

MANUAL TRANSAXLE SYSTEM

PROBLEM SYMPTOMS TABLE

HINT:

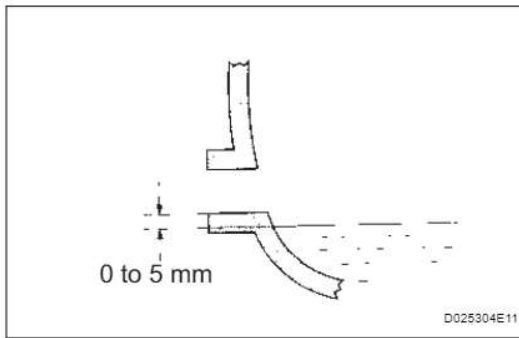
Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Symptom	Suspected Area	See page
Noise	Oil (Level Low)	MX-2
	Oil (Wrong)	MX-2
	Gear (Worn or damaged)	MX-18
	Bearing (Worn or damaged)	MX-18
Oil Leakage	Oil (Level too high)	MX-2
	Gasket (Damaged)	MX-18
	Oil seal (Worn or damaged)	MX-104
	O-Ring (Worn or damaged)	MX-18
Hard to shift or will not shift	Control cable (Faulty)	MX-9
	Synchronizer ring (Worn or damaged)	MX-76
	-	MX-87
	Shift key spring (damaged)	MX-32
	-	MX-69
	-	MX-80
Jumps out of gear	Locking ball spring (damaged)	MX-32
	Shift fork (worn)	MX-32
	-	MX-76
	-	MX-87
	Gear (worn or damaged)	MX-32
	-	MX-76
	-	MX-87
	Bearing (Worn or damaged)	MX-32
	-	MX-76
	-	MX-87

MX

MX-2

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE OIL



MANUAL TRANSAXLE OIL

ON-VEHICLE INSPECTION

1. CHECK MANUAL TRANSAXLE OIL

- Stop the vehicle on a level place.
- Remove the filler plug and gasket.
- Check that the oil surface is within 5 mm (0.02 in.) from the lowest position of the inner surface of the filler plug opening.

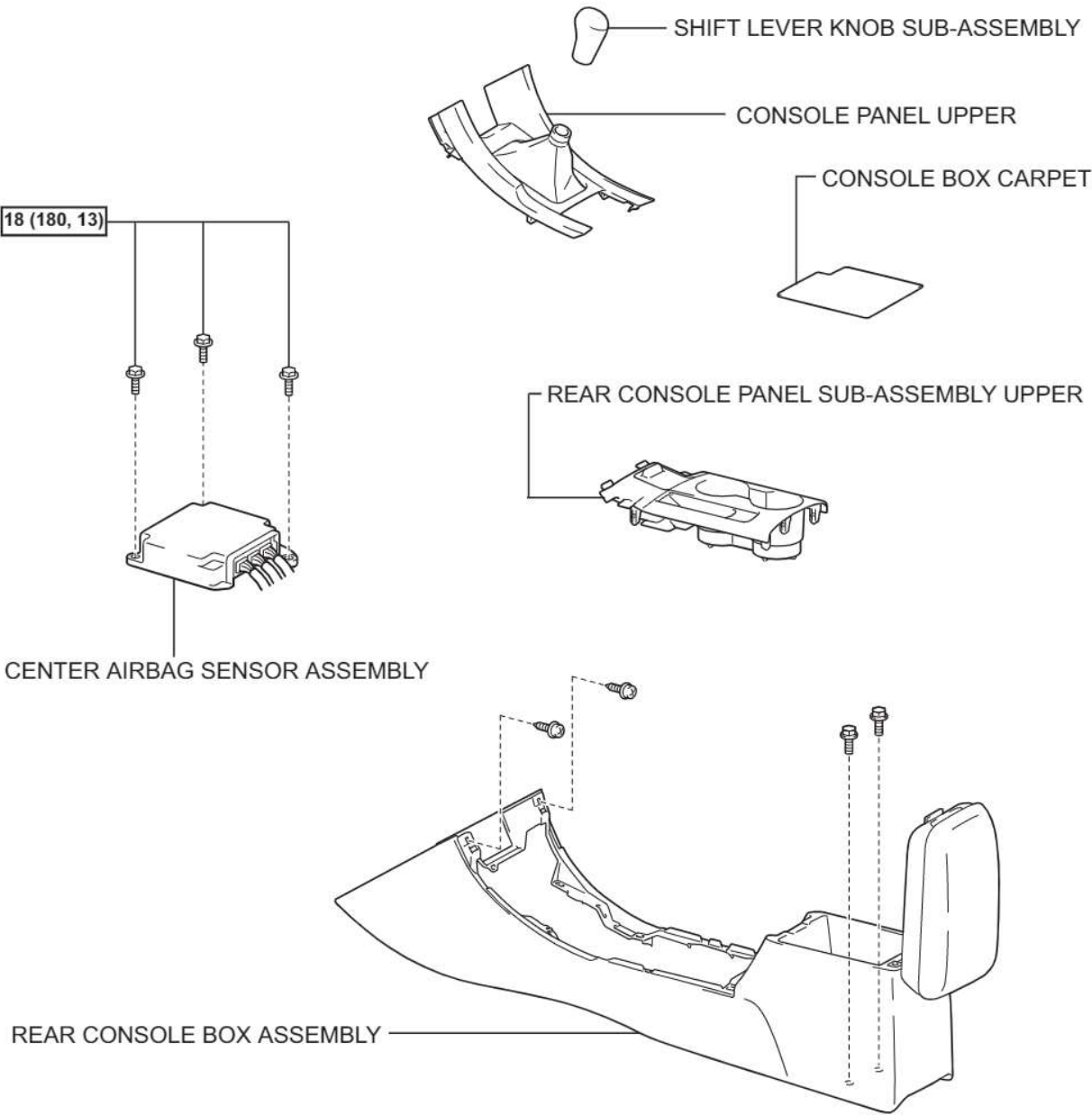
NOTICE:

- An excessively large or small amount of oil may cause trouble.
 - After replacing the oil, drive the vehicle and then check the oil level.
- Check for oil leakage when the oil level is low.
 - Install the filler plug with a new gasket.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)

FLOOR SHIFT LEVER ASSEMBLY

COMPONENTS

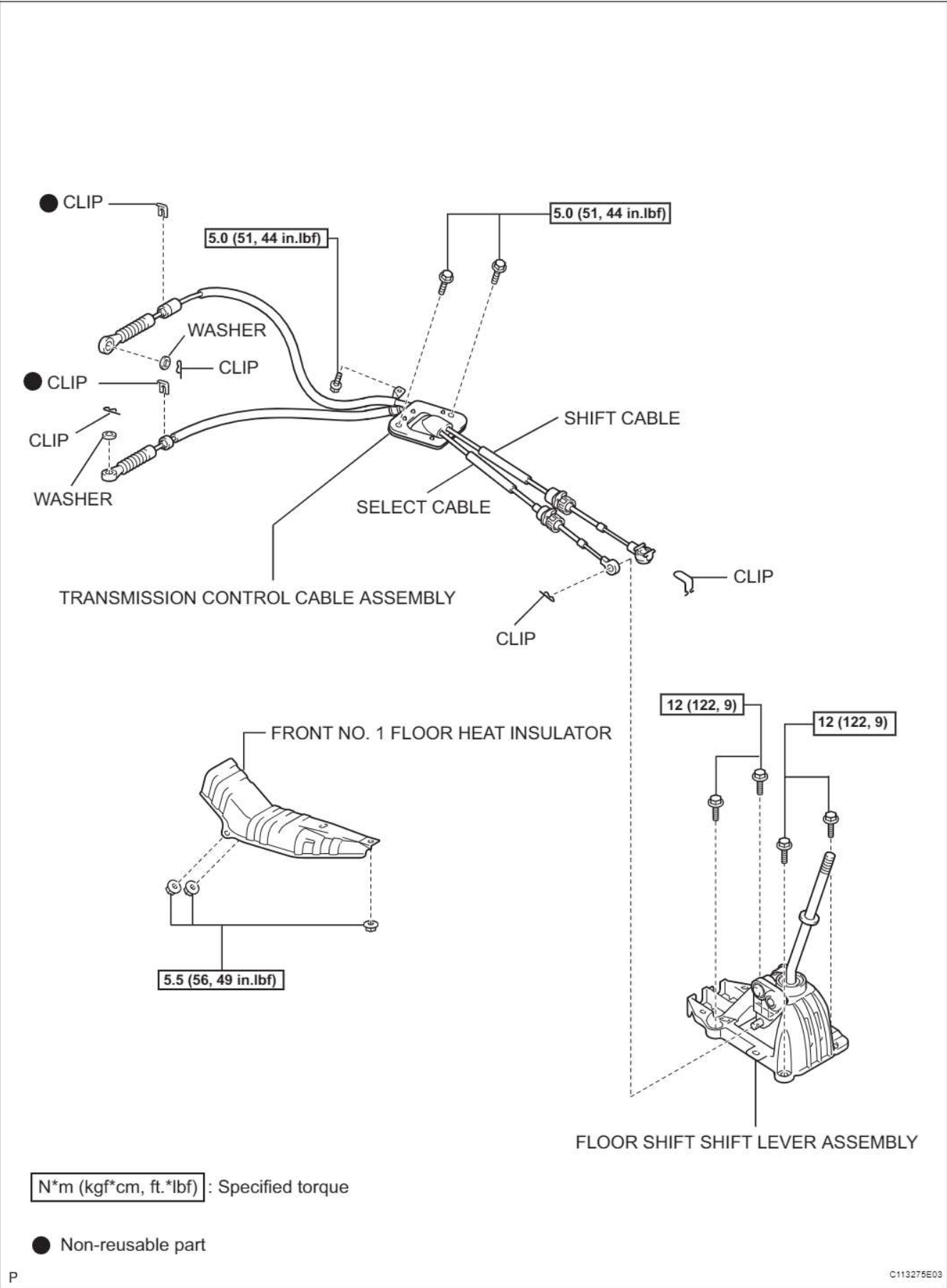


N*m (kgf*cm, ft.*lbf) : Specified torque

MX

MX-4

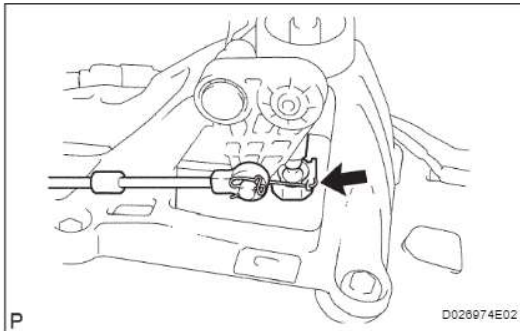
E350 MANUAL TRANSAXLE – FLOOR SHIFT LEVER ASSEMBLY



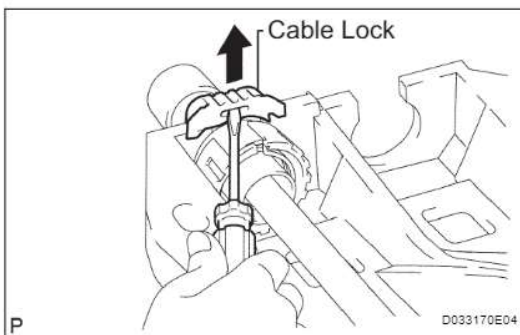
E350 MANUAL TRANSAXLE – FLOOR SHIFT LEVER ASSEMBLY**MX-5****REMOVAL**

1. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (See page [IP-5](#))
2. REMOVE CONSOLE PANEL UPPER (See page [IP-5](#))
3. REMOVE REAR CONSOLE PANEL SUB-ASSEMBLY UPPER (See page [IP-18](#))
4. REMOVE REAR CONSOLE BOX ASSEMBLY (See page [IP-18](#))
5. **DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

(a) Remove the 2 clips, and disconnect the cable ends of the control.



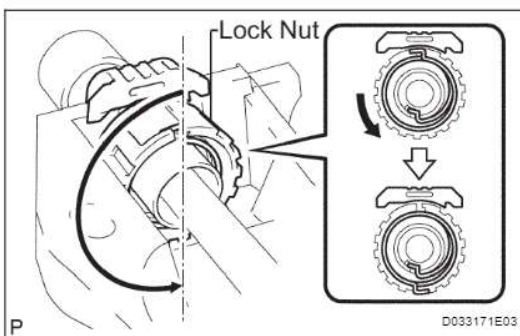
(b) Using a screwdriver, release the cable locks of the shift cable and select cable.



(c) Turn the lock nuts 180° counterclockwise, and hold them in that position to remove the shift cable and select cable.

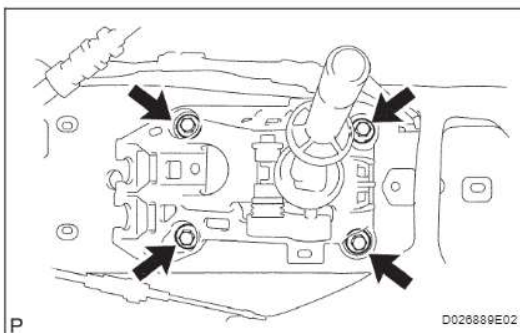
NOTICE:

Do not push in the cable locks.



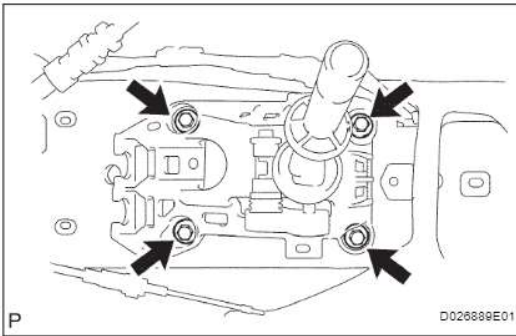
6. **REMOVE FLOOR SHIFT LEVER ASSEMBLY**

(a) Remove the 4 bolts and shift lever.

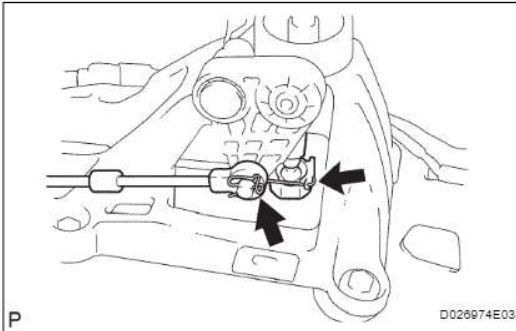
**MX**

MX-6**E350 MANUAL TRANSAXLE – FLOOR SHIFT LEVER ASSEMBLY****INSTALLATION****1. INSTALL FLOOR SHIFT LEVER ASSEMBLY**

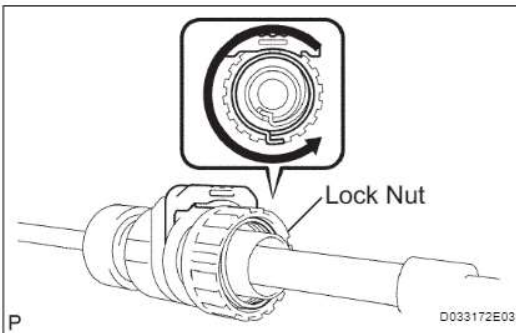
- (a) Install the shift lever with the 4 bolts.

Torque: 12 N*m (122 kgf*cm, 9 ft.*lbf)**2. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

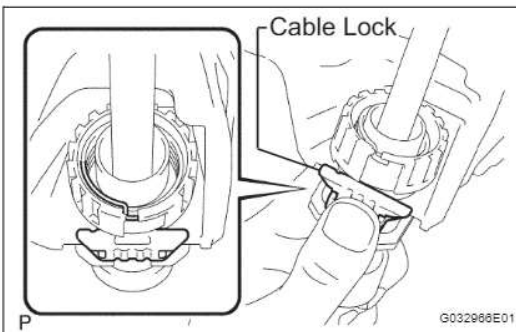
- (a) Connect the ends of the control cable and install the 2 clips to the shift lever.



- (b) Turn the lock nuts of the shift cable 270° counterclockwise, and hold them in that position.
- (c) Install the shift cable and select cable while holding the lock nuts.
- (d) Check that the cables are installed securely.

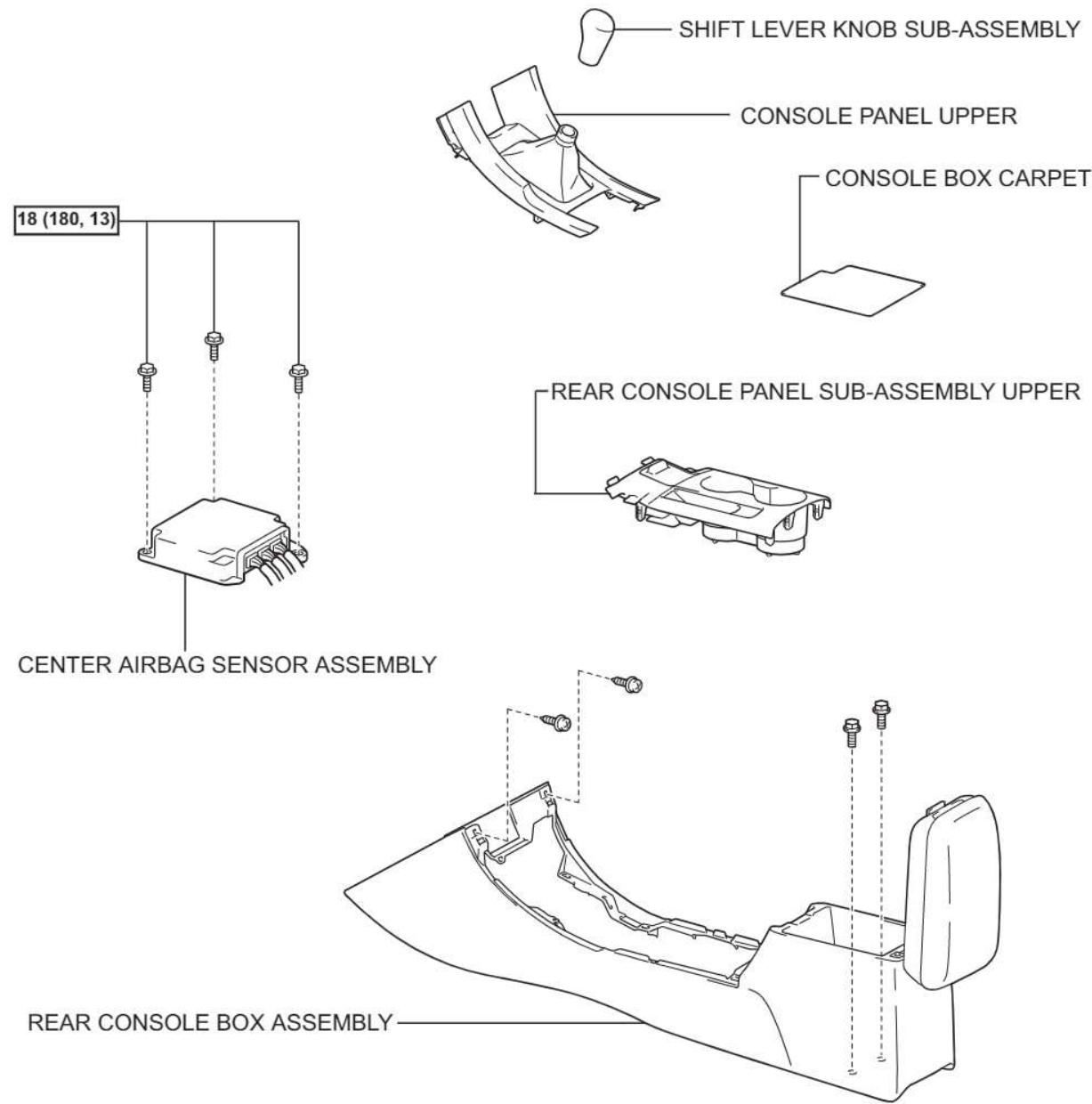


- (e) Push in the cable locks of the shift cable and select cable.

3. INSTALL REAR CONSOLE BOX ASSEMBLY (See page [IP-22](#))**4. INSTALL REAR CONSOLE PANEL SUB-ASSEMBLY UPPER (See page [IP-22](#))****5. INSTALL CONSOLE PANEL UPPER (See page [IP-11](#))****6. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (See page [IP-12](#))****MX**

TRANSMISSION CONTROL CABLE

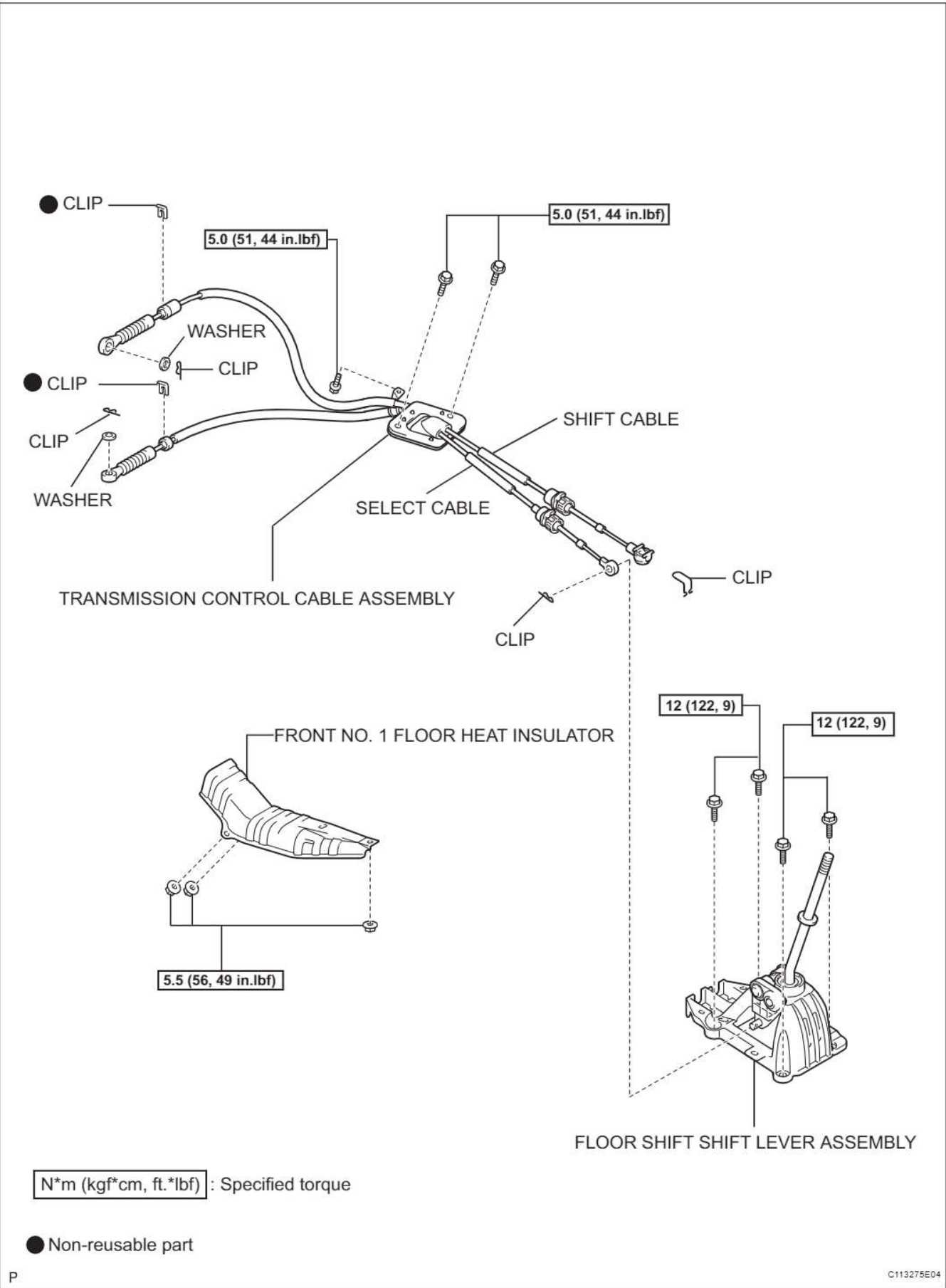
COMPONENTS



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MX-8

E350 MANUAL TRANSAXLE – TRANSMISSION CONTROL CABLE



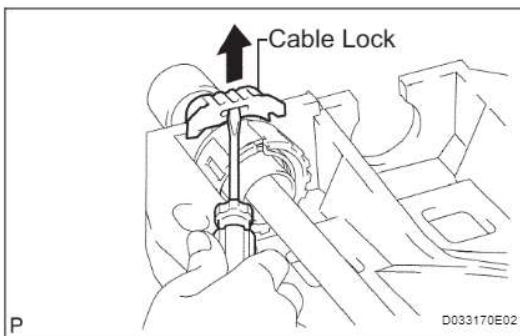
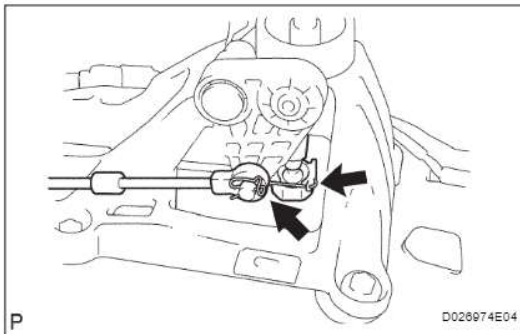
REMOVAL

1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:

Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.

2. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (See page [IP-5](#))
3. REMOVE CONSOLE PANEL UPPER (See page [IP-5](#))
4. REMOVE REAR CONSOLE PANEL SUB-ASSEMBLY UPPER (See page [IP-18](#))
5. REMOVE REAR CONSOLE BOX ASSEMBLY (See page [IP-18](#))
6. REMOVE AIR CONDITIONING UNIT ASSEMBLY (See page [AC-25](#))
7. REMOVE CENTER AIRBAG SENSOR ASSEMBLY
8. REMOVE EXHAUST PIPE ASSEMBLY (See page [EX-2](#))
9. REMOVE FRONT NO. 1 FLOOR HEAT INSULATOR
10. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY
 - (a) Remove the 2 clips and disconnect the cable ends of the control cable.

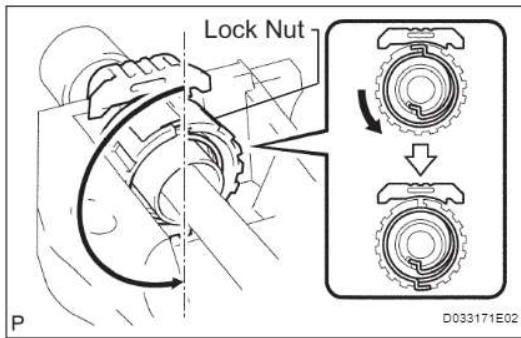


- (b) Using a screwdriver, release the cable locks of the shift cable and select cable.

MX

MX-10

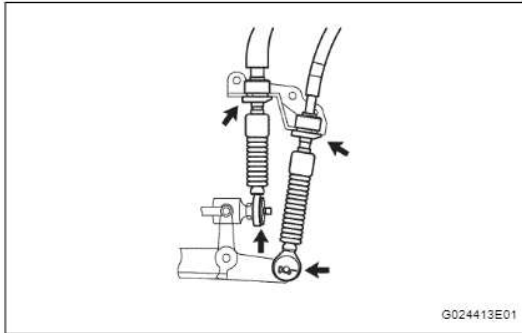
E350 MANUAL TRANSAXLE – TRANSMISSION CONTROL CABLE



- (c) Turn the lock nuts 180° counterclockwise, and hold them in that position to remove the shift cable and select cable.
- (d) Remove the shift cable from the floor shift lever assembly while holding the lock nut.
- (e) Repeat the above process for the select cable.

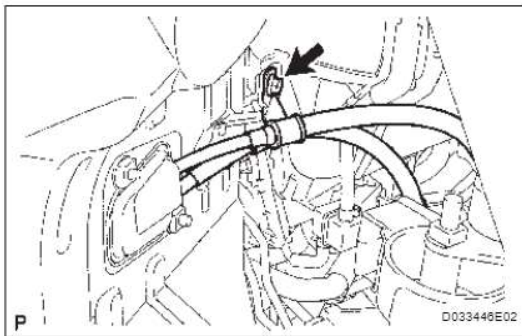
NOTICE:

Do not push in the cable locks.



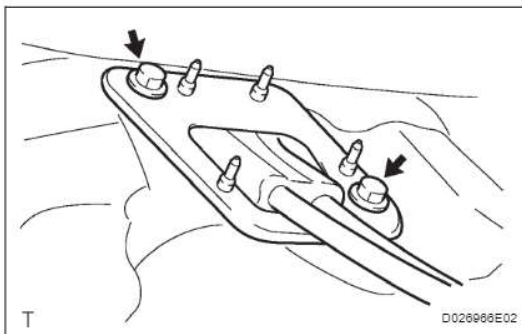
11. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Remove the 2 clips and 2 washers, and disconnect the top ends of the control cable from the transaxle.
- (b) Remove the 2 clips and disconnect the control cable bracket.

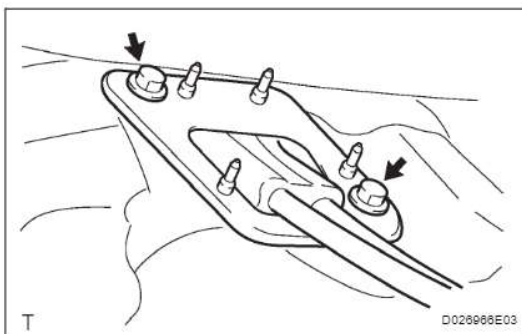


- (c) Remove the 2 nuts and clamp from the body.
- (d) Remove the clamp from the control cable.

MX



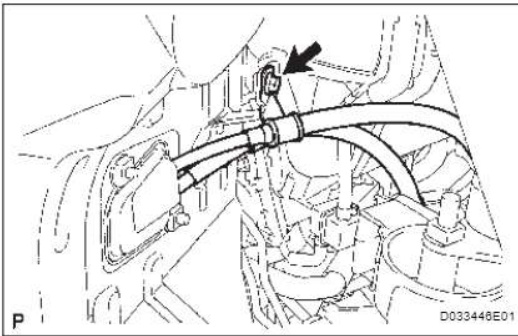
- (e) Remove the 2 bolts from the retainer.
- (f) Pull out the control cable from the floor.



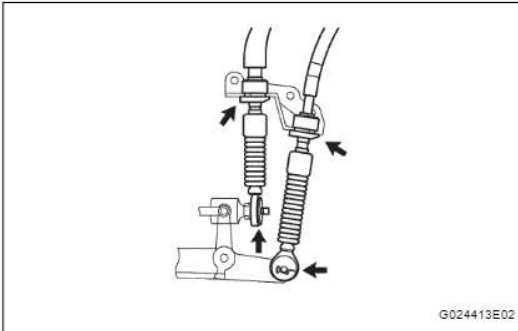
INSTALLATION

1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

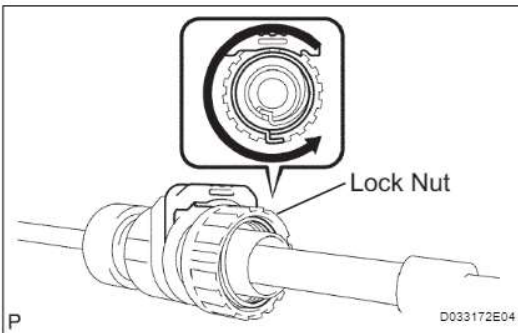
- (a) Install the control cable with the 2 bolts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

E350 MANUAL TRANSAXLE – TRANSMISSION CONTROL CABLE**MX-11**

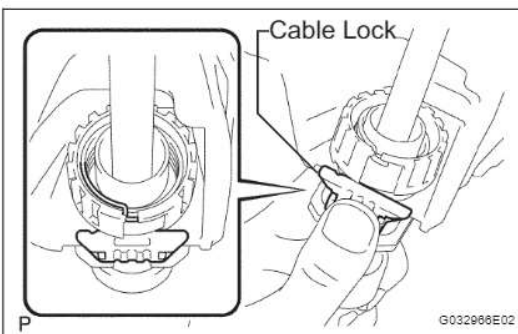
- (b) Install the clamp to the control cable.
- (c) Install the clamp to the body with the 2 nuts.
Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)



- (d) Connect the control cable to the control cable bracket, and install 2 new clips.
- (e) Connect the control cable to the transaxle, and install the 2 washers and 2 clips.

**2. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

- (a) Connect the ends of the control cable and install the 2 clips to the shift lever.
- (b) Turn the lock nuts of the shift cable 270° counterclockwise, and hold them in that position.
- (c) Install the shift cable while holding them.
- (d) Check that the cable are installed securely.



- (e) Push in the cable locks of the shift cable and select cable.

3. INSTALL FRONT NO. 1 FLOOR HEAT INSULATOR**Torque: 5.5 N*m (56 kgf*cm, 49 in.*lbf)****4. INSTALL EXHAUST PIPE ASSEMBLY (See page [EX-3](#))****5. INSTALL CENTER AIRBAG SENSOR ASSEMBLY****6. INSTALL AIR CONDITIONING UNIT ASSEMBLY (See page [AC-32](#))****7. INSTALL REAR CONSOLE BOX ASSEMBLY (See page [IP-22](#))****8. INSTALL REAR CONSOLE PANEL SUB-ASSEMBLY UPPER (See page [IP-23](#))****9. INSTALL CONSOLE PANEL UPPER (See page [IP-11](#))****10. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (See page [IP-12](#))****11. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL****MX**

MX-12**E350 MANUAL TRANSAXLE – TRANSMISSION CONTROL CABLE**

12. PERFORM INITIALIZATION**NOTICE:**

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

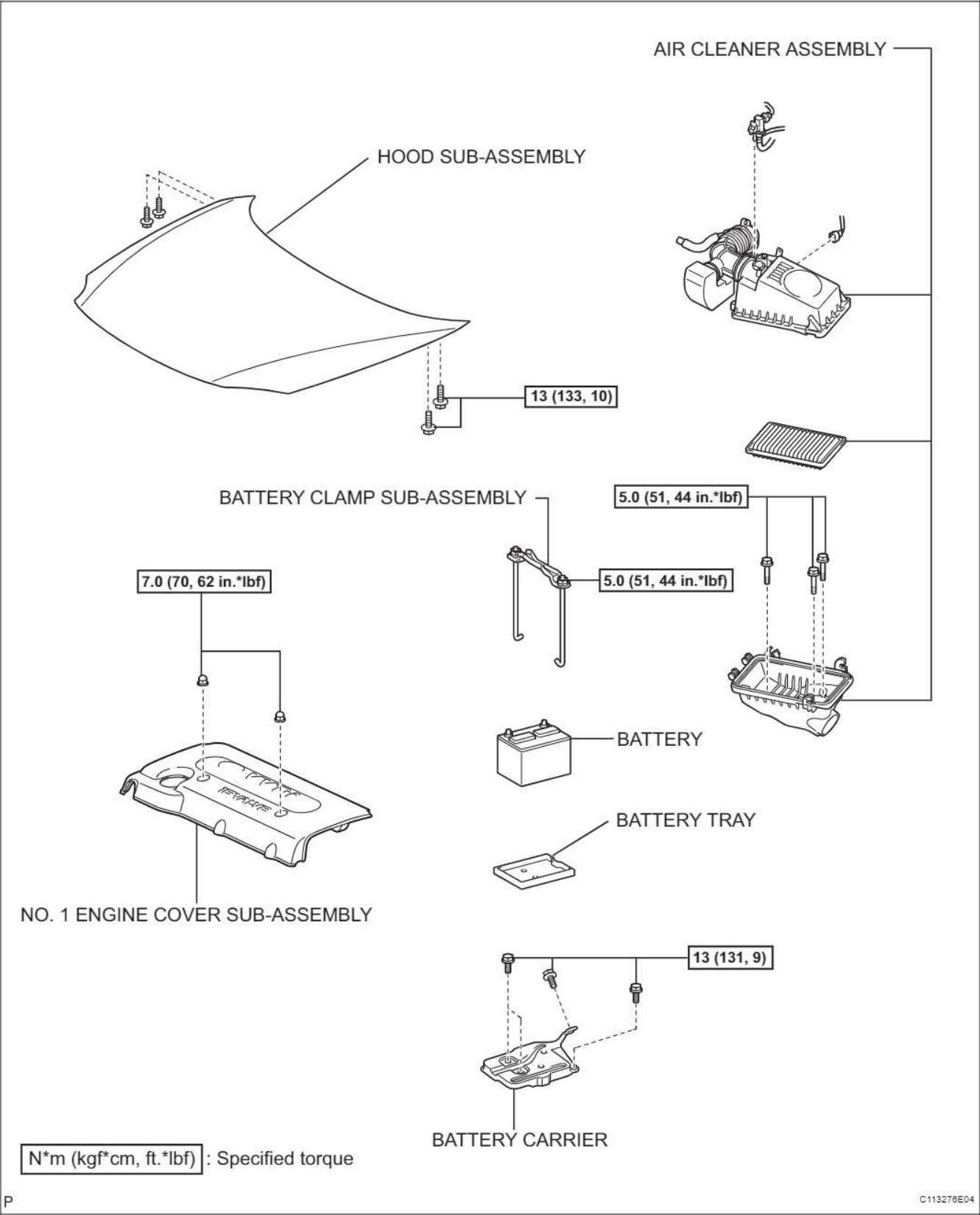
(a) Perform initialization (see page [IN-23](#)).

13. CHECK SRS WARNING LIGHT

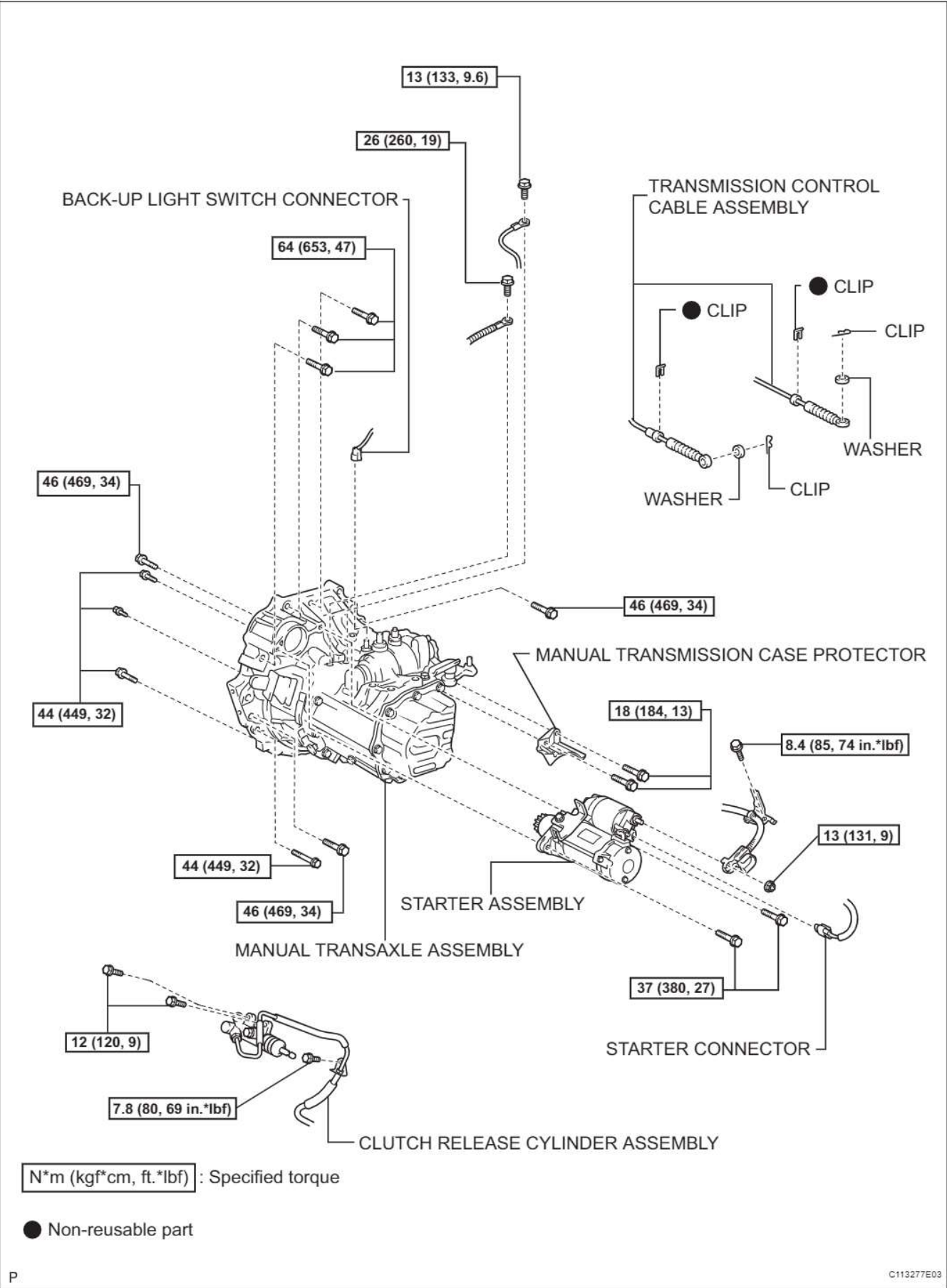
(a) Check the SRS warning light (see page [RS-11](#)).

