SECTION 5A3

AISIN 50–40LE AUTOMATIC TRANSAXLE

CAUTION: Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in LOCK unless otherwise noted.

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SPECIFICATIONS

TRANSAXLE SPECIFICATIONS

Transaxle Capacity	
Maximum Torque Multiplication of the Torque Converter	2.0
Torque Converter Diameter	241 mm (9.5 in.)
Ratios	
First Gear	3.900:1
Second Gear	2.228:1
Third Gear	1.477:1
Fourth Gear	1.062:1
Reverse	4.271:1
Measurements	
Weight of Transaxle	81 kg (178.6 lb)
Fluid Capacity	7.5 L (7.9 qts)
Automatic Transaxle Fluid	TOTAL FLUID HX

FLUID LEVEL SET AFTER SERVICE

Repair	Amount of Fluid to Add After Repair
Maintenance Replace	2.5 – 3.0L (2.6 – 3.1 qts)
Complete Overhaul	5.5 – 6.0L (5.8 – 6.3 qts)
Dry	6.5 – 7.0L (6.9 – 7.4 qts)

Important: Make sure to maintain the proper fluid level in the transaxle. After each repair or service procedure, add the specified amount of fluid and check to confirm that the transaxle contains the appropriate fluid level. Refer to "Transaxle Fluid Level Checking Procedure" in this section.

LINE PRESSURE SPECIFICATION

Application	Idling	Stall
At "D" range	3.5 – 4.1 kg/cm^2 (50–58 psi)	10.6 – 13.6 kg/cm^2(151–193 psi)
At "R" range	6.0 – 7.0 kg/cm^2 (85–100 psi)	16.3 – 20.5 kg/cm^2(282–292 psi)

RANGE REFERENCE

Range		Park/ Neutral	Reverse	D				3			L	
Gear		P/N	R	1st	2nd	3rd	4th	1st	2nd	3rd	1st	2nd
C_1	Forward Clutch			A	A	A	A	A	A	A	A	A
C_2	Direct Clutch		A				A					
C_3	Under Drive Clutch					A	A			A		
B_1	2nd Coast Brake				O	O			O	O		O
B_2	2nd Brake				O	O	O		O	O		O
B_3	1st & Reverse Brake		O								O	
B_4	Under Drive Brake	O	O	O	O			O	O		O	O
F_1	Planetary Sungear Oneway Clutch				L	L			L	L		L
F_2	Ring Gear OneWay Clutch			L				L			L	
F_3	Under Drive Planetry Sungear Oneway Clutch			L	L			L	L		L	L
S_1	Solenoid No. 1	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	ON
S_2	Solenoid No. 2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	ON	ON

A : Applied L : Locking

FASTENER TIGHTENING SPECIFICATIONS

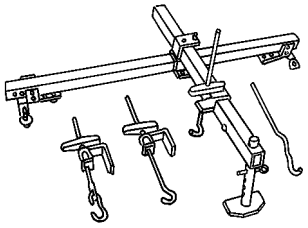
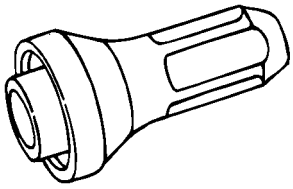
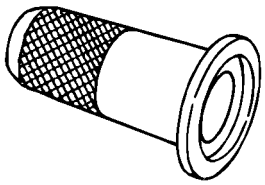
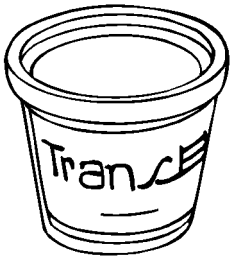
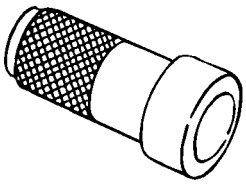
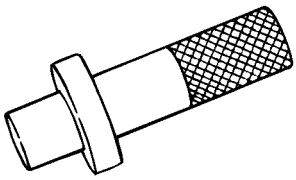
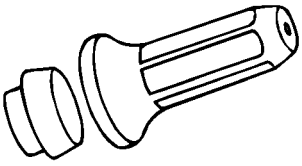
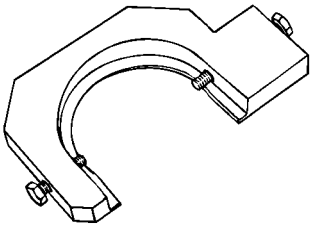
Application	N•m	Lb-Ft	Lb-In
Accumulator Piston Cover Screws	8-12	—	71-106
Coolant Surge Tank Bolt	25	18	—
Fluid Cooler Pipe to Radiator Bolt	20-29	15-22	—
Fluid Cooler Pipe to Transaxle Bolts	20-29	15-22	—
Fluid Filler Tube Bracket Nut	15	11	—
Front Engine Mount Bracket to Engine Bolts	90	66	—
Front Engine Mount Bracket to Transaxle through Bolts	90	66	—
Input Shaft Speed (ISS) Sensor	4-7	—	35-62
Key Interlock Solenoid Screws	2	—	18
Linear Solenoid to Valve Body Clamp Bolt	6-7	—	53-62
Lockup Solenoid to Valve Body Clamp Bolt	6-7	—	53-62
Lube Apply Tube Clamp Bolt	4-7	—	35-62
Oil Pan-to-Transaxle Case Bolts	40	30	—
Oil Pump–to–Transaxle Case Bolts	20-29	15-22	—
Output Shaft Speed (OSS) Sensor	4-7	—	35-62
Park/Neutral Position (PNP) Switch Bolt	10-16	7-11	—
Park/Neutral Position (PNP) Switch Retaining Nut	6-8	—	53-71
Park/Neutral Position (PNP) Switch Stud Bolt	20-29	15-22	—
Rear Valve Body Cover Plate No. 1 Bolts	6-7	—	53-62
Rear Valve Body Cover Plate No. 2 Bolts	6-7	—	53-62
Ring Gear Locking Plate Set Bolts	90-103	66-76	—
Shift Control Cable Adjuster Pinch Bolt Nut	8	—	71
Shift Control Cable Linkage Retaining Nut	15	11	—
Shift Control Cable Mounting Bracket Nuts	6	—	53
Shift Interlock Solenoid Bolts	4	—	36
Shift Solenoid 1 (SS1)–to–Valve Body Bolt	6-7	—	53-62
Shift Solenoid 2 (SS2)–to–Valve Body Bolt	6-7	—	53-62
Stator Support–to–Oil Pump Body M5 Bolts	6-7	—	53-62
Stator Support–to–Oil Pump Body M6 Bolts	10-14	—	89-124
Torque Converter–to–Flex Plate Bolts	60	44	—
Transaxle Cam Plate and Detent Spring Retaining Bolts	8-12	—	71-106
Transaxle Case Plate Bolts	4-7	—	35-62
Transaxle Center Bracket–to–Transaxle Bolts	90	66	—
Transaxle Center Mount–to–Center Member Bolts	65	48	—
Transaxle Housing–to–Transaxle Case Bolts	23-35	17-26	—
Transaxle Housing Cover–to–Transaxle Case Bolts	6-9	—	53-78
Transaxle Left Bracket–to– Transaxle Bolts	48	35	—
Transaxle Left Mount–to–Transaxle Left Bracket Bolt	48	35	—
Transaxle Fluid Drain Plug	23-55	17-40	—

Fastener Tightening Specifications (Cont'd)

Application	N•m	Lb-Ft	Lb-In
Transaxle Oil Filter Bolts	4-7	—	35-62
Transaxle Oil Reserver Plate Bolts	4-7	—	35-62
Transaxle Rear Case–to–Transaxle Case M6 Bolts	8-12	—	71-106
Transaxle Rear Case–to–Transaxle Case M8 Bolts	20-29	15-22	—
Transmission Fluid Temperature (TFT) Sensor	7-13	—	62-115
Transmission Fluid Temperature (TFT) Sensor Protector Bolt	20-29	15-22	—
Transmission Fluid Temperature (TFT) Sensor Protector Nut	20-29	15-22	—
Underdrive Brake Accumulator Bracket Bolts	8-12	—	71-106
Underdrive Brake Band Anchor Bolt	133-200	100-149	—
Valve Body–to–Case Bolts	6-7	—	53-62
Valve Body Cover–to–Case Bolts	20-30	15-22	—
Valve Body Suction Cover–to–Case Bolts	6-7	—	53-62

SPECIAL TOOLS

SPECIAL TOOLS TABLE

 A102B152	**J-28467-B Engine Support Fixture**	 C5A0084A	**J-28540-A Seal Installer**
 C5A0010A	**KM-674 Oil Seal Installer**	 C5A0082A	**J-36850 Assembly Lubricant**
 C5A0076A	**KM-697 Bearing Driver**	 C5A0187A	**KM-695 Bearing Driver**
 C5A0083A	**J-41102 Seal Installer**	 C5A0148A	**KM-696 Gear Holder**

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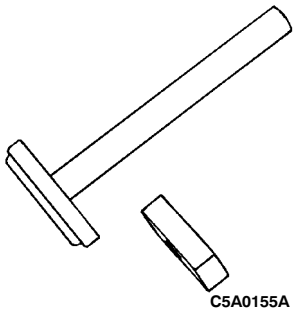
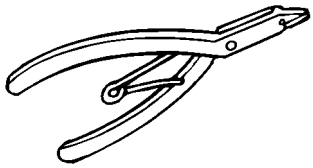
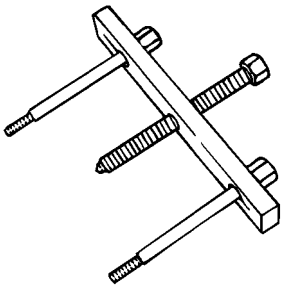
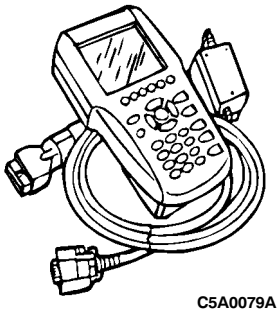
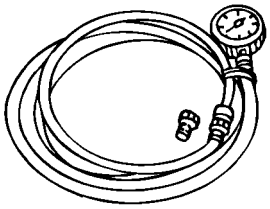
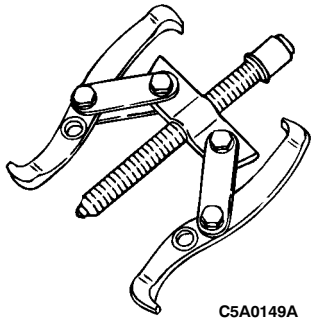
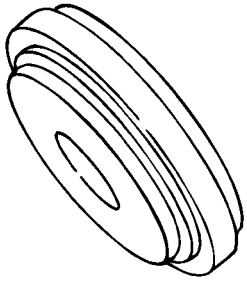
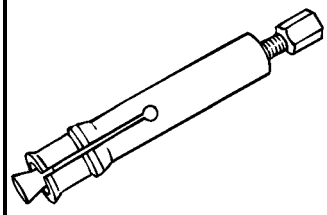
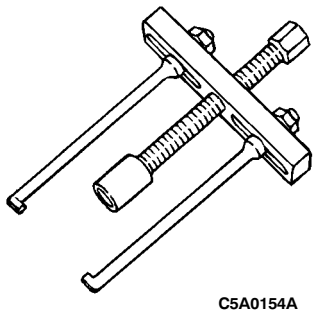
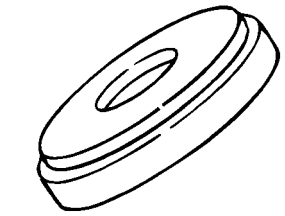
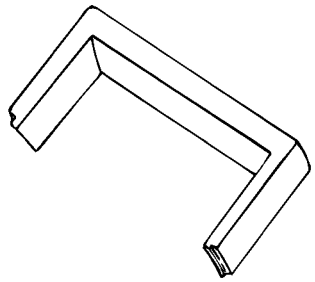
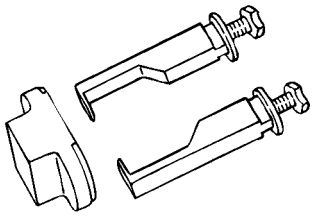
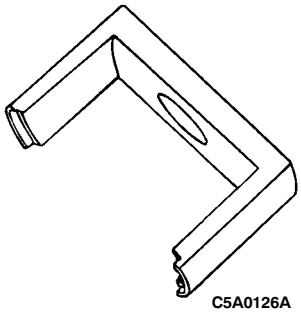
 C5A0155A	**KM-305 Bearing Driver**
 C5A0088A	**KM-396 Snap Ring Pliers**
 C5A0087A	**KM-702 Oil Pump Remover**
 C5A0079A	**DC-11017-A Scan-100 Scan Tool**
 C5A0080A	**KM-498-B Universal Pressure Gauge Set**
 C5A0149A	**KM-161-A Two-Jaw Puller**
 C5A0151A	**KM-695 Bearing Driver Adapter**
 C5A0153A	**KM-J-28544 Bearing Pre-Load Tool**

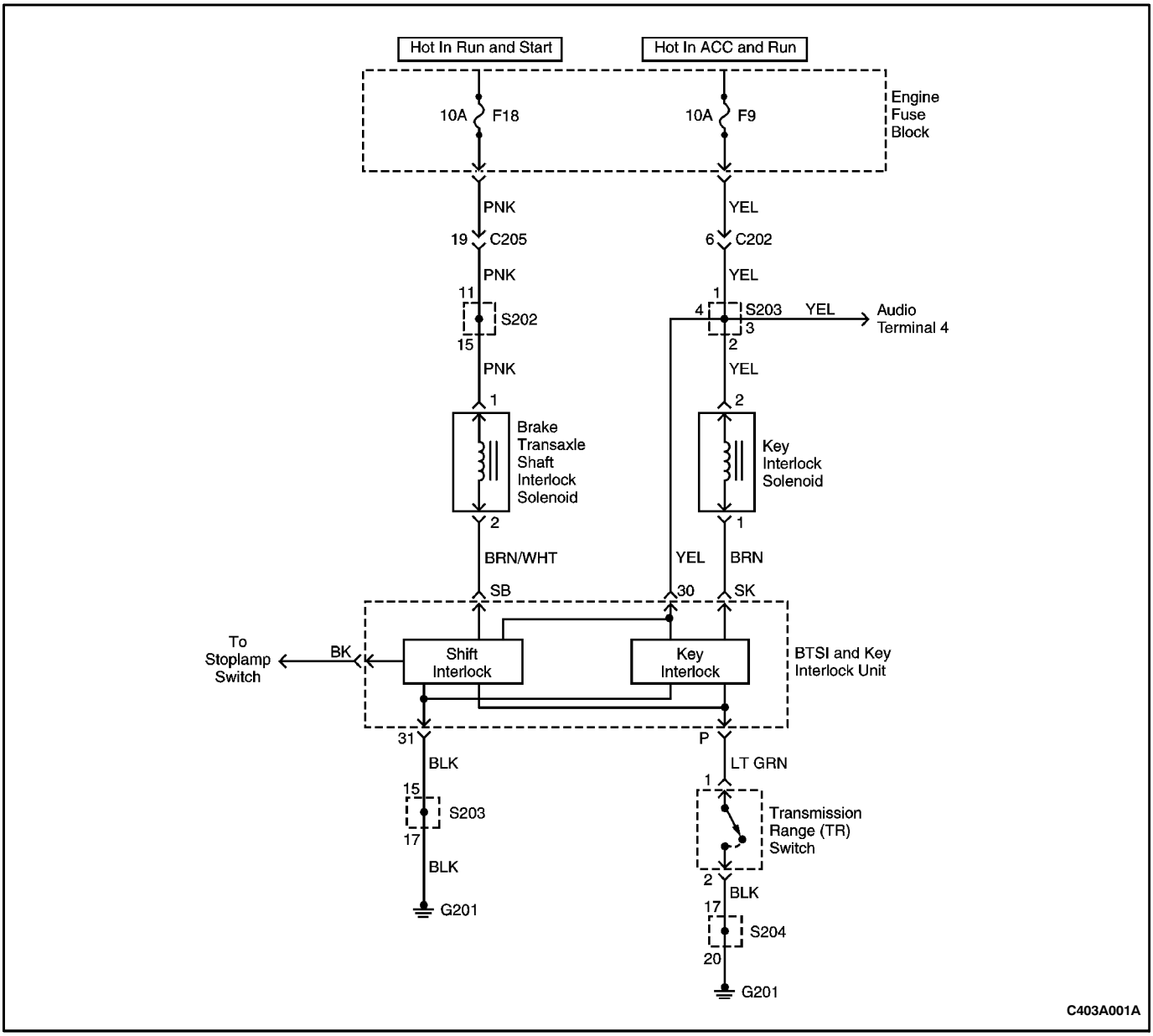
SPECIAL TOOLS TABLE (Cont'd)

 C5A0154A	**KM-210-A Bearing Puller**
 C5A0156A	**KM-695-A Bearing Driver Adapter**
 C5A0145A	**KM-699 Spring Compressor**

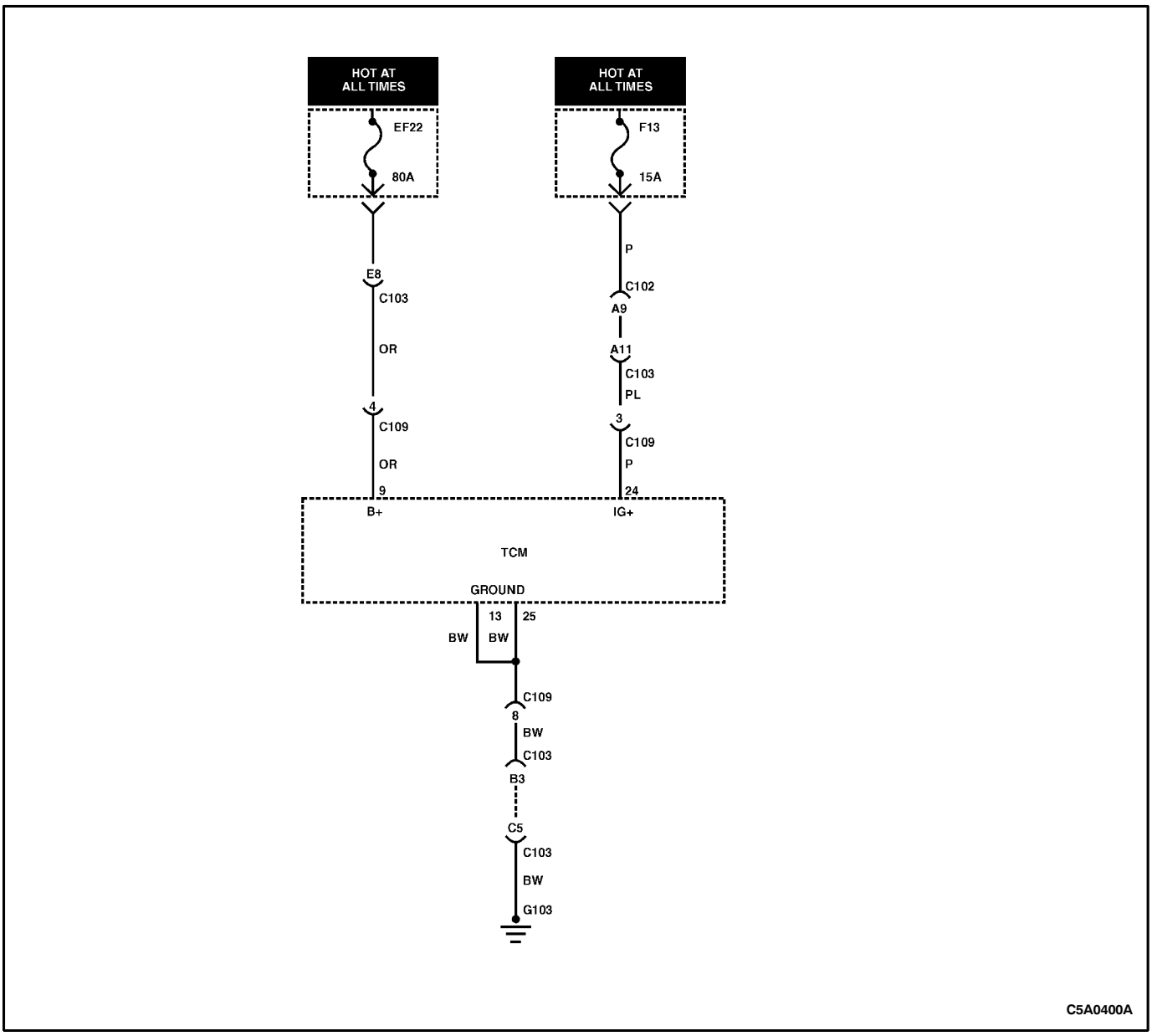
 C5A0150A	**KM-709 Bearing Puller Adapter**
 C5A0126A	**KM-698 Spring Compressor**

SCHEMATIC DIAGRAMS

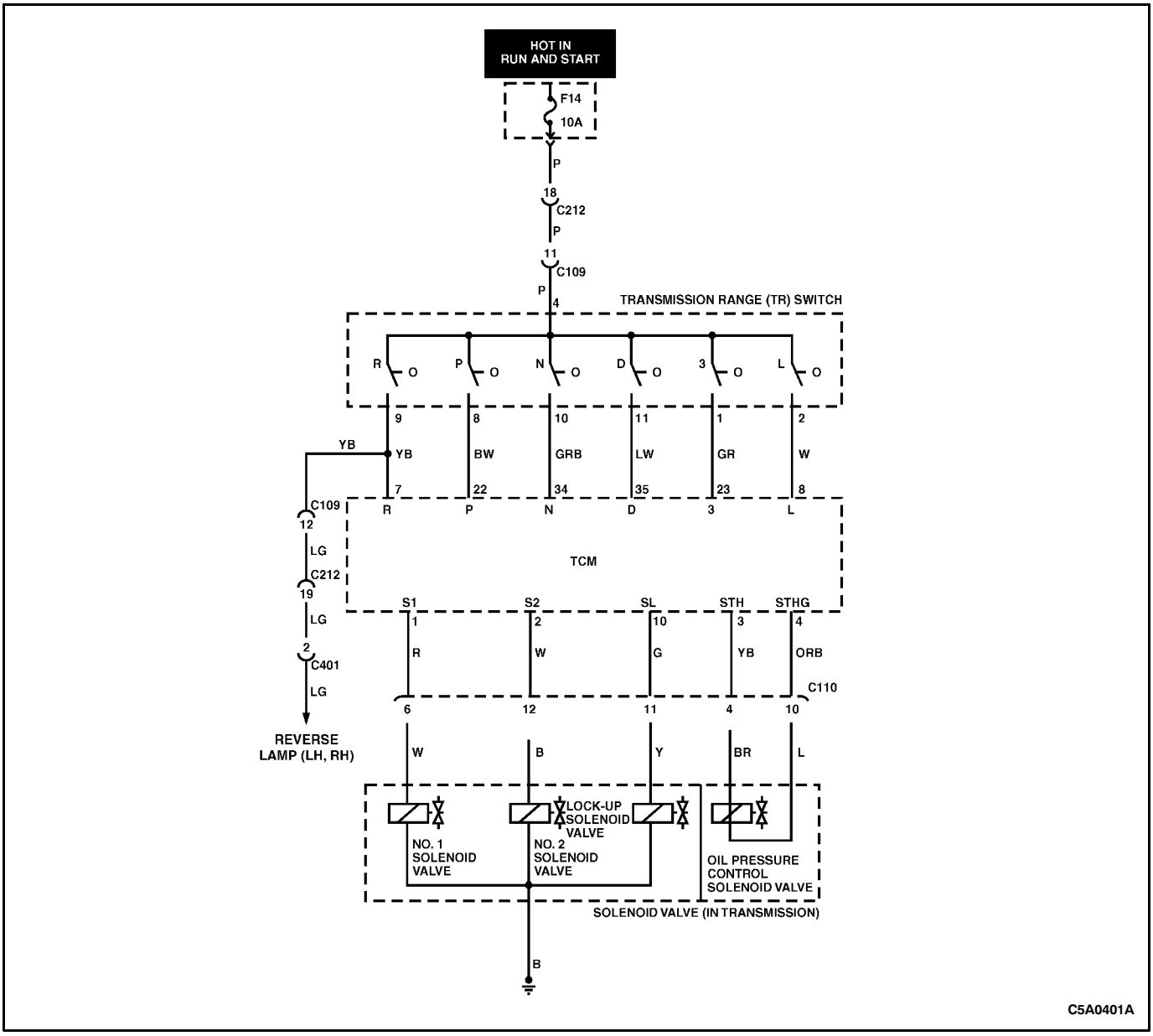
BTSI AND KEY INTERLOCK UNIT



TRANSMISSION CONTROL MODULE (1 OF 5)



TRANSMISSION CONTROL MODULE (2 OF 5)



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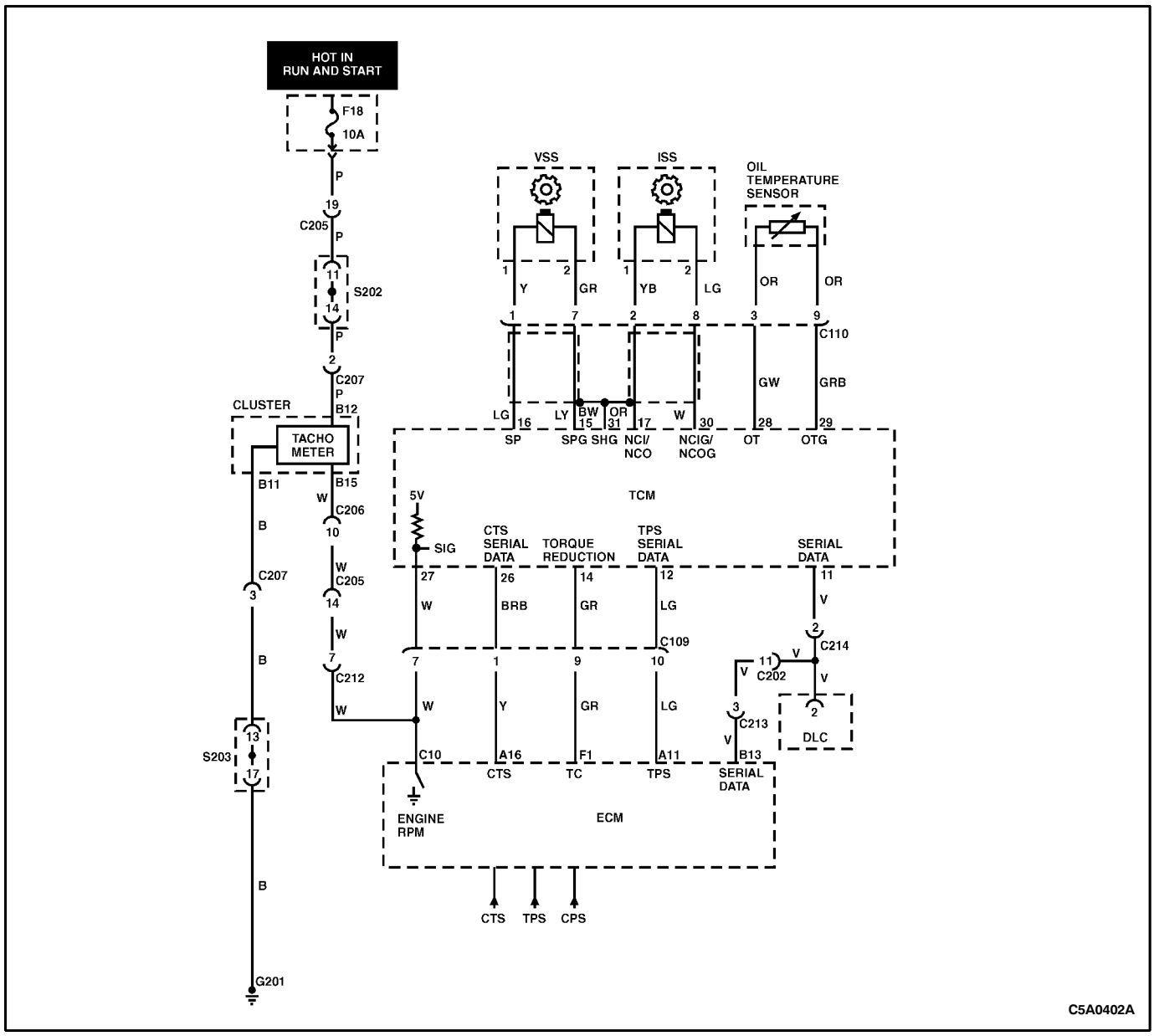

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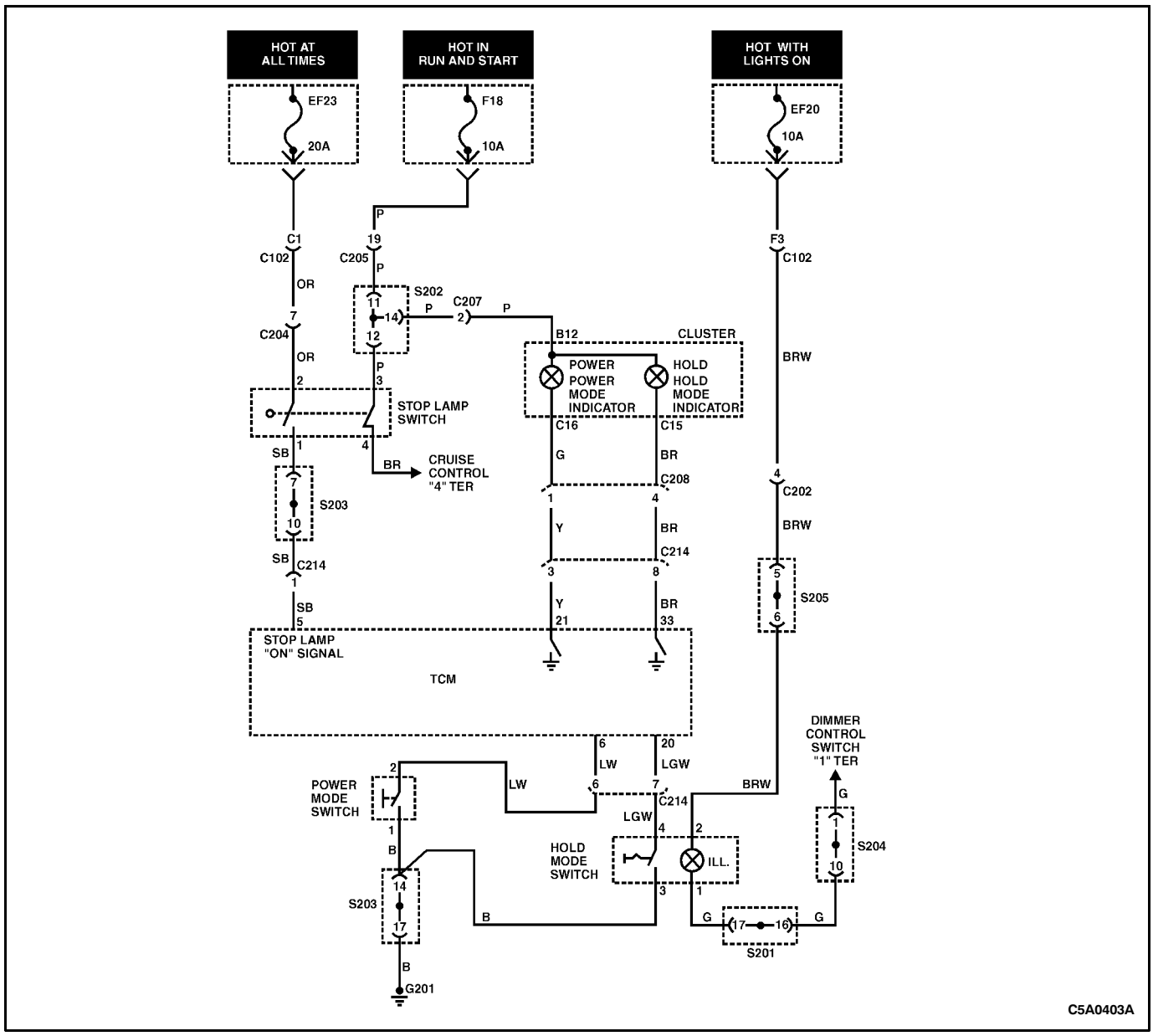

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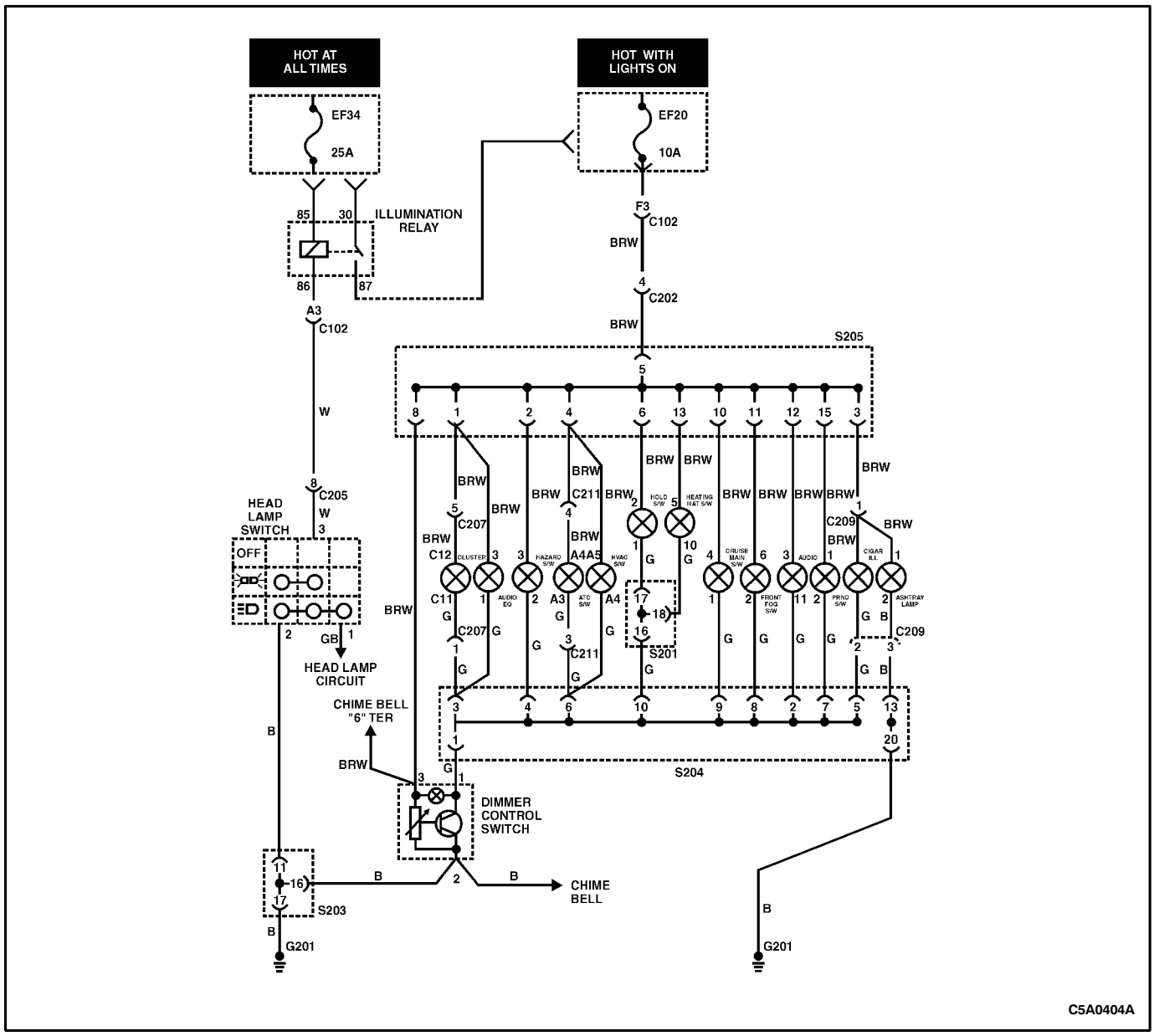
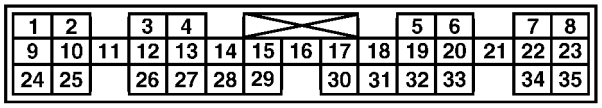
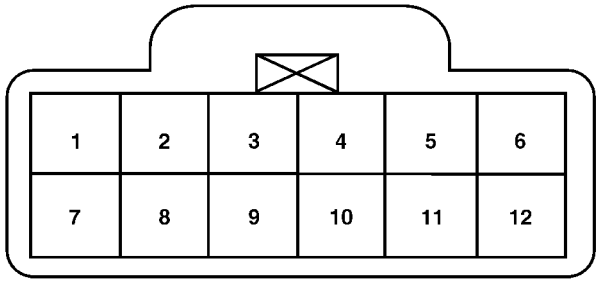


CONNECTOR END VIEW



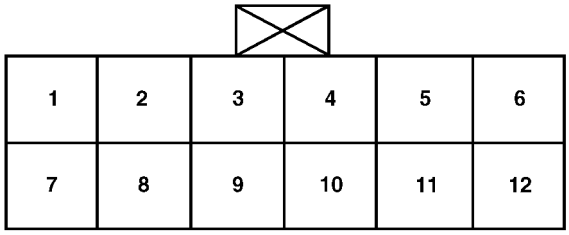
TRANSMISSION CONTROL
MODULE (TCM)
CONNECTOR

C5A0405A



C110
TRANSMISSION CONTROL MODULE (TCM)
SENSOR (BLACK) CONNECTOR

C5A0410A



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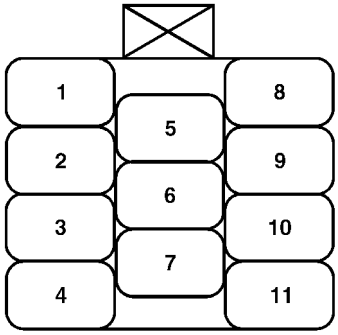
TRANSMISSION CONTROL MODULE (TCM)
ENGINE CONTROL (BLACK) CONNECTOR

C5A0406A



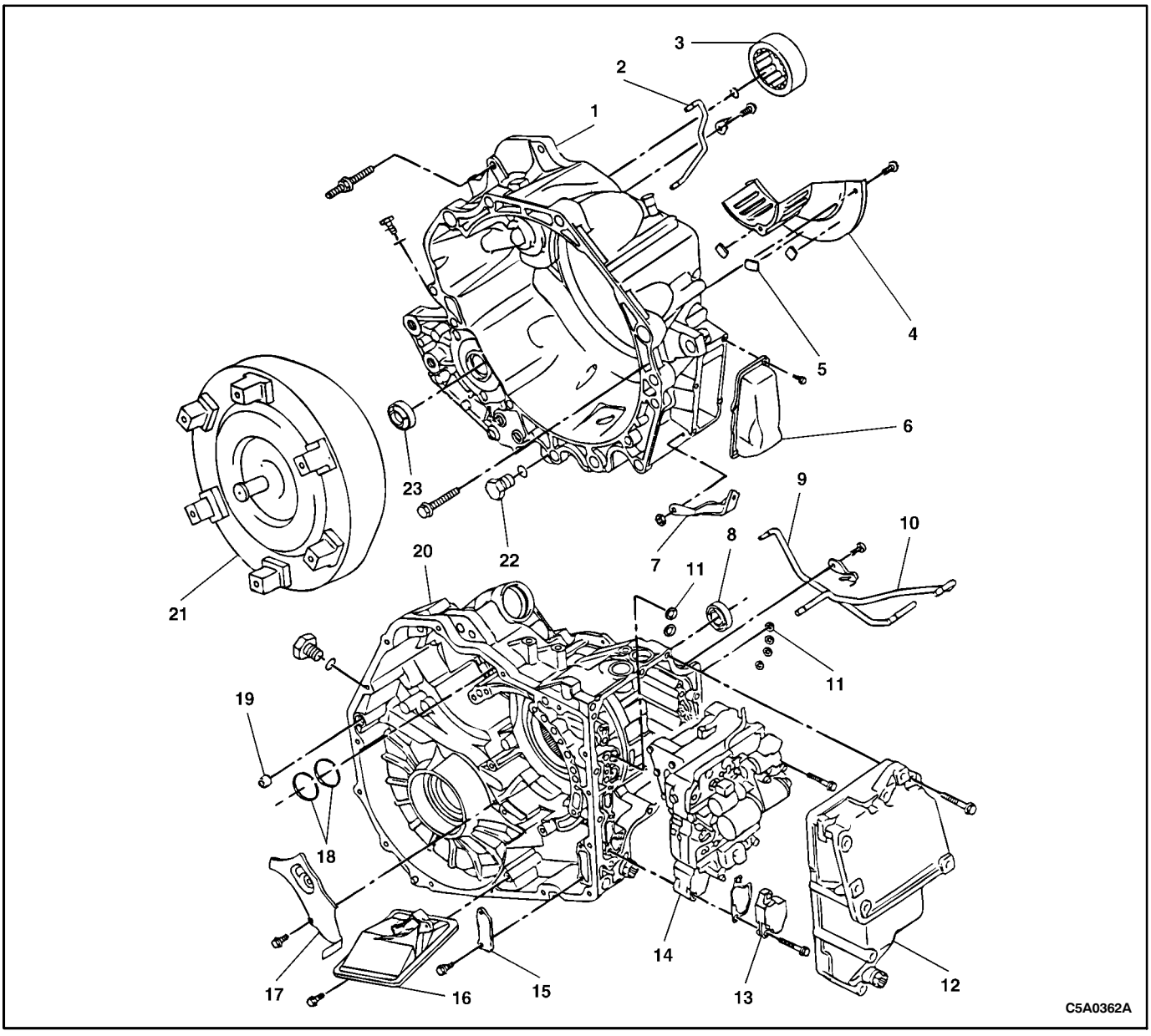
TRANSMISSION RANGE (TR)
SWITCH CONNECTOR

C5A0408A

COMPONENT LOCATOR

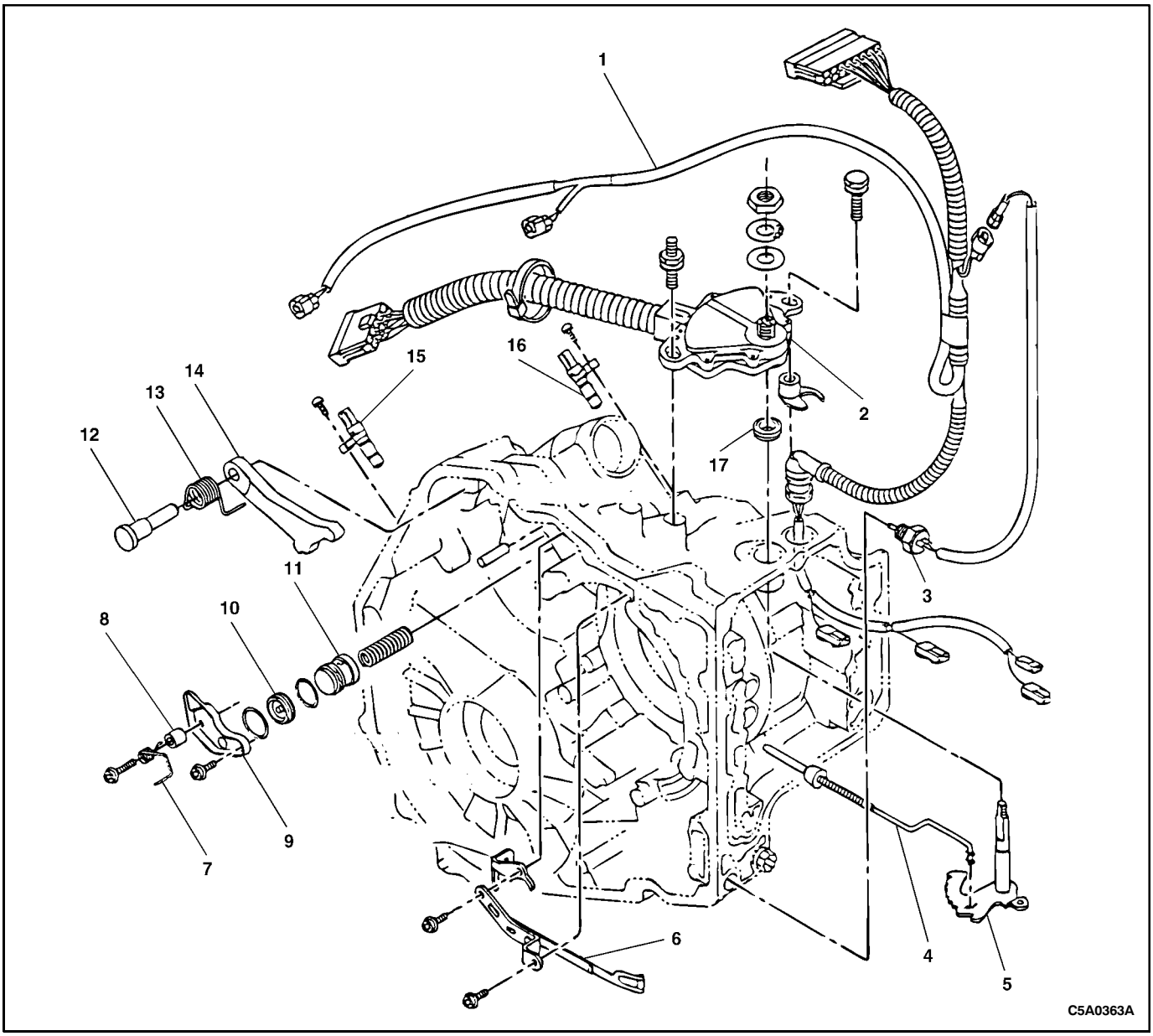
50–40LE AUTOMATIC TRANSAXLE

Component Locator



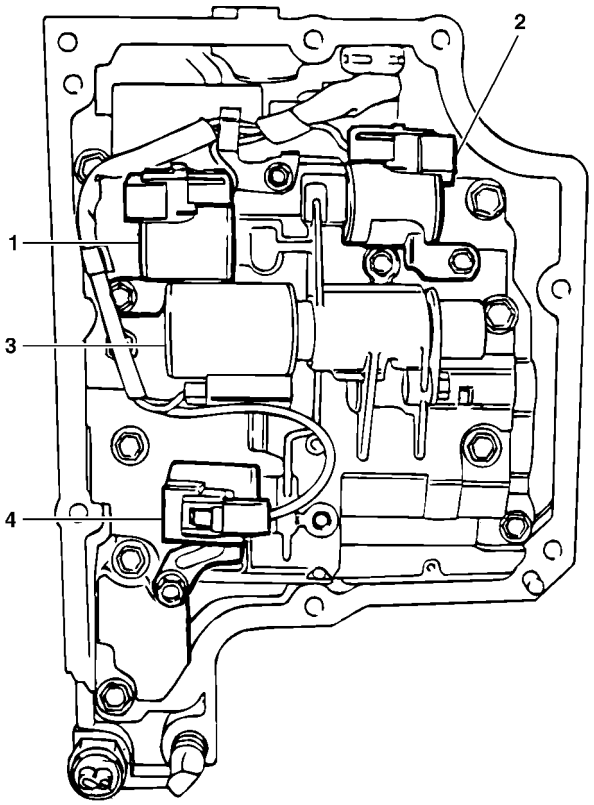
1. Transaxle Housing Side
2. Differential Bearing Lubrication Apply Tube
3. Roller Bearing
4. Oil Reserver Plate
5. Magnet
6. Transaxle Housing Cover
7. Transmission Fluid Temperature (TFT) Sensor Protector Bracket
8. Oil Seal
9. Apply Tube
10. Lubrication Apply Tube
11. Apply Seal
12. Valve Body Cover
13. Suction Cover
14. Valve Body
15. Transaxle Case Plate
16. Oil Filter
17. Oil Reserver Plate
18. Seal Rings
19. Apply Seal
20. Transaxle Case Side
21. Torque Converter
22. Plug
23. Oil Seal

Component Locator



1. Transmission Wire Loom
2. Park/Neutral Position (PNP) Switch
3. Transmission Fluid Temperature (TFT) Sensor
4. Parking Lock Rod
5. Manual Valve Lever
6. Detent Spring
7. Torsion Spring
8. Spring Guide Sleeve
9. Accumulator Bracket
10. Accumulator Cover
11. Accumulator Piston
12. Parking Lock Pawl Shaft
13. Spring
14. Parking Lock Pawl
15. Output Shaft Speed (OSS) Sensor
16. Input Shaft Speed (ISS) Sensor
17. Oil Seal

Component Locator



C5A0372A

1. Shift Solenoid 1 (SS1)
2. Shift Solenoid 2 (SS2)
3. Linear Solenoid (Pressure)
4. Lockup Solenoid

DIAGNOSIS

SYMPTOM DIAGNOSIS

PRELIMINARY CHECKS

To properly diagnose a concern, first understand the condition. Customer contact may be required to begin to verify the concern. Understand the conditions as to when the concern occurs. For example:

- Hot or cold vehicle temperature
- Hot or cold ambient temperature
- Vehicle driving conditions
- Vehicle loaded or unloaded

After understanding when and how the concern occurs, proceed to verify the concern. Perform the following initial steps before performing on–board diagnostic procedures.

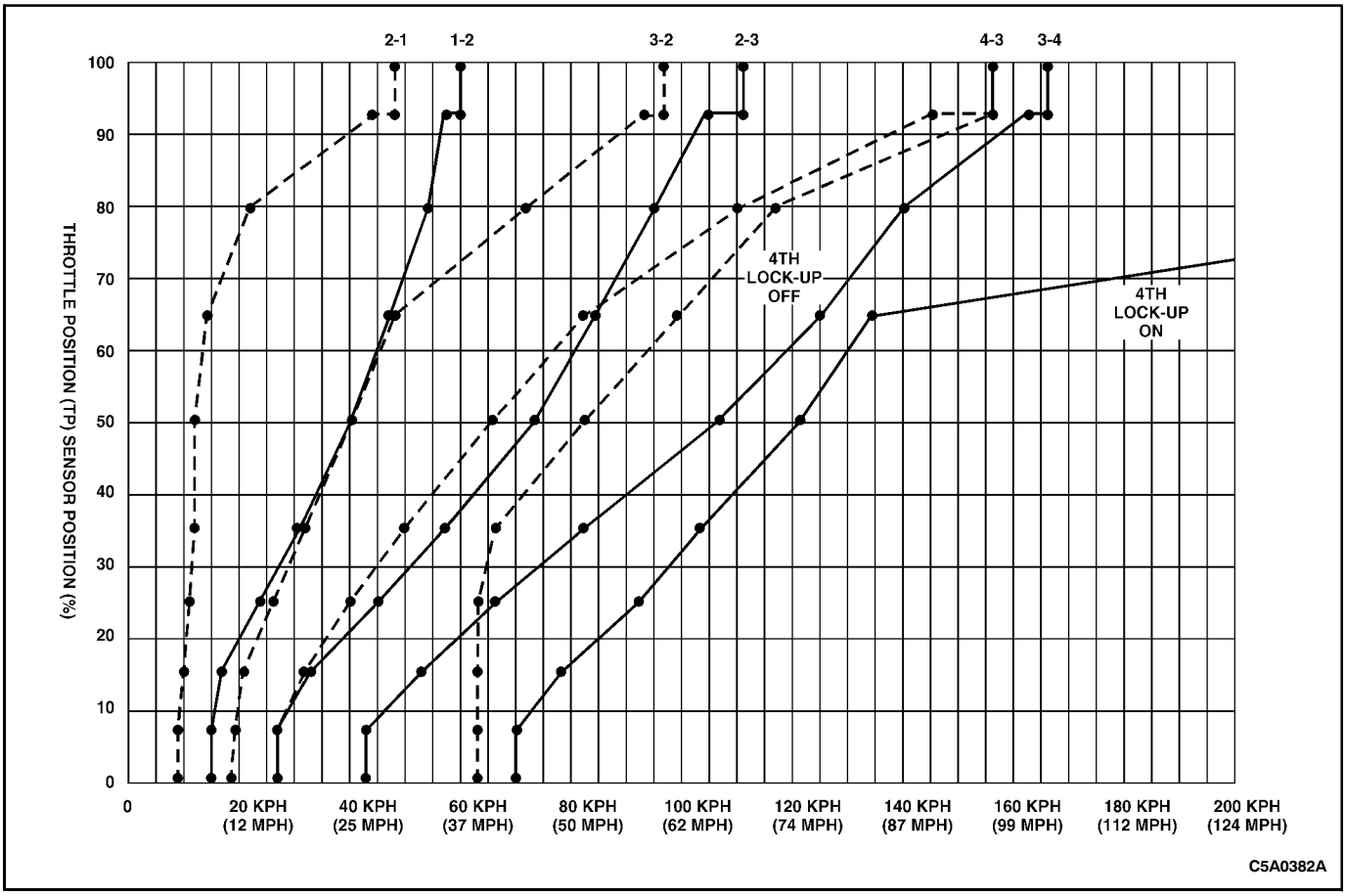
- Verify the concern by driving the vehicle
- Check the Automatic Transmission Fluid (ATF) level and condition
- Check shift linkage for proper adjustment.

Test Driving the Vehicle

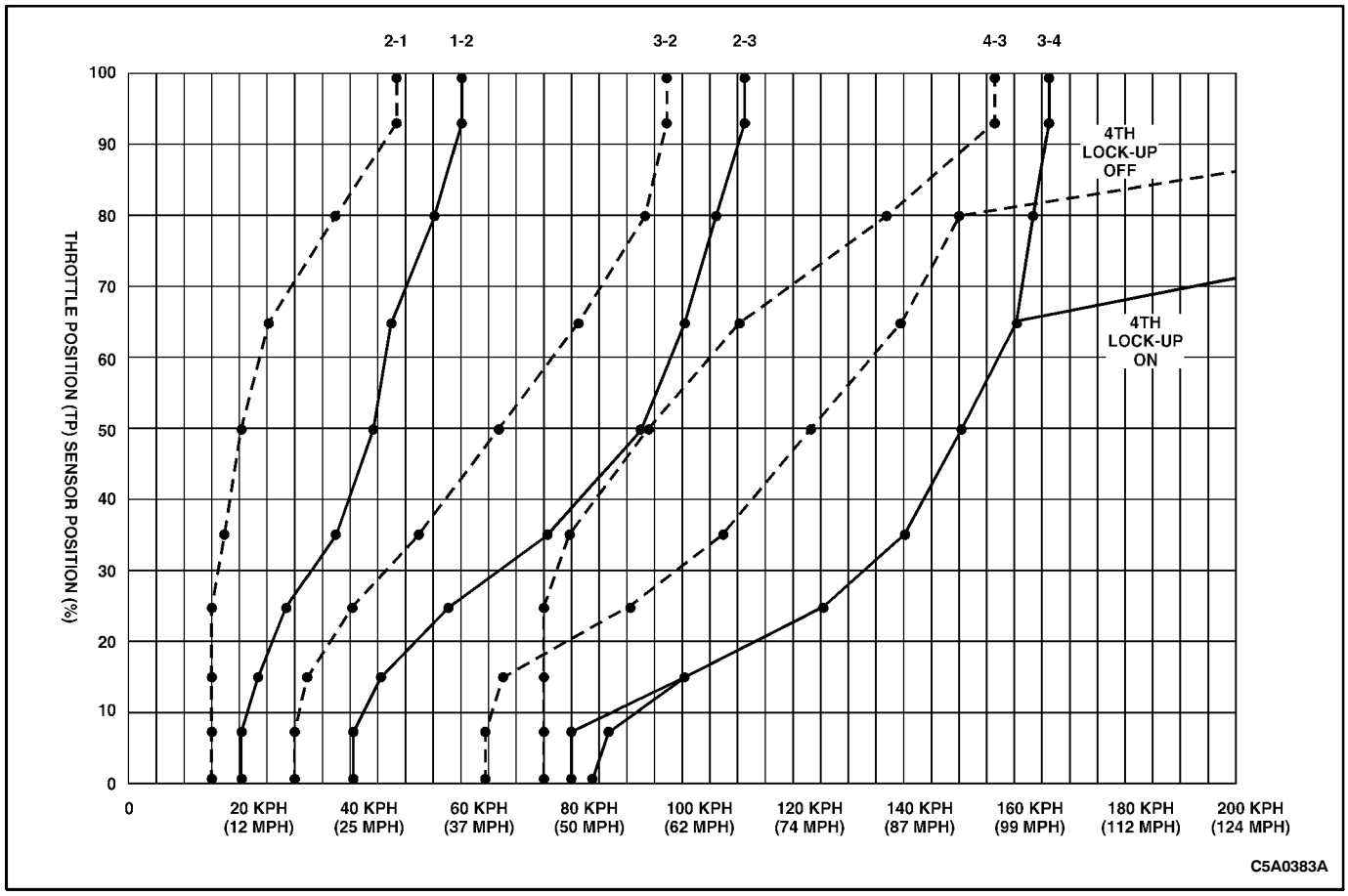
Check the level of the ATF before performing a road test.

Begin the test drive with the vehicle in the D position. Drive the vehicle causing the transmission to upshift and downshift. Listen for abnormal sounds coming from the transmission or driveline related sounds. Check the shifting speeds at light acceleration and that the shift points are correct. Also check for any slipping or abrupt shifts. Check that the lockup function occurs and is correct.

Shift Point Chart–Economy Range



Shift Point Chart–Power Range



Check Fluid Level

Do not drive the vehicle if the ATF level is low. Check the level of the ATF, using the following procedure:

1. Position the vehicle on a level surface. Apply the parking brake and block the wheels.
2. Run the engine at idle speed, depress the brake pedal and move the shift lever through each range. Allow time in each range to engage the transmission, then return to park.
3. Allow the ATF to reach normal operating temperature. Normal operating temperature is 80-90°C (176-194°F). Do not turn off the engine during the fluid level check.
4. Pull the fluid level indicator out of the indicator tube, wipe it clean and put it back into the tube. Make sure it is fully seated. Pull the fluid level indicator out of the indicator tube again and check the fluid level.
5. The fluid level should be between the MIN and MAX marks on the side of the fluid indicator marked 80°C (176°F). If the transmission fluid is below the specified level, add TOTAL FLUID HX as necessary.

High or Low Fluid Level

Do not overfill the transaxale. ATF that is too high will result in foaming. Foaming will cause erratic control pressure, and the aerated fluid will be forced from the vent. If an overfill occurs, excess fluid must be removed.

If the ATF is too low, the transaxle will experience loss of engagement or slipping. A low fluid level may indicate a leak that could cause transaxle damage.

Fluid Condition Check

Observe the color and odor of the ATF. It should be dark red, not brown or black. A burnt odor indicates an overheating condition, a clutch disc failure or band failure. Also inspect the fluid for specks, signs of engine coolant or varnish on the indicator. If fluid contamination or transmission failure is confirmed by futher evidence of coolant or excessive solids in the transaxle, the transmission should be disassembled and completely cleaned and serviced.

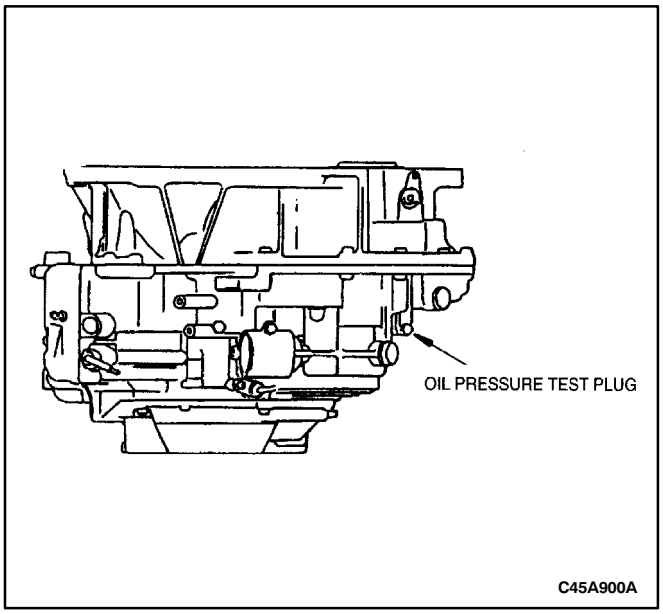
LEAK DIAGNOSIS

LINE PRESSURE CHECK PROCEDURE

The AISIN 50–40LE Automatic transaxle uses a vant type oil pump to produce hydraulic pressure, and a transaxle pressure control solenoid to control that pressure at the pressure regulator valve, after it leaves the pump. Line pressure are calibrated for 2 sets of gear range Drive and Reverse. This allows the transaxle line pressure to be appropirate for different pressure needs in different gear range.

1. Remove the oil pressure test plug on transaxle case and mount oil pressure gauge (KM–498–B).
2. Check the four wheels.
3. Fully apply the parking brake.
4. Start the engine and allow it to warm up at idle.
5. Step down strongly on the brake pedal with your left foot.
6. Shift into “D” or “R” range to measure line pressure.
7. Apply the accelerator pedal with your right foot, and messure the line pressure at the engine speed (stall speed 2250 ± 200 rpm).

Caution: Do not racing more than 5 seconds or the automatic transaxle damaged.



LOCATING FLUID LEAKS

General Method

1. Verify that the material leaking is transaxle fluid.
2. Thoroughly clean the suspected leak area.
3. Allow the transaxle to reach the normal operating temperature of 80-90°C (176-194°F).
4. Park the vehicle over a clean paper or a clean cardboard.
5. Turn the engine OFF and look for fluid spots on the paper.
6. Make the necessary repairs to correct the leak.

Powder Method

1. Thoroughly clean the suspected leak area.
2. Apply an aerosol type powder, such as foot powder, to the suspected leak area.
3. Allow the transaxle to reach the normal operating temperature of 80-90°C (176-194°F).
4. Turn the engine OFF.
5. Inspect the suspected leak area and trace the leak path through the powder to find the source of the leak.
6. Make the necessary repairs to correct the leak.

Once the leak point is found, the source of the leak must be determined and repaired.

FLUID DRIPS OUT OF CONVERTER BELL HOUSING

Checks	Action
Check for a leak at the weld seam of the torque converter.	Replace the torque converter.

LEAK BETWEEN TRANSAXLE HOUSING AND CONVERTER BELL HOUSING

Checks	Action
Check for loosened fastening bolts on the torque converter bell housing.	Tighten the bolts on the torque converter bell housing.

LEAK BETWEEN TRANSAXLE HOUSING AND SIDE COVER

Checks	Action
Check for loosened fastening bolts on the fluid pan.	Tighten the side cover bolts. Replace the silicone sealer, as needed.
Check for a damaged side cover.	Replace the side cover gasket.

LEAK BETWEEN TRANSAXLE HOUSING AND TRANSAXLE HOUSING COVER

Checks	Action
Check for loosened bolts connecting the housing cover to the transaxle.	Tighten the housing cover bolts.
Check for a damaged housing cover.	Replace the housing cover.

LEAK AT FLUID COOLER

Checks	Action
Check for a loose cooler pipe bolt connection on the transaxle and/or the radiator.	Tighten the bolts on the transaxle and/or the radiator.
Check for a damaged gasket at the transaxle connection.	Replace the gasket.
Check for a leak in the cooler.	Replace the radiator.

LEAK AT THE BRAKE ADJUSTING BOLT

Checks	Action
Check for a damaged O-ring at the brake band.	Replace the O-ring.

LEAK AT DIFFERENTIAL

Checks	Action
Check for any damaged shaft seals at the input shafts.	Replace the shaft seals.

LEAK AT DIFFERENTIAL EXTENSION

Checks	Action
Check for a damaged O-ring.	Replace the O-ring.
Check for loosened extension housing bolts.	Tighten the extension housing bolts.

LEAK AT SPEED SENSORS

Checks	Action
Check for a damaged O-ring in the speed sensor.	Replace the O-ring.

LEAK AT BREATHER

Checks	Action
Check whether the fluid level is too high.	Correct the fluid level.
Check for the wrong grade of transaxle fluid.	Drain the transaxle fluid and replace it with the correct transaxle fluid. Replace the transaxle, as needed.

LEAK AT SELECTOR SHAFT

Checks	Action
Check for a damaged selector shaft seal.	Replace the selector shaft seal.

DIAGNOSIS BY SYMPTOM

Condition	Possible Causes	Action
Engine does not start in Park and/or Neutral.	• Gearshift lever and cable out of adjustment. • Transmission Range (TR) switch does not operate. • TR switch not correctly aligned with the transaxle.	• Confirm gear selector or cable adjustment and operation. • Adjust the TR switch.
Engine starts in gearshift lever positions other than Park or Neutral.	• Gearshift lever or cable damaged or out of adjustment. • TR switch damaged or out of adjustment.	• Check gearshift lever or cable adjustment and operation. • Confirm TR switch adjustment and operation.
Vehicle moves in Park or transaxle stays in Park when shifted to another gear.	• Gearshift lever and cable out of adjustment. • Parking pawl damaged.	• Check the gearshift lever and cable adjustments and operation. • Inspect the parking pawl. Repair or replace as necessary.
Vehicle moves in Neutral.	• Gearshift lever and cable out of adjustment. • Torque converter damaged. • Forward/direct clutch damaged.	• Check the gearshift lever and cable adjustment and operation. • Inspect the torque converter. • Inspect the forward/direct clutch. Repair or replace as necessary.
Vehicle does not move in any forward gear position or reverse.	• Shift cable damaged. • Automatic transmission fluid level. • Oil pump broken or damaged seals. • Torque converter damaged.	• Inspect the shift cable. Repair or replace as necessary. • Check the fluid level and fill as necessary. • Inspect the oil pump. Repair or replace as necessary. • Inspect the torque converter. Replace as necessary.
Vehicle does not move in any forward gear position, reverse is OK.	• ATF level. • Solenoid valves for shifting. • Forward/direct clutch worn or damaged. • One-way clutch worn or damaged. • Oil flow to forward/direct clutch blocked.	• Check the fluid level and fill as necessary. • Inspect the solenoid valves. Replace as necessary. • Inspect the one-way clutch. Replace as necessary. • Inspect the clutch. Replace as necessary. • Perform clutch operation test.
Vehicle does not move in reverse, forward gear positions OK.	• Low/reverse clutch worn or damaged.	• Inspect the low/reverse clutch. Check the clutch pack clearance.
Noise in Park or Neutral, does not stop in Drive	• Loose flywheel-to-converter nuts. • Oil pump worn. • Torque converter failure.	• Tighten nuts to specifications. • Inspect the oil pump. Replace as necessary. • Inspect the torque converter. Replace as necessary.
Noise in all gears, changes with acceleration to deceleration.	• Automatic transmission fluid level. • Front wheel driveshaft and joint. • Differential gear set worn.	• Check the fluid level and fill as necessary. • Inspect the driveshaft and joint. Replace as necessary. • Inspect the differential gear set. Repair or replace as necessary.

Condition	Possible Causes	Action
Harsh shifts in all gears	• Engine mounts loose. • Front wheel driveshaft and joint. • Line pressure incorrect. • Main control valve body. • Sticking accumulator piston.	• Replace/repair as necessary. • Replace/repair as necessary. • Perform line pressure test. • Inspect valve body. Repair or replace as necessary. • Inspect accumulator piston.
Soft shifts in all gears.	• ATF level. • Line pressure incorrect. • Sticking accumulator piston. • Main control valve body. • Oil pump worn. • Internal fluid leak. • Primary regulator valve failure.	• Check the fluid level and fill as necessary. • Perform line pressure test. • Inspect accumulator piston. Repair or replace as necessary. • Inspect valve body. Repair or replace as necessary. • Inspect the oil pump. Repair or replace as necessary. • Inspect the transmission. • Inspect the primary regulator valve.
Erratic shifting or incorrect shifting points.	• ATF level and quality. • Throttle Position (TP) sensor out of range. • Line pressure. • Solenoid valves. • Clutches slipping.	• Check the fluid level and condition and fill as necessary. • Check the TP sensor signal. Replace as necessary. • Perform line pressure test. • Inspect the solenoid valves. • Inspect the clutches.
Improper torque converter lockup	• Throttle position (TP) sensor out of range. • Solenoid valves.	• Check the TP sensor signal. • Inspect the solenoid valves. Replace as required. • Inspect the torque converter. Replace as necessary.
Skipping Gears.	• Transmission fluid temperature (TFT) sensor. • Main control valve body. • Solenoid valves.	• Inspect TFT sensor. Replace as necessary. • Inspect the valve body. Replace as necessary. • Inspect the solenoid valves. Replace as necessary.
Transaxle overheating.	• ATF level. • Restriction in fluid cooler lines. • Worn clutches.	• Check fluid level and fill as necessary. • Repair or replace the cooler lines. • Inspect the clutches.
Engine stalls when put in gear.	• Main control valve body. • Solenoid valves. • Torque converter. • Oil pump.	• Inspect the clutches. • Inspect the main control valve body. • Inspect the solenoid valves. • Inspect the torque converter. Replace as necessary. • Inspect the oil pump. Repair or replace as necessary.
No kickdown	• Main control valve body.	• Inspect the main control body.
Poor fuel economy.	• Linear solenoid valve.	• Inspect the liner solenoid valve. Replace as necessary.
Surges while cruising.	• Linear solenoid valve. • Main control valve body.	• Inspect the linear solenoid valve. Replace as necessary. • Inspect the main control valve body. Repair or replace as necessary.

Condition	Possible Causes	Action
No 1–2 upshift.	● Solenoid valve. ● Main control valve body. ● One-way clutch.	● Inspect the main control valve body. Repair or replace as necessary. ● Inspect the solenoid valves. ● Inspect the one-way clutch. Replace as necessary.
No 2–3 upshift	● Solenoid valve. ● Main control valve body. ● One-way clutch.	● Inspect the main control valve body. Repair or replace as necessary. ● Inspect the solenoid valves. Replace as necessary. ● Inspect the one-way clutch. Replace as necessary.
No 3–4 upshift	● Solenoid valve. ● Main control valve body. ● TFT sensor.	● Inspect the main control valve body. Repair or replace as necessary. ● Inspect the solenoid valves. Replace as necessary. ● Inspect the TFT sensor. Replace as necessary.
No 4–3 downshift	● Solenoid valve. ● Main control valve body. ● One-way clutch.	● Inspect the main control valve body. Repair or replace as necessary. ● Inspect the solenoid valves. Replace as necessary. ● Inspect the one-way clutch.
No 3–2 downshift	● Solenoid valve. ● Main control valve body. ● Coast clutch.	● Inspect the main control valve body. Repair or replace as necessary. ● Inspect the solenoid valves. Replace as necessary. ● Inspect the coast clutch.
No 2–1 downshift.	● Solenoid valve. ● Main control valve body.	● Inspect the main control valve body. Repair or replace as necessary. ● Inspect the solenoid valves. Replace as necessary.

DIAGNOSTIC TROUBLE CODES

DTC	DESCRIPTION	TYPE	Illuminate MIL
P0604	Internal Control Module Random Access Memory (RAM) Error	B	Yes
P1790	Internal Control Module Random Memory Checksum Error	B	Yes
P0705	Transmission Range Sensor Circuit Malfunction	B	Yes
P0722	Output Speed Sensor Circuit No Signal	B	Yes
P0727	Engine Speed Input Sensor Circuit No Signal	D	No
P0741	TCC System Stuck off	B	Yes
P0742	TCC System Stuck on	B	Yes
P0743	Torque Converter Clutch System (SL) Electrical	B	Yes
P0751	Shift Solenoid A (S1) Performance	B	Yes
P0753	Shift Solenoid A (S1) Electrical	A	Yes
P0756	Shift Solenoid B (S2) Performance	B	Yes
P0758	Shift Solenoid B (S2) Electrical	A	Yes
P0717	Input/Turbine Speed Sensor Circuit No Signal	B	Yes
P0712	Transmission Fluid Temperature Sensor Circuit – Low Input	C2	No*1
P0713	Transmission Fluid Temperature Sensor Circuit – Highr Input	C2	No*1
P0748	Pressure Control Solenoid (STH) Electrical	C1	No*1
P1791	TPS Signal Malfunction	A	Yes
P1701	WT Signal Malfunction	D	No
P1702	Torque Control Signal Malfunction	C1	No*1

✴1 : Illuminate Power Lamp on Instrument Cluster

DTC P0604 – INTERNAL TRANSMISSION CONTROL MODULE (TCM) RANDOM ACCESS MEMORY (ROM) ERROR

Conditions for Setting the DTC

- The transmission control module (TCM) cannot carry out the four RAM initialization routines within 20 milliseconds after ignition ON.

Action Taken When the DTC Sets

- The TCM illuminates the malfunction indicator lamp (MIL) after two consecutive ignition cycles with a failure reported.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive ignition cycles without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it can carry out the four RAM initialization routines within 20 milliseconds after ignition ON.

DTC P0604 – Internal Transmission Control Module (TCM) Random Access Memory (RAM) Error

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Cycle the ignition two times. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect Transmission Control Module (TCM) wiring harness and connector for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0604 displayed?	—	Replace the Transmission Control Module (TCM).	Inspect Transmission Control Module (TCM) wiring harness and connector for signs of an intermittent condition. Repair as necessary.

DTC P0705 – TRANSMISSION RANGE (TR) SENSOR CIRCUIT MALFUNCTION (PRNDL INPUT)

Conditions for Setting the DTC

- The transmission control module (TCM) cannot detect a signal from the Transmission Range (TR) sensor circuit for 50 seconds continuously.
- Vehicle speed is greater than 30 Km/h (mph).
- Engine rpm is greater than 1500.
- No OSS DTC P0722.
- No engine speed input sensor DTC P0727.
- The TCM detects more than two equal signals from the TR sensor circuit for 30 seconds continuously.

Action Taken When the DTC Sets

- The TCM illuminates the malfunction indicator lamp (MIL) after two consecutive trips with a failure reported.
- No TCC lockup control.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects one TR sensor signal for greater than 50 seconds.

DTC P0705 – Transmission Range (TR) Sensor Circuit Malfunction (PRNDL Input)

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6.5Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission range (TR) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0705 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission range (TR) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.

DTC P0705 – Transmission Range (TR) Sensor Circuit Malfunction (PRNDL Input)

<table>
<tr><th>Step</th><th>Action</th><th>Value(s)</th><th>Yes</th><th>No</th></tr>
<tr><td>3</td><td>1. Select Transmission Data Display from the Data Display Menu.
2. Move the shift control lever through all of the gear ranges (P, R, N, D, 3, L) while observing the Range Status.
Does the scan tool display the correct gear ranges?</td><td>—</td><td>Go to Step 4.</td><td>Check the adjustment of the transmission range (TR) sensor. Refer to ”On-Vehicle Service” in this section. If the TR sensor is adjusted properly, replace the TR sensor.</td></tr>
<tr><td>4</td><td>1. Turn the ignition OFF.
2. Disconnect the transmission range (TR) sensor connector.
3. With the engine OFF, turn the ignition switch to the RUN position.
4. Measure the voltage at pin 4 (PNK) of the transmission range (TR) sensor female connector.
Is the measurement within the specified value?</td><td>12 volts</td><td>Go to Step 5.</td><td>Check Fuse F14 (10A) for an open. If Fuse is OK, Repair open circuit between Fuse F14 and the transmission range (TR) sensor female connector.</td></tr>
<tr><td>5</td><td>Measure the voltage of the TR sensor at the transmission control module (TCM) connector with the shift control lever in the positions shown below.
Shift Control Level Position / TCM Connector Pin
P – 10
R – 2
N – 25
D – 24
3 – 9
L – 1
Are the measurements within the specified value?</td><td>12 volts</td><td>Replace the Transmission Control Module (TCM).</td><td>If one or more of measurements are not within specifications, repair the circuit(s) as necessary. If all measurements are not within specifications, replace the transmission range (TR) sensor.</td></tr>
</table>

DTC P0712 – TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR CIRCUIT LOW INPUT

Conditions for Setting the DTC

- The transmission control module (TCM) detects that the voltage of the transmission fluid temperature (TFT) sensor signal is less than 50 mV for 5 minutes continuously.

Action Taken When the DTC Sets

- The TCM illuminates the power lamp after two consecutive trips with a failure reported.
- No increase in line pressure at low temperature.
- No auto mode change at high temperature.

Conditions for Clearing the MIL/DTC

- The TCM turns off the power lamp after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the ATF temperature is between 0°C and 150°C for 15 minutes continuously.

DTC P0712 – Transmission Fluid Temperature (TFT) Sensor Circuit Low Input

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the POWER Lamp ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0712 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.

DTC P0712 – Transmission Fluid Temperature (TFT) Sensor Circuit Low Input

Step	Action	Value(s)	Yes	No
3	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Select Transmission Data Display from the Data Display Menu. 3. With the TCM sensor (C110) connector disconnected, observe the Transmission Fluid Temperature. Does the scan tool display the specified value?	Less than – 40°C	Go to Step 4.	Go to Step 6.
4	Jumper pin 3 (GRN/WHT) to pin 9 (GRY/WHT) in the female TCM sensor (C110) connector and observe the Transmission Fluid Temperature. Does the scan tool display the specified value?	Greater than + 175°C	Go to Step 5.	Go to Step 6.
5	1. Disconnect the transmission fluid temperature (TFT) sensor connector. 2. Measure the resistance between pin 4 (ORN) of the male TCM sensor (C110) connector and pin 2 (ORN) of the TFT sensor connector. 3. Measure the resistance between pin 10 (ORN) of the male TCM sensor (C110) connector and pin 1 (ORN) of the TFT sensor connector. Are the measurements within the specified value?	5 ohms or less	Replace the transmission fluid temperature (TFT) sensor.	Repair the circuit(s) as necessary.
6	1. Disconnect the transmission control module (TCM) connector. 2. Measure the resistance between pin 3 (GRN/WHT) of the female TCM sensor (C110) connector and ground. 3. Measure the resistance between pin 9 (GRY/WHT) of the female TCM sensor (C110) connector and ground. Are the measurements within the specified value?	5 ohms or less	Repair the circuit(s) as necessary.	Replace the transmission control module (TCM).

DTC P0713 – TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR CIRCUIT HIGH INPUT

Conditions for Setting the DTC

- The transmission control module (TCM) detects the voltage difference of the transmission fluid temperature (TFT) sensor signal is less than 75 mV 15 minutes after ignition ON.

Action Taken When the DTC Sets

- The TCM illuminates the power lamp after two consecutive trips with a failure reported.
- No increase in line pressure at low temperature.
- No auto mode change at high temperature.

Conditions for Clearing the MIL/DTC

- The TCM turns off the power lamp after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the ATF temperature is between 0°C and 150°C for 15 minutes continuously.

DTC P0713 – Transmission Fluid Temperature (TFT) Sensor Circuit High Input

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the POWER Lamp ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0713 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.

DTC P0713 – Transmission Fluid Temperature (TFT) Sensor Circuit High Input

Step	Action	Value(s)	Yes	No
3	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Select Transmission Data Display from the Data Display Menu. 3. With the TCM sensor (C110) connector disconnected, observe the Transmission Fluid Temperature. Does the scan tool display the specified value?	Less than – 40°C	Go to Step 4.	Go to Step 6.
4	Jumper pin 3 (GRN/WHT) to pin 9 (GRY/WHT) in the female TCM sensor (C110) connector and observe the Transmission Fluid Temperature. Does the scan tool display the specified value?	Greater than + 175°C	Go to Step 5.	Go to Step 6.
5	1. Disconnect the transmission fluid temperature (TFT) sensor connector. 2. Measure the resistance between pin 4 (ORN) of the male TCM sensor (C110) connector and pin 2 (ORN) of the TFT sensor connector. 3. Measure the resistance between pin 10 (ORN) of the male TCM sensor (C110) connector and pin 1 (ORN) of the TFT sensor connector. Are the measurements within the specified value?	5 ohms or less	Replace the transmission fluid temperature (TFT) sensor.	Repair the circuit(s) as necessary.
6	1. Disconnect the transmission control module (TCM) connector. 2. Measure the resistance between pin 3 (GRN/WHT) of the female TCM sensor (C110) connector and pin 31 (GRN/WHT) of the TCM connector. 3. Measure the resistance between pin 9 (GRY/WHT) of the female TCM sensor (C110) connector and pin 30 (GRY/WHT) of the TCM connector. Are the measurements within the specified value?	5 ohms or less	Replace the transmission control module (TCM).	Repair the circuit(s) as necessary.

DTC P0717 – INPUT SHAFT SPEED (ISS) SENSOR CIRCUIT NO SIGNAL

Conditions for Setting the DTC

- The transmission control module (TCM) cannot detect a pulse from the input shaft speed (ISS) sensor while it detects 6 pulses of the output shaft speed (OSS) sensor signal 500 times continuously.
- Output shaft speed (OSS) sensor signal is greater than 7 Km/h (4 mph) in 1st gear, 13 Km/h (8 mph) in 2nd gear, 18 Km/h (11 mph) in 3rd gear or 26 Km/h (16 mph) in 4th gear.
- 10 seconds after Neutral to Drive shift.
- 2.5 seconds after Neutral to Drive shift and ATF temperature is greater than 0°C.
- ISS sensor signal is greater than 66 Km/h (41 mph) 2.5 seconds after Neutral to Drive shift.
- Engine rpm is 400 or greater.
- No TR sensor DTC P0705.
- No TFT sensor DTC P0712 or P0713.
- No engine speed input DTC P0727.

Action Taken When the DTC Sets

- The TCM illuminates the malfunction indicator lamp (MIL) after two consecutive trips with a failure reported.
- No TCC lockup control.
- No torque converter reduction control.
- No line pressure reduction control.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the ISS signal is greater than 10 Km/h (mph) for 30 seconds continuously.

DTC P0717 – Input Shaft Speed (ISS) Sensor Circuit No Signal

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0717 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.

DTC P0717 – Input Shaft Speed (ISS) Sensor Circuit No Signal

Step	Action	Value(s)	Yes	No
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 15 (ORN) and pin 29 (WHT) of the TCM connector. Is the measurement within the specified value?	300–600 ohms	Replace the Transmission Control Module (TCM).	Go to Step 4.
4	1. Disconnect the input shaft speed (ISS) sensor connector. 2. Measure the resistance across the pins of the ISS sensor. Is the measurement within the specified value?	300–600 ohms	Go to Step 5.	Replace the input shaft speed (ISS) sensor.
5	1. Measure the resistance between pin 15 (ORN) of the TCM connector and pin 2 (YEL/BLK) of the ISS sensor connector. 2. Measure the resistance between pin 29 (WHT) of the TCM connector and pin 1 (LT GRN) of the ISS sensor connector. Are the measurements within the specified value?	5 ohms or less	Go to Step 7.	Go to Step 6.
6	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 15 (ORN) of the TCM connector and pin 2 (ORN) of the TCM sensor connector (C110). 3. Measure the resistance between pin 29 (WHT) of the TCM connector and pin 8 (WHT) of the TCM sensor connector (C110). Are the measurements within the specified value?	5 ohms or less	Repair the circuit(s) as necessary between the TCM sensor connector and the ISS connector.	Repair the circuit(s) as necessary between the TCM connector and the TCM sensor connector.
7	1. Measure the resistance between pin 15 (ORN) of the TCM connector and ground. 2. Measure the resistance between pin 29 (WHT) of the TCM connector and ground. Are the measurements within the specified value?	5 ohms or less	Go to Step 8.	Replace the Transmission Control Module (TCM).
8	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 2 (ORN) of the TCM sensor connector (C110) and ground. 3. Measure the resistance between pin 8 (WHT) of the TCM sensor connector (C110) and ground. Are the measurements within the specified value?	5 ohms or less	Repair the circuit(s) as necessary between the TCM sensor connector and the ISS connector.	Repair the circuit(s) as necessary between the TCM connector and the TCM sensor connector.

DTC P0722 – OUTPUT SHAFT SPEED (OSS) SENSOR CIRCUIT NO SIGNAL

Conditions for Setting the DTC

- The transmission control module (TCM) cannot detect a pulse from the output shaft speed (OSS) sensor while it detects 10 pulses of the input shaft speed (ISS) sensor signal 500 times continuously.
- Input shaft speed (ISS) sensor signal is greater than 4 Km/h (2 mph).
- 10 seconds after Neutral to Drive shift.
- 2.5 seconds after Neutral to Drive shift and ATF temperature is greater than 0°C.
- OSS sensor signal is greater than 66 Km/h (41 mph) 2.5 seconds after Neutral to Drive shift.
- No TR sensor DTC P0705.
- No TFT sensor DTC P0712 or P0713.

Action Taken When the DTC Sets

- The TCM illuminates the malfunction indicator lamp (MIL) after two consecutive trips with a failure reported.
- The TCM selects ISS signal for vehicle speed.
- No TCC lockup control.
- No torque converter reduction control.
- No line pressure reduction control.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the OSS signal is greater than 10 Km/h (mph) for 30 seconds continuously.

DTC P0722 – Output Shaft Speed (OSS) Sensor Circuit No Signal

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0722 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.

DTC P0722 – Output Shaft Speed (OSS) Sensor Circuit No Signal

Step	Action	Value(s)	Yes	No
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 16 (BLU/GRN) and pin 17 (BLU/YEL) of the TCM connector. Is the measurement within the specified value?	300–600 ohms	Replace the Transmission Control Module (TCM).	Go to Step 4
4	1. Disconnect the output shaft speed (OSS) sensor connector. 2. Measure the resistance across the pins of the OSS sensor. Is the measurement within the specified value?	300–600 ohms	Go to Step 5.	Replace the output shaft speed (OSS) sensor.
5	1. Measure the resistance between pin 16 (BLU/GRN) of the TCM connector and pin 2 (YEL) of the OSS sensor connector. 2. Measure the resistance between pin 17 (BLU/YEL) of the TCM connector and pin 1 (GRY) of the OSS sensor connector. Are the measurements within the specified value?	5 ohms or less	Go to Step 7.	Go to Step 6.
6	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 16 (BLU/GRN) of the TCM connector and pin 1 (BLU/GRN) of the TCM sensor connector (C110). 3. Measure the resistance between pin 17 (BLU/YEL) of the TCM connector and pin 7 (BLU/YEL) of the TCM sensor connector (C110). Are the measurements within the specified value?	5 ohms or less	Repair the circuit(s) as necessary between the TCM sensor connector and the OSS connector.	Repair the circuit(s) as necessary between the TCM connector and the TCM sensor connector.
7	1. Measure the resistance between pin 16 (BLU/GRN) of the TCM connector and ground. 2. Measure the resistance between pin 17 (BLU/YEL) of the TCM connector and ground. Are the measurements within the specified value?	5 ohms or less	Go to Step 8.	Replace the Transmission Control Module (TCM).
8	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 1 (BLU/GRN) of the TCM sensor connector (C110) and ground. 3. Measure the resistance between pin 7 (BLU/YEL) of the TCM sensor connector (C110) and ground. Are the measurements within the specified value?	5 ohms or less	Repair the circuit(s) as necessary between the TCM sensor connector and the OSS connector.	Repair the circuit(s) as necessary between the TCM connector and the TCM sensor connector.

DTC P0727 – ENGINE SPEED INPUT CIRCUIT NO SIGNAL

Conditions for Setting the DTC

- The Transmission Control Module (TCM) detects no pulse of the engine speed input sensor while detecting the correct TP sensor signal for 10 seconds continuously.
- No TP sensor DTC P1791.

Action Taken When the DTC Sets

- The TCM stores DTC P0727 after two consecutive trips with a failure reported.

Conditions for Clearing the MIL/DTC

- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the engine speed sensor signal is greater than 40 rpm for 20 seconds continuously.

DTC P0727 – Engine Speed Input Circuit No Signal

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. 9. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 10. Request DTC by Status. Is DTC P0727 displayed?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, engine control module (ECM) J2 (white) connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Disconnect the engine control module (ECM) J2 (white) connector. 4. Measure the resistance between pin 32 (WHT) of the TCM connector and pin C10 (WHT) of the ECM J2 (white) connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 3.	Repair the circuit as necessary.
3	1. Measure the resistance between pin 32 (WHT) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit as necessary.	Go to Step 4.
4	1. Connect the ECM J2 (white) connector. 2. Start the engine. 3. Measure the voltage at pin 32 (WHT) of the TCM connector. Is the measurement within the specified value?	12 volts	Replace the transmission control module (TCM).	Replace the powertrain control module (PCM).

DTC P0741 – TORQUE CONVERTER CLUTCH (TCC) CIRCUIT STUCK OFF

Conditions for Setting the DTC

- The transaxle is in 4th gear and the transmission control module (TCM) is commanding the torque converter clutch (TCC) solenoid ON.
- The throttle opening is between 8 and 100%.
- The vehicle speed is between 5 km/h (2 mph) and 100 km/h (62 mph).
- 20 seconds have passed since transaxle was placed in D.
- The brake switch is OFF.
- Engine coolant temperature (ECT) is normal.
- Transmission fluid temperature (TFT) is greater than 20°C.
- Engine rpm is greater than 400.
- No TR sensor DTC P0705.
- No TFT sensor DTC P0712.
- No TFT sensor DTC P0713.
- No 1SS sensor DTC P0717.
- No OSS sensor DTC P0722.
- No engine revolution DTC P0727.
- No TCC Solenoid DTC P0743.
- No SS1 DTC P0753.
- No SS2 DTC P0758.
- No ECT sensor DTC P1701.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history 2 seconds after the transaxle is placed in D.

DTC P0741 – Torque Converter Clutch (TCC) Circuit Stuck Off

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0741 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 22 (GRN) of the TCM connector and ground. Is the measurement within the specified value?	11–15 ohms	Replace the transmission control module (TCM).	Go to Step 4.

DTC P0741 − Torque Converter Clutch (TCC) Circuit Stuck Off

Step	Action	Value(s)	Yes	No
4	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 8 (YEL) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	11−15 ohms	Go to Step 5.	Repair the circuit (GRN) between the TCM connector and the female TCM sensor (C110) connector.
5	1. Remove the valve body cover. 2. Disconnect the lockup solenoid connector. 3. Measure the resistance between the lockup solenoid and ground. Is the measurement within the specified value?	11−15 ohms	Repair the circuit (YEL) between the male TCM sensor (C110) connector and the lockup solenoid.	Replace the lockup solenoid.

DTC P0742 – TORQUE CONVERTER CLUTCH (TCC) CIRCUIT STUCK ON

Conditions for Setting the DTC

- The transaxle is in 2nd or 3rd gear and the transmission control module (TCM) is not commanding the torque converter clutch (TCC) solenoid ON.
- The throttle opening is between 20 and 100%.
- The vehicle speed is between 5 km/h (2 mph) and 70 km/h (43 mph).
- 20 seconds have passed since transaxle was placed in D.
- The brake switch is OFF.
- Engine coolant temperature (ECT) is normal.
- Transmission fluid temperature (TFT) is greater than 20°C.
- Engine rpm is greater than 400.
- No TR sensor DTC P0705.
- No TFT sensor DTC P0712.
- No TFT sensor DTC P0713.
- No 1SS sensor DTC P0717.
- No OSS sensor DTC P0722.
- No engine revolution DTC P0727.
- No TCC Solenoid DTC P0743.
- No SS1 DTC P0753.
- No SS2 DTC P0758.
- No ECT sensor DTC P1701.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history 2 seconds after the transaxle is placed in D.

DTC P0742 – Torque Converter Clutch (TCC) Circuit Stuck On

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0742 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.3

DTC P0742 – Torque Converter Clutch (TCC) Circuit Stuck On

Step	Action	Value(s)	Yes	No
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 22 (GRN) of the TCM connector and ground. Is the measurement within the specified value?	11−15 ohms	Replace the transmission control module (TCM).	Go to Step 4.
4	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 8 (YEL) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	11−15 ohms	Go to Step 5.	Repair the circuit (GRN) between the TCM connector and the female TCM sensor (C110) connector.
5	1. Remove the valve body cover. 2. Disconnect the lockup solenoid connector. 3. Measure the resistance between the lockup solenoid and ground. Is the measurement within the specified value?	11−15 ohms	Repair the circuit between the male TCM sensor (C110) connector and the lockup solenoid.	Replace the lockup solenoid.

DTC P0743 – TORQUE CONVERTER CLUTCH (TCC) CIRCUIT ELECTRICAL

Conditions for Setting the DTC

- The transmission control module (TCM) detects an OFF signal from the lockup solenoid monitor for 630 milliseconds when the lockup solenoid driver outputs the ON signal.
- The TCM detects an ON signal from the lockup solenoid monitor for 500 milliseconds when the lockup solenoid driver outputs the OFF signal.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.
- No TCC lockup control.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it does not detect a failure for 1 second.

DTC P0743 – Torque Converter Clutch (TCC) Circuit Electrical

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0743 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 22 (GRN) of the TCM connector and ground. Is the measurement within the specified value?	11–15 ohms	Replace the transmission control module (TCM).	Go to Step 4.

DTC P0743 – TORQUE CONVERTER CLUTCH (TCC) CIRCUIT ELECTRICAL

Step	Action	Value(s)	Yes	No
4	1. Remove the valve body cover. 2. Disconnect the lockup solenoid connector. 3. Measure the resistance between the lockup solenoid connector and pin 22 (GRN) of the TCM connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 6.	Go to Step 5.
5	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 8 (YEL) of the male TCM sensor (C110) connector and the lockup solenoid connector. Is the measurement within the specified value?	5 ohms or less	Repair the circuit between the TCM connector and the female TCM sensor (C110) connector.	Repair the circuit between the male TCM sensor (C110) connector and the lockup solenoid connector.
6	1. Measure the resistance between pin 22 (GRN) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Go to Step 7.	Replace the lockup solenoid.
7	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 8 (YEL) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit between the male TCM sensor (C110) connector and the lockup solenoid connector.	Repair the circuit between the TCM connector and the female TCM sensor (C110) connector.

DTC P0748 – PRESSURE CONTROL (LINEAR) SOLENOID ELECTRICAL

Conditions for Setting the DTC

- The transmission control module (TCM) detects that the current of the pressure control (linear) solenoid is less than 10 mA for 12.5 seconds continuously when the TCM output current is greater than 60 mA.
- The TCM detects that the current of the linear solenoid is greater than 1.4A for 0.5 second continuously.

Action Taken When the DTC Sets

- The TCM illuminates the power lamp after a failure report.
- 4th gear is held in “D” range.
- 4th gear is held in “3” range.
- 1st gear is held in “L” range.
- No TCC lockup control.
- Full line pressure.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history when it detects that the current of the pressure control (linear) solenoid is between 0.1 and 1.4A for 12.5 seconds continuously.

DTC P0748 – Pressure Control (Linear) Solenoid Electrical

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform one vehicle drive cycle. Is the POWER Lamp ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0748 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 5 (ORN/BLK) and pin 6 (YEL/BLK) of the TCM connector. Is the measurement within the specified value?	2–6 ohms	Replace the transmission control module (TCM).	Go to Step 4.

DTC P0748 – Pressure Control (Linear) Solenoid Electrical

Step	Action	Value(s)	Yes	No
4	1. Remove the valve body cover. 2. Disconnect the pressure control (linear) solenoid connector. 3. Measure the resistance between pin 1 (BRN) of the linear solenoid and pin 6 (YEL/BLK) of the TCM connector. 4. Measure the resistance between pin 2 (BLU) of the linear solenoid and pin 5 (ORN/BLK) of the TCM connector. Are the measurements within the specified value?	5 ohms or less	Go to Step 6.	Go to Step 5.
5	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 1 (BRN) of the linear solenoid and pin 3 (BRN) of the male TCM sensor connector. 3. Measure the resistance between pin 2 (BLU) of the linear solenoid and pin 9 (BLU) of the male TCM sensor connector. Are the measurements within the specified value?	5 ohms or less	Repair the circuit(s) between the TCM connector and the female TCM sensor connector.	Repair the circuit(s) between the male TCM sensor connector and the linear solenoid.
6	1. Measure the resistance between pin 1 (BRN) of the linear solenoid and ground. 2. Measure the resistance between pin 2 (BLU) of the linear solenoid and ground. Are the measurements within the specified value?	5 ohms or less	Go to Step 7.	Go to Step 8.
7	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 1 (BRN) of the linear solenoid and ground. 3. Measure the resistance between pin 2 (BLU) of the linear solenoid ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit(s) between the male TCM sensor connector and the linear solenoid.	Repair the circuit(s) between the TCM connector and the female TCM sensor connector.
8	1. Measure the voltage between pin 1 (BRN) of the linear solenoid and 6 (YEL/BLK) of the TCM connector. 2. Measure the voltage between pin 2 (BLU) of the linear solenoid and pin 5 (ORN/BLK) of the TCM connector. Are the measurements within the specified value?	12 volts	Go to Step 9.	Replace the linear solenoid.
9	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the voltage between pin 1 (BRN) of the linear solenoid and pin 3 (BRN) of the male TCM sensor connector. 3. Measure the voltage between pin 2 (BLU) of the linear solenoid and pin 9 (BLU) of the male TCM sensor connector. Are the measurements within the specified value?	12 volts	Repair the circuit(s) between the male TCM sensor connector and the linear solenoid.	Repair the circuit(s) between the TCM connector and the female TCM sensor connector.

DTC P0751 – SHIFT SOLENOID 1 (SS1) STUCK OFF

Conditions for Setting the DTC

- The transaxle is in 2nd or 3rd gear.
- The throttle opening is between 8 and 100%.
- The vehicle speed is between 5 km/h (2 mph) and 100 km/h (62 mph).
- 20 seconds have passed since transaxle was placed in D.
- The brake switch is OFF.
- Engine coolant temperature (ECT) is normal.
- Transmission fluid temperature (TFT) is greater than 20°C.
- Engine rpm is greater than 400.
- No TR sensor DTC P0705.
- No TFT sensor DTC P0712.
- No TFT sensor DTC P0713.
- No 1SS sensor DTC P0717.
- No OSS sensor DTC P0722.
- No engine revolution DTC P0727.
- No TCC Solenoid DTC P0743.
- No SS1 DTC P0753.
- No SS2 DTC P0758.
- No ECT sensor DTC P1701.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.
- No TCC lockup control.
- No torque control reduction.
- No line pressure reduction control.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history 2 seconds after the transaxle is placed in D.

DTC P0751 – Shift Solenoid 1 (SS1) Stuck Off

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan–100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0751 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 8 (RED) of the TCM connector and ground. Is the measurement within the specified value?	11–15 ohms	Replace the transmission control module (TCM).	Go to Step 4.

DTC P0751 − Shift Solenoid 1 (SS1) Stuck Off

Step	Action	Value(s)	Yes	No
4	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 1 (WHT) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	11−15 ohms	Go to Step 5.	Repair the circuit (RED) between the TCM connector and the female TCM sensor (C110) connector.
5	1. Remove the valve body cover. 2. Disconnect the shift solenoid 1 connector. 3. Measure the resistance between the shift solenoid 1 and ground. Is the measurement within the specified value?	11−15 ohms	Repair the circuit (WHT) between the male TCM sensor (C110) connector and the shift solenoid 1.	Replace the shift solenoid 1.

DTC P0753 – SHIFT SOLENOID 1 (SS1) ELECTRICAL

Conditions for Setting the DTC

- The transmission control module (TCM) detects an OFF signal from the shift solenoid 1 (SS1) monitor for 300 milliseconds when the SS1 driver outputs the ON signal.
- The TCM detects an ON signal from the SS1 monitor for 500 milliseconds when the SS1 driver outputs the OFF signal.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.
- 4th gear is held in “D” range.
- 4th gear is held in “3” range.
- 1st gear is held in “L” range.
- No TCC lockup control.
- Full line pressure.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it does not detect a failure for 1 second.

DTC P0753 – Shift Solenoid 1 (SS1) Electrical

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform one vehicle drive cycle. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0753 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 8 (RED) of the TCM connector and ground. Is the measurement within the specified value?	11–15 ohms	Replace the transmission control module (TCM).	Go to Step 4.
4	1. Remove the valve body cover. 2. Disconnect the shift solenoid 1 (SS1) connector. 3. Measure the resistance between the SS1 connector and pin 8 (RED) of the TCM connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 6.	Go to Step 5.

DTC P0753 − Shift Solenoid 1 (SS1) Electrical

Step	Action	Value(s)	Yes	No
5	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 1 (WHT) of the male TCM sensor (C110) connector and the SS1 connector. Is the measurement within the specified value?	5 ohms or less	Repair the circuit (RED) between the TCM connector and the female TCM sensor (C110) connector.	Repair the circuit (WHT) between the male TCM sensor (C110) connector and the shift solenoid 1 connector.
6	Measure the resistance between pin 8 (RED) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Go to Step 7.	Replace the shift solenoid 1.
7	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 1 (WHT) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit (WHT) between the male TCM sensor (C110) connector and the shift solenoid 1 connector.	Repair the circuit (RED) between the TCM connector and the female TCM sensor (C110) connector.

DTC P0756 – SHIFT SOLENOID 2 (SS2) STUCK OFF

Conditions for Setting the DTC

- The transaxle is in 1st or 2nd gear.
- The throttle opening is between 8 and 100%.
- The vehicle speed is between 5 km/h (2 mph) and 100 km/h (62 mph).
- 20 seconds have passed since transaxle was placed in D.
- The brake switch is OFF.
- Engine coolant temperature (ECT) is normal.
- Transmission fluid temperature (TFT) is greater than 20°C.
- Engine rpm is greater than 400.
- No TR sensor DTC P0705.
- No TFT sensor DTC P0712.
- No TFT sensor DTC P0713.
- No 1SS sensor DTC P0717.
- No OSS sensor DTC P0722.
- No engine revolution DTC P0727.
- No TCC Solenoid DTC P0743.
- No SS1 DTC P0753.
- No SS2 DTC P0758.
- No ECT sensor DTC P1701.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.
- No TCC lockup control.
- No torque control reduction.
- No line pressure reduction control.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history 2 seconds after the transaxle is placed in D.

DTC P0756– Shift Solenoid 2 (SS2) Stuck Off

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.2
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0756 displayed?		Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 7 (WHT) of the TCM connector and ground. Is the measurement within the specified value?	11–15 ohms	Replace the transmission control module (TCM).	Go to Step 4.

DTC P0756− Shift Solenoid 2 (SS2) Stuck Off

Step	Action	Value(s)	Yes	No
4	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 7 (BLK) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	11−15 ohms	Go to Step 5.	Repair the circuit (WHT) between the TCM connector and the female TCM sensor (C110) connector.
5	1. Remove the valve body cover. 2. Disconnect the shift solenoid 2 connector. 3. Measure the resistance between the shift solenoid 2 and ground. Is the measurement within the specified value?	11−15 ohms	Repair the circuit (BLK) between the male TCM sensor (C110) connector and the shift solenoid 2.	Replace the shift solenoid 2.

DTC P0758 – SHIFT SOLENOID 2 (SS2) ELECTRICAL

Conditions for Setting the DTC

- The transmission control module (TCM) detects an OFF signal from the shift solenoid 2 (SS2) monitor for 300 milliseconds when the SS2 driver outputs the ON signal.
- The TCM detects an ON signal from the SS2 monitor for 500 milliseconds when the SS2 driver outputs the OFF signal.

Action Taken When the DTC Sets

- The TCM illuminates the Malfunction Indicator Lamp (MIL) after two consecutive trips with a failure reported.
- 4th gear is held in “D” range.
- 4th gear is held in “3” range.
- 1st gear is held in “L” range.
- No TCC lockup control.
- Full line pressure.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it does not detect a failure for 1 second.

DTC P0758 – Shift Solenoid 2 (SS2) Electrical

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform one vehicle drive cycle. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P0758 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Measure the resistance between pin 7 (WHT) of the TCM connector and ground. Is the measurement within the specified value?	11–15 ohms	Replace the transmission control module (TCM).	Go to Step 4.
4	1. Remove the valve body cover. 2. Disconnect the shift solenoid 2 (SS2) connector. 3. Measure the resistance between the SS2 connector and pin 7 (WHT) of the TCM connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 6.	Go to Step 5.

DTC P0758 − Shift Solenoid 2 (SS2) Electrical

Step	Action	Value(s)	Yes	No
5	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 7 (BLK) of the male TCM sensor (C110) connector and the SS2 connector. Is the measurement within the specified value?	5 ohms or less	Repair the circuit (WHT) between the TCM connector and the female TCM sensor (C110) connector.	Repair the circuit (BLK) between the male TCM sensor (C110) connector and the shift solenoid 2 connector.
6	Measure the resistance between pin 7 (WHT) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Go to Step 7.	Replace the shift solenoid 2.
7	1. Disconnect the transmission control module (TCM) sensor (C110) connector. 2. Measure the resistance between pin 7 (BLK) of the male TCM sensor (C110) connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit (BLK) between the male TCM sensor (C110) connector and the shift solenoid 2 connector.	Repair the circuit (WHT) between the TCM connector and the female TCM sensor (C110) connector.

DTC P1701 – ENGINE COOLANT TEMPERATURE (ECT) SENSOR CIRCUIT MALFUNCTION

Conditions for Setting the DTC

- The transmission control module (TCM) detects no engine coolant temperature (ECT) signal for 2.5 seconds continuously.

Conditions for Clearing the MIL/DTC

- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects an ECT signal for 2.5 seconds continuously.

DTC P1701 – Engine Coolant Temperature (ECT) Sensor Circuit

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. 9. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 10 Request DTC by Status. Is DTC P1701 displayed?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Disconnect the engine control module (ECM) J2 (red) connector. 4. Measure the resistance between pin 33 (BRN) of the TCM connector and pin A16 (BRN) of the ECM J2 (red) connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 3.	Repair the circuit as necessary.
3	Measure the resistance between pin 33 (BRN) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit as necessary.	Go to Step 4.
4	1. Connect the ECM J2 (red) connector. 2. Start the engine. 3. Measure the voltage at pin 33 (BRN) of the TCM connector. Is the measurement within the specified value?	0.2 volts	Replace the transmission control module (TCM).	Replace the powertrain control module (PCM).

DTC P1702 −TORQUE CONVERTER CLUTCH (TCC) CIRCUIT MALFUNCTION

Conditions for Setting the DTC

- The transmission control module (TCM) detects that the voltage of the torque control line is ground level when the TCM doesn't output the torque control signal for 2.5 seconds continuously.

Action Taken When the DTC Sets

- The TCM illuminates the power lamp after a trip with a failure reported.
- 4th gear is held in "D" range.
- 4th gear is held in "3" range.
- 1st gear is held in "L" range.
- No TCC lockup control.
- Full line pressure.

Conditions for Clearing the MIL/DTC

- The TCM turns off the power lamp after a trip without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the voltage of the torque control line is not ground level when the TCM doesn't output the torque control signal for 2.5 seconds continuously.

DTC P1702 – Torque Converter Clutch (TCC) Circuit Malfunction

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform one vehicle drive cycle. Is the POWER Lamp ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P1702 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110) and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Disconnect the engine control module (ECM) (blue) connector. 4. Measure the resistance between pin 18 (GRY) of the TCM connector and pin F1 (GRYN) of the ECM (blue) connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 4.	Repair the circuit as necessary.

DTC P1702 – TORQUE CONVERTER CLUTCH (TCC) CIRCUIT MALFUNCTION

Step	Action	Value(s)	Yes	No
4	Measure the resistance between pin 18 (GRY) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit as necessary.	Go to Step 5.
5	1. Connect the ECM (blue) connector. 2. Start the engine. 3. Measure the voltage at pin 18 (GRY) of the TCM connector. Is the measurement within the specified value?	12 volts	Replace the transmission control module (TCM).	Replace the powertrain control module (PCM).

DTC P1790 – INTERNAL TRANSMISSION CONTROL MODULE (TCM) RANDOM ACCESS MEMORY (RAM) CHECKSUM ERROR

Conditions for Setting the DTC

- The transmission control module (TCM) detects a difference between the calculated checksum data and the real checksum data.

Action Taken When the DTC Sets

- The TCM illuminates the malfunction indicator lamp (MIL) after two consecutive trips with a failure reported.

Conditions for Clearing the MIL/DTC

- The TCM turns off the MIL after three consecutive trips without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the calculated checksum data is the same as the real checksum data.

DTC P1790 – Internal Transmission Control Module (TCM) Random Access Memory (RAM) Checksum Error

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform two vehicle drive cycles. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect Transmission Control Module (TCM) wiring harness and connector for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P1790 displayed?	—	Replace the Transmission Control Module (TCM).	Inspect Transmission Control Module (TCM) wiring harness and connector for signs of an intermittent condition. Repair as necessary.

DTC P1791 – THROTTLE POSITION (TP) SENSOR CIRCUIT MALFUNCTION

Conditions for Setting the DTC

- The transmission control module (TCM) detects a malfunction of the throttle position (TP) sensor signal.
- No TP sensor signal.
- TP sensor duty ratio is less than 2.0%.
- TP sensor duty ratio is more than 98.0%.
- Engine speed is greater than 400 rpm.

Action Taken When the DTC Sets

- The TCM illuminates the malfunction indicator lamp (MIL) after a trip with a failure reported.
- 4th gear is held in “D” range.
- 4th gear is held in “3” range.
- 1st gear is held in “L” range.
- No TCC lockup control.
- Full line pressure.

Conditions for Clearing the MIL/DTC

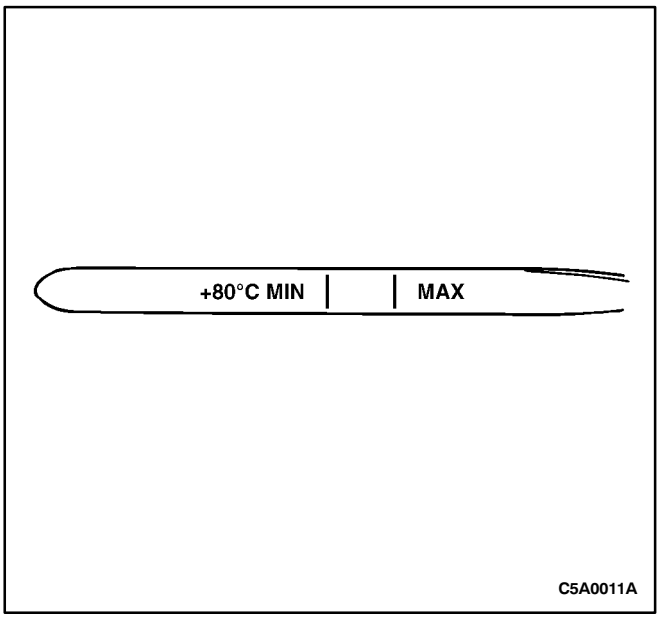
- The TCM turns off the MIL after a trip without a failure reported.
- The Scan-100 scan tool can clear the DTC from the TCM history.
- The TCM clears the DTC from the TCM history if it detects that the TP sensor duty ratio is between 2.0% and 98.0% for 4 seconds continuously.

DTC P1791 – Throttle Position (TP) Sensor Circuit Malfunction

Step	Action	Value(s)	Yes	No
1	1. Turn the ignition OFF. 2. Install the Scan-100 Scan tool. 3. With the engine OFF, turn the ignition switch to the RUN position. 4. Select Store Freeze Frame/Failure Records from the Diagnostic Trouble Codes Information menu. 5. Store Freeze Frame/Failure Records. 6. Select Clear DTC Information from the Diagnostic Trouble Codes Information menu. 7. Clear DTC Information. 8. Perform one vehicle drive cycle. Is the Malfunction Indicator Lamp (MIL) ON?	—	Go to Step 2.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.
2	1. Select Request DTC by Status from the Diagnostic Trouble Codes Information menu. 2. Request DTC by Status. Is DTC P1791 displayed?	—	Go to Step 3.	Inspect the transmission control module (TCM) connector, transmission control module (TCM) sensor connector (C110), transmission fluid temperature (TFT) sensor connector and the wiring harnesses for signs of an intermittent condition. Repair as necessary.

DTC P1791 − Throttle Position (TP) Sensor Circuit Malfunction

Step	Action	Value(s)	Yes	No
3	1. Turn the ignition OFF. 2. Disconnect the transmission control module (TCM) connector. 3. Disconnect the engine control module (ECM) J2 (red) connector. 4. Measure the resistance between pin 20 (LT GRN) of the TCM connector and pin A11 (LT GRN) of the ECM J2 (red) connector. Is the measurement within the specified value?	5 ohms or less	Go to Step 4.	Repair the circuit as necessary.
4	Measure the resistance between pin 20 (LT GRN) of the TCM connector and ground. Is the measurement within the specified value?	5 ohms or less	Repair the circuit as necessary.	Go to Step 5.
5	1. Connect the ECM J2 (red) connector. 2. Start the engine. 3. Measure the voltage at pin 20 (LT GRN) of the TCM connector. Is the measurement within the specified value?	0.2 volts	Replace the transmission control module (TCM).	Replace the powertrain control module (PCM).



MAINTENANCE AND REPAIR ON-VEHICLE SERVICE

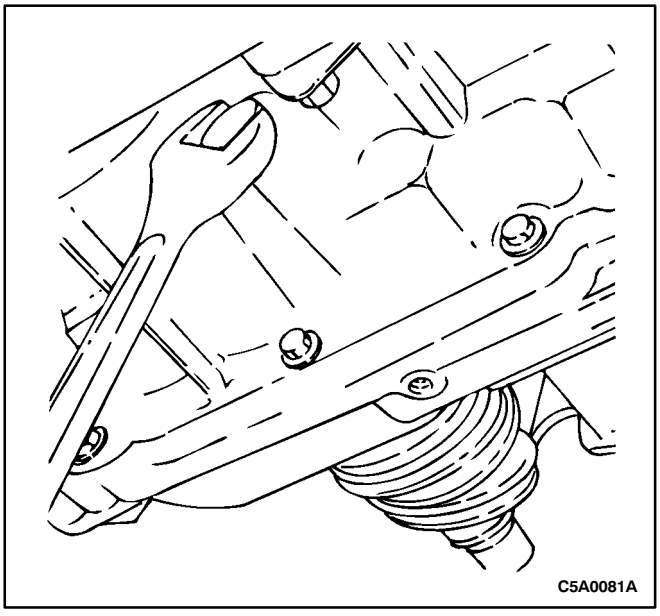
TRANSAXLE FLUID LEVEL CHECKING PROCEDURE

Notice: Check the fluid level when the transaxle temperature is above 80°C (176°F).

Notice: During the fluid level check, the selector lever must be in position P.

Notice: When adding fluid or making a complete fluid change, always use TOTAL FLUID HX. Failure to use the proper fluid will cause hose and seal damage and fluid leaks.

1. Make sure the vehicle is level.
2. Remove the transaxle fluid dipstick and check the transaxle fluid level.
3. The correct fluid level must be between the MIN and the MAX notches on the dipstick.
4. If the fluid level is below the MIN notch, add transaxle fluid through the fluid filler tube and check for leaks in the transaxle.



5. If the fluid is above the MAX notch, the transaxle is overfilled. Drain some of the fluid through the fluid pan drain plug. Check the transaxle fluid level.

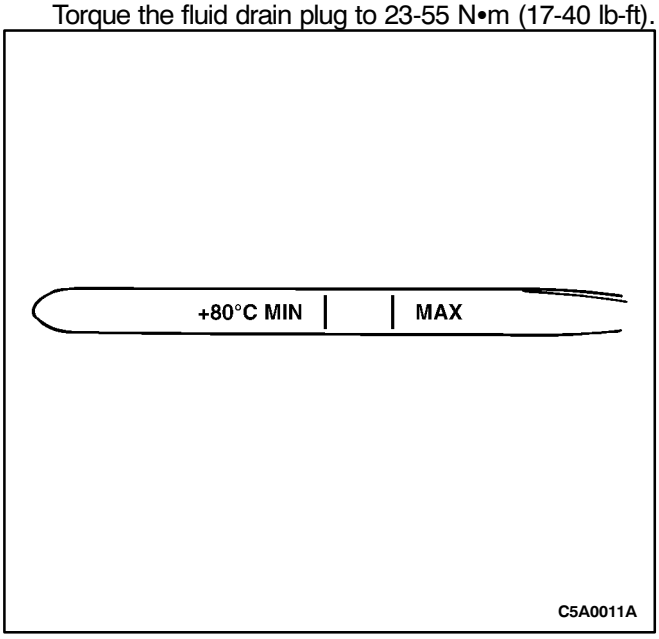
FLUID DRAIN PROCEDURE

Draining Procedure

1. Raise and support the vehicle. Refer to “Vehicle Lifting Procedures,” *Section OB, General Information.*
2. Place a suitable fluid drainage container under the transaxle.
3. Remove the fluid drain plug. Allow the fluid to drain completely.
4. Clean the drain plug threads.
5. Install the fluid drain plug.

Tighten

Torque the fluid drain plug to 23-55 N•m (17-40 lb-ft).



Filling Procedure

1. Remove the drainage container and lower the vehicle.
2. Add three-fourths of the recommended amount of TOTAL FLUID HX.
3. Start the engine and allow it to reach normal operating temperature.
4. Shift the gear selector through all positions.
5. Check the fluid level and add fluid in 0.4 liter (0.5 quart) increments until the dipstick indicates a safe level.

CASE POROSITY REPAIR

1. Determine the leak area. Refer to “Locating Fluid Leaks” in this section.
2. Clean the leak area with the solvent. Air dry.

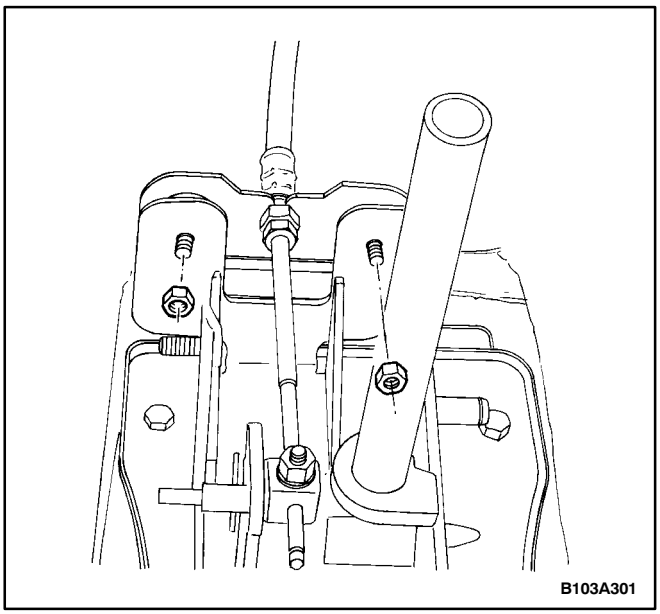
Caution: Epoxy cement may cause skin irritations and eye damage. Read and follow all information on the container label as provided by the manufacturer.

3. Mix a sufficient amount of epoxy cement following the manufacturer’s recommendations.
4. While the transaxle case is hot, apply epoxy cement with a clean, dry soldering acid brush.
5. Allow the epoxy cement to dry for 3 hours before starting the engine.

