AUTOMATIC TRANSMISSION

	Page
TROUBLESHOOTING	AT-2
ATF INSPECTION	AT-4
ADJUSTMENTS	AT-4
TESTS	AT-5
ELECTRIC CONTROL	AT-14
ON-VEHICLE REPAIR	AT-17
REMOVAL OF TRANSMISSION	AT-26
DISASSEMBLY OF TRANSMISSION	AT-29
COMPONENT GROUP DISASSEMBLY, INSPECTION AND ASSEMBLY	AT-34
Oil Pump	AT-35
Overdrive Input Shaft and Clutch	AT-38
Overdrive Case and Brake	AT-43
Front Clutch	AT-46
Rear Clutch	AT-50
Center Support Assembly	AT-53
Planetary Gear Output Shaft	AT-56
Transmission Case and Rear Brake Pistons	AT-61
Valve Body	AT-64
Governor Body	AT-86
Extension Housing	AT-87
Torque Converter	AT-88
Electrical Parts	AT-88
ASSEMBLY OF TRANSMISSION	AT-90
INSTALLATION OF TRANSMISSION	AT-101

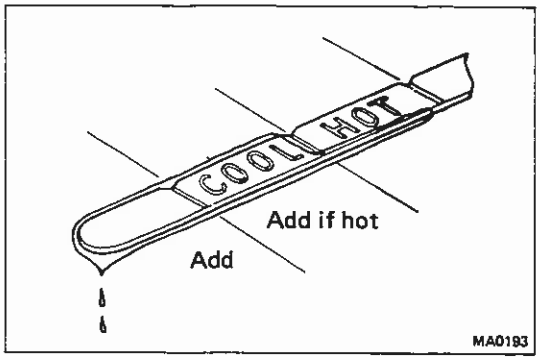
TROUBLESHOOTING

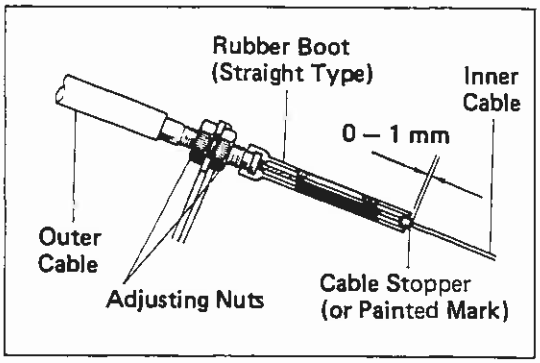
Problem	Possible cause	Remedy	Page
Fluid discolored or smells burnt	Fluid contaminated	Replace fluid	MA-11
	Torque converter faulty	Replace torque converter	AT-28
	Transmission faulty	Disassemble and inspect transmission	AT-29
Vehicle does not move in any range	Manual linkage out of adjustment	Adjust shift linkage	AT-4
	Valve body or primary regulator faulty	Inspect valve body	AT-64
	Parking lock pawl faulty	Inspect parking lock pawl	AT-21
	Torque converter faulty	Replace torque converter	AT-28
	Converter drive plate broken	Replace torque converter	AT-28
	Oil pump intake strainer blocked	Clean strainer	AT-17
Shift lever position incorrect	Manual shift linkage out of adjustment	Adjust shift linkage	AT-4
	Manual valve and lever faulty	Inspect valve body	AT-64
	Transmission faulty	Disassemble and inspect transmission	AT-29
Harsh engagement into any drive range	Throttle cable out of adjustment	Adjust throttle cable	AT-4
	Valve body or primary regulator faulty	Inspect valve body	AT-64
	Accumulator pistons faulty	Inspect accumulator pistons	AT-31
	Transmission faulty	Disassemble and inspect transmission	AT-29
Delayed 1-2, 2-3 or 3-OD up-shift, or down-shifts from OD-3 or 3-2 then shifts back to OD or 3	Throttle cable out of adjustment	Adjust throttle cable	AT-4
	Throttle cable and cam faulty	Inspect throttle cable and cam	AT-20
	Governor faulty	Inspect governor	AT-86
	Valve body faulty	Inspect valve body	AT-64
Slips on 1-2, 2-3 or 3-OD up-shift, or slips or shudders on take-off	Manual linkage out of adjustment	Adjust linkage	AT-4
	Throttle cable out of adjustment	Adjust throttle cable	AT-4
	Valve body faulty	Inspect valve body	AT-64
	Transmission faulty	Disassemble and inspect transmission	AT-29
Drag, binding or tie-up on 1-2, 2-3 or 3-OD up-shift	Manual linkage out of adjustment	Adjust linkage	AT-4
	Valve body faulty	Inspect valve body	AT-64
	Transmission faulty	Disassemble and inspect transmission	AT-29

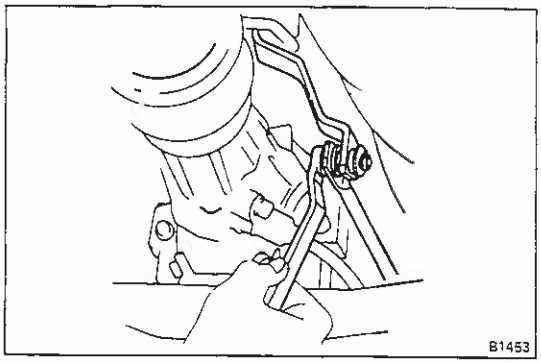
TROUBLESHOOTING (Cont'd)

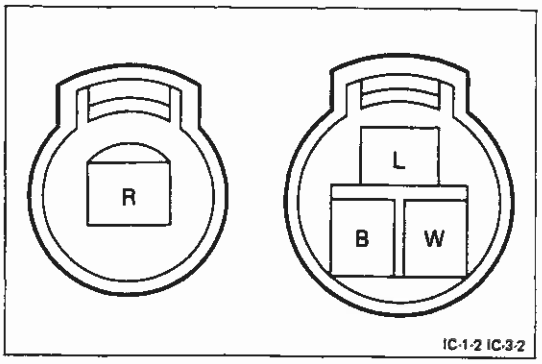
Problem	Possible cause	Remedy	Page
Harsh down-shift	Throttle cable out of adjustment	Adjust throttle cable	AT-4
	Throttle cable and cam faulty	Inspect throttle cable and cam	AT-20
	Accumulator pistons faulty	Inspect accumulator pistons	AT-31
	Valve body faulty	Inspect valve body	AT-64
	Transmission faulty	Disassemble and inspect transmission	AT-29
No down-shift when coasting	Govenor faulty	Inspect governor	AT-86
	Valve body faulty	Inspect valve body	AT-64
Down-shift occurs too quick or too late while coasting	Throttle cable out of adjustment	Adjust throttle cable	AT-4
	Throttle cable faulty	Inspect throttle cable	AT-20
	Governor faulty	Inspect governor	AT-86
	Valve body faulty	Inspect valve body	AT-64
	Transmission faulty	Disassemble and inspect transmission	AT-29
No. OD-3, 3-2 or 2-1 kickdown	Throttle cable out of adjustment	Adjust throttle cable	AT-4
	Governor faulty	Inspect governor	AT-86
	Valve body faulty	Inspect valve body	AT-64
No engine braking in "2" range	Valve body faulty	Inspect valve body	AT-64
	Transmission faulty	Disassembie and inspect transmission	AT-29
Vehicle does not hold in "P"	Manual linkage out of adjustment	Adjust linkage	AT-4
	Parking lock pawl cam and spring faulty	Inspect cam and spring	AT-21

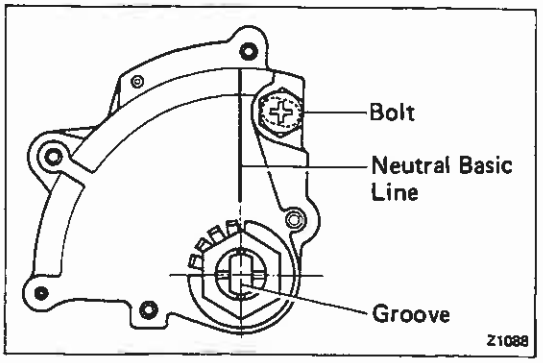
NOTE: See page AT-14 for inspection procedures for electrical controls of automatic transmission with overdrive.











ATF INSPECTION

1. CHECK FLUID LEVEL (See page MA-14)
2. CHECK FLUID CONDITION
   If the ATF smells burnt or is black, replace it.
3. REPLACE ATF (See page MA-11)

ADJUSTMENTS

ADJUSTMENT OF THROTTLE CABLE

1. DEPRESS ACCELERATOR PEDAL ALL THE WAY AND CHECK THAT THROTTLE VALVE OPENS FULLY
   If the throttle valve does not open fully, adjust the accelerator link.
2. FULLY DEPRESS ACCELERATOR
3. LOOSEN ADJUSTMENT NUTS
4. ADJUST THROTTLE CABLE
   (a) Adjust the cable housing so that the distance between the end of the boot and the stopper on the cable is correct.
   Distance: 0 – 1 mm (0 – 0.04 in.)
   (b) Tighten the adjusting nuts.
   (c) Recheck the adjustments.

ADJUSTMENT OF FLOOR SHIFT LINKAGE

ADJUST SHIFT LINKAGE

(a) Loosen the nut on the shift linkage.
(b) Push the manual lever fully rearward.
(c) Return the lever two notches to the NEUTRAL position.
(d) Set the shift selector in "N".
(e) While holding the selector lightly toward the "R" range side, tighten the shift linkage nut.

ADJUSTMENT OF NEUTRAL START SWITCH

If the engine will start with the shift selector in any range other than "N" or "P" range, adjustment is required.

1. LOOSEN NEUTRAL START SWITCH BOLT AND SET SHIFT SELECTOR IN "N" RANGE
2. ADJUST NEUTRAL START SWITCH
   (a) Disconnect the neutral start switch connector.
   (b) Connect the ohmmeter between the terminals.
   (c) Adjust the switch to the point where there is continuity between W and B terminals.
   (d) Connect the neutral start switch connector.
3. TORQUE NEUTRAL START SWITCH BOLT
   Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

TESTS

STALL TEST

The object of this test is to check the overall performance of the transmission and engine by measuring the maximum engine speeds at the "D" and "R" ranges.

CAUTION:

(a) **Perform this test at normal operation fluid temperature (50 – 80°C or 122 – 176°F).**

(b) **Do not continuously run this test longer than 5 seconds.**

MEASURE STALL SPEED

(a) Chock the front and rear wheels.

(b) Mount an engine tachometer.

(c) Fully apply the parking brake.

(d) Step down strongly on the brake pedal with your left foot.

(e) Start the engine.

(f) Shift into "D" range. Step all the way down on the accelerator pedal with your right foot. Quickly read the highest engine rpm at this time.

Stall speed: 1,900 ± 150 rpm

(g) Perform the same test in "R" range.

EVALUATION

(a) If the engine speed is the same for both ranges but lower than specified value:

- Engine output is insufficient.
- Stator one-way clutch is not operating properly.

NOTE: If more than 600 rpm below the specified value, the torque converter could be at fault.

(b) If the stall speed in "D" range is higher than specified:

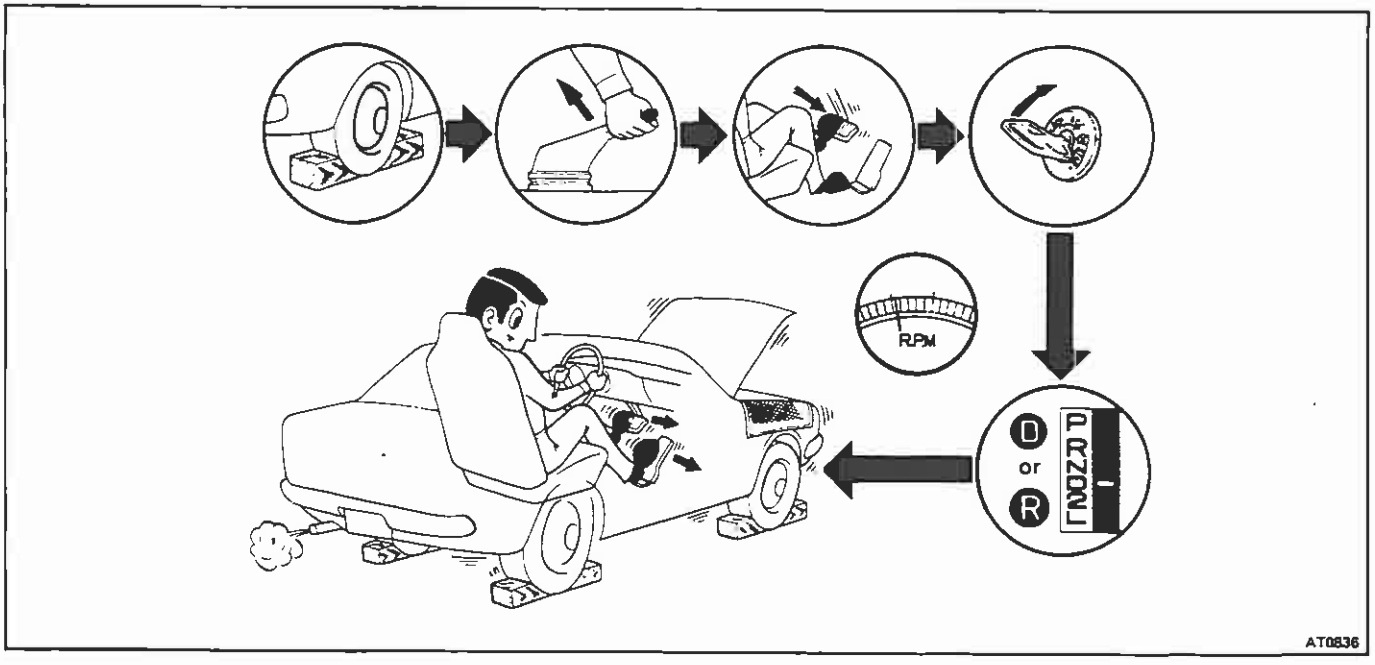
- Line pressure too low
- Front clutch slipping
- One-way clutch No. 2 not operating properly
- OD one-way clutch not operating properly

(c) If the stall speed in "R" range is higher than specified:

- Line pressure too low
- Rear clutch slipping
- Brake No. 3 slipping
- OD one-way clutch not operating properly

(d) If the stall speed in "R" and "D" range is higher than specified:

- Line pressure too low
- Improper fluid level
- OD one-way clutch not operating properly



TIME LAG TEST

If the shift lever is shifted while the engine is idling, there will be a certain time elapse or lag before the shock can be felt. This is used for checking the condition of the OD clutch, front clutch, rear clutch and brake No. 3.

MEASURE TIME LAG

(a) Fully apply the parking brake.

(b) Start the engine and check the idle speed.