MANUAL TRANSAXLE ASSEMBLY

COMPONENTS

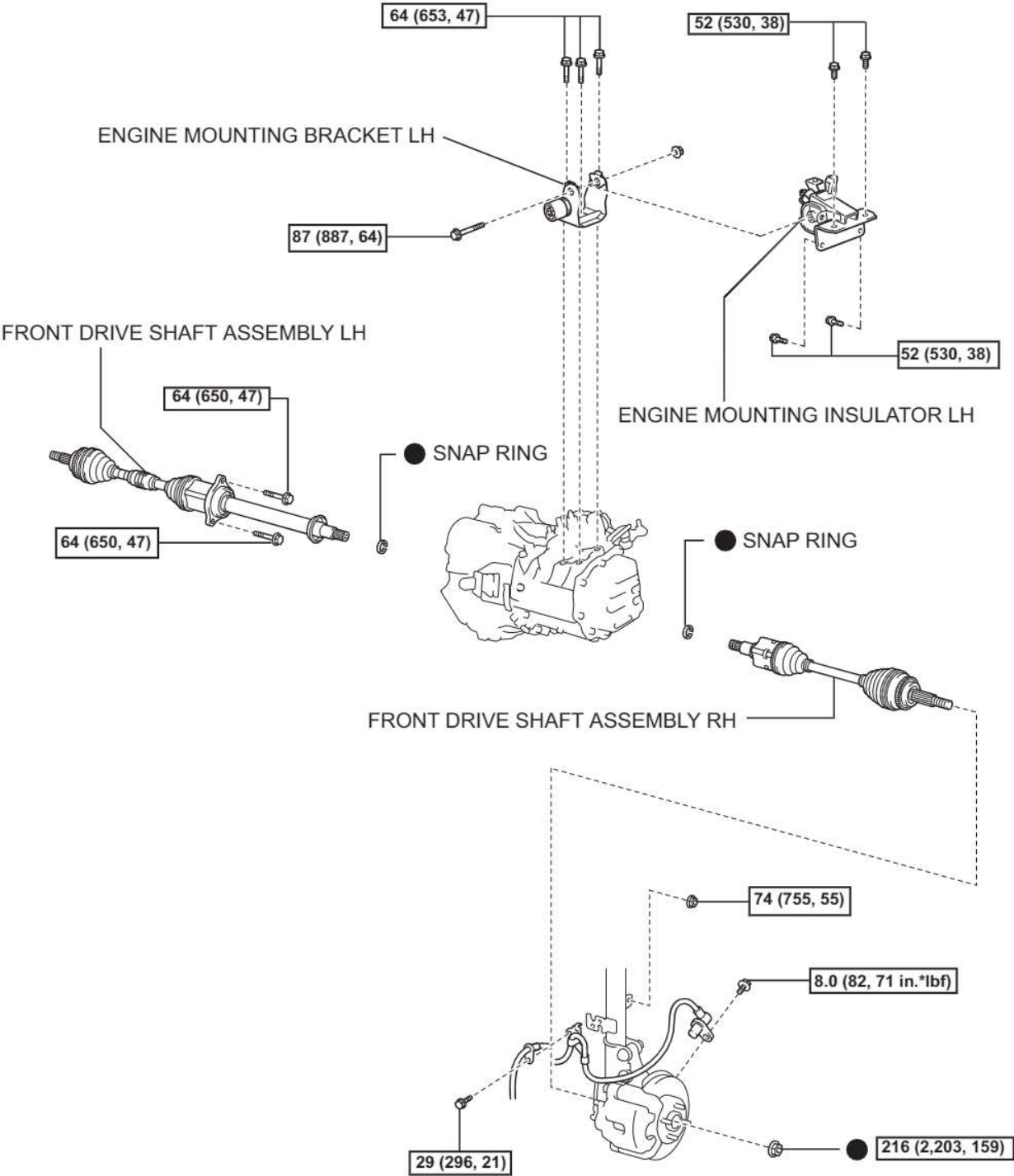


MX-14 E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY



E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY

MX-15



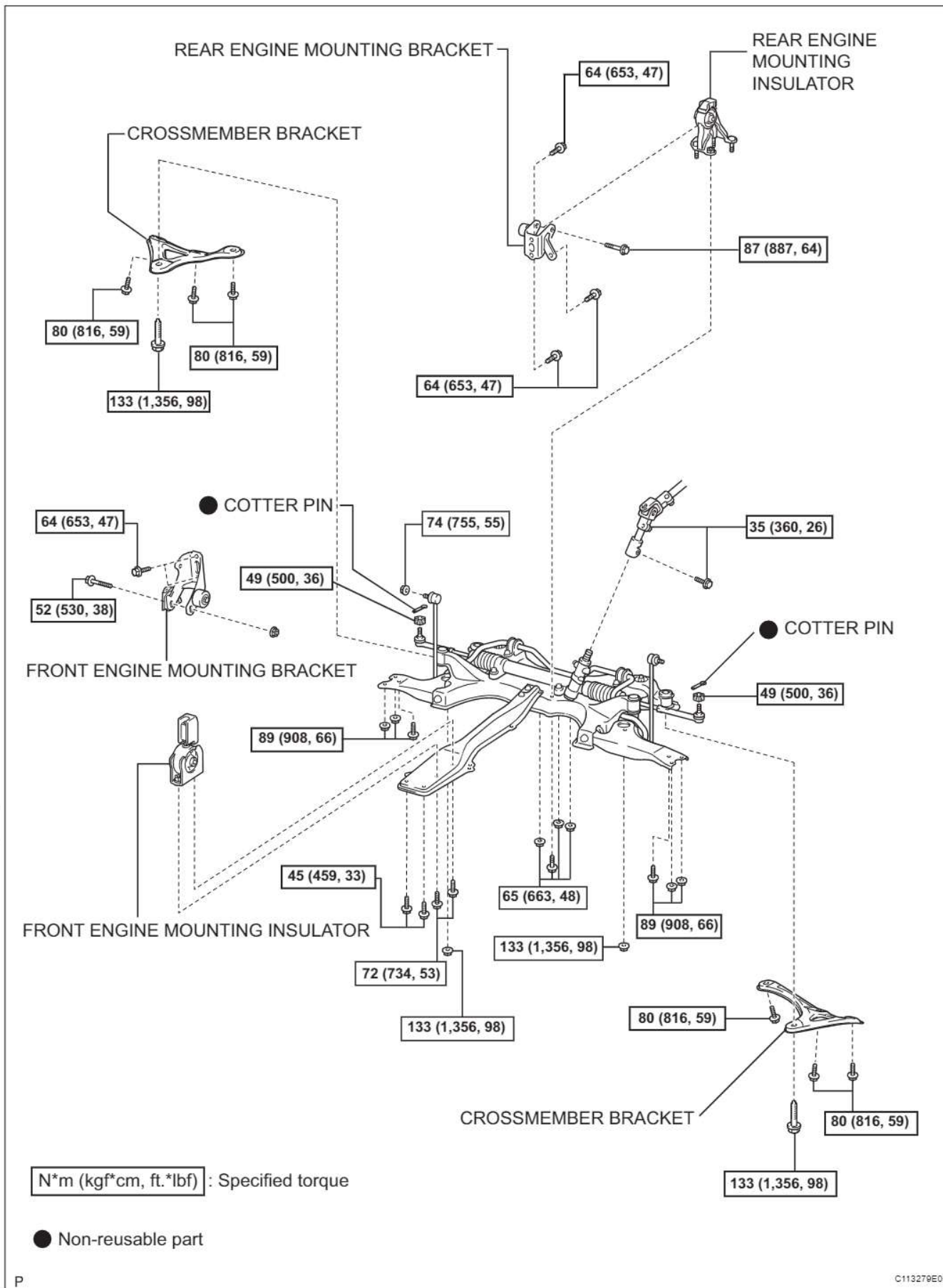
N*m (kgf*cm, ft.*lbf) : Specified torque

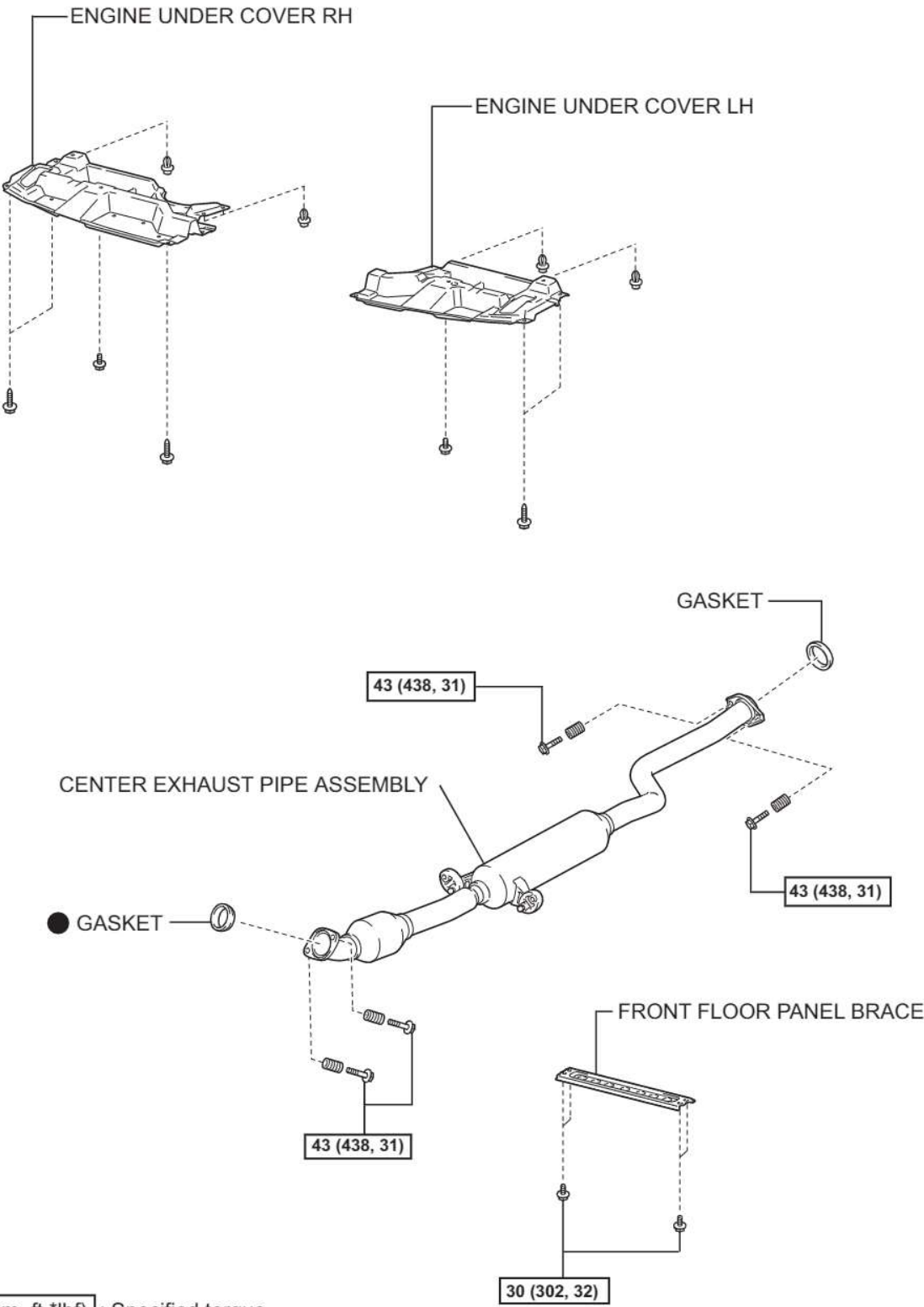
● Non-reusable part

MX

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E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY





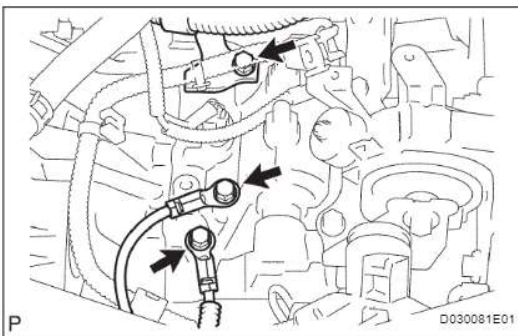
N*m (kgf*cm, ft.*lbf) : Specified torque

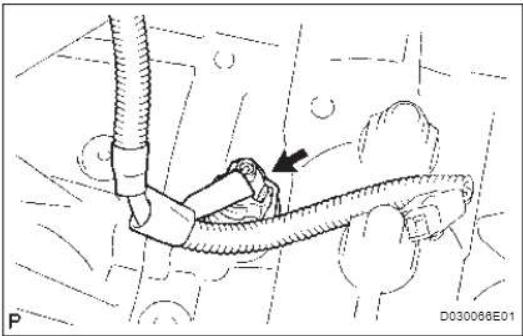
● Non-reusable part

MX

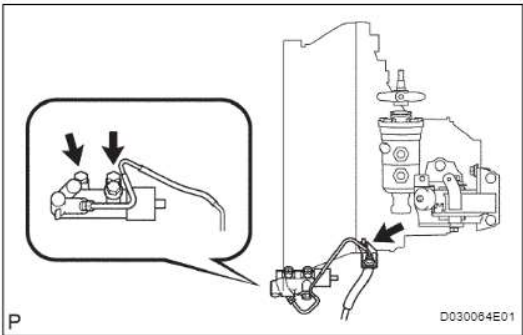
MX-18**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY****REMOVAL**

1. **DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**
CAUTION:
Wait at least 90 seconds after disconnecting the cable from the negative (-) battery terminal to prevent airbag and seat belt pretensioner activation.
2. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
3. **REMOVE COLUMN HOLE COVER SILENCER SHEET**
(See page [SR-9](#))
4. **DISCONNECT NO. 2 STEERING INTERMEDIATE SHAFT ASSEMBLY** (See page [SR-9](#))
5. **REMOVE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY** (See page [SR-9](#))
6. **REMOVE FRONT WHEEL**
7. **REMOVE ENGINE UNDER COVER LH**
8. **REMOVE ENGINE UNDER COVER RH**
9. **DRAIN TRANSAXLE OIL**
 - (a) Remove the filler plug and gasket.
 - (b) Remove the drain plug and gasket, and drain the oil.
 - (c) Install a new gasket and the drain plug.
Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)
10. **REMOVE CENTER EXHAUST PIPE ASSEMBLY** (See page [EX-2](#))
11. **REMOVE HOOD SUB-ASSEMBLY**
12. **REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY**
13. **REMOVE AIR CLEANER ASSEMBLY**
14. **REMOVE BATTERY CLAMP SUB-ASSEMBLY**
15. **REMOVE BATTERY**
16. **REMOVE BATTERY TRAY**
17. **REMOVE BATTERY CARRIER**
 - (a) Remove the 4 bolts and battery carrier.
18. **REMOVE STARTER ASSEMBLY** (See page [ST-6](#))
19. **DISCONNECT WIRE HARNESS**
 - (a) Remove the 3 bolts, and disconnect the 3 wire harnesses.

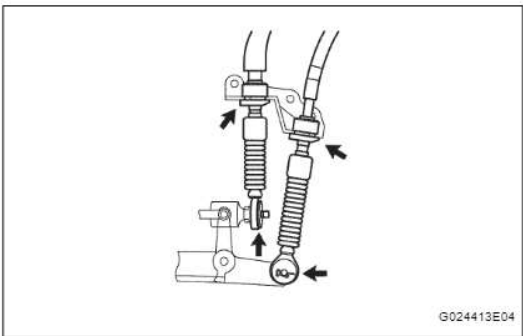
**MX**



20. DISCONNECT BACK-UP LIGHT SWITCH



21. DISCONNECT CLUTCH RELEASE CYLINDER ASSEMBLY
- (a) Remove the 3 bolts and disconnect the release cylinder.



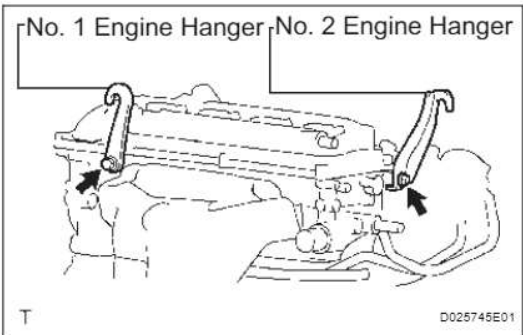
22. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY
- (a) Remove the 2 clips and 2 washers, and disconnect the 2 cables from the transaxle.
- (b) Remove the 2 clips, and disconnect the 2 cables from the bracket.

23. REMOVE FRONT DRIVE SHAFT ASSEMBLY LH
- (a) Remove the drive shaft (see page [DS-5](#)).

24. REMOVE FRONT DRIVE SHAFT ASSEMBLY RH
- (a) Remove the drive shaft (see page [DS-5](#)).

25. DISCONNECT PRESSURE FEED TUBE ASSEMBLY (See page [PS-21](#))

26. SUSPEND ENGINE ASSEMBLY
- (a) Install the No. 1 and No. 2 engine hangers in the correct direction.

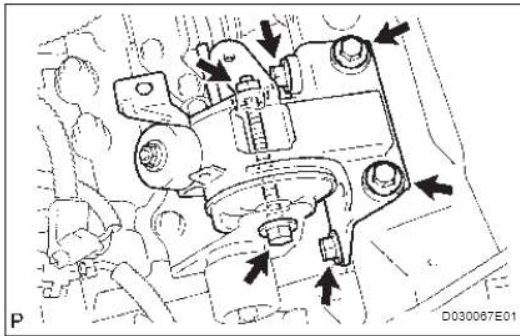


Part Name	Parts No.
No. 1 engine hanger	12281-28010
No. 2 engine hanger	12282-28010
Bolt	91512-61020

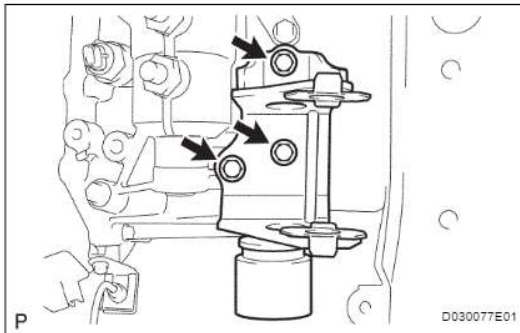
- Torque: 38 N*m (387 kgf*cm, 28 ft.*lbf)**
- (b) Attach the engine chain hoist to the engine hanger.
- CAUTION:**
Do not attempt to hang the engine by hooking the chain to any other part.

27. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY (See page [PS-22](#))

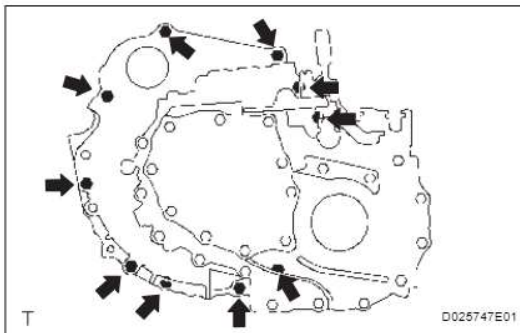
28. SUPPORT MANUAL TRANSAXLE ASSEMBLY
- (a) Support the transaxle with a transmission jack.

MX-20**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY****29. REMOVE ENGINE MOUNTING INSULATOR LH**

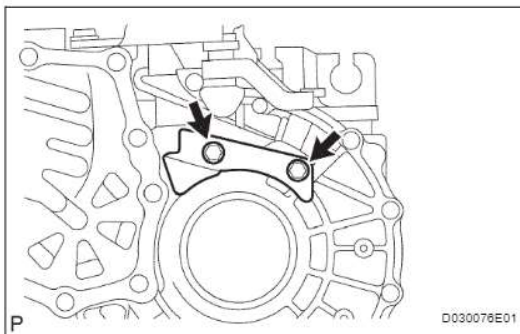
- (a) Remove the 5 bolts, nut and engine mounting insulator.

**30. REMOVE ENGINE MOUNTING BRACKET LH**

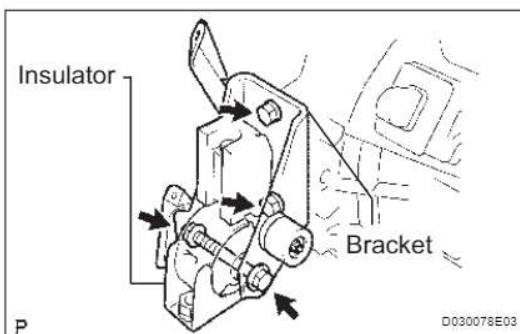
- (a) Remove the 3 bolts and engine mounting bracket.

**31. REMOVE MANUAL TRANSAXLE ASSEMBLY**

- (a) Remove the 10 bolts.
(b) Separate and remove the transaxle from the engine.

MX**32. REMOVE MANUAL TRANSMISSION CASE PROTECTOR**

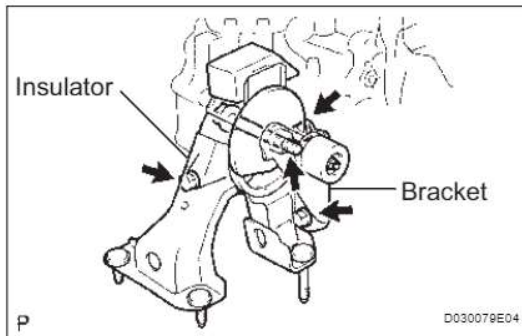
- (a) Remove the 2 bolts and case protector.

**33. REMOVE FRONT ENGINE MOUNTING BRACKET**

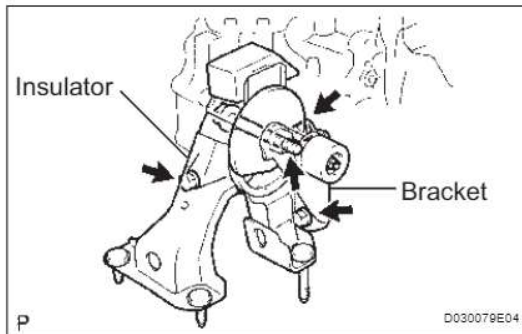
- (a) Remove the bolt, nut and front engine mounting insulator from the front engine mounting bracket.
(b) Remove the 2 bolts and front engine mounting bracket from the transaxle.

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY

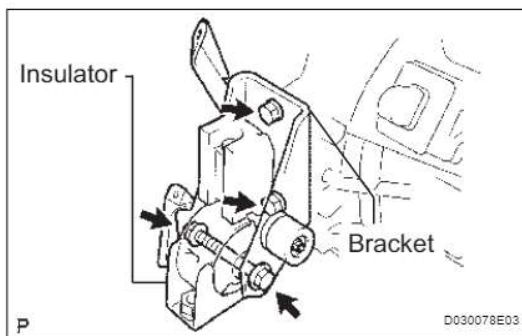
MX-21

**34. REMOVE REAR ENGINE MOUNTING BRACKET**

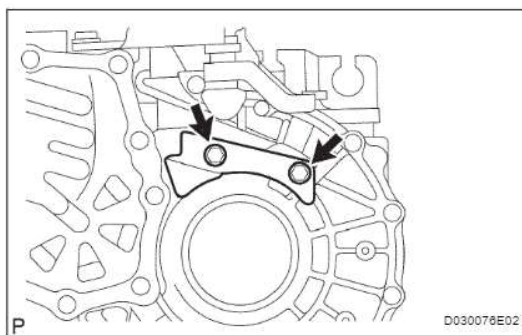
- (a) Remove the bolt and rear engine mounting insulator from the rear engine mounting bracket.
- (b) Remove the 3 bolts and rear engine mounting bracket from the transaxle.

**INSTALLATION****1. INSTALL REAR ENGINE MOUNTING BRACKET**

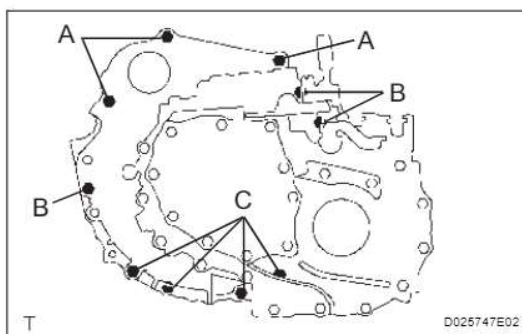
- (a) Install the rear engine mounting bracket to the transaxle with the 3 bolts.
Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf)
- (b) Install the rear engine mounting insulator with the bolt to the rear engine mounting bracket.
Torque: 87 N*m (887 kgf*cm, 64 ft.*lbf)

**2. INSTALL FRONT ENGINE MOUNTING BRACKET**

- (a) Install the front engine mounting bracket and 2 bolts to the transaxle.
Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf)
- (b) Install the front engine mounting insulator, bolt and nut to the front engine mounting bracket.
Torque: 52 N*m (530 kgf*cm, 38 ft.*lbf)

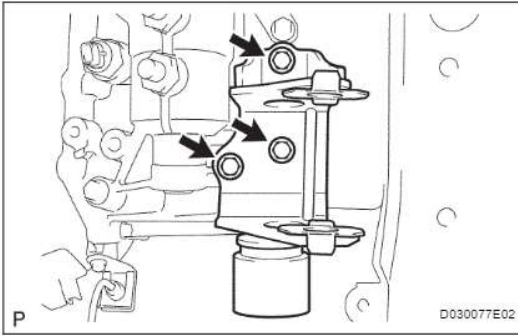
**3. INSTALL MANUAL TRANSMISSION CASE PROTECTOR**

- (a) Install the case protector with the 2 bolts.
Torque: 18 N*m (184 kgf*cm, 13 ft.*lbf)

**4. INSTALL MANUAL TRANSAXLE ASSEMBLY**

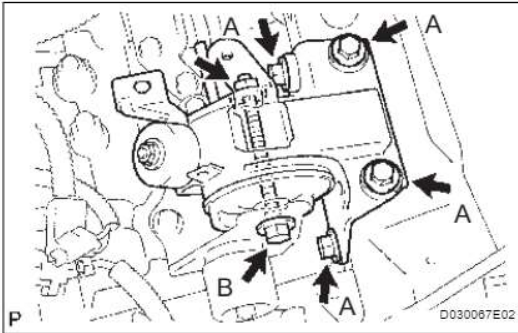
- (a) Align the input shaft with the clutch disc and install the transaxle to the engine.
- (b) Install the 10 bolts.
Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf) for bolt A
46 N*m (469 kgf*cm, 34 ft.*lbf) for bolt B
44 N*m (449 kgf*cm, 32 ft.*lbf) for bolt C

MX

MX-22**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY****5. INSTALL ENGINE MOUNTING BRACKET LH**

- (a) Install the engine mounting bracket to the transaxle with the 3 bolts.

Torque: 64 N*m (653 kgf*cm, 47 ft.*lbf)

**6. INSTALL ENGINE MOUNTING INSULATOR LH**

- (a) Install the engine mounting insulator with the 5 bolts and nut.

Torque: 52 N*m (530 kgf*cm, 38 ft.*lbf) for bolt A
87 N*m (887 kgf*cm, 64 ft.*lbf) for bolt B

7. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY (See page [PS-37](#))**8. CONNECT PRESSURE FEED TUBE ASSEMBLY (See page [PS-38](#))****9. INSTALL FRONT DRIVE SHAFT ASSEMBLY LH**

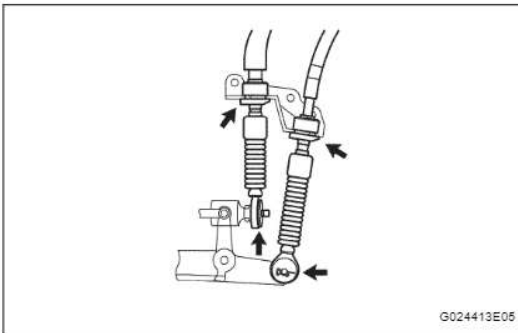
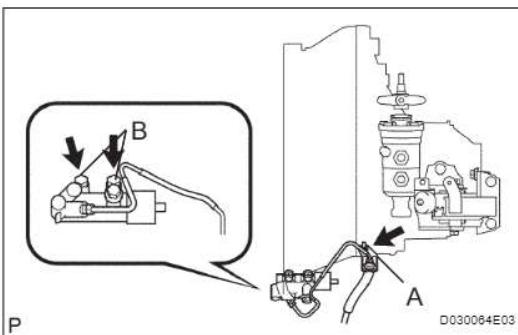
- (a) Install the drive shaft (see page [DS-16](#)).

10. INSTALL FRONT DRIVE SHAFT ASSEMBLY RH

- (a) Install the drive shaft (see page [DS-16](#)).

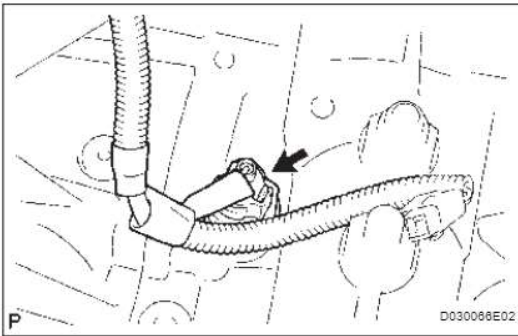
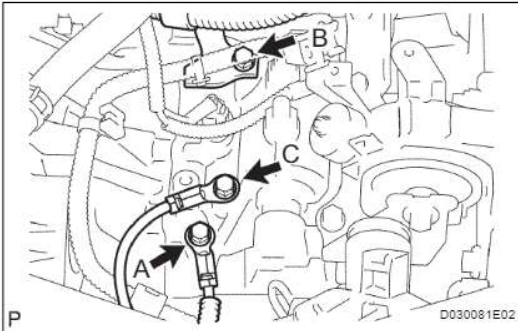
11. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Connect the 2 cable ends with the 2 washers and 2 clips.
 (b) Install 2 new clips to the control cable bracket.

**MX****12. INSTALL CLUTCH RELEASE CYLINDER ASSEMBLY**

- (a) Install the release cylinder with the 3 bolts.

Torque: 7.8 N*m (80 kgf*cm, 69 in.*lbf) for bolt A
12 N*m (120 kgf*cm, 9 ft.*lbf) for bolt B

**13. CONNECT BACK-UP LIGHT SWITCH****14. CONNECT WIRE HARNESS**

- (a) Install the 3 wire harnesses with the 3 bolts.

Torque: 26 N*m (260 kgf*cm, 19 ft.*lbf) for bolt A
 8.4 N*m (85 kgf*cm, 74 in.*lbf) for bolt B
 13 N*m (133 kgf*cm, 9.6 ft.*lbf) for bolt C

15. INSTALL STARTER ASSEMBLY (See page [ST-14](#))**16. INSTALL BATTERY CARRIER**

- (a) Install the battery carrier with the 3 bolts.

17. INSTALL BATTERY TRAY**18. INSTALL BATTERY****19. INSTALL BATTERY CLAMP SUB-ASSEMBLY**

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

20. INSTALL AIR CLEANER ASSEMBLY

Torque: 5.0 N*m (51 kgf*cm, 44 in.*lbf)

21. INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY**22. INSTALL HOOD SUB-ASSEMBLY**

Torque: 13 N*m (133 kgf*cm, 10 ft.*lbf)

23. ADJUST HOOD SUB-ASSEMBLY

- (a) Adjust the hood (see page [ED-1](#)).

24. INSTALL CENTER EXHAUST PIPE ASSEMBLY (See page [EX-4](#))**25. ADD TRANSAXLE OIL (See page [MX-2](#))****26. INSPECT TRANSAXLE OIL (See page [MX-2](#))****27. INSTALL FRONT WHEEL**

Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)

28. INSTALL NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY**29. CONNECT NO. 2 STEERING INTERMEDIATE SHAFT ASSEMBLY (See page [PS-39](#))****30. INSTALL COLUMN HOLE COVER SILENCER SHEET****31. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL**

MX-24**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE ASSEMBLY**

32. PERFORM INITIALIZATION**NOTICE:**

Certain systems need to be initialized after disconnecting and reconnecting the cable from the negative (-) battery terminal.

(a) Perform initialization (see page [IN-23](#)).

33. CHECK SRS WARNING LIGHT

(a) Check the SRS warning light (see page [RS-11](#)).

34. PLACE FRONT WHEEL FACING STRAIGHT AHEAD**35. INSPECT STEERING WHEEL CENTER POINT****36. ADD POWER STEERING FLUID****37. BLEED AIR FROM POWER STEERING FLUID (See page [PS-3](#))****38. CHECK POWER STEERING FLUID LEVEL IN RESERVOIR (See page [PS-4](#))****39. INSPECT FOR POWER STEERING FLUID LEAK****40. INSPECT FRONT WHEEL ALIGNMENT**

(a) Inspect wheel alignment (see page [SP-2](#)).

41. INSTALL ENGINE UNDER COVER LH**42. INSTALL ENGINE UNDER COVER RH****43. CHECK ABS SPEED SENSOR SIGNAL**

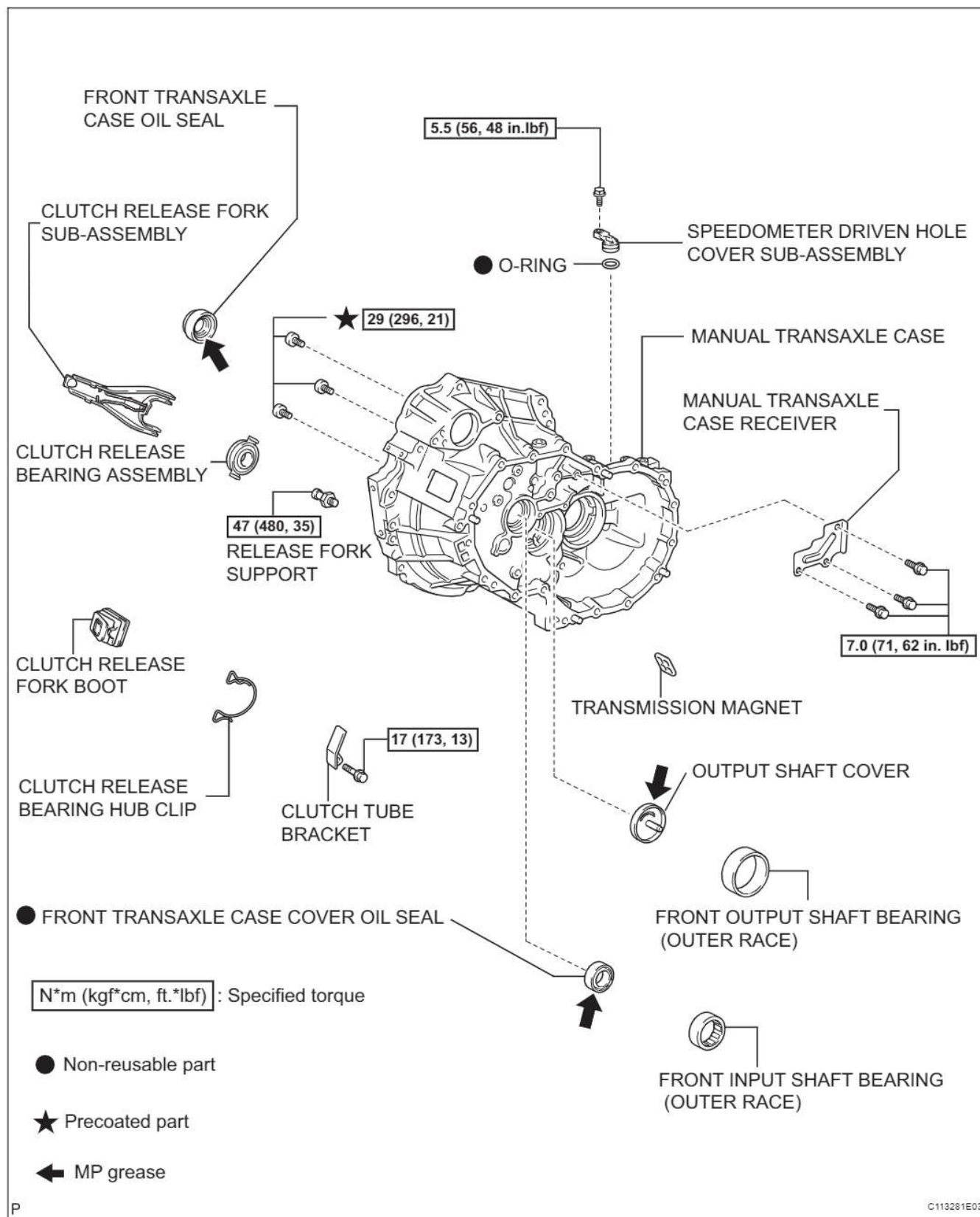
(a) Check the sensor signal (see page [BC-20](#)).

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT

MX-25

MANUAL TRANSAXLE UNIT

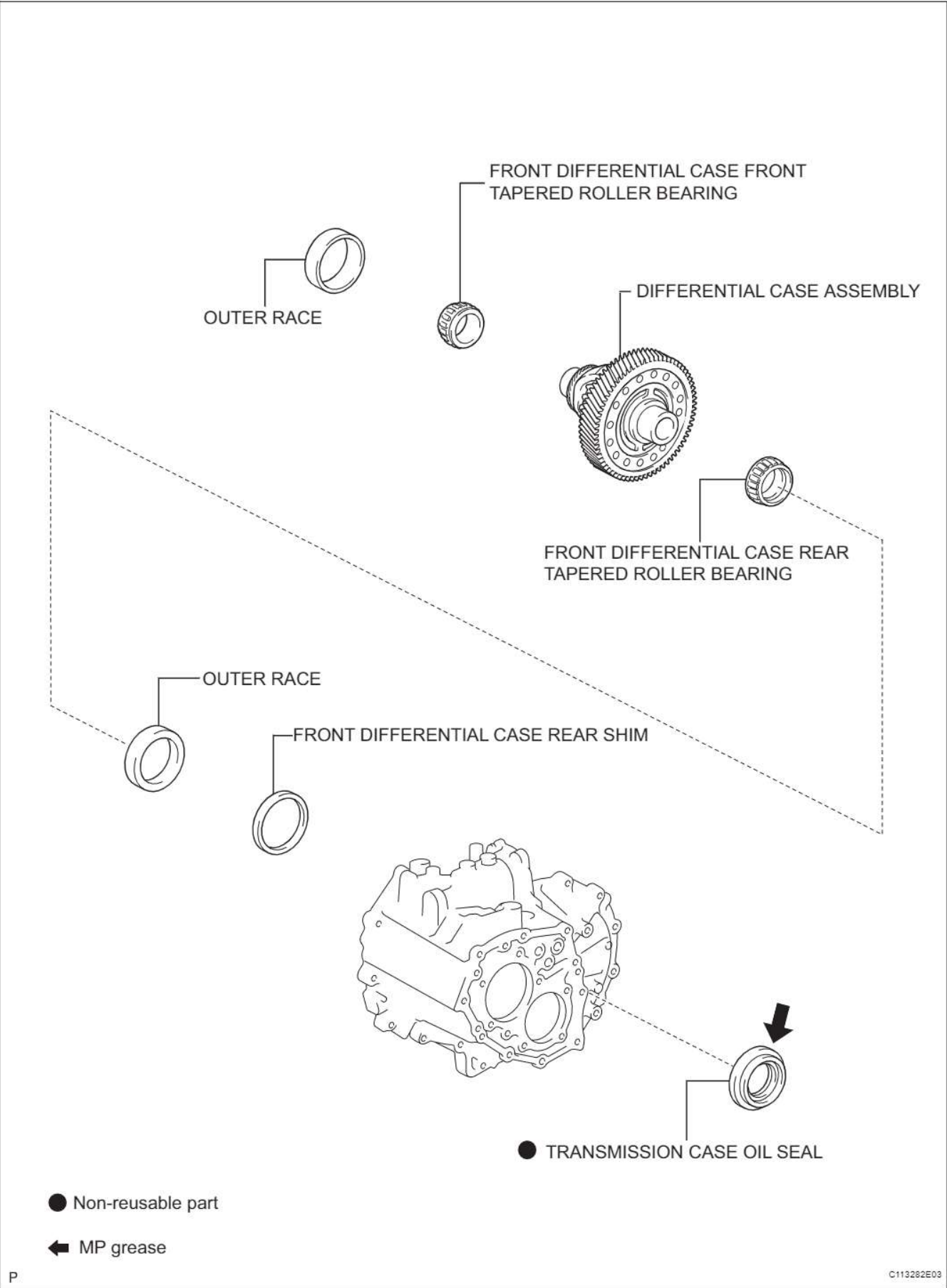
COMPONENTS



MX

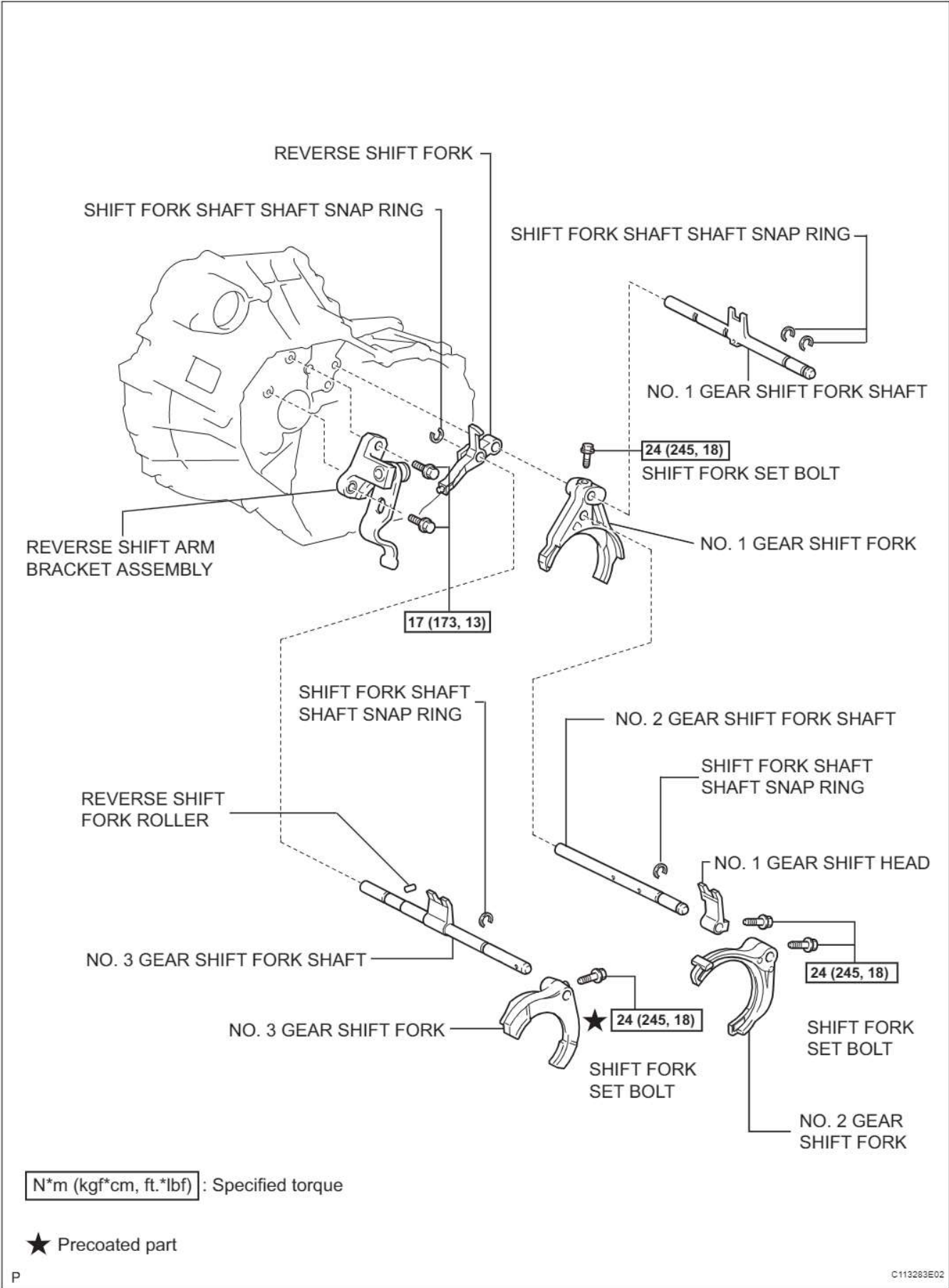
MX-26

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT



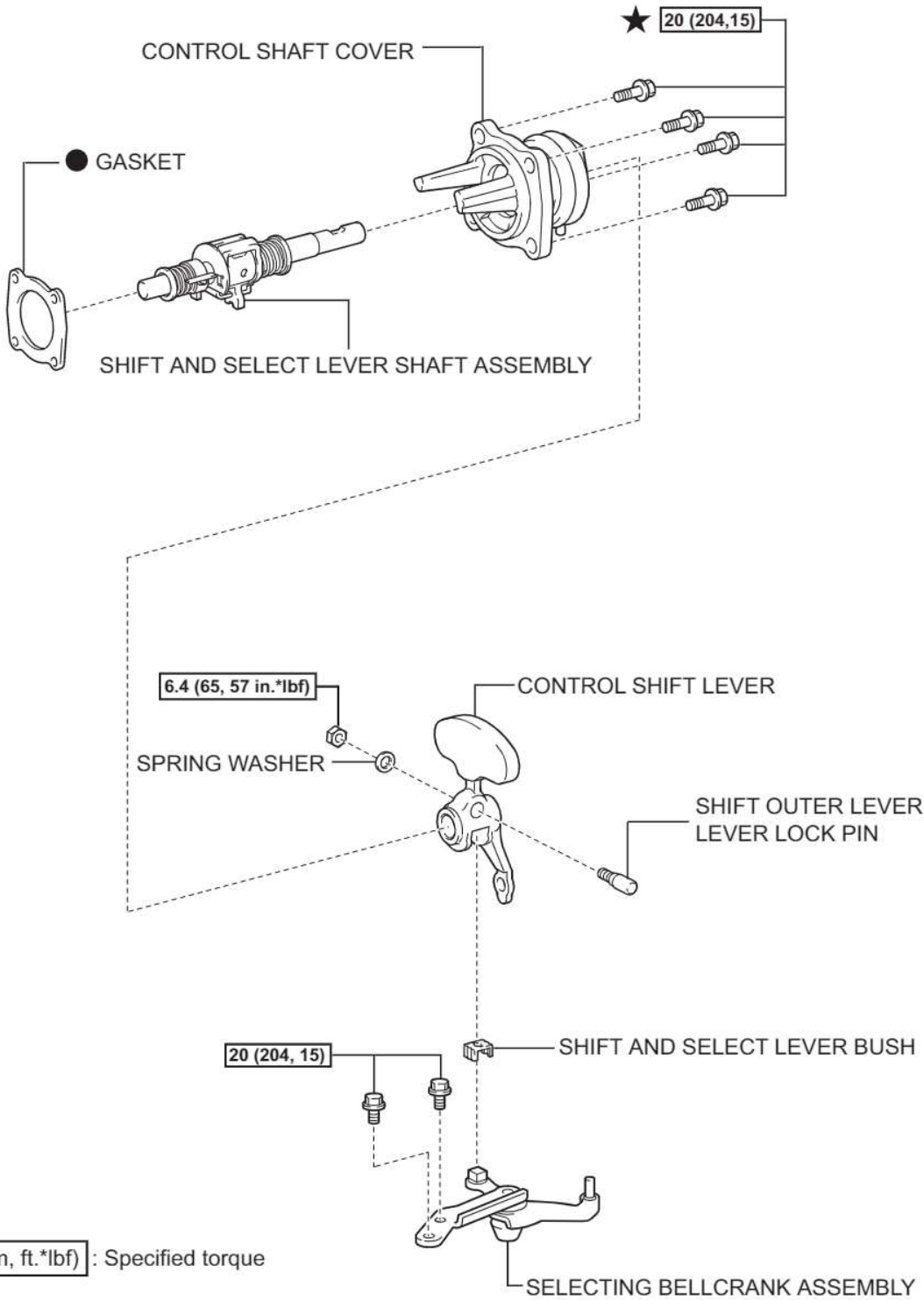
E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT

MX-27



MX-28

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT



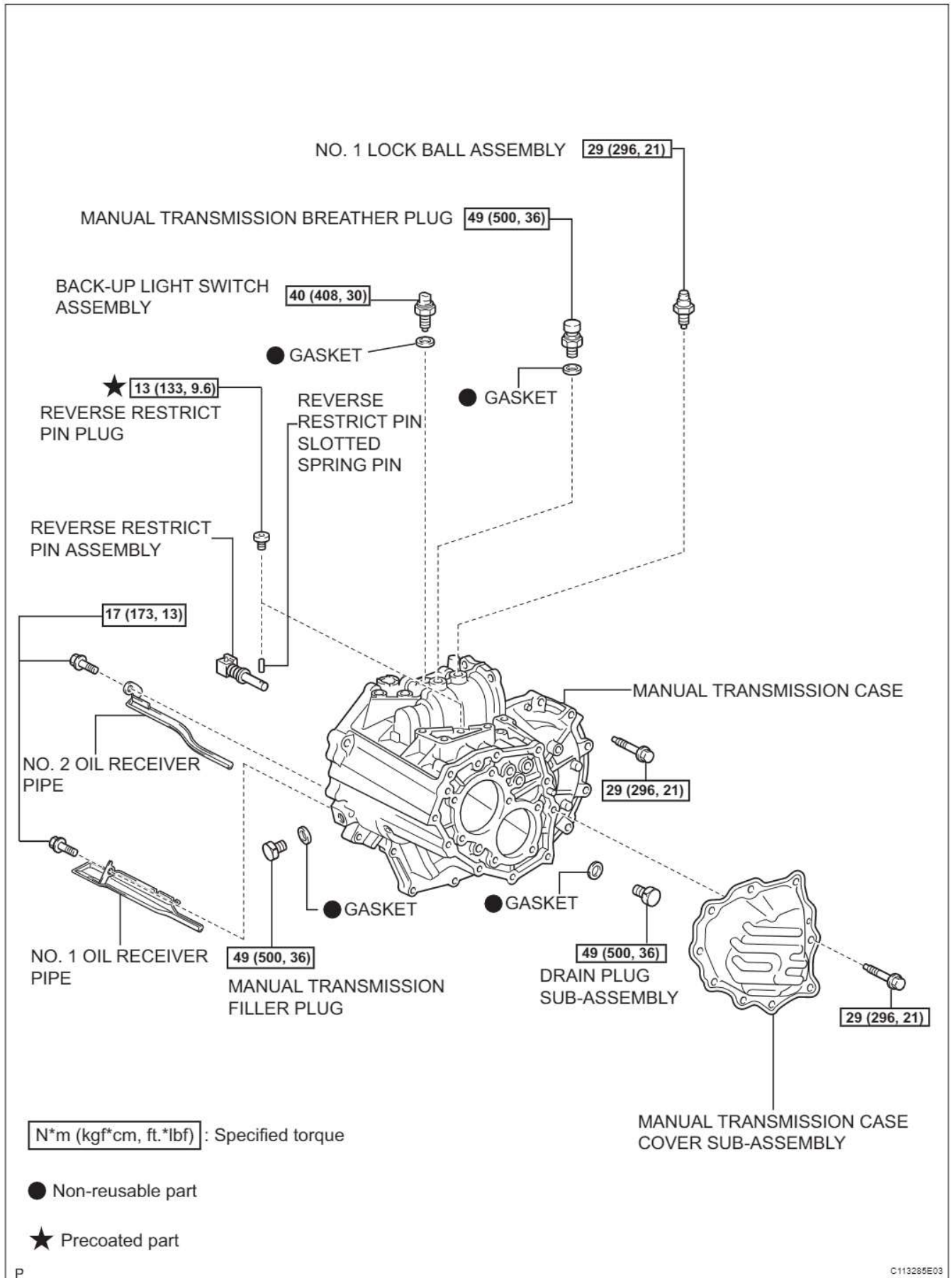
N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

