. CLEAR DTC (Pending and Current DTC)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(e) Clear the DTCs.

3. CLEAR DTC (Pending and Current DTC without using Techstream)

(a) Perform either of the following operations:

(1) Disconnect the cable from the negative (-) battery terminal for more than 1 minute.

(2) Remove the EFI MAIN and ETCS fuses from the engine room relay block located inside the

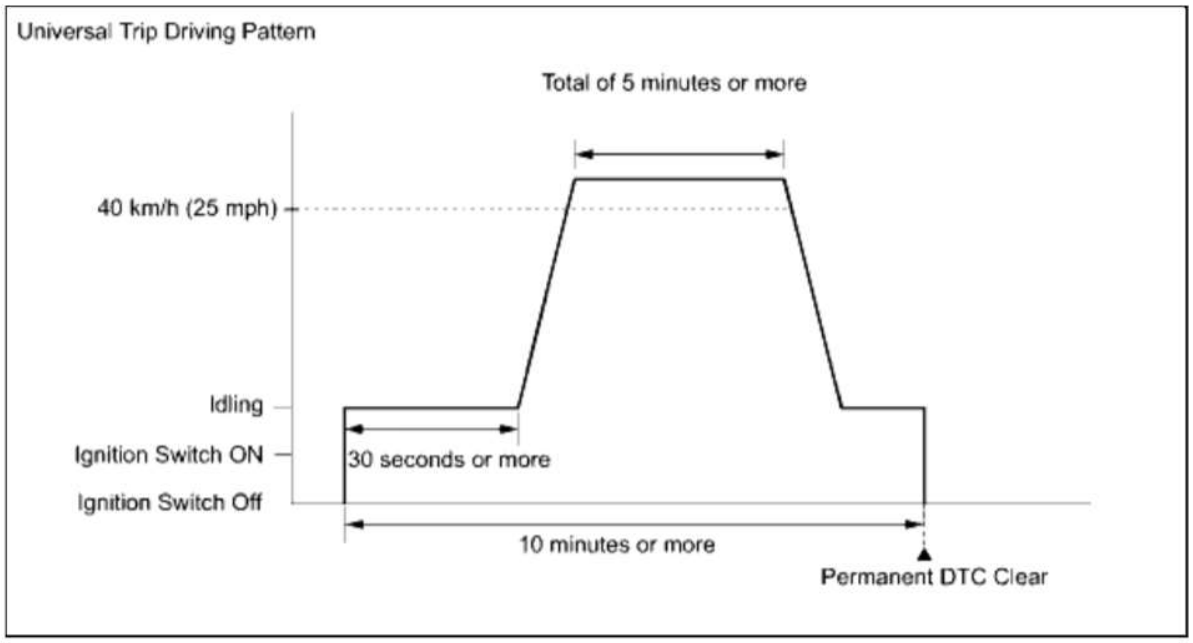
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engine compartment for more than 1 minute.

4. CLEAR PERMANENT DTC

HINT:

Even if the following procedure is not performed, permanent DTCs are cleared if no malfunction are detected during 3 consecutive driving cycles.



(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Turn the Techstream on.

(d) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(e) Check if permanent DTCs are stored.

HINT:

If permanent DTCs are not output, it is not necessary to continue this procedure.

(f) Clear DTCs.

(g) Perform the universal trip.

1. Idle the engine for 30 seconds or more.
2. Drive the vehicle at 40 km/h (25 mph) or more for a total of 5 minutes or more.

HINT:

- It is possible to complete the drive pattern even if the vehicle decelerates to less than 40 km/h (25 mph) during the driving cycle provided that the vehicle is driven at 40 km/h (25 mph) or more for a total of 5 minutes.
- When accelerating through the gears, make sure the vehicle is driven so all gears are used in order and no gears are skipped.

3. Allow 10 minutes or more to elapse from the time the engine is started.

(h) Turn the ignition switch off.

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(i) Wait 15 seconds.

(j) Turn the ignition switch to ON.

(k) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(l) Check that the permanent DTCs have been cleared.

HINT:

- If the permanent DTCs have not been cleared, perform the universal trip again.
- The permanent DTCs are cleared when the universal trip is completed.



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W760D8X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DIAGNOSIS SYSTEM (2010 Corolla)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

(a) When troubleshooting OBD II vehicles, the only difference from the usual troubleshooting procedure is to connect Techstream to the vehicle, and read off various data output from the vehicle's ECM.



(b) OBD II regulations require that the vehicle's on-board computer illuminate the Malfunction Indicator Lamp (MIL) on the instrument panel when the computer detects a malfunction in the computer itself or in the drive system components which affect the vehicle emissions. In addition to illuminating the MIL when a malfunction is detected, the applicable DTCs prescribed by SAE J2012 are recorded in the ECM memory INFO .

If the malfunction does not occur in 3 consecutive trips, the MIL goes off but the DTCs remain in the ECM memory.

(c) To check the DTCs, connect the Techstream to the DLC3 of the vehicle. Techstream also enables you to erase the DTCs and check freeze frame data and various forms of engine data (For operating instructions, see the instruction book).

(d) The DTCs include SAE controlled codes and Manufacturer controlled codes. SAE controlled codes must be set as prescribed by the SAE, while Manufacturer controlled codes can be set freely by a manufacturer within the prescribed limits INFO .

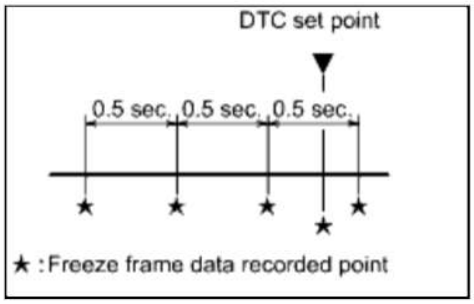
(e) The diagnosis system operates in "normal mode" during the normal vehicle use. In normal mode, "2-trip detection logic" is used to ensure accurate detection of malfunction. "Check mode" is also available to technicians as an option. In check mode, "1-trip detection logic" is used for simulating malfunction symptoms and increasing the system's ability to detect malfunctions, including intermittent malfunction.

(f) *2 trip detection logic: When a malfunction is first detected, the malfunction is temporarily stored in the ECM memory (1st trip). IF the ignition switch is turned off and then turned on (IG) again, and same malfunction is detected again, the MIL will illuminate.

(g) The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air/fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.

(h) Techstream displays freeze frame data recorded at five different points: 1) 3 times before the DTC is set, 2) once when the DTC is set, and 3) once after the DTC is set. The data can be used to simulate the vehicle's condition around the time of the malfunction. The data may be helpful

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in determining the cause of a malfunction. It may also be helpful in determining whether a DTC is being caused by a temporary malfunction.

2. INSPECT THE DLC3

(a) Check the DLC3 INFO .

3. CHECK BATTERY VOLTAGE

(a) Measure the battery voltage.

Battery voltage:
11 to 14 V

If voltage is below 11 V, replace the battery before proceeding.

4. CHECK MIL

(a) Check that the MIL illuminates when turning the ignition switch to the ON position.

HINT:

If the MIL does not light up, troubleshoot the combination meter.

(b) When the engine is started, the MIL should go off. If the lamp remains on, it means that the diagnosis system has detected a malfunction or abnormality in the system.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W780BRX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: CHECK MODE PROCEDURE (2010 Corolla)		

CHECK MODE PROCEDURE

HINT:

Check mode has a higher sensitivity to malfunctions and can detect malfunction that normal mode cannot detect. Check mode can also detect all the malfunctions that normal mode can detect. In check mode, DTCs are detected with 1-trip detection logic.

1. DTC CHECK (CHECK MODE)

HINT:

Techstream only: Compared to the normal mode, the check mode is more sensitive for detecting malfunctions. Furthermore, the same diagnostic items which are detected in the normal mode can also be detected in the check mode.

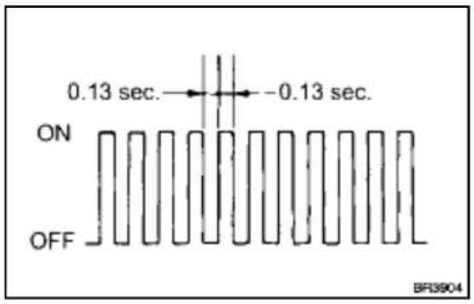
(a) Procedure for Check Mode using Techstream.

(1) Check the initial conditions.

- Battery positive voltage 11 V or more
- Throttle valve fully closed
- Transaxle in the P or N position
- A/C switch is off

(2) Turn the ignition switch off.

(3) Connect Techstream to the DLC3.



(4) Turn the ignition switch to the ON position and turn the Techstream main switch ON.

(5) Enter the following menus: Powertrain / Engine and ECT / Utility / Check Mode.

NOTICE:

All DTCs and freeze frame data recorded will be erased if: 1) Techstream is used to change the ECM from normal mode to check mode or vice-versa; or 2) during check mode, the ignition switch is turned from the ON position to ACC position or turned OFF.

(6) Start the engine (the MIL goes off after the engine starts).

(7) Perform "MONITOR DRIVE PATTERN" for the ECT test INFO, or simulate the conditions of the malfunction described by the customer.

NOTICE:

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Leave the ignition switch to the ON position until you have checked the DTCs, etc.

(8) After simulating malfunction conditions, use the Techstream diagnosis selector to check the DTCs and freeze frame data, etc.

(9) When you use Techstream: Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(10) After checking the DTC, inspect the applicable circuit.

(11) INFO to confirm the details of the DTCs.

2. DTC CLEAR

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the ON position and turn the Techstream main switch ON.

(c) When you use Techstream: Enter the following menus: Powertrain / Engine and ECT / Trouble Codes / Clear.

HINT:

When operating Techstream to erase the codes, the DTCs and freeze frame data will be erased. (See the Techstream instruction book for operating instructions.)



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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000O8L0BUX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: FAIL-SAFE CHART (2010 Corolla)		

FAIL-SAFE CHART

1. FAIL-SAFE

This function minimizes the loss of the ECT functions when any malfunction occurs in a sensor or solenoid.

(a) ATF (Automatic Transmission Fluid) temperature sensor:

When the ATF temperature sensor has a malfunction, 5th upshift is prohibited.

(b) Counter gear speed sensor NC (Speed sensor NC):

When the counter gear speed sensor has a malfunction, 5th upshift is prohibited.

(c) Shift solenoid valve DSL:

When the solenoid valve DSL has a malfunction, the current to the solenoid valve is stopped.

This stops lock-up control, then fuel economy decreases.

(d) Shift solenoid valve SL1, SL2, SL3 and S4:

Fail safe function:

If either of the shift solenoid valve circuits develops an open or short, the ECM turns the other shift solenoid "ON" and "OFF" in order to shift into the gear positions shown in the table below.

Manual shifting as shown in the following table must be done (In case of a short circuit, the ECM stops sending the current to the short circuited solenoid).

Even if starting the engine in the fail-safe mode, the gear position remains in the same position.

HINT:

FL: Flex Lock-up

Normal	Solenoid Valve	SL1	ON	OFF	ON	OFF	OFF
		SL2	ON	ON	OFF	FL	FL
		SL3	OFF	OFF	OFF	ON	ON
		S4	OFF	OFF	OFF	OFF	ON
	Gear Position		1st	2nd	3rd	4th	5th
SL1 Malfunction (During driving at 1st or 2nd)	Solenoid Valve	SL1	OFF				
		SL2	ON	ON	OFF to ON	FL to ON	FL to ON
		SL3	OFF	OFF	OFF	ON to OFF	ON to OFF

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		S4	OFF	OFF	OFF	OFF	ON to OFF
	Gear Position		1st to 2nd	2nd	3rd to 2nd	4th to 2nd	5th to 2nd
SL1 Malfunction (During driving at 3rd)	Solenoid Valve	SL1	OFF				
		SL2	ON to FL	ON to FL	OFF to FL	FL	FL
		SL3	OFF	OFF	OFF	ON to OFF	ON to OFF
		S4	OFF to ON	OFF to ON	OFF to ON	OFF to ON	ON
	Gear Position		1st to 4th	2nd to 4th	3rd to 4th	4th	5th to 4th
SL1 Malfunction (During driving at 4th or 5th)	Solenoid Valve	SL1	OFF				
		SL2	ON to FL	ON to FL	OFF to FL	FL	FL
		SL3	OFF to ON	OFF to ON	OFF to ON	ON	ON
		S4	OFF	OFF	OFF	OFF	ON
	Gear Position		1st to 4th	2nd to 4th	3rd to 4th	4th	5th
SL2 Malfunction	Solenoid Valve	SL1	ON	OFF to ON	ON	OFF to ON	OFF to ON
		SL2	OFF				
		SL3	OFF	OFF	OFF	ON to OFF	ON to OFF
		S4	OFF to ON	OFF to ON	OFF to ON	OFF to ON	ON
	Gear Position		1st to 4th	2nd to 4th	3rd to 4th	4th	5th to 4th
SL3 Malfunction	Solenoid Valve	SL1	ON	OFF	ON	OFF to ON	OFF to ON
		SL2	ON	ON	OFF	FL	FL
		SL3	OFF				
		S4	OFF	OFF	OFF	OFF to ON	ON
	Gear Position		1st	2nd	3rd	4th	5th to 4th
S4 Malfunction	Solenoid	SL1	ON	OFF	ON	OFF	OFF

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	Valve	SL2	ON	ON	OFF	FL	FL
		SL3	OFF	OFF	OFF	ON	ON
		S4	OFF				
	Gear Position		1st	2nd	3rd	4th	5th to 4th
SL1, SL2, SL3, and S4 Malfunction	Solenoid Valve	SL1	OFF				
		SL2	OFF				
		SL3	OFF				
		S4	OFF				
	Gear Position		1st to 4th	2nd to 4th	3rd to 4th	4th	5th to 4th

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W840ELX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input) (2010 Corolla)		

DTC	**P0705**	**Transmission Range Sensor Circuit Malfunction (PRNDL Input)**

DESCRIPTION

The park/neutral position switch detects the shift lever position and sends signals to the ECM.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0705	(A) Any 2 or more signals of the following are ON simultaneously (2-trip detection logic) • P input signal is ON. • N input signal is ON. • R input signal is ON. • D input signal is ON. (B) Any 2 or more signals of the following are ON simultaneously (2-trip detection logic) • NSW input signal is ON. • R input signal is ON. • D input signal is ON (C) When any of following conditions is met for 2.0 sec. or more in the S position (2-trip detection logic) • NSW input signal is ON. • P input signal is ON. • N input signal is ON. • R input signal is ON. (D) All switches are OFF simultaneously for NSW, P, N, R, D positions (2-trip detection logic). • NSW input signal is OFF. • P input signal is OFF. • N input signal is OFF. • R input signal is OFF. • D input signal is OFF	• Open or short in park/neutral position switch circuit • Park/neutral position switch • ECM

MONITOR DESCRIPTION

These DTCs indicate a problem with the park/neutral position switch and the wire harness in the park/neutral position switch circuit.

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The park/neutral position switch detects the shift lever position and sends a signal to the ECM.

For security, the park/neutral position switch detects the shift lever position so that engine can be started only when the shift lever is in the P or N position.

The park/neutral position switch sends a signal to the ECM according to the shift position (P, R, N, or D). The ECM determines that there is a problem with the switch or related parts if it receives more than 1 position signal simultaneously. The ECM will turn on the MIL and store the DTC.

MONITOR STRATEGY

Related DTCs	P0705: Park/neutral position switch/Verify switch input
Required sensors/Components	Park/neutral position switch
Frequency of operation	Continuous
Duration	Condition (A), (B), (C) 2 sec. Condition (D) 60 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	None
Ignition switch	ON
Battery voltage	10.5 V or more

TYPICAL MALFUNCTION THRESHOLDS

1. One of the following conditions is met: Condition (A), (B), (C) and (D)

Condition (A)

Number of the following signal input at the same time	2 or more
P switch	ON
N switch	ON
R switch	ON
D switch	ON

Condition (B)

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Number of the following signal input at the same time	2 or more
NSW switch	ON
R switch	ON
D switch	ON

Condition (C) When shift lever is in the S position, one of the following conditions is met.

NSW switch	ON
P switch	ON
N switch	ON
R switch	ON

Condition (D) All of following conditions are met.

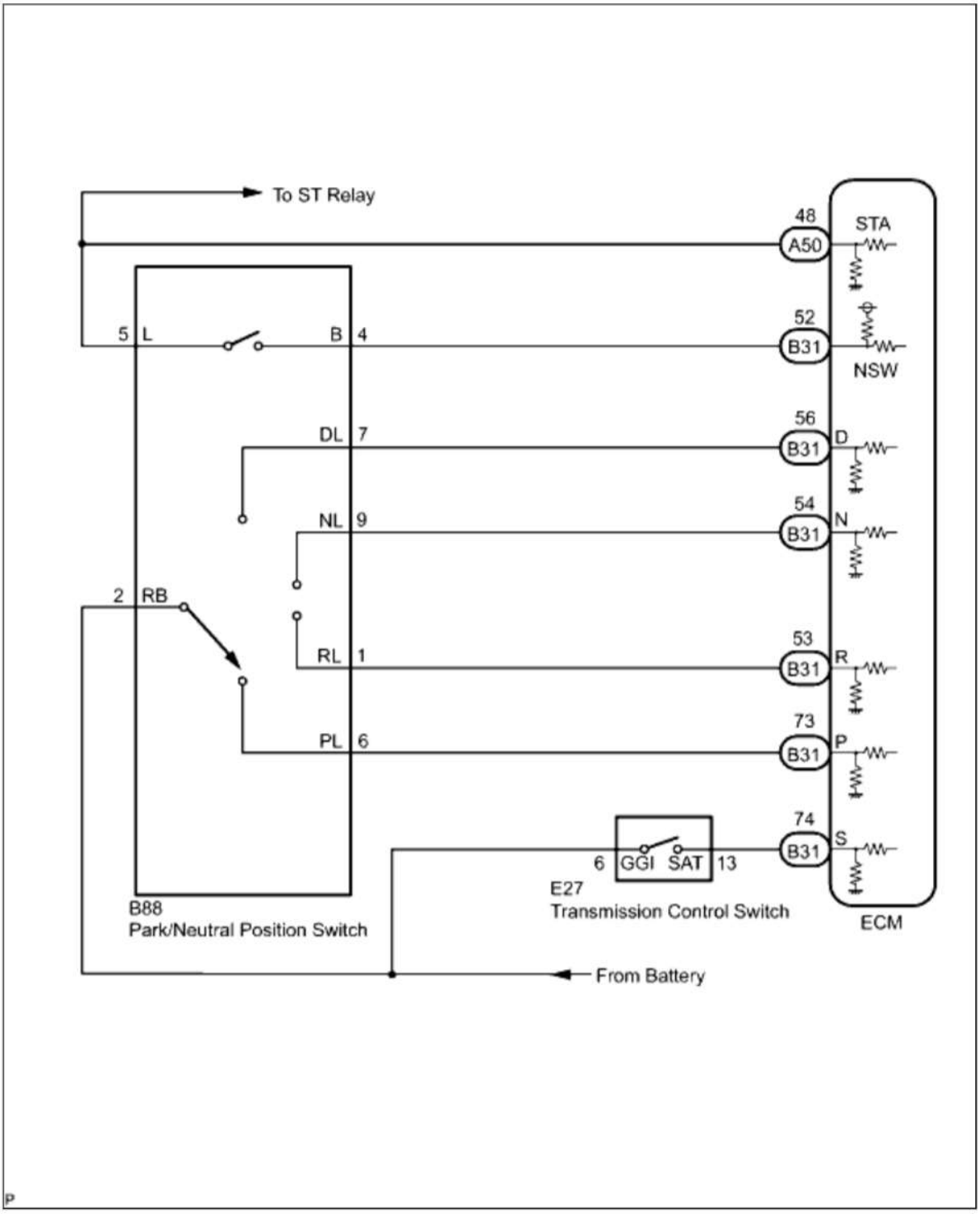
NSW switch	OFF
P switch	OFF
N switch	OFF
R switch	OFF
D switch	OFF

COMPONENT OPERATING RANGE

Park/neutral Position switch	The park/neutral position switch sends only one signal to the ECM.

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

HINT:

Using Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List

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information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

1. READ DATA LIST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Data List".

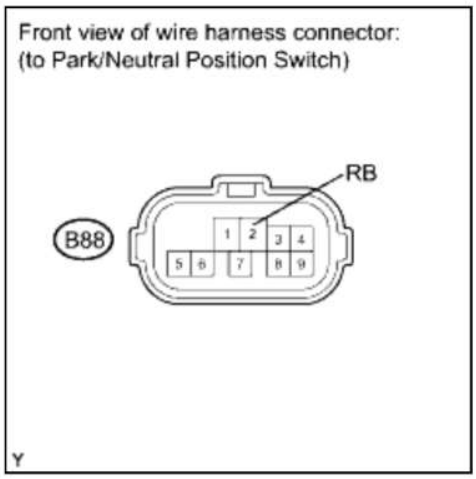
(g) According to the display on the tester, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Neutral Position SW Signal	PNP Switch Status/ ON or OFF	Shift lever position is: P and N: ON Except P and N: OFF	When the shift lever position displayed on Techstream differs from the actual position, adjustment of the PNP switch or the shift cable may be incorrect.
Shift SW Status (R Range)	PNP Switch Status/ ON or OFF	Shift lever position is: R: ON Except R: OFF	↑
Shift SW Status (P Range)	PNP Switch Status/ ON or OFF	Shift lever position is: P: ON Except P: OFF	↑
Shift SW Status (N Range)	PNP Switch Status/ ON or OFF	Shift lever position is: N: ON Except N: OFF	↑
Shift SW Status (D Range)	PNP Switch Status/ ON or OFF	Shift lever position is: D and S: ON Except D and S: OFF	↑
Sports Mode Selection SW	Sport Mode Select Switch Status/ ON or OFF	Shift lever position is: S, "+" and "-": ON Except S, "+" and "-": OFF	-

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PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (BATTERY - PARK/NEUTRAL POSITION SWITCH)**



(a) Disconnect the park/neutral position switch connector.

(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

Standard voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
B88-2 (RB) - Body ground	Ignition switch ON	11 to 14 V

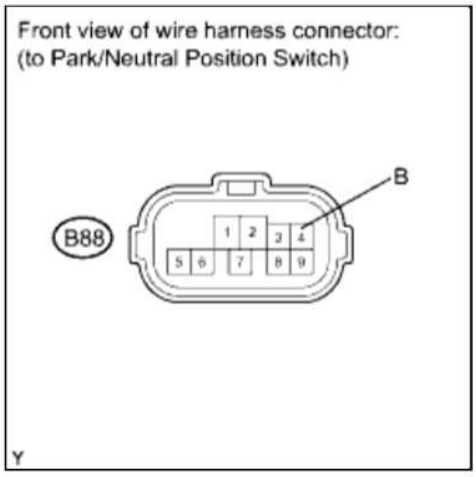
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (OUTPUT SIGNAL)**

(a) Turn the ignition switch to ON.

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(b) Measure the voltage according to the value(s) in the table below.

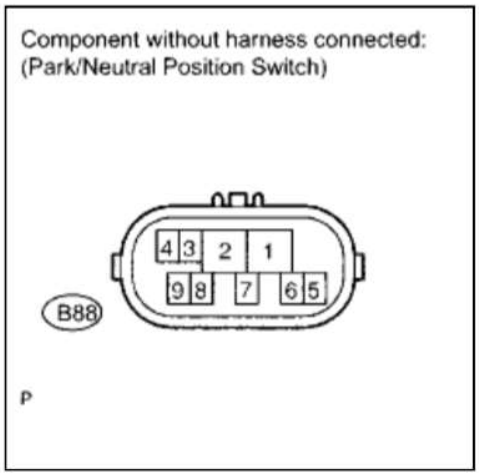
Standard voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
B88-4 (B) - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)**

OK ▼

3.	**INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**



(a) Disconnect the park/neutral position switch connector.

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(b) Measure resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard resistance:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
4 - 5	P and N	Below 1 Ω
	Except P and N	10 Ω or higher
2 - 6	P	Below 1 Ω
	Except P	10 Ω or higher
2 - 1	R	Below 1 Ω
	Except R	10 Ω or higher
2 - 9	N	Below 1 Ω
	Except N	10 Ω or higher
2 - 7	D, S, "+" and "-"	Below 1 Ω
	Except D, S, "+" and "-"	10 Ω or higher

NG ▶ **REPLACE PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

OK ▼

4.	CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)

(a) Connect the park/neutral position switch connector.

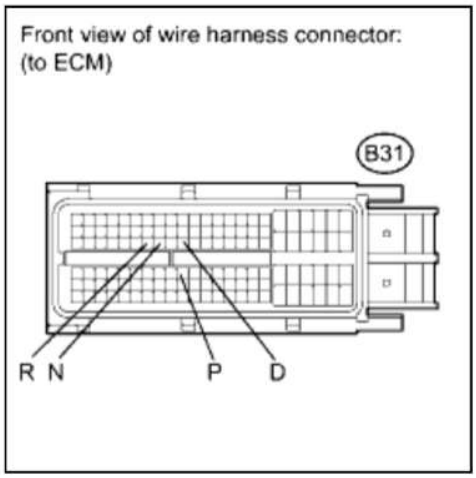
(b) Disconnect the ECM connector.

(c) Turn the ignition switch to ON, and measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

Standard voltage:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
B31-73 (P) - Body	P	11 to 14 V

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ground	Except P	Below 1 V
B31-54 (N) - Body ground	N	11 to 14 V
	Except N	Below 1 V
B31-53 (R) - Body ground	R	11 to 14 V *
	Except R	Below 1 V
B31-56 (D) - Body ground	D and S	11 to 14 V
	Except D and S	Below 1 V

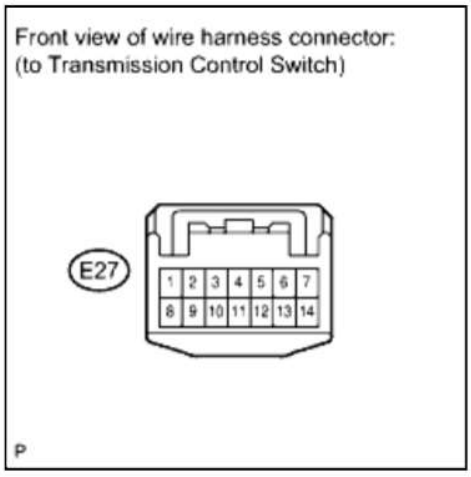
HINT:

***: The voltage will drop slightly due to the turning on of the back up light.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

5.	CHECK HARNESS AND CONNECTOR (BATTERY - TRANSMISSION CONTROL SWITCH)



(a) Disconnect the transmission control switch connector of shift lock control unit assembly.

(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

Standard voltage:

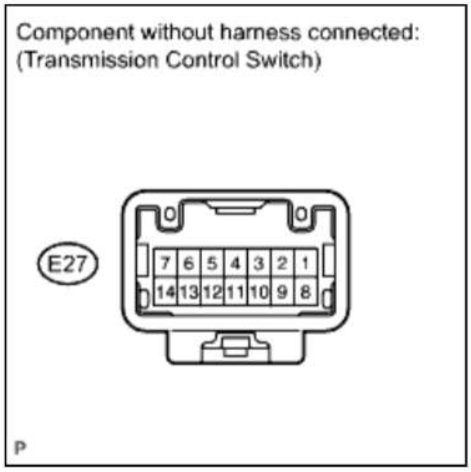
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TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
E27-6 - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK
▼

6.	**INSPECT SHIFT LOCK CONTROL UNIT (TRANSMISSION CONTROL SWITCH)**



(a) Disconnect the transmission control switch connector of shift lock control unit assembly.

(b) Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard resistance:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
E27-6 - E27-13	S, "+" and "-"	Below 1 Ω
	Except S, "+" and "-"	10 Ω or higher

NG ▶ **REPLACE SHIFT LOCK CONTROL UNIT**

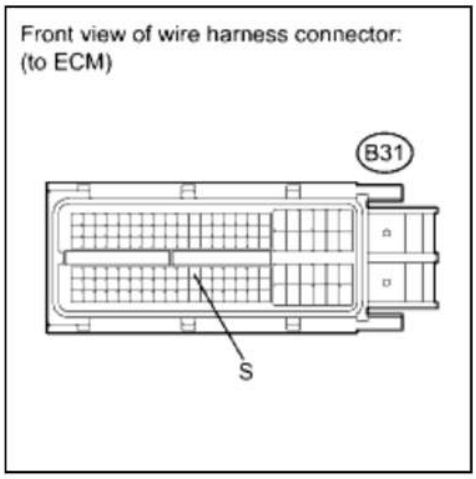
OK
▼

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7.	CHECK HARNESS AND CONNECTOR (TRANSMISSION CONTROL SWITCH - ECM)

(a) Connect the park/neutral position switch connector.

(b) Disconnect the ECM connector.



(c) Turn the ignition switch to ON, and measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

Standard voltage:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
B31-74 (S) - Body ground	S, "+" and "-"	11 to 14 V
	Except S, "+" and "-"	Below 1 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

8.	CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)

(a) Turn the ignition switch off.

(b) Disconnect the ECM connector.

(c) Disconnect the park/neutral position switch connector.

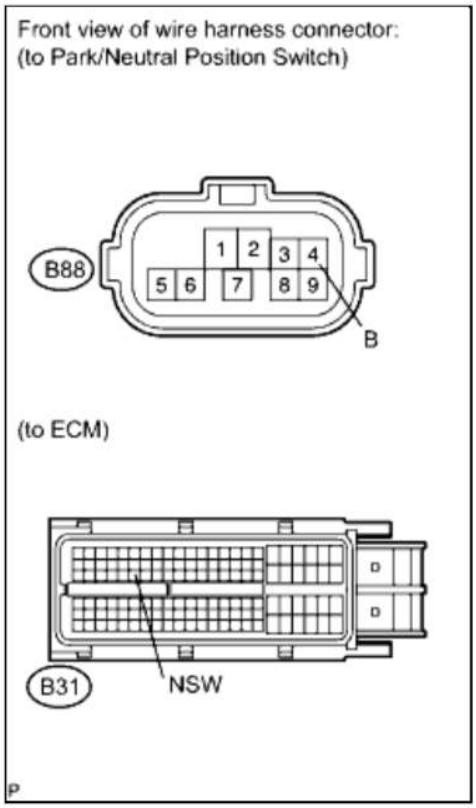
(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B88-4 (B) - B31-52 (NSW)	Always	Below 1 Ω

Standard resistance (Check for short):

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B88-4 (B) or B31-52 (NSW) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7E0CHX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DATA LIST / ACTIVE TEST (2010 Corolla)		

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the ON position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the tester, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light Switch	Stop light switch Status/ ON or OFF	• Brake Pedal is depressed: ON • Brake Pedal is released: OFF	-
Neutral Position SW Signal	PNP switch Status/ ON or OFF	Shift lever position is: P and N: ON Except P and N: OFF	When the shift lever position displayed on the Techstream differs from the actual position, adjustment of the PNP switch or the shift cable may be incorrect. **HINT:** **When the failure still occurs even after adjusting these parts,** INFO .
Shift SW Status (R Range)	PNP switch Status/ ON or OFF	Shift lever position is: P: ON Except P: OFF	↑
Shift SW		Shift lever position is:	

2. ACTIVE TEST

HINT:

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Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the ON position.

(e) Push the "ON" button of Techstream.

(f) Select the item "Powertrain / Engine and ECT / Active Test".

(g) According to the display on tester, perform the "Active Test".

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set the each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st / 2nd / 3rd / 4th / 5th	Possible to check the operation of the shift solenoid valves.
Activate the Lock Up	[Test Details] Control the shift solenoid DSL to set the automatic transaxle to the lock-up condition. [Vehicle Condition] • Vehicle Speed: 60 km/h (37 mph) or more	ON / OFF	Possible to check the DSL operation.
Activate the Solenoid (SL1)	[Test Details] Operate the shift solenoid SL1 [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position	ON / OFF	-
Activate the Solenoid (SL2)	[Test Details] Operate the shift solenoid SL2 [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position	ON / OFF	-

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Activate the Solenoid (SL3)	[Test Details] Operate the shift solenoid SL3 [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position	ON / OFF	-
Activate the Solenoid (S4))	[Test Details] Operate the shift solenoid S4 [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position	ON / OFF	-
Activate the Solenoid (SR)	[Test Details] Operate the shift solenoid SR [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position	ON / OFF	-
Activate the Solenoid (DSL)	[Test Details] Operate the shift solenoid DSL [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position	ON / OFF	-
Activate the Solenoid (SLT)*	[Test Details] Operate the shift solenoid SLT and raise the line pressure. [Vehicle Condition] • Vehicle Stopped. • IDL: ON **HINT:** **OFF: Line pressure up (When the active test of "Activate the Solenoid (SLT)" is performed, the ECM commands the SLT solenoid to turn off).** ON: No action (normal operation)	ON / OFF	-

*: "Activate the Solenoid (SLT)" in the Active Test is performed to check the line pressure changes by connecting the SST to the automatic transaxle, which is used in the HYDRAULIC TEST INFO as well.

HINT:

The pressure values in Active Test and HYDRAULIC TEST are different from each other.

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Last Modified: 3-10-2010	6.4 S	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W710BDX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2010 Corolla)		

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the parts listed in the table below and proceed to the page given.

HINT:

- *1: Comes on MIL (Malfunction Indicator Lamp) light up
- *2: "DTC stored" mark means ECM memorizes the malfunction code if the ECM detects the DTC detection condition.
- This DTC may be output when the clutch, brake and gear components etc. inside the automatic transaxle are damaged.

AUTOMATIC TRANSAXLE SYSTEM

DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
P0705	Transmission Range Sensor Circuit Malfunction (PRNDL Input)	1. Open or short in park/neutral position switch circuit 2. Park/neutral position switch 3. ECM	Comes on	DTC stored	INFO
P0711	Transmission Fluid Temperature Sensor "A" Performance	1. Transmission wire (ATF temperature sensor)	Comes on	DTC stored	INFO
P0712	Transmission Fluid Temperature Sensor "A" Circuit Low Input	1. Short in ATF temperature sensor circuit 2. Transmission wire (ATF temperature sensor) 3. ECM	Comes on	DTC stored	INFO
P0713	Transmission Fluid Temperature Sensor "A" Circuit High Input	1. Open in ATF temperature sensor circuit 2. Transmission wire (ATF temperature sensor) 3. ECM	Comes on	DTC stored	INFO
P0717	Turbine Speed Sensor Circuit No Signal	1. Open or short in transmission revolution sensor NT (speed sensor NT) circuit 2. Transmission revolution sensor NT (speed sensor NT)	Comes on	DTC stored	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
		3. ECM 4. Automatic transaxle assembly			
P0724	Brake Switch "B" Circuit High	1. Short in stop light switch circuit 2. Stop light switch 3. ECM	Comes on	DTC stored	INFO
P0741	Torque Converter Clutch Solenoid Performance (Shift Solenoid Valve DSL)	1. Shift solenoid valve DSL remains open or closed 2. Valve body is blocked 3. Torque converter clutch 4. Automatic transaxle (clutch, brake or gear etc.) 5. Line pressure is too low	Comes on	DTC stored	INFO
P0746	Pressure Control Solenoid "A" Performance (Shift Solenoid Valve SL1)	1. Shift solenoid valve SL1 remains open or closed 2. Valve body is blocked 3. Automatic transaxle (clutch, brake or gear etc.)	Comes on	DTC stored	INFO
P0748	Pressure Control Solenoid "A" Electrical (Shift Solenoid Valve SL1)	1. Open or short in shift solenoid valve SL1 circuit 2. Shift solenoid valve SL1 3. ECM	Comes on	DTC stored	INFO
P0766	Shift Solenoid "D" Performance (Shift Solenoid Valve S4)	1. Shift solenoid valve S4 remains open or closed 2. Valve body is blocked (Brake control valve) 3. Automatic transaxle (clutch, brake or gear etc.)	Comes on	DTC stored	INFO
P0771	Shift Solenoid "E" Performance (Shift Solenoid Valve SR)	1. Shift solenoid valve SR remains open or closed 2. Valve body is blocked 3. Automatic transaxle (clutch, brake or gear etc.)	Comes on	DTC stored	INFO
P0776	Pressure Control Solenoid "B" Performance (Shift Solenoid Valve SL2)	1. Shift solenoid valve SL2 remains open or closed 2. Valve body is blocked 3. Automatic transaxle (clutch, brake or gear etc.)	Comes on	DTC stored	INFO
P0778	Pressure Control Solenoid "B" Electrical (Shift Solenoid Valve SL2)	1. Open or short in shift solenoid valve SL2 circuit 2. Shift solenoid valve SL2	Comes on	DTC stored	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
		3. ECM			
P0793	Intermediate Shaft Speed Sensor "A"	1. Open or short in transmission revolution sensor NC (speed sensor NC) circuit 2. Transmission revolution sensor NC (speed sensor NC) 3. ECM	Comes on	DTC stored	INFO
P0796	Pressure Control Solenoid "C" Performance (Shift Solenoid Valve SL3)	1. Shift solenoid valve SL3 remains open or closed 2. Valve body is blocked 3. Automatic transaxle (clutch, brake or gear etc.)	Comes on	DTC stored	INFO
P0798	Pressure Control Solenoid "C" Electrical (Shift Solenoid Valve SL3)	1. Open or short in shift solenoid valve SL3 circuit 2. Shift solenoid valve SL3 3. ECM	Comes on	DTC stored	INFO
P0982	Shift Solenoid "D" Control Circuit Low (Shift Solenoid Valve S4)	1. Short in shift solenoid valve S4 circuit 2. Shift solenoid valve S4 3. ECM	Comes on	DTC stored	INFO
P0983	Shift Solenoid "D" Control Circuit High (Shift Solenoid Valve S4)	1. Open in shift solenoid valve S4 circuit 2. Shift solenoid valve S4 3. ECM	Comes on	DTC stored	INFO
P0985	Shift Solenoid "E" Control Circuit Low (Shift Solenoid Valve SR)	1. Short in shift solenoid valve SR circuit 2. Shift solenoid valve SR 3. ECM	Comes on	DTC stored	INFO
P0986	Shift Solenoid "E" Control Circuit High (Shift Solenoid Valve SR)	1. Open in shift solenoid valve SR circuit 2. Shift solenoid valve SR 3. ECM	Comes on	DTC stored	INFO
P2714	Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT)	1. Shift solenoid valve SLT remains closed 2. Valve body is blocked 3. Automatic transaxle (clutch, brake or gear etc.)	Comes on	DTC stored	INFO
P2716	Pressure Control Solenoid "D" Electrical (Shift Solenoid Valve SLT)	1. Open or short in shift solenoid valve SLT circuit 2. Shift solenoid valve SLT	Comes on	DTC stored	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
		3. ECM			
P2769	Torque Converter Clutch Solenoid Circuit Low (Shift Solenoid Valve DSL)	1. Short in shift solenoid valve DSL circuit 2. Shift solenoid valve DSL 3. ECM	Comes on	DTC stored	INFO
P2770	Torque Converter Clutch Solenoid Circuit High (Shift Solenoid Valve DSL)	1. Open in shift solenoid valve DSL circuit 2. Shift solenoid valve DSL 3. ECM	Comes on	DTC stored	INFO



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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7Z09RX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0711: Transmission Fluid Temperature Sensor "A" Performance (2010 Corolla)		

DTC	**P0711**	**Transmission Fluid Temperature Sensor "A" Performance**

DESCRIPTION

The ATF (Automatic Transmission Fluid) temperature sensor converts the fluid temperature into a resistance value which is input into the ECM.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0711	One of the following conditions (A), (B) or (C) is met: (A) (a), (b) and (c) are detected: (2-trip detection logic) • (a) Intake air and engine coolant temperatures are more than 15°C (59°F) at engine start • (b) Soak time is more than 5 hours • (c) After normal driving for over 10 min. and 5 km (3 mile) or more, ATF temperature is less than 20°C (68°F) (B) Both (a) and (b) are detected: (2-trip detection logic) • (a) Intake air and engine coolant temperatures are more than -10°C (14°F) at engine start • (b) After normal driving for over 19 min. and 9 km (6 mile) or more, ATF temperature is less than 20°C (68°F) (C) Both (a) and (b) are detected: (2-trip detection logic) • (a) Engine coolant temperature is less than 35°C (95°F) at engine start • (b) ATF temperature is 110°C (230°F) or more when engine coolant temperature reaches 60°C (140°F)	Transmission wire (ATF temperature sensor)

MONITOR DESCRIPTION

The ATF temperature sensor converts the ATF temperature to an electrical resistance value. Based on the resistance, the ECM determines the ATF temperature and detects an open or short in the ATF temperature circuit or a fault in the ATF temperature sensor.

After running the vehicle for a certain period, the ATF temperature should increase. If the ATF

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temperature is below 20°C (68°F) after running the vehicle for a certain period, the ECM interprets this as a fault, and turns on the, MIL and stores the DTC.

When the ATF temperature is 110°C (230°F) or more and engine coolant temperature reaches 60°C (140°F) after cold start, the ECM also determines this as a fault, turns on the MIL, and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0711: ATF temperature sensor/Rationality check
Required sensors/Components	ATF temperature sensor (TFT sensor)
Frequency of operation	Continuous
Duration	3 sec.: Condition (A), (B) Continuous.: Condition (C)
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0112, P0113 (IAT sensor circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system) P2610 (Soak timer circuit)

Condition (A):

Time after engine start	10 min.
Driving distance after engine start	5 km (3 mile) or more
IAT (Intake air temperature) (12 sec. after starting engine)	15°C (59°F) or more
ECT (12 sec. after starting engine)	15°C (59°F) or more
Soak time	5 hours

Condition (B):

Time after engine start	18 min. and 20 sec.
Driving distance after engine start	9 km (6 mile) or more
IAT (Intake air temperature) (12 sec. after starting engine)	-10°C (14°F) or more
ECT (12 sec. after starting engine)	-10°C (14°F) or more

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Condition (C):

ECT (Current temperature)	60°C (140°F) or more
ECT (12 sec. after engine start)	Less than 35°C (95°F)

TYPICAL MALFUNCTION THRESHOLDS

Condition (A), (B):

ATF temperature sensor	Less than 20°C (68°F)

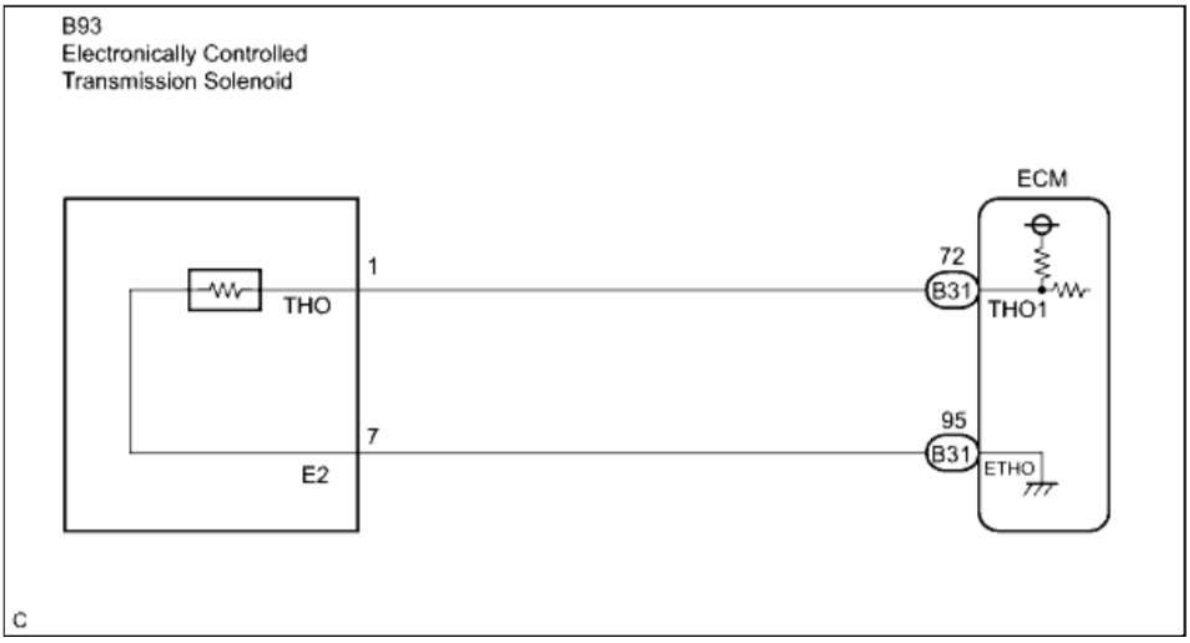
Condition (C):

ATF temperature sensor	110°C (230°F) or more

COMPONENT OPERATING RANGE

ATF temperature sensor	Atmospheric temperature to approx. 130°C (266°F)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- Perform the universal trip to clear permanent DTCs INFO .
- If DTCs P0711 and P2610 are output simultaneously, confirm that the ATF temperature is as

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specified in "Normal Condition" using the Techstream first. When the ATF temperature is as specified in "Normal Condition", perform troubleshooting for DTC P2610 INFO .

