

2005 Toyota RAV4

2005 TRANSMISSION Clutch - RAV4

2005 TRANSMISSION

Clutch - RAV4

TROUBLESHOOTING

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

Symptom	Suspected Area
Clutch grabs/chatters	1. Engine mounting (Loosen) 2. Clutch disc (Runout is excessive) 3. Clutch disc (Oily) 4. Clutch disc (Worn out) 5. Clutch disc torsion rubber (Damaged) 6. Clutch disc (Glazed) 7. Diaphragm spring (Out of tip alignment)
Clutch pedal spongy	1. Clutch line (Air in line) 2. Master cylinder cup (Damaged) 3. Release cylinder cup (Damaged)
Clutch noisy	1. Release bearing (Worn, dirty, or damaged) 2. Clutch disc torsion rubber (Damaged)
Clutch slips	1. Clutch pedal (Free play out of adjustment) 2. Clutch disc (Oily) 3. Clutch disc (Worn out) 4. Diaphragm spring (Damaged) 5. Pressure plate (Distortion) 6. Flywheel (Distortion)
Clutch does not disengage	1. Clutch pedal (Free play out of adjustment) 2. Clutch line (Air in line) 3. Master cylinder cup (Damaged) 4. Release cylinder cup (Damaged) 5. Clutch disc (out of true) 6. Clutch disc (Runout is excessive) 7. Clutch disc (Lining broken) 8. Clutch disc (Dirty or burned) 9. Clutch disc (Oily) 10. Clutch disc (Lack of spline grease) 11. Diaphragm spring (Damaged) 12. Diaphragm spring (Out of tip alignment) 13. Pressure plate (Distortion)

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Fig. 1: Problem Symptoms Chart

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CLUTCH PEDAL

INSPECTION

1. CHECK PEDAL HEIGHT

Pedal height from dash panel:

169.0 to 179.0 mm (6.653 to 7.047 in.)

2. IF NECESSARY, ADJUST PEDAL HEIGHT

- a. Loosen the lock nut and turn the stopper bolt until the height becomes correct.
- b. Tighten the lock nut.

3. CHECK PEDAL FREE PLAY AND PUSH ROD PLAY

- a. Depress the pedal until clutch resistance begins to be felt.

Pedal free play: 5.0 to 15.0 mm (0.197 to 0.591 in.)

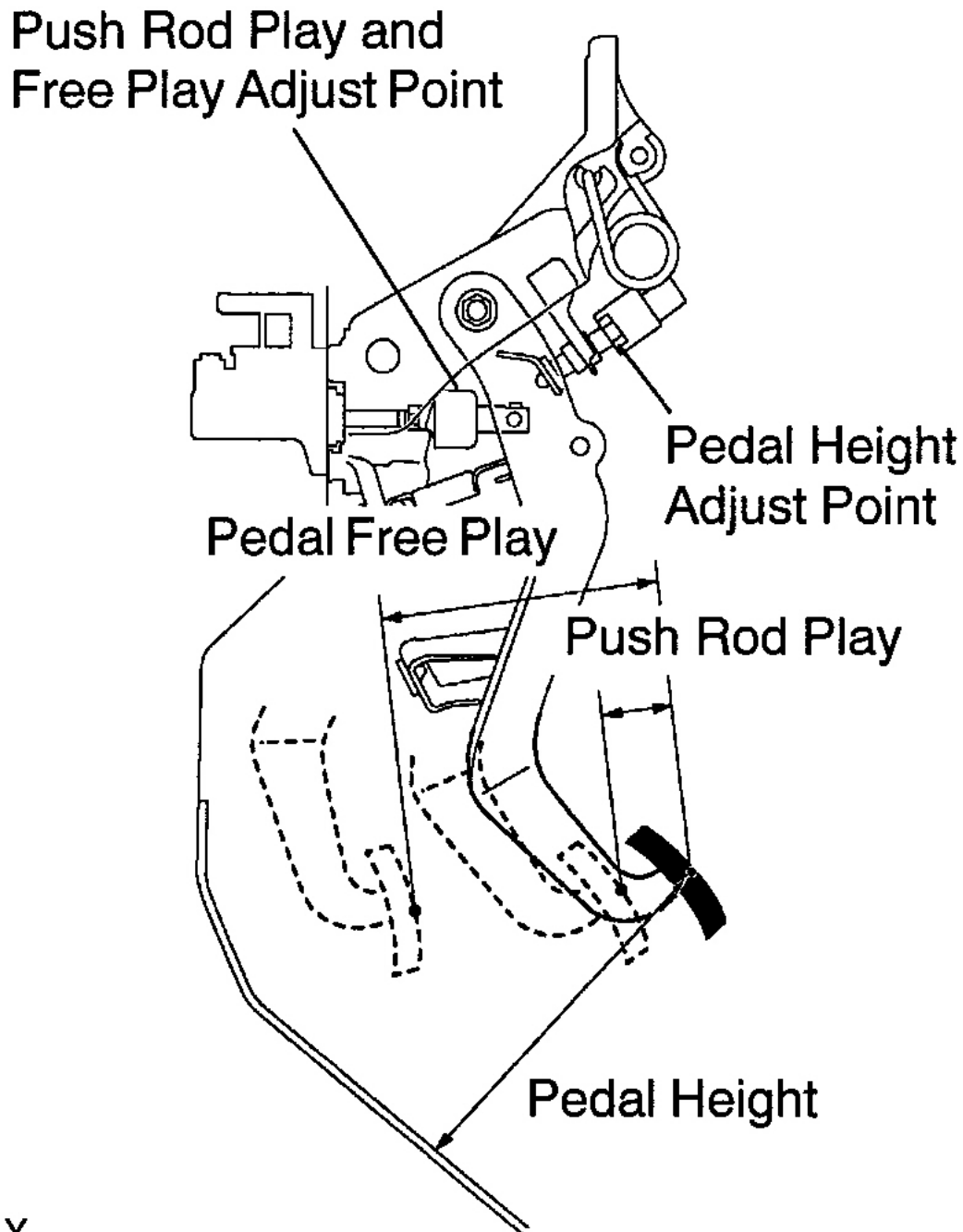
- b. Gently push on the pedal until the resistance begins to increase a little.

Push rod play at pedal top:

1.0 to 5.0 mm (0.039 to 0.197 in.)

4. IF NECESSARY, ADJUST PEDAL FREE PLAY AND PUSH ROD PLAY

- a. Loosen the lock nut and turn the push rod until the free play and push rod play becomes correct.
- b. Tighten the lock nut.
- c. After adjusting the pedal free play, check the pedal height.



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Fig. 2: Checking Pedal Free Play And Push Rod Play
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. CHECK CLUTCH RELEASE POINT

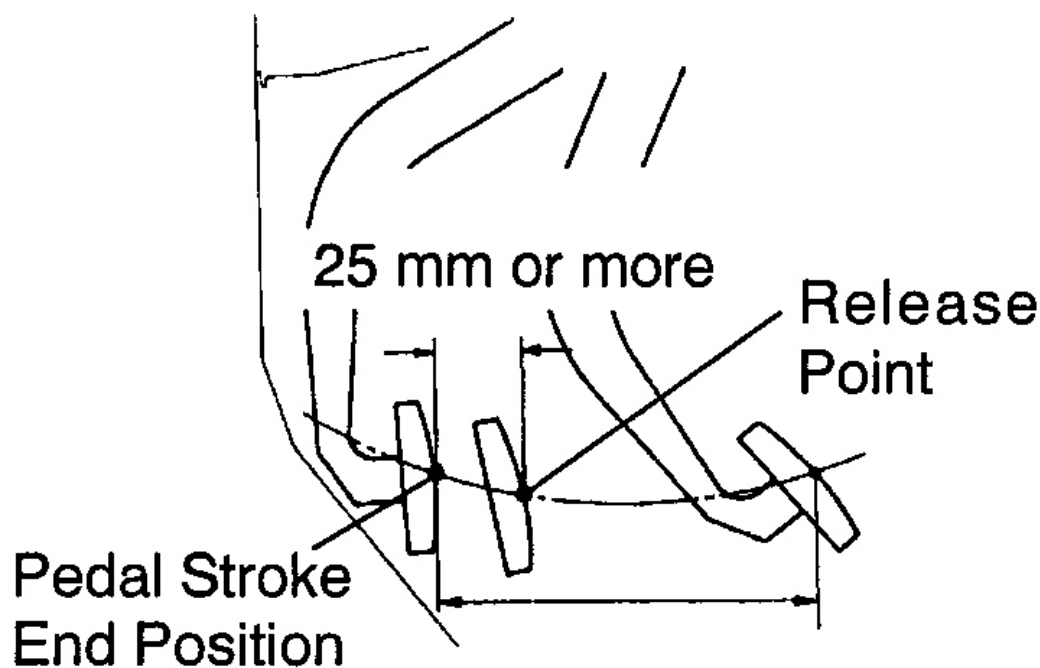
- a. Pull the parking brake lever and install the wheel stopper.
- b. Start and idle the engine.
- c. Without depressing the clutch pedal, slowly shift the shift lever into reverse position until the gears contact.
- d. Gradually depress the clutch pedal and measure the stroke distance from the point the gear noise stops (release point) to the pedal stroke end position.

Standard distance: 25 mm (0.98 in.) or more

(From pedal stroke end position to release point)

If the distance is not as specified, perform the following operations:

- Inspect pedal height.
- Inspect push rod play and pedal free play.
- Bleed the clutch line.
- Inspect the clutch cover and disc.



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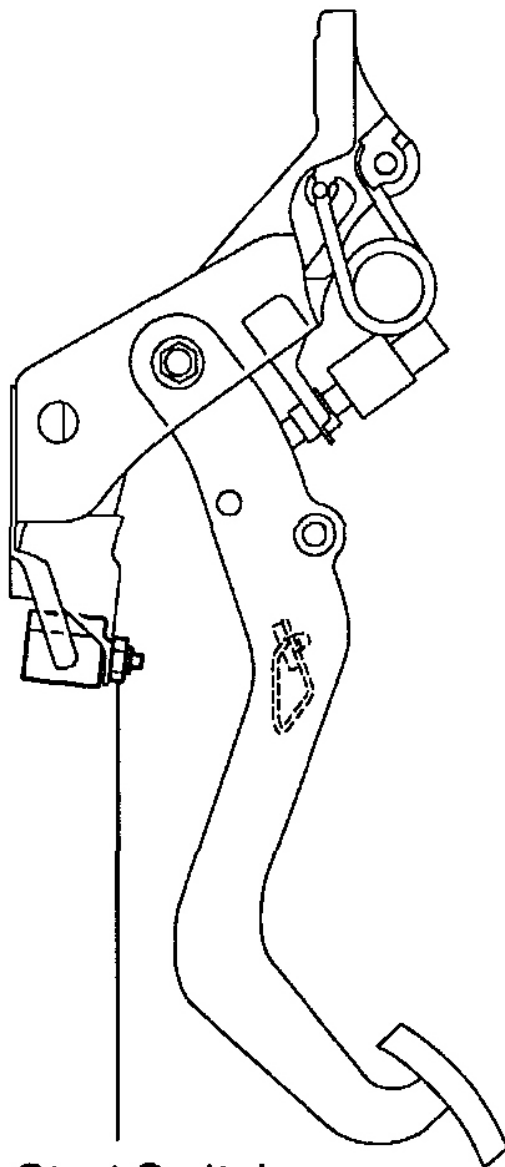
Fig. 3: Identifying Pedal Stroke End Position

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. CHECK CLUTCH START SYSTEM

- a. Check that the engine does not start when the clutch pedal is released.
- b. Check that the engine starts when the clutch pedal is fully depressed.

If necessary, replace the clutch start switch.



Clutch Start Switch

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Fig. 4: Checking Clutch Start Switch

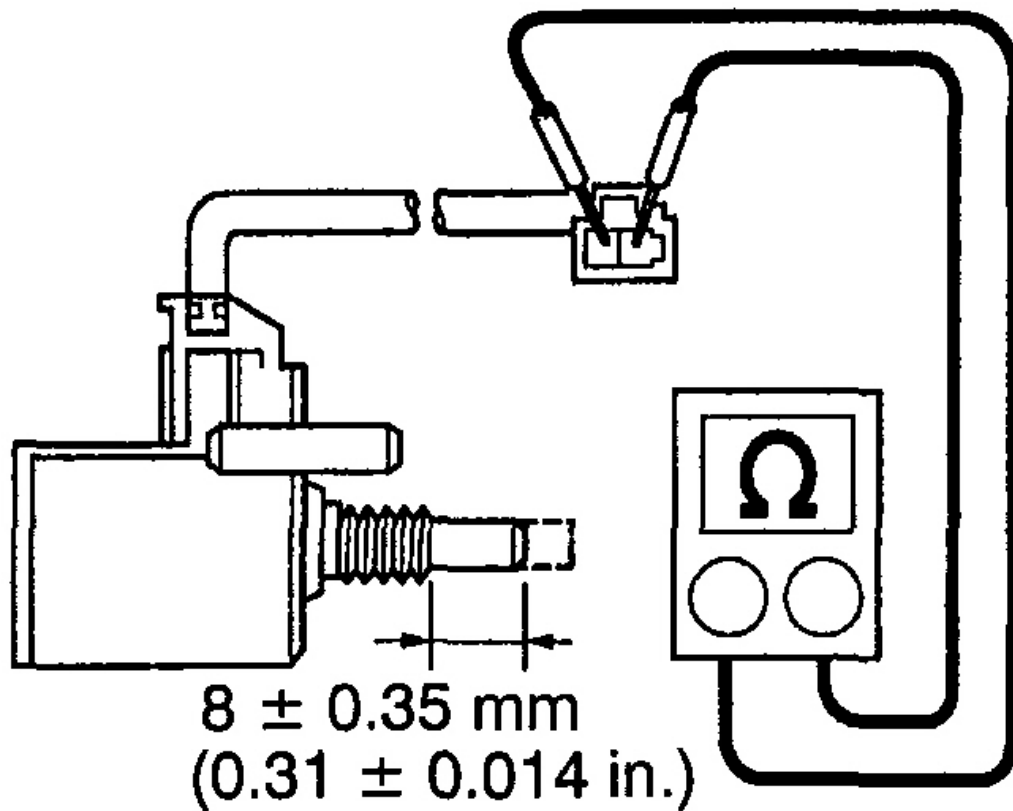
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

7. INSPECT CLUTCH START SWITCH CONTINUITY

Check the resistance between terminals when the switch is ON and OFF.