★ Precoated part

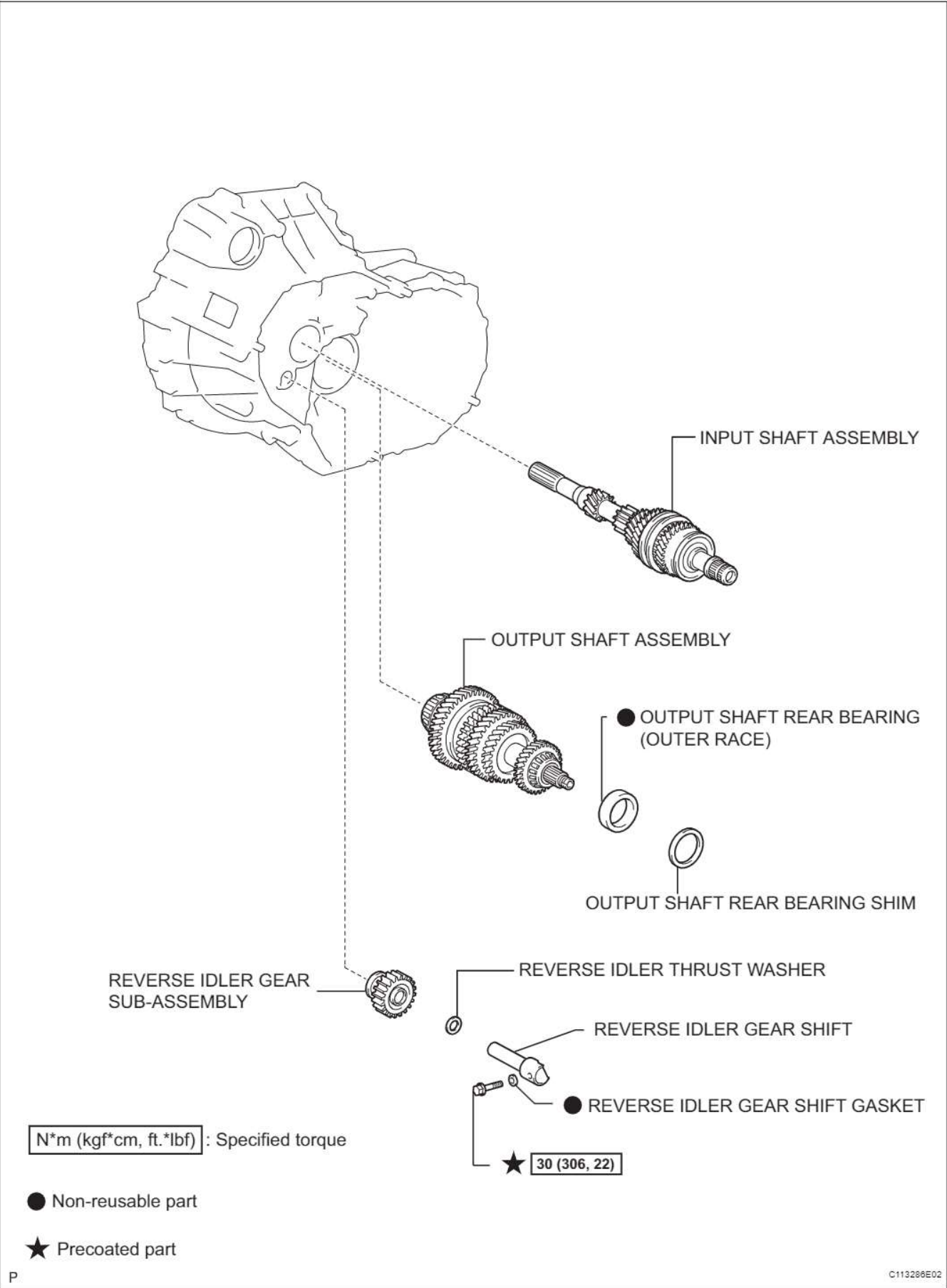
P

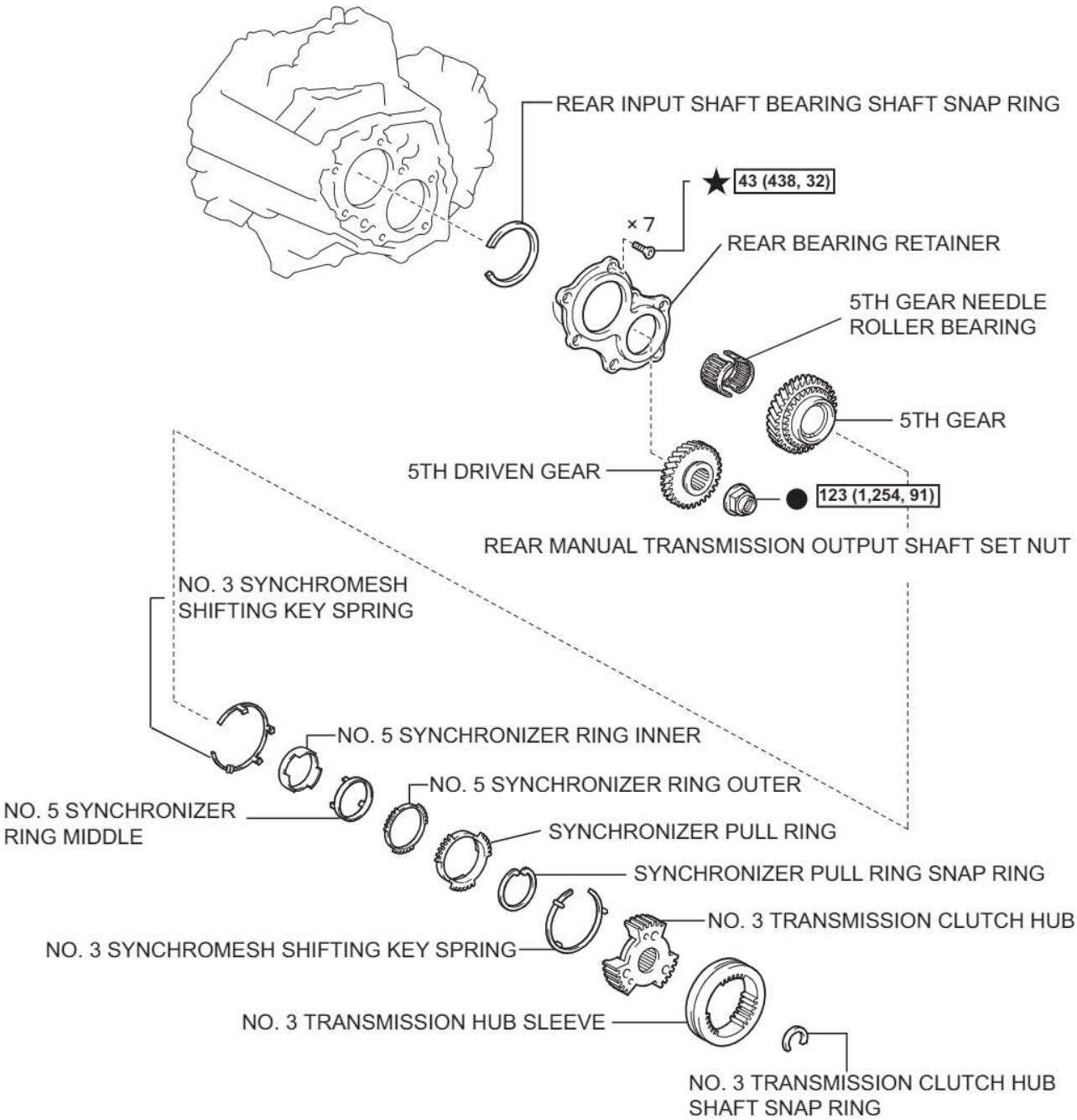
C113284E06



MX-30

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT



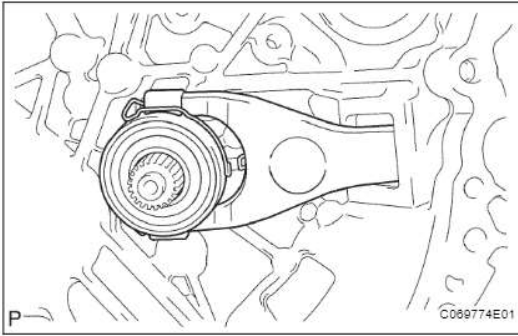


N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

★ Precoated part

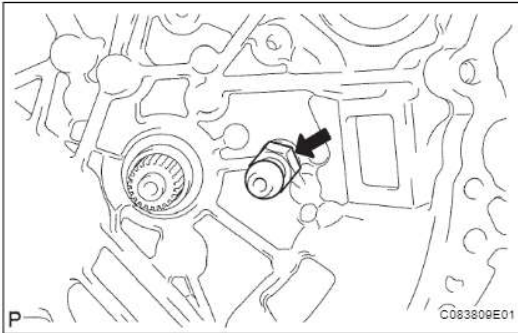
MX

MX-32**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****REMOVAL****1. REMOVE CLUTCH RELEASE FORK SUB-ASSEMBLY**

- (a) Remove the clutch release fork with the clutch release bearing from the transaxle case.

2. REMOVE CLUTCH RELEASE BEARING ASSEMBLY

- (a) Remove the release bearing and clutch release bearing hub clip from the clutch release fork.

**3. REMOVE CLUTCH RELEASE FORK SUPPORT**

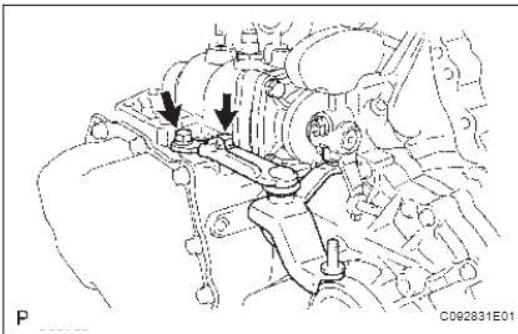
- (a) Remove the clutch release fork support from the transaxle case.

4. REMOVE CLUTCH RELEASE FORK BOOT

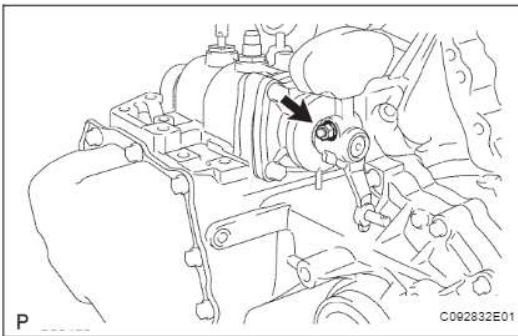
- (a) Remove the clutch release fork boot from the manual transaxle case.

5. REMOVE SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY

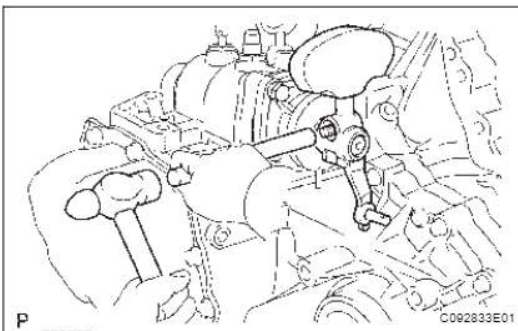
- (a) Remove the bolt and hole cover.
(b) Remove the O-ring from the hole cover.

**6. REMOVE SELECTING BELLCRANK ASSEMBLY**

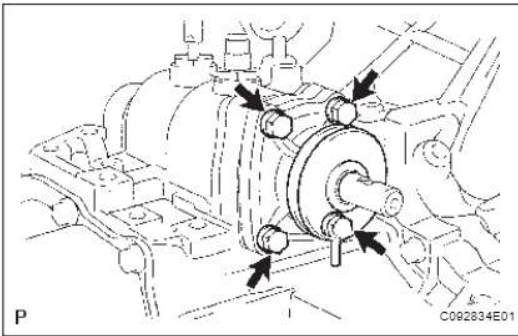
- (a) Remove the 2 bolts and selecting bellcrank assembly from the transmission case.
(b) Remove the shift and select lever bush from the selecting bellcrank.

MX**7. REMOVE CONTROL SHIFT LEVER**

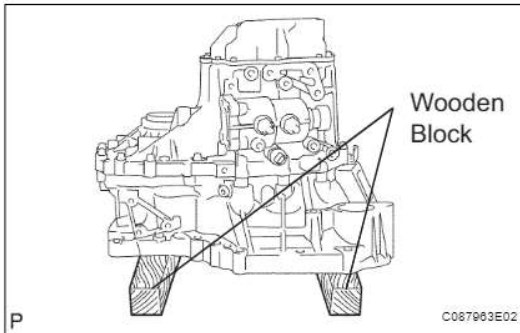
- (a) Remove the nut and spring washer.



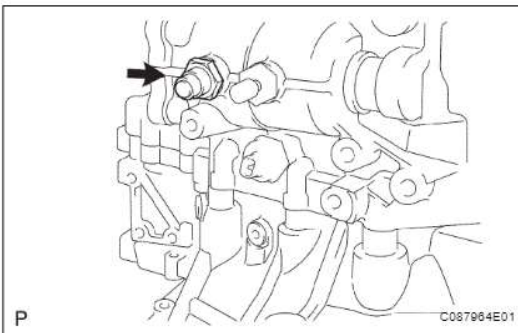
- (b) Using a brass bar and hammer, remove the shift outer lever lever lock pin.
(c) Remove the control shift lever.

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-33****8. REMOVE CONTROL SHAFT COVER**

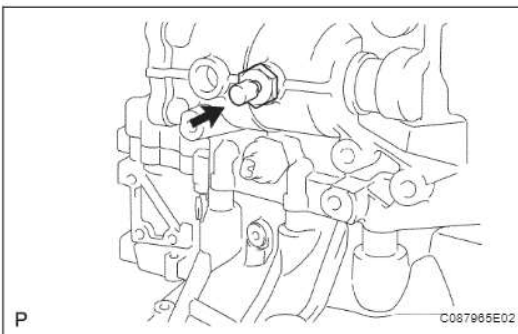
- (a) Remove the 4 bolts, control shift cover and gasket from the transmission case.

**9. FIX MANUAL TRANSAXLE ASSEMBLY**

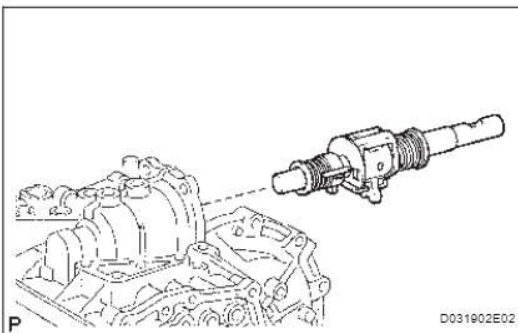
- (a) Place the transaxle on wooden blocks.

**10. REMOVE NO. 1 LOCK BALL ASSEMBLY**

- (a) Remove the lock ball from the transmission case.

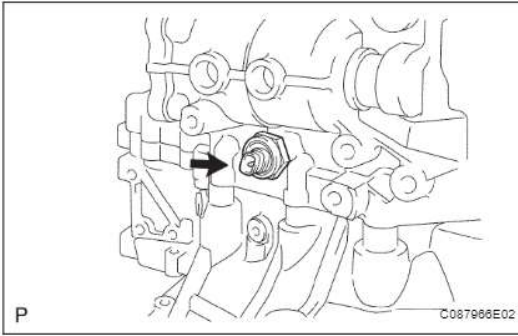
**11. REMOVE MANUAL TRANSMISSION BREATHER PLUG**

- (a) Remove the breather plug and gasket.

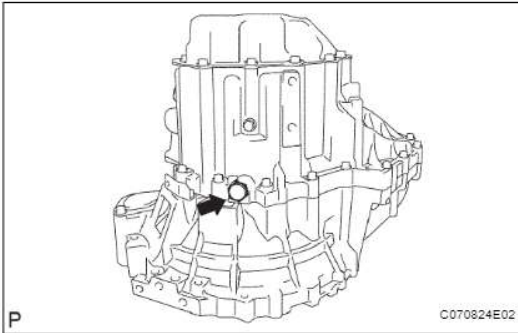
**12. REMOVE SHIFT AND SELECT LEVER SHAFT ASSEMBLY**

- (a) Remove the shift and select lever shaft from the transmission case.

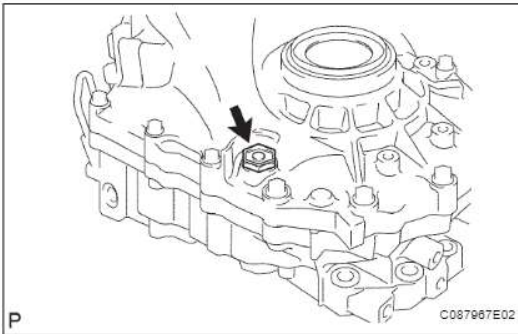
MX

MX-34**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****13. REMOVE BACK-UP LIGHT SWITCH ASSEMBLY**

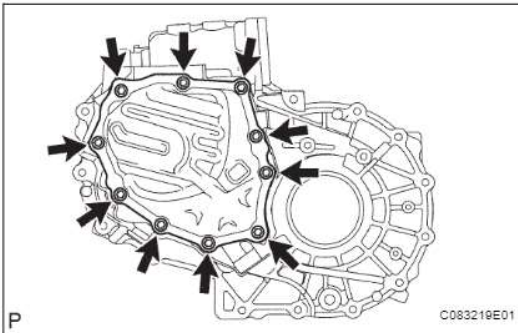
- (a) Remove the back-up light switch and gasket from the transmission case.

**14. REMOVE FILLER PLUG**

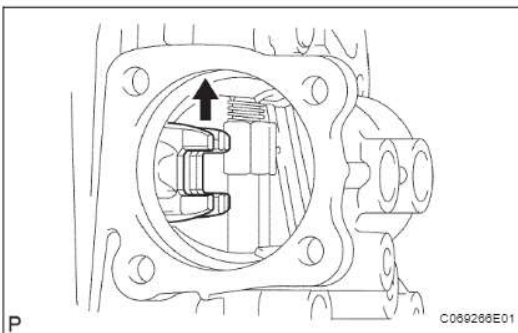
- (a) Remove the filler plug and gasket from the transmission case.

**15. REMOVE DRAIN PLUG SUB-ASSEMBLY**

- (a) Remove the drain plug and gasket from the transmission case.

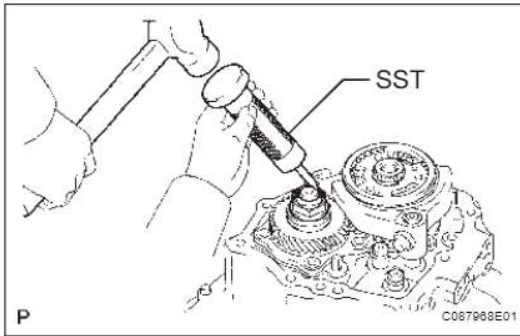
**16. REMOVE MANUAL TRANSMISSION CASE COVER SUB-ASSEMBLY**

- (a) Remove the 10 bolts and transmission case cover from the transmission case.

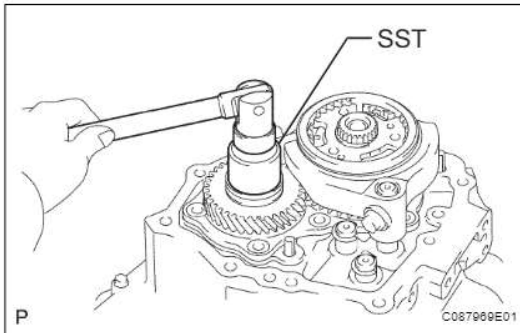
**17. REMOVE REAR MANUAL TRANSMISSION OUTPUT SHAFT SET NUT**

- (a) Engage the 2 gears simultaneously to lock the transmission.

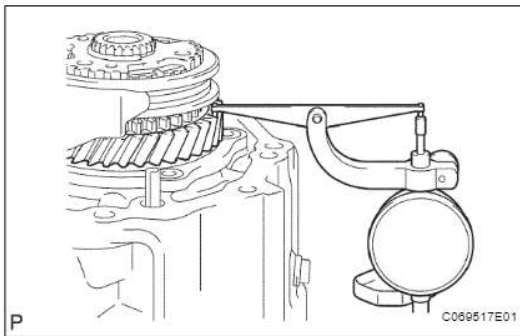
MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-35**

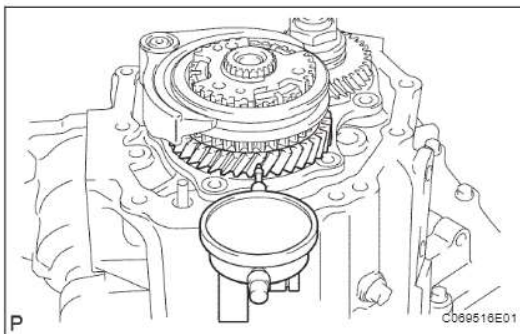
- (b) Using SST and a hammer, unstake the rear set nut.
SST 09930-00010



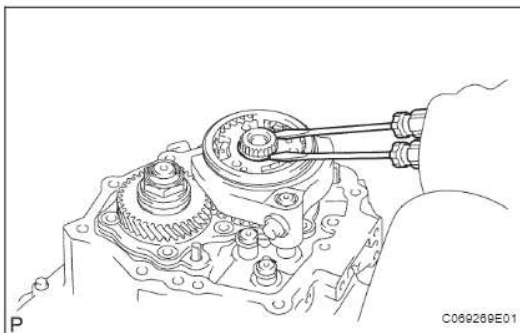
- (c) Using SST, remove the shaft rear set nut from the output shaft.
SST 09229-55010
- (d) Disengage the 2 gears.

**18. INSPECT 5TH GEAR THRUST CLEARANCE**

- (a) Using a dial indicator, measure the thrust clearance.
Standard clearance:
0.10 to 0.65 mm (0.0039 to 0.0256 in.)
If the clearance is out of specification, replace the No. 3 transmission clutch hub, 5th gear or input shaft rear radial ball bearing.

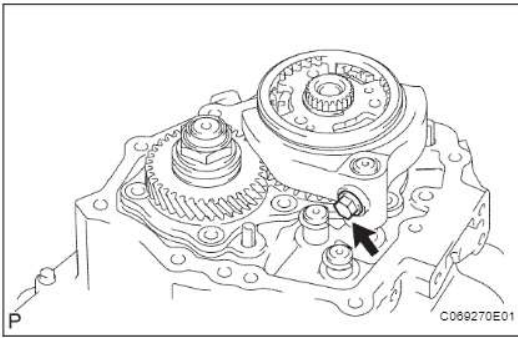
**19. INSPECT 5TH GEAR RADIAL CLEARANCE**

- (a) Using a dial indicator, measure the radial clearance.
Standard clearance:
0.009 to 0.050 mm (0.0004 to 0.0020 in.)
If the clearance is out of specification, replace the 5th gear, 5th gear needle roller bearing or input shaft.

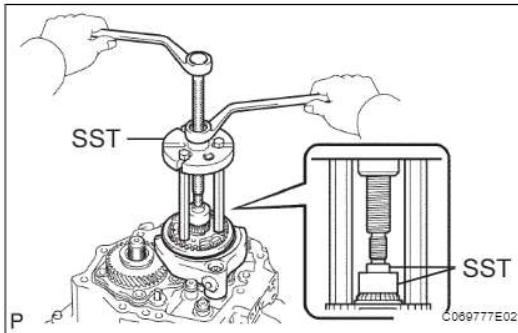
**20. REMOVE NO. 3 TRANSMISSION CLUTCH HUB**

- (a) Using 2 screwdrivers and a hammer, remove the No. 3 transmission clutch hub shaft snap ring from the input shaft.
HINT:
Cover with a shop rag to keep the snap ring from flying off.

MX

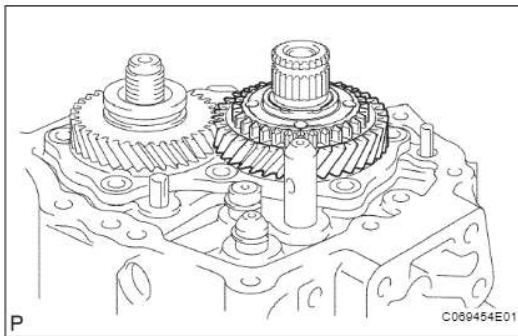
MX-36**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**

- (b) Remove the shift fork set bolt from the No. 3 gear shift fork.

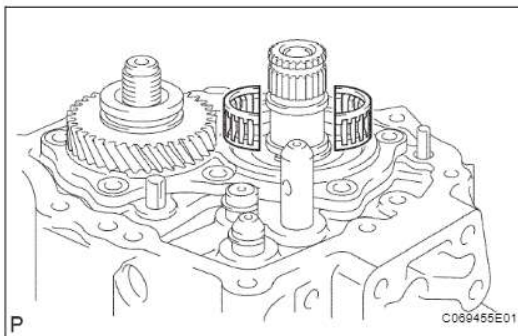


- (c) Using SST, remove the No. 3 transmission clutch hub, No. 3 transmission hub sleeve and No. 3 gear shift fork from the input shaft.

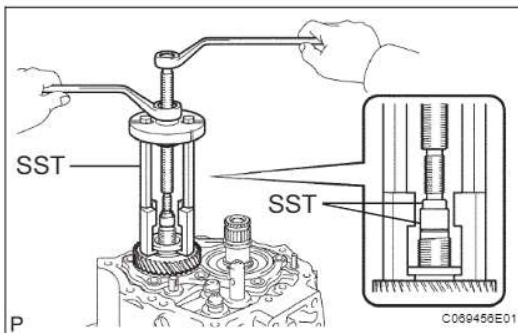
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010), 09950-50013 (09957-04010), 09950-60010 (09951-00280)

**21. REMOVE 5TH GEAR**

- (a) Remove the 5th gear from the input shaft.

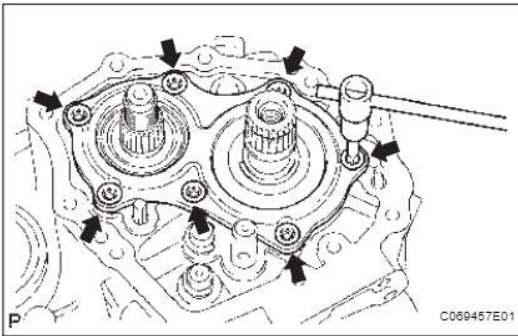
**22. REMOVE 5TH GEAR NEEDLE ROLLER BEARING**

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

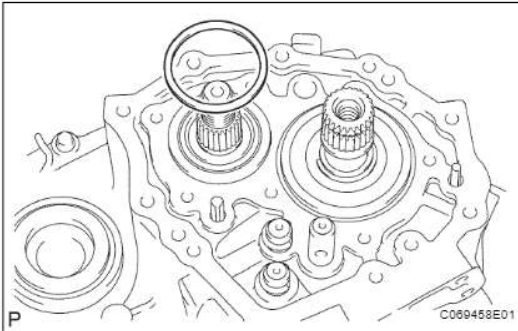
**23. REMOVE 5TH DRIVEN GEAR**

- (a) Using SST, remove the 5th driven gear from the output shaft.

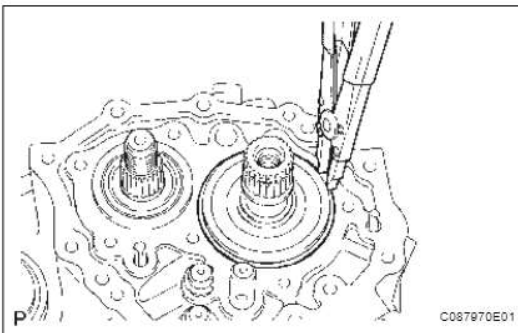
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09957-04010), 09950-60010 (09951-00180, 09955-03011), 09950-50013

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-37****24. REMOVE REAR BEARING RETAINER**

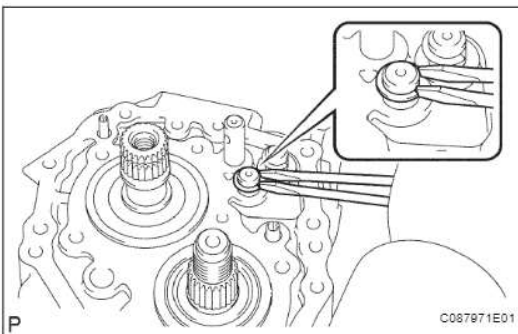
- (a) Using a T45 "TORX" socket, remove the 7 "TORX" screws and bearing retainer from the transmission case.

**25. REMOVE OUTPUT SHAFT REAR BEARING SHIM**

- (a) Remove the rear bearing shim from the output shaft.

**26. REMOVE INPUT SHAFT REAR BEARING SHAFT SNAP RING**

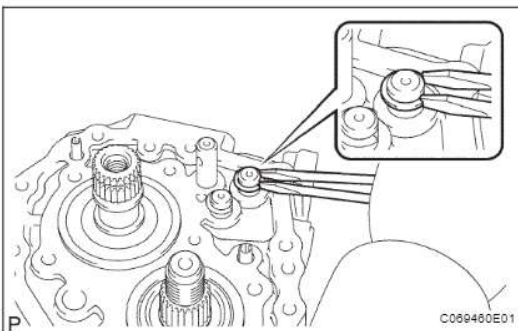
- (a) Using a snap ring expander, remove the shaft snap ring from the input shaft.

**27. REMOVE SHIFT FORK SHAFT SHAFT SNAP RING**

- (a) Using 2 screwdrivers and a hammer, remove the shaft snap ring from the No. 1 gear shift fork shaft.

HINT:

Cover with a shop rag to keep the snap ring from flying off.

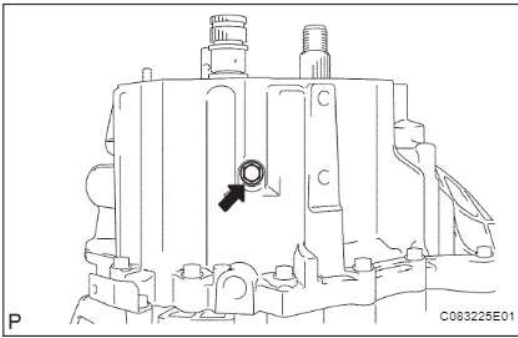


- (b) Using 2 screwdrivers and a hammer, remove the shaft snap ring from the No. 2 gear shift fork shaft.

HINT:

Cover with a shop rag to keep the snap ring from flying off.

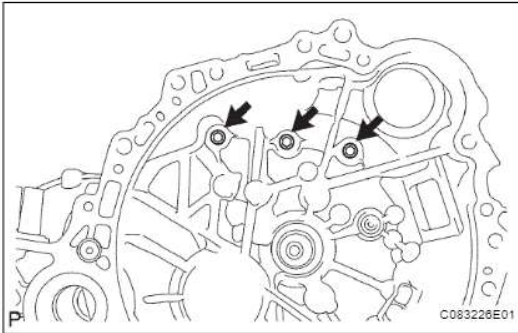
MX

MX-38**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****28. REMOVE REVERSE IDLER GEAR SHAFT BOLT**

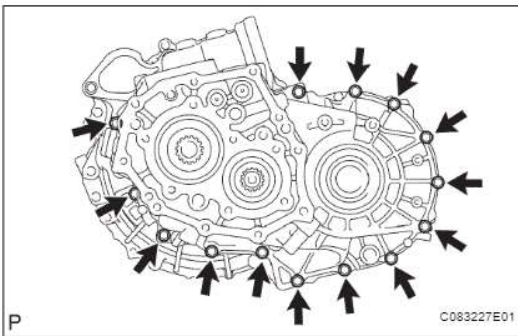
- (a) Remove the reverse idler gear shaft bolt and gasket.

29. REMOVE CLUTCH TUBE BRACKET

- (a) Remove the bolt and clutch tube bracket.

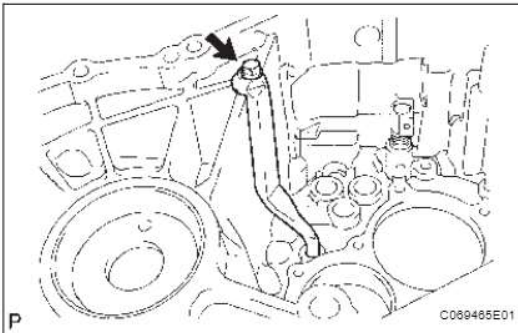
**30. REMOVE MANUAL TRANSMISSION CASE**

- (a) Remove the 3 bolts from the transaxle case side.



- (b) Remove the 14 bolts from the transmission case side.

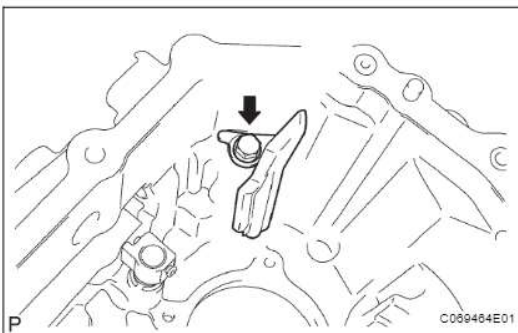
- (c) Tapping with a plastic-faced hammer, remove the transmission case.

**31. REMOVE NO. 2 OIL RECEIVER PIPE**

- (a) Remove the bolt and No. 2 oil receiver pipe from the transmission case.

NOTICE:

Do not damage the pipe.

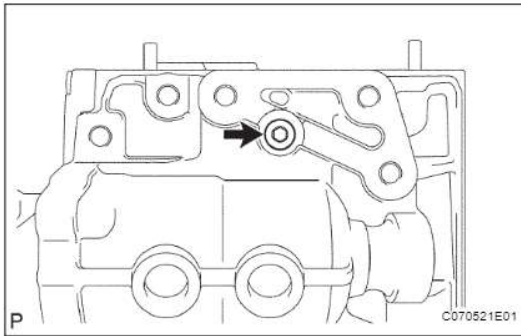
**32. REMOVE NO. 1 OIL RECEIVER PIPE**

- (a) Remove the bolt and oil receiver pipe from the transmission case.

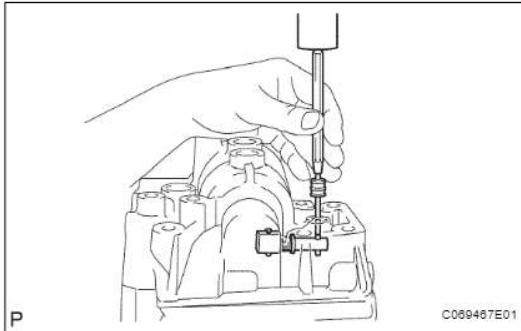
NOTICE:

Do not damage the pipe.

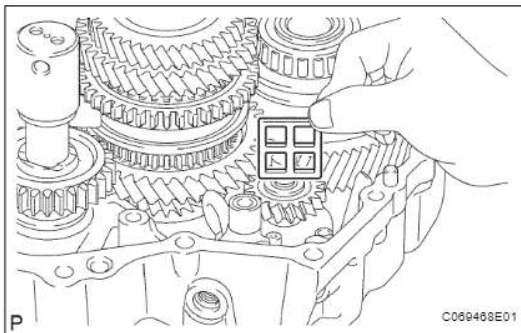
MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-39****33. REMOVE REVERSE RESTRICT PIN ASSEMBLY**

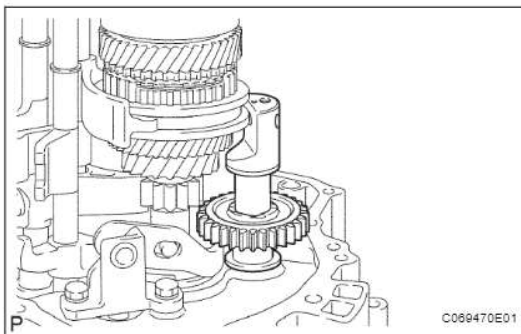
- (a) Using a 6 mm hexagon wrench, remove the reverse restrict pin plug from the transmission case.



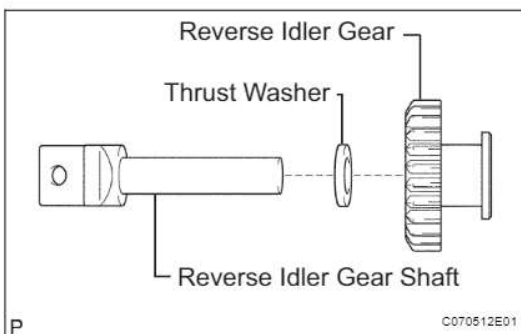
- (b) Using a 5 mm pin punch, remove the slotted pin.
(c) Remove the reverse restrict pin.

**34. REMOVE TRANSMISSION MAGNET**

- (a) Remove the transmission magnet from the transaxle case.

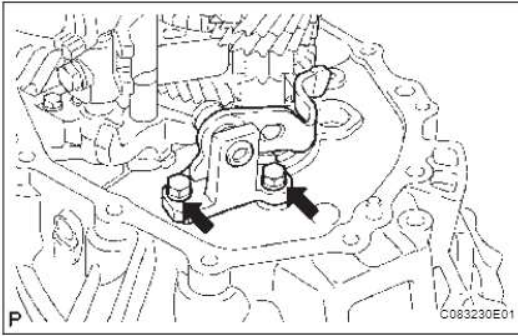
**35. REMOVE REVERSE IDLER GEAR SUB-ASSEMBLY**

- (a) Remove the reverse idler gear with the reverse idler gear shaft from the transaxle case.

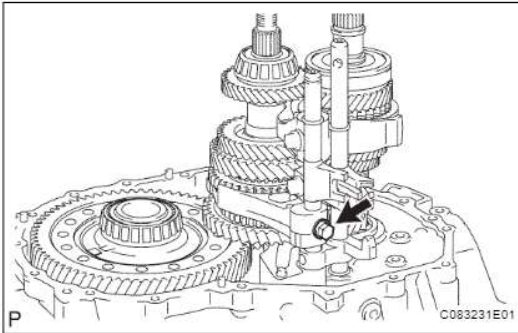


- (b) Remove the reverse idler gear and reverse idler thrust washer from the gear shaft.

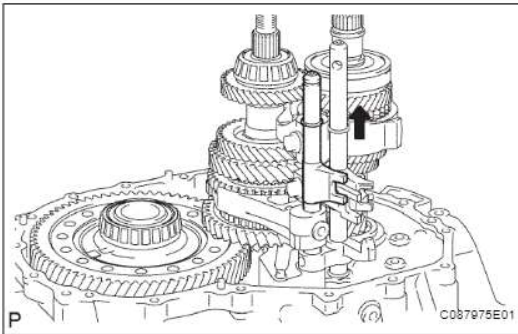
MX

MX-40**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****36. REMOVE REVERSE SHIFT ARM BRACKET ASSEMBLY**

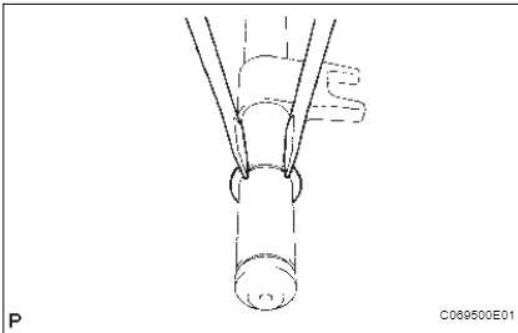
- (a) Remove the 2 bolts and reverse shift arm bracket from the transaxle case.

**37. REMOVE NO. 1 GEAR SHIFT FORK SHAFT**

- (a) Remove the shift fork set bolt from the No. 1 gear shift fork.



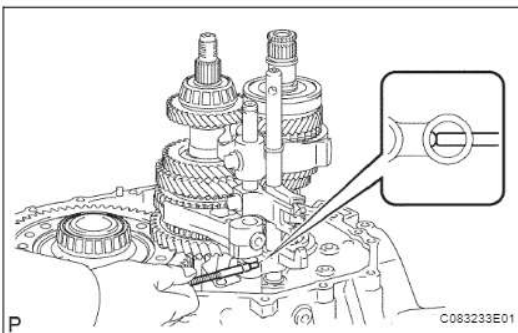
- (b) Pull out the No. 1 gear shift fork shaft while the No. 3 gear shift fork shaft is pulled up.



- (c) Using 2 screwdrivers and a hammer, remove the shift fork shaft snap ring from the No. 1 gear shift fork shaft.

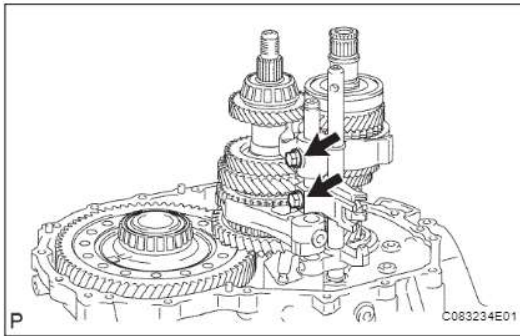
HINT:

Cover with a shop rag to keep the snap ring from flying off.

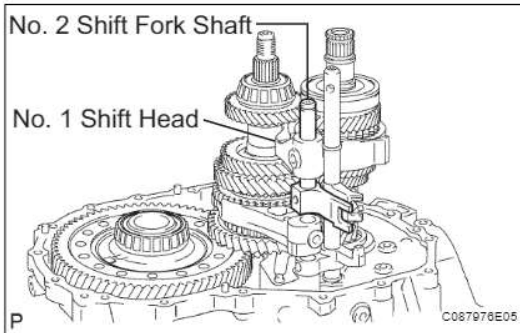
**38. REMOVE REVERSE SHIFT FORK ROLLER**

- (a) Using a magnetic finger, remove the reverse shift fork roller from the reverse shift fork.

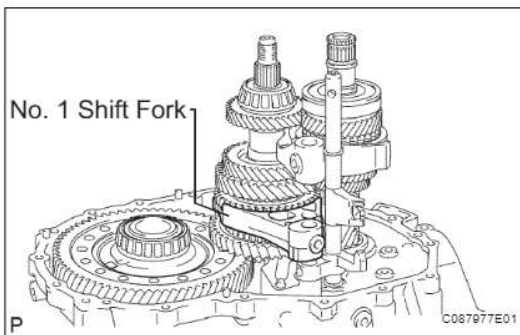
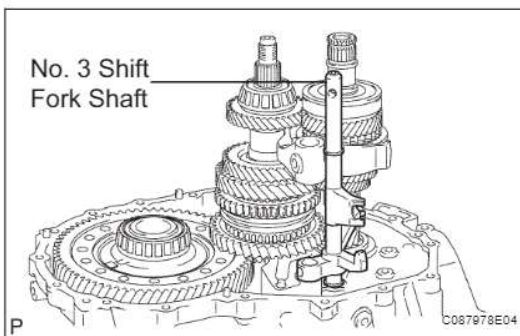
MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-41****39. REMOVE NO. 2 GEAR SHIFT FORK SHAFT**

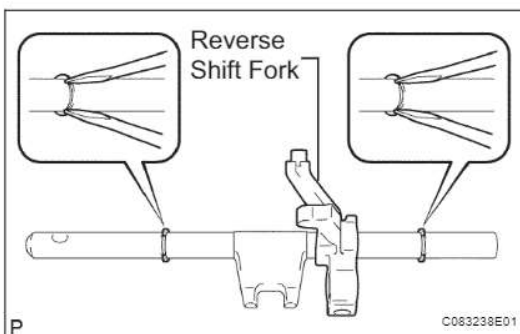
- (a) Remove the shift fork set bolt and shift head set bolt from the No. 2 gear shift fork and No. 1 gear shift head.



- (b) Remove the No. 2 gear shift fork shaft head and No. 1 gear shift head from the transaxle case.

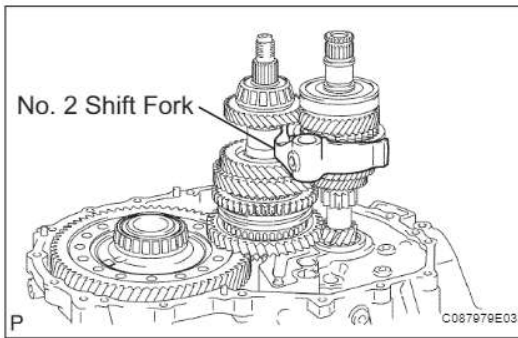
**40. REMOVE NO. 1 GEAR SHIFT FORK****41. REMOVE NO. 3 GEAR SHIFT FORK SHAFT**

- (a) Remove the No. 3 gear shift fork shaft from the transaxle case.

