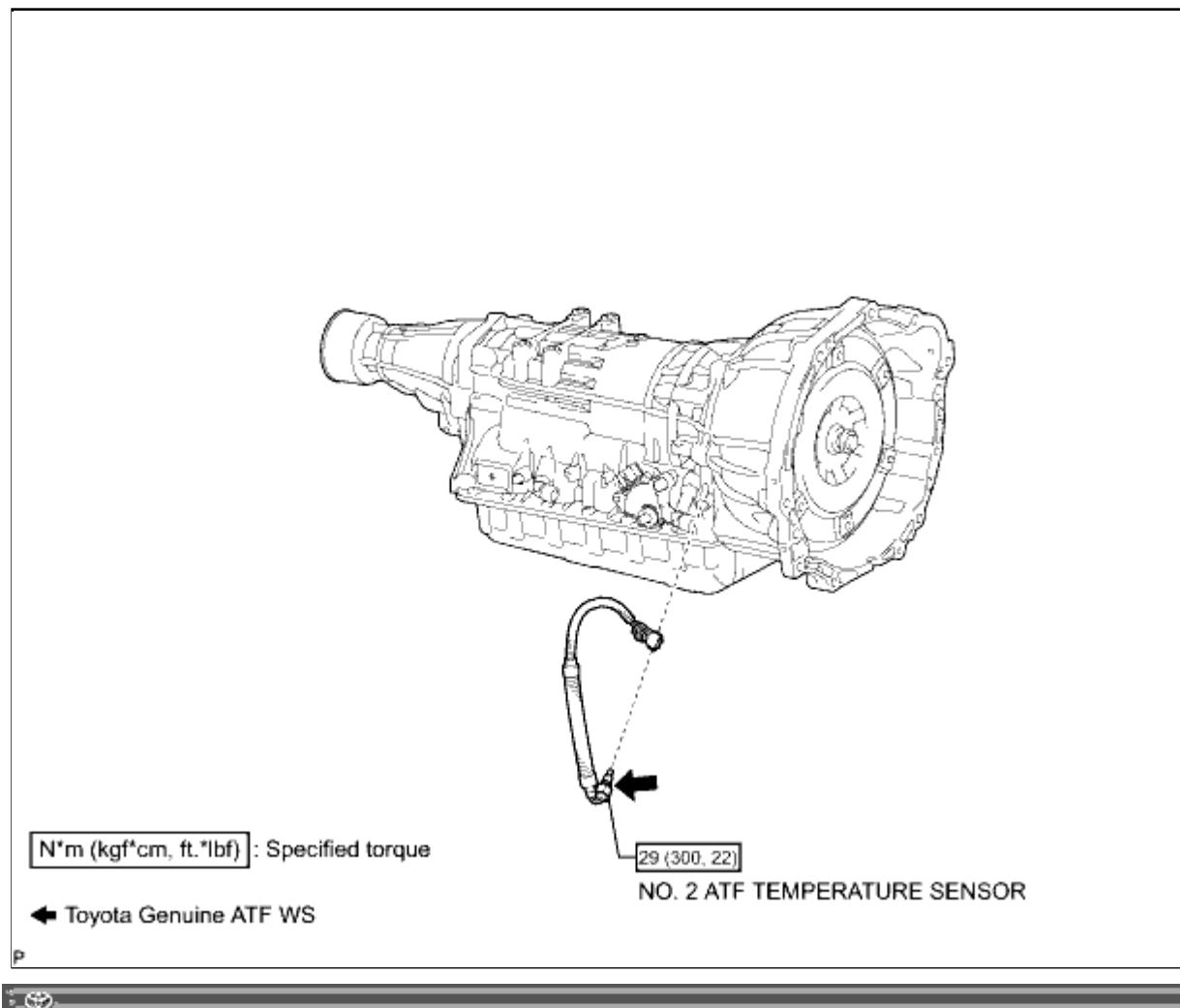


Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000003B2L005X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: ATF TEMPERATURE SENSOR: COMPONENTS (2010 4Runner)		

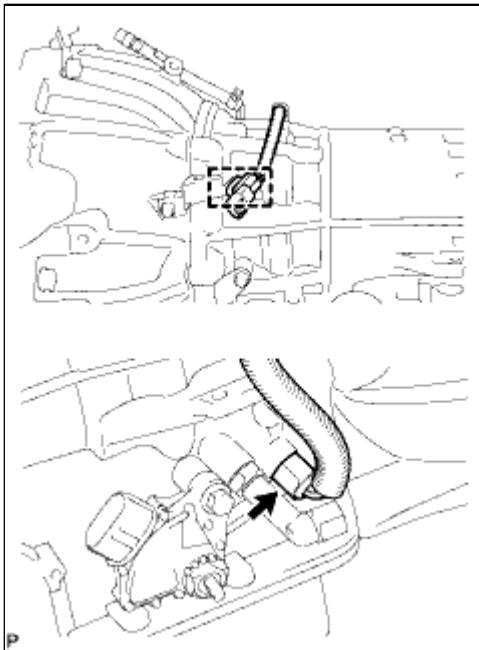
## COMPONENTS

## ILLUSTRATION



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NL000X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: ATF TEMPERATURE SENSOR: REMOVAL (2010 4Runner)		

## **REMOVAL**



### **1. REMOVE NO. 2 ATF TEMPERATURE SENSOR**

- Disconnect the temperature sensor connector.
- Detach the sensor connector clamp from the connector stay.
- Remove the temperature sensor.



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Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NJ000X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: ATF TEMPERATURE SENSOR: INSPECTION (2010 4Runner)		

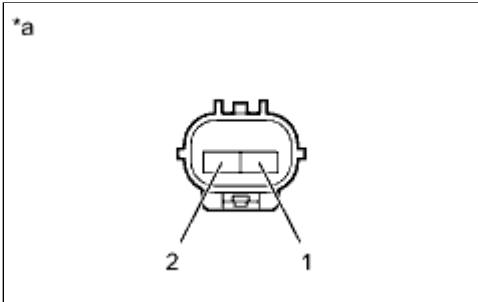
## **INSPECTION**

### **1. INSPECT NO. 2 ATF TEMPERATURE SENSOR**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	Always	79 Ω to 156 kΩ
1 - Body ground	Always	10 kΩ or higher
2 - Body ground	Always	10 kΩ or higher



### **Text in Illustration**

*a	Component without harness connected (No. 2 ATF Temperature Sensor)
----	---

### **HINT:**

If the resistance is out of the specified range at either of the ATF temperatures shown in the table below, the driveability of the vehicle may decrease.

Standard Resistance:

ATF TEMPERATURE	SPECIFIED CONDITION
20°C (68°F)	10.3 to 13.9 kΩ
120°C (248°F)	0.58 to 0.65 kΩ

If the result is not as specified, replace the No. 2 ATF temperature sensor.

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<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: ATF TEMPERATURE SENSOR: INSTALLATION (2010 4Runner)		

## **INSTALLATION**

### **1. INSTALL AUTOMATIC TRANSMISSION FLUID TEMPERATURE SENSOR**

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

**Torque: 29 N·m (300 kgf·cm, 22ft·lbf)**

- (c) Attach the sensor connector clamp to the connector stay.
- (d) Connect the temperature sensor connector.

### **2. CHECK AUTOMATIC TRANSMISSION FLUID**

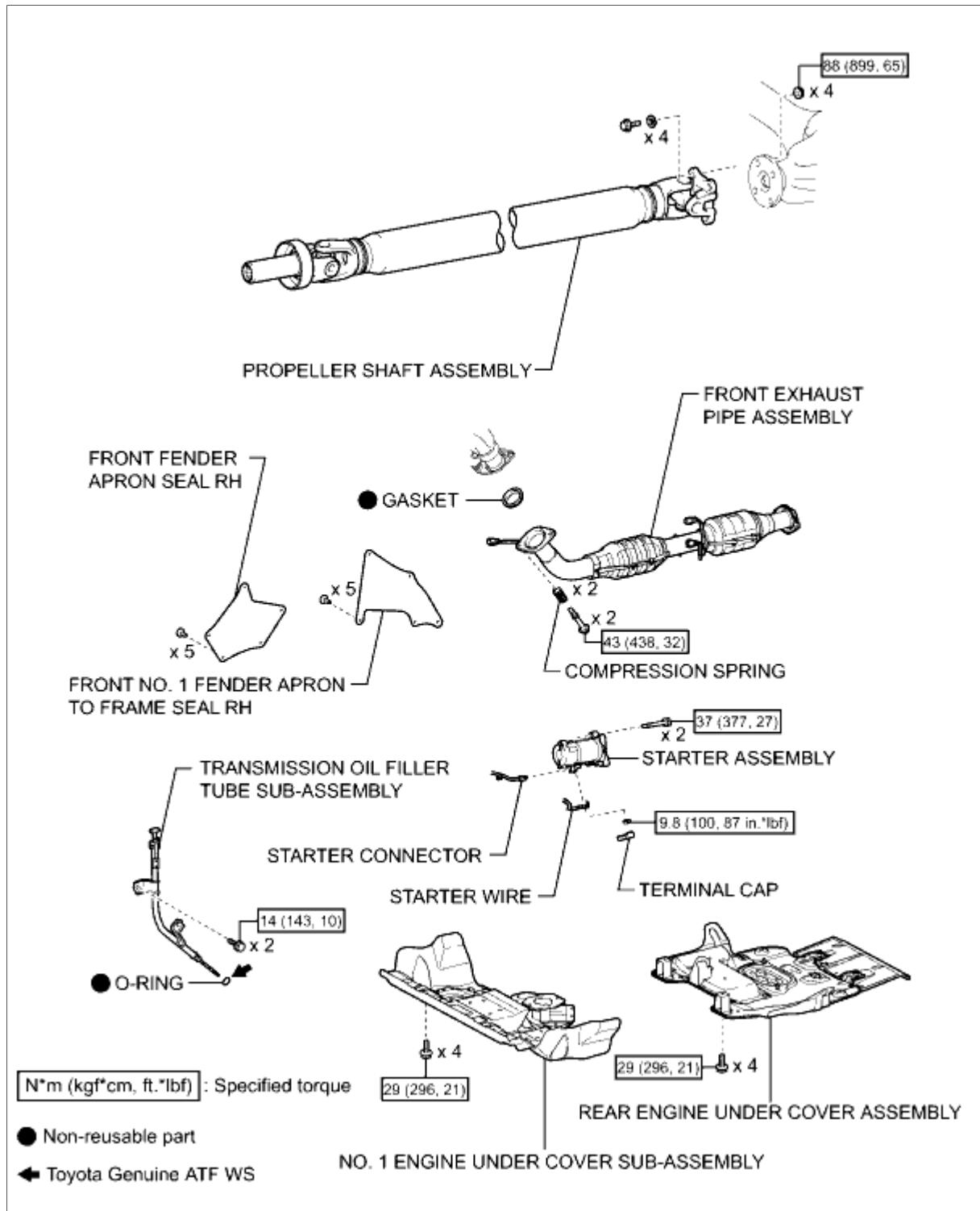
- (a) Check the automatic transmission fluid .



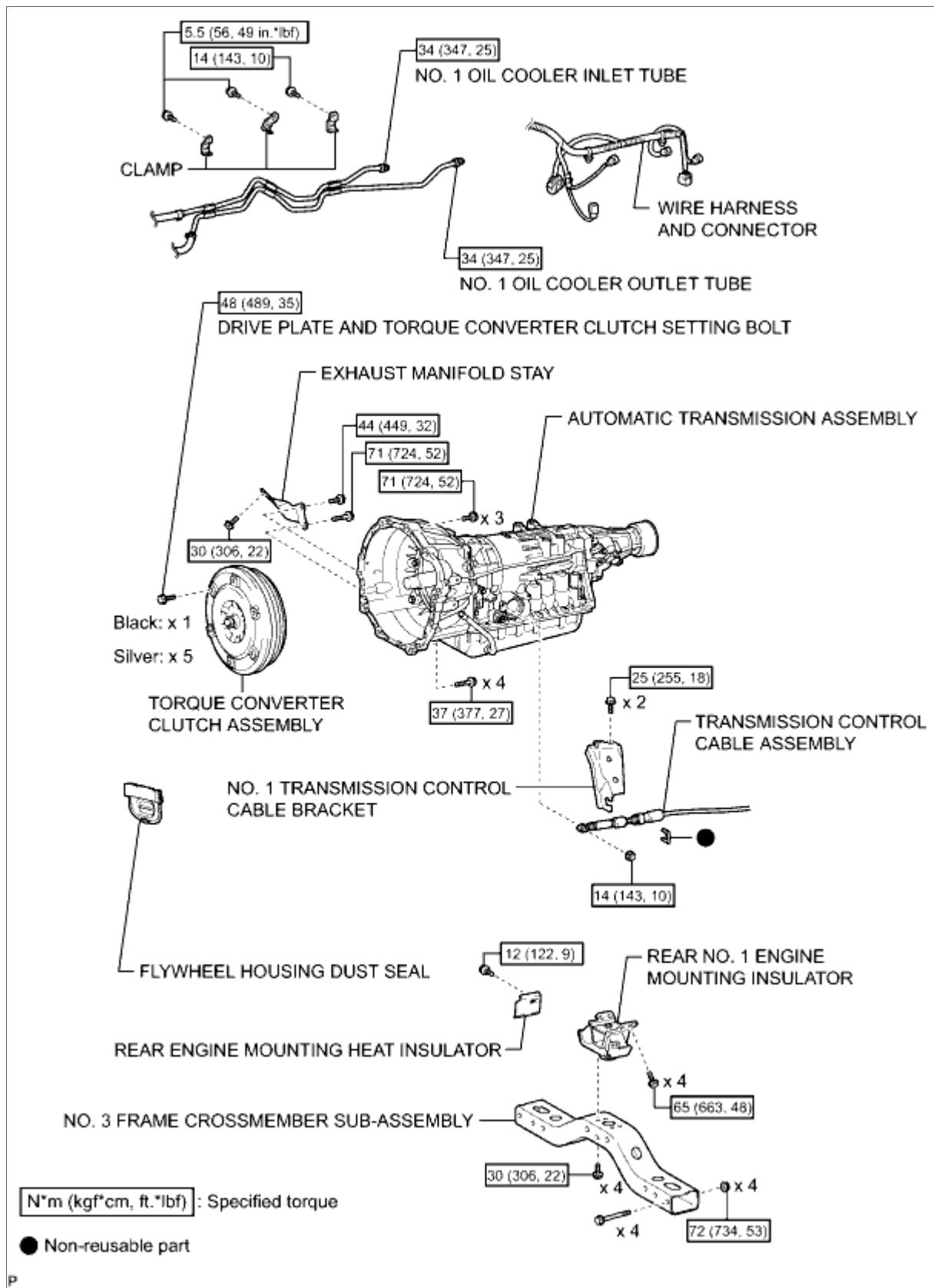
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000003B20007X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



## ILLUSTRATION



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Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NV00QX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: REMOVAL (2010 4Runner)		

## **REMOVAL**

### **1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

**NOTICE:**

When disconnecting the cable, some systems need to be initialized after the cable is reconnected .

### **2. REMOVE NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY**

### **3. REMOVE REAR ENGINE UNDER COVER ASSEMBLY**

### **4. REMOVE FRONT FENDER APRON SEAL RH**

### **5. REMOVE FRONT NO. 1 FENDER APRON TO FRAME SEAL RH**

### **6. REMOVE FRONT EXHAUST PIPE ASSEMBLY**

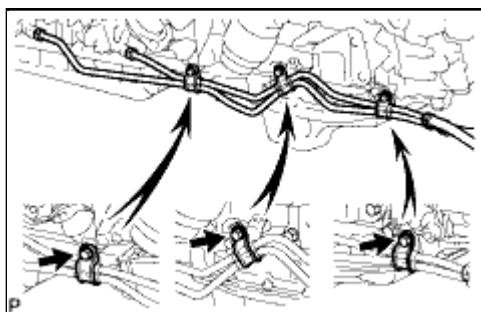
### **7. REMOVE PROPELLER SHAFT ASSEMBLY**

(a) Remove the propeller shaft .

### **8. DRAIN AUTOMATIC TRANSMISSION FLUID**

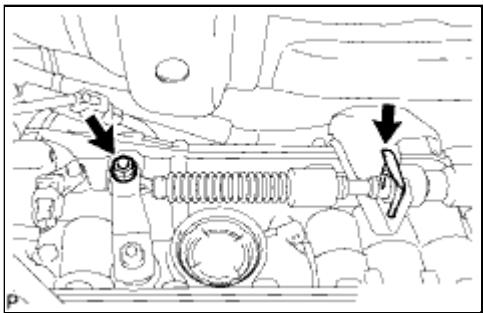
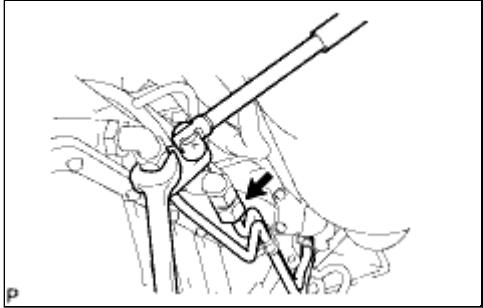
### **9. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY**

### **10. DISCONNECT NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE**



(a) Remove the 3 bolts to open the 3 No. 2 oil cooler hose clamps.

(b) Using a union nut wrench, disconnect the inlet tube and outlet tube.

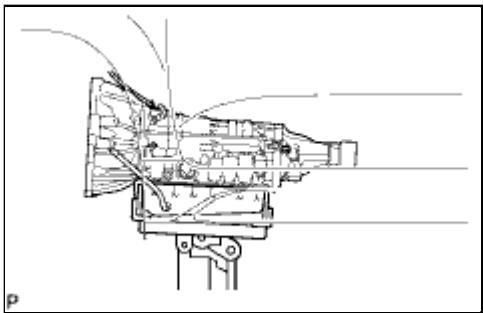


## 11. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Remove the nut and clip, and disconnect the transmission control cable.

## 12. REMOVE STARTER ASSEMBLY

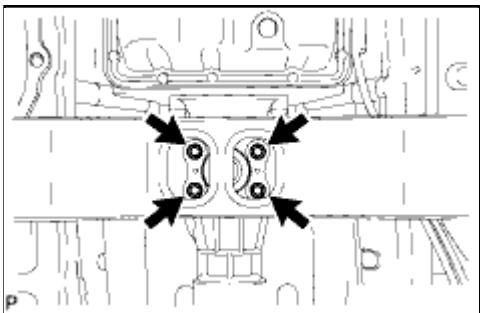
- (a) Remove the starter .



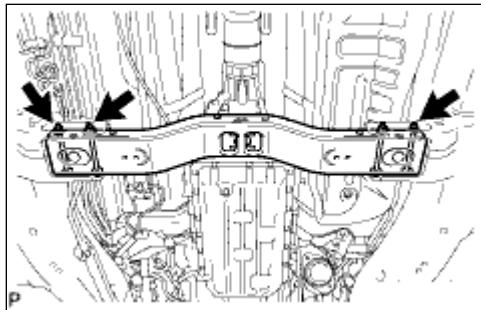
## 13. SUPPORT AUTOMATIC TRANSMISSION ASSEMBLY

- (a) Support the transmission with a transmission jack.

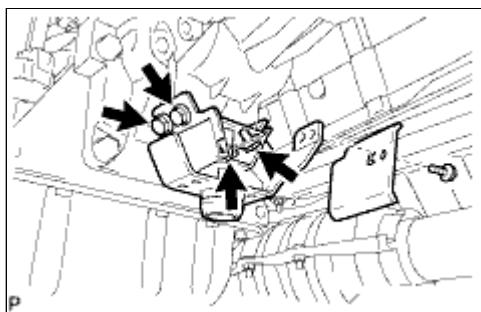
## 14. REMOVE NO. 3 FRAME CROSMEMBER SUB-ASSEMBLY



- (a) Remove the 4 bolts of the rear engine mounting insulator.



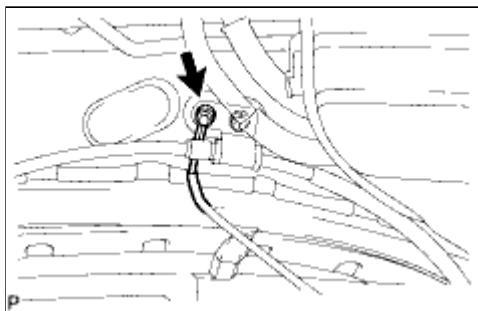
(b) Remove the 4 nuts, 4 bolts and frame crossmember.



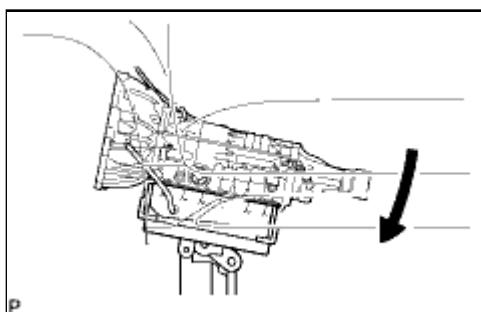
## 15. REMOVE REAR NO. 1 ENGINE MOUNTING INSULATOR

- Remove the bolt and rear engine mounting heat insulator.
- Remove the 4 bolts and engine mounting insulator from the transmission.

## 16. DISCONNECT WIRE HARNESS AND CONNECTOR



(a) Remove the nut and disconnect the ground cable.



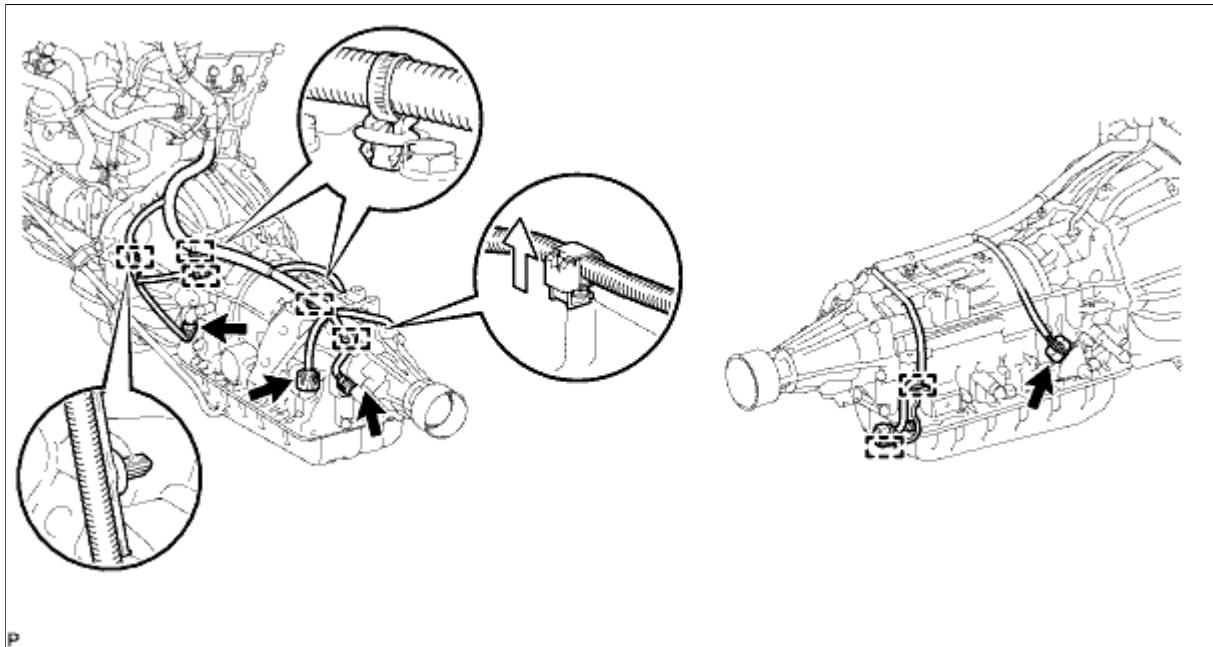
(b) Tilt the transmission downward.

### NOTICE:

Make sure the cooling fan does not contact the fan shroud.

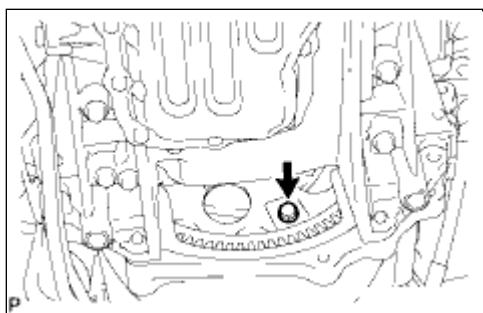
(c) Disconnect the park/neutral position switch connector, transmission wire connector and 2 speed sensor connectors.

(d) Detach the 2 connector clamps and 5 harness clamps, and disconnect the wire harness.



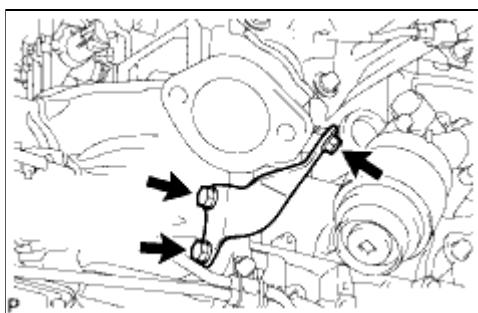
## 17. REMOVE DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT

(a) Remove the flywheel housing dust seal.

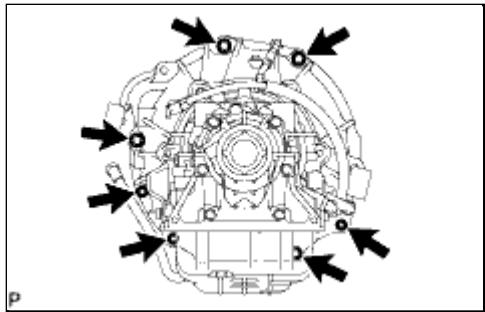


(b) Turn the crankshaft to gain access to the 6 bolts and remove each bolt while holding the crankshaft pulley bolt with a wrench.

## 18. REMOVE AUTOMATIC TRANSMISSION ASSEMBLY



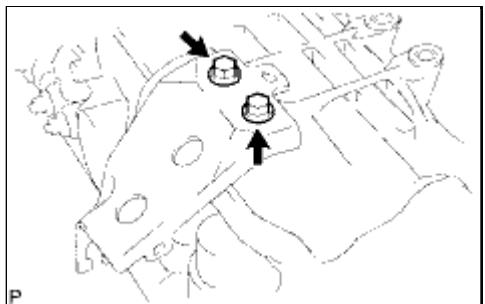
(a) Remove the 3 bolts and exhaust manifold stay.



(b) Remove the 7 bolts and transmission.

**NOTICE:**

**Do not use excess force to pry off the transmission assembly.**



**19. REMOVE NO. 1 TRANSMISSION CONTROL CABLE BRACKET**

(a) Remove the 2 bolts and control cable bracket from the transmission.

**20. REMOVE TORQUE CONVERTER CLUTCH ASSEMBLY**



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<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: INSTALLATION (2010 4Runner)		

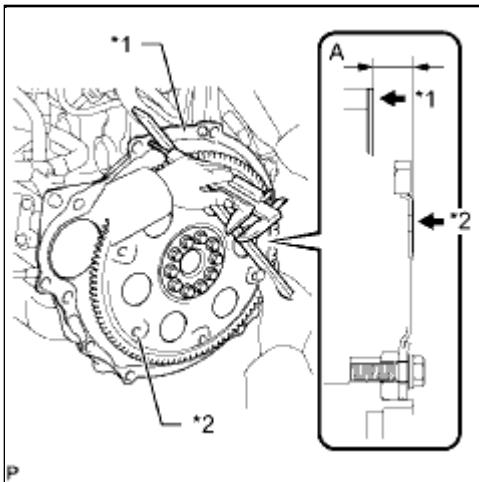
## INSTALLATION

### 1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

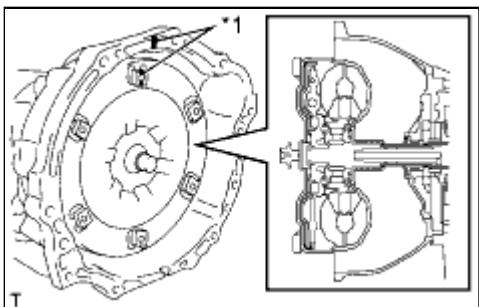
(a) Inspect the torque converter clutch .

### 2. INSTALL TORQUE CONVERTER CLUTCH ASSEMBLY

(a) Install the torque converter clutch to the automatic transmission.



(b) Using a vernier caliper and straightedge, measure dimension "A" between the transmission fitting surface of the engine\*1 and the torque converter fitting surface of the drive plate\*2 (step 1).



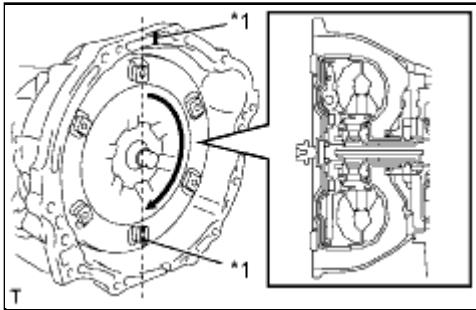
(c) Aligning the matchmarks on the transmission case and torque converter clutch, and then mesh the splines of the input shaft and turbine runner.

#### Text in Illustration

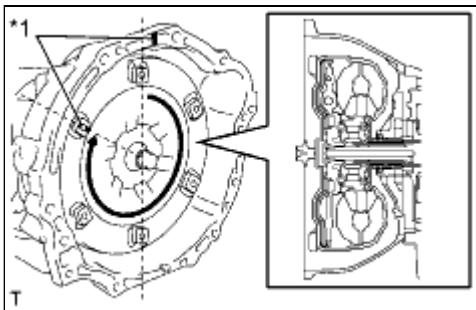
*1	Matchmark
----	-----------

(d) Mesh the splines of the stator shaft and stator while turning the torque converter clutch.

#### Text in Illustration



*1	Matchmark
----	-----------



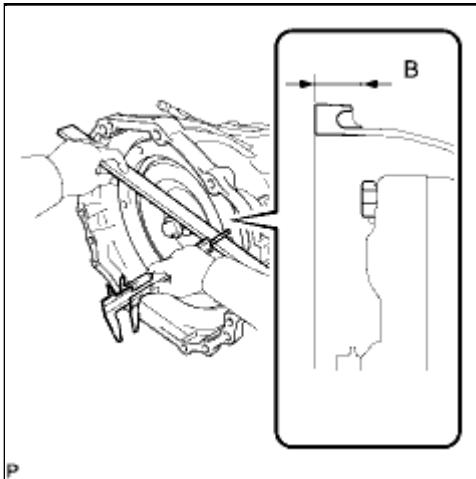
- (e) Turn the torque converter clutch to mesh the key of the oil pump drive gear into the slot on the torque converter clutch.

### Text in Illustration

*1	Matchmark
----	-----------

**NOTICE:**

**Do not push on the torque converter when aligning the matchmarks.**



- (f) Using a vernier caliper and straightedge, measure dimension "B" shown in the illustration and check that B is more than A (measured in step 1).

Standard dimension:

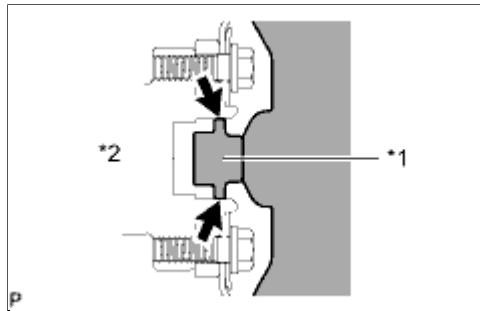
$B = A + 1.00 \text{ mm (0.0394 in.) or more}$

### 3. INSTALL NO. 1 TRANSMISSION CONTROL CABLE BRACKET

- (a) Install the control cable bracket with the 2 bolts.

**Torque: 25 N·m (255 kgf·cm, 18ft·lbf)**

### 4. INSTALL AUTOMATIC TRANSMISSION ASSEMBLY



- (a) Apply clutch spline grease to the surface of the crankshaft that contacts the torque converter clutch centerpiece.

Clutch spline grease:

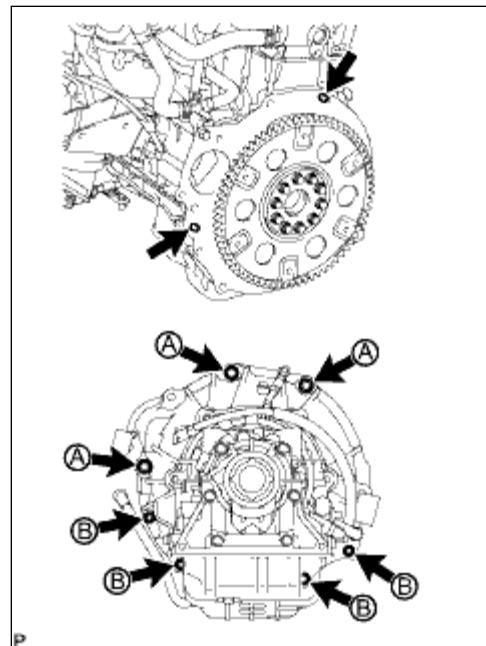
Toyota Genuine Clutch Spline Grease or equivalent

**Maximum grease amount**

Approximately 1 g (0.0353 oz.)

#### Text in Illustration

*1	Torque Converter Clutch Centerpiece
*2	Crankshaft



- (b) Confirm that the 2 knock pins are on the surface of the engine block that contacts the transmission before transmission installation.

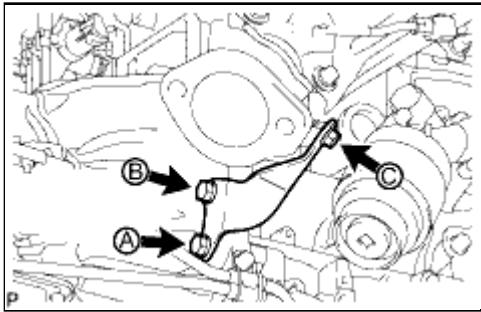
- (c) Install the transmission with the 7 bolts.

**for bolt A (17 mm head) - Torque: 71 N·m (724 kgf·cm, 52ft·lbf)**

**for bolt B (14 mm head) - Torque: 37 N·m (377 kgf·cm, 27ft·lbf)**

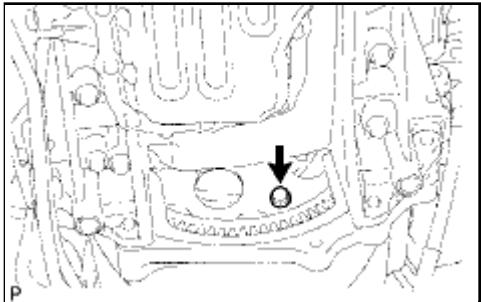
- (d) Install the exhaust manifold stay with the 3 bolts.

**for bolt A - Torque: 71 N·m (724 kgf·cm, 52ft·lbf)**



for bolt B - Torque: 44 N·m (449 kgf·cm, 32ft·lbf)

for bolt C - Torque: 30 N·m (306 kgf·cm, 22ft·lbf)



## 5. INSTALL DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT

- (a) Turn the crankshaft to gain access to the installation locations of the 6 torque converter clutch setting bolts and install each bolt while holding the crankshaft pulley bolt with a wrench.

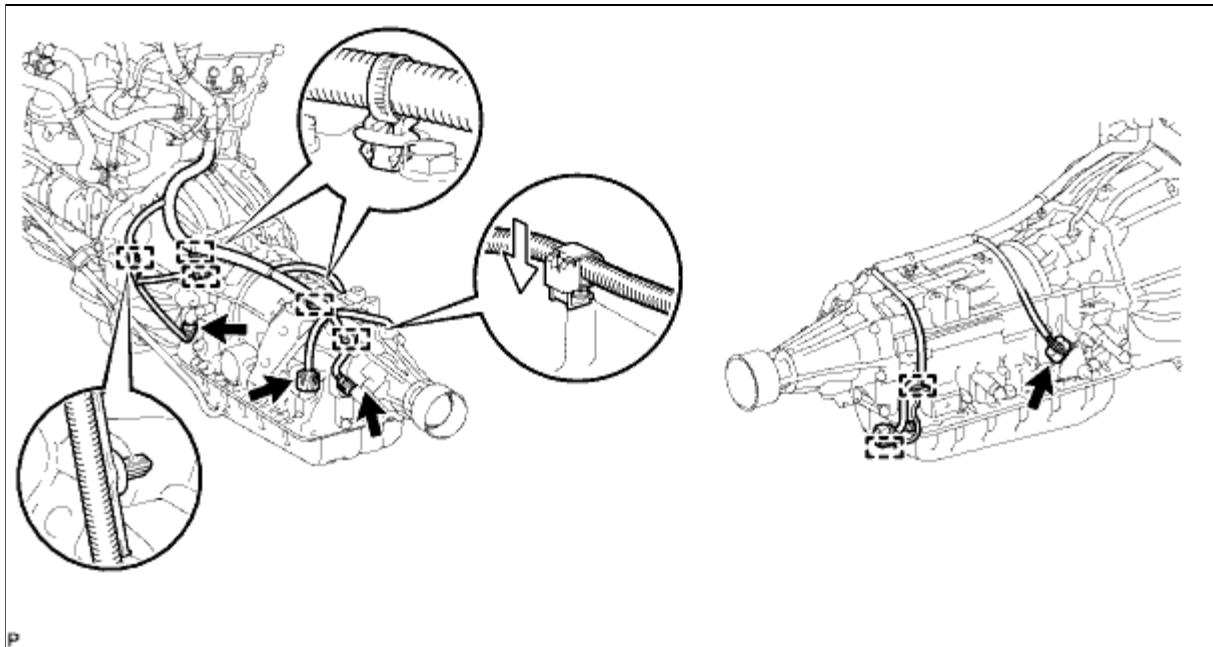
**Torque: 48 N·m (489 kgf·cm, 35ft·lbf)**

### NOTICE:

**Install the black bolt first, and then the 5 silver bolts.**

- (b) Install the flywheel housing dust seal.

## 6. CONNECT WIRE HARNESS AND CONNECTOR



- (a) Connect the park/neutral position switch connector, transmission wire connector and 2 speed sensor connectors.
- (b) Attach the 2 connector clamps and 5 harness clamps.
- (c) Tilt up the automatic transmission.

(d) Connect the ground cable with the nut.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

## 7. INSTALL REAR NO. 1 ENGINE MOUNTING INSULATOR

(a) Install the engine mounting insulator to the transmission with the 4 bolts.

**Torque: 65 N·m (663 kgf·cm, 48ft·lbf)**

(b) Install the rear engine mounting heat insulator to the engine mounting insulator with the bolt.

**Torque: 12 N·m (122 kgf·cm, 9ft·lbf)**

## 8. INSTALL NO. 3 FRAME CROSMEMBER SUB-ASSEMBLY

(a) Install the frame crossmember to the rear engine mounting insulator with the 4 bolts.

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

(b) Install the frame crossmember with the 4 bolts and 4 nuts.

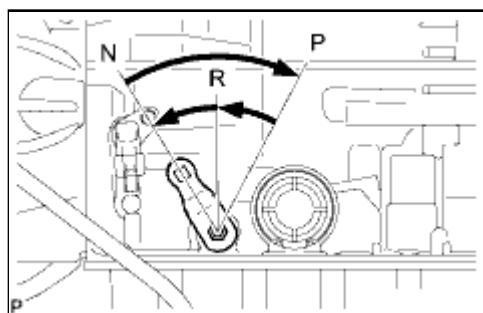
**Torque: 72 N·m (734 kgf·cm, 53ft·lbf)**

## 9. INSTALL STARTER ASSEMBLY

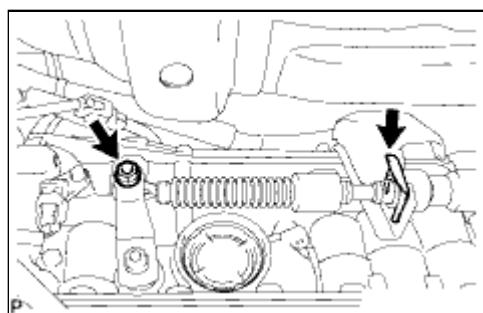
(a) Install the starter .

## 10. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Move the shift lever to P.



(b) Turn the control shaft lever clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.

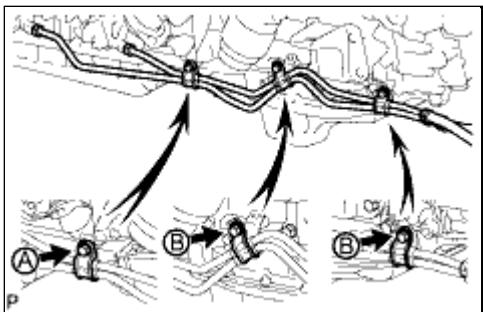


(c) Connect the transmission control cable to the transmission control cable bracket with a new clip, and connect the cable end to the control shaft lever with the nut.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

## 11. CONNECT NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE

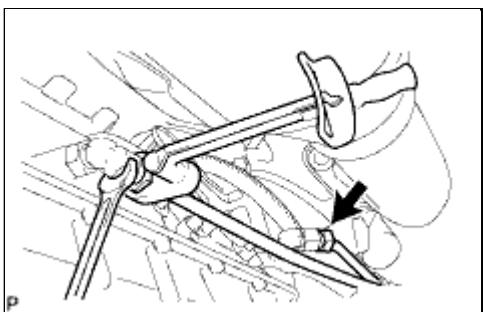
(a) Temporarily install the ends of the oil cooler tubes to the oil cooler tube unions by hand.



(b) Close the 3 No. 2 oil cooler hose clamps and install the 3 bolts.

**for bolt A - Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

**for bolt B - Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**



(c) Using a union nut wrench, tighten the inlet and outlet tubes.

**Torque: 34 N·m (347 kgf·cm, 25ft·lbf)**

**NOTICE:**

**Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench** [INFO](#).

## 12. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY [INFO](#)

## 13. INSTALL PROPELLER SHAFT ASSEMBLY

(a) Install the propeller shaft [INFO](#).

## 14. INSTALL FRONT EXHAUST PIPE ASSEMBLY [INFO](#)

## 15. ADD AUTOMATIC TRANSMISSION FLUID

Fluid type:

Toyota Genuine ATF WS

## 16. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

**NOTICE:**

**When disconnecting the cable, some systems need to be initialized after the cable is reconnected** [INFO](#).

## 17. ADJUST SHIFT LEVER POSITION [INFO](#)

## 18. INSPECT SHIFT LEVER POSITION [INFO](#)

## 19. CHECK FOR EXHAUST GAS LEAKS

## 20. INSPECT AUTOMATIC TRANSMISSION FLUID

(a) Inspect the automatic transmission fluid [INFO](#).

## 21. INSTALL FRONT NO. 1 FENDER APRON TO FRAME SEAL RH [INFO](#)

## 22. INSTALL FRONT FENDER APRON SEAL RH [INFO](#)

**23. INSTALL REAR ENGINE UNDER COVER ASSEMBLY**

INFO

**24. INSTALL NO. 1 ENGINE UNDER COVER**

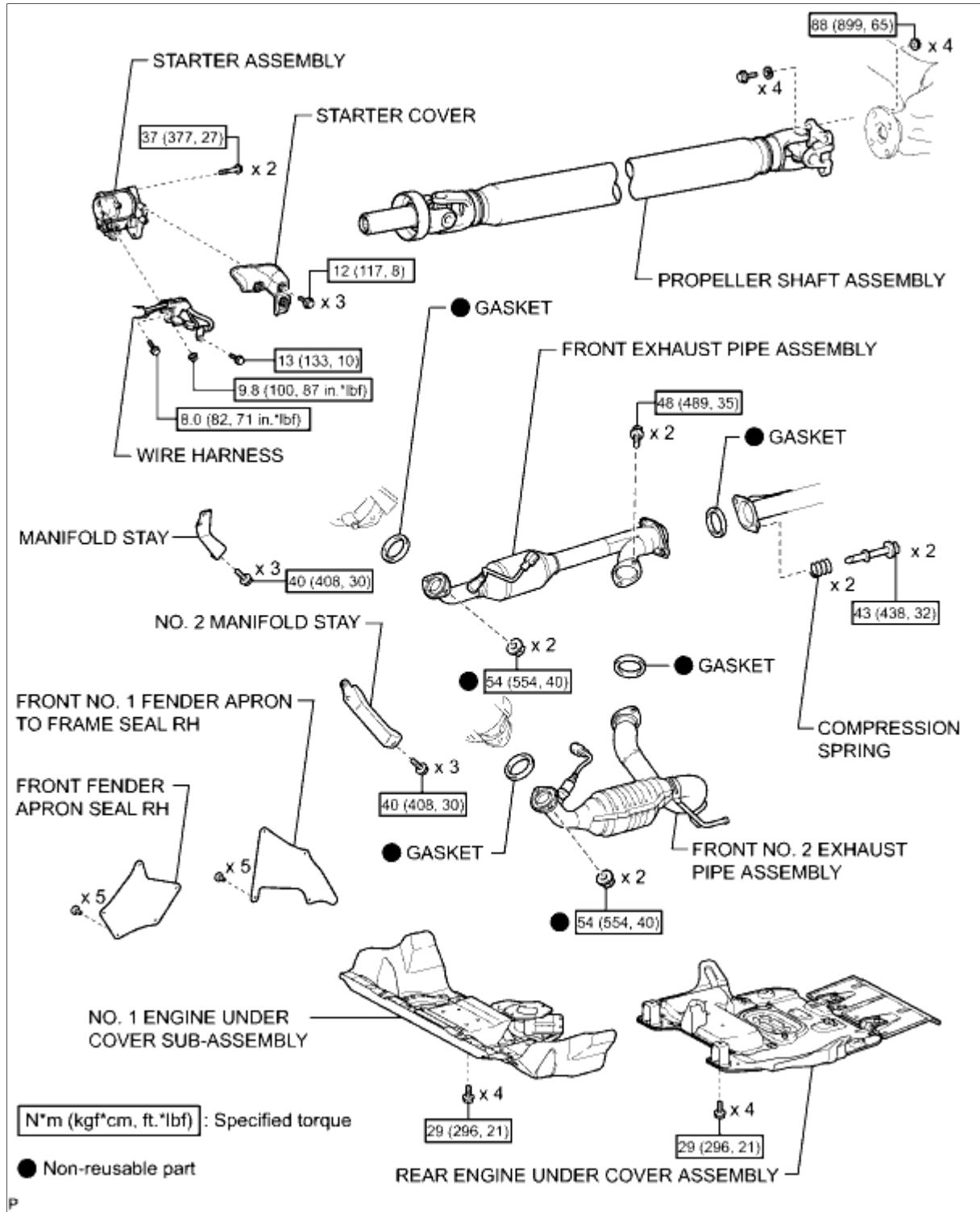
INFO



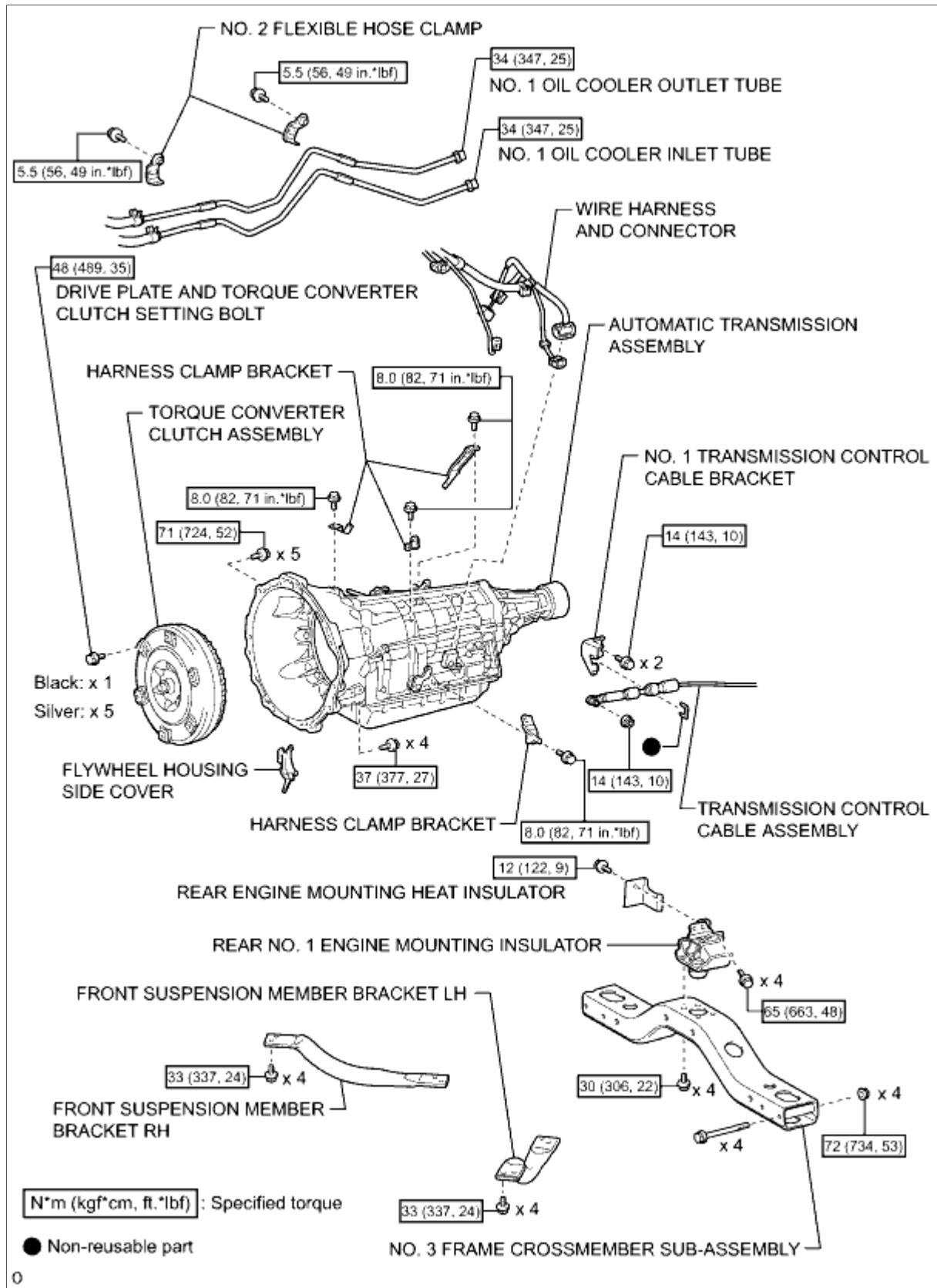
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000018ZC01UX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



## ILLUSTRATION



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000018ZD01VX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: REMOVAL (2010 4Runner)		

## **REMOVAL**

### **1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

**NOTICE:**

When disconnecting the cable, some systems need to be initialized after the cable is reconnected .

### **2. REMOVE NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY**

### **3. REMOVE REAR ENGINE UNDER COVER ASSEMBLY**

### **4. REMOVE FRONT FENDER APRON SEAL RH**

### **5. REMOVE FRONT NO. 1 FENDER APRON TO FRAME SEAL RH**

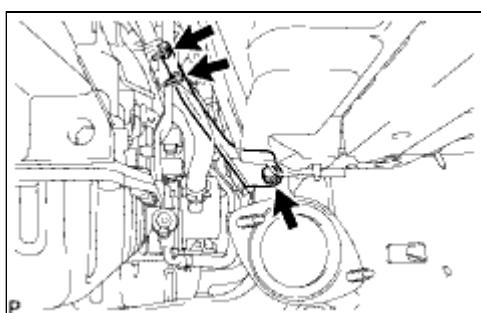
### **6. DRAIN AUTOMATIC TRANSMISSION FLUID**

### **7. REMOVE PROPELLER SHAFT ASSEMBLY**

(a) Remove the propeller shaft .

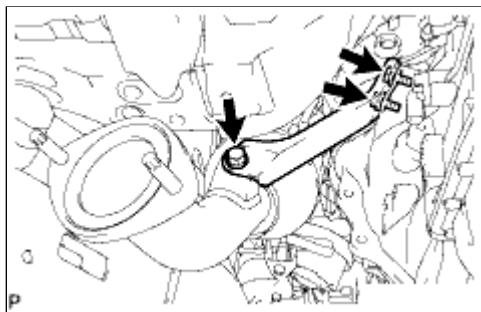
### **8. REMOVE FRONT EXHAUST PIPE ASSEMBLY**

(a) Remove the front exhaust pipe .



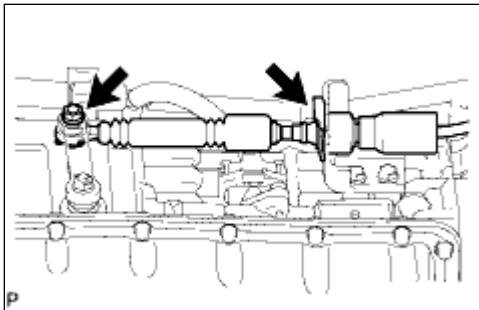
### **9. REMOVE MANIFOLD STAY**

(a) Remove the 3 bolts and stay.



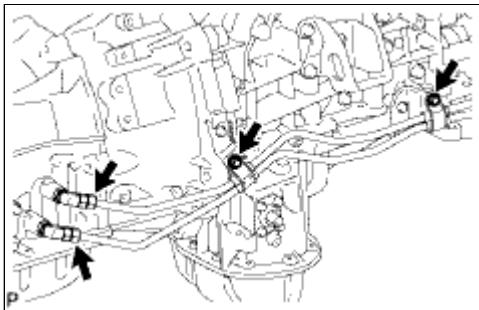
### **10. REMOVE NO. 2 MANIFOLD STAY**

(a) Remove the 3 bolts and stay.



## 11. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Remove the nut and clip, and disconnect the transmission control cable from the transmission.



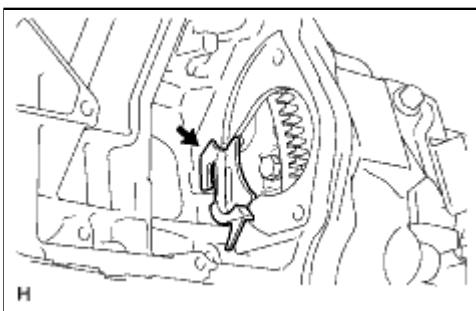
## 12. DISCONNECT NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE

- (a) Remove the 2 bolts to open the 2 No. 2 flexible hose clamps.  
(b) Using a union nut wrench, disconnect the inlet tube and outlet tube from each oil cooler tube union.

## 13. REMOVE STARTER ASSEMBLY

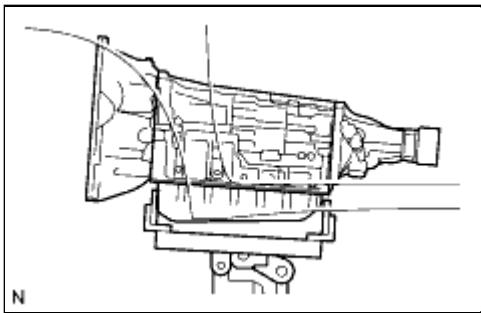
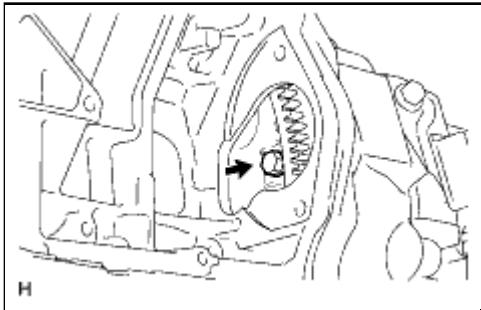
- (a) Remove the starter .

## 14. REMOVE DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



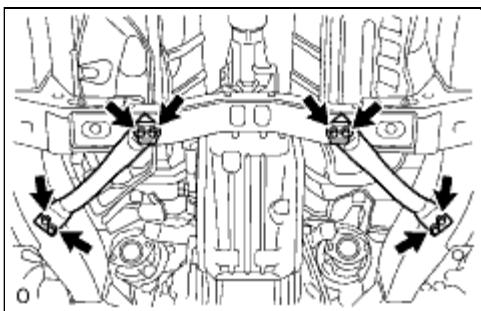
- (a) Remove the flywheel housing side cover.

- (b) Turn the crankshaft to gain access to the 6 bolts and remove each bolt while holding the crankshaft pulley bolt with a wrench.



## 15. SUPPORT AUTOMATIC TRANSMISSION ASSEMBLY

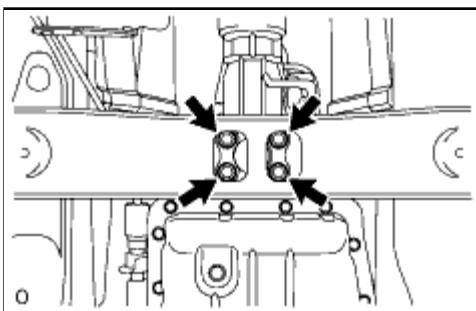
(a) Support the transmission with a transmission jack. Lift the transmission slightly from the crossmember.



## 16. REMOVE FRONT SUSPENSION MEMBER BRACKET LH AND RH (for X-Runner)

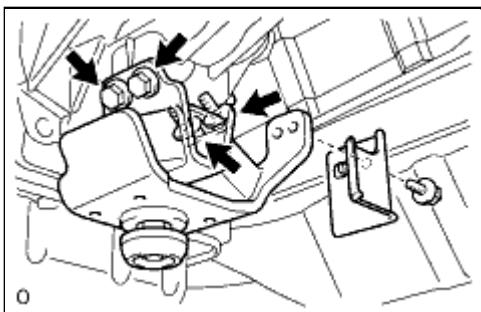
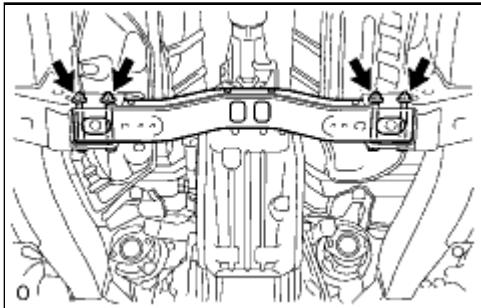
(a) Remove the 8 bolts and front suspension member bracket LH and RH.

## 17. REMOVE NO. 3 FRAME CROSMEMBER SUB-ASSEMBLY



(a) Remove the 4 bolts of the rear engine mounting insulator.

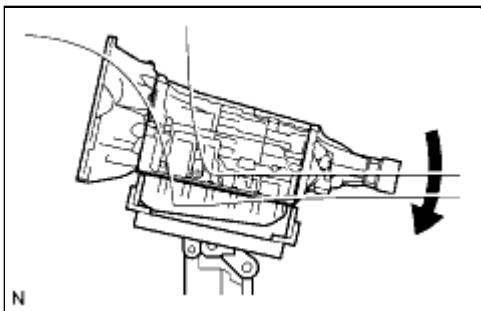
(b) Remove the 4 nuts, 4 bolts and frame crossmember.



## 18. REMOVE REAR NO. 1 ENGINE MOUNTING INSULATOR

- (a) Remove the bolt and rear engine mounting heat insulator.
- (b) Remove the 4 bolts and rear engine mounting insulator from the transmission.

## 19. DISCONNECT WIRE HARNESS AND CONNECTOR



- (a) Tilt the transmission downward.

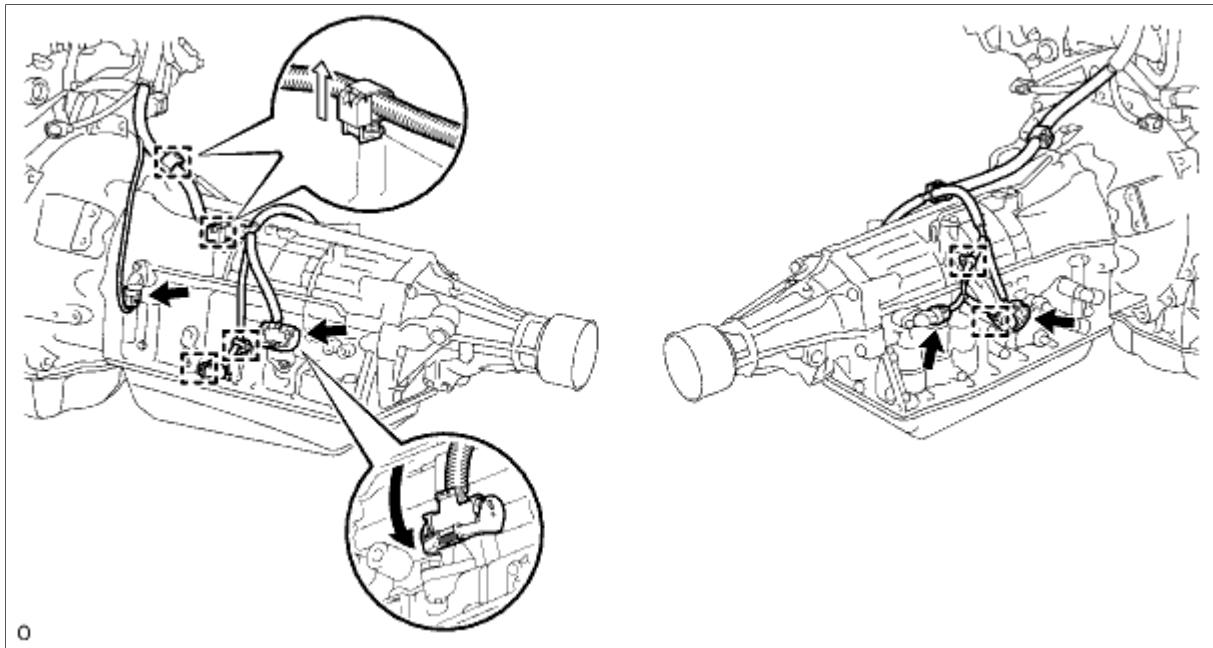
### NOTICE:

Make sure the cooling fan does not contact the fan shroud.

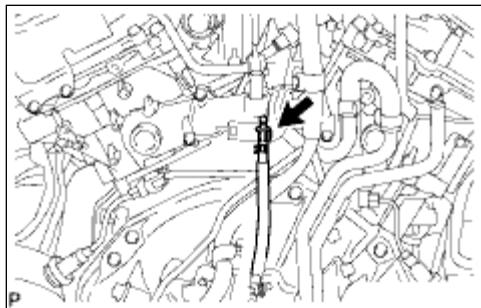
- (b) Disconnect the park/neutral position switch connector, transmission wire connector and 2 speed sensor connectors.

### HINT:

Detach the claw, press down the lever, and then disconnect the transmission wire connector.

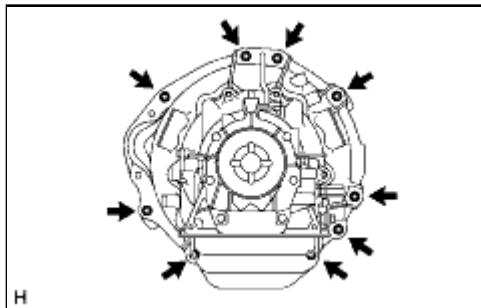


(c) Detach the 2 connector clamps and 4 harness clamps, and disconnect the wire harness.



## 20. DISCONNECT BREATHER PLUG HOSE

(a) Disconnect the breather plug hose from the engine side.



## 21. REMOVE AUTOMATIC TRANSMISSION ASSEMBLY

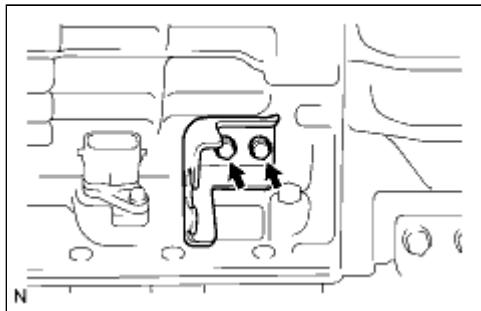
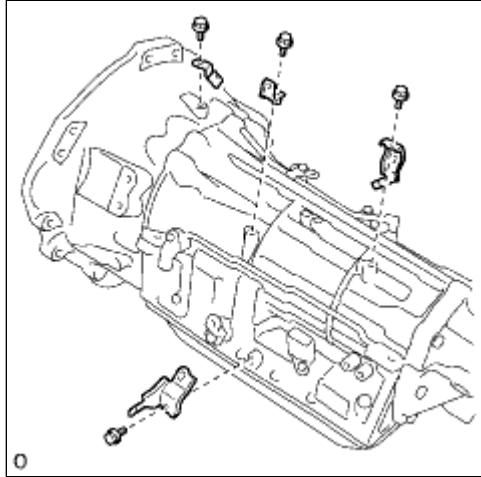
(a) Remove the 9 bolts and automatic transmission.

### NOTICE:

**Do not use excess force when prying the transmission assembly.**

## 22. REMOVE HARNESS CLAMP BRACKET

(a) Remove the 4 bolts and 4 harness clamp brackets.



**23. REMOVE NO. 1 TRANSMISSION CONTROL CABLE BRACKET**

- (a) Remove the 2 bolts and transmission control cable bracket.

**24. REMOVE TORQUE CONVERTER CLUTCH ASSEMBLY**

**25. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY**

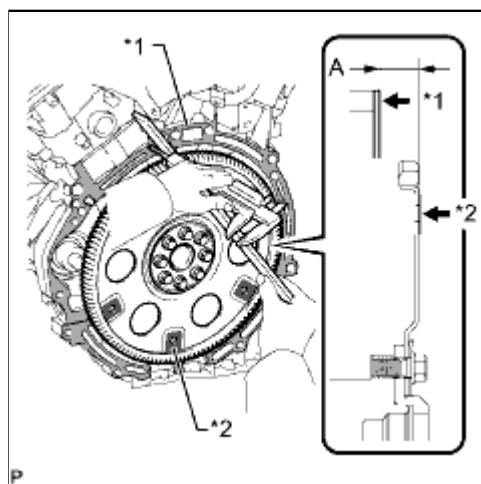
- (a) Inspect the torque converter clutch INFO.



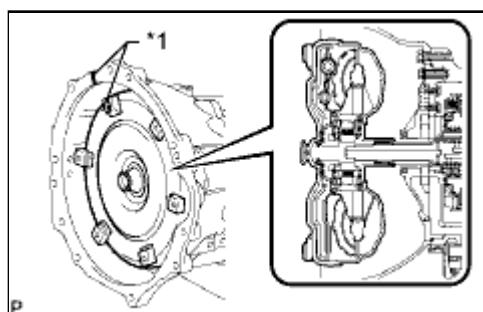
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000018ZB01WX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TORQUE CONVERTER CLUTCH ASSEMBLY



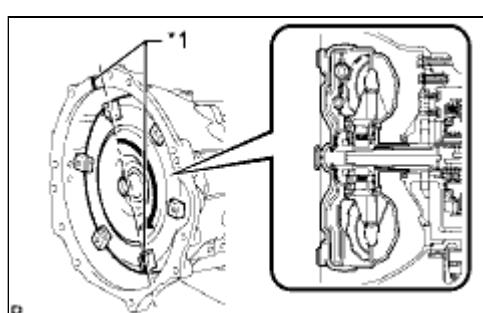
(a) Using a vernier caliper and straightedge, measure dimension "A" between the transmission fitting surface of the engine\*1 and the torque converter clutch fitting surface of the drive plate\*2 (step 1).



(b) Align the matchmarks on the transmission case and torque converter clutch, and then mesh the splines of the input shaft and turbine runner.

#### Text in Illustration

*1	Matchmark
----	-----------



(c) Mesh the splines of the stator shaft and stator while turning the torque converter clutch.

#### Text in Illustration

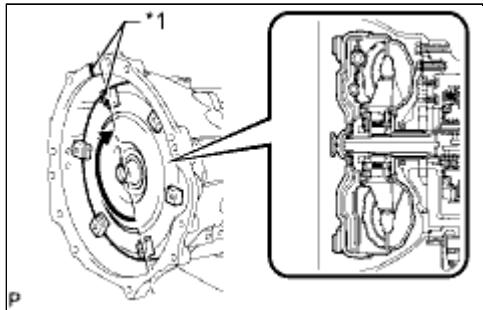
*1	Matchmark
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**HINT:**

**Turn the torque converter clutch approximately 180°.**

- (d) Turn the torque converter clutch and align the matchmarks on the torque converter clutch and transmission case to fit the key of the oil pump drive gear into the slot on the torque converter clutch.

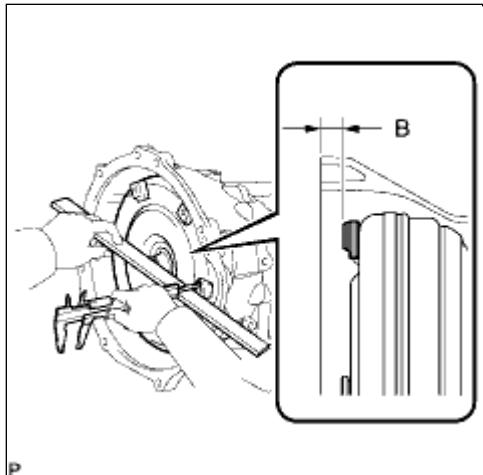
### Text in Illustration



\*1 Matchmark

**NOTICE:**

**Do not push on the torque converter clutch when aligning the matchmarks.**



- (e) Using a vernier caliper and straightedge, measure dimension B shown in the illustration and check that B is more than A (measured in step 1).

Standard distance:

A + 1 mm (0.0394 in.) or more

## 2. INSTALL NO. 1 TRANSMISSION CONTROL CABLE BRACKET

- (a) Install the transmission control cable bracket with the 2 bolts.

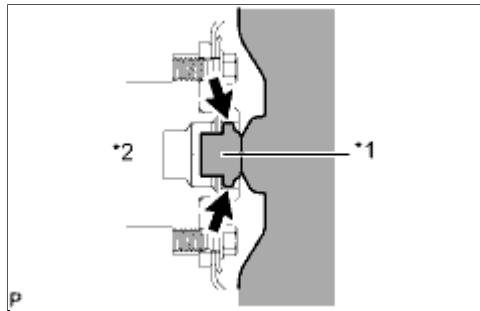
**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

## 3. INSTALL WIRE HARNESS CLAMP BRACKET

- (a) Install the 4 brackets with the 4 bolts.

**Torque: 8.0 N·m (82 kgf·cm, 71in·lbf)**

## 4. INSTALL AUTOMATIC TRANSMISSION ASSEMBLY



- (a) Apply clutch spline grease to the surface of the crankshaft that contacts the torque converter clutch centerpiece.

Clutch spline grease:

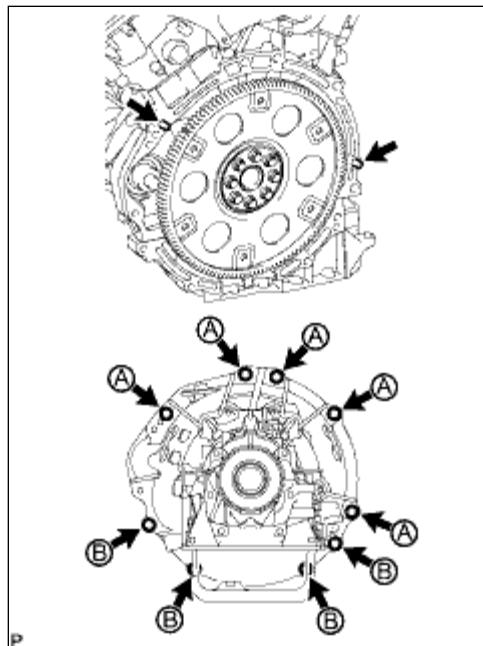
Toyota Genuine Clutch Spline Grease or equivalent

**Maximum grease amount**

Approximately 1 g (0.0353 oz.)

#### Text in Illustration

*1	Torque Converter Clutch Center Peace
*2	Crankshaft



- (b) Confirm that the 2 knock pins are on the transmission contact surface of the engine block before transmission installation.

- (c) Install the automatic transmission with the 9 bolts.

**for 17 mm head bolt A - Torque: 71 N·m (724 kgf·cm, 52ft·lbf)**

**for 14 mm head bolt B - Torque: 37 N·m (377 kgf·cm, 27ft·lbf)**

## 5. CONNECT BREATHER PLUG HOSE

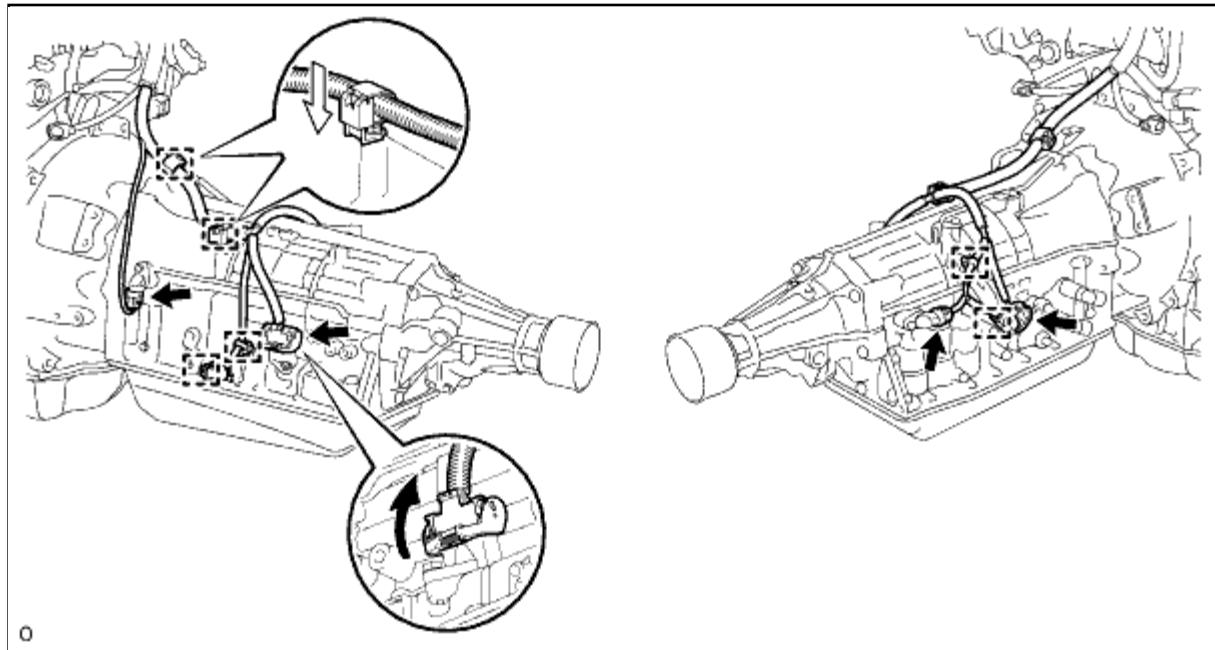
- (a) Connect the breather plug hose to the engine.

## 6. CONNECT WIRE HARNESS AND CONNECTOR

- (a) Connect the park/neutral start switch connector, transmission wire connector and 2 speed sensor connectors.

**HINT:**

**Push up the lever until the claw of the transmission wire connector makes a connection sound.**



- (b) Connect the 2 connector clamps and 4 harness clamps.

- (c) Tilt up the automatic transmission.

## 7. INSTALL REAR NO. 1 ENGINE MOUNTING INSULATOR

- (a) Install the rear engine mounting insulator to the transmission with the 4 bolts.

**Torque: 65 N·m (663 kgf·cm, 48ft·lbf)**

- (b) Install the rear engine mounting heat insulator to the engine mounting insulator.

**Torque: 12 N·m (122 kgf·cm, 9ft·lbf)**

## 8. INSTALL NO. 3 FRAME CROSSMEMBER SUB-ASSEMBLY

- (a) Install the frame crossmember to the rear engine mounting insulator with the 4 bolts.

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

- (b) Install the frame crossmember with the 4 bolts and 4 nuts.

**Torque: 72 N·m (734 kgf·cm, 53ft·lbf)**

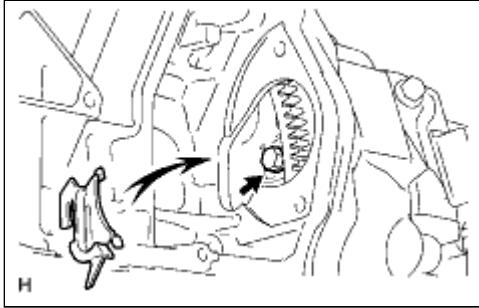
## 9. INSTALL FRONT SUSPENSION MEMBER BRACKET LH AND RH (for X-Runner)

- (a) Install the front suspension member bracket LH and RH with the 8 bolts.

**Torque: 33 N·m (337 kgf·cm, 24ft·lbf)**

## 10. INSTALL DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT

- (a) Turn the crankshaft to gain access to the installation



locations of the 6 torque converter clutch setting bolts and install each bolt while holding the crankshaft pulley bolt with a wrench.

**Torque: 48 N·m (489 kgf·cm, 35ft·lbf)**

**NOTICE:**

Install the black bolt first, and then the 5 silver bolts.

- (b) Install the flywheel housing side cover.

## 11. INSTALL STARTER ASSEMBLY

- (a) Install the starter .

## 12. CONNECT NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE

- (a) Temporarily install the ends of the oil cooler inlet tube and outlet tub to each oil cooler tube union by hand.

- (b) Close the 2 No. 2 flexible hose clamps and install the 2 bolts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

- (c) Using a union nut wrench, tighten the inlet and outlet tubes.

**Torque: 34 N·m (347 kgf·cm, 25ft·lbf)**

**NOTICE:**

Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench .

## 13. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Connect the transmission control cable to the transmission control cable bracket with a new clip, and connect the cable end to the control shaft lever with the nut.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

## 14. INSTALL NO. 2 MANIFOLD STAY

- (a) Install the stay with the 3 bolts.

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

## 15. INSTALL MANIFOLD STAY

- (a) Install the stay with the 3 bolts.

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

## 16. INSTALL FRONT EXHAUST PIPE ASSEMBLY

- (a) Install the front exhaust pipe .

## 17. INSTALL PROPELLER SHAFT ASSEMBLY

- (a) Install the propeller shaft .

## 18. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

**NOTICE:**

When disconnecting the cable, some systems need to be initialized after the cable is reconnected .

**19. ADD AUTOMATIC TRANSMISSION FLUID**

(a) Add automatic transmission fluid .

**20. ADJUST SHIFT LEVER POSITION** 

**21. INSPECT SHIFT LEVER POSITION** 

**22. INSPECT FOR EXHAUST GAS LEAK** 

**23. INSTALL FRONT NO. 1 FENDER APRON TO FRAME SEAL RH** 

**24. INSTALL FRONT FENDER APRON SEAL RH** 

**25. INSTALL REAR ENGINE UNDER COVER ASSEMBLY** 

**26. INSTALL NO. 1 ENGINE UNDER COVER** 

**27. PERFORM RESET MEMORY**

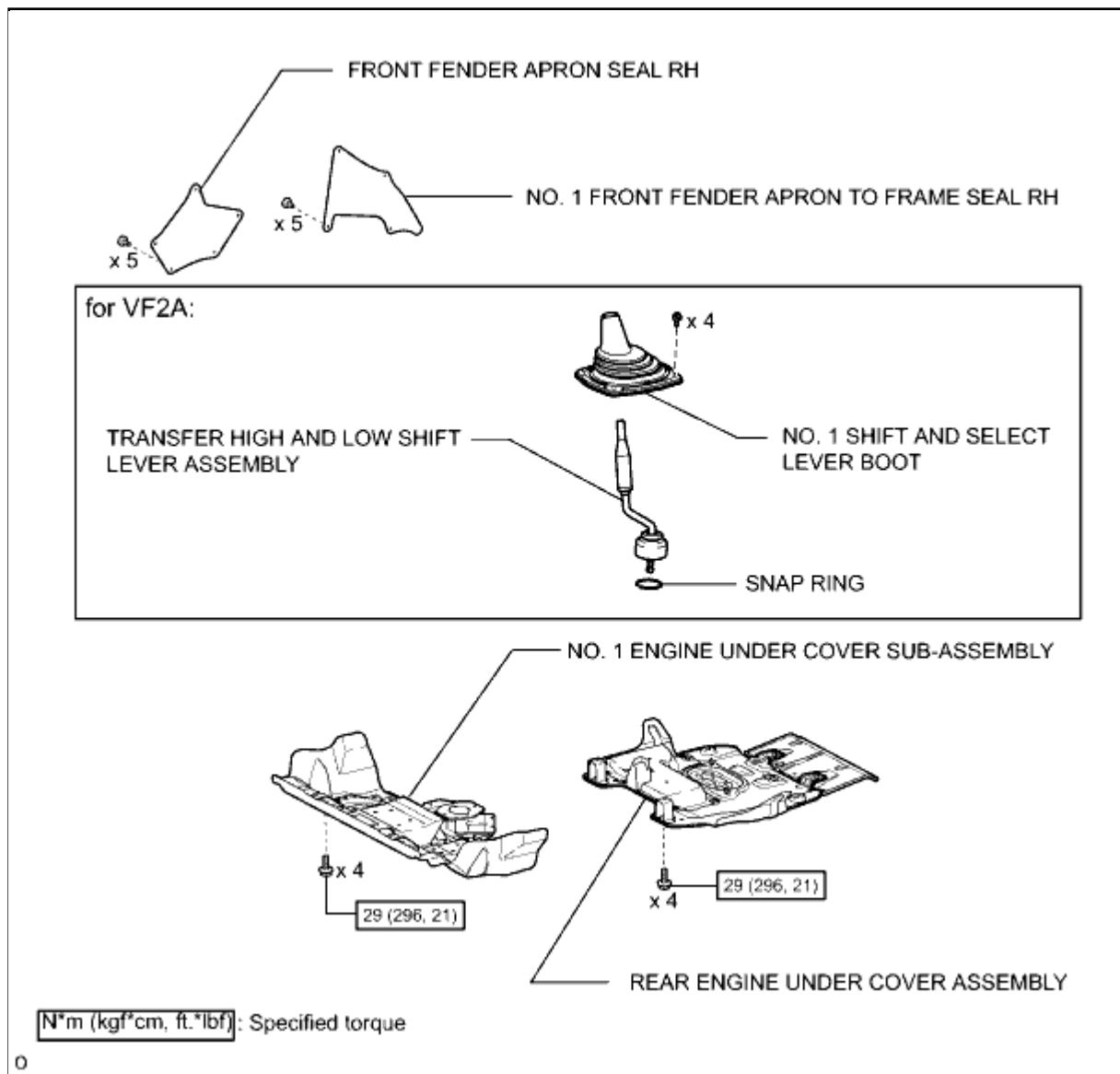
(a) Perform the RESET MEMORY procedures (A/T initialization) .



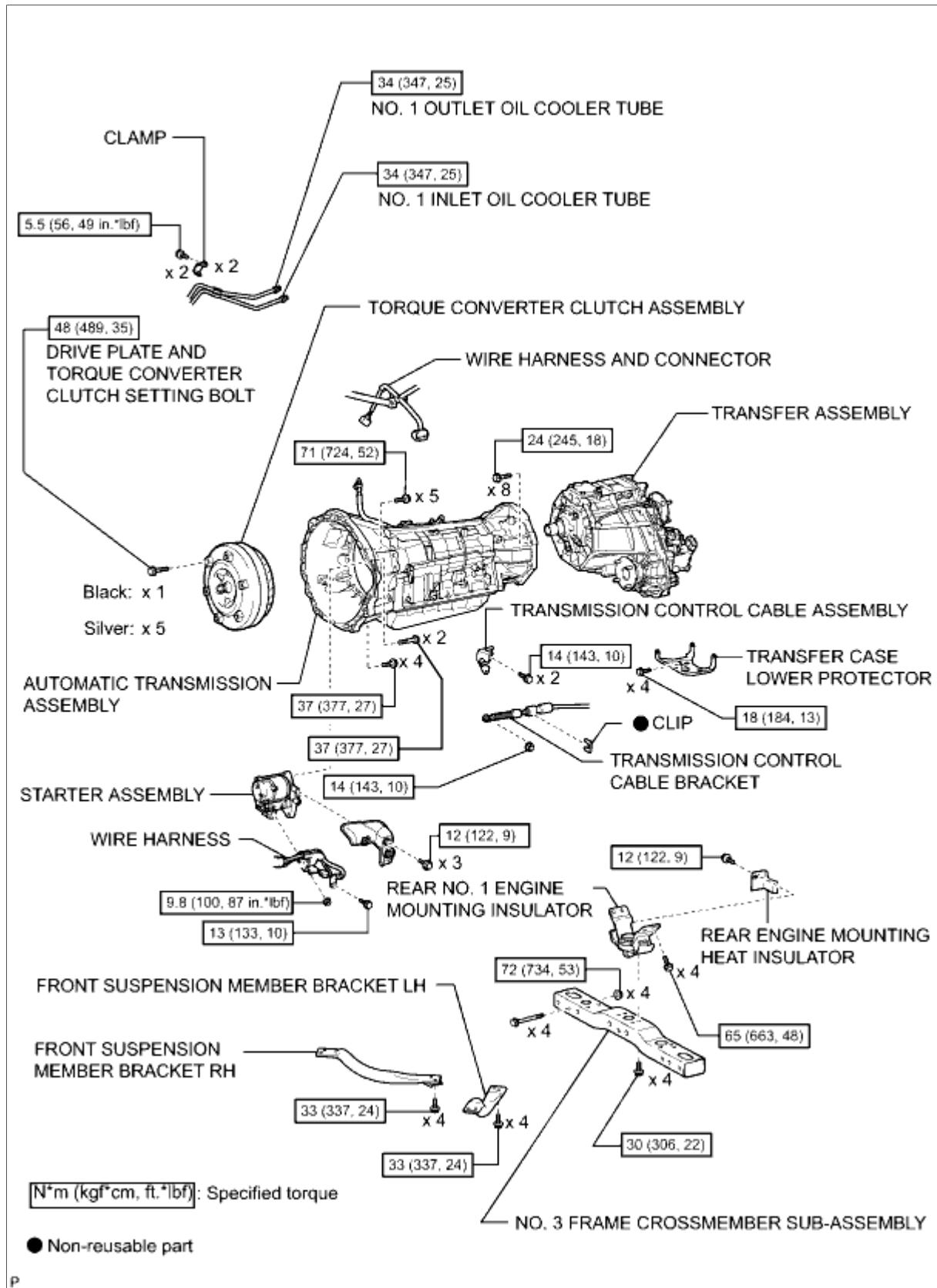
Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000018ZC01VX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



## ILLUSTRATION



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Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000018ZD01WX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: REMOVAL (2010 4Runner)		

## **REMOVAL**

### **1. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL**

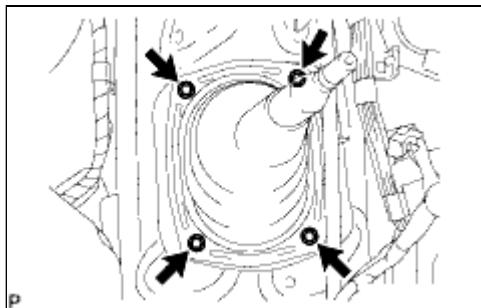
**NOTICE:**

When disconnecting the cable, some systems need to be initialized after the cable is reconnected .

### **2. REMOVE CONSOLE BOX ASSEMBLY (for VF2A)**

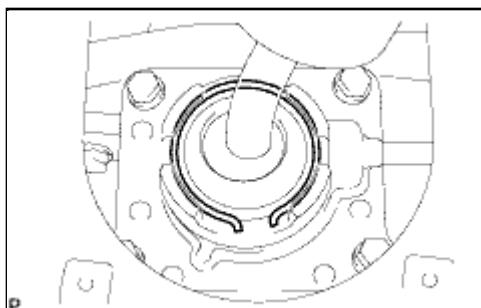
(a) Remove the console box assembly .

### **3. REMOVE TRANSFER HIGH AND LOW SHIFT LEVER ASSEMBLY (for VF2A)**



(a) Remove the 4screws and No. 1 shift and select lever boot.

(b) Fold back the transfer front drive shift boot.



(c) Using needle-nose pliers, remove the snap ring and pull out the transfer high and low shift lever.

### **4. REMOVE NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY**

### **5. REMOVE REAR ENGINE UNDER COVER ASSEMBLY**

### **6. REMOVE FRONT FENDER APRON SEAL RH**

### **7. REMOVE NO. 1 FRONT FENDER APRON TO FRAME SEAL RH**

## **8. DRAIN AUTOMATIC TRANSMISSION FLUID**

INFO

## **9. REMOVE TRANSFER CASE LOWER PROTECTOR**

- (a) Remove the 4 bolts and transfer case lower protector.

## **10. REMOVE FRONT PROPELLER SHAFT ASSEMBLY**

- (a) Remove the front propeller shaft

INFO

## **11. REMOVE PROPELLER SHAFT ASSEMBLY**

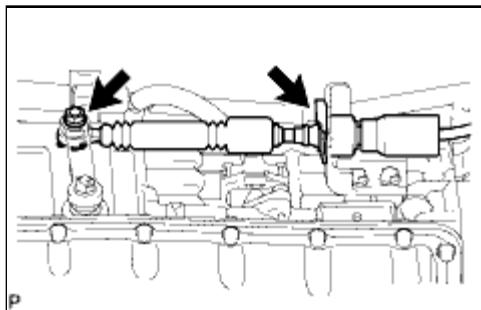
- (a) Remove the propeller shaft

INFO

## **12. REMOVE FRONT EXHAUST PIPE ASSEMBLY**

- (a) Remove the front exhaust pipe assembly

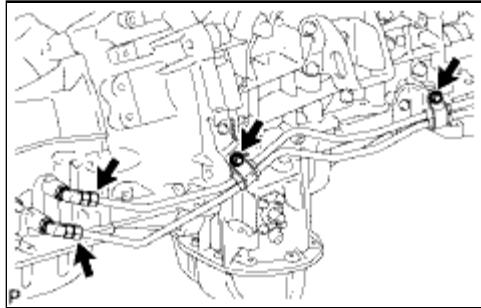
INFO



## **13. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

- (a) Remove the nut and clip, and disconnect the transmission control cable from the automatic transmission.

## **14. DISCONNECT NO. 1 INLET OIL COOLER TUBE AND NO. 1 OUTLET OIL COOLER TUBE**

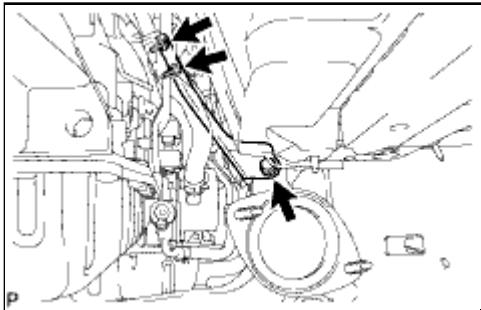


- (a) Remove the 2 bolts to open the 2 No. 2 flexible hose clamps.

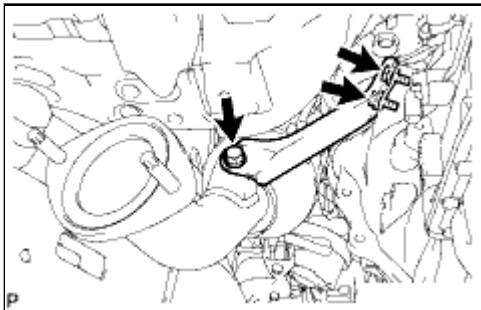
- (b) Using a union nut wrench, disconnect the No. 1 oil cooler inlet tube and No. 1 oil cooler outlet tube from each oil cooler tube union.

## **15. REMOVE MANIFOLD STAY**

- (a) Remove the 3 bolts and stay.



## 16. REMOVE NO. 2 MANIFOLD STAY

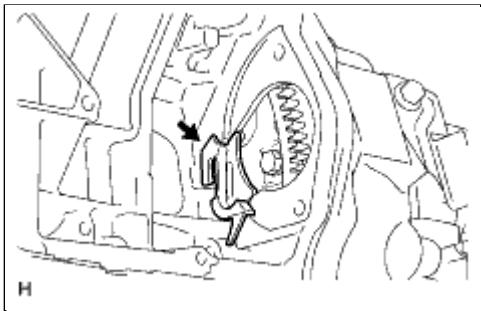


(a) Remove the 3 bolts and stay.

## 17. REMOVE STARTER ASSEMBLY

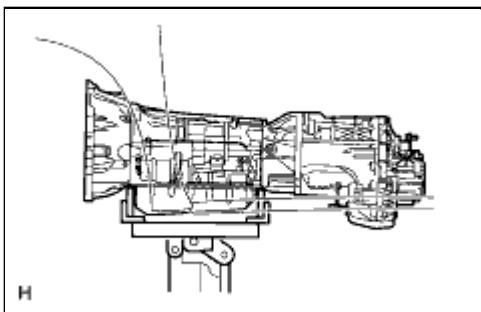
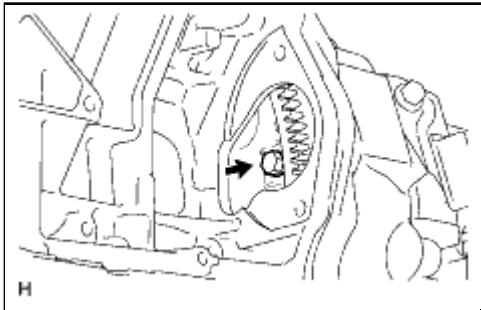
(a) Remove the starter assembly INFO.

## 18. REMOVE DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



(a) Remove the flywheel housing side cover.

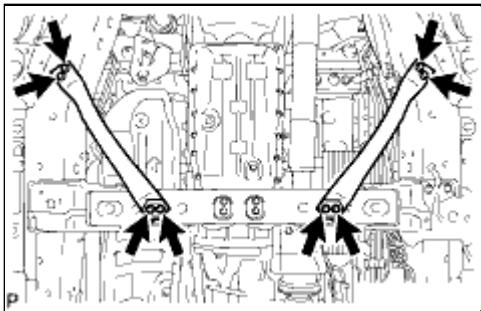
(b) Turn the crankshaft to gain access to the 6 bolts and remove each bolt while holding the crankshaft pulley setting bolt with a wrench.



## 19. SUPPORT AUTOMATIC TRANSMISSION ASSEMBLY

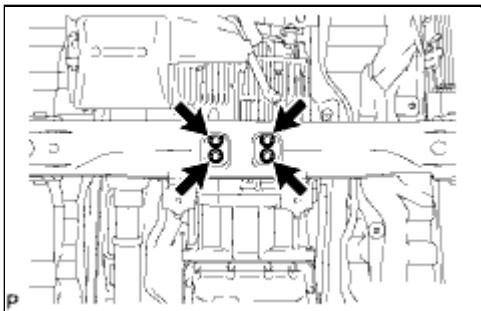
(a) Support the transmission with a transmission jack. Lift the transmission slightly from the crossmember.

## 20. REMOVE FRONT SUSPENSION MEMBER BRACKET LH AND RH (for X-Runner)

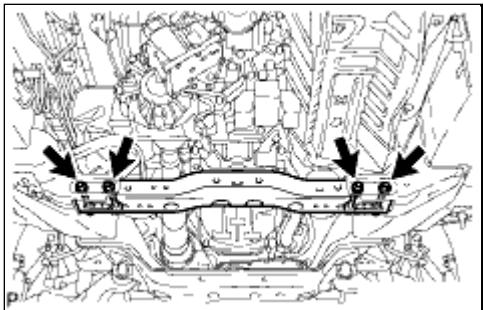


(a) Remove the 8 bolts and front suspension member bracket LH and RH.

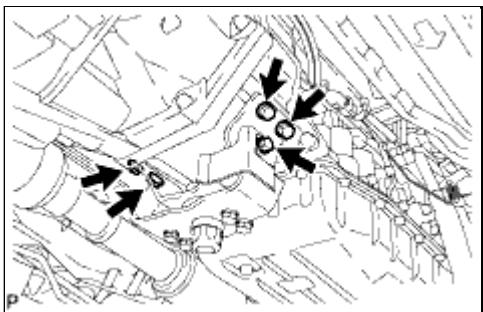
## 21. REMOVE NO. 3 FRAME CROSMEMBER SUB-ASSEMBLY



(a) Remove the 4 bolts of the rear engine mounting insulator.



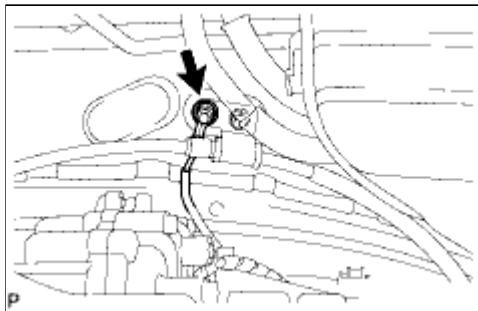
(b) Remove the 4 nuts, 4 bolts and frame crossmember.



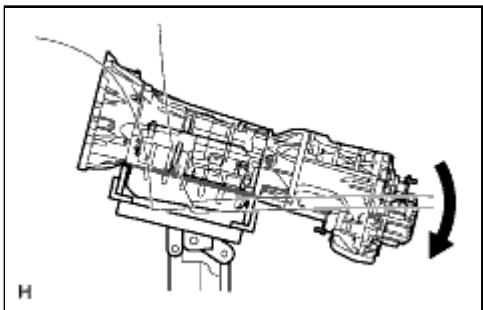
## 22. REMOVE REAR NO. 1 ENGINE MOUNTING INSULATOR

- Remove the bolt and rear engine mounting heat insulator.
- Remove the 4 bolts and rear engine mounting insulator from the transmission.

## 23. DISCONNECT WIRE HARNESS AND CONNECTOR



- Remove the nut and disconnect the ground cable.



- Tilt the transmission downward.

**NOTICE:**

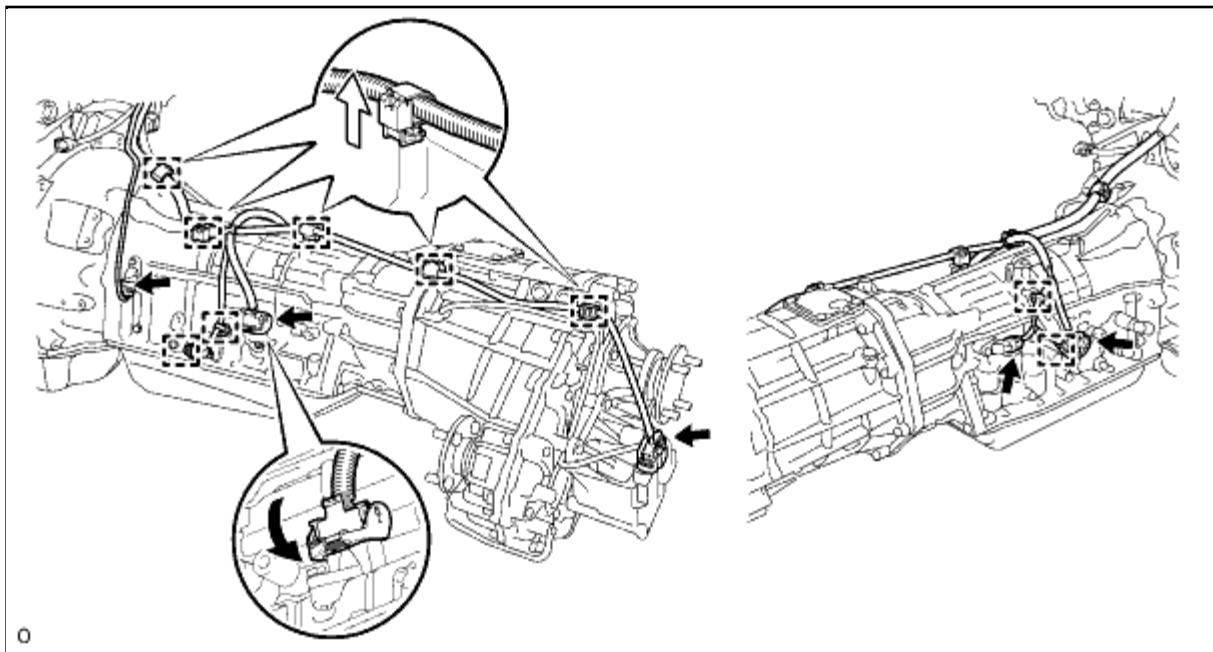
Make sure the cooling fan does not contact the fan shroud.

- for VF4BM:

- (1) Disconnect the park/neutral position switch connector, transmission wire connector, 2 transmission speed sensor connectors and transfer control side connectors.

**HINT:**

**Detach the claw, press down the lever, and then disconnect the transmission wire connector.**



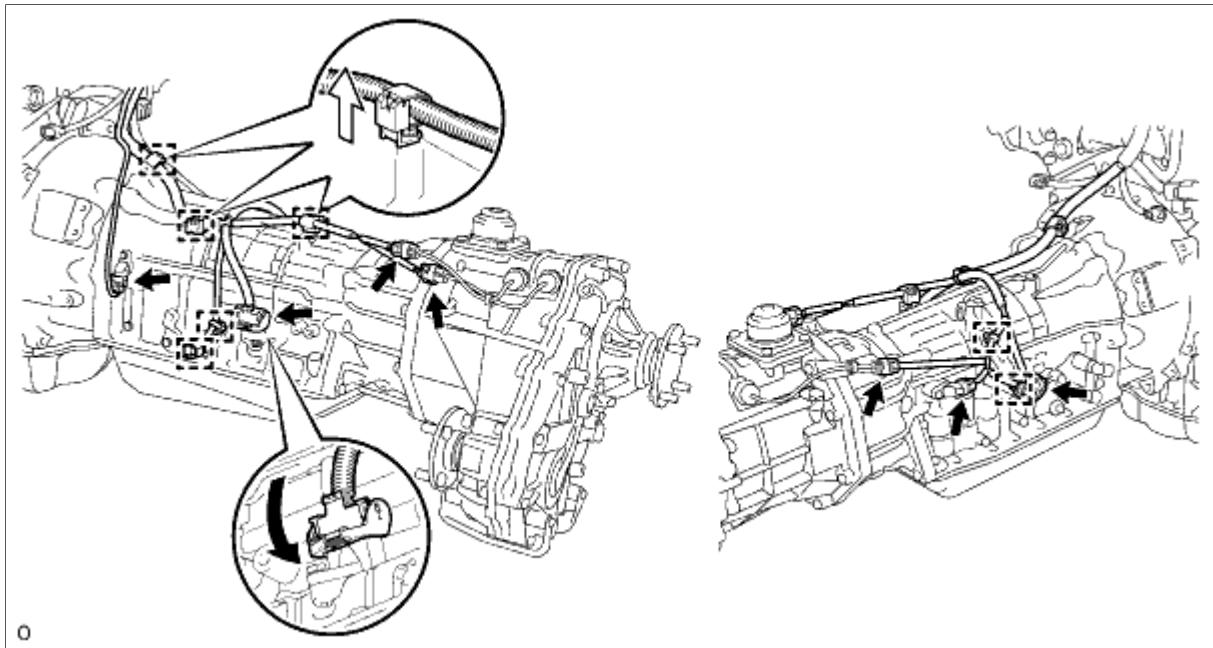
- (2) Detach the 2 connector clamps and 7 harness clamps, and disconnect wire harness.

(d) for VF2A:

- (1) Disconnect the park/neutral position switch connector, transmission wire connector, 2 transmission speed sensor connectors and 3 transfer connectors.

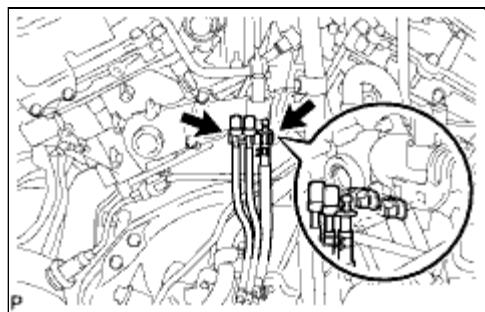
**HINT:**

**Detach the claw, press down the lever, and then disconnect the transmission wire connector.**



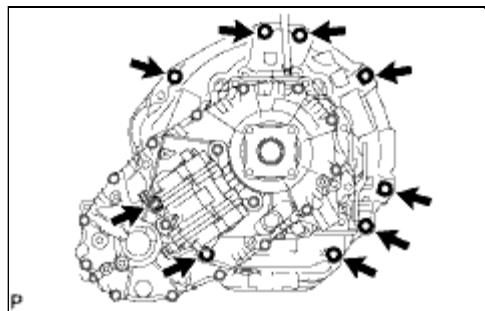
(2) Detach the 2 connector clamps and 5 harness clamps, and disconnect the wire harness.

#### 24. DISCONNECT BREATHER PLUG HOSE



(a) Disconnect the 3 breather plug hoses from the engine.

#### 25. REMOVE AUTOMATIC TRANSMISSION ASSEMBLY



(a) Remove the 9 bolts and transmission.

**NOTICE:**

**Do not use excess force when prying the transmission assembly.**

#### 26. REMOVE TRANSFER ASSEMBLY

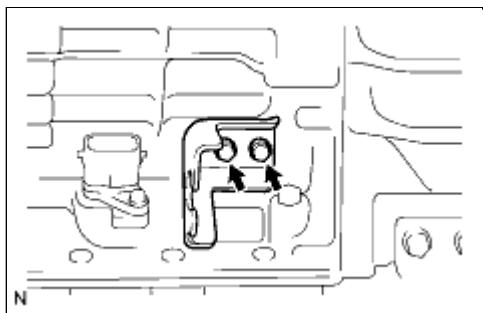
(a) for VF4BM :

Remove the transfer  .

(b) for VF2A:

Remove the transfer  .

## 27. REMOVE NO. 1 TRANSMISSION CONTROL CABLE BRACKET



(a) Remove the 2 bolts and control cable bracket.

## 28. REMOVE TORQUE CONVERTER CLUTCH ASSEMBLY

## 29. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY

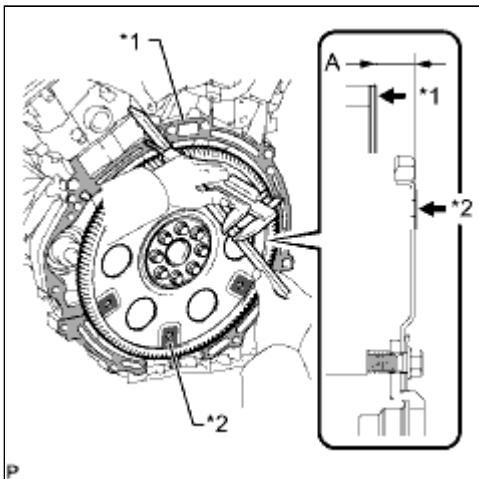
(a) Inspect the torque converter clutch  .



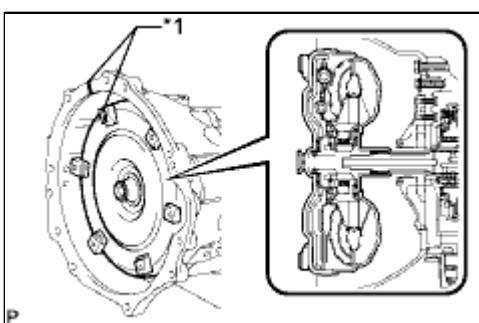
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000018ZB01XX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION ASSEMBLY: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TORQUE CONVERTER CLUTCH ASSEMBLY



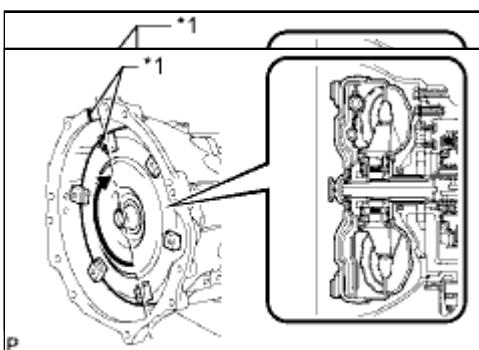
- (a) Using a vernier caliper and straightedge, measure dimension A between the transmission fitting surface of the engine \*1 and the torque converter fitting surface of the drive plate \*2 (step 1)



- (b) Aligning the matchmarks on the transmission case and torque converter clutch, and then mesh the splines of the input shaft and turbine runner.

#### Text in Illustration

*1	Matchmark
----	-----------



- (c) Mesh the splines of the stator shaft and stator while turning the torque converter clutch.

- (d) Turn the torque converter clutch and align the

**Text in Illustration**  
matchmarks on the torque converter clutch and transmission case to mesh the key of the oil pump drive gear into the slot on the torque converter clutch.

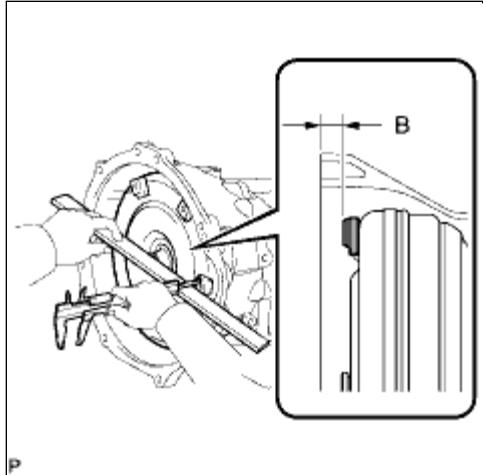
\*1 Matchmark  
**Text in Illustration**

**HINT:**

Turn the torque converter clutch approximately 180°.

**NOTICE:**

**Do not push on the torque converter when aligning the matchmarks.**



(e) Using a vernier caliper and straightedge, measure dimension B shown in the illustration and check that B is more than A (measured in step 1).

Standard distance:

A + 1 mm (0.0394 in.) or more

## 2. INSTALL NO. 1 TRANSMISSION CONTROL CABLE BRACKET

- (a) Install the No. 1 transmission control cable bracket to the transmission assembly with the 2 bolts.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

## 3. INSTALL TRANSFER ASSEMBLY

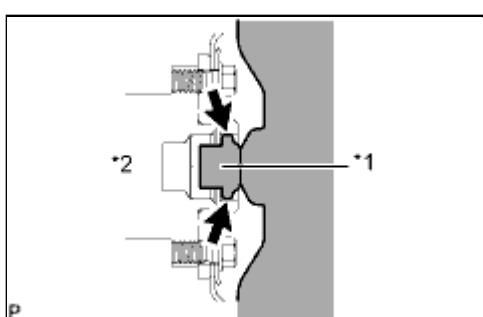
- (a) for VF4BM :

Install the transfer .

- (b) for VF2A :

Install the transfer .

## 4. INSTALL AUTOMATIC TRANSMISSION ASSEMBLY



- (a) Apply clutch spline grease to the surface of the crankshaft that contacts the torque converter clutch centerpiece.

Clutch spline grease:

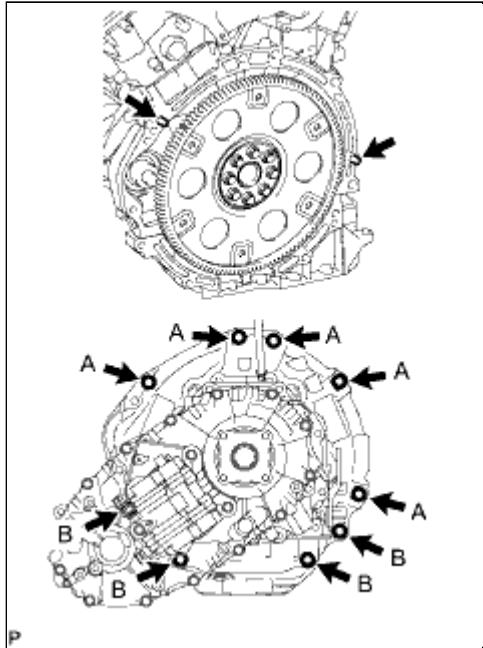
Toyota Genuine Clutch Spline Grease or equivalent

**Maximum grease amount**

Approximately 1 g (0.0353 oz.)

**Text in Illustration**

* 1	Torque Converter Clutch Centerpiece
* 2	Crankshaft



(b) Confirm that the 2 knock pins are on the transmission contact surface of the engine block before transmission installation.

(c) Install the transmission with the 9 bolts.

**for 17 mm head bolt A - Torque: 71 N·m (724 kgf·cm, 52ft·lbf)**

**for 14 mm head bolt B - Torque: 37 N·m (377 kgf·cm, 27ft·lbf)**

## 5. CONNECT BREATHER HOSE

(a) Connect the 3 breather plug hoses to the engine.

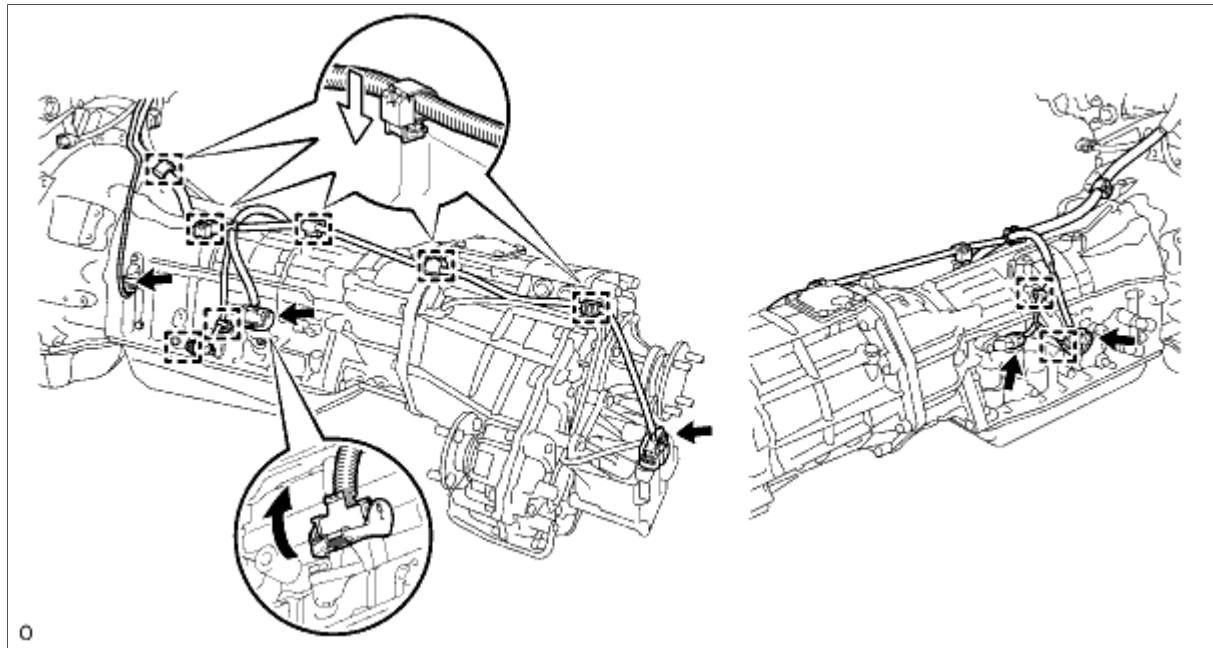
## 6. CONNECT WIRE HARNESS AND CONNECTOR

(a) for VF4BM :

(1) Connect the park/neutral position switch connector, transmission wire connector, 2 speed sensor connectors and transfer control side connector.

### **HINT:**

**Push up the lever until the claw of the transmission wire connector makes a connection sound.**



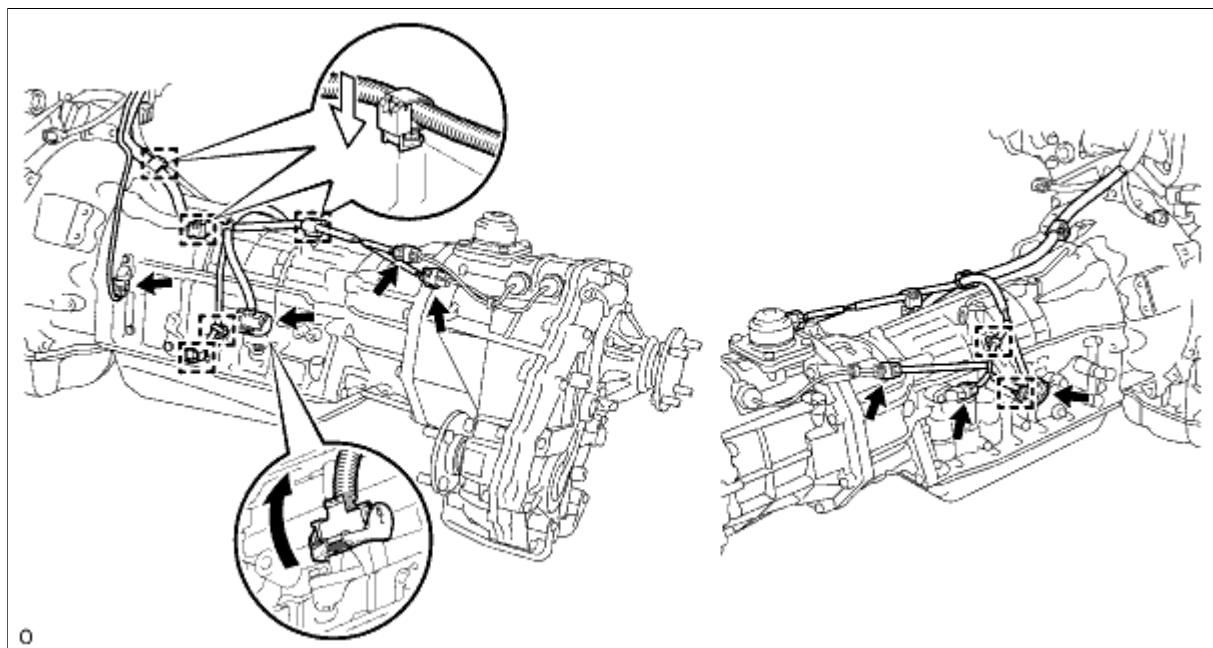
(2) Attach the 2 connector clamps and 7 harness clamps.

(b) for VF2A:

(1) Connect the park/neutral position switch connector, transmission wire connector, 2 speed sensor connectors and 3 transfer connector.

**HINT:**

**Push up the lever until the claw of the transmission wire connector makes a connection sound.**



(2) Attach the 2 connector clamps and 5 harness clamps.

(c) Tilt up the automatic transmission.

(d) Connect the ground cable with the nut.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

## 7. INSTALL REAR NO. 1 ENGINE MOUNTING INSULATOR

(a) Install the rear engine mounting insulator to the transmission with the 4 bolts.

**Torque: 65 N·m (663 kgf·cm, 48ft·lbf)**

(b) Install the rear engine mounting heat insulator to the engine mounting insulator.

**Torque: 12 N·m (122 kgf·cm, 9ft·lbf)**

## 8. INSTALL NO. 3 FRAME CROSMEMBER SUB-ASSEMBLY

(a) Install the frame crossmember to the rear engine mounting insulator with the 4 bolts.

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

(b) Install the frame crossmember to the frame with the 4 bolts and 4 nuts.

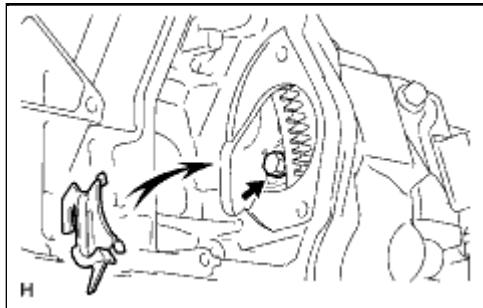
**Torque: 72 N·m (734 kgf·cm, 53ft·lbf)**

## 9. INSTALL FRONT SUSPENSION MEMBER BRACKET LH AND RH (for X-Runner)

(a) Install the front suspension member bracket LH and front suspension member bracket RH with the 8 bolts.

**Torque: 33 N·m (337 kgf·cm, 24ft·lbf)**

## 10. INSTALL DRIVE PLATE AND TORQUE CONVERTER CLUTCH SETTING BOLT



(a) Turn the crankshaft to gain access to the installation locations of the 6 bolts and install each bolt while holding the crankshaft pulley setting bolt with a wrench.

**Torque: 48 N·m (489 kgf·cm, 35ft·lbf)**

**NOTICE:**

**Install the black bolt first, and then the 5 silver bolts.**

(b) Install the flywheel housing side cover to the engine.

## 11. CONNECT NO. 1 INLET OIL COOLER TUBE AND NO. 1 OUTLET OIL COOLER TUBE

(a) Temporarily install the ends of the oil cooler inlet tube and outlet tube to each oil cooler tube union by hand.

(b) Close the 2 flexible hose clamps and install the 2 bolts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

(c) Using a union nut wrench, tighten the inlet and outlet tubes.

**Torque: 34 N·m (346 kgf·cm, 25ft·lbf)**

**NOTICE:**

**Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench** .

## 12. INSTALL STARTER ASSEMBLY

(a) Install the starter assembly .

## 13. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Connect the transmission control cable to the transmission control cable bracket with a new clip, and connect the cable end to the control shaft lever with the nut.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

## 14. INSTALL MANIFOLD STAY

- (a) Install the stay with the 3 bolts.

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

## 15. INSTALL NO. 2 MANIFOLD STAY

- (a) Install the stay with the 3 bolts.

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

## 16. INSTALL FRONT EXHAUST PIPE ASSEMBLY

- (a) Install the front exhaust pipe assembly .

## 17. INSTALL PROPELLER SHAFT ASSEMBLY

- (a) Install the propeller shaft .

## 18. INSTALL FRONT PROPELLER SHAFT ASSEMBLY

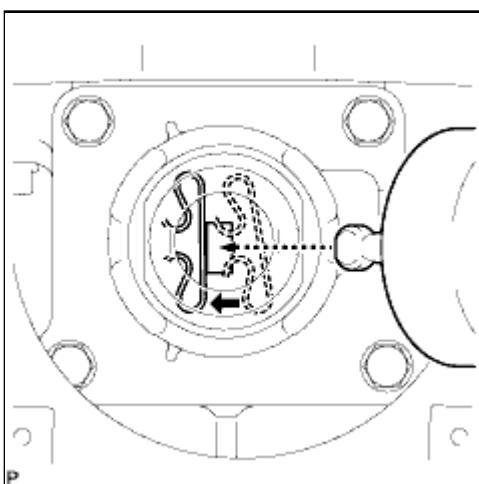
- (a) Install the front propeller shaft .

## 19. INSTALL TRANSFER CASE LOWER PROTECTOR

- (a) Install the transfer case lower protector with the 4 bolts.

**Torque: 18 N·m (184 kgf·cm, 13ft·lbf)**

## 20. INSTALL TRANSFER HIGH AND LOW SHIFT LEVER ASSEMBLY (for VF2A)

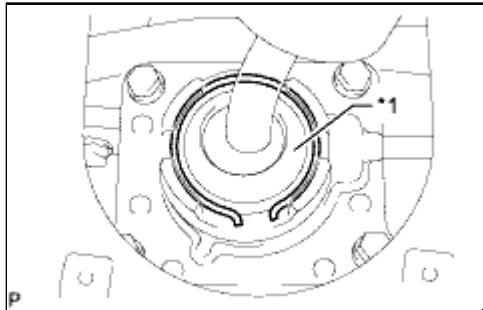


- (a) While pushing the select return spring to the left with the end of the transfer high and low shift lever, insert the end of the shift lever into the shift fork.

### Text in Illustration

\*1 Select Return Spring

- (b) While holding down the shift lever cap, install the snap ring to install the transfer high and low shift lever.



## Text in Illustration

\* 1

Shift Lever Cap

- (c) Return the transfer front drive shift boot to its original position.
- (d) Install the No. 1 shift and select lever boot with the 4 screws.

## 21. INSTALL CONSOLE BOX ASSEMBLY (for VF2A)

- (a) Install the console box assembly INFO.

## 22. CONNECT CABLE TO NEGATIVE BATTERY TERMINAL

### NOTICE:

When disconnecting the cable, some systems need to be initialized after the cable is reconnected INFO.

## 23. ADD AUTOMATIC TRANSMISSION FLUID

- (a) Add automatic transmission fluid INFO.

## 24. ADJUST SHIFT LEVER POSITION INFO

## 25. INSPECT SHIFT LEVER POSITION INFO

## 26. INSPECT FOR EXHAUST GAS LEAK INFO

## 27. INSTALL FRONT FENDER APRON SEAL RH INFO

## 28. INSTALL NO. 1 FRONT FENDER APRON TO FRAME SEAL RH INFO

## 29. INSTALL REAR ENGINE UNDER COVER ASSEMBLY INFO

## 30. INSTALL NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY INFO

## 31. RESET PERFORM RESET MEMORY

- (a) Perform the Reset Memory procedures (A/T initialization) INFO.



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000014P800NX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION FLUID: ON-VEHICLE INSPECTION (2010 4Runner)		

## ON-VEHICLE INSPECTION

### 1. CHECK TRANSMISSION FLUID LEVEL

#### HINT:

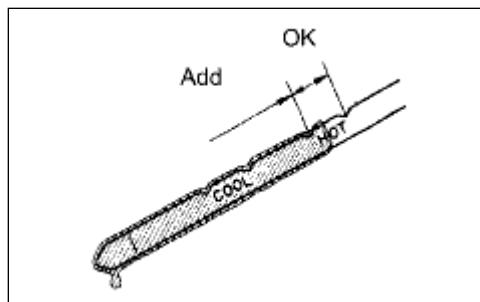
- Drive the vehicle so that the engine and transmission are at the normal operating temperature.

Standard ATF temperature:

70 to 80°C (158 to 176°F)

- The ATF temperature can be checked with the Techstream.

Enter the following menus: Powertrain / Engine and ECT / Data List / A/T Oil Temperature 3.



(a) Park the vehicle on a level surface and set the parking brake.

- (b) With the engine idling and the brake pedal depressed, move the shift lever to all positions from P to L. Then return it to P.
- (c) Pull out the dipstick and wipe it clean.
- (d) Push it back fully into the pipe.
- (e) Pull it out and check that the fluid level is in the HOT range.

If the level is not in the HOT range, add transmission fluid.



Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BL001ZX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION FLUID: ADJUSTMENT (2010 4Runner)		

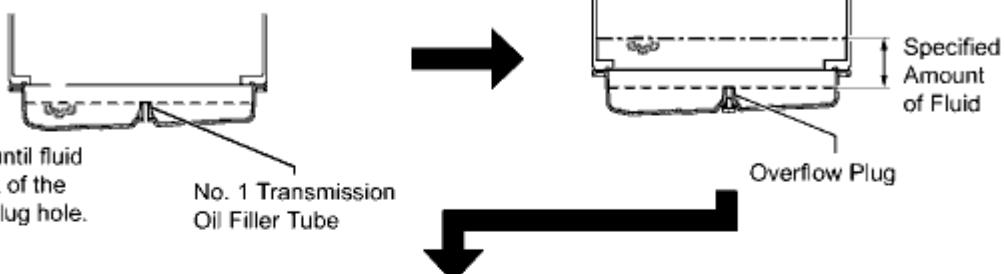
## ADJUSTMENT

### Fluid Filling Procedure:

#### TRANSMISSION FILL (When necessary)

Add fluid to the oil pan to the specified level.

Add the correct amount of fluid specified for the operation that was performed.



#### FLUID TEMPERATURE CHECK

Start the engine to circulate the fluid. Enter fluid temperature detection mode and engine idle speed control mode, and adjust the fluid temperature to the specified value.

#### FLUID LEVEL CHECK

Drain excess fluid at the specified fluid temperature.

If no fluid comes out, add fluid until fluid comes out of the overflow plug hole.



Keep the overflow plug open until only drops of fluid come out.



P

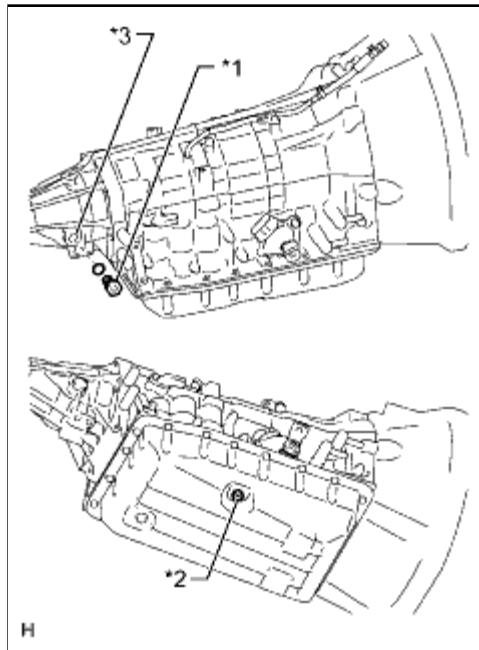
### NOTICE:

- This transmission requires Toyota Genuine ATF WS.
- After servicing the transmission, you must follow the ATF adjustment procedure.
- Maintain the vehicle in a horizontal position while adjusting the fluid level.

## 1. BEFORE FILLING TRANSMISSION

- When you have replaced the entire transmission, transmission pan, drain plug, valve body and/or torque converter, proceed to the "Transmission Fill" procedures.
- When you have replaced the transmission hose and/ or output shaft oil seal, proceed to the "Fluid Temperature Check" procedures.

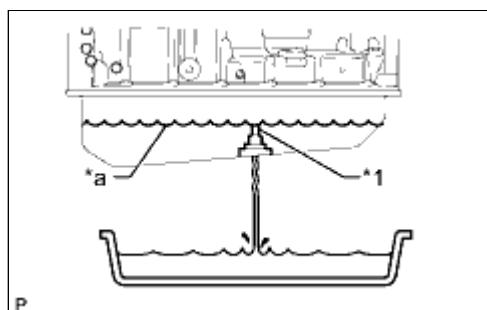
## 2. TRANSMISSION FILL



(a) Remove the refill plug and overflow plug.

### Text in Illustration

* 1	Refill Plug
* 2	Overflow Plug
* 3	Refill Hole



(b) Fill the transmission through the refill hole until fluid begins to trickle out of the overflow tube.

### Text in Illustration

* 1	Overflow Tube
* a	Specified fluid level

(c) Reinstall the overflow plug.

(d) Fill the transmission with the amount of fluid listed in the table below.

Reference Capacity:

REPAIR	FILL AMOUNT
Transmission pan and drain plug removal	1.7 liters (1.8 US qts, 1.5 Imp. qts)
Transmission valve body removal	4.3 liters (4.5 US qts, 3.8 Imp. qts)
Torque converter removal	5.4 liters (5.7 US qts, 4.8 Imp. qts)

- (e) Install the refill plug.

**HINT:**

If you cannot fill the listed amount of fluid, perform the following:

- (1) Start the engine and idle it.

**NOTICE:**

Check that electrical systems such as the air conditioning system, audio system and lighting system are off.

- (2) Move the shift lever through the entire gear range to circulate the fluid.  
(3) Wait for 30 seconds with the engine idling.  
(4) Stop the engine.  
(5) Remove the refill plug.  
(6) Fill the transmission with the remaining fluid until the amount in the table has been filled.  
(7) Install the refill plug.

### 3. FLUID TEMPERATURE CHECK

**NOTICE:**

The ATF temperature can be confirmed by using the Techstream.

- (a) Turn the ignition switch off.  
(b) Connect the Techstream to the DLC3.  
(c) Turn the ignition switch to ON.  
(d) Enter the following menus: Powertrain / ECT / Data List / A/T Oil Temperature 1.  
(e) Check the ATF temperature.

**NOTICE:**

If the ATF temperature is higher than 45°C (113°F), turn the ignition switch off and wait until the fluid temperature drops to below 40°C (104°F).

### 4. FLUID LEVEL CHECK

**NOTICE:**

- It is necessary to change to temperature detection mode in order to idle the vehicle appropriately.
- The ATF temperature must be between 40 and 45°C (104 and 113°F) to accurately check the fluid level.

- (a) When using the Techstream:

Enter the following menus: Powertrain / ECT / Active Test / Connect the TC and TE1.

Standard condition:

Indicator lights in the combination meter blink.

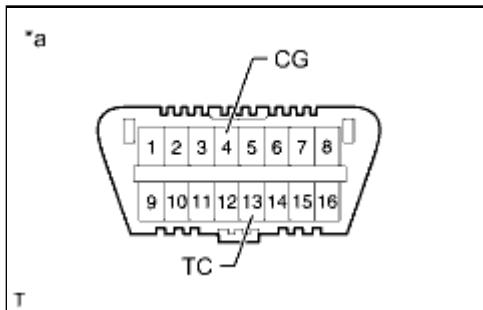
(b) When not using the Techstream:

Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

**SST: 09843-18040**

Standard condition:

Indicator lights in the combination meter blink.



## Text in Illustration

\* 1 Front view of DLC3:

(c) Start the engine and idle it.

### NOTICE:

Check that electrical systems such as the air conditioning system, audio system and lighting system are off.

(d) Slowly move the shift lever from P to S, and then change the gear from 1st to 5th. Then return the shift lever to P.

### HINT:

**Slowly move the shift lever to circulate the fluid through each part of the transmission.**



(e) Move the shift lever to D, and quickly move it back and forth between N and D (once within 1.5 seconds) for at least 6 seconds. This will activate the fluid temperature detection mode.

Standard condition:

Indicator light [A/T OIL TEMP] remains illuminated for 2 seconds and then turns off.

(f) When using the Techstream:

Return the shift lever to P and terminate the Active Test on the Techstream.

(g) When not using the Techstream:

Return the shift lever to P and disconnect SST from the DLC3.

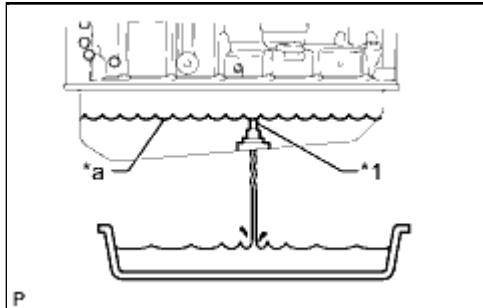
(h) Allow the engine to idle until the fluid temperature reaches 40 to 45°C (104 to 113°F).

### HINT:

**The indicator [A/T OIL TEMP] will come on again when the fluid temperature reaches 40°C (104°F) and will blink if it is higher than 45°C (113°F).**

## Indicator [A/T OIL TEMP] Indication of ATF Temperature

Below 40°C (104°F)	40 to 45°C (104 to 113°F)	Higher than 45°C (113°F)
Turn off	Turn on	Blinking



(i) Remove the overflow plug and gasket with the engine idling.

(j) Wait until the overflow slows to a trickle.

#### Text in Illustration

* 1	Overflow Tube
* a	Specified fluid level

#### NOTICE:

If the fluid does not overflow, perform the following:

(1) Remove the refill plug and gasket.

(2) Refill the transmission through the refill hole until fluid begins to trickle out of the overflow tube.

(3) Wait until the overflow slows to a trickle.

(k) Install a new gasket and the overflow plug.

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

(l) Install a new gasket and the refill plug.

**Torque: 37 N·m (379 kgf·cm, 27ft·lbf)**

#### 5. COMPLETE

(a) Turn the ignition switch off.

(b) When using the Techstream:

Disconnect the Techstream from the DLC3.

(c) Inspect for automatic transmission fluid leak.



Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BL0021X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION FLUID: ADJUSTMENT (2010 4Runner)		

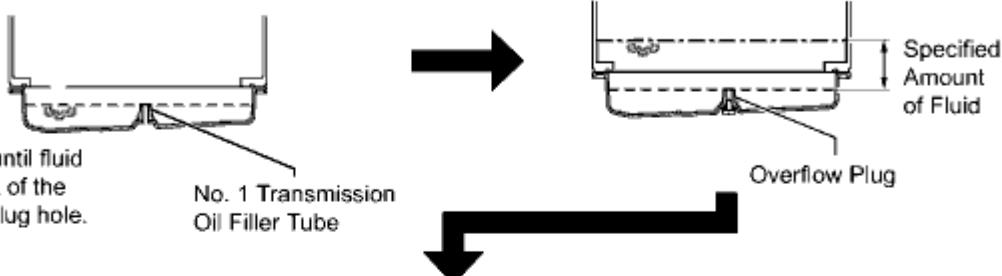
## ADJUSTMENT

### Fluid Filling Procedure:

#### TRANSMISSION FILL (When necessary)

Add fluid to the oil pan to the specified level.

Add the correct amount of fluid specified for the operation that was performed.



#### FLUID TEMPERATURE CHECK

Start the engine to circulate the fluid. Enter fluid temperature detection mode and engine idle speed control mode, and adjust the fluid temperature to the specified value.

#### FLUID LEVEL CHECK

Drain excess fluid at the specified fluid temperature.

If no fluid comes out, add fluid until fluid comes out of the overflow plug hole.



Keep the overflow plug open until only drops of fluid come out.



P

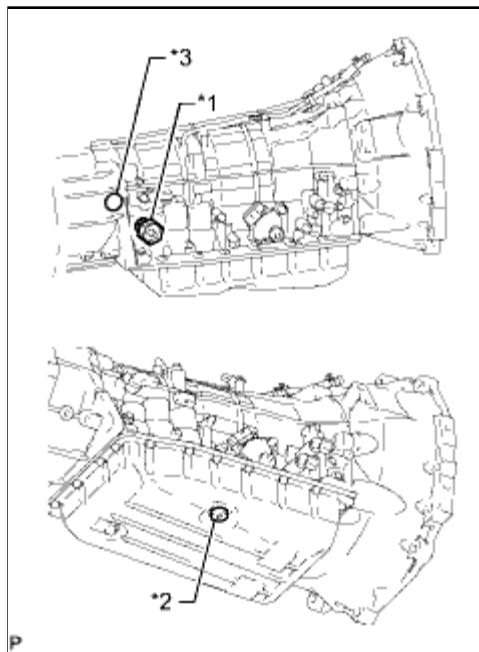
### **NOTICE:**

- This transmission requires Toyota Genuine ATF WS.
- After servicing the transmission, you must follow the ATF adjustment procedure.
- Maintain the vehicle in a horizontal position while adjusting the fluid level.

## 1. BEFORE FILLING TRANSMISSION

- When you have replaced the entire transmission, transmission pan, drain plug, valve body and/or torque converter, proceed to the "Transmission Fill" procedures.
- When you have replaced the transmission hose and/ or output shaft oil seal, proceed to the "Fluid Temperature Check" procedures.

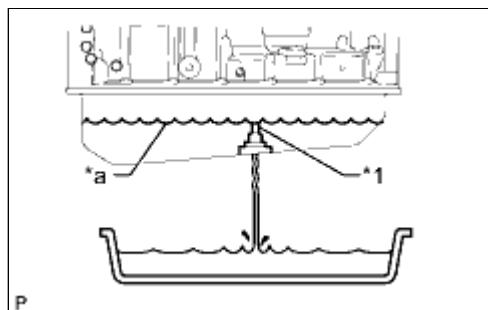
## 2. TRANSMISSION FILL



(a) Remove the refill plug and overflow plug.

### Text in Illustration

* 1	Refill Plug
* 2	Overflow Plug
* 3	Refill Hole



(b) Fill the transmission through the refill hole until fluid begins to trickle out of the overflow tube.

### Text in Illustration

* 1	Overflow Tube
* a	Specified fluid level

(c) Reinstall the overflow plug.

(d) Fill the transmission with the amount of fluid listed in the table below.

Reference Capacity:

REPAIR	FILL AMOUNT
Transmission pan and drain plug removal	1.7 liters (1.8 US qts, 1.5 Imp. qts)
Transmission valve body removal	4.3 liters (4.5 US qts, 3.8 Imp. qts)
Torque converter removal	5.4 liters (5.7 US qts, 4.8 Imp. qts)

- (e) Install the refill plug.

**HINT:**

If you cannot fill the listed amount of fluid, perform the following:

- (1) Start the engine and idle it.

**NOTICE:**

Check that electrical systems such as the air conditioning system, audio system and lighting system are off.

- (2) Move the shift lever through the entire gear range to circulate the fluid.  
(3) Wait for 30 seconds with the engine idling.  
(4) Stop the engine.  
(5) Remove the refill plug.  
(6) Fill the transmission with the remaining fluid until the amount in the table has been filled.  
(7) Install the refill plug.

### 3. FLUID TEMPERATURE CHECK

**NOTICE:**

The ATF temperature can be confirmed by using the Techstream.

- (a) Turn the ignition switch off.  
(b) Connect the Techstream to the DLC3.  
(c) Turn the ignition switch to ON.  
(d) Enter the following menus: Powertrain / ECT / Data List / A/T Oil Temperature 1.  
(e) Check the ATF temperature.

**NOTICE:**

If the ATF temperature is higher than 45°C (113°F), turn the ignition switch off and wait until the fluid temperature drops to below 40°C (104°F).

### 4. FLUID LEVEL CHECK

**NOTICE:**

- It is necessary to change to temperature detection mode in order to idle the vehicle appropriately.
- The ATF temperature must be between 40 and 45°C (104 and 113°F) to accurately check the fluid level.

- (a) When using the Techstream:

Enter the following menus: Powertrain / ECT / Active Test / Connect the TC and TE1.

Standard condition:

Indicator lights in the combination meter blink.

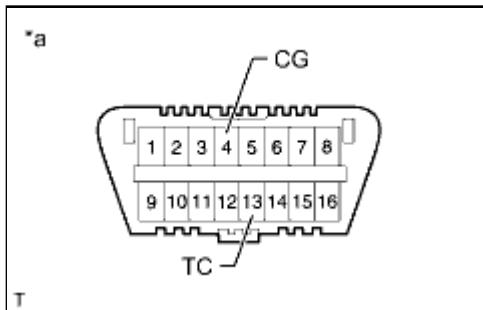
(b) When not using the Techstream:

Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

**SST: 09843-18040**

Standard condition:

Indicator lights in the combination meter blink.



## Text in Illustration

\* 1 Front view of DLC3:

(c) Start the engine and idle it.

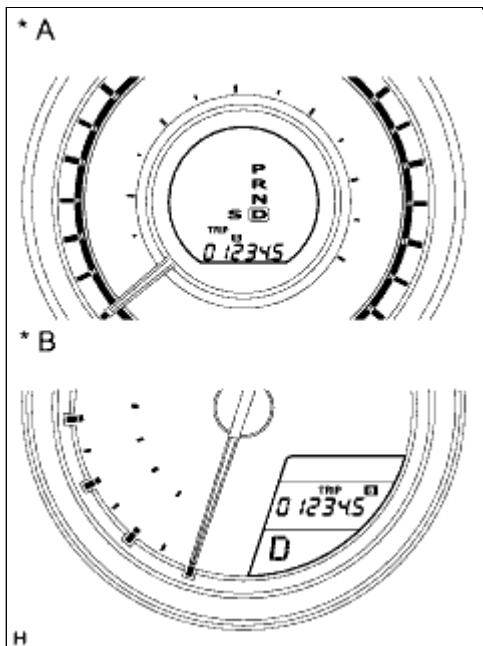
### NOTICE:

Check that electrical systems such as the air conditioning system, audio system and lighting system are off.

(d) Slowly move the shift lever from P to S, and then change the gear from 1st to 5th. Then return the shift lever to P.

### HINT:

**Slowly move the shift lever to circulate the fluid through each part of the transmission.**



(e) Move the shift lever to D, and quickly move it back and forth between N and D (once within 1.5 seconds) for at least 6 seconds. This will activate the fluid temperature detection mode.

Standard condition:

Indicator light [D] remains illuminated for 2 seconds and then turns off.

## Text in Illustration

*A	Optitron Meter
*B	Standard Meter

(f) When using the Techstream:

Return the shift lever to P and terminate the Active Test on the Techstream.

(g) When not using the Techstream:

Return the shift lever to P and disconnect SST from the DLC3.

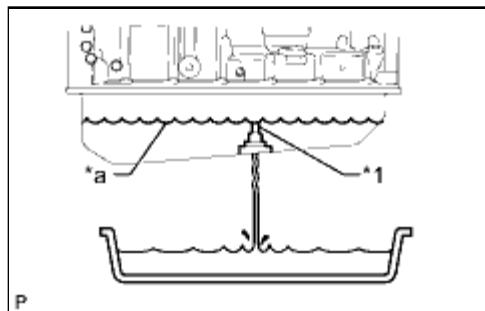
(h) Allow the engine to idle until the fluid temperature reaches 40 to 45°C (104 to 113°F).

**HINT:**

**The indicator [D] will come on again when the fluid temperature reaches 40°C (104°F) and will blink if it is higher than 45°C (113°F).**

**Indicator [D] Indication of ATF Temperature**

Below 40°C (104°F)	40 to 45°C (104 to 113°F)	Higher than 45°C (113°F)
Turn off	Turn on	Blinking



(i) Remove the overflow plug and gasket with the engine idling.

(j) Wait until the overflow slows to a trickle.

**Text in Illustration**

*1	Overflow Tube
*a	Specified fluid level

**NOTICE:**

**If the fluid does not overflow, perform the following:**

(1) Remove the refill plug and gasket.

(2) Refill the transmission through the refill hole until fluid begins to trickle out of the overflow tube.

(3) Wait until the overflow slows to a trickle.

(k) Install a new gasket and the overflow plug.

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

(l) Install a new gasket and the refill plug.

**Torque: 37 N·m (379 kgf·cm, 27ft·lbf)**

**5. COMPLETE**

(a) Turn the ignition switch off.

(b) When using the Techstream:

Disconnect the Techstream from the DLC3.

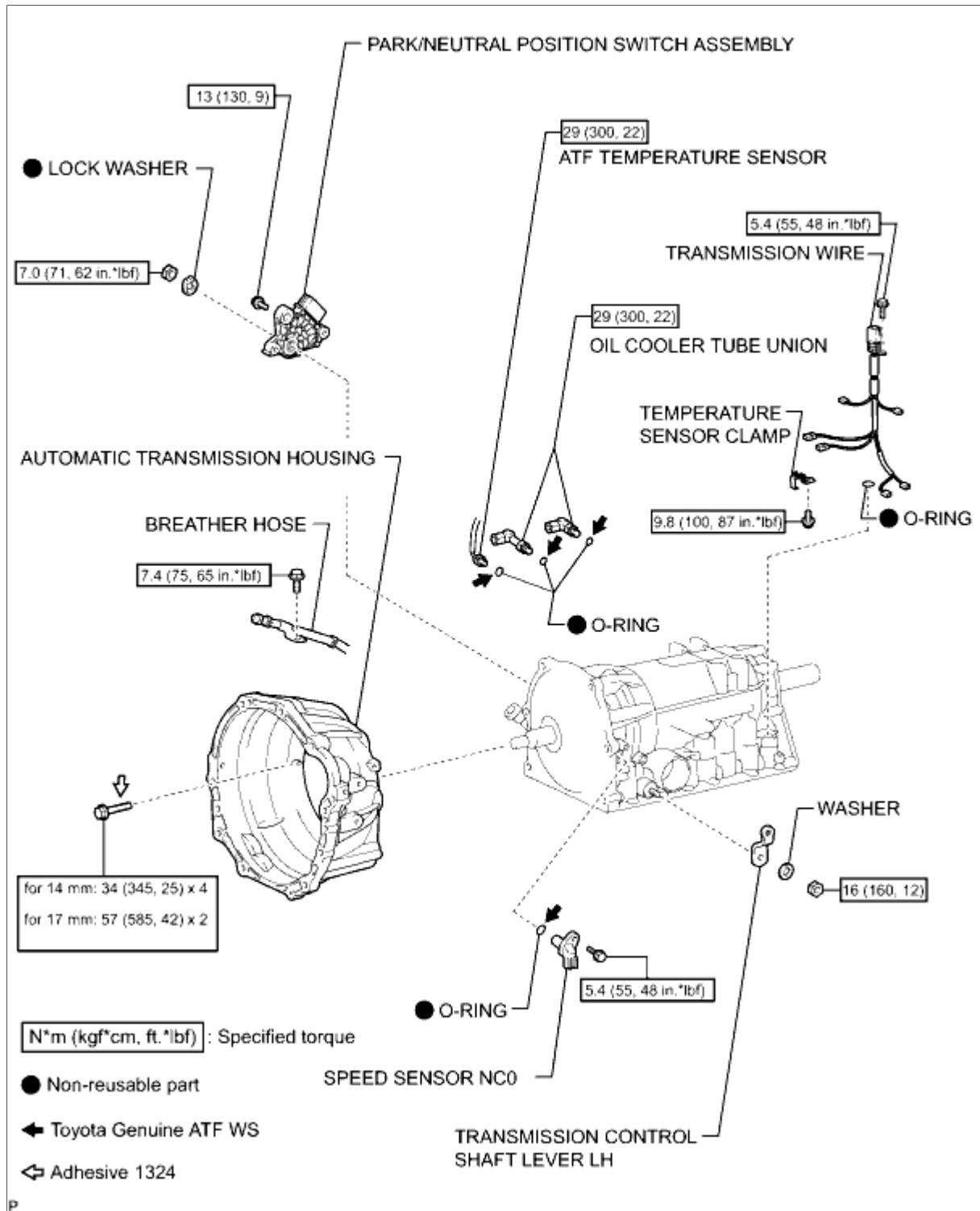
(c) Inspect for automatic transmission fluid leak.