RESISTANCE SPECIFICATION

Switch position	Condition
ON (pushed)	Below 1 ohm
OFF (free)	10 kohm or higher



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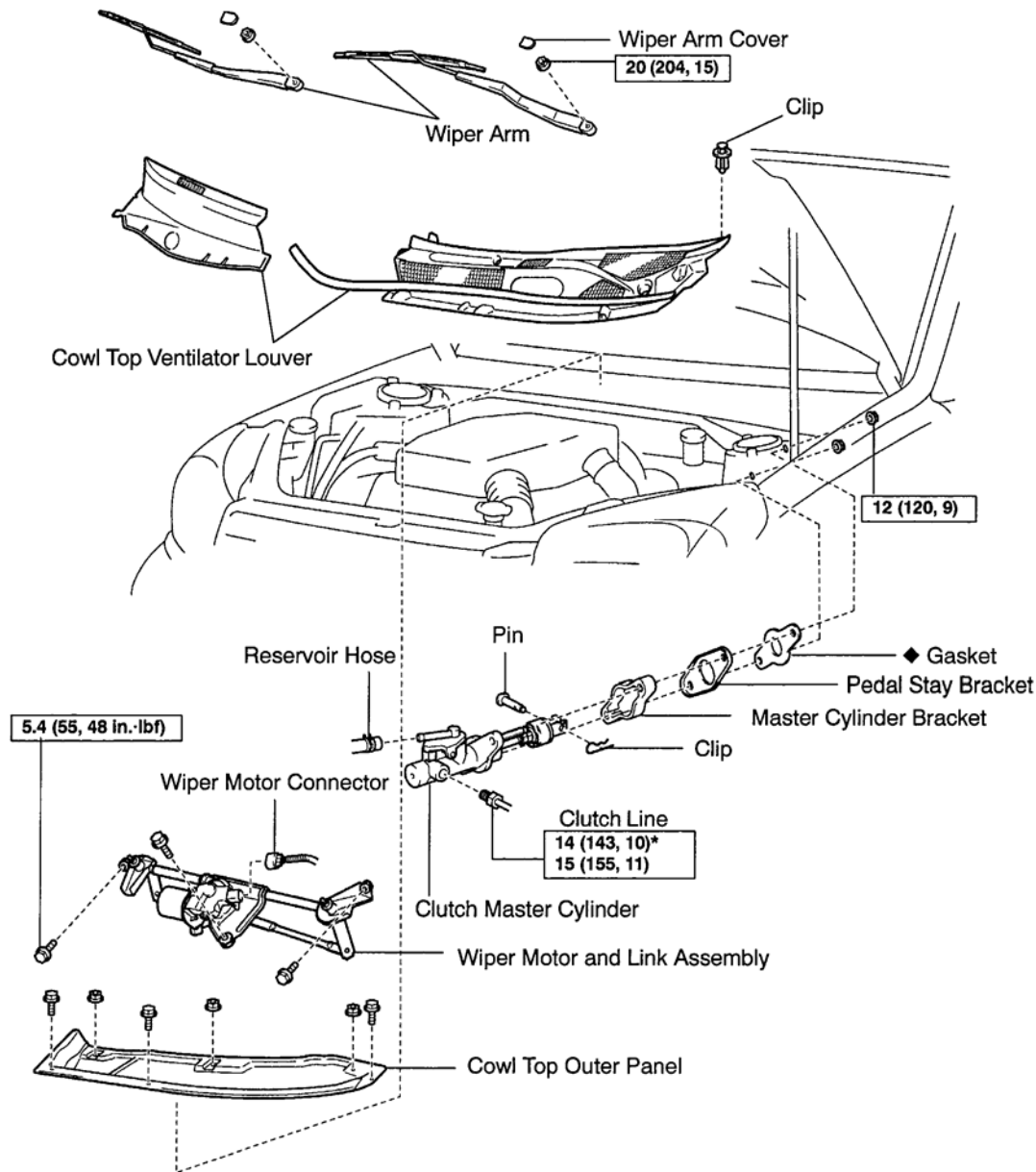
Fig. 5: Checking Resistance Between Terminals (Clutch Start Switch)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CLUTCH MASTER CYLINDER**COMPONENTS**

2005 Toyota RAV4

2005 TRANSMISSION Clutch - RAV4



^P N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

*For use with SST

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Fig. 6: Exploded View Of Clutch Master Cylinder Components & Torque Specifications (1 Of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

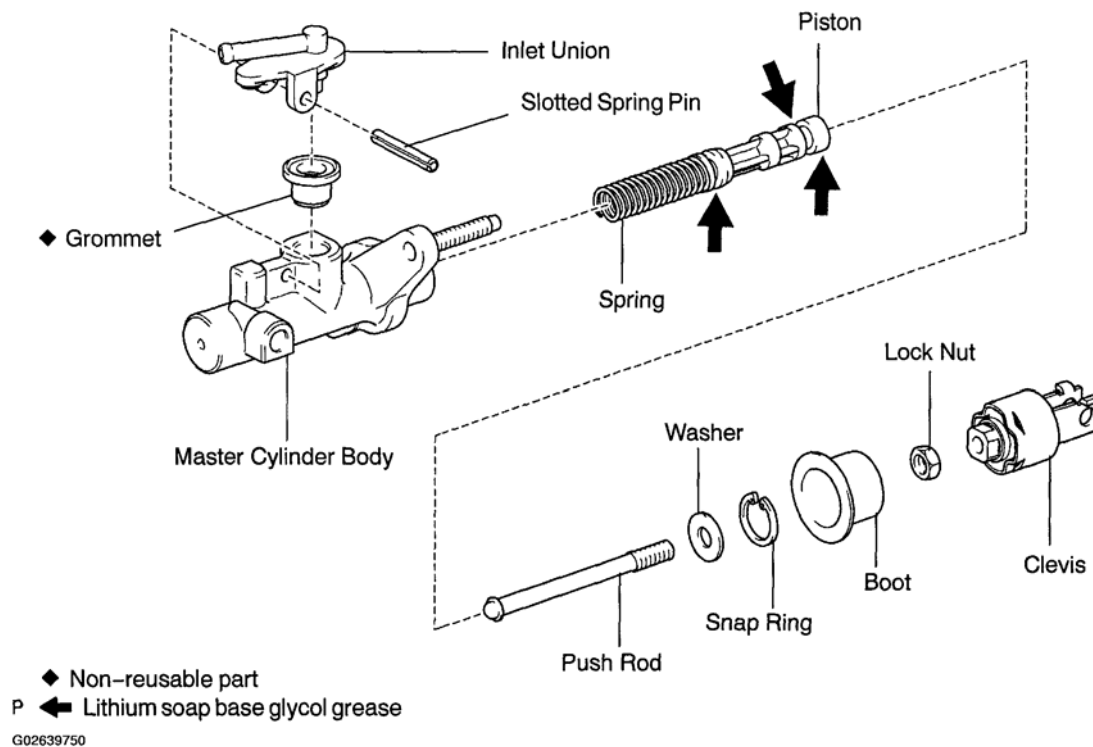
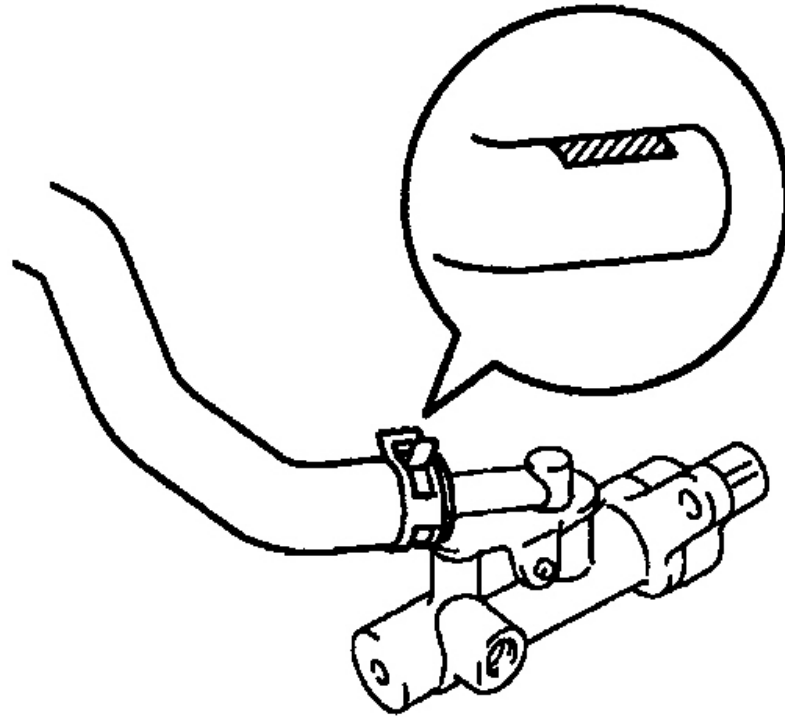


Fig. 7: Exploded View Of Clutch Master Cylinder Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. **REMOVE WIPER ASSEMBLY (See REMOVAL)**
2. **DISCONNECT RESERVOIR HOSE**
 - a. Using pliers, disconnect the clip.
 - b. Disconnect the reservoir hose from the inlet union.
 - c. Use a container to catch the fluid.



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Fig. 8: Disconnecting Reservoir Hose

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. DISCONNECT CLUTCH LINE

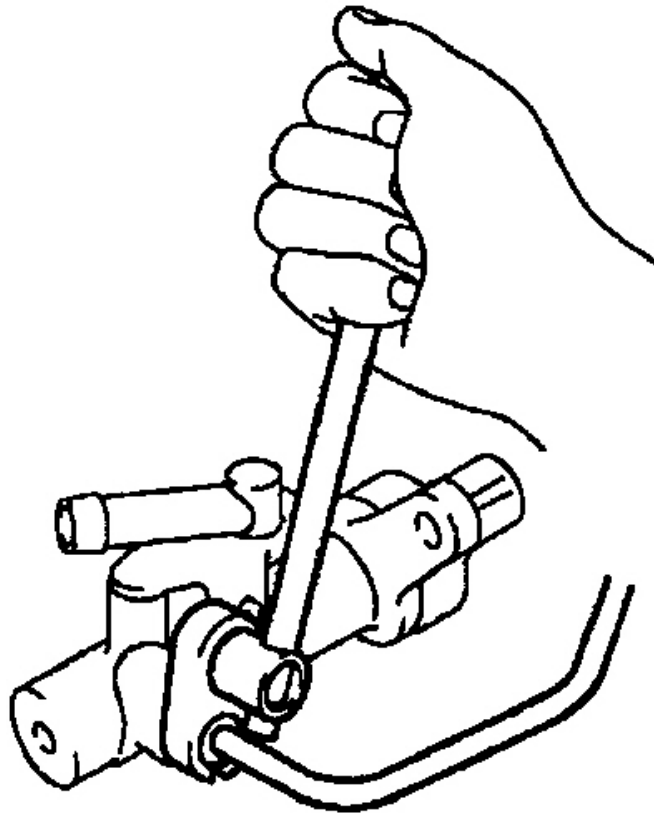
- a. Using SST, disconnect the clutch line.

SST 09023-00101

- b. Use a container to catch the fluid.

4. REMOVE CLIP AND PIN

Using needle-nose pliers, remove the clip and pin.



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Fig. 9: Disconnecting Clutch Fluid Line

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE CLUTCH MASTER CYLINDER

- a. Remove the 2 nuts.
- b. Pull out the master cylinder.
- c. Remove the gasket, pedal stay bracket and master cylinder bracket from the master cylinder.