- In the table below, the value listed under "Normal Condition" are reference values.

HINT:

Using Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

1. READ DATA LIST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the tester, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
A/T Oil Temperature 1	ATF Temp. Sensor Value/min.: -40°C (-40°F), max.: 215°C (419°F)	• After Stall Test; Approx. 80°C (176°F) • Equal to ambient temperature when cold soak	If the value is "-40°C (-40°F)" or "215°C (419°F)", ATF temp. sensor circuit is opened or shorted.

HINT:

When DTC P0712 is output and Techstream output is 150°C (302°F), there is a short circuit.

When DTC P0713 is output and Techstream output is -40°C (-40°F), there is an open circuit.

Measure the resistance between terminal THO1 (THO) and body ground.

TEMPERATURE DISPLAYED	MALFUNCTION
-40°C (-40°F)	Open circuit
150°C (302°F) or more	Short circuit

HINT:

If a circuit related to the ATF temperature sensor become open, P0713 is immediately set (in 0.5 second).

When P0713 is set, P0711 cannot be detected.

It is not necessary to inspect the circuit when P0711 is set.

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PROCEDURE

1.	CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0711)

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and push the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0711" is output	A
"P0711" and other DTCs	B

HINT:

If any other codes besides "P0711" are output, perform troubleshooting for those DTCs first.

B ▶ **GO TO DTC CHART**

A ▼

2.	CHECK TRANSMISSION FLUID LEVEL

OK:
Automatic transmission fluid level is correct.

NG ▶ **ADD FLUID**

OK ▶ **REPLACE TRANSMISSION WIRE (ATF TEMPERATURE SENSOR)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W850B0X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0712,P0713: Transmission Fluid Temperature Sensor "A" Circuit Low Input (2010 Corolla)		

DTC	**P0712**	**Transmission Fluid Temperature Sensor "A" Circuit Low Input**

DTC	**P0713**	**Transmission Fluid Temperature Sensor "A" Circuit High Input**

DESCRIPTION

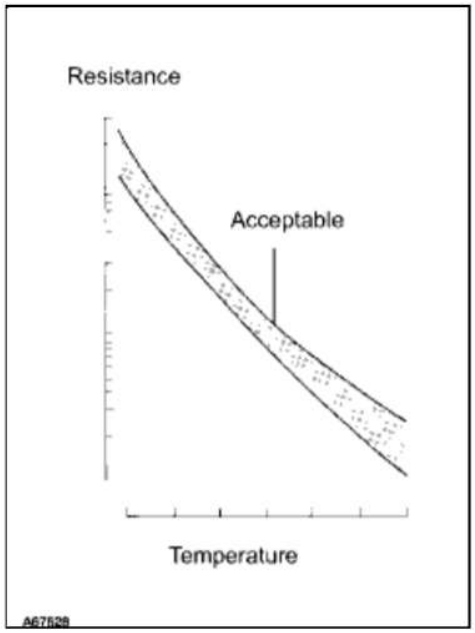
The ATF (Automatic Transmission Fluid) temperature sensor converts the fluid temperature into a resistance value which is input into the ECM.

The ECM applies a voltage to the temperature sensor through ECM terminal THO1.

The sensor resistance changes with the transmission fluid temperature. As the temperature becomes higher, the sensor resistance decreases.

One terminal of the sensor is grounded so that the sensor resistance decreases and the voltage goes down as the temperature becomes higher.

The ECM calculates the fluid temperature based on the voltage signal.



DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA

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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0712	ATF temperature sensor resistance is less than 79 Ω for 0.5 sec. or more (1-trip detection logic)	• Short in ATF temperature sensor circuit • Transmission wire (ATF temperature sensor) • ECM
P0713	Either of the following conditions is met (1-trip detection logic) (A) 15 minutes or more after the engine is started, ATF temperature sensor resistance is more than 156 kΩ for 0.5 sec. or more. (B) The condition (A) of "TYPICAL ENABLING CONDITIONS" for DTC P0711 is met and ATF temperature sensor resistance is more than 156 kΩ for 0.5 sec. or more.	• Open in ATF temperature sensor circuit • Transmission wire (ATF temperature sensor) • ECM

MONITOR DESCRIPTION

These DTCs indicate an open or short in the automatic transmission fluid (ATF) temperature sensor (TFT sensor) circuit. The automatic transmission fluid (ATF) temperature sensor converts ATF temperature to an electrical resistance value. Based on the resistance, the ECM determines the ATF temperature, and the ECM detects an opens or shorts in the ATF temperature circuit. If the resistance value of the ATF temperature is less than 79 Ω *1 or more than 156 kΩ *2, the ECM interprets this as a fault in the ATF sensor or wiring. The ECM will turn on the MIL and store the DTC.

*1: 150°C (302°F) or more is indicated regardless of the actual ATF temperature.

*2: -40°C (-40°F) is indicated regardless of the actual ATF temperature.

HINT:

The ATF temperature can be checked on the Techstream display.

MONITOR STRATEGY

Related DTCs	P0712: ATF temperature sensor/Range check (Low resistance) P0713: ATF temperature sensor/Range check (High resistance)
Required sensors/Components	ATF temperature sensor (TFT sensor)
Frequency of operation	Continuous
Duration	0.5 sec.
MIL operation	Immediate
Sequence of operation	None

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TYPICAL ENABLING CONDITIONS

P0712: Range check (Low resistance)

The monitor will run whenever these DTCs are not present.	None
The typical enabling condition is not available.	-

P0713: Range check (High resistance)

One of the following conditions is met: Condition (A) or (B)

Condition (A)

The monitor will run whenever this DTC is not present.	None
Time after engine start	15 min. or more

TYPICAL MALFUNCTION THRESHOLDS

P0712: Range check (Low resistance)

TFT sensor resistance	Less than 79 Ω

P0713: Range check (High resistance)

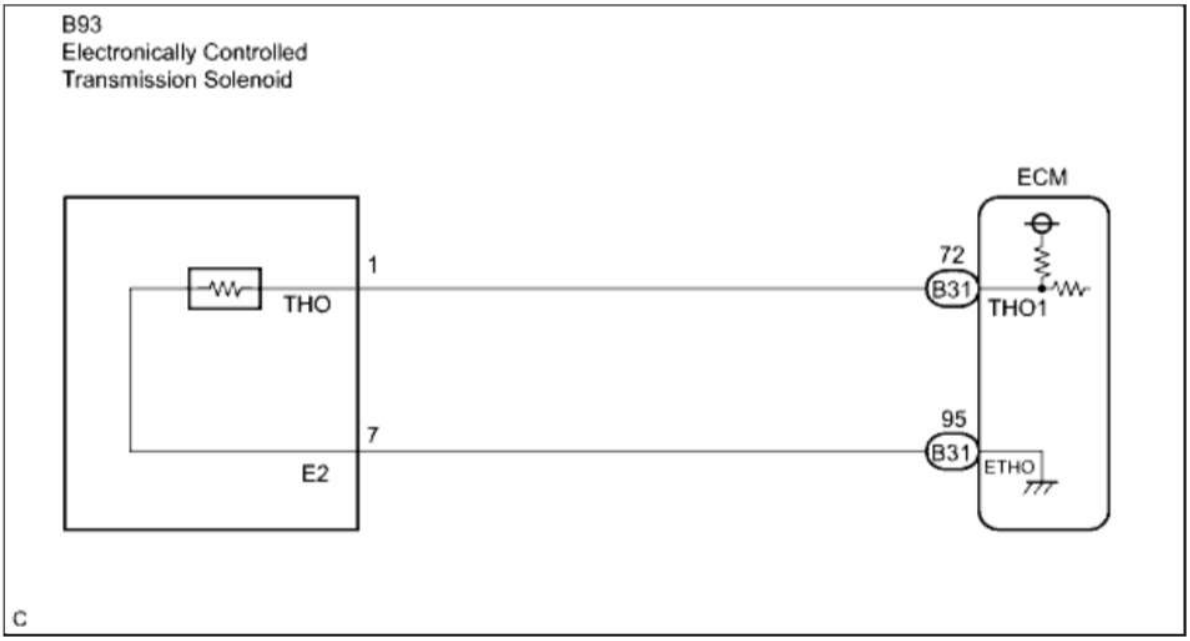
TFT sensor resistance	More than 156 kΩ

COMPONENT OPERATING RANGE

TFT sensor.	Atmospheric temperature to approx. 130°C (266°F)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

HINT:

Using Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

1. READ DATA LIST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the tester, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
A/T Oil Temperature 1	ATF Temp. Sensor Value/min.: -40°C (-40°F), max.: 215°C	• After Stall Test; Approx. 80°C (176°F)	If the value is "-40°C (-40°F)" or "215°C (419°F)", ATF temp. sensor

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
	(419°F)	• Equal to ambient temperature when cold soak	circuit is opened or shorted.

HINT:

When DTC P0712 is output and Techstream output is 150°C (302°F), there is a short circuit.

When DTC P0713 is output and Techstream output is -40°C (-40°F), there is an open circuit.

Measure the resistance between terminal THO1 (THO) and body ground.

TEMPERATURE DISPLAYED	MALFUNCTION
-40°C (-40°F)	Open circuit
150°C (302°F) or more	Short circuit

HINT:

If a circuit related to the ATF temperature sensor become open, P0713 is immediately set (in 0.5 second).

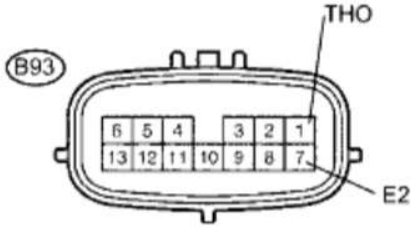
When P0713 is set, P0711 cannot be detected.

It is not necessary to inspect the circuit when P0711 is set.

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (ATF TEMPERATURE SENSOR)**

Component without harness connected:
(Transmission Wire)



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

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Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (THO) - 7 (E2)	Always	79 Ω to 156 kΩ
1 (THO) - Body ground	Always	10 kΩ or higher
7 (E2) - Body ground	Always	↑

HINT:

If the resistance is out of the specified range with either the ATF temperature shown in the table below, the driveability of the vehicle may decrease.

ATF TEMPERATURE	SPECIFIED CONDITION
10 °C (50°F)	5 to 8 kΩ
25 °C (77°F)	2.5 to 4.5 kΩ
110°C (230°F)	0.22 to 0.28 kΩ

NG ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)**

(a) Connect the transmission wire connector to the transaxle.

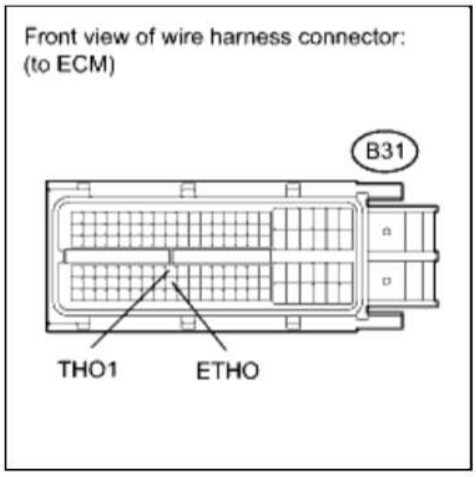
(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-72 (THO1) - B31-95 (ETHO)	Always	79 Ω to 156 kΩ

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(d) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-72 (THO1) - Body ground	Always	10 kΩ or higher
B31-95 (ETHO) - Body ground	Always	

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

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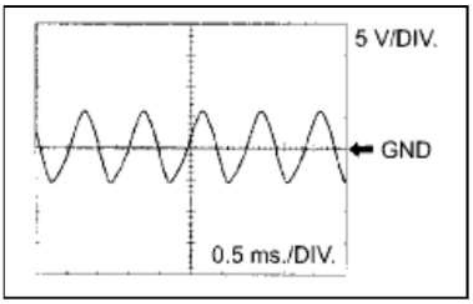
Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VR044X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0717: Turbine Speed Sensor Circuit No Signal (2010 Corolla)		

DTC	**P0717**	**Turbine Speed Sensor Circuit No Signal**

DESCRIPTION

This sensor detects the rotation speed of the input turbine. By comparing the input turbine speed signal (NT) with the counter gear speed sensor signal (NC), the ECM detects the shift timing of the gears and appropriately controls the engine torque and hydraulic pressure according to various conditions. Thus, providing smooth gear shift.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0717	ECM detects conditions (a), (b) and (c) continuously for 5 sec. or more: (1-trip detection logic) (a) Vehicle speed: 50 km/h (31 mph) or more (b) Park/neutral position switch (NSW and R) is OFF (c) Speed sensor (NT): less than 300 rpm	• Open or short in transmission revolution sensor NT (speed sensor NT) circuit • Transmission revolution sensor NT (speed sensor NT) • ECM • Automatic transaxle assembly



Reference (Using an oscilloscope):

Check the waveform between terminals NT+ and NT- of the ECM connector.

Standard: Refer to the illustration.

Terminal	NT+ - NT-
Tool setting	5 V/DIV., 0.5 ms./DIV.
Vehicle condition	Vehicle speed 20 km/h (12 mph)

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MONITOR DESCRIPTION

The NT terminal of the ECM detects a revolution signal from the speed sensor (NT) (input RPM). The ECM calculates a gearshift comparing the speed sensor (NT) with the speed sensor (NC).

While the vehicle is operating in 2nd, 3rd, 4th or 5th gear in the shift position of D, if the input shaft revolution is less than 300 rpm *1 although the output shaft revolution is more than 1,000 rpm *2, the ECM detects the trouble, illuminates the MIL and stores the DTC.

*1: Pulse is not output or is irregularly output.

*2: The vehicle speed is 50 km/h (31 mph) or more.

MONITOR STRATEGY

Related DTCs	P0717: Speed sensor (NT)/Verify pulse input
Required sensors/Components	Speed sensor (NT), Speed sensor (NC)
Frequency of operation	Continuous
Duration	5 sec.
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	P0500 (VSS) P0748, P0778, P0798 (Shift solenoid valve (range))
Shift change	Shift change is completed and before starting next shift change operation
ECM selected gear	2nd, 3rd, 4th or 5th
Output shaft rpm	1,000 rpm or more
NSW switch	OFF
R switch	OFF
Engine	Running
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

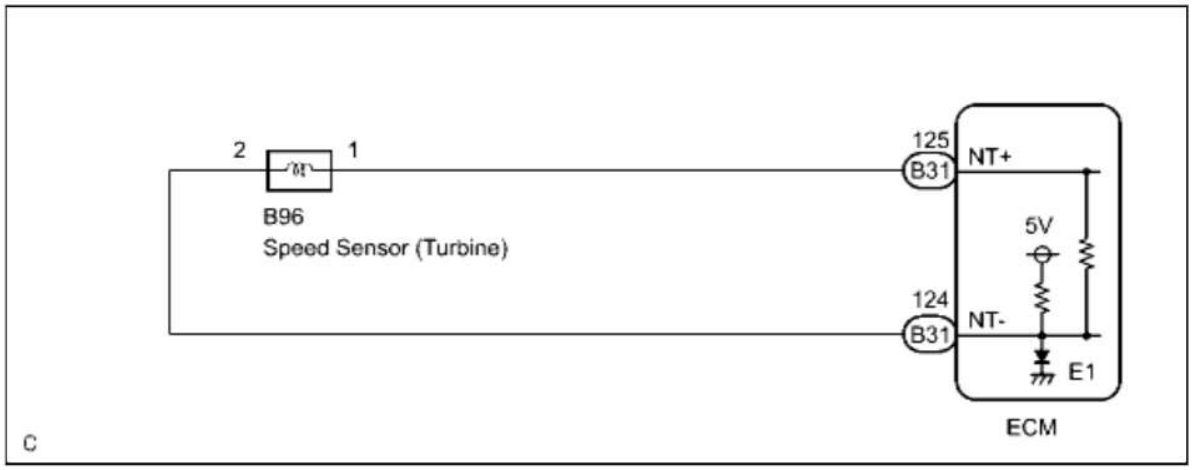
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Sensor signal rpm	Less than 300 rpm

COMPONENT OPERATING RANGE

Speed sensor (NT)	Turbine speed is equal to engine speed with lock-up ON

WIRING DIAGRAM



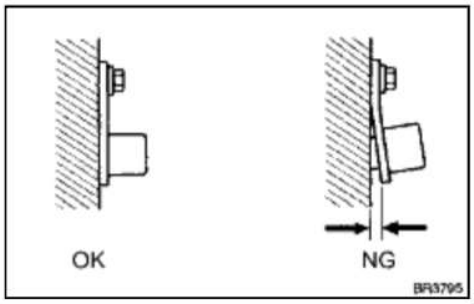
INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	**INSPECT SPEED SENSOR INSTALLATION**



(a) Check the speed sensor installation.

OK:

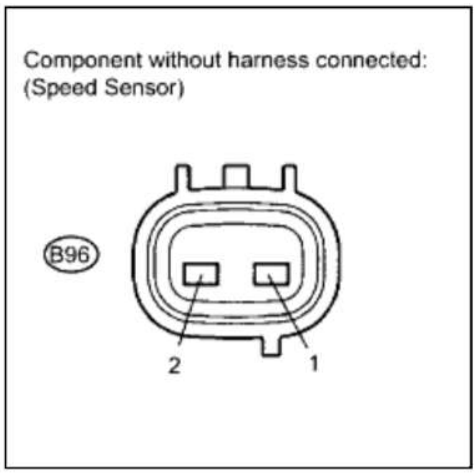
The installation bolt is tightened properly and there is no clearance between the sensor and transaxle case.

NG ▶ **REPLACE SPEED SENSOR (NT)**

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OK

2.	**INSPECT SPEED SENSOR (NT)**



(a) Disconnect the speed sensor connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION 20 °C (68 °F)
1 - 2	20°C (68°F)	560 to 680 Ω

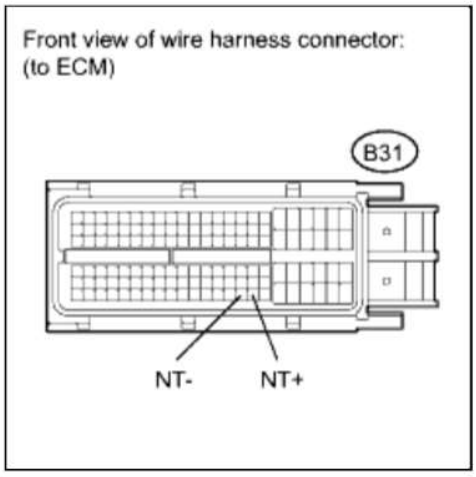
NG ▶ **REPLACE SPEED SENSOR (NT)**

OK

3.	**CHECK HARNESS AND CONNECTOR (SPEED SENSOR - ECM)**

(a) Connect the speed sensor connector.

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(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-125 (NT+) - B31-124 (NT-)	20°C (68°F)	560 to 680 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-125 (NT+) - Body ground	Always	10 kΩ or higher
B31-124 (NT-) - Body ground	Always	

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W003HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0724: Brake Switch "B" Circuit High (2010 Corolla)		

DTC	**P0724**	**Brake Switch "B" Circuit High**

DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling while driving in lock-up condition when brakes are suddenly applied.

When the brake pedal is depressed, this switch sends a signals to the ECM. Then the ECM cancels the operation of the lock-up clutch while braking is in progress.

DTC NO.	DTC DETECTING CONDITION	TROUBLE AREA
P0724	The stop light switch remains ON even when the vehicle is driven in a STOP (less than 3 km/h (2 mph) and GO (30 km/h (19 mph) or more) fashion 5 times. (2-trip detection logic).	• Short in stop light switch circuit • Stop light switch • ECM

MONITOR DESCRIPTION

This DTC indicates that the stop light switch remains on. When the stop light switch remains ON during "stop and go" driving, the ECM interprets this as a fault in the stop light switch and the MIL comes on and the ECM stores the DTC. The vehicle must stop (less than 3 km/h (2 mph)) and go (30 km/h (19 mph) or more) 5 times for two driving cycles in order to detect a malfunction.

MONITOR STRATEGY

Related DTCs	P0724: Stop light switch/Rationality
Required sensors/Components	Stop light switch, Vehicle speed sensor
Frequency of operation	Continuous
Duration	GO and STOP 5 times
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

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The monitor will run whenever this DTC is not present.	None
Ignition switch	ON
Starter	OFF
Battery voltage	8 V or more
GO (Vehicle speed is 30 km/h (18.63 mph) or more)	Once
STOP (Vehicle speed is less than 3 km/h (1.86 mph))	Once

TYPICAL MALFUNCTION THRESHOLDS

Brake switch	Remain ON during GO and STOP 5 times

WIRING DIAGRAM

INFO

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO **.**

PROCEDURE

1.	**READ VALUE USING DATA LIST**

HINT:

Using Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the tester, read the "Data List".

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE (DISPLAY)	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light Switch	Stop light Switch Status/ ON or OFF	Brake pedal is depressed: ON Brake pedal is released: OFF	-

NOTICE:

In the table below, the value listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether apart is faulty or not.

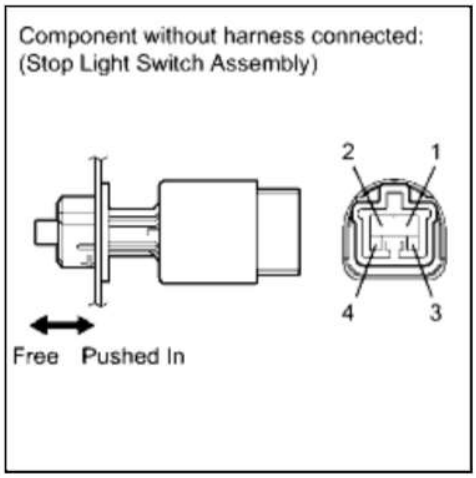
Result

RESULT	PROCEED TO
NG	A
OK	B

B ▶ **CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - ECM)**

A ▼

2.	**INSPECT STOP LIGHT SWITCH ASSEMBLY**



(a) Remove the stop light switch assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

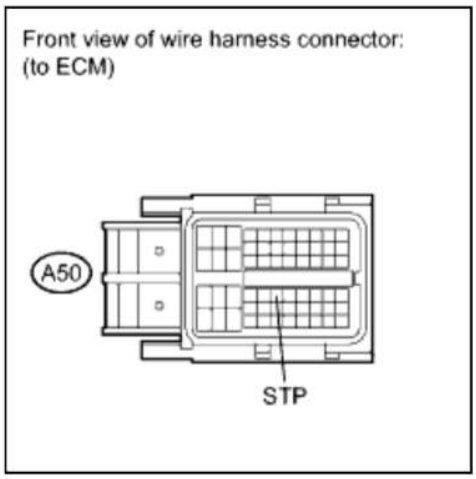
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TESTER CONNECTION	SWITCH POSITION	SPECIFIED CONDITION
1 - 2	Switch pin free	Below 1 Ω
	Switch pin pushed in	10 kΩ or higher
3 - 4	Switch pin free	10 kΩ or higher
	Switch pin pushed in	Below 1 Ω

NG ▶ **REPLACE STOP LIGHT SWITCH ASSEMBLY**

OK ▼

3.	CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - ECM)



(a) Install the stop light switch assembly.

(b) Measure the voltage according to the value(s) in the table below when the brake pedal is depressed and released.

Standard voltage:

CONDITION	TESTER CONNECTION	SPECIFIED CONDITION
A50-36 (STP) - Body ground	Brake pedal is depressed	11 to 14 V
	Brake pedal is released	Below 1 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VW01WX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0741: Torque Converter Clutch Solenoid Performance (Shift Solenoid Valve DSL) (2010 Corolla)		

DTC	**P0741**	**Torque Converter Clutch Solenoid Performance (Shift Solenoid Valve DSL)**

SYSTEM DESCRIPTION

The ECM uses the signals from the throttle position sensor, air-flow meter, turbine (input) speed sensor, intermediate (counter) shaft speed sensor and crankshaft position sensor to monitor the engagement condition of the lock-up clutch.

Then the ECM compares the engagement condition of the lock-up clutch with the lock-up schedule in the ECM memory to detect a mechanical problems of the shift solenoid valve DSL, valve body and torque converter clutch.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0741	Lock-up does not occur when driving in lock-up range Lock-up remains ON in lock-up OFF range (2-trip detection logic)	• Shift solenoid valve DSL remains open or closed • Valve body is blocked • Torque converter clutch • Automatic transaxle (clutch, brake or gear etc.) • Line pressure is too low

MONITOR DESCRIPTION

Torque converter lock-up is controlled by the ECM based on the speed sensor (NT), speed sensor (NC), engine rpm, engine load, engine temperature, vehicle speed, transmission temperature, and gear selection. The ECM determines the lock-up status of the torque converter by comparing the engine rpm (NE) to the input turbine rpm (NT). The ECM calculates the actual transmission gear by comparing input turbine rpm (NT) to counter gear rpm (NC). When conditions are appropriate, the ECM requests "lock-up" by applying control voltage to the shift solenoid DSL. When the DSL is turned on, it applies pressure to the lock-up relay valve and locks the torque converter clutch.

If the ECM detects no lock-up after lock-up has been requested or if it detects lock-up when it is not requested, the ECM interprets this as a fault in the shift solenoid valve DSL or lock-up system performance. The ECM will turn on the MIL and store the DTC.

Example:

HINT:

When any of the following is met, the system judges it as a malfunction.

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- There is a difference in rotation between the input side (engine speed) and output side (input turbine speed) of the torque converter when the ECM commands lock-up.

  (Engine speed is at least 100 rpm greater than input turbine speed.)
- There is no difference in rotation between the input side (engine speed) and output side (input turbine speed) of the torque converter when the ECM commands lock-up off.

  (The difference between engine speed and input turbine speed is less than 35 rpm.)

MONITOR STRATEGY

Related DTCs	P0741: Shift solenoid valve DSL/OFF malfunction Shift solenoid valve DSL/ON malfunction
Required sensors/Components	Shift solenoid valve DSL, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE), Throttle position sensor (VPA1), Mass air flow sensor (MAF), Transmission temperature sensor (THO1), Engine coolant temperature sensor (ECT)
Frequency of operation	Continuous
Duration	OFF malfunction (A) Continuous. OFF malfunction (B) 1 sec. OFF malfunction (C) 3.5 sec. ON malfunction 1.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit) P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit)

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	P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

OFF malfunction (A):

ECM selected gear	3rd
Throttle valve opening angle	4.5% or more at engine speed gear 1900 rpm (varies with engine speed)

OFF malfunction (B):

ECM selected gear	5th
Vehicle speed	10 km/h (6 mph) or more

OFF malfunction (C):

ECM lock-up command	ON
ECM selected gear	3rd, 4th or 5th
Vehicle speed	25 km/h (16 mph) or more

ON malfunction:

ECM lock-up command	OFF
ECM selected gear	3rd, 4th or 5th
Throttle valve opening angle	8.5% or more
Vehicle speed	3rd 25 to 60 km/h (16 to 37 mph)
	4th, 5th 25 to 120 km/h (16 to 75 mph)

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: OFF malfunction or ON malfunction

OFF malfunction:

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Engine speed - Input (turbine) speed When condition "OFF" malfunction (A)" of shift solenoid "D" is detected;	75 rpm or more
Engine speed - Input (turbine) speed When condition "OFF" malfunction (A)" of shift solenoid "D" is not detected;	100 rpm or more

ON malfunction:

Difference between engine speed and input (turbine) speed	Less than 35 rpm

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO **.**

HINT:

Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Select the item "Powertrain / Engine and ECT / Active Test".

(f) According to the display on the tester, perform the "Active Test".

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Activate the Lock Up	[Test Details] Control the shift solenoid DSL to set the automatic transaxle to the lock-up condition. [Vehicle Condition] • Throttle valve opening angle: Less than 35 % • Vehicle Speed: 60 km/h (37 mph) or more	ON/OFF	Possible to check the DSL operation.

HINT:

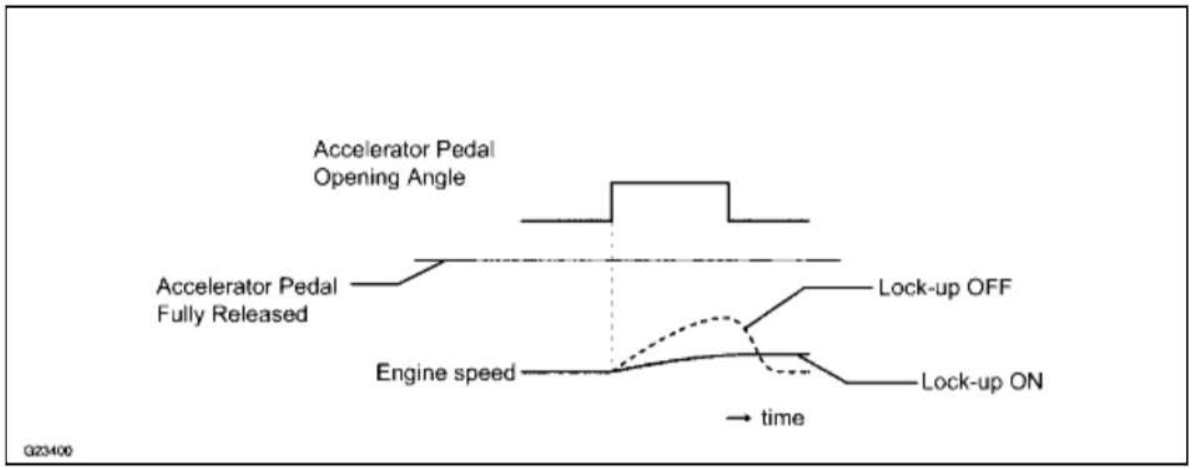
- This test can be conducted when the vehicle speed is 60 km/h (37 mph) or more.
- This test can be conducted in the 5th gear.

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(g) Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

HINT:

- When changing the accelerator pedal opening angle while driving, if the engine speed does not change, lock-up is on.
- Slowly release, but not fully, the accelerator pedal in order to decelerate. (Fully releasing the pedal will close the throttle valve and lock-up may be turned off.)



PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0741)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0741" is output	A
"P0741" and other DTCs	B

HINT:

If any other codes besides "P0741" are output, perform the troubleshooting for those DTCs first.

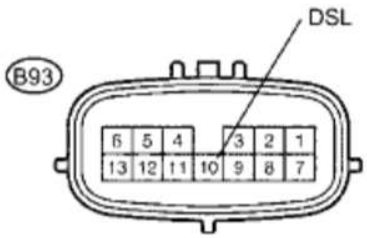
B ▶ GO TO DTC CHART

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A

2.	INSPECT TRANSMISSION WIRE (DSL)

Component without harness connected:
(Transmission Wire)



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
10 - Body ground	20°C (68°F)	11 to 13 Ω

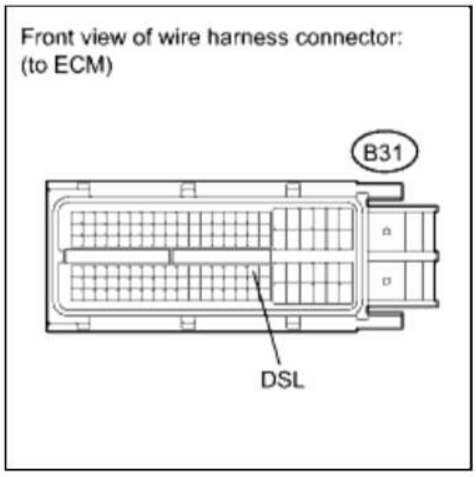
NG ▶ **INSPECT SHIFT SOLENOID VALVE DSL**

OK

3.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)

(a) Connect the transmission wire connector.

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(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

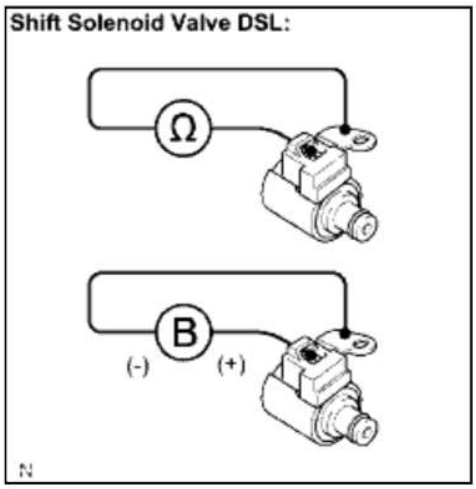
Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-79 (DSL) - Body ground	20°C (68°F)	11 to 13 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

4.	**INSPECT SHIFT SOLENOID VALVE DSL**



(a) Remove the shift solenoid valve DSL.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (DSL) - Solenoid Body (DSL)	20°C (68°F)	11 to 13 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid valve makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE DSL**

OK
▼

5.	CHECK TRANSMISSION WIRE

OK:

The connectors and pins are securely installed.

There is no open or short on the wire harness.

NG ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

OK
▼

6.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve and they operate smoothly.

NG ▶ **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY**

OK

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7.	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:
The torque converter clutch operates normally.

NG ▶ REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VT02JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0746: Pressure Control Solenoid "A" Performance (Shift Solenoid Valve SL1) (2010 Corolla)		

DTC	**P0746**	**Pressure Control Solenoid "A" Performance (Shift Solenoid Valve SL1)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect mechanical problems of the shift solenoid valves, valve body or automatic transaxle (clutch, brake or gear etc.).

DTC NO.	DTC DETECTING CONDITION	TROUBLE AREA
P0746	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve SL1 remains open or closed • Valve body is blocked • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd, 4th or 5th gear position). When the gear position commanded by the ECM and the actual gear position are not the same, the ECM illuminates the MIL, and store the DTC.

HINT:

Example:

When either condition (a) or (b) is met, the ECM detects a malfunction.

(a) The ECM commands the 1st gear, but the actual gear is 2nd.

(b) The ECM commands the 2nd gear, but the actual gear is 1st.

MONITOR STRATEGY

Related DTCs	P0746:

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	Shift solenoid valve SL1/OFF malfunction Shift solenoid valve SL1/ON malfunction
Required sensors/Components	Shift solenoid valve SL1, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous
Duration	0.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

ALL:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit) P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

OFF malfunction:

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (25 mph)
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

ON malfunction:

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ECM selected gear	2nd
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: OFF malfunction or ON malfunction OFF malfunction:

2 detections are necessary per driving cycle:

1st detection; temporary flag ON

2nd detection; pending fault code ON

Input (turbine) speed/Intermediate shaft speed	1.49 to 1.63

ON malfunction:

Input (turbine) speed/Intermediate shaft speed	2.72 to 2.86

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO **.**

HINT:

Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Active Test / Shift Status".

(g) According to the display on the tester, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to

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confirm the problem INFO .

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th/5th	Possible to check the operation of the shift solenoid valves.

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List / Shift Status display on Techstream.

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0746)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0746" is output	A
"P0746" and other DTCs	B

HINT:

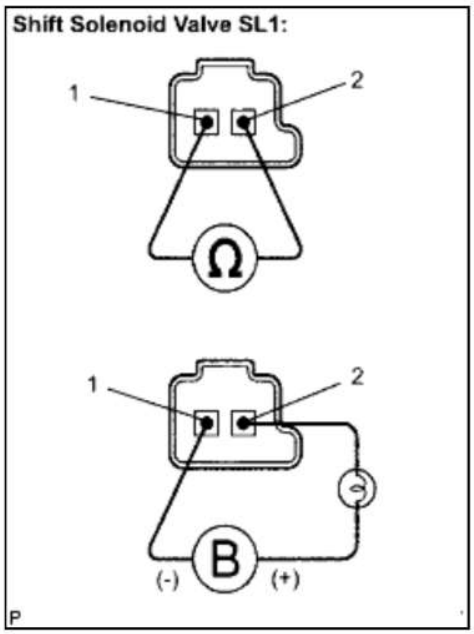
If any other codes besides "P0746" are output, perform the troubleshooting for those DTCs first.

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B ▶ GO TO DTC CHART

A ▼

2.	INSPECT SHIFT SOLENOID VALVE SL1



(a) Remove the shift solenoid valve SL1.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ REPLACE SHIFT SOLENOID VALVE SL1

OK

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3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:
There are no foreign objects on each valve and they operate smoothly.

NG ▶ REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK ▼

4.	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:
The torque converter clutch operates normally.

NG ▶ REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W4028X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0748: Pressure Control Solenoid "A" Electrical (Shift Solenoid Valve SL1) (2010 Corolla)		

DTC	**P0748**	**Pressure Control Solenoid "A" Electrical (Shift Solenoid Valve SL1)**

DESCRIPTION

Shifting from 1st to 5th is performed in combination with "ON" and "OFF" operation of the shift solenoid valves SL1, SL2, SL3, S4 and SR which are controlled by the ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valves to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0748	• The ECM checks for an open or short in the shift solenoid valve SL1 circuit while driving and shift gears. (1-trip detection logic) • Output signal duty equals to 100 %. (NOTE: SL1 output signal duty is less than 100 % under normal condition.)	• Open or short in shift solenoid valve SL1 circuit • Shift solenoid valve SL1 • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other normal shift solenoid valves "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.)

INFO .

MONITOR STRATEGY

Related DTCs	P0748: Shift solenoid valve SL1/Range check
Required sensors/Components	Shift solenoid valve SL1
Frequency of operation	Continuous
Duration	1 sec.
MIL operation	Immediate

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Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	None
Solenoid current cut status	Not cut
Battery voltage	11 V or more
Ignition switch	ON
Starter	OFF
CPU commanded duty ratio to SL1	19% or more

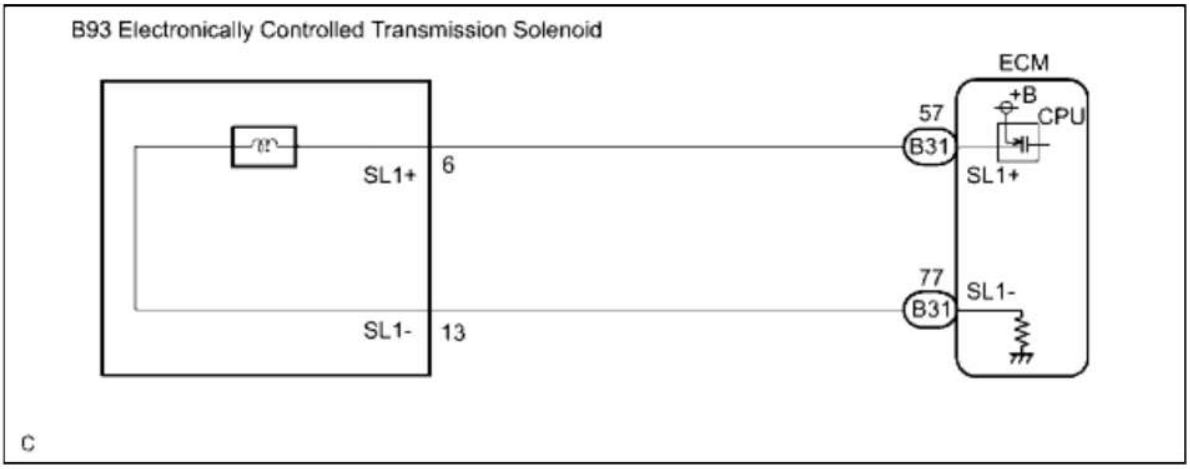
TYPICAL MALFUNCTION THRESHOLDS

Solenoid status from IC	Fail (Open or short)

COMPONENT OPERATING RANGE

Output signal duty	Less than 100%

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

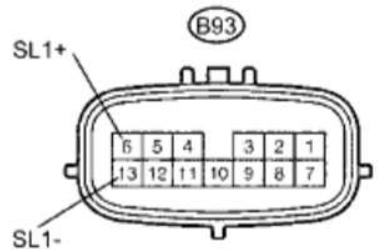
Perform the universal trip to clear permanent DTCs INFO .

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PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (SL1)**

Component without harness connected:
(Transmission Wire)



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
6 (SL1+) - 13 (SL1-)	20°C (68°F)	5.0 to 5.6 Ω

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
6 (SL1+) - Body ground	Always	10 kΩ or higher
13 (SL1-) - Body ground	Always	

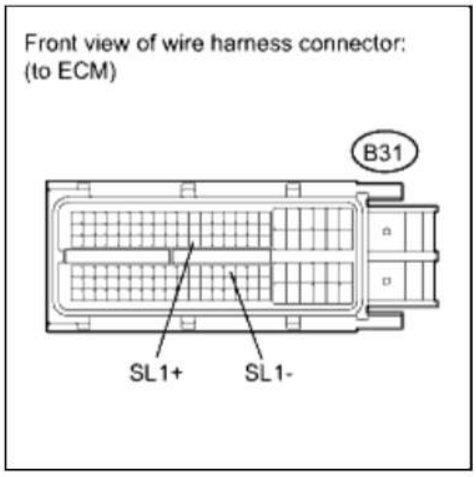
NG ▶ **INSPECT SHIFT SOLENOID VALVE SL1**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)**

(a) Connect the transmission connector to the transaxle.

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(b) Disconnect the connector from the ECM.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-57 (SL1+) - B31-77 (SL1-)	20°C (68°F)	5.0 to 5.6 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-57 (SL1+) - Body ground	Always	10 kΩ or higher
B31-77 (SL1-) - Body ground	Always	

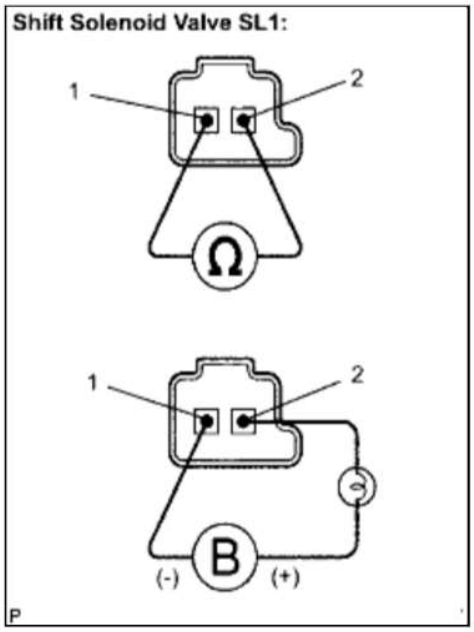
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

3.	**INSPECT SHIFT SOLENOID VALVE SL1**

(a) Remove the shift solenoid valve SL1.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SL1**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W8205HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0766: Shift Solenoid "D" Performance (Shift Solenoid Valve S4) (2010 Corolla)		

DTC	**P0766**	**Shift Solenoid "D" Performance (Shift Solenoid Valve S4)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect mechanical problems of the shift solenoid valves, valve body or automatic transaxle (clutch, brake or gear etc.).

DTC NO.	DTC DETECTING CONDITION	TROUBLE AREA
P0766	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve S4 remains open or closed • Valve body is blocked • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd, 4th or 5th gear position). When the gear position commanded by the ECM and the actual gear position are not the same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0766: Shift solenoid valve S4/OFF malfunction Shift solenoid valve S4/ON malfunction
Required sensors/Components	Shift solenoid valve S4, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous

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Duration	OFF malfunction (A) and ON malfunction (B) 1 sec. OFF malfunction (B) 1.2 sec. ON malfunction (A) 0.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit) P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

OFF malfunction (A):

ECM selected gear	5th
Throttle valve opening angle	5% or more
Vehicle speed	10 km/h (6 mph) or more

OFF malfunction (B):

ECM lock-up command	ON
ECM selected gear	3rd, 4th or 5th

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Throttle valve opening angle	10% or more
Vehicle speed	3rd 25 to 100 km/h (16 to 62 mph)
	4th, 5th 25 to 120 km/h (16 to 75 mph)

ON malfunction (A):

ECM selected gear	4th or 5th
Throttle valve opening angle	4.5% or more at engine speed 1,900 rpm (Varies with engine speed)

ON malfunction (B):

ECM selected gear	4th
Throttle valve opening angle	5% or more
Vehicle speed	10 km/h (6 mph) or more

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: OFF malfunction (A) and (B), or ON malfunction (A) and (B)

2 detections are necessary per driving cycle:

1st detection; temporary flag ON

2nd detection; pending fault code ON

OFF malfunction (A):

Intermediate shaft speed/Output speed	1.34 to 1.48

OFF malfunction (B):

Difference between engine speed and input (turbine) speed	Less than 35 rpm

ON malfunction (A):

Input (turbine) speed/Intermediate shaft speed	0.64 to 0.74

ON malfunction (B):

Intermediate shaft speed/Output speed	0.95 to 1.09

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INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

HINT:

Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Active Test / Shift Status".

(g) According to the display on the tester, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to confirm the problem INFO .