FLUID COOLER FLUSHING

Flushing Procedure

1. Drain the fluid from the transaxle and refill the transaxle with new transaxle fluid. Refer to “Fluid Drain Procedure” in this section.
2. Let the engine idle for 5 minutes.
3. Drain the fluid from the transaxle and refill the transaxle with new transaxle fluid. Refer to “Fluid Drain Procedure” in this section.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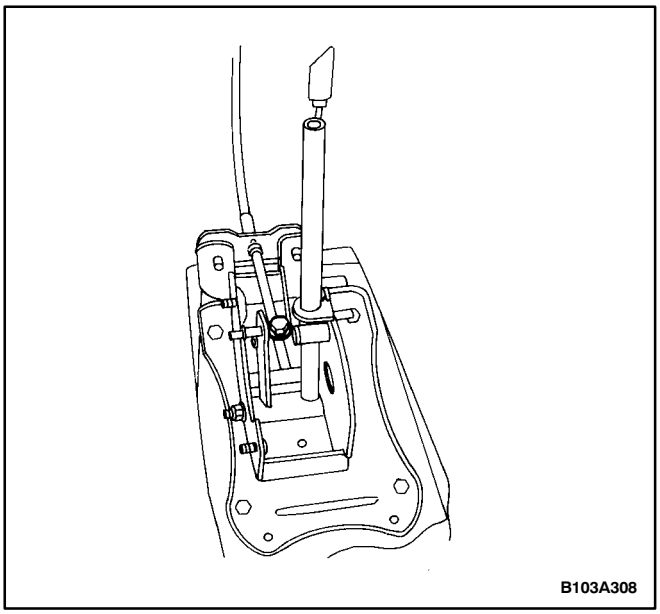
SHIFT CONTROL LEVER

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the right and the left front lower trim panels, the shift control panel, and the floor console. Refer to *Section 9G, Interior Trim.*
3. Remove the transmission range (TR) switch.
4. Remove the nuts from the shift control cable mounting bracket at the front of the shift control assembly.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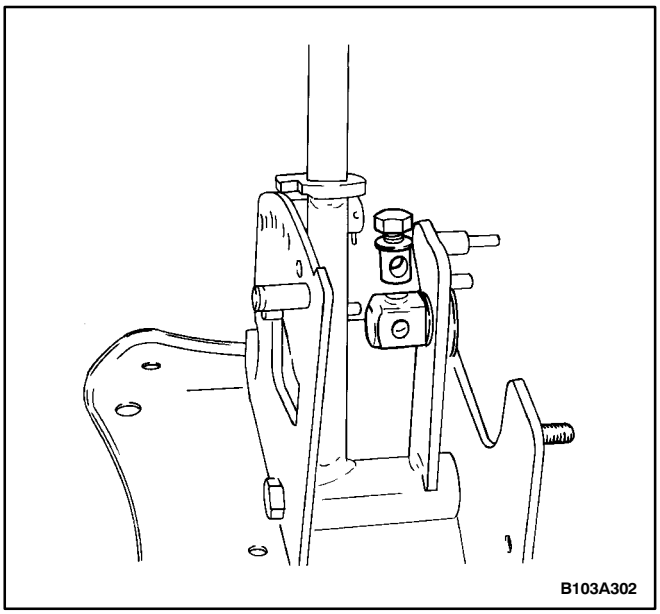
5. Loosen the nut on the shift control cable adjuster pinch bolt.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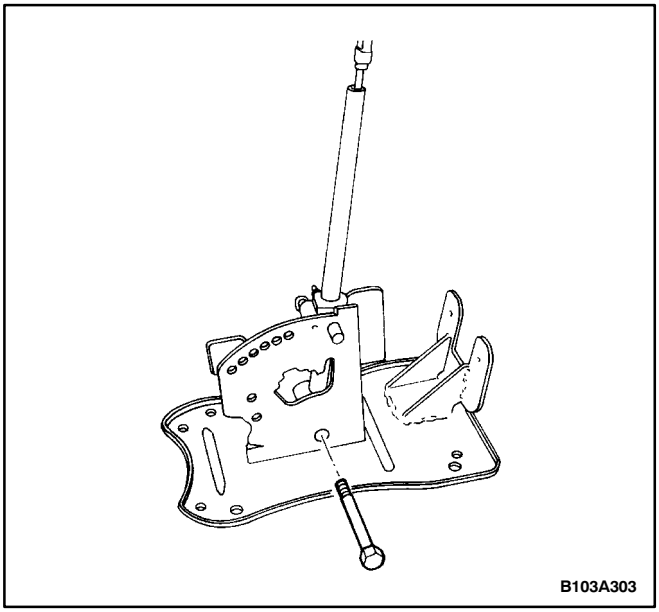
6. Slide the shift control cable out of the shift control cable adjuster and remove the pinch bolt.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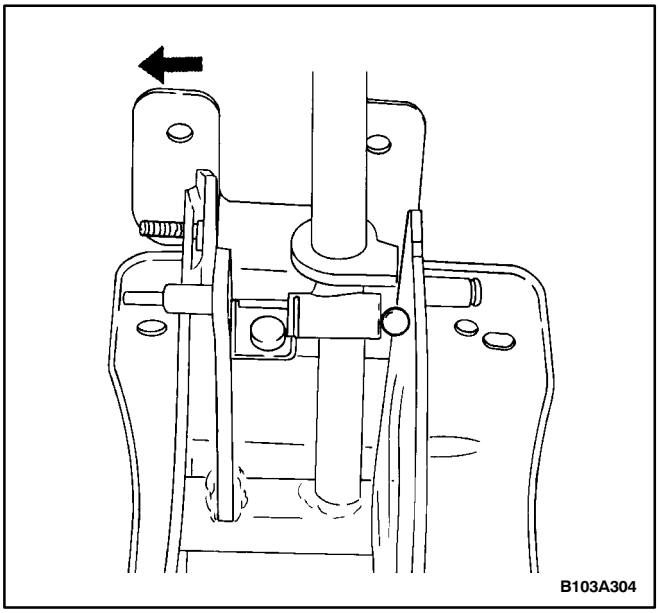
7. Remove the bolt from the bottom of the shift control lever.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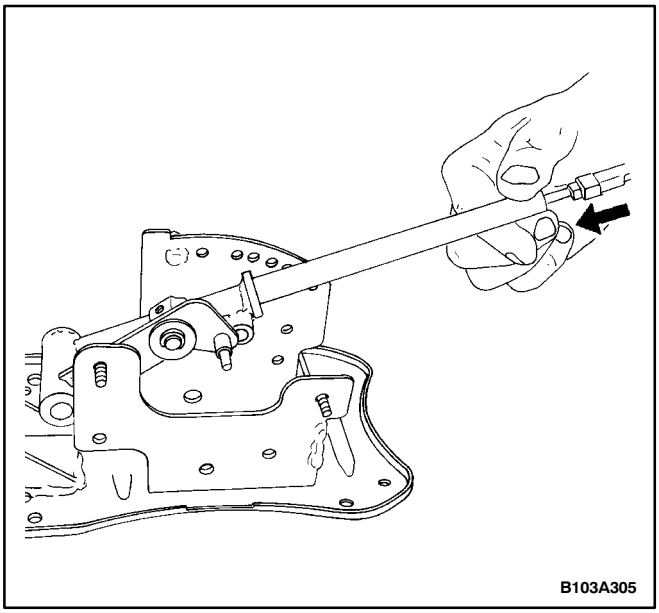
8. Tilt the shift control lever to the left side and remove the spring-loaded detent ball.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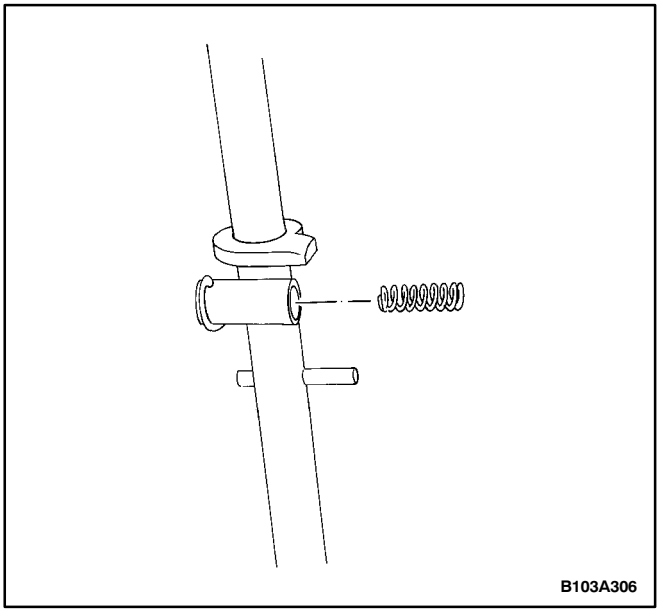
9. Remove the shift control lever by pressing the lock release button while pivoting the bottom of the shift control lever toward the front of the vehicle.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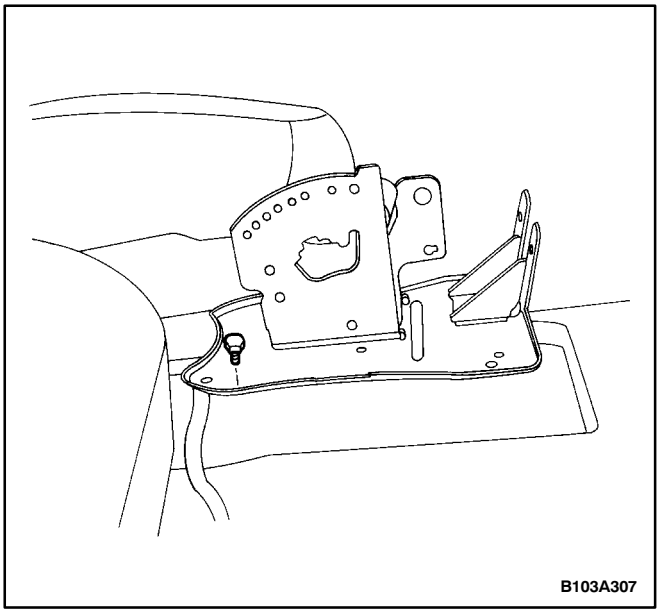
10. Slide the detent spring out of the shift control lever.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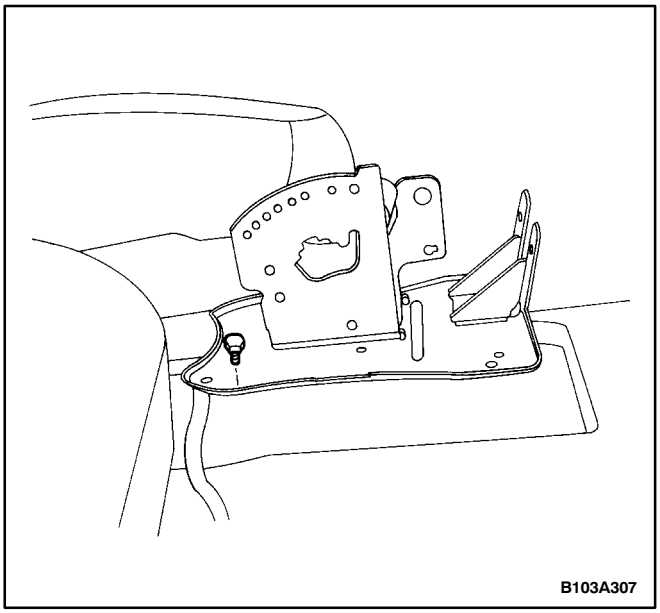
11. Remove the bolts holding the shift control assembly to the floor panel.
12. Remove the shift control assembly.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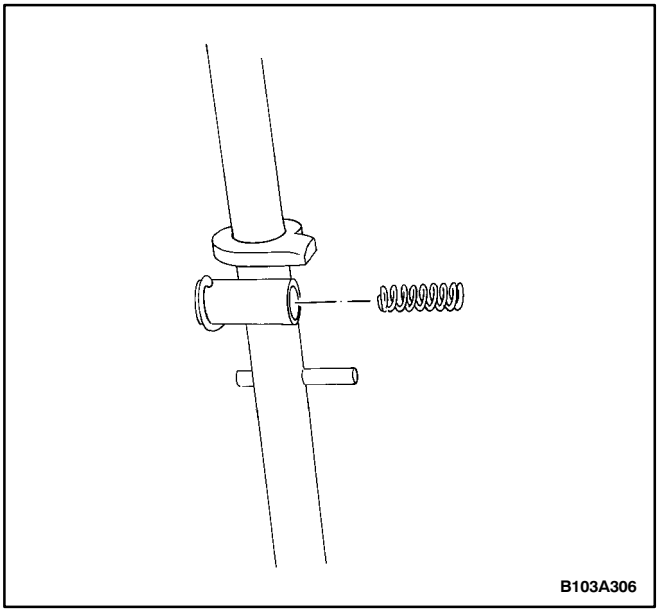
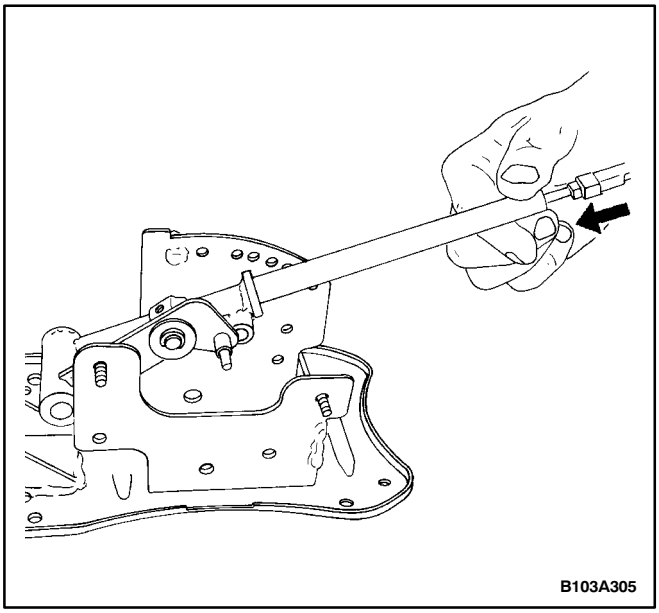
Installation Procedure

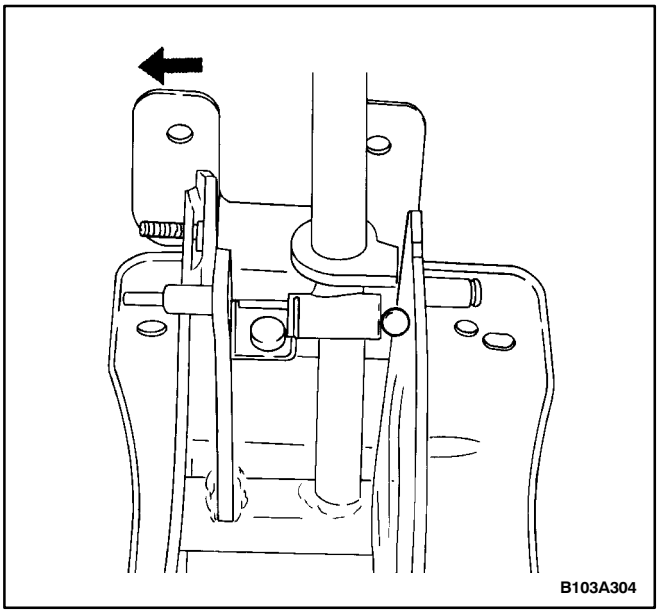
1. Install the shift control assembly in the floor panel with the bolts.


B103A306

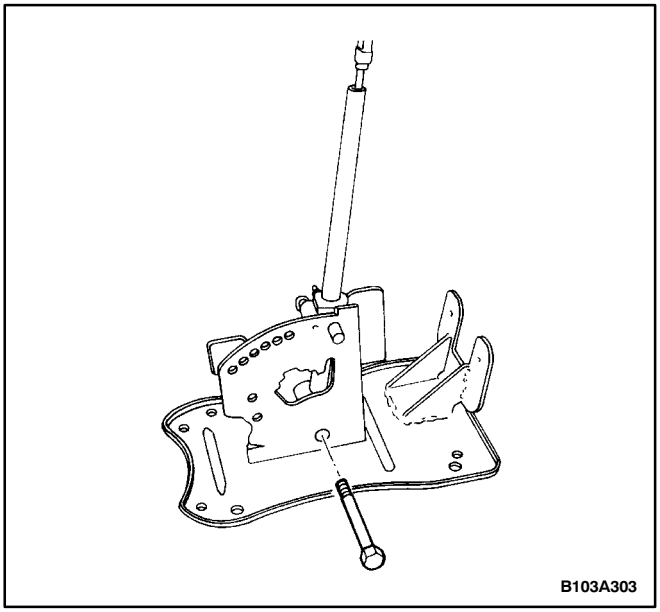
2. Install the detent spring into the shift control lever.


B103A305

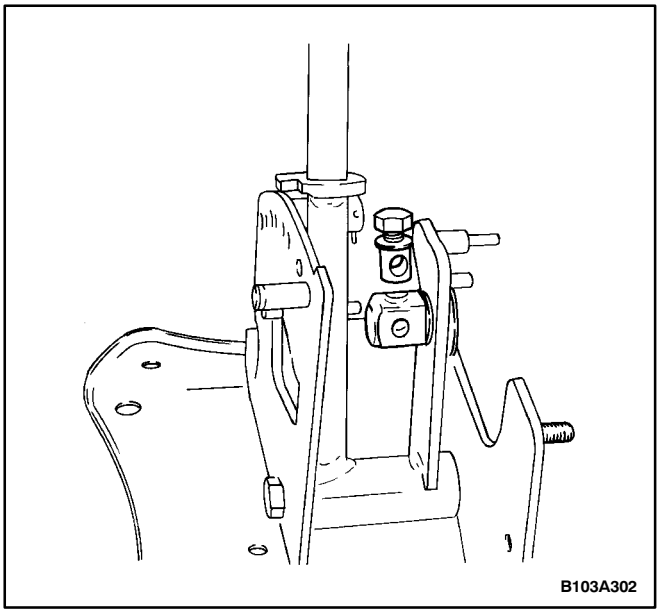
3. Install the shift control lever by pressing the lock release button while pivoting the bottom of the shift control lever toward the rear of the vehicle.


B103A304

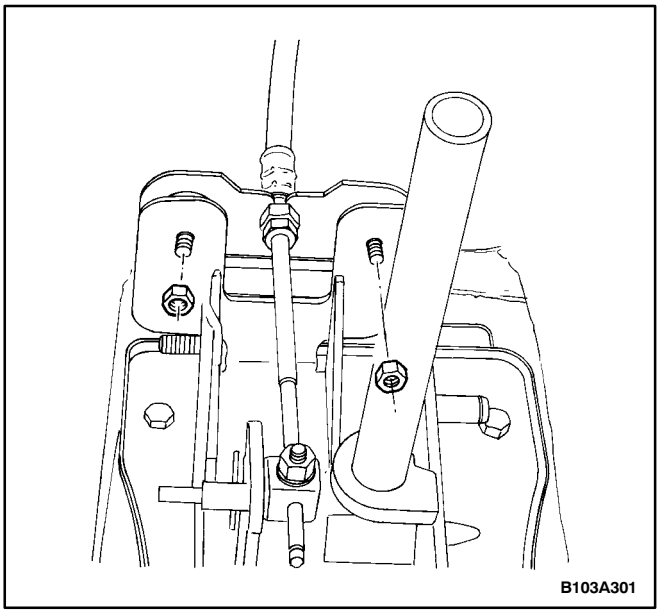
4. Tilt the shift control lever to the left and install the detent ball.


B103A303

5. Install the bolt in the bottom of the shift control lever.


B103A302

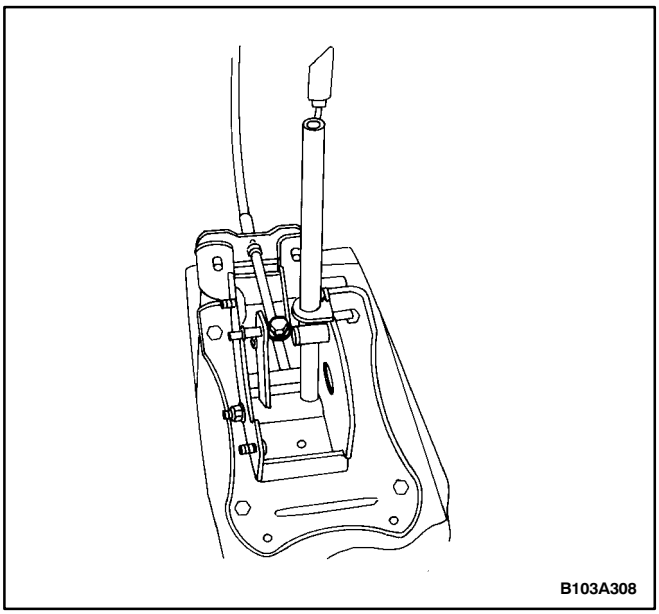
6. Insert the shift control cable adjuster pinch bolt into the shift control assembly and slide the shift control cable in to the shift control cable adjuster.


B103A301

7. Attach the shift control cable mounting bracket to the shift control assembly with the nuts.

Tighten

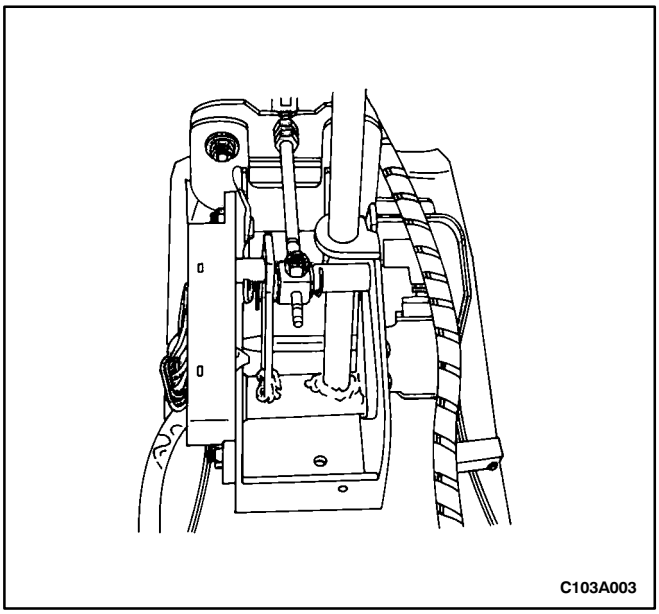
Tighten the shift control cable mounting bracket nuts to 6 N•m (53 lb-in).


B103A308

8. Install the nut on the shift control cable adjuster pinch bolt. Refer to “Control Cable Adjustment” in this section.

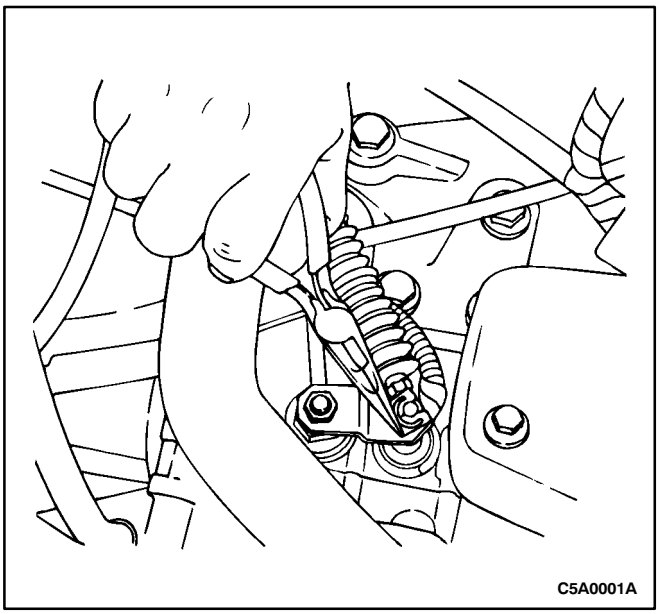
Tighten

Tighten the shift control cable adjuster pinch bolt nut to 8 N•m (71 lb-in).


C103A003

Notice: Make sure the slot in the TR switch is all the way forward and the shift control lever is in the P position. Failure to do so may damage the TR switch and produce a false gear indication.

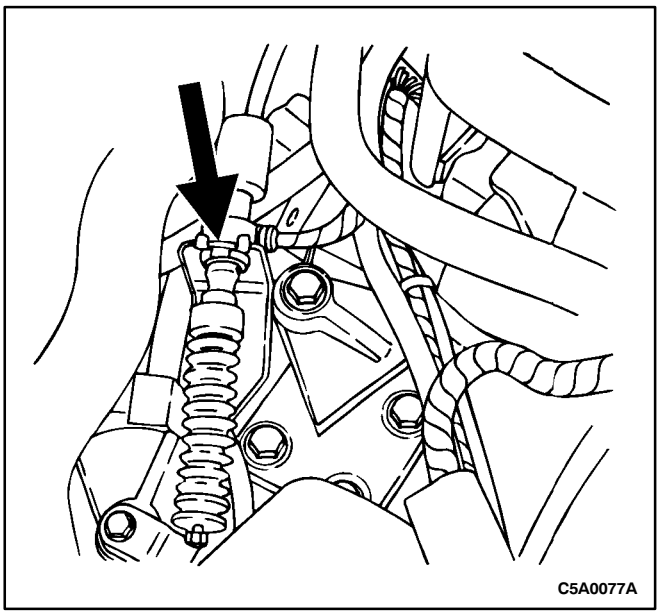
9. Install the TR switch on the shift control assembly.
10. Install the floor console, the shift control panel, and the right and the left front lower trim panels. Refer to *Section 9G, Interior Trim.*
11. Connect the negative battery cable.


C5A0001A

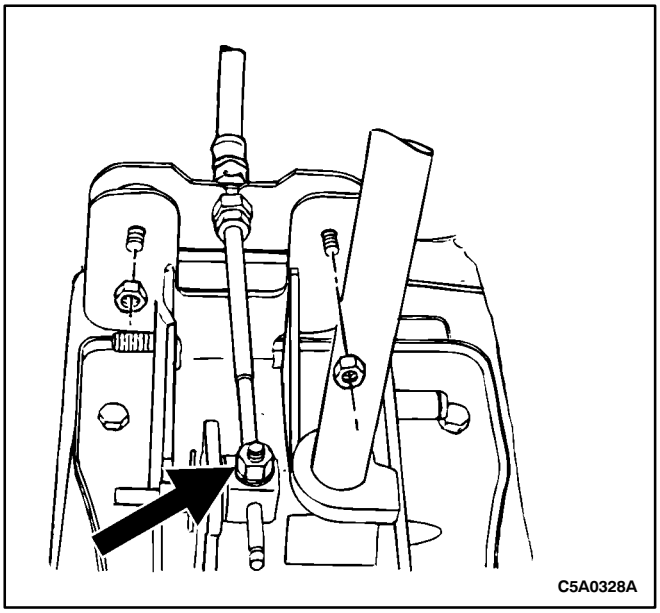
SHIFT CONTROL CABLE

Removal Procedure

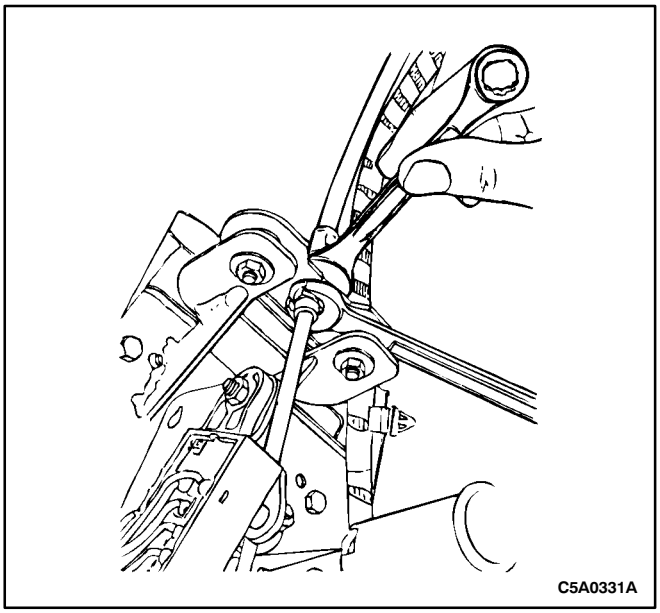
1. Remove the battery and the battery tray. Refer to *Section 1E, Engine Electrical.*
2. Remove the retaining clip on the park/neutral position switch, (PNP switch).


C5A0077A

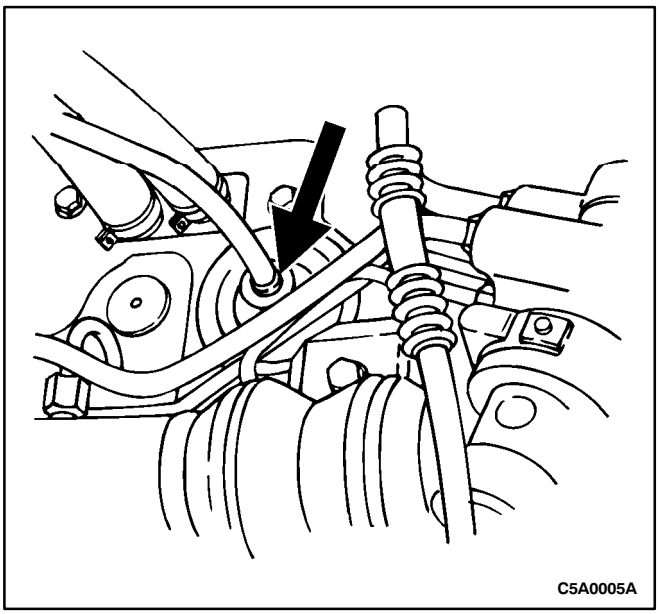
3. Remove the clip on the transaxle case bracket.
4. Remove the shift control cable from the transaxle case bracket.
5. Remove the trim panel from the floor console. Refer to *Section 9G, Interior Trim.*


C5A0328A

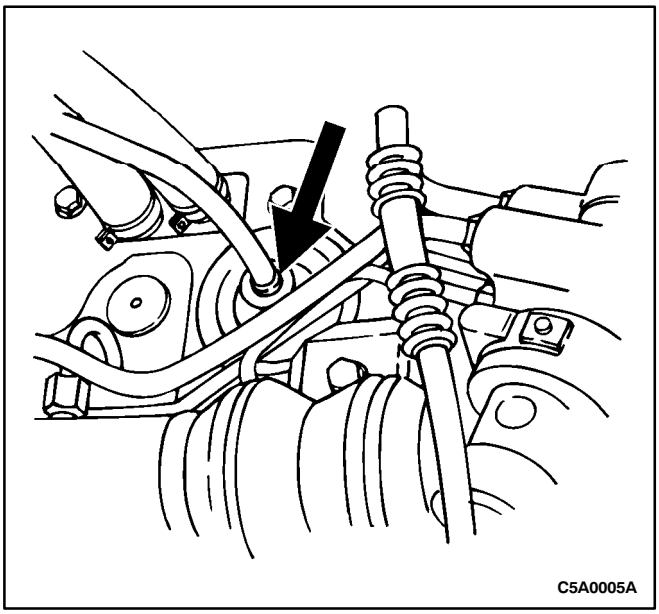
6. Loosen the pinch bolt on the shift control lever.


C5A0331A

7. Remove the shift control cable from the shift control assembly by holding one nut with a wrench while loosening the other with a wrench.

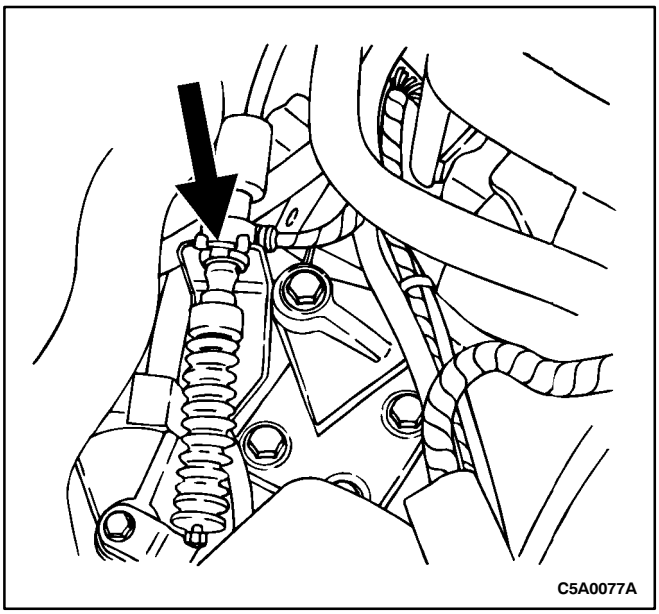


8. Pull the shift control cable through the firewall along with the grommet from beneath the vehicle.

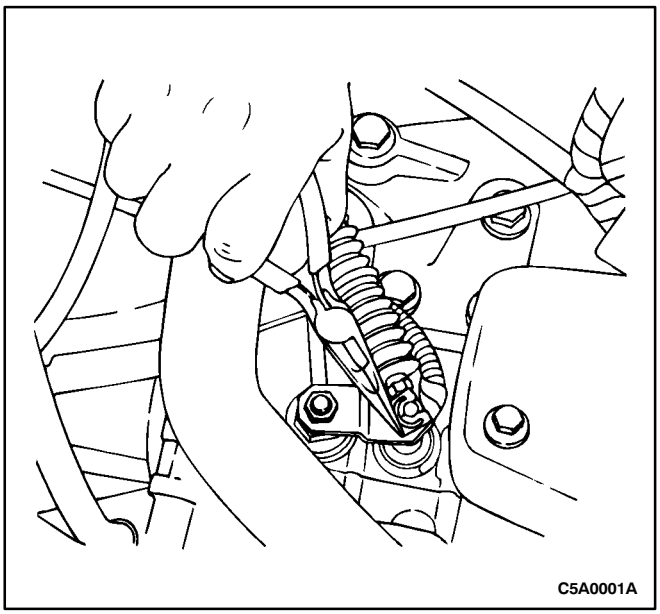


Installation Procedure

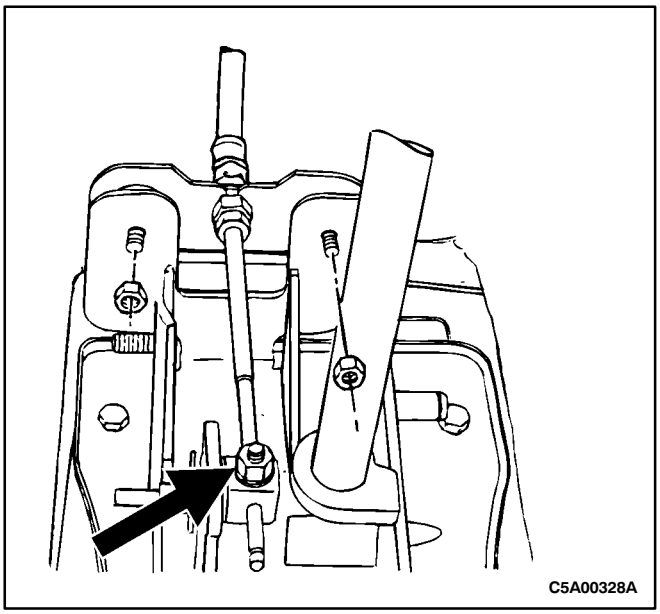
1. Push the shift control cable through the firewall into the passenger compartment. Seat the rubber grommet in the firewall. (Hint: use foaming glass cleaner to ease installation).
2. Move the transaxle shift lever to the park position, then install the shift control cable into the transaxle mount bracket.



3. Install the clip onto the shift control cable at the transaxle mount bracket.
4. Snap the shift control cable onto the transaxle shift control lever.


C5A0001A

5. Install the retaining clip onto the transaxle shift control lever.


C5A00328A

6. Move the shifter forward until it contacts the stop, then install the shift control cable at the selector in the vehicle.

   Tighten

   Tighten the shift control cable attachment nut to 6 N•m (53 lb-in).

7. Insert the shift control cable into the connecting slot on the shift control lever and secure it with the pinch bolt and the nut.

   Tighten

   Tighten the shift control cable adjustment pinch bolt nut to 8 N•m (71 lb-in).

8. Install the floor console trim panel. Refer to *Section 9G, Interior Trim.*
9. Install the battery tray and the battery. Refer to *Section 1E, Engine Electrical.*

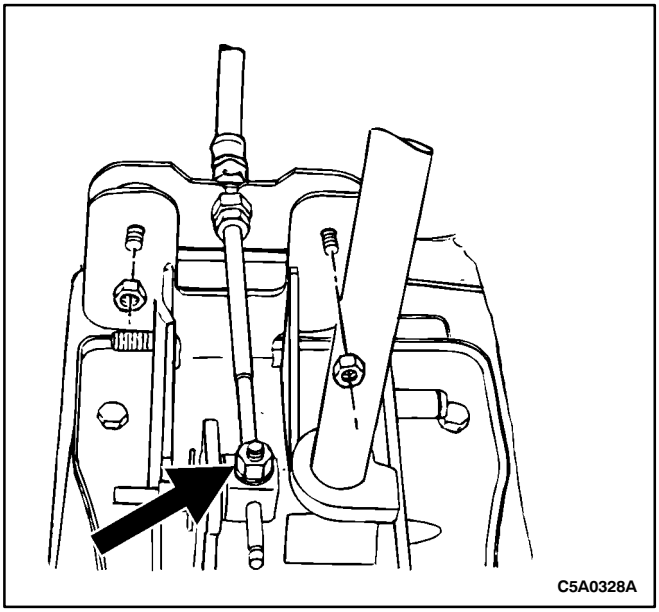
CONTROL CABLE ADJUSTMENT

Adjustment Procedure

The various shift control cable positions must match at the shift control lever in the vehicle and at the selector lever on the transaxle to provide proper transaxle shifting.

Place the shift control lever in the PARK position and check the selector lever connection to verify that it is in the forward most position. If it is not, the following adjustment must be performed:

1. Place the shift control lever in the PARK position.
2. Remove the trim panel from the floor console. Refer to *Section 9G, Interior Trim.*

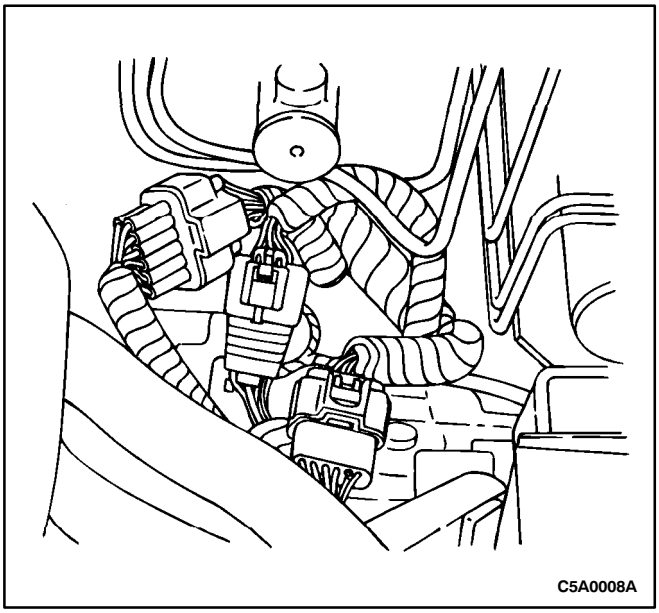

C5A0328A

3. Loosen the pinch bolt nut on the shift control lever.
4. Move the transaxle shift lever forward toward the front of the vehicle.
5. Verify that the shifter is in the PARK position, then tighten the shift control cable adjuster pinch bolt and nut.

Tighten

Tighten the shift control cable adjuster pinch bolt nut to 8 N•m (71 lb-in).

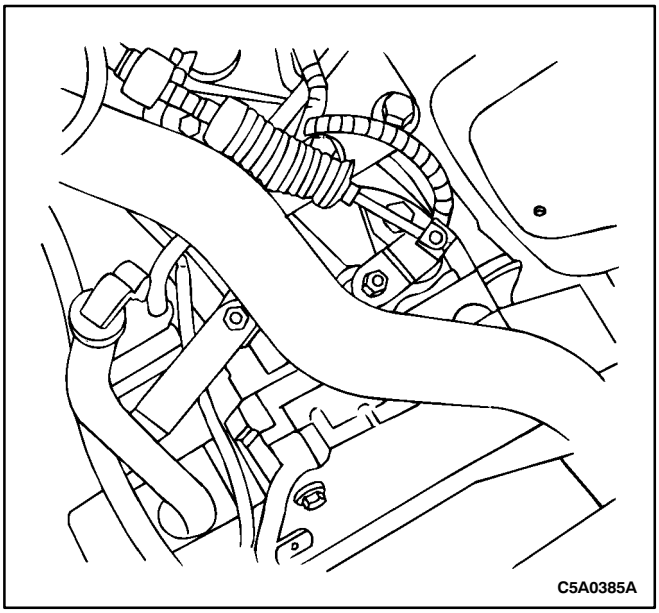
6. Install the floor console trim panel. Refer to *Section 9G, Interior Trim.*


C5A0008A

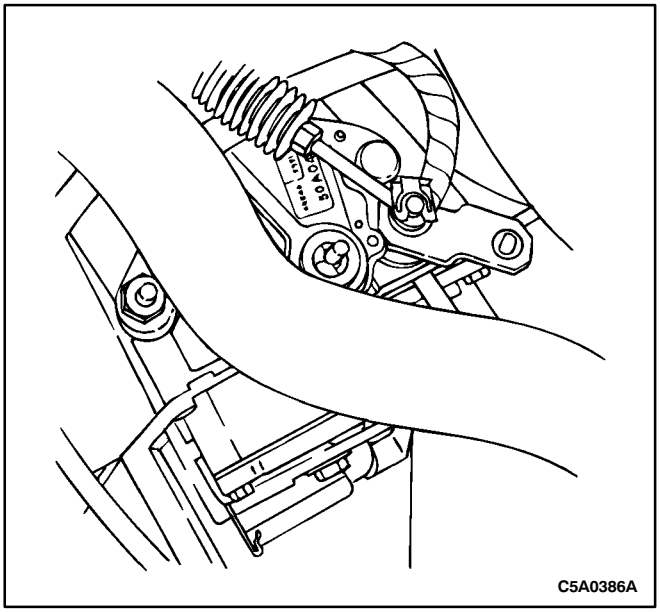
PARK/NEUTRAL POSITION (PNP) SWITCH

Removal Procedure

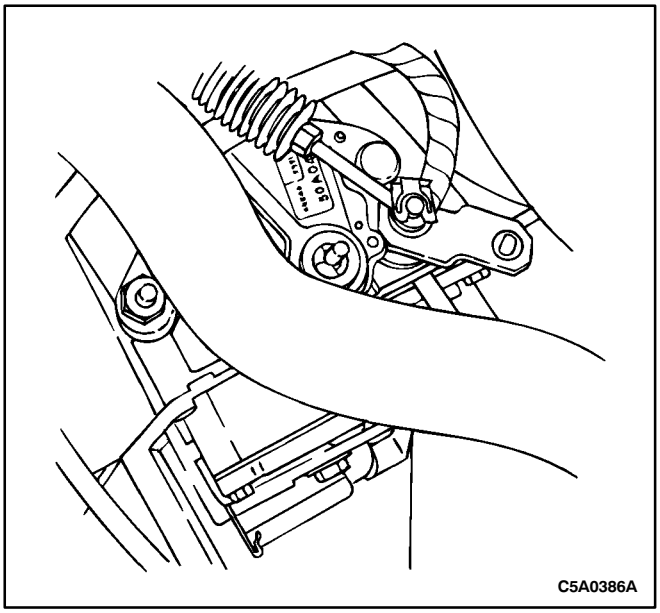
1. Remove the battery and battery tray. Refer to *Section 1E, Engine Electrical.*
2. Disconnect the park/neutral position (PNP) switch electrical connector from the wiring harness.


C5A0385A

3. Remove the nut retaining the shift control cable linkage to the PNP switch and the nut retaining the fluid filler tube to the PNP switch stud bolt.



4. Remove the bolt, nut and washer and stud bolt retaining the PNP switch to the transaxle case, then remove the PNP switch.



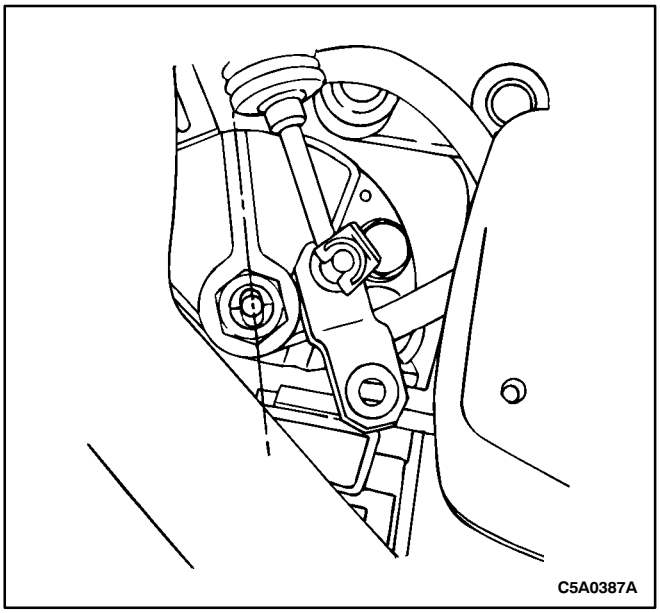
Installation Procedure

1. Install the park/neutral position (PNP) switch, then install the stud bolt, bolt and nut and washer hand tight.

Tighten

Tighten the retaining nut to 6-8 N•m (53-71 lb-ft).

2. Place the shift control lever in the Neutral (N) position.

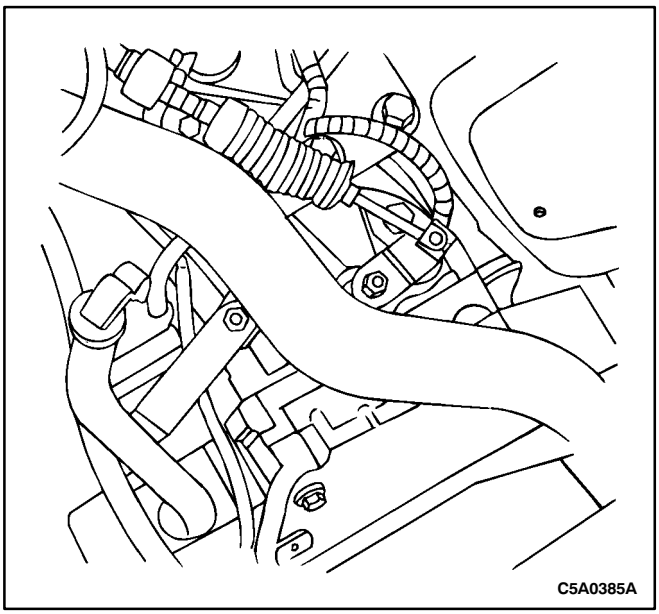


3. Align the neutral basic line on the PNP switch with the flat on the manual detent lever.

Tighten

Tighten the stud bolt to 20-29 N•m (14-22 lb-ft).

Tighten the bolt to 10-16 N•m (7-11 lb-ft).

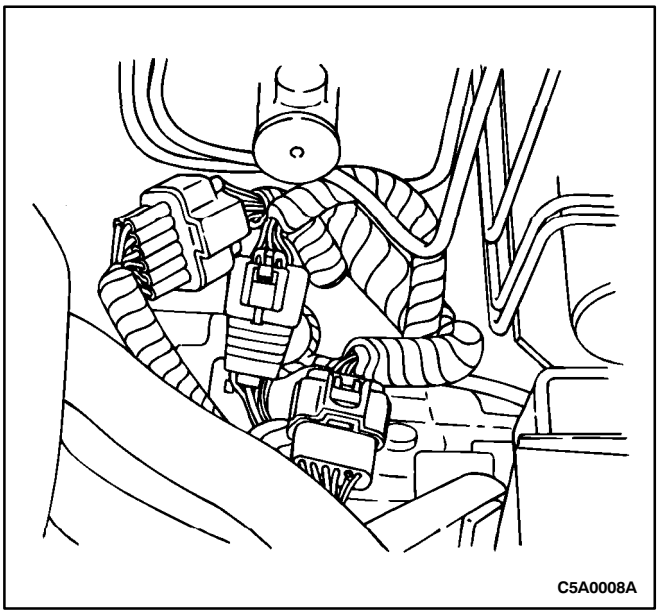

C5A0385A

4. Position the fluid filler tube bracket on the stud bolt and the shift control cable linkage on the manual detent lever stud. Install the shift control cable linkage and fluid filler tube bracket retaining nuts.

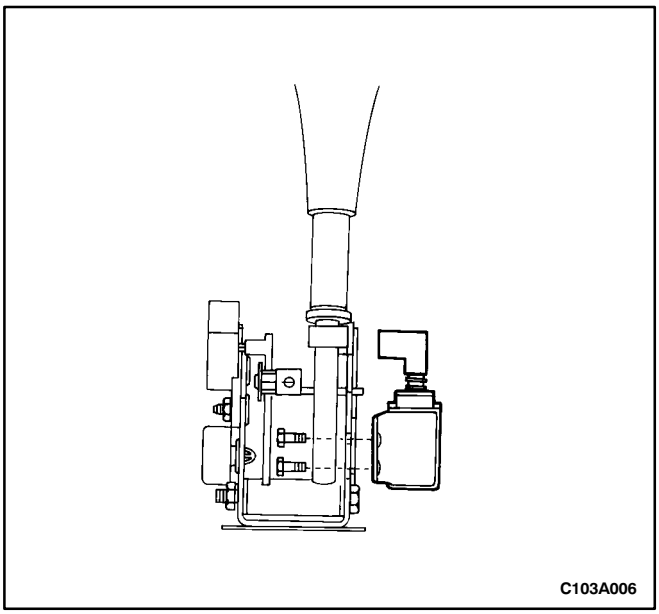
Tighten

Tighten the shift control cable linkage retaining nut to 15 N•m (11 lb-ft).

Tighten the fluid filler tube bracket retaining nut to 15 N•m (11 lb-ft).


C5A0008A

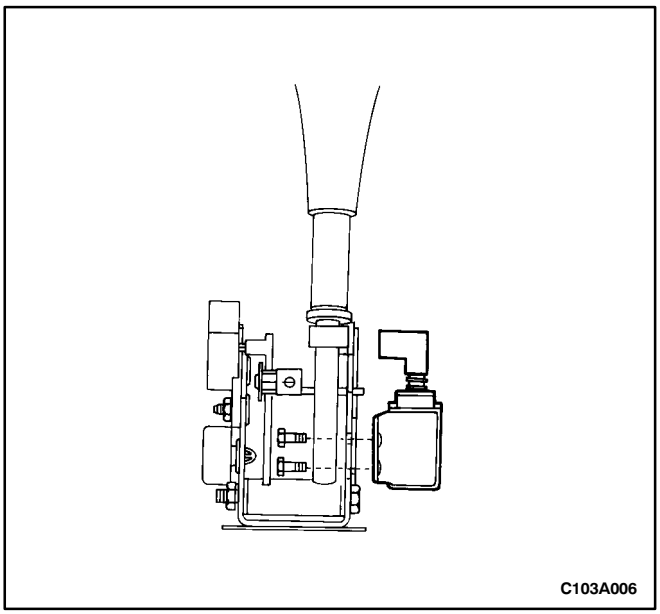
5. Connect the PNP switch electrical connector to the wiring harness.
6. Install the battery and battery tray. Refer to *Section 1E, Engine Electrical.*


C103A006

BRAKE TRANSAXLE SHIFT INTERLOCK

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the center console. Refer to *Section 9G, Interior Trim.*
3. Disconnect the electrical connector from the shift interlock solenoid.
4. Remove the shift interlock solenoid bolts and the shift interlock solenoid.

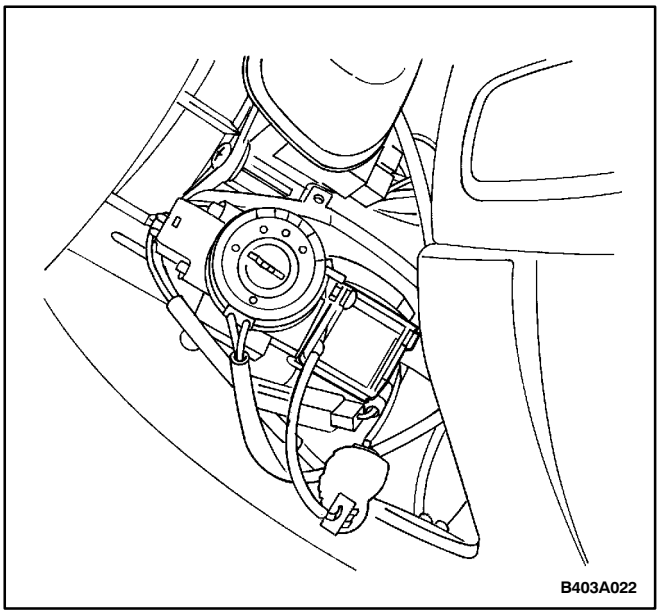

C103A006

Installation procedure

1. Install the shift interlock solenoid and the shift interlock solenoid bolts.

   Tighten

   Tighten the shift interlock solenoid bolts to 4 N•m (35 lb-in).
2. Connect the electrical connector to the shift interlock solenoid.
3. Install the center console. Refer to *Section 9G, Interior Trim.*
4. Connect the negative battery cable.


B403A022

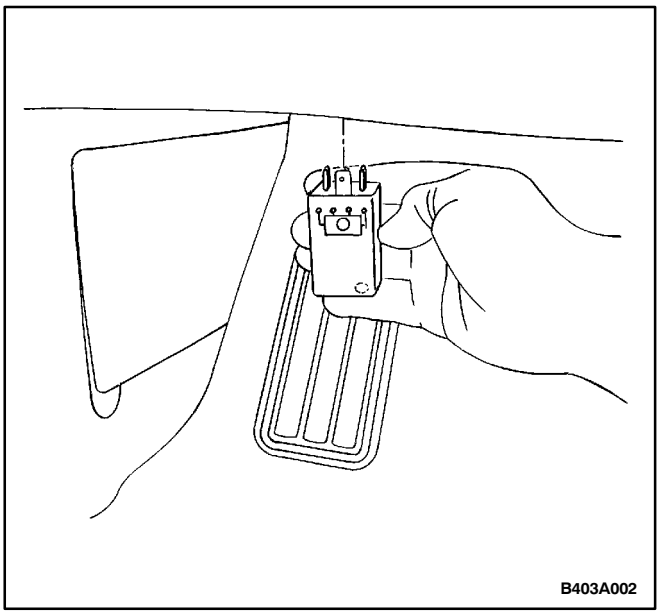
KEY INTERLOCK

Removal Procedure

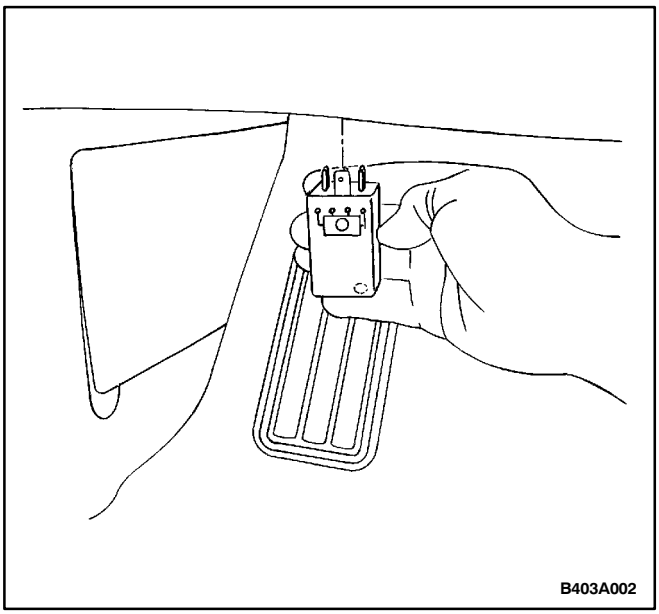
1. Disconnect the negative battery cable.
2. Remove the upper and the lower steering column cover panels. Refer to *Section 6E, Steering Wheel and Column.*

Notice: Be careful when removing the key interlock solenoid. There is a plunger with a spring attached that can become easily lost.

3. Disconnect the key interlock solenoid electrical connector and remove the key interlock solenoid screws and the key interlock solenoid.

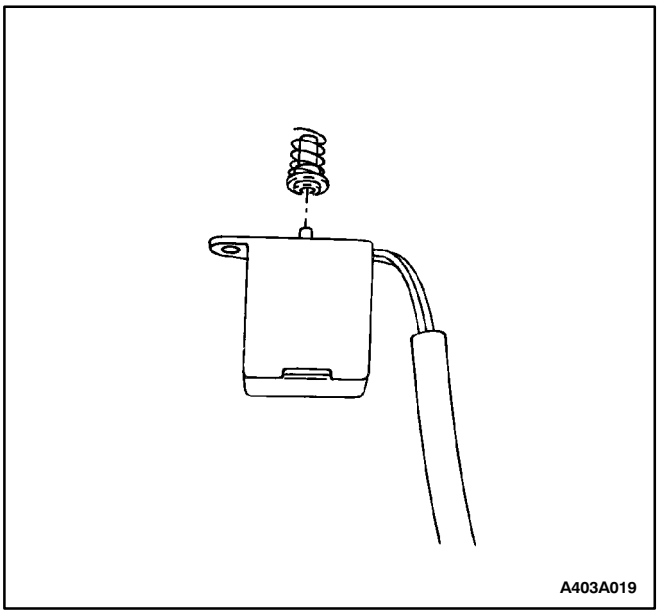

B403A002

4. Remove the key interlock unit. It is located to the left of the steering column behind the driver knee bolster.

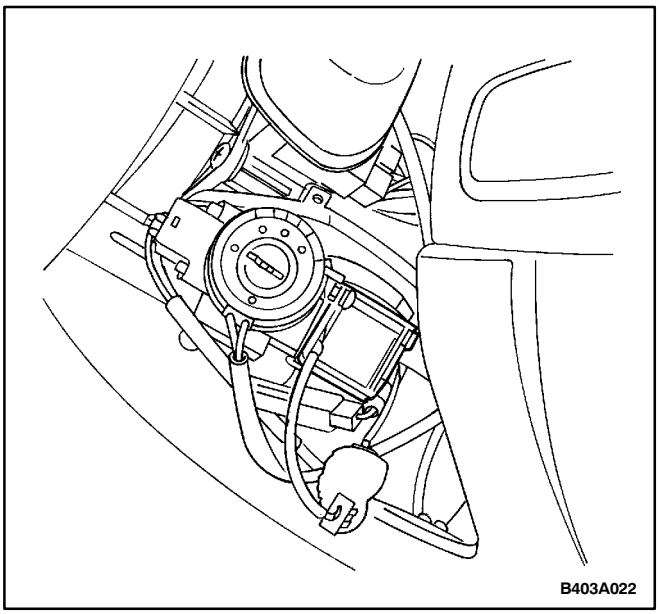

B403A002

Installation Procedure

1. Install the key interlock unit.


A403A019

2. Place the spring and the plunger on the key interlock solenoid.

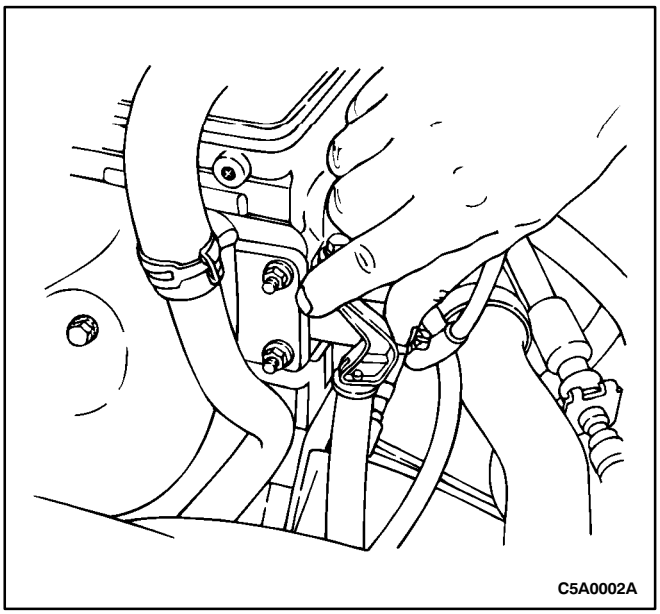

B403A022

3. Install the key interlock solenoid and the solenoid screws.

Tighten

Tighten the key interlock solenoid screws to 2 N•m (18 lb-in).

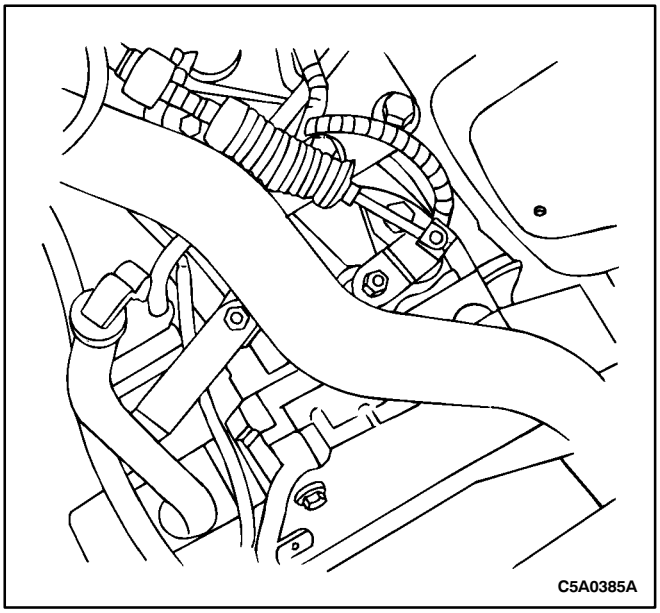
4. Install the upper and the lower steering column cover panels. Refer to *Section 6E, Steering Wheel and Column.*
5. Connect the negative battery cable.


C5A0002A

FLUID FILLER TUBE

Removal Procedure

1. Remove the transaxle oil dipstick.


C5A0385A

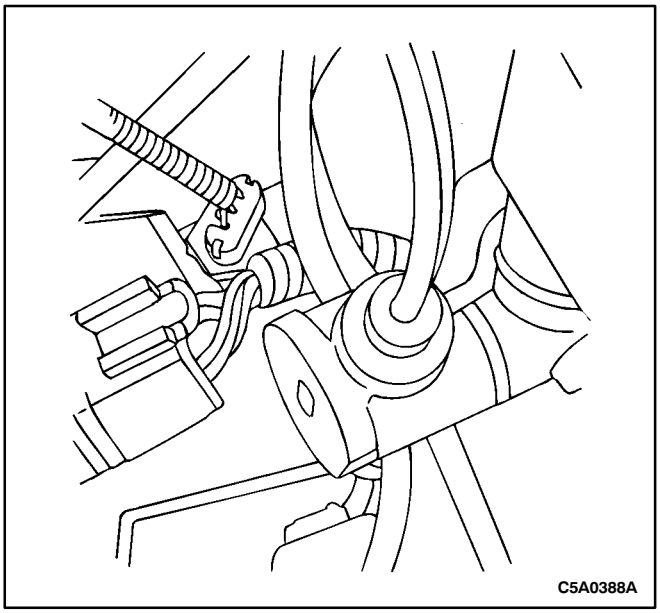
2. Remove the fluid filler tube nut from the park/neutral position (PNP) switch stud.
3. Grasp the body of the fluid filler tube, then pull it out of the transaxle case.

Installation Procedure

1. Install a new O-ring on the fluid filler tube.
2. Lubricate the O-ring with TOTAL FLUID HX.
3. Install the fluid filler tube into the transaxle case.
4. Install the fluid filler tube nut on the stud on the PNP switch.

Tighten

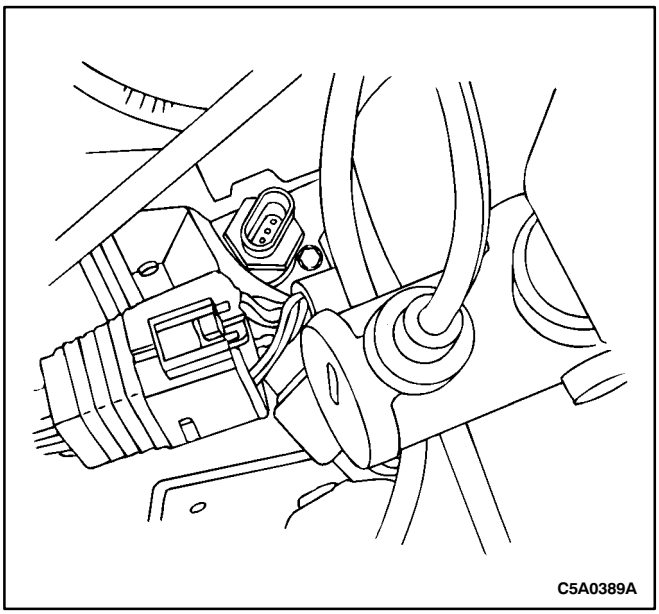
Tighten the fluid filler tube nut to 15 N•m (11 lb-ft).


C5A0388A

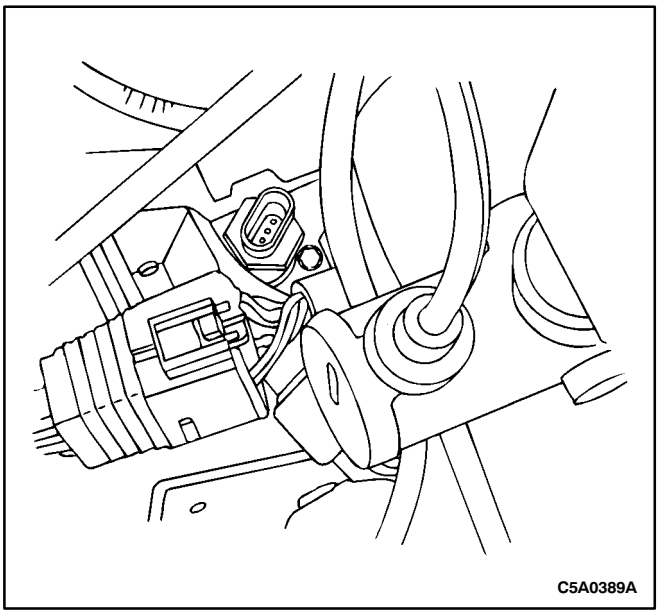
VEHICLE SPEED SENSOR (VSS)

Removal Procedure

1. Disconnect the negative battery cable.
2. Disconnect the vehicle speed sensor (VSS) electrical connector.



3. Remove the VSS retaining bolt, then the VSS.
4. Remove and discard the O-ring from the VSS.



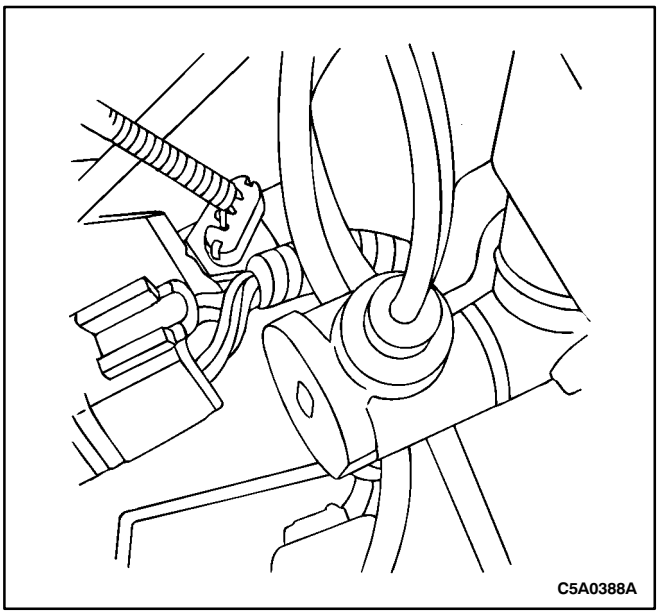
Installation Procedure

Notice: Lubricate the O-ring with TOTAL FLUID HX.

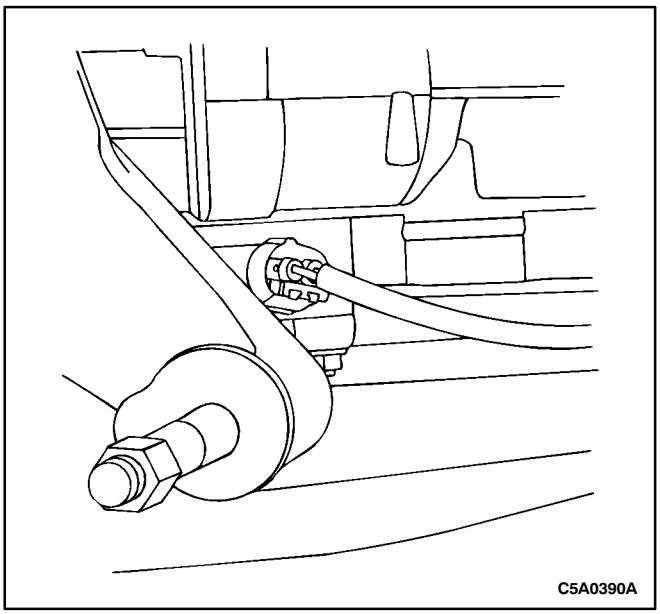
1. Install a new O-ring onto the vehicle speed sensor (VSS).
2. Install the VSS into the transaxle case, then install the retaining bolt.

Tighten

Tighten the retaining bolt to 4−7 N•m (35-62 lb-in).



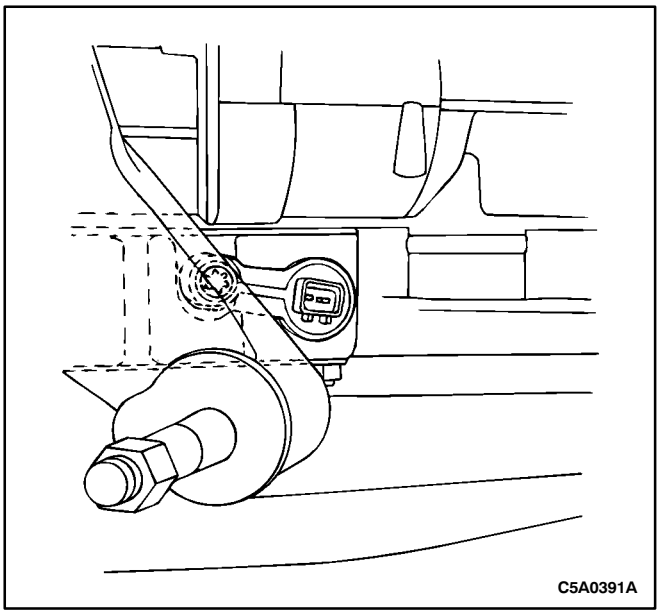
3. Connect the VSS electrical connector.
4. Connect the negative battery cable.


C5A0390A

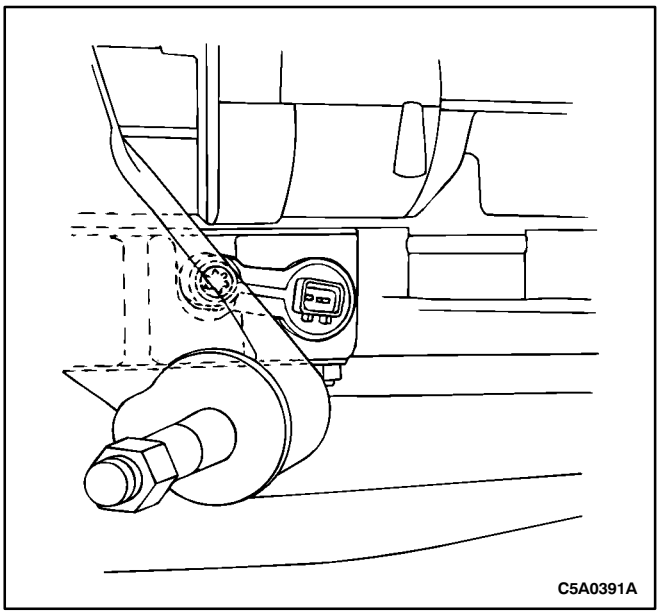
INPUT SHAFT SPEED (ISS) SENSOR

Removal Procedure

1. Remove the transaxle left bracket. Refer to “Transaxle Left Bracket” in this section.
2. Disconnect the input shaft speed (ISS) sensor electrical connector.


C5A0391A

3. Using the appropriate Torx® fastener tool, remove the ISS sensor retaining bolt, then grasp the body of the ISS sensor and remove it from the transaxle.


C5A0391A

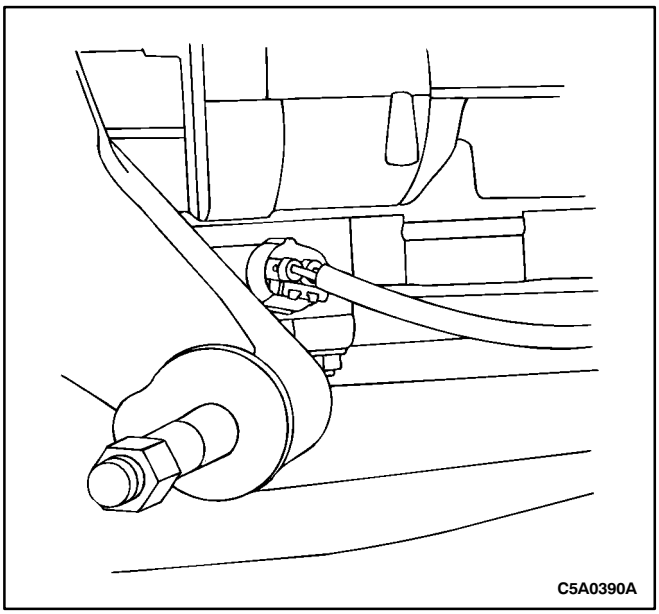
Installation Procedure

Notice: Lubricate the O-ring with TOTAL FLUID HX.

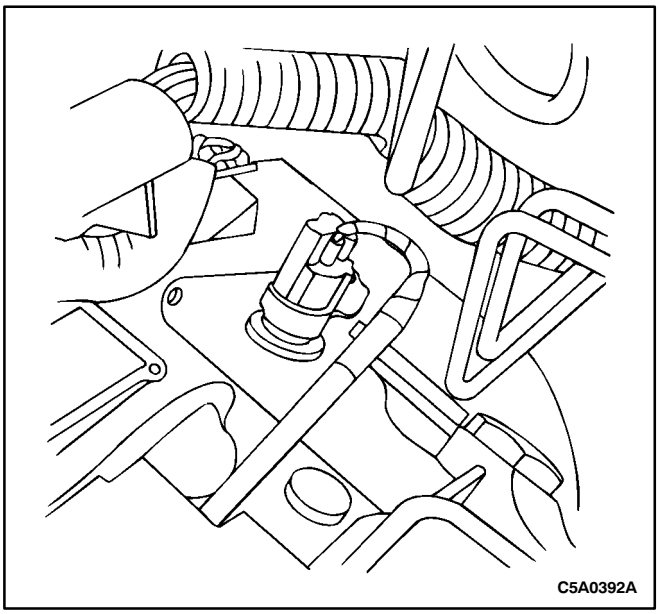
1. Install a new O-ring on the ISS sensor.
2. Install the ISS sensor and retaining bolt into the transaxle case.

Tighten

Tighten the ISS sensor retaining bolt to 4-7 N•m (35-62 lb-in).


C5A0390A

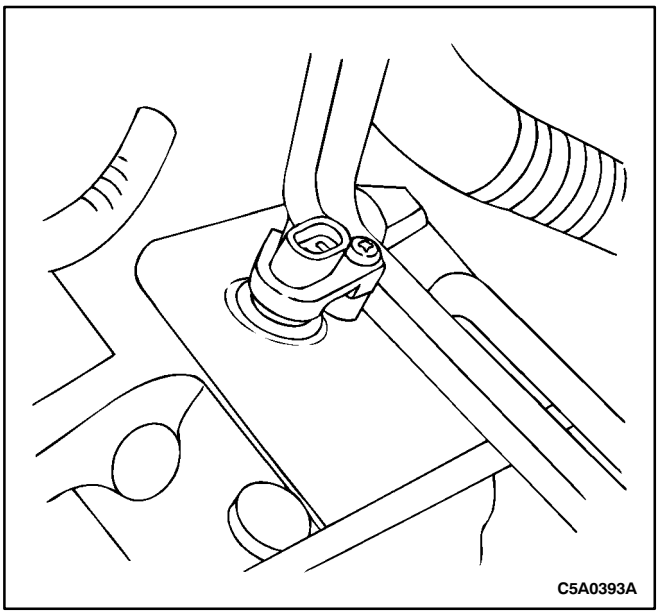
3. Connect the ISS sensor electrical connector.
4. Install the transaxle left bracket. Refer to “Transaxle Left Bracket” in this section.


C5A0392A

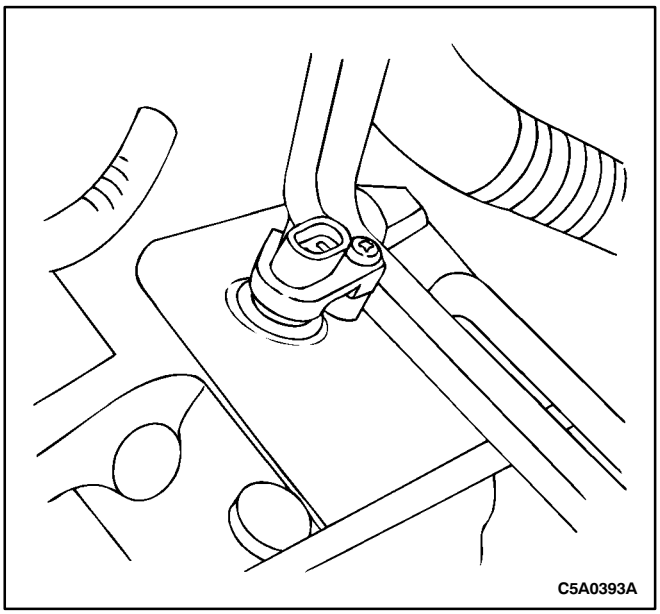
OUTPUT SHAFT SPEED (OSS) SENSOR

Removal Procedure

1. Disconnect the output shaft speed (OSS) sensor electrical connector.


C5A0393A

2. Using the appropriate Torx® fastener tool, remove the OSS sensor retaining bolt, then grasp the body of the OSS sensor and remove it from the transaxle.



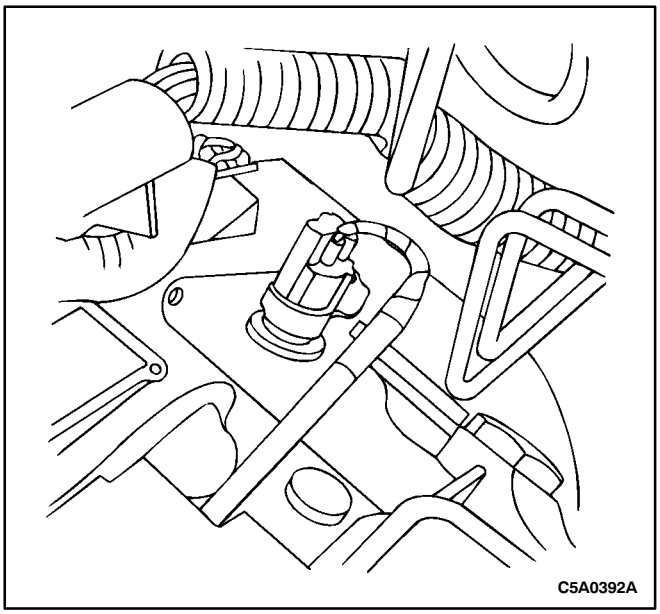
Installation Procedure

Notice: Lubricate the O-ring with TOTAL FLUID HX.

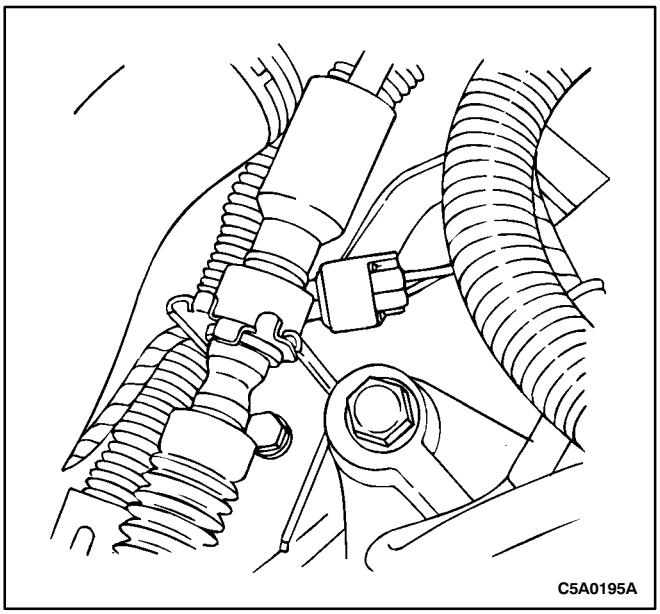
1. Install a new O-ring on the output shaft speed (OSS) sensor.
2. Install the OSS sensor and retaining bolt into the transaxle case.

Tighten

Tighten the OSS sensor retaining bolt to 4-7 N•m (35-62 lb-in).



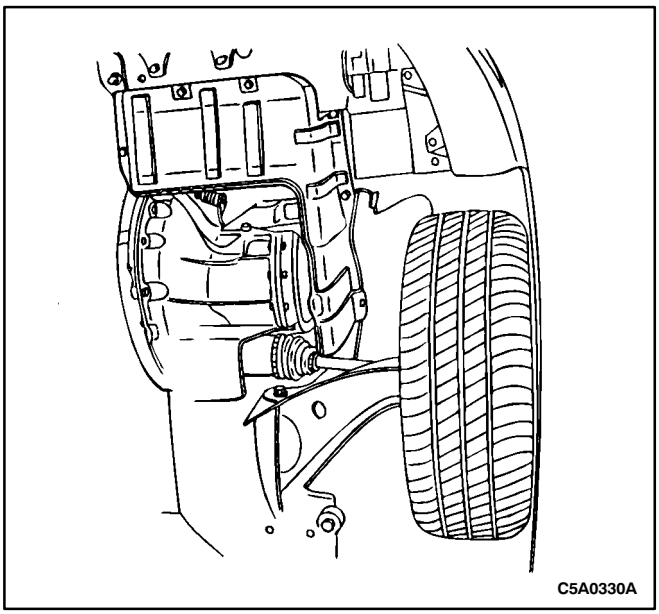
3. Connect the (OSS) sensor electrical connector.



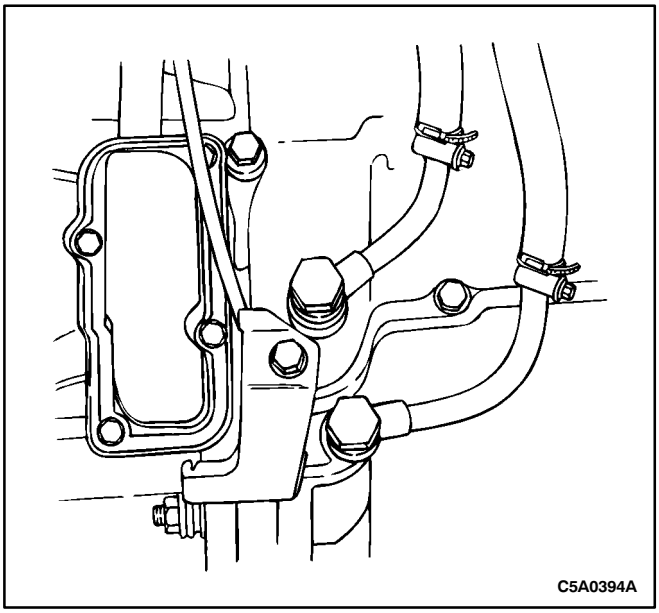
TRANSMISSION FLUID TEMPERATURE (TFT) SENSOR

Removal Procedure

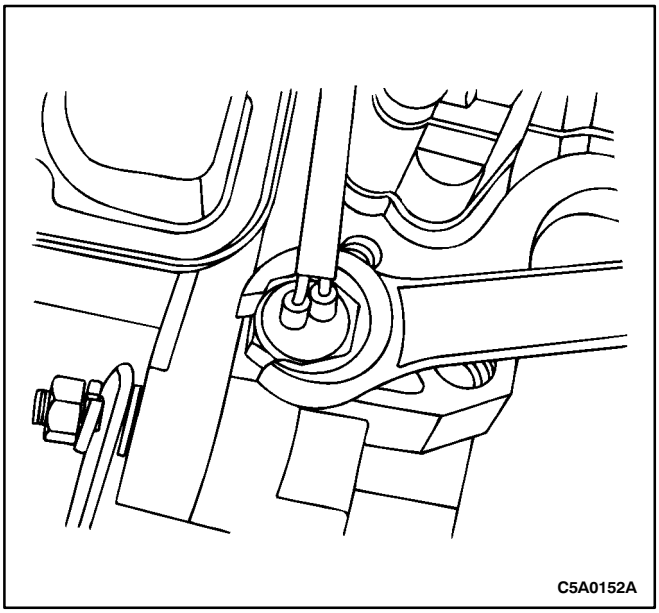
1. Disconnect the transmission fluid temperature (TFT) sensor electrical connector.
2. Raise and support the vehicle. Refer to *Section OB, General Information.*
3. Drain the transaxle fluid. Refer to “Fluid Drain Procedure” in this section.


C5A0330A

4. Remove the engine undercover.

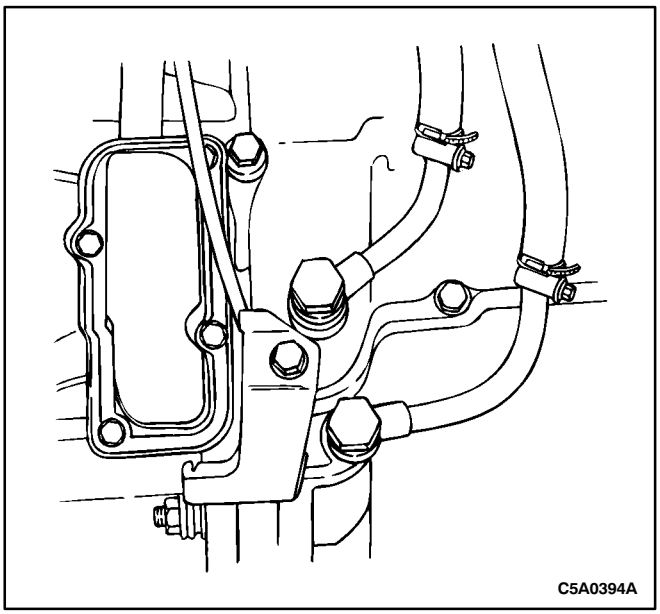

C5A0394A

5. Remove the nut and bolt from the TFT sensor protector bracket, then remove the bracket.


C5A0152A

Notice: Discard the TFT sensor O-ring.

6. Remove the TFT sensor.


C5A0394A

Installation Procedure

Notice: Lubricate the TFT sensor O-ring with TOTAL FLUID HX.

1. Install a new O-ring on the transmission fluid temperature (TFT) sensor.
2. Install the TFT into the transaxle case hand tight.

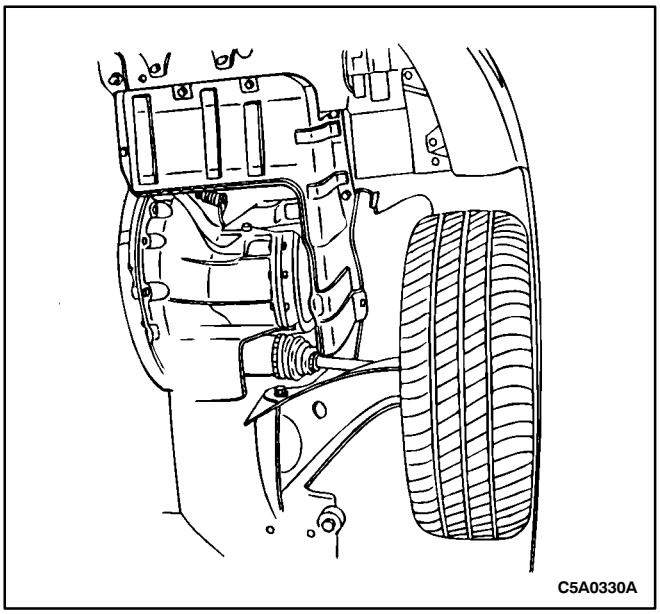
Tighten

Tighten the TFT sensor to 7-13 N•m (62-115 lb-in).

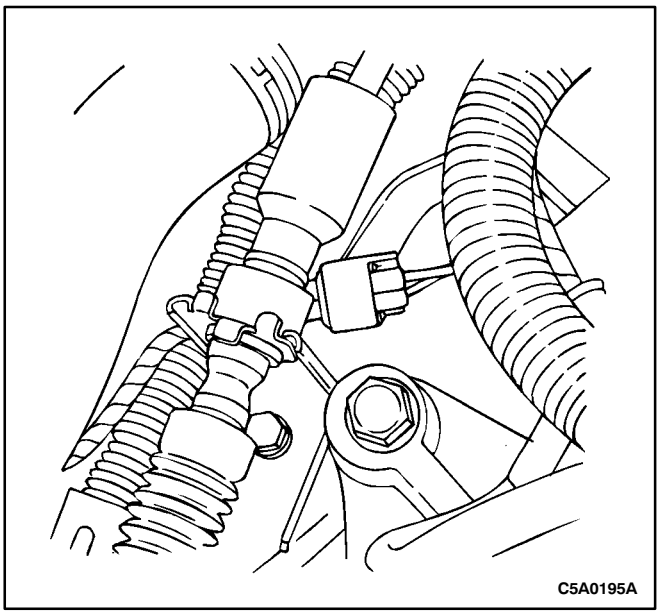
3. Install the TFT sensor protector and nut and bolt.

Tighten

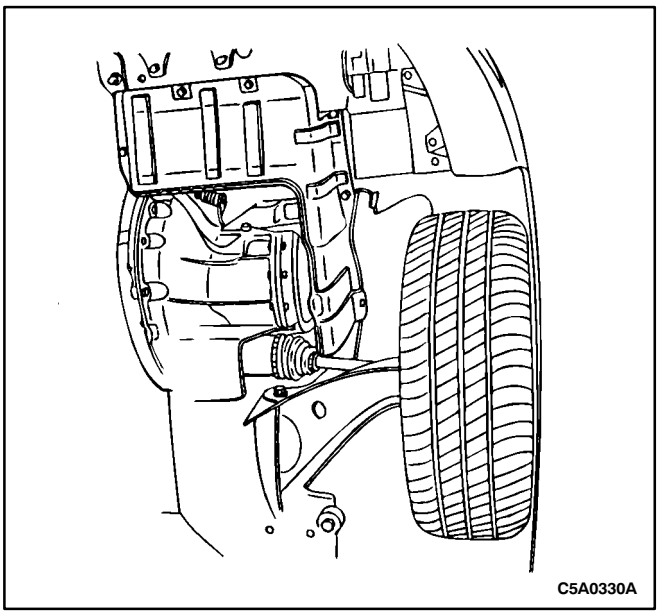
Tighten the nut and bolt to 20-29 N•m (15-22 lb-ft.).


C5A0330A

4. Install the engine undercover.
5. Lower the vehicle.


C5A0195A

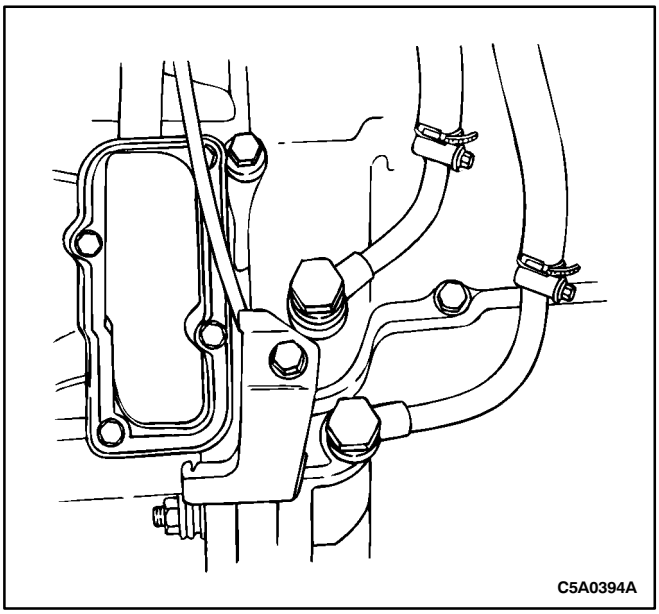
6. Connect the TFT sensor electrical connector.
7. Refill the transaxle. Refer to “Fluid Drain Procedure” in this section.


C5A0330A

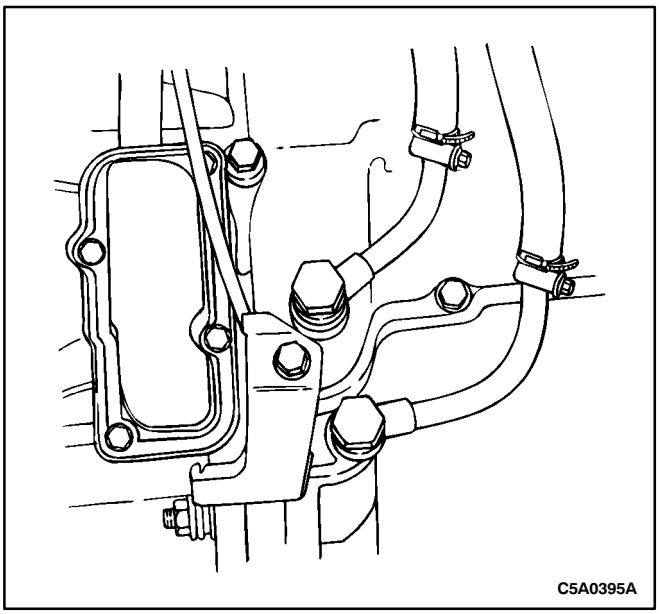
VALVE BODY SOLENOIDS

Removal Procedure

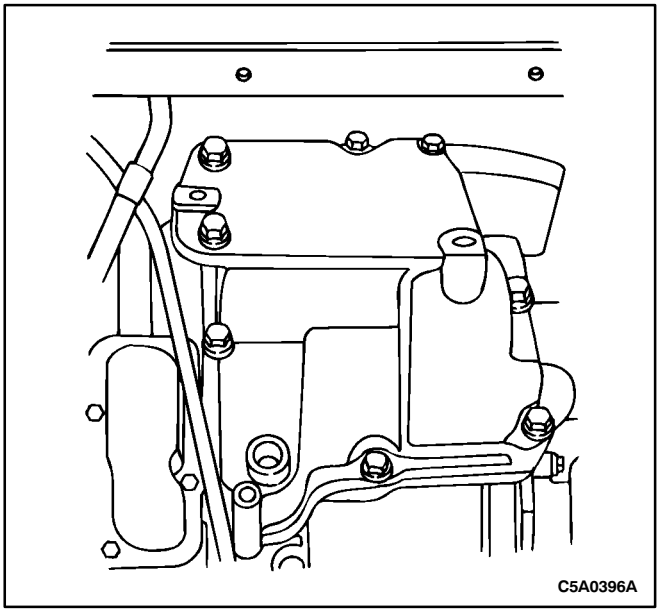
1. Disconnect the negative battery cable.
2. Raise and support the vehicle. Refer to *Section 0B, General Information.*
3. Drain the transaxle fluid. Refer to “Fluid Drain Procedure” in this section.
4. Remove the engine under cover.


C5A0394A

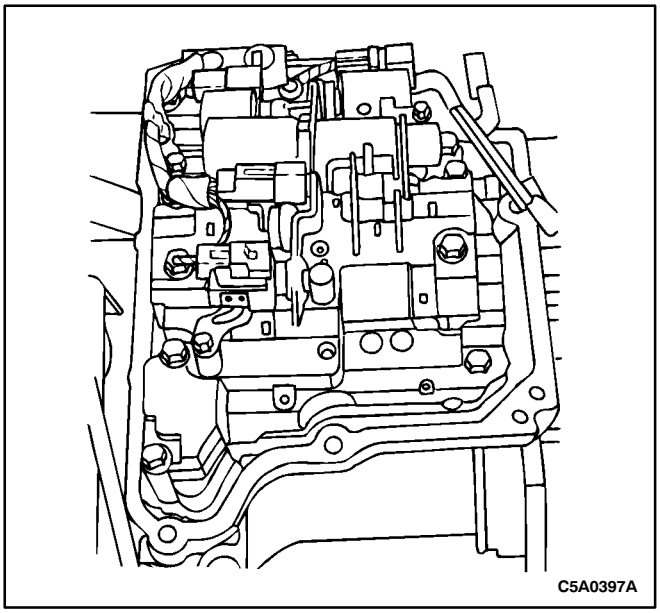
5. Remove the nut and bolt from the transmission fluid temperature (TFT) sensor protector bracket, then remove the bracket.


C5A0395A

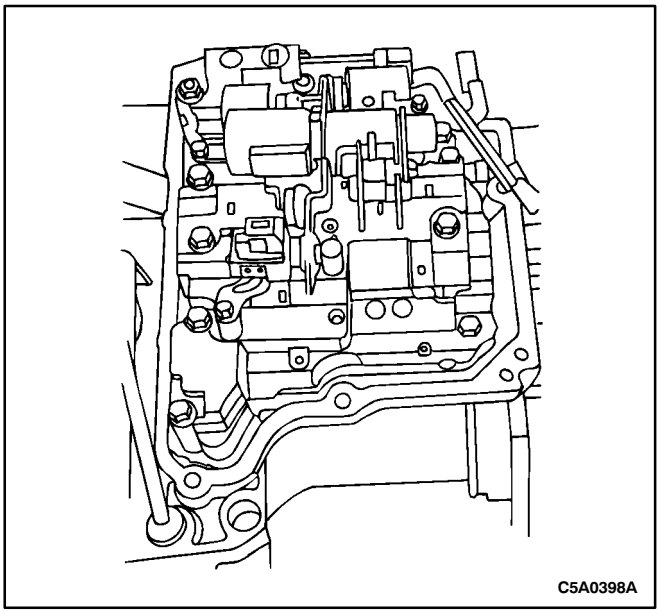
6. Disconnect the fluid cooler pipes at the valve body cover and allow the fluid to drain, then position the pipes aside.


C5A0396A

7. Remove the eight bolts from the valve body cover, then remove the cover.


C5A0397A

8. Disconnect the electrical connectors from shift solenoid 1 (SS1), shift solenoid 2 (SS2), the linear solenoid and the lockup solenoid.


C5A0398A

Notice: Discard the SS1 O-ring.

9. Remove the retaining bolt, clamp and SS1.

Notice: Discard the SS2 O-ring.

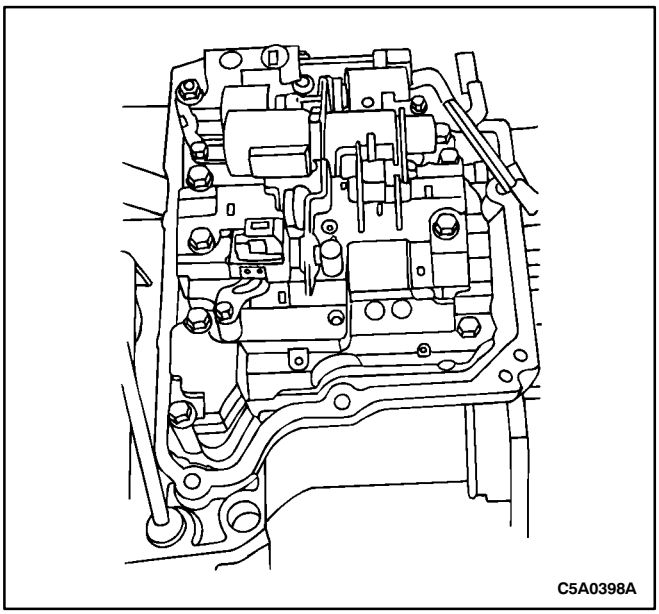
10. Remove the retaining bolt and SS2.
11. Remove the valve body bolt located to the left of the linear solenoid.

Notice: Discard the linear solenoid O-ring.

12. Remove the retaining bolt and the linear solenoid.

Notice: Discard the lockup solenoid O-ring.

13. Remove the retaining bolt and the lockup solenoid.


C5A0398A

Installation Procedure

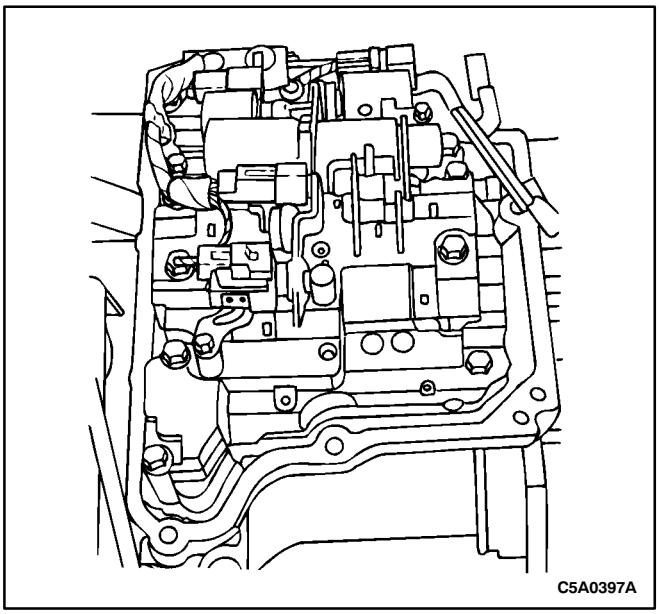
Notice: Lubricate the SS1, SS2, linear solenoid and lockup solenoid O-rings with TOTAL FLUID HX.

1. Install new O-rings on shift solenoid 1 (SS1), shift solenoid 2 (SS2), the linear solenoid and the lockup solenoid.
2. Install SS1, SS2, the linear solenoid and the lockup solenoid into the valve body, then install the solenoid retaining bolts and clamp and the valve body bolt.

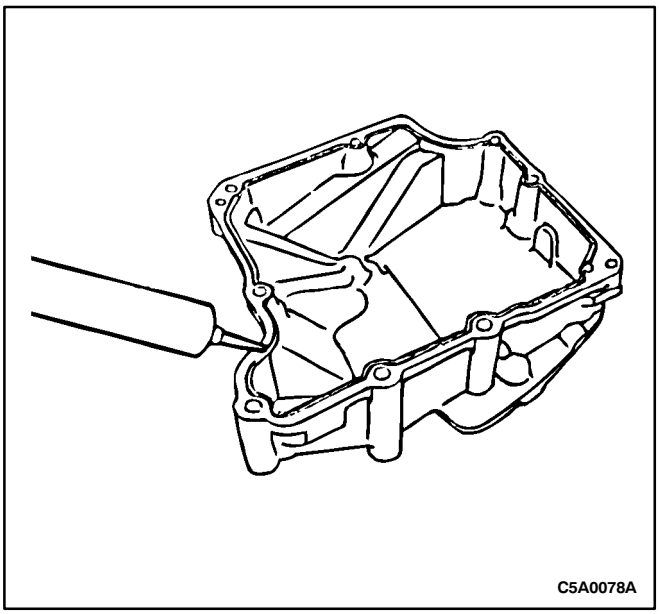
Tighten

Tighten the SS1, SS2, the linear solenoid and the lockup solenoid retaining bolts to 6-7 N•m (53-62 lb-in).

Tighten the valve body bolt to 6-7 N•m (53-62 lb-in).

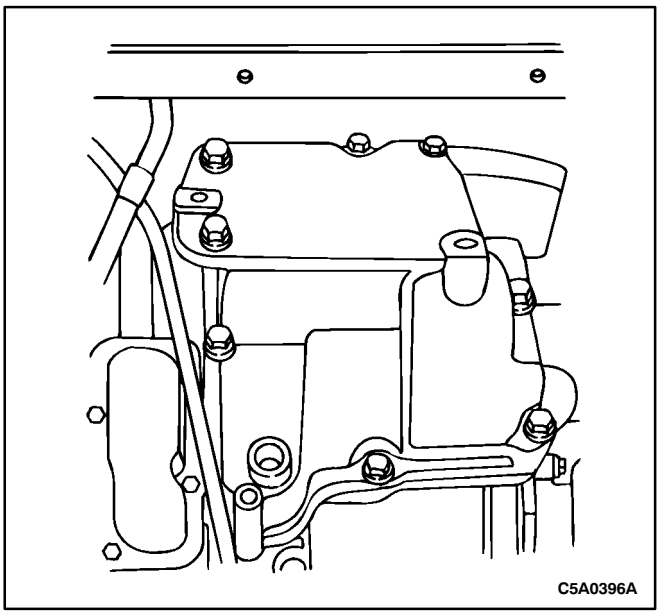

C5A0397A

3. Connect the SS1, SS2, the linear solenoid and the lockup solenoid electrical connectors.


C5A0078A

Notice: Remove the old gasket material from the valve body cover and mating surface of the transaxle.

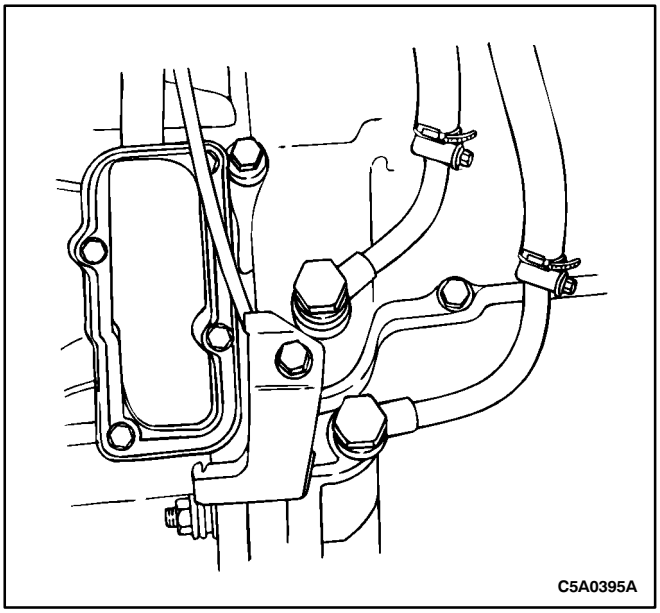
4. Apply a bead of silicone sealant on the valve body cover.


C5A0396A

5. Install the valve body cover and the eight bolts.

Tighten

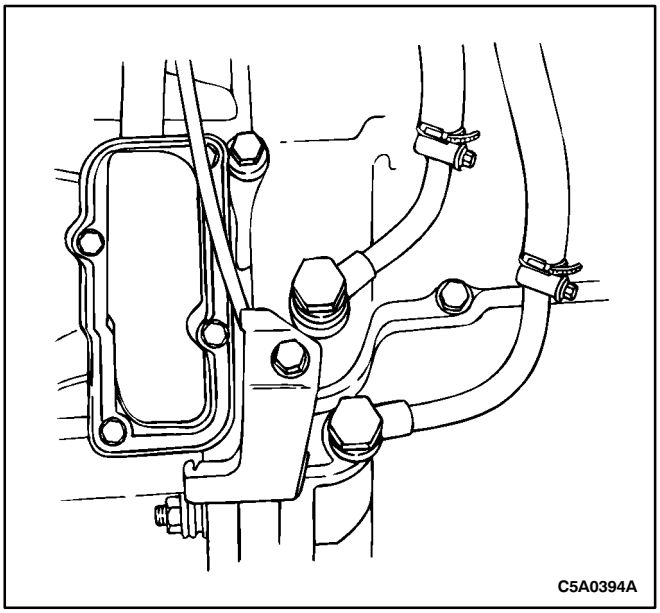
Tighten the valve body cover bolts to 20-30 N•m (14-22 lb-ft).


C5A0395A

6. Connect the fluid cooler pipes at the valve body cover.

Tighten

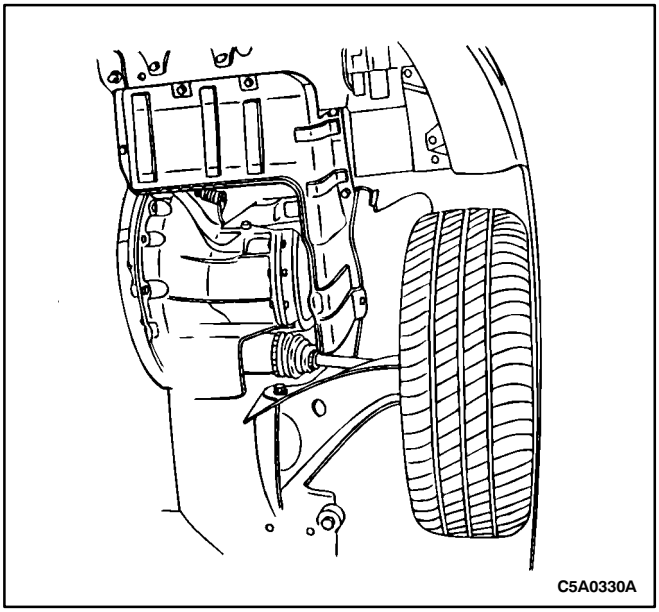
Tighten the fluid cooler pipe bolts to 20-29 N•m (15-22 lb-ft).


C5A0394A

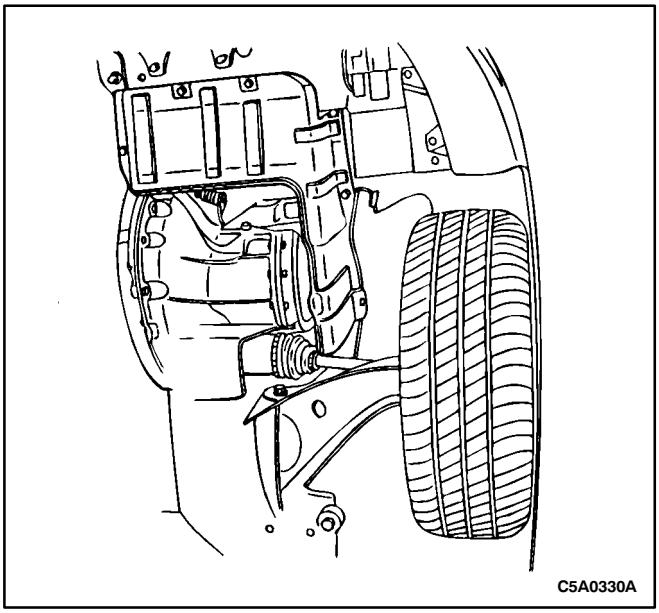
7. Position the transmission fluid temperature (TFT) sensor protector bracket, then install the nut and bolt.

Tighten

Tighten the TFT sensor protector bracket nut and bolt to 20-29 N•m (15-22 lb-ft).


C5A0330A

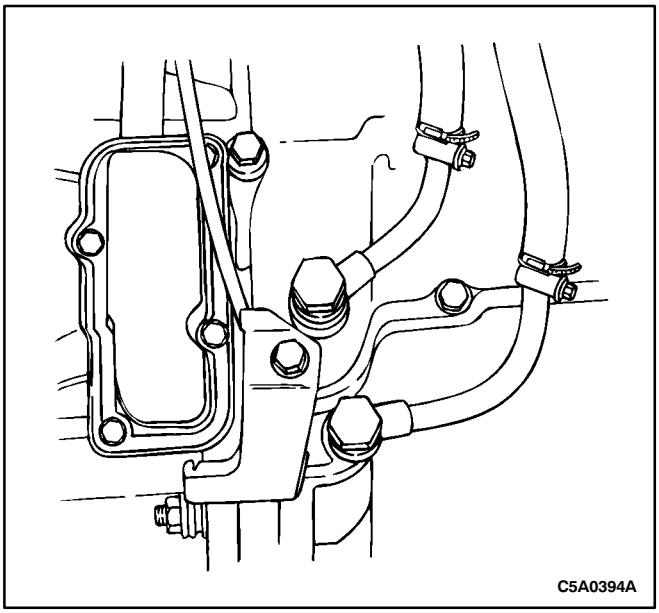
8. Install the engine under cover.
9. Lower the vehicle.
10. Connect the negative battery cable.
11. Fill the transaxle with fluid. Refer to “Fluid Drain Procedure” in this section.


C5A0330A

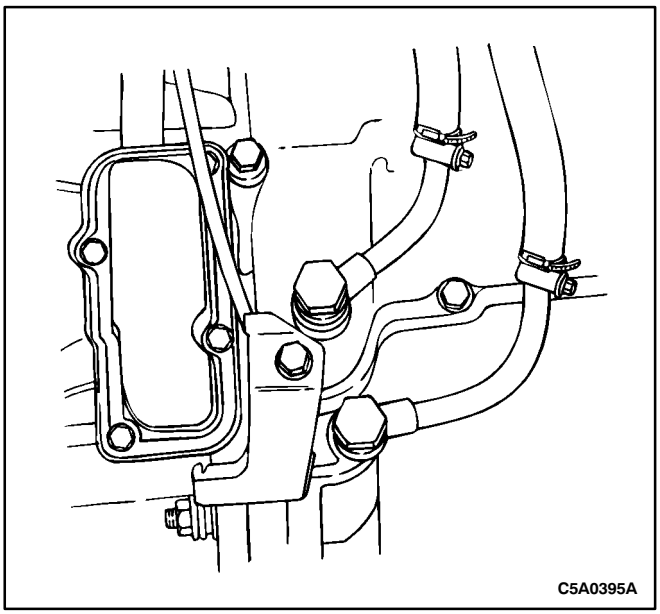
VALVE BODY

Removal Procedure

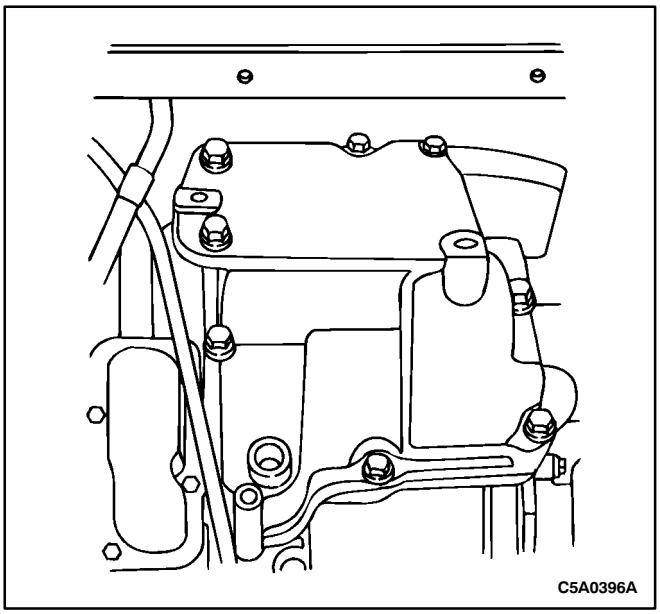
1. Disconnect the negative battery cable.
2. Raise and support the vehicle. Refer to “Vehicle Lifting Procedures,” *Section 0B, General Information.*
3. Drain the transaxle fluid. Refer to “Fluid Drain Procedure” in this section.
4. Remove the engine under cover.


C5A0394A

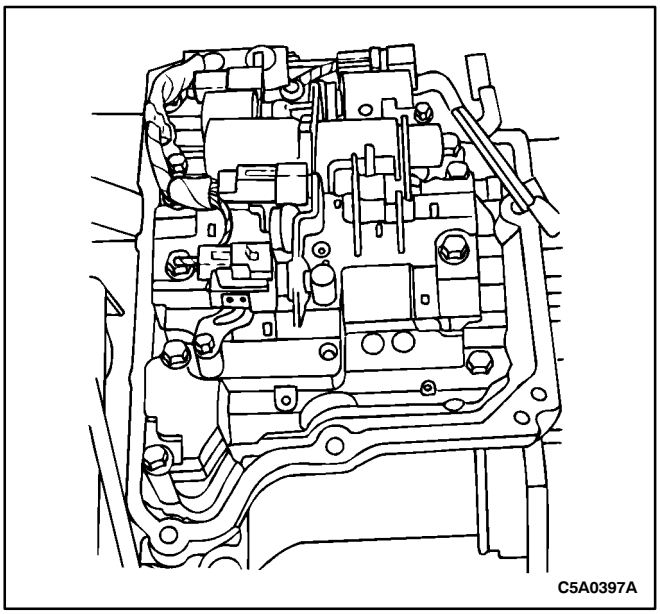
5. Remove the nut and bolt from the transmission fluid temperature (TFT) sensor protector bracket, then remove the bracket.



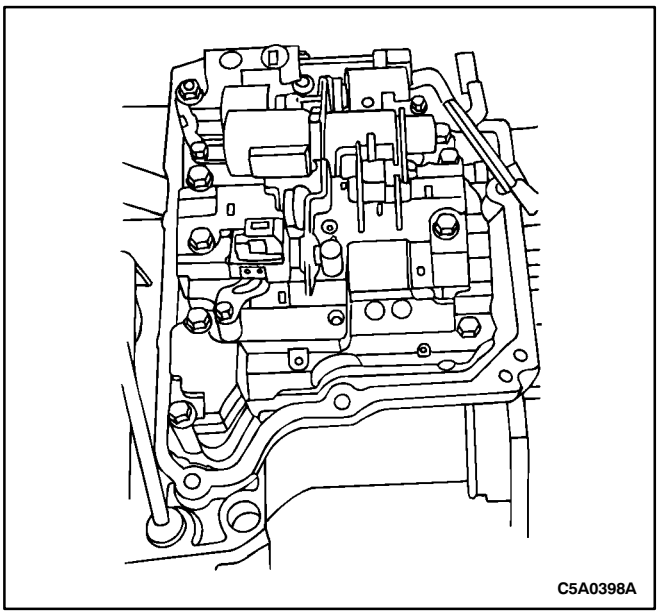
6. Disconnect the fluid cooler pipes at the valve body cover and allow the fluid to drain, then position the pipes aside.



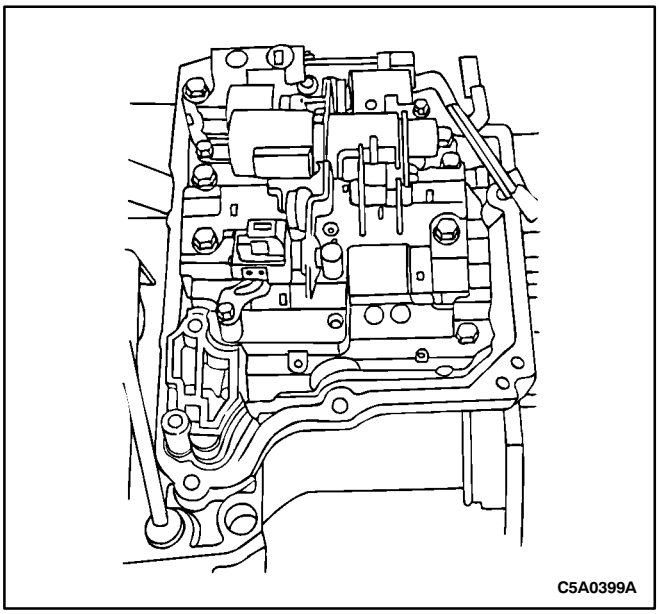
7. Remove the eight bolts from the valve body cover, then remove the cover.



8. Disconnect the four electrical connectors from valve body solenoids.

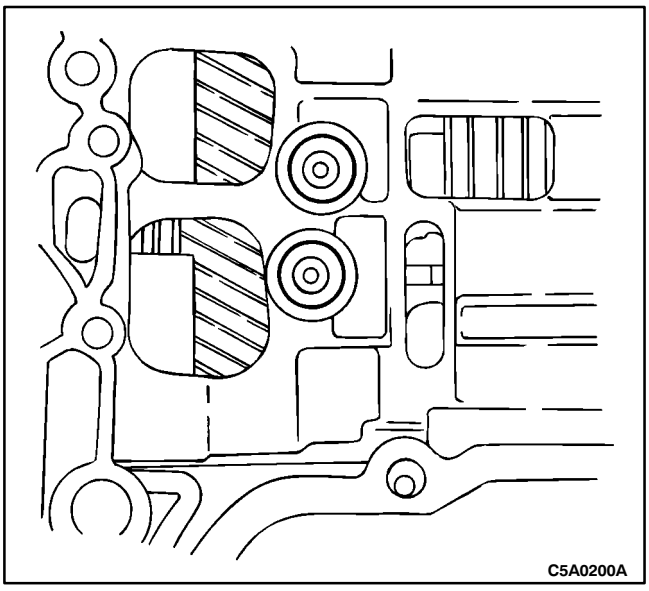


9. Remove the two suction cover retaining bolts and the suction cover.

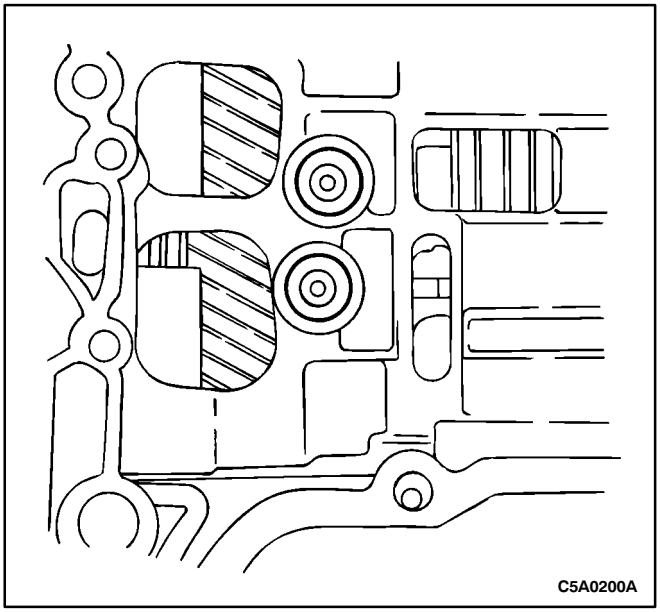


Caution: Use care not to damage the manual valve connecting rod or the lever.

10. Loosen the seven valve body retaining bolts and remove six of the bolts. Support the valve body and remove the seventh bolt. Continue to support the valve body and carefully disconnect the manual valve connecting rod from the lever. Remove the valve body.



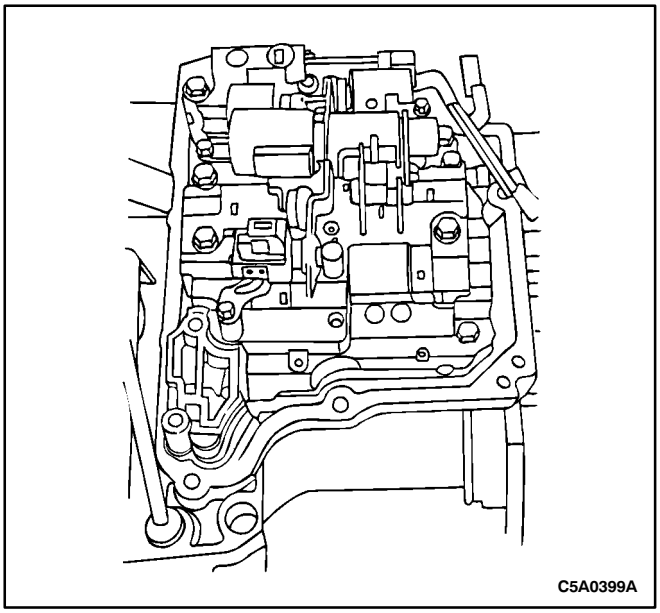
11. Remove and discard the two valve body apply seals.


C5A0200A

Installation Procedure

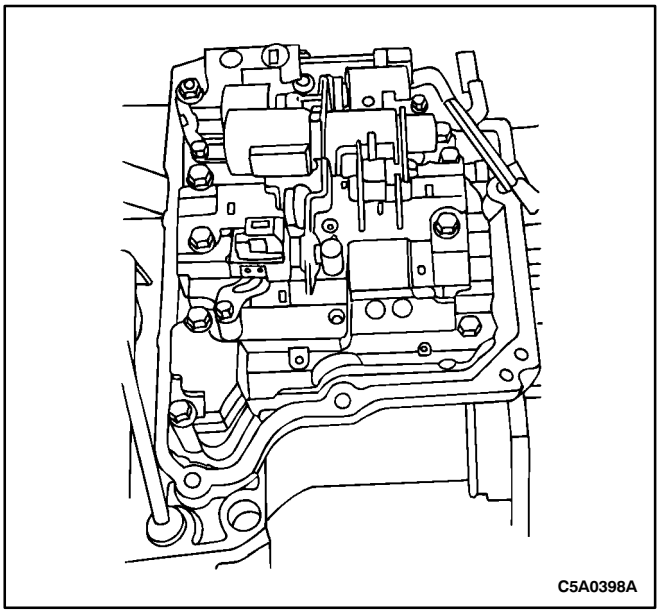
Notice: Lubricate the valve body apply seals with TOTAL FLUID HX.

1. Install two new valve body apply seals.


C5A0399A

Caution: Use care not to damage the manual valve connecting rod or the lever.

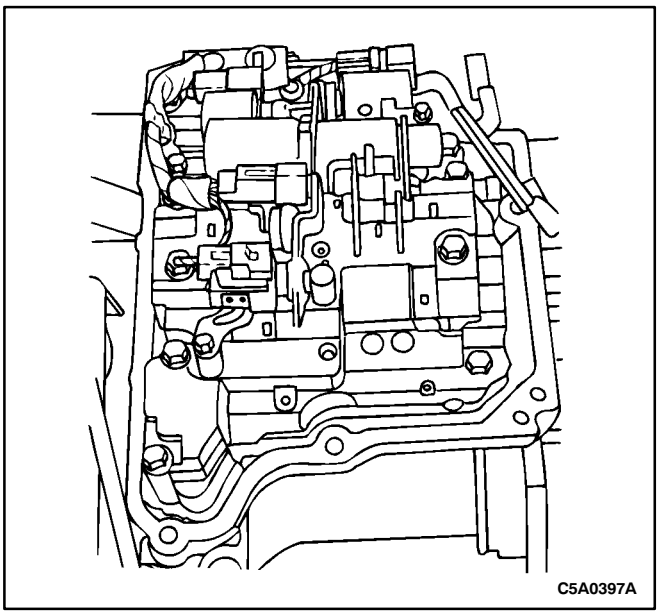
2. Support and position the valve body onto the transaxle case. While supporting the valve body, carefully connect the manual valve connecting rod to the lever and install one of the valve body bolts hand tight. Install the remaining six valve body retaining bolts hand tight.