Idle speed (A/C OFF) "N" range 750 rpm

(c) Shift the shift lever from "N" to "D" range. Using a stop watch, measure the time it takes from shifting the lever until the shock is felt.

Time lag: Less than 1.2 seconds

(d) In the same manner, measure the time lag for "N" → "R".

Time lag: Less than 1.5 seconds

CAUTION:

(a) **Perform this test at normal operation fluid temperature (50 – 80°C or 122 – 176°F).**

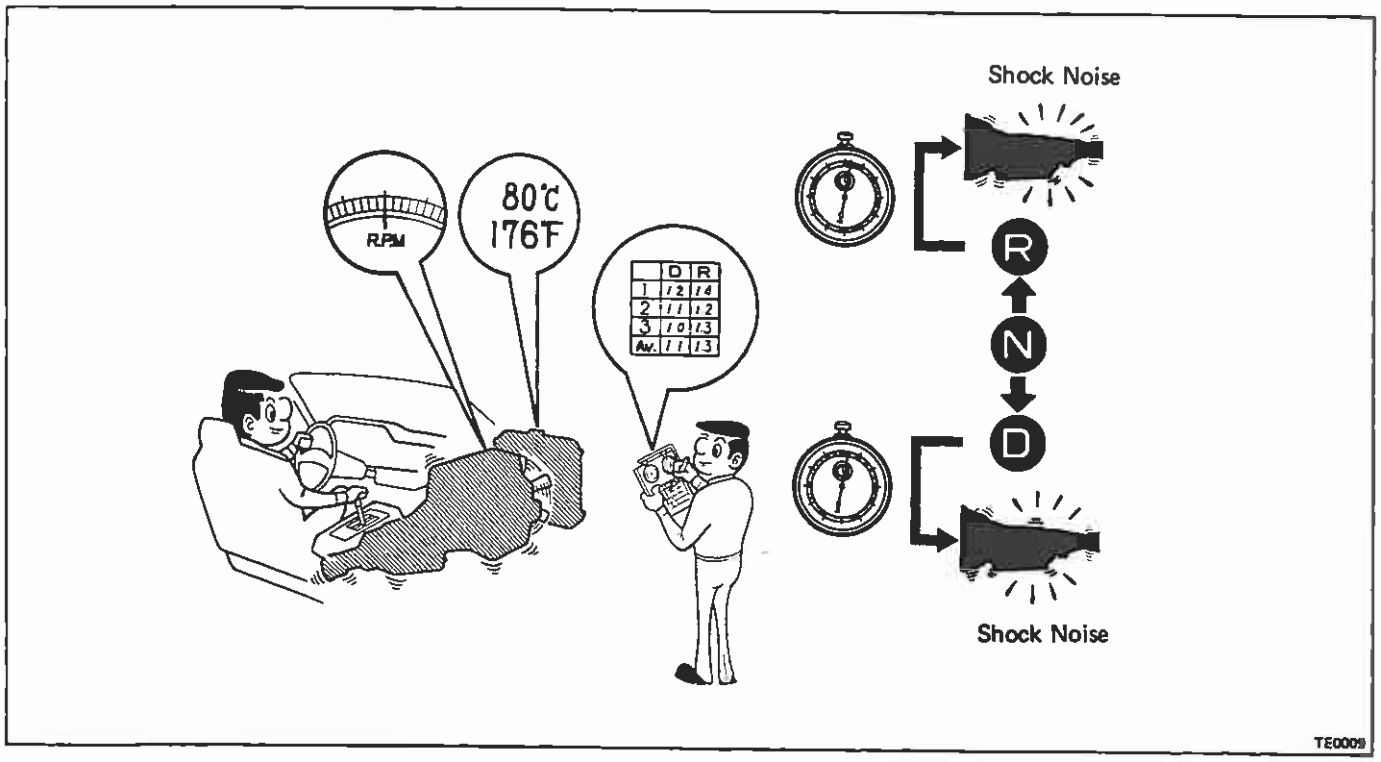
(b) **Be sure to an allow one minute interval between tests.**

(c) **Make three measurements and take the average value.**

EVALUATION

(a) If "N" → "D" time lag is longer than specified:
- Line pressure too low
- Front clutch worn
- OD one-way clutch not operating properly

(b) If "N" → "R" time lag is longer than specified:
- Line pressure too low
- Rear clutch worn
- Brake No. 3 worn
- OD one-way clutch not operating properly



HYDRAULIC TEST

1. PREPARATION

(a) Warm up the transmission fluid.

(b) Chock the front wheels.

(c) Jack up rear of the vehicle and support it on stands.

(d) Remove the transmission case test the plugs and mount hydraulic pressure gauges.

SST 09992-00093

CAUTION:

(a) **Perform this test at normal operation fluid temperature (50 – 80°C or 122 – 176°F).**

(b) **Measurement can be made with a 1,000 rpm test (32 km/h test), but if tests are to be made at 1,800 and 3,500 rpm (57 and 111 km/h), it would be safer to test on road or a chassis dynamometer because an on-stand test could be hazardous.**

2. MEASURE GOVERNOR PRESSURE

(a) Check that the parking brake is not applied.

(b) Start the engine.

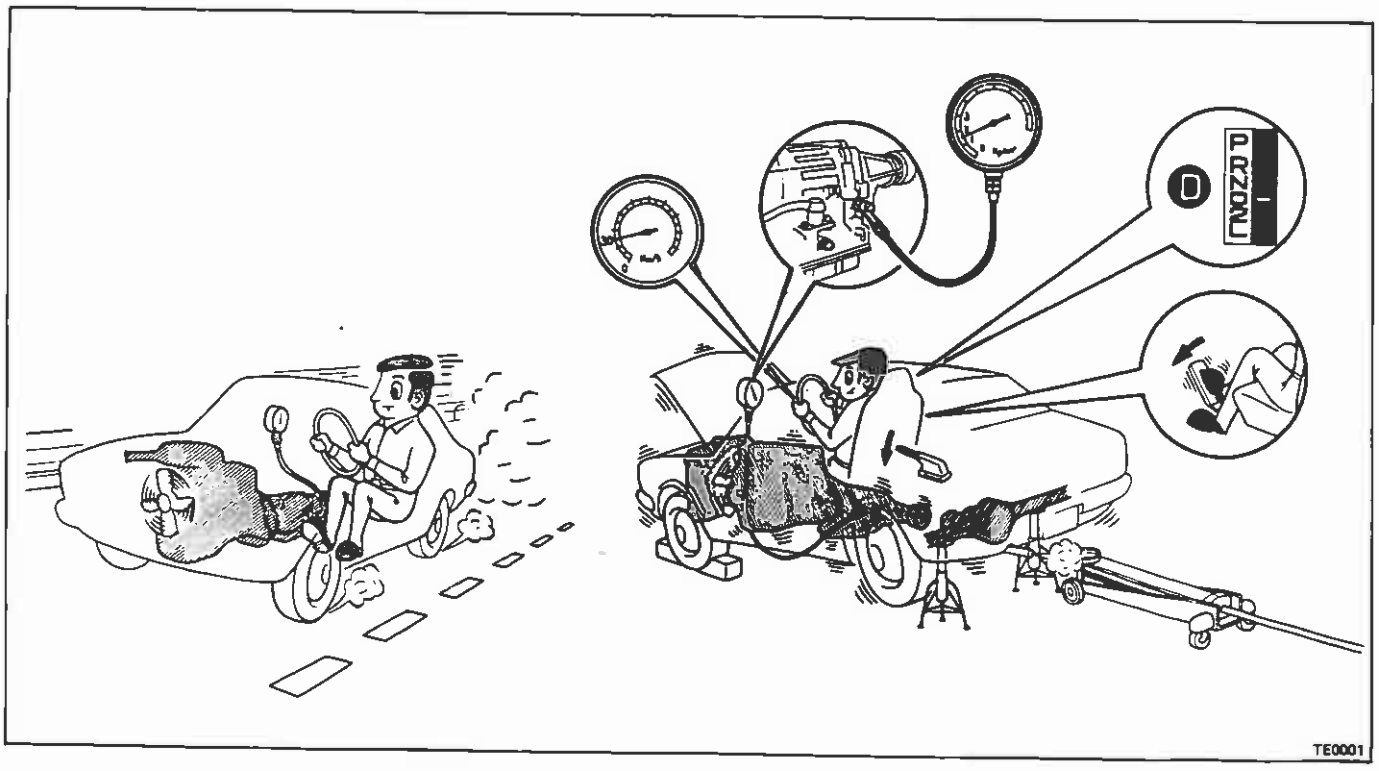
(c) Shift into "D" range and measure the governor pressures at the speeds specified in the table.

EVALUATION

If governor pressure is defective:

- Line pressure defective
- Fluid leakage in governor pressure circuit
- Governor valve operation defective

Output shaft	Vehicle speed (Reference only)	Governor pressure
1,000 rpm	32 km/h (20 mph)	0.9 – 1.5 kg/cm² (13 – 21 psi, 88 – 147 kPa)
1,800 rpm	57 km/h (35 mph)	1.6 – 2.2 kg/cm² (23 – 31 psi, 157 – 216 kPa)
3,500 rpm	111 km/h (69 mph)	4.1 – 5.3 kg/cm² (58 – 75 psi, 402 – 520 kPa)



3. MEASURE LINE PRESSURE

(a) Fully apply the parking brake and chock the four wheels.

(b) Start the engine and shift into "D" range.

(c) Step down strongly on the brake pedal with your left foot and while manipulating the accelerator pedal with the right foot, measure the line pressures at the engine speeds specified in the table below.

(d) In the same manner, perform the test for "R" range.

Engine speed rpm	Line pressure kg/cm² (psi) (kPa)	
	"D" range	"R" range
Idling	4.4 – 4.8 (63 – 68) (431 – 471)	5.2 – 6.2 (74 – 88) (510 – 608)
Stall	9.8 – 10.8 (139 – 154) (961 – 1,059)	11.5 – 14.4 (164 – 205) (1,128 – 1,412)

(e) If the measured pressures are not up to specified values, recheck the throttle cable adjustment and retest.

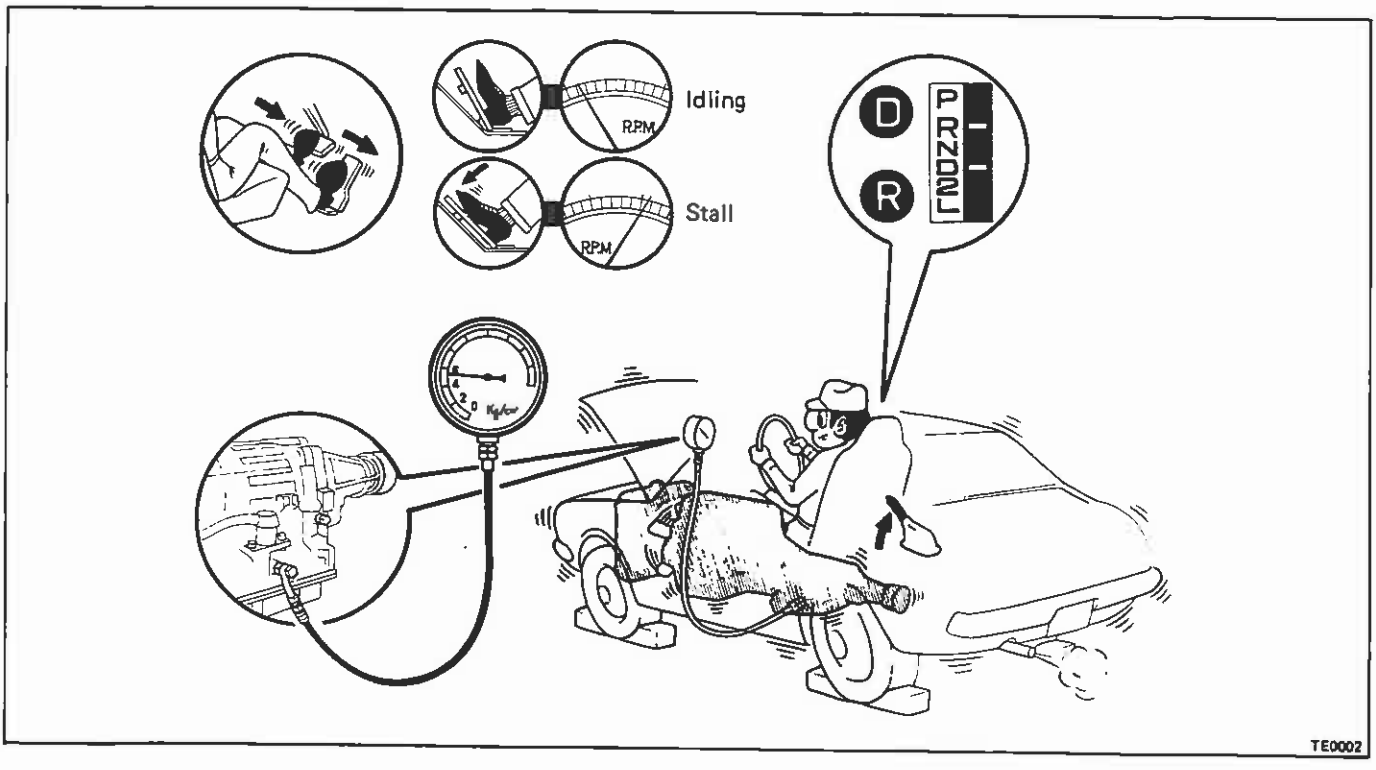
EVALUATION

(a) If the measured values at all ranges are higher than specified:
- Throttle cable out-of-adjustment
- Throttle valve defective
- Regulator valve defective

(b) If the measured values at all ranges are lower than specified:
- Throttle cable out-of-adjustment
- Throttle valve defective
- Regulator valve defective
- Oil pump defective
- OD clutch defective

(c) If pressure is low in "D" range only:
- "D" range circuit fluid leakage
- Front clutch defective
- OD clutch defective

(d) If pressure is low in "R" range only:
- "R" range circuit fluid leakage
- Rear clutch defective
- Brake No. 3 defective
- OD clutch defective



TE0002

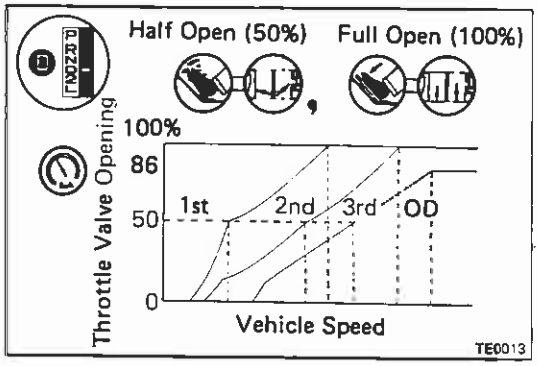
ROAD TEST

CAUTION: Perform this test at normal operation fluid temperature (50 – 80°C or 122 – 176°F).