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th/5th	Possible to check the operation of the shift solenoid valves.

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List / Shift Status display on Techstream.

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PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0766)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0766" is output	A
"P0766" and other DTCs	B

HINT:

If any other codes besides "P0766" are output, perform the troubleshooting for those DTCs first.

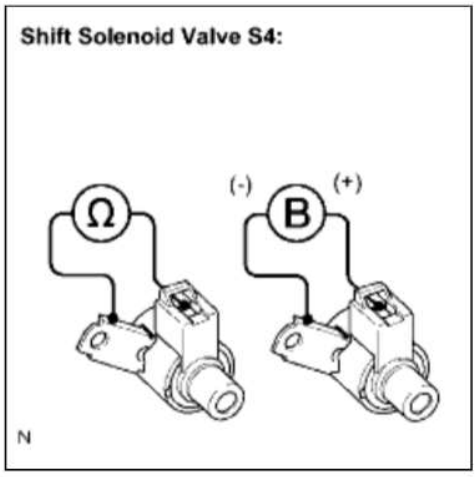
B ▶ GO TO DTC CHART

A ▼

2.	**INSPECT SHIFT SOLENOID VALVE S4**

(a) Remove the shift solenoid valve S4.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S4) - Solenoid Body (S4)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE S4**

OK ▼

3.	**INSPECT TRANSMISSION VALVE BODY ASSEMBLY**

OK:

There are no foreign objects on each valve and they operate smoothly.

NG ▶ **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY**

OK ▼

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4.	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:
The torque converter clutch operates normally.

NG ▶ REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VX01ZX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0771: Shift Solenoid "E" Performance (Shift Solenoid Valve SR) (2010 Corolla)		

DTC	**P0771**	**Shift Solenoid "E" Performance (Shift Solenoid Valve SR)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect mechanical problems of the shift solenoid valves, valve body or automatic transaxle (clutch, brake or gear etc.).

DTC NO.	DTC DETECTING CONDITION	TROUBLE AREA
P0771	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve SR remains open or closed • Valve body is blocked • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd, 4th or 5th gear position). When the gear position commanded by the ECM and the actual gear position are not the same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0771: Shift solenoid valve SR/OFF malfunction Shift solenoid valve SR/ON malfunction
Required sensors/Components	Shift solenoid valve SR, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous

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Duration	OFF malfunction (A) 1 sec. OFF malfunction (B) 3.5 sec. ON malfunction (A) Continuous ON malfunction (B) and (C) 0.8 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit) P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

OFF malfunction (A):

ECM selected gear	5th
Throttle valve opening angle	5% or more
Vehicle speed	10 km/h (6 mph) or more

OFF malfunction (B):

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ECM lock-up command	ON
ECM selected gear	3rd, 4th or 5th
Vehicle speed	25 km/h (16 mph) or more

ON malfunction (A):

ECM lock-up command	OFF

ON malfunction (B):

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (25 mph)
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

ON malfunction (C):

ECM selected gear	3rd
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

ON malfunction (D):

Duration time from shift command of ECM	15 sec. or more
ECM selected gear	4th or 5th

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: OFF malfunction (A) and (B), or ON malfunction (A), (B), (C) and (D)

OFF malfunction (A):

Intermediate shaft speed/Output speed	1.34 to 1.48

OFF malfunction (B):

Engine speed - Input (turbine) speed When condition "OFF" malfunction (A)" of shift solenoid "D" is detected;	75 rpm or more
Engine speed - Input (turbine) speed When condition "OFF" malfunction (A)" of shift solenoid "D" is not detected;	100 rpm or more

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ON malfunction (A):

Difference between engine speed and input (turbine) speed	150 rpm or more

ON malfunction (B):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

ON malfunction (C):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

ON malfunction (D):

Input (turbine) speed/Intermediate shaft speed	0.64 to 0.74

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO **.**

HINT:

Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Active Test / Shift Status".

(g) According to the display on the tester, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to confirm the problem INFO **.**

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th/5th	Possible to check the operation of the shift solenoid valves.

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List / Shift Status display on Techstream.

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0771)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0771" is output	A
"P0771" and other DTCs	B

HINT:

If any other codes besides "P0771" are output, perform the troubleshooting for those DTCs first.

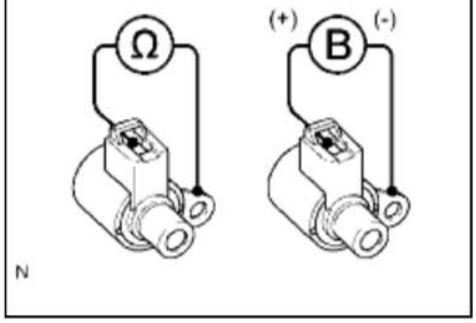
B ▶ GO TO DTC CHART

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A

2.	INSPECT SHIFT SOLENOID VALVE SR

Shift Solenoid Valve SR:



(a) Remove the shift solenoid valve SR.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (SR) - Solenoid Body (SR)	20°C (68°F)	11 to 15 Ω

(c) Connect positive (+) lead to the terminal of solenoid connector, negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SR**

OK

3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

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There are no foreign objects on each valve and they operate smoothly.

NG ▶ **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY**

OK ▼

4.	**INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY**

OK:
The torque converter clutch operates normally.

NG ▶ **REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY**

OK ▶ **REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VU02JX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0776: Pressure Control Solenoid "B" Performance (Shift Solenoid Valve SL2) (2010 Corolla)		

DTC	**P0776**	**Pressure Control Solenoid "B" Performance (Shift Solenoid Valve SL2)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect mechanical problems of the shift solenoid valves, valve body or automatic transaxle (clutch, brake or gear etc.).

DTC NO.	DTC DETECTING CONDITION	TROUBLE AREA
P0776	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve SL2 remains open or closed • Valve body is blocked • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd, 4th or 5th gear position). When the gear position commanded by the ECM and the actual gear position are not the same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0776: Shift solenoid valve SL2/OFF malfunction Shift solenoid valve SL2/ON malfunction
Required sensors/Components	Shift solenoid valve SL2, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous

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Duration	OFF malfunction (A) 1.8 sec. OFF malfunction (B) and (C) 0.8 sec. ON malfunction (A) and (B) 0.8 sec. ON malfunction (C) 0.4 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit) P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

OFF malfunction (A):

ECM lock-up command	OFF
Vehicle speed	3rd Less than 60 km/h (37 mph)
	4th, 5th Less than 120 km/h (75 mph)
Throttle valve opening angle	8.5% or more

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OFF malfunction (B):

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (25 mph)
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

OFF malfunction (C):

ECM selected gear	3rd
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

OFF malfunction (D):

Duration time from shift command of ECM	15 sec. or more
ECM selected gear	4th or 5th

ON malfunction (A):

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (25 mph)
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

ON malfunction (B):

ECM selected gear	3rd
Throttle valve opening angle	7% or more at output speed 1400 rpm (Varies with engine speed)
Malfunction of pressure control solenoid "B" (SL2) and "C" (SL3)	Not detected

ON malfunction (C):

Throttle valve opening angle	7.0% or more at output speed 1050 rpm (Varies with engine speed)
Malfunction of pressure control solenoid "B" (SL2)	Not detected

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: OFF malfunction (A),

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(B), (C) and (D), or ON malfunction (A), (B) and (C)

OFF malfunction (A):

Difference between engine speed and input (turbine) speed	Less than 35 rpm

OFF malfunction (B) and (C):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

OFF malfunction (D):

Input (turbine) speed/Intermediate shaft speed	0.64 to 0.74

ON malfunction (A):

Input (turbine) speed/Intermediate shaft speed	2.72 to 2.86

ON malfunction (B):

Input (turbine) speed - Intermediate shaft speed	700 rpm or more

ON malfunction (C):

Input (turbine) speed - Intermediate shaft speed	Less than -500 rpm or 700 rpm or more

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

HINT:

Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

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(f) Select the item "Powertrain / Engine and ECT / Active Test / Shift Status".

(g) According to the display on the tester, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to confirm the problem INFO **.**

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th/5th	Possible to check the operation of the shift solenoid valves.

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List / Shift Status display on Techstream.

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0776)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

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DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0776" is output	A
"P0776" and other DTCs	B

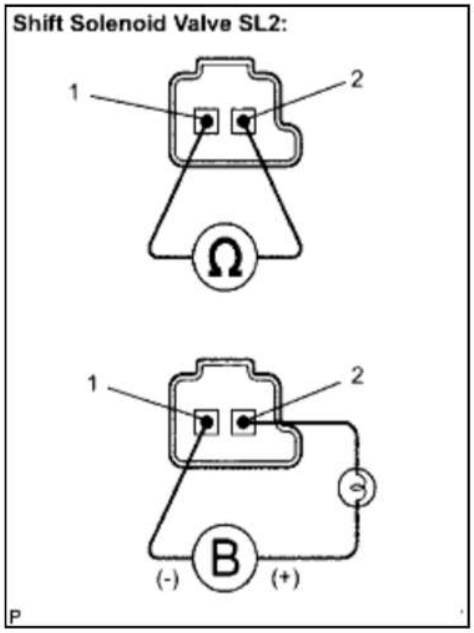
HINT:

If any other codes besides "P0776" are output, perform the troubleshooting for those DTCs first.

B ▶ GO TO DTC CHART

A ▼

2.	INSPECT SHIFT SOLENOID VALVE SL2



(a) Remove the shift solenoid valve SL2.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to

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terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ REPLACE SHIFT SOLENOID VALVE SL2

OK ▼

3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve and they operate smoothly.

NG ▶ REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK ▼

4.	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:

The torque converter clutch operates normally.

NG ▶ REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W5028X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0778: Pressure Control Solenoid "B" Electrical (Shift Solenoid Valve SL2) (2010 Corolla)		

DTC	**P0778**	**Pressure Control Solenoid "B" Electrical (Shift Solenoid Valve SL2)**

DESCRIPTION

Shifting from 1st to 5th is performed in combination with "ON" and "OFF" operation of the shift solenoid valves SL1, SL2, SL3, S4 and SR which are controlled by the ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valves to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0778	ECM checks for an open or short circuit in shift solenoid valves SL2 (1-trip detection logic) Hybrid IC for solenoid indicates fail.	• Open or short in shift solenoid valve SL2 circuit • Shift solenoid valve SL2 • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other normal shift solenoid valves "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.)

INFO .

MONITOR STRATEGY

Related DTCs	P0778: Shift solenoid valve SL2/Range check
Required sensors/Components	Shift solenoid valve SL2
Frequency of operation	Continuous
Duration	1 sec.
MIL operation	Immediate
Sequence of operation	None

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TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	None
Solenoid current cut status	Not cut
Battery voltage	11 V or more
Ignition switch	ON
Starter	OFF
CPU commanded duty ratio to SL2	19% or more

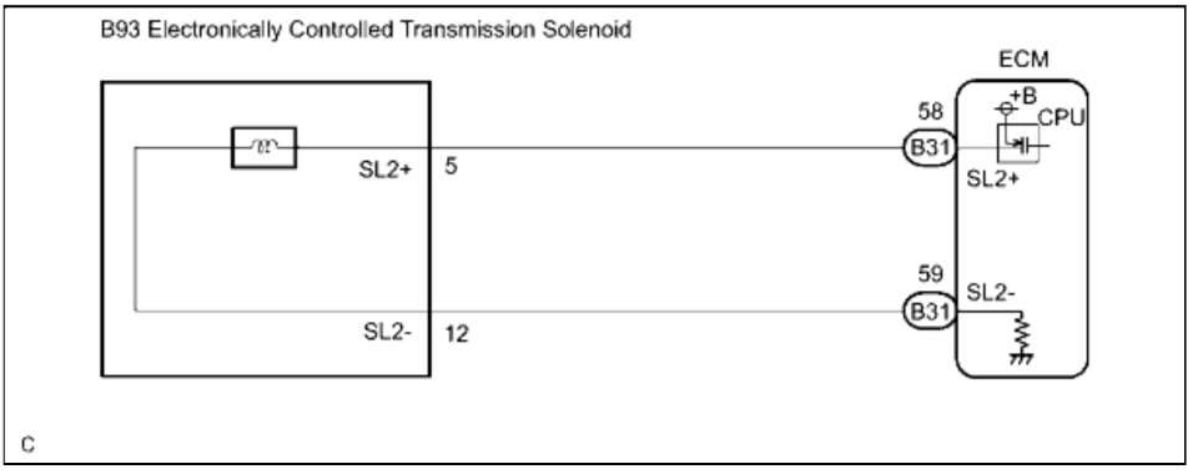
TYPICAL MALFUNCTION THRESHOLDS

Solenoid status from IC	Fail (Open or short)

COMPONENT OPERATING RANGE

Output signal duty	Less than 100%

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

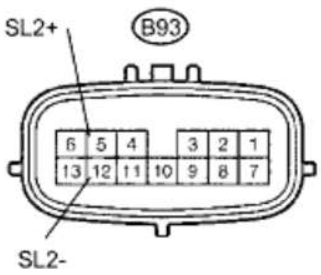
Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

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1.	INSPECT TRANSMISSION WIRE (SL2)

Component without harness connected:
(Transmission Wire)



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
5 (SL2+) - 12 (SL2-)	20°C (68°F)	5.0 to 5.6 Ω

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
5 (SL2+) - Body ground	Always	10 kΩ or higher
12 (SL2-) - Body ground	Always	

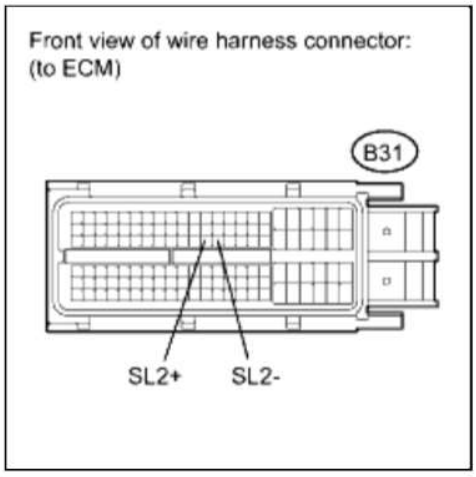
NG ▶ **INSPECT SHIFT SOLENOID VALVE SL2**

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)

(a) Connect the transmission connector to the transaxle.

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(b) Disconnect the connector from the ECM.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-58 (SL2+) - B31-59 (SL2-)	20°C (68°F)	5.0 to 5.6 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-58 (SL2+) - Body ground	Always	10 kΩ or higher
B31-59 (SL2-) - Body ground	Always	

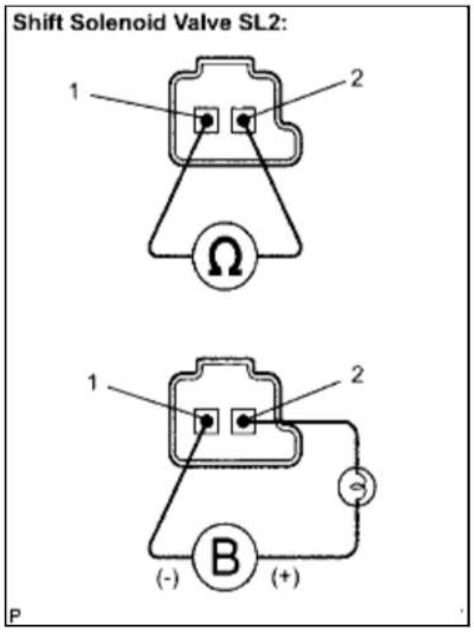
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

3.	**INSPECT SHIFT SOLENOID VALVE SL2**

(a) Remove the shift solenoid valve SL2.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SL2**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VS028X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0793: Intermediate Shaft Speed Sensor "A" (2010 Corolla)		

DTC	**P0793**	**Intermediate Shaft Speed Sensor "A"**

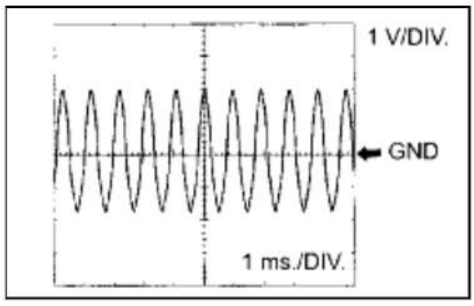
DESCRIPTION

This sensor detects the rotation speed of the counter gear. By comparing the counter gear speed signal (NC) with the direct clutch speed sensor signal (NT), the ECM detects the shift timing of the gears and appropriately controls the engine torque and hydraulic pressure according to various conditions. Thus smooth gear shifting is performed.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0793	ECM detects conditions (a), (b) and (c) continuously for 5 sec. or more: (1-trip detection logic) • (a) Vehicle speed: 50 km/h (31 mph) or more • (b) Park/neutral position switch (NSW) is OFF • (c) Speed sensor (NC): less than 300 rpm	• Open or short in transmission revolution sensor NC (speed sensor NC) circuit • Transmission revolution sensor NC (speed sensor NC) • ECM

Reference (Using an oscilloscope):

Check the waveform between terminals NC+ and NC- of the ECM connector.



Standard: Refer to the illustration.

Terminal	NC+ - NC-
Tool setting	1 V/DIV., 1 ms./DIV.

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Vehicle condition	Vehicle speed 30 km/h (19 mph): (3rd gear) Engine speed 1,400 rpm

MONITOR DESCRIPTION

The NC terminal of the ECM detects a revolution signal from the speed sensor (NC) (counter gear rpm). The ECM calculates a gearshift comparing the speed sensor (NT) with the speed sensor (NC).

While the vehicle is operating in 2nd, 3rd, 4th or 5th gear in the shift position of D, if the counter gear revolution is less than 300 rpm *1although the output shaft revolution is more than 1,000 rpm *2, the ECM detects the trouble, illuminates the MIL and stores the DTC.

*1: Pulse is not output or is irregularly output.

*2: The vehicle speed is 50 km/h (31 mph) or more.

MONITOR STRATEGY

Related DTCs	P0793: Speed sensor (NC)/Verify pulse input
Required sensors/Components	Speed sensor (NC), Speed sensor (NT), Park/neutral position switch
Frequency of operation	Continuous
Duration	5 sec.
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	P0500 (VSS) P0748, P0778, P0798 (Shift solenoid valve(range))
Engine	Running
NSW switch	OFF
Output shaft rpm	1,000 rpm or more
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

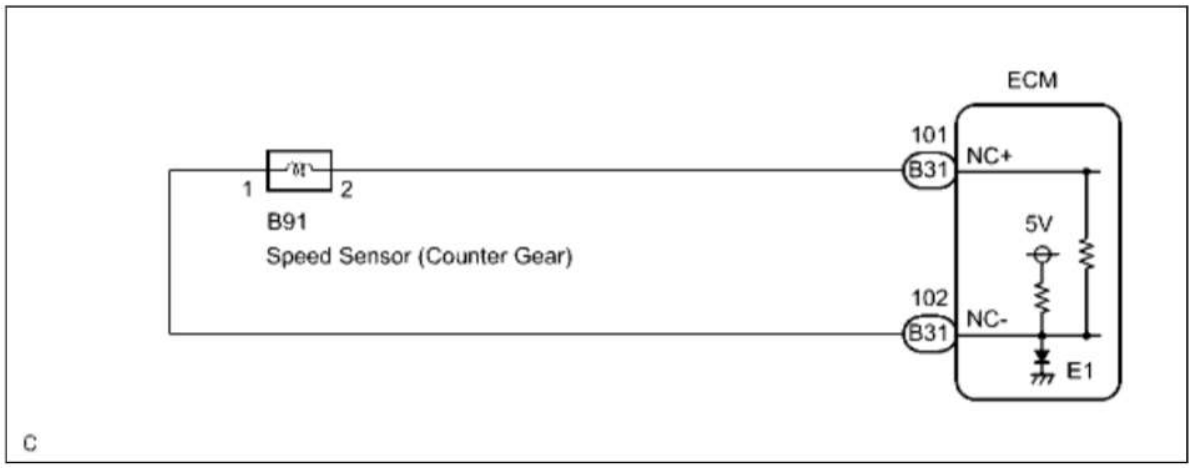
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Sensor signal rpm	Less than 300 rpm

COMPONENT OPERATING RANGE

Counter gear speed sensor (NC)	**HINT:** **3rd when shift lever position is D position (After warming up the engine);** • Intermediate shaft speed (NC) becomes close to the engine speed.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO **.**

HINT:

Using Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

1. READ DATA LIST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

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(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the tester, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
SPD (NC)	Counter Gear Speed/display: 50 r/min	**HINT:** **3rd when shift lever position is D position (After warming up the engine);** • Intermediate shaft speed (NC) becomes close to the engine speed.	-

HINT:

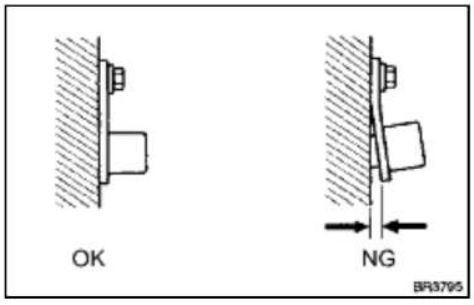
- SPD (NC) is always 0 while driving:

  Open or short in the sensor or circuit.
- SPD (NC) is always more than 0 and less than 300 rpm while driving the vehicle at 50 km/h (31 mph) or more:

  Sensor trouble, improper installation, or intermittent connection trouble of the circuit.

PROCEDURE

1.	**INSPECT SPEED SENSOR INSTALLATION**



(a) Check the speed sensor installation.

OK:

The installation bolt is tightened properly and there is no clearance between the sensor and transaxle case.

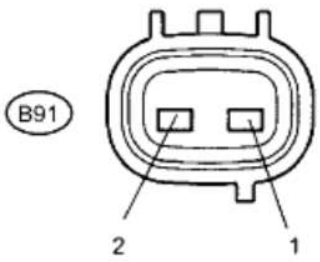
NG ▶ **REPLACE SPEED SENSOR (NC)**

OK

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2.	INSPECT SPEED SENSOR (NC)

Component without harness connected:
(Speed Sensor)



(a) Disconnect the speed sensor connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20 °C (68 °F)	560 to 680 Ω

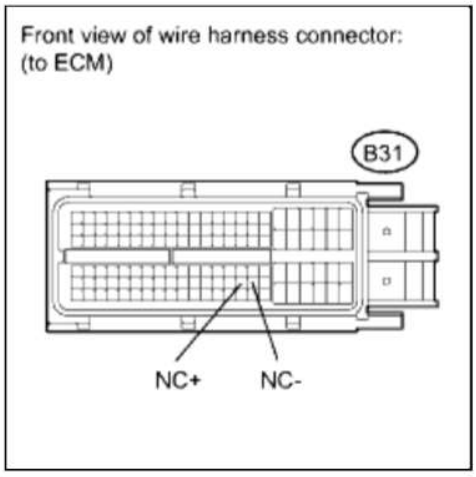
NG ▶ REPLACE SPEED SENSOR (NC)

OK

3.	CHECK HARNESS AND CONNECTOR (SPEED SENSOR - ECM)

(a) Connect the speed sensor connector.

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(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-101 (NC+) - B31-102 (NC-)	20 °C (68 °F)	560 to 680 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-101 (NC+) - Body ground	Always	10 kΩ or higher
B31-102 (NC-) - Body ground	Always	

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VV02NX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0796: Pressure Control Solenoid "C" Performance (Shift Solenoid Valve SL3) (2010 Corolla)		

DTC	**P0796**	**Pressure Control Solenoid "C" Performance (Shift Solenoid Valve SL3)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor to detect the actual gear position (1st, 2nd, 3rd, 4th or 5th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect mechanical troubles of the shift solenoid valves and valve body.

DTC NO.	DTC DETECTING CONDITION	TROUBLE AREA
P0796	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve SL3 remains open or closed • Valve body is blocked • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd, 4th or 5th gear position). When the gear position commanded by the ECM and the actual gear position are not the same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0796: Shift solenoid valve SL3/OFF malfunction Shift solenoid valve SL3/ON malfunction
Required sensors/Components	Shift solenoid valve SL3, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous
Duration	OFF malfunction (A) 0.8 sec. OFF malfunction (B)

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	1 sec. ON malfunction (A) and (B) 0.8 sec. ON malfunction (C) 0.4 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

All:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit) P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
ECT (Engine coolant temperature)	10°C (50°F) or more
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

OFF malfunction (A):

ECM selected gear	4th or 5th
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

OFF malfunction (B):

ECM selected gear	4th
Throttle valve opening angle	5% or more
Vehicle speed	10 km/h (6 mph) or more

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ON malfunction (A):

ECM selected gear	1st
Vehicle speed	Less than 40 km/h (25 mph)
Throttle valve opening angle	4.5% or more at engine speed 1900 rpm (Varies with engine speed)

ON malfunction (B):

ECM selected gear	3rd
Throttle valve opening angle	7.0% or more at output speed 1400 rpm (Varies with engine speed)
Malfunction of pressure control solenoid "B" (SL2) and "C" (SL3)	Not detected

ON malfunction (C):

Throttle valve opening angle	7.0% or more at output speed 1050 rpm (Varies with engine speed)
Malfunction of pressure control solenoid "B" (SL2)	Not detected

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: OFF malfunction (A) and (B), or ON malfunctions (A), (B) and (C)

2 detections are necessary per driving cycle:

1st detection; temporary flag ON

OFF malfunction (A):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

OFF malfunction (B):

Intermediate shaft speed/Output speed	0.95 to 1.09

ON malfunction (A):

Input (turbine) speed/Intermediate shaft speed	0.93 to 1.07

ON malfunction (B):

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Input (turbine) speed - Intermediate shaft speed	700 rpm or more

ON malfunction (C):

Input (turbine) speed - Intermediate shaft speed	Less than -500 rpm or 700 rpm or more

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO **.**

HINT:

Using Techstream to perform Active Test allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Test early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Test.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect Techstream to the DLC3.

(d) Turn the ignition switch to the on position.

(e) Turn on the tester.

(f) Select the item "Powertrain / Engine and ECT / Active Test / Shift Status".

(g) According to the display on the tester, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to confirm the problem INFO **.**

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph)	1st/2nd /3rd/4th/5th	Possible to check the operation of the shift solenoid valves.

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
	[Others] • Press "→" button: Shift up • Press "←" button: Shift down		

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List / Shift Status display on Techstream.

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0796)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

DISPLAY (DTC OUTPUT)	PROCEED TO
Only "P0796" is output	A
"P0796" and other DTCs	B

HINT:

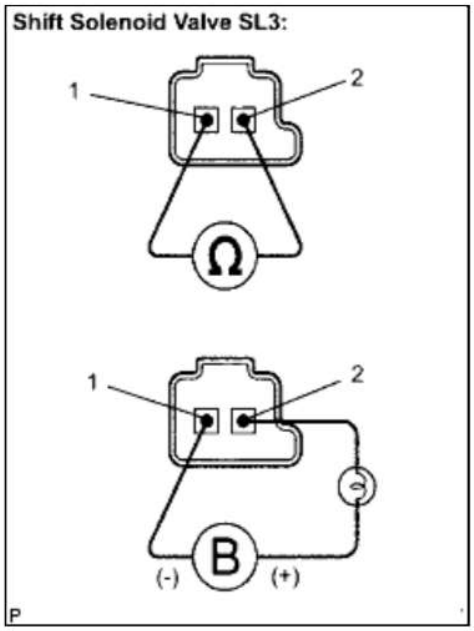
If any other codes besides "P0796" are output, perform the troubleshooting for those DTCs first.

B ▶ GO TO DTC CHART

A ▼

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2.	INSPECT SHIFT SOLENOID VALVE SL3



(a) Remove the shift solenoid valve SL3.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SL3**

OK ▼

3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve and they operate smoothly.

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NG ▶ REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK ▼

4.	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:
The torque converter clutch operates normally.

NG ▶ REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W802NX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0798: Pressure Control Solenoid "C" Electrical (Shift Solenoid Valve SL3) (2010 Corolla)		

DTC	**P0798**	**Pressure Control Solenoid "C" Electrical (Shift Solenoid Valve SL3)**

DESCRIPTION

Shifting from 1st to 5th is performed in combination with "ON" and "OFF" operation of the shift solenoid valves SL1, SL2, SL3, S4 and SR which are controlled by the ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valves to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0798	• The ECM checks for an open or short in the shift solenoid valve SL3 circuit while driving and shifting gears. (1-trip detection logic) • Output signal duty equals to 100 %. (NOTE: SL3 output signal duty is less than 100 % under normal condition.)	• Open or short in shift solenoid valve SL3 circuit • Shift solenoid valve SL3 • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other normal shift solenoid valves "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.)

INFO .

MONITOR STRATEGY

Related DTCs	P0798: Shift solenoid valve SL3/Range check
Required sensors/Components	Shift solenoid valve SL3
Frequency of operation	Continuous
Duration	1 sec.

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MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	None
Solenoid current cut status	Non cut
CPU commanded duty ratio to SL3	19% or more
Battery voltage	11 V or more
Ignition switch	ON
Starter	OFF

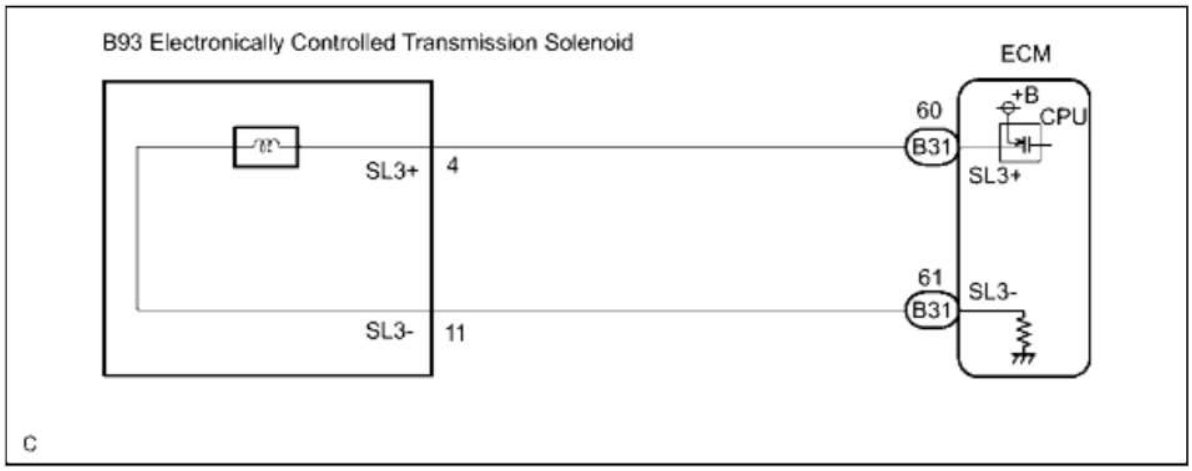
TYPICAL MALFUNCTION THRESHOLDS

Solenoid status from IC	Fail (Open or short)

COMPONENT OPERATING RANGE

Output signal duty	Less than 100%

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

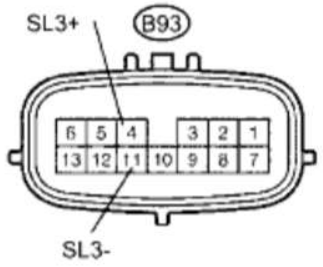
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Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	INSPECT TRANSMISSION WIRE (SL3)

Component without harness connected:
(Transmission Wire)



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
4 (SL3+) - 11 (SL3-)	20°C (68°F)	5.0 to 5.6 Ω

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

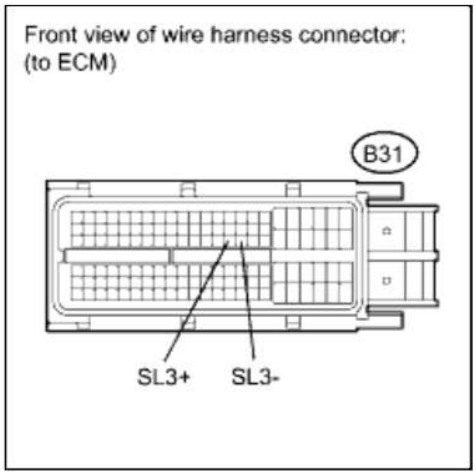
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
4 (SL3+) - Body ground	Always	10 kΩ or higher
11 (SL3-) - Body ground	Always	

NG ▶ INSPECT SHIFT SOLENOID VALVE SL3

OK ▼

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2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission connector to the transaxle.

(b) Disconnect the connector from the ECM.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-60 (SL3+) - B31-61 (SL3-)	20°C (68°F)	5.0 to 5.6 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-60 (SL3+) - Body ground	Always	10 kΩ or higher
B31-61 (SL3-) - Body ground	Always	

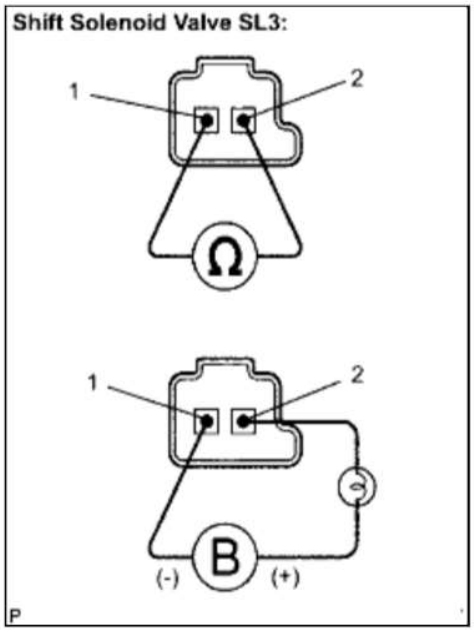
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

3.	INSPECT SHIFT SOLENOID VALVE SL3

(a) Remove the shift solenoid valve SL3.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SL3**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W202HX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0982,P0983: Shift Solenoid "D" Control Circuit Low (Shift Solenoid Valve S4) (2010 Corolla)		

DTC	**P0982**	**Shift Solenoid "D" Control Circuit Low (Shift Solenoid Valve S4)**

DTC	**P0983**	**Shift Solenoid "D" Control Circuit High (Shift Solenoid Valve S4)**

DESCRIPTION

Shifting from 1st to 5th is performed in combination with "ON" and "OFF" operation of the shift solenoid valves SL1, SL2, SL3, S4 and SR which are controlled by the ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valves to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0982	ECM detects short in solenoid valve S4 circuit 2 times when solenoid valve S4 is operated (1-trip detection logic)	• Short in shift solenoid valve S4 circuit • Shift solenoid valve S4 • ECM
P0983	ECM detects open in solenoid valve S4 circuit 2 times when solenoid valve S4 is not operated (1-trip detection logic)	• Open in shift solenoid valve S4 circuit • Shift solenoid valve S4 • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other normal shift solenoid valves "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.)

INFO .

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MONITOR STRATEGY

Related DTCs	P0982: Shift solenoid valve S4/Range check (Low resistance) P0983: Shift solenoid valve S4/Range check (High resistance)
Required sensors/Components	Shift solenoid valve S4
Frequency of operation	Continuous
Duration	0.064 sec. or more
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P0982: Range check (Low resistance):

The monitor will run whenever this DTC is not present.	None
Shift solenoid valve S4	ON
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

P0983: Range check (High resistance):

The monitor will run whenever this DTC is not present.	None
Shift solenoid valve S4	OFF
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

P0982: Range check (Low resistance):

Shift solenoid valve S4 resistance	8 Ω or less

P0983: Range check (High resistance):

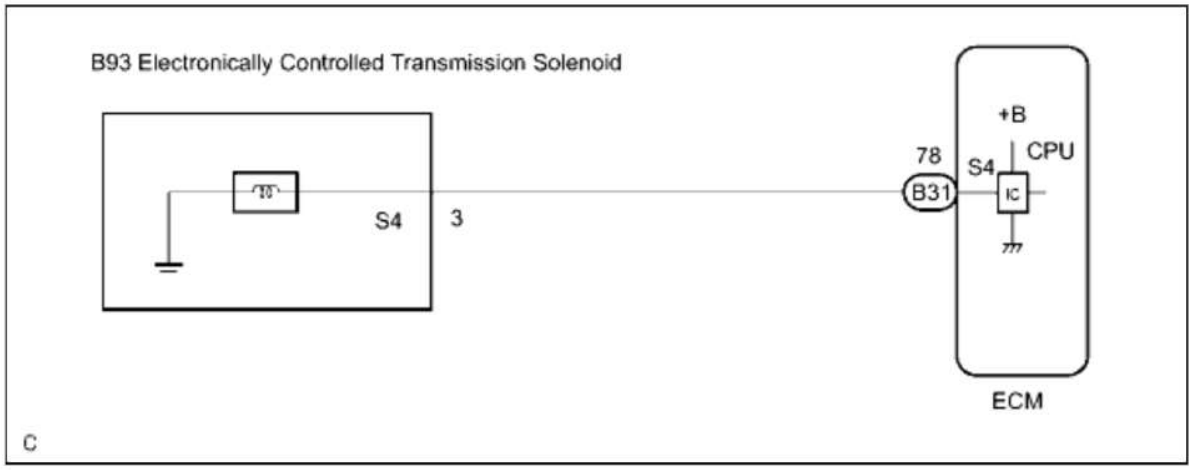
Shift solenoid valve S4 resistance	100 kΩ or more

COMPONENT OPERATING RANGE

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Shift solenoid valve S4	Resistance: 11 to 15 Ω at 20°C (68°F)

WIRING DIAGRAM



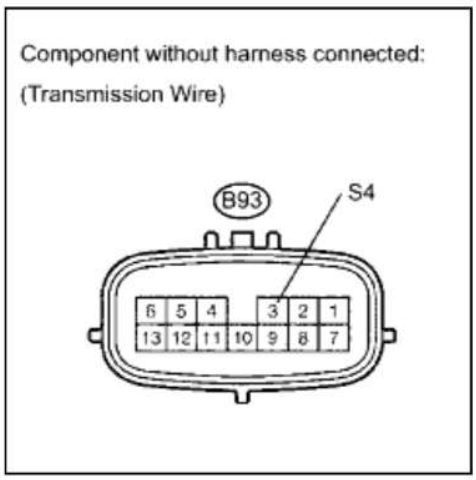
INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (S4)**



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

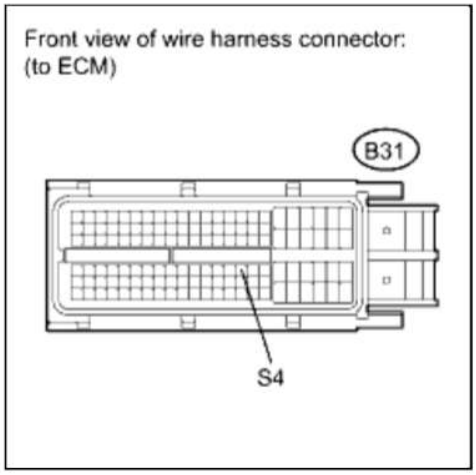
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 - Body ground	20°C (68°F)	11 to 15 Ω

NG ▶ **INSPECT SHIFT SOLENOID VALVE S4**

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission connector to the transaxle.

(b) Disconnect the connector from the ECM.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

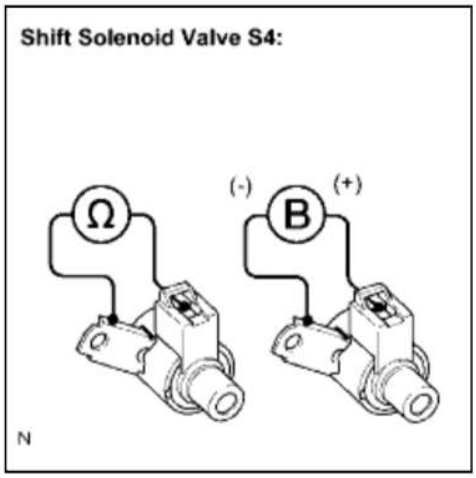
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-78 (S4) - Body ground	20°C (68°F)	11 to 15 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

3.	INSPECT SHIFT SOLENOID VALVE S4

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(a) Remove the shift solenoid valve S4.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S4) - Solenoid Body (S4)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE S4**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W6022X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0985,P0986: Shift Solenoid "E" Control Circuit Low (Shift Solenoid Valve SR) (2010 Corolla)		

DTC	**P0985**	**Shift Solenoid "E" Control Circuit Low (Shift Solenoid Valve SR)**

DTC	**P0986**	**Shift Solenoid "E" Control Circuit High (Shift Solenoid Valve SR)**

DESCRIPTION

Shifting from 1st to 5th is performed in combination with "ON" and "OFF" operation of the shift solenoid valves SL1, SL2, SL3, S4 and SR which are controlled by the ECM. If an open or short circuit occurs in either of the shift solenoid valves, the ECM controls the remaining normal shift solenoid valves to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0985	ECM detects short in solenoid valve SR circuit 2 times when solenoid valve SR is operated (1-trip detection logic)	• Short in shift solenoid valve SR circuit • Shift solenoid valve SR • ECM
P0986	ECM detects open in solenoid valve SR circuit 2 times when solenoid valve SR is not operated (1-trip detection logic)	• Open in shift solenoid valve SR circuit • Shift solenoid valve SR • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other normal shift solenoid valves "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.)

INFO .

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MONITOR STRATEGY

Related DTCs	P0985: Shift solenoid valve SR/Range check (Low resistance) P0986: Shift solenoid valve SR/Range check (High resistance)
Required sensors/Components	Shift solenoid valve SR
Frequency of operation	Continuous
Duration	0.064 sec.
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P0985: Range check (Low resistance):

The monitor will run whenever this DTC is not present.	None
Shift solenoid valve SR	ON
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

P0986: Range check (High resistance):

The monitor will run whenever this DTC is not present.	None
Shift solenoid valve SR	OFF
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

P0985: Range check (Low resistance):

Shift solenoid valve SR resistance	8 Ω or less

P0986: Range check (High resistance):

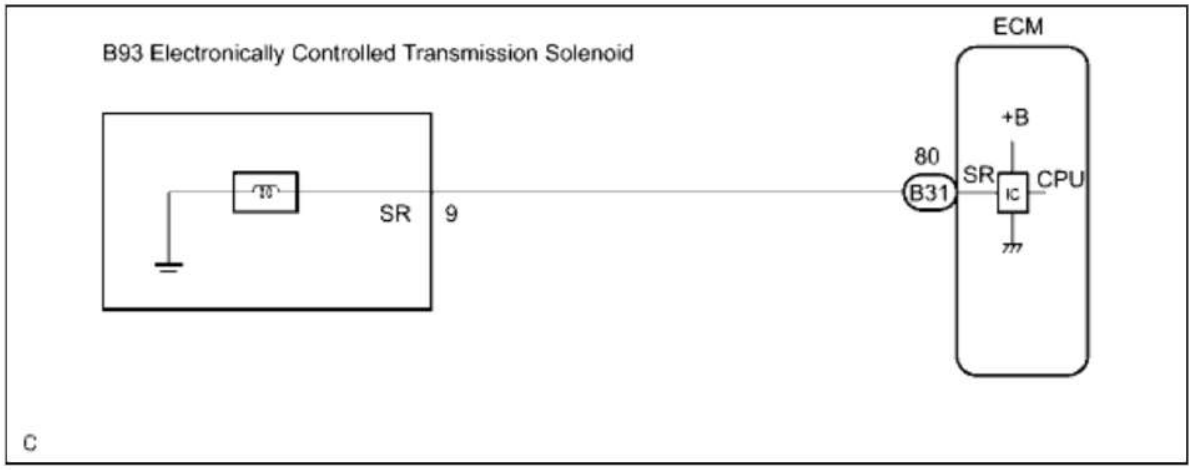
Shift solenoid valve SR resistance	100 kΩ or more

COMPONENT OPERATING RANGE

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Shift solenoid valve SR	Resistance: 11 to 15 Ω at 20°C (68°F)

WIRING DIAGRAM



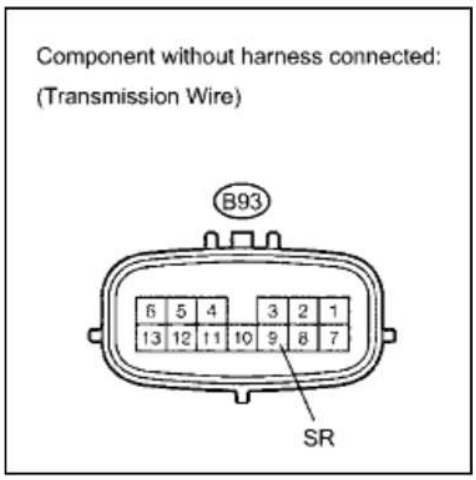
INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (SR)**



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

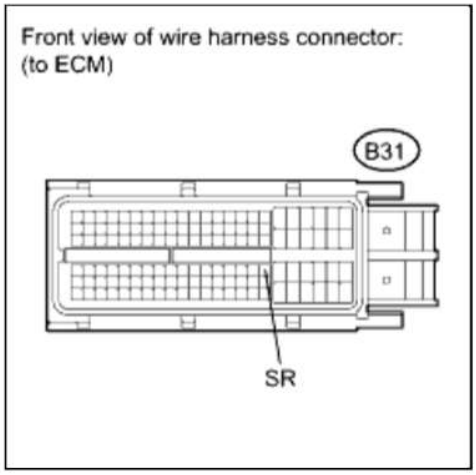
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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
9 - Body ground	20°C (68°F)	11 to 15 Ω

NG ▶ **INSPECT SHIFT SOLENOID VALVE SR**

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION - ECM)



(a) Connect the transmission connector to the transaxle.