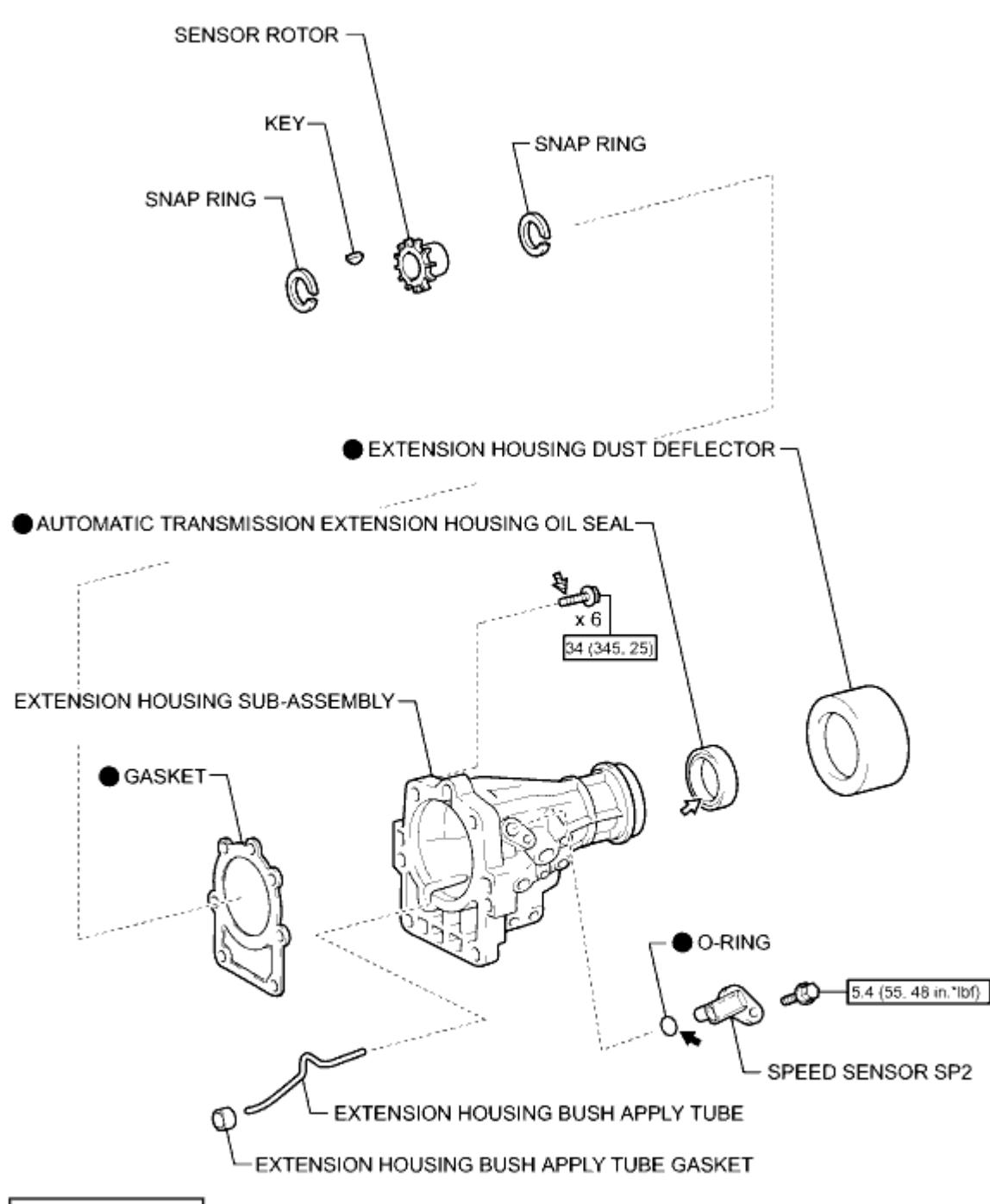
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000003B2P005X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



## ILLUSTRATION



N<sup>•</sup>m (kgf<sup>•</sup>cm, ft.<sup>•</sup>lbf) : Specified torque

● Non-reusable part

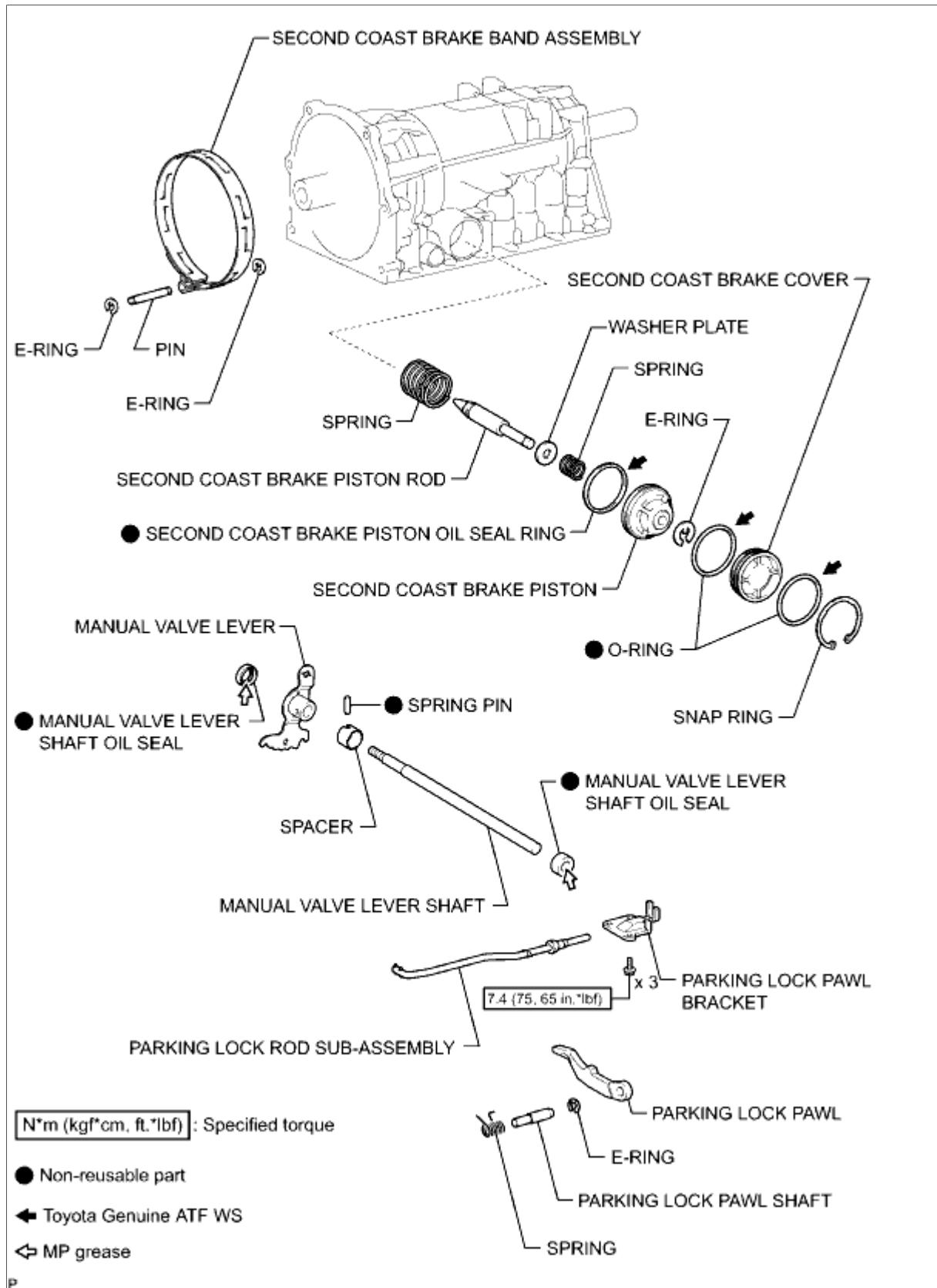
← Toyota Genuine ATF WS

↳ MP grease

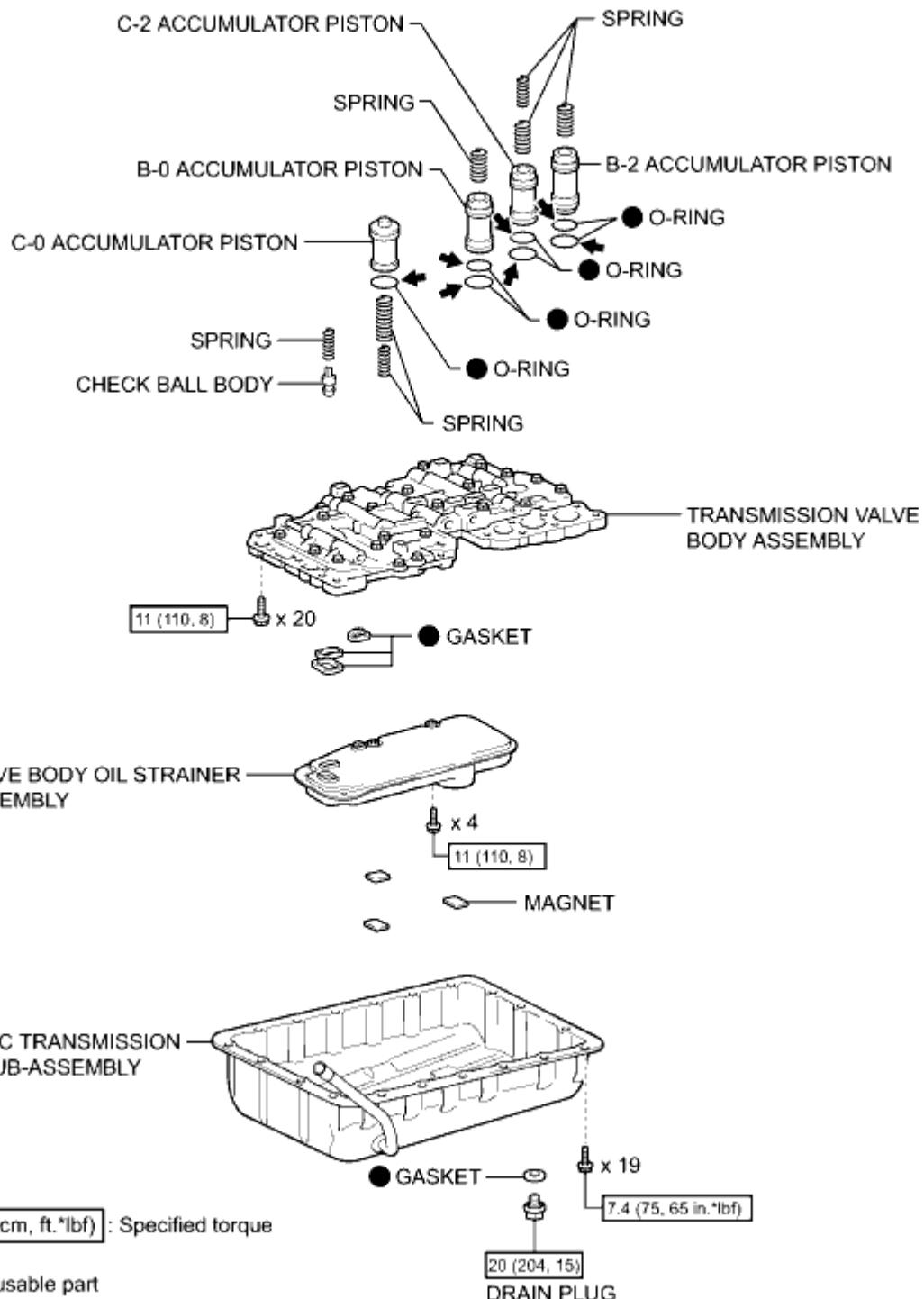
↳ Adhesive 1324

P

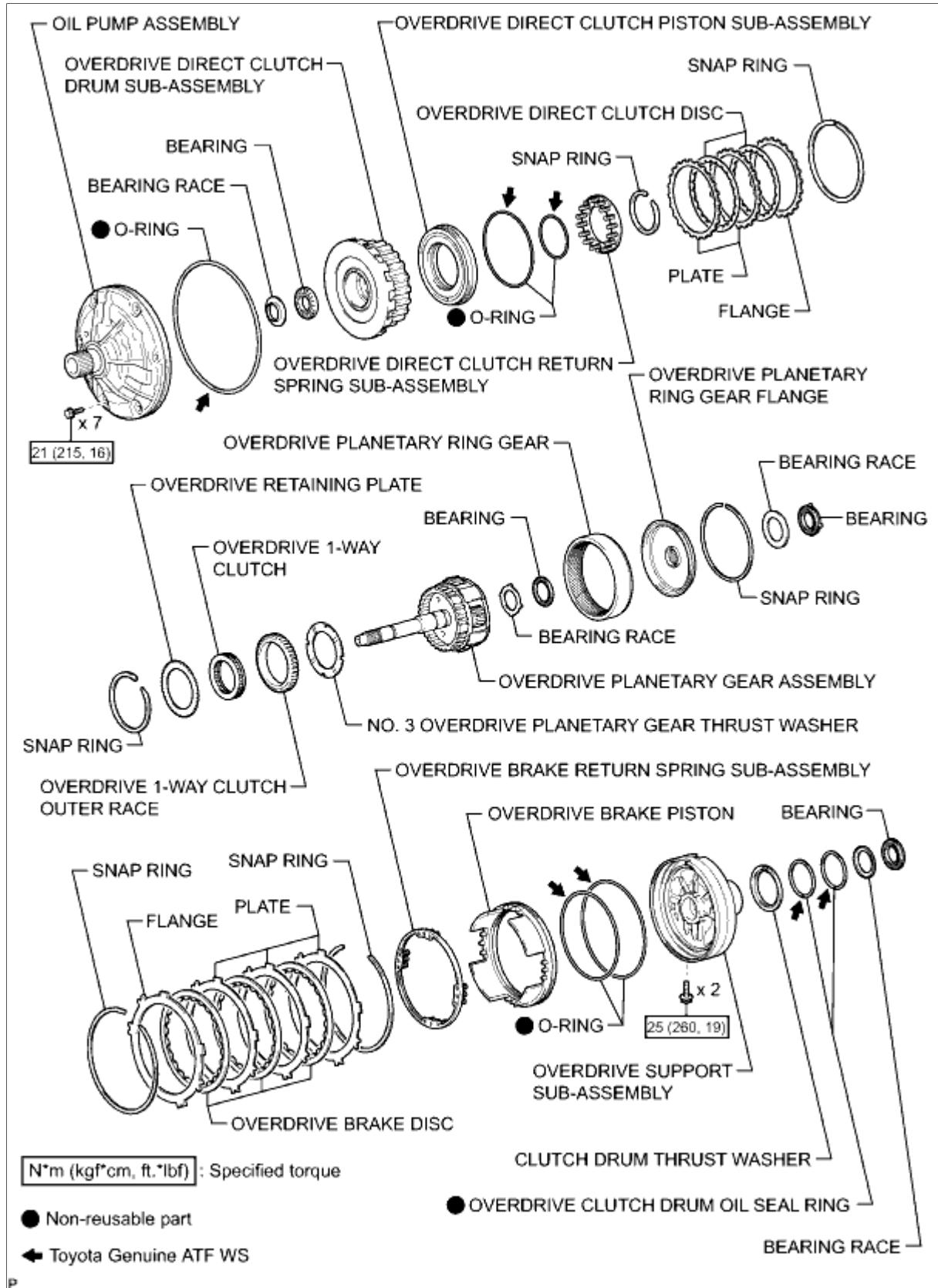
## ILLUSTRATION



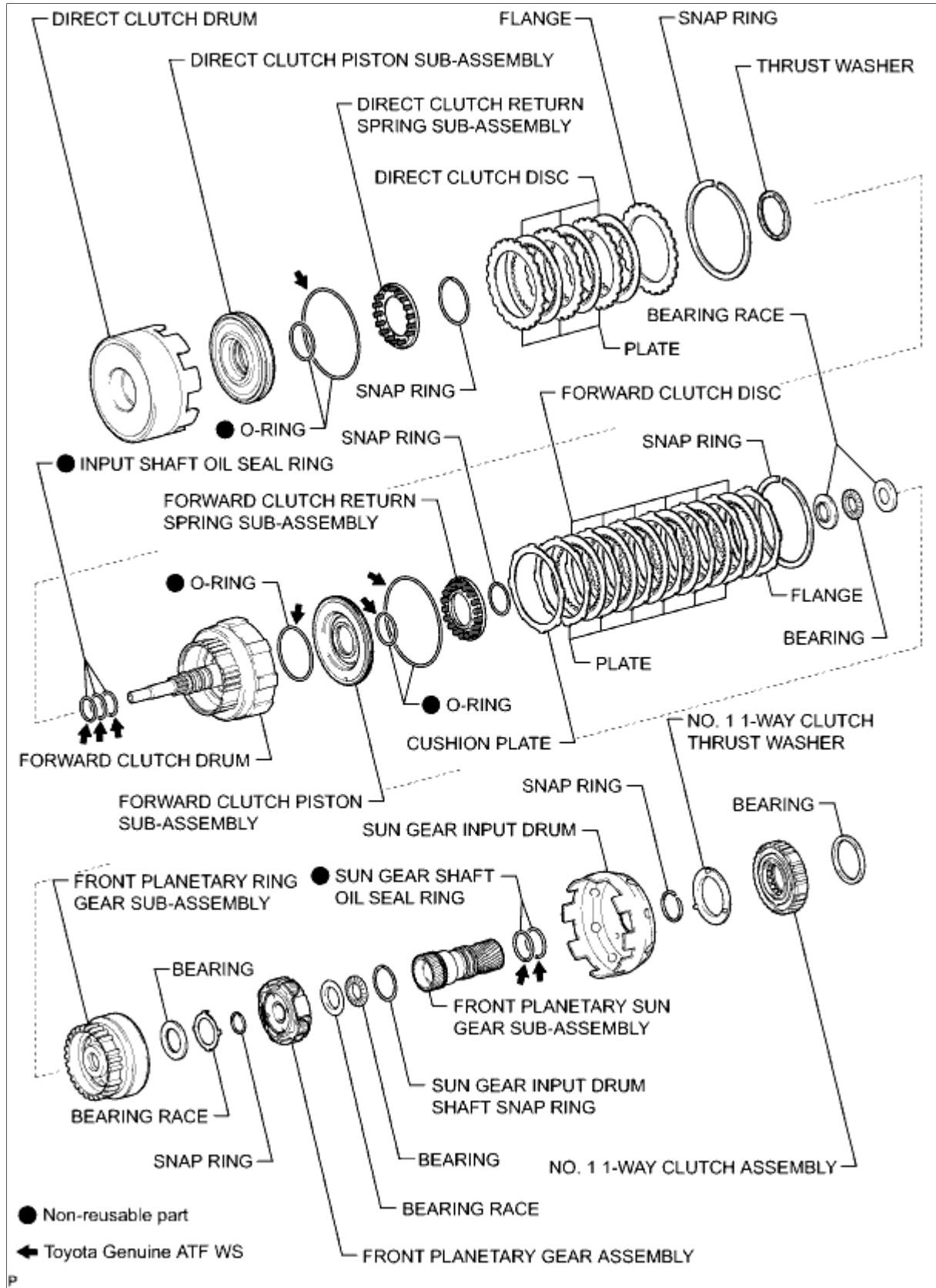
## ILLUSTRATION



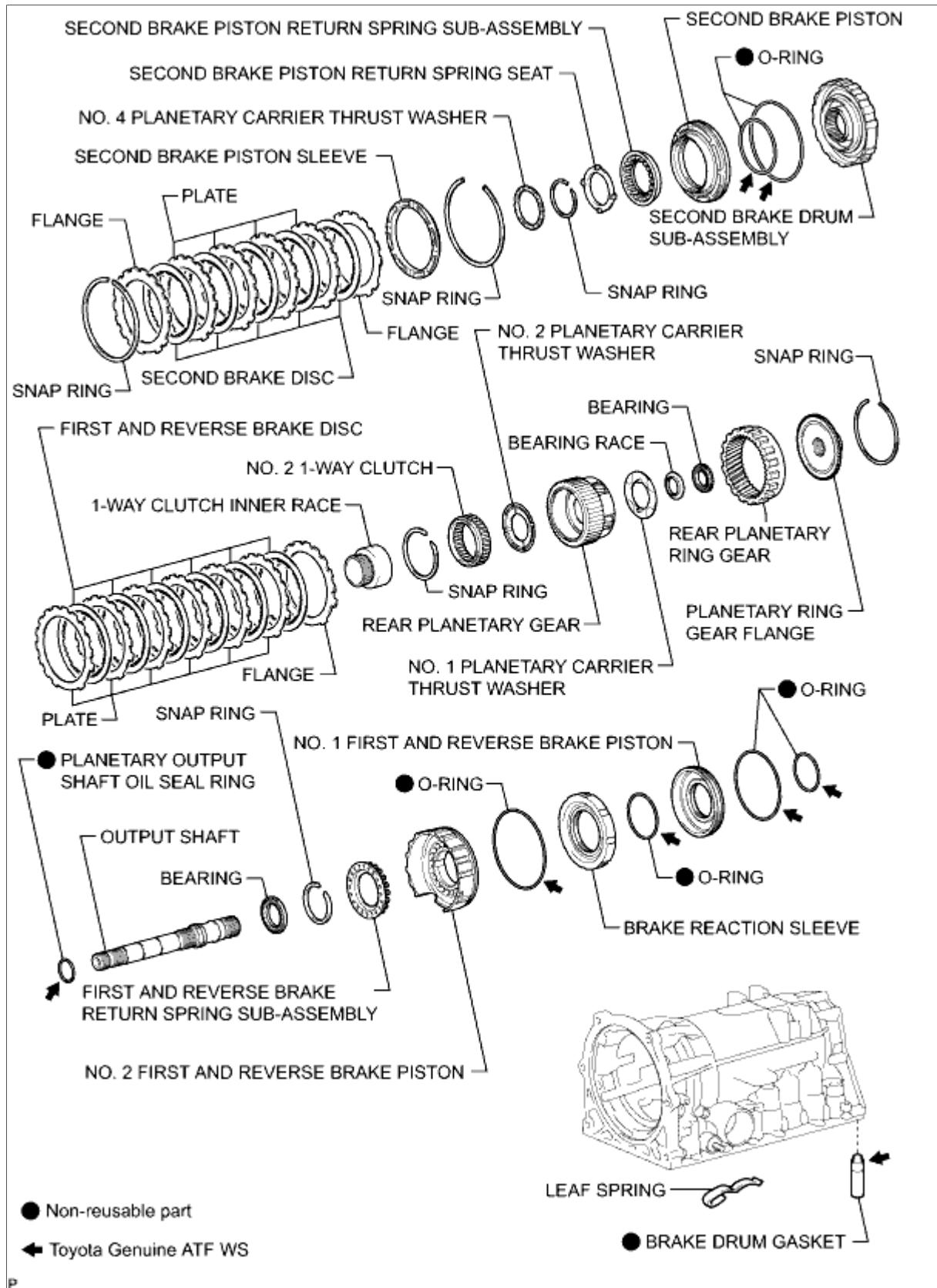
## ILLUSTRATION



## ILLUSTRATION



## ILLUSTRATION



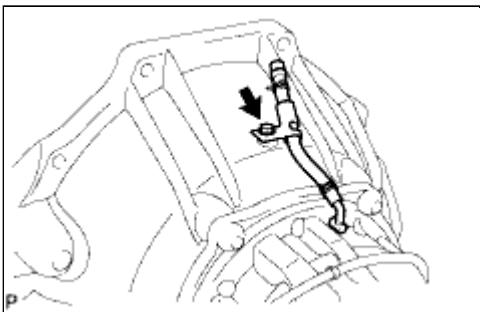
P



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013B3000X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: DISASSEMBLY (2010 4Runner)		

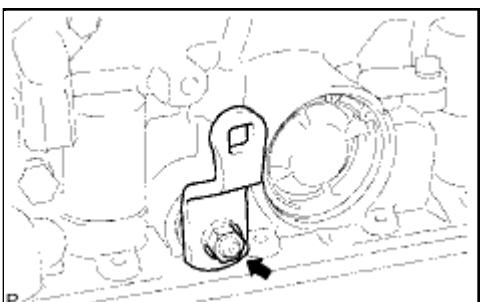
## **DISASSEMBLY**

### **1. REMOVE DRAIN PLUG**



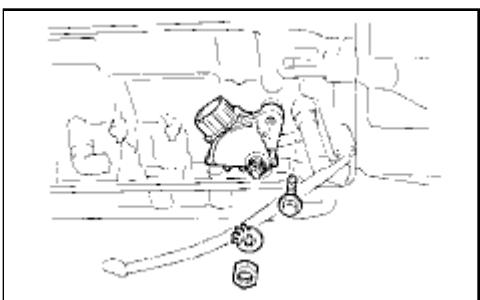
### **2. REMOVE BREATHER HOSE**

- (a) Remove the bolt and breather hose plug with the breather hose and clamp.
- (b) Remove the breather hose from the breather hose plug.



### **3. REMOVE TRANSMISSION CONTROL SHAFT LEVER LH**

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

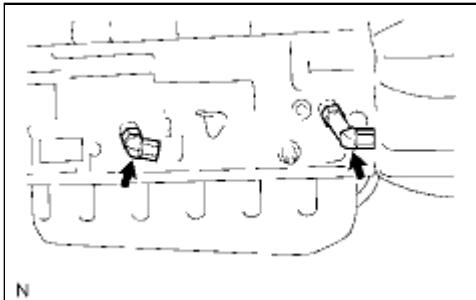
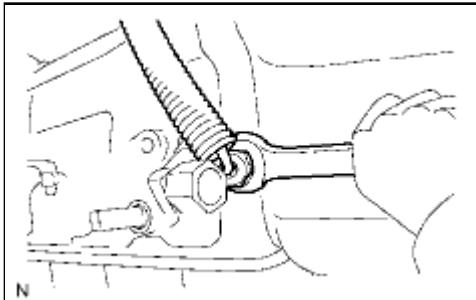


### **4. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Using a screwdriver, bend the tabs of the lock washer.
- (b) Remove the nut and lock washer.
- (c) Remove the bolt and park/neutral position switch.

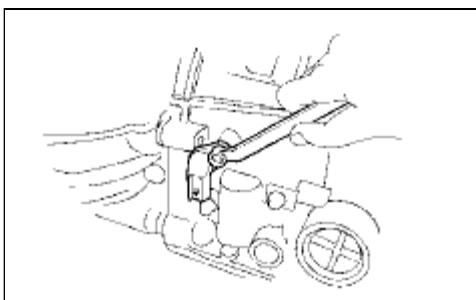
### **5. REMOVE ATF TEMPERATURE SENSOR**

- (a) Remove the sensor.
- (b) Remove the O-ring from the sensor.



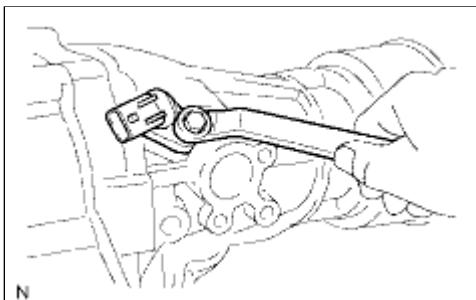
## 6. REMOVE OIL COOLER TUBE UNION

- Remove the 2 tube unions.
- Remove the O-ring from each tube union.



## 7. REMOVE SPEED SENSOR NC0

- Remove the bolt and sensor.
- Remove the O-ring from the sensor.

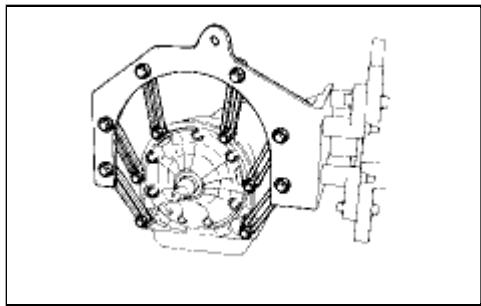
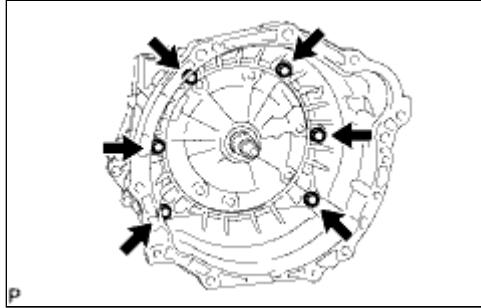


## 8. REMOVE SPEED SENSOR SP2

- Remove the bolt and sensor.
- Remove the O-ring from the sensor.

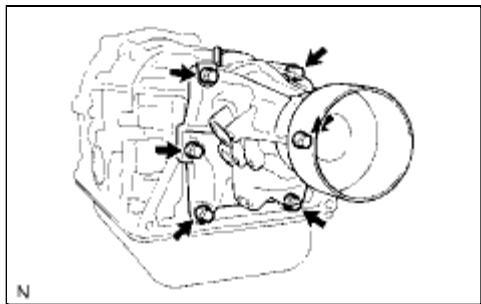
## 9. REMOVE AUTOMATIC TRANSMISSION HOUSING

- Remove the 6 bolts.
- Remove the transmission housing.



## 10. FIX TRANSMISSION CASE

(a) Install the transmission case to an overhaul attachment.

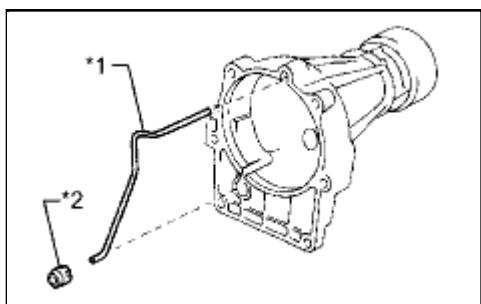


## 11. REMOVE EXTENSION HOUSING SUB-ASSEMBLY

(a) Remove the 6 bolts.

(b) Remove the extension housing and gasket.

## 12. REMOVE EXTENSION HOUSING BUSH APPLY TUBE



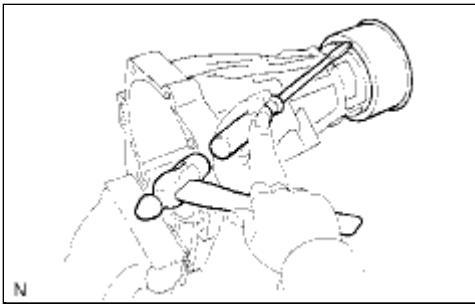
(a) Remove the extension housing bush apply tube together with the extension housing bush apply tube gasket.

### Text in Illustration

*1	Extension Housing Bush Apply Tube
*2	Extension Housing Bush Apply Tube Gasket

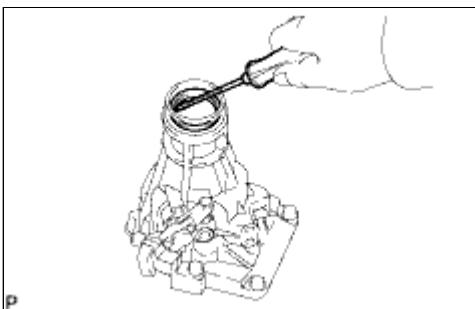
## 13. REMOVE EXTENSION HOUSING BUSH APPLY TUBE GASKET

(a) Remove the gasket from the extension housing bush apply tube.



#### 14. REMOVE EXTENSION HOUSING DUST DEFLECTOR

- (a) Secure the extension housing in a vise between aluminum plates.
- (b) Using a screwdriver and hammer, tap off the dust deflector.



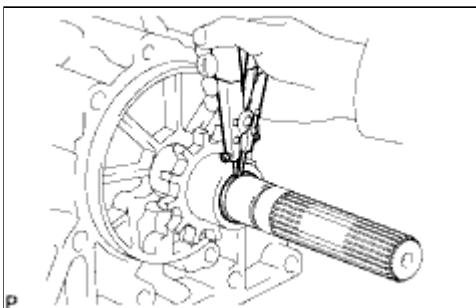
#### 15. REMOVE AUTOMATIC TRANSMISSION EXTENSION HOUSING OIL SEAL

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

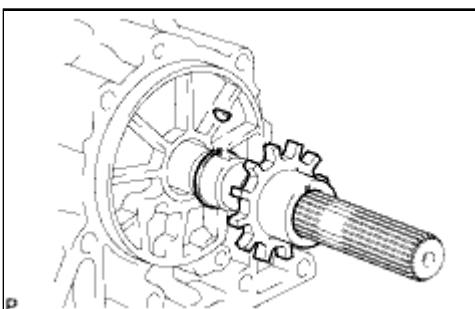
**NOTICE:**

**Do not damage the automatic transmission extension housing oil seal.**

#### 16. REMOVE SENSOR ROTOR



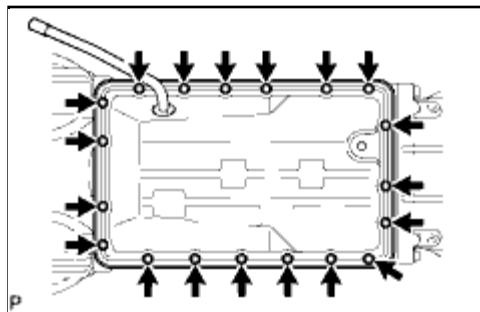
- (a) Using a snap ring expander, remove the snap ring.



- (b) Remove the sensor rotor and key.

- (c) Using a snap ring expander, remove the snap ring.

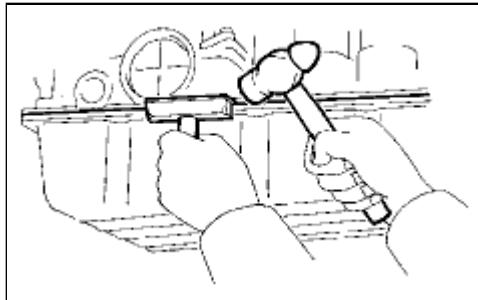
## 17. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY



**NOTICE:**

**Do not turn the transmission over as this will contaminate the valve body with foreign matter located at the bottom of the pan.**

- (a) Remove the 19 bolts.



- (b) Insert the blade of an oil pan seal cutter between the transmission case and oil pan, and cut through the applied sealer.

**NOTICE:**

**Be careful not to damage the flanges of the oil pan and transmission case.**

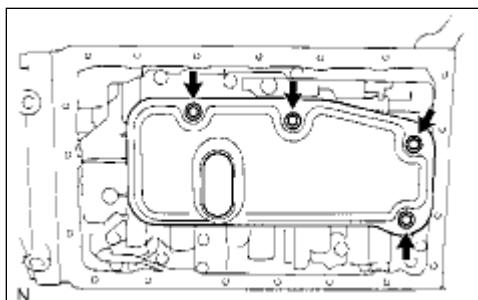
- (c) Remove the pan from the transmission case.

## 18. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

INFO

## 19. REMOVE VALVE BODY OIL STRAINER ASSEMBLY

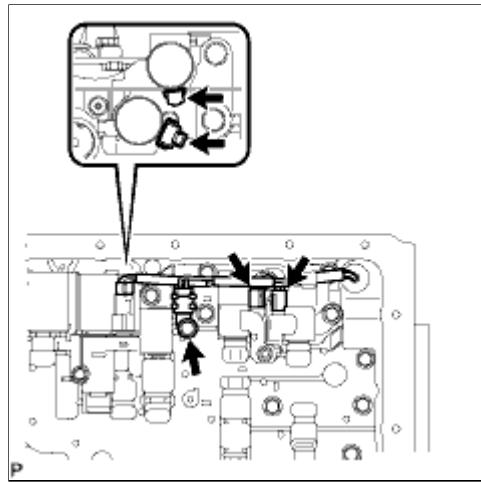
- (a) Turn over the transmission.



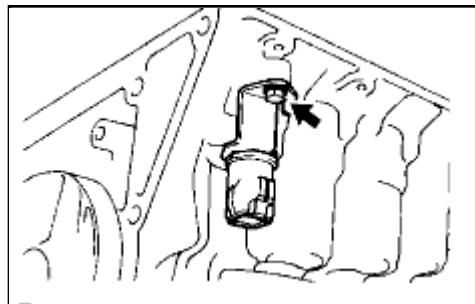
- (b) Remove the 4 bolts and valve body oil strainer from the valve body.

- (c) Remove the 3 gaskets from the oil strainer.

## 20. REMOVE TRANSMISSION WIRE

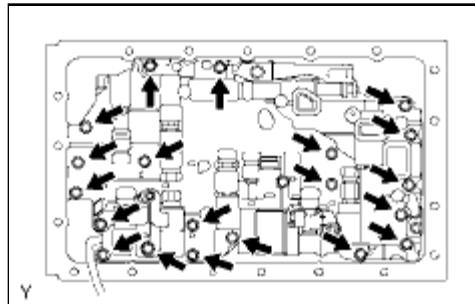


- (a) Remove the bolt and temperature sensor clamp, and disconnect the temperature sensor.
- (b) Disconnect the 4 connectors from the shift solenoid valves.



(c) Remove the bolt and stopper plate from the case.

- (d) Pull out the transmission wire from the transmission case to remove it.
- (e) Remove the O-ring from the transmission wire connector.



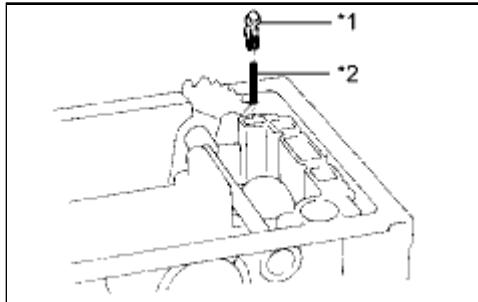
## **21. REMOVE TRANSMISSION VALVE BODY ASSEMBLY**

- (a) Remove the 20 bolts and valve body.

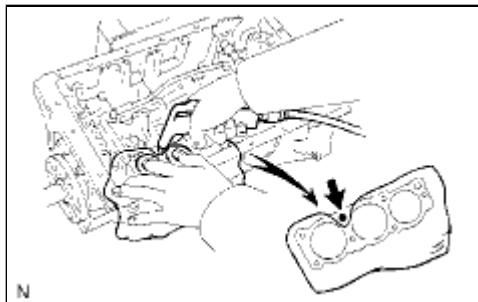
## **22. REMOVE CHECK BALL BODY**

- (a) Remove the check ball body and spring.

## **Text in Illustration**

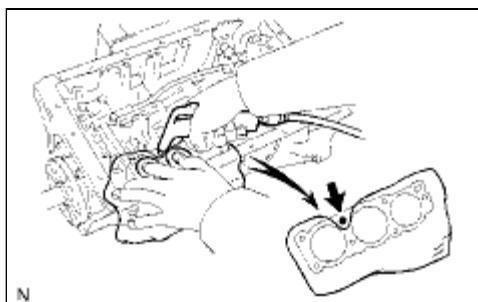


*1	Check Ball Body
*2	Spring



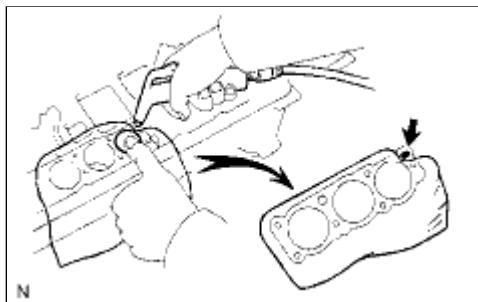
### 23. REMOVE B-2 ACCUMULATOR PISTON

- Apply compressed air to the oil hole to remove the B-2 accumulator piston and spring.
- Remove the 2 O-rings from the piston.



### 24. REMOVE C-2 ACCUMULATOR PISTON

- Apply compressed air to the oil hole to remove the C-2 accumulator piston and 2 springs.
- Remove the 2 O-rings from the piston.

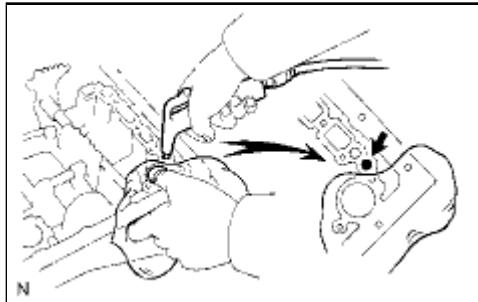


### 25. REMOVE B-0 ACCUMULATOR PISTON

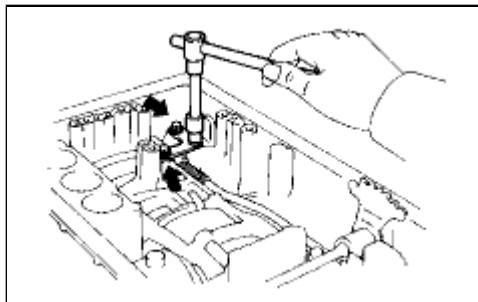
- Apply compressed air to the oil hole to remove the B-0 accumulator piston and spring.
- Remove the 2 O-rings from the piston.

### 26. REMOVE C-0 ACCUMULATOR PISTON

- Apply compressed air to the oil hole to remove the C-0 accumulator piston and 2 springs.

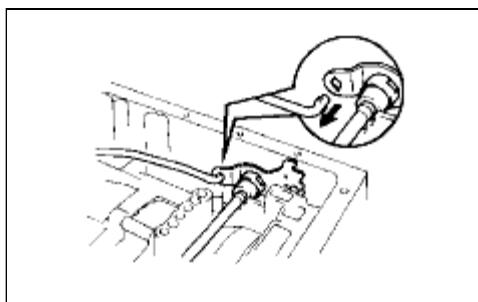


(b) Remove the O-ring from the piston.



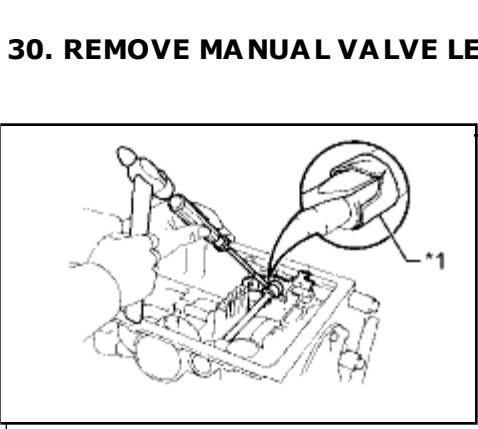
## 27. REMOVE PARKING LOCK PAWL BRACKET

(a) Remove the 3 bolts and bracket.



## 28. REMOVE PARKING LOCK ROD SUB-ASSEMBLY

(a) Disconnect the parking lock rod from the manual valve lever to remove it.



## 30. REMOVE MANUAL VALVE LEVER SHAFT

(a) Pull out the parking lock pawl shaft from the front side, and then remove the lock pawl and spring.

### Text in Illustration

*1	Parking Lock Pawl Shaft
*2	Lock Pawl
*3	Spring
*4	E-Ring

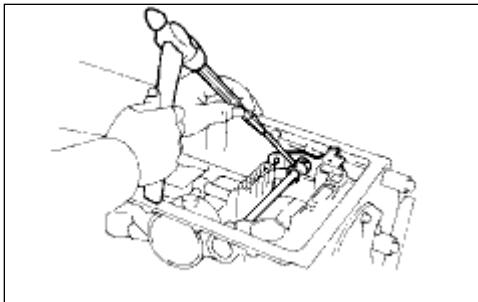
(a) Using a hammer and screwdriver, cut off the spacer and remove it from the shaft.

### Text in Illustration

(b) Remove the E-ring from the shaft.

\*1

Spacer

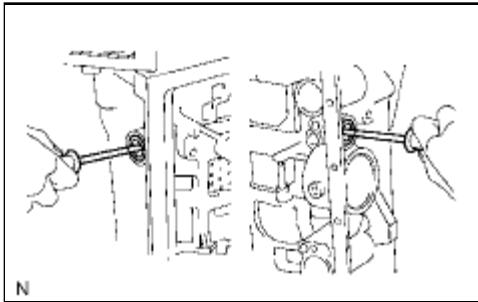


(b) Using a pin punch and hammer, tap out the spring pin.

**HINT:**

**Tap out the spring pin slowly so that it does not fall into the transmission case.**

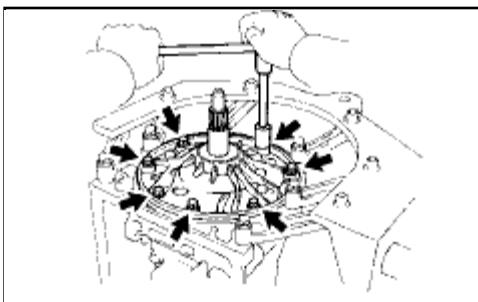
(c) Pull out the manual valve lever shaft through the case and remove the manual valve lever.



**31. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL**

(a) Using a screwdriver, pry out the 2 oil seals.

**32. REMOVE OIL PUMP ASSEMBLY**

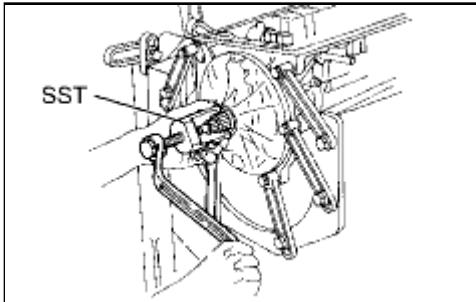


(a) Stand the transmission upright.

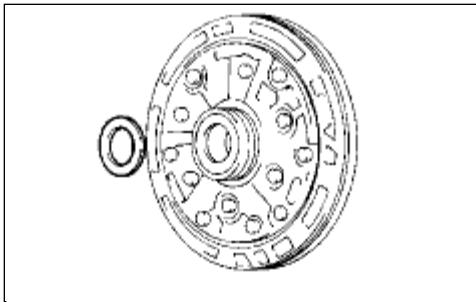
(b) Remove the 7 bolts from the transmission case.

(c) Using SST, remove the oil pump.

**SST: 09610-20012**

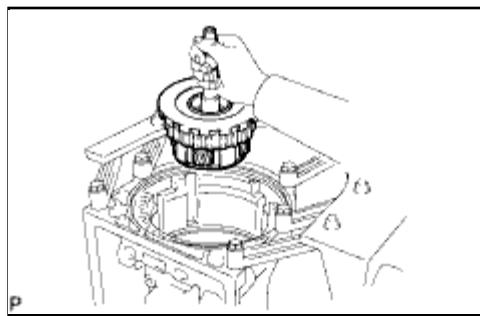


(d) Remove the O-ring from the oil pump.

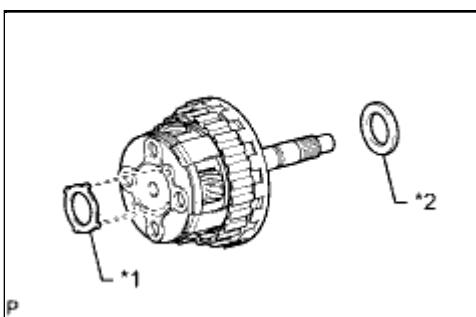


(e) Remove the bearing race from the oil pump.

### 33. REMOVE OVERDRIVE PLANETARY GEAR ASSEMBLY WITH OVERDRIVE DIRECT CLUTCH AND OVERDRIVE 1-WAY CLUTCH ASSEMBLY



(a) Remove the planetary gear together with the direct clutch and 1-way clutch from the transmission case.



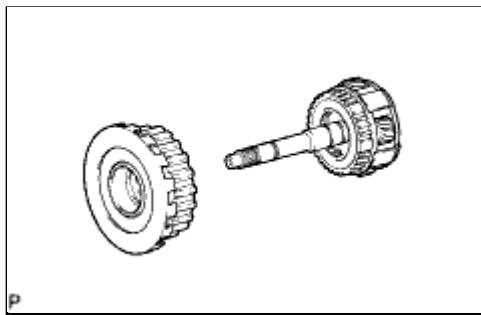
(b) Remove the bearing race and bearing.

#### Text in Illustration

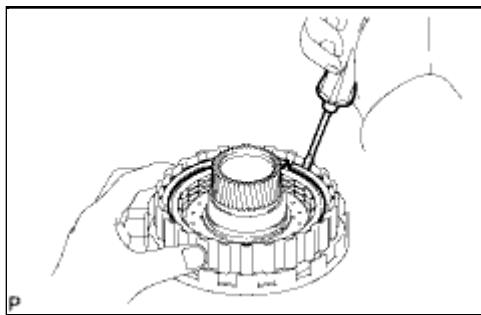
*1	Bearing Race
*2	Bearing

#### 34. INSPECT OVERDRIVE 1-WAY CLUTCH

INFO



#### 35. REMOVE OVERDRIVE DIRECT CLUTCH ASSEMBLY

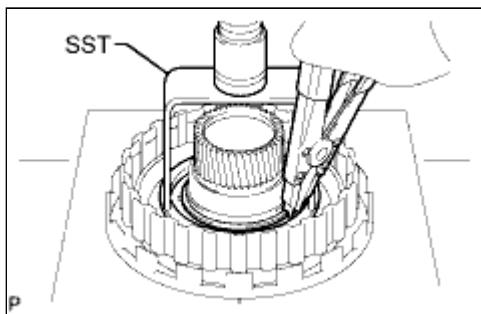


#### 36. REMOVE OVERDRIVE DIRECT CLUTCH DISC SET

- Using a screwdriver, pry out the snap ring from the overdrive direct clutch drum.
- Remove the flange, 2 discs and 2 plates.

#### 37. INSPECT OVERDRIVE DIRECT CLUTCH DISC

INFO



#### 38. REMOVE OVERDRIVE DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY

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

**SST: 09350-30020**

09350-07040

##### NOTICE:

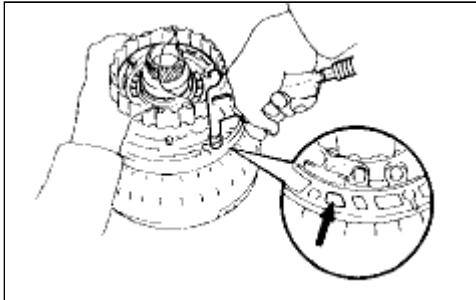
**Do not deform the spring seat. Stop compressing the spring when the spring seat is lowered to a position 1 to 2 mm (0.0394 to 0.0787 in.) from the snap ring groove.**

- Using snap ring expander, remove the snap ring.
- Remove the clutch return spring.

#### 39. INSPECT OVERDRIVE DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY

INFO

#### 40. REMOVE OVERDRIVE DIRECT CLUTCH PISTON SUB-ASSEMBLY



- (a) Place the oil pump onto the torque converter clutch, and then place the overdrive direct clutch onto the oil pump.
- (b) Hold the overdrive direct clutch piston by hand and apply compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)) to the oil pump to remove the overdrive direct clutch piston.

**HINT:**

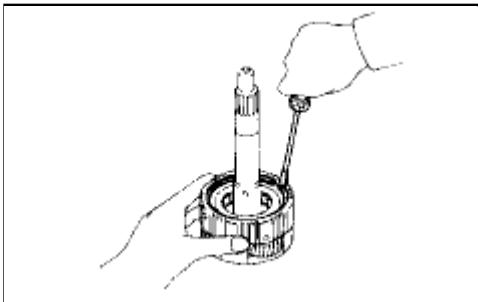
If the piston is at an angle and cannot be removed, press down on the protruding side and apply compressed air again.

- (c) Remove the 2 O-rings from the piston.

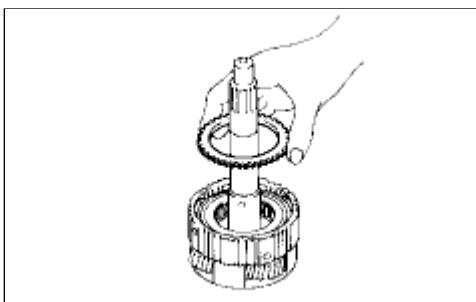
**41. INSPECT OVERDRIVE DIRECT CLUTCH PISTON SUB-ASSEMBLY** INFO

**42. INSPECT OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY** INFO

**43. REMOVE OVERDRIVE RETAINING PLATE**

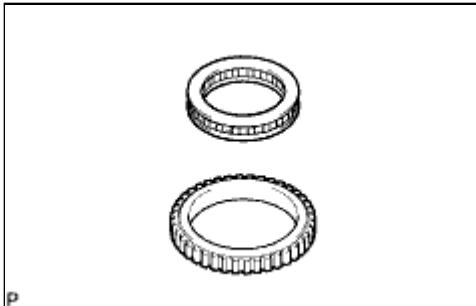
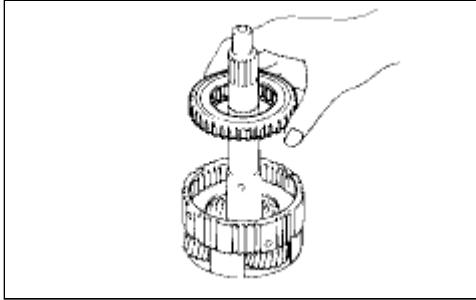


- (a) Using a screwdriver, pry out the snap ring.



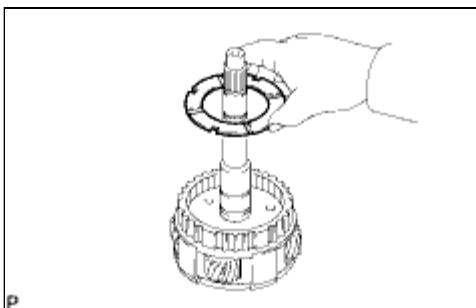
- (b) Remove the retaining plate.

**44. REMOVE OVERDRIVE 1-WAY CLUTCH OUTER RACE WITH OVERDRIVE 1-WAY CLUTCH**



#### **45. REMOVE OVERDRIVE 1-WAY CLUTCH**

(a) Remove the overdrive 1-way clutch from the outer race.

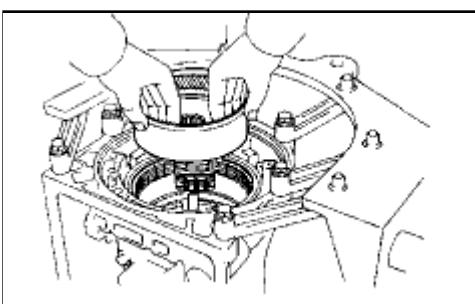


#### **46. REMOVE NO. 3 OVERDRIVE PLANETARY GEAR THRUST WASHER**

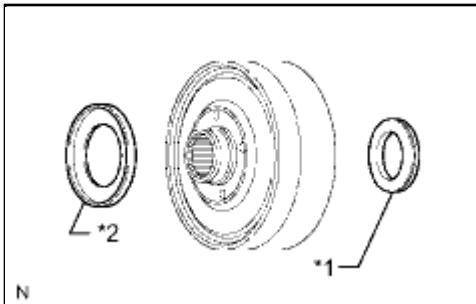
#### **47. INSPECT OVERDRIVE PLANETARY GEAR ASSEMBLY**



#### **48. REMOVE OVERDRIVE PLANETARY RING GEAR WITH OVERDRIVE PLANETARY RING GEAR FLANGE**



(a) Remove the ring gear together with the overdrive planetary ring gear flange from the transmission case.

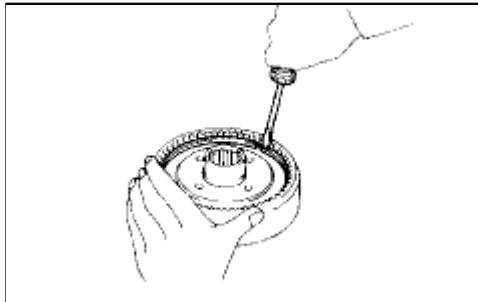


(b) Remove the bearing and bearing race from the overdrive planetary ring gear.

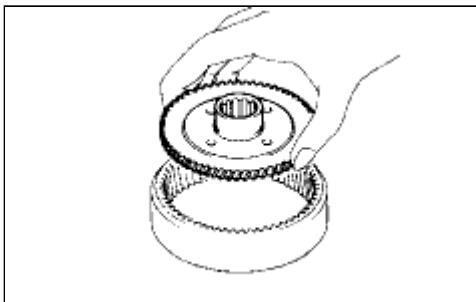
### Text in Illustration

*1	Bearing
*2	Bearing Race

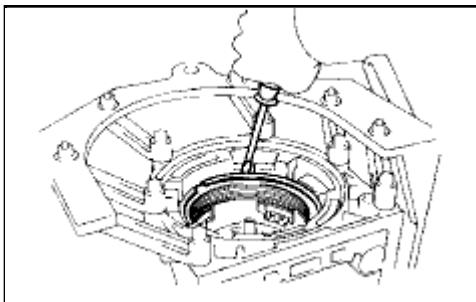
## 49. REMOVE OVERDRIVE PLANETARY RING GEAR FLANGE



(a) Using a screwdriver, pry out the snap ring.



(b) Remove the ring gear flange from the overdrive planetary ring gear.



## 50. REMOVE OVERDRIVE BRAKE DISC SET

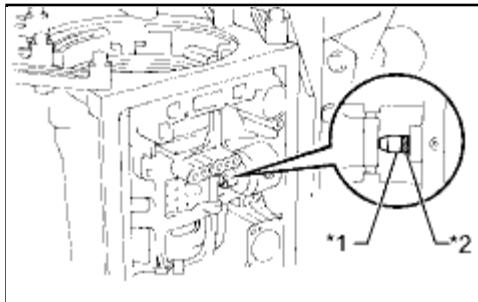
(a) Using a screwdriver, pry out the snap ring.

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

## 51. INSPECT OVERDRIVE BRAKE DISC

INFO

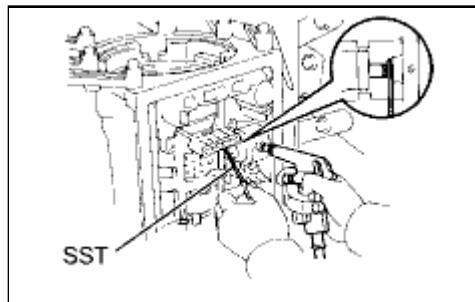
## 52. INSPECT PISTON STROKE OF SECOND COAST BRAKE



- (a) Using a waterproof pen, place a mark on the 2nd coast brake piston rod as shown in the illustration.

### Text in Illustration

* 1	Piston Rod
* 2	Mark



- (b) Using SST, measure the piston stroke while applying and releasing compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)).

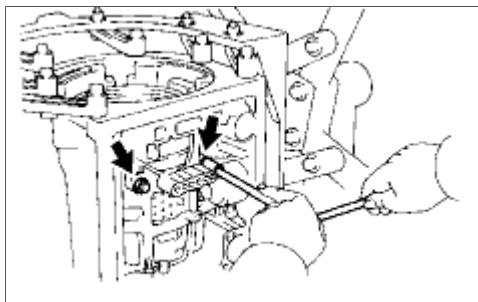
**SST: 09240-00020**

Standard piston stroke:

1.5 to 3.0 mm (0.0591 to 0.118 in.)

If the stroke is not as specified, inspect the brake band.

## 53. REMOVE OVERDRIVE SUPPORT SUB-ASSEMBLY

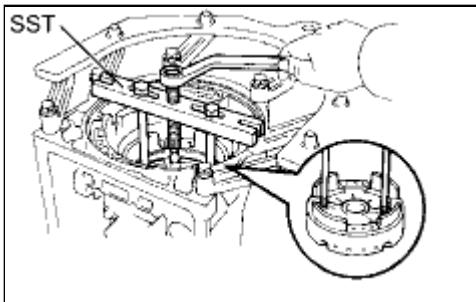
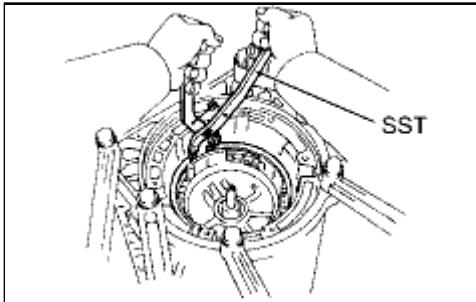


- (a) Remove the 2 bolts holding the overdrive brake assembly to the case.

- (b) Using SST, remove the snap ring.

**SST: 09350-30020**

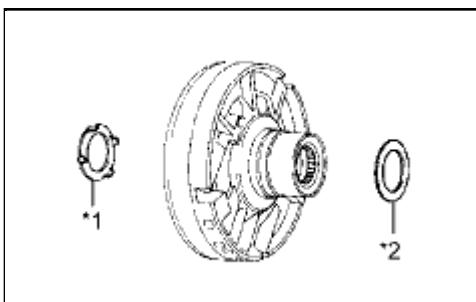
09350-07060



(c) Using SST, remove the overdrive brake assembly.

**SST: 09350-30020**

09350-07020

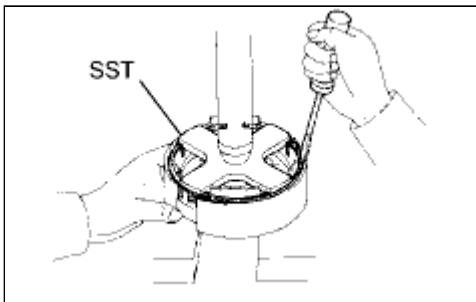


(d) Remove the bearing and bearing race from the overdrive brake.

### Text in Illustration

*1	Bearing
*2	Bearing Race

## 54. INSPECT PISTON OPERATION OF OVERDRIVE BRAKE INFO



## 55. REMOVE OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

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

**SST: 09350-30020**

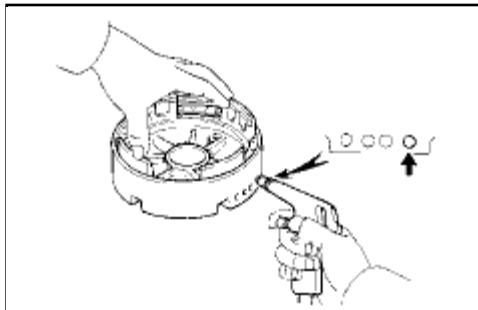
09350-07030

(b) Using a screwdriver, pry out the snap ring.

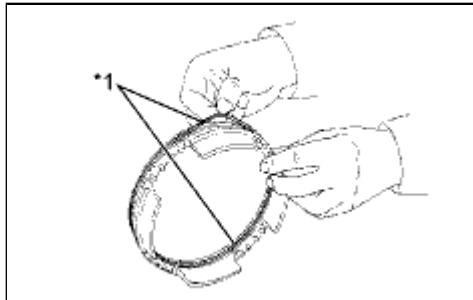
(c) Remove the brake return spring.

## 56. INSPECT OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY INFO

## 57. REMOVE OVERDRIVE BRAKE PISTON



- (a) Place the overdrive support onto the direct clutch assembly.
- (b) Hold the overdrive brake piston so that it is not slanted and apply compressed air (392 kPa (4 kgf/cm<sup>2</sup>, 57 psi)) into the passage to remove the overdrive brake piston.

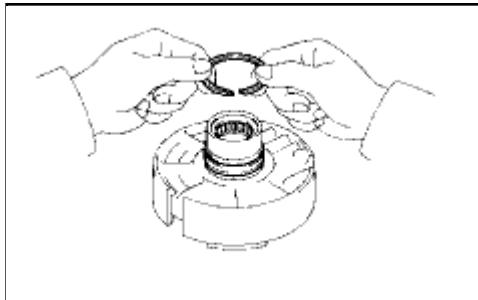


(c) Remove the 2 O-rings from the overdrive brake piston.

### Text in Illustration

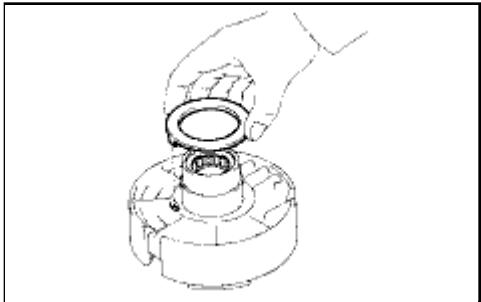
*1	O-Ring
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## 58. REMOVE OVERDRIVE CLUTCH DRUM OIL SEAL RING

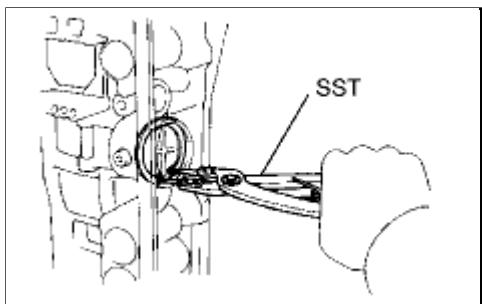


- (a) Remove the 2 oil seal rings from the overdrive support.

- 
- (b) Remove the clutch drum thrust washer from the overdrive support.



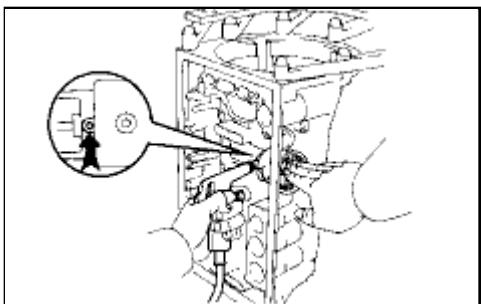
## 59. REMOVE SECOND COAST BRAKE PISTON



(a) Using SST, remove the snap ring.

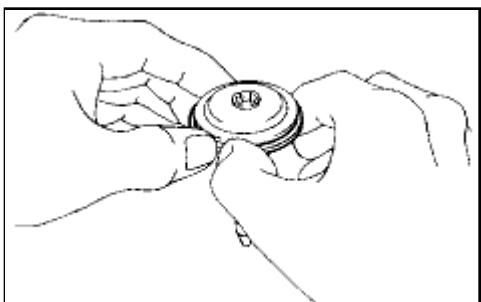
**SST: 09350-30020**

09350-07060



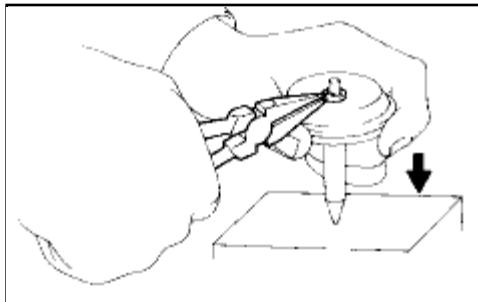
(b) Apply compressed air to the oil hole to remove the second coast brake cover, piston assembly and spring.

(c) Remove the 2 O-rings from the cover.



## 60. REMOVE SECOND COAST BRAKE PISTON OIL SEAL RING

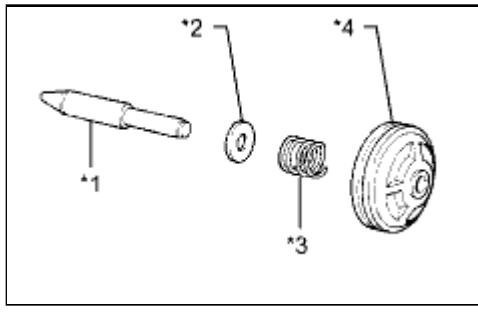
## 61. REMOVE SECOND COAST BRAKE PISTON ROD



(a) Firmly press the piston down to compress the compression spring.

(b) Remove the E-ring.

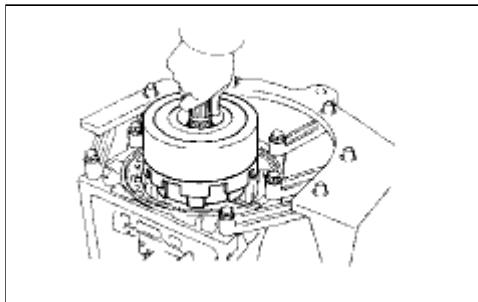
(c) Remove the piston rod, washer plate and spring from the piston.



### Text in Illustration

* 1	Piston Rod
* 2	Washer Plate
* 3	Spring
* 4	Piston

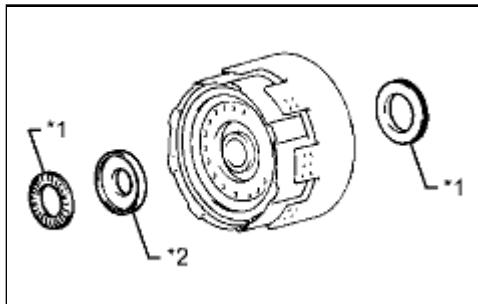
## 62. REMOVE DIRECT CLUTCH ASSEMBLY WITH FORWARD CLUTCH ASSEMBLY



(a) Remove the direct clutch together with the forward clutch from the case.

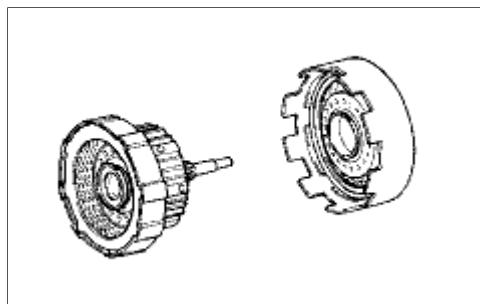
(b) Remove the 2 bearings and bearing race.

### Text in Illustration



*1	Bearing
*2	Bearing Race

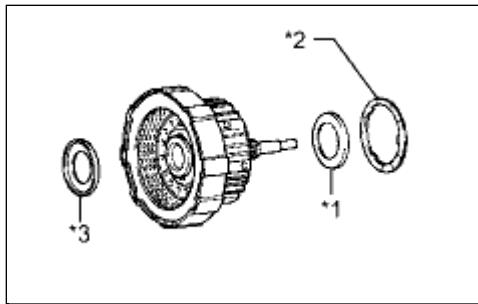
### 63. REMOVE FORWARD CLUTCH ASSEMBLY



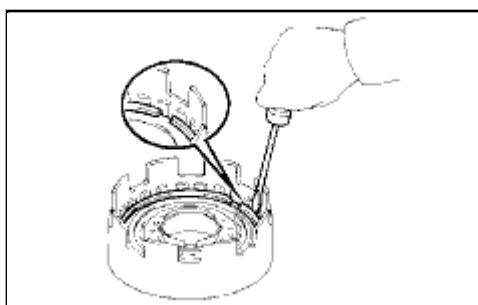
(a) Remove the forward clutch from the direct clutch.

(b) Remove the bearing, thrust washer and bearing race from the forward clutch.

#### Text in Illustration



*1	Bearing
*2	Thrust Washer
*3	Bearing Race



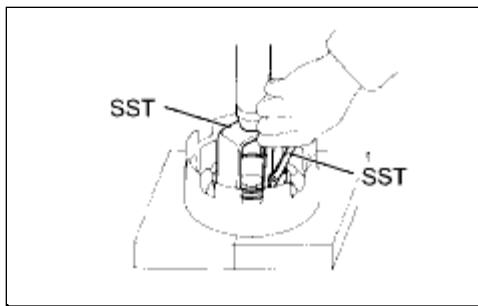
### 64. REMOVE DIRECT CLUTCH DISC SET

- Using a screwdriver, pry out the snap ring from the direct clutch drum.
- Remove the flange, 3 discs and 3 plates.

### 65. INSPECT DIRECT CLUTCH DISC

INFO

## 66. REMOVE DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



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

**SST: 09350-30020**

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- (b) Using SST, remove the snap ring.

**SST: 09350-30020**

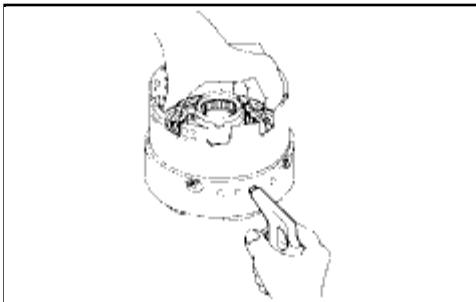
09350-07070

- (c) Remove the return spring.

## 67. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



## 68. REMOVE DIRECT CLUTCH PISTON SUB-ASSEMBLY

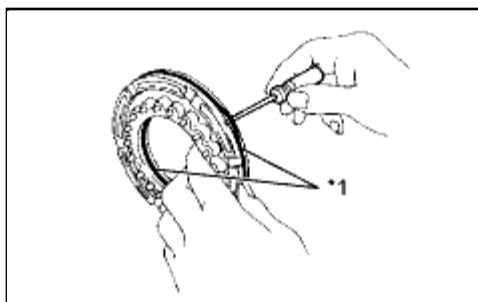


- (a) Place the direct clutch drum on the overdrive support.

- (b) Hold the direct clutch piston and apply compressed air (196 kPa (2.0 kgf/cm<sup>2</sup>, 28.5 psi)) to the overdrive support to remove the direct clutch piston.

### HINT:

**Make sure the direct clutch piston is not tilted before applying compressed air.**



- (c) Using a small screwdriver, remove the 2 O-rings from the piston.

### Text in Illustration

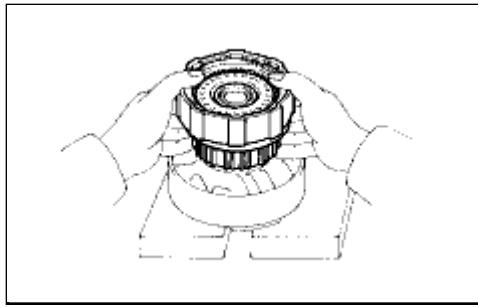
*1	O-Ring
----	--------

## 69. INSPECT DIRECT CLUTCH PISTON SUB-ASSEMBLY



## 70. INSPECT DIRECT CLUTCH DRUM SUB-ASSEMBLY

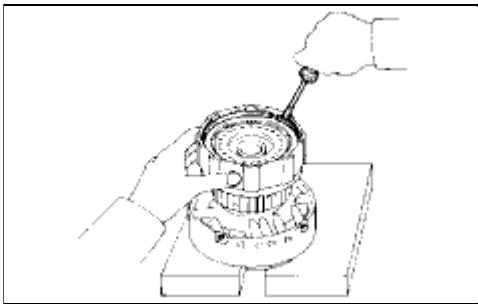




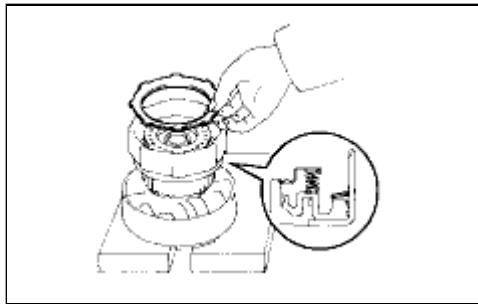
## 71. FIX FORWARD CLUTCH ASSEMBLY

- (a) Place the overdrive support on wooden blocks or similar objects to prevent the forward clutch shaft from touching the work stand.
- (b) Place the forward clutch on the overdrive support.

## 72. REMOVE FORWARD CLUTCH DISC SET



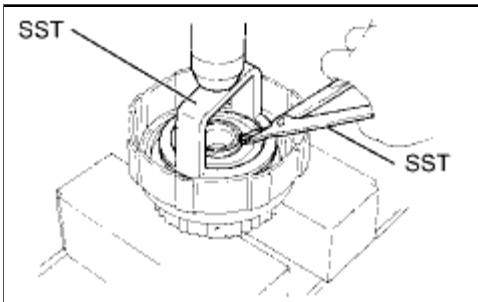
- (a) Using a screwdriver, pry out the snap ring from the forward clutch drum.
- (b) Remove the flange, 6 discs and 6 plates.



- (c) Remove the cushion plate.

## 73. INSPECT FORWARD CLUTCH DISC INFO

## 74. REMOVE FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY



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

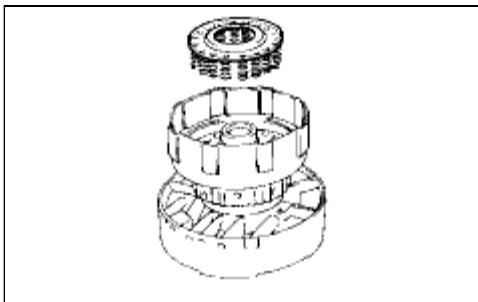
**SST: 09350-30020**

09350-07040

(b) Using SST, remove the snap ring.

**SST: 09350-30020**

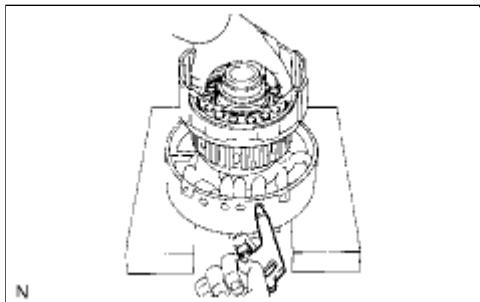
09350-07070



(c) Remove the piston return spring.

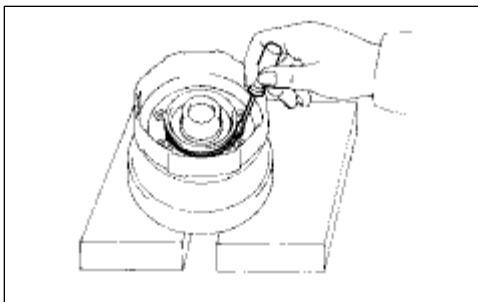
## 75. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY INFO

## 76. REMOVE FORWARD CLUTCH PISTON SUB-ASSEMBLY



(a) Place the forward clutch drum onto the overdrive support.

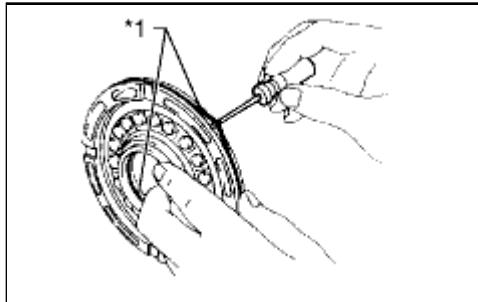
(b) Hold the forward clutch piston by hand and apply compressed air (196 kPa (2.0 kgf/cm<sup>2</sup>, 28.5 psi)) to the overdrive support to remove the forward clutch piston.



(c) Remove the O-ring from the forward clutch drum.



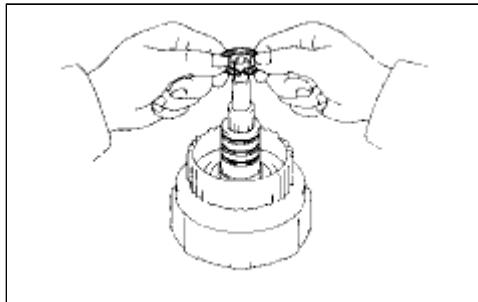
(d) Remove the 2 O-rings from the forward clutch piston.



### Text in Illustration

*1	O-Ring
----	--------

## 77. INSPECT FORWARD CLUTCH PISTON SUB-ASSEMBLY INFO

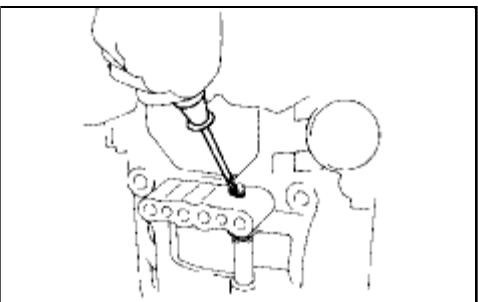


## 78. REMOVE INPUT SHAFT OIL SEAL RING

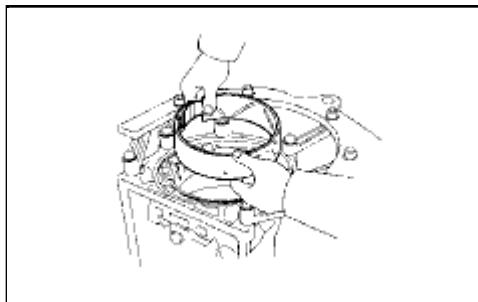
- Remove the 3 oil seal rings from the forward clutch drum groove.

## 79. INSPECT INPUT SHAFT SUB-ASSEMBLY INFO

## 80. REMOVE SECOND COAST BRAKE BAND ASSEMBLY



- Using a screwdriver, pry off the 2 E-rings from the pin and pull out the pin.

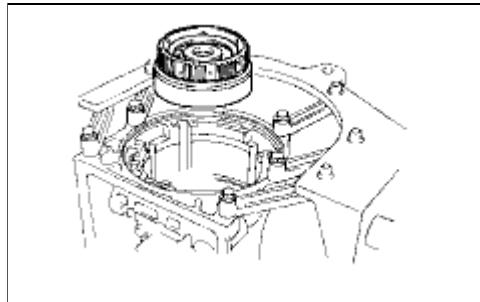


- Remove the 2nd coast brake band from the case.

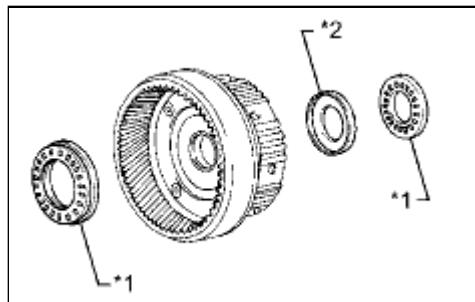
## 81. INSPECT SECOND COAST BRAKE BAND ASSEMBLY

INFO

## 82. REMOVE FRONT PLANETARY RING GEAR SUB-ASSEMBLY



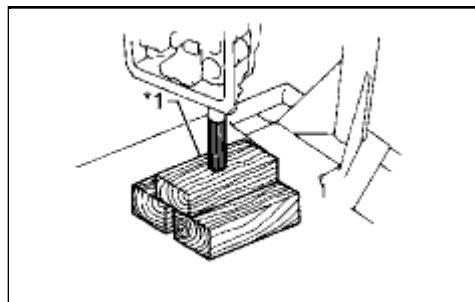
(a) Remove the planetary ring gear from the case.



(b) Remove the 2 bearings and bearing race from the planetary ring gear.

### Text in Illustration

*1	Bearing
*2	Bearing Race



(c) Place the output shaft on wooden blocks or similar objects.

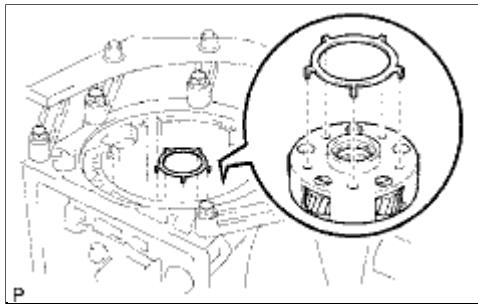
### Text in Illustration

*1	Wooden Block
----	--------------

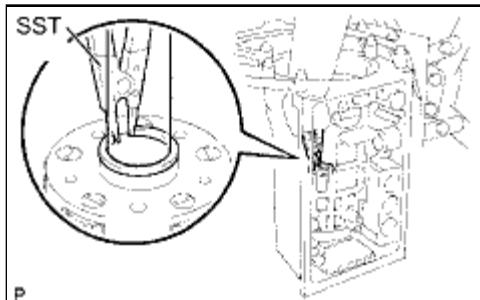
## 83. INSPECT FRONT PLANETARY RING GEAR SUB-ASSEMBLY

INFO

## 84. REMOVE FRONT PLANETARY GEAR ASSEMBLY

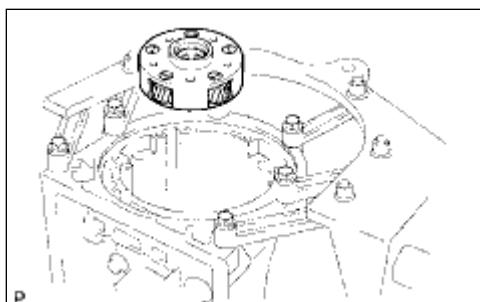


(a) Remove the bearing race from the planetary gear.

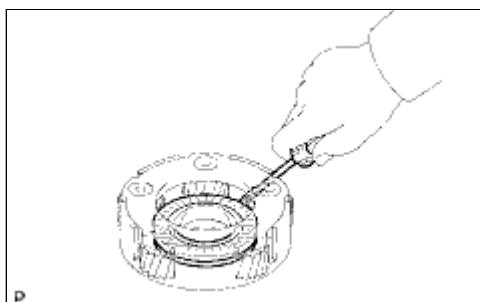


(b) Using SST, remove the snap ring.

**SST: 09350-30020**  
09350-07070



(c) Remove the planetary gear from the case.

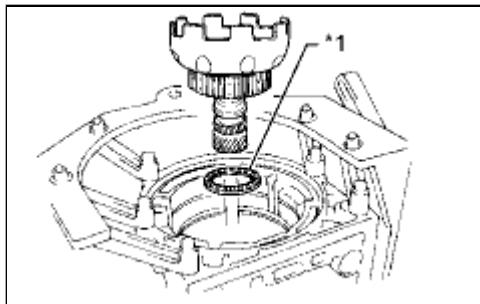


(d) Remove the bearing and bearing race from the planetary gear.

## 85. INSPECT FRONT PLANETARY GEAR ASSEMBLY

INFO

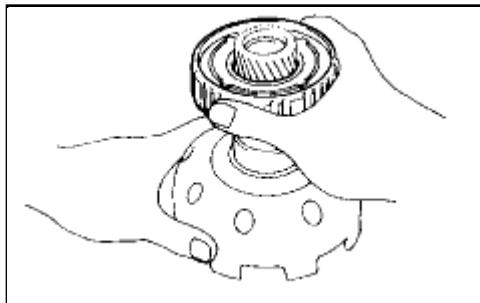
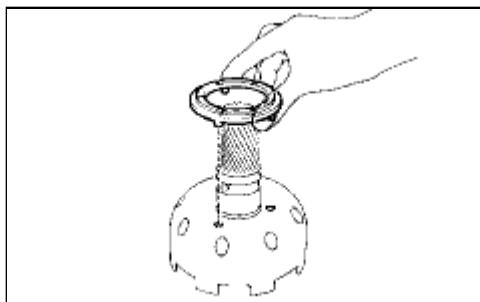
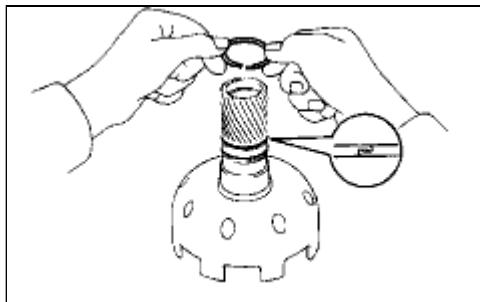
## 86. REMOVE PLANETARY SUN GEAR SUB-ASSEMBLY

**WITH SUN GEAR INPUT DRUM AND NO. 1 1-WAY CLUTCH ASSEMBLY****Text in Illustration**

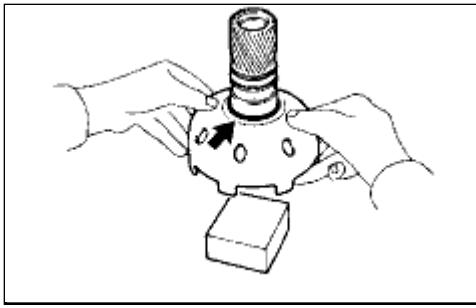
*1	Thrust Washer
----	---------------

**87. INSPECT NO. 1 1-WAY CLUTCH ASSEMBLY**

INFO

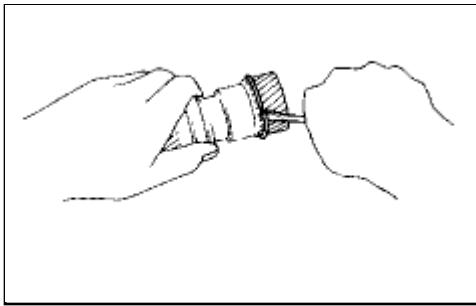
**88. REMOVE NO. 1 1-WAY CLUTCH ASSEMBLY****89. REMOVE NO. 1 1-WAY CLUTCH THRUST WASHER****90. REMOVE SUN GEAR SHAFT OIL SEAL RING**

- (a) Remove the 2 oil seal rings from the sun gear input drum.



## 91. REMOVE SUN GEAR INPUT DRUM

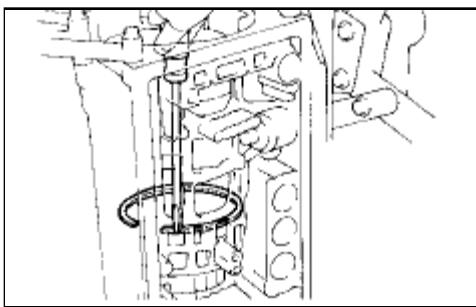
- (a) Place the planetary sun gear onto a wooden block or similar object.
- (b) Using snap ring pliers, remove the snap ring.
- (c) Remove the input drum from the planetary sun gear.



## 92. REMOVE SUN GEAR INPUT DRUM SHAFT SNAP RING

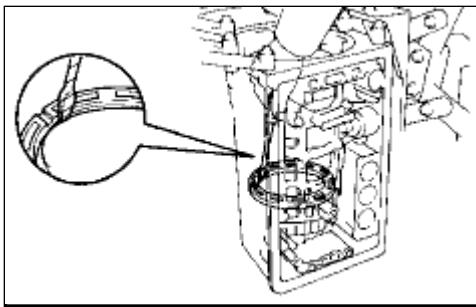
- (a) Using a screwdriver, pry off the snap ring from the planetary sun gear.

## 93. INSPECT PLANETARY SUN GEAR SUB-ASSEMBLY



## 94. REMOVE SECOND BRAKE DISC SET

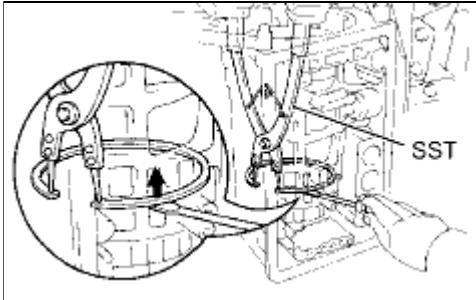
- (a) Using a screwdriver, pry out the snap ring.
- (b) Remove the 2 flanges, 5 discs and 4 plates.



## 95. REMOVE SECOND BRAKE PISTON SLEEVE

- (a) Using a screwdriver, remove the sleeve.

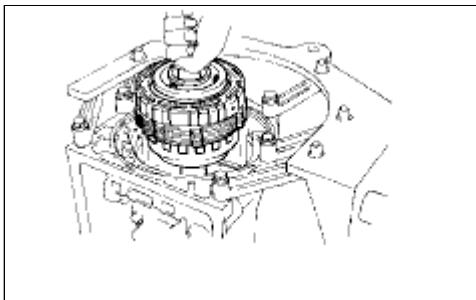
## 96. REMOVE OUTPUT SHAFT WITH REAR PLANETARY GEAR, NO. 2 1-WAY CLUTCH, FIRST AND REVERSE BRAKE DISC SET AND SECOND BRAKE DRUM



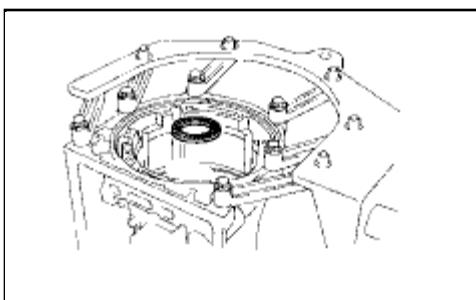
(a) Using SST and a screwdriver, remove the snap ring.

**SST: 09350-30020**

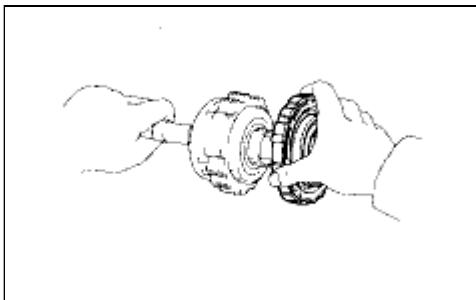
09350-07060



(b) Remove the output shaft together with the rear planetary gear, No. 2 1-way clutch, first and reverse brake disc set and second brake drum from the transmission case.

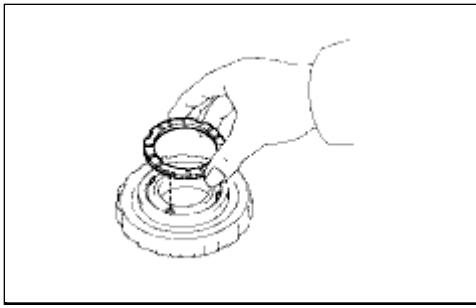


(c) Remove the thrust bearing from the transmission case.



## **97. REMOVE SECOND BRAKE DRUM SUB-ASSEMBLY**

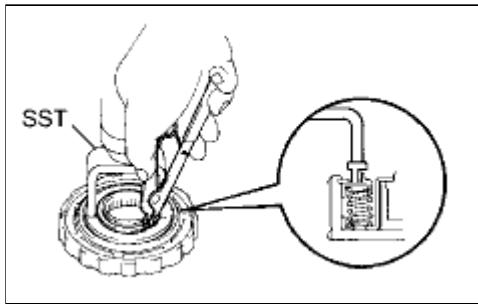
(a) Remove the second brake drum.



**98. REMOVE NO. 4 PLANETARY CARRIER THRUST WASHER**

**99. INSPECT SECOND BRAKE PISTON** INFO

**100. REMOVE SECOND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY**



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

**SST: 09350-30020**

09350-07040

**NOTICE:**

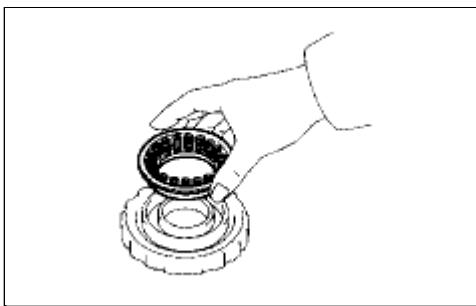
**Do not deform the spring seat. Stop compressing the spring when the spring seat is lowered to a position 1 to 2 mm (0.0394 to 0.0787 in.) from the snap ring groove.**

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

**NOTICE:**

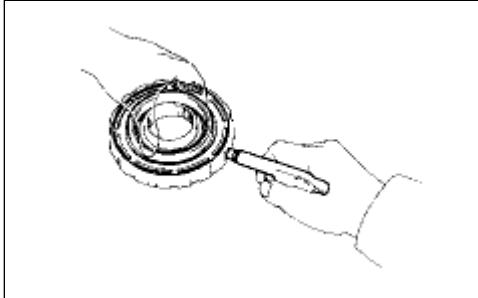
**Do not expand the snap ring excessively.**

(c) Remove the second brake piston return spring seat.



(d) Remove the piston return spring.

**101. INSPECT SECOND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY** INFO

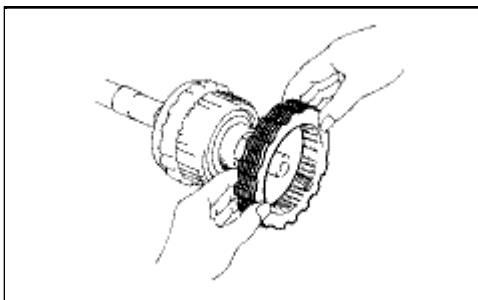
**102. REMOVE SECOND BRAKE PISTON**

- (a) Hold the second brake piston by hand and apply compressed air to the 2nd brake drum to remove the 2nd brake piston.

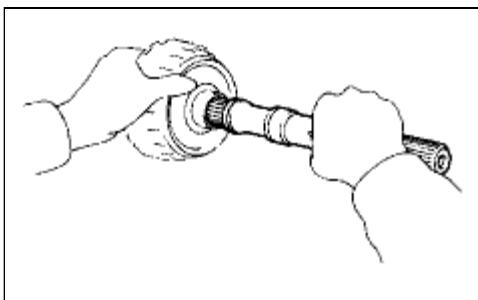
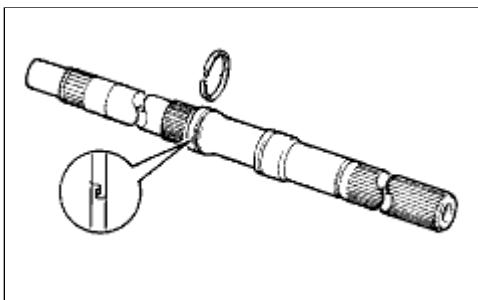
**HINT:**

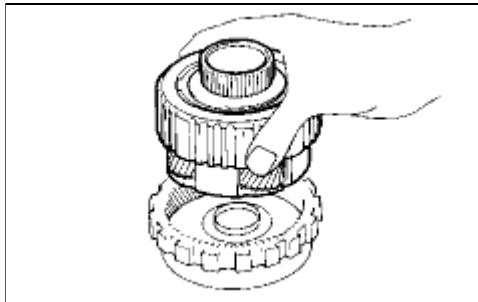
If the piston is at an angle and cannot be removed, press down on the protruding side and apply compressed air again.

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

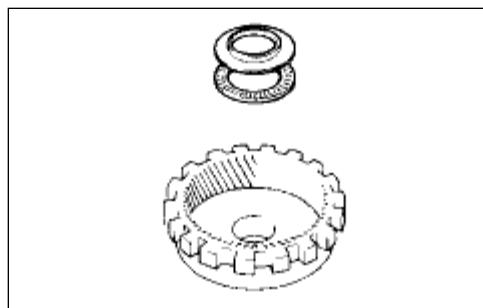
**103. REMOVE FIRST AND REVERSE BRAKE DISC SET**

- (a) Remove the flange, 6 plates and 6 discs.

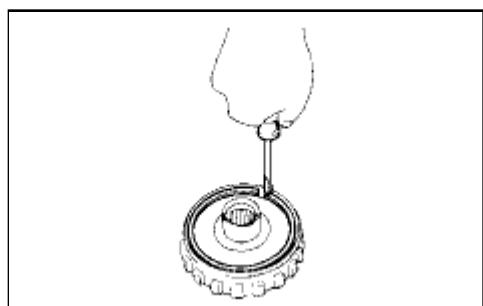
**104. INSPECT FIRST AND REVERSE BRAKE DISC** INFO**105. REMOVE OUTPUT SHAFT****106. REMOVE PLANETARY OUTPUT SHAFT OIL SEAL RING****107. REMOVE REAR PLANETARY RING GEAR**



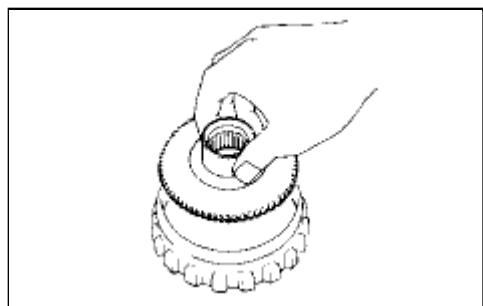
(a) Remove the rear planetary gear from the planetary ring gear.



(b) Remove the 2 bearing race and bearing from the planetary ring gear.



(c) Using a screwdriver, pry out the snap ring.

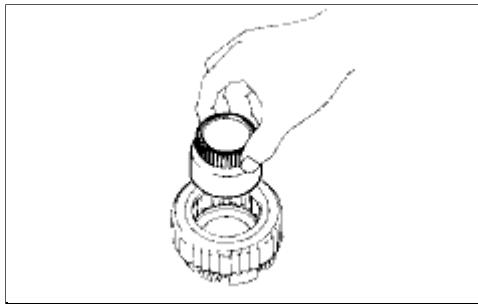


(d) Remove the planetary ring gear flange.

#### 108. INSPECT NO. 2 1-WAY CLUTCH

INFO

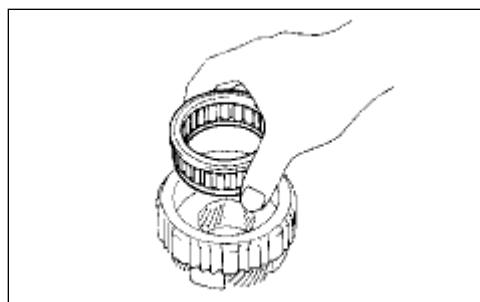
#### 109. REMOVE NO. 2 1-WAY CLUTCH



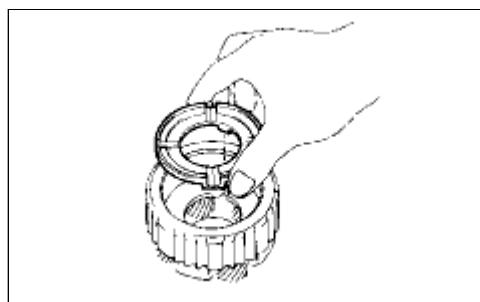
(a) Remove the 1-way clutch inner race from the planetary gear.



(b) Using a screwdriver, pry out the snap ring.

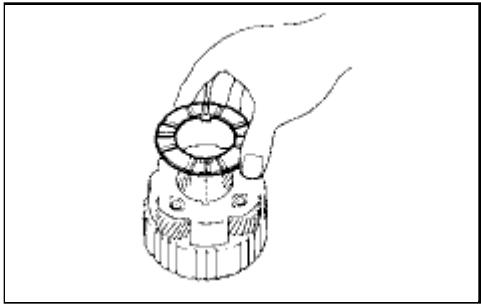


(c) Remove the 1-way clutch from the planetary gear.



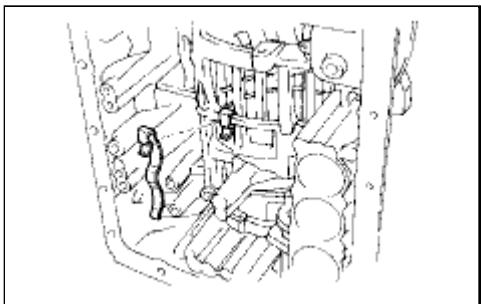
(d) Remove the No. 2 planetary carrier thrust washer from the planetary gear.

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

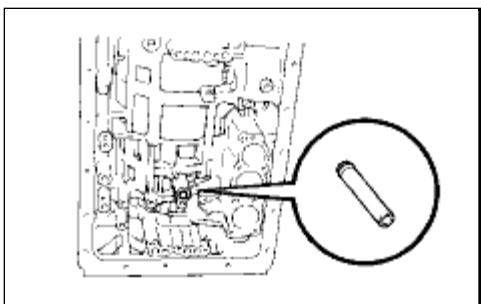


### 110. INSPECT REAR PLANETARY GEAR ASSEMBLY

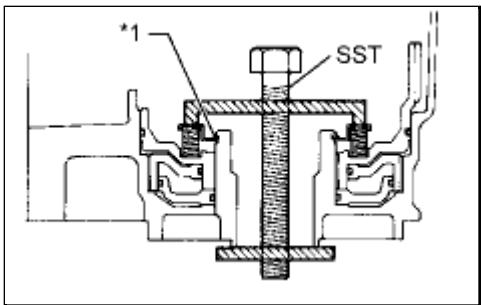
INFO



### 111. REMOVE LEAF SPRING



### 112. REMOVE BRAKE DRUM GASKET



### 113. REMOVE FIRST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Place SST on the first and reverse brake return spring and compress the brake return spring.

SST: 09350-30020

09350-07050

#### Text in Illustration

\*1

Snap Ring

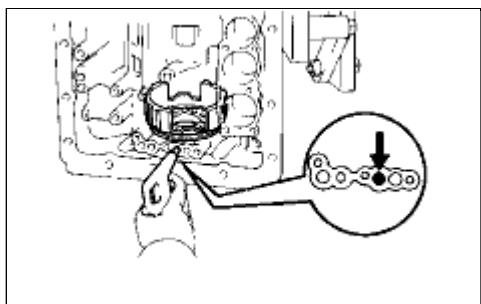
(b) Using SST, remove the snap ring and brake return spring.

**SST: 09350-30020**

09350-07070

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

[INFO]



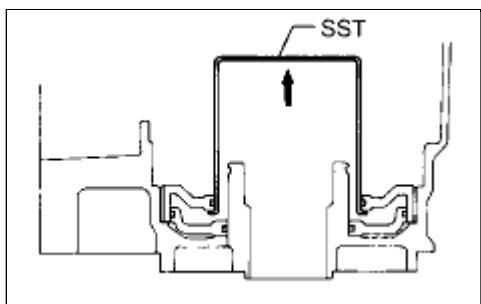
## 115. REMOVE NO. 2 FIRST AND REVERSE BRAKE PISTON

(a) Hold the No. 2 first and reverse brake piston and apply compressed air to the transmission case to remove the brake piston.

### HINT:

If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

(b) Remove the O-ring from the brake piston.



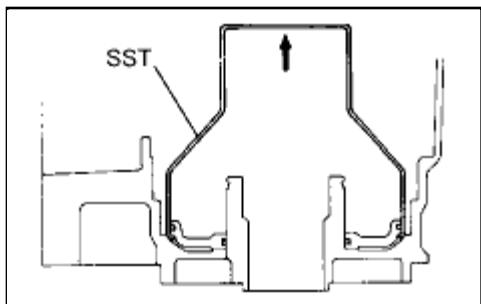
## 116. REMOVE BRAKE REACTION SLEEVE

(a) Using SST, remove the sleeve.

**SST: 09350-30020**

09350-07080

(b) Remove the O-rings from the sleeve.



## 117. REMOVE NO. 1 1ST AND REVERSE BRAKE PISTON

(a) Using SST, remove the brake piston.

**SST: 09350-30020**

09350-07090

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

## 118. INSPECT TRANSMISSION CASE BUSH

[INFO]



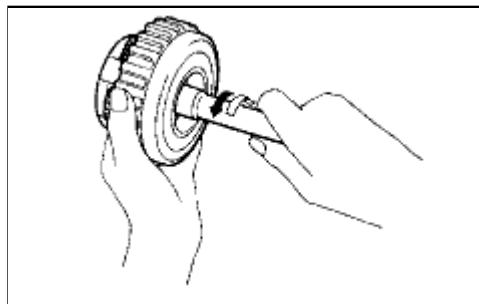
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013B1000X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: INSPECTION (2010 4Runner)		

## INSPECTION

### 1. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

- (a) Remove the magnets and use them to collect steel particles.
- (b) Carefully look at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.
  - Steel (magnetic): bearing, gear and clutch plate wear.
  - Brass (non-magnetic): bush wear.

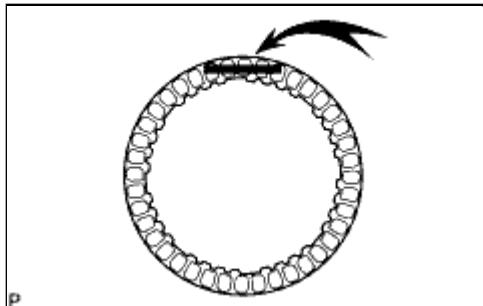
### 2. INSPECT OVERDRIVE 1-WAY CLUTCH



- (a) Hold the overdrive direct clutch drum and turn the input shaft. Check that the input shaft can be turned clockwise freely and locks when turned counterclockwise.

#### Text in Illustration

	Lock
	Free

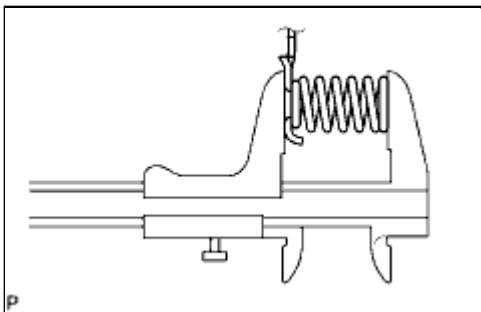


### 3. INSPECT OVERDRIVE DIRECT CLUTCH DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

#### NOTICE:

When assembling new discs, soak them in ATF for at least 15 minutes before assembly.



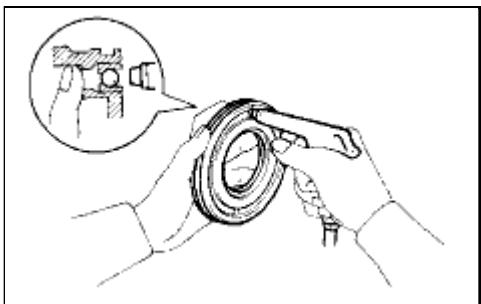
#### 4. INSPECT OVERDRIVE CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

15.8 mm (0.622 in.)

If the length is not as specified, replace the overdrive clutch return spring sub-assembly.

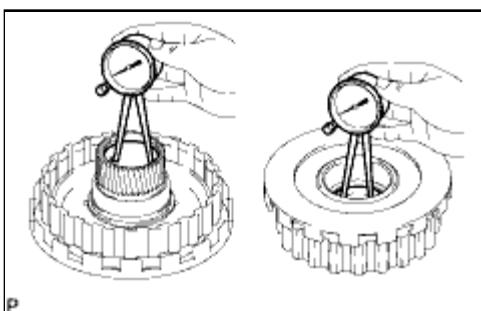


#### 5. INSPECT OVERDRIVE DIRECT CLUTCH PISTON SUB-ASSEMBLY

- (a) Check that the check ball is free by shaking the piston.

- (b) Check that the valve does not have leaks by applying low-pressure compressed air.

If the result is not as specified, replace the overdrive direct clutch piston sub-assembly.



#### 6. INSPECT OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSEMBLY

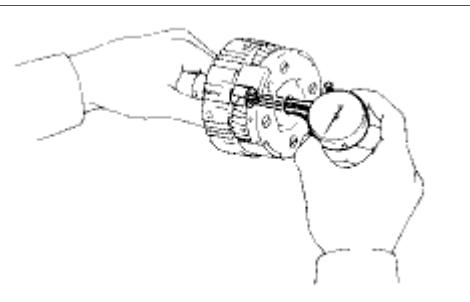
- (a) Using a dial indicator, measure the inside diameter of the clutch drum bushes.

Standard inside diameter:

27.037 to 27.063 mm (1.06 to 1.07 in.)

If the inside diameter is not as specified, replace the overdrive direct clutch drum sub-assembly.

#### 7. INSPECT OVERDRIVE PLANETARY GEAR ASSEMBLY

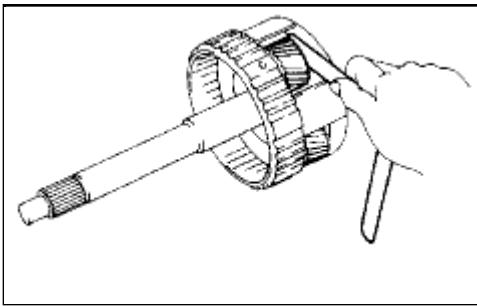


- (a) Using a dial indicator, measure the inside diameter of the planetary gear bush.

Standard inside diameter:

11.2 to 11.221 mm (0.441 to 0.442 in.)

If the inside diameter is not as specified, replace the overdrive planetary gear assembly.

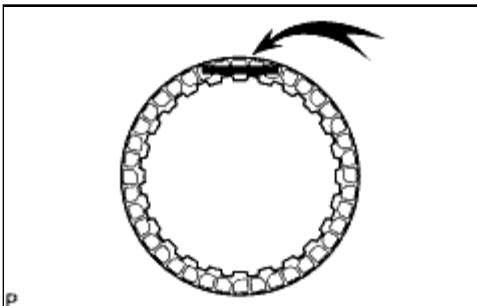


- (b) Using a feeler gauge, measure the planetary pinion gear thrust clearance.

Standard clearance:

0.20 to 0.60 mm (0.00787 to 0.0236 in.)

If the clearance is not as specified, replace the overdrive planetary gear assembly.



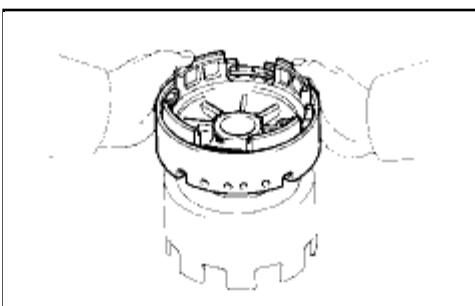
## 8. INSPECT OVERDRIVE BRAKE DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

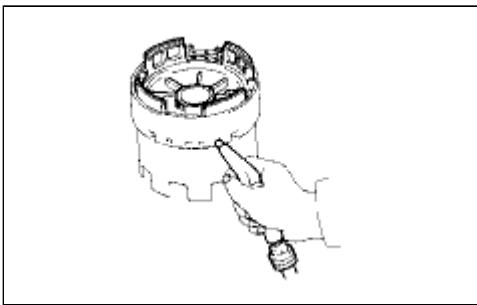
**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

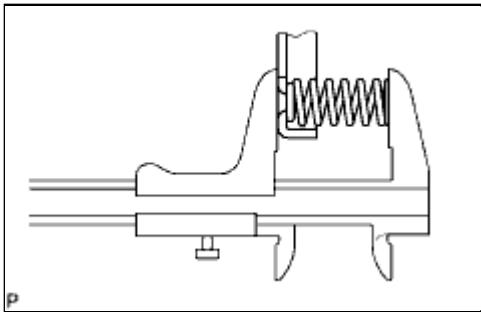
## 9. INSPECT PISTON OPERATION OF OVERDRIVE BRAKE



- (a) Place the overdrive support assembly onto the direct clutch assembly.



- (b) Apply compressed air (392 kPa (4 kgf/cm<sup>2</sup>, 57 psi)) into the oil passage and check that the overdrive brake piston moves smoothly.



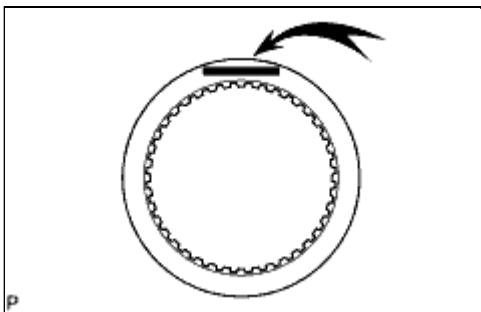
## 10. INSPECT OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

17.03 mm (0.671 in.)

If the length is not as specified, replace the overdrive brake return spring sub-assembly.

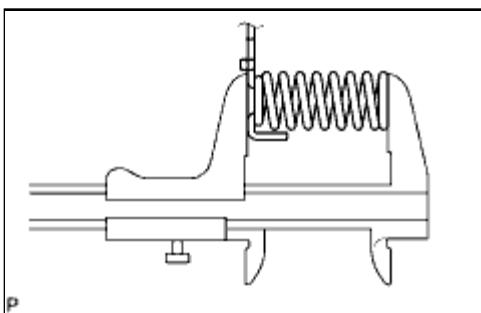


## 11. INSPECT DIRECT CLUTCH DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**



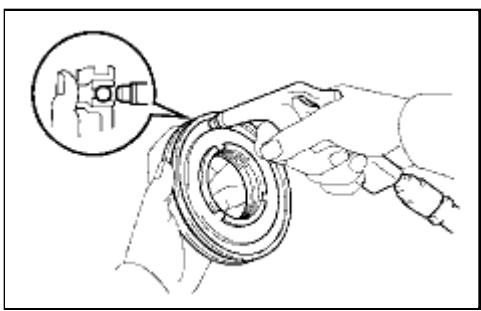
## 12. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

21.32 mm (0.839 in.)

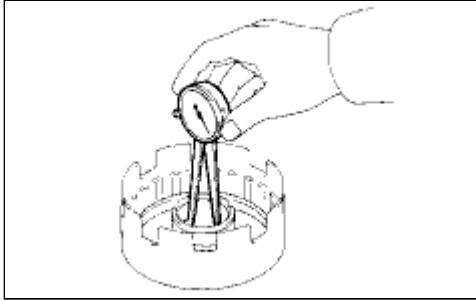
If the length is not as specified, replace the direct clutch return spring sub-assembly.



## 13. INSPECT DIRECT CLUTCH PISTON SUB-ASSEMBLY

- (a) Check that the check ball is free by shaking the piston.
- (b) Check that the valve does not have leaks by applying low-pressure compressed air.

## 14. INSPECT DIRECT CLUTCH DRUM SUB-ASSEMBLY

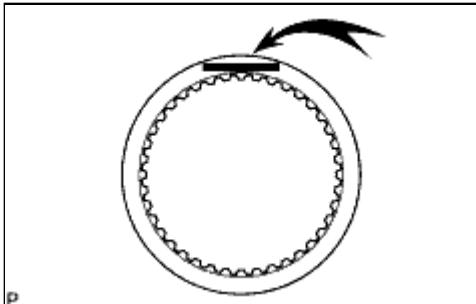


- (a) Using a dial indicator, measure the inside diameter of the clutch drum bush.

Standard inside diameter:

53.915 to 53.94 mm (2.123 to 2.124 in.)

If the inside diameter is not as specified, replace the direct clutch drum sub-assembly.

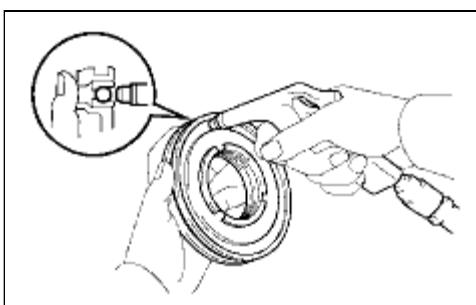


## 15. INSPECT FORWARD CLUTCH DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

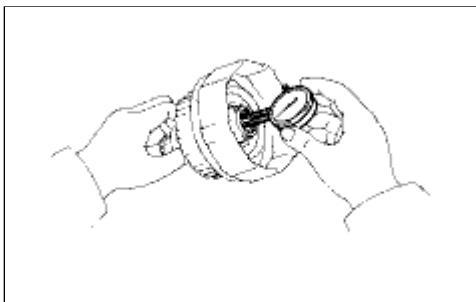
### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**



## 16. INSPECT FORWARD CLUTCH PISTON SUB-ASSEMBLY

- (a) Check that the check ball is free by shaking the piston.  
(b) Check that the valve does not have leaks by applying low-pressure compressed air.



## 17. INSPECT INPUT SHAFT SUB-ASSEMBLY

- (a) Using a dial indicator, measure the inside diameter of the input shaft bush.

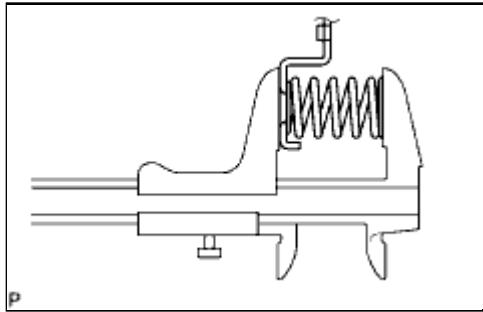
Standard inside diameter:

24.0 to 24.026 mm (0.945 to 0.946 in.)

If the inside diameter is not as specified, replace the input shaft sub-assembly.

## 18. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the

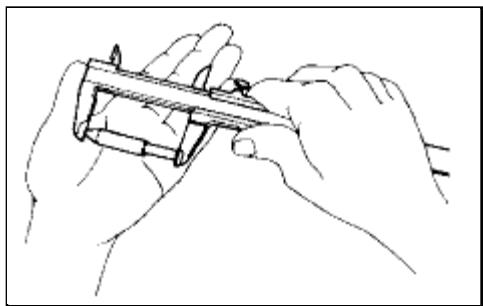


spring together with the spring seat.

Standard free length:

19.47 mm (0.767 in.)

If the length is not as specified, replace the forward clutch return spring sub-assembly.



**HINT:**

**There are 2 different standard lengths for the piston rod.**

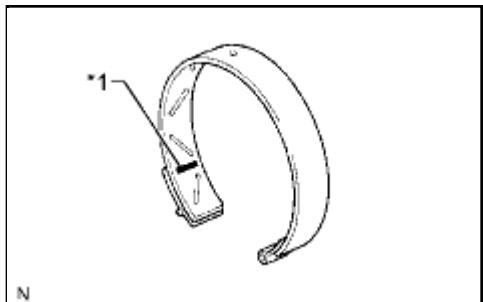
Piston Rod Length:

GROOVE MARK	LENGTH
Without	78.3 to 78.5 mm (3.08 to 3.09 in.)
With	79.8 to 80.0 mm (3.14 to 3.15 in.)

If the length is not as specified, replace the rod with a new one even if the brake band works normally.

**20. INSPECT SECOND COAST BRAKE BAND ASSEMBLY**

**Text in Illustration**

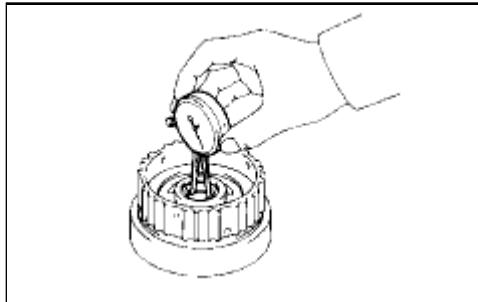


*1	Printed Number
----	----------------

**NOTICE:**

- If the lining of the brake band is peeled off or discolored, or if any part of the printed numbers is damaged, replace the brake band.
- When installing a new band, soak it in ATF for at least 15 minutes before installation.

**21. INSPECT FRONT PLANETARY RING GEAR SUB-ASSEMBLY**

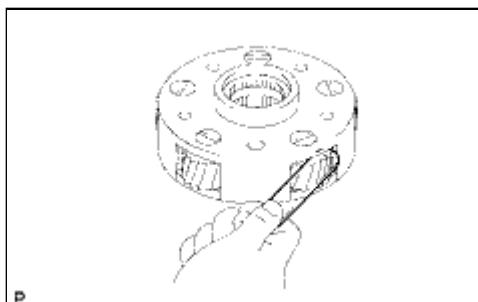


(a) Using a dial indicator, measure the inside diameter of the planetary ring gear bush.

Standard inside diameter:

24.0 to 24.026 mm (0.945 to 0.946 in.)

If the inside diameter is not as specified, replace the front planetary ring gear sub-assembly.



## 22. INSPECT FRONT PLANETARY GEAR ASSEMBLY

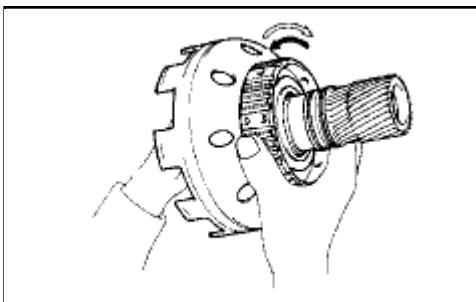
(a) Using a feeler gauge, measure the pinion gear thrust clearance.

Standard clearance:

0.20 to 0.60 mm (0.00787 to 0.0236 in.)

If the clearance is not as specified, replace the front planetary gear assembly.

## 23. INSPECT NO. 1 1-WAY CLUTCH ASSEMBLY



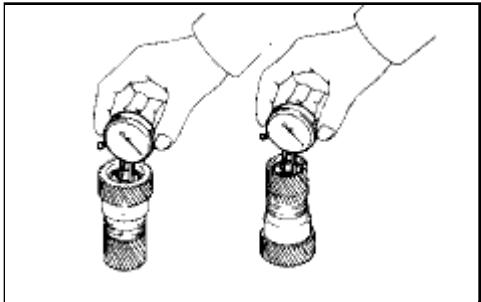
(a) Hold the planetary sun gear and turn the 1-way clutch assembly. Check that the 1-way clutch hub can be turned clockwise freely and locks when turned counterclockwise.

### Text in Illustration

	Lock
	Free

## 24. INSPECT PLANETARY SUN GEAR SUB-ASSEMBLY

(a) Using a dial indicator, measure the inside diameter of the

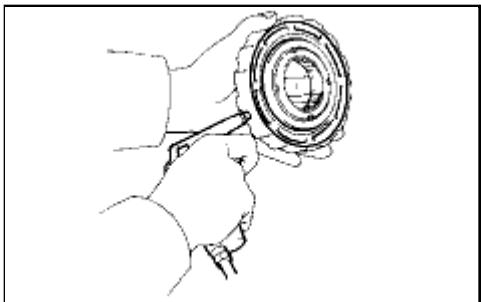


planetary sun gear bushes.

Standard inside diameter:

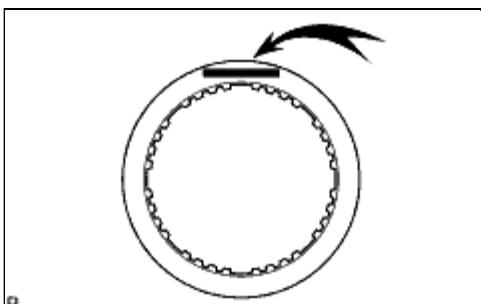
27.00 to 27.026 mm (1.063 to 1.064 in.)

If the inside diameter is not as specified, replace the planetary sun gear sub-assembly.



## 25. INSPECT SECOND BRAKE PISTON

- Check that the second brake piston moves smoothly when applying compressed air to and releasing low-pressure compressed air from the second brake drum.

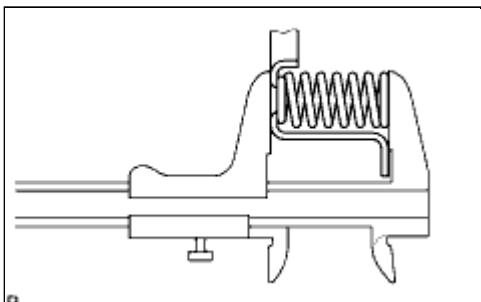


## 26. INSPECT SECOND BRAKE DISC

- Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**



## 27. INSPECT SECOND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- Using a vernier caliper, measure the free length of the spring together with the spring seat.

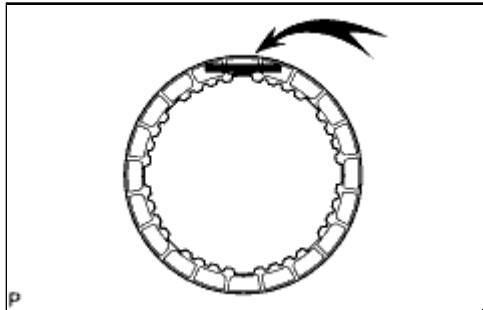
Standard free length:

16.05 mm (0.632 in.)

If the length is not as specified, replace the second brake piston return spring sub-assembly.

## 28. INSPECT FIRST AND REVERSE BRAKE DISC

- Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the

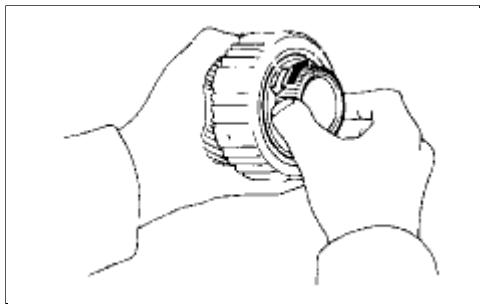


lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

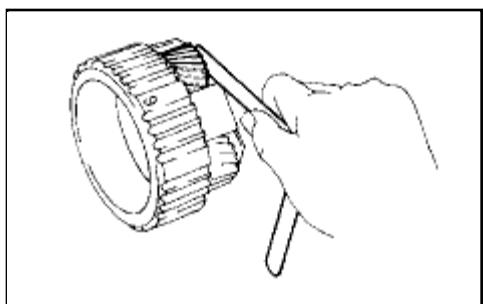
## 29. INSPECT NO. 2 1-WAY CLUTCH



- (a) Hold the planetary gear and turn the 1-way clutch inner race. Check that the 1-way clutch inner race can be turned counterclockwise freely and locks when turned clockwise.

**Text in Illustration**

A solid black arrow pointing to the right, enclosed in a thin rectangular border.	Lock
A solid black arrow pointing to the right, enclosed in a thin rectangular border.	Free



## 30. INSPECT REAR PLANETARY GEAR ASSEMBLY

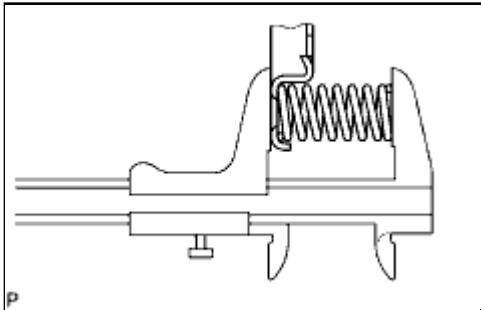
- (a) Using a feeler gauge, measure the thrust clearance.

Standard clearance:

0.20 to 0.60 mm (0.00797 to 0.0236 in.)

If the clearance is not as specified, replace the rear planetary gear assembly.

## 31. INSPECT FIRST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

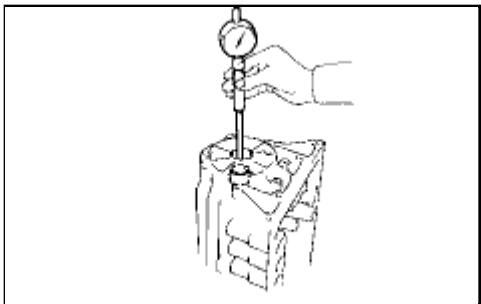


- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

18.382 mm (0.724 in.)

If the length is not as specified, replace the first and reverse brake return spring sub-assembly.



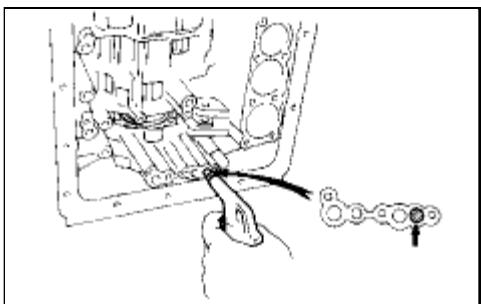
### 32. INSPECT TRANSMISSION CASE BUSH

- (a) Using a cylinder gauge, measure the inside diameter of the transmission case rear bush.

Standard inside diameter:

38.113 to 38.138 mm (1.5005 to 1.5014 in.)

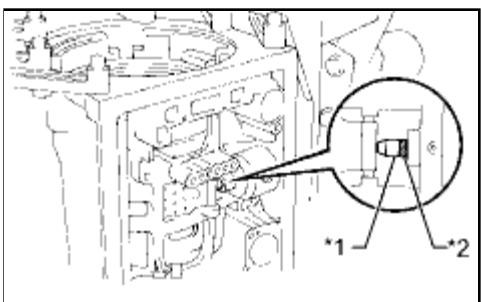
If the inside diameter is not as specified, replace the automatic transmission case sub-assembly.



### 33. INSPECT PISTON OPERATION OF FIRST AND REVERSE BRAKE

- (a) Make sure the first and reverse brake pistons move smoothly when compressed air is applied into the transmission case.

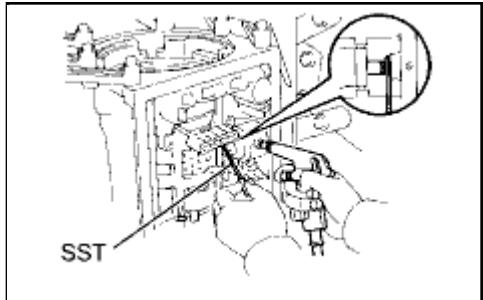
### 34. INSPECT PISTON OPERATION OF SECOND COAST BRAKE



- (a) Place a mark on the 2nd coast brake piston rod.

**Text in Illustration**

*1	Mark
*2	Piston Rod



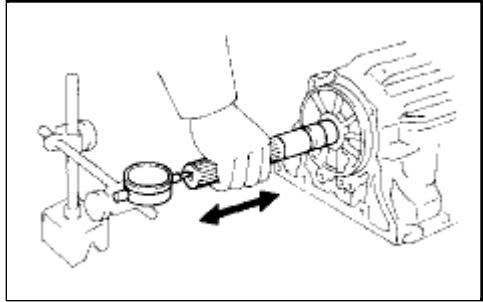
- (b) Using SST, measure the stroke while applying and releasing compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)).

**SST: 09240-00020**

Standard piston stroke:

1.5 to 3.0 mm (0.059 to 0.118 in.)

If the stroke is not as specified, replace the brake band with a new one.



### 35. INSPECT OUTPUT SHAFT END PLAY

- (a) Using a dial indicator, measure the end play of the output shaft while moving it by hand.

Standard end play:

0.30 to 1.04 mm (0.0118 to 0.0409 in.)

If the end play is not as specified, check for improper installation.

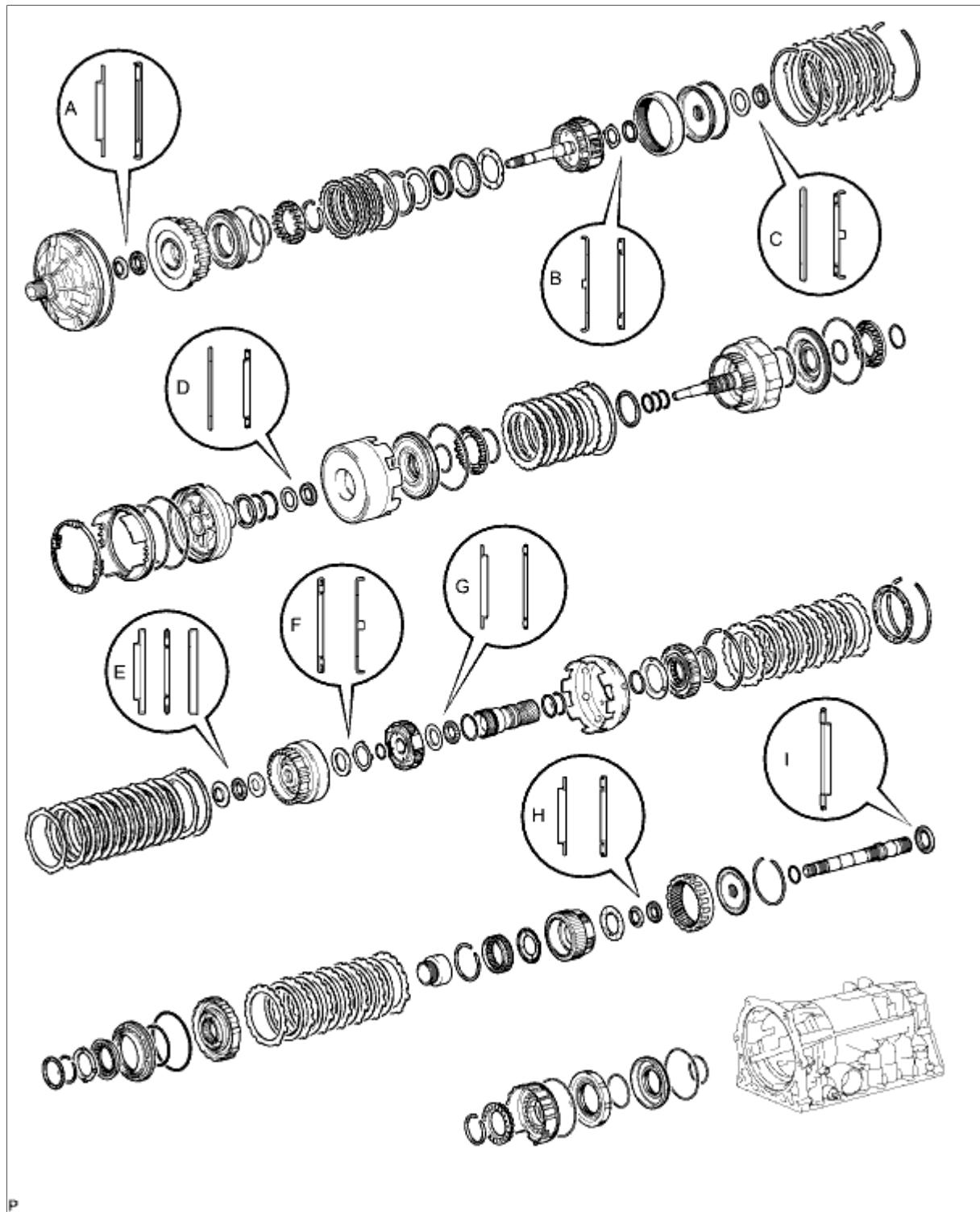
- (b) Check that the output shaft rotates smoothly.



<b>Last Modified:</b> 5-10-2010	6.4 A	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013B4000X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

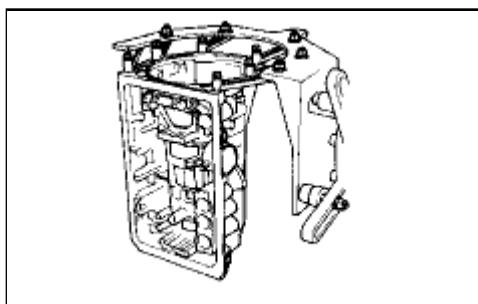
### **1. BEARING POSITION**



Bearing Diameter:

MARK	FRONT RACE DIAMETER INSIDE/OUTSIDE	THRUST BEARING DIAMETER INSIDE/OUTSIDE	REAR RACE DIAMETER INSIDE/OUTSIDE
A	28.45 mm (1.12 in.)/47.1 to 47.35 mm (1.85 to 1.86 in.)	29.04 to 29.25 mm (1.14 to 1.15 in.)/50.04 to 50.34 mm (1.97 to 1.98 in.)	-

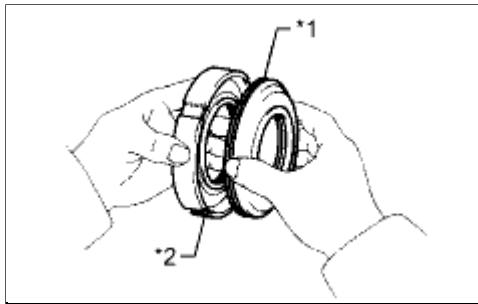
MARK	FRONT RACE DIAMETER INSIDE/OUTSIDE	THRUST BEARING DIAMETER INSIDE/OUTSIDE	REAR RACE DIAMETER INSIDE/OUTSIDE
B	33.0 to 33.25 mm (1.30 to 1.31 in.)/49.9 to 50.4 mm (1.96 to 1.98 in.)	31.45 to 31.70 mm (1.24 to 1.25 in.)/49.1 to 49.4 mm (1.93 to 1.94 in.)	-
C	37.1 to 37.3 mm (1.46 to 1.47 in.)/58.70 to 58.95 mm (2.31 to 2.32 in.)	33.75 to 33.85 mm (1.329 to 1.333 in.)/49.8 to 50.3 mm (1.96 to 1.98 in.)	-
D	36.5 to 37 mm (1.44 to 1.46 in.)/50.75 to 50.95 mm (2.00 to 2.01 in.)	33.55 to 33.80 mm (1.32 to 1.33 in.)/47.62 to 47.87 mm (1.87 to 1.88 in.)	-
E	25.98 mm (1.02 in.)/48.87 mm (1.92 in.)	25.94 to 26.07 mm (1.02 to 1.03 in.)/46.62 to 46.87 mm (1.84 to 1.85 in.)	26.5 to 27.0 mm (1.04 to 1.06 in.)/47.02 mm (1.85 in.)
F	-	35 to 35.3 mm (1.38 to 1.39 in.)/50.50 to 53.75 mm (2.11 to 2.12 in.)	34 to 34.5 mm (1.34 to 1.36 in.)/48.5 to 49 mm (1.91 to 1.93 in.)
G	33.55 to 33.80 mm (1.32 to 1.33 in.)/47.3 to 47.8 mm (1.86 to 1.88 in.)	35.45 to 35.61 mm (1.396 to 1.402 in.)/47.62 to 47.87 mm (1.87 to 1.88 in.)	-
H	28.5 mm (1.12 in.)/44.2 mm (1.74 in.)	27.65 to 27.8 mm (1.089 to 1.094 in.)/44.2 mm (1.74 in.)	-
I	-	39.38 mm (1.55 in.)/57.94 to 58.36 mm (2.28 to 2.30 in.)	-



## 2. FIX TRANSMISSION CASE

(a) Install the transmission case to an overhaul attachment.

## 3. INSTALL NO. 1 FIRST AND REVERSE BRAKE PISTON



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

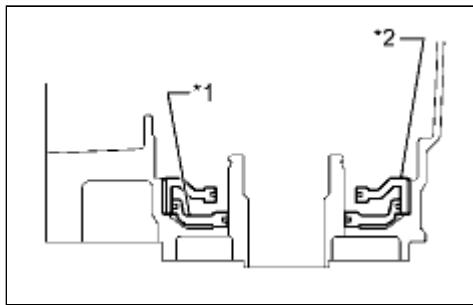
#### Text in Illustration

*1	No. 1 First and Reverse Brake Piston
*2	Reaction Sleeve

(b) Coat a new O-ring with ATF and install it to the reaction sleeve.

(c) Install the No. 1 brake piston to the reaction sleeve.

(d) With the No. 1 brake piston on the bottom (the rear side), install the brake reaction sleeve and No. 1 brake piston to the transmission case.



#### Text in Illustration

*1	No. 1 First and Reverse Brake Piston
*2	Reaction Sleeve

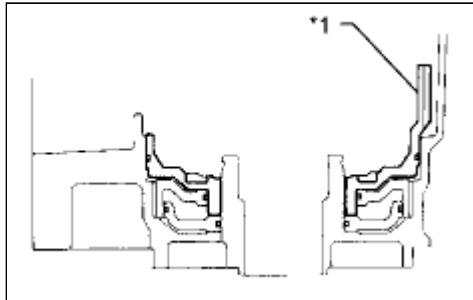
#### NOTICE:

Be careful not to damage the O-rings.

## 4. INSTALL NO. 2 FIRST AND REVERSE BRAKE PISTON

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

(b) With the spring seat of the piston facing upward (the front side), install the piston to the transmission case.



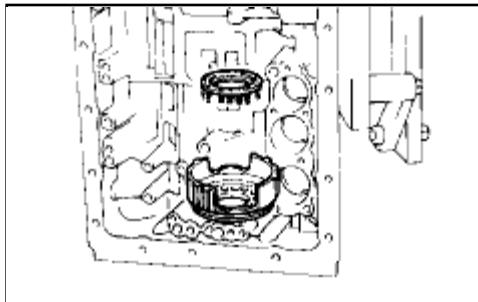
#### Text in Illustration

*1	No. 2 First and Reverse Brake Piston
----	--------------------------------------

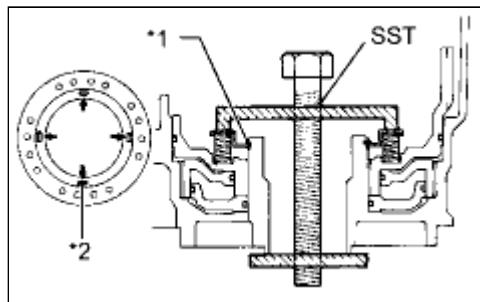
#### NOTICE:

Be careful not to damage the O-ring.

## 5. INSTALL FIRST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY



(a) Install the No. 2 brake return spring to the brake piston.



(b) Place SST on the brake return spring and compress the brake return spring.

**SST: 09350-30020**

09350-07050

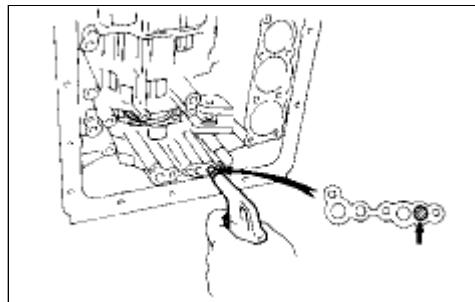
(c) Using SST, install the snap ring. Make sure the end gap of the snap ring is not aligned with a spring retainer claw.

**SST: 09350-30020**

09350-07070

### Text in Illustration

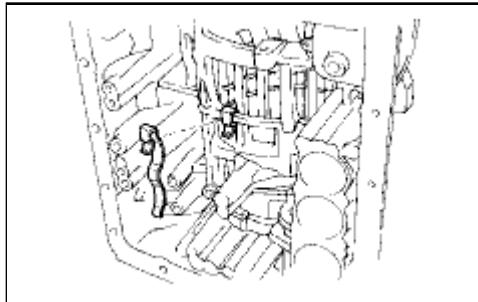
*1	Snap Ring
*2	Retainer Claw



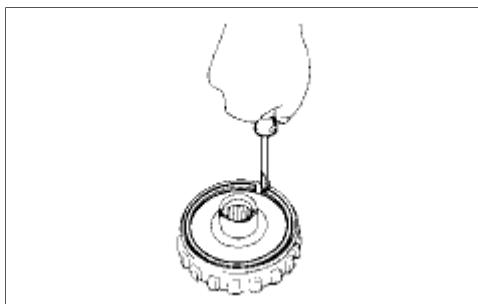
## 6. INSPECT PISTON OPERATION OF FIRST AND REVERSE BRAKE

(a) Make sure the first and reverse brake pistons move smoothly when compressed air is applied into the transmission case.

## 7. INSTALL LEAF SPRING



## 8. INSTALL REAR PLANETARY RING GEAR FLANGE

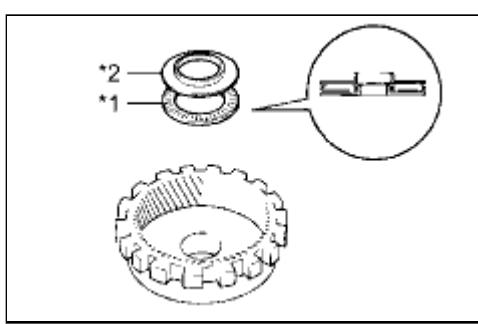


(a) Install the ring gear flange to the rear planetary ring gear.

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

(c) Coat the bearing and bearing race with petroleum jelly and install them to the rear planetary ring gear.

Bearing and Bearing Race Diameter:

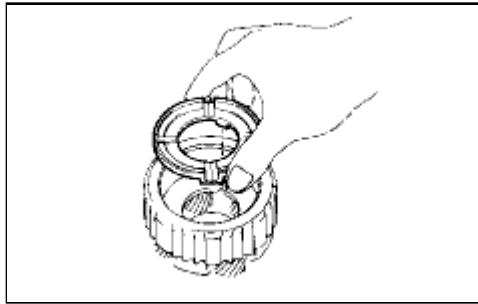


ITEM	INSIDE	OUTSIDE
Bearing H	27.65 to 27.8 mm (1.089 to 1.094 in.)	44.2 mm (1.74 in.)
Bearing Race H	28.5 mm (1.12 in.)	44.2 mm (1.74 in.)

### Text in Illustration

*1	Bearing H
*2	Bearing Race H

(d) Coat the No. 2 planetary carrier thrust washer with petroleum jelly.

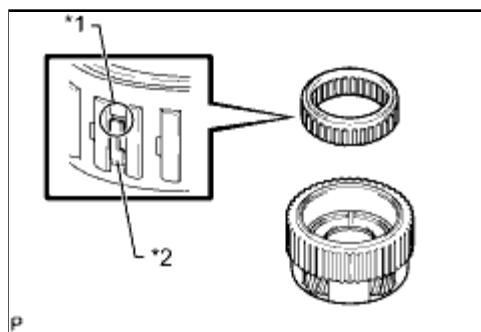


(e) Install the thrust washer to the planetary gear.

**HINT:**

**Make sure that the tabs of the washer fit into the cutout portions of the planetary gear.**

## 9. INSTALL NO. 2 1-WAY CLUTCH



(a) Install the 1-way clutch to the planetary gear.

**HINT:**

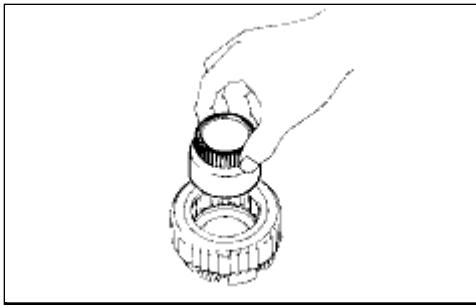
**Make sure that the open ends of the guides of the 1-way clutch are facing upward.**

**Text in Illustration**

* 1	Open End
* 2	Guide



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

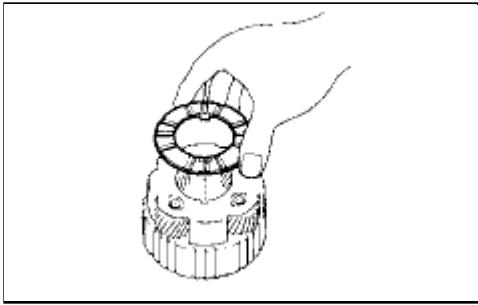


- (c) While turning the 1-way clutch inner race counterclockwise, install the 1-way clutch inner race to the planetary gear.

## 10. INSPECT NO. 2 1-WAY CLUTCH



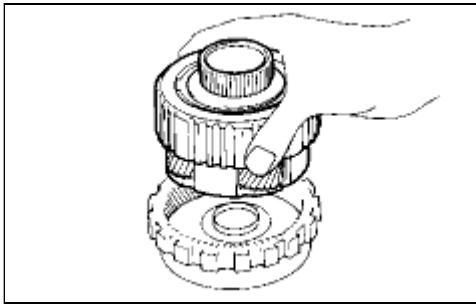
## 11. INSTALL REAR PLANETARY GEAR ASSEMBLY



- (a) Coat the No. 1 planetary carrier thrust washer with petroleum jelly.  
(b) Install the thrust washer to the planetary gear.

### HINT:

Make sure that the tabs of the washer fit into the cutout portions of the planetary gear.

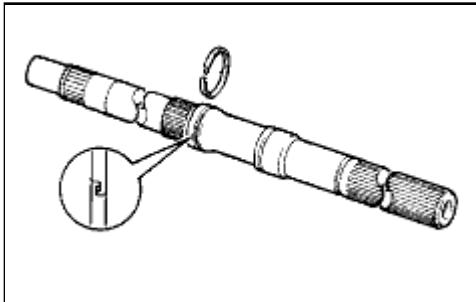


- (c) Install the rear planetary gear to the rear planetary ring gear.

## 12. INSTALL PLANETARY OUTPUT SHAFT OIL SEAL RING

- (a) Coat the oil seal ring with ATF and install it to the output shaft.

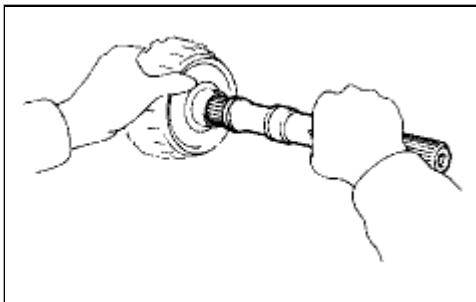
### HINT:



After installing the oil seal ring, check that it rotates smoothly.

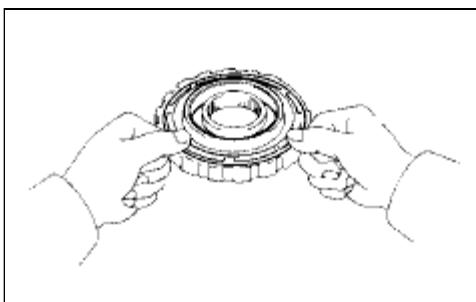
**NOTICE:**

Do not expand the ring excessively.



**13. INSTALL OUTPUT SHAFT**

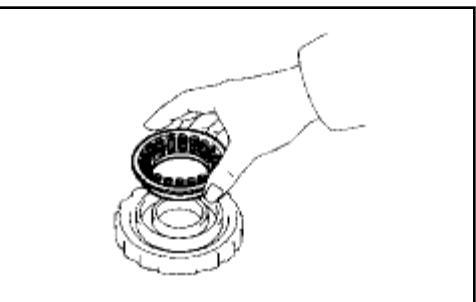
- Install the output shaft to the rear planetary gear flange.



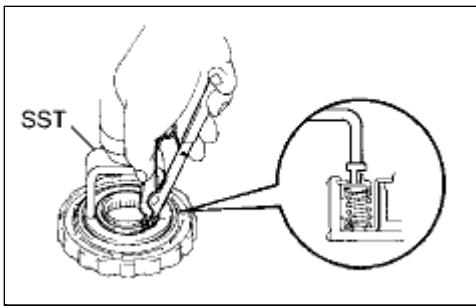
**14. INSTALL SECOND BRAKE PISTON**

- Coat 2 new O-rings with ATF and install them to the second brake piston.
- Being careful not to damage the O-rings, press the second brake piston toward the second brake drum with both hands.

**15. INSTALL SECOND BRAKE PISTON RETURN SPRING SUB-ASSEMBLY**



- Install the piston return spring.
- Install the second brake piston return spring seat.



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

**SST: 09350-30020**

09350-07040

**NOTICE:**

**Do not deform the spring seat. Stop compressing the spring when the spring seat is lowered to a position 1 to 2 mm (0.0394 to 0.0787 in.) from the snap ring groove.**

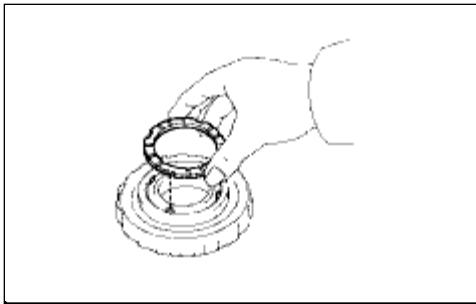
(d) Using a snap ring expander, install the snap ring.

**NOTICE:**

**Do not expand the snap ring excessively.**

## 16. INSPECT SECOND BRAKE PISTON

INFO

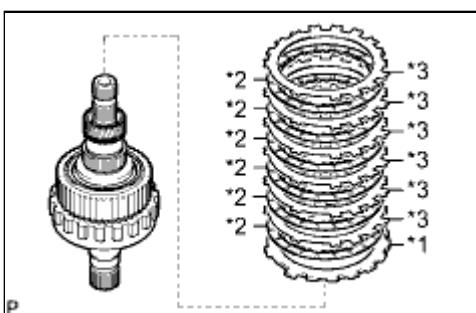


## 17. INSTALL NO. 4 PLANETARY CARRIER THRUST WASHER

(a) Coat the thrust washer with petroleum jelly and install it.

**HINT:**

**Make sure that the cutout portions of the thrust washer fit onto the teeth of the spring retainer.**



## 18. INSTALL FIRST AND REVERSE BRAKE DISC SET

(a) Install the flange with the rounded edge facing upward.

(b) Install the 6 discs and 6 plates.

Install in order:

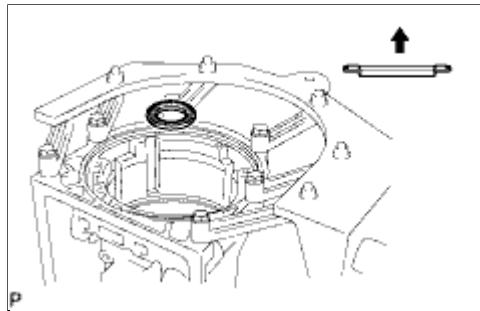
\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3

\*3

### Text in Illustration

*1	Flange
*2	Disc
*3	Plate

## 19. INSTALL OUTPUT SHAFT WITH REAR PLANETARY GEAR, NO. 2 1-WAY CLUTCH, FIRST AND REVERSE BRAKE DISC SET AND SECOND BRAKE DRUM



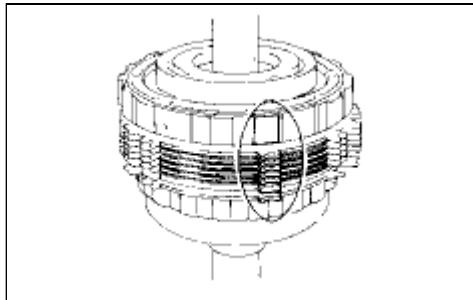
(a) Coat the bearing with petroleum jelly and install it to the case.

Bearing Diameter:

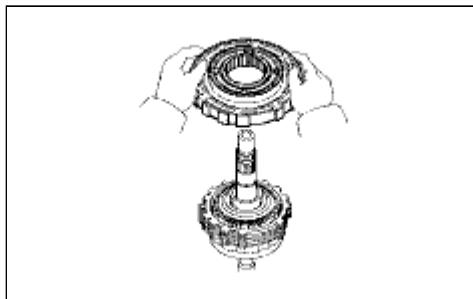
ITEM	INSIDE	OUTSIDE
Bearing I	39.38 mm (1.55 in.)	57.94 to 58.36 mm (2.28 to 2.30 in.)

**NOTICE:**

**Make sure the bearing is installed facing the proper direction.**



(b) Align the teeth on the flange, discs and plates.

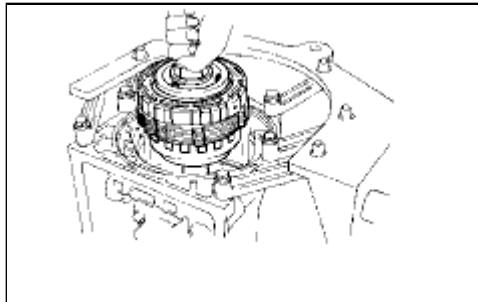
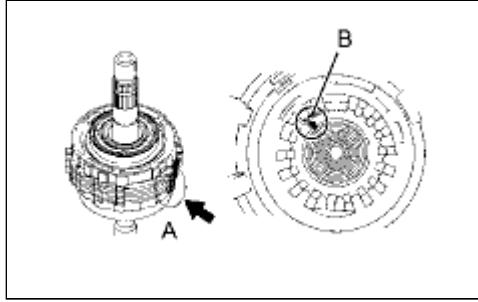


(c) Install the 2nd brake drum to the planetary gear with the snap ring facing upward.

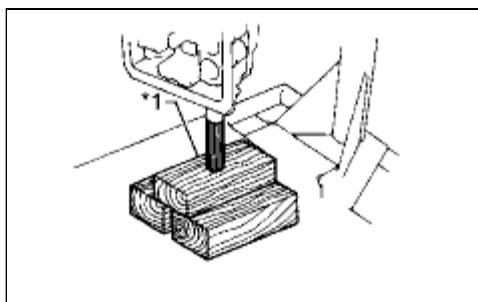
**NOTICE:**

**Make sure the oil hole in the drum faces towards the lower side of the transmission case (the side where the valve body is installed).**

(d) Align the teeth of the planetary gear assembly, indicated by A in the illustration, with the splines of the transmission case, indicated by B in the illustration.



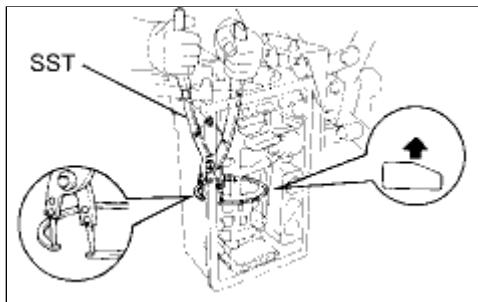
(e) Install the assembled planetary gear.



(f) Place the output shaft on wooden blocks.

### Text in Illustration

\*1 Wooden Block



(g) Using SST, install the snap ring.

**SST: 09350-30020**

09350-07060

## 20. SELECT FIRST AND REVERSE BRAKE FLANGE

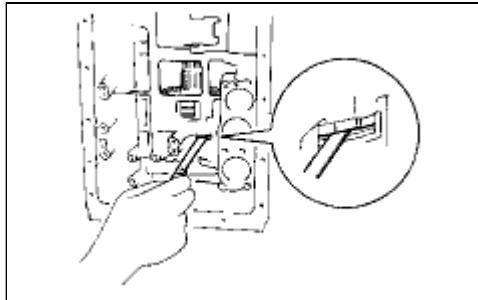
(a) Using a feeler gauge, measure the clearance between the plate and second brake drum.

Standard clearance:

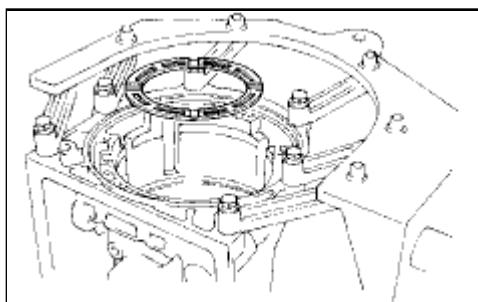
0.70 to 1.22 mm (0.0276 to 0.0480 in.)

If the clearance is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

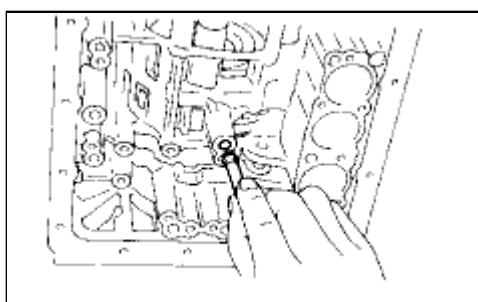
Flange Thickness:



MARK	THICKNESS
55	3.94 to 4.06 mm (0.155 to 0.160 in.)
54	4.14 to 4.26 mm (0.163 to 0.168 in.)
53	4.34 to 4.46 mm (0.171 to 0.176 in.)
52	4.54 to 4.66 mm (0.179 to 0.183 in.)
51	4.74 to 4.86 mm (0.187 to 0.191 in.)
50	4.92 to 5.08 mm (0.194 to 0.200 in.)
66	5.10 to 5.30 mm (0.201 to 0.209 in.)
67	5.30 to 5.50 mm (0.209 to 0.217 in.)



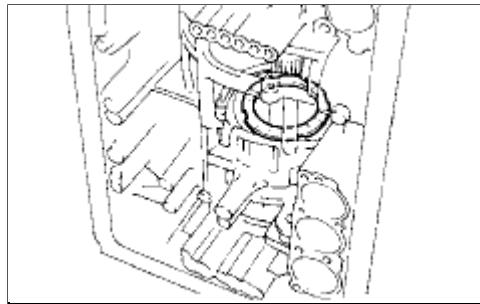
## 21. INSTALL SECOND BRAKE PISTON SLEEVE



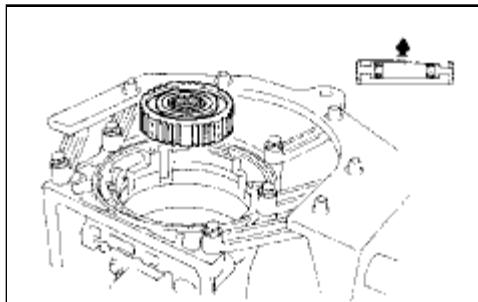
## 22. INSTALL BRAKE DRUM GASKET

- (a) Coat a new gasket with ATF and install it.

## 23. INSTALL NO. 1 1-WAY CLUTCH ASSEMBLY

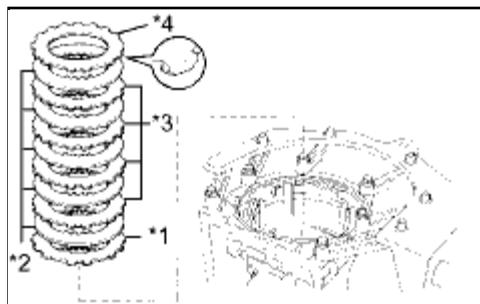


(a) Install the thrust washer to the second brake piston return spring.



(b) Install the 1-way clutch as shown in the illustration.

## 24. INSTALL SECOND BRAKE DISC SET



(a) Install the 1.8 mm (0.0709 in.) plate with the rounded edge of the plate facing the discs.

(b) Install the 5 discs, 4 2.5 mm (0.0984 in.) thick plates and flange.

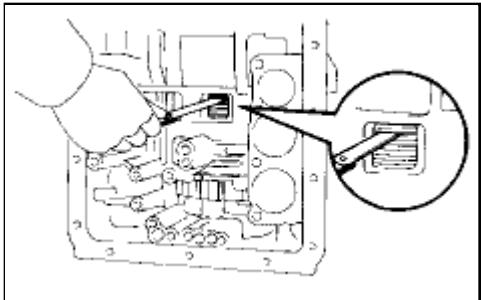
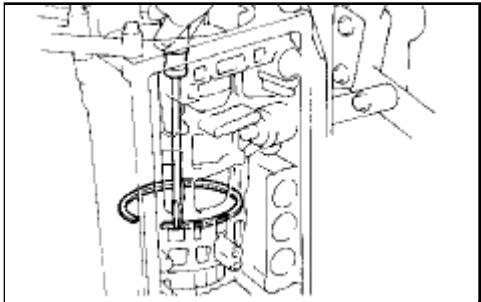
Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*4

### Text in Illustration

* 1	1.8 mm (0.0709 in.) Thick Plate
* 2	Disc
* 3	2.5 mm (0.0984 in.) Thick Plate
* 4	Flange

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



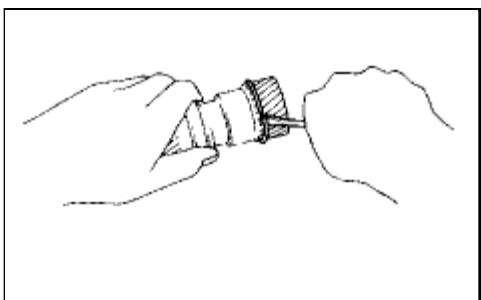
## 25. INSPECT SECOND BRAKE

(a) Using a feeler gauge, measure the clearance between the snap ring and flange.

Standard clearance:

0.62 to 1.98 mm (0.0244 to 0.0780 in.)

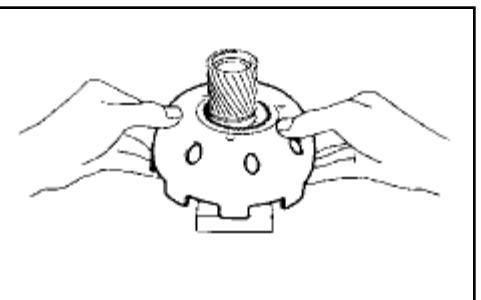
If the clearance is not as specified, inspect the discs.



## 26. INSTALL SUN GEAR INPUT DRUM SHAFT SNAP RING

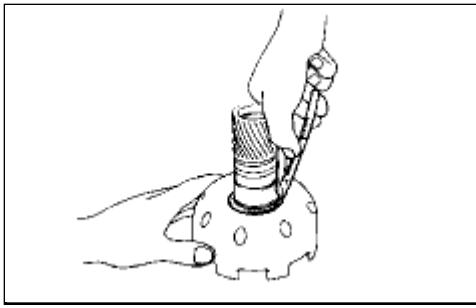
(a) Using a screwdriver, install the snap ring to the planetary sun gear.

## 27. INSTALL SUN GEAR INPUT DRUM

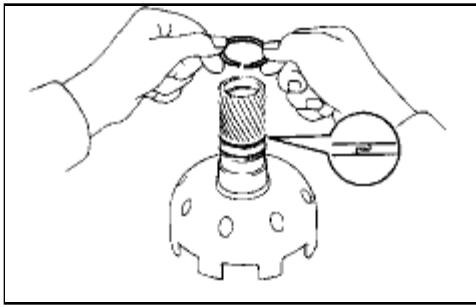


(a) Place the planetary sun gear onto a wooden block or similar object.

(b) Install the input drum to the planetary sun gear.



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



## 28. INSTALL SUN GEAR SHAFT OIL SEAL RING

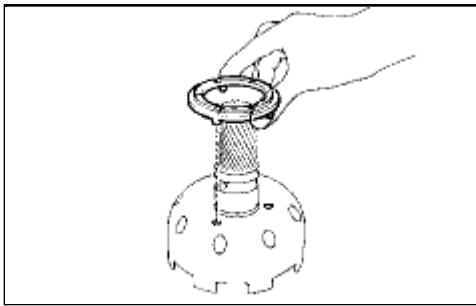
- Coat the 2 oil seal rings with ATF.
- Install the 2 oil seal rings to the planetary sun gear.

**HINT:**

After installing the oil seal rings, check that they rotate smoothly.

**NOTICE:**

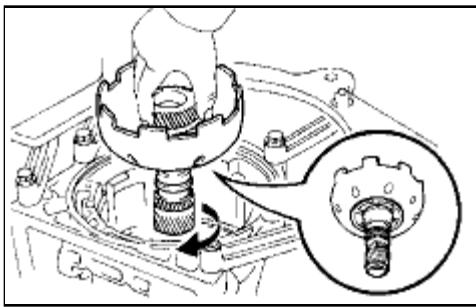
Do not expand the rings excessively.



## 29. INSTALL NO. 1 1-WAY CLUTCH THRUST WASHER

**HINT:**

Make sure that the tabs of the washer fit into the holes in the sun gear input drum.



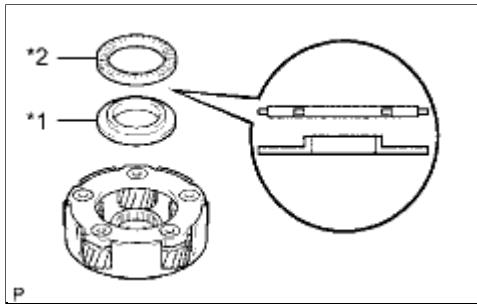
## 30. INSTALL PLANETARY SUN GEAR SUB-ASSEMBLY WITH SUN GEAR INPUT DRUM

- While turning the sun gear clockwise, install it to the 1-way clutch.

**HINT:**

Confirm that the thrust washer is installed correctly.

## 31. INSTALL FRONT PLANETARY GEAR ASSEMBLY



(a) Coat the bearing and bearing race with petroleum jelly and install them to the planetary gear.

Bearing and Bearing Race Diameter:

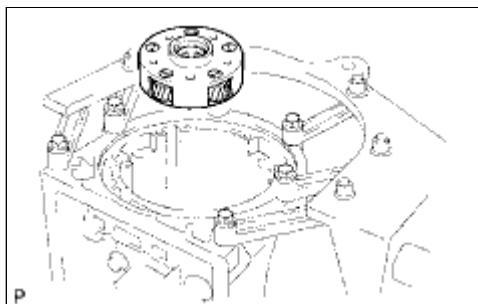
ITEM	INSIDE	OUTSIDE
Bearing Race G	33.55 to 33.80 mm (1.32 to 1.33 in.)	47.3 to 47.8 mm (1.86 to 1.88 in.)
Bearing G	35.45 to 35.61 mm (1.396 to 1.402 in.)	47.62 to 47.87 mm (1.87 to 1.88 in.)

#### Text in Illustration

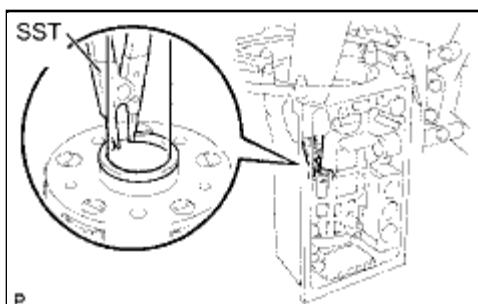
*1	Bearing Race G
*2	Bearing G

#### NOTICE:

Make sure the bearing and race are installed facing the proper directions.



(b) Install the planetary gear to the sun gear input drum.



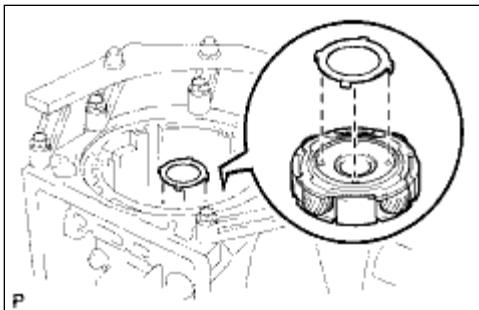
(c) Using SST, install the snap ring.

**SST: 09350-30020**

09350-07070

(d) Remove the wooden blocks from under the output shaft.

(e) Coat the bearing race with petroleum jelly and install it to the planetary gear.



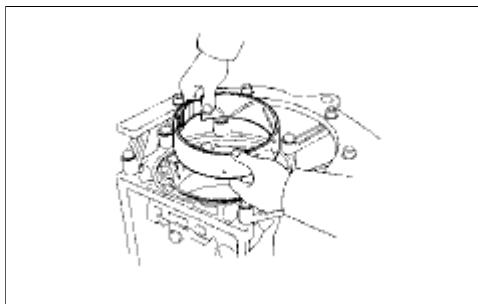
Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Bearing Race F	34 to 34.5 mm (1.34 to 1.36 in.)	48.5 to 49 mm (1.91 to 1.93 in.)

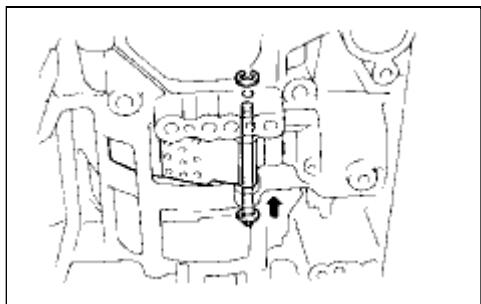
**NOTICE:**

Make sure the bearing race is installed facing the proper direction.

### 32. INSTALL SECOND COAST BRAKE BAND ASSEMBLY



(a) Install the brake band to the case.



(b) Install the pin to the brake band as shown in the illustration.

(c) Install the E-ring to the pin.