1. "D" RANGE TEST

Shift into "D" range, and while driving with the accelerator pedal held constant at specified point (throttle valve opening 50% and 100%) and OD switch "ON", check the following points.

(a) At each of the above throttle openings, check to see that 1 → 2, 2 → 3 and 3 → OD up-shift take place and also that the shift points conform to those shown on the automatic shift diagram.



NOTE: 3 → OD up-shift does not take place with a throttle valve opening of more than 86% or coolant temperature below 50°C or 122°F.

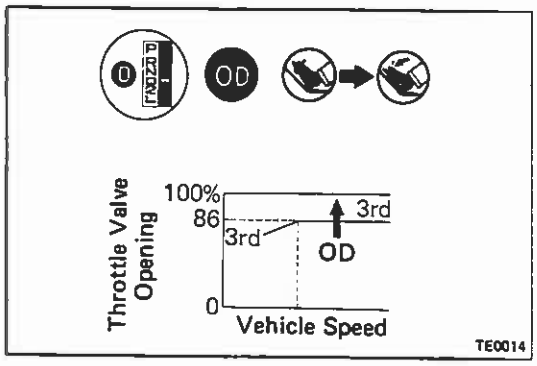
EVALUATION

(1) If there is no 1 → 2 up-shift,
- Governor valve is defective
- 1-2 shift valve is stuck

(2) If there is no 2 → 3 up-shift,
- 2-3 shift valve is stuck

(3) If there is no 3 → OD up-shift (throttle valve opening 1/2),
- 3-OD shift valve is stuck

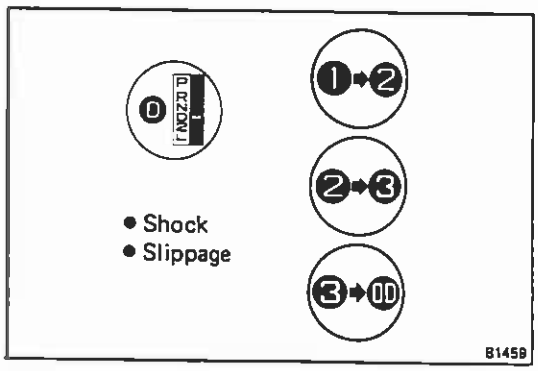
(4) If the shift point is defective,
- Throttle cable is out-of-adjustment
- Throttle valve, 1-2 shift valve, 2-3 shift valve, 3-OD shift valve etc., are defective.



(b) In the same manner, check the shock and the slip at 1 → 2, 2 → 3 and 3 → OD up-shifts.

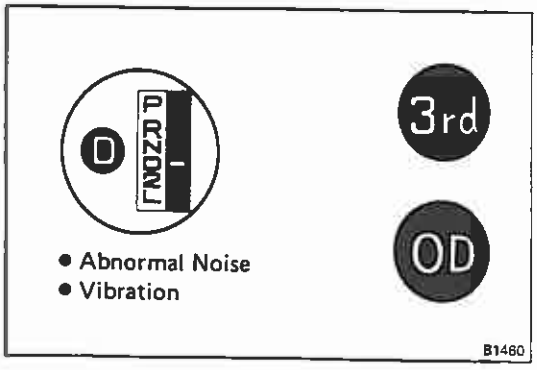
EVALUATION

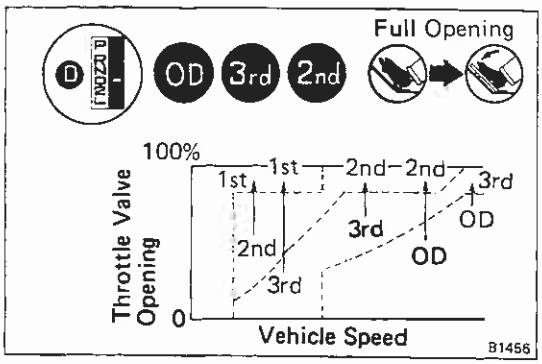
If the shock is excessive,
- Line pressure is too high
- Accumulator is defective
- Check ball is defective



(c) Run in "D" range 3rd gear or OD gear and check for abnormal noise and vibration.

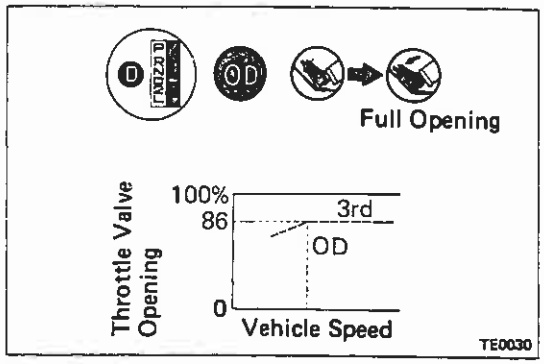
NOTE: Check for cause of abnormal noise and vibration must be made with extreme care as they could also be due to unbalance in propeller shaft, differential, tire, torque converter, etc. or insufficient bending rigidity, etc., in the power train.



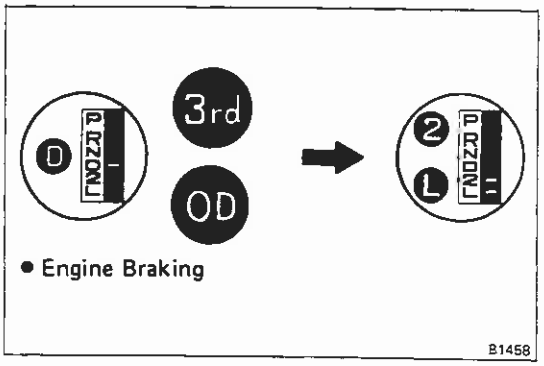


(d) While running in "D" range 2nd, 3rd gears and OD, check to see that the possible kick-down vehicle speed limits for 2 → 1, 3 → 1, 3 → 2, OD → 3 and OD → 2 kick-downs conform to those indicated on the automatic shift diagram.

(e) Check for abnormal shock and slip at kick-down.



NOTE: OD → 3 kick-down is possible with a throttle valve opening of more than 86%.

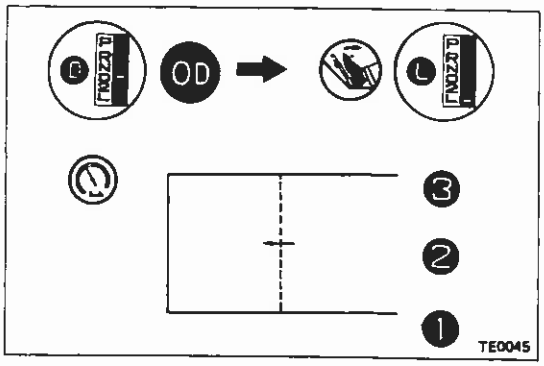


(f) While running in "D" range 3rd gear or OD gear, shift to "2" and "L" ranges and check the engine braking effect at each of these ranges.

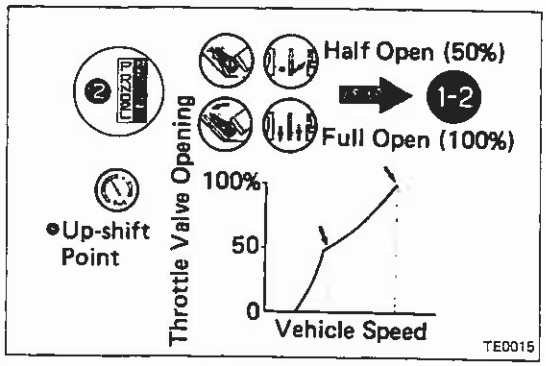
EVALUATION

(1) If there is no engine braking effect at "2" range:
- Brake No. 1 is defective

(2) If there is not engine braking effect at "L" range:
- Brake No. 3 is defective

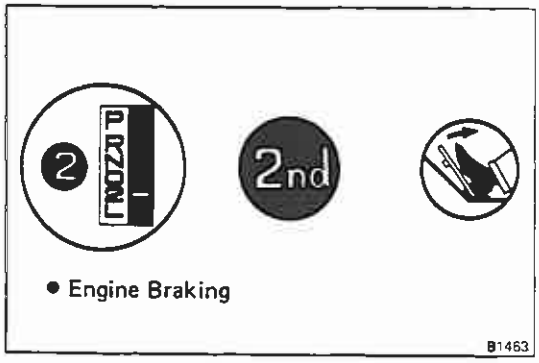


(g) While running in "D" range, release the foot from the accelerator pedal and shift into "L" range. Then check to see if OD → 3, 3 → 2 and 2 → 1 down-shift points conform to those indicated on the automatic shift diagram.

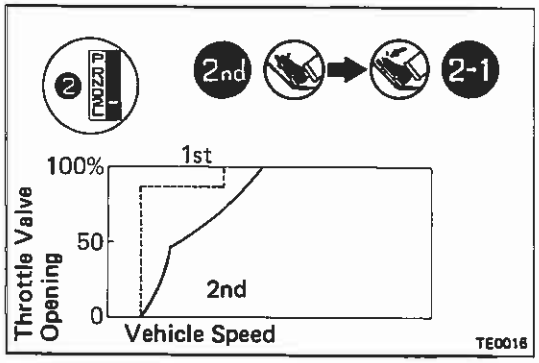


2. "2" RANGE TEST

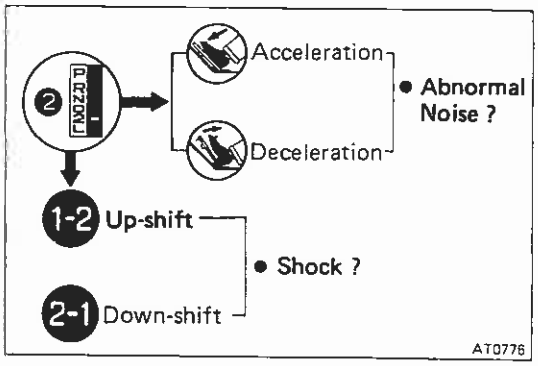
(a) Shift to "2" range and run with the throttle valve opening at 50% and 100% respectively. Then check the 1 → 2 up-shift points at each of the throttle valve openings to see that it conforms to those indicated on the automatic shift diagram.



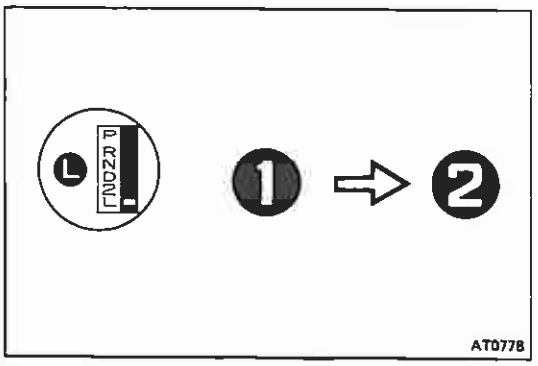
(b) While running in "2" range, 2nd gear, release the accelerator pedal and check the engine braking effect.



(c) Perform a kick-down from the "2" range and check the possible 2 → 1 kick-down vehicle speed limit to see if it conforms to that indicated on the automatic shift diagram.

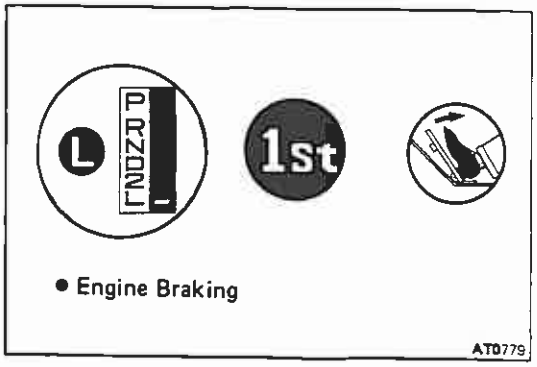


(d) Check for abnormal noise at acceleration and deceleration, and for shock at up-shift and down-shift.

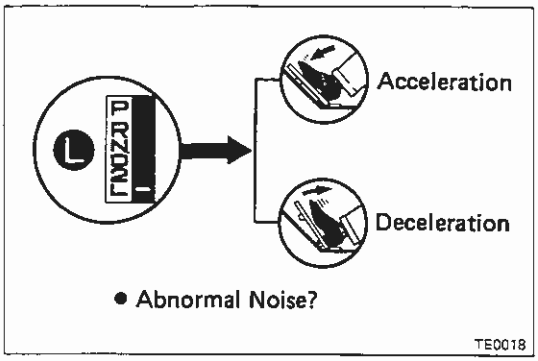


3. "L" RANGE TEST

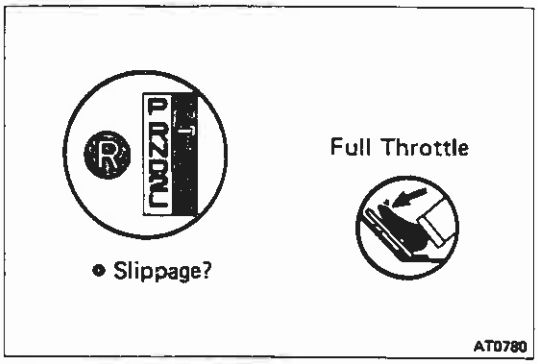
(a) While running in the "L" range, check to see that there is no up-shift to 2nd gear.



(b) While running in "L" range, release the accelerator pedal and check the engine braking effect.

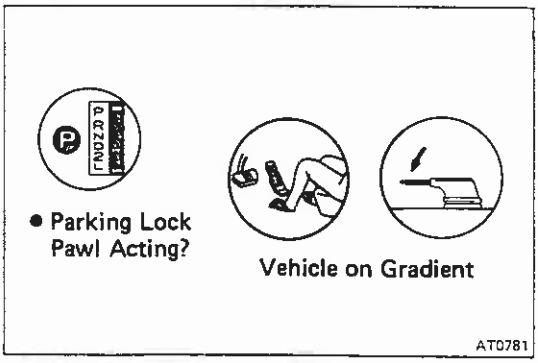


(c) Check for abnormal noise at acceleration and deceleration.