(b) Disconnect the connector from the ECM.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

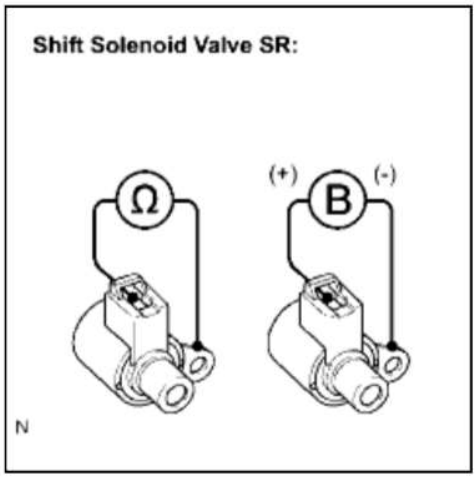
TESTER CONNECTION	SPECIFIED CONDITION	SPECIFIED CONDITION
B31-80 (SR) - Body ground	20°C (68°F)	11 to 15 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

3.	INSPECT SHIFT SOLENOID VALVE SR

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(a) Remove the shift solenoid valve SR.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (SR) - Solenoid Body (SR)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SR**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002OCX006X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2714: Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT) (2010 Corolla)		

DTC	**P2714**	**Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT)**

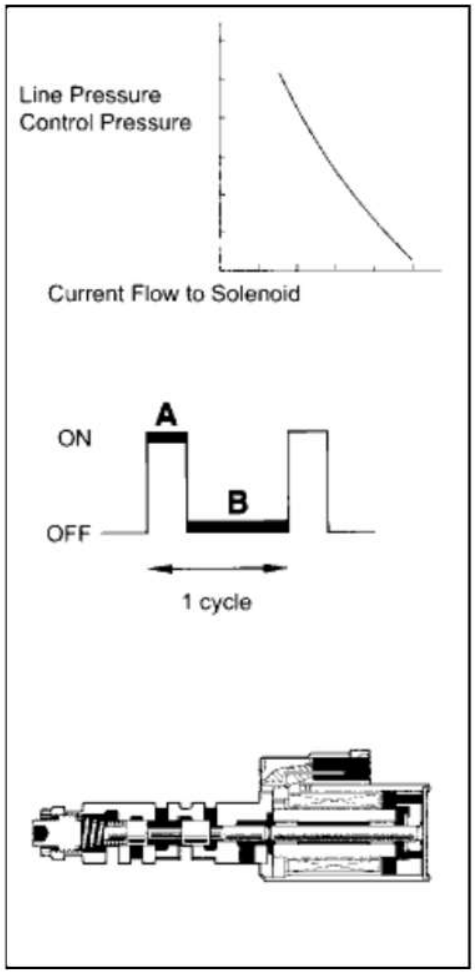
SYSTEM DESCRIPTION

The linear solenoid valve (SLT) controls the transmission line pressure for smooth transmission operation based on signals from the throttle position sensor and the vehicle speed sensor. The ECM adjusts the duty ratio (*) of the SLT solenoid valve to control hydraulic line pressure coming from the primary regulator valve. Appropriate line pressure assures smooth shifting with varying engine outputs.

(*): Duty Ratio

The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then

Duty Ratio=A/(A+B) x 100(%)



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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2714	ECM detects a malfunction on SLT (ON side) according to the revolution difference of the turbine, intermediate and the output shaft, and also by the oil pressure. (2-trip detection logic)	• Shift solenoid valve SLT remains closed • Valve body is blocked • Automatic transaxle (clutch, brake or gear, etc.)

MONITOR DESCRIPTION

In any forward position, when the difference in the revolutions of the turbine, Intermediate and output shaft exceeds the specified value (varies with Intermediate and output speed) determined by the ECM, the ECM illuminates the MIL and store the DTC.

When shift solenoid valve SLT remains on, the oil pressure goes down and the clutch engagement force decreases.

NOTICE:

If you continue driving under these conditions, the clutch will burn out and the vehicle will no longer be drivable.

MONITOR STRATEGY

Related DTCs	P2714: Shift solenoid valve SLT/ON malfunction
Required sensors/Components	Shift solenoid valve SLT, Speed sensor (NT), Speed sensor (NC), Crankshaft position sensor (NE)
Frequency of operation	Continuous
Duration	1 sec.
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

ON malfunction:

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0712, P0713 (ATF temperature sensor circuit) P0717 (Turbine speed sensor circuit) P0793 (Intermediate shaft speed sensor circuit) P0500 (Vehicle speed sensor circuit) P0748 (Shift solenoid valve SL1 circuit) P0778 (Shift solenoid valve SL2 circuit) P0798 (Shift solenoid valve SL3 circuit)

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	P0982, P0983 (Shift solenoid valve S4 circuit) P0985, P0986 (Shift solenoid valve SR circuit) P2769, P2770 (Shift solenoid valve DSL circuit) P2716 (Shift solenoid valve SLT circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle system)
Transmission range	"D"
TFT (Transmission fluid temperature)	-20°C (-4°F) or more

ON malfunction (A):

ECM selected gear	4th
Temporary MAIN gear	1st or 2nd or 3rd or 4th
NT - NC x Temporary MAIN gear ratio NT: Input (turbine) speed NC: Intermediate shaft speed	More than 100 rpm at Intermediate shaft speed 1,000 rpm
Temporary U/D gear	Low or High
NC - NO x Temporary U/D gear ratio NO: Output speed	More than 300 rpm at Output speed 1,000 rpm
TT TT: Turbine Torque	142 Nm or more
NT	250 rpm or more
NC	250 rpm or more
NO	250 rpm or more

ON malfunction (B):

ECM selected gear	5th
Temporary MAIN gear	1st or 2nd or 3rd or 4th
NT - NC x Temporary MAIN gear ratio NT: Input (turbine) speed NC: Intermediate shaft speed	More than 100 rpm at Intermediate shaft speed 1,000 rpm
Temporary U/D gear	Low or High
NC - NO x Temporary U/D gear ratio NO: Output speed	More than 300 rpm at Output speed 1,000 rpm
TT TT: Turbine Torque	142 Nm or more
NT	250 rpm or more

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NC	250 rpm or more
NO	250 rpm or more

TYPICAL MALFUNCTION THRESHOLDS

[ON malfunction]

Detection condition: Total accumulated time of ON malfunctions (a) and (b) is 1 second or more

ON malfunction (a):

NT - NC x 4th gear ratio	More than 100 rpm at Intermediate shaft speed 1,000 rpm
NC - NO x Low gear ratio	More than 300 rpm at Output speed 1,000 rpm
Duration	0.85 sec. or more
Shift Solenoid valve SL1 Performance	Not performance malfunction

ON malfunction (b):

NT - NC x 4th gear ratio	More than 100 rpm at Intermediate shaft speed 1,000 rpm
NC - NO x High gear ratio	More than 300 rpm at Output speed 1,000 rpm
Duration	0.85 sec. or more
Shift Solenoid valve SL1 Performance	Not performance malfunction

INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P2714)**

(a) Connect Techstream to the DLC3.

(b) Turn the ignition switch to the on position and turn the Techstream main switch ON.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using Techstream.

Result:

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DISPLAY (DTC OUTPUT)	PROCEED TO
Only P2714 is output	A
P2714 and other DTCs	B

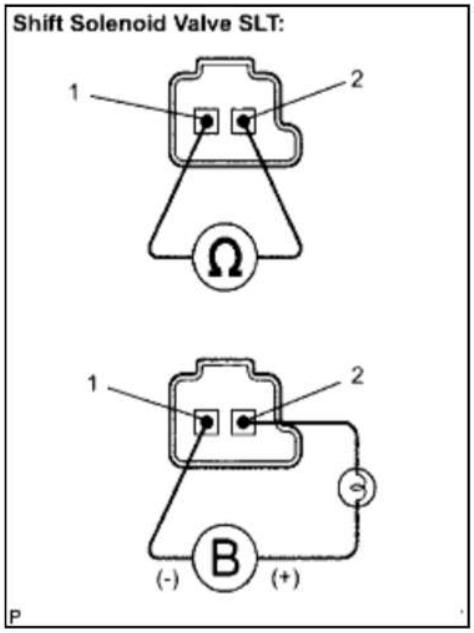
HINT:

If any other codes besides "P2714" are output, perform troubleshooting for those DTCs first.

B ▶ **GO TO DTC CHART**

A ▼

2.	INSPECT SHIFT SOLENOID VALVE SLT



(a) Remove the shift solenoid valve SLT.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to

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terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ REPLACE SHIFT SOLENOID VALVE SLT

OK ▼

3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve.

NG ▶ REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK ▼

4.	INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

OK:

The torque converter clutch operates normally.

NG ▶ REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W104AX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2716: Pressure Control Solenoid "D" Electrical (Shift Solenoid Valve SLT) (2010 Corolla)		

DTC	**P2716**	**Pressure Control Solenoid "D" Electrical (Shift Solenoid Valve SLT)**

DESCRIPTION

The linear solenoid valve (SLT) controls the transmission line pressure for smooth transmission operation based on signals from the throttle position sensor and the vehicle speed sensor. The ECM adjusts the duty cycle of the SLT solenoid valve to control hydraulic line pressure coming from the primary regulator valve. Appropriate line pressure assures smooth shifting with varying engine outputs.

(*): Duty Ratio

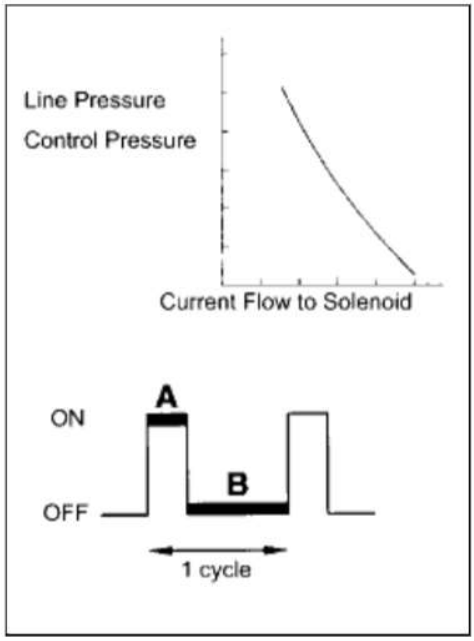
The duty ratio is the ratio of the period of continuity in one cycle.

For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then

Duty Ratio=A/(A + B) x 100(%)

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2716	Open or short is detected in shift solenoid valve SLT circuit for 1 second or more while driving (1-trip detecting logic).	• Open or short in shift solenoid valve SLT circuit • Shift solenoid valve SLT • ECM

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MONITOR DESCRIPTION

When an open or short in the linear solenoid valve (SLT) circuit is detected, the ECM interprets this as a fault. The ECM will turn on the MIL and store the DTC.

MONITOR STRATEGY

Related DTCs	P2716: Shift solenoid valve SLT/Range check
Required sensors/Components	Shift solenoid valve SLT
Frequency of operation	Continuous
Duration	1 sec.
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor will run whenever this DTC is not present.	None
Solenoid current cut status	Not cut
Battery voltage	11 V or more
Ignition switch	ON
Starter	OFF
CPU commanded duty ratio to SLT	19% or more

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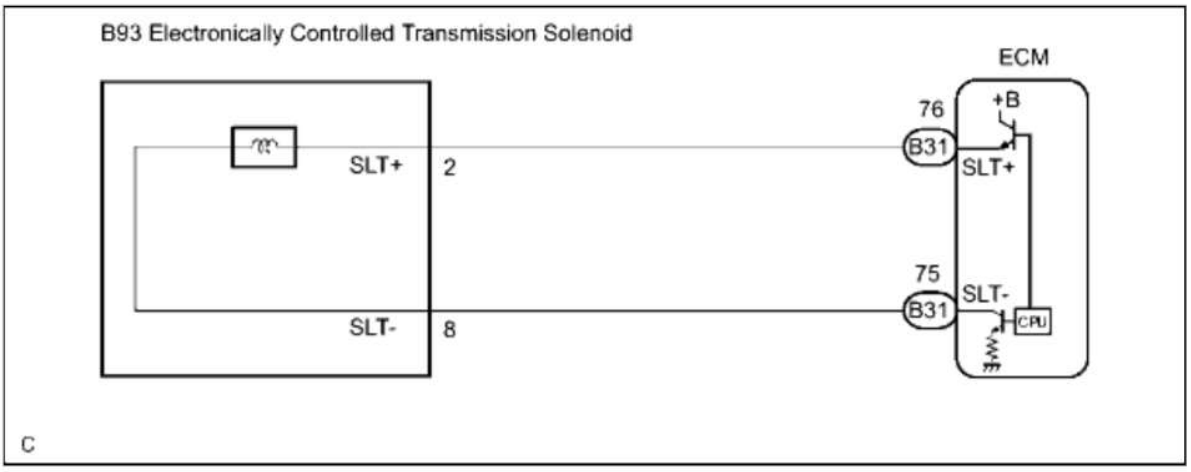
TYPICAL MALFUNCTION THRESHOLDS

Solenoid status from IC	Fail (Open or short)

COMPONENT OPERATING RANGE

Shift solenoid valve SLT	Resistance: 5.0 to 5.6 Ω at 20°C (68°F)

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

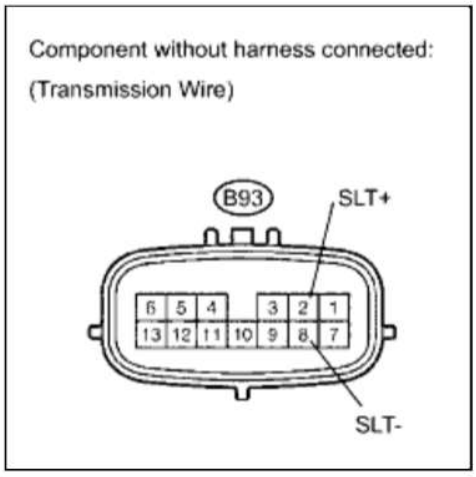
Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (SLT)**

(a) Disconnect the transmission wire connector from the transaxle.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (SLT+) - 8 (SLT-)	20°C (68°F)	5.0 to 5.6 Ω

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 (SLT+) - Body ground	Always	10 kΩ or higher
8 (SLT-) - Body ground	Always	

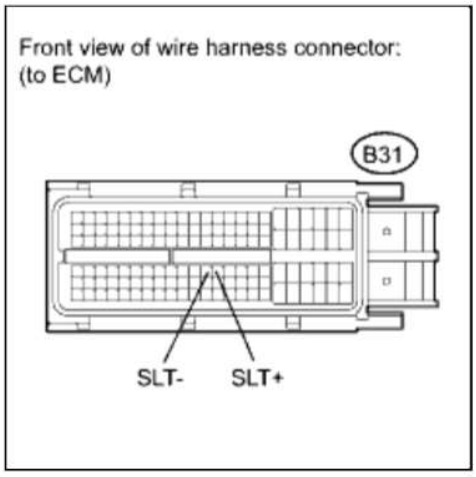
NG ▶ **INSPECT SHIFT SOLENOID VALVE SLT**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)**

(a) Connect the transmission wire connector to the transaxle.

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(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-76 (SLT+) - B31-75 (SLT-)	20°C (68°F)	5.0 to 5.6 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-76 (SLT+) - Body ground	Always	10 kΩ or higher
B31-75 (SLT-) - Body ground	Always	↑

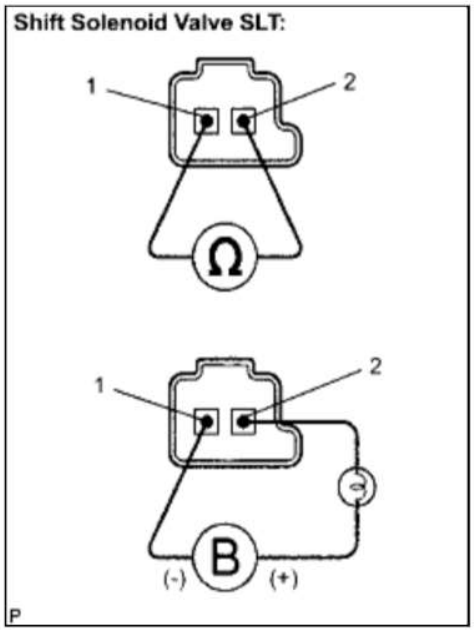
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

3.	**INSPECT SHIFT SOLENOID VALVE SLT**

(a) Remove the shift solenoid valve (SLT).

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance :

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SLT**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W9029X
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2769,P2770: Torque Converter Clutch Solenoid Circuit Low (Shift Solenoid Valve DSL) (2010 Corolla)		

DTC	**P2769**	**Torque Converter Clutch Solenoid Circuit Low (Shift Solenoid Valve DSL)**

DTC	**P2770**	**Torque Converter Clutch Solenoid Circuit High (Shift Solenoid Valve DSL)**

DESCRIPTION

The shift solenoid valve DSL is turned "ON" and "OFF" by signals from the ECM in order to control the hydraulic pressure operation, the lock-up relay valve, which then controls operation of the lock-up clutch.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2769	ECM detects short in solenoid valve DSL circuit (0.1 sec.) when solenoid valve DSL is operated (2-trip detection logic)	• Short in shift solenoid valve DSL circuit • Shift solenoid valve DSL • ECM
P2770	ECM detects open in solenoid valve DSL circuit (0.1 sec.) when solenoid valve DSL is not operated (2-trip detection logic)	• Open in shift solenoid valve DSL circuit • Shift solenoid valve DSL • ECM

MONITOR DESCRIPTION

Torque converter lock-up is controlled by the ECM based on engine rpm, engine load, engine temperature, vehicle speed, transmission temperature, and shift range selection. The ECM determines the lock-up status of the torque converter by comparing the engine rpm (NE) to the input turbine rpm (NT). The ECM calculates the actual transmission gear by comparing input turbine rpm (NT) to counter gear rpm (NC). When conditions are appropriate, the ECM requests "lock-up" by applying control voltage to the shift solenoid DSL. When the DSL is opened, it applies pressure to the lock-up relay valve and locks the torque converter clutch. If the ECM detects an open or short in the DSL solenoid circuit, the ECM interprets this as a fault in the DSL solenoid or circuit. The ECM will turn on the MIL

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and store the DTC.

MONITOR STRATEGY

Related DTCs	P2769: Shift solenoid valve DSL/Range check (Low resistance) P2770: Shift solenoid valve DSL/Range check (High resistance)
Required sensors/Components	Shift solenoid valve DSL
Frequency of operation	Continuous
Duration	0.064 sec. or more
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P2769: Range check (Low resistance):

The monitor will run whenever this DTC is not present.	None
Shift solenoid valve DSL	ON
Solenoid current cut status	Not cut
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

P2770: Range check (High resistance):

The monitor will run whenever this DTC is not present.	None
Shift solenoid valve DSL	ON
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

P2769: Range check (Low resistance):

Shift solenoid valve DSL resistance	8 Ω or less

P2770: Range check (High resistance):

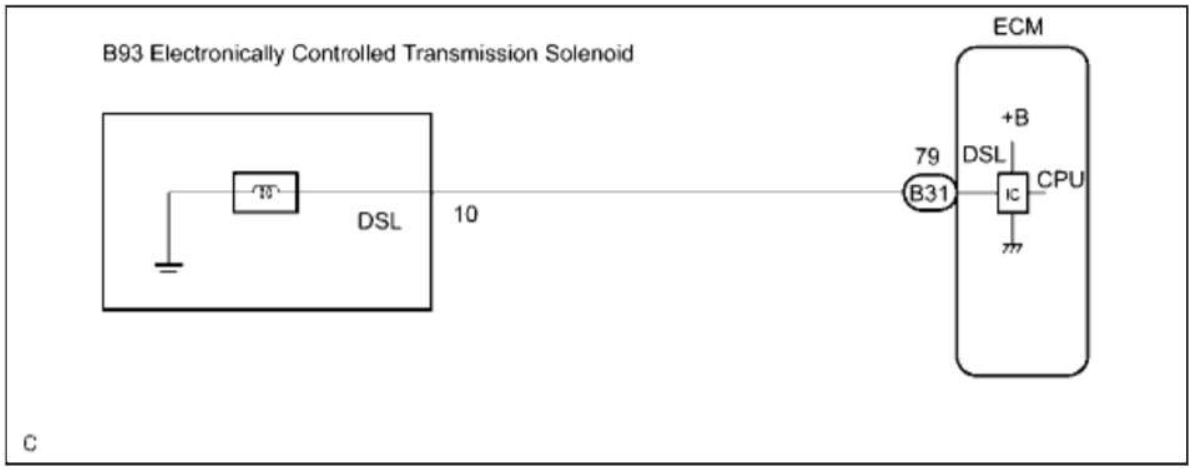
Shift solenoid valve DSL resistance	100 kΩ or more

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COMPONENT OPERATING RANGE

Shift solenoid valve DSL	Resistance: 11 to 13 Ω at 20°C (68°F)

WIRING DIAGRAM



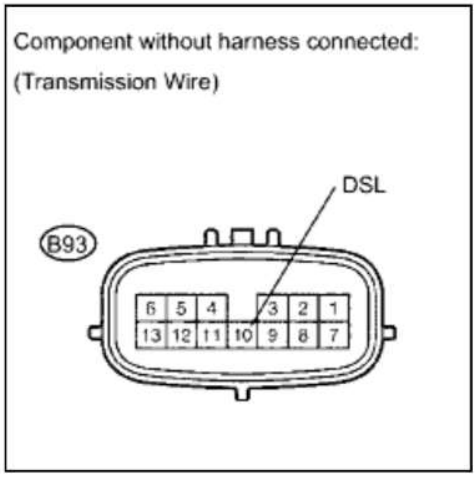
INSPECTION PROCEDURE

NOTICE:

Perform the universal trip to clear permanent DTCs INFO .

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (DSL)**



(a) Disconnect the transmission wire connector from the transaxle.

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(b) Measure the resistance according to the value(s) in the table below.

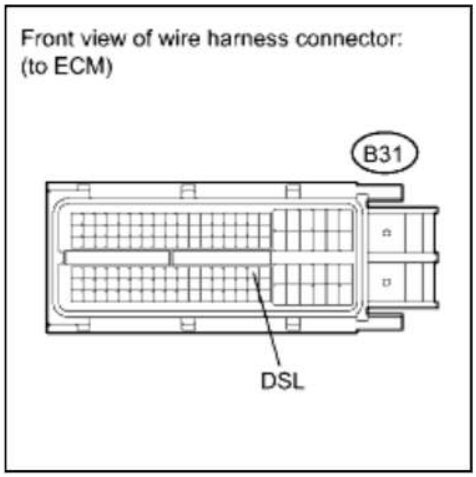
Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
10 (DSL) - Body ground	20°C (68°F)	11 to 13 Ω

NG ▶ **INSPECT SHIFT SOLENOID VALVE DSL**

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission wire connector.

(b) Disconnect the ECM connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

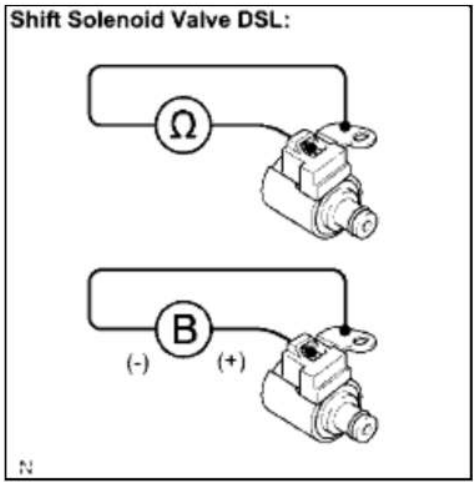
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
C24-79 (DSL) - Body ground	20°C (68°F)	11 to 13 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM**

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3.	INSPECT SHIFT SOLENOID VALVE DSL



(a) Remove the shift solenoid valve DSL.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (DSL) - Solenoid Body (DSL)	20°C (68°F)	11 to 13 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid valve makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE DSL**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 J	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015Y101GX
Title: U250E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: Transmission Control Switch Circuit (2010 Corolla)		

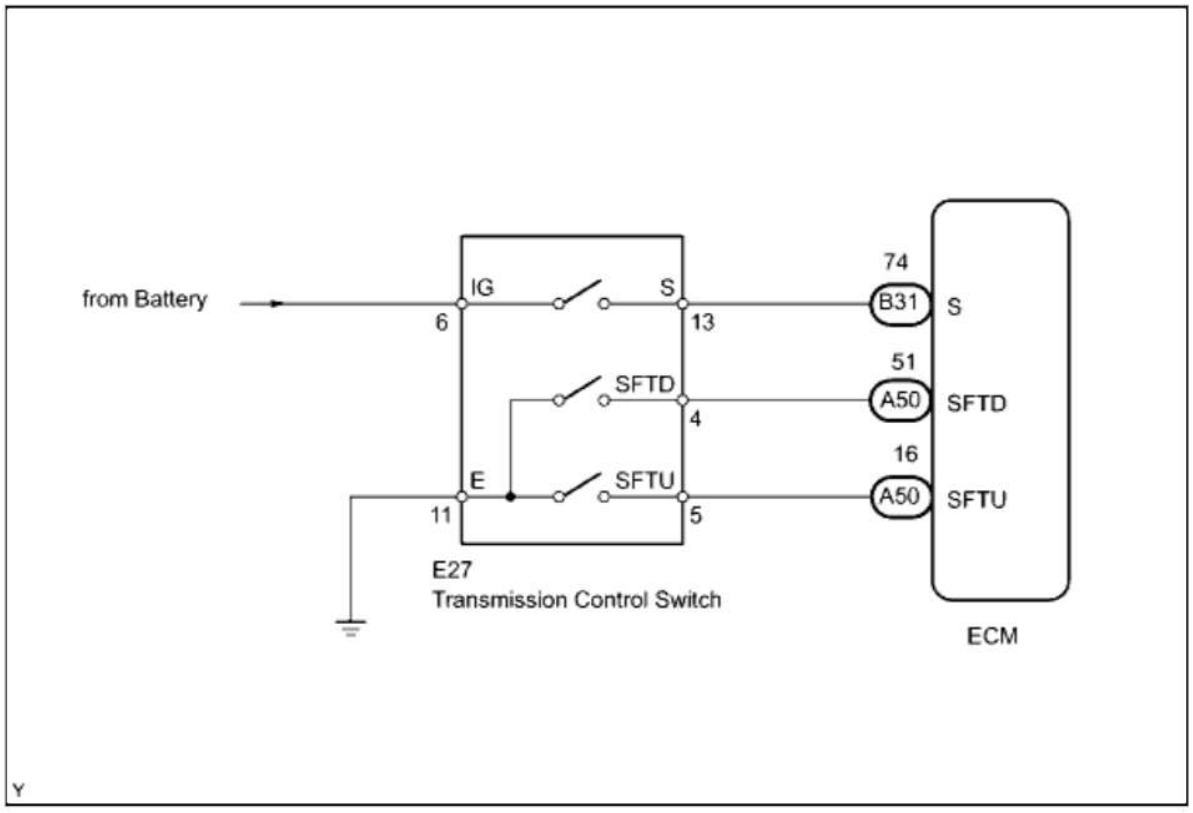
Transmission Control Switch Circuit

DESCRIPTION

When moving the shift lever into the S position using the transmission control switch, it is possible to switch the shift range position between "1" (first range) and "5" (fifth range).

Shifting up "+" once raises one shift range position, and shifting down "-" lowers one shift range position.

WIRING DIAGRAM

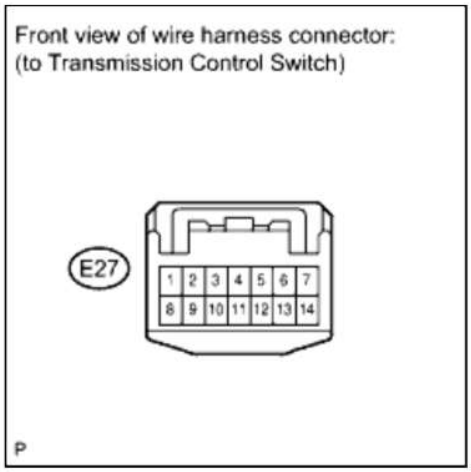


INSPECTION PROCEDURE

PROCEDURE

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1.	CHECK HARNESS AND CONNECTOR (BATTERY - TRANSMISSION CONTROL SWITCH)



(a) Disconnect the transmission control switch connector of shift lock control unit assembly.

(b) Measure the voltage according to the value(s) in the table below.

Standard voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
6 - Body ground	IG switch ON	11 to 14 V
	IG switch OFF	Below 1 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

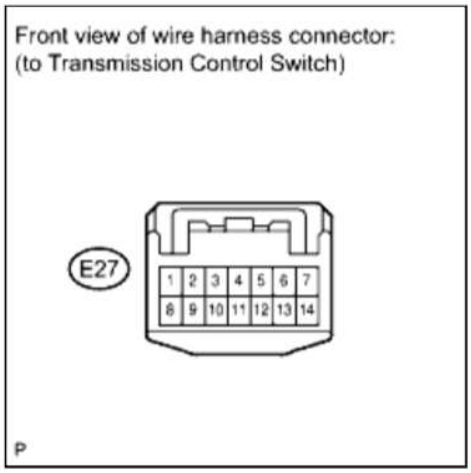
2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION CONTROL SWITCH - BODY GROUND)

(a) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
11 - Body ground	Always	Below 1 Ω

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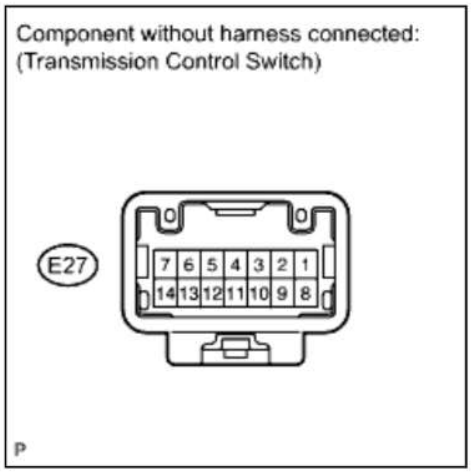
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

3.	INSPECT SHIFT LOCK CONTROL UNIT (TRANSMISSION CONTROL SWITCH)

(a) Measure resistance between each terminal of shift lock control unit assembly when the shift lever is moved to each position.

Standard resistance (Check for short):



TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
6 - 13	S, "+" and "-"	Below 1 Ω
	Except S, "+" and "-"	10 kΩ or higher
5 - 11	Press continuously "+" (Up shift)	Below 1 Ω
	S	10 kΩ or higher
4 - 11	Press continuously "-" (Down shift)	Below 1 Ω
	S	10 kΩ or higher

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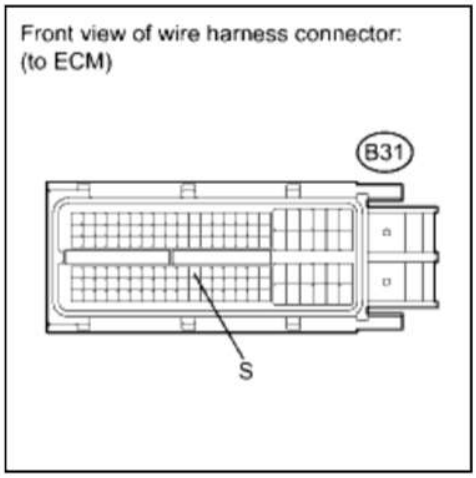
NG ▶ **REPLACE SHIFT LOCK CONTROL UNIT (TRANSMISSION CONTROL SWITCH)**

OK ▼

4.	CHECK HARNESS AND CONNECTOR (TRANSMISSION CONTROL SWITCH - ECM)

(a) Connect the transmission control switch connector of shift lock control unit assembly.

(b) Disconnect the ECM connector.

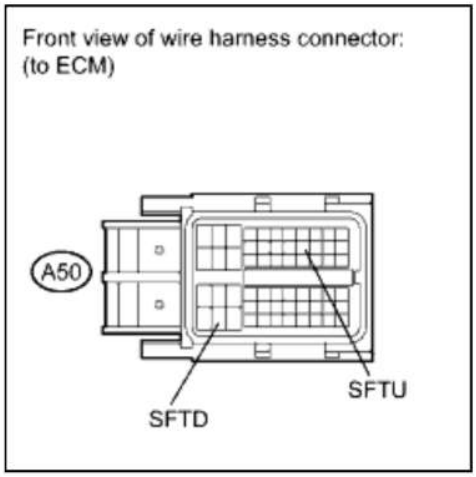


(c) Turn the ignition switch to ON, and measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

Standard voltage:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
B31-74 (S) - Body ground	S, "+" and "-"	11 to 14 V
	Except S, "+" and "-"	Below 1 V

(d) Turn the ignition switch off.



(e) Disconnect the ECM connector.

(f) Measure the resistance according to the value(s) in the table below when the shift lever is

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moved to each position.

Standard resistance (Check for short):

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
A50-16 (SFTU) - Body ground	Press continuously "+" (Up shift)	Below 1 Ω
	S	10 kΩ or higher
A50-51 (SFTD) - Body ground	Press continuously "-" (Down shift)	Below 1 Ω
	S	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE**

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Last Modified: 3-10-2010	6.4 L	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000U9U07WX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: PRECAUTION (2010 Corolla)		

PRECAUTION

NOTICE:

- Perform the RESET MEMORY (AT initialization) when replacing the automatic transaxle assembly, engine assembly or ECM INFO .
- Perform the REGISTRATION (VIN registration) when replacing the ECM INFO

HINT:

RESET MEMORY can not be completed by only disconnecting the battery cable.

1. EXPRESSIONS OF IGNITION SWITCH

(a) The type of ignition switch used on this model differs according to the specifications of the vehicle. The expressions listed in the table below are used in this section.

SWITCH TYPE		IGNITION SWITCH (POSITION)	ENGINE SWITCH (CONDITION)
Expression	Ignition switch off	LOCK	Off
	Ignition switch ON	ON	On (IG)
	Ignition switch ACC	ACC	On (ACC)
	Engine start	START	Start

2. REMOVAL AND INSTALLATION PROCEDURE PRECAUTIONS

(a) The automatic transaxle is composed of highly precision-finished parts which need careful inspection before reassembly. Even a small nick could cause fluid leakage or affect the performance. The instructions here are organized so that you work on only one component group at a time. This will help avoid confusion caused by similar-looking parts of different sub-assemblies being on your workbench at the same time. The component groups are inspected and repaired from the converter housing side. Complete the inspection, repair and reassembly before proceeding to the next component group as much as possible. If a defect is found in a certain component group during reassembly, inspect and repair this group immediately. If a component group cannot be assembled because some parts are being ordered, be sure to keep all parts of the group in a separate container while proceeding with disassembly, inspection, repair and reassembly of other component groups. Recommended: Toyota Genuine ATF WS

(b) All disassembled parts should be washed clean and any fluid passages and holes should be blown through with compressed air.

(c) Dry all parts with compressed air. Never use a piece of cloth to dry them.

(d) When using compressed air, always aim away from yourself to prevent accidentally spraying ATF or kerosene in your face.

(e) Only recommended automatic transaxle fluid or kerosene should be used for cleaning.

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(f) After cleaning, the parts should be arranged in the correct order for efficient inspection, repair, and reassembly.

(g) New discs for the brakes and clutches that are to be used for replacement must be soaked in ATF for at least 15 minutes before reassembly.

(h) All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with ATF prior to reassembly.

(i) All gaskets and rubber O-rings should be replaced with new ones.

(j) Do not apply adhesive cements to gaskets and similar parts.

(k) Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.

(l) When replacing a worn bushing, the sub-assembly containing the bushing must also be replaced.

(m) Check thrust bearings and races for wear or damage. Replace them as necessary.

(n) When working with FIPG material, you must observe the following:

- Using a razor blade and a gasket scraper, remove all the old packing (FIPG) material from the gasket surface.
- Thoroughly clean all components to remove any loose material.
- Clean both sealing surfaces with a non-residue solvent.
- Parts must be reassembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7I0BNX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DEFINITION OF TERMS (2010 Corolla)		

DEFINITION OF TERMS

TERM	DEFINITION
Monitor description	Description of what the ECM monitors and how it detects malfunctions (monitoring purpose and its details).
Related DTCs	Diagnostic code
Typical enabling condition	Preconditions that allow the ECM to detect malfunctions. With all preconditions satisfied, the ECM sets the DTC when the monitored value(s) exceeds the malfunction threshold(s).
Sequence of operation	The priority order that is applied to monitoring, if multiple sensors and components are used to detect the malfunction. While another sensor is being monitored, the next sensor or component will not be monitored until the previous monitoring has concluded.
Required sensor/components	The sensors and components that are used by the ECM to detect malfunctions.
Frequency of operation	The number of times that the ECM checks for malfunctions per driving cycle. "Once per driving cycle" means that the ECM detects malfunction only one time during a single driving cycle. "Continuous" means that the ECM detects malfunction every time when enabling condition is met.
Duration	The minimum time that the ECM must sense a continuous deviation in the monitored value(s) before setting a DTC. This timing begins after the "typical enabling conditions" are met.
Malfunction thresholds	Beyond this value, the ECM will conclude that there is a malfunction and set a DTC.
MIL operation	MIL illumination timing after a defect is detected. "Immediately" means that the ECM illuminates MIL the instant the ECM determines that there is a malfunction. "2 driving cycle" means that the ECM illuminates MIL if the same malfunction is detected again in the 2nd driving cycle.
Component operating range	Normal operation range of sensors and solenoids under normal driving conditions. Use these ranges as a reference. They cannot be used to judge if a sensor or solenoid is defective or not.

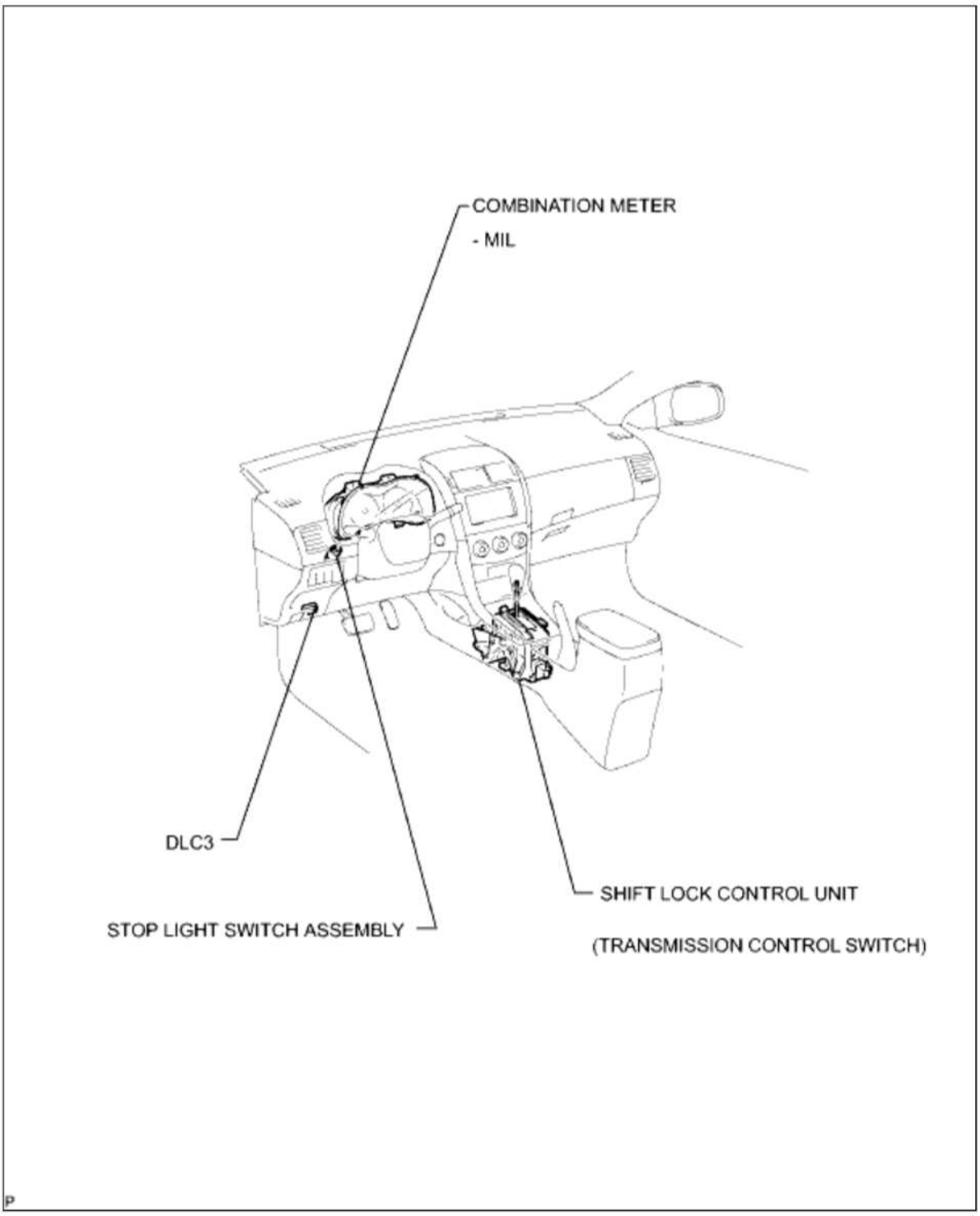
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Last Modified: 3-10-2010	6.4 R	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W720AJX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: PARTS LOCATION (2010 Corolla)		

PARTS LOCATION

ILLUSTRATION

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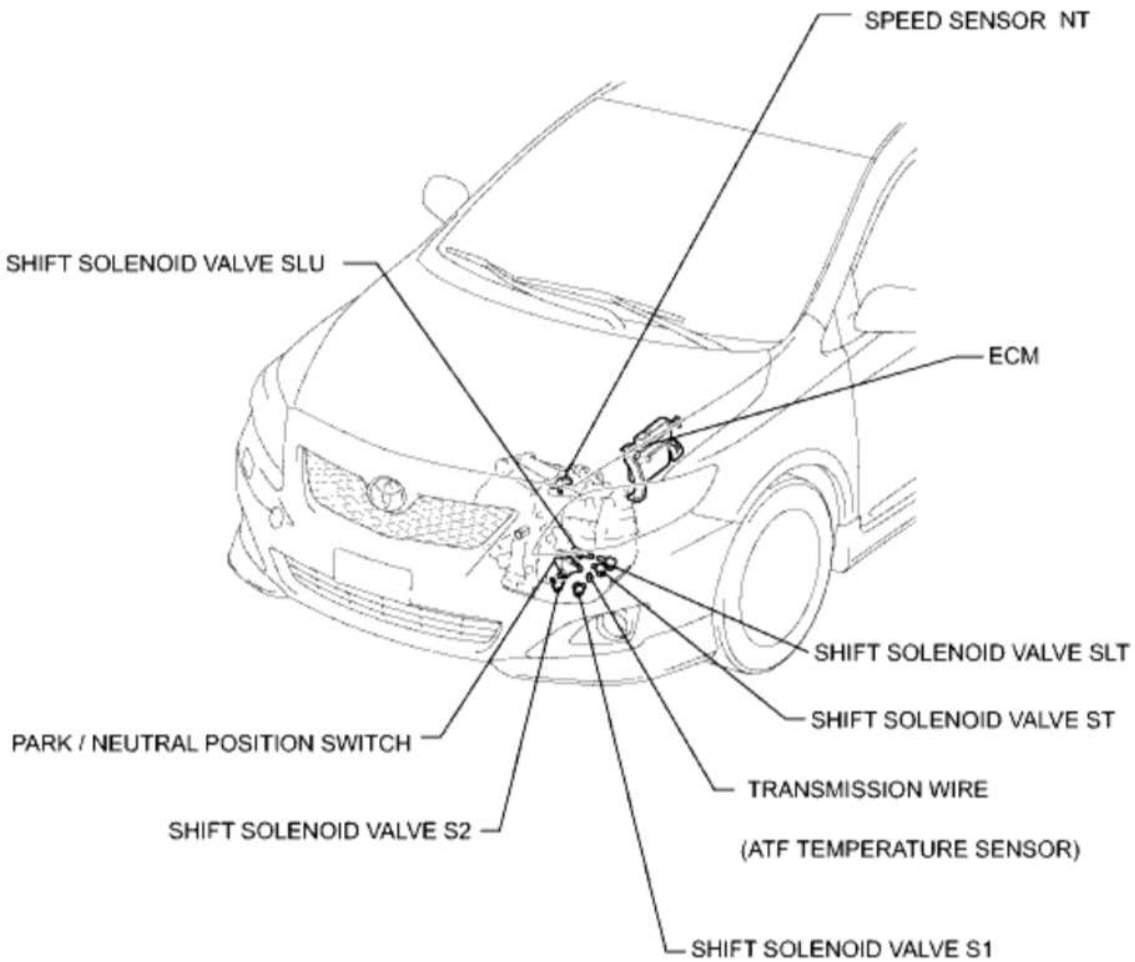


ILLUSTRATION

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VALVE BODY ASSEMBLY :

SHIFT SOLENOID VALVE (S1, S2, ST, SLT, SLU, NT)



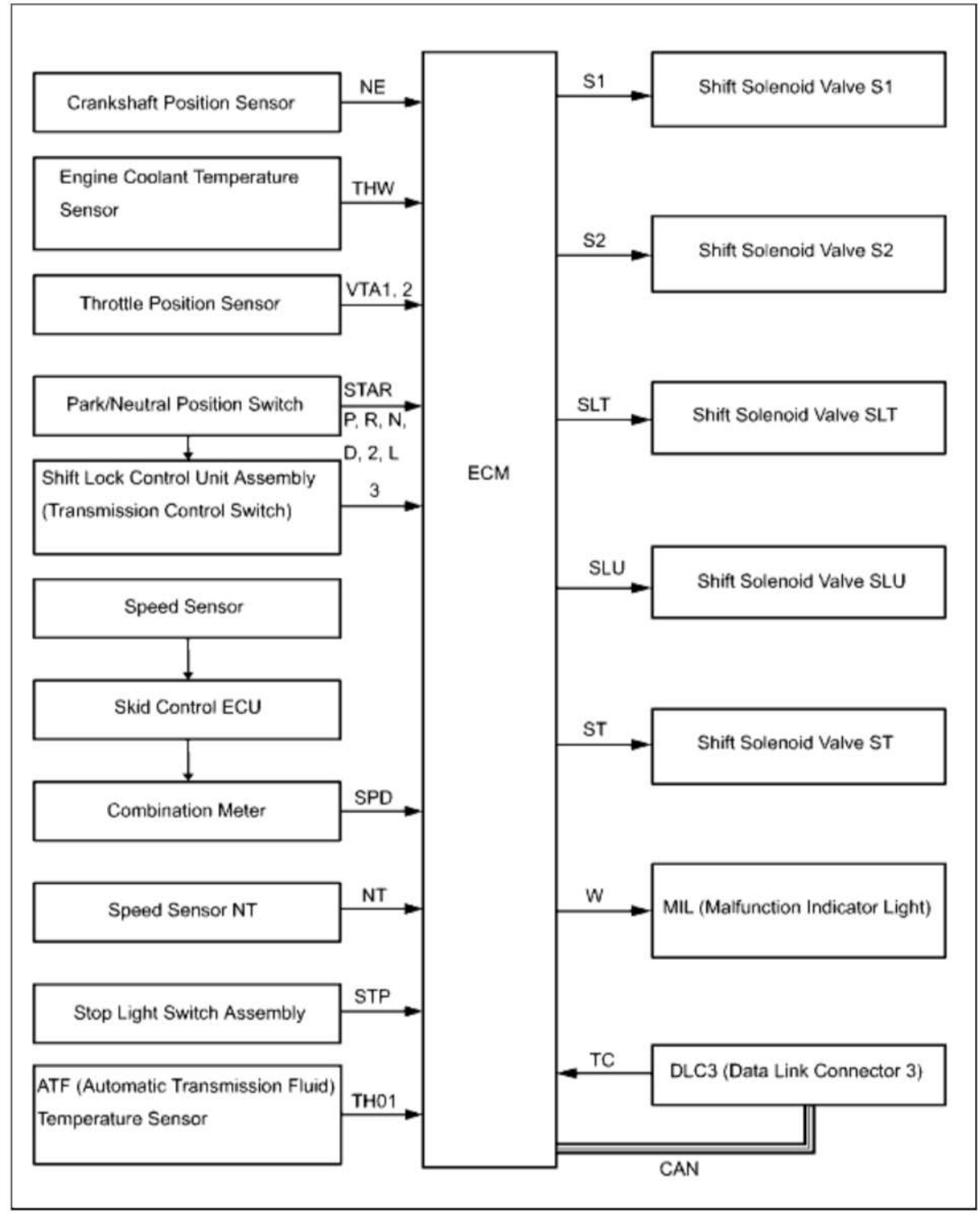
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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7D09GX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: SYSTEM DIAGRAM (2010 Corolla)		

SYSTEM DIAGRAM

The configuration of the electronic control system in the U341E automatic transaxle is as shown in the following chart.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W6Z0DIX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2010 Corolla)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- The ECM of this system is connected to the CAN and multiplex communication system. Therefore, before starting troubleshooting, make sure to check that there is no trouble in the CAN and multiplex communication.
- *: Use the Techstream.