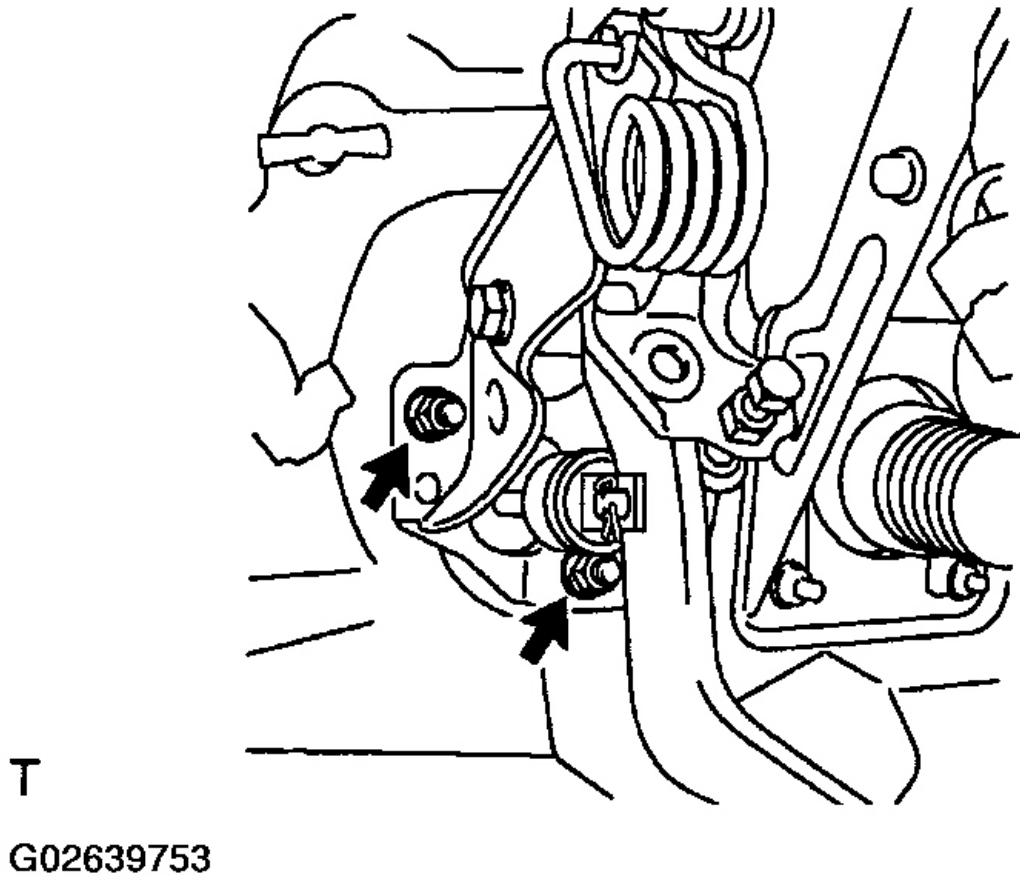
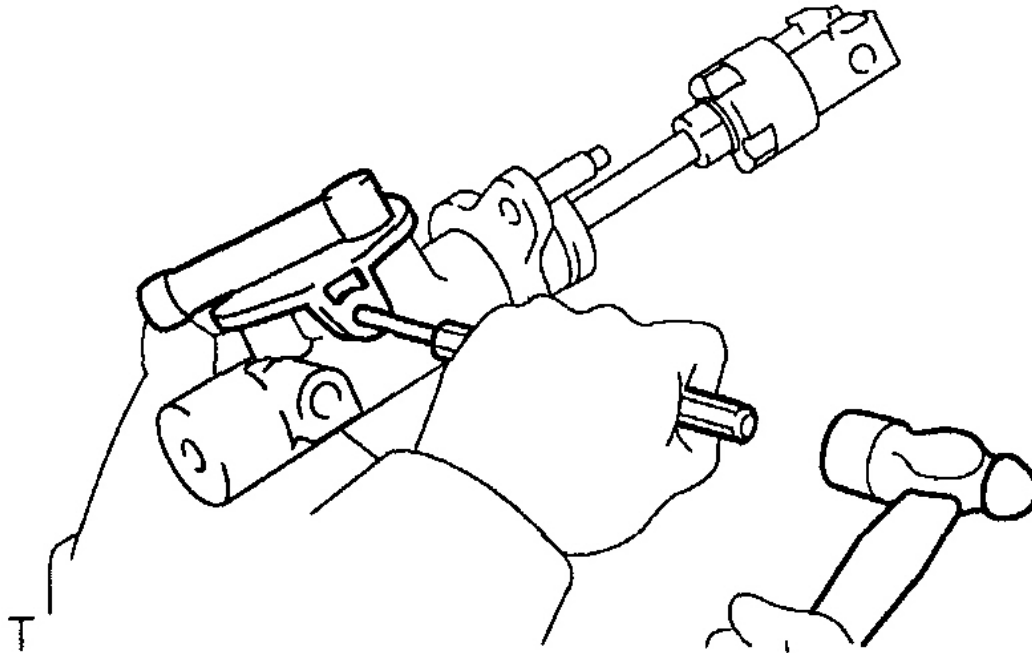


Fig. 10: Removing Clutch Master Cylinder
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE INLET UNION

- a. Using a pin punch and a hammer, tap out the slotted spring pin.
- b. Remove the inlet union.
- c. Remove the grommet from the inlet union.



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Fig. 11: Removing Master Cylinder Inlet Union
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE CLEVIS

Loosen the lock nut, and remove the clevis and lock nut.

3. REMOVE PUSH ROD

- Remove the boot.
- Using snap ring pliers, remove the snap ring while pushing the push rod.
- Pull out the push rod and washer.

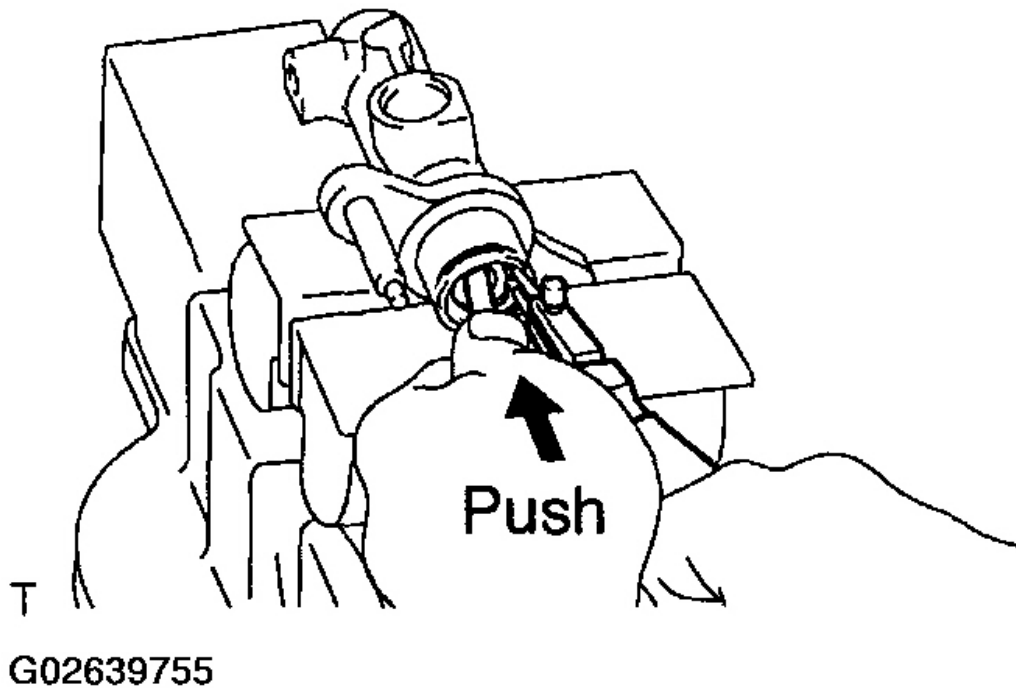
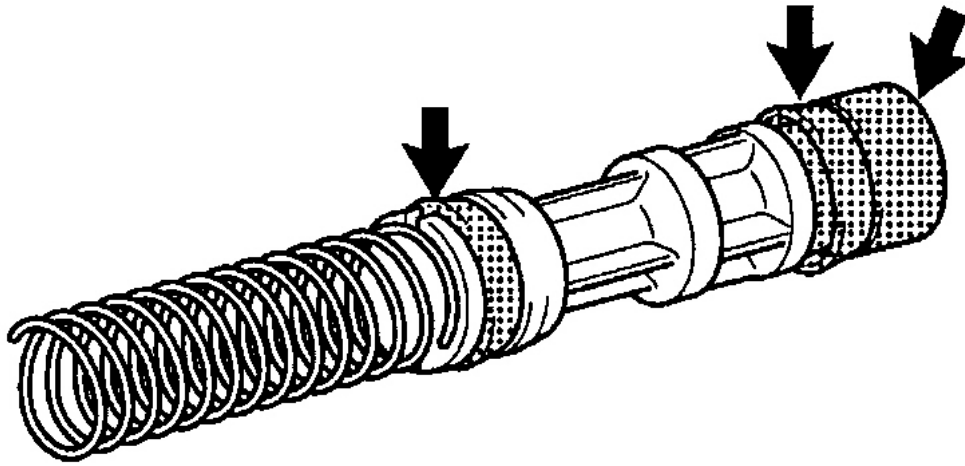


Fig. 12: Removing Snap Ring & Push Rod
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE PISTON WITH SPRING FROM CYLINDER

REASSEMBLY

1. COAT PARTS WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN



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Fig. 13: Applying Lithium Soap Base Glycol Grease To Piston Seals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSERT PISTON WITH SPRING INTO CYLINDER
3. INSTALL PUSH ROD
 - a. Install the washer to the push rod.
 - b. Push the push rod into the piston.
 - c. Using snap ring pliers, install the snap ring.

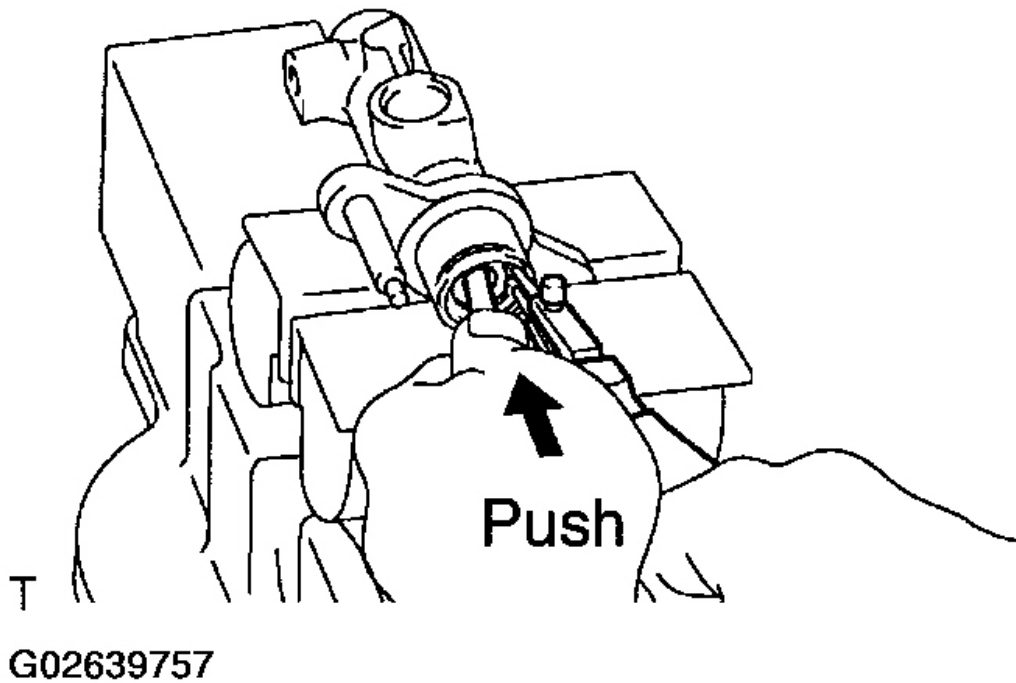


Fig. 14: Installing Push Rod & Snap Ring

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSTALL BOOT TO CYLINDER
5. TEMPORARILY INSTALL LOCK NUT AND CLEVIS
6. INSTALL INLET UNION
 - a. Install a new grommet and inlet union to the cylinder body.
 - b. Using a pin punch and a hammer, tap in the slotted spring pin.