4. "R" RANGE TEST

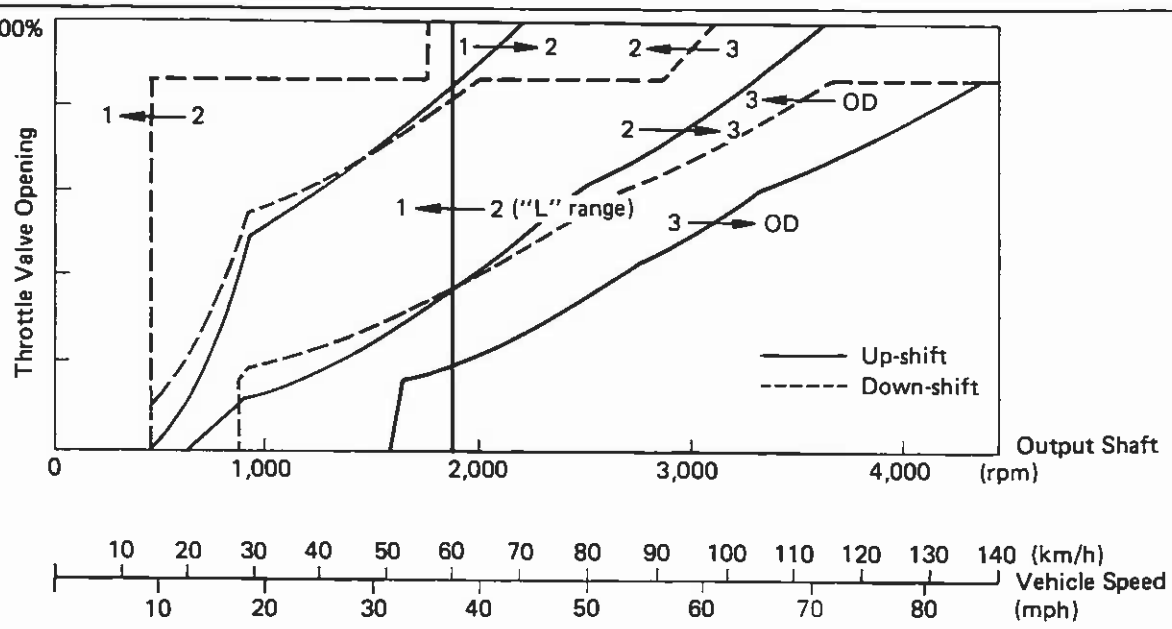
Shift into "R" range and, while running at full throttle, check for slipping.



5. "P" RANGE TEST

Stop the vehicle on a gradient (more than 9%) and after shifting into "P" range, release the parking brake. Then check that the parking lock pawl prevents the vehicle from moving.

AUTOMATIC SHIFT DIAGRAM



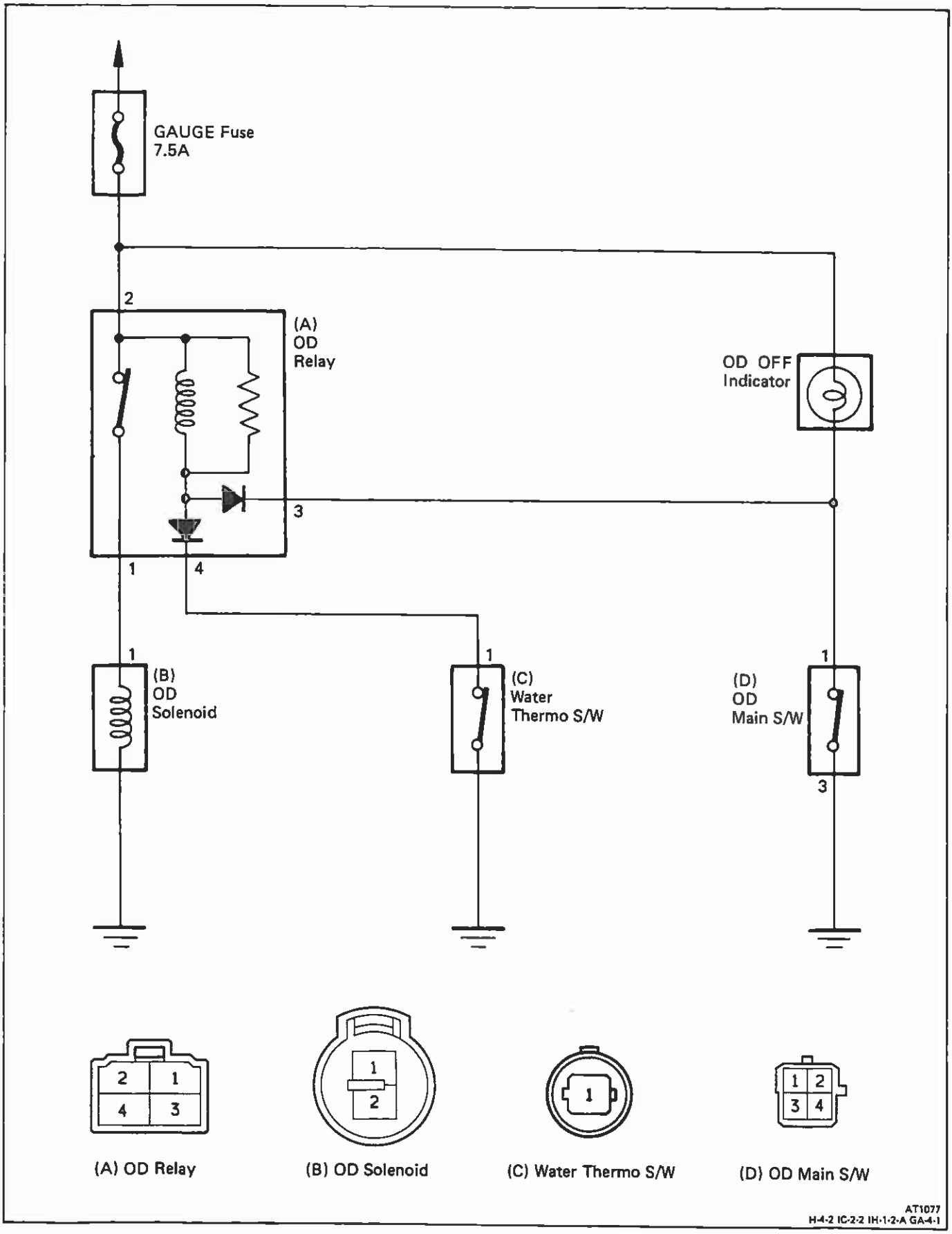
*1. 3 → OD up-shift point with closed throttle valve is at 38 – 52 km/h (24 – 32 mph).
*2. OD → 3 down-shift possible up to maximum speed.

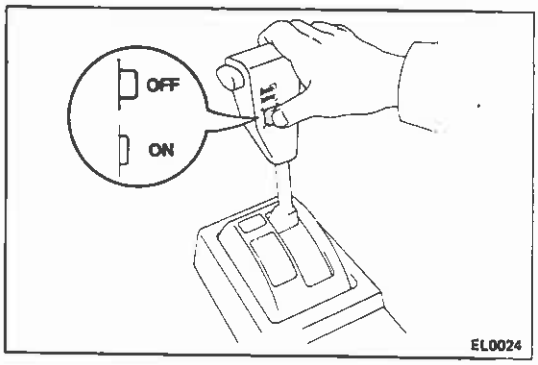
km/h (mph)

Differential gear ratio	"D" range (throttle valve fully open)						"L" range
	1 → 2	2 → 3	3 → OD	OD → 3	3 → 2	2 → 1	2 → 1
3.583	57 – 73 (35 – 45)	105 – 122 (65 – 76)	*1	*2	91 – 108 (57 – 67)	42 – 54 (26 – 34)	47 – 65 (29 – 40)

ELECTRIC CONTROL

CIRCUIT





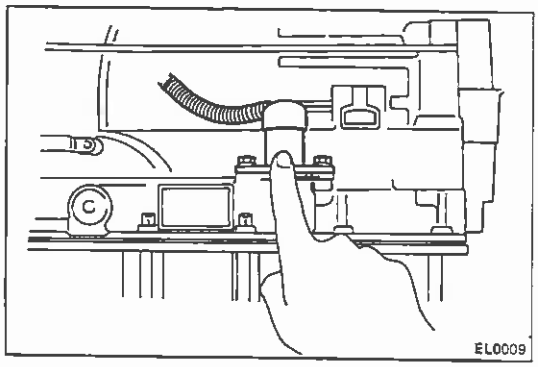
INSPECTION OF ELECTRIC CONTROL COMPONENTS

1. INSPECT OVERDRIVE RELAY AND SOLENOID

(a) Turn on the ignition switch and the main switch.

(b) Disconnect the connector from the thermo switch.

(c) Repeatedly ground the wire side of the connector with a subwire.

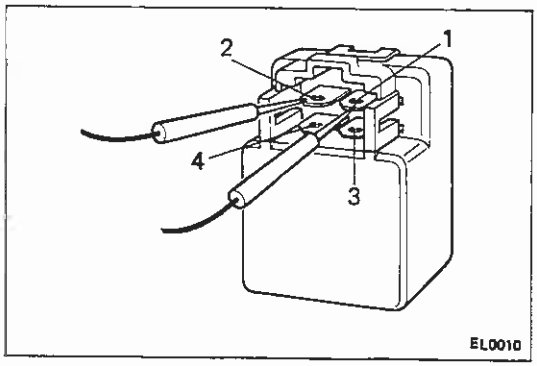


(d) At this time, confirm that an operation sound from the solenoid and overdrive relay can be heard.

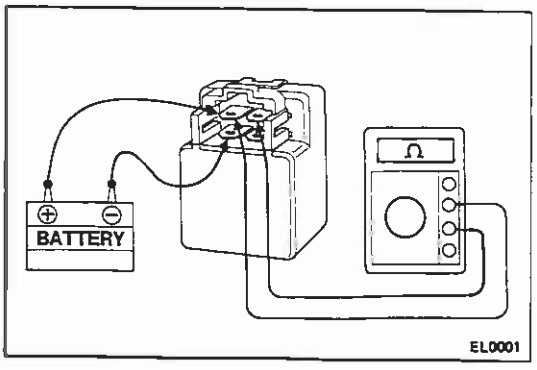
If there is no sound from either solenoid relay, check them.

2. INSPECT OVERDRIVE RELAY

(a) Remove the overdrive relay from the pedal bracket.

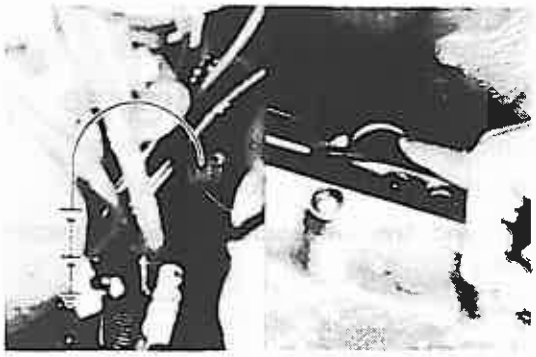


(b) Using an ohmmeter, check that there is continuity between terminals 1 and 2.



(c) Apply 12 V battery voltage across terminals 2 and 4.

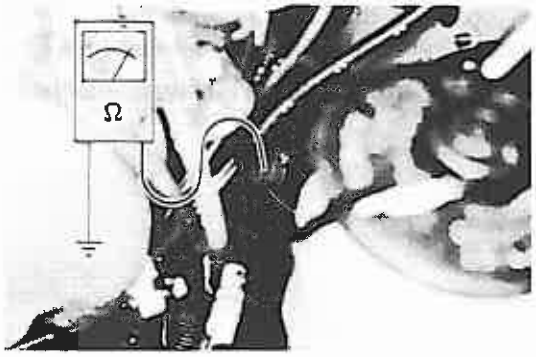
Using an ohmmeter, check that there is no continuity between terminals 1 and 2.



3. INSPECT OVERDRIVE SOLENOID

(a) Disconnect the solenoid wire and apply a 12 V battery voltage to the solenoid.

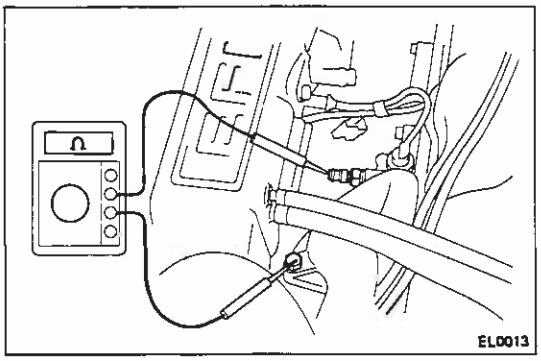
Confirm that a solenoid operation sound is heard.



(b) Using an ohmmeter, measure the solenoid coil resistance.

Resistance: 13 Ω

(c) Connect the solenoid wire.

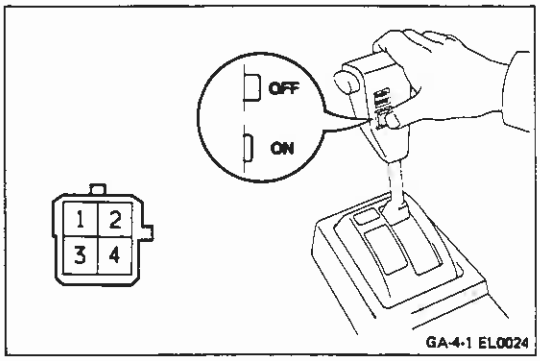


4. INSPECT THERMO SWITCH

(a) Disconnect the thermo switch wire.

(b) Using an ohmmeter, measure the resistance between the terminal and ground.

Coolant temperature	Resistance (Point)
Below 43°C (109°F)	0 Ω (Closed)
Above 55°C (131°F)	∞ Ω (Open)



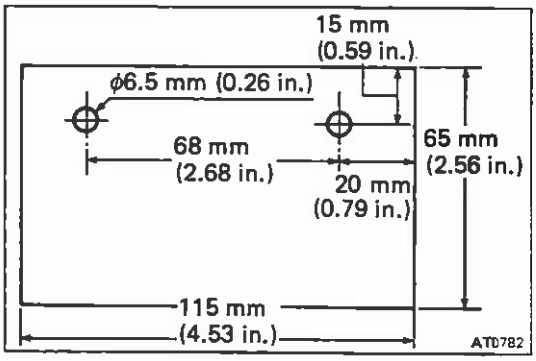
5. INSPECT OVERDRIVE MAIN SWITCH

(a) Remove the console box.

(b) Using an ohmmeter, measure the resistance between terminals 1 and 3.

- **Switch ON – Resistance: ∞ Ω**
- **Switch OFF – Resistance: 0 Ω**

(c) Install the console box.



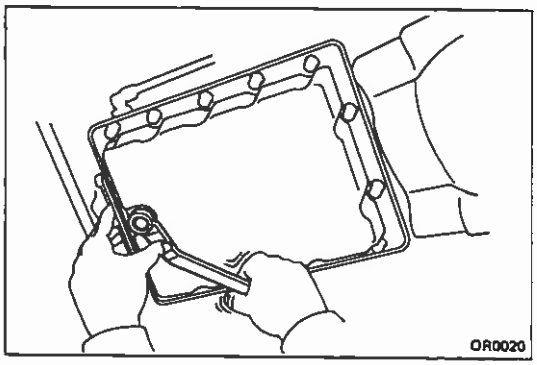
ON-VEHICLE REPAIR

REMOVAL OF VALVE BODY

1. MAKE PLATE TO RETAIN ACCUMULATOR PISTONS

A retainer is helpful for holding accumulator pistons during removal and installation of the valve body.