1.	**Vehicle Brought to Workshop**

NEXT

2.	**Customer Problem Analysis**

NEXT

3.	**Inspect Battery Voltage**

Standard voltage:
11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

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4.	Connect the Techstream to the DLC3*

NEXT

5.	Check and Clear DTCs and Freeze Frame Data*

HINT: INFO

NEXT

6.	Visual Inspection

NEXT

7.	Setting the Check Mode Diagnosis*

HINT: INFO

NEXT

8.	Problem Symptom Confirmation

HINT: INFO

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Result:

RESULT	PROCEED TO
Symptom does not occur	A
Symptom occurs	B

B ▶ **Go to step 10**

A ▼

9.	**Symptom Simulation**

HINT: INFO

NEXT ▼

10.	**DTC Check***

HINT: INFO

Result:

RESULT	PROCEED TO
DTC is not output	A
DTC is output	B

B ▶ **Go to step 18**

A ▼

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11.	Basic Inspection

HINT: INFO , INFO and INFO

NG ▶ Go to step 21

OK ▼

12.	Mechanical System Test

HINT: INFO

NG ▶ Go to step 17

OK ▼

13.	Hydraulic Test

HINT: INFO

NG ▶ Go to step 17

OK ▼

14.	Manual Shifting Test

HINT: INFO

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NG ▶ Go to step 16

OK
▼

15.	Problem Symptoms Table Chapter 1

HINT: INFO

NG ▶ Go to step 19

OK
▼

16.	Problem Symptoms Table Chapter 2

HINT: INFO

NEXT
▼

17.	Part Inspection

NEXT ▶ Go to step 21

18.	DTC Chart

HINT: INFO

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NEXT

19.	Circuit Inspection

NEXT

20.	Identification of Problem

NEXT

21.	Repair or Replace

NEXT

22.	Confirmation Test

NEXT End

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W750BLX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: SYSTEM DESCRIPTION (2010 Corolla)		

SYSTEM DESCRIPTION

1. SYSTEM DESCRIPTION

(a) The ECT (Electronic controlled automatic transmission/transaxle) is an automatic transmission/transaxle that electronically controls shift timing using the ECM. The ECM detects electrical signals that indicate engine and driving conditions, and controls the shift point, based on driver habits and road conditions. As a result, fuel efficiency and power transaxle performance are improved.

Shift shock has been reduced by controlling the engine and transaxle simultaneously.

In addition, the ECT has features such as follows:

- Diagnostic function
- Fail-safe function when a malfunction occurs

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W790AWX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: ROAD TEST (2010 Corolla)		

ROAD TEST

1. PROBLEM SYMPTOM CONFIRMATION

(a) Based on the result of the customer problem analysis, try to reproduce the symptoms. If the problem is that the transaxle does not shift up, shift down, or the shift point is too high or too low, conduct the following road test referring to the automatic shift schedule and simulate the problem symptoms.

2. ROAD TEST

NOTICE:

Perform the test at the ATF (Automatic Transmission Fluid) temperature 50 to 80°C (122 to 176°F) in the normal operation.

(a) D position test:

Shift into the D position and fully depress the accelerator pedal and check the following points.

(1) Check up-shift operation.

Check that 1 → 2, 2 → 3 and 3 → 4th up-shifts take place, and that the shift points conform to the automatic shift schedule INFO.

HINT:

4th Gear Up-shift Prohibition Control

- Engine coolant temperature is 40°C (104°F) or less and vehicle speed is at 70 km/h (43 mph) or less.
- ATF temperature is 0°C (32°F) or less.

4th Gear Lock-up Prohibition Control

- Brake pedal is depressed.
- Accelerator pedal is released.
- Engine coolant temperature is 60°C (140°F) or less.
- ATF temperature is 10°C (50°F) or less.

(2) Check for shift shock and slip.

Check for shock and slip at the 1 → 2, 2 → 3 and 3 → 4th up-shifts.

(3) Check for abnormal noise and vibration.

Check for abnormal noise and vibration when up-shifting from 1 → 2, 2 → 3 and 3 → 4th while driving with the shift lever in the D position, and check while driving in the lock-up condition.

HINT:

The check for the cause of abnormal noise and vibration must be done thoroughly as it could also be due to loss of balance in the differential, torque converter clutch, etc.

(4) Check kick-down operation.

Check vehicle speeds when the 2nd to 1st, 3rd to 2nd and 4th to 3rd kick-downs take place

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while driving with the shift lever in the D position. Confirm that each speed is within the applicable vehicle speed range indicated in the automatic shift schedule INFO .

(5) Check abnormal shock and slip at kick-down.

(6) Check the lock-up mechanism.

- Drive in D position (4th gear), at a steady speed (lock-up ON).
- Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

HINT:

If there is a big jump in engine speed, there is no lock-up.

(b) 3 position test:

Shift into the 3 position and fully depress the accelerator pedal and check the following points.

(1) Check up-shift operation.

Check that the 1 → 2 and 2 → 3 up-shift take place and that the shift point conforms to the automatic shift schedule INFO .

HINT:

There is no 4th up-shift in the 3 position.

(2) Check engine braking.

While running in the 3 position and 3rd gear, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noise during acceleration and deceleration, and for shock at up-shift and down-shift.

(c) 2 position test:

Shift into the 2 position and fully depress the accelerator pedal and check the following points.

(1) Check up-shift operation.

Check that the 1 → 2 up-shift takes place and that the shift point conforms to the automatic shift schedule INFO .

HINT:

There is no 3rd up-shift and lock-up in the 2 position.

(2) Check engine braking.

While running in the 2 position and 2nd gear, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noise during acceleration and deceleration, and for shock at up-shift and down-shift.

(d) L position test:

Shift into the L position and fully depress the accelerator pedal and check the following points.

(1) Check no up-shift.

While running in the L position, check that there is no up-shift to 2nd gear.

HINT:

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There is no lock-up in the L position.

(2) Check engine braking.

While running in the L position, release the accelerator pedal and check the engine braking effect.

(3) Check for abnormal noise during acceleration and deceleration.

(e) R position test:

Shift into the R position, lightly depress the accelerator pedal, and check that the vehicle moves backward without any abnormal noise or vibration.

CAUTION:

Before conducting this test ensure that the test area is free from people and obstruction.

(f) P position test:

Stop the vehicle on the grade (more than 5°) and after shifting into the P position, release the parking brake. Then, check that the parking lock pawl holds the vehicle in place.



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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7A0C6X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: MECHANICAL SYSTEM TESTS (2010 Corolla)		

MECHANICAL SYSTEM TESTS

1. PERFORM MECHANICAL SYSTEM TESTS

(a) Measure the stall speed.

The object of this test is to check the overall performance of the transaxle and engine by measuring the stall speeds in the D position.

NOTICE:

- Driving test should be done on a paved road (a nonskid road).
- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature 50 to 80°C (122 to 176°F).
- Do not continuously run this test for longer than 5 seconds.
- To ensure safety, do this test in a wide, clear level area which provides good traction.
- The stall test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is doing the test.

(1) Chock the 4 wheels.

(2) Connect the Techstream to the DLC3.

(3) Fully apply the parking brake.

(4) Keep your left foot pressed firmly on the brake pedal.

(5) Start the engine.

(6) Shift into the D position. Press all the way down on the accelerator pedal with your right foot.

(7) Quickly read the stall speed at this time.

Stall speed:
2410 +- 300 rpm

Evaluation:

PROBLEM	POSSIBLE CAUSE
(a) Stall engine speed is low in D position	• Engine power output may be insufficient • Stator one-way clutch not operating properly **HINT:** **If the value is less than the specified value by 600 rpm or more, the torque converter could be faulty.**
(b) Stall engine speed is high in D position	• Line pressure is too low • Forward clutch slipping • No. 2 one-way clutch not operating properly • Improper fluid level

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(b) Measure the time lag.

(1) When the shift lever is shifted while the engine is idling, there will be a certain time lapse or lag before the shock can be felt. This is used for checking the condition of the clutch and brake.

NOTICE:

- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature: 50 to 80°C (122 to 176°F).
- Be sure to allow 1 minute interval between tests.
- Perform the test three times, and measure the time lags. Calculate the average value of the three time lags.

(2) Connect the Techstream to the DLC3.

(3) Fully apply the parking brake.

(4) Start and warm up the engine and check idle speed.

Idle speed:
approx. 700 rpm (In N position and A/C OFF)

(5) Shift the lever from N to D position. Using a stop watch, measure the time from when the lever is shifted until the shock is felt.

Time lag:
N → D less than 1.2 seconds

(6) In the same way, measure the time lag for N → R.

Time lag:
N → R less than 1.5 seconds

Evaluation (If N → D or N → R time lag is longer than the specified):

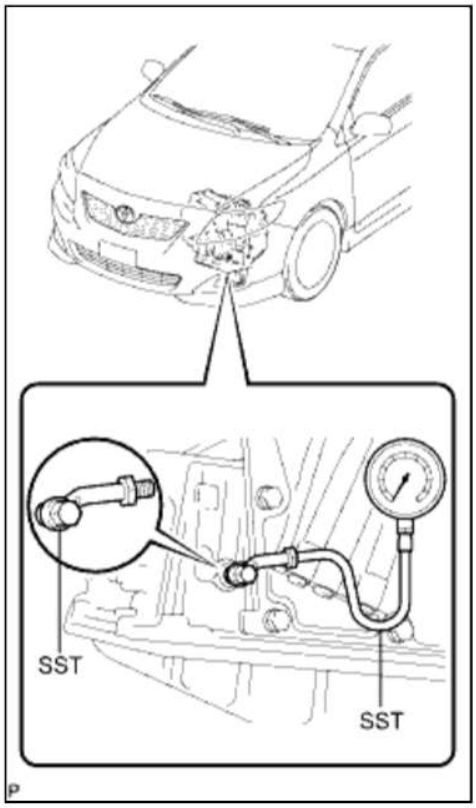
PROBLEM	POSSIBLE CAUSE
N → D time lag is longer	• Line pressure is too low • Forward clutch worn • No. 2 one-way clutch is not operating properly
N → R time lag is longer	• Line pressure is too low • Reverse clutch worn • 1st and reverse brake worn

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7B0BWX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: HYDRAULIC TEST (2010 Corolla)		

HYDRAULIC TEST

1. PERFORM HYDRAULIC TEST



(a) Measure the line pressure.

NOTICE:

- Perform the test at the normal operating ATF (Automatic Transmission Fluid) temperature: 50 to 80°C (122 to 176°F).
- The line pressure test should always be carried out in pairs. One technician should observe the conditions of wheels or wheel stoppers outside the vehicle while the other is performing the test.
- Be careful to prevent SST hose from interfering with the exhaust pipe.
- This Check must be conducted after checking and adjusting engine.
- Perform under condition that A/C is OFF.
- When conducting stall test, do not continue more than 5 seconds.

(1) Warm up the ATF.

(2) Remove the test plug on the front left side of the transaxle case and connect SST.

SST: 09992-00095

09992-00231

09992-00271

(3) Fully apply the parking brake and chock the 4 wheels.

(4) Connect the Techstream to the DLC3.

(5) Start the engine and check idling speed.

(6) Keep your left foot pressing firmly on the brake pedal and shift into D position.

(7) Measure the line pressure when the engine is idling.

(8) Depress the accelerator pedal all the way down. Quickly read the highest line pressure when engine speed reaches stall speed.

(9) In the same way, do the test in R position.

Specified line pressure:

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CONDITION	D POSITION KPA (KGF/CM^2, PSI)	R POSITION KPA (KGF/CM^2, PSI)
Idling	372 to 412 kPa (3.8 to 4.2 kgf/cm^2, 54 to 60 psi)	553 to 623 kPa (5.6 to 6.4 kgf/cm^2, 80 to 100 psi)
Stall test	1120 to 1230 kPa (11.4 to 12.5 kgf/cm^2, 162 to 178 psi)	1660 to 1870 kPa (16.9 to 19.1 kgf/cm^2, 241 to 271 psi)

Evaluation:

PROBLEM	POSSIBLE CAUSE
If the measured values at all positions are higher	• Shift solenoid valve SLT defective • Regulator valve detective
If the measured values at all positions are lower	• Shift solenoid valve SLT defective • Regulator valve detective • Oil pump defective
If pressure is low in the D position only	• D position circuit fluid leak • Forward clutch defective
If pressure is low in the R position only	• R position circuit fluid leak • Reverse clutch defective • 1st and reverse brake defective

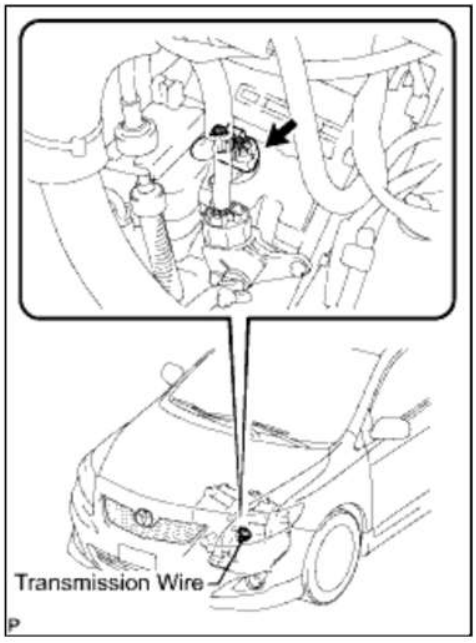
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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7C0CWX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: MANUAL SHIFTING TEST (2010 Corolla)		

MANUAL SHIFTING TEST

1. MANUAL SHIFTING TEST

The purpose of this manual shifting test is to determine whether a problem is caused by either mechanical or electrical factors. Disconnecting the transmission wire disables electrically-controlled automatic gear shifting. In this case, operating the shift lever is the only way to shift the transaxle gear. If the gear is not changed by shift lever operation, it is assumed that there is a mechanical problem.



(a) Turn the ignition switch off.

(b) Disconnect the transmission wire connector.

(c) Warm up the engine.

(d) Drive the vehicle.

(e) Check the transaxle operation when the shift lever is moved into L, 2, 3 and D positions.

Standard:

SHIFT LEVER	OPERATION
L to 2	No Shift (Not Change)
2 to 3	No Shift (Not Change)
3 to D	No Shift (Not Change)
D to 3	No Shift (Not Change)

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SHIFT LEVER	OPERATION
3 to 2	No Shift (Not Change)
2 to L	No Shift (Not Change)

(f) Turn the ignition switch off.

(g) Connect the transmission wire connector.

(h) Clear DTCs INFO .

HINT:

When the transmission wire is disconnected, the transaxle gear will be set as listed below.

SHIFT LEVER	GEAR
P	Parking
R	Reverse
N	Neutral
D	3rd
3	3rd
2	3rd
L	3rd

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7F0B1X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: INITIALIZATION (2010 Corolla)		

INITIALIZATION

1. RESET MEMORY

NOTICE:

- Perform the RESET MEMORY (AT initialization) when replacing the automatic transaxle assembly, engine assembly or ECM.
- The RESET MEMORY can be performed only with the Techstream.

HINT:

The ECM memorizes the condition that the ECT controls the automatic transaxle assembly and engine assembly according to those characteristics. Therefore, when the automatic transaxle assembly, engine assembly, or ECM has been replaced, it is necessary to reset the memory so that the ECM can memorize the new information.

Reset procedure is as follows.

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON and the Techstream main switch on.

(d) Enter the following menus: Powertrain / Engine and ECT / Utility / Reset Memory. Then, press "Next".

CAUTION:

After performing the RESET MEMORY, be sure to perform the ROAD TEST  **described earlier.**

HINT:

The ECM is learned by performing the ROAD TEST.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7K0BOX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: MONITOR DRIVE PATTERN (2010 Corolla)		

MONITOR DRIVE PATTERN

1. MONITOR DRIVE PATTERN FOR ECT TEST

(a) Perform this drive pattern as one method to simulate the detection conditions of the ECT malfunctions. (The DTCs may not be detected due the actual driving conditions. And some codes may not be detected through this drive pattern.)

HINT:

Preparation for driving

- Warm up the engine sufficiently. (Engine coolant temperature is 60°C (140°F) or higher)
- Drive the vehicle when the atmospheric temperature is -10°C (14°F) or higher. (Malfunction is not detected when the atmospheric temperature is less than -10°C (14°F))

Driving note

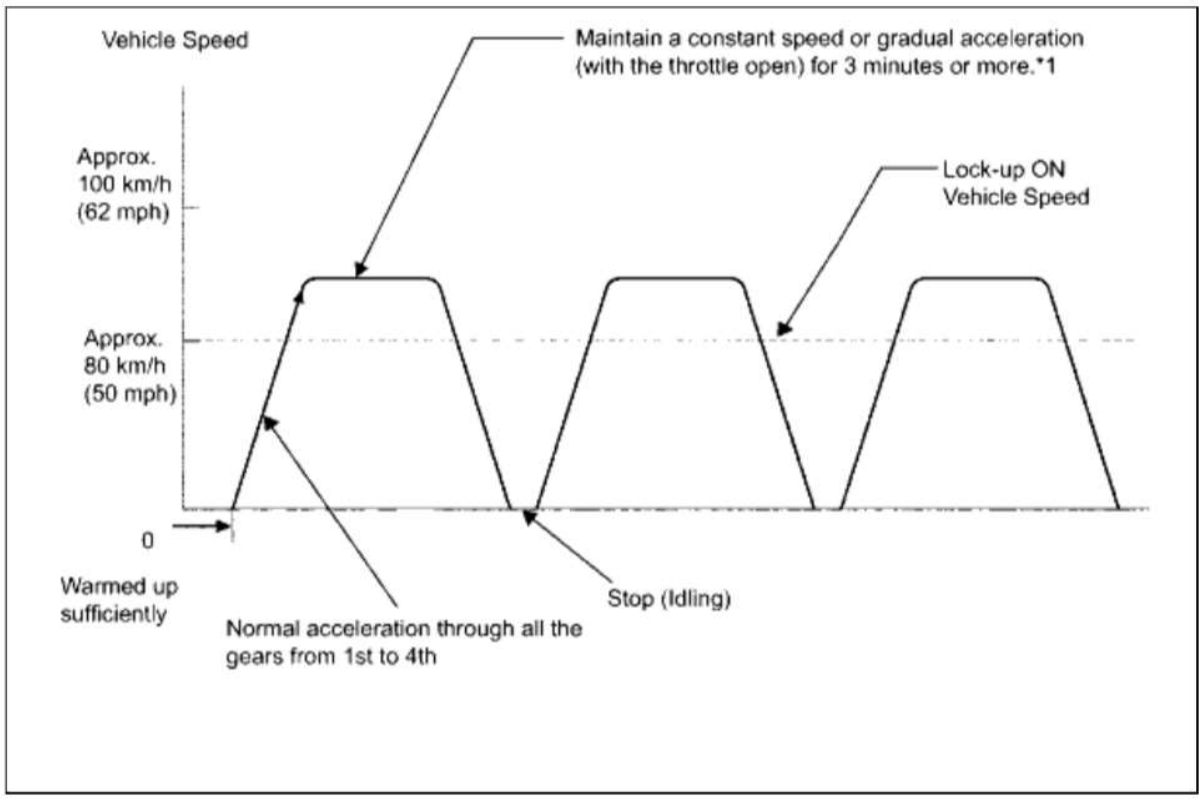
- Drive the vehicle through all gears.

  Stop → 1st → 2nd → 3rd → 4th → 4th (lock-up ON).
- Repeat the above driving pattern three times or more.

NOTICE:

- When using the Techstream, monitor status can be found in the "Powertrain / Engine and ECT / Data List".
- In the event that the drive pattern must be interrupted (possibly due to traffic conditions or other factors), the drive pattern can be resumed and, in most cases, the monitor can be completed.
- Perform this drive pattern on a level road as much as possible and strictly observe the posted speed limits and traffic laws while driving.

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HINT:

***1: Drive at such a speed in the uppermost gear, to engage lock-up. The vehicle can be driven at a speed lower than that in the above diagram under the lock-up condition.**

NOTICE:

If necessary to drive the vehicle for approximately 30 minutes to detect DTC P0711 (ATF temperature sensor malfunction).

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Last Modified: 3-10-2010	6.4 T	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W730DDX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: PROBLEM SYMPTOMS TABLE (2010 Corolla)		

PROBLEM SYMPTOMS TABLE

HINT:

- If a normal code is displayed during the diagnostic trouble code check although the trouble still occurs, check the electrical circuits for each symptom in the order given in the charts on the following pages and proceed to the page given for troubleshooting.
- The Matrix Chart is divided into 2 chapters.
- When the circuit on which mark *1 is attached is a malfunction, DTC could be output.

Chapter 1:

Refer to the table below when the trouble cause is considered to be electrical. If the instruction PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE is given in the flowchart of each circuit, inspect the suspected areas in descending order for each symptom. If the trouble still occurs even though there are no abnormalities in the inspections listed for the symptoms, check and replace the ECM.

Chapter 1: Electronic Circuit Matrix Chart:

SYMPTOM	SUSPECTED AREA	SEE PAGE
No up-shift (A particular gear, from 1st to 3rd gear, is not up-shifted)	ECM	INFO
No up-shift (3rd to 4th)	Transmission control switch circuit*1	INFO
	ECM	INFO
No down-shift (4th to 3rd)	Transmission control switch circuit*1	INFO
	ECM	INFO
No down-shift (A particular gear, from 3rd to 1st gear, is not down-shifted)	ECM	INFO
No lock-up or No lock-up off	Stop light switch circuit*1	INFO
	Engine coolant temp. sensor circuit*1 (for 2ZR-FE)	INFO
	ECM	INFO
Shift point too high or too low	Throttle position sensor circuit*1 (for 2ZR-FE)	INFO
	Engine coolant temp. sensor circuit*1 (for 2ZR-FE)	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
	ECM	INFO
Up-shift to 4th from 3rd while shift lever is 3 position	Transmission control switch circuit*1	INFO
	ECM	INFO
Up-shift to 4th from 3rd while engine is cold	Engine coolant temp. sensor circuit*1 (for 2ZR-FE)	INFO
	ECM	INFO
Harsh engagement (N to D)	ECM	INFO
Harsh engagement (Lock-up)	ECM	INFO
Harsh engagement (Any driving position)	ECM	INFO
Poor acceleration	ECM	INFO
Engine stalls when starting off or stopping	ECM	INFO
No kick-down	ECM	INFO
Malfunction in shifting	Park/neutral position switch circuit*1	INFO
	ECM	INFO

Chapter 2: On-Vehicle Repair and Off-Vehicle Repair.

SYMPTOM	SUSPECTED AREA	SEE PAGE
Vehicle does not move in any forward position and reverse position	Manual valve	INFO
	Valve body assembly	INFO
	Planetary gear unit	INFO
	Forward clutch	INFO
	No. 2 one-way clutch	INFO
	Reverse clutch	INFO
	1st and reverse brake	INFO
Vehicle does not move in R position	Manual valve	INFO
	Planetary gear unit	INFO
	Reverse Clutch	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
	1st and reverse brake	INFO
No up-shift (1st to 2nd)	Valve body assembly	INFO
	2nd brake	INFO
	No. 1 one-way clutch	INFO
No up-shift (2nd to 3rd)	Valve body assembly	INFO
	Direct clutch	INFO
No up-shift (3rd to 4th)	Valve body assembly	INFO
	O/D and 2nd brake	INFO
No down-shift (4th to 3rd)	Valve body assembly	INFO
No down-shift (3rd to 2nd)	Valve body assembly	INFO
No down-shift (2nd to 1st)	Valve body assembly	INFO
No lock-up or No lock-up off	Shift solenoid valve SL	INFO
	Valve body assembly	INFO
	Torque converter clutch	INFO
Harsh engagement (N to D)	Valve body assembly	INFO
	Forward clutch	INFO
	No. 2 one-way clutch	INFO
Harsh engagement (N to R)	C3 accumulator	INFO
	Valve body assembly	INFO
	Reverse clutch	INFO
	1st and reverse brake	INFO
Harsh engagement (Lock-up)	Valve body assembly	INFO
	Torque converter clutch	INFO
Harsh engagement (1st to 2nd)	B2 accumulator	INFO
	Valve body assembly	INFO
	2nd brake	INFO
	No. 1 one-way clutch	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
Harsh engagement (2nd to 3rd)	C2 accumulator	INFO
	Valve body assembly	INFO
	Direct clutch	INFO
Harsh engagement (3rd to 4th)	Shift solenoid valve ST	INFO
	Valve body assembly	INFO
	O/D and 2nd brake	INFO
Harsh engagement (4th to 3rd)	Valve body assembly	INFO
	Shift solenoid valve ST	INFO
Harsh engagement (D, 2, L position)	Shift solenoid valve SLT	INFO
	Valve body assembly	INFO
Slip or shudder (Forward position)	Valve body assembly	INFO
	Oil strainer	INFO
	Torque converter clutch	INFO
	Forward clutch	INFO
	Direct clutch	INFO
	O/D and 2nd brake	INFO
	2nd brake	INFO
	No. 1 one-way clutch	INFO
	No. 2 one-way clutch	INFO
Slip or shudder (Reverse position)	Oil strainer	INFO
	Valve body assembly	INFO
	Reverse clutch	INFO
	1st and reverse brake	INFO
Slip or shudder (1st)	No. 2 one-way clutch	INFO
Slip or shudder (2nd)	2nd brake	INFO
	No. 1 one-way clutch	INFO
Slip or shudder (3rd)	Direct clutch	INFO

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SYMPTOM	SUSPECTED AREA	SEE PAGE
Slip or shudder (4th)	O/D and 2nd brake	INFO
Shift point too high or too low	Shift solenoid valve SLT	INFO
No engine braking (1st: L position)	Valve body assembly	INFO
	1st and reverse brake	INFO
No engine braking (2nd: 2 position)	Valve body assembly	INFO
	O/D and 2nd brake	INFO
No kick-down	Valve body assembly	INFO
Poor acceleration (All position)	Shift solenoid valve SLT	INFO
	Valve body assembly	INFO
	Torque converter clutch	INFO
Large shift shock or engine stalls when starting off or stopping	Torque converter clutch	INFO
Engine stalls when starting off or stopping	Shift solenoid valve SL	INFO
	Torque converter clutch	INFO

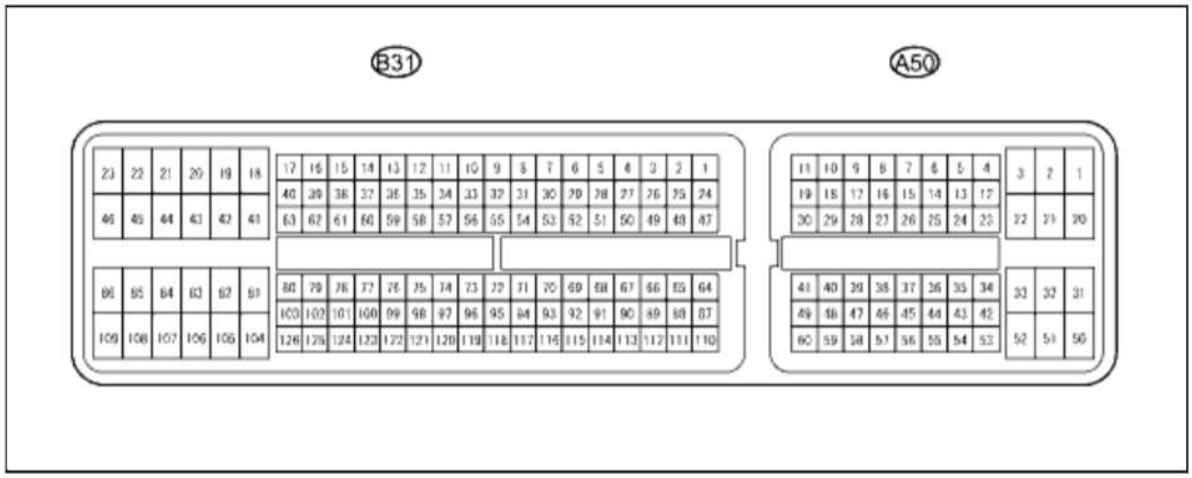


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Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W740A1X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: TERMINALS OF ECM (2010 Corolla)		

TERMINALS OF ECM

1. ECM



HINT:

Each ECM terminal's standard voltage is shown in the table below.

In the table, first follow the information under "Condition". Look under "Terminal No. (Symbols)" for the terminals to inspected. The standard voltage between the terminals is shown under "Specific Condition".

Use the illustration above as a reference for the ECM terminals.

TERMINAL NO. (SYMBOLS)	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A50-36 (STP) - B31-104 (E1)	Stop light switch signal	Brake pedal is depressed	7.5 to 14 V
		Brake pedal is released	Below 1.5 V
B31-52 (STAR) - B31-104 (E1)	Park neutral switch signal	Ignition switch ON and shift lever P and N position	Below 2 V
		Ignition switch ON and shift lever except P and N position	11 to 14 V
B31-73 (P) - B31-104 (E1)	Park position switch signal	Ignition switch ON and shift lever P position	11 to 14 V
		Ignition switch ON and shift lever except P position	Below 1 V
B31-53 (R) - B31-104 (E1)	R shift position switch signal	Ignition switch ON and shift lever R position	11 to 14 V

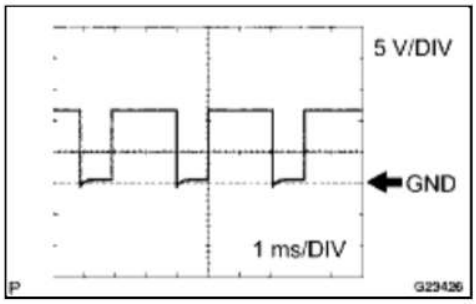
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TERMINAL NO. (SYMBOLS)	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
		Ignition switch ON and shift lever except R position	Below 1 V
B31-54 (N) - B31-104 (E1)	Neutral position switch signal	Ignition switch ON and shift lever N position	11 to 14 V
		Ignition switch ON and shift lever except N position	Below 1 V
B31-56 (D) - B31-104 (E1)	D shift position switch signal	Ignition switch ON and shift lever D and 3 position	11 to 14 V
		Ignition switch ON and shift lever except D and 3 position	Below 1 V
A50-26 (3) - B31-104 (E1)	3 shift position switch signal	Ignition switch ON and shift lever 3 position	11 to 14 V
		Ignition switch ON and shift lever except 3 position	Below 1 V
B31-55 (2) - B31-104 (E1)	2 shift position switch signal	Ignition switch ON and shift lever 2 position	11 to 14 V
		Ignition switch ON and shift lever except 2 position	Below 1 V
B31-74 (L) - B31-104 (E1)	L shift position switch signal	Ignition switch ON and shift lever L position	11 to 14 V
		Ignition switch ON and shift lever except L position	Below 1 V
B31-79 (S1) - B31-104 (E1)	S1 solenoid signal	Ignition switch ON	11 to 14 V
		1st or 2nd gear	11 to 14 V
		3rd or 4th gear	Below 1 V
B31-78 (S2) - B31-104 (E1)	S2 solenoid signal	Ignition switch ON	11 to 14 V
		1st or 4th gear	11 to 14 V
		2nd or 3rd gear	Below 1 V
B31-57 (SLU+) - B31-77 (SLU-)	SLU solenoid signal	Ignition switch ON	Below 1 V
B31-80 (ST) - B31-104 (E1)	ST solenoid signal	Ignition switch ON	Below 1 V
		Ignition switch ON and R gear	11 to 14 V
B31-40 (SLT+) - B31-39 (SLT-)	SLT solenoid signal	Ignition switch ON	Pulse generation (See waveform 1)
B31-125 (NT+) - B31-124 (NT-)	Speed sensor (NT) signal	Engine is running	Pulse generation (See waveform 2)

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TERMINAL NO. (SYMBOLS)	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
B31-72 (THO1) - B31-95 (ETHO)	ATF temperature sensor signal	ATF temperature: 115°C (239°F) or more	Below 1.5 V

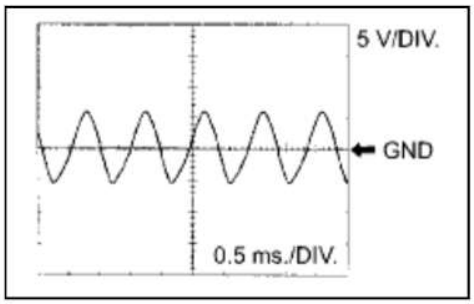
(a) Waveform 1



Reference:

Terminal	SLT+ - SLT-
Tool setting	5 V/DIV, 1ms/DIV
Vehicle condition	Engine idle speed

(b) Waveform 2



Reference:

Terminal	NT+ - NT-
Tool setting	5 V/DIV, 0.5ms/DIV
Vehicle condition	Vehicle speed 20 km/h (12 mph)

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W760D7X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DIAGNOSIS SYSTEM (2010 Corolla)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

When troubleshooting OBD II (On-Board Diagnostics) vehicles, a Techstream (complying with SAE J1987) must be connected to the DLC3 (Data Link Connector 3) of the vehicle. Various data in the vehicle's ECM (Engine Control Module) can be then read.

OBD II regulations require that the vehicle's on-board computer illuminate the MIL (Malfunction Indicator Lamp) on the instrument panel when the computer detects a malfunction in:



a. The emission control systems and components.
b. The powertrain control components (which affect vehicle emissions).
c. The computer itself.

In addition, the applicable DTCs prescribed by SAE J2012 are recorded in the ECM memory. If the malfunction does not recur in 3 consecutive trips, the MIL turns off automatically but the DTCs remain recorded in the ECM memory.

To check the DTCs, connect the Techstream to the DLC3. The Techstream displays DTCs, freeze frame data, and a variety of the engine data. The DTCs and freeze frame data can be erased with the Techstream. In order to enhance OBD function on vehicles and develop the Off-Board diagnosis system, Controller Area Network (CAN) communication is used in this system. CAN is a network which uses a pair of data transmission lines spanning multiple computers and sensors. It allows for high speed communications between the systems and simplification of the wire harness connections.

2. NORMAL MODE AND CHECK MODE

The diagnosis system operates in "normal mode" during normal vehicle use. In normal mode, "2 trip detection logic" is used to ensure accurate detection of malfunctions. "Check mode" is also available to technicians as an option. In check mode, "1-trip detection logic" is used for simulating malfunction symptoms and increasing the system's ability to detect malfunctions, including intermittent malfunctions (Techstream only).

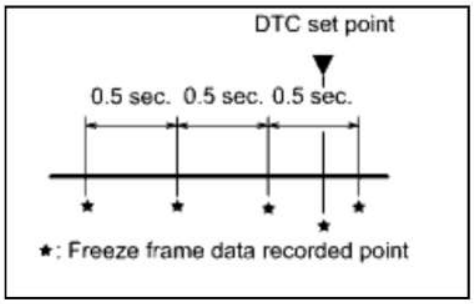
3. 2-TRIP DETECTION LOGIC

(a) When a malfunction is first detected, the malfunction is temporarily stored in the ECM memory (1st trip). If the ignition switch is turned off and then turned to ON again, and the same malfunction is detected again, the MIL will illuminate.

4. FREEZE FRAME DATA

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(a) The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air/fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.



(b) The Techstream displays freeze frame data recorded at five different points: 1) 3 times before the DTC is set, 2) once when the DTC is set, and 3) once after the DTC is set. The data can be used to simulate the vehicle's condition around the time of the malfunction. The data may be helpful in determining the cause of a malfunction. It may also be helpful in determining whether a DTC is being caused by a temporary malfunction.

5. CHECK DLC3

(a) Check the DLC3 INFO .

6. CHECK BATTERY VOLTAGE

(a) Measure the battery voltage.

Battery voltage:
11 to 14 V

If voltage is below 11 V, replace the battery before proceeding.

7. CHECK MIL

(a) Check that the MIL illuminates when turning the ignition switch to ON.

HINT:

If the MIL does not light up, troubleshoot the combination meter.

(b) When the engine is started, the MIL should go off. If the lamp remains on, it means that the diagnosis system has detected a malfunction or abnormality in the system.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W770CLX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DTC CHECK / CLEAR (2010 Corolla)		

DTC CHECK / CLEAR

1. CHECK DTC

(a) DTCs which are stored in the ECM can be displayed with the Techstream.

These scan tools can display pending DTCs and current DTCs. Some DTC are not stored if the ECM does not detect a malfunction during consecutive driving. However, the detected malfunction during once driving is stored as pending DTC.

(1) Connect the Techstream to the DLC3.

(2) Turn the ignition switch to ON.

(3) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

(4) Confirm the DTCs and freeze frame data and then write them down.

(5) Confirm the details of the DTCs INFO .

NOTICE:

When simulating a symptom with the scan tool to check the DTCs, use normal mode. For codes on DIAGNOSTIC TROUBLE CODE CHART which are subject to "2-trip detection logic", perform the following actions.

Turn the ignition switch off after the symptom is simulated once. Then repeat the simulation process again. When the problem has been simulated twice, the MIL illuminates and the DTCs are recorded in the ECM.

2. CLEAR DTC WITH TECHSTREAM

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Enter the following menus: Powertrain / Engine and ECT / Trouble Codes.

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Last Modified: 3-10-2010	6.4 D	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W780BQX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: CHECK MODE PROCEDURE (2010 Corolla)		

CHECK MODE PROCEDURE

1. DESCRIPTION

(a) Check mode has a higher sensitivity to malfunctions and can detect malfunctions that normal mode cannot detect. Check mode can also detect all the malfunctions that normal mode can detect. In check mode, DTCs are detected with 1-trip detection logic.

2. CHECK MODE PROCEDURE

(a) Make sure that the items below are true:

(1) Battery positive voltage 11 V or more

(2) Throttle valve fully closed

(3) Transaxle in the P or N position

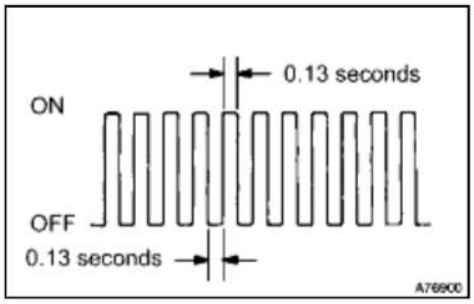
(4) A/C switched OFF

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Enter the following menus: Powertrain / Engine and ECT / Utility / Check Mode.



(f) Change the ECM to check mode. Make sure the MIL flashes as shown in the illustration.

NOTICE:

All DTCs and freeze frame data recorded will be erased if: 1) the Techstream is used to change the ECM from normal mode to check mode or vice versa; or 2) during check mode, the ignition switch is turned from to ON to to ACC or off.

Before check mode, make notes of the DTCs and freeze frame data.

(g) Start the engine. The MIL should turn off after the engine starts.

(h) Perform "MONITOR DRIVE PATTERN" for the ECT test INFO .

(Or, simulate the conditions of the malfunction described by the customer).

(i) After simulating the malfunction conditions, use the Techstream diagnosis selector to check the DTC and freeze frame data.

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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000O8L0BTX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: FAIL-SAFE CHART (2010 Corolla)		

FAIL-SAFE CHART

1. FAIL-SAFE

This function minimizes the loss of the ECT functions when any malfunction occurs in each sensor or solenoid.

(a) Vehicle speed signal (SPD):

When there are problems with vehicle speed signals, 4th upshift is prohibited.

(b) Input turbine speed sensor NT (Speed sensor NT):

When the input turbine speed sensor has a malfunction, 4th upshift is prohibited.

(c) ATF (Automatic Transmission Fluid) temperature sensor:

When the ATF temperature sensor has a malfunction, 4th upshift is prohibited.