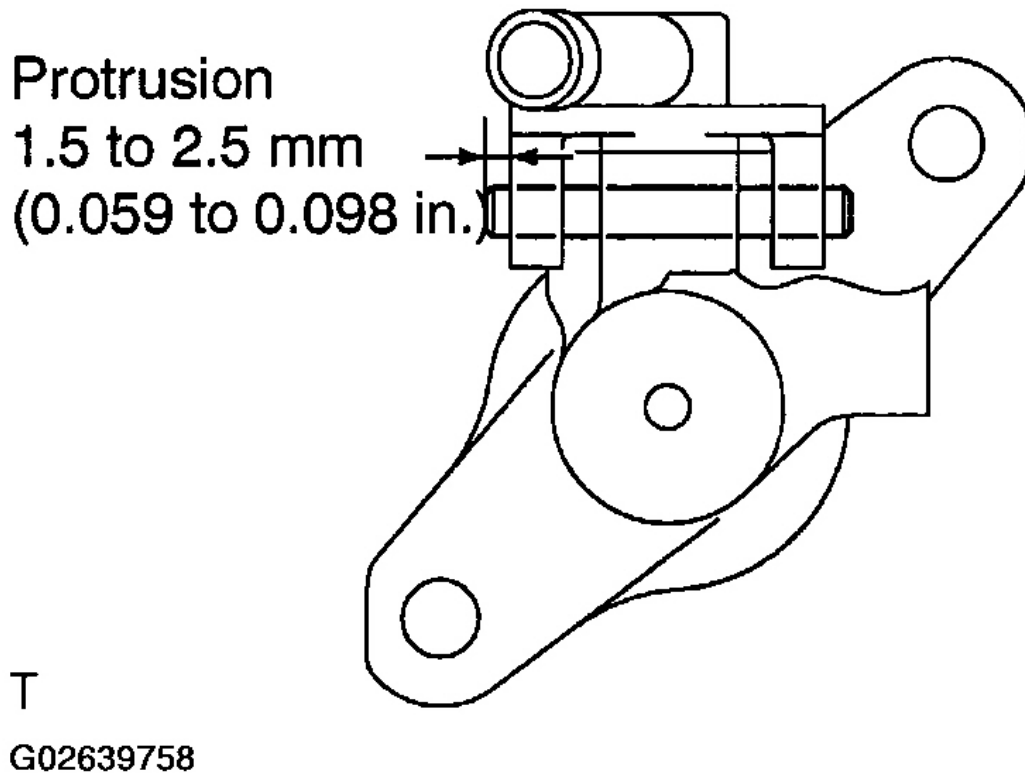


Fig. 15: Tapping In Slotted Spring Pin
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL CLUTCH MASTER CYLINDER

- Install the gasket, pedal stay bracket and master cylinder bracket to the master cylinder.
- Install the master cylinder with the 2 nuts.

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

- Connect the push rod to the clutch pedal with the pin and pin clip.

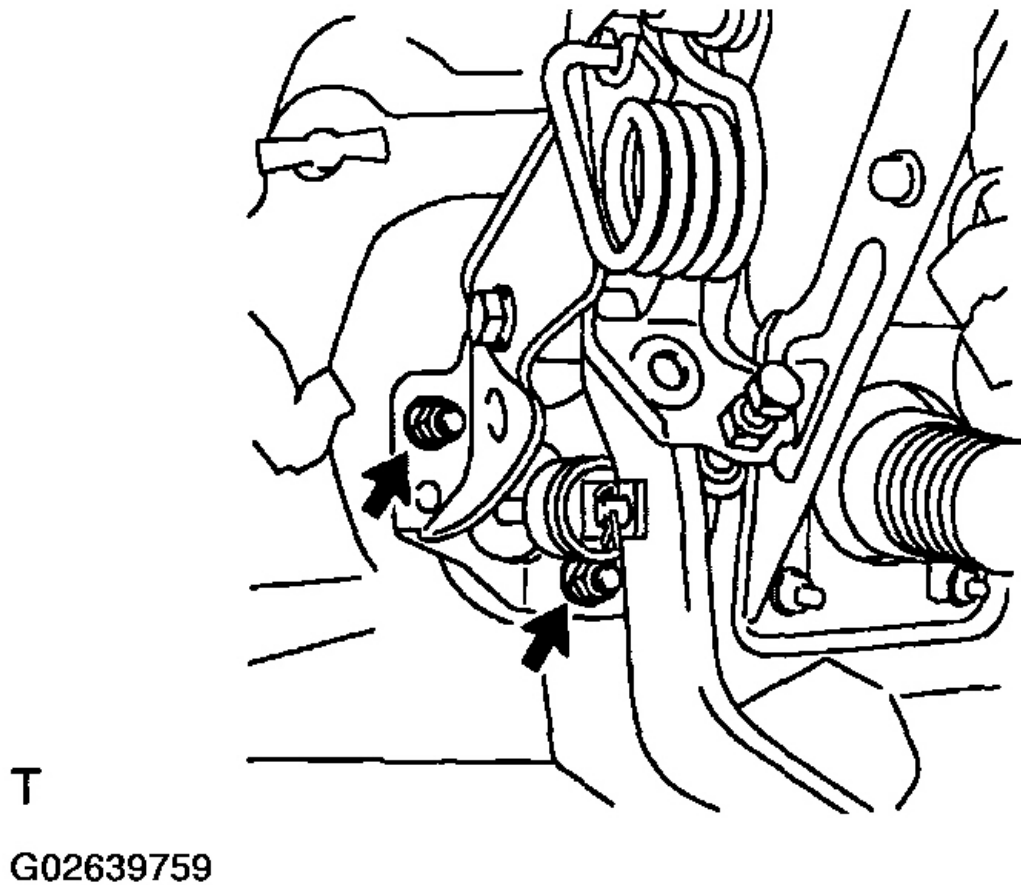


Fig. 16: Installing Master Cylinder

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CONNECT CLUTCH LINE

Using SST, connect the clutch line.

SST 09023-00101

Torque:

15 N.m (155 kgf.cm, 11 ft.lbf)

14 N.m (143 kgf.cm, 10 ft.lbf) for use with SST

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

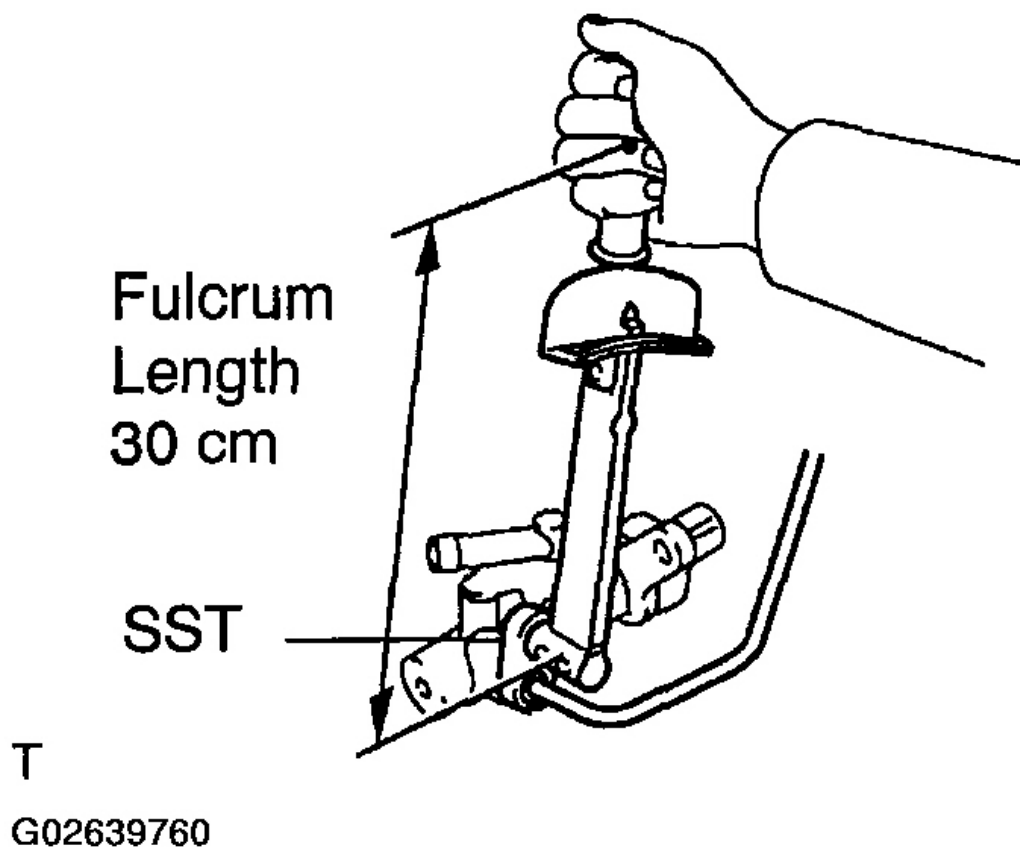


Fig. 17: Connecting Clutch Fluid Line

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. CONNECT RESERVOIR HOSE

- a. Connect the reservoir hose to the inlet union.

NOTE: Facing the mark upwards.

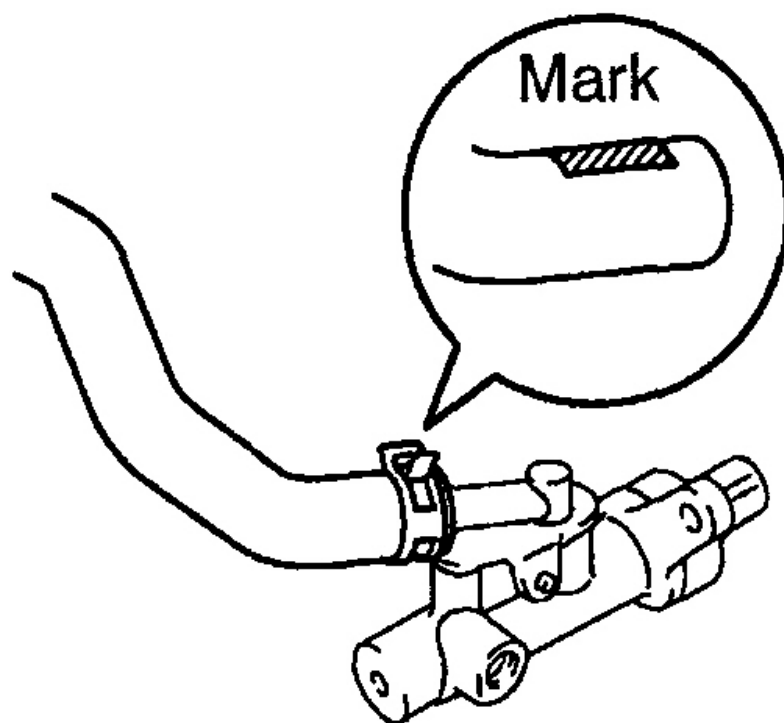
- b. Using pliers, connect the clip.

4. INSTALL WIPER ASSEMBLY (See INSTALLATION)

5. FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM (See BRAKE FLUID)

6. ADJUST CLUTCH PEDAL (See CLUTCH PEDAL)

7. CHECK FOR LEAKS



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Fig. 18: Connecting Reservoir Hose

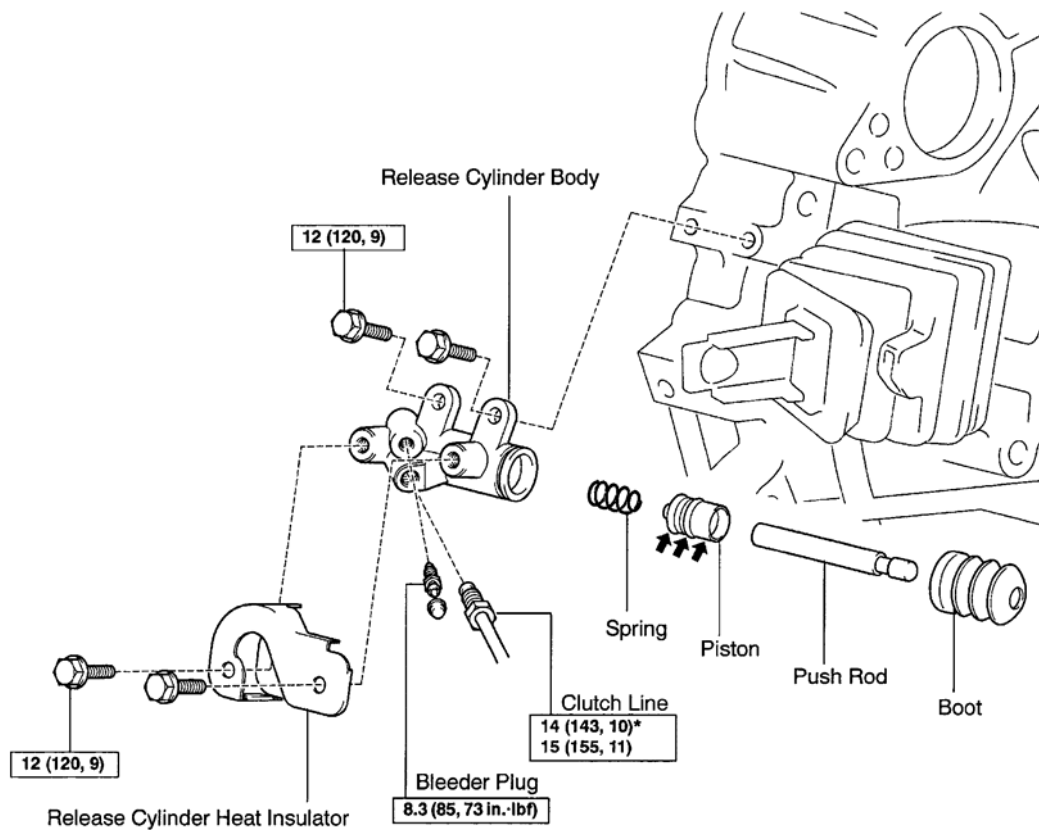
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CLUTCH RELEASE CYLINDER

COMPONENTS

2005 Toyota RAV4

2005 TRANSMISSION Clutch - RAV4



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

*For use with SST

p ← Lithium soap base glycol grease

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Fig. 19: Exploded View Of Clutch Release Cylinder Components & Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. DISCONNECT CLUTCH LINE FROM RELEASE CYLINDER

- Remove the 2 bolts and release cylinder heat insulator.
- Using SST, disconnect the clutch line from the release cylinder.