C5A0398A

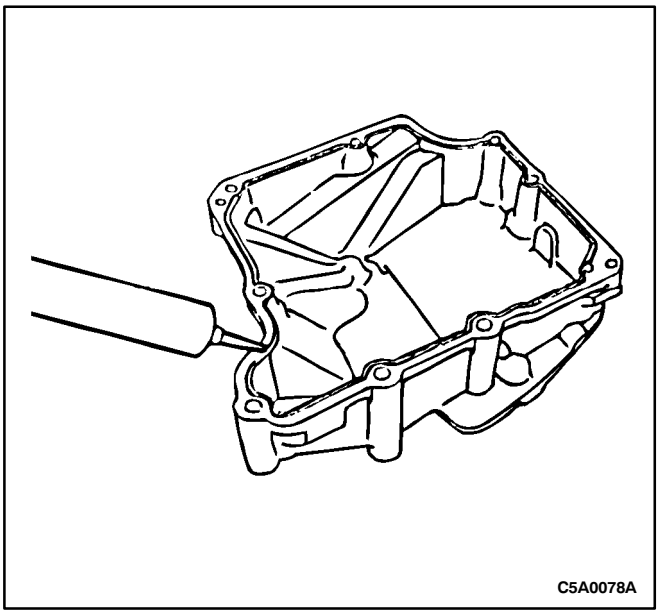
3. Install the suction cover and suction cover retaining bolts hand tight.

Tighten

Tighten the valve body and suction cover retaining bolts to 6-7 N•m (53-62 lb-in).

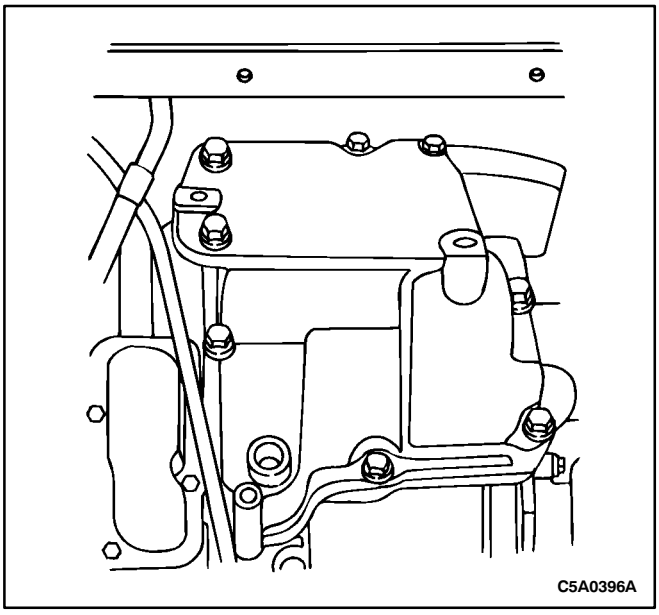

C5A0397A

4. Connect the four valve body solenoid electrical connectors.


C5A0078A

Notice: Remove the old gasket material from the valve body cover and mating surface of transaxle.

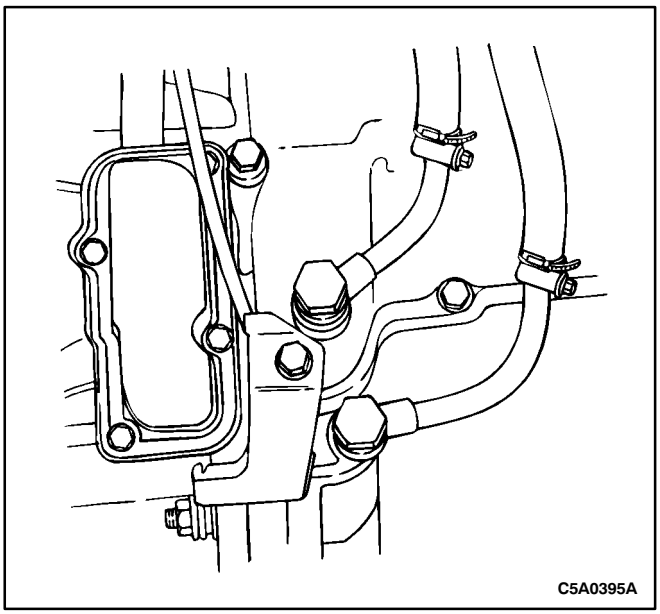
5. Apply a bead of silicone sealant on the valve body cover.


C5A0396A

6. Install the valve body cover and the eight bolts.

Tighten

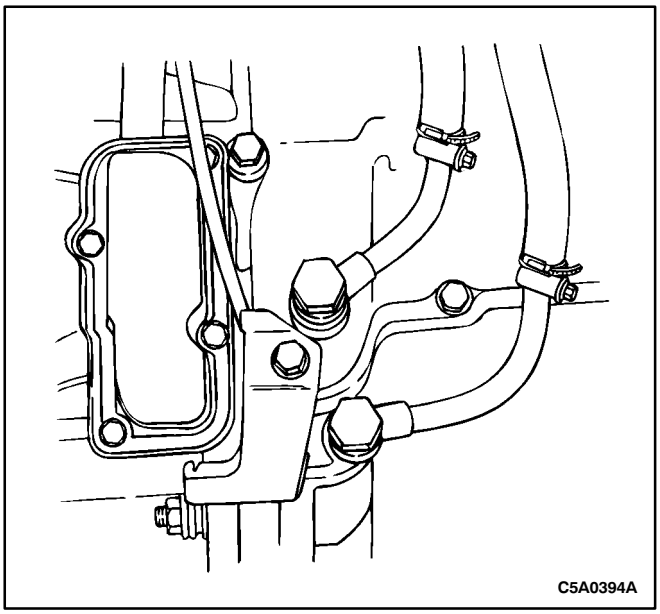
Tighten the valve body cover bolts to 20-30 N•m (15-22 lb-ft).


C5A0395A

7. Connect the fluid cooler pipes at the valve body cover.

Tighten

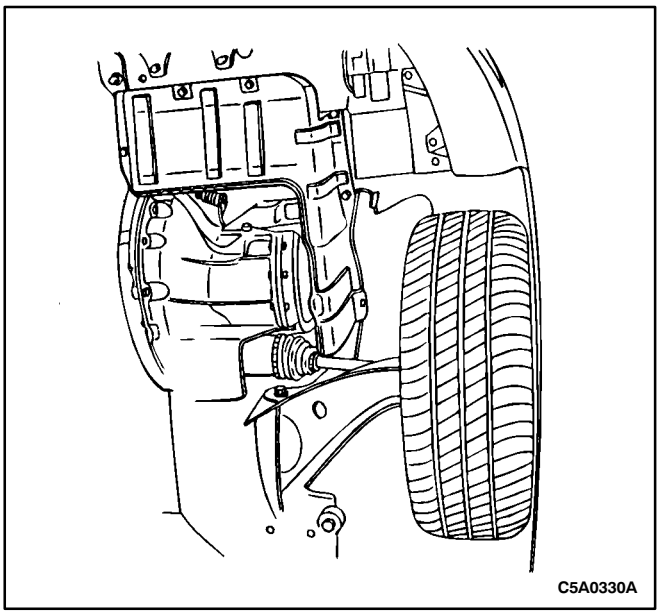
Tighten the fluid cooler pipe bolts to 20-29 N•m (15-22 lb-ft).


C5A0394A

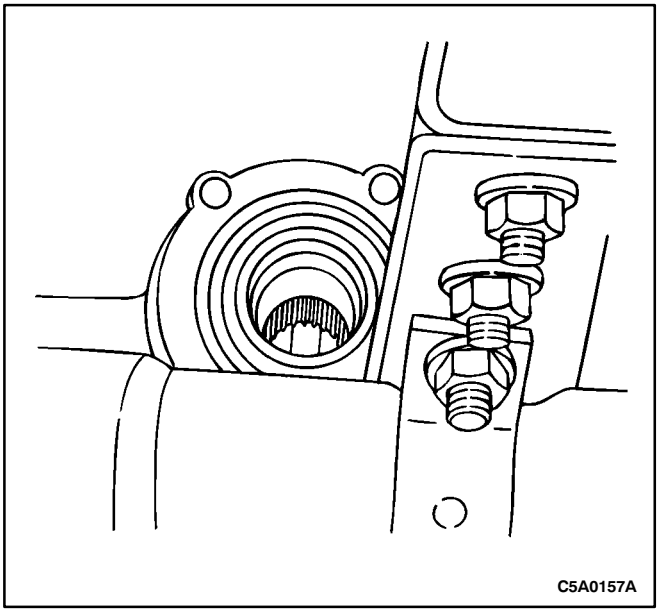
8. Position the transmission fluid temperature (TFT) sensor protector bracket, then install the nut and bolt.

Tighten

Tighten the TFT sensor protector bracket nut and bolt to 20-29 N•m (15-22 lb-ft).


C5A0330A

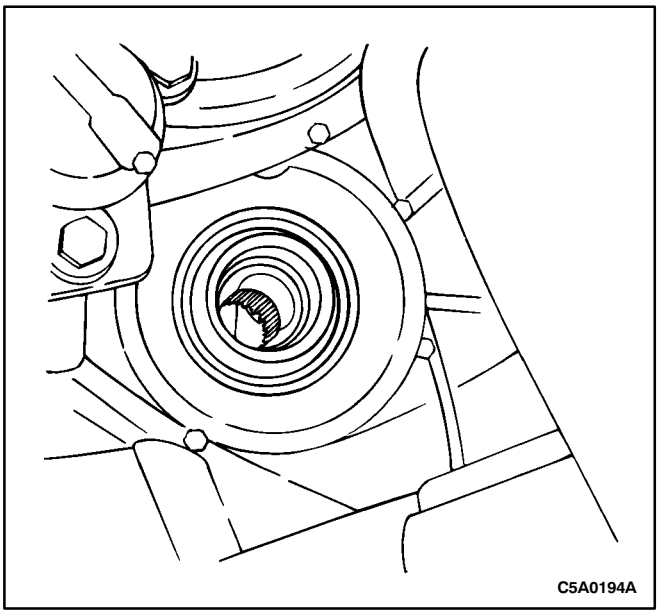
9. Install the engine under cover.
10. Lower the vehicle.
11. Connect the negative battery cable.
12. Fill the transaxle with fluid. Refer to “Fluid Drain Procedure” in this section.


C5A0157A

DRIVE AXLE FLUID SEALS

Removal Procedure

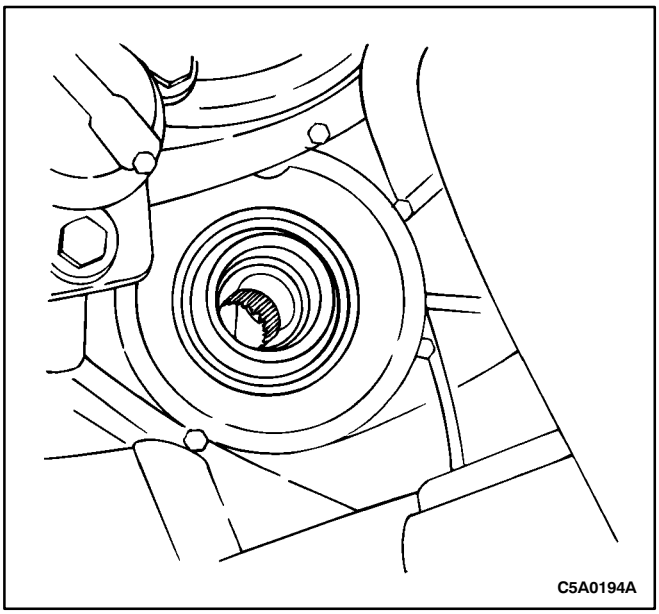
1. Raise and suitably support the vehicle.
2. Remove the wheels. Refer to *Section 2E, Tires and Wheels.*
3. Disconnect the automatic transaxle drive axles from the automatic transaxle. Refer to *Section 3A, Automatic Transaxle Drive Axle.*
4. Remove the right side drive axle fluid seal.

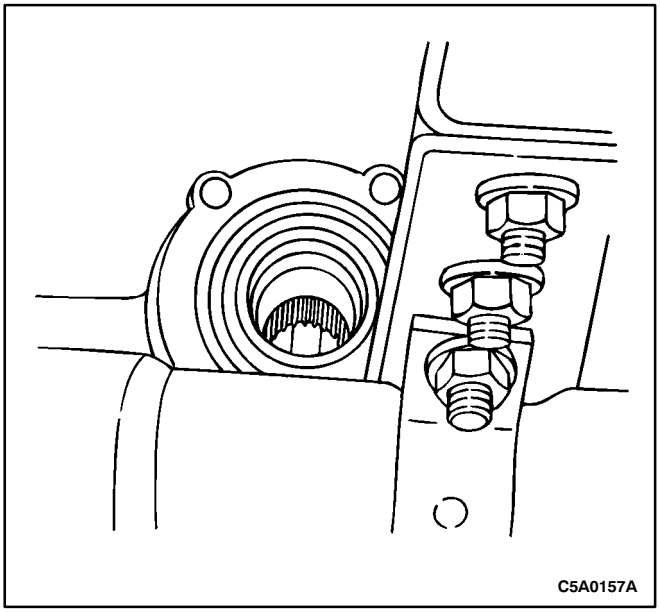

C5A0194A

5. Remove the left side drive axle fluid seal.

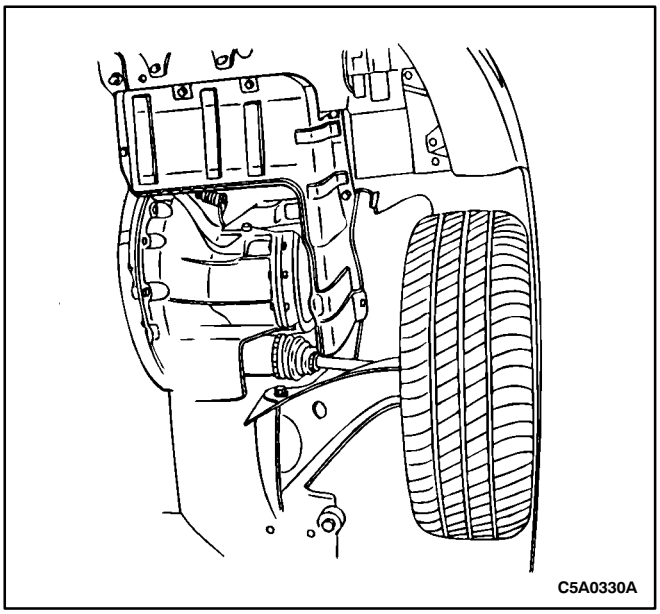
Installation Procedure

1. Install the left side drive axle fluid seal.


C5A0194A


C5A0157A

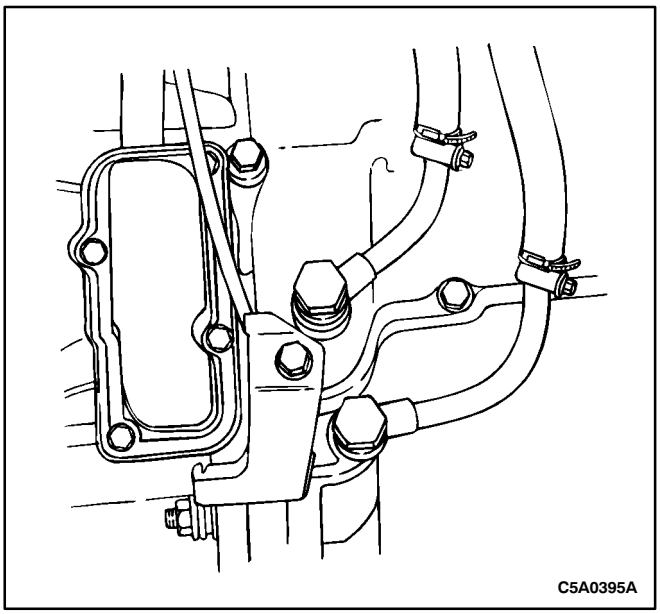
2. Install the right side drive axle fluid seal.
3. Connect the automatic transaxle drive axles to the automatic transaxle. Refer to *Section 3A, Automatic Transaxle Drive Axle.*
4. Install the wheels. Refer to *Section 2E, Tires and Wheels.*
5. Lower the vehicle.


C5A0330A

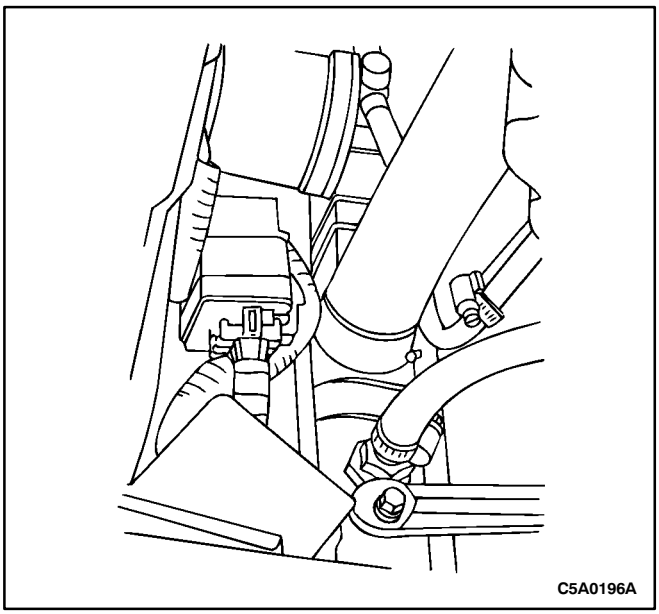
FLUID COOLER PIPES AND HOSES

Removal Procedure

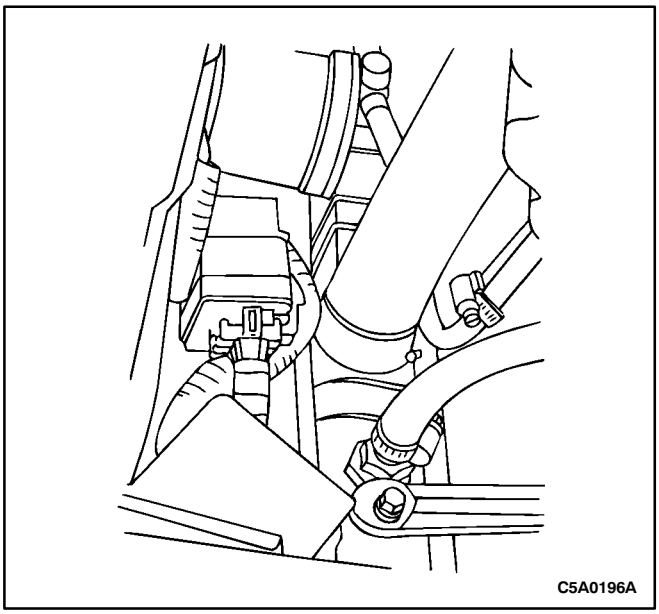
1. Raise and support the vehicle. Refer to *Section OB, General Information.*
2. Drain the transaxle fluid. Refer to “Fluid Drain Procedure” in this section.
3. Remove the engine undercover.


C5A0395A

4. Remove the two fluid cooler pipe bolts from the transaxle and allow the fluid to drain.


C5A0196A

5. Disconnect hose clamp from the lower hose at the radiator, then remove the fluid cooler pipe bolt from the upper radiator.
6. Remove the fluid cooler pipes and hoses.

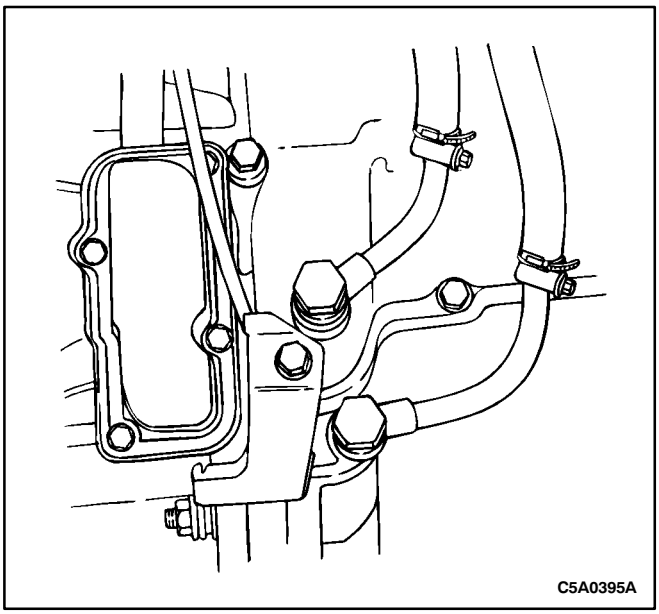

C5A0196A

Installation Procedure

1. Position the fluid cooler pipes at the radiator. Connect the lower hose at the radiator and tighten the clamp, then install the fluid cooler pipe and bolt at the upper radiator.

Tighten

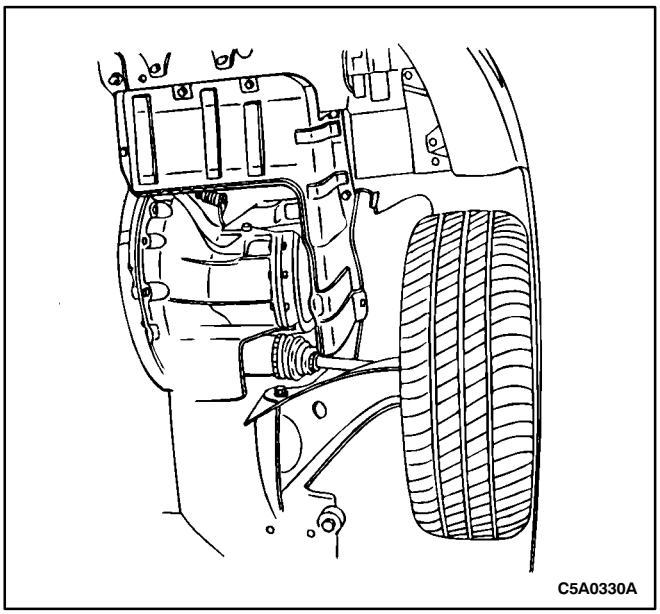
Tighten the fluid cooler pipe bolt to 20-29 N•m (15-22 lb-ft).


C5A0395A

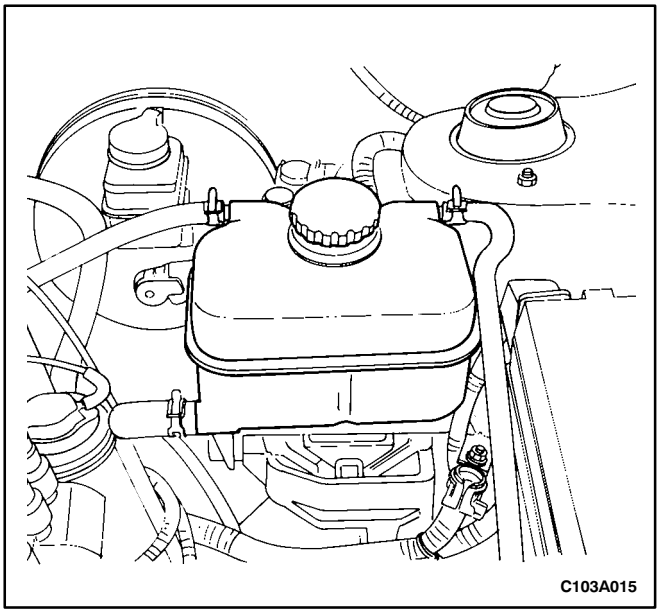
2. Position the fluid cooler pipes at the transaxle and install the fluid cooler pipe bolts.

Tighten

Tighten the fluid cooler pipe bolt to 20-29 N•m (15-22 lb-ft).


C5A0330A

3. Install the engine undercover.
4. Lower the vehicle.
5. Fill the transaxle with fluid. Refer to “Fluid Drain Procedure” in this section.


C103A015

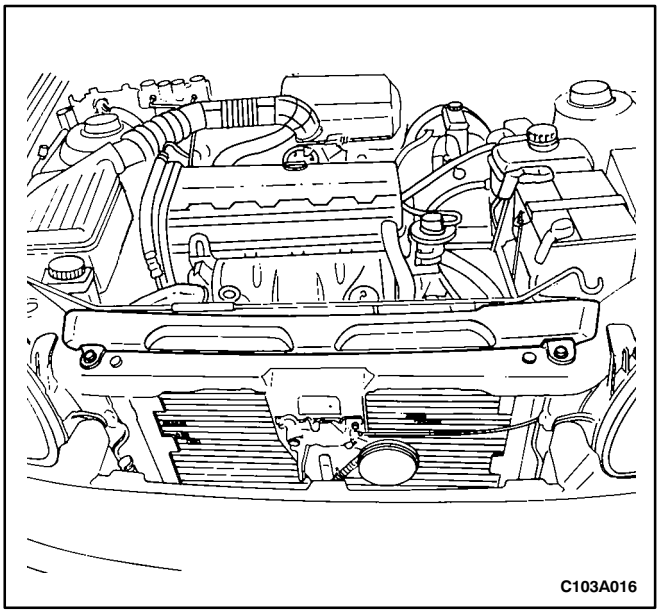
TRANSAXLE LEFT MOUNT

Tools Required

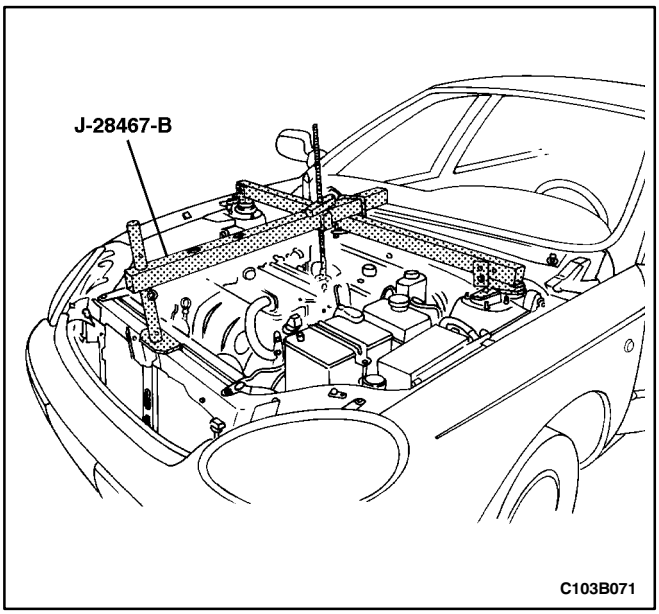
J-28467-B Engine Support Fixture

Removal Procedure

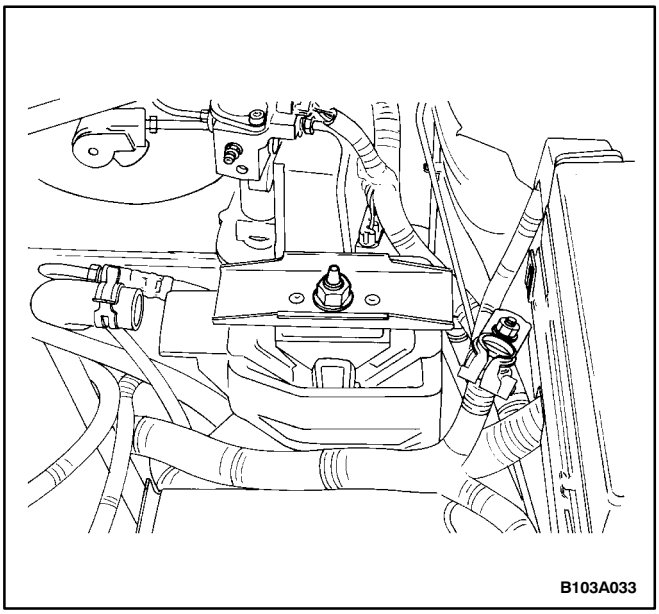
1. Disconnect the battery. Remove the battery and the battery tray.
2. Remove the coolant surge tank.


C103A016

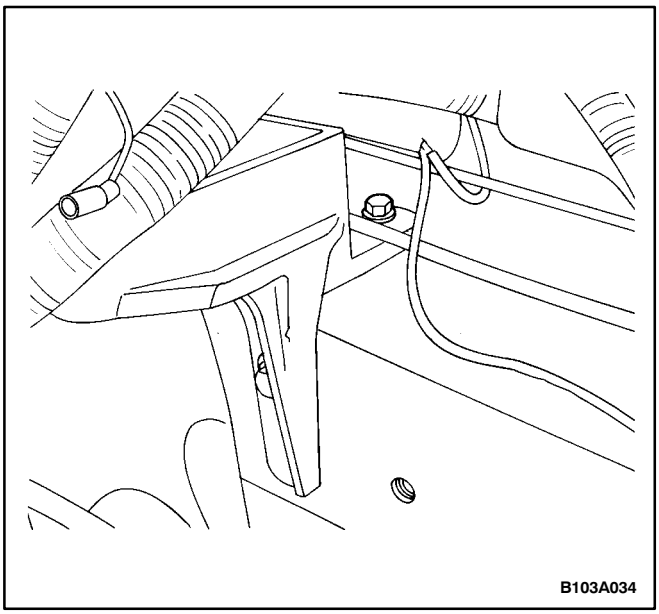
3. Remove the upper radiator cover.



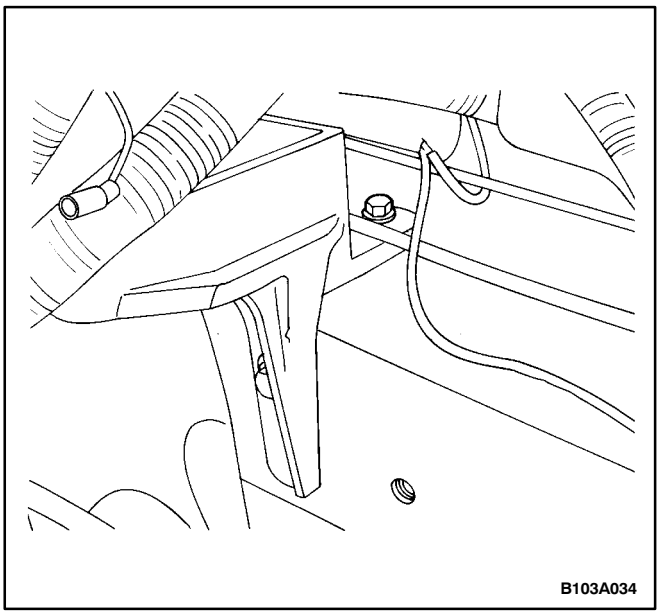
4. Attach the engine support fixture J-28467-B to the engine.
5. Support the engine with the engine support fixture J-28467-B.



6. Remove the bolt that connects the transaxle left mount to the left transaxle bracket.



7. Remove the bolts that connect the transaxle left mount to the vehicle. Two bolts are on each side of the mount.
8. Remove the transaxle left mount.

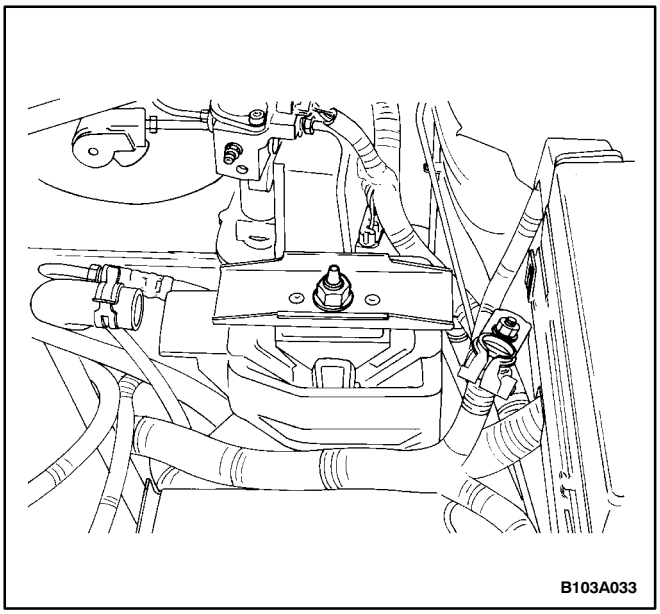

B103A034

Installation Procedure

1. Install the transaxle left mount.
2. Install the bolts that connect the transaxle left mount to the vehicle.

Tighten

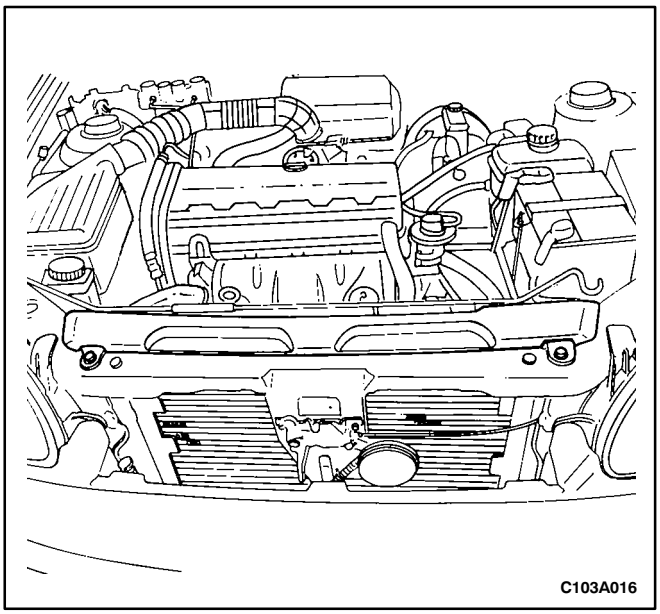
Tighten the transaxle left mount-to-body connecting bolts to 58 N•m (43 lb-ft).


B103A033

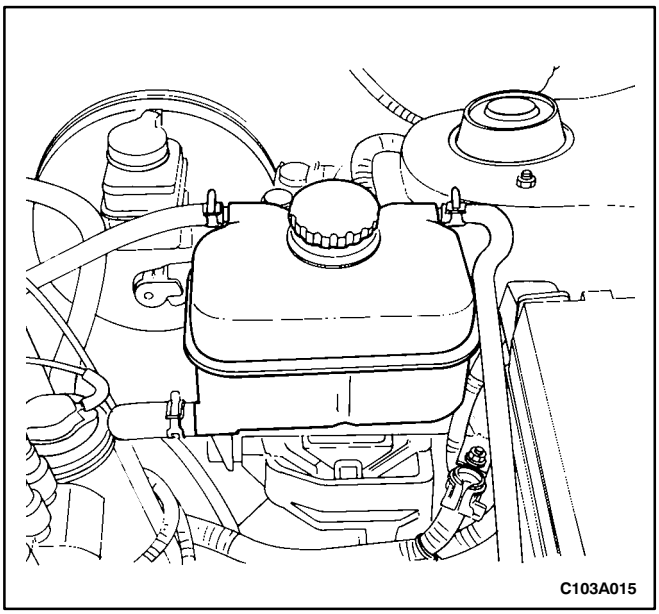
3. Install the bolt that connects the transaxle left mount to the transaxle left bracket.

Tighten

Tighten the transaxle left mount-to-transaxle left bracket connecting bolt to 48 N•m (35 lb-ft).


C103A016

4. Remove the engine support fixture J-28467-B from the engine.
5. Install the upper radiator cover.

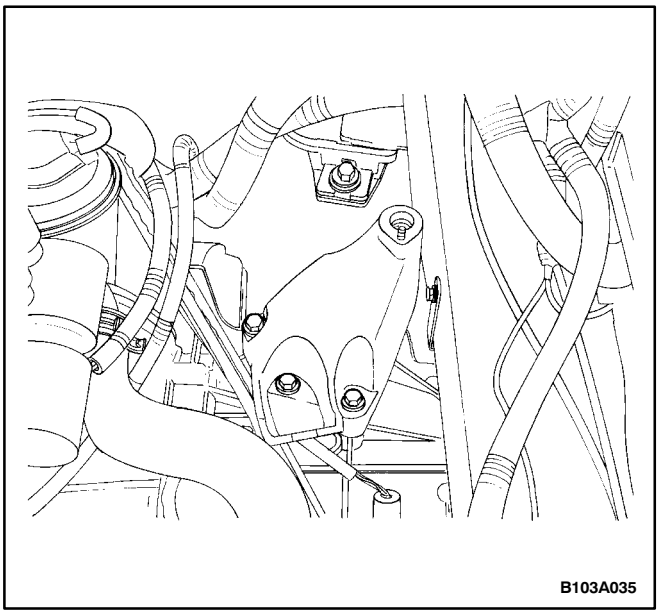

C103A015

6. Install the coolant surge tank with the bolts.

Tighten

Tighten the coolant surge tank mounting bolts to 25 N•m (18 lb-ft).

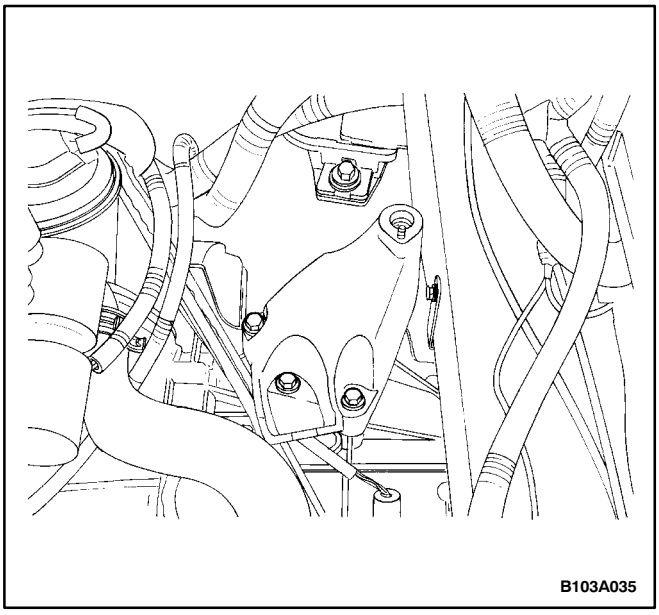
7. Install the battery tray and the battery. Connect the battery.


B103A035

TRANSAXLE LEFT BRACKET

Removal Procedure

1. Remove the transaxle left mount. Refer to “Transaxle Left Mount” in this section.
2. Remove the bolts that connect the transaxle to the transaxle left bracket.
3. Remove the transaxle left bracket.


B103A035

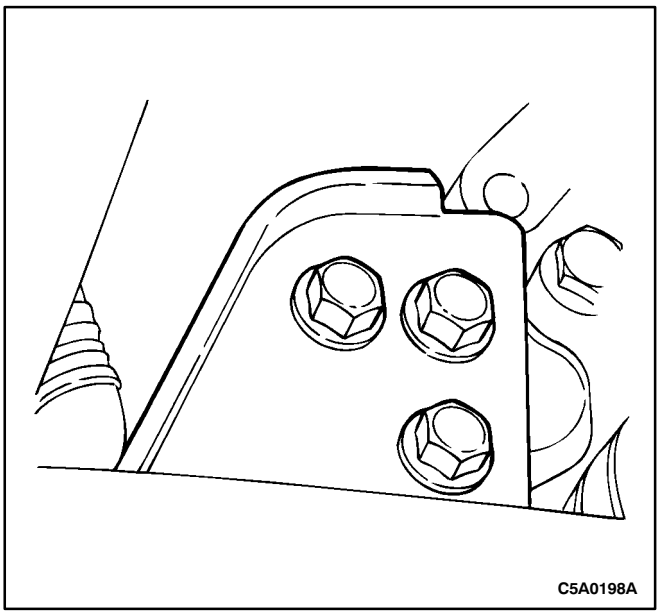
Installation Procedure

1. Install the transaxle left bracket.
2. Install the bolts that connect the transaxle left bracket to the transaxle.

Tighten

Tighten the transaxle left bracket connecting bolts to 48 N•m (35 lb-ft).

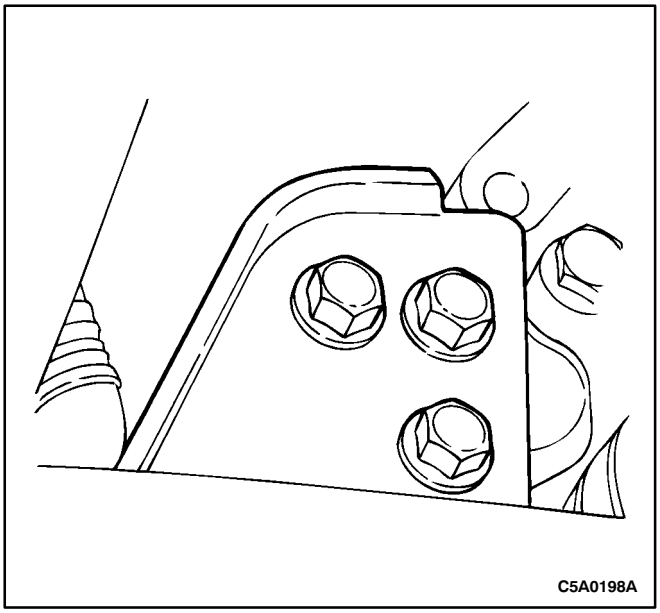
3. Install the transaxle left mount. Refer to “Transaxle Left Mount” in this section.



TRANSAXLE CENTER BRACKET

Removal Procedure

1. Remove the center member from the vehicle. Refer to *Section 9N, Frame and Underbody.*
2. Remove the bolts that connect the transaxle center bracket to the transaxle.
3. Remove the transaxle center bracket.

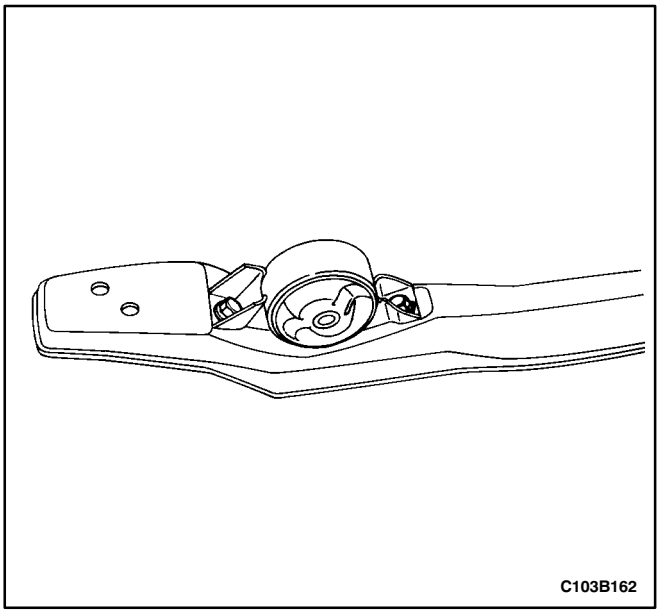


Installation Procedure

1. Install the transaxle center bracket to the transaxle with the bolts.

   ### Tighten

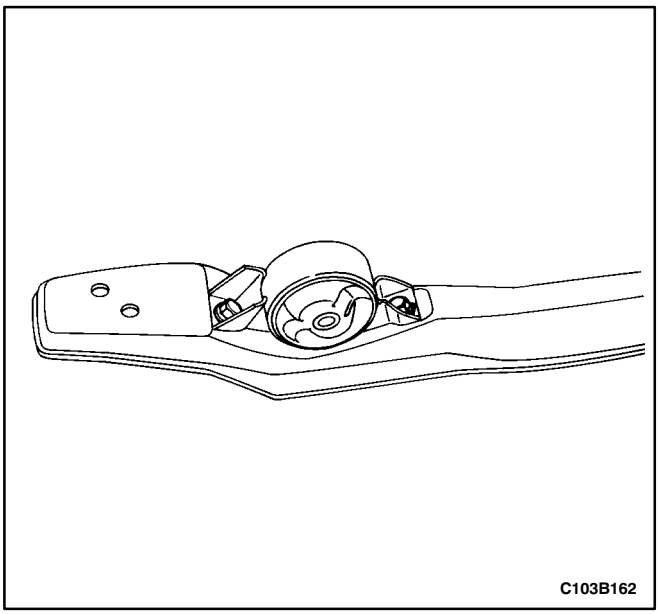
   Tighten the transaxle center bracket-to-transaxle bolts to 48 N•m (35 lb-ft).
2. Install the center member into the vehicle. Refer to *Section 9N, Frame and Underbody.*



TRANSAXLE CENTER MOUNT

Removal Procedure

1. Remove the center member from the vehicle. Refer to Section 9N, Frame and Underbody.
2. Remove the transaxle center mount-to-center member bolts.
3. Remove the transaxle center mount.


C103B162

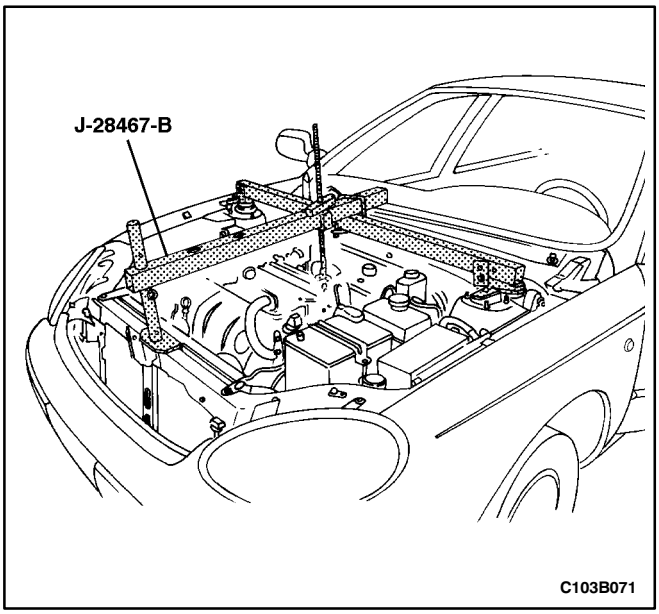
Installation Procedure

1. Install the transaxle center mount.
2. Install the transaxle center mount-to-center member bolts.

Tighten

Tighten the transaxle center bracket-to-transaxle bolts to 65 N•m (48 lb-ft).

3. Install the center member into the vehicle. Refer to *Section 9N, Frame and Underbody.*

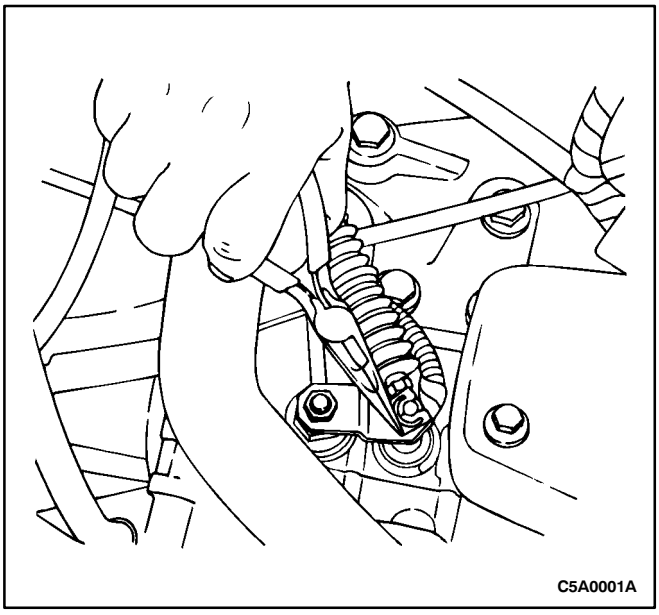


C103B071

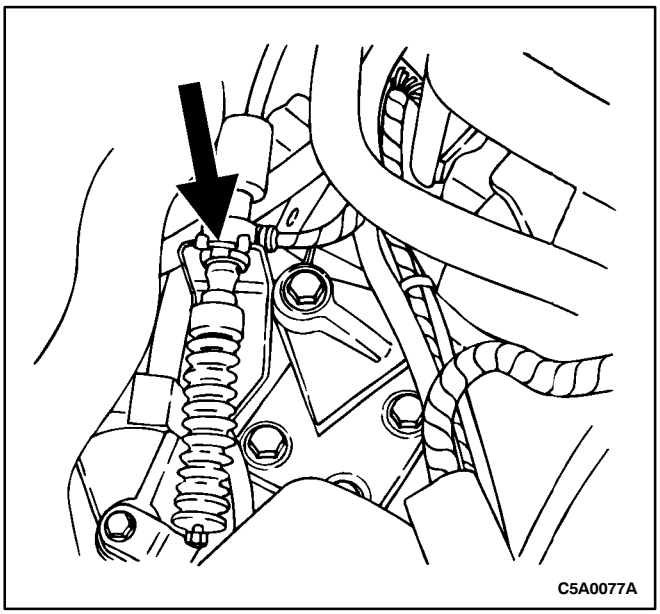
TRANSAXLE ASSEMBLY

Removal Procedure

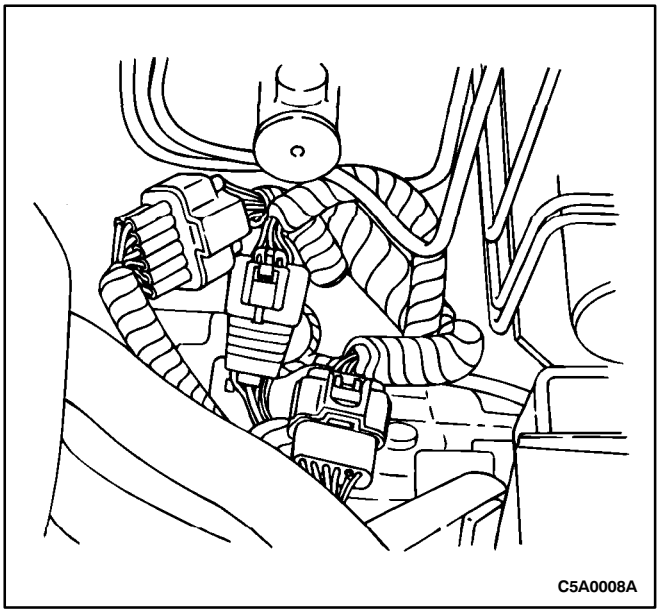
1. Install Engine Support Fixture J-28467-B to support the engine.
2. Remove the battery and battery tray. Refer to *Section 1E, Engine Electrical.*
3. Remove the transaxle left mount. Refer to “Transaxle Left Mount” in this section.


C5A0001A

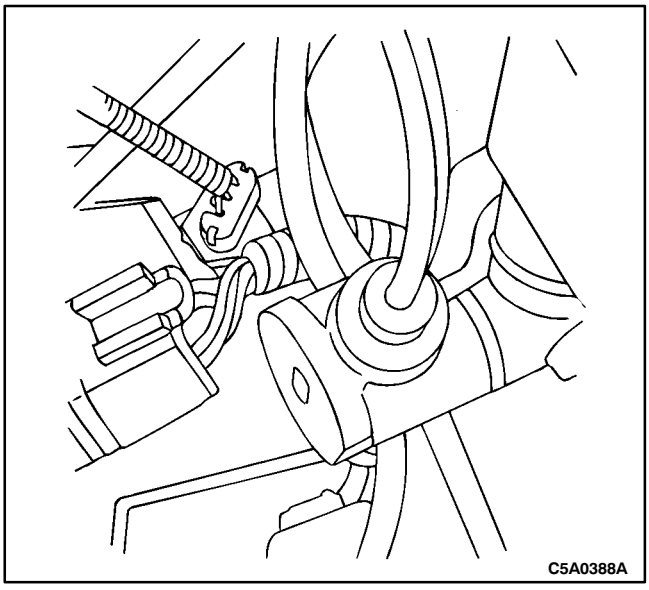
4. Remove the clip retaining the shift control cable to the park/neutral position (PNP) switch, then disconnect the cable.



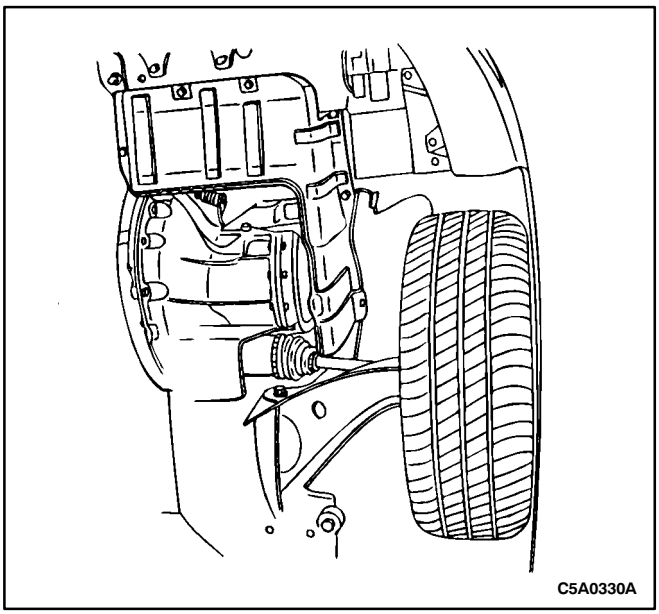
5. Remove the clip retaining the shift control cable to the bracket, then disconnect the cable and position aside.



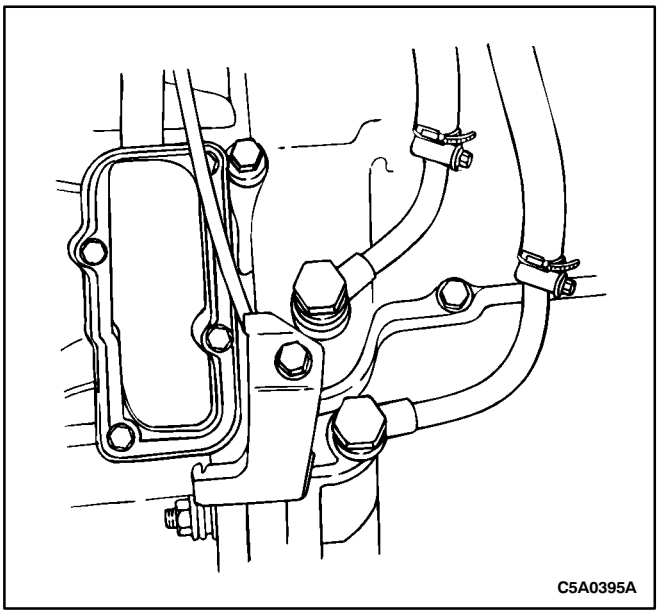
6. Disconnect the 11-pin PNP switch and 12-pin transaxle sensor electrical connectors.



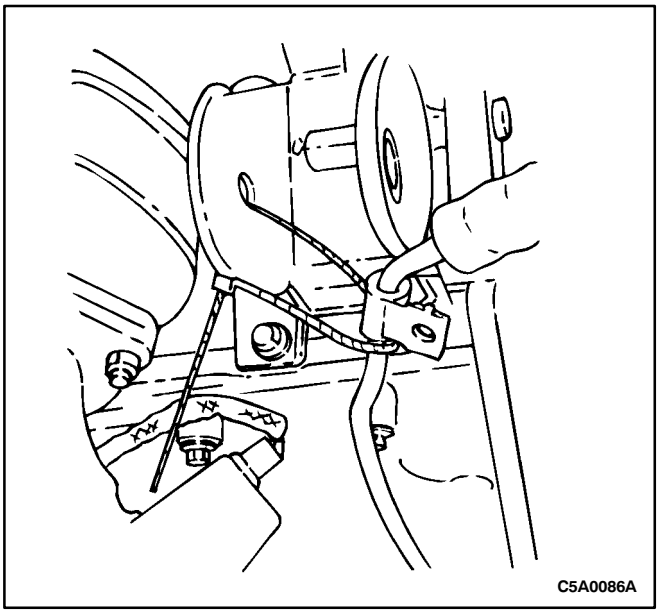
7. Disconnect the vehicle speed sensor (VSS) electrical connector.
8. Disconnect the vent tube from the top of the transaxle.
9. Remove the three upper transaxle-to-engine mounting bolts.
10. Raise and support the vehicle. Refer to *Section OB, General Information.*


C5A0330A

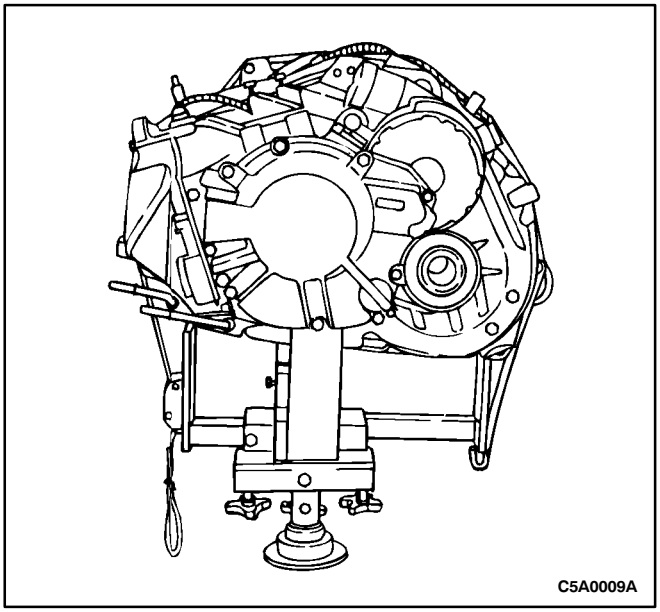
11. Remove the engine under cover.
12. Drain the transaxle fluid. Refer to “Fluid Drain Procedure” in this section.


C5A0395A

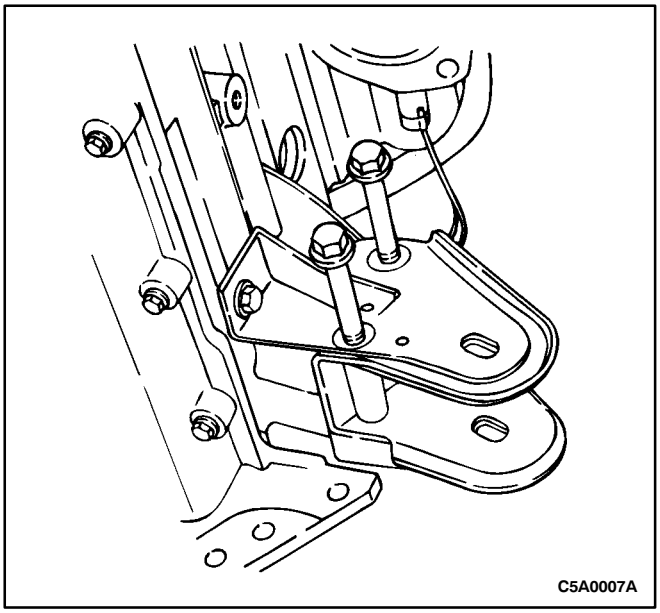
13. Disconnect the fluid cooler pipes at the valve body cover and allow the fluid to drain, then position the pipes aside.
14. Remove the left and right drive axle assemblies. Refer to *Section 3A, Automatic Transaxle Drive Axle.*
15. Remove the center member. Refer to *Section 9N, Frame and Underbody.*


C5A0086A

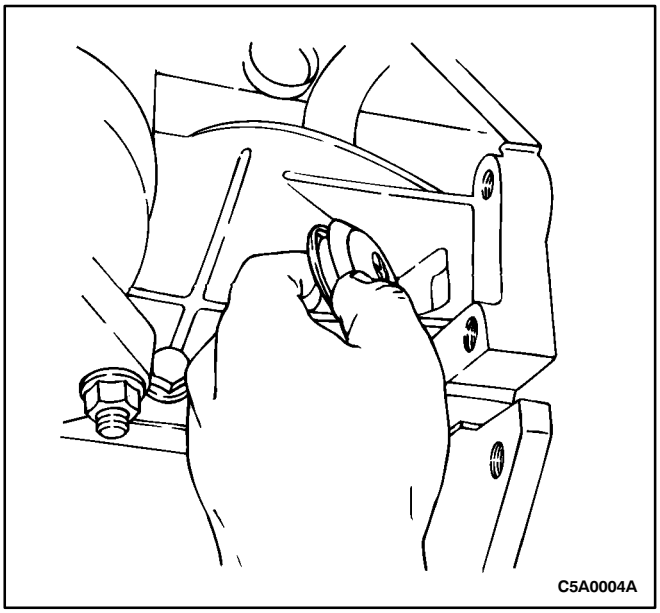
16. Position the power steering hose away from the installation area and secure it with a plastic tie strap.
17. Remove the starter motor. Refer to *Section 1E, Engine Electrical.*
18. Remove the two engine-to-transaxle retaining bolts next to the starter motor opening.


C5A0009A

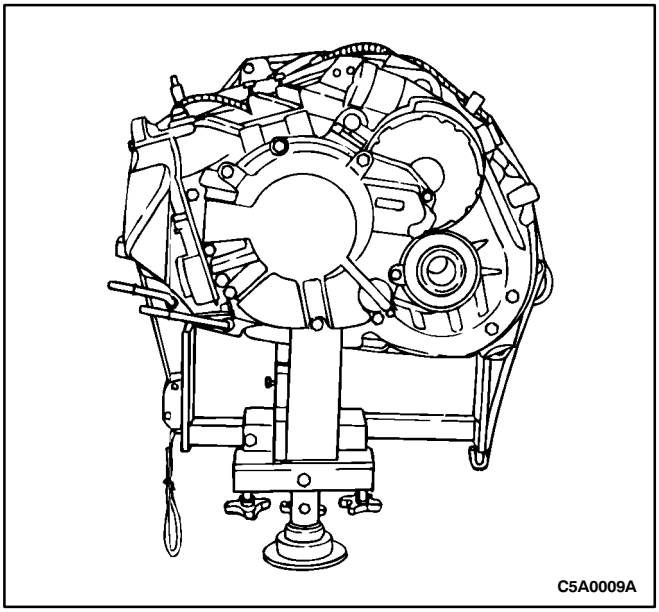
19. Secure the transaxle to a transaxle jack.


C5A0007A

20. Remove the front engine mount bracket.


C5A0004A

21. Remove the torque converter access cover, then remove the six torque converter-to-flex plate retaining bolts.
22. Remove the oil pan-to-transaxle case retaining bolts.
23. Carefully remove the transaxle from the engine compartment.


C5A0009A

Installation Procedure

1. Secure the transaxle to the transaxle jack, then carefully position in the vehicle.

Notice: Do not tighten the retaining bolts at this time.

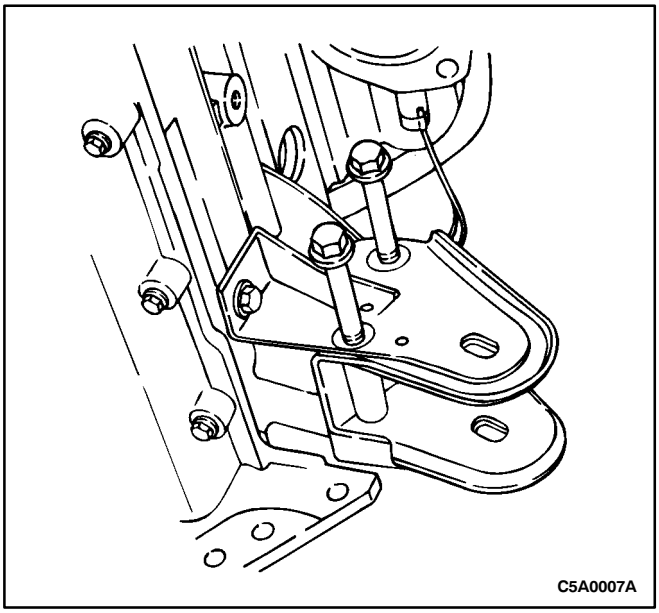
2. Install the oil pan-to-transaxle case retaining bolts hand tight.

Notice: Do not tighten the retaining bolts at this time.

3. Install the two engine-to-transaxle retaining bolts next to the starter motor opening hand tight.
4. Install the six torque converter-to-flex plate retaining bolts.

Tighten

Tighten the torque converter-to-flex plate retaining bolts to 60 N•m (44 lb-ft)


C5A0007A

5. Install the front engine mount bracket.

Tighten

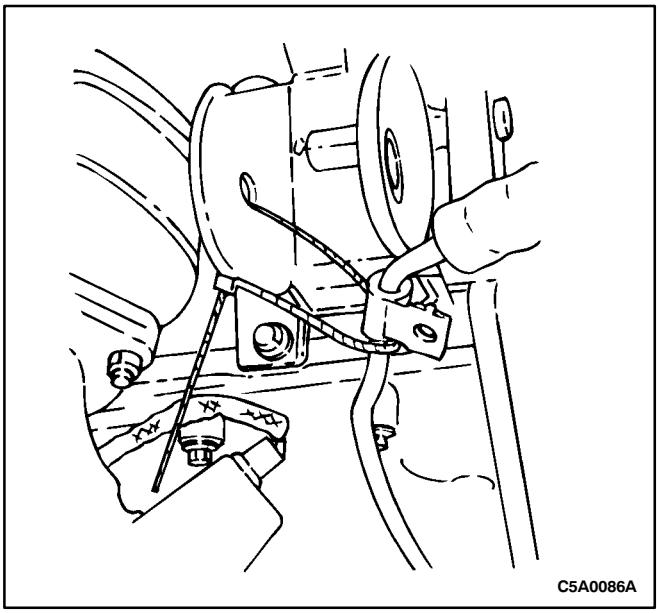
Tighten the front engine mount bracket-to-engine retaining bolts to 90 N•m (66 lb-ft).

Tighten the front engine mount bracket-to-transaxle through bolts to 90 N•m (66 lb-ft).

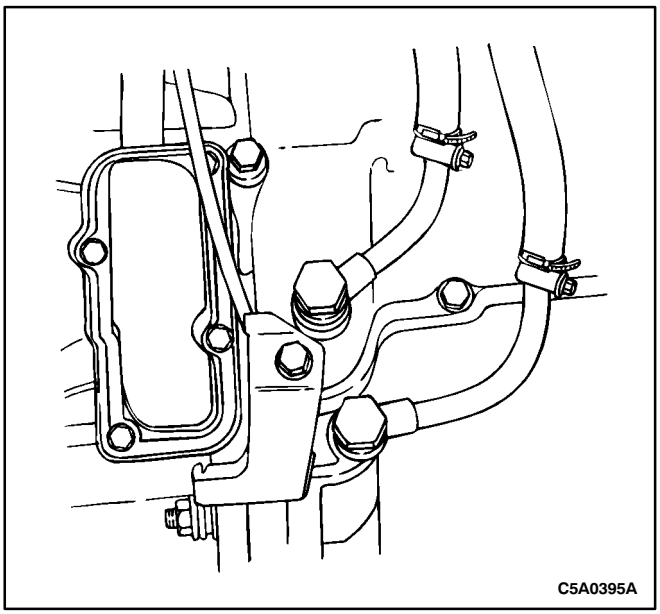
Tighten the oil pan-to-transaxle case retaining bolts to 40 N•m (30 lb-ft).

Tighten the two engine-to-transaxle retaining bolts next to the starter motor opening to 75 N•m (55 lb-ft).

6. Install the starter motor. Refer to *Section 1E, Engine Electrical.*
7. Remove the transaxle jack.
8. Install the center member. Refer to *Section 9N, Frame and Underbody.*


C5A0086A

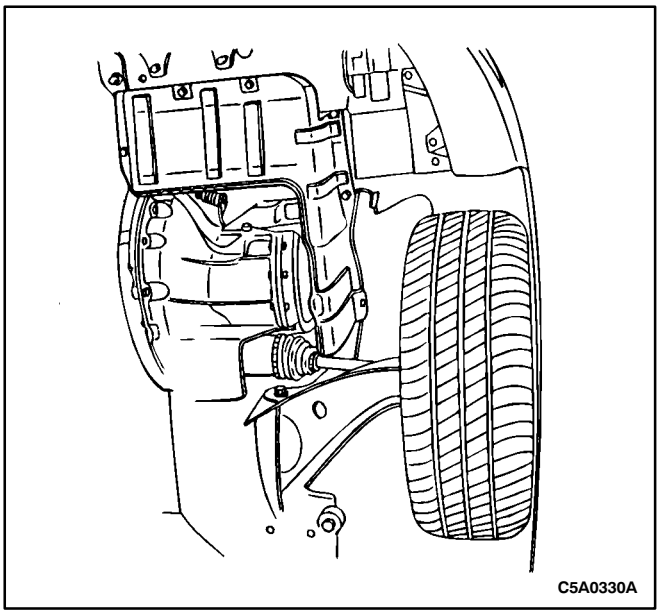
9. Cut the plastic tie strap. Position and secure the power steering hose to the center member.
10. Install the left and right drive axle assemblies. Refer to *Section 3A, Automatic Transaxle Drive Axle.*


C5A0395A

11. Connect the fluid cooler pipes at the valve body cover.

Tighten

Tighten the fluid cooler pipe bolts to 20-29 N•m (15-22 lb-ft).

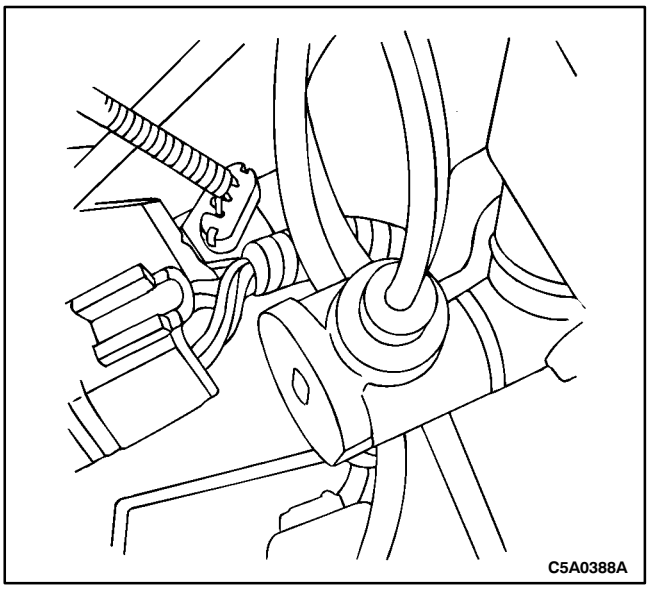

C5A0330A

12. Install the engine under cover.
13. Lower the vehicle.
14. Install the three upper transaxle-to-engine mounting bolts.

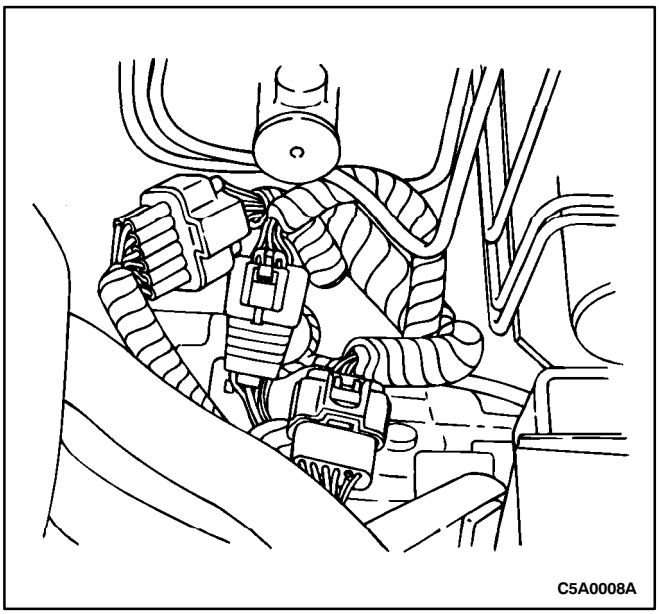
Tighten

Tighten the three upper transaxle-to-engine mounting bolts to 75 N•m (55 lb-ft).

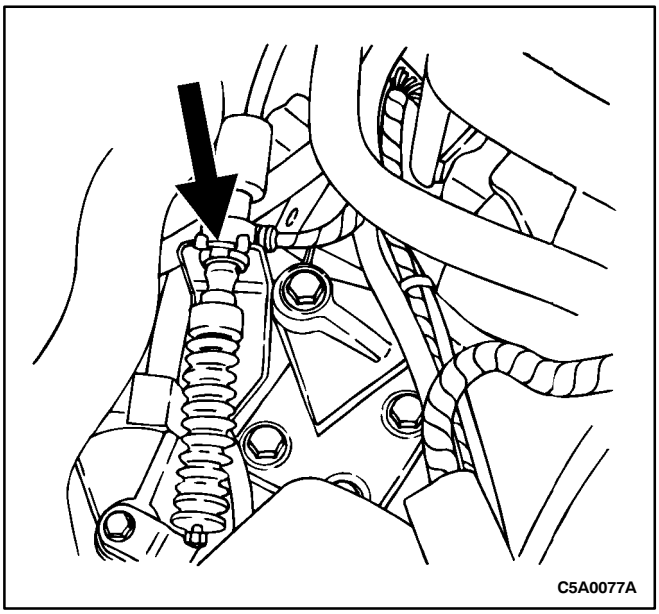
15. Connect the vent tube to the top of the transaxle.


C5A0388A

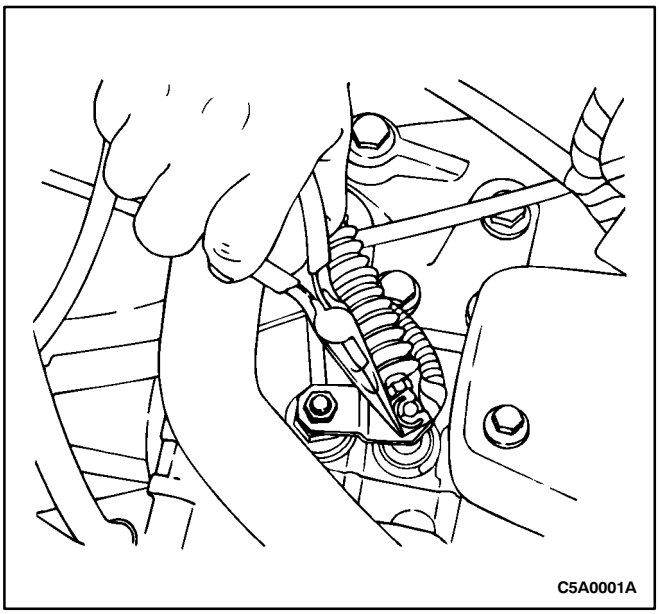
16. Connect the vehicle speed sensor (VSS) electrical connector.


C5A0008A

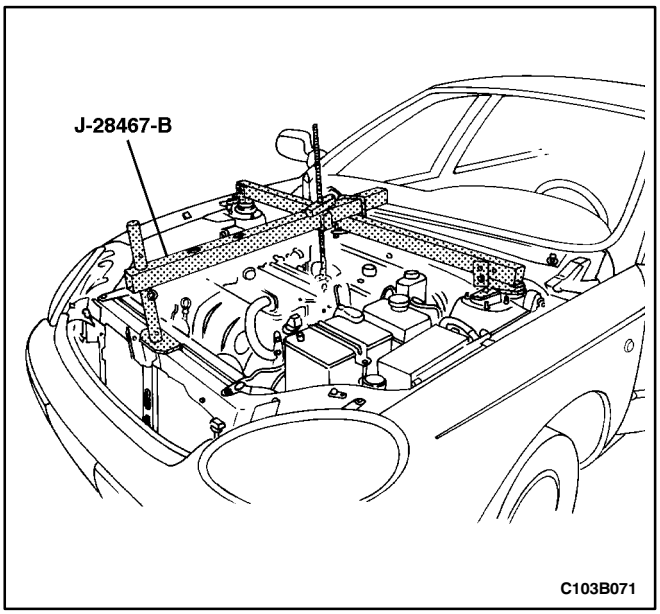
17. Connect the 11-pin PNP switch and 12-pin transaxle sensor electrical connectors.


C5A0077A

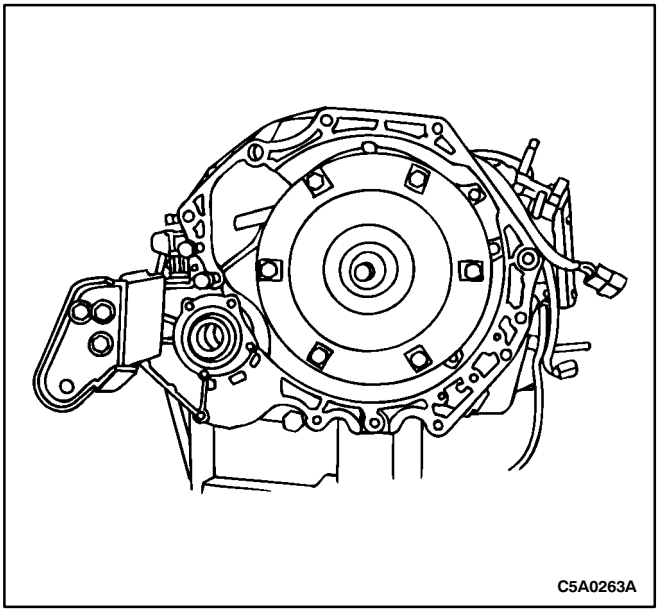
18. Position the shift control cable on the bracket, then install the retaining clip.


C5A0001A

19. Connect the shift control cable to the park/neutral position (PNP) switch, then install the retaining clip.
20. Install the transaxle left mount. Refer to “Transaxle Left Mount” in this section.
21. Install the battery and battery tray. Refer to *Section 1E, Engine Electrical.*



22. Remove Engine Support Fixture J-28467-B.
23. Fill the transaxle with fluid. Refer to “Fluid Drain Procedure” in this section.


C5A0263A

UNIT REPAIR

MAJOR COMPONENT DISASSEMBLY

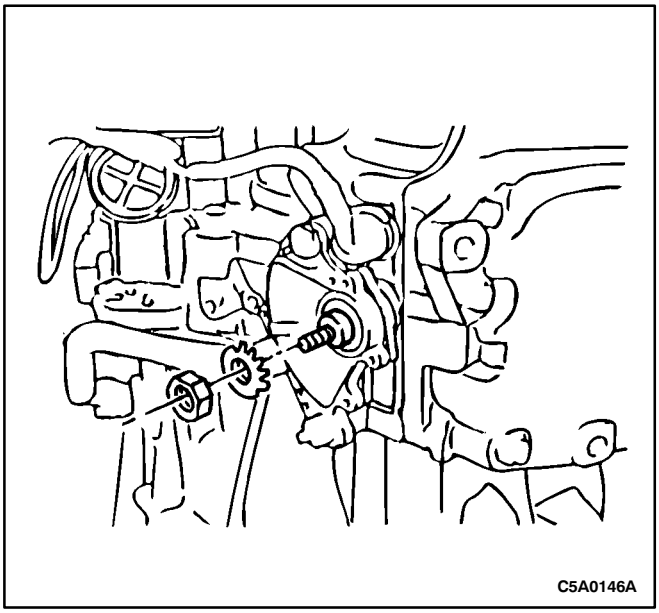
Tools Required

KM-210-A Bearing Puller

KM-709 Bearing Puller Adapter

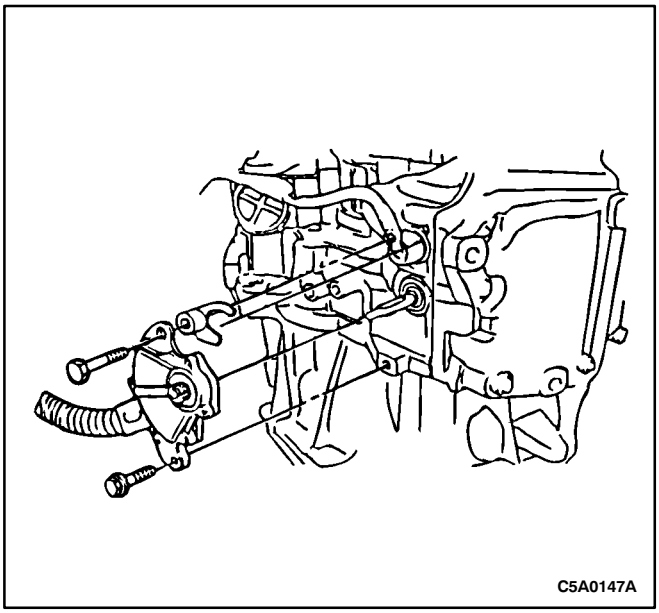
Disassembly Procedure

1. Remove the torque converter.

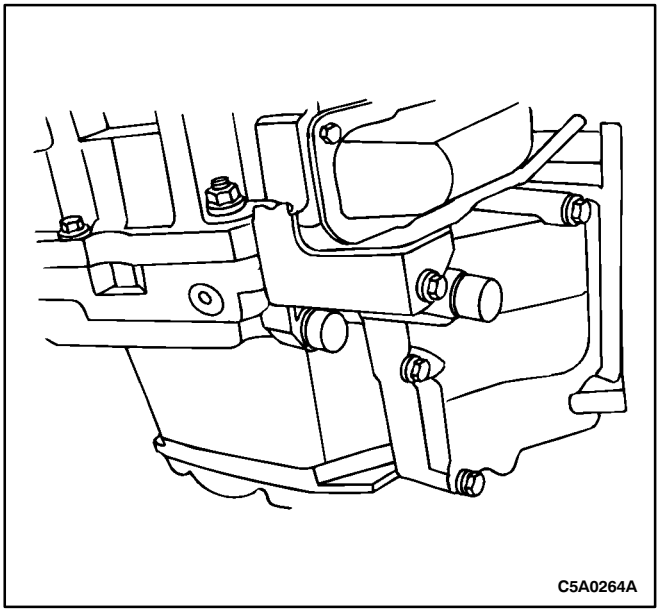

C5A0146A

Notice: Loosen the staked part of the washer before removing.

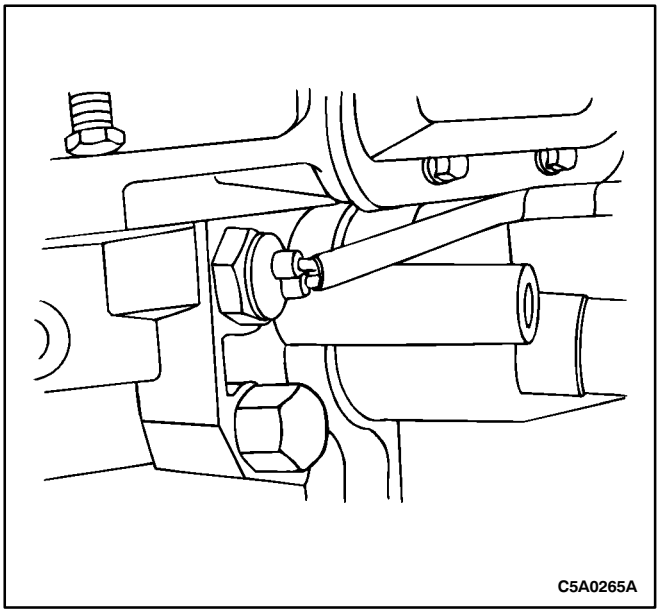
2. Remove the park/neutral position (PNP) switch nut and washer.


C5A0147A

3. Remove the two bolts and the PNP switch.

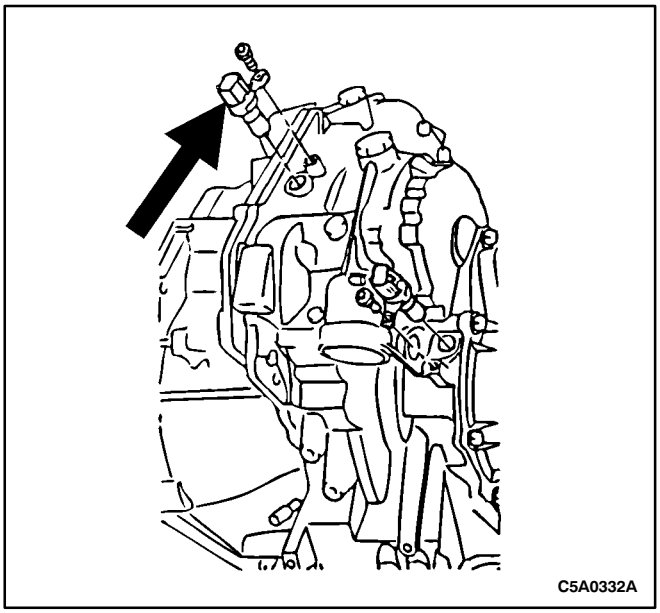

C5A0264A

4. Remove the Transmission Fluid Temperature (TFT) sensor protector bracket.

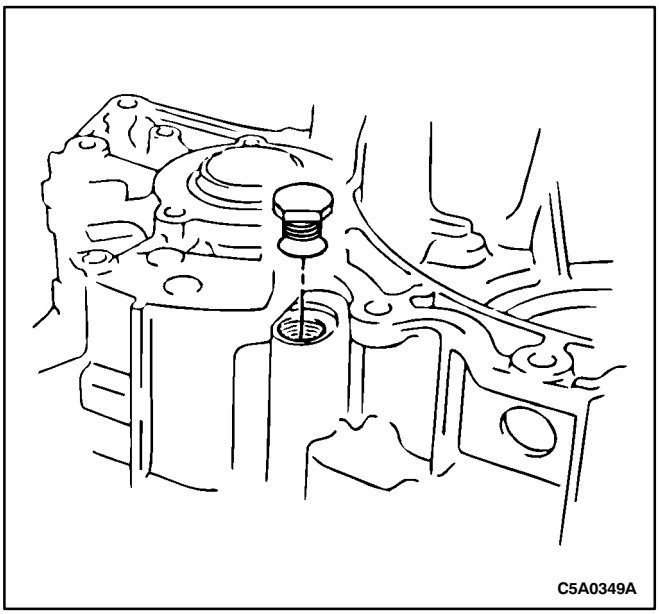

C5A0265A

Notice: Remove and discard the O-ring.

5. Remove the Transmission Fluid Temperature (TFT) sensor.

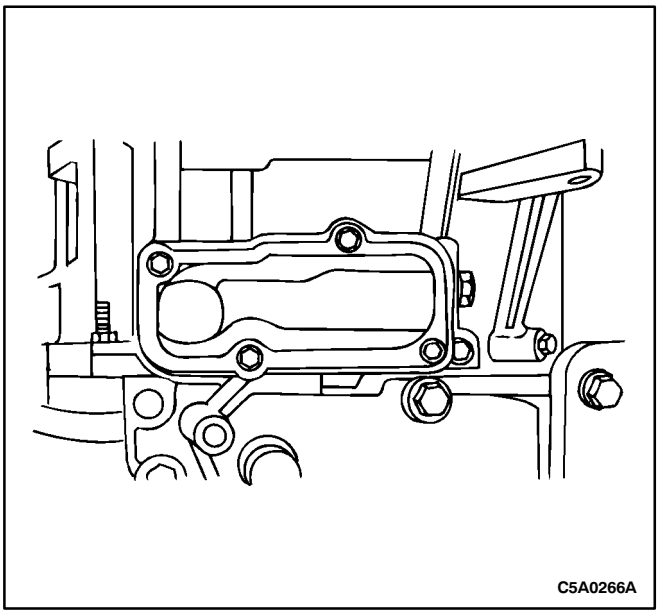

C5A0332A

6. Remove the input shaft speed (ISS) and output shaft speed (OSS) sensors.



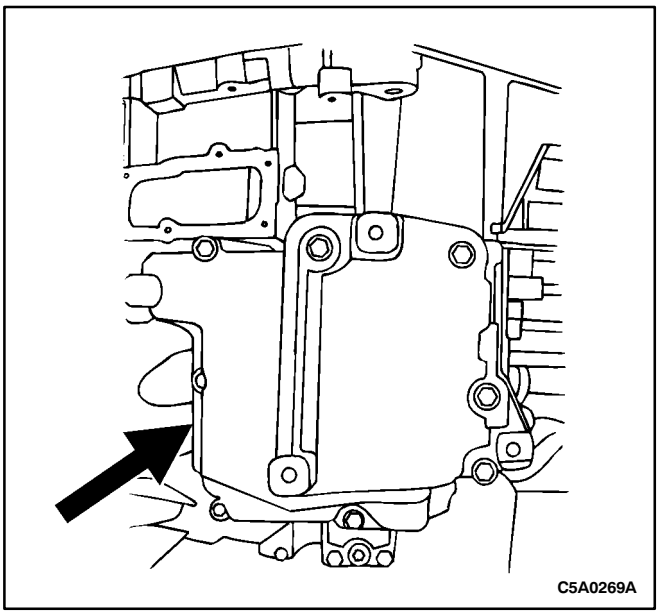
Notice: Discard the gasket.

7. Remove the drain plug and gasket.



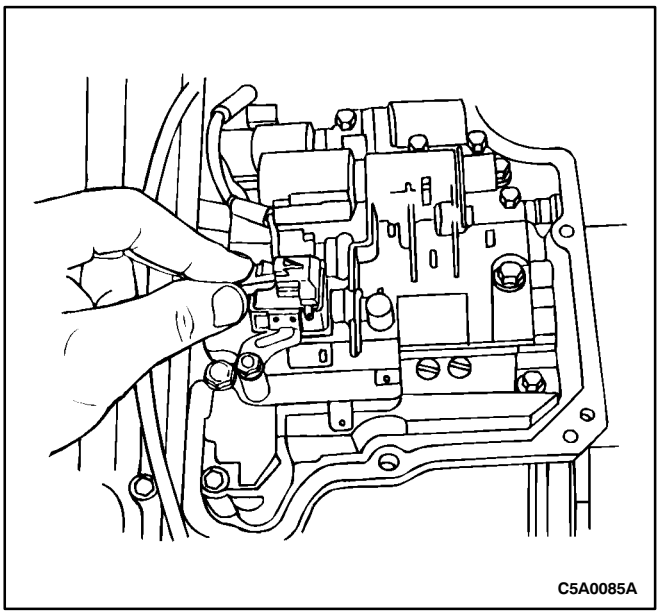
Caution: Be careful not to damage the contact surfaces of the transaxle housing.

8. Remove the transaxle housing cover.

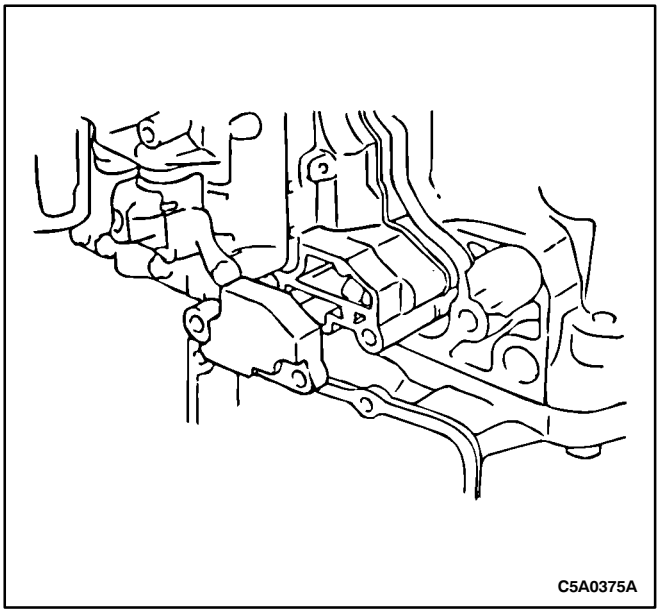


Caution: Be careful not to damage the contact surfaces of the transaxle housing.

9. Remove the valve body cover.

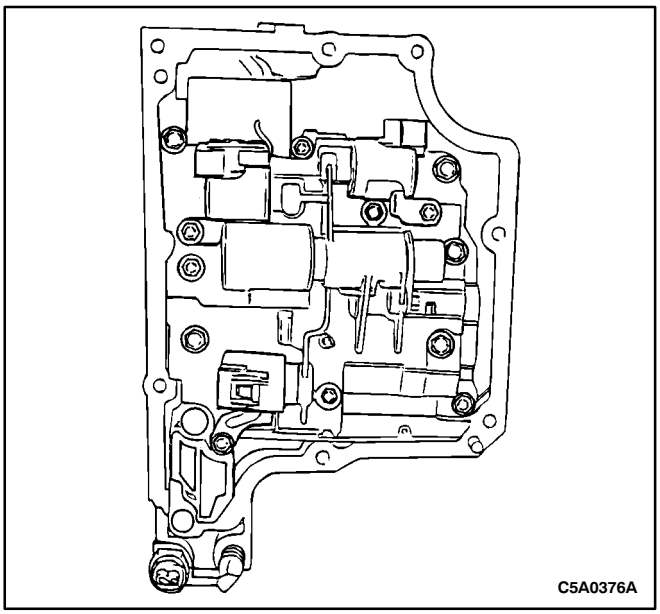

C5A0085A

10. Disconnect the solenoid electrical connectors.


C5A0375A

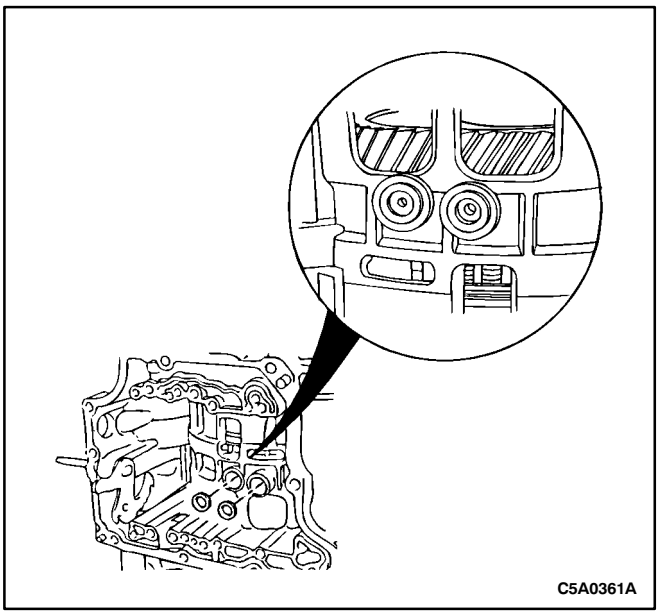
Notice: Discard the gasket.

11. Remove the suction cover and gasket.


C5A0376A

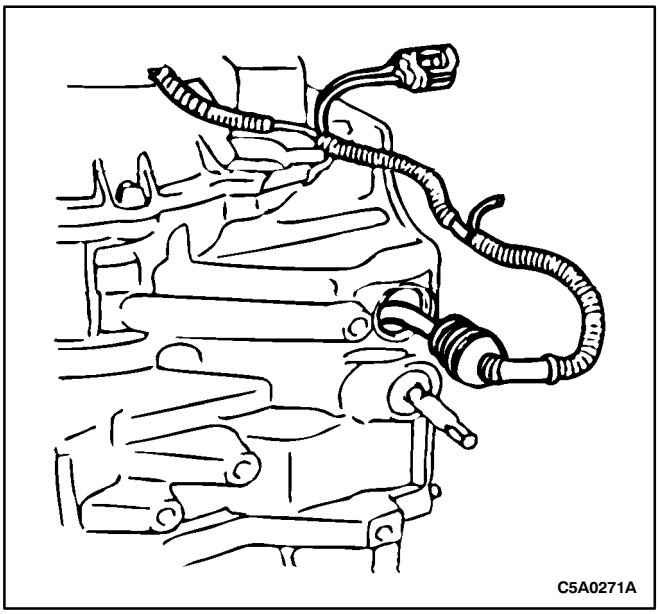
Notice: Disconnect the manual valve connecting rod from the manual valve lever.

12. Remove the seven bolts and the valve body.

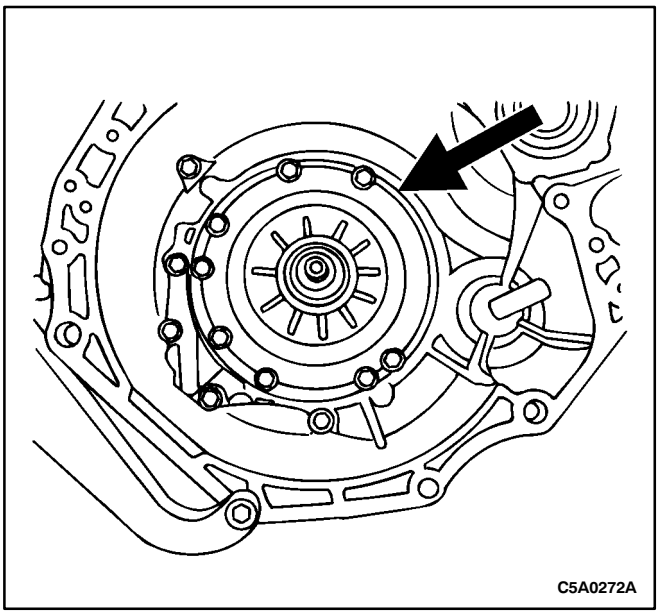


Notice: Discard the apply seals.

13. Remove the two apply seals.



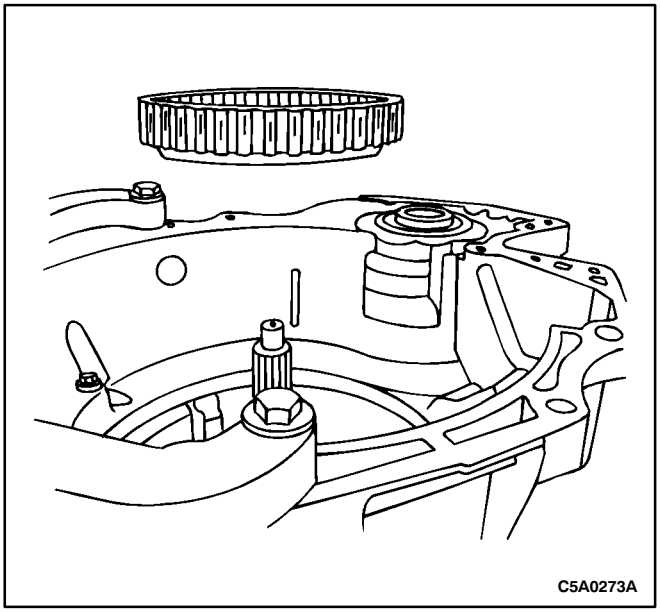
14. Remove the solenoid wire harness.



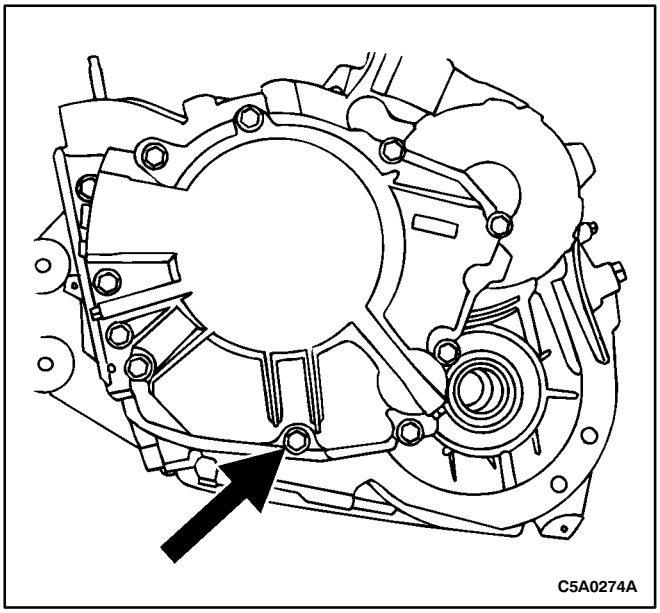
Caution: Be careful not to damage the stator shaft bushing.

Notice: Loosen the bolts evenly.

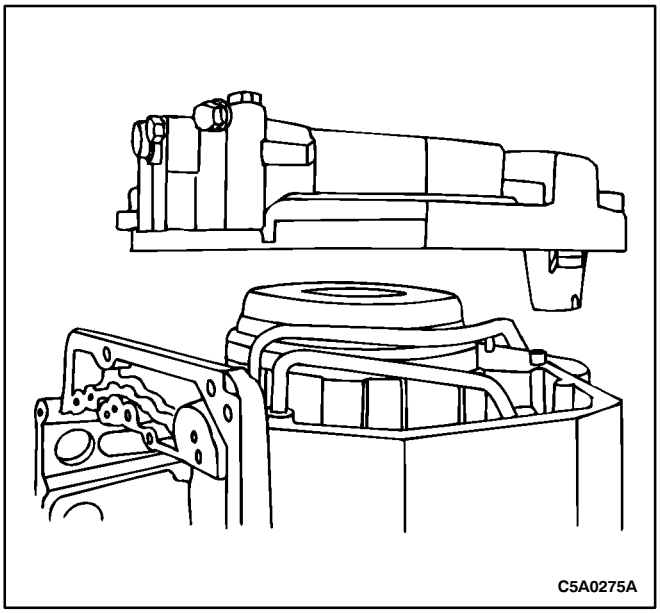
15. Remove the oil pump, second coast and second brake assembly.


C5A0273A

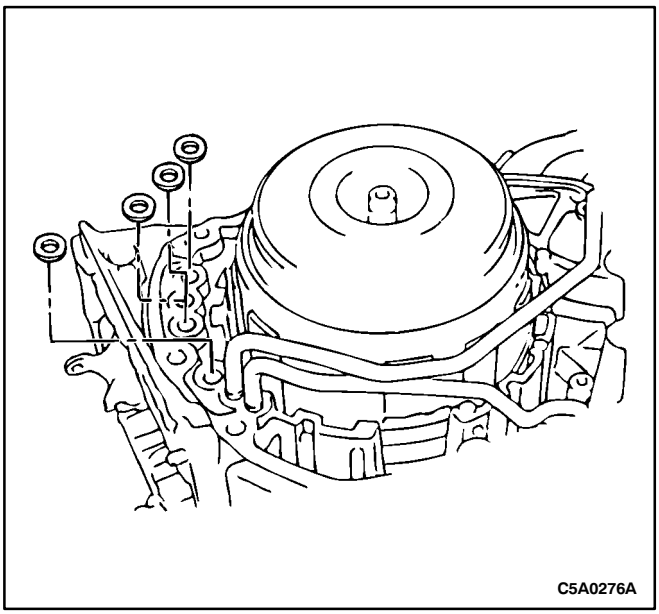
16. Remove the brake hub and one-way clutch.


C5A0274A

17. Remove the nine transaxle rear case bolts.

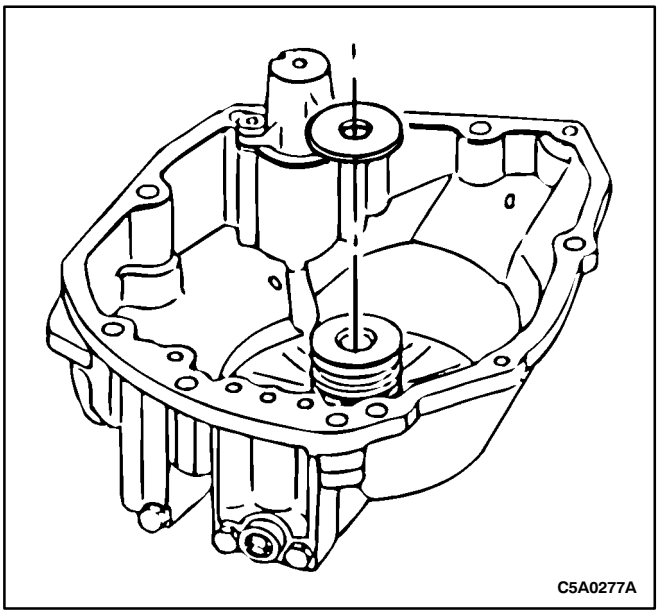

C5A0275A

18. Remove the transaxle rear case.

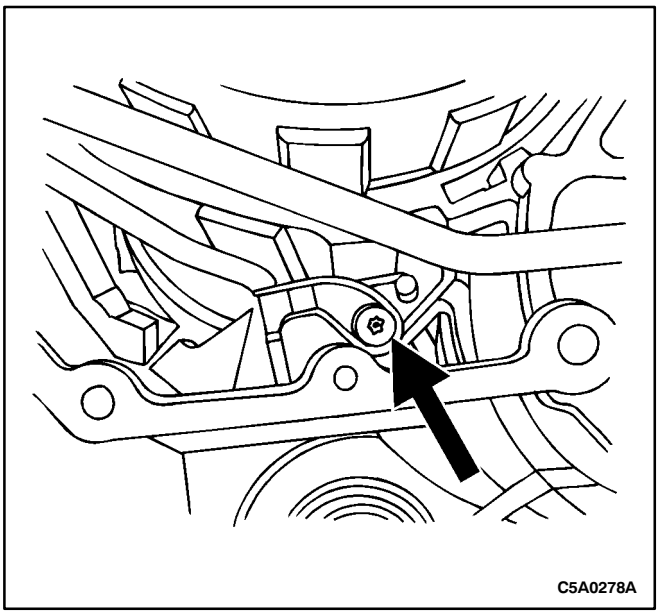

C5A0276A

Notice: Discard the apply seals.

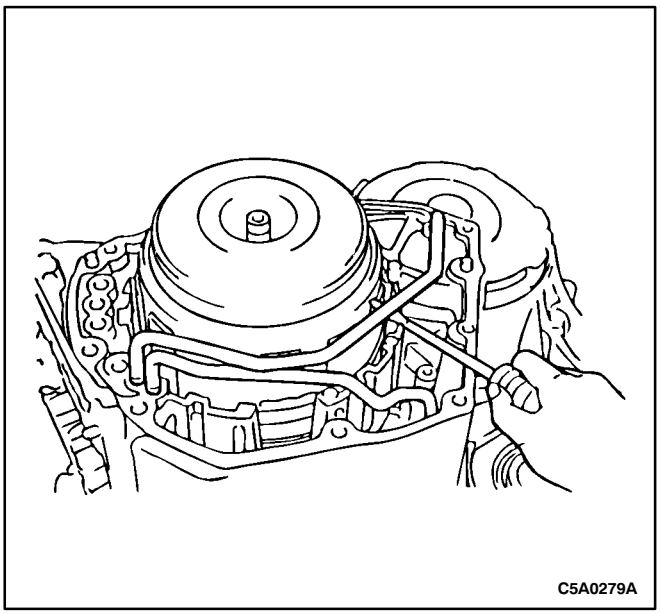
19. Remove the four apply seals.


C5A0277A

20. Remove the thrust washer from the transaxle rear case.

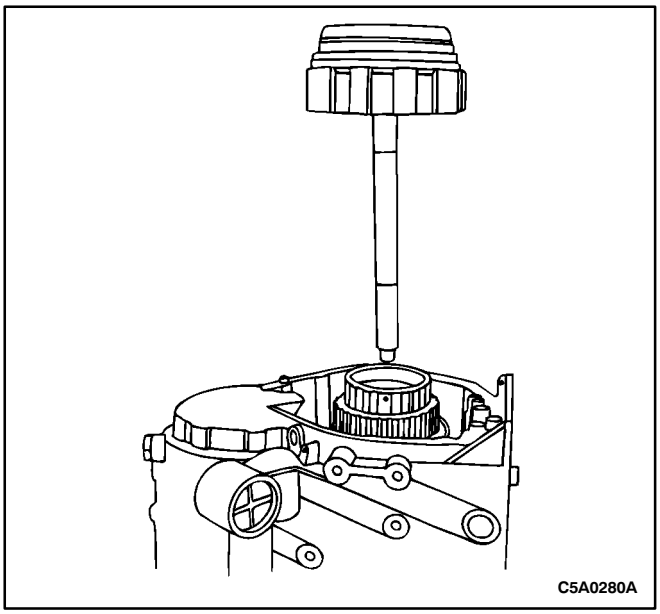

C5A0278A

21. Remove the tube clamp bolt and the clamp.

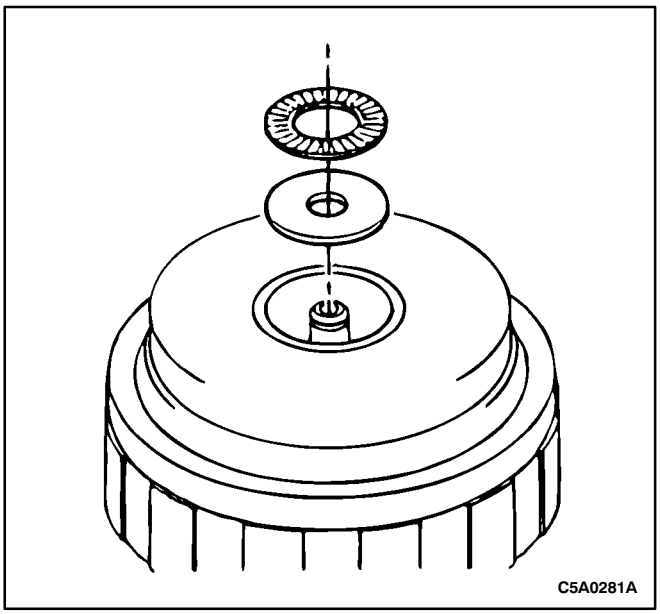

C5A0279A

Caution: Be careful not to damage the tubes.

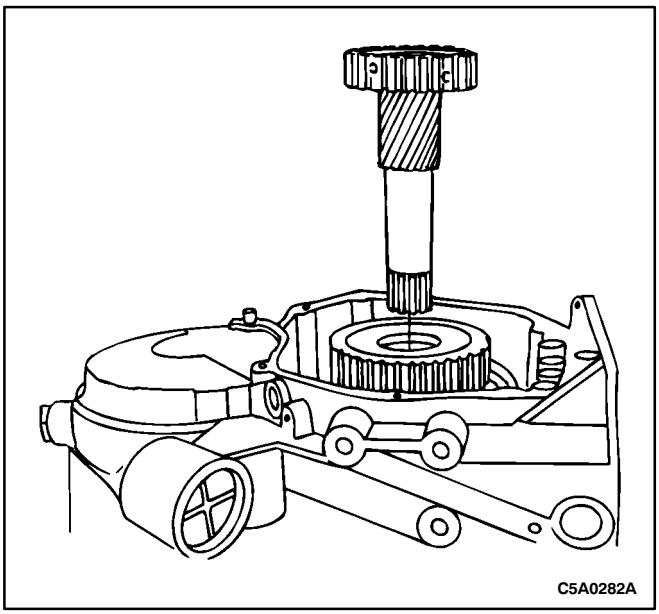
22. Remove the apply tubes.
    - Pry up both ends of the tube with a large screwdriver.


C5A0280A

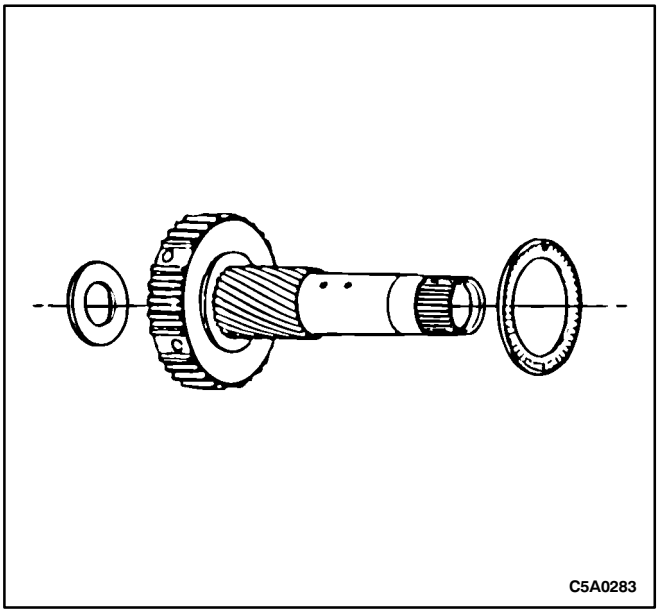
23. Remove the forward/direct clutch assembly.


C5A0281A

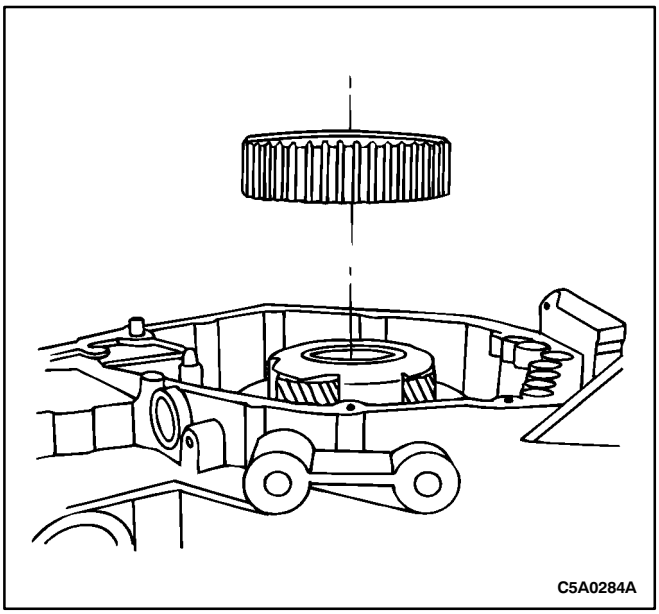
24. Remove the forward/direct clutch thrust washer and bearing.


C5A0282A

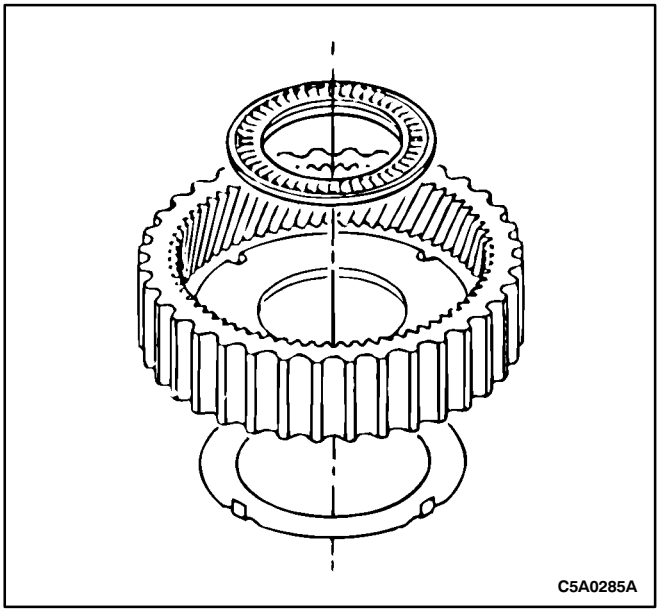
25. Remove the planetary sun gear.


C5A0283

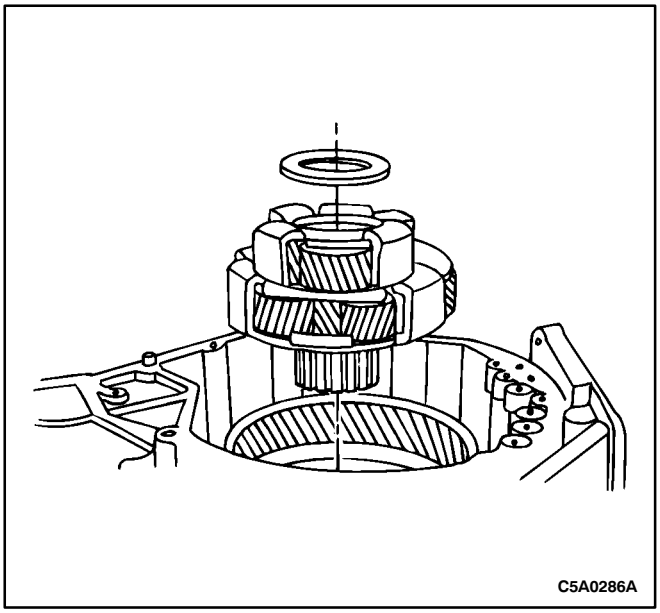
26. Remove the planetary sun gear thrust washer and bearing.


C5A0284A

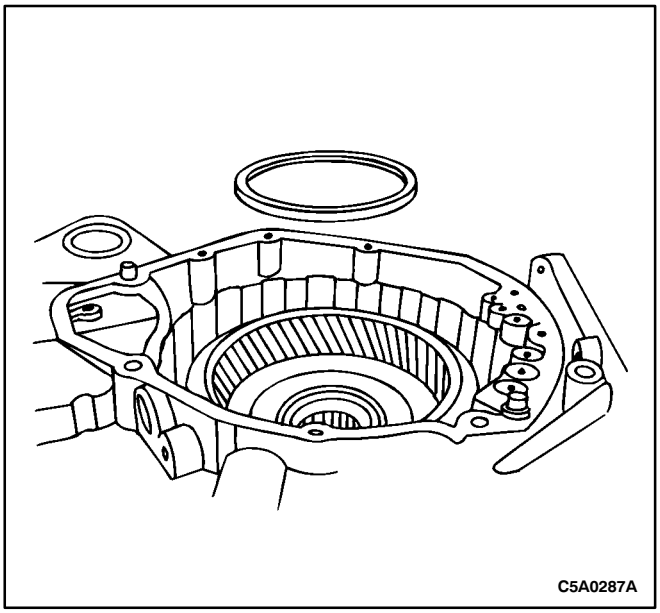
27. Remove the rear planetary ring gear.


C5A0285A

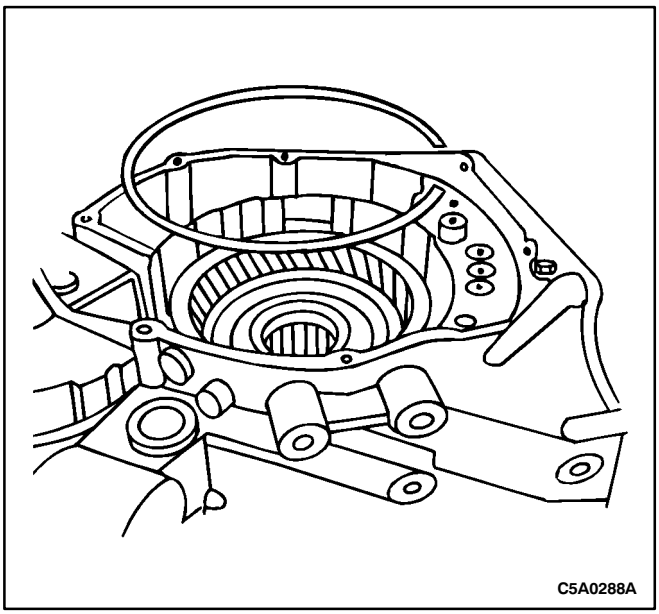
28. Remove the rear planetary ring gear thrust washer and bearing.


C5A0286A

29. Remove the planetary gear and thrust washer.

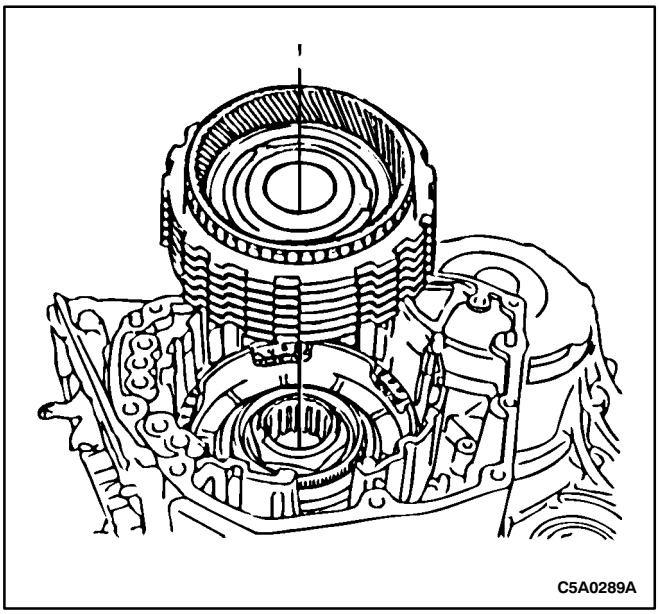

C5A0287A

30. Remove the bearing.

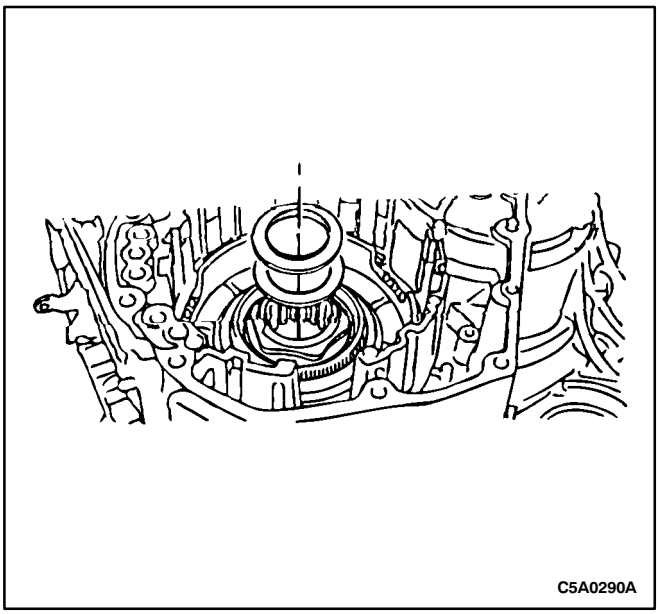

C5A0288A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

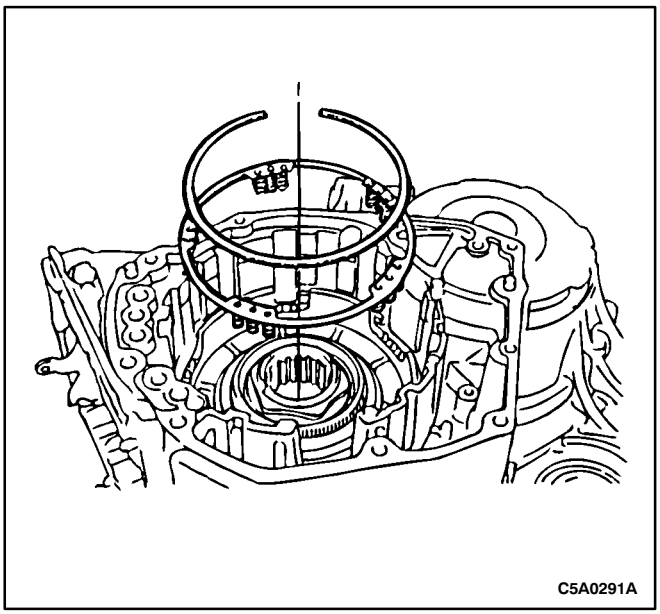
31. Remove the snap ring retaining the low/reverse brake clutch piston assembly, front planetary ring gear and one-way clutch.