(d) Shift solenoid valve SLU:

If the ECM detects a malfunction in the solenoid valve SLU, it turns the valve off.

(e) Shift solenoid valve SLT:

When the solenoid valve SLT has a malfunction, 4th upshift is prohibited.

(f) Engine coolant temperature sensor:

When the engine coolant temperature sensor has a malfunction, 4th upshift is prohibited.

(g) Knock sensor:

When the knock sensor has a malfunction, 4th upshift is prohibited.

(h) Throttle position sensor:

When the throttle position sensor has a malfunction, 4th upshift is prohibited.

(i) Shift solenoid valve S1 and S2:

Fail safe function:

If either of the shift solenoid valve circuits develops an open or short, the ECM turns the other shift solenoid "ON" and "OFF" in order to shift into the gear positions shown in the table below.

The ECM also turns the shift solenoid valve ST OFF at the same time. If both solenoids malfunction, hydraulic control cannot be performed electronically and must be done manually.

Manual shifting as shown in the following table must be done (In case of a short circuit, the ECM stops sending current to the short circuit solenoid).

Even if starting the engine in the fail-safe mode, the gear position remains in the same position.

Normal	Solenoid Valve	S1	ON	ON	OFF	OFF
		S2	ON	OFF	OFF	ON
	Gear Position		1st	2nd	3rd	4th (O/D)

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S1 Malfunction	Solenoid Valve	S1	X			
		S2	ON → OFF	OFF	OFF	ON
	Gear Position *1		3rd	3rd	3rd	4th (O/D)
S2 Malfunction	Solenoid Valve	S1	ON	ON	OFF	OFF
		S2	X			
	Gear Position *1		2nd	2nd	3rd	3rd
S1 and S2 Malfunction	Solenoid Valve	S1	X			
		S2	X			
	Gear Position *1		3rd	3rd	3rd	3rd

- *1: Actual gear shift (gear position) under fail-safe operation.
- X: OFF (the ECM stops sending current to a malfunctioning solenoid valve)
- →: Condition in the electrical malfunction is shown on the left of "→".

  Condition in the fail-safe mode is shown on the right of "→".



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Last Modified: 3-10-2010	6.4 U	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7E0CGX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DATA LIST / ACTIVE TEST (2010 Corolla)		

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the Techstream, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light Switch	Stop light switch Status/ON or OFF	• Brake Pedal is depressed: ON • Brake Pedal is released: OFF	-
Neutral Position SW Signal	PNP switch Status/ON or OFF	Shift lever position is: P and N: ON Except P and N: OFF	When the shift lever position displayed on the Techstream differs from the actual position, adjustment of the PNP switch or the shift cable may be incorrect. **HINT:** **When the failure still occurs even after adjusting these parts,** INFO .
Shift SW Status (R Range)	PNP switch Status/ON or OFF	Shift lever position is: P: ON Except P: OFF	↑
Shift SW		Shift lever position is:	

2. ACTIVE TEST

HINT:

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Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Active Test".

(g) According to the display on Techstream, perform the "Active Test".

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set the each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th	Possible to check the operation of the shift solenoid valves.
Activate the Lock Up	[Test Details] Control the shift solenoid SLU to set the automatic transaxle to the lock-up condition. [Vehicle Condition] Vehicle Speed: 60 km/h (36 mph) or more, and 4th gear	ON/OFF	Possible to check the SLU operation.
Activate the Solenoid (S1)	[Test Details] Operate the shift solenoid S1. [Vehicle Condition] • Vehicle Stopped. • IDL: ON	ON/OFF	-
Activate the Solenoid (S2)	[Test Details] Operate the shift solenoid S2. [Vehicle Condition] • Vehicle Stopped. • IDL: ON	ON/OFF	-

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Activate the Solenoid (SLU)	[Test Details] Operate the shift solenoid SLU. [Vehicle Condition] • Vehicle Stopped. • Shift lever P or N position.	ON/OFF	-
Activate the Solenoid (ST)	[Test Details] Operate the shift solenoid ST. [Vehicle Condition] • Vehicle Stopped. • IDL: ON	ON/OFF	-
Activate the Solenoid (SLT)*	[Test Details] Operate the shift solenoid SLT and raise the line pressure. [Vehicle Condition] • Vehicle Stopped. • IDL: ON **HINT:** **OFF: Line pressure up (When the active test of "Activate the Solenoid (SLT)" is performed, the ECM commands the SLT solenoid to turn off).** ON: No action (normal operation)	ON/OFF	-

*: "Activate the Solenoid (SLT)" in the Active Test is performed to check the line pressure changes by connecting the SST to the automatic transaxle, which is used in the HYDRAULIC TEST INFO as well.

HINT:

The pressure values in Active Test and HYDRAULIC TEST are different from each other.

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Last Modified: 3-10-2010	6.4 S	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W710BCX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2010 Corolla)		

DIAGNOSTIC TROUBLE CODE CHART

If a DTC is displayed during the DTC check, check the parts listed in the table below and proceed to the page given.

HINT:

- *1: Comes on MIL (Malfunction Indicator Lamp) light up
- *2: "DTC stored" mark means ECM memorizes the malfunction code if the ECM detects the DTC detection condition.
- This DTC may be output when the clutch, brake and gear components etc. inside the automatic transaxle are damaged.

AUTOMATIC TRANSAXLE SYSTEM:

DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
P0705	Transmission Range Sensor Circuit Malfunction (PRNDL Input)	1. Open or short in park/neutral position switch circuit 2. Park/neutral position switch 3. ECM	Come on	DTC stored	INFO
P0710	Transmission Fluid Temperature Sensor "A" Circuit	1. Open or short in ATF temperature sensor circuit 2. Transmission wire (ATF temperature sensor) 3. ECM	Come on	DTC stored	INFO
P0711	Transmission Fluid Temperature Sensor "A" Performance	1. Transmission wire (ATF temperature sensor)	Come on	DTC stored	INFO
P0712	Transmission Fluid Temperature Sensor "A" Circuit Low Input	1. Short in ATF temperature sensor circuit 2. Transmission wire (ATF temperature sensor) 3. ECM	Come on	DTC stored	INFO
P0713	Transmission Fluid Temperature Sensor "A" Circuit High Input	1. Open in ATF temperature sensor circuit 2. Transmission wire (ATF temperature sensor) 3. ECM	Come on	DTC stored	INFO
P0717	Turbine Speed Sensor Circuit No Signal	1. Open or short in transmission revolution	Come on	DTC stored	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
		sensor NT (speed sensor NT) circuit 2. Transmission revolution sensor NT (speed sensor NT) 3. ECM 4. Automatic transaxle assembly			
P0724	Brake Switch "B" Circuit High	1. Short in stop light switch circuit 2. Stop light switch 3. ECM	Come on	DTC stored	INFO
P0751	Shift Solenoid "A" Performance (Shift Solenoid Valve S1)	1. Shift solenoid valve S1 remains open or closed 2. Valve body is blocked 3. Shift solenoid valve S1 4. Automatic transaxle (clutch, brake or gear etc.)	Come on	DTC stored	INFO
P0756	Shift Solenoid "B" Performance (Shift Solenoid Valve S2)	1. Shift solenoid valve S2 remains open or closed 2. Valve body is blocked 3. Shift solenoid valve S2 4. Automatic transaxle (clutch, brake or gear etc.)	Come on	DTC stored	INFO
P0787	Shift / Timing Solenoid Low (Shift Solenoid Valve ST)	1. Short in shift solenoid valve ST circuit 2. Shift solenoid valve ST 3. ECM	Come on	DTC stored	INFO
P0788	Shift / Timing Solenoid High (Shift Solenoid Valve ST)	1. Open in shift solenoid valve ST circuit 2. Shift solenoid valve ST 3. ECM	Come on	DTC stored	INFO
P0973	Shift Solenoid "A" Control Circuit Low (Shift Solenoid Valve S1)	1. Short in shift solenoid valve S1 circuit 2. Shift solenoid valve S1 3. ECM	Come on	DTC stored	INFO
P0974	Shift Solenoid "A" Control Circuit High (Shift Solenoid Valve S1)	1. Open in shift solenoid valve S1 circuit 2. Shift solenoid valve S1 3. ECM	Come on	DTC stored	INFO
P0976	Shift Solenoid "B" Control Circuit Low (Shift Solenoid Valve S2)	1. Short in shift solenoid valve S2 circuit	Come on	DTC stored	INFO

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DTC CODE	DETECTION ITEM	TROUBLE AREA	MIL *1	MEMORY *2	SEE PAGE
		2. Shift solenoid valve S2 3. ECM			
P0977	Shift Solenoid "B" Control Circuit High (Shift Solenoid Valve S2)	1. Open in shift solenoid valve S2 circuit 2. Shift solenoid valve S2 3. ECM	Come on	DTC stored	INFO
P2714	Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT)	1. Shift solenoid valve SLT remains closed 2. Valve body is blocked 3. Torque converter clutch 4. Automatic transaxle (clutch, brake or gear etc.)	Come on	DTC stored	INFO
P2716	Pressure Control Solenoid "D" Electrical (Shift Solenoid Valve SLT)	1. Open or short in shift solenoid valve SLT circuit 2. Shift solenoid valve SLT 3. ECM	Come on	DTC stored	INFO
P2757	Torque Converter Clutch Pressure Control Solenoid Performance (Shift Solenoid Valve SLU)	1. Shift solenoid valve SLU remains open or closed 2. Valve body is blocked 3. Shift solenoid valve SLU 4. Torque converter clutch 5. Automatic transaxle (clutch, brake or gear etc.) 6. Line pressure is too low	Come on	DTC stored	INFO
P2759	Torque Converter Clutch Pressure Control Solenoid Control Circuit Electrical (Shift Solenoid Valve SLU)	1. Open or short in shift solenoid valve SLU circuit 2. Shift solenoid valve SLU 3. ECM	Come on	DTC stored	INFO

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W840EKX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0705: Transmission Range Sensor Circuit Malfunction (PRNDL Input) (2010 Corolla)		

DTC	**P0705**	**Transmission Range Sensor Circuit Malfunction (PRNDL Input)**

DESCRIPTION

The park/neutral position switch detects the shift lever position and sends signals to the ECM.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0705	(A) Any 2 or more signals of the following are ON simultaneously (2-trip detection logic) • STAR input signal is ON. • R input signal is ON. • D input signal is ON. • 2 input signal is ON. • L input signal is ON. (B) Any 2 or more signals of the following are ON simultaneously (2-trip detection logic) • P input signal is ON. • R input signal is ON. • N input signal is ON. • D input signal is ON. • 2 input signal is ON. • L input signal is ON. (C) All switches are OFF simultaneously for P, R, N, D, 2 and L positions (2-trip detection logic) (D) Both 1 and 2 are met (2-trip detection logic) 1. One of following is met a. STAR input signal is ON. b. P input signal is ON. c. R input signal is ON. d. N input signal is ON. 2. One of following is ON. a. 3 input signal is ON.	• Open or short in park/neutral position switch circuit • Park/neutral position switch • ECM

MONITOR DESCRIPTION

The park/neutral position switch detects the gearshift position and sends a signal to the ECM.

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For security, the park/neutral position switch detects the gearshift position so that engine can be started only when the vehicle is in P or N shift position.

When the park/neutral position switch sends more than one signal at a time from switch positions P, R, N, D, 3, 2 or L the ECM interprets this as a fault in the switch. The ECM will turn on the MIL.

MONITORSTRATEGY

Related DTCs	P0705: Park/neutral position switch/Verify switch input
Required sensors/Components	Park/neutral position switch
Frequency of operation	Continuous
Duration	Condition (a) and (c): 2 seconds Condition (b): 60 seconds
MIL operation	2 driving cycles
Sequence of operation	None

TYPICALENABLINGCONDITIONS

The monitor runs whenever the following DTCs are not present.	None
Ignition switch	ON
Battery voltage	10.5 V or more

TYPICALMALFUNCTIONTHRESHOLDS

One of the following conditions is met: Condition (a), (b), (c) or (d)

Condition (a):

Number of following signals input simultaneously	2 or more
STAR switch	ON
R switch	ON
D switch	ON
2 switch	ON
L switch	ON

Condition (b):

Number of following signals input simultaneously	2 or more
P switch	ON

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R switch	ON
N switch	ON
D switch	ON
2 switch	ON
L switch	ON

Condition (c):
All of the following conditions are met.

P switch	OFF
R switch	OFF
N switch	OFF
D switch	OFF
2 switch	OFF
L switch	OFF

Condition (d):
When shift lever is in P, R or N position, either of following conditions is met.

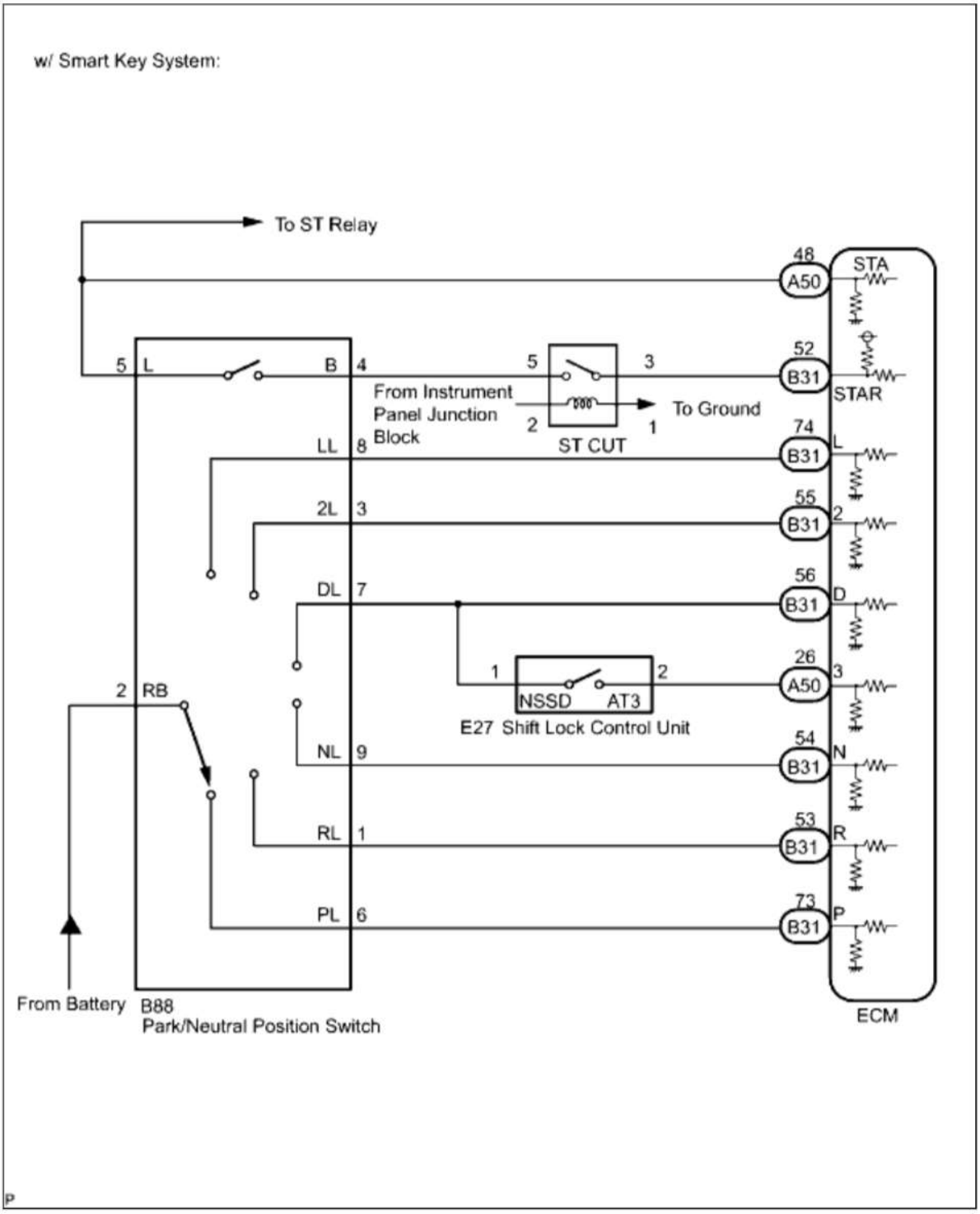
3 switch	ON
L switch	ON

COMPONENT OPERATING RANGE

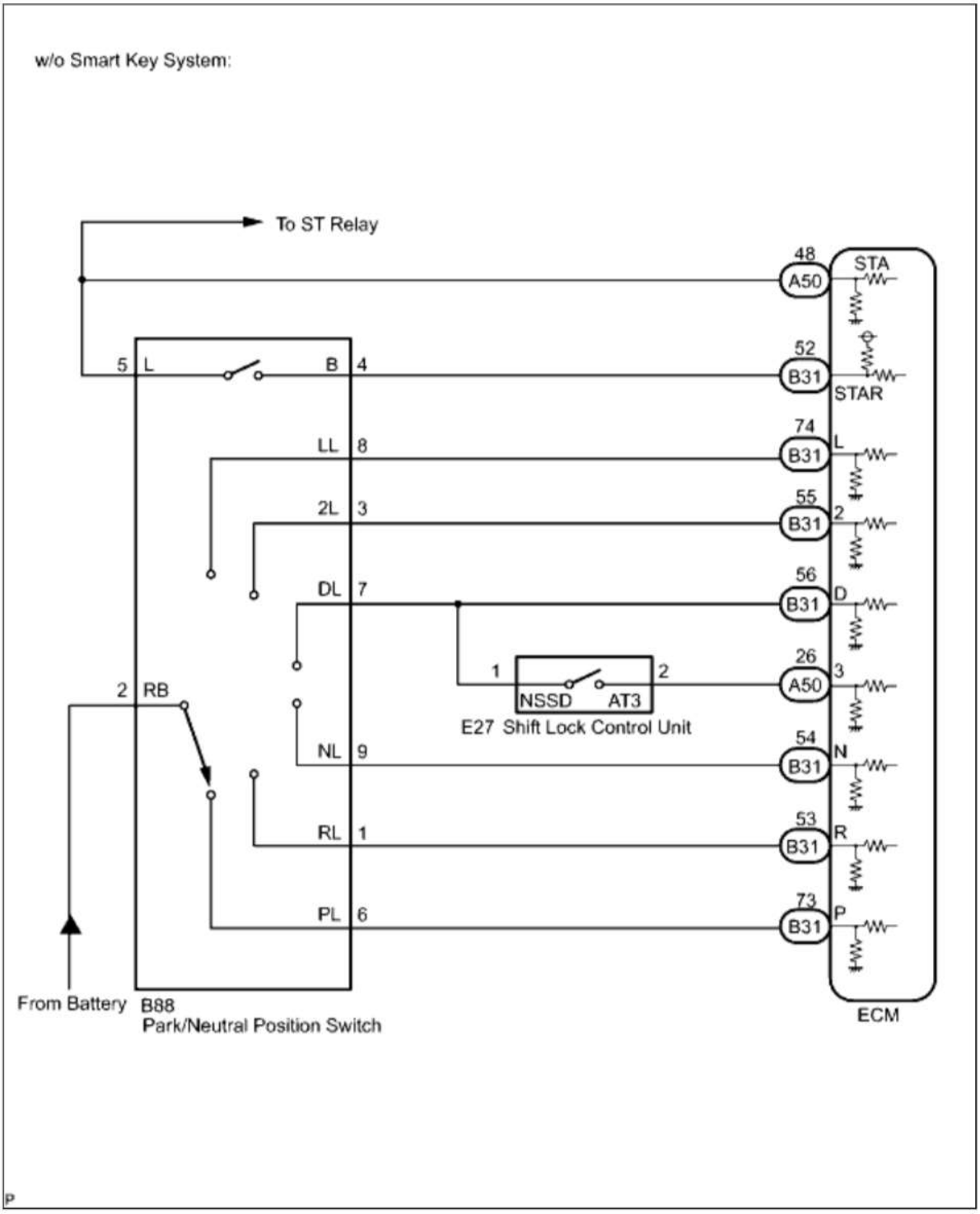
Park/neutral position switch	The park/neutral position switch sends only one signal to the ECM.

WIRING DIAGRAM

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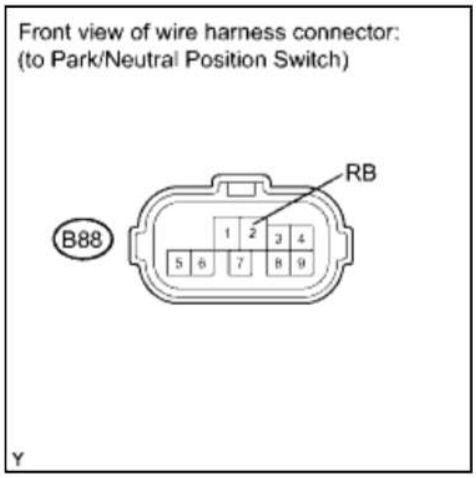


INSPECTION PROCEDURE

PROCEDURE

1.	CHECK HARNESS AND CONNECTOR (BATTERY - PARK/NEUTRAL POSITION SWITCH)

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(a) Disconnect the park/neutral position switch connector.

(b) Turn the ignition switch to ON.

(c) Measure the voltage according to the value(s) in the table below.

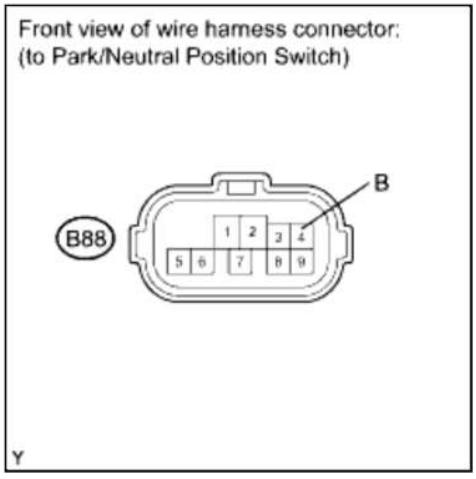
Standard voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
B88-2 (RB) - Body ground	Ignition switch ON	11 to 14 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK
▼

2.	**CHECK HARNESS AND CONNECTOR (OUTPUT SIGNAL)**



(a) Turn the ignition switch to ON.

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(b) Measure the voltage according to the value(s) in the table below.

Standard voltage:

TESTER CONNECTION	SWITCH CONDITION	SPECIFIED CONDITION
B88-4 (B) - Body ground	Ignition switch ON	11 to 14 V

Result:

RESULT	PROCEED TO
OK	A
NG	B

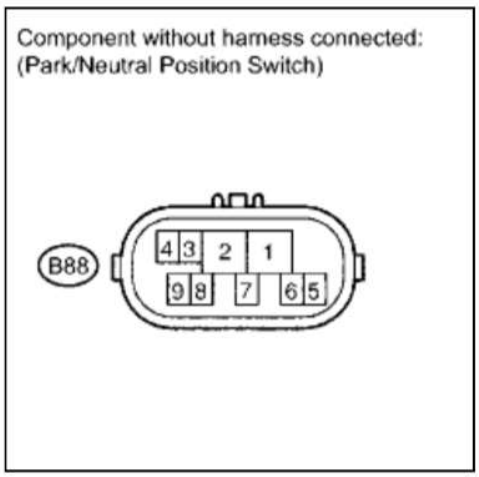
B ▶ CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)

A ▼

3.	INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY

(a) Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard resistance:



TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
4 - 5	P and N	Below 1 Ω
	Except P and N	10 kΩ or higher
2 - 6	P	Below 1 Ω
	Except P	10 kΩ or higher
2 - 1	R	Below 1 Ω
	Except R	10 kΩ or higher
2 - 9	N	Below 1 Ω
	Except N	10 kΩ or higher
2 - 7	D and 3	Below 1 Ω

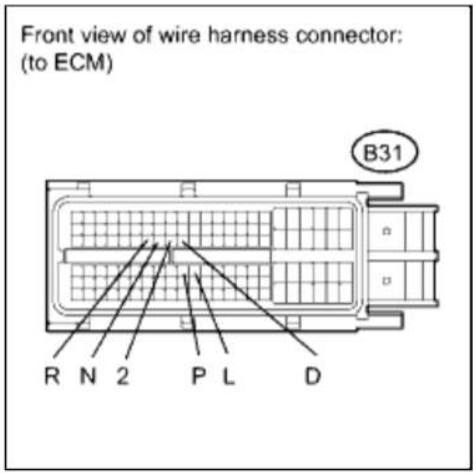
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	Except D and 3	10 kΩ or higher
2 - 3	2	Below 1 Ω
	Except 2	10 kΩ or higher
2 - 8	L	Below 1 Ω
	Except L	10 kΩ or higher

NG ▶ **REPLACE PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

OK ▼

4.	CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)



(a) Connect the park/neutral position switch connector.

(b) Disconnect the ECM connectors.

(c) Turn the ignition switch to ON, and measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

Standard voltage:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
B31-73 (P) - Body ground	P	11 to 14 V
	Except P	Below 1 V
B31-54 (N) - Body ground	N	11 to 14 V

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TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
	Except N	Below 1 V
B31-53 (R) - Body ground	R	11 to 14 V*
	Except R	Below 1 V
B31-56 (D) - Body ground	D and 3	11 to 14 V
	Except D and 3	Below 1 V
B31-55 (2) - Body ground	2	11 to 14 V
	Except 2	Below 1 V
B31-74 (L) - Body ground	L	11 to 14 V
	Except L	Below 1 V

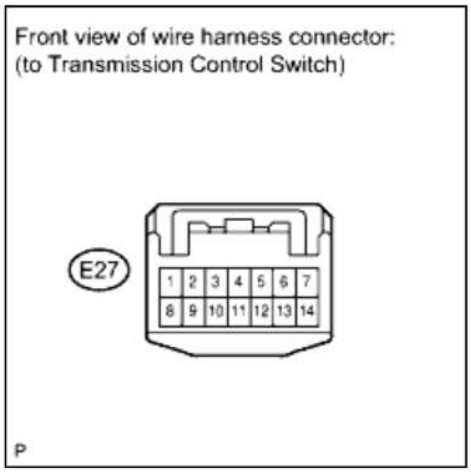
HINT:

***: The voltage will drop slightly due to lighting up of the back up light.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - TRANSMISSION CONTROL SWITCH)**



(a) Disconnect the transmission control switch connector of shift lock control unit assembly.

(b) Turn the ignition switch to ON, and measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

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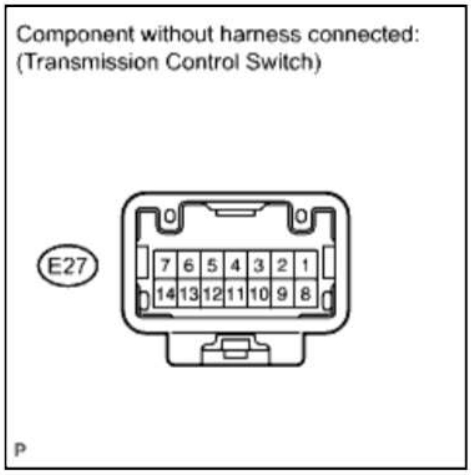
Standard voltage:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
1 - Body ground	D and 3	11 to 14 V
	Except D and 3	Below 1 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

6.	**INSPECT SHIFT LOCK CONTROL UNIT ASSEMBLY (TRANSMISSION CONTROL SWITCH)**



(a) Measure the resistance according to the value(s) in the table below when the shift lever is moved to each position.

Standard resistance:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
1 - 2	3 and 2	Below 1 Ω
	Except 3 and 2	10 kΩ or higher

Result:

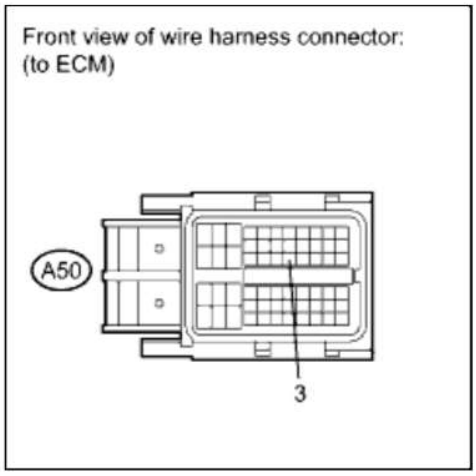
RESULT	PROCEED TO
OK	A
NG	B

B ▶ **REPLACE SHIFT LOCK CONTROL UNIT ASSEMBLY**

A ▼

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7.	CHECK HARNESS AND CONNECTOR (TRANSMISSION CONTROL SWITCH - ECM)



(a) Connect the transmission control switch connector of shift lock control unit assembly.

(b) Turn the ignition switch to ON, and measure the voltage according to the value(s) in the table below when the shift lever is moved to each position.

Standard voltage:

TESTER CONNECTION	SHIFT POSITION	SPECIFIED CONDITION
A50-26 (3) - Body ground	3	11 to 14 V
	Except 3	Below 1 V

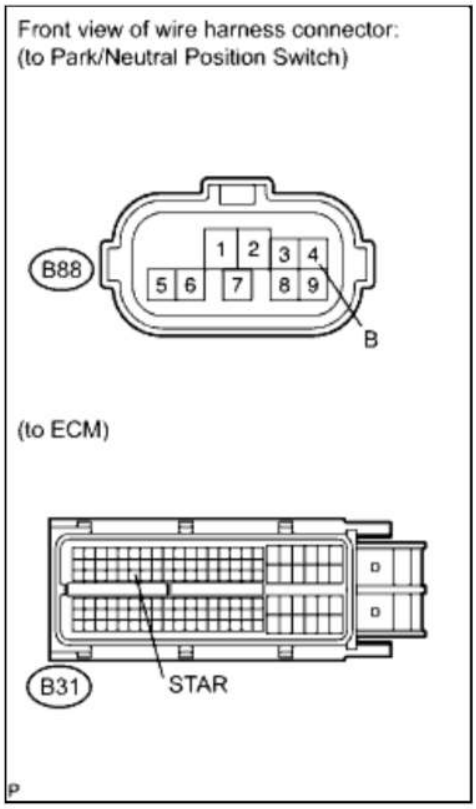
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

8.	CHECK HARNESS AND CONNECTOR (PARK/NEUTRAL POSITION SWITCH - ECM)

(a) Turn the ignition switch off.

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(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for open):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B88-4 (B) - B31-52 (STAR)	Always	Below 1 Ω

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B88-4 (B) or B31-52 (STAR) - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W850AZX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0710,P0712,P0713: Transmission Fluid Temperature Sensor "A" Circuit (2010 Corolla)		

DTC	**P0710**	**Transmission Fluid Temperature Sensor "A" Circuit**

DTC	**P0712**	**Transmission Fluid Temperature Sensor "A" Circuit Low Input**

DTC	**P0713**	**Transmission Fluid Temperature Sensor "A" Circuit High Input**

DESCRIPTION

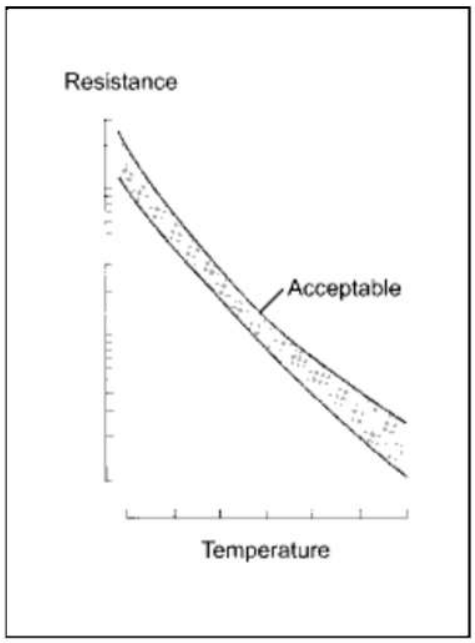
The ATF (Automatic Transmission Fluid) temperature sensor converts the fluid temperature into a resistance value which is input into the ECM.

The ECM applies a voltage to the temperature sensor through ECM terminal THO1 (THO).

The sensor resistance changes with the transmission fluid temperature. As the temperature becomes higher, the sensor resistance decreases.

One terminal of the sensor is grounded so that the sensor resistance decreases and the voltage goes down as the temperature becomes higher.

The ECM calculates the fluid temperature based on the voltage signal.



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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0710	(a) and (b) are detected momentarily within 0.5 sec. when neither P0712 nor P0713 is detected (1-trip detection logic) (a) ATF temperature sensor resistance is less than 79 Ω. (b) ATF temperature sensor resistance is more than 156 kΩ. HINT: Within 0.5 sec., the malfunction switches from (a) to (b) or from (b) to (a)	• Open or short in ATF temperature sensor circuit • Transmission wire (ATF temperature sensor) • ECM
P0712	ATF temperature sensor resistance is less than 79 Ω for 0.5 sec. or more (1-trip detection logic)	• Short in ATF temperature sensor circuit • Transmission wire (ATF temperature sensor) • ECM
P0713	ATF temperature sensor resistance is more than 156 kΩ when 15 minutes or more have elapsed after the engine start DTC is detected for 0.5 sec. or more (1-trip detection logic)	• Open in ATF temperature sensor circuit • Transmission wire (ATF temperature sensor) • ECM

MONITOR DESCRIPTION

These DTCs indicate an open or short in the automatic transmission fluid (ATF) temperature sensor (TFT sensor) circuit. The automatic transmission fluid (ATF) temperature sensor converts ATF temperature to an electrical resistance value. Based on the resistance, the ECM determines the ATF temperature, and the ECM detects an opens or shorts in the ATF temperature circuit. If the resistance value of the ATF temperature is less than 79 Ω *1 or more than 156 kΩ *2, the ECM interprets this as a fault in the ATF sensor or wiring. The ECM will turn on the MIL and store the DTC.

*1: 150°C (302°F) or more is indicated regardless of the actual ATF temperature.

*2: -40°C (-40°F) is indicated regardless of the actual ATF temperature.

HINT:

The ATF temperature can be checked on the Techstream display.

MONITOR STRATEGY

Related DTCs	P0710: ATF temperature sensor/Range check (Fluttering) P0712: ATF temperature sensor/Range check (Low resistance) P0713: ATF temperature sensor/Range check (High resistance)

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Required sensors/Components	ATF temperature sensor (TFT*1 sensor)
Frequency of operation	Continuous
Duration	0.45 seconds
MIL operation	Immediate
Sequence of operation	None

*1: Transmission Fluid Temperature

TYPICAL ENABLING CONDITIONS

P0710: Range check (Fluttering)

The monitor runs whenever the following DTCs are not present.	None
The typical enabling conditions are not available.	-

P0712: Range check (Low resistance)

The monitor runs whenever the following DTCs are not present.	None
The typical enabling conditions are not available.	-

P0713: Range check (High resistance)

The monitor runs whenever the following DTCs are not present.	None
Time after engine start	15 minutes or more

TYPICAL MALFUNCTION THRESHOLDS

P0710: Range check (Fluttering)

ATF temperature sensor (TFT sensor) resistance	Less than 79 Ω or More than 156 kΩ

P0712: Range check (Low resistance)

ATF temperature sensor (TFT sensor) resistance	Less than 79 Ω

P0713: Range check (High resistance)

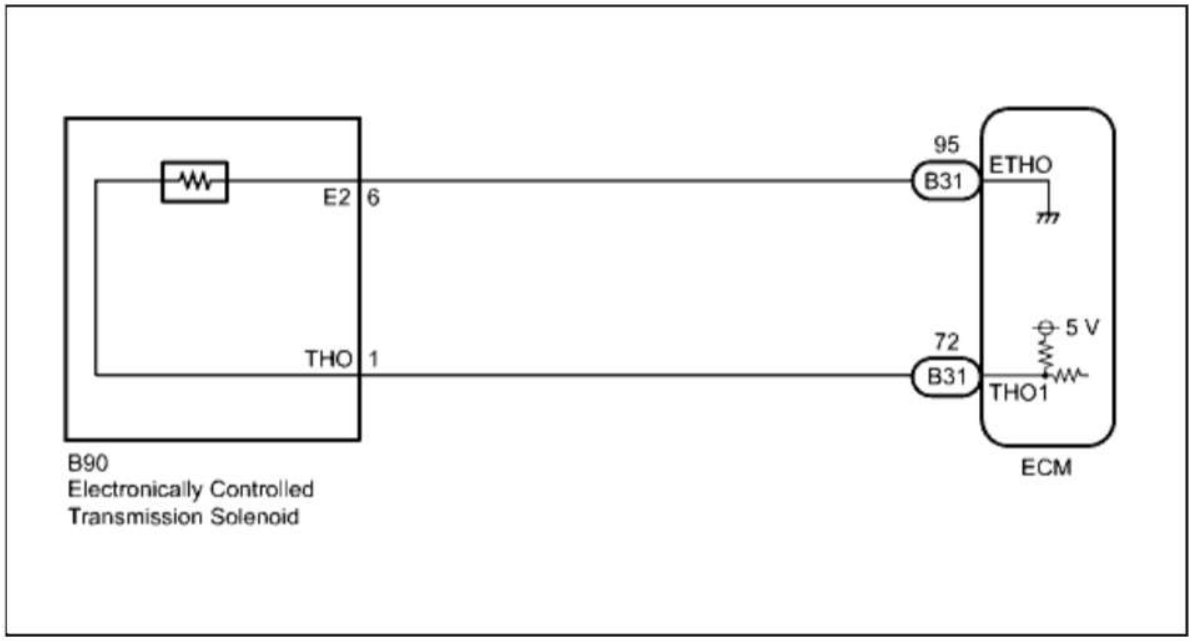
ATF temperature sensor (TFT sensor) resistance	More than 156 kΩ

COMPONENT OPERATING RANGE

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ATF temperature sensor (TFT sensor) resistance	Resistance: 79 Ω to 156 kΩ

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the value listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

1. READ DATA LIST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the Techstream, read the "Data List".

TESTER	MEASUREMENT	NORMAL CONDITION	DIAGNOSTIC NOTE

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DISPLAY	ITEM/RANGE		
A/T Oil Temperature 1	ATF Temp. Sensor Value/ min.: -40°C (-40°F) max.: 215°C (419°F)	• After Stall Test: Approx. 80°C (176°F) • Equal to ambient temperature when cold soak	If the value is "-40°C (-40°F)" or "215°C (419°F)", ATF temp. sensor circuit is opened or shorted.

HINT:

When DTC P0712 is output and Techstream output is 150°C (302°F), there is a short circuit.

When DTC P0713 is output and Techstream output is -40°C (-40°F), there is an open circuit.

Measure the resistance between terminal THO1 (THO) and body ground.

TEMPERATURE DISPLAYED	MALFUNCTION
-40°C (-40°F)	Open circuit
150°C (302°F) or more	Short circuit

HINT:

If a circuit related to the ATF temperature sensor become open, P0713 is immediately set (in 0.5 second).

When P0713 is set, P0711 cannot be detected.

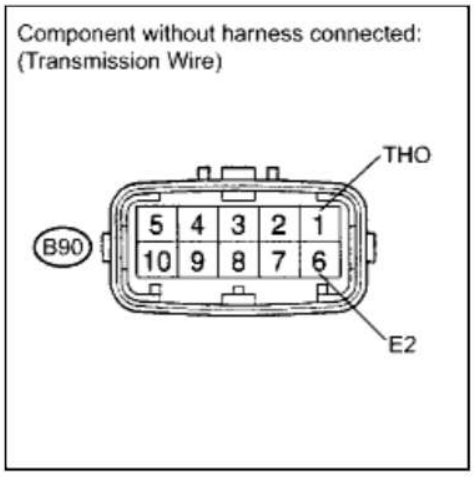
It is not necessary to inspect the circuit when P0711 is set.

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (ATF TEMPERATURE SENSOR)**

(a) Disconnect the transmission wire connector from the transaxle.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (THO) - 6 (E2)	Always	79 Ω to 156 kΩ
1 (THO) - Body ground	Always	10 kΩ or higher
6 (E2) - Body ground	Always	↑

HINT:

If the resistance is out of the specified range with either the ATF temperature shown in the table below, the driveability of the vehicle may decrease.

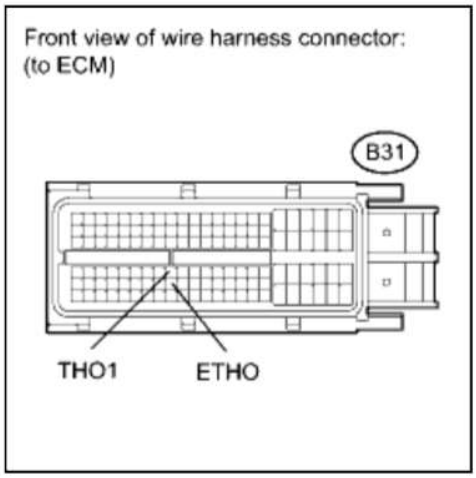
ATF Temperature	Specified Condition
10°C (50°F)	5 to 8 kΩ
25°C (77°F)	2.5 to 4.5 kΩ
110°C (230°F)	0.22 to 0.28 kΩ

NG ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)**

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(a) Connect the transmission wire connector to the transaxle.

(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-72 (THO1) - B31-95 (ETHO)	Always	79 Ω to 156 kΩ

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-72 (THO1) - Body ground	Always	10 kΩ or higher
B31-95 (ETHO) - Body ground	Always	↑

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W7Z09QX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0711: Transmission Fluid Temperature Sensor "A" Performance (2010 Corolla)		

DTC	**P0711**	**Transmission Fluid Temperature Sensor "A" Performance**

SYSTEM DESCRIPTION

The ATF (Automatic Transmission Fluid) temperature sensor converts the fluid temperature into a resistance value which is input into the ECM.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0711	Either of the following Condition (A) or (B) is met: Condition (A): All of (a), (b) and (c) are detected (2-trip detection logic): (a) Intake air and engine coolant temperatures are more than -10°C (14°F) at engine start. (b) After normal driving for over 5 minutes and 5.6 miles (9 km) or more, ATF temperature is less than 20°C (68°F). (c) 19 minutes or more have elapsed after engine start. Condition (B): Both (a) and (b) are detected (2-trip detection logic) (a) Engine coolant temperature is less than 35°C (95°F) at engine start. (b) ATF temperature is 100°C (212°F) or more when engine coolant temperature reaches 60°C (140°F).	Transmission wire (ATF temperature sensor)

MONITOR DESCRIPTION

The ATF temperature sensor converts the ATF temperature to an electrical resistance value. Based on the resistance, the ECM determines the ATF temperature and detects opens or shorts in the ATF temperature circuit or a fault of the ATF temperature sensor.

After running the vehicle for a certain period, the ATF temperature should increase. If the ATF temperature is below 20°C (68°F) after running the vehicle for a certain period, the ECM interprets this as a fault, and turns on the MIL.

When the ATF temperature is 100°C (212°F) or more and engine coolant temperature reaches 60°C (140°F) after cold start, the ECM also determines this as a fault, turns on the MIL, and stores the DTC.

MONITOR STRATEGY

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Related DTCs	P0711: ATF temperature sensor/Rationality check
Required sensors/Components	ATF temperature sensor (TFT* sensor)
Frequency of operation	Continuous
Duration	Condition (A): 3 seconds Condition (B): 10 seconds
MIL operation	2 driving cycles
Sequence of operation	None

*: Transmission Fluid Temperature

TYPICAL ENABLING CONDITIONS

The following conditions are common to Condition (A) and (B).