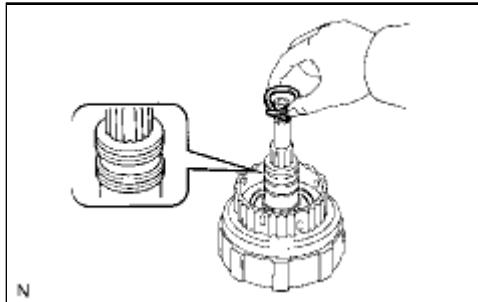
### 33. INSTALL INPUT SHAFT OIL SEAL RING

(a) Coat the 3 oil seal rings with ATF.

(b) Squeeze the ends of the 3 oil seal rings together, and then install them to the forward clutch drum groove.

**NOTICE:**

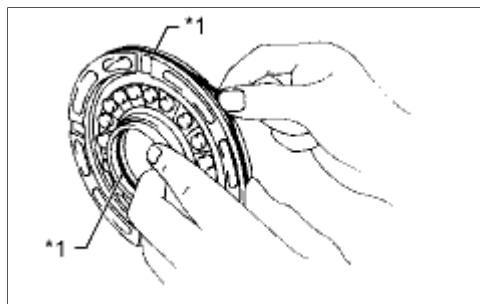
Do not squeeze the rings excessively.



**HINT:**

After installing the oil seal rings, check that they rotate smoothly.

### 34. INSTALL FRONT CLUTCH PISTON SUB-ASSEMBLY

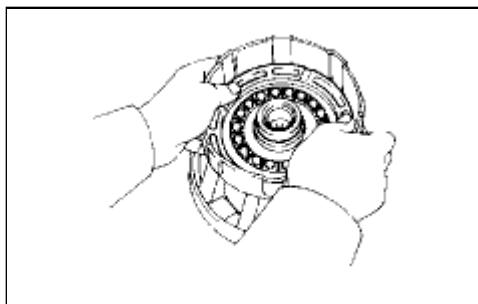


- (a) Coat 2 new O-rings with ATF and install them to the forward clutch piston.

**Text in Illustration**

*1	O-Ring
----	--------

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

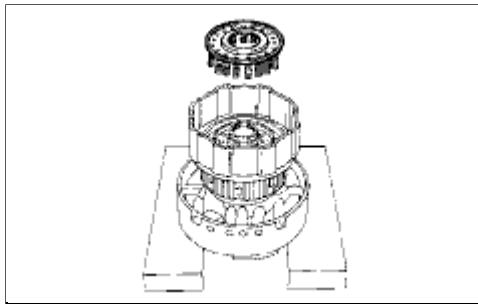


- (c) Press the clutch piston into the forward clutch drum with both hands to install it.

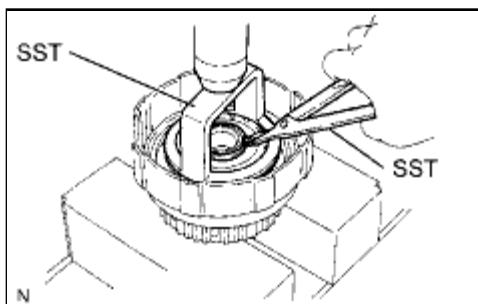
**NOTICE:**

Be careful not to damage the O-ring.

### 35. INSTALL FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY



(a) Install the piston return spring.



(b) Place SST on the spring retainer, compress the return spring with a press, and then install the snap ring.

**SST: 09350-30020**

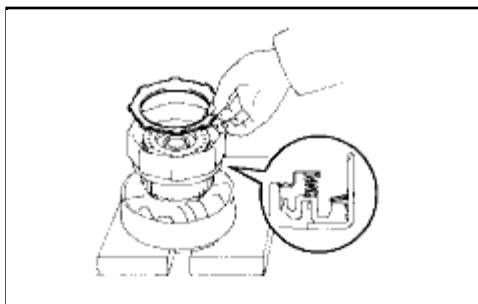
09350-07040

09350-07070

**NOTICE:**

Make sure the end gap of the snap ring is not aligned with the spring retainer claw.

### 36. INSTALL FORWARD CLUTCH DISC SET



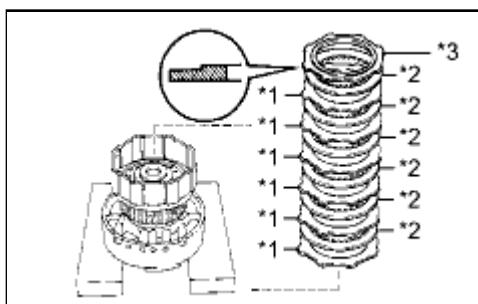
(a) Install the cushion plate.

(b) Install the 6 plates, 6 discs and flange.

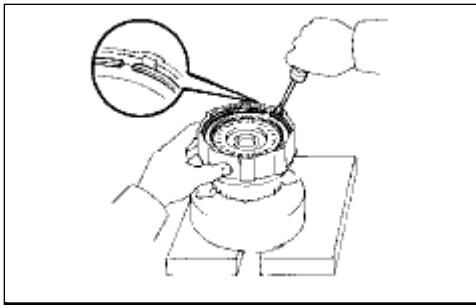
Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

#### Text in Illustration



*1	Plate
*2	Disc
*3	Flange



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

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the cutout portion of the forward clutch drum.**

### 37. SELECT FORWARD CLUTCH FLANGE

(a) Using SST and a dial indicator, measure the moving distance (A) of the clutch flange at both ends across the diameter while applying and releasing compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi))

**SST: 09350-30020**

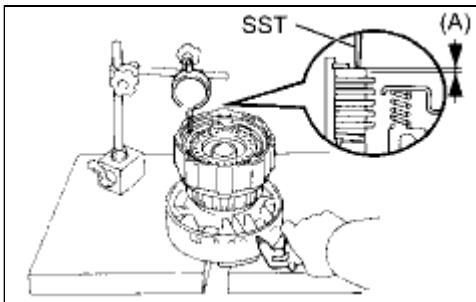
**09350-06120**

Standard moving distance (A):

0.60 to 1.00 mm (0.0236 to 0.0394 in.)

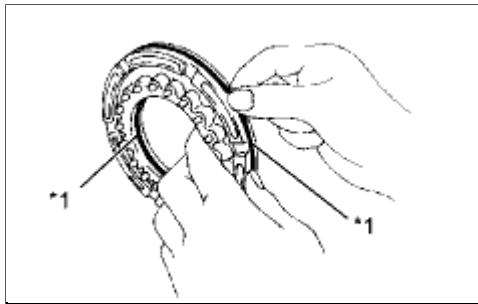
If the moving distance (A) is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

Flange Thickness:



MARK	THICKNESS
90	2.95 to 3.05 mm (0.116 to 0.120 in.)
91	3.15 to 3.25 mm (0.124 to 0.128 in.)
92	3.35 to 3.45 mm (0.132 to 0.136 in.)
93	3.55 to 3.65 mm (0.140 to 0.144 in.)
94	3.75 to 3.85 mm (0.148 to 0.152 in.)
95	3.95 to 4.05 mm (0.156 to 0.159 in.)
96	4.15 to 4.25 mm (0.163 to 0.167 in.)
97	4.35 to 4.45 mm (0.171 to 0.175 in.)

### 38. INSTALL DIRECT CLUTCH PISTON SUB-ASSEMBLY

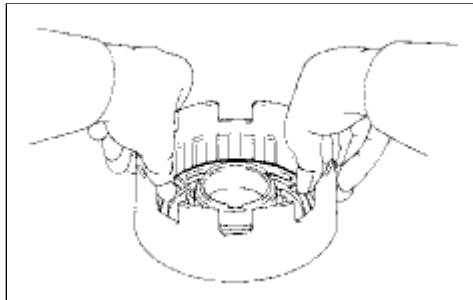


(a) Coat 2 new O-rings with ATF and install them to the direct clutch piston.

**Text in Illustration**

\*1

O-Ring

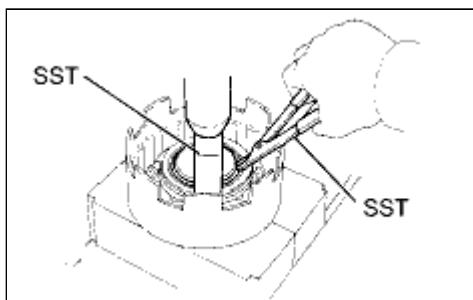
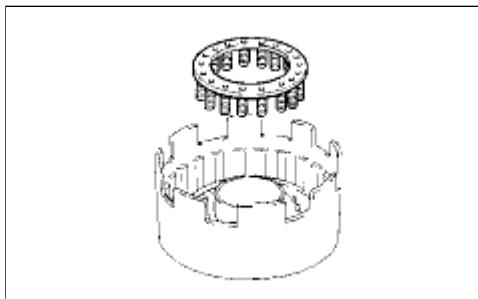


(b) Press the clutch piston into the clutch drum with both hands to install it.

**NOTICE:**

**Be careful not to damage the O-rings.**

### 39. INSTALL DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



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

**SST: 09350-30020**  
**09350-07040**

(b) Using SST, install the snap ring.

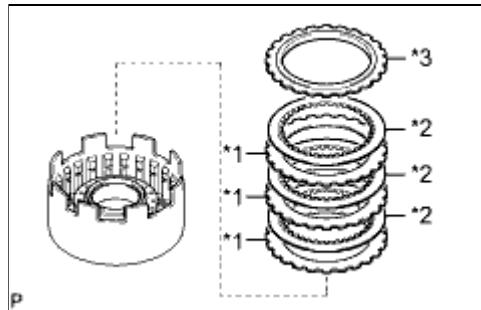
**SST: 09350-30020**

09350-07070

**NOTICE:**

Be sure the end gap of the snap ring is not aligned with the spring retainer claw.

**40. INSTALL DIRECT CLUTCH DISC SET**



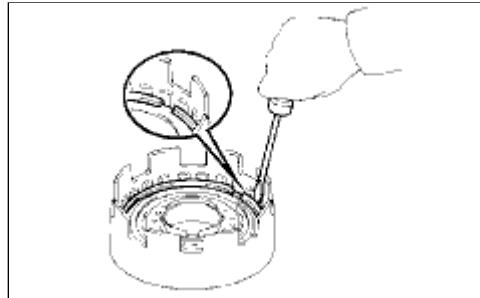
- (a) Install the 3 plates and 3 discs.
- (b) Install the flange with the flat end facing downward.

Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

**Text in Illustration**

*1	Plate
*2	Disc
*3	Flange

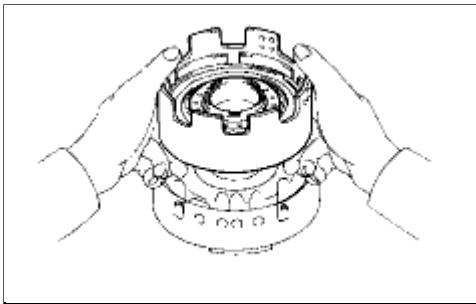


- (c) Using a screwdriver, install the snap ring.

**NOTICE:**

Make sure the end gap of the snap ring is not aligned with the cutout portion of the direct clutch drum.

**41. SELECT DIRECT CLUTCH FLANGE**



(a) Place the direct clutch onto the overdrive support.

(b) Using SST and a dial indicator, measure the moving distance (A) of the clutch flange at both ends across the diameter while applying and releasing compressed air (186 to 206 kPa (1.9 to 2.1 kgf/cm<sup>2</sup>, 27 to 30 psi)).

**SST: 09350-30020**

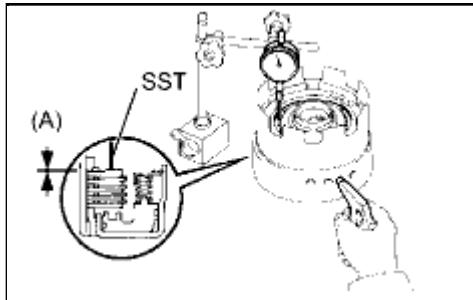
09350-06120

Standard moving distance (A):

0.40 to 0.70 mm (0.0157 to 0.0276 in.)

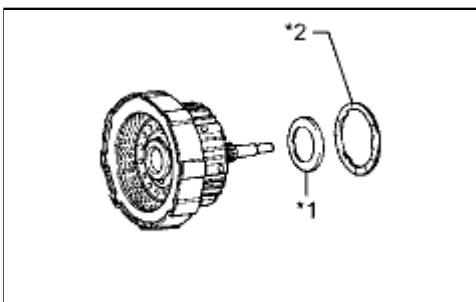
If the moving distance (A) is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

Flange Thickness:



MARK	THICKNESS
53	3.25 to 3.35 mm (0.128 to 0.132 in.)
54	3.35 to 3.45 mm (0.132 to 0.136 in.)
55	3.45 to 3.55 mm (0.136 to 0.140 in.)
56	3.55 to 3.65 mm (0.140 to 0.144 in.)
57	3.65 to 3.75 mm (0.144 to 0.148 in.)
58	3.75 to 3.85 mm (0.148 to 0.152 in.)

## 42. INSTALL DIRECT CLUTCH ASSEMBLY



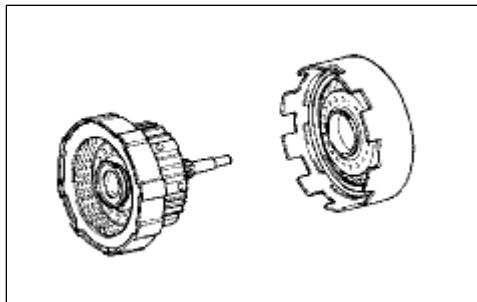
(a) Install the bearing and thrust washer to the forward clutch.

Bearing Diameter:

ITEM	INSIDE	OUTSIDE
Bearing D	33.55 to 33.80 mm (1.32 to 1.33 in.)	47.62 to 47.87 mm (1.87 to 1.88 in.)

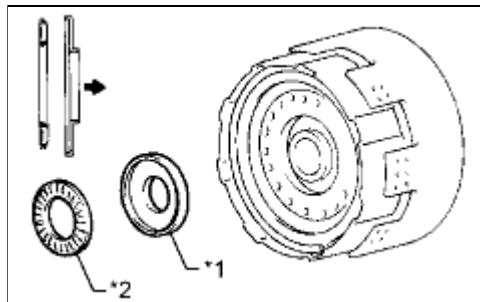
**Text in Illustration**

*1	Bearing D
*2	Thrust Washer



(b) Install the direct clutch to the forward clutch.

**43. INSTALL FRONT PLANETARY RING GEAR SUB-ASSEMBLY**



(a) Coat the bearing race and bearing with petroleum jelly and install them to the forward clutch.

Bearing and Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Bearing Race E	25.98 mm (1.02 in.)	48.87 mm (1.92 in.)
Bearing E	25.94 to 26.07 mm (1.02 to 1.03 in.)	46.62 to 46.87 mm (1.84 to 1.85 in.)

**Text in Illustration**

*1	Bearing Race E
*2	Bearing E

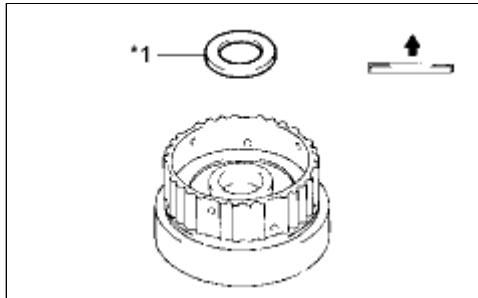
**NOTICE:**

**Make sure the bearing and race are installed facing the proper directions.**

- (b) Coat the bearing race with petroleum jelly and install it to the front planetary ring gear.

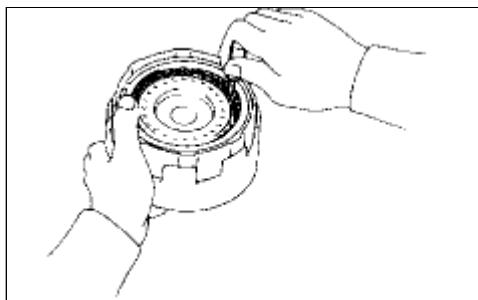
Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Bearing Race E	26.5 to 27.0 mm (1.04 to 1.06 in.)	47.02 mm (1.85 in.)

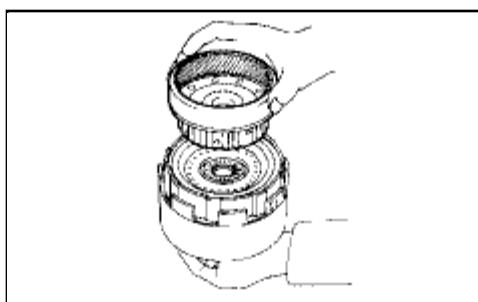


**NOTICE:**

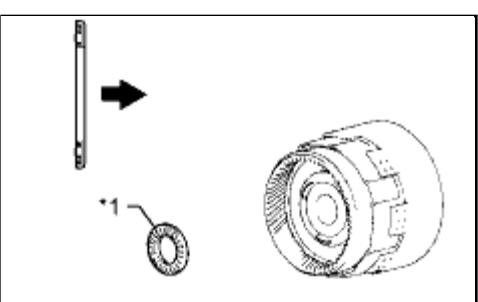
**Make sure the bearing race is installed facing the proper direction.**



- (c) Align the teeth of the discs in the forward clutch.



- (d) Align the splines of the planetary ring gear with the teeth of the discs and install the planetary ring gear to the forward clutch.



#### **44. INSTALL DIRECT CLUTCH ASSEMBLY WITH FORWARD CLUTCH ASSEMBLY**

(a) Coat the bearing with petroleum jelly and install it to the ring gear.

Bearing Diameter:

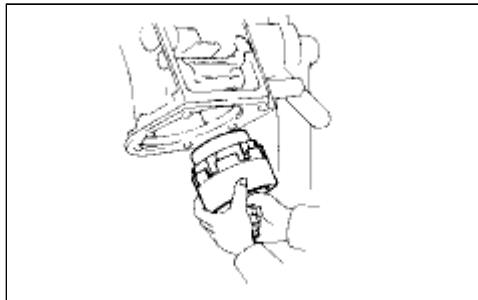
ITEM	INSIDE	OUTSIDE
Bearing F	35 to 35.3 mm (1.38 to 1.39 in.)	50.50 to 53.75 mm (2.11 to 2.12 in.)

#### Text in Illustration

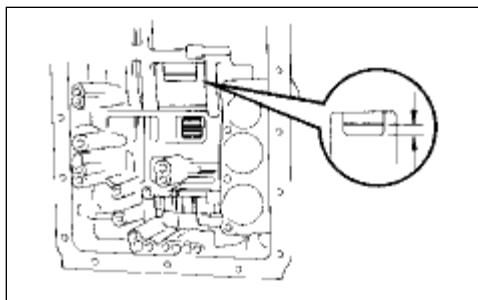
*1	Bearing F
----	-----------

**NOTICE:**

Make sure the bearing is installed facing the proper direction.



(b) Install the assembled direct clutch, forward clutch and front planetary ring gear to the transmission case.



(c) Using a vernier caliper, measure the distance between the sun gear input drum and direct clutch drum as shown in the illustration.

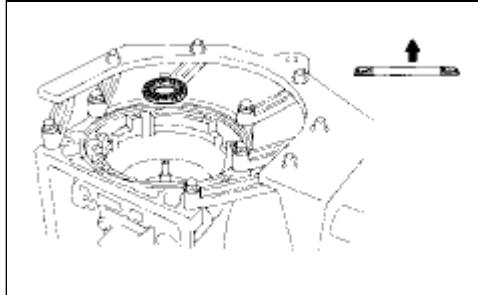
Standard distance:

5.3 to 7.3 mm (0.209 to 0.287 in.)

If the distance is not as specified, check for improper installation.

(d) Coat the bearing with petroleum jelly and install it to the front clutch.

#### 45. INSTALL SECOND COAST BRAKE PISTON ROD



Bearing Diameter:

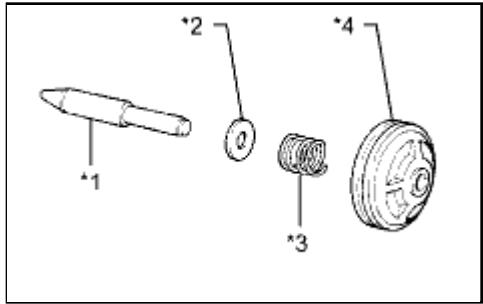
(a) Install the washer plate, compression spring and piston to ITEM INSIDE OUTSIDE the piston rod.

Bearing 33.55 to 33.80 mm 47.62 to 47.87 mm (1.32 to 1.33 in.) (1.87 to 1.88 in.)

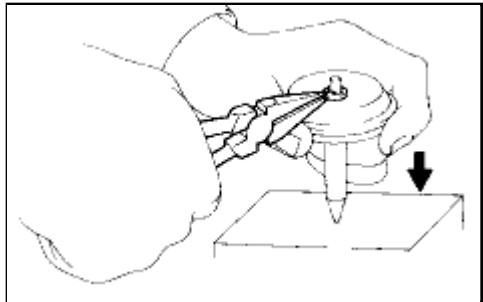
#### Text in Illustration

**NOTICE:**

Make sure the bearing is installed facing the proper direction.

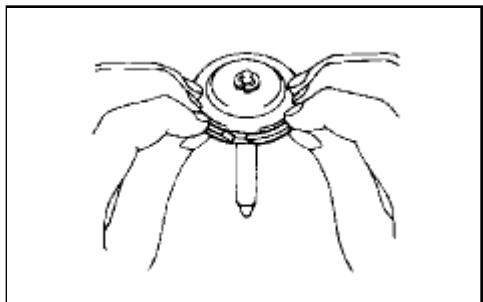


*1	Piston Rod
*2	Washer Plate
*3	Compression Spring
*4	Piston



(b) Firmly press the piston down to compress the compression spring.

(c) Install the E-ring.



#### 46. INSTALL SECOND COAST BRAKE PISTON OIL SEAL RING

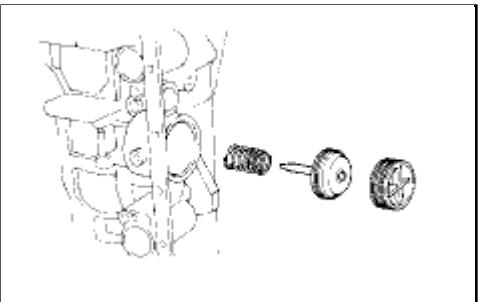
(a) Coat a new oil seal ring with ATF.

(b) Spread the ends of the ring to install the oil seal ring to the piston groove. Then squeeze its ends together.

**NOTICE:**

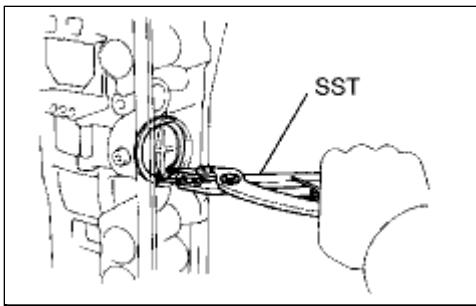
**Do not spread the ring ends excessively.**

#### 47. INSTALL SECOND COAST BRAKE PISTON ASSEMBLY



(a) Coat 2 new O-rings with ATF and install them to the second coast brake cover.

(b) Install the spring, piston assembly and cover to the case.

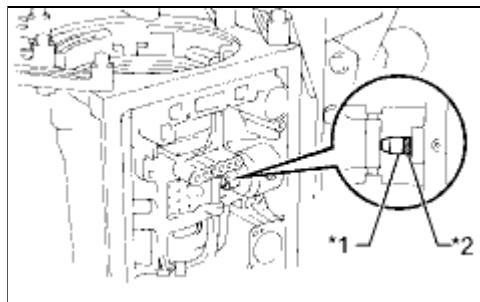


(c) Using SST, install the snap ring.

**SST: 09350-30020**

09350-07060

## 48. INSPECT PISTON STROKE OF SECOND COAST BRAKE



(a) Using a waterproof pen, place a mark on the second coast brake piston rod as shown in the illustration.

### Text in Illustration

* 1	Piston Rod
* 2	Mark

(b) Using SST, measure the piston stroke while applying and releasing compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)).

**SST: 09240-00020**

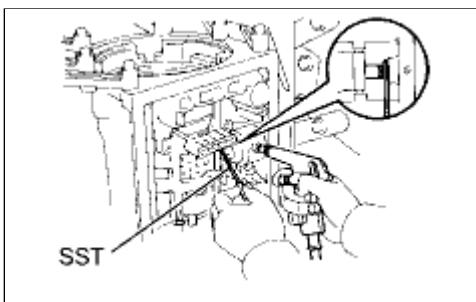
Standard piston stroke:

1.5 to 3.0 mm (0.0591 to 0.118 in.)

If the piston stroke is not as specified, inspect the brake band.

If the piston stroke is still not as specified, select a piston rod of an appropriate length from the table below so that the measured value is within the standard range.

Piston Rod Length:

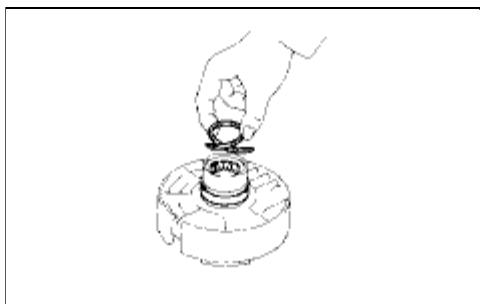


GROOVE MARK	LENGTH
Without	78.3 to 78.5 mm (3.08 to 3.09 in.)

With

79.8 to 80.0 mm (3.14 to 3.15 in.)

## 49. INSTALL OVERDRIVE CLUTCH DRUM OIL SEAL RING



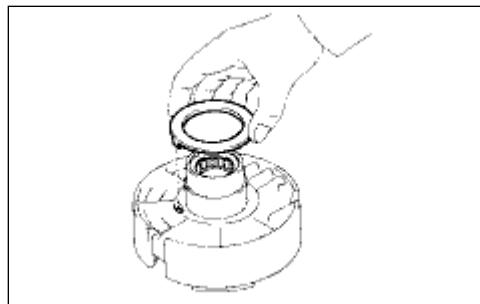
- (a) Coat 2 new oil seal rings with ATF.
- (b) Squeeze the ends of the 2 oil seal rings together, and then install them to the stator shaft groove.

**NOTICE:**

**Do not squeeze the rings excessively.**

**HINT:**

**After installing the oil seal rings, check that they rotate smoothly.**

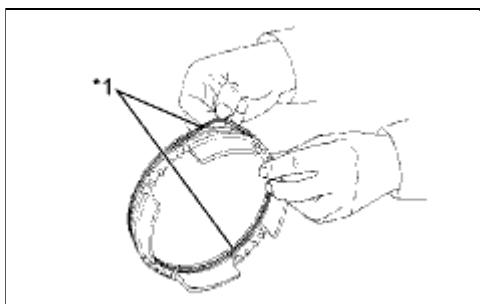


- (c) Coat the thrust washer with petroleum jelly and install it to the overdrive support.

**HINT:**

**Make sure that the tab of the washer fits into the groove of the overdrive support.**

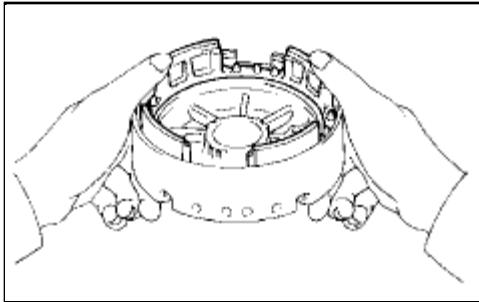
## 50. INSTALL OVERDRIVE BRAKE PISTON



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

**Text in Illustration**

* 1	O-Ring
-----	--------

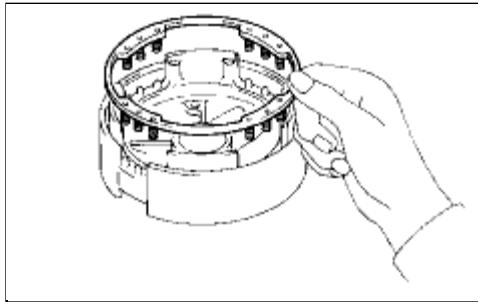


- (b) Press the brake piston into the overdrive support with both hands to install it.

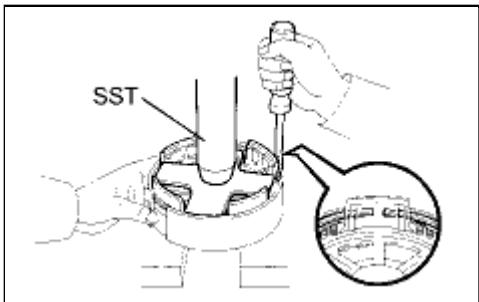
**NOTICE:**

**Be careful not to damage the O-rings.**

## 51. INSTALL OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY



- (a) Install the return spring to the brake piston.



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

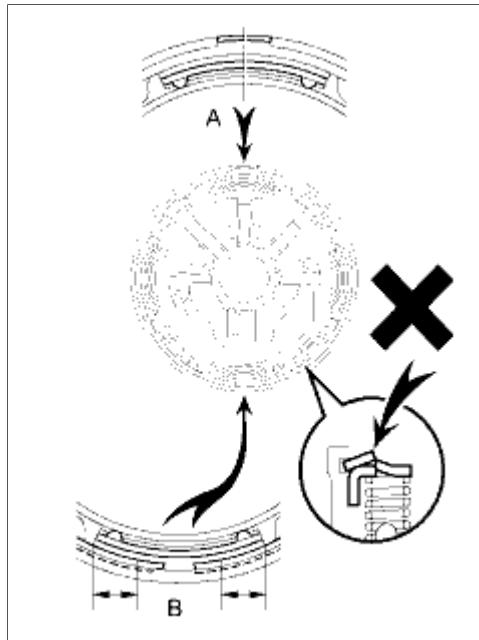
**SST: 09350-30020**

09350-07030

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

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the cutout portion of the overdrive support.**

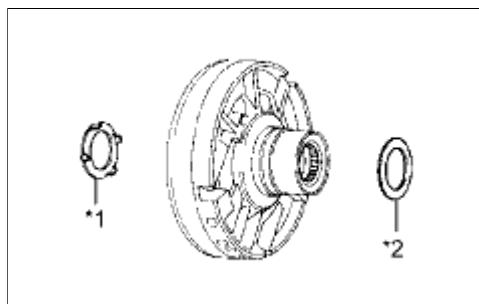


#### **HINT:**

- After assembling the overdrive support assembly completely, align the position of the piston with A in the illustration.
- Align the end gap of the snap ring with B in the illustration.
- Make sure that the snap ring is not on top of the part of the return spring that prevents the snap ring from coming off. Check this in all 8 locations.

#### **52. INSPECT PISTON OPERATION OF OVERDRIVE BRAKE** INFO

#### **53. INSTALL OVERDRIVE BRAKE ASSEMBLY**



(a) Coat the bearing and bearing race with petroleum jelly and install them to the overdrive brake assembly.

Bearing and Bearing Race Diameter:

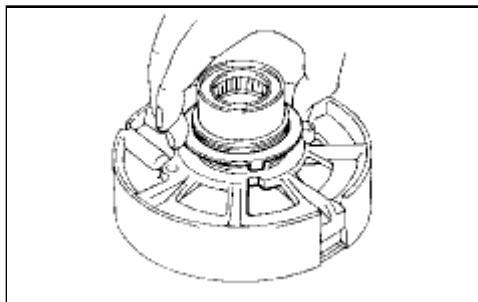
ITEM	INSIDE	OUTSIDE
Bearing C	33.75 to 33.85 mm (1.329 to 1.333 in.)	49.8 to 50.3 mm (1.96 to 1.98 in.)
Bearing Race D	36.5 to 37 mm (1.44 to 1.46 in.)	50.75 to 50.95 mm (2.00 to 2.01 in.)

**Text in Illustration**

*1	Bearing C
*2	Bearing Race D

**NOTICE:**

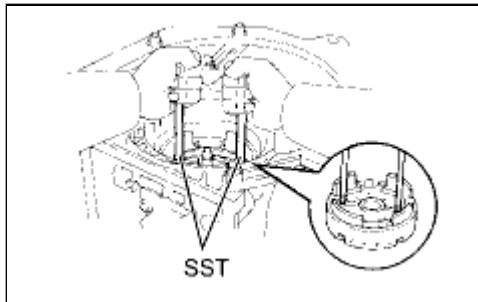
**Make sure the bearing and race are installed facing the proper directions.**



(b) Confirm that the thrust washer is installed correctly.

**HINT:**

**Make sure that the tab of the washer fits into the hole on the overdrive brake assembly.**

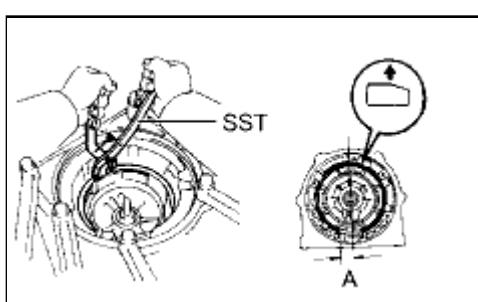


(c) Using the 2 bolts of SST, aim the bolt and oil holes of the overdrive brake assembly toward the valve body side, and align them with the bolt holes of the transmission case. Then install the overdrive brake assembly.

**SST: 09350-30020**

09350-07020

(d) Temporarily install the 2 bolts.



(e) Using SST, install the snap ring.

**SST: 09350-30020**

09350-07060

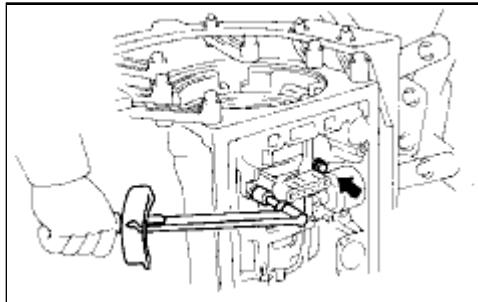
Standard distance A :  
24 mm (0.945 in.)

**HINT:**

**Install the snap ring with the open end facing toward the valve body.**

(f) Tighten the 2 bolts.

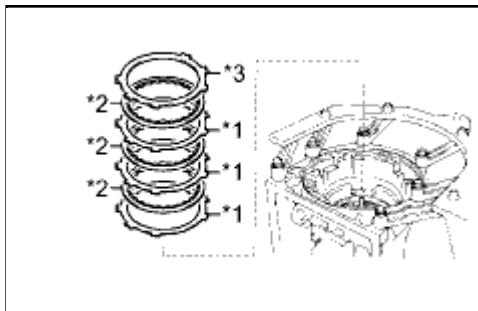
**Torque: 25 N·m (260 kgf·cm, 19ft·lbf)**



#### 54. INSPECT OUTPUT SHAFT END PLAY

INFO

#### 55. INSTALL OVERDRIVE BRAKE DISC SET



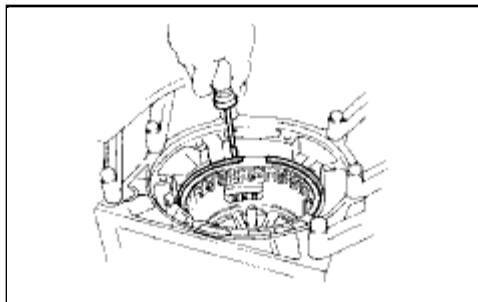
(a) Install the 3 plates, 3 discs and flange.

Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

##### Text in Illustration

*1	Plate
*2	Disc
*3	Flange



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

#### 56. SELECT OVERDRIVE BRAKE FLANGE

(a) Place SST and a dial indicator on the overdrive brake piston.

**SST: 09350-30020**

09350-06120

(b) Measure the stroke while applying and releasing compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi))

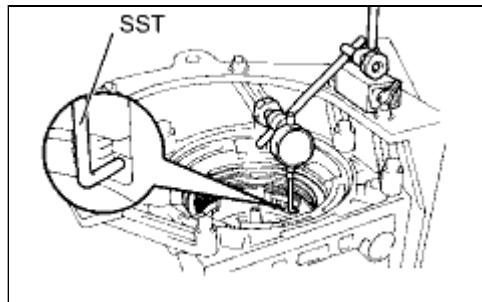
Standard piston stroke:

1.75 to 2.05 mm (0.0689 to 0.0807 in.)

If the piston stroke is not as specified, parts may have been assembled incorrectly. Check and reassemble again.

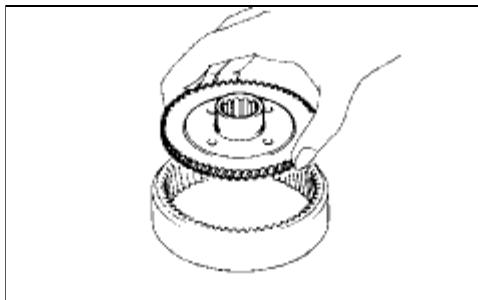
If the piston stroke is still outside the standard range, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

Flange Thickness:



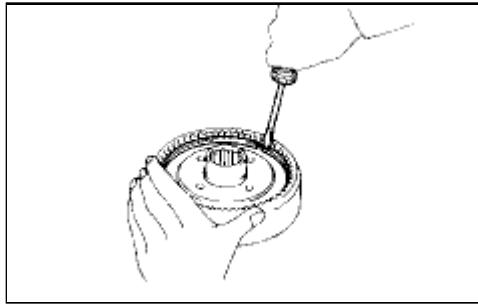
MARK	THICKNESS
33	3.25 to 3.35 mm (0.128 to 0.132 in.)
35	3.45 to 3.55 mm (0.136 to 0.140 in.)
36	3.55 to 3.65 mm (0.140 to 0.144 in.)
37	3.65 to 3.75 mm (0.144 to 0.148 in.)
38	3.75 to 3.85 mm (0.148 to 0.152 in.)
39	3.85 to 3.95 mm (0.152 to 0.156 in.)
40	3.95 to 4.05 mm (0.156 to 0.159 in.)

## 57. INSTALL OVERDRIVE PLANETARY RING GEAR FLANGE

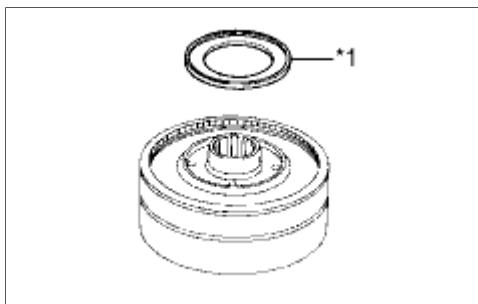


(a) Install the ring gear flange to the overdrive planetary ring gear.

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



## 58. INSTALL OVERDRIVE PLANETARY RING GEAR



- (a) Coat the bearing race with petroleum jelly and install it to the overdrive planetary ring gear flange.

Bearing Race Diameter:

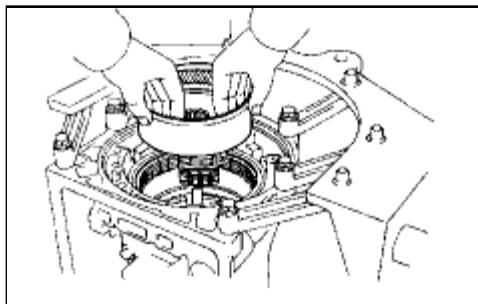
ITEM	INSIDE	OUTSIDE
Bearing Race C	37.1 to 37.3 mm (1.46 to 1.47 in.)	58.70 to 58.95 mm (2.31 to 2.32 in.)

### Text in Illustration

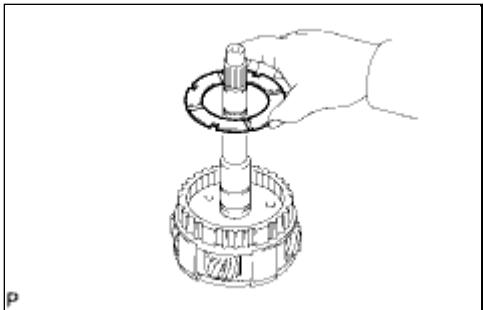
*1	Bearing Race C
----	----------------

### NOTICE:

Make sure the bearing race is installed facing the proper direction.



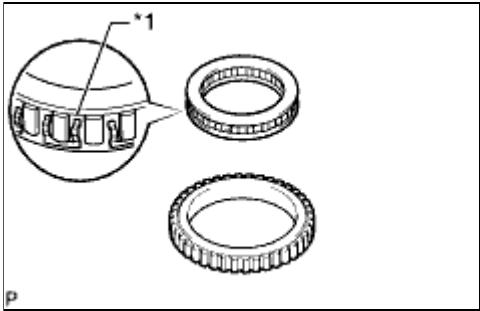
(b) Install the ring gear.



## 59. INSTALL NO. 3 OVERDRIVE PLANETARY GEAR THRUST WASHER

- (a) Install the thrust washer to the overdrive planetary gear with the grooves facing upward.

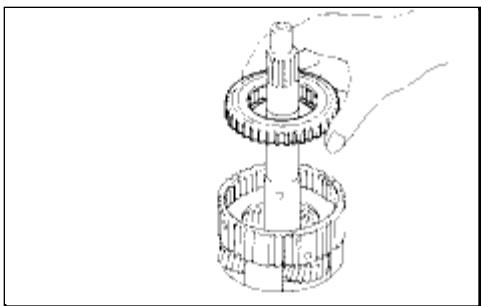
## 60. INSTALL OVERDRIVE 1-WAY CLUTCH



- (a) Install the 2 retainers to the 1-way clutch.  
(b) Install the 1-way clutch to the outer race with the flange of the 1-way clutch facing upward.

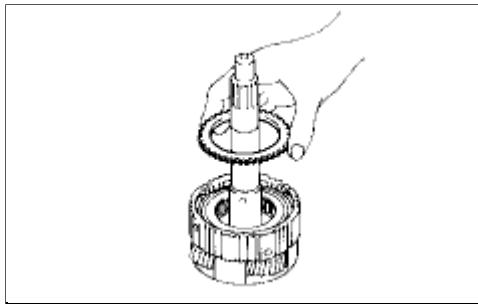
### Text in Illustration

* 1	Flange
-----	--------

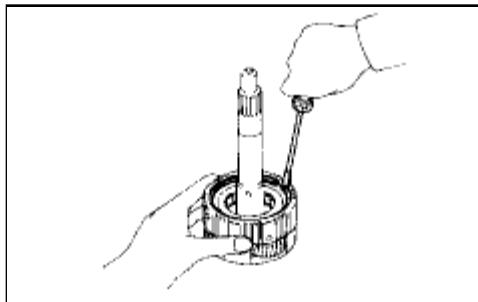


- (c) Install the overdrive 1-way clutch and outer race to the overdrive planetary gear.

## 61. INSTALL OVERDRIVE RETAINING PLATE

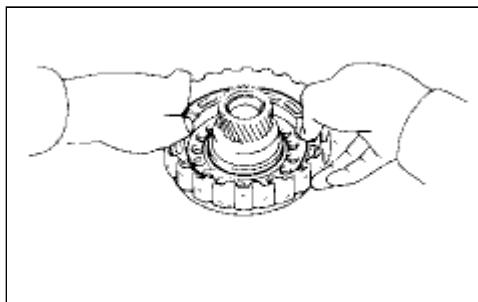


(a) Install the retaining plate.



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

## 62. INSPECT OVERDRIVE 1-WAY CLUTCH INFO



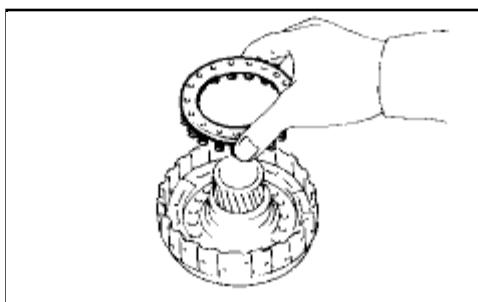
## 63. INSTALL OVERDRIVE DIRECT CLUTCH PISTON SUB-ASSEMBLY

- Coat 2 new O-rings with ATF and install them to the overdrive direct clutch piston.
- Press the clutch piston into the clutch drum with both hands to install it.

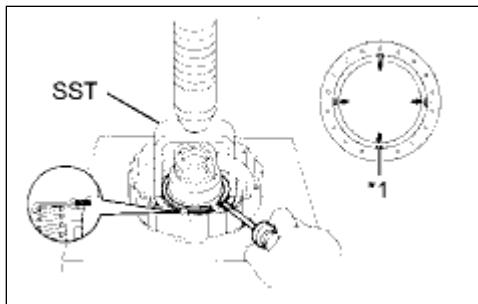
**NOTICE:**

Be careful not to damage the O-rings.

## 64. INSTALL OVERDRIVE BRAKE RETURN SPRING SUB-ASSEMBLY



(a) Install the overdrive brake return spring to the overdrive direct clutch piston.



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

**SST: 09350-30020**

09350-07040

**NOTICE:**

**Do not deform the spring seat. Stop compressing the spring when the spring seat is lowered to a position 1 to 2 mm (0.0394 to 0.0787 in.) from the snap ring groove.**

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

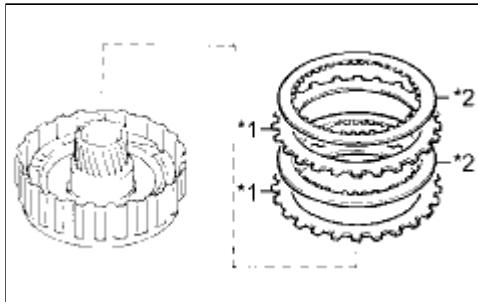
**Text in Illustration**

* 1	Retainer Claw
-----	---------------

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the spring retainer claw.**

## 65. INSTALL OVERDRIVE DIRECT CLUTCH DISC SET



(a) Install the 2 plates and 2 discs.

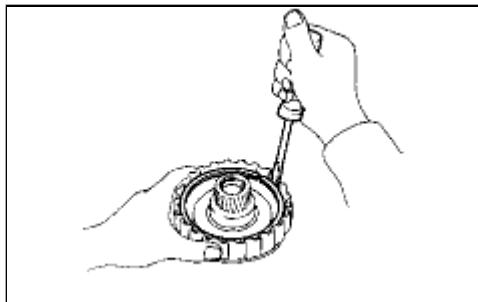
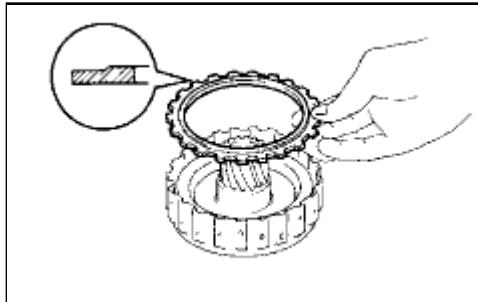
Install in order:

\*1 - \*2 - \*1 - \*2

**Text in Illustration**

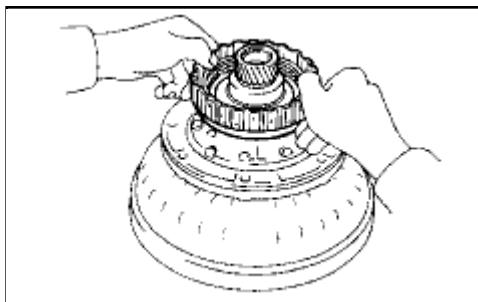
* 1	Plate
* 2	Disc

(b) Install the flange with the flat end facing downward.



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

## 66. SELECT OVERDRIVE CLUTCH FLANGE



(a) Place the oil pump onto the torque converter clutch, and then place the overdrive direct clutch drum assembly onto the oil pump.

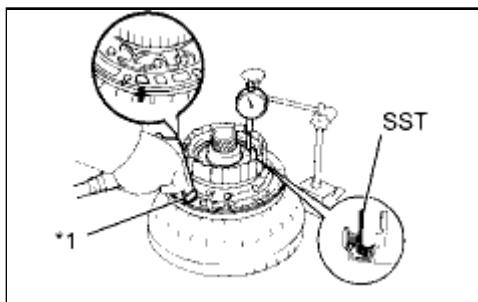
(b) Using SST and a dial indicator, measure the overdrive direct clutch piston stroke while applying and releasing compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)).

**SST: 09350-30020**

09350-06120

Standard piston stroke:

1.85 to 2.15 mm (0.0728 to 0.0846 in.)



**Text in Illustration**

\*1

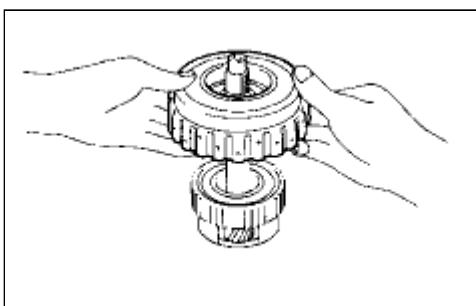
Vinyl Tape

If the piston stroke is not as specified, parts may have been assembled incorrectly. Check and reassemble again.

If the piston stroke is still outside the standard range, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

Flange Thickness:

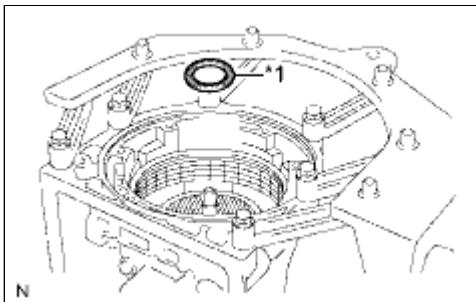
MARK	THICKNESS
21	3.05 to 3.15 mm (0.120 to 0.124 in.)
20	3.15 to 3.25 mm (0.124 to 0.128 in.)
19	3.25 to 3.35 mm (0.128 to 0.132 in.)
18	3.35 to 3.45 mm (0.132 to 0.136 in.)
17	3.45 to 3.55 mm (0.136 to 0.140 in.)
16	3.55 to 3.65 mm (0.140 to 0.144 in.)



## 67. INSTALL OVERDRIVE DIRECT CLUTCH DRUM

- Align the teeth of the discs in the direct clutch assembly.
- Install the direct clutch drum assembly to the overdrive planetary gear.

## 68. INSTALL OVERDRIVE PLANETARY GEAR ASSEMBLY WITH DIRECT CLUTCH ASSEMBLY AND OVERDRIVE 1-WAY CLUTCH ASSEMBLY



- Coat the bearing with petroleum jelly and install it to the ring gear.

Bearing Diameter:

ITEM	INSIDE	OUTSIDE
Bearing B	31.45 to 31.70 mm (1.24 to 1.25 in.)	49.1 to 49.4 mm (1.93 to 1.94 in.)

## Text in Illustration

\*1

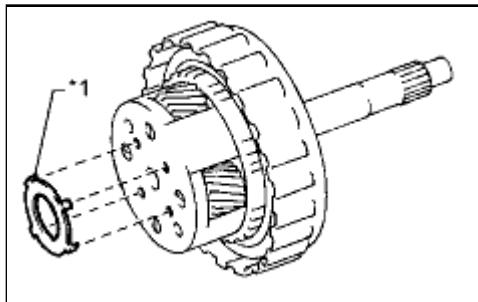
Bearing B

### NOTICE:

Make sure the bearing is installed facing the proper direction.

- (b) Coat the bearing race with petroleum jelly and install it to the planetary gear.

Bearing Race Diameter:



ITEM	INSIDE	OUTSIDE
Bearing Race B	33.0 to 33.25 mm (1.30 to 1.31 in.)	49.9 to 50.4 mm (1.96 to 1.98 in.)

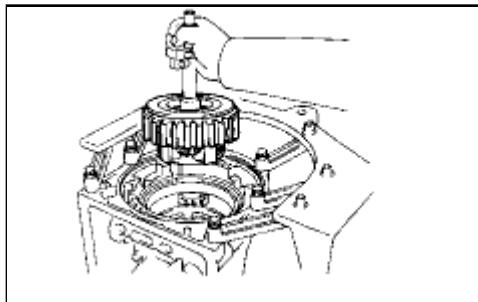
## Text in Illustration

\*1

Bearing Race B

### NOTICE:

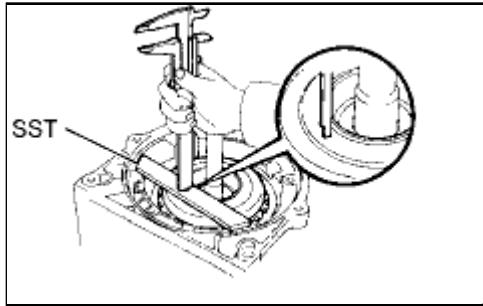
Make sure the bearing race is installed facing the proper direction.



- (c) Install the overdrive planetary gear together with the overdrive direct clutch and 1-way clutch.

- (d) Place SST on the transmission case.

**SST: 09350-36010**  
09350-06090



(e) Using a vernier caliper, measure the distance between the top of SST and the clutch drum.

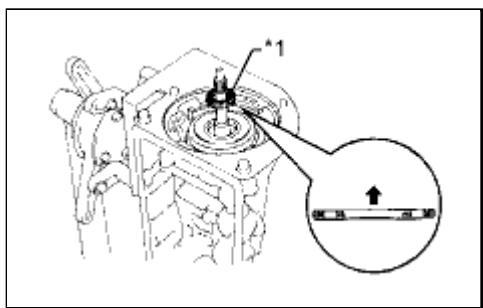
Standard distance:

15.5 to 16.5 mm (0.610 to 0.650 in.)

If the distance is not as specified, check for improper installation.

(f) Coat the bearing with petroleum jelly and install it to the overdrive direct clutch.

Bearing Diameter:



ITEM	INSIDE	OUTSIDE
Bearing A	29.04 to 29.25 mm (1.14 to 1.15 in.)	50.04 to 50.34 mm (1.97 to 1.98 in.)

### Text in Illustration

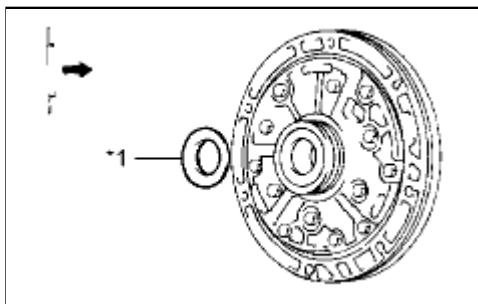
\*1

Bearing A

#### NOTICE:

Make sure the bearing is installed facing the proper direction.

## 69. INSTALL OIL PUMP ASSEMBLY



(a) Coat the bearing race with petroleum jelly and install it to the oil pump.

Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Bearing Race A	28.45 mm (1.12 in.)	47.1 to 47.35 mm (1.85 to 1.86 in.)

#### Text in Illustration

\*1

Bearing Race A

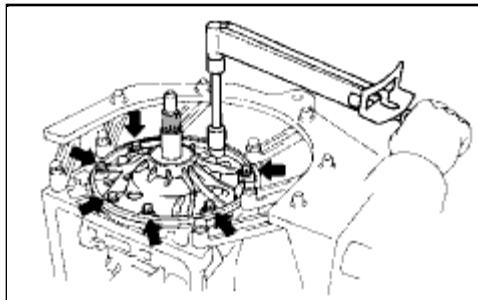
**NOTICE:**

**Make sure the bearing race is installed facing the proper direction.**

- (b) Coat a new O-ring with ATF and install it to the pump body.
- (c) Slide the oil pump onto the input shaft, align the bolt holes of the oil pump assembly with the bolt holes of the transmission case and install the oil pump.
- (d) Hold the input shaft and lightly press the oil pump body to slide the oil seal rings toward the overdrive direct clutch drum.

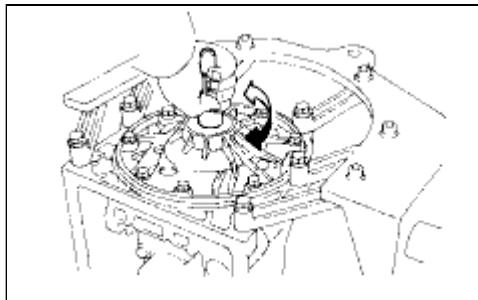
**NOTICE:**

**Do not forcefully push on the oil pump as the oil seal rings will stick to the direct clutch drum.**



(e) Install the 7 bolts.

**Torque: 21 N·m (215 kgf·cm, 16ft·lbf)**



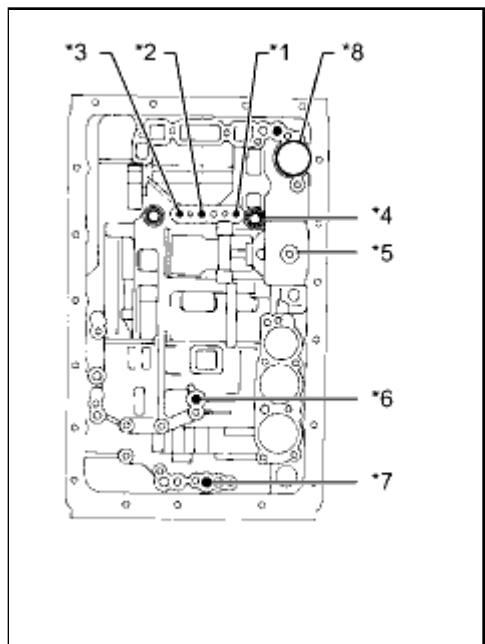
#### 70. INSPECT INPUT SHAFT ROTATION

- (a) Make sure the input shaft rotates smoothly.

#### 71. INSPECT INDIVIDUAL PISTON OPERATION

- (a) Check the operating sound while applying compressed air to the oil hole indicated in the illustration.

#### Text in Illustration

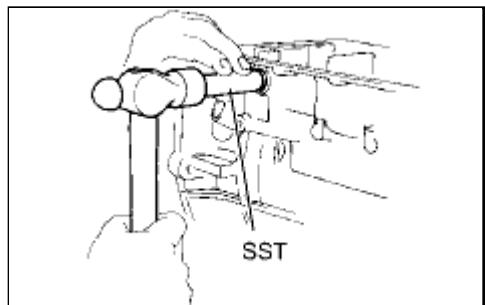


*1	Overdrive Direct Clutch (C1)
*2	Direct Clutch (C2)
*3	Forward Clutch (C3)
*4	Overdrive Brake (B1)
*5	Second Coast Brake (B2)
*6	Second Brake (B3)
*7	First and Reverse Brake (B4)
*8	C-0 Accumulator Piston Hole

**HINT:**

**When inspecting the overdrive direct clutch, check the operating sound with the C-0 accumulator piston hole closed.**

**If there is no sound, disassemble and check the installation condition of the parts.**



## 72. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

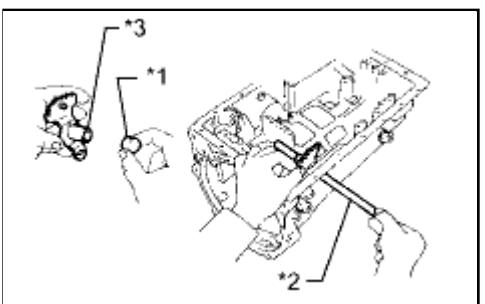
(a) Using SST and a hammer, tap in 2 new oil seals.

**SST: 09350-30020**

09350-07110

(b) Coat the lips of the oil seals with MP grease.

## 73. INSTALL MANUAL VALVE LEVER SHAFT

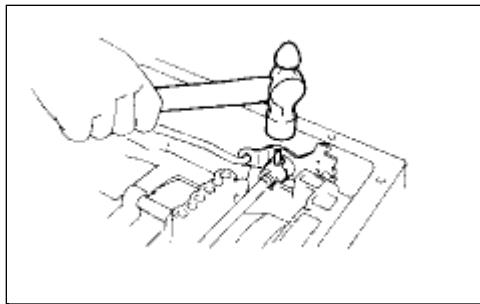


(a) Install a new spacer to the manual valve lever.

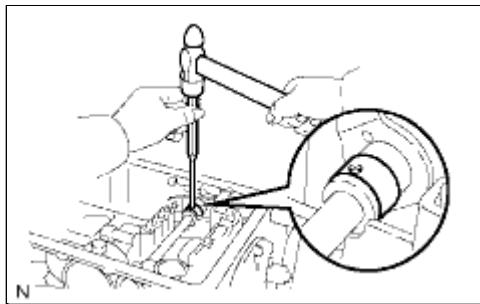
**Text in Illustration**

*1	Spacer
*2	Manual Valve Lever Shaft
*3	Manual Valve Lever

(b) Pass the manual valve lever shaft through the transmission case and manual valve lever to install it.



(c) Using a hammer, tap in a new spring pin.

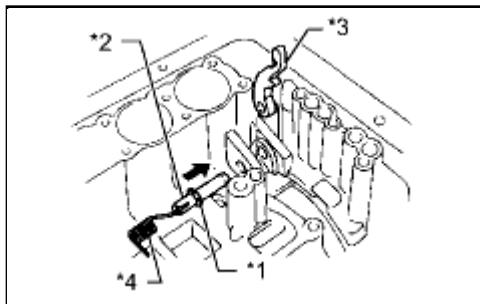


(d) Align the manual valve lever indentation with the spacer hole and stake them with a punch.

(e) Check that the shaft rotates smoothly.

#### 74. INSTALL PARKING LOCK PAWL

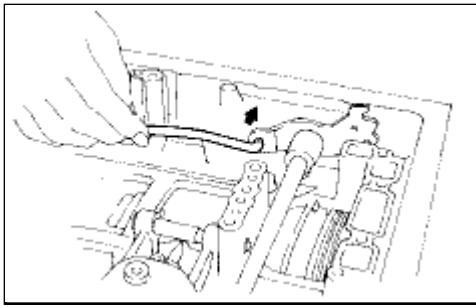
(a) Install the E-ring to the parking lock pawl shaft.



#### Text in Illustration

*1	E-Ring
*2	Parking Lock Pawl Shaft
*3	Parking Lock Pawl
*4	Spring

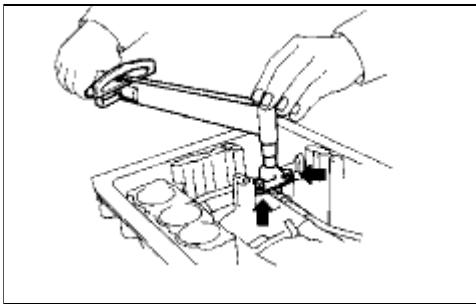
(b) Install the parking lock pawl, shaft and spring.



## 75. INSTALL PARKING LOCK ROD SUB-ASSEMBLY

- (a) Connect the parking lock rod to the manual valve lever to install it.

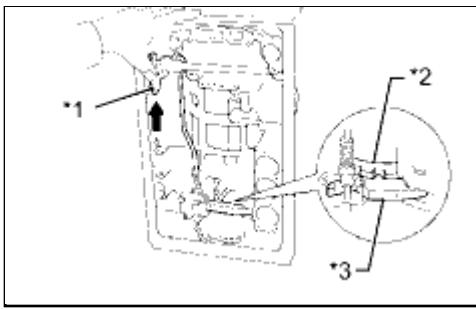
## 76. INSTALL PARKING LOCK PAWL BRACKET



- (a) Install the parking lock pawl bracket to the transmission case with the 3 bolts.

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

- (b) Shift the manual valve lever to the P position and confirm that the planetary ring gear is correctly locked by the parking lock pawl.



### Text in Illustration

*1	Manual Valve Lever
*2	Planetary Ring Gear
*3	Parking Lock Pawl

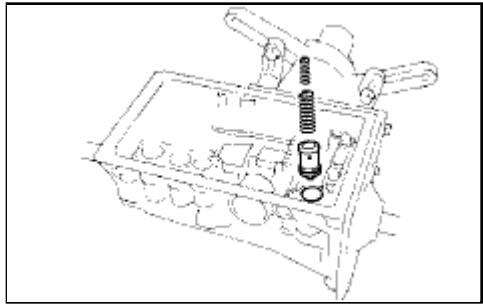
## 77. INSTALL C-0 ACCUMULATOR PISTON

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

- (b) Install the 2 springs and accumulator piston to the hole.

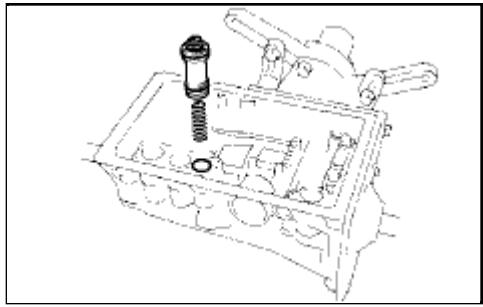
Accumulator Spring Diameter:

ITEM	FREE LENGTH	COLOR



	OUTER DIAMETER	
C-0 Inner Spring	46.0 mm (1.81 in.) 14.02 mm (0.552 in.)	Yellow
C-0 Outer Spring	74.6 mm (2.94 in.) 20.9 mm (0.823 in.)	Orange

## 78. INSTALL B-0 ACCUMULATOR PISTON

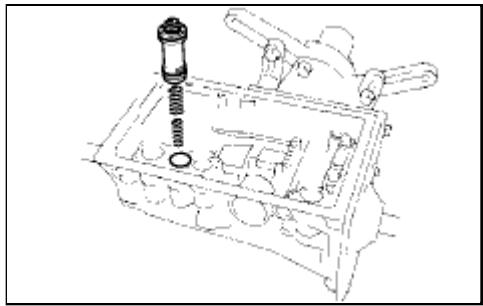


- Coat 2 new O-rings with ATF and install them to the piston.
- Install the spring and accumulator piston to the hole.

Accumulator Spring Diameter:

ITEM	FREE LENGTH OUTER DIAMETER	COLOR
B-0 Spring	63.6 mm (2.50 in.) 16.0 mm (0.630 in.)	Red

## 79. INSTALL C-2 ACCUMULATOR PISTON



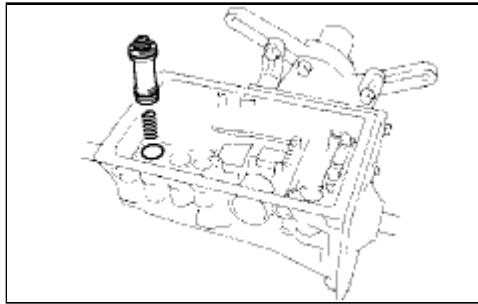
- Coat 2 new O-rings with ATF and install them to the piston.
- Install the 2 springs and accumulator piston to the hole.

Accumulator Spring Diameter:

ITEM	FREE LENGTH OUTER DIAMETER	COLOR
C-2 Inner Spring	42.06 mm (1.66 in.) 14.7 mm (0.579 in.)	Pink
C-2 Outer Spring	68.53 mm (2.70 in.) 20.2 mm (0.795 in.)	Blue

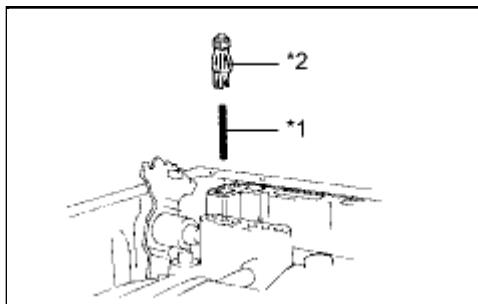
## 80. INSTALL B-2 ACCUMULATOR PISTON

- Coat 2 new O-rings with ATF and install them to the piston.
- Install the spring and accumulator piston to the hole.



Accumulator Spring Diameter:

ITEM	FREE LENGTH OUTER DIAMETER	COLOR
B-2 Spring	70.50 mm (2.78 in.) 19.9 mm (0.783 in.)	Light Green



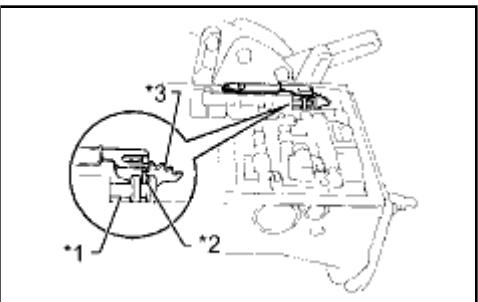
## 81. INSTALL CHECK BALL BODY

(a) Install the spring and check ball body.

### Text in Illustration

*1	Spring
*2	Check Ball Body

## 82. INSTALL TRANSMISSION VALVE BODY ASSEMBLY



(a) Install the valve body and align the groove of the manual valve with the pin of the manual valve lever.

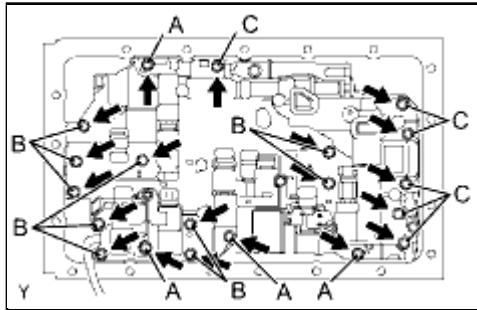
### Text in Illustration

*1	Manual Valve
*2	Pin
*3	Manual Valve Lever

(b) Install the 20 bolts.

**Torque: 11 N·m (110 kgf·cm, 8ft·lbf)**

**HINT:**



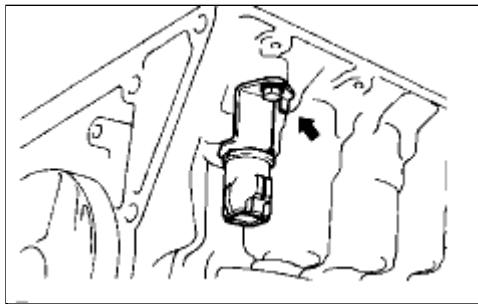
**Each bolt length is indicated below.**

**23 mm (0.906 in.) for A**

**28 mm (1.10 in.) for B**

**36 mm (1.42 in.) for C**

### 83. INSTALL TRANSMISSION WIRE

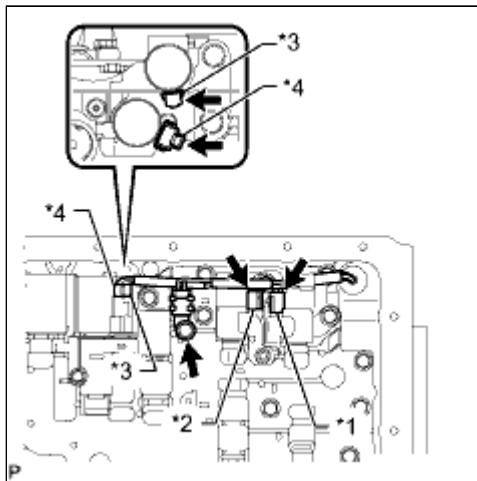


(a) Coat a new O-ring with ATF and install it to the transmission wire.

(b) Install the transmission wire to the case.

(c) Install the stopper plate with the bolt.

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



(d) Connect the 4 connectors to the 4 shift solenoid valves.

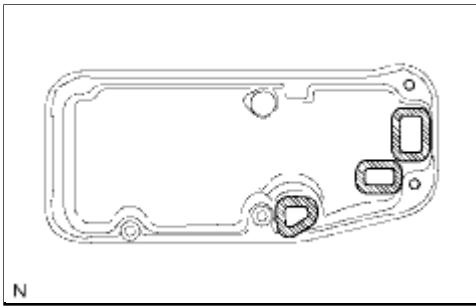
#### Text in Illustration

* 1	White
* 2	Black
* 3	Orange/Green
* 4	Yellow/Brown

(e) Connect the temperature sensor and install the temperature sensor clamp with the bolt.

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

### 84. INSTALL VALVE BODY OIL STRAINER ASSEMBLY



(a) Install 3 new gaskets to the oil strainer.

(b) Install the oil strainer with the 4 bolts.

**Torque: 11 N·m (110 kgf·cm, 8ft·lbf)**

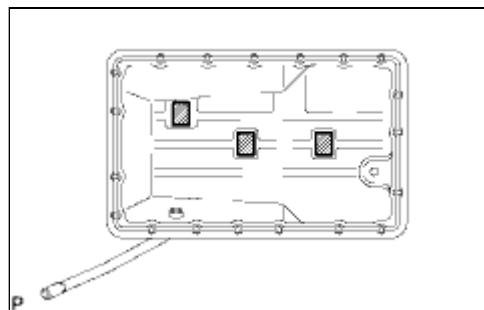
**HINT:**

**Each bolt length is indicated below.**

**14 mm (0.55 in.) for A**

**20 mm (0.79 in.) for B**

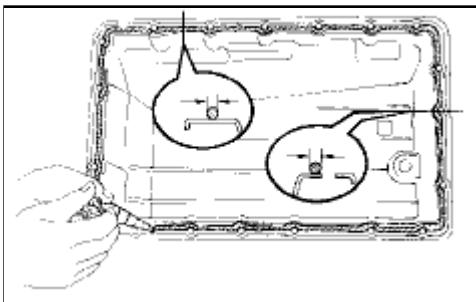
**23 mm (0.91 in.) for C**



## **85. INSTALL OIL CLEANER MAGNET**

(a) Install the 3 magnets.

## **86. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**



(a) Remove all old seal packing from the contact surfaces of the transmission case and oil pan.

**NOTICE:**

**Be careful not to drop oil on the contact surfaces of the transmission case and oil pan.**

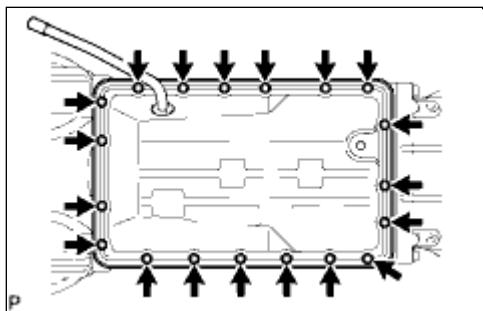
(b) Apply seal packing to the oil pan.

Seal packing:

Toyota Genuine Seal Packing 1281,  
Three Bond 1281 or equivalent

**Seal diameter**

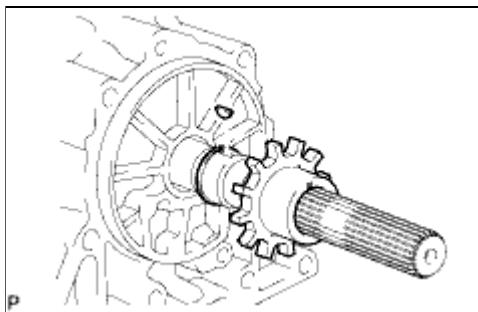
2 to 3 mm (0.0787 to 0.118 in.)



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

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

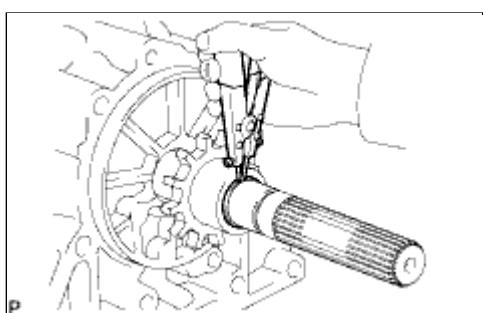
## 87. INSTALL SENSOR ROTOR



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

(b) Install the key to the output shaft.

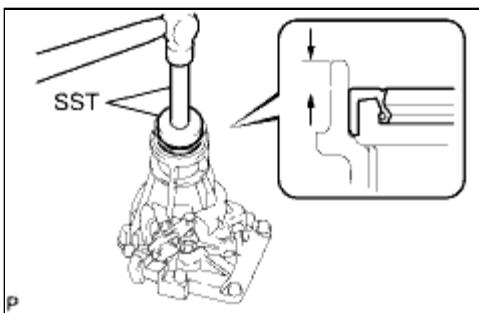
(c) Align the groove of the sensor rotor with the key and install the sensor rotor.



(d) Using a snap ring expander, install the snap ring.

## 88. INSTALL AUTOMATIC TRANSMISSION EXTENSION HOUSING 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: 09950-60010**

09951-00580

**SST: 09950-70010**

09951-07100

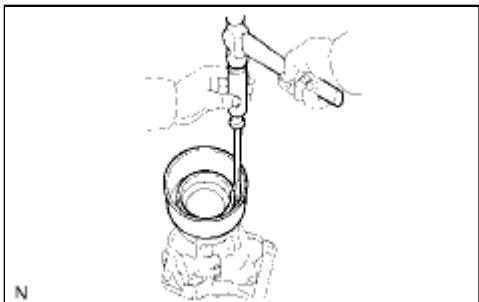
Standard depth:

5.8 to 6.2 mm (0.228 to 0.244 in.)

**NOTICE:**

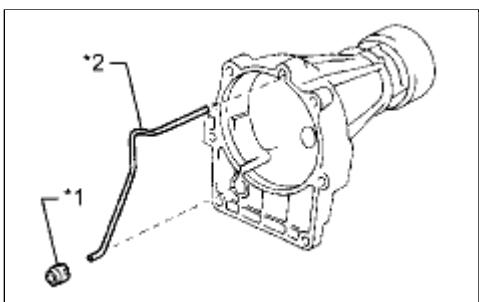
Be careful not to damage the lip of the oil seal.

## 89. INSTALL EXTENSION HOUSING DUST DEFLECTOR



(a) Using a screwdriver and hammer, tap on a new dust deflector.

## 90. INSTALL EXTENSION HOUSING BUSH APPLY TUBE GASKET



(a) Install the gasket to the extension housing bush apply tube.

### Text in Illustration

*1	Extension Housing Bush Apply Tube Gasket
*2	Extension Housing Bush Apply Tube

## 91. INSTALL EXTENSION HOUSING BUSH APPLY TUBE

(a) Install the extension housing bush apply tube together with the gasket to the extension housing.

## 92. INSTALL EXTENSION HOUSING SUB-ASSEMBLY

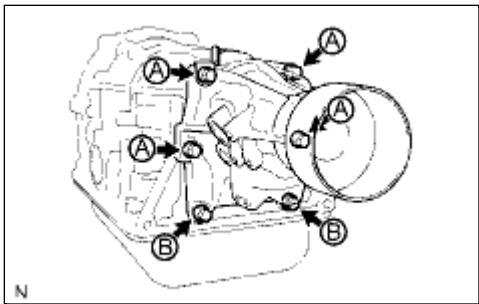
(a) Clean the threads of the bolts.

(b) Apply adhesive to the 6 bolts.

Adhesive:

Toyota Genuine Adhesive 1324,

Three Bond 1324 or equivalent



- (c) Install a new gasket and the extension housing to the transmission case with the 6 bolts.

**Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**

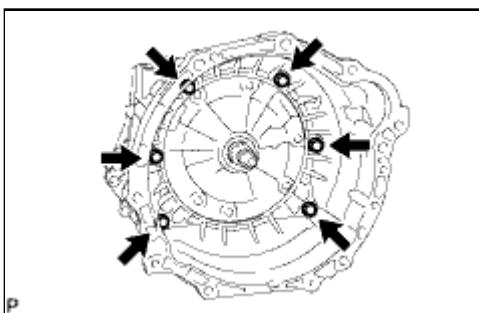
**HINT:**

Each bolt length is indicated below.

45 mm (1.77 in.) for A

35 mm (1.38 in.) for B

### 93. INSTALL AUTOMATIC TRANSMISSION HOUSING



- (a) Clean the threads of the bolts and case with non-residue solvent.

- (b) Apply adhesive to the 6 bolts.

Adhesive:

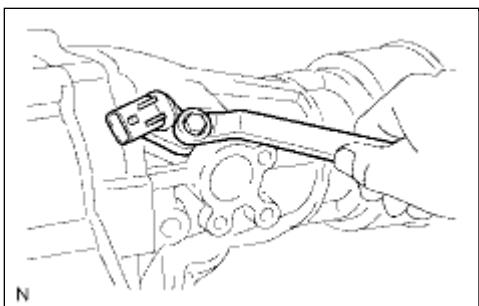
Toyota Genuine Adhesive 1324,

Three Bond 1324 or equivalent

- (c) Install the transmission housing with the 6 bolts.

**for 14 mm bolt - Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**

**for 17 mm bolt - Torque: 57 N·m (585 kgf·cm, 42ft·lbf)**

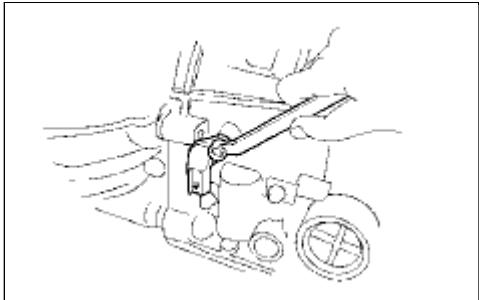


### 94. INSTALL SPEED SENSOR SP2

- (a) Install a new O-ring to the sensor.

- (b) Install the sensor with the bolt.

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

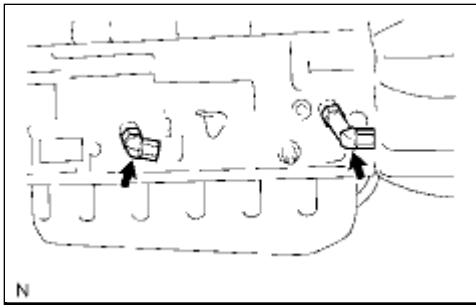


### 95. INSTALL SPEED SENSOR NC0

- (a) Install a new O-ring to the sensor.

- (b) Install the speed sensor with the bolt.

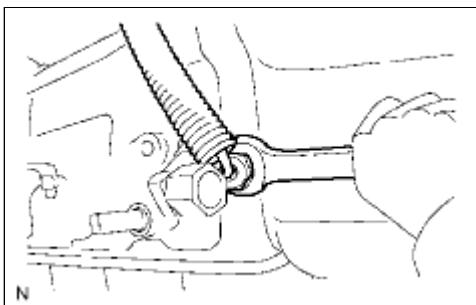
**Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)**



## 96. INSTALL OIL COOLER TUBE UNION

- (a) Coat 2 new O-rings with ATF and install one to each tube union.

**Torque: 29 N·m (300 kgf·cm, 22ft·lbf)**

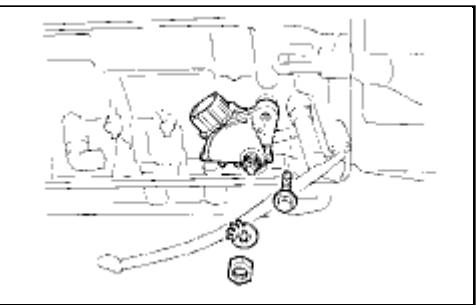


## 97. INSTALL AUTOMATIC TRANSMISSION FLUID TEMPERATURE SENSOR

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

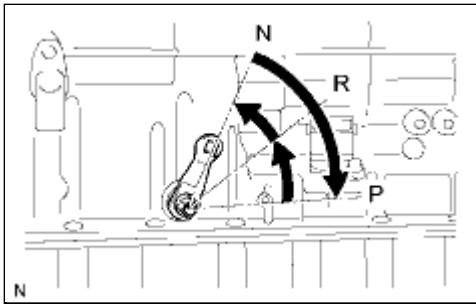
**Torque: 29 N·m (300 kgf·cm, 22ft·lbf)**

## 98. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY



- (a) Install the park/neutral position switch to the manual valve lever shaft and temporarily install the adjusting bolt.  
(b) Install a new lock washer and the nut.

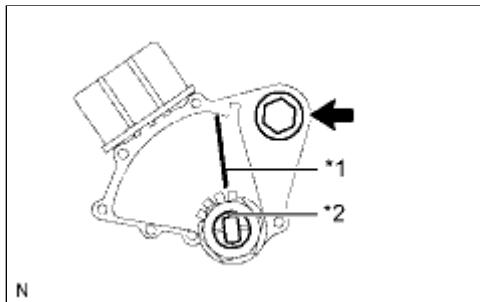
**Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)**



- (c) Turn the control shaft lever LH clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.

(d) Align the neutral basic line with the switch groove as shown in the illustration and tighten the adjusting bolt.

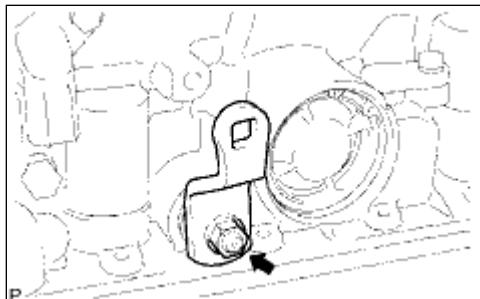
**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**



## Text in Illustration

* 1	Neutral Basic Line
* 2	Groove

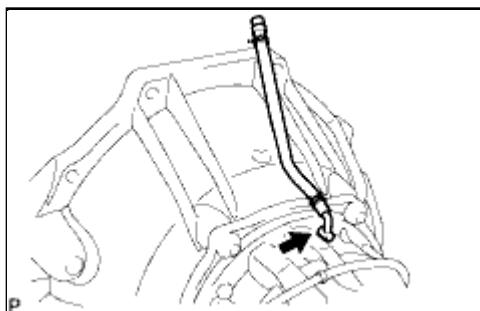
(e) Using a screwdriver, bend the tabs of the lock washer.



## 99. INSTALL TRANSMISSION CONTROL SHAFT LEVER LH

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

**Torque: 16 N·m (160 kgf·cm, 12ft·lbf)**



## 100. INSTALL BREATHER HOSE

## 101. INSTALL DRAIN PLUG

(a) Install a new gasket and the drain plug.

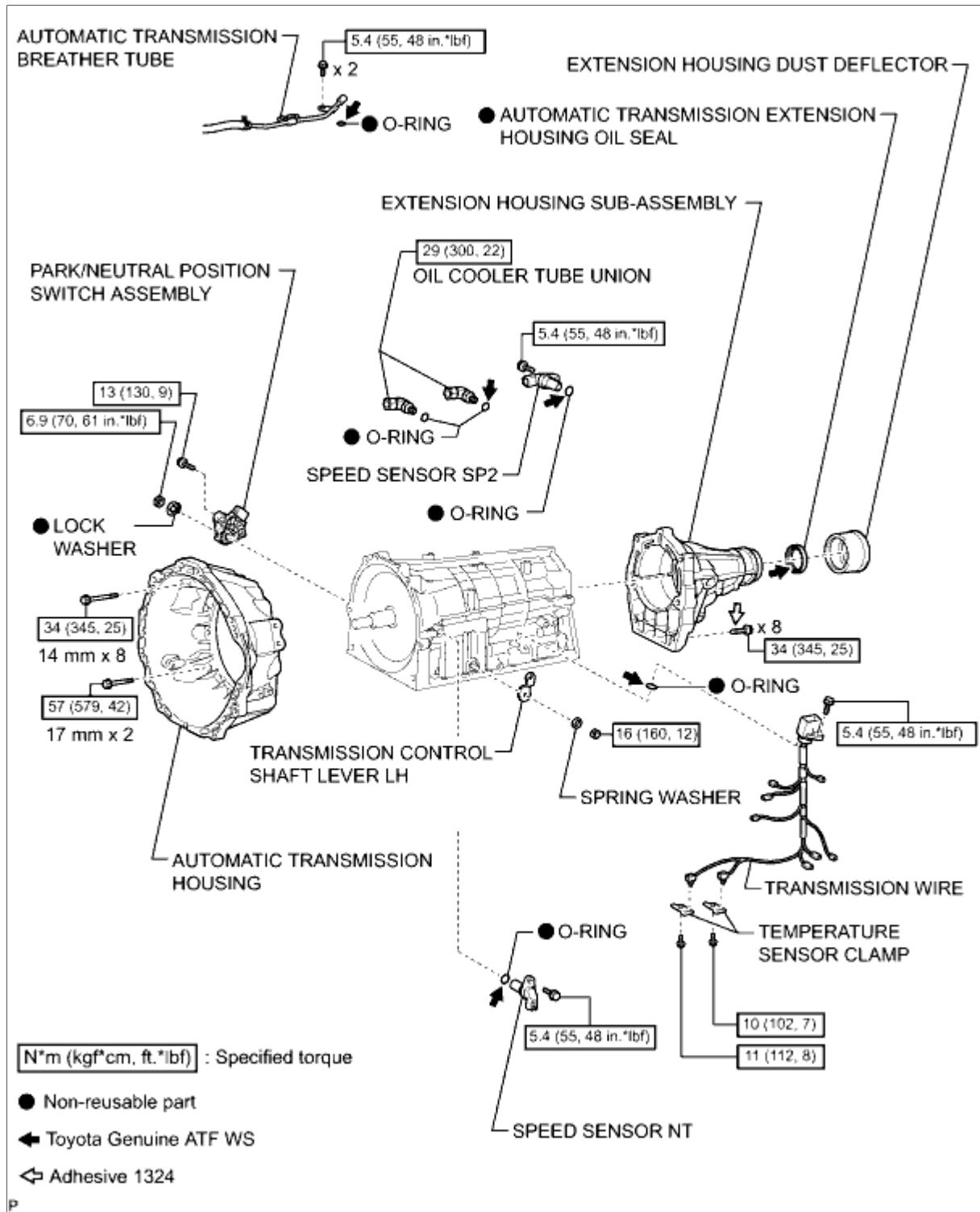
**Torque: 20 N·m (204 kgf·cm, 15ft·lbf)**



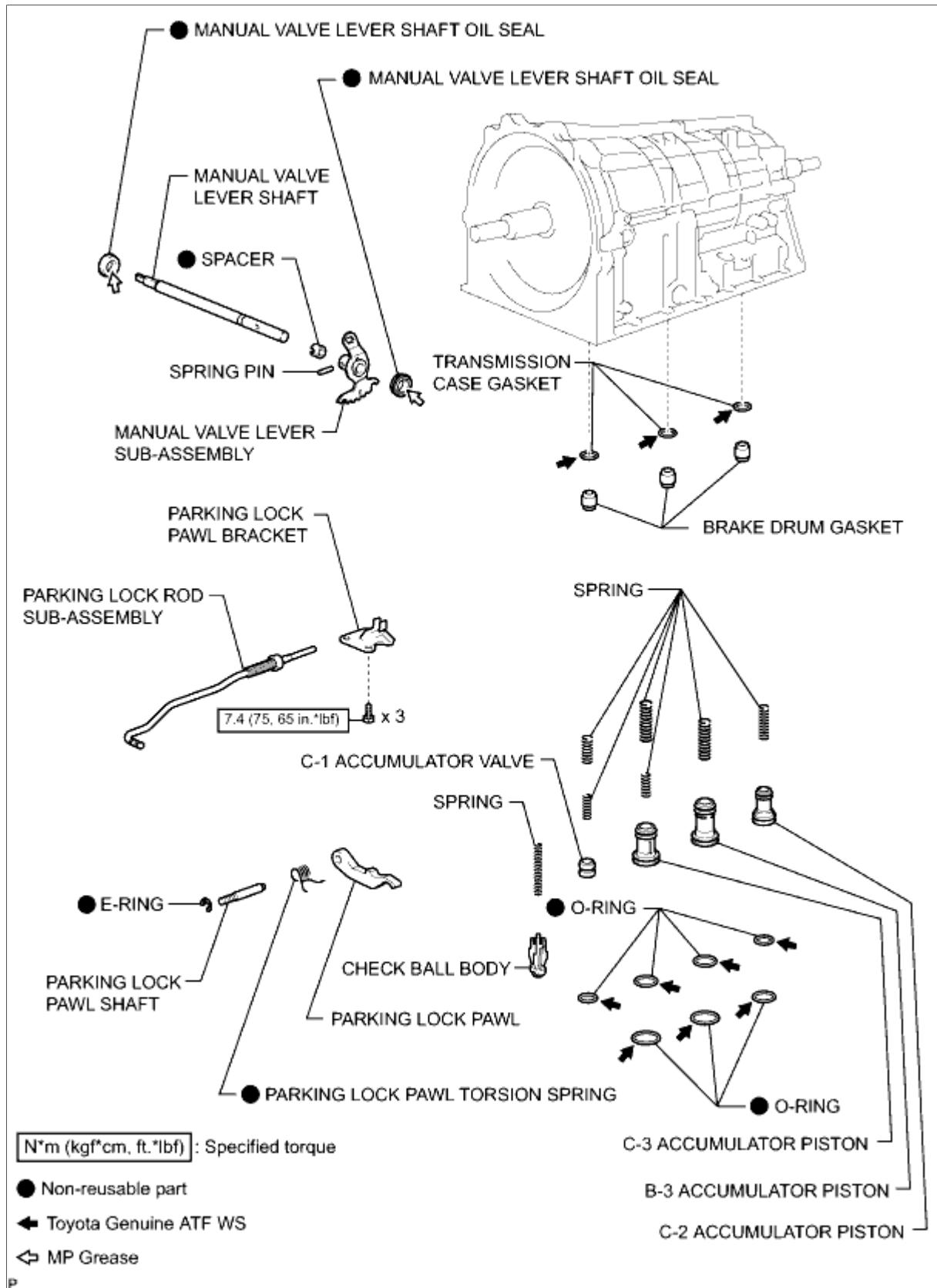
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013EY02PX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

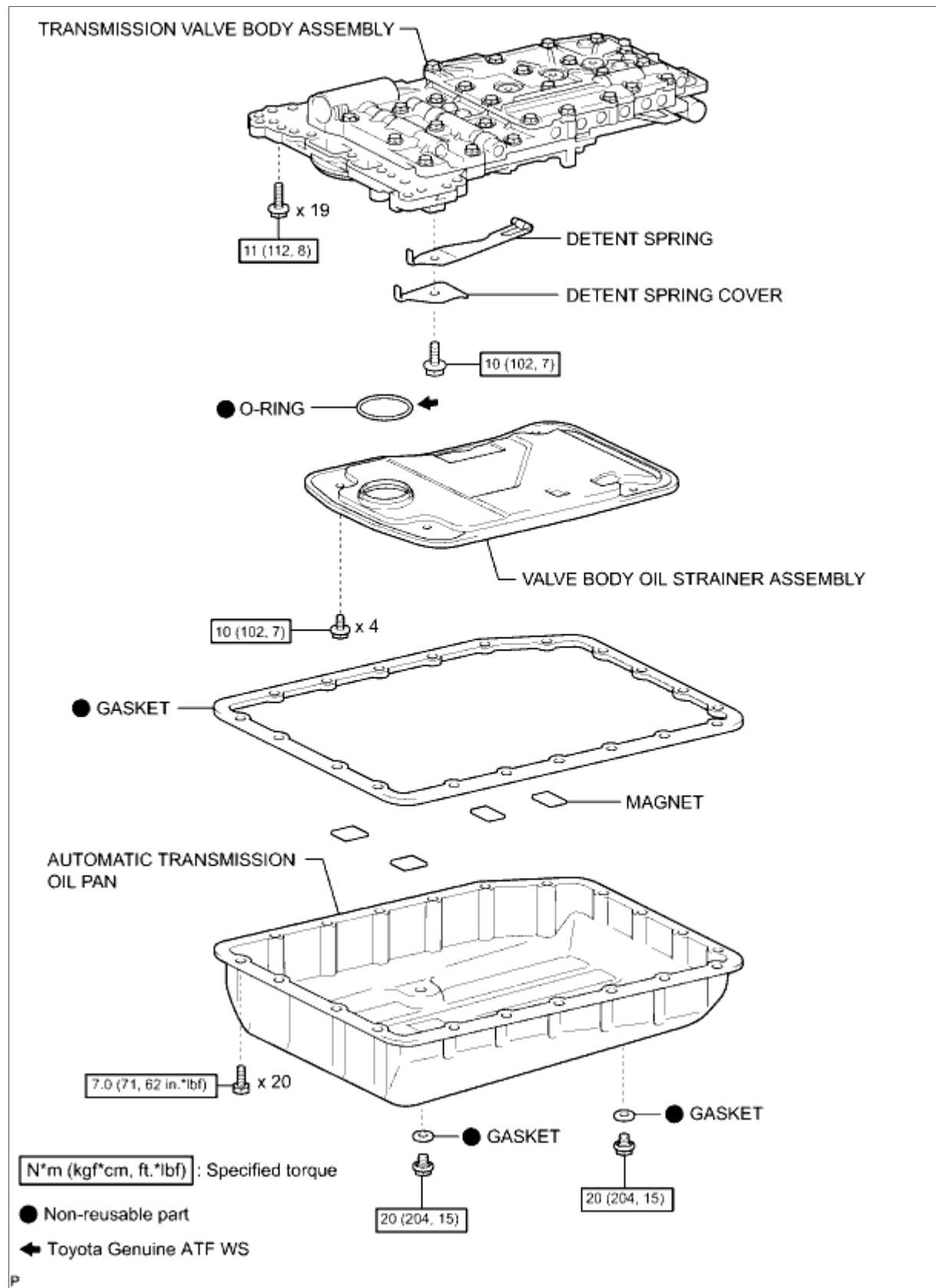
## **ILLUSTRATION**



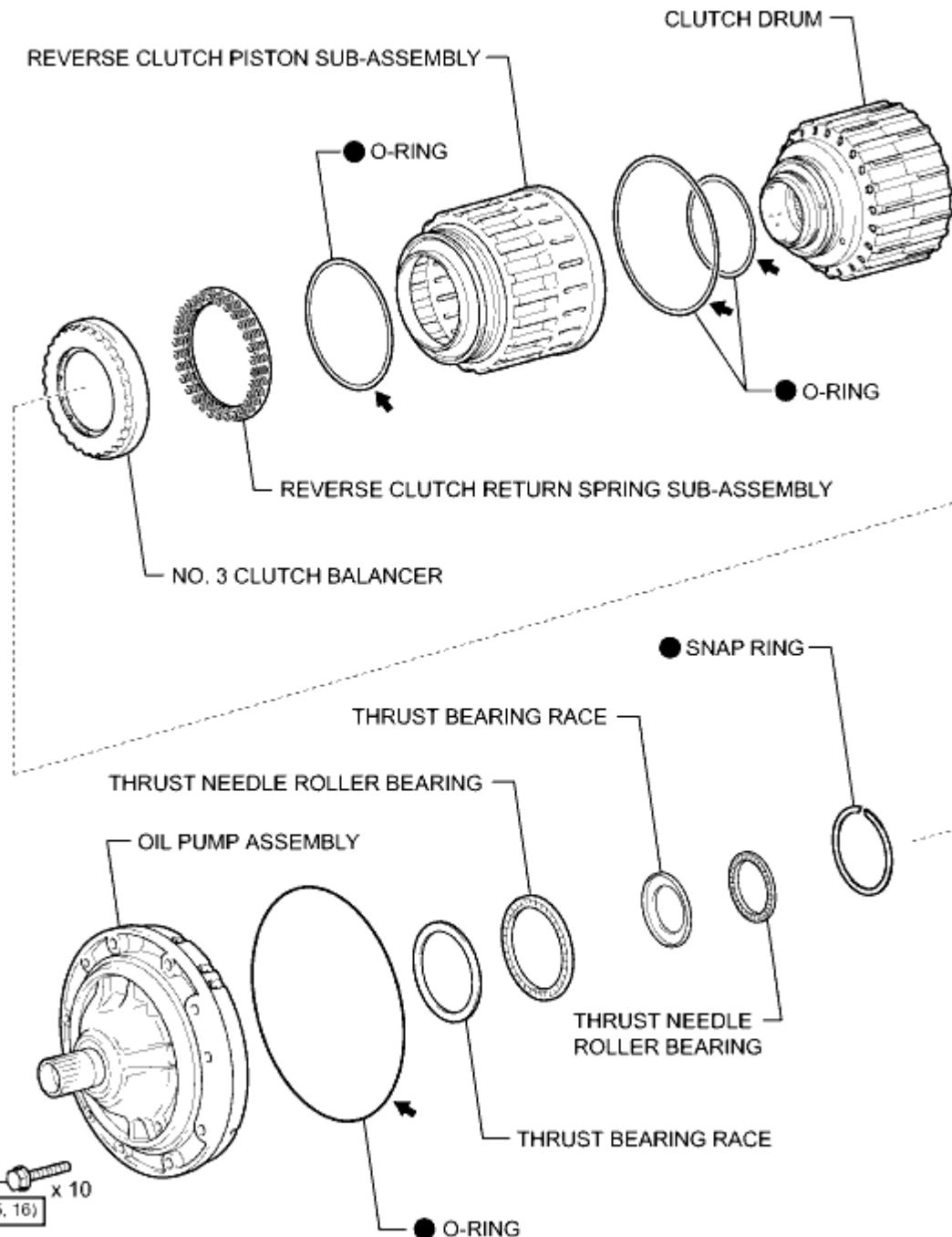
## ILLUSTRATION



## ILLUSTRATION



## ILLUSTRATION

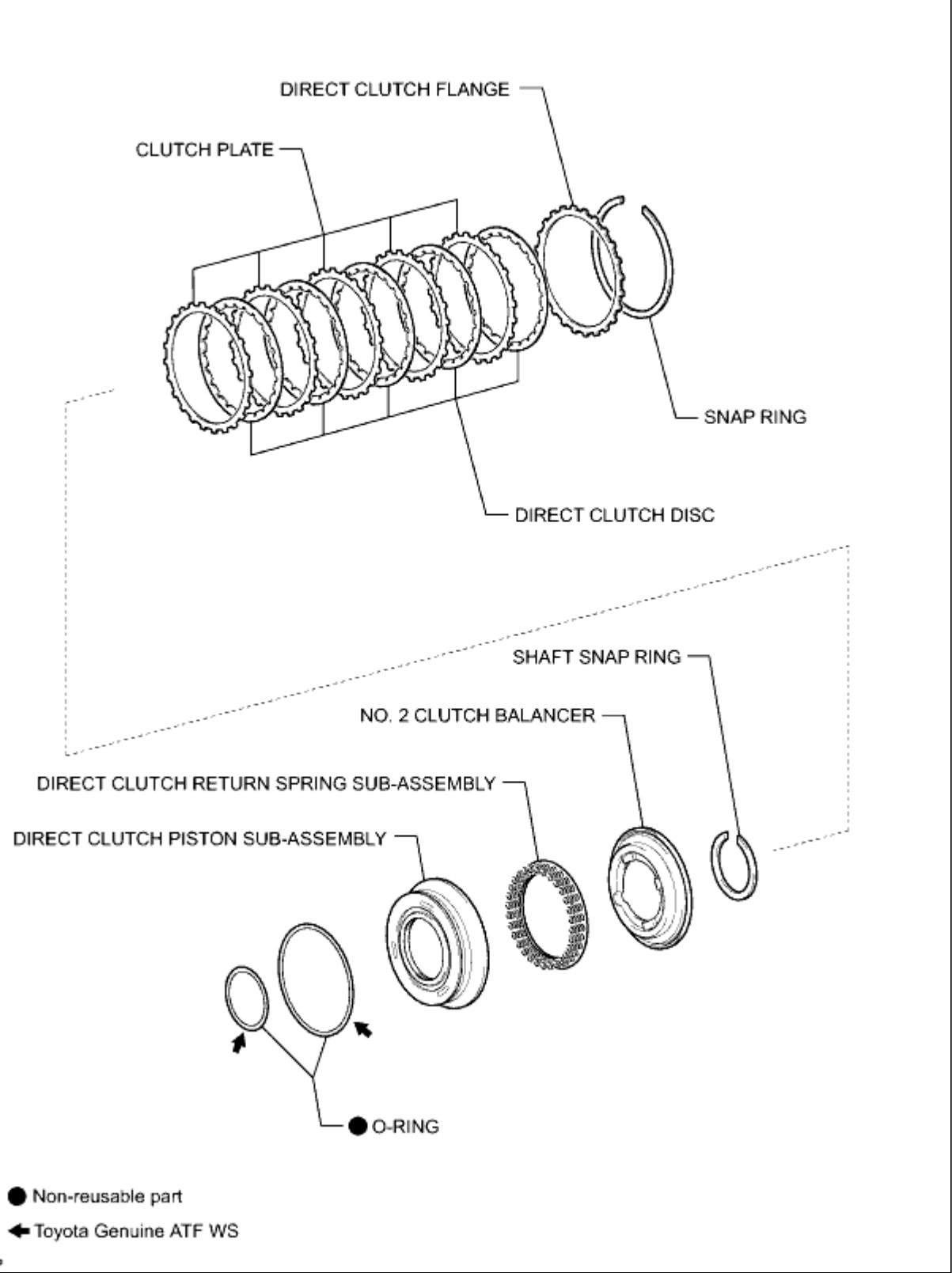


**N·m (kgf·cm, ft·lbf)** : Specified torque

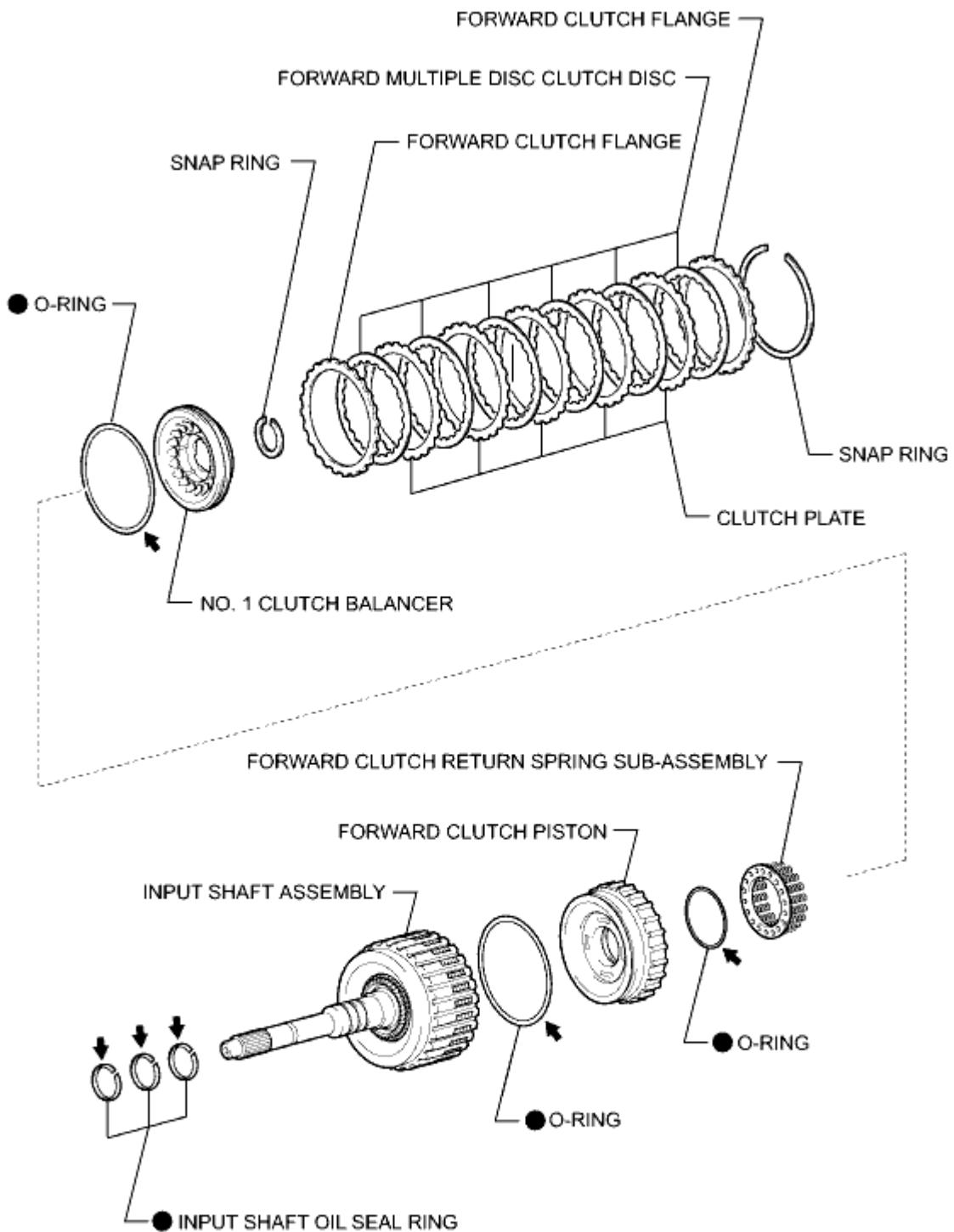
● Non-reusable part

← Toyota Genuine ATF WS

## ILLUSTRATION



## ILLUSTRATION

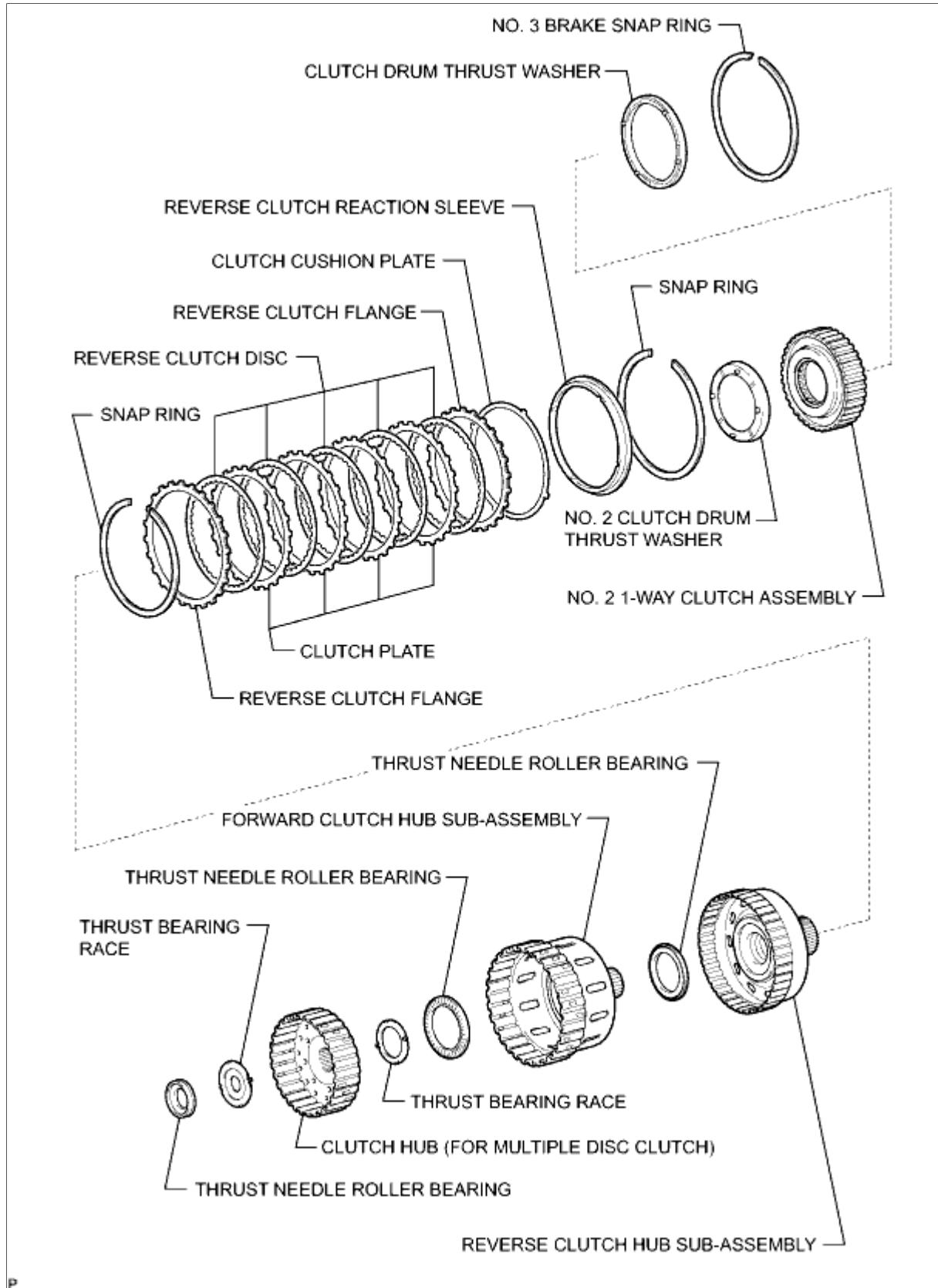


● Non-reusable part

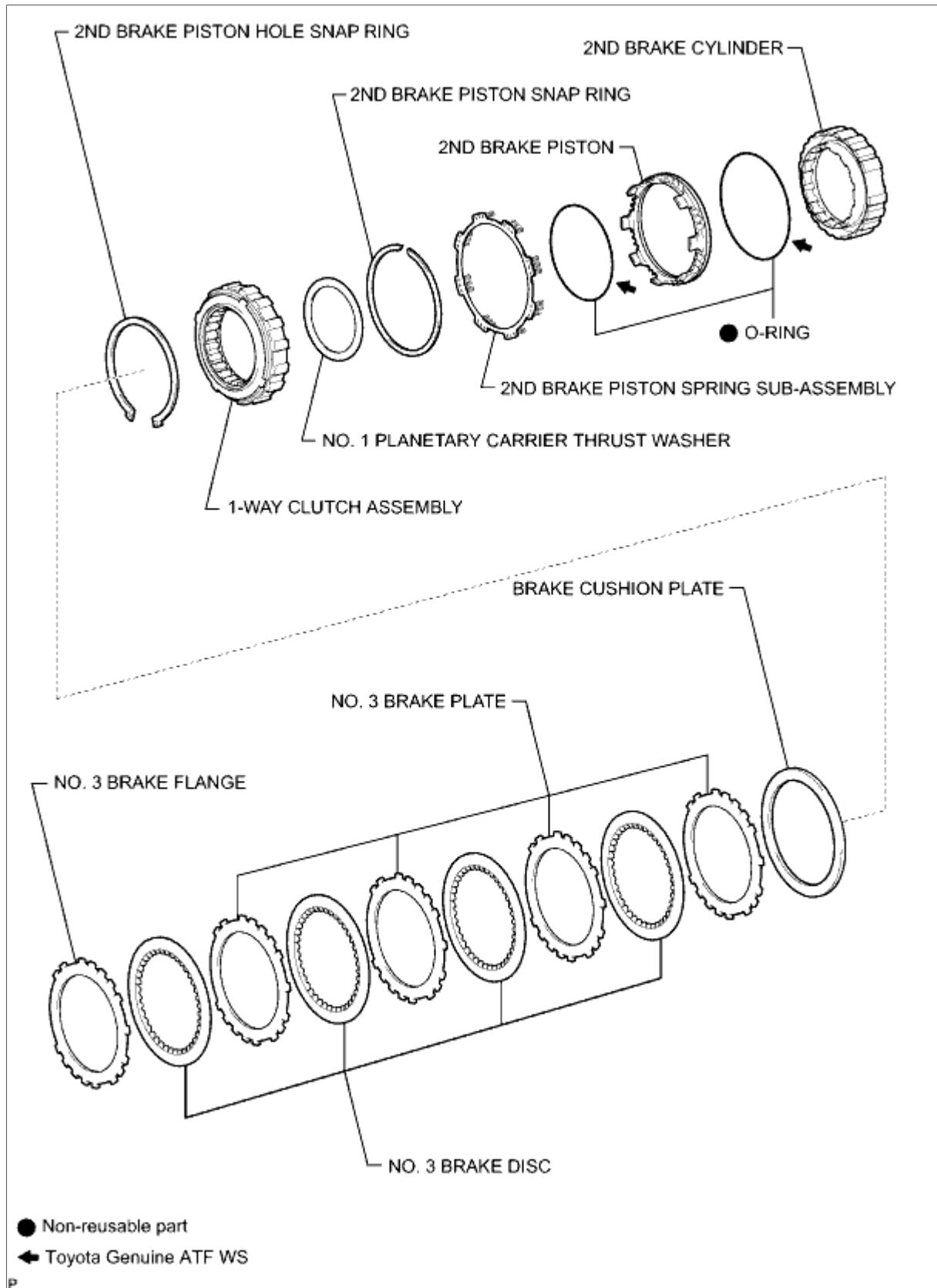
← Toyota Genuine ATF WS

P

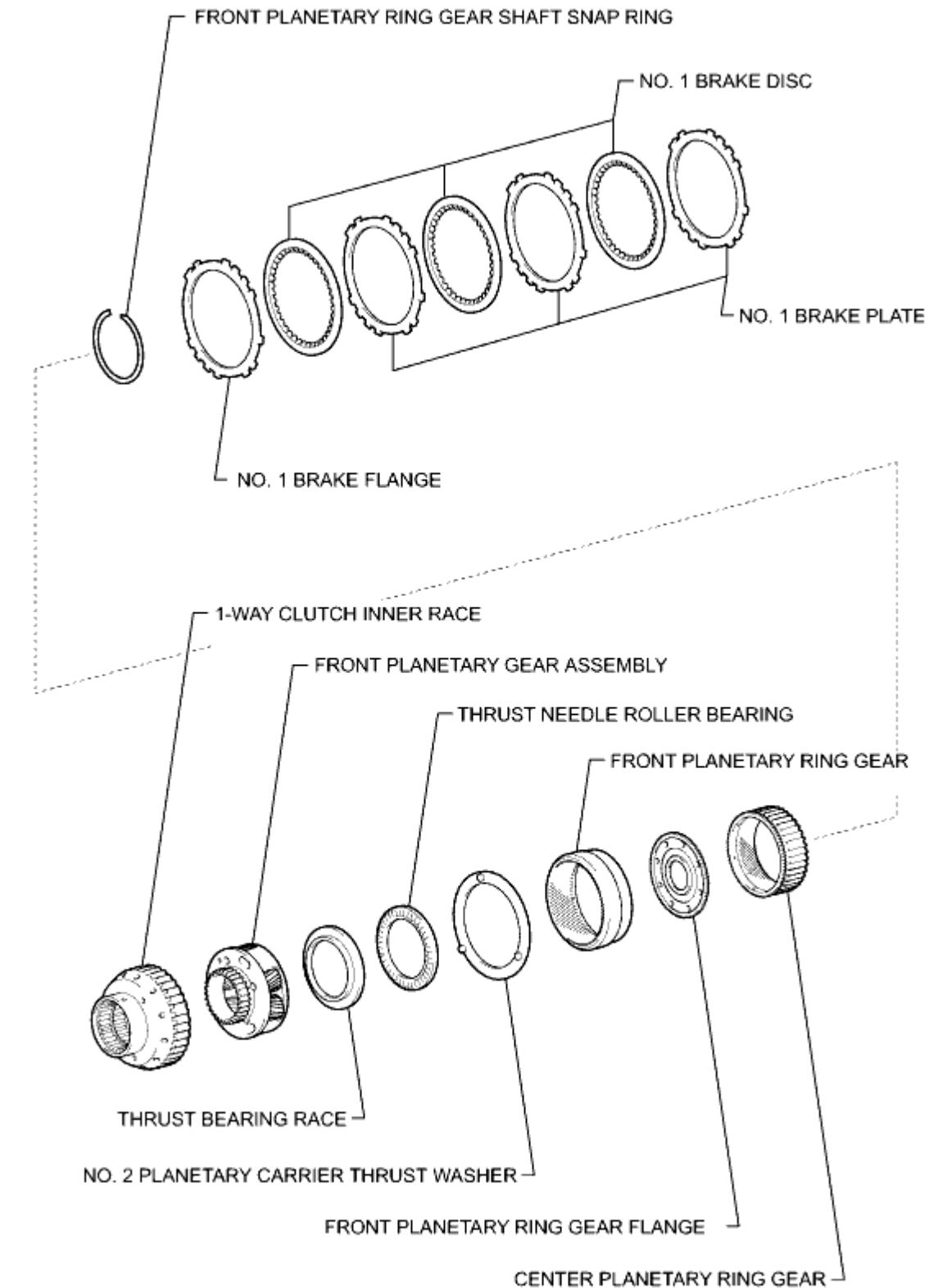
## ILLUSTRATION



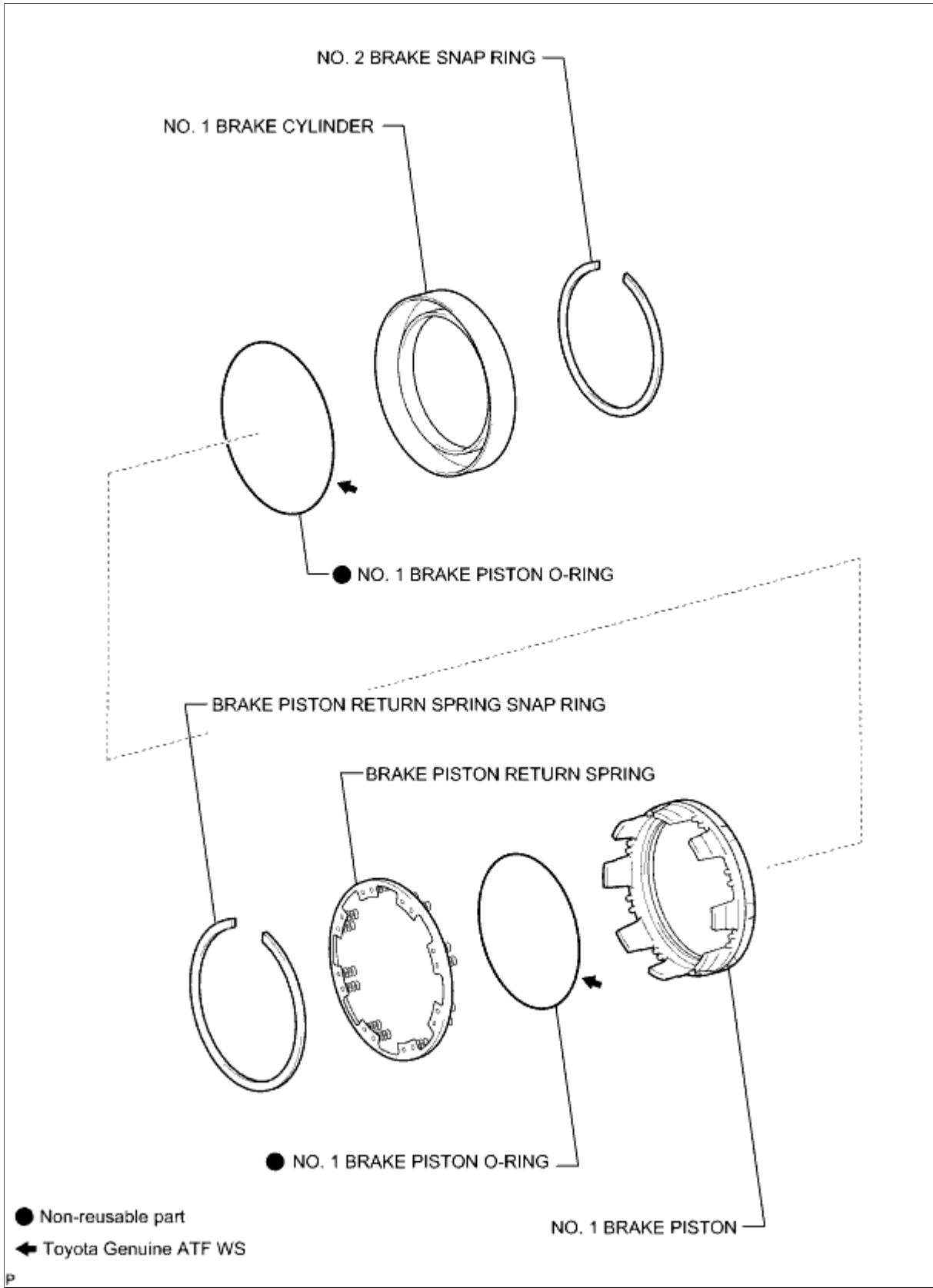
## ILLUSTRATION



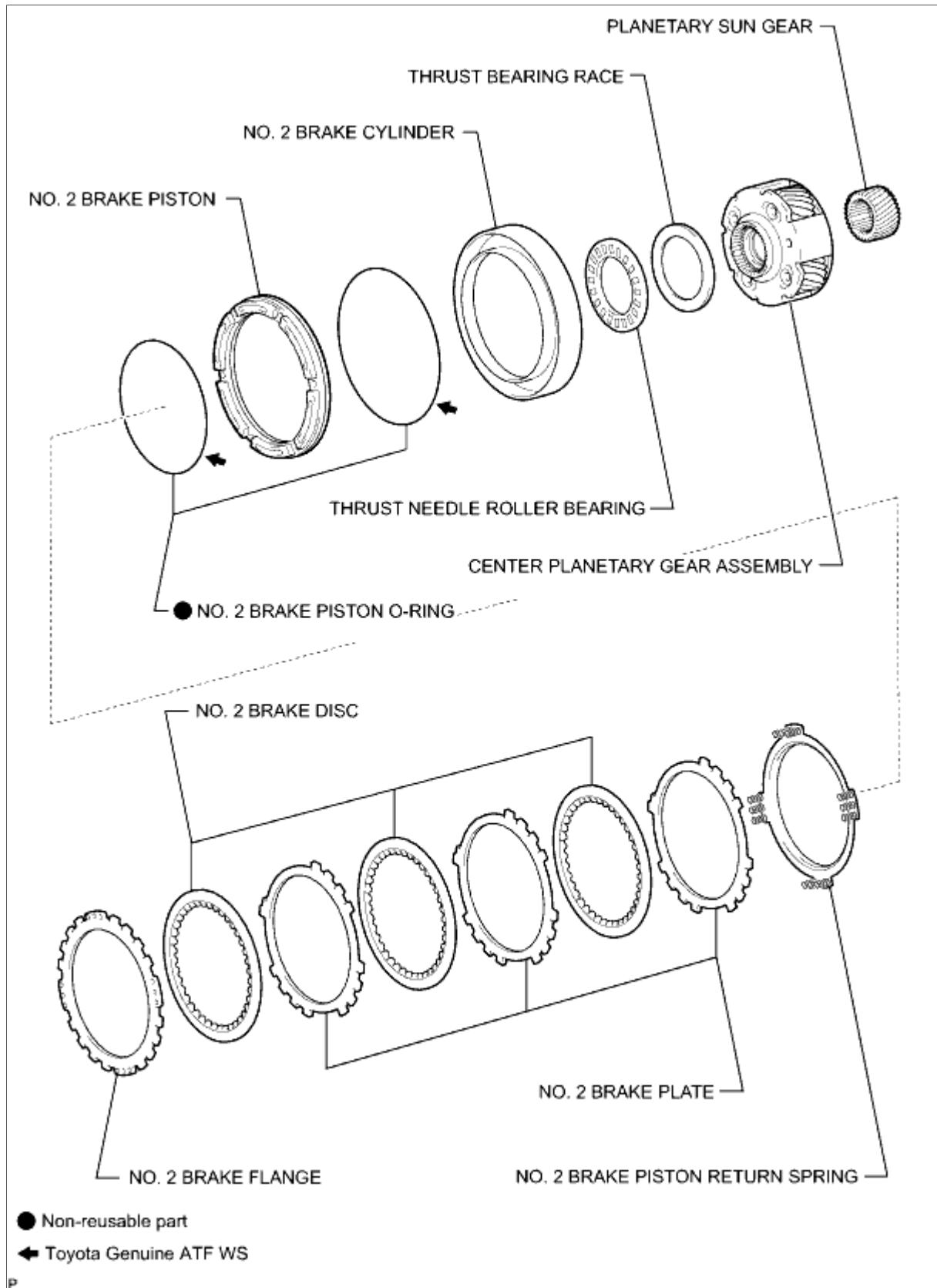
## ILLUSTRATION



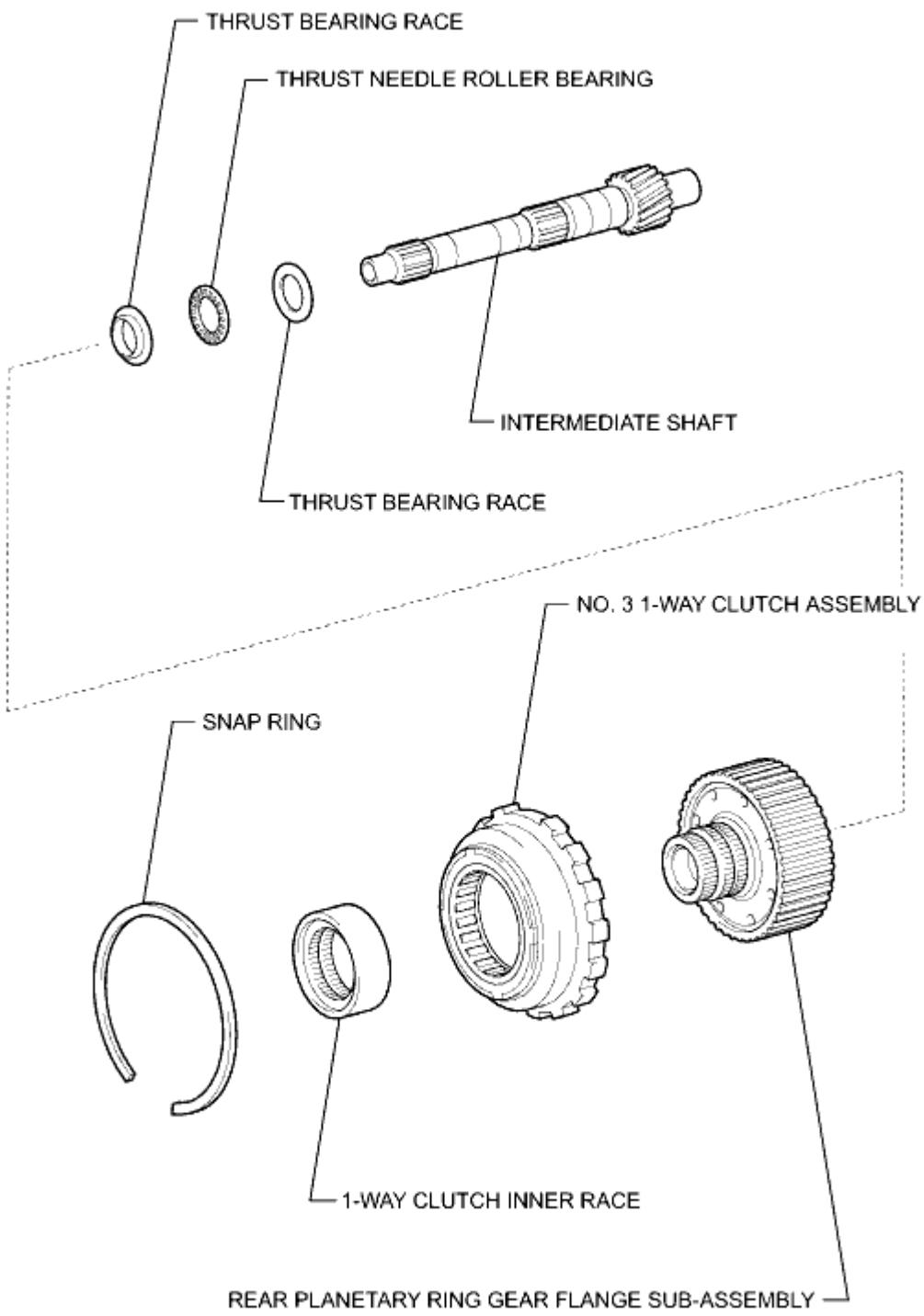
## ILLUSTRATION



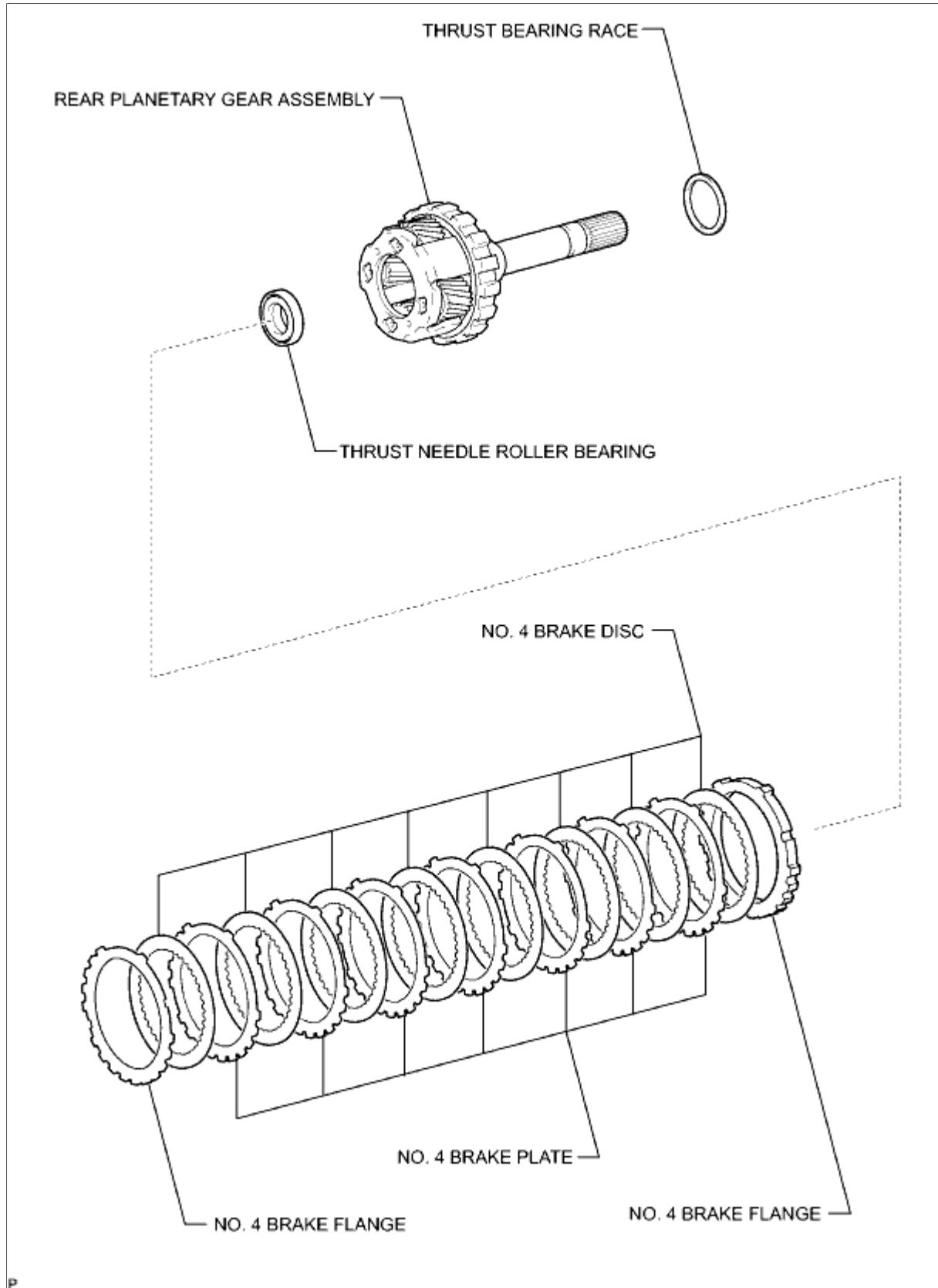
## ILLUSTRATION



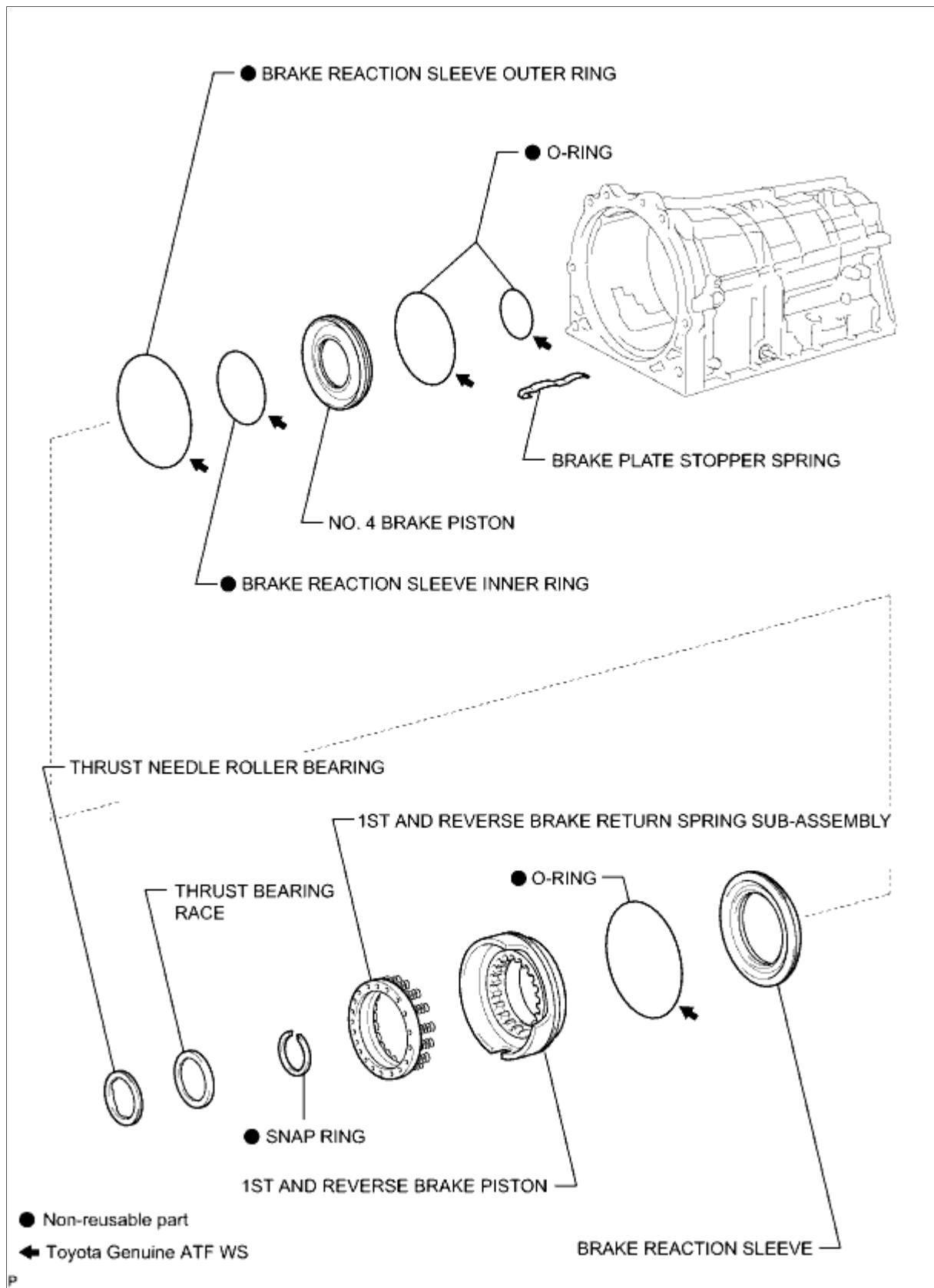
## ILLUSTRATION



## ILLUSTRATION

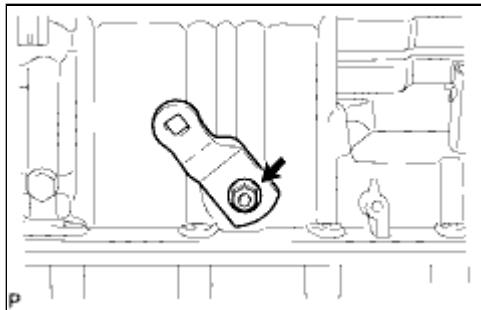


## ILLUSTRATION



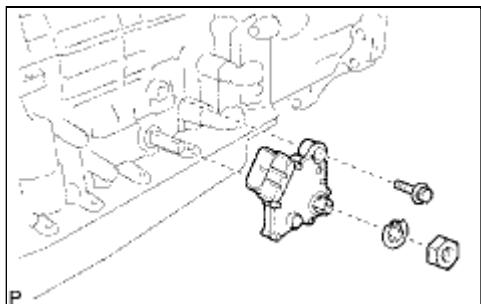
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013EZ02RX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: DISASSEMBLY (2010 4Runner)		

## **DISASSEMBLY**



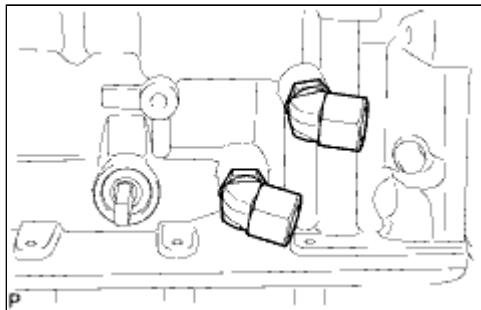
### **1. REMOVE TRANSMISSION CONTROL SHAFT LEVER LH**

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



### **2. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Using a screwdriver, bend the tabs of the lock washer.
- (b) Remove the nut, lock washer and bolt.
- (c) Remove the park/neutral position switch.

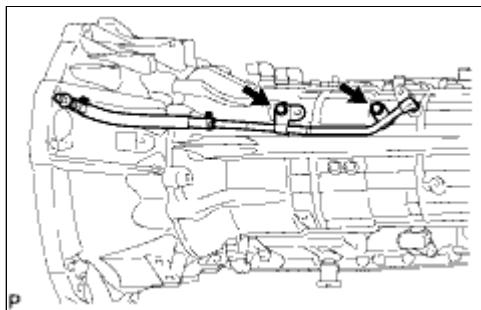
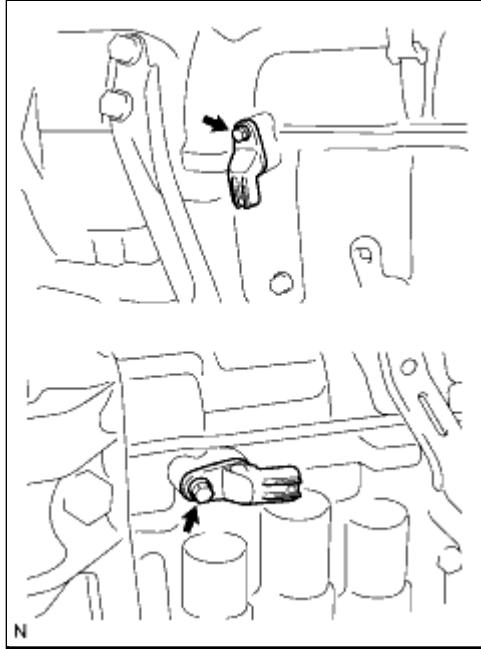


### **3. REMOVE OIL COOLER TUBE UNION**

- (a) Remove the 2 oil cooler tube unions.
- (b) Remove the 2 O-rings from the oil cooler tube unions.

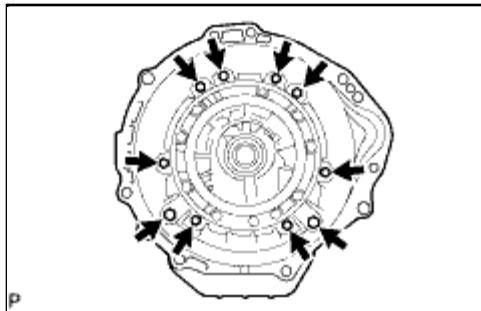
### **4. REMOVE SPEED SENSOR**

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



## 5. REMOVE AUTOMATIC TRANSMISSION BREATHER TUBE

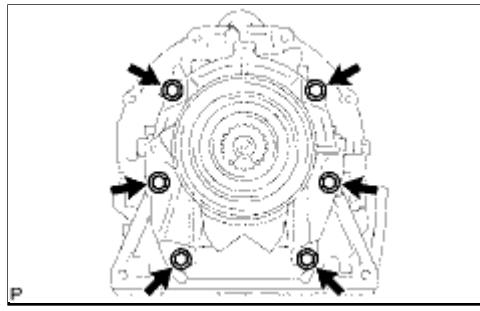
- Remove the 2 bolts.
- Remove the breather tube.
- Remove the O-ring from the tube.



## 6. REMOVE AUTOMATIC TRANSMISSION HOUSING

- Remove the 10 bolts.
- Remove the transmission housing.

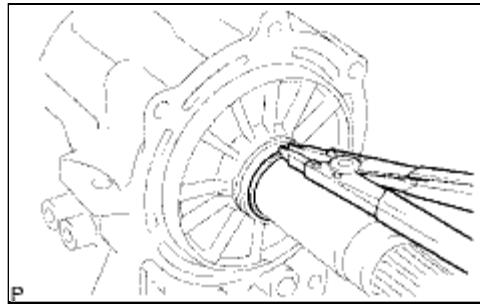
## 7. REMOVE EXTENSION HOUSING SUB-ASSEMBLY



- (a) Remove the 6 bolts.
- (b) Remove the extension housing.

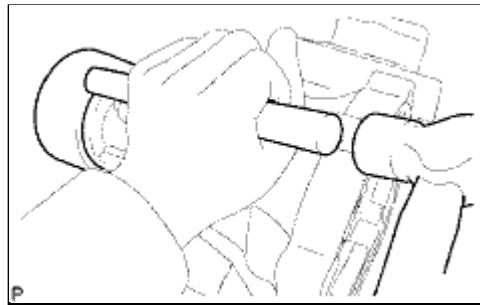
**HINT:**

**Use a brass bar and hammer to remove the extension housing.**



- (c) Using a snap ring expander, remove the snap ring.

- (d) Remove the thrust needle roller bearing and 2 bearing races.
- (e) Remove the 2 transfer case ring pins from the transmission case adapter.



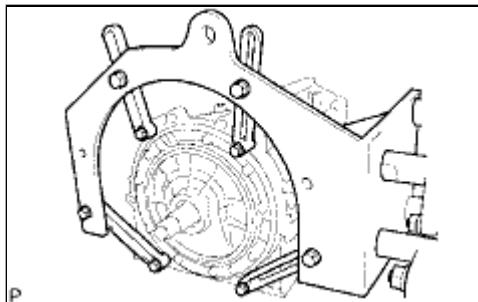
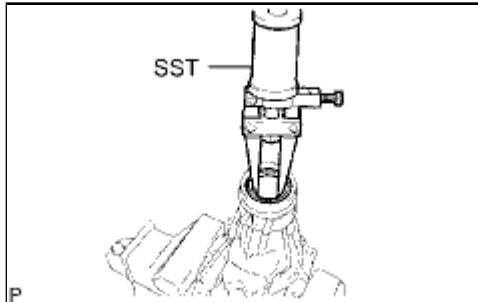
**8. REMOVE EXTENSION HOUSING DUST DEFLECTOR**

- (a) Using a brass bar and hammer, tap out the dust deflector.

**9. REMOVE AUTOMATIC TRANSMISSION EXTENSION HOUSING OIL SEAL**

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

**SST: 09308-00010**



## 10. FIX AUTOMATIC TRANSMISSION CASE SUB-ASSEMBLY

(a) Install the transmission case to an overhaul attachment.

## 11. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

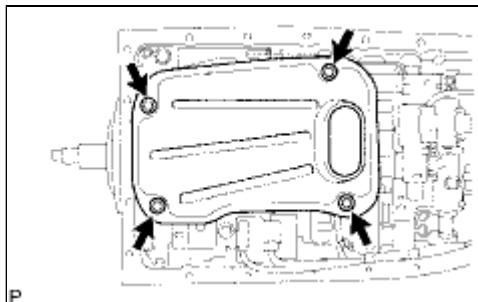
### NOTICE:

Do not turn the transmission over as this will contaminate the valve body with foreign matter in the bottom of the pan.

- (a) Remove the drain plug and 20 bolts.
- (b) Remove the 4 magnets from the oil pan.

## 12. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

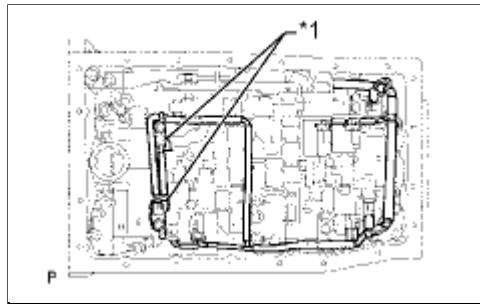
INFO



## 13. REMOVE VALVE BODY OIL STRAINER ASSEMBLY

- (a) Turn over the transmission.
- (b) Remove the 4 bolts and oil strainer from the valve body.
- (c) Remove the O-ring from the oil strainer.

## 14. REMOVE TRANSMISSION WIRE

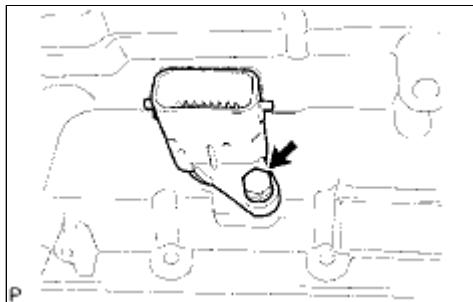


- (a) Remove the 2 bolts and 2 temperature sensor clamps, and disconnect the 2 ATF temperature sensors.

**Text in Illustration**

*1	Temperature Sensor Clamp
----	--------------------------

- (b) Disconnect the 7 connectors from the solenoid valves.



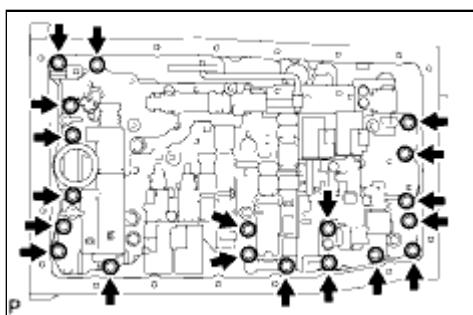
- (c) Remove the bolt from the case.

- (d) Pull the transmission wire out of the transmission case to remove it.

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

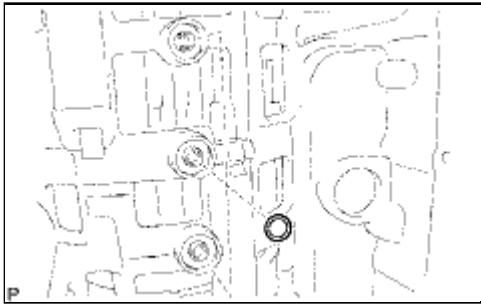
**15. REMOVE TRANSMISSION VALVE BODY ASSEMBLY**

- (a) Remove the bolt, detent spring cover and detent spring.



- (b) Remove the 19 bolts and valve body.

**16. REMOVE TRANSMISSION CASE GASKET**

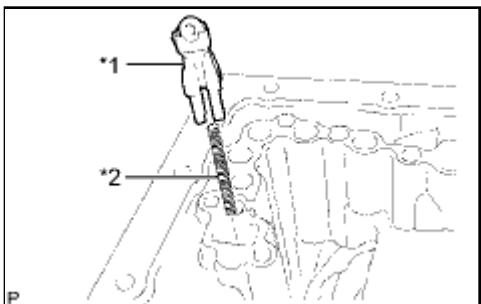


(a) Remove the 3 gaskets.



## 17. REMOVE BRAKE DRUM GASKET

(a) Remove the 3 gaskets.

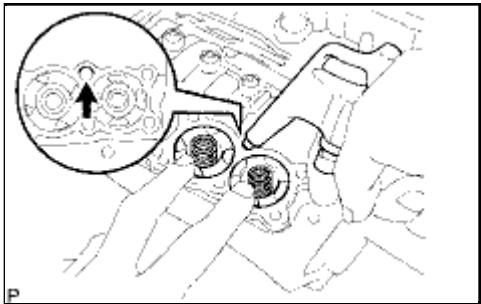


## 18. REMOVE CHECK BALL BODY

(a) Remove the check ball body and spring.

### Text in Illustration

*1	Check Ball Body
*2	Spring



## 19. REMOVE C-2 ACCUMULATOR PISTON

(a) Apply compressed air to the oil hole to remove the C-2 accumulator piston and spring.

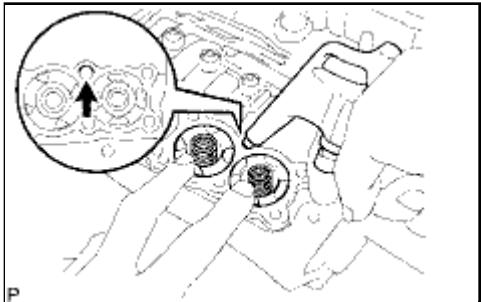
(b) Remove the 2 O-rings from the piston.

### NOTICE:

Be careful as the C-3 and B-3 accumulator pistons may jump out.

## 20. REMOVE B-3 ACCUMULATOR PISTON

(a) Apply compressed air to the oil hole to remove the B-3

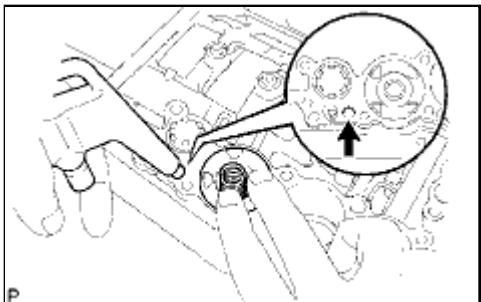


accumulator piston and spring.

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

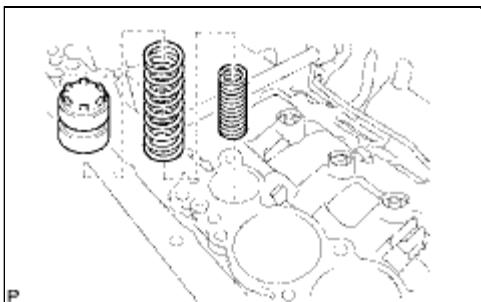
**NOTICE:**

**Be careful as the C-3 accumulator piston may jump out.**



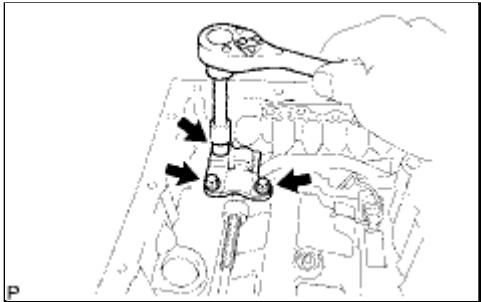
**21. REMOVE C-3 ACCUMULATOR PISTON**

- (a) Apply compressed air to the oil hole to remove the C-3 accumulator piston and 2 springs.  
(b) Remove the 2 O-rings from the piston.



**22. REMOVE C-1 ACCUMULATOR VALVE**

- (a) Remove the C-1 accumulator valve and 2 springs.

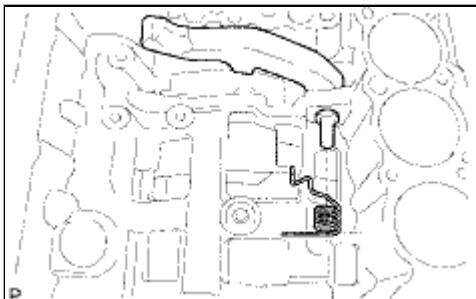
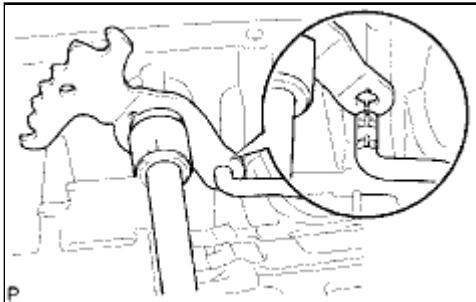


**23. REMOVE PARKING LOCK PAWL BRACKET**

- (a) Remove the 3 bolts and bracket.

**24. REMOVE PARKING LOCK ROD SUB-ASSEMBLY**

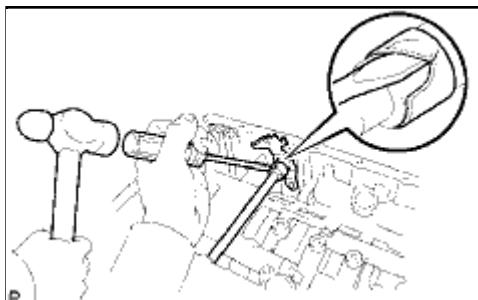
- (a) Disconnect the parking lock rod from the manual valve lever to remove it.



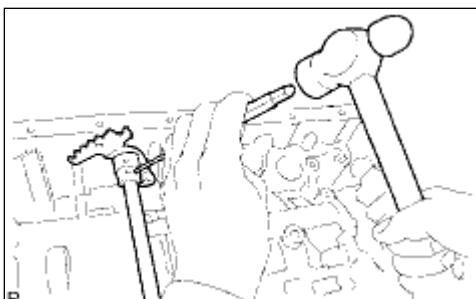
## 25. REMOVE PARKING LOCK PAWL SHAFT

- Pull out the parking lock pawl shaft from the front side to remove it, and then remove the lock pawl and spring.
- Remove the E-ring from the shaft.

## 26. REMOVE MANUAL VALVE LEVER SUB-ASSEMBLY



- Using a hammer and screwdriver, cut off the spacer and remove it from the shaft.

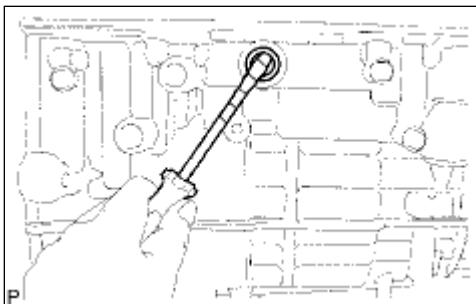


- Using a pin punch and hammer, tap out the spring pin.

**HINT:**

**Slowly drive out the spring pin so that it does not fall into the transmission case.**

- Pull the manual valve lever shaft out through the case and remove the manual valve lever.



## 27. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL

- Using a screwdriver, pry out the 2 oil seals.

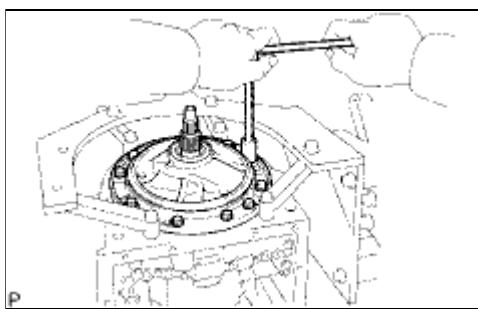
### **HINT:**

**Tape the screwdriver tip before use.**

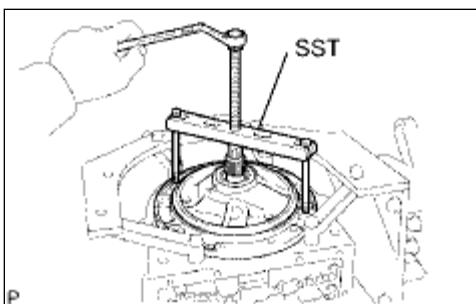
### **NOTICE:**

**Be careful not to damage the transmission case.**

## 28. REMOVE OIL PUMP ASSEMBLY



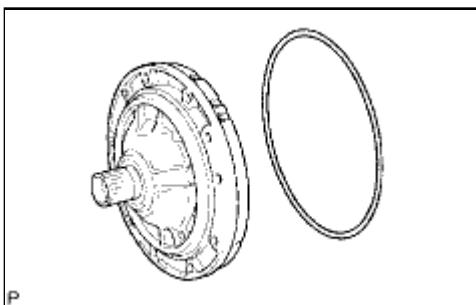
- Remove the 10 bolts.



- Using SST, remove the oil pump.

**SST: 09350-30020**

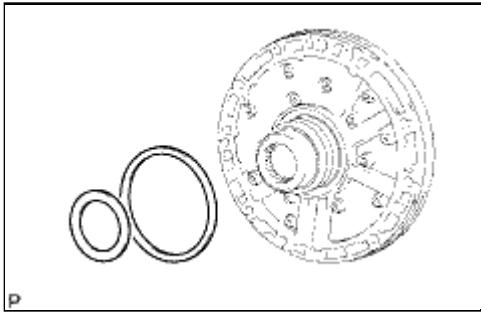
**09350-07020**



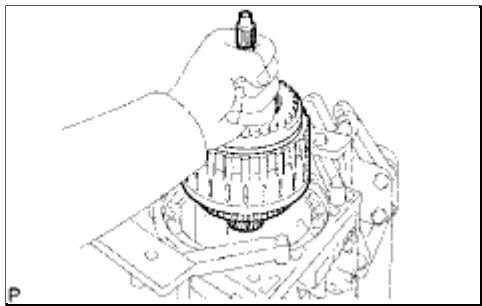
- Remove the O-ring from the front oil pump.



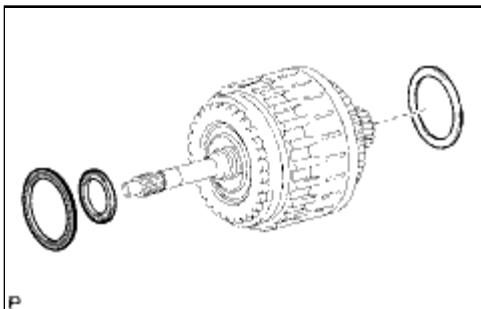
- Remove the 2 thrust bearing races from the front oil pump.



## 29. REMOVE CLUTCH DRUM AND INPUT SHAFT ASSEMBLY

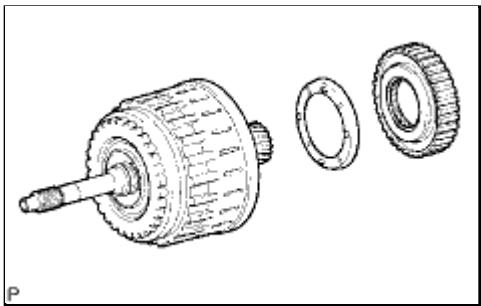


(a) Remove the clutch drum and input shaft assembly from the transmission case.