C5A0289A

32. Remove the low/reverse brake clutch piston assembly, front planetary ring gear and one-way clutch.

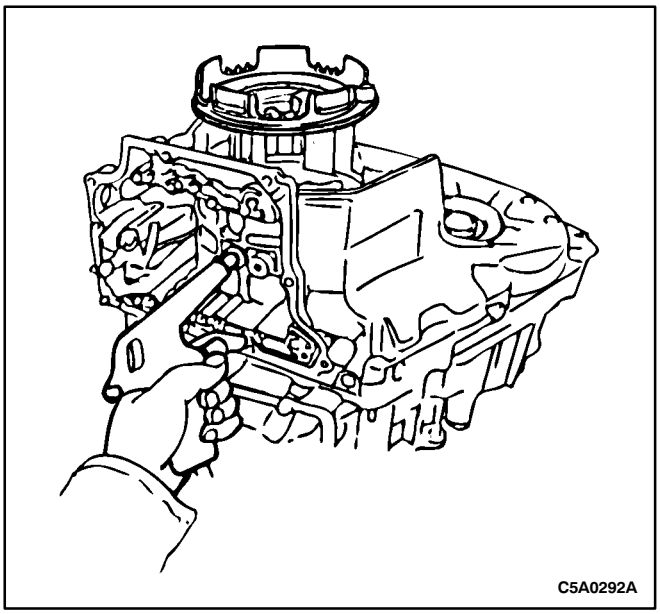

C5A0290A

33. Remove the thrust washer and bearing.


C5A0291A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

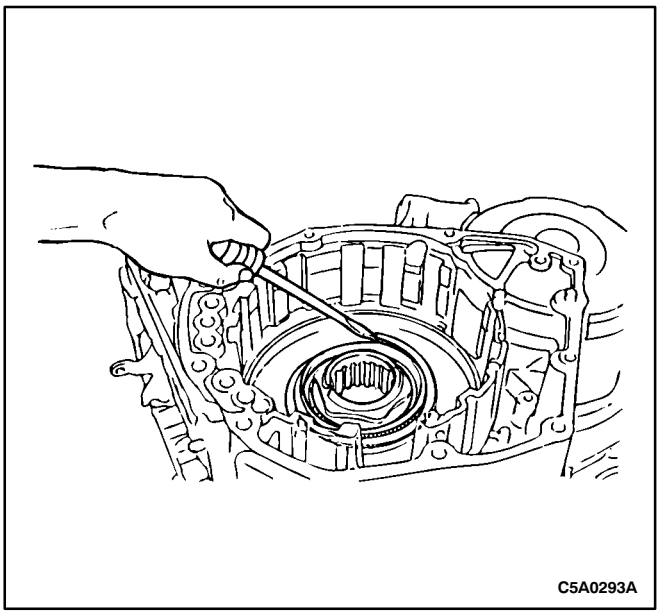
34. Remove the snap ring and the low/reverse return spring.


C5A0292A

WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needlenose pliers to remove.

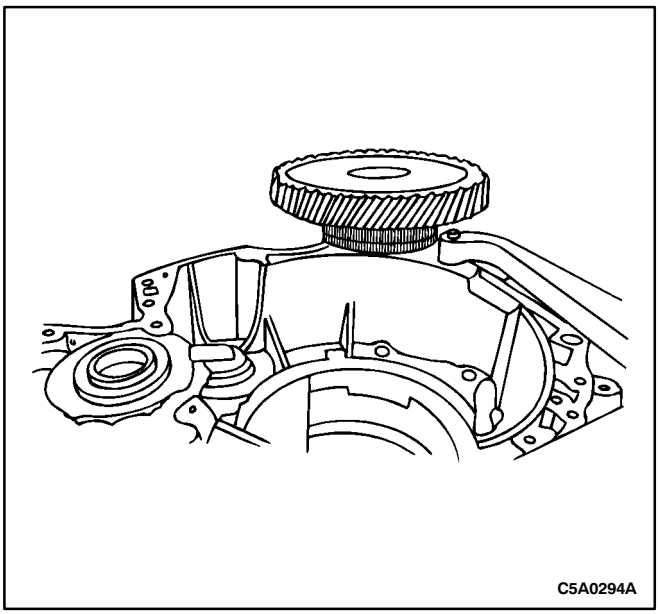
35. Apply 396 kPa (57 psi) of compressed air into the oil passage to remove the low/reverse brake piston.


C5A0293A

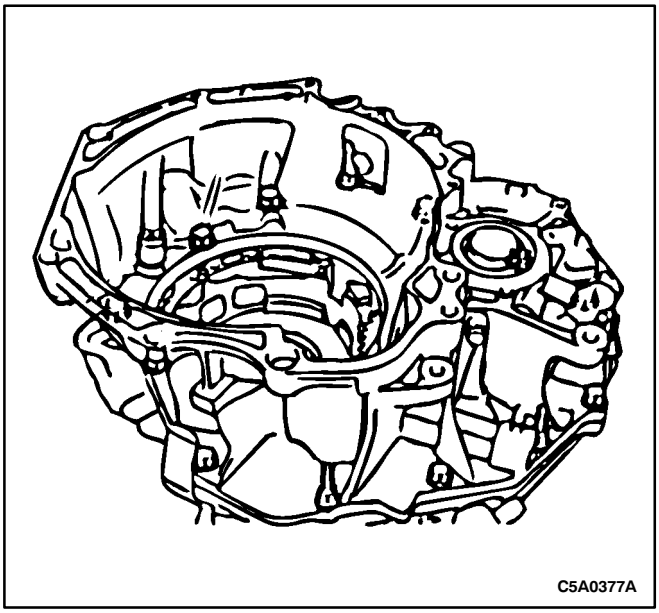
WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

Notice: Rotate the transaxle on its side before removing.

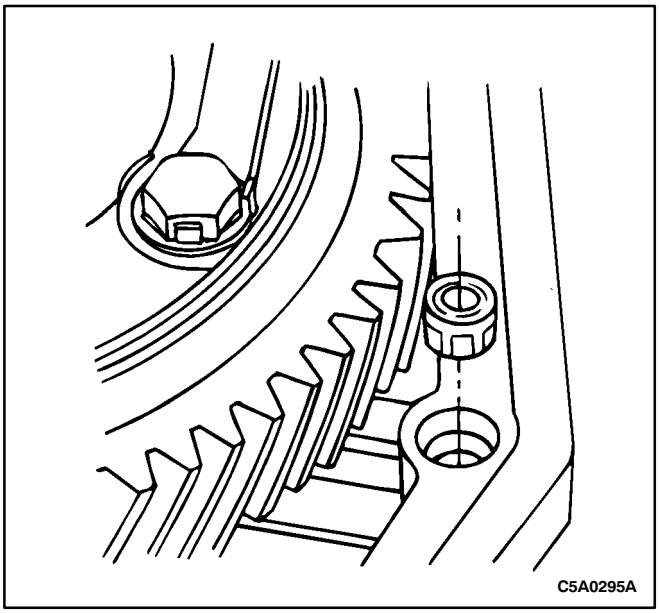
36. Remove the counter drive gear snap ring.


C5A0294A

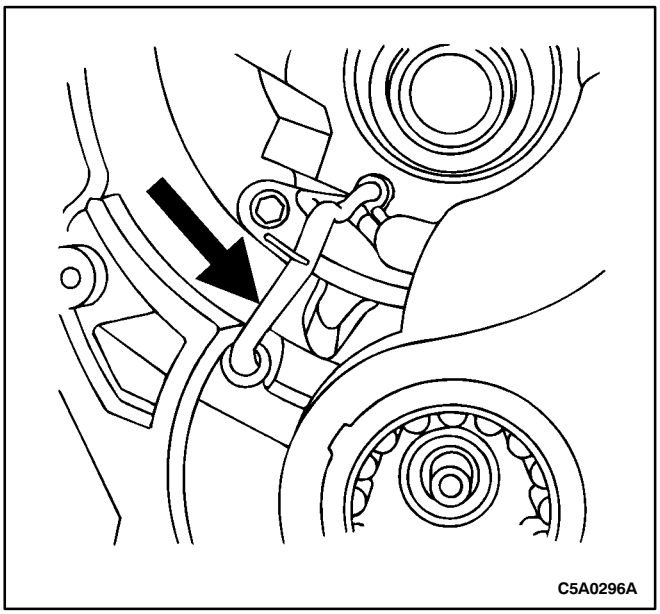
37. Remove the counter drive gear.


C5A0377A

38. Remove the 15 bolts and separate the transaxle housing from the transaxle case.

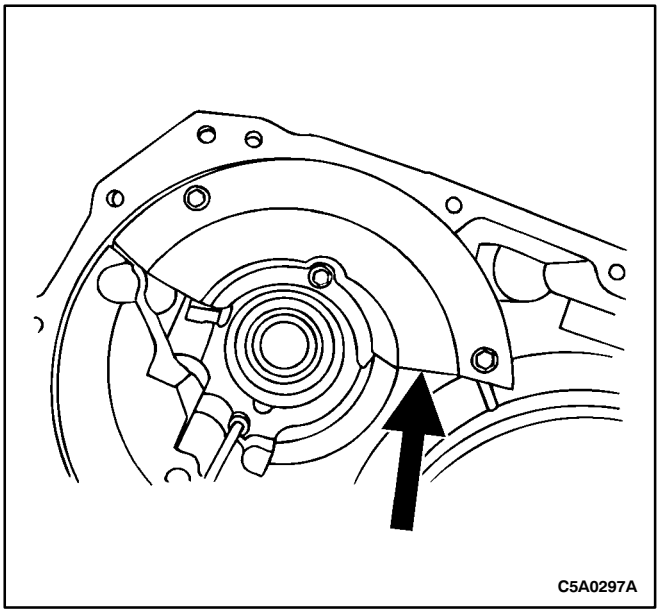

C5A0295A

39. Remove and discard the apply seal.

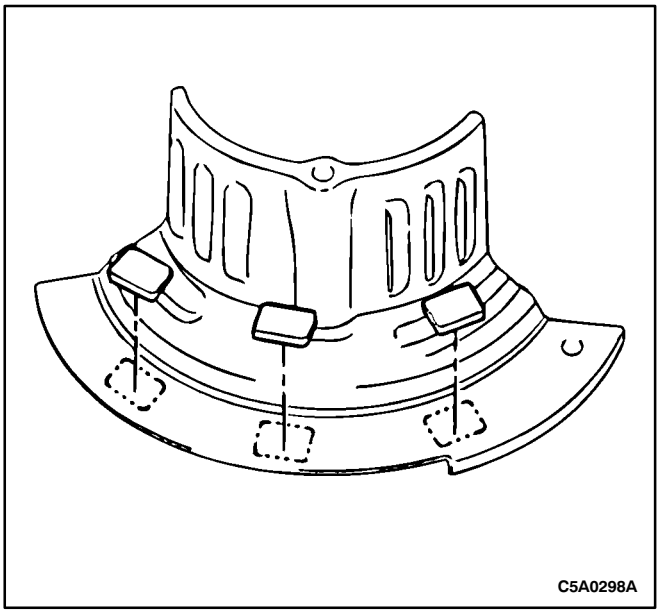

C5A0296A

Caution: Be careful not to damage the tube.

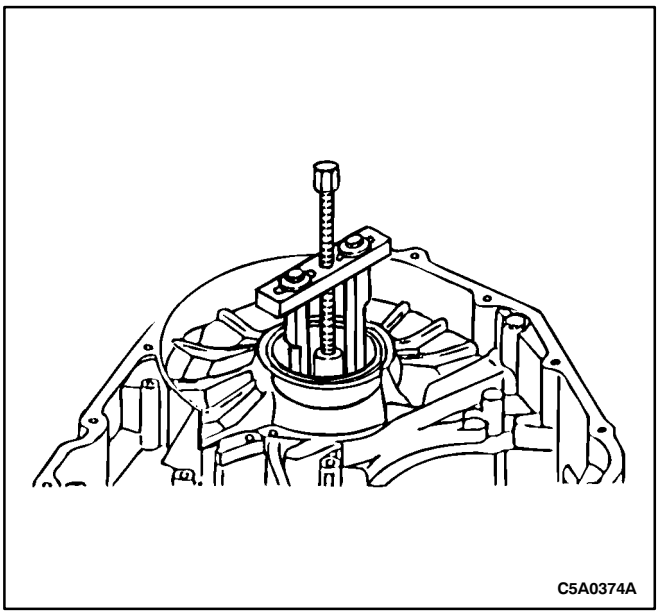
40. Remove the differential bearing lubrication apply tube.
    - Pry up both ends of the tube with a large screwdriver.


C5A0297A

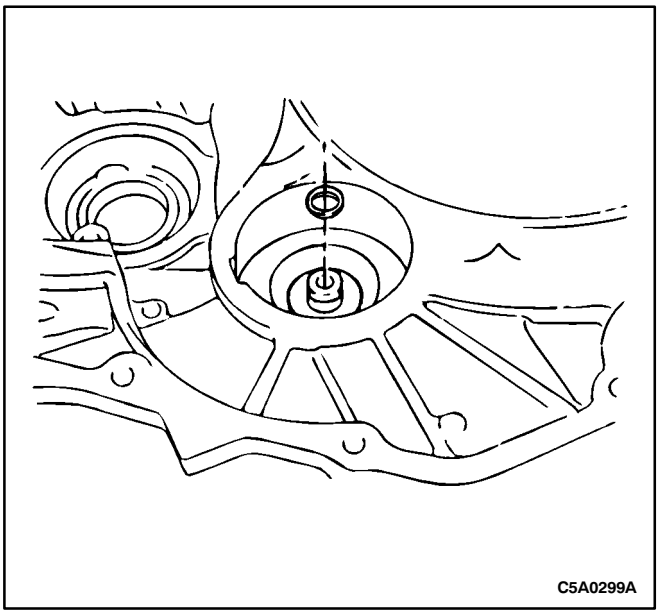
41. Remove the three bolts and the oil reserver plate.


C5A0298A

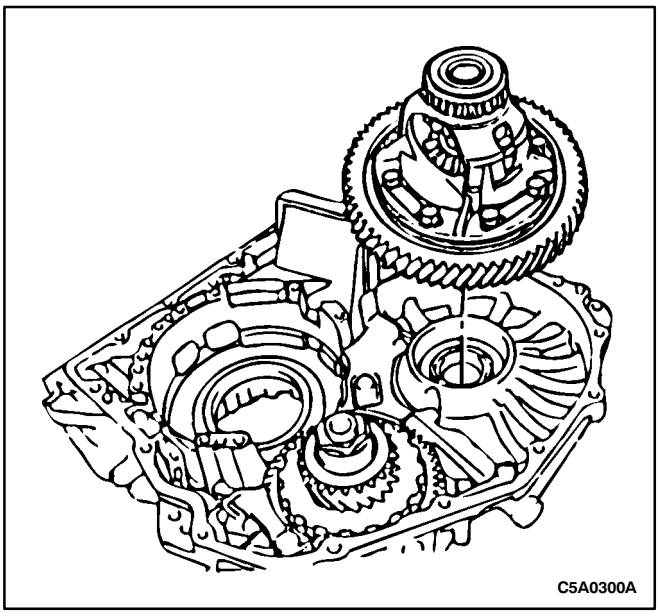
42. Remove the magnets from the oil reserver plate.


C5A0374A

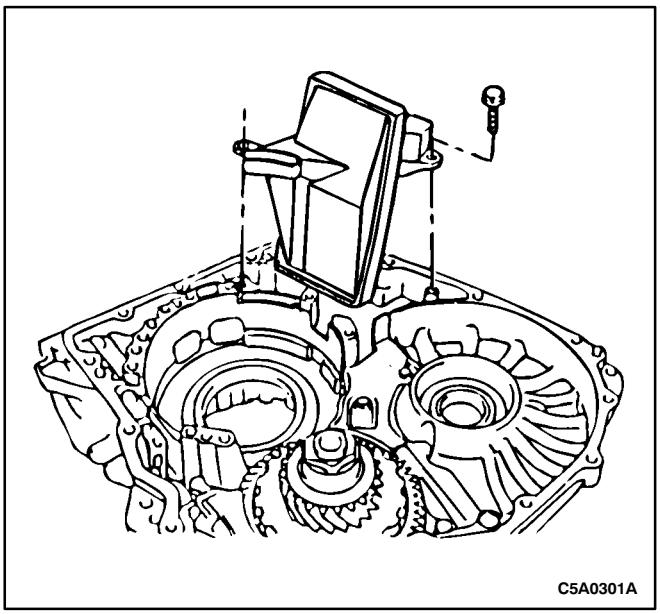
43. Using bearing puller KM−210-A and bearing puller adapter KM-709, remove the differential bearing from the transaxle housing.


C5A0299A

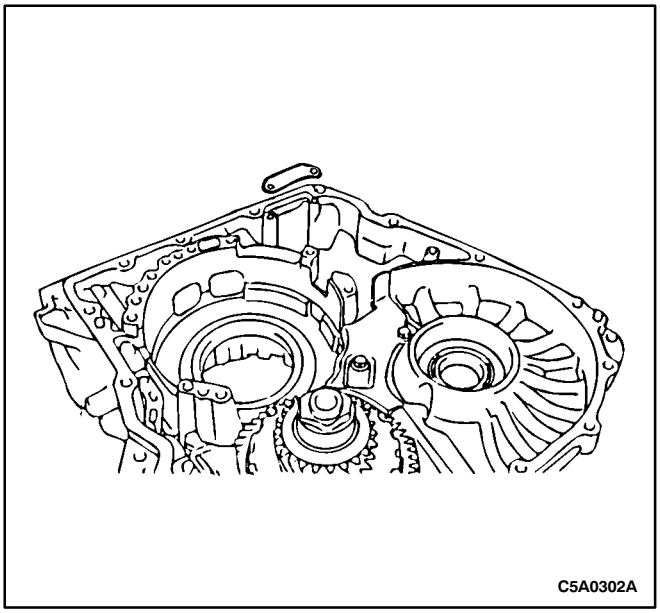
44. Remove the oil seal ring.


C5A0300A

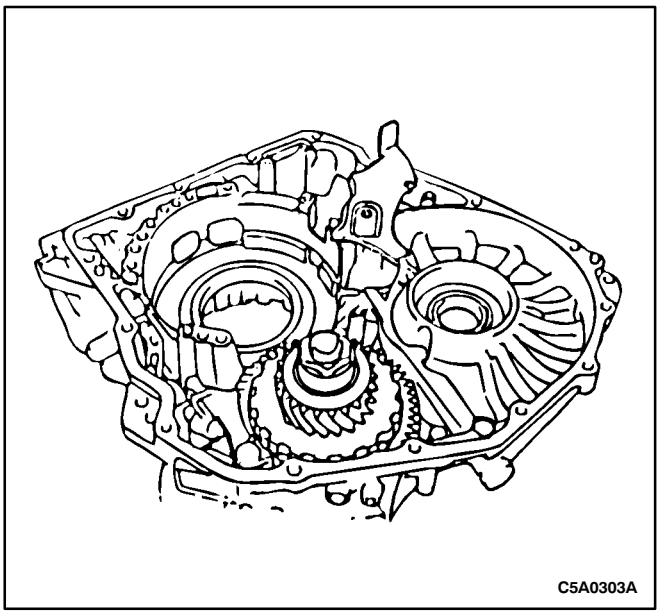
45. Remove the differential case.


C5A0301A

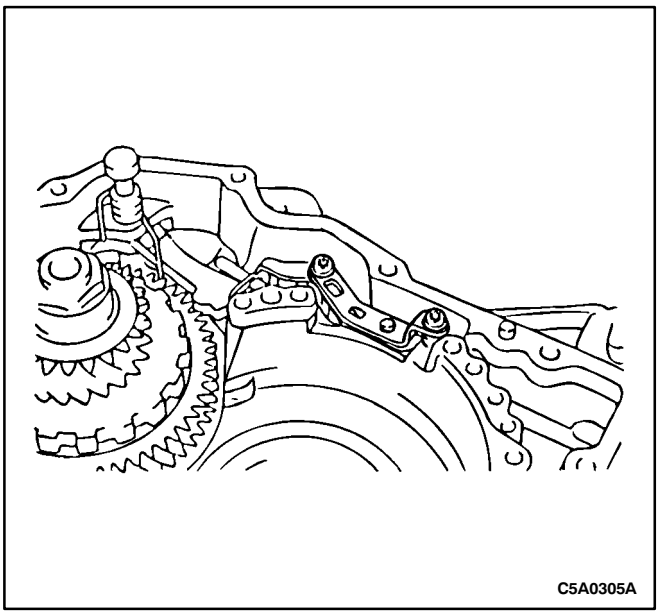
46. Remove the transaxle oil filter.


C5A0302A

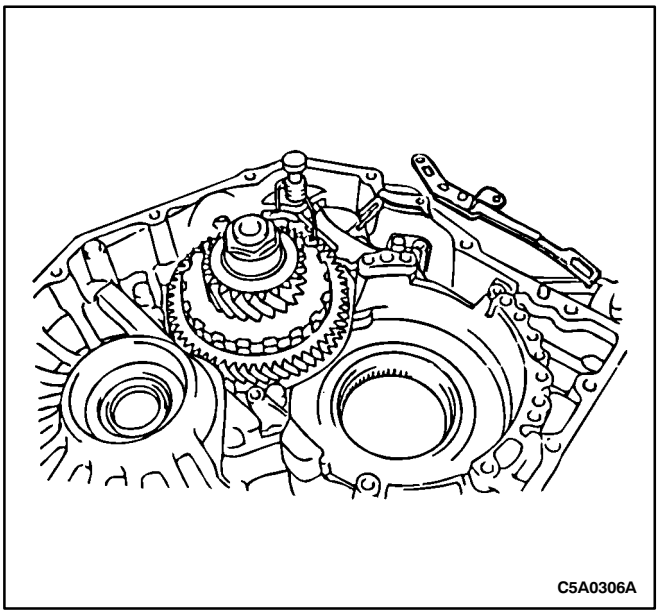
47. Remove the transaxle case plate.


C5A0303A

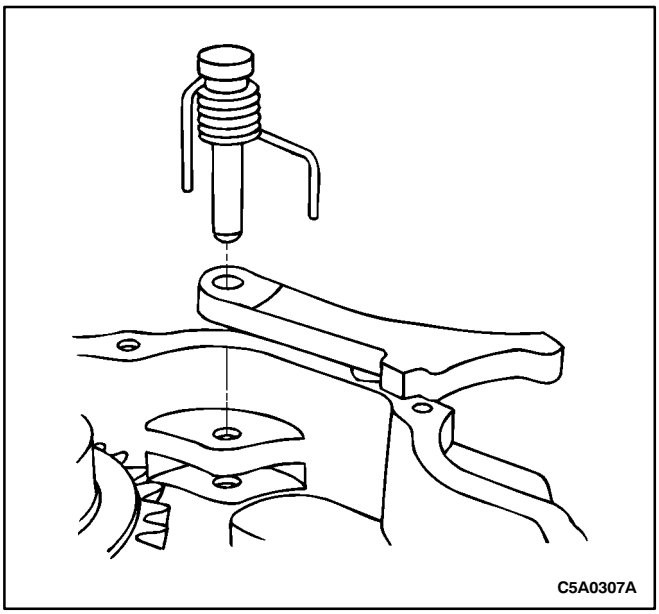
48. Remove the two bolts and the oil reserver plate.


C5A0305A

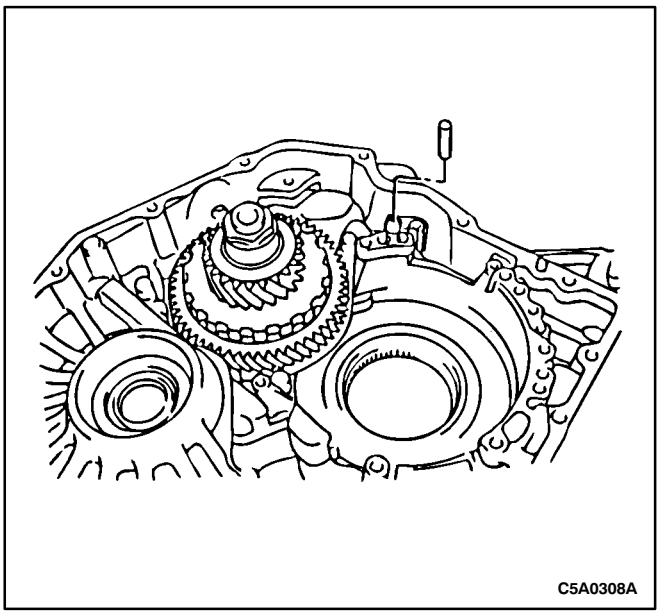
49. Remove the two cam plate bolts.


C5A0306A

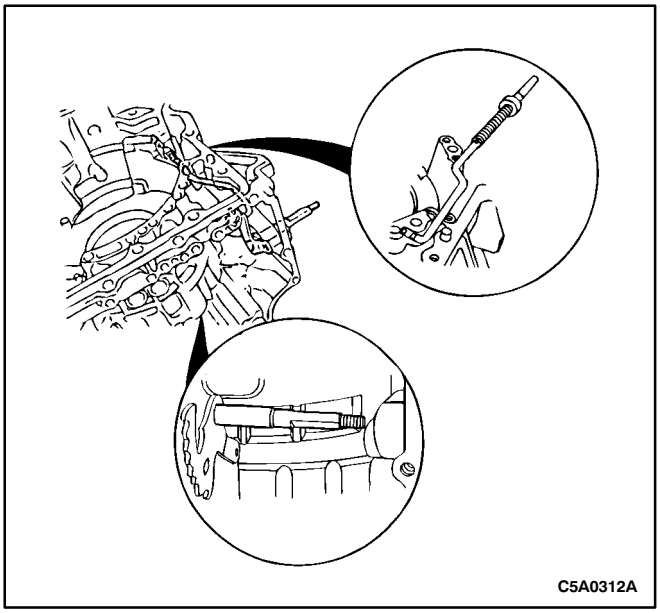
50. Remove the cam plate.


C5A0307A

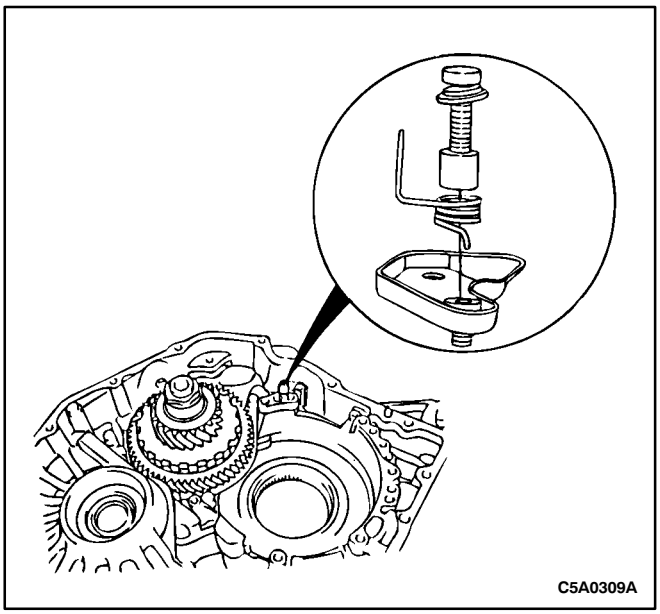
51. Remove the parking lock pawl shaft, torsion spring and the parking lock pawl.


C5A0308A

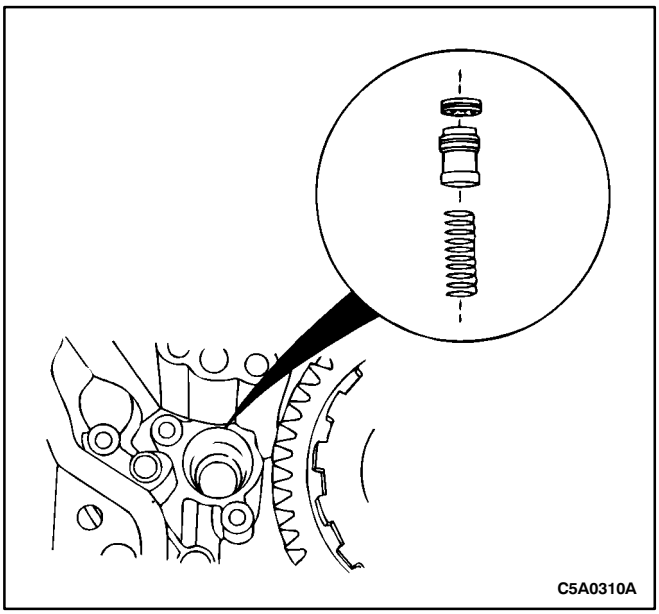
52. Remove the parking lock pin


C5A0312A

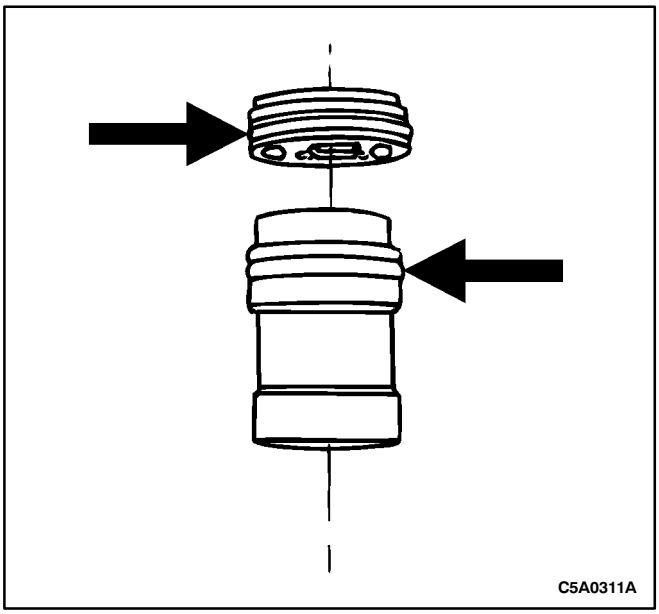
53. Disconnect the parking lock rod from the manual detent lever and remove them.


C5A0309A

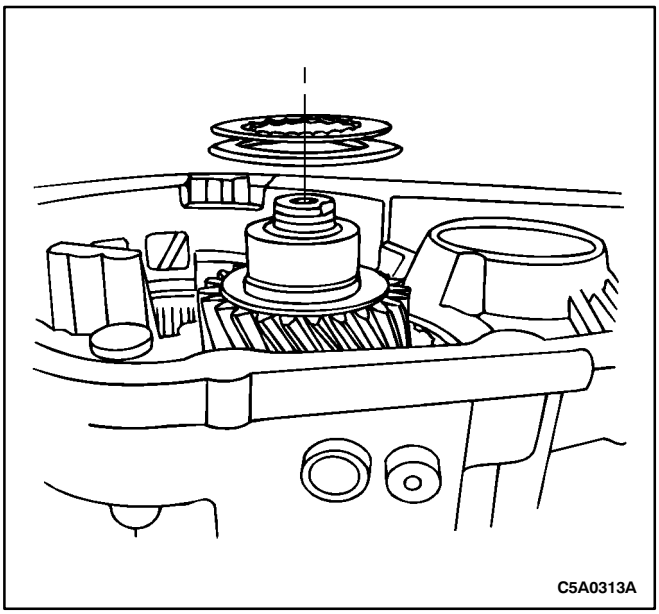
54. Remove the two bolts, the torsion spring, the spacer and the accumulator bracket.



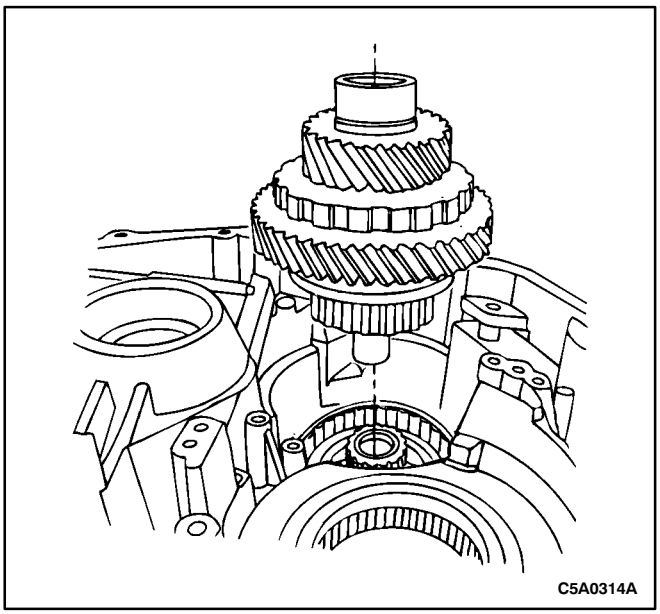
55. Remove the underdrive brake accumulator cover, piston and spring.



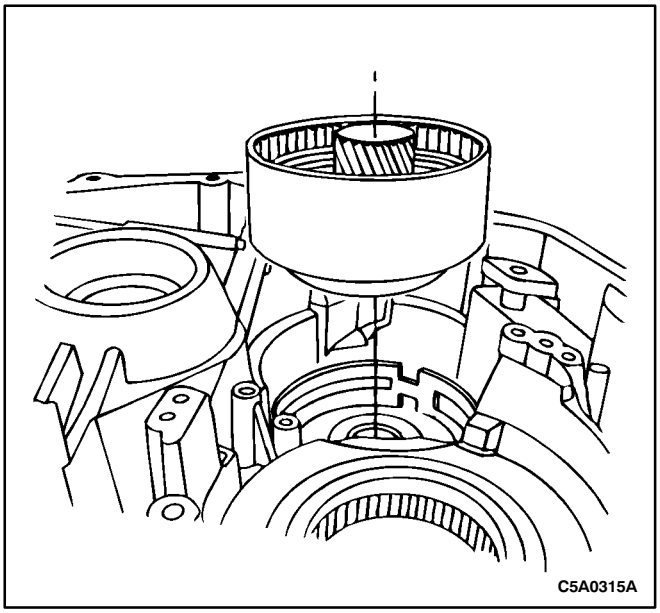
56. Remove and discard the O-rings from the accumulator cover and piston.



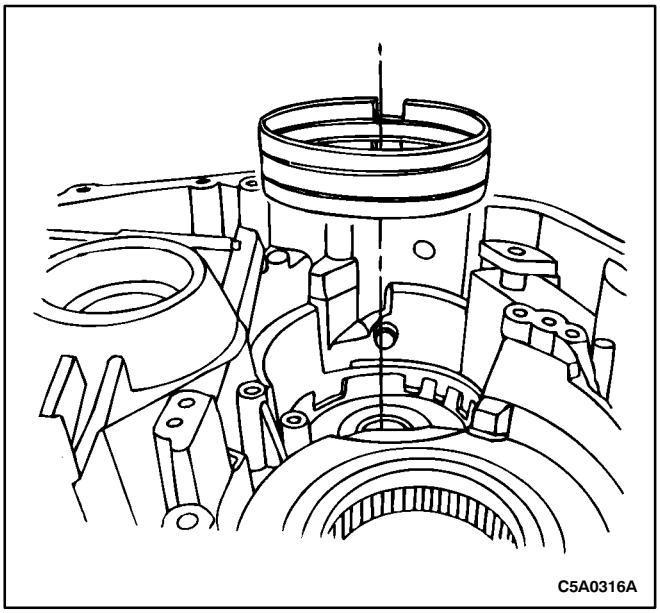
57. Remove the underdrive planetary gear thrust washer and bearing.



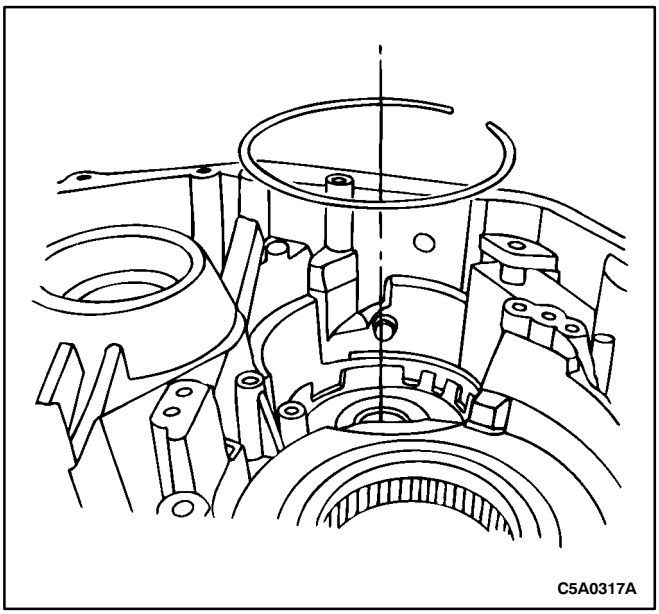
58. Remove the underdrive planetary gear.



59. Remove the underdrive clutch.

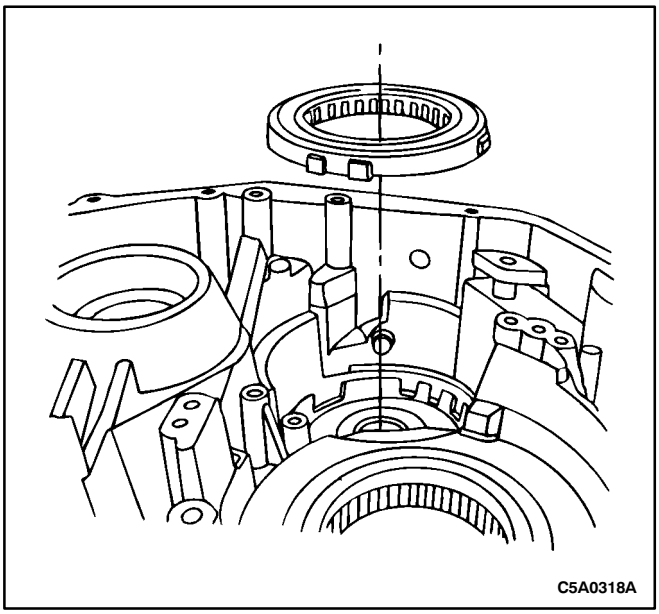


60. Remove the underdrive brake band.

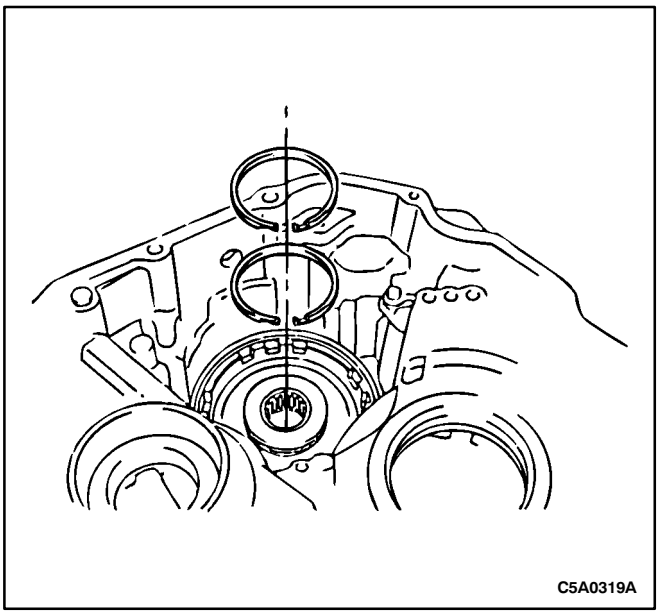

C5A0317A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

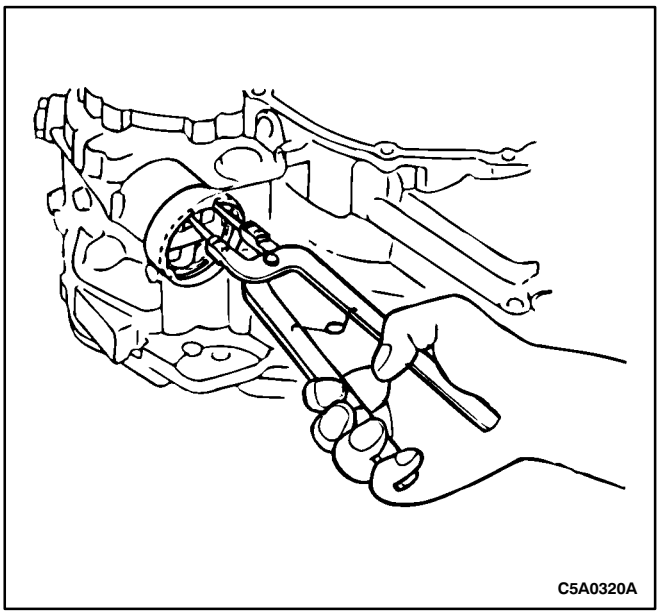
61. Remove the one-way clutch snap ring.


C5A0318A

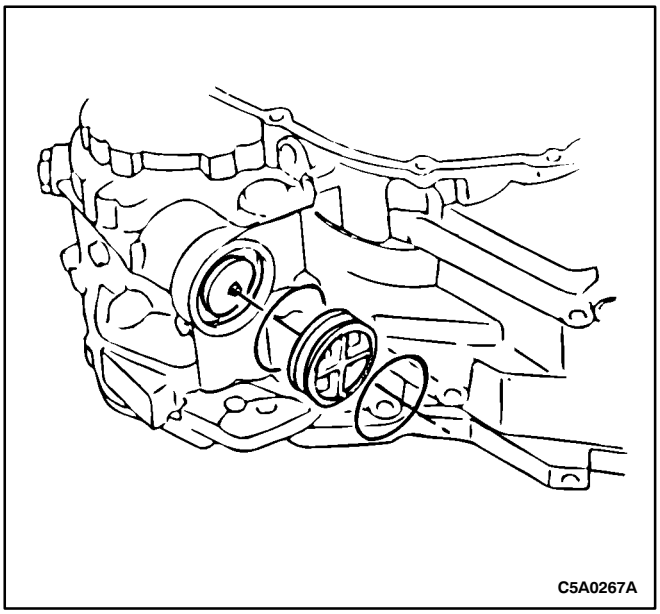
62. Remove the one-way clutch.


C5A0319A

63. Remove the two seal rings.
    - Push one end of the seal ring into the groove and unhook both ends. Spread the rings apart and remove.

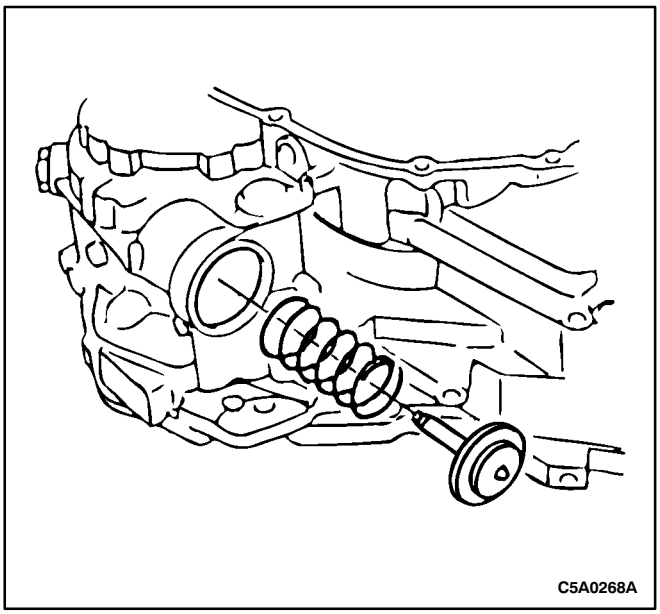

C5A0320A

64. Remove the underdrive brake piston snap ring.


C5A0267A

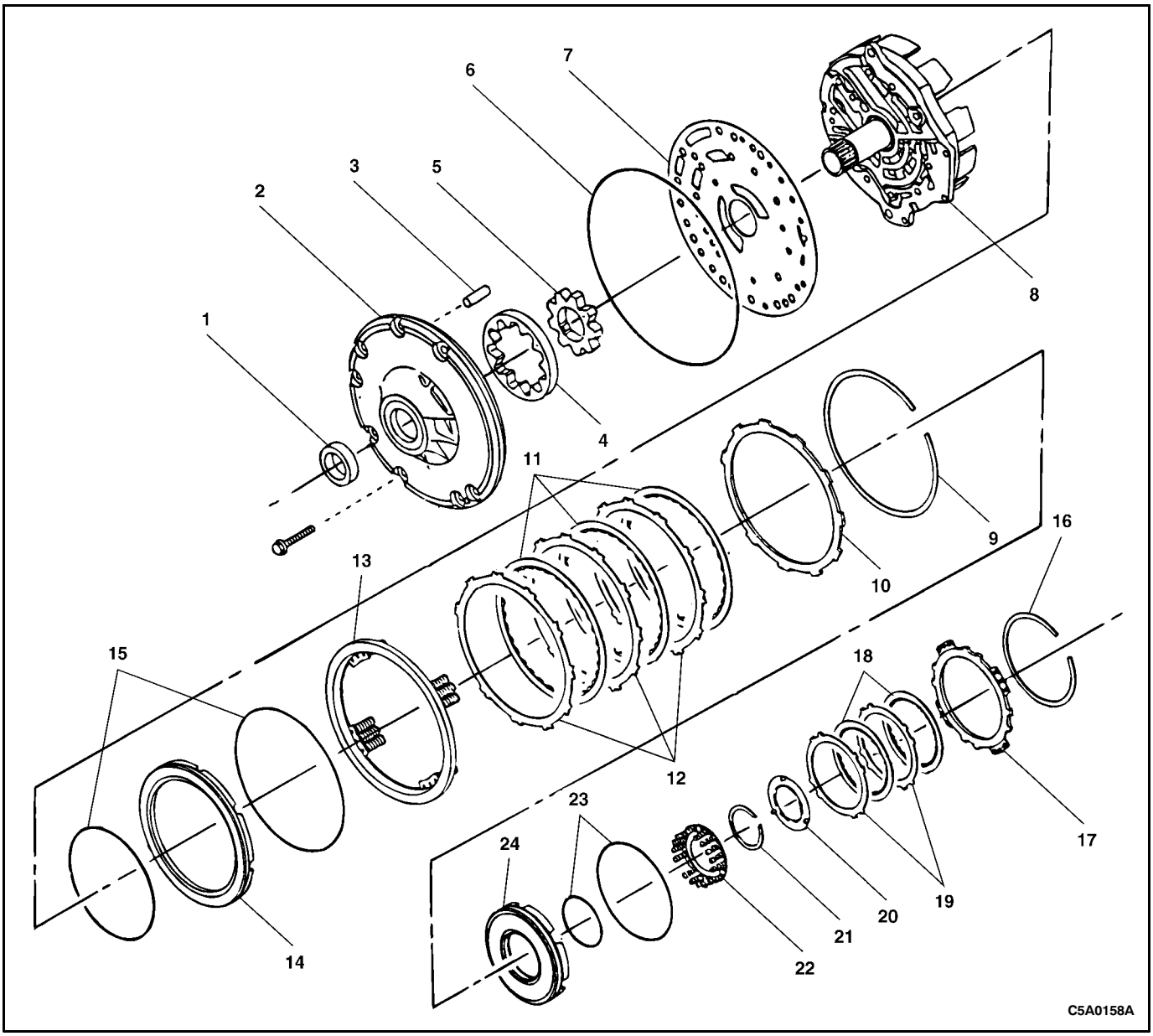
Notice: Remove and discard the cover O-rings.

65. Remove the underdrive brake piston cover.

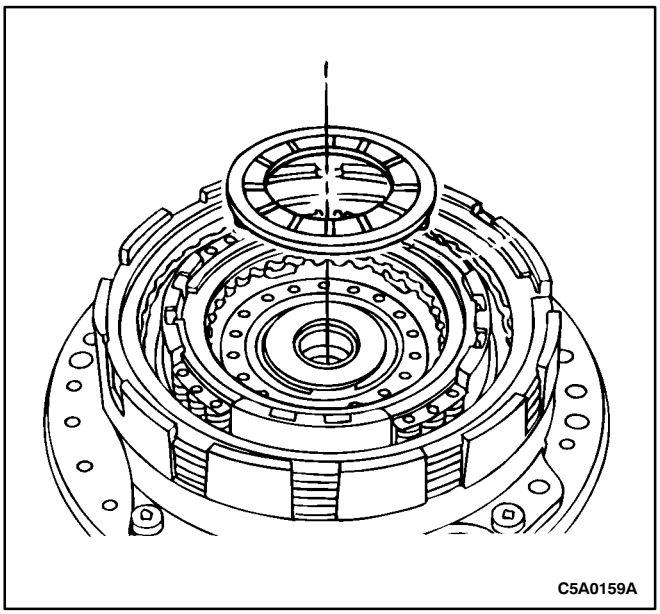

C5A0268A

66. Remove the underdrive brake piston and spring.

OIL PUMP, SECOND COAST AND SECOND BRAKE ASSEMBLY



1. Oil Pump Seal
2. Oil Pump Body
3. Straight Pin
4. Pump Driven Gear
5. Pump Drive Gear
6. O-Ring
7. Oil Pump Plate
8. Stator Support
9. Snap Ring
10. Second Brake Pressure Plate
11. Second Brake Friction Plate
12. Second Brake Steel Plate
13. Second Brake Piston Return Spring
14. Second Brake Piston
15. O-Ring
16. Snap Ring
17. Coast Clutch Pressure Plate
18. Coast Clutch Friction Plate
19. Coast Clutch Steel Plate
20. Thrust Washer
21. Shaft Snap Ring
22. Second Coast Piston Return Spring
23. O-Ring
24. Second Coast Piston


C5A0159A

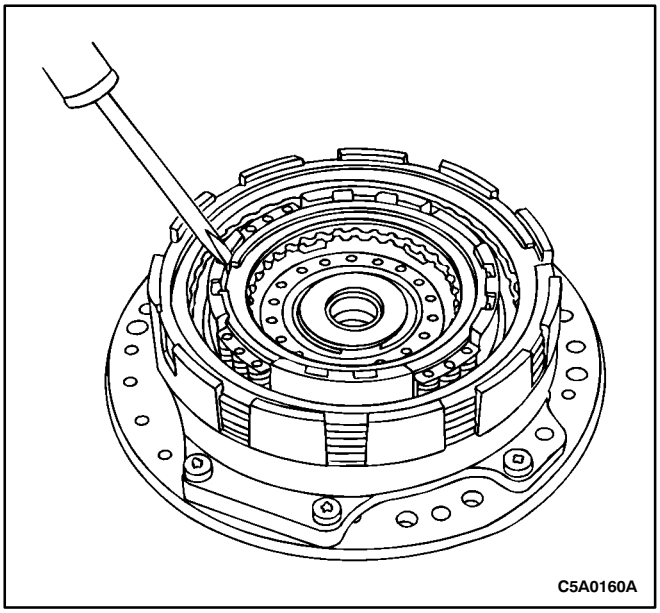
Tools Required

KM-698 Spring Compressor

KM-674 Oil Seal Installer

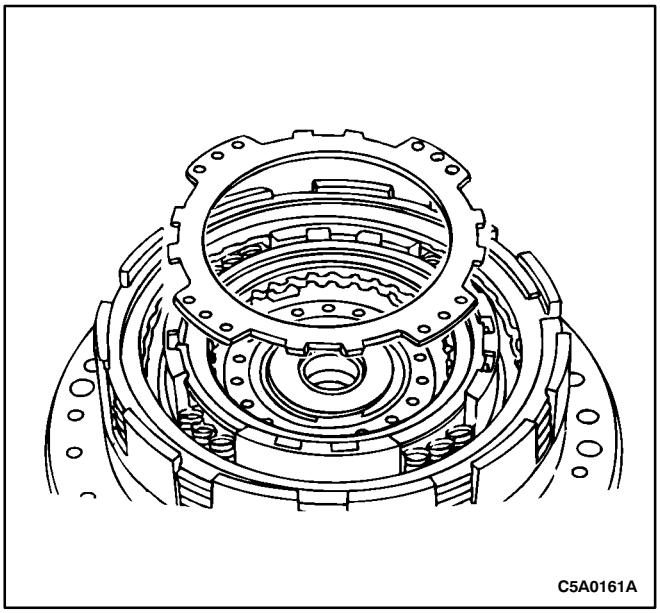
Disassembly Procedure

1. Remove the thrust washer.

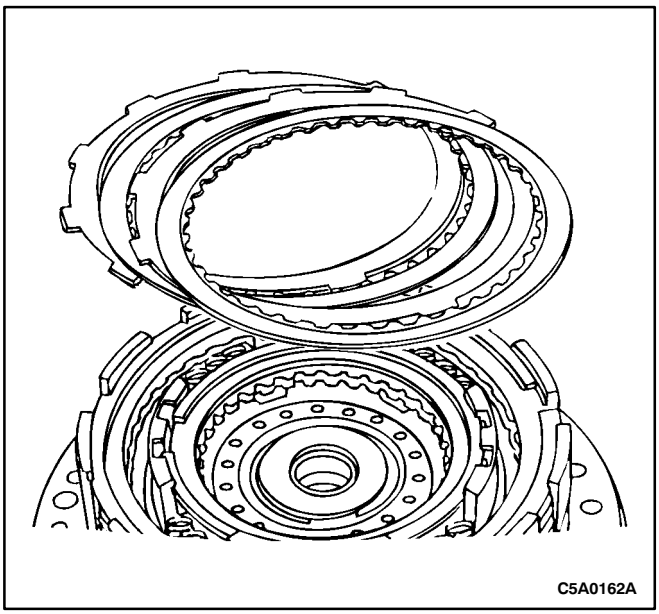

C5A0160A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

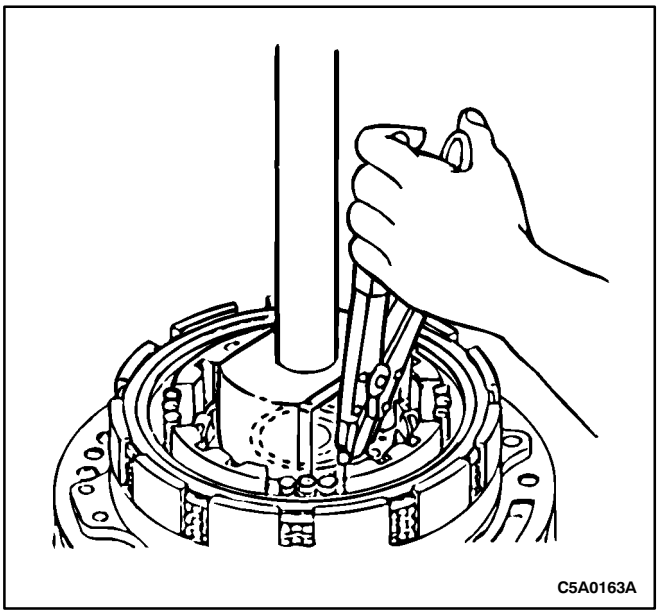
2. Carefully remove the snap ring.


C5A0161A

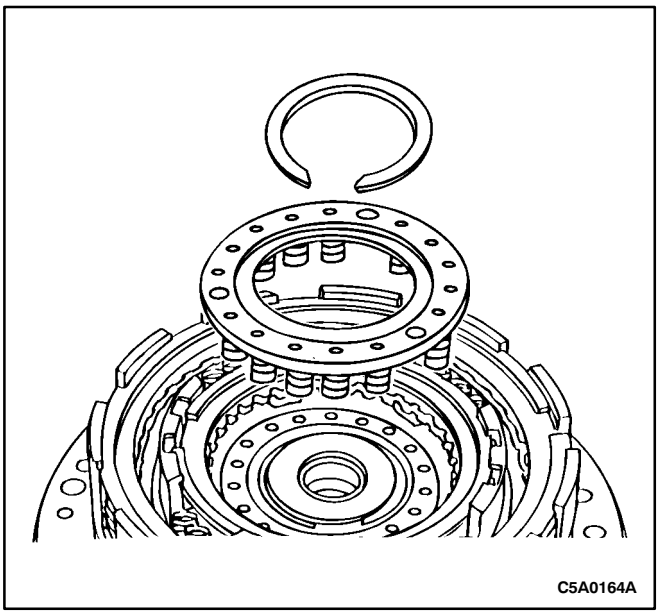
3. Remove the coast clutch pressure plate.


C5A0162A

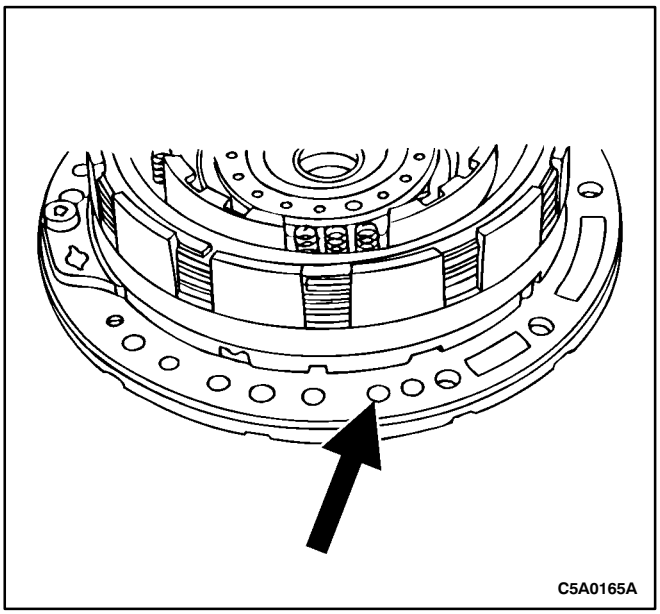
4. Remove the coast clutch disc pack.


C5A0163A

5. Position spring compressor KM-698 on the clutch piston return spring. Using a press, compress the spring, then remove the snap ring from the groove.


C5A0164A

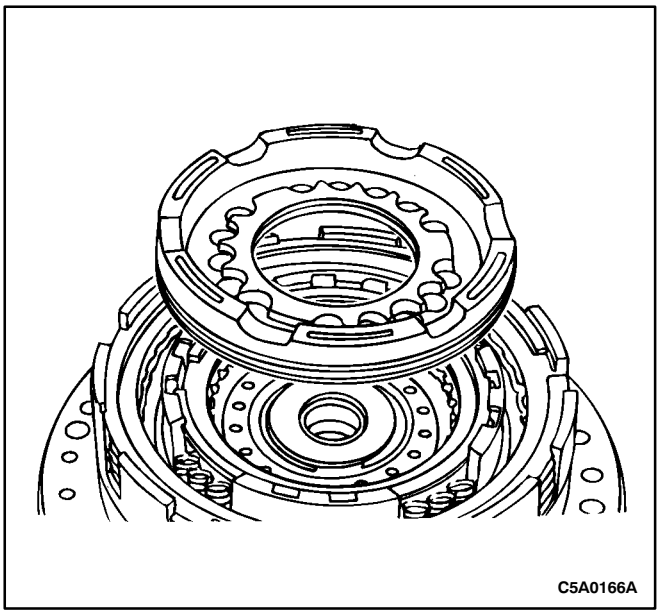
6. Remove the snap ring and the clutch piston return spring.


C5A0165A

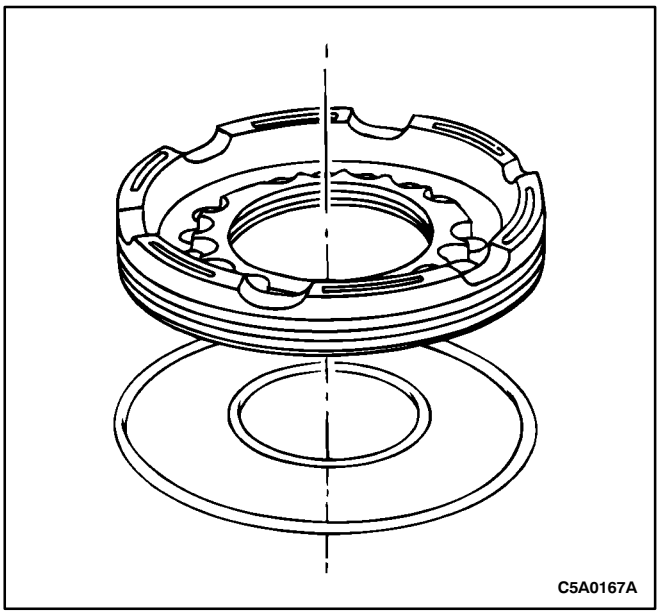
WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needlenose pliers to remove.

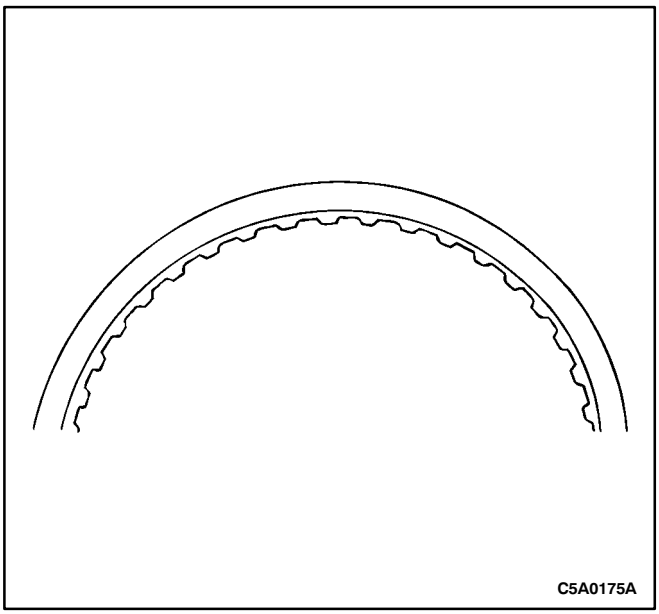
7. Apply 396 kPa (57 psi) of compressed air into the oil passage shown to remove the second coast piston.


C5A0166A

8. Remove the second coast piston.


C5A0167A

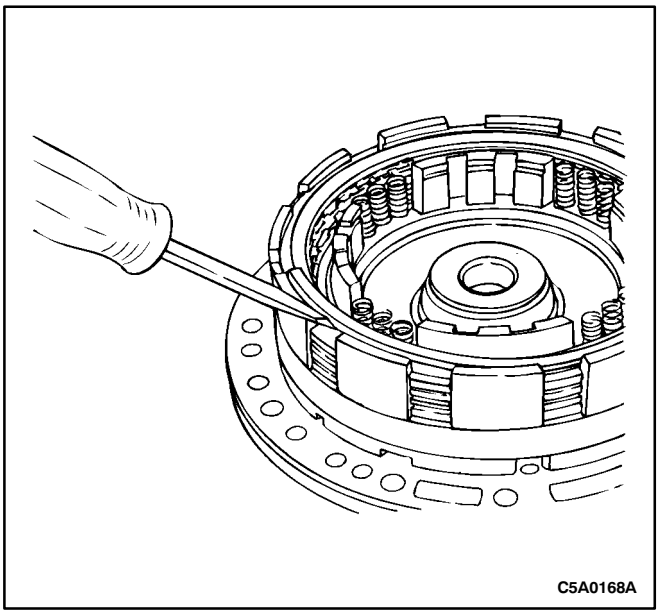
9. Remove and discard the second coast piston O-rings.


C5A0175A

Notice: Check the steel and friction plates for wear or damage. Replace if necessary.

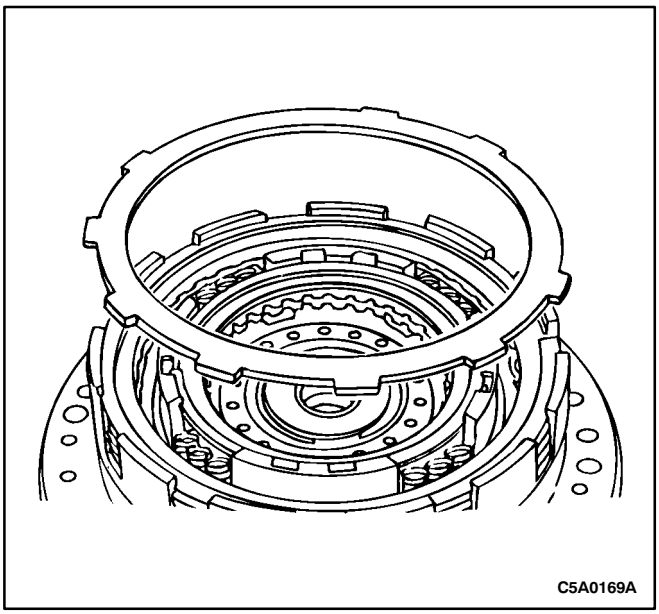
Notice: New clutch plates should be soaked in TOTAL FLUID HX for two hours before being assembled.

10. Inspect the coast clutch steel and friction plates.

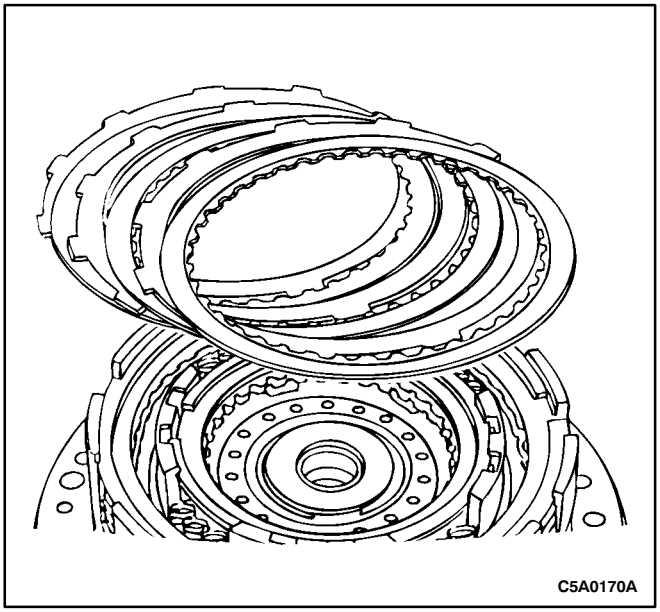

C5A0168A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

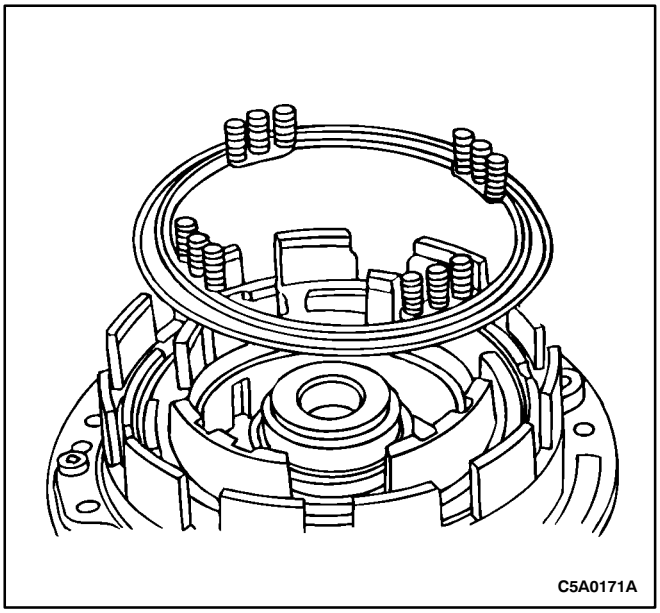
11. Carefully remove the snap ring.


C5A0169A

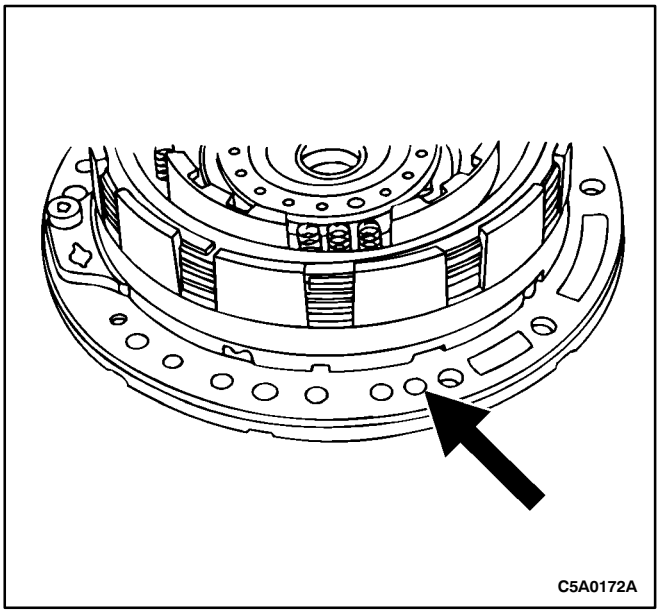
12. Remove the second brake upper flange.


C5A0170A

13. Remove the second brake clutch pack.


C5A0171A

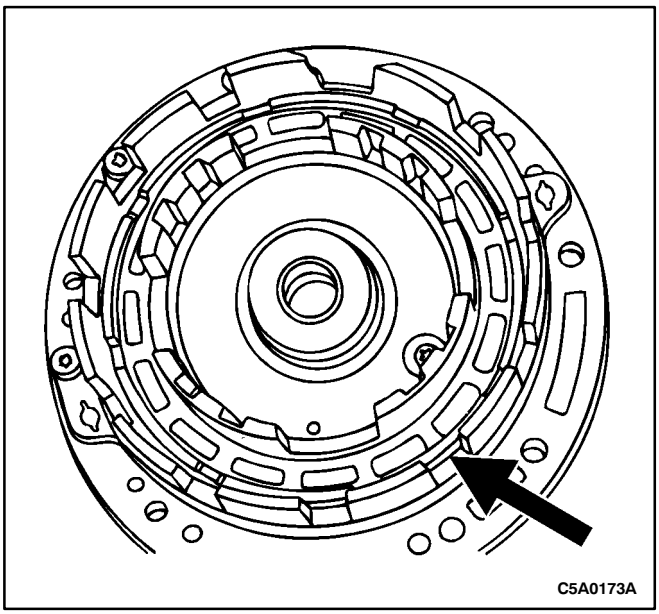
14. Remove second brake piston return spring.


C5A0172A

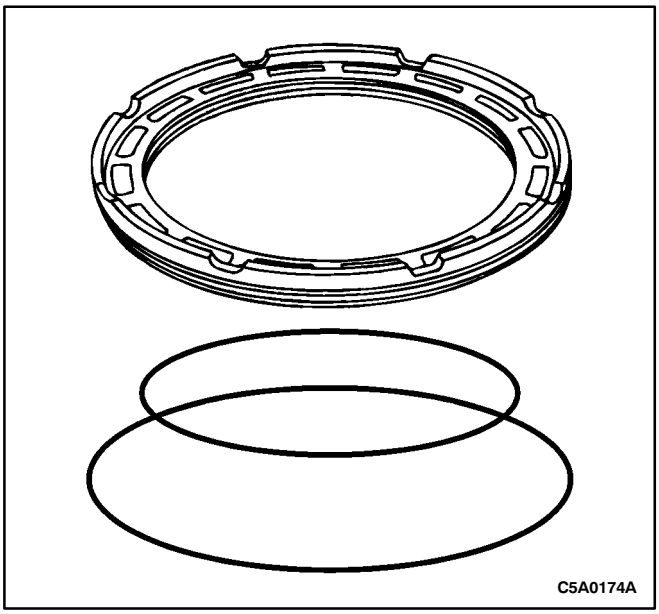
WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needle-nose pliers to remove.

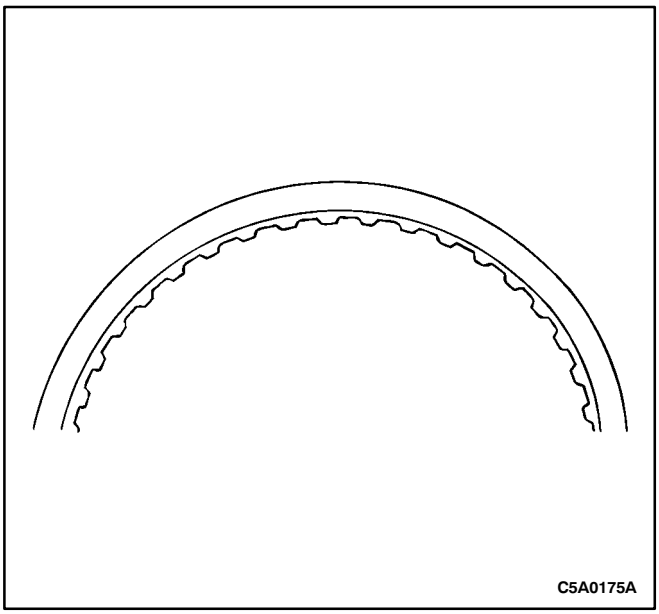
15. Apply 396 kPa (57 psi) of compressed air into the oil passage shown to remove the second brake piston.


C5A0173A

16. Remove the second brake piston.


C5A0174A

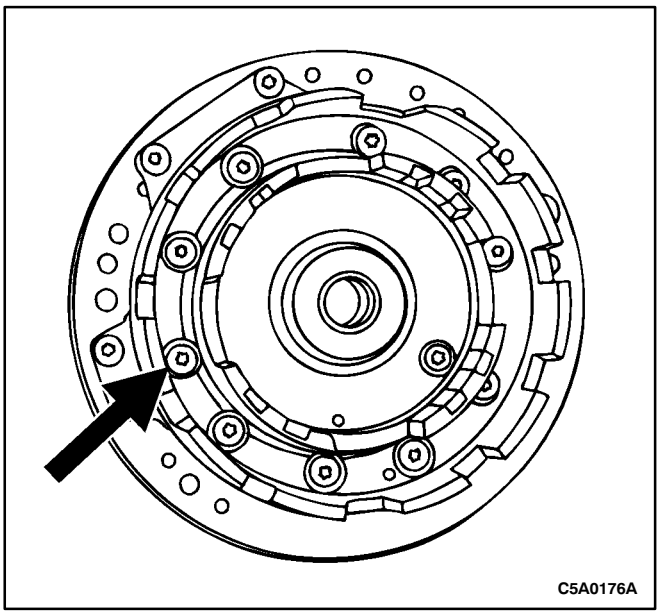
17. Remove and discard the second brake piston O-rings.


C5A0175A

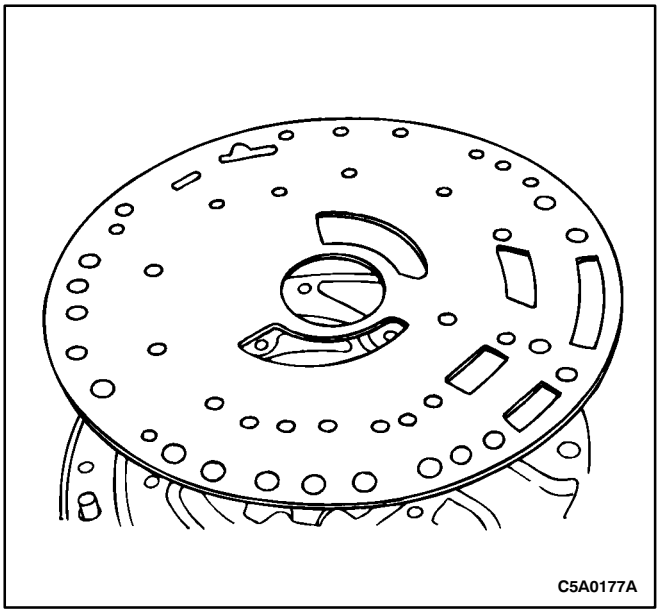
Notice: Check the steel and friction plates for wear or damage. Replace as necessary.

Notice: New clutch plates should be soaked in TOTAL FLUID HX for two hours before being assembled.

18. Inspect the second brake flange, steel and friction plates.

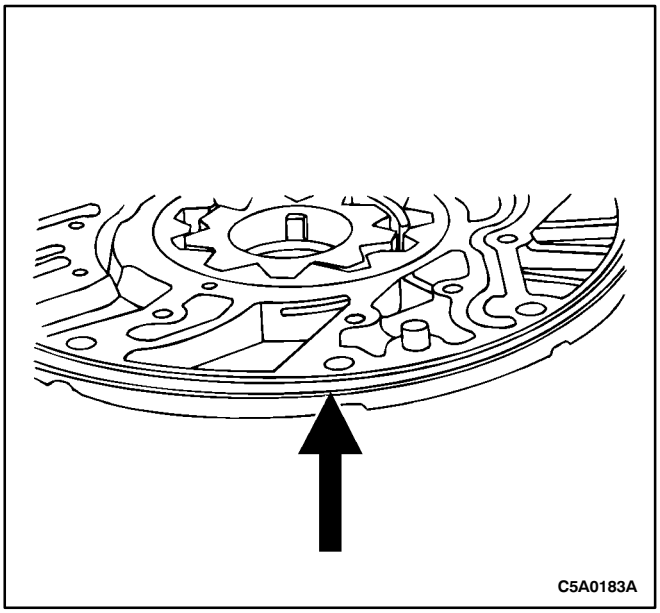


19. Remove the stator support to oil pump body bolts.

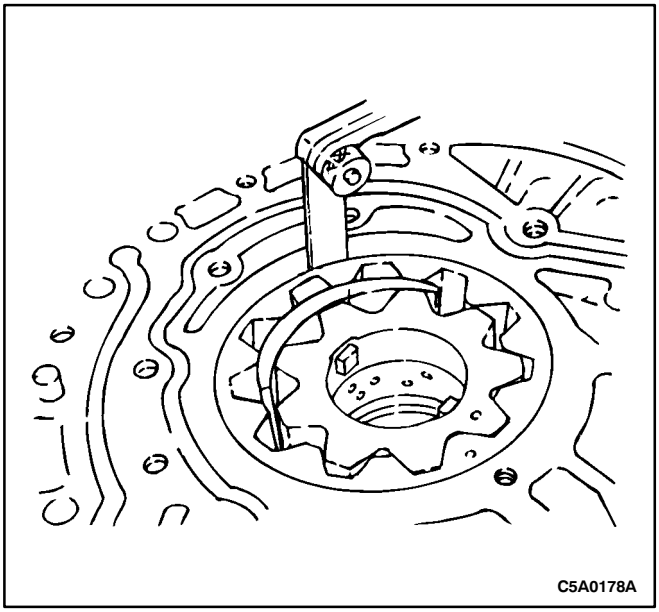


Notice: Replace the oil pump plate if the gear face contact surface is scratched or worn.

20. Remove the oil pump plate.

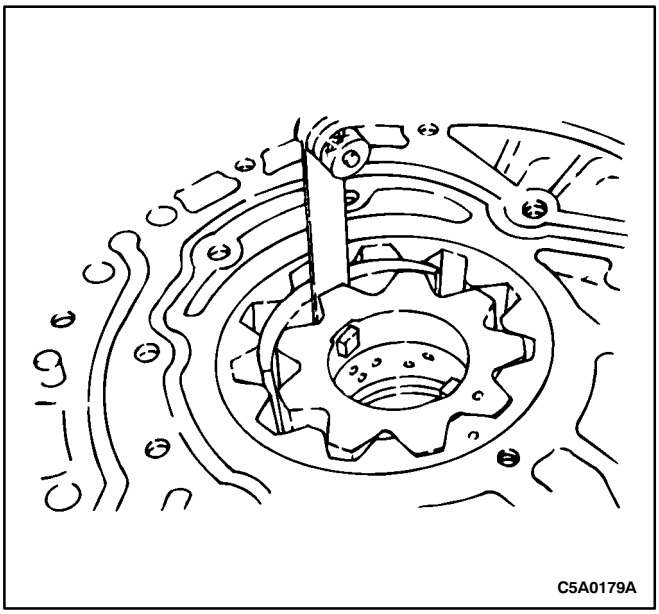


21. Remove and discard the oil pump body O-ring.


C5A0178A

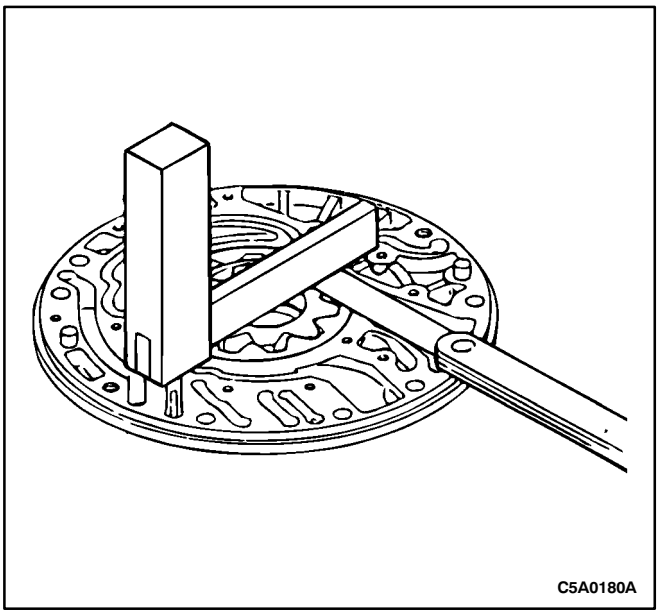
22. Measure the clearance between the pump driven gear and the oil pump body. If not as specified, replace the gears.

Standard Clearance	0.075-0.150 mm (0.003-0.006 in)
Maximum	0.20 mm (0.008 in)


C5A0179A

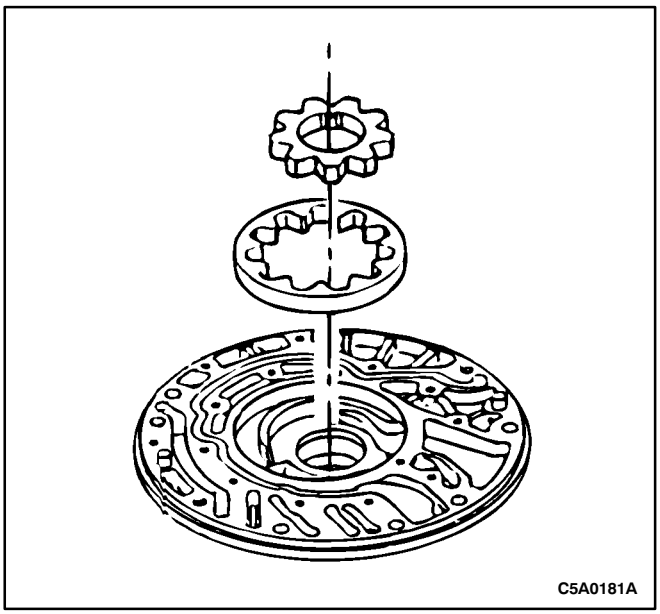
23. Measure the clearance between the pump drive gear and the oil pump body boss. If not as specified, replace the oil pump body and gears.

Standard Clearance	0.004-0.248 mm (0.0001-0.010 in)
Maximum	0.298 mm (0.012 in)


C5A0180A

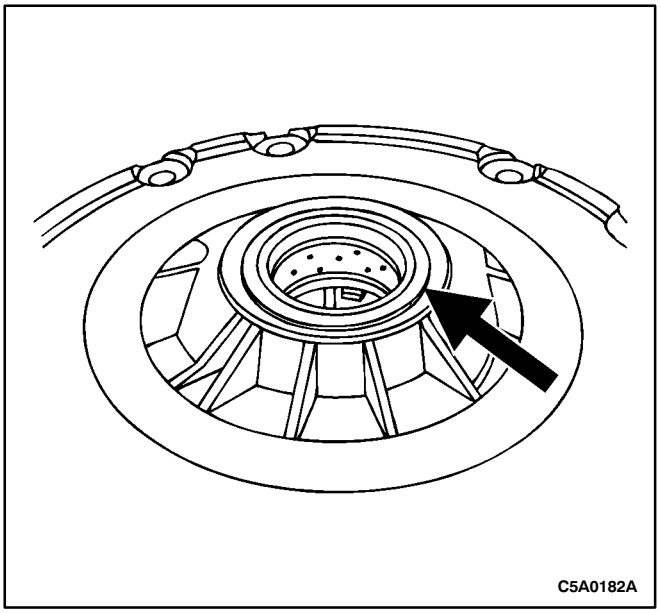
24. Measure the clearance between the pump drive gear, driven gear and the oil pump body. If not as specified, replace the oil pump body and gears.

Standard Clearance	0.030-0.050 mm (0.001-0.002 in)
Maximum	0.100 mm (0.004 in)


C5A0181A

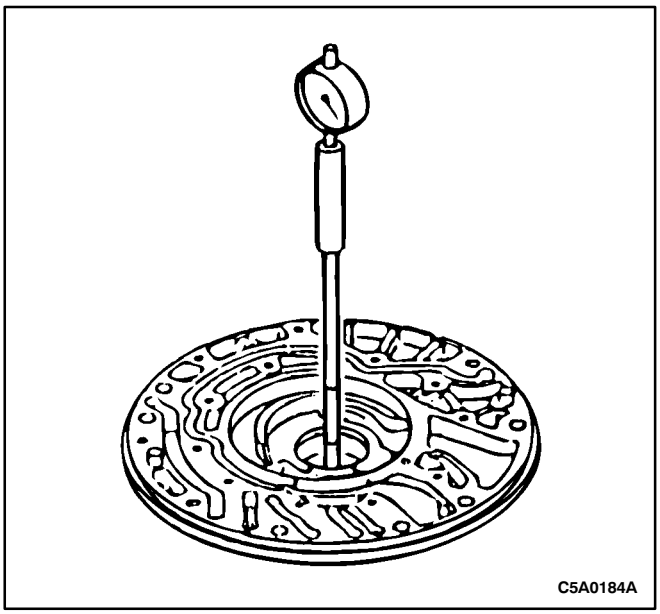
Notice: Check the pump driven gear and drive gear for wear or damage. Replace as necessary.

25. Remove the pump driven gear and pump drive gear.


C5A0182A

Notice: Be careful not to damage the oil pump body bushing.

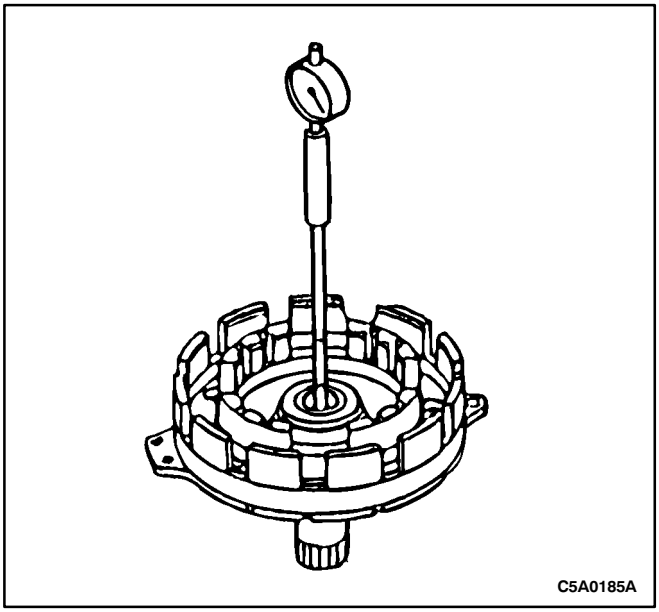
26. Remove and discard the oil pump seal.


C5A0184A

27. Inspect the oil pump body bushing.

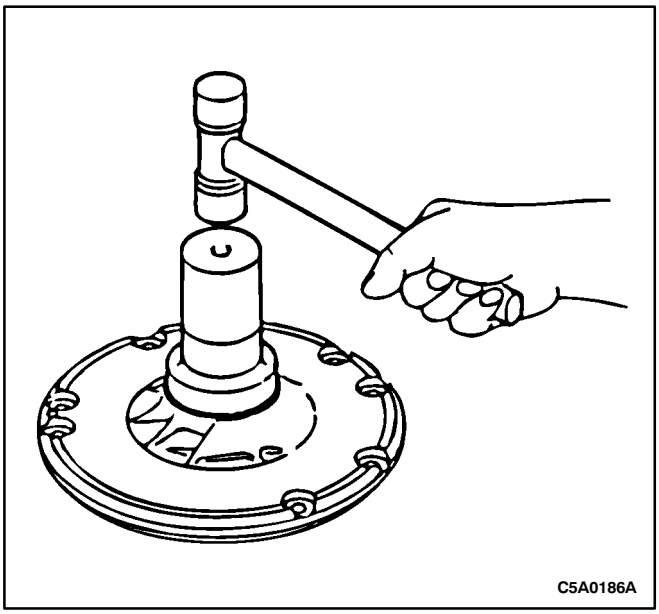
- Using a dial indicator, measure the inner diameter of the oil pump body bushing. Measure the bushing at three different places and calculate the average. If it is greater than the maximum, replace the oil pump body.

Standard	38.113-38.138 mm (1.500-1.501 in)
Maximum	38.180 mm (1.503 in)


C5A0185A

28. Inspect the stator support shaft bushing.
    - Using a dial indicator, measure the inner diameter of the stator support shaft bushing. Measure the bushing at three different places and calculate the average. If it is greater than the maximum, replace the stator support.

Standard	21.510-21.527 mm (.846-.847 in)
Maximum	21.570 mm (.849 in)


C5A0186A

Assembly Procedure

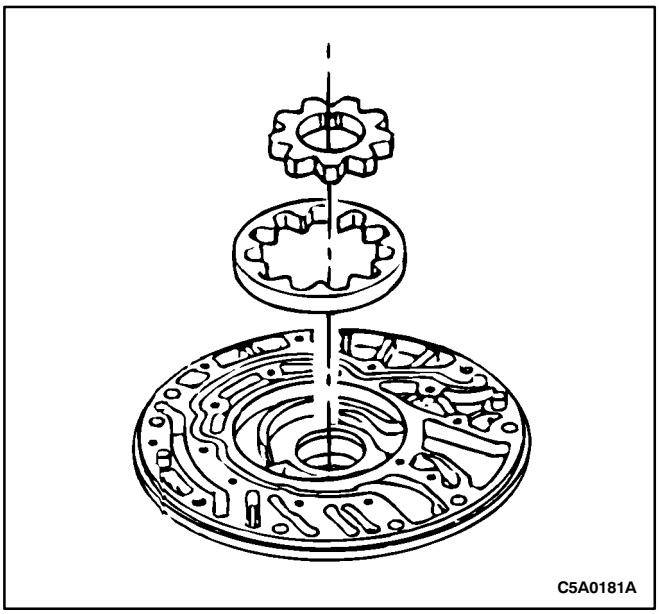
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.

Notice: Apply automatic transmission fluid to the inner surface of the oil pump body.

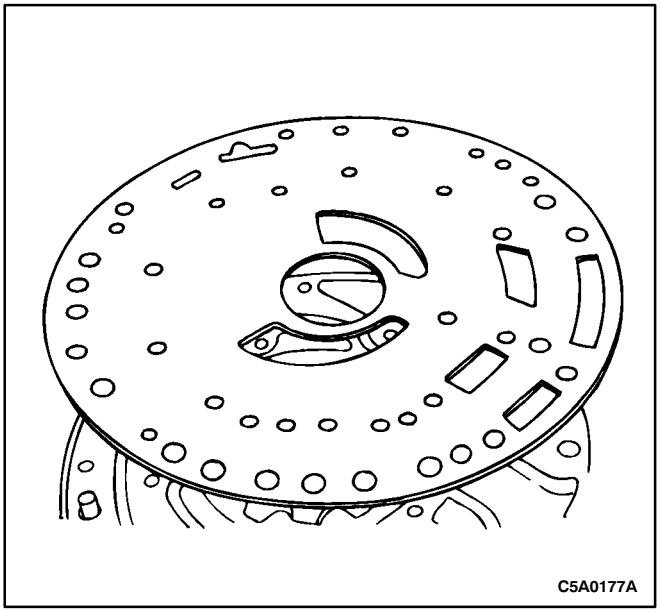
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the oil lip seal.

Notice: The seal should be flush with the outer edge of the oil pump body.

2. Install a new oil pump seal using oil seal installer KM-674.

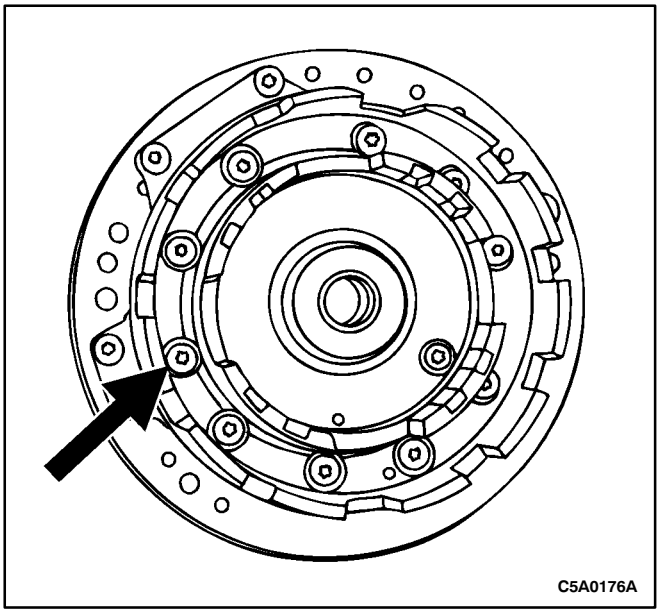

C5A0181A

3. Install the pump driven gear and pump drive gear.
    - Align the marks on the gears.
    - Apply TOTAL FLUID HX into the gear cavity


C5A0177A

Notice: Align the oil pump plate hole with the dowel pin in the oil pump body.

4. Install the oil pump plate.

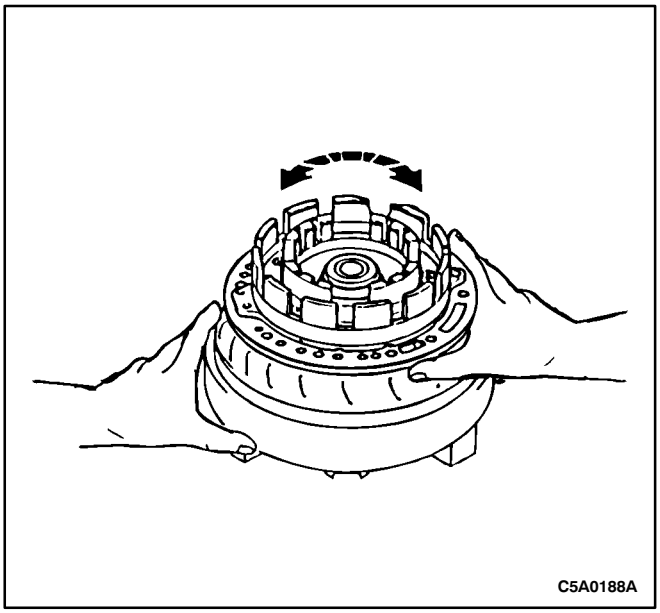

C5A0176A

Caution: Tighten the bolts evenly and gradually.

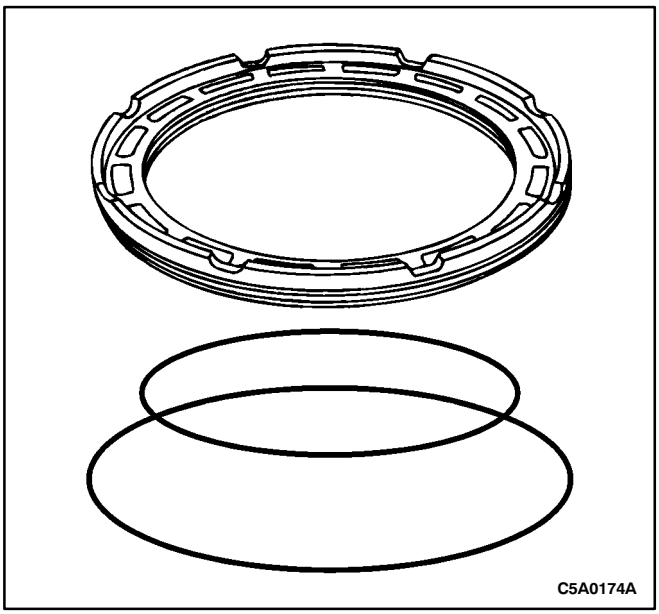
5. Install the stator support.
   - Align the stator support with each bolt hole in the oil pump body and temporarily tighten the bolts evenly and gradually.

Tighten

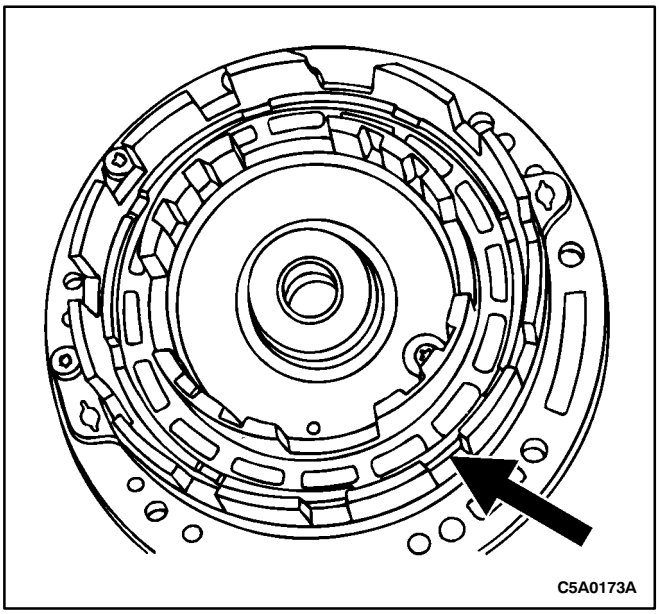
Tighten the M5 bolts to 6-7 N•m (53-62 lb-in) and the M6 bolts to 10-14 N•m (89-124 lb-in).


C5A0188A

6. Check the pump drive gear rotation.
   - Install the pump assembly into the torque converter to verify smooth operation.



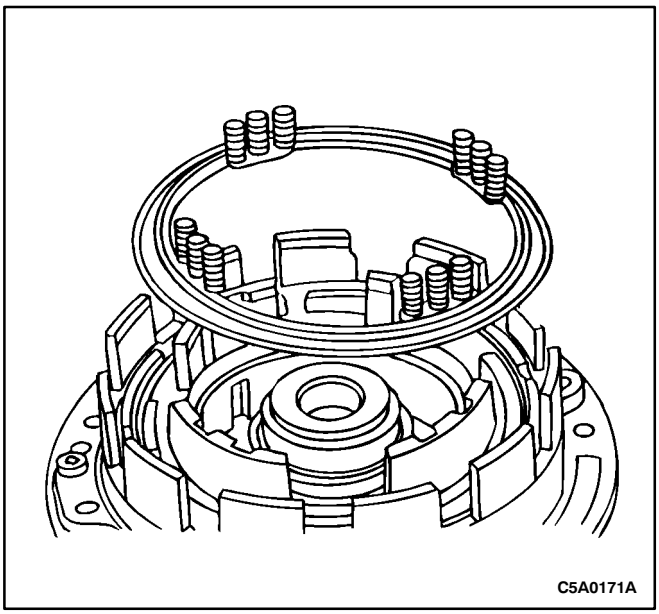
7. Install new second brake piston O-rings.



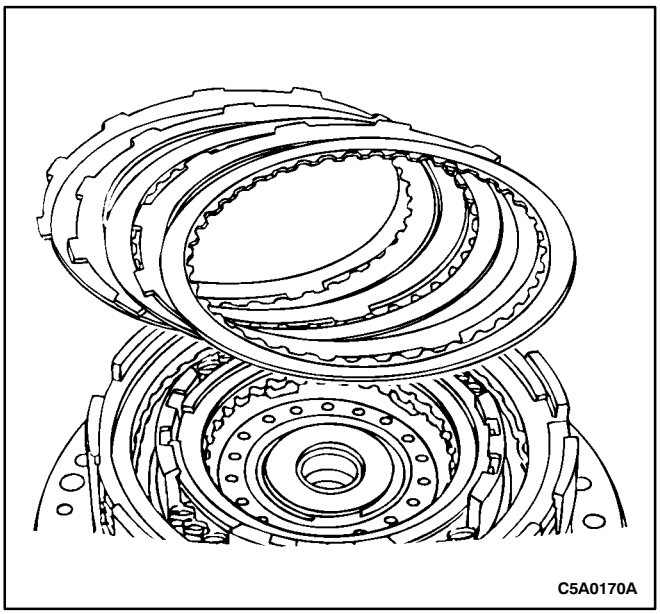
Notice: Apply TOTAL FLUID HX to the new second brake piston O-rings and the stator support seal area.

Notice: Seat the piston by pushing evenly around the circumference of the piston, being careful not to damage the outer seal.

8. Install the second brake piston.

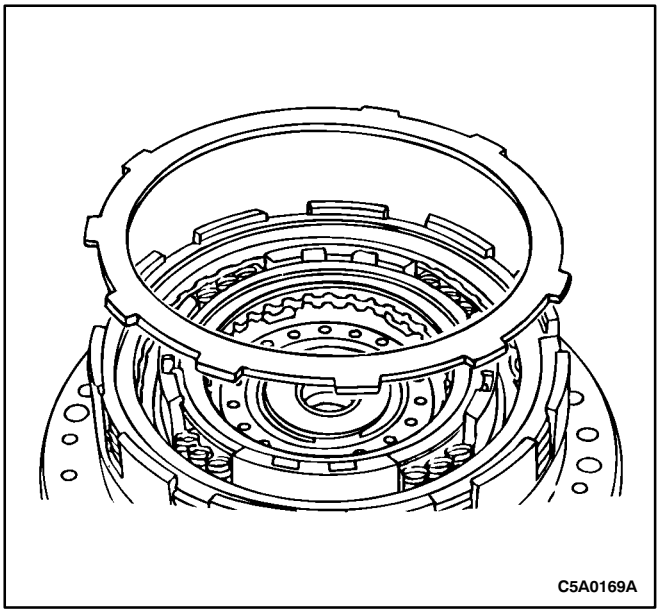


9. Install the second brake piston return spring.


C5A0170A

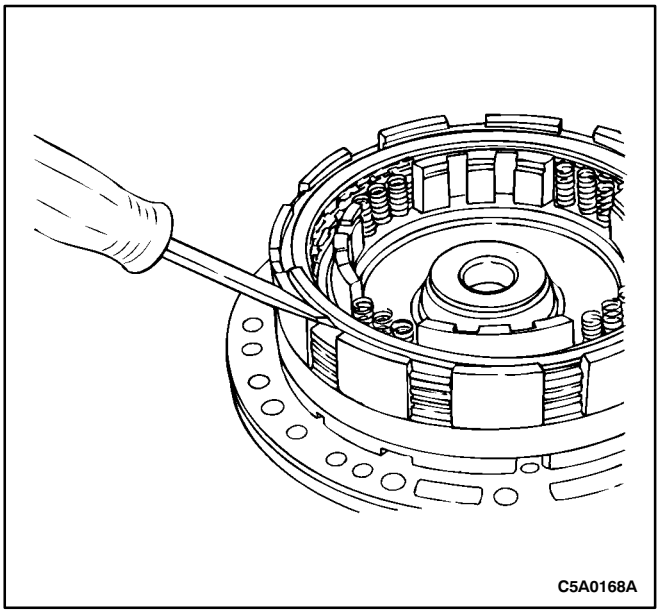
Notice: The flanges are thicker than the steels.

10. Install the second brake clutch pack.
    - The installation order is: flange-friction-steel-friction-steel-friction.


C5A0169A

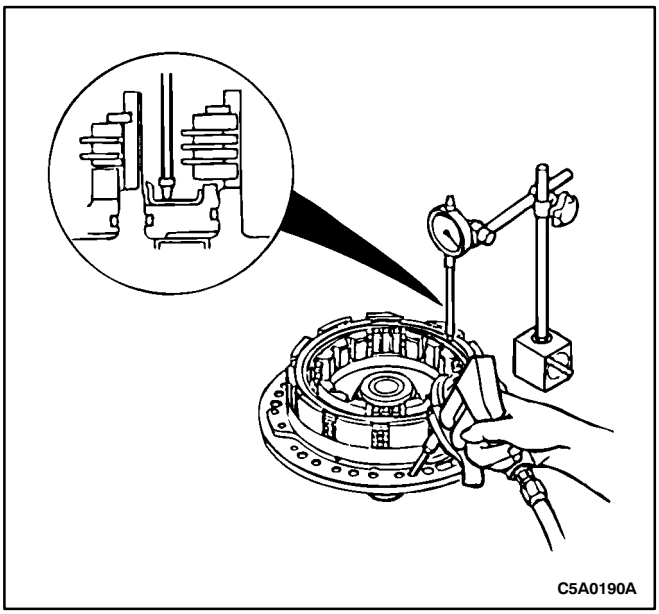
Notice: The flanges are thicker than the steels.

11. Install the second brake top flange.


C5A0168A

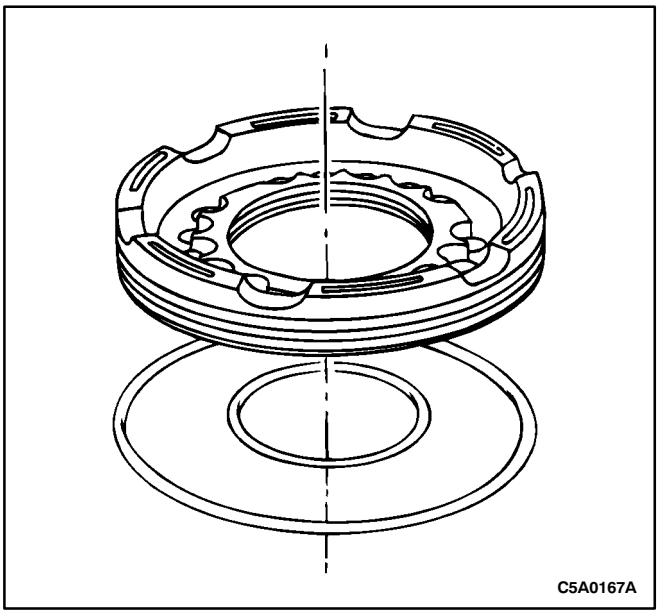
Notice: Be sure the snap ring end gap is not aligned with one of the stator support cutouts.

12. Install the snap ring.

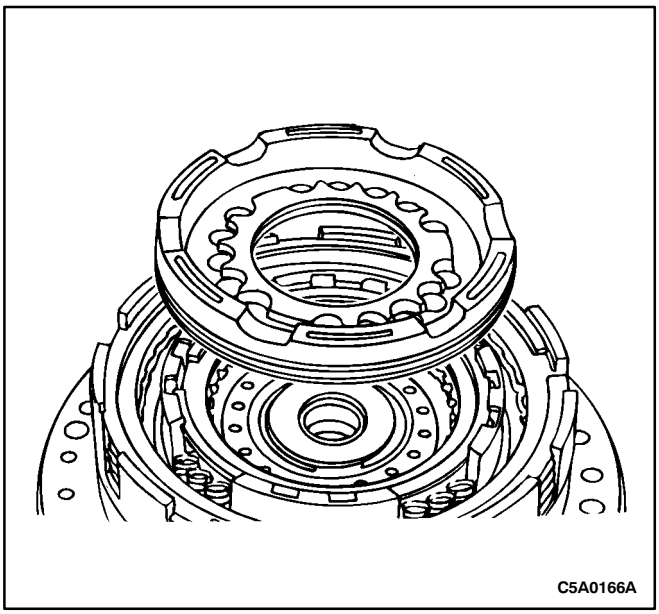

C5A0190A

WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

13. Check the second brake clutch operation.
    - Install a dial indicator.
    - Apply 396 kPa (57 psi) of compressed air into the oil passage shown and measure the second brake clutch piston stroke. The piston stroke is 1.14-1.860 mm (0.045-0.073 in). The clutch should make a solid apply sound, with no whistle or sign of leaks.


C5A0167A

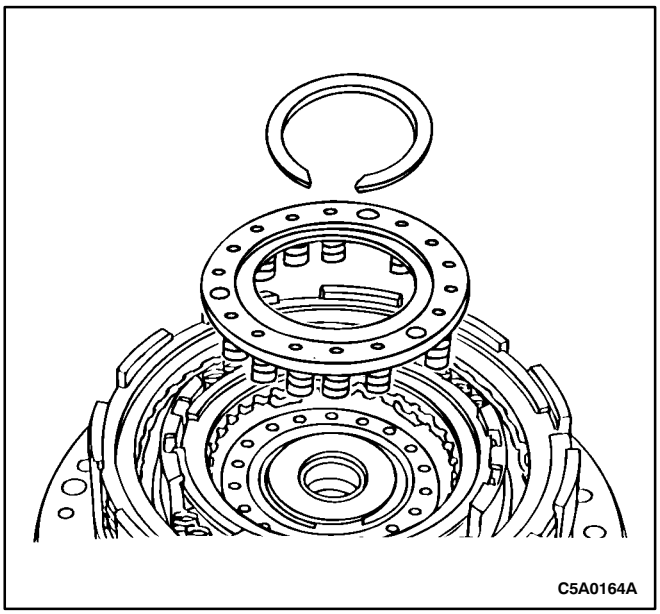
14. Install new second coast piston O-rings.


C5A0166A

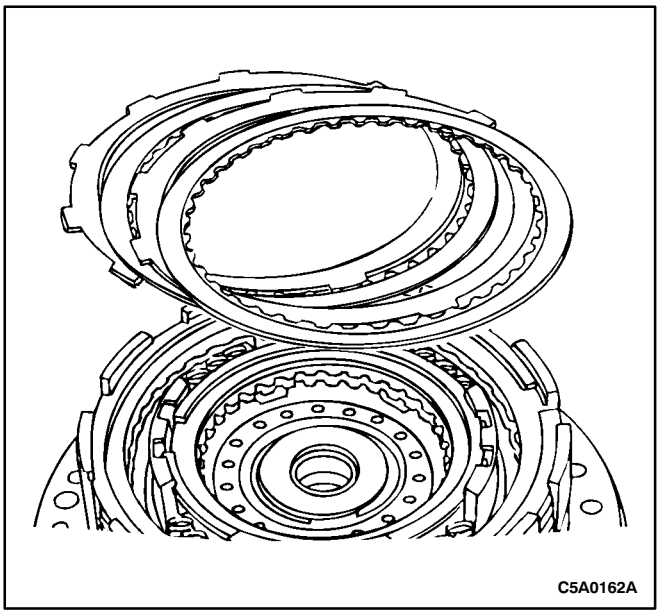
Notice: Apply TOTAL FLUID HX to the new second coast piston O-rings and the stator support seal area.

Notice: Seat the piston by pushing evenly around the circumference of the piston, being careful not to damage the outer seal.

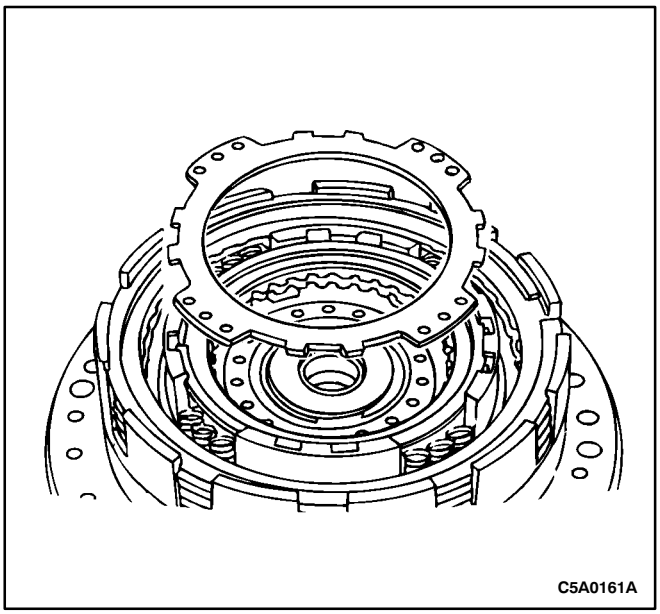
15. Install the second coast piston.


C5A0164A

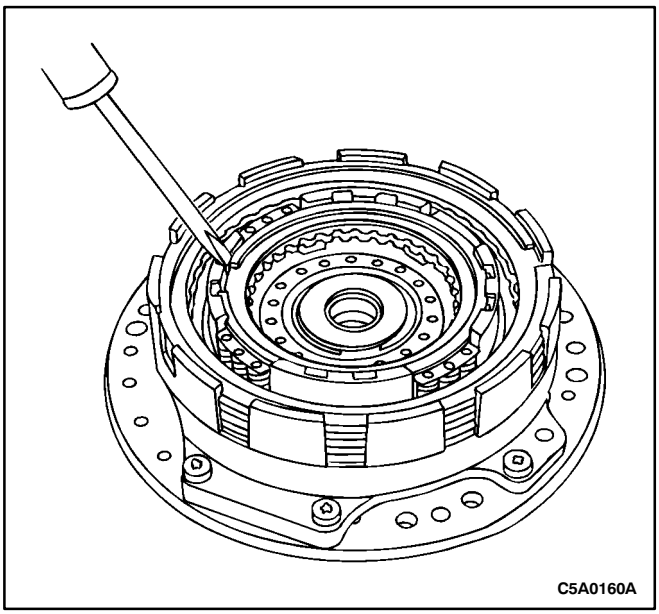
16. Install the second coast piston return spring. Position spring compressor KM-698 on the clutch piston return spring. Using a press, compress the spring, then install the snap ring in the groove.


C5A0162A

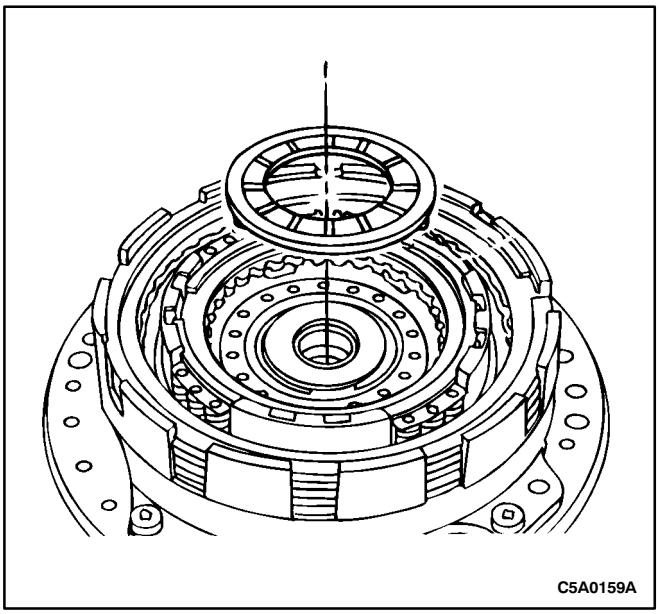
17. Install the coast clutch disc pack.
    - The installation order is: steel-friction-steel-friction.


C5A0161A

18. Install the coast clutch pressure plate.

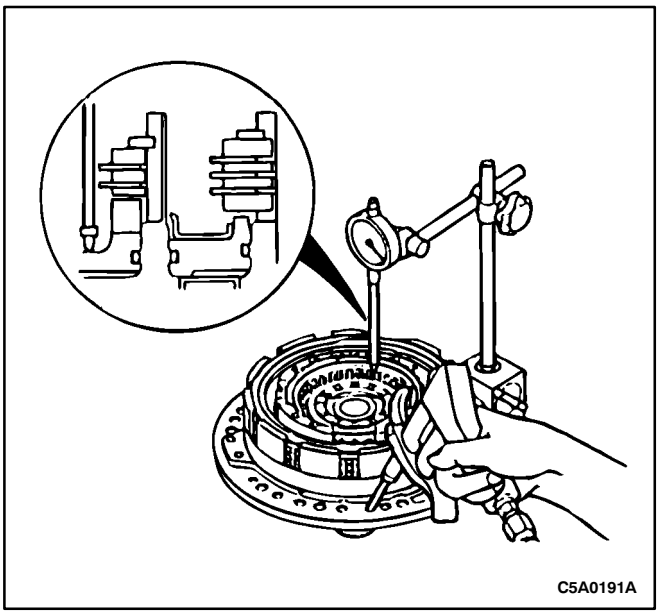

C5A0160A

19. Install the snap ring.


C5A0159A

Caution: Make sure the lugs of the thrust washer align with the second coast piston return spring.

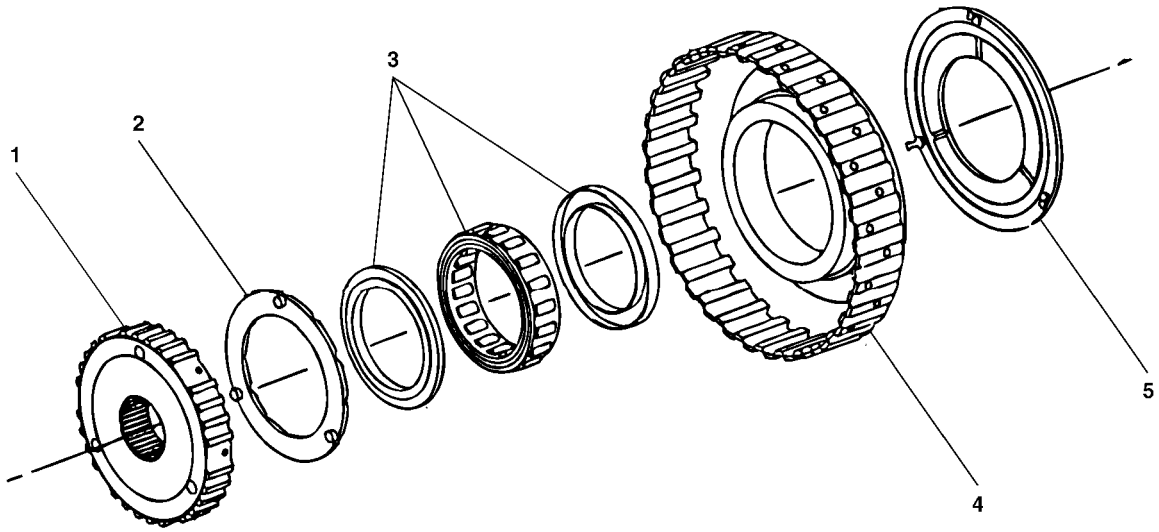
20. Install the thrust washer.


C5A0191A

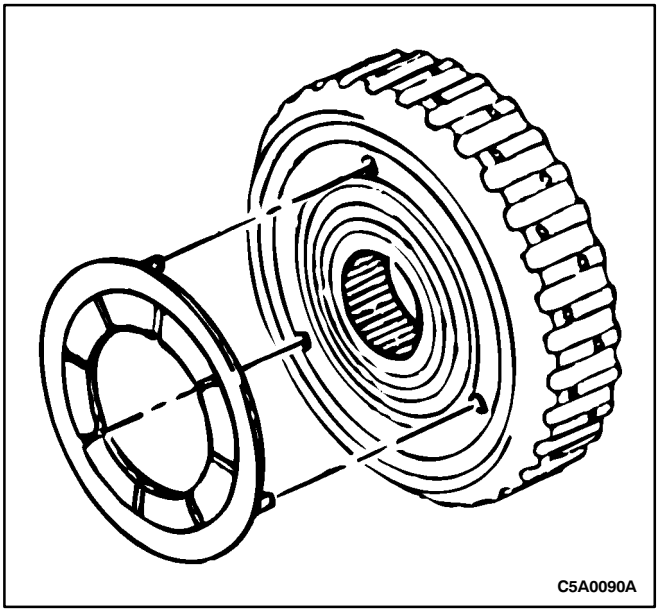
WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

21. Check the second coast clutch operation.
    - Install a dial indicator.
    - Apply 396 kPa (57 psi), of compressed air into the oil passage and measure the second coast clutch piston stroke. The piston stroke is 0.760-1.440 mm (0.029-0.056 in). The clutch should make a solid apply sound, with no whistle or sign of leaks.

SECOND COAST, SECOND BRAKE HUB AND ONE-WAY CLUTCH

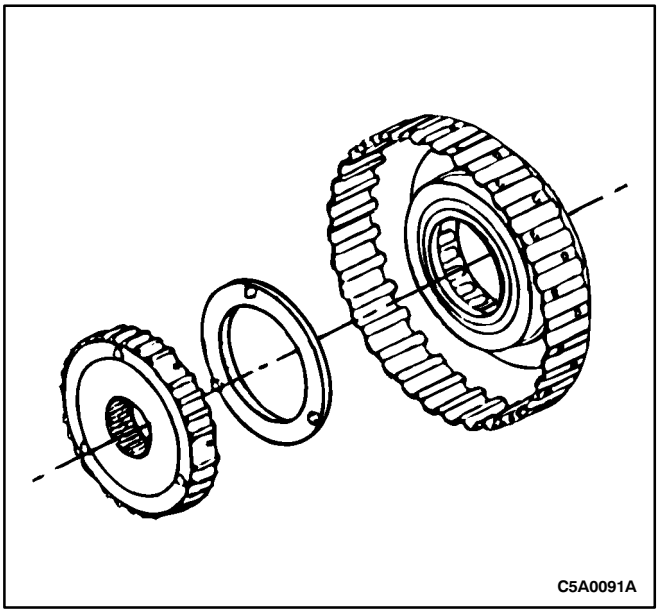


1. Second Coast Brake Hub (Inner Race)
2. Thrust Washer
3. one-way Clutch
4. Second Brake Hub (Outer Race)
5. Rear Thrust Washer

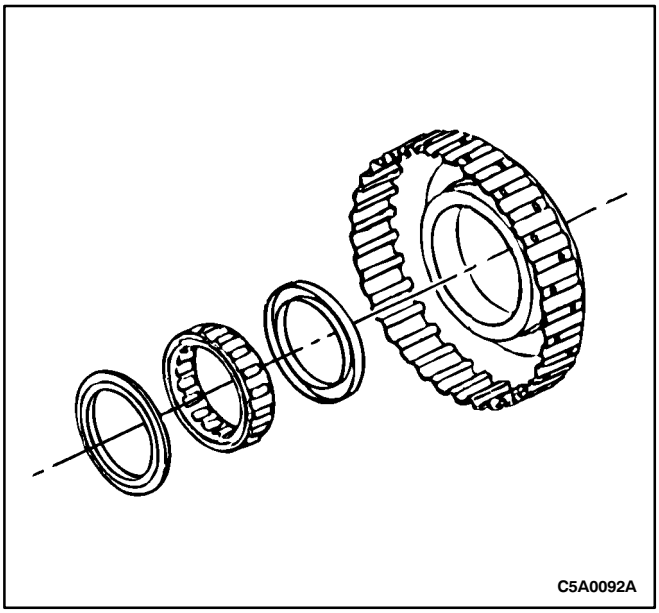

C5A0090A

Disassembly Procedure

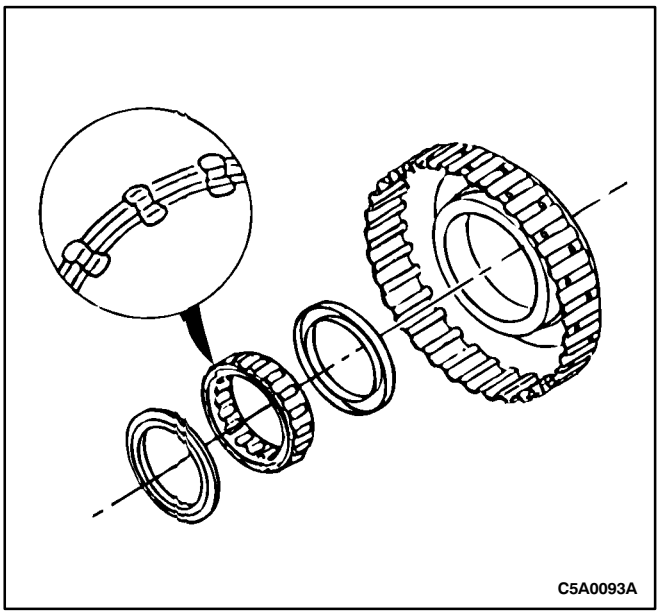
1. Remove the rear thrust washer.