The plate may be made from aluminum or plastic.

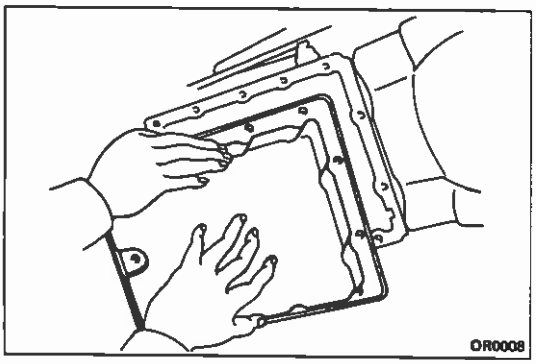


2. CLEAN TRANSMISSION EXTERIOR

To help prevent contamination, clean the exterior of the transmission.

3. DRAIN TRANSMISSION FLUID

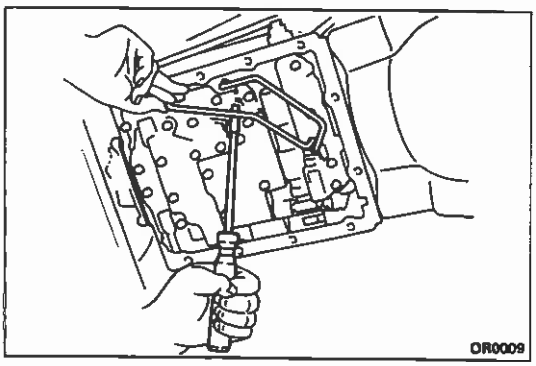
Remove the drain plug and drain the fluid into a suitable container.



4. REMOVE OIL PAN, FILLER TUBE AND GASKET

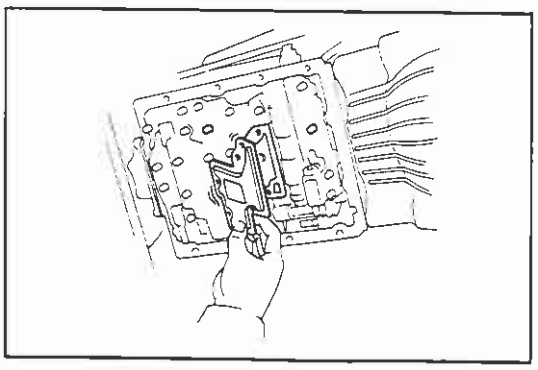
CAUTION: Some fluid will remain in the oil pan. Be careful not to damage the filler tube and O-ring.

Remove all pan bolts, and carefully remove the pan assembly. Discard the gasket.



5. REMOVE OIL TUBES

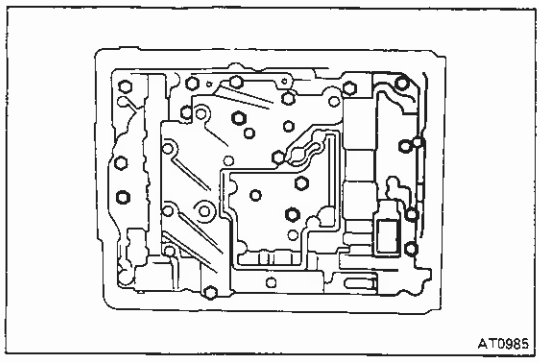
Pry up both tube ends with a large screwdriver and remove the tubes.



6. REMOVE OIL STRAINER

Remove the five bolts, and the oil strainer.

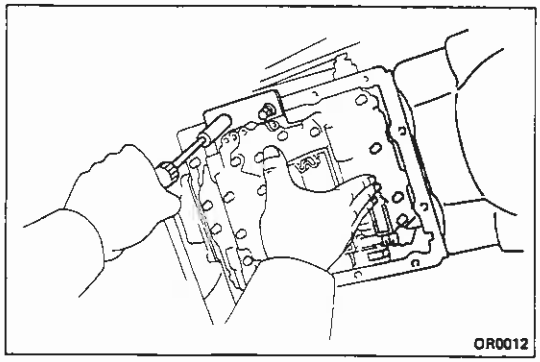
CAUTION: Be careful as some oil will come out with the strainer.


AT0985

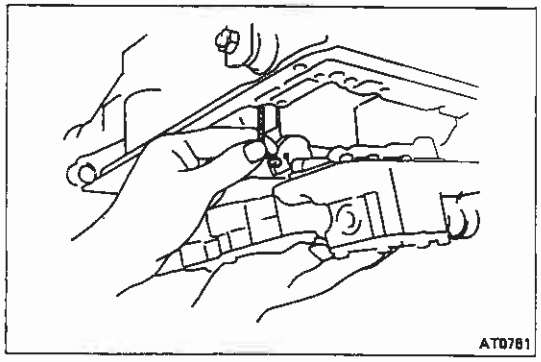
7. REMOVE VALVE BODY

(a) Remove the seventeen bolts.

NOTE: Bolt lengths will be shown for installation, so there is no need to mark them now.


OR0012

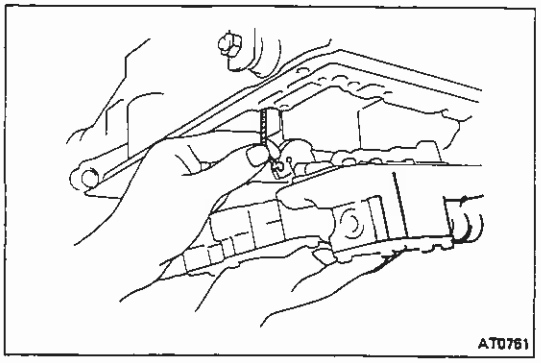
(b) Lower valve body slightly, and install the accumulator piston retaining plate. Hold it in place with two pan bolts, finger tight.


AT0761

(c) Disconnect the throttle cable from the cam and remove the valve body.

DISASSEMBLY, INSPECTION AND ASSEMBLY OF VALVE BODY

(See page AT-64)


AT0761

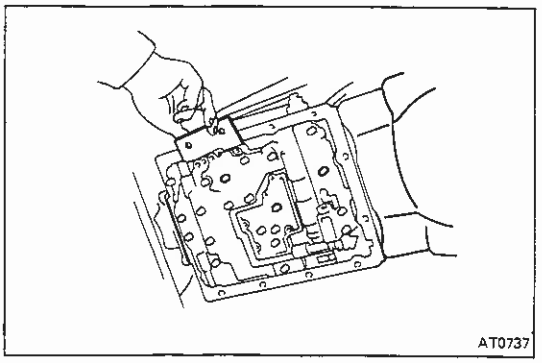
INSTALLATION OF VALVE BODY

1. CONNECT THROTTLE CABLE TO CAM

Push the cable fitting into the cam.

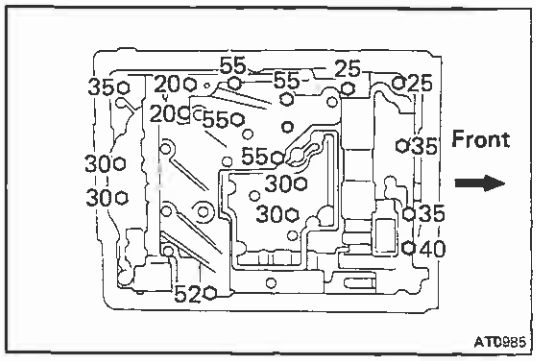
2. ALIGN MANUAL VALVE LEVER WITH MANUAL VALVE AND LOOSELY INSTALL SEVERAL BOLTS IN VALVE BODY

Leave the bolts loose so that the accumulator retaining plate can be removed.


AT0737

3. REMOVE ACCUMULATOR RETAINING PLATE

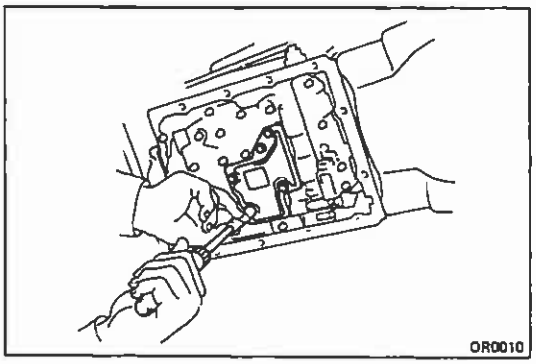
Remove the two pan bolts, and slide out the plate.



4. INSTALL VALVE BODY BOLTS

Install the bolts as shown. Tighten the bolts evenly.

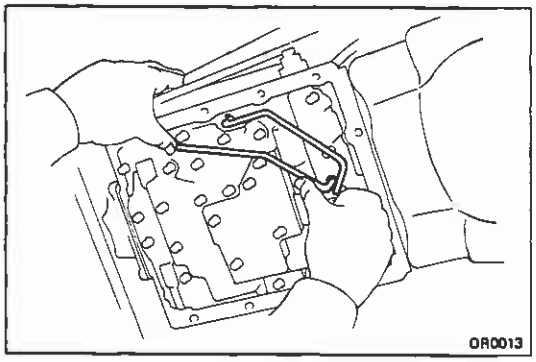
Torque: 100 kg-cm (7 ft-lb, 10 N·m)



5. INSTALL OIL STRAINER

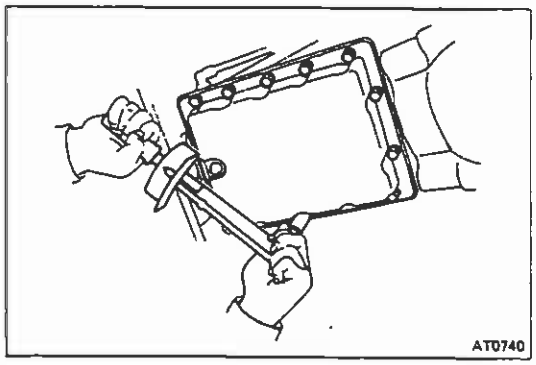
Be sure the strainer is clean. Torque the bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



6. INSTALL TWO OIL TUBES

Press the tubes by hand into the positions indicated in the figure.



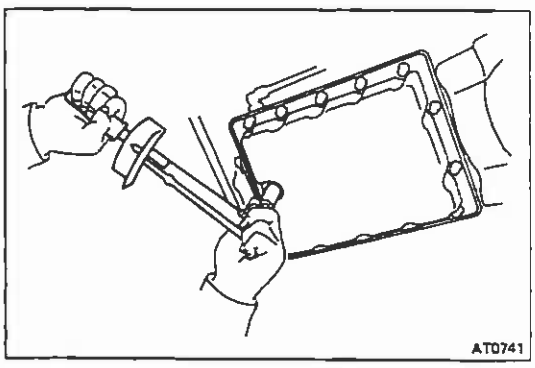
7. INSTALL PAN WITH NEW GASKET

Be sure the pan is clean and the magnet is in place.

CAUTION: Do not use gasket sealer.

Tighten the bolts evenly.

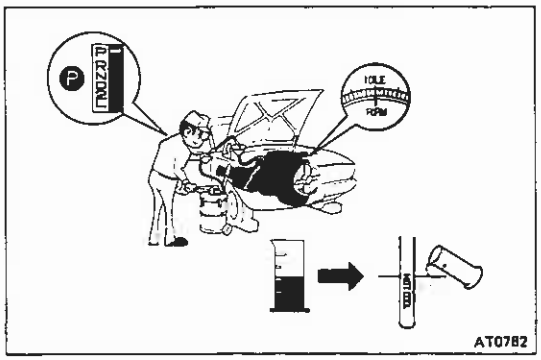
Torque: 45 kg-cm (39 in.-lb, 4.4 N·m)



8. INSTALL DRAIN PLUG

Torque the drain plug.

Torque: 205 kg-cm (15 ft-lb, 20 N·m)



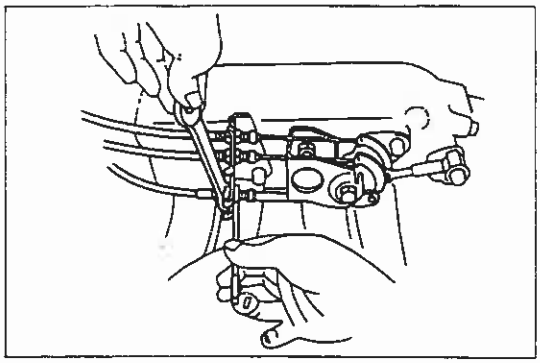
9. FILL TRANSMISSION WITH ATF

Add only about two quarts of ATF.

CAUTION: Do not overfill.

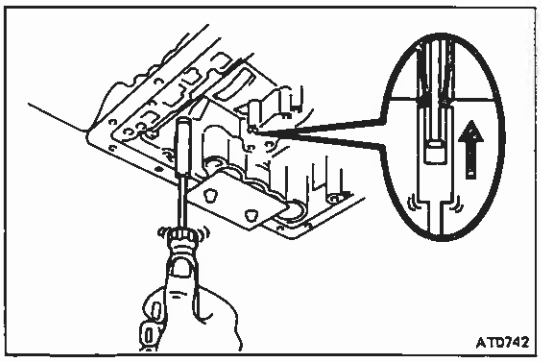
Fluid type: ATF DEXRON® II

10. CHECK FLUID LEVEL
(See page MA-14)



REMOVAL OF THROTTLE CABLE

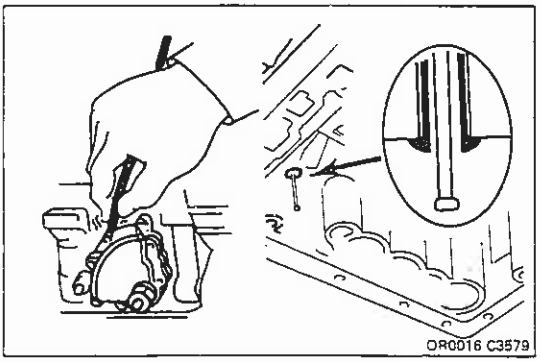
1. DISCONNECT THROTTLE CABLE
   (a) Disconnect the cable housing from the bracket.
   (b) Disconnect the cable from the throttle linkage.



2. REMOVE VALVE BODY (See page AT-17)

3. PUSH THROTTLE CABLE OUT OF TRANSMISSION CASE

Using a 10-mm socket, push the throttle cable out.