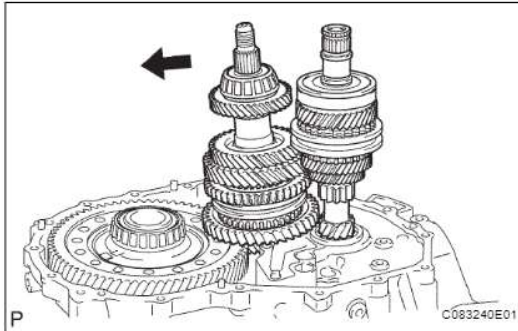


- (b) Using 2 screwdrivers and a hammer, remove the 2 shift fork shaft snap rings from the No. 3 gear shift fork shaft.
HINT:
Cover with a shop rag to keep the snap ring from flying off.
- (c) Remove the reverse shift fork from the No. 3 gear shift fork shaft.

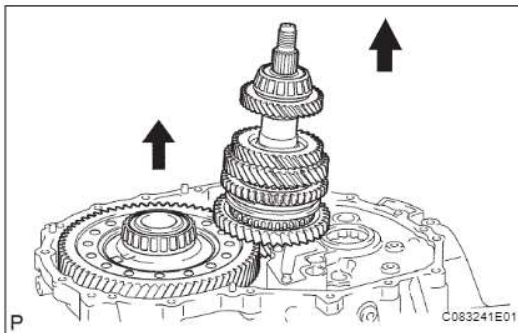
MX

MX-42**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****42. REMOVE NO. 2 GEAR SHIFT FORK**

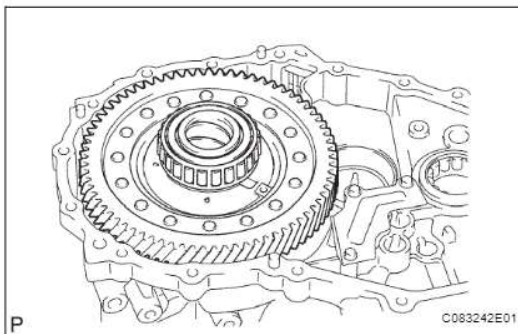
- (a) Remove the No. 2 gear shift fork from the input shaft.

**43. REMOVE INPUT SHAFT ASSEMBLY**

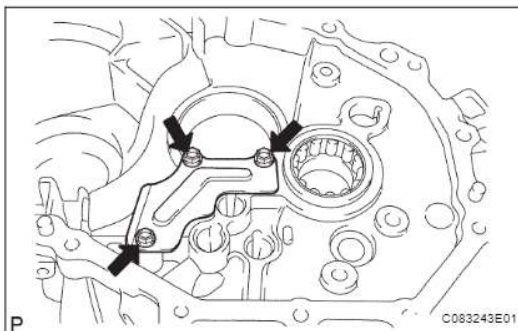
- (a) Tilt the output shaft, then remove the input shaft from the transaxle case.

**44. REMOVE OUTPUT SHAFT ASSEMBLY**

- (a) Slightly lift up on the differential case with the output shaft at an angle.
(b) Remove the output shaft from the transaxle case.

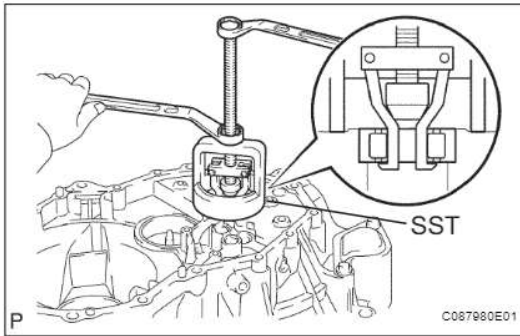
**45. REMOVE DIFFERENTIAL CASE ASSEMBLY**

- (a) Remove the differential case from the transaxle case.

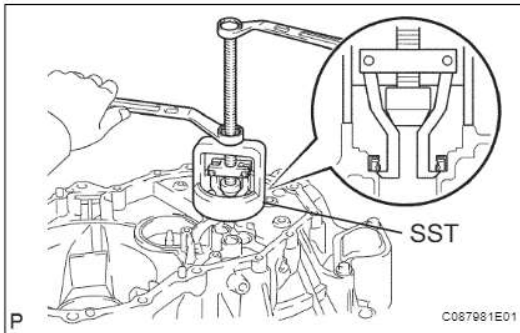
**46. REMOVE MANUAL TRANSAXLE CASE RECEIVER**

- (a) Remove the 3 bolts and transaxle case receiver from the transaxle case.

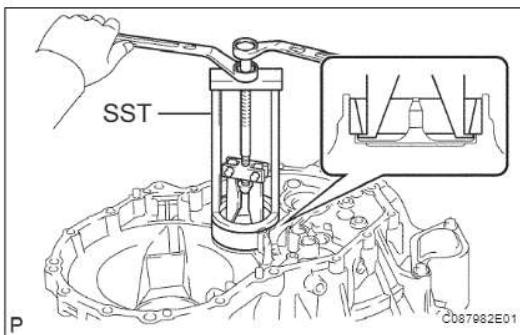
MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-43****47. REMOVE INPUT SHAFT FRONT BEARING**

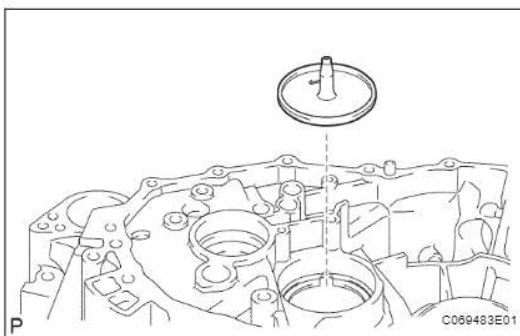
- (a) Using SST, remove the input shaft front bearing (outer race) from the transaxle case.
SST 09612-65014 (09612-01040, 09612-01050)

**48. REMOVE FRONT TRANSAXLE CASE OIL SEAL**

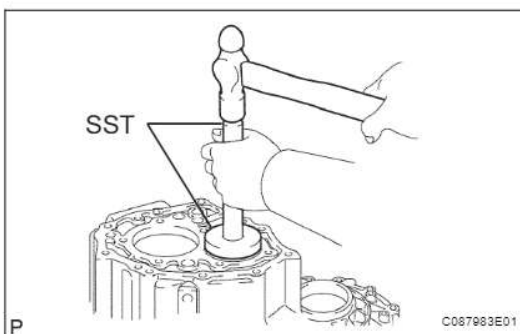
- (a) Using SST, remove the oil seal from the transaxle case.
SST 09612-65014 (09612-01040, 09612-01050)

**49. REMOVE FRONT OUTPUT SHAFT BEARING**

- (a) Using SST, remove the front bearing (outer race) from the transaxle case.

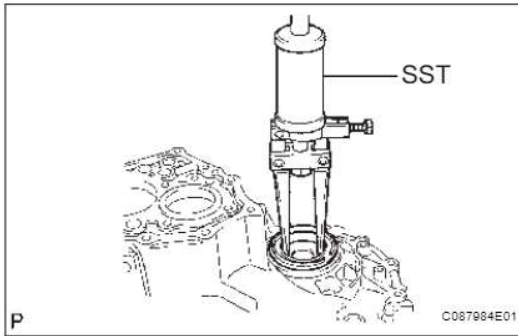
**50. REMOVE OUTPUT SHAFT COVER**

- (a) Remove the output shaft cover from the transaxle case.

**51. REMOVE REAR OUTPUT SHAFT BEARING**

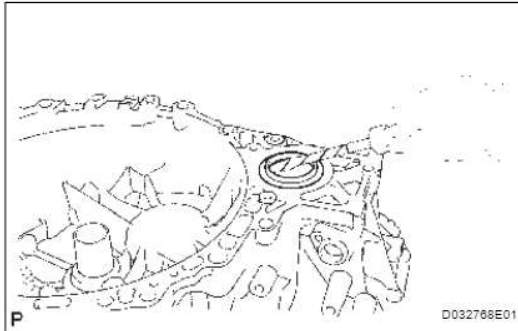
- (a) Using SST, tap out the rear bearing from the transmission case (outer race).
SST 09950-60010 (09951-00680), 09950-70010 (09951-07100)

MX

MX-44**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****52. REMOVE TRANSMISSION CASE OIL SEAL**

- (a) Using SST, tap out the oil seal from the transmission case.

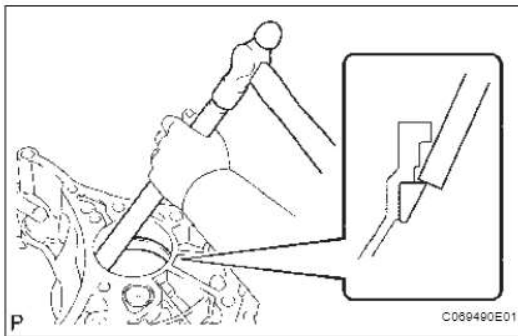
SST 09308-00010

**53. REMOVE FRONT TRANSAXLE CASE COVER OIL SEAL**

- (a) Using a screwdriver, pry out the cover oil seal.

HINT:

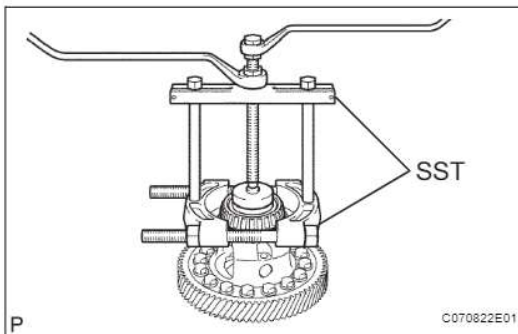
Tape the screwdriver tip before use to avoid damage.

**54. REMOVE FRONT DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING**

- (a) Using a brass bar and hammer, tap out the front tapered roller bearing (outer race) from the transaxle case.

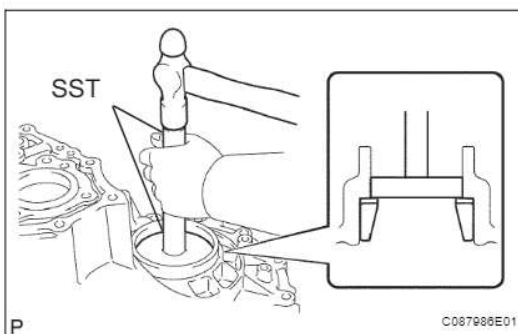
- (b) Using SST, remove the case front tapered roller bearing from the front differential case.

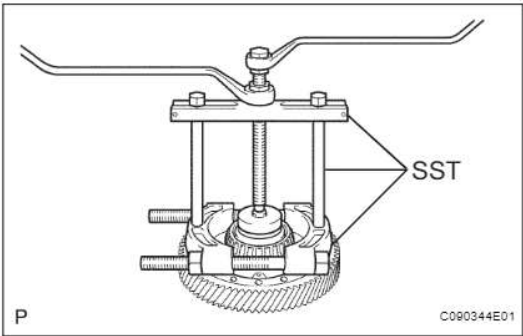
**SST 09950-00020, 09950-00030, 09950-40011
(09957-04010), 09950-60010 (09951-00560)**

**55. REMOVE FRONT DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING**

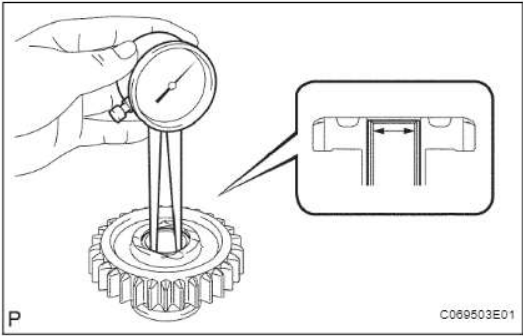
- (a) Using SST and a hammer, tap out the rear tapered roller bearing (outer race) and rear shim from the transmission case.

**SST 09950-60020 (09951-00790), 09950-70010
(09951-07100)**





- (b) Using SST, remove the rear tapered roller bearing (inner race) from the front differential case.
SST 09950-00020, 09950-00030, 09950-40011 (09957-04010), 09950-60010 (09951-00490)

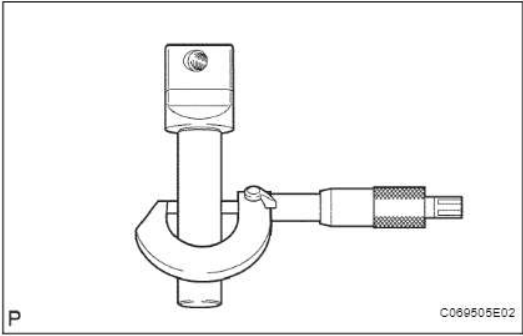


56. INSPECT REVERSE IDLER GEAR SUB-ASSEMBLY

- (a) Using a caliper gauge, measure the inside diameter of the reverse idler gear.
Standard inside diameter

Standard Inside Diameter	Maximum Inside Diameter
20.056 to 20.074 mm (0.7896 to 0.7903 in.)	20.074 mm (0.7903 in.)

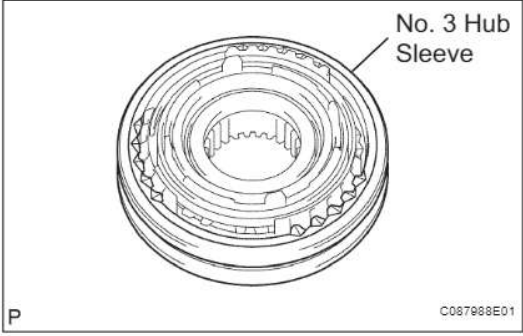
If the inside diameter is greater than the maximum, replace the reverse idler gear.



- (b) Using a micrometer, measure the outside diameter of the reverse idler gear shaft.
Standard outside diameter

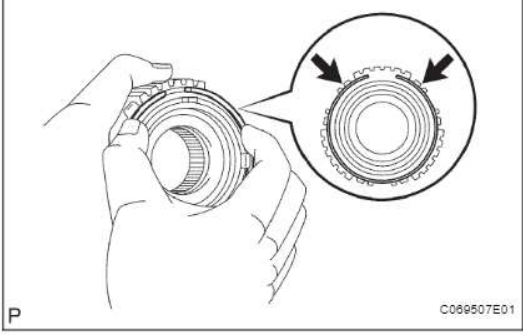
Standard Outside Diameter	Minimum Outside Diameter
19.984 to 20.000 mm (0.7868 to 0.7874 in.)	19.984 mm (0.7868 in.)

If the outside diameter is less than the minimum, replace the reverse idler gear shaft.



57. REMOVE NO. 3 TRANSMISSION HUB SLEEVE

- (a) Remove the No. 3 transmission hub sleeve from the No. 3 transmission clutch hub.



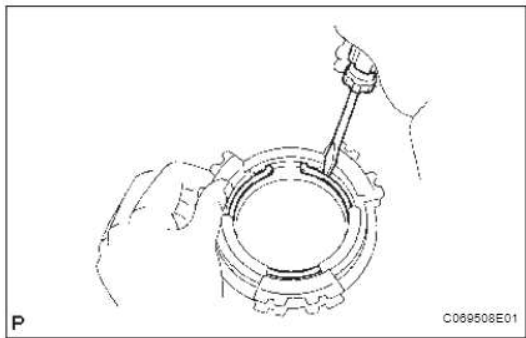
58. REMOVE NO. 3 SYNCHROMESH SHIFTING KEY SPRING

- (a) Remove the 2 No. 3 synchromesh shifting key springs and synchronizer ring set from the No. 3 transmission clutch hub while pushing on the No. 3 synchromesh shifting key spring.

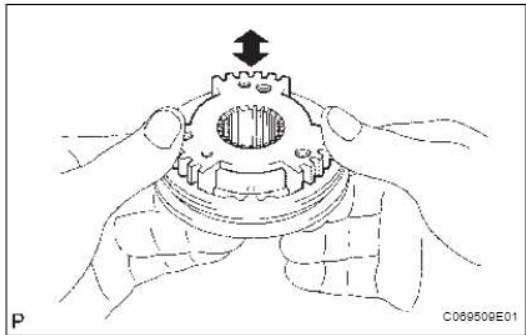
MX

MX-46

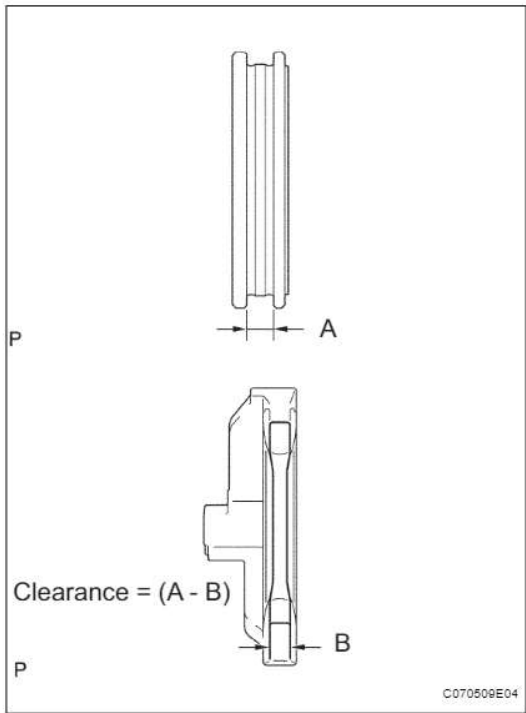
E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT



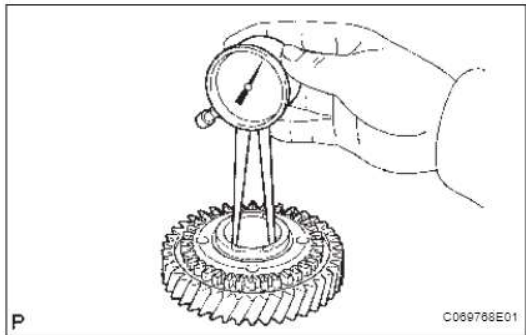
- 59. REMOVE SYNCHRONIZER PULL RING**
- (a) Using a screwdriver, remove the synchronizer pull ring snap ring.
 - (b) Remove the synchronizer pull ring, No. 5 synchronizer ring outer, No. 5 synchronizer ring inner and No. 5 synchronizer ring middle.



- 60. INSPECT NO. 3 TRANSMISSION CLUTCH HUB**
- (a) Inspect the sliding condition between the No. 3 transmission clutch hub and the No. 3 transmission hub sleeve.
 - (b) Inspect the tip of the spline gear on the No. 3 transmission hub sleeve for wear.



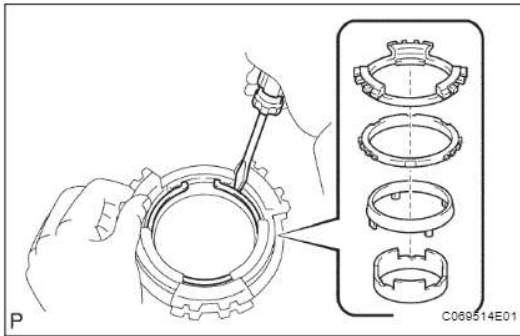
- 61. INSPECT NO. 3 TRANSMISSION HUB SLEEVE**
- (a) Using vernier calipers, measure the width of the No. 3 transmission hub sleeve groove (A) and the thickness of the claw part on the No. 3 gear shift fork (B), and calculate the clearance.
- Standard clearance:**
- A - B = 0.15 to 0.35 mm (0.0059 to 0.0138 in.)**
- If the clearance is out of specification, replace the No. 3 transmission hub sleeve and No. 3 gear shift fork with new ones.



- 62. INSPECT 5TH GEAR**
- (a) Using a caliper gauge, measure the inside diameter of the 5th gear.
- Standard inside diameter**

Standard Inside Diameter	Maximum Inside Diameter
34.981 to 34.997 mm (1.3772 to 1.3778 in.)	34.997 mm (1.3778 in.)

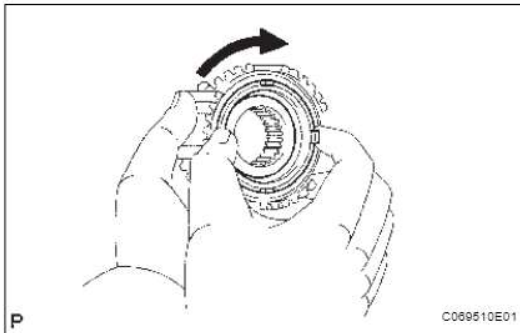
If the inside diameter is greater the maximum, replace the 5th gear.



INSTALLATION

1. INSTALL SYNCHRONIZER PULL RING

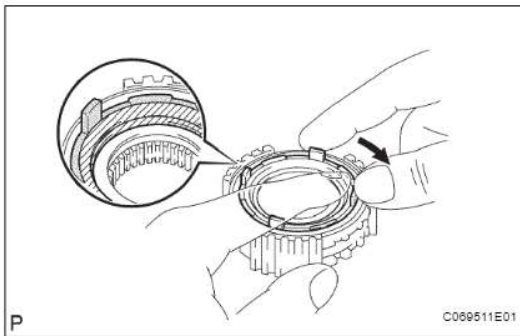
- Install the No. 5 synchronizer ring middle, No. 5 synchronizer ring outer and synchronizer pull ring to the No. 5 synchronizer ring inner. Using a screwdriver, fix them in place with the synchronizer pull ring snap ring.



2. INSTALL NO. 5 SYNCHRONIZER RING MIDDLE

- Check that the No. 5 synchronizer ring middle rotates smoothly.

- Check that the No. 5 synchronizer ring middle does not rotate while being pushed against the No. 3 clutch hub.



3. INSTALL NO. 3 SYNCHROMESH SHIFTING KEY SPRING

- Install the No. 3 synchromesh shifting key spring to the No. 3 transmission clutch hub.

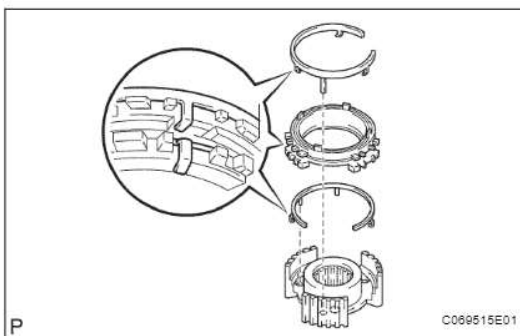
NOTICE:

Align the projection of the shifting key spring with the hole of the No. 3 clutch hub and install it.

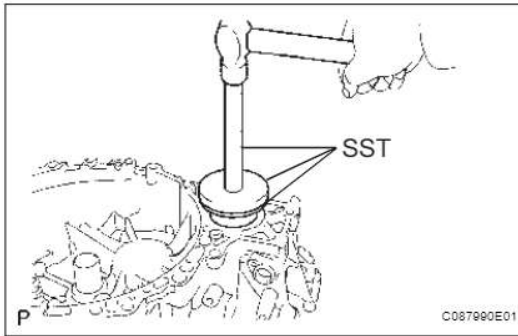
- Install the synchronizer ring set and No. 3 synchromesh shifting key spring to the No. 3 transmission clutch hub.

NOTICE:

- Engage the shifting key spring claw to the center of the teeth of the synchronizer ring.
- Align the projection of the shifting key spring with the hole of the No. 3 clutch hub and install it.



MX

MX-48**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****4. INSTALL FRONT TRANSAXLE CASE COVER OIL SEAL**

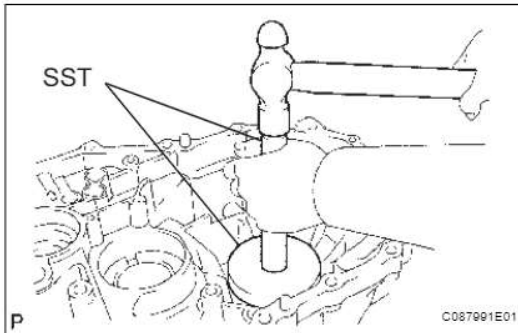
- (a) Using SST and a hammer, install a new front transaxle case cover oil seal.

SST 09316-20011, 09950-60020 (09951-00910), 09950-70010 (09951-07150)

Standard depth:

-0.5 to 0.5 mm (-0.020 to 0.020 in.)

- (b) Coat the lip of the oil seal with MP grease.

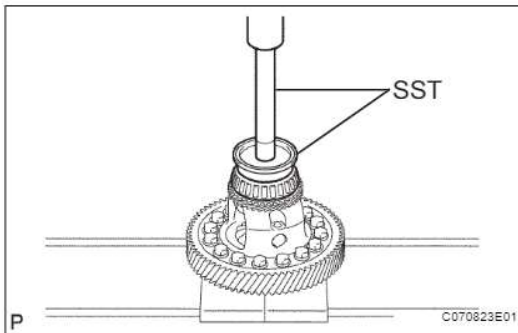
**5. INSTALL FRONT DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING**

- (a) Using SST and a hammer, tap in the front tapered roller bearing (outer race) to the front transaxle case.

SST 09950-60020 (09951-00910), 09950-70010 (09951-07100, 09951-07150)

- (b) Using SST and a press, press in the front tapered roller bearing (inner race) to the front differential case.

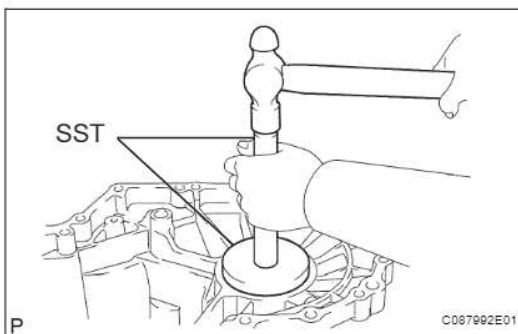
SST 09950-70010 (09951-07100, 09951-07150), 09608-10010

**6. INSTALL FRONT DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING**

- (a) Install the rear shim.

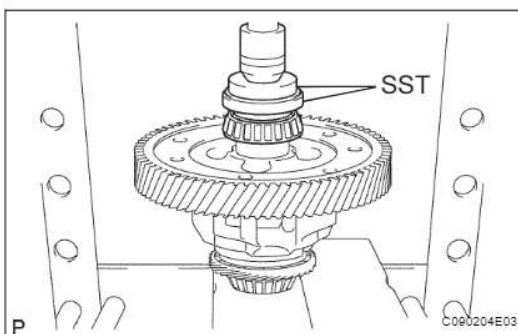
- (b) Using SST and a hammer, tap in the rear tapered roller bearing (outer race).

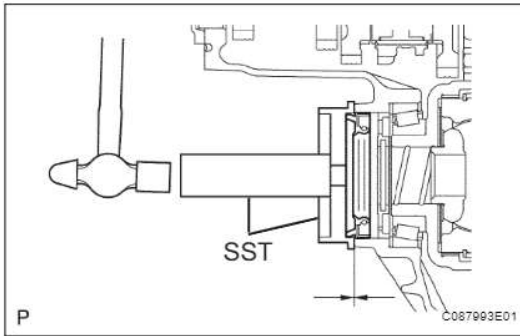
SST 09950-60020 (09951-00890), 09950-70010 (09951-07100)



- (c) Using SST and a press, press in the rear tapered roller bearing (inner race).

SST 09631-12090, 09950-60010 (09951-00600), 09950-70010 (09951-07100)



E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-49****7. INSTALL TRANSMISSION CASE OIL SEAL**

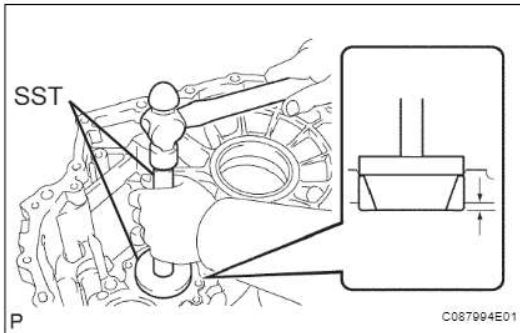
- (a) Using SST and a hammer, tap in a new oil seal to the transmission case.

SST 09608-32010, 09950-70010 (09951-07150)

Standard depth:

3.0 to 4.0 mm (0.118 to 0.158 in.)

- (b) Coat the oil seal lip with MP grease.

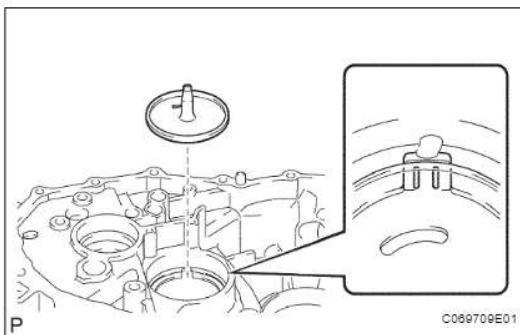
**8. INSTALL REAR OUTPUT SHAFT BEARING**

- (a) Using SST and a hammer, tap in the rear bearing (outer race) to the transmission case.

SST 09950-60020 (09951-00680), 09950-70010 (09951-07100)

Standard clearance:

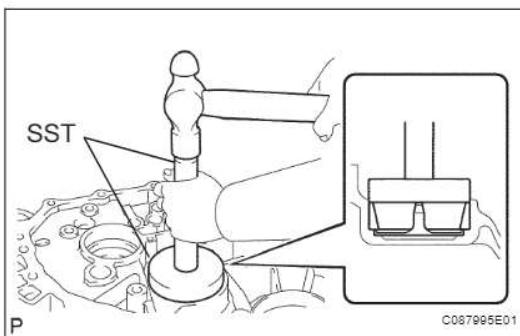
3.8 to 4.4 mm (0.150 to 0.173 in.)

**9. INSTALL OUTPUT SHAFT COVER**

- (a) Coat the shaft cover with MP grease, and install it to the transaxle case.

NOTICE:

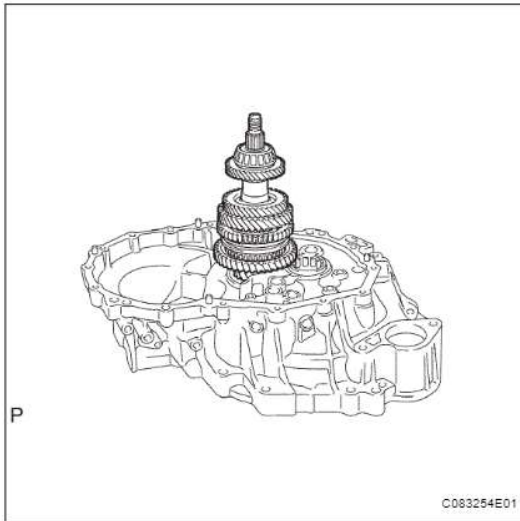
Align the projection of the output shaft with the transaxle groove and install it.

**10. INSTALL FRONT OUTPUT SHAFT BEARING**

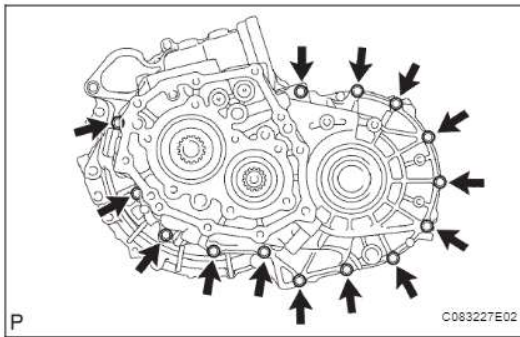
- (a) Using SST and a hammer, tap in the front bearing (outer race).

SST 09950-60020 (09951-00730), 09950-70010 (09951-07100)

MX

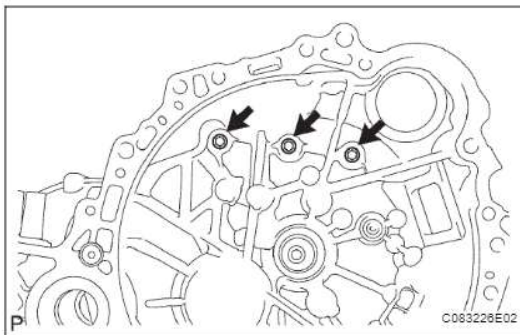
MX-50**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****11. ADJUST OUTPUT SHAFT BEARING PRELOAD**

- (a) Install the output shaft to the transaxle case.



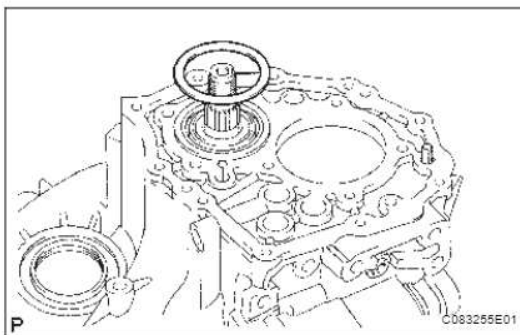
- (b) Install the transmission case to the transaxle case with the 14 bolts.

Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)



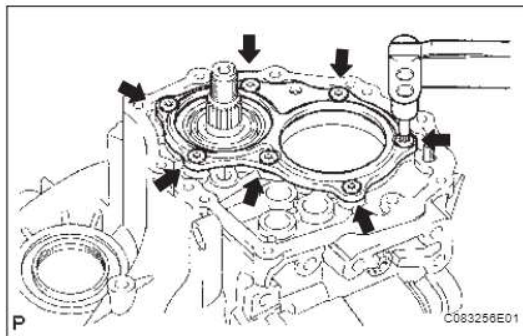
- (c) Install the 3 bolts on the transaxle side.

Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)



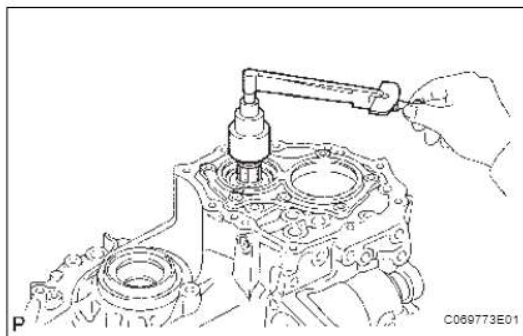
- (d) Install the output shaft rear bearing shim to the output shaft.

MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-51**

- (e) Using a T45 "TORX" socket, install the rear bearing retainer with the 7 "TORX" screws to the transmission case.

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)



- (f) Turn the output shaft in both directions to make sure that it starts to turn smoothly.
 (g) Temporarily install the output shaft rear set nut.
 (h) Using a socket wrench and torque wrench, inspect the preload.

Standard preload

Bearing	Torque
New	0.8 to 1.6 N*m (8.16 to 16.32 kgf*cm 7.1 to 14.2 in.lbf)
Used	0.5 to 1.0 N*m (5.10 to 10.20 kgf*cm 4.4 to 8.9 in.lbf)

- (i) If preload is out of specification, select a proper output shaft rear bearing shim and adjust it.
HINT:
 The preload of all the output shaft rear bearing shims varies in torque from about 0.04 to 0.06 N*m (0.408 to 0.612 kgf*cm, 0.354 to 0.531 in.*lbf)

Standard shim thickness

Part No	Mark	Thickness
90564-59001	0	1.30 mm (0.0512 in.)
90564-59002	1	1.35 mm (0.0531 in.)
90564-59003	2	1.40 mm (0.0551 in.)
90564-59004	3	1.45 mm (0.0571 in.)
90564-59005	4	1.50 mm (0.0591 in.)
90564-59006	5	1.55 mm (0.0610 in.)
90564-59007	6	1.60 mm (0.0630 in.)
90564-59008	7	1.65 mm (0.0650 in.)
90564-59009	8	1.70 mm (0.0669 in.)
90564-59010	9	1.75 mm (0.0689 in.)
90564-59011	A	1.80 mm (0.0709 in.)
90564-59012	B	1.85 mm (0.0728 in.)
90564-59013	C	1.90 mm (0.0748 in.)
90564-59014	D	1.95 mm (0.0768 in.)
90564-59015	E	2.00 mm (0.0787 in.)
90564-59016	F	2.05 mm (0.0807 in.)
90564-59017	G	2.10 mm (0.0827 in.)
90564-59018	H	2.15 mm (0.0846 in.)
90564-59019	J	2.20 mm (0.0866 in.)
90564-59020	K	2.25 mm (0.0886 in.)
90564-59021	L	2.30 mm (0.0906 in.)
90564-59022	M	2.35 mm (0.0925 in.)

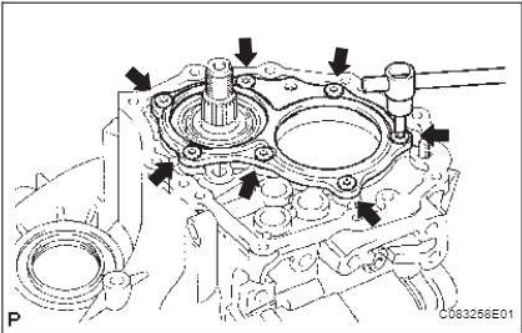
MX

MX-52

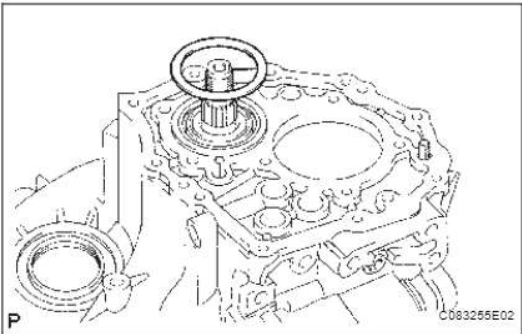
E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT

Part No	Mark	Thickness
90564-59023	N	2.40 mm (0.0945 in.)
90564-59024	O	2.45 mm (0.0965 in.)
90564-59025	P	2.50 mm (0.0984 in.)

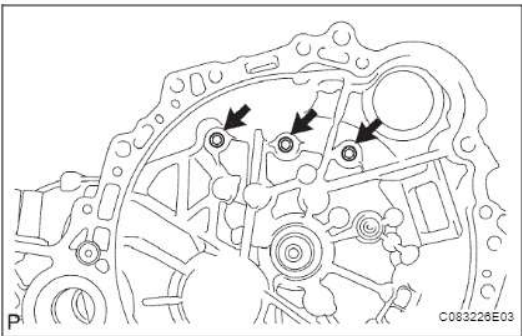
- (j) Remove the output shaft rear set nut from the output shaft.
- (k) Using a T45 "TORX" socket, remove the 7 "TORX" screws and rear bearing retainer from the manual transmission case.



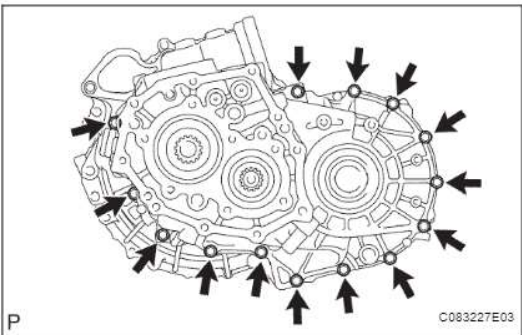
- (l) Remove the output shaft rear bearing shim from the output shaft.



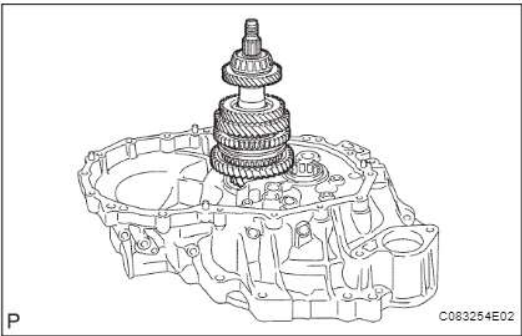
- (m) Remove the 3 bolts.



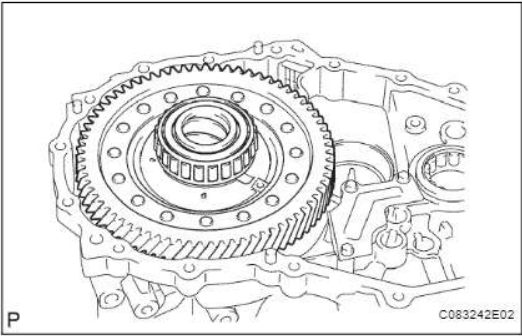
- (n) Remove the 14 bolts and transmission case from the transaxle case.



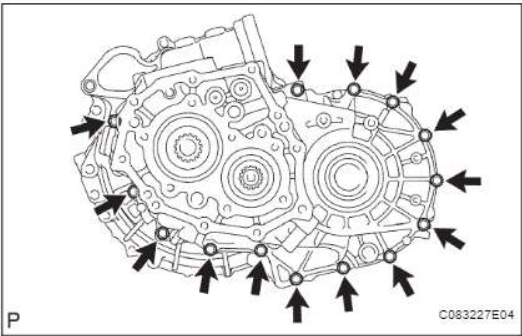
MX



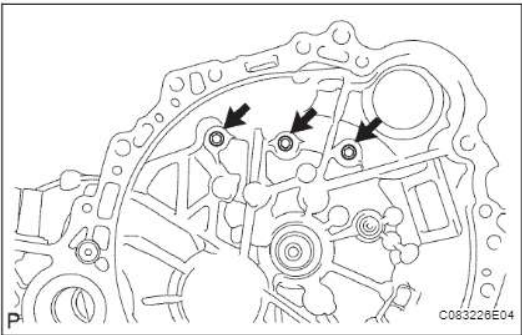
- (o) Remove the output shaft assembly from the front transaxle case.



12. ADJUST TAPERED ROLLER BEARING PRELOAD
- (a) Install the differential case assembly to the transaxle case.

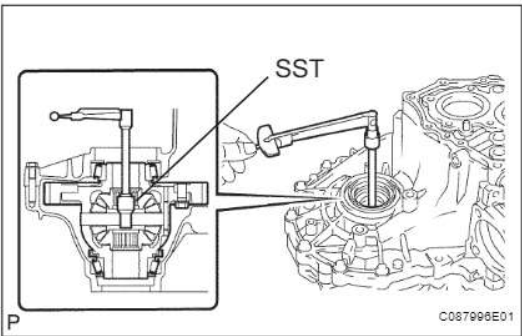


- (b) Install the 14 bolts and transmission case to the transaxle case.
Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)



- (c) Install the 3 bolts on the front transaxle case side.
Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)
- (d) Turn the differential case in both directions to make sure that it starts to turn smoothly.

MX



- (e) Using SST and a torque wrench, measure the preload.
Standard preload

Bearing	Torque
New	0.8 to 1.6 N*m (8.16 to 16.32 kgf*cm, 7.1 to 14.2 in.*lbf)
Used	0.5 to 1.0 N*m (5.10 to 10.2 kgf*cm, 4.4 to 8.9 in.*lbf)

If the preload is out of specification, select a proper front differential case rear shim and adjust it.

MX-54

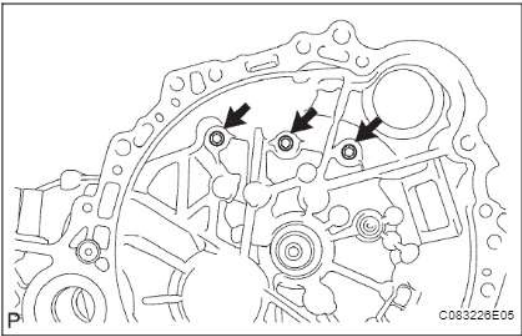
E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT

HINT:
The preload of all the front differential case rear shims varies in torque from about 0.04 to 0.06 N*m (0.408 to 0.612 kgf*cm, 0.354 to 0.531 in.*lbf).

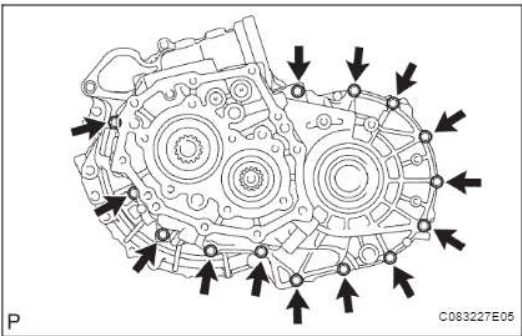
Standard shim thickness

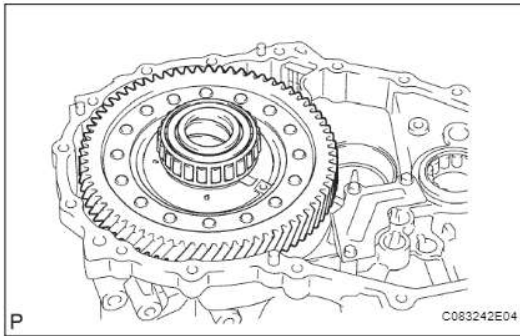
Part No.	Mark	Thickness
90564-56055	0	2.00 mm (0.0787 in.)
90564-56056	1	2.05 mm (0.0807 in.)
90564-56057	2	2.10 mm (0.0827 in.)
90564-56058	3	2.15 mm (0.0846 in.)
90564-56059	4	2.20 mm (0.0866 in.)
90564-56060	5	2.25 mm (0.0886 in.)
90564-56061	6	2.30 mm (0.0906 in.)
90564-56062	7	2.35 mm (0.0925 in.)
90564-56063	8	2.40 mm (0.0945 in.)
90564-56064	9	2.45 mm (0.0965 in.)
90564-56065	A	2.50 mm (0.0984 in.)
90564-56066	B	2.55 mm (0.1004 in.)
90564-56067	C	2.60 mm (0.1024 in.)
90564-56068	D	2.65 mm (0.1043 in.)
90564-56069	E	2.70 mm (0.1063 in.)
90564-56070	F	2.75 mm (0.1083 in.)
90564-56071	G	2.80 mm (0.1102 in.)
90564-56072	H	2.85 mm (0.1122 in.)

(f) Remove the 3 bolts.