C5A0091A

2. Remove the second coast brake hub from the second brake hub. Separate the thrust washer from the inner race.

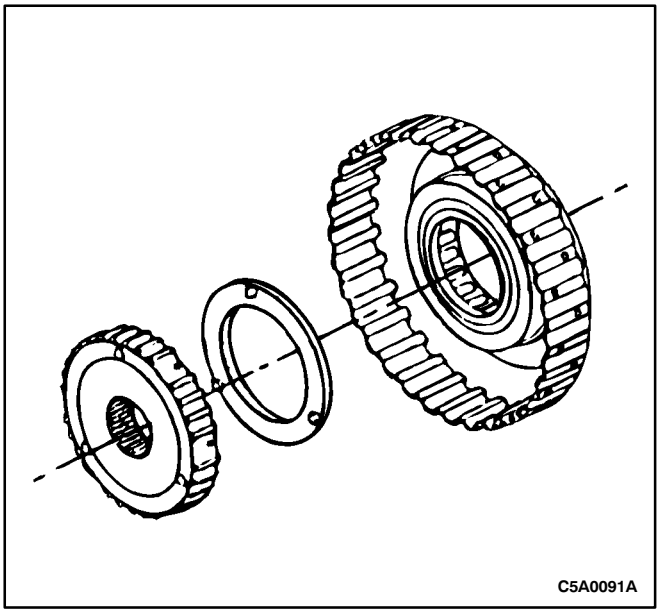

C5A0092A

3. Remove the one-way clutch from the second brake hub.


C5A0093A

Assembly Procedure

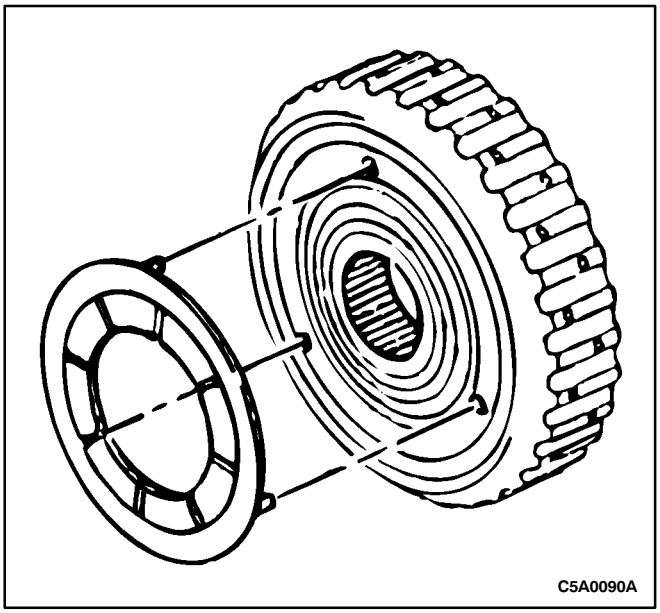
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Install the one-way clutch into the outer race.


C5A0091A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer.

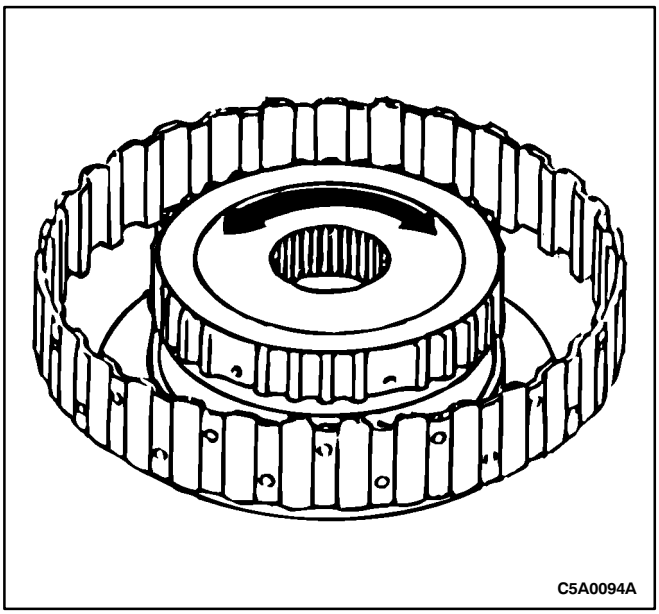
Notice: While turning the inner race, slide it onto the outer race.

3. Position the thrust washer onto the inner race. Install the second coast brake hub into the second brake hub.


C5A0090A

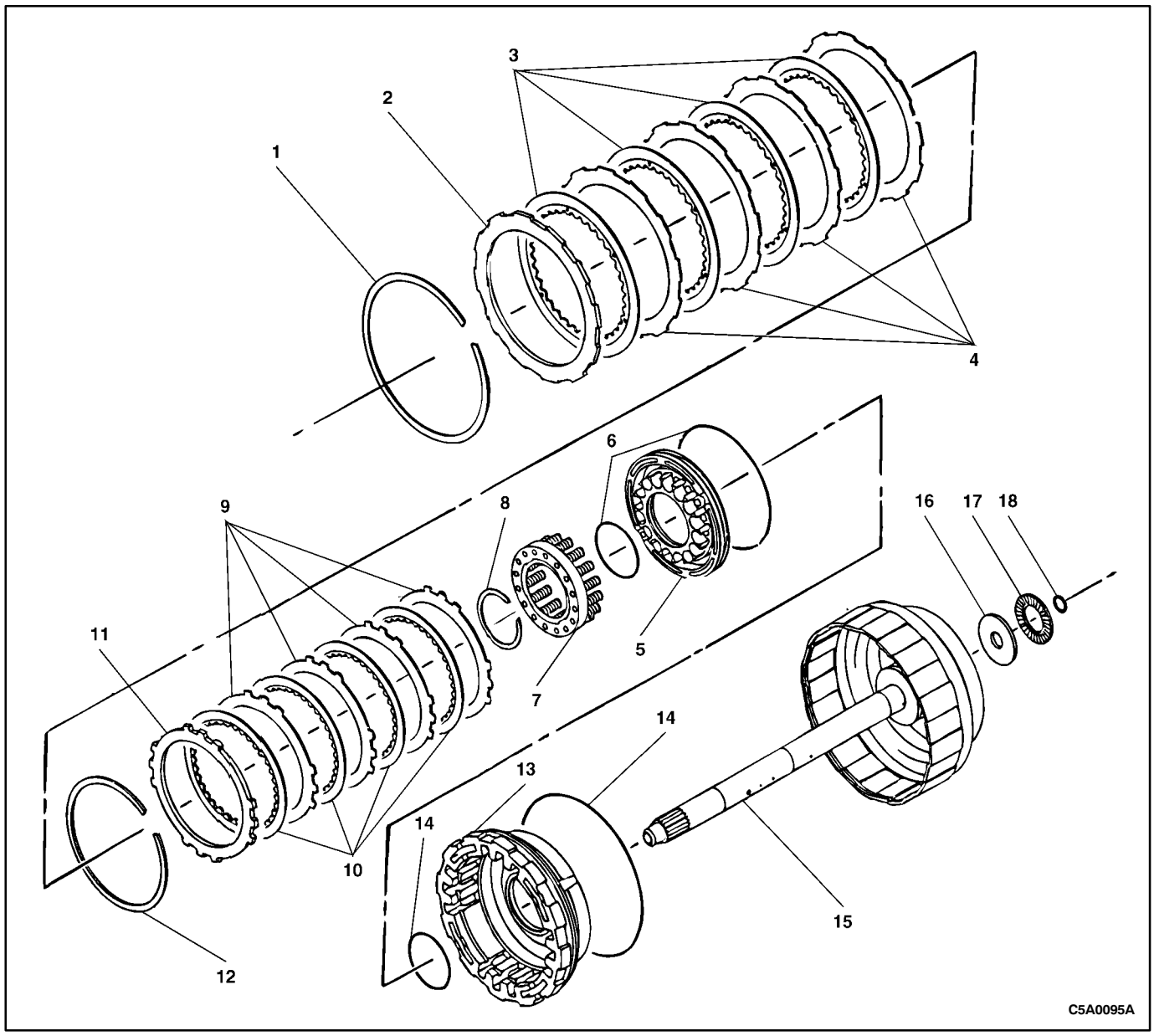
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer.

4. Install the rear thrust washer.

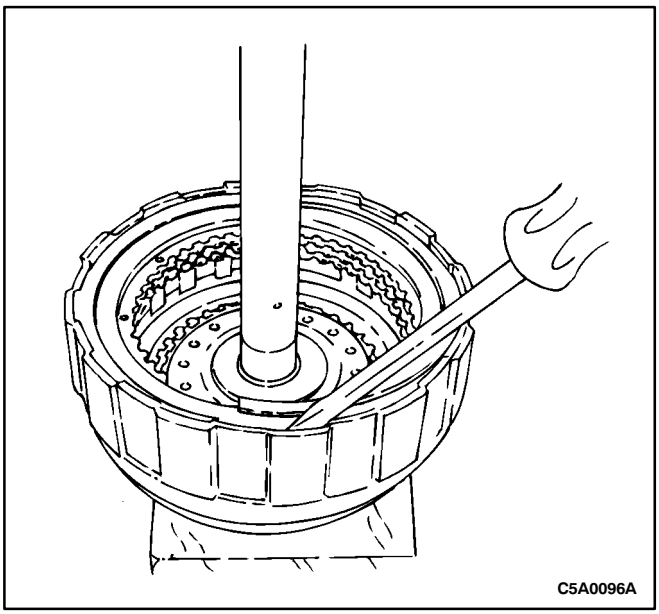

C5A0094A

5. Verify the operation of the one-way clutch. While holding the outer race, turn the inner race. The inner race should rotate smoothly when turned clockwise, and lock when turned counterclockwise.

FORWARD AND DIRECT CLUTCH



1. Snap Ring
2. Forward Clutch Pressure Plate
3. Forward Clutch Friction Plate
4. Forward Clutch Steel Plate
5. Direct Clutch Piston
6. O-Rings
7. Clutch Piston Return Spring
8. Snap Ring
9. Direct Clutch Steel Plate
10. Direct Clutch Friction Plate
11. Direct Clutch Pressure Plate
12. Snap Ring
13. Forward Clutch Piston
14. O-Rings
15. Input Shaft
16. Thrust Bearing Race
17. Thrust Bearing
18. Seal Ring


C5A0096A

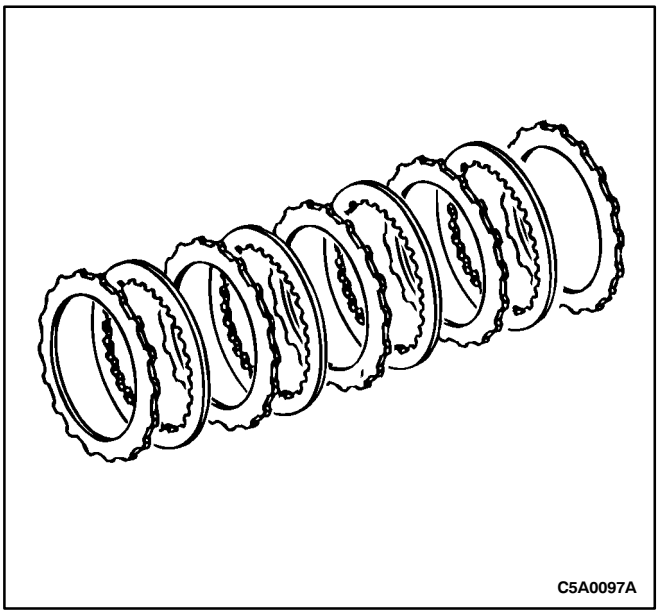
Tools Required

KM-698 Spring Compressor

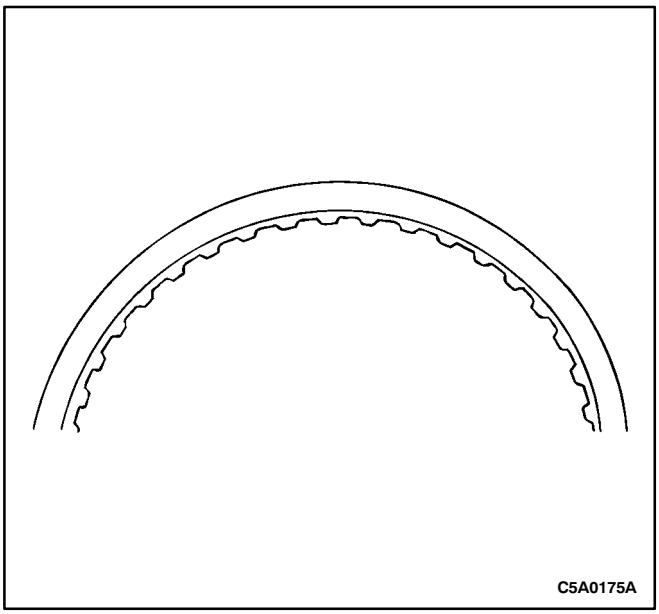
Disassembly Procedure

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

1. Carefully remove the snap ring.


C5A0097A

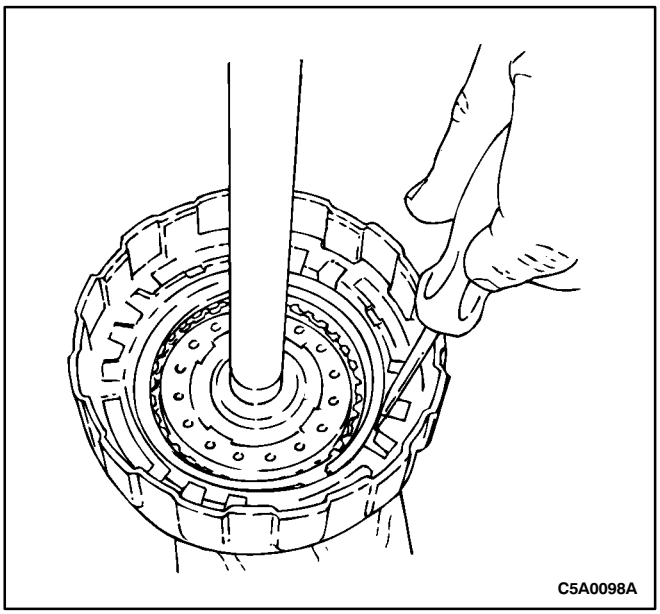
2. Remove the forward clutch pressure plate and the forward clutch disc pack.


C5A0175A

Notice: Check the steel and friction plates for wear or damage. Replace as necessary.

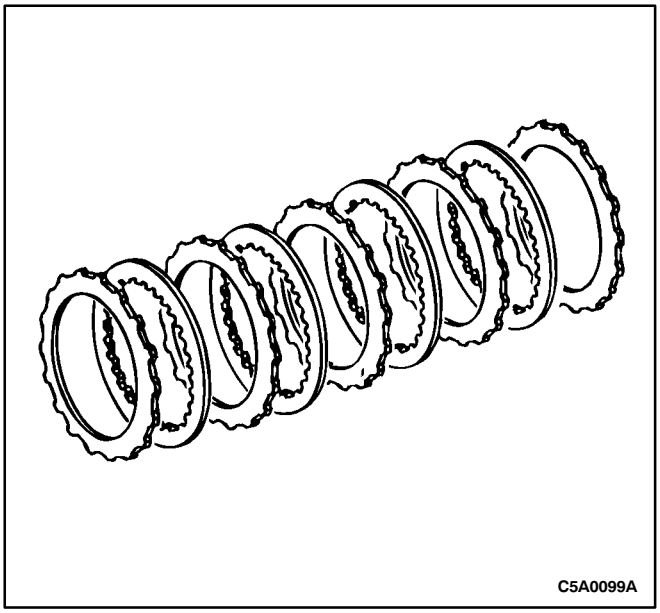
Notice: New clutch plates should be soaked in TOTAL FLUID HX for two hours before being assembled.

3. Inspect the forward clutch steel and friction plates.

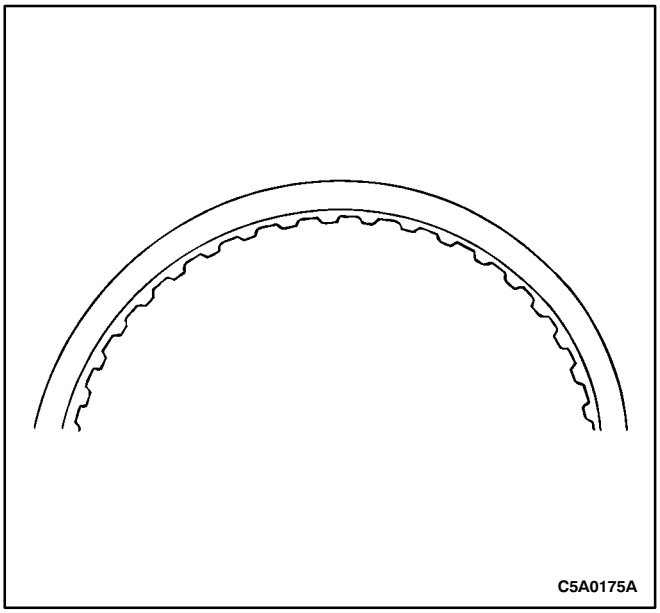

C5A0098A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

4. Carefully remove the snap ring.


C5A0099A

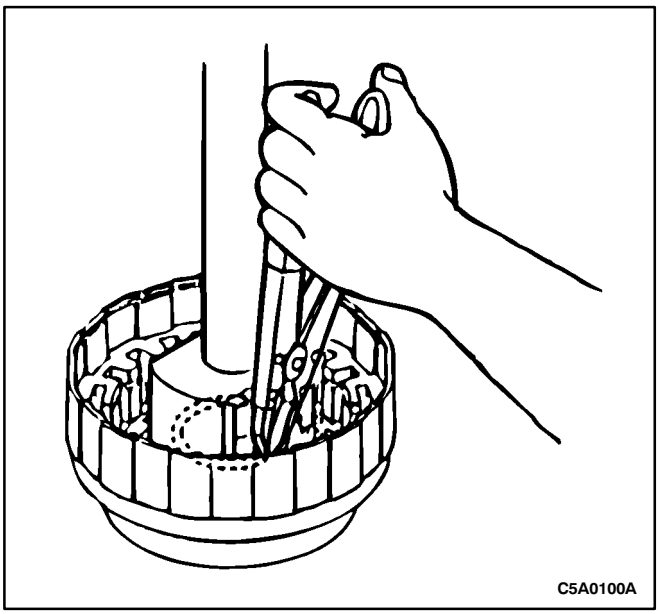
5. Remove the direct clutch pressure plate and the direct clutch disc pack.


C5A0175A

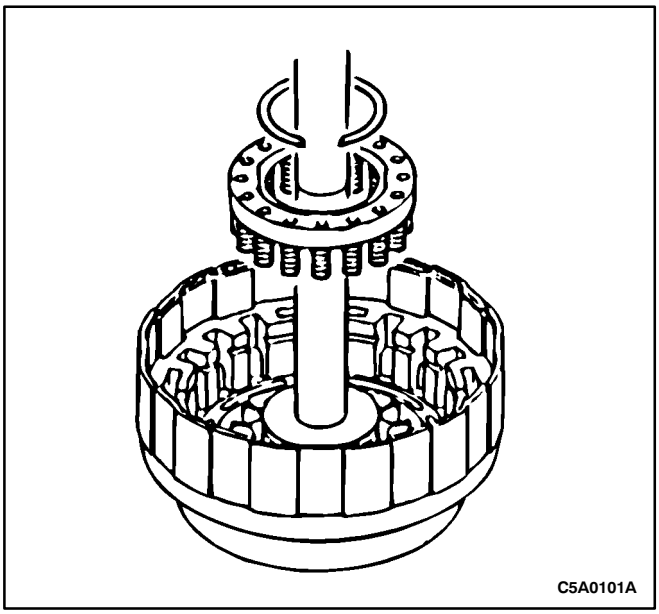
Notice: Check the steel and friction plates for wear or damage. Replace as necessary.

Notice: New clutch plates should be soaked in TOTAL FLUID HX for two hours before being assembled.

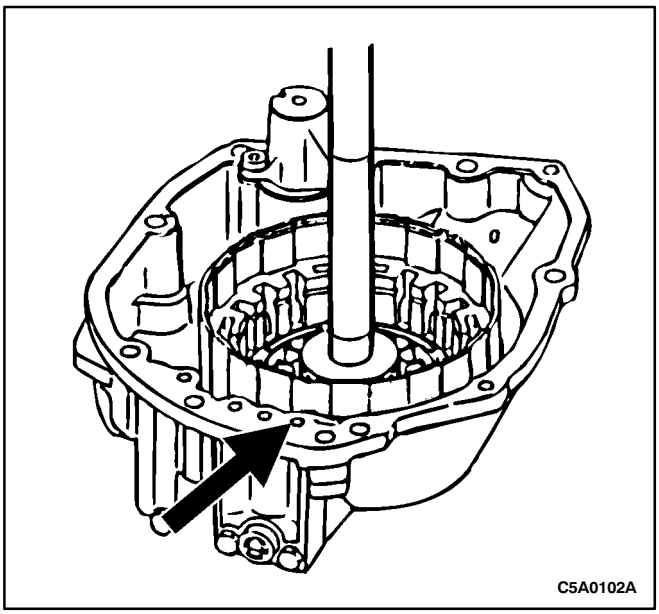
6. Inspect the direct clutch steel and friction plates.


C5A0100A

7. Position spring compressor KM 698 on the clutch piston return spring. Using a press, compress the springs, then remove the snap ring from the groove.


C5A0101A

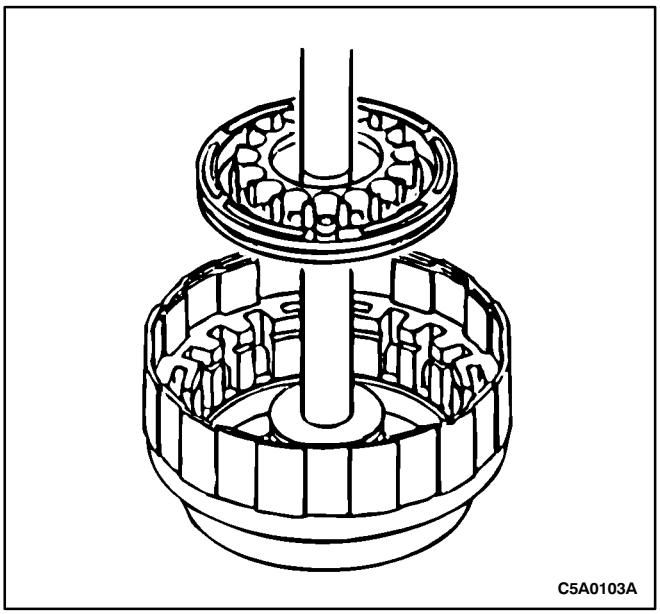
8. Remove the snap ring and the clutch piston return spring.


C5A0102A

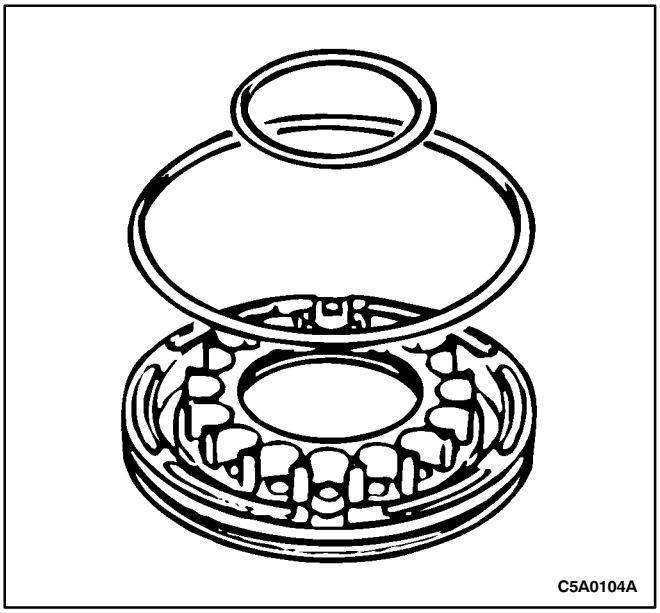
WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needlenose pliers to remove.

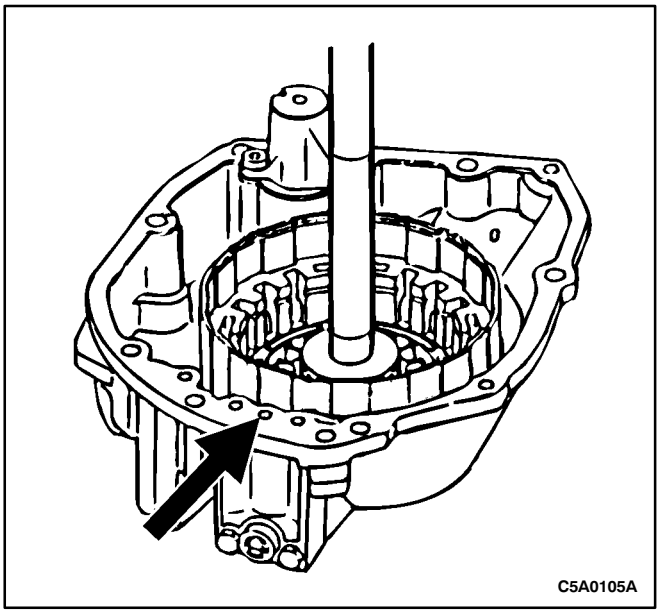
9. Install the input shaft into the rear case. Apply 396 kPa (57 psi) of compressed air into the oil passage shown to remove the direct clutch piston.


C5A0103A

10. Remove the direct clutch piston.


C5A0104A

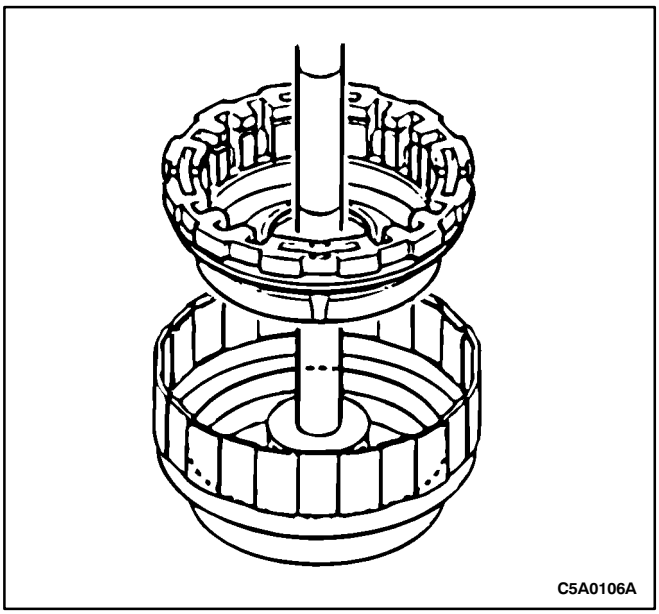
11. Remove and discard the direct clutch piston O-rings.


C5A0105A

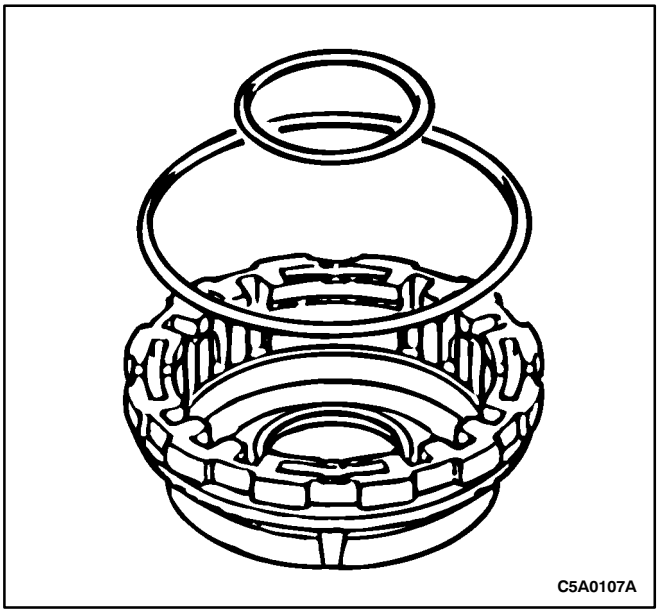
WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needlenose pliers to remove.

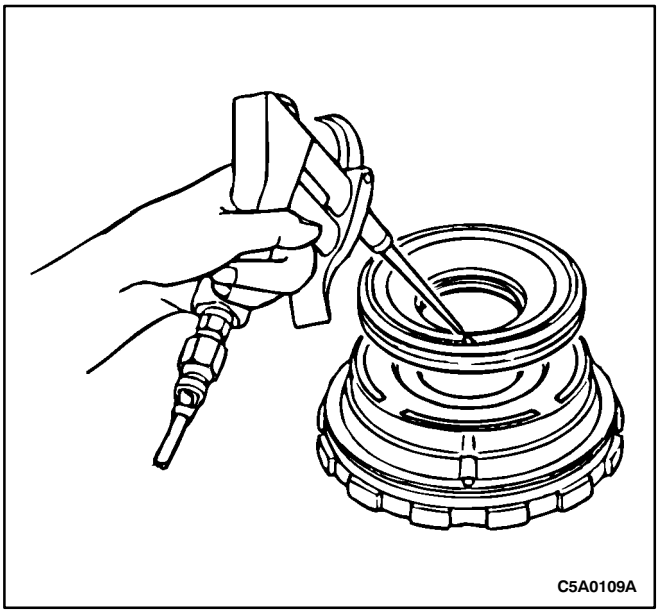
12. Install the input shaft into the rear case. Apply 396 kPa (57 psi) of compressed air into the oil passage shown to remove the forward clutch piston.


C5A0106A

13. Remove the forward clutch piston.

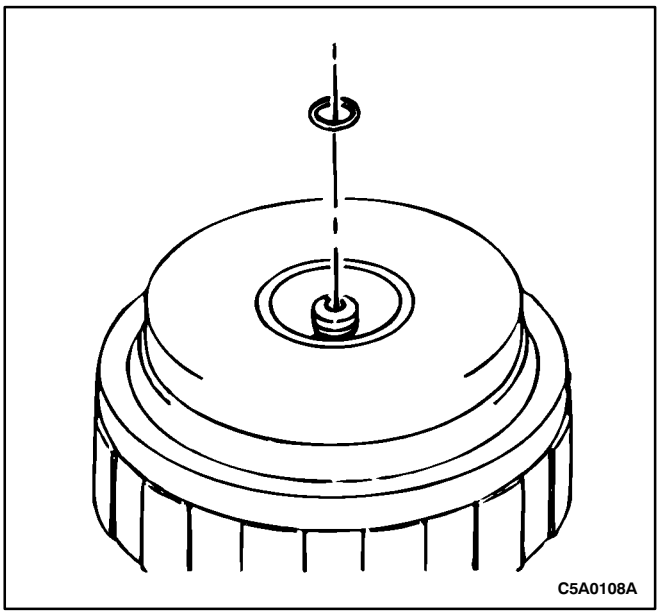

C5A0107A

14. Remove and discard the forward clutch piston O-rings.

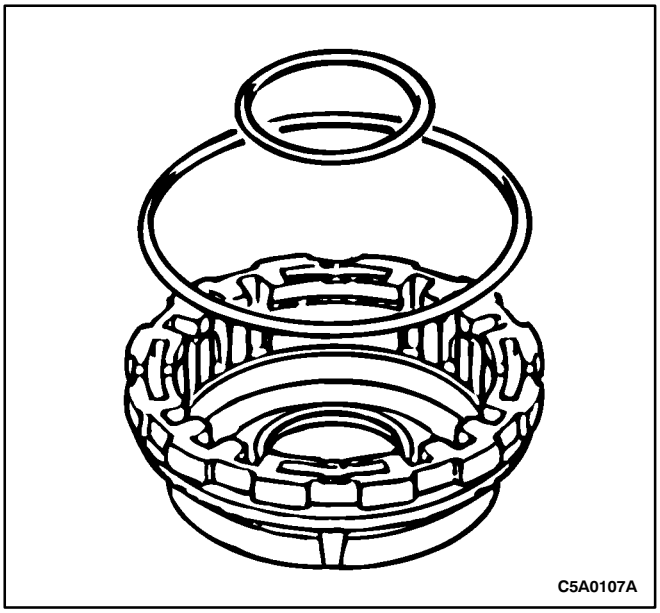

C5A0109A

WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

15. Inspect the forward and direct clutch piston.
    - Check that the valve does not leak by applying low-pressure compressed air.

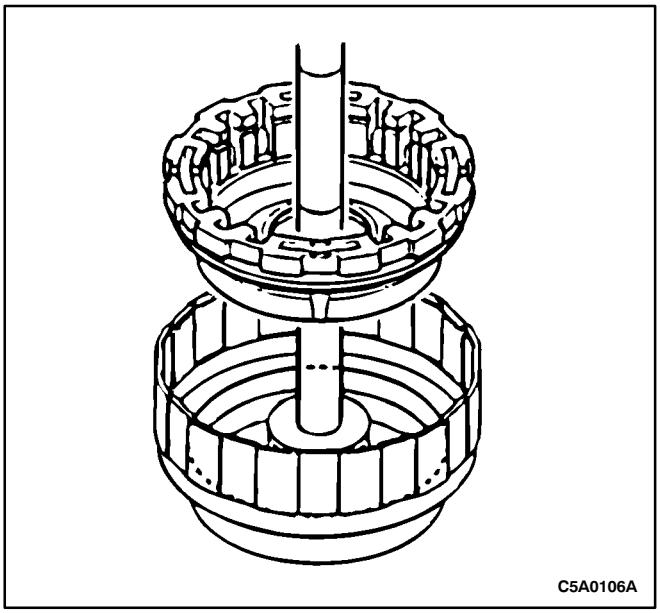

C5A0108A

16. Remove the seal ring.


C5A0107A

Assembly Procedure

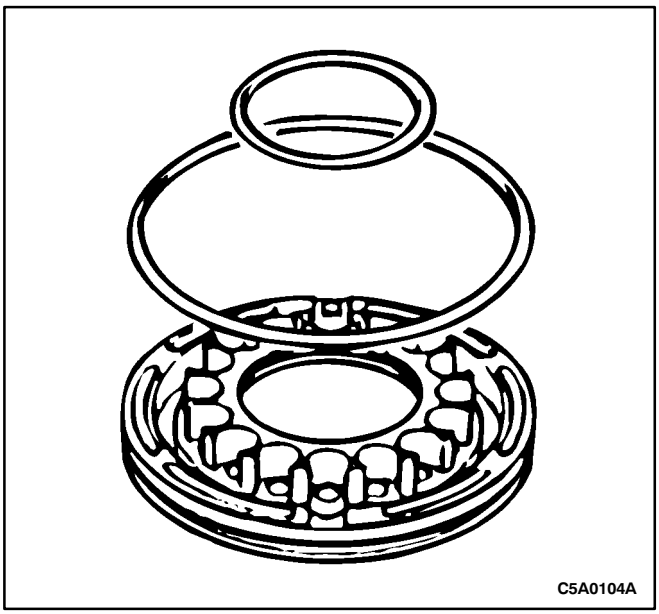
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Install new forward clutch piston O-rings.


C5A0106A

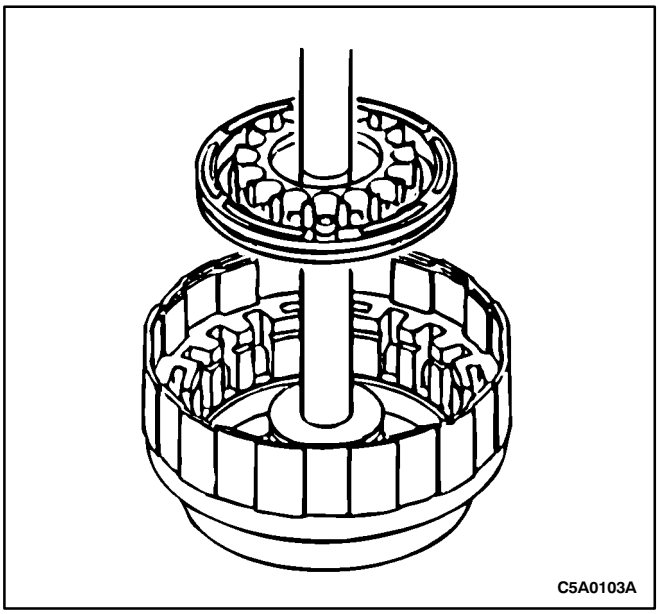
Notice: Apply TOTAL FLUID HX to the new forward clutch piston O-rings and the input shaft seal area.

Notice: Seat the piston by pushing evenly around the circumference of the piston, being careful not to damage the outer seal.

3. Install the forward clutch piston.


C5A0104A

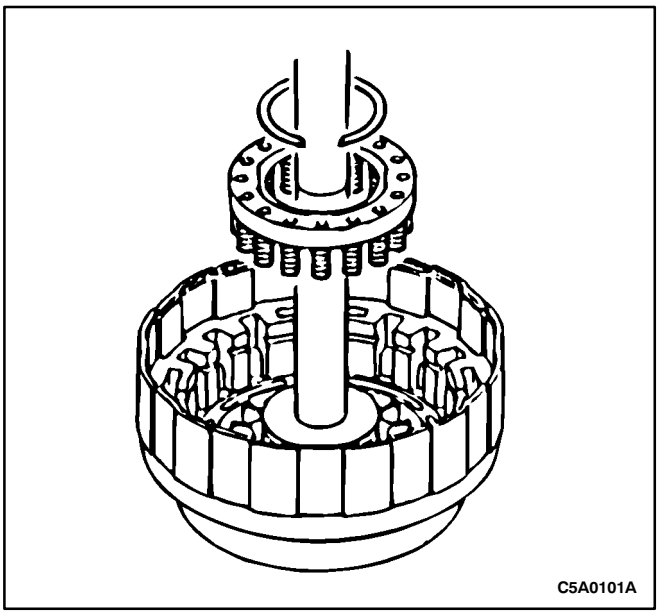
4. Install new direct clutch piston O-rings.


C5A0103A

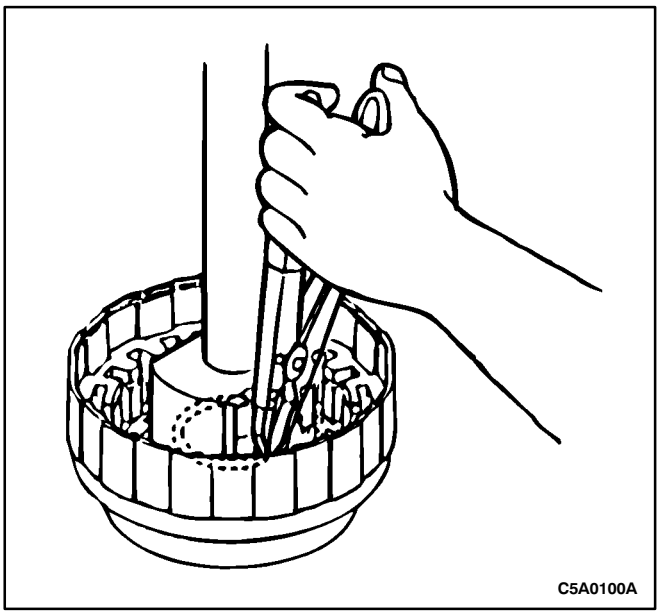
Notice: Apply TOTAL FLUID HX to the new direct clutch piston O-rings and the input shaft seal area.

Notice: Seat the piston by pushing evenly around the circumference of the piston, being careful not to damage the outer seal.

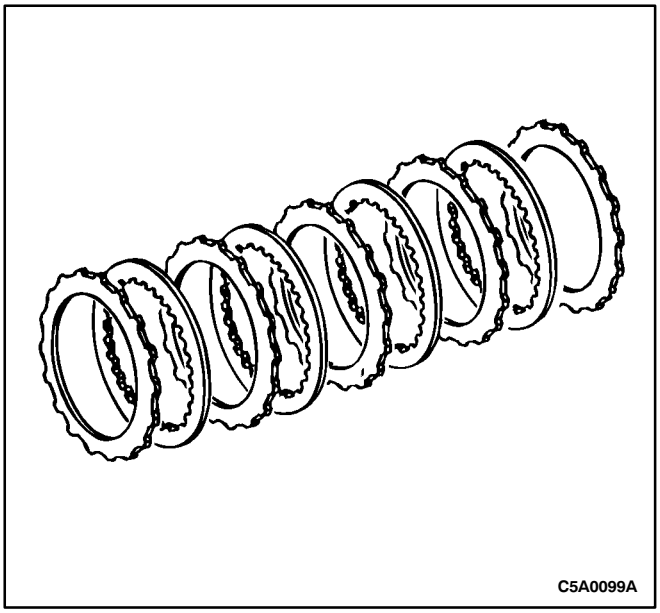
5. Install the direct clutch piston.


C5A0101A

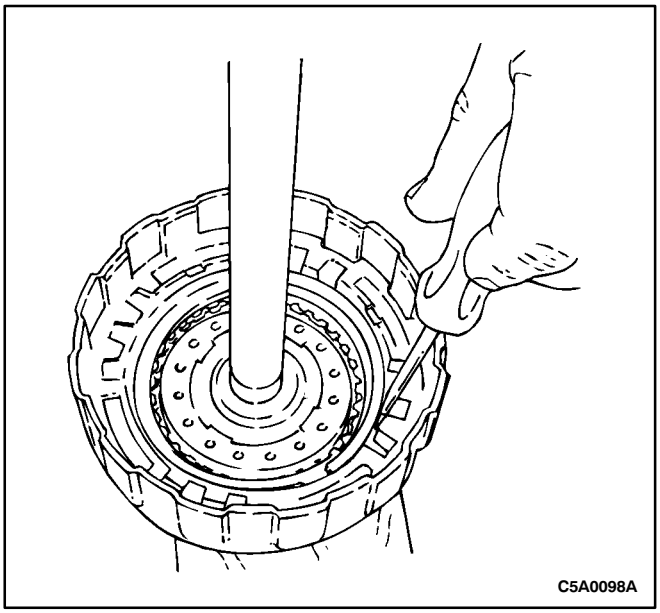
6. Install the clutch piston return spring on the direct clutch piston.


C5A0100A

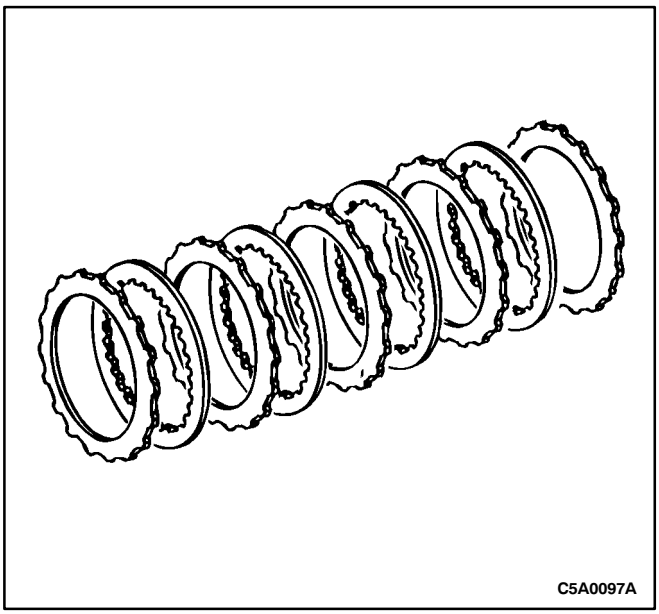
7. Install the clutch piston return spring. Position spring compressor KM-698 on the clutch piston return spring. Using a press, compress the spring, then install the snap ring into the groove.


C5A0099A

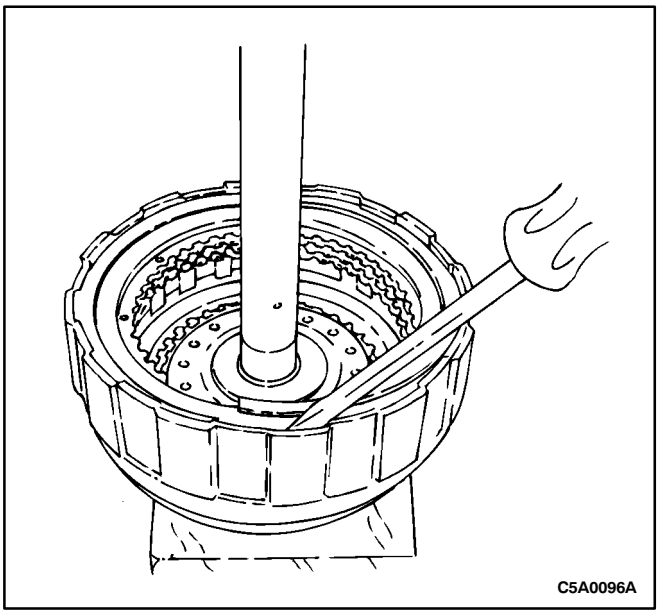
8. Install the direct clutch disc pack and direct clutch pressure plate.
   - The installation order is: steel-friction-steel-friction-steel-friction-steel-friction-pressure plate.


C5A0098A

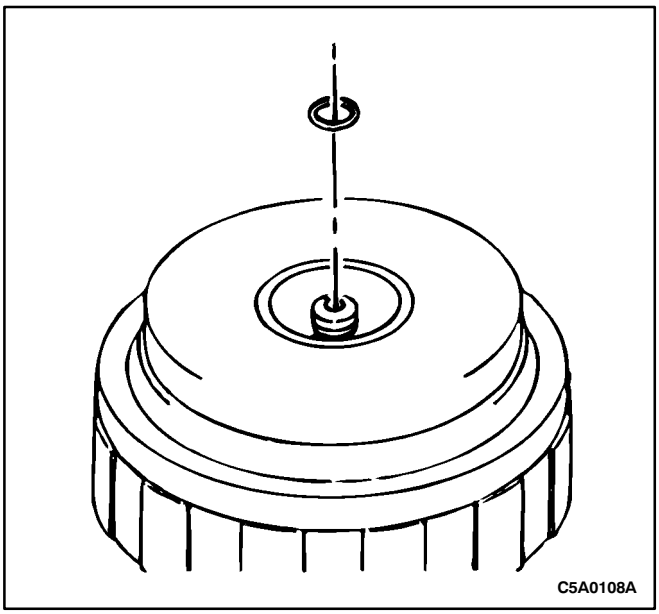
9. Install the snap ring.


C5A0097A

10. Install the forward clutch disc pack and forward clutch pressure plate.
    - The installation order is: steel-friction-steel-friction-steel-friction-steel-friction-pressure plate.

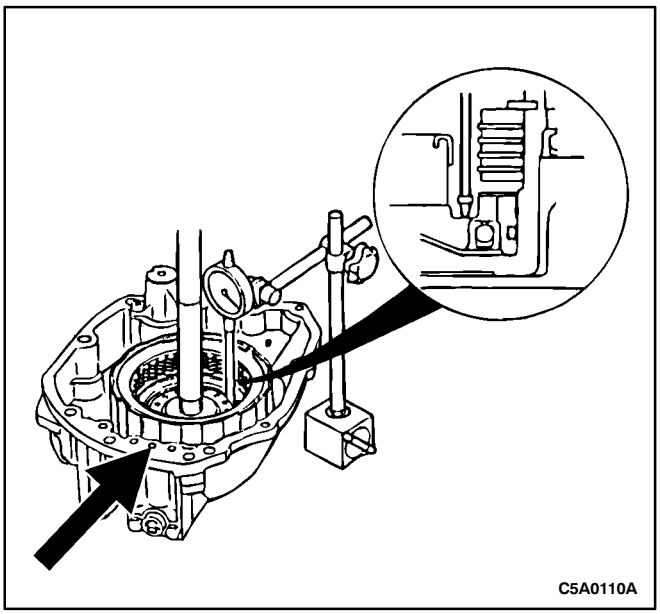

C5A0096A

11. Install the snap ring.


C5A0108A

Notice: Apply TOTAL FLUID HX to the seal ring. Spread the seal ring apart and install it into the groove.

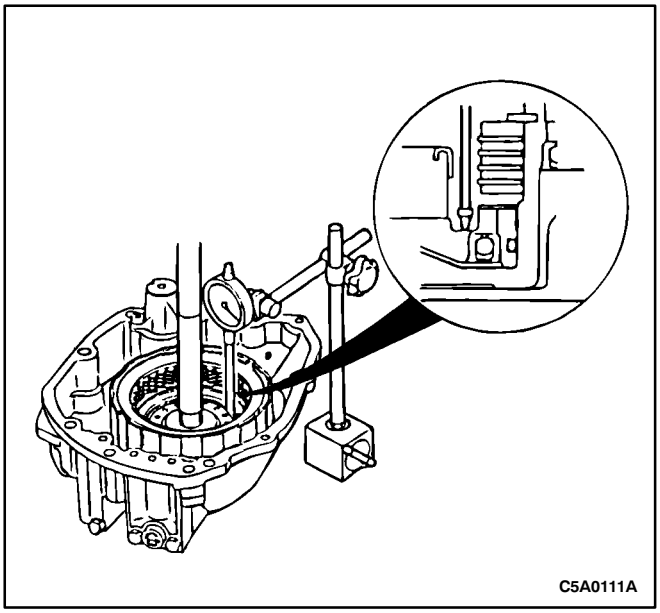
12. Install the seal ring.



WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

13. Check the direct clutch operation.

- Install the forward and direct clutch assembly into the rear cover. Install a dial indicator.
- Apply 396 kPa (57 psi) of compressed air into the oil passage and measure the direct clutch piston stroke. The piston stroke is 1.520-1.890 mm (0.059-0.074 in). The clutch should make a solid apply sound, with no whistle or sign of leaks.

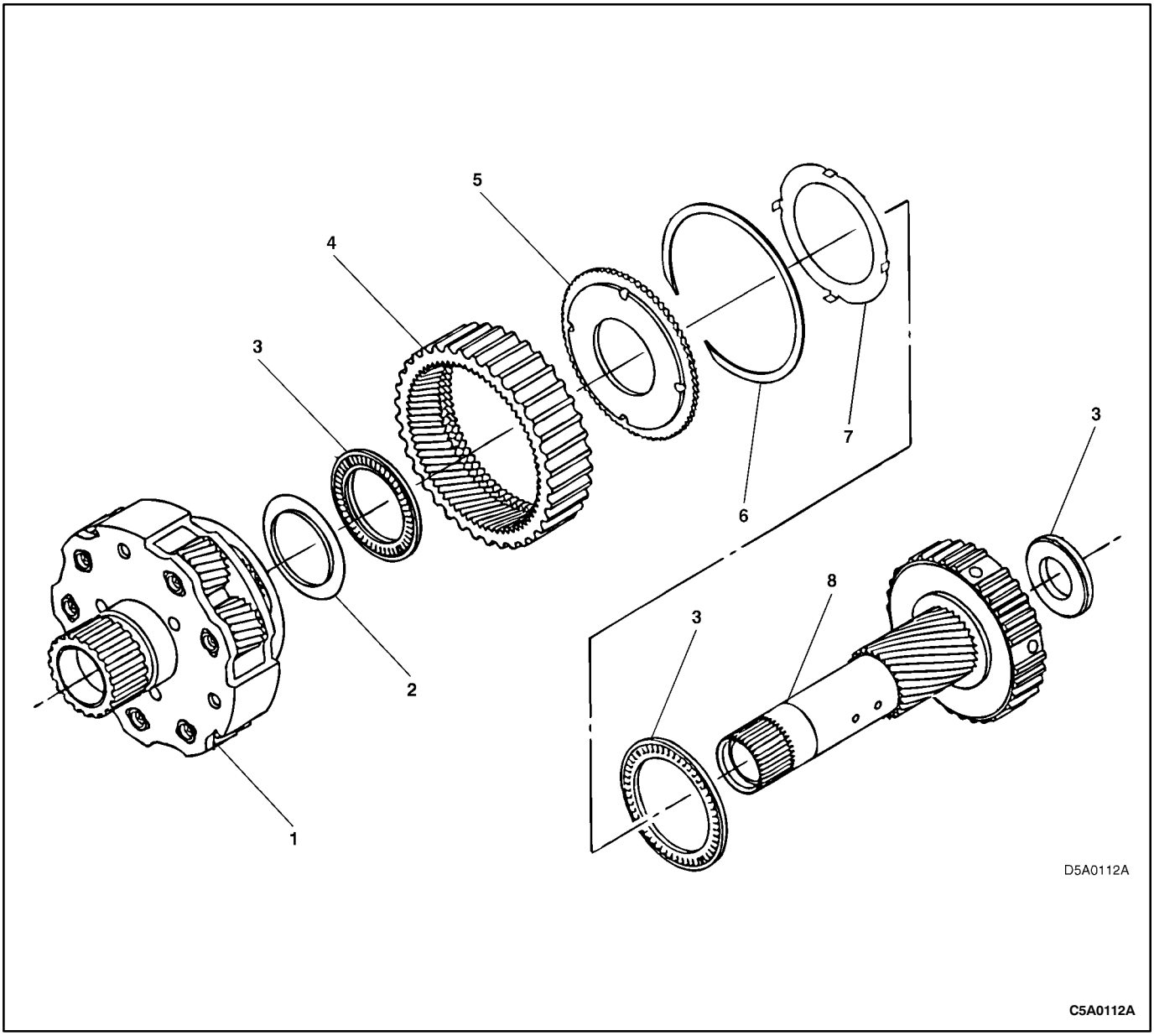


WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

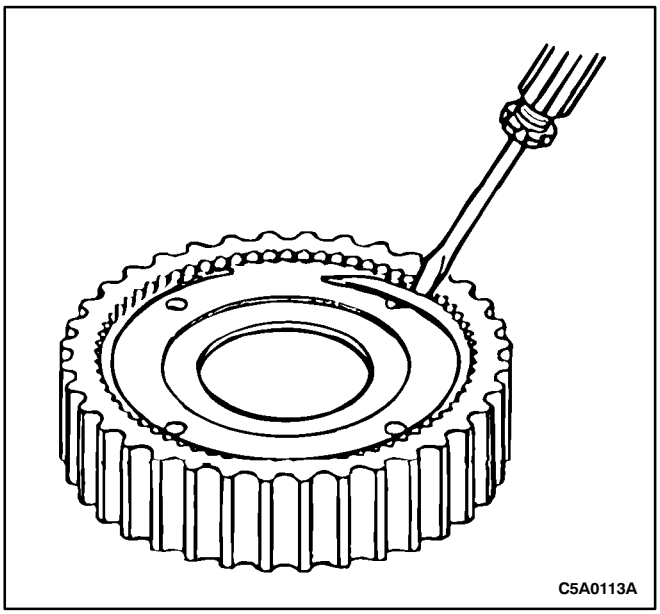
14. Check the forward clutch operation.

- Install the forward and direct clutch assembly into the rear cover. Install a dial indicator.
- Apply 396 kPa (57 psi) of compressed air into the oil passage and measure the direct clutch piston stroke. The piston stroke is 1.520-1.890 mm (0.059-0.074 in). The clutch should make a solid apply sound, with no whistle or sign of leaks.

PLANETARY GEAR AND PLANETARY SUN GEAR



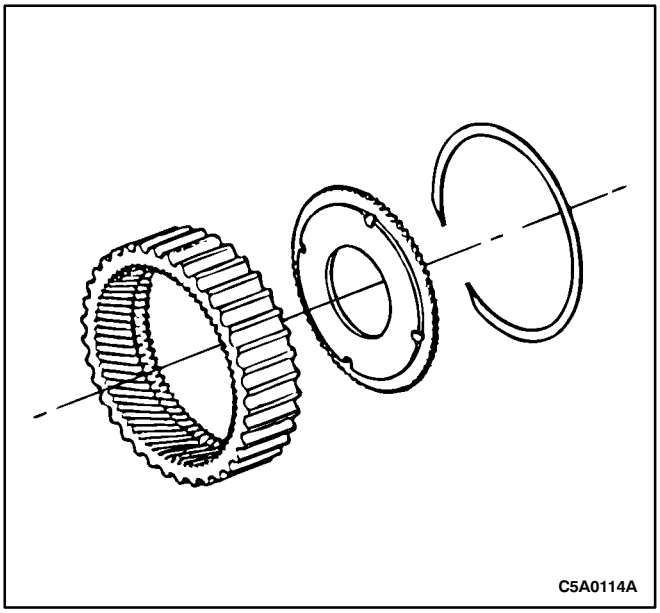
1. Planetary Gear Assembly
2. Thrust Bearing Race
3. Thrust Bearing
4. Rear Planetary Ring Gear
5. Rear Planetary Ring Gear Flange
6. Snap Ring
7. Thrust Bearing Race (Tabbed)
8. Planetary Sun Gear


C5A0113A

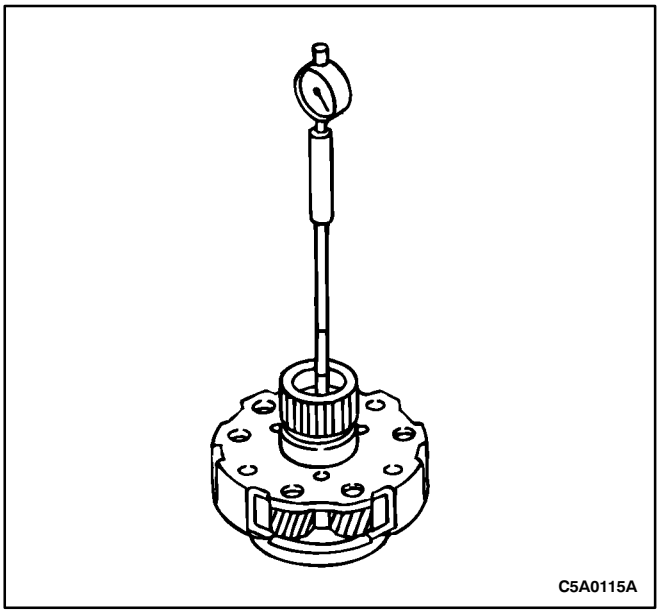
Disassembly Procedure

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

1. Carefully remove the snap ring.

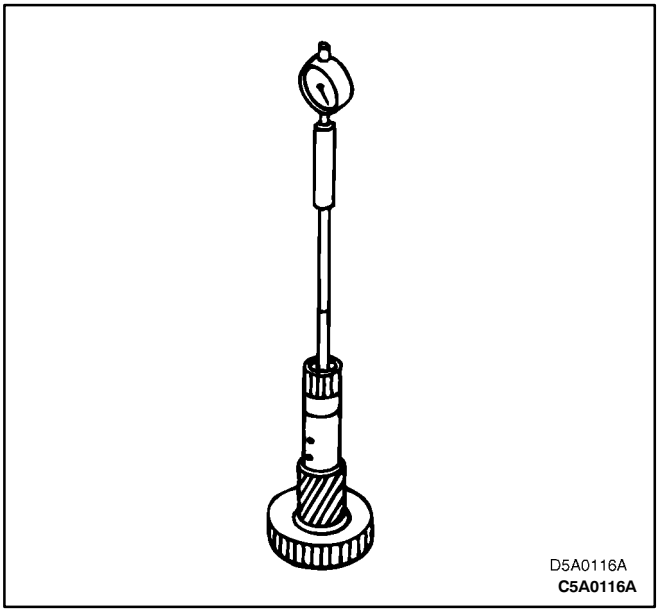

C5A0114A

2. Remove the rear planetary ring gear flange.


C5A0115A

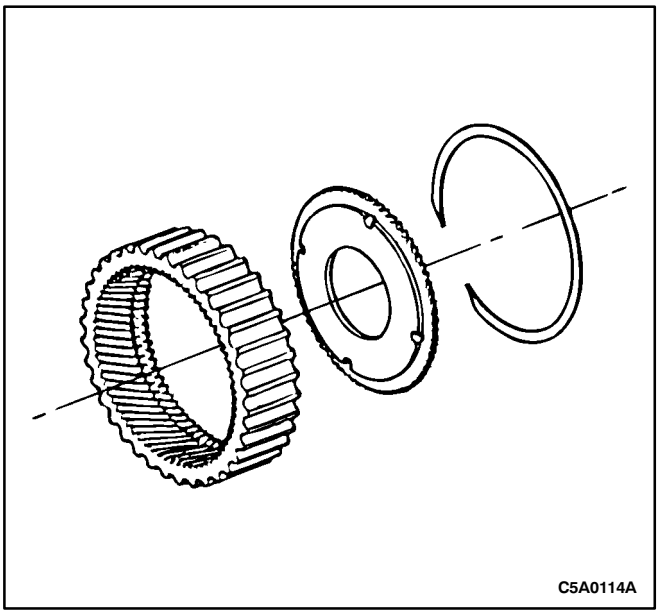
3. Inspect the planetary gear assembly.
   - Using a dial indicator, measure the inner diameter of the planetary gear bushing. Measure the bushing at three different places and calculate the average. If it is greater than the maximum, replace the planetary gear assembly.

Standard	30.00-30.030 mm (1.181-1.182 in)
Maximum	30.080 mm (1.184 in)


D5A0116A
C5A0116A

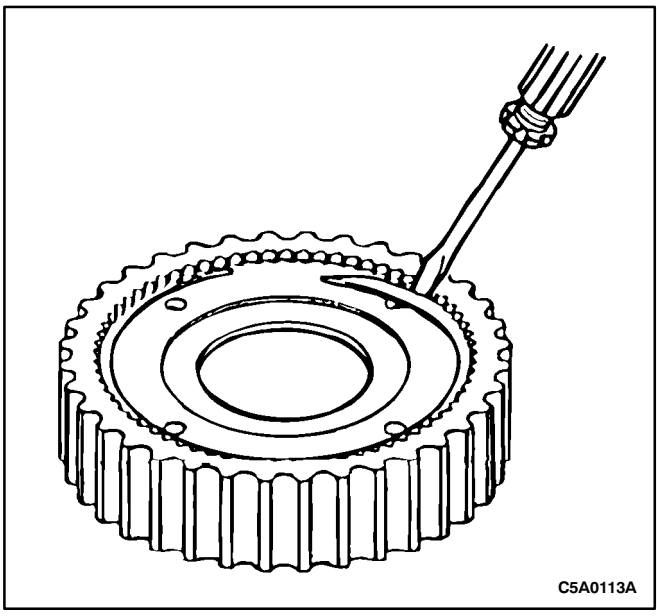
4. Inspect the planetary sun gear.
   - Using a dial indicator, measure the inner diameter of the planetary sun gear bushing. Measure the bushing at three different places and calculate the average. If it is greater than the maximum, replace the planetary sun gear.

Standard	21.50-21.530 mm (0.846-0.847 in)
Maximum	21.580 mm (0.849 in)


C5A0114A

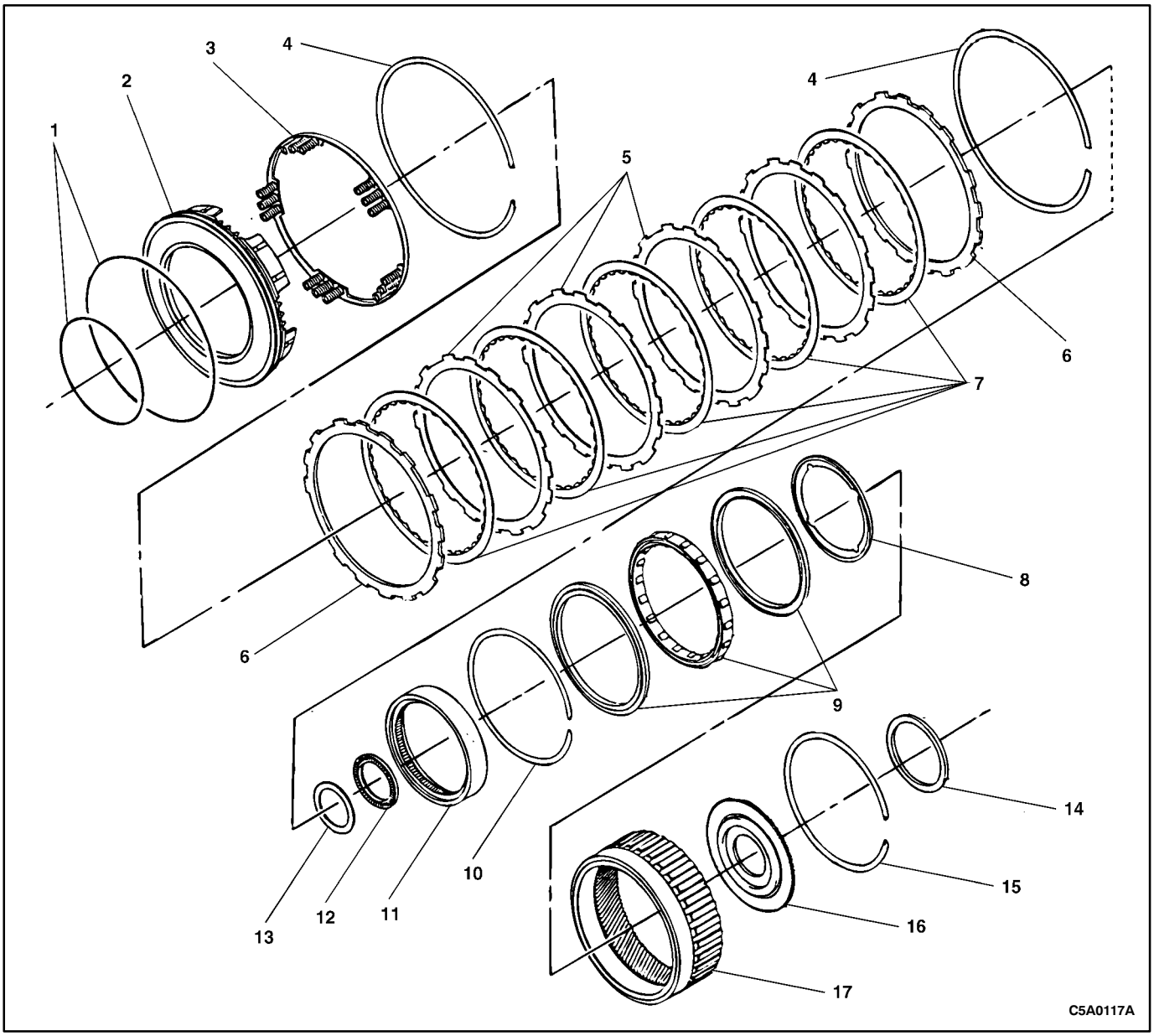
Assembly Procedure

1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Install the rear planetary ring gear flange.

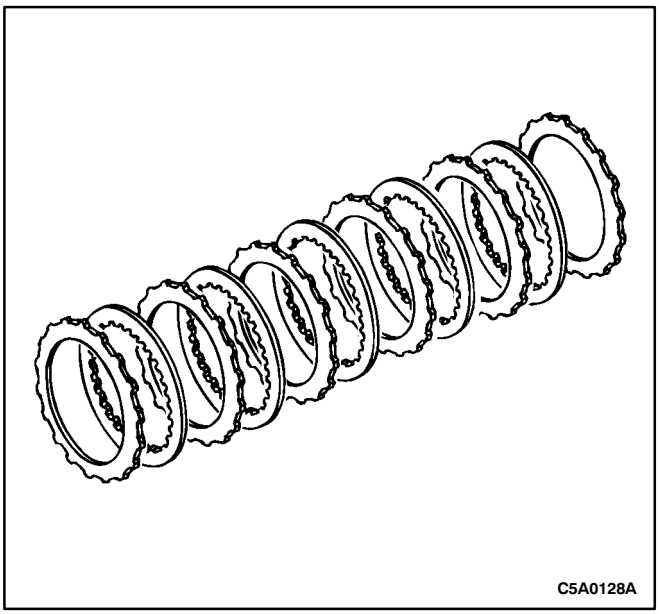

C5A0113A

3. Install the snap ring.

LOW/REVERSE BRAKE CLUTCH PISTON ASSEMBLY, FRONT PLANETARY RING GEAR AND ONE-WAY CLUTCH

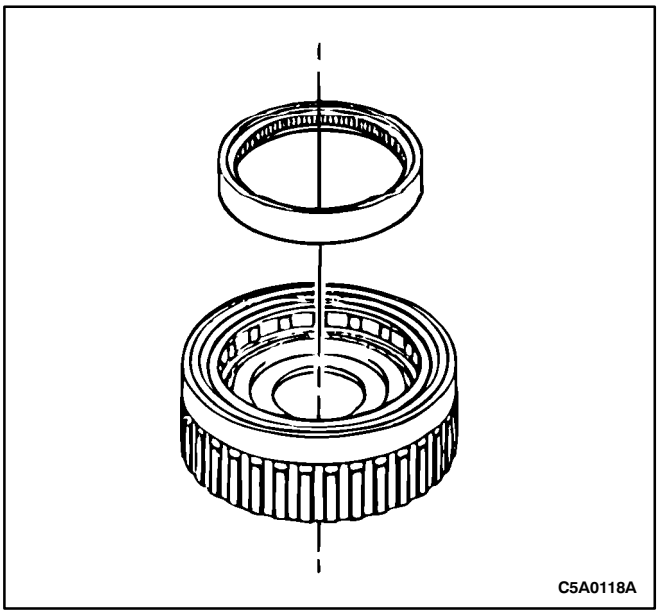


1. O-Ring
2. Low/Reverse Brake Piston
3. Brake Piston Return Spring
4. Snap Ring
5. Clutch Steel Plate
6. Clutch Pressure Plate
7. Clutch Friction Plate
8. Thrust Washer
9. One-Way Clutch
10. Snap Ring
11. One-Way Clutch Inner Race
12. Thrust Bearing
13. Thrust Bearing Race
14. Thrust Bearing
15. Snap Ring
16. Front Planetary Ring Gear Flange
17. Low/Reverse Planetary Ring Gear

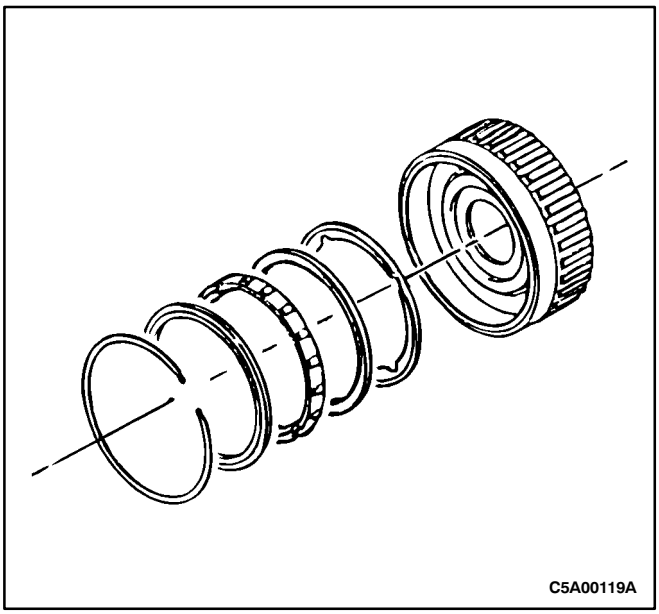

C5A0128A

Disassembly Procedure

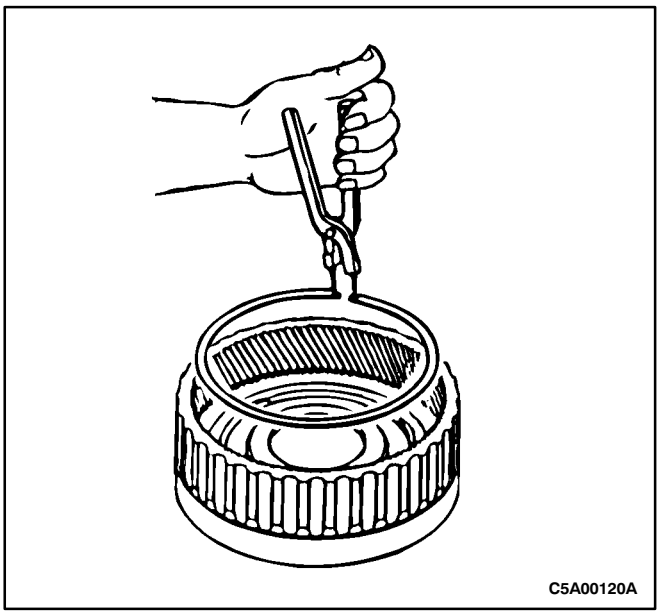
1. Remove the low/reverse clutch pack and the clutch pressure plates from the planetary ring gear.


C5A0118A

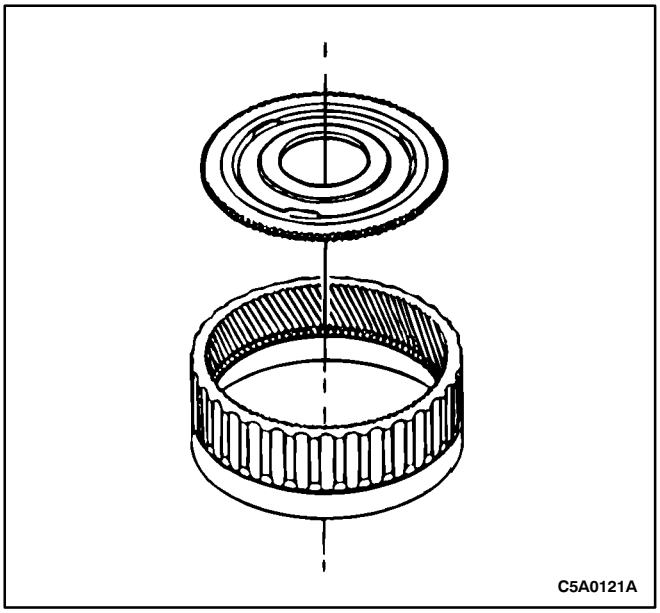
2. Remove the one-way clutch inner race.


C5A00119A

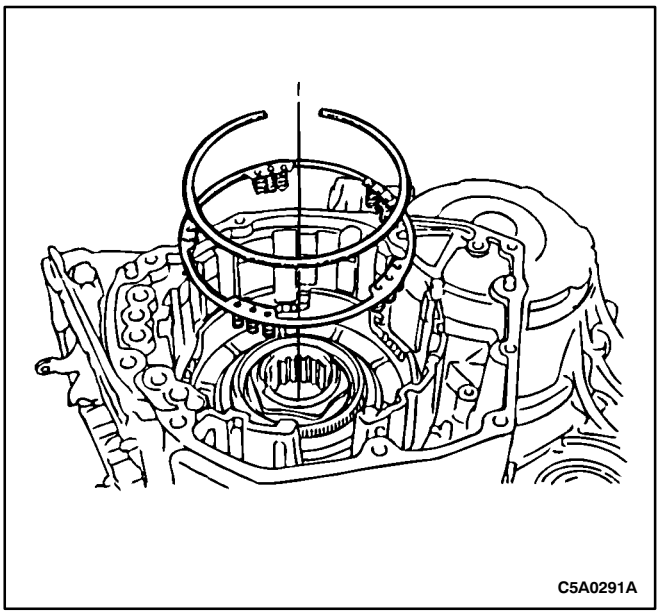
3. Remove the snap ring, one-way clutch and thrust washer.


C5A00120A

4. Remove the snap ring.

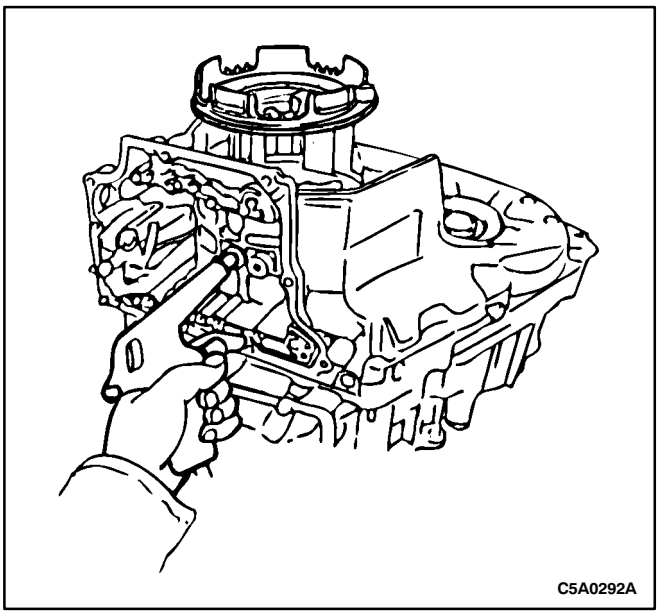

C5A0121A

5. Remove the front planetary ring gear flange.


C5A0291A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

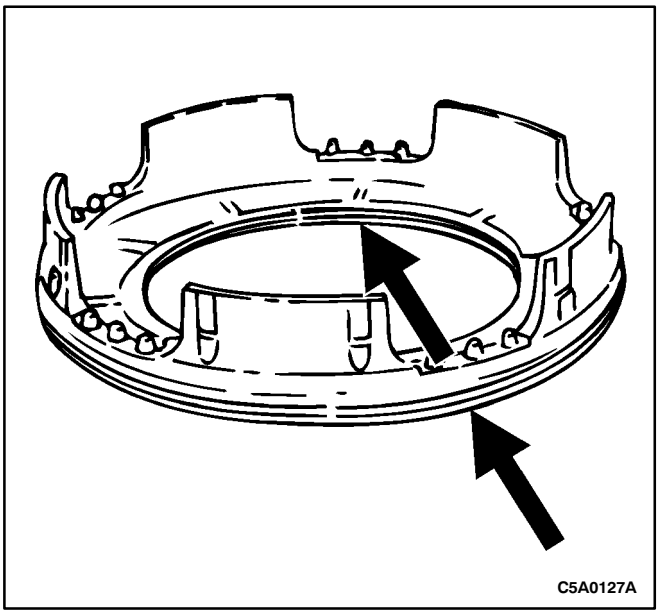
6. Remove the snap ring and the brake piston return spring.


C5A0292A

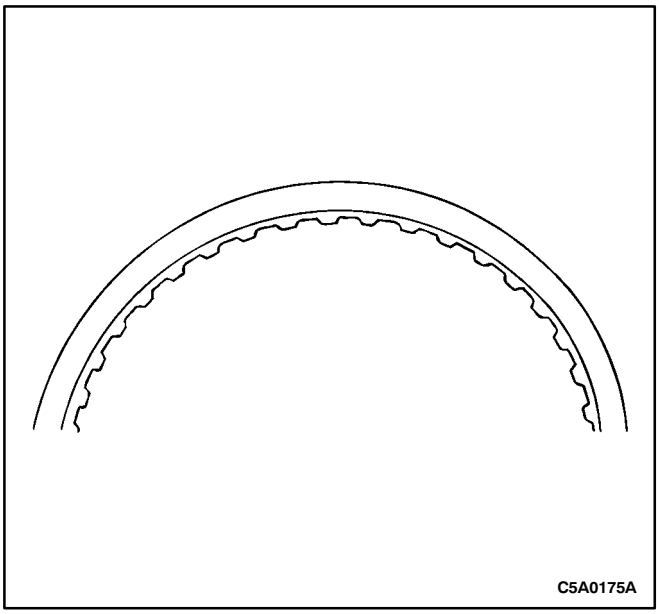
WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needlenose pliers to remove.

7. Apply 396 kPa (57 psi) of compressed air into the oil passage to remove the low/reverse brake piston.


C5A0127A

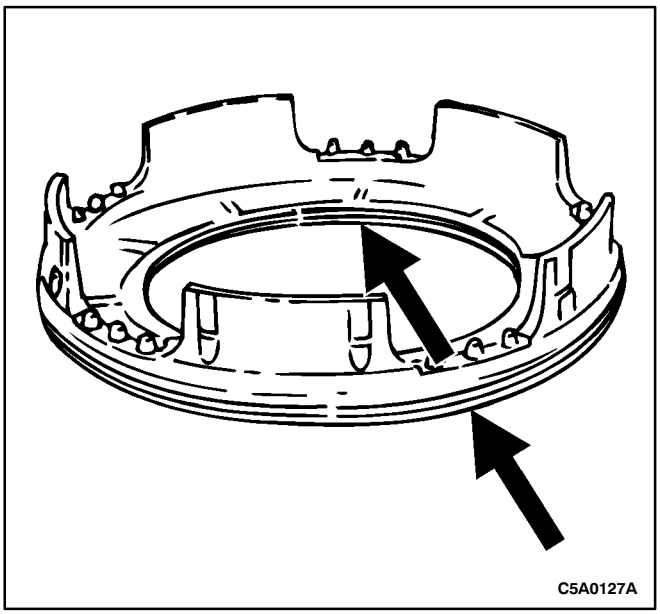
8. Remove and discard the low/reverse brake piston O-rings.


C5A0175A

Notice: Check the steel and friction plates for wear or damage. Replace as necessary.

Notice: New clutch plates should be soaked in TOTAL FLUID HX for two hours before being assembled.

9. Inspect the clutch steel and friction plate surfaces.


C5A0127A

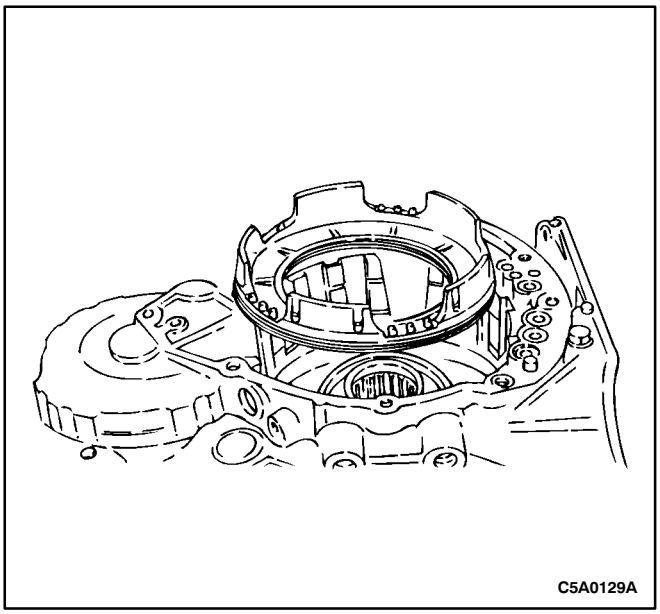
Assembly Procedure

Notice: Inspect the transaxle case for damage or wear.

Notice: Inspect all parts for damage or wear.

Notice: Check the low/reverse clutch piston and transaxle case seal area for burrs or damage.

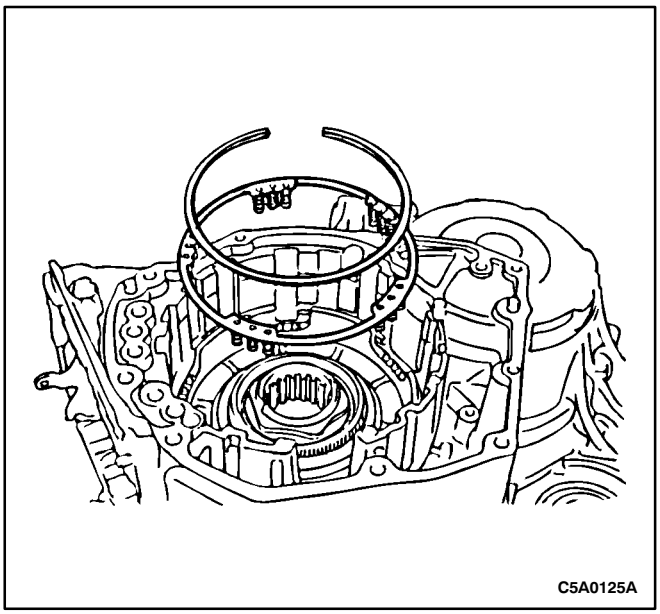
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts and clean the fluid passages.
2. Install new low/reverse brake piston O-rings.


C5A0129A

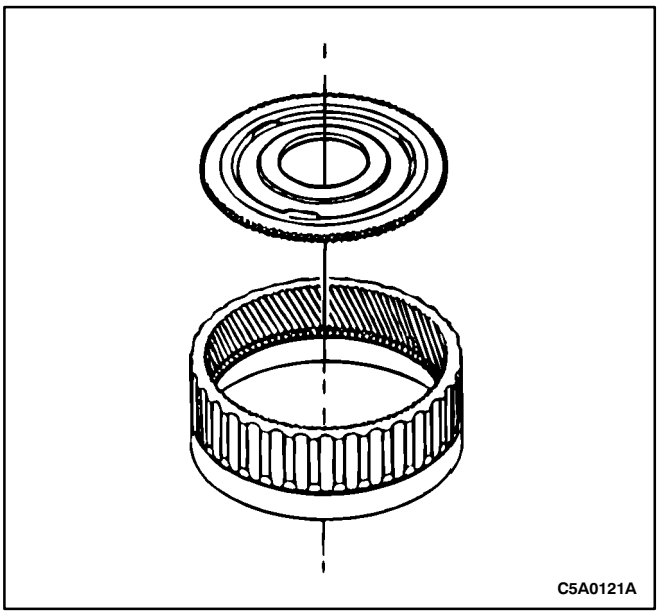
Notice: Apply TOTAL FLUID HX to the new low/reverse brake piston O-rings and the transaxle seal area.

Notice: Seat the piston by pushing evenly around the circumference of the piston, being careful not to damage the outer seal.

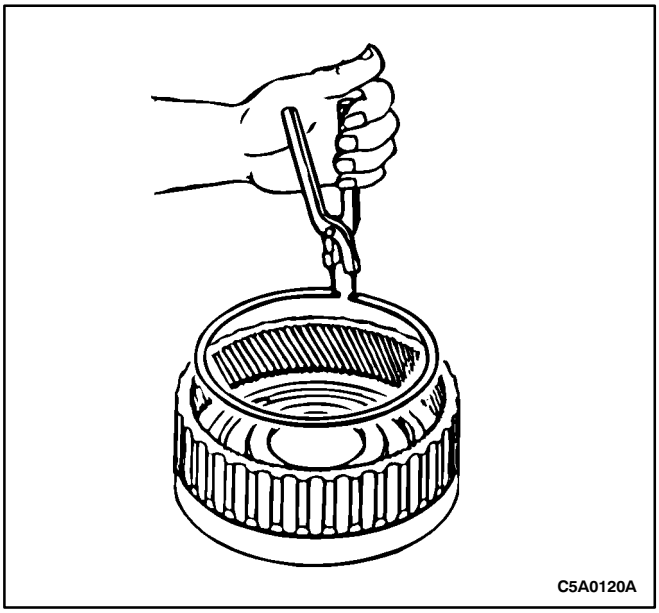
3. Install the low/reverse brake piston into the case.


C5A0125A

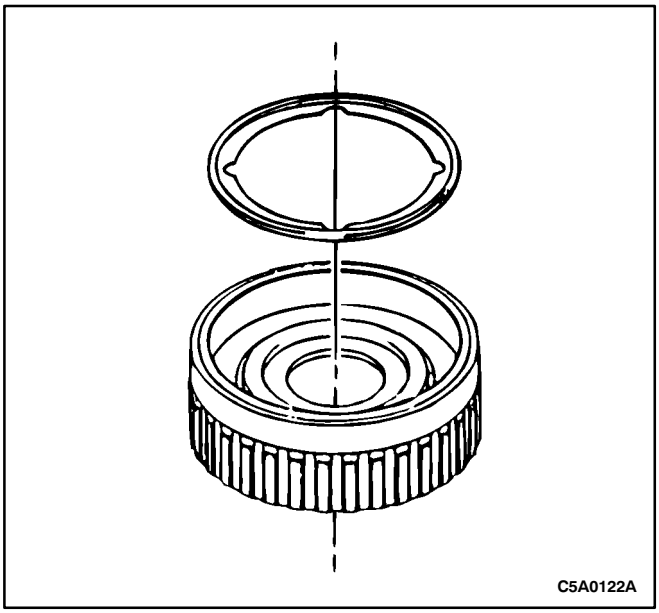
4. Install the brake piston return spring and snap ring into the case.
   - Compress the brake piston return spring by hand and install the snap ring into the groove with a screwdriver.
   - Be sure the end gap of the snap ring is not aligned with one of the case cutouts.


C5A0121A

5. Install the front planetary ring gear flange.

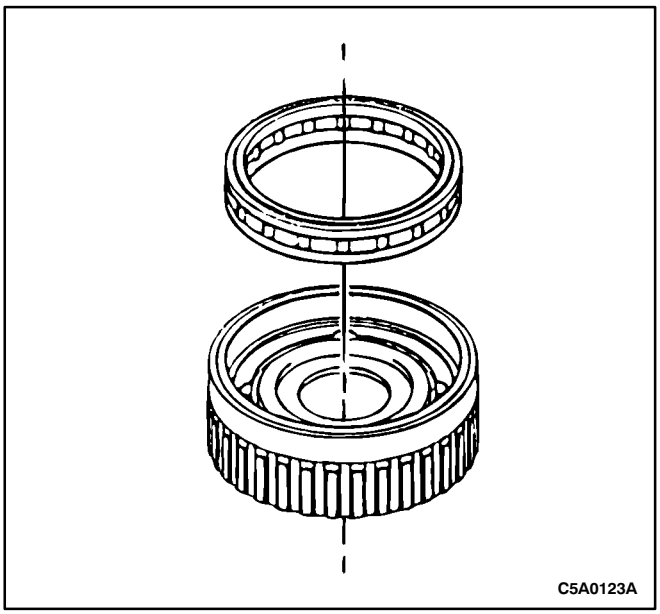

C5A0120A

6. Install the snap ring.


C5A0122A

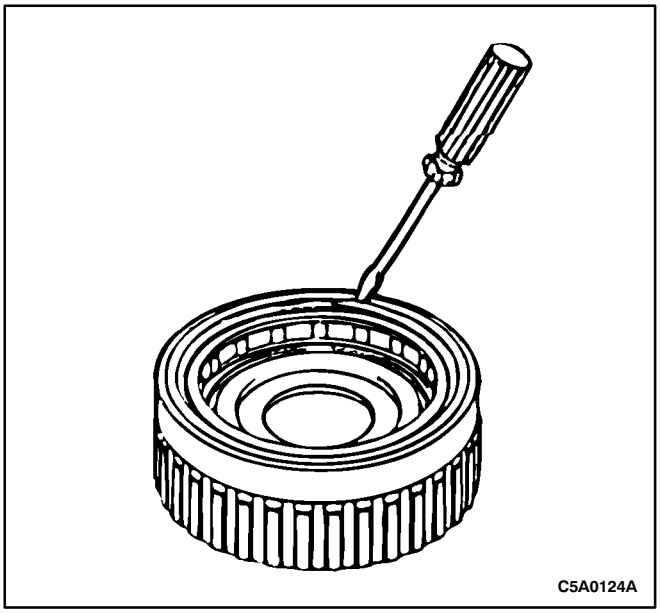
Notice: Install the flat surface of the thrust washer toward the flange.

7. Install the thrust washer.

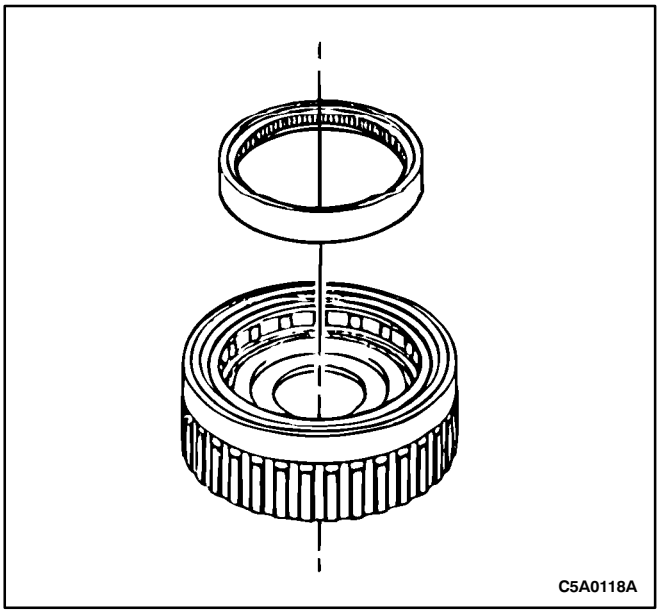

C5A0123A

Notice: Apply TOTAL FLUID HX to the one-way clutch.

8. Install the one-way clutch.


C5A0124A

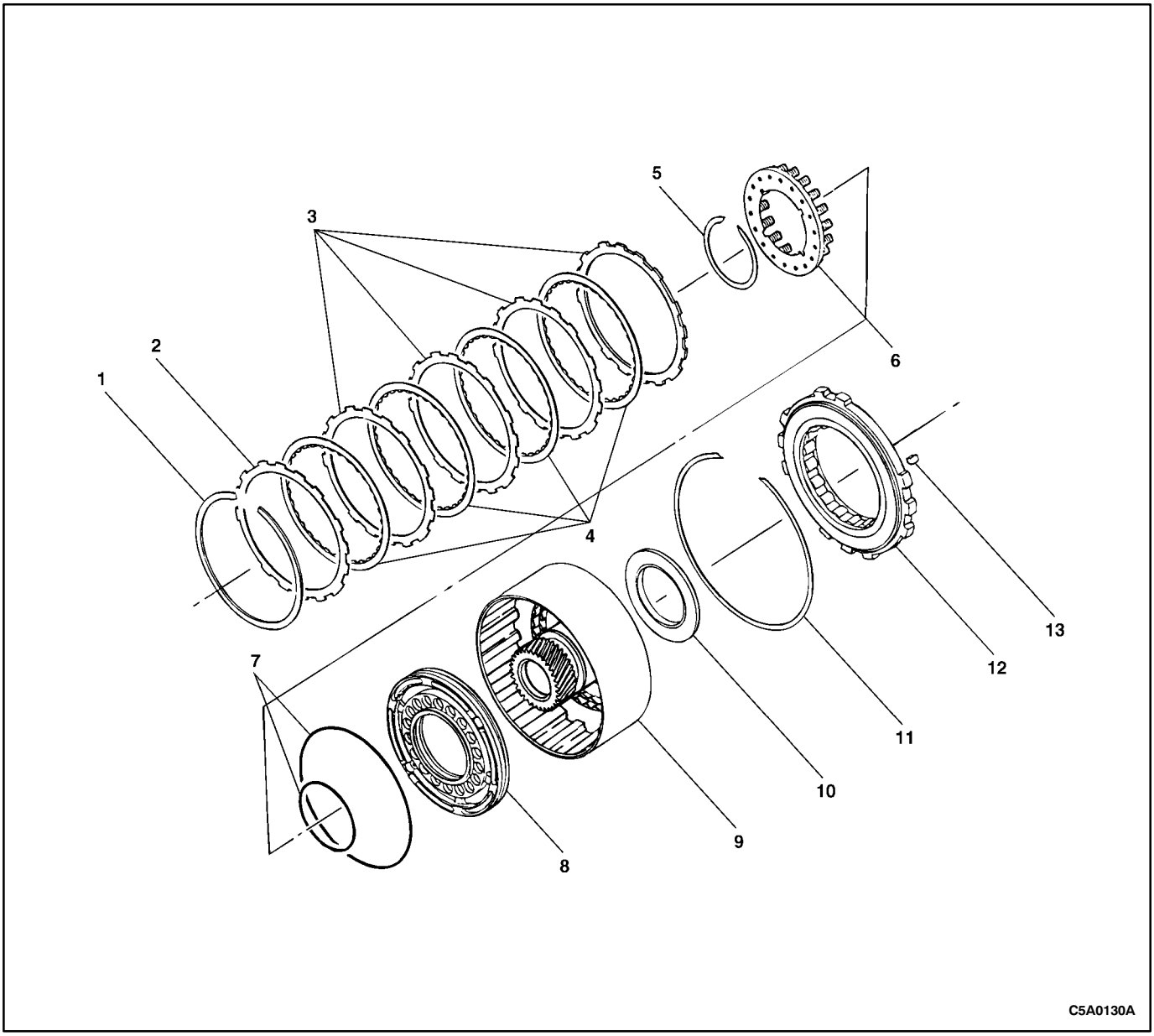
9. Install the snap ring.


C5A0118A

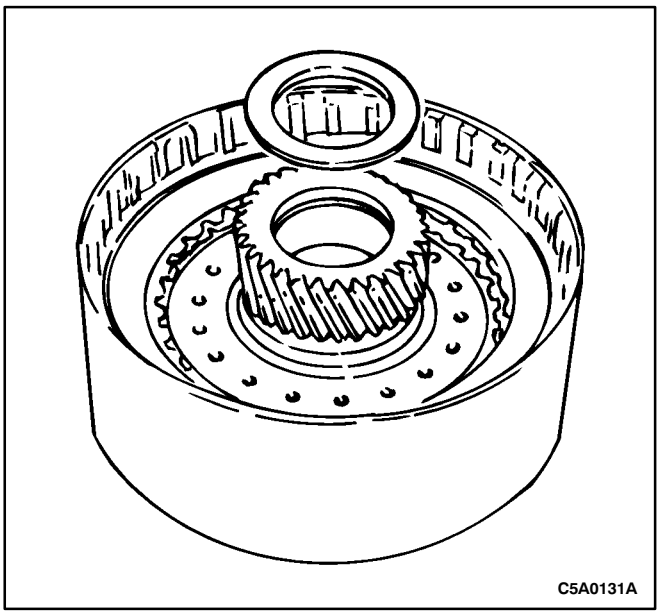
Notice: Apply TOTAL FLUID HX to the one-way clutch inner race.

10. Install the one-way clutch inner race.
11. Verify the operation of the one-way clutch. While holding the front ring gear, verify that the inner race rotates smoothly when turned counterclockwise and locks when turned clockwise.

UNDERDRIVE CLUTCH



1. Snap Ring
2. Clutch Pressure Plate
3. Clutch Steel Plates
4. Clutch Friction Plates
5. Shaft Snap Ring
6. Clutch Piston Return Spring
7. O-Rings
8. Underdrive Clutch Piston
9. Underdrive Drum
10. Thrust Bearing
11. Snap Ring
12. Underdrive One-Way Clutch
13. Outer Race Retainer

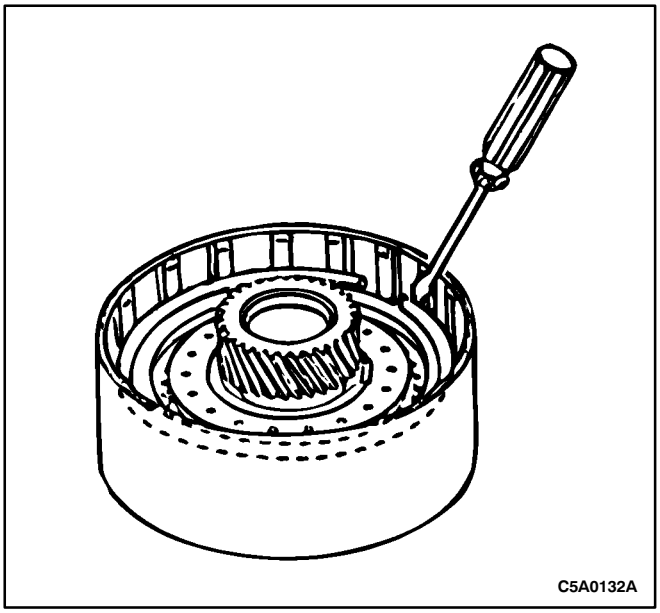

C5A0131A

Tools Required

KM-698 Spring Compressor

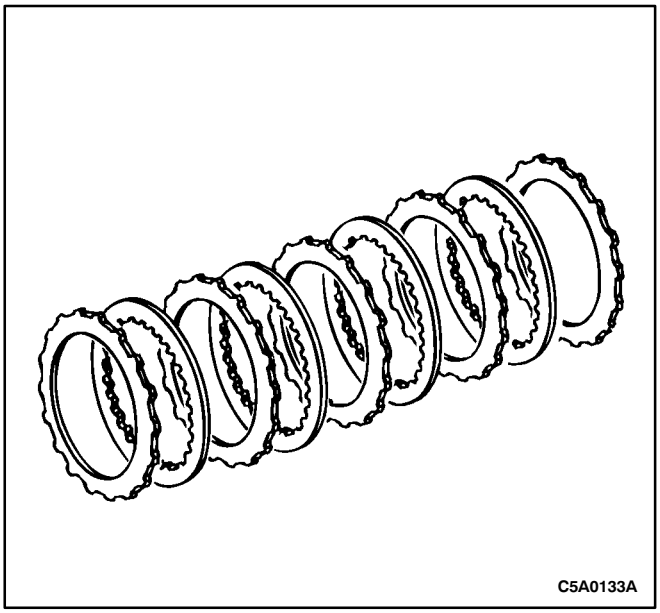
Disassembly Procedure

1. Remove the thrust washer.

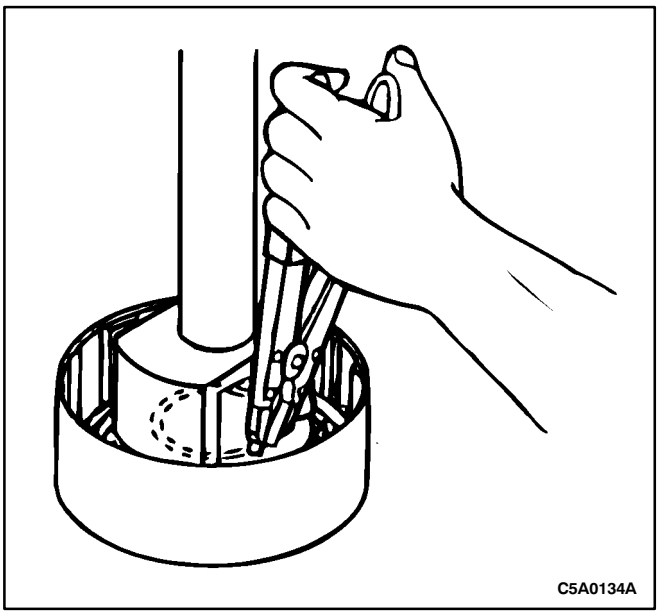

C5A0132A

WARNING: USE CAUTION WHEN REMOVING SNAP RINGS OR PERSONAL INJURY MAY RESULT.

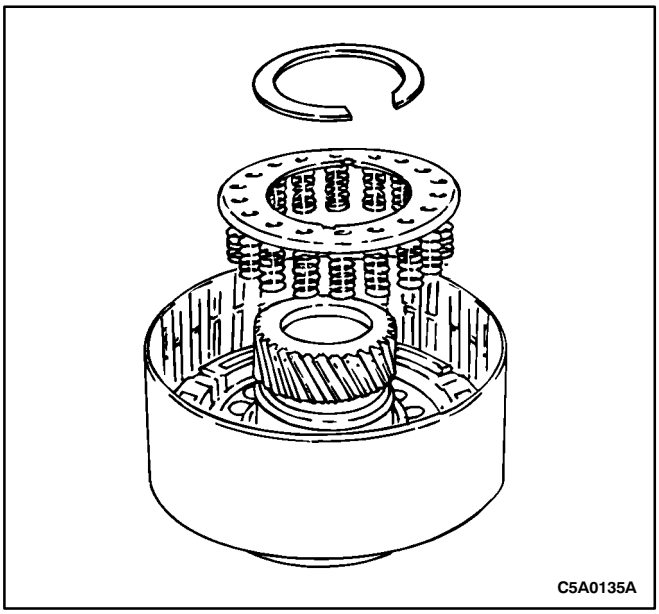
2. Carefully remove the snap ring.


C5A0133A

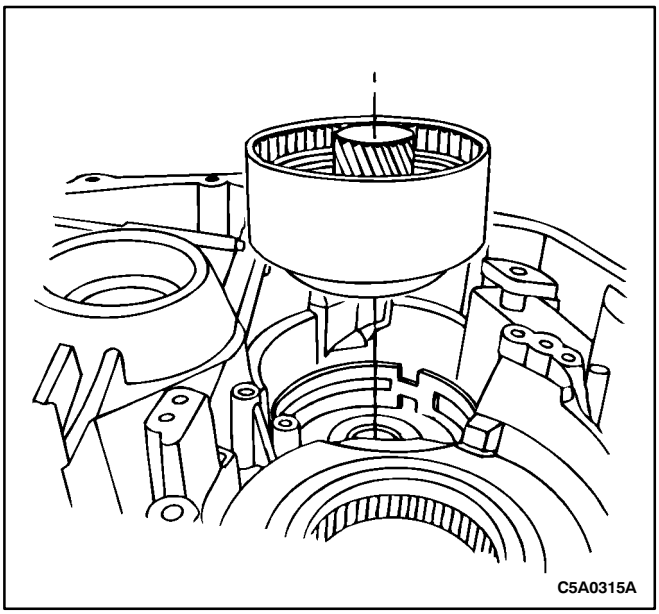
3. Remove the underdrive clutch pack.


C5A0134A

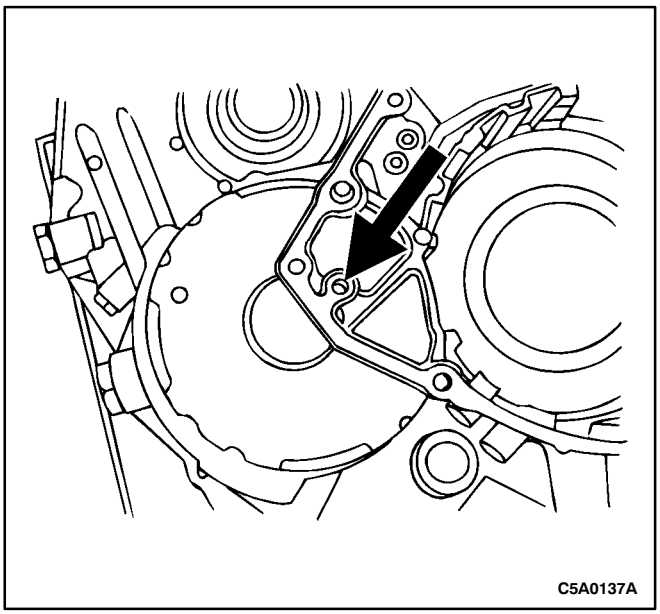
4. Position spring compressor KM-698 on the clutch piston return spring. Using a press, compress the springs, then remove the snap ring from the groove.


C5A0135A

5. Remove the snap ring and the clutch piston return spring.


C5A0315A

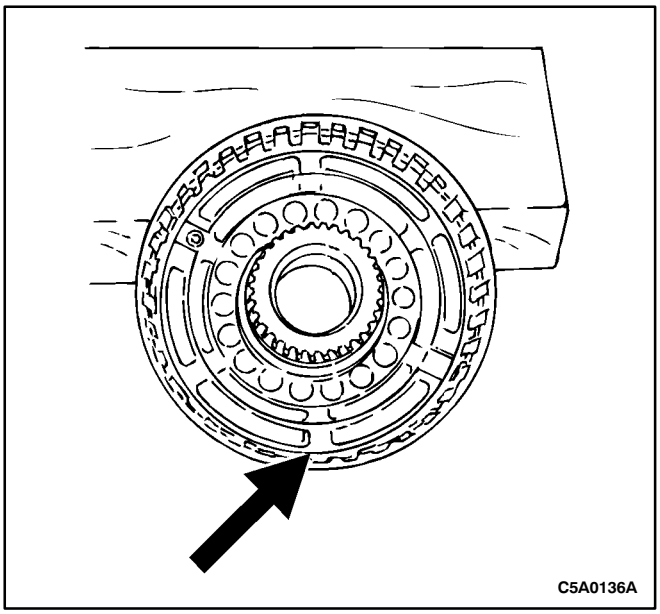
6. Install the underdrive drum into the transaxle case.


C5A0137A

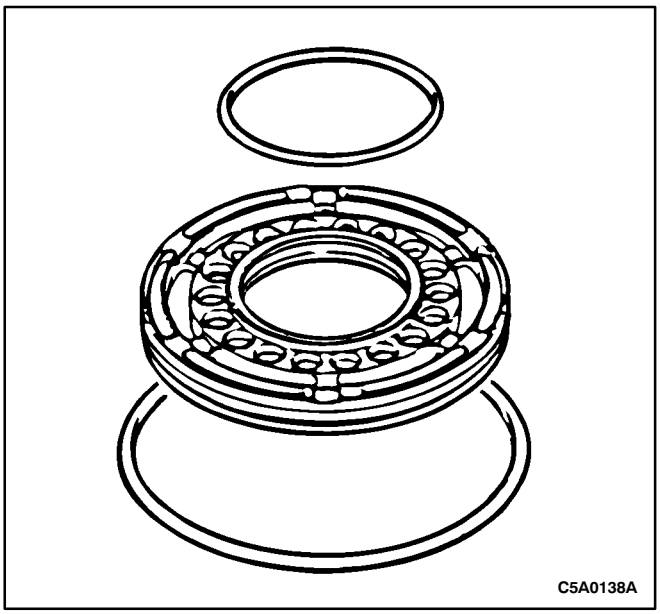
WARNING: USE CAUTION WHEN REMOVING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

Notice: If the piston does not come out completely, use needlenose pliers to remove.

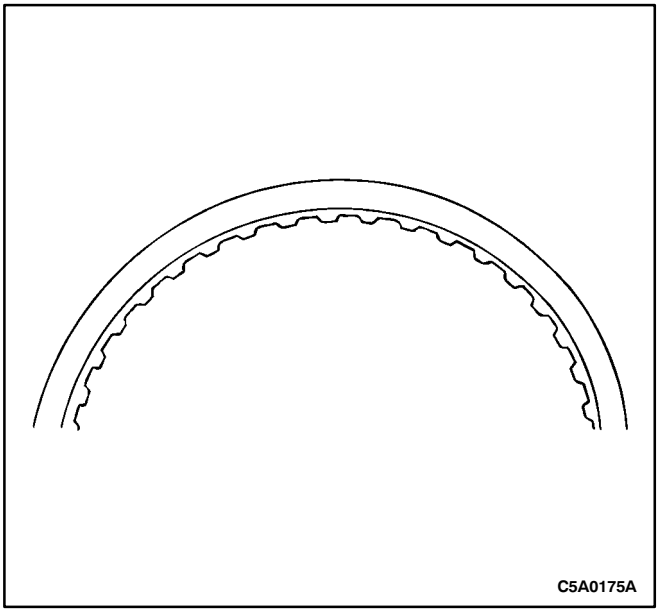
7. Apply 396 kPa (57 psi) of compressed air into the oil passage to remove the underdrive clutch piston.


C5A0136A

8. Remove the underdrive clutch piston.


C5A0138A

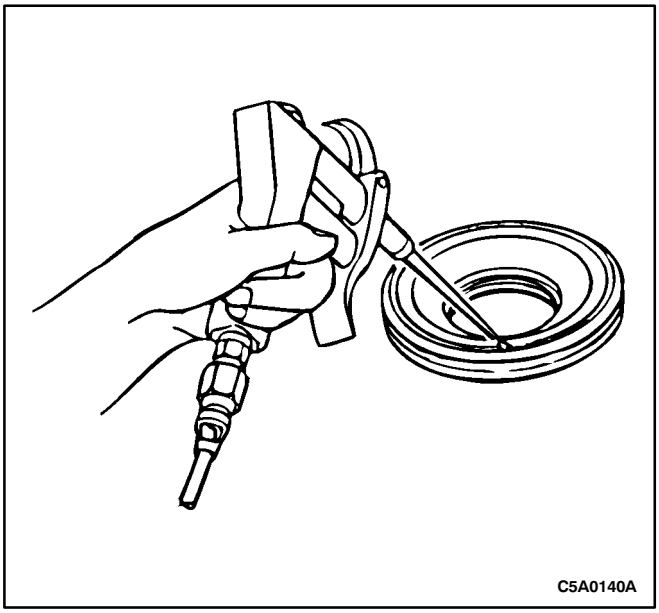
9. Remove and discard the underdrive clutch piston O-rings.


C5A0175A

Notice: Check the steel and friction plates for wear or damage. Replace as necessary.

Notice: New clutch plates should be soaked in TOTAL FLUID HX for two hours before being assembled.

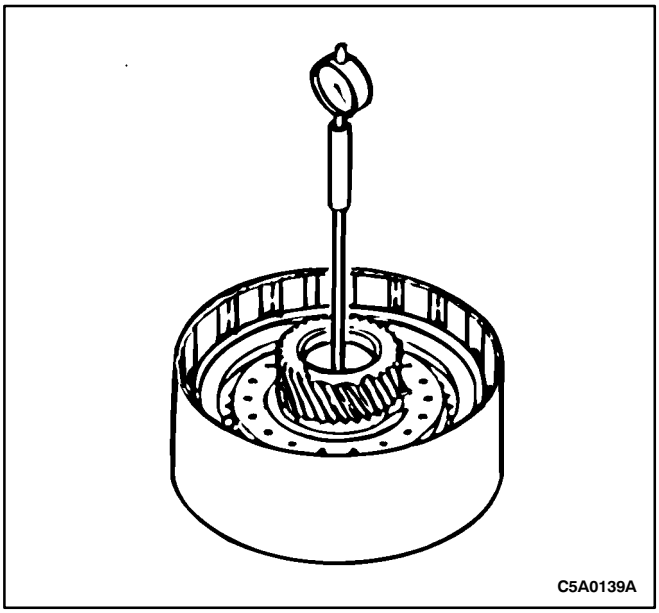
10. Inspect the clutch steel and friction plate surfaces.


C5A0140A

WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

11. Inspect the underdrive clutch piston.

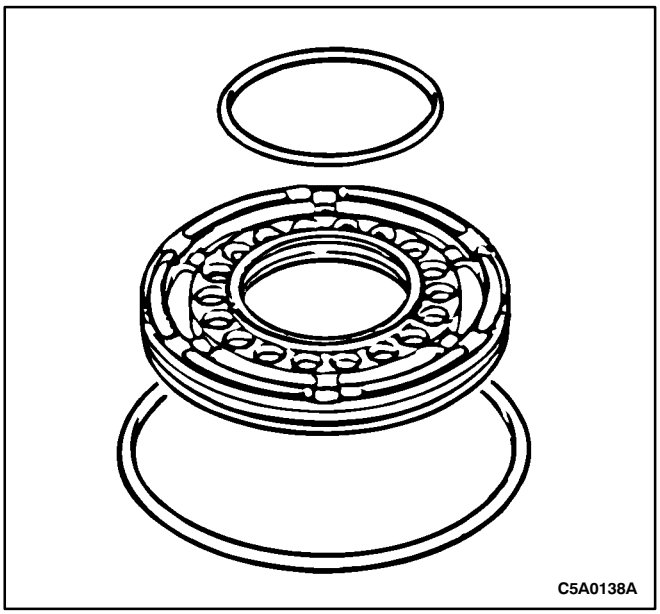
- Check that the valve does not leak by applying low-pressure compressed air.


C5A0139A

12. Inspect the underdrive drum.

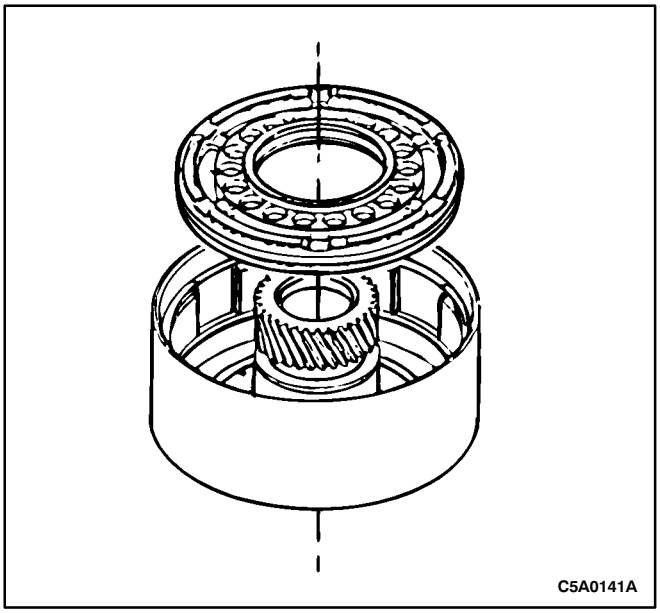
- Using a dial indicator, measure the inner diameter of the underdrive drum bushing. Measure the bushing at three different places and calculate the average. If it is greater than the maximum, replace the underdrive drum.

	Standard	Maximum
Front	28.5-28.525 mm (1.122-1.123 in)	28.570 mm (1.124 in)
Rear	28.5-28.525 mm (1.122-1.123 in)	28.570 mm (1.124 in)



Assembly Procedure

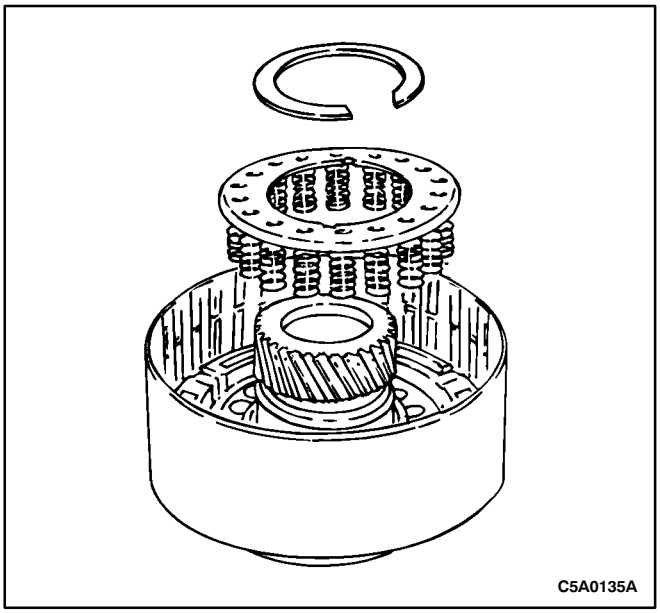
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Install new underdrive clutch piston O-rings.



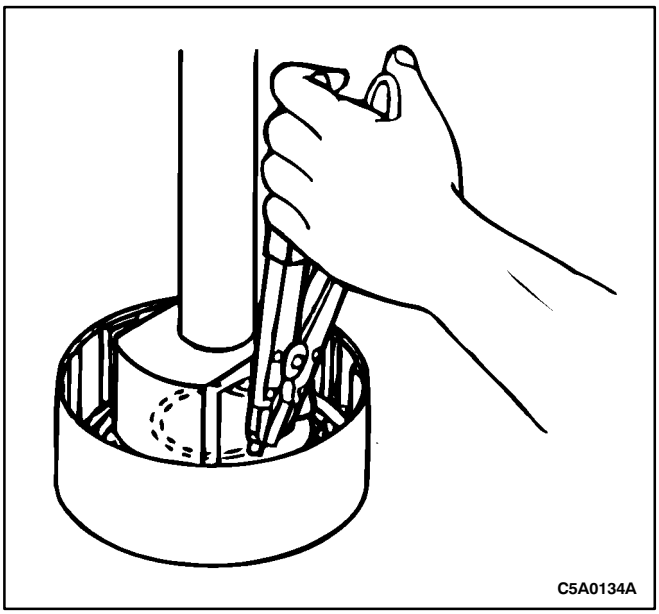
Notice: Apply TOTAL FLUID HX to the new underdrive clutch piston O-rings and the drum seal area.

Notice: Seat the piston by pushing evenly around the circumference of the piston, being careful not to damage the outer seal.

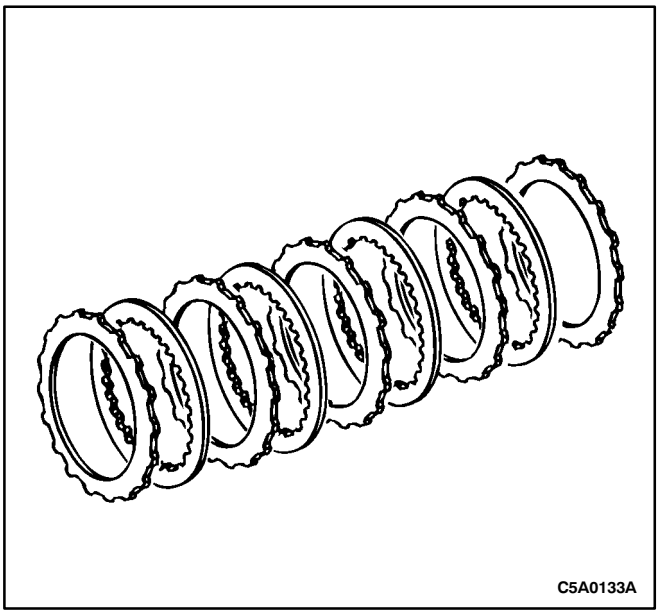
3. Install the underdrive clutch piston into the underdrive drum.