SST 09023-00101

- Use a container to catch the fluid.

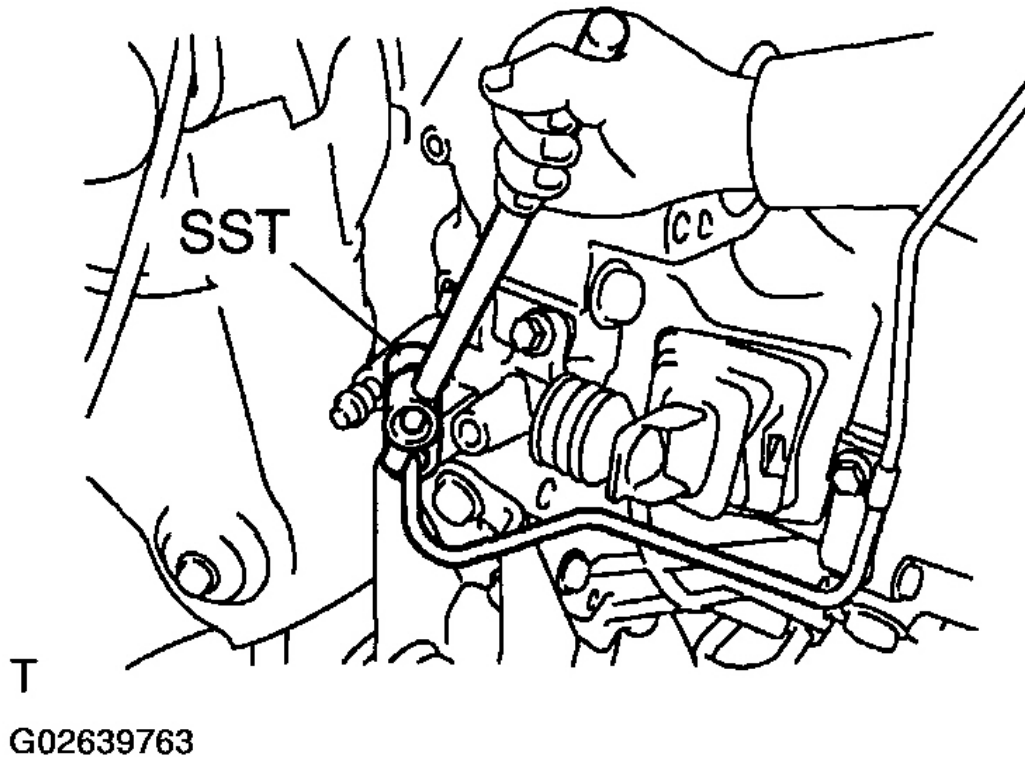
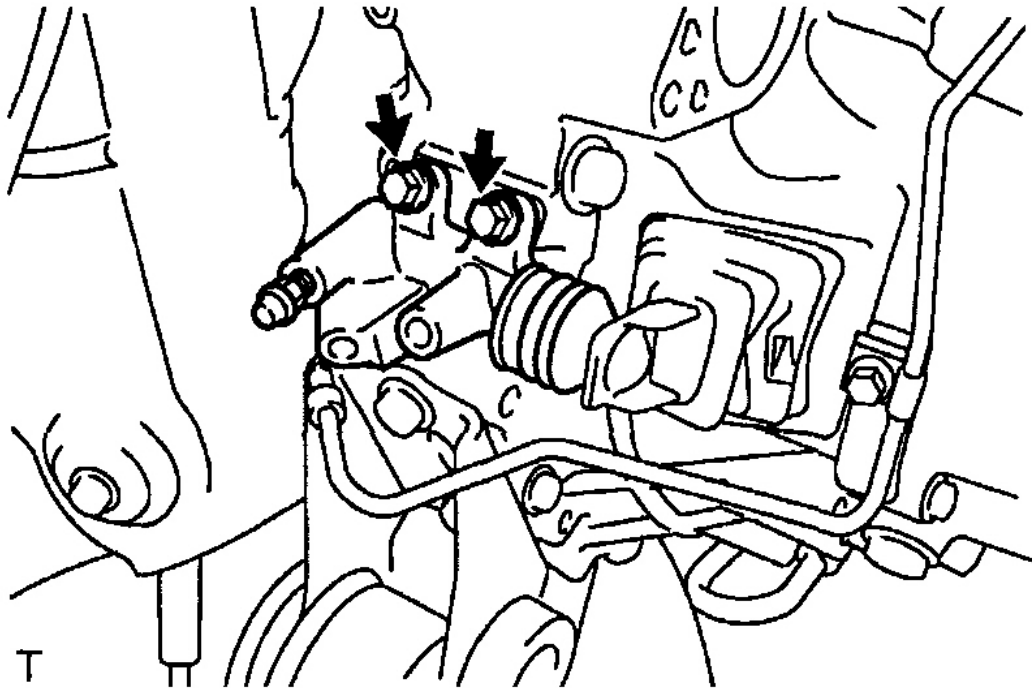


Fig. 20: Disconnecting Clutch Fluid Line From Release Cylinder
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE RELEASE CYLINDER

Remove the 2 bolts and release cylinder.



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Fig. 21: Removing Clutch Release Cylinder

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DISASSEMBLY

1. REMOVE BOOT AND PUSH ROD

- Pull out the boot with the push rod.
- Remove the boot from the push rod.

2. REMOVE PISTON AND SPRING

Using compressed air, remove the piston with the spring from the cylinder.

NOTE:

- Blowing off the air may cause the piston's jump-out. When removing the piston, hold it with your hand using a waste cloth.
- Take care not to splash brake fluid when air-blowing.

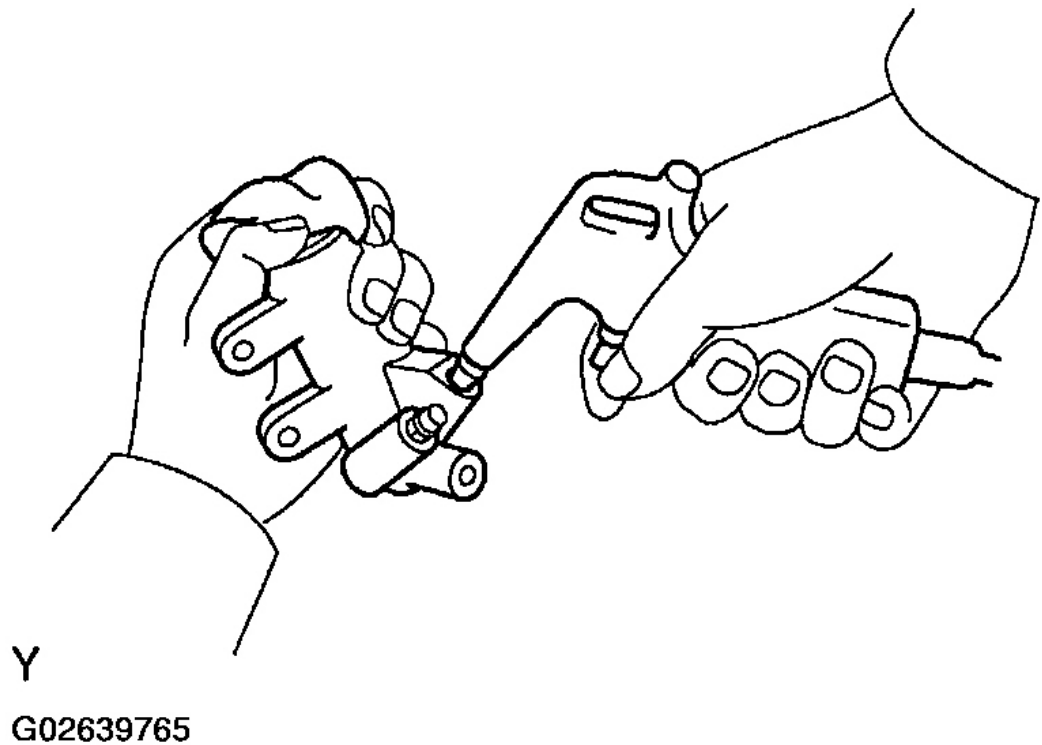
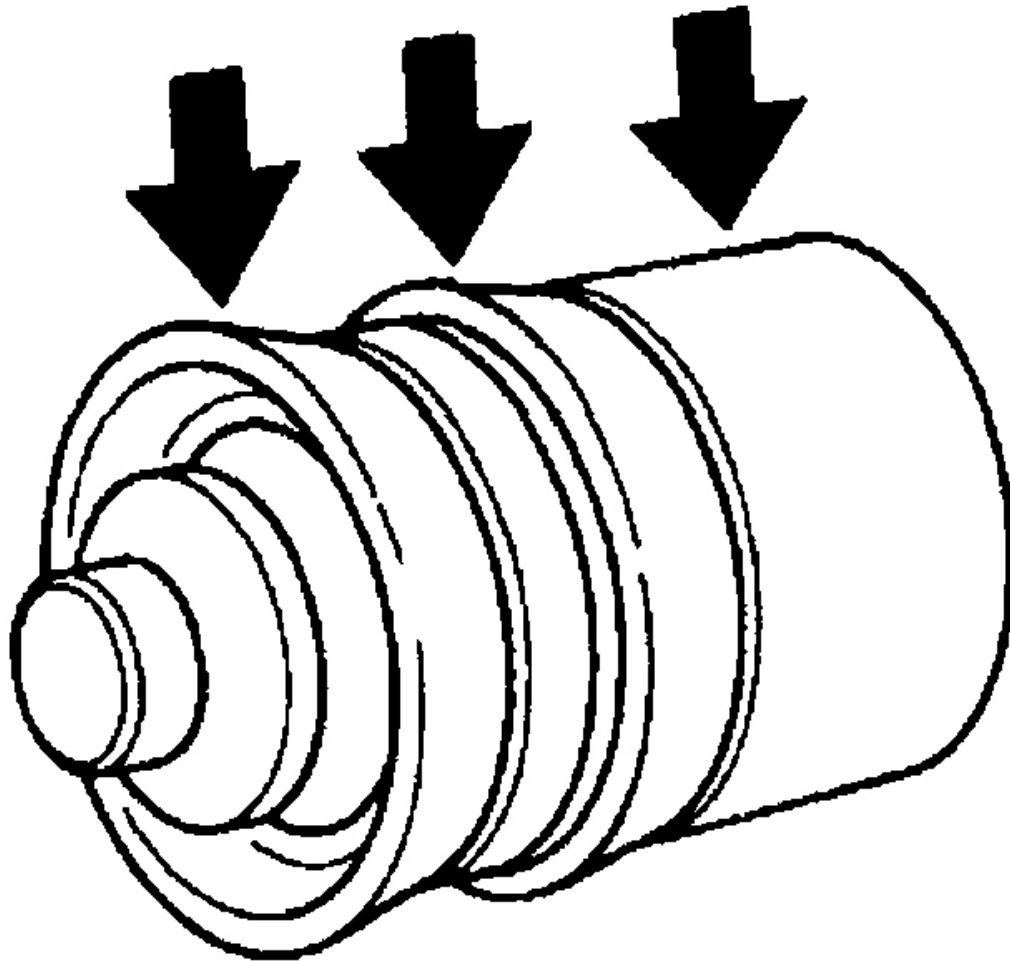


Fig. 22: Removing Piston With Spring From Cylinder
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REASSEMBLY

1. **COAT PISTON WITH LITHIUM SOAP BASE GLYCOL GREASE, AS SHOWN**
2. **INSTALL PISTON AND SPRING INTO CYLINDER**
3. **INSTALL BOOT AND PUSH ROD**
 - a. Install the push rod to the boot.
 - b. Install the boot with the push rod to the cylinder.



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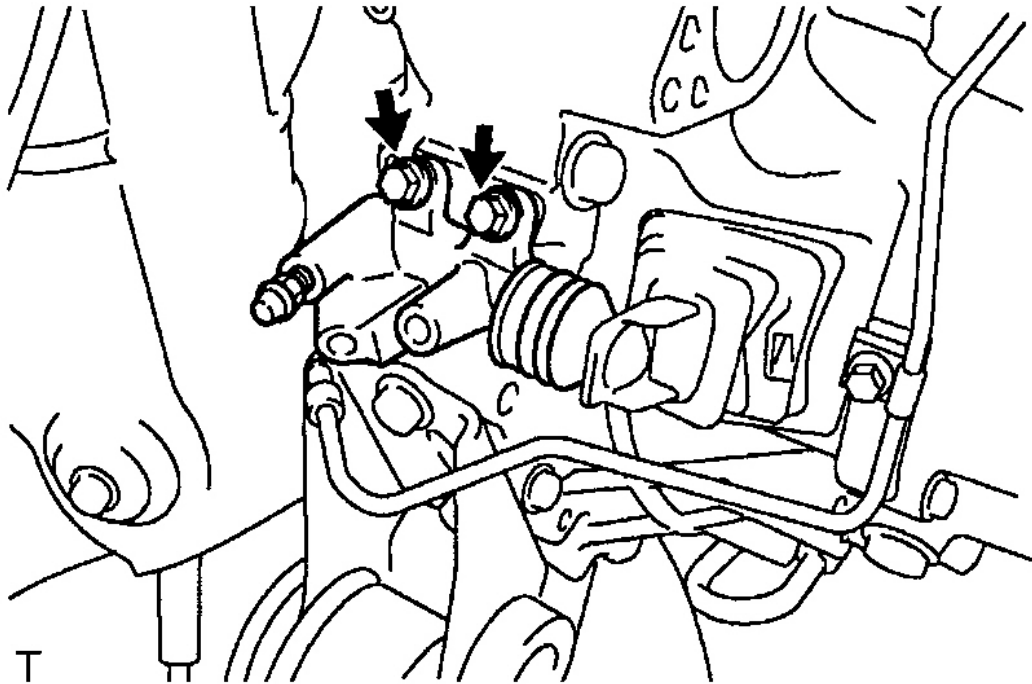
Fig. 23: Installing Push Rod To Boot
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. INSTALL RELEASE CYLINDER

Install the release cylinder with the 2 bolts.