(b) Remove the clutch drum thrust washer and 2 thrust needle roller bearings.

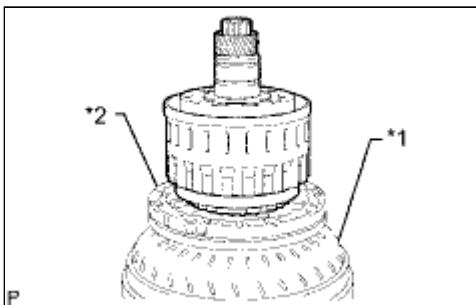
## 30. INSPECT NO. 2 1-WAY CLUTCH ASSEMBLY INFO



## 31. REMOVE NO. 2 1-WAY CLUTCH ASSEMBLY

(a) Remove the 1-way clutch and No. 2 clutch drum thrust washer from the clutch drum and input shaft assembly.

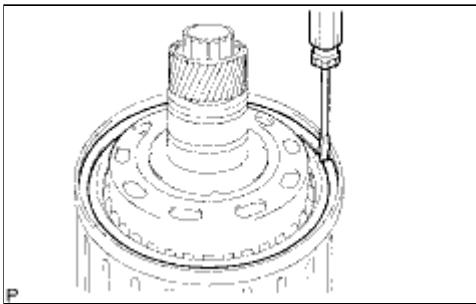
## 32. FIX CLUTCH DRUM AND INPUT SHAFT ASSEMBLY



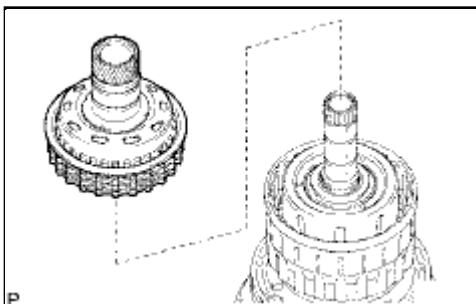
### Text in Illustration

*1	Torque Converter Clutch
*2	Oil Pump

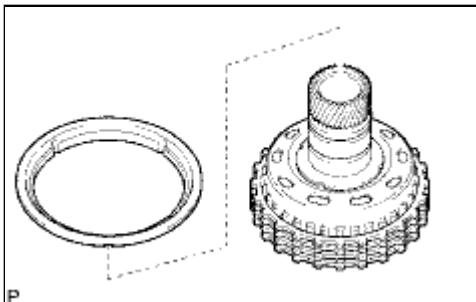
## 33. REMOVE REVERSE CLUTCH HUB SUB-ASSEMBLY



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



(b) Remove the reverse clutch hub sub-assembly, reverse clutch reaction sleeve, clutch cushion, plate reverse clutch flange, 5 reverse clutch discs and 4 clutch plates from the clutch drum.



## 34. REMOVE REVERSE CLUTCH REACTION SLEEVE

(a) Remove the reverse clutch reaction sleeve from the reverse clutch hub.

### **35. REMOVE REAR CLUTCH DISC**

(a) Remove the clutch cushion plate, reverse clutch flange, 5 discs and 4 plates from the reverse clutch hub.

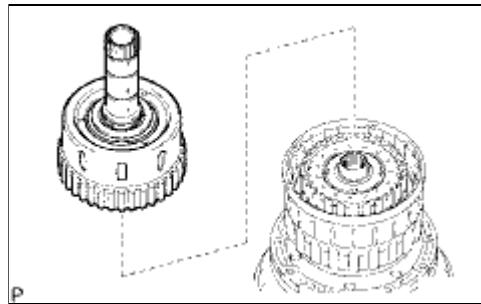
### **36. INSPECT REAR CLUTCH DISC**

**INFO**

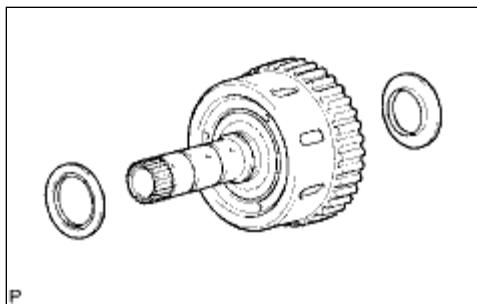
### **37. INSPECT REVERSE CLUTCH HUB SUB-ASSEMBLY**

**INFO**

### **38. REMOVE FORWARD CLUTCH HUB SUB-ASSEMBLY**



(a) Remove the forward clutch hub from the clutch drum.

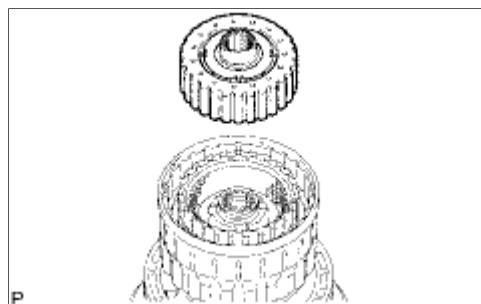


(b) Remove the 2 thrust needle roller bearings from the forward clutch hub.

### **39. INSPECT FORWARD CLUTCH HUB SUB-ASSEMBLY**

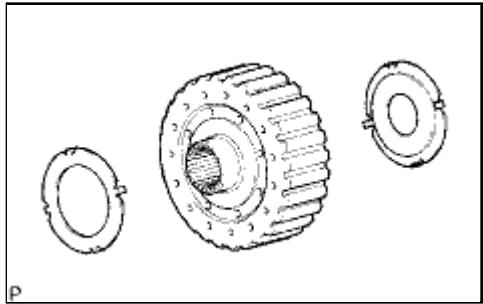
**INFO**

### **40. REMOVE MULTIPLE DISC CLUTCH HUB**



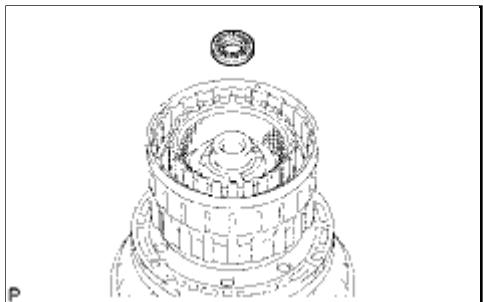
(a) Remove the multiple disc clutch hub from the clutch drum.

(b) Remove the 2 thrust bearing races from the multiple disc

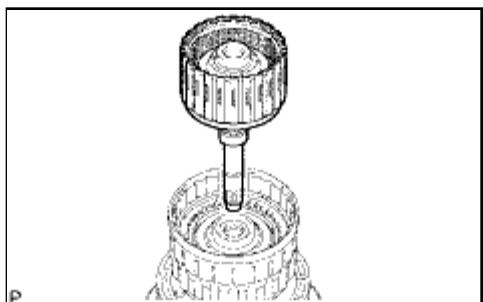


clutch hub.

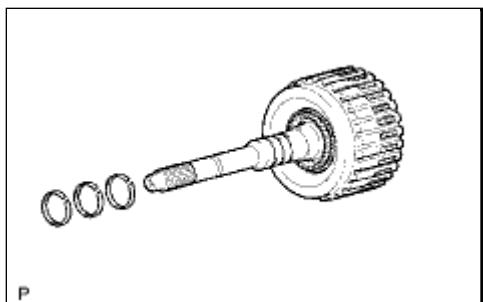
#### 41. REMOVE INPUT SHAFT ASSEMBLY



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



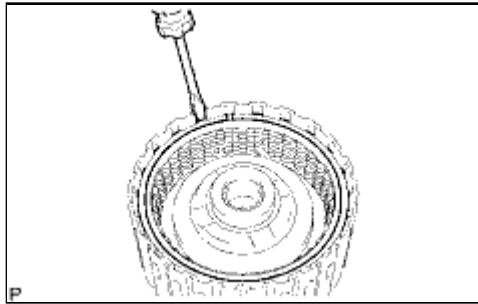
(b) Remove the input shaft assembly from the clutch drum.



#### 42. REMOVE INPUT SHAFT OIL SEAL RING

(a) Remove the 3 oil seal rings from the input shaft.

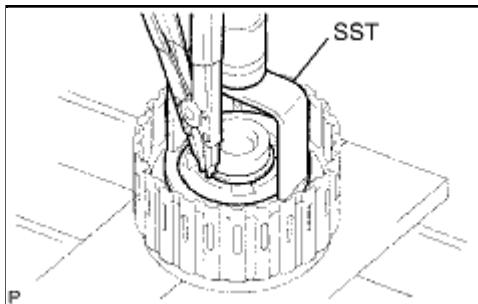
#### 43. REMOVE FORWARD MULTIPLE DISC CLUTCH DISC



- (a) Using a screwdriver, remove the hole snap ring.
- (b) Remove the 2 flanges, 6 discs and 5 plates from the input shaft.

#### 44. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC INFO

#### 45. REMOVE NO. 1 CLUTCH BALANCER



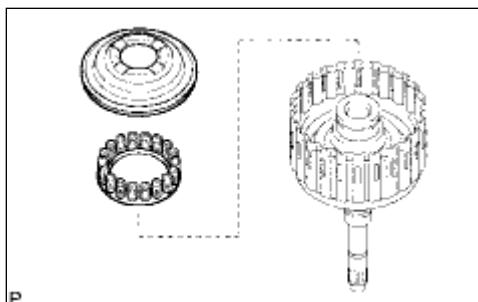
- (a) Place SST on the clutch balancer and compress the return spring with a press.

**SST: 09350-30020**

09350-07040

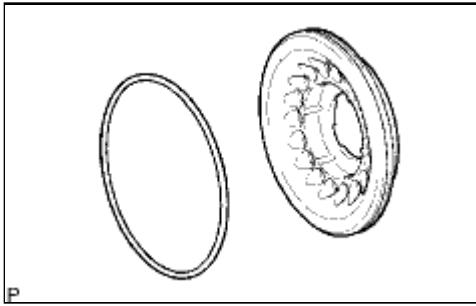
09350-07070

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



- (c) Remove the clutch balancer and forward clutch return spring from the input shaft assembly.

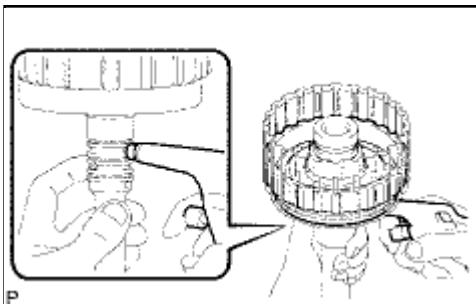
- (d) Remove the O-ring from the No. 1 clutch balancer.



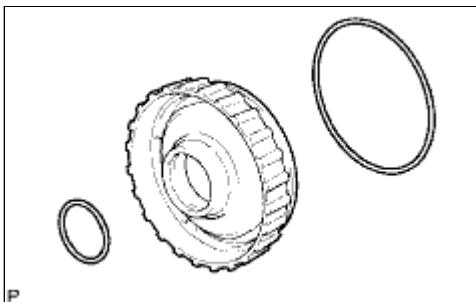
#### 46. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

INFO

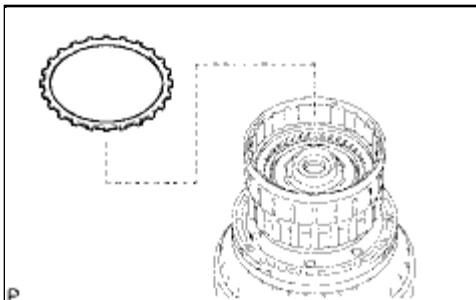
#### 47. REMOVE FORWARD CLUTCH PISTON



- (a) Hold the input shaft by hand and apply compressed air ( $392 \text{ kPa}$  ( $4.0 \text{ kgf/cm}^2$ ,  $57 \text{ psi}$ )) to the input shaft to remove the forward clutch piston.

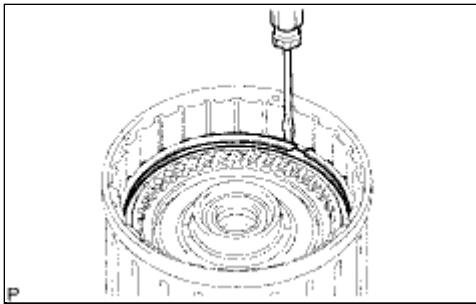


- (b) Remove the 2 O-rings from the forward clutch piston.



#### 48. REMOVE REVERSE CLUTCH FLANGE

- (a) Remove the reverse clutch flange from the clutch drum.

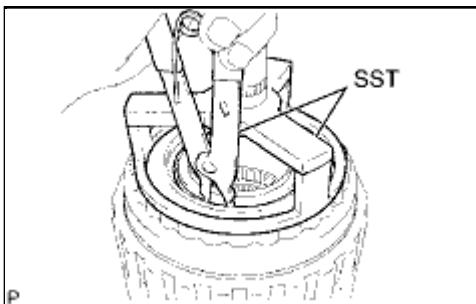


#### 49. REMOVE DIRECT CLUTCH DISC

- (a) Using a screwdriver, remove the 2 hole snap rings from the clutch drum.
- (b) Remove the reverse clutch flange, 5 discs and 5 plates from the clutch drum.

#### 50. INSPECT DIRECT CLUTCH DISC

INFO



#### 51. REMOVE NO. 3 CLUTCH BALANCER

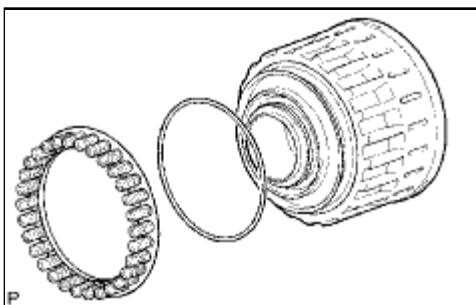
- (a) Place SST on the clutch balancer and compress the return spring with a press.

**SST: 09387-00070**

- (b) Using SST, remove the snap ring.

**SST: 09350-30020**

09350-07070



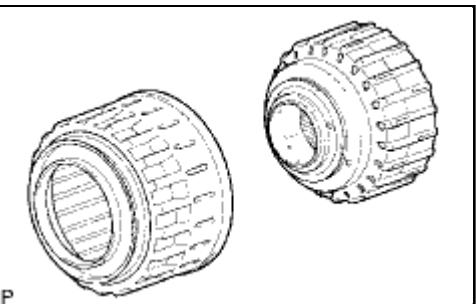
#### 52. REMOVE REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Remove the reverse clutch return spring and O-ring from the reverse clutch piston.

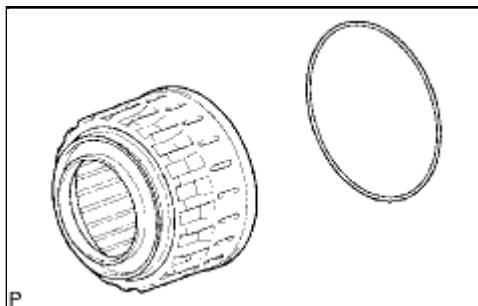
#### 53. INSPECT REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY

INFO

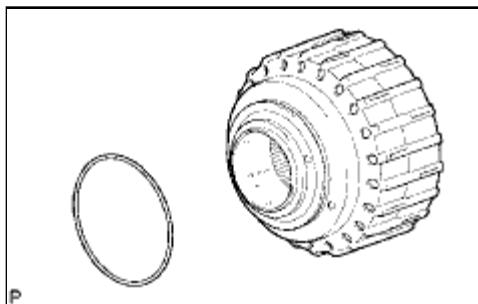
#### 54. REMOVE REVERSE CLUTCH PISTON SUB-ASSEMBLY



(a) Remove the reverse clutch piston sub-assembly from the clutch drum.

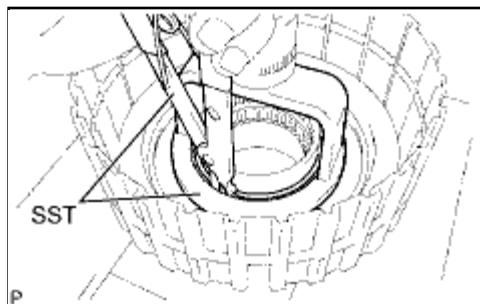


(b) Remove the O-ring from the reverse clutch piston.



(c) Remove the O-ring from the clutch drum.

## 55. REMOVE DIRECT CLUTCH PISTON SUB-ASSEMBLY



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

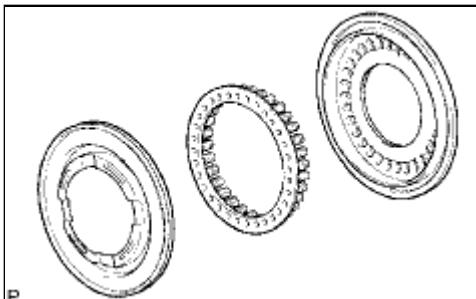
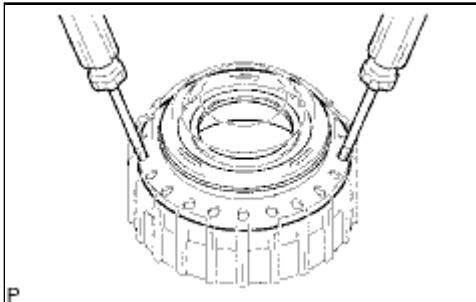
**SST: 09320-89010**

(b) Using SST, remove the snap ring.

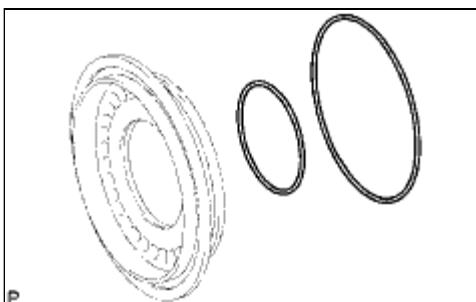
**SST: 09350-30020**

09350-07070

(c) Using 2 screwdrivers, remove the direct clutch piston sub-assembly from the clutch drum.



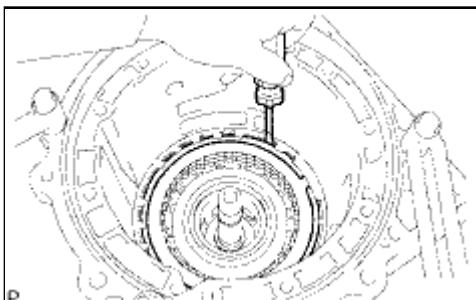
(d) Remove the No. 2 clutch balancer and direct clutch return spring from the direct clutch piston.



(e) Remove the 2 O-rings from the direct clutch piston.

## 56. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY

INFO



## 57. REMOVE NO. 3 BRAKE SNAP RING

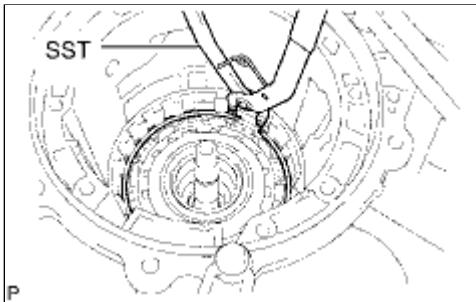
(a) Using a screwdriver, remove the No. 3 brake snap ring from the case.

## 58. REMOVE NO. 3 BRAKE DISC

(a) Remove the flange, 4 discs, 4 plates and cushion plate from the case.

## 59. INSPECT NO. 3 BRAKE DISC

INFO

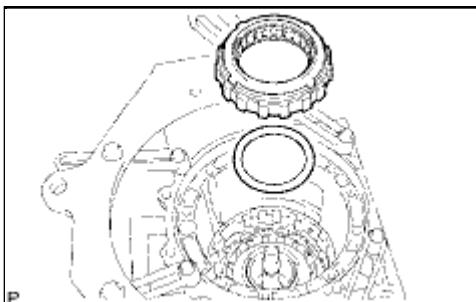


## 60. REMOVE 2ND BRAKE PISTON HOLE SNAP RING

- (a) Using SST, remove the snap ring.

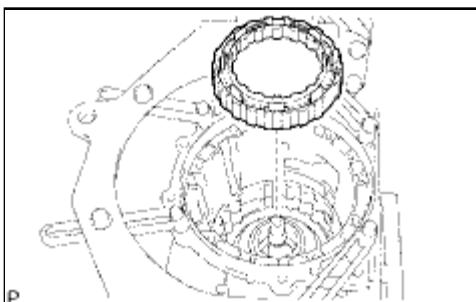
**SST: 09350-30020**

09350-07060



## 61. REMOVE 1-WAY CLUTCH ASSEMBLY

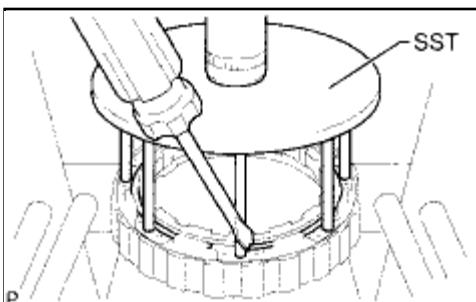
- (a) Remove the 1-way clutch assembly and No. 1 planetary carrier thrust washer from the case.



## 62. REMOVE 2ND BRAKE CYLINDER

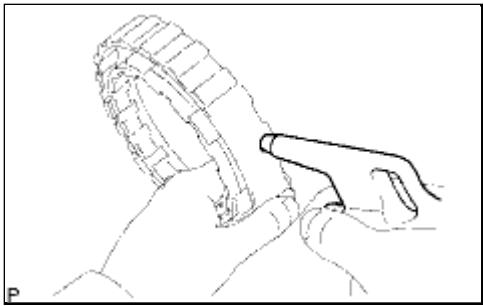
- (a) Remove the 2nd brake cylinder from the case.

## 63. REMOVE 2ND BRAKE PISTON

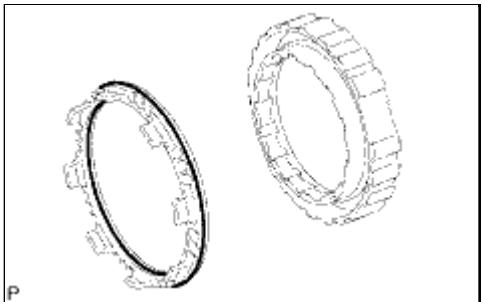


- (a) Using SST and a press, compress the return spring and remove the snap ring.

**SST: 09351-40010**



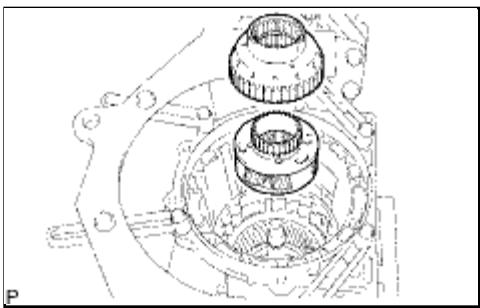
(b) Hold the 2nd brake cylinder and apply compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)) to the 2nd brake cylinder to remove the 2nd brake piston.



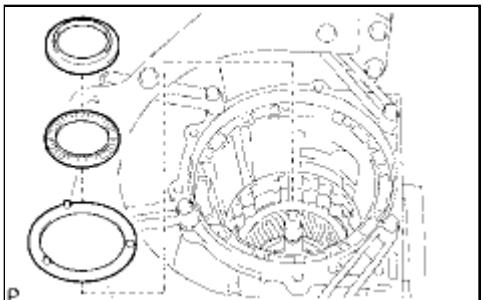
(c) Remove the 2 O-rings from the 2nd brake piston.

#### 64. INSPECT NO. 3 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY INFO

#### 65. REMOVE FRONT PLANETARY GEAR ASSEMBLY



(a) Remove the 1-way clutch inner race and front planetary gear assembly from the case.



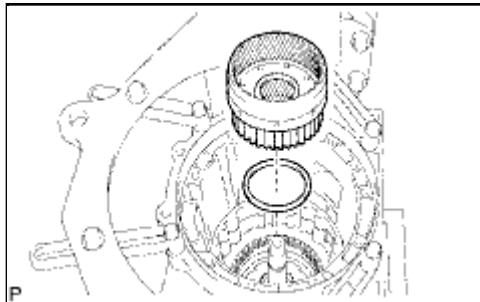
(b) Remove the thrust bearing race, thrust needle roller bearing and No. 2 planetary carrier thrust washer from the front planetary gear assembly.

## 66. INSPECT FRONT PLANETARY GEAR ASSEMBLY

INFO

## 67. INSPECT 1-WAY CLUTCH ASSEMBLY

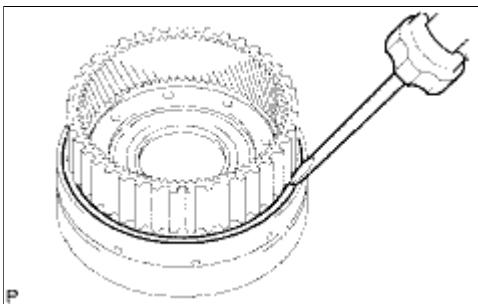
INFO



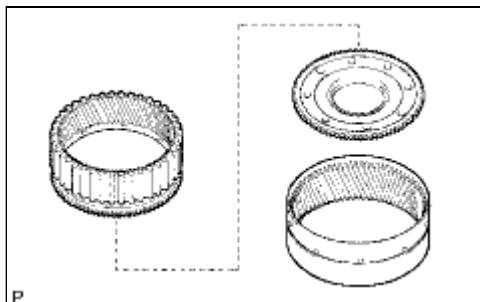
## 68. REMOVE FRONT PLANETARY RING GEAR

- Remove the front planetary ring gear and thrust needle roller bearing from the transmission case.

## 69. REMOVE CENTER PLANETARY RING GEAR



- Using a screwdriver, remove the snap ring.



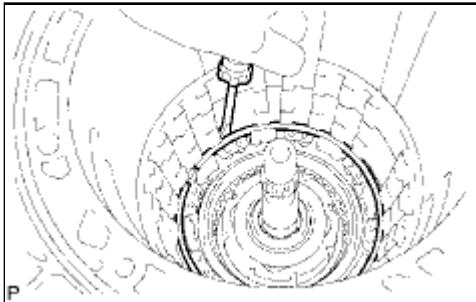
- Remove the center planetary ring gear and front planetary ring gear flange from the front planetary ring gear.

## 70. REMOVE NO. 1 BRAKE DISC

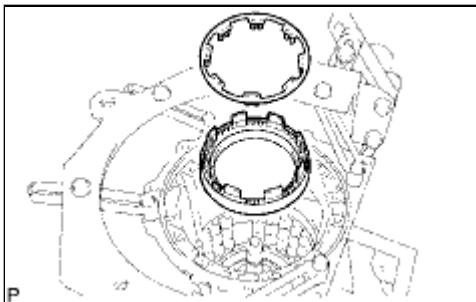
- Remove the flange, 3 discs and 3 plates from the case.

## 71. INSPECT NO. 1 BRAKE DISC

## 72. REMOVE BRAKE PISTON RETURN SPRING SNAP RING



- (a) Using a screwdriver, remove the brake piston return spring snap ring from the case.

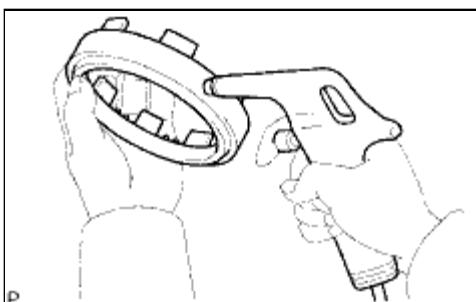


### 73. REMOVE BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Remove the brake piston return spring and No. 1 brake piston with No. 1 brake cylinder from the transmission case.

### 74. INSPECT BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

INFO



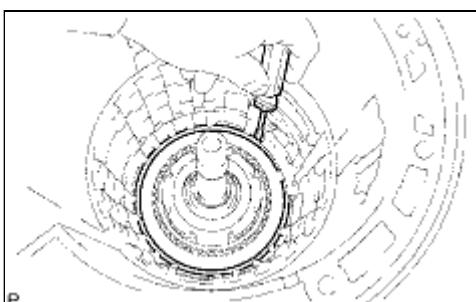
### 75. REMOVE NO. 1 BRAKE PISTON

- (a) Hold the No. 1 brake cylinder and apply compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)) to the No. 1 brake cylinder to remove the No. 1 brake piston.

#### HINT:

If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

- (b) Remove the 2 O-rings from the No. 1 brake piston.



### 76. REMOVE NO. 2 BRAKE DISC

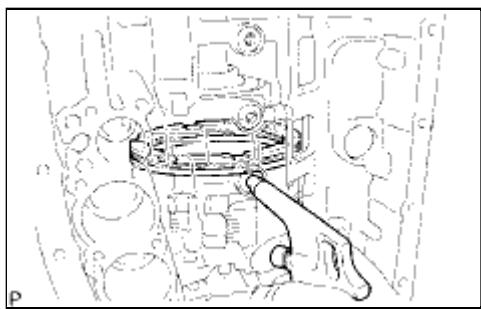
- (a) Using a screwdriver, remove the snap ring from the case.  
(b) Remove the flange, 3 discs, 3 plates and brake piston return spring from the case.

### 77. INSPECT NO. 2 BRAKE DISC

INFO

## 78. INSPECT NO. 2 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

INFO



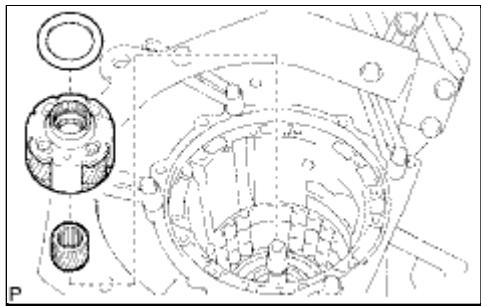
## 79. REMOVE NO. 2 BRAKE PISTON

- Apply compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)) to the transmission case to remove the No. 2 brake piston.

### HINT:

If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

- Remove the 2 O-rings from the No. 2 brake piston.



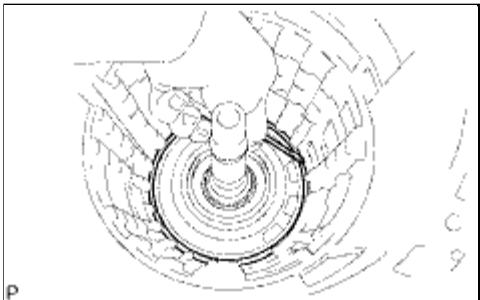
## 80. REMOVE CENTER PLANETARY GEAR ASSEMBLY

- Remove the thrust bearing race, center planetary gear and planetary sun gear from the case.

## 81. INSPECT CENTER PLANETARY GEAR ASSEMBLY

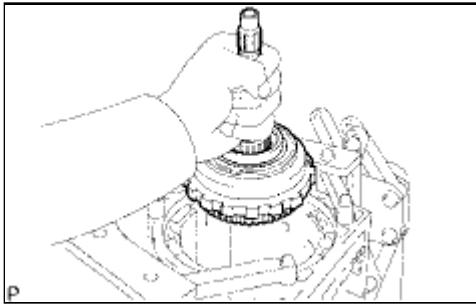
INFO

## 82. REMOVE INTERMEDIATE SHAFT



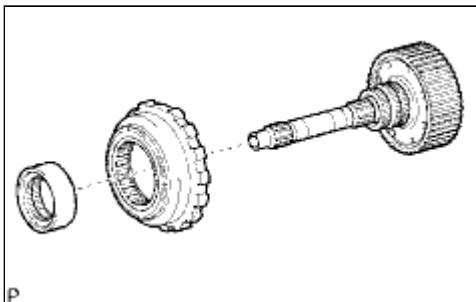
- Using a screwdriver, remove the snap ring from the case.

- Remove the intermediate shaft with No. 3 1-way clutch assembly from the case.



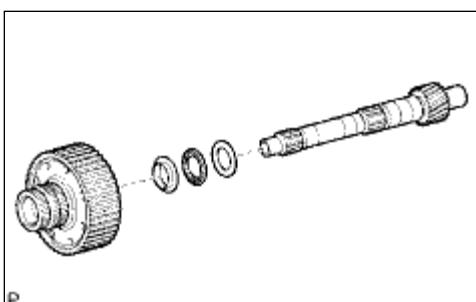
### 83. INSPECT NO. 3 1-WAY CLUTCH ASSEMBLY

INFO



### 84. REMOVE NO. 3 1-WAY CLUTCH ASSEMBLY

- (a) Remove the No. 3 1-way clutch assembly and 1-way clutch inner race from the intermediate shaft.



### 85. REMOVE REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY

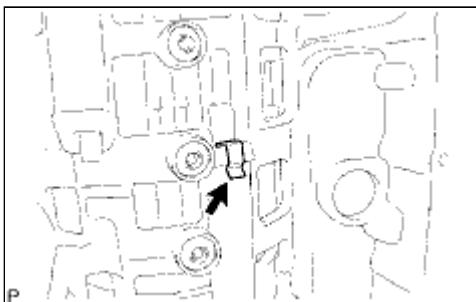
- (a) Remove the planetary ring gear flange, 2 thrust bearing races and thrust needle roller bearing from the intermediate shaft.

### 86. INSPECT REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY

INFO

### 87. INSPECT INTERMEDIATE SHAFT

INFO



### 88. REMOVE BRAKE PLATE STOPPER SPRING

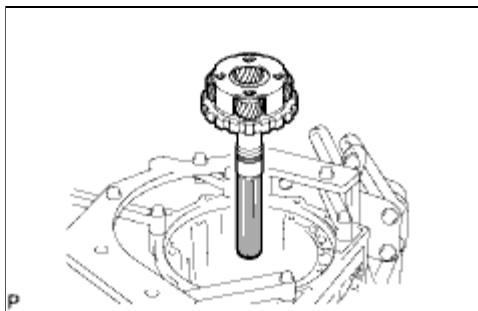
## **89. REMOVE NO. 4 BRAKE DISC**

(a) Remove the 7 plates, 8 discs and 2 flanges from the case.

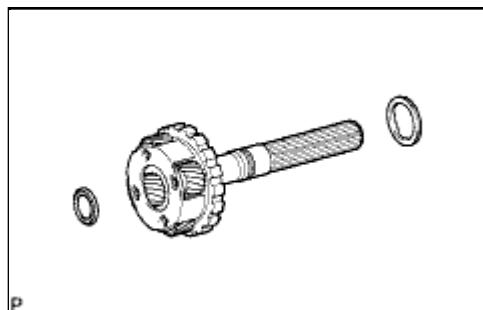
## **90. INSPECT NO. 4 BRAKE DISC**

**INFO**

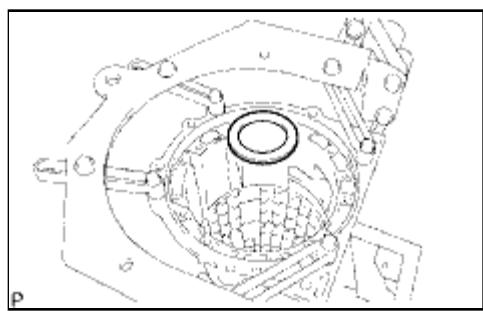
## **91. REMOVE REAR PLANETARY GEAR ASSEMBLY**



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



(b) Remove the 2 thrust needle roller bearings from the rear planetary gear.



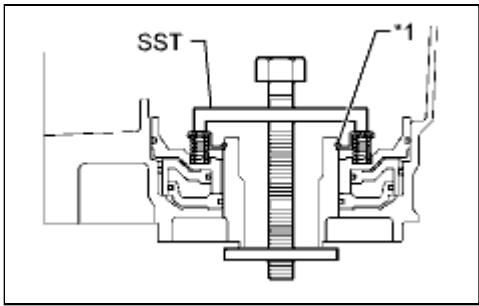
(c) Remove the thrust bearing race from the case.

## **92. INSPECT REAR PLANETARY GEAR ASSEMBLY**

**INFO**

## **93. REMOVE 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY**

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



**SST: 09350-30020**

09350-07050

## Text in Illustration

\*1

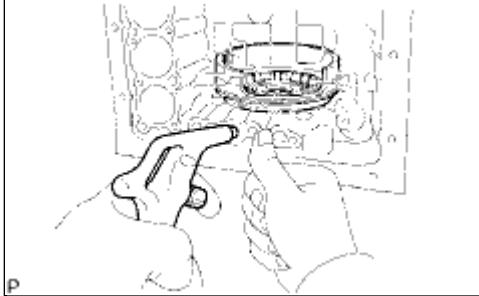
Snap Ring

- (b) Using SST, remove the snap ring and brake return spring.

**SST: 09350-30020**

09350-07070

## 94. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY INFO



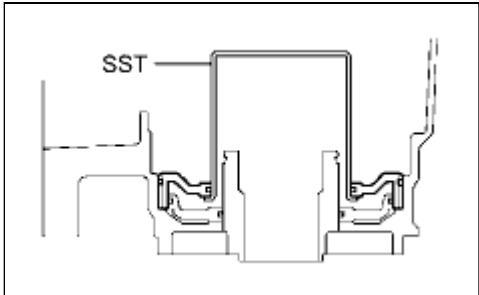
## 95. REMOVE 1ST AND REVERSE BRAKE PISTON

- (a) Apply compressed air (392 kPa (4.0 kgf/cm<sup>2</sup>, 57 psi)) to the transmission case to remove the 1st and reverse brake piston.

### HINT:

If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

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



## 96. REMOVE BRAKE REACTION SLEEVE

- (a) Using SST, remove the reaction sleeve.

**SST: 09350-30020**

09350-07080

- (b) Remove the 2 O-rings from the reaction sleeve.

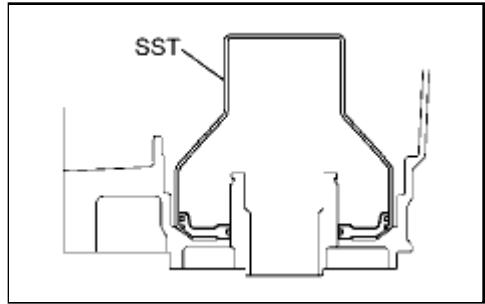
## 97. REMOVE NO. 4 BRAKE PISTON

- (a) Using SST, remove the brake piston.

**SST: 09350-30020**

09350-07090

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



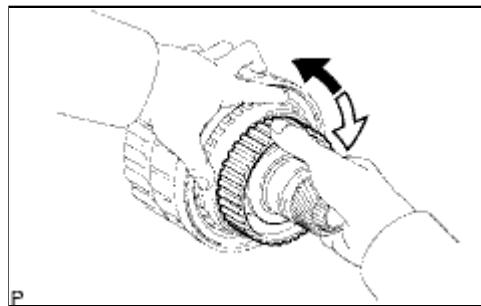
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013EX02SX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: INSPECTION (2010 4Runner)		

## INSPECTION

### 1. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

- (a) Remove the magnets and use them to collect steel particles.
- (b) Carefully look at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.
  - Steel (magnetic): bearing, gear and clutch plate wear
  - Brass (non-magnetic): bush wear

### 2. INSPECT NO. 2 1-WAY CLUTCH ASSEMBLY



- (a) Hold the reverse clutch hub and turn the 1-way clutch assembly.
- (b) Check that the 1-way clutch turns freely when turned clockwise and locks when turned counterclockwise.

#### Text in Illustration

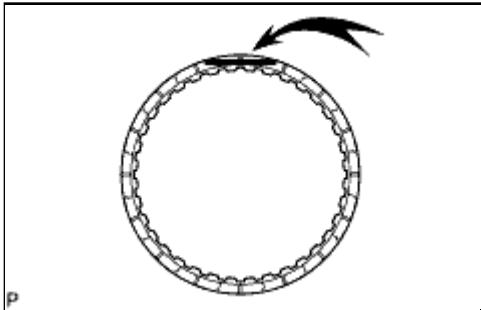
	Lock
	Free

### 3. INSPECT REAR CLUTCH DISC

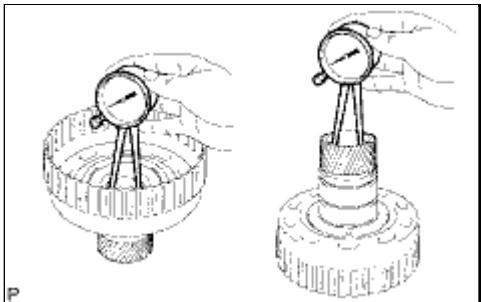
- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

#### NOTICE:

When assembling new discs, soak them in ATF for at least 15



**minutes before assembly.**



#### **4. INSPECT REVERSE CLUTCH HUB SUB-ASSEMBLY**

- (a) Using a dial indicator, measure the inside diameter of the reverse clutch hub bush.

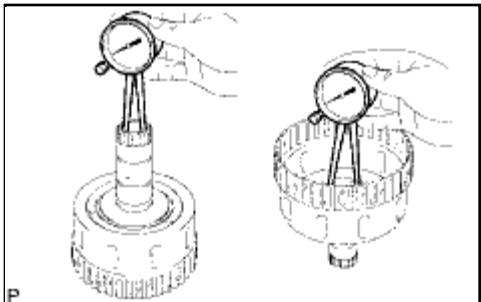
Standard inside diameter:

35.812 to 35.837 mm (1.410 to 1.411 in.)

Maximum inside diameter:

35.887 mm (1.413 in.)

If the inside diameter is more than the maximum, replace the reverse clutch hub.



#### **5. INSPECT FORWARD CLUTCH HUB SUB-ASSEMBLY**

- (a) Using a dial indicator, measure the inside diameter of the forward clutch hub bush.

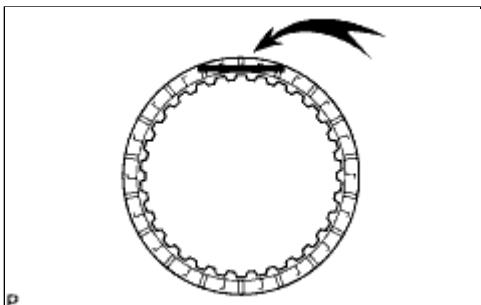
Standard inside diameter:

26.037 to 26.062 mm (1.025 to 1.026 in.)

Maximum inside diameter:

26.112 mm (1.028 in.)

If the inside diameter is more than the maximum, replace the forward clutch hub.

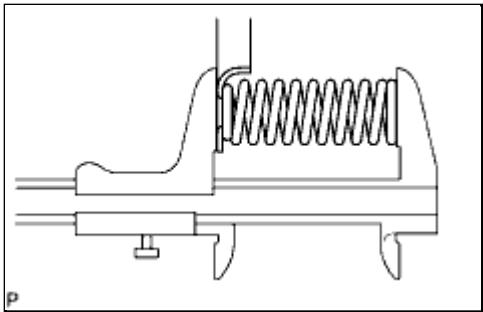


#### **6. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC**

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

##### **NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

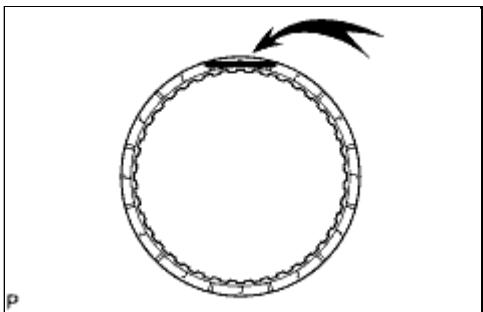


## 7. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

26.74 mm (1.05 in.)

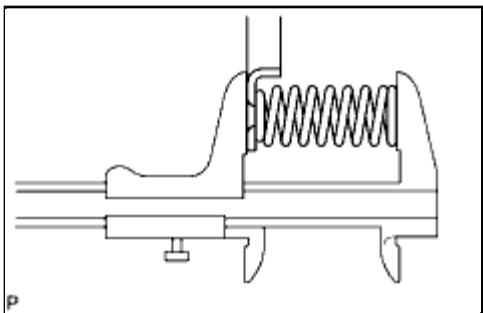


## 8. INSPECT DIRECT CLUTCH DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

### NOTICE:

When assembling new discs, soak them in ATF for at least 15 minutes before assembly.

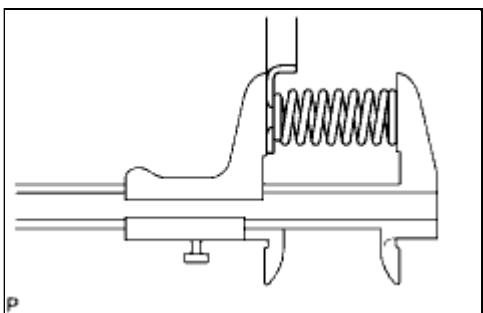


## 9. INSPECT REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

21.04 mm (0.828 in.)



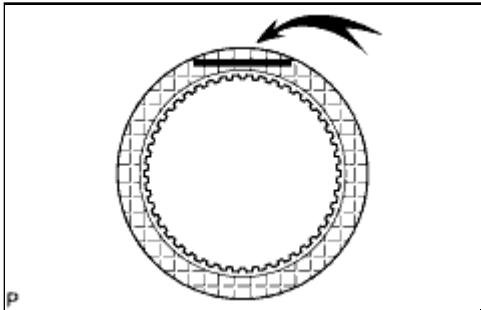
## 10. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

19.51 mm (0.768 in.)

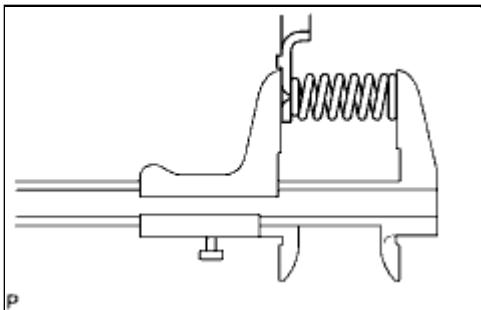
## 11. INSPECT NO. 3 BRAKE DISC



- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**



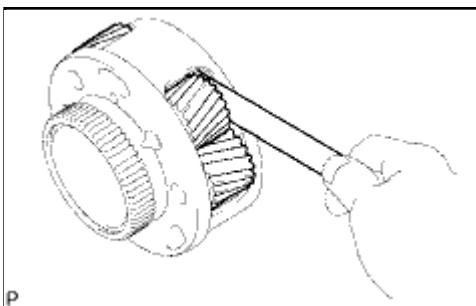
**12. INSPECT NO. 3 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY**

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

15.72 mm (0.619 in.)

**13. INSPECT FRONT PLANETARY GEAR ASSEMBLY**



- (a) Using a feeler gauge, measure the front planetary pinion gear thrust clearance.

Standard clearance:

0.2 to 0.6 mm (0.00787 to 0.0236 in.)

Maximum clearance:

0.65 mm (0.0256 in.)

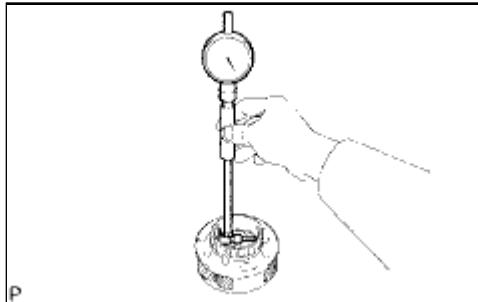
- If the clearance is more than the maximum, replace the front planetary gear assembly.

- (b) Using a cylinder gauge, measure the inside diameter of the front planetary gear bush.

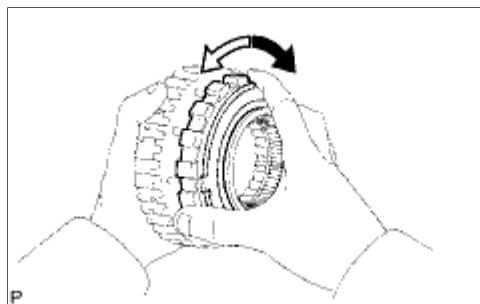
Maximum inside diameter:

57.48 mm (2.26 in.)

If the inside diameter is more than the maximum, replace the front planetary gear.



#### 14. INSPECT 1-WAY CLUTCH ASSEMBLY



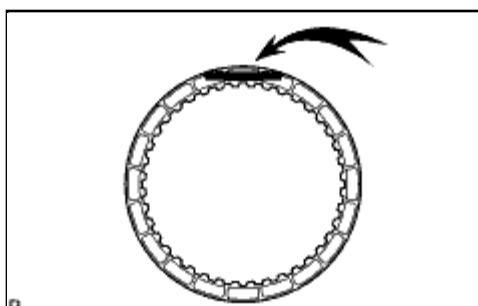
(a) Install the 1-way clutch to the 1-way clutch inner race.

##### Text in Illustration

	Lock
	Free

(b) Hold the 1-way clutch inner race and turn the 1-way clutch assembly. Check that the 1-way clutch turns freely when turned counterclockwise and locks when turned clockwise.

(c) Remove the 1-way clutch from the 1-way clutch inner race.

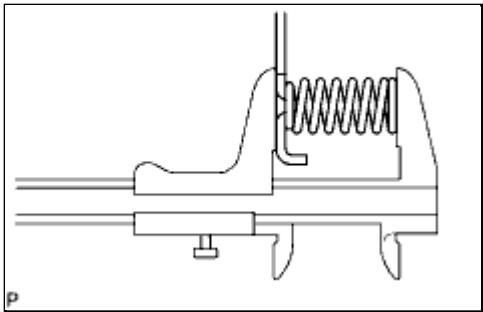


#### 15. INSPECT NO. 1 BRAKE DISC

(a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

##### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

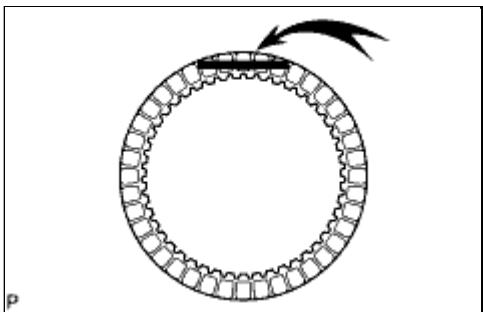


## 16. INSPECT BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

17.05 mm (0.671 in.)

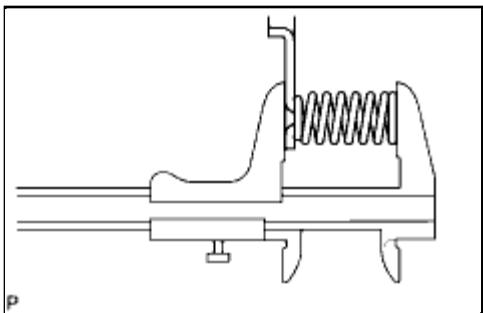


## 17. INSPECT NO. 2 BRAKE DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

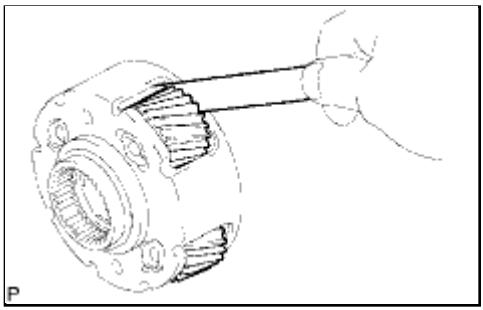


## 18. INSPECT NO. 2 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

17.45 mm (0.687 in.)



## 19. INSPECT CENTER PLANETARY GEAR ASSEMBLY

- (a) Using a feeler gauge, measure the center planetary pinion gear thrust clearance.

Standard clearance:

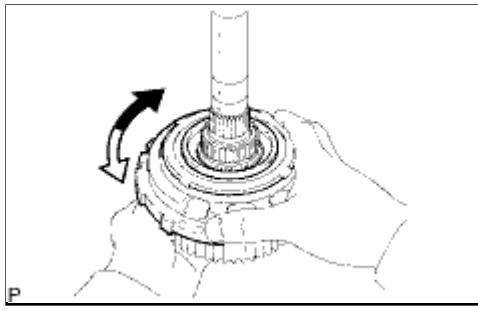
0.12 to 0.68 mm (0.00472 to 0.0268 in.)

Maximum clearance:

0.73 mm (0.0287 in.)

If the clearance is more than the maximum, replace the center planetary gear assembly.

## 20. INSPECT NO. 3 1-WAY CLUTCH ASSEMBLY

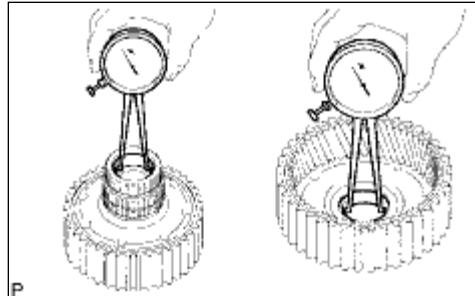


- (a) Hold the rear planetary ring gear flange and turn the 1-way clutch. Check that the 1-way clutch turns freely when turned counterclockwise and locks when turned clockwise.

**Text in Illustration**

	Lock
	Free

**21. INSPECT REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY**



- (a) Using a dial indicator, measure the inside diameter of the rear planetary ring gear bush.

Standard inside diameter:

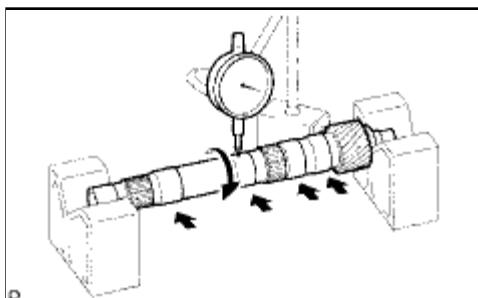
32.176 to 32.201 (1.267 to 1.268 in.)

Maximum inside diameter:

32.251 mm (1.270 in.)

If the inside diameter is more than the maximum, replace the rear planetary ring gear.

**22. INSPECT INTERMEDIATE SHAFT**



- (a) Using a dial indicator, measure the intermediate shaft runout.

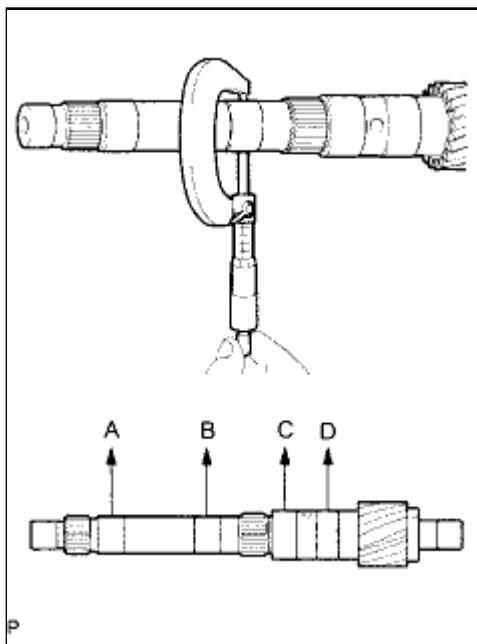
Standard runout:

0.03 mm (0.00118 in.)

Maximum runout:

0.08 mm (0.00315 in.)

If the runout is more than the maximum, replace the intermediate shaft with a new one.



(b) Using a micrometer, measure the diameter of the intermediate shaft at the positions shown in the diagram.

Standard diameter:

**A, B**

25.962 to 25.975 mm (1.022 to 1.023 in.)

**C, D**

32.062 to 32.075 mm (1.262 to 1.263 in.)

Minimum diameter:

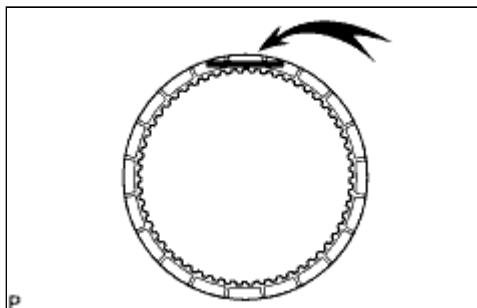
**A, B**

25.912 mm (1.02 in.)

**C, D**

32.012 mm (1.26 in.)

If the diameter is less than the minimum, replace the intermediate shaft with a new one.



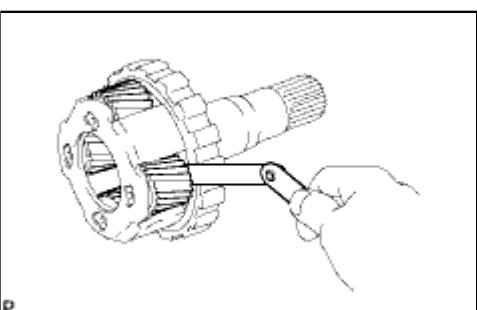
### 23. INSPECT NO. 4 BRAKE DISC

(a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

### 24. INSPECT REAR PLANETARY GEAR ASSEMBLY



(a) Using a feeler gauge, measure the rear planetary pinion gear thrust clearance.

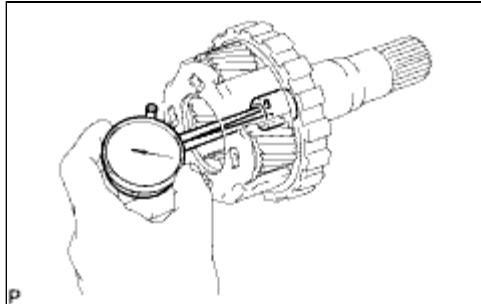
Standard clearance:

0.2 to 0.6 mm (0.00787 to 0.0236 in.)

Maximum clearance:

0.65 mm (0.0256 in.)

- If the clearance is more than the maximum, replace the planetary gear assembly.

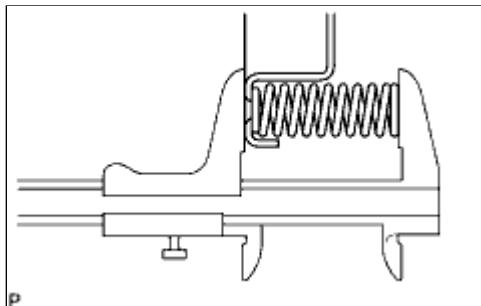


(b) Using a dial indicator, measure the inside diameter of the rear planetary gear bush.

Maximum inside diameter:

20.075 mm (0.790 in.)

If the inside diameter is more than the maximum, replace the rear planetary gear assembly.

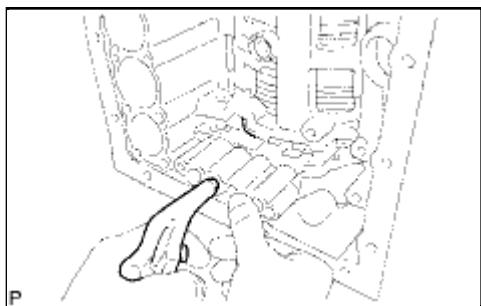


## 25. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

23.74 mm (0.935 in.)

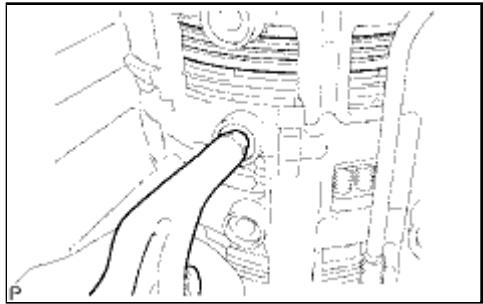


## 26. INSPECT 1ST AND REVERSE BRAKE

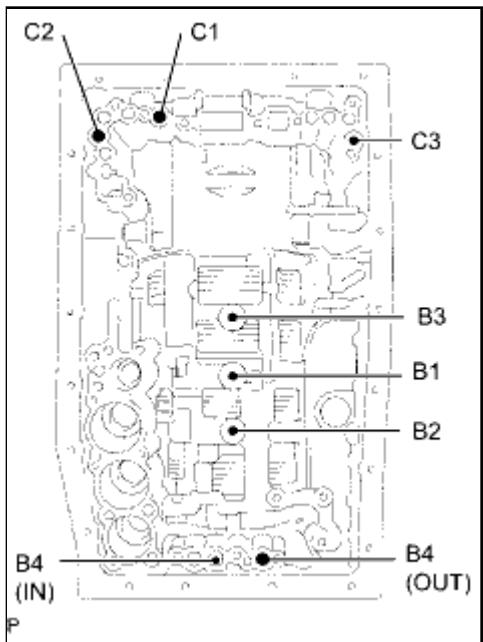
(a) Make sure the 1st and reverse brake piston moves smoothly when applying compressed air into and releasing compressed air from the transmission case.

## 27. INSPECT NO. 1 BRAKE

(a) Make sure the No. 1 brake piston moves smoothly when applying compressed air into and releasing compressed air from the transmission case.



## 28. INSPECT INDIVIDUAL PISTON OPERATION



(a) Check the operating sound while applying compressed air into the oil holes indicated in the illustration.

### **HINT:**

**When inspecting the O/D direct clutch, check with the C3 accumulator piston hole closed.**

**If there is no sound, disassemble and check the installation condition of the parts.**

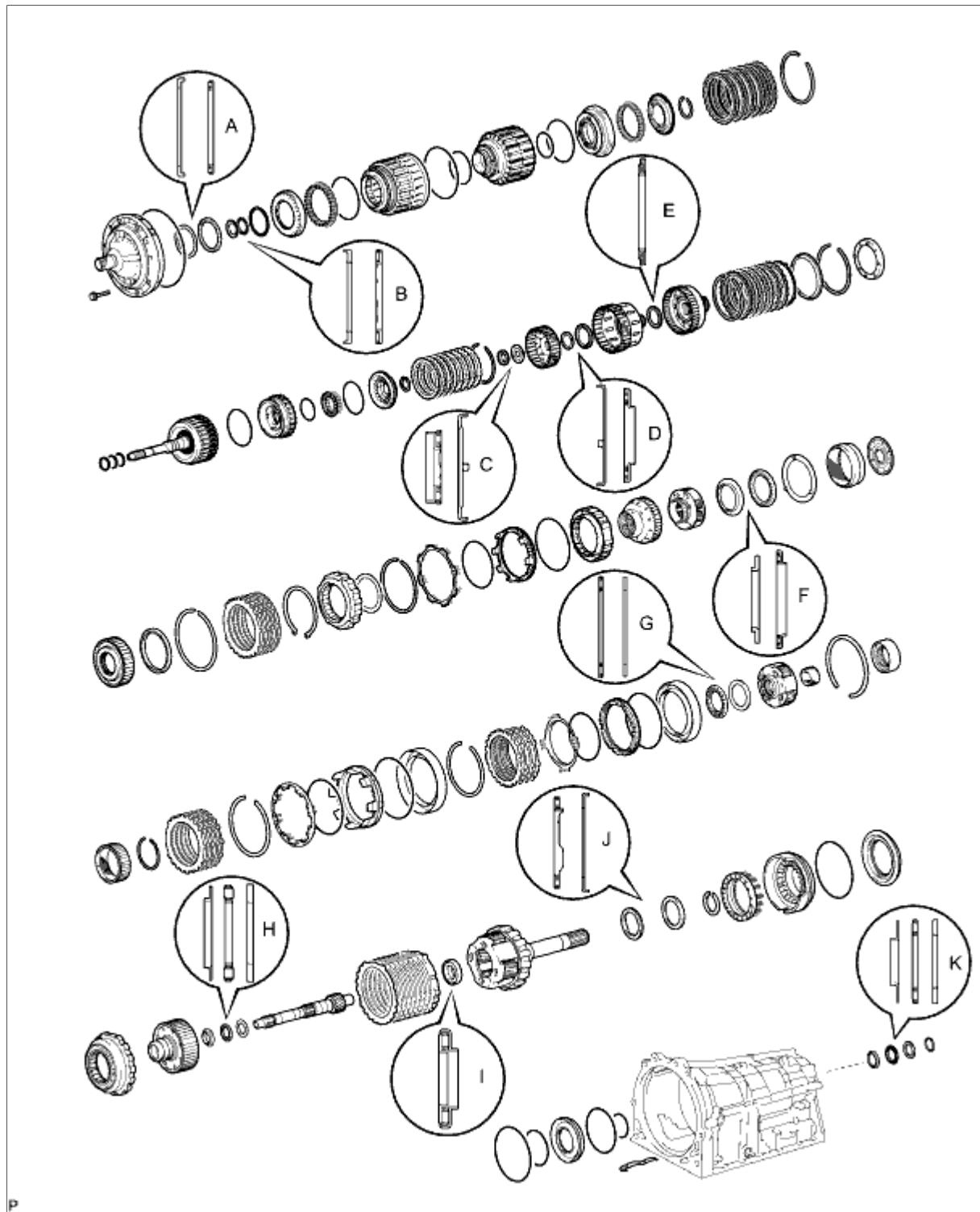
1. No. 2 clutch (C2)
2. No. 3 clutch (C3)
3. No. 1 clutch (C1)
4. No. 3 brake (B3)
5. No. 1 brake (B1)
6. No. 2 brake (B2)
7. No. 4 brake (B4)



<b>Last Modified:</b> 5-10-2010	6.4 A	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013F002RX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. BEARING POSITION**



**Bearing and Race Diameter:**

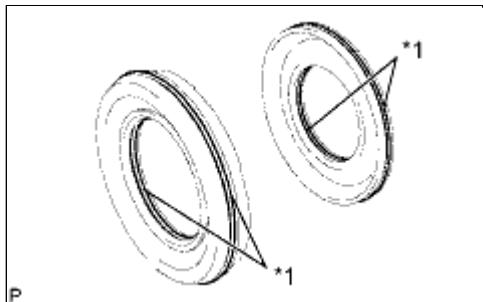
MARK	FRONT RACE DIAMETER INSIDE/OUTSIDE	THRUST BEARING DIAMETER INSIDE/OUTSIDE	REAR RACE DIAMETER INSIDE/OUTSIDE
A	74.3 to 74.6 mm (2.93 to 2.94 in.)/87.4 to 87.7 mm (3.44 to 3.45 in.)	72.0 to 72.3 mm (2.83 to 2.85 in.)/85.3 to 85.6 mm (3.36 to 3.37 in.)	-

MARK	FRONT RACE DIAMETER INSIDE/OUTSIDE	THRUST BEARING DIAMETER INSIDE/OUTSIDE	REAR RACE DIAMETER INSIDE/OUTSIDE
B	37.0 to 37.3 mm (1.46 to 1.47 in.)/52.1 to 52.3 mm (2.05 to 2.06 in.)	34.7 to 34.9 mm (1.366 to 1.374 in.)/51.6 to 51.9 mm (2.03 to 2.04 in.)	-
C	-	21.4 to 21.6 mm (0.841 to 0.850 in.)/40.8 to 41.0 mm (1.606 to 1.614 in.)	22.7 to 22.9 mm (0.892 to 0.902 in.)/60.0 to 60.4 mm (2.36 to 2.38 in.)
D	33.3 to 33.5 mm (1.31 to 1.32 in.)/56.3 to 56.6 mm (2.22 to 2.23 in.)	38.5 to 38.7 mm (1.515 to 1.524 in.)/56.5 to 57.0 mm (2.22 to 2.24 in.)	-
E	-	42.6 to 42.8 mm (1.68 to 1.69 in.)/60.8 to 61.1 mm (2.39 to 2.41 in.)	-
F	38.0 to 38.2 mm (1.496 to 1.504 in.)/56.5 to 57.0 mm (2.22 to 2.24 in.)	43.4 to 43.6 mm (1.71 to 1.72 in.)/58.0 to 58.4 mm (2.28 to 2.30 in.)	-
G	-	55.8 to 56.0 mm (2.197 to 2.204 in.)/76.1 to 76.4 mm (2.996 to 3.008 in.)	53.8 to 54.0 mm (2.12 to 2.13 in.)/73.7 to 74.0 mm (2.90 to 2.91 in.)
H	33.4 to 33.6 mm (1.31 to 1.32 in.)/48.7 to 49.0 mm (1.92 to 1.93 in.)	32.2 to 32.3 mm (1.268 to 1.272 in.)/49.0 to 49.2 mm (1.93 to 1.94 in.)	32.2 to 32.4 mm (1.27 to 1.28 in.)/48.7 to 49.0 mm (1.92 to 1.93 in.)
I	-	21.5 to 21.8 mm (0.846 to 0.858 in.)/40.5 to 40.8 mm (1.59 to 1.61 in.)	-
J	-	43.6 to 43.9 mm (1.72 to 1.73 in.)/60.6 to 60.9 mm (2.39 to 2.40 in.)	47.2 to 47.4 mm (1.86 to 1.87 in.)/66.9 to 67.1 mm (2.63 to 2.64 in.)
K	36.9 to 37.2 mm (1.45 to 1.46 in.)/49.4 to 50.0 mm (1.94 to 1.97 in.)	36.15 to 36.31 mm (1.42 to 1.43 in.)/52.06 to 52.36 mm (2.05 to 2.06 in.)	36.15 to 36.4 mm (1.42 to 1.43 in.)/50.5 to 51.0 mm (1.99 to 2.01 in.)

## 2. ASSEMBLE NO. 4 BRAKE PISTON AND BRAKE REACTION SLEEVE

- (a) Coat 2 new O-rings with ATF and install them to the brake reaction sleeve.
- (b) Coat 2 new O-rings with ATF and install them to the No. 4 brake piston.

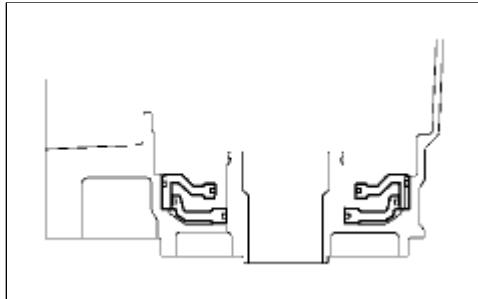
**Text in Illustration**



\*1

New O-Ring

(c) Install the No. 4 brake piston to the reaction sleeve.

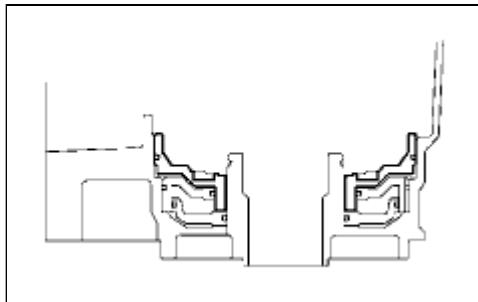


### 3. INSTALL NO. 4 BRAKE PISTON WITH BRAKE REACTION SLEEVE

(a) Install the No. 4 brake piston with brake reaction sleeve to the transmission case.

**NOTICE:**

- Do not damage the O-rings.
- Make sure the No. 4 brake piston is underneath the brake reaction sleeve.



### 4. INSTALL 1ST AND REVERSE BRAKE PISTON

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

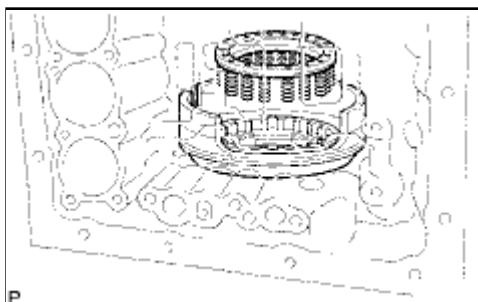
(b) Install the O-ring to the 1st and reverse brake piston.

(c) With the spring seat of the piston facing upwards (the front side), install the piston to the transmission case.

**NOTICE:**

Be careful not to damage the O-ring.

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

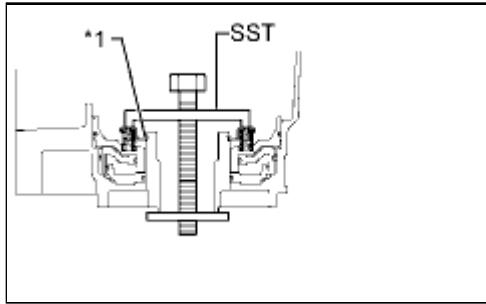


(a) Install the brake return spring to the 1st and reverse brake piston.

(b) Place SST on the spring retainer and compress the return spring.

**SST: 09350-30020**

09350-07050



(c) Using SST, install the snap ring.

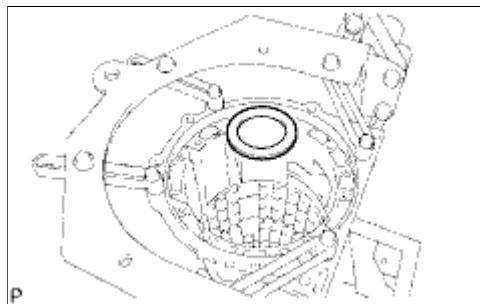
**SST: 09350-30020**

09350-07070

**Text in Illustration**

*1	Snap Ring
----	-----------

## 6. INSTALL REAR PLANETARY GEAR ASSEMBLY



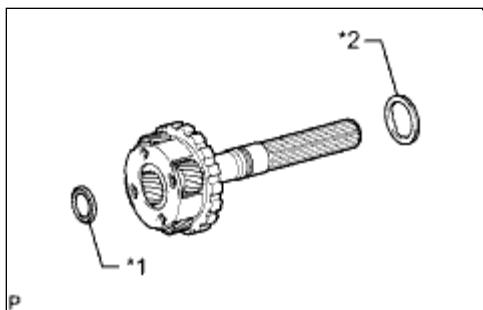
(a) Install the No. 9 thrust bearing race.

Thrust Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Race J	47.2 to 47.4 mm (1.86 to 1.87 in.)	66.9 to 67.1 mm (2.63 to 2.64 in.)

(b) Coat the 2 thrust needle roller bearings with petroleum jelly and install them to the rear planetary gear.

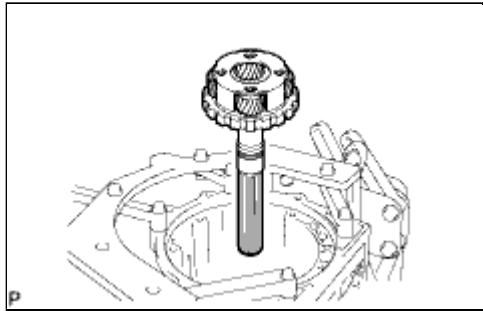
Thrust Needle Roller Bearing Diameter:



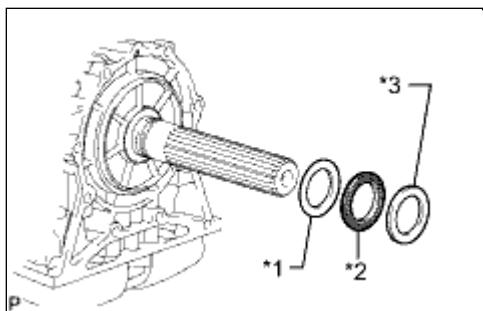
ITEM	INSIDE	OUTSIDE
Bearing J	43.6 to 43.9 mm (1.72 to 1.73 in.)	60.6 to 60.9 mm (2.39 to 2.40 in.)
Bearing I	21.5 to 21.8 mm (0.846 to 0.858 in.)	40.5 to 40.8 mm (1.59 to 1.61 in.)

## **Text in Illustration**

* 1	Bearing I
* 2	Bearing J



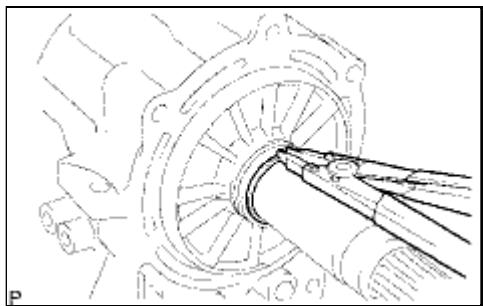
(c) Install the rear planetary gear assembly.



(d) Install the rear planetary flange thrust bearing race, thrust needle roller bearing and thrust bearing selective race.

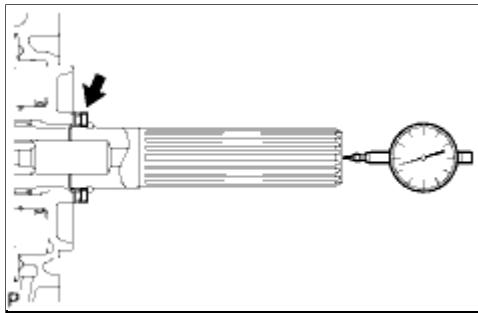
## **Text in Illustration**

* 1	Race K
* 2	Bearing K
* 2	Selective Race



(e) Using a snap ring expander, install the snap ring.

(f) Using a dial indicator, measure the rear planetary gear end play.



Standard end play:

0.02 to 0.12 mm (0.000787 to 0.00472 in.)

If the end play is not as specified, replace the thrust bearing race shown in the illustration with one of a different thickness so that the measured value is within the standard range.

**HINT:**

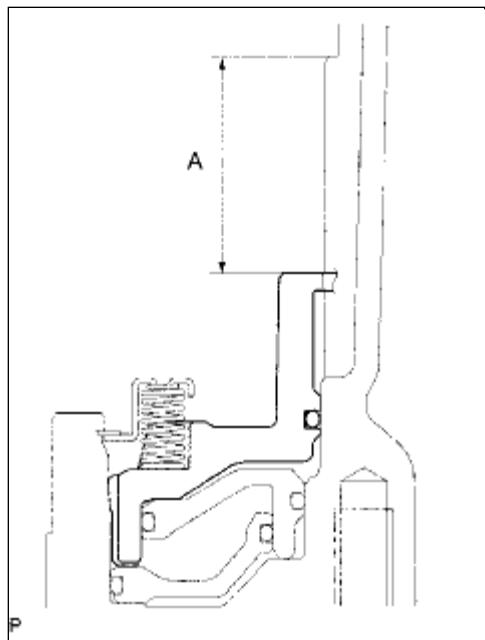
**Use the table below to select a thrust bearing race of an appropriate thickness.**

Bearing Race Thickness:

MARK	THICKNESS
	3.775 to 3.825 mm (0.149 to 0.151 in.)
	3.825 to 3.875 mm (0.151 to 0.153 in.)
	3.875 to 3.925 mm (0.153 to 0.155 in.)
	3.925 to 3.975 mm (0.155 to 0.156 in.)
	3.975 to 4.025 mm (0.156 to 0.158 in.)
	4.025 to 4.075 mm (0.158 to 0.160 in.)
	4.075 to 4.125 mm (0.160 to 0.162 in.)

MARK	THICKNESS
	4.125 to 4.175 mm (0.162 to 0.164 in.)
	4.175 to 4.225 mm (0.164 to 0.166 in.)
	4.225 to 4.275 mm (0.166 to 0.168 in.)
	4.275 to 4.325 mm (0.168 to 0.170 in.)
	4.325 to 4.375 mm (0.170 to 0.172 in.)

## 7. SELECT 1ST AND REVERSE BRAKE FLANGE



(a) Using a vernier caliper, measure distance A (from the top surface of the 1st and reverse brake piston to the step in the transmission case) in the illustration.

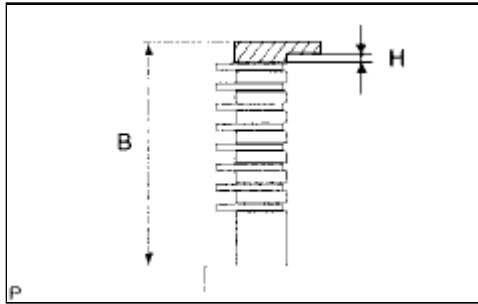
**NOTICE:**

**Make sure the 1st and reverse brake piston is installed securely to the transmission case.**

**HINT:**

**Distance A = 36.35 to 37.09 mm (1.43 to 1.46 in.)**

(b) Assemble the 2 flanges, 8 discs and 7 plates, and using a vernier caliper, measure distance B in the illustration at both ends across the diameter, and calculate the average.



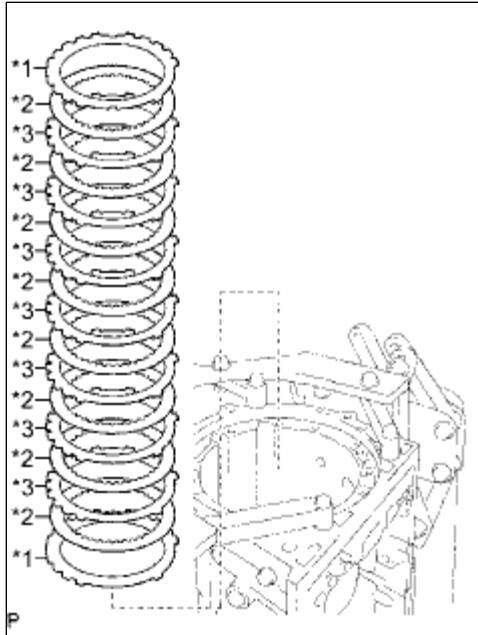
**HINT:**

**Distance B = 36.04 to 37.14 mm (1.42 to 1.46 in.)**

- (c) Select a 1st and reverse brake flange so that the value of measured distance A minus distance B is 2.85 to 3.15 mm (0.112 to 0.124 in.).

Flange H Thickness:

NO.	THICKNESS
0	0 mm (0 in.)
2	0.15 to 0.25 mm (0.00590 to 0.00984 in.)
4	0.35 to 0.45 mm (0.0138 to 0.0177 in.)
6	0.55 to 0.65 mm (0.0217 to 0.0256 in.)
8	0.75 to 0.85 mm (0.0295 to 0.0335 in.)
10	0.95 to 1.05 mm (0.0374 to 0.0413 in.)
12	1.15 to 1.25 mm (0.0453 to 0.0492 in.)
14	1.35 to 1.45 mm (0.0531 to 0.0571 in.)



## 8. INSTALL NO. 4 BRAKE DISC

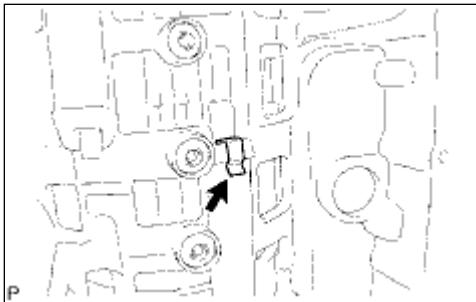
- (a) Install the 2 flanges, 8 discs and 7 plates.

Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*1

### Text in Illustration

*1	Flange
*2	Disc
*2	Plate

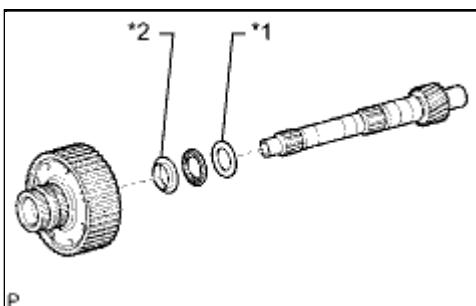


## 9. INSTALL BRAKE PLATE STOPPER SPRING

## 10. INSTALL REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY

- (a) Install the thrust bearing race, thrust needle roller bearing, thrust bearing race and planetary ring gear flange to the intermediate shaft.

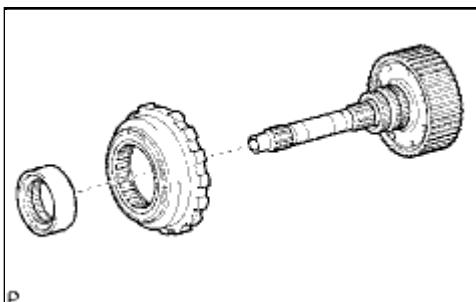
Thrust Needle Roller Bearing and Race Diameter:



ITEM	INSIDE	OUTSIDE
Race H Rear	32.2 to 32.4 mm (1.27 to 1.28 in.)	48.7 to 49.0 mm (1.92 to 1.93 in.)
Bearing H	32.2 to 32.3 mm (1.268 to 1.272 in.)	49.0 to 49.2 mm (1.93 to 1.94 in.)
Race H Front	33.4 to 33.6 mm (1.31 to 1.32 in.)	48.7 to 49.0 mm (1.92 to 1.93 in.)

## Text in Illustration

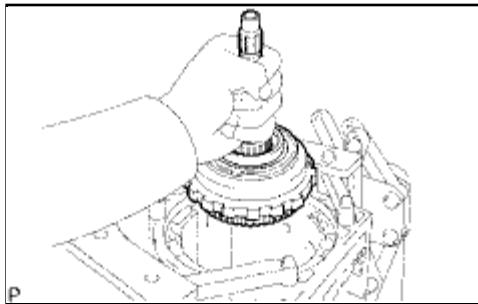
*1	Race H Rear
*2	Race H Front



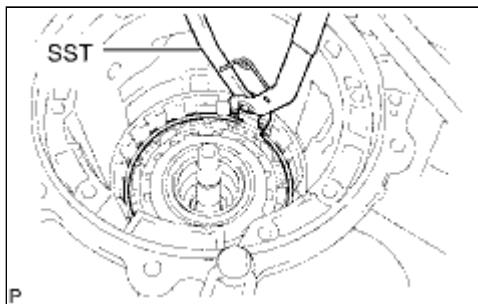
## 11. INSTALL NO. 3 1-WAY CLUTCH ASSEMBLY

- (a) Install the 1-way clutch and 1-way clutch inner race to the intermediate shaft.

## 12. INSTALL INTERMEDIATE SHAFT



(a) Install the intermediate shaft with No. 3 1-way clutch assembly to the case.

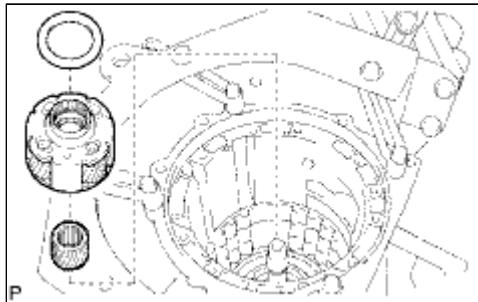


(b) Using SST, install the snap ring.

**SST: 09350-30020**

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## 13. INSTALL CENTER PLANETARY GEAR ASSEMBLY



(a) Install the planetary sun gear and center planetary gear to the case.

(b) Coat the thrust bearing race with petroleum jelly and install it to the center planetary gear.

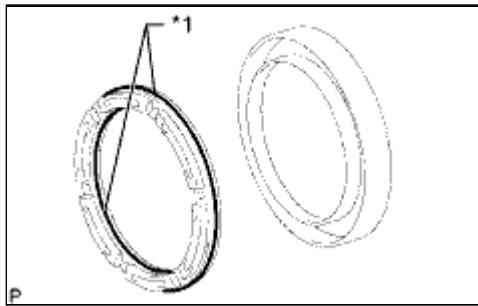
Thrust Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Race G	53.8 to 54.0 mm (2.12 to 2.13 in.)	73.7 to 74.0 mm (2.90 to 2.91 in.)

## 14. INSTALL NO. 2 BRAKE PISTON

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

**Text in Illustration**



*1	New O-Ring
----	------------

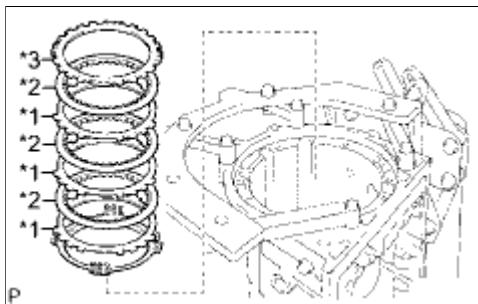
(b) Press the brake piston into the brake cylinder with both hands.

**NOTICE:**

**Be careful not to damage the O-rings.**

(c) Install the No. 2 brake piston to the case.

## 15. INSTALL NO. 2 BRAKE DISC



(a) Install the brake piston return spring.

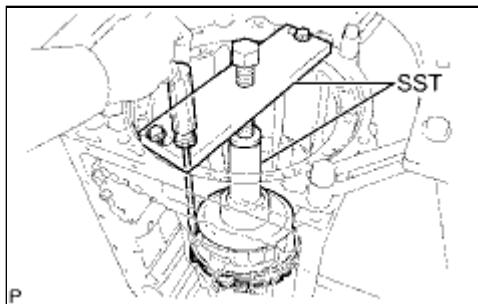
(b) Install the 3 plates, 3 discs and flange.

Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

### Text in Illustration

*1	Disc
*2	Plate
*2	Flange

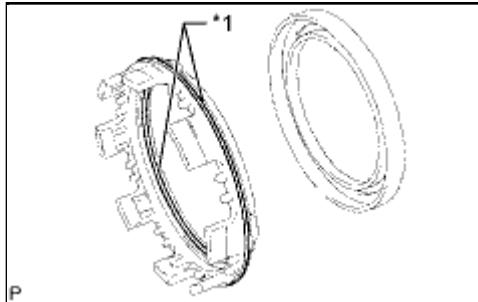


(c) Using SST and a press, compress the return spring and install the No. 2 brake spring snap ring.

**SST: 09351-40010**

## 16. INSTALL NO. 1 BRAKE PISTON

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



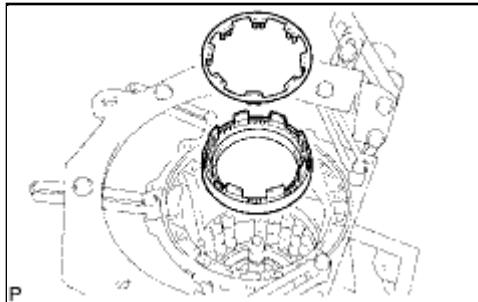
### Text in Illustration

*1	New O-Ring
----	------------

- (b) Press the brake piston into the brake cylinder with both hands.

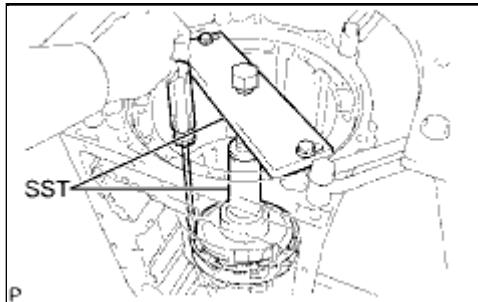
**NOTICE:**

**Be careful not to damage the O-rings.**



## 17. INSTALL BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Install the No. 1 brake piston with No. 1 brake cylinder and the brake piston return spring to the transmission case.



## 18. INSTALL BRAKE PISTON RETURN SPRING SNAP RING

- (a) Using SST and a press, compress the return spring and install the brake piston return spring snap ring.

**SST: 09351-40010**

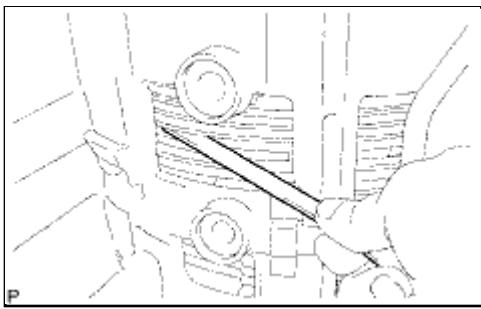
## 19. SELECT NO. 1 BRAKE FLANGE

- (a) Using a feeler gauge, measure the distance between the snap ring and flange.

**HINT:**

**0.42 to 0.72 mm (0.0165 to 0.0283 in.)**

If the distance is outside the specification, parts may have



been assembled incorrectly. Perform the reassembly again. If the distance is still outside the specification, select No. 1 brake flange so that the value of measured distance is 0.42 to 0.72 mm (0.0165 to 0.0283 in.).

Flange Thickness:

MARK	THICKNESS
0	1.95 to 2.05 mm (0.0768 to 0.0807 in.)
1	2.15 to 2.25 mm (0.0846 to 0.0886 in.)
2	2.35 to 2.45 mm (0.0925 to 0.0965 in.)
3	2.55 to 2.65 mm (0.100 to 0.104 in.)

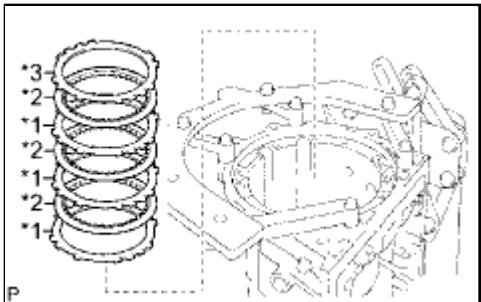
## 20. INSTALL NO. 1 BRAKE DISC

(a) Install the 3 plates, 3 discs and flange.

Install in order:

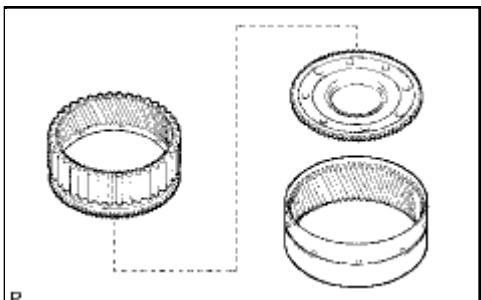
\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

### Text in Illustration



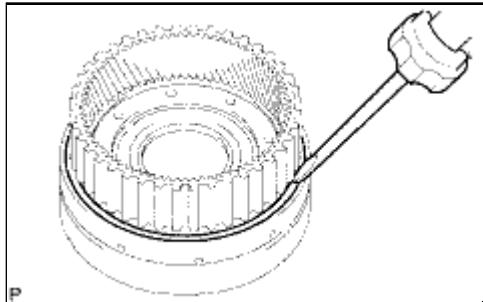
*1	Plate
*2	Disc
*3	Flange

## 21. INSTALL CENTER PLANETARY RING GEAR

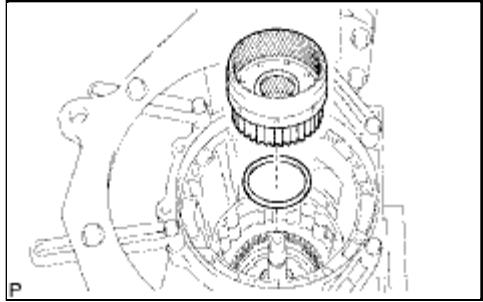


(a) Install the center planetary ring gear and front planetary ring gear flange to the front planetary ring gear.

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



## 22. INSTALL FRONT PLANETARY RING GEAR

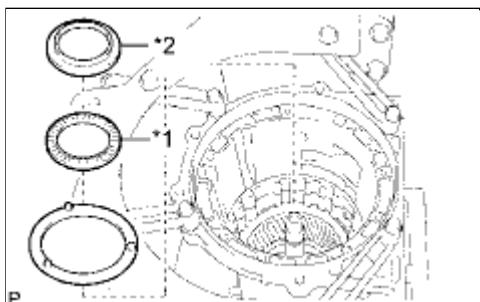


- (a) Install the thrust needle roller bearing and front planetary ring gear to the case.

Thrust Needle Roller Bearing Diameter:

ITEM	INSIDE	OUTSIDE
Bearing G	55.8 to 56.0 mm (2.197 to 2.204 in.)	76.1 to 76.4 mm (2.996 to 3.008 in.)

## 23. INSTALL FRONT PLANETARY GEAR ASSEMBLY



- (a) Install the thrust washer and thrust needle roller bearing.

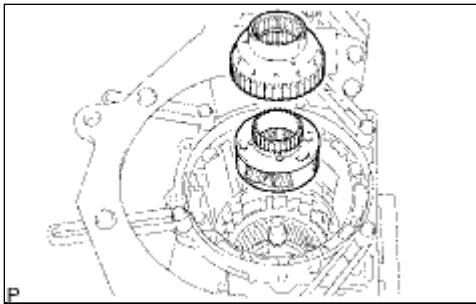
- (b) Coat the No. 5 thrust race with petroleum jelly and install it to the front planetary ring gear.

Thrust Needle Roller Bearing and Race Diameter:

ITEM	INSIDE	OUTSIDE
Bearing F	43.4 to 43.6 mm (1.71 to 1.72 in.)	58.0 to 58.4 mm (2.28 to 2.30 in.)
Race F	38.0 to 38.2 mm (1.496 to 1.504 in.)	56.5 to 57.0 mm (2.22 to 2.24 in.)

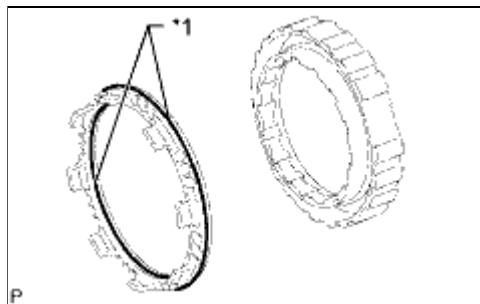
### Text in Illustration

*1	Bearing F
*2	Race F



(c) Install the front planetary gear assembly and 1-way clutch inner race to the case.

## 24. INSTALL 2ND BRAKE PISTON



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

### Text in Illustration

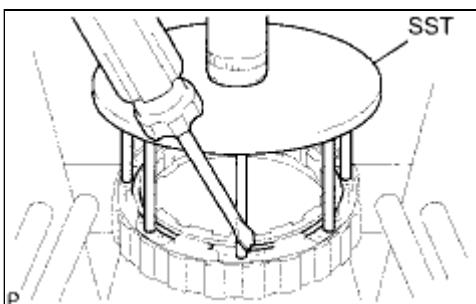
*1	New O-Ring
----	------------

(b) Press the 2nd brake cylinder into the 2nd brake piston with both hands.

**NOTICE:**

Be careful not to damage the O-rings.

(c) Install the return spring to the 2nd brake cylinder.



(d) Using SST and a press, compress the return spring and install the snap ring.

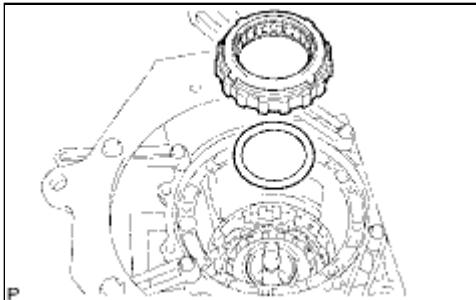
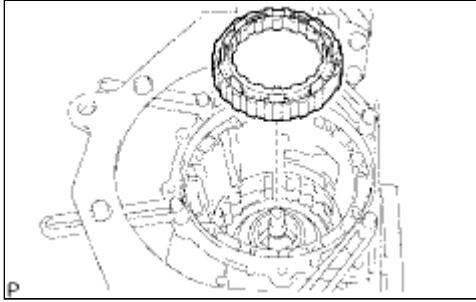
**SST: 09351-40010**

**NOTICE:**

Make sure the end gap of the snap ring is not aligned with the spring retainer claw.

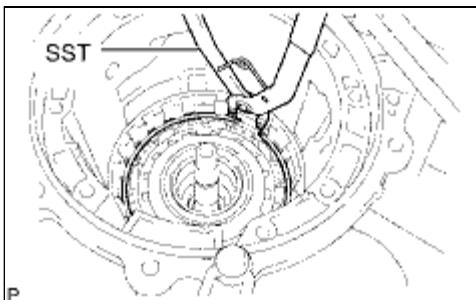
## 25. INSTALL 2ND BRAKE CYLINDER

(a) Install the 2nd brake cylinder to the case.



## 26. INSTALL 1-WAY CLUTCH ASSEMBLY

- (a) Install the thrust washer and 1-way clutch to the case.



## 27. INSTALL 2ND BRAKE PISTON HOLE SNAP RING

- (a) Using SST, install the snap ring.

**SST: 09350-30020**

09350-07060

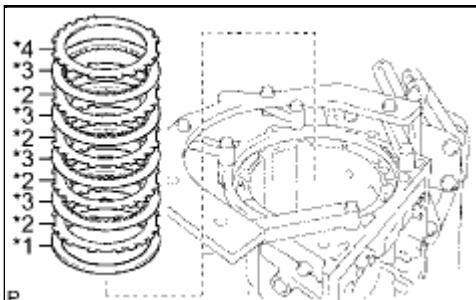
## 28. INSTALL NO. 3 BRAKE DISC

- (a) Install the cushion plate, 4 plates, 4 discs and flange to the case.

Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*4

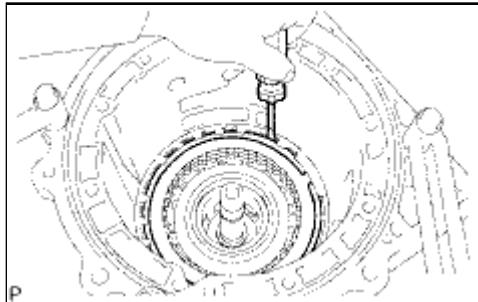
### Text in Illustration



*1	Cushion Plate
*2	Plate
*3	Disc

\*4

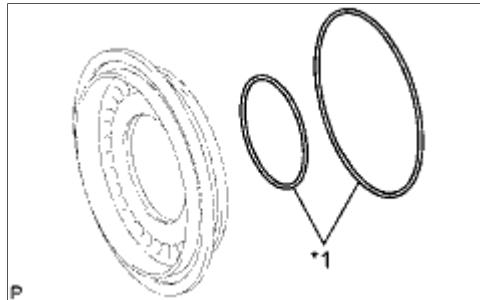
Flange



## 29. INSTALL NO. 3 BRAKE SNAP RING

- Using a screwdriver, install the snap ring.

## 30. INSTALL DIRECT CLUTCH PISTON SUB-ASSEMBLY

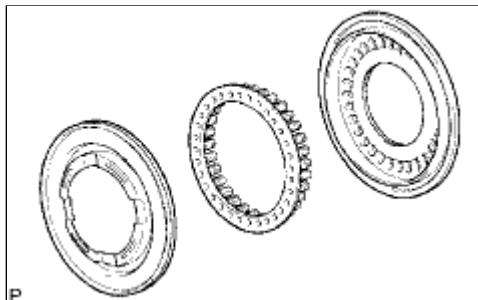


- Coat 2 new O-rings with ATF and install them to the direct clutch piston.

### Text in Illustration

\*1

New O-Ring

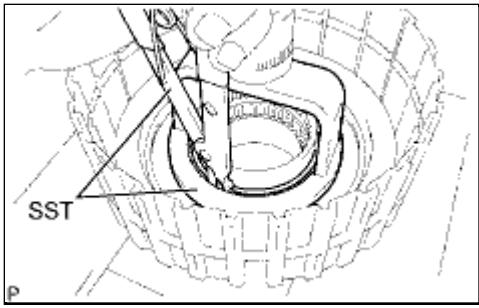


- Install the direct clutch return spring and No. 2 clutch balancer to the direct clutch piston.

- Press the direct clutch piston into the clutch drum with both hands.

### NOTICE:

Be careful not to damage the O-rings.



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

**NOTICE:**

Stop pressing when the spring sheet is lowered to a position 1 to 2 mm (0.039 to 0.078 in.) from the snap ring groove to prevent the spring sheet from being deformed.

**SST: 09320-89010**

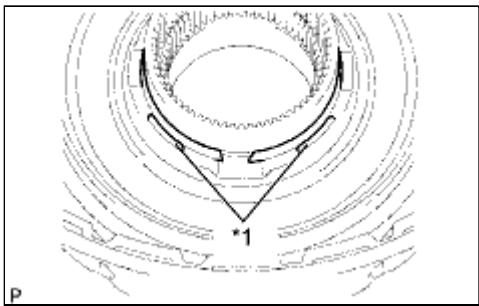
**SST: 09350-30020**

09350-07070

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

**NOTICE:**

Do not expand the snap ring excessively.



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

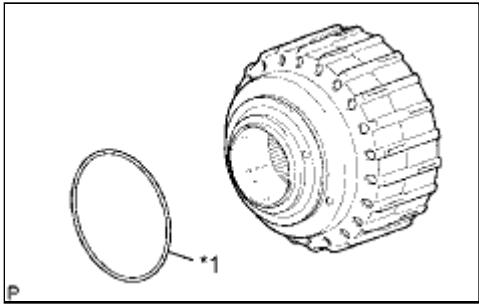
**Text in Illustration**

*1	Stopper
----	---------

**NOTICE:**

Make sure the end gap of the snap ring is not aligned with the spring retainer claw.

**31. INSTALL REVERSE CLUTCH PISTON SUB-ASSEMBLY**



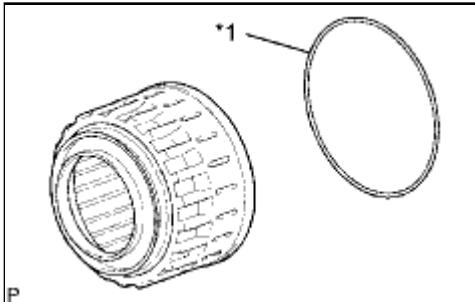
(a) Coat a new O-ring with ATF and install it to the clutch drum.

**Text in Illustration**

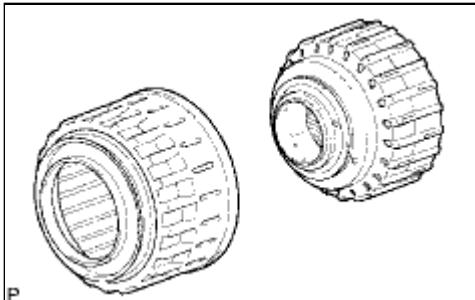
*1	New O-Ring
----	------------

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

**Text in Illustration**



\*1 New O-Ring

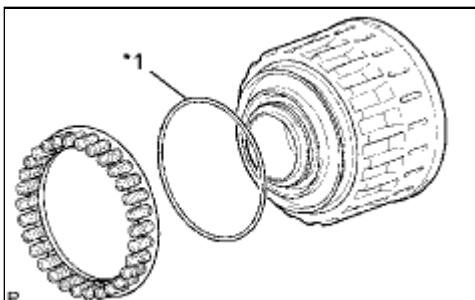


(c) Press the clutch drum into the reverse clutch piston with both hands.

**NOTICE:**

Be careful not to damage the O-ring.

### 32. INSTALL REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY



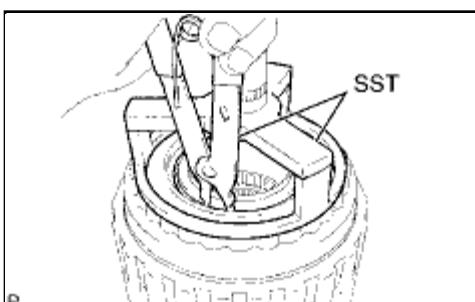
(a) Coat a new O-ring with ATF and install it to the reverse clutch piston.

#### Text in Illustration

\*1 New O-Ring

(b) Install the reverse clutch return spring to the reverse clutch piston.

### 33. INSTALL NO. 3 CLUTCH BALANCER



(a) Place SST on the No. 3 clutch balancer and compress the clutch balancer with a press.

**SST: 09387-00070**

**SST: 09350-30020**

09350-07070

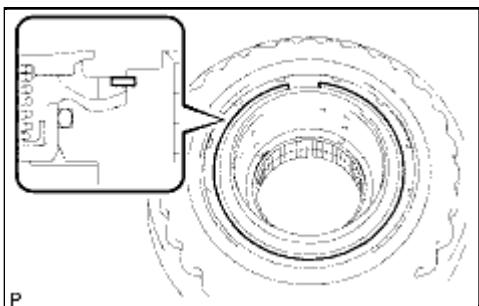
**NOTICE:**

Stop pressing when the spring sheet is lowered to a position 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring sheet from being deformed.

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

**NOTICE:**

**Do not expand the snap ring excessively.**

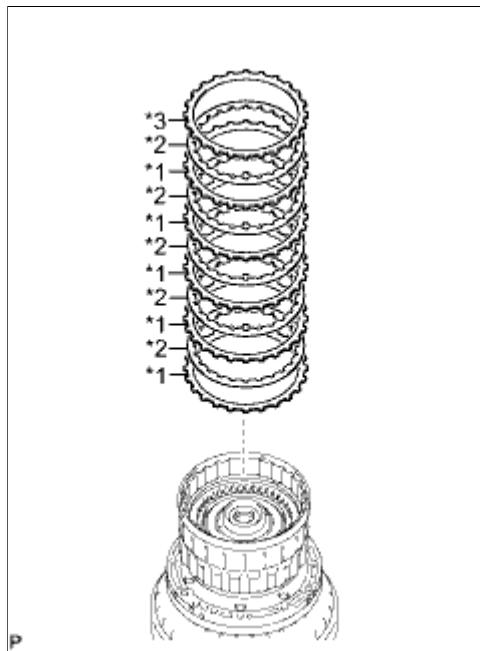


(c) Position the end gap of the snap ring as shown in the illustration.

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the spring retainer claw.**

### 34. INSTALL DIRECT CLUTCH DISC



(a) Install the 5 plates, 5 discs and reverse clutch flange to the clutch drum.

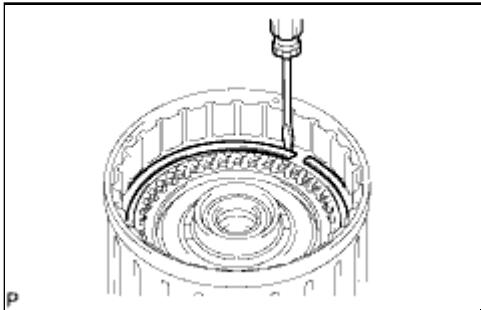
Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

**Text in Illustration**

*1	Plate
*2	Disc
*3	Flange

(b) Using a screwdriver, install the snap ring to the clutch

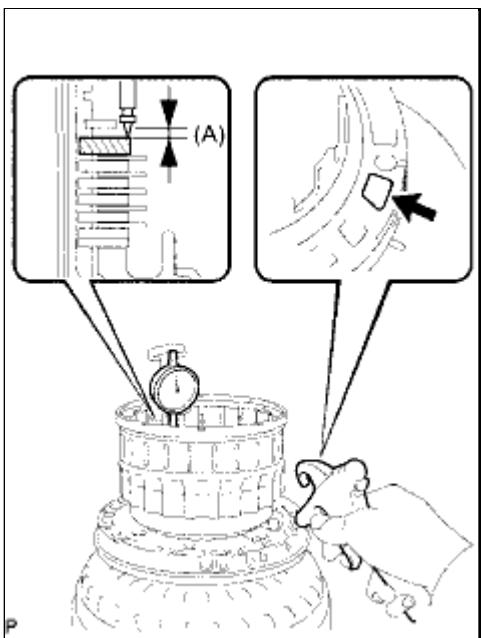


drum.

- (c) Using a dial indicator, measure the moving distance (A) of the clutch flange at both ends across the diameter while applying compressed air into the oil hole as shown in the illustration.

Standard moving distance (A):

0.55 to 0.85 mm (0.0217 to 0.0335 in.)



**NOTICE:**

**When measuring the moving distance, install a standard flange (thickness: 3.4 mm (0.134 in.)) to the position indicated by the shaded area in the illustration.**

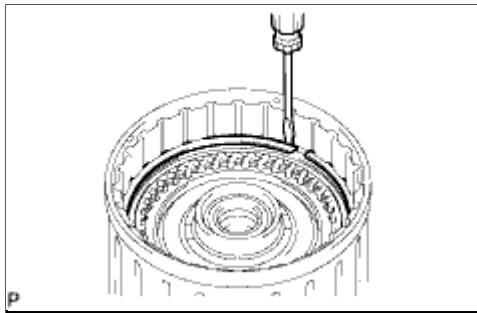
If the moving distance (A) is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

Flange Thickness:

MARK	THICKNESS
2	2.95 to 3.05 mm (0.116 to 0.120 in.)
3	3.05 to 3.15 mm (0.120 to 0.124 in.)
4	3.15 to 3.25 mm (0.124 to 0.128 in.)
5	3.25 to 3.35 mm (0.128 to 0.132 in.)
6	3.35 to 3.45 mm (0.132 to 0.136 in.)
7	3.45 to 3.55 mm (0.136 to 0.140 in.)
8	3.55 to 3.65 mm (0.140 to 0.144 in.)
9	3.65 to 3.75 mm (0.144 to 0.148 in.)
A	3.75 to 3.85 mm (0.148 to 0.152 in.)

- (d) Temporarily remove the snap ring, replace the flange with the selected flange and reinstall the snap ring.

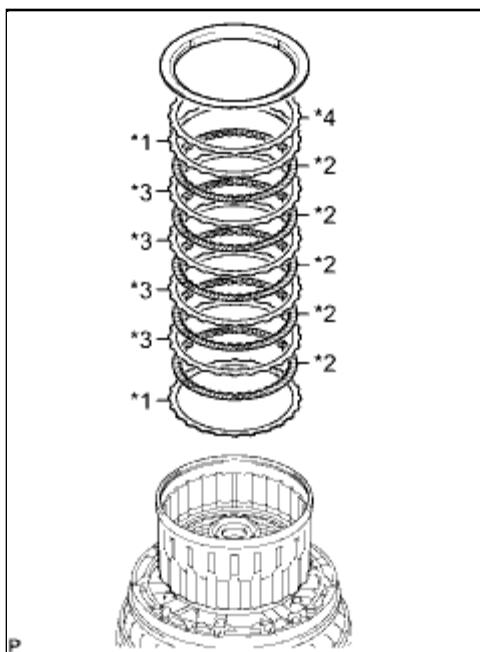
### 35. SELECT REVERSE CLUTCH FLANGE



(a) Using a screwdriver, install the snap ring to the clutch drum.

**NOTICE:**

**Make sure to install the direct clutch and reverse clutch snap rings so that their openings face opposite directions.**



(b) Install the 2 flanges, 5 discs, 4 plates, cushion plate and reverse clutch reaction sleeve to the clutch drum.

Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*1 - \*4

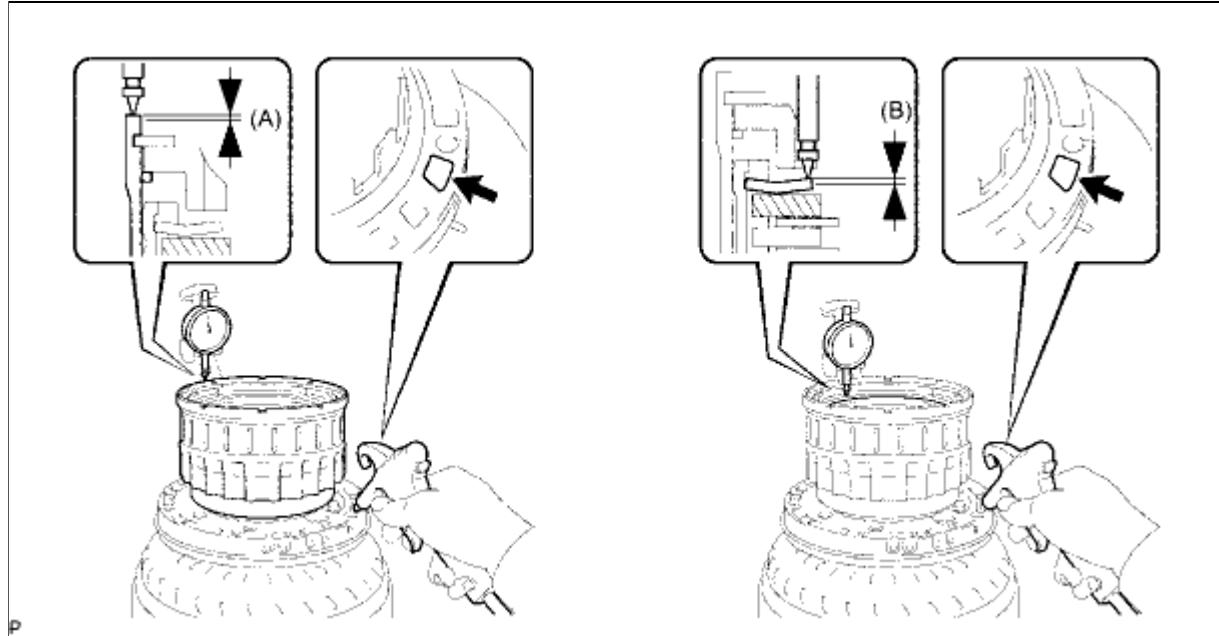
### Text in Illustration

*1	Flange
*2	Disc
*3	Plate
*4	Cushion Plate



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

(d) Using a dial indicator, measure the moving distance (A minus B) of the top surface of the reverse clutch piston (A) and cushion plate at both ends across the diameter (B) while applying compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) into the oil hole as shown in the illustration. Then choose a flange of an appropriate thickness from the table so that the measured value is within the standard range.



Standard moving distance (A minus B):  
0.56 to 0.86 mm (0.0220 to 0.0339 in.)

**NOTICE:**

**When measuring the moving distance, install a standard flange (thickness: 3.3 mm (0.130 in.)) to the position indicated by the shaded area in the illustration.**

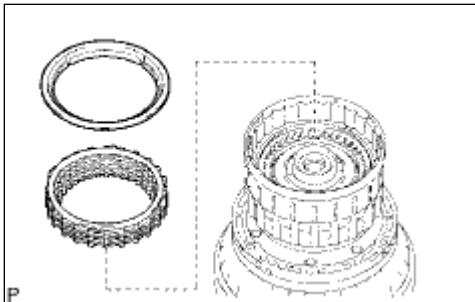
**HINT:**

**Distance (A) = 1.05 to 2.15 mm (0.0413 to 0.0846 in.)**

**Distance (B) = 0.72 to 1.08 mm (0.0283 to 0.0425 in.)**

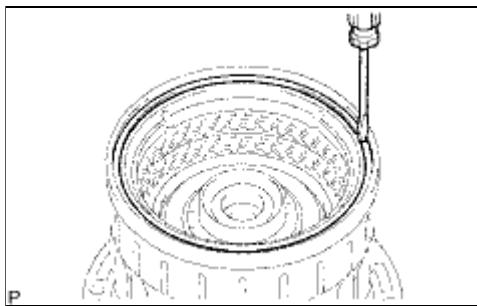
Flange Thickness:

MARK	THICKNESS
0	2.75 to 2.85 mm (0.108 to 0.112 in.)
1	2.85 to 2.95 mm (0.112 to 0.116 in.)
2	2.95 to 3.05 mm (0.116 to 0.120 in.)
3	3.05 to 3.15 mm (0.120 to 0.124 in.)
4	3.15 to 3.25 mm (0.124 to 0.128 in.)
5	3.25 to 3.35 mm (0.128 to 0.132 in.)
6	3.35 to 3.45 mm (0.132 to 0.136 in.)
7	3.45 to 3.55 mm (0.136 to 0.140 in.)
8	3.55 to 3.65 mm (0.140 to 0.144 in.)
9	3.65 to 3.75 mm (0.144 to 0.148 in.)
A	3.75 to 3.85 mm (0.148 to 0.152 in.)

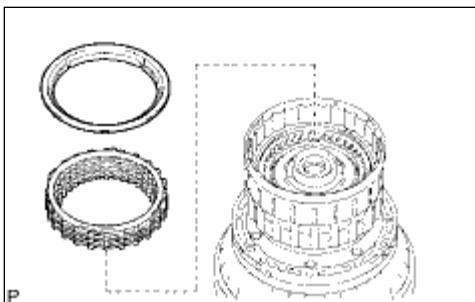


(e) Remove the snap ring, reverse clutch reaction sleeve and rear clutch disc set from the clutch drum.

### 36. REMOVE REVERSE CLUTCH REACTION SLEEVE

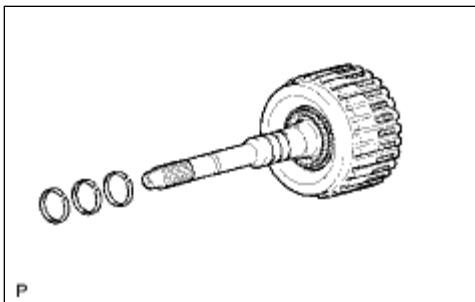


(a) Using a screwdriver, remove the snap ring from the clutch drum.



(b) Remove the reverse clutch reaction sleeve, clutch cushion plate, reverse clutch flange, 5 reverse clutch discs and 4 clutch plates from the reverse clutch hub.

### 37. INSTALL INPUT SHAFT OIL SEAL RING



(a) Coat 3 new oil seal rings with ATF.

(b) Squeeze the ends of the 3 oil seal rings together, and then install them to the starter shaft

groove.

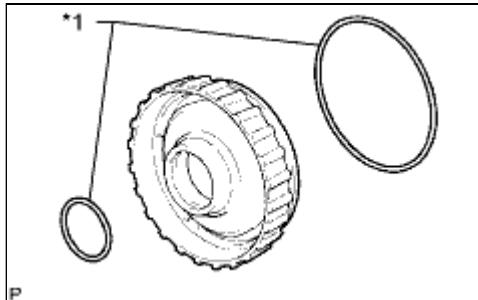
**NOTICE:**

**Do not excessively widen the rings.**

**HINT:**

**After installing the oil seal rings, check that they rotate smoothly.**

### 38. INSTALL FORWARD CLUTCH PISTON



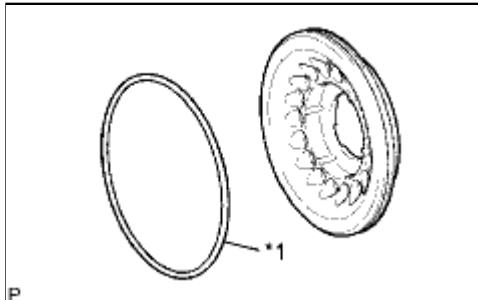
- (a) Coat 2 new O-rings with ATF and install them to the forward clutch piston.

#### Text in Illustration

* 1	New O-Ring
-----	------------

- (b) Install the forward clutch piston to the input shaft.

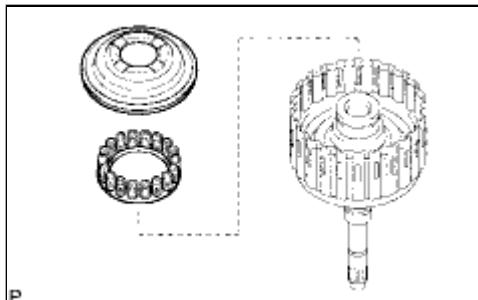
### 39. INSTALL NO. 1 CLUTCH BALANCER



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

#### Text in Illustration

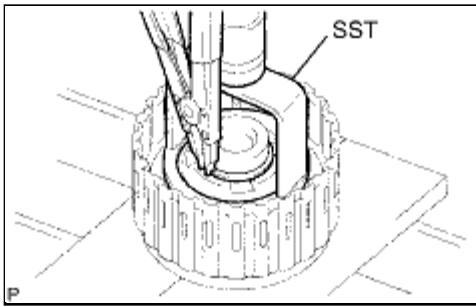
* 1	New O-Ring
-----	------------



- (b) Install the forward clutch return spring and clutch balancer.

**NOTICE:**

**Be careful not to damage the O-ring.**



(c) Place SST on the No. 1 clutch balancer and compress the return spring with a press.

**SST: 09350-30020**

09350-07040

09350-07070

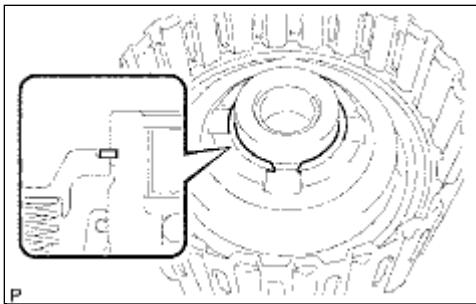
**NOTICE:**

**Stop pressing when the spring sheet is lowered to a position 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring sheet from being deformed.**

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

**NOTICE:**

**Do not expand the snap ring excessively.**

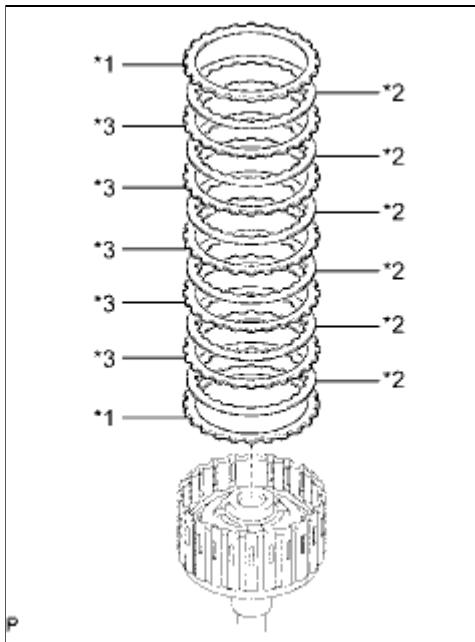


(e) Position the end gap of the snap ring as shown in the illustration.

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the spring retainer claw.**

## 40. INSTALL FORWARD MULTIPLE DISC CLUTCH DISC



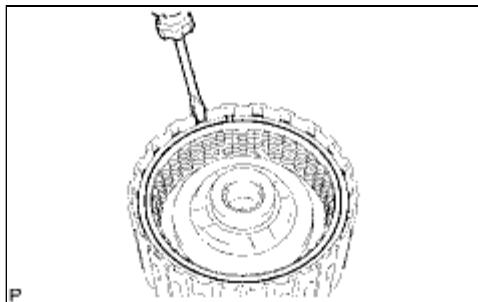
(a) Install the 2 flanges, 6 discs and 5 plates to the input shaft assembly.

Install in order:

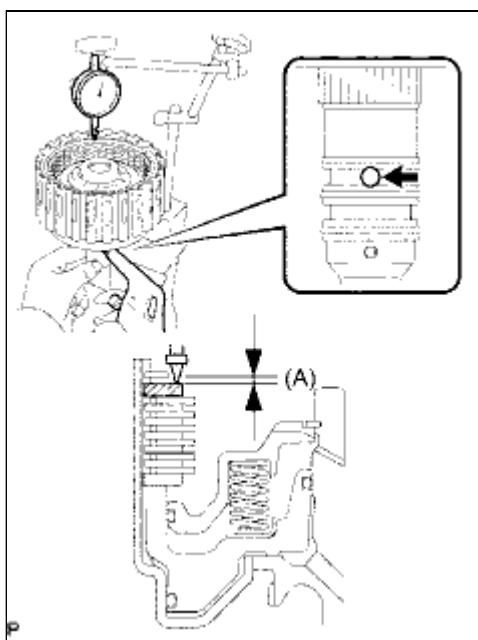
\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*1

### Text in Illustration

*1	Flange
*2	Disc
*3	Plate



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



(c) Using a dial indicator, measure the moving distance (A) of the clutch flange at both ends across the diameter while applying compressed air into the oil hole as shown in the illustration.

Standard moving distance (A):

0.61 to 0.91 mm (0.0240 to 0.0358 in.)

#### NOTICE:

When measuring the moving distance, install a standard flange (thickness: 3.4 mm (0.134 in.)) to the position indicated by the shaded area in the illustration.

#### HINT:

Moving distance (A): 0.26 to 1.36 mm (0.0102 to 0.0535 in.)

If the moving distance (A) is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

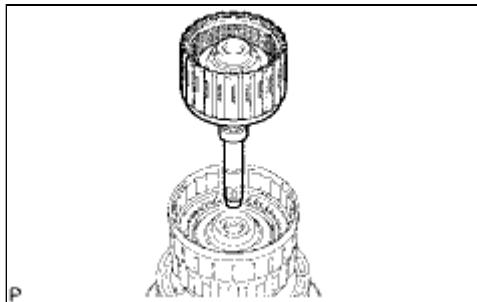
Flange Thickness:

MARK	THICKNESS
0	2.95 to 3.05 mm (0.116 to 0.120 in.)
1	3.05 to 3.15 mm (0.120 to 0.124 in.)
2	3.15 to 3.25 mm (0.124 to 0.128 in.)
3	3.25 to 3.35 mm (0.128 to 0.132 in.)
4	3.35 to 3.45 mm (0.132 to 0.136 in.)

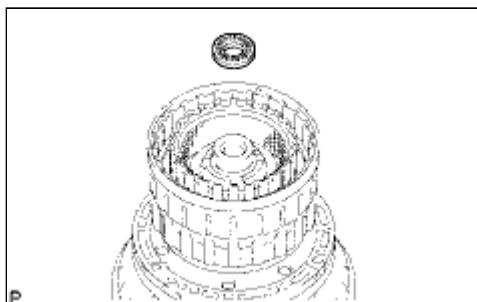
5	3.45 to 3.55 mm (0.136 to 0.140 in.)
6	3.55 to 3.65 mm (0.140 to 0.144 in.)
7	3.65 to 3.75 mm (0.144 to 0.148 in.)
8	3.75 to 3.85 mm (0.148 to 0.152 in.)
9	3.85 to 3.95 mm (0.148 to 0.152 in.)
A	3.95 to 4.05 mm (0.152 to 0.159 in.)

(d) Temporarily remove the snap ring, replace the flange with the selected flange and reinstall the snap ring.

#### 41. INSTALL INPUT SHAFT ASSEMBLY



(a) Install the input shaft to the clutch drum.



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

Thrust Needle Roller Bearing Diameter:

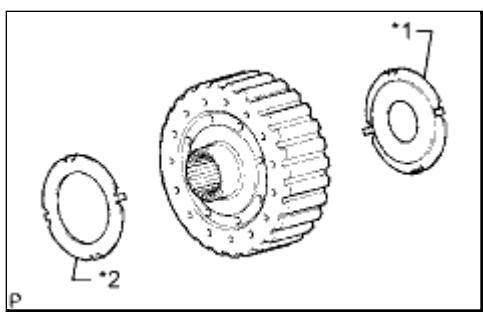
ITEM	INSIDE	OUTSIDE
Bearing C	21.4 to 21.6 mm (0.841 to 0.850 in.)	40.8 to 41.0 mm (1.606 to 1.614 in.)

#### 42. INSTALL MULTIPLE DISC CLUTCH HUB

(a) Coat the 2 thrust bearing races with petroleum jelly and install them to the multiple disc clutch hub.

Thrust Bearing Race Diameter:

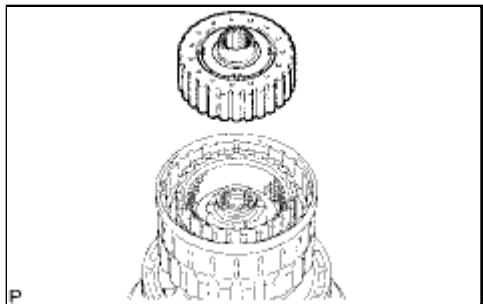
ITEM	INSIDE	OUTSIDE



Race C	22.7 to 22.9 mm (0.892 to 0.902 in.)	60.0 to 60.4 mm (2.36 to 2.38 in.)
Race D	33.3 to 33.5 mm (1.31 to 1.32 in.)	56.3 to 56.6 mm (2.22 to 2.23 in.)

### Text in Illustration

*1	Race C
*2	Race D

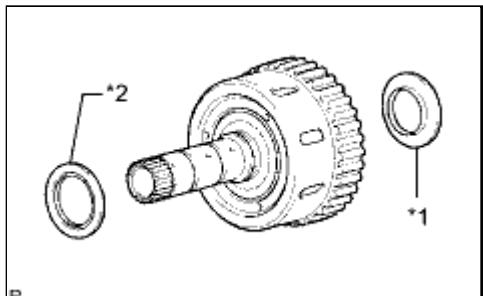


(b) Install the multiple disc clutch hub to the clutch drum.

### 43. INSTALL FORWARD CLUTCH HUB SUB-ASSEMBLY

(a) Coat the 2 thrust needle roller bearings with petroleum jelly and install them to the forward clutch hub.

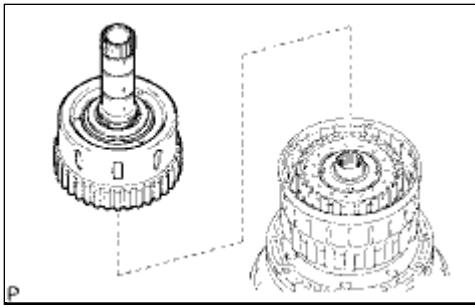
Thrust Needle Roller Bearing Diameter:



ITEM	INSIDE	OUTSIDE
Bearing D	38.5 to 38.7 mm (1.515 to 1.524 in.)	56.5 to 57.0 mm (2.22 to 2.24 in.)
Bearing E	42.6 to 42.8 mm (1.68 to 1.69 in.)	60.8 to 61.1 mm (2.39 to 2.41 in.)

### Text in Illustration

* 1	Bearing D
* 2	Bearing E



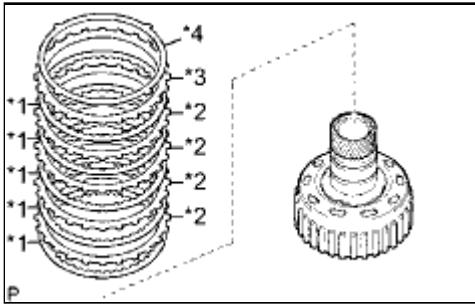
(b) Install the forward clutch hub to the clutch drum.

#### 44. INSTALL REAR CLUTCH DISC

(a) Install the 5 discs, 4 plates, reverse clutch flange and clutch cushion plate to the reverse clutch hub.

Install in order:

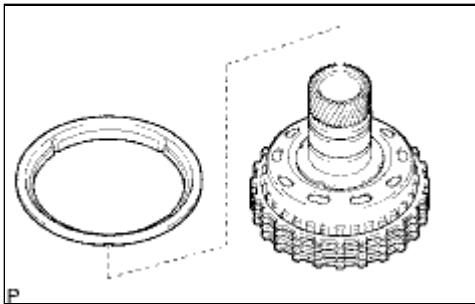
\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*3 - \*4



#### Text in Illustration

*1	Disc
*2	Plate
*3	Flange
*4	Cushion Plate

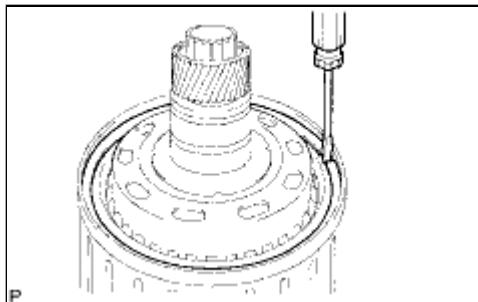
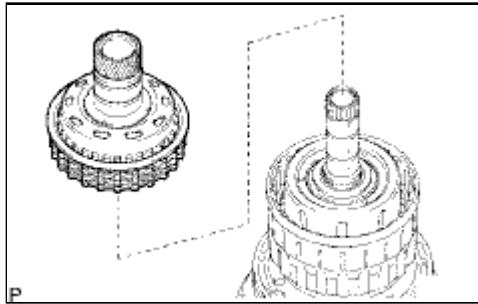
#### 45. INSTALL REVERSE CLUTCH REACTION SLEEVE



(a) Install the reverse clutch reaction sleeve to the reverse clutch hub.

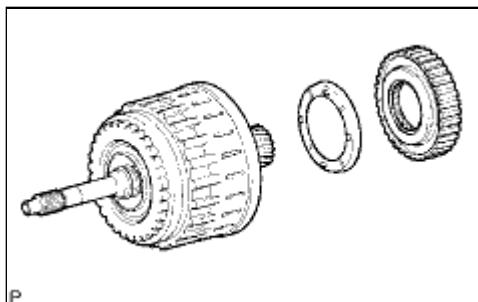
#### 46. INSTALL REVERSE CLUTCH HUB SUB-ASSEMBLY

(a) Install the reverse clutch hub to the clutch drum.



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

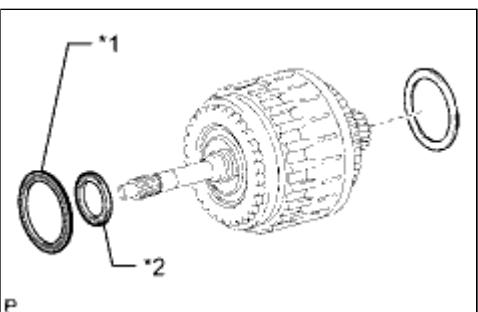
#### 47. INSTALL NO. 2 1-WAY CLUTCH ASSEMBLY



(a) Coat the No. 2 clutch drum thrust washer with petroleum jelly and install it to the clutch drum.

(b) Install the 1-way clutch to the clutch drum.

#### 48. INSTALL CLUTCH DRUM AND INPUT SHAFT ASSEMBLY



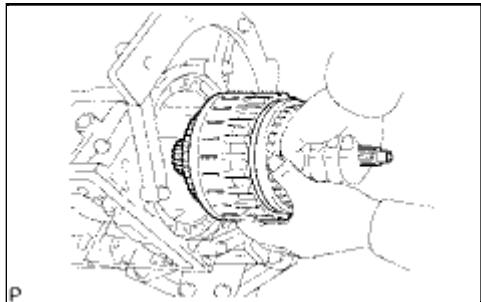
(a) Coat the 2 thrust needle roller bearings and clutch drum thrust washer with petroleum jelly and install them to the clutch drum and input shaft assembly.

Thrust Needle Roller Bearing Diameter:

ITEM	INSIDE	OUTSIDE
Bearing A	72.0 to 72.3 mm (2.83 to 2.85 in.)	85.3 to 85.6 mm (3.36 to 3.37 in.)
Bearing B	34.7 to 34.9 mm (1.366 to 1.374 in.)	51.6 to 51.9 mm (2.03 to 2.04 in.)

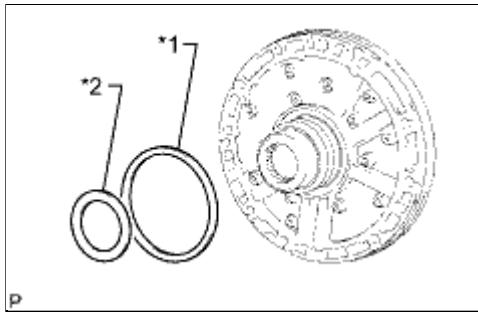
**Text in Illustration**

*1	Bearing A
*2	Bearing B



(b) Install the clutch drum and input shaft assembly to the transmission case.

**49. INSTALL OIL PUMP ASSEMBLY**



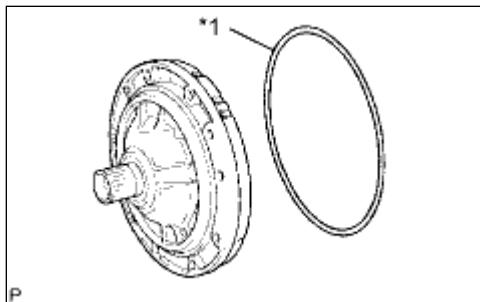
(a) Coat the No. 1 and No. 2 thrust bearing races with petroleum jelly and install them to the front oil pump.

Thrust Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Race A	74.3 to 74.6 mm (2.93 to 2.94 in.)	87.4 to 87.7 mm (3.44 to 3.45 in.)
Race B	37.0 to 37.3 mm (1.46 to 1.47 in.)	52.1 to 52.3 mm (2.05 to 2.06 in.)

**Text in Illustration**

*1	Race A
----	--------



(b) Coat a new O-ring with ATF and install it to the oil pump assembly.

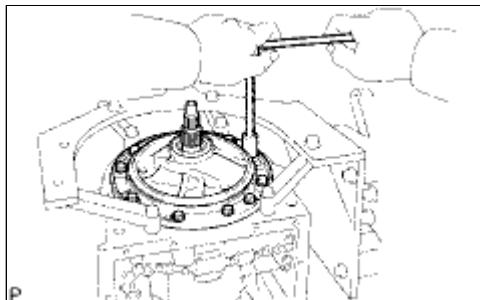
### Text in Illustration

*1	New O-Ring
----	------------

- (c) Slide the oil pump onto the input shaft, align the bolt holes of the oil pump assembly with the bolt holes of the transmission case and install the oil pump.
- (d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the overdrive direct clutch drum.

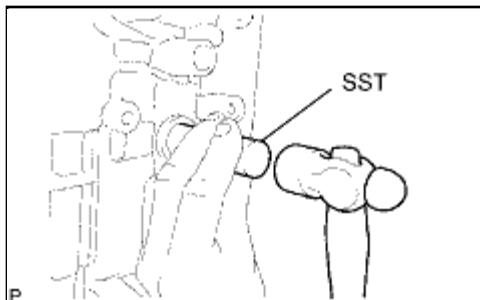
**NOTICE:**

**Do not excessively push on the oil pump, as the oil seal rings will stick to the direct clutch drum.**



(e) Install the 10 bolts.

**Torque: 21 N·m (215 kgf·cm, 16ft·lbf)**



### 50. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

- (a) Using SST and a hammer, tap in 2 new oil seals.

**SST: 09350-30020**

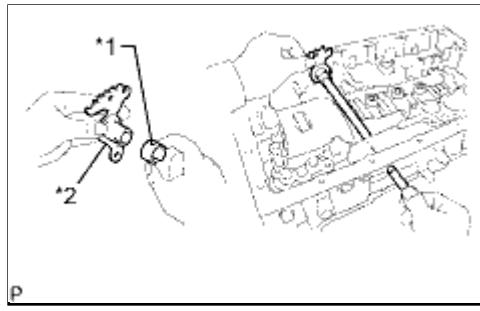
09350-07110

- (b) Coat the lips of the oil seals with MP grease.

### 51. INSPECT INDIVIDUAL PISTON OPERATION



### 52. INSTALL MANUAL VALVE LEVER SUB-ASSEMBLY

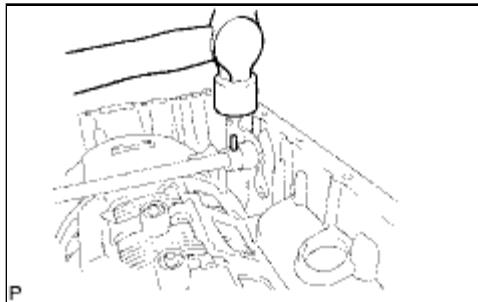


(a) Install a new spacer to the manual valve lever.

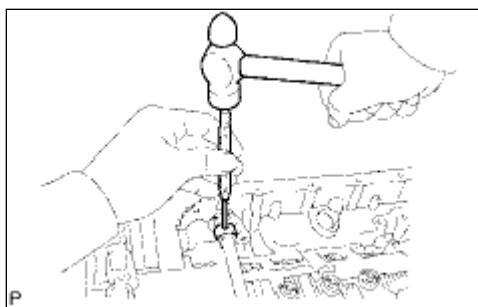
**Text in Illustration**

*1	Spacer
*2	Manual Valve Lever

(b) Push the manual valve lever shaft through the transmission case, and install the manual valve lever to the manual valve lever shaft.



(c) Using a hammer, tap in a new spring pin.



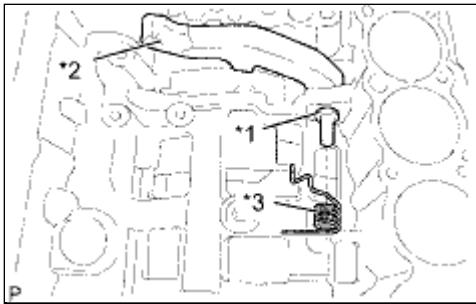
(d) Align the manual valve lever indentation with the spacer hole, and stake them together with a punch.

(e) Check that the shaft rotates smoothly.

**53. INSTALL PARKING LOCK PAWL SHAFT**

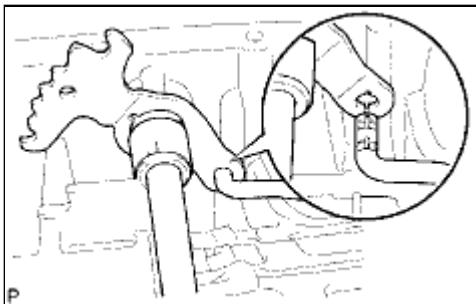
(a) Install the E-ring to the shaft.

(b) Install the parking lock pawl, shaft and spring.



## Text in Illustration

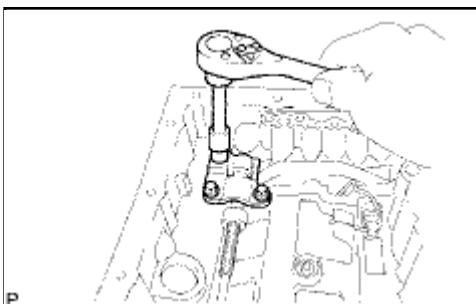
*1	E-Ring
*2	Parking Lock Pawl
*3	Spring



## 54. INSTALL PARKING LOCK ROD SUB-ASSEMBLY

- Connect the parking lock rod to the manual valve lever to install it.

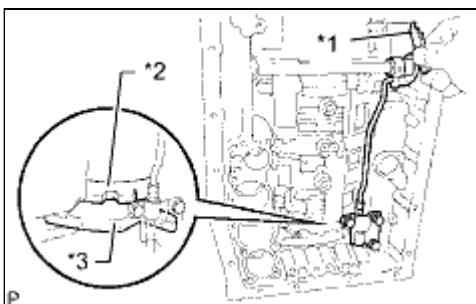
## 55. INSTALL PARKING LOCK PAWL BRACKET



- Install the parking lock pawl bracket to the transmission case with the 3 bolts.

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

- Move the manual valve lever to the P position, and confirm that the planetary ring gear is correctly locked by the lock pawl.



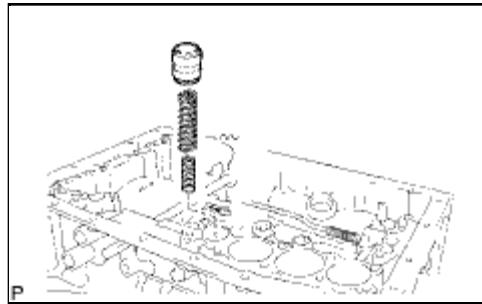
## Text in Illustration

*1	Manual Valve Lever
*2	Planetary Ring Gear
*3	Parking Lock Pawl

## 56. INSTALL C-1 ACCUMULATOR VALVE

(a) Install the 2 springs and accumulator valve to the hole.

Accumulator Spring Diameter:

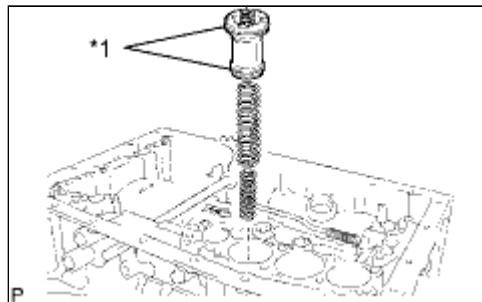


SPRING	FREE LENGTH OUTER DIAMETER	COLOR
C-1 Inner	30.40 mm (1.20 in.) 11.40 mm (0.449 in.)	Pink
C-1 Outer	48.76 mm (1.92 in.) 16.60 mm (0.654 in.)	Light Green

## 57. INSTALL C-3 ACCUMULATOR PISTON

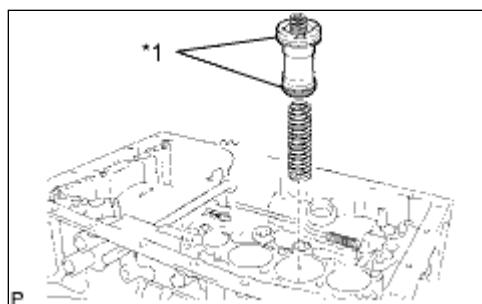
(a) Coat 2 new O-rings with ATF and install them to the piston.

### Text in Illustration



*1	New O-Ring
(b) Install the 2 springs and accumulator piston to the hole.	
Accumulator Spring Diameter:	

SPRING	FREE LENGTH OUTER DIAMETER	COLOR
C-3 Inner	44.0 mm (1.73 in.) 14.0 mm (0.551 in.)	Yellow
C-3 Outer	73.35 mm (2.89 in.) 19.90 mm (0.784 in.)	Red



## 58. INSTALL B-3 ACCUMULATOR PISTON

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

### Text in Illustration

\* 1

New O-Ring

(b) Install the spring and accumulator piston to the hole.

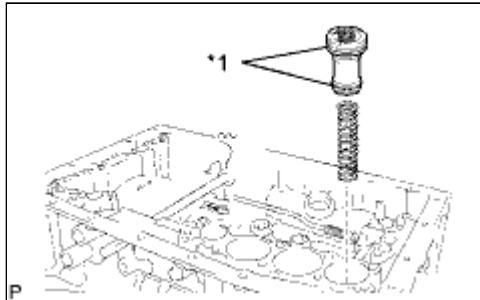
Accumulator Spring Diameter:

SPRING	FREE LENGTH OUTER DIAMETER	COLOR
B-3	70.5 mm (2.78 in.) 19.7 mm (0.776 in.)	Purple

## 59. INSTALL C-2 ACCUMULATOR PISTON

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

### Text in Illustration



\* 1

New O-Ring

(b) Install the spring and accumulator piston to the hole.

Accumulator Spring Diameter:

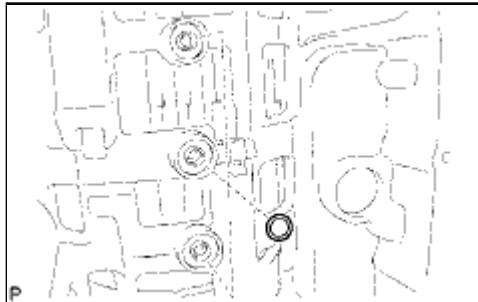
SPRING	FREE LENGTH OUTER DIAMETER	COLOR
C-2	62.0 mm (2.44 in.) 15.9 mm (0.626 in.)	White



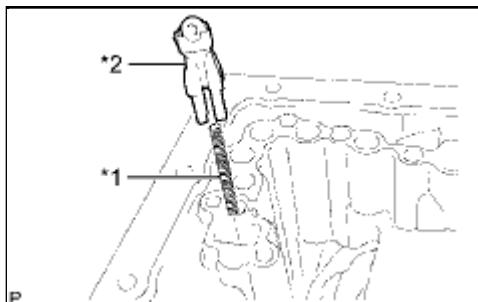
## 60. INSTALL BRAKE DRUM GASKET

(a) Install the 3 brake drum gaskets.

## 61. INSTALL TRANSMISSION CASE GASKET



(a) Install the 3 transmission case gaskets.



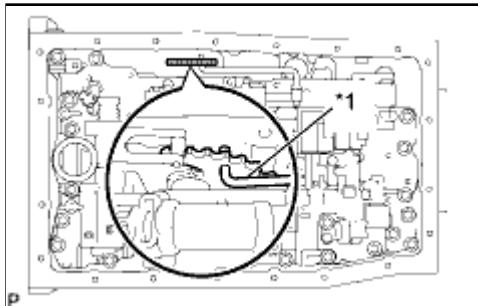
## 62. INSTALL CHECK BALL BODY

(a) Install the spring and check ball body.

### Text in Illustration

*1	Spring
*2	Check Ball Body

## 63. INSTALL TRANSMISSION VALVE BODY ASSEMBLY



(a) Insert the pin of the manual valve into the hole of the manual valve lever.

### Text in Illustration

*1	Pin
----	-----

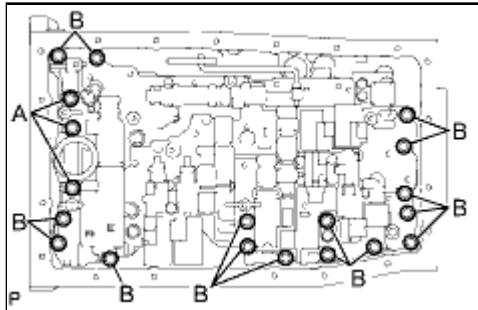
(b) Install the transmission valve body assembly with the 19 bolts.

**Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

### HINT:

Each bolt length is indicated below.

**36 mm (1.42 in.) for bolt A**

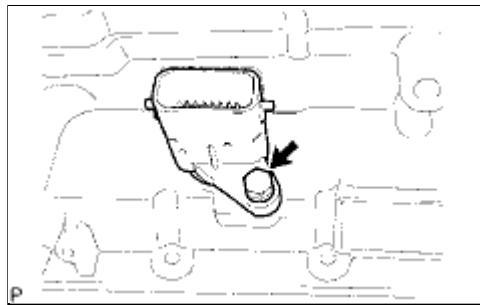


**25 mm (0.984 in.) for bolt B**

- (c) Install the detent spring and detent spring cover with the bolt.

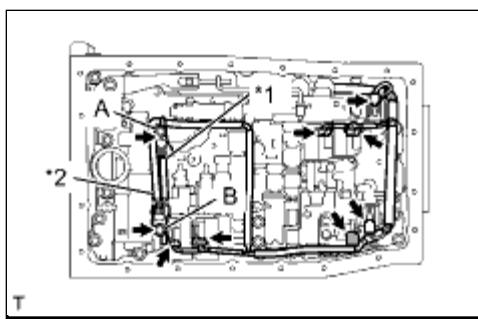
**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

#### 64. INSTALL TRANSMISSION WIRE



- (a) Coat a new O-ring with ATF and install it to the transmission wire connector.
- (b) Install the transmission wire harness.
- (c) Install the bolt.

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



- (d) Connect the 7 solenoid connectors.

- (e) Connect the 2 ATF temperature sensors with the 2 clamps and 2 bolts.

**for bolt A - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

**for bolt B - Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

#### Text in Illustration

* 1	No. 1 Temperature Sensor
-----	--------------------------

\*2

No. 2 Temperature Sensor

**HINT:**

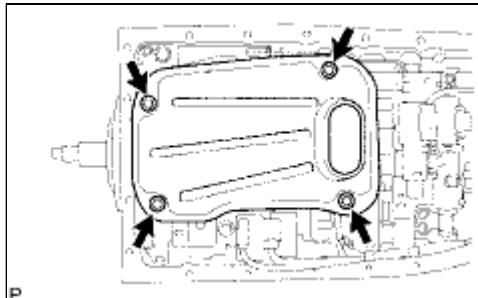
Each bolt length is indicated below.

12 mm (0.472 in.) for bolt A

36 mm (1.42 in.) for bolt B

**Sensor Wire Harness**

WIRE HARNESS	COLOR
No. 1 temperature sensor	Orange
No. 2 temperature sensor	Blue

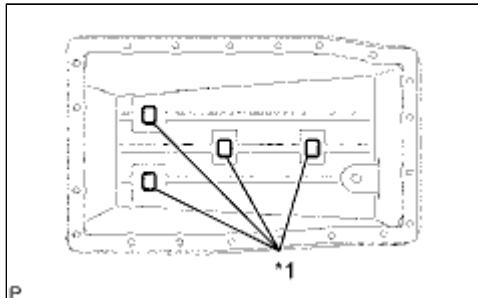


**65. INSTALL VALVE BODY OIL STRAINER ASSEMBLY**

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

(b) Install the oil strainer with the 4 bolts.

**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**



**66. INSTALL TRANSMISSION OIL CLEA NER MAGNET**

(a) Install the 4 magnets.

**Text in Illustration**

\*1

Magnet

**67. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**

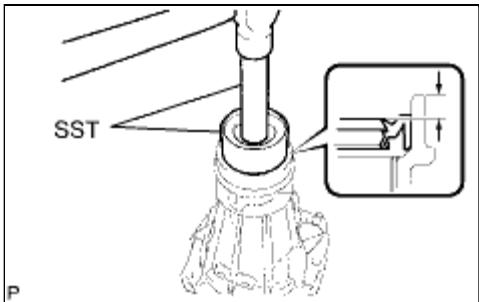
(a) Install a new gasket to the oil pan.

(b) Install the oil pan with the 20 bolts.

**Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)**

(c) Install the drain plug.

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



## 68. INSTALL AUTOMATIC TRANSMISSION EXTENSION HOUSING OIL SEAL

- Coat the lip of a new oil seal with ATF.
- Using SST and a hammer, tap in the oil seal.

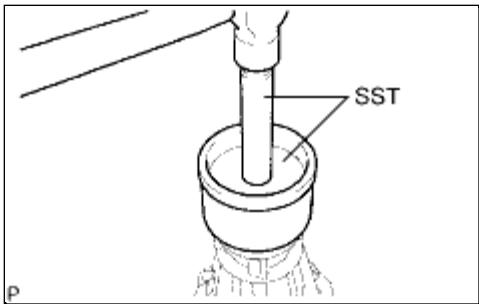
**SST: 09710-30050**

**SST: 09950-70010**

**09951-07100**

Standard depth:

5.4 to 5.8 mm (0.213 to 0.228 in.)



## 69. REMOVE EXTENSION HOUSING DUST DEFLECTOR

- Using SST and a hammer, tap in a new dust deflector.

**SST: 09223-15020**

**SST: 09950-70010**

**09951-07100**

## 70. INSTALL EXTENSION HOUSING SUB-ASSEMBLY

- Clean the threads of the bolts and case with non residue solvent.

- Apply seal packing to the extension housing.

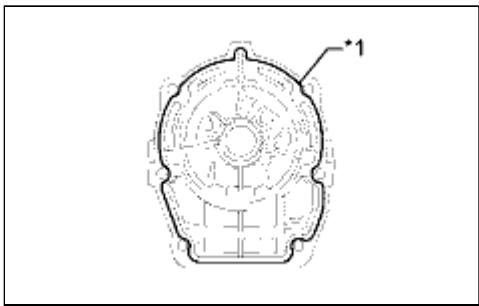
Seal packing:

Toyota Genuine Seal Packing 1281,

Three Bond 1281 or equivalent

Seal diameter:

1.0 to 1.5 mm (0.0394 to 0.0591 in.)



### Text in Illustration

*1	Seal Packing
----	--------------

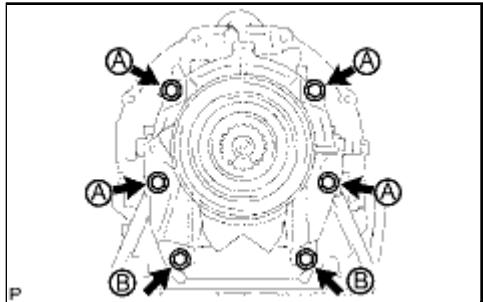
- Apply adhesive to the threads of the 6 bolts.

Adhesive:

Toyota Genuine Adhesive 1324,

Three Bond 1324 or equivalent

- Install the extension housing with the 6 bolts.



**Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**

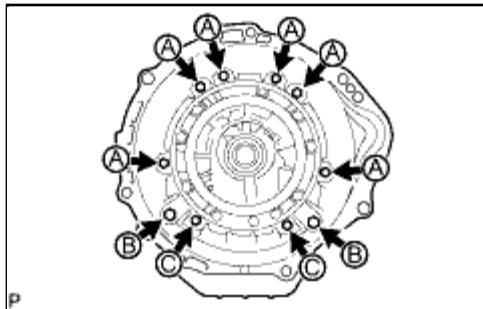
**HINT:**

Each bolt length is indicated below.

45 mm (1.77 in.) for bolt A

35 mm (1.38 in.) for bolt B

## 71. INSTALL AUTOMATIC TRANSMISSION HOUSING



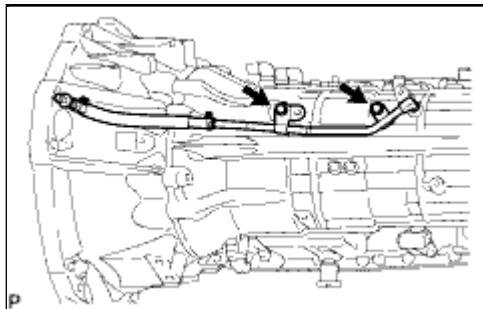
(a) Clean the threads of the bolts and case with non-residue solvent.

(b) Install the transmission housing with the 10 bolts.

for 14 mm head bolt A - **Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**

for 17 mm head bolt B - **Torque: 57 N·m (579 kgf·cm, 42ft·lbf)**

for 14 mm head bolt C - **Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**



## 72. INSTALL AUTOMATIC TRANSMISSION BREATHER TUBE

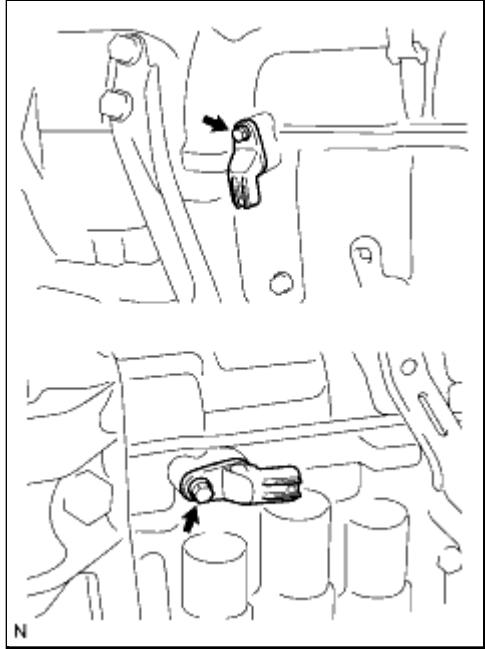
(a) Coat a new O-ring with ATF and install it to the breather tube.

(b) Install the breather tube with the 2 bolts.

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

## 73. INSTALL SPEED SENSOR

(a) Coat 2 new O-rings with ATF and install one to each speed sensor.

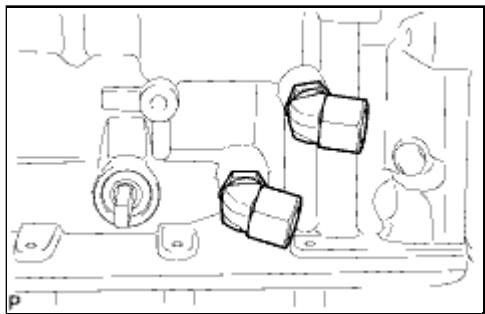


(b) Install the 2 speed sensors.