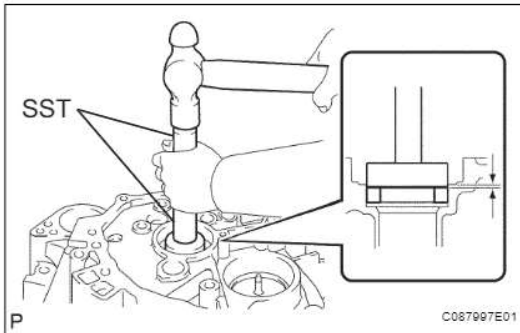


(g) Remove the 14 bolts and transmission case from the transaxle case.

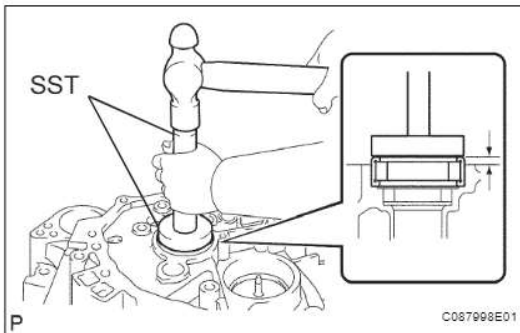


E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-55**

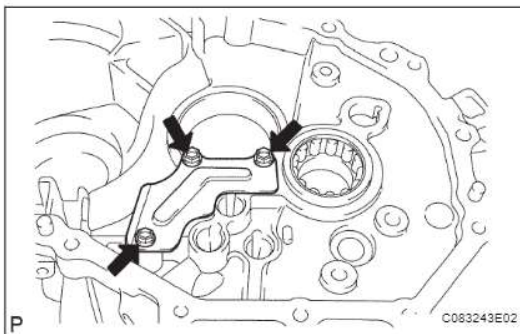
- (h) Remove the differential case assembly from the transaxle case.

**13. INSTALL FRONT TRANSAXLE CASE OIL SEAL**

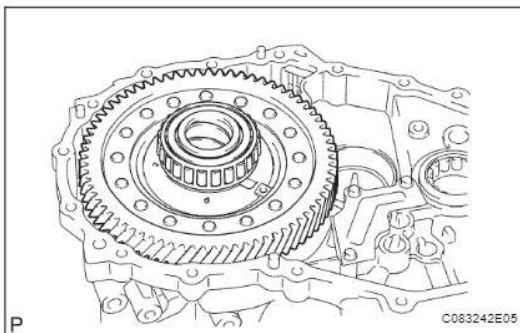
- (a) Using SST and a hammer, tap in a new oil seal to the transaxle case.
SST 09950-60010 (09951-00420), 09950-70010 (09951-07150)
Standard distance:
1 to 2 mm (0.04 to 0.08 in.)
 (b) Coat the lip of the oil seal with MP grease.

**14. INSTALL FRONT INPUT SHAFT BEARING**

- (a) Coat the input shaft front bearing with gear oil, and using SST, install it to the transaxle case.
SST 09950-60010 (09951-00570), 09950-70010 (09951-07150)
Standard distance:
4.28 to 4.60 mm (0.1685 to 0.1811 in.)

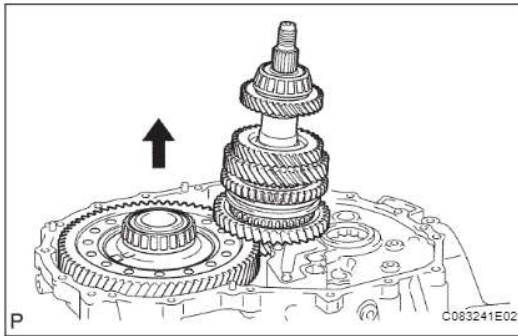
**15. INSTALL MANUAL TRANSAXLE CASE RECEIVER**

- (a) Install the 3 bolts and the receiver to the transaxle case.
Torque: 7.0 N*m (71 kgf*cm, 62 in.*lbf)

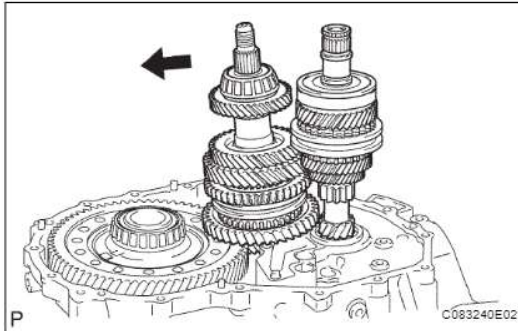
**16. INSTALL DIFFERENTIAL CASE ASSEMBLY**

- (a) Coat the differential case tapered roller bearing with gear oil, and install the differential case to the transaxle case.

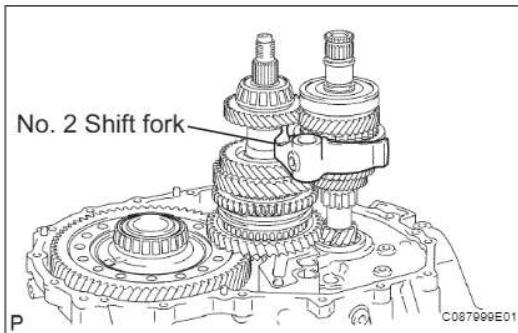
MX

MX-56**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****17. INSTALL OUTPUT SHAFT ASSEMBLY**

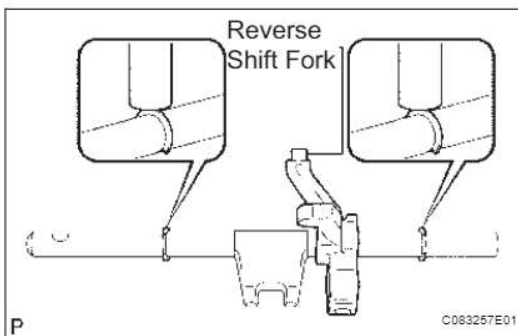
- (a) Apply gear oil to each sliding part of the output shaft.
- (b) Slightly lift up on the differential case at an angle, and install the output shaft to the transaxle case.

**18. INSTALL INPUT SHAFT ASSEMBLY**

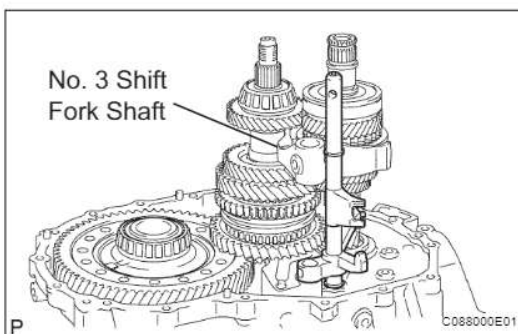
- (a) Apply gear oil to each sliding part of the input shaft.
- (b) Install the input shaft to the transaxle case while tilting the output shaft.

**19. INSTALL NO. 2 GEAR SHIFT FORK**

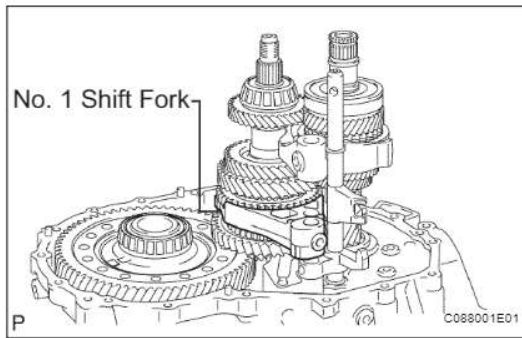
- (a) Coat the No. 2 gear shift fork with gear oil, and install it to the input shaft assembly.

**20. INSTALL NO. 3 GEAR SHIFT FORK**

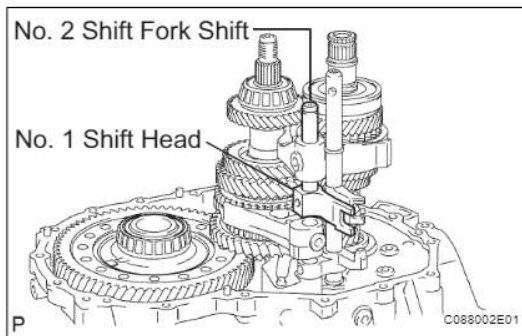
- (a) Install the reverse shift fork to the No. 3 gear shift fork shaft.
- (b) Using a brass bar and hammer, install the 2 shift fork shaft snap rings to the No. 3 gear shift fork shaft.



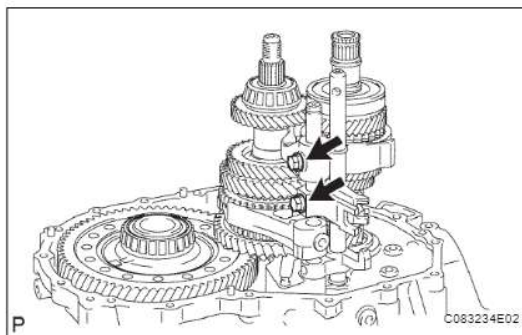
- (c) Apply gear oil to each sliding part of the No. 3 gear shift fork shaft, and install it to the transaxle case.

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-57****21. INSTALL NO. 1 GEAR SHIFT FORK**

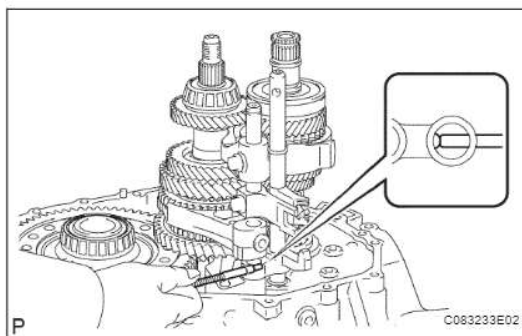
- (a) Apply gear oil to each sliding part of the No. 1 gear shift fork, and install it to the output shaft assembly.

**22. INSTALL NO. 2 GEAR SHIFT FORK**

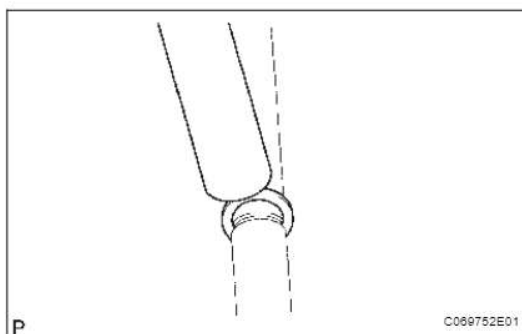
- (a) Apply gear oil to each sliding part of the No. 2 gear shift fork shaft and No. 1 gear shift head, and install them to the transaxle case.



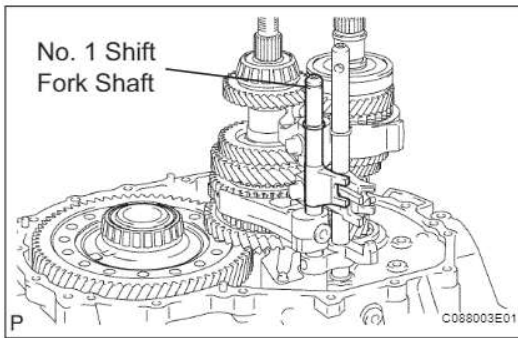
- (b) Install the shift fork set bolt and shift head set bolt to the No. 1 gear shift head and No. 2 gear shift fork.

**23. INSTALL REVERSE SHIFT FORK ROLLER**

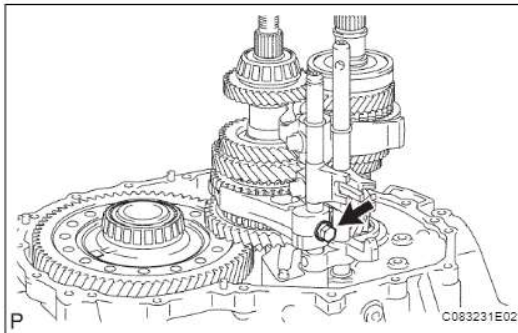
- (a) Using a magnetic finger, install the reverse shift fork roller to the reverse shift fork.

MX**24. INSTALL NO. 1 GEAR SHIFT FORK SHAFT**

- (a) Using a brass bar and hammer, tap in the shaft snap ring to the No. 1 shift fork shaft.

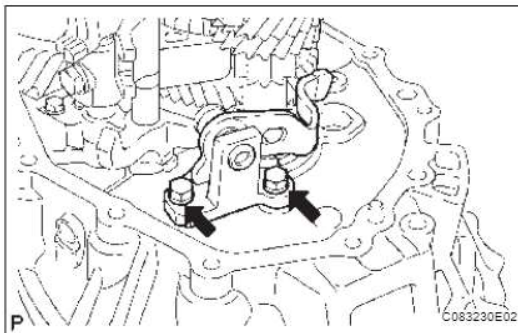
MX-58**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**

- (b) Install the No. 1 gear shift fork shaft to the transaxle case.



- (c) Install the shift fork set bolt to the No. 1 gear shift fork.

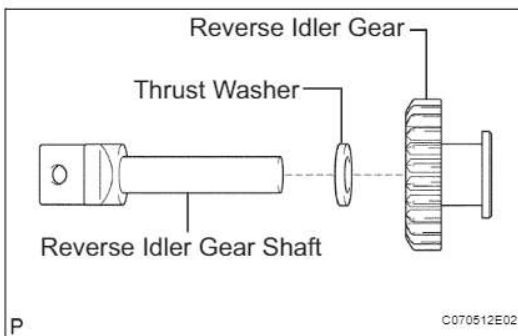
Torque: 24 N*m (245 kgf*cm, 18 ft.*lbf)



25. INSTALL REVERSE SHIFT ARM BRACKET ASSEMBLY

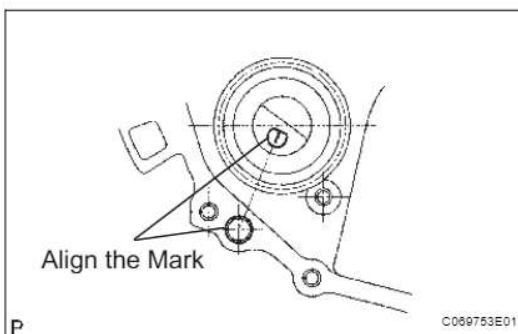
- (a) Install the reverse shift arm bracket to the transaxle case with the 2 bolts.

Torque: 17 N*m (173 kgf*cm, 13 ft.*lbf)

MX

26. INSTALL REVERSE IDLER GEAR SUB-ASSEMBLY

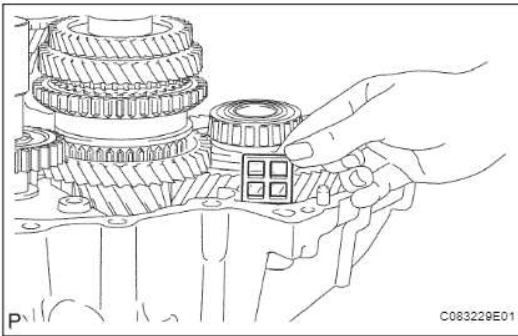
- (a) Coat the reverse idler gear and thrust washer with gear oil, and install them to the reverse idler gear shaft.



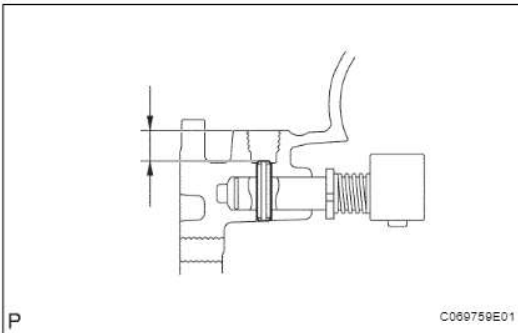
- (b) Install the reverse idler gear with the reverse idler gear shaft to the transaxle case.

HINT:

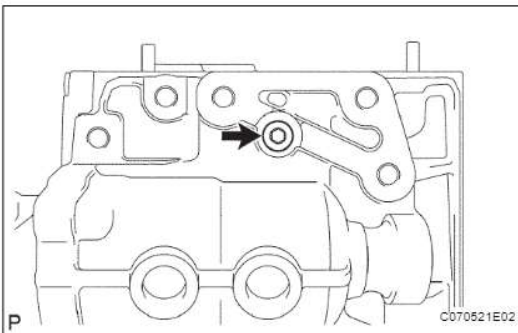
Align the mark of the reverse idler gear shaft with the hole of the bolts.

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-59****27. INSTALL TRANSMISSION MAGNET**

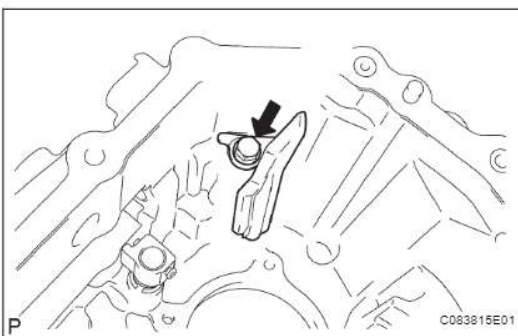
- (a) Clean the transmission magnet, and install it to the transaxle case.

**28. INSTALL REVERSE RESTRICT PIN ASSEMBLY**

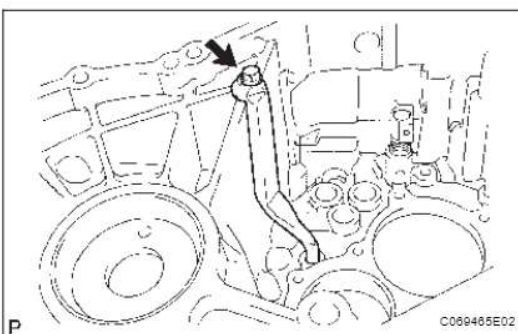
- (a) Install the reverse restrict pin to the transaxle case.
 (b) Using a 5 mm pin punch, install the slotted spring pin.

Standard clearance:**12.5 to 13.5 mm (0.492 to 0.531 in.)**

- (c) Coat the reverse restrict pin plug with adhesive 1324, and using a 6 mm hexagon wrench, install it to the manual transmission case.

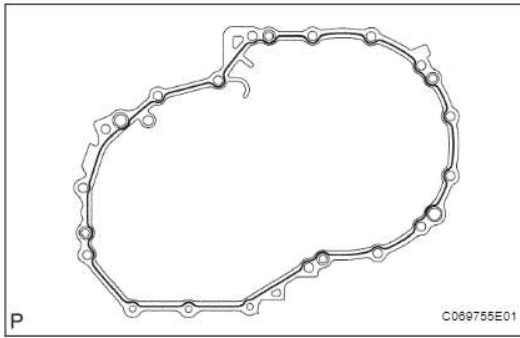
Torque: 13 N*m (133 kgf*cm, 9.6 ft.*lbf)**29. INSTALL NO. 1 OIL RECEIVER PIPE**

- (a) Install the oil receiver pipe to the transmission case with the bolt.

Torque: 17 N*m (173 kgf*cm, 13 ft.*lbf)**NOTICE:****Do not damage the pipe.****30. INSTALL NO. 2 OIL RECEIVER PIPE**

- (a) Install the oil receiver pipe to the transmission case with the bolt.

Torque: 17 N*m (173 kgf*cm, 13 ft.*lbf)**NOTICE:****Do not damage the pipe.****MX**

MX-60**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****31. INSTALL MANUAL TRANSMISSION CASE**

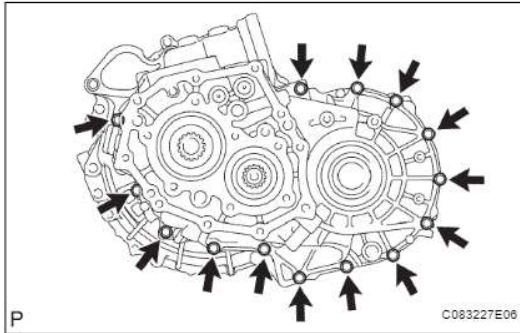
- (a) Apply FIPG to the transmission case in a continuous line, as shown in the illustration.

FIPG:

Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

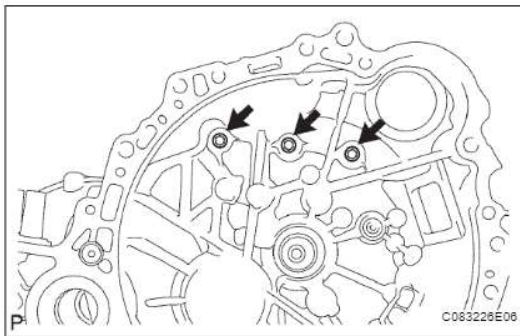
NOTICE:

Install the part within 10 minutes after applying the packing material (FIPG).



- (b) Install the transmission case to the transaxle case with the 14 bolts.

Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)



- (c) Coat the 3 bolts with adhesive, and install them on the transaxle case side.

Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)

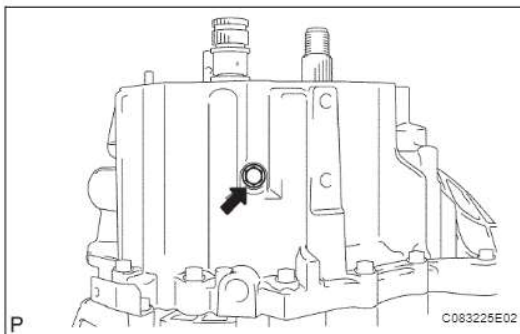
Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

32. INSTALL CLUTCH TUBE BRACKET

- (a) Install the clutch tube bracket with the bolt.

Torque: 17 N*m (173 kgf*cm, 13 ft.*lbf)

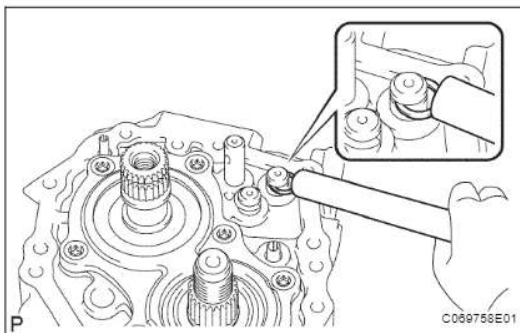
**33. INSTALL REVERSE IDLER GEAR SHAFT BOLT**

- (a) Coat the reverse idler gear shaft bolt with adhesive, and install a new reverse idler gear shaft gasket and the reverse idler gear shaft bolt to the transmission case.

Torque: 30 N*m (306 kgf*cm, 22 ft.*lbf)

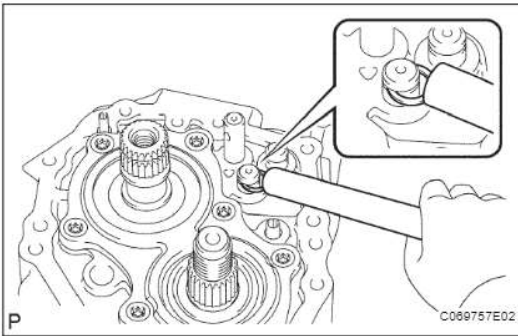
Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

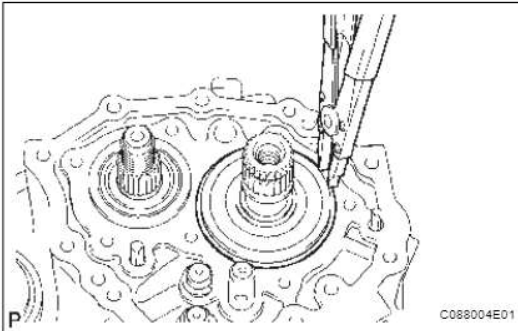
**34. INSTALL SHIFT FORK SHAFT SHAFT SNAP RING**

- (a) Using a brass bar and hammer, tap in the shaft snap ring to the No. 1 gear shift fork shaft.

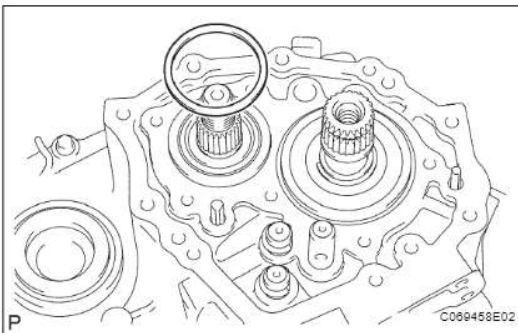
MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-61**

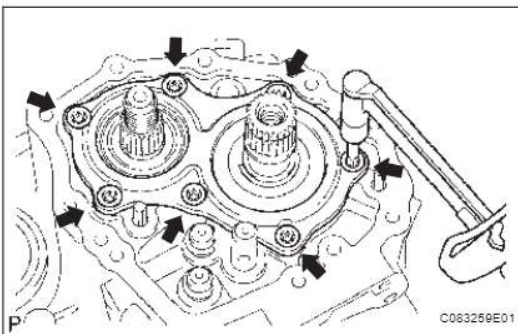
- (b) Using a brass bar and hammer, tap in the shaft snap ring to the No. 2 gear shift fork shaft.

**35. INSTALL INPUT SHAFT REAR BEARING SHAFT SNAP RING**

- (a) Using a snap ring expander, install the shaft snap ring.

**36. INSTALL OUTPUT SHAFT REAR BEARING SHIM**

- (a) Install the output shaft rear bearing shim to the output shaft.

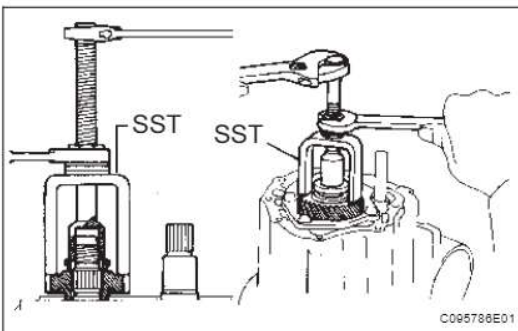
**37. INSTALL REAR BEARING RETAINER**

- (a) Coat the 7 bolts with adhesive, and using a T45 "TORX" socket, install the bearing retainer with the bolts.

Torque: 43 N*m (438 kgf*cm, 32 ft.*lbf)

Adhesive:

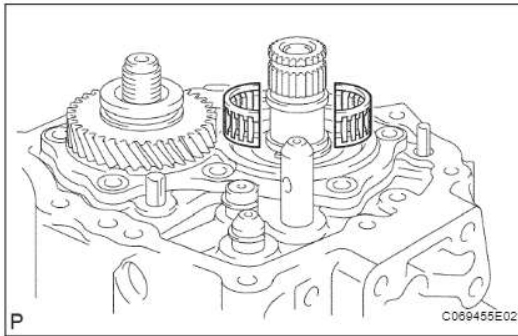
Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

**38. INSTALL 5TH DRIVEN GEAR**

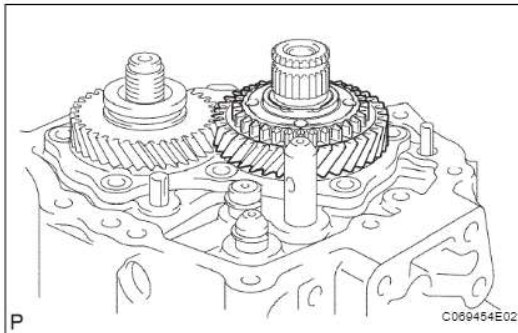
- (a) Using SST, install the 5th driven gear to the output shaft.

SST 09309-12020

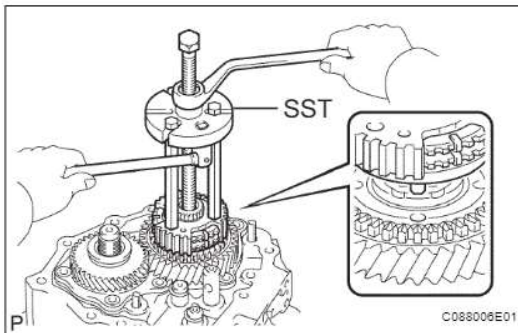
MX

MX-62**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****39. INSTALL 5TH GEAR NEEDLE ROLLER BEARING**

- (a) Coat the needle roller bearing with gear oil, and install it to the input shaft.

**40. INSTALL 5TH GEAR**

- (a) Coat the 5th gear with gear oil, and install it to the input shaft.

**41. INSTALL NO. 3 TRANSMISSION CLUTCH HUB**

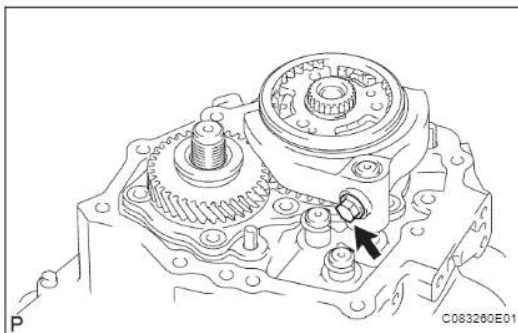
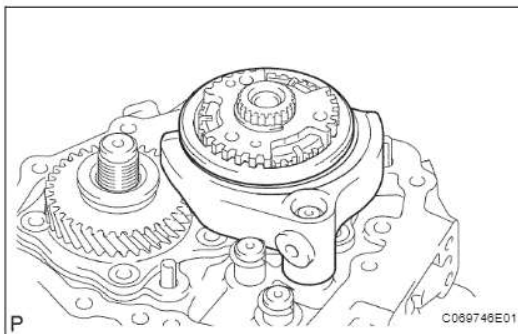
- (a) Using SST, install the No. 3 transmission clutch hub to the input shaft.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010)

NOTICE:

Align the projection of the synchronizer ring with the hole of the 5th gear and install it.

- (b) Install the No. 3 transmission hub sleeve and No. 3 gear shift fork to the No. 3 transmission clutch hub.

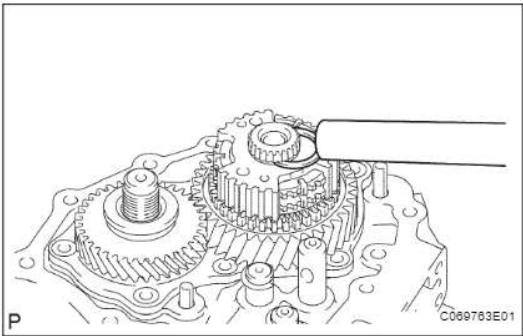


- (c) Coat the shift fork set bolt with adhesive, and install it to the No. 3 gear shift fork.

Torque: 24 N*m (245 kgf*cm, 18 ft.*lbf)

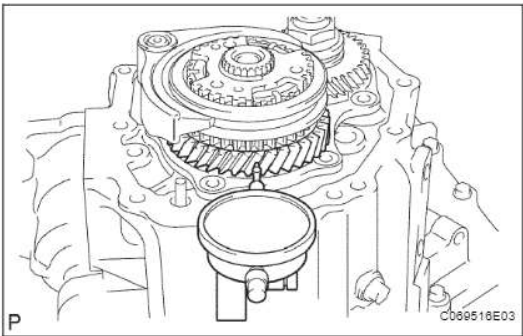
Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

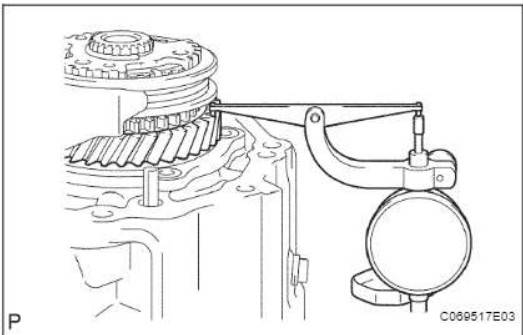


- (d) Select the No. 3 transmission clutch hub shaft snap ring that allows the minimum amount of axial play. Using a brass bar and hammer, tap in the No. 3 transmission clutch hub shaft snap ring.
- Standard clearance:**
0.1 mm (0.004 in.) or less
- Standard snap ring**

Part No.	Mark	Thickness
90520-27061	a	1.75 to 1.80 mm (0.0689 to 0.0709 in.)
90520-27062	b	1.80 to 1.85 mm (0.0709 to 0.0728 in.)
90520-27063	c	1.85 to 1.90 mm (0.0728 to 0.0748 in.)
90520-27064	d	1.90 to 1.95 mm (0.0748 to 0.0768 in.)
90520-27065	e	1.95 to 2.00 mm (0.0768 to 0.0787 in.)
90520-27066	f	2.00 to 2.05 mm (0.0787 to 0.0807 in.)
90520-27067	g	2.05 to 2.10 mm (0.0807 to 0.0827 in.)
90520-27068	h	2.10 to 2.15 mm (0.0827 to 0.0846 in.)
90520-27069	j	2.15 to 2.20 mm (0.0846 to 0.0866 in.)



- 42. INSPECT 5TH GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the 5th gear radial clearance.
- Standard clearance:**
0.009 to 0.050 mm (0.0004 to 0.0020 in.)
- If the clearance is out of specification, replace the 5th gear, 5th gear needle roller bearing or input shaft.

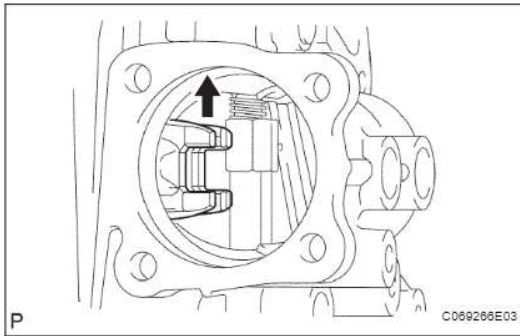


- 43. INSPECT 5TH GEAR THRUST CLEARANCE**
- (a) Using a dial indicator, measure the 5th gear thrust clearance.
- Standard clearance:**
0.10 to 0.65 mm (0.0039 to 0.0260 in.)
- If the clearance is out of specification, replace the No. 3 transmission clutch hub, 5th gear or input shaft rear radial ball bearing.



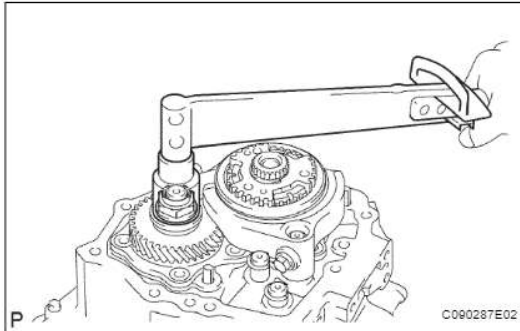
MX-64

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT

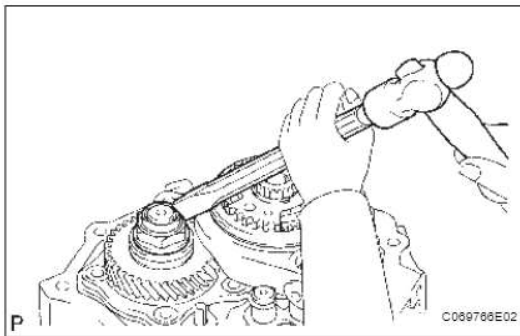


44. INSTALL MANUAL TRANSMISSION OUTPUT SHAFT REAR SET NUT

- (a) Engage the 2 gears simultaneously to lock the transmission.

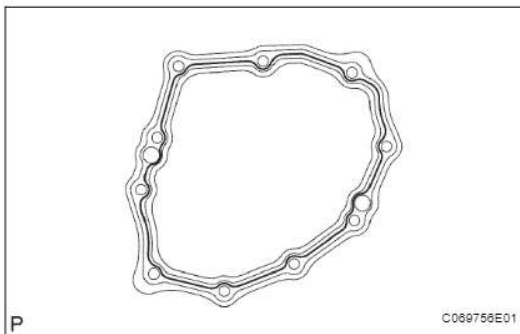


- (b) Install a new transmission output shaft rear set nut.
Torque: 123 N*m (1,254 kgf*cm, 90 ft.*lbf)



- (c) Using a chisel and hammer, stake the rear set nut.
(d) Disengage the 2 gears.

MX



45. INSTALL MANUAL TRANSMISSION CASE COVER SUB-ASSEMBLY

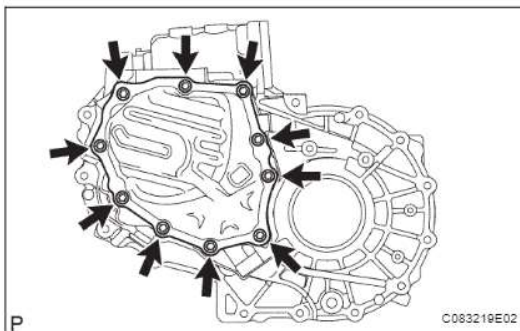
- (a) Apply FIPG to the transaxle case cover, as shown in the installation.

FIPG:

Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

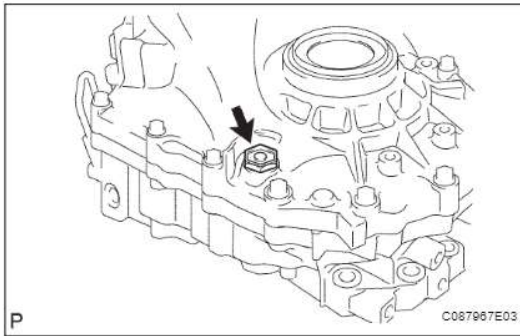
NOTICE:

Install the part within 10 minutes after applying the packing material (FIPG).



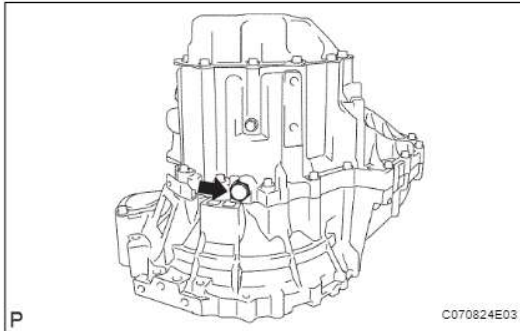
- (b) Install the transmission case cover to the transaxle case with the 10 bolts.

Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-65****46. INSTALL DRAIN PLUG SUB-ASSEMBLY**

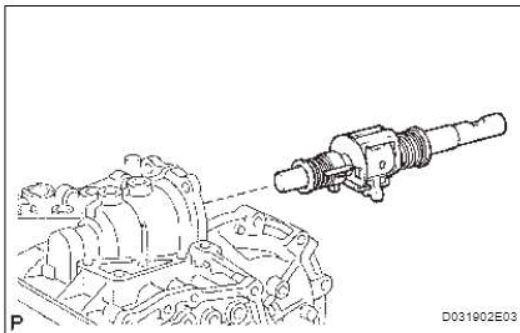
- (a) Install a new gasket and the drain plug to the transmission case.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)

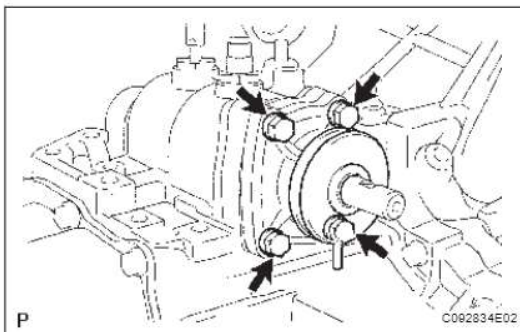
**47. INSTALL MANUAL TRANSMISSION FILLER PLUG**

- (a) Install a new gasket and the filler plug to the transaxle case.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)

**48. INSTALL SHIFT AND SELECT LEVER SHAFT ASSEMBLY**

- (a) Coat the shift and select lever shaft with gear oil, and install it to the transmission case.

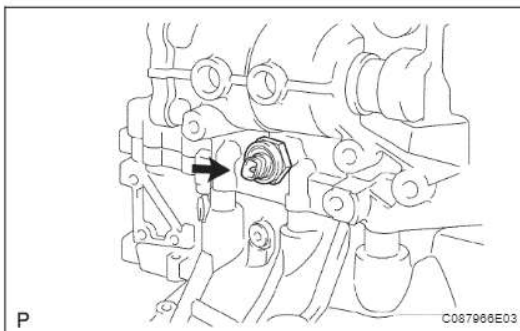
**49. INSTALL CONTROL SHAFT COVER**

- (a) Coat the 4 bolts with adhesive, and install a new gasket and the control shaft cover with the 4 bolts.

Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

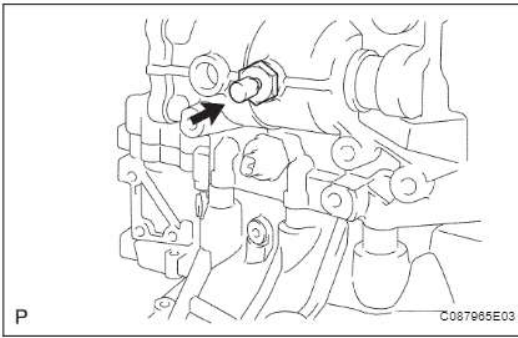
Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

**50. INSTALL BACK-UP LIGHT SWITCH ASSEMBLY**

- (a) Install a new gasket and the back-up light switch to the manual transmission case.

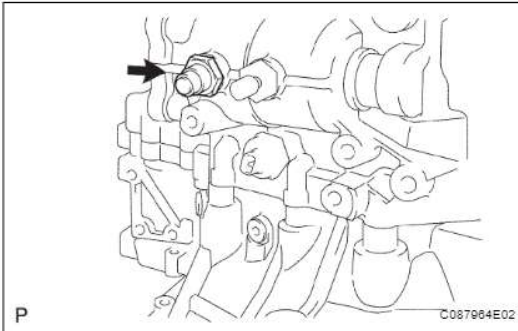
Torque: 40 N*m (408 kgf*cm, 30 ft.*lbf)

MX

MX-66**E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT****51. INSTALL MANUAL TRANSMISSION BREATHER PLUG**

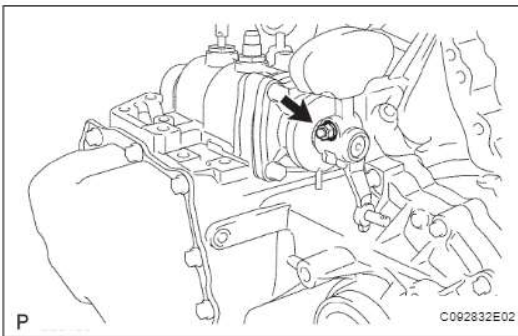
- (a) Install a new gasket and the breather plug to the case.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)

**52. INSTALL NO. 1 LOCK BALL ASSEMBLY**

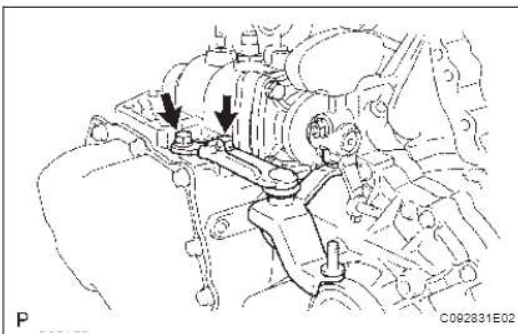
- (a) Install the No. 1 lock ball to the transmission case.

Torque: 29 N*m (296 kgf*cm, 21 ft.*lbf)

**53. INSTALL CONTROL SHIFT LEVER**

- (a) Install the control shift lever with the shift outer lever lever lock pin to the shift and select lever shaft.
- (b) Install the spring washer with the nut.

Torque: 6.4 N*m (65 kgf*cm, 57 in.*lbf)

**54. INSTALL SELECTING BELLCRANK ASSEMBLY**

- (a) Install the shift and select lever bush to the selecting bellcrank.
- (b) Coat the 2 bolts with adhesive, and install the selecting bellcrank to the transmission case with the 2 bolts.

Adhesive:

Toyota Genuine Adhesive 1344, Three Bond 1344 or equivalent

Torque: 20 N*m (204 kgf*cm, 15 ft.*lbf)

55. INSTALL SPEEDOMETER DRIVEN HOLE COVER SUB-ASSEMBLY

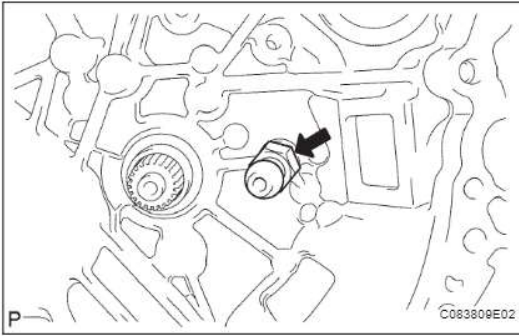
- (a) Install a new O-ring to the hole cover.
- (b) Install the hole cover to the transmission case with the bolt.

Torque: 5.5 N*m (56 kgf*cm, 48 ft.*lbf)

56. INSTALL CLUTCH RELEASE FORK BOOT

- (a) Install the clutch release fork boot to the transaxle case.

MX

E350 MANUAL TRANSAXLE – MANUAL TRANSAXLE UNIT**MX-67****57. INSTALL RELEASE FORK SUPPORT**

- (a) Using a deep socket wrench, install the release fork support to the transaxle case.

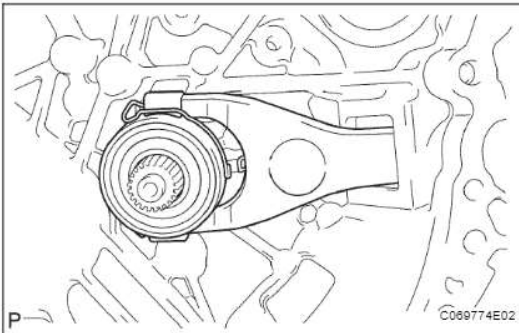
Torque: 47 N*m (480 kgf*cm, 35 ft.*lbf)

58. INSTALL CLUTCH RELEASE BEARING ASSEMBLY

- (a) Coat the clutch release bearing with release hub grease, and install it to the clutch release fork with the clutch release bearing clip.

Sealant:

Toyota Genuine Release Hub Grease or equivalent

**59. INSTALL CLUTCH RELEASE FORK SUB-ASSEMBLY**

- (a) Apply clutch spline grease to the input shaft spline.
(b) Install the clutch release fork to the input shaft.