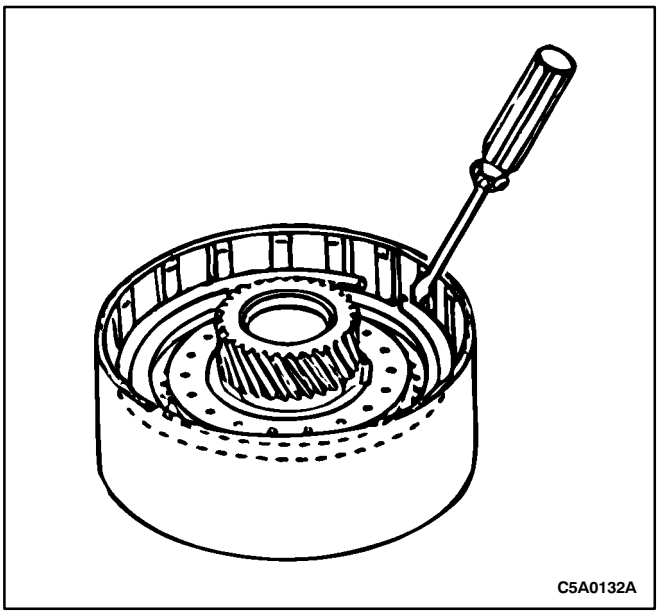
4. Install the clutch piston return spring on the underdrive piston.


C5A0134A

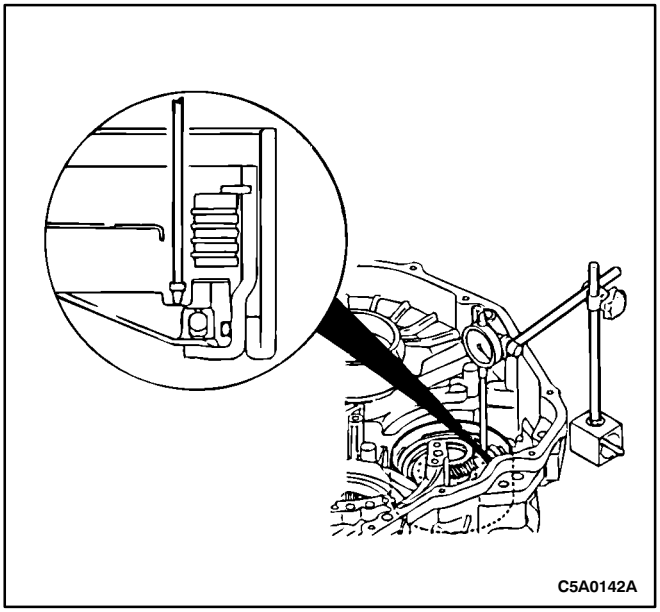
5. Position spring compressor KM-698 on the clutch piston return spring. Using a press, compress the springs, then install the snap ring into the groove.


C5A0133A

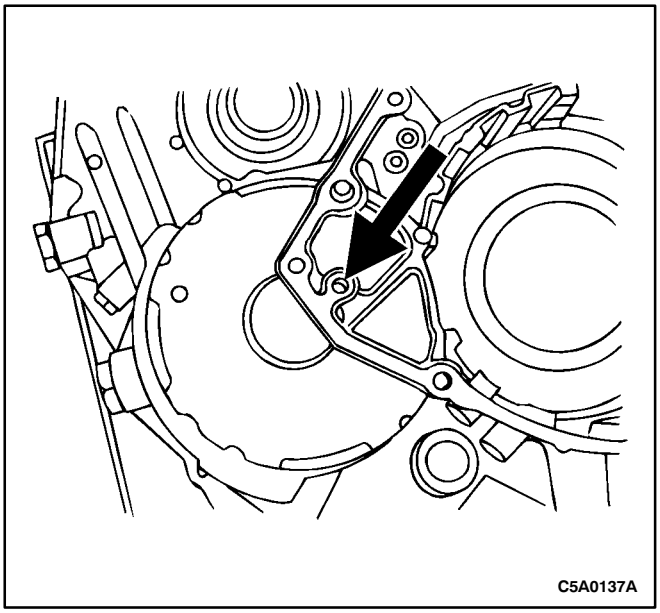
6. Install the underdrive clutch pack and the clutch pressure plate.
   - The installation order is: steel-friction-steel-friction-steel-friction-steel-friction
   - Install the pressure plate with the flat end facing upward.


C5A0132A

7. Install the snap ring into the groove.

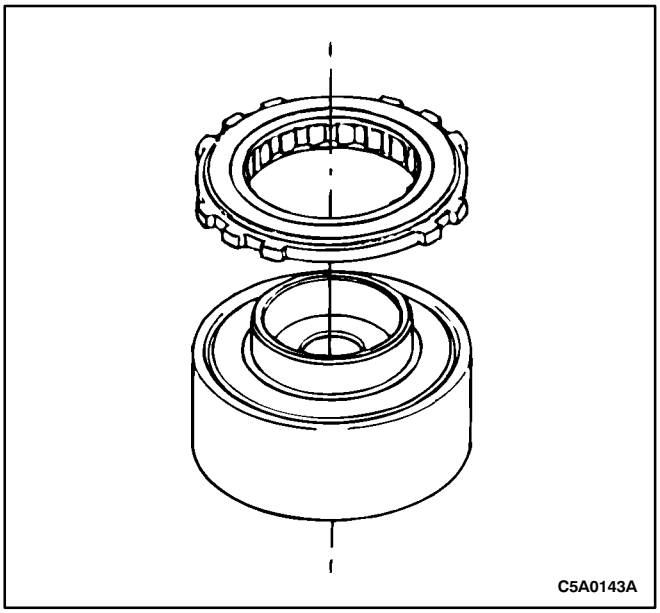

C5A0142A

8. Check the underdrive clutch operation.
   - Install the underdrive clutch assembly into the transaxle case.
   - Install a dial indicator.

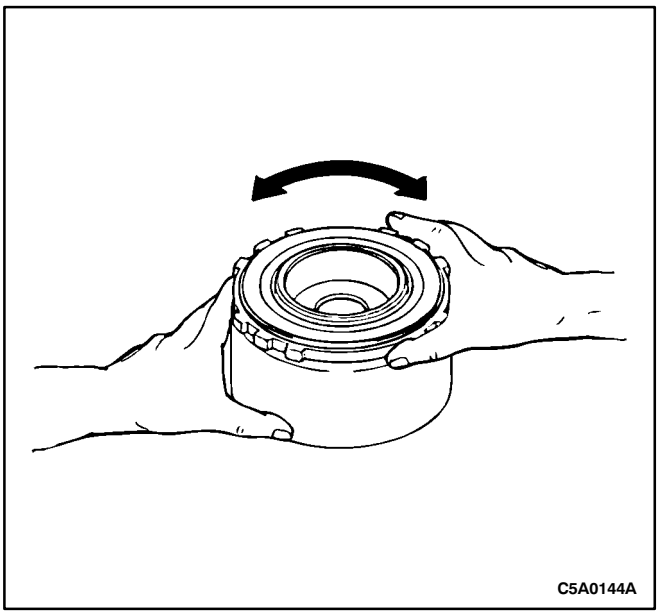

C5A0137A

WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR PERSONAL INJURY MAY RESULT.

9. Apply 396 kPa (57 psi) of compressed air into the oil passage shown. Measure the underdrive clutch piston stroke.
   - The piston stroke is 1.52-1.890 mm (.060-.074 in). The clutch should make a solid apply sound, with no whistle or sign of leaks.

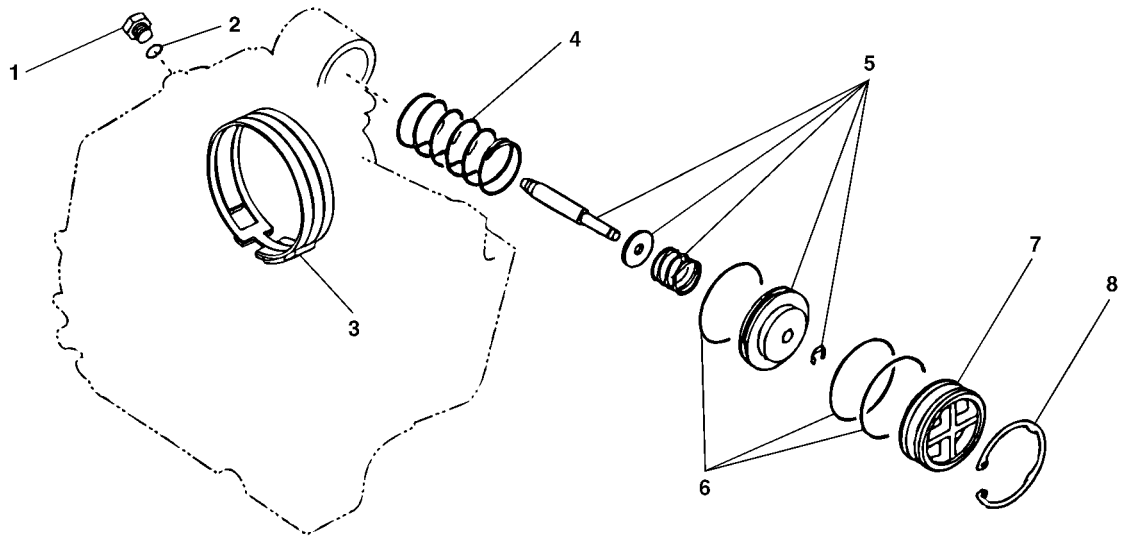

C5A0143A

10. Install the one-way clutch onto the underdrive clutch drum.



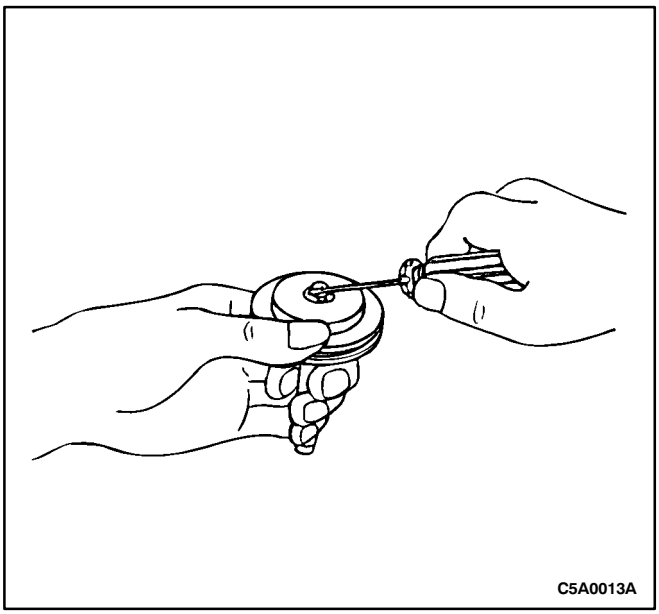
11. Verify the operation of the one-way clutch. While holding the outer race, turn the underdrive clutch. The underdrive clutch should rotate smoothly when turned counterclockwise and locks when turned clockwise.

UNDERDRIVE BRAKE



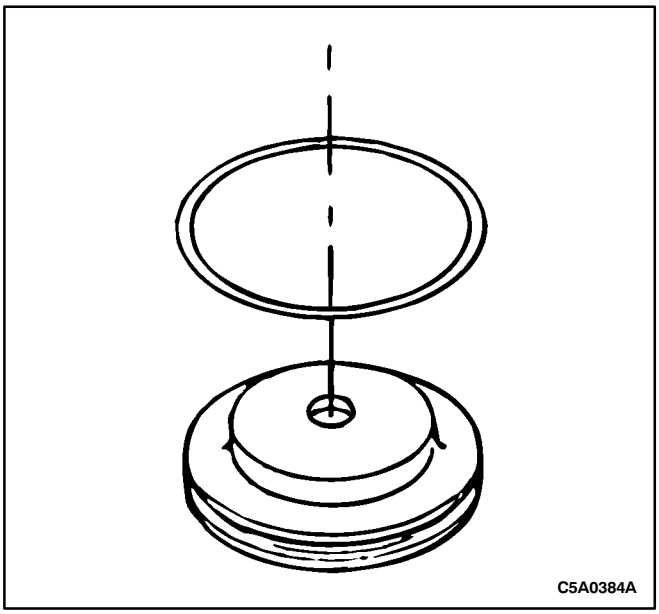
C5A0012A

1. Underdrive Brake Bolt
2. Underdrive Brake Bolt O-Ring
3. Underdrive Brake Band
4. Underdrive Brake Spring
5. Underdrive Brake Piston
6. O-Rings
7. Underdrive Brake Cover
8. Snap Ring

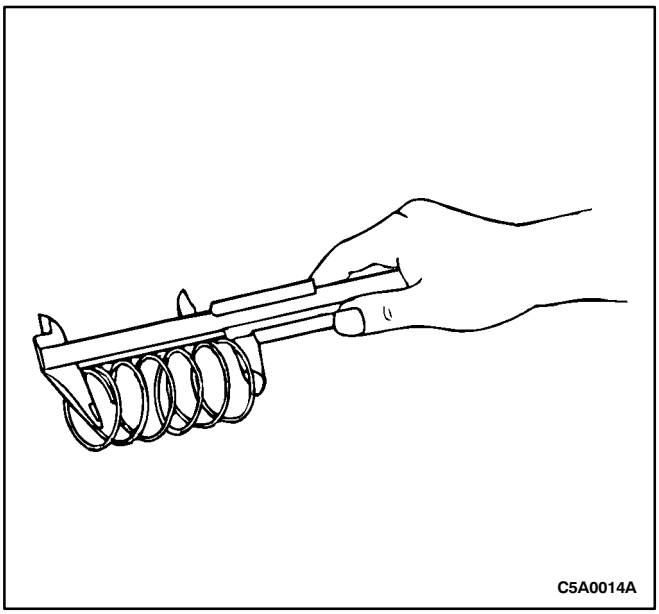

C5A0013A

Disassembly Procedure

1. Remove and discard the snap ring from the underdrive brake piston assembly. Separate the spring, washer and piston rod.

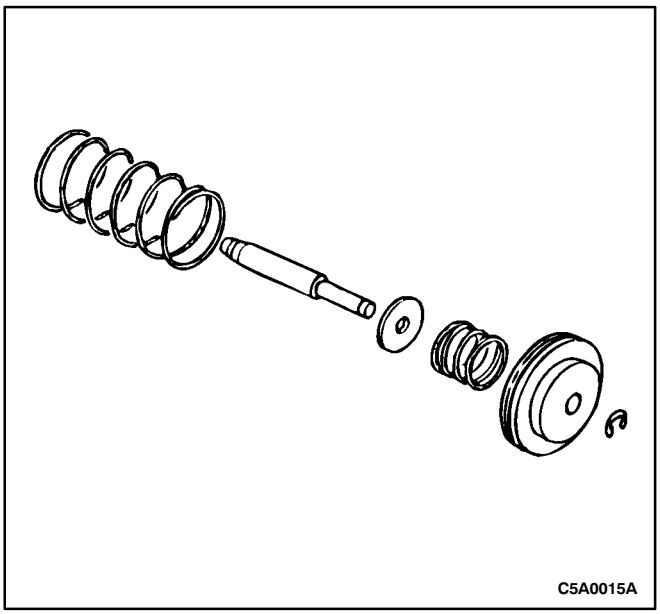

C5A0384A

2. Remove and discard the underdrive brake piston O-ring.


C5A0014A

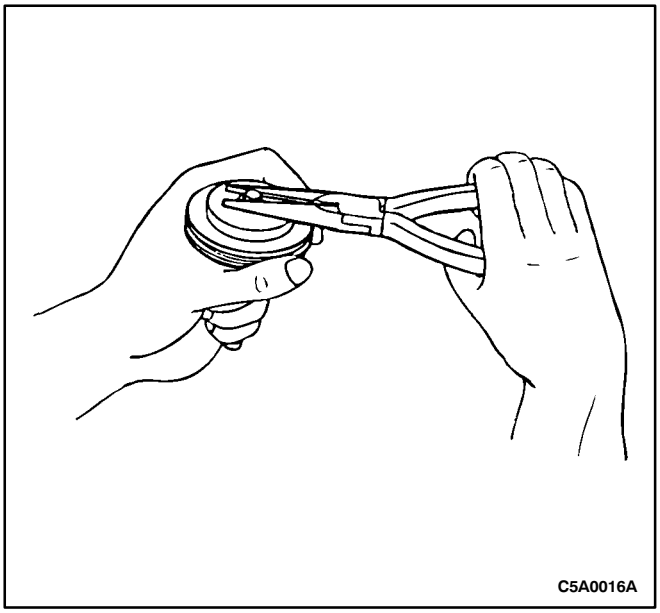
3. Inspect the underdrive brake spring.
   - Using vernier calipers, measure the free length and outer diameter of the spring. If it does not meet specifications, replace it.

	Free length	Outer Diameter
Inner	17.500 mm (0.68 in)	19.500 mm (0.77 in)
Outer	63.200 mm (2.49 in)	29.700 mm (1.17 in)


C5A0015A

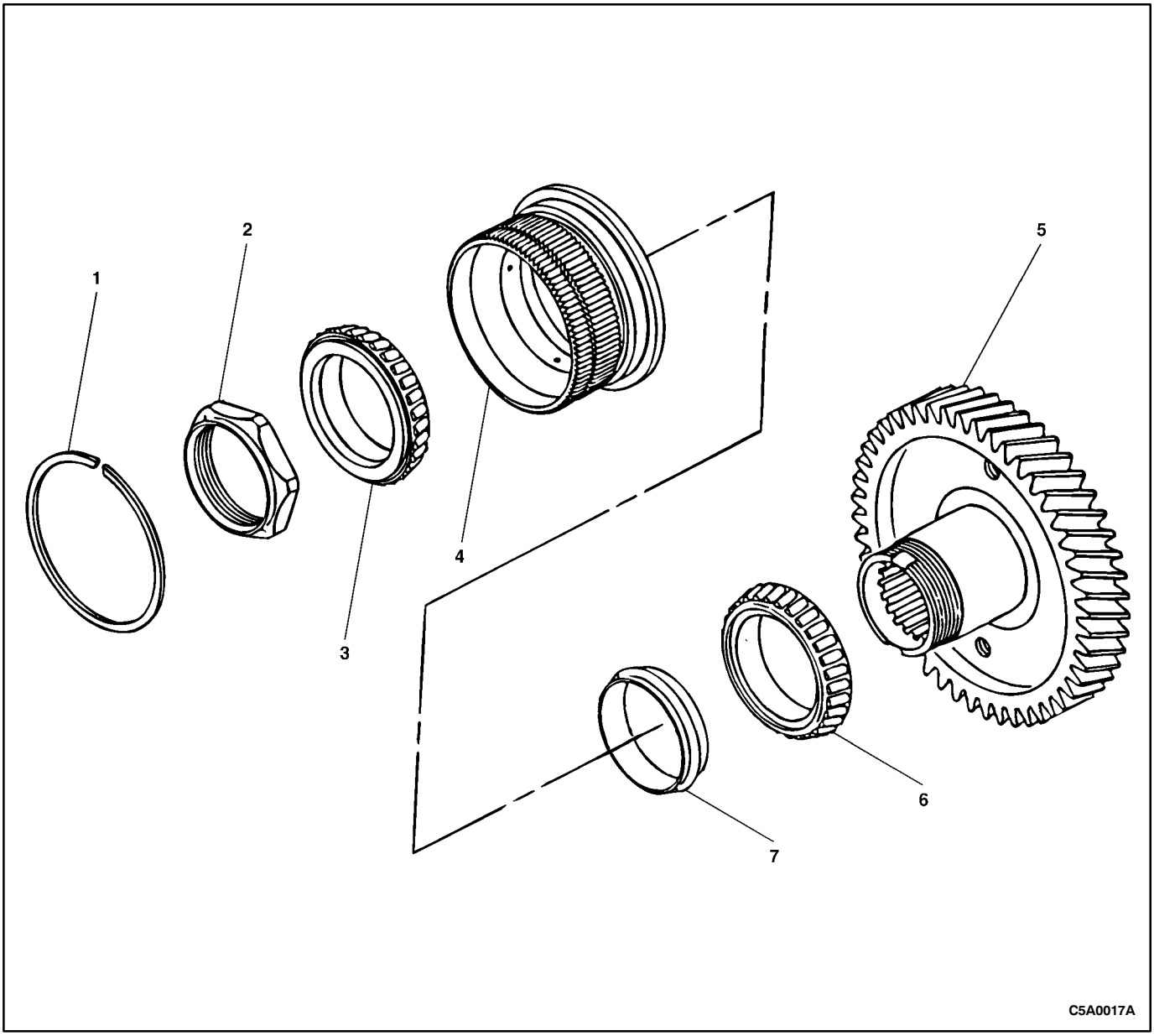
Assembly Procedure

1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Assemble the piston rod, washer and compression spring to the piston.

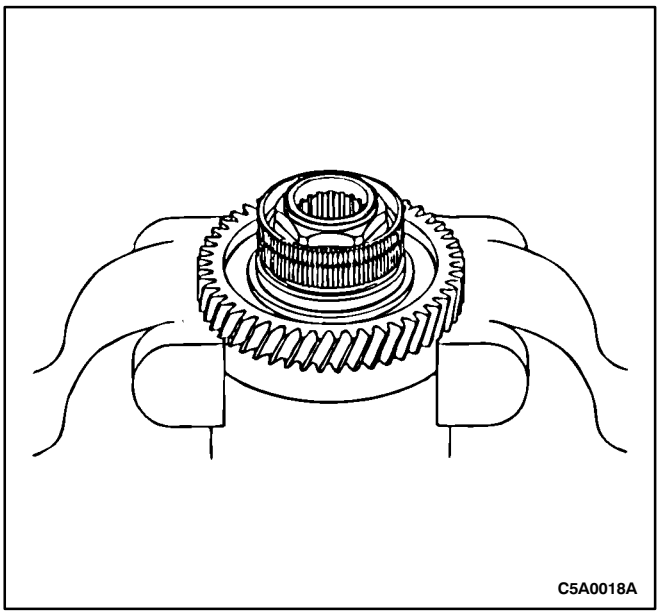

C5A0016A

3. Install a new snap ring.

COUNTER DRIVE GEAR



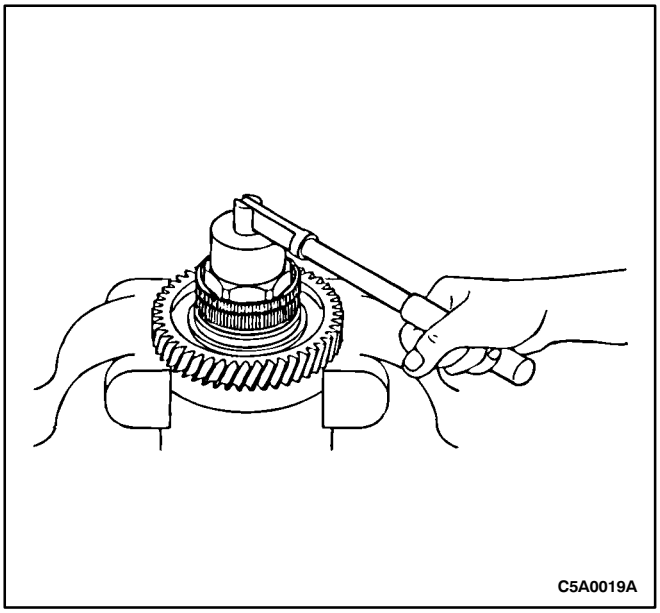
1. Snap Ring (Tapered)
2. locknut
3. Bearing
4. Bearing race
5. Counter Drive Gear
6. Bearing
7. Spacer
8. Snap Ring


C5A0018A

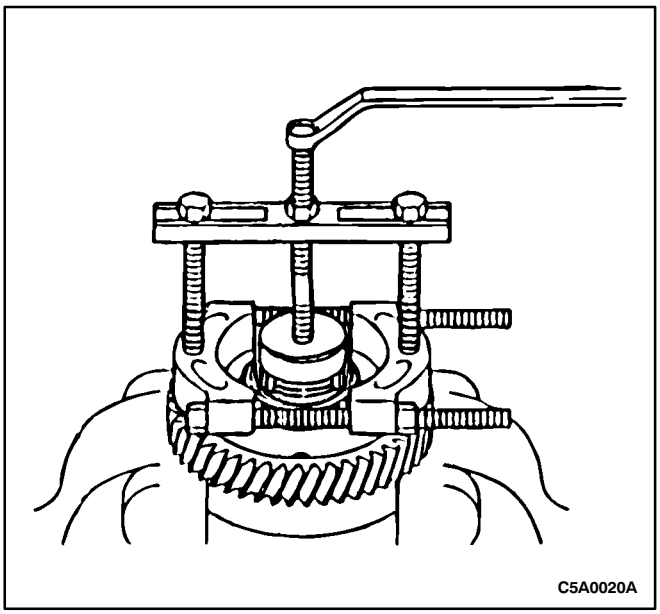
Disassembly Procedure

Caution: Use wood blocks or a brass jaw vise to prevent damage to the counter drive gear.

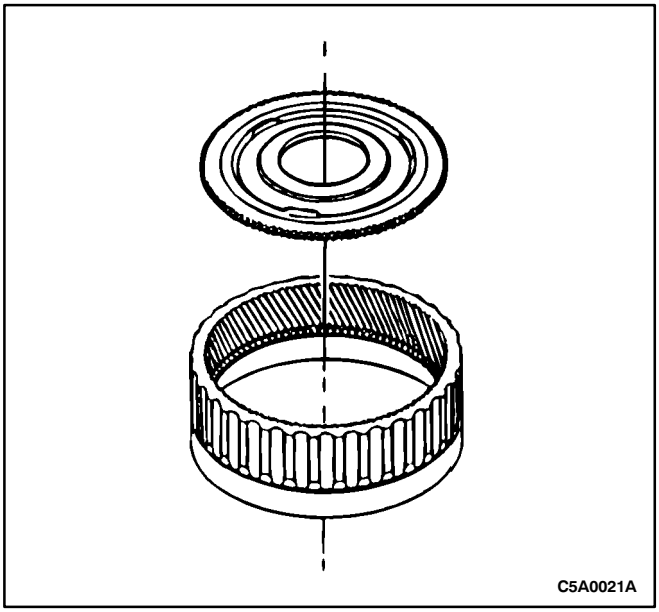
1. Install the counter drive gear into a vise.


C5A0019A

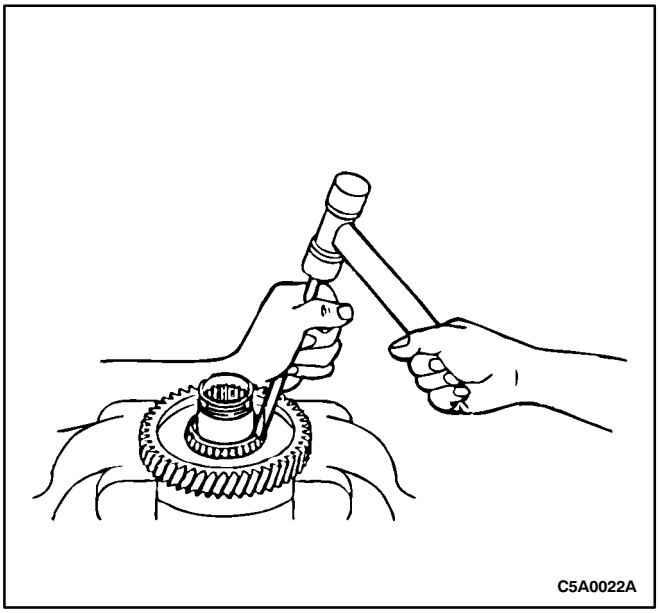
2. Remove and discard the locknut.


C5A0020A

3. Using a suitable bearing puller, remove the bearing.

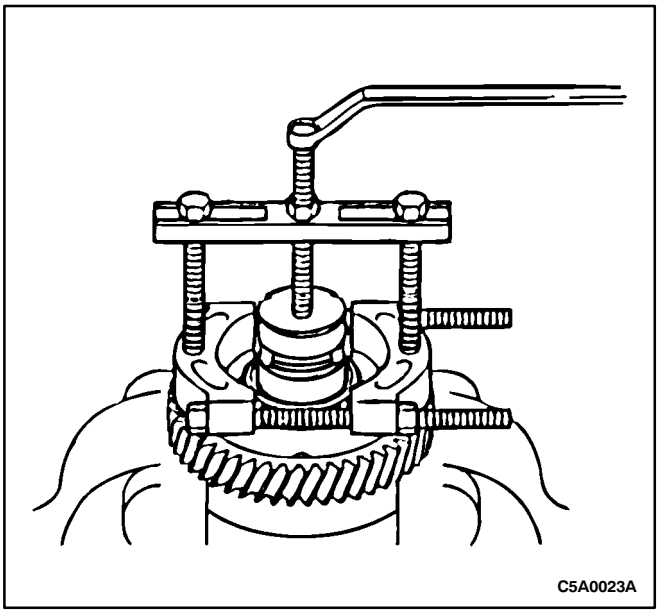


4. Remove bearing race and the spacer.

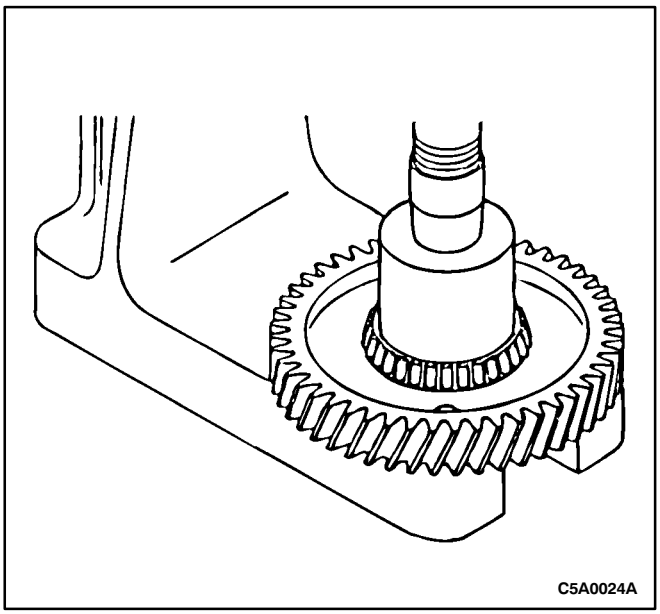


WARNING: USE CAUTION WHEN USING A CHISEL TO REMOVE COMPONENTS OR PERSONAL INJURY MAY RESULT.

5. Using a chisel, carefully remove the bearing cage and rollers.

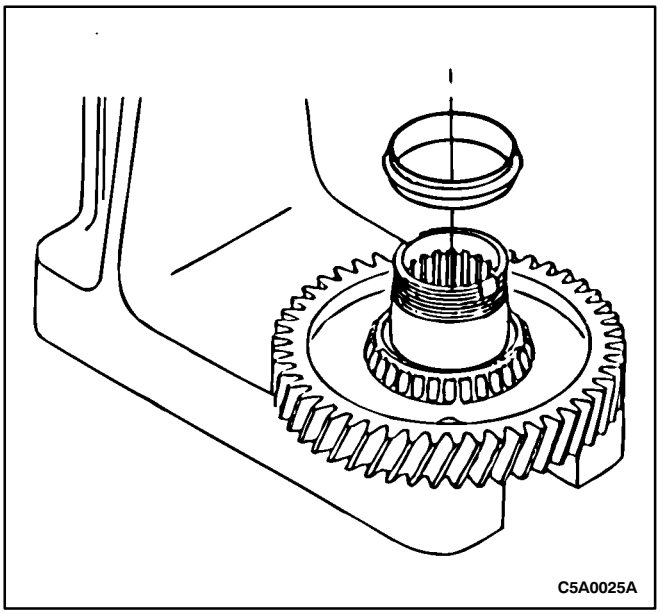


6. Using a suitable bearing puller, remove the bearing race.

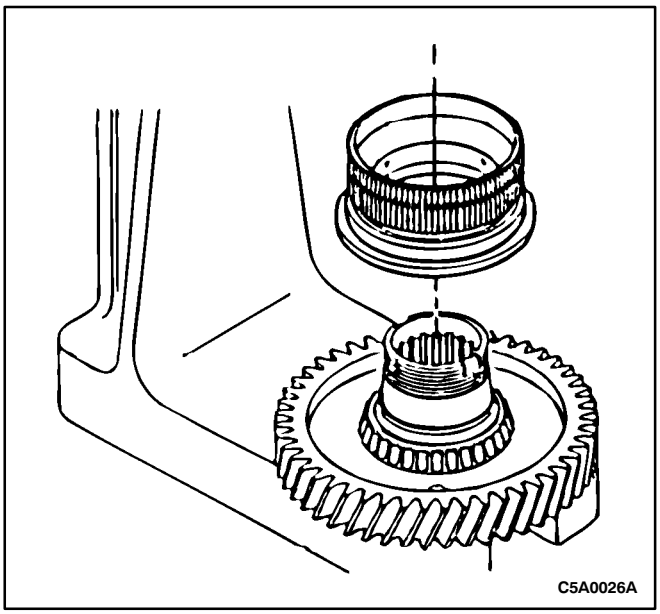


Assembly Procedure

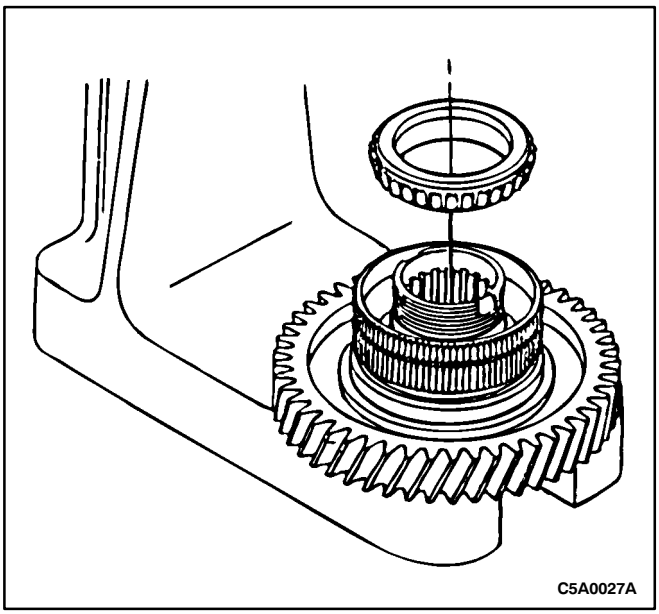
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Using a press, install a new inner bearing on the counter drive gear.



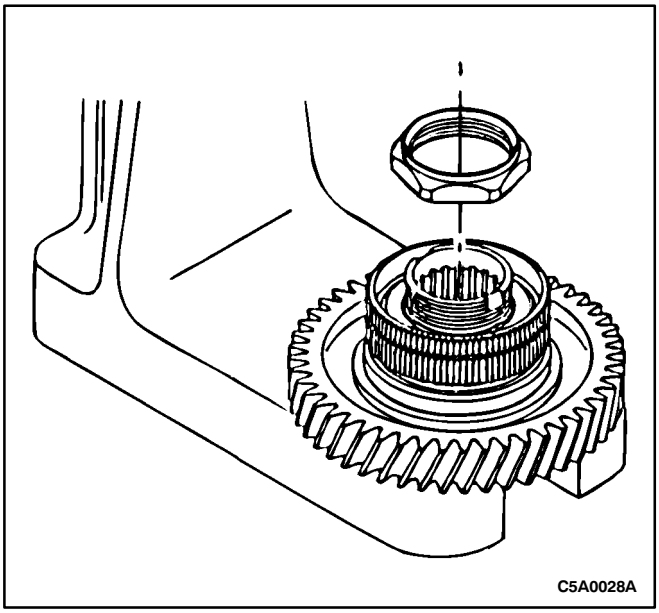
3. Install a new spacer.



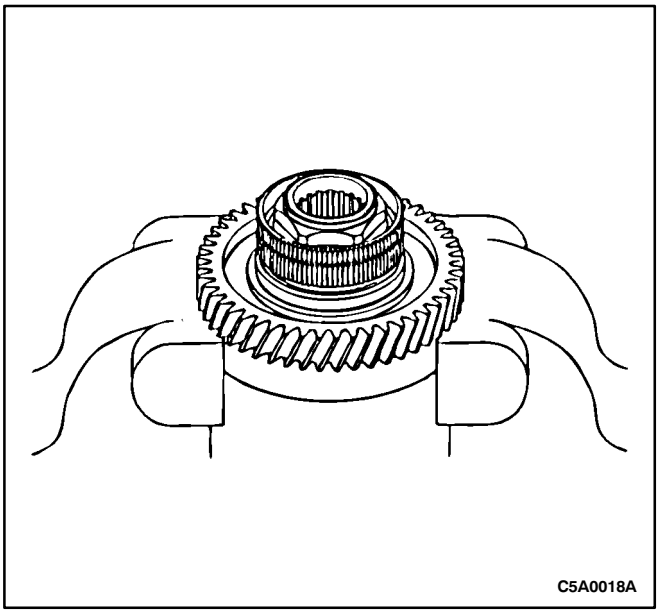
4. Install the bearing race.



5. Using a press, install a new bearing until the bearing touches the spacer.

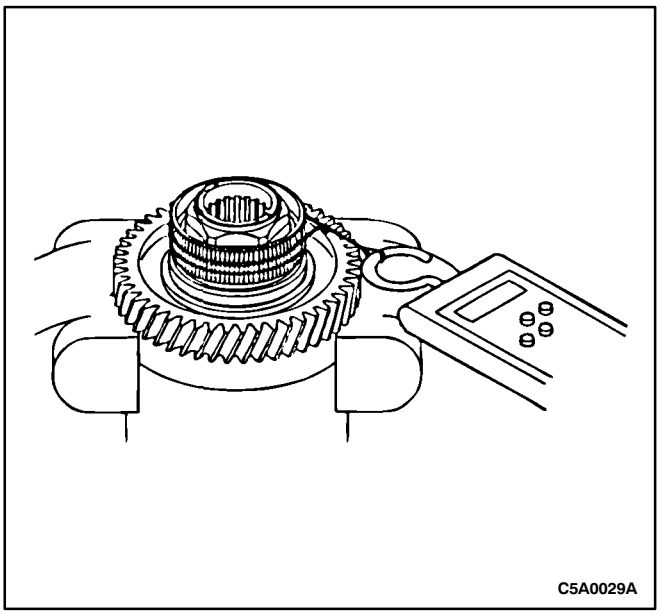


6. Install a new locknut. Do not tighten at this time.



Caution: Use wood blocks or a brass jaw vise to prevent damage to the counter drive gear.

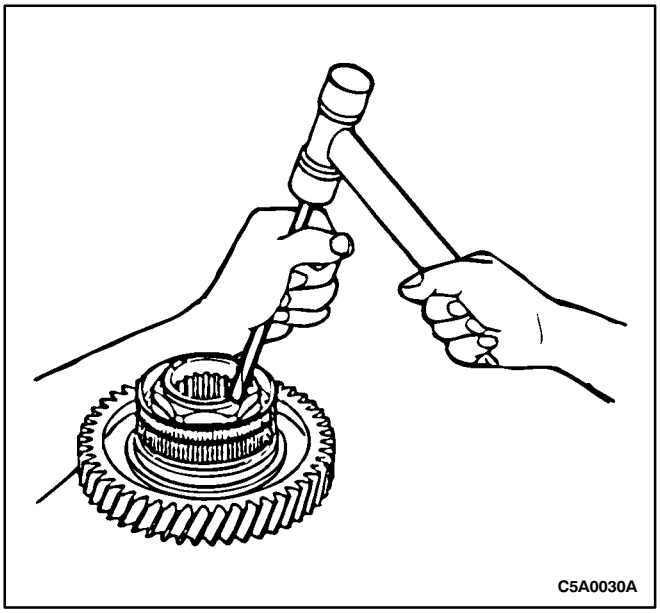
7. Install the counter drive gear into a vise.


C5A0029A

Notice: Seat the bearing by turning the counter drive gear in both directions before measuring the torque.

Notice: Measure the starting torque three times and calculate the average. If the torque is not within specification, replace the spacer.

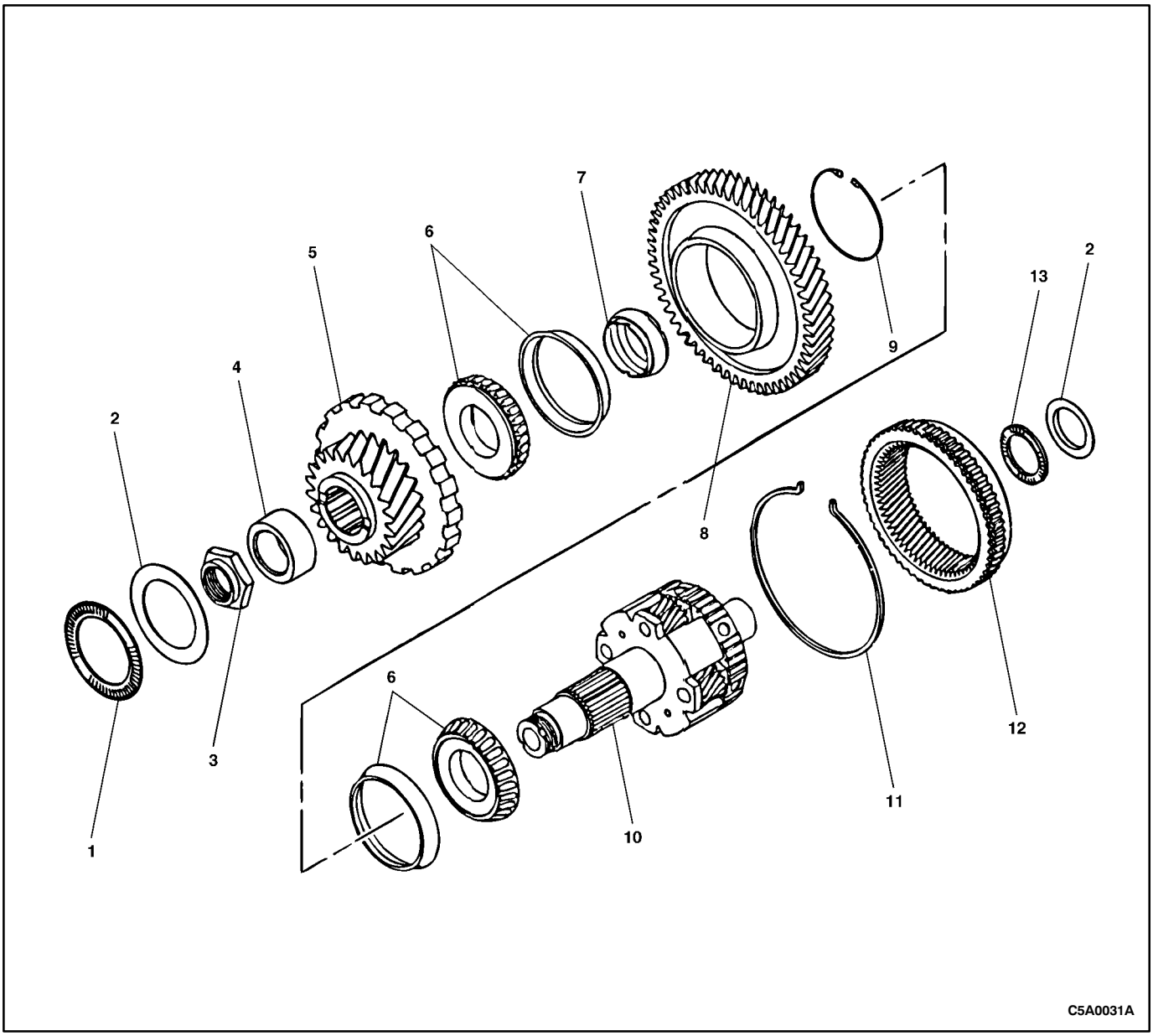
8. Tighten the locknut until the starting torque is .294-.784 N•m (3-7 lb-in).


C5A0030A

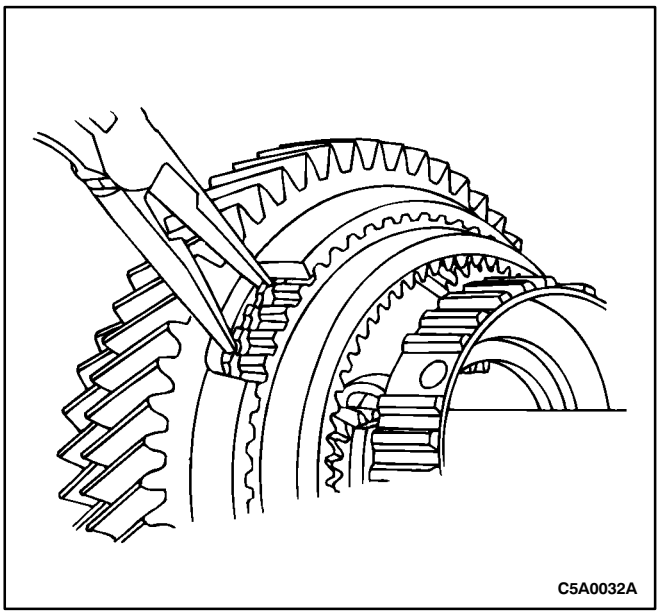
WARNING: USE CAUTION WHEN STAKING COMPONENTS WITH A CHISEL OR PERSONAL INJURY MAY RESULT.

9. Using a chisel, stake the locknut into the groove in two spots.

UNDERDRIVE PLANETARY GEAR AND DIFFERENTIAL DRIVE PINION GEAR



1. Thrust Bearing
2. Thrust Washer
3. locknut
4. Drive Pinion Gear Inner Bearing
5. Differential Drive Pinion Gear
6. Bearing and Race (Tapered)
7. Spacer
8. Counter Driven Gear
9. Snap Ring
10. Underdrive Planetary Gear
11. Snap Ring
12. Underdrive Planetary Ring Gear
13. Thrust Bearing


C5A0032A

Tools Required

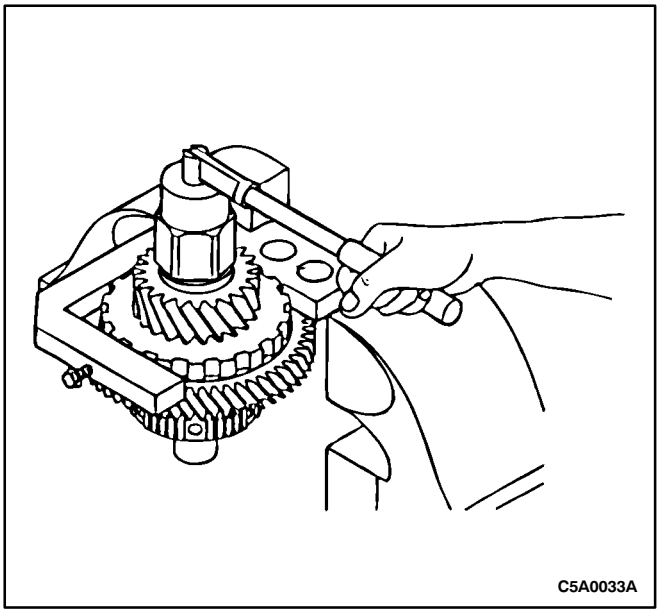
KM-696 Gear Holder

KM-697 Bearing Installer

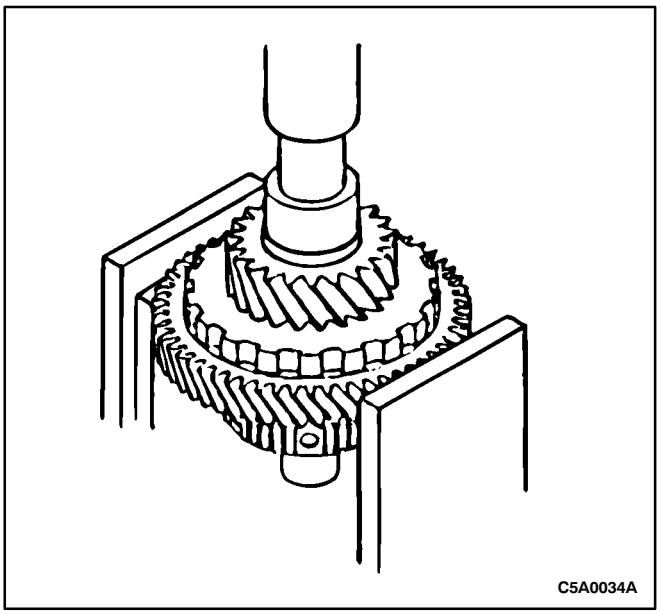
KM-695 Bearing Installer

Disassembly Procedure

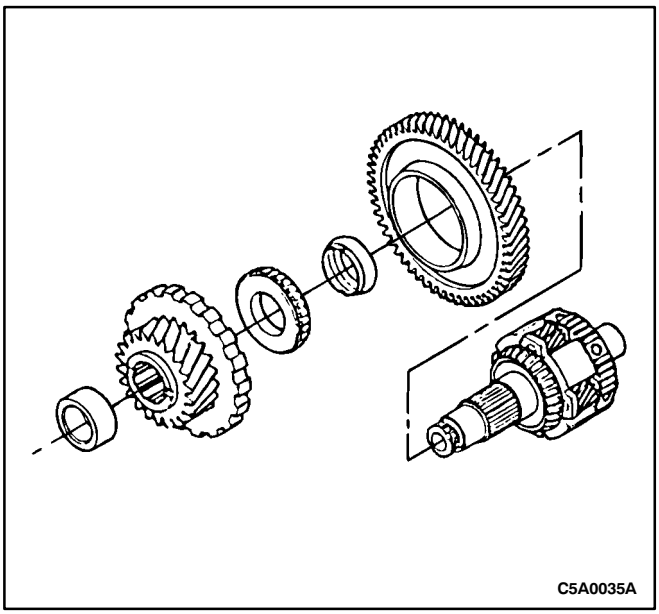
1. Compress the snap ring and remove the underdrive planetary ring gear.


C5A0033A

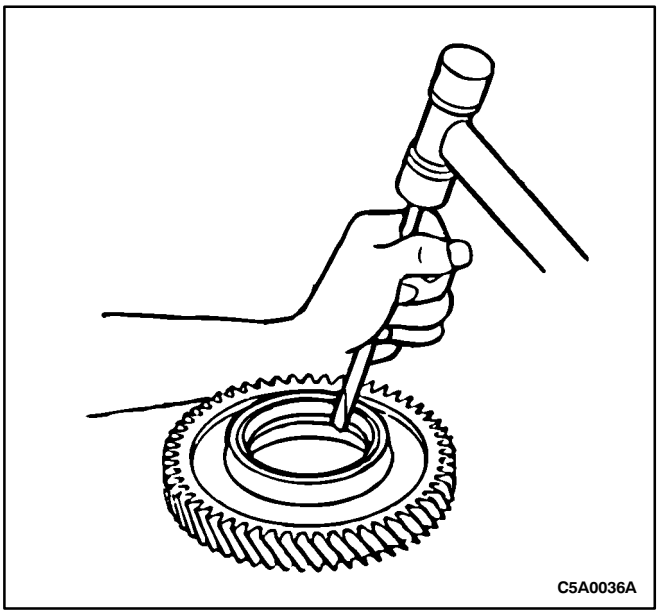
2. Using gear holder KM-696, install the gear assembly and gear holder in a vise. Remove and discard the locknut.


C5A0034A

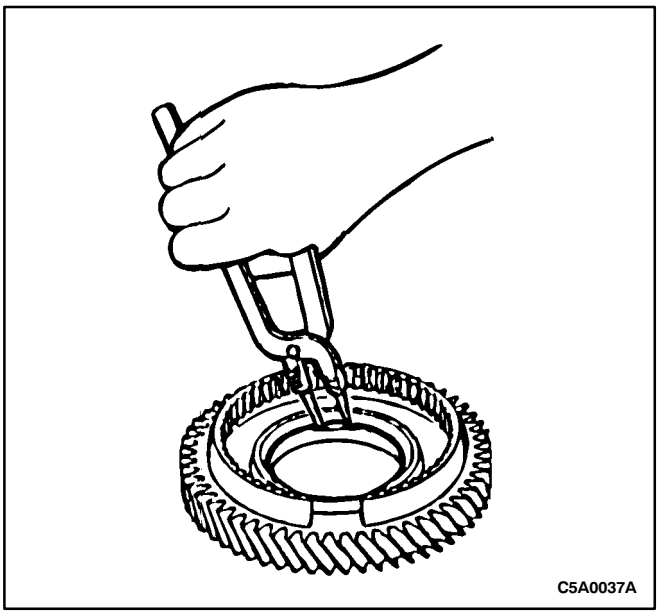
3. Install the gear assembly on a press.


C5A0035A

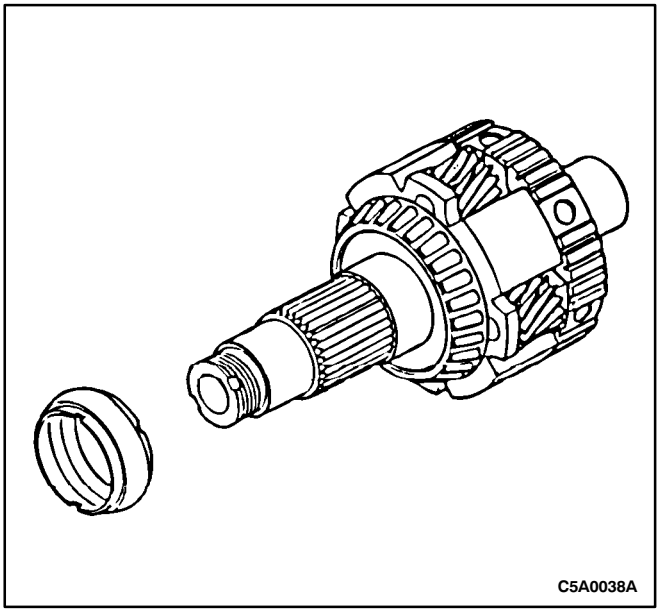
4. Press out the drive pinion gear inner bearing, differential drive pinion gear, bearing, spacer and counter driven gear.


C5A0036A

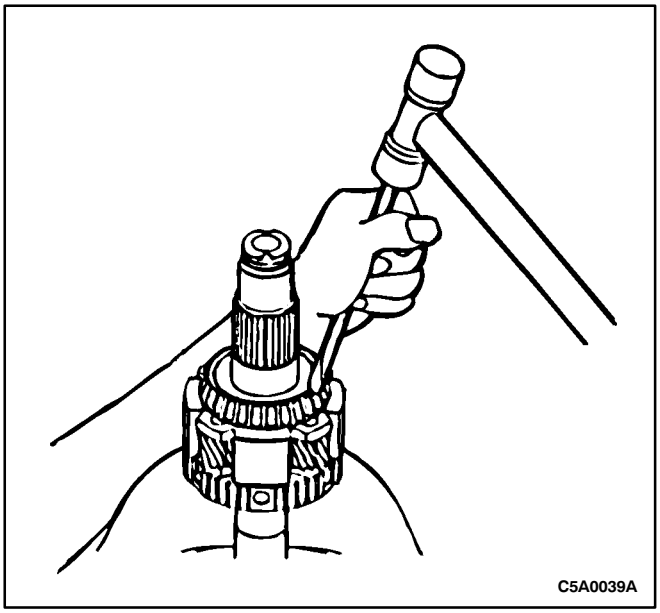
5. Remove the bearing races from the counter driven gear.


C5A0037A

6. Remove the snap ring.

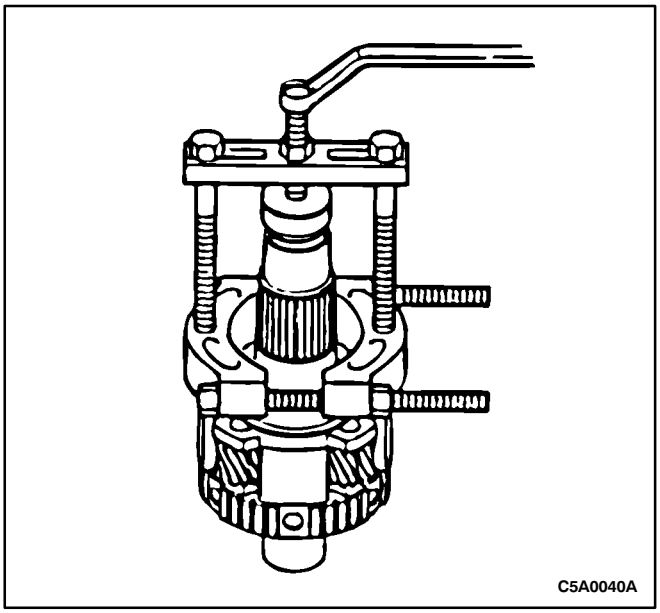

C5A0038A

7. Remove the spacer.

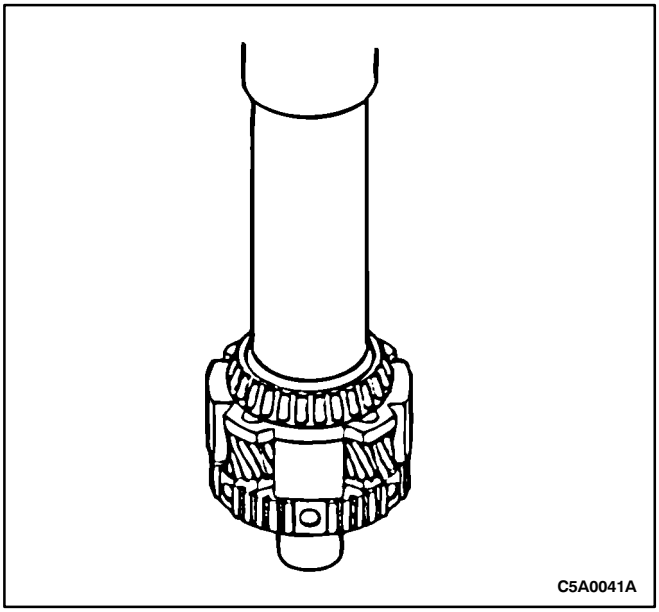

C5A0039A

WARNING: USE CAUTION WHEN USING A CHISEL TO REMOVE COMPONENTS OR PERSONAL INJURY MAY RESULT.

8. Using a chisel and hammer, carefully remove the bearing cage and rollers.
   - Be careful not to damage the underdrive planetary gear.


C5A0040A

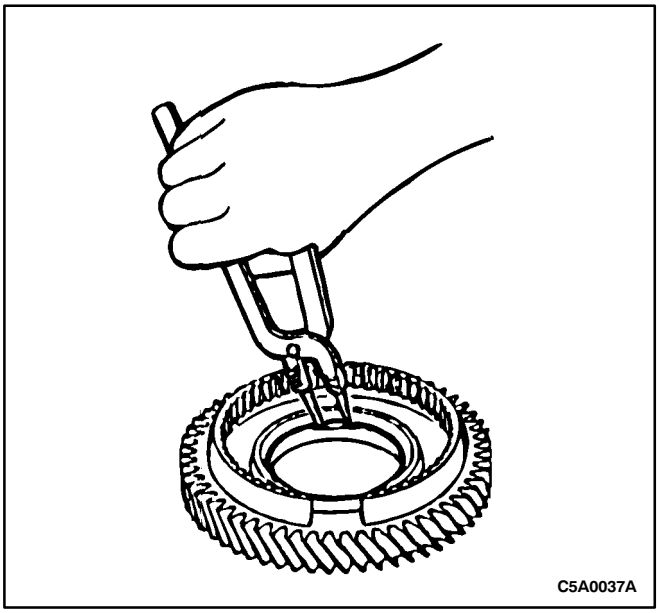
9. Using a suitable bearing puller, remove the bearing race from the underdrive planetary gear.


C5A0041A

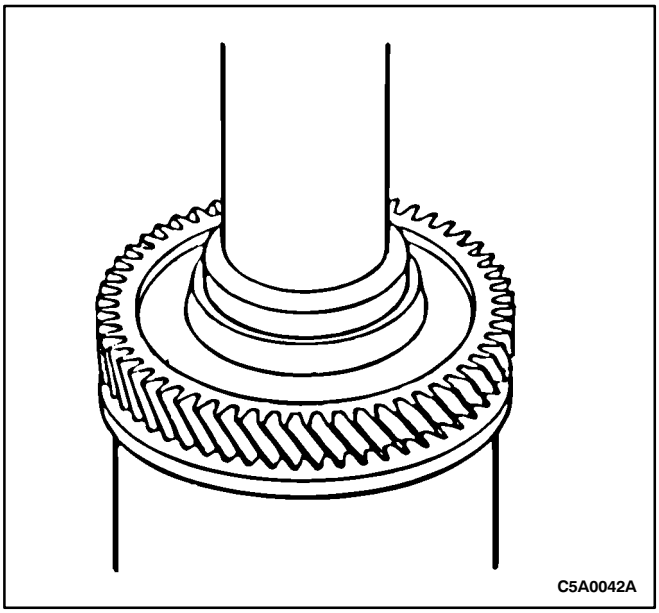
Assembly Procedure

Notice: Press the bearing until it touches the shaft

1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Using bearing installer KM-697, press a new bearing on the rear of the underdrive planetary gear.

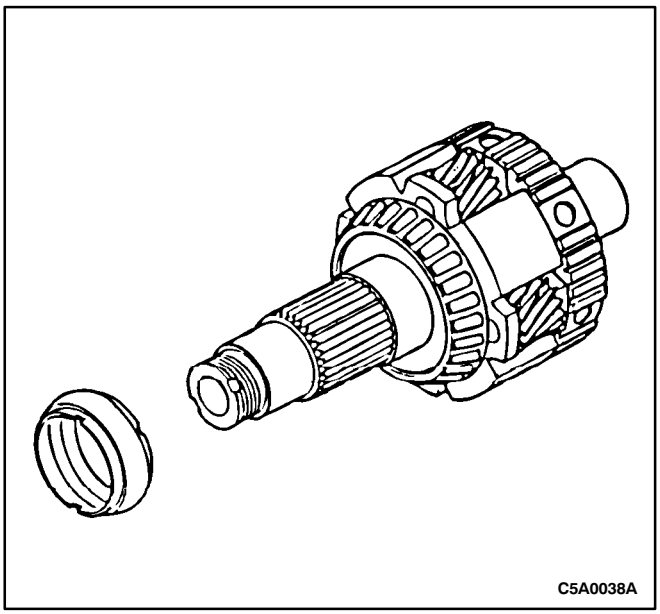

C5A0037A

3. Install the snap ring into the counter driven gear.

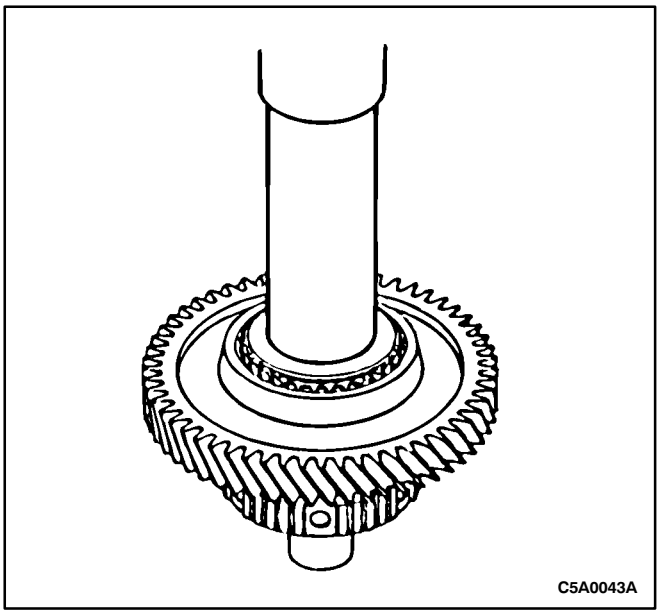

C5A0042A

Notice: Press the bearing races into the counter driven gear until they touch the snap ring.

4. Using bearing installers KM-697 and KM-695, press the bearing races into the counter driven gear.

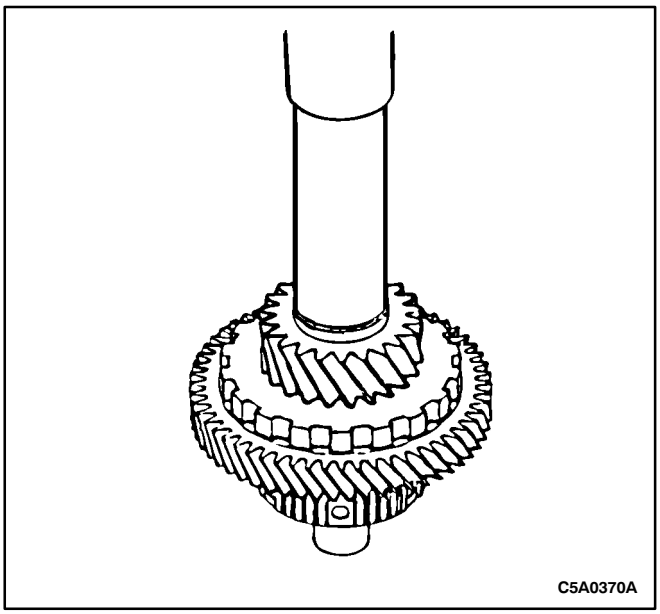

C5A0038A

5. Install the spacer.
6. Install the counter driven gear.


C5A0043A

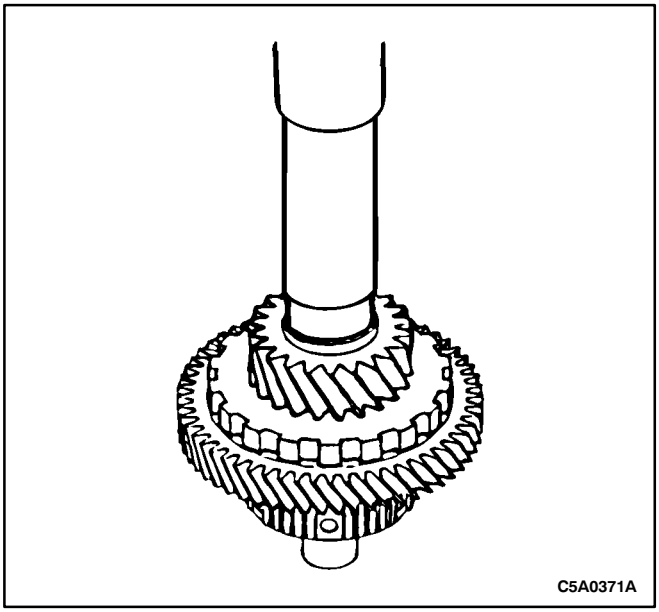
Notice: Press the new bearing until it touches the underdrive planetary gear.

7. Using bearing installer KM-697, press a new bearing onto the front of the underdrive planetary gear.


C5A0370A

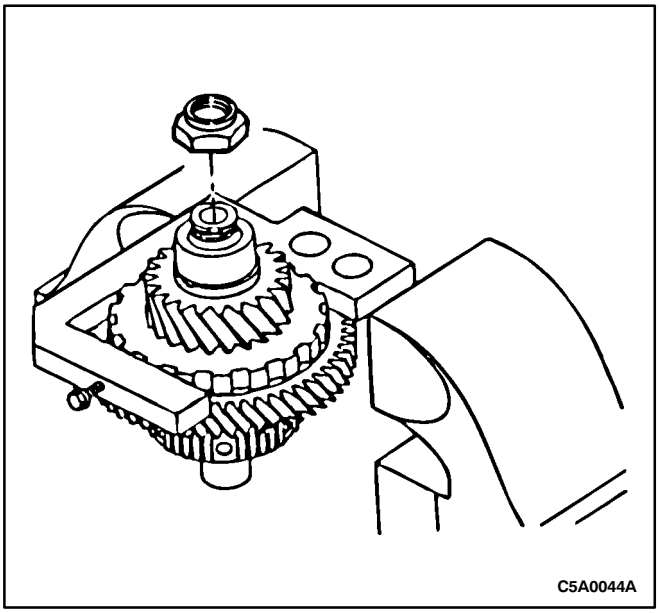
Notice: Press the differential drive pinion gear until it touches the underdrive planetary gear.

8. Using bearing installer KM-697, press the differential drive pinion gear onto the underdrive planetary gear.

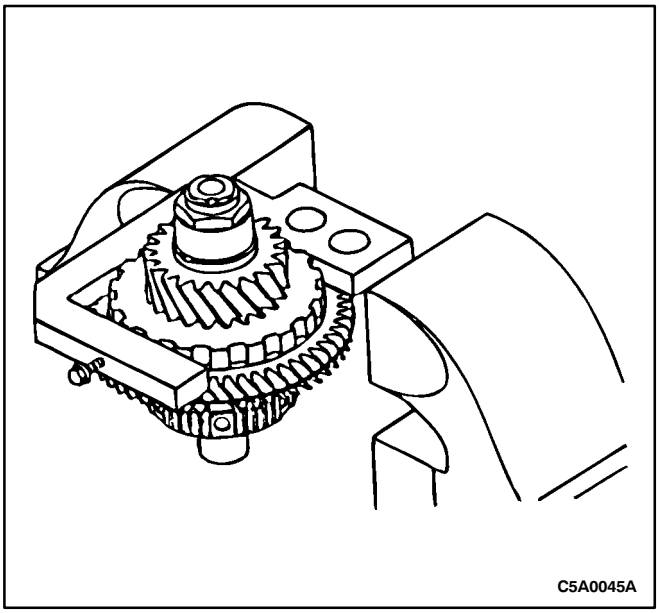

C5A0371A

Notice: Press the drive pinion gear inner bearing until it touches the differential drive pinion gear.

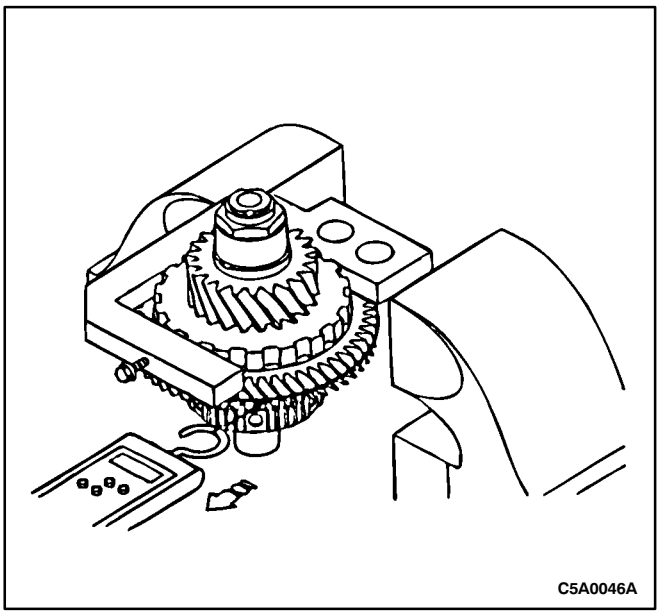
9. Using bearing installer KM-697, press on the drive pinion gear inner bearing.


C5A0044A

10. Install a new locknut. Do not tighten at this time.


C5A0045A

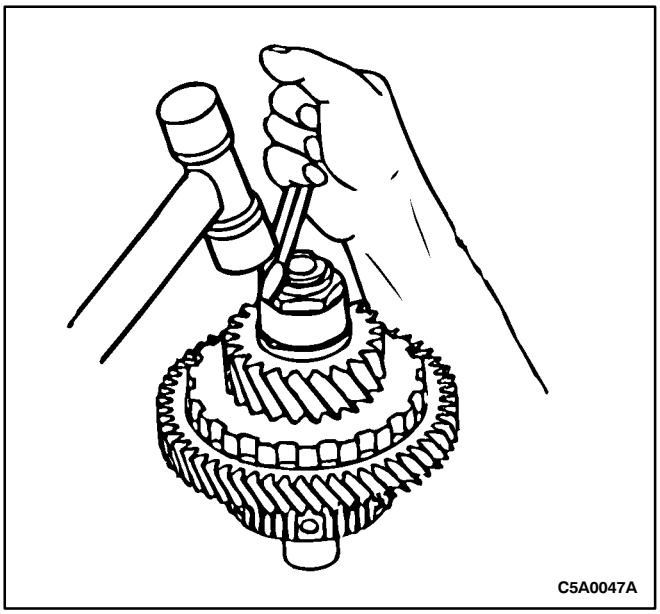
11. Install the gear assembly and gear holder KM-696 in a vise.


C5A0046A

Notice: Seat the bearing by turning the counter drive gear in both directions before measuring the torque.

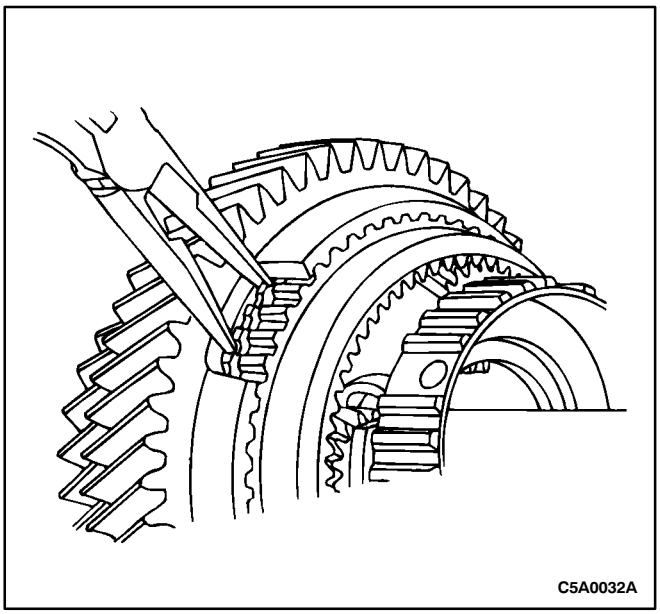
Notice: Measure the starting torque three times and calculate the average. If the torque is not within specification, replace the spacer.

12. Tighten the locknut until the starting torque is 0.54-1.32 N•m (5-12 lb-in).


C5A0047A

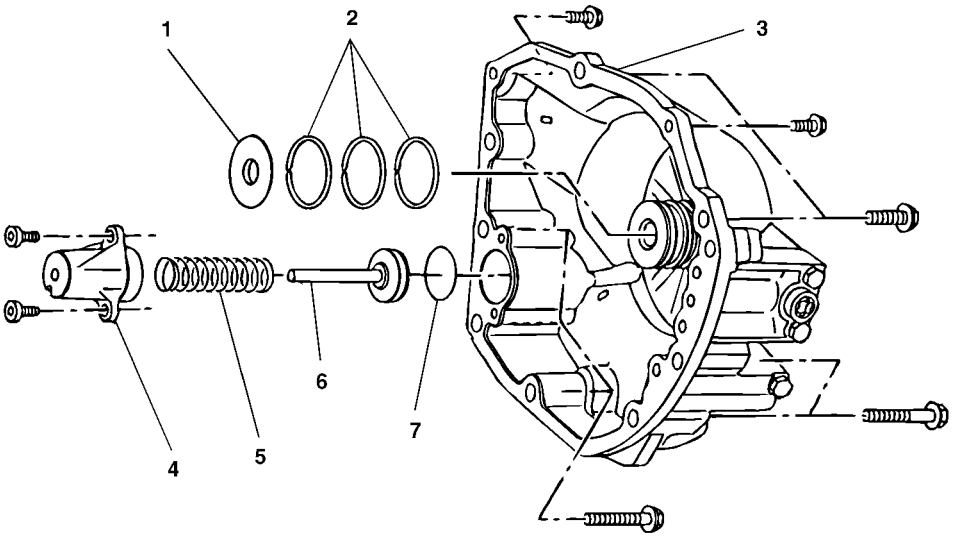
WARNING: USE CAUTION WHEN STAKING COMPONENTS WITH A CHISEL OR PERSONAL INJURY MAY RESULT.

13. Using a chisel, stake the locknut into the groove in two spots.


C5A0032A

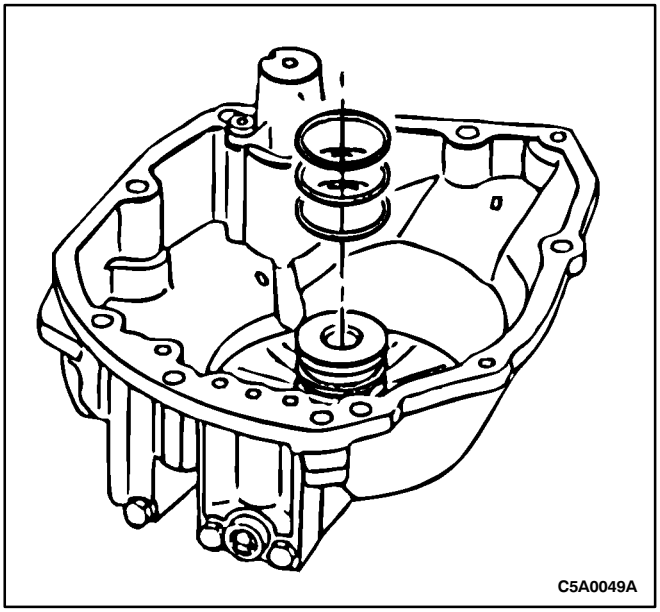
14. Install the snap ring and the underdrive planetary ring gear.

TRANSAXLE REAR CASE AND C-1 ACCUMULATOR PISTON



C5A0048A

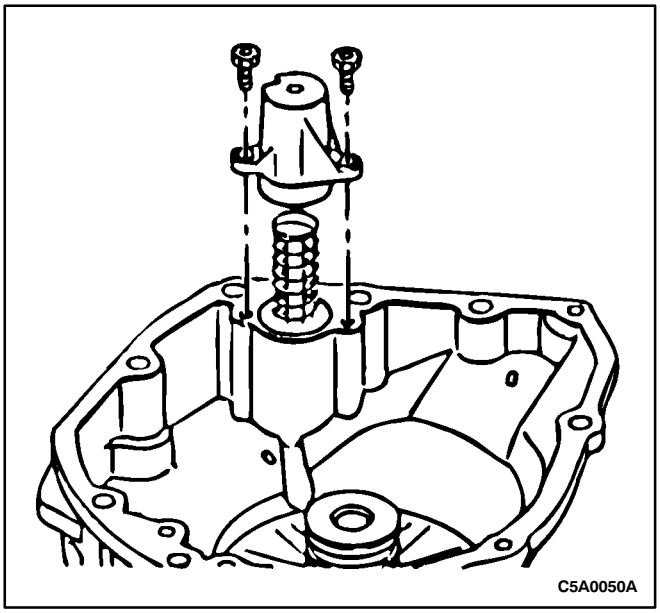
1. Thrust Washer
2. Seal Rings
3. Transaxle Case
4. C-1 Accumulator Cover
5. Spring
6. C-1 Accumulator Piston
7. O-Ring


C5A0049A

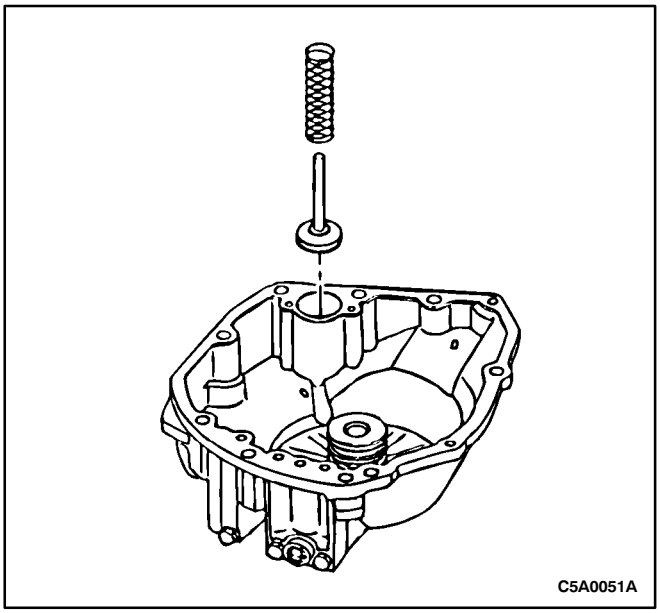
Disassembly Procedure

Notice: Do not spread the seal rings ends more than necessary.

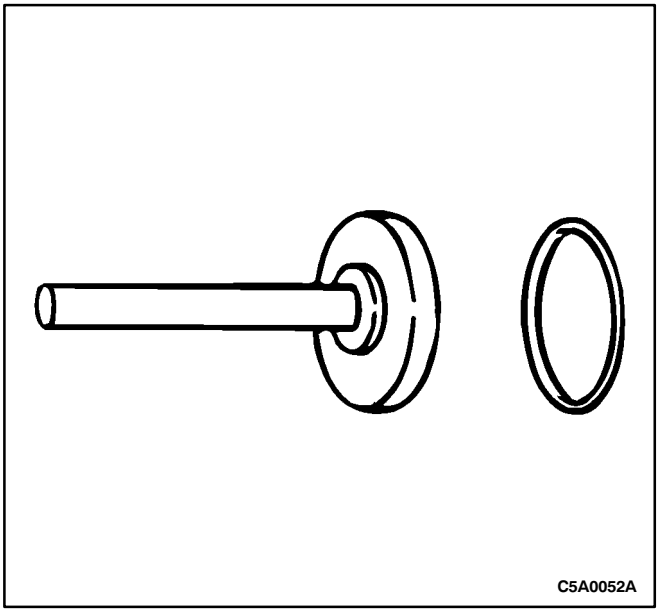
1. Remove the seal rings.


C5A0050A

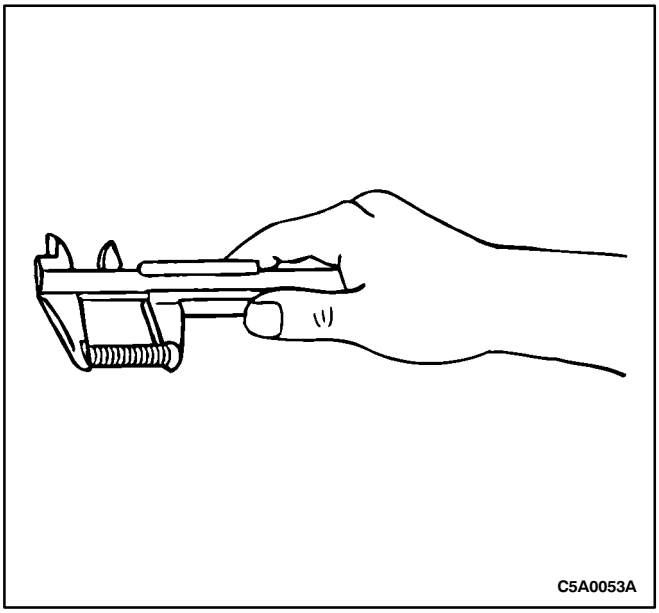
2. Remove the C-1 accumulator cover.


C5A0051A

3. Remove the spring and the C-1 accumulator piston.

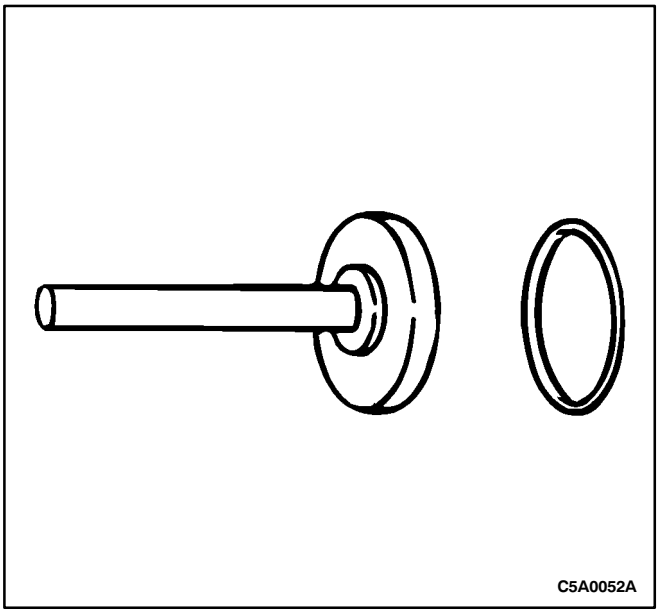

C5A0052A

4. Remove and discard the O-ring from the C-1 accumulator piston.


C5A0053A

5. Inspect the spring.
   - Using vernier calipers, measure the free length and outer diameter of the spring. If it does not meet specifications, replace it.

Free Length	Outer Diameter
78.100 mm (3.07 in)	20.700 mm (0.815 in)

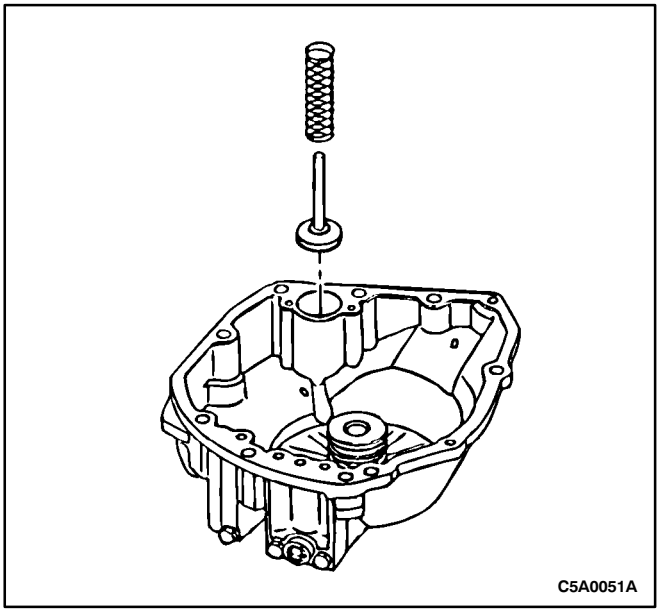

C5A0052A

Assembly Procedure

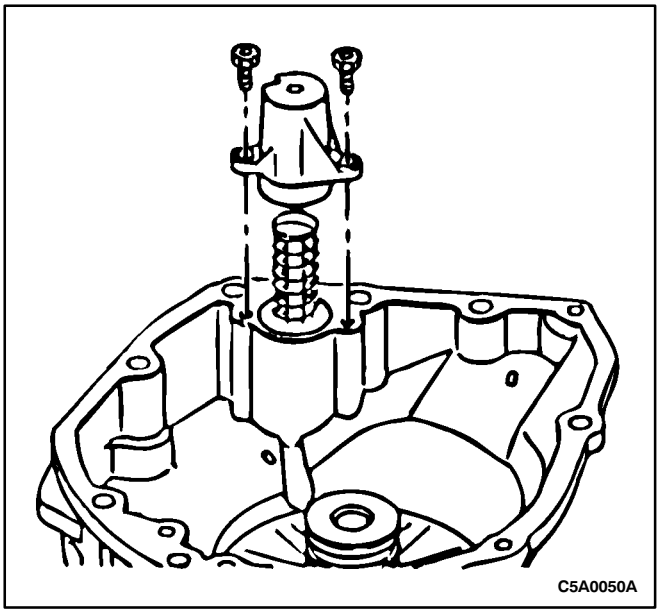
1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.

Notice: Apply TOTAL FLUID HX to the O-ring and the C-1 accumulator piston cavity.

2. Install a new O-ring on the C-1 accumulator piston.


C5A0051A

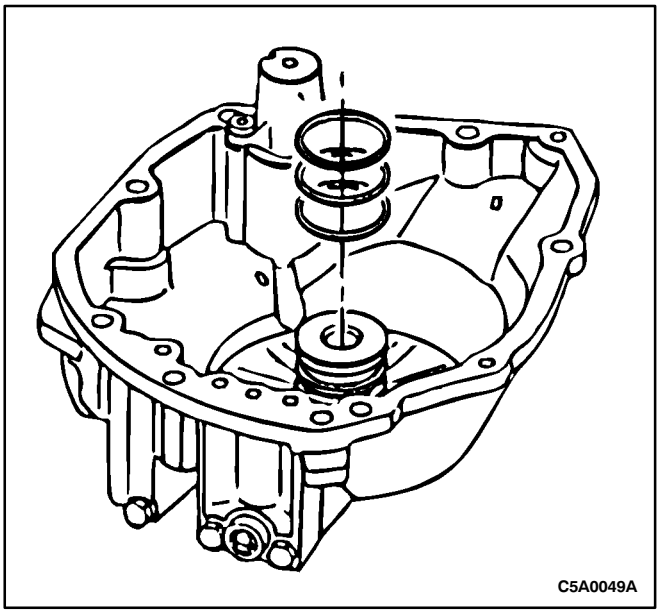
3. Install the C-1 accumulator piston and the spring.


C5A0050A

4. Install the C-1 accumulator cover.

Tighten

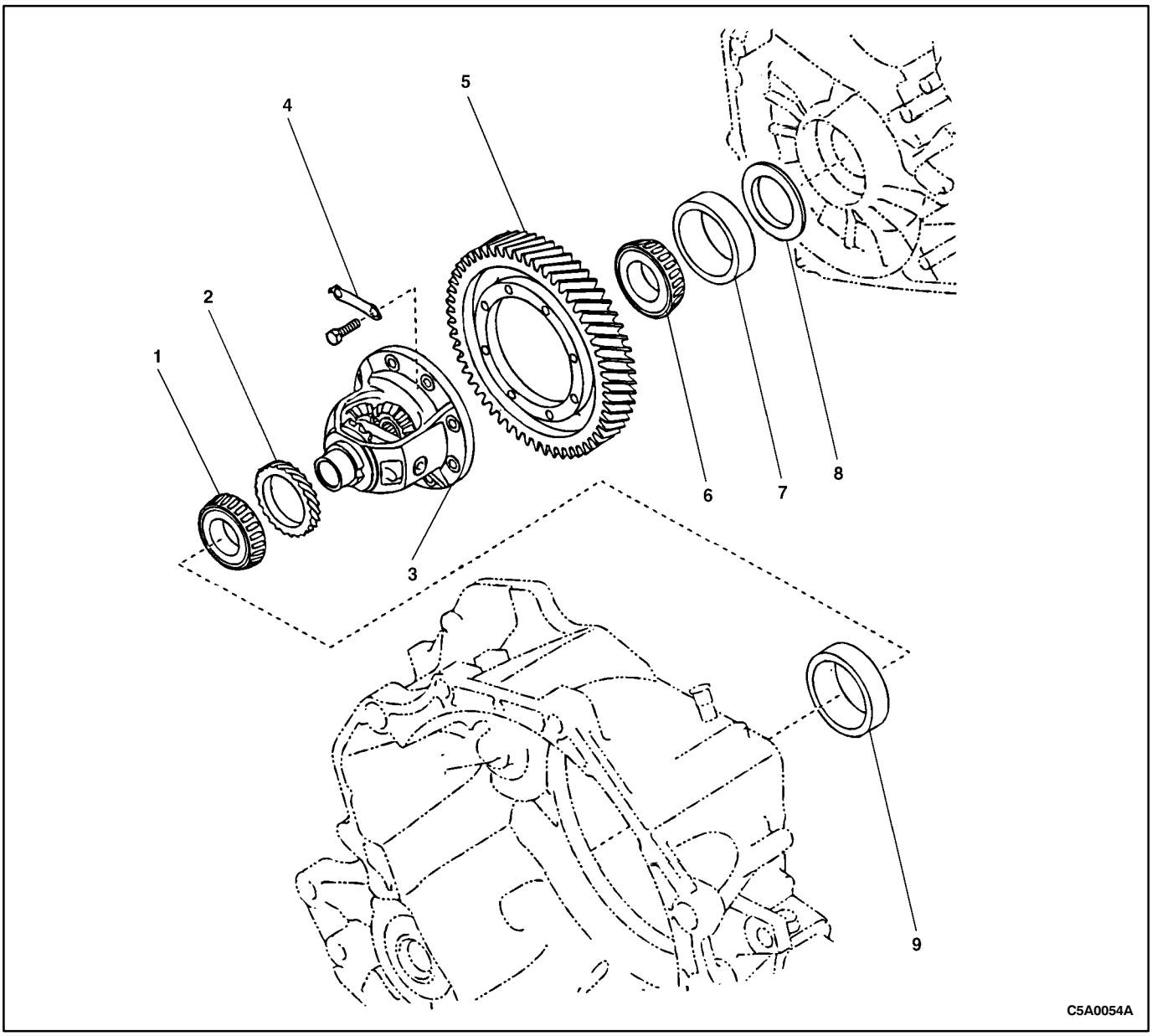
Tighten the bolts to 8-12 N•m (71-106 lb-in).


C5A0049A

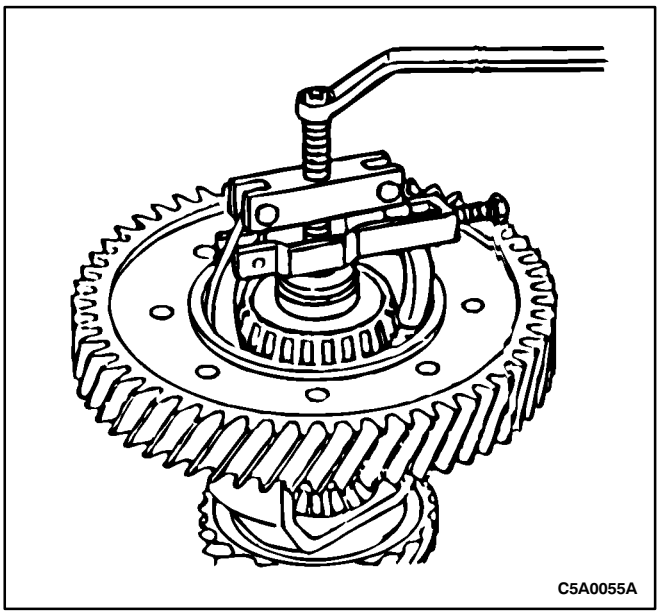
Notice: Apply TOTAL FLUID HX to the seal rings. Do not spread the seal rings ends more than necessary.

5. Install the seal rings.

DIFFERENTIAL



1. Inner Bearing (Differential Case Side)
2. Speedometer Drive Gear
3. Differential Case
4. Differential Ring Gear Bolt Lock Plate
5. Differential Ring Gear
6. Outer Bearing (Ring Gear Side)
7. Outer Bearing Race
8. Shim
9. Inner Bearing Race


C5A0055A

Tools Required

KM-709 Bearing Puller Adapter

KM-695 Bearing Installer

KM-J 28544 Adapter

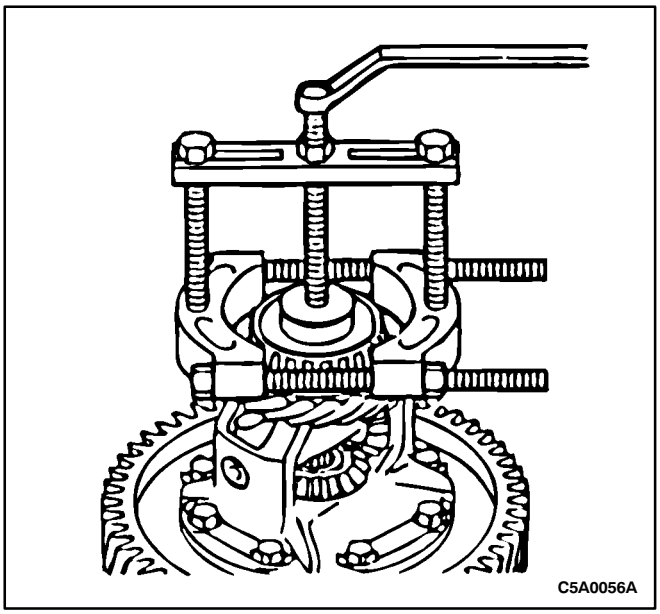
KM-674 Oil Seal Installer

KM-210-A Bearing Puller

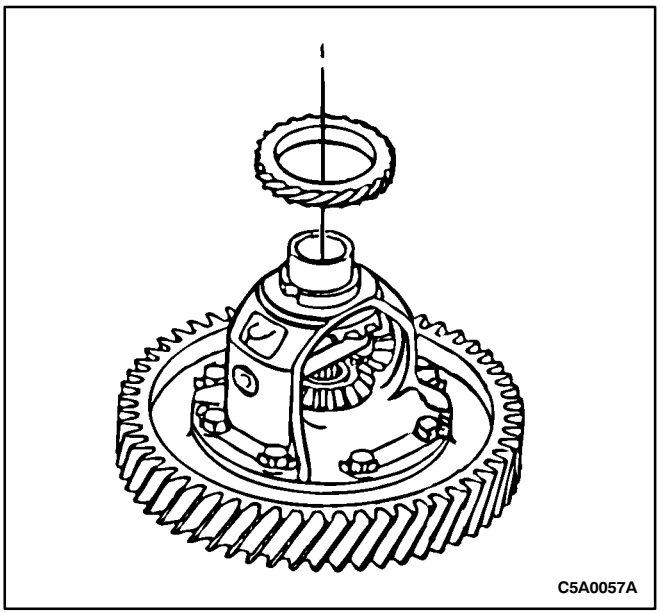
Disassembly Procedure

Notice: Install the bearing puller to the cut out portion of the differential case.

1. Using a bearing puller, remove the outer bearing.

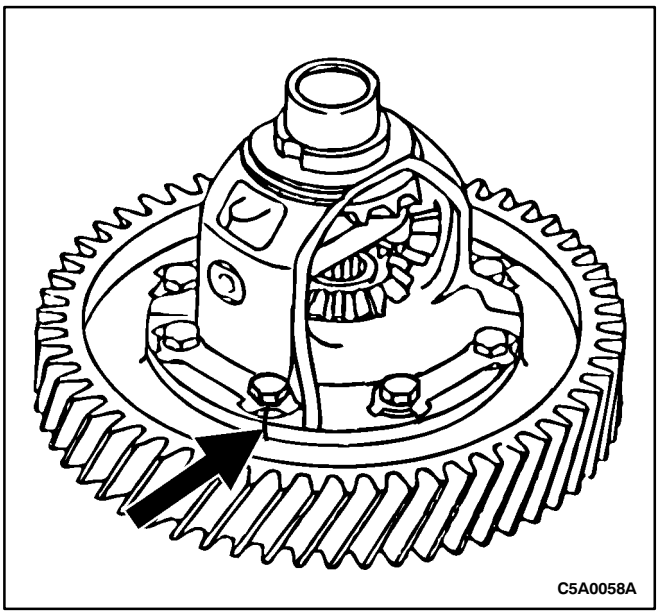

C5A0056A

2. Using a suitable bearing puller, remove the inner bearing.

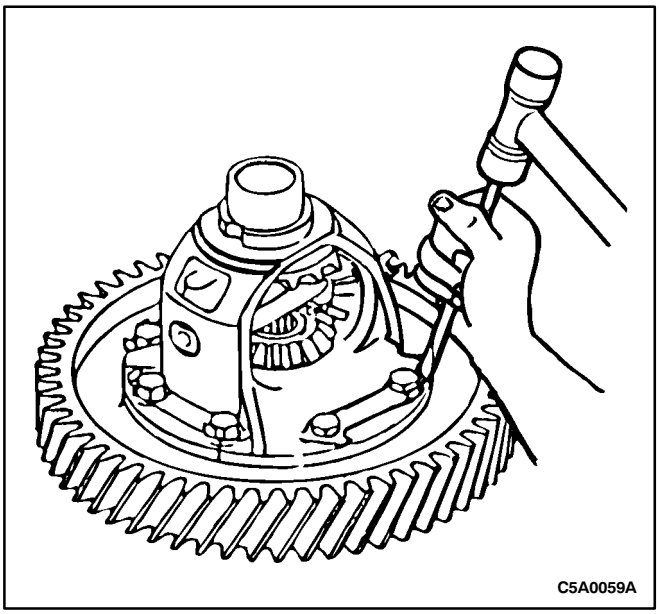

C5A0057A

WARNING: USE CAUTION WHEN REMOVING THE SPEEDOMETER DRIVE GEAR OR PERSONAL INJURY MAY RESULT.

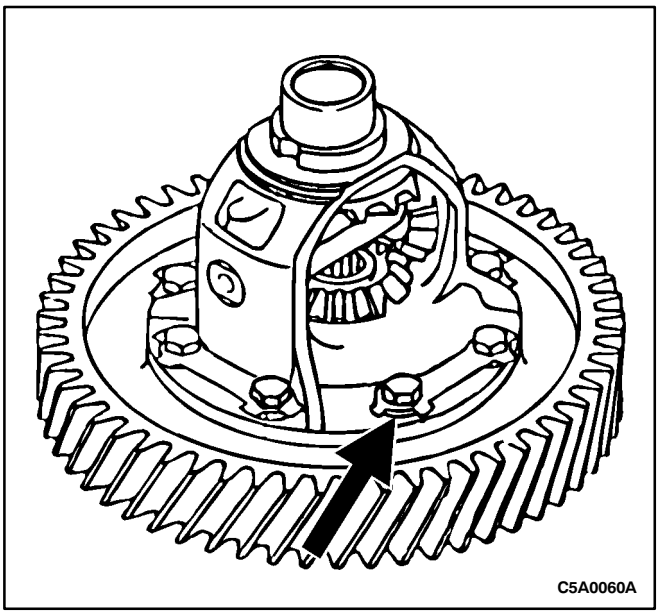
3. Remove the speedometer drive gear.


C5A0058A

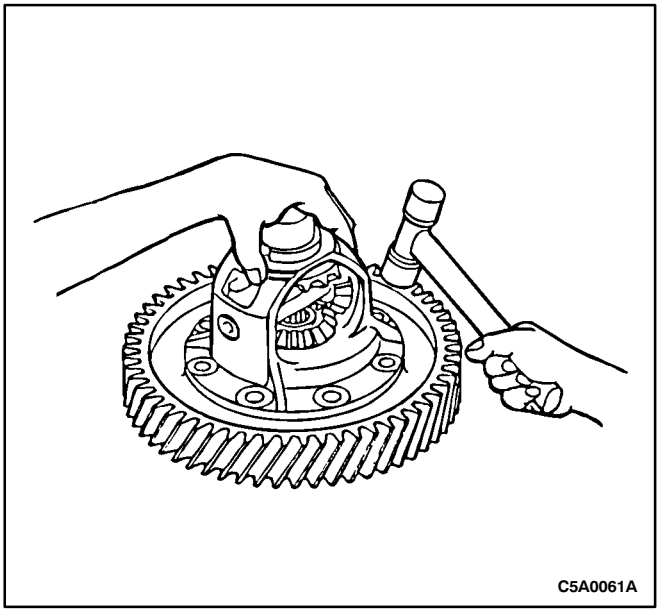
4. Index mark the differential ring gear and the differential case using a scribe.


C5A0059A

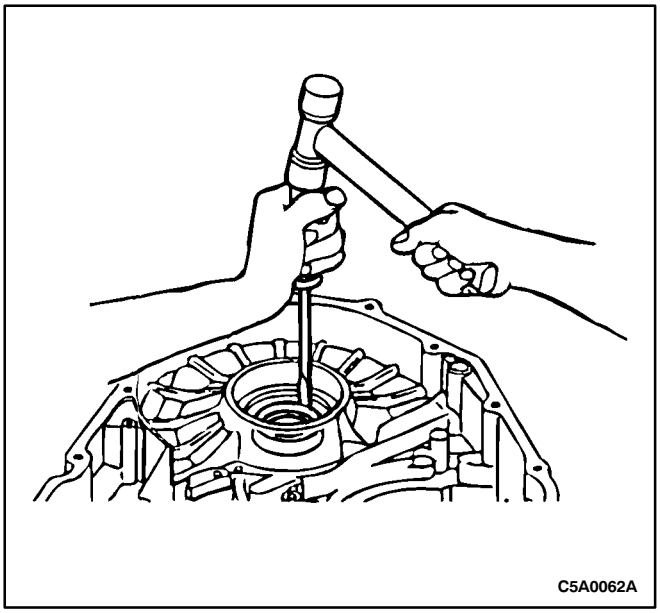
5. Tap down the tabs of the differential ring gear bolt lock plate.


C5A0060A

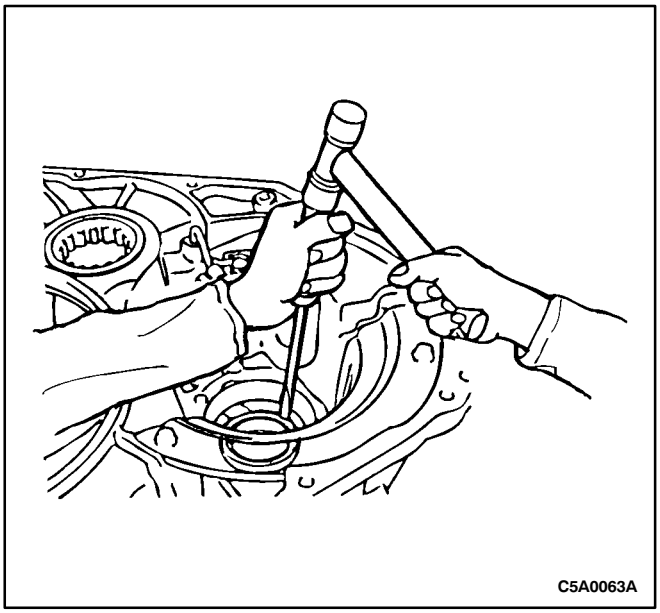
6. Remove and discard the differential ring gear bolts and lock plates.


C5A0061A

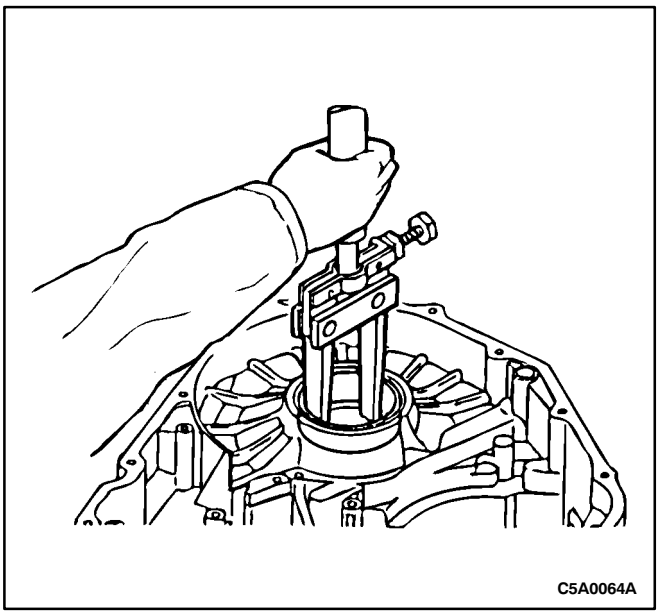
7. Using a plastic hammer, tap the on the ring gear to remove.


C5A0062A

8. Remove and discard the oil seal from the transaxle case side.

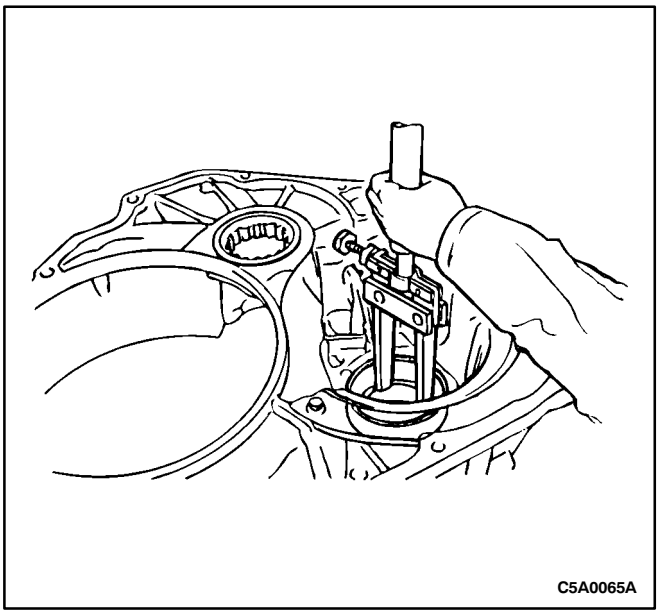

C5A0063A

9. Remove and discard the oil seal from the transaxle housing side.

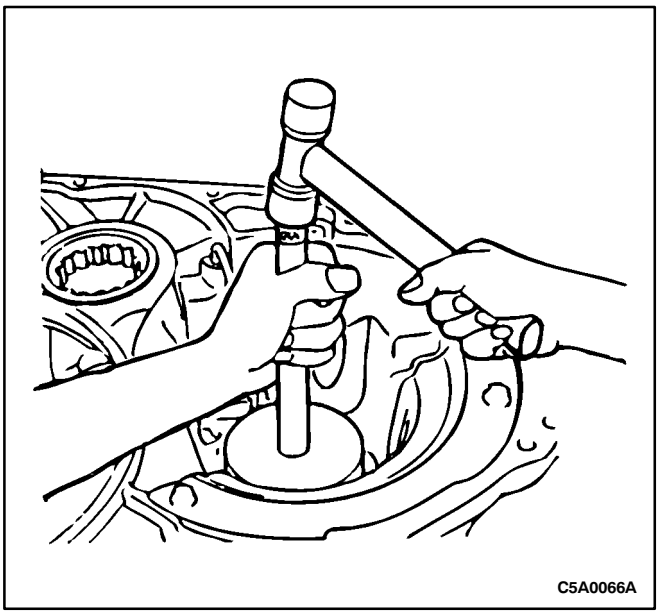

C5A0064A

Notice: If equipped, remove preload shim.

10. Using bearing puller KM-210-A and bearing puller adapter KM-709, remove the bearing cup from the transaxle case side.

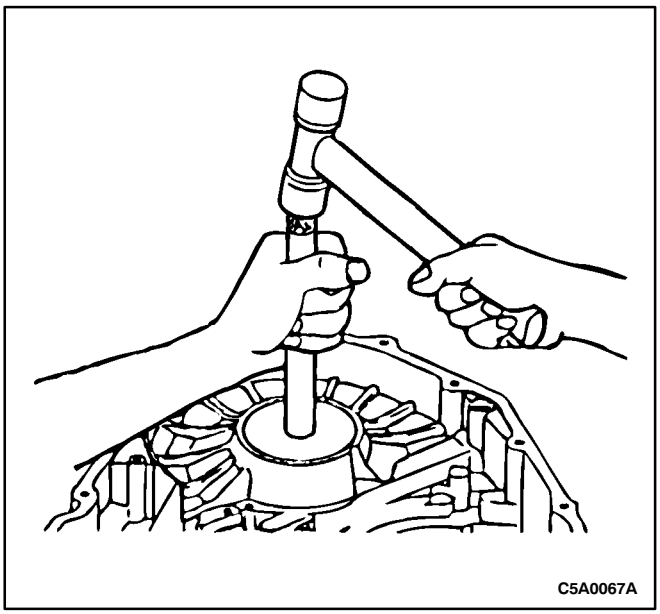

C5A0065A

11. Using bearing puller KM-210-A and bearing puller adapter KM-709, remove the bearing cup from the transaxle housing side.


C5A0066A

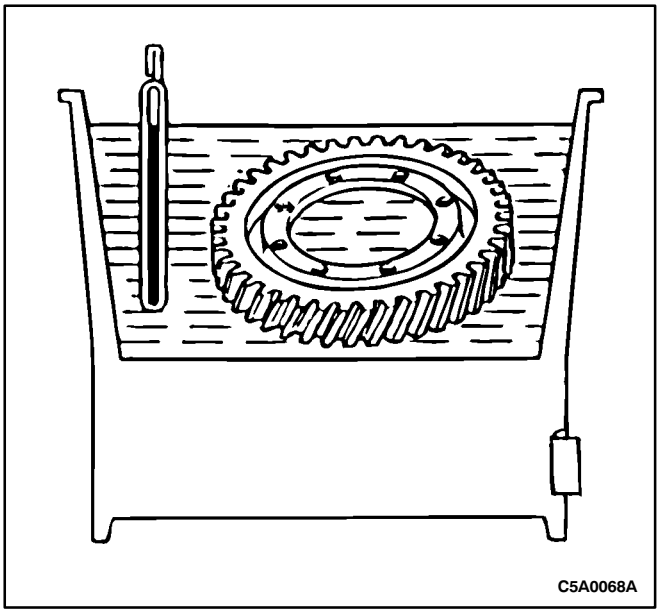
Assembly Procedure

1. Clean the components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.
2. Using bearing installer KM-695, install the bearing cup into the transaxle housing.


C5A0067A

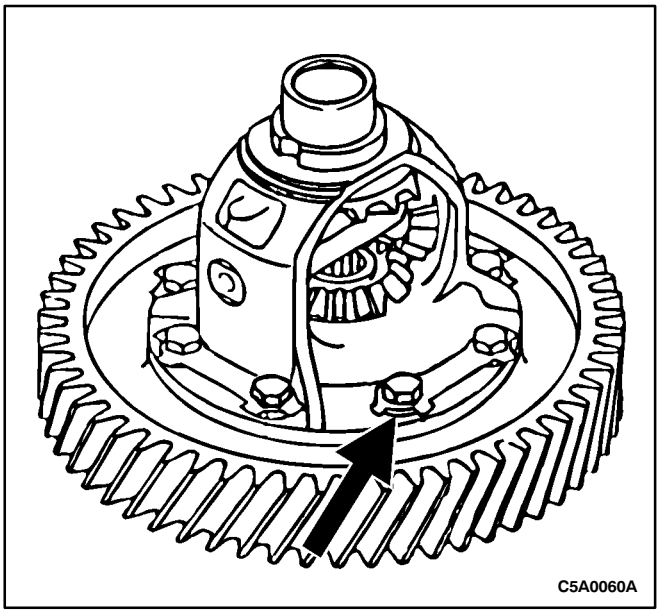
Notice: If equipped, install preload shim.

3. Using bearing installer KM-695, install the bearing cup into the transaxle case.


C5A0068A

Caution: Do not heat the differential ring gear above 110°C (255°F).

4. Using a oil bath or an oven, heat the differential ring gear to 90-100°C (219-237°F).


C5A0060A

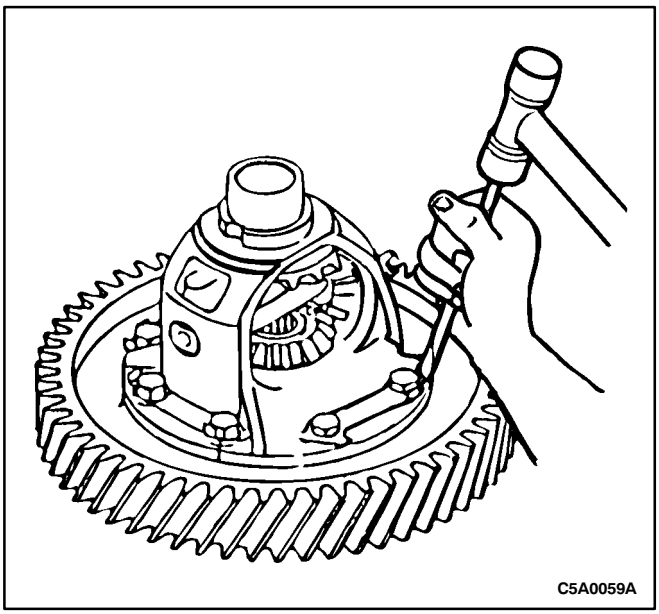
Notice: Clean the oil from the contact surface of the differential ring gear.

Notice: Tighten the bolts evenly and gradually.

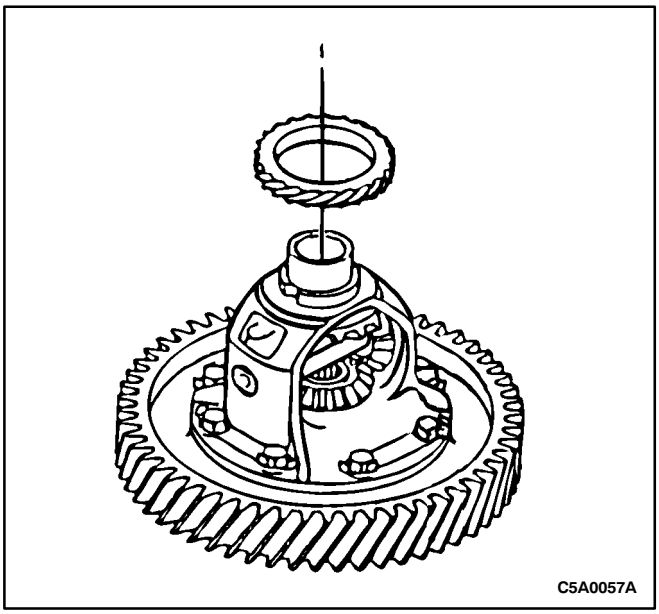
5. Install the differential ring gear on the differential case. Install new differential ring gear bolts and lock plates.

Tighten

Tighten ring gear bolts to 90-103 N•m (66-76 lb-ft).

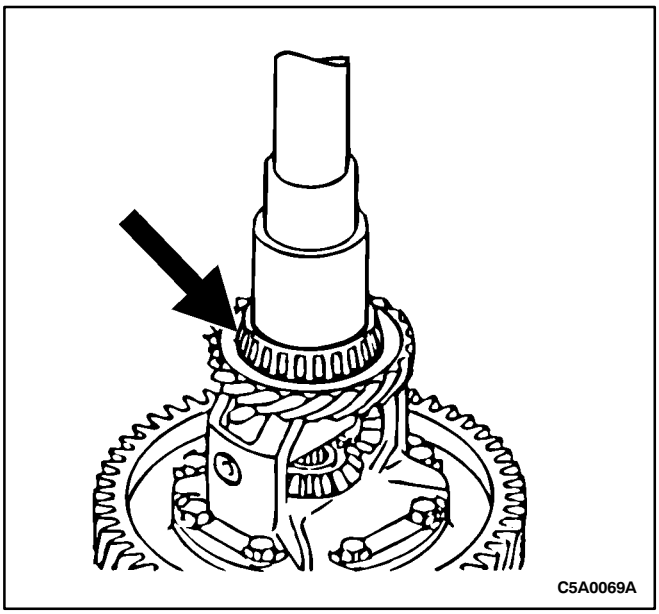

C5A0059A

6. Bend the differential ring gear bolt lock plate tabs in the locked position.

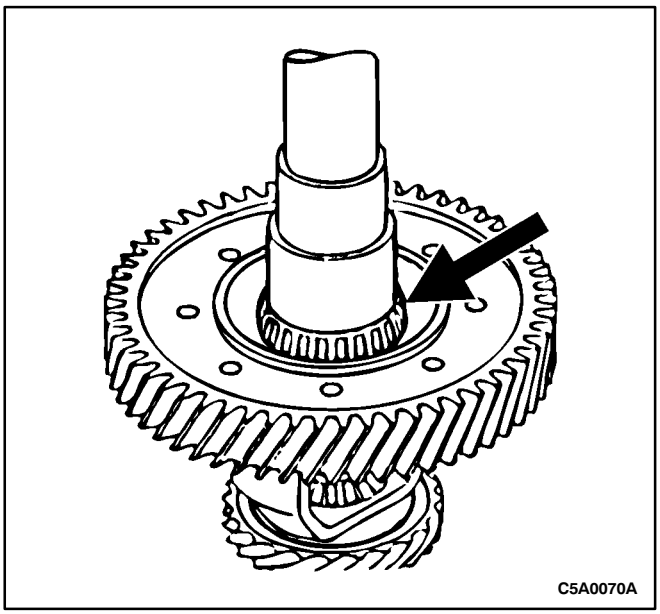

C5A0057A

WARNING: USE CAUTION WHEN INSTALLING THE SPEEDOMETER DRIVE GEAR OR PERSONAL INJURY MAY RESULT.

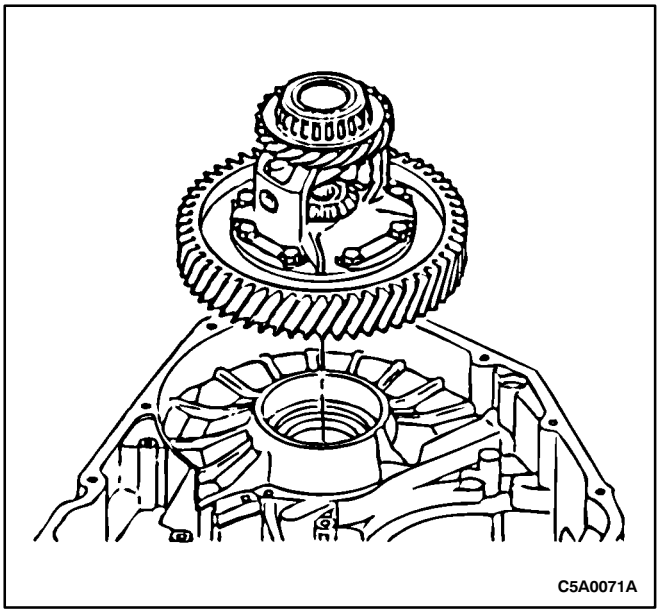
7. Install the speedometer drive gear.


C5A0069A

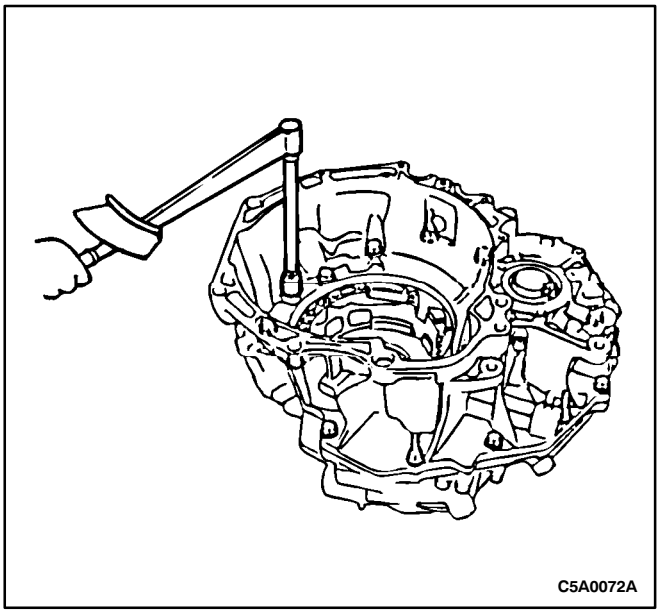
8. Using a press, press the outer bearing onto the differential case.


C5A0070A

9. Using a press, press the inner bearing onto the differential case.


C5A0071A

10. Install the differential assembly in the transaxle case.

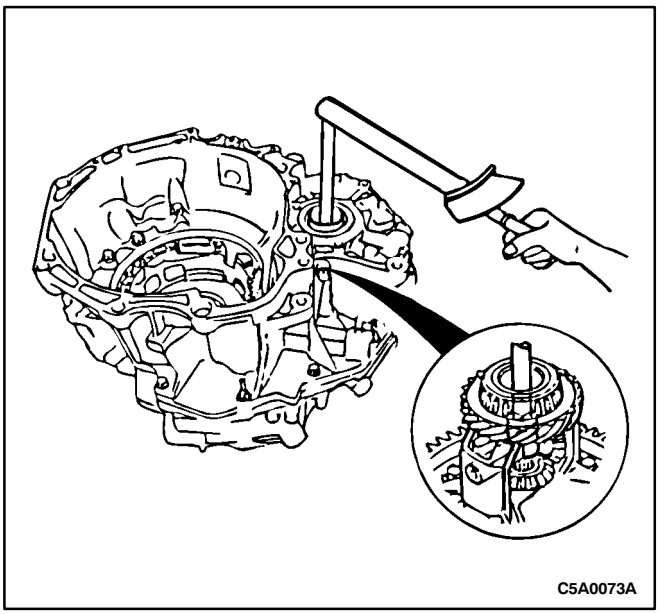

C5A0072A

Notice: Tighten the bolts evenly and gradually.