(c) Install the 2 bolts.

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

#### 74. INSTALL OIL COOLER TUBE UNION

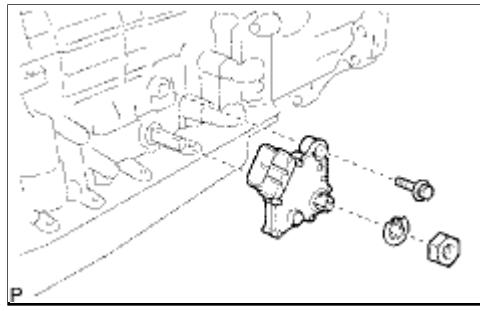


(a) Coat a new O-ring with ATF and install one to each oil cooler tube union.

(b) Install the oil cooler tube union.

**Torque: 29 N·m (300 kgf·cm, 22ft·lbf)**

#### 75. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

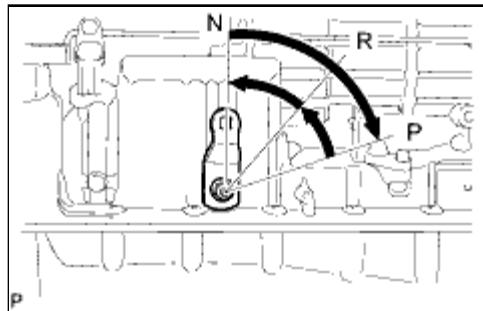


(a) Install the park/neutral position switch to the manual valve lever shaft, and temporarily install the adjusting bolt.

(b) Install a new lock washer and the nut.

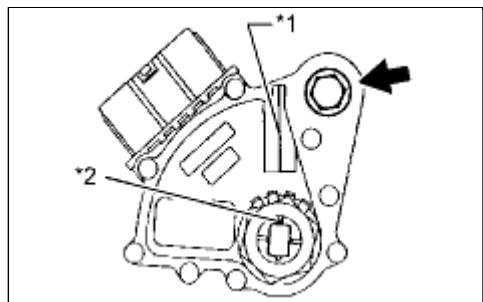
**Torque: 6.9 N·m (70 kgf·cm, 61in·lbf)**

(c) Temporarily install the control shaft lever.



(d) Turn the control shaft lever clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.

(e) Remove the control shaft lever.



(f) Align the neutral basic line with the switch groove, and tighten the adjusting bolt.

## Text in Illustration

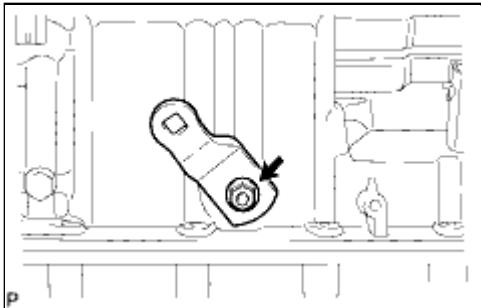
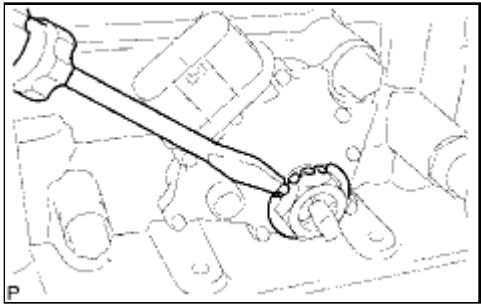
* 1	Neutral Basic Line
* 2	Groove

**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**

(g) Using a screwdriver, bend the tabs of the lock washer.

### HINT:

**Bend at least 2 of the lock washer tabs.**



## 76. INSTALL TRANSMISSION CONTROL SHAFT LEVER LH

- (a) Install the control shaft lever with the spring washer and nut.

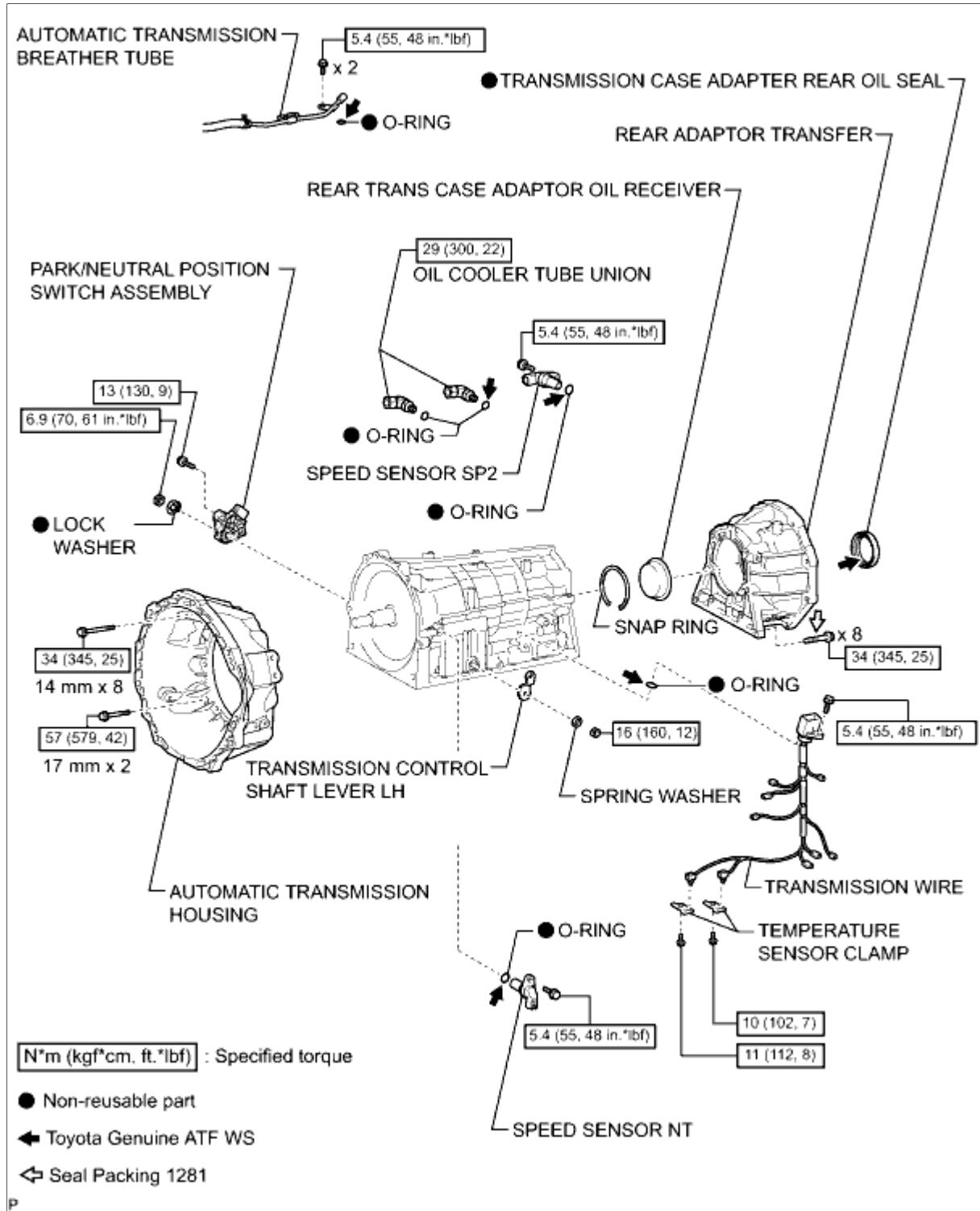
**Torque: 16 N·m (160 kgf·cm, 12ft·lbf)**



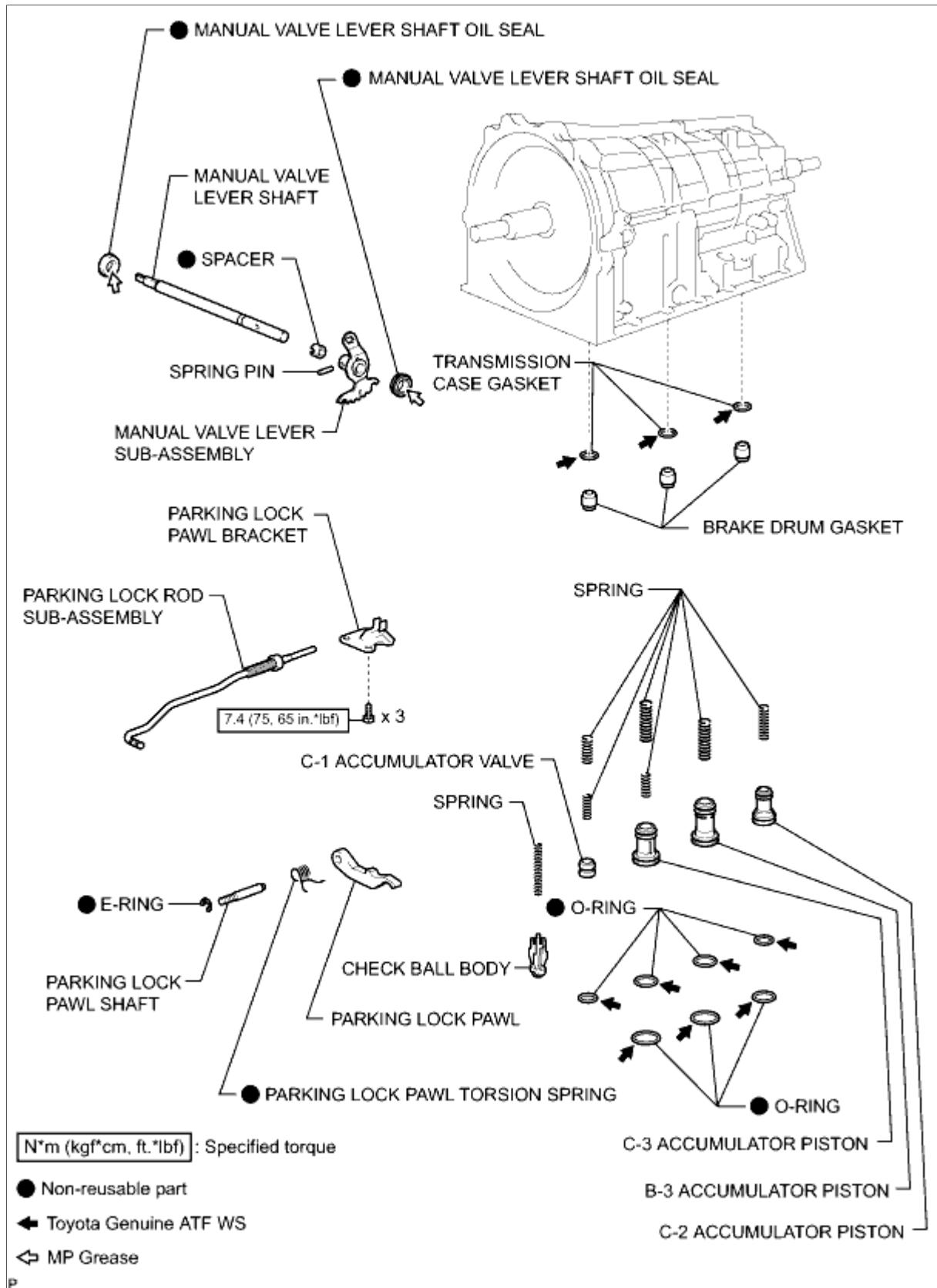
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013EY02OX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

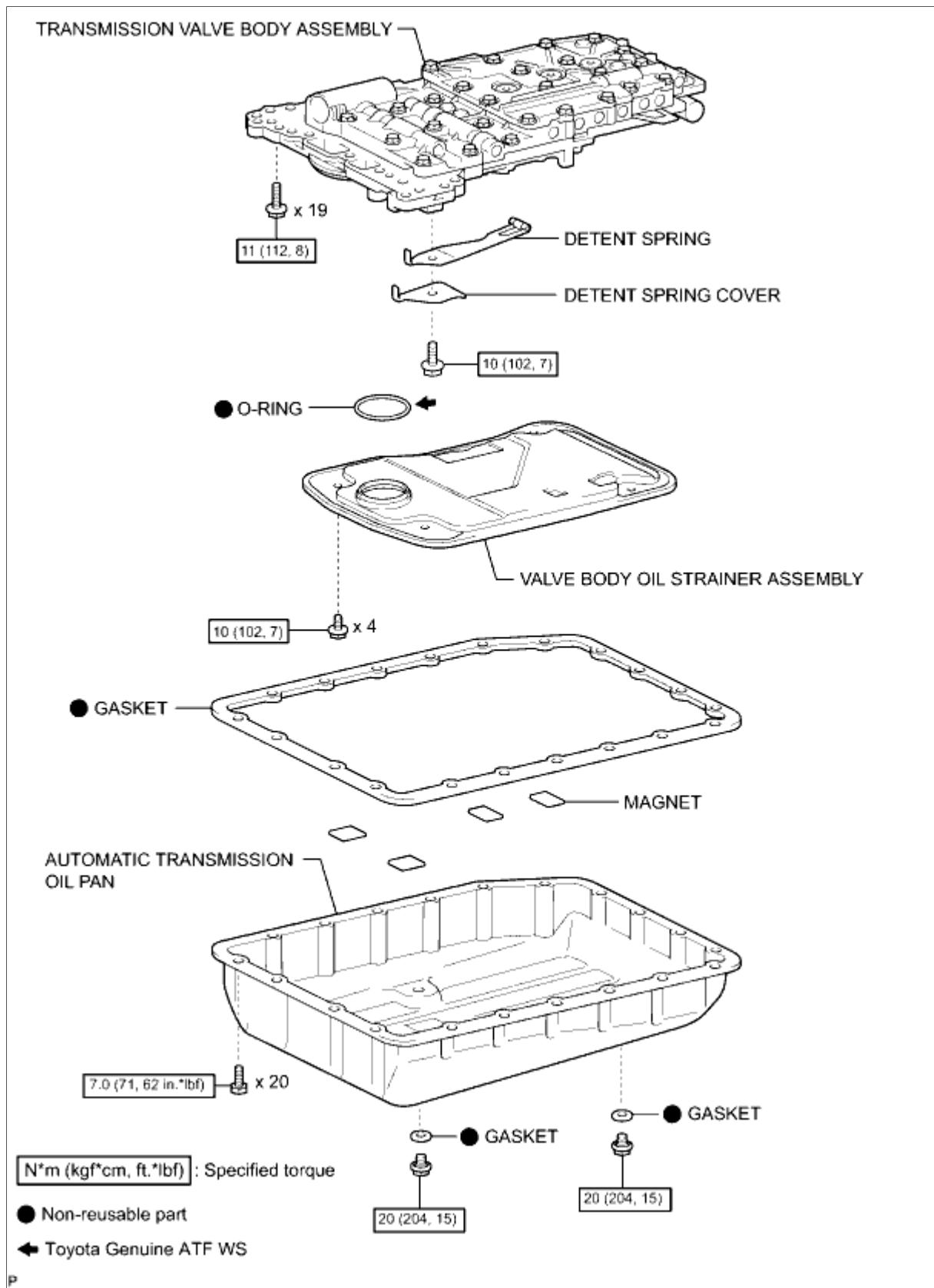
## **ILLUSTRATION**



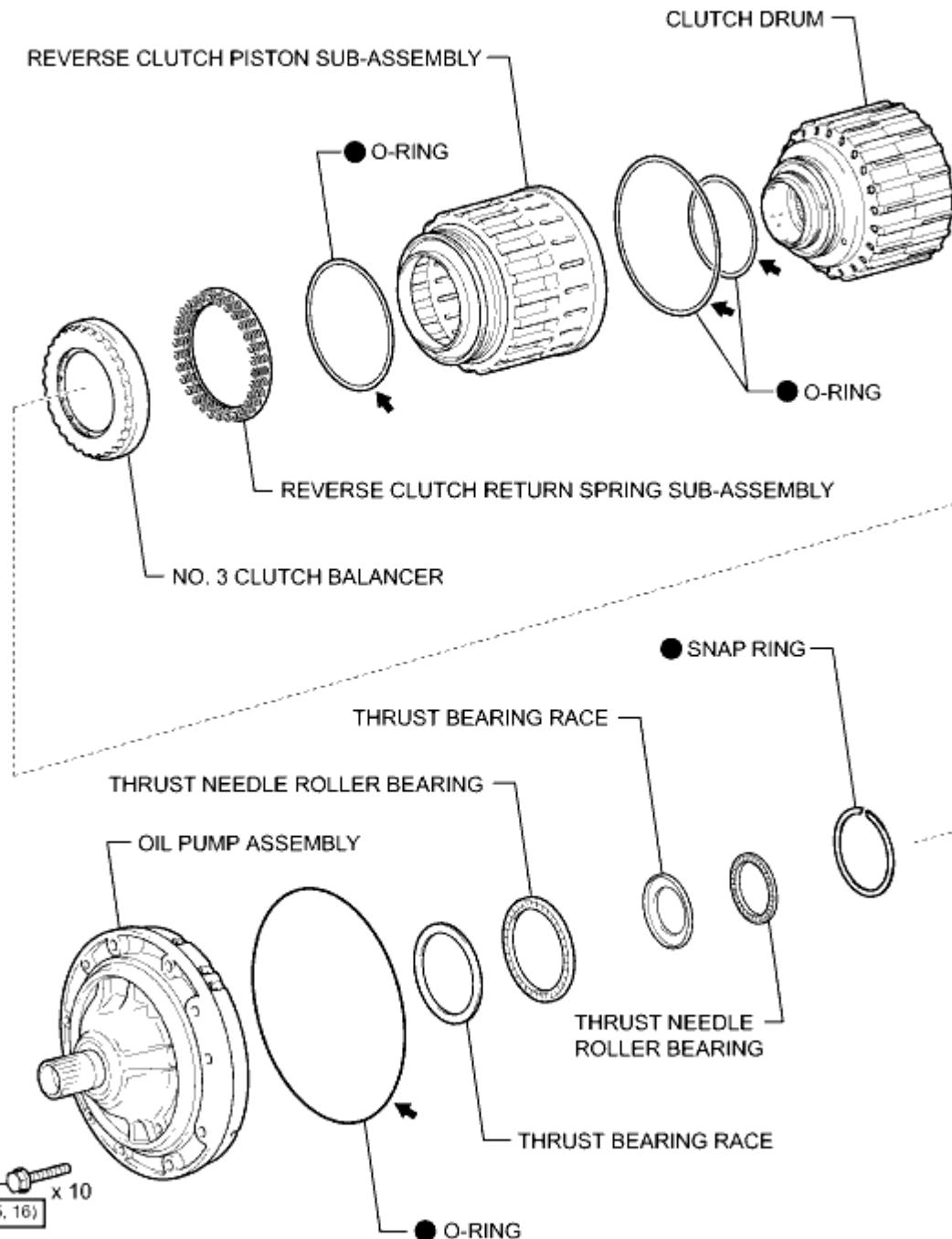
## ILLUSTRATION



## ILLUSTRATION



## ILLUSTRATION

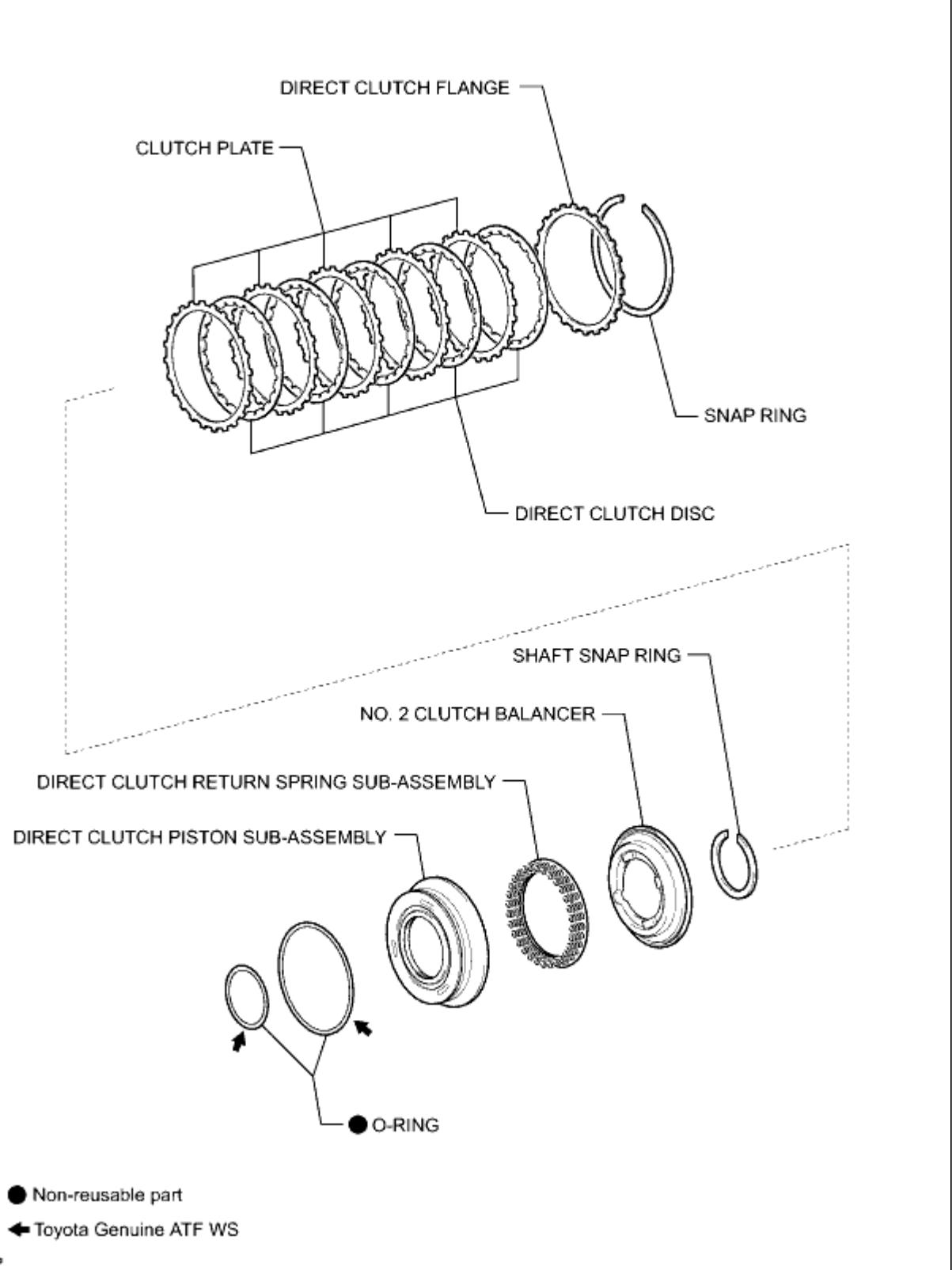


**N·m (kgf·cm, ft·lbf)** : Specified torque

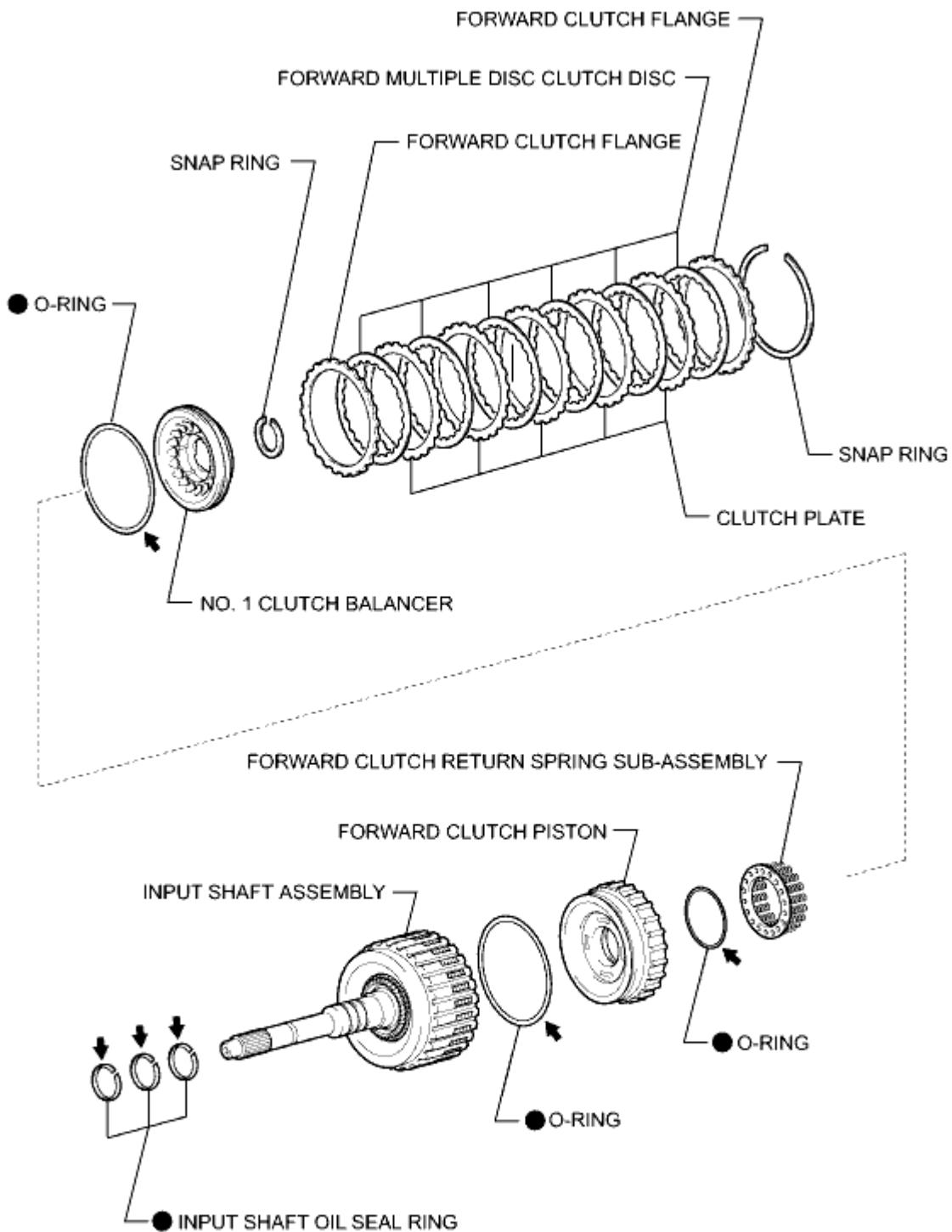
● Non-reusable part

← Toyota Genuine ATF WS

## ILLUSTRATION



## ILLUSTRATION

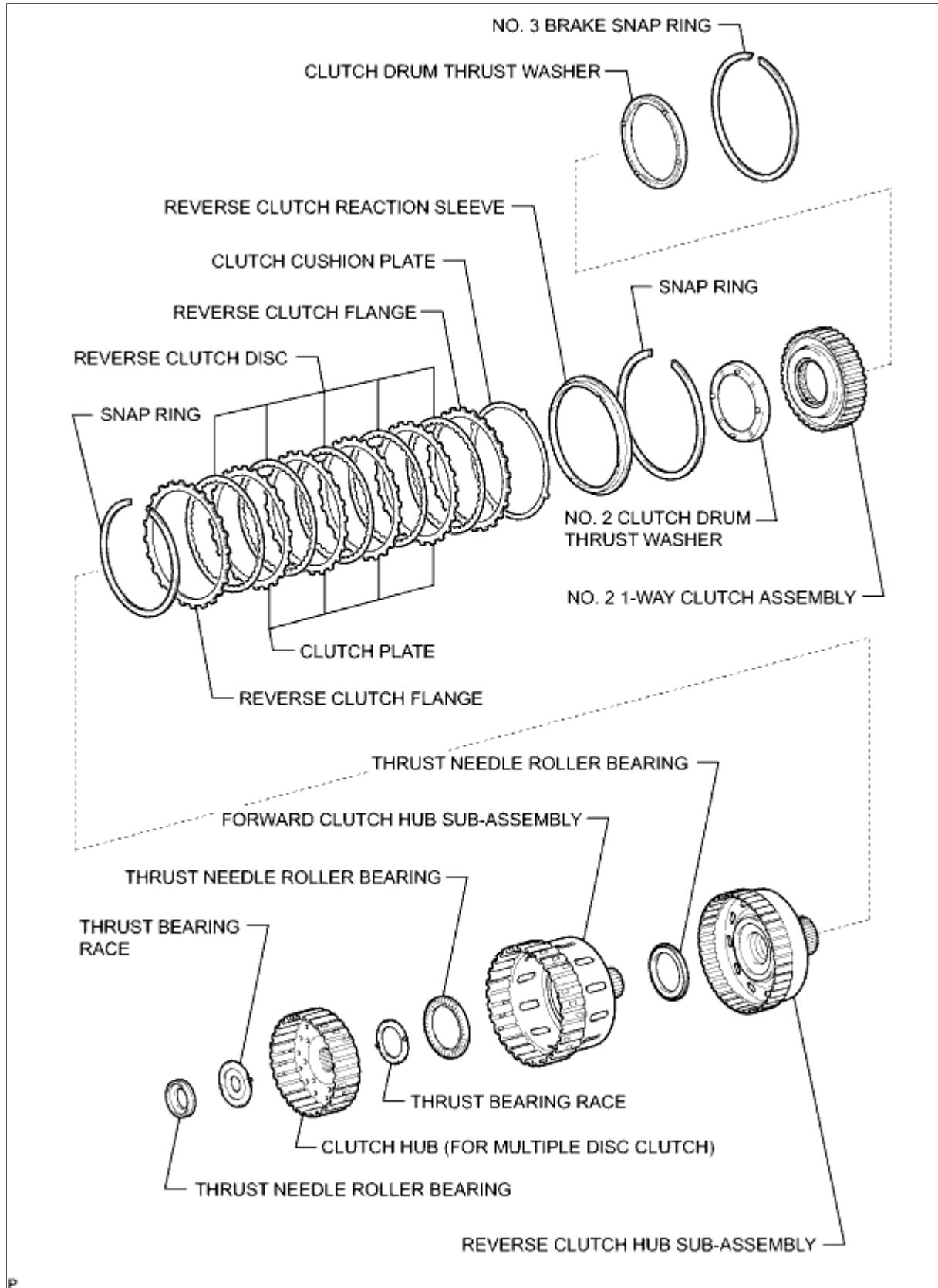


● Non-reusable part

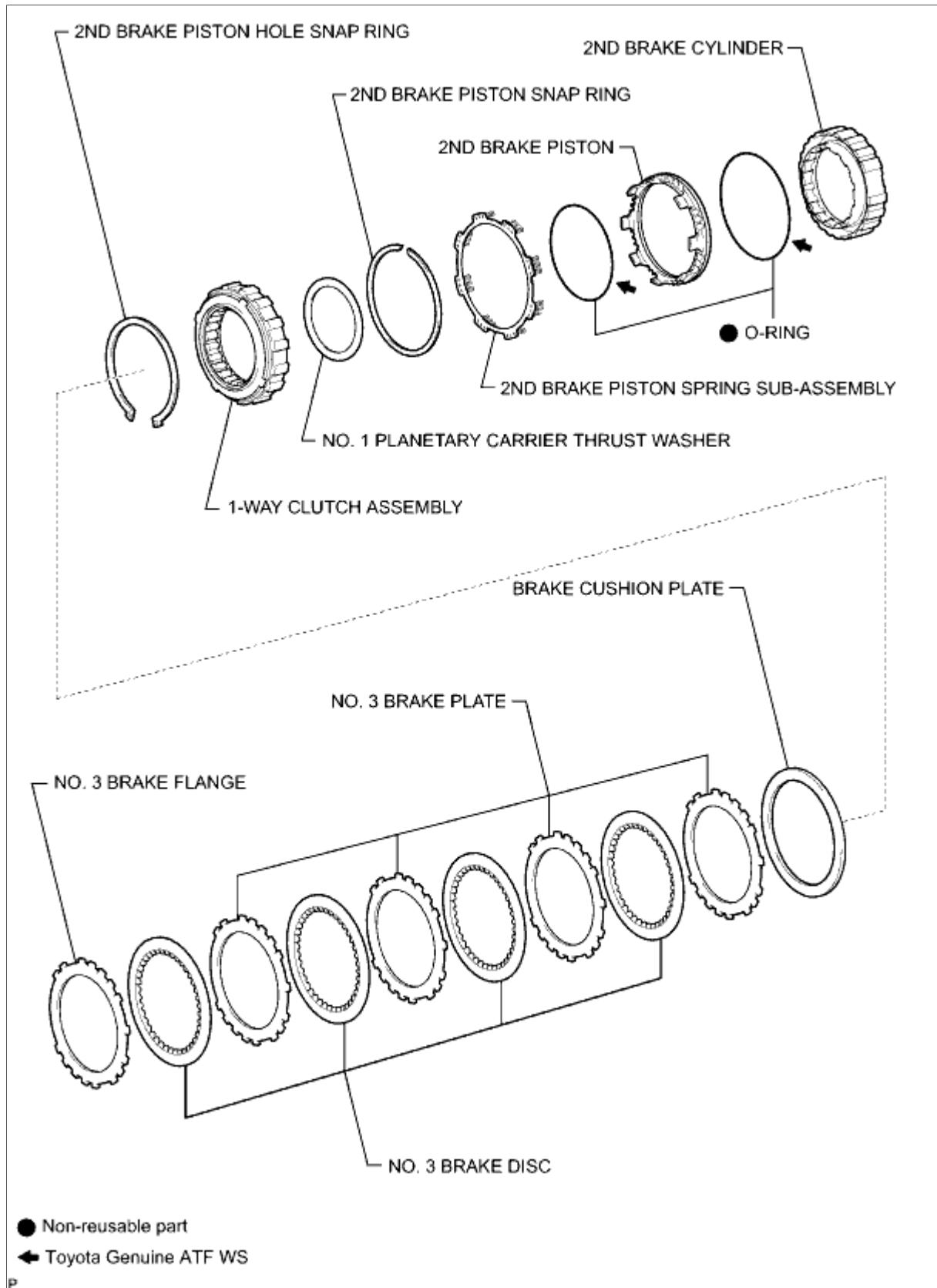
← Toyota Genuine ATF WS

P

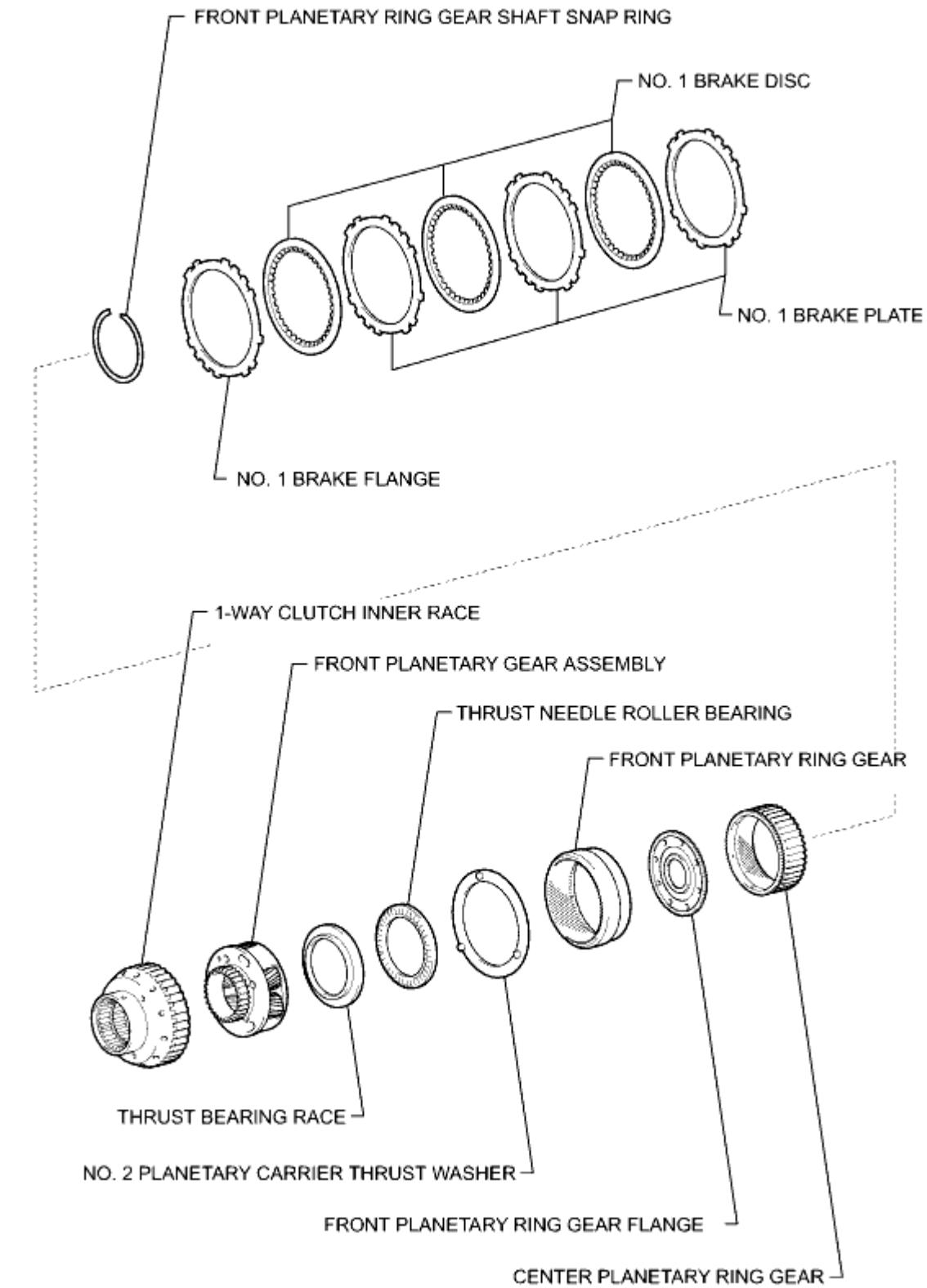
## ILLUSTRATION



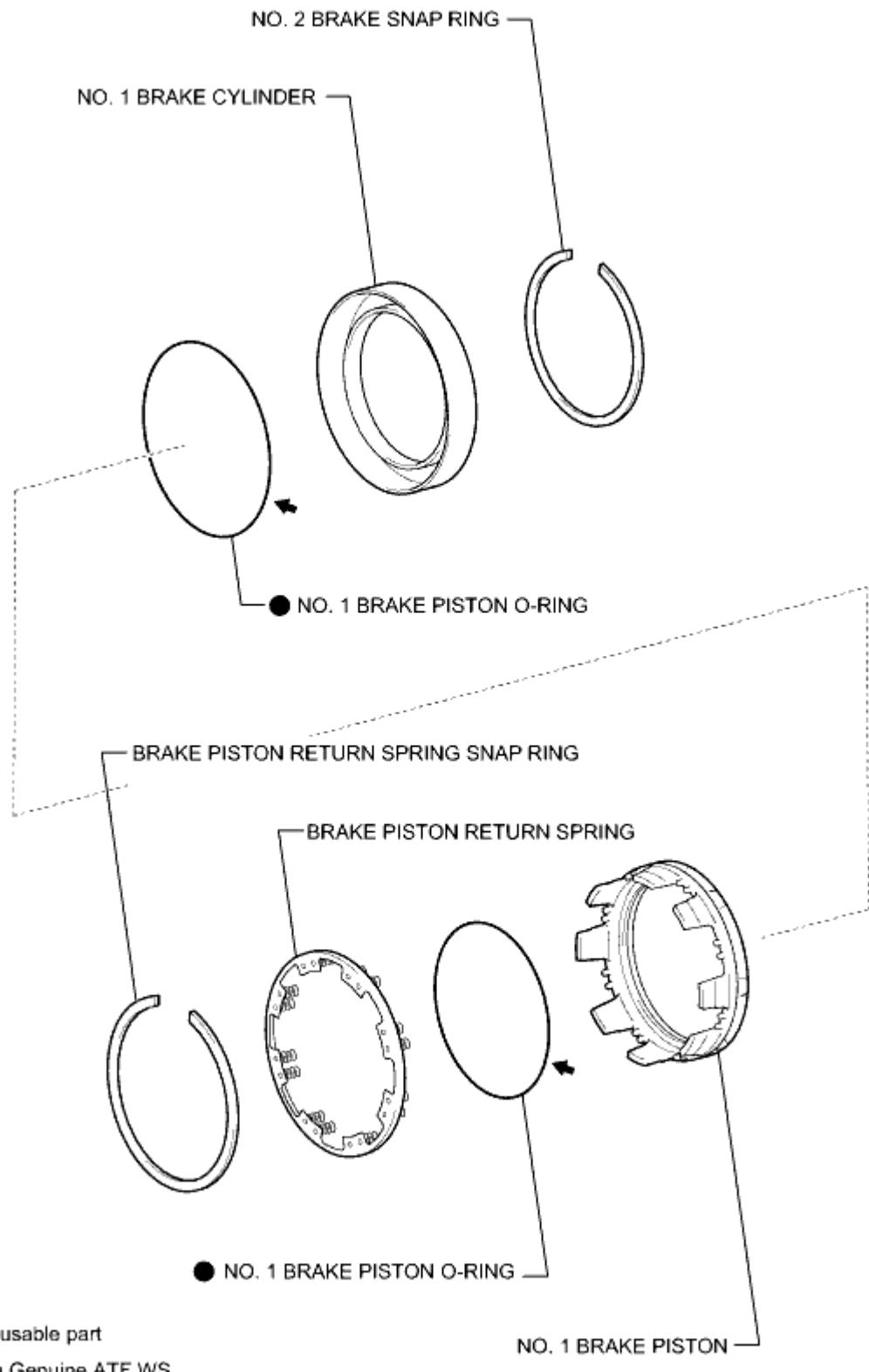
## ILLUSTRATION



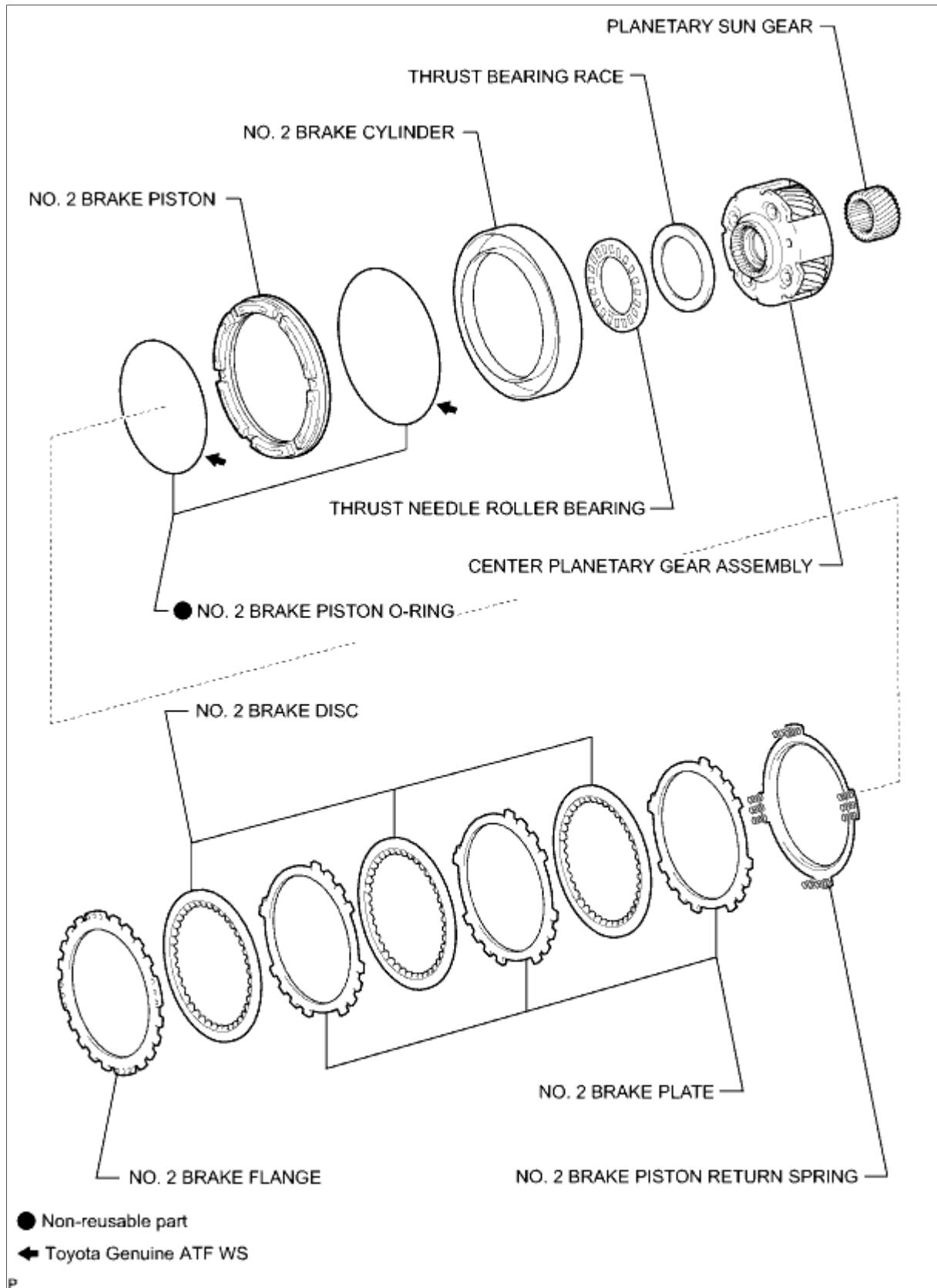
## ILLUSTRATION



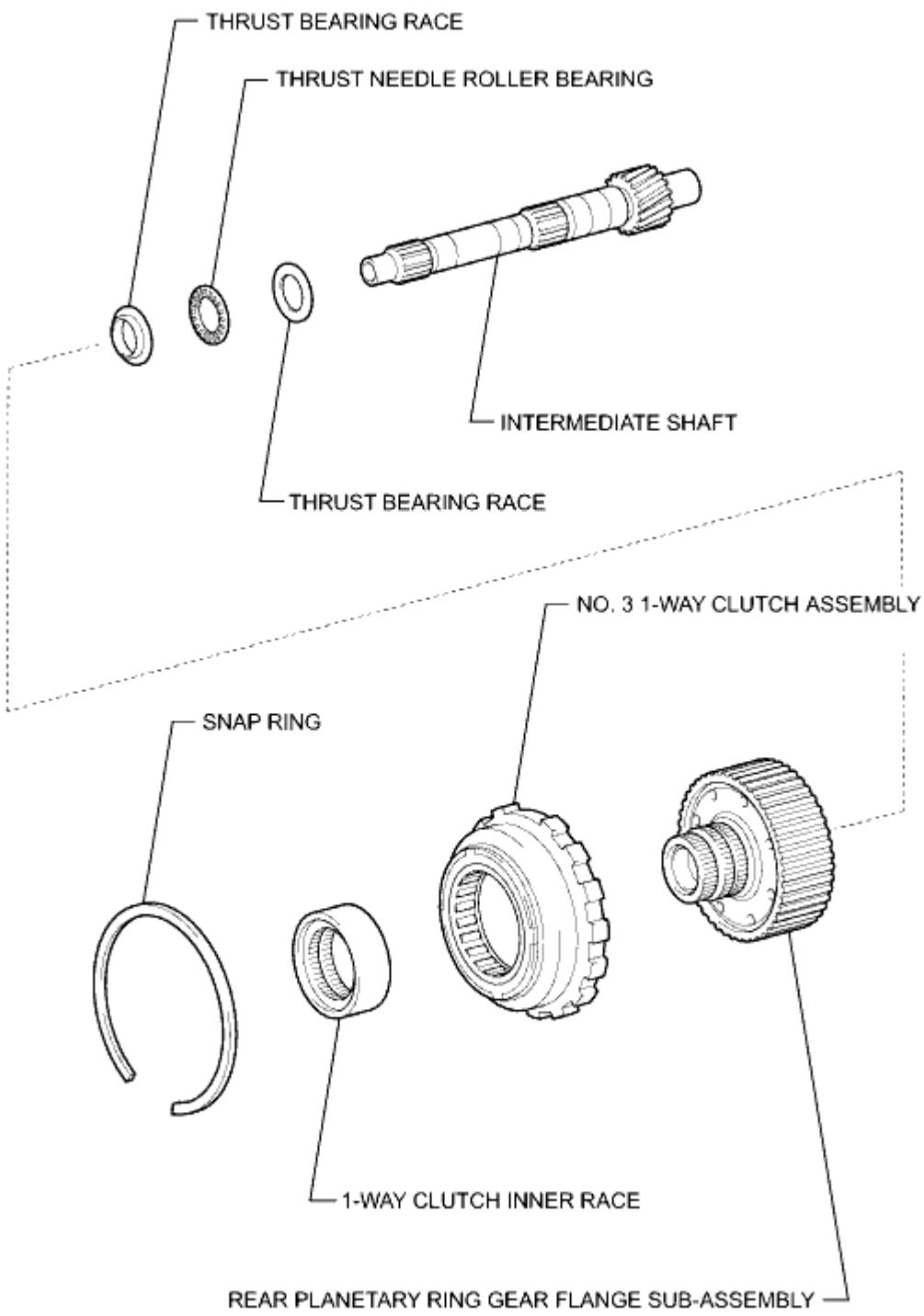
## ILLUSTRATION

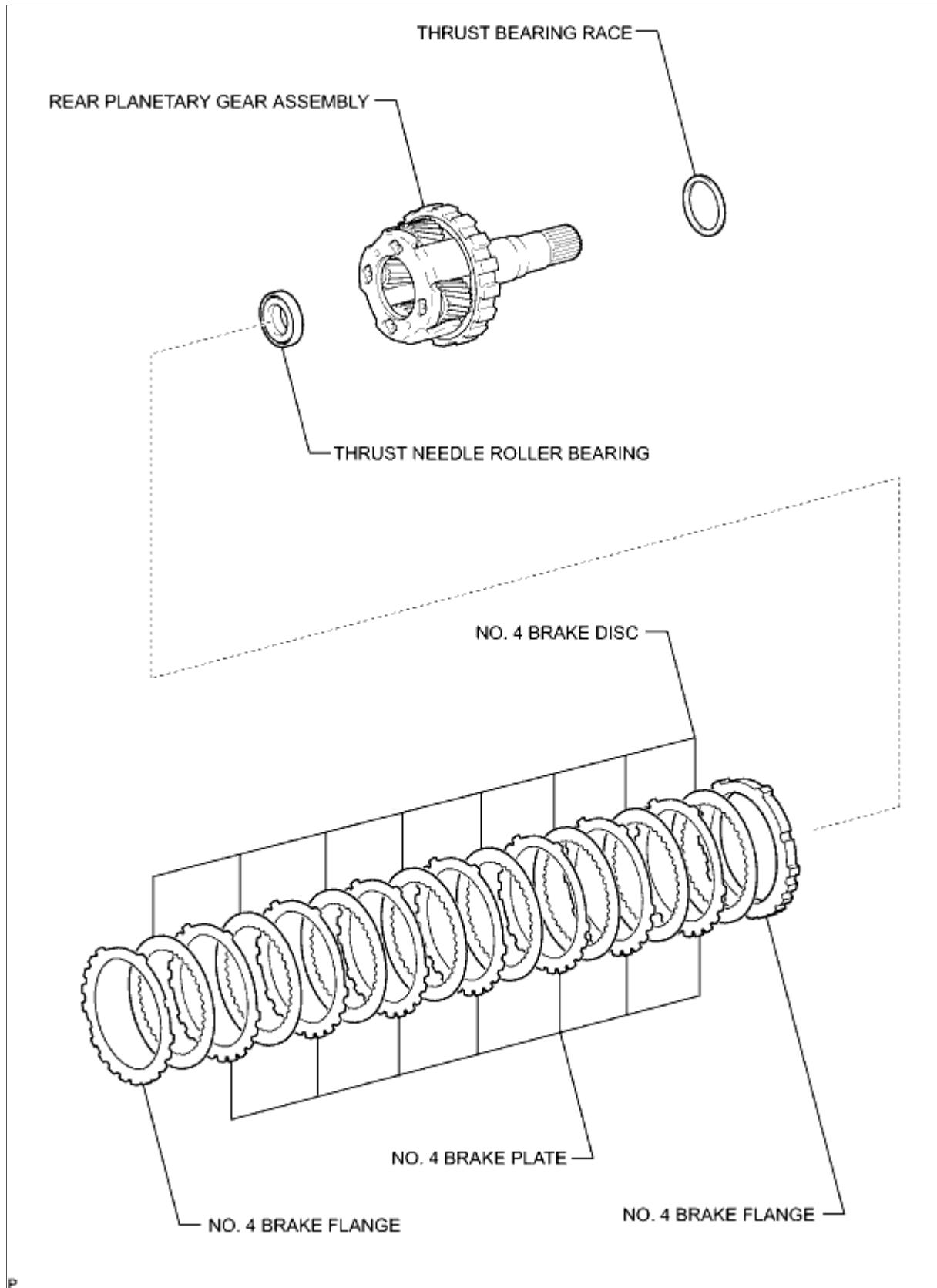


## ILLUSTRATION

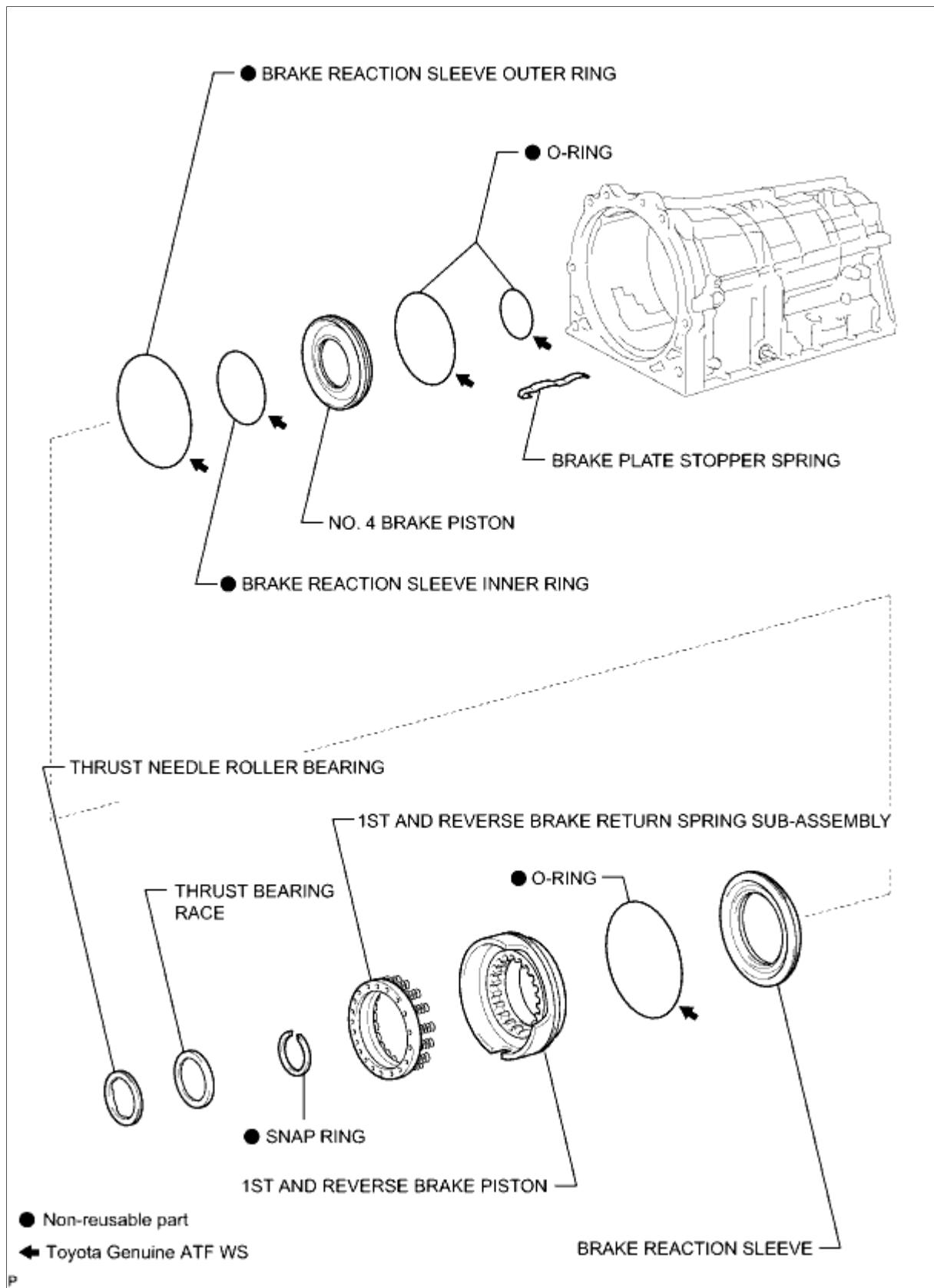


## ILLUSTRATION



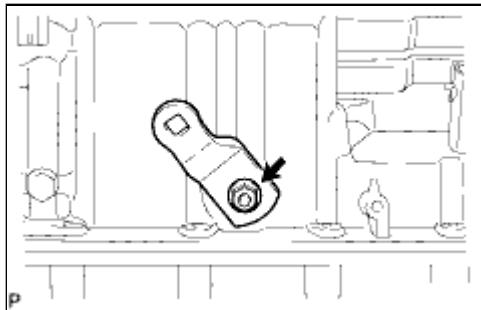


## ILLUSTRATION



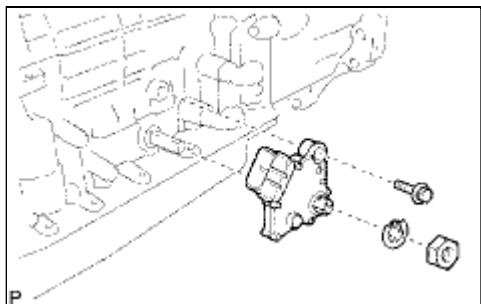
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013EZ02SX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: DISASSEMBLY (2010 4Runner)		

## **DISASSEMBLY**



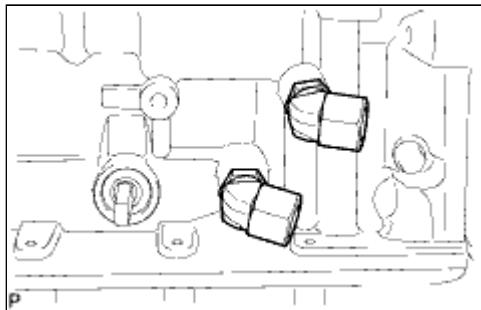
### **1. REMOVE TRANSMISSION CONTROL SHAFT LEVER LH**

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



### **2. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Using a screwdriver, bend the tabs of the lock washer.
- (b) Remove the nut, lock washer and bolt.
- (c) Remove the park/neutral position switch.

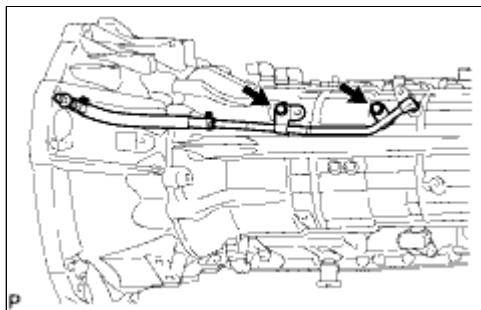
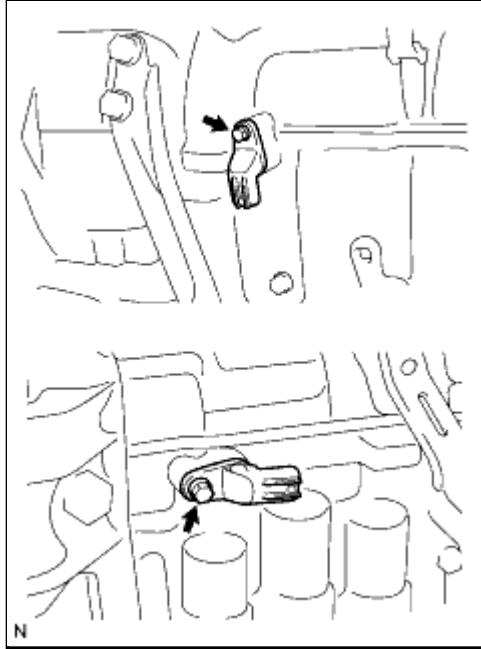


### **3. REMOVE OIL COOLER TUBE UNION**

- (a) Remove the 2 oil cooler tube unions.
- (b) Remove the 2 O-rings from the oil cooler tube unions.

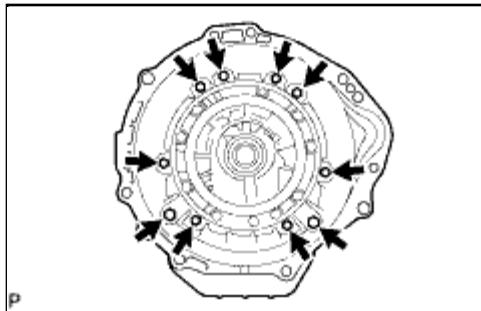
### **4. REMOVE SPEED SENSOR**

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



## 5. REMOVE AUTOMATIC TRANSMISSION BREATHER TUBE

- Remove the 2 bolts.
- Remove the breather tube.
- Remove the O-ring from the tube.



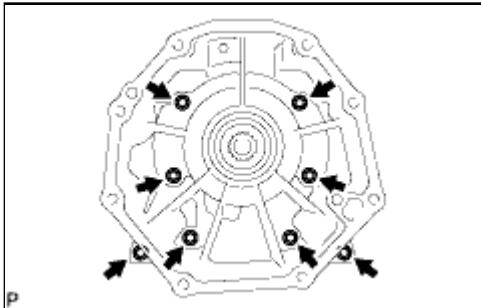
## 6. REMOVE AUTOMATIC TRANSMISSION HOUSING

- Remove the 10 bolts.
- Remove the transmission housing.

## 7. REMOVE REAR ADAPTOR TRANSFER

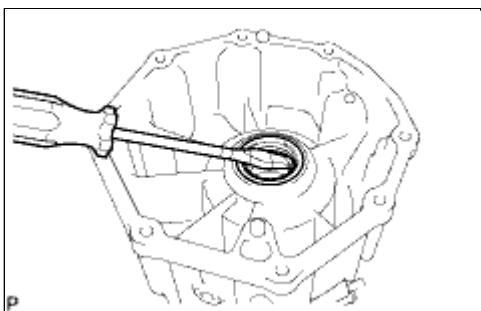
- Remove the 8 bolts.
- Remove the transmission case adapter.

**HINT:**



**Use a brass bar and hammer to remove the transmission case adapter.**

- (c) Remove the 2 transfer case ring pins from the transmission case adapter.



## 8. REMOVE TRANSMISSION CASE ADAPTER REAR OIL SEAL

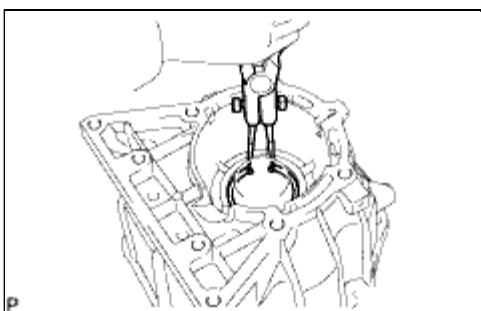
- (a) Using a screwdriver, pry out the oil seal.

**HINT:**

Tape the screwdriver with tip before use.

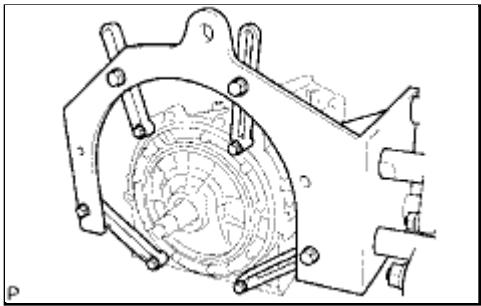
**NOTICE:**

Be careful not to damage the transmission case.



## 9. REMOVE REAR TRANS CASE ADAPTOR OIL RECEIVER

- (a) Using snap ring pliers, remove the snap ring and oil receiver.



## 10. FIX AUTOMATIC TRANSMISSION CASE SUB-ASSEMBLY

- (a) Install the transmission case to an overhaul attachment.

## 11. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

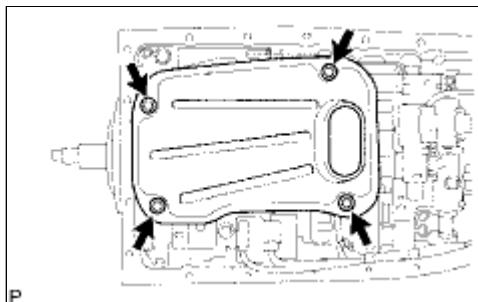
**NOTICE:**

Do not turn the transmission over as this will contaminate the valve body with foreign matter in the bottom of the pan.

- (a) Remove the drain plug and 20 bolts.
- (b) Remove the 4 magnets from the oil pan.

## 12. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

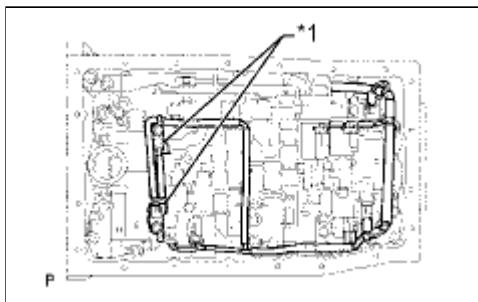
INFO



## 13. REMOVE VALVE BODY OIL STRAINER ASSEMBLY

- (a) Turn over the transmission.
- (b) Remove the 4 bolts and oil strainer from the valve body.
- (c) Remove the O-ring from the oil strainer.

## 14. REMOVE TRANSMISSION WIRE



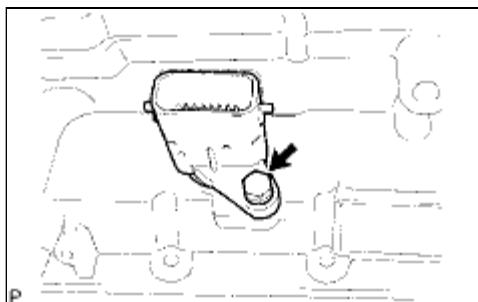
- (a) Remove the 2 bolts and 2 temperature sensor clamps, and disconnect the 2 ATF temperature sensors.

### Text in Illustration

\* 1

Temperature Sensor Clamp

- (b) Disconnect the 7 connectors from the solenoid valves.

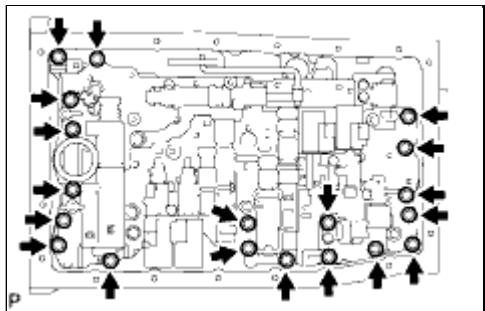


- (c) Remove the bolt from the case.

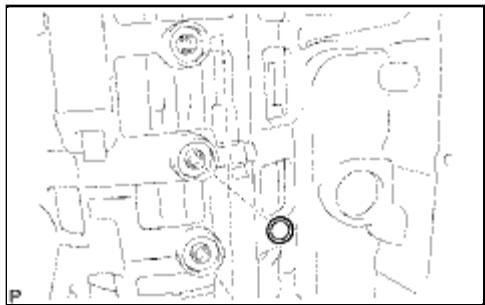
- (d) Pull the transmission wire out of the transmission case to remove it.
- (e) Remove the O-ring from the transmission wire.

## **15. REMOVE TRANSMISSION VALVE BODY ASSEMBLY**

(a) Remove the bolt, detent spring cover and detent spring.



(b) Remove the 19 bolts and valve body.



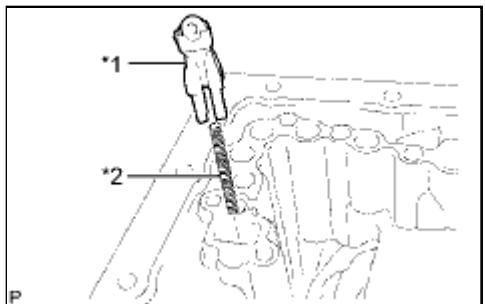
## **16. REMOVE TRANSMISSION CASE GASKET**

(a) Remove the 3 gaskets.



## **17. REMOVE BRAKE DRUM GASKET**

(a) Remove the 3 gaskets.

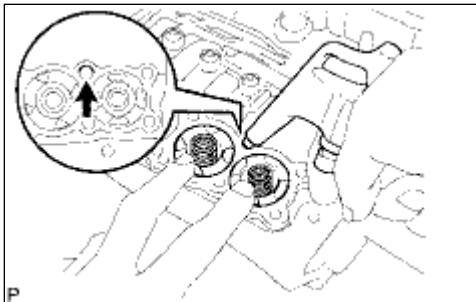


## **18. REMOVE CHECK BALL BODY**

(a) Remove the check ball body and spring.

### **Text in Illustration**

*1	Check Ball Body
*2	Spring

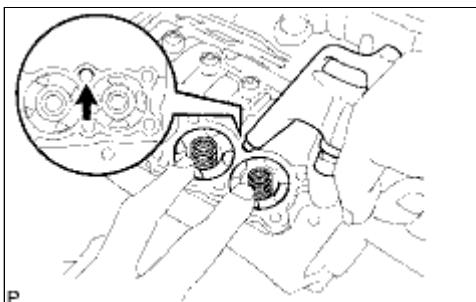


## 19. REMOVE C-2 ACCUMULATOR PISTON

- Apply compressed air to the oil hole to remove the C-2 accumulator piston and spring.
- Remove the 2 O-rings from the piston.

**NOTICE:**

Be careful as the C-3 and B-3 accumulator pistons may jump out.

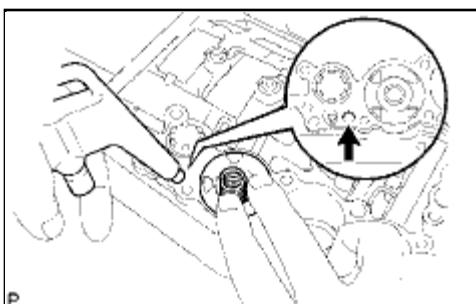


## 20. REMOVE B-3 ACCUMULATOR PISTON

- Apply compressed air to the oil hole to remove the B-3 accumulator piston and spring.
- Remove the 2 O-rings from the piston.

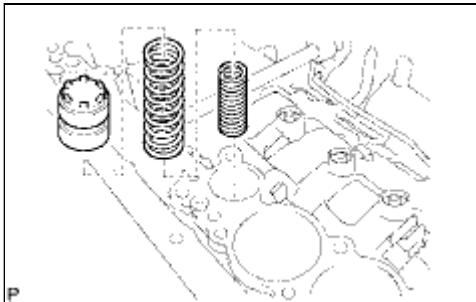
**NOTICE:**

Be careful as the C-3 accumulator piston may jump out.



## 21. REMOVE C-3 ACCUMULATOR PISTON

- Apply compressed air to the oil hole to remove the C-3 accumulator piston and 2 springs.
- Remove the 2 O-rings from the piston.

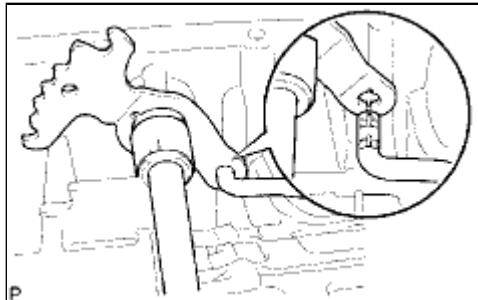
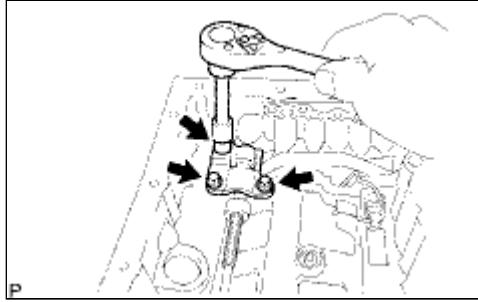


## 22. REMOVE C-1 ACCUMULATOR VALVE

- Remove the C-1 accumulator valve and 2 springs.

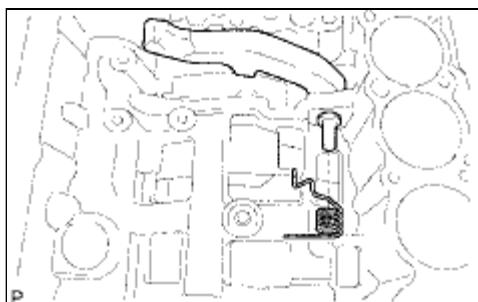
## 23. REMOVE PARKING LOCK PAWL BRACKET

- Remove the 3 bolts and bracket.



#### 24. REMOVE PARKING LOCK ROD SUB-ASSEMBLY

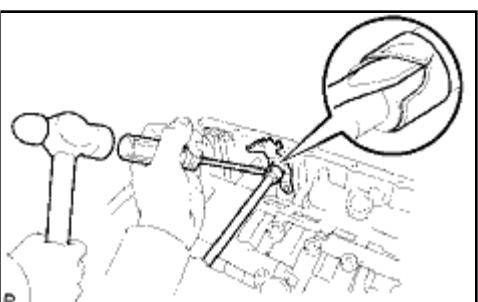
- Disconnect the parking lock rod from the manual valve lever to remove it.



#### 25. REMOVE PARKING LOCK PAWL SHAFT

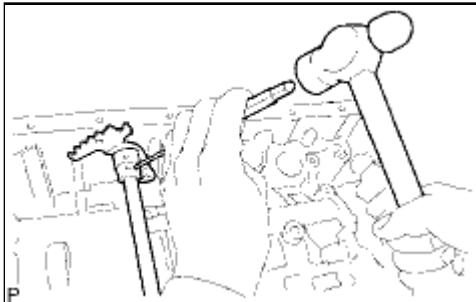
- Pull out the parking lock pawl shaft from the front side to remove it, and then remove the lock pawl and spring.
- Remove the E-ring from the shaft.

#### 26. REMOVE MANUAL VALVE LEVER SUB-ASSEMBLY



(a) Using a hammer and screwdriver, cut off the spacer and remove it from the shaft.

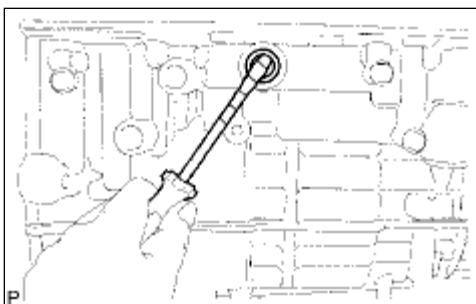
(b) Using a pin punch and hammer, tap out the spring pin.



**HINT:**

**Slowly drive out the spring pin so that it does not fall into the transmission case.**

- (c) Pull the manual valve lever shaft out through the case and remove the manual valve lever.



**27. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL**

- (a) Using a screwdriver, pry out the 2 oil seals.

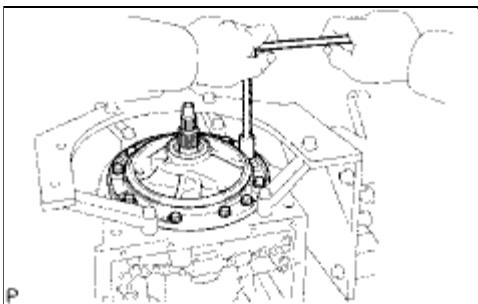
**HINT:**

**Tape the screwdriver tip before use.**

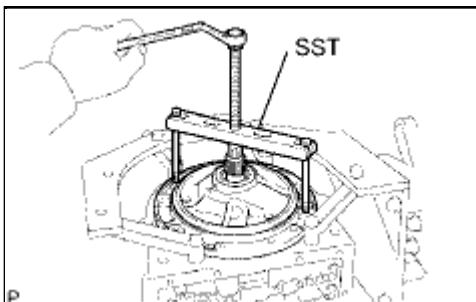
**NOTICE:**

**Be careful not to damage the transmission case.**

**28. REMOVE OIL PUMP ASSEMBLY**



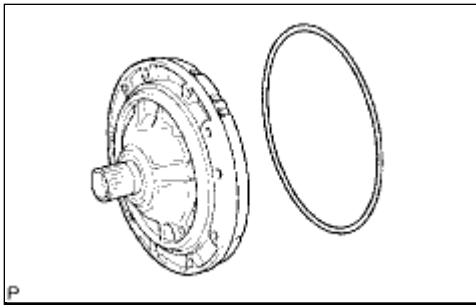
- (a) Remove the 10 bolts.



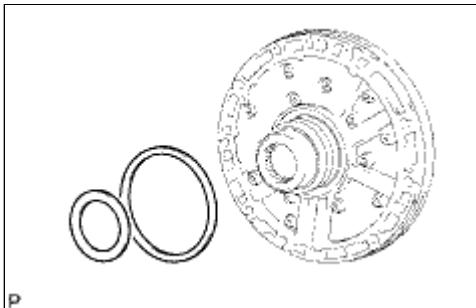
- (b) Using SST, remove the oil pump.

**SST: 09350-30020**

**09350-07020**

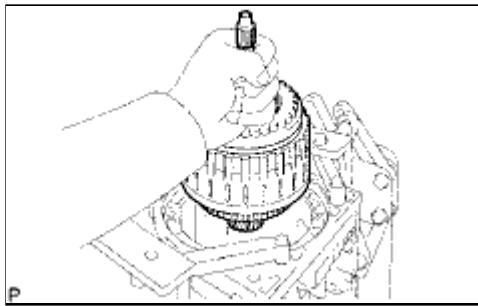


(c) Remove the O-ring from the front oil pump.

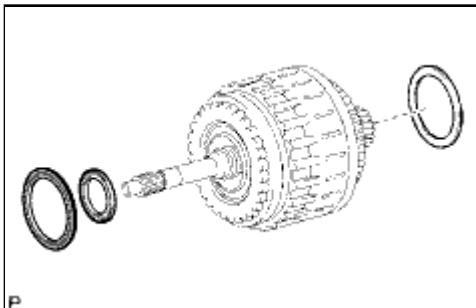


(d) Remove the 2 thrust bearing races from the front oil pump.

## 29. REMOVE CLUTCH DRUM AND INPUT SHAFT ASSEMBLY



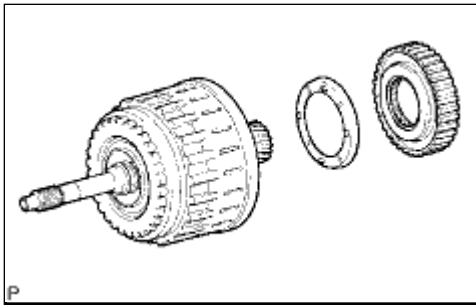
(a) Remove the clutch drum and input shaft assembly from the transmission case.



(b) Remove the clutch drum thrust washer and 2 thrust needle roller bearings.

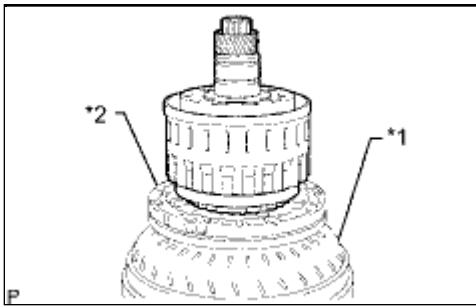
## 30. INSPECT NO. 2 1-WAY CLUTCH ASSEMBLY

INFO



### 31. REMOVE NO. 2 1-WAY CLUTCH ASSEMBLY

- (a) Remove the 1-way clutch and No. 2 clutch drum thrust washer from the clutch drum and input shaft assembly.



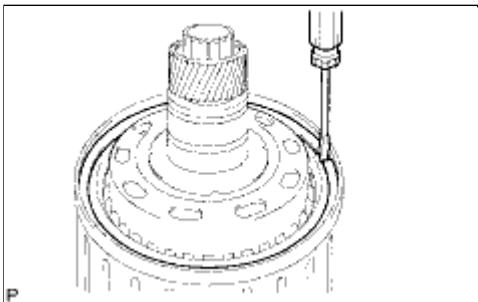
### 32. FIX CLUTCH DRUM AND INPUT SHAFT ASSEMBLY

- (a) Place the oil pump onto the torque converter clutch, and then place the clutch drum and input shaft assembly onto the oil pump.

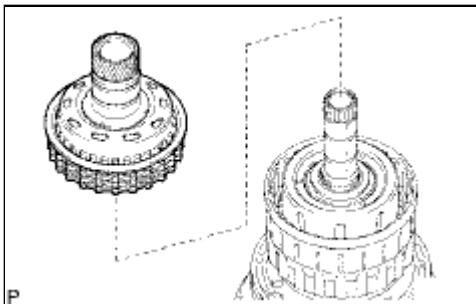
#### Text in Illustration

*1	Torque Converter Clutch
*2	Oil Pump

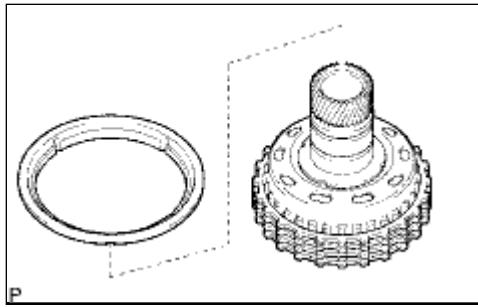
### 33. REMOVE REVERSE CLUTCH HUB SUB-ASSEMBLY



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



- (b) Remove the reverse clutch hub sub-assembly, reverse clutch reaction sleeve, clutch cushion, plate reverse clutch flange, 5 reverse clutch discs and 4 clutch plates from the clutch drum.



#### 34. REMOVE REVERSE CLUTCH REACTION SLEEVE

- (a) Remove the reverse clutch reaction sleeve from the reverse clutch hub.

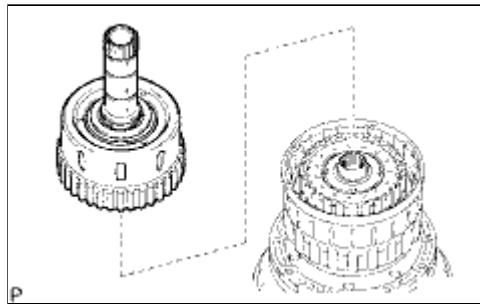
#### 35. REMOVE REAR CLUTCH DISC

- (a) Remove the clutch cushion plate, reverse clutch flange, 5 discs and 4 plates from the reverse clutch hub.

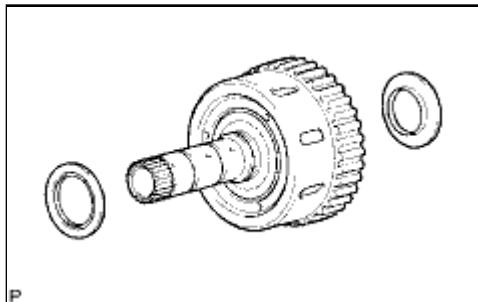
#### 36. INSPECT REAR CLUTCH DISC INFO

#### 37. INSPECT REVERSE CLUTCH HUB SUB-ASSEMBLY INFO

#### 38. REMOVE FORWARD CLUTCH HUB SUB-ASSEMBLY



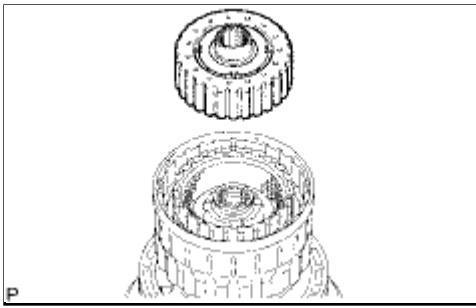
- (a) Remove the forward clutch hub from the clutch drum.



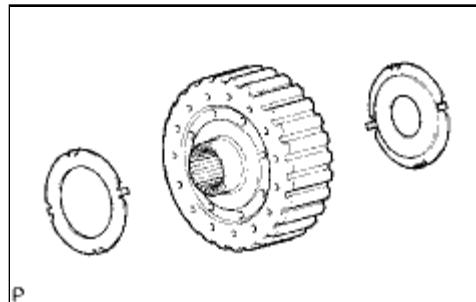
- (b) Remove the 2 thrust needle roller bearings from the forward clutch hub.

#### 39. INSPECT FORWARD CLUTCH HUB SUB-ASSEMBLY INFO

#### 40. REMOVE MULTIPLE DISC CLUTCH HUB

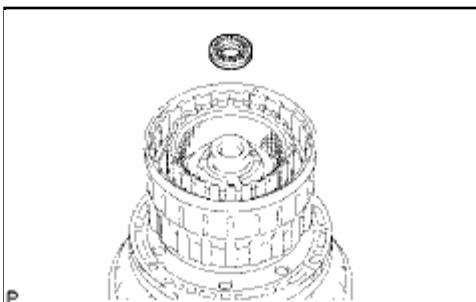


(a) Remove the multiple disc clutch hub from the clutch drum.

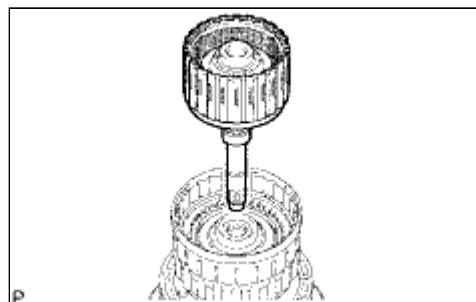


(b) Remove the 2 thrust bearing races from the multiple disc clutch hub.

#### **41. REMOVE INPUT SHAFT ASSEMBLY**

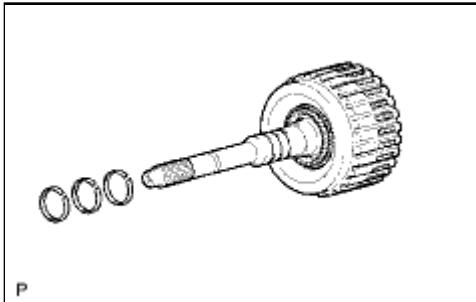


(a) Remove the thrust needle roller bearing from the clutch drum.

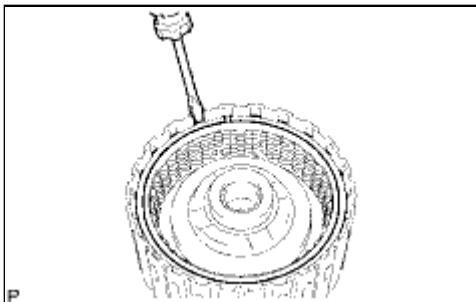


(b) Remove the input shaft assembly from the clutch drum.

#### **42. REMOVE INPUT SHAFT OIL SEAL RING**



(a) Remove the 3 oil seal rings from the input shaft.



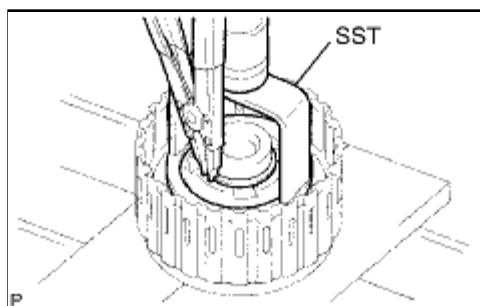
#### 43. REMOVE FORWARD MULTIPLE DISC CLUTCH DISC

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

(b) Remove the 2 flanges, 6 discs and 5 plates from the input shaft.

#### 44. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC INFO

#### 45. REMOVE NO. 1 CLUTCH BALANCER



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

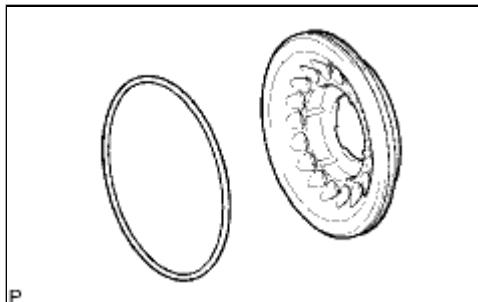
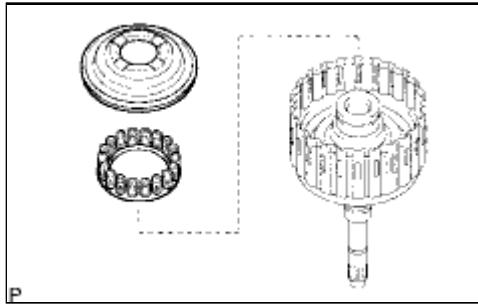
**SST: 09350-30020**

09350-07040

09350-07070

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

(c) Remove the clutch balancer and forward clutch return spring from the input shaft assembly.

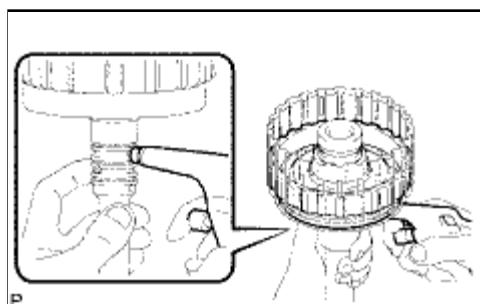


(d) Remove the O-ring from the No. 1 clutch balancer.

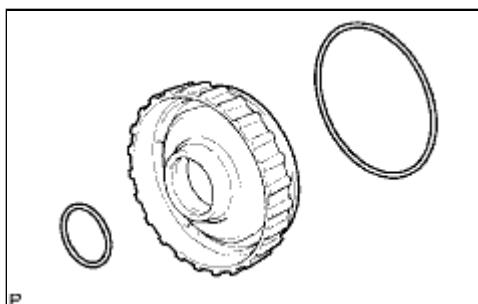
#### 46. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

INFO

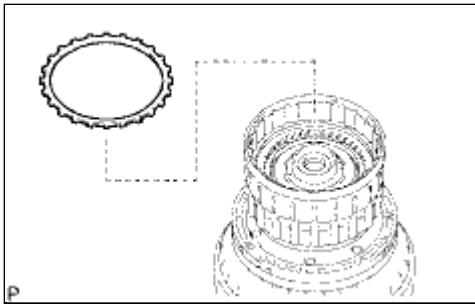
#### 47. REMOVE FORWARD CLUTCH PISTON



(a) Hold the input shaft by hand and apply compressed air to the input shaft to remove the forward clutch piston.

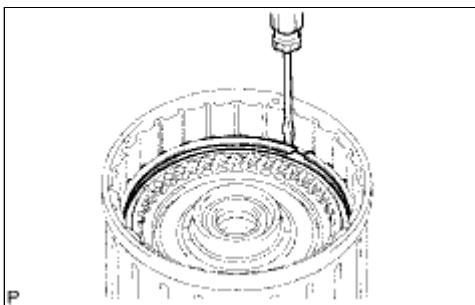


(b) Remove the 2 O-rings from the forward clutch piston.



#### 48. REMOVE REVERSE CLUTCH FLANGE

- Remove the reverse clutch flange from the clutch drum.

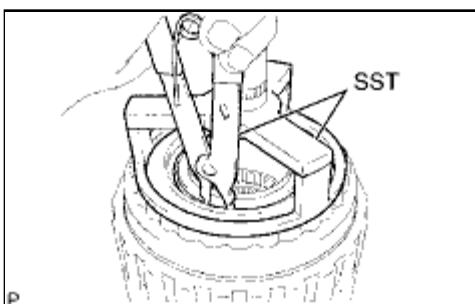


#### 49. REMOVE DIRECT CLUTCH DISC

- Using a screwdriver, remove the 2 hole snap rings from the clutch drum.
- Remove the reverse clutch flange, 5 discs and 5 plates from the clutch drum.

#### 50. INSPECT DIRECT CLUTCH DISC

INFO



#### 51. REMOVE NO. 3 CLUTCH BALANCER

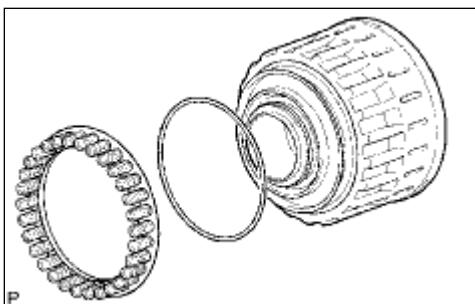
- Place SST on the clutch balancer and compress the return spring with a press.

**SST: 09387-00070**

- Using SST, remove the snap ring.

**SST: 09350-30020**

09350-07070



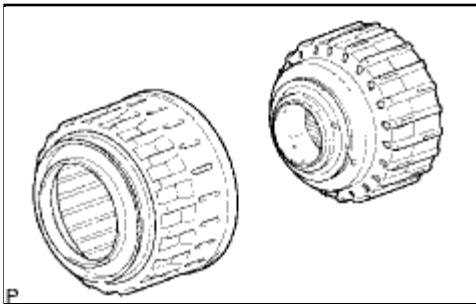
#### 52. REMOVE REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY

- Remove the reverse clutch return spring and O-ring from the reverse clutch piston.

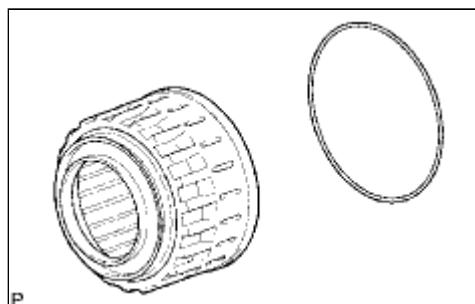
#### 53. INSPECT REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY

INFO

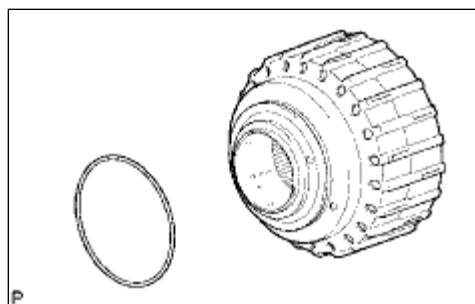
#### **54. REMOVE REVERSE CLUTCH PISTON SUB-ASSEMBLY**



(a) Remove the reverse clutch piston sub-assembly from the clutch drum.

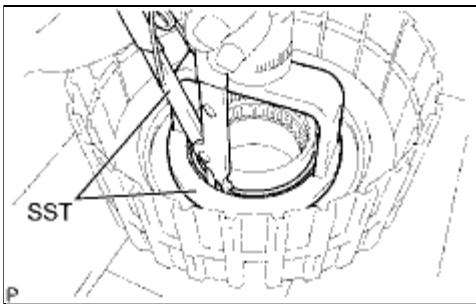


(b) Remove the O-ring from the reverse clutch piston.



(c) Remove the O-ring from the clutch drum.

#### **55. REMOVE DIRECT CLUTCH PISTON SUB-ASSEMBLY**



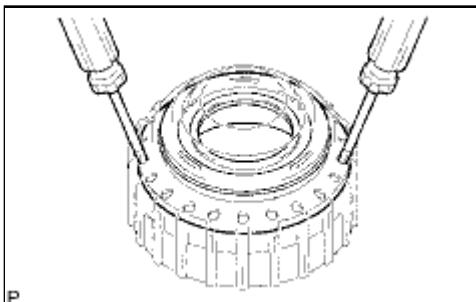
(a) Place SST on the direct clutch piston and compress the return spring with a press.

**SST: 09320-89010**

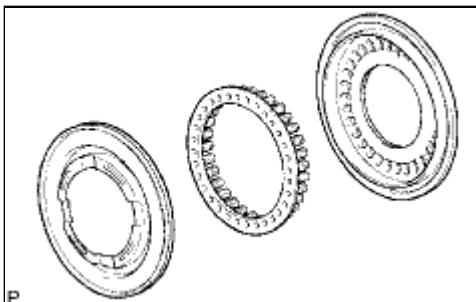
(b) Using SST, remove the snap ring.

**SST: 09350-30020**

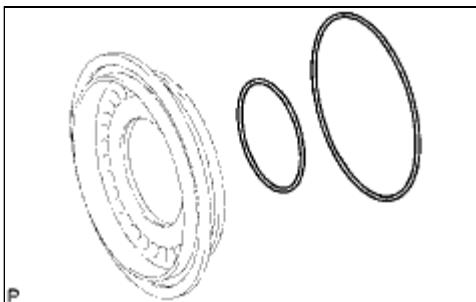
09350-07070



(c) Using 2 screwdrivers, remove the direct clutch piston sub-assembly from the clutch drum.



(d) Remove the No. 2 clutch balancer and direct clutch return spring from the direct clutch piston.



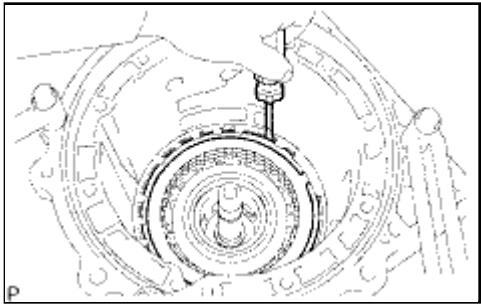
(e) Remove the 2 O-rings from the direct clutch piston.

## 56. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY



## 57. REMOVE NO. 3 BRAKE SNAP RING

(a) Using a screwdriver, remove the No. 3 brake snap ring from the case.

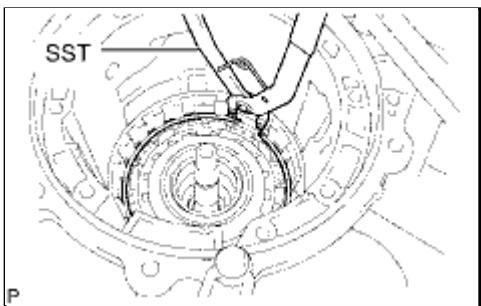


## 58. REMOVE NO. 3 BRAKE DISC

(a) Remove the flange, 4 discs, 4 plates and cushion plate from the case.

## 59. INSPECT NO. 3 BRAKE DISC

**INFO**

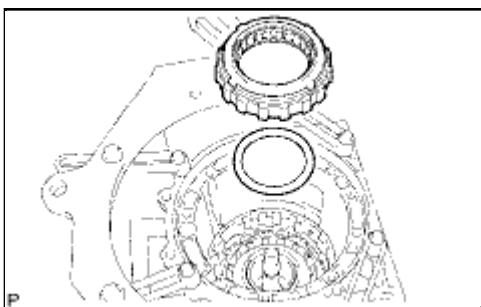


## 60. REMOVE 2ND BRAKE PISTON HOLE SNAP RING

(a) Using SST, remove the snap ring.

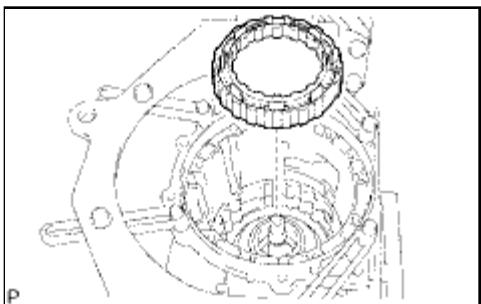
**SST: 09350-30020**

09350-07060



## 61. REMOVE 1-WAY CLUTCH ASSEMBLY

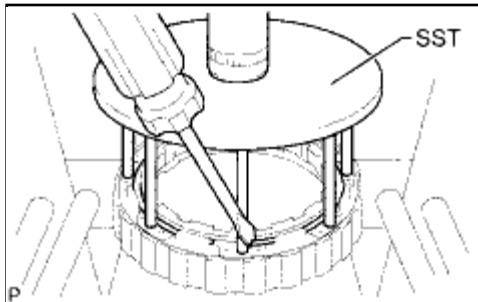
(a) Remove the 1-way clutch assembly and No. 1 planetary carrier thrust washer from the case.



## 62. REMOVE 2ND BRAKE CYLINDER

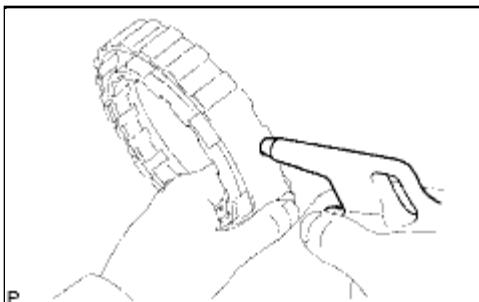
(a) Remove the 2nd brake cylinder from the case.

### 63. REMOVE 2ND BRAKE PISTON

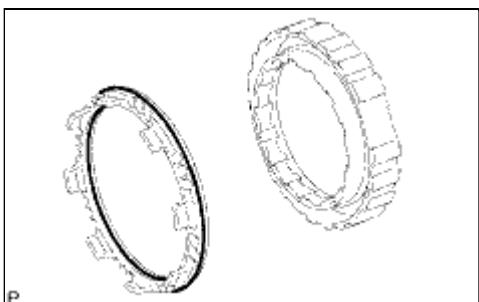


(a) Using SST and a press, compress the return spring and remove the snap ring.

**SST: 09351-40010**



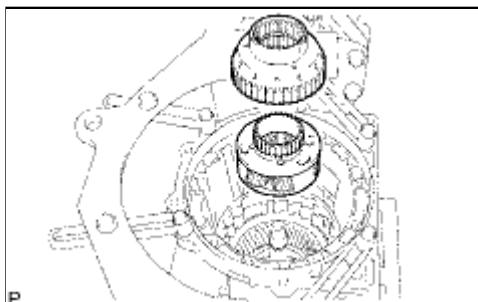
(b) Hold the 2nd brake cylinder and apply compressed air to the 2nd brake cylinder to remove the 2nd brake piston.



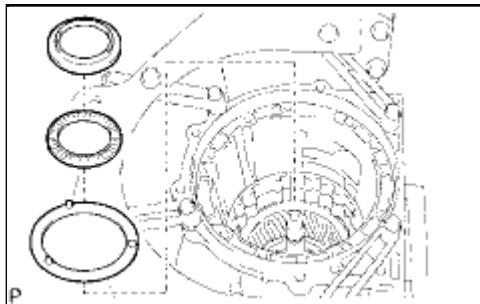
(c) Remove the 2 O-rings from the 2nd brake piston.

### 64. INSPECT NO. 3 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY INFO

### 65. REMOVE FRONT PLANETARY GEAR ASSEMBLY



(a) Remove the 1-way clutch inner race and front planetary gear assembly from the case.



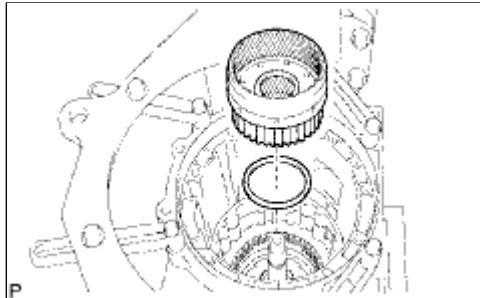
(b) Remove the thrust bearing race, thrust needle roller bearing and No. 2 planetary carrier thrust washer from the front planetary gear assembly.

## 66. INSPECT FRONT PLANETARY GEAR ASSEMBLY

[INFO]

## 67. INSPECT 1-WAY CLUTCH ASSEMBLY

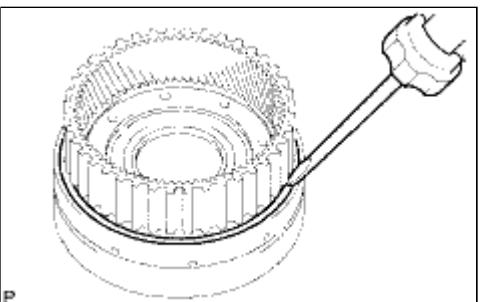
[INFO]



## 68. REMOVE FRONT PLANETARY RING GEAR

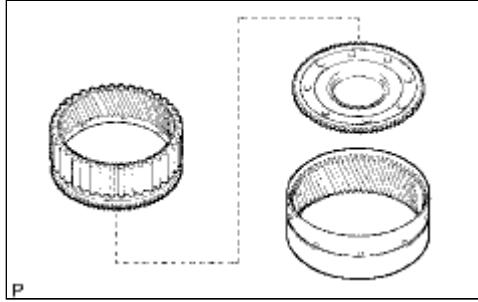
(a) Remove the front planetary ring gear and thrust needle roller bearing from the transmission case.

## 69. REMOVE CENTER PLANETARY RING GEAR



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

(b) Remove the center planetary ring gear and front planetary ring gear flange from the front planetary ring gear.

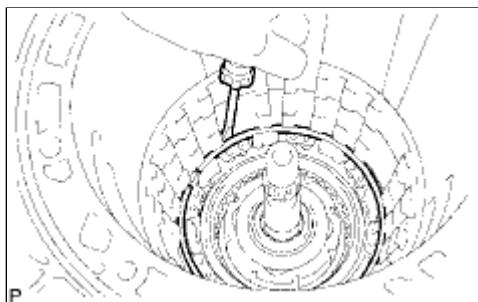


## 70. REMOVE NO. 1 BRAKE DISC

- (a) Remove the flange, 3 discs and 3 plates from the case.

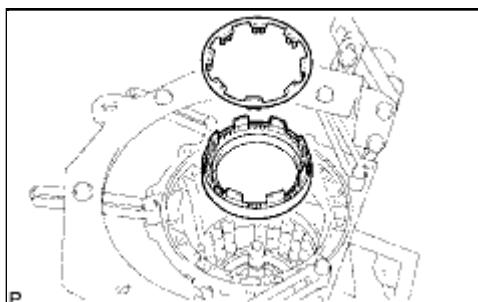
## 71. INSPECT NO. 1 BRAKE DISC

INFO



## 72. REMOVE BRAKE PISTON RETURN SPRING SNAP RING

- (a) Using a screwdriver, remove the brake piston return spring snap ring from the case.



## 73. REMOVE BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Remove the brake piston return spring and No. 1 brake piston with No. 1 brake cylinder from the transmission case.

## 74. INSPECT BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

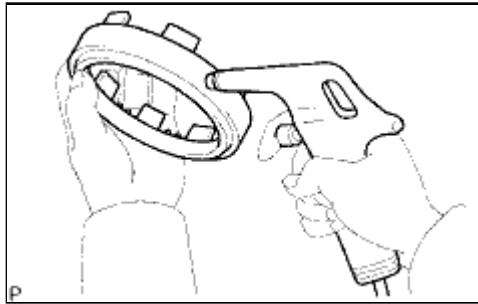
INFO

## 75. REMOVE NO. 1 BRAKE PISTON

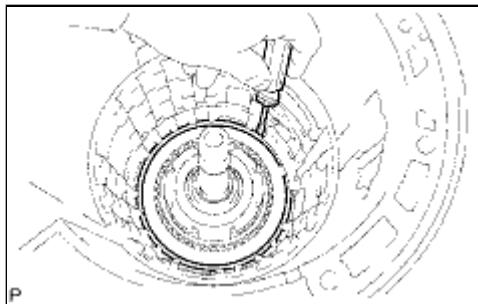
- (a) Hold the No. 1 brake cylinder and apply compressed air to the No. 1 brake cylinder to remove the No. 1 brake piston.

### HINT:

If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.



(b) Remove the 2 O-rings from the No. 1 brake piston.



## 76. REMOVE NO. 2 BRAKE DISC

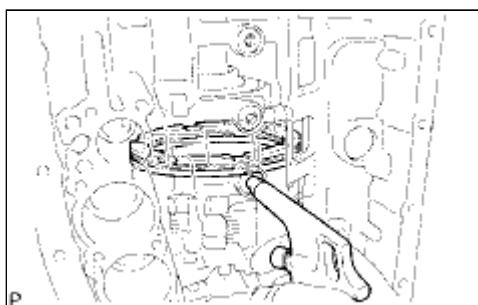
- Using a screwdriver, remove the snap ring from the case.
- Remove the flange, 3 discs, 3 plates and brake piston return spring from the case.

## 77. INSPECT NO. 2 BRAKE DISC

**INFO**

## 78. INSPECT NO. 2 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

**INFO**



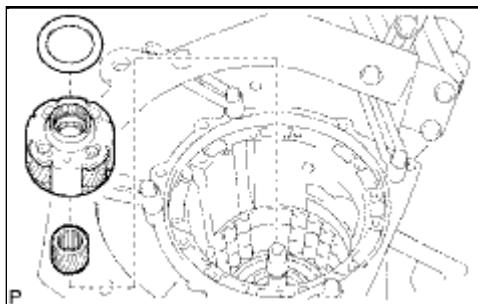
## 79. REMOVE NO. 2 BRAKE PISTON

- Apply compressed air to the transmission case to remove the No. 2 brake piston.

### HINT:

If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

- Remove the 2 O-rings from the No. 2 brake piston.



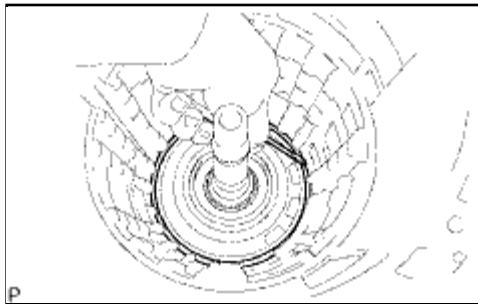
## 80. REMOVE CENTER PLANETARY GEAR ASSEMBLY

- Remove the thrust bearing race, center planetary gear and planetary sun gear from the case.

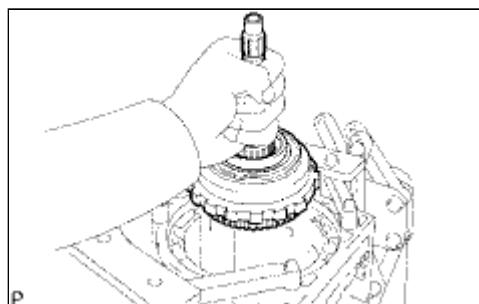
## 81. INSPECT CENTER PLANETARY GEAR ASSEMBLY

**INFO**

## 82. REMOVE INTERMEDIATE SHAFT

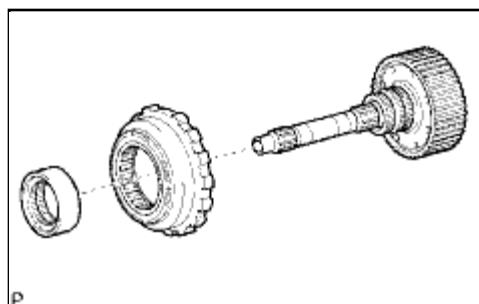


(a) Using a screwdriver, remove the snap ring from the case.



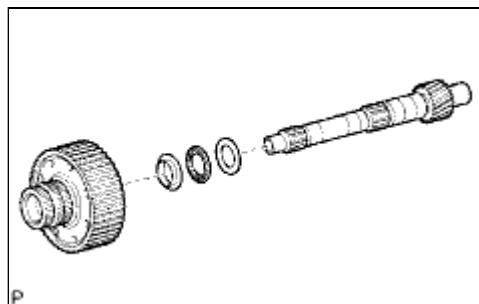
(b) Remove the intermediate shaft with No. 3 1-way clutch assembly from the case.

## 83. INSPECT NO. 3 1-WAY CLUTCH ASSEMBLY INFO



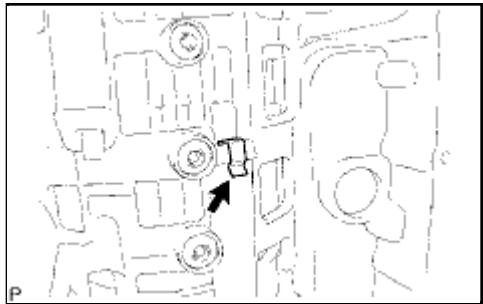
## 84. REMOVE NO. 3 1-WAY CLUTCH ASSEMBLY

(a) Remove the No. 3 1-way clutch assembly and 1-way clutch inner race from the intermediate shaft.

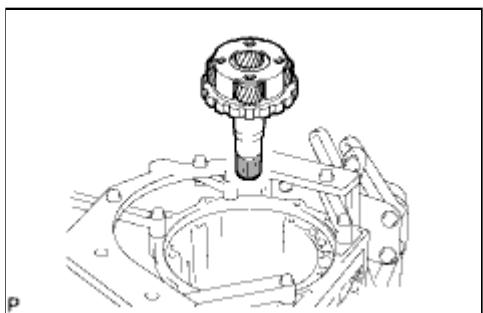


## 85. REMOVE REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY

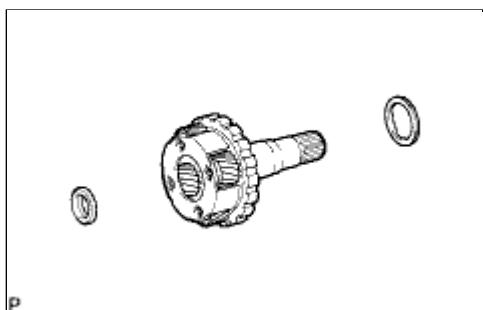
(a) Remove the planetary ring gear flange, 2 thrust bearing races and thrust needle roller bearing from the intermediate shaft.

**86. INSPECT REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY** INFO**87. INSPECT INTERMEDIATE SHAFT** INFO**88. REMOVE BRAKE PLATE STOPPER SPRING****89. REMOVE NO. 4 BRAKE DISC**

- (a) Remove the 7 plates, 8 discs and 2 flanges from the case.

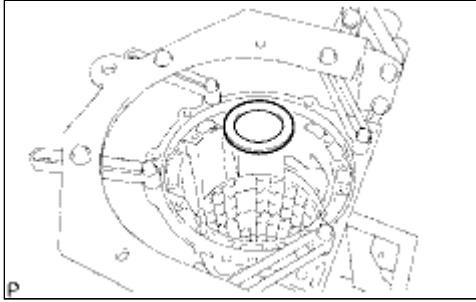
**90. INSPECT NO. 4 BRAKE DISC** INFO**91. REMOVE REAR PLANETARY GEAR ASSEMBLY**

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



- (b) Remove the 2 thrust needle roller bearings from the rear planetary gear.

- (c) Remove the thrust bearing race from the case.



## 92. INSPECT REAR PLANETARY GEAR ASSEMBLY

INFO

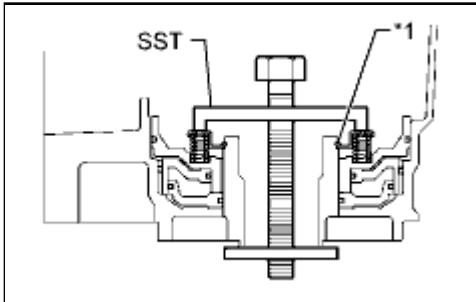
## 93. REMOVE 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

- Place SST on the spring retainer and compress the brake return spring.

**SST: 09350-30020**

09350-07050

### Text in Illustration



\*1 Snap Ring

- Using SST, remove the snap ring and brake return spring.

**SST: 09350-30020**

09350-07070

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

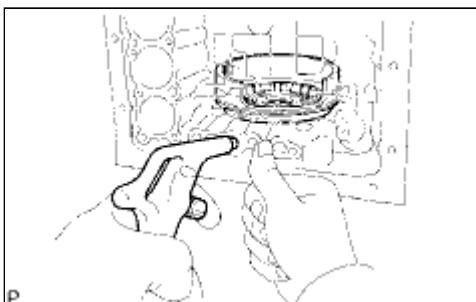
INFO

## 95. REMOVE 1ST AND REVERSE BRAKE PISTON

- Apply compressed air to the transmission case to remove the 1st and reverse brake piston.

### HINT:

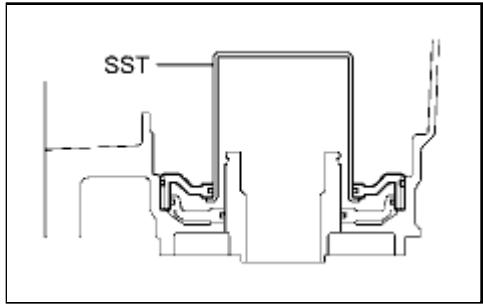
If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.



- Remove the O-ring from the 1st and reverse brake piston.

## 96. REMOVE BRAKE REACTION SLEEVE

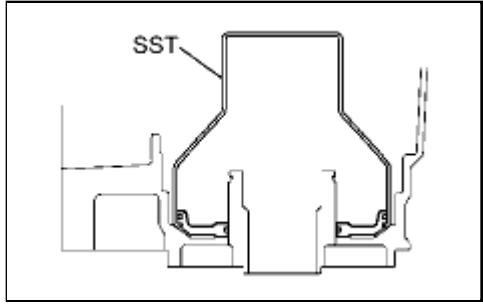
- Using SST, remove the reaction sleeve.



**SST: 09350-30020**

09350-07080

(b) Remove the 2 O-rings from the reaction sleeve.



## 97. REMOVE NO. 4 BRAKE PISTON

(a) Using SST, remove the brake piston.

**SST: 09350-30020**

09350-07090

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



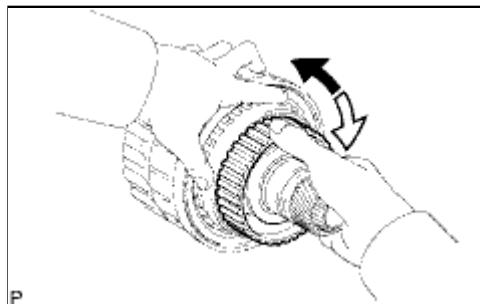
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013EX02TX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: INSPECTION (2010 4Runner)		

## INSPECTION

### 1. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

- (a) Remove the magnets and use them to collect steel particles.
- (b) Carefully look at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.
  - Steel (magnetic): bearing, gear and clutch plate wear
  - Brass (non-magnetic): bush wear

### 2. INSPECT NO. 2 1-WAY CLUTCH ASSEMBLY



- (a) Hold the reverse clutch hub and turn the 1-way clutch assembly.
- (b) Check that the 1-way clutch turns freely when turned clockwise and locks when turned counterclockwise.

#### Text in Illustration

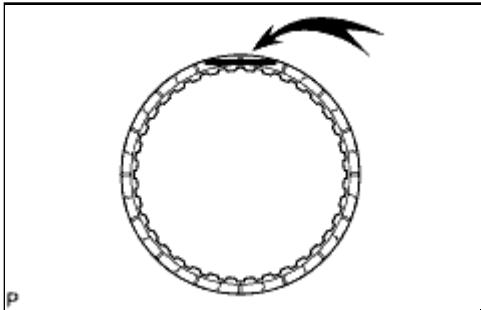
	Lock
	Free

### 3. INSPECT REAR CLUTCH DISC

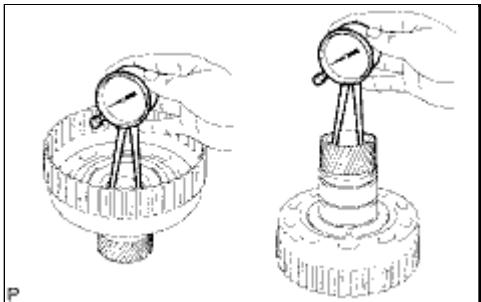
- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

#### NOTICE:

When assembling new discs, soak them in ATF for at least 15



**minutes before assembly.**



#### **4. INSPECT REVERSE CLUTCH HUB SUB-ASSEMBLY**

- (a) Using a dial indicator, measure the inside diameter of the reverse clutch hub bush.

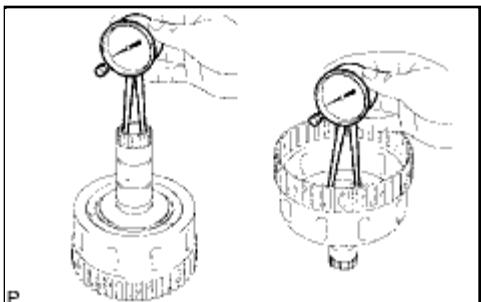
Standard inside diameter:

35.812 to 35.837 mm (1.410 to 1.411 in.)

Maximum inside diameter:

35.887 mm (1.413 in.)

If the inside diameter is more than the maximum, replace the reverse clutch hub.



#### **5. INSPECT FORWARD CLUTCH HUB SUB-ASSEMBLY**

- (a) Using a dial indicator, measure the inside diameter of the forward clutch hub bush.

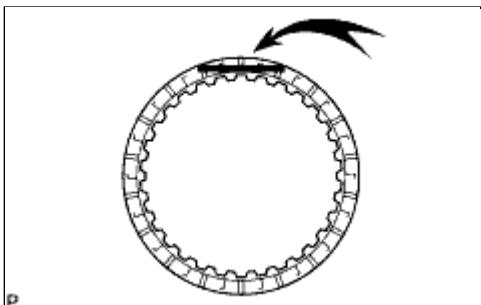
Standard inside diameter:

26.037 to 26.062 mm (1.025 to 1.026 in.)

Maximum inside diameter:

26.112 mm (1.028 in.)

If the inside diameter is more than the maximum, replace the forward clutch hub.

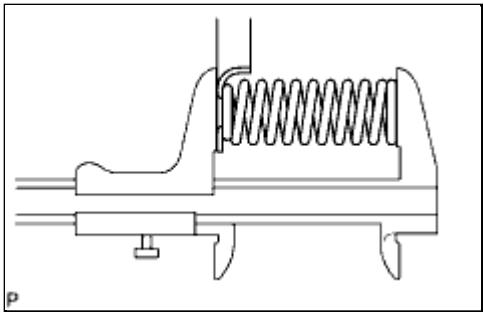


#### **6. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC**

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

##### **NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

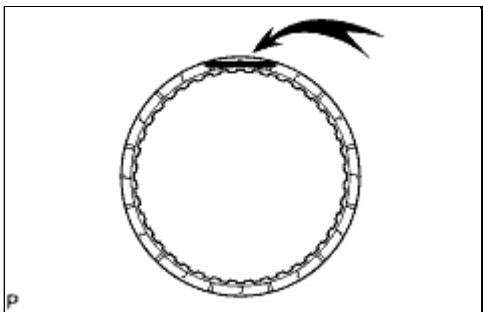


## 7. INSPECT FORWARD CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

26.74 mm (1.05 in.)

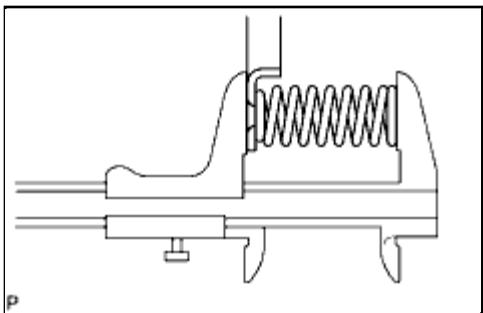


## 8. INSPECT DIRECT CLUTCH DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

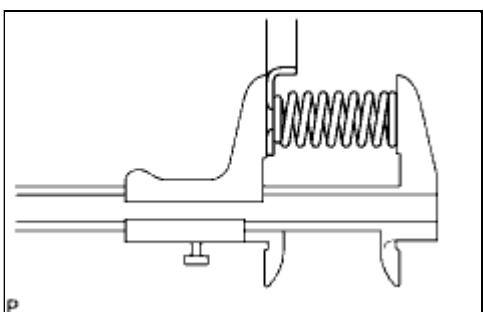


## 9. INSPECT REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

21.04 mm (0.828 in.)



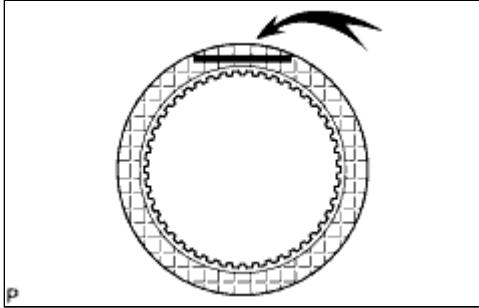
## 10. INSPECT DIRECT CLUTCH RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

19.51 mm (0.768 in.)

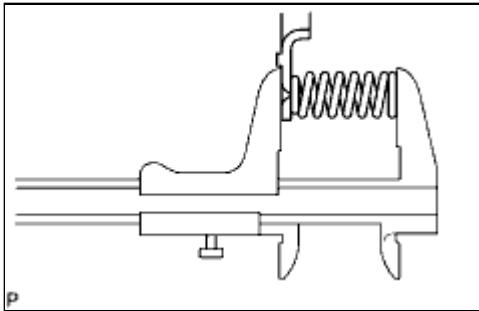
## 11. INSPECT NO. 3 BRAKE DISC



- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**



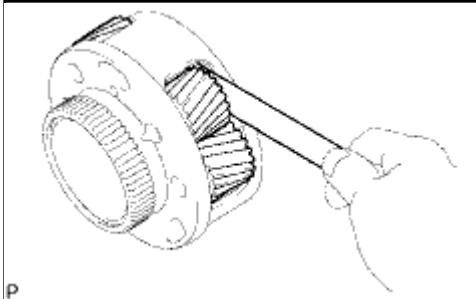
**12. INSPECT NO. 3 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY**

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

15.72 mm (0.619 in.)

**13. INSPECT FRONT PLANETARY GEAR ASSEMBLY**



- (a) Using a feeler gauge, measure the front planetary pinion gear thrust clearance.

Standard clearance:

0.2 to 0.6 mm (0.00787 to 0.0236 in.)

Maximum clearance:

0.65 mm (0.0256 in.)

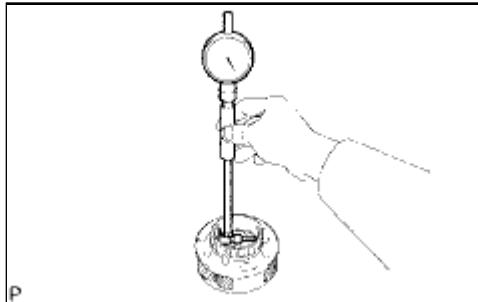
- If the clearance is more than the maximum, replace the front planetary gear assembly.

- (b) Using a cylinder gauge, measure the inside diameter of the front planetary gear bush.

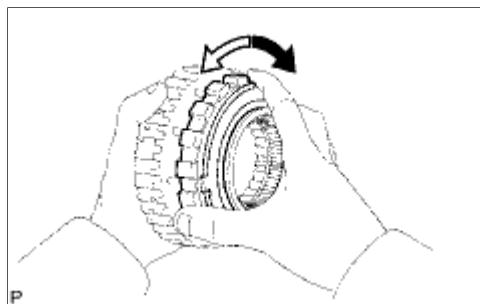
Maximum inside diameter:

57.48 mm (2.26 in.)

If the inside diameter is more than the maximum, replace the front planetary gear.



#### 14. INSPECT 1-WAY CLUTCH ASSEMBLY

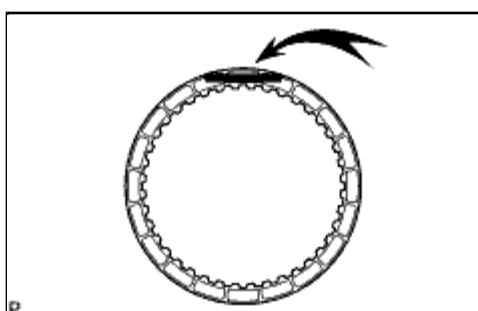


- Install the 1-way clutch to the 1-way clutch inner race.
- Hold the 1-way clutch inner race and turn the 1-way clutch assembly. Check that the 1-way clutch turns freely when turned counterclockwise and locks when turned clockwise.

##### Text in Illustration

	Lock
	Free

- Remove the 1-way clutch from the 1-way clutch inner race.

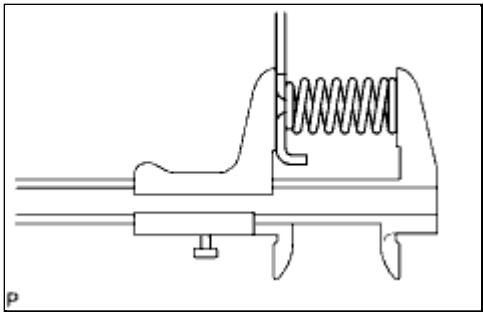


#### 15. INSPECT NO. 1 BRAKE DISC

- Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

##### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

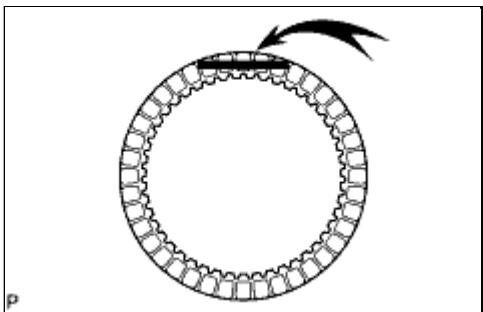


## 16. INSPECT BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

17.05 mm (0.671 in.)

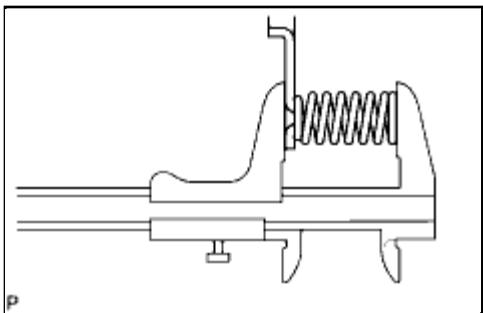


## 17. INSPECT NO. 2 BRAKE DISC

- (a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

### NOTICE:

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

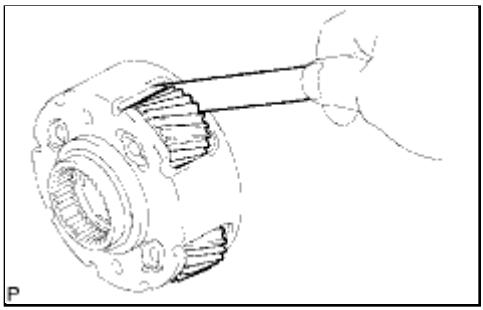


## 18. INSPECT NO. 2 BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

17.45 mm (0.687 in.)



## 19. INSPECT CENTER PLANETARY GEAR ASSEMBLY

- (a) Using a feeler gauge, measure the center planetary pinion gear thrust clearance.

Standard clearance:

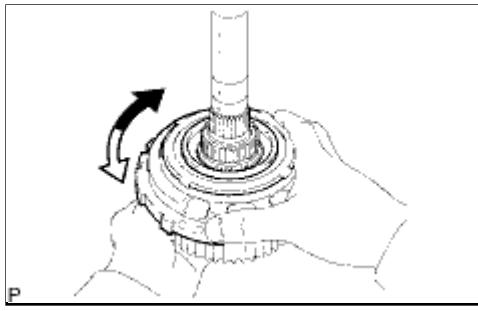
0.12 to 0.68 mm (0.00472 to 0.0268 in.)

Maximum clearance:

0.73 mm (0.0287 in.)

If the clearance is more than the maximum, replace the center planetary gear assembly.

## 20. INSPECT NO. 3 1-WAY CLUTCH ASSEMBLY

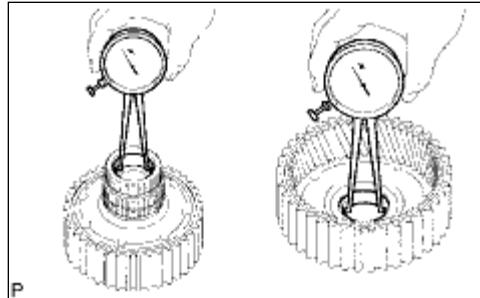


- (a) Hold the rear planetary ring gear flange and turn the 1-way clutch. Check that the 1-way clutch turns freely when turned counterclockwise and locks when turned clockwise.

**Text in Illustration**

	Lock
	Free

**21. INSPECT REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY**



- (a) Using a dial indicator, measure the inside diameter of the rear planetary ring gear bush.

Standard inside diameter:

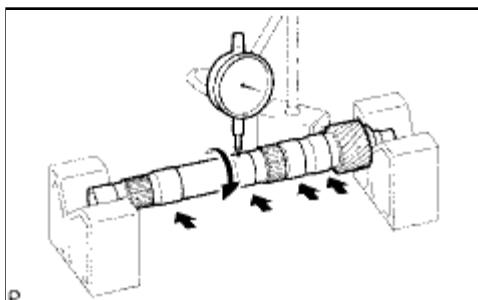
32.176 to 32.201 (1.267 to 1.268 in.)

Maximum inside diameter:

32.251 mm (1.270 in.)

If the inside diameter is more than the maximum, replace the rear planetary ring gear.

**22. INSPECT INTERMEDIATE SHAFT**



- (a) Using a dial indicator, measure the intermediate shaft runout.

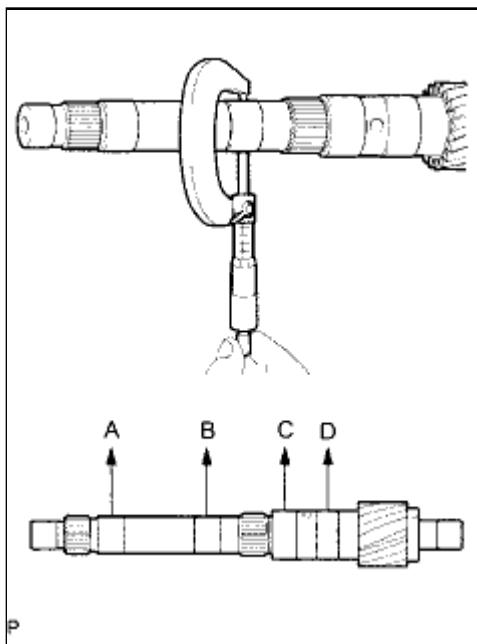
Standard runout:

0.03 mm (0.00118 in.)

Maximum runout:

0.08 mm (0.00315 in.)

If the runout is more than the maximum, replace the intermediate shaft with a new one.



(b) Using a micrometer, measure the diameter of the intermediate shaft at the positions shown in the diagram.

Standard diameter:

**A, B**

25.962 to 25.975 mm (1.022 to 1.023 in.)

**C, D**

32.062 to 32.075 mm (1.262 to 1.263 in.)

Minimum diameter:

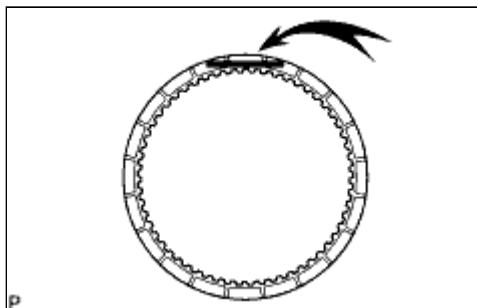
**A, B**

25.912 mm (1.02 in.)

**C, D**

32.012 mm (1.26 in.)

If the diameter is less than the minimum, replace the intermediate shaft with a new one.



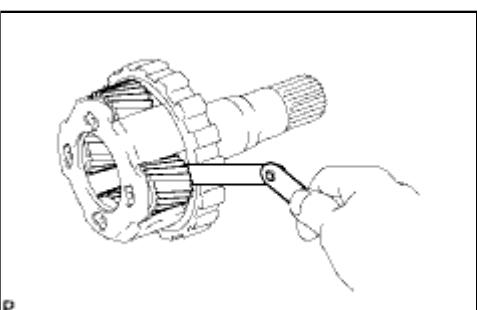
### 23. INSPECT NO. 4 BRAKE DISC

(a) Replace all the discs if one of the following problems is present: 1) a disc, plate or flange is worn or burnt, 2) the lining of a disc is peeled off or discolored, or 3) the grooves or printed numbers have even a little bit of damage.

**NOTICE:**

**When assembling new discs, soak them in ATF for at least 15 minutes before assembly.**

### 24. INSPECT REAR PLANETARY GEAR ASSEMBLY



(a) Using a feeler gauge, measure the rear planetary pinion gear thrust clearance.

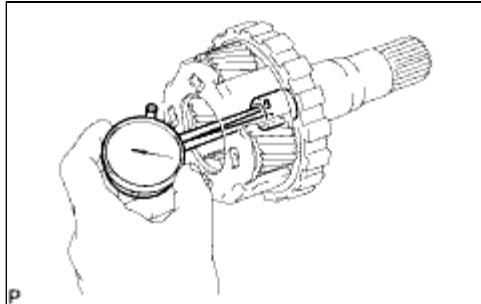
Standard clearance:

0.2 to 0.6 mm (0.00787 to 0.0236 in.)

Maximum clearance:

0.65 mm (0.0256 in.)

- If the clearance is more than the maximum, replace the planetary gear assembly.

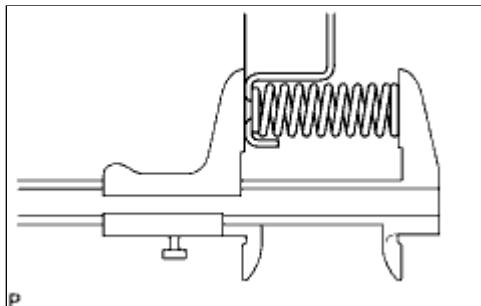


(b) Using a dial indicator, measure the inside diameter of the rear planetary gear bush.

Maximum inside diameter:

20.075 mm (0.790 in.)

If the inside diameter is more than the maximum, replace the rear planetary gear assembly.

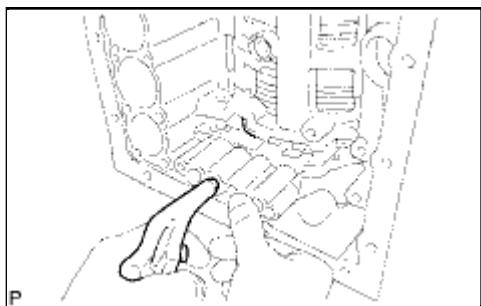


## 25. INSPECT 1ST AND REVERSE BRAKE RETURN SPRING SUB-ASSEMBLY

(a) Using a vernier caliper, measure the free length of the spring together with the spring seat.

Standard free length:

23.74 mm (0.935 in.)

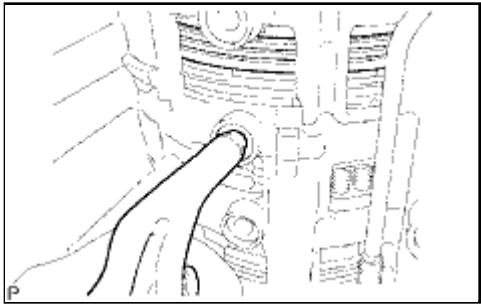


## 26. INSPECT 1ST AND REVERSE BRAKE

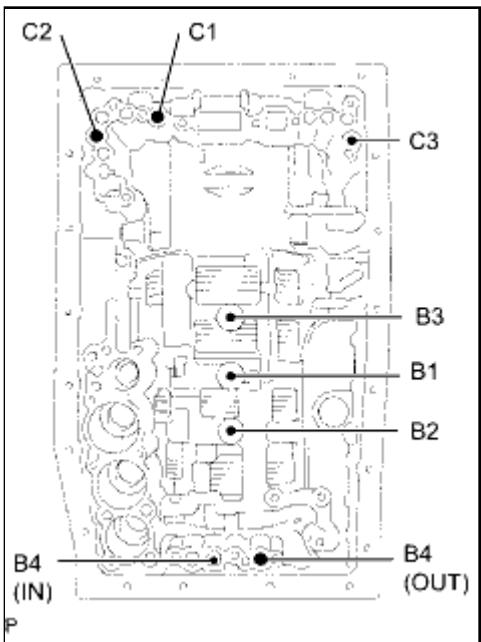
(a) Make sure the 1st and reverse brake piston moves smoothly when applying compressed air into and releasing compressed air from the transmission case.

## 27. INSPECT NO. 1 BRAKE

(a) Make sure the No. 1 brake piston moves smoothly when applying compressed air into and releasing compressed air from the transmission case.



## 28. INSPECT INDIVIDUAL PISTON OPERATION



(a) Check the operating sound while applying compressed air into the oil holes indicated in the illustration.

### **HINT:**

**When inspecting the O/D direct clutch, check with the C3 accumulator piston hole closed.**

**If there is no sound, disassemble and check the installation condition of the parts.**

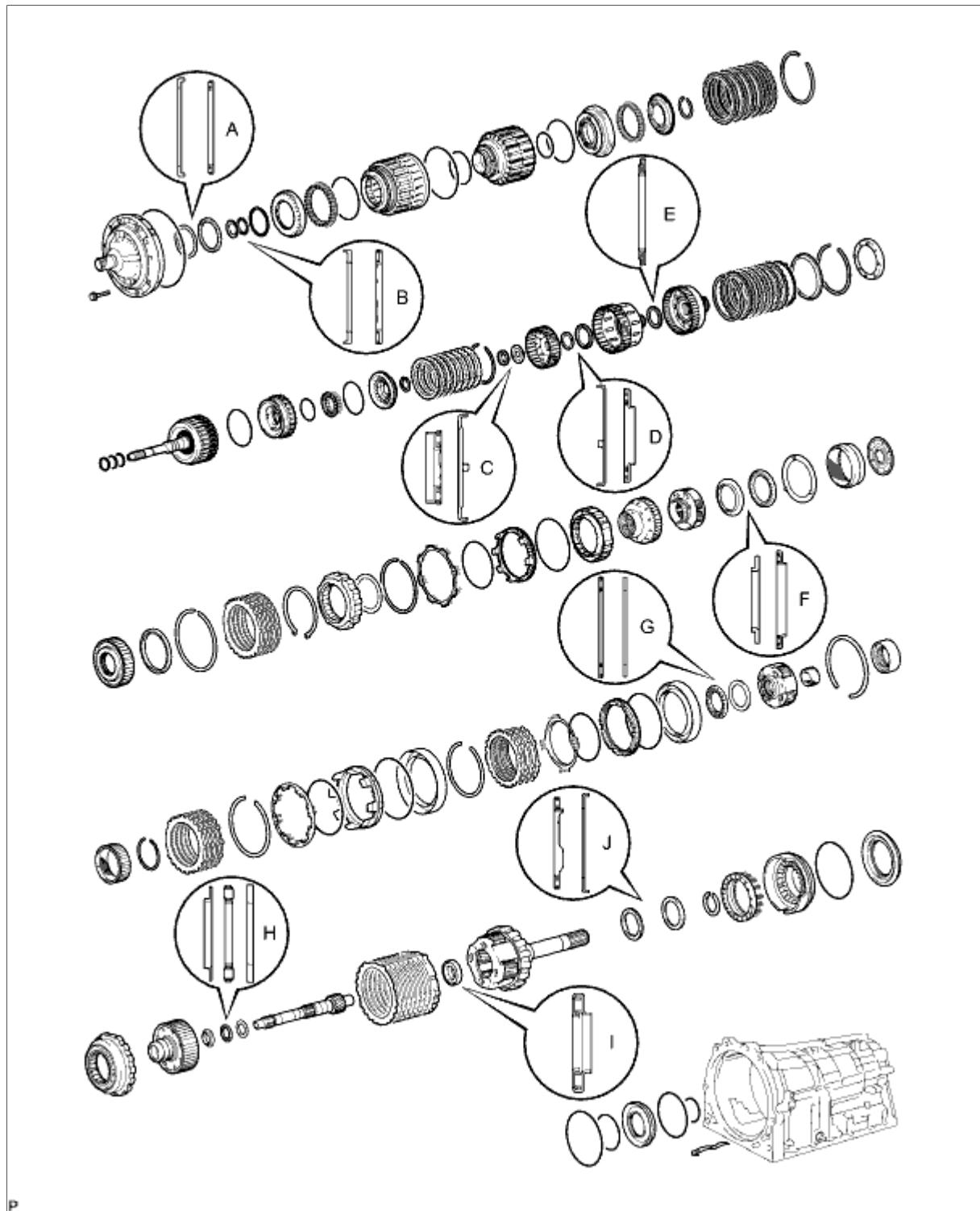
1. No. 2 clutch (C2)
2. No. 3 clutch (C3)
3. No. 1 clutch (C1)
4. No. 3 brake (B3)
5. No. 1 brake (B1)
6. No. 2 brake (B2)
7. No. 4 brake (B4)



<b>Last Modified:</b> 5-10-2010	6.4 A	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013F002SX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: AUTOMATIC TRANSMISSION UNIT: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. BEARING POSITION**



Bearing and Race Diameter:

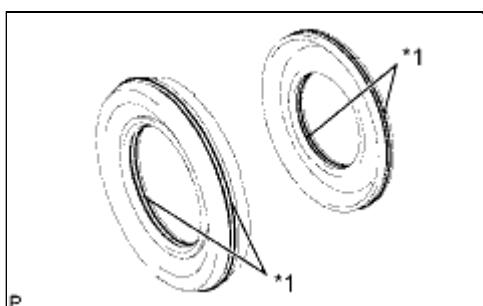
MARK	FRONT RACE DIAMETER INSIDE/OUTSIDE	THRUST BEARING DIAMETER INSIDE/OUTSIDE	REAR RACE DIAMETER INSIDE/OUTSIDE
A	74.3 to 74.6 mm (2.93 to 2.94 in.)/87.4 to 87.7 mm (3.44 to 3.45 in.)	72.0 to 72.3 mm (2.83 to 2.85 in.)/85.3 to 85.6 mm (3.36 to 3.37 in.)	-

MARK	FRONT RACE DIAMETER INSIDE/OUTSIDE	THRUST BEARING DIAMETER INSIDE/OUTSIDE	REAR RACE DIAMETER INSIDE/OUTSIDE
B	37.0 to 37.3 mm (1.46 to 1.47 in.)/52.1 to 52.3 mm (2.05 to 2.06 in.)	34.7 to 34.9 mm (1.366 to 1.374 in.)/51.6 to 51.9 mm (2.03 to 2.04 in.)	-
C	-	21.4 to 21.6 mm (0.841 to 0.850 in.)/40.8 to 41.0 mm (1.606 to 1.614 in.)	22.7 to 22.9 mm (0.892 to 0.902 in.)/60.0 to 60.4 mm (2.36 to 2.38 in.)
D	33.3 to 33.5 mm (1.31 to 1.32 in.)/56.3 to 56.6 mm (2.22 to 2.23 in.)	38.5 to 38.7 mm (1.515 to 1.524 in.)/56.5 to 57.0 mm (2.22 to 2.24 in.)	-
E	-	42.6 to 42.8 mm (1.68 to 1.69 in.)/60.8 to 61.1 mm (2.39 to 2.41 in.)	-
F	38.0 to 38.2 mm (1.496 to 1.504 in.)/56.5 to 57.0 mm (2.22 to 2.24 in.)	43.4 to 43.6 mm (1.71 to 1.72 in.)/58.0 to 58.4 mm (2.28 to 2.30 in.)	-
G	-	55.8 to 56.0 mm (2.197 to 2.204 in.)/76.1 to 76.4 mm (2.996 to 3.008 in.)	53.8 to 54.0 mm (2.12 to 2.13 in.)/73.7 to 74.0 mm (2.90 to 2.91 in.)
H	33.4 to 33.6 mm (1.31 to 1.32 in.)/48.7 to 49.0 mm (1.92 to 1.93 in.)	32.2 to 32.3 mm (1.268 to 1.272 in.)/49.0 to 49.2 mm (1.93 to 1.94 in.)	32.2 to 32.4 mm (1.27 to 1.28 in.)/48.7 to 49.0 mm (1.92 to 1.93 in.)
I	-	21.5 to 21.8 mm (0.846 to 0.858 in.)/40.5 to 40.8 mm (1.59 to 1.61 in.)	-
J	-	43.6 to 43.9 mm (1.72 to 1.73 in.)/60.6 to 60.9 mm (2.39 to 2.40 in.)	47.2 to 47.4 mm (1.86 to 1.87 in.)/66.9 to 67.1 mm (2.63 to 2.64 in.)

## 2. ASSEMBLE NO. 4 BRAKE PISTON AND BRAKE REACTION SLEEVE

(a) Coat 2 new O-rings with ATF and install them to the brake reaction sleeve.

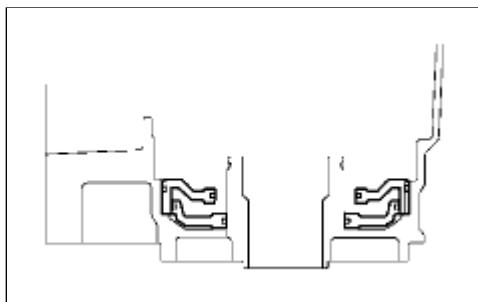
### Text in Illustration



*1	New O-Ring
----	------------

(b) Coat 2 new O-rings with ATF and install them to the No. 4 brake piston.

(c) Install the No. 4 brake piston to the reaction sleeve.

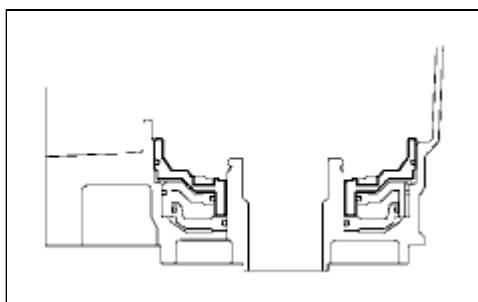


### 3. INSTALL NO. 4 BRAKE PISTON WITH BRAKE REACTION SLEEVE

(a) Install the No. 4 brake piston with brake reaction sleeve to the transmission case.

**NOTICE:**

- Do not damage the O-rings.
- Make sure the No. 4 brake piston is underneath the brake reaction sleeve.



### 4. INSTALL 1ST AND REVERSE BRAKE PISTON

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

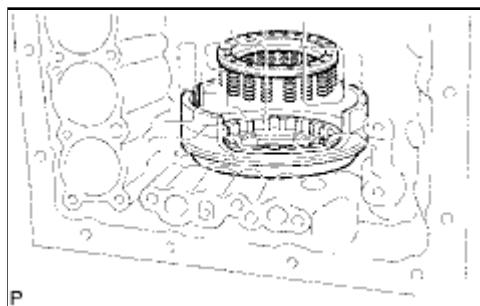
(b) Install the O-ring to the 1st and reverse brake piston.

(c) With the spring seat of the piston facing upwards (the front side), install the piston to the transmission case.

**NOTICE:**

Be careful not to damage the O-ring.

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

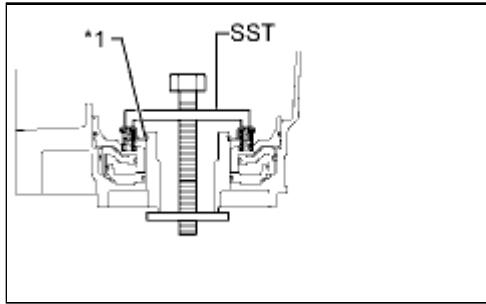


(a) Install the brake return spring to the 1st and reverse brake piston.

(b) Place SST on the spring retainer and compress the return spring.

**SST: 09350-30020**

09350-07050



(c) Using SST, install the snap ring.

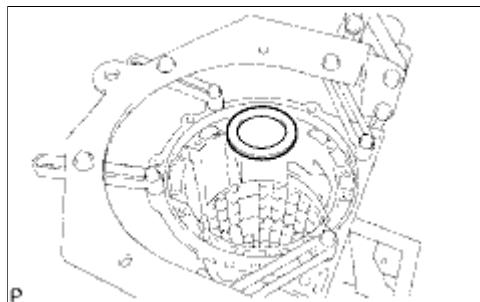
**SST: 09350-30020**

09350-07070

**Text in Illustration**

*1	Snap Ring
----	-----------

## 6. INSTALL REAR PLANETARY GEAR ASSEMBLY



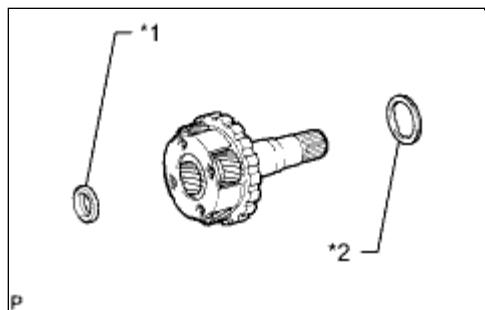
(a) Install the No. 9 thrust bearing race.

Thrust Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Race J	47.2 to 47.4 mm (1.86 to 1.87 in.)	66.9 to 67.1 mm (2.63 to 2.64 in.)

(b) Coat the 2 thrust needle roller bearings with petroleum jelly and install them to the rear planetary gear.

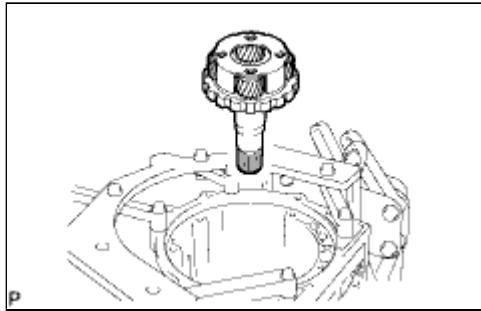
Thrust Needle Roller Bearing Diameter:



ITEM	INSIDE	OUTSIDE
Bearing J	43.6 to 43.9 mm (1.72 to 1.73 in.)	60.6 to 60.9 mm (2.39 to 2.40 in.)
Bearing I	21.5 to 21.8 mm (0.846 to 0.858 in.)	40.5 to 40.8 mm (1.59 to 1.61 in.)

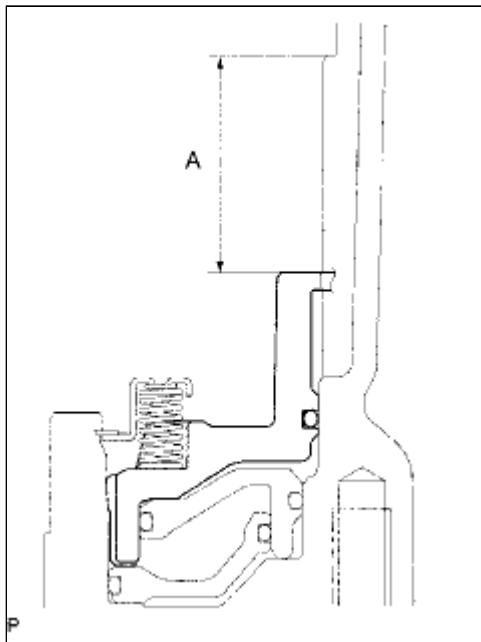
## Text in Illustration

* 1	Bearing I
* 2	Bearing J



(c) Install the rear planetary gear assembly.

## 7. SELECT 1ST AND REVERSE BRAKE FLANGE



(a) Using a vernier caliper, measure distance A (from the top surface of the 1st and reverse brake piston to the step in the transmission case) in the illustration.

**NOTICE:**

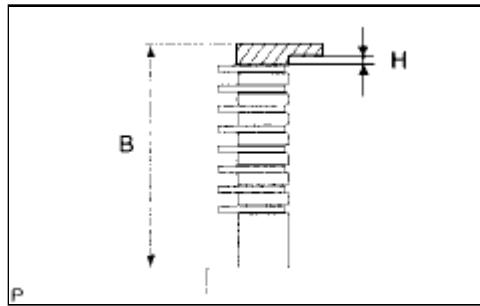
**Make sure the 1st and reverse brake piston is installed securely to the transmission case.**

**HINT:**

**Distance A = 36.35 to 37.09 mm (1.43 to 1.46 in.)**

(b) Assemble the 2 flanges, 8 discs and 7 plates, and using a vernier caliper, measure distance B in the illustration at both ends across the diameter, and calculate the average.

**HINT:**

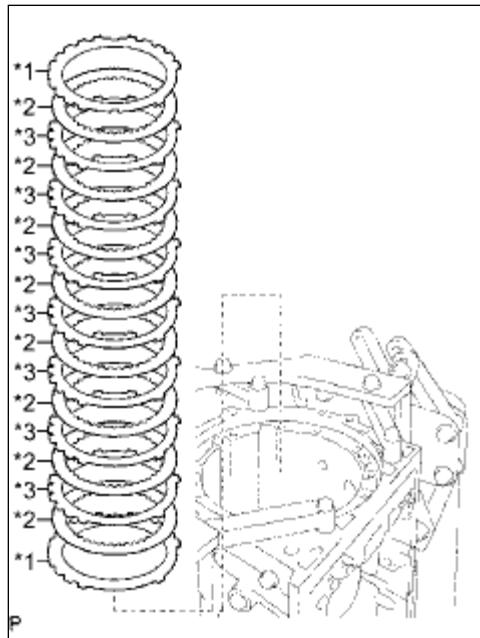


**Distance B = 36.04 to 37.14 mm (1.42 to 1.46 in.)**

- (c) Select a 1st and reverse brake flange so that the value of measured distance A minus distance B is 2.85 to 3.15 mm (0.112 to 0.124 in.).

Flange H Thickness:

NO.	THICKNESS
0	0 mm (0 in.)
2	0.15 to 0.25 mm (0.00590 to 0.00984 in.)
4	0.35 to 0.45 mm (0.0138 to 0.0177 in.)
6	0.55 to 0.65 mm (0.0217 to 0.0256 in.)
8	0.75 to 0.85 mm (0.0295 to 0.0335 in.)
10	0.95 to 1.05 mm (0.0374 to 0.0413 in.)
12	1.15 to 1.25 mm (0.0453 to 0.0492 in.)
14	1.35 to 1.45 mm (0.0531 to 0.0571 in.)



## 8. INSTALL NO. 4 BRAKE DISC

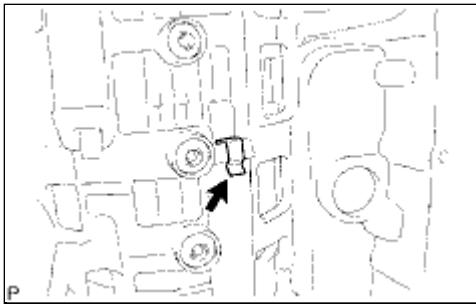
- (a) Install the 2 flanges, 8 discs and 7 plates.

Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*1

### Text in Illustration

*1	Flange
*2	Disc
*2	Plate

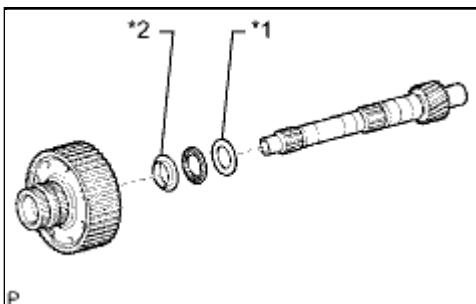


## 9. INSTALL BRAKE PLATE STOPPER SPRING

## 10. INSTALL REAR PLANETARY RING GEAR FLANGE SUB-ASSEMBLY

- (a) Install the thrust bearing race, thrust needle roller bearing, thrust bearing race and planetary ring gear flange to the intermediate shaft.

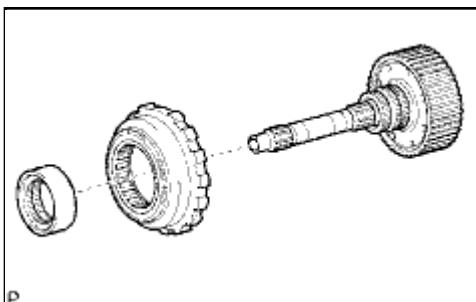
Thrust Needle Roller Bearing and Race Diameter:



ITEM	INSIDE	OUTSIDE
Race H Rear	32.2 to 32.4 mm (1.27 to 1.28 in.)	48.7 to 49.0 mm (1.92 to 1.93 in.)
Bearing H	32.2 to 32.3 mm (1.268 to 1.272 in.)	49.0 to 49.2 mm (1.93 to 1.94 in.)
Race H Front	33.4 to 33.6 mm (1.31 to 1.32 in.)	48.7 to 49.0 mm (1.92 to 1.93 in.)

## Text in Illustration

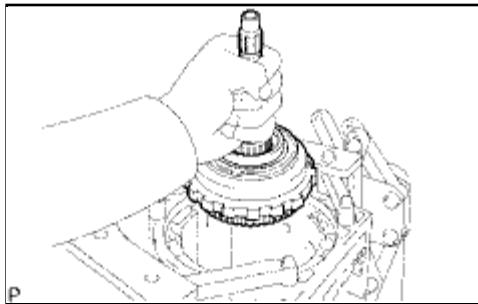
*1	Race H Rear
*2	Race H Front



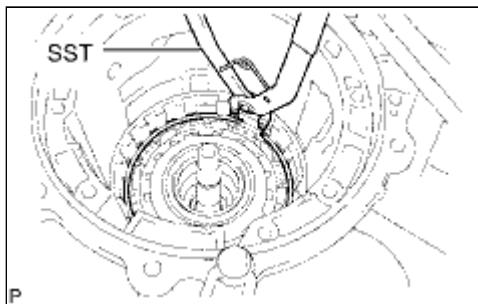
## 11. INSTALL NO. 3 1-WAY CLUTCH ASSEMBLY

- (a) Install the 1-way clutch and 1-way clutch inner race to the intermediate shaft.