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



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Fig. 24: Installing Release Cylinder With 2 Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CONNECT CLUTCH LINE TO RELEASE CYLINDER

- a. Using SST, connect the clutch line to the release cylinder.

SST 09023-00101

Torque:

14 N.m (143 kgf.cm, 10 ft.lbf) for use with SST

15 N.m (155 kgf.cm, 11 ft.lbf)

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.).

- b. Install the 2 bolts and release cylinder heat insulator.

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

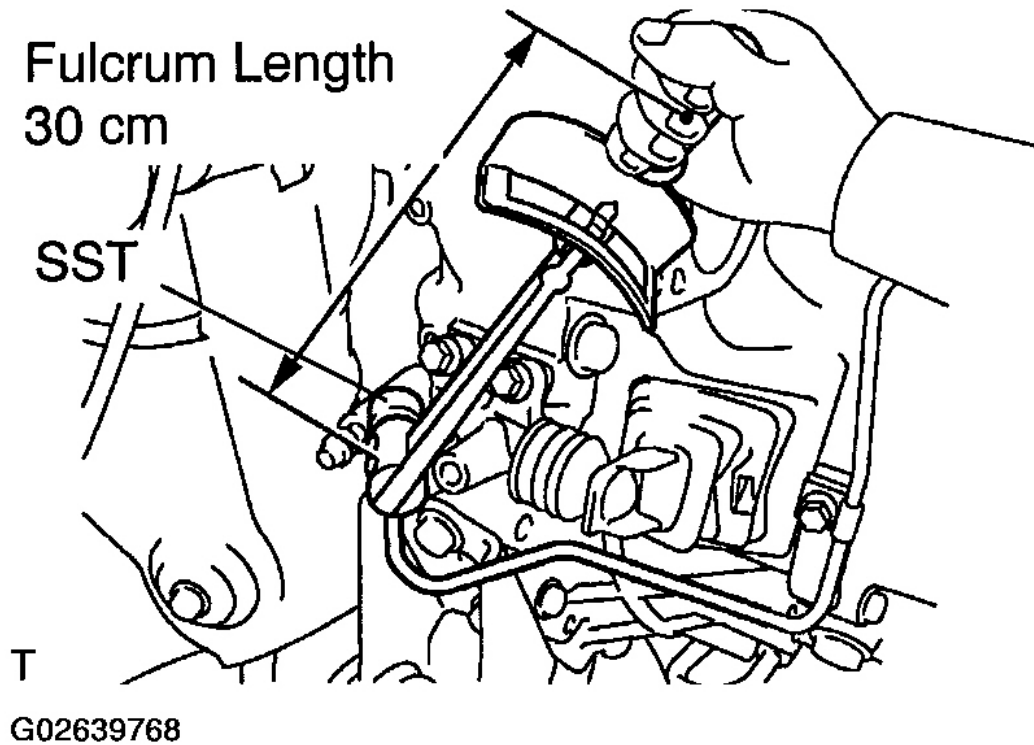


Fig. 25: Connecting Clutch Fluid Line To Release Cylinder
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

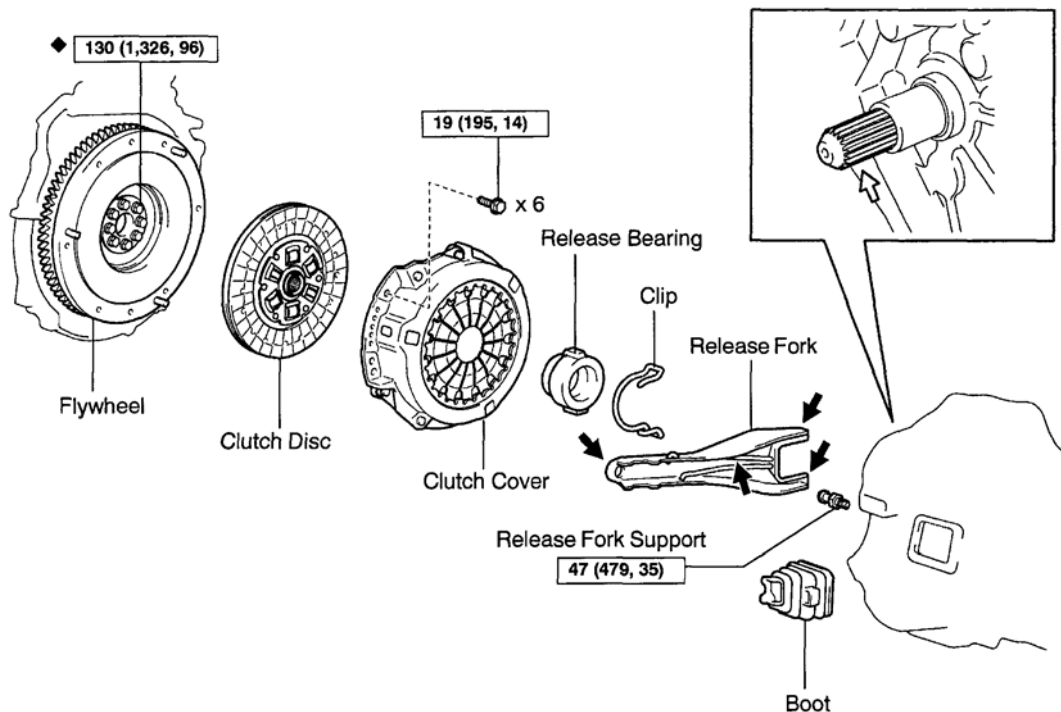
3. **FILL BRAKE RESERVOIR WITH BRAKE FLUID AND BLEED CLUTCH SYSTEM (See BRAKE FLUID)**
4. **CHECK FOR LEAKS**

CLUTCH UNIT

COMPONENTS

2005 Toyota RAV4

2005 TRANSMISSION Clutch - RAV4



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

◆ Non-reusable part

↪ Clutch spline grease

p ↪ Release hub grease

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Fig. 26: Exploded View Of Clutch Unit Components & Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

1. REMOVE TRANSAXLE FROM ENGINE

2WD: See REMOVAL

4WD: See REMOVAL

2. REMOVE CLUTCH COVER AND DISC

- Align the matchmarks on the clutch cover with the one on the flywheel.
- Loosen each set bolt one turn at a time until spring tension is released.

- c. Remove the set bolts, and pull off the clutch cover with the clutch disc.

NOTE: Do not drop the clutch disc.

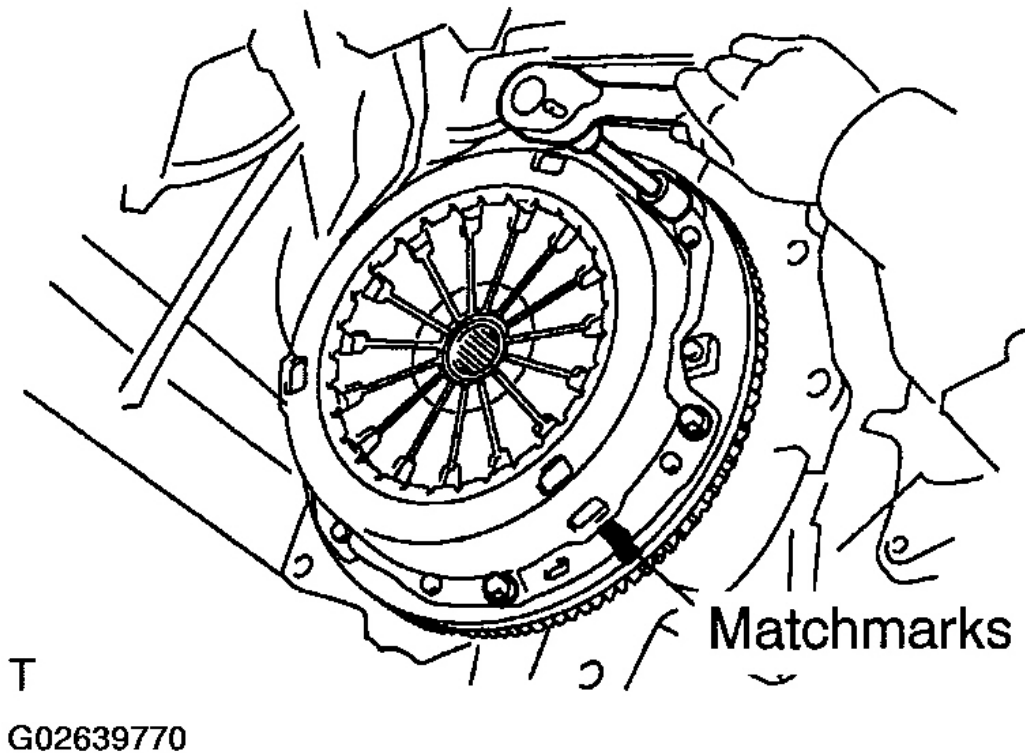
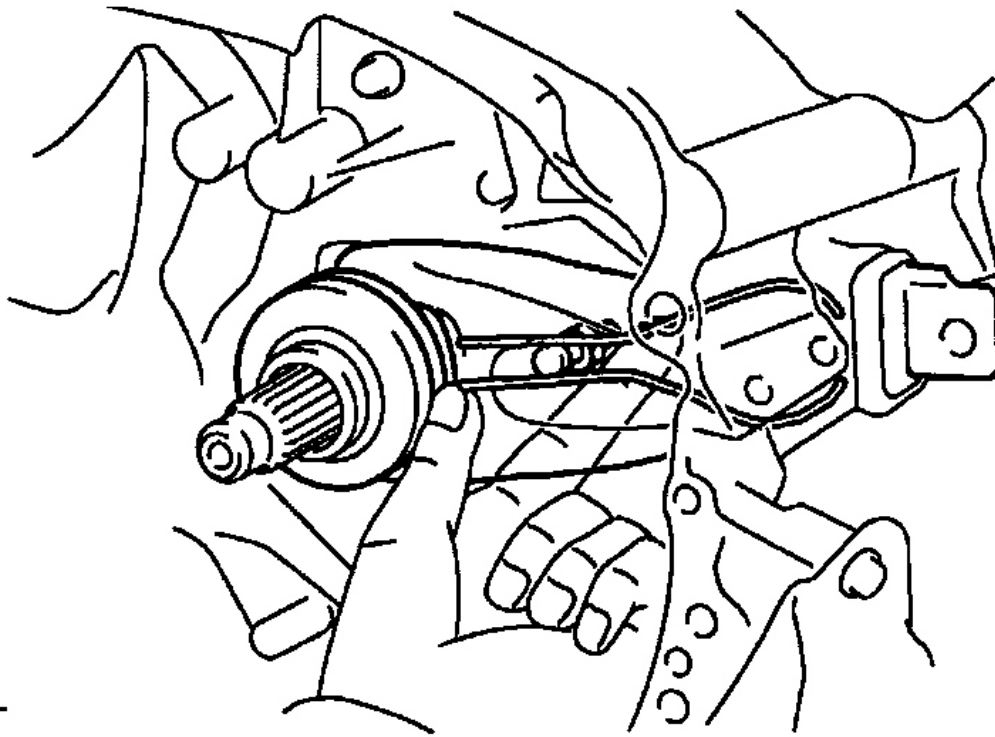


Fig. 27: Applying Matchmarks On Clutch Cover & Flywheel
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE RELEASE BEARING AND FORK FROM TRANSAXLE

Remove the release bearing with the fork together and then separate them.