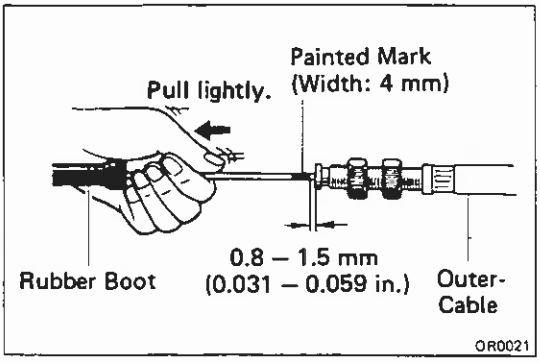


INSTALLATION OF THROTTLE CABLE

1. INSTALL CABLE IN TRANSMISSION CASE

Be sure to push it in all the way.

2. INSTALL VALVE BODY (See page AT-18)

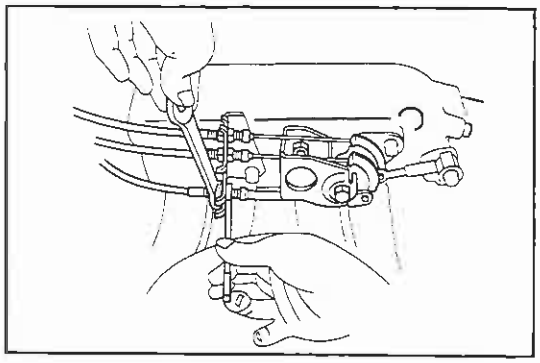


3. IF THROTTLE CABLE IS NEW, PAINT MARK ON INNER CABLE

NOTE: New cables do not have a cable stopper installed. Therefore, to make adjustment possible, paint a mark as described below.

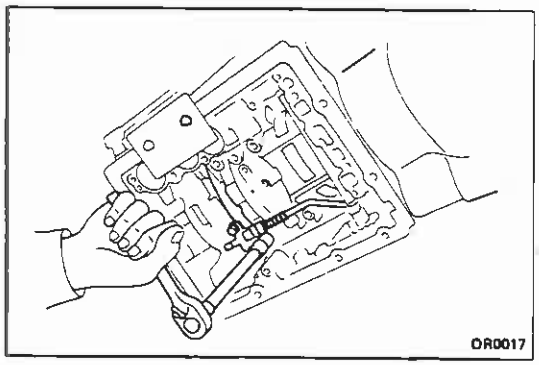
(a) Pull the inner cable lightly until slight resistance is felt, and hold it.

(b) Paint a mark as shown, about 4 mm (0.16 in.) in width.

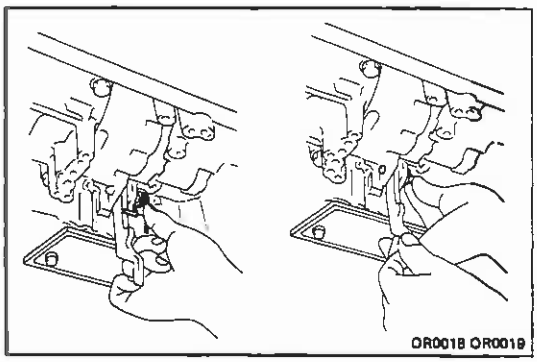


4. CONNECT THROTTLE CABLE
   (a) Connect the cable to the throttle linkage.
   (b) Connect the cable housing to the bracket.
5. ADJUST THROTTLE CABLE (See page AT-4)
6. TEST DRIVE VEHICLE

REMOVAL OF PARKING LOCK PAWL

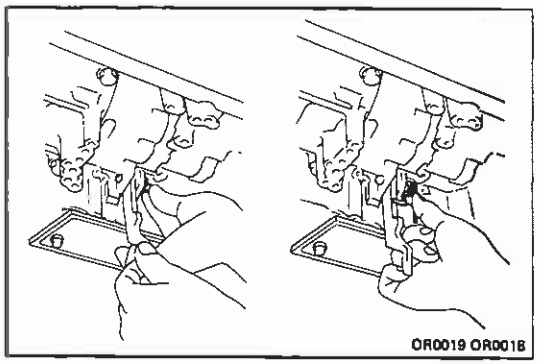


1. REMOVE VALVE BODY (See page AT-17)
2. REMOVE PARKING LOCK PAWL BRACKET
   Remove the two bolts and bracket.

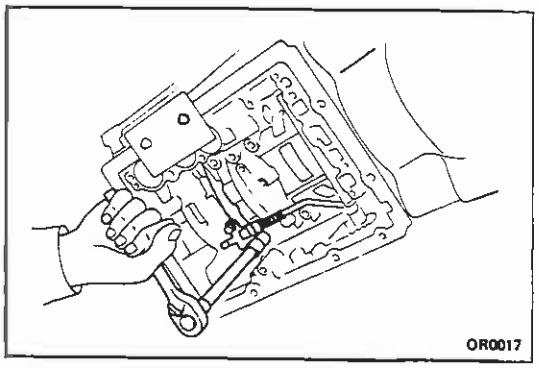


3. REMOVE SPRING FROM PARKING LOCK PAWL PIVOT PIN
4. REMOVE PIVOT PIN AND PARKING LOCK PAWL

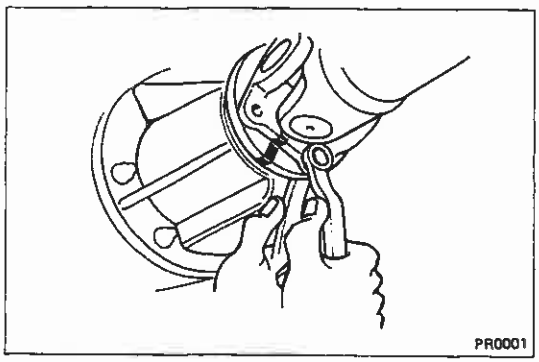
INSTALLATION OF PARKING LOCK PAWL



1. INSTALL PARKING LOCK PAWL AND PIVOT PIN
2. INSTALL PIVOT SPRING

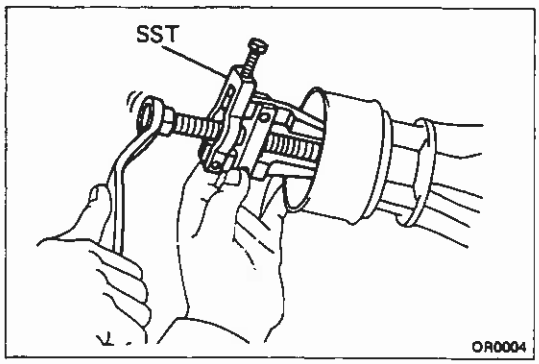


3. INSTALL PARKING LOCK PAWL BRACKET
   (a) Push the lock rod fully forward.
   (b) Install the two bolts finger tight.
   (c) Check that the pawl operates smoothly.
   (d) Torque the bolts.
   Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)
4. INSTALL VALVE BODY (See page AT-18)



REPLACEMENT OF REAR OIL SEAL

1. RAISE VEHICLE, AND POSITION PAN TO CATCH ANY FLUID THAT MAY DRIP
2. REMOVE PROPELLER SHAFT

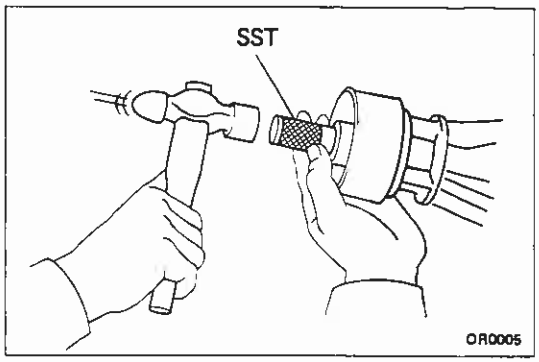


3. REMOVE REAR DUST SEAL AND OIL SEAL

CAUTION: **Clean the rear extension housing before removing the seal.**

Using SST, remove the two seals.

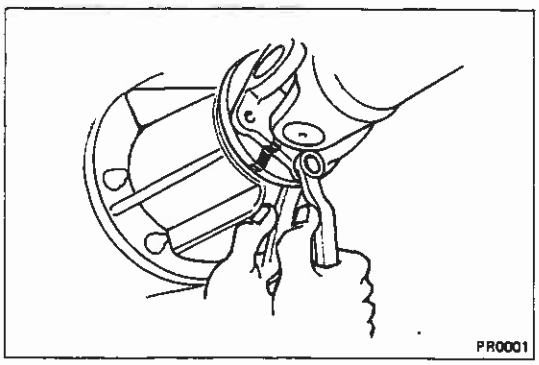
SST 09308-10010



4. INSTALL NEW OIL SEAL AND DUST SEAL

Using SST, drive in the oil seal as far as it will go.
Drive in the dust seal flush with the housing.

SST 09325-20010

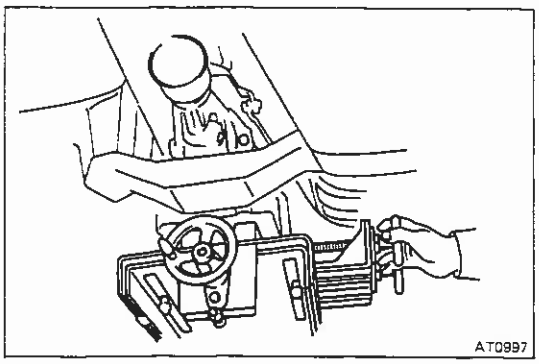


5. INSTALL PROPELLER SHAFT
6. LOWER VEHICLE AND CHECK FLUID LEVEL (See page MA-14)

Add fluid as necessary.

Fluid type: ATF DEXRON® II

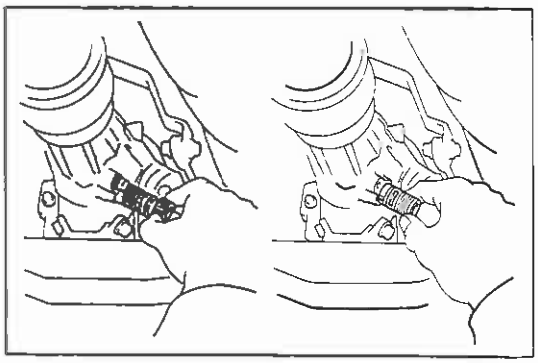
CAUTION: Do not overfill.



REMOVAL OF EXTENSION HOUSING

1. RAISE VEHICLE AND POSITION PAN TO CATCH ANY FLUID THAT MAY DRIP
2. REMOVE PROPELLER SHAFT
3. JACK UP TRANSMISSION SLIGHTLY

Securely support the transmission on a transmission jack. Lift the transmission slightly to remove weight from the rear support member.

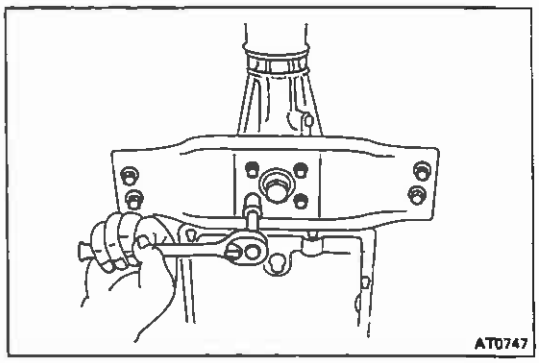


4. DISCONNECT SPEEDOMETER CABLE

Loosen the serrated collar with pliers. Do not lose the felt dust protector and washer.

5. REMOVE SPEEDOMETER DRIVEN GEAR

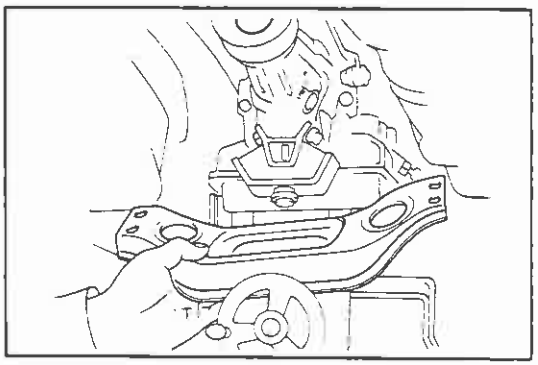
Remove one bolt and locking tab. Pry out the speedometer gear with a screwdriver.

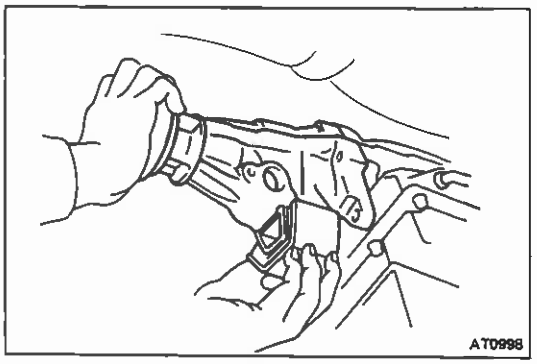


6. REMOVE REAR SUPPORT MEMBER

(a) Remove the ground strap and the rubber exhaust hanger.

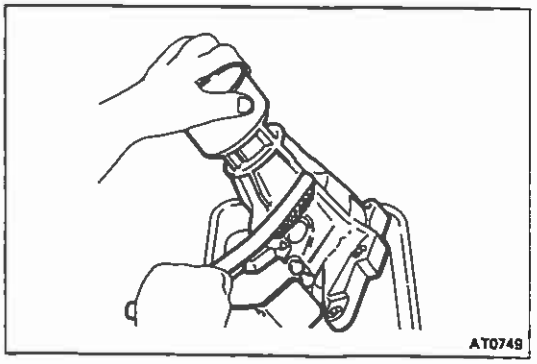
(b) Remove the eight bolts and support.





7. REMOVE EXTENSION HOUSING AND GASKET

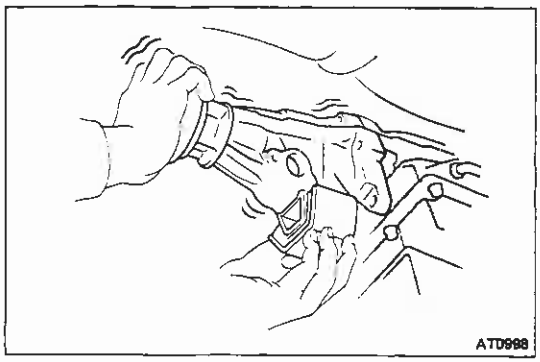
Remove the six bolts. If necessary, tap the extension housing with a soft-faced hammer or block of wood to loosen it.



8. CLEAN AND INSPECT COMPONENTS

(a) Wash components in clean solvent, and dry with compressed air.

(b) Check the case, speedometer gear and output shaft for cracks, wear or damage.