## 12. INSTALL INTERMEDIATE SHAFT



(a) Install the intermediate shaft with No. 3 1-way clutch assembly to the case.

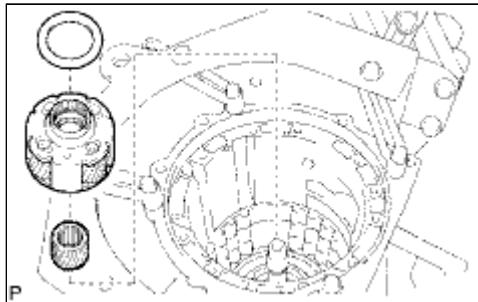


(b) Using SST, install the snap ring.

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09350-07060

## 13. INSTALL CENTER PLANETARY GEAR ASSEMBLY



(a) Install the planetary sun gear and center planetary gear to the case.

(b) Coat the thrust bearing race with petroleum jelly and install it to the center planetary gear.

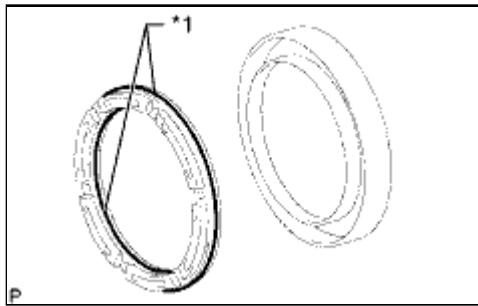
Thrust Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Race G	53.8 to 54.0 mm (2.12 to 2.13 in.)	73.7 to 74.0 mm (2.90 to 2.91 in.)

## 14. INSTALL NO. 2 BRAKE PISTON

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

**Text in Illustration**



*1	New O-Ring
----	------------

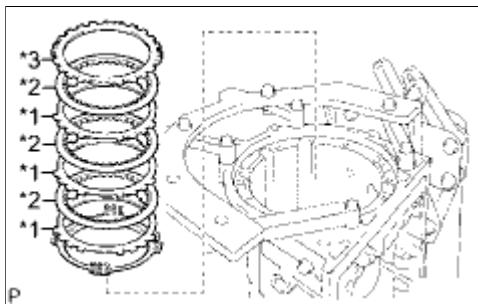
(b) Press the brake piston into the brake cylinder with both hands.

**NOTICE:**

**Be careful not to damage the O-rings.**

(c) Install the No. 2 brake piston to the case.

## 15. INSTALL NO. 2 BRAKE DISC



(a) Install the brake piston return spring.

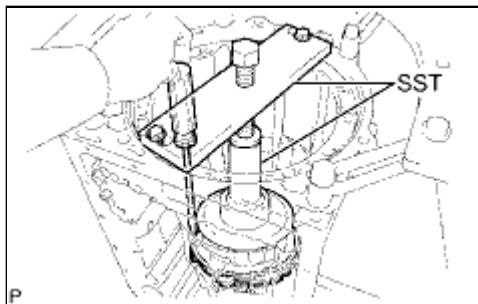
(b) Install the 3 plates, 3 discs and flange.

Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

### Text in Illustration

*1	Disc
*2	Plate
*2	Flange

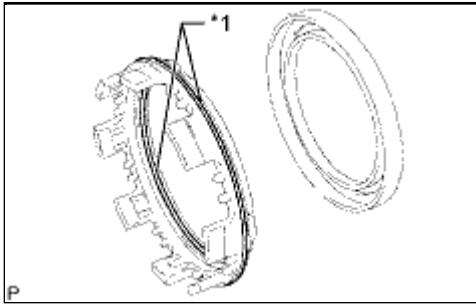


(c) Using SST and a press, compress the return spring and install the No. 2 brake spring snap ring.

**SST: 09351-40010**

## 16. INSTALL NO. 1 BRAKE PISTON

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



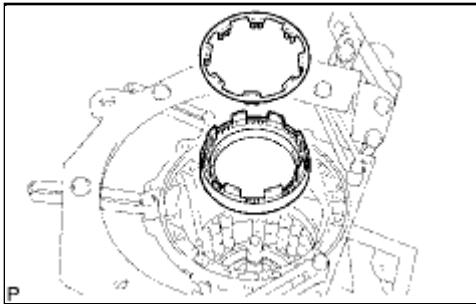
### Text in Illustration

*1	New O-Ring
----	------------

- (b) Press the brake piston into the brake cylinder with both hands.

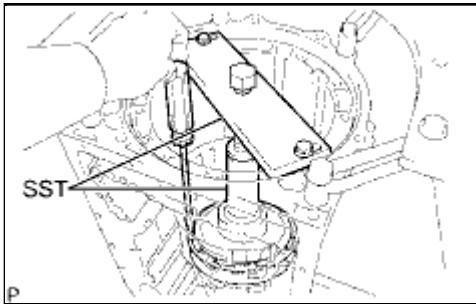
**NOTICE:**

**Be careful not to damage the O-rings.**



## 17. INSTALL BRAKE PISTON RETURN SPRING SUB-ASSEMBLY

- (a) Install the No. 1 brake piston with No. 1 brake cylinder and the brake piston return spring to the transmission case.



## 18. INSTALL BRAKE PISTON RETURN SPRING SNAP RING

- (a) Using SST and a press, compress the return spring and install the brake piston return spring snap ring.

**SST: 09351-40010**

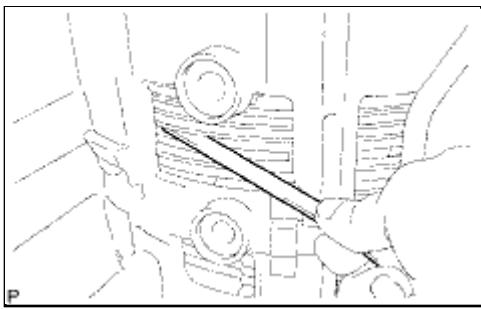
## 19. SELECT NO. 1 BRAKE FLANGE

- (a) Using a feeler gauge, measure the distance between the snap ring and flange.

**HINT:**

**0.42 to 0.72 mm (0.0165 to 0.0283 in.)**

If the distance is outside the specification, parts may have



been assembled incorrectly. Perform the reassembly again. If the distance is still outside the specification, select No. 1 brake flange so that the value of measured distance is 0.42 to 0.72 mm (0.0165 to 0.0283 in.).

Flange Thickness:

MARK	THICKNESS
0	1.95 to 2.05 mm (0.0768 to 0.0807 in.)
1	2.15 to 2.25 mm (0.0846 to 0.0886 in.)
2	2.35 to 2.45 mm (0.0925 to 0.0965 in.)
3	2.55 to 2.65 mm (0.100 to 0.104 in.)

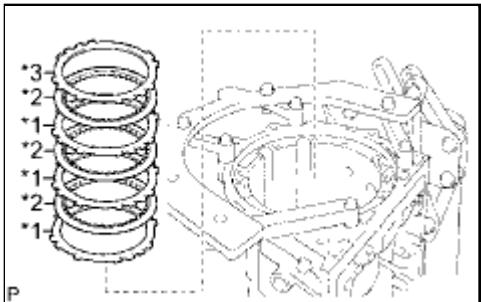
## 20. INSTALL NO. 1 BRAKE DISC

(a) Install the 3 plates, 3 discs and flange.

Install in order:

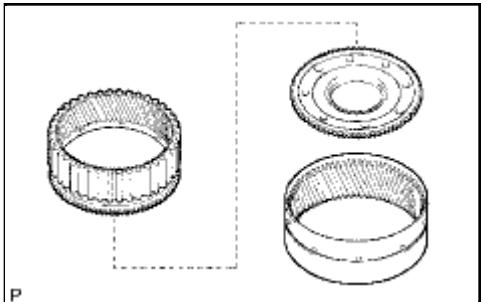
\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

### Text in Illustration



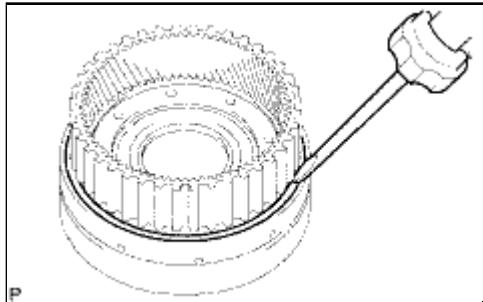
*1	Plate
*2	Disc
*3	Flange

## 21. INSTALL CENTER PLANETARY RING GEAR

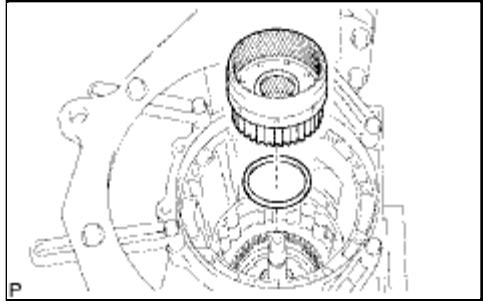


(a) Install the center planetary ring gear and front planetary ring gear flange to the front planetary ring gear.

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



## 22. INSTALL FRONT PLANETARY RING GEAR

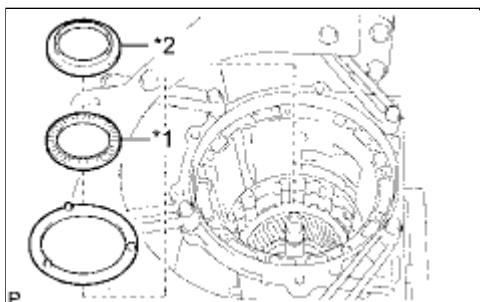


(a) Install the thrust needle roller bearing and front planetary ring gear to the case.

Thrust Needle Roller Bearing Diameter:

ITEM	INSIDE	OUTSIDE
Bearing G	55.8 to 56.0 mm (2.197 to 2.204 in.)	76.1 to 76.4 mm (2.996 to 3.008 in.)

## 23. INSTALL FRONT PLANETARY GEAR ASSEMBLY



(a) Install the thrust washer and thrust needle roller bearing.

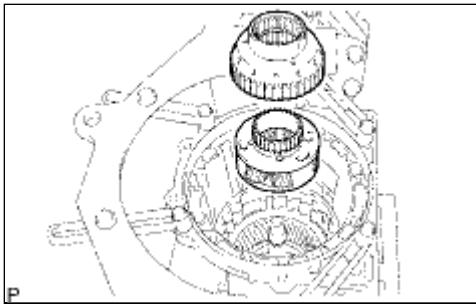
(b) Coat the No. 5 thrust race with petroleum jelly and install it to the front planetary ring gear.

Thrust Needle Roller Bearing and Race Diameter:

ITEM	INSIDE	OUTSIDE
Bearing F	43.4 to 43.6 mm (1.71 to 1.72 in.)	58.0 to 58.4 mm (2.28 to 2.30 in.)
Race F	38.0 to 38.2 mm (1.496 to 1.504 in.)	56.5 to 57.0 mm (2.22 to 2.24 in.)

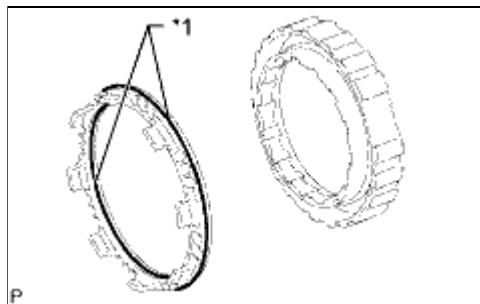
### Text in Illustration

*1	Bearing F
*2	Race F



(c) Install the front planetary gear assembly and 1-way clutch inner race to the case.

## 24. INSTALL 2ND BRAKE PISTON



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

### Text in Illustration

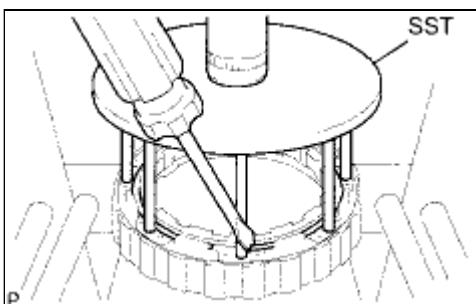
*1	New O-Ring
----	------------

(b) Press the 2nd brake cylinder into the 2nd brake piston with both hands.

**NOTICE:**

Be careful not to damage the O-rings.

(c) Install the return spring to the 2nd brake cylinder.



(d) Using SST and a press, compress the return spring and install the snap ring.

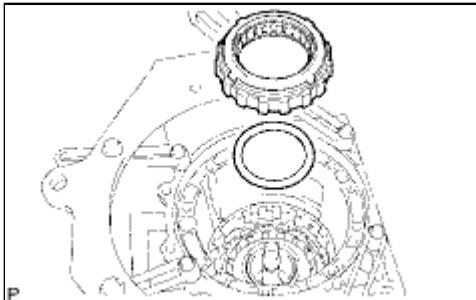
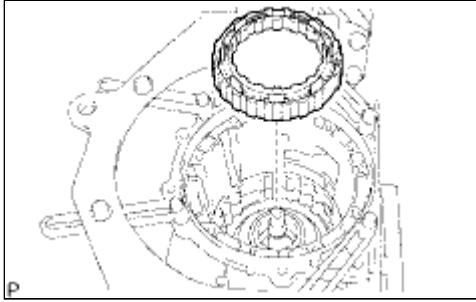
**SST: 09351-40010**

**NOTICE:**

Make sure the end gap of the snap ring is not aligned with the spring retainer claw.

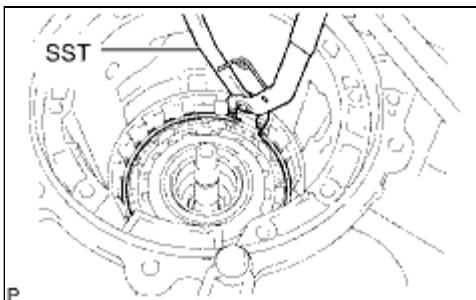
## 25. INSTALL 2ND BRAKE CYLINDER

(a) Install the 2nd brake cylinder to the case.



## 26. INSTALL 1-WAY CLUTCH ASSEMBLY

- (a) Install the thrust washer and 1-way clutch to the case.



## 27. INSTALL 2ND BRAKE PISTON HOLE SNAP RING

- (a) Using SST, install the snap ring.

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09350-07060

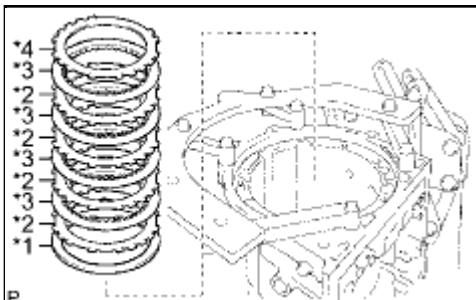
## 28. INSTALL NO. 3 BRAKE DISC

- (a) Install the cushion plate, 4 plates, 4 discs and flange to the case.

Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*4

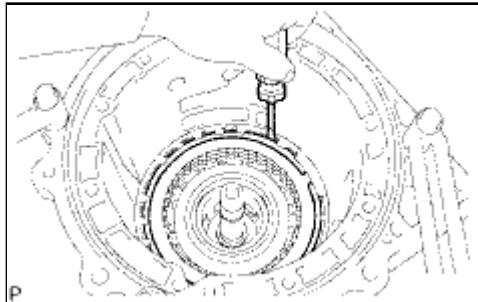
### Text in Illustration



*1	Cushion Plate
*2	Plate
*3	Disc

\*4

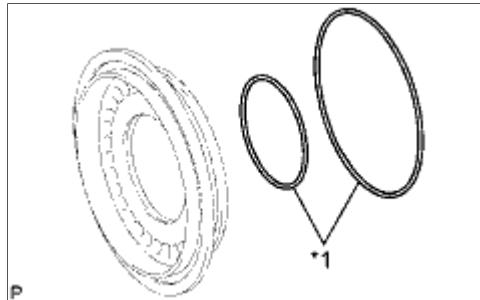
Flange



## 29. INSTALL NO. 3 BRAKE SNAP RING

- Using a screwdriver, install the snap ring.

## 30. INSTALL DIRECT CLUTCH PISTON SUB-ASSEMBLY

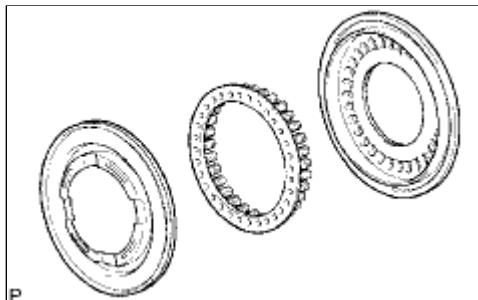


- Coat 2 new O-rings with ATF and install them to the direct clutch piston.

### Text in Illustration

\*1

New O-Ring

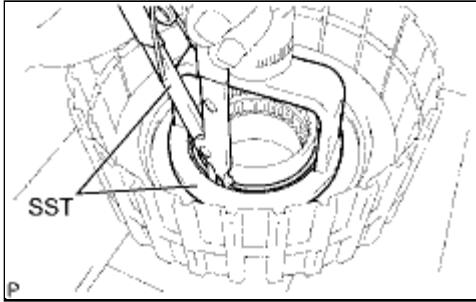


- Install the direct clutch return spring and No. 2 clutch balancer to the direct clutch piston.

- Press the direct clutch piston into the clutch drum with both hands.

### NOTICE:

Be careful not to damage the O-rings.



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

**SST: 09320-89010**

**SST: 09350-30020**

09350-07070

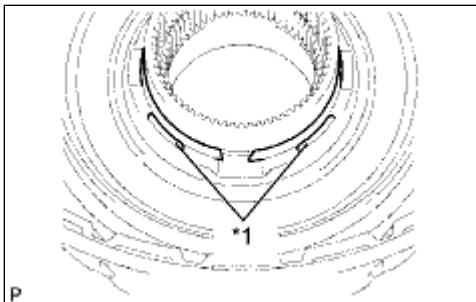
**NOTICE:**

**Stop pressing when the spring sheet is lowered to a position 1 to 2 mm (0.039 to 0.078 in.) from the snap ring groove to prevent the spring sheet from being deformed.**

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

**NOTICE:**

**Do not expand the snap ring excessively.**



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

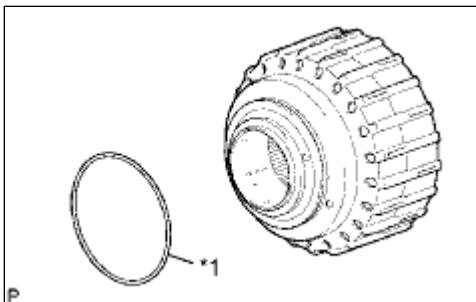
**Text in Illustration**

*1	Stopper
----	---------

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the spring retainer claw.**

**31. INSTALL REVERSE CLUTCH PISTON SUB-ASSEMBLY**



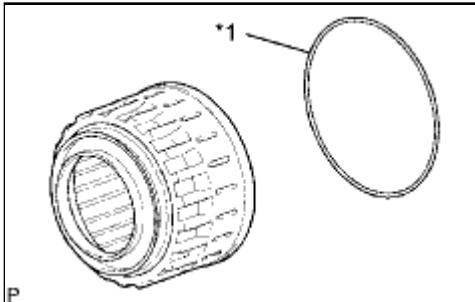
(a) Coat a new O-ring with ATF and install it to the clutch drum.

**Text in Illustration**

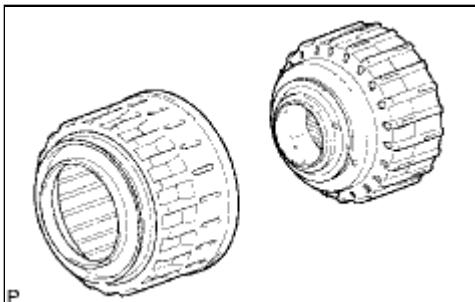
*1	New O-Ring
----	------------

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

**Text in Illustration**



\*1 New O-Ring

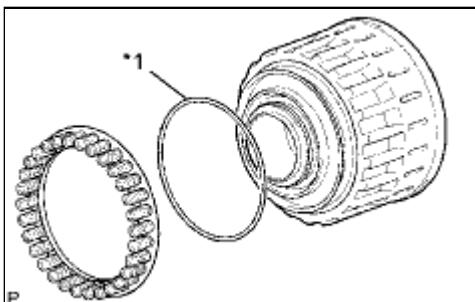


(c) Press the clutch drum into the reverse clutch piston with both hands.

**NOTICE:**

Be careful not to damage the O-ring.

### 32. INSTALL REVERSE CLUTCH RETURN SPRING SUB-ASSEMBLY



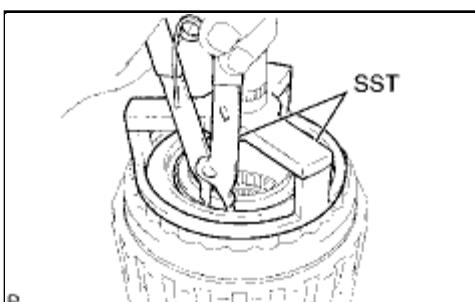
(a) Coat a new O-ring with ATF and install it to the reverse clutch piston.

#### Text in Illustration

\*1 New O-Ring

(b) Install the reverse clutch return spring to the reverse clutch piston.

### 33. INSTALL NO. 3 CLUTCH BALANCER



(a) Place SST on the No. 3 clutch balancer and compress the clutch balancer with a press.

**SST: 09387-00070**

**SST: 09350-30020**

09350-07070

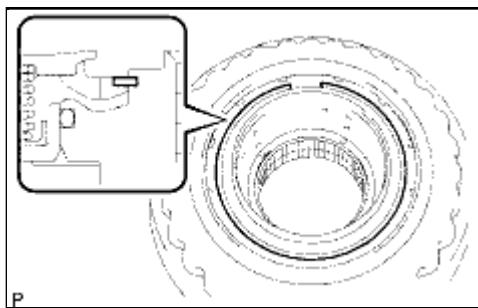
**NOTICE:**

Stop pressing when the spring sheet is lowered to a position 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring sheet from being deformed.

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

## **NOTICE:**

**Do not expand the snap ring excessively.**

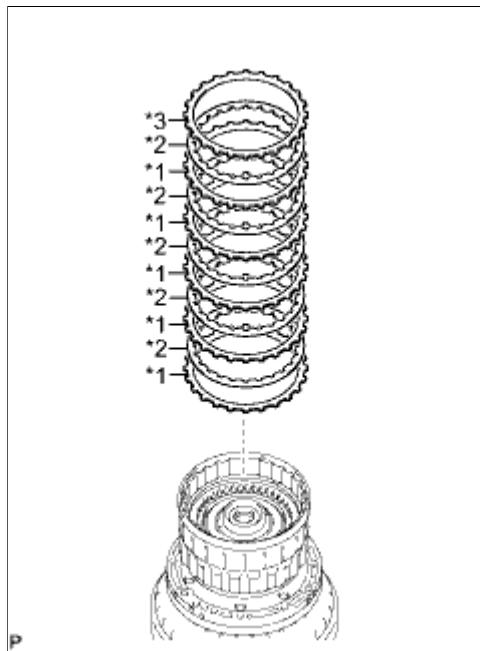


(c) Position the end gap of the snap ring as shown in the illustration.

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the spring retainer claw.**

### **34. INSTALL DIRECT CLUTCH DISC**



(a) Install the 5 plates, 5 discs and reverse clutch flange to the clutch drum.

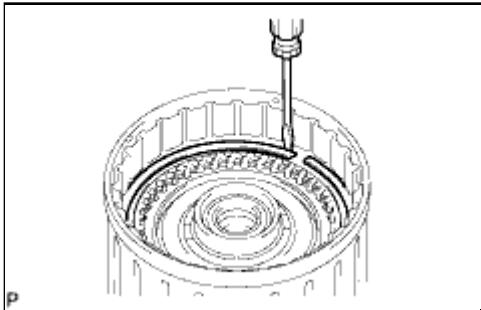
## **Text in Illustration**

* 1	Plate
* 2	Disc
* 3	Flange

Install in order:

\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*3

(b) Using a screwdriver, install the snap ring to the clutch

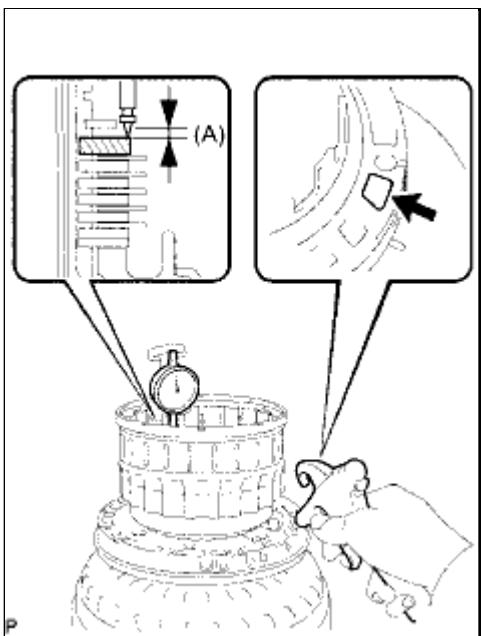


drum.

- (c) Using a dial indicator, measure the moving distance (A) of the clutch flange at both ends across the diameter while applying compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) into the oil hole as shown in the illustration.

Standard moving distance (A):

0.55 to 0.85 mm (0.0217 to 0.0335 in.)



**NOTICE:**

**When measuring the moving distance, install a standard flange (thickness: 3.4 mm (0.134 in.)) to the position indicated by the shaded area in the illustration.**

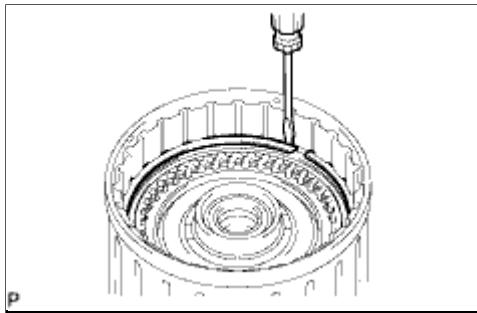
If the moving distance (A) is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

Flange Thickness:

MARK	THICKNESS
2	2.95 to 3.05 mm (0.116 to 0.120 in.)
3	3.05 to 3.15 mm (0.120 to 0.124 in.)
4	3.15 to 3.25 mm (0.124 to 0.128 in.)
5	3.25 to 3.35 mm (0.128 to 0.132 in.)
6	3.35 to 3.45 mm (0.132 to 0.136 in.)
7	3.45 to 3.55 mm (0.136 to 0.140 in.)
8	3.55 to 3.65 mm (0.140 to 0.144 in.)
9	3.65 to 3.75 mm (0.144 to 0.148 in.)
A	3.75 to 3.85 mm (0.148 to 0.152 in.)

- (d) Temporarily remove the snap ring, replace the flange with the selected flange and reinstall the snap ring.

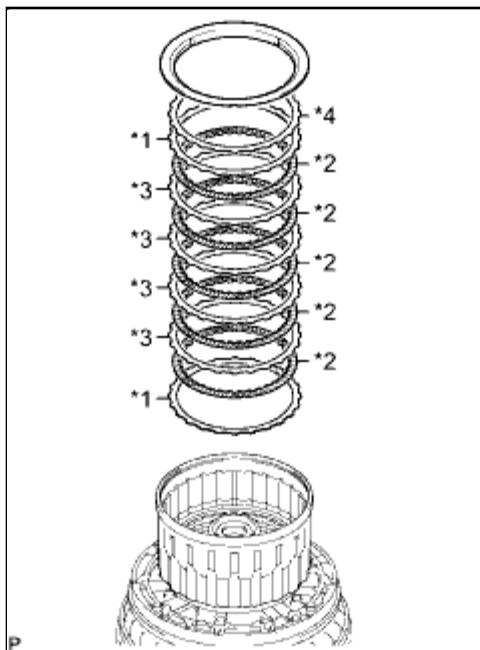
### 35. SELECT REVERSE CLUTCH FLANGE



(a) Using a screwdriver, install the snap ring to the clutch drum.

**NOTICE:**

**Make sure to install the direct clutch and reverse clutch snap rings so that their openings face opposite directions.**



(b) Install the 2 flanges, 5 discs, 4 plates, cushion plate and reverse clutch reaction sleeve to the clutch drum.

Install in order:

\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*1 - \*4

### Text in Illustration

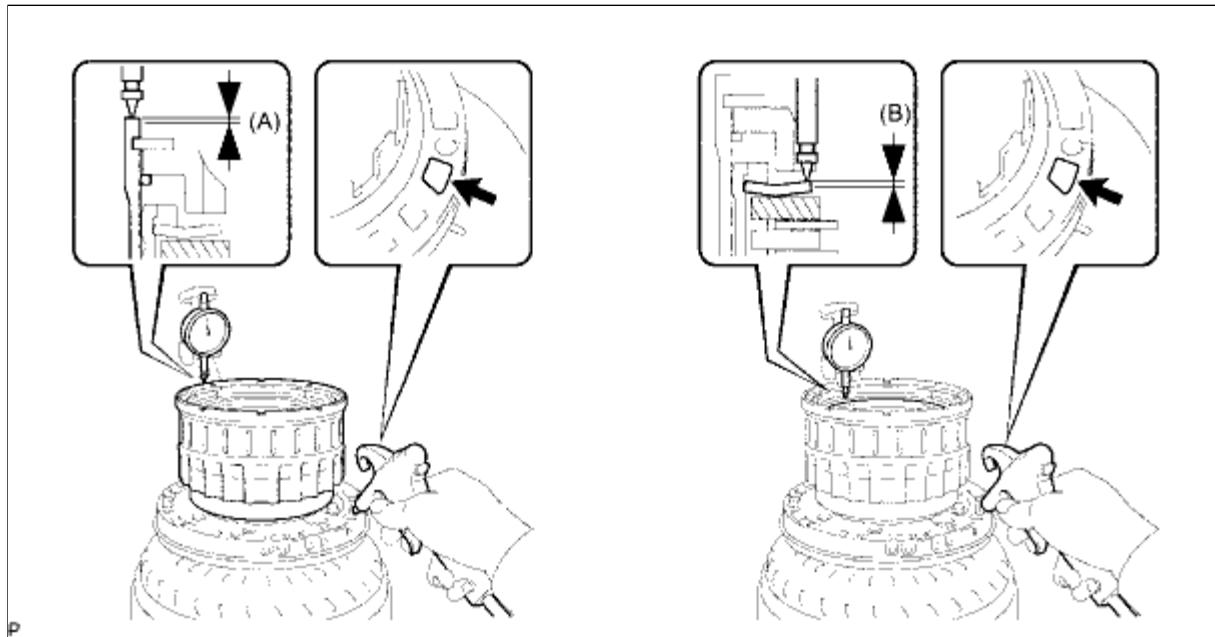
*1	Flange
*2	Disc
*3	Plate
*4	Cushion Plate



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

(d) Using a dial indicator, measure the moving distance (A minus B) of the top surface of the reverse clutch piston (A) and cushion plate at both ends across the diameter (B) while applying compressed air (392 kPa, 4.0 kgf/cm<sup>2</sup>, 57 psi) into the oil hole as shown in the illustration. Then choose a flange of an appropriate thickness from the table so that the measured value is within

the standard range.



Standard moving distance (A minus B):  
0.56 to 0.86 mm (0.0220 to 0.0339 in.)

**NOTICE:**

**When measuring the moving distance, install a standard flange (thickness: 3.3 mm (0.130 in.)) to the position indicated by the shaded area in the illustration.**

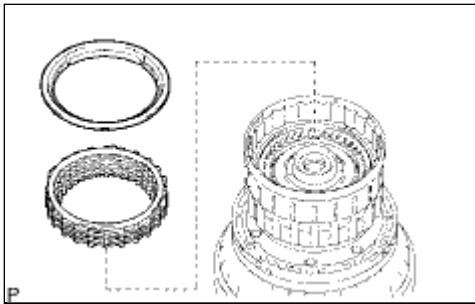
**HINT:**

**Distance (A) = 1.05 to 2.15 mm (0.0413 to 0.0846 in.)**

**Distance (B) = 0.72 to 1.08 mm (0.0283 to 0.0425 in.)**

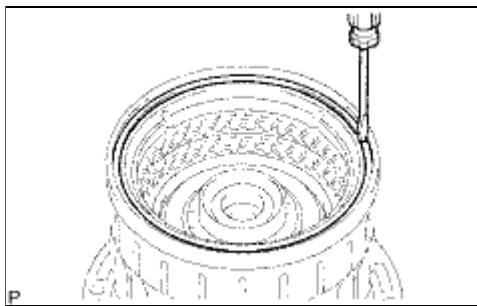
Flange Thickness:

MARK	THICKNESS
0	2.75 to 2.85 mm (0.108 to 0.112 in.)
1	2.85 to 2.95 mm (0.112 to 0.116 in.)
2	2.95 to 3.05 mm (0.116 to 0.120 in.)
3	3.05 to 3.15 mm (0.120 to 0.124 in.)
4	3.15 to 3.25 mm (0.124 to 0.128 in.)
5	3.25 to 3.35 mm (0.128 to 0.132 in.)
6	3.35 to 3.45 mm (0.132 to 0.136 in.)
7	3.45 to 3.55 mm (0.136 to 0.140 in.)
8	3.55 to 3.65 mm (0.140 to 0.144 in.)
9	3.65 to 3.75 mm (0.144 to 0.148 in.)
A	3.75 to 3.85 mm (0.148 to 0.152 in.)

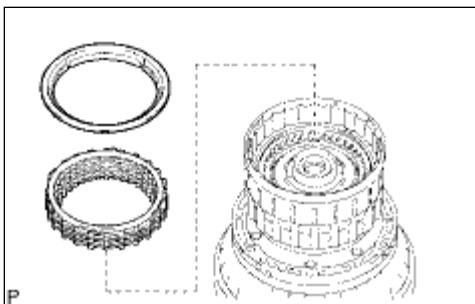


(e) Remove the snap ring, reverse clutch reaction sleeve and rear clutch disc set from the clutch drum.

### 36. REMOVE REVERSE CLUTCH REACTION SLEEVE

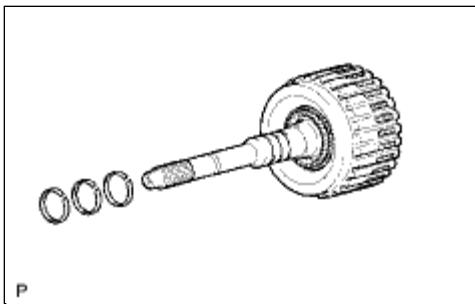


(a) Using a screwdriver, remove the snap ring from the clutch drum.



(b) Remove the reverse clutch reaction sleeve, clutch cushion plate, reverse clutch flange, 5 reverse clutch discs and 4 clutch plates from the reverse clutch hub.

### 37. INSTALL INPUT SHAFT OIL SEAL RING



(a) Coat 3 new oil seal rings with ATF.

(b) Squeeze the ends of the 3 oil seal rings together, and then install them to the starter shaft

groove.

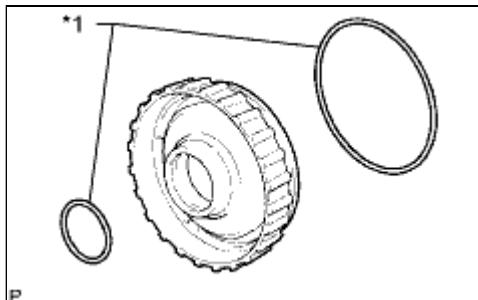
**HINT:**

After installing the oil seal rings, check that they rotate smoothly.

**NOTICE:**

Do not excessively widen the rings.

### 38. INSTALL FORWARD CLUTCH PISTON



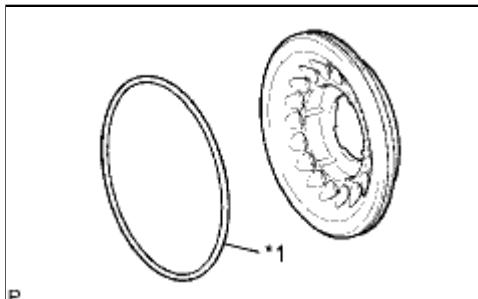
- (a) Coat 2 new O-rings with ATF and install them to the forward clutch piston.

#### Text in Illustration

* 1	New O-Ring
-----	------------

- (b) Install the forward clutch piston to the input shaft.

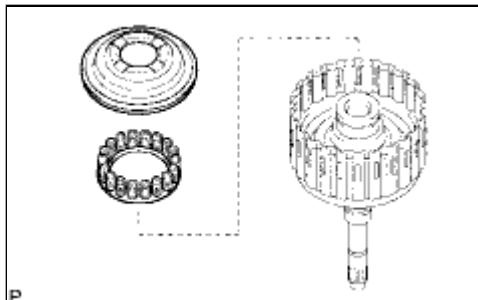
### 39. INSTALL NO. 1 CLUTCH BALANCER



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

#### Text in Illustration

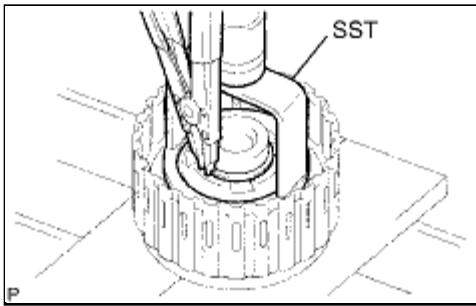
* 1	New O-Ring
-----	------------



- (b) Install the forward clutch return spring and clutch balancer.

**NOTICE:**

Be careful not to damage the O-ring.



(c) Place SST on the No. 1 clutch balancer and compress the return spring with a press.

**SST: 09350-30020**

09350-07040

09350-07070

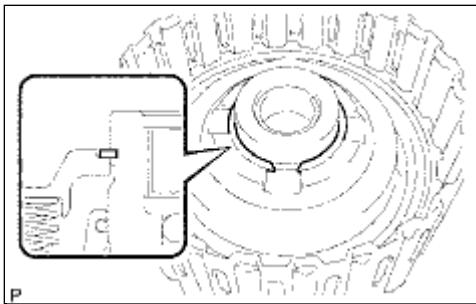
**NOTICE:**

**Stop pressing when the spring sheet is lowered to a position 1 to 2 mm (0.0393 to 0.0787 in.) from the snap ring groove to prevent the spring sheet from being deformed.**

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

**NOTICE:**

**Do not expand the snap ring excessively.**

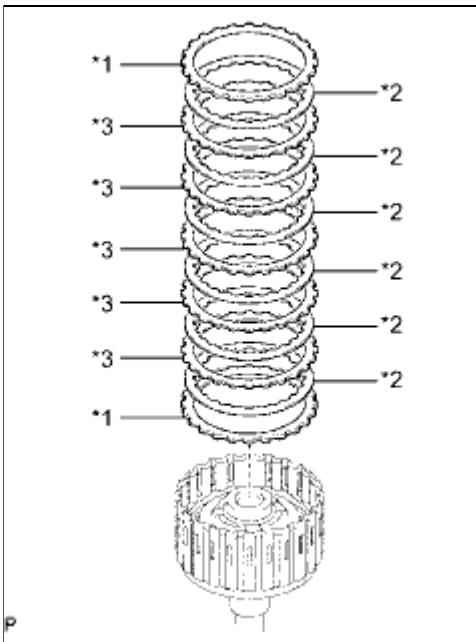


(e) Position the end gap of the snap ring as shown in the illustration.

**NOTICE:**

**Make sure the end gap of the snap ring is not aligned with the spring retainer claw.**

## 40. INSTALL FORWARD MULTIPLE DISC CLUTCH DISC



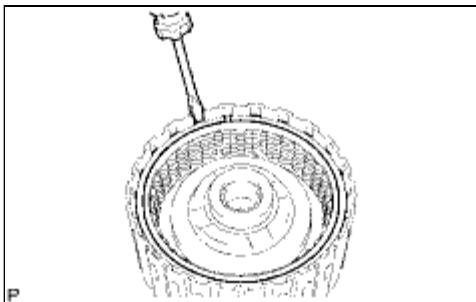
(a) Install the 2 flanges, 6 discs and 5 plates to the input shaft assembly.

Install in order:

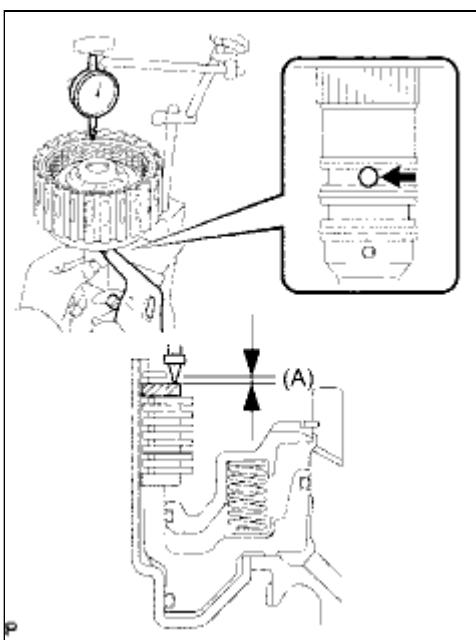
\*1 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*3 - \*2 - \*1

### Text in Illustration

*1	Flange
*2	Disc
*3	Plate



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



(c) Using a dial indicator, measure the moving distance (A) of the clutch flange at both ends across the diameter while applying compressed air (196 kPa, 2.0 kgf/cm<sup>2</sup>, 28 psi) into the oil hole as shown in the illustration.

Standard moving distance:

0.61 to 0.91 mm (0.0240 to 0.0358 in.)

#### NOTICE:

When measuring the moving distance, install a standard flange (thickness: 3.4 mm (0.134 in.)) to the position indicated by the shaded area in the illustration.

#### HINT:

Moving distance (A): 0.26 to 1.36 mm (0.0102 to 0.0535 in.)

If the moving distance (A) is not as specified, select a flange of an appropriate thickness from the table below so that the measured value is within the standard range.

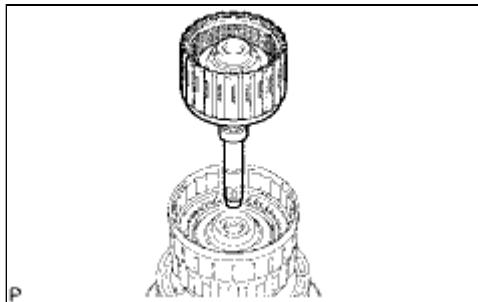
Flange Thickness:

MARK	THICKNESS
0	2.95 to 3.05 mm (0.116 to 0.120 in.)
1	3.05 to 3.15 mm (0.120 to 0.124 in.)
2	3.15 to 3.25 mm (0.124 to 0.128 in.)
3	3.25 to 3.35 mm (0.128 to 0.132 in.)
4	3.35 to 3.45 mm (0.132 to 0.136 in.)

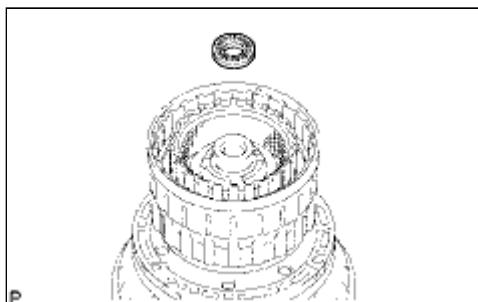
5	3.45 to 3.55 mm (0.136 to 0.140 in.)
6	3.55 to 3.65 mm (0.140 to 0.144 in.)
7	3.65 to 3.75 mm (0.144 to 0.148 in.)
8	3.75 to 3.85 mm (0.148 to 0.152 in.)
9	3.85 to 3.95 mm (0.148 to 0.152 in.)
A	3.95 to 4.05 mm (0.152 to 0.159 in.)

(d) Temporarily remove the snap ring, replace the flange with the selected flange and reinstall the snap ring.

#### 41. INSTALL INPUT SHAFT ASSEMBLY



(a) Install the input shaft to the clutch drum.



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

Thrust Needle Roller Bearing Diameter:

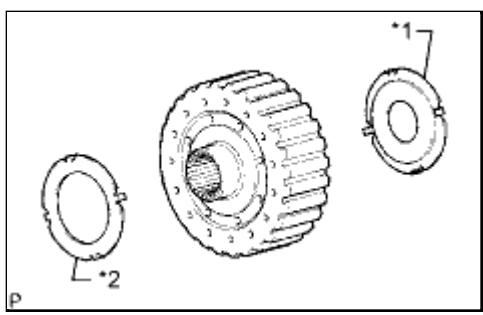
ITEM	INSIDE	OUTSIDE
Bearing C	21.4 to 21.6 mm (0.841 to 0.850 in.)	40.8 to 41.0 mm (1.606 to 1.614 in.)

#### 42. INSTALL MULTIPLE DISC CLUTCH HUB

(a) Coat the 2 thrust bearing races with petroleum jelly and install them to the multiple disc clutch hub.

Thrust Bearing Race Diameter:

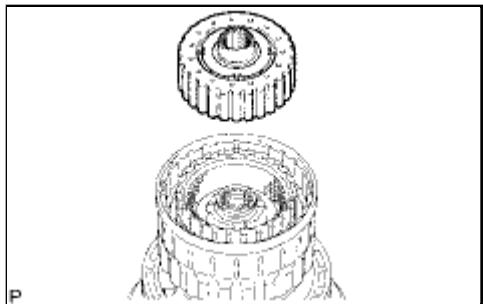
ITEM	INSIDE	OUTSIDE



Race C	22.7 to 22.9 mm (0.892 to 0.902 in.)	60.0 to 60.4 mm (2.36 to 2.38 in.)
Race D	33.3 to 33.5 mm (1.31 to 1.32 in.)	56.3 to 56.6 mm (2.22 to 2.23 in.)

### Text in Illustration

*1	Race C
*2	Race D

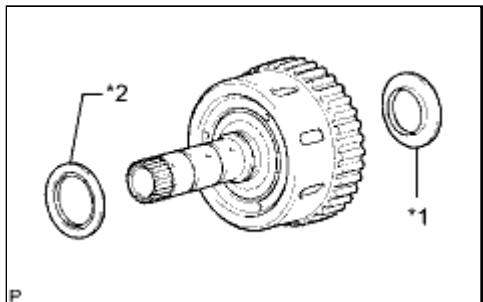


(b) Install the multiple disc clutch hub to the clutch drum.

### 43. INSTALL FORWARD CLUTCH HUB SUB-ASSEMBLY

(a) Coat the 2 thrust needle roller bearings with petroleum jelly and install them to the forward clutch hub.

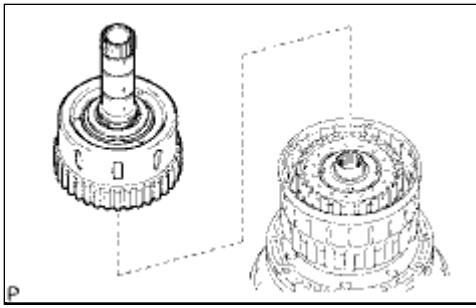
Thrust Needle Roller Bearing Diameter:



ITEM	INSIDE	OUTSIDE
Bearing D	38.5 to 38.7 mm (1.515 to 1.524 in.)	56.5 to 57.0 mm (2.22 to 2.24 in.)
Bearing E	42.6 to 42.8 mm (1.68 to 1.69 in.)	60.8 to 61.1 mm (2.39 to 2.41 in.)

### Text in Illustration

* 1	Bearing D
* 2	Bearing E



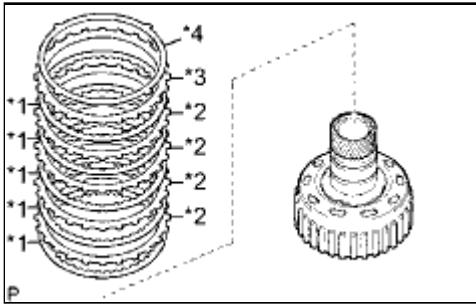
(b) Install the forward clutch hub to the clutch drum.

#### 44. INSTALL REAR CLUTCH DISC

(a) Install the 5 discs, 4 plates, reverse clutch flange and clutch cushion plate to the reverse clutch hub.

Install in order:

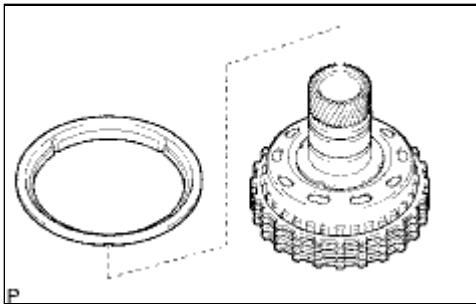
\*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*2 - \*1 - \*3 - \*4



#### Text in Illustration

*1	Disc
*2	Plate
*3	Flange
*4	Cushion Plate

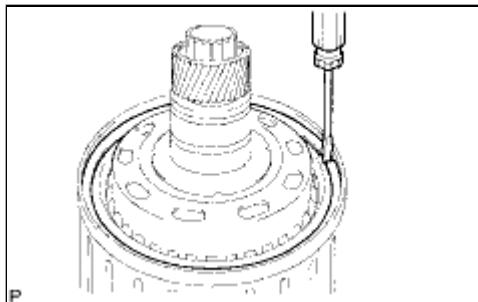
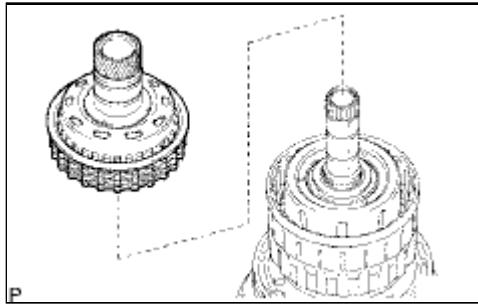
#### 45. INSTALL REVERSE CLUTCH REACTION SLEEVE



(a) Install the reverse clutch reaction sleeve to the reverse clutch hub.

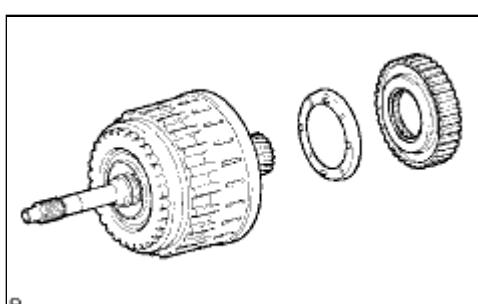
#### 46. INSTALL REVERSE CLUTCH HUB SUB-ASSEMBLY

(a) Install the reverse clutch hub to the clutch drum.



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

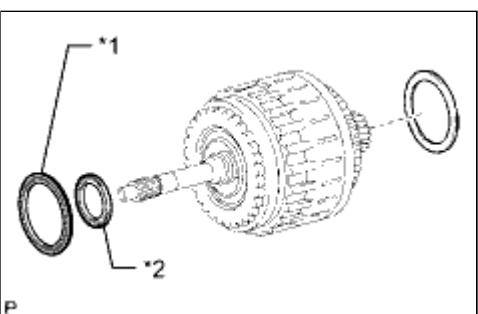
#### 47. INSTALL NO. 2 1-WAY CLUTCH ASSEMBLY



(a) Coat the No. 2 clutch drum thrust washer with petroleum jelly and install it to the clutch drum.

(b) Install the 1-way clutch to the clutch drum.

#### 48. INSTALL CLUTCH DRUM AND INPUT SHAFT ASSEMBLY



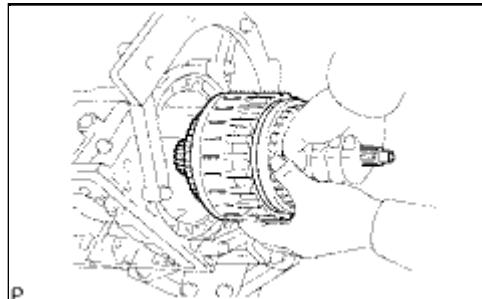
(a) Coat the 2 thrust needle roller bearings and clutch drum thrust washer with petroleum jelly and install them to the clutch drum and input shaft assembly.

### Text in Illustration

*1	Bearing A
*2	Bearing B

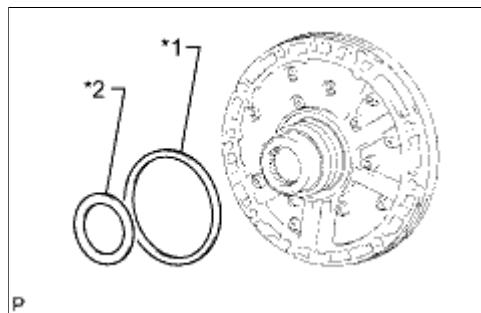
Thrust Needle Roller Bearing Diameter:

ITEM	INSIDE	OUTSIDE
Bearing A	72.0 to 72.3 mm (2.83 to 2.85 in.)	85.3 to 85.6 mm (3.36 to 3.37 in.)
Bearing B	34.7 to 34.9 mm (1.366 to 1.374 in.)	51.6 to 51.9 mm (2.03 to 2.04 in.)



(b) Install the clutch drum and input shaft assembly to the transmission case.

### 49. INSTALL OIL PUMP ASSEMBLY



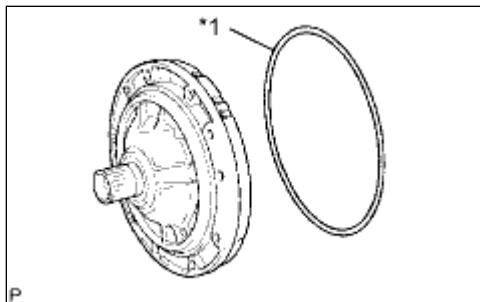
(a) Coat the No. 1 and No. 2 thrust bearing races with petroleum jelly and install them to the front oil pump.

Thrust Bearing Race Diameter:

ITEM	INSIDE	OUTSIDE
Race A	74.3 to 74.6 mm (2.93 to 2.94 in.)	87.4 to 87.7 mm (3.44 to 3.45 in.)
Race B	37.0 to 37.3 mm (1.46 to 1.47 in.)	52.1 to 52.3 mm (2.05 to 2.06 in.)

### Text in Illustration

*1	Race A
----	--------



(b) Coat a new O-ring with ATF and install it to the oil pump assembly.

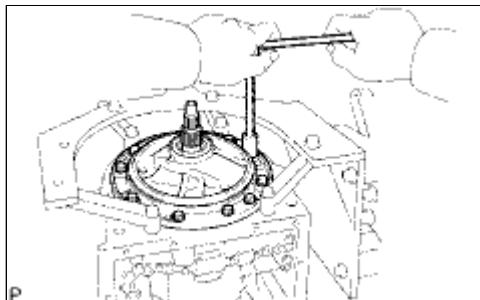
### Text in Illustration

*1	New O-Ring
----	------------

- (c) Slide the oil pump onto the input shaft, align the bolt holes of the oil pump assembly with the bolt holes of the transmission case and install the oil pump.
- (d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the overdrive direct clutch drum.

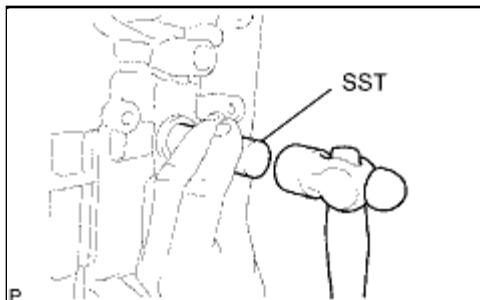
**NOTICE:**

**Do not excessively push on the oil pump, as the oil seal rings will stick to the direct clutch drum.**



(e) Install the 10 bolts.

**Torque: 21 N·m (215 kgf·cm, 16ft·lbf)**



### 50. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

- (a) Using SST and a hammer, tap in 2 new oil seals.

**SST: 09350-30020**

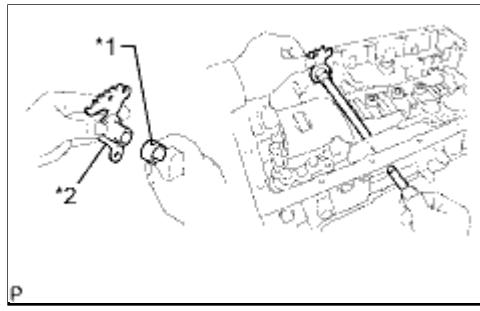
09350-07110

- (b) Coat the lips of the oil seals with MP grease.

### 51. INSPECT INDIVIDUAL PISTON OPERATION



### 52. INSTALL MANUAL VALVE LEVER SUB-ASSEMBLY

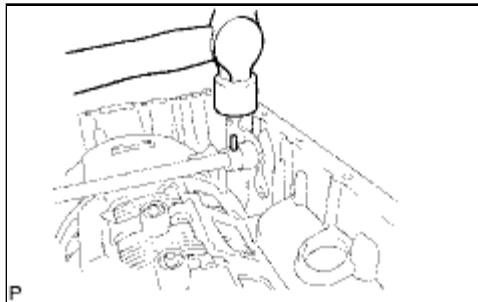


(a) Install a new spacer to the manual valve lever.

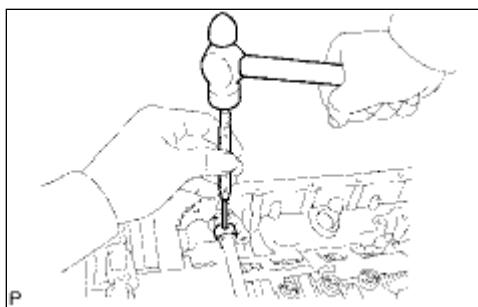
**Text in Illustration**

*1	Spacer
*2	Manual Valve Lever

(b) Push the manual valve lever shaft through the transmission case, and install the manual valve lever to the manual valve lever shaft.



(c) Using a hammer, tap in a new spring pin.



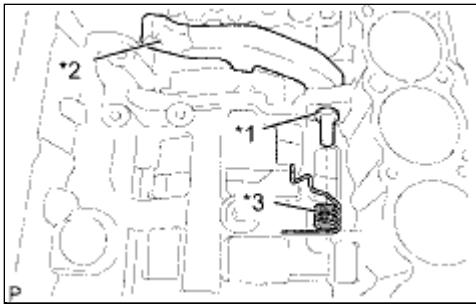
(d) Align the manual valve lever indentation with the spacer hole, and stake them together with a punch.

(e) Check that the shaft rotates smoothly.

**53. INSTALL PARKING LOCK PAWL SHAFT**

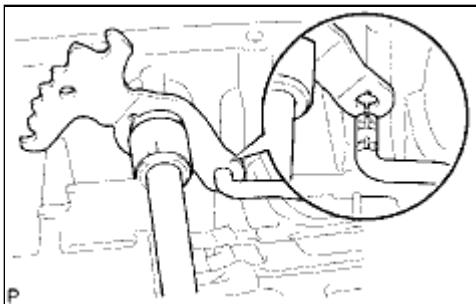
(a) Install the E-ring to the shaft.

(b) Install the parking lock pawl, shaft and spring.



## Text in Illustration

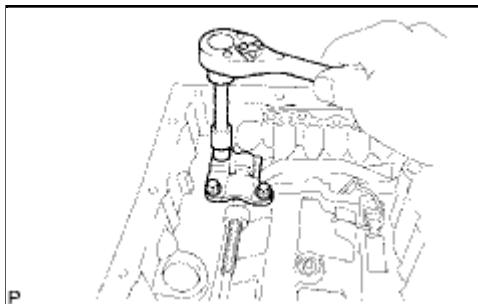
*1	E-Ring
*2	Parking Lock Pawl
*3	Spring



## 54. INSTALL PARKING LOCK ROD SUB-ASSEMBLY

- Connect the parking lock rod to the manual valve lever to install it.

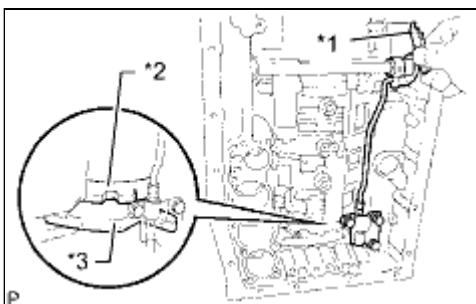
## 55. INSTALL PARKING LOCK PAWL BRACKET



- Install the parking lock pawl bracket to the transmission case with the 3 bolts.

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

- Move the manual valve lever to the P position, and confirm that the planetary ring gear is correctly locked by the lock pawl.



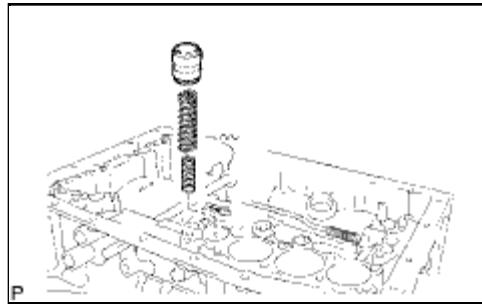
## Text in Illustration

*1	Manual Valve Lever
*2	Planetary Ring Gear
*3	Parking Lock Pawl

## 56. INSTALL C-1 ACCUMULATOR VALVE

(a) Install the 2 springs and accumulator valve to the hole.

Accumulator Spring Diameter:

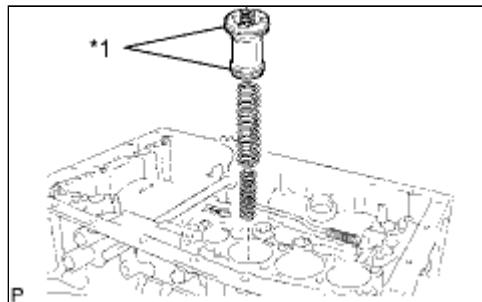


SPRING	FREE LENGTH OUTER DIAMETER	COLOR
C-1 Inner	30.40 mm (1.20 in.) 11.40 mm (0.449 in.)	Pink
C-1 Outer	48.76 mm (1.92 in.) 16.60 mm (0.654 in.)	Light Green

## 57. INSTALL C-3 ACCUMULATOR PISTON

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

### Text in Illustration

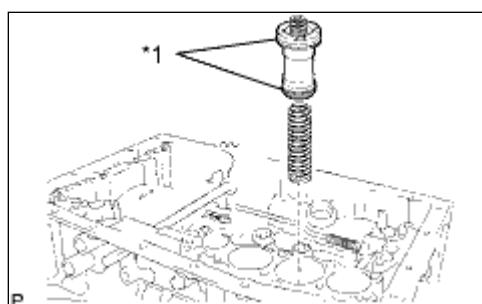


*1	New O-Ring
(b) Install the 2 springs and accumulator piston to the hole.	
Accumulator Spring Diameter:	
SPRING	FREE LENGTH OUTER DIAMETER

## 58. INSTALL B-3 ACCUMULATOR PISTON

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

### Text in Illustration



\* 1

New O-Ring

(b) Install the spring and accumulator piston to the hole.

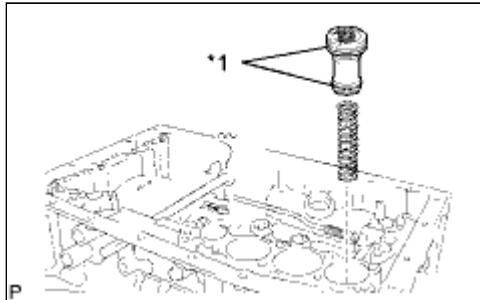
Accumulator Spring Diameter:

SPRING	FREE LENGTH OUTER DIAMETER	COLOR
B-3	70.5 mm (2.78 in.) 19.7 mm (0.776 in.)	Purple

## 59. INSTALL C-2 ACCUMULATOR PISTON

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

### Text in Illustration



\* 1

New O-Ring

(b) Install the spring and accumulator piston to the hole.

Accumulator Spring Diameter:

SPRING	FREE LENGTH OUTER DIAMETER	COLOR
C-2	62.0 mm (2.44 in.) 15.9 mm (0.626 in.)	White



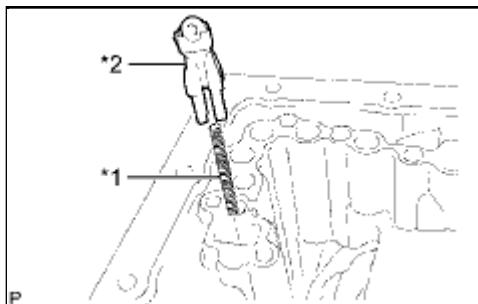
## 60. INSTALL BRAKE DRUM GASKET

(a) Install the 3 brake drum gaskets.

## 61. INSTALL TRANSMISSION CASE GASKET



(a) Install the 3 transmission case gaskets.



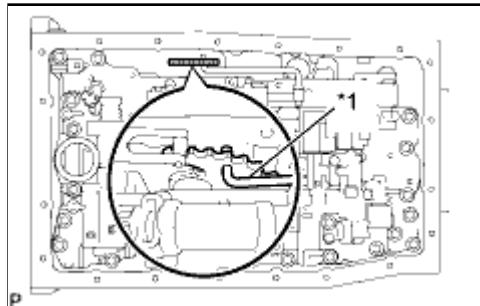
## 62. INSTALL CHECK BALL BODY

(a) Install the spring and check ball body.

### Text in Illustration

* 1	Spring
* 2	Check Ball Body

## 63. INSTALL TRANSMISSION VALVE BODY ASSEMBLY



(a) Insert the pin of the manual valve into the hole of the manual valve lever.

### Text in Illustration

* 1	Pin
-----	-----

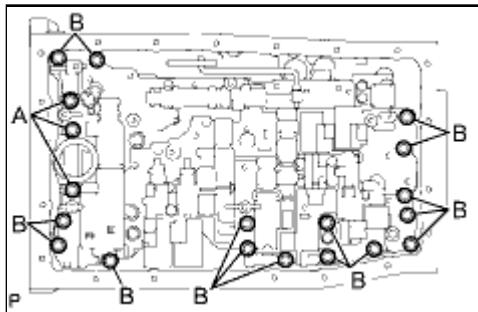
(b) Install the transmission valve body assembly with the 19 bolts.

**Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

### HINT:

Each bolt length is indicated below.

**36 mm (1.42 in.) for bolt A**

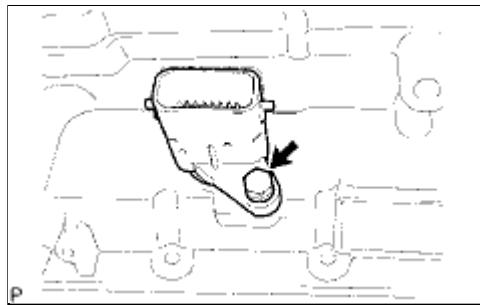


**25 mm (0.984 in.) for bolt B**

- (c) Install the detent spring and detent spring cover with the bolt.

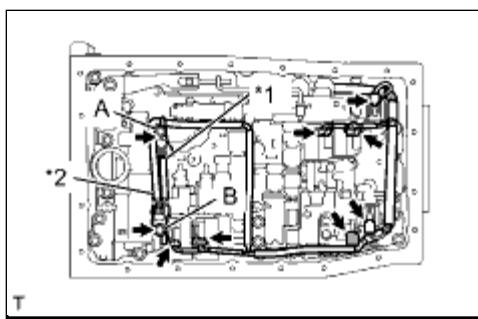
**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

#### 64. INSTALL TRANSMISSION WIRE



- (a) Coat a new O-ring with ATF and install it to the transmission wire connector.
- (b) Install the transmission wire harness.
- (c) Install the bolt.

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



- (d) Connect the 7 solenoid connectors.

- (e) Connect the 2 ATF temperature sensors with the 2 clamps and 2 bolts.

**for bolt A - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

**for bolt B - Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

#### Text in Illustration

* 1	No. 1 Temperature Sensor
-----	--------------------------

\*2

No. 2 Temperature Sensor

**HINT:**

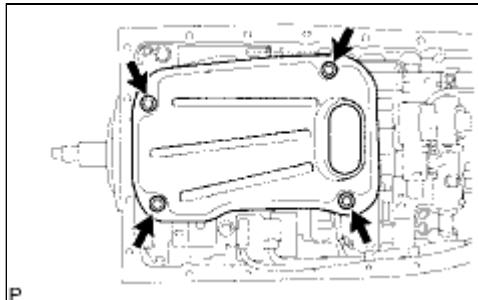
Each bolt length is indicated below.

12 mm (0.472 in.) for bolt A

36 mm (1.42 in.) for bolt B

**Sensor Wire Harness**

WIRE HARNESS	COLOR
No. 1 temperature sensor	Orange
No. 2 temperature sensor	Blue

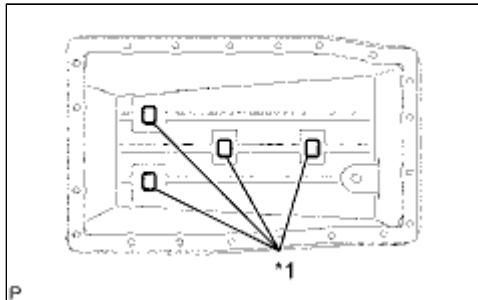


**65. INSTALL VALVE BODY OIL STRAINER ASSEMBLY**

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

(b) Install the oil strainer with the 4 bolts.

**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**



**66. INSTALL TRANSMISSION OIL CLEANER MAGNET**

(a) Install the 4 magnets.

**67. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**

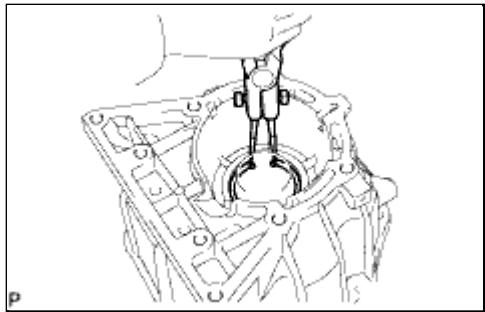
(a) Install a new gasket to the oil pan.

(b) Install the oil pan with the 20 bolts.

**Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)**

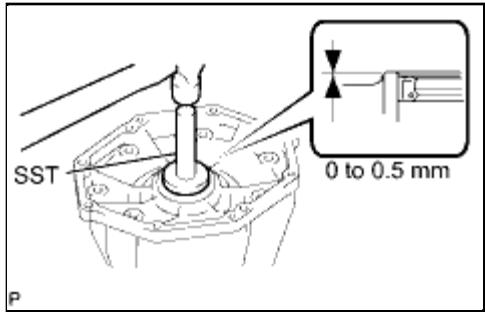
(c) Install the drain plug.

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



## 68. INSTALL REAR TRANS CASE ADAPTOR OIL RECEIVER

- Install the trans case adaptor oil receiver to the rear adaptor transfer.
- Using snap ring pliers, install the snap ring.



## 69. INSTALL TRANSMISSION CASE ADAPTER REAR OIL SEAL

- Coat the lip of a new oil seal with ATF.
- Using SST and a hammer, tap in the oil seal.

**SST: 09950-60010**

09951-00650

**SST: 09950-70010**

09951-07150

Standard depth:

0 to 0.5 mm (0 to 0.0197 in.)

## 70. INSTALL TRANSFER ADAPTER REAR

- Clean the threads of the bolts and case.

- Apply seal packing or equivalent to the transmission case adapter and 8 bolts.

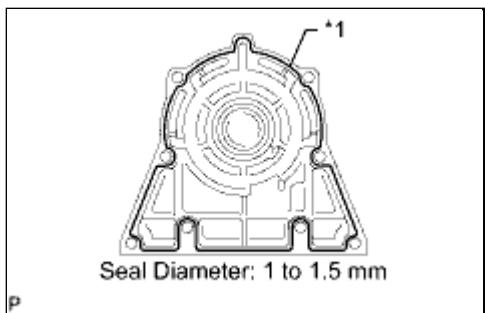
Seal packing:

Toyota Genuine Seal Packing 1281,

Three Bond 1281 or equivalent

Seal diameter:

1.0 to 1.5 mm (0.0394 to 0.0591 in.)



## Text in Illustration

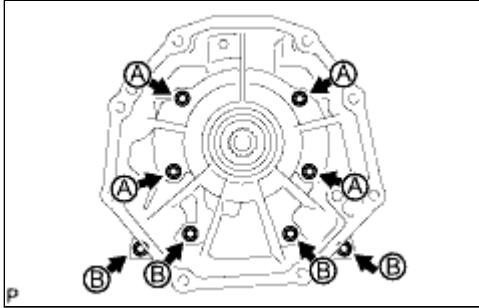
\*1

Seal Packing

- Install the transmission case adapter with the 8 bolts.

**Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**

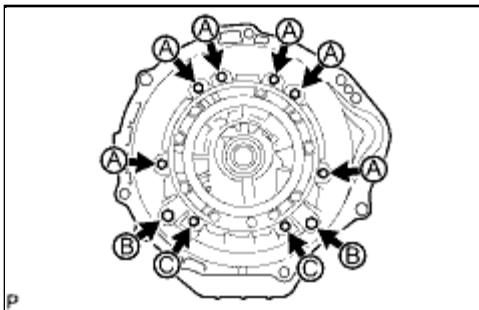
**HINT:**



Each bolt length is indicated below.

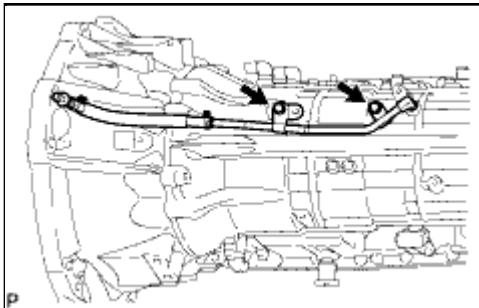
50 mm (1.97 in.) for bolt A

40 mm (1.57 in.) for bolt B



## 71. INSTALL AUTOMATIC TRANSMISSION HOUSING

- Clean the threads of the bolts and case with non-residue solvent.
- Install the transmission housing with the 10 bolts.
  - for 14 mm head bolt A - Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**
  - for 17 mm head bolt B - Torque: 57 N·m (579 kgf·cm, 42ft·lbf)**
  - for 14 mm head bolt C - Torque: 34 N·m (345 kgf·cm, 25ft·lbf)**

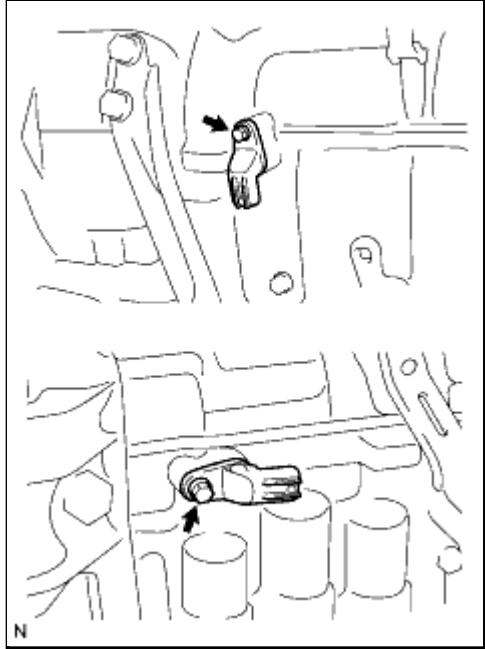


## 72. INSTALL AUTOMATIC TRANSMISSION BREATHER TUBE

- Coat a new O-ring with ATF and install it to the breather tube.
- Install the breather tube with the 2 bolts.  
**Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)**

## 73. INSTALL SPEED SENSOR

- Coat 2 new O-rings with ATF and install one to each speed sensor.

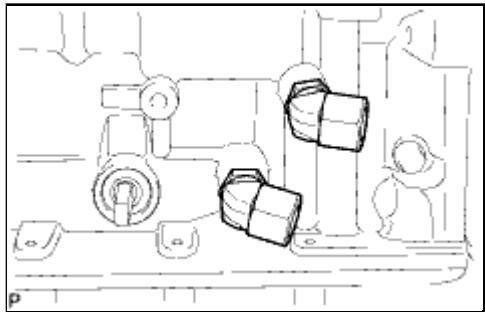


(b) Install the 2 speed sensors.

(c) Install the 2 bolts.

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

#### 74. INSTALL OIL COOLER TUBE UNION

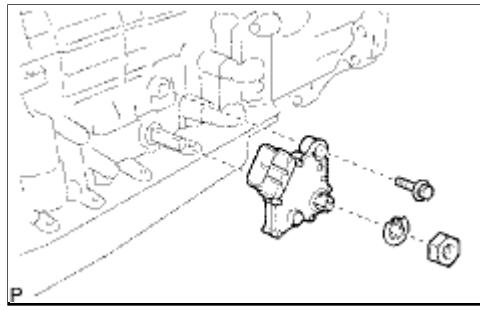


(a) Coat a new O-ring with ATF and install one to each oil cooler tube union.

(b) Install the oil cooler tube union.

**Torque: 29 N·m (300 kgf·cm, 22ft·lbf)**

#### 75. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

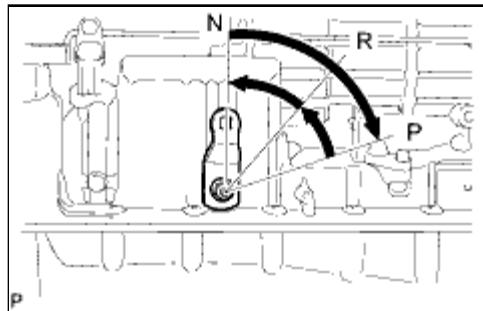


(a) Install the park/neutral position switch to the manual valve lever shaft, and temporarily install the adjusting bolt.

(b) Install a new lock washer and the nut.

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

(c) Temporarily install the control shaft lever.

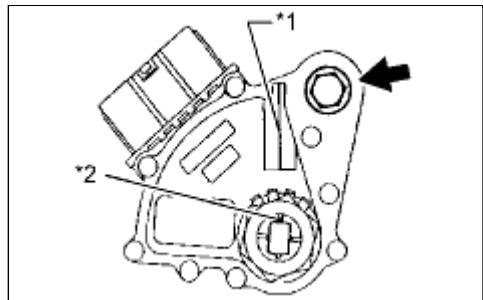


(d) Turn the control shaft lever clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.

(e) Remove the control shaft lever.

(f) Align the neutral basic line with the switch groove, and tighten the adjusting bolt.

## Text in Illustration



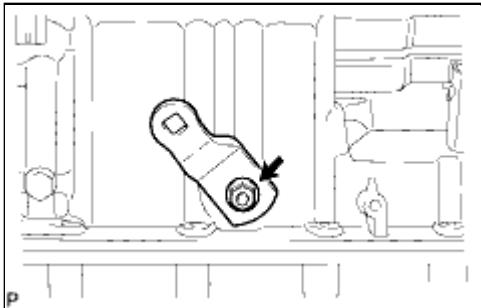
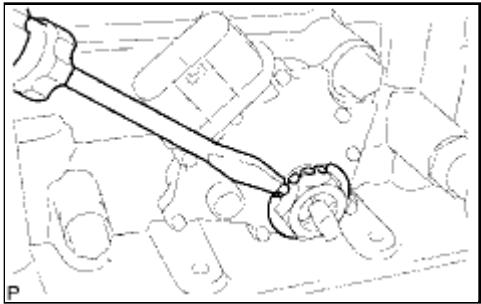
* 1	Neutral Basic Line
* 2	Groove

**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**

(g) Using a screwdriver, bend the tabs of the lock washer.

## HINT:

**Bend at least 2 of the lock washer tabs.**



## 76. INSTALL TRANSMISSION CONTROL SHAFT LEVER LH

- (a) Install the control shaft lever with the spring washer and nut.

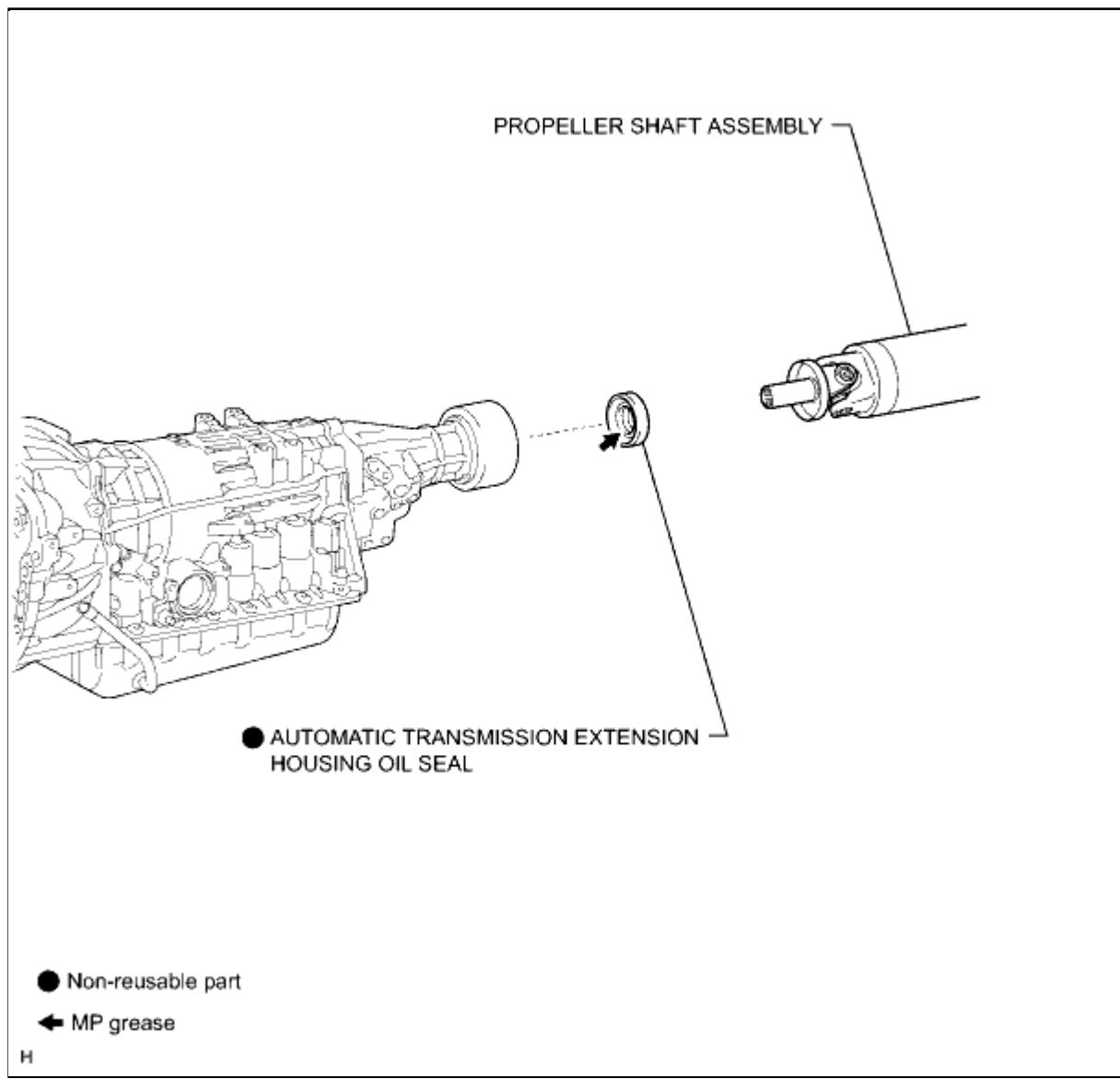
**Torque: 16 N·m (160 kgf·cm, 12ft·lbf)**



Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001LQY009X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: EXTENSION HOUSING REAR OIL SEAL: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION

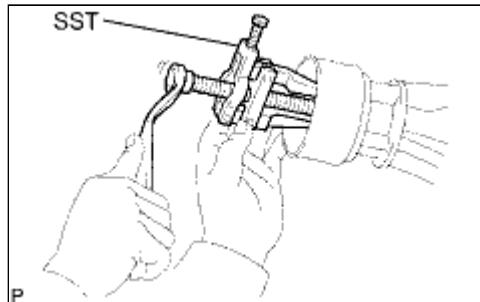


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001OZK00BX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: EXTENSION HOUSING REAR OIL SEAL: REPLACEMENT (2010 4Runner)		

## REPLACEMENT

### 1. REMOVE PROPELLER SHAFT ASSEMBLY

- (a) Remove the propeller with center bearing shaft .

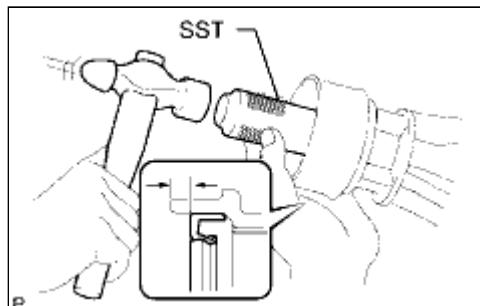


### 2. REMOVE AUTOMATIC TRANSMISSION EXTENSION HOUSING OIL SEAL

- (a) Using SST, remove the oil seal.

**SST: 09308-10010**

### 3. INSTALL AUTOMATIC TRANSMISSION EXTENSION HOUSING 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: 09309-37010**

Standard depth:

5.8 to 6.2 mm (0.228 to 0.244 in.)

#### NOTICE:

Be careful not to damage the lip of the oil seal.

### 4. INSTALL PROPELLER SHAFT ASSEMBLY

- (a) Install the propeller with center bearing shaft .

### 5. ADD AUTOMATIC TRANSMISSION FLUID

Fluid type:

Toyota Genuine ATF WS

## **6. INSPECT AUTOMATIC TRANSMISSION FLUID**

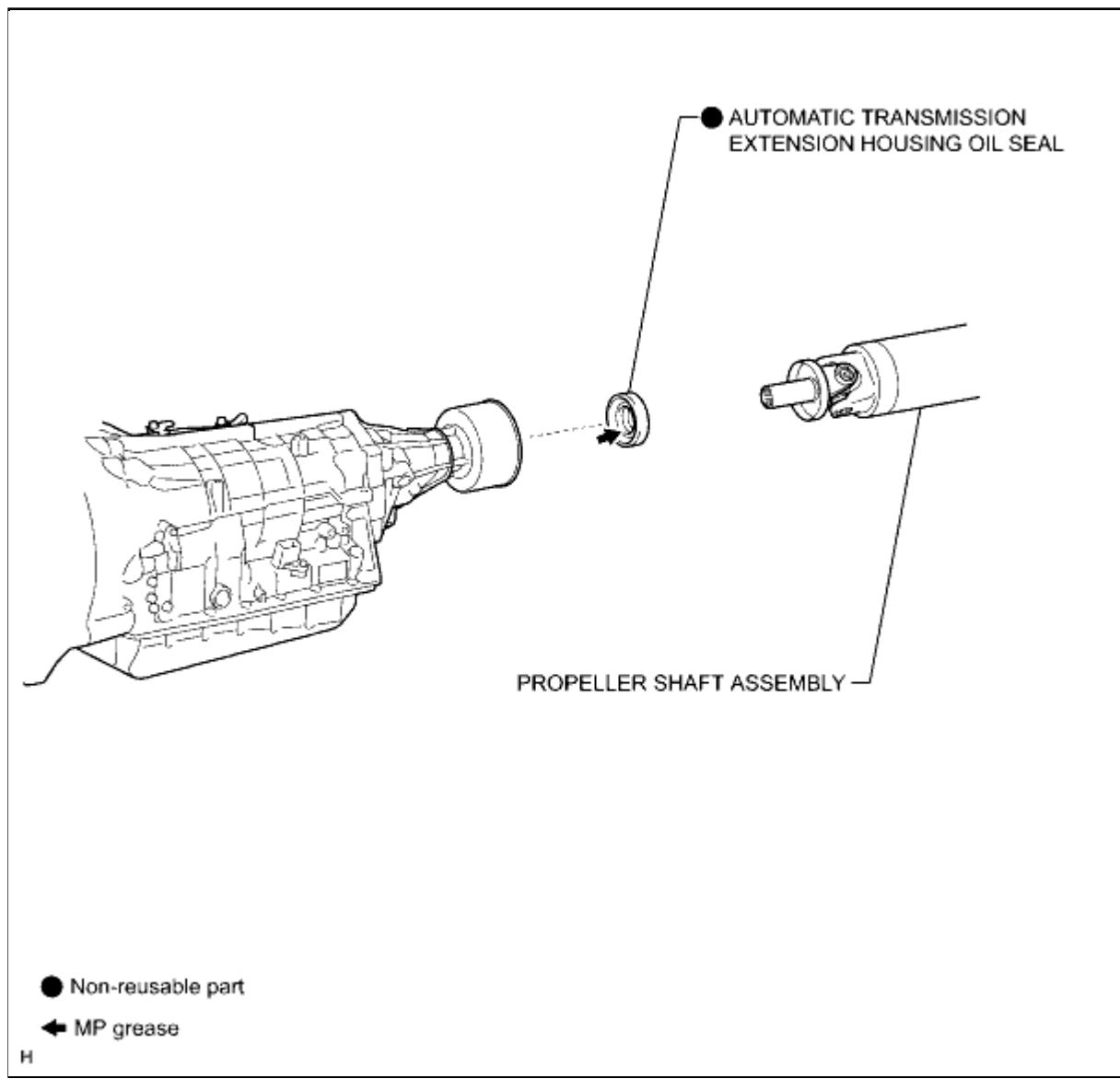
(a) Inspect the automatic transmission fluid  .



Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BLA00RX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: EXTENSION HOUSING REAR OIL SEAL: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION

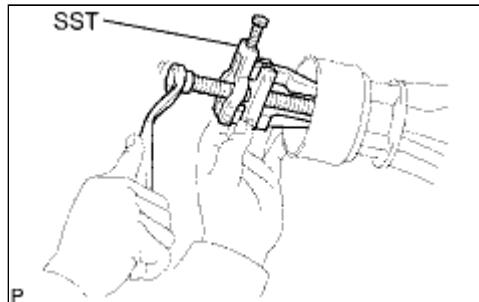


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013C400WX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: EXTENSION HOUSING REAR OIL SEAL: REPLACEMENT (2010 4Runner)		

## REPLACEMENT

### 1. REMOVE PROPELLER SHAFT ASSEMBLY

- (a) Remove the propeller shaft .



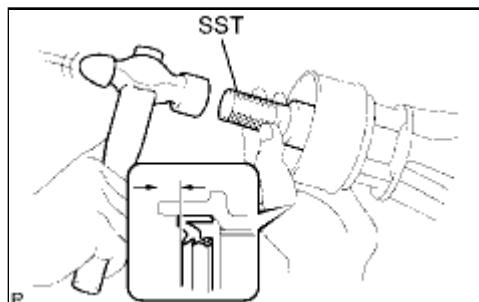
### 2. REMOVE AUTOMATIC TRANSMISSION EXTENSION HOUSING OIL SEAL

- (a) Using SST, remove the oil seal.

SST: 09308-00010

### 3. INSTALL AUTOMATIC TRANSMISSION EXTENSION HOUSING 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: 09316-60011

09316-00011

09316-00051

Standard depth:

5.4 to 5.8 mm (0.213 to 0.228 in.)

### 4. INSTALL PROPELLER SHAFT ASSEMBLY

- (a) Install the propeller shaft .

### 5. ADD AUTOMATIC TRANSMISSION FLUID

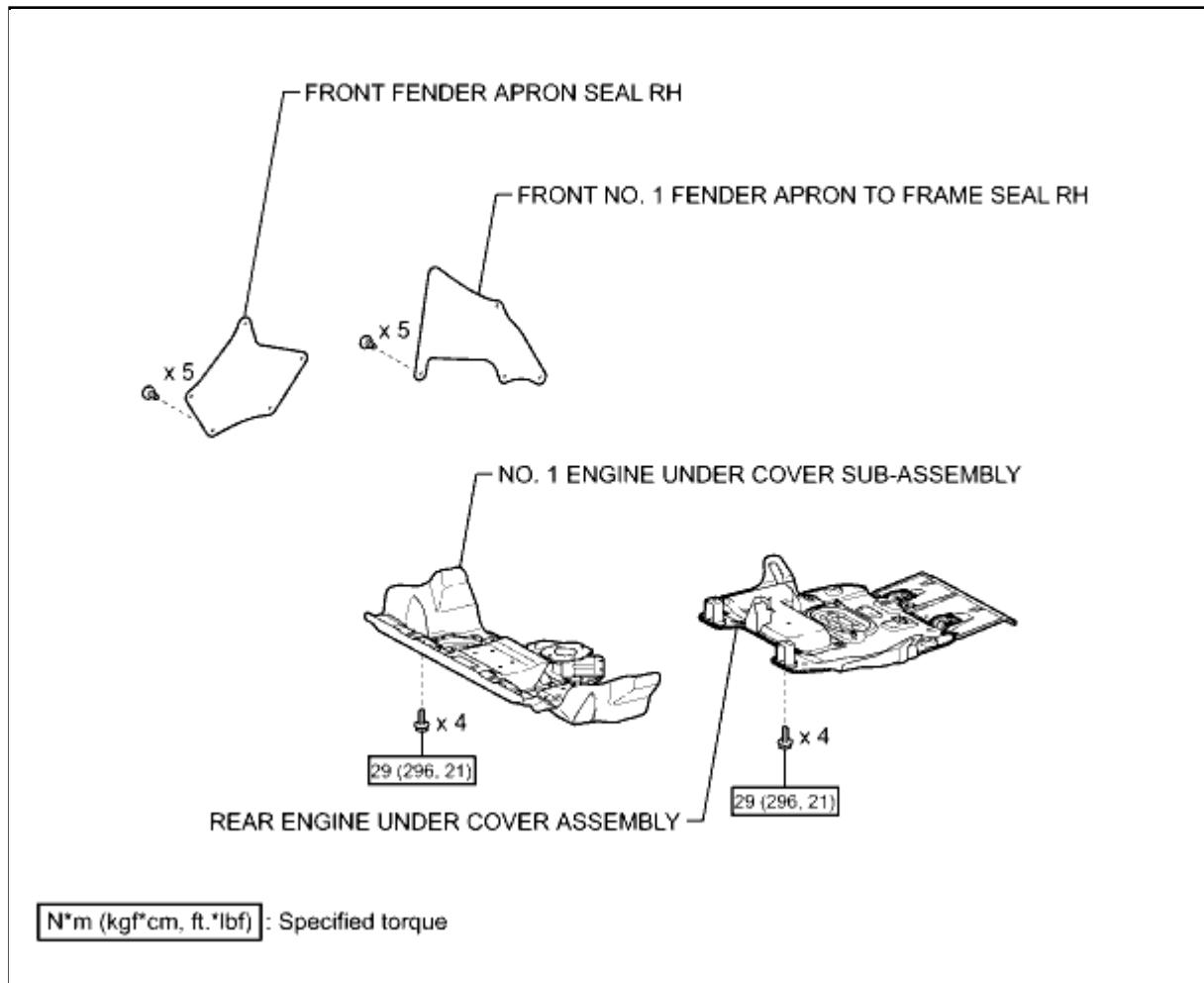
- (a) Add automatic transmission fluid .



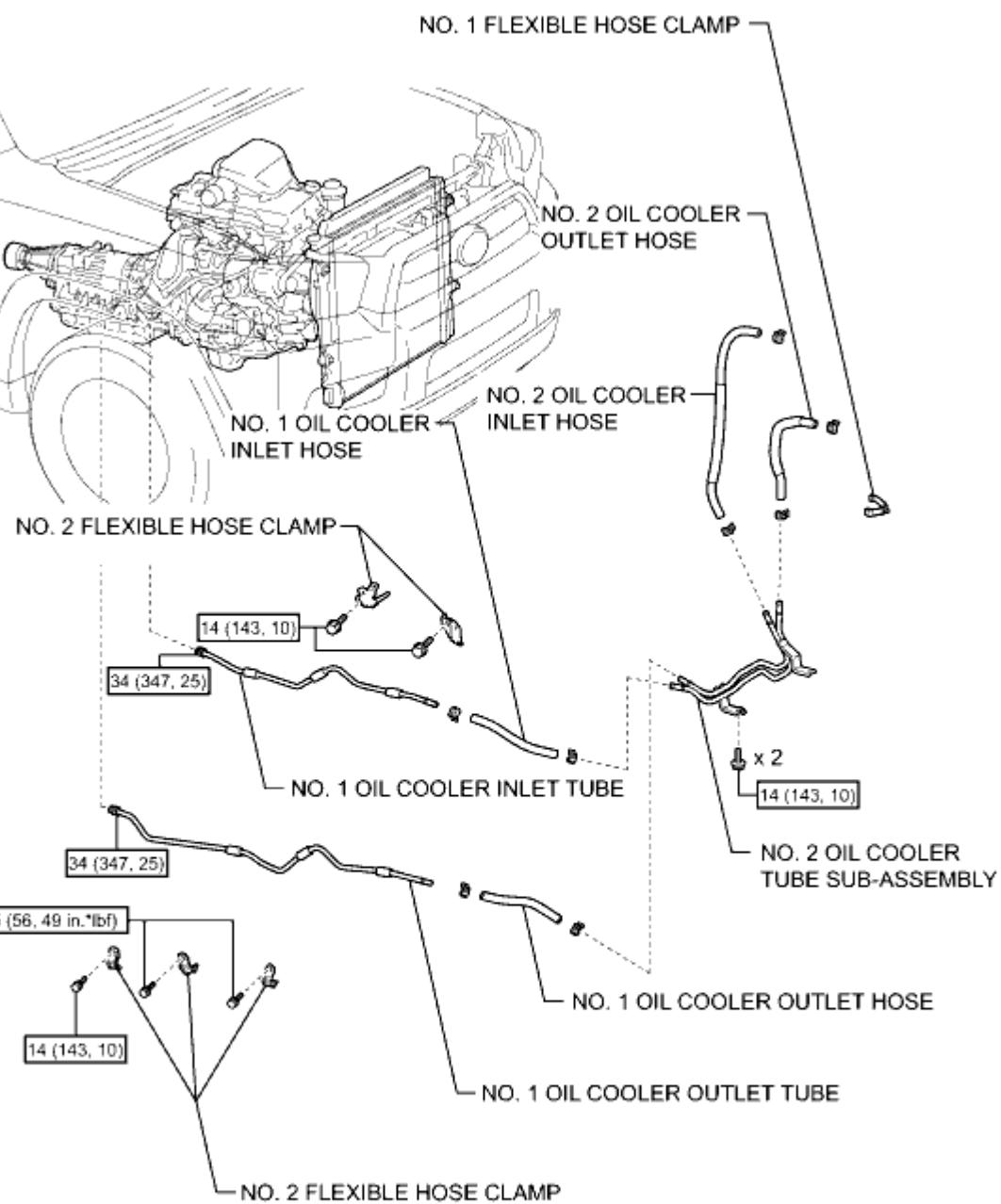
Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454X003X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



## ILLUSTRATION

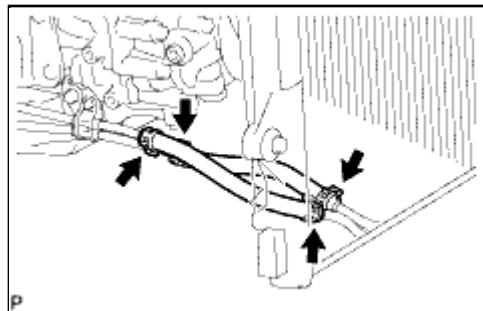


N\*m (kgf\*cm, ft.\*lbf) : Specified torque

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454Y003X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: REMOVAL (2010 4Runner)		

## **REMOVAL**

- 1. REMOVE NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY** INFO
  
- 2. REMOVE REAR ENGINE UNDER COVER ASSEMBLY** INFO
  
- 3. REMOVE FRONT FENDER APRON SEAL RH** INFO
  
- 4. REMOVE FRONT NO. 1 FENDER APRON TO FRAME SEAL RH** INFO

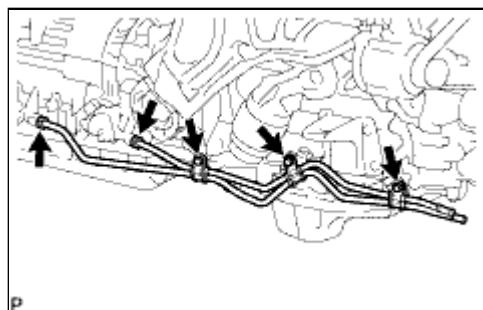


### **5. REMOVE NO. 1 OIL COOLER INLET HOSE AND NO. 1 OIL COOLER OUTLET HOSE**

- (a) Disconnect the No. 1 oil cooler inlet hose and No. 1 oil cooler outlet hose from the No. 2 oil cooler tube.
- (b) Disconnect the 2 hoses from the oil cooler inlet tube and No. 1 oil cooler outlet tube and remove them.

**NOTICE:**

**When disconnecting the hoses from the tube, support the tube by hand and be careful to prevent the tube from being deformed.**

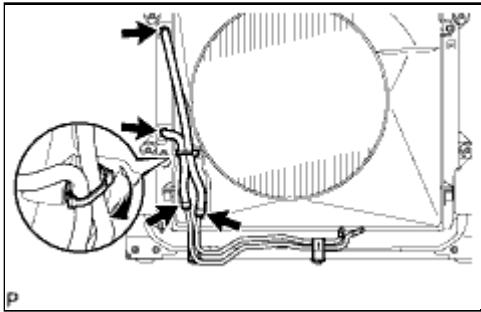


### **6. REMOVE NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE**

- (a) Using a union nut wrench, disconnect the No. 1 oil cooler inlet tube and No. 1 oil cooler outlet tube from each oil cooler tube union.
- (b) Remove the 3 bolts to open the 3 No. 2 flexible hose clamps and remove 2 oil cooler tubes.
- (c) Remove the 2 bolts and 2 No. 2 flexible hose clamps.

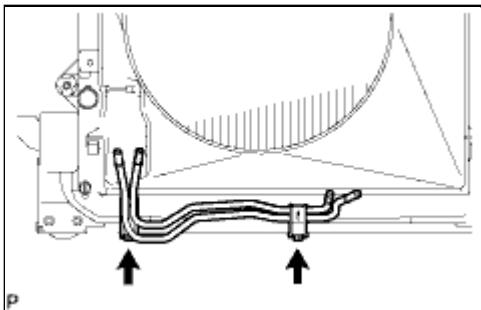
### **7. REMOVE NO. 2 OIL COOLER INLET HOSE AND NO. 2 OIL COOLER OUTLET HOSE**

- (a) Detach the claw to open the No. 1 flexible hose clamp.
- (b) Disconnect the No. 2 oil cooler inlet hose and No. 2 oil cooler outlet hose from the radiator.
- (c) Disconnect the 2 hoses from the No. 2 oil cooler tube and remove them.



**NOTICE:**

When disconnecting the hoses from the tube, support the tube by hand and be careful to prevent the tube from being deformed.



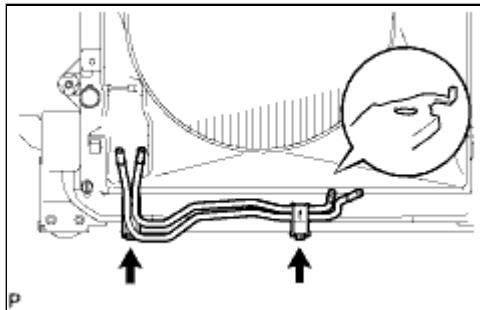
**8. REMOVE NO. 2 OIL COOLER TUBE SUB-ASSEMBLY**

- (a) Remove the 2 bolts and No. 2 oil cooler tube.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454W003X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: INSTALLATION (2010 4Runner)		

## INSTALLATION



### 1. INSTALL NO. 2 OIL COOLER TUBE SUB-ASSEMBLY

(a) Install the No. 2 oil cooler tube with the 2 bolts.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

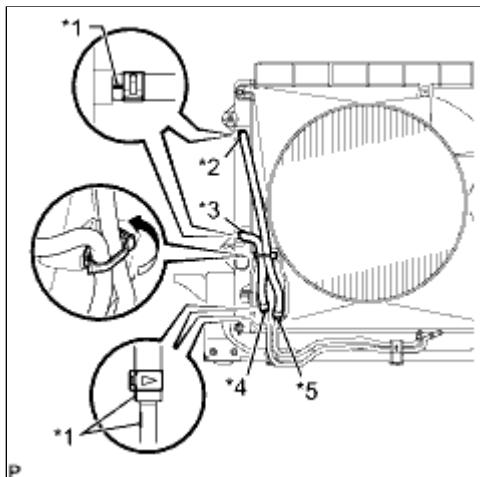
**NOTICE:**

Make sure the rotation stopper of the tube contacts the crossmember.

### 2. INSTALL NO. 2 OIL COOLER INLET HOSE AND NO. 2 OIL COOLER OUTLET HOSE

(a) Connect the No. 2 oil cooler inlet hose and No. 2 oil cooler outlet hose to the No. 2 oil cooler tube.

#### Text in Illustration



*1	Paint Mark
*2	Yellow Paint Mark
*3	Green Paint Mark
*4	Blue Paint Mark
*5	Pink Paint Mark

(b) Connect the 2 hoses to the radiator to install them, and then pass the 2 hoses through the No. 1 flexible hose clamp and close the clamp.

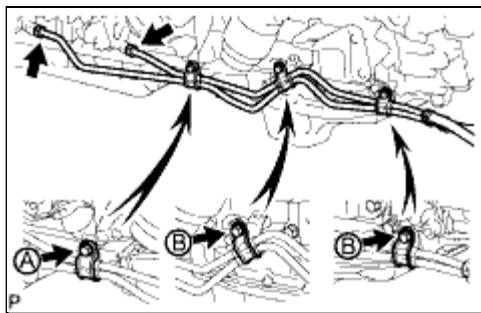
**NOTICE:**

- When connecting the hoses to the tube, support the tube by hand and be careful to prevent the tube from being deformed.
- Make sure the paint marks and pinching portion of each clip are facing the directions shown in the illustration.

### 3. INSTALL NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE

(a) Install the 2 No. 2 flexible hose clamps with the 2 bolts.

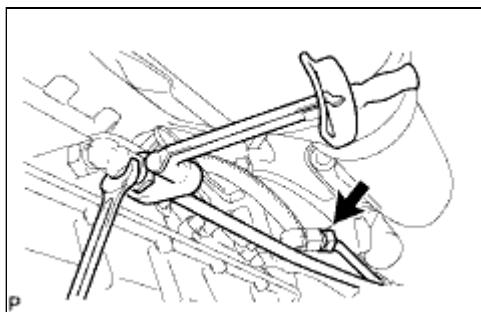
**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**



(c) Close the 3 No. 2 flexible hose clamps and install the 3 bolts.

**for bolt A - Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

**for bolt B - Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

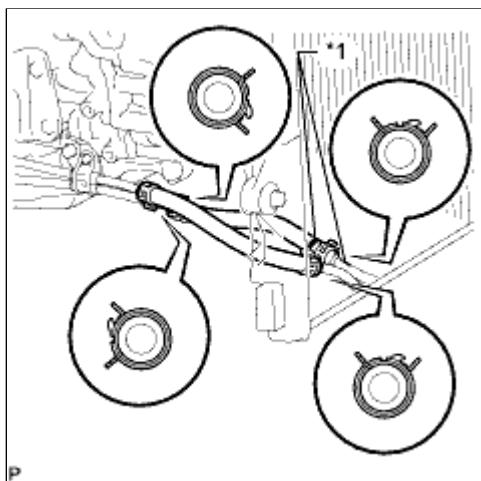


(d) Using a union nut wrench, tighten the oil cooler tubes.

**Torque: 34 N·m (347 kgf·cm, 25ft·lbf)**

**NOTICE:**

Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench INFO.



#### 4. INSTALL NO. 1 OIL COOLER INLET HOSE AND NO. 1 OIL COOLER OUTLET HOSE

(a) Connect the No. 1 oil cooler inlet hose and No. 1 oil cooler outlet hose to the oil cooler inlet tube and No. 1 oil cooler outlet tube.

#### Text in Illustration

\*1 Pink Paint Mark

(b) Connect the 2 hoses to the No. 2 oil cooler tube to install them.

**NOTICE:**

- When connecting the hoses to the tube, support the tube by hand and be careful to prevent the tube from being deformed.

- Make sure the paint marks and pinching portion of each clip are facing the directions shown in the illustration.

## 5. ADJUST AUTOMATIC TRANSMISSION FLUID LEVEL

(a) Adjust the automatic transmission fluid level .

## 6. INSTALL FRONT NO. 1 FENDER APRON TO FRAME SEAL RH

## 7. INSTALL FRONT FENDER APRON SEAL RH

## 8. INSTALL REAR ENGINE UNDER COVER ASSEMBLY

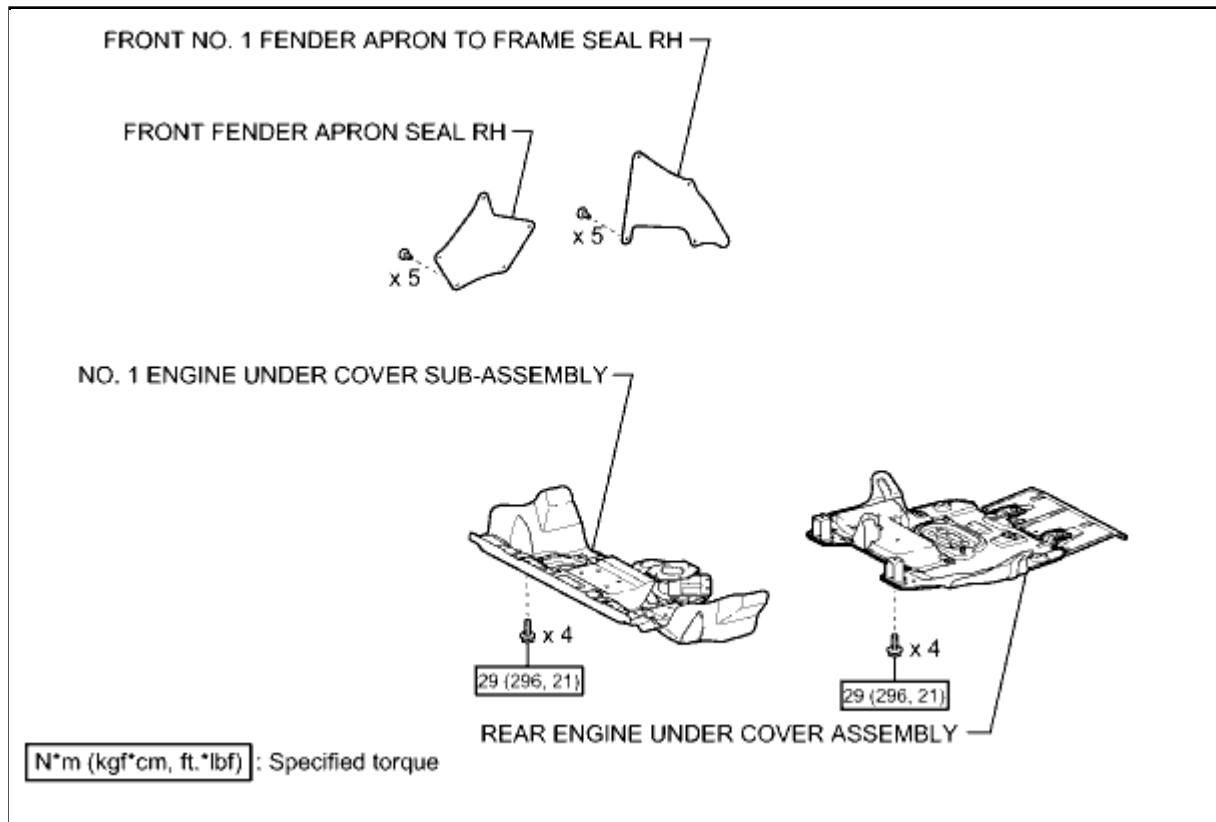
## 9. INSTALL NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY



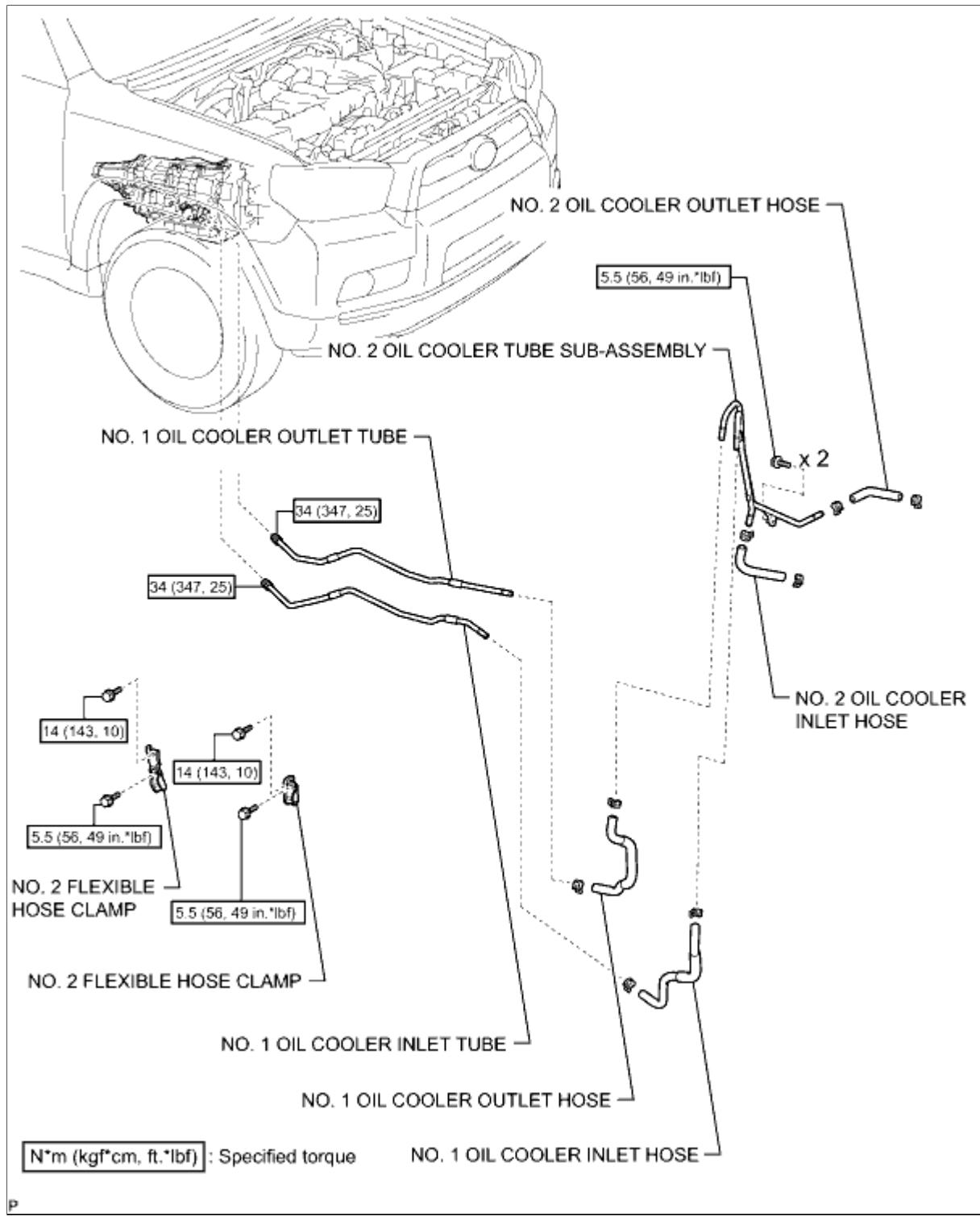
Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001BZC01PX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



## ILLUSTRATION



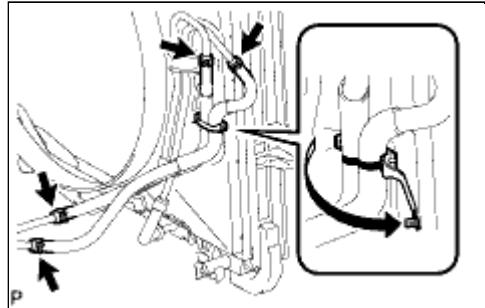
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Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001BZD01TX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: REMOVAL (2010 4Runner)		

## REMOVAL

1. REMOVE NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY INFO
2. REMOVE REAR ENGINE UNDER COVER ASSEMBLY INFO
3. REMOVE FRONT FENDER APRON SEAL RH INFO
4. REMOVE FRONT NO. 1 FENDER APRON TO FRAME SEAL RH INFO

### 5. REMOVE NO. 1 OIL COOLER INLET HOSE AND NO. 1 OIL COOLER OUTLET HOSE

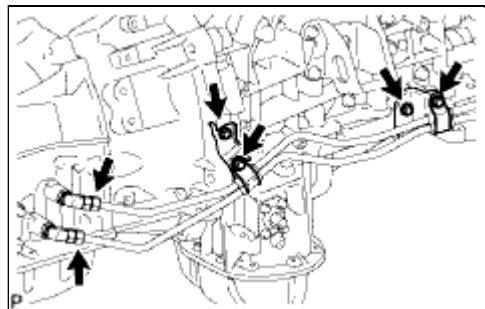


- (a) Detach the claw to open the No. 1 flexible hose clamp.
- (b) Disconnect the No. 1 oil cooler inlet hose and No. 1 oil cooler outlet hose from the No. 2 oil cooler tube.
- (c) Disconnect the 2 hoses from the oil cooler inlet tube and No. 1 oil cooler outlet tube and remove them.

**NOTICE:**

**When disconnecting the hoses from the tube, support the tube by hand and be careful to prevent the tube from being deformed.**

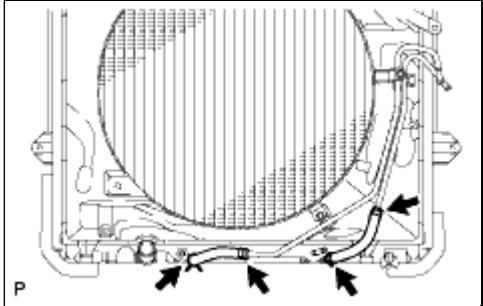
### 6. REMOVE NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE



- (a) Using a union nut wrench, disconnect the No. 1 oil cooler inlet tube and No. 1 oil cooler outlet tube from each oil cooler tube union.

- (b) Remove the 2 bolts to open the 2 No. 2 flexible hose clamps and remove the 2 oil cooler tubes.
- (c) Remove the 2 bolts and 2 No. 2 flexible hose clamps.

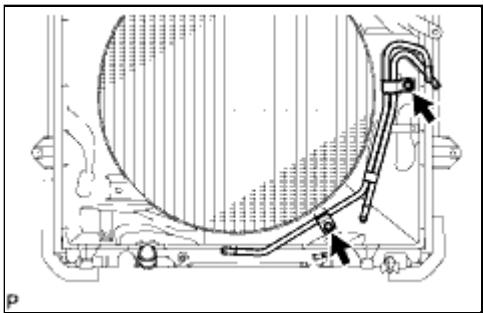
### 7. REMOVE NO. 2 OIL COOLER INLET HOSE AND NO. 2 OIL COOLER OUTLET HOSE



- (a) Disconnect the No. 2 oil cooler inlet hose and No. 2 oil cooler outlet hose from the radiator.
- (b) Disconnect the 2 hoses from the No. 2 oil cooler tube and remove them.

**NOTICE:**

**When disconnecting the hoses from the tube, support the tube by hand and be careful to prevent the tube from being deformed.**



**8. REMOVE NO. 2 OIL COOLER TUBE SUB-ASSEMBLY**

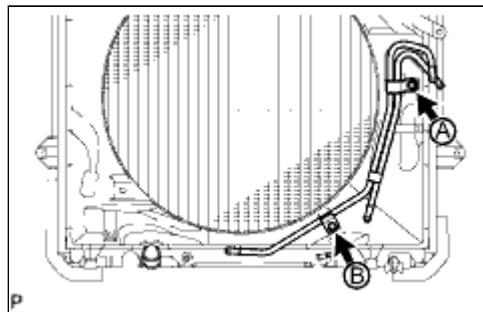
- (a) Remove the 2 bolts and No. 2 oil cooler tube.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001BZB01TX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: INSTALLATION (2010 4Runner)		

## INSTALLATION

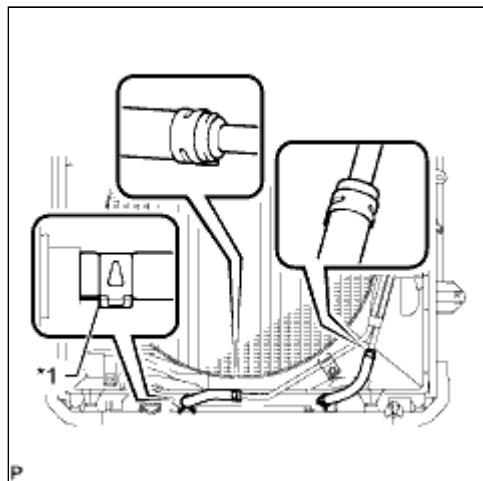
### 1. INSTALL NO. 2 OIL COOLER TUBE SUB-ASSEMBLY



(a) Temporarily install the oil cooler tube to the fan shroud with bolt A. Install bolt B and tighten it to the specified torque. Then tighten bolt A to the specified torque.

**Torque: 5.5 N·m (56 kgf·cm, 49in-lbf)**

### 2. INSTALL NO. 2 OIL COOLER INLET HOSE AND NO. 2 OIL COOLER OUTLET HOSE



(a) Connect the No. 2 oil cooler inlet hose and No. 2 oil cooler outlet hose to the No. 2 oil cooler tube.

#### Text in Illustration

\*1

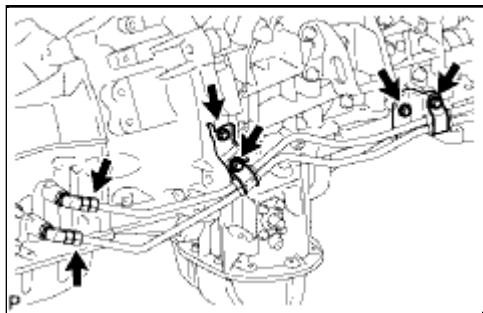
Yellow Point Mark

(b) Connect the 2 hoses to the radiator to install them.

#### NOTICE:

- When connecting the hoses to the tube, support the tube by hand and be careful to prevent the tube from being deformed.
- Make sure the paint mark and pinching portion of each clip are facing the directions shown in the illustration.

### 3. INSTALL NO. 1 INLET OIL COOLER TUBE AND NO. 1



## OUTLET OIL COOLER TUBE

(a) Install the 2 No. 2 flexible hose clamps with the 2 bolts.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

(b) Temporarily install the ends of the 2 oil cooler tubes to each oil cooler tube union by hand.

(c) Close the 2 No. 2 flexible hose clamps and install the 2 bolts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

(d) Using a union nut wrench, tighten the inlet and outlet tubes.

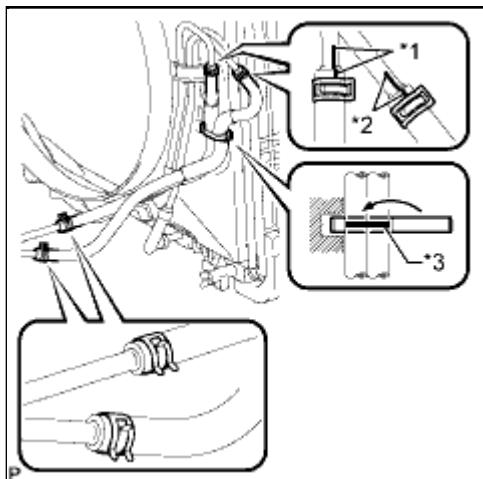
**Torque: 34 N·m (347 kgf·cm, 25ft·lbf)**

### NOTICE:

Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench .

## 4. INSTALL NO. 1 OIL COOLER INLET HOSE AND NO. 1 OIL COOLER OUTLET HOSE

(a) Connect the No. 1 oil cooler inlet hose and No. 1 oil cooler outlet hose to the oil cooler inlet tube and No. 1 oil cooler outlet tube.



### Text in Illustration

* 1	Blue Paint Mark
* 2	Pink Paint Mark
* 3	White Paint Mark

(b) Connect the 2 hoses to the No. 2 oil cooler tube to install them, and then pass the 2 hoses through the No. 1 flexible hose clamp and close the clamp.

### NOTICE:

- When connecting the hoses to the tube, support the tube by hand and be careful to prevent the tube from being deformed.
- Make sure the paint marks and pinching portion of each clip are facing the directions shown in the illustration.

## 5. ADJUST AUTOMATIC TRANSMISSION FLUID LEVEL

(a) Adjust the automatic transmission fluid level .

**6. INSTALL FRONT NO. 1 FENDER APRON TO FRAME SEAL RH** 

**7. INSTALL FRONT FENDER APRON SEAL RH** 

**8. INSTALL REAR ENGINE UNDER COVER ASSEMBLY** 

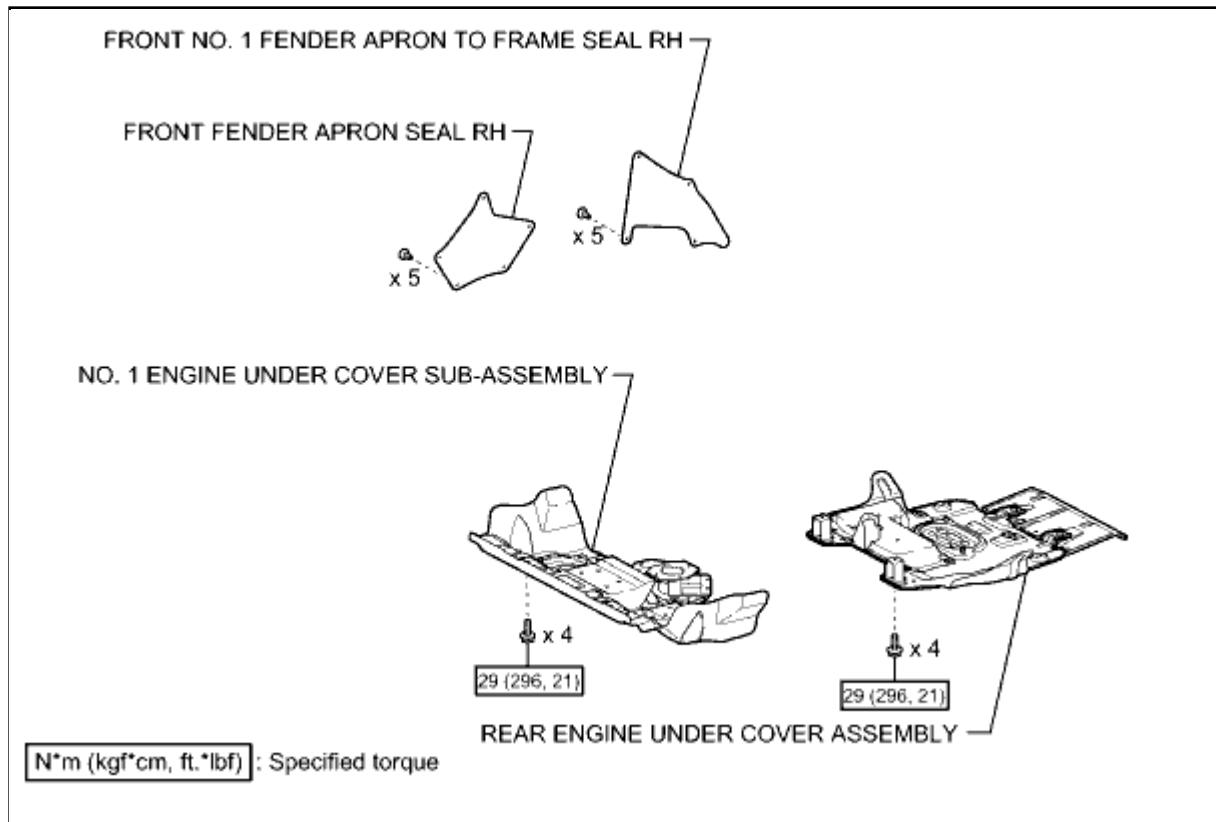
**9. INSTALL NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY** 



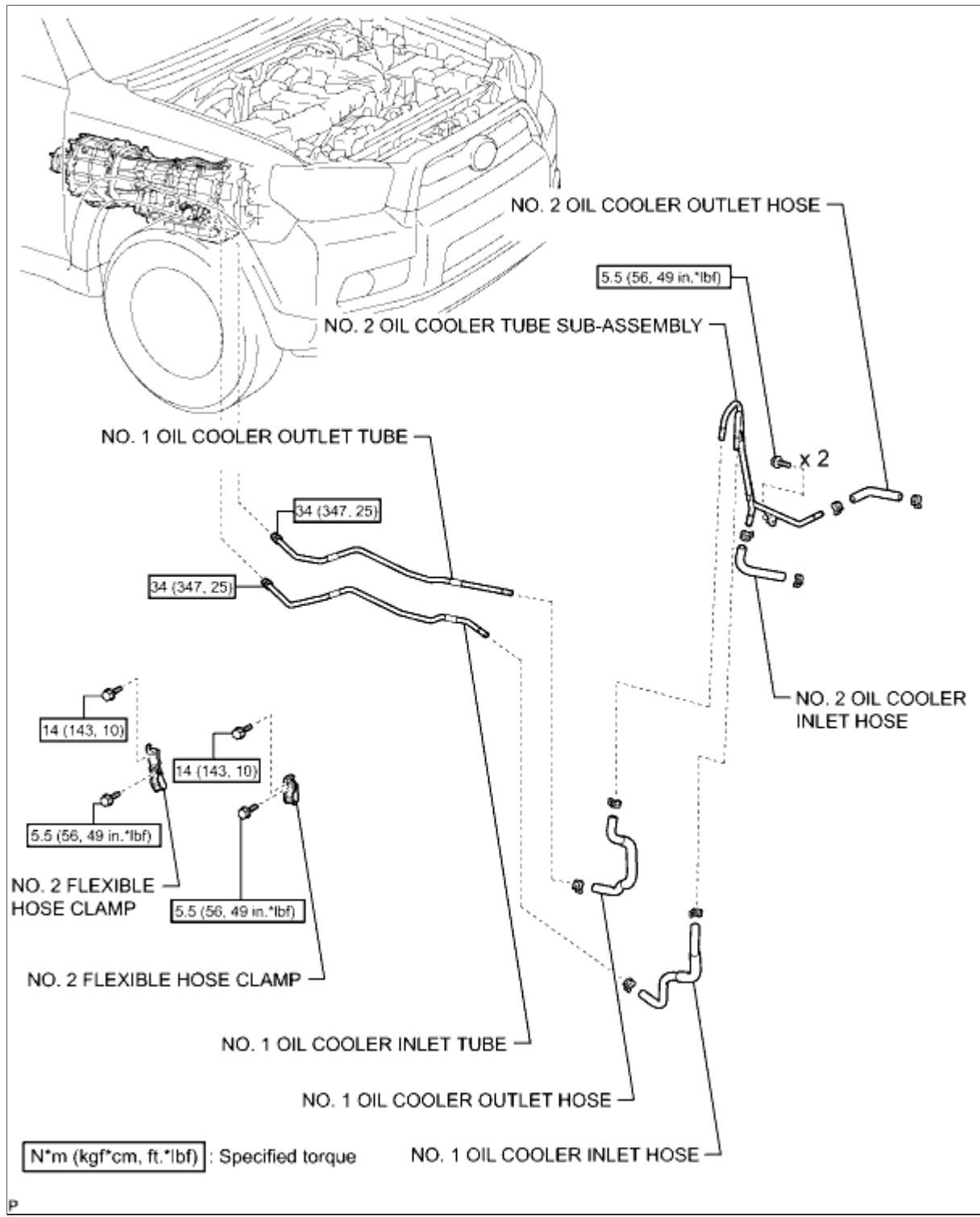
Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001BZC01OX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



## ILLUSTRATION



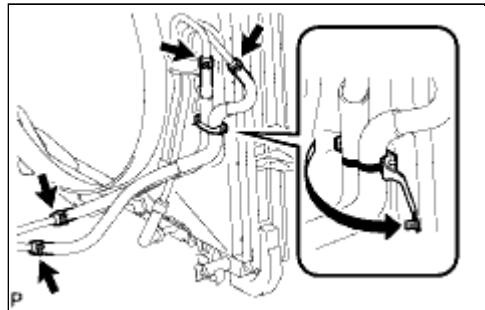
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Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001BZD01RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: REMOVAL (2010 4Runner)		

## REMOVAL

1. REMOVE NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY INFO
2. REMOVE REAR ENGINE UNDER COVER ASSEMBLY INFO
3. REMOVE FRONT FENDER APRON SEAL RH INFO
4. REMOVE FRONT NO. 1 FENDER APRON TO FRAME SEAL RH INFO

### 5. REMOVE NO. 1 OIL COOLER INLET HOSE AND NO. 1 OIL COOLER OUTLET HOSE

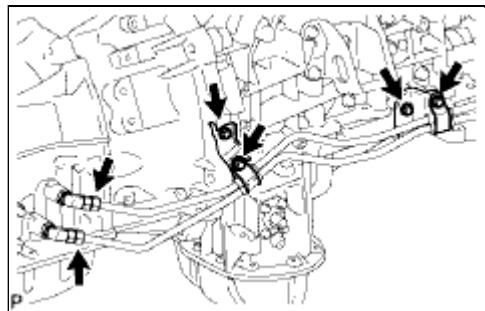


- (a) Detach the claw to open the No. 1 flexible hose clamp.
- (b) Disconnect the No. 1 oil cooler inlet hose and No. 1 oil cooler outlet hose from the No. 2 oil cooler tube.
- (c) Disconnect the 2 hoses from the oil cooler inlet tube and No. 1 oil cooler outlet tube and remove them.

**NOTICE:**

**When disconnecting the hoses from the tube, support the tube by hand and be careful to prevent the tube from being deformed.**

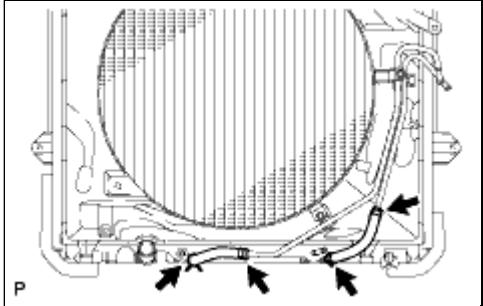
### 6. REMOVE NO. 1 OIL COOLER INLET TUBE AND NO. 1 OIL COOLER OUTLET TUBE



- (a) Using a union nut wrench, disconnect the No. 1 oil cooler inlet tube and No. 1 oil cooler outlet tube from the each oil cooler tube union.

- (b) Remove the 2 bolts to open the 2 No. 2 flexible hose clamps and remove the 2 oil cooler tubes.
- (c) Remove the 2 bolts and 2 No. 2 flexible hose clamps.

### 7. REMOVE NO. 2 OIL COOLER INLET HOSE AND NO. 2 OIL COOLER OUTLET HOSE

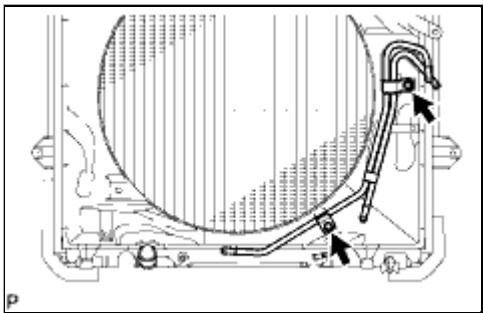


(a) Disconnect the No. 2 oil cooler inlet hose and No. 2 oil cooler outlet hose from the radiator.

(b) Disconnect the 2 hoses from the No. 2 oil cooler tube and remove them.

**NOTICE:**

**When disconnecting the hoses from the tube, support the tube by hand and be careful to prevent the tube from being deformed.**



**8. REMOVE NO. 2 OIL COOLER TUBE SUB-ASSEMBLY**

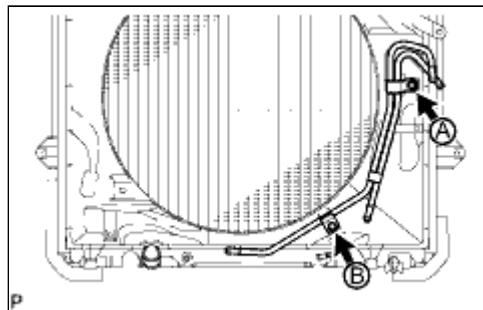
(a) Remove the 2 bolts and No. 2 oil cooler tube.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000001BZB01RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL COOLER: INSTALLATION (2010 4Runner)		

## INSTALLATION

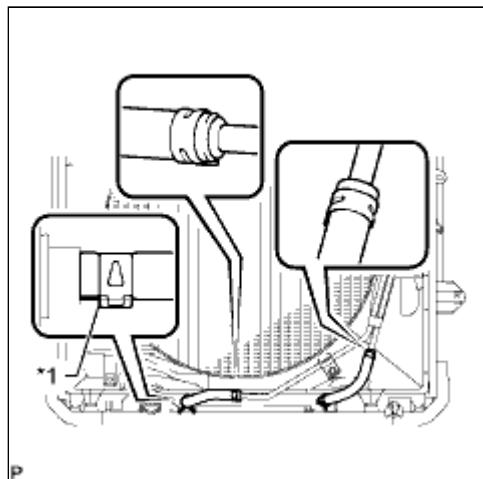
### 1. INSTALL NO. 2 OIL COOLER TUBE SUB-ASSEMBLY



(a) Temporarily install the oil cooler tube to the fan shroud with bolt A. Install bolt B and tighten it to the specified torque. Then tighten bolt A to the specified torque.

**Torque: 5.5 N·m (56 kgf·cm, 49in-lbf)**

### 2. INSTALL NO. 2 OIL COOLER INLET HOSE AND NO. 2 OIL COOLER OUTLET HOSE



(a) Connect the No. 2 oil cooler inlet hose and No. 2 oil cooler outlet hose to the No. 2 oil cooler tube.

#### Text in Illustration

\*1

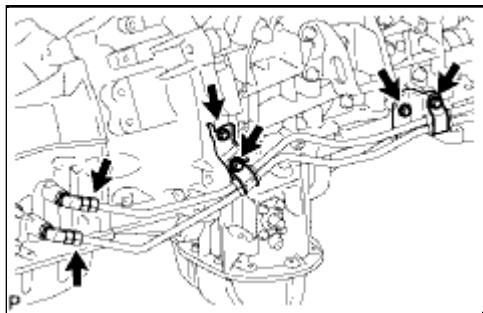
Yellow Point Mark

(b) Connect the 2 hoses to the radiator to install them.

#### NOTICE:

- When connecting the hoses to the tube, support the tube by hand and be careful to prevent the tube from being deformed.
- Make sure the paint mark and pinching portion of each clip are facing the directions shown in the illustration.

### 3. INSTALL NO. 1 INLET OIL COOLER TUBE AND NO. 1



## OUTLET OIL COOLER TUBE

(a) Install the 2 No. 2 flexible hose clamps with the 2 bolts.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

(b) Temporarily install the ends of the 2 oil cooler tubes to each oil cooler tube union by hand.

(c) Close the 2 No. 2 flexible hose clamps and install the 2 bolts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

(d) Using a union nut wrench, tighten the inlet and outlet tubes.

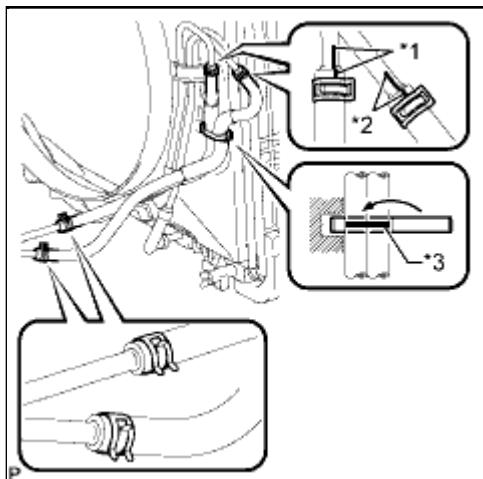
**Torque: 34 N·m (347 kgf·cm, 25ft·lbf)**

### NOTICE:

Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench .

## 4. INSTALL NO. 1 OIL COOLER INLET HOSE AND NO. 1 OIL COOLER OUTLET HOSE

(a) Connect the No. 1 oil cooler inlet hose and No. 1 oil cooler outlet hose to the oil cooler inlet tube and No. 1 oil cooler outlet tube.



### Text in Illustration

* 1	Blue Paint Mark
* 2	Pink Paint Mark
* 3	White Paint Mark

(b) Connect the 2 hoses to the No. 2 oil cooler tube to install them, and then pass the 2 hoses through the No. 1 flexible hose clamp and close the clamp.

### NOTICE:

- When connecting the hoses to the tube, support the tube by hand and be careful to prevent the tube from being deformed.
- Make sure the paint marks and pinching portion of each clip are facing the directions shown in the illustration.

## 5. ADJUST AUTOMATIC TRANSMISSION FLUID LEVEL

(a) Adjust the automatic transmission fluid level .

**6. INSTALL FRONT NO. 1 FENDER APRON TO FRAME SEAL RH** 

**7. INSTALL FRONT FENDER APRON SEAL RH** 

**8. INSTALL REAR ENGINE UNDER COVER ASSEMBLY** 

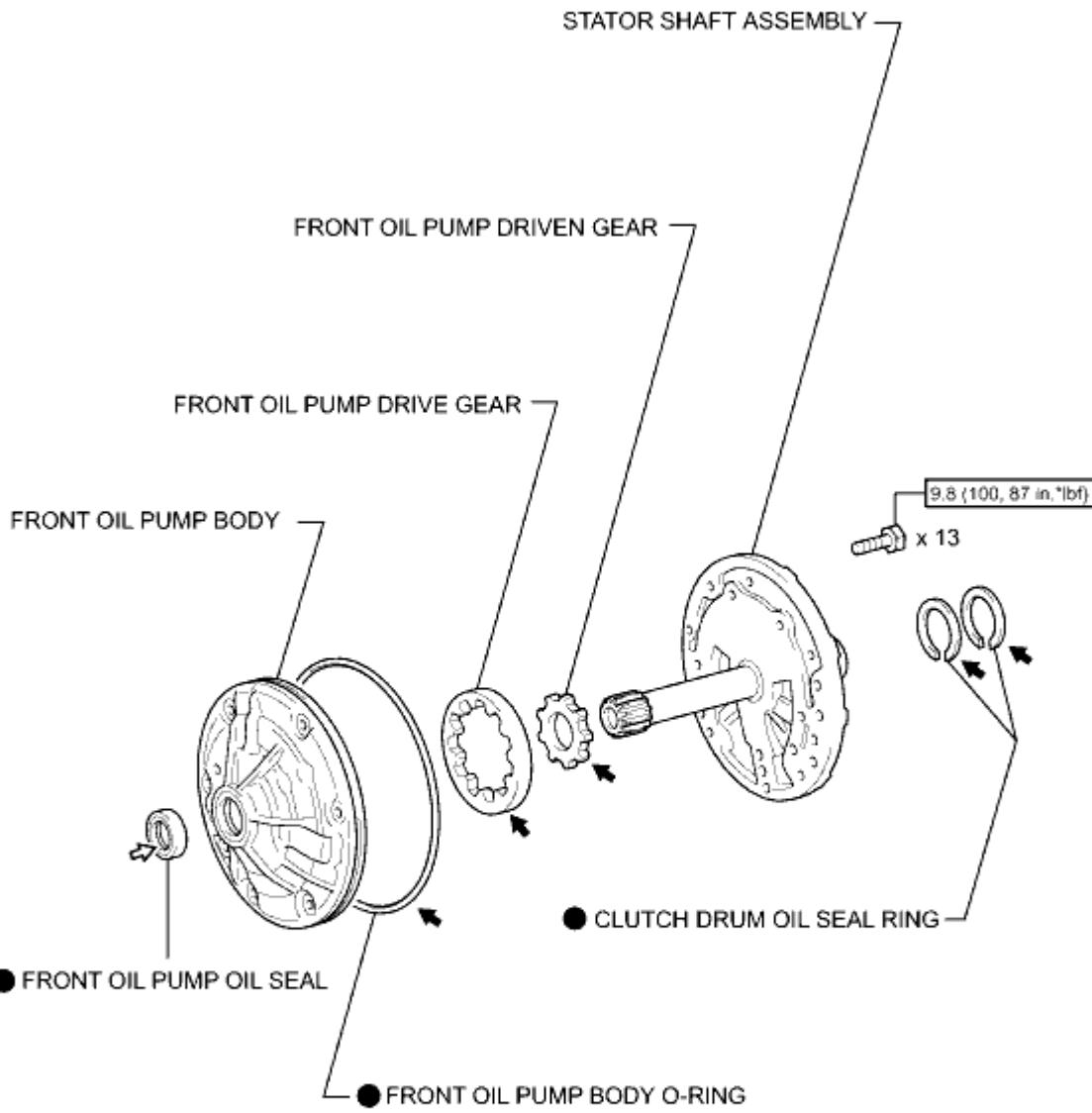
**9. INSTALL NO. 1 ENGINE UNDER COVER SUB-ASSEMBLY** 



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013B600PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



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

● Non-reusable part

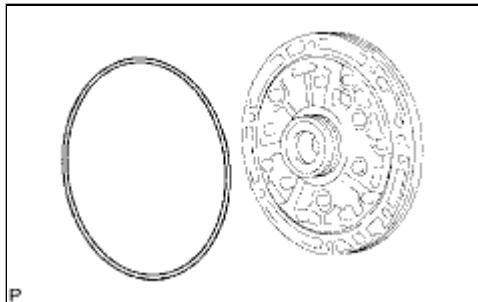
← Toyota Genuine ATF WS

↳ MP grease

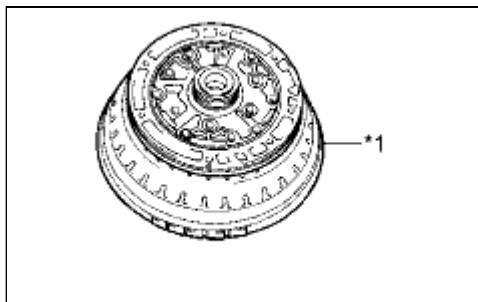
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Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013B700PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: DISASSEMBLY (2010 4Runner)		

## **DISASSEMBLY**



### **1. REMOVE FRONT OIL PUMP BODY O-RING**

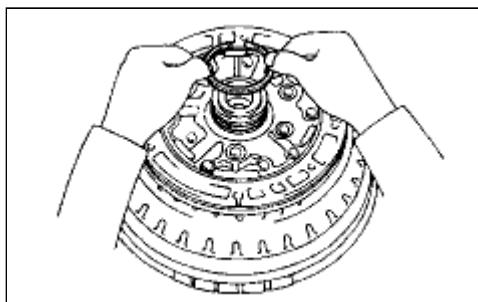


### **2. FIX OIL PUMP ASSEMBLY**

(a) Place the oil pump body on the torque converter clutch.

#### **Text in Illustration**

*1	Torque converter clutch
----	-------------------------



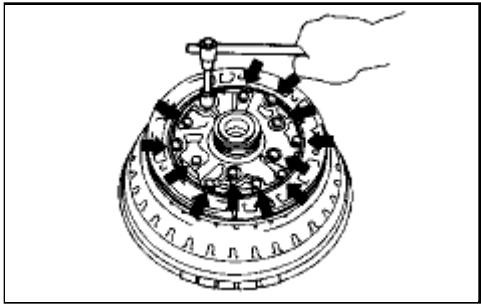
### **3. REMOVE CLUTCH DRUM OIL SEAL RING**

(a) Remove the 2 oil seal rings.

### **4. REMOVE STATOR SHAFT ASSEMBLY**

(a) Remove the 13 bolts and stator shaft from the oil pump body.

(b) Remove the oil pump body from the torque converter clutch.



**5. INSPECT FRONT OIL PUMP BODY** INFO

**6. INSPECT STATOR SHAFT ASSEMBLY** INFO

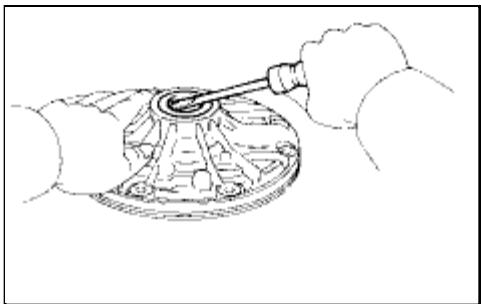
**7. INSPECT CLEARANCE OF FRONT OIL PUMP BODY** INFO



**8. REMOVE FRONT OIL PUMP DRIVE GEAR**



**9. REMOVE FRONT OIL PUMP DRIVEN GEAR**



**10. REMOVE FRONT OIL PUMP OIL SEAL**

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

**NOTICE:**

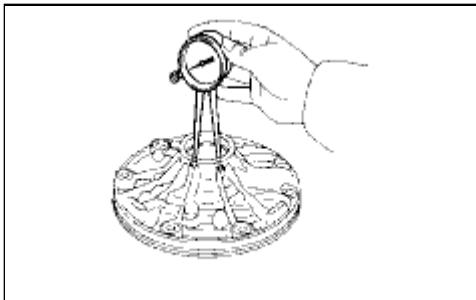
Be careful not to damage the bush or oil pump body.



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Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013B500PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: INSPECTION (2010 4Runner)		

## **INSPECTION**

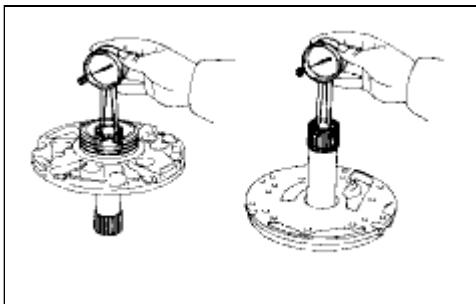


### **1. INSPECT FRONT OIL PUMP BODY**

(a) Using a dial indicator, measure the inside diameter of the oil pump body bush.

Maximum inside diameter:  
38.138 mm (1.50 in.)

If the inside diameter is more than the maximum, replace the oil pump body.



### **2. INSPECT STATOR SHAFT ASSEMBLY**

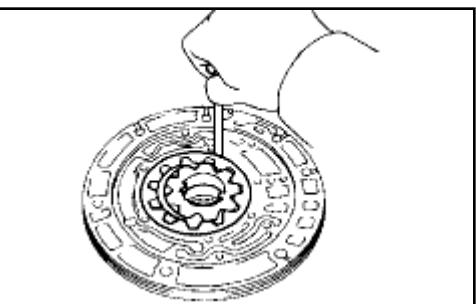
(a) Using a dial indicator, measure the inside diameter of the stator shaft bush.

Maximum Inside Diameter:

FRONT SIDE	REAR SIDE
21.527 mm (0.847 in.)	27.026 mm (1.06 in.)

If the inside diameter is more than the maximum, replace the stator shaft.

### **3. INSPECT CLEARANCE OF FRONT OIL PUMP BODY**



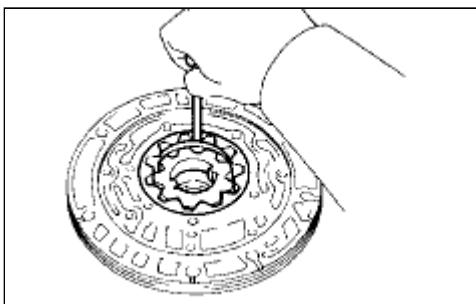
(a) Push the driven gear to one side of the body.

(b) Using a feeler gauge, measure the body clearance.

Standard body clearance:

0.07 to 0.15 mm (0.00276 to 0.00591 in.)

If the body clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.

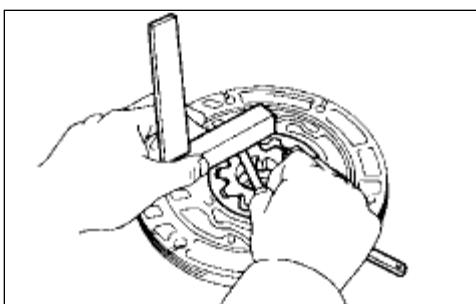


- (c) Using a feeler gauge, measure the tip clearance between the driven gear teeth and drive gear teeth.

Standard tip clearance:

0.004 to 0.248 mm (0.000157 to 0.00976 in.)

If the tip clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.



- (d) Using a steel straightedge and feeler gauge, measure the side clearance of both gears.

Standard side clearance:

0.02 to 0.05 mm (0.000787 to 0.00197 in.)

If the side clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly.

Replace the part or parts determined to be the most likely cause of the problem.

**HINT:**

**There are 5 different thicknesses for drive and driven gears.**

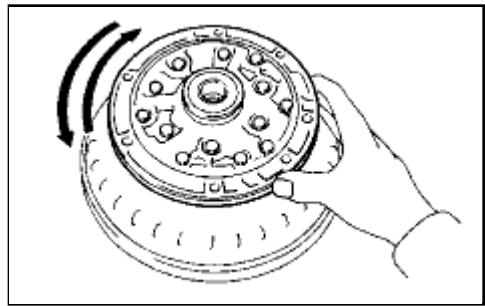
Drive and Driven Gear Thickness:

MARK	SPECIFIED CONDITION
M	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
N	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
P	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
R	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
S	11.731 to 11.740 mm (0.4618 to 0.4622 in.)

#### **4. INSPECT OIL PUMP DRIVE GEAR ROTATION**

- (a) Check that the drive gear rotates smoothly.

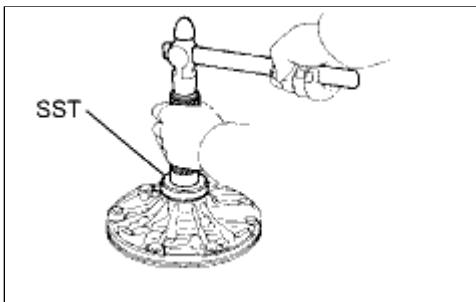
- (b) Remove the oil pump from the torque converter.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013B800PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL FRONT OIL PUMP OIL SEAL**



(a) Using SST and a hammer, tap in a new oil seal.

**SST: 09350-30020**

09351-32140

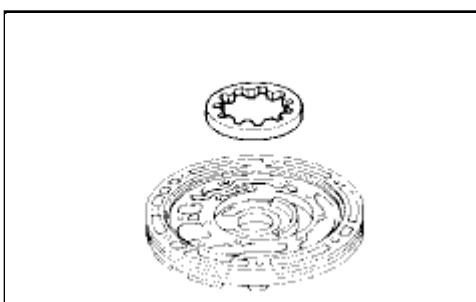
**HINT:**

**Make sure the oil seal end is flush with the outer edge of the pump body.**

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

### **2. FIX FRONT OIL PUMP BODY**

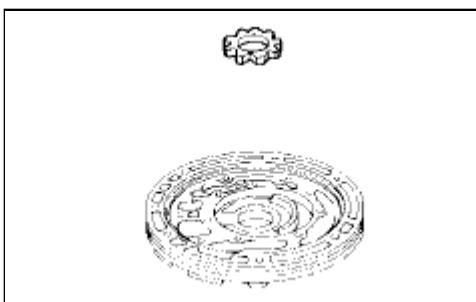
(a) Place the oil pump body on the torque converter clutch.



### **3. INSTALL FRONT OIL PUMP DRIVEN GEAR**

(a) Coat the driven gear with ATF.

(b) Install the driven gear to the oil pump body.

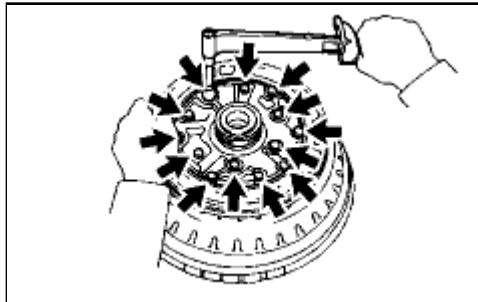


### **4. INSTALL FRONT OIL PUMP DRIVE GEAR**

(a) Coat the drive gear with ATF.

(b) Install the drive gear to the oil pump body.

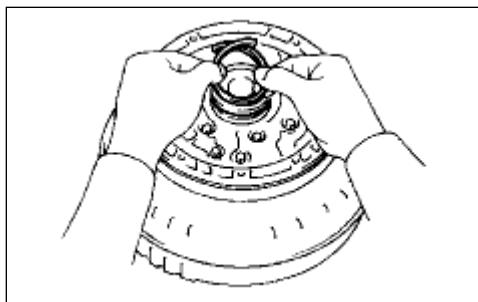
### **5. INSTALL STATOR SHAFT ASSEMBLY**



(a) Align the bolt holes of the stator shaft with the bolt holes of the oil pump body and install the stator shaft to the oil pump body.

(b) Install the 13 bolts.

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



## 6. INSTALL CLUTCH DRUM OIL SEAL RING

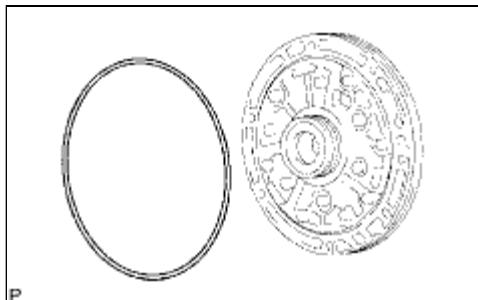
(a) Coat 2 new oil seal rings with ATF.

(b) Squeeze the ends of the 2 oil seal rings together with the overlap distance 8.0 mm (0.314 in.) or less, and then install them to the stator shaft groove.

**HINT:**

**After installing the oil seal rings, check that they rotate smoothly.**

## 7. INSPECT OIL PUMP DRIVE GEAR ROTATION INFO



## 8. INSTALL FRONT OIL PUMP BODY O-RING

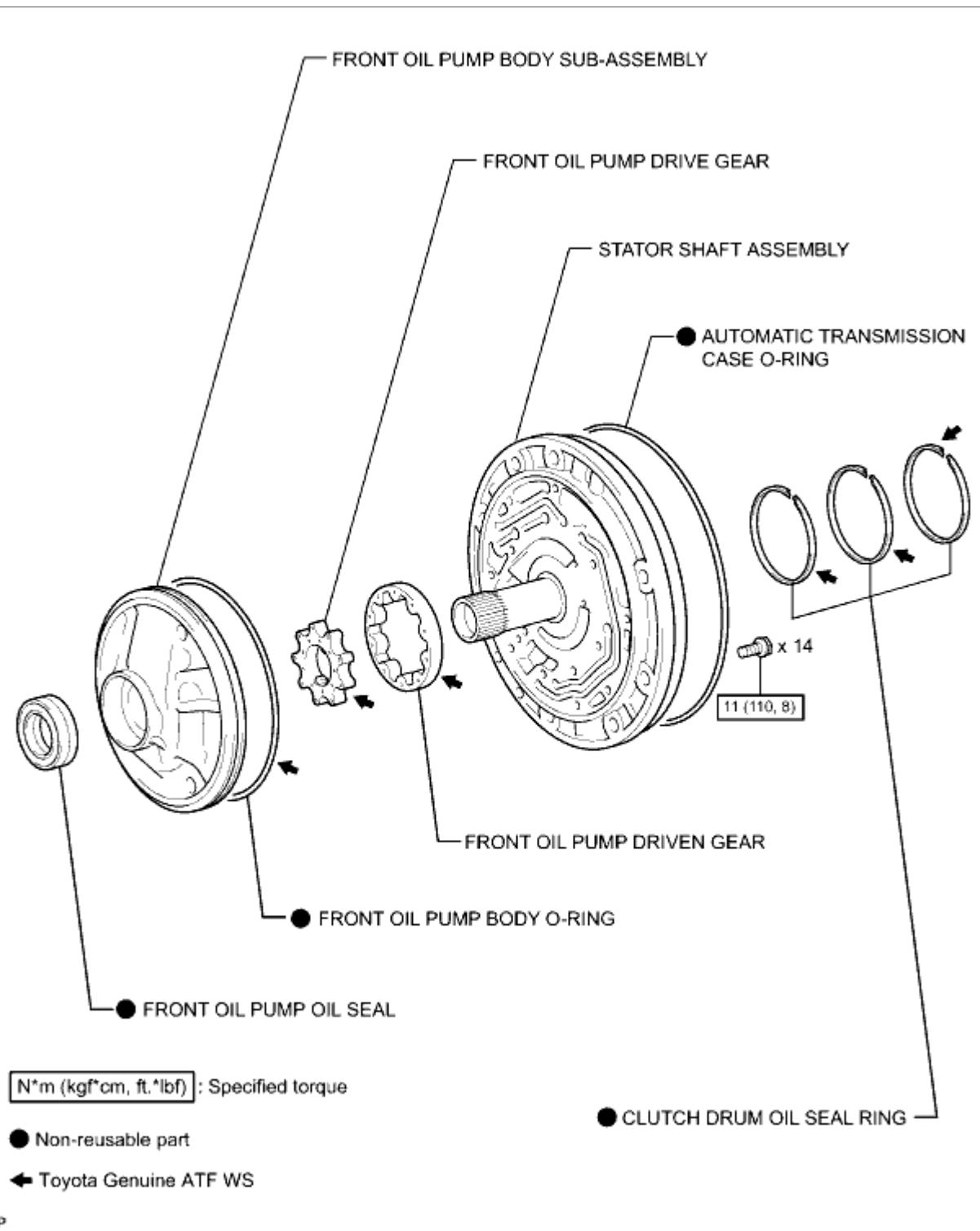
(a) Install a new O-ring to the oil pump.