11. Apply sealer to the transaxle case and install the transaxle housing.

Tighten

Tighten the bolts to 23-35 N•m (17-26 lb-ft).

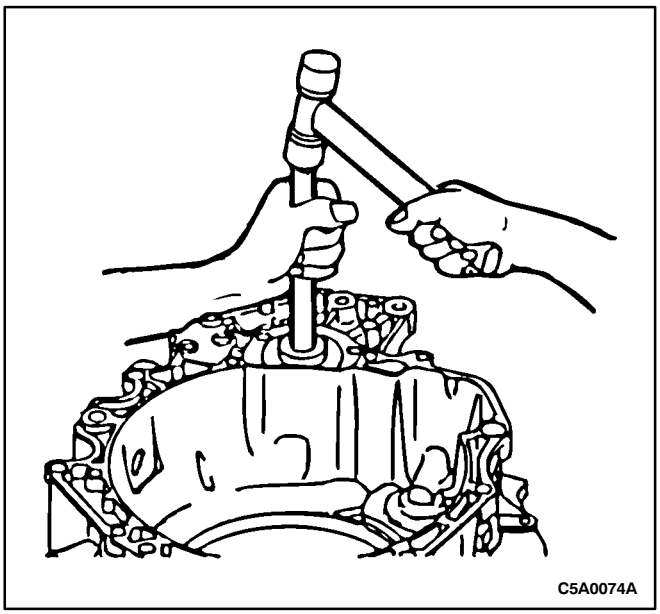

C5A0073A

12. Using adapter KM-J-28644, measure the starting preload.
    - Rotate the differential in both directions to seat the bearing.

Preload	
New Bearing	.686-1.18 N•m (6-10 lb-in)
Reused Bearing	.343-.588 N•m (3-5 lb-in)

- If the preload is not within specifications, remove the differential assembly. Remove the outer bearing race and select the correct adjusting shim. If the preload is below specifications, install a thicker shim. If the preload is above specifications, install a thinner shim.
- Install selected shim, reinstall differential assembly and recheck preload.

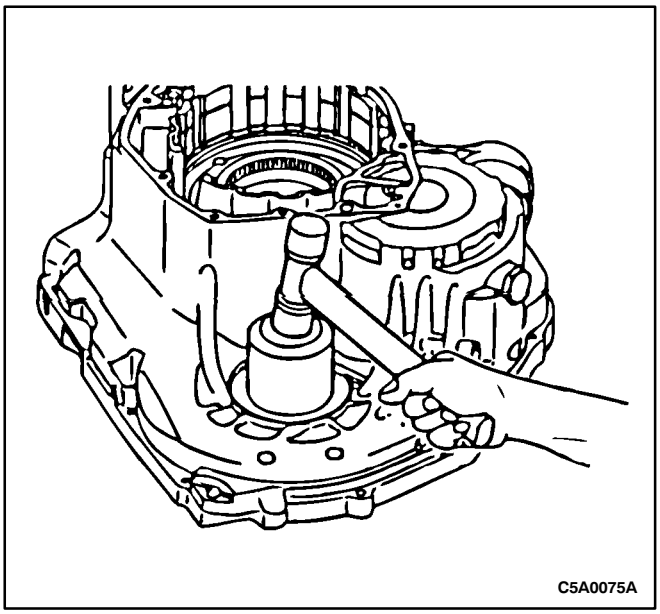
Part Number	**Thickness mm (in)**
5040 037 021Z	1.00 (.039)
5040 037 022W	1.05 (.041)
5040 037 023T	1.10 (.043)
5040 037 024P	1.15 (.045)
5040 037 025L	1.20 (.047)
5040 037 026H	1.25 (.049)
5040 037 027E	1.30 (.051)
5040 037 028B	1.33 (.052)
5040 037 029Y	1.36 (.053)
5040 037 030E	1.39 (.054)
5040 037 031B	1.42 (.055)
5040 037 032Y	1.45 (.057)
5040 037 033V	1.48 (0.58)
5040 037 034S	1.51 (.059)
5040 037 035N	1.54 (.060)
5040 037 036K	1.57 (.061)
5040 037 037G	1.60 (.062)
5040 037 038D	1.65 (.064)
5040 037 039A	1.70 (.066)
5040 037 040G	1.75 (.068)
5040 037 041D	1.80 (.070)
5040 037 042A	1.85 (.072)
5040 037 043X	1.90 (.074)


C5A0074A

Notice: The distance from the outer edge of the seal to the transaxle housing should be 0.500 mm (0.019 in).

Notice: Apply Transjel Assembly Lubricant J-36850 to the oil seal lip.

13. Using oil seal installer KM-674, install a new oil seal into the transaxle housing.

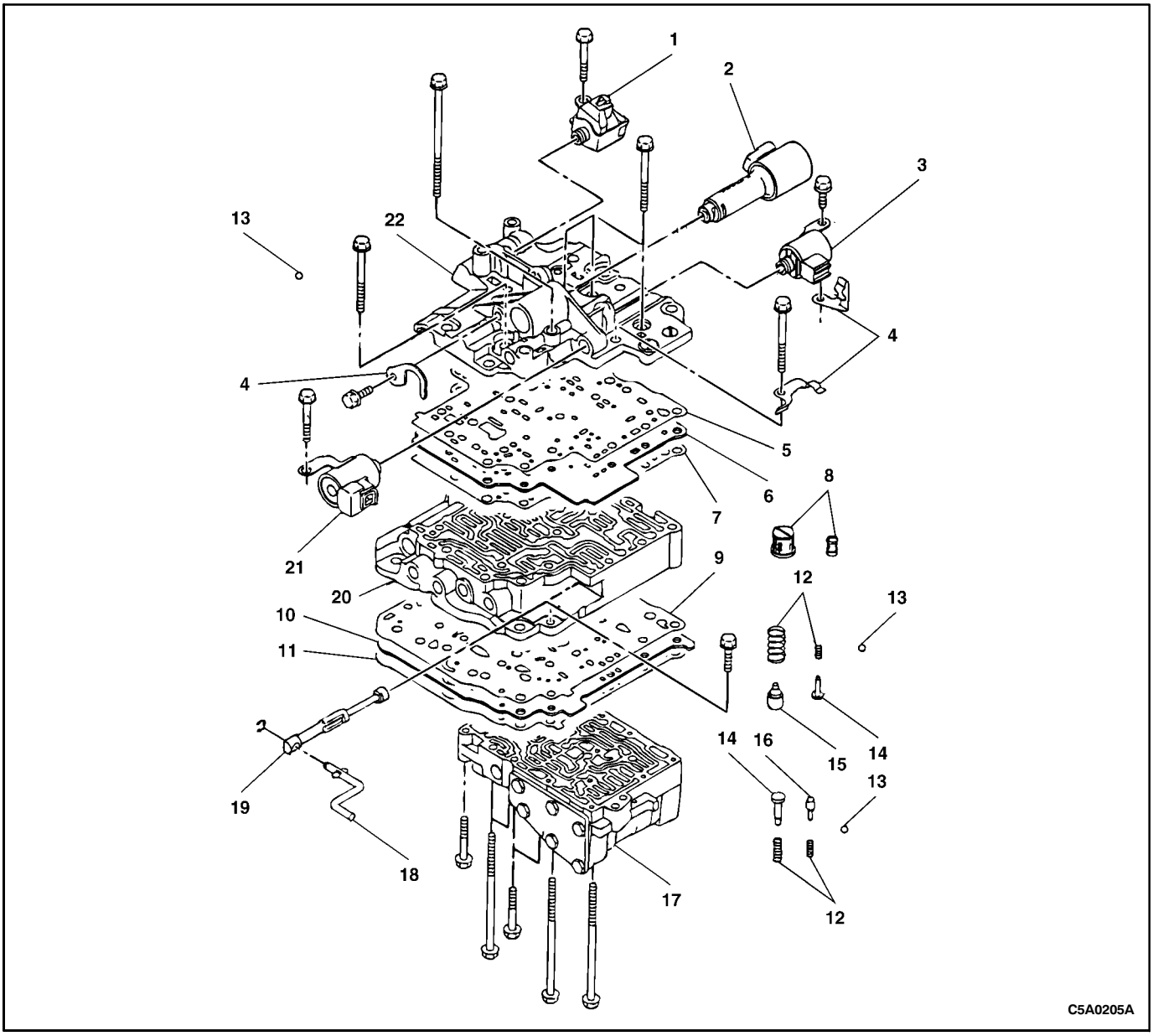

C5A0075A

Notice: Install the oil seal until the seal touches the transaxle case.

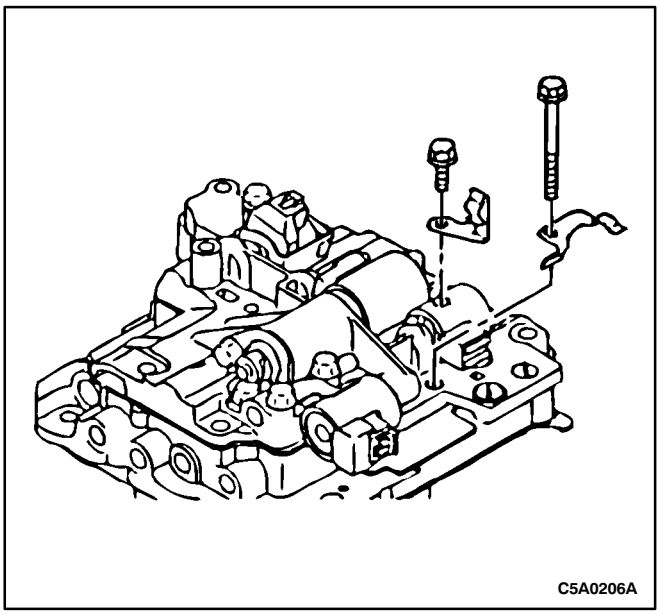
Notice: Apply Transjel Assembly Lubricant J-36850 to the oil seal lip.

14. Using oil seal installer KM-674, install a new oil seal into the transaxle case.

VALVE BODY ASSEMBLY

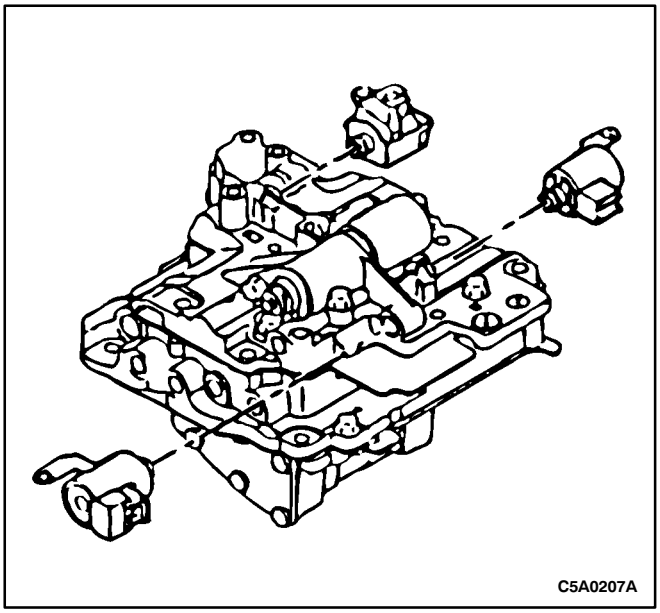


1. Lockup Solenoid
2. Linear Solenoid
3. Shift Solenoid 1 (SS1)
4. Wire Harness Clamp
5. Upper Valve Body Gasket
6. Upper Valve Body Separator Plate
7. Center Valve Body Gasket (No. 1)
8. Oil Strainer
9. Center Valve Body Gasket (No.2)
10. Center Valve Body Separator Plate
11. Lower Valve Body Gasket
12. Spring(s)
13. Check Ball
14. Check Valve
15. Bypass Valve
16. Pressure Relief Valve
17. Lower Valve Body
18. Manual Valve Rod
19. Manual Valve
20. Center Valve Body
21. Shift Solenoid 2 (SS2)
22. Upper Valve Body

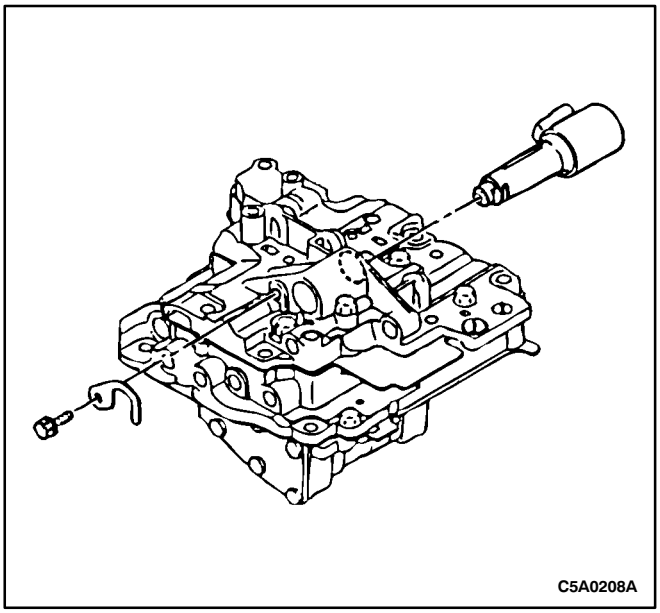

C5A0206A

Disassembly Procedure

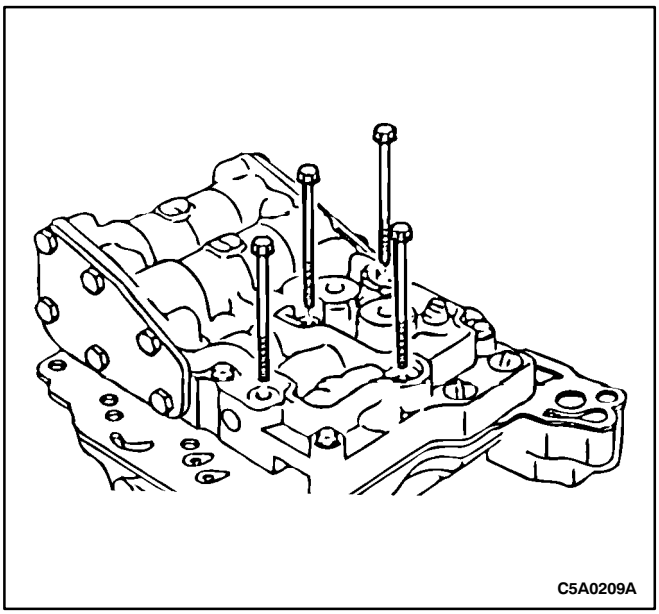
1. Remove the wire harness clamps.


C5A0207A

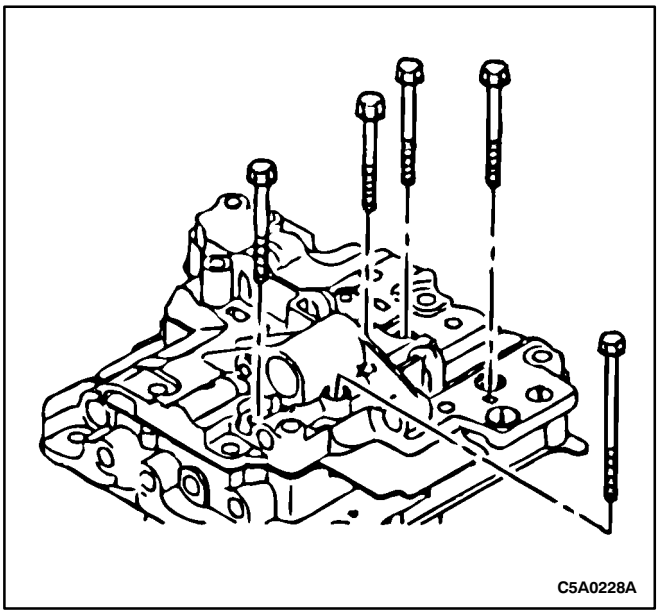
2. Remove the shift and lockup solenoids.


C5A0208A

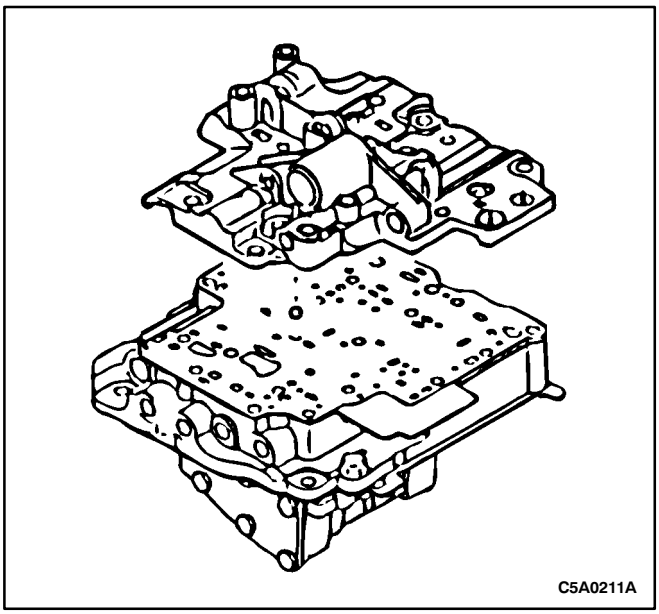
3. Remove the linear solenoid and the wire harness clamp.


C5A0209A

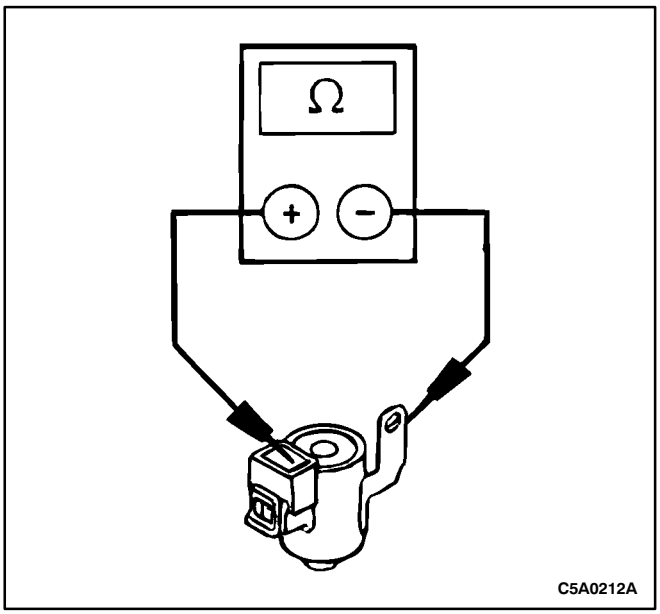
4. Turn the valve body assembly over and remove the four bolts from the lower valve body.


C5A0228A

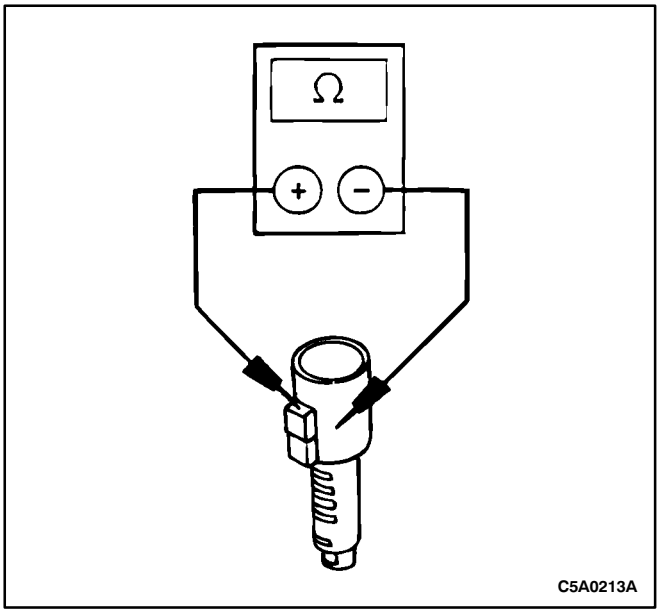
5. Turn the valve body assembly over and remove the five bolts from the upper valve body.


C5A0211A

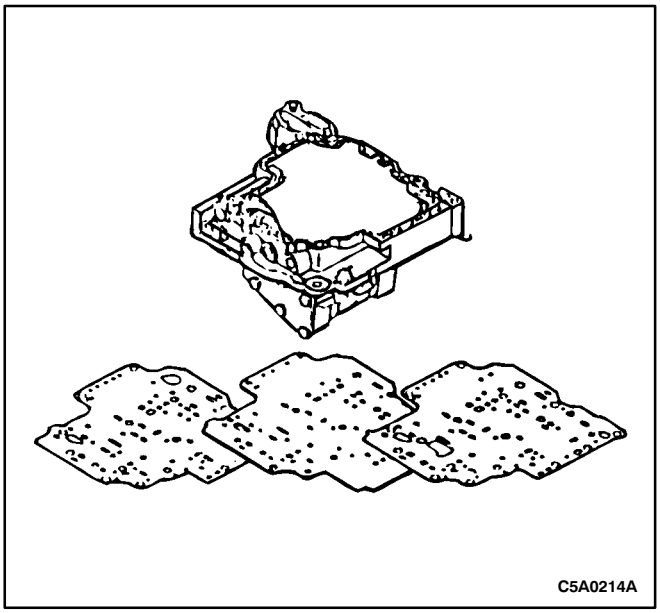
6. Lift off the upper valve body. Remove the check ball.



7. Inspect the shift solenoids and the lockup solenoid. Replace the solenoids if they are not within specifications.
   - Using an ohmmeter, check the resistance between the solenoid terminal and the solenoid body. The standard resistance for shift solenoids is 12-16 ohms. The standard resistance for the lockup solenoid is 11-15 ohms.
   - Apply battery voltage to the solenoids. An operation noise should be heard.

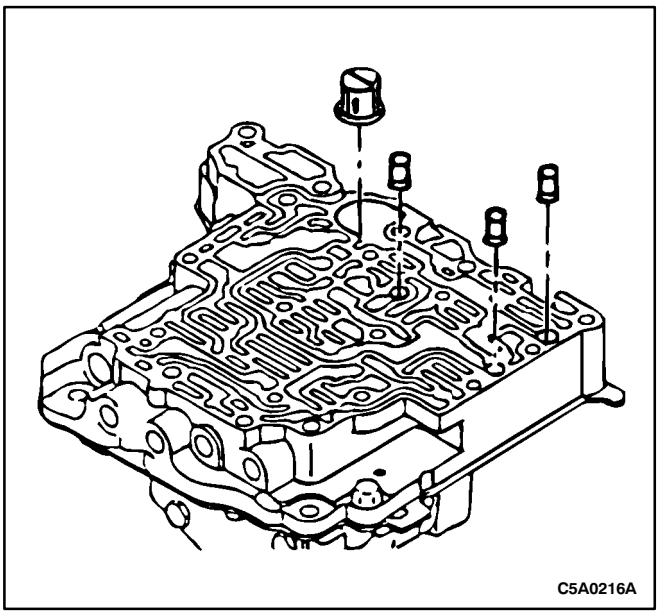


8. Inspect the linear solenoid. If the solenoid is not within specifications, replace it.
   - Using an ohmmeter, check the resistance between the solenoid terminals. The standard resistance is -3.6 ohms.

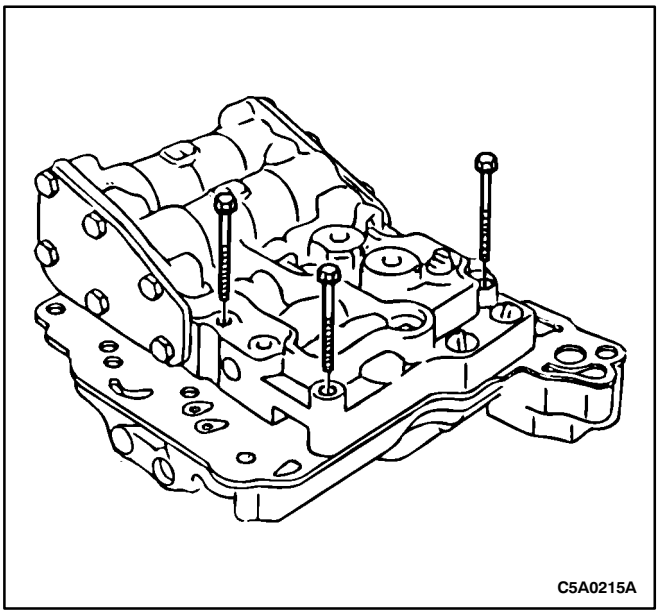


Notice: Discard the valve body gaskets.

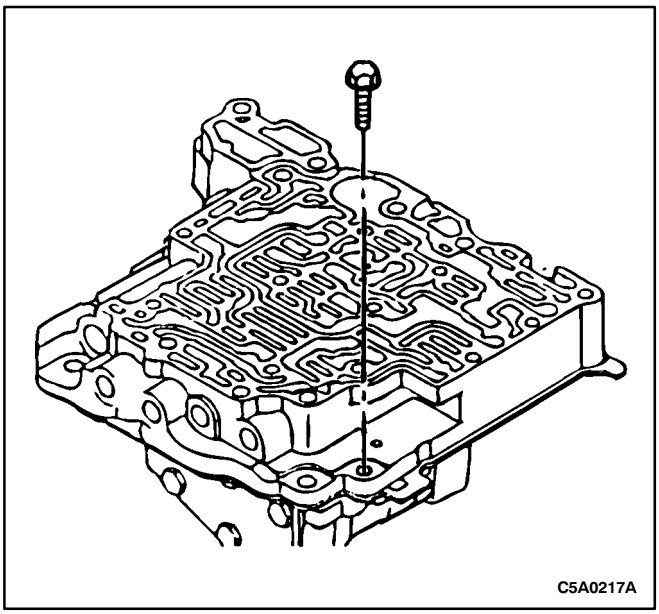
9. Remove the upper valve body gasket, the upper valve body separator plate and the center valve body gasket.


C5A0216A

10. Remove the oil strainers from the center valve body.

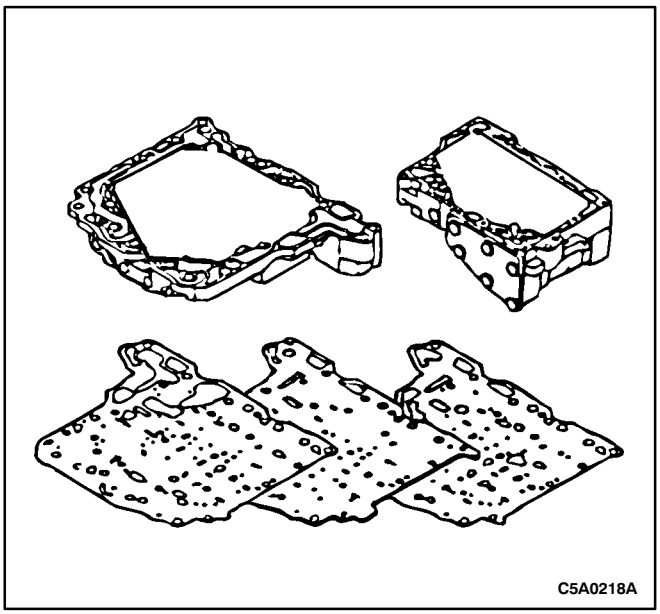

C5A0215A

11. Remove the three bolts from the lower valve body.


C5A0217A

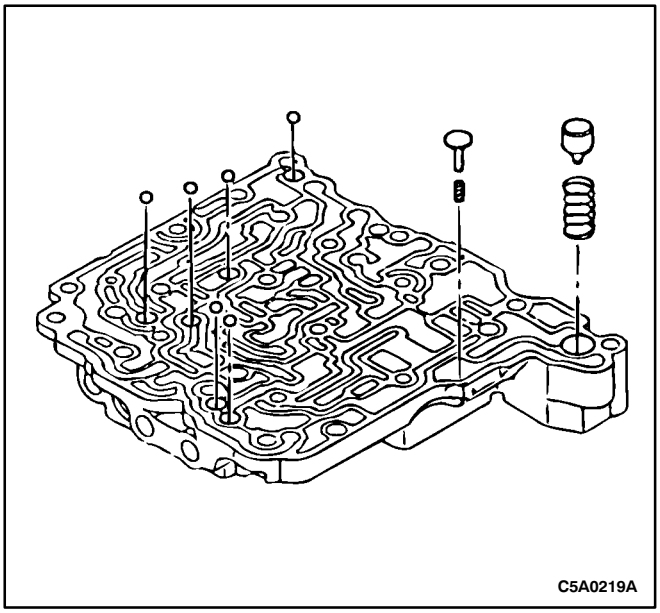
Notice: Hold the gaskets and separator plate to the center valve body and remove as an assembly.

12. Turn the valve body over and remove the remaining bolt. Separate the center valve body from the lower valve body.

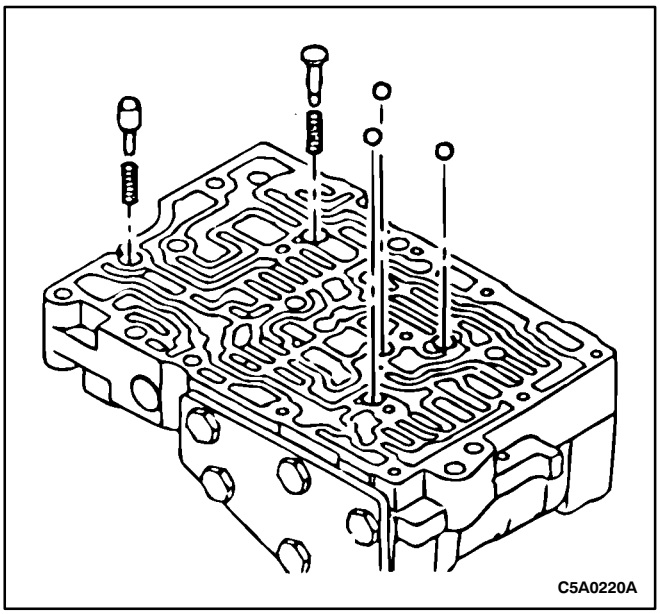

C5A0218A

Notice: Discard the valve body gaskets.

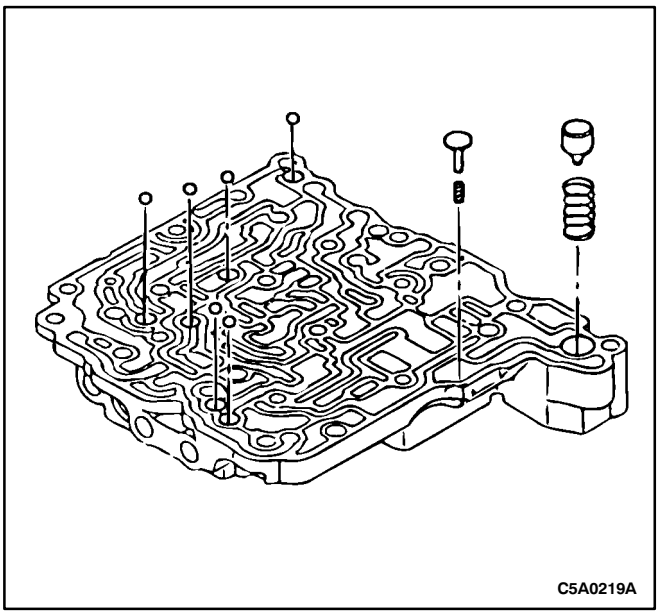
13. Separate the valve body gaskets and separator plate.


C5A0219A

14. Remove the bypass valve, the check valve, springs and the check balls from the center valve body.


C5A0220A

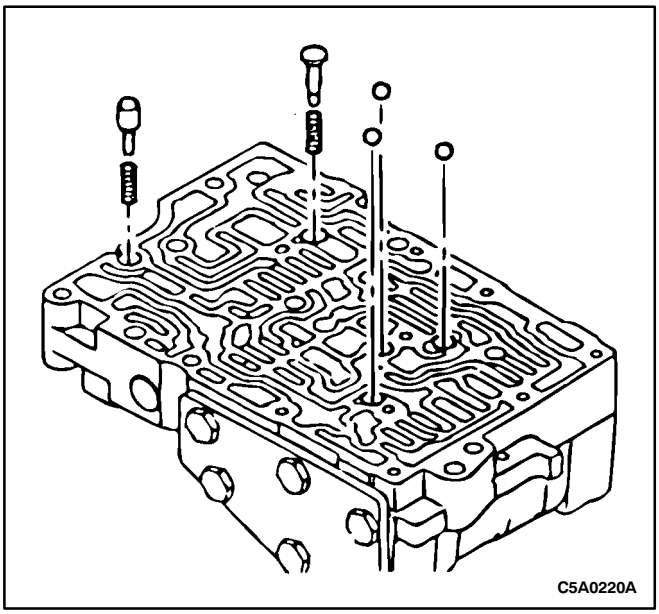
15. Remove the check valve, the pressure relief valve, springs and check balls from the lower valve body.


C5A0219A

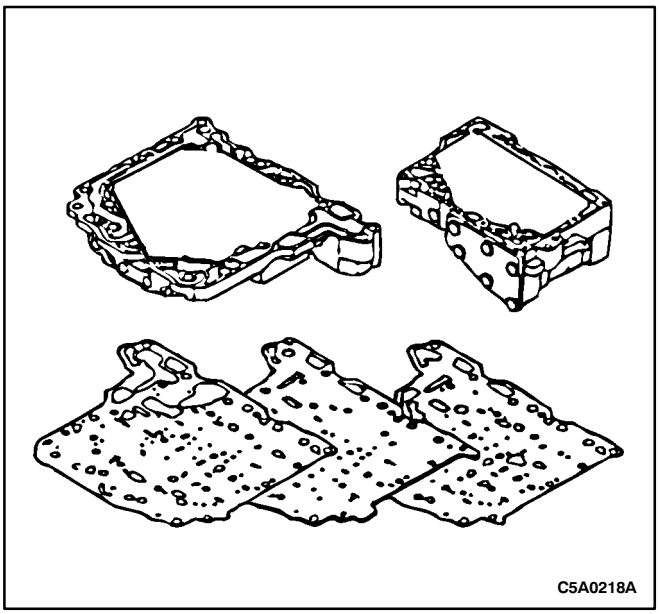
Assembly Procedure

Notice: Coat the valves and springs with TOTAL FLUID HX prior to assembly.

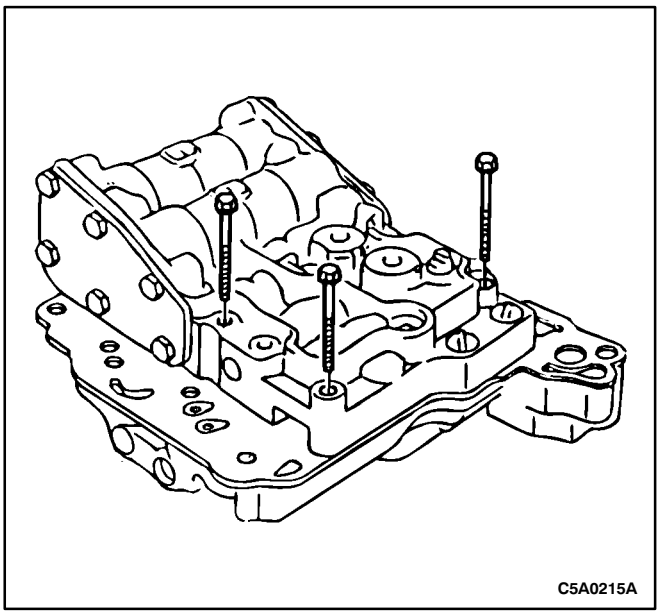
1. Install the bypass valve, the check valve, springs and the check balls in the center valve body.


C5A0220A

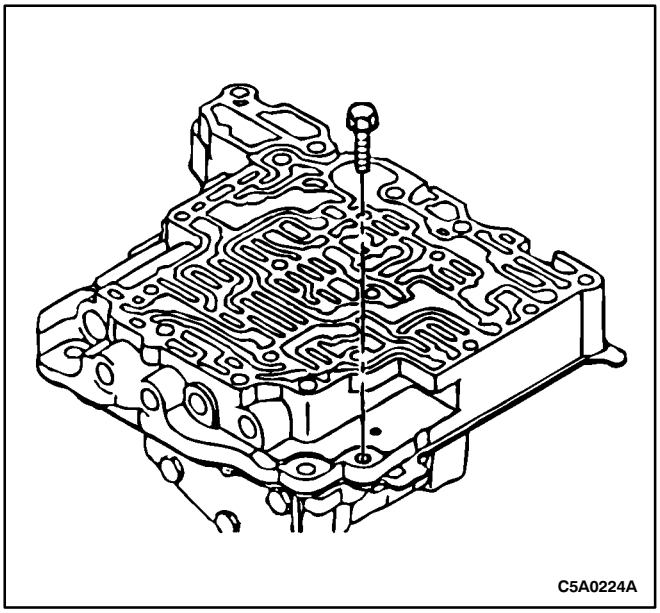
2. Install the check valve, the pressure relief valve, springs and check balls in the lower valve body.


C5A0218A

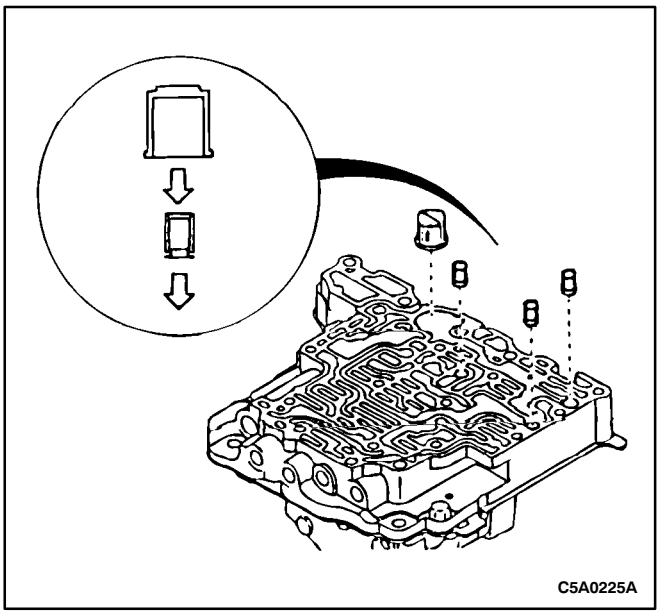
3. Install a new center valve body gasket, a center valve body separator plate and a new lower valve body gasket on the center valve body.
   - Place the center valve body onto the lower valve body. Hold the center valve body, gaskets and plate securely so they do not separate.


C5A0215A

4, Install the three bolts in the lower valve body. Do not tighten the bolts at this time.

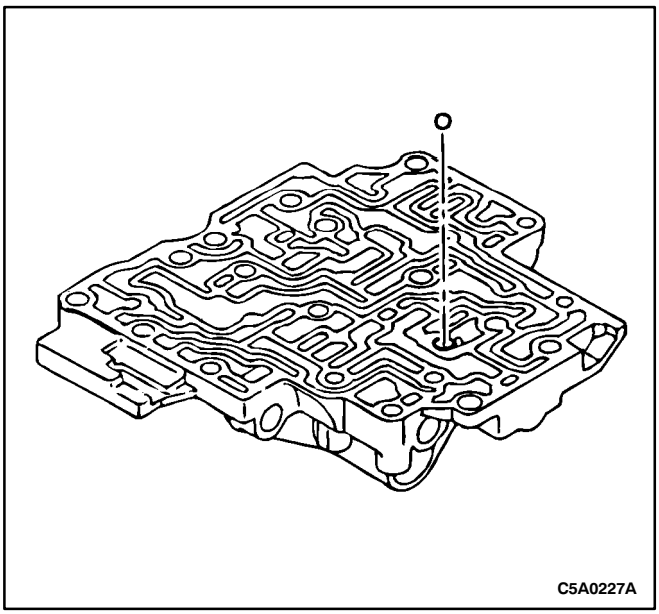

C5A0224A

5. Turn the valve body over and install the bolt. Do not tighten the bolt at this time.

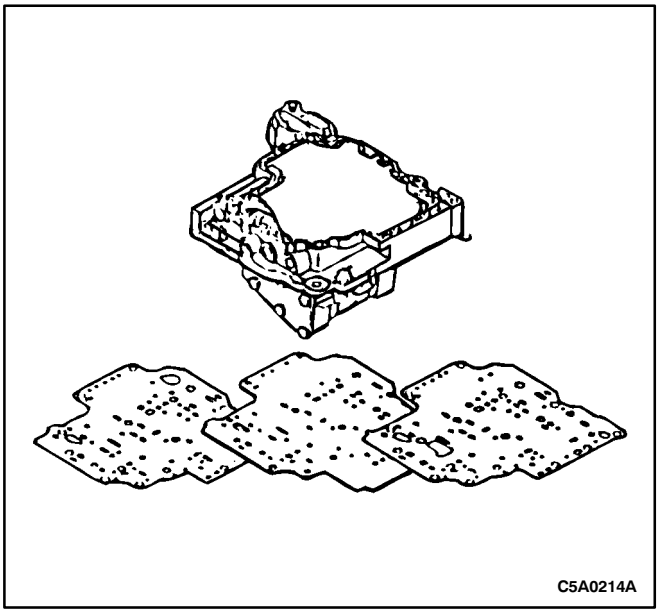

C5A0225A

Notice: Coat the oil strainers with TOTAL FLUID HX prior to assembly.

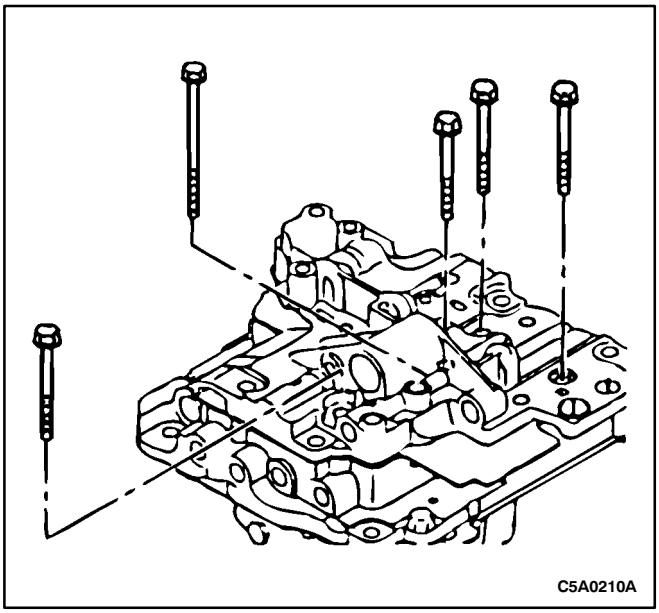
6. Install the oil strainers into the center valve body.


C5A0227A

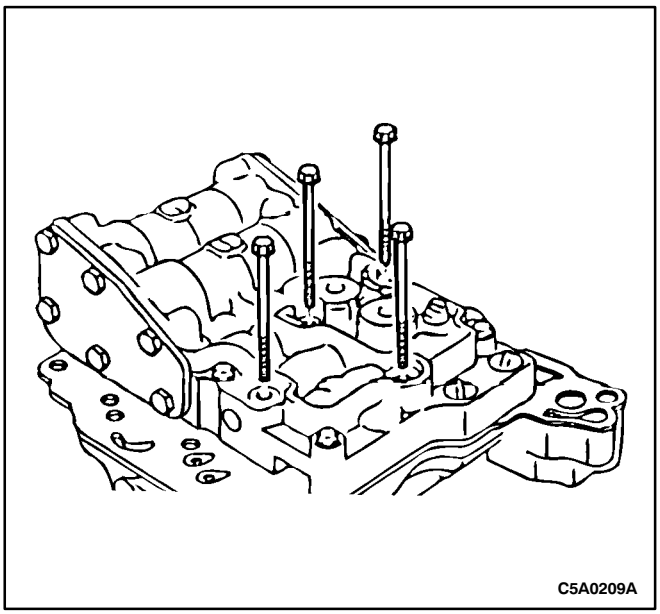
7. Install the check ball in the upper valve body.


C5A0214A

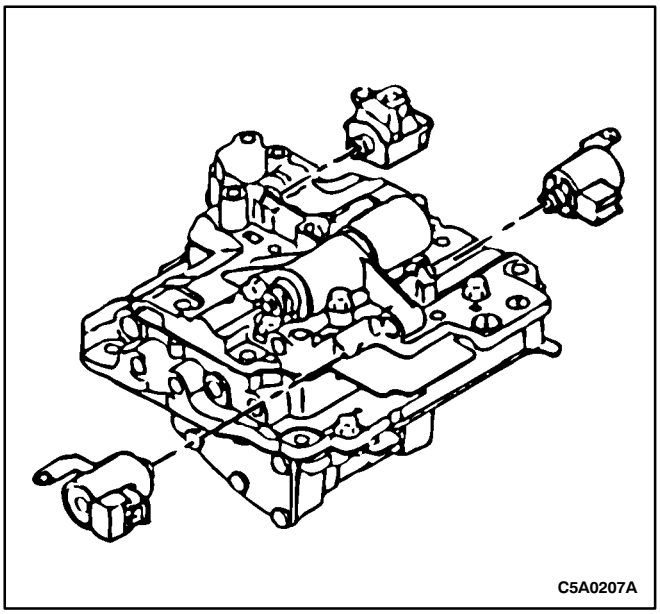
8. Install a new center valve body gasket, a center valve body separator plate and a new upper valve body gasket.
   - Place the upper valve body onto the center valve body. Hold the upper valve body, gaskets and plate securely so they do not separate.


C5A0210A

9. Install the five bolts in the upper valve body. Do not tighten at this time.
   - Three 50 mm (1.9 in) bolts
   - One 45 mm (1.8 in) bolt
   - One 65 mm (2.5 in) bolt


C5A0209A

10. Turn the valve body over and install the four bolts. Do not tighten the bolt at this time.
    - 65 mm (2.5 in) bolts

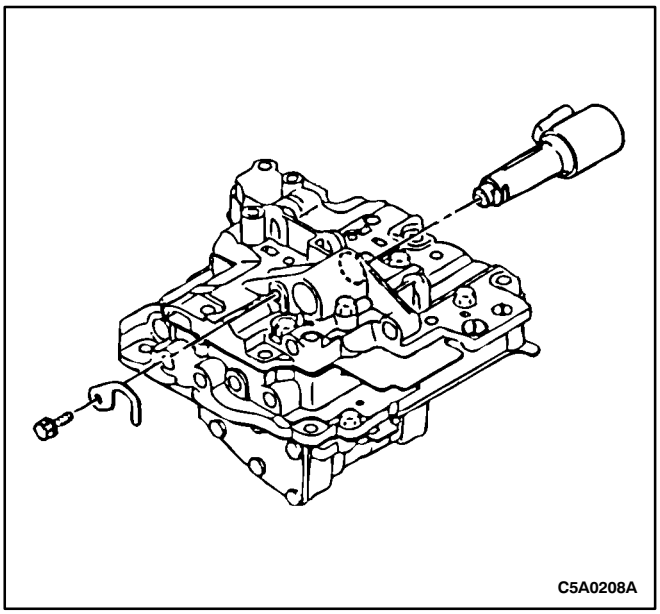

C5A0207A

Notice: Apply TOTAL FLUID HX to the solenoid O-ring.

11. Install the shift and lockup solenoids.

Tighten

Tighten the solenoid bolts to 6-7 N•m (52-65 lb-in).

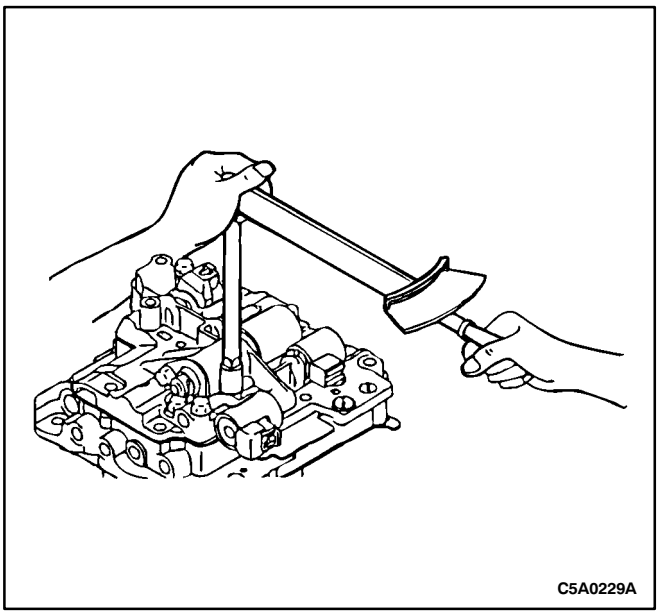

C5A0208A

Notice: Apply TOTAL FLUID HX to the solenoid O-ring.

12. Install the linear solenoid and the wire harness clamp.

Tighten

Tighten the solenoid bolt to 6-7 N•m (52-65 lb-in).

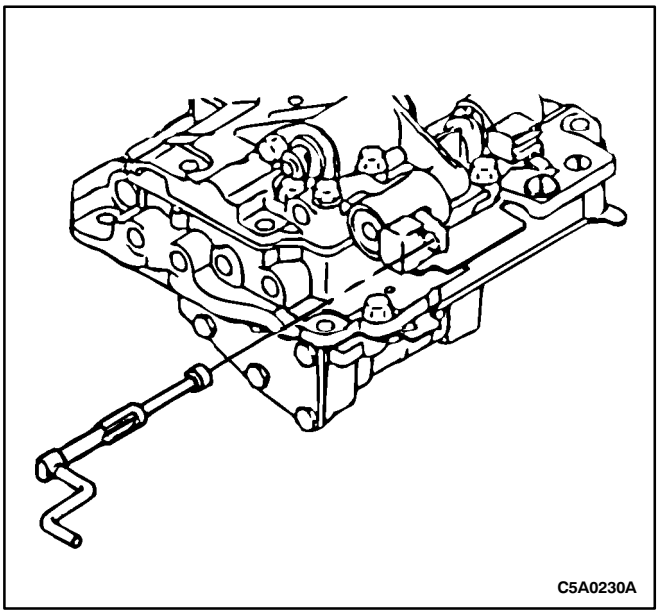

C5A0229A

Notice: Tighten the bolts evenly and gradually.

13. Tighten the 14 upper and lower valve body bolts.

Tighten

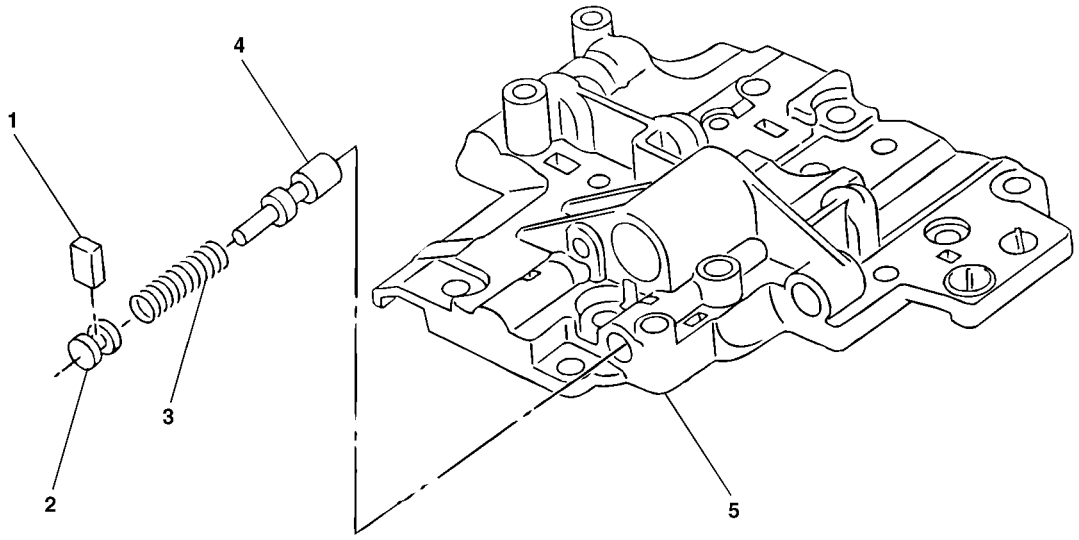
Tighten the bolts to 6-7 N•m (52-65 lb-in).


C5A0230A

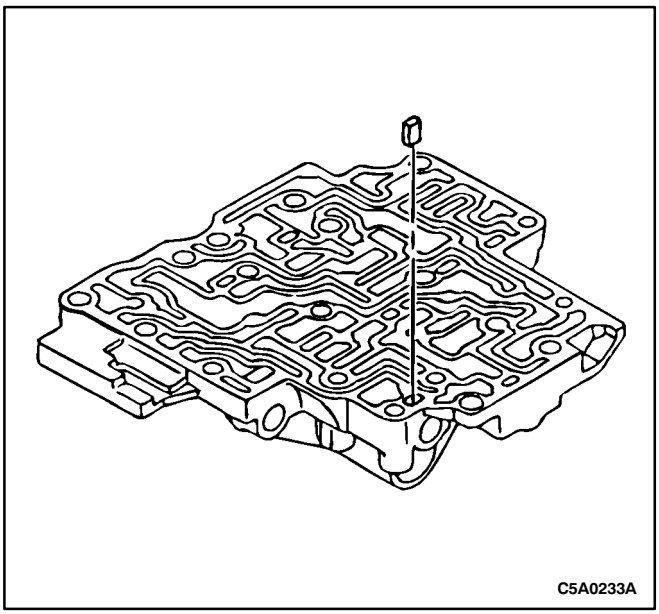
Notice: Coat the manual valve with TOTAL FLUID HX prior to assembly.

14. Install the manual valve.

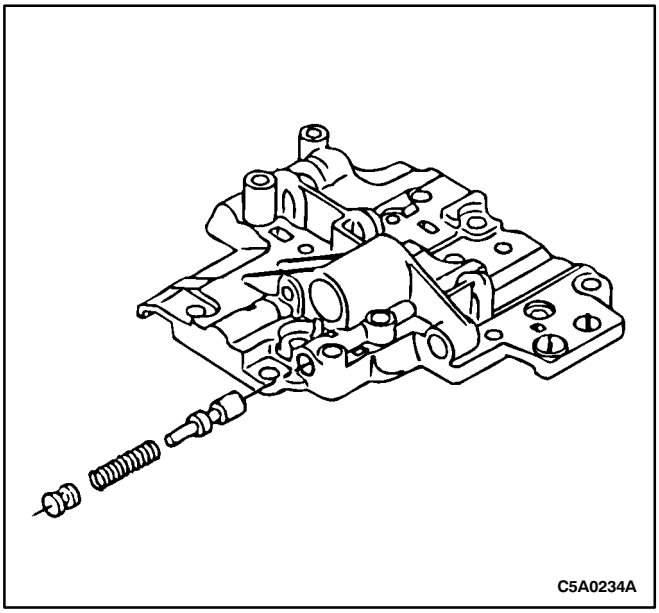
UPPER VALVE BODY



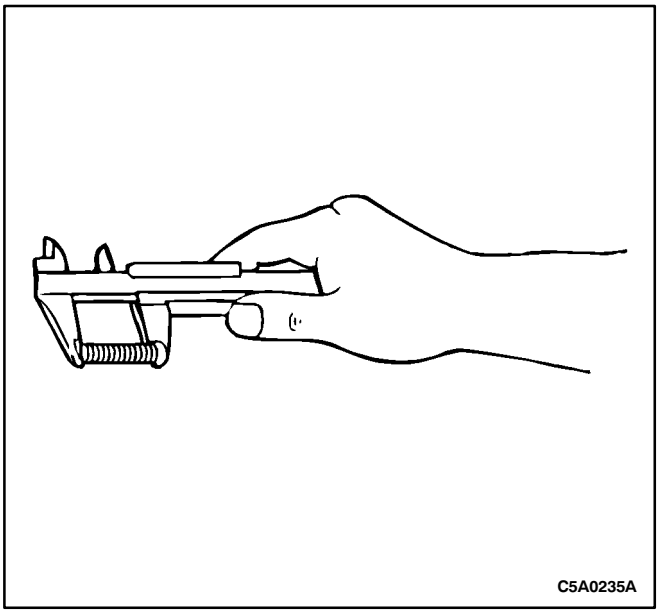
1. Key
2. Retainer
3. Valve Spring
4. Solenoid Modulator Valve
5. Upper Valve Body


C5A0233A

1. Remove the key

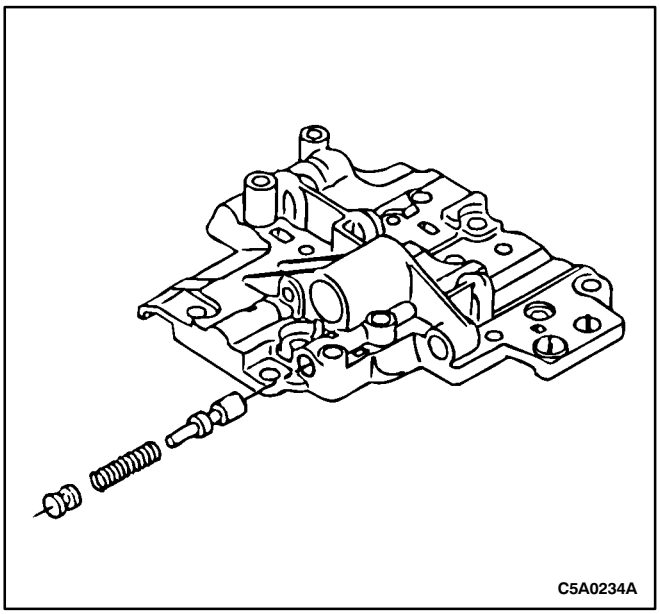

C5A0234A

2. Remove the retainer, valve spring and the solenoid modulator valve.


C5A0235A

3. Inspect the valve spring.
   - Using vernier calipers, measure the free length and outer diameter of the spring. If it does not meet specifications, replace it.

Free Length	Outer Diameter
28.53mm (1.1 in)	8.0mm (0.314 in)

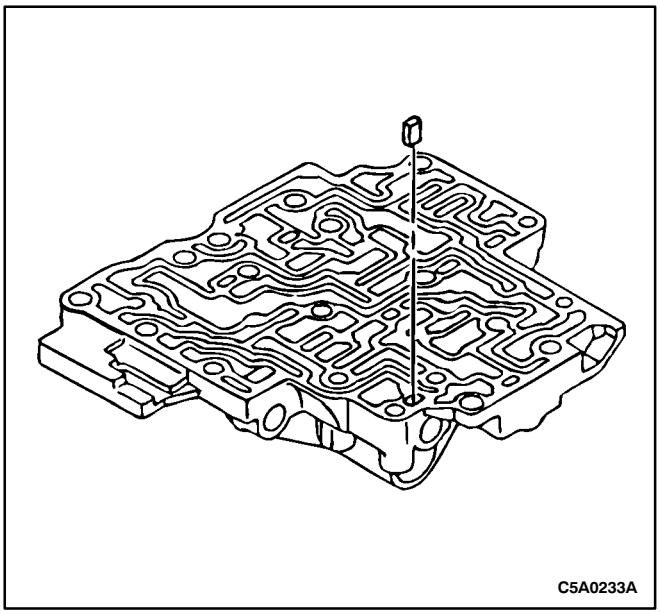

C5A0234A

Assembly Procedure

Notice: Inspect the valve for damage or wear, replace if necessary. The valve should fit snugly in the bore.

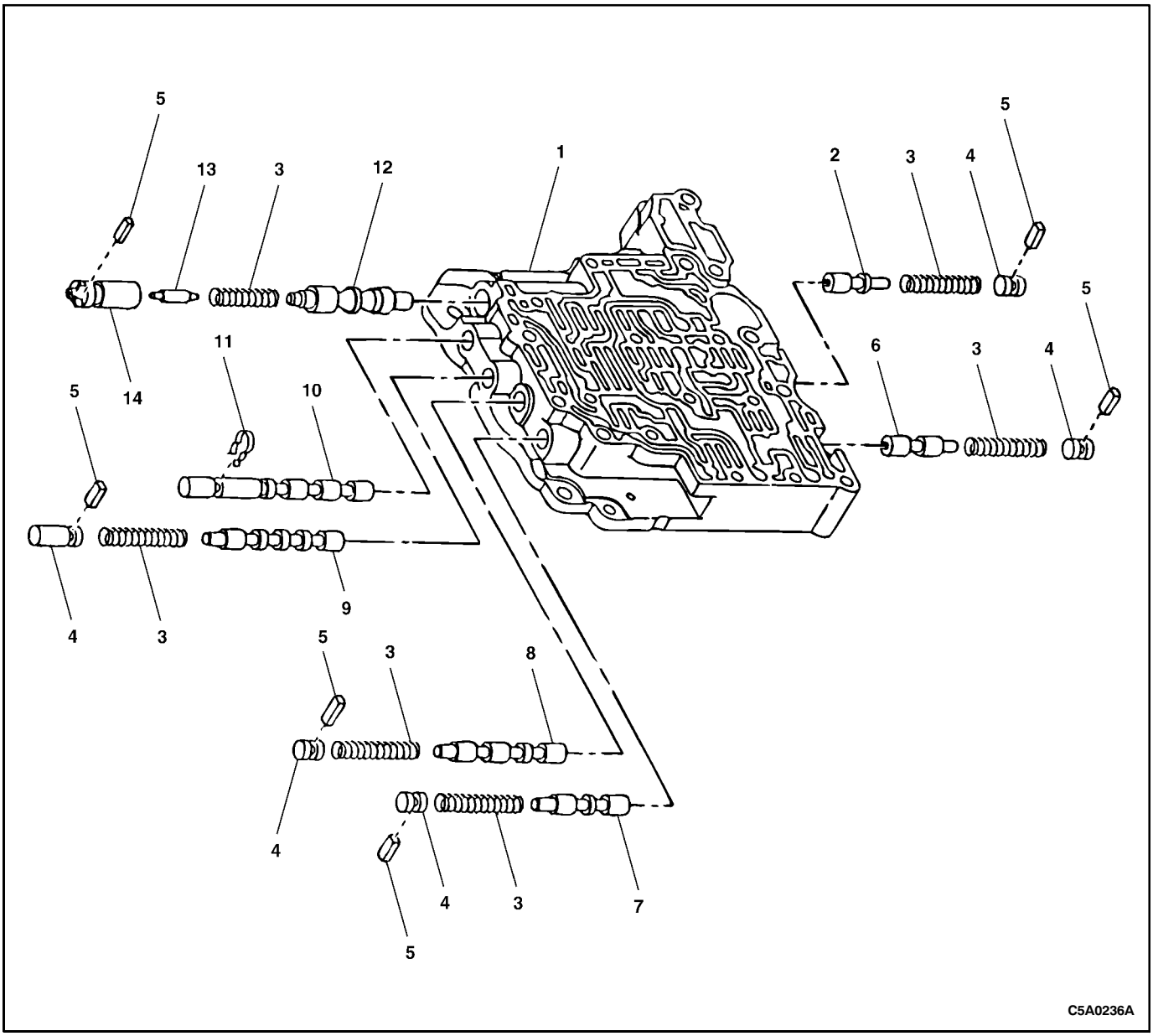
Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

1. Install the solenoid modulator valve, valve spring and the valve retainer.

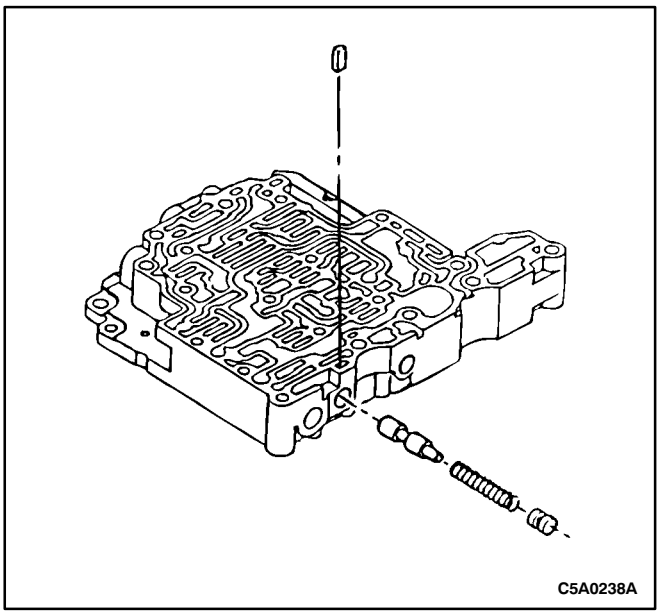

C5A0233A

2. Install the key.

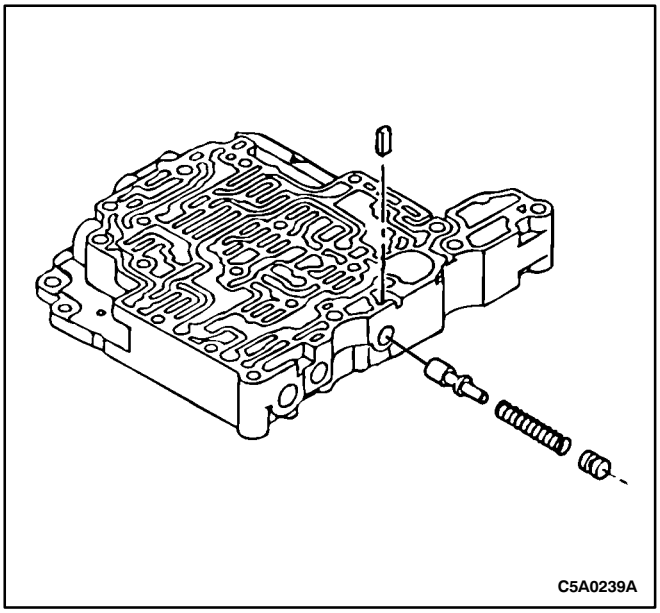
CENTER VALVE BODY



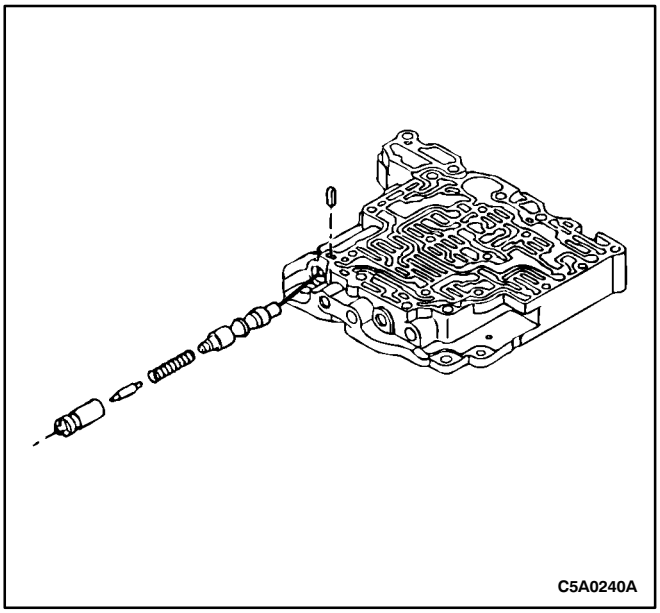
1. Center Valve Body
2. Coast (LockUp) Modulator Valve
3. Valve Sprin
4. Retainer
5. Key
6. Clutch Modulator Valve
7. 2-3 Shift Valve
8. 3-4 Shift Valve
9. 1-2 Shift Valve
10. Neutral Control Valve
11. Snap Ring Retainer
12. Primary Regulator Valve
13. Primary Regulator Valve Plunger
14. Primary Regulator Valve Plunger Sleeve


C5A0238A

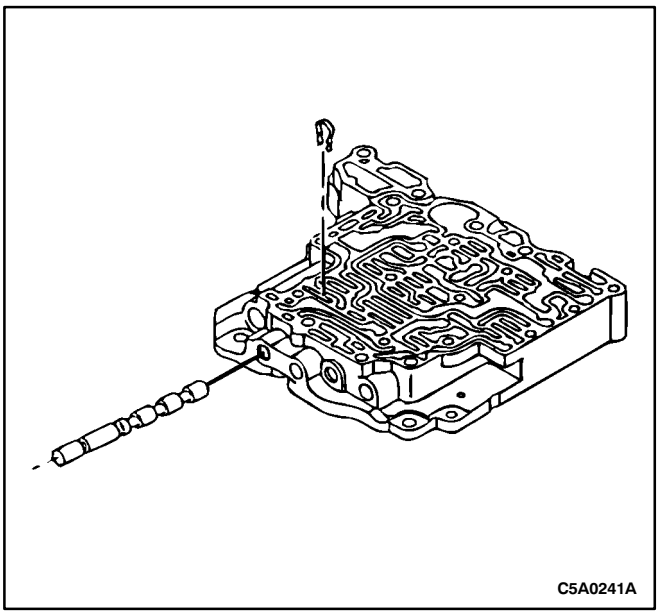
1. Remove the key, the retainer, the valve spring and the clutch modulator valve.


C5A0239A

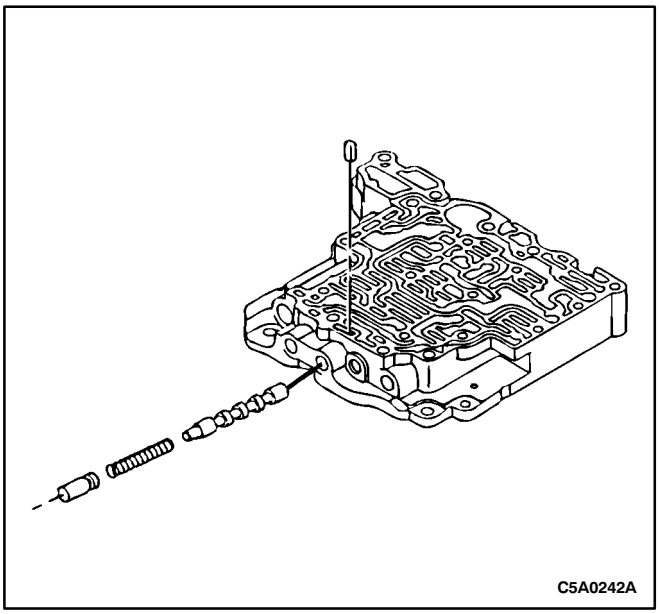
2. Remove the key, the retainer, the valve spring and the coast (lockup) modulator valve.


C5A0240A

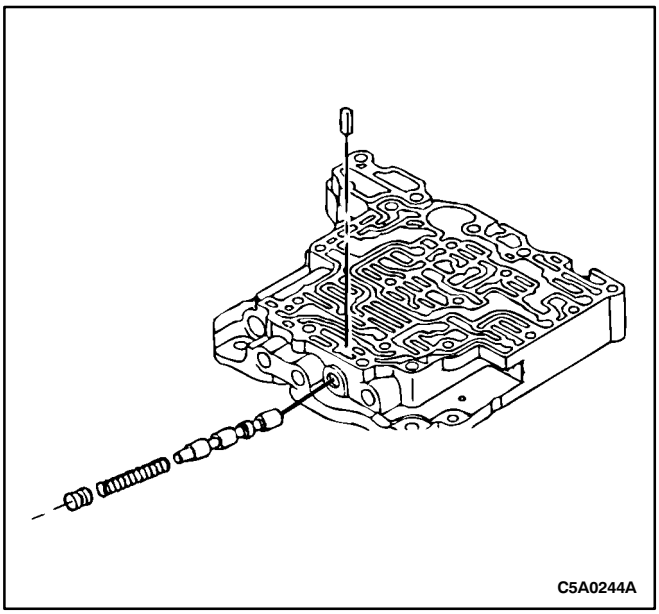
3. Remove the key, the primary regulator valve plunger sleeve, the primary regulator valve plunger, valve spring, and the primary regulator valve.


C5A0241A

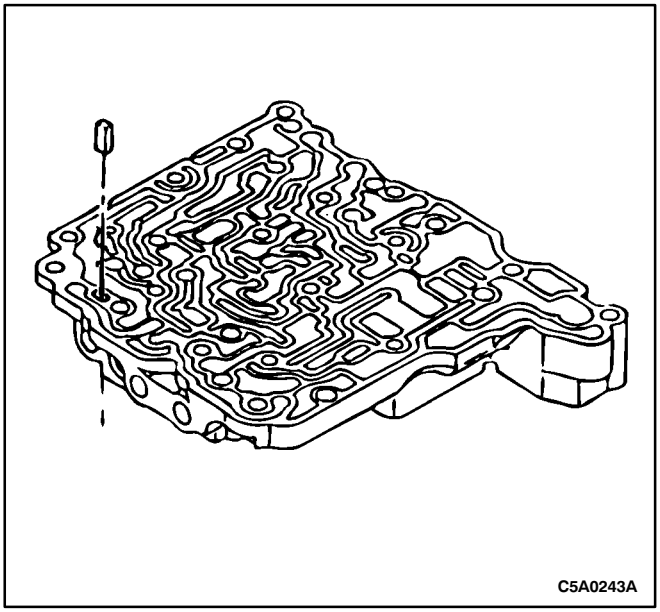
4. Remove the snap ring retainer and the neutral control valve.


C5A0242A

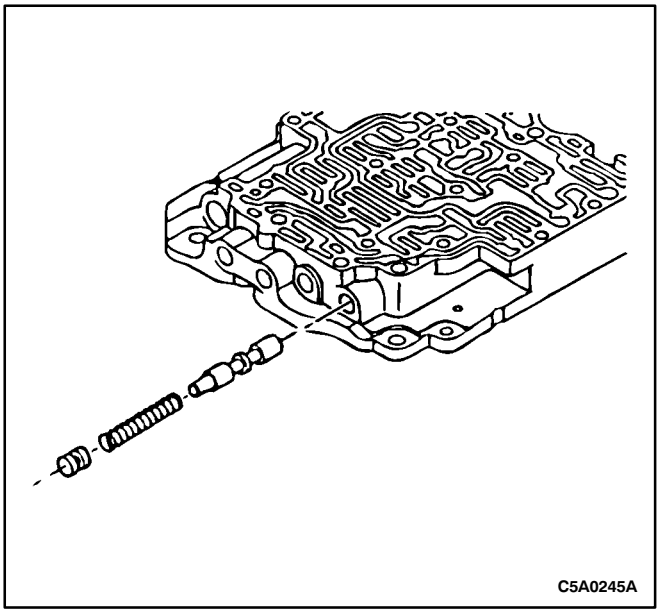
5. Remove the key, the retainer, the valve spring and the 1-2 shift valve.


C5A0244A

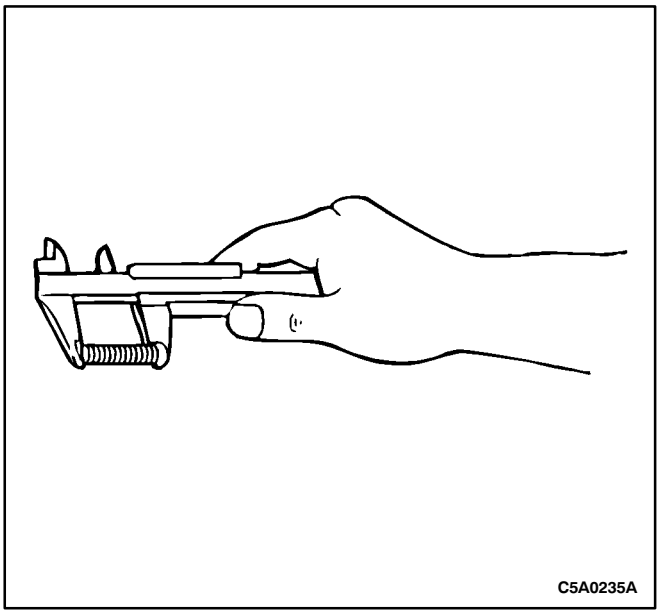
6. Remove the key, the retainer, the valve spring and the 3-4 shift valve.


C5A0243A

7. Remove the key.

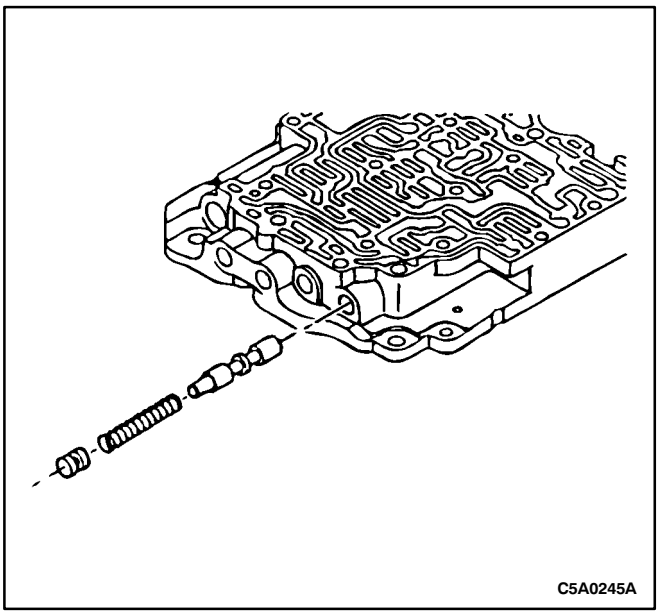

C5A0245A

8. Remove the retainer, the valve spring and the 2-3 shift valve.


C5A0235A

9. Inspect the valve springs.
   - Using vernier calipers, measure the free length and outer diameter of the spring. If it does not meet specifications, replace it.

Valve	Valve Spring Free Length mm (in)	Valve Spring Outer Diameter mm (in)
Primary Regulator	29.72 (1.2)	10.5 (0.41)
1-2 Shift	33.95 (1.3)	8.2 (0.32)
2-3 Shift	33.95 (1.3)	8.2 (0.32)
3-4 Shift	33.95 (1.3)	8.2 (0.32)
Coast (Lockup) Modulator	22.42 (0.88)	8.0 (0.31)
Clutch Modulator	22.78 (0.90)	8.3 (0.33)


C5A0245A

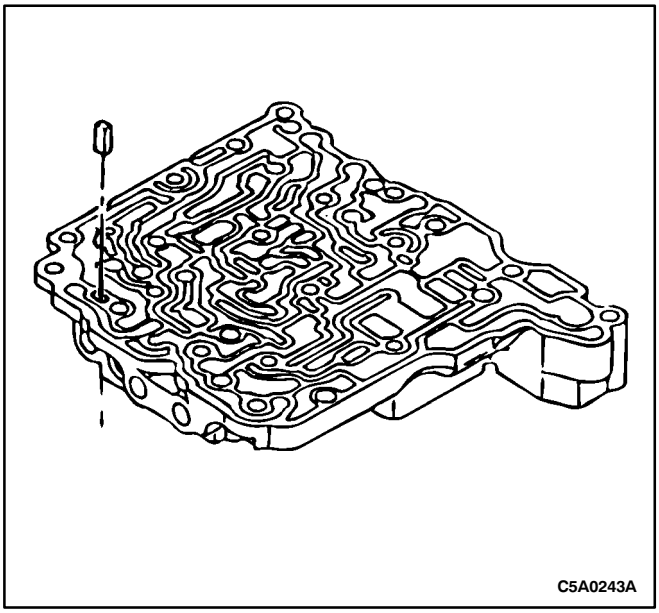
Assembly Procedure

Notice: Inspect the valve for damage or wear. Replace if necessary.

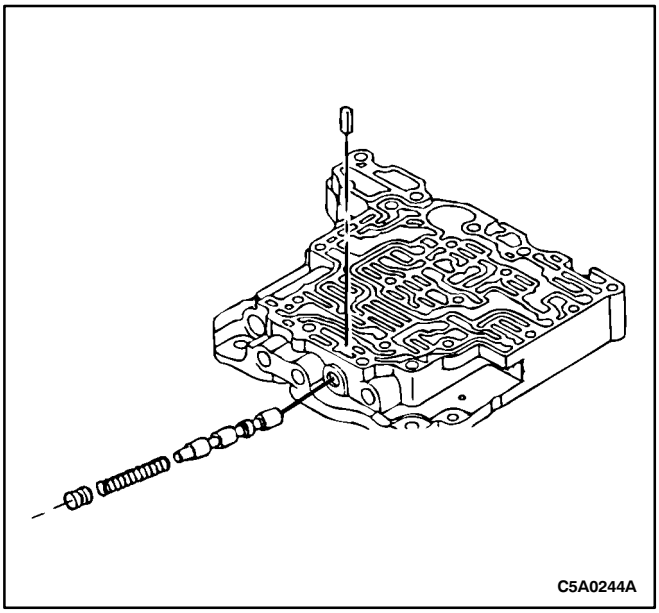
Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring and retainer with TOTAL FLUID HX prior to assembly.

1. Install the 2-3 shift valve, the valve spring and the retainer.


C5A0243A

2. Install the key.

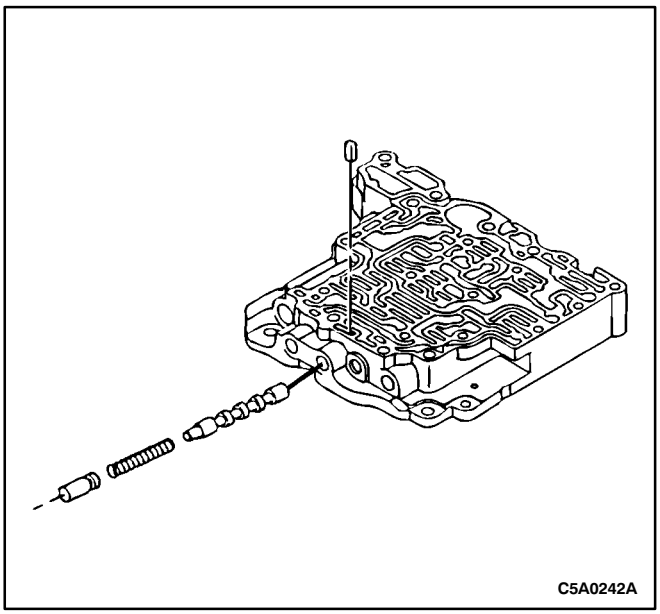

C5A0244A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring and retainer with TOTAL FLUID HX prior to assembly.

3. Install the 3-4 shift valve, the valve spring, the retainer and the key.

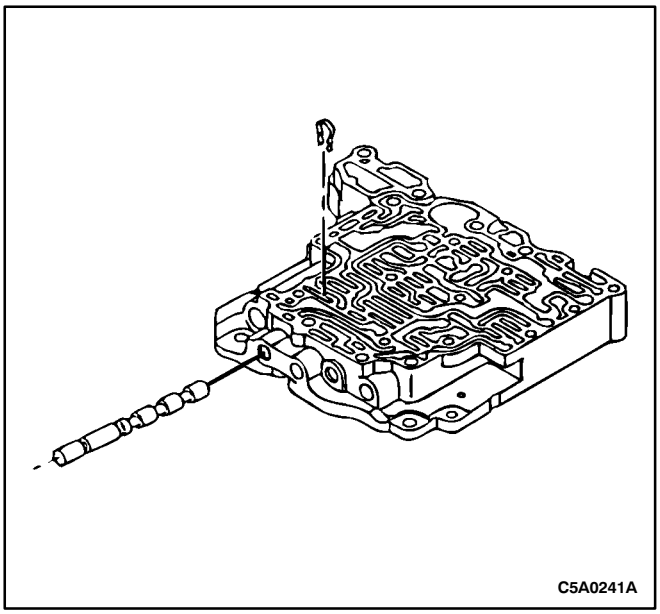

C5A0242A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring and retainer with TOTAL FLUID HX prior to assembly.

4. Install the 1-2 shift valve, the valve spring , the retainer and the key.

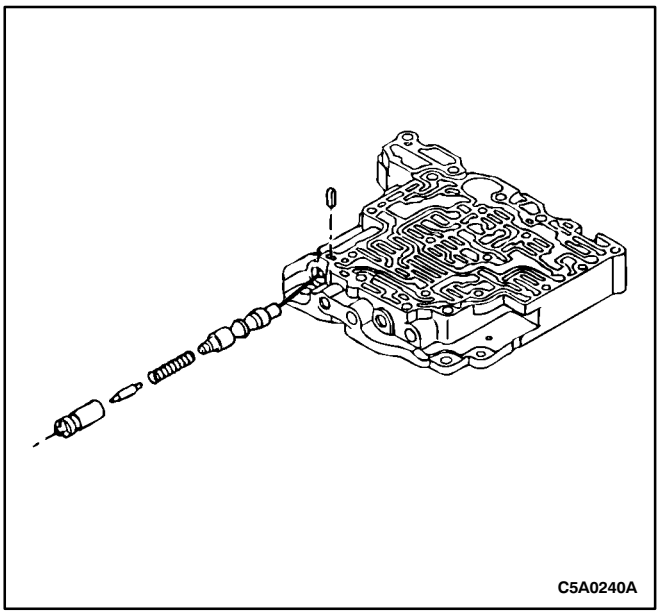

C5A0241A

Notice: Inspect the plug for damage or wear. Replace if necessary.

Notice: The plug should fit snugly in the bore.

Notice: Coat the plug with TOTAL FLUID HX prior to assembly.

5. Install the neutral control plug and the snap ring retainer.

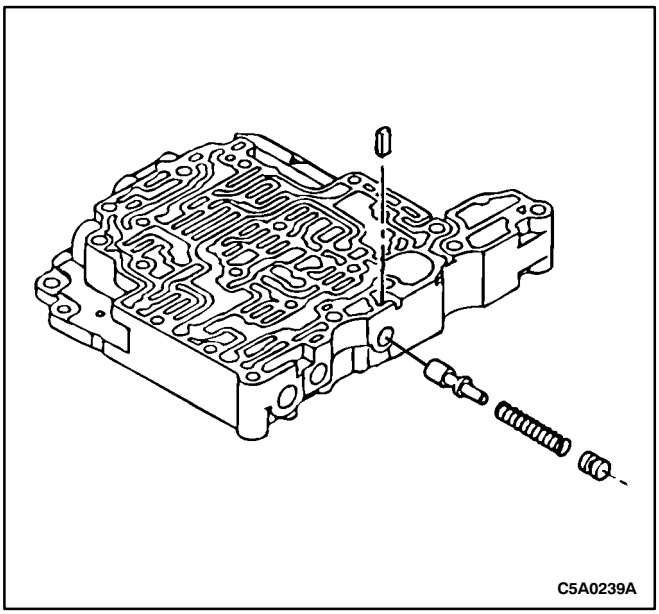

C5A0240A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring, plunger and sleeve with TOTAL FLUID HX prior to assembly.

6. Install the primary regulator valve, the valve spring, the primary regulator valve plunger, the primary regulator valve plunger sleeve, and the key.

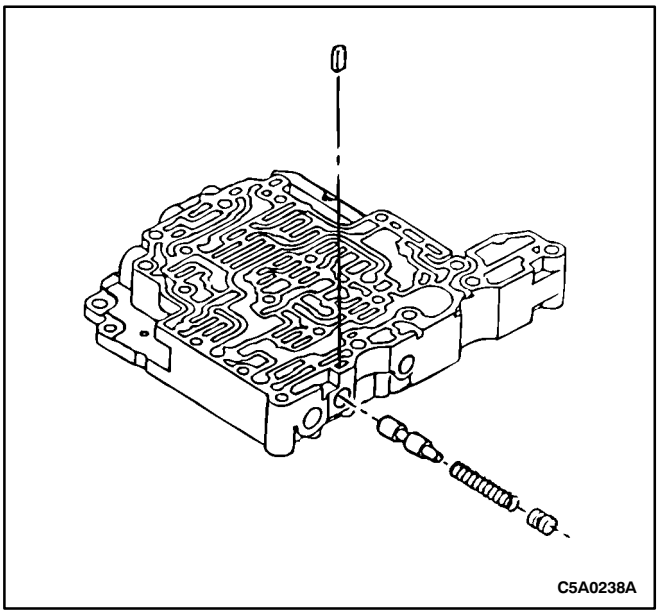


Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring and retainer with TOTAL FLUID HX prior to assembly.

7. Install the coast (lockup) modulator valve, the valve spring, the retainer and the key.



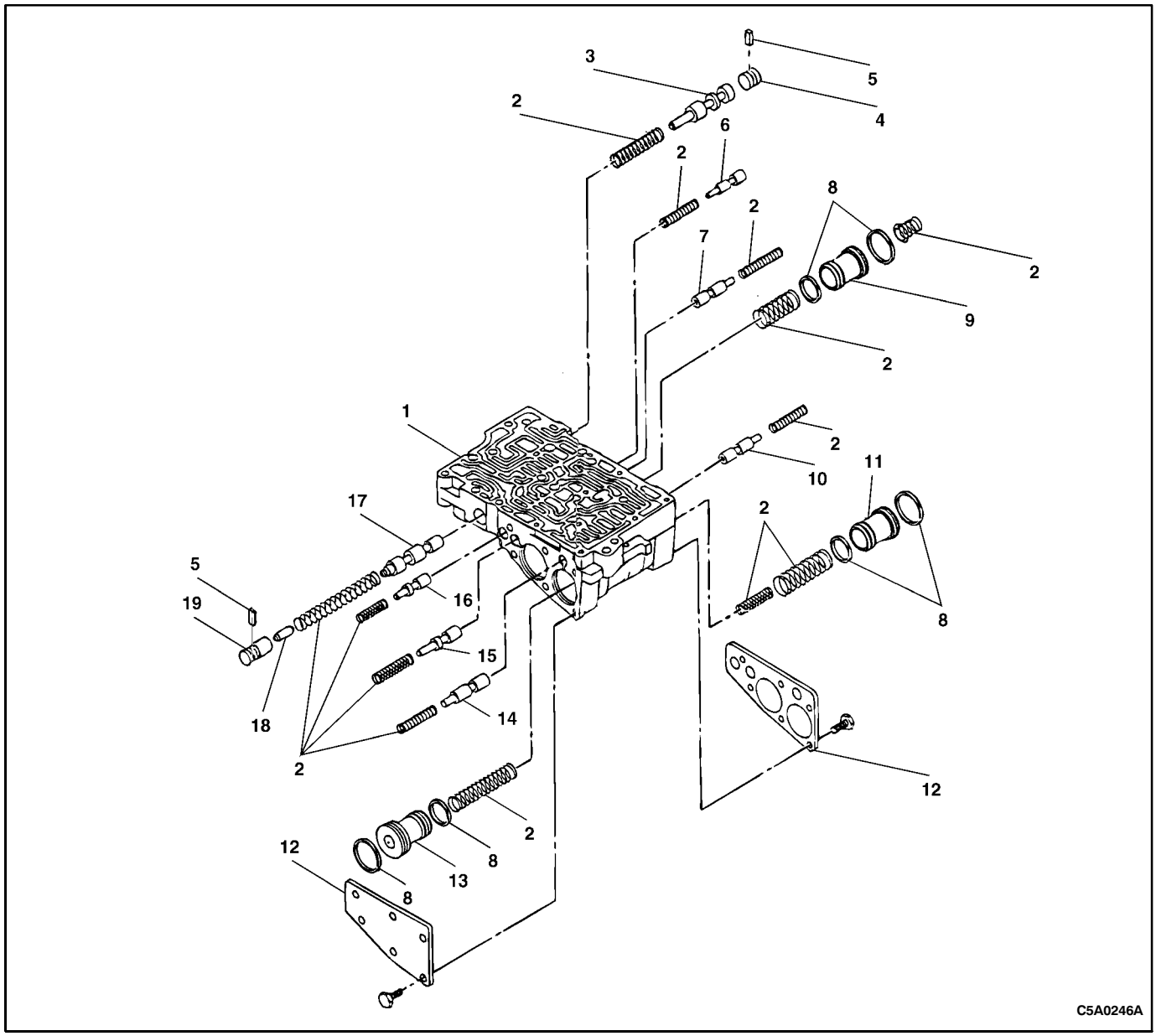
Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

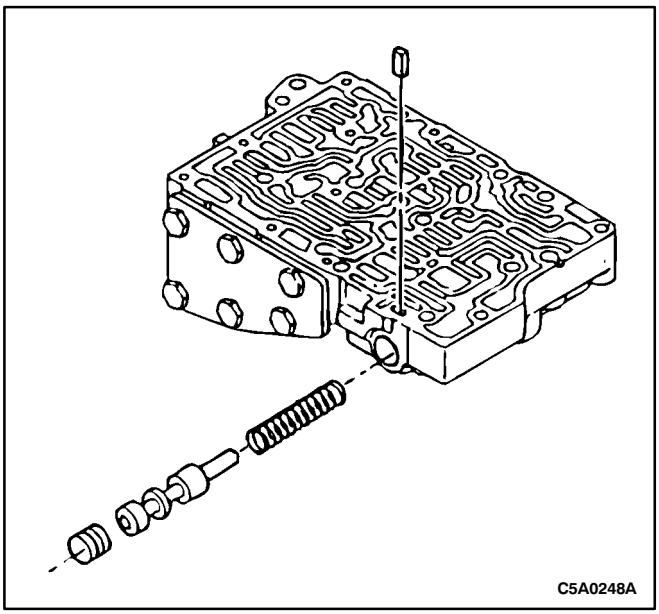
Notice: Coat the valve, spring and retainer with TOTAL FLUID HX prior to assembly.

8. Install the clutch modulator valve, the valve spring, the retainer and the key.

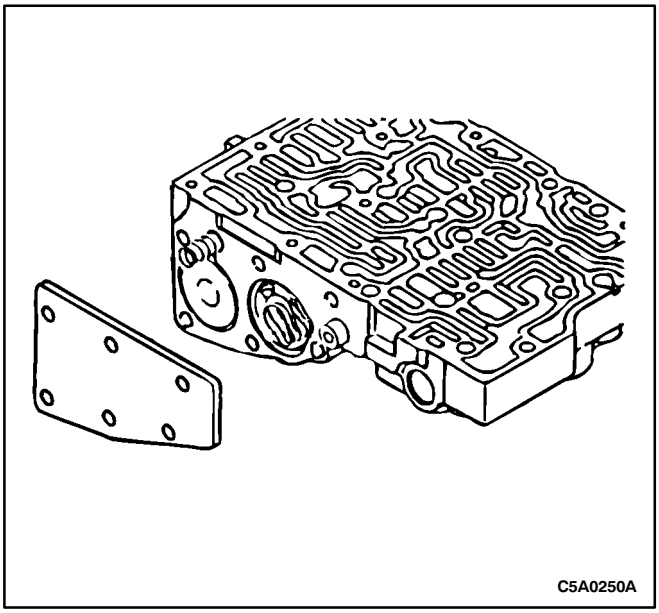
LOWER VALVE BODY



1. Lower Valve Body
2. Valve Spring
3. Secondary Regulator Valve
4. Retainer
5. Key
6. Accumulator Control Valve
7. B2 Accumulator Valve
8. Seal Rings
9. B2 Accumulator Piston
10. C2 Accumulator Valve
11. C2 Accumulator Piston
12. Cover Plate
13. C3 Accumulator Piston
14. C3 Accumulator Valve
15. B1 Accumulator Valve
16. Coast Modulator Valve
17. Lockup Control Valve
18. Lockup Control Plunger
19. Lockup Control Plunger Sleeve

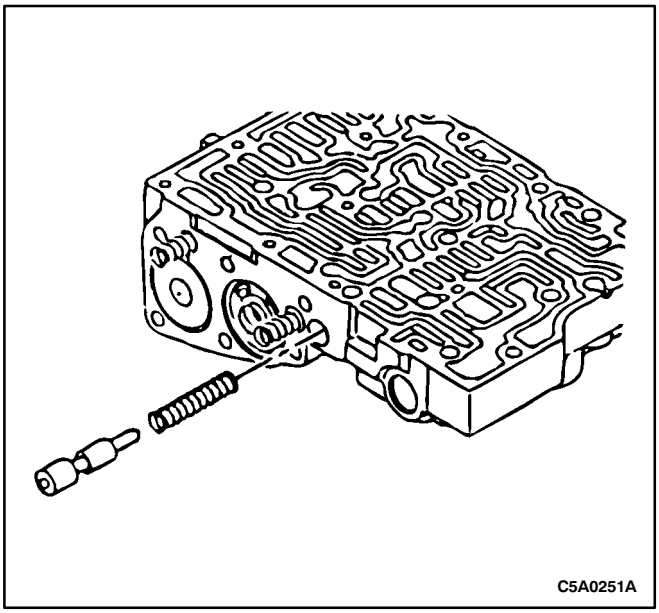

C5A0248A

1. Remove the key, the retainer, the secondary regulator valve and the valve spring.

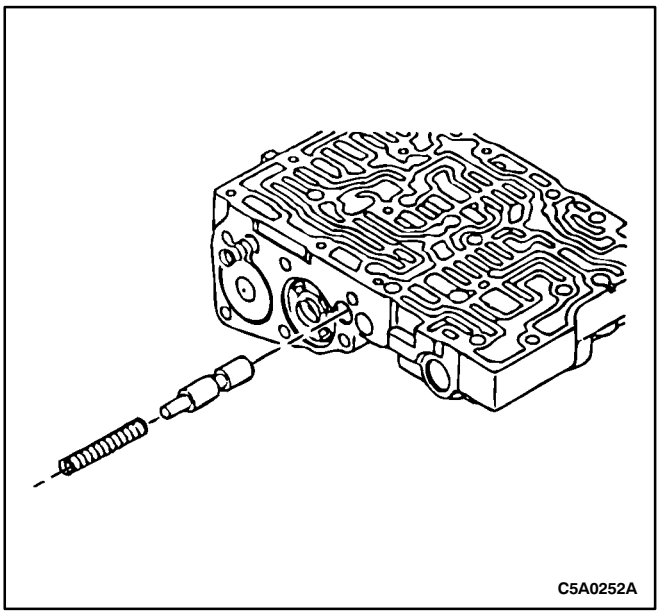

C5A0250A

Notice: Discard the gasket.

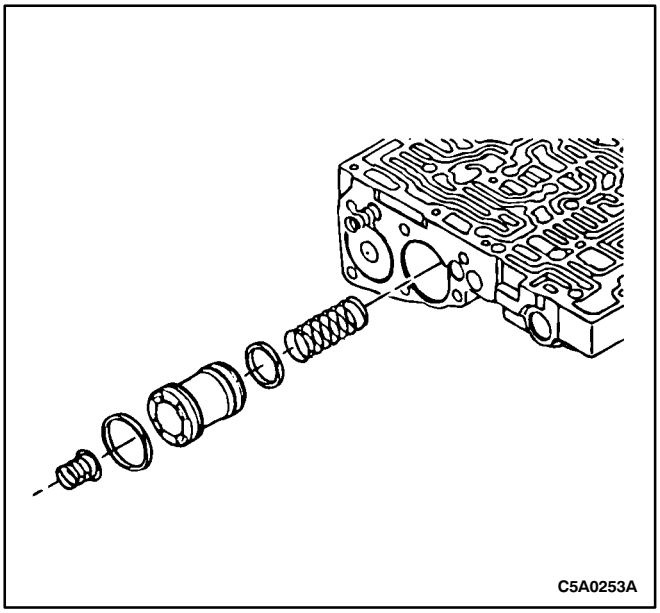
2. Remove the cover plate and gasket.


C5A0251A

3. Remove the valve spring and the accumulator control valve.

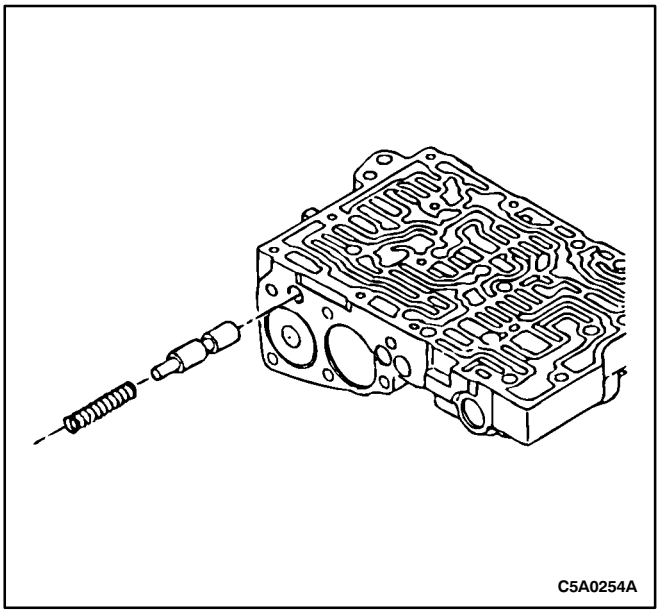

C5A0252A

4. Remove the valve spring and the B2 accumulator valve.

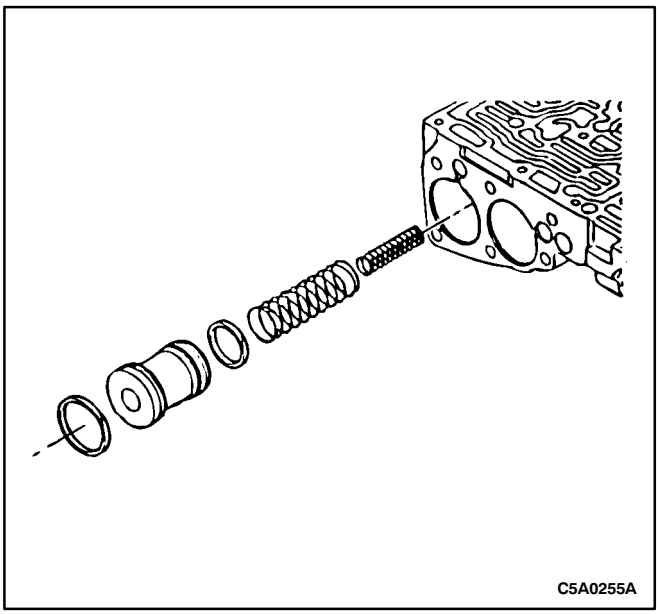

C5A0253A

Notice: Remove the seal rings from the piston and discard them.

5. Remove the B2 accumulator piston and the springs.

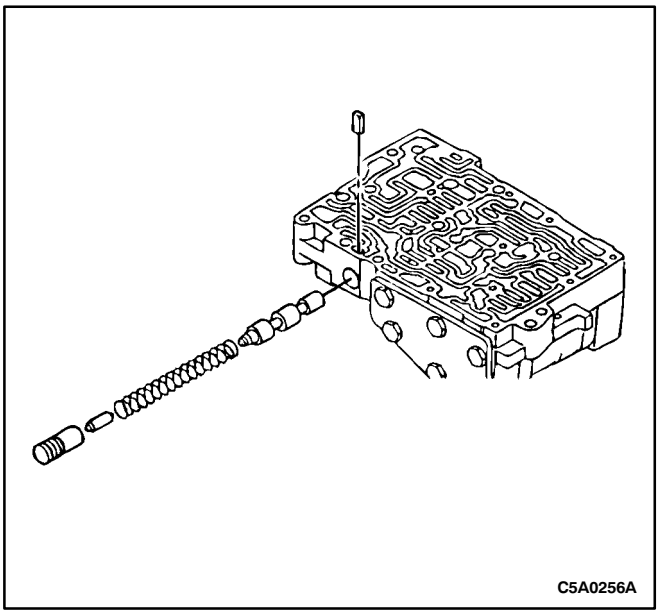

C5A0254A

6. Remove the valve spring and the C2 accumulator valve.

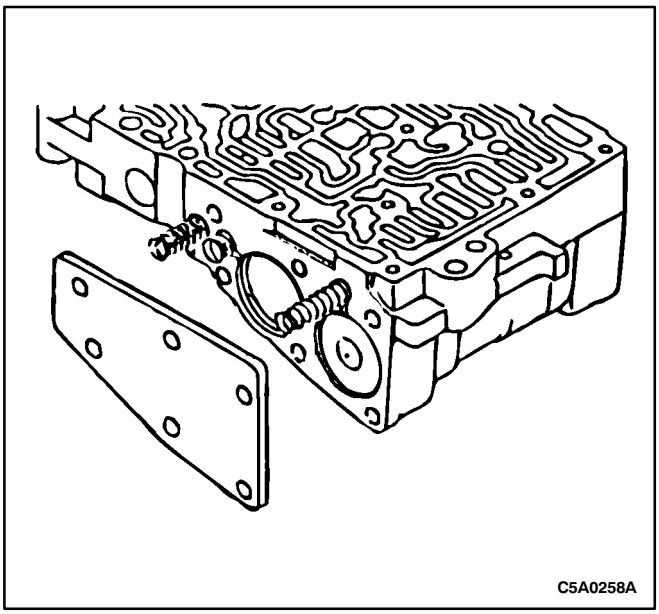

C5A0255A

Notice: Remove discard the seal rings from the piston.

7. Remove the C2 accumulator piston and the springs.

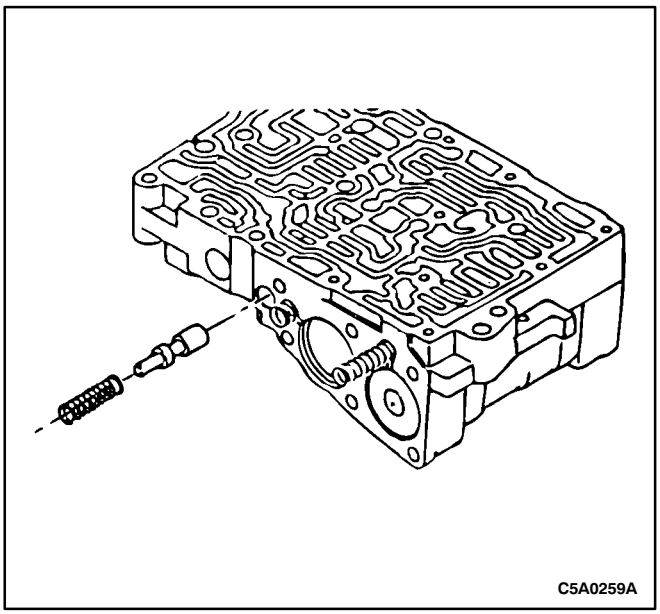

C5A0256A

8. Remove the key, the lockup control plunger sleeve, lockup control plunger, the valve spring and the lockup control valve.

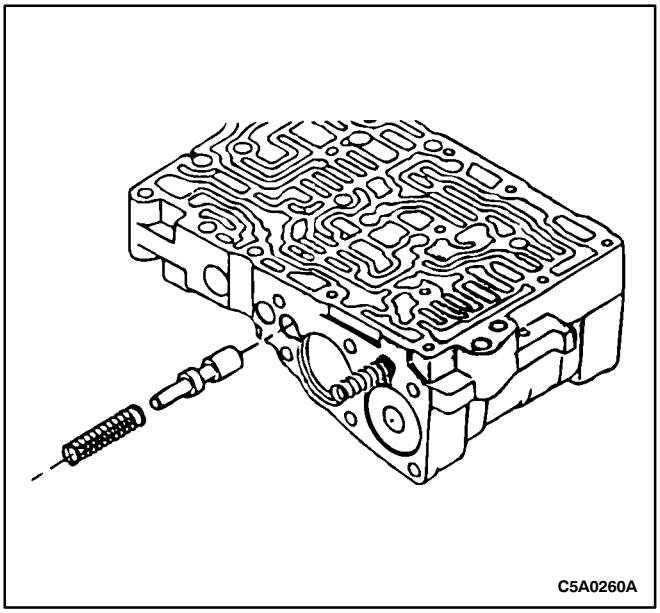

C5A0258A

Notice: Discard the gasket.

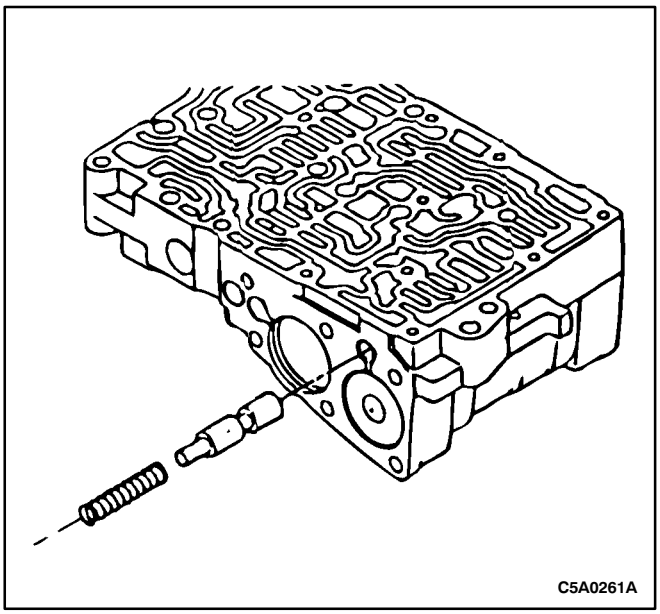
9. Remove the cover plate and gasket.


C5A0259A

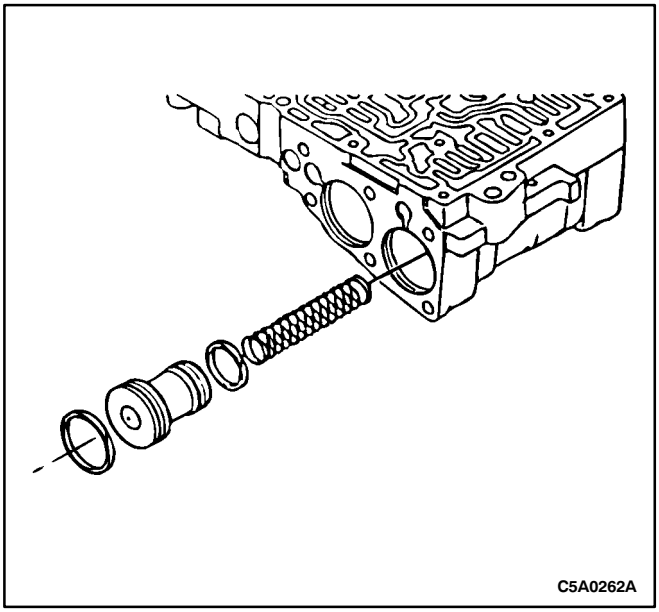
10. Remove the valve spring and the coast modulator valve.


C5A0260A

11. Remove the valve spring and the B1 modulator valve.

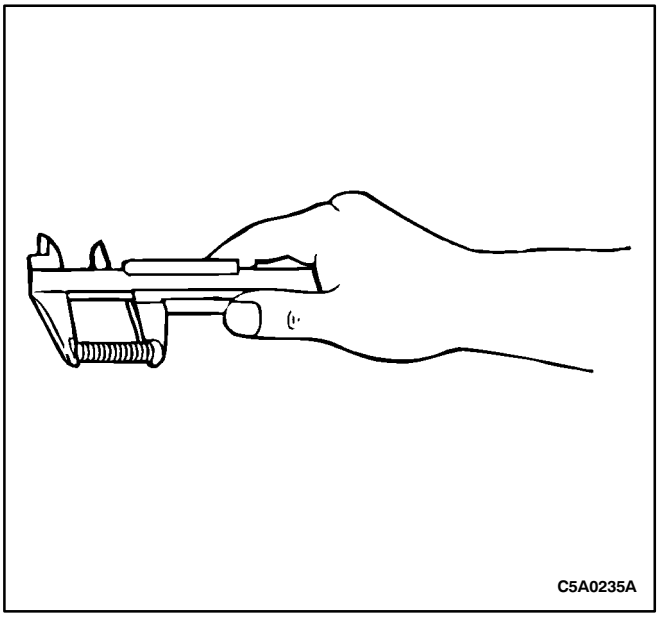

C5A0261A

12. Remove the valve spring and the C3 modulator valve.


C5A0262A

Notice: Remove the seal rings from the piston and discard them.

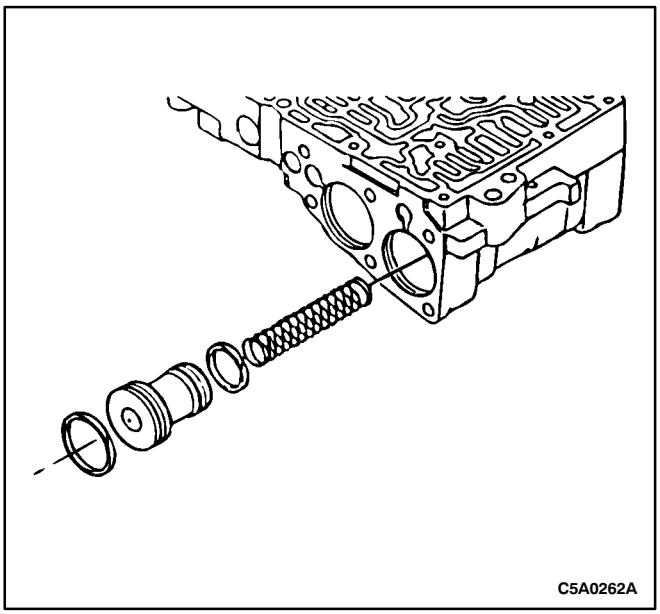
13. Remove the C3 accumulator piston and spring.


C5A0235A

14. Inspect the valve springs.

- Using vernier calipers, measure the free length and outer diameter of the spring. If it does not meet specifications, replace it.

Valve or Piston	Valve Spring Free Length mm (in)	Valve Spring Outer Diameter mm (in)
Secondary	37.4 (1.5)	10.0 (0.39)
Regulator Accumulator	26.6 (1.0)	7.2 (0.28)
Control B2 Valve	32.77 (1.3)	7.0 (0.27)
B2 Piston-Inner	15.0 (0.59)	11.9 (0.47)
B2 Piston-Outer	46.0 (1.8)	15.2 (0.60)
C2 Piston-Inner	37.0 (1.4)	10.3 (0.40)
C2 Piston-Outer	46.0 (1.8)	15.3 (0.60)
C2 Accumulator	30.67 (1.2)	7.0 (0.27)
LockUp Control	64.94 (2.5)	9.6 (0.38)
Coast Modulator	24.37 (0.95)	7.2 (0.28)
B1 Modulator	25.94 (1.0)	8.0 (0.31)
C3 Piston	46.0 (1.8)	11.6 (0.46)
C3 Accumulator	30.67 (1.2)	7.0 (0.27)


C5A0262A

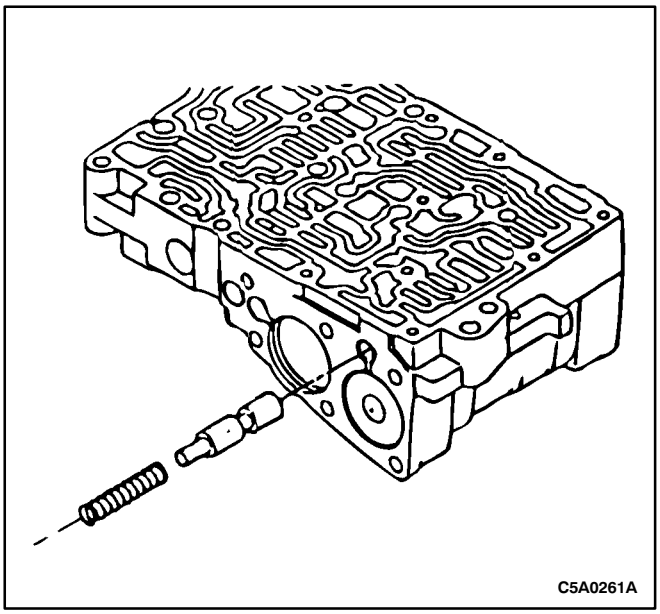
Assembly Procedure

Notice: Inspect the piston for damage or wear. Replace if necessary.

Notice: The piston should fit snugly in the bore.

Notice: Coat the piston, spring and seal rings with TOTAL FLUID HX prior to assembly.

1. Install new seal rings on the piston. Then install the spring and C3 accumulator piston.

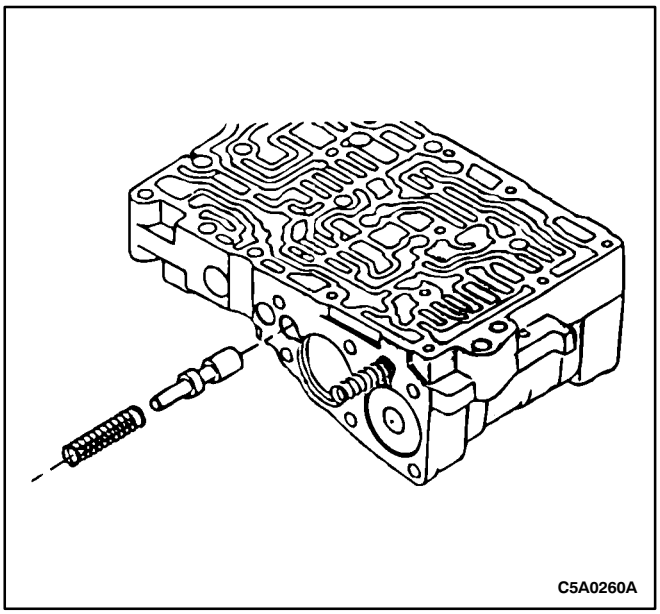

C5A0261A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

2. Install the C3 modulator valve and the valve spring.

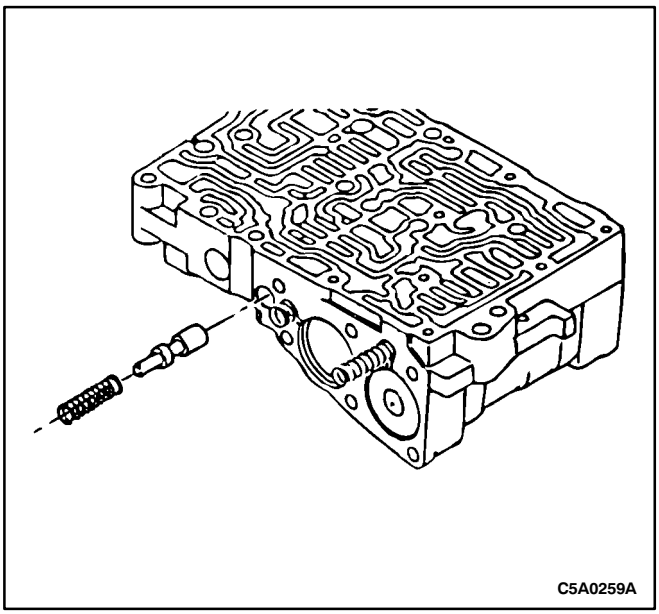

C5A0260A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

3. Install the B1 modulator valve and the valve spring.

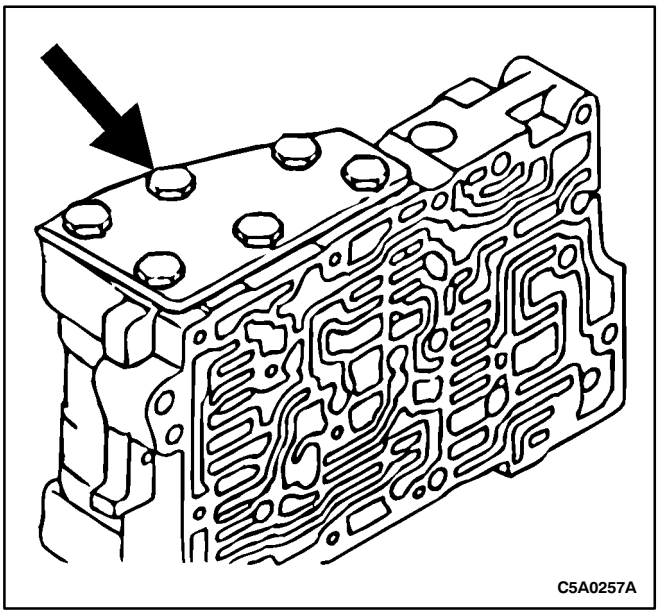

C5A0259A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

4. Install the coast modulator valve and the valve spring.

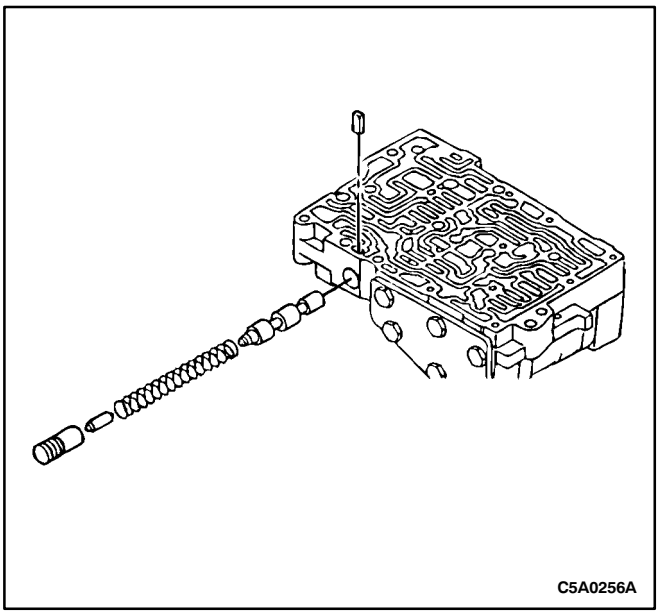

C5A0257A

Notice: Tighten the six bolts evenly and gradually.

5. Install a new gasket and the cover plate.

Tighten

Tighten the bolts to 6-7 N•m (53-62 lb-in).

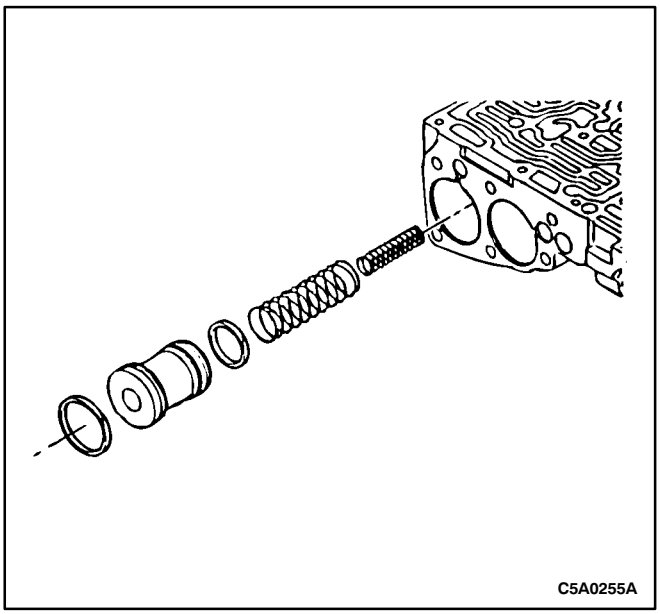

C5A0256A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring, plunger and sleeve with TOTAL FLUID HX prior to assembly.