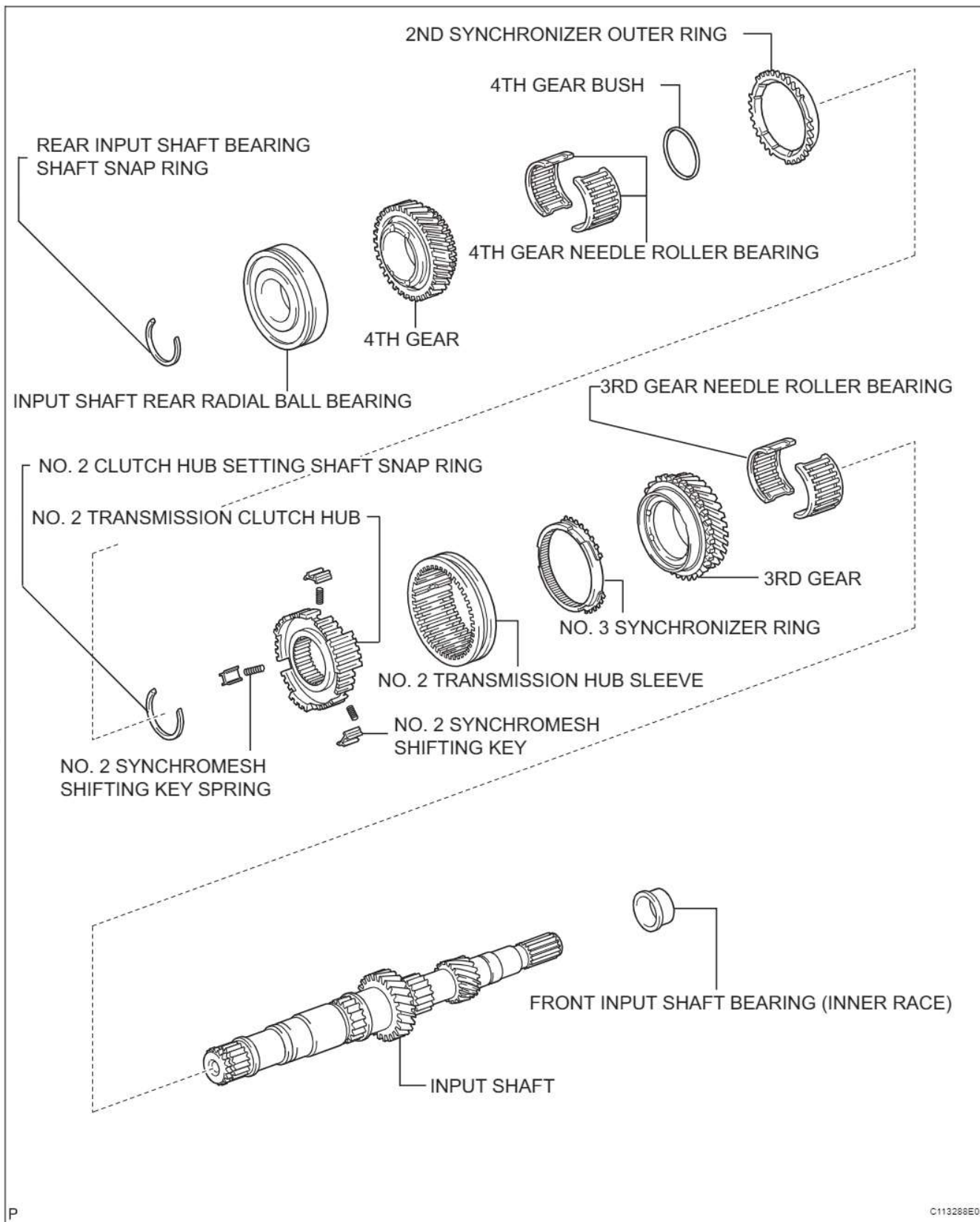
MX

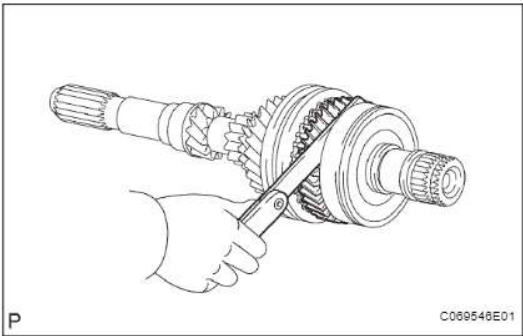
MX-68

E350 MANUAL TRANSAXLE – INPUT SHAFT

INPUT SHAFT

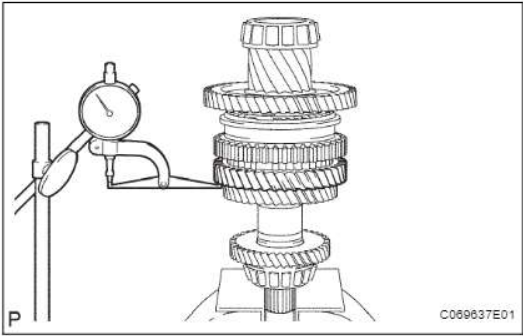
COMPONENTS



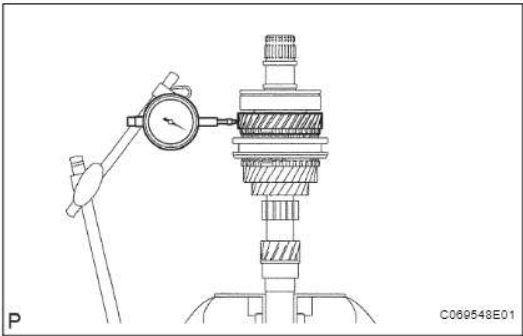


REMOVAL

1. **INSPECT 4TH GEAR THRUST CLEARANCE**
- (a) Using a feeler gauge, measure the thrust clearance.
- Standard clearance:**
0.10 to 0.57 mm (0.0039 to 0.0224 in.)
- If the clearance is out of specification, replace the No. 2 transmission clutch hub, 4th gear or input shaft rear radial ball bearing.



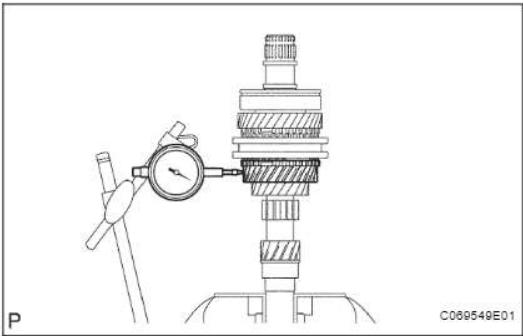
2. **INSPECT 3RD GEAR THRUST CLEARANCE**
- (a) Using a dial indicator, measure the thrust clearance.
- Standard clearance:**
0.10 to 0.35 mm (0.0039 to 0.0138 in.)
- If the clearance is out of specification, replace the No. 2 transmission clutch hub, 3rd gear or input shaft.



3. **INSPECT 4TH GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the radial clearance.
- Standard clearance**

Bearing	Standard Clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

If the clearance is out of specification, replace the 4th gear, needle roller bearing or input shaft.

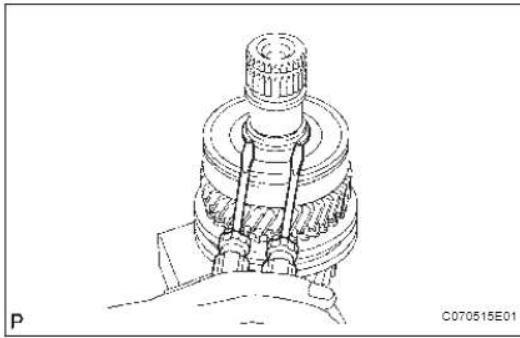


4. **INSPECT 3RD GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the gear radial clearance.
- Standard clearance**

Bearing	Standard Clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

If the clearance is out of specification, replace the 3rd gear, needle roller bearing or input shaft.

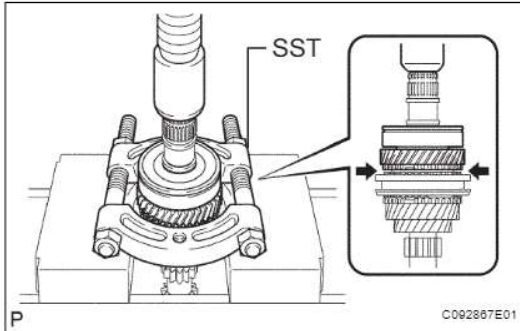
MX

MX-70**E350 MANUAL TRANSAXLE – INPUT SHAFT****5. REMOVE 4TH GEAR**

- (a) Hold the input shaft assembly in a vise with soft jaws.
- (b) Using 2 screwdrivers and a hammer, tap out the input shaft rear bearing shaft snap ring from the input shaft.

HINT:

Cover with a shop rag to keep the snap ring from flying off.

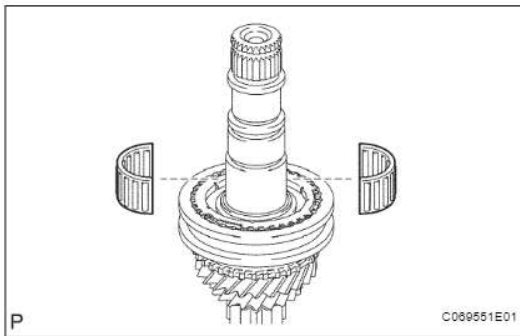


- (c) Using SST and a press, press out the input shaft rear bearing and 4th gear.

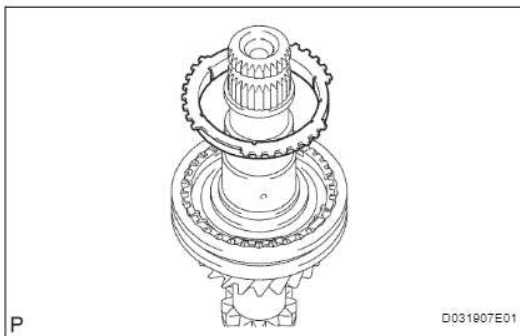
SST 09950-00020

NOTICE:

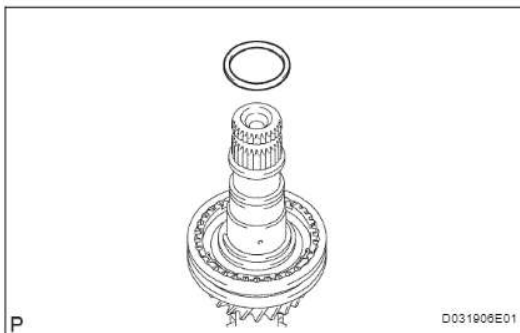
Do not overtighten the SST.

**6. REMOVE 4TH GEAR NEEDLE ROLLER BEARING**

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

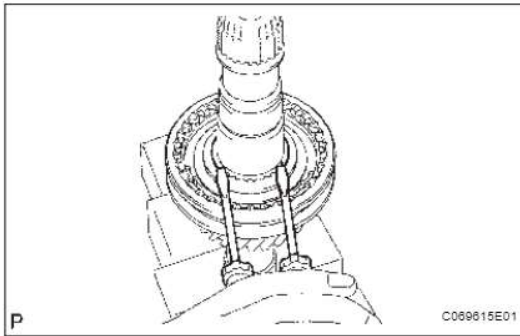
**7. REMOVE 2ND SYNCHRONIZER OUTER RING**

- (a) Remove the 2nd synchronizer outer ring (No. 4 synchronizer ring) from the No. 2 transmission clutch hub.

**8. REMOVE 4TH GEAR BUSH**

- (a) Remove the 4th gear bush from the No. 2 transmission clutch hub.

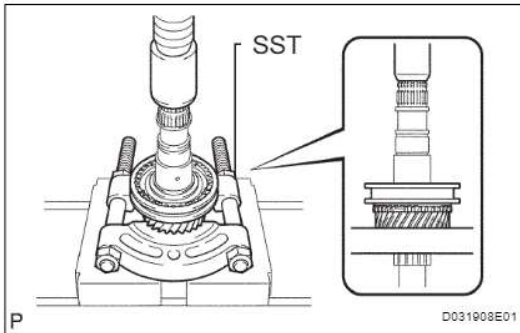
MX

E350 MANUAL TRANSAXLE – INPUT SHAFT**MX-71****9. REMOVE 3RD GEAR**

- (a) Using 2 screwdrivers and a hammer, remove the No. 2 clutch hub setting shaft snap ring from the input shaft.

HINT:

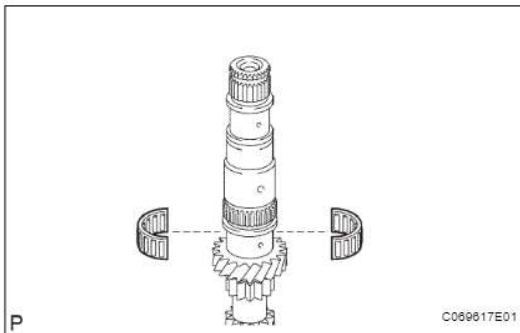
Cover with a shop rag to keep the snap ring from flying off.



- (b) Using SST and a press, remove the No. 2 transmission clutch hub and 3rd gear from the input shaft.

SST 09950-00020**NOTICE:**

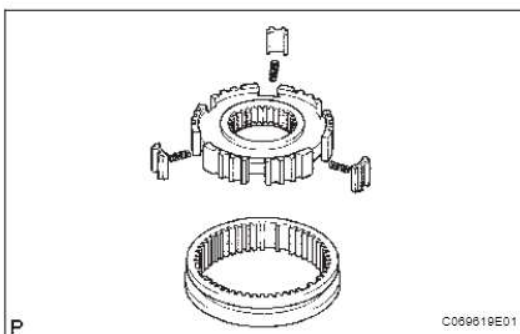
Do not overtighten the SST.

**10. REMOVE 3RD GEAR NEEDLE ROLLER BEARING**

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

**11. REMOVE NO. 3 SYNCHRONIZER RING**

- (a) Remove the No. 3 synchronizer ring from the 3rd gear.

**12. REMOVE NO. 2 TRANSMISSION HUB SLEEVE**

- (a) Remove the No. 2 transmission hub sleeve, 3 No. 2 synchromesh shifting keys and 3 No. 2 synchromesh shifting key springs from the No. 2 transmission clutch hub.

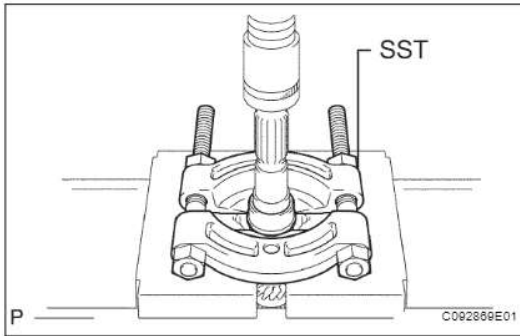
HINT:

Cover with a shop rag to keep the shifting key and shifting key spring from flying off.

MX

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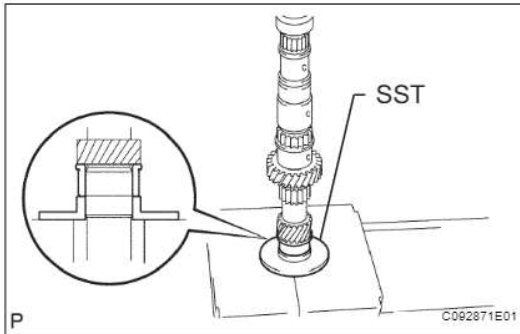
E350 MANUAL TRANSAXLE – INPUT SHAFT

**13. REMOVE INPUT SHAFT FRONT BEARING**

- (a) Using SST and a press, press out the input shaft front bearing (inner race) from the input shaft.

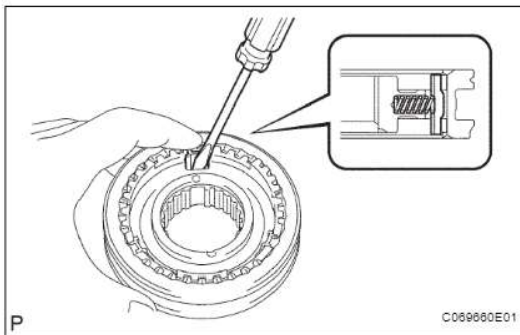
NOTICE:

Do not overtighten the SST.

**INSTALLATION****1. INSTALL FRONT INPUT SHAFT BEARING**

- (a) Using SST and a press, press in the front bearing (inner race).

SST 09608-00071

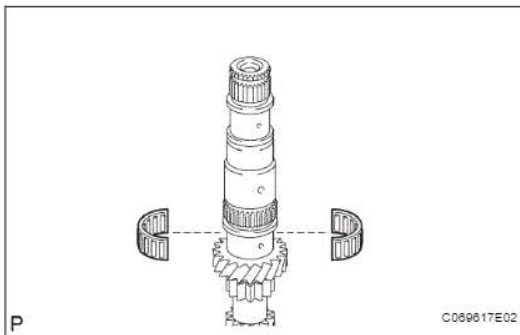
**2. INSTALL NO. 2 TRANSMISSION HUB SLEEVE**

- (a) Coat the No. 2 transmission hub sleeve with gear oil, and install it to the No. 2 transmission clutch hub.

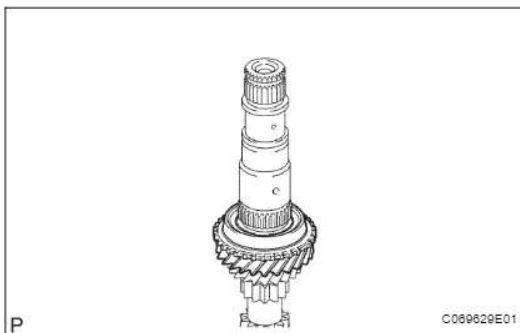
NOTICE:

Set the No. 2 transmission clutch hub sleeve and the No. 2 transmission clutch hub in the correct orientation.

- (b) Using a screwdriver, install the 3 synchromesh key springs with the 3 synchromesh shifting keys to the No. 2 transmission clutch hub.

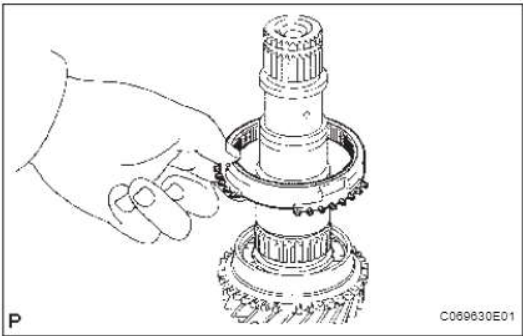
**3. INSTALL 3RD GEAR NEEDLE ROLLER BEARING**

- (a) Coat the 3rd gear bearing with gear oil, and install it to the input shaft.

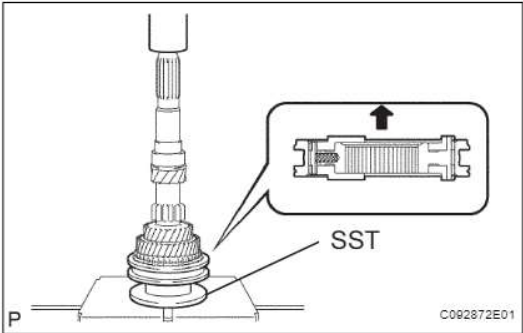
**4. INSTALL 3RD GEAR**

- (a) Coat the 3rd gear with gear oil, and install it to the input shaft.

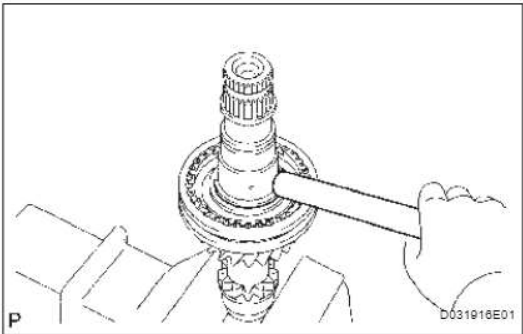
MX



- 5. INSTALL NO. 3 SYNCHRONIZER RING**
- (a) Coat the No. 3 synchronizer ring with gear oil, and install it to the 3rd gear.

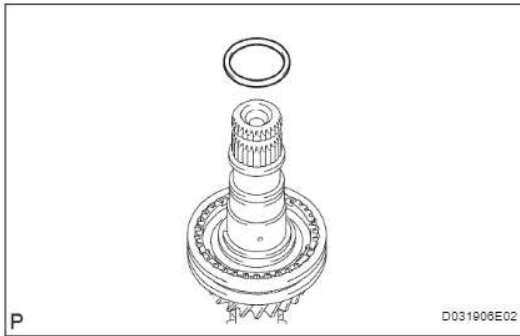


- 6. INSTALL NO. 2 TRANSMISSION CLUTCH HUB**
- (a) Using SST and a press, press in the No. 2 transmission clutch hub to the input shaft.
- NOTICE:**
- Align the claw of the No. 2 clutch hub with the notch of the No. 3 synchronizer ring and install them.
 - Make sure that the 3rd gear can rotate.

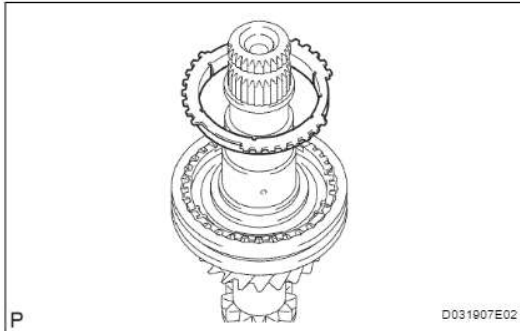


- (b) Select a No. 2 clutch hub setting shaft snap ring so that the clearance between the No. 2 transmission clutch hub and the No. 2 clutch hub setting shaft snap ring will be within specification. Using a brass bar and hammer, install the No. 2 clutch hub setting shaft snap ring.
- Standard clearance:**
0.1 mm (0.004 in.) or less
- Standard snap ring thickness**

Part No.	Mark	Thickness
90520-34003	H	2.30 to 2.35 mm (0.0906 to 0.0925 in.)
90520-34004	J	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
90520-34005	K	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
90520-34006	L	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
90520-34007	M	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
90520-34008	N	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
90520-34009	P	2.60 to 2.65 mm (0.1024 to 0.1043 in.)

MX-74**E350 MANUAL TRANSAXLE – INPUT SHAFT****7. INSTALL 4TH GEAR BUSH**

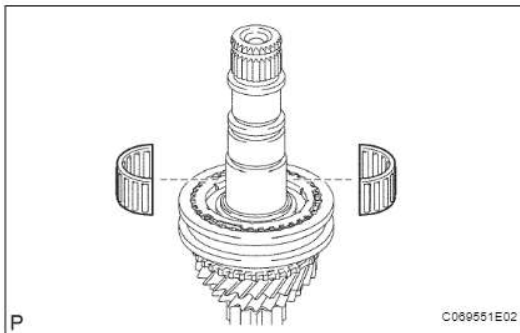
- (a) Coat the 4th gear bush with gear oil, and install it to the input shaft.

**8. INSTALL 2ND SYNCHRONIZER OUTER RING**

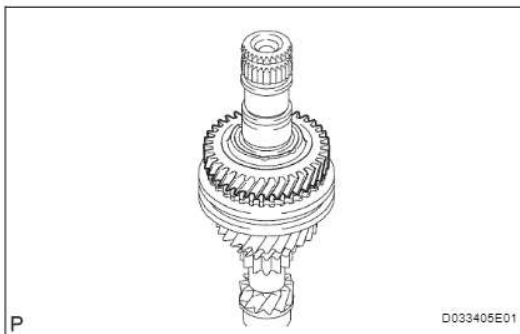
- (a) Coat the 2nd synchronizer outer ring (No. 4 synchronizer ring) with gear oil, and install it to the No. 2 transmission clutch hub.

NOTICE:

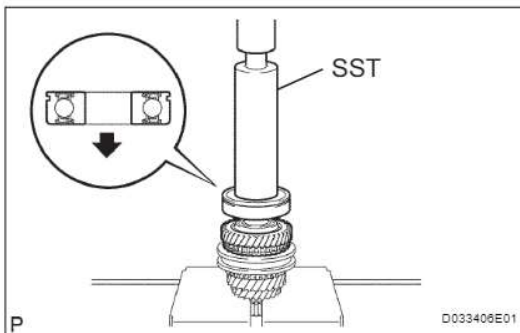
Align the claw of the No. 2 clutch hub with the notch of the 2nd synchronizer outer ring (No. 4 synchronizer ring) and install it.

**9. INSTALL 4TH GEAR NEEDLE ROLLER BEARING**

- (a) Coat the needle roller bearing with gear oil, and install it to the input shaft.

**10. INSTALL 4TH GEAR**

- (a) Coat the 4th gear with gear oil, and install it to the input shaft.

**11. INSTALL REAR INPUT SHAFT RADIAL BALL**

- (a) Using SST and a press, press in the rear radial ball bearing to the input shaft.

SST 09608-06041

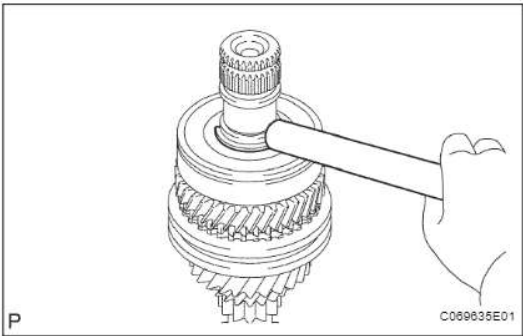
NOTICE:

- Install the bearing with its groove for the snap ring facing upward.
- Make sure that the 3rd gear rotates.

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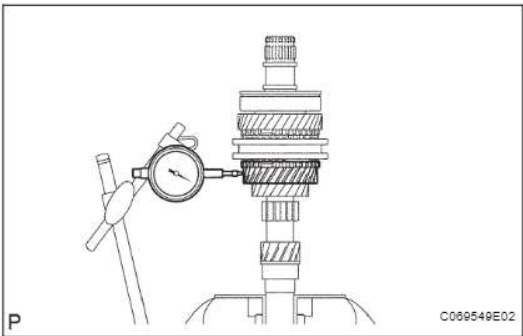
E350 MANUAL TRANSAXLE – INPUT SHAFT

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- (b) Select a rear bearing shaft snap ring so that the clearance between the rear radial ball bearing and the rear bearing shaft snap ring will be within specification. Using a brass bar and hammer, install the rear bearing shaft snap ring.
- Standard clearance:**
0.1 mm (0.004 in.) or less
- Standard snap ring thickness**

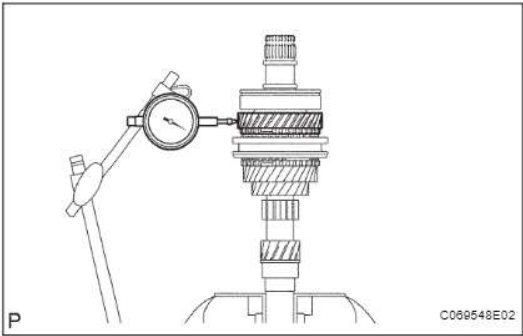
Part No.	Mark	Thickness
90520-30008	1	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
90520-30009	2	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
90520-30010	3	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
90520-30011	4	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
90520-30012	5	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
90520-30013	6	2.60 to 2.65 mm (0.1024 to 0.1043 in.)
90520-30021	7	2.65 to 2.70 mm (0.1043 to 0.1063 in.)
90520-30022	8	2.70 to 2.75 mm (0.1063 to 0.1083 in.)



- 12. INSPECT 3RD GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the radial clearance.
- Standard clearance**

Bearing	Standard Clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

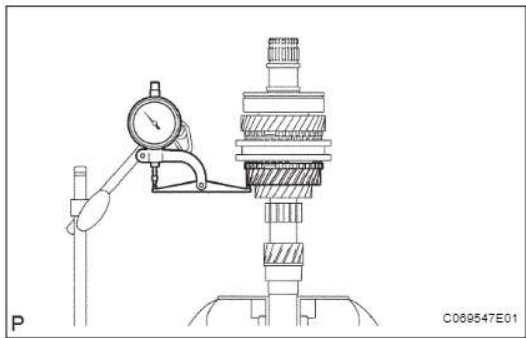
If the clearance is out of specification, replace the 3rd gear, needle roller bearing or input shaft.



- 13. INSPECT 4TH GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the radial clearance.
- Standard clearance**

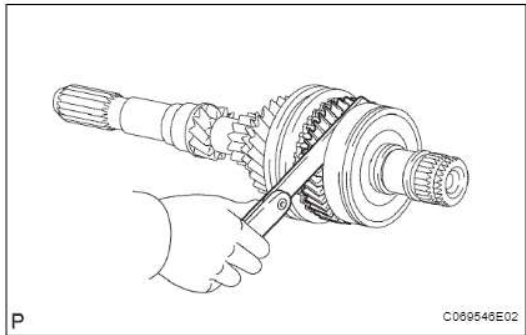
Bearing	Standard Clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

If the clearance is out of specification, replace the 4th gear, needle roller bearing or input shaft.



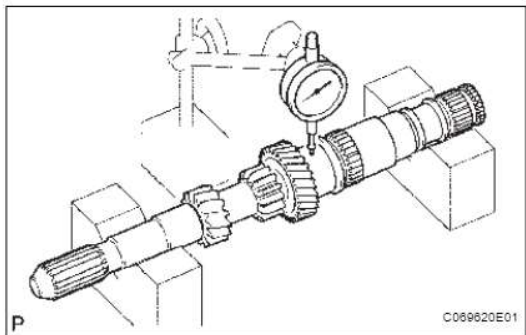
14. INSPECT 3RD GEAR THRUST CLEARANCE

- (a) Using a dial indicator, measure the thrust clearance.
Standard clearance:
0.10 to 0.35 mm (0.0039 to 0.0138 in.)
If the clearance is out of specification, replace the No. 2 transmission clutch hub, 3rd gear or input shaft.



15. INSPECT 4TH GEAR THRUST CLEARANCE

- (a) Using a feeler gauge, measure the thrust clearance.
Standard clearance:
0.10 to 0.57 mm (0.0039 to 0.0224 in.)
If the clearance is out of specification, replace the No. 2 transmission clutch hub, 4th gear or input shaft rear radial ball bearing.



INSPECTION

1. INSPECT INPUT SHAFT

- (a) Using a V-block and dial indicator, measure the shaft for runout.
Maximum runout:
0.03 mm (0.0012 in.)
If the runout is greater than the maximum, replace the input shaft.

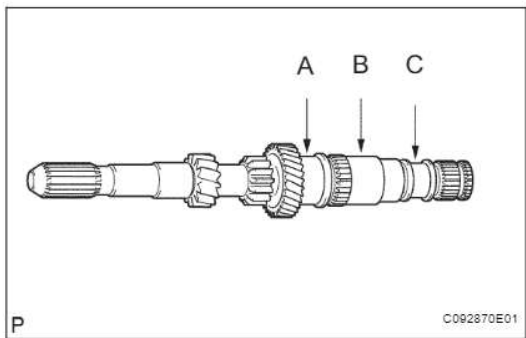
- (b) Using a micrometer, measure the outside diameter of the input shaft journal surface.
Standard outside diameter

Journal Position	Outside Diameter
A	35.984 to 36.000 mm (1.4167 to 1.4173 in.)
B	35.984 to 36.000 mm (1.4167 to 1.4173 in.)
C	27.957 to 27.972 mm (1.1007 to 1.1013 in.)

Minimum outside diameter

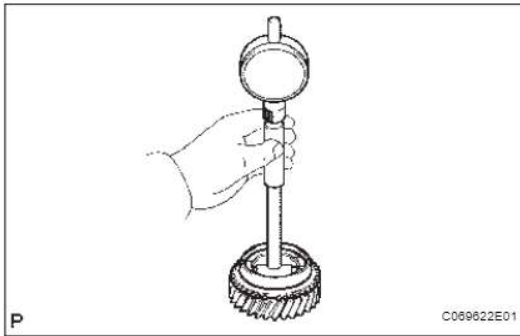
Journal Position	Outside Diameter
A	35.984 mm (1.4167 in.)
B	35.984 mm (1.4167 in.)
C	27.957 mm (1.1007 in.)

If the outside diameter is less than the minimum, replace the input shaft.



E350 MANUAL TRANSAXLE – INPUT SHAFT

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**2. INSPECT 4TH GEAR**

- (a) Using a cylinder gauge, measure the inside diameter of the 4th gear.

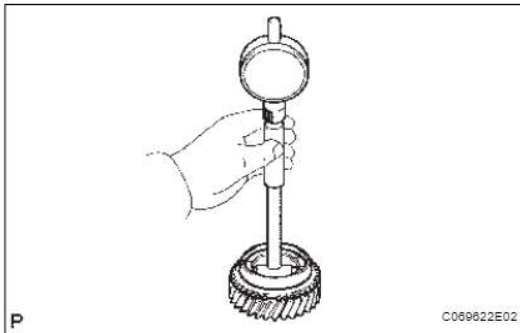
Standard Inside Diameter:

42.009 to 42.025 mm (1.6539 to 1.6545 in.)

Maximum Inside Diameter:

42.025 mm (1.6545 in.)

If the inside diameter is greater than the maximum, replace the 4th gear.

**3. INSPECT 3RD GEAR**

- (a) Using a cylinder gauge, measure the inside diameter.

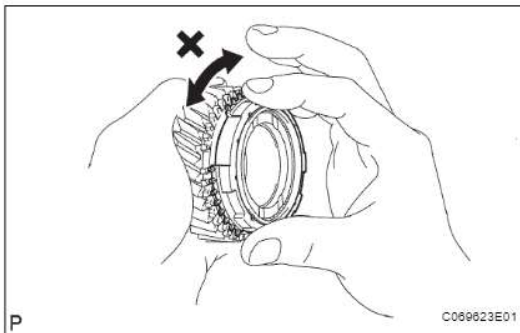
Standard inside diameter:

43.009 to 43.025 mm (1.6933 to 1.6939 in.)

Maximum inside diameter:

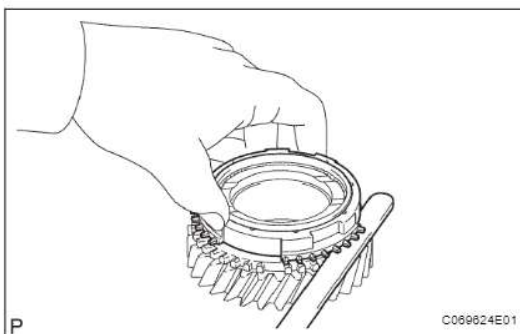
43.025 mm (1.6939 in.)

If the inside diameter is greater than the maximum, replace the 3rd gear.

**4. INSPECT 2ND SYNCHRONIZER OUTER RING**

- (a) Coat the 4th gear cone with gear oil. Turn the 2nd synchronizer outer ring (synchronizer ring No. 4) in one direction while pushing it against the 4th gear cone. Check that the ring locks.

If the 2nd synchronizer outer ring does not lock, replace the ring or the 4th gear.

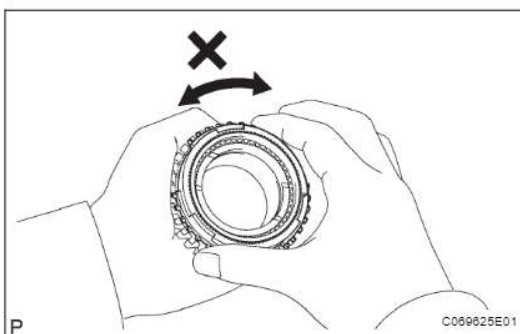


- (b) Using a feeler gauge, measure the clearance between the 2nd synchronizer outer ring (No. 4 synchronizer ring) back and 4th gear spline end.

Standard clearance:

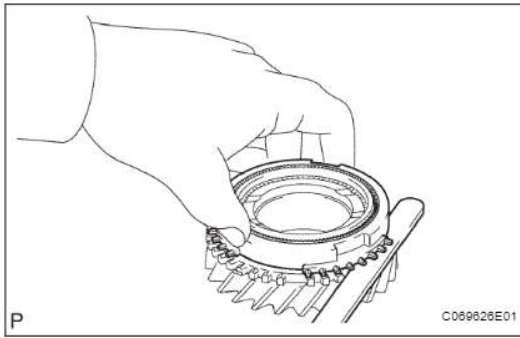
0.75 to 1.65 mm (0.0295 to 0.0650 in.)

If the clearance is out of specification, replace the 2nd synchronizer outer ring.

**5. INSPECT NO. 3 SYNCHRONIZER RING**

- (a) Coat the 3rd gear cone with gear oil. Turn the No. 3 synchronizer ring in one direction while pushing it against the 3rd gear cone. Check that the ring locks. If the No. 3 synchronizer ring does not lock, replace the ring or the 3rd gear.

MX

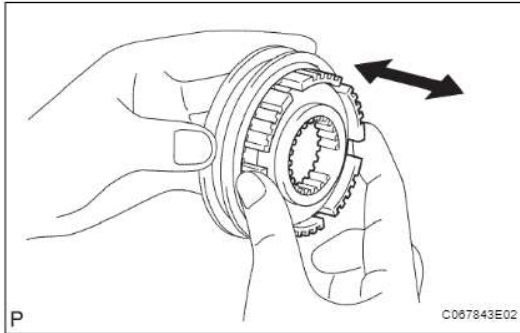
MX-78**E350 MANUAL TRANSAXLE – INPUT SHAFT**

- (b) Using a feeler gauge, measure the clearance between the No. 3 synchronizer ring back and 3rd gear spline end.

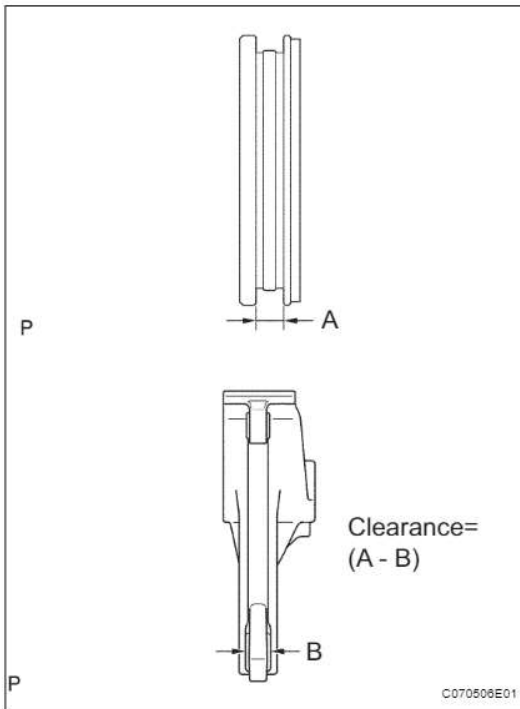
Standard clearance:

0.65 to 1.75 mm (0.0256 to 0.0689 in.)

If the clearance is out of specification, replace the No. 3 synchronizer ring.

**6. INSPECT NO. 2 TRANSMISSION HUB SLEEVE**

- (a) Inspect the sliding condition between the No. 2 transmission hub sleeve and No. 2 transmission clutch hub.
- (b) Inspect the tip of the spline gear on the No. 2 transmission hub sleeve for wear.
- If any defects are found, replace the transmission hub sleeve or the transmission clutch hub.



- (c) Using vernier calipers, measure the width of the No. 2 transmission hub sleeve groove (A) and the thickness of the claw part on the No. 2 gear shift fork (B), and calculate the clearance.

Standard clearance:

A - B = 0.11 to 0.69 mm

If the clearance is out of specification, replace the No. 2 transmission hub sleeve and No. 2 gear shift fork with new ones.

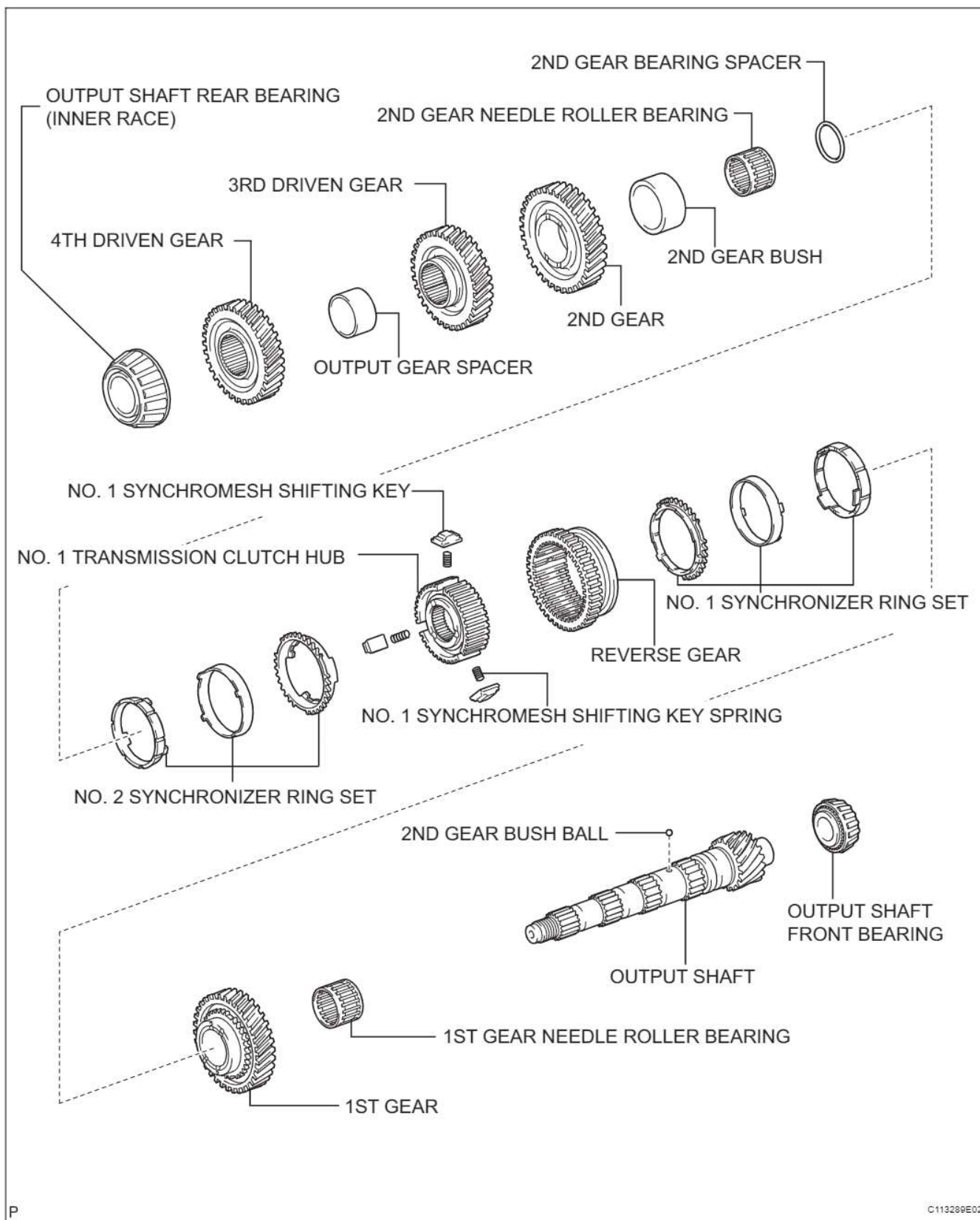
MX

E350 MANUAL TRANSAXLE – OUTPUT SHAFT

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OUTPUT SHAFT

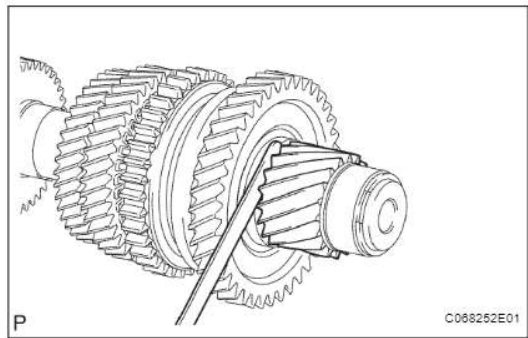
COMPONENTS



MX

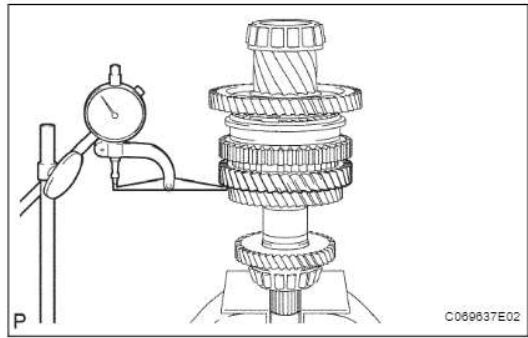
MX-80

E350 MANUAL TRANSAXLE – OUTPUT SHAFT

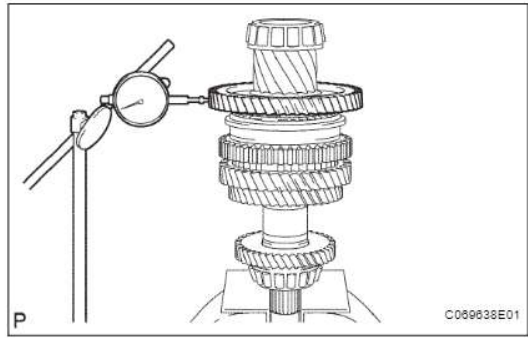


REMOVAL

1. **INSPECT 1ST GEAR THRUST CLEARANCE**
- (a) Using a feeler gauge, measure the thrust clearance.
- Standard clearance:**
0.25 to 0.40 mm (0.0098 to 0.0157 in.)
- If the clearance is out of specification, replace the 1st gear or No. 1 transmission clutch hub.