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Fig. 28: Removing Release Bearing With Fork Together
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE RELEASE FORK SUPPORT AND BOOT

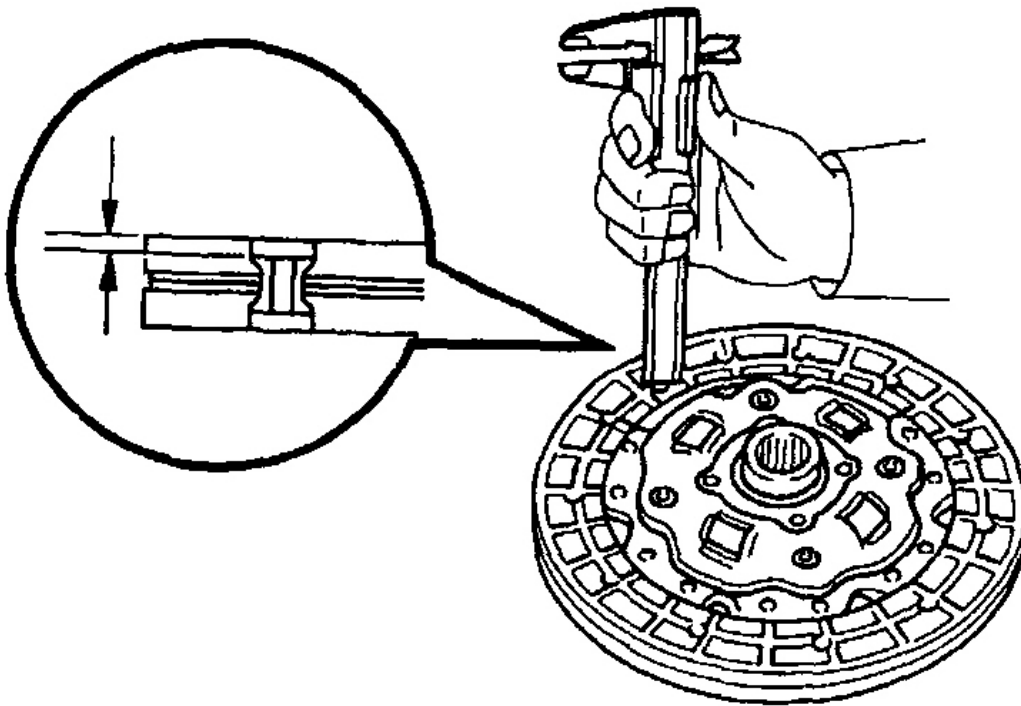
INSPECTION

1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using vernier calipers, measure the rivet head depth.

Minimum rivet depth: 0.3 mm (0.012 in.)

If necessary, replace the clutch disc.



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Fig. 29: Measuring Rivet Head Depth

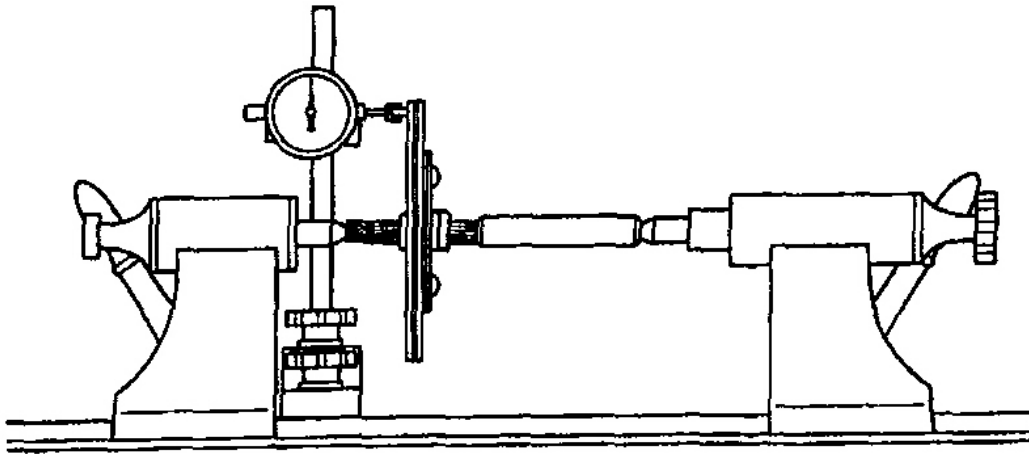
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc runout.

Maximum runout: 0.8 mm (0.031 in.)

If necessary, replace the clutch disc.



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Fig. 30: Checking Disc Runout

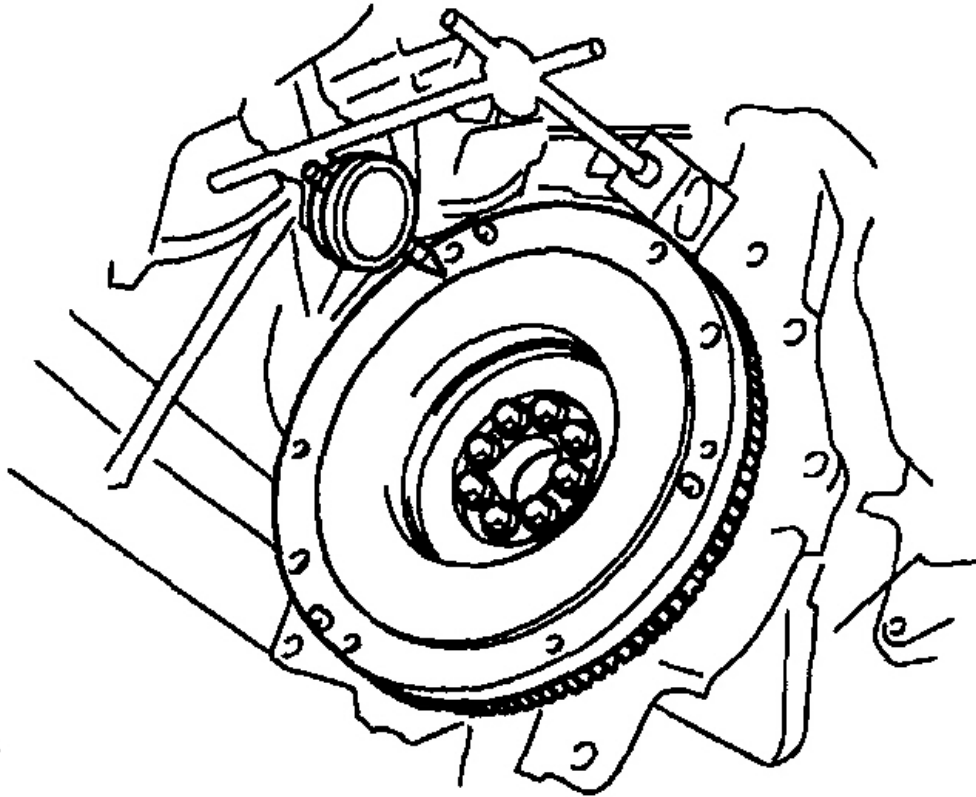
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout: 0.1 mm (0.004 in.)

If necessary, replace the flywheel.



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Fig. 31: Checking Flywheel Runout

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Install the 8 mounting bolts in several passes, in the sequence shown.

Torque: 130 N.m (1,325 kgf.cm, 96 ft.lbf)

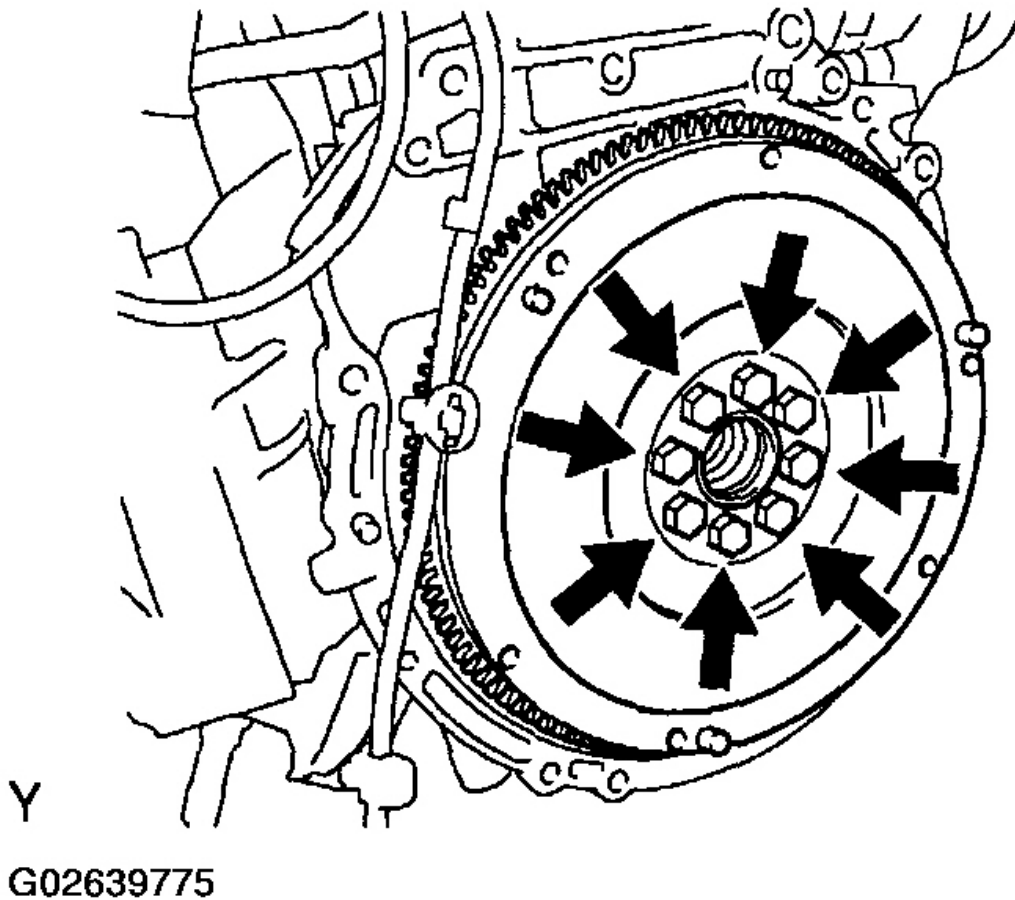


Fig. 32: Installing Flywheel Mounting Bolts

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. INSPECT DIAPHRAGM SPRING FOR WEAR

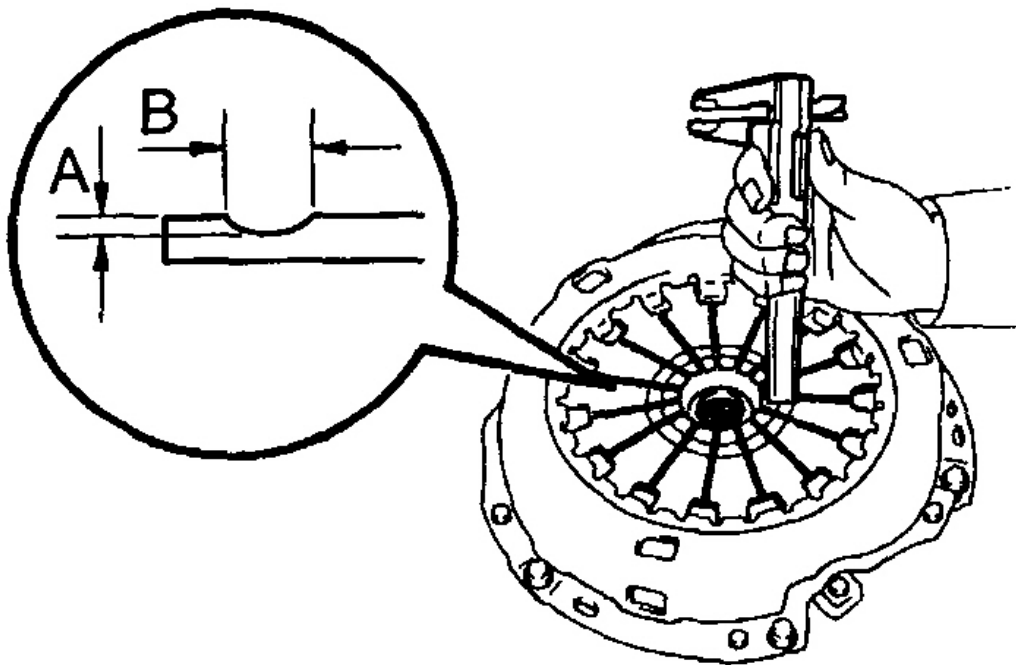
Using vernier calipers, measure the diaphragm spring for depth and width of wear.

Maximum:

Depth (A): 0.5 mm (0.020 in.)

Width (B): 6.0 mm (0.236 in.)

If necessary, replace the clutch cover.



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Fig. 33: Measuring Diaphragm Spring For Wear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

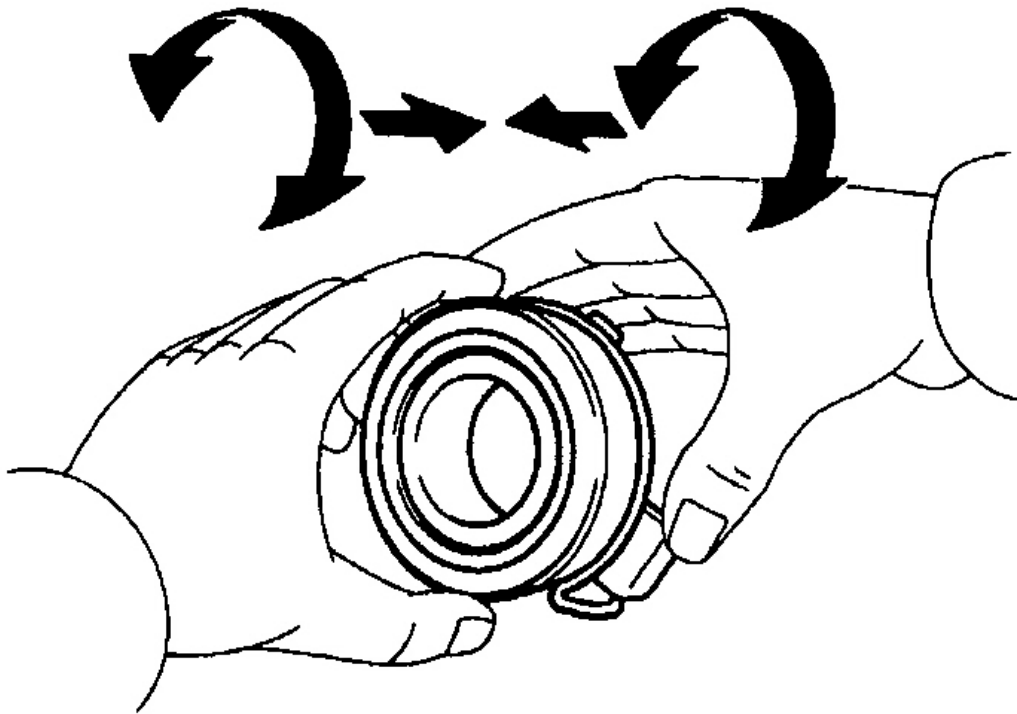
5. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction.