INSTALLATION OF EXTENSION HOUSING

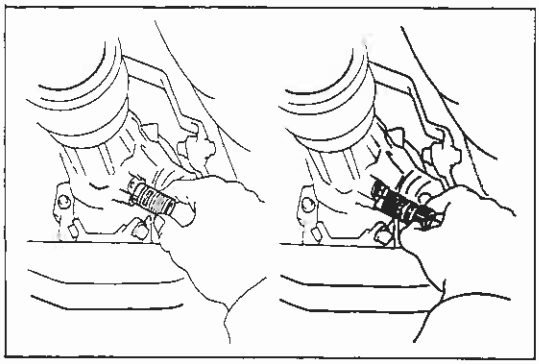
NOTE: If necessary, install a new oil seal before installation. (See page AT-22)

1. INSTALL NEW GASKET AND EXTENSION HOUSING ON TRANSMISSION

Install the six bolts finger tight. Then torque the bolts.

NOTE: The two lower bolts are shorter.

Torque: 345 kg-cm (25 ft-lb, 34 N·m)



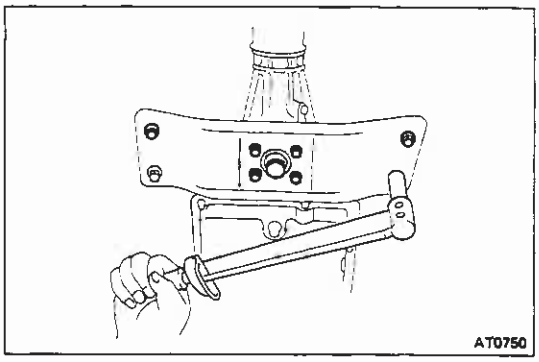
2. INSTALL SPEEDOMETER DRIVEN GEAR

(a) Install a new O-ring on the shaft sleeve.

(b) Install the lock plate with a bolt and washer.

3. CONNECT SPEEDOMETER CABLE

Place the felt dust protector and washer on the end of the cable. Tighten the collar with pliers.

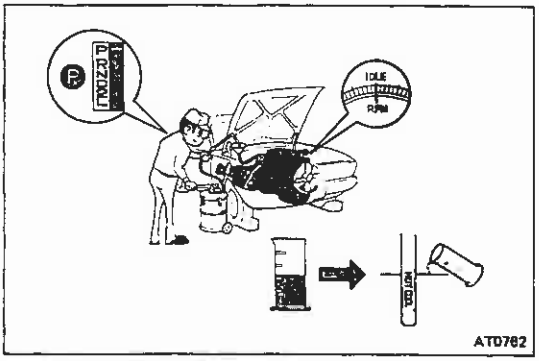


4. INSTALL REAR SUPPORT MEMBER

(a) Install the support member to chassis and lower the transmission to allow installation of the center bolts.

(b) Install the ground strap and rubber exhaust hanger.

5. INSTALL PROPELLER SHAFT

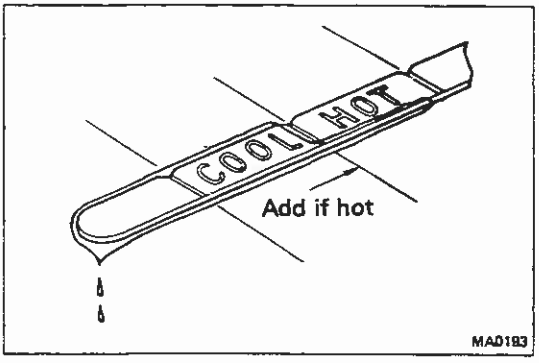


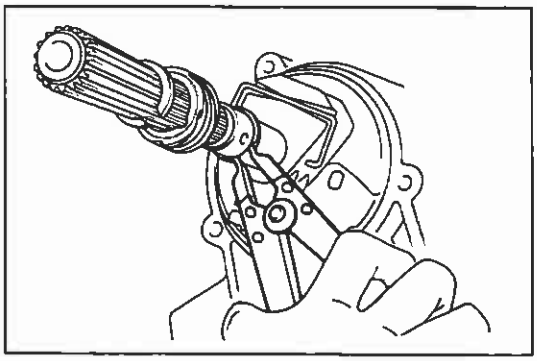
6. LOWER VEHICLE AND CHECK FLUID LEVEL **(See page MA-14)**

Add fluid as necessary.

CAUTION: Do not overfill.

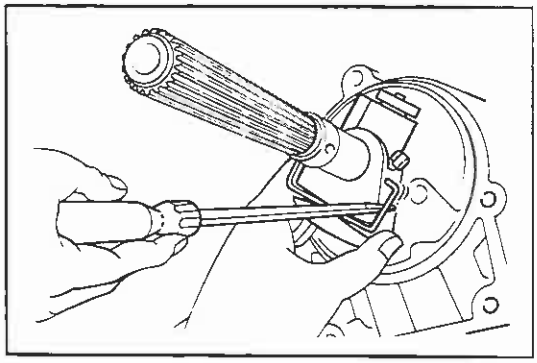
Fluid type: ATF DEXRON® II





REMOVAL OF GOVERNOR ASSEMBLY

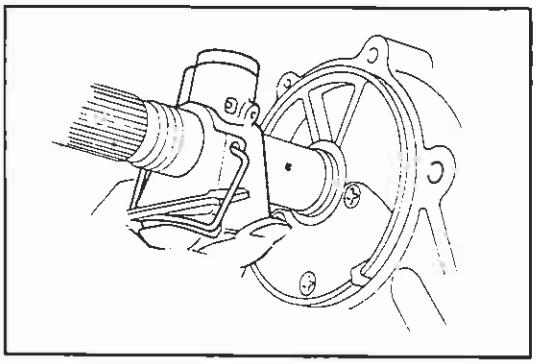
1. REMOVE EXTENSION HOUSING (See page AT-22)
2. REMOVE SPEEDOMETER DRIVE GEAR
   (a) Using snap ring pliers, remove the snap ring.
   (b) Slide off the speedometer gear.
   (c) Remove the lock ball and the other snap ring.



3. REMOVE GOVERNOR FROM OUTPUT SHAFT
   (a) Remove the lock bolt.
   (b) Using a larger screwdriver, lift the retaining clip on the square side of the governor body and slide it off of the shaft.

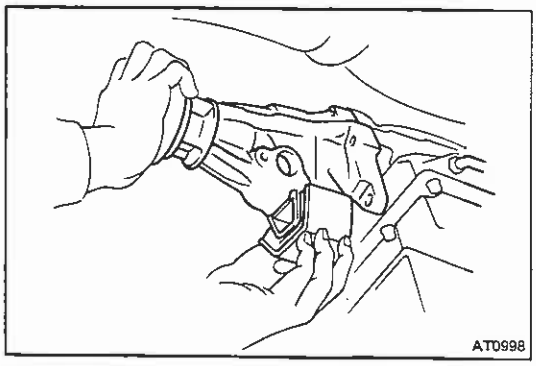
INSPECTION AND REPAIR OF GOVERNOR ASSEMBLY

(See page AT-86)



INSTALLATION OF GOVERNOR ASSEMBLY

1. INSTALL GOVERNOR ON OUTPUT SHAFT
   (a) Using a large screwdriver, lift the retaining clip, and slide the governor on the shaft with the retaining ring facing the end of the shaft.
   (b) Release the retaining clip into the hole in the output shaft. Check that the governor assembly is secure.
   (c) Install the lock bolt and then stake the lock plate.



2. INSTALL SPEEDOMETER DRIVE GEAR
   (a) Install the snap ring and lock ball.
   (b) Slide the speedometer gear on the shaft.
   (c) Using snap ring pliers, install the outer snap ring.
3. INSTALL EXTENSION HOUSING (See page AT-24)

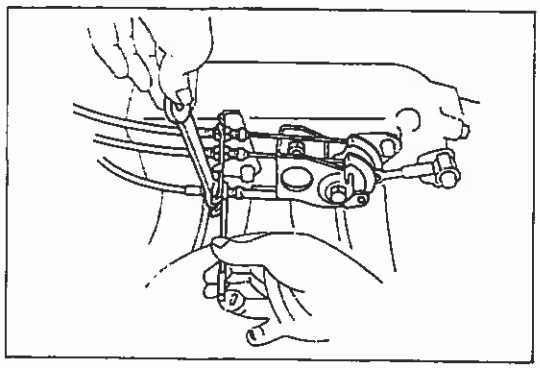
REMOVAL OF TRANSMISSION

1. DISCONNECT BATTERY CABLE FROM NEGATIVE TERMINAL

2. DRAIN COOLANT

   Open the radiator drain cock and drain coolant into a suitable container.

3. DISCONNECT UPPER RADIATOR HOSE



4. REMOVE AIR INTAKE CONNECTOR

5. DISCONNECT TRANSMISSION THROTTLE CABLE

   (a) Loosen the adjusting nuts, and disconnect the cable housing from the bracket.

   (b) Disconnect the cable from the throttle linkage.

6. RAISE VEHICLE AND DRAIN TRANSMISSION

   CAUTION: Be sure the vehicle is securely supported.

7. DISCONNECT WIRING CONNECTORS TO NEUTRAL START AND BACK-UP LIGHT SWITCHES

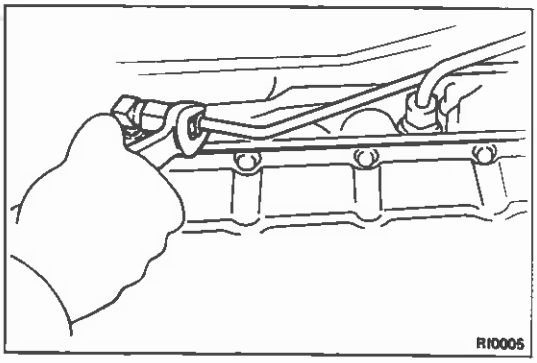
   Disconnect the three connectors located near the starter.

8. REMOVE INTERMEDIATE SHAFT WITH CENTER BEARING FROM PROPELLER SHAFT

9. DISCONNECT MANUAL SHIFT LINKAGE

10. DISCONNECT SPEEDOMETER CABLE

11. REMOVE SLIDING YOKE FROM GEAR HOUSING AND SHIFT (See step 2 on page SR-4)



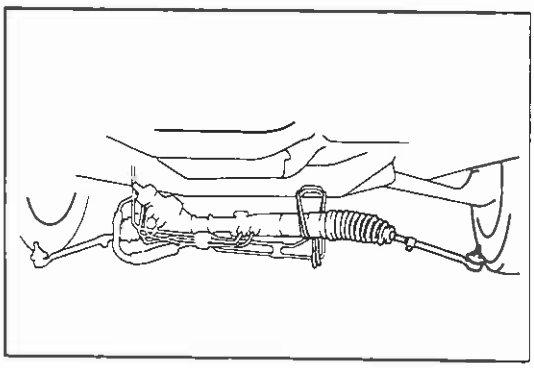
12. DISCONNECT TWO OIL COOLER LINES

13. REMOVE FRONT EXHAUST PIPE

(a) Disconnect the front pipe from the rear pipe.

(b) Remove the pipe clamp from the transmission housing.

(c) Disconnect the pipe from the exhaust manifold and remove the pipe from the vehicle.



14. REMOVE POWER STEERING GEAR HOUSING

(a) Remove the clamp for the power steering oil cooler.

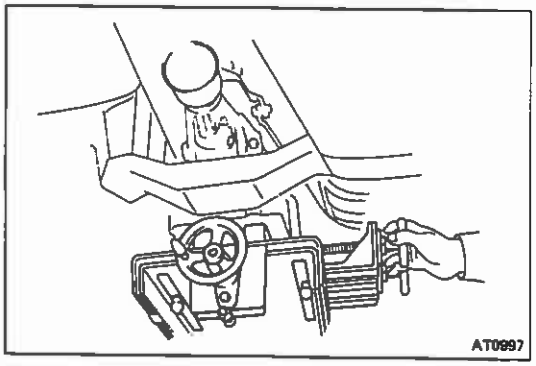
(b) Remove the clamp for the automatic transmission oil cooler pipe at the left of the cylinder block.

(c) Remove the clamp for the power steering pressure lines.

(d) Disconnect both tie rod ends with SST.

SST 09611-22012

(e) Remove the gear housing and suspend it at the cross-member with string.

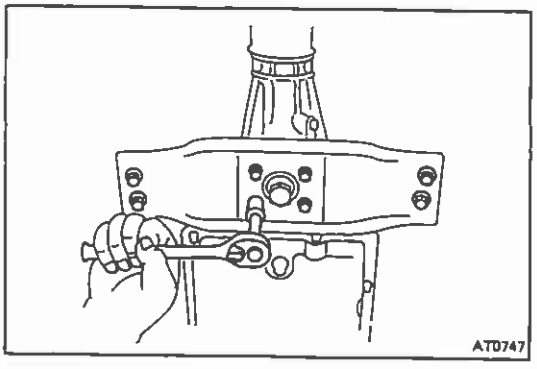


15. REMOVE BOTH STIFFENER PLATES FROM TRANSMISSION HOUSING

16. JACK UP TRANSMISSION SLIGHTLY

If a transmission jack is not available, be sure to put a wooden block between the jack and the transmission pan to prevent damage.

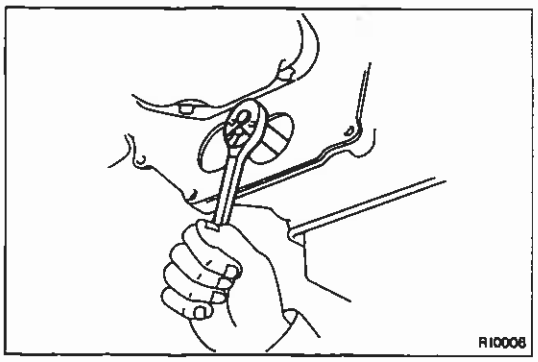
Raise the transmission enough to remove the weight from the rear support member.



17. REMOVE REAR SUPPORT MEMBER

(a) Remove the ground strap.

(b) Remove the eight bolts, and remove the rear support member.



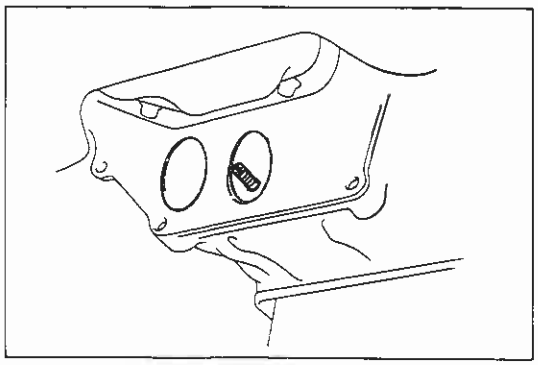
18. REMOVE ENGINE UNDERCOVER

For rotating the engine and torque converter, remove the engine undercover to gain access to the crankshaft pulley.

19. REMOVE SIX TORQUE CONVERTER MOUNTING BOLTS

(a) Pry out the rubber plug from the service hole at the rear of the engine.