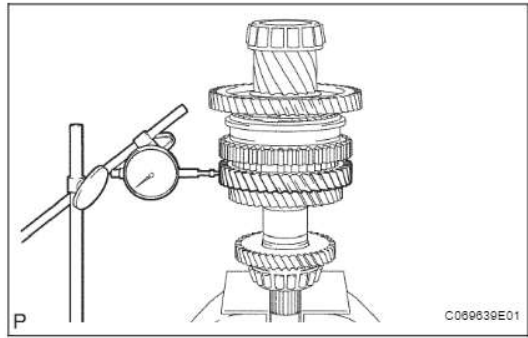
2. **INSPECT 2ND GEAR THRUST CLEARANCE**
- (a) Using a dial indicator, measure the thrust clearance.
- Standard clearance:**
0.10 to 0.35 mm (0.0039 to 0.0138 in.)
- If the clearance is out of specification, replace the No. 1 transmission clutch hub, 2nd gear or 3rd driven gear.



3. **INSPECT 1ST GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the radial clearance.
- Standard clearance**

Bearing	Standard clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

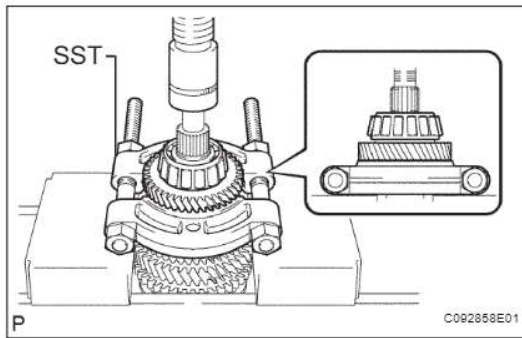
If the clearance is out of specification, replace the 1st gear and 1st gear needle roller bearing.



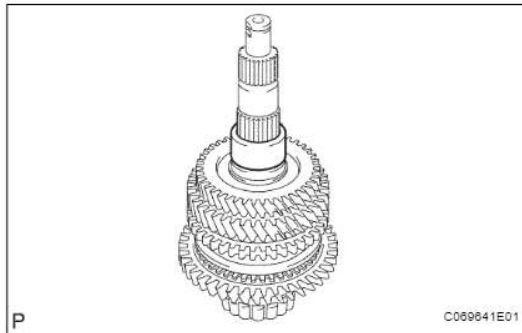
4. **INSPECT 2ND GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the radial clearance.
- Standard clearance**

Bearing	Standard clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

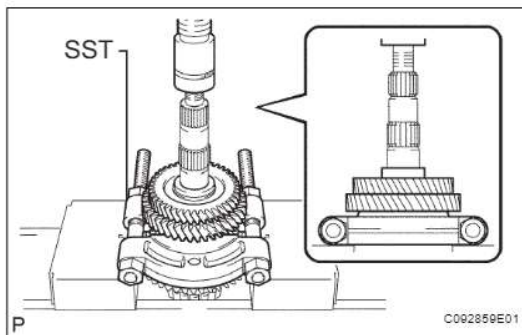
If the clearance is out of specification, replace the 2nd gear, 2nd gear bush and 2nd gear needle roller bearing.

E350 MANUAL TRANSAXLE – OUTPUT SHAFT**MX-81****5. REMOVE 4TH DRIVEN GEAR**

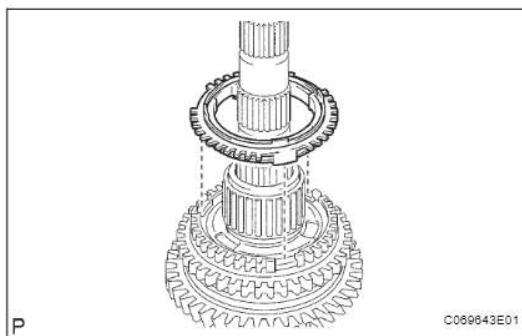
- (a) Using SST and a press, press out the output shaft rear bearing (inner race) and 4th driven gear.

SST 09950-00020**6. REMOVE OUTPUT GEAR SPACER**

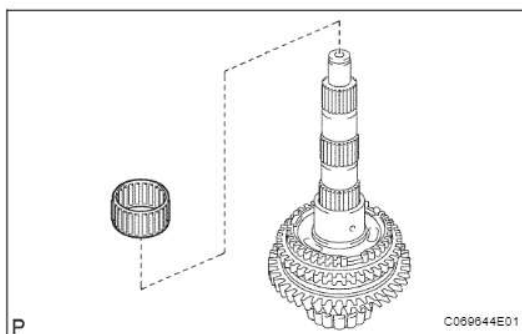
- (a) Remove the output gear spacer from the output shaft.

**7. REMOVE 2ND GEAR**

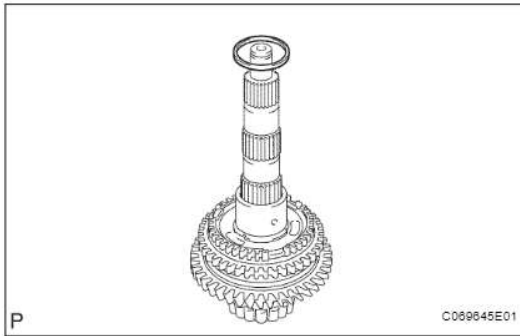
- (a) Using SST and a press, press out the 3rd driven gear and 2nd gear from the output shaft.

SST 09950-00020**8. REMOVE NO. 2 SYNCHRONIZER RING SET**

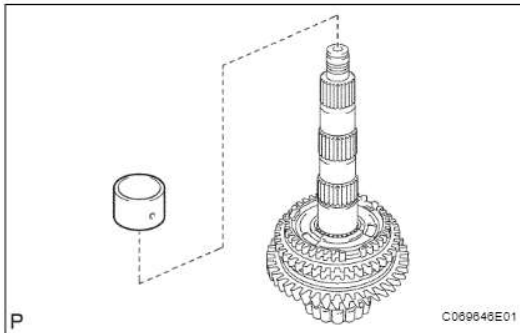
- (a) Remove the No. 2 synchronizer ring set from the No. 1 transmission clutch hub.

MX**9. REMOVE 2ND GEAR NEEDLE ROLLER BEARING**

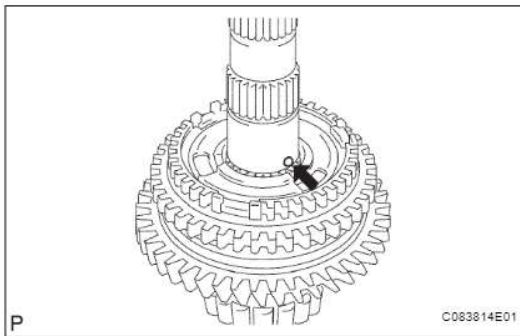
- (a) Remove the needle roller bearing from the output shaft.

MX-82**E350 MANUAL TRANSAXLE – OUTPUT SHAFT****10. REMOVE 2ND GEAR BEARING SPACER**

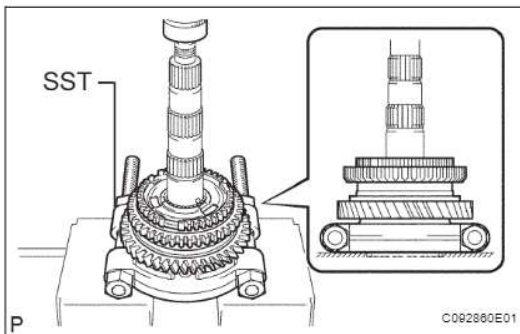
- (a) Remove the bearing spacer from the output shaft.

**11. REMOVE 2ND GEAR BUSH**

- (a) Remove the bush from the output shaft.

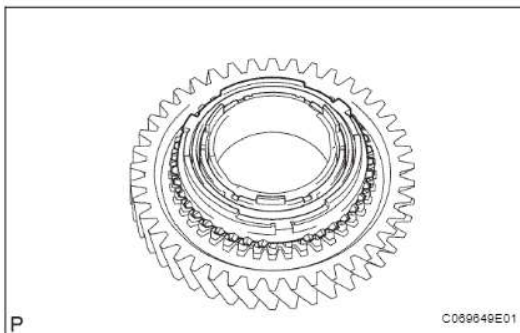
**12. REMOVE 2ND GEAR BUSH BALL**

- (a) Using a magnetic finger, remove the bush ball from the output shaft.

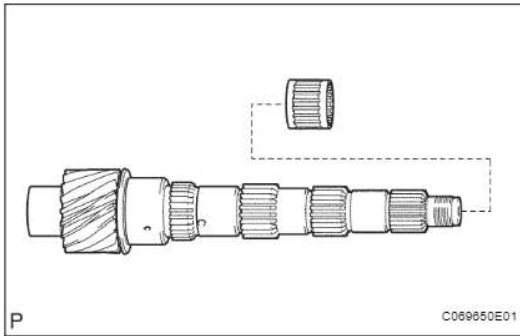
**13. REMOVE 1ST GEAR**

- (a) Using SST and a press, remove the No. 1 transmission clutch hub and 1st gear from the output shaft.

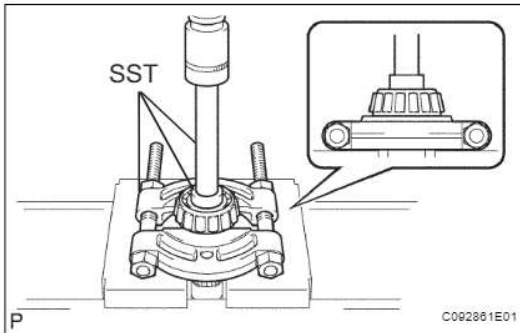
SST 09950-00020

**14. REMOVE NO. 1 SYNCHRONIZER RING SET**

- (a) Remove the No. 1 synchronizer ring set from the 1st gear.

E350 MANUAL TRANSAXLE – OUTPUT SHAFT**MX-83****15. REMOVE 1ST GEAR NEEDLE ROLLER BEARING**

- (a) Remove the needle roller bearing from the output shaft.

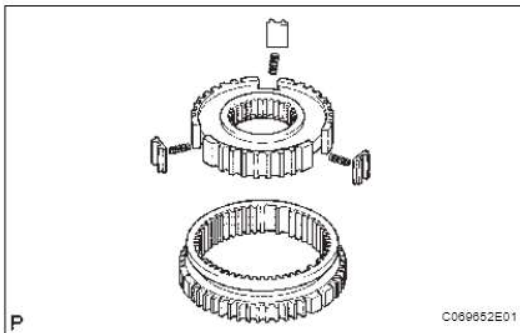
**16. REMOVE FRONT OUTPUT SHAFT BEARING**

- (a) Using SST and a press, press out the front bearing (inner race) from the output shaft.

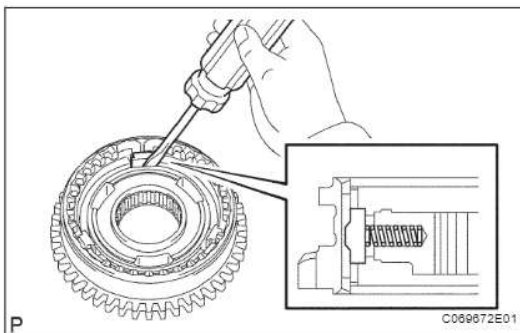
SST 09950-00020, 09950-60010 (09951-00320), 09950-70010 (09951-07150)

NOTICE:

Do not overtighten the SST.

**17. REMOVE REVERSE GEAR**

- (a) Remove the No. 1 transmission clutch hub, 3 No. 1 synchromesh shifting keys and 3 No. 1 synchromesh shifting key springs from the reverse gear.

**INSTALLATION****1. INSTALL REVERSE GEAR**

- (a) Coat the reverse gear with gear oil.
(b) Install the 3 No. 1 synchromesh shifting key springs and No. 1 transmission clutch hub to the reverse gear.

NOTICE:

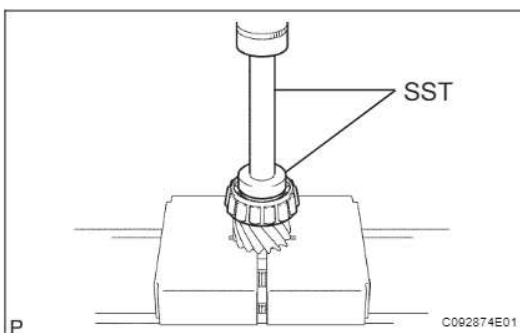
Assemble the reverse gear and the No. 1 transmission clutch hub in the correct direction.

- (c) Using a screwdriver, install the 3 No. 1 synchromesh shifting keys to the reverse gear.

2. INSTALL FRONT OUTPUT SHAFT BEARING

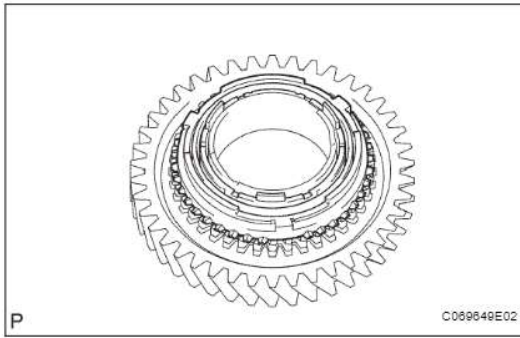
- (a) Using SST and a press, press in the front bearing (inner race) to the output shaft.

SST 09950-60010 (09951-00430), 09950-70010 (09951-07150)

**MX**

MX-84

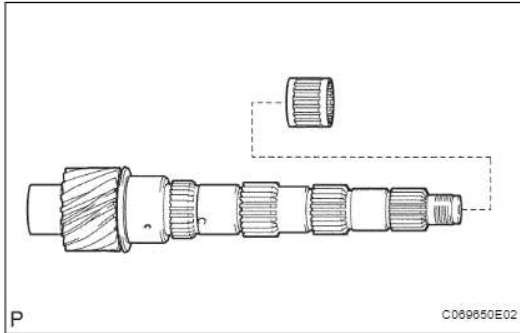
E350 MANUAL TRANSAXLE – OUTPUT SHAFT

**3. INSTALL NO. 1 SYNCHRONIZER RING SET**

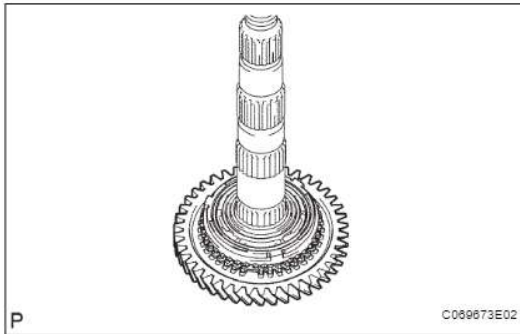
- (a) Coat the No. 1 synchronizer ring set with gear oil, and install it to the 1st gear.

NOTICE:

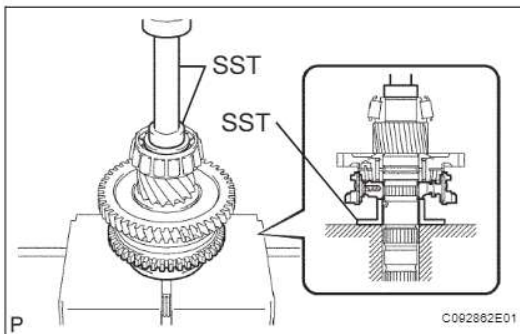
Align the claw of the No. 1 synchronizer ring set (middle) with the hole of the 1st gear and install it.

**4. INSTALL 1ST GEAR NEEDLE ROLLER BEARING**

- (a) Coat the needle roller bearing with gear oil, and install it to the output shaft.

**5. INSTALL 1ST GEAR**

- (a) Coat the 1st gear with gear oil, and install it to the output shaft.

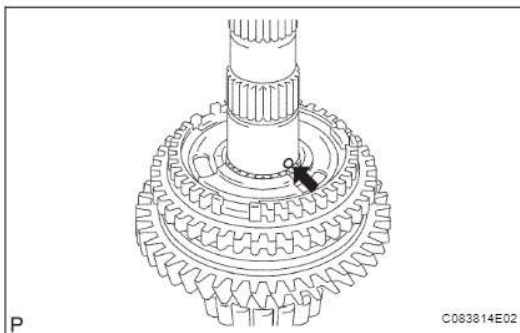
**6. INSTALL NO. 1 TRANSMISSION CLUTCH HUB**

- (a) Using SST and a press, press in the No. 1 transmission clutch hub to the output shaft.

SST 09316-60011 (09316-00031), 09950-60010 (09951-00320), 09950-70010 (09951-07100)

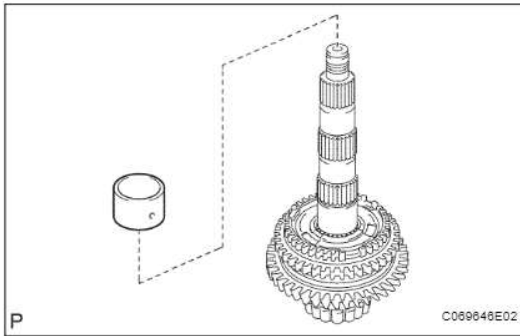
NOTICE:

- Align the claw of the No. 1 synchronizer ring set (outer) with the hole of the No. 1 transmission clutch hub and install it.
- Make sure that the 1st gear rotates.

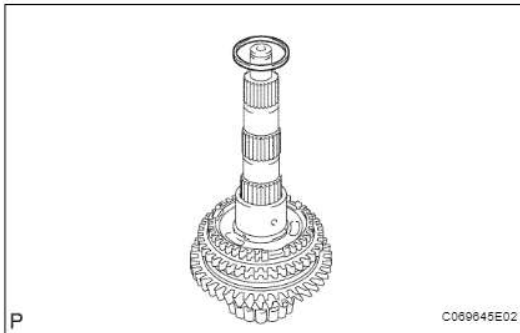
**7. INSTALL 2ND GEAR BUSH BALL**

- (a) Coat the bush ball with MP grease, and install it to the output shaft.

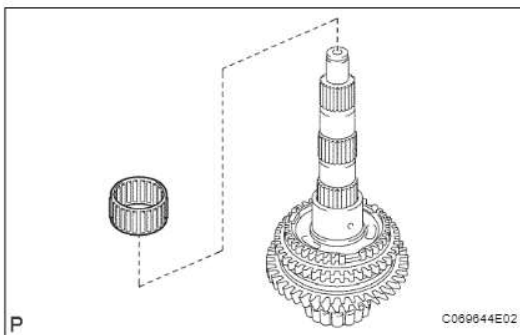
MX

E350 MANUAL TRANSAXLE – OUTPUT SHAFT**MX-85****8. INSTALL 2ND GEAR BUSH**

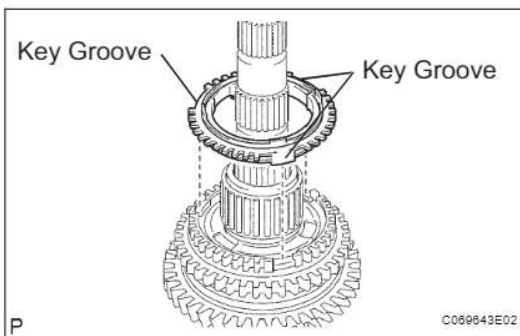
- (a) Coat the bush with gear oil, and install it to the output shaft.

**9. INSTALL 2ND GEAR BEARING SPACER**

- (a) Coat the bearing spacer with gear oil, and install it to the output shaft.

**10. INSTALL 2ND GEAR NEEDLE ROLLER BEARING**

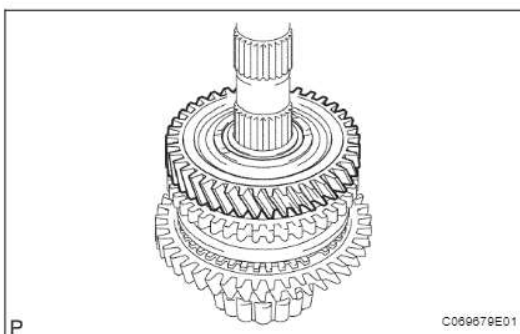
- (a) Coat the needle roller bearing with gear oil, and install it to the output shaft.

**11. INSTALL NO. 2 SYNCHRONIZER RING SET**

- (a) Coat the No. 2 synchronizer ring set with gear oil, and install it to the No. 1 transmission clutch hub.

NOTICE:

Align the key groove on the No. 2 synchronizer ring set with the No. 1 synchromesh shifting key.

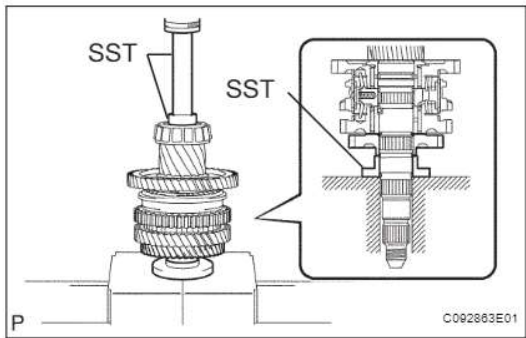
**12. INSTALL 2ND GEAR**

- (a) Coat the 2nd gear with gear oil, and install it to the output shaft.

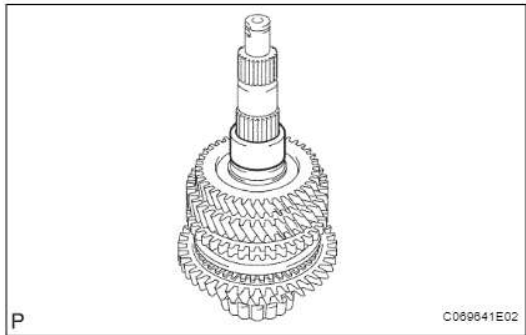
MX

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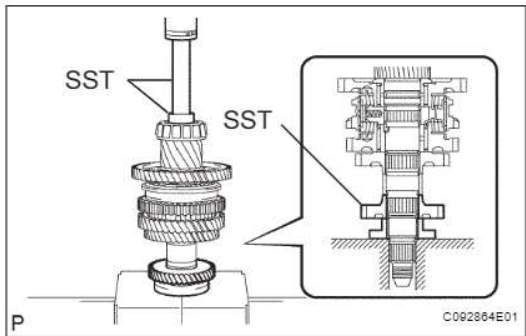
E350 MANUAL TRANSAXLE – OUTPUT SHAFT



- 13. INSTALL 3RD DRIVEN GEAR**
- (a) Using SST and a press, press in the 3rd driven gear to the output shaft.
- SST 09608-00071, 09950-60010 (09951-00320), 09950-70010 (09951-07100)**

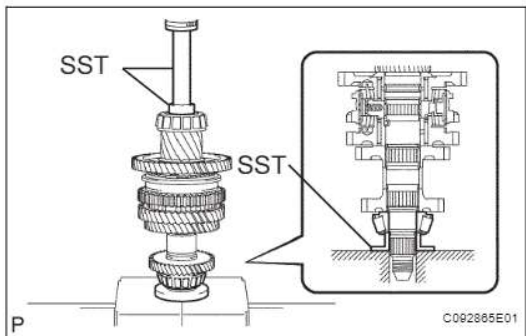


- 14. INSTALL OUTPUT GEAR SPACER**
- (a) Install the output gear spacer to the output shaft.

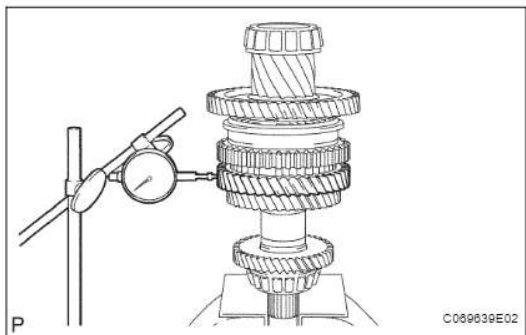


- 15. INSTALL 4TH DRIVEN GEAR**
- (a) Using SST and a press, press in the 4th driven gear to the output shaft.
- SST 09608-00071, 09950-60010 (09951-00320), 09950-70010 (09951-07100)**

MX



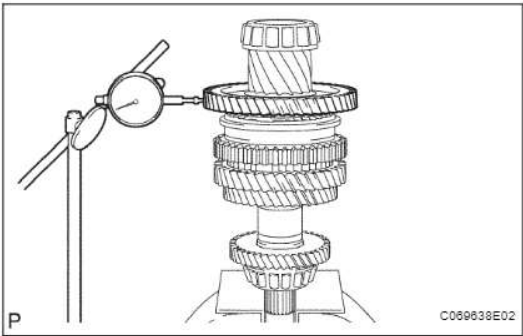
- 16. INSTALL FRONT OUTPUT SHAFT BEARING**
- (a) Using SST and a press, press in the front bearing (inner race) to the output shaft.
- SST 09506-30012, 09950-60010 (09951-00320), 09950-70010 (09951-07100)**



- 17. INSPECT 2ND GEAR RADIAL CLEARANCE**
- (a) Using a dial indicator, measure the radial clearance.
- Standard clearance**

Bearing	Standard clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

If the clearance is out of specification, replace the 2nd gear, 2nd gear bush and 2nd gear needle roller bearing.

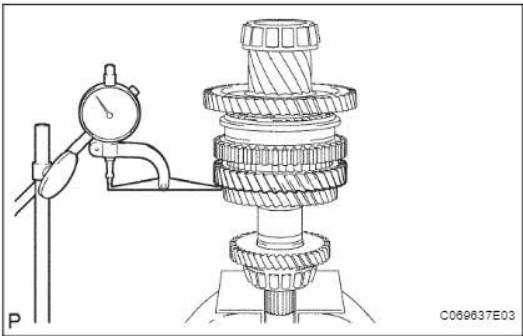


18. INSPECT 1ST GEAR RADIAL CLEARANCE

- (a) Using a dial indicator, measure the radial clearance.
Standard clearance

Bearing	Standard clearance
KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)

If the clearance is out of specification, replace the 1st gear and 1st gear needle roller bearing..

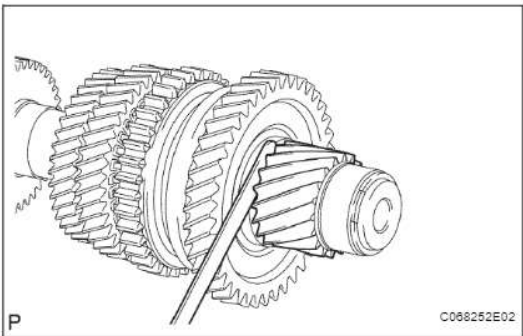


19. INSPECT 2ND GEAR THRUST CLEARANCE

- (a) Using a dial indicator, measure the thrust clearance.
Standard clearance:

0.10 to 0.35 mm (0.0039 to 0.0138 in.)

If the clearance is out of specification, replace the No. 1 transmission clutch hub, 2nd gear or 3rd driven gear.

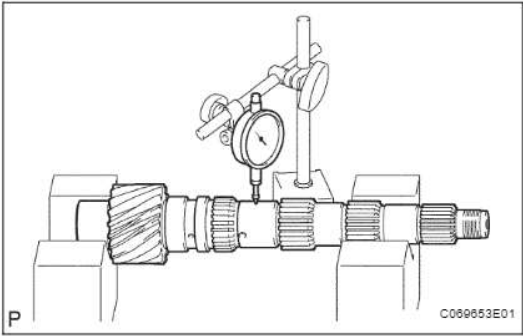


20. INSPECT 1ST GEAR THRUST CLEARANCE

- (a) Using a feeler gauge, measure the thrust clearance.
Standard clearance:

0.25 to 0.40 mm (0.0098 to 0.0157 in.)

If the clearance is out of specification, replace the 1st gear or No. 1 transmission clutch hub.



INSPECTION

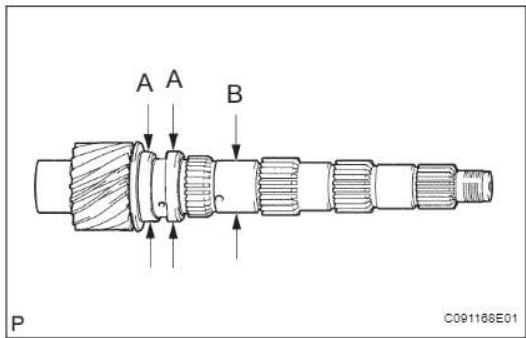
1. INSPECT OUTPUT SHAFT

- (a) Using a V-block and a dial indicator, inspect the shaft for runout.

Maximum runout:

0.03 mm (0.0012 in.)

If the runout is greater than the maximum, replace the output shaft.



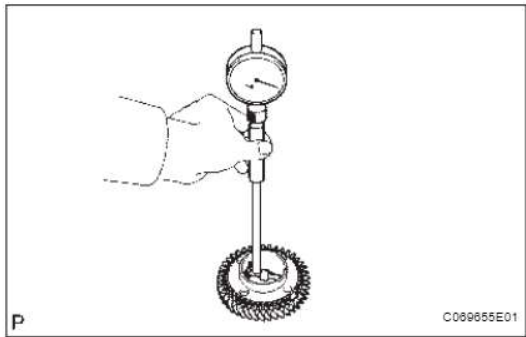
- (b) Using a micrometer, measure the outside diameter of the output shaft journal surface.
- Standard outside diameter**

Journal Position	Specified Condition
A	37.610 to 37.626 mm (1.4807 to 1.4813 in.)
B	34.502 to 34.512 mm (1.3583 to 1.3587 in.)

Minimum outside diameter

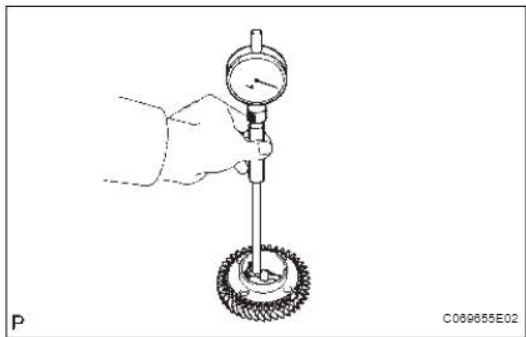
Journal Position	Specified Condition
A	37.610 mm (1.4807 in.)
B	34.502 mm (1.3583 in.)

If the outside diameter is less than the minimum, replace the output shaft.



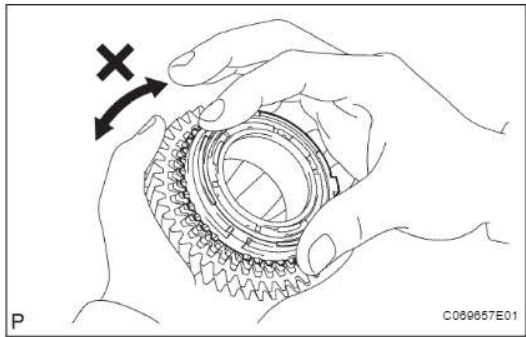
2. INSPECT 2ND GEAR

- (a) Using a cylinder gauge, measure the inside diameter.
- Standard inside diameter:**
50.009 to 50.025 mm (1.9689 to 1.9695 in.)
- Maximum inside diameter:**
50.025 mm (1.9695 in.)
- If the inside diameter is greater than the maximum, replace the 2nd gear.



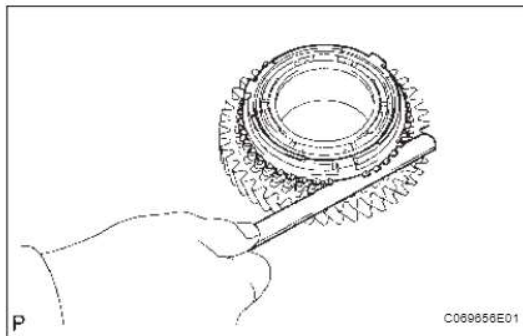
3. INSPECT 1ST GEAR

- (a) Using a cylinder gauge, measure the inside diameter.
- Standard inside diameter:**
51.009 to 51.025 mm (2.0082 to 2.0089 in.)
- Maximum inside diameter:**
51.025 mm (2.0089 in.)
- If the inside diameter is greater than the maximum, replace the 1st gear.



4. INSPECT NO. 2 SYNCHRONIZER RING SET

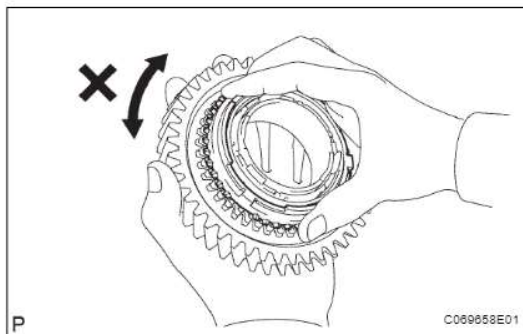
- (a) Coat the 2nd gear cone with gear oil. Turn the No. 2 synchronizer ring set in one direction while pushing it against the No. 2 synchronizer ring set. Check that the ring locks.
- If the No. 2 synchronizer ring set does not lock, replace the synchronizer ring or 2nd gear.

E350 MANUAL TRANSAXLE – OUTPUT SHAFT**MX-89**

- (b) Check the clearance between the No. 2 synchronizer ring set and 2nd gear while pushing the 2nd gear against the No. 2 synchronizer ring set.

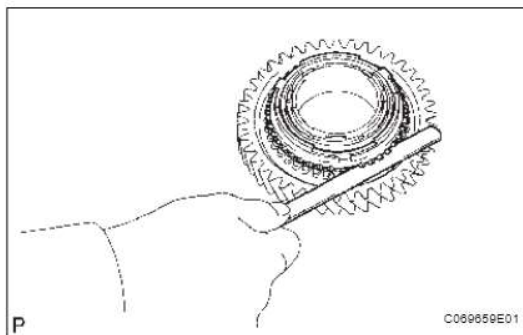
Standard clearance:**0.70 to 1.45 mm (0.0276 to 0.0571 in.)**

If the clearance is out of specification, replace the No. 2 synchronizer ring set with a new one.

**5. INSPECT NO. 1 SYNCHRONIZER RING SET**

- (a) Coat the 1st gear cone with gear oil. Turn the No. 1 synchronizer ring set in one direction while pushing it against the 1st gear cone. Check that the ring locks.

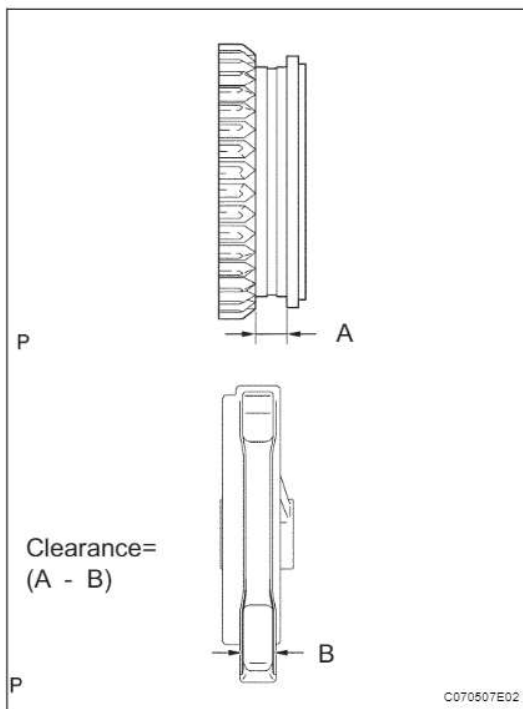
If the No. 1 synchronizer ring set does not lock, replace it with a new one.



- (b) Check the clearance between the No. 1 synchronizer ring set and 1st gear while pushing the 1st gear against the cone of the No. 1 synchronizer ring set.

Standard clearance:**0.70 to 1.45 mm (0.0276 to 0.0571 in.)**

If the clearance is out of specification, replace the No. 1 synchronizer ring set with a new one.

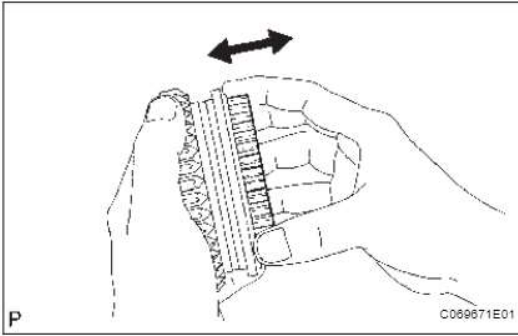
**6. INSPECT REVERSE GEAR**

- (a) Using vernier calipers, measure the width of the reverse gear groove (A) and thickness of the claw part on the No. 1 gear shift fork (B), and calculate the clearance.

Standard clearance:**A - B = 0.15 to 0.35 mm (0.0059 to 0.0138 in.)**

If the clearance is out of specification, replace the reverse gear and No. 1 gear shift fork with new ones.

MX

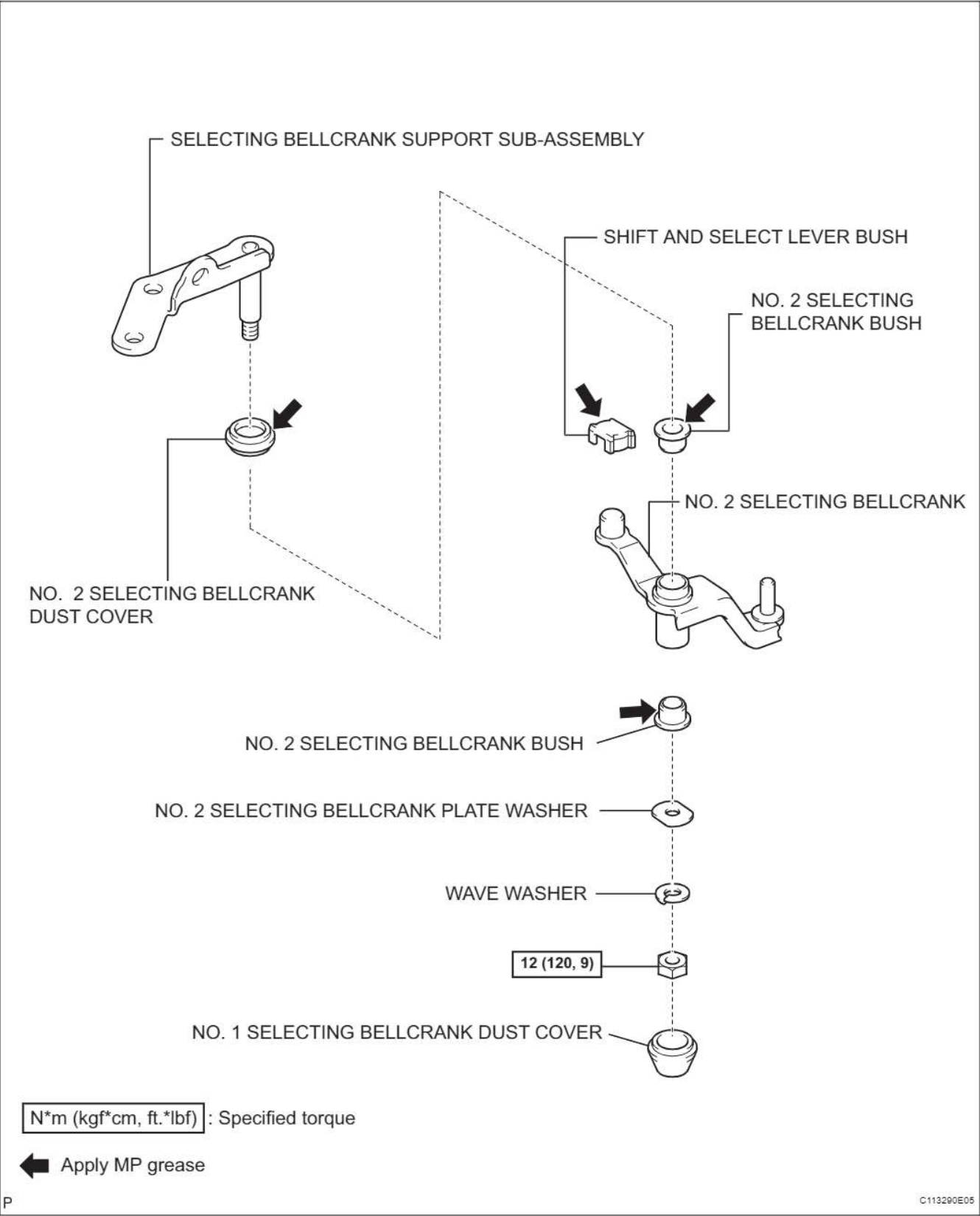
MX-90**E350 MANUAL TRANSAXLE – OUTPUT SHAFT****7. INSPECT NO. 1 TRANSMISSION CLUTCH HUB**

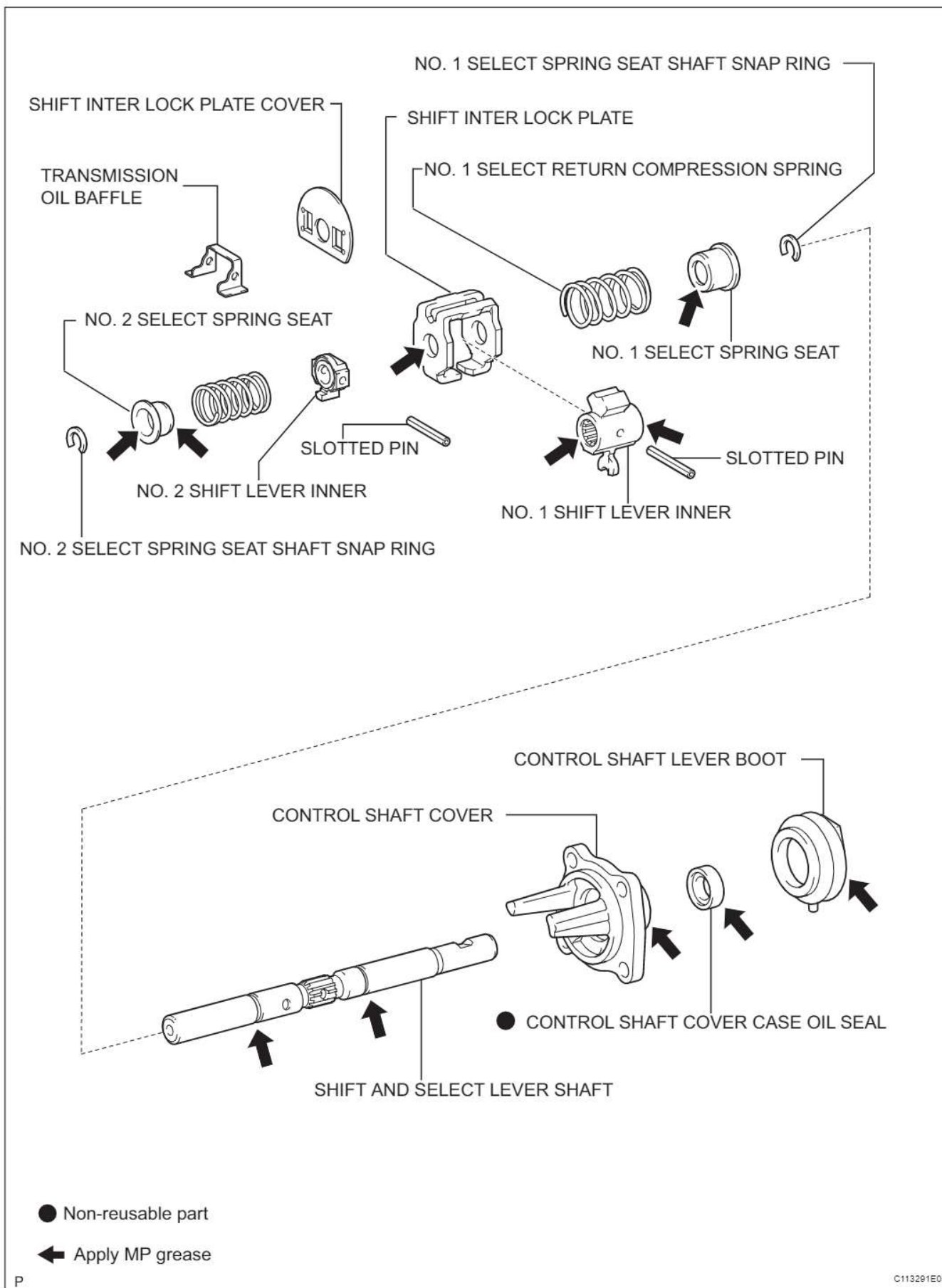
- (a) Check the sliding condition between the No. 1 transmission clutch hub and the reverse gear.
- (b) Check the tip of the spline gear on the sleeve of the reverse gear for wear.

If any defects are found, replace the reverse gear or the No. 1 transmission clutch hub.

SHIFT AND SELECT LEVER SHAFT

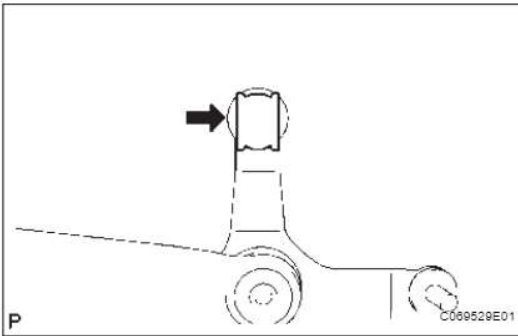
COMPONENTS



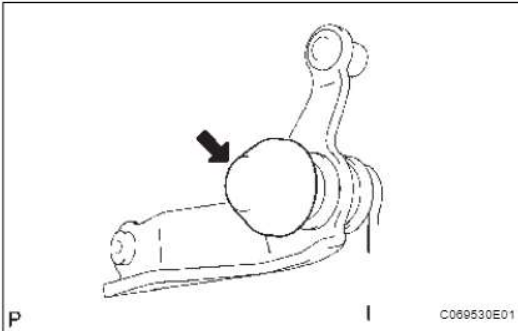
MX-92**E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT**

E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT**MX-93****REMOVAL****1. REMOVE SHIFT AND SELECT LEVER BUSH**

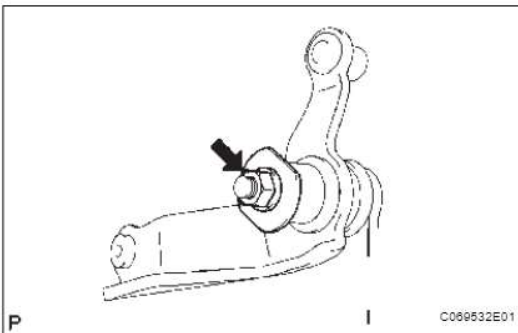
- (a) Remove the bush from the No. 2 selecting bellcrank.