6. Install the lockup control valve and the valve spring. Insert the lockup control plunger in the lockup control plunger sleeve and install into the valve body. Push in the key.

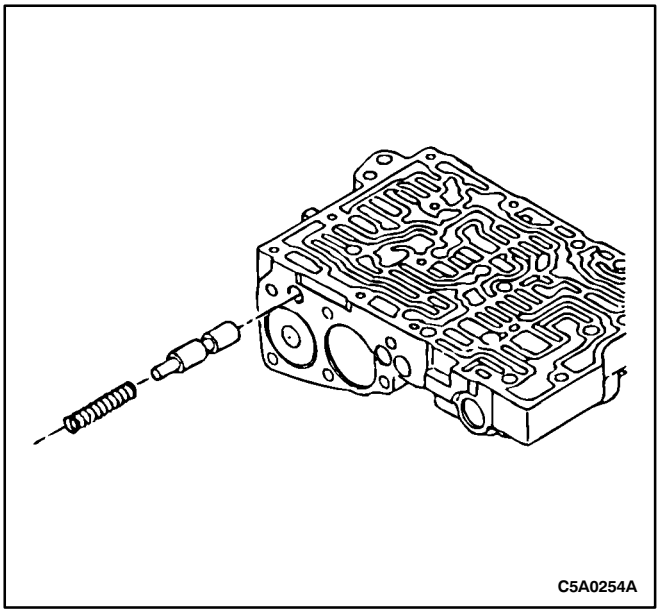

C5A0255A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The piston should fit snugly in the bore.

Notice: Coat the piston, springs and seal rings with TOTAL FLUID HX prior to assembly.

7. Install new seal rings on the piston. Then install the springs and C2 accumulator piston.

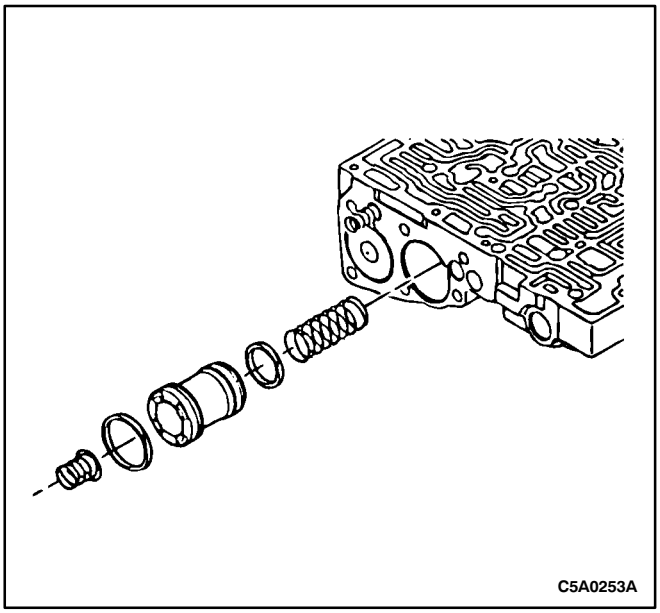

C5A0254A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

8. Install the C2 accumulator valve and the valve spring.

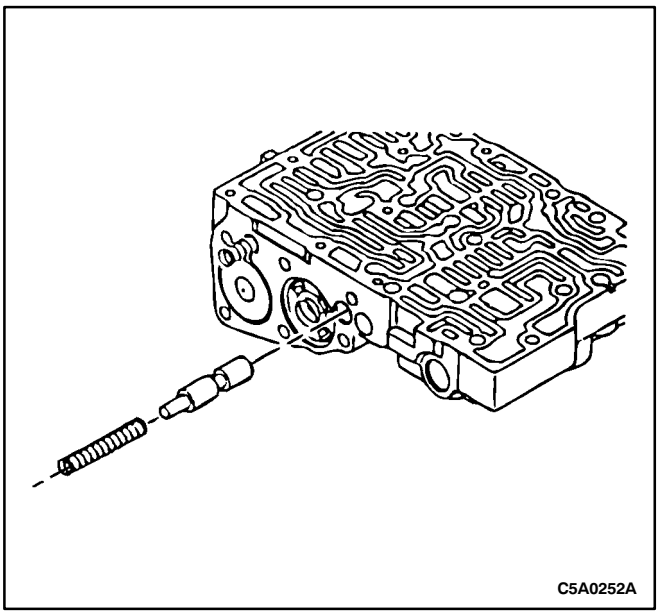

C5A0253A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The piston should fit snugly in the bore.

Notice: Coat the piston, springs and seal rings with TOTAL FLUID HX prior to assembly.

9. Install new seal rings on the piston. Then install the springs and B2 accumulator piston.

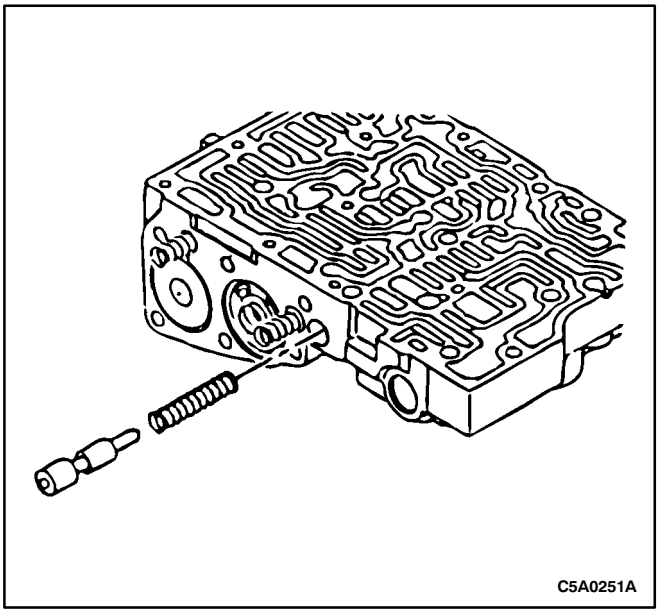

C5A0252A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

10. Install the B2 accumulator valve and the valve spring.

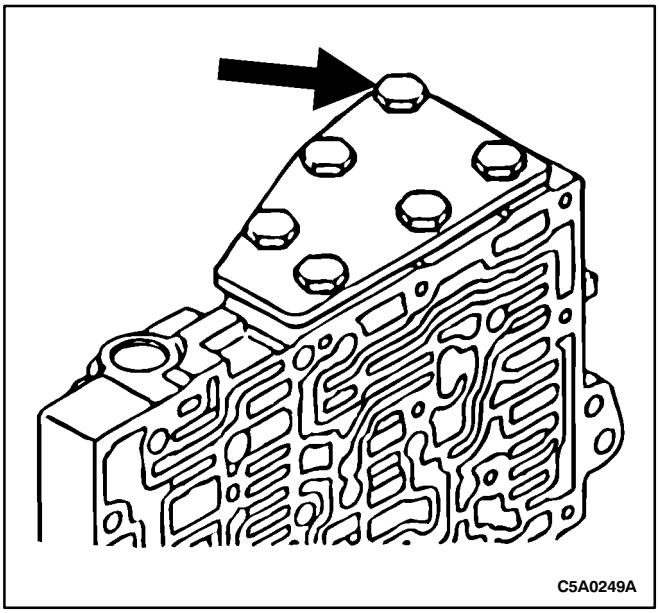

C5A0251A

Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve and spring with TOTAL FLUID HX prior to assembly.

11. Install the accumulator control valve and the valve spring.

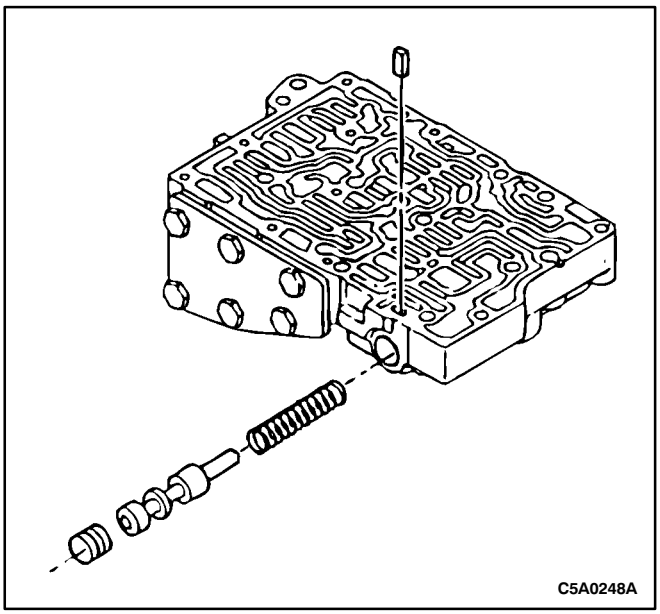

C5A0249A

Notice: Tighten the bolts evenly and gradually.

12. Install a new gasket and the cover plate.

Tighten

Tighten the bolts to 6-7 N•m (53-62 lb-in).



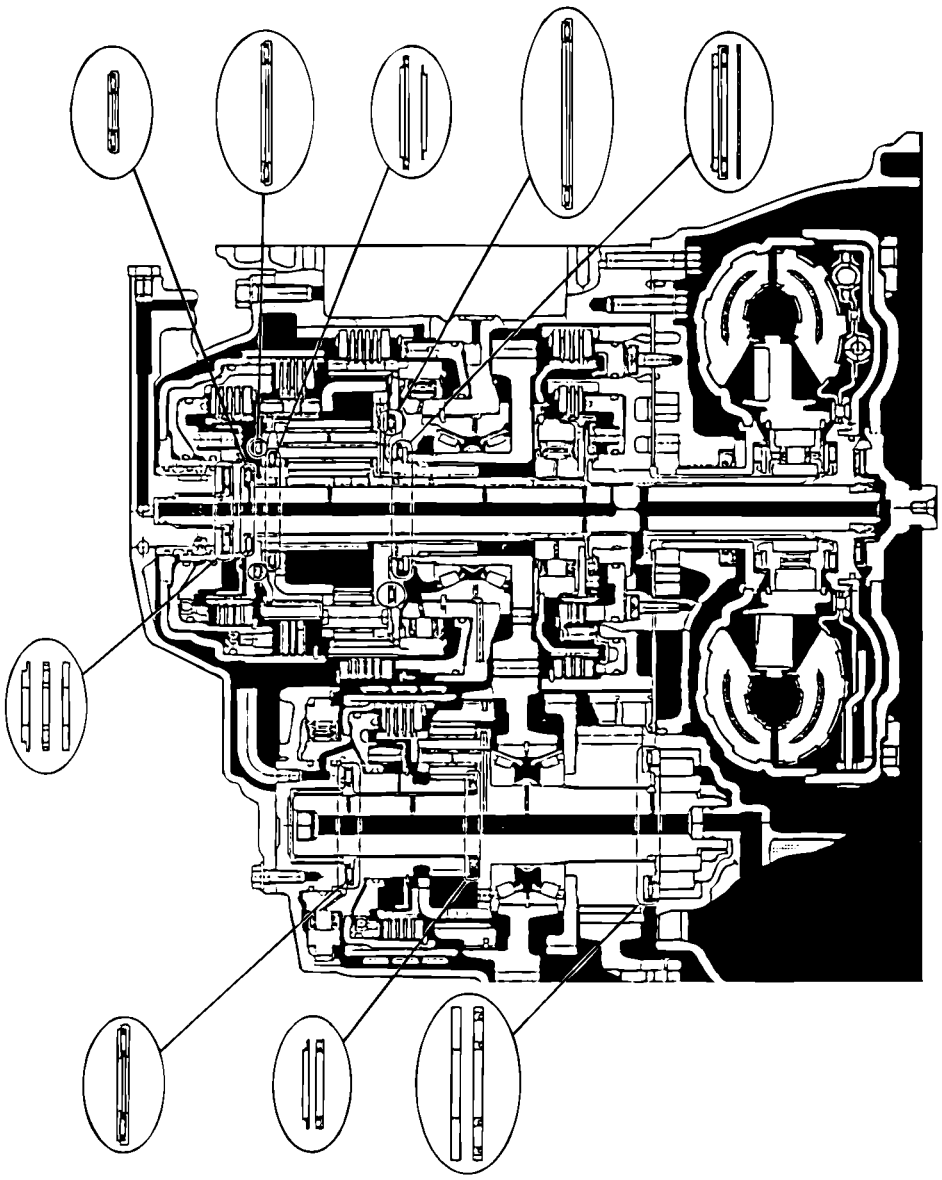
Notice: Inspect the valve for damage or wear. Replace if necessary.

Notice: The valve should fit snugly in the bore.

Notice: Coat the valve, spring and retainer with Texaco 1854 automatic transmission prior to assembly.

13. Install the valve spring, the secondary regulator valve and the retainer. Push in the key.

BEARING AND THRUST WASHER LOCATION



Bearing and Thrust Washer Location									
	Diameter	**1 mm (in)**	**2 mm (in)**	**3 mm (in)**	**4 mm (in)**	**5 mm (in)**	**6 mm (in)**	**7 mm (in)**	**8 mm (in)**
Thrust Washers	Outer	58.0 (2.3)		54.0 (2.1)	74.0 (2.9)		41.0 (1.6)		
	Inner	43.8 (1.7)		39.0 (1.5)	53.0 (2.0)		13.5 (0.53)		
Front Bearings	Outer	61.7 (2.4)	88.7 (3.5)	57.0 (2.2)	68.5 (2.7)	42.0 (1.6)	41.7 (1.6)	71.0 (2.8)	41.8 (1.6)
	Inner	46.0 (1.8)	72.4 (2.8)	39.0 (1.5)	50.0 (2.0)	22.1 (0.87)	23.0 (0.90)	49.0 (1.9)	28.6 (1.1)
Thrust Washers-Rear	Outer						41.0 (1.6)	71.0 (2.8)	57.3 (2.2)
	Inner						15.3 (0.60)	49.1 (1.9)	36.3 (1.4)

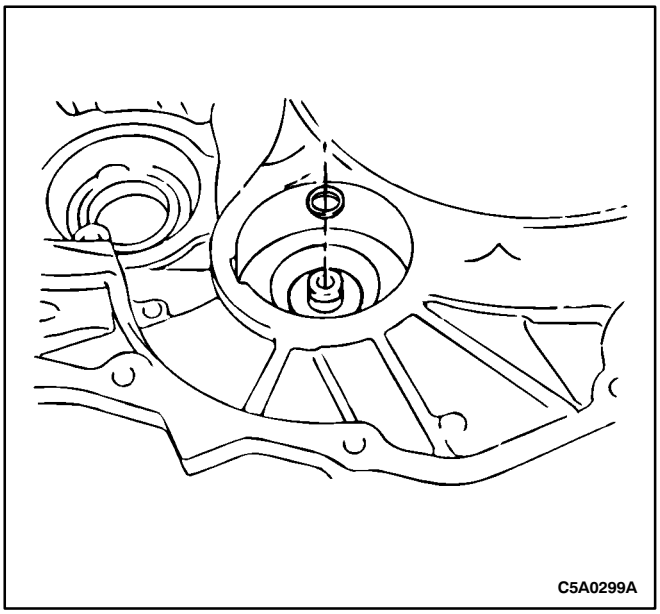
MAJOR COMPONENT ASSEMBLY

Tools Required

KM 674 Oil Seal Installer

Assembly Procedure

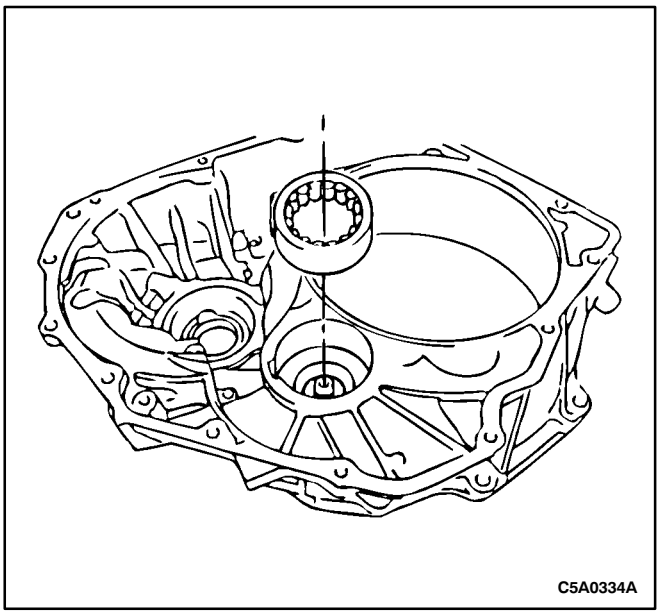
1. Clean components using a clean, high-quality parts cleaning solvent and use compressed air to dry all parts. Inspect all parts for damage or wear.


C5A0299A

Notice: Apply TOTAL FLUID HX to the seal ring.

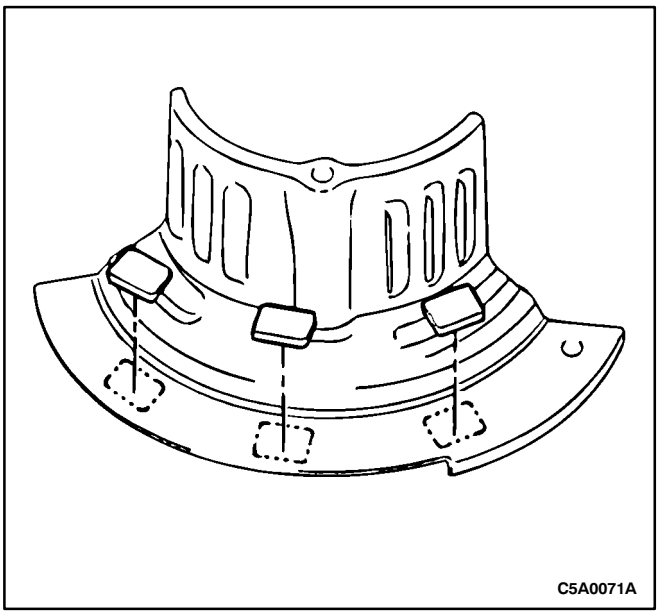
Notice: Do not spread the seal ring ends more than necessary.

2. Install a new seal ring on the transaxle housing.

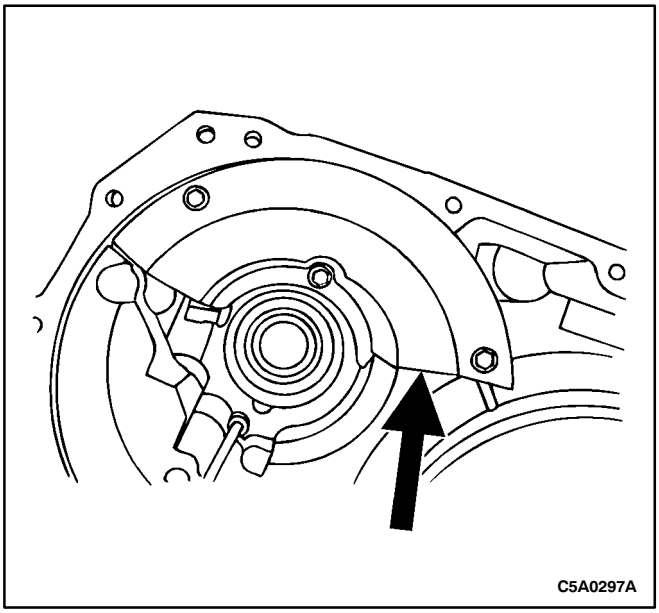

C5A0334A

Notice: Press the bearing until it touches the housing.

3. Using a suitable press, install the bearing in the transaxle housing.


C5A0071A

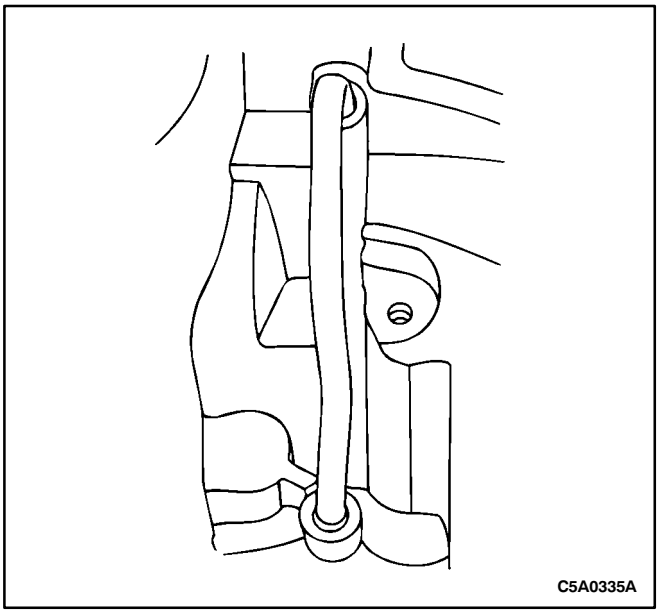
4. Install the magnets on the oil reserver plate.


C5A0297A

5. Install the oil reserver plate.

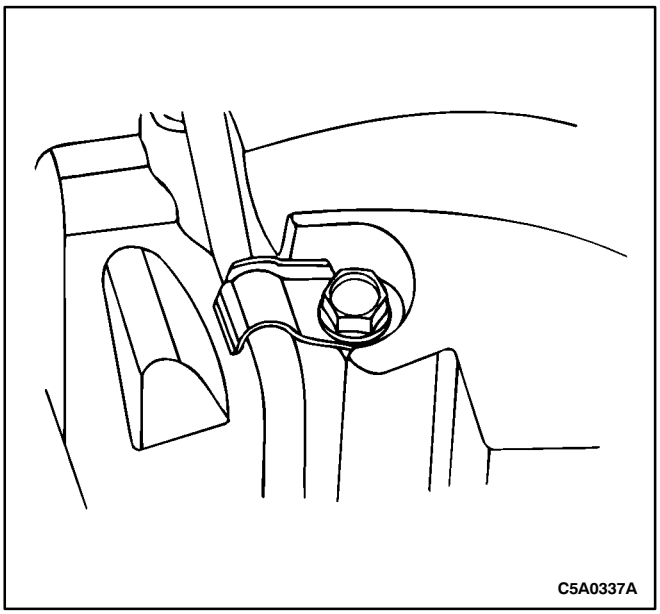
Tighten

Tighten the bolts to 4-7 N•m (35-62 lb-in).

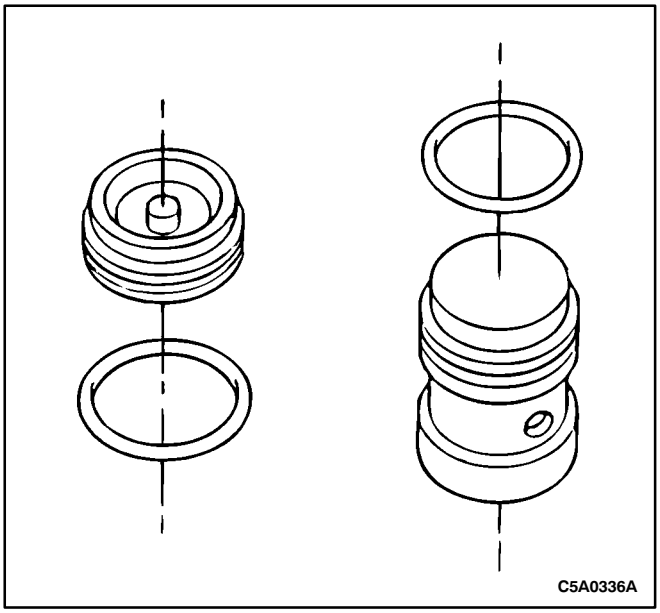

C5A0335A

Caution: Do not bend or damage the tube.

6. Install the lubricant apply tube.
   - Using a plastic hammer, tap the tube into place.

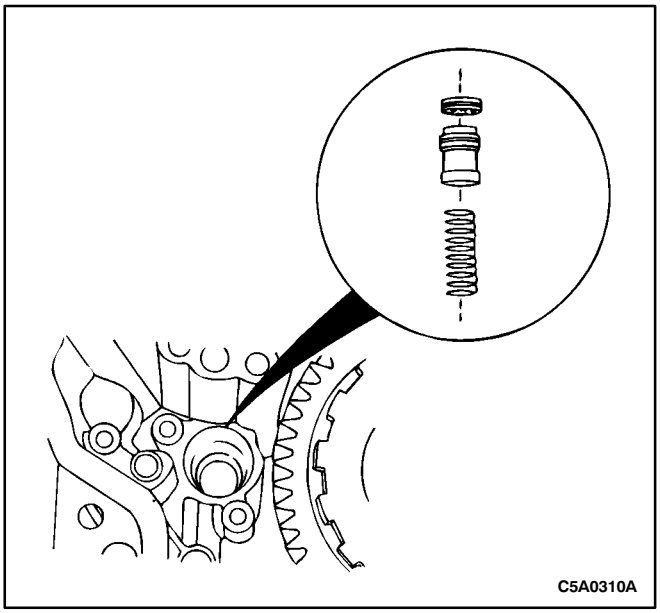

C5A0337A

7. Install the apply tube clamp and bolt.

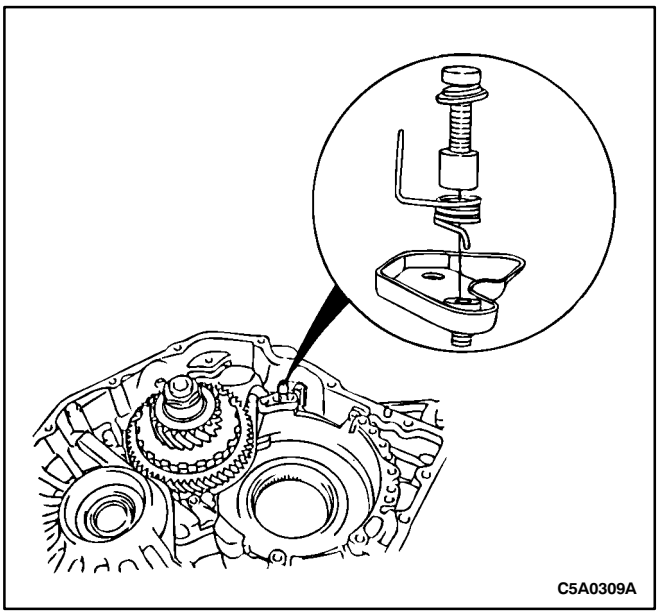

C5A0336A

Notice: Apply TOTAL FLUID HX to the O-rings and the piston bore.

8. Install new O-rings on the underdrive brake accumulator cover and the underdrive brake accumulator piston.


C5A0310A

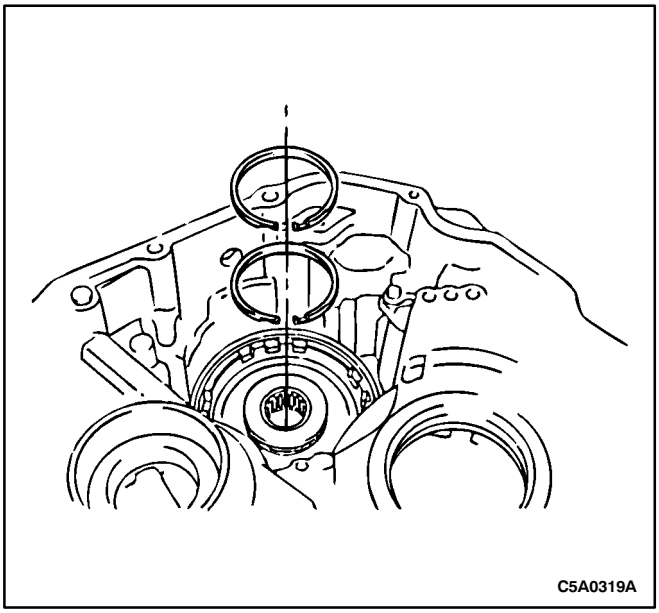
9. Install the accumulator piston spring, the underdrive brake accumulator piston and the underdrive brake accumulator cover.


C5A0309A

10. Install the underdrive brake accumulator bracket, the spring guide sleeve, the spring and the two bracket bolts.

Tighten

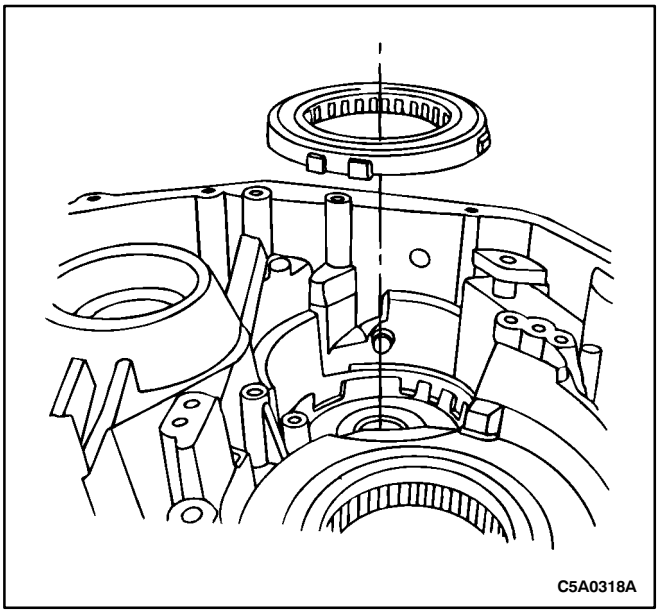
Tighten the bolts to 8-12 N•m (71-106 lb-in).


C5A0319A

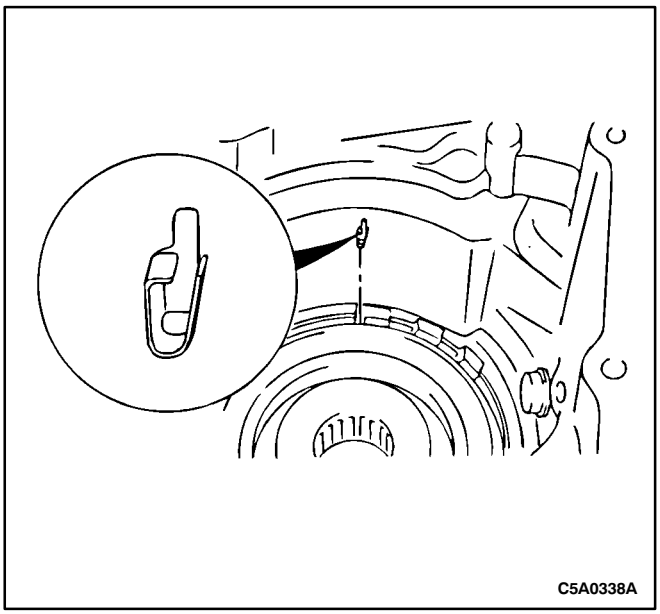
Notice: Apply TOTAL FLUID HX to the seal rings.

Notice: Do not spread the seal ring ends more than necessary.

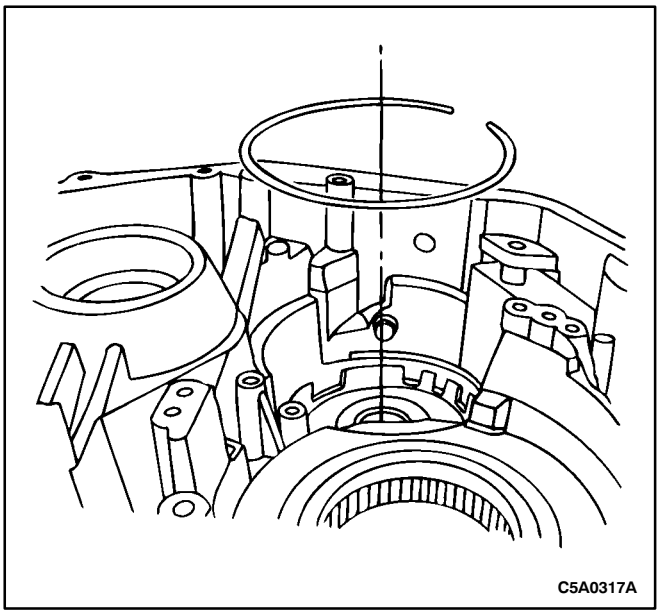
11. Install new seal rings of the underdrive clutch drum.


C5A0318A

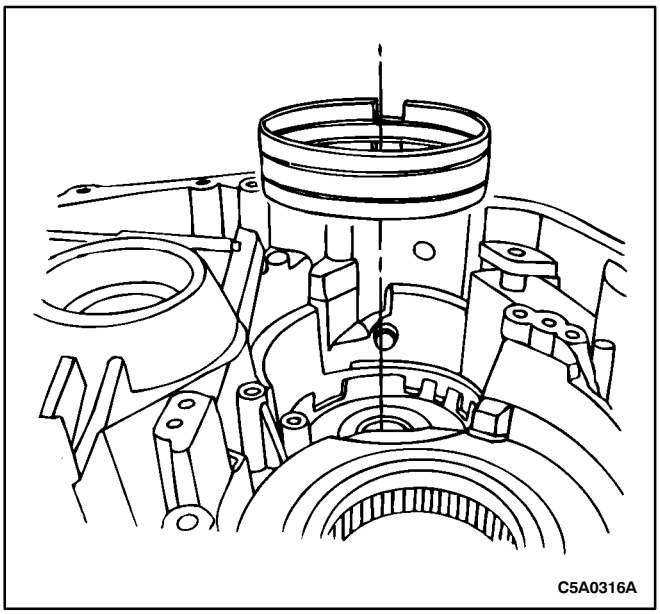
12. Install the underdrive one-way clutch.



13. Install the underdrive one-way clutch outer race retainer as shown.

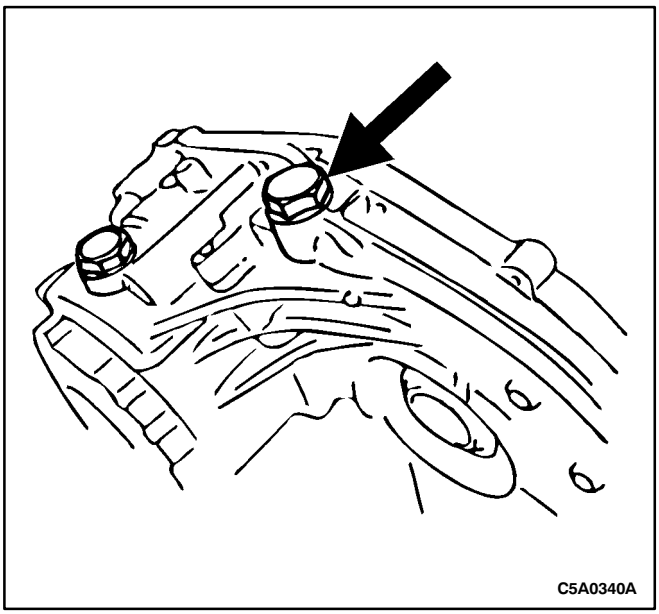


14. Install the snap ring.



Notice: Align the brake band with the position of the anchor bolt.

15. Install the underdrive brake band.

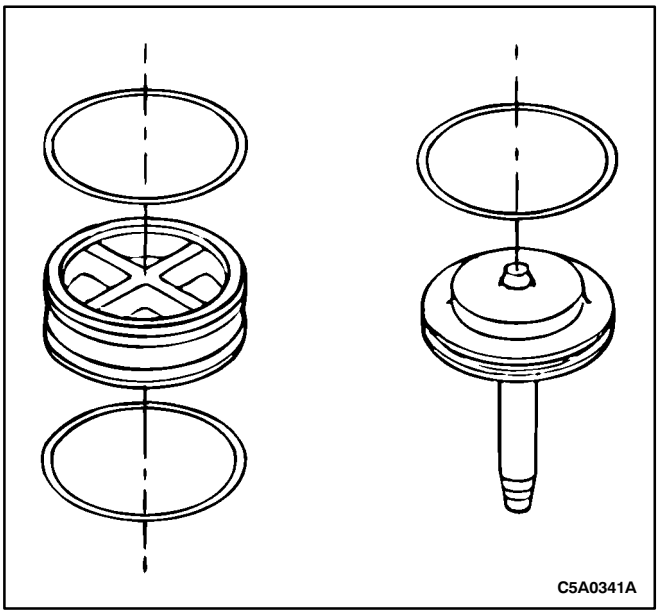

C5A0340A

Notice: Apply TOTAL FLUID HX to the O-ring.

16. Install a new O-ring on the anchor bolt. Install the anchor bolt.

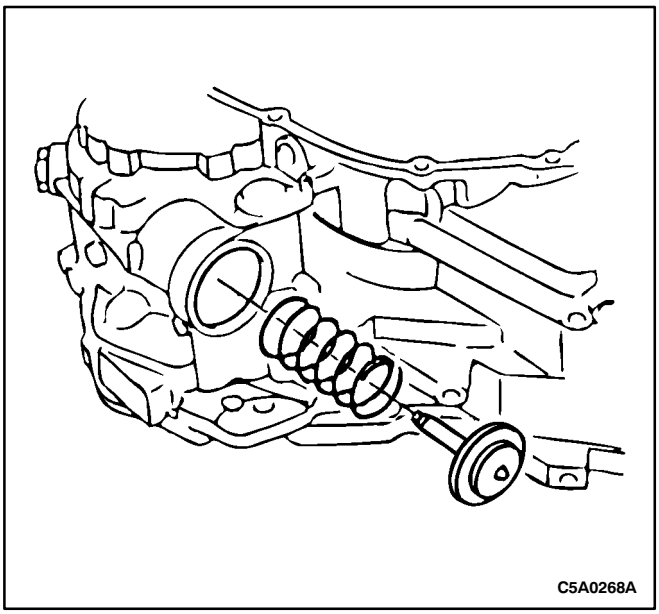
Tighten

Tighten the bolt to 133-200 N•m (98-147 lb-ft).


C5A0341A

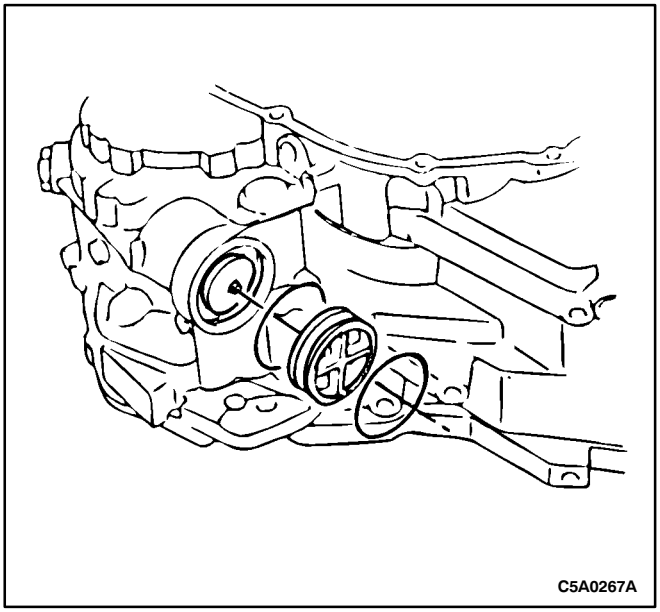
Notice: Apply TOTAL FLUID HX fluid to the O-rings.

17. Install new O-rings on the underdrive brake piston and the underdrive brake piston cover.

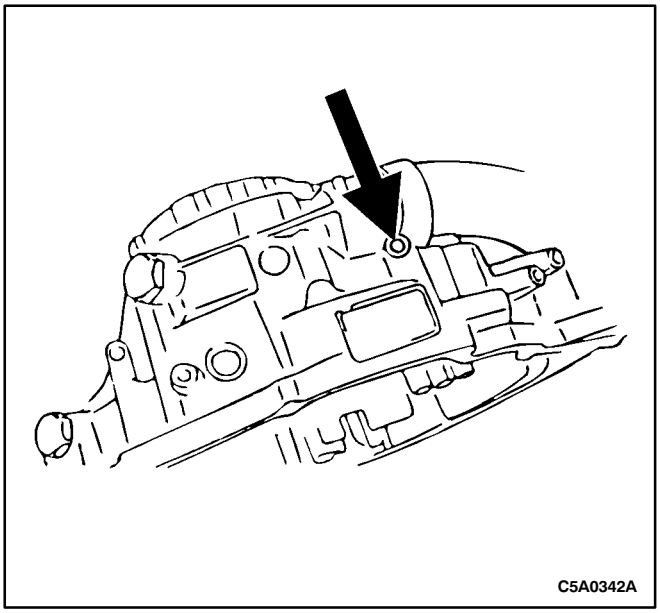

C5A0268A

Notice: Set the piston rod in the brake band depression.

18. Install the spring and underdrive brake piston.

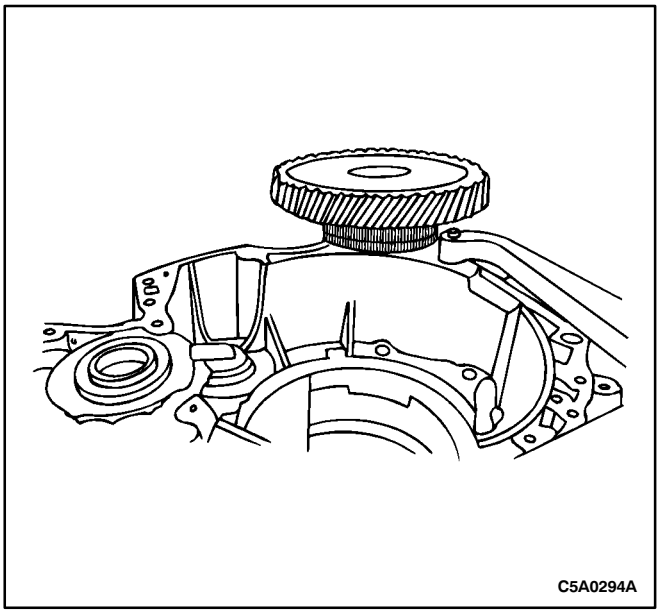

C5A0267A

19. Install the underdrive brake piston cover and the snap ring.

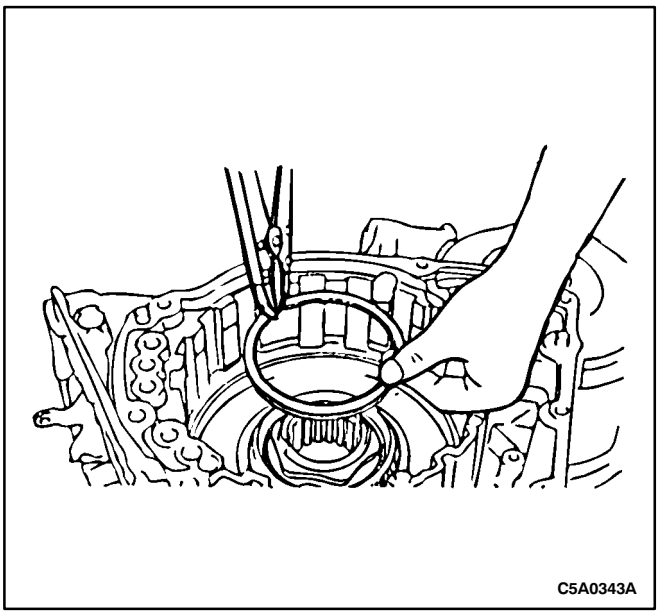

C5A0342A

WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR INJURY MAY RESULT.

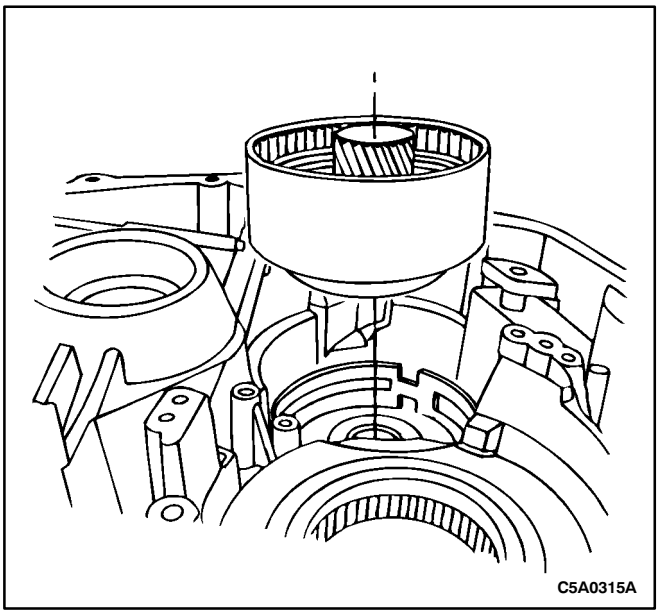
20. Inspect the underdrive brake piston stroke.
    - Measure the brake piston stroke by applying compressed air into the passage shown. The piston stroke should be 5.48-7.02 mm. If the stroke is not within specifications, replace the piston rod with a longer one.


C5A0294A

21. Install the counter drive gear into the transaxle case.

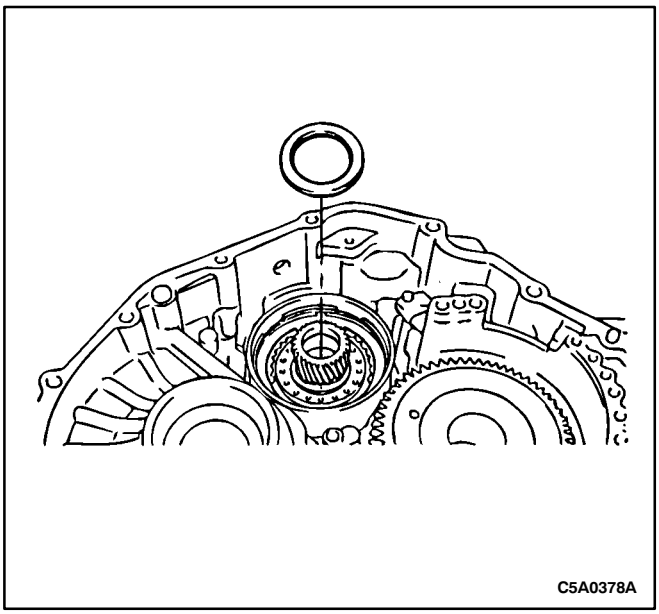

C5A0343A

22. Install the snap ring.


C5A0315A

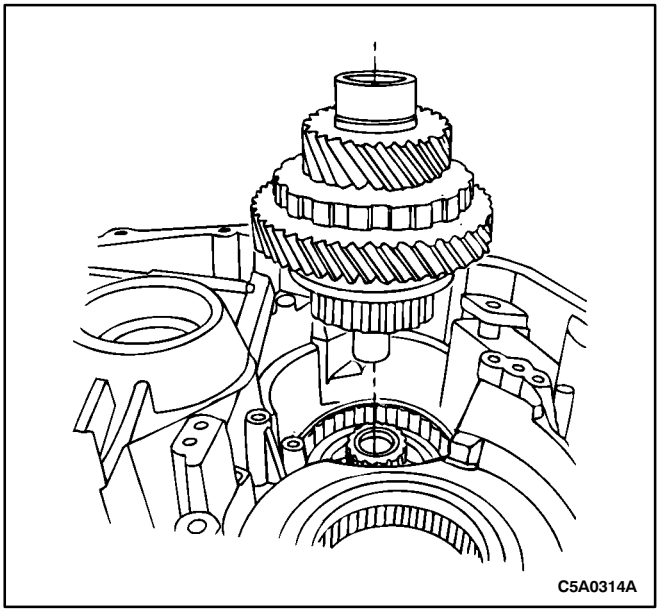
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer before installing.

23. Install the thrust washer and the underdrive clutch.
    - Make sure the underdrive clutch turns freely counterclockwise and locks clockwise.


C5A0378A

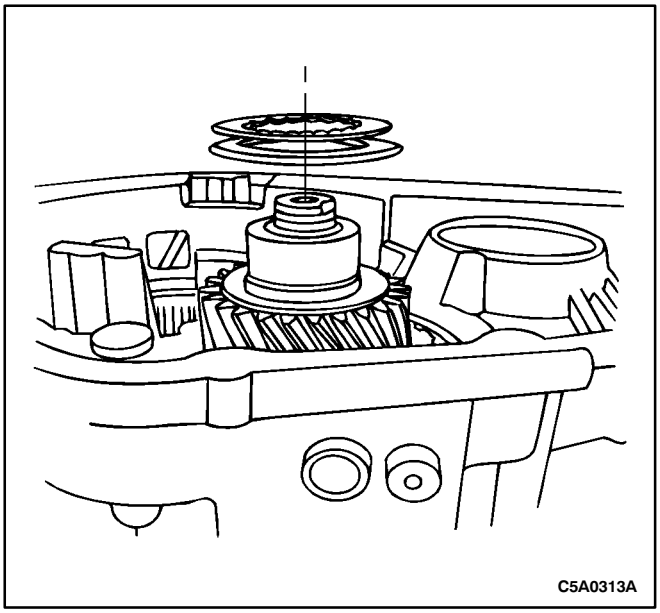
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer before installing.

24. Install the thrust washer.


C5A0314A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer before installing.

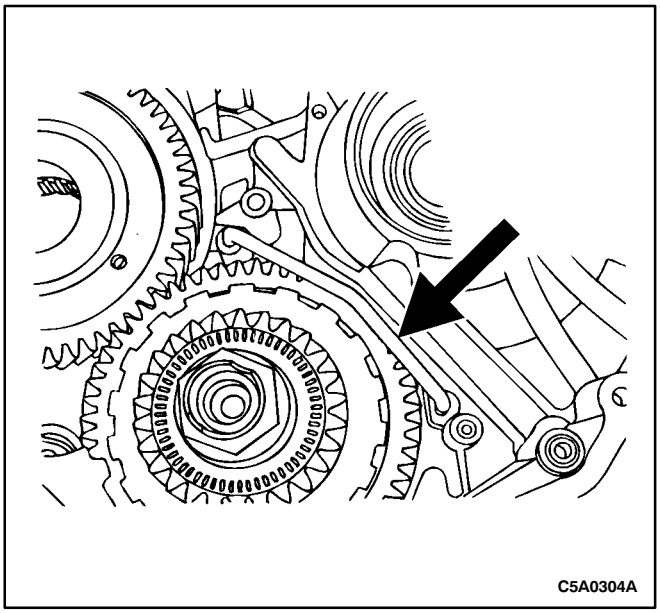
25. Install the thrust bearing to the rear side of the underdrive planetary gear. Install the planetary gear.
    - Make sure the counterdrive and counterdriven gear rotate smoothly.
    - Align the teeth of the clutch friction plates before installing the planetary gear.


C5A0313A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer before installing.

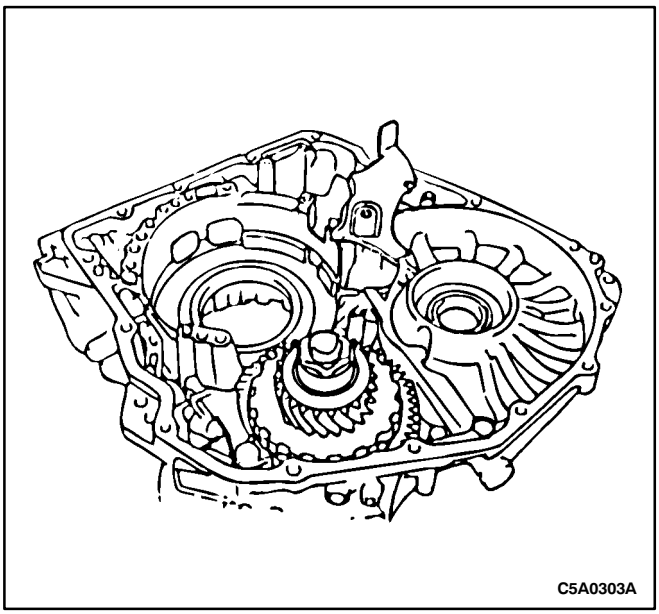
Notice: Make sure the roller bearings are facing up.

26. Install the thrust washer and bearing.


C5A0304A

Caution: Do not bend or damage the tube.

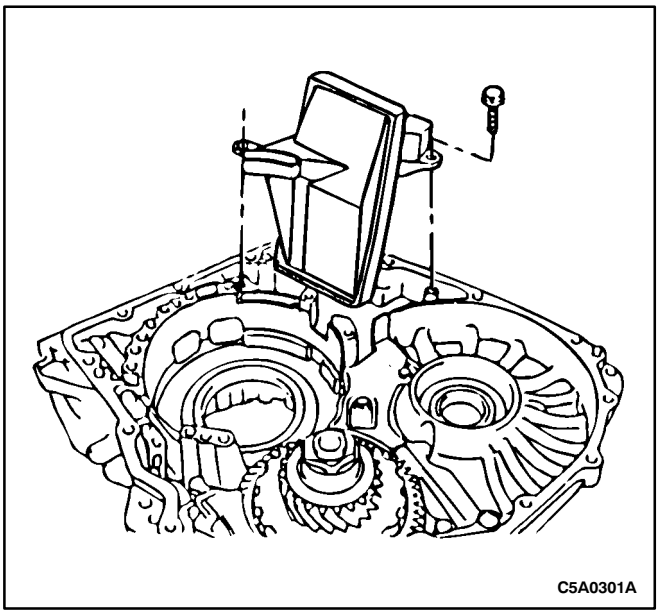
27. Install the lubricant apply tube.
    - Using a plastic hammer, tap the tube into place.


C5A0303A

28. Install the oil reserver plate.

Tighten

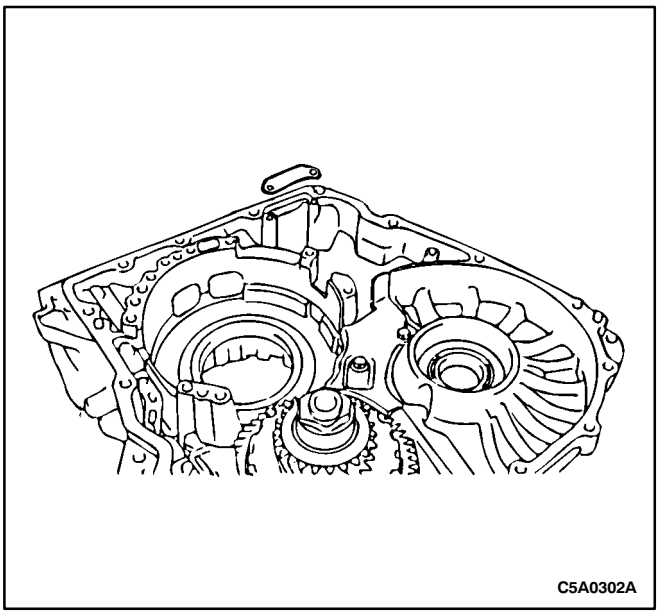
Tighten the bolts to 4-7 N•m (35-62 lb-in).


C5A0301A

29. Install the oil filter.

Tighten

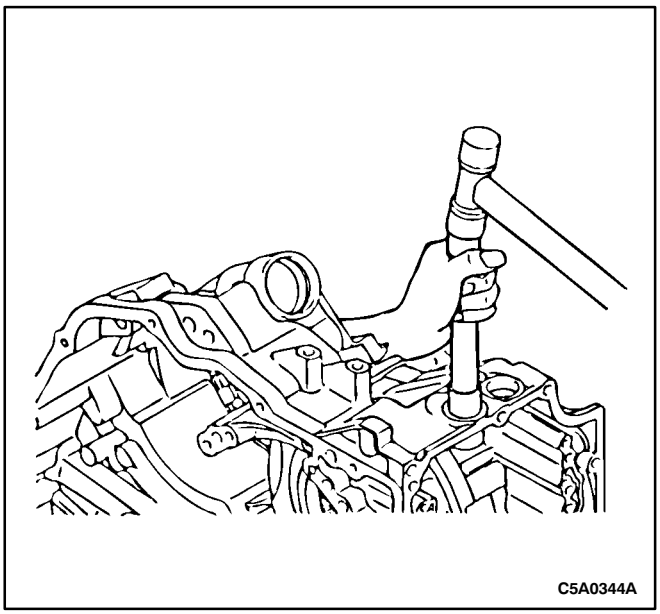
Tighten the bolt to 4-7 N•m (35-62 lb-in).


C5A0302A

30. Install the transaxle case plate.

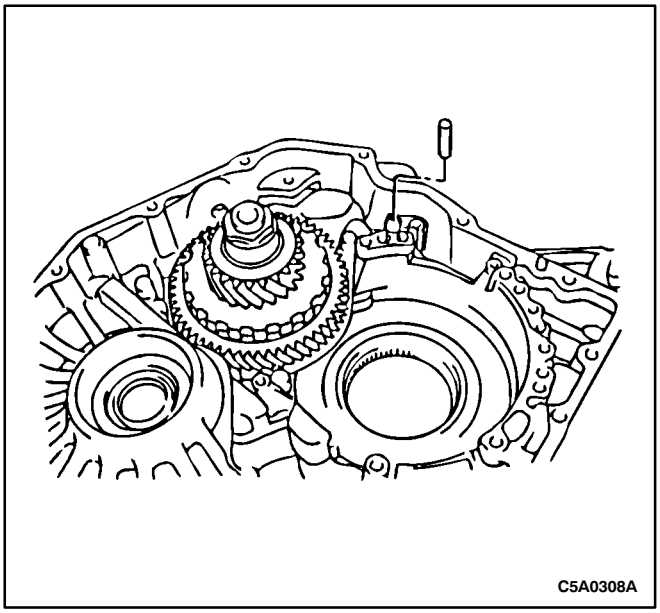
Tighten

Tighten the bolt to 4-7 N•m (35-62 lb-in).

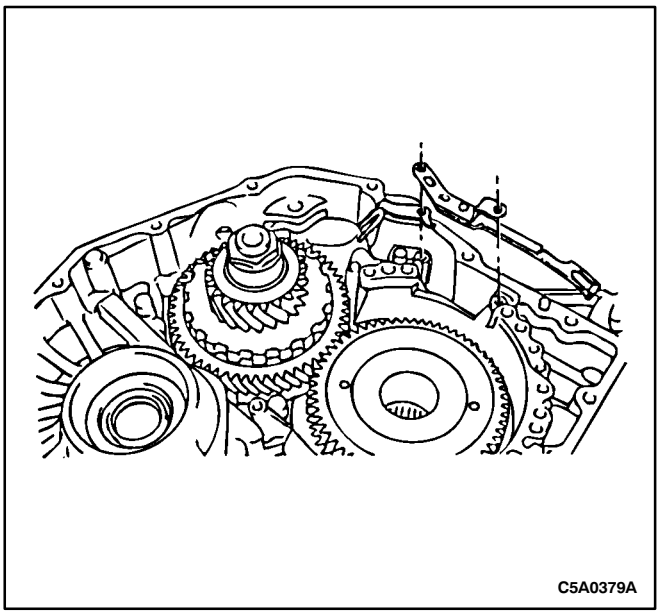

C5A0344A

Notice: Apply TOTAL FLUID HX to the seal and seal bore.

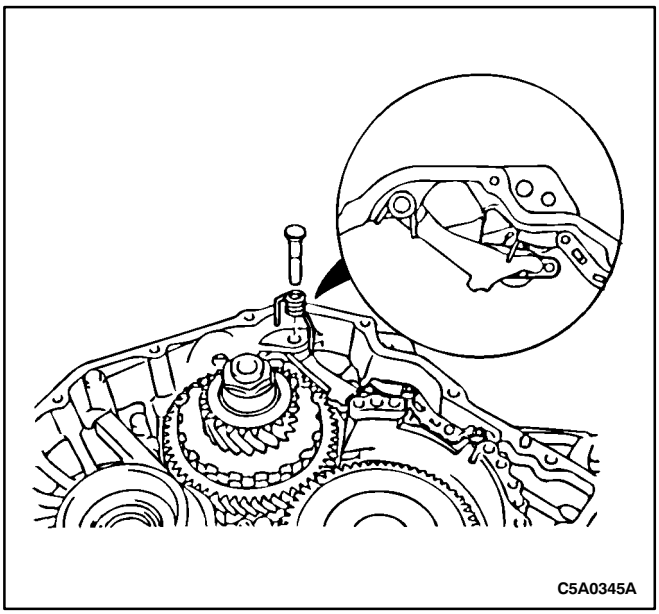
31. Using a seal driver, install a new manual valve lever oil seal.


C5A0308A

32. Install the parking lock pin

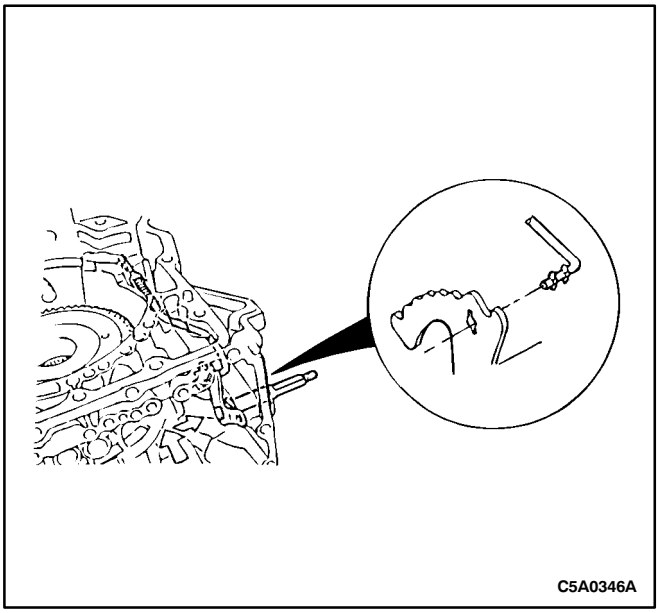

C5A0379A

33. Install the cam plate, detent spring and the parking lock rod. Install the detent spring bolts, but do not tighten at this time.


C5A0345A

Notice: Make sure the cam plate and the parking pawl spring are in the positions shown.

34. Install the parking lock pawl. Place the spring on the parking lock pawl shaft and install them into the transaxle case.

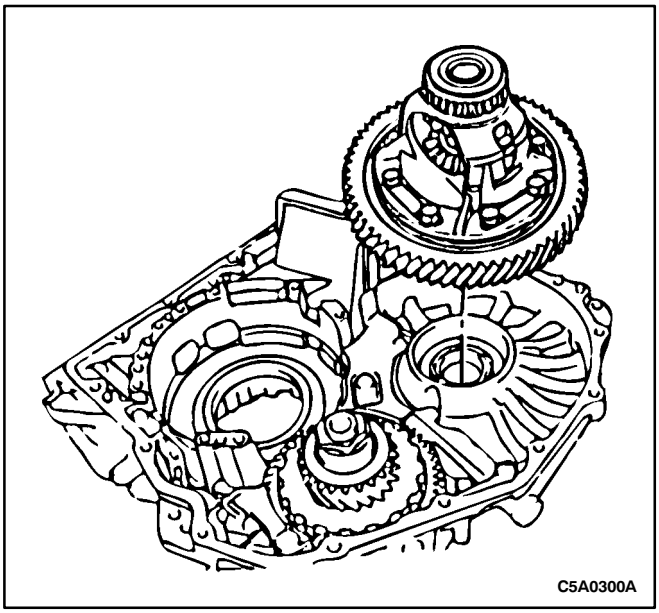

C5A0346A

Notice: Check that the detent spring tip roller is centered on the manual valve lever.

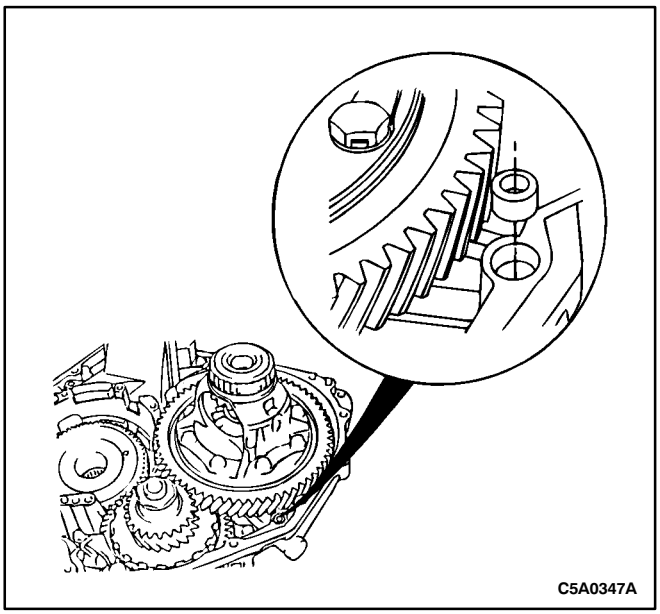
35. Install the manual valve lever. Connect the parking lock rod to the manual valve lever. Place the detent lever on the manual valve lever.

Tighten

Tighten the detent spring bolts to 8-12 N•m (71-106 lb-in).

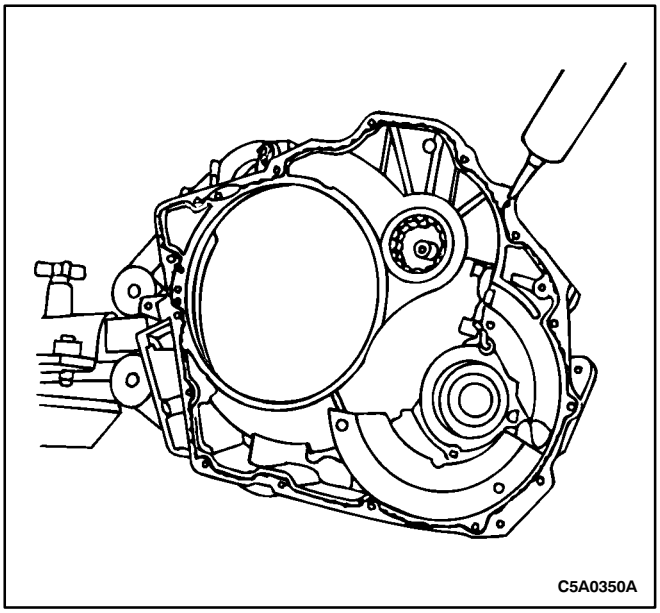

C5A0300A

36. Install the differential case.

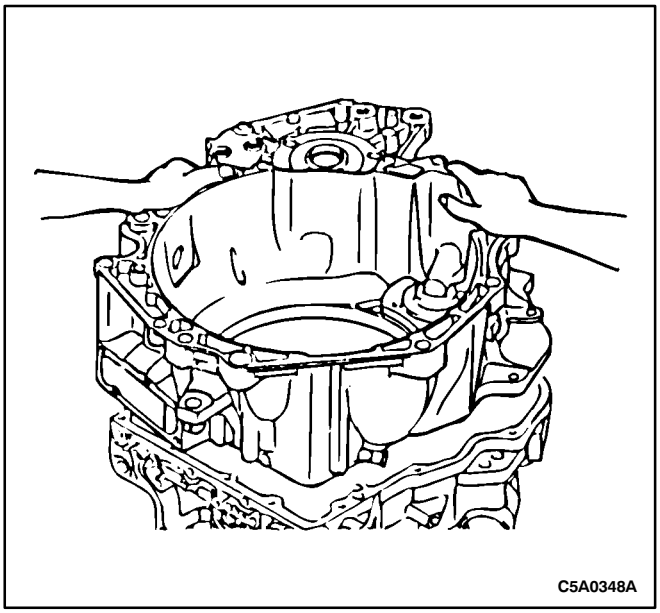

C5A0347A

Notice: Apply TOTAL FLUID HX to the seal.

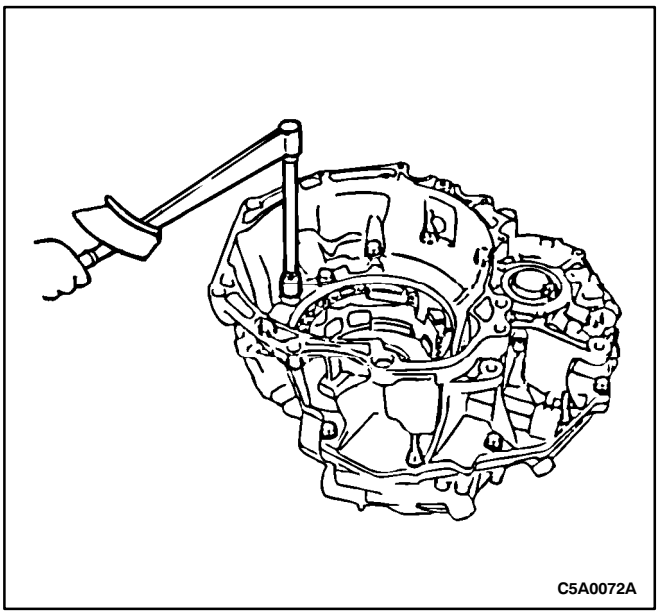
37. Install a new apply seal.


C5A0350A

38. Apply sealer to the transansaxle case.


C5A0348A

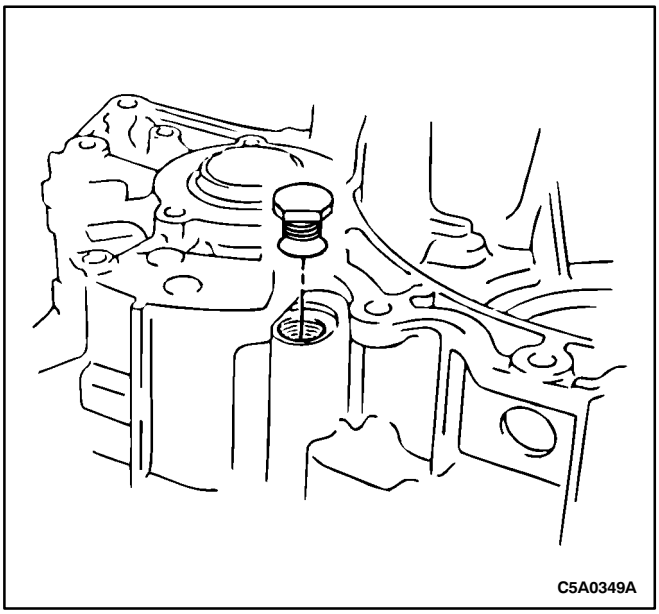
39. Install the transaxle housing to the transaxle case.


C5A0072A

40. Install the housing-to-case bolts.

Tighten

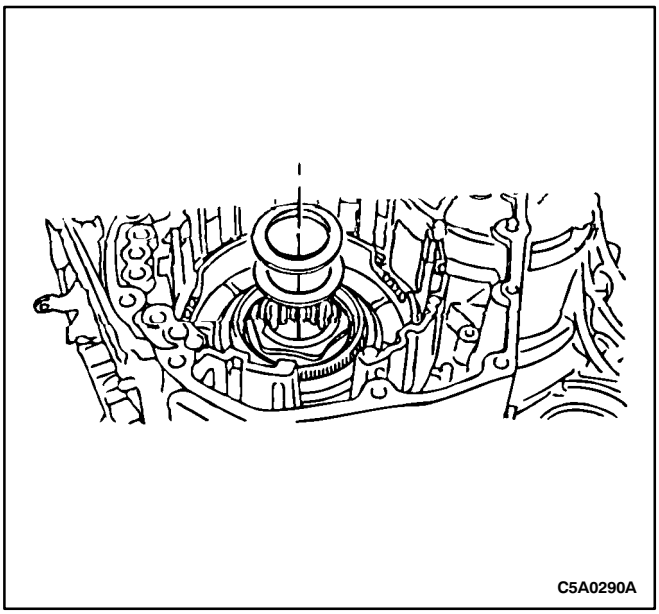
Tighten the bolts to 23-35 N•m (17-26 lb-ft).


C5A0349A

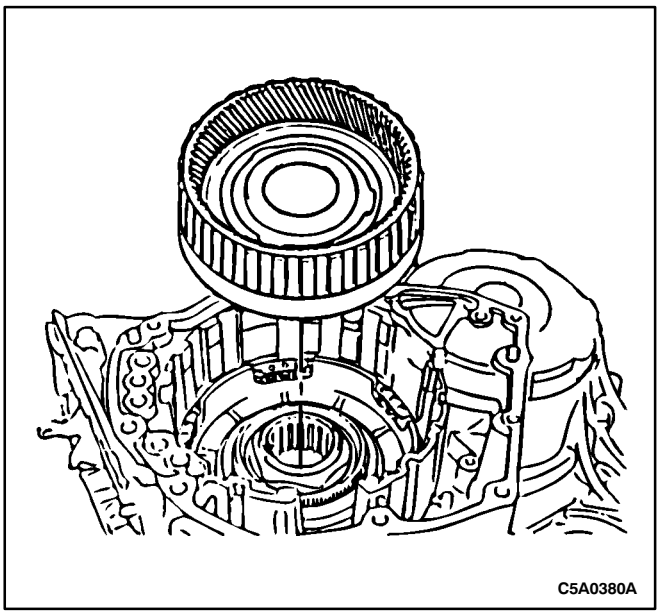
41. Install the drain plug with a new gasket.

Tighten

Tighten the plug to 23-55 N•m (17-40 lb-ft).

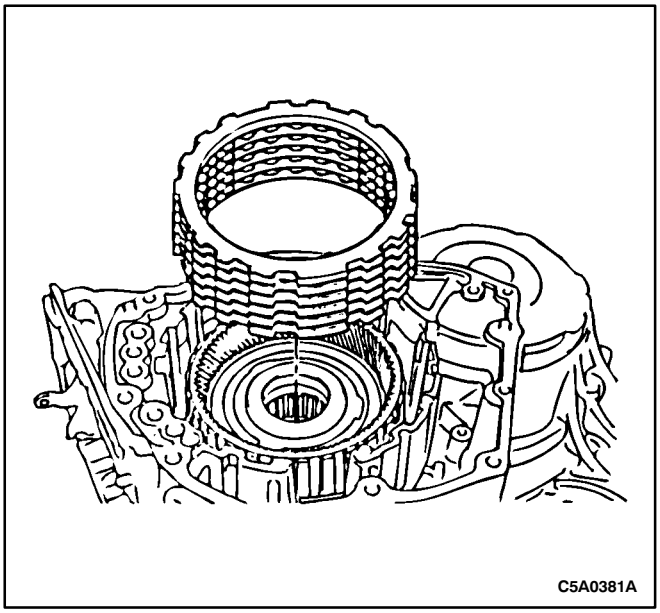

C5A0290A

42. Place the thrust bearing and race on the front planetary ring gear flange.


C5A0380A

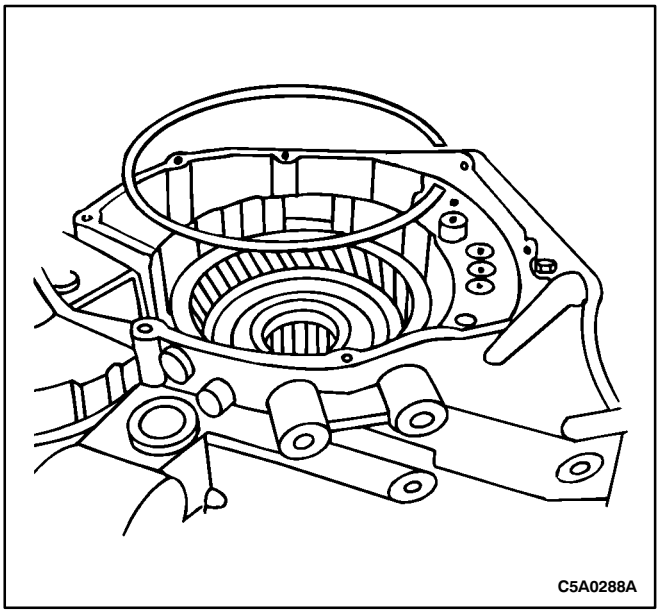
Notice: Make sure that the ring gear turns freely counterclockwise and locks clockwise.

43. Install the front planetary ring gear flange and the one-way clutch assembly.

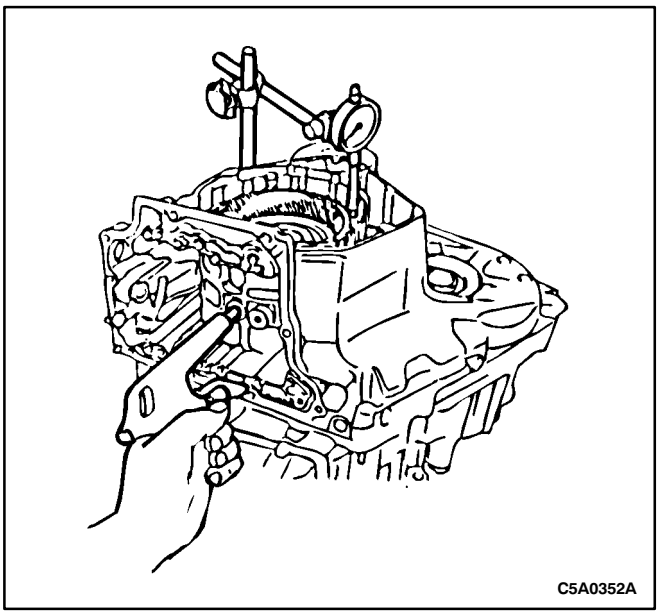

C5A0381A

Notice: The installation order is: pressure-friction-steel-friction-steel-friction-steel-friction -steel-friction-pressure.

44. Install the low/reverse clutch pack and the clutch pressure plates.

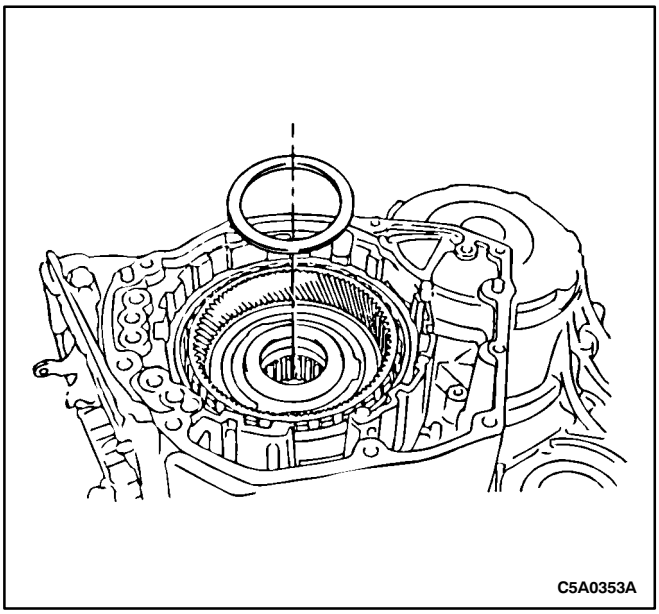

C5A0288A

45. Install the snap ring.


C5A0352A

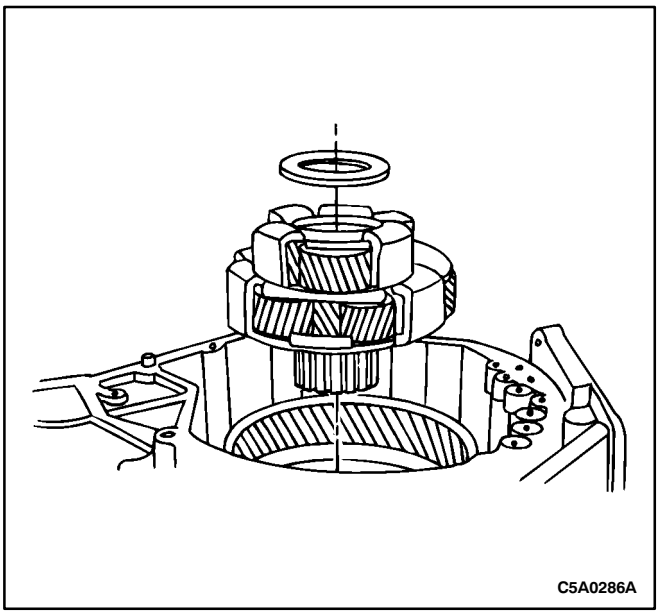
WARNING: USE CAUTION WHEN CHECKING COMPONENTS WITH COMPRESSED AIR OR INJURY MAY RESULT.

46. Verify the operation of the low/reverse brake piston.
    - Apply 396 kPa (57 psi) of compressed air into the oil passage shown and measure the piston stroke. The piston stroke is 1.75-2.55 mm (0.069-0.100 in). The clutch pack should make a solid apply sound, with no whistle or signs of leakage.


C5A0353A

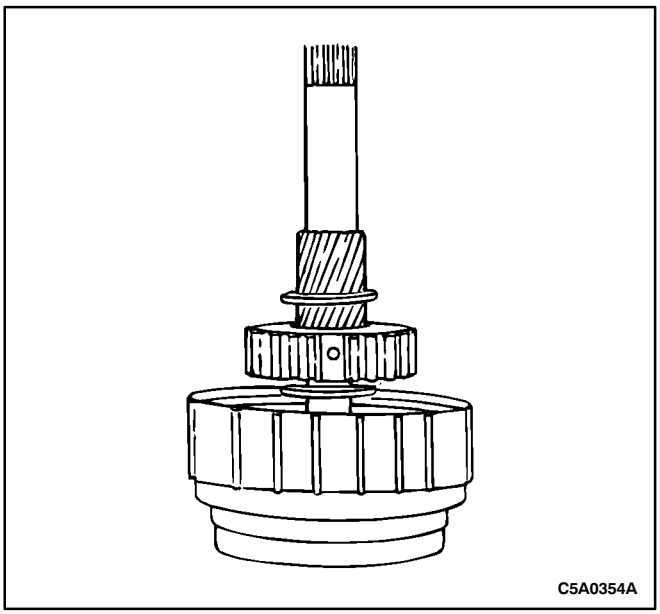
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer before installing.

47. Install the thrust washer.


C5A0286A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust washer before installing.

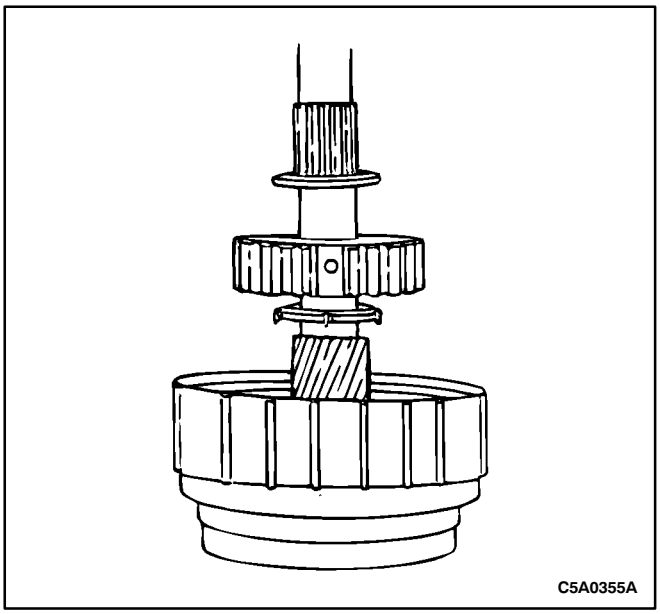
48. Install the planetary carrier and the thrust washer.


C5A0354A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust bearing before installing.

Notice: Align the teeth of the clutch friction plates.

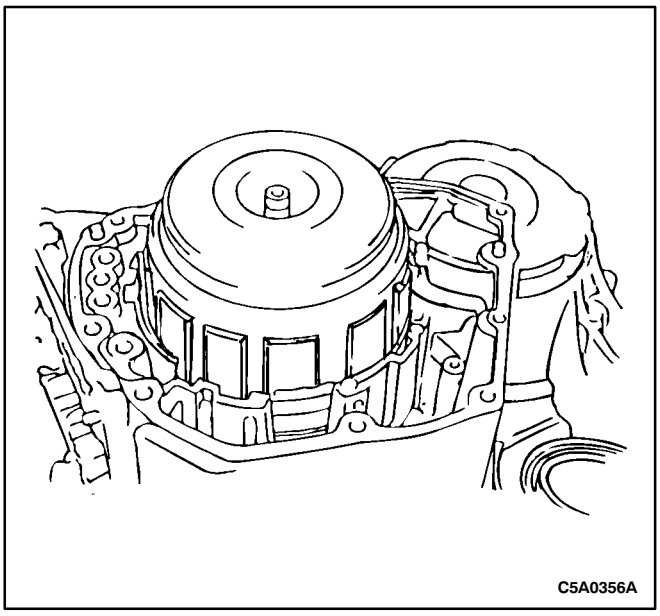
49. Install the planetary sun gear and thrust washer into the forward/direct clutch. Place the thrust bearing on the planetary sun gear.


C5A0355A

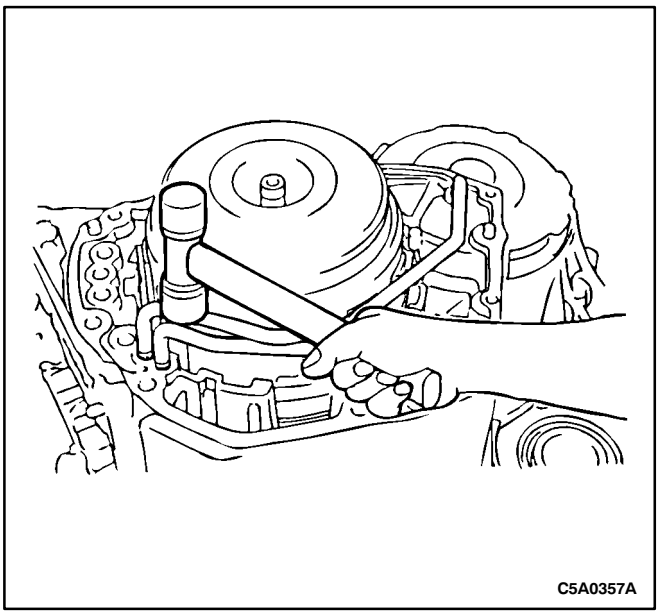
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust bearing before installing.

Notice: Align the teeth of the clutch friction plates.

50. Install the rear planetary ring gear and thrust washer into the forward/direct clutch. Place the thrust bearing on the rear planetary ring gear.


C5A0356A

51. Install the forward/direct clutch assembly.

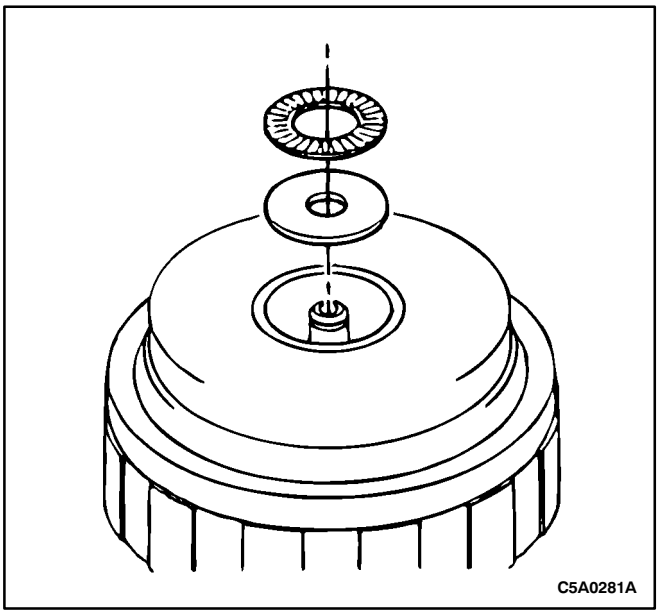

C5A0357A

Caution: Do not bend or damage the tube.

52. Install the lubricant apply tubes.
    - Using a plastic hammer, tap the tube into place.

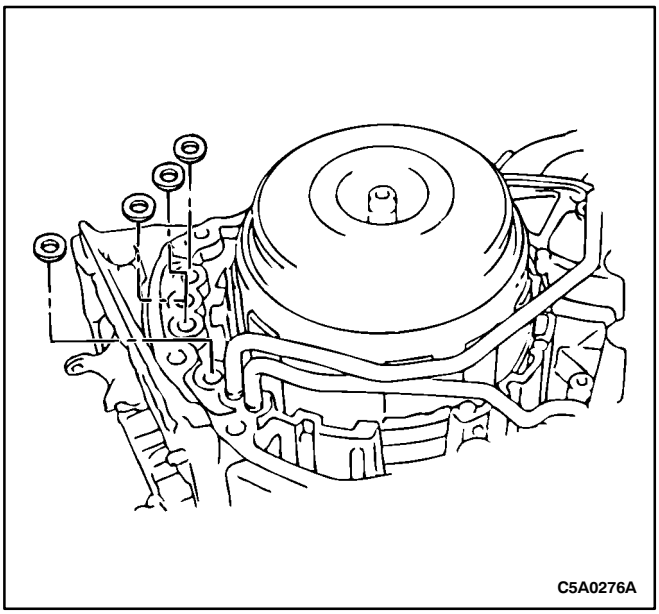
Tighten

Position the tube clamp and tighten the bolt to 4-7 N•m (35-61 lb-in).


C5A0281A

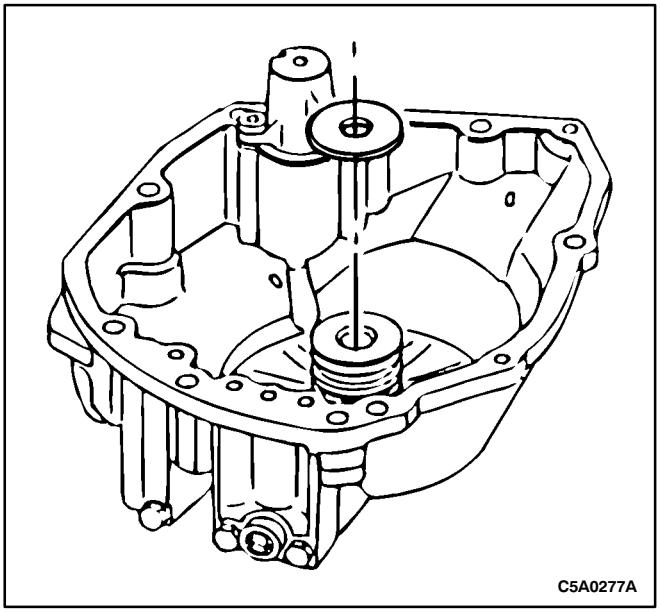
Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the thrust bearing before installing.

53. Install the thrust bearing and race.

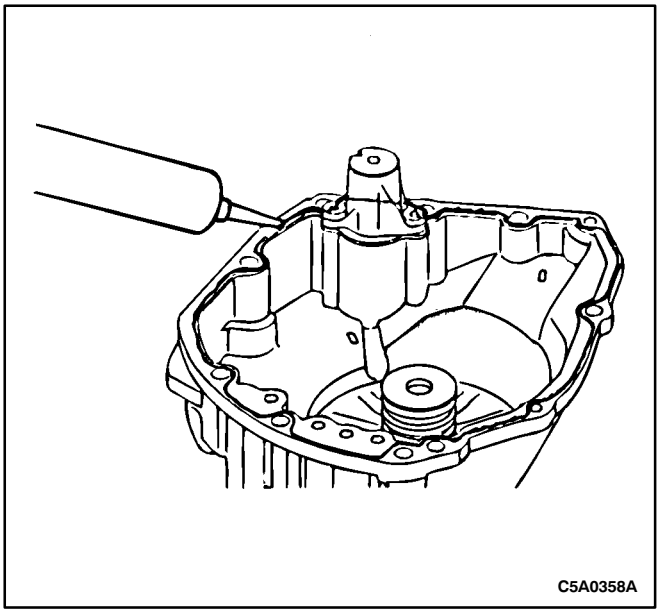

C5A0276A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the seals before installing.

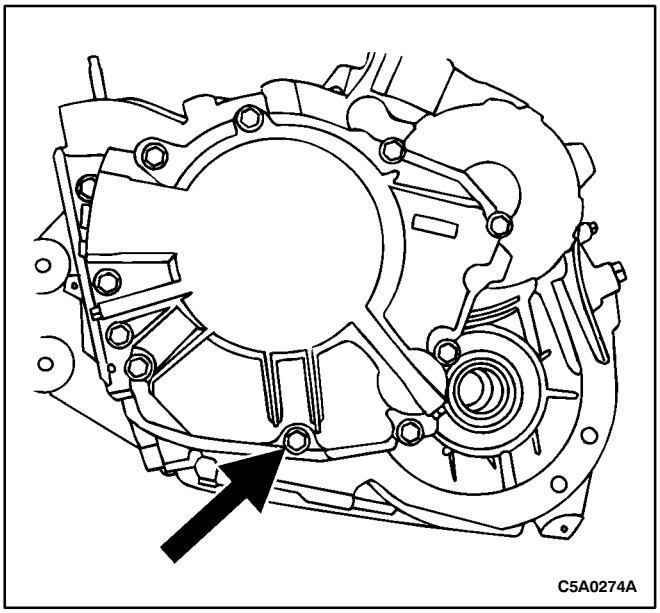
54. Install four new apply seals.


C5A0277A

55. Install the thrust washer on the rear case.


C5A0358A

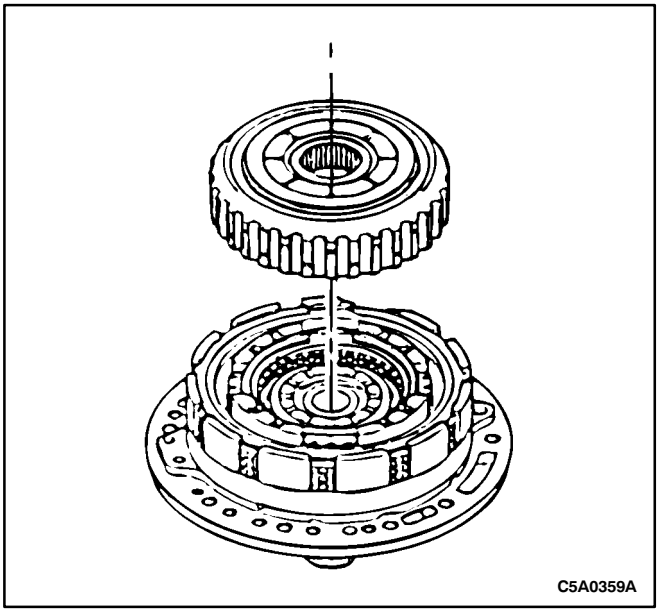
56. Apply sealer to the rear case.


C5A0274A

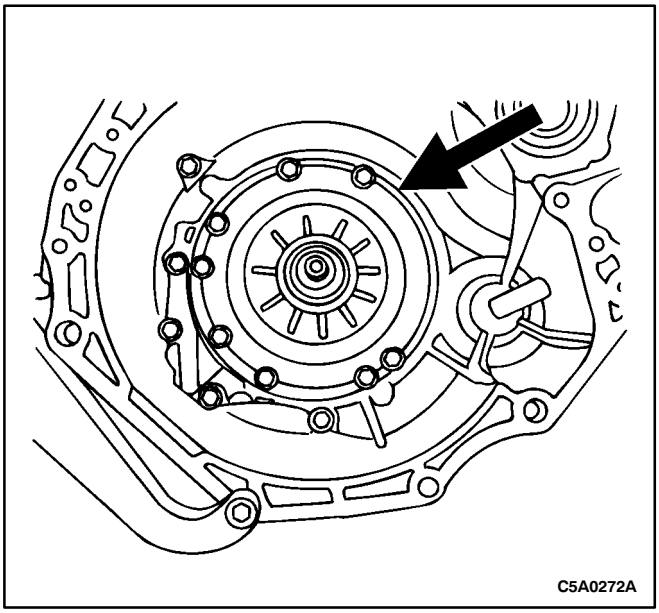
57. Install the rear case.

Tighten

Tighten the M6 bolts to 8-12 N•m (71-106 lb-in) and the M8 bolts to 20-29 N•m (15-22 lb-ft).


C5A0359A

58. Install the brake hub and one-way clutch assembly into the oil pump.


C5A0272A

Notice: Apply TOTAL FLUID HX to the O-ring and oil pump bore.

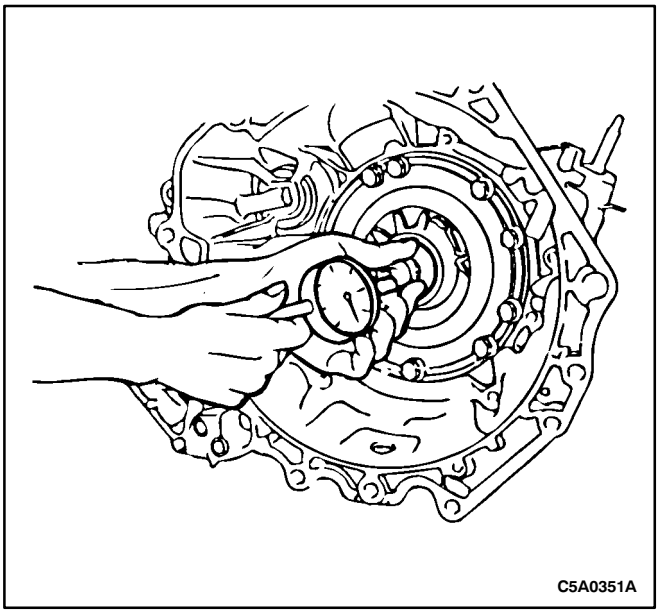
Notice: Make sure there is some thrust play of the input shaft before installing the oil pump.

Notice: Install the bolts evenly and gradually.

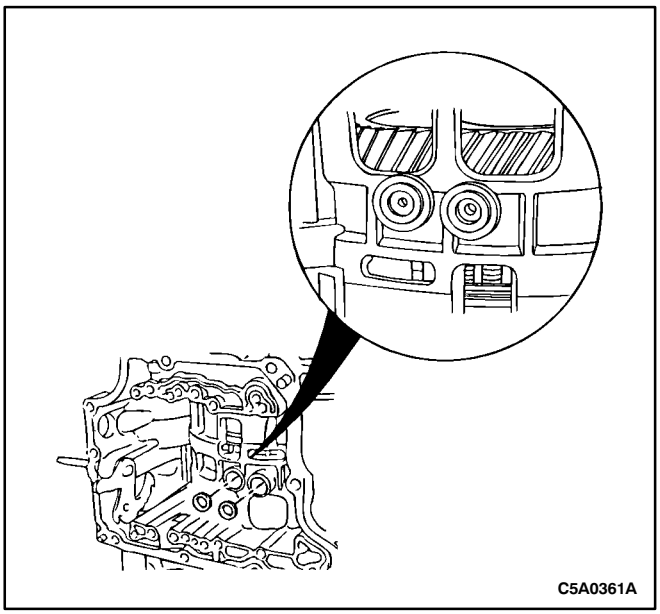
59. Install the oil pump.
    - Install the oil pump through the input shaft with the transmission in the horzontal position. Lightly press the oil pump into the transaxle case.

Tighten

Tighten the bolts to 20-29 N•m (15-22 lb-ft).

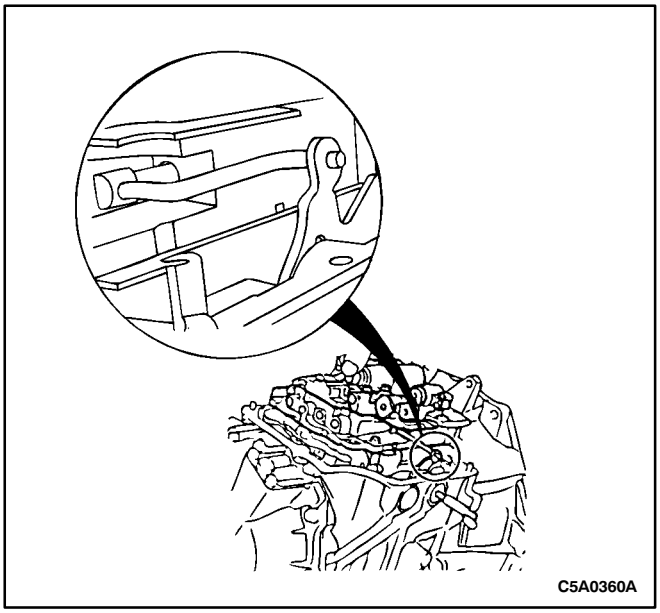

C5A0351A

60. Using a dial indicator, measure the thrust play of the input shaft. The thrust play should be 0.372-0.90 mm (0.005-0.035 in).

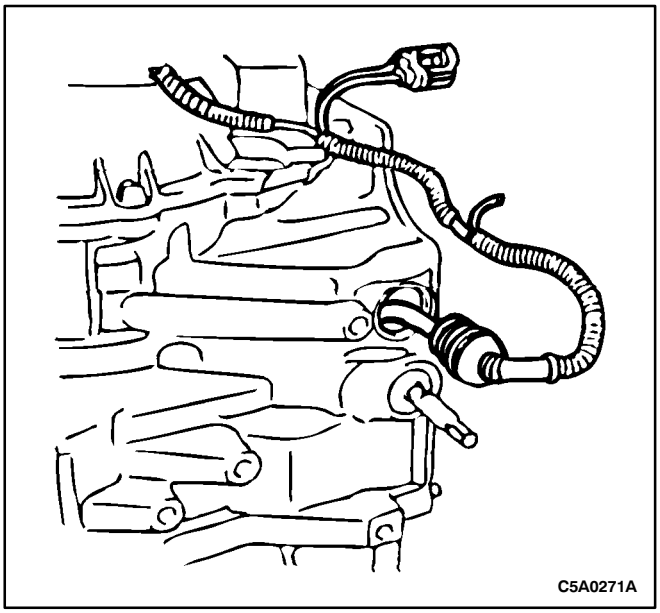

C5A0361A

Notice: Apply Transjel Assembly Lubricant J-36850 or equivalent to the seals before installing.

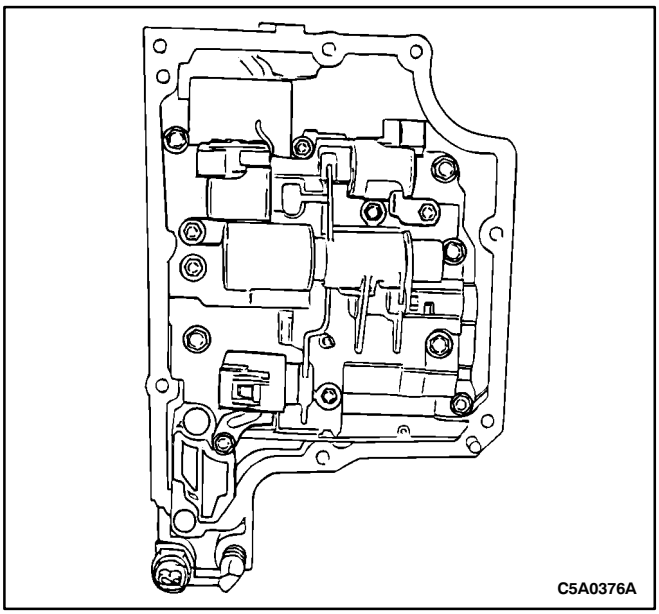
61. Install two new apply seals.


C5A0360A

62. Install the valve body.
    - Holding the valve body in place, connect the manual valve connecting rod to the manual detent lever.


C5A0271A

63. Install the solenoid wire harness.

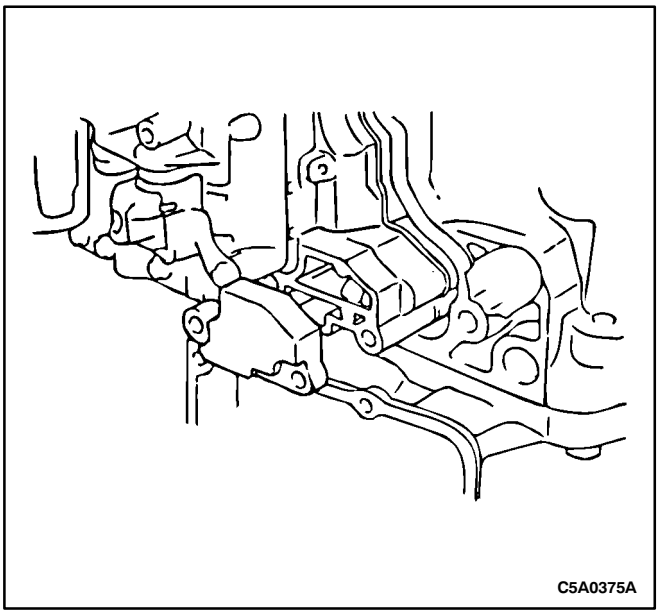

C5A0376A

Notice: Tighten the bolts evenly and gradually.

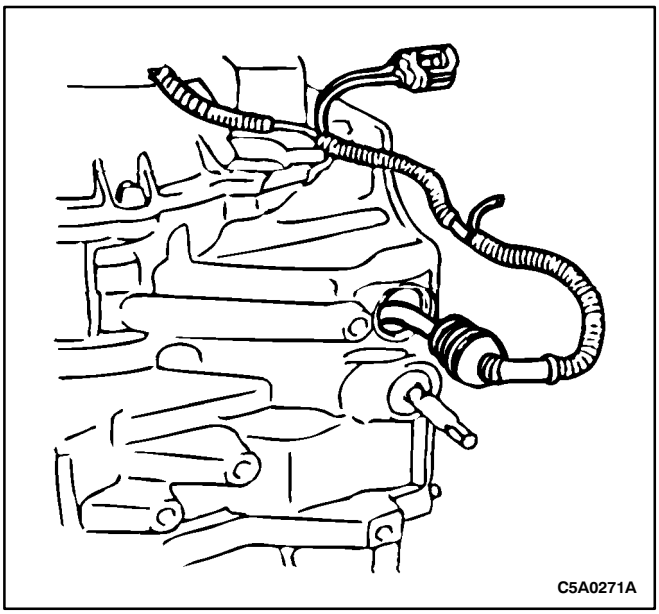
64. Install the seven bolts

Tighten

Tighten the bolts to 6-7 N•m (53-62 lb-in).


C5A0375A

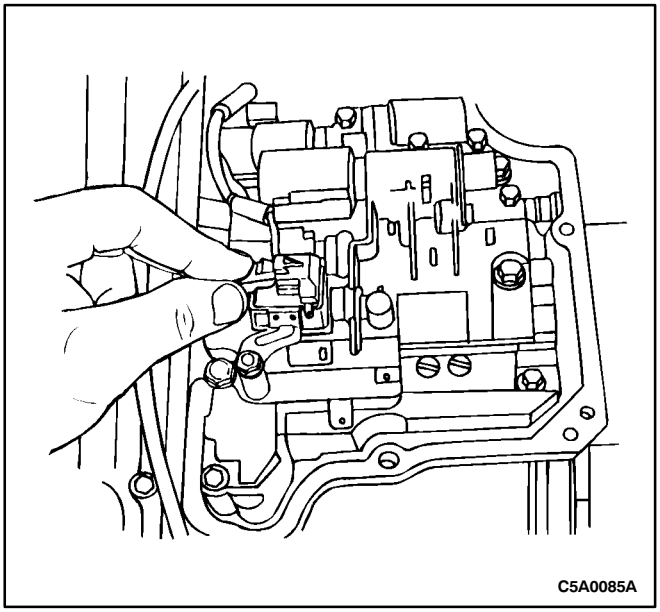
65. Install the suction cover with a new gasket.


C5A0271A

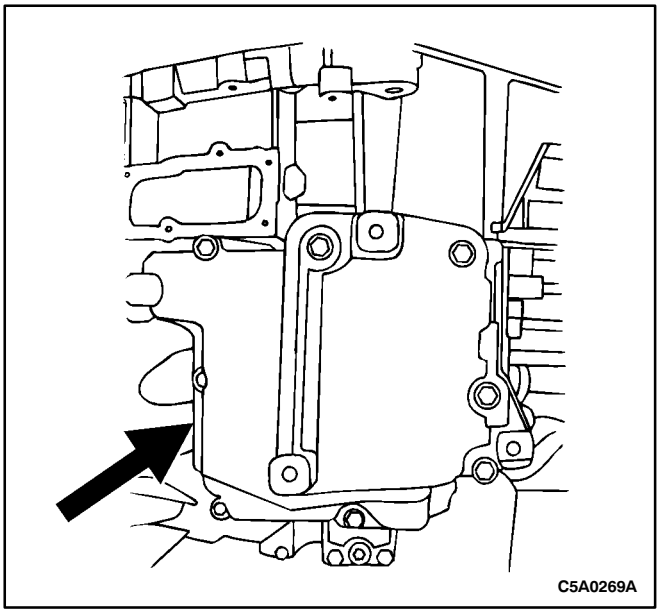
Notice: Install a new O-ring on the harness.

Notice: Apply TOTAL FLUID HX to the O-ring and to the harness case bore.

66. Install the solenoid wire harness.


C5A0085A

67. Connect the solenoid electrical connectors.

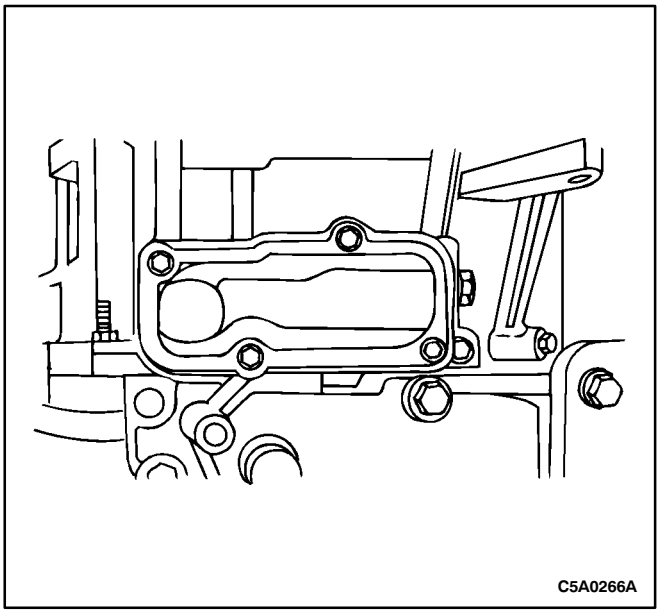

C5A0269A

Notice: Use sealer on the side cover.

68. Install the valve body cover.

Tighten

Tighten the bolts to 20-30 N•m (15-22 lb-ft)

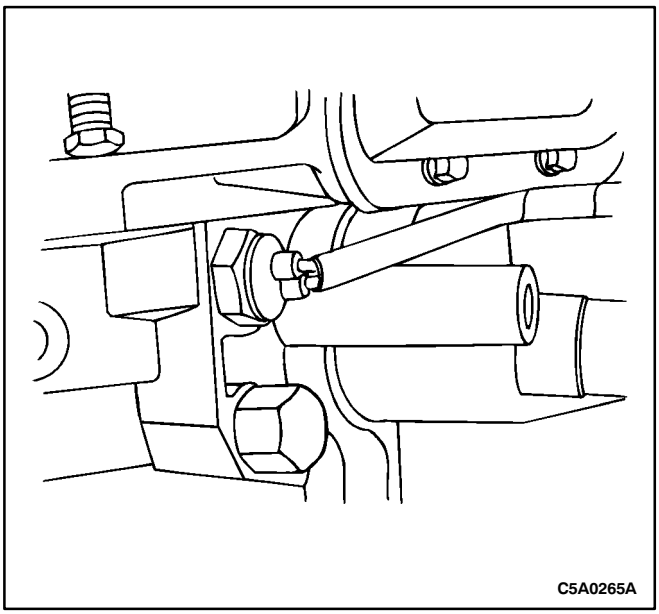

C5A0266A

Notice: Use sealer on the housing cover.

69. Install the transaxle housing cover.

Tighten

Tighten the bolts to 6-9 N•m (53-78 lb-in).

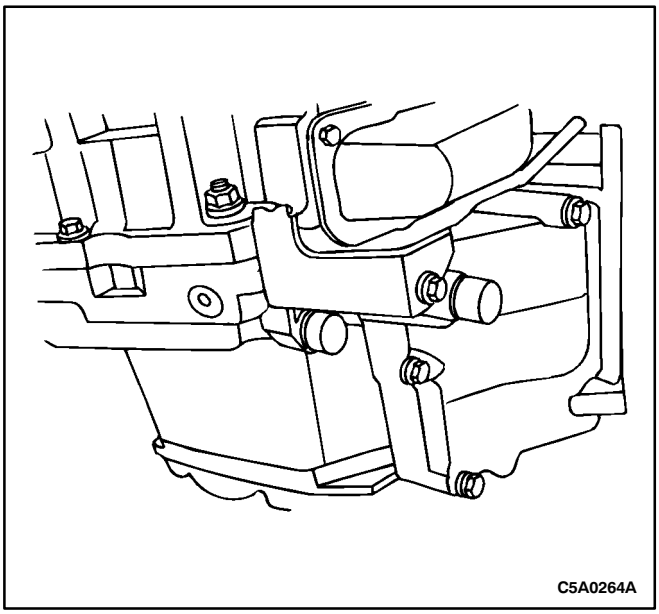

C5A0265A

Notice: Apply TOTAL FLUID HX to the O-ring.

70. Install the Transmission Fluid Temperature (TFT) sensor with a new O-ring.

Tighten

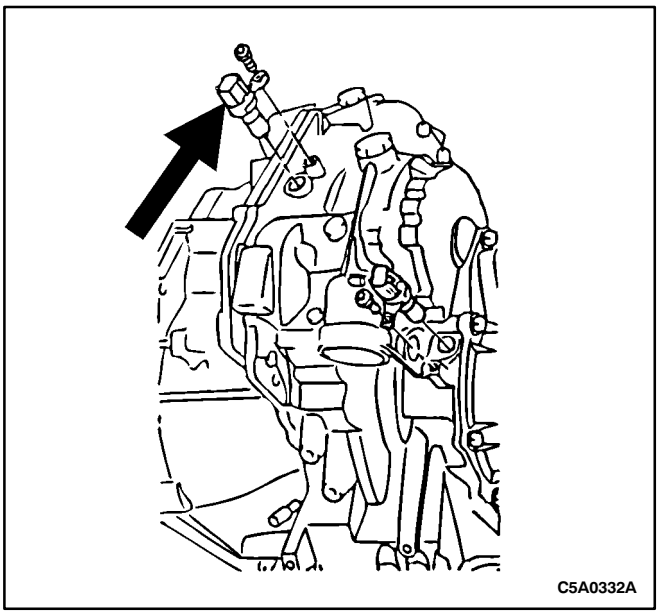
Tighten the sensor to 7-13 N•m (62-115 lb-in).


C5A0264A

71. Install the TFT protector bracket.

Tighten

Tighten the bolts to 20-29 N•m (15-22 lb-ft).


C5A0332A

Notice: Install new O-rings on the input shaft speed (ISS) and output shaft speed (OSS) sensors.

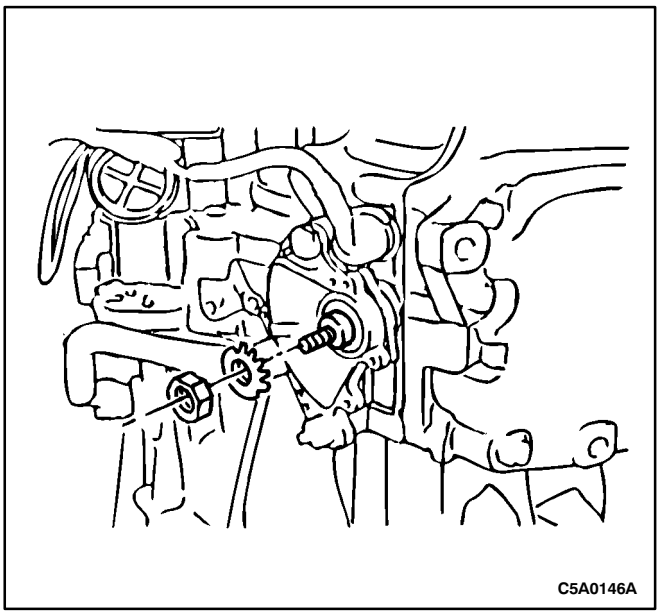
Notice: Apply TOTAL FLUID HX to the O-rings and to the case bore of the ISS and OSS sensors.

72. Install the input shaft speed (ISS) and output shaft speed (OSS) sensors.

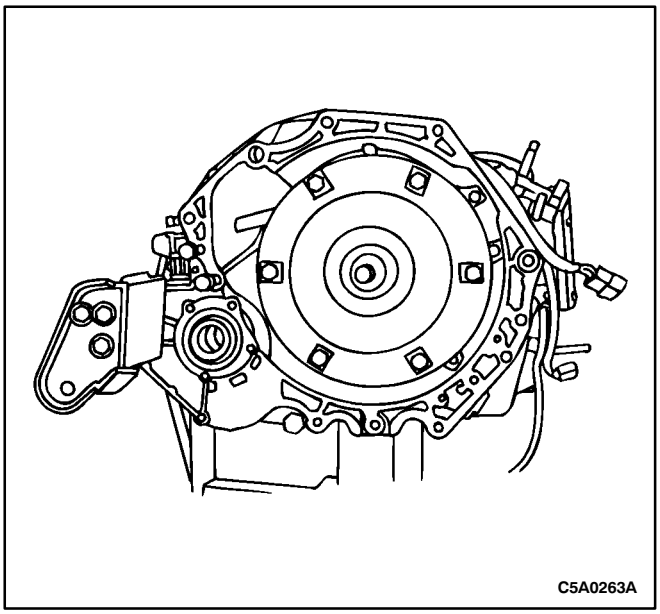
Tighten

Tighten the bolts to 4-7 N•m (35-62 lb-in).

73. Connect the wire harness to the ISS, OSS and to the TFT sensors.


C5A0146A

74. Install the park/neutral position (PNP) switch. Refer to “Park/Neutral Position (PNP) Switch” in this section.


C5A0263A

75. Install the torque converter.

GENERAL DESCRIPTION AND SYSTEM OPERATION

50-40LE AUTOMATIC TRANSMISSION

The 50-40LE automatic transmission is an electronically controlled four-speed transmission. It is designed for front-wheel-drive vehicles with a tranversely mounted engine.

The 50-40LE consists of three planetary gear trains with clutches, brakes and sun gears, and a primary and secondary shaft. Two of the three planetary gear trains make up the transmission primary shaft. The underdrive planetary gear is a single planetary gear train and the front planetary has a double set of gears.

The outer set has the short planetary gears and the inner set consists of long planetary gears. The planetary sun gear is common to the inner and outer planetary gears of the front planetary gear. The secondary shaft consists of the underdrive planetary gear train

The two intermediate gears transmit power from the primary to the secondary shaft. From the secondary shaft the power is then transmitted to the differential gear by the differential drive pinion gear and the counter driven gear.

The fluid pressure in the hydraulic system is created by the oil pump. The oil pump is attached to the transaxle case and is part of the second coast and brake clutch assembly. The oil pump also lubricates all moving parts of the transaxle, supplies fluid pressure to the shift components. The brakes and clutches are controlled by gear shifting valves which are controlled by the solenoids in the valve body. The transmission has four forward gears and one reverse gear.

The transmission is controlled by an electronic shift system. The Transmission Control Module (TCM) processes input signals and data received from engine and transmission sensors. From the information received, the TCM controls the transmission hydraulic system.

The electronic shift system consists of the following:

- Transmission control module (TCM)
- Shift solenoids (SS1 and SS2)
- Linear solenoid (pressure)
- Lockup solenoid
- Input shaft speed (ISS) sensor
- Output shaft speed (OSS) sensor
- Transmission Fluid Temperature (TFT) sensor
- Park/neutral position (PNP) Switch

Transmission Control Module (TCM)

The TCM primarily controls shift points and lockup engagement. It has a 35 pin-connector and is located on the passenger side under the instrument panel. Shifting is caused by two solenoids which are actuated by the TCM. The TCM also determines when the torque converter lock-up function is to be activated. Through the linear solenoid, when shifting occurs, the TCM actuates the solenoid valve to change the fluid pressure in the transmission.

Shift Solenoids

The shift solenoids are in the upper valve body. Both solenoids control shifting by opening and closing the fluid circulation system. The solenoids are grounded in the transmission and operate when they are supplied with battery voltage.

The battery voltage is controlled by the TCM, which sends a signal for up or down shifting, depending on vehicle speed, throttle position and driver demand.

Lockup Solenoid

The lockup solenoid is in the lower section of the upper valve body. The solenoid controls the torque converter lockup function. The solenoid is grounded in the transmission and operate when it is supplied with battery voltage.

The battery voltage is controlled by the TCM, which sends a signal for lockup engagement or disengagemaent according to vehicle speed, throttle position and driver demand.

Linear Solenoid

The linear solenoid is in the center of the upper valve body and regulates the transmission's fluid pressure system. It is internally grounded in the TCM and operates when it is supplied with battery voltage from the TCM, through the linear solenoid and back to the TCM.

The battery voltage is controlled by a varying current from the TCM. The strength of the current is a function of the throttle position.

Input Shaft Speed Sensor

The input shaft speed (ISS) sensor provides the TCM with the data on the speed of the transmission input shaft.

The input sensor is an electromagnetic type and measures the speed of the input shaft behind the torque converter by a toothed wheel on the forward/direct clutch drum.

The TCM uses the input sensor signal and vehicle speed to calculate shift times. Fuel pressure regulation, control of the torque converter lock-up function and engine torque reduction are based on the input shaft rpm and the vehicle speed received from the TCM.

Output Shaft Speed (OSS) Sensor

The output shaft speed (OSS) sensor provides the TCM with the data on the speed of the transmission output shaft.

The output sensor is an electromagnetic type and measures the speed of the output shaft by the parking lock ring gear.

The TCM uses the output sensor signal and vehicle speed to check shift times.

Transmission Fluid Temperature (TFT) Sensor

The TFT sensor provides the TCM with information on the transmission fluid temperature. The TFT sensor's integral resistance has negative temperature dependence (resistance declines as temperature rises) . The TCM uses information from the TFT sensor to calculate the gear shift points and to engage the torque converter lockup function.

Park/Neutral Position (PNP) Switch

The PNP switch is mounted to the manual detent lever on top of the transmission. Incorporated in the PNP switch are the backup lamp switch, starting interlock switch and switches to inform the TCM on gear engagement.