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0710, P0712, P0713 (ATF temperature sensor circuit (TFT sensor)) P0115, P0117, P0118 (ECT sensor circuit) P0112, P0113 (IAT sensor circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle control system)
ATF temperature sensor (TFT sensor) circuit	No circuit malfunction
ECT (Engine Coolant Temperature) sensor circuit	No circuit malfunction
IAT (Intake Air Temperature) sensor circuit	No circuit malfunction
Electronic Throttle Control System (if applicable)	No circuit malfunction

Condition (A):

Time after engine start	18 minutes and 20 seconds or more
Driving distance after engine start	5.6 mile (9 km) or more
Accumulated driving time	4 minutes and 10 seconds or more
ECT	-15°C (5°F) or more
IAT (12 seconds after engine start)	-10°C (14°F) or more
ECT (12 seconds after engine start)	-10°C (14°F) or more

Condition (B):

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ECT (Current temperature)	60°C (140°F) or more
ECT (12 seconds after engine start)	Less than 35°C (95°F)
ATF temperature (12 seconds after engine start)	100°C (212°F) or more

TYPICAL MALFUNCTION THRESHOLDS

Either of the following conditions is met: Condition (A) or (B)

Condition (A):

ATF temperature	Less than 20°C (68°F)

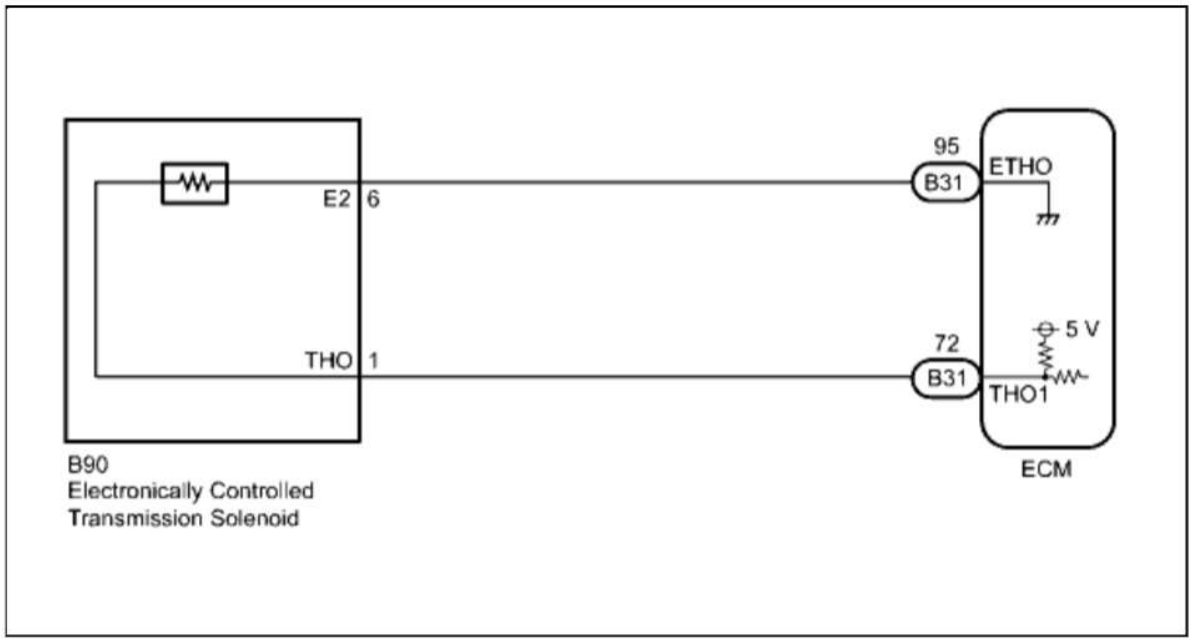
Condition (B):

ATF temperature	100°C (212°F) or more

COMPONENT OPERATING RANGE

ATF temperature	Atmospheric temperature to approx. 130°C (266°F)

WIRING DIAGRAM



INSPECTION PROCEDURE

HINT:

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Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the value listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether apart is faulty or not.

1. READ DATA LIST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the Techstream, read the "Data List".

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
A/T Oil Temperature 1	ATF Temp. Sensor Value/ min.: -40°C (-40°F) max.: 215°C (419°F)	• After Stall Test: Approx. 80°C (176°F) • Equal to ambient temperature when cold soak	If the value is "-40°C (-40°F)" or "215°C (419°F)", ATF temp. sensor circuit is opened or shorted.

HINT:

When DTC P0712 is output and the Techstream output is 150°C (302°F), there is a short circuit.

When DTC P0713 is output and the Techstream output is -40°C (-40°F), there is an open circuit.

Measure the resistance between terminal THO (TH01) and body ground.

TEMPERATURE DISPLAYED	MALFUNCTION
-40°C (-40°F)	Open circuit
150°C (302°F) or more	Short circuit

HINT:

If a circuit related to the ATF temperature sensor becomes open, P0713 is immediately set (in 0.5 second).

When P0713 is set, P0711 cannot be detected.

It is not necessary to inspect the circuit when P0711 is set.

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PROCEDURE

1.	CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0711)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON and the Techstream main switch on.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using the Techstream.

Result:

RESULT	PROCEED TO
P0711	A
P0711 and other DTCs	B

HINT:

If any other codes besides "P0711" are output, perform troubleshooting for those DTCs first.

B ▶ **GO TO DTC CHART**

A ▼

2.	CHECK TRANSMISSION FLUID LEVEL

OK:
Automatic transmission fluid level is correct.

NG ▶ **ADD FLUID**

OK ▶ **REPLACE TRANSMISSION WIRE (ATF TEMPERATURE SENSOR)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015VR043X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0717: Turbine Speed Sensor Circuit No Signal (2010 Corolla)		

DTC	**P0717**	**Turbine Speed Sensor Circuit No Signal**

DESCRIPTION

This sensor detects the rotation speed of the input turbine. By comparing the input turbine speed signal (NT) with the output shaft speed, the ECM detects the shift timing of the gears and appropriately controls the engine torque and hydraulic pressure according to various conditions. Thus, providing smooth gear shift.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0717	ECM detects conditions (a), (b) and (c) continuously for 5 sec. or more: (1-trip detection logic) (a) Vehicle speed: 50 km/h (31 mph) or more (b) Park/neutral position switch (STAR, R and L) is OFF (c) Speed sensor (NT): less than 300 rpm	• Open or short in transmission revolution sensor NT (speed sensor NT) circuit • Transmission revolution sensor NT (speed sensor NT) • ECM • Automatic transaxle assembly

MONITOR DESCRIPTION

The input speed sensor detects the transmission input shaft speed. The ECM determines the gear shift timing based on a comparison of the input speed sensor (input shaft speed) with the output speed sensor (output shaft speed).

When the output shaft speed is higher than the expected value and the input shaft speed is 300 rpm or less while running with the shift in the D position, the ECM will conclude that there is malfunction of the input turbine speed sensor (NT). The ECM will illuminate the MIL.

MONITOR STRATEGY

Related DTCs	P0717: Turbine speed sensor/Verify pulse input
Required sensors/Components	Transmission revolution sensor (Speed sensor (NT))
Frequency of operation	Continuous
Duration	5 seconds
MIL operation	Immediate

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Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor runs whenever the following DTCs are not present.	P0500 (VSS) P0748 - P0798 (Trans solenoid (range))
Shift change	After shift change is completed and before starting next shift change operation
ECM selected gear	2nd, 3rd or 4th
Output shaft rpm	1000 rpm or more
Park/neutral position switch	OFF
R switch	OFF
L switch	OFF
Transmission range switch fail	Not detected
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF
Engine	Running

TYPICAL MALFUNCTION THRESHOLDS

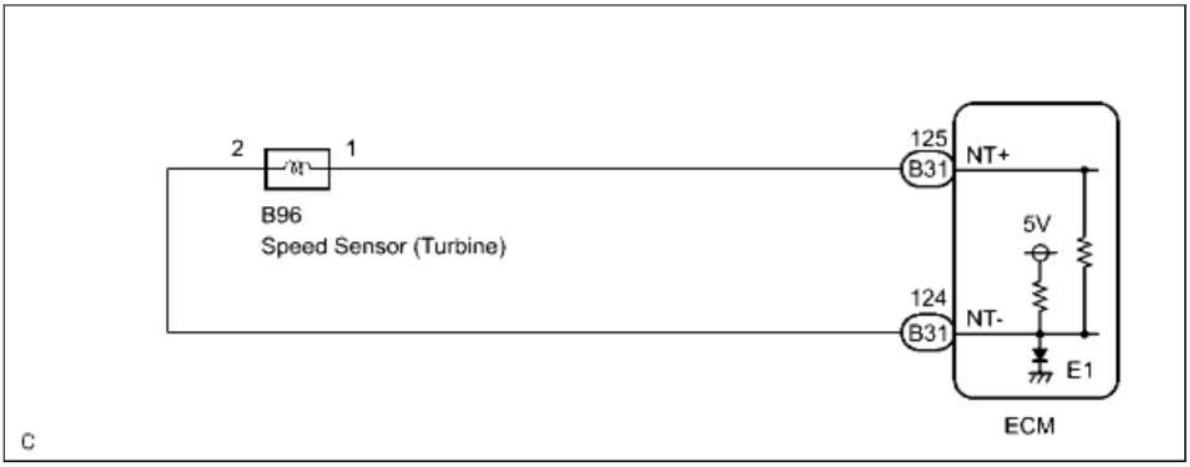
Sensor signal rpm	Less than 300 rpm

COMPONENT OPERATING RANGE

Transmission revolution sensor (speed sensor (NT))	Input turbine speed is equal to engine speed when lock-up ON

WIRING DIAGRAM

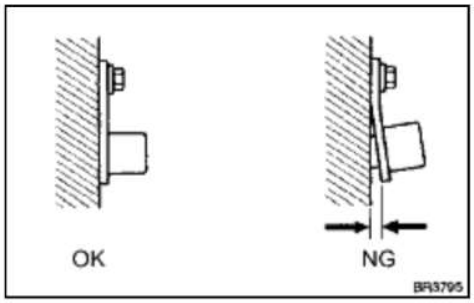
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INSPECTION PROCEDURE

PROCEDURE

1.	INSPECT SPEED SENSOR INSTALLATION



(a) Check the speed sensor installation.

OK:

The installation bolt is tightened properly and there is no clearance between the sensor and transaxle case.

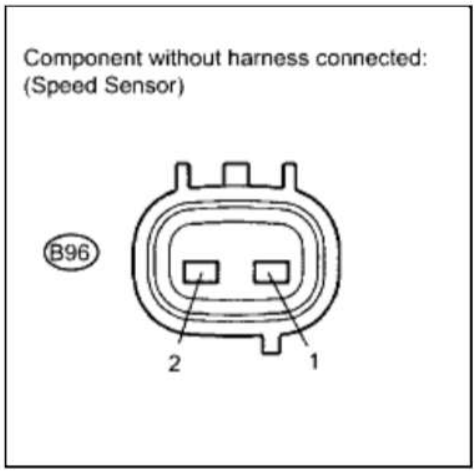
NG ▶ **REPLACE SPEED SENSOR (NT)**

OK ▼

2.	INSPECT SPEED SENSOR (NT)

(a) Disconnect the speed sensor connector from the transaxle.

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(b) Measure the resistance according to the value(s) in the table below.

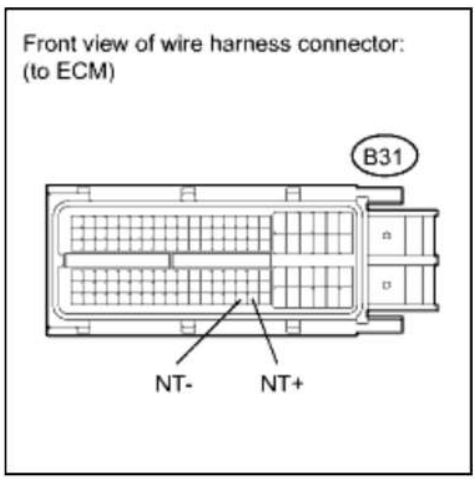
Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

NG ▶ **REPLACE SPEED SENSOR (NT)**

OK ▼

3.	CHECK HARNESS AND CONNECTOR (SPEED SENSOR - ECM)



(a) Connect the speed sensor connector.

(b) Disconnect the ECM connector.

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(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-125 (NT+) - B31-124 (NT-)	20°C (68°F)	560 to 680 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-125 (NT+) - Body ground	Always	10 kΩ or higher
B31-124 (NT-) - Body ground	Always	↑

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W003GX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0724: Brake Switch "B" Circuit High (2010 Corolla)		

DTC	**P0724**	**Brake Switch "B" Circuit High**

DESCRIPTION

The purpose of this circuit is to prevent the engine from stalling while driving in lock-up condition when brakes are suddenly applied.

When the brake pedal is depressed, this switch sends a signals to the ECM. Then the ECM cancels the operation of the lock-up clutch while braking is in progress.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0724	The stop light switch remains ON even when the vehicle is driven in a STOP (less than 3 km/h (2 mph) and GO (30 km/h (19 mph) or more) fashion 5 times. (2-trip detection logic).	• Short in stop light switch circuit • Stop light switch • ECM

MONITOR DESCRIPTION

This DTC indicates that the stop light switch remains on. When the stop light switch remains ON during "stop and go" driving, the ECM interprets this as a fault in the stop light switch and the MIL comes on and the ECM stores the DTC. The vehicle must stop (less than 3 km/h (2 mph)) and go (30 km/h (19 mph) or more) 5 times for two driving cycles in order to detect a malfunction.

MONITOR STRATEGY

Related DTCs	P0724: Stop light switch/Verify switch input
Required sensors/Components	Stop light switch, Vehicle speed sensor
Frequency of operation	Continuous
Duration	GO and STOP 5 times
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

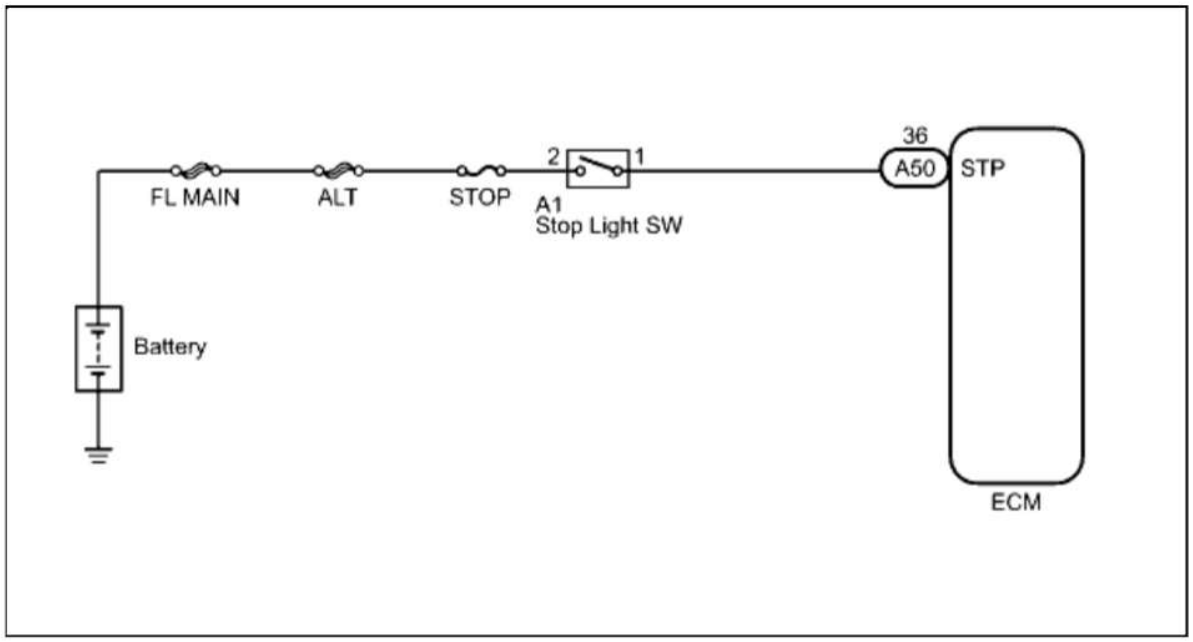
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The monitor will run whenever this DTC is not present.	None
Ignition switch	ON
Starter	OFF
Battery voltage	8 V or more
GO (Vehicle speed is 30 km/h (18.63 mph) or more)	Once
STOP (Vehicle speed is less than 3 km/h (1.86 mph))	Once

TYPICAL MALFUNCTION THRESHOLDS

Brake switch	Remain ON during GO and STOP 5 times

WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	READ VALUE USING DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and

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other items to be read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Data List".

(g) According to the display on the Techstream, read the "Data List".

Standard:

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light Switch	Stop light switch Status/ON or OFF	• Brake Pedal is depressed: ON • Brake Pedal is released: OFF	-

NOTICE:

In the table above, the value listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

Result:

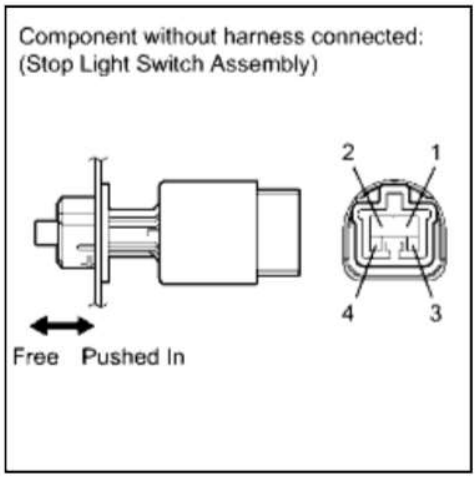
RESULT	PROCEED TO
NG	A
OK	B

B ▶ **CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - ECM)**

A ▼

2.	**INSPECT STOP LIGHT SWITCH ASSEMBLY**

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(a) Remove the stop light switch assembly.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	SWITCH POSITION	SPECIFIED CONDITION
1 - 2	Switch pin free	Below 1 Ω
↑	Switch pin pushed in	10 kΩ or higher
3 - 4	Switch pin free	10 kΩ or higher
↑	Switch pin pushed in	Below 1 Ω

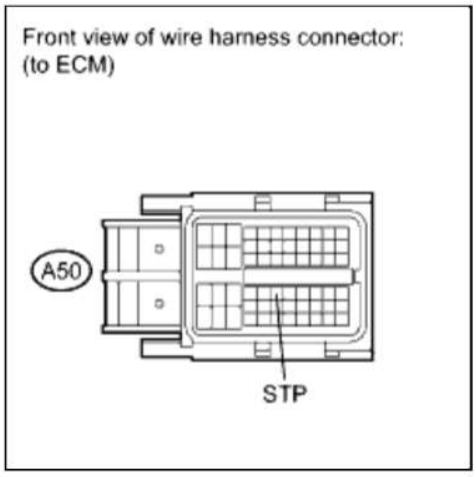
NG ▶ **REPLACE STOP LIGHT SWITCH ASSEMBLY**

OK ▼

3.	**CHECK HARNESS AND CONNECTOR (STOP LIGHT SWITCH ASSEMBLY - ECM)**

(a) Install the stop light switch assembly.

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(b) Disconnect the ECM connector.

(c) Measure the voltage according to the value(s) in the table below when the brake pedal is depressed and released.

Standard voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A50-36 (STP) - Body ground	Brake pedal is depressed	11 to 14 V
	Brake pedal is released	Below 1 V

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

TOYOTA

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026F7015X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0751: Shift Solenoid "A" Performance (Shift Solenoid Valve S1) (2010 Corolla)		

DTC	**P0751**	**Shift Solenoid "A" Performance (Shift Solenoid Valve S1)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor and speed sensor NT to detect the actual gear position (1st, 2nd, 3rd or 4th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect the mechanical problems of the shift solenoid valves, the valve body or automatic transaxle (clutch, brake or gear etc.).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0751	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve S1 remains open or closed • Valve body is blocked • Shift solenoid valve S1 • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd or 4th gear position). When the gear position commanded by the ECM and the actual gear position are not same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0751: Shift solenoid valve S1/OFF malfunction Shift solenoid valve S1/ON malfunction
Required sensors/Components	Shift solenoid valve S1, Speed sensor (NT), Speed sensor (SPD), Engine coolant temperature sensor (ECT)
Frequency of operation	Continuous

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Duration	OFF malfunction (a): 0.85 seconds OFF malfunction (b): 0.8 seconds ON malfunction (a): 0.8 seconds ON malfunction (b): 0.8 seconds
MIL operation	2 driving cycle
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The following conditions are common to all OFF malfunctions and ON malfunctions.

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0500 (Vehicle speed sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0973, P0974 (Shift solenoid valve S1 circuit) P0976, P0977 (Shift solenoid valve S2 circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle control system)
ECT (Engine Coolant Temperature)	60°C (140°F) or more
Time after shifting N to D	4.5 seconds or more
Transmission shift position	D
Shift solenoid valve S1 circuit	No circuit malfunction
Shift solenoid valve S2 circuit	No circuit malfunction
ECT sensor circuit	No circuit malfunction
Electronic Throttle Control System (if applicable)	No circuit malfunction
Speed sensor (NT) circuit	No circuit malfunction
Speed sensor (SPD) circuit	No circuit malfunction

OFF malfunction (a):

ECM gearshift command	1st
Vehicle speed	5.6 mph (9 km/h) or more and

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	Less than 24.9 mph (40 km/h)
Throttle valve opening angle	7.0 % or more and 4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

OFF malfunction (b):

ECM gearshift command	4th
Last ECM selected gear	3rd

ON malfunction (a):

ECM gearshift command	4th
Last ECM selected gear	3rd

ON malfunction (b):

ECM gearshift command	4th
V current - V last V current: Vehicle speed at current ECM selected gear V last: Vehicle speed at last ECM selected gear	Less than 9.3 mph (15 km/h)
TH current - TH last TH current: Throttle valve opening angle at current ECM selected gear TH last: Throttle valve opening angle at last ECM selected gear	Less than 20 %
Vehicle speed (current)	Less than 52.8 mph (85 km/h)
Throttle valve opening angle (current)	Less than 35 %
Engine speed (current)	3200 rpm or more

TYPICAL MALFUNCTION THRESHOLDS

[OFF malfunction]

Both of the following conditions met: OFF malfunctions (a) and (b)

2 detections are necessary per driving cycle.

1st detection: Temporary flag ON

2nd detection: Pending fault code ON

OFF malfunction (a):

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Input speed/Output speed (NT/NO) NT: Input (turbine) speed NO: Internal counter shaft speed	0.64 or more and less than 0.78 (Current) (This means actual gear is 4th)

OFF malfunction (b):

Input speed/Output speed (NT/NO)	Changes as follows 0.95 or more and less than 1.09 (Last) (This means actual gear is 3rd) to 0.64 or more and less than 0.78 (Current) (This means actual gear is 4th)

[ON malfunction]

Both of the following conditions met: ON malfunctions (a) and (b)

ON malfunction (a):

Input speed/Output speed (NT/NO)	No change as follows 0.95 or more and less than 1.09 (Last) (This means actual gear is 3rd) to 0.64 or more and less than 0.78 (Current) (This means actual gear is 4th)

ON malfunction (b):

NE change **HINT:** **NE current - NE last** NE current: Engine speed at current ECM selected gear NE last: Engine speed at last ECM selected gear	1100 rpm or more

INSPECTION PROCEDURE

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

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(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Active Test".

(g) According to the display on the Techstream, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with the Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to confirm the problem INFO **.**

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set the each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th	Possible to check the operation of the shift solenoid valves.

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List/Shift Status display on the Techstream.

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0751)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON and the Techstream main switch on.

(c) Select the item "Powertrain / Engine and ECT / Trouble Codes".

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(d) Read the DTCs using the Techstream.

Result:

RESULT	PROCEED TO
P0751	A
P0751 and other DTCs	B

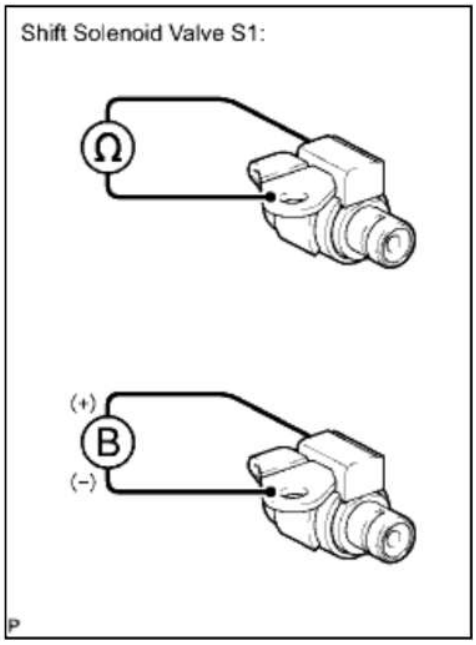
HINT:

If any other codes besides "P0751" are output, perform the troubleshooting for those DTCs first.

B ▶ **GO TO DTC CHART**

A ▼

2.	**INSPECT SHIFT SOLENOID VALVE S1**



(a) Remove the shift solenoid valve S1.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S1) - Solenoid Body (S1)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE S1**

OK ▼

3.	**INSPECT TRANSMISSION VALVE BODY ASSEMBLY**

OK:

There are no foreign objects on each valve and they operate smoothly.

NG ▶ **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY**

OK ▶ **REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026F8015X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0756: Shift Solenoid "B" Performance (Shift Solenoid Valve S2) (2010 Corolla)		

DTC	**P0756**	**Shift Solenoid "B" Performance (Shift Solenoid Valve S2)**

SYSTEM DESCRIPTION

The ECM uses signals from the vehicle speed sensor and speed sensor NT to detect the actual gear position (1st, 2nd, 3rd or 4th gear).

Then the ECM compares the actual gear with the shift schedule in the ECM memory to detect the mechanical problems of the shift solenoid valves, the valve body or automatic transaxle (clutch, brake or gear etc.).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0756	The gear required by the ECM does not match the actual gear when driving (2-trip detection logic)	• Shift solenoid valve S2 remains open or closed • Valve body is blocked • Shift solenoid valve S2 • Automatic transaxle (clutch, brake or gear etc.)

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". According to the input shaft revolution, intermediate (counter) shaft revolution and output shaft revolution, the ECM detects the actual gear position (1st, 2nd, 3rd or 4th gear position). When the gear position commanded by the ECM and the actual gear position are not same, the ECM illuminates the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P0756: Shift solenoid valve S2/OFF malfunction Shift solenoid valve S2/ON malfunction
Required sensors/Components	Shift solenoid valve S2, Speed sensor (NT), Speed sensor (SPD), Engine coolant temperature sensor (ECT)
Frequency of operation	Continuous
Duration	0.85 seconds

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MIL operation	2 driving cycle
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The following conditions are common to all OFF malfunctions and ON malfunctions.

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0500 (Vehicle speed sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0973, P0974 (Shift solenoid valve S1 circuit) P0976, P0977 (Shift solenoid valve S2 circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle control system)
ECT (Engine Coolant Temperature)	60°C (140°F) or more
Transmission shift position	D
Time after shifting N to D	4.5 seconds or more
Shift solenoid valve S1 circuit	No circuit malfunction
Shift solenoid valve S2 circuit	No circuit malfunction
ECT sensor circuit	No circuit malfunction
Electronic Throttle Control System (if applicable)	No circuit malfunction
Speed sensor (NT) circuit	No circuit malfunction
Speed sensor (SPD) circuit	No circuit malfunction

OFF malfunction (a):

ECM gearshift command	1st
Vehicle speed	5.6 mph (9 km/h) or more and less than 24.9 mph (40 km/h)
Throttle valve opening angle	4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

OFF malfunction (b):

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ECM gearshift command	3rd
Vehicle speed	5.6 mph (9 km/h) or more
Throttle valve opening angle	4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

OFF malfunction (c):

ECM gearshift command	4th
Vehicle speed	5.6 mph (9 km/h) or more
Throttle valve opening angle	4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

ON malfunction (a):

ECM gearshift command	2nd
Vehicle speed	5.6 mph (9 km/h) or more
Throttle valve opening angle	4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

ON malfunction (b):

ECM gearshift command	3rd
Vehicle speed	5.6 mph (9 km/h) or more
Throttle valve opening angle	4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

ON malfunction (c):

ECM gearshift command	4th
Vehicle speed	5.6 mph (9 km/h) or more
Throttle valve opening angle	4.0 % or more at engine speed of 1900 rpm (Conditions vary with engine speed)

TYPICAL MALFUNCTION THRESHOLDS

[OFF malfunction]

All of the following conditions met: OFF malfunctions (a), (b) and (c)

2 detections are necessary per driving cycle.

1st detection: Temporary flag ON

2nd detection: Pending fault code ON

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OFF malfunction (a):

Input speed/Output speed (NT/NO) NT: Input (turbine) speed NO: Internal counter shaft speed	1.50 or more and less than 1.80 (This means actual gear is 2nd)

OFF malfunction (b):

Input speed/Output speed (NT/NO)	0.95 or more and less than 1.09 (This means actual gear is 3rd)

OFF malfunction (c):

Input speed/Output speed (NT/NO)	0.95 or more and less than 1.09 (This means actual gear is 3rd)

[ON malfunction]

All of the following conditions met: ON malfunctions (a), (b) and (c)

ON malfunction (a):

Input speed/Output speed (NT/NO)	2.75 or more and less than 3.51 (This means actual gear is 1st)

ON malfunction (b):

Input speed/Output speed (NT/NO)	0.64 or more and less than 0.78 (This means actual gear is 4th)

ON malfunction (c):

Input speed/Output speed (NT/NO)	0.64 or more and less than 0.78 (This means actual gear is 4th)

INSPECTION PROCEDURE

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

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(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item "Powertrain / Engine and ECT / Active Test".

(g) According to the display on the Techstream, perform the "Active Test".

HINT:

While driving, the shift position can be forcibly changed with the Techstream.

Comparing the shift position commanded by the Active Test with the actual shift position enables you to confirm the problem INFO **.**

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Control the Shift Position	[Test Details] Operate the shift solenoid valve and set the each shift position by yourself. [Vehicle Condition] • IDL: ON • Less than 50 km/h (31 mph) [Others] • Press "→" button: Shift up • Press "←" button: Shift down	1st/2nd /3rd/4th	Possible to check the operation of the shift solenoid valves.

HINT:

- This test can be conducted when the vehicle speed is 50 km/h (31 mph) or less.
- The shift position commanded by the ECM is shown in the Data List/Shift Status display on the Techstream.

PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P0756)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON and the Techstream main switch on.

(c) Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using the Techstream.

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Result:

RESULT	PROCEED TO
P0756	A
P0756 and other DTCs	B

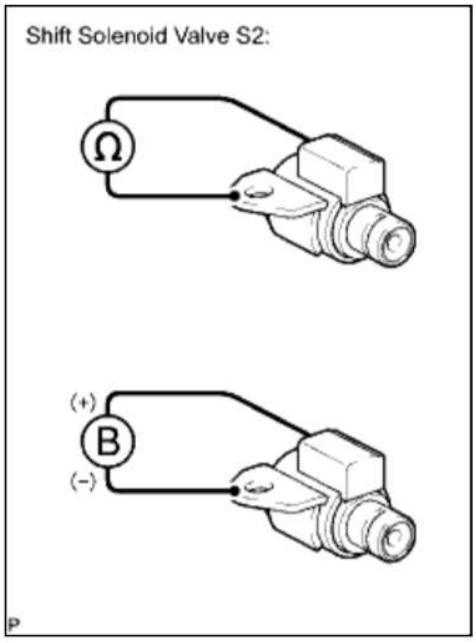
HINT:

If any other codes besides "P0756" are output, perform the troubleshooting for those DTCs first.

B ▶ GO TO DTC CHART

A ▼

2.	INSPECT SHIFT SOLENOID VALVE S2



(a) Remove the shift solenoid valve S2.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S2) - Solenoid Body (S2)	20°C (68°F)	11 to 15 Ω

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(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ REPLACE SHIFT SOLENOID VALVE S2

OK ▼

3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve and they operate smoothly.

NG ▶ REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

OK ▶ REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026FB013X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0787,P0788: Shift / Timing Solenoid Low (Shift Solenoid Valve ST) (2010 Corolla)		

DTC	**P0787**	**Shift / Timing Solenoid Low (Shift Solenoid Valve ST)**

DTC	**P0788**	**Shift / Timing Solenoid High (Shift Solenoid Valve ST)**

DESCRIPTION

Shift solenoid valve ST is switched ON-OFF by a signal from ECM so that let in or out timing of 2nd brake is adjusted by operating orifice control valve. Therefore, shift solenoid valve ST operates when letting in or out reverse clutch.

If the shift solenoid valve ST is broken, the shift shock becomes big.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0787	ECM detects short in solenoid valve ST circuit 2 times when solenoid valve ST is operated (1-trip detection logic)	• Short in shift solenoid valve ST circuit • Shift solenoid valve ST • ECM
P0788	ECM detects open in solenoid valve ST circuit 2 times when solenoid valve ST is not operated (1-trip detection logic)	• Open in shift solenoid valve ST circuit • Shift solenoid valve ST • ECM

MONITOR DESCRIPTION

The ECM commands gearshift by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and the MIL comes on. Illuminating the MIL, the ECM performs the fail-safe and turns the other shift solenoid valves in good condition "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.).

MONITOR STRATEGY

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Related DTCs	P0787: Shift timing solenoid/Range check (Low resistance) P0788: Shift timing solenoid/Range check (High resistance)
Required sensors/Components	Shift solenoid valve ST
Frequency of operation	Continuous
Duration	0.128 seconds
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P0787: Range check (Low resistance)

The monitor runs whenever the following DTCs are not present	None
Solenoid	ON
Time after solenoid OFF to ON	More than 0.008 seconds
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

P0788: Range check (High resistance)

The monitor runs whenever the following DTCs are not present	None
Solenoid	OFF
Time after solenoid ON to OFF	More than 0.008 seconds
Battery voltage	8 V or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

P0787: Range check (Low resistance)

Shift solenoid valve ST resistance	8 Ω or less

P0788: Range check (High resistance)

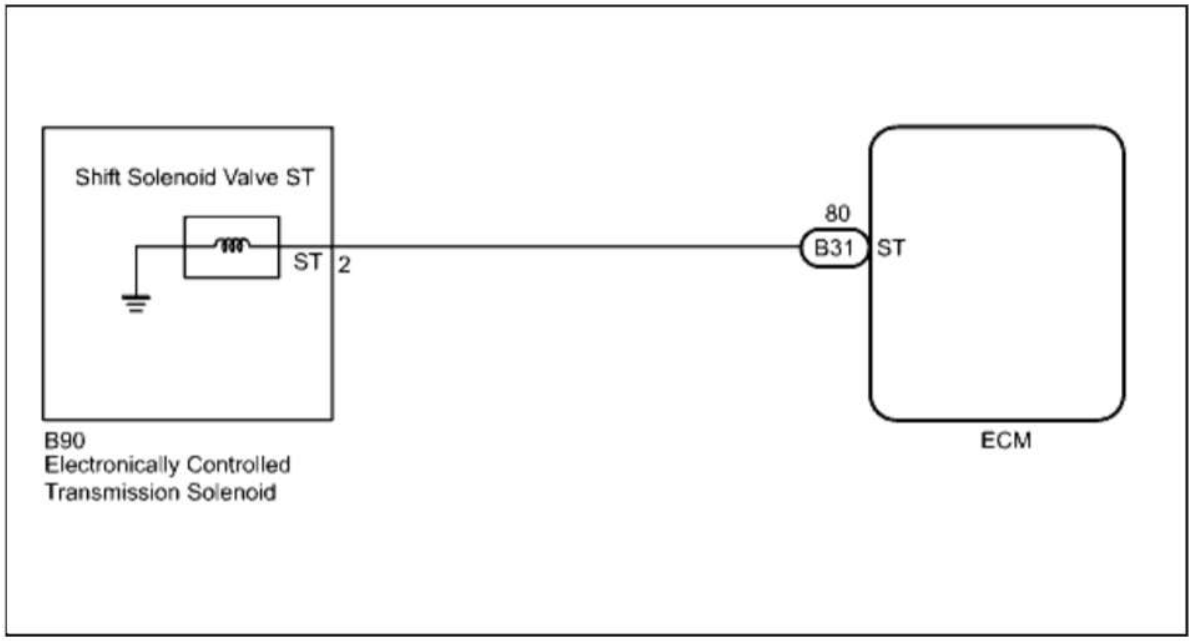
Shift solenoid valve ST resistance	100 kΩ or more

COMPONENT OPERATING RANGE

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Shift solenoid valve ST resistance	11 to 15 Ω at 20°C (68°F)

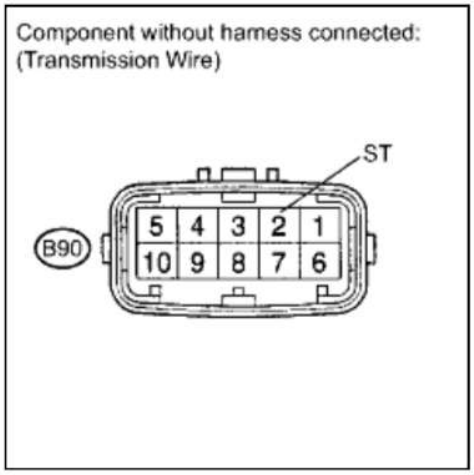
WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (ST)**



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

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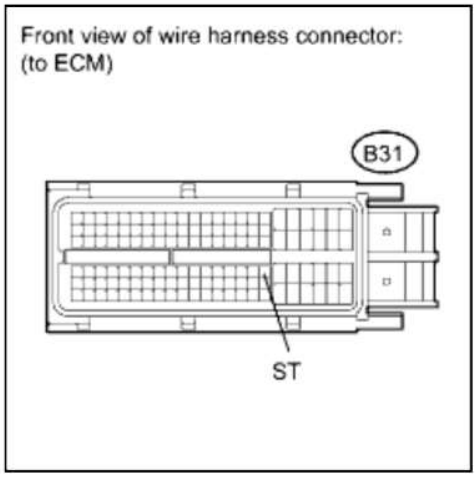
Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
2 - Body ground	20°C (68°F)	11 to 15 Ω

NG ▶ **INSPECT SHIFT SOLENOID VALVE ST**

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission wire connector to the transaxle.

(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

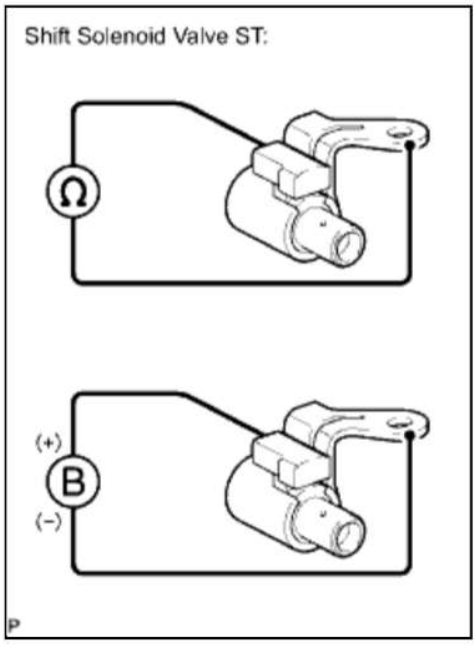
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-80 (ST) - Body ground	20°C (68°F)	11 to 15 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

3.	INSPECT SHIFT SOLENOID VALVE ST

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(a) Remove the shift solenoid valve ST.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (ST) - Solenoid Body (ST)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE ST**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026F9018X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0973,P0974: Shift Solenoid "A" Control Circuit Low (Shift Solenoid Valve S1) (2010 Corolla)		

DTC	**P0973**	**Shift Solenoid "A" Control Circuit Low (Shift Solenoid Valve S1)**

DTC	**P0974**	**Shift Solenoid "A" Control Circuit High (Shift Solenoid Valve S1)**

DESCRIPTION

Shifting from 1st to 4th is performed in combination with "ON" and "OFF" of the shift solenoid valve S1 and S2 controlled by ECM. If an open or short circuit occurs in either of the solenoid valves, the ECM controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0973	ECM detects short in solenoid valve S1 circuit 2 times when solenoid valve S1 is operated (1-trip detection logic)	• Short in shift solenoid valve S1 circuit • Shift solenoid valve S1 • ECM
P0974	ECM detects open in solenoid valve S1 circuit 2 times when solenoid valve S1 is not operated (1-trip detection logic)	• Open in shift solenoid valve S1 circuit • Shift solenoid valve S1 • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other shift solenoid valves in good condition "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.) INFO .

MONITOR STRATEGY

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Related DTCs	P0973: Shift solenoid valve S1/Range check (Low resistance) P0974: Shift solenoid valve S1/Range check (High resistance)
Required sensors/Components	Shift solenoid valve S1
Frequency of operation	Continuous
Duration	0.128 seconds or more
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P0973: Range check (Low resistance)

The monitor runs whenever the following DTCs are not present.	None
Solenoid	ON
Time after solenoid OFF to ON	More than 0.008 seconds

P0974: Range check (High resistance)

The monitor runs whenever the following DTCs are not present.	None
Solenoid	OFF
Time after solenoid ON to OFF	More than 0.008 seconds

TYPICAL MALFUNCTION THRESHOLDS

P0973: Range check (Low resistance)

Shift solenoid valve S1 resistance	8 Ω or less

P0974: Range check (High resistance)

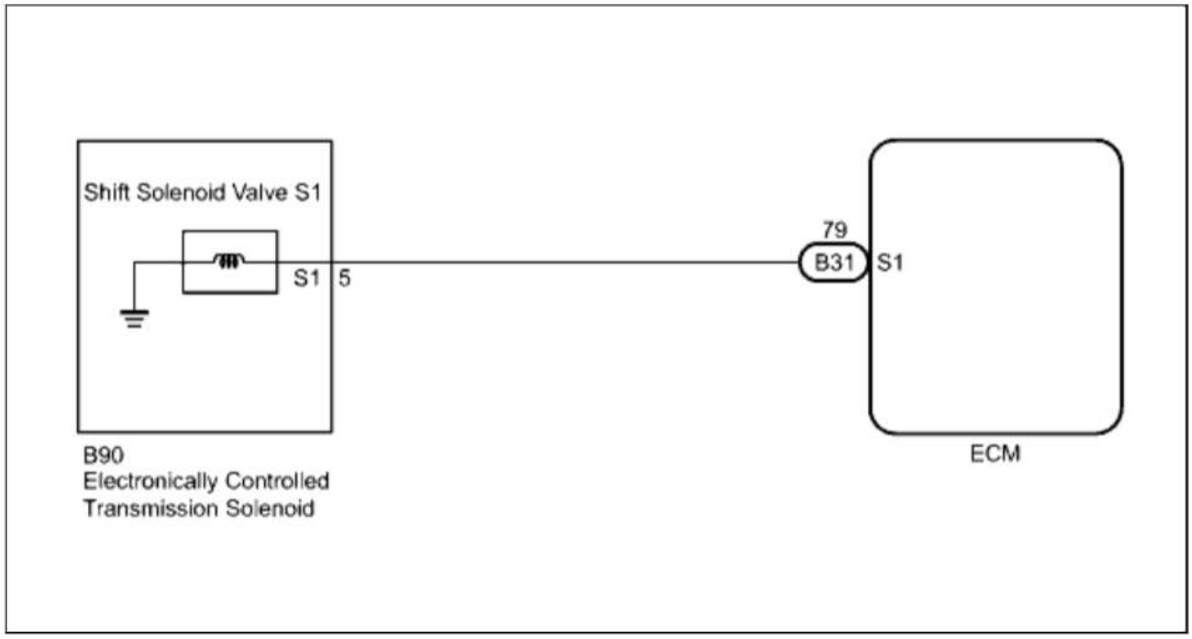
Shift solenoid valve S1 resistance	100 kΩ or more

COMPONENT OPERATING RANGE

Shift solenoid valve S1 resistance	11 to 15 Ω at 20°C (68°F)

WIRING DIAGRAM

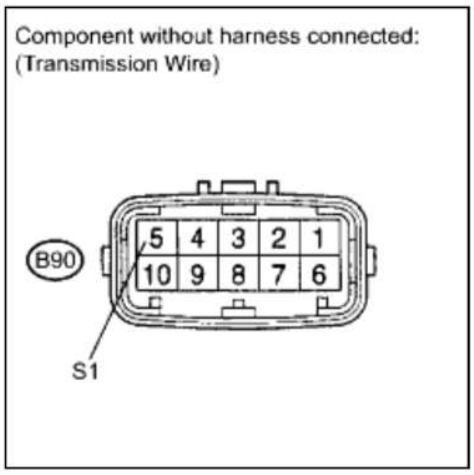
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INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (S1)**



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

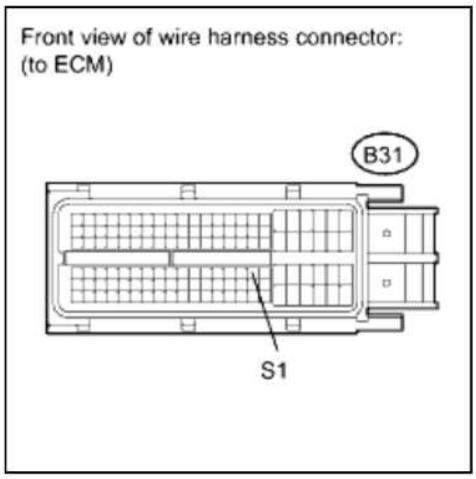
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
5 - Body ground	20°C (68°F)	11 to 15 Ω

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NG ▶ INSPECT SHIFT SOLENOID VALVE S1

OK ▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission wire connector to the transaxle.