**2. REMOVE NO. 1 SELECTING BELLCRANK DUST COVER**

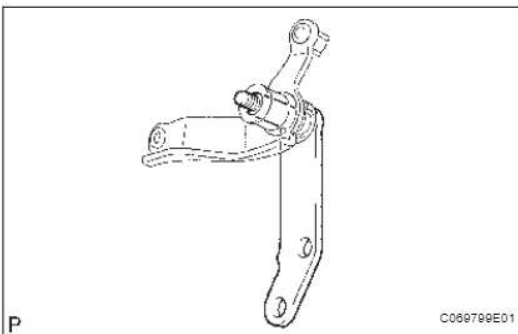
- (a) Remove the dust cover from the No. 2 selecting bellcrank.

**3. REMOVE SELECTING BELLCRANK SUPPORT SUB-ASSEMBLY**

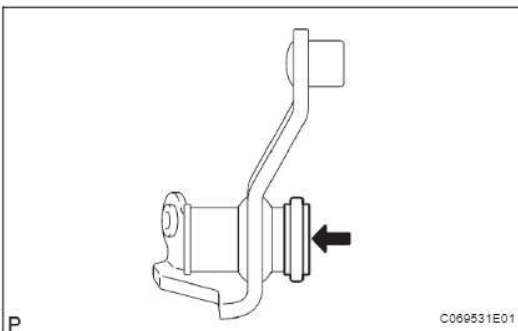
- (a) Remove the nut, wave washer and No. 2 selecting bellcrank plate washer from the No. 2 selecting bellcrank.

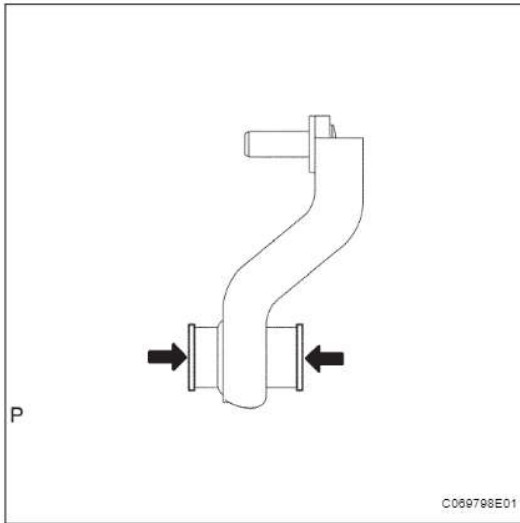


- (b) Remove the selecting bellcrank support from the No. 2 selecting bellcrank.

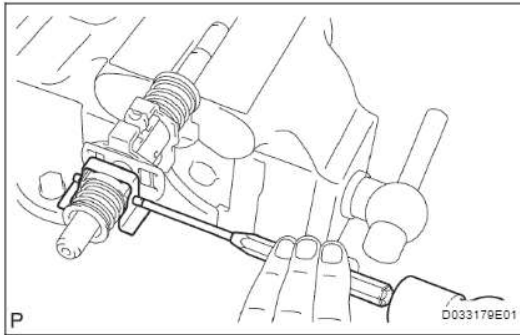
**4. REMOVE NO. 2 SELECTING BELLCRANK DUST COVER**

- (a) Remove the dust cover from the No. 2 selecting bellcrank.

**MX**

MX-94**E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT****5. REMOVE NO. 2 SELECTING BELLCRANK BUSH**

- (a) Remove the bushes from the No. 2 selecting bellcrank.

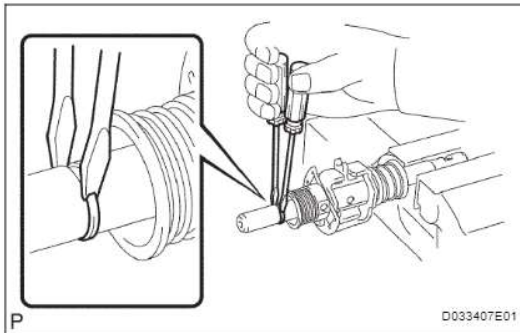
**6. REMOVE NO. 2 SHIFT LEVER INNER**

- (a) Hold the shift and select lever shaft in a vise with soft jaws.

NOTICE:

Do not damage the shift and select lever shaft.

- (b) Using a 5 mm pin punch and a hammer, tap out the slotted pin and remove the transmission oil baffle.

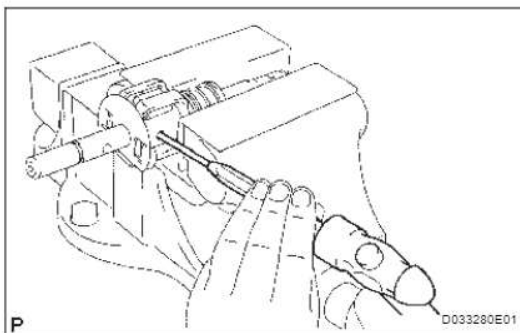


- (c) Apply force to the No. 2 select return compression spring, then using 2 screwdrivers and a hammer, tap out the No. 2 select spring seat shaft snap ring from the shift and select lever shaft.

- (d) Remove the No. 2 select spring seat, No. 2 select return compression spring and No. 2 shift lever inner.

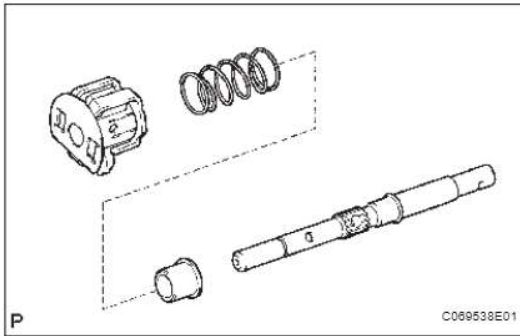
NOTICE:

Use a cloth to prevent the snap ring from flying off.

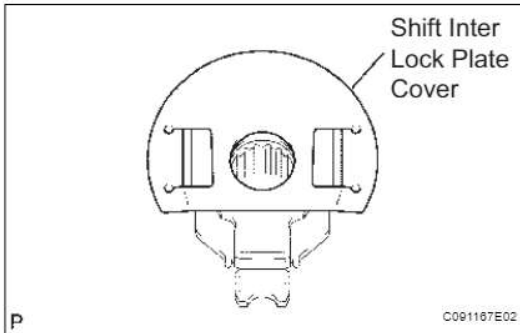
**7. REMOVE NO. 1 SELECT SPRING SEAT**

- (a) Using a 5 mm pin punch and a hammer, remove the slotted pin from the shift and select lever shaft.

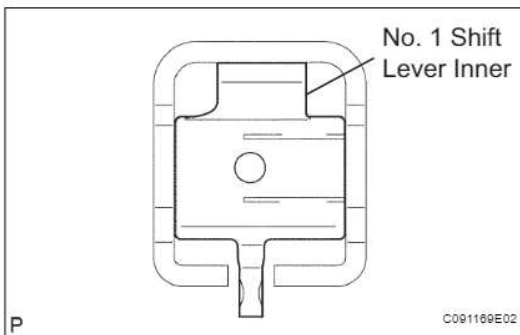
MX

E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT**MX-95**

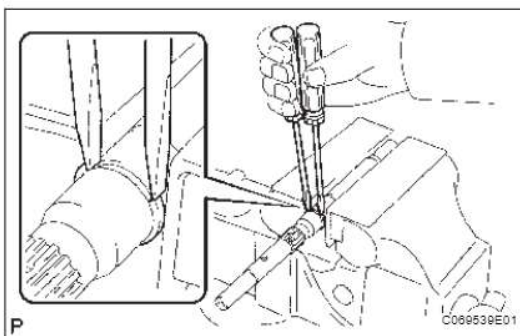
- (b) Remove the shift inter lock plate assembly, shift lever assembly, No. 1 select return compression spring and No. 1 select spring seat from the shift and select lever shaft.

**8. REMOVE SHIFT INTER LOCK PLATE COVER**

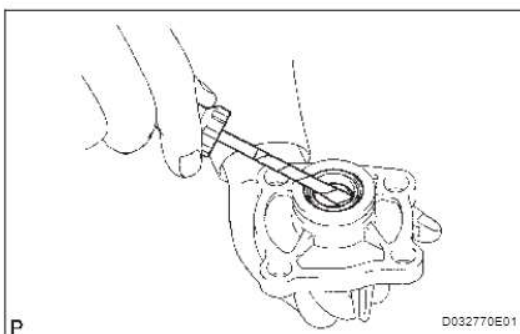
- (a) Remove the shift inter lock plate cover from the shift inter lock plate.

**9. REMOVE NO. 1 SHIFT LEVER INNER**

- (a) Remove the No. 1 shift lever inner from the shift inter lock plate.

**10. REMOVE NO. 1 SELECT SPRING SEAT SHAFT SNAP RING**

- (a) Using 2 screwdrivers and a hammer, tap out the snap ring.

**11. REMOVE SHIFT AND SELECT LEVER SHAFT DUST BOOT**

- (a) Remove the dust boot from the control shaft cover.

12. REMOVE CONTROL SHAFT COVER OIL SEAL

- (a) Using a screwdriver, remove the oil seal from the control shaft cover.

HINT:

Tape the screwdriver tip before use to avoid damage.

MX

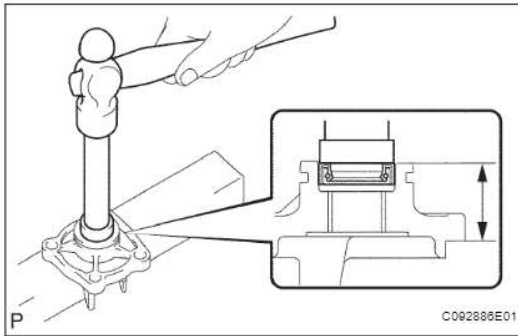
MX-96**E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT****INSTALLATION****1. INSTALL CONTROL SHAFT COVER OIL SEAL**

- (a) Using SST and a hammer, tap in a new control shaft cover oil seal to the control shaft cover.

SST 09950-60010 (09951-00280), 09950-70010 (09951-07100)

Standard oil seal drive in depth:

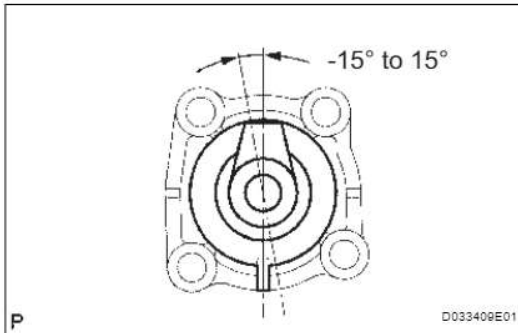
28.5 +/- 0.50 mm (1.122 +/- 0.020 in.)

**2. INSTALL SHIFT AND SELECT LEVER SHAFT DUST BOOT**

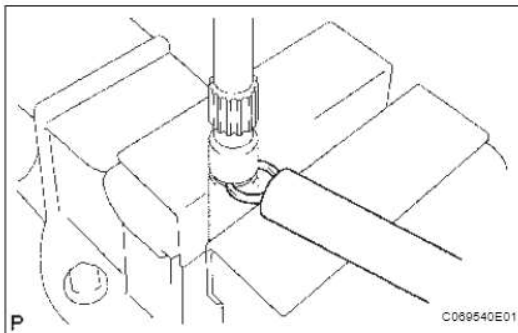
- (a) Install the shift and select lever shaft dust boot to the control shaft cover.

HINT:

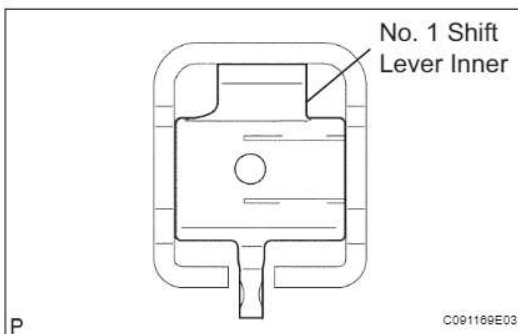
It is acceptable for the dust boot to be tilted +15° to -15°.

**3. INSTALL NO. 1 SELECT SPRING SEAT SHAFT SNAP RING**

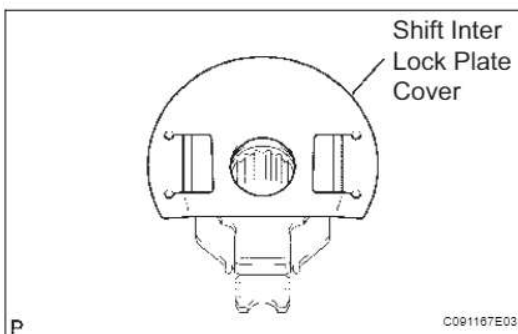
- (a) Using a brass bar and hammer, tap in the shaft snap ring.

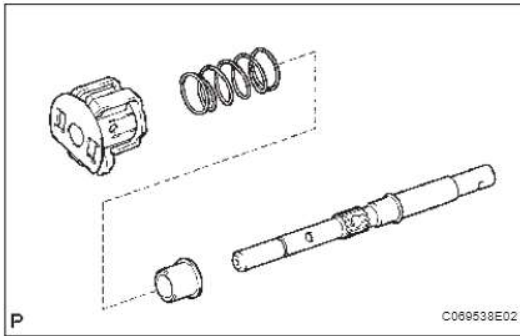
**4. REMOVE NO. 1 SHIFT LEVER INNER**

- (a) Coat the No. 1 shift lever inner and shift inter lock plate with MP grease, and install them.

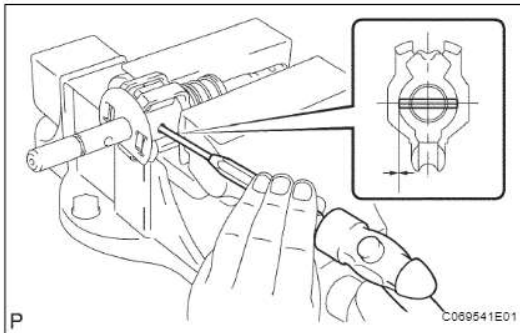
**5. INSTALL SHIFT INTER LOCK PLATE COVER**

- (a) Install the shift inter lock plate cover to the shift inter lock plate.

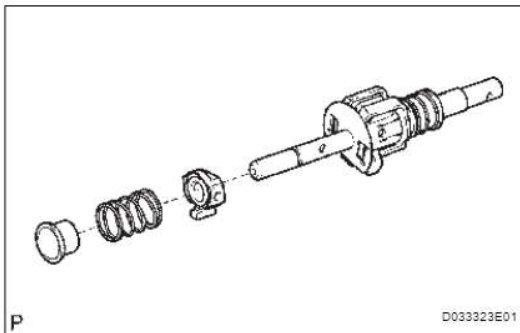
**MX**

E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT**MX-97****6. INSTALL NO. 1 SELECT SPRING SEAT**

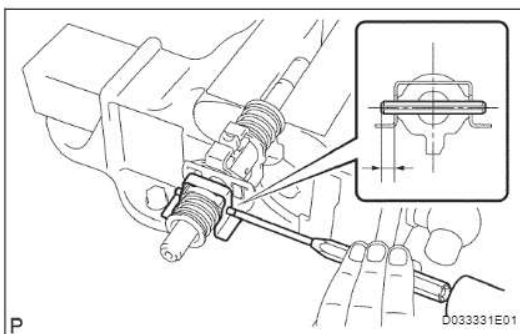
- (a) Coat the No. 1 select spring seat with MP grease, and install it.
- (b) Install the No. 1 select return compression spring and shift inter lock plate assembly to the shift and select lever shaft.



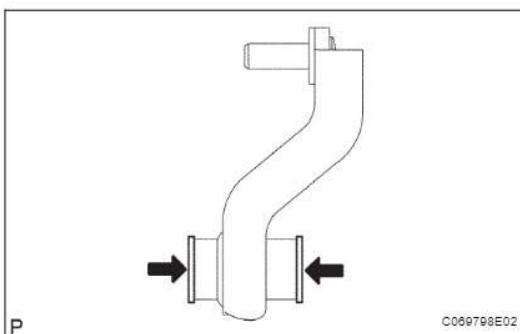
- (c) Hold the shift and select lever shaft in a vise with soft jaws.
- (d) Using a 5 mm pin punch, install the No. 1 shift lever inner slotted pin to the shift and select lever shaft.

Standard clearance:**-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)****7. INSTALL NO. 2 SHIFT LEVER INNER**

- (a) Install the No. 2 shift lever inner and No. 2 select return compression spring to the shift and select lever shaft.
- (b) Coat the select spring seat No. 2 with MP grease, and install it to the shift and select lever shaft.
- (c) Using a brass bar and hammer, tap in the No. 2 select spring seat shaft snap ring to the shift and select lever shaft.

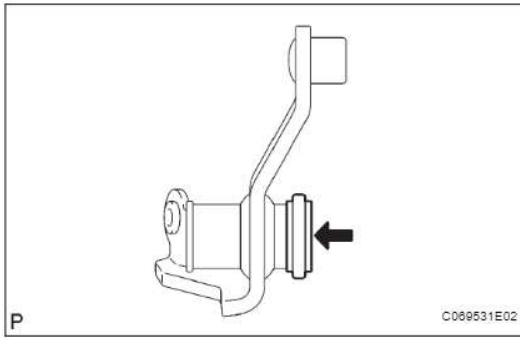


- (d) Install the transmission oil baffle. Using a 5 mm pin punch and a hammer, tap in the No. 2 shift lever inner slotted pin to the shift and select lever shaft.

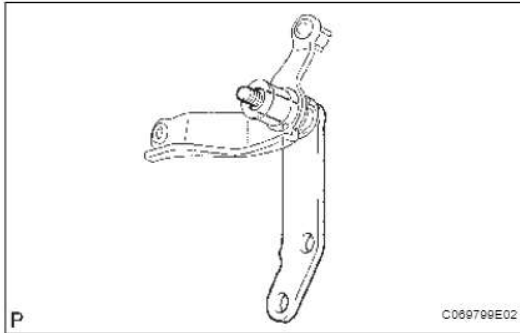
Standard clearance:**5.8 to 6.8 mm (0.2283 to 0.2677 in.)****8. INSTALL NO. 2 SELECTING BELLCRANK BUSH**

- (a) Coat the bushes with MP grease, and install them to the No. 2 selecting bellcrank.

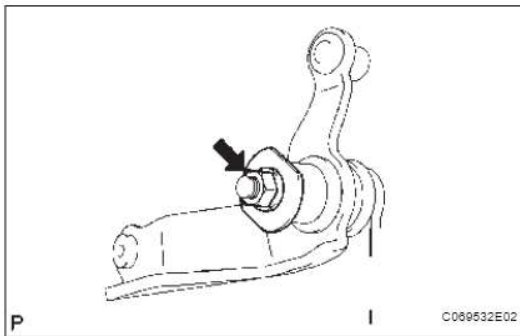
MX

MX-98**E350 MANUAL TRANSAXLE – SHIFT AND SELECT LEVER SHAFT****9. INSTALL NO. 2 SELECTING BELLCRANK DUST COVER**

- (a) Coat the dust cover with MP grease, and install it to the No. 2 selecting bellcrank.

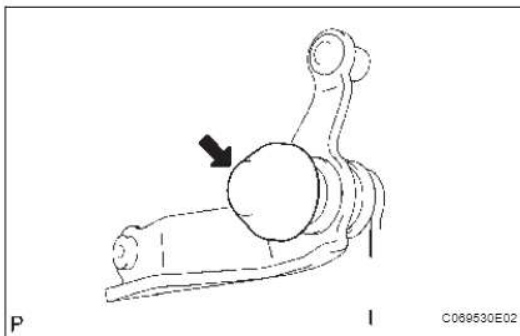
**10. INSTALL SELECTING BELLCRANK SUPPORT SUB-ASSEMBLY**

- (a) Install the selecting bellcrank support to the No. 2 selecting bellcrank.

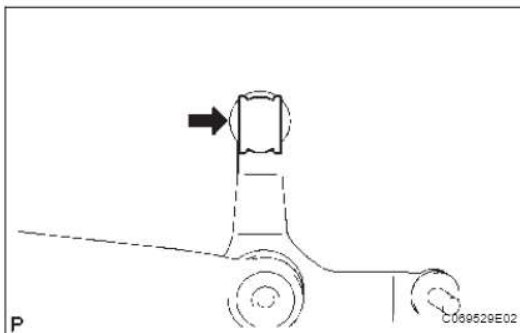


- (b) Install the No. 2 selecting bellcrank plate washer, wave washer and nut.

Torque: 12 N*m (120 kgf*cm, 9 ft.*lbf)

**11. INSTALL NO. 1 SELECTING BELLCRANK DUST COVER**

- (a) Install the dust cover to the No. 2 selecting bellcrank.

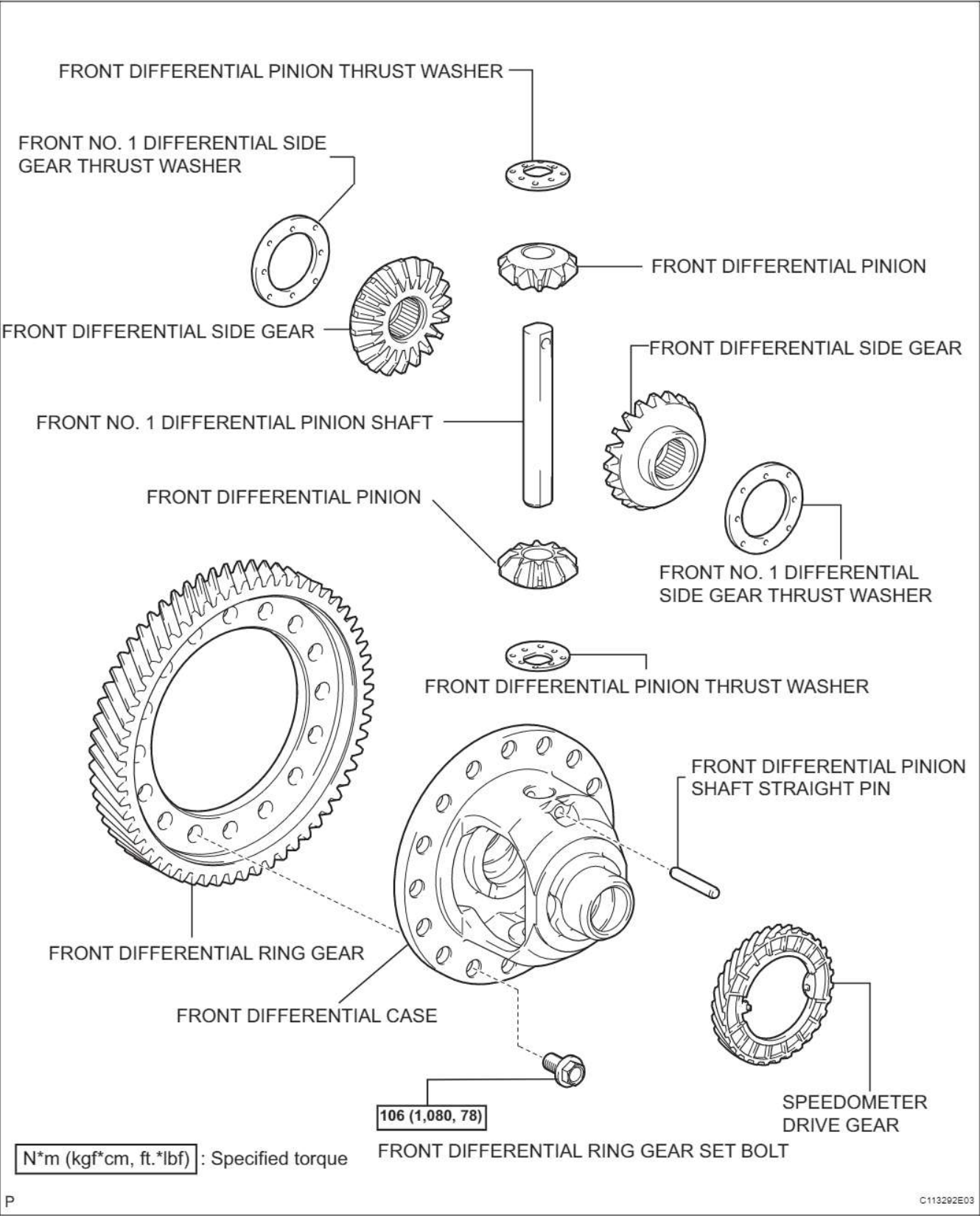
**12. INSTALL SHIFT AND SELECT LEVER BUSH**

- (a) Install the bush to the No. 2 selecting bellcrank.

MX

E350 MANUAL TRANSAXLE – DIFFERENTIAL CASE

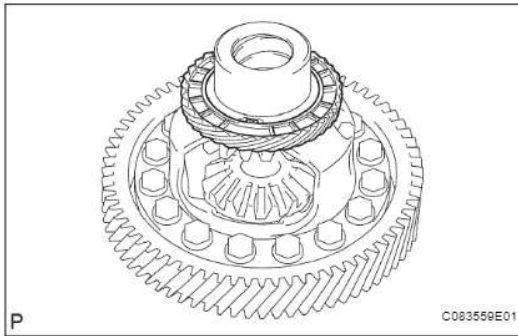
DIFFERENTIAL CASE
COMPONENTS



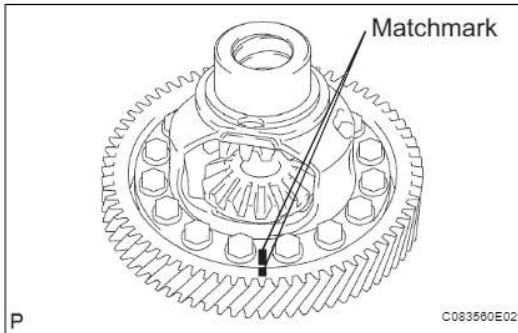
MX

MX-100**E350 MANUAL TRANSAXLE – DIFFERENTIAL CASE****REMOVAL****1. REMOVE SPEEDOMETER DRIVE GEAR**

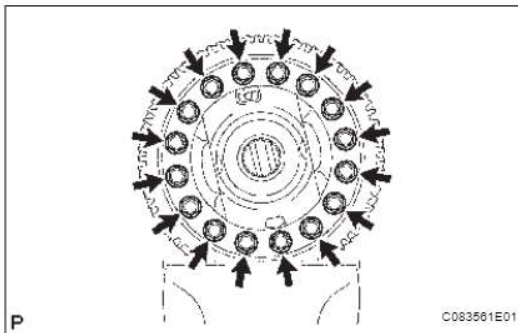
- (a) Remove the drive gear from the front differential case.

**2. REMOVE FRONT DIFFERENTIAL RING GEAR**

- (a) Put matchmarks on the ring gear and the differential case.



- (b) Remove the 16 bolts.
(c) Using a plastic-faced hammer, tap out the differential case.

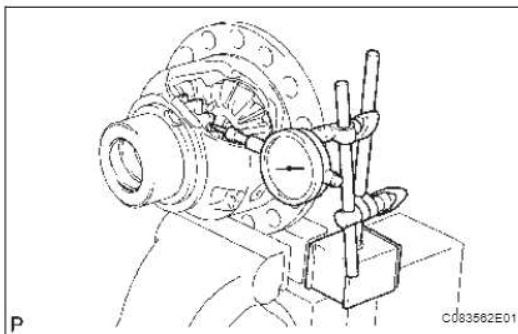
**3. INSPECT FRONT DIFFERENTIAL SIDE GEAR BACKLASH**

- (a) Hold the differential pinion to the front differential case side. Using a dial indicator, measure the differential side gear backlash.

Standard backlash:

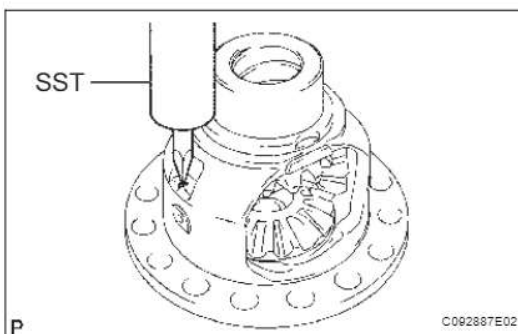
0.10 to 0.20 mm (0.0039 to 0.0079 in.)

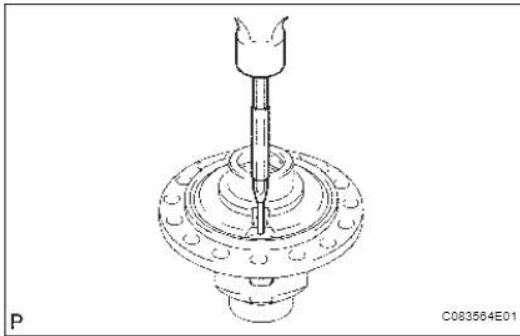
If the backlash is out of specification, install proper side gear thrust washers.

**4. REMOVE FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN**

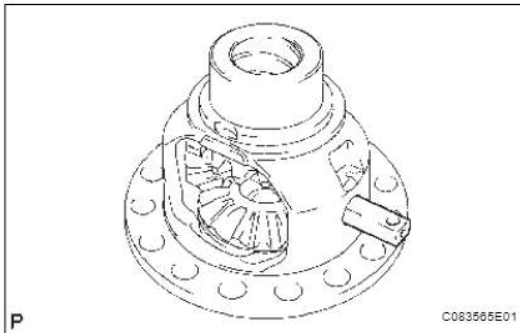
- (a) Using SST and a hammer, unstake the staked part of the differential case.

SST 09930-00010

**MX**

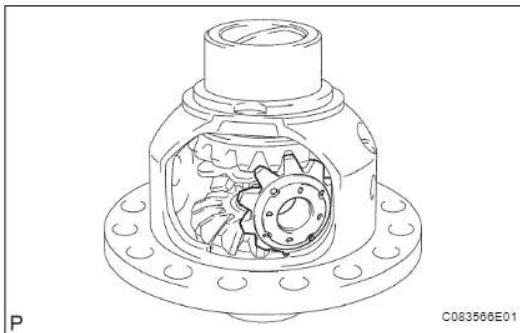
E350 MANUAL TRANSAXLE – DIFFERENTIAL CASE**MX-101**

- (b) Using a pin punch and a hammer, tap out the straight pin from the differential case.



5. REMOVE FRONT NO. 1 DIFFERENTIAL PINION SHAFT

- (a) Remove the No. 1 differential pinion shaft from the differential case.

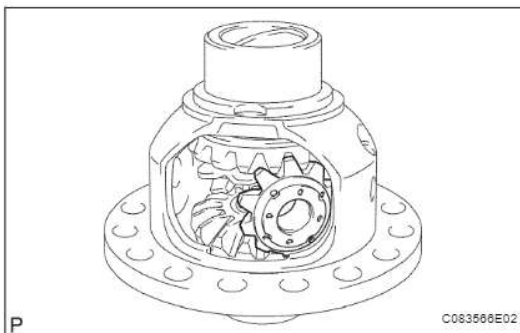


6. REMOVE FRONT DIFFERENTIAL SIDE GEAR

- (a) Remove the 2 differential pinions, 2 differential pinion thrust washers, 2 differential side gears and 2 No. 1 differential side gear thrust washers from the differential case.

HINT:

Remove the 2 pinion thrust washers and side gear thrust washers while turning the differential pinion.



INSTALLATION

1. INSTALL FRONT DIFFERENTIAL SIDE GEAR

- (a) Coat the rotating surfaces of the differential side gears with gear oil.
- (b) Install the 2 differential side gear thrust washers to the 2 differential side gears.
- (c) Install the 2 differential side gears, 2 differential pinions and 2 differential side gear thrust washers to the differential case.

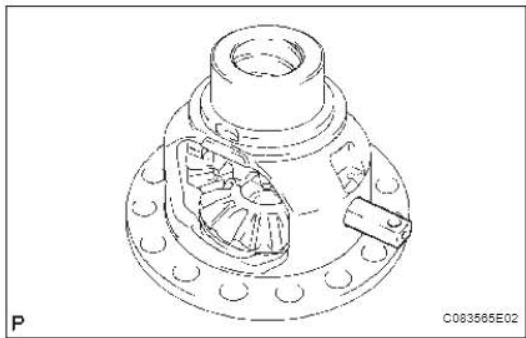
HINT:

Install the 2 differential pinions with the differential pinion thrust washers while turning the differential pinion.

MX

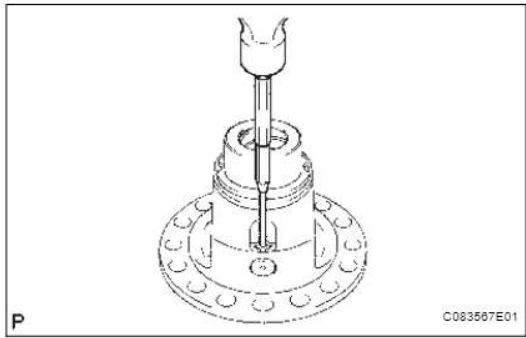
MX-102

E350 MANUAL TRANSAXLE – DIFFERENTIAL CASE



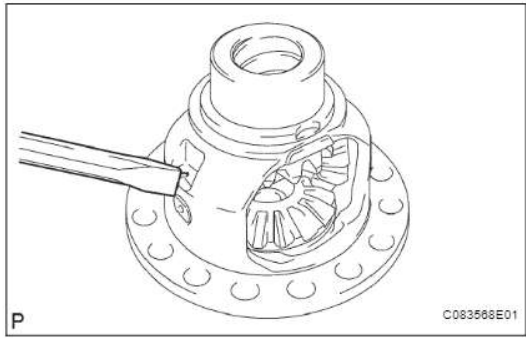
2. INSTALL FRONT NO. 1 DIFFERENTIAL PINION SHAFT

- (a) Coat the rotating surface of the No. 1 differential pinion shaft with gear oil.
- (b) Install the No. 1 differential pinion shaft to the differential case so that the hole for the differential pinion shaft straight pin is aligned with the hole in the differential case.

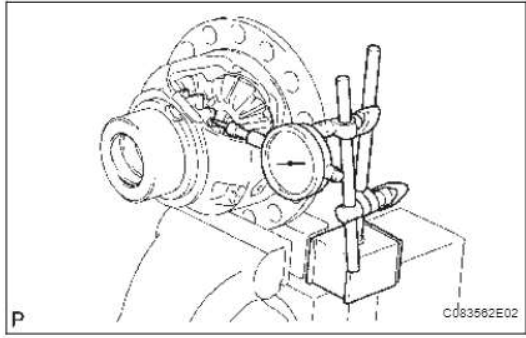


3. INSTALL FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN

- (a) Using a pin punch and a hammer, tap in the differential pinion shaft straight pin to the differential case.



- (b) Using a chisel and hammer, stake the differential case hole.



4. ADJUST FRONT DIFFERENTIAL SIDE GEAR BACKLASH

- (a) Hold the differential pinion to the differential case side. Using a dial indicator, measure the differential side gear backlash.

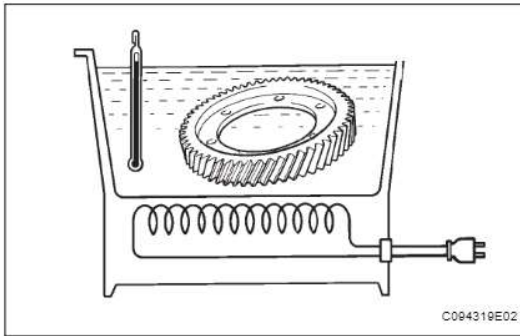
Standard backlash:

0.10 to 0.20 mm (0.0039 to 0.0079 in.)

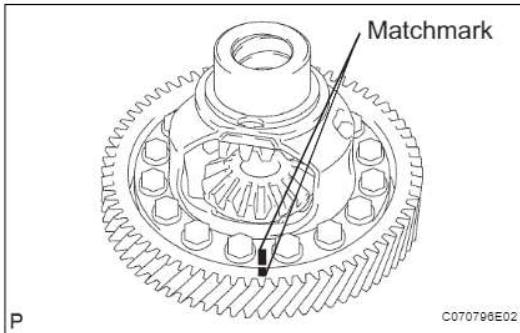
If the backlash is out of specification, select another differential side gear thrust washer and adjust it.

Standard thrust washer thickness

Part No.	Mark	Thickness
41361-28230	1	1.00 mm (0.0394 in.)
41361-28240	2	1.10 mm (0.0433 in.)
41361-28250	3	1.20 mm (0.0472 in.)
41361-28260	4	1.30 mm (0.0512 in.)

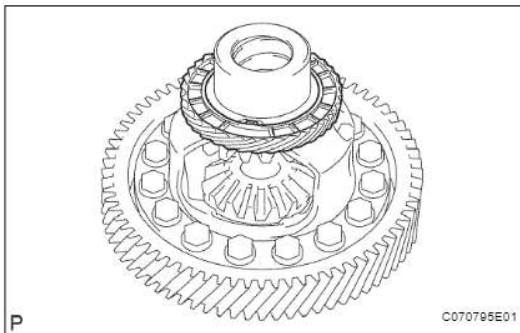
E350 MANUAL TRANSAXLE – DIFFERENTIAL CASE**MX-103****5. INSTALL FRONT DIFFERENTIAL RING GEAR**

- (a) Clean the contact surface of the differential case and differential ring gear.
- (b) Using a heater, heat the differential ring gear to 90 to 110°C (194 to 230°F).
- (c) After the moisture on the ring gear has completely evaporated, quickly install the differential ring gear to the differential case.

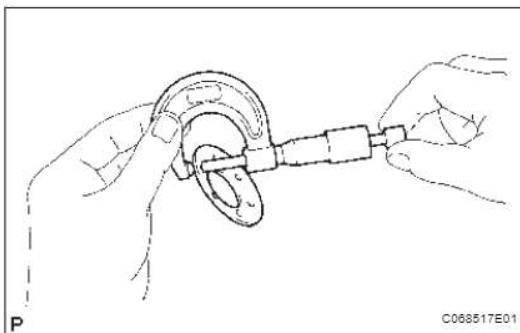


- (d) Aligning the matchmarks, quickly install the front differential ring gear to the differential case with the 16 bolts.

Torque: 106 N*m (1,080 kgf*cm, 78 ft.*lbf)

**6. INSTALL SPEEDOMETER DRIVE GEAR**

- (a) Install the drive gear to the differential case.

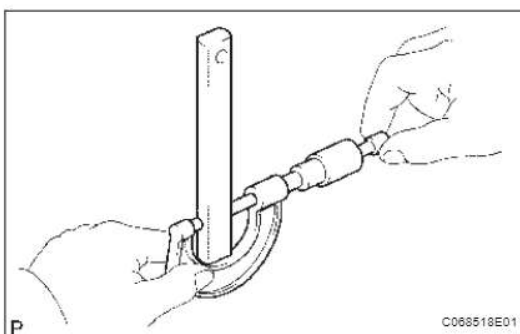
**INSPECTION****1. INSPECT FRONT DIFFERENTIAL PINION THRUST WASHER**

- (a) Using a micrometer, measure the thickness of the thrust washer.

Minimum thickness:

0.9 mm (0.035 in.)

If the thickness is less than the minimum, replace the thrust washer.

**2. INSPECT FRONT NO. 1 DIFFERENTIAL PINION SHAFT**

- (a) Using a micrometer, measure the outside diameter.

Minimum diameter:

17.975 mm (0.70768 in.)

If the outside diameter is less than the minimum, replace the No. 1 differential pinion shaft.

MX

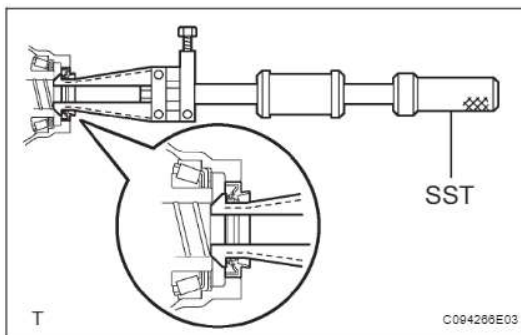
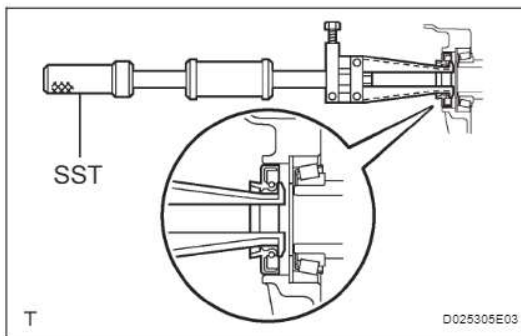
MX-104

E350 MANUAL TRANSAXLE – FRONT DIFFERENTIAL OIL SEAL

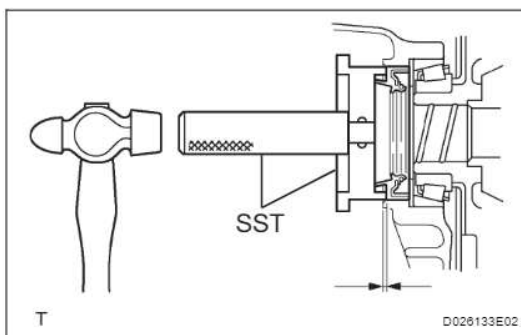
FRONT DIFFERENTIAL OIL SEAL

REMOVAL

1. **DRAIN MANUAL TRANSAXLE OIL**
 - (a) Remove the filler plug and gasket.
 - (b) Remove the drain plug and gasket, and drain the oil.
 - (c) Install the drain plug.
2. **REMOVE FRONT WHEEL**
3. **REMOVE ENGINE UNDER COVER LH**
4. **REMOVE ENGINE UNDER COVER RH**
5. **REMOVE FRONT DRIVE SHAFT ASSEMBLY LH**
 - (a) Remove the drive shaft (see page [DS-5](#)).
6. **REMOVE FRONT DRIVE SHAFT ASSEMBLY RH**
 - (a) Remove the drive shaft (see page [DS-5](#)).
7. **REMOVE TRANSMISSION CASE OIL SEAL**
 - (a) Using SST, tap out the oil seal.
SST 09308-00010

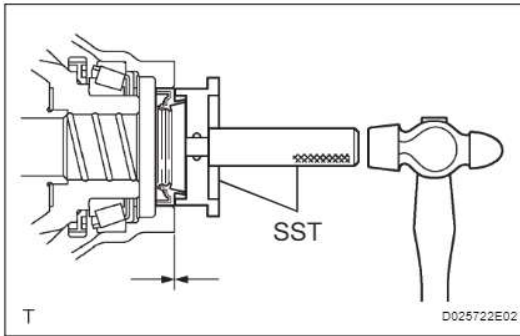


8. **REMOVE FRONT TRANSAXLE CASE COVER OIL SEAL**
 - (a) Using SST, tap out the oil seal.
SST 09308-00010



INSTALLATION

1. **INSTALL TRANSMISSION CASE OIL SEAL**
 - (a) Coat the lip of a new oil seal with MP grease.
 - (b) Using SST and a hammer, tap in the oil seal.
SST 09608-32010, 09950-70010 (09951-07200)
Standard depth:
3.0 to 4.0 mm (0.118 to 0.158 in.)
NOTICE:
Be careful not to damage the lip of the oil seal.

E350 MANUAL TRANSAXLE – FRONT DIFFERENTIAL OIL SEAL**MX-105****2. INSTALL FRONT TRANSAXLE CASE COVER OIL SEAL**

- (a) Coat the lip of a new oil seal with MP grease.
- (b) Using SST and a hammer, tap in the oil seal.

SST 09608-10010, 09950-70010 (09951-07200)**Standard depth:****-0.5 to 0.5 mm (-0.020 to 0.020 in.)****NOTICE:****Be careful not to damage the lip of the oil seal.****3. INSTALL FRONT DRIVE SHAFT ASSEMBLY LH**

- (a) Install drive shaft (see page [DS-16](#)).

4. INSTALL FRONT DRIVE SHAFT ASSEMBLY RH

- (a) Install drive shaft (see page [DS-16](#)).

5. INSTALL FRONT WHEEL**Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)****6. ADD MANUAL TRANSAXLE OIL****Oil grade:****API GL-4 or GL-5****Viscosity:****SAE 75W-90****Standard capacity:****2.5 liters (2.6 US qts, 2.2 Imp. qts)****7. INSPECT MANUAL TRANSAXLE OIL**

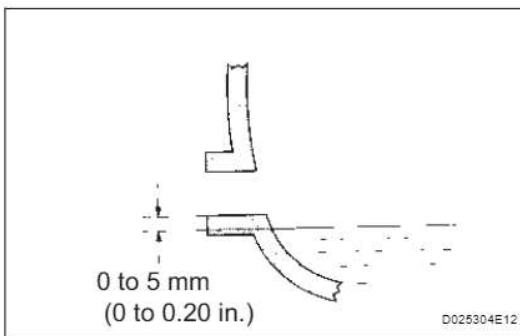
- (a) Inspect transaxle oil (see page [MX-2](#)).

8. INSPECT FRONT WHEEL ALIGNMENT

- (a) Inspect wheel alignment (see page [SP-2](#)).

9. INSTALL ENGINE UNDER COVER LH**10. INSTALL ENGINE UNDER COVER RH****11. CHECK ABS SPEED SENSOR SIGNAL**

- (a) Check the speed sensor signal (see page [BC-24](#)).

**MX**