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013F802SX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

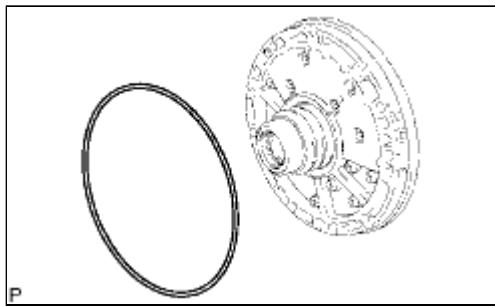
## **ILLUSTRATION**



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013F902SX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: DISASSEMBLY (2010 4Runner)		

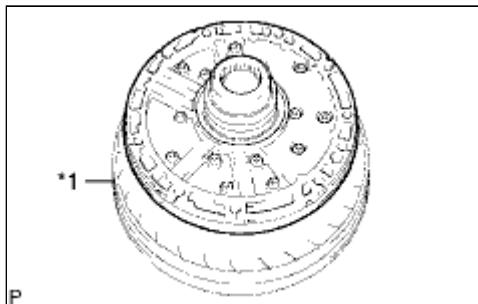
## DISASSEMBLY

### 1. REMOVE AUTOMATIC TRANSMISSION CASE O-RING



(a) Remove the O-ring from the oil pump assembly.

### 2. FIX OIL PUMP ASSEMBLY

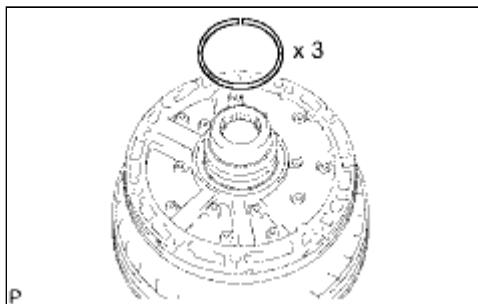


(a) Place the oil pump body on the torque converter clutch.

#### Text in Illustration

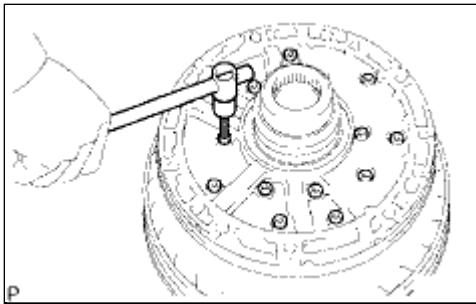
*1	Torque Converter Clutch
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### 3. REMOVE CLUTCH DRUM OIL SEAL RING



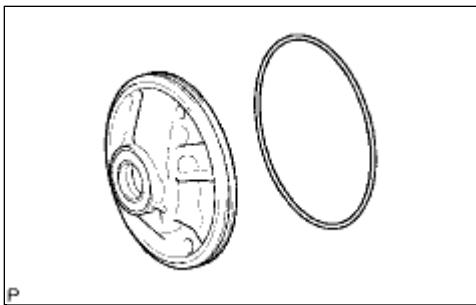
(a) Remove the 3 oil seal rings.

### 4. REMOVE STATOR SHAFT ASSEMBLY



(a) Remove the 14 bolts and stator shaft from the oil pump body.

## 5. REMOVE FRONT OIL PUMP BODY O-RING



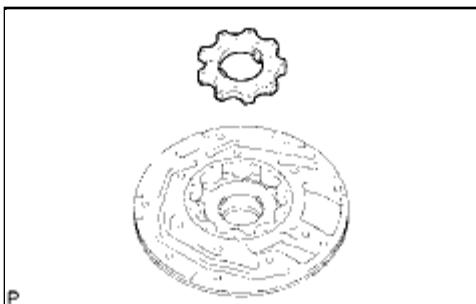
(a) Remove the O-ring from the oil pump body.

(b) Remove the oil pump body from the torque converter clutch.

## 6. INSPECT FRONT OIL PUMP BODY SUB-ASSEMBLY INFO

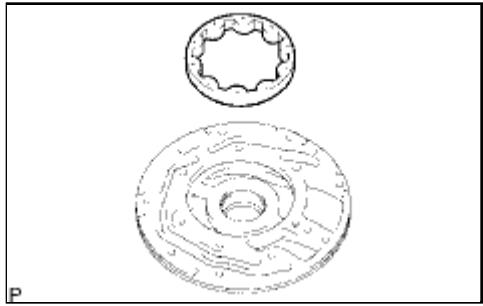
## 7. INSPECT STATOR SHAFT ASSEMBLY INFO

## 8. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY INFO

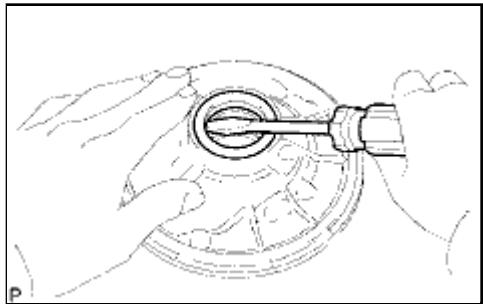


## 9. REMOVE FRONT OIL PUMP DRIVE GEAR

## 10. REMOVE FRONT OIL PUMP DRIVEN GEAR



## 11. REMOVE FRONT OIL PUMP OIL SEAL



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

**NOTICE:**

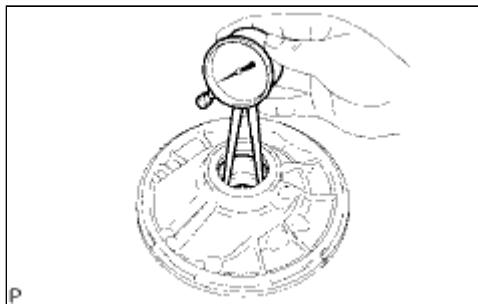
Be careful not to damage the bushing or oil pump body.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013F702TX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT FRONT OIL PUMP BODY SUB-ASSEMBLY**

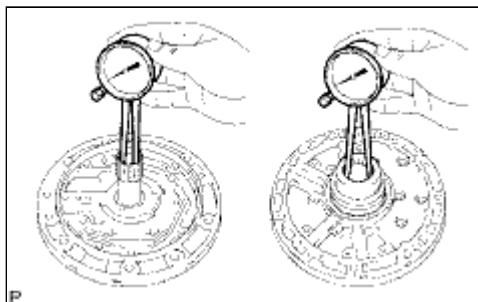


- (a) Using a dial indicator, measure the inside diameter of the oil pump body bush.

Maximum inside diameter:  
38.188 mm (1.50 in.)

If the inside diameter is more than the maximum, replace the oil pump body sub-assembly.

### **2. INSPECT STATOR SHAFT ASSEMBLY**



- (a) Using a dial indicator, measure the inside diameter of the stator shaft bush.

Maximum inside diameter:

**Front side**

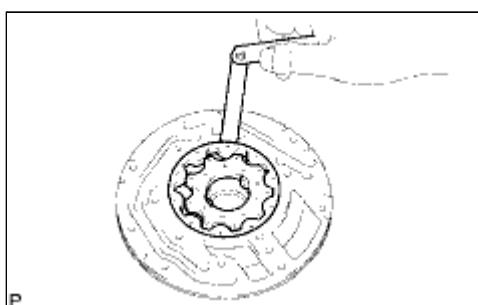
21.577 mm (0.849 in.)

**Rear side**

32.08 mm (1.26 in.)

If the inside diameter is more than the maximum, replace the stator shaft assembly.

### **3. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY**



- (a) Push the driven gear to one side of the body.

(b) Using a feeler gauge, measure the body clearance.

Standard body clearance:

0.10 to 0.17 mm (0.00394 to 0.00669 in.)

Maximum body clearance:

0.17 mm (0.00669 in.)

- If the body clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.

(c) Using a feeler gauge, measure the tip clearance between the driven gear teeth and drive gear teeth.

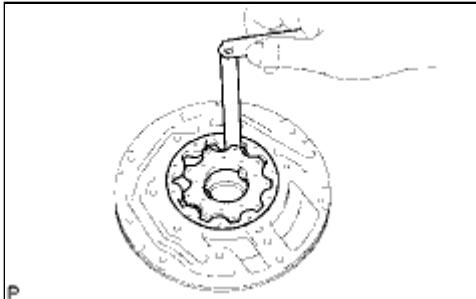
Standard tip clearance:

0.070 to 0.150 mm (0.00276 to 0.00591 in.)

Maximum tip clearance:

0.150 mm (0.00591 in.)

If the tip clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.



(d) Using a steel straightedge and feeler gauge, measure the side clearance of both gears.

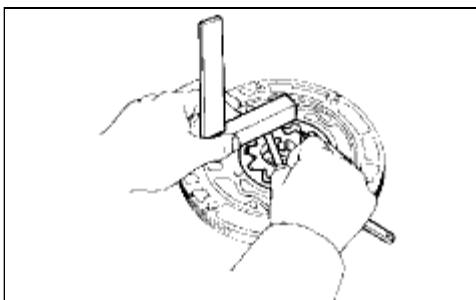
Standard side clearance:

0.02 to 0.05 mm (0.000787 to 0.00197 in.)

Maximum side clearance:

0.05 mm (0.00197 in.)

If the side clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.

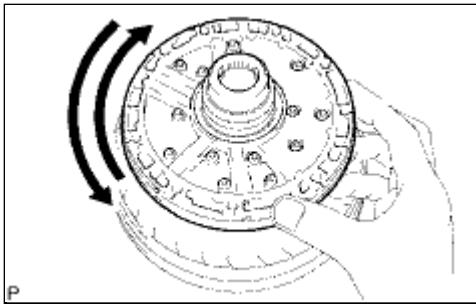


**HINT:**

**There are 5 different drive and driven gear thicknesses.**

Drive and Driven Gear Thickness:

MARK	THICKNESS
0	10.74 to 10.749 mm (0.42283 to 0.42319 in.)
1	10.75 to 10.759 mm (0.42323 to 0.42358 in.)
2	10.76 to 10.77 mm (0.42362 to 0.42401 in.)
3	10.771 to 10.78 mm (0.42405 to 0.42441 in.)
4	10.781 to 10.79 mm (0.42445 to 0.42480 in.)



#### 4. INSPECT FRONT OIL PUMP DRIVE GEAR ROTATION

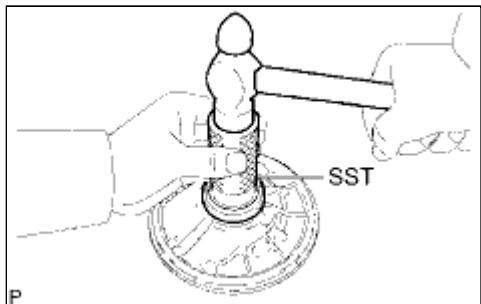
- (a) Place the oil pump body on the torque converter clutch.
- (b) Check that the drive gear rotates smoothly.
- (c) Remove the oil pump assembly from the torque converter clutch.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FA02TX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL FRONT OIL PUMP OIL SEAL**



(a) Using SST and a hammer, tap in a new oil seal.

**SST: 09350-30020**

09351-32140

**HINT:**

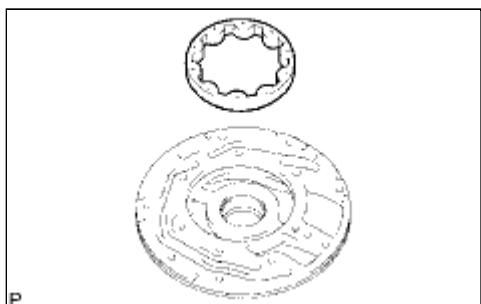
**Make sure the oil seal end is flush with the outer edge of the pump body.**

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

### **2. FIX FRONT OIL PUMP BODY SUB-ASSEMBLY**

(a) Place the oil pump body on the torque converter clutch.

### **3. INSTALL FRONT OIL PUMP DRIVEN GEAR**

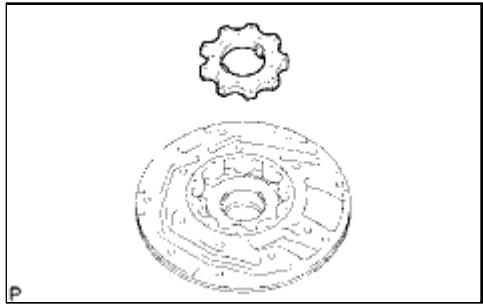


(a) Coat the driven gear with ATF.

(b) Install the driven gear to the oil pump body.

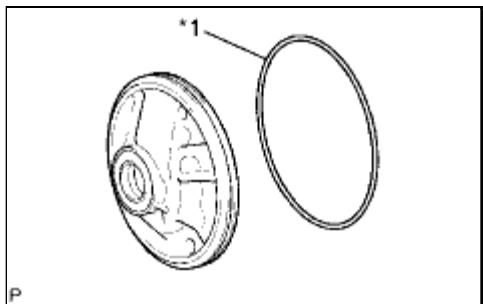
### **4. INSTALL FRONT OIL PUMP DRIVE GEAR**

(a) Coat the drive gear with ATF.



(b) Install the drive gear to the oil pump body.

## 5. INSTALL FRONT OIL PUMP BODY O-RING

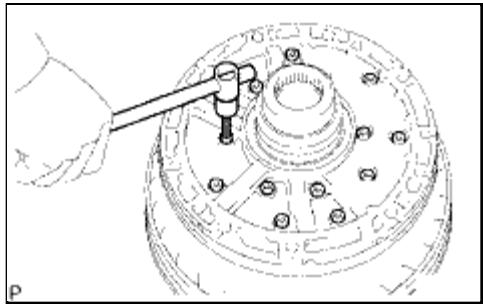


(a) Coat a new O-ring with ATF and install it to the oil pump body.

### Text in Illustration

* 1	New O-Ring
-----	------------

## 6. INSTALL STATOR SHAFT ASSEMBLY



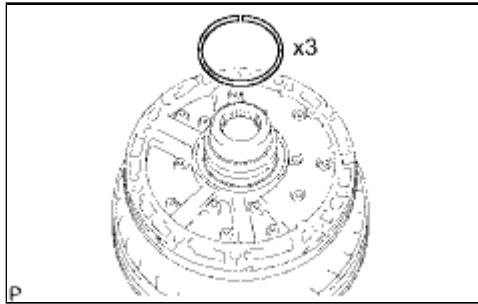
(a) Align the bolt holes of the stator shaft with the bolt holes of the oil pump body and install the stator shaft to the oil pump body.

(b) Install the 14 bolts.

**Torque: 11 N·m (110 kgf·cm, 8ft·lbf)**

## 7. INSTALL CLUTCH DRUM OIL SEAL RING

(a) Coat 3 new oil seal rings with ATF.



- (b) Squeeze the ends of the 3 oil seal rings together with an overlap distance of 8 mm (0.314 in.) or less, and then install them to the starter shaft groove.

**HINT:**

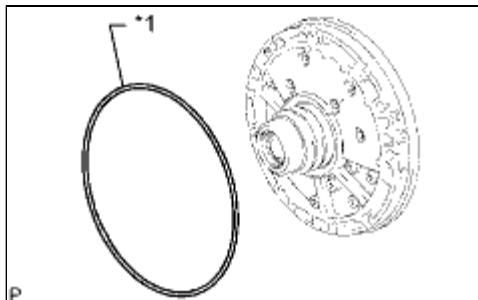
**After installing the oil seal rings, check that they rotate smoothly.**

**NOTICE:**

**Do not excessively widen the rings.**

## 8. INSPECT OIL PUMP DRIVE GEAR ROTATION INFO

## 9. INSTALL AUTOMATIC TRANSMISSION CASE O-RING



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

### Text in Illustration

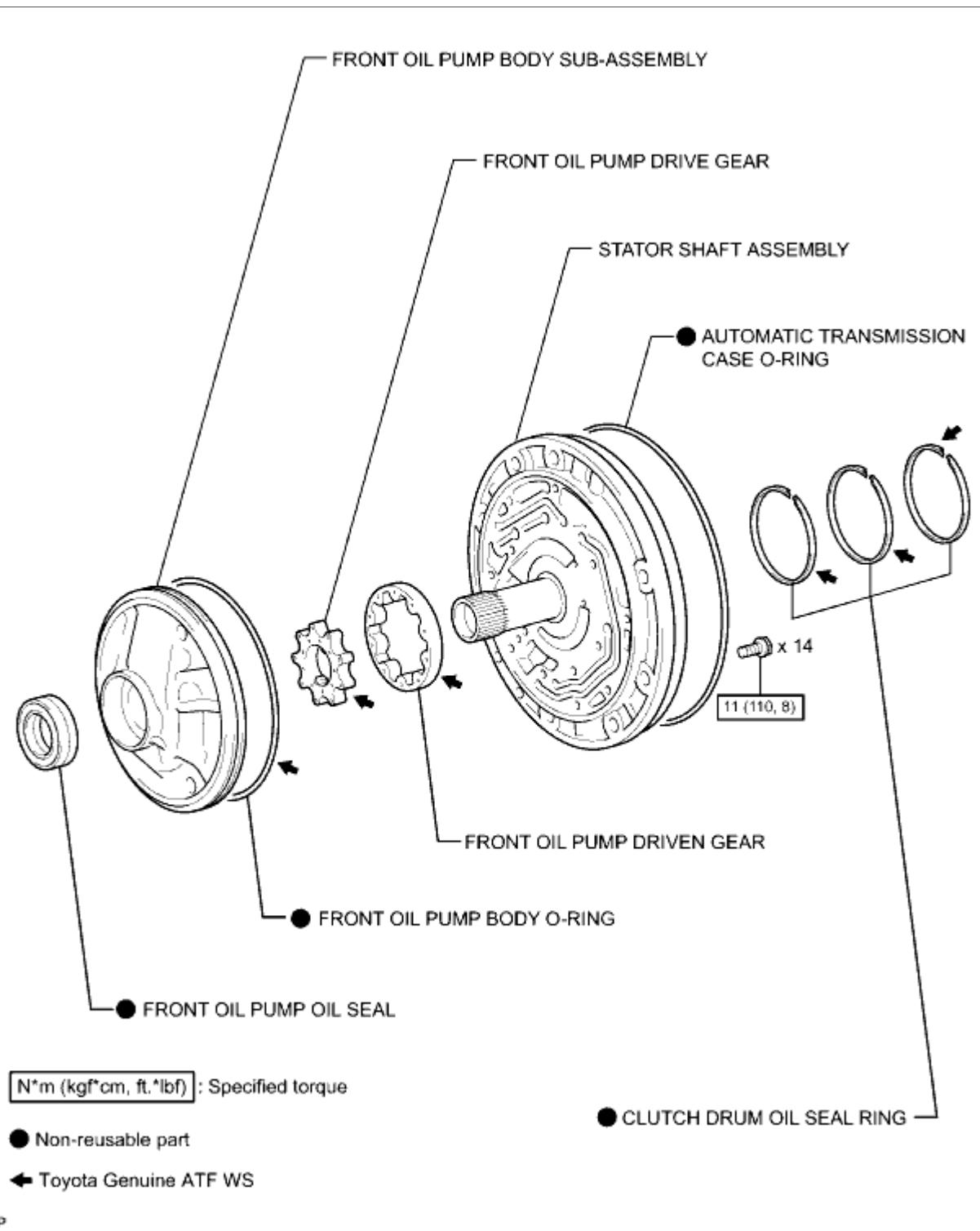
* 1	New O -Ring
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<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000013F802RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

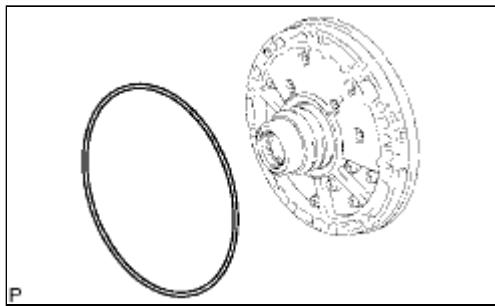
## **ILLUSTRATION**



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013F902RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: DISASSEMBLY (2010 4Runner)		

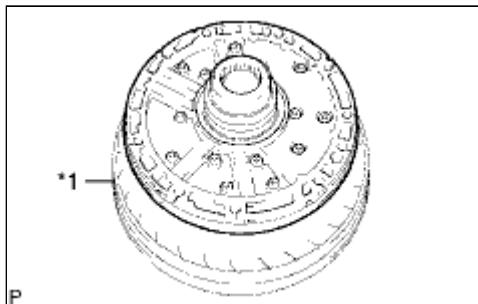
## DISASSEMBLY

### 1. REMOVE AUTOMATIC TRANSMISSION CASE O-RING



(a) Remove the O-ring from the oil pump assembly.

### 2. FIX OIL PUMP ASSEMBLY

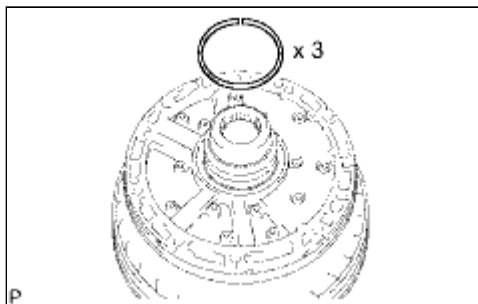


(a) Place the oil pump body on the torque converter clutch.

### Text in Illustration

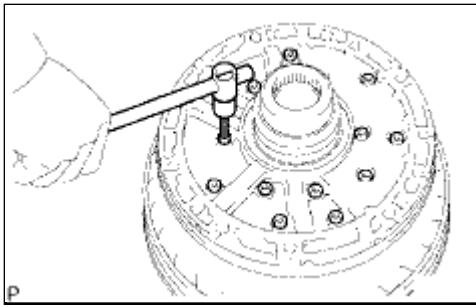
*1	Torque Converter Clutch
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### 3. REMOVE CLUTCH DRUM OIL SEAL RING



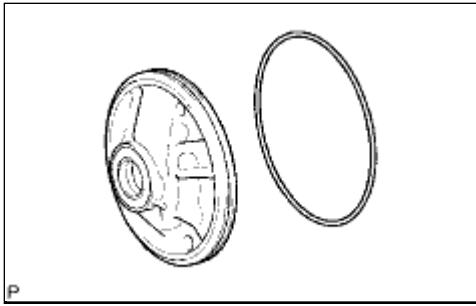
(a) Remove the 3 oil seal rings.

### 4. REMOVE STATOR SHAFT ASSEMBLY



(a) Remove the 14 bolts and stator shaft from the oil pump body.

## 5. REMOVE FRONT OIL PUMP BODY O-RING



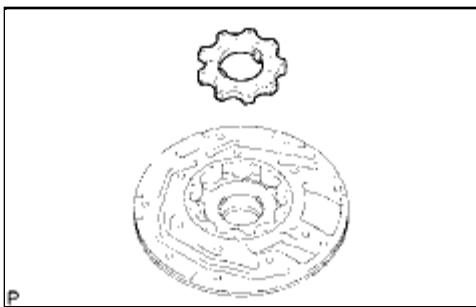
(a) Remove the O-ring from the oil pump body.

(b) Remove the oil pump body from the torque converter clutch.

## 6. INSPECT FRONT OIL PUMP BODY SUB-ASSEMBLY INFO

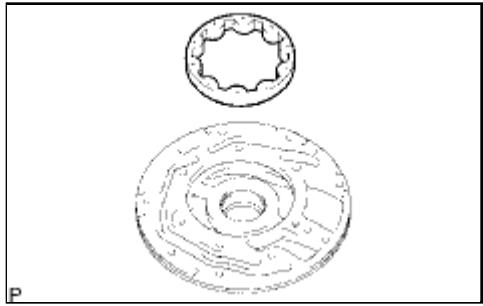
## 7. INSPECT STATOR SHAFT ASSEMBLY INFO

## 8. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY INFO

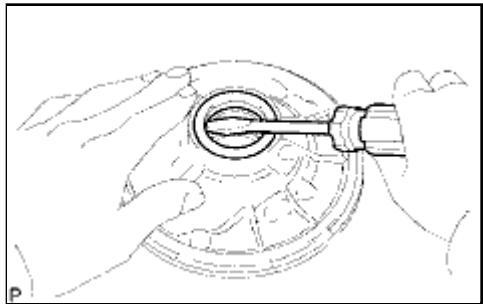


## 9. REMOVE FRONT OIL PUMP DRIVE GEAR

## 10. REMOVE FRONT OIL PUMP DRIVEN GEAR



## 11. REMOVE FRONT OIL PUMP OIL SEAL



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

**NOTICE:**

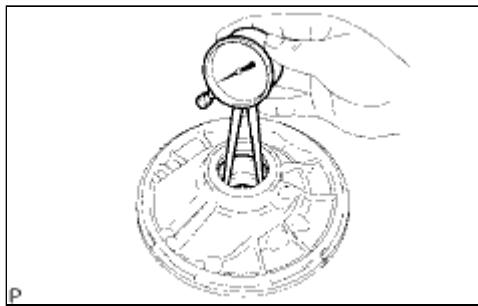
Be careful not to damage the bushing or oil pump body.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013F702SX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: INSPECTION (2010 4Runner)		

## INSPECTION

### 1. INSPECT FRONT OIL PUMP BODY SUB-ASSEMBLY

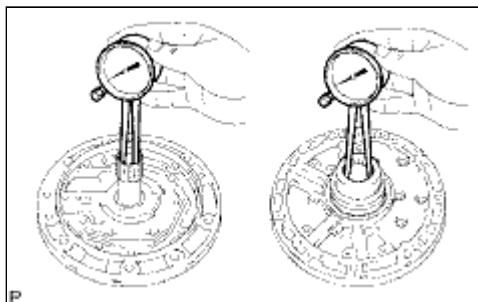


(a) Using a dial indicator, measure the inside diameter of the oil pump body bush.

Maximum inside diameter:  
38.188 mm (1.50 in.)

If the inside diameter is more than the maximum, replace the oil pump body sub-assembly.

### 2. INSPECT STATOR SHAFT ASSEMBLY



(a) Using a dial indicator, measure the inside diameter of the stator shaft bush.

Maximum inside diameter:

**Front side**

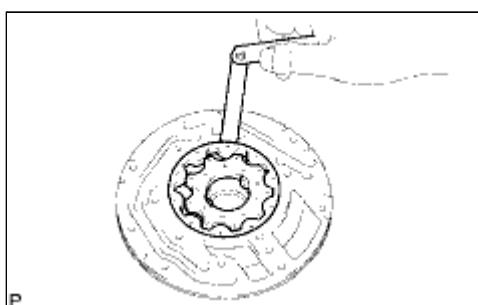
21.577 mm (0.849 in.)

**Rear side**

32.08 mm (1.26 in.)

If the inside diameter is more than the maximum, replace the stator shaft assembly.

### 3. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY



(a) Push the driven gear to one side of the body.

(b) Using a feeler gauge, measure the body clearance.

Standard body clearance:

0.10 to 0.17 mm (0.00394 to 0.00669 in.)

Maximum body clearance:

0.17 mm (0.00669 in.)

- If the body clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.

(c) Using a feeler gauge, measure the tip clearance between the driven gear teeth and drive gear teeth.

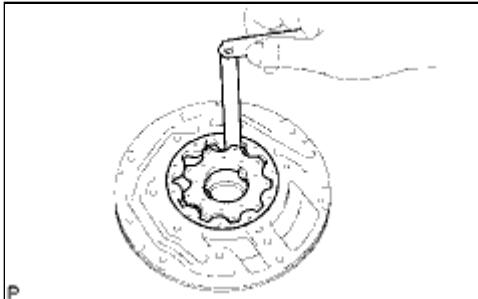
Standard tip clearance:

0.070 to 0.150 mm (0.00276 to 0.00591 in.)

Maximum tip clearance:

0.150 mm (0.00591 in.)

If the tip clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.



(d) Using a steel straightedge and feeler gauge, measure the side clearance of both gears.

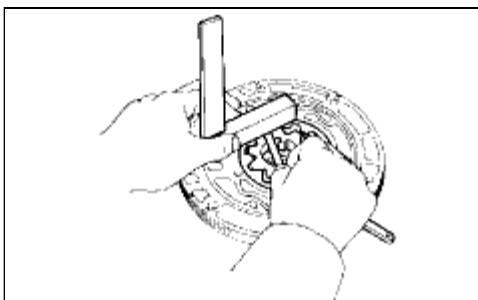
Standard side clearance:

0.02 to 0.05 mm (0.000787 to 0.00197 in.)

Maximum side clearance:

0.05 mm (0.00197 in.)

If the side clearance is more than the maximum, replace the drive gear, driven gear or pump body assembly. Replace the part or parts determined to be the most likely cause of the problem.

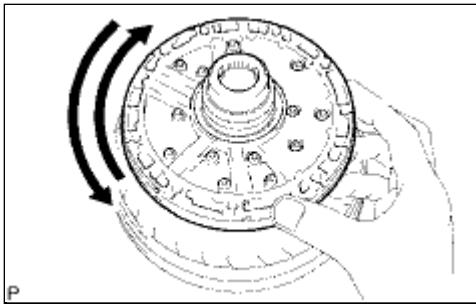


**HINT:**

**There are 5 different drive and driven gear thicknesses.**

Drive and Driven Gear Thickness:

MARK	THICKNESS
0	10.74 to 10.749 mm (0.42283 to 0.42319 in.)
1	10.75 to 10.759 mm (0.42323 to 0.42358 in.)
2	10.76 to 10.77 mm (0.42362 to 0.42401 in.)
3	10.771 to 10.78 mm (0.42405 to 0.42441 in.)
4	10.781 to 10.79 mm (0.42445 to 0.42480 in.)



#### 4. INSPECT FRONT OIL PUMP DRIVE GEAR ROTATION

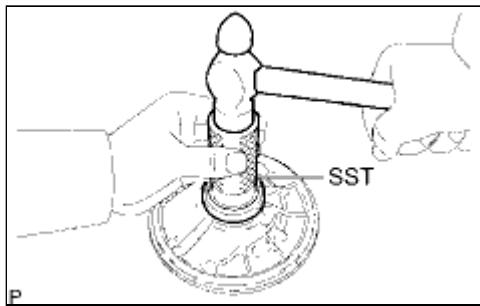
- (a) Place the oil pump body on the torque converter clutch.
- (b) Check that the drive gear rotates smoothly.
- (c) Remove the oil pump assembly from the torque converter clutch.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FA02SX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: OIL PUMP: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL FRONT OIL PUMP OIL SEAL**



(a) Using SST and a hammer, tap in a new oil seal.

**SST: 09350-30020**

09351-32140

**HINT:**

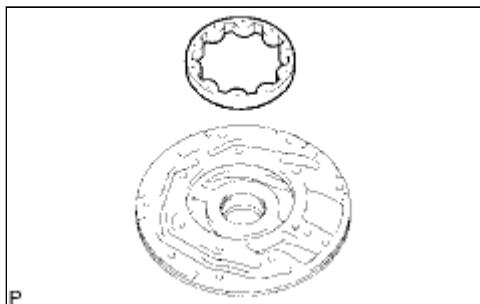
**Make sure the oil seal end is flush with the outer edge of the pump body.**

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

### **2. FIX FRONT OIL PUMP BODY SUB-ASSEMBLY**

(a) Place the oil pump body on the torque converter clutch.

### **3. INSTALL FRONT OIL PUMP DRIVEN GEAR**

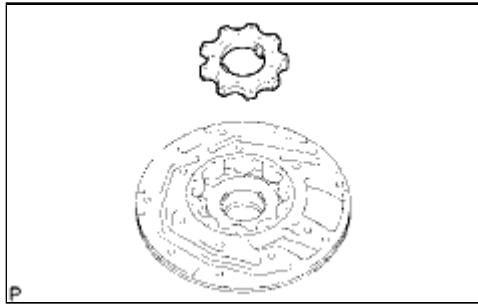


(a) Coat the driven gear with ATF.

(b) Install the driven gear to the oil pump body.

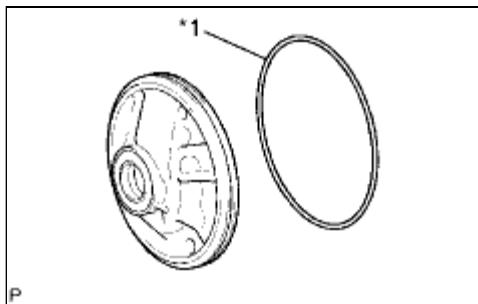
### **4. INSTALL FRONT OIL PUMP DRIVE GEAR**

(a) Coat the drive gear with ATF.



(b) Install the drive gear to the oil pump body.

## 5. INSTALL FRONT OIL PUMP BODY O-RING

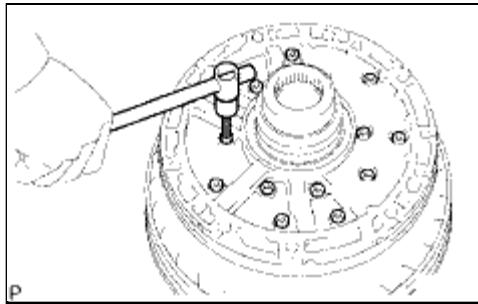


(a) Coat a new O-ring with ATF and install it to the oil pump body.

### Text in Illustration

* 1	New O-Ring
-----	------------

## 6. INSTALL STATOR SHAFT ASSEMBLY



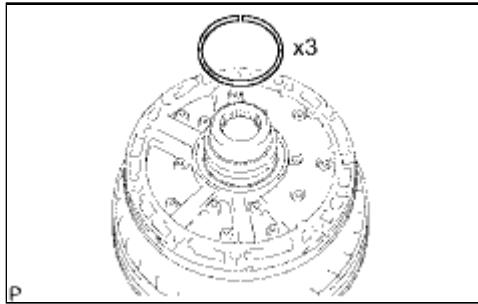
(a) Align the bolt holes of the stator shaft with the bolt holes of the oil pump body and install the stator shaft to the oil pump body.

(b) Install the 14 bolts.

**Torque: 11 N·m (110 kgf·cm, 8ft·lbf)**

## 7. INSTALL CLUTCH DRUM OIL SEAL RING

(a) Coat 3 new oil seal rings with ATF.



- (b) Squeeze the ends of the 3 oil seal rings together with an overlap distance of 8 mm (0.314 in.) or less, and then install them to the starter shaft groove.

**HINT:**

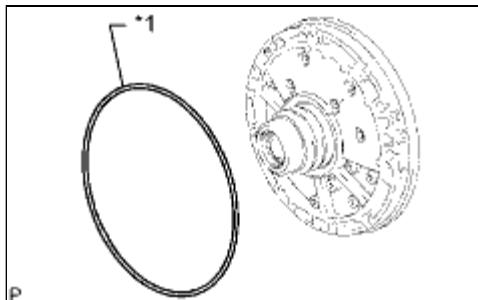
**After installing the oil seal rings, check that they rotate smoothly.**

**NOTICE:**

**Do not excessively widen the rings.**

## 8. INSPECT OIL PUMP DRIVE GEAR ROTATION INFO

## 9. INSTALL AUTOMATIC TRANSMISSION CASE O-RING



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

### Text in Illustration

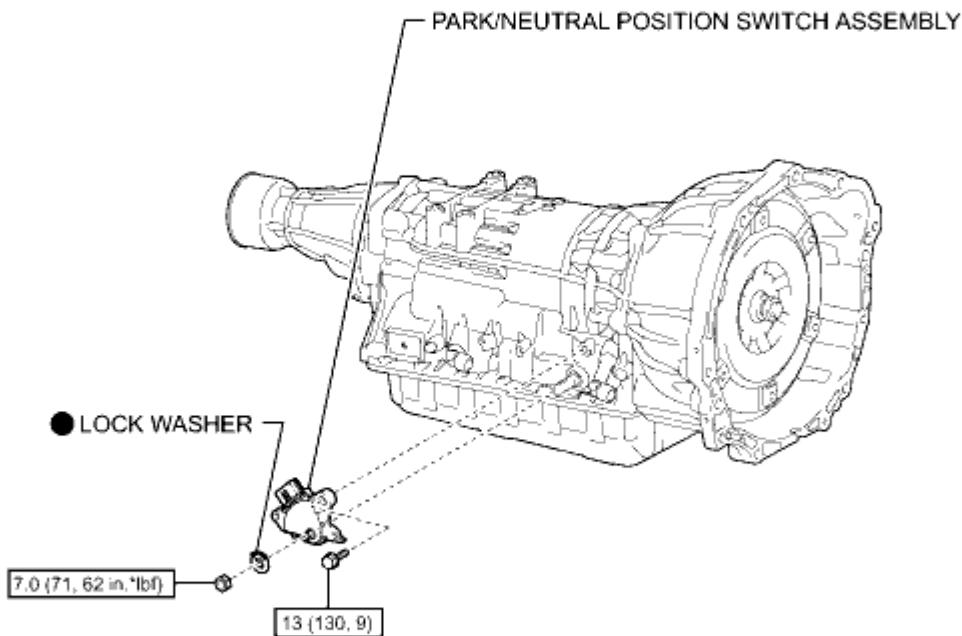
* 1	New O -Ring
-----	-------------



Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000003B2M006X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



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

● Non-reusable part

P

<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000010ND02TX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ON-VEHICLE INSPECTION (2010 4Runner)		

## **ON-VEHICLE INSPECTION**

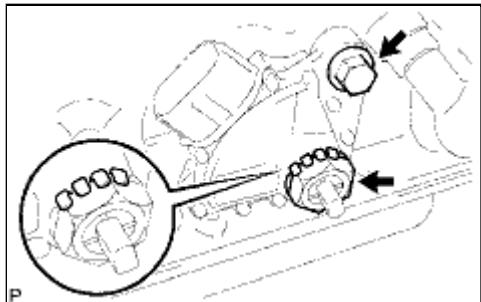
### **1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Apply the parking brake and turn the ignition switch to ON.
- (b) Depress the brake pedal and check that the engine starts when the shift lever is in N or P, but does not start when the shift lever is in other positions.
- (c) Check that the back-up light illuminates and the reverse warning buzzer sounds when the shift lever is in R, and that the back-up light and reverse warning buzzer do not operate when the shift lever is in other positions.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NC03DX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: REMOVAL (2010 4Runner)		

## **REMOVAL**



### **1. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Using a screwdriver, bend the tabs of the lock washer.
- (b) Remove the lock nut and lock washer.
- (c) Remove the bolt and park/neutral position switch.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NA01DX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSPECTION (2010 4Runner)		

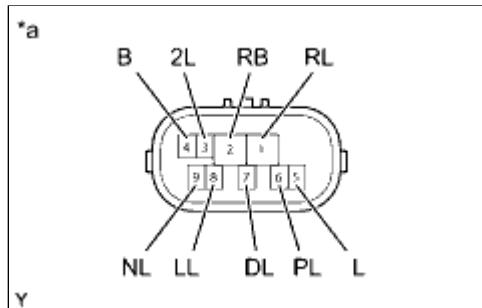
## INSPECTION

### 1. INSPECT PARK/NEUTRAL POSITION SWITCH

(a) Measure the resistance of the park/neutral switch when the shift lever is moved to each position.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>• 2 (RB) - 6 (PL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever in P	Below 1 Ω
2 (RB) - 1 (RL)	Shift lever in R	Below 1 Ω
<ul style="list-style-type: none"> <li>• 2 (RB) - 9 (NL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever in N	Below 1 Ω
2 (RB) - 7 (DL)	Shift lever in D or 3	Below 1 Ω
2 (RB) - 3 (2L)	Shift lever in 2	Below 1 Ω
2 (RB) - 8 (LL)	Shift lever in L	Below 1 Ω
<ul style="list-style-type: none"> <li>• 2 (RB) - 6 (PL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever not in P	10 kΩ or higher
2 (RB) - 1 (RL)	Shift lever not in R	10 kΩ or higher
<ul style="list-style-type: none"> <li>• 2 (RB) - 9 (NL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever not in N	10 kΩ or higher



2 (RB) - 7 (DL)	Shift lever not in D or 3	10 kΩ or higher
2 (RB) - 3 (2L)	Shift lever not in 2	10 kΩ or higher
2 (RB) - 8 (LL)	Shift lever not in L	10 kΩ or higher

## Text in Illustration

*a	Component without harness connected (Park/Neutral Position Switch)
----	---

If the result is not as specified, replace the switch assembly.

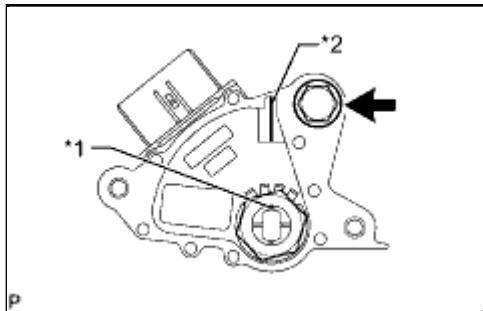


Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N803EX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ADJUSTMENT (2010 4Runner)		

## ADJUSTMENT

### 1. ADJUST PARK/NEUTRAL POSITION SWITCH ASSEMBLY

- (a) Loosen the bolt of the park/neutral position switch and move the shift lever to N.
- (b) Align the groove with the neutral basic line.



#### Text in Illustration

* 1	Groove
* 2	Neutral Basic Line

- (c) Hold the switch in position and tighten the bolt.

**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**

- (d) After the adjustment, perform the on-vehicle inspection



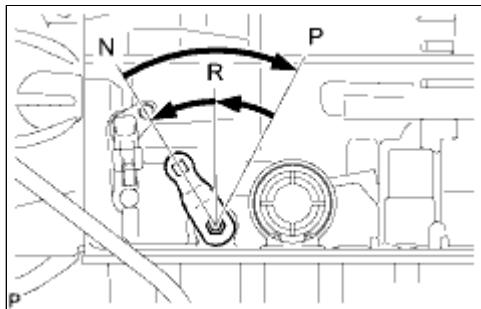
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N903EX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSTALLATION (2010 4Runner)		

## INSTALLATION

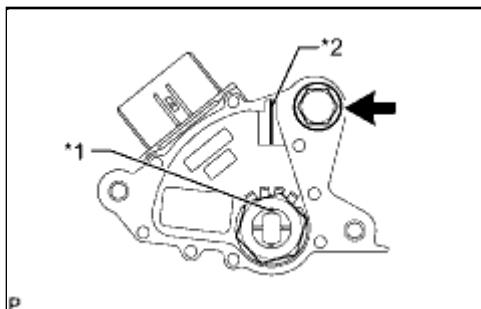
### 1. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

- (a) Install the park/neutral position switch to the manual valve shaft.
- (b) Temporarily install the bolt.
- (c) Install a new lock washer and the nut.

**Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)**



- (d) Turn the control shaft lever LH clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.



- (e) Align the groove with the neutral basic line.

#### Text in Illustration

*1	Groove
*2	Neutral Basic Line

- (f) Hold the switch in position and tighten the bolt.

**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**

- (g) Using a screwdriver, bend the tabs of the lock washer.
- (h) Connect the switch connector.

### 2. ADJUST SHIFT LEVER POSITION INFO

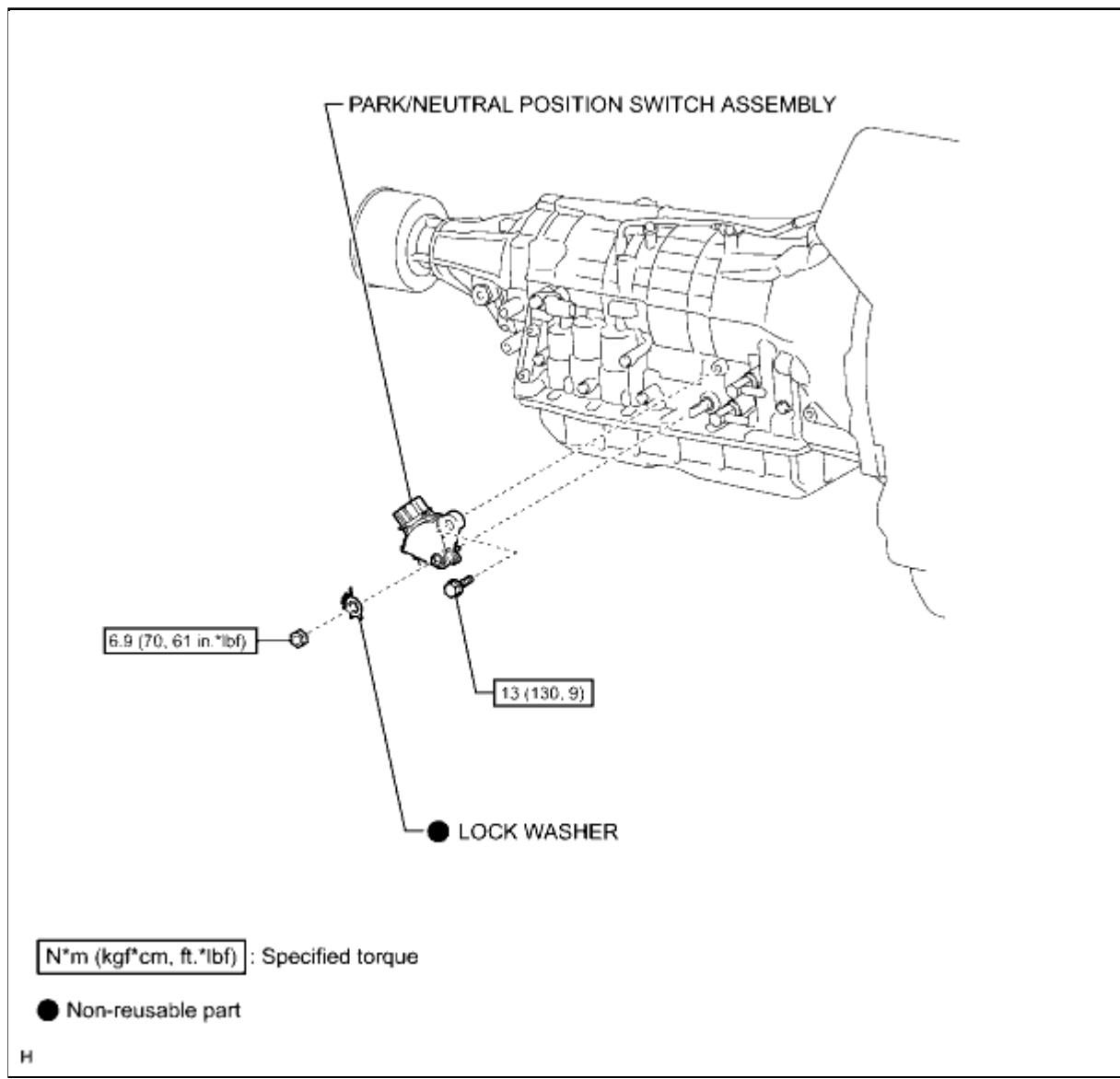
### 3. INSPECT SHIFT LEVER POSITION INFO

### 4. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY INFO

Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BKY01QX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000010ND02MX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ON-VEHICLE INSPECTION (2010 4Runner)		

## **ON-VEHICLE INSPECTION**

### **1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Apply the parking brake and turn the ignition switch on (IG).
- (b) Depress the brake pedal and check that the engine starts when the shift lever is in N or P, but does not start when the shift lever is in other positions.
- (c) Check that the back-up light illuminates and the reverse warning buzzer sounds when the shift lever is in R, but do not function when the shift lever is in other positions.

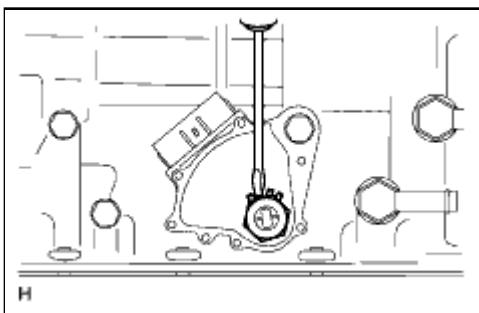


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NC036X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: REMOVAL (2010 4Runner)		

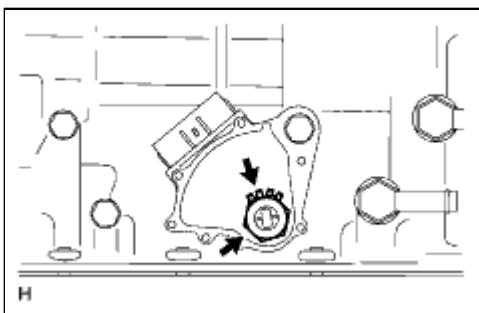
## REMOVAL

### 1. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY

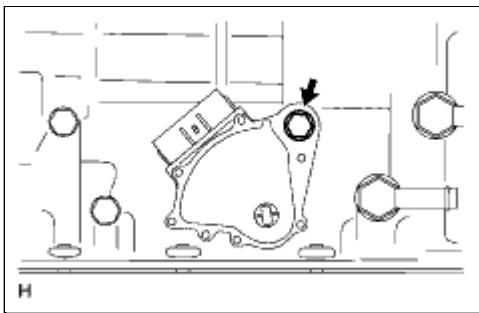
(a) Disconnect the switch connector.



(b) Using a screwdriver, bend the tabs of the lock washer.



(c) Remove the lock nut and lock washer.



(d) Remove the bolt and switch.



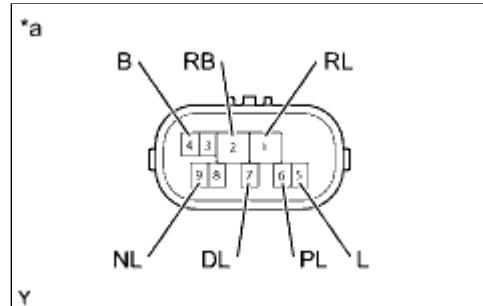
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BKX01QX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSPECTION (2010 4Runner)		

## INSPECTION

### **1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>• 2 (RB) - 6 (PL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever in P	Below 1 Ω
2 (RB) - 1 (RL)	Shift lever in R	Below 1 Ω
<ul style="list-style-type: none"> <li>• 2 (RB) - 9 (NL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever in N	Below 1 Ω
2 (RB) - 7 (DL)	<ul style="list-style-type: none"> <li>• Shift lever in D</li> <li>• Shift lever in S, "+" or "-"</li> </ul>	Below 1 Ω
<ul style="list-style-type: none"> <li>• 2 (RB) - 6 (PL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever not in P	10 kΩ or higher
2 (RB) - 1 (RL)	Shift lever not in R	10 kΩ or higher
<ul style="list-style-type: none"> <li>• 2 (RB) - 9 (NL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever not in N	10 kΩ or higher

2 (RB) - 7 (DL)	<ul style="list-style-type: none"><li>• Shift lever not in D</li><li>• Shift lever not in S, "+" or "-"</li></ul>	10 kΩ or higher
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## Text in Illustration

* 1	Component without harness connected (Park/Neutral Position Switch)
-----	---

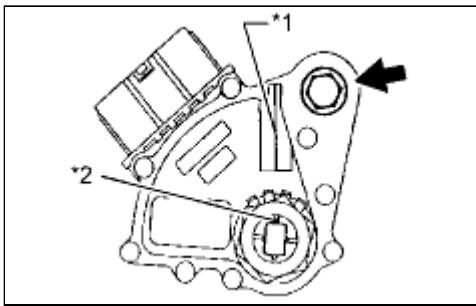
If the result is not as specified, replace the switch.



Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N8037X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ADJUSTMENT (2010 4Runner)		

## **ADJUSTMENT**

### **1. ADJUST PARK/NEUTRAL POSITION SWITCH ASSEMBLY**



(a) Loosen the bolt of the park/neutral position switch and move the shift lever to the N position.

(b) Align the neutral basic line with the switch groove.

(c) Hold the switch in position and tighten the bolt.

**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**

#### **Text in Illustration**

* 1	Neutral Basic Line
* 2	Groove

(d) After the adjustment, perform the on-vehicle inspection  .

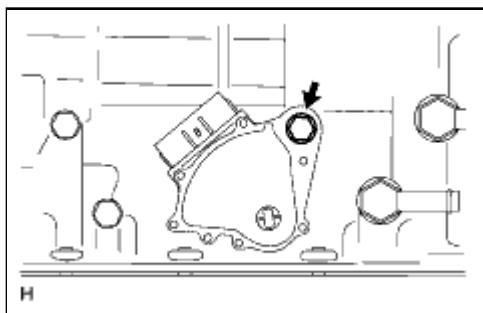


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N9037X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

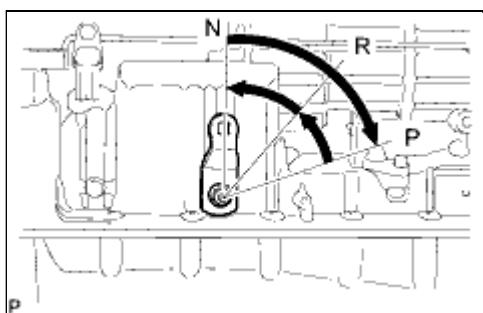
(a) Install the switch to the manual valve shaft.



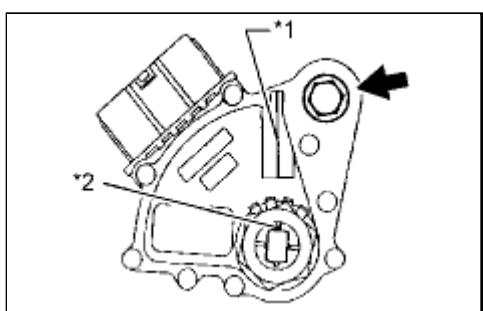
(b) Temporarily install the bolt.

(c) Install a new lock washer and the nut.

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



(d) Turn the control shaft lever LH clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.



(e) Align the neutral basic line with the switch groove.

#### Text in Illustration

*1	Neutral Basic Line
*2	Groove

(f) Hold the switch in position and tighten the bolt.

**Torque: 13 N·m (130 kgf·cm, 9ft·lbf)**

(g) Using a screwdriver, bend the tabs of the lock washer.

(h) Connect the switch connector.

## **2. INSPECT SHIFT LEVER POSITION**

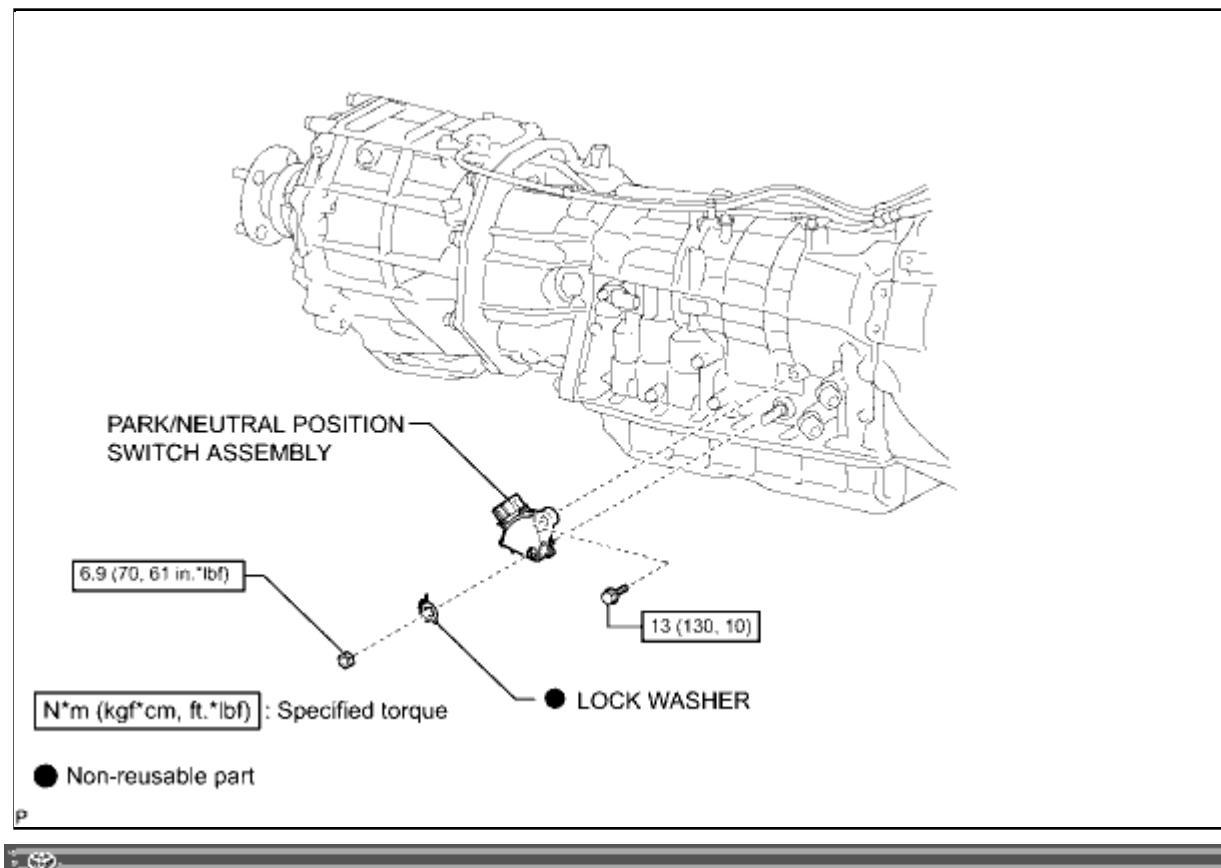
## **3. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**



Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BKY01RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000010ND02NX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ON-VEHICLE INSPECTION (2010 4Runner)		

## **ON-VEHICLE INSPECTION**

### **1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

- (a) Apply the parking brake and turn the ignition switch to on (IG).
- (b) Depress the brake pedal and check that the engine starts when the shift lever is in N or P, but does not start in other positions.
- (c) Check that the back-up light illuminates and the reverse warning buzzer sounds only when the shift lever is in R.

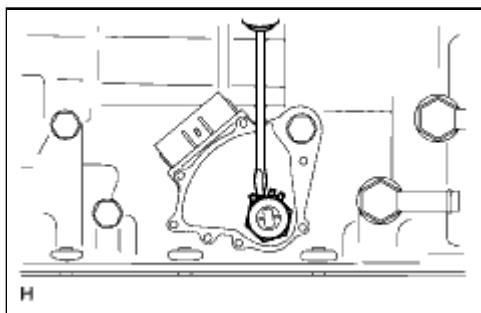


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010NC037X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: REMOVAL (2010 4Runner)		

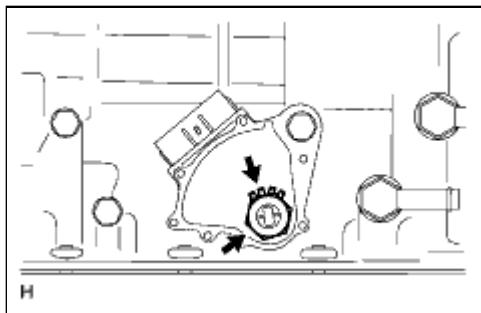
## REMOVAL

### 1. REMOVE PARK/NEUTRAL POSITION SWITCH ASSEMBLY

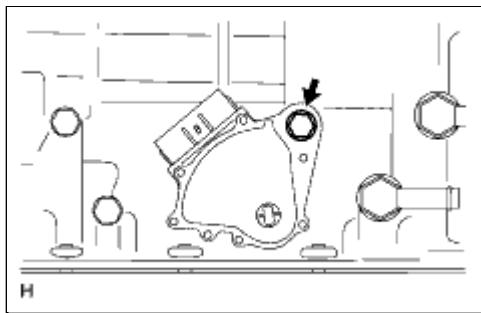
(a) Disconnect the switch connector.



(b) Using a screwdriver, bend the tabs of the lock washer.



(c) Remove the lock nut and lock washer.



(d) Remove the bolt and switch.

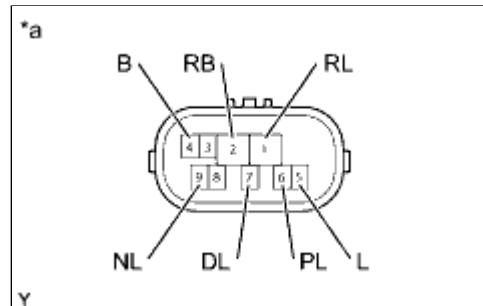
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BKX01RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>• 2 (RB) - 6 (PL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever in P	Below 1 Ω
2 (RB) - 1 (RL)	Shift lever in R	Below 1 Ω
<ul style="list-style-type: none"> <li>• 2 (RB) - 9 (NL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever in N	Below 1 Ω
2 (RB) - 9 (NL)	Shift lever not in N	10 kΩ or higher
2 (RB) - 7 (DL)	<ul style="list-style-type: none"> <li>• Shift lever in D</li> <li>• Shift lever in S, "+" or "-"</li> </ul>	Below 1 Ω
<ul style="list-style-type: none"> <li>• 2 (RB) - 6 (PL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever not in P	10 kΩ or higher
2 (RB) - 1 (RL)	Shift lever not in R	10 kΩ or higher
<ul style="list-style-type: none"> <li>• 2 (RB) - 9 (NL)</li> <li>• 4 (B) - 5 (L)</li> </ul>	Shift lever not in N	10 kΩ or higher
	<ul style="list-style-type: none"> <li>• Shift lever not</li> </ul>	

**Text in Illustration**

\*a

Component without harness connected  
(Park/Neutral Position Switch)

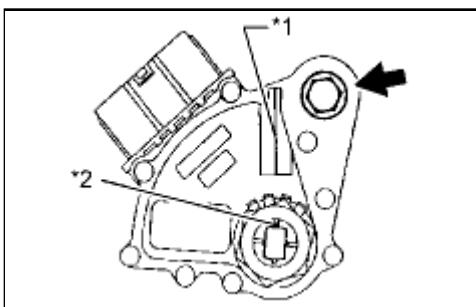
If the result is not as specified, replace the switch.



Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N8038X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: ADJUSTMENT (2010 4Runner)		

## **ADJUSTMENT**

### **1. ADJUST PARK/NEUTRAL POSITION SWITCH ASSEMBLY**



(a) Loosen the bolt of the park/neutral position switch and move the shift lever to N.

#### **Text in Illustration**

*1	Neutral Basic Line
*2	Groove

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

(c) Hold the switch in position and tighten the bolt.

**Torque: 13 N·m (130 kgf·cm, 10ft·lbf)**

(d) After the adjustment, perform the on-vehicle inspection .

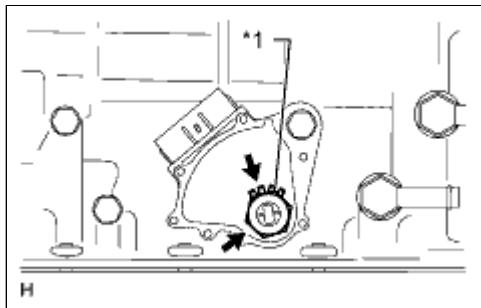


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N9038X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: PARK / NEUTRAL POSITION SWITCH: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL PARK/NEUTRAL POSITION SWITCH ASSEMBLY

- (a) Install the switch to the manual valve shaft.
- (b) Temporarily install the bolt.

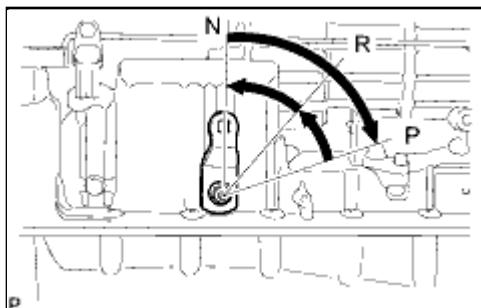


(c) Install a new lock washer and the nut.

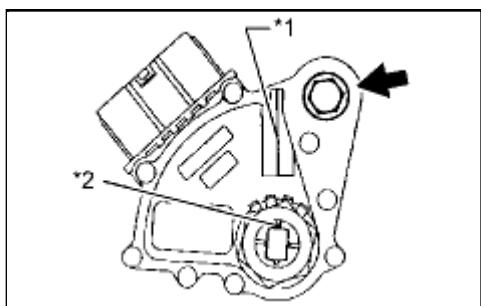
**Torque:** 6.9 N·m (70 kgf·cm, 61in·lbf)

#### Text in Illustration

*1	New Lock Washer
----	-----------------



(d) Turn the control shaft lever LH clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.



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

#### Text in Illustration

*1	Neutral Basic Line
*2	Groove

- (f) Hold the switch in position and tighten the bolt.

**Torque:** 13 N·m (130 kgf·cm, 10ft·lbf)

- (g) Using a screwdriver, bend the tabs of the lock washer.

(h) Connect the switch connector.

**2. ADJUST SHIFT LEVER POSITION** 

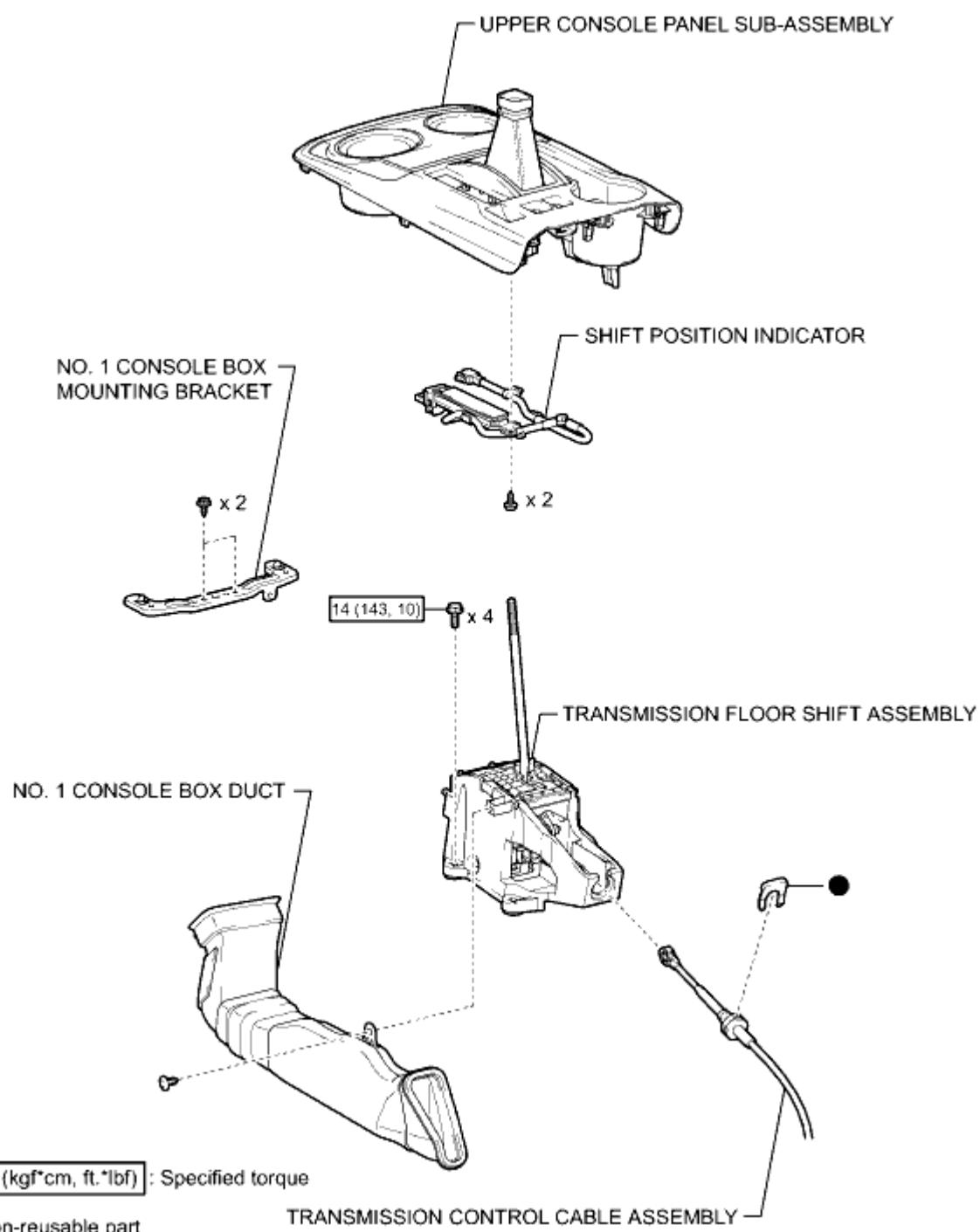
**3. INSPECT PARK/NEUTRAL POSITION SWITCH ASSEMBLY** 



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002YBE01MX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002M9A02KX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ON-VEHICLE INSPECTION (2010 4Runner)		

## **ON-VEHICLE INSPECTION**

### **1. CHECK SHIFT LOCK OPERATION**

- (a) Move the shift lever to P.
- (b) Turn the ignition switch off.
- (c) Check that the shift lever cannot be moved from P.
- (d) Turn the ignition switch to ON, depress the brake pedal and check that the shift lever can be moved to other positions.

If the operation cannot be performed as specified, inspect the transmission floor shift assembly and shift lock control ECU.

### **2. CHECK SHIFT LOCK RELEASE BUTTON OPERATION**

- (a) When operating the shift lever with the shift lock release button pressed, check that the lever can be moved to any position.
- If the operation cannot be performed as specified, check the transmission floor shift assembly.

### **3. CHECK KEY INTERLOCK OPERATION**

- (a) Turn the ignition switch to ON.
  - (b) Depress the brake pedal and move the shift lever to any position other than P.
  - (c) Check that the ignition switch cannot be turned off.
  - (d) Move the shift lever to P, turn the ignition switch off and check that the key can be removed.
- If the results are not as specified, inspect the shift lock control ECU.



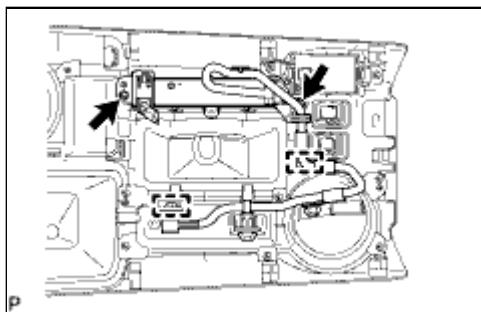
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBF01MX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REMOVAL (2010 4Runner)		

## **REMOVAL**

### **1. REMOVE REAR CONSOLE BOX ASSEMBLY**

(a) Remove the rear console box .

### **2. REMOVE SHIFT POSITION INDICATOR**

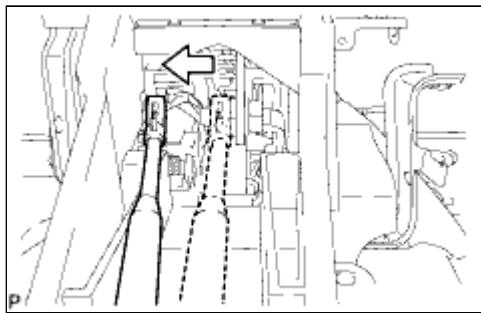


(a) Detach the connector clamp and harness clamp.

(b) Remove the 2 screws and shift position indicator from the upper console panel sub-assembly.

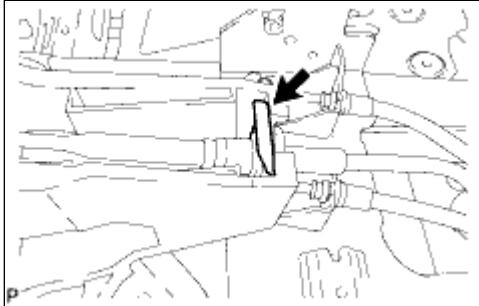
### **3. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

(a) Move the shift lever to N.



(b) Disconnect the transmission control cable end from the shift lever.

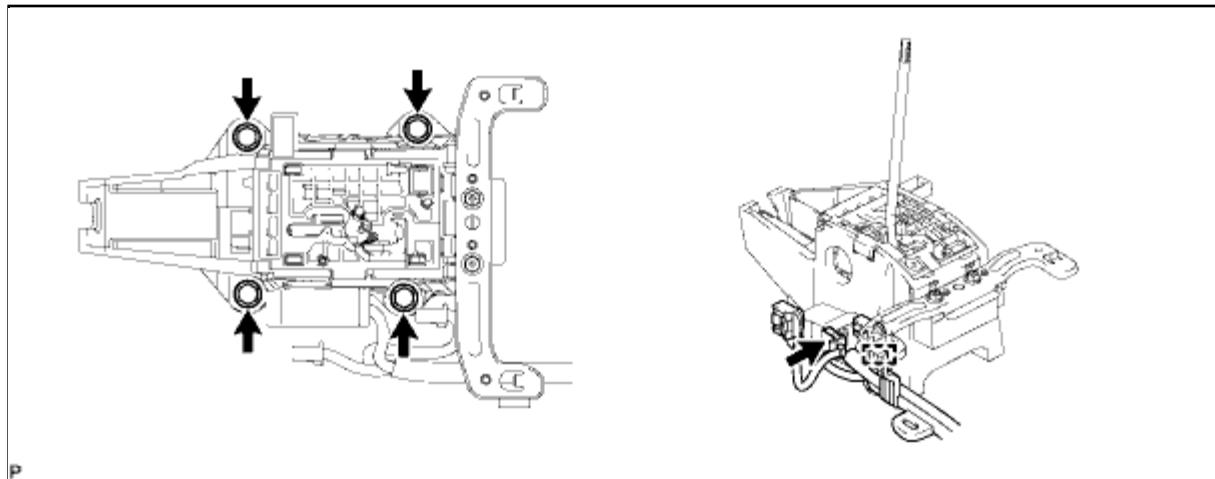
(c) Remove the clip and disconnect the transmission control cable from the shift lever retainer.



#### 4. REMOVE NO. 1 CONSOLE BOX DUCT

- Remove the clip and console box duct.

#### 5. REMOVE TRANSMISSION FLOOR SHIFT ASSEMBLY



- Disconnect the connector and detach the harness clamp.

- Remove the 4 bolts and transmission floor shift.

#### 6. REMOVE NO. 1 CONSOLE BOX MOUNTING BRACKET

- Remove the 2 screws and console box mounting bracket.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000030G601MX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSPECTION (2010 4Runner)		

## **INSPECTION**

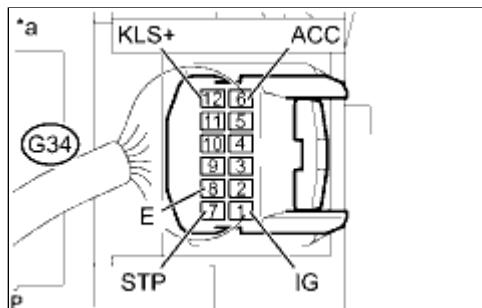
### **1. INSPECT TRANSMISSION FLOOR SHIFT ASSEMBLY (SHIFT LOCK CONTROL ECU)**

- (a) Measure the voltage and resistance according to the value(s) in the table below.

**HINT:**

**Do not disconnect the shift lock control ECU connector.**

Standard Voltage and Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
G34-6 (ACC) - G34-8 (E)	Ignition switch ON	11 to 14 V
G34-6 (ACC) - G34-8 (E)	Ignition switch ACC	11 to 14 V
G34-6 (ACC) - G34-8 (E)	Ignition switch off	Below 1 V
G34-7 (STP) - G34-8 (E)	Brake pedal depressed	11 to 14 V
G34-7 (STP) - G34-8 (E)	Brake pedal released	Below 1 V
G34-12 (KLS+) - G34-8 (E)	1. Ignition switch ACC and shift lever in P	Below 1 V
	2. Ignition switch ACC and shift lever not in P (Within approx. 1 second)	7.5 to 11 V
	3. Ignition switch ACC and shift lever not in P (After approx. 2 seconds)	6 to 9.5 V
G34-1 (IG) - G34-8 (E)	Ignition switch ON	11 to 14 V
G34-1 (IG) - G34-8 (E)	Ignition switch off	Below 1 V

G34-8 (E) - Body ground	Always	Below 1 Ω
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## Text in Illustration

*a	Component with harness connected (Shift Lock Control ECU)
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If the result is not as specified, replace the transmission floor shift assembly.



Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454Z002X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ADJUSTMENT (2010 4Runner)		

## ADJUSTMENT

### 1. INSPECT SHIFT LEVER POSITION

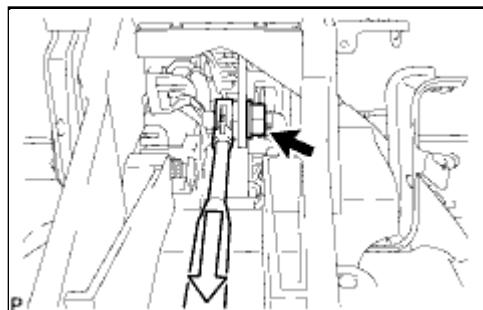
- (a) When moving the shift lever from P to R with the ignition switch to ON and the brake pedal depressed, make sure that it moves smoothly and correctly into position.
- (b) Check that the shift lever does not stop when moving the shift lever from R to P, and check that the shift lever does not stick when moving the shift lever from D to L.
- (c) Start the engine and make sure that the vehicle moves forward after moving the shift lever from N to D and moves in reverse after moving the shift lever to R.

If the operation cannot be performed as specified, inspect the park/neutral position switch assembly and check the transmission floor shift assembly installation condition.

If the indicator and shift lever position do not match, carry out the following adjustment procedures.

### 2. ADJUST SHIFT LEVER POSITION

- (a) Remove the rear console box .
- (b) Move the shift lever to N.



(c) Loosen the nut of the control cable end.

- (d) While pushing the control cable slightly toward the rear side of the vehicle, tighten the nut.

**Torque: 12 N·m (122 kgf·cm, 9ft·lbf)**

- (e) Move the shift lever and check that there is less wobble when moving the shift lever from N to D than when moving the shift lever to P.

- (f) Install the rear console box .

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBD01MX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSTALLATION (2010 4Runner)		

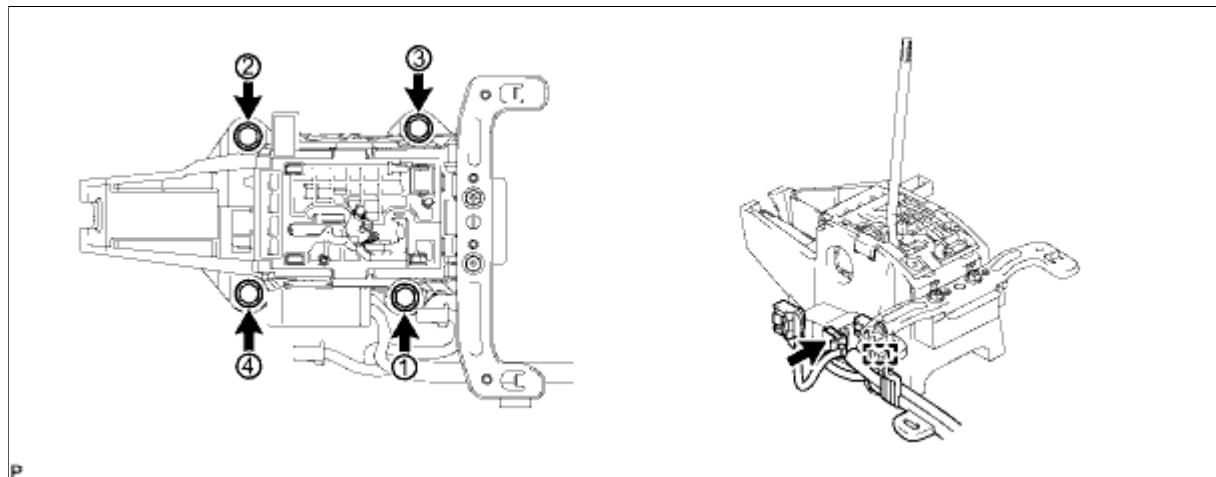
## INSTALLATION

### 1. INSTALL NO. 1 CONSOLE BOX MOUNTING BRACKET

- (a) Install the console box mounting bracket with the 2 screws.

### 2. INSTALL TRANSMISSION FLOOR SHIFT ASSEMBLY

- (a) Install the transmission floor shift with the 4 bolts. Be sure to tighten the bolts in the order shown in the illustration.



**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

- (b) Connect the connector and attach the harness clamp.

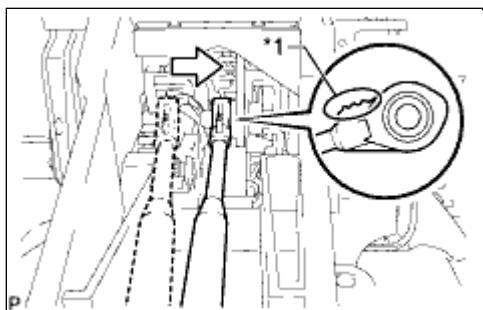
### 3. INSTALL NO. 1 CONSOLE BOX DUCT

- (a) Install the console box duct with the clip.

### 4. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Connect the transmission control cable to the shift lever retainer and install a new clip.

- (b) Connect the control cable end to the shift lever.



**NOTICE:**

Make sure to connect the cable end so that the inner cable is not twisted. Confirm that the ridged side of the cable end is facing upward.

### Text in Illustration

\*1

Ridged

**5. ADJUST SHIFT LEVER POSITION** **6. INSPECT SHIFT LEVER POSITION** **7. INSTALL SHIFT POSITION INDICATOR**

- (a) Install the shift position indicator to the upper console panel sub-assembly with the 2 screws.
- (b) Attach the connector clamp and harness clamp.

**8. INSTALL REAR CONSOLE BOX ASSEMBLY**

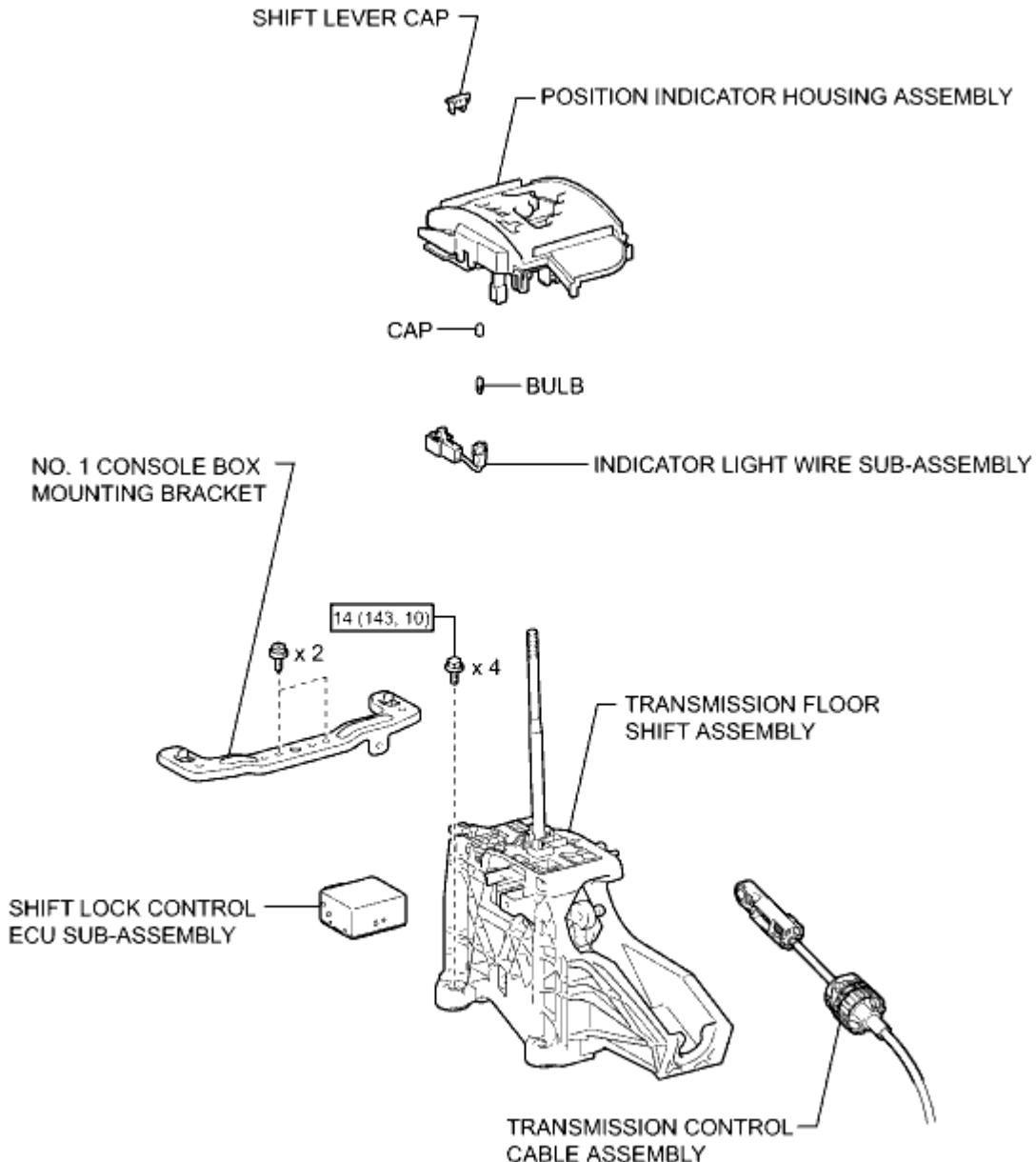
- (a) Install the rear console box .



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Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBE01GX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



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

0



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002M9A02EX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ON-VEHICLE INSPECTION (2010 4Runner)		

## ON-VEHICLE INSPECTION

### 1. CHECK SHIFT LOCK OPERATION

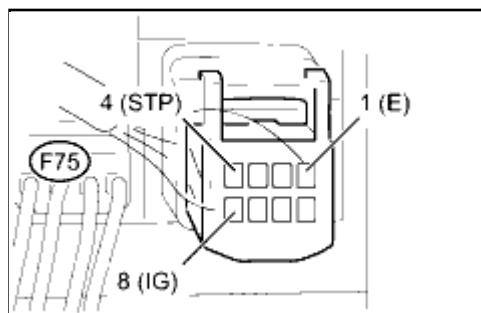
- (a) Move the shift lever to P.
- (b) Turn the ignition switch off.
- (c) Check that the shift lever cannot be moved from P.
- (d) Turn the ignition switch to on (IG), depress the brake pedal and check that the shift lever can be moved to other positions.

If the operation cannot be performed as specified, inspect the transmission floor shift assembly and shift lock control ECU.

### 2. CHECK SHIFT LOCK RELEASE BUTTON OPERATION

- (a) When operating the shift lever with the shift lock release button pressed, check that the lever can be moved to any position.
- If the operation cannot be performed as specified, check the transmission floor shift assembly.

### 3. CHECK SHIFT LOCK CONTROL ECU



- (a) Measure the voltage and resistance according to the value(s) in the table below.

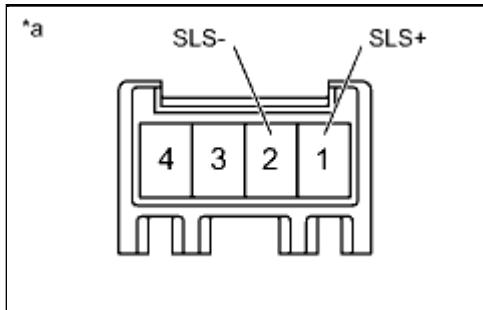
#### HINT:

**Do not disconnect the shift lock control ECU connector.**

Standard Voltage and resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
F75-8 (IG) - F75-1 (E)	Ignition switch ON	11 to 14 V
F75-8 (IG) - F75-1 (E)	Ignition switch off	Below 1 V
F75-4 (STP) - F75-1 (E)	Brake pedal depressed	11 to 14 V
F75-4 (STP) - F75-1 (E)	Brake pedal released	Below 1 V

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
F75-1 (E) - Body ground	Always	Below 1 Ω



(b) Disconnect the shift lock solenoid connector from the shift lock control ECU.

(c) Measure the voltage according to the value(s) in the table below.

**HINT:**

**Do not disconnect the shift lock control ECU connector.**

Standard Voltage:

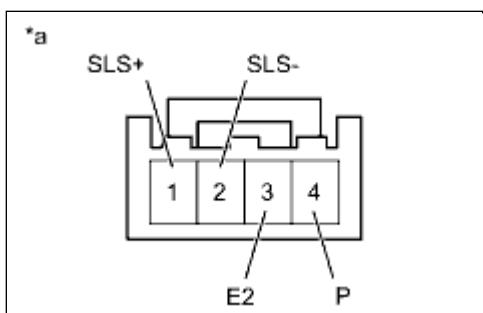
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (SLS+) - 2 (SLS-)	Ignition switch off	Below 1 V
1 (SLS+) - 2 (SLS-)	Ignition switch ON	Below 1 V
	Ignition switch ON and brake pedal depressed	11 to 14 V

**Text in Illustration**

*a	Component without harness connected (Shift Lock Control ECU)
----	---

If the result is not as specified, replace the transmission floor shift assembly.

#### 4. CHECK SHIFT LOCK SOLENOID



- (a) Disconnect the shift lock solenoid connector from the shift lock control ECU.
- (b) Measure the resistance according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
-------------------	-----------	---------------------

1 (SLS+) - 2 (SLS-)	Always	101 to 123 Ω
3 (E2) - 4 (P)	Shift lever in P	10 kΩ or higher
3 (E2) - 4 (P)	Shift lever not in P	Below 1 Ω

## Text in Illustration

*a	Component without harness connected: (Shift Lock Control Solenoid)
----	---

- (c) Apply 12 V of battery voltage to the shift lock solenoid and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>• Battery positive (+) → Terminal 1 (SLS+)</li> <li>• Battery negative (-) → Terminal 2 (SLS-)</li> </ul>	Solenoid moves and makes an operating noise

If the result is not as specified, replace the transmission floor shift assembly.



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Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBF01GX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REMOVAL (2010 4Runner)		

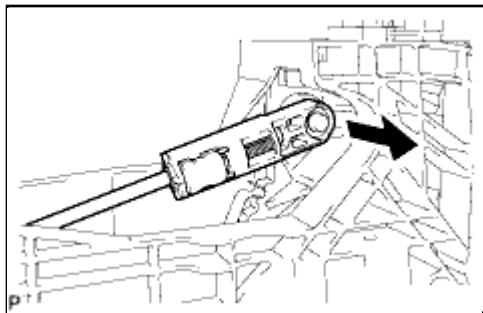
## **REMOVAL**

### **1. REMOVE REAR CONSOLE BOX ASSEMBLY**

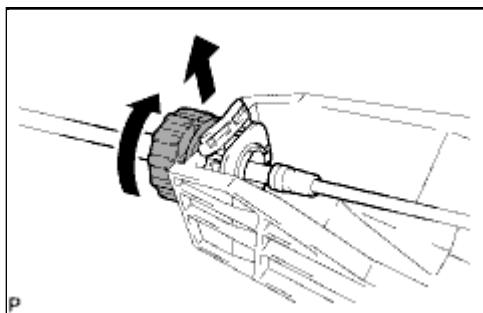
- (a) Remove the rear console box  .

### **2. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

- (a) Move the shift lever to N.



- (b) Disconnect the transmission control cable end from the shift lever.

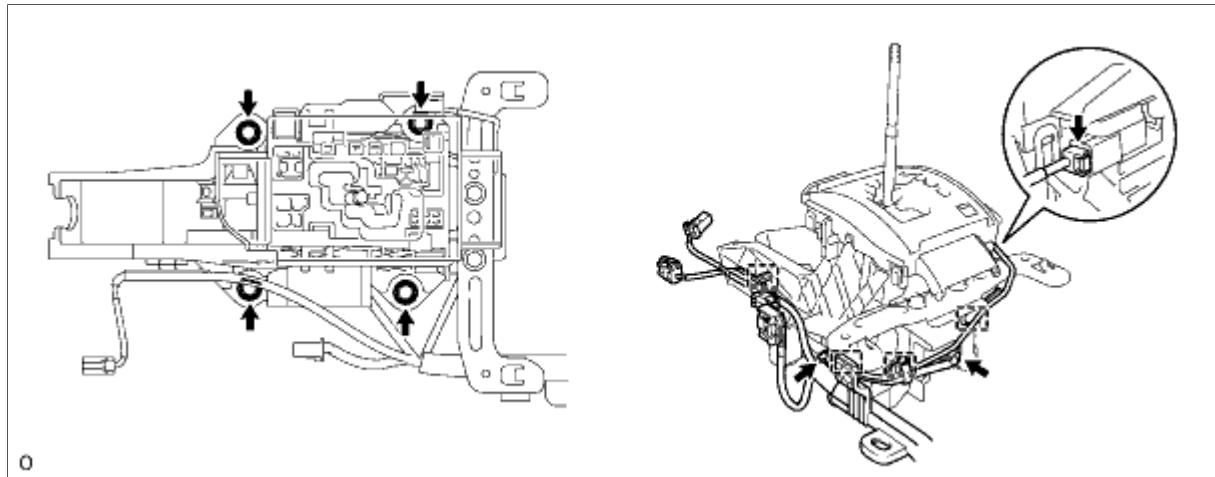


- (c) Rotate the socket counterclockwise approximately 180° and, while holding the nut in that position, disconnect the transmission control cable from the shift lever retainer.

**NOTICE:**

**Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.**

### **3. REMOVE TRANSMISSION FLOOR SHIFT ASSEMBLY**



- (a) Disconnect the 3 connectors and detach the 4 wire harness clamps.
- (b) Remove the 4 bolts and transmission floor shift.

#### **4. REMOVE NO. 1 CONSOLE BOX MOUNTING BRACKET**

- (a) Remove the 2 screws and console box mounting bracket.

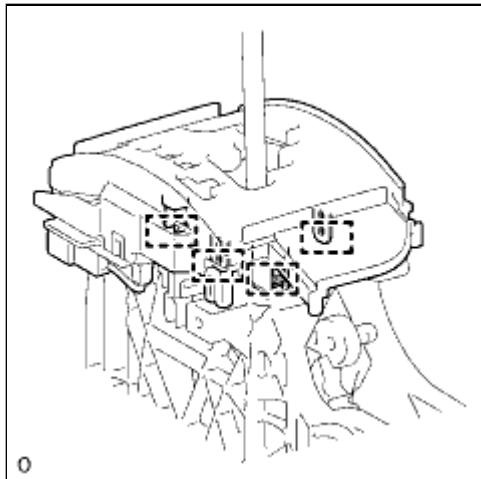


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBG01IX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: DISASSEMBLY (2010 4Runner)		

## **DISASSEMBLY**

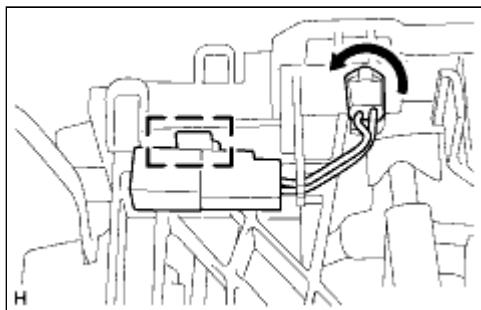
### **1. REMOVE SHIFT LEVER CAP**

### **2. REMOVE POSITION INDICATOR HOUSING ASSEMBLY**



(a) Detach the 4 claws and remove the floor shift position indicator housing.

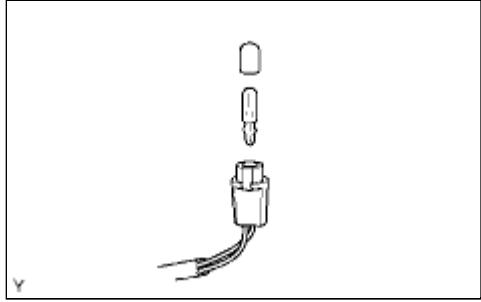
### **3. REMOVE INDICATOR LIGHT WIRE SUB-ASSEMBLY**



(a) Detach the wire connector clamp from the position indicator housing.

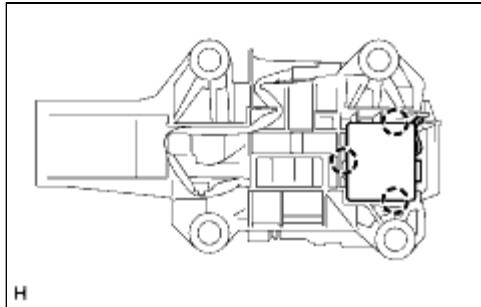
(b) Rotate the indicator light wire socket counterclockwise to align the key part and remove the wire.

(c) Remove the cap and bulb from the indicator light wire socket.



#### 4. REMOVE SHIFT LOCK CONTROL ECU SUB-ASSEMBLY

(a) Disconnect the shift lock solenoid connector from the shift lock control ECU.



(b) Detach the 3 claws and remove the shift lock control ECU from the transmission floor shift.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000030G601GX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSPECTION (2010 4Runner)		

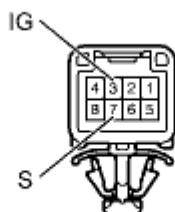
## INSPECTION

### 1. INSPECT TRANSMISSION CONTROL SWITCH

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (IG) - 7 (S)	Shift lever in S, "+" or "-"	Below 1 Ω
3 (IG) - 7 (S)	Shift lever not in S, "+" or "-"	10 kΩ or higher



#### Text in Illustration

*a	Component without harness connected: (Transmission Control Switch)
----	---

If the result is not as specified, replace the transmission floor shift.



Last Modified: 5-10-2010	6.4 N	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000047ZX001X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ADJUSTMENT (2010 4Runner)		

## ADJUSTMENT

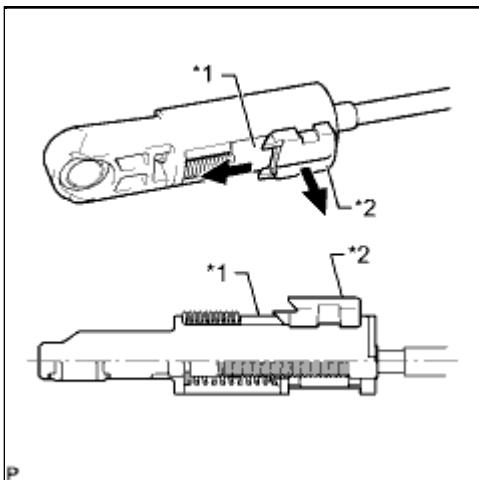
### 1. INSPECT SHIFT LEVER POSITION

- (a) When moving the shift lever from P to R with the ignition switch to on (IG) and the brake pedal depressed, make sure that it moves smoothly and correctly into position.
- (b) Check that the shift lever does not stop when moving the shift lever from R to P, and check that the shift lever does not stick when moving the shift lever from D to S.
- (c) Start the engine and make sure that the vehicle moves forward after moving the shift lever from N to D and moves in reverse after moving the shift lever to R.

If the operation cannot be performed as specified, inspect the park/neutral position switch assembly and check the transmission floor shift assembly installation condition.

### 2. ADJUST SHIFT LEVER POSITION

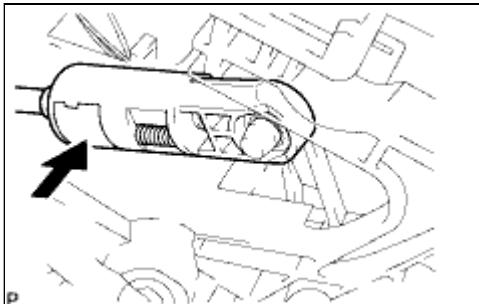
- (a) Remove the rear console box .
- (b) Move the shift lever to N.



(c) Slide the slider in the direction shown in the illustration and pull out the lock piece.

#### Text in Illustration

*1	Slider
*2	Lock Piece



(d) Push the lock piece into the adjuster case and lock it.

#### NOTICE:

Make sure that the lock piece is completely locked by the slider.

(e) Install the rear console box  .



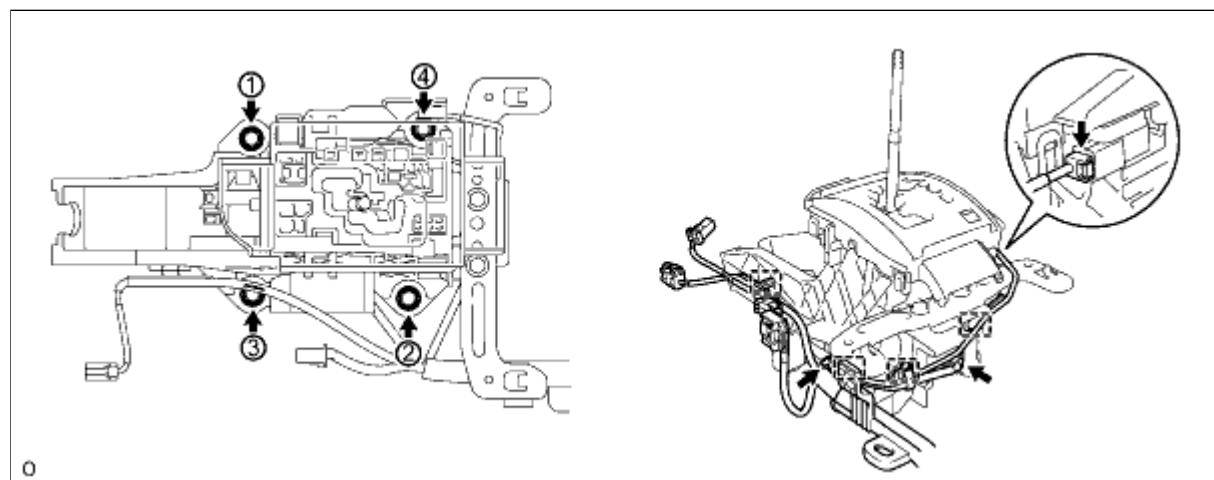
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBD01GX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL NO. 1 CONSOLE BOX MOUNTING BRACKET

(a) Install the console box mounting bracket with the 2 screws.

### 2. INSTALL SHIFT LEVER ASSEMBLY



(a) Install the transmission floor shift with the 4 bolts tighten the bolt in the order shown in the illustration.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

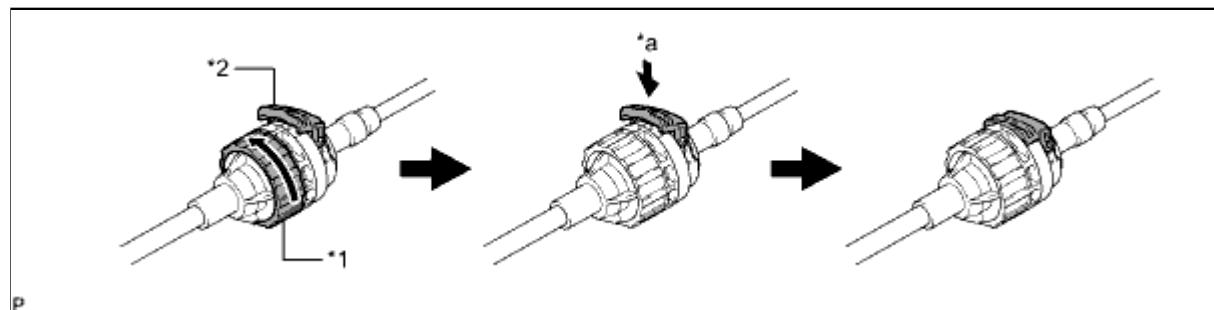
(b) Connect the 3 connectors and attach the 4 wire harness clamps.

### 3. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Turn the socket of the transmission control cable 180° counterclockwise. While holding the socket in place, push in the lock piece until the lock piece clicks twice.

#### NOTICE:

**Do not over-rotate the socket as it will come off the internal spring and the transmission control cable will not be reusable.**



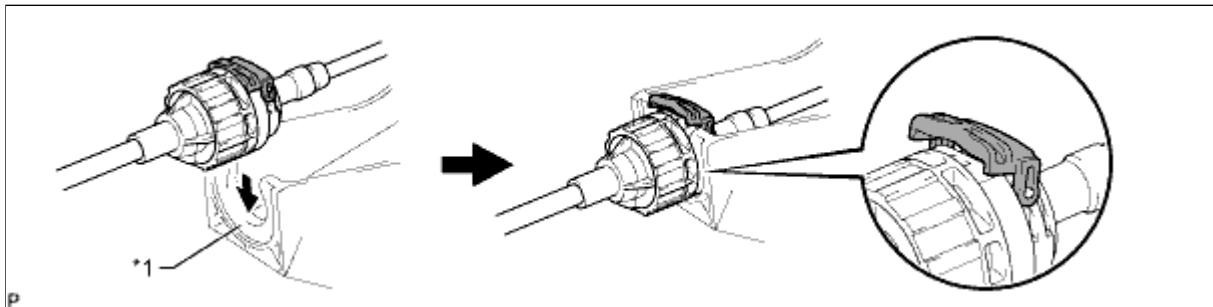
**Text in Illustration**

*1	Socket	*2	Lock Piece
*a	Push in	-	-

**HINT:**

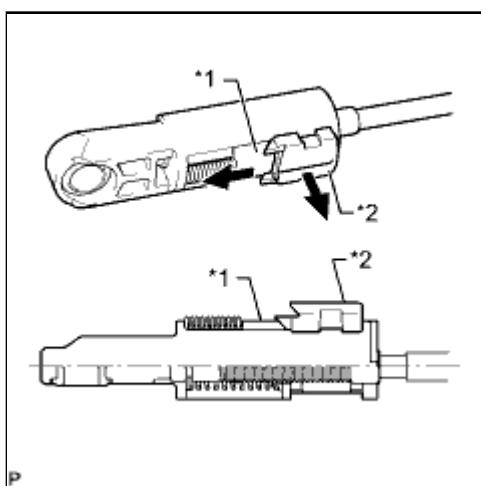
If the lock piece cannot be pushed in, slightly turn the socket clockwise and then push in the lock piece again.

- (b) Install the outer part of the transmission control cable to the shift lever retainer. Check that the socket and lock piece are positioned at original position.



**Text in Illustration**

*1	Shift Lever Retainer	-	-
----	----------------------	---	---



- (c) Slide the slider in the direction shown in the illustration and pull out the lock piece.

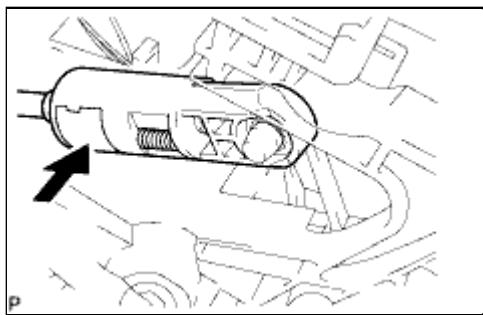
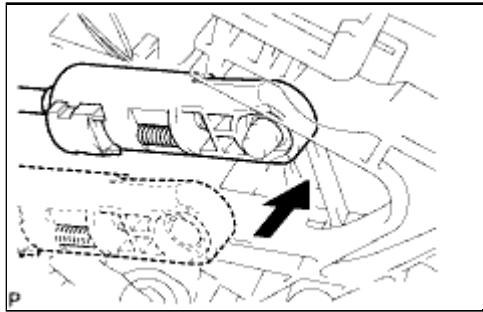
**Text in Illustration**

*1	Slider
*2	Lock Piece

- (d) Connect the end of the cable to the shift lever.

**NOTICE:**

- Make sure that the lock piece is pulled up.
- Push on the end of the cable all the way to the base of the pin.



(e) Push the lock piece into the adjuster case and lock it.

**NOTICE:**

**Make sure that the lock piece is completely locked by the slider.**

#### 4. INSPECT SHIFT LEVER POSITION INFO

#### 5. INSTALL REAR CONSOLE BOX ASSEMBLY

(a) Install the rear console box INFO.

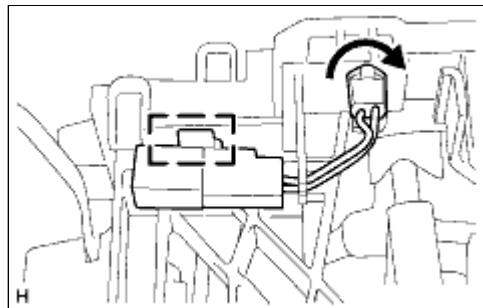


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBH01IX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL SHIFT LOCK CONTROL ECU SUB-ASSEMBLY**

- (a) Attach the 3 claws to install the shift lock control ECU to the transmission floor shift.
- (b) Connect the shift lock solenoid connector to the shift lock control ECU.



### **2. INSTALL INDICATOR LIGHT WIRE SUB-ASSEMBLY**

- (a) Install the bulb and cap to the indicator light wire.
- (b) Align the wire with the key part of the position indicator housing, and install the wire. Then rotate the wire clockwise until it locks.
- (c) Attach the connector clamp to the position indicator housing.

### **3. INSTALL POSITION INDICATOR HOUSING ASSEMBLY**

- (a) Attach the 4 claws to install the position indicator housing to the transmission floor shift.

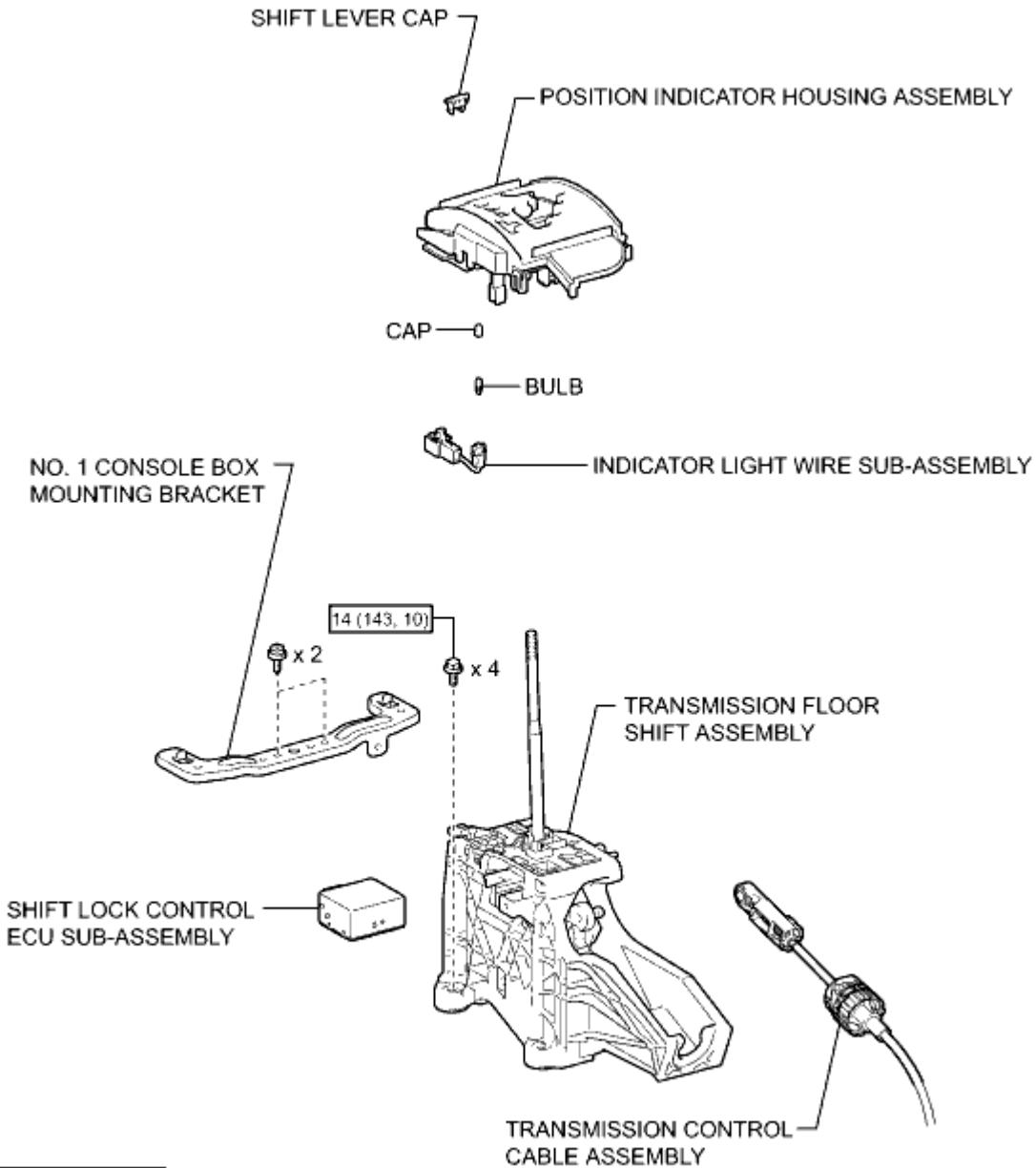
### **4. INSTALL SHIFT LEVER CAP**



Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBE01FX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002M9A02CX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ON-VEHICLE INSPECTION (2010 4Runner)		

## ON-VEHICLE INSPECTION

### 1. CHECK SHIFT LOCK OPERATION

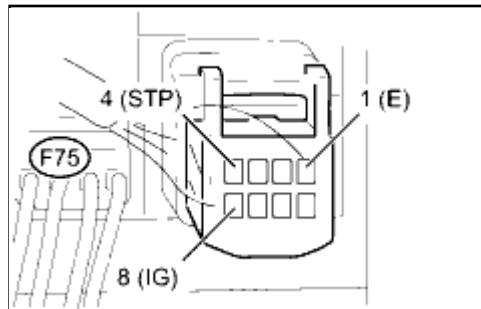
- (a) Move the shift lever to P.
- (b) Turn the ignition switch off.
- (c) Check that the shift lever cannot be moved from P.
- (d) Turn the ignition switch to on (IG), depress the brake pedal and check that the shift lever can be moved to other positions.

If the operation cannot be performed as specified, inspect the transmission floor shift assembly and shift lock control ECU.

### 2. CHECK SHIFT LOCK RELEASE BUTTON OPERATION

- (a) When operating the shift lever with the shift lock release button pressed, check that the lever can be moved to any position.
- If the operation cannot be performed as specified, check the transmission floor shift assembly.

### 3. CHECK SHIFT LOCK CONTROL ECU



- (a) Measure the voltage and resistance according to the value(s) in the table below.

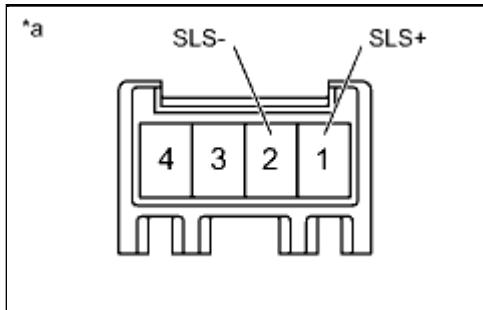
#### HINT:

**Do not disconnect the shift lock control ECU connector.**

Standard Voltage and resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
F75-8 (IG) - F75-1 (E)	Ignition switch ON	11 to 14 V
F75-8 (IG) - F75-1 (E)	Ignition switch off	Below 1 V
F75-4 (STP) - F75-1 (E)	Brake pedal depressed	11 to 14 V
F75-4 (STP) - F75-1 (E)	Brake pedal released	Below 1 V

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
F75-1 (E) - Body ground	Always	Below 1 Ω



(b) Disconnect the shift lock solenoid connector from the shift lock control ECU.

(c) Measure the voltage according to the value(s) in the table below.

**HINT:**

**Do not disconnect the shift lock control ECU connector.**

Standard Voltage:

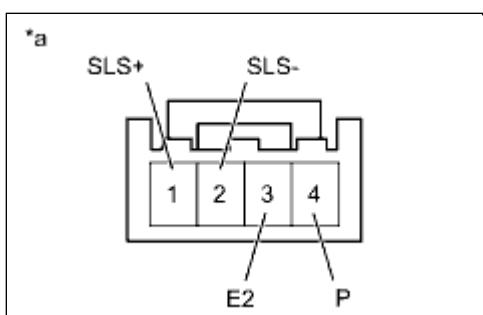
TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (SLS+) - 2 (SLS-)	Ignition switch off	Below 1 V
1 (SLS+) - 2 (SLS-)	Ignition switch ON	Below 1 V
	Ignition switch ON and brake pedal depressed	11 to 14 V

**Text in Illustration**

*a	Component without harness connected (Shift Lock Control ECU)
----	---

If the result is not as specified, replace the transmission floor shift assembly.

#### 4. CHECK SHIFT LOCK SOLENOID



- (a) Disconnect the shift lock solenoid connector from the shift lock control ECU.  
(b) Measure the resistance according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
-------------------	-----------	---------------------

1 (SLS+) - 2 (SLS-)	Always	101 to 123 Ω
3 (E2) - 4 (P)	Shift lever in P	10 kΩ or higher
3 (E2) - 4 (P)	Shift lever not in P	Below 1 Ω

## Text in Illustration

*a	Component without harness connected: (Shift Lock Control Solenoid)
----	---

- (c) Apply 12 V of battery voltage to the shift lock solenoid and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>• Battery positive (+) → Terminal 1 (SLS+)</li> <li>• Battery negative (-) → Terminal 2 (SLS-)</li> </ul>	Solenoid moves and makes an operating noise

If the result is not as specified, replace the transmission floor shift assembly.



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Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBF01FX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REMOVAL (2010 4Runner)		

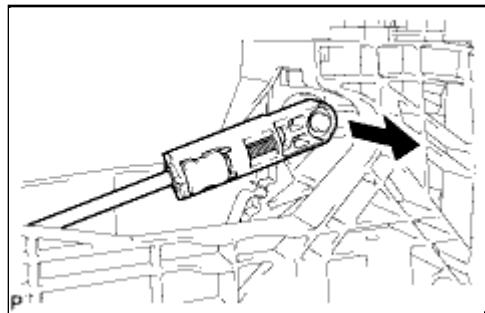
## **REMOVAL**

### **1. REMOVE REAR CONSOLE BOX ASSEMBLY**

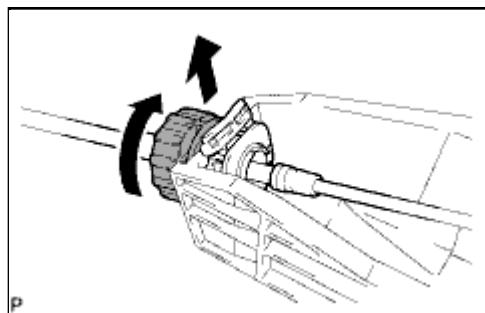
- (a) Remove the rear console box .

### **2. DISCONNECT TRANSMISSION CONTROL CABLE ASSEMBLY**

- (a) Move the shift lever to N.



- (b) Disconnect the transmission control cable end from the shift lever.

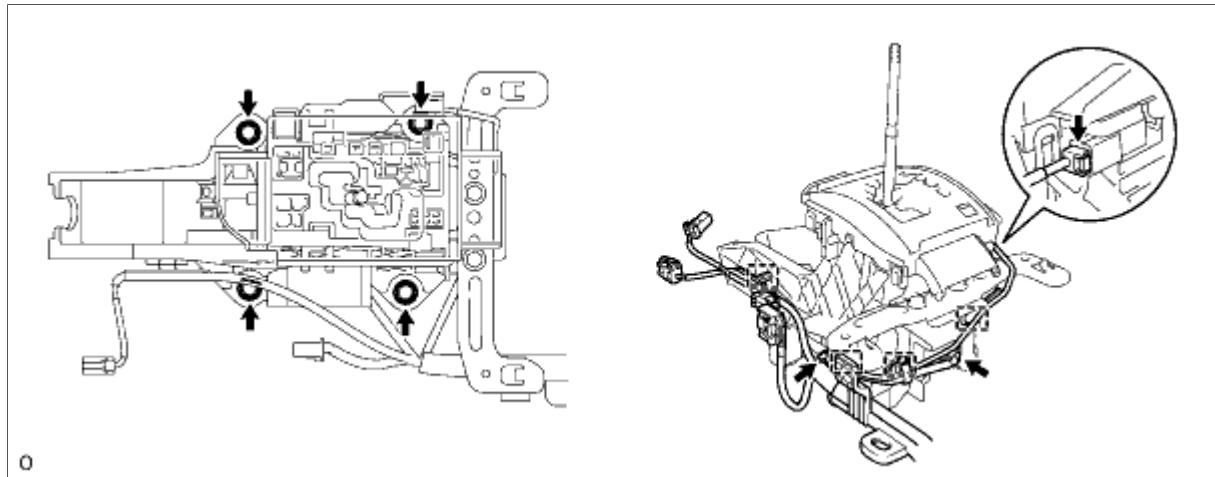


- (c) Rotate the socket counterclockwise approximately 180° and, while holding the nut in that position, disconnect the transmission control cable from the shift lever retainer.

**NOTICE:**

**Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.**

### **3. REMOVE TRANSMISSION FLOOR SHIFT ASSEMBLY**



- (a) Disconnect the 3 connectors and detach the 4 wire harness clamps.
- (b) Remove the 4 bolts and transmission floor shift.

#### **4. REMOVE NO. 1 CONSOLE BOX MOUNTING BRACKET**

- (a) Remove the 2 screws and console box mounting bracket.

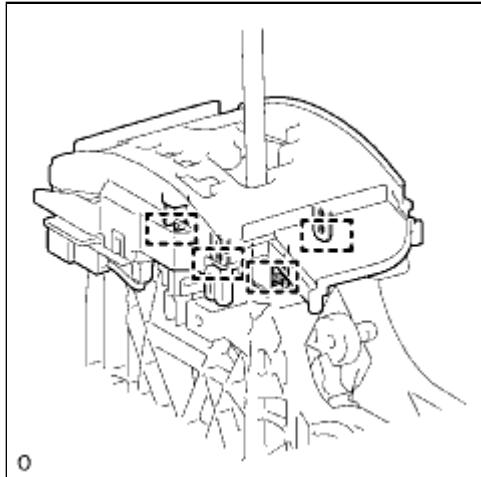


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBG01HX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: DISASSEMBLY (2010 4Runner)		

## **DISASSEMBLY**

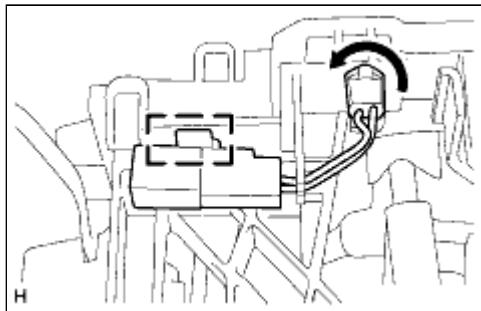
### **1. REMOVE SHIFT LEVER CAP**

### **2. REMOVE POSITION INDICATOR HOUSING ASSEMBLY**



(a) Detach the 4 claws and remove the floor shift position indicator housing.

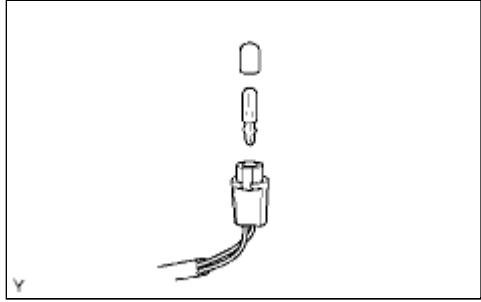
### **3. REMOVE INDICATOR LIGHT WIRE SUB-ASSEMBLY**



(a) Detach the wire connector clamp from the position indicator housing.

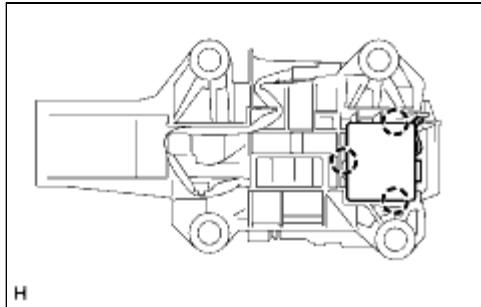
(b) Rotate the indicator light wire socket counterclockwise to align the key part and remove the wire.

(c) Remove the cap and bulb from the indicator light wire socket.



#### 4. REMOVE SHIFT LOCK CONTROL ECU SUB-ASSEMBLY

(a) Disconnect the shift lock solenoid connector from the shift lock control ECU.



(b) Detach the 3 claws and remove the shift lock control ECU from the transmission floor shift.



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Model Year: 2010	Model: 4Runner	Doc ID: RM0000030G601FX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSPECTION (2010 4Runner)		

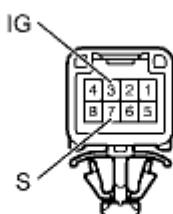
## INSPECTION

### 1. INSPECT TRANSMISSION CONTROL SWITCH

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3 (IG) - 7 (S)	Shift lever in S, "+" or "-"	Below 1 Ω
3 (IG) - 7 (S)	Shift lever not in S, "+" or "-"	10 kΩ or higher



#### Text in Illustration

*a	Component without harness connected: (Transmission Control Switch)
----	---

If the result is not as specified, replace the transmission floor shift.



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Model Year: 2010	Model: 4Runner	Doc ID: RM0000047ZX000X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: ADJUSTMENT (2010 4Runner)		

## **ADJUSTMENT**

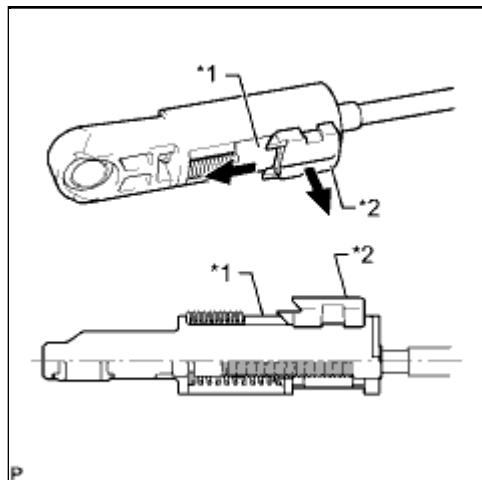
### **1. INSPECT SHIFT LEVER POSITION**

- (a) When moving the shift lever from P to R with the ignition switch to on (IG) and the brake pedal depressed, make sure that it moves smoothly and correctly into position.
- (b) Check that the shift lever does not stop when moving the shift lever from R to P, and check that the shift lever does not stick when moving the shift lever from D to S.
- (c) Start the engine and make sure that the vehicle moves forward after moving the shift lever from N to D and moves in reverse after moving the shift lever to R.

If the operation cannot be performed as specified, inspect the park/neutral position switch assembly and check the transmission floor shift assembly installation condition.

### **2. ADJUST SHIFT LEVER POSITION**

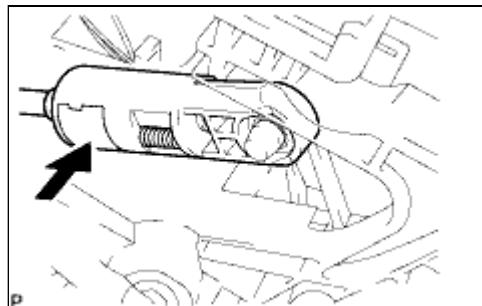
- (a) Remove the rear console box  .
- (b) Move the shift lever to N.



(c) Slide the slider in the direction shown in the illustration and pull out the lock piece.

#### **Text in Illustration**

*1	Slider
*2	Lock Piece



(d) Push the lock piece into the adjuster case and lock it.

#### **NOTICE:**

**Make sure that the lock piece is completely locked by the slider.**

(e) Install the rear console box  .



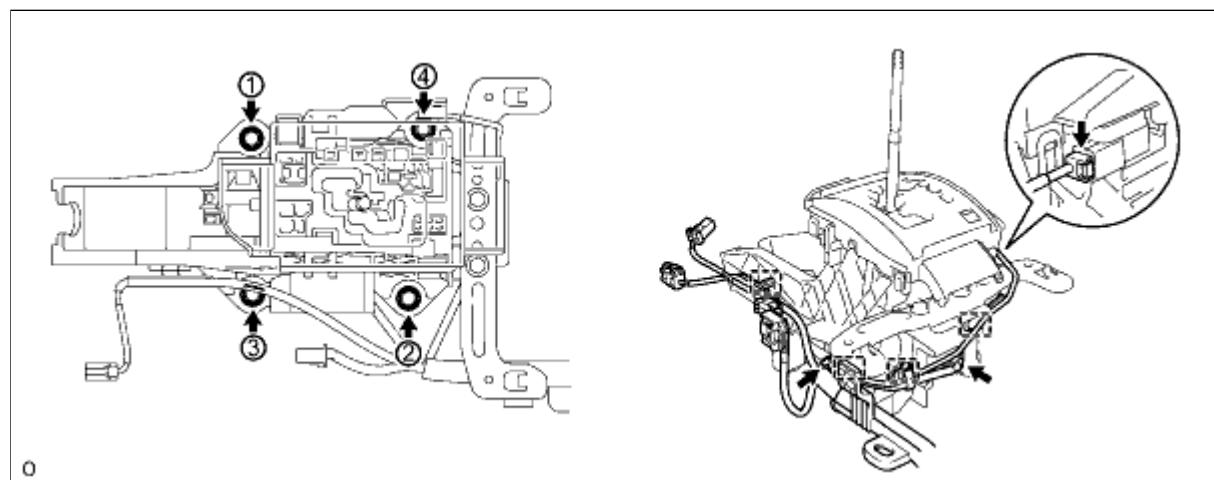
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBD01FX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL NO. 1 CONSOLE BOX MOUNTING BRACKET

(a) Install the console box mounting bracket with the 2 screws.

### 2. INSTALL SHIFT LEVER ASSEMBLY



(a) Install the transmission floor shift with the 4 bolts tighten the bolt in the order shown in the illustration.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

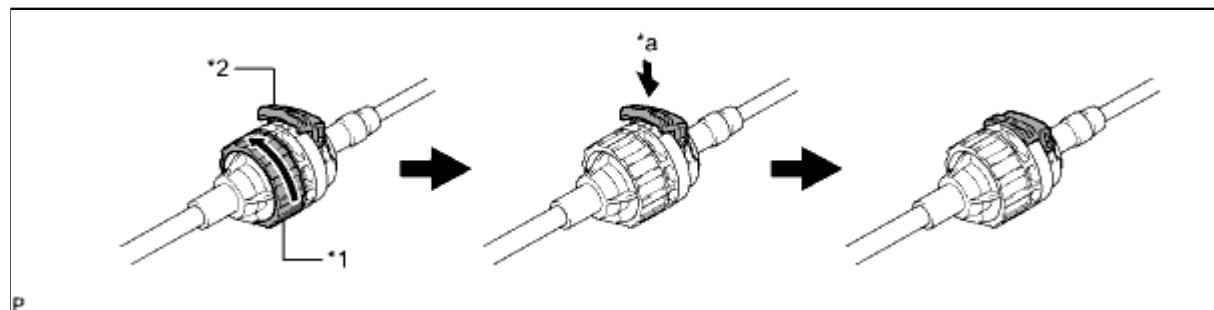
(b) Connect the 2 connectors and attach the 4 wire harness clamps.

### 3. CONNECT TRANSMISSION CONTROL CABLE ASSEMBLY

(a) Turn the socket of the transmission control cable 180° counterclockwise. While holding the socket in place, push in the lock piece until the lock piece clicks twice.

#### NOTICE:

**Do not over-rotate the socket as it will come off the internal spring and the transmission control cable will not be reusable.**



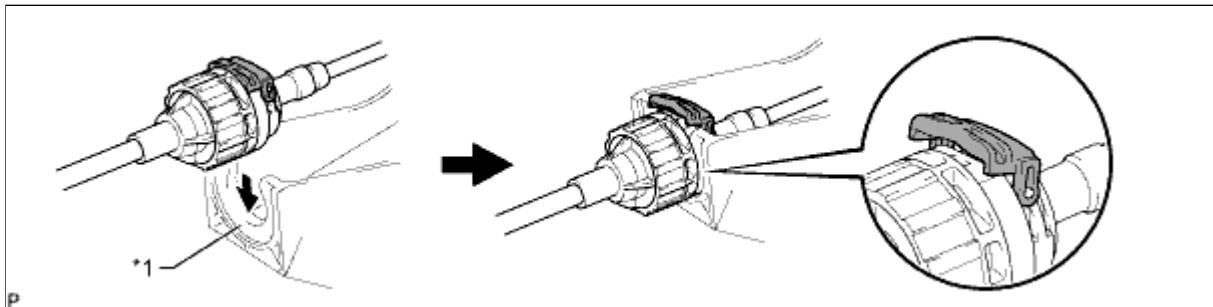
**Text in Illustration**

*1	Socket	*2	Lock Piece
*a	Push in	-	-

**HINT:**

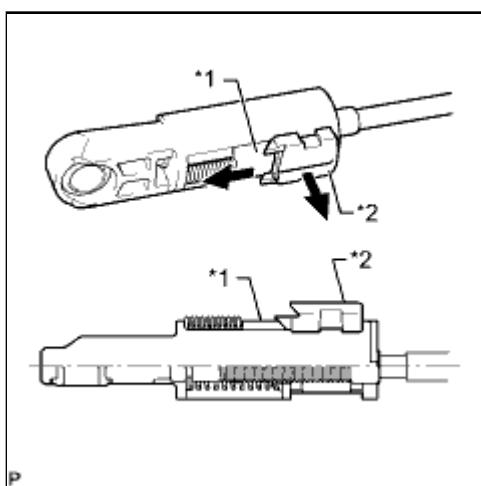
If the lock piece cannot be pushed in, slightly turn the socket clockwise and then push in the lock piece again.

- (b) Install the outer part of the transmission control cable to the shift lever retainer. Check that the socket and lock piece are positioned at original position.



**Text in Illustration**

*1	Shift Lever Retainer	-	-
----	----------------------	---	---



- (c) Slide the slider in the direction shown in the illustration and pull out the lock piece.

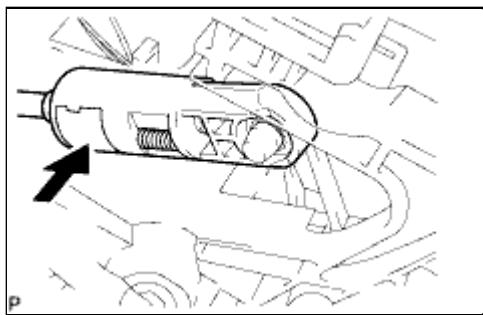
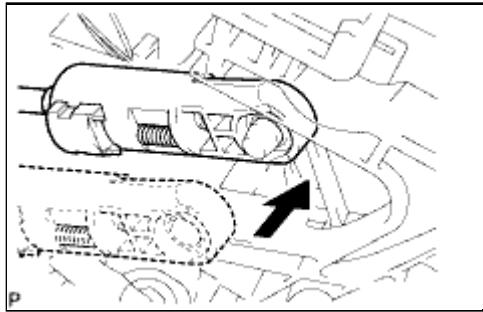
**Text in Illustration**

*1	Slider
*2	Lock Piece

- (d) Connect the end of the cable to the shift lever.

**NOTICE:**

- Make sure that the lock piece is pulled up.
- Push on the end of the cable all the way to the base of the pin.



(e) Push the lock piece into the adjuster case and lock it.

**NOTICE:**

**Make sure that the lock piece is completely locked by the slider.**

#### 4. INSPECT SHIFT LEVER POSITION INFO

#### 5. INSTALL REAR CONSOLE BOX ASSEMBLY

(a) Install the rear console box INFO.

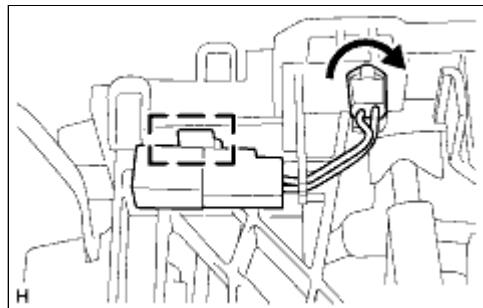


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002YBH01HX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SHIFT LEVER: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL SHIFT LOCK CONTROL ECU SUB-ASSEMBLY**

- (a) Attach the 3 claws to install the shift lock control ECU to the transmission floor shift.
- (b) Connect the shift lock solenoid connector to the shift lock control ECU.



### **2. INSTALL INDICATOR LIGHT WIRE SUB-ASSEMBLY**

- (a) Install the bulb and cap to the indicator light wire.
- (b) Align the wire with the key part of the position indicator housing, and install the wire. Then rotate the wire clockwise until it locks.
- (c) Attach the connector clamp to the position indicator housing.

### **3. INSTALL POSITION INDICATOR HOUSING ASSEMBLY**

- (a) Attach the 4 claws to install the position indicator housing to the transmission floor shift.

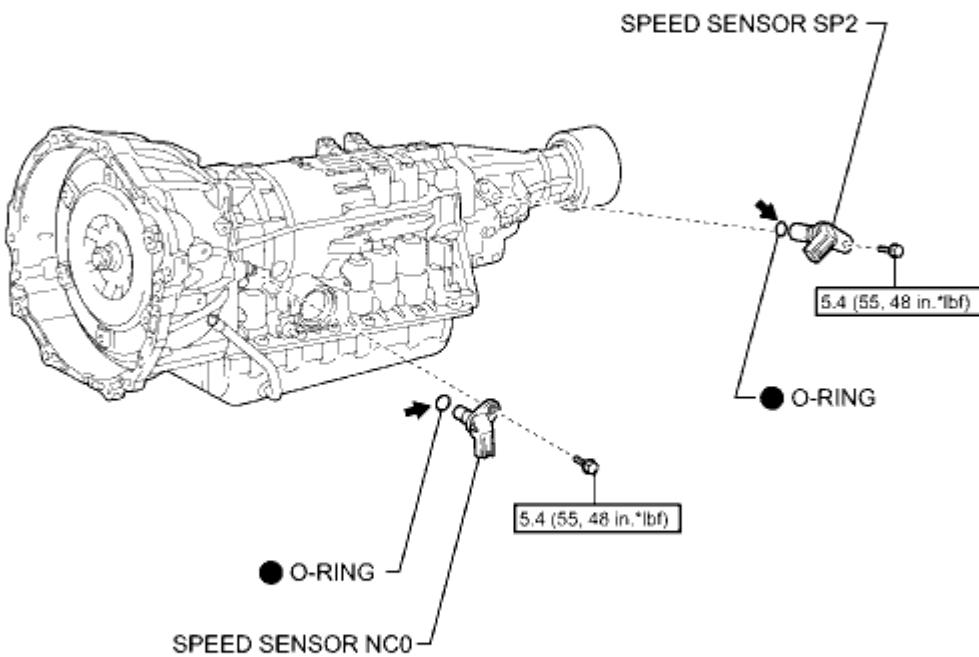
### **4. INSTALL SHIFT LEVER CAP**



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Model Year: 2010	Model: 4Runner	Doc ID: RM000003B2I007X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



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

● Non-reusable part

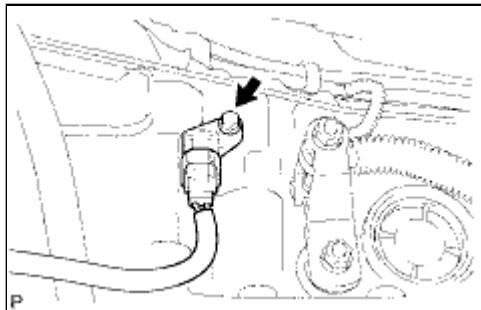
← Toyota Genuine ATF WS

P



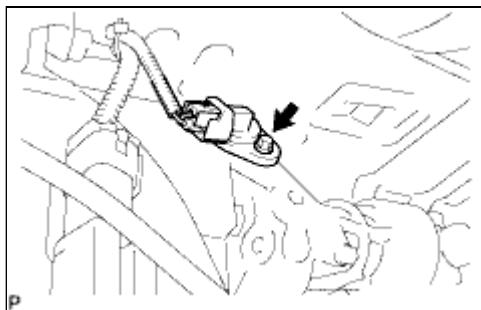
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N500QX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: REMOVAL (2010 4Runner)		

## REMOVAL



### **1. REMOVE SPEED SENSOR NC0**

- Disconnect the sensor connector.
- Remove the bolt and sensor.
- Remove the O-ring from the sensor.



### **2. REMOVE SPEED SENSOR SP2**

- Disconnect the sensor connector.
- Remove the bolt and sensor.
- Remove the O-ring from the sensor.



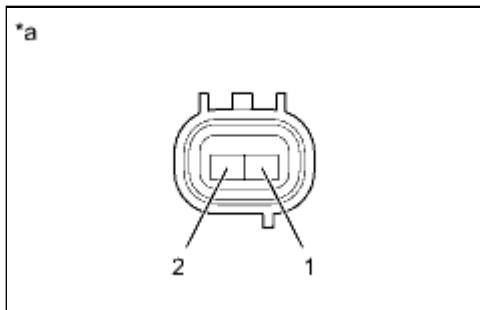
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N300QX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT SPEED SENSOR NC0 AND SP2**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

#### **Text in Illustration**

*a	Component without harness connected (Speed Sensor)
----	---

If the result is not as specified, replace the sensor.

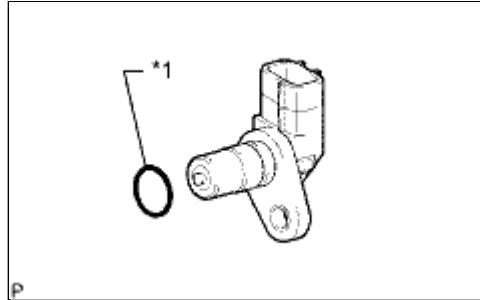


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FM00QX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSTALLATION (2010 4Runner)		

## **INSTALLATION**

### **1. INSTALL SPEED SENSOR NCO**

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



**Text in Illustration**

*1	New O-Ring
----	------------

(b) Install the sensor with the bolt.

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

(c) Connect the sensor connector.

### **2. INSTALL SPEED SENSOR SP2**

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

(b) Install the sensor with the bolt.

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

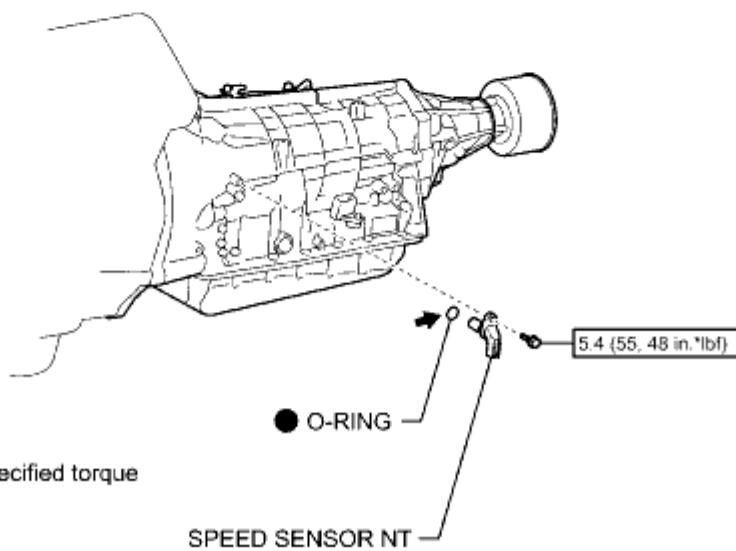
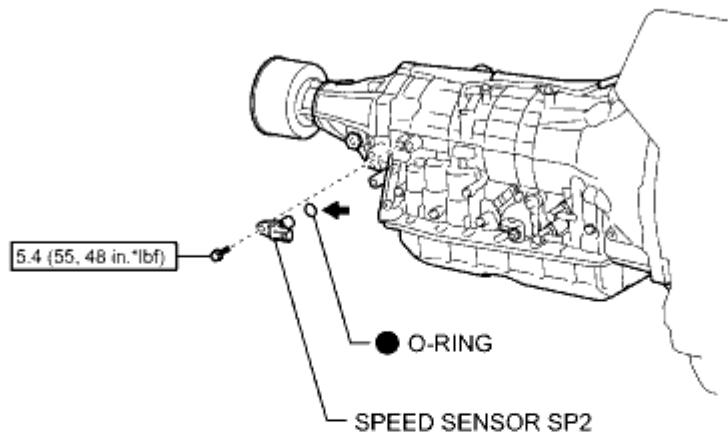
(c) Connect the sensor connector.



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<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BL301PX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



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

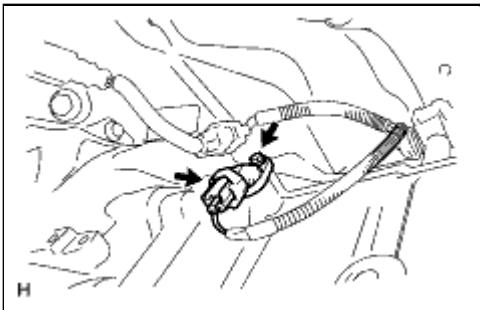
● Non-reusable part

← Toyota Genuine ATF WS

H

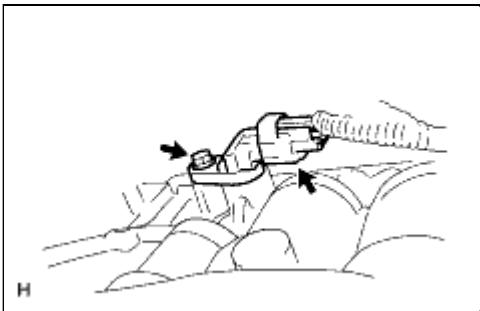
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BL401PX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: REMOVAL (2010 4Runner)		

## REMOVAL



### **1. REMOVE SPEED SENSOR NT**

- Disconnect the sensor connector.
- Remove the bolt and sensor.
- Remove the O-ring from the sensor.



### **2. REMOVE SPEED SENSOR SP2**

- Disconnect the sensor connector.
- Remove the bolt and sensor.
- Remove the O-ring from the sensor.



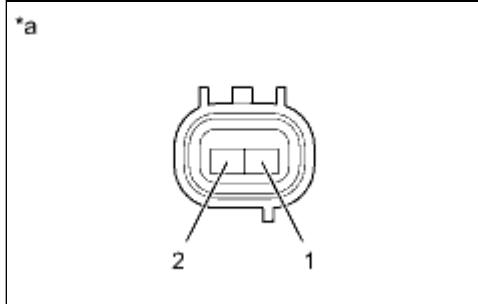
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BL201PX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT SPEED SENSOR NT AND SP2**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

#### **Text in Illustration**

*a	Component without harness connected (Speed Sensor)
----	---

If the result is not as specified, replace the sensor.



<b>Last Modified:</b> 5-10-2010	6.4 A	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BL101PX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSTALLATION (2010 4Runner)		

## **INSTALLATION**

### **1. INSTALL SPEED SENSOR SP2**

- (a) Coat a new O-ring with ATF and install it to the sensor.
- (b) Install the sensor with the bolt.

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

- (c) Connect the sensor connector.

### **2. INSTALL SPEED SENSOR NT**

- (a) Coat a new O-ring with ATF and install it to the sensor.
- (b) Install the sensor with the bolt.

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

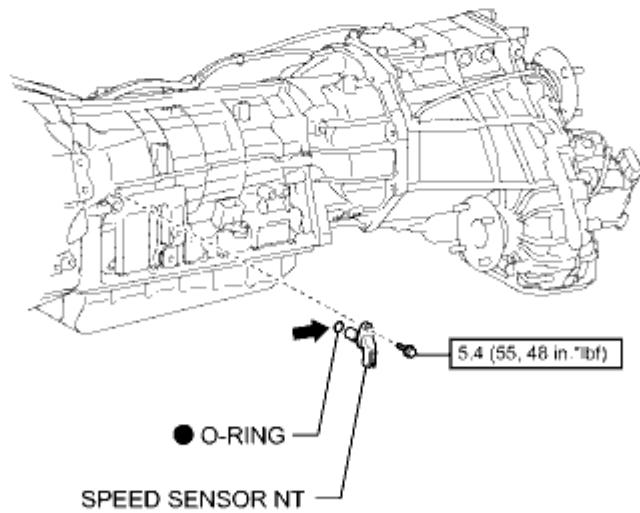
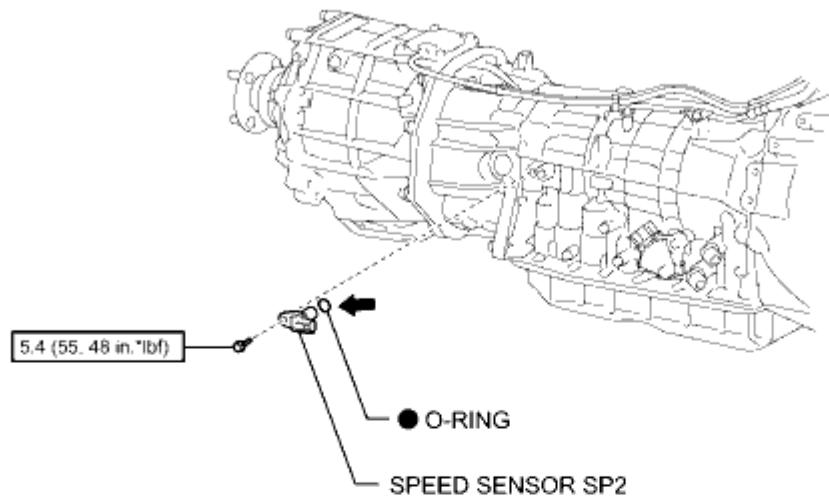
- (c) Connect the sensor connector.



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BL301QX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



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

● Non-reusable part

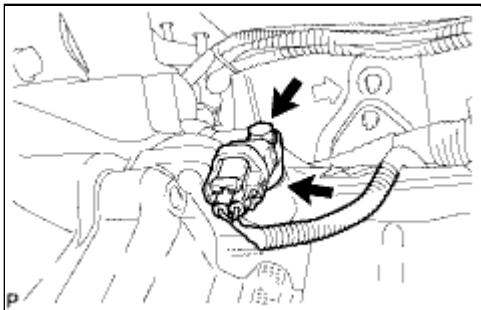
← Toyota Genuine ATF WS

P



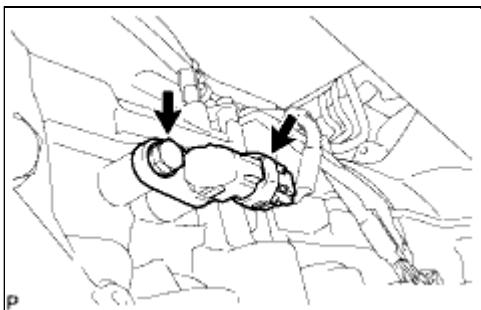
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BL401QX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: REMOVAL (2010 4Runner)		

## REMOVAL



### 1. REMOVE SPEED SENSOR NT

- (a) Disconnect the sensor connector.
- (b) Remove the bolt and sensor.
- (c) Remove the O-ring from the sensor.



### 2. REMOVE SPEED SENSOR SP2

- (a) Disconnect the sensor connector.
- (b) Remove the bolt and sensor.
- (c) Remove the O-ring from the sensor.



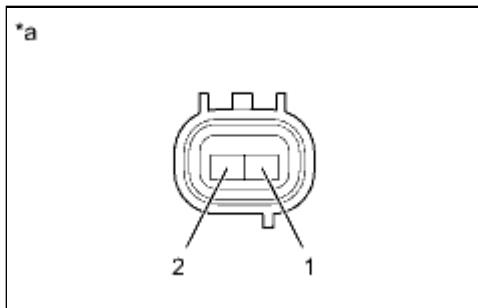
Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002BL201QX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT SPEED SENSOR NT AND SP2**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	560 to 680 Ω

#### **Text in Illustration**

*a	Component without harness connected (Speed Sensor)
----	---

If the result is not as specified, replace the sensor.



<b>Last Modified:</b> 5-10-2010	6.4 A	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BL101QX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: SPEED SENSOR: INSTALLATION (2010 4Runner)		

## **INSTALLATION**

### **1. INSTALL SPEED SENSOR SP2**

- (a) Coat a new O-ring with ATF and install it to the sensor.
- (b) Install the sensor with the bolt.

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

- (c) Connect the sensor connector.

### **2. INSTALL SPEED SENSOR NT**

- (a) Coat a new O-ring with ATF and install it to the sensor.
- (b) Install the sensor with the bolt.

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

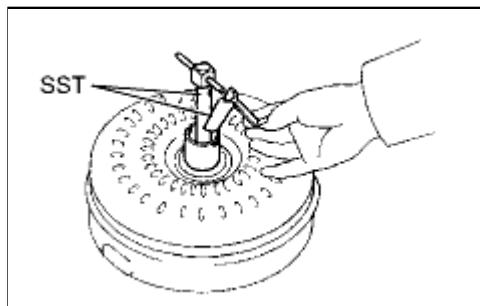
- (c) Connect the sensor connector.



<b>Last Modified:</b> 5-10-2010	6.4 G	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM0000010NN000X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TORQUE CONVERTER CLUTCH AND DRIVE PLATE: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY**



(a) Inspect the 1-way clutch.

(1) Install SST to the inner race of the 1-way clutch.

**SST: 09350-32014**

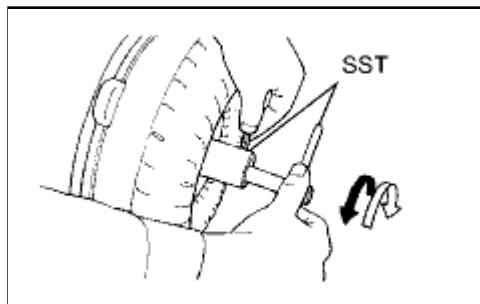
09351-32010

(2) Set SST so that it fits in the notch of the converter hub and in the outer race of the 1-way clutch.

**SST: 09350-32014**

09351-32020

(3) With the torque converter standing on its side, check that the clutch locks when SST is turned counterclockwise and rotates freely and smoothly when SST is turned clockwise.



**Text in Illustration**

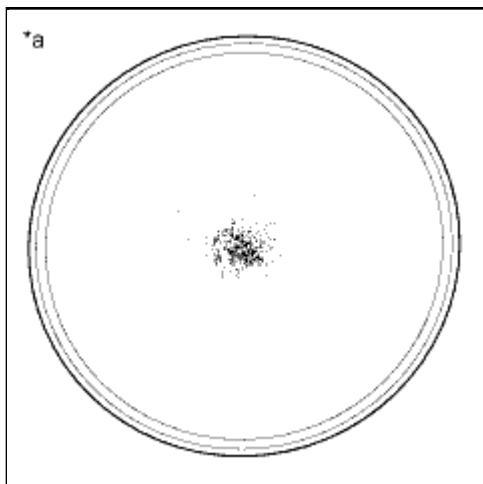
	Lock
	Free

If the results are not as specified, clean the converter and recheck the 1-way clutch.

If the results still are not as specified even after cleaning the converter, replace the converter.

(b) Determine the condition of the torque converter clutch.

## Text in Illustration



*a	Sample showing maximum allowable amount of powder in ATF
----	--

(1) Check that the following conditions are met:

- During the stall test or when the shift lever is in N, metallic sounds are not emitted from the torque converter clutch.
- The 1-way clutch turns in one direction and locks in the other direction.
- The amount of powder in the ATF is not more than the sample shown in the illustration.

If the results are not as specified, replace the torque converter clutch assembly.

**HINT:**

**The sample illustration shows approximately 0.025 liters (0.026 US qts, 0.022 Imp. qts) of ATF taken from a removed torque converter clutch.**

(c) Replace the ATF in the torque converter clutch.

- (1) If the ATF is discolored and/or has a foul odor, stir the ATF in the torque converter clutch thoroughly and drain the ATF with the torque converter facing upward.

(d) Clean and check the oil cooler and oil pipe line.

- (1) If the torque converter clutch is inspected or the ATF is replaced, clean the oil cooler and oil pipe line.

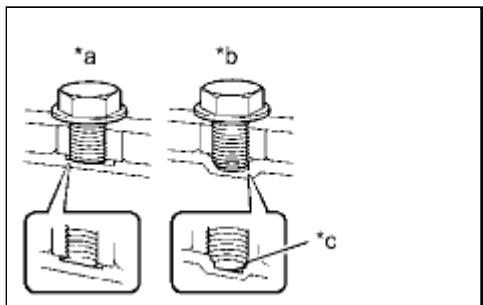
**HINT:**

- Apply compressed air at 196 kPa (2 kgf/cm<sup>2</sup>, 28 psi) into the inlet hose.
- If a large amount of powder is found in the ATF, add new ATF using a bucket pump and clean the oil cooler and oil pipe line again.

- (2) If the ATF is cloudy, inspect the oil cooler (radiator).

- (e) Prevent deformation of the torque converter clutch and damage to the oil pump gear.

## Text in Illustration

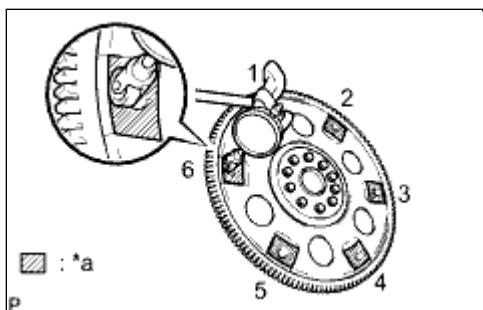


*a	CORRECT
*b	INCORRECT
*c	Bottom is damaged

- (1) When any marks due to interference are found on the end of a bolt for the torque converter clutch and on the bottom of the bolt hole, replace the bolt and torque converter clutch.
- (2) Make sure all of the bolts are the same length.
- (3) Make sure no spring washers are missing.

## 2. INSPECT DRIVE PLATE

(a) Check the drive plate for damage.



(b) Set up a dial indicator and measure the runout of the 6 portions around the torque converter clutch contact surfaces.

Maximum runout:  
0.30 mm (0.0118 in.)

### Text in Illustration

* a	Measuring point
-----	-----------------

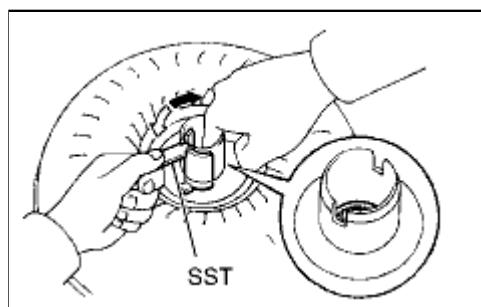
If the runout is more than the maximum or the drive plate is damaged, replace the drive plate .



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013F2025X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TORQUE CONVERTER CLUTCH AND DRIVE PLATE: INSPECTION (2010 4Runner)		

## INSPECTION

### 1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY



(a) Inspect the 1-way clutch.

(1) Install SST to the inner race of the 1-way clutch.

**SST: 09350-32014**

09351-32020

(2) Press on the serrations of the starter with a finger and rotate it.

Check if it rotates smoothly when turned clockwise and locks when turned counterclockwise.

#### Text in Illustration

	Free
	Lock

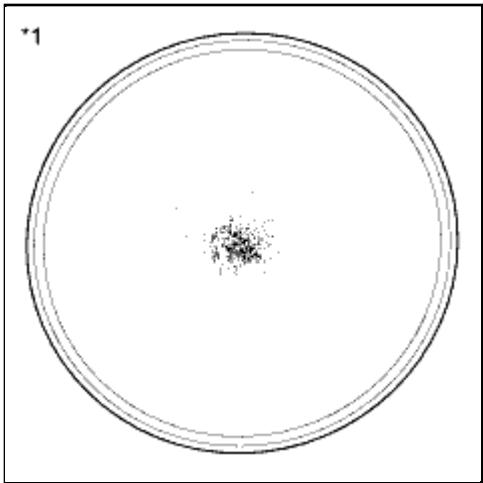
If the results are not as specified, clean the converter and recheck the 1-way clutch. If the results still are not as specified, replace the torque converter clutch assembly.

(b) Determine the condition of the torque converter clutch.

#### Text in Illustration

*1	Sample showing maximum allowable amount of powder in ATF
----	--

(1) Check that the following conditions are met:



- During the stall test or when the shift lever is in N, metallic sounds are not emitted from the torque converter clutch.
- The 1-way clutch turns in one direction and locks in the other direction.
- The amount of powder in the ATF is not more than the sample shown in the illustration.

If the results are not as specified, replace the torque converter clutch assembly.

**HINT:**

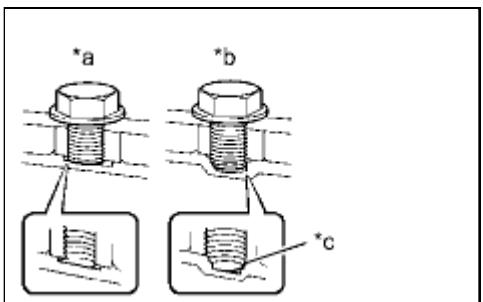
**The sample illustration shows approximately 0.025 liters (0.026 US qts, 0.022 Imp. qts) of ATF taken from a removed torque converter clutch.**

(c) Replace the ATF in the torque converter clutch.