HINT:

The bearing is permanently lubricated and requires no cleaning or lubrication.

If necessary, replace the release bearing.



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Fig. 34: Inspecting Release Bearing Movement
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

1. **INSTALL CLUTCH DISC AND CLUTCH COVER ON FLYWHEEL**
 - a. Insert SST in the clutch disc, then insert them in the flywheel.

SST 09301-00210

HINT:

Take care not to insert clutch disc in the wrong direction.

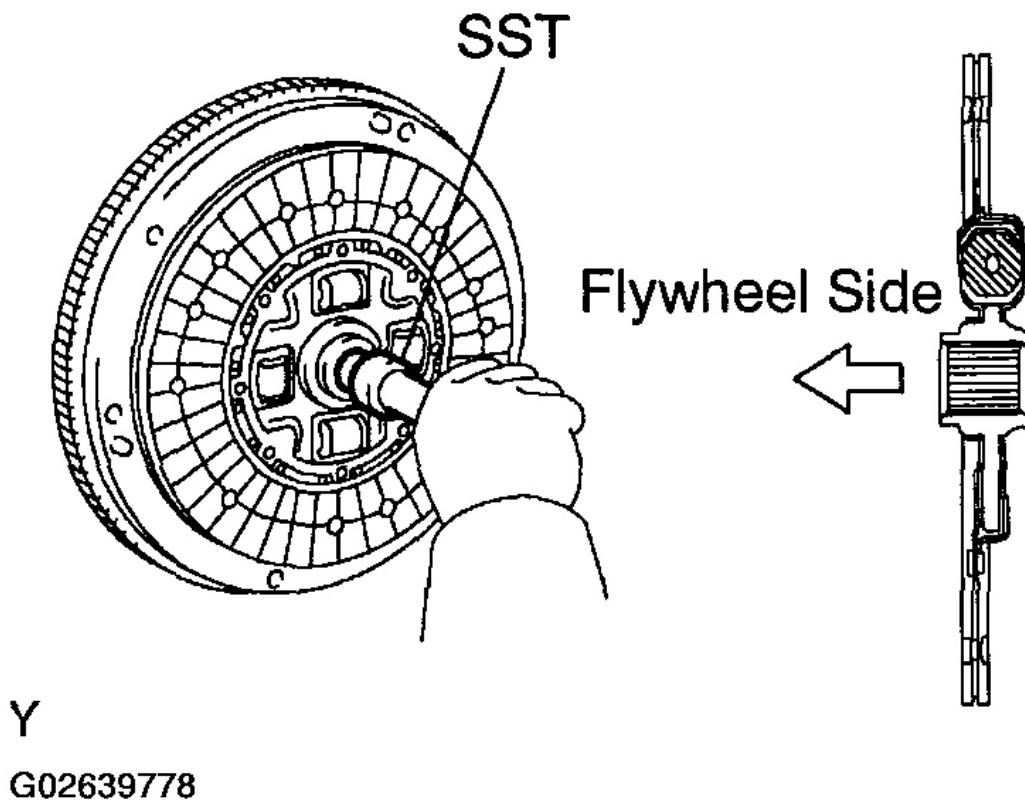


Fig. 35: Inserting Clutch Alignment Tool Into Clutch Disc
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Align the matchmarks on the clutch cover and flywheel.
- c. Following the procedures shown in the illustration, tighten the 6 bolts in the order starting the bolt locating near the knock pin on the top.

Torque: 19 N.m (195 kgf.cm, 14 ft.lbf)

HINT:

- Following the order in the illustration, tighten the bolts at a time evenly.
- Move SST up and down, right and left lightly, after checking that the disc is in the center, tighten the bolts.

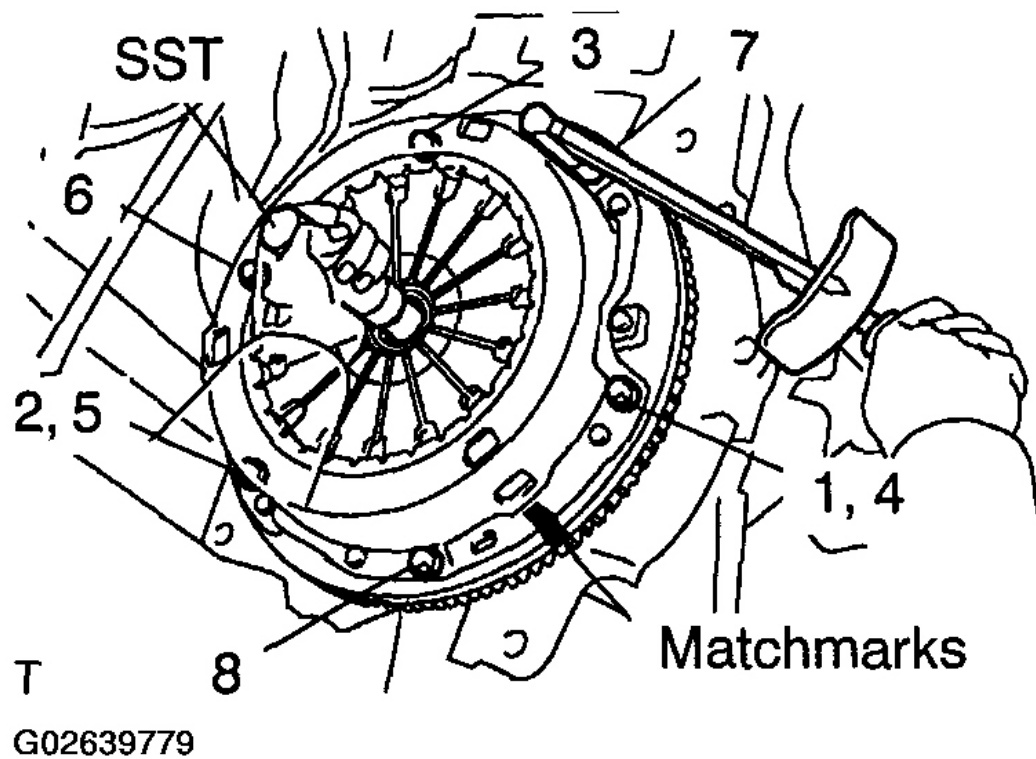


Fig. 36: Tightening Clutch Cover Bolts In Sequence
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.

Maximum non-alignment: 0.5 mm (0.020 in.)

If alignment is not as specified, using SST, adjust the diaphragm spring tip alignment.

SST 09333-00013

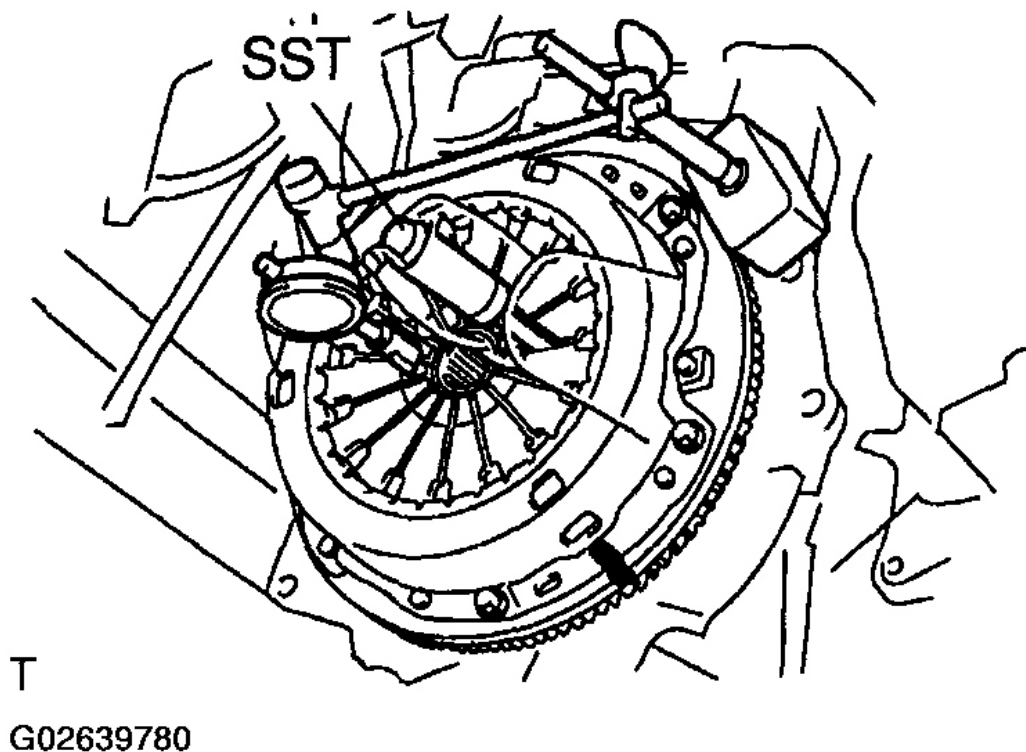


Fig. 37: Checking Diaphragm Spring Tip Alignment
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL BOOT AND RELEASE FORK SUPPORT TO TRANSAXLE

Torque: 47 N.m (479 kgf.cm, 35 ft.lbf)

4. APPLY RELEASE HUB GREASE

Apply release hub grease to the release fork and hub contact, release fork and push rod contact and release fork pivot points.

Sealant:

Part No. 08887-01806, RELEASE HUB GREASE or equivalent

5. APPLY CLUTCH SPRING GREASE

Apply clutch spline grease to the input shaft spline.

Sealant:

Part No. 08887-01706, CLUTCH SPLINE GREASE or equivalent

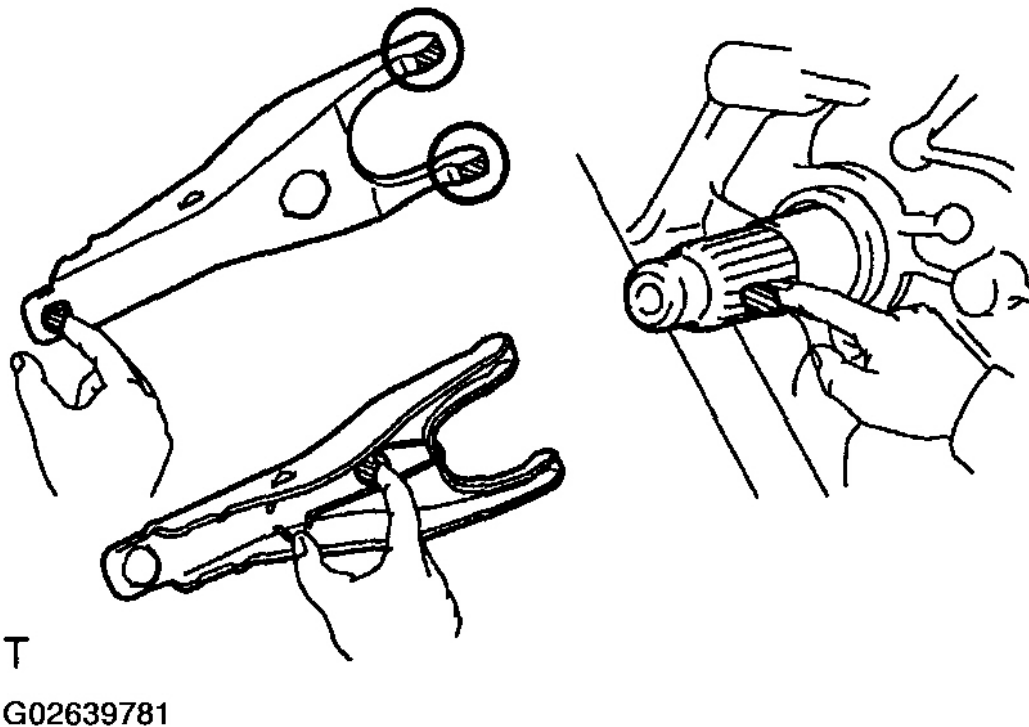


Fig. 38: Applying Release Hub Grease To Release Fork, Hub & Shaft Splines
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. INSTALL RELEASE BEARING AND FORK TO TRANSAXLE

Install the bearing to the release fork, and then install them to the transaxle.

7. INSTALL TRANSAXLE TO ENGINE

2WD: See INSTALLATION

4WD: See INSTALLATION