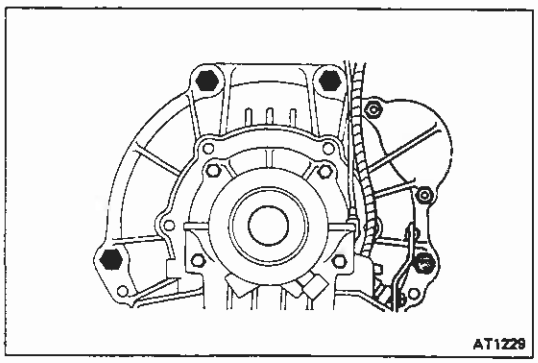
(b) Turn the crankshaft to gain access to each bolt. Remove the six bolts.



20. INSTALL GUIDE PIN IN TORQUE CONVERTER

Install the guide pin in one of the torque converter bolt holes.

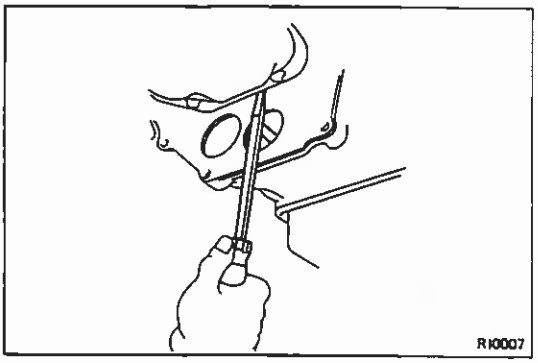
If necessary, a guide pin can be made by cutting off the head of a bolt.



21. REMOVE TRANSMISSION HOUSING MOUNTING BOLTS

(a) Remove the starter.

(b) Remove the transmission housing mounting bolts.



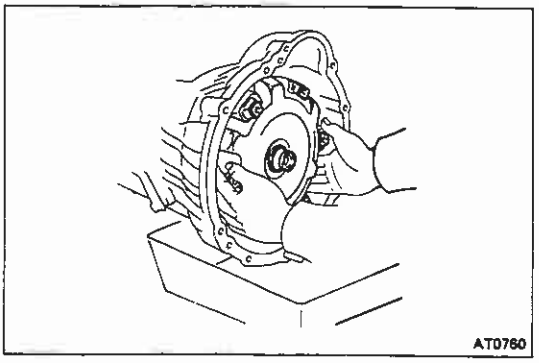
22. PRY ON END OF GUIDE PIN TO BEGIN MOVING TRANSMISSION WITH CONVERTER TOWARD REAR

The guide pin helps keep the converter with the transmission.

23. REMOVE TRANSMISSION ASSEMBLY

Draw out the transmission down and toward the rear.

CAUTION: Be careful not to snag the throttle cable or neutral start switch cable. Keep the oil pan positioned downward.

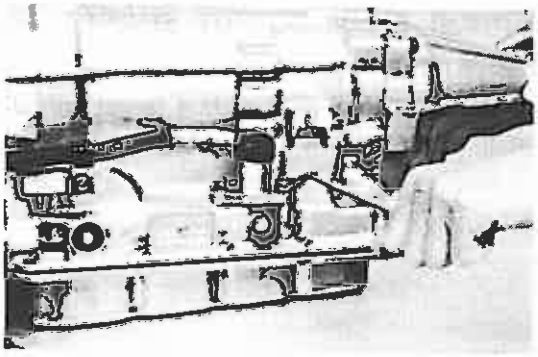


24. PLACE PAN UNDER CONVERTER HOUSING, AND REMOVE CONVERTER

Pull the converter straight off, and allow the fluid to drain into the pan.

25. REMOVE FILLER TUBE

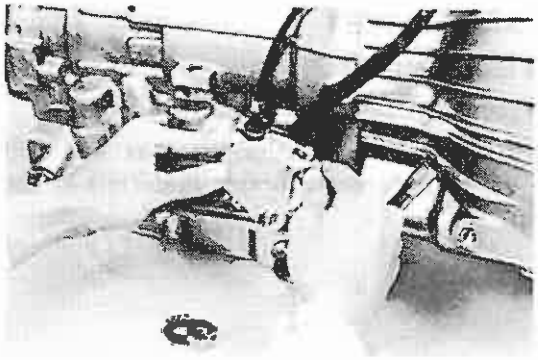
26. REMOVE REAR TRANSMISSION MOUNT WITH GROUND STRAP



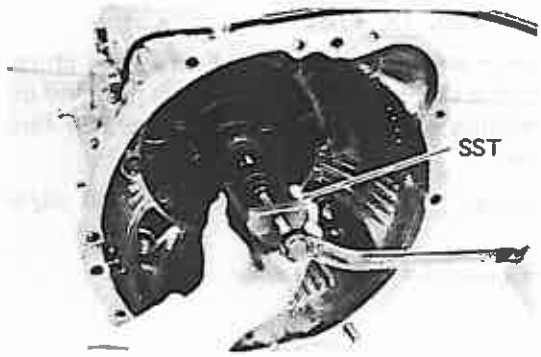
DISASSEMBLY OF TRANSMISSION

SEPARATE BASIC SUBASSEMBLY

1. REMOVE SOLENOID



2. REMOVE SHIFT HANDLE
3. REMOVE NEUTRAL START SWITCH



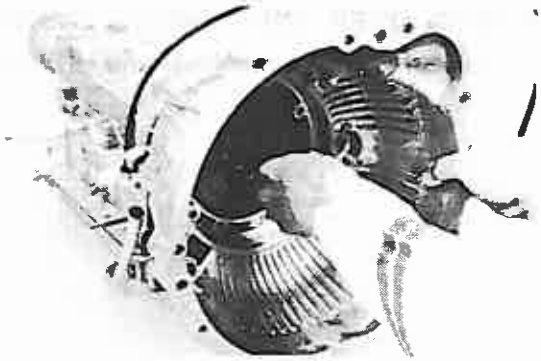
4. UNBOLT FRONT PUMP HOUSING
5. PULL FRONT PUMP FREE

   Position SST on shaft in back of the spline.

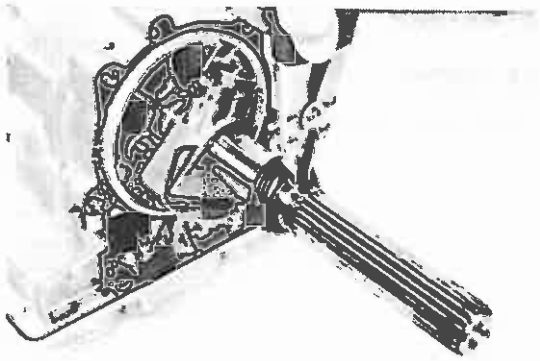
   SST 09610-20012

   CAUTION: Do not damage the shaft bushing surface. Turn the end bolt of SST to free the pump.
6. REMOVE FRONT PUMP

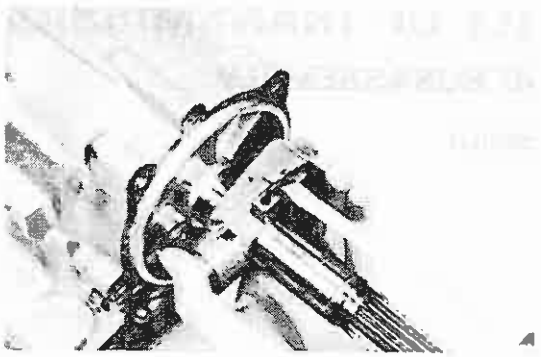
   Grasp the front pump stator shaft and pull the pump from the case.



7. REMOVE CONVERTER HOUSING
   (a) Remove the two 12-mm bolts and four 10-mm bolts.
   (b) Hold the input shaft while removing the connector housing.



8. REMOVE SPEEDOMETER DRIVEN GEAR HOUSING
9. REMOVE EXTENSION HOUSING AND GASKET
10. REMOVE SPEEDOMETER DRIVE GEAR



11. REMOVE GOVERNOR FROM OUTPUT SHAFT

(a) Remove the governor body lock bolt.

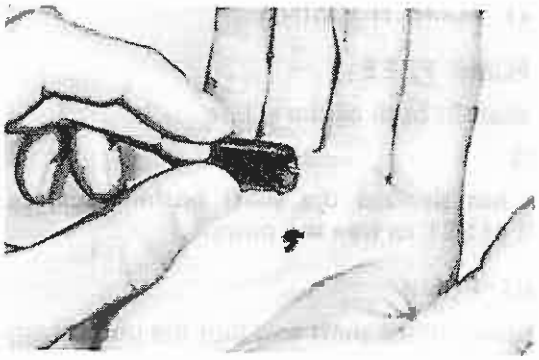
(b) While lifting the retaining clip with a larger screwdriver, slide off the governor valve.

12. REMOVE PAN AND GASKET

(a) Remove the fourteen bolts.

(b) Remove the pan by lifting the transmission case.

NOTE: Do not turn the transmission over as this will contaminate the valve body with foreign materials in the bottom of the pan.

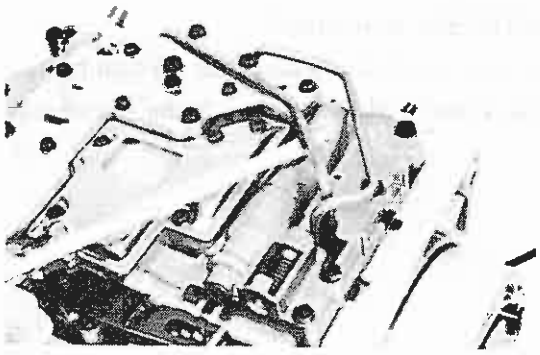


13. EXAMINE PARTICLES IN PAN

Remove the magnet and use it to collect any steel chips. Look carefully at the chips and particles in the pan and on the magnet to anticipate what type of wear you will find in the transmission:

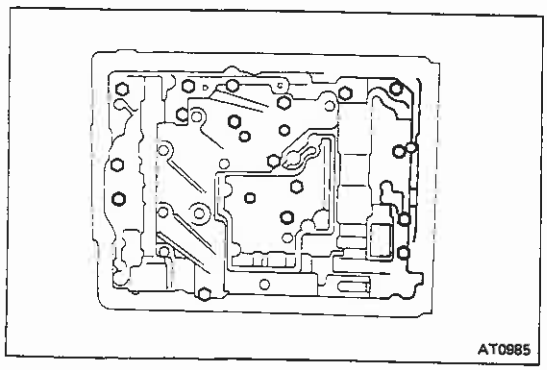
Steel (magnetic) = bearing, gear and clutch plate wear.

Brass (nonmagnetic) = bushing wear.



14. TURN TRANSMISSION OVER AND REMOVE TUBES

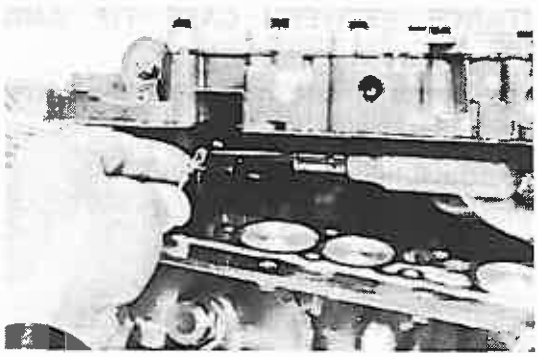
Pry up both tube ends with a large screwdriver and remove the tubes.



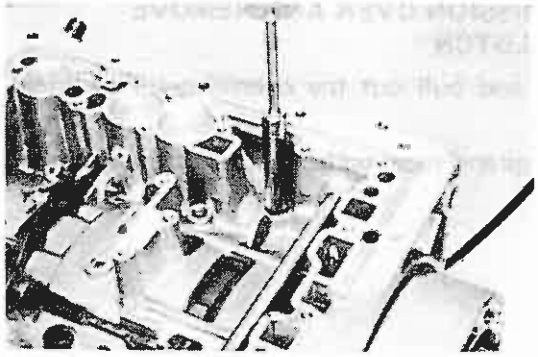
15. REMOVE OIL STRAINER

16. REMOVE VALVE BODY

(a) Remove the seventeen bolts.

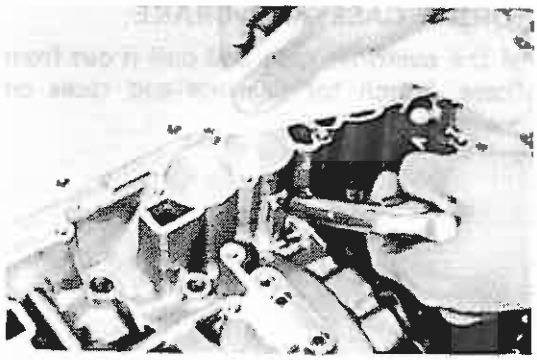


(b) Disconnect the throttle cable from the cam and remove the valve body.



17. REMOVE THROTTLE CABLE AND RETAINER

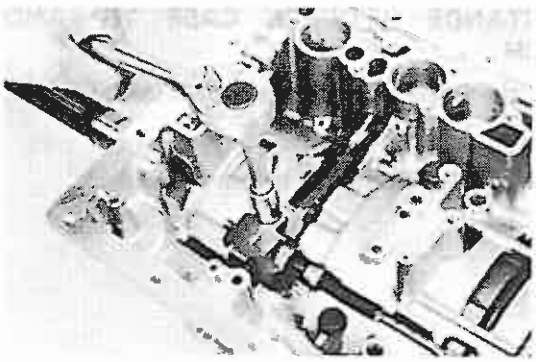
Using a 10-mm socket, push the plastic throttle cable retainer out of the transmission case.



18. COVER PISTON WITH A RAG AND, REMOVE ACCUMULATOR PISTONS AND SPRINGS

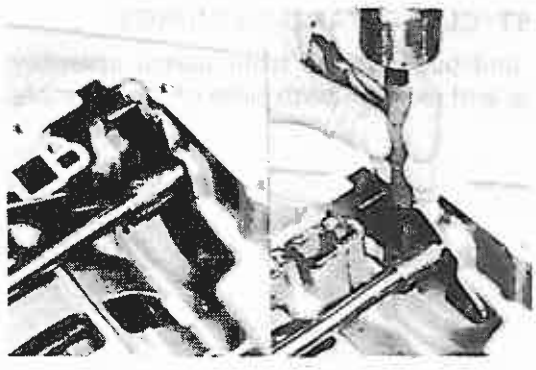
WARNING: Keep face away to avoid injury.

Position a rag to catch each piston. Using low-pressure compressed air (1 kg/cm², 14 psi or 98 kPa max.), pop each piston into the rag. Force air into the holes as shown to remove the pistons and springs.



19. REMOVE PARKING LOCK ROD

20. REMOVE SPRING, PIVOT PIN AND PARKING LOCK PAWL