(1) AT If the ATF is discolored and/or has a foul odor, stir the ATF in the torque converter clutch thoroughly and drain the ATF with the torque converter facing upward.

(d) Prevent deformation of the torque converter clutch and damage to the oil pump gear.

### Text in Illustration



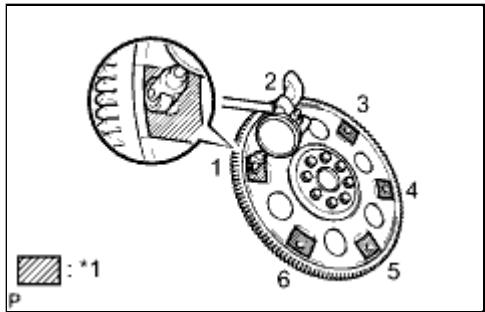
*a	Correct
*b	Incorrect
*c	Bottom is damaged

- (1) When any marks due to interference are found on the end of the bolt for the torque converter clutch and on the bottom of the bolt hole, replace the bolt and torque converter clutch.
- (2) All of the bolts should be the same length.
- (3) Make sure no spring washers are missing.

## 2. INSPECT DRIVE PLATE

(a) Check the drive plate for damage.

(b) Set up a dial indicator and measure the runout of the 6 portions around the torque converter clutch contact surfaces.



Maximum runout:  
0.30 mm (0.0118 in.)

## Text in Illustration

\*a Measuring Point

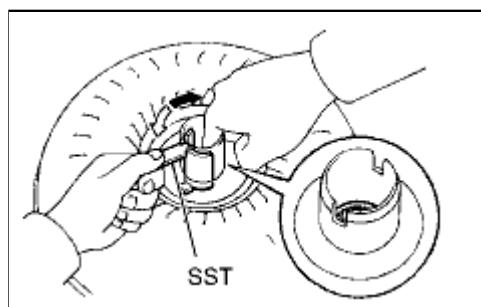
If the runout is more than the maximum, or the drive plate  
is damaged, replace the drive plate **INFO**.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013F2028X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TORQUE CONVERTER CLUTCH AND DRIVE PLATE: INSPECTION (2010 4Runner)		

## **INSPECTION**

### **1. INSPECT TORQUE CONVERTER CLUTCH ASSEMBLY**



(a) Inspect the 1-way clutch.

(1) Install SST to the inner race of the 1-way clutch.

**SST: 09350-32014**

09351-32010

09351-32010

(2) Press on the serrations of the starter with a finger and rotate it.

Check if it rotates smoothly when turned clockwise and locks when turned counterclockwise.

#### **Text in Illustration**

	Free
	Lock

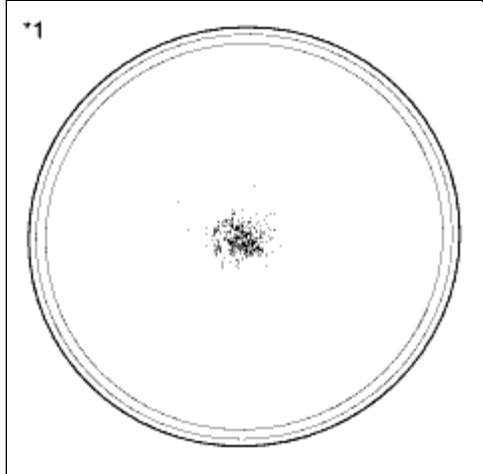
If the results are not as specified, clean the converter and recheck the 1-way clutch. If the results still are not as specified, replace the torque converter clutch assembly.

(b) Determine the condition of the torque converter clutch.

#### **Text in Illustration**

* 1	Sample showing maximum allowable amount of powder in ATF
-----	--

(1) Check that the following conditions are met:



- During the stall test or when the shift lever is in N, metallic sounds are not emitted from the torque converter clutch.
- The 1-way clutch turns in one direction and locks in the other direction.
- The amount of powder in the ATF is not more than the sample shown in the illustration.

If the results are not as specified, replace the torque converter clutch assembly.

**HINT:**

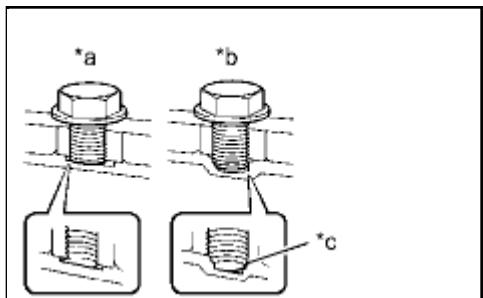
**The sample illustration shows approximately 0.025 liters (0.026 US qts, 0.022 Imp. qts) of ATF taken from a removed torque converter clutch.**

(c) Replace the ATF in the torque converter clutch.

(1) AT If the ATF is discolored and/or has a foul odor, stir the ATF in the torque converter clutch thoroughly and drain the ATF with the torque converter facing upward.

(d) Prevent deformation of the torque converter clutch and damage to the oil pump gear.

### Text in Illustration



*a	Correct
*b	Incorrect
*c	Bottom is damaged

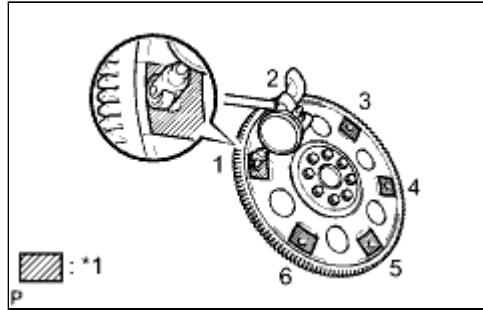
- (1) When any marks due to interference are found on the end of the bolt for the torque converter clutch and on the bottom of the bolt hole, replace the bolt and torque converter clutch.
- (2) All of the bolts should be the same length.
- (3) Make sure no spring washers are missing.

## 2. INSPECT DRIVE PLATE

(a) Check the drive plate for damage.

(b) Set up a dial indicator and measure the runout of the 6 portions around the torque converter clutch contact

surfaces.



## Text in Illustration

\*a Measuring Point

Maximum runout:  
0.30 mm (0.0118 in.)

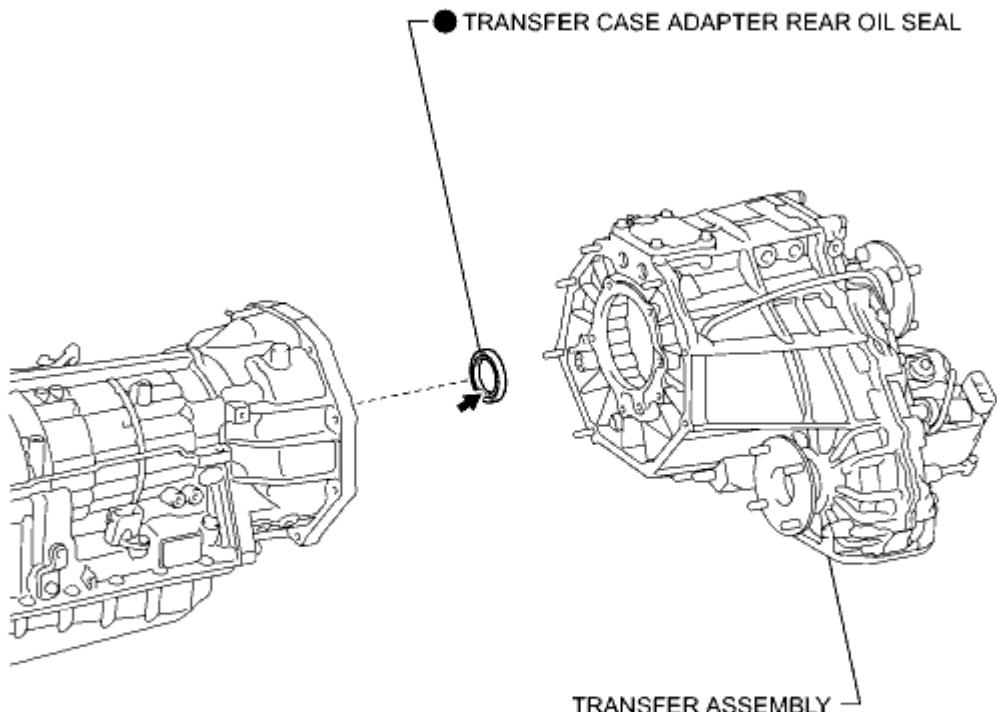
If the runout is more than the maximum, or the drive plate  
is damaged, replace the drive plate **INFO**.



Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000048DT000X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSFER ADAPTOR OIL SEAL: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



● Non-reusable part

← Toyota Genuine ATF WS

O



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000048DS000X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSFER ADAPTOR OIL SEAL: REPLACEMENT (2010 4Runner)		

## REPLACEMENT

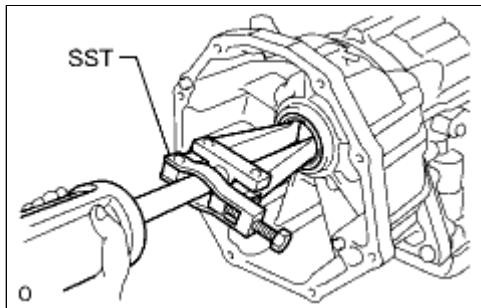
### 1. REMOVE TRANSFER ASSEMBLY

(a) for VF2A :

Remove the transfer .

(b) for VF4BM :

Remove the transfer .



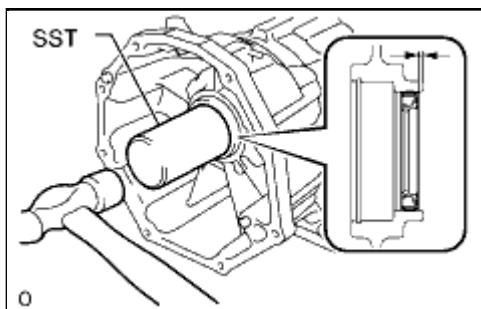
### 2. REMOVE TRANSFER CASE ADAPTER REAR OIL SEAL

(a) Using SST, tap out the oil seal.

**SST: 09308-00010**

### 3. INSTALL TRANSFER CASE ADAPTER REAR OIL SEAL

(a) Coat the lip of a new oil seal with ATF.



(b) Using SST and a hammer, tap in the oil seal.

**SST: 09223-00010**

Standard depth:

0 to 0.5 mm (0 to 0.0197 in.)

### 4. INSTALL TRANSFER ASSEMBLY

(a) for VF2A :

Install the transfer .

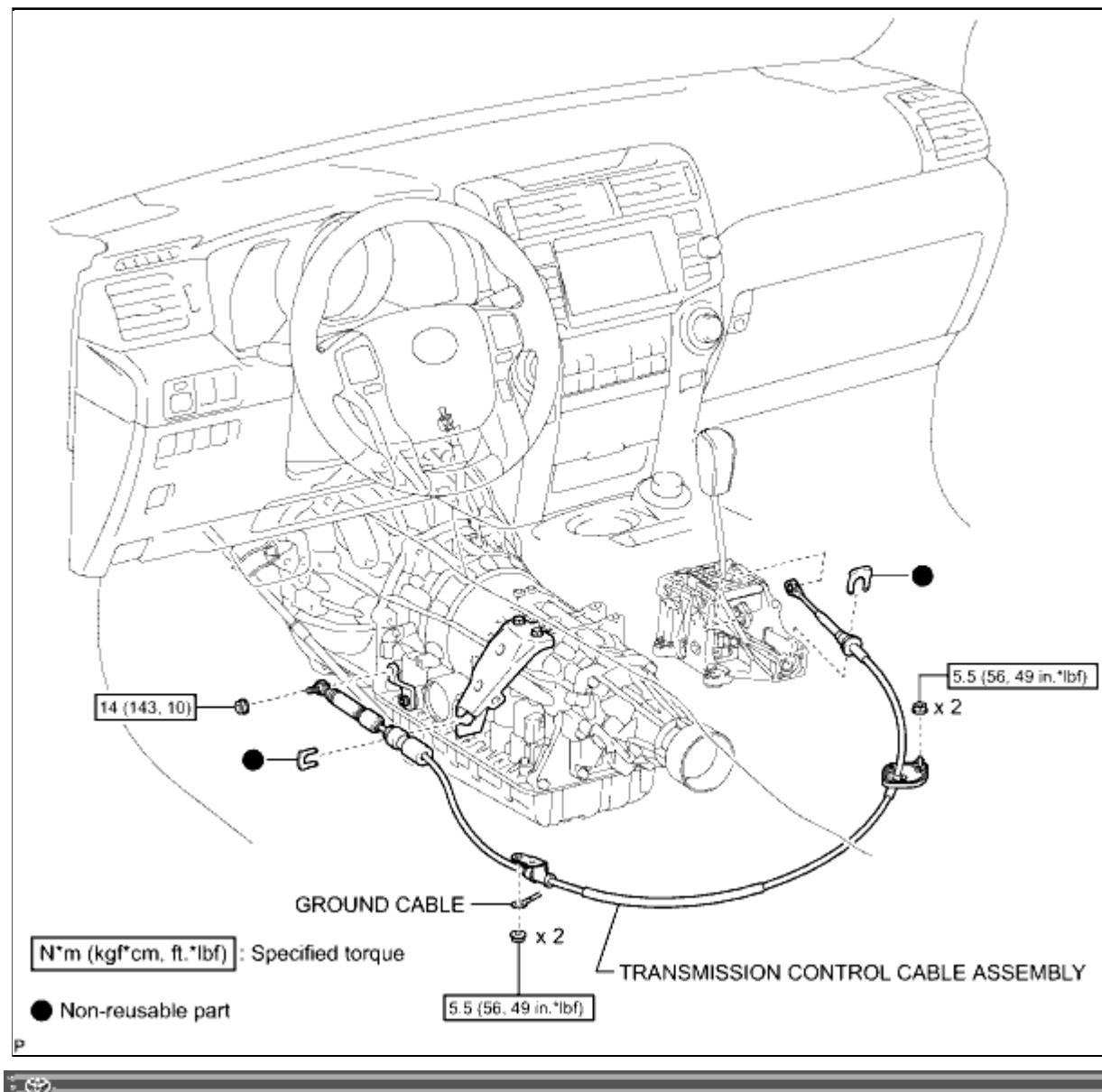
(b) for VF4BM :

Install the transfer .

Last Modified: 5-10-2010	6.4 K	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002ZLL017X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: COMPONENTS (2010 4Runner)		

## COMPONENTS

## ILLUSTRATION



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002ZLM018X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: REMOVAL (2010 4Runner)		

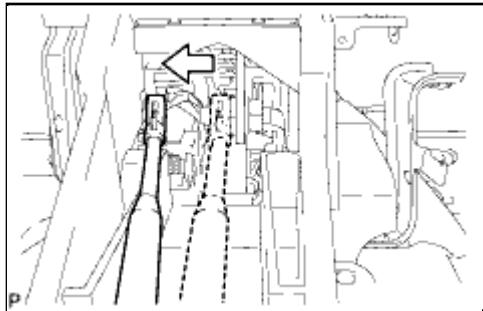
## **REMOVAL**

### **1. REMOVE REAR CONSOLE BOX ASSEMBLY**

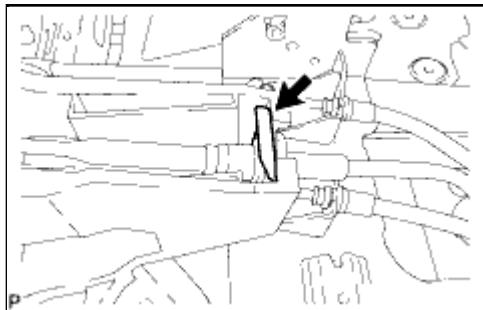
(a) Remove the rear console box  .

### **2. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY**

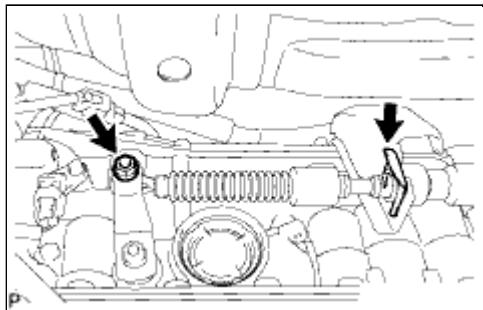
(a) Move the shift lever to N.



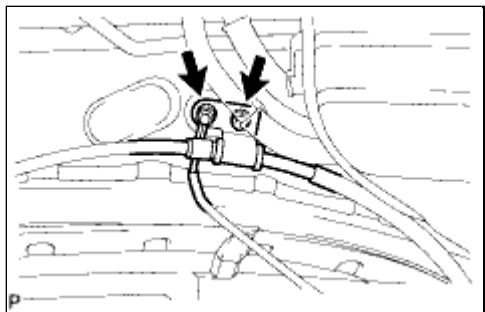
(b) Disconnect the transmission control cable end from the shift lever.



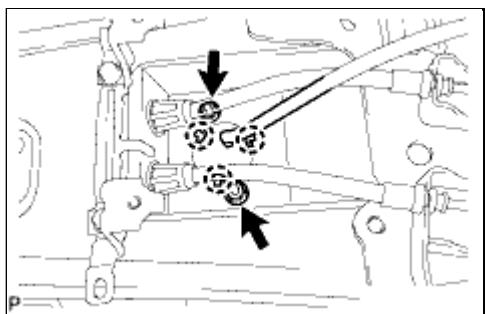
(c) Remove the clip and disconnect the transmission control cable from the shift lever retainer.



(d) Remove the nut and clip and disconnect the transmission control cable from the automatic transmission.



(e) Remove the 2 nuts and disconnect the ground cable and transmission control cable support.



(f) Remove the 2 nuts, detach the 3 claws, and then pull out the transmission control cable.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000002ZLK019X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: INSTALLATION (2010 4Runner)		

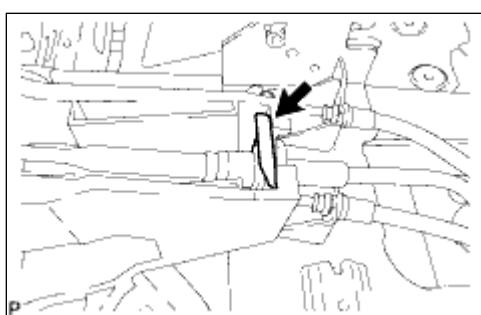
## INSTALLATION

### 1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

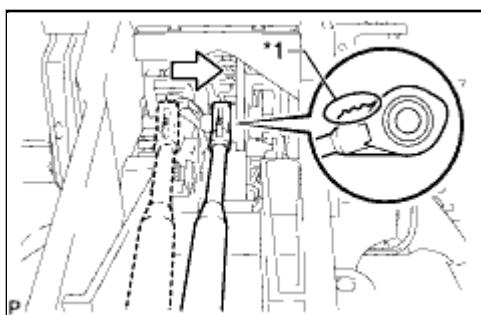
(a) Insert the transmission control cable from outside the vehicle and attach the 3 claws of the cable retainer.

(b) Install the 2 nuts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**



(c) Connect the transmission control cable to the shift lever retainer and install a new clip.



**Text in Illustration**

*1	Ridge
----	-------

**NOTICE:**

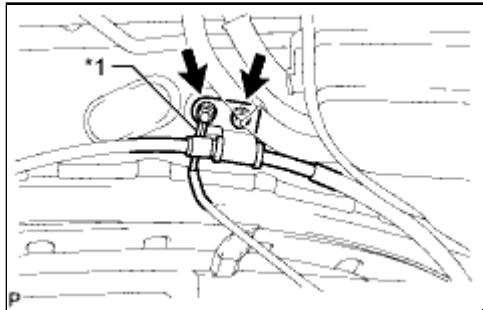
Make sure to connect the cable end so that the inner cable is not twisted. Confirm that the ridged side of the cable end is facing upward.

(e) Move the shift lever to N.

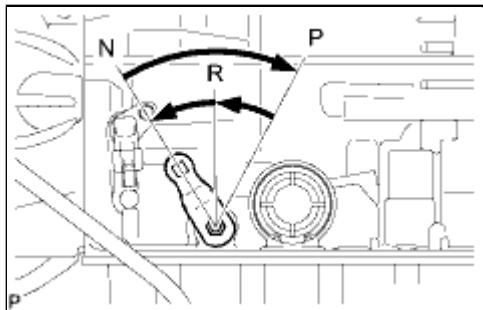
(f) Connect the transmission control cable support and ground cable with the 2 nuts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

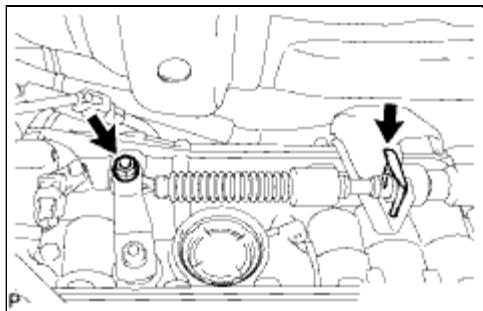
**Text in Illustration**



\*1 Ground Cable



(g) Turn the control shaft lever clockwise until it stops, and then turn it counterclockwise 2 notches to set it to the N position.



(h) Connect the transmission control cable to the transmission control cable bracket with a new clip, and then connect the cable end to the control shaft lever with the nut.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

## 2. ADJUST SHIFT LEVER POSITION INFO

## 3. INSPECT SHIFT LEVER POSITION INFO

## 4. INSTALL REAR CONSOLE BOX ASSEMBLY

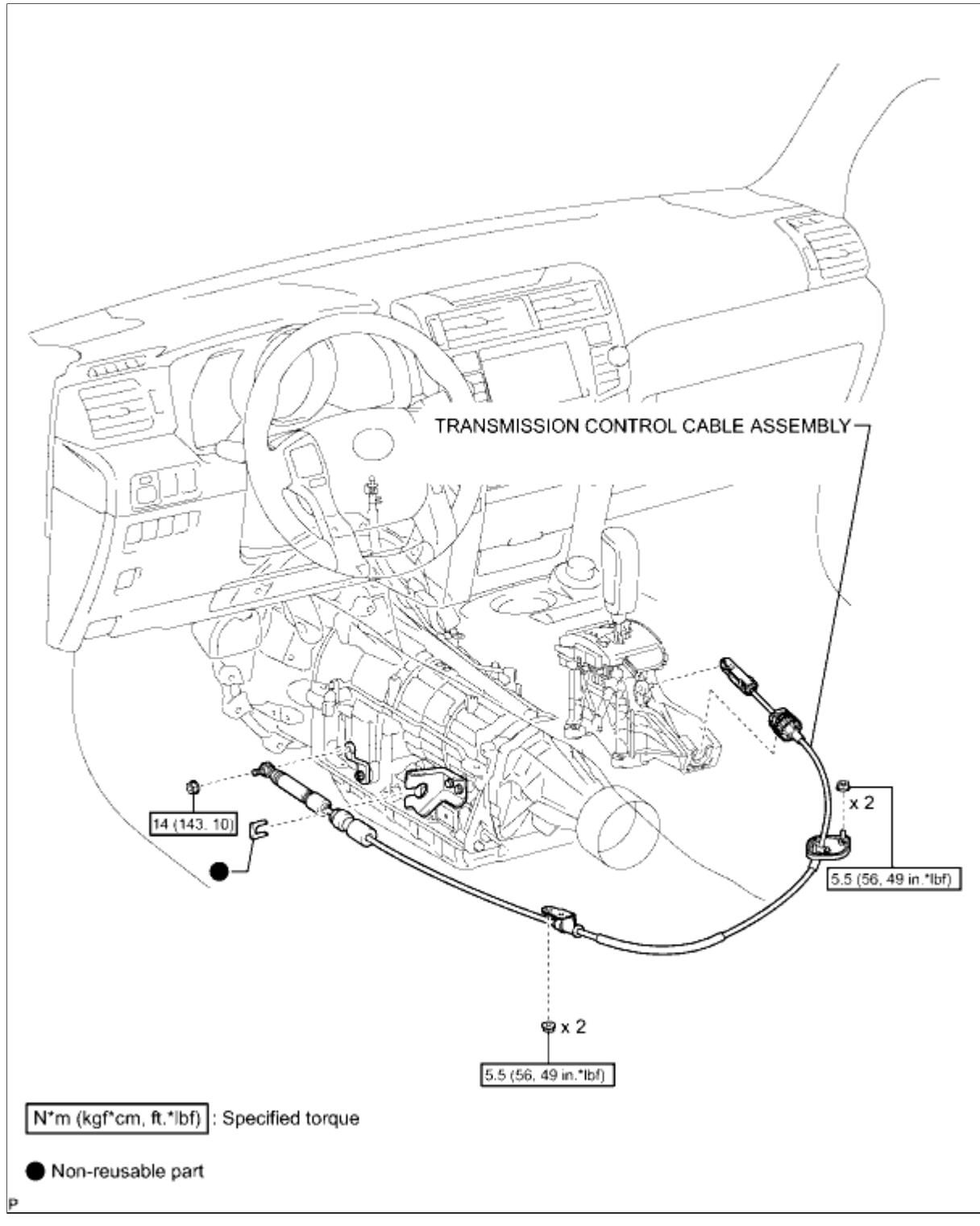
(a) Install the rear console box INFO.



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM00000454T002X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454S002X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Insert the transmission control cable from the vehicle outside, and attach the 3 claws of the cable retainer.

- (b) Install the 2 nuts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

- (c) Connect the transmission control cable to the transmission control cable bracket with a new clip, and connect the cable end to the control shaft lever with the nut.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

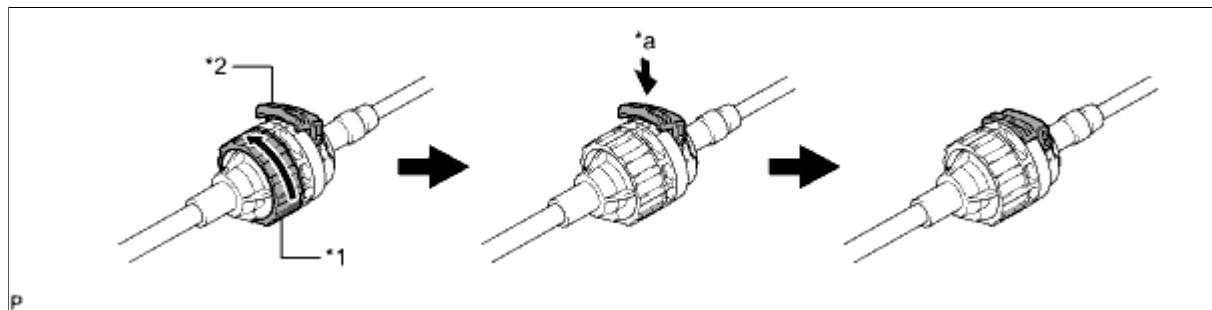
- (d) Connect the transmission control cable support with the 2 nuts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

- (e) Turn the socket of the transmission control cable 180° counterclockwise. While holding the socket in place, push in the lock piece until the lock piece clicks twice.

#### NOTICE:

**Do not over-rotate the socket as it will come off the internal spring and the transmission control cable will not be reusable.**



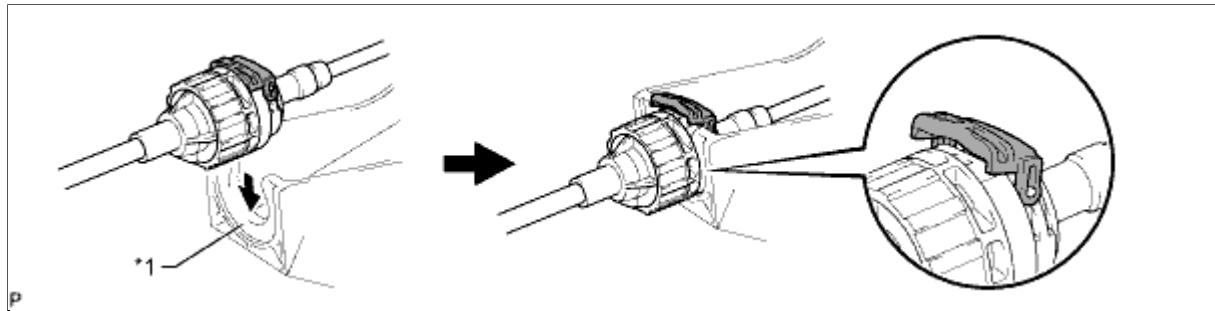
#### Text in Illustration

*1	Socket	*2	Lock Piece
*a	Push in	-	-

#### HINT:

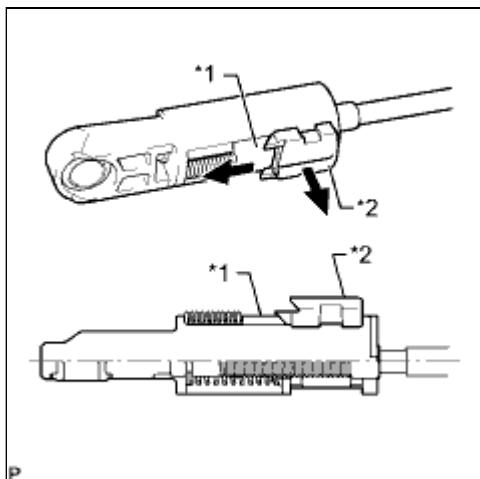
**If the lock piece cannot be pushed in, slightly turn the socket clockwise and then push in the lock piece again.**

- (f) Install the outer part of the transmission control cable to the shift lever retainer. Check that the socket and lock piece are positioned at original position.



### Text in Illustration

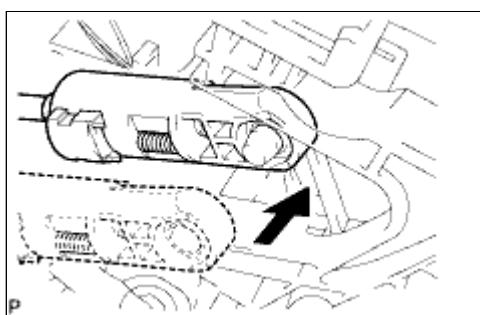
* 1	Shift Lever Retainer	-	-
-----	----------------------	---	---



(g) Slide the slider in the direction shown in the illustration and pull out the lock piece.

### Text in Illustration

* 1	Slider
* 2	Lock Piece



(h) Connect the end of the cable to the shift lever.

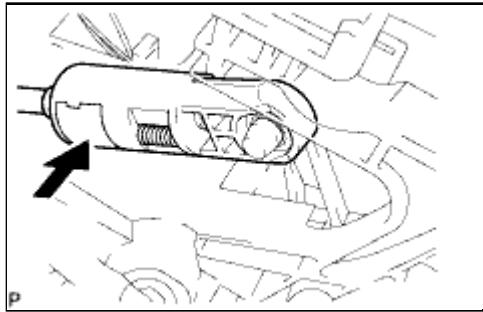
**NOTICE:**

- Make sure that the lock piece is pulled up.
- Push on the end of the cable all the way to the base of the pin.

(i) Push the lock piece into the adjuster case and lock it.

**NOTICE:**

Make sure that the lock piece is completely locked by the slider.



## 2. INSTALL REAR CONSOLE BOX ASSEMBLY

(a) Install the console box INFO.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454U002X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: REMOVAL (2010 4Runner)		

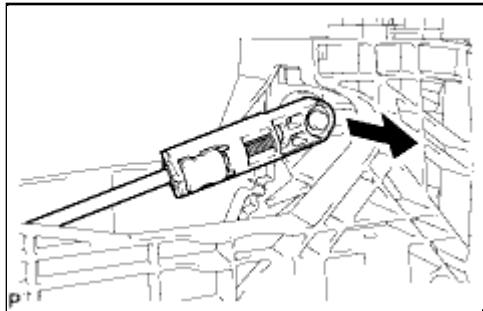
## **REMOVAL**

### **1. REMOVE CONSOLE BOX ASSEMBLY**

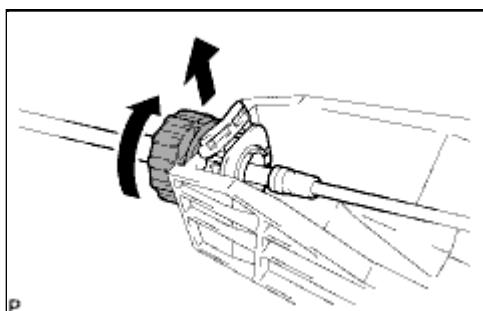
(a) Remove the console box assembly .

### **2. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY**

(a) Move the shift lever to N.



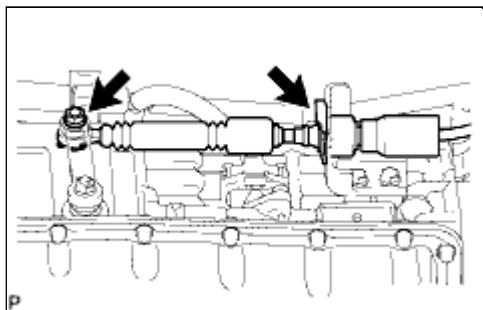
(b) Disconnect the transmission control cable end from the shift lever.



(c) Rotate the socket counterclockwise approximately 180° and, while holding the nut in that position, disconnect the transmission control cable from the shift lever retainer.

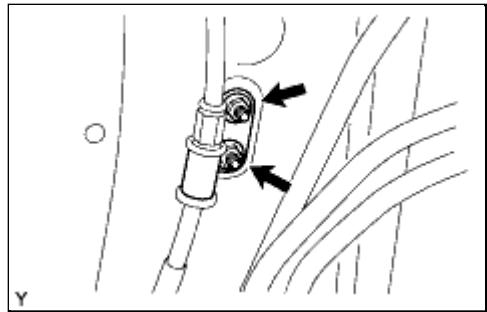
**NOTICE:**

**Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.**

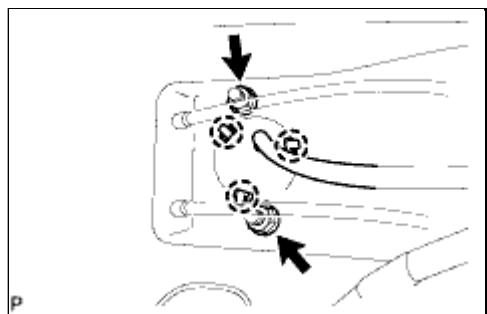


(d) Remove the nut and clip, and disconnect the transmission control cable assembly from the automatic transmission.

(e) Disconnect the end of the transmission control cable from the shift lever assembly.



(f) Remove the 2 nuts and disconnect the transmission control cable support.



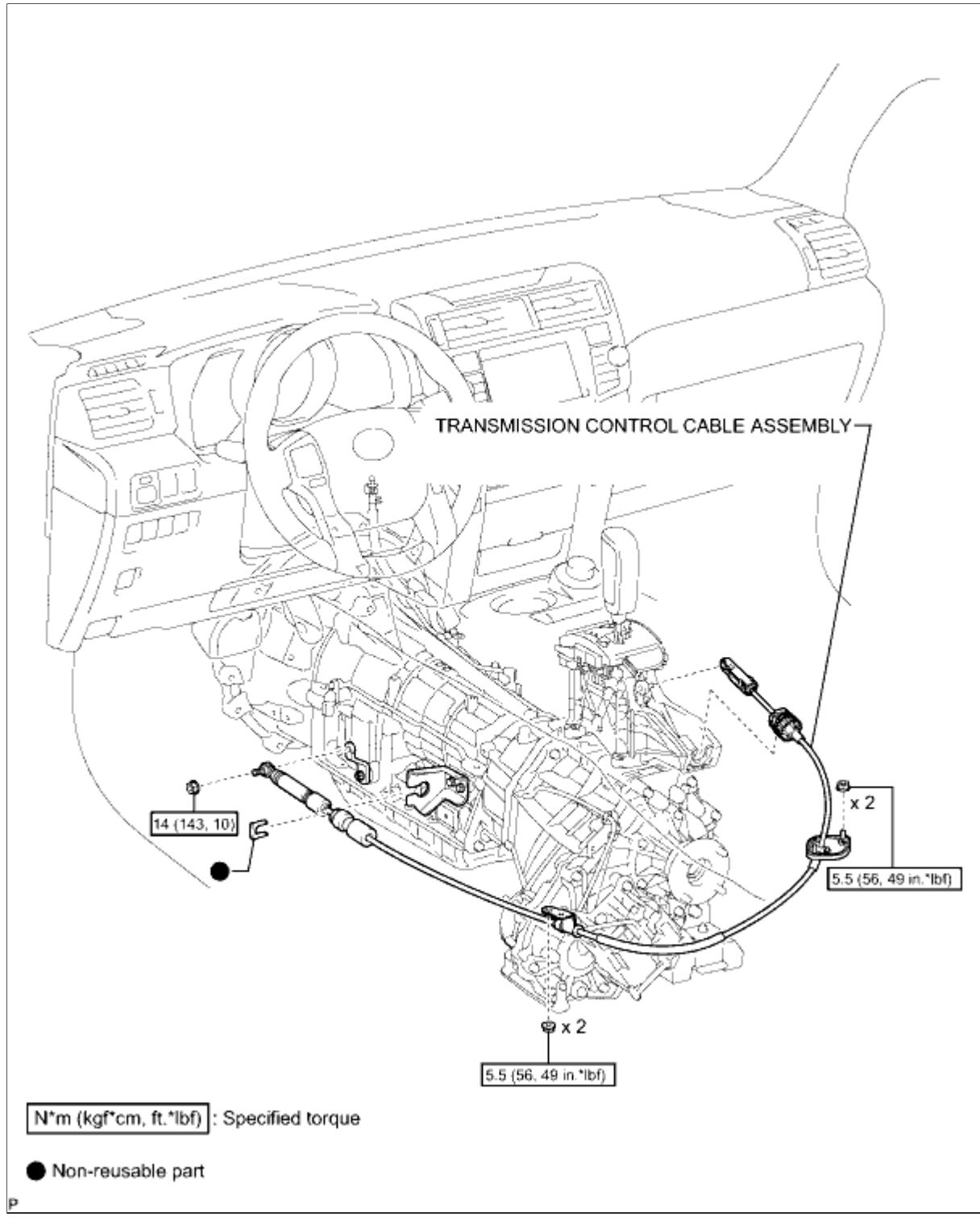
(g) Remove the 2 nuts and detach the 3 claws, and then pull out the transmission control cable.



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM00000454T001X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454U001X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: REMOVAL (2010 4Runner)		

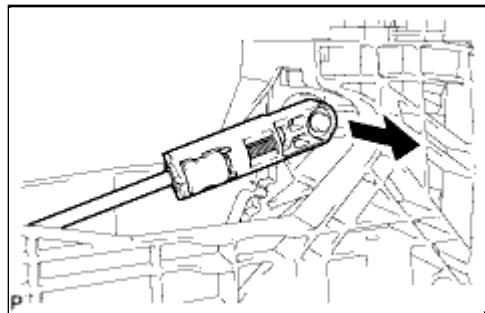
## **REMOVAL**

### **1. REMOVE CONSOLE BOX ASSEMBLY**

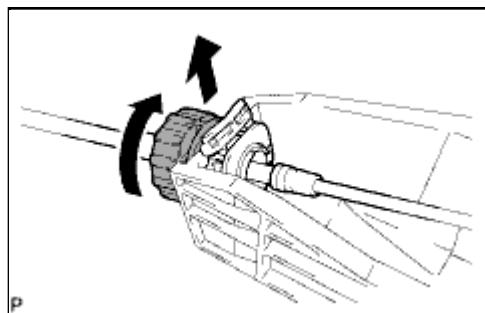
(a) Remove the console box assembly .

### **2. REMOVE TRANSMISSION CONTROL CABLE ASSEMBLY**

(a) Move the shift lever to N.



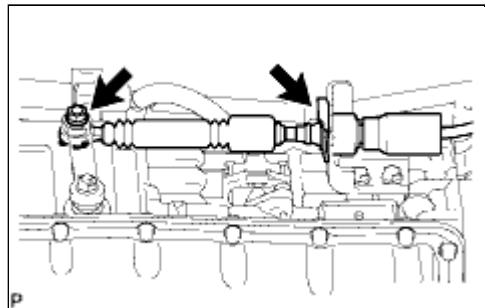
(b) Disconnect the transmission control cable end from the shift lever.



(c) Rotate the socket counterclockwise approximately 180° and, while holding the nut in that position, disconnect the transmission control cable from the shift lever retainer.

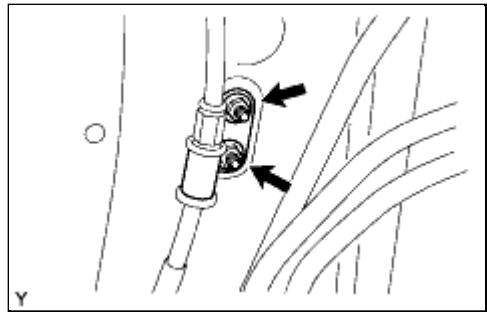
**NOTICE:**

**Do not over-rotate the nut as it will come off the internal spring and the transmission control cable will not be reusable.**

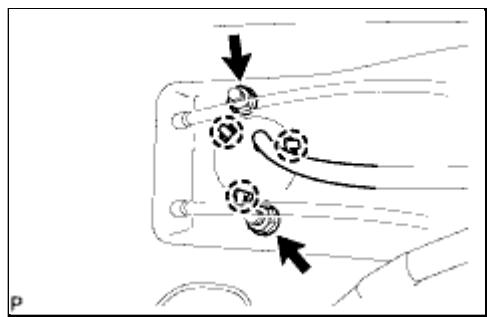


(d) Remove the nut and clip, and disconnect the transmission control cable assembly from the automatic transmission.

(e) Disconnect the end of the transmission control cable from the shift lever assembly.



(f) Remove the 2 nuts and disconnect the transmission control cable support.



(g) Remove the 2 nuts and detach the 3 claws, and then pull out the transmission control cable.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454S001X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION CONTROL CABLE: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TRANSMISSION CONTROL CABLE ASSEMBLY

- (a) Insert the transmission control cable from the vehicle outside, and attach the 3 claws of the cable retainer.

- (b) Install the 2 nuts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

- (c) Connect the transmission control cable to the transmission control cable bracket with a new clip, and connect the cable end to the control shaft lever with the nut.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

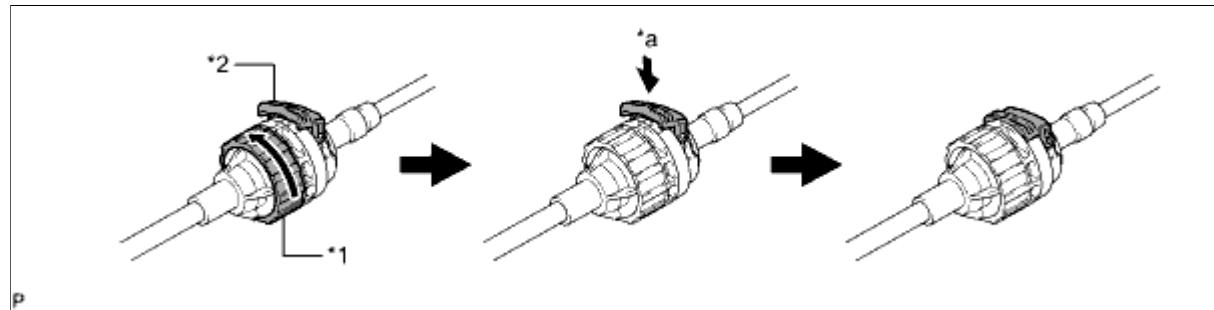
- (d) Connect the transmission control cable support with the 2 nuts.

**Torque: 5.5 N·m (56 kgf·cm, 49in·lbf)**

- (e) Turn the socket of the transmission control cable 180° counterclockwise. While holding the socket in place, push in the lock piece until the lock piece clicks twice.

#### NOTICE:

**Do not over-rotate the socket as it will come off the internal spring and the transmission control cable will not be reusable.**



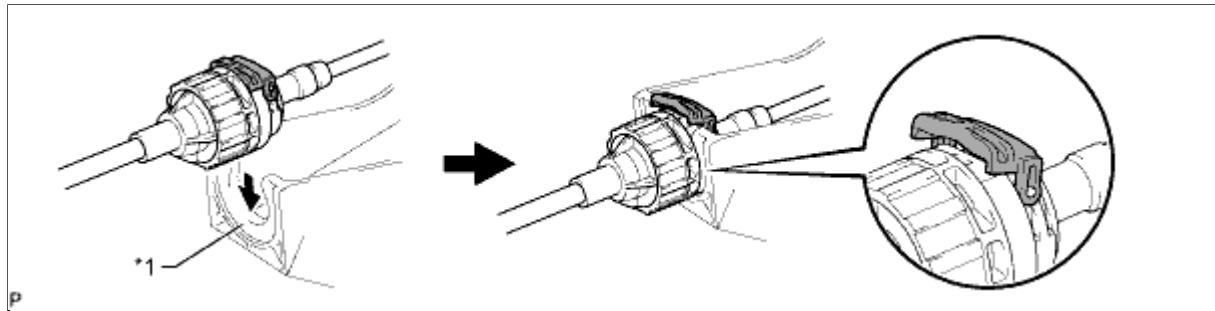
#### Text in Illustration

*1	Socket	*2	Lock Piece
*a	Push in	-	-

#### HINT:

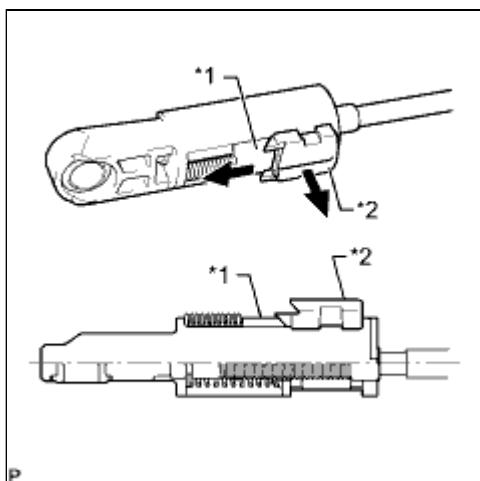
**If the lock piece cannot be pushed in, slightly turn the socket clockwise and then push in the lock piece again.**

- (f) Install the outer part of the transmission control cable to the shift lever retainer. Check that the socket and lock piece are positioned at original position.



### Text in Illustration

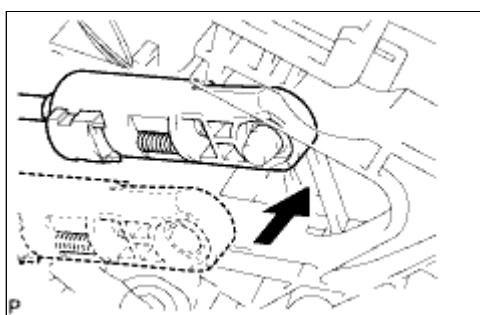
* 1	Shift Lever Retainer	-	-
-----	----------------------	---	---



(g) Slide the slider in the direction shown in the illustration and pull out the lock piece.

### Text in Illustration

* 1	Slider
* 2	Lock Piece



(h) Connect the end of the cable to the shift lever.

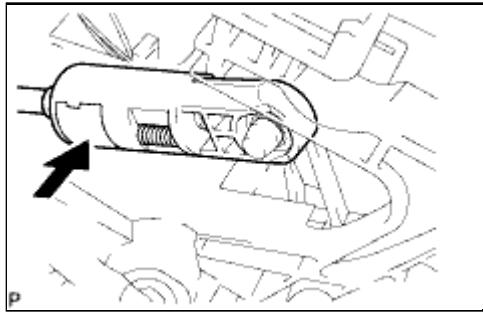
#### NOTICE:

- Make sure that the lock piece is pulled up.
- Push on the end of the cable all the way to the base of the pin.

(i) Push the lock piece into the adjuster case and lock it.

#### NOTICE:

Make sure that the lock piece is completely locked by the slider.



## 2. INSTALL REAR CONSOLE BOX ASSEMBLY

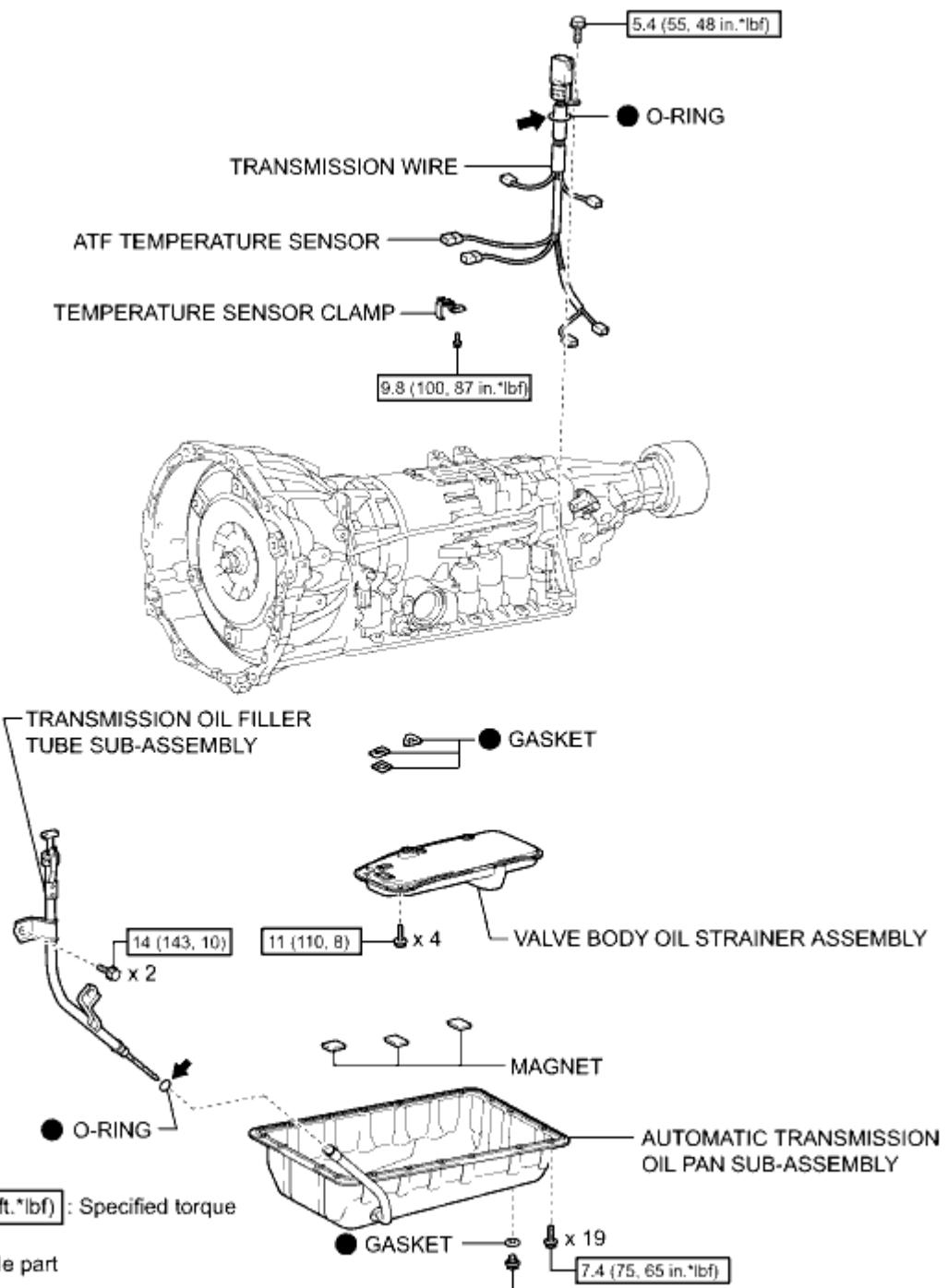
(a) Install the console box INFO.



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000003B2J007X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



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

● Non-reusable part

← Toyota Genuine ATF WS

P

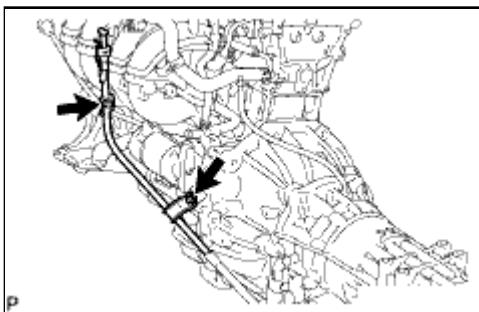
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010N200PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: REMOVAL (2010 4Runner)		

## **REMOVAL**

### **1. DRAIN AUTOMATIC TRANSMISSION FLUID**

- (a) Remove the drain plug and gasket, and drain the ATF.
- (b) Install a new gasket and the drain plug.

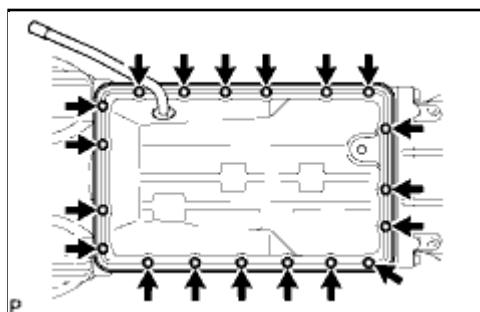
**Torque: 20 N·m (204 kgf·cm, 15ft·lbf)**



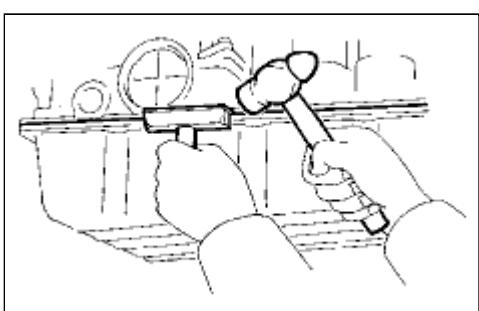
### **2. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY**

- (a) Remove the transmission oil dipstick.
- (b) Remove the 2 bolts and oil filler tube.
- (c) Remove the O-ring from the oil filler tube.

### **3. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**



- (a) Remove the 19 bolts.



- (b) Insert an oil pan seal cutter between the transmission case and oil pan. Cut through the seal and remove the oil pan.

#### **NOTICE:**

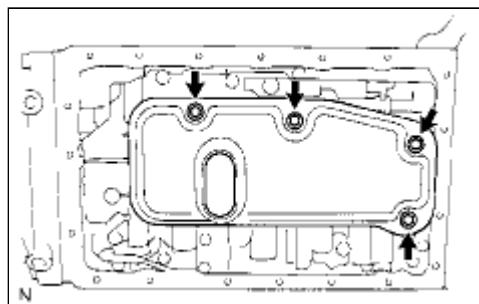
- Be careful not to damage the flanges of the oil pan and transmission case..
- Some fluid will remain in the oil pan. Carefully remove the oil pan.

(c) Examine the particles in the oil pan.

(1) Remove all the magnets and use them to collect steel particles. Carefully look at the foreign matter and particles in the pan and on the magnets to determine the type of wear you will find in the transmission.

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

Brass (non-magnetic): bush wear



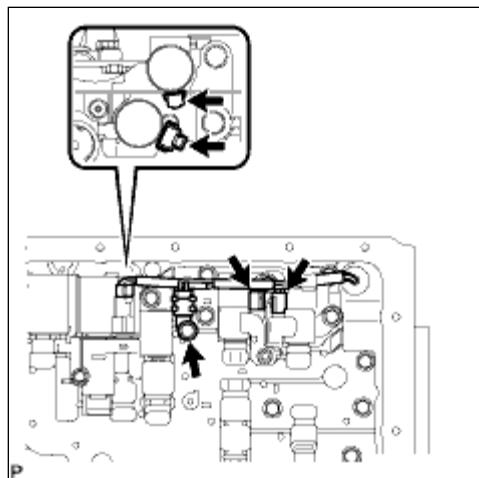
#### 4. REMOVE VALVE BODY OIL STRAINER ASSEMBLY

(a) Remove the 4 bolts and oil strainer.

**NOTICE:**

Be careful as some fluid may leak out of the oil strainer.

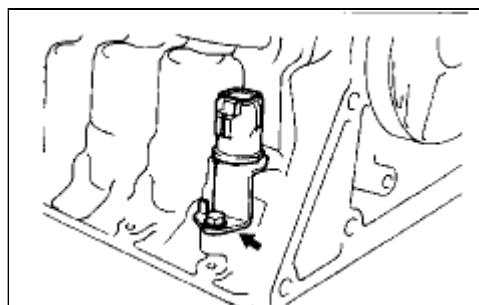
(b) Remove the 3 gaskets from the oil strainer.



#### 5. DISCONNECT TRANSMISSION WIRE

(a) Remove the bolt and temperature sensor clamp, and disconnect the temperature sensor.

(b) Disconnect the 4 connectors from the 4 shift solenoid valves.



#### 6. REMOVE TRANSMISSION WIRE

(a) Remove the bolt and stopper plate from the case.

(b) Pull out the transmission wire from the transmission case.

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

Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM000004646004X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSPECTION (2010 4Runner)		

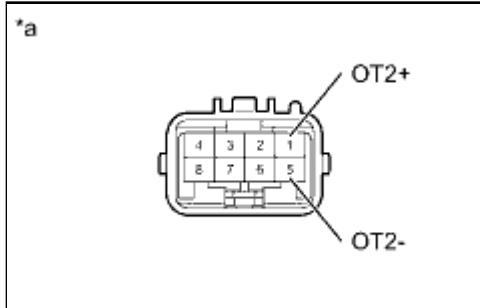
## INSPECTION

### **1. INSPECT TRANSMISSION WIRE (NO. 1 ATF TEMPERATURE SENSOR)**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 (OT2+) - 5 (OT2-)	Always	79 Ω to 156 kΩ
1 (OT2+) - Body ground	Always	10 kΩ or higher
5 (OT2-) - Body ground	Always	10 kΩ or higher



#### **Text in Illustration**

*a	Component without harness connected (Transmission Wire)
----	--

#### HINT:

If the resistance is out of the specified range at any of the ATF temperatures shown in the table below, the driveability of the vehicle may decrease.

Standard Resistance:

ATF TEMPERATURE	SPECIFIED CONDITION
10°C (50°F)	5 to 8 kΩ
25°C (77°F)	2.5 to 4.5 kΩ
110°C (230°F)	0.22 to 0.28 kΩ

If the result is not as specified, replace the transmission wire.



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Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000010MZ00PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSTALLATION (2010 4Runner)		

## INSTALLATION

### NOTICE:

**When working with seal packing material, perform the following:**

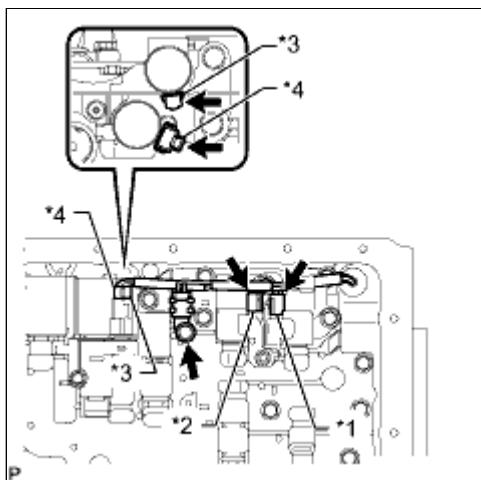
- Using a razor blade and gasket scraper, remove all old seal packing material from the gasket surfaces.
- Clean all components thoroughly to remove all foreign matter.
- Clean both sealing surfaces with a non-residue solvent.
- Apply seal packing material in a continuous line approximately 2 to 3 mm (0.0787 to 0.118 in.) in diameter on the sealing surface.
- Reassemble parts within 10 minutes of applying seal packing material. Failing to do so will require the seal packing material to be removed and reapplied.

### 1. INSTALL TRANSMISSION WIRE

- (a) Coat a new O-ring with ATF and install it to the transmission wire.
- (b) Install the transmission wire to the case.
- (c) Install the stopper plate with the bolt.

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

### 2. CONNECT TRANSMISSION WIRE



(a) Connect the 4 connectors to the 4 shift solenoid valves.

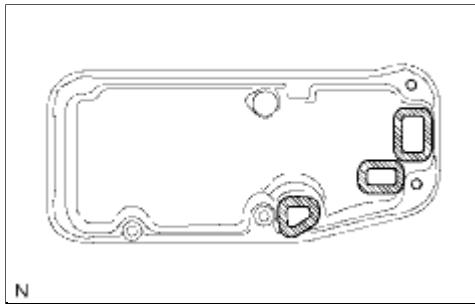
#### Text in Illustration

*1	White
*2	Black
*3	Orange/Green
*4	Yellow/Brown

- (b) Connect the temperature sensor with temperature sensor clamp and the bolt.

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

### 3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY



(a) Install 3 new gaskets.

(b) Install the oil strainer with the 4 bolts.

**Torque: 11 N·m (110 kgf·cm, 8ft·lbf)**

**HINT:**

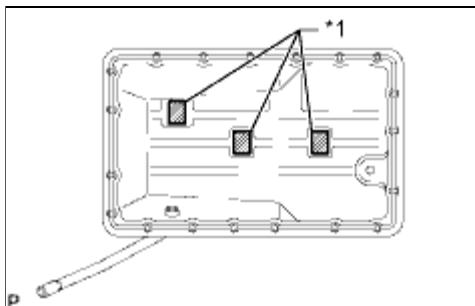
**Each bolt length is indicated below.**

14 mm (0.55 in.) for bolt A

20 mm (0.79 in.) for bolt B

23 mm (0.91 in.) for bolt C

#### 4. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY



**HINT:**

**Remove any packing material and be careful not to spill oil on the contact surfaces of the transmission case and oil pan.**

(a) Install the 3 magnets to the locations indicated in the illustration.

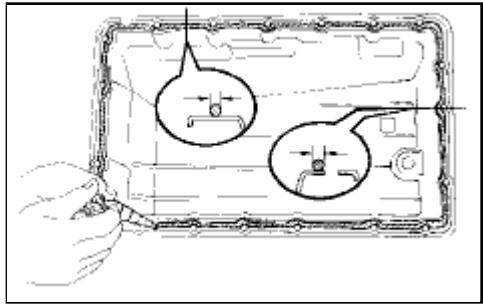
**Text in Illustration**

\*1

Magnet

(b) Apply seal packing to the oil pan as shown in the illustration.

Seal packing:



Toyota Genuine Seal Packing 1281,

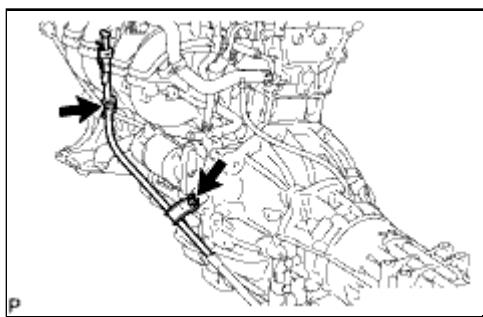
Three Bond 1281 or equivalent

**Seal diameter**

2 to 3 mm (0.0787 to 0.118 in.)

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

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



## 5. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY

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

(b) Install the oil filler tube to the transmission with the 2 bolts.

**Torque: 14 N·m (143 kgf·cm, 10ft·lbf)**

(c) Install the oil dipstick.

## 6. ADD AUTOMATIC TRANSMISSION FLUID

Fluid type:

Toyota Genuine ATF WS

## 7. INSPECT AUTOMATIC TRANSMISSION FLUID

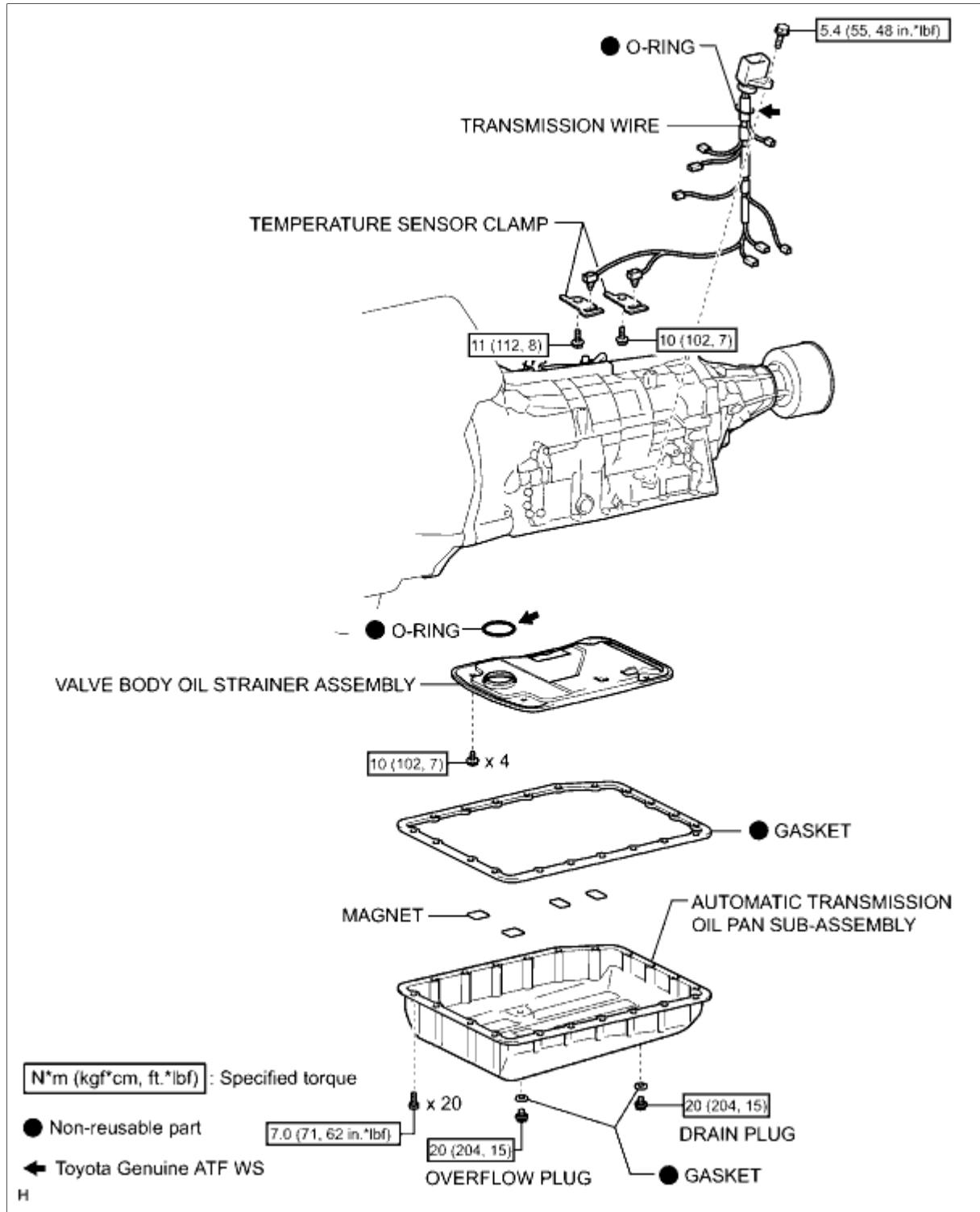
(a) Inspect the automatic transmission fluid .



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BKW01QX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013C102KX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: REMOVAL (2010 4Runner)		

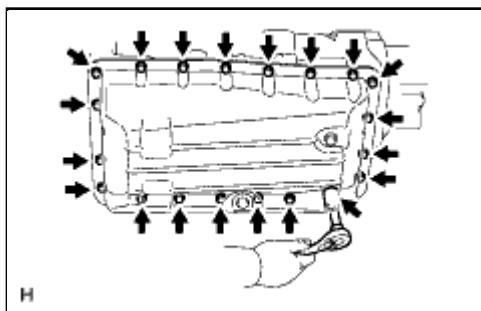
## **REMOVAL**

### **1. DRAIN AUTOMATIC TRANSMISSION FLUID**

- (a) Remove the drain plug and gasket, and drain ATF.
- (b) Install a new gasket and the drain plug.

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

### **2. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**



- (a) Remove the 20 bolts, oil pan and gasket from the transmission.

**NOTICE:**

**Some fluid will remain in the oil pan. Remove all the pan bolts, and carefully remove the oil pan assembly.**

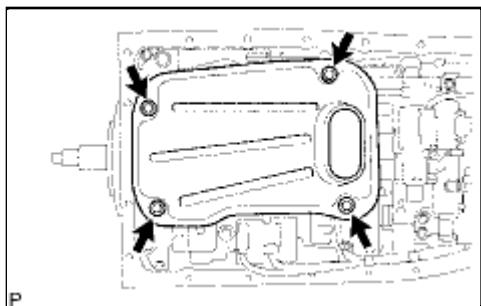
- (b) Examine the particles in the pan.

(1) Remove the 4 magnets and use them to collect steel particles. Carefully inspect the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.

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

Brass (non-magnetic): bush wear

### **3. REMOVE VALVE BODY OIL STRAINER ASSEMBLY**

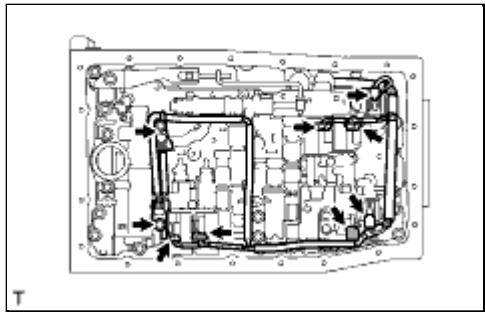


- (a) Remove the 4 bolts and oil strainer.

**NOTICE:**

**Be careful as some fluid may leak out of the oil strainer.**

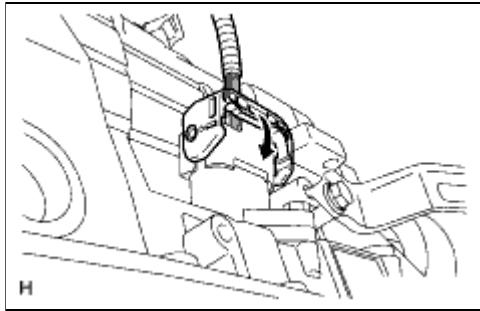
- (b) Remove the O-ring from the oil strainer.



#### 4. DISCONNECT TRANSMISSION WIRE

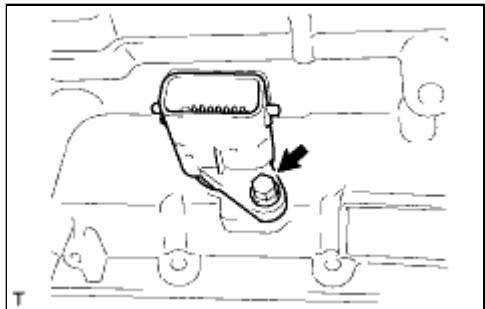
- (a) Remove the 2 bolts and 2 temperature sensor clamps.
- (b) Disconnect the 2 ATF temperature sensors.
- (c) Disconnect the 7 connectors from the solenoid valves.

#### 5. REMOVE TRANSMISSION WIRE



(a) Disconnect the wire connector.

(1) Detach the claw, press down the lever, and then disconnect the transmission wire connector.



(b) Remove the bolt and pull out the transmission wire.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FS020X
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSPECTION (2010 4Runner)		

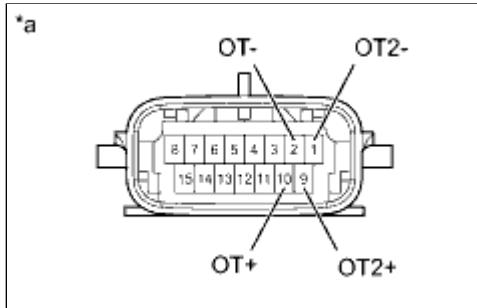
## INSPECTION

### **1. INSPECT TRANSMISSION WIRE (ATF TEMPERATURE SENSOR)**

(a) Measure the resistance according to the value(s) in the table below.

Standard resistance:

TESTER CONNECTION	ATF TEMPERATURE	SPECIFIED CONDITION
2 (OT-) - 10 (OT+)	10°C (50°F)	5 to 8 kΩ
2 (OT-) - 10 (OT+)	25°C (77°F)	2.5 to 4.5 kΩ
2 (OT-) - 10 (OT+)	110°C (230°F)	0.22 to 0.28 kΩ
1 (OT2-) - 9 (OT2+)	10°C (50°F)	5 to 8 kΩ
1 (OT2-) - 9 (OT2+)	25°C (77°F)	2.5 to 4.5 kΩ
1 (OT2-) - 9 (OT2+)	110°C (230°F)	0.22 to 0.28 kΩ



### **Text in Illustration**

*a	Component without harness connected (Transmission Wire)
----	--

### **HINT:**

If the resistance is out of the specified range at one of the ATF temperatures shown in the table below, the driveability of the vehicle may decrease.

Resistance (Reference):

ATF TEMPERATURE	SPECIFIED CONDITION
10°C (50°F)	5 to 8 kΩ

25°C (77°F)	2.5 to 4.5 kΩ
110°C (230°F)	0.22 to 0.28 kΩ

If the result is not as specified, replace the transmission wire.



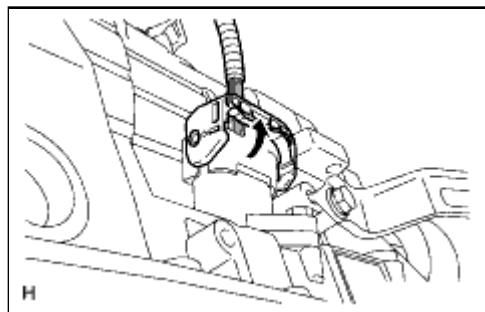
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013BZ02KX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TRANSMISSION WIRE

- (a) Coat a new O-ring with ATF and install it to the transmission wire connector.
- (b) Install the transmission wire with the bolt.

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

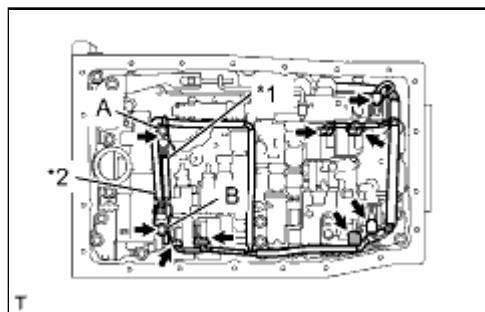


- (c) Connect the transmission wire connector.

**HINT:**

**Push up the lever until the claw of the transmission wire connector makes a connection sound.**

### 2. CONNECT TRANSMISSION WIRE



- (a) Connect the 7 connectors to the solenoid valves.

- (b) Connect the 2 ATF temperature sensors with the 2 clamps and 2 bolts.

**for bolt A - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

**for bolt B - Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

**Text in Illustration**

* 1	Orange
* 2	Blue

**HINT:**

**Each bolt length is indicated below.**

**12 mm (0.472 in.) for bolt A**

**36 mm (1.41 in.) for bolt B**

### **3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY**

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

(b) Install the oil strainer with the 4 bolts.

**Torque: 10 N·m (102 kgf·cm, 7ft-lbf)**

### **4. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**

#### **NOTICE:**

**Remove the gasket and be careful not to spill oil on the contacting surfaces of the transmission case and oil pan.**

(a) Install a new gasket and the oil pan with the 20 bolts.

**Torque: 7.0 N·m (71 kgf·cm, 62in-lbf)**

### **5. ADD AUTOMATIC TRANSMISSION FLUID**

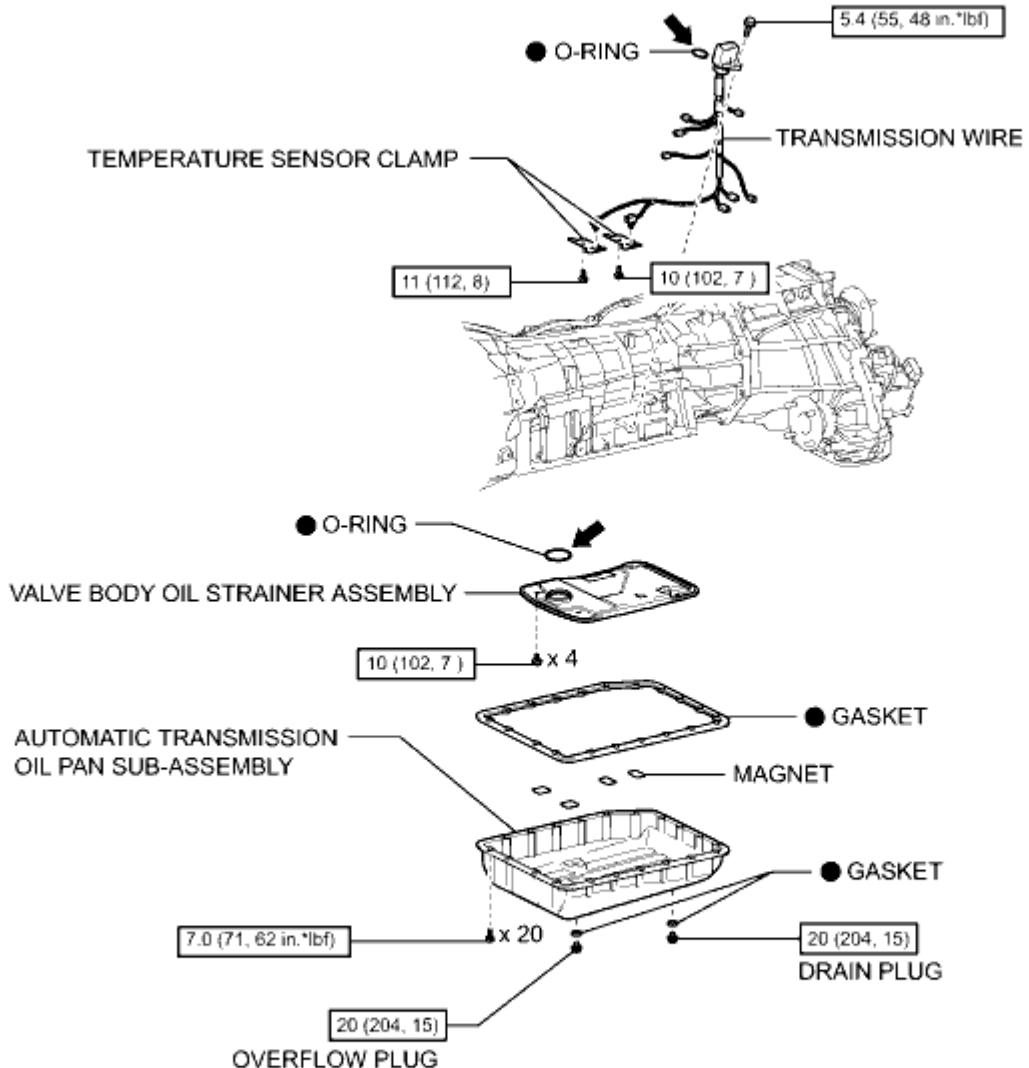
(a) Add automatic transmission fluid  .



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BKW01RX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



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

● Non-reusable part

← Toyota Genuine ATF WS

P



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013C102LX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: REMOVAL (2010 4Runner)		

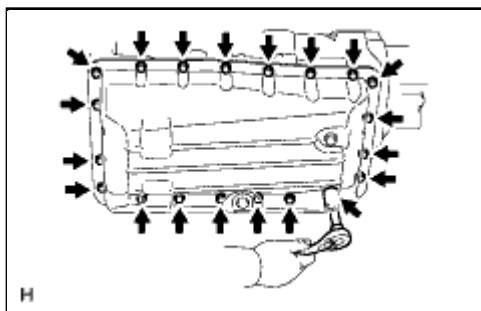
## **REMOVAL**

### **1. DRAIN AUTOMATIC TRANSMISSION FLUID**

- (a) Remove the drain plug and gasket, and drain the ATF.
- (b) Install a new gasket and the drain plug.

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

### **2. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY**



- (a) Remove the 20 bolts, oil pan and gasket from the transmission.

**NOTICE:**

**Some fluid will remain in the oil pan. Remove all the pan bolts, and carefully remove the oil pan assembly.**

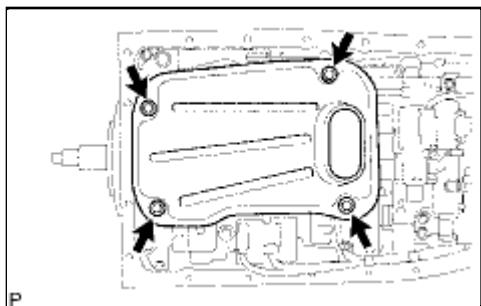
- (b) Examine the particles in the pan.

(1) Remove the 4 magnets and use them to collect steel particles. Carefully inspect the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.

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

Brass (non-magnetic): bush wear

### **3. REMOVE VALVE BODY OIL STRAINER ASSEMBLY**

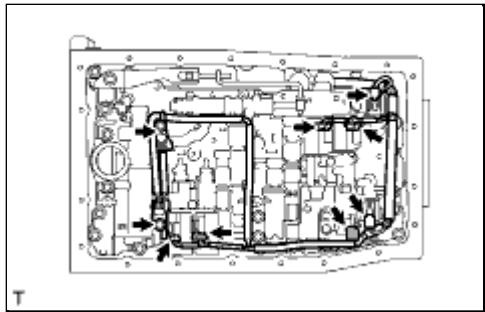


- (a) Remove the 4 bolts and oil strainer.

**NOTICE:**

**Be careful as some fluid may leak out of the oil strainer.**

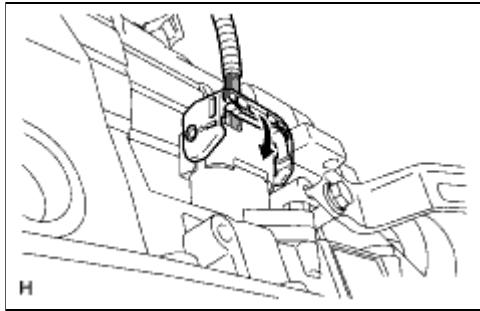
- (b) Remove the O-ring from the oil strainer.



#### 4. DISCONNECT TRANSMISSION WIRE

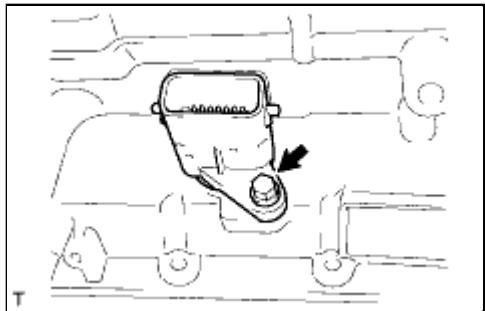
- (a) Remove the 2 bolts and 2 temperature sensor clamps.
- (b) Disconnect the 2 ATF temperature sensors.
- (c) Disconnect the 7 connectors from the solenoid valves.

#### 5. REMOVE TRANSMISSION WIRE



(a) Disconnect the wire connector.

(1) Detach the claw, press down the lever, and then disconnect the transmission wire connector.



(b) Remove the bolt and pull out the transmission wire.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FS021X
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSPECTION (2010 4Runner)		

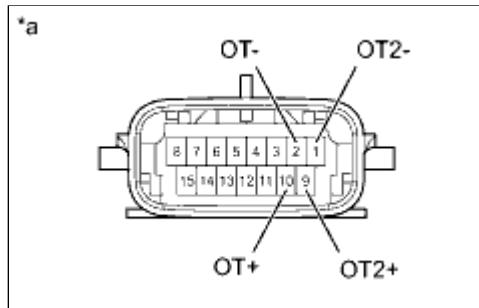
## **INSPECTION**

### **1. INSPECT TRANSMISSION WIRE (ATF TEMPERATURE SENSOR)**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	ATF TEMPERATURE	SPECIFIED CONDITION
2 (OT-) - 10 (OT+)	10°C (50°F)	5 to 8 kΩ
2 (OT-) - 10 (OT+)	25°C (77°F)	2.5 to 4.5 kΩ
2 (OT-) - 10 (OT+)	110°C (230°F)	0.22 to 0.28 kΩ
1 (OT2-) - 9 (OT2+)	10°C (50°F)	5 to 8 kΩ
1 (OT2-) - 9 (OT2+)	25°C (77°F)	2.5 to 4.5 kΩ
1 (OT2-) - 9 (OT2+)	110°C (230°F)	0.22 to 0.28 kΩ



### **Text in Illustration**

*a	Component without harness connected (Transmission Wire)
----	--

### **HINT:**

If the resistance is out of the specified range at one of the ATF temperatures shown in the table below the driveability of the vehicle may decrease.

Resistance (Reference):

ATF Temperature	Specified Condition
10°C (50°F)	5 to 8 kΩ

25°C (77°F)	2.5 to 4.5 kΩ
110°C (230°F)	0.22 to 0.28 kΩ

If the result is not as specified, replace the transmission wire.



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013BZ02LX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: TRANSMISSION WIRE: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TRANSMISSION WIRE

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

(b) Install the transmission wire with the bolt.

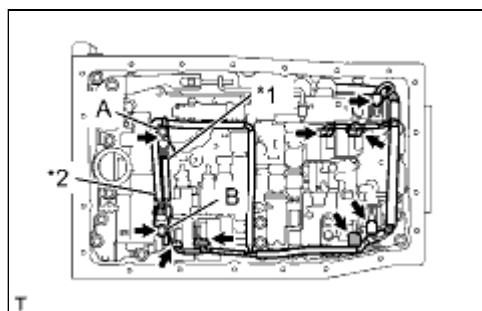
**Torque: 5.4 N·m (55 kgf·cm, 48in·lbf)**

(c) Connect the transmission wire connector.

**HINT:**

**Push up the lever until the claw of the transmission wire connector makes a connection sound.**

### 2. CONNECT TRANSMISSION WIRE



(a) Connect the 7 connectors to the solenoid valves.

#### Text in Illustration

* 1	Orange
* 2	Blue

(b) Connect the 2 ATF temperature sensors with the 2 clamps and 2 bolts.

**for bolt A - Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

**for bolt B - Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

**HINT:**

**Each bolt length is indicated below.**

**12 mm (0.472 in.) for bolt A**

36 mm (1.42 in.) for bolt B

### 3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY

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

(b) Install the oil strainer with the 4 bolts.

**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

### 4. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

**NOTICE:**

**Remove the gasket and be careful not to spill oil on the contacting surfaces of the transmission case and**

**oil pan.**

(a) Install a new gasket and the oil pan with the 20 bolts.

**Torque: 7.0 N·m (71 kgf·cm, 62in·lbf)**

## **5. ADD AUTOMATIC TRANSMISSION FLUID**

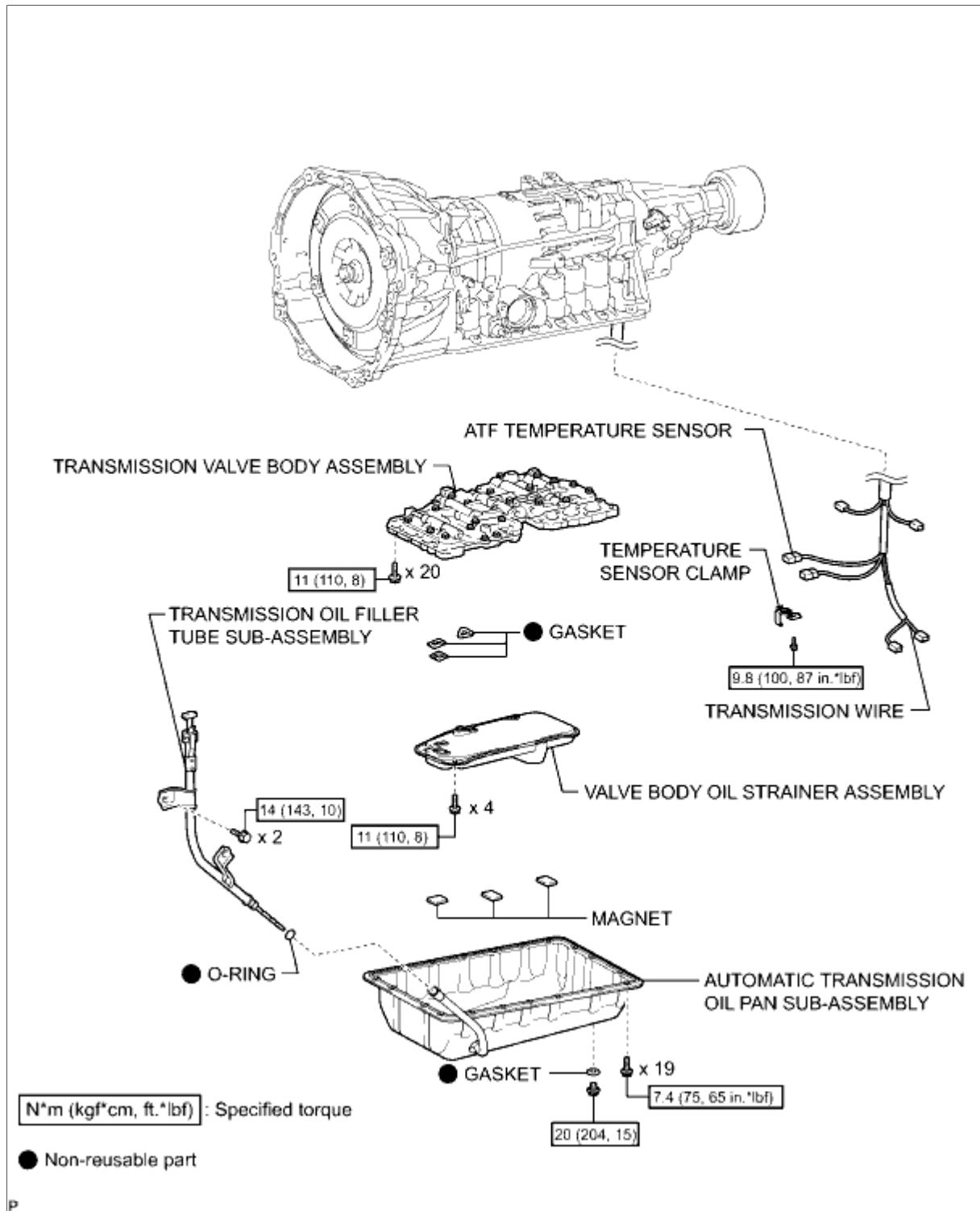
(a) Add automatic transmission fluid  .



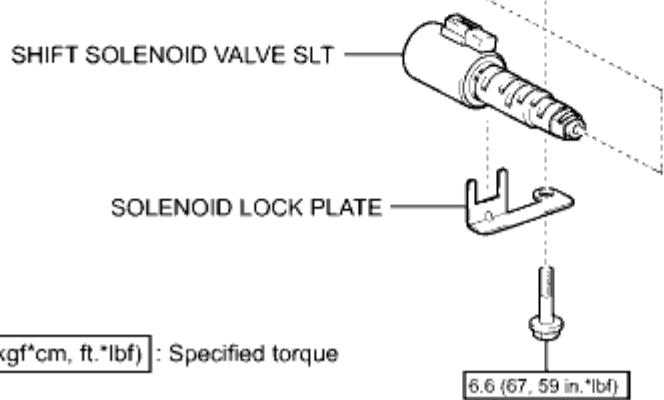
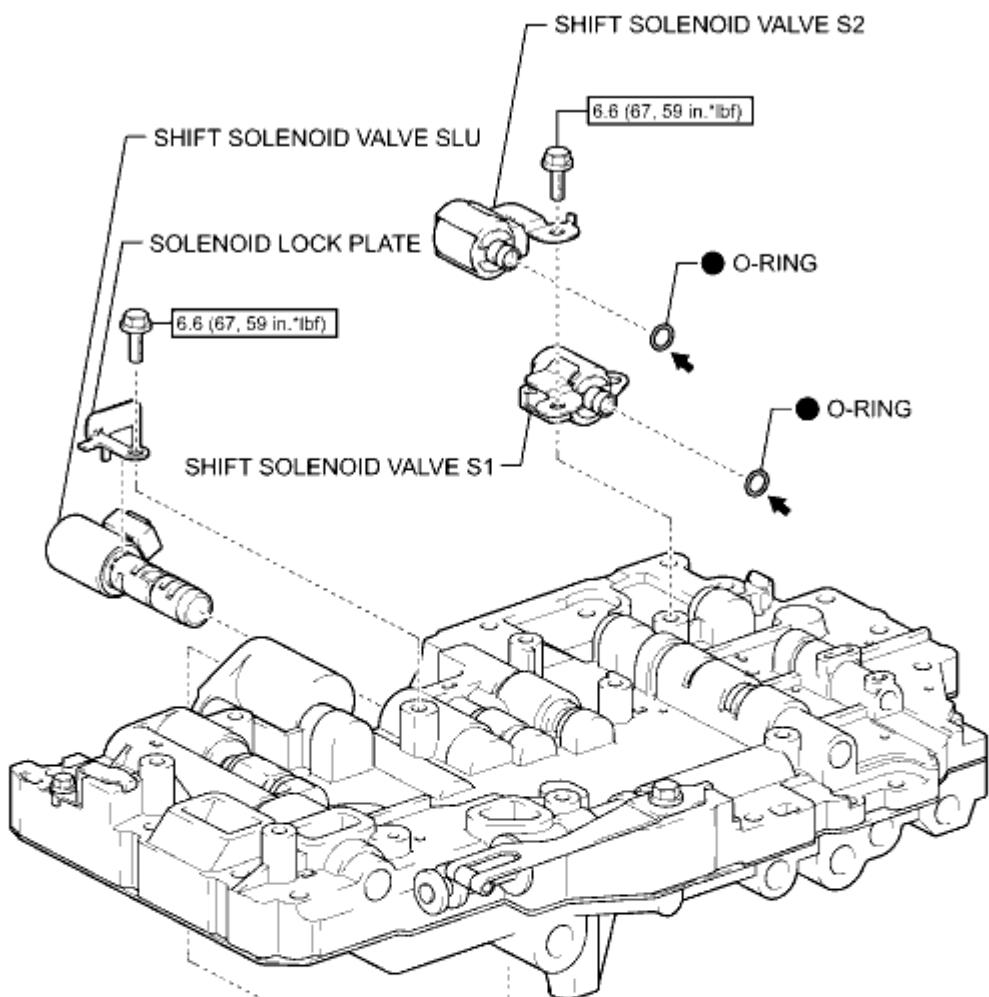
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000003B2N007X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



## ILLUSTRATION



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

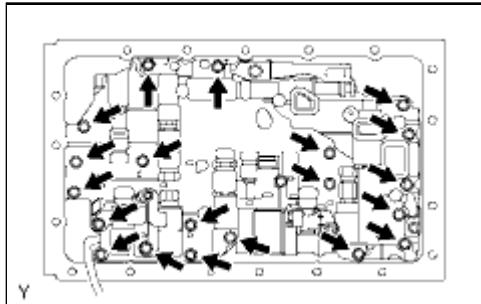
● Non-reusable part

← Toyota Genuine ATF WS

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013B000PX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REMOVAL (2010 4Runner)		

## REMOVAL

1. DRAIN AUTOMATIC TRANSMISSION FLUID INFO
2. REMOVE TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY INFO
3. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY INFO
4. REMOVE VALVE BODY OIL STRAINER ASSEMBLY INFO
5. DISCONNECT TRANSMISSION WIRE INFO



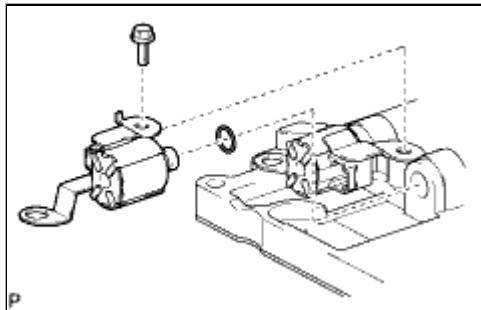
### 6. REMOVE TRANSMISSION VALVE BODY ASSEMBLY

(a) Remove the 20 bolts and valve body.



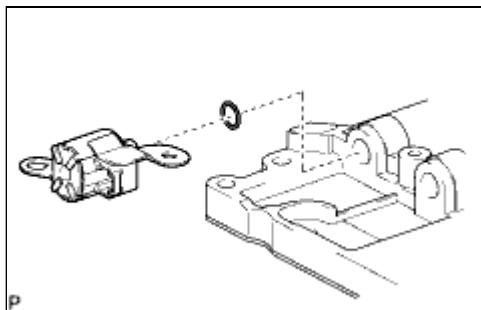
Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013BC00UX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: DISASSEMBLY (2010 4Runner)		

## **DISASSEMBLY**



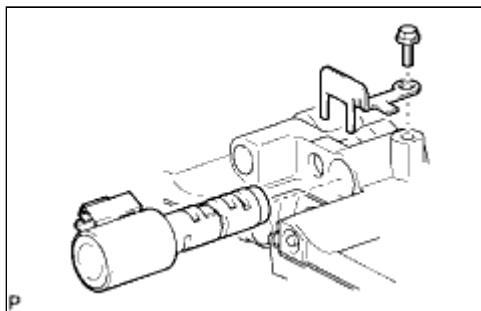
### **1. REMOVE SHIFT SOLENOID VALVE S2**

- (a) Remove the bolt and shift solenoid valve S2.
- (b) Remove the O-ring from the shift solenoid valve.



### **2. REMOVE SHIFT SOLENOID VALVE S1**

- (a) Remove the shift solenoid valve S1.
- (b) Remove the O-ring from the shift solenoid valve.

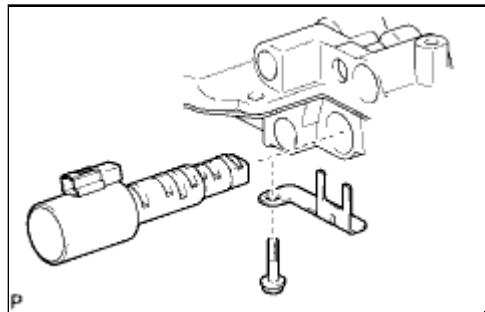


### **3. REMOVE SHIFT SOLENOID VALVE SLU**

- (a) Remove the bolt and lock plate.
- (b) Remove the shift solenoid valve SLU.

### **4. REMOVE SHIFT SOLENOID VALVE SLT**

- (a) Remove the bolt and lock plate.
- (b) Remove the shift solenoid valve SLT.



Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000454V004X
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSPECTION (2010 4Runner)		

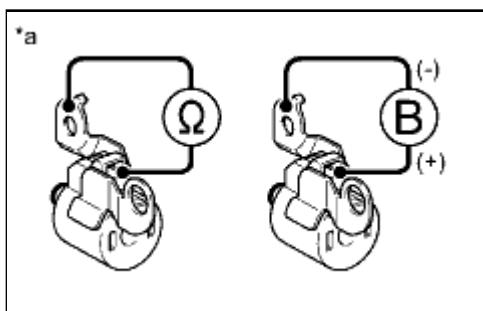
## **INSPECTION**

### **1. INSPECT SHIFT SOLENOID VALVE S2**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve S2 connector terminal - Shift solenoid valve S2 body	20°C (68°F)	11 to 15 Ω



#### **Text in Illustration**

*a	Component without harness connected (Shift Solenoid Valve S2)
----	--

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve S2 connector</li> <li>Battery negative (-) → Shift solenoid valve S2 body</li> </ul>	Valve moves and makes an operating noise

If the result is not as specified, replace the solenoid valve.

### **2. INSPECT SHIFT SOLENOID VALVE S1**

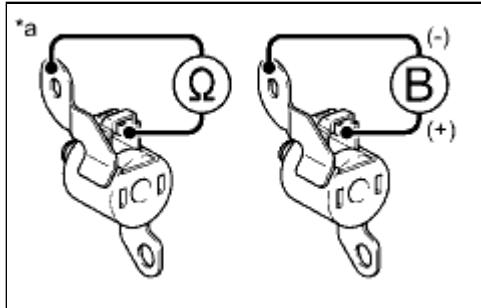
(a) Measure the resistance according to the value(s) in the

table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve S1 connector terminal - Shift solenoid valve S1 body	20°C (68°F)	11 to 15 Ω

## Text in Illustration



*a	Component without harness connected (Shift Solenoid Valve S1)
----	--

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"><li>Battery positive (+) → Shift solenoid valve S1 connector</li><li>Battery negative (-) → Shift solenoid valve S1 body</li></ul>	Valve moves and makes an operating noise

If the result is not as specified, replace the solenoid valve.

## 3. INSPECT SHIFT SOLENOID VALVE SLU AND SLT

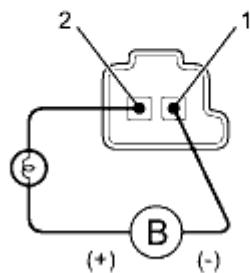
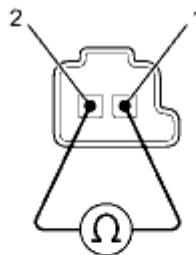
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

## Text in Illustration

\*a



\*a

Component without harness connected  
(Shift Solenoid Valve)

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"><li>• Battery positive (+) with a 21 W bulb → Terminal 2</li><li>• Battery negative (-) → Terminal 1</li></ul>	Valve moves and makes an operating noise

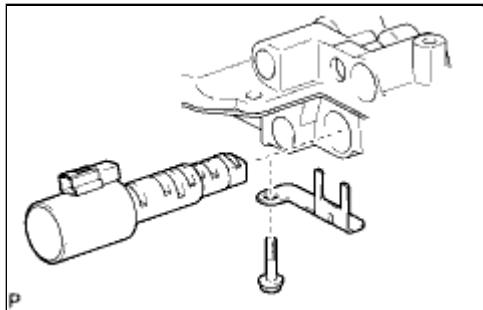
If the result is not as specified, replace the solenoid valve.



TOYOTA

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013BD00UX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REASSEMBLY (2010 4Runner)		

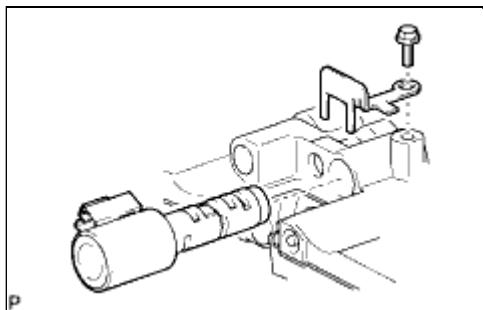
## **REASSEMBLY**



### **1. INSTALL SHIFT SOLENOID VALVE SLT**

- (a) Install the shift solenoid valve SLT with the solenoid lock plate and bolt.

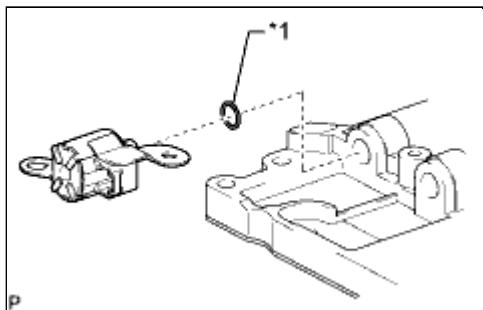
**Torque: 6.6 N·m (67 kgf·cm, 59in·lbf)**



### **2. INSTALL SHIFT SOLENOID VALVE SLU**

- (a) Install the shift solenoid valve SLU with the solenoid lock plate and bolt.

**Torque: 6.6 N·m (67 kgf·cm, 59in·lbf)**



### **3. INSTALL SHIFT SOLENOID VALVE S1**

- (a) Coat a new O-ring with ATF and install it to the shift solenoid valve S1.

#### **Text in Illustration**

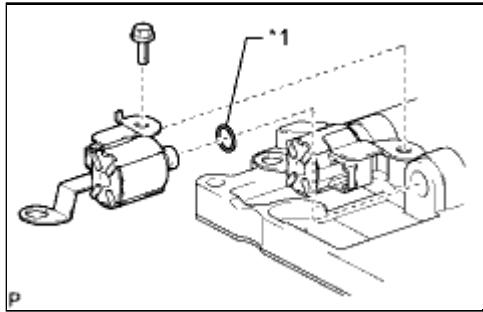
\*1

New O-Ring

- (b) Install the shift solenoid valve S1.

### **4. INSTALL SHIFT SOLENOID VALVE S2**

- (a) Coat a new O-ring with ATF and install it to the shift solenoid valve S2.



## Text in Illustration

*1	New O-Ring
----	------------

(b) Install the shift solenoid valve S2 with the bolt.

**Torque: 6.6 N·m (67 kgf·cm, 59in·lbf)**



Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013AZ00QX
<b>Title:</b> A343E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSTALLATION (2010 4Runner)		

## INSTALLATION

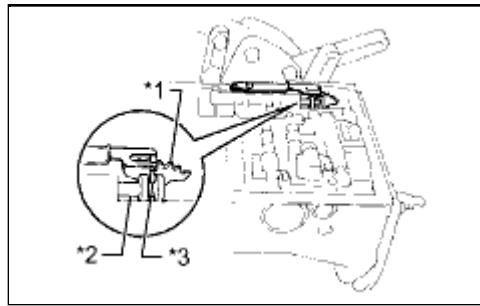
### NOTICE:

**When working with seal packing material, perform the following:**

- Using a razor blade and gasket scraper, remove all old seal packing material from the gasket surfaces.
- Clean all components thoroughly to remove all foreign matter.
- Clean both sealing surfaces with a non-residue solvent.
- Apply seal packing material in a continuous line approximately 2 to 3 mm (0.0787 to 0.118 in.) in diameter on the sealing surface.
- Reassemble parts within 10 minutes of applying seal packing material. Failing to do so will require the seal packing material to be removed and reapplied.

### 1. INSTALL TRANSMISSION VALVE BODY ASSEMBLY

(a) Install the valve body and align the groove of the manual valve with the pin of the manual valve lever.



#### Text in Illustration

* 1	Manual Valve Lever
* 2	Manual Valve
* 3	Pin

(b) Install the 20 bolts.

**Torque: 11 N·m (110 kgf·cm, 8ft·lbf)**

#### HINT:

Each bolt length is indicated below.

23 mm (0.91 in.) for A

28 mm (1.10 in.) for B

36 mm (1.42 in.) for C

### 2. CONNECT TRANSMISSION WIRE



### 3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY



### 4. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY



## **5. INSTALL TRANSMISSION OIL FILLER TUBE SUB-ASSEMBLY**

INFO

## **6. ADD AUTOMATIC TRANSMISSION FLUID**

Fluid type:

Toyota Genuine ATF WS

## **7. INSPECT AUTOMATIC TRANSMISSION FLUID**

- (a) Inspect the automatic transmission fluid

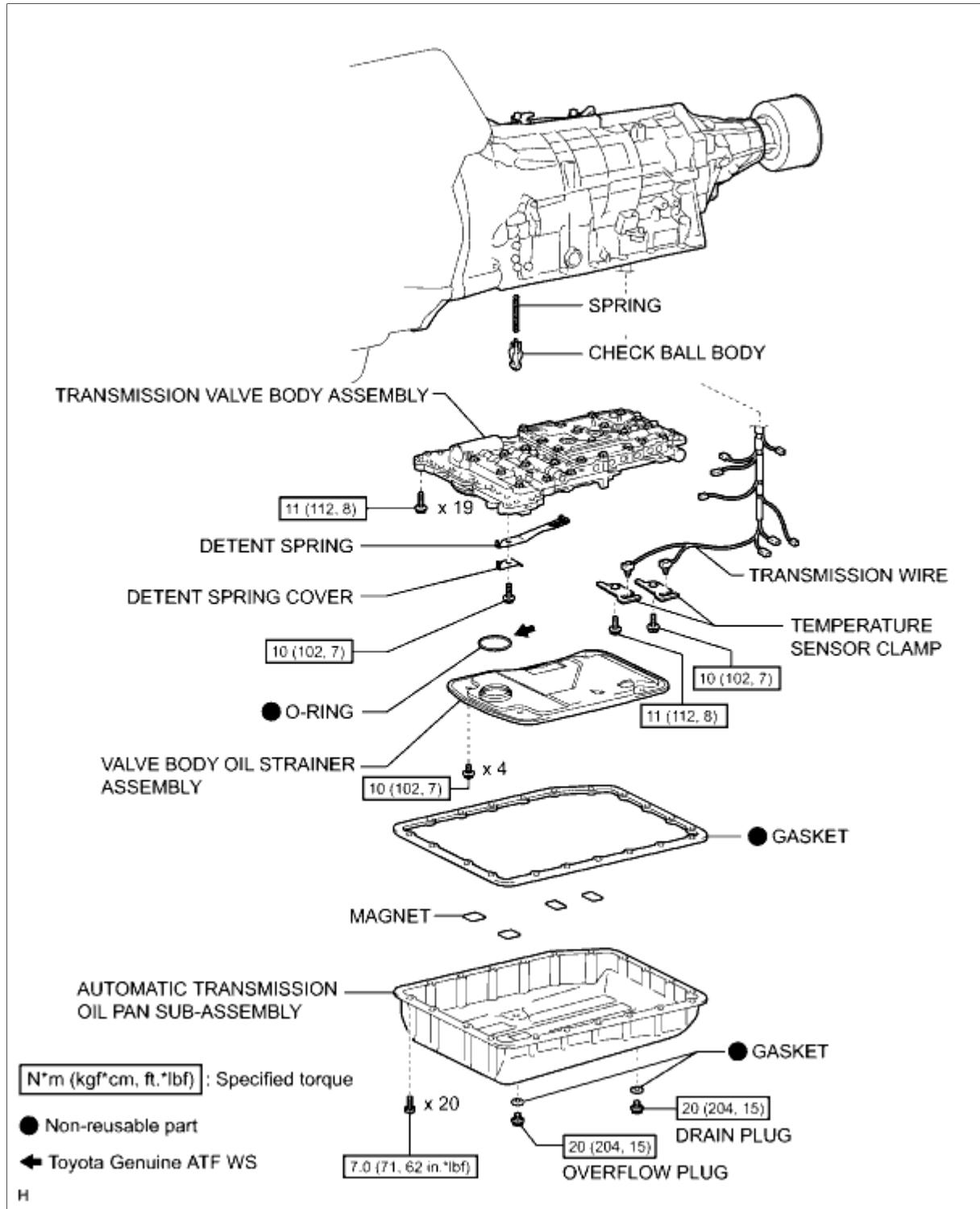
INFO



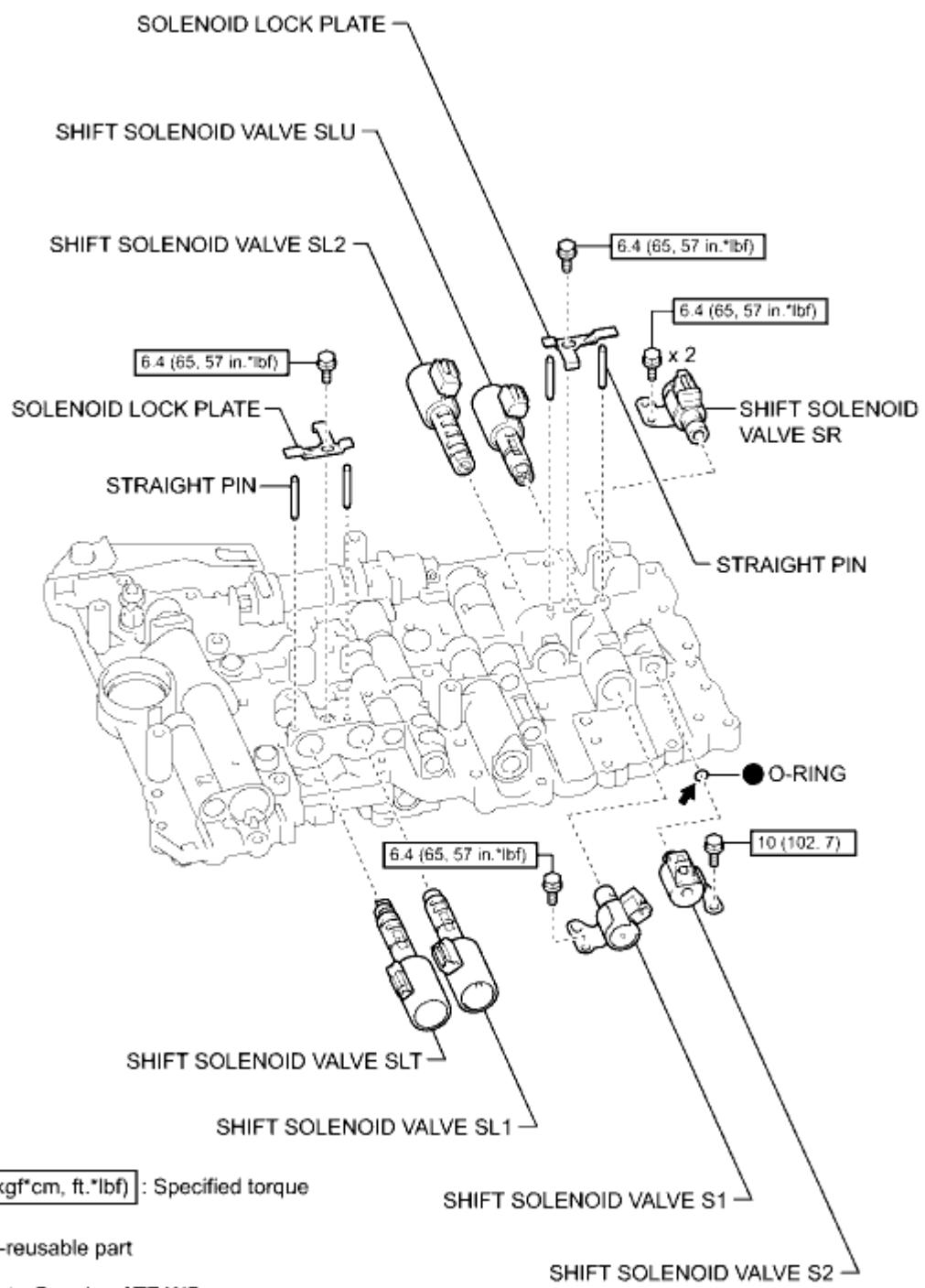
<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BKZ01SX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



## ILLUSTRATION



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

SHIFTSOLENOID VALVE S1

● Non-reusable part

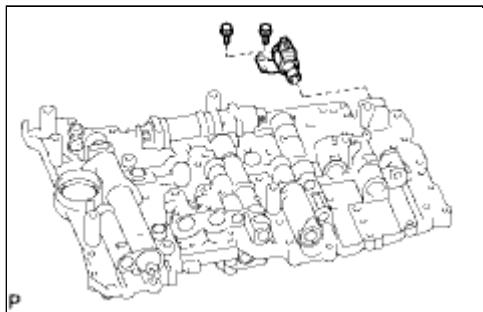
← Toyota Genuine ATF WS

P

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FG01WX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: DISASSEMBLY (2010 4Runner)		

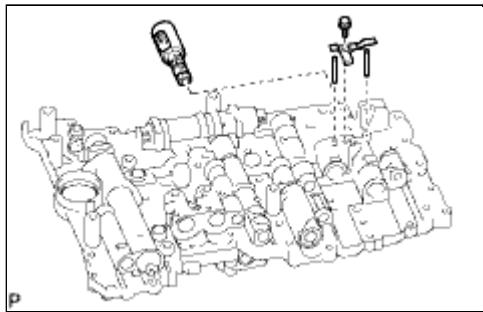
## **DISASSEMBLY**

### **1. REMOVE SHIFT SOLENOID VALVE SR**



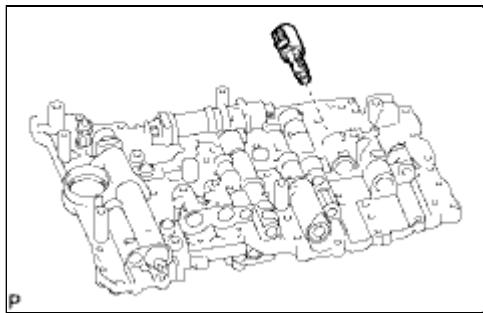
(a) Remove the 2 bolts and solenoid valve.

### **2. REMOVE SHIFT SOLENOID VALVE SLU**



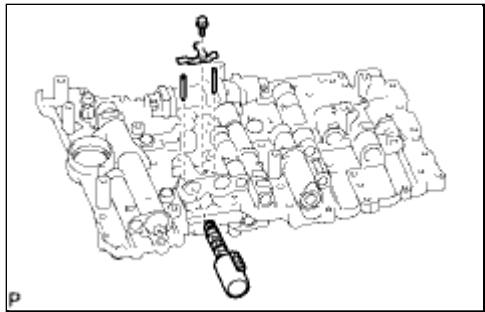
(a) Remove the bolt, solenoid lock plate and 2 straight pins.

(b) Remove the solenoid valve.



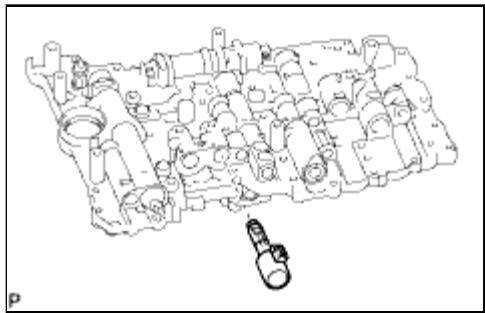
### **3. REMOVE SHIFT SOLENOID VALVE SLT**

### **4. REMOVE SHIFT SOLENOID VALVE SLT**

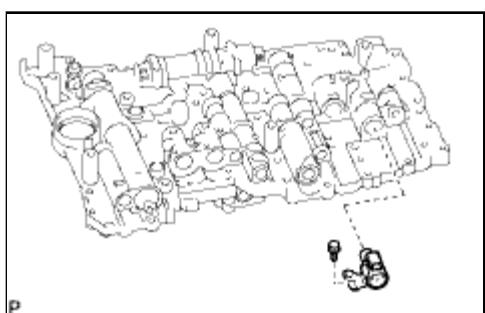


(a) Remove the bolt, solenoid lock plate and 2 straight pins.

(b) Remove the solenoid valve.



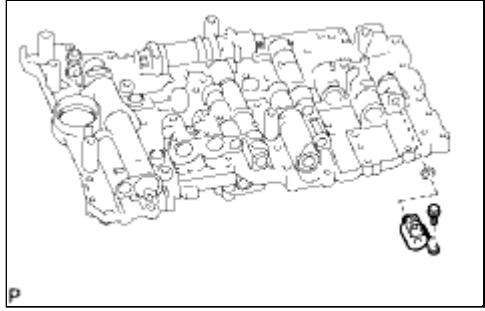
## 5. REMOVE SHIFT SOLENOID VALVE S1



(a) Remove the bolt and shift solenoid valve.

## 7. REMOVE SHIFT SOLENOID VALVE S2

(a) Remove the bolt and solenoid valve.



(b) Remove the O-ring from the shift solenoid valve.

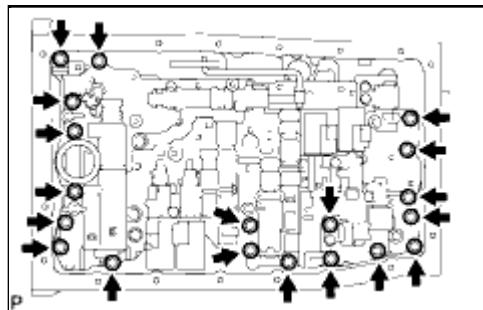


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013CM02MX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REMOVAL (2010 4Runner)		

## REMOVAL

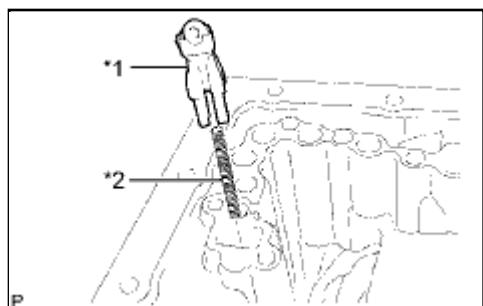
1. DRAIN AUTOMATIC TRANSMISSION FLUID INFO
2. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY INFO
3. REMOVE VALVE BODY OIL STRAINER ASSEMBLY INFO
4. DISCONNECT TRANSMISSION WIRE INFO
5. REMOVE TRANSMISSION VALVE BODY ASSEMBLY

(a) Remove the bolt, detent spring cover and detent spring.



(b) Remove the 19 bolts and valve body.

(c) Remove the check ball body and spring.



### Text in Illustration

*1	Check Ball Body
*2	Spring

#### NOTICE:

**Do not drop the check ball body and spring.**

Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000301D00JX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSPECTION (2010 4Runner)		

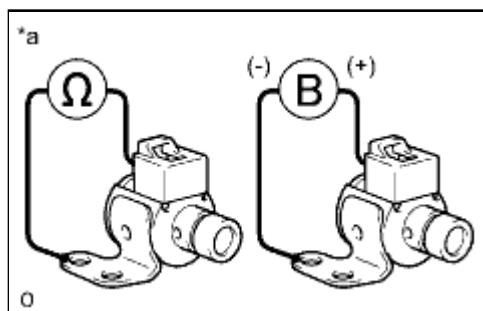
## **INSPECTION**

### **1. INSPECT SHIFT SOLENOID VALVE SR**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve SR connector terminal - Shift solenoid valve SR body	20°C (68°F)	11 to 15 Ω



#### **Text in Illustration**

\*a Component without harness connected (Shift Solenoid Valve SR)

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve SR connector</li> <li>Battery negative (-) → Shift solenoid valve SR body</li> </ul>	Valve moves and makes an operating noise

If the result is not as specified, replace the solenoid valve.

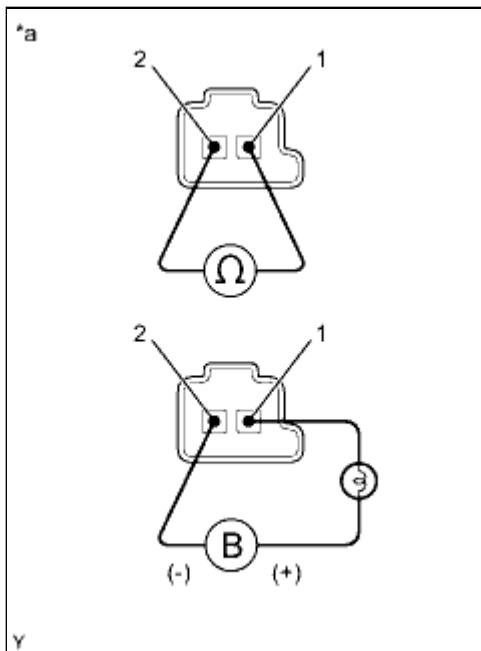
### **2. INSPECT SHIFT SOLENOID VALVE SL1 AND SL2**

(a) Measure the resistance according to the value(s) in the

table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω



### Text in Illustration

*a	Component without harness connected (Shift Solenoid Valve)
----	---

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"><li>Battery positive (+) with a 21 W bulb → Terminal 1</li><li>Battery negative (-) → Terminal 2</li></ul>	Valve moves and makes an operating noise

If the result is not as specified, replace the solenoid valve.

### 3. INSPECT SHIFT SOLENOID VALVE SLT AND SLU

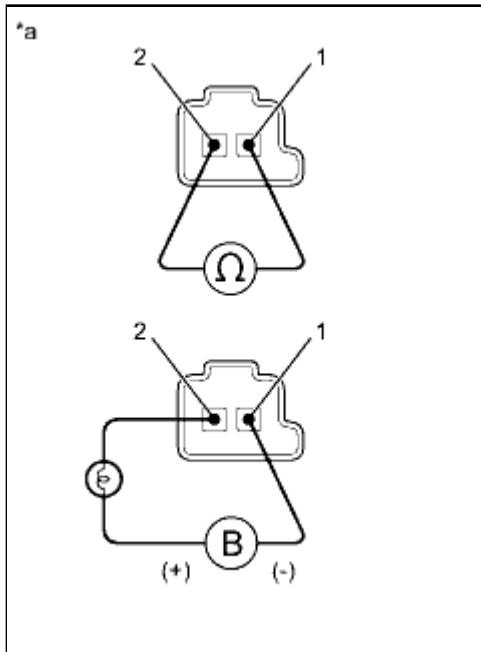
(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

### Text in Illustration

*a	Component without harness connected
----	-------------------------------------



(Shift Solenoid Valve)

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
Battery positive (+) with a 21 W bulb → Terminal 2 Battery negative (-) → Terminal 1	Valve moves and makes an operating noise

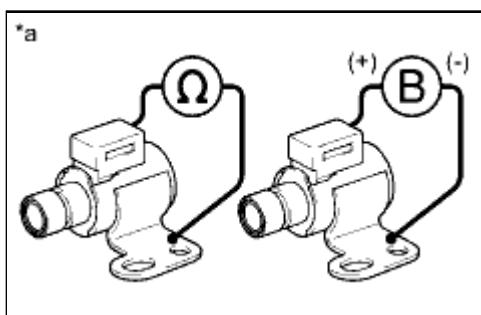
If the result is not as specified, replace the solenoid valve.

#### 4. INSPECT SHIFT SOLENOID VALVE S1

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve S1 connector terminal - Shift solenoid valve S1 body	20°C (68°F)	11 to 15 Ω



#### Text in Illustration

*a	Component without harness connected (Shift Solenoid Valve S1)
----	--

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION

<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve S1 connector</li> <li>Battery negative (-) → Shift solenoid valve S1 body</li> </ul>	Valve moves and makes an operating noise
---	--

If the result is not as specified, replace the solenoid valve.

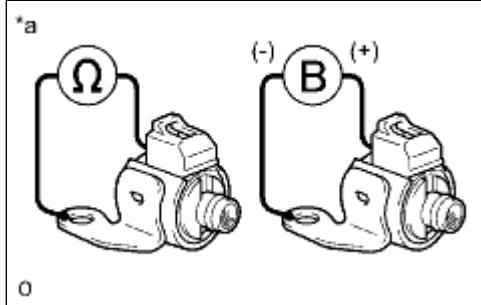
## 5. INSPECT SHIFT SOLENOID VALVE S2

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve S2 connector terminal - Shift solenoid valve S2 body	20°C (68°F)	11 to 15 Ω

### Text in Illustration



\*a Component without harness connected  
(Shift Solenoid Valve S2)

(b) Apply 12 V battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

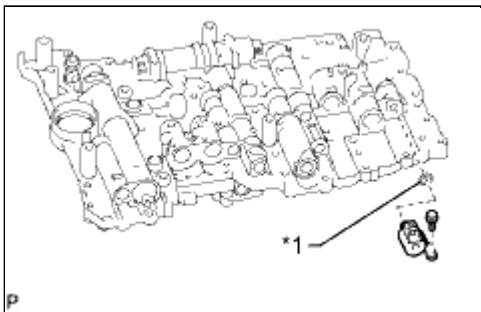
MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve S2 connector</li> <li>Battery negative (-) → Shift solenoid valve S2 body</li> </ul>	Valve moves and makes an operating noise

If the result is not as specified, replace the solenoid valve.

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FH01XX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL SHIFT SOLENOID VALVE S2**



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

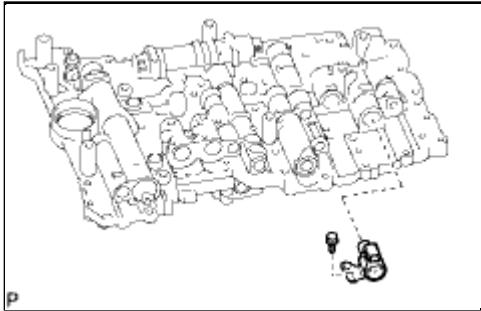
#### **Text in Illustration**

\*1

New O-Ring

(b) Install the solenoid valve with the bolt.

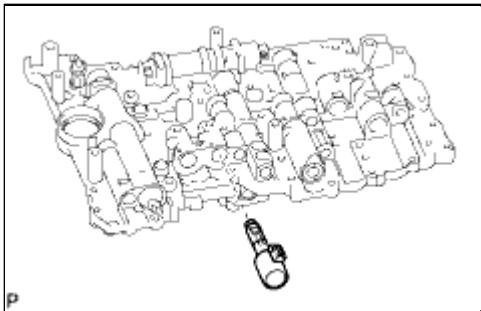
**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**



### **2. INSTALL SHIFT SOLENOID VALVE S1**

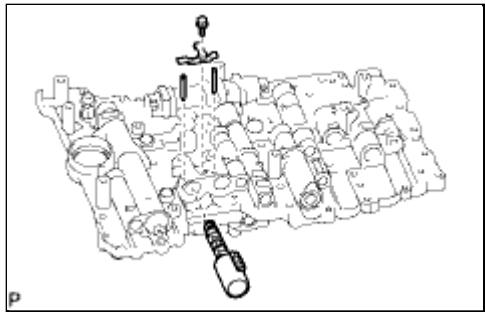
(a) Install the solenoid valve with the bolt.

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



### **3. INSTALL SHIFT SOLENOID VALVE SL1**

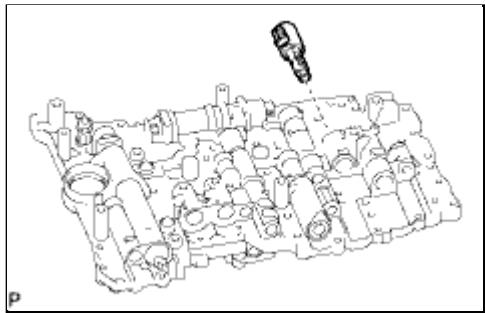
### **4. INSTALL SHIFT SOLENOID VALVE SLT**



(a) Install the solenoid valve.

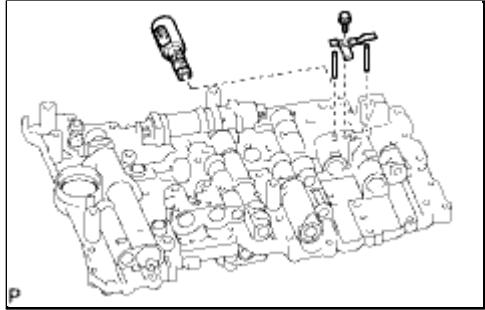
(b) Install the 2 straight pins and solenoid lock plate with the bolt.

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



## 5. INSTALL SHIFT SOLENOID VALVE SL2

## 6. INSTALL SHIFT SOLENOID VALVE SLU



(a) Install the solenoid valve.

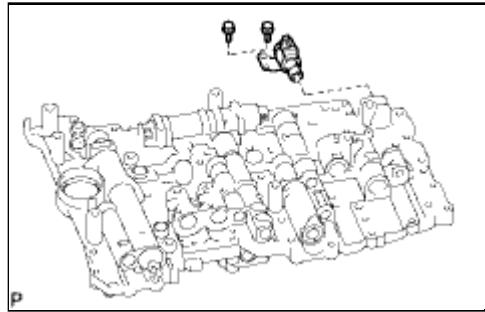
(b) Install 2 straight pins and solenoid lock plate with the bolt.

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

## 7. INSTALL SHIFT SOLENOID VALVE SR

(a) Install the solenoid valve with the 2 bolts.

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



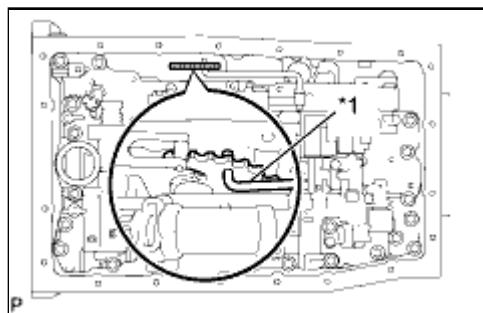
cardiagn.com

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013CK02MX
<b>Title:</b> A750E AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TRANSMISSION VALVE BODY ASSEMBLY

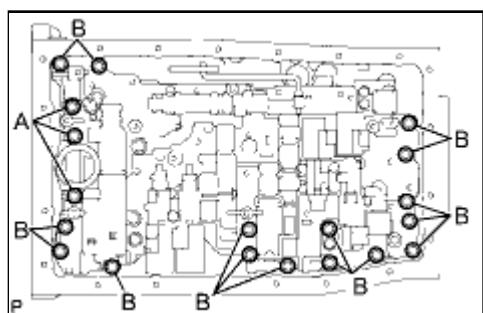
(a) Install the spring and check ball body.



(b) Insert the pin of the manual valve into the hole of the manual valve lever.

#### Text in Illustration

*1	Pin
----	-----



(c) Install the transmission valve body assembly with the 19 bolts.

**Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

#### HINT:

Each bolt length is indicated below.

36 mm (1.42 in.) for bolt A

25 mm (0.984 in.) for bolt B

(d) Install the detent spring cover and detent spring with the bolt.

**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

### 2. CONNECT TRANSMISSION WIRE

**INFO**

### 3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY

**INFO**

### 4. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY

**INFO**

### 5. ADD AUTOMATIC TRANSMISSION FLUID

(a) Add automatic transmission fluid **INFO**.

### 6. PERFORM RESET MEMORY

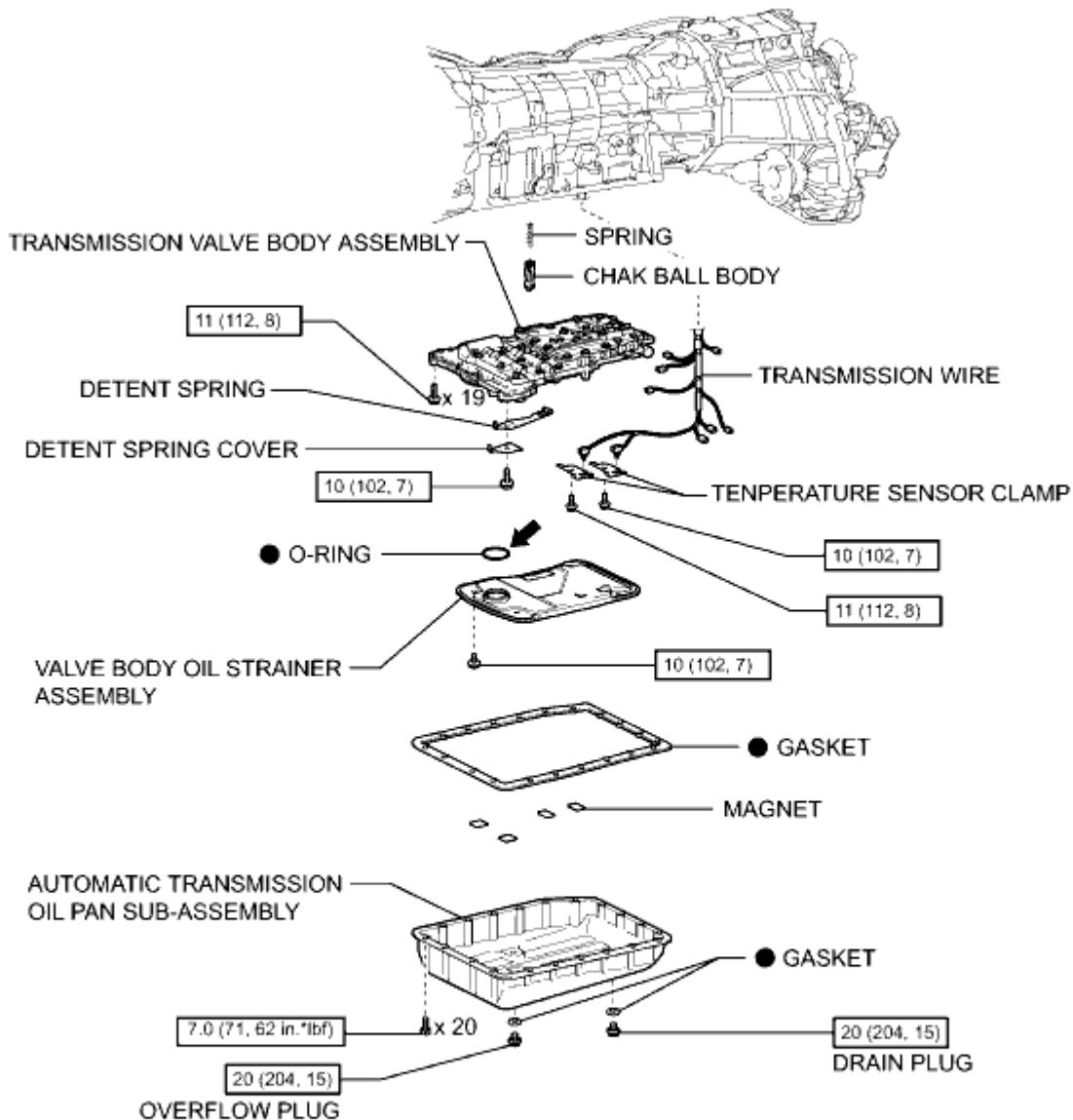
(a) Perform the RESET MEMORY procedures (A/T initialization) **INFO**.



<b>Last Modified:</b> 5-10-2010	6.4 K	<b>From:</b> 200908
<b>Model Year:</b> 2010	<b>Model:</b> 4Runner	<b>Doc ID:</b> RM000002BKZ01TX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: COMPONENTS (2010 4Runner)		

## **COMPONENTS**

## **ILLUSTRATION**



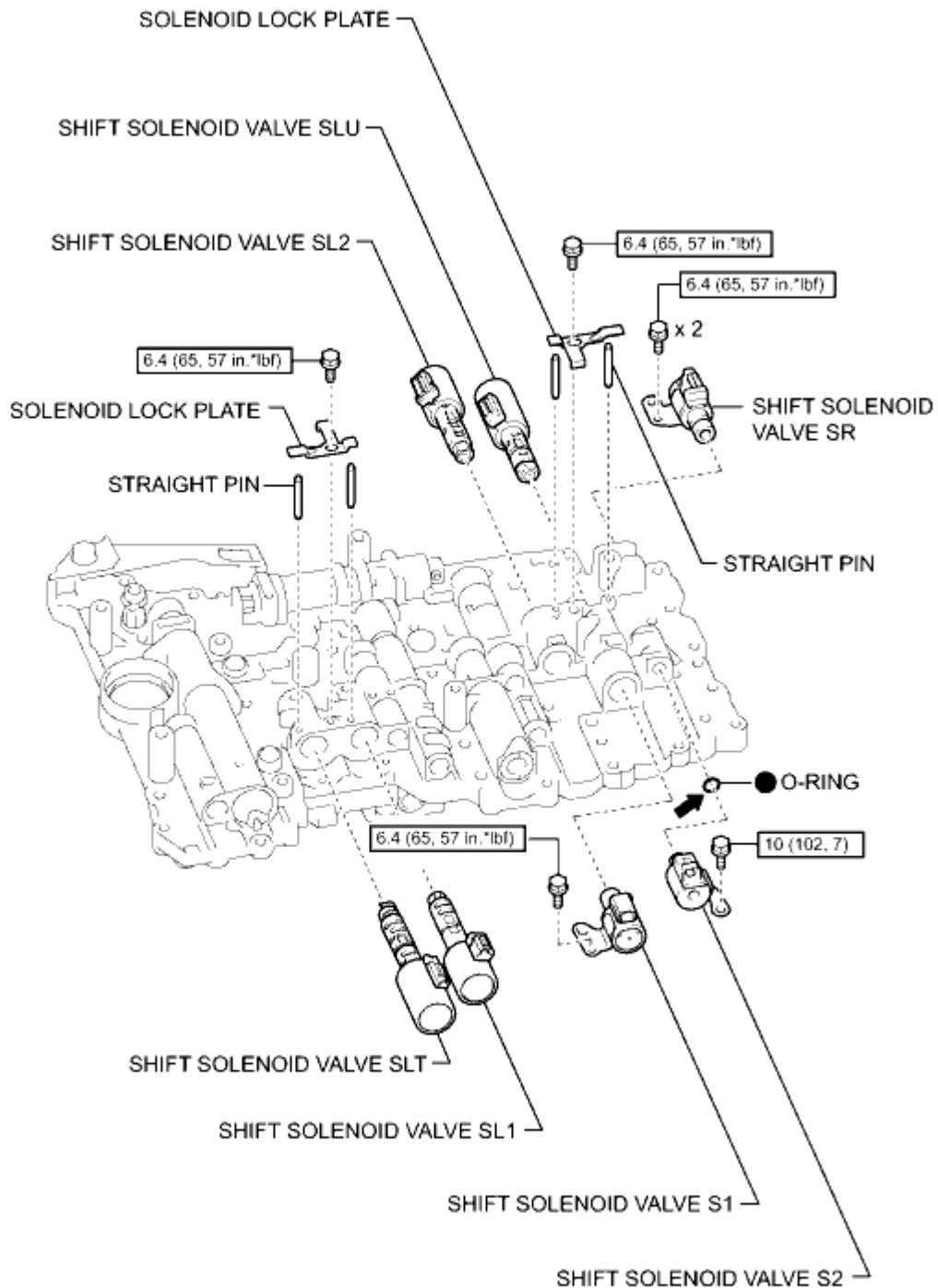
**N<sup>•</sup>m (kgf<sup>•</sup>cm, ft.<sup>•</sup>lbf)**: Specified torque

● Non-reusable part

← Toyota Genuine ATF WS

P

## ILLUSTRATION



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

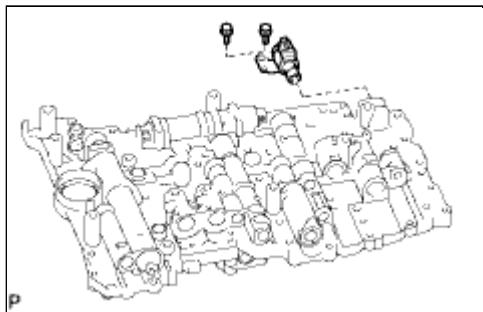
● Non-reusable part

← Toyota Genuine ATF WS

Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FG01XX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: DISASSEMBLY (2010 4Runner)		

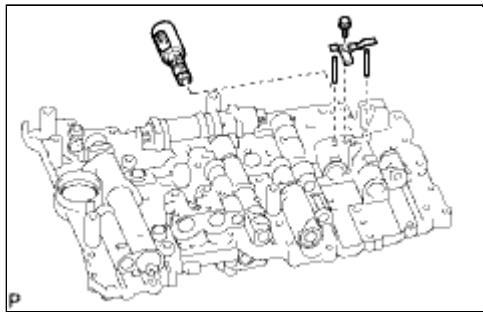
## **DISASSEMBLY**

### **1. REMOVE SHIFT SOLENOID VALVE SR**



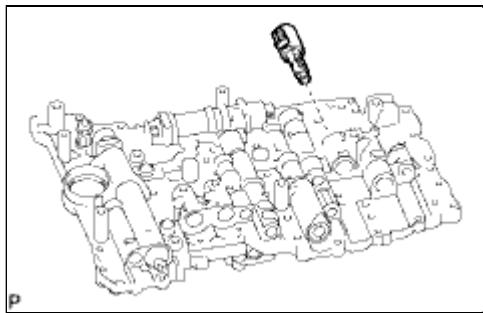
(a) Remove the 2 bolts and solenoid valve.

### **2. REMOVE SHIFT SOLENOID VALVE SLU**



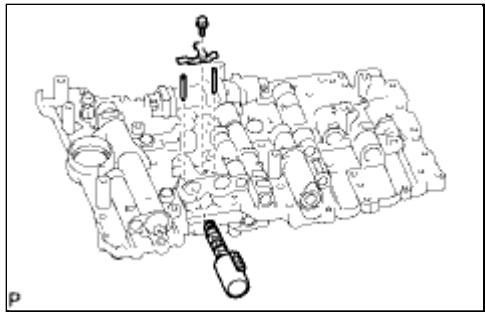
(a) Remove the bolt, solenoid lock plate and 2 straight pins.

(b) Remove the solenoid valve.



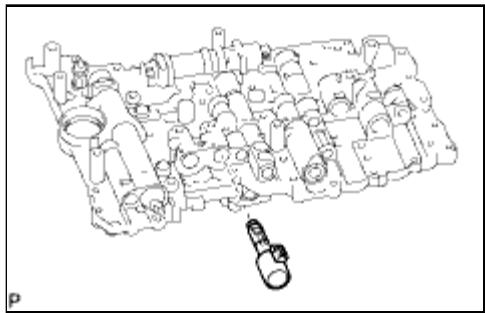
### **3. REMOVE SHIFT SOLENOID VALVE SLT**

### **4. REMOVE SHIFT SOLENOID VALVE SLT**

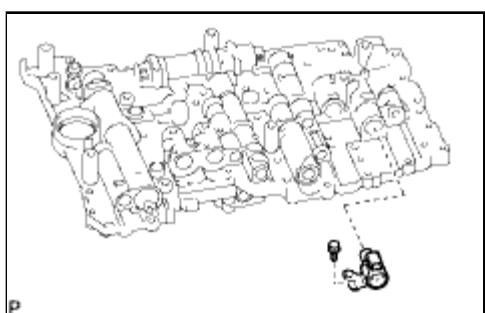


(a) Remove the bolt, solenoid lock plate and 2 straight pins.

(b) Remove the solenoid valve.



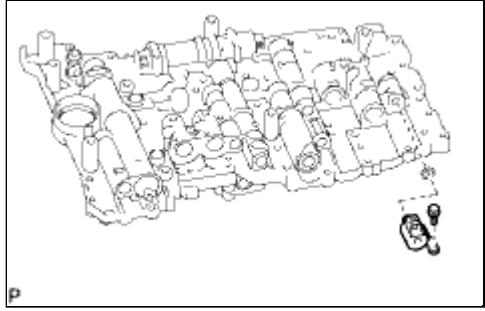
## 5. REMOVE SHIFT SOLENOID VALVE S1



(a) Remove the bolt and shift solenoid valve S1.

## 7. REMOVE SHIFT SOLENOID VALVE S2

(a) Remove the bolt and solenoid valve.



(b) Remove the O-ring from the shift solenoid valve.

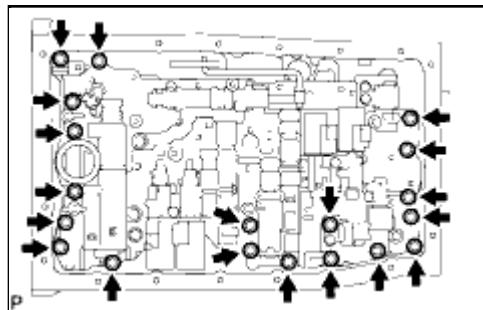


Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013CM02NX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REMOVAL (2010 4Runner)		

## REMOVAL

1. DRAIN AUTOMATIC TRANSMISSION FLUID INFO
2. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY INFO
3. REMOVE VALVE BODY OIL STRAINER ASSEMBLY INFO
4. DISCONNECT TRANSMISSION WIRE INFO
5. REMOVE TRANSMISSION VALVE BODY ASSEMBLY

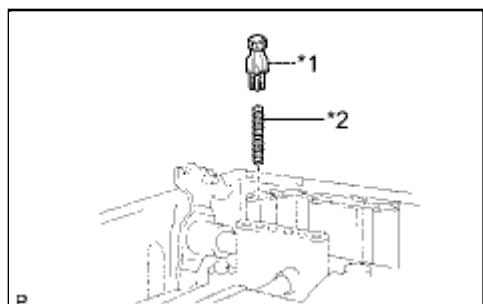
(a) Remove the bolt, detent spring cover and detent spring.



(b) Remove the 19 bolts and valve body.

(c) Remove the check ball body and spring.

### Text in Illustration



* 1	Check Ball Body
* 2	Spring

#### NOTICE:

**Do not drop the check ball body and spring.**

Last Modified: 5-10-2010	6.4 G	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM00000301D00KX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSPECTION (2010 4Runner)		

## **INSPECTION**

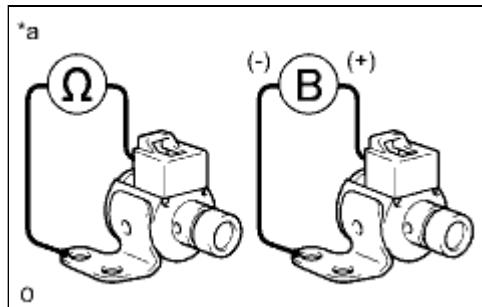
### **1. INSPECT SHIFT SOLENOID VALVE SR**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve SR connector terminal - Shift solenoid valve SR body	20°C (68°F)	11 to 15 Ω

#### **Text in Illustration**



*a	Component without harness connected (Shift Solenoid Valve SR)
----	--

(b) Apply 12 V of battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve SR connector</li> <li>Battery negative (-) → Shift solenoid valve SR body</li> </ul>	Valve moves and makes an operating noise

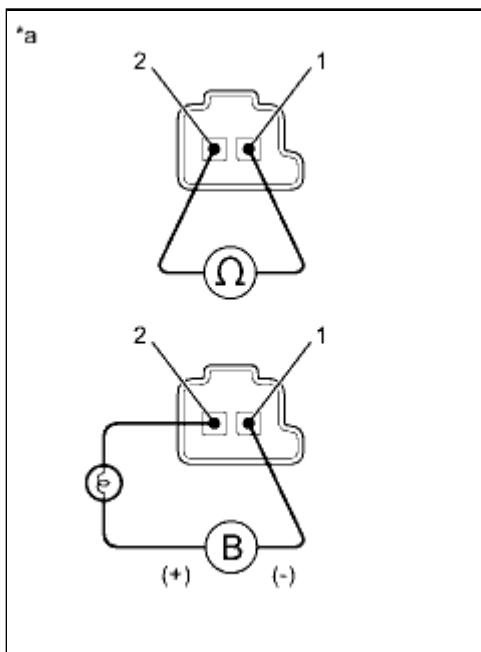
If the result is not as specified, replace the solenoid valve.

### **2. INSPECT SHIFT SOLENOID VALVE SLU AND SLT**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω



## Text in Illustration

*a	Component without harness connected (Shift Solenoid Valve)
----	---

(b) Apply 12 V of battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"><li>Battery positive (+) with a 21 W bulb → Terminal 2</li><li>Battery negative (-) → Terminal 1</li></ul>	Valve moves and makes an operating noise

If the result is not as specified, replace the solenoid valve.

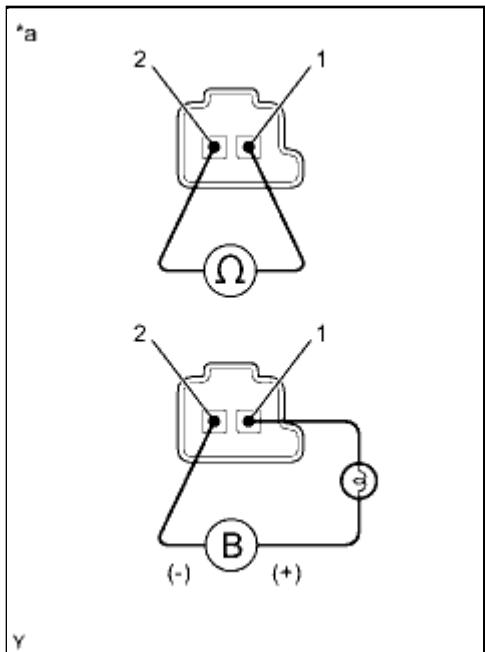
## 3. INSPECT SHIFT SOLENOID VALVE SL1 AND SL2

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	20°C (68°F)	5.0 to 5.6 Ω

## Text in Illustration



\*a Component without harness connected  
(Shift Solenoid Valve)

(b) Apply 12 V of battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) with a 21 W bulb → Terminal 1</li> <li>Battery negative (-) → Terminal 2</li> </ul>	Valve moves and makes an operating noise

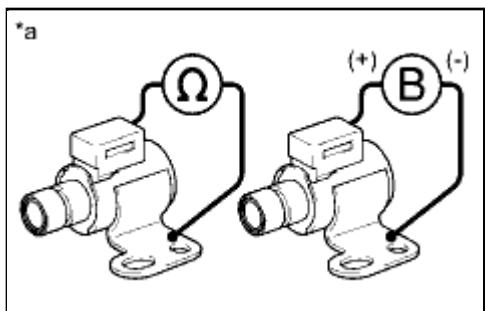
If the result is not as specified, replace the solenoid valve.

#### 4. INSPECT SHIFT SOLENOID VALVE S1

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve S1 connector terminal - Shift solenoid valve S1 body	20°C (68°F)	11 to 15 Ω



#### Text in Illustration

\*a Component without harness connected  
Shift Solenoid Valve S1

(b) Apply 12 V of battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve S1 connector</li> <li>Battery negative (-) → Shift solenoid valve S1 body</li> </ul>	Valve moves and makes an operating noise

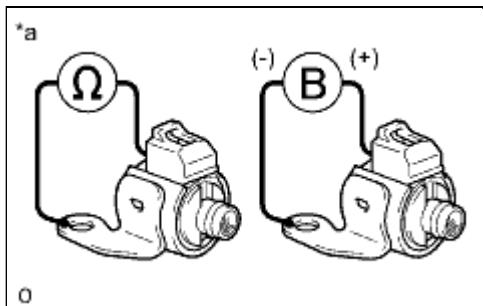
If the result is not as specified, replace the solenoid valve.

## 5. INSPECT SHIFT SOLENOID VALVE S2

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
Shift solenoid valve S2 connector terminal - Shift solenoid valve S2 body	20°C (68°F)	11 to 15 Ω



### Text in Illustration

\*a

Component without harness connected  
Shift Solenoid Valve S2

(b) Apply 12 V of battery voltage to the shift solenoid valve and check that the valve moves and makes an operating noise.

OK:

MEASUREMENT CONDITION	SPECIFIED CONDITION
<ul style="list-style-type: none"> <li>Battery positive (+) → Shift solenoid valve S2 connector</li> <li>Battery negative (-) → Shift solenoid valve S2 body</li> </ul>	Valve moves and makes an operating noise

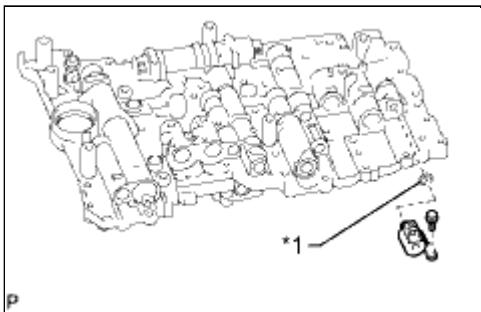
If the result is not as specified, replace the solenoid valve.



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Model Year: 2010	Model: 4Runner	Doc ID: RM0000013FH01YX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: REASSEMBLY (2010 4Runner)		

## **REASSEMBLY**

### **1. INSTALL SHIFT SOLENOID VALVE S2**



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

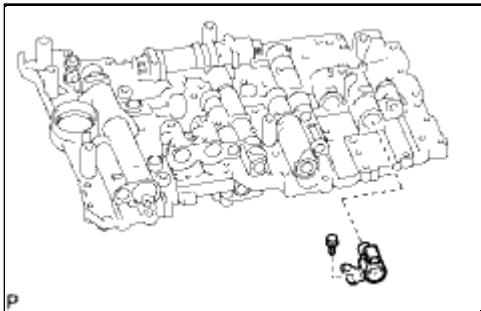
#### **Text in Illustration**

\*1

New O-Ring

(b) Install the solenoid valve with the bolt.

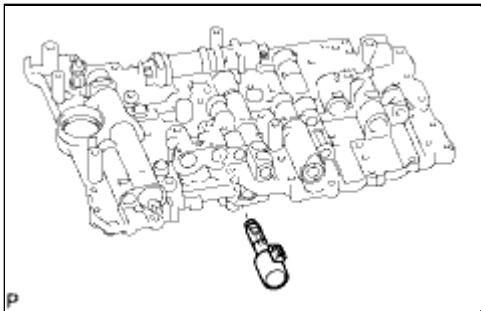
**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**



### **2. INSTALL SHIFT SOLENOID VALVE S1**

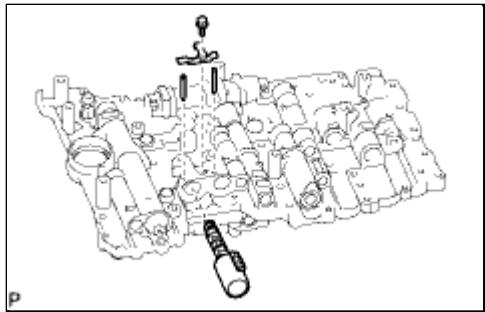
(a) Install the solenoid valve with the bolt.

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



### **3. INSTALL SHIFT SOLENOID VALVE SL1**

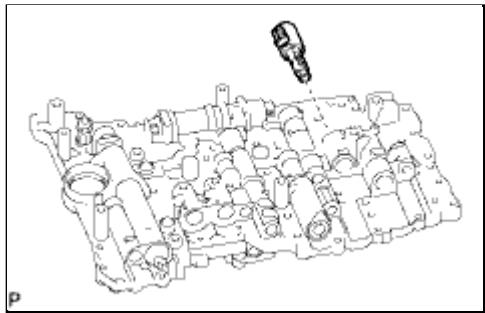
### **4. INSTALL SHIFT SOLENOID VALVE SLT**



(a) Install the solenoid valve.

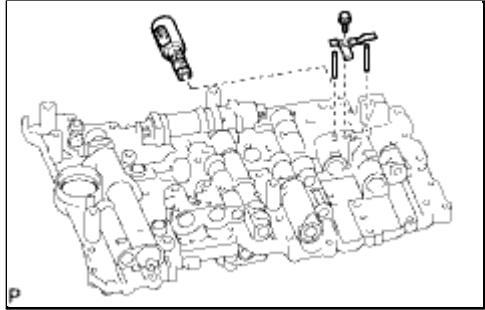
(b) Install the 2 straight pins and solenoid lock plate with the bolt.

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



## 5. INSTALL SHIFT SOLENOID VALVE SL2

## 6. INSTALL SHIFT SOLENOID VALVE SLU



(a) Install the solenoid valve.

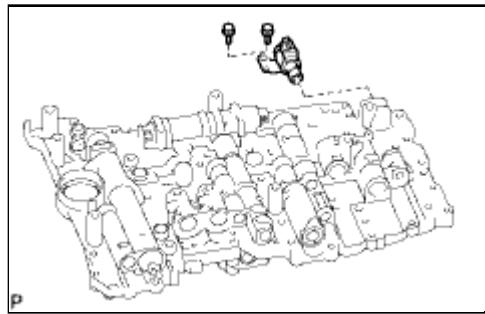
(b) Install the 2 straight pins and solenoid lock plate with the bolt.

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

## 7. INSTALL SHIFT SOLENOID VALVE SR

(a) Install the solenoid valve with the 2 bolts.

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



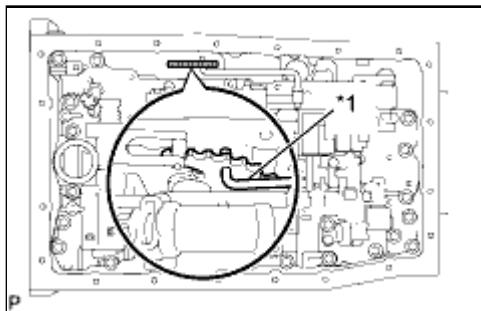
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Last Modified: 5-10-2010	6.4 A	From: 200908
Model Year: 2010	Model: 4Runner	Doc ID: RM0000013CK02NX
<b>Title:</b> A750F AUTOMATIC TRANSMISSION / TRANSAXLE: VALVE BODY ASSEMBLY: INSTALLATION (2010 4Runner)		

## INSTALLATION

### 1. INSTALL TRANSMISSION VALVE BODY ASSEMBLY

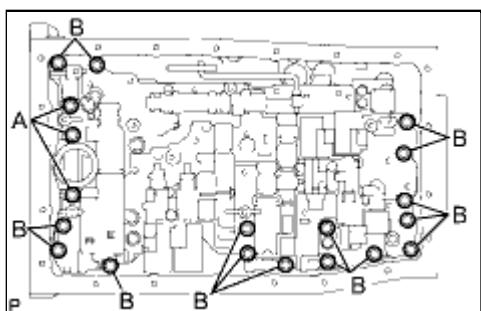
(a) Install the spring and check ball body.



(b) Insert the pin of the manual valve into the hole of the manual valve lever.

#### Text in Illustration

*1	Pin
----	-----



(c) Install the transmission valve body with the 19 bolts.

**Torque: 11 N·m (112 kgf·cm, 8ft·lbf)**

#### HINT:

Each bolt length is indicated below.

32 mm (1.26 in.) for bolt A

25 mm (0.984 in.) for bolt B

(d) Install the detent spring and detent spring cover with the bolt.

**Torque: 10 N·m (102 kgf·cm, 7ft·lbf)**

### 2. CONNECT TRANSMISSION WIRE INFO

### 3. INSTALL VALVE BODY OIL STRAINER ASSEMBLY INFO

### 4. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB-ASSEMBLY INFO

### 5. ADD AUTOMATIC TRANSMISSION FLUID

(a) Add automatic transmission fluid INFO.

### 6. PERFORM RESET MEMORY

Perform the RESET MEMORY procedures (A/T initialization INFO).