(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-79 (S1) - Body ground	20°C (68°F)	11 to 15 Ω

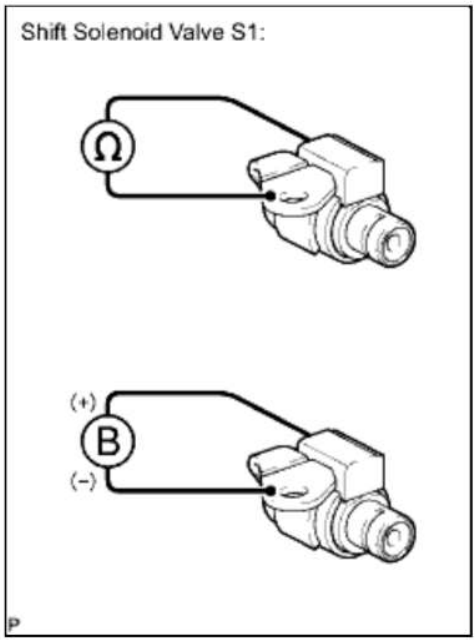
NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

OK ▶ REPLACE ECM (for 2ZR-FE)

3.	INSPECT SHIFT SOLENOID VALVE S1

(a) Remove the shift solenoid valve S1.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S1) - Solenoid Body (S1)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE S1**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000026FA018X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P0976,P0977: Shift Solenoid "B" Control Circuit Low (Shift Solenoid Valve S2) (2010 Corolla)		

DTC	**P0976**	**Shift Solenoid "B" Control Circuit Low (Shift Solenoid Valve S2)**

DTC	**P0977**	**Shift Solenoid "B" Control Circuit High (Shift Solenoid Valve S2)**

DESCRIPTION

Shifting from 1st to 4th is performed in combination with "ON" and "OFF" of the shift solenoid valve S1 and S2 controlled by ECM. If an open or short circuit occurs in either of the solenoid valves, the ECM controls the remaining normal solenoid valve to allow the vehicle to be operated smoothly (Fail safe function).

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P0976	ECM detects short in solenoid valve S2 circuit 2 times when solenoid valve S2 is operated (1-trip detection logic)	• Short in shift solenoid valve S2 circuit • Shift solenoid valve S2 • ECM
P0977	ECM detects open in solenoid valve S2 circuit 2 times when solenoid valve S2 is not operated (1-trip detection logic)	• Open in shift solenoid valve S2 circuit • Shift solenoid valve S2 • ECM

MONITOR DESCRIPTION

The ECM commands gear shifts by turning the shift solenoid valves "ON/OFF". When there is an open or short circuit in any shift solenoid valve circuit, the ECM detects the problem and illuminates the MIL and stores the DTC. And the ECM performs the fail-safe function and turns the other shift solenoid valves in good condition "ON/OFF" (In case of an open or short circuit, the ECM stops sending current to the circuit.) INFO .

MONITOR STRATEGY

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Related DTCs	P0976: Shift solenoid valve S2/Range check (Low resistance) P0977: Shift solenoid valve S2/Range check (High resistance)
Required sensors/Components	Shift solenoid valve S2
Frequency of operation	Continuous
Duration	0.128 seconds or more
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

P0976: Range check (Low resistance)

The monitor runs whenever the following DTCs are not present.	None
Solenoid	ON
Time after solenoid OFF to ON	More than 0.008 seconds

P0977: Range check (High resistance)

The monitor runs whenever the following DTCs are not present.	None
Solenoid	OFF
Time after solenoid ON to OFF	More than 0.008 seconds

TYPICAL MALFUNCTION THRESHOLDS

P0976: Range check (Low resistance)

Shift solenoid valve S2 resistance	8 Ω or less

P0977: Range check (High resistance)

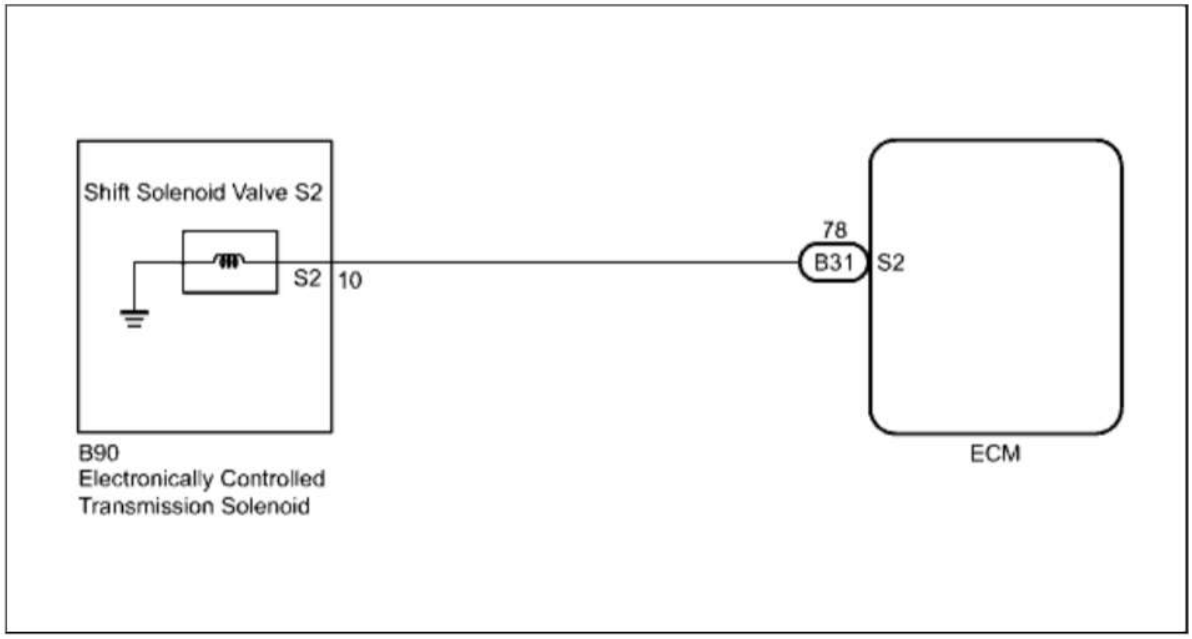
Shift solenoid valve S2 resistance	100 kΩ or more

COMPONENT OPERATING RANGE

Shift solenoid valve S2 resistance	11 to 15 Ω at 20°C (68°F)

WIRING DIAGRAM

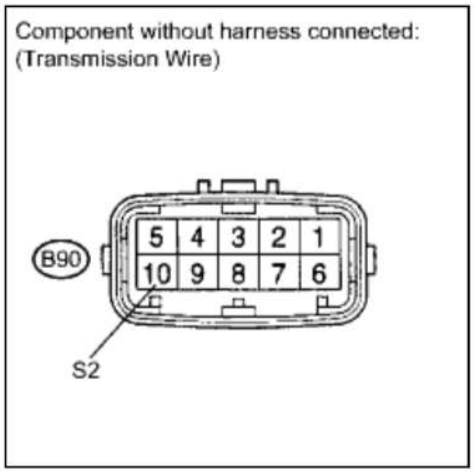
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INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (S2)**



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

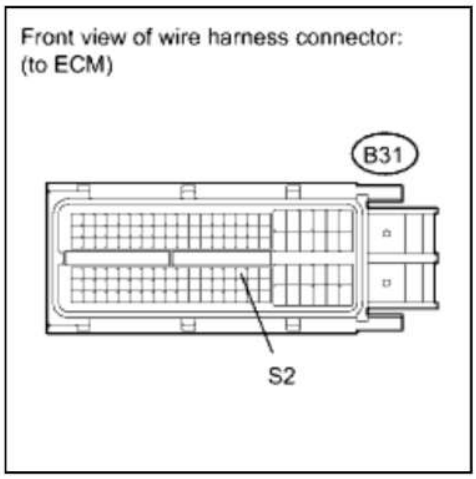
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
10 - Body ground	20°C (68°F)	11 to 15 Ω

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NG ▶ **INSPECT SHIFT SOLENOID VALVE S2**

OK
▼

2.	CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)



(a) Connect the transmission wire connector to the transaxle.

(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-78 (S2) - Body ground	20°C (68°F)	11 to 15 Ω

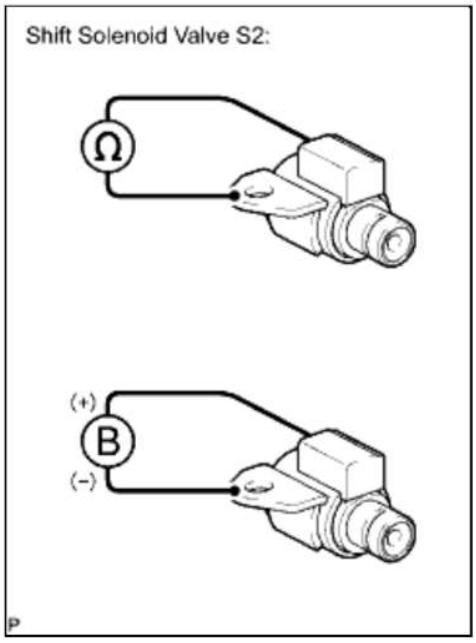
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

3.	INSPECT SHIFT SOLENOID VALVE S2

(a) Remove the shift solenoid valve S2.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Solenoid Connector (S2) - Solenoid Body (S2)	20°C (68°F)	11 to 15 Ω

(c) Connect the positive (+) lead to the terminal of the solenoid connector, and the negative (-) lead to the solenoid body.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE S2**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000002QVF00YX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2714: Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT) (2010 Corolla)		

DTC	**P2714**	**Pressure Control Solenoid "D" Performance (Shift Solenoid Valve SLT)**

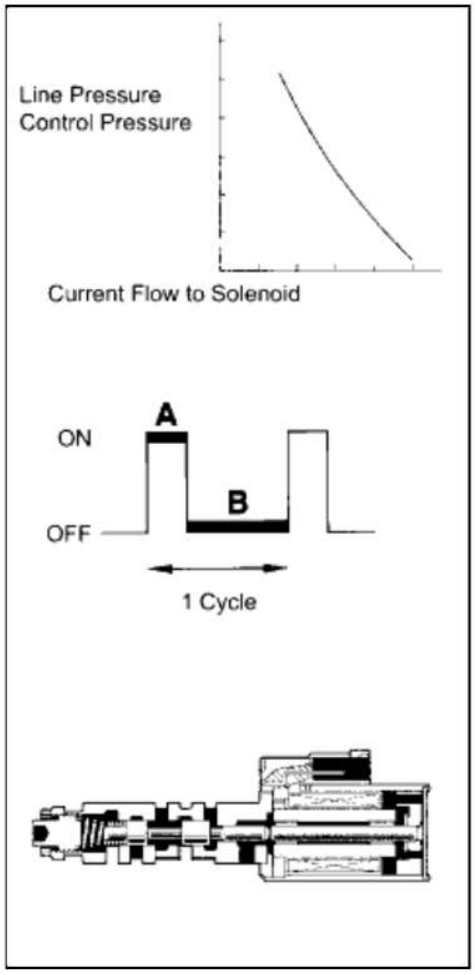
SYSTEM DESCRIPTION

The shift solenoid valve SLT controls the transmission line pressure for smooth transmission operation based on signals from the throttle position sensor and the vehicle speed sensor. The ECM adjusts the duty ratio (*) of the shift solenoid valve SLT to control hydraulic line pressure coming from the primary regulator valve. Appropriate line pressure assures smooth shifting with varying engine outputs.

(*): Duty Ratio

The duty ratio is the ratio of the period of continuity in one cycle. For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then

Duty Ratio = A/(A + B) x 100 (%)



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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2714	ECM detects a malfunction on SLT (ON side) according to the revolution difference of the turbine, intermediate and the output shaft, and also by the oil pressure. (2-trip detection logic)	• Shift solenoid valve SLT remains closed • Valve body is blocked • Torque converter clutch • Automatic transaxle (clutch, brake or gear, etc.)

MONITOR DESCRIPTION

In any forward position, when the difference between the revolutions of the turbine, Intermediate and output shaft exceeds the specified value (varies with Intermediate, output speed) determined by the ECM, the ECM illuminates the MIL and store the DTC.

When shift solenoid valve SLT remains on, the oil pressure goes down and the clutch engagement force decreases.

NOTICE:

If you continue driving under these conditions, the clutch will burn out and the vehicle will no longer be drivable.

MONITOR STRATEGY

Related DTCs	P2714: Shift solenoid valve SLT/ON malfunction
Required sensors/Components	Shift solenoid valve SLT, Speed sensor (NT), Speed sensor (SPD)
Frequency of operation	Continuous
Duration	1.0 second
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The following conditions are common to ON malfunctions (a), (b), (c) and (d).

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0500 (Vehicle speed sensor circuit) P0710, P0712, P0713 (ATF temperature sensor circuit (TFT sensor)) P0717 (Turbine speed sensor circuit) P0973, P0974 (Shift solenoid valve S1 circuit) P0976, P0977 (Shift solenoid valve S2 circuit)

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	P2759 (Shift solenoid valve SLU circuit) P2716 (Shift solenoid valve SLT circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 ((Electronic throttle control system)
Transmission shift position	D
Time after shifting N to D	4.5 seconds or more
ATF (Automatic Transmission Fluid) temperature	-10°C (14°F) or more
ATF temperature sensor (TFT sensor) circuit	No circuit malfunction
Electronic Throttle Control System (if applicable)	No circuit malfunction
Shift solenoid valve S1 circuit	No circuit malfunction
Shift solenoid valve S2 circuit	No circuit malfunction
Shift solenoid valve SLU circuit	No circuit malfunction
Shift solenoid valve SLT circuit	No circuit malfunction
Speed sensor (NT) circuit	No circuit malfunction
Speed sensor (SPD) circuit	No circuit malfunction

ON malfunction (a):

ECM gearshift command	1st
Input (turbine) speed	200 rpm or more
Output speed	300 rpm or more

ON malfunction (b):

ECM gearshift command	2nd
Input (turbine) speed	200 rpm or more
Output speed	300 rpm or more

ON malfunction (c):

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ECM gearshift command	3rd
Input (turbine) speed	200 rpm or more
Output speed	300 rpm or more

ON malfunction (d):

ECM gearshift command	4th
Input (turbine) speed	200 rpm or more
Output speed	300 rpm or more

TYPICAL MALFUNCTION THRESHOLDS

[ON malfunction]

Detection condition: Total accumulated time of ON malfunctions (a), (b), (c) and (d) is 1 second or more

ON malfunction (a):

NT - NO x 1st gear ratio NT: Input (turbine) speed NO: Internal counter shaft speed	More than 300 rpm at output speed of 1000 rpm (Conditions vary with output speed)
Duration	0.85 seconds or more

ON malfunction (b):

NT - NO x 2nd gear ratio	More than 300 rpm at output speed of 1000 rpm (Conditions vary with output speed)
Duration	0.85 seconds or more

ON malfunction (c):

NT - NO x 3rd gear ratio	More than 300 rpm at output speed of 1000 rpm (Conditions vary with output speed)
Duration	0.85 seconds or more

ON malfunction (d):

NT - NO x 4th gear ratio	More than 300 rpm at output speed of 1000 rpm (Conditions vary with output speed)
Duration	0.85 seconds or more

INSPECTION PROCEDURE

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PROCEDURE

1.	CHECK OTHER DTCS OUT PUT (IN ADDITION TO DTC P2714)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON and the Techstream main switch on.

(c) When you use Techstream:

Select the item "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using the Techstream.

Result:

RESULT	PROCEED TO
P2714	A
P2714 and other DTCs	B

HINT:

If any other codes besides "P2714" are output, perform the troubleshooting for those DTCs first.

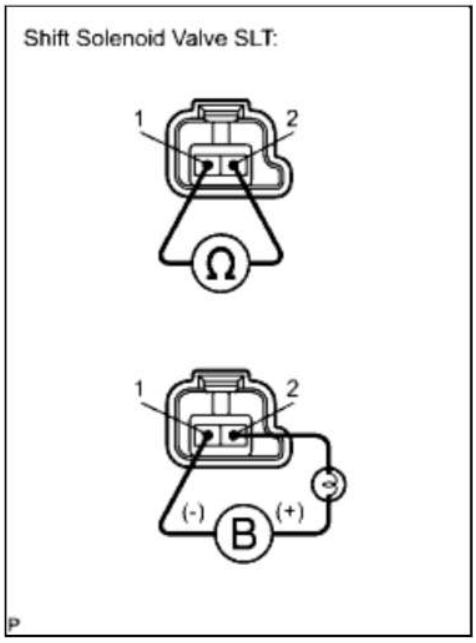
B ▶ GO TO DTC CHART

A ▼

2.	INSPECT SHIFT SOLENOID VALVE SLT

(a) Remove the shift solenoid valve SLT.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SLT**

OK ▼

3.	**INSPECT TRANSMISSION VALVE BODY ASSEMBLY**

OK:

There are no foreign objects on each valve.

NG ▶ **REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY**

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OK

4.	**INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY**

OK:
The torque converter clutch operates normally.

NG ▶ **REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY**

OK ▶ **REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM0000015W1049X
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2716: Pressure Control Solenoid "D" Electrical (Shift Solenoid Valve SLT) (2010 Corolla)		

DTC	**P2716**	**Pressure Control Solenoid "D" Electrical (Shift Solenoid Valve SLT)**

DESCRIPTION

The shift solenoid valve SLT controls the transmission line pressure for smooth transmission operation based on signals from the throttle position sensor and the vehicle speed sensor. The ECM adjusts the duty cycle of the shift solenoid valve SLT to control hydraulic line pressure coming from the primary regulator valve. Appropriate line pressure assures smooth shifting with varying engine outputs.

(*): Duty Ratio

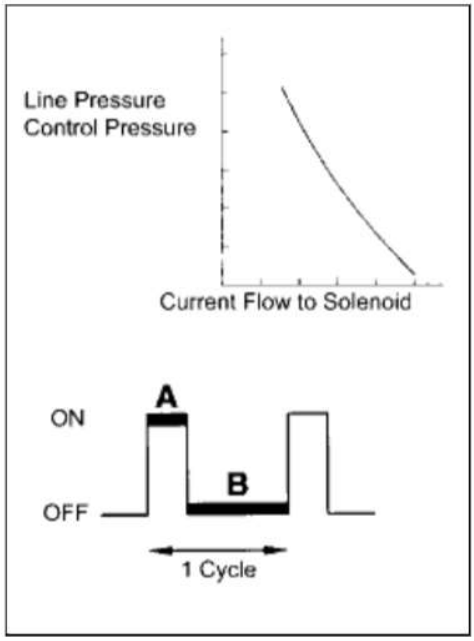
The duty ratio is the ratio of the period of continuity in one cycle.

For example, if A is the period of continuity in one cycle, and B is the period of non-continuity, then

Duty Ratio = A/(A + B) x 100 (%)

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2716	Open or short is detected in shift solenoid valve SLT circuit for 1 second or more while driving (1-trip detecting logic).	• Open or short in shift solenoid valve SLT circuit • Shift solenoid valve SLT • ECM

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MONITOR DESCRIPTION

When an open or short in the shift solenoid valve SLT circuit is detected, the ECM interprets this as a fault. The ECM will turn on the MIL and store the DTC.

MONITOR STRATEGY

Related DTCs	P2716: Shift solenoid valve SLT/Range check
Required sensors/Components	Shift solenoid valve SLT
Frequency of operation	Continuous
Duration	1.0 second
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor runs whenever the following DTCs are not present	None
Solenoid current cut status	Not cut
Battery voltage	11 V or more
CPU commanded duty ratio	19 % or more
Ignition switch	ON
Starter	OFF

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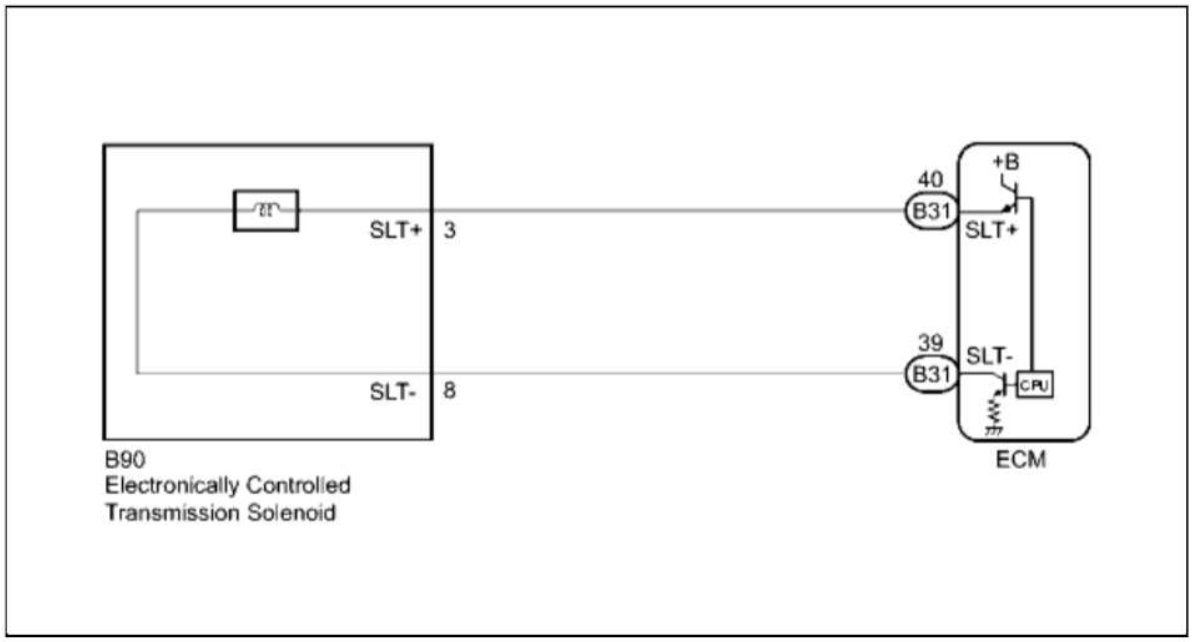
TYPICAL MALFUNCTION THRESHOLDS

Solenoid status (SLT) from MIC	Fail

COMPONENT OPERATING RANGE

Shift solenoid valve SLT	Resistance: 5.0 Ω to 5.6 Ω at 20°C (68°F)

WIRING DIAGRAM



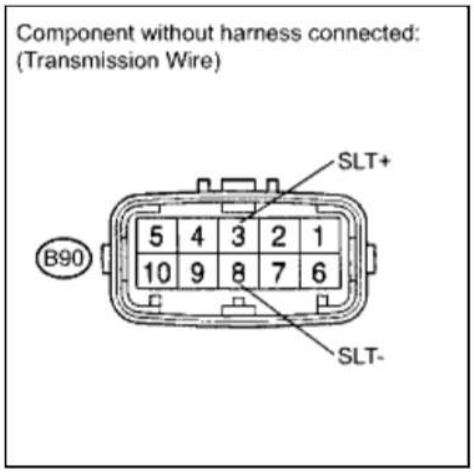
INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (SLT)**

(a) Disconnect the transmission wire connector from the transaxle.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (SLT+) - 8 (SLT-)	20°C (68°F)	5.0 to 5.6 Ω

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (SLT+) - Body ground	Always	10 kΩ or higher
8 (SLT-) - Body ground	Always	↑

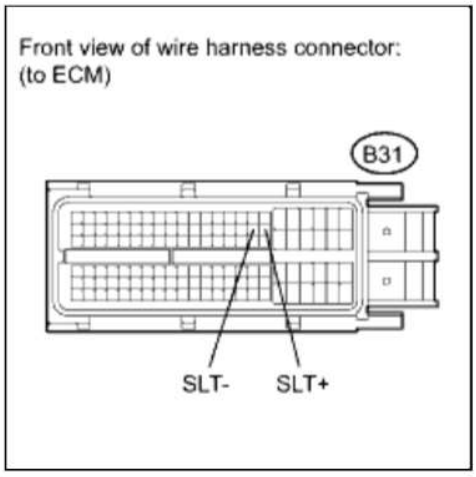
NG ▶ **INSPECT SHIFT SOLENOID VALVE SLT**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)**

(a) Connect the transmission wire connector to the transaxle.

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(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-40 (SLT+) - B31-39 (SLT-)	20°C (68°F)	5.0 to 5.6 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-40 (SLT+) - Body ground	Always	10 kΩ or higher
B31-39 (SLT-) - Body ground	Always	↑

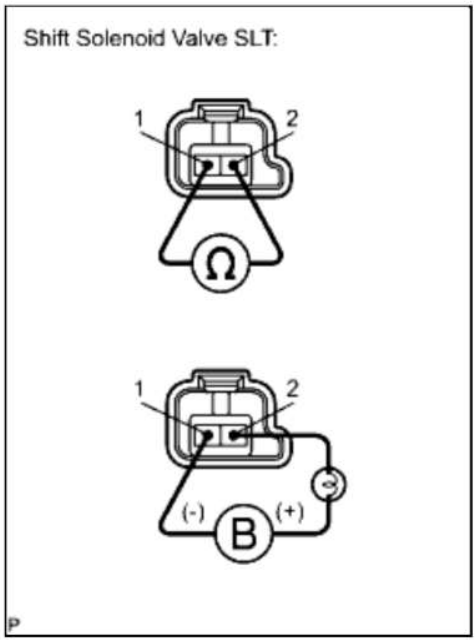
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE ECM (for 2ZR-FE)**

3.	**INSPECT SHIFT SOLENOID VALVE SLT**

(a) Remove the shift solenoid valve SLT.

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(b) Measure the resistance according to the value(s) in the table below.

Standard resistance :

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SLT**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

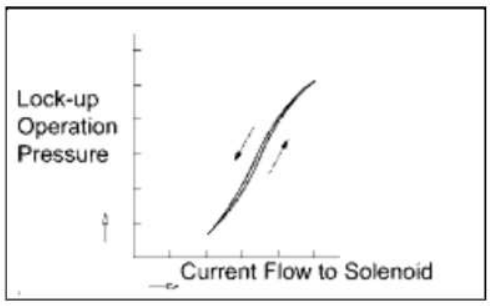
TOYOTA

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W8D05BX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2757: Torque Converter Clutch Pressure Control Solenoid Performance (Shift Solenoid Valve SLU) (2010 Corolla)		

DTC	**P2757**	**Torque Converter Clutch Pressure Control Solenoid Performance (Shift Solenoid Valve SLU)**

SYSTEM DESCRIPTION



The ECM uses the signals from the throttle position sensor, turbine (input) speed sensor, vehicle speed sensor and crankshaft position sensor to monitor the engagement condition of the lock-up clutch.

Then the ECM compares the engagement condition of the lock-up clutch with the lock-up schedule in the ECM memory to detect mechanical problems of shift solenoid valve SLU, valve body and torque converter clutch.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2757	Lock-up does not occur when driving in lock-up range or lock-up remains ON in lock-up OFF range. (2-trip detection logic)	• Shift solenoid valve SLU remains open or closed • Valve body is blocked • Shift solenoid valve SLU • Torque converter clutch • Automatic transaxle (clutch, brake or gear etc.) • Line pressure is too low

MONITOR DESCRIPTION

Torque converter lock-up is controlled by the ECM based on the speed sensor (NT), engine rpm (NE), engine load, engine coolant temperature, vehicle speed, transmission fluid temperature, and gear selection. The ECM determines the lock-up status of the torque converter by comparing the engine rpm (NE) to the input turbine rpm (NT). The ECM calculates the actual transmission gear by comparing

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input turbine rpm (NT) to output shaft speed. When conditions are appropriate, the ECM requests lock-up by applying the control voltage to shift solenoid valve SLU. When SLU is turned on, it applies pressure to the lock-up relay valve and locks the torque converter clutch.

If the ECM detects no lock-up after lock-up has been requested or if it detects lock-up when it is not requested, the ECM interprets this as a fault in shift solenoid valve SLU or lock-up system performance. The ECM turns on the MIL and stores the DTC.

Example:

When either of the following is met, the system judges it as a malfunction.

- There is a difference in the rotations of the input side (engine speed) and output side (input turbine speed) of the torque converter when the ECM commands lock-up.

  (Engine speed is at least 100 rpm greater than input turbine speed.)
- There is no difference in the rotations of the input side (engine speed) and output side (input turbine speed) of the torque converter when the ECM commands lock-up off.

  (The difference between engine speed and input turbine speed is less than 35 rpm.)

MONITOR STRATEGY

Related DTCs	P2757: Shift solenoid valve SLU/OFF malfunction Shift solenoid valve SLU/ON malfunction
Required sensors/Components	Shift solenoid valve SLU, Speed sensor (NT), Crankshaft position sensor (NE), Engine coolant temperature sensor (ECT)
Frequency of operation	Continuous
Duration	OFF malfunction: 3.5 seconds ON malfunction: 1.8 seconds
MIL operation	2 driving cycles
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The following conditions are common to OFF malfunction and ON malfunction.

The monitor will run whenever this DTC is not present. (Not circuit malfunction)	P0500 (Vehicle speed sensor circuit) P0115, P0117, P0118 (ECT sensor circuit) P0717 (Turbine speed sensor circuit) P0973, P0974 (Shift solenoid valve S1 circuit) P0976, P0977 (Shift solenoid valve S2 circuit) P2759 (Shift solenoid valve SLU circuit) P0120, P0121, P0122, P0123, P0220, P0222, P0223, P0604, P0606, P060A, P060D, P060E, P0657, P1607, P2102, P2103, P2111, P2112, P2118, P2119, P2135 (Electronic throttle control system)

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Time after shifting N to D	4.5 seconds or more
ECT (Engine Coolant Temperature)	60°C (140°F) or more
Transmission shift position	D
ECM selected gear	3rd or 4th
Vehicle speed	15.5 mph (25 km/h) or more
Shift solenoid valve S1 circuit	No circuit malfunction
Shift solenoid valve S2 circuit	No circuit malfunction
Shift solenoid valve SLU circuit	No circuit malfunction
ECT sensor circuit	No circuit malfunction
Electronic Throttle Control System (if applicable)	No circuit malfunction
Speed sensor (NT) circuit	No circuit malfunction
Speed sensor (SPD) circuit	No circuit malfunction

OFF malfunction:

ECM lock-up command	ON
Duration time from lock-up on command	3 seconds or more
Actual gear	3rd or 4th

ON malfunction:

ECM lock-up command	OFF
Throttle valve opening angle	8 % or more
Vehicle speed	Less than 37.3 mph (60 km/h)
Actual gear	3rd
Calculated load value	22 % or more

TYPICAL MALFUNCTION THRESHOLDS

OFF malfunction:

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Engine speed - Input (turbine) speed (NE - NT)	100 rpm or more

[ON malfunction]

2 detections are necessary per driving cycle.

1st detection: Temporary flag ON

2nd detection: Pending fault code ON

Vehicle speed must be under 6.2 mph (10 km/h) once before 2nd detection.

ON malfunction:

Difference between engine speed and Input (turbine) speed	Less than 35 rpm

INSPECTION PROCEDURE

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

1. PERFORM ACTIVE TEST

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn on the Techstream.

(f) Select the item: "Powertrain / Engine and ECT / Active Test".

(g) According to the display on the Techstream, perform the Active Test.

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Activate the Lock Up	[Test Details] Control the shift solenoid SLU to set the automatic transaxle to the lock-up condition. [Vehicle Condition] Vehicle Speed: 60 km/h (36 mph) or more, and 4th gear	ON/OFF	Possible to check the SLU operation.

HINT:

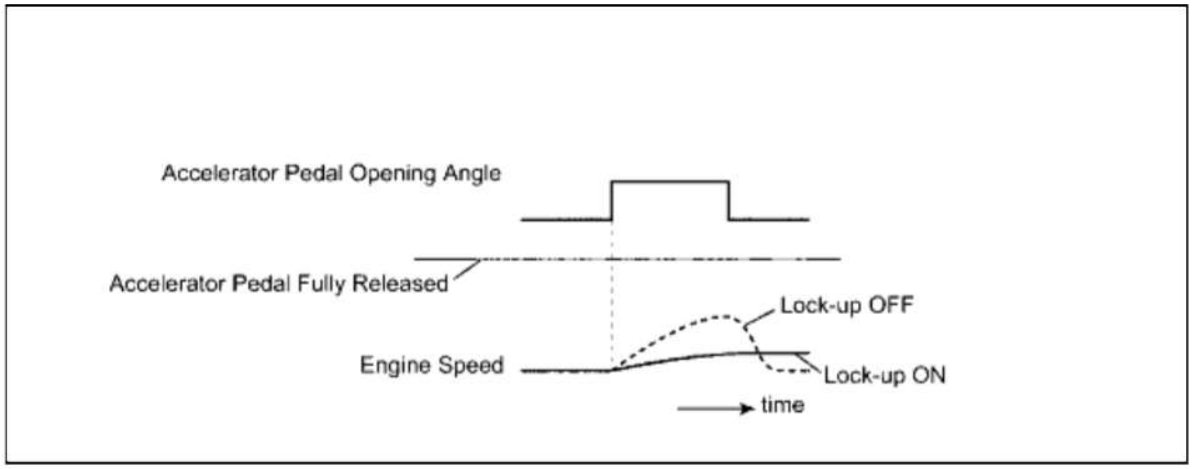
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- This test can be conducted when the vehicle speed is 60 km/h (36 mph) or more.
- This test can be conducted in the 4th gear.

(h) Lightly depress the accelerator pedal and check that the engine speed does not change abruptly.

HINT:

- When changing the accelerator pedal opening angle while driving, if the engine speed does not change, lock-up is on.
- Slowly release, but not fully, the accelerator pedal in order to decelerate. (Fully releasing the pedal will close the throttle valve and lock-up may be turned off.)



PROCEDURE

1.	**CHECK OTHER DTCS OUTPUT (IN ADDITION TO DTC P2757)**

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON and the Techstream main switch on.

(c) Select the item: "Powertrain / Engine and ECT / Trouble Codes".

(d) Read the DTCs using the Techstream.

Result:

RESULT	PROCEED TO
P2757	A
P2757 and other DTCs	B

HINT:

If any other codes besides "P2757" are output, perform the troubleshooting for those DTCs first.

B ▶ GO TO DTC CHART

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A

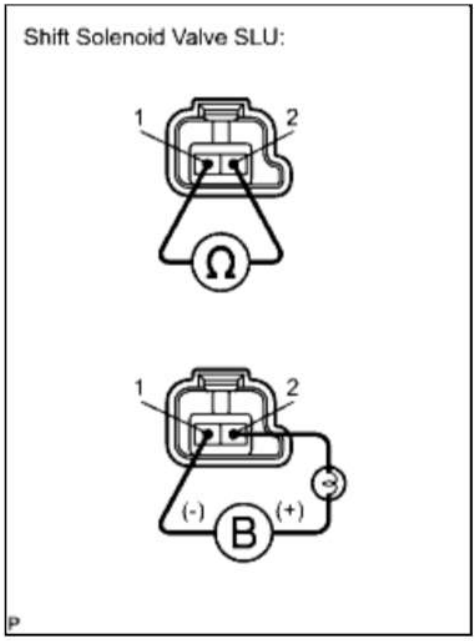
2.	INSPECT SHIFT SOLENOID VALVE SLU

(a) Remove the shift solenoid valve SLU.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω



(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ REPLACE SHIFT SOLENOID VALVE SLU

OK

3.	INSPECT TRANSMISSION VALVE BODY ASSEMBLY

OK:

There are no foreign objects on each valve and they operate smoothly.

NG ▶ REPAIR OR REPLACE TRANSMISSION VALVE BODY ASSEMBLY

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OK

4.	**INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY**

OK:
The torque converter clutch operates normally.

NG ▶ **REPLACE TORQUE CONVERTER CLUTCH ASSEMBLY**

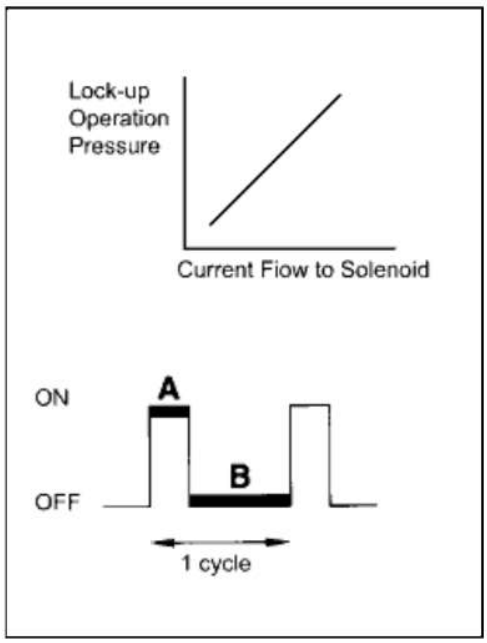
OK ▶ **REPAIR OR REPLACE AUTOMATIC TRANSAXLE ASSEMBLY**

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Last Modified: 3-10-2010	6.4 C	**From:** 200901
Model Year: 2010	**Model:** Corolla	**Doc ID:** RM000000W8905UX
Title: U341E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSAXLE SYSTEM: P2759: Torque Converter Clutch Pressure Control Solenoid Control Circuit Electrical (Shift Solenoid Valve SLU) (2010 Corolla)		

DTC	**P2759**	**Torque Converter Clutch Pressure Control Solenoid Control Circuit Electrical (Shift Solenoid Valve SLU)**

DESCRIPTION



The amount of current flowing to the solenoid is controlled by the duty ratio* of the ECM output signal. The higher the duty ratio* becomes, the higher the lock-up hydraulic pressure becomes during the lock-up operation.

*: The duty ratio is the ratio of the current ON time (A) to the total of the current ON and OFF times (A + B).

Duty Ratio = A / (A + B) x 100 (%)

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
P2759	Open or short is detected in shift solenoid valve SLU circuit for 1 second or more while driving. (1-trip detection logic)	• Open or short in shift solenoid valve SLU circuit • Shift solenoid valve SLU

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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
		• ECM

MONITOR DESCRIPTION

When an open or short in the shift solenoid valve SLU circuit is detected, the ECM interprets this as a fault. The ECM will turn on the MIL and stores the DTC.

MONITOR STRATEGY

Related DTCs	P2759: Shift solenoid valve SLU/Range check
Required sensors/Components	Shift solenoid valve SLU
Frequency of operation	Continuous
Duration	1.0 second
MIL operation	Immediate
Sequence of operation	None

TYPICAL ENABLING CONDITIONS

The monitor runs whenever the following DTCs are not present.	None
Solenoid current cut status	Not cut
Battery voltage	11 V or more
CPU commanded duty ratio	19 % or more
Ignition switch	ON
Starter	OFF

TYPICAL MALFUNCTION THRESHOLDS

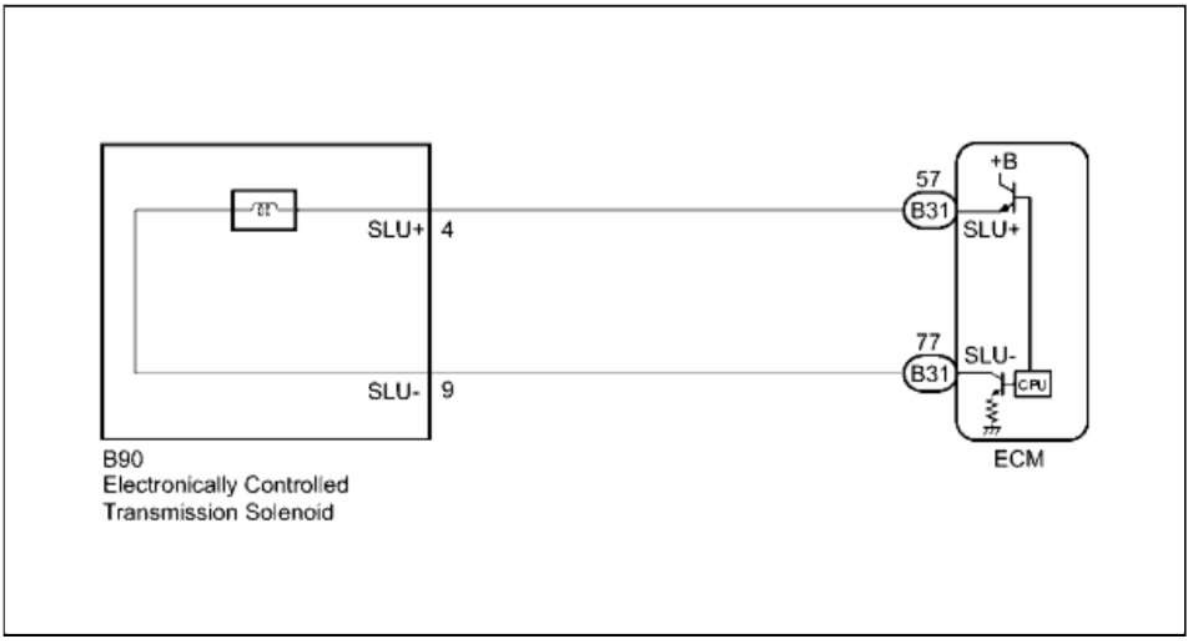
Solenoid status (SLU) from MIC	Fail

COMPONENT OPERATING RANGE

Solenoid status (SLU)	Resistance: 5.0 to 5.6 Ω at 20°C (68°F)

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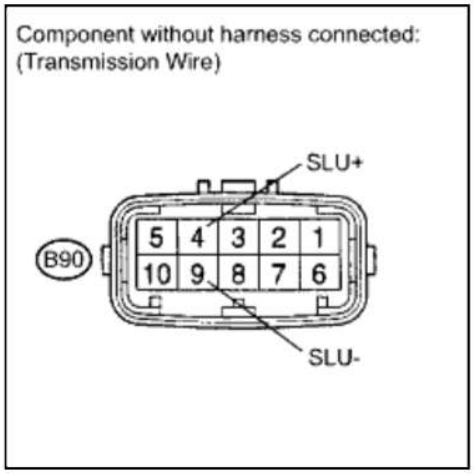
WIRING DIAGRAM



INSPECTION PROCEDURE

PROCEDURE

1.	**INSPECT TRANSMISSION WIRE (SLU)**



(a) Disconnect the transmission wire connector from the transaxle.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
4 (SLU+) - 9 (SLU-)	20°C (68°F)	5.0 to 5.6 Ω

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
4 (SLU+) - Body ground	Always	10 kΩ or higher
9 (SLU-) - Body ground	Always	↑

NG ▶ **INSPECT SHIFT SOLENOID VALVE SLU**

OK ▼

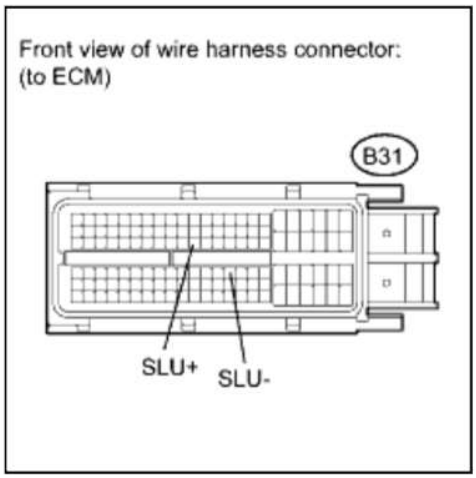
2.	**CHECK HARNESS AND CONNECTOR (TRANSMISSION WIRE - ECM)**

(a) Connect the transmission wire connector to the transaxle.

(b) Disconnect the ECM connectors.

(c) Measure the resistance according to the value(s) in the table below.

Standard resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-57 (SLU+) - B31-77 (SLU-)	20°C (68°F)	5.0 to 5.6 Ω

(d) Measure the resistance according to the value(s) in the table below.

Standard resistance (Check for short):

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-57 (SLU+) - Body ground	Always	10 kΩ or higher

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
B31-77 (SLU-) - Body ground	Always	↑

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

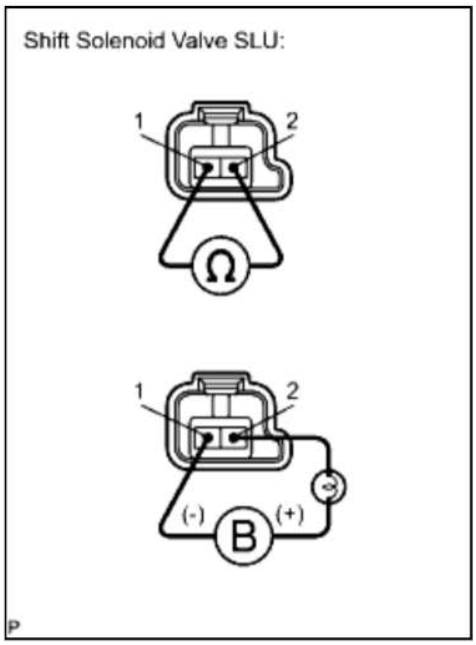
OK ▶ **REPLACE ECM (for 2ZR-FE)**

3.	INSPECT SHIFT SOLENOID VALVE SLU

(a) Remove the shift solenoid valve SLU.

(b) Measure the resistance according to the value(s) in the table below.

Standard resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

(c) Connect the positive (+) lead with a 21 W bulb to terminal 2 and the negative (-) lead to terminal 1 of the solenoid valve connector, then check the movement of the valve.

OK:

The solenoid makes an operating sound.

NG ▶ **REPLACE SHIFT SOLENOID VALVE SLU**

OK ▶ **REPAIR OR REPLACE TRANSMISSION WIRE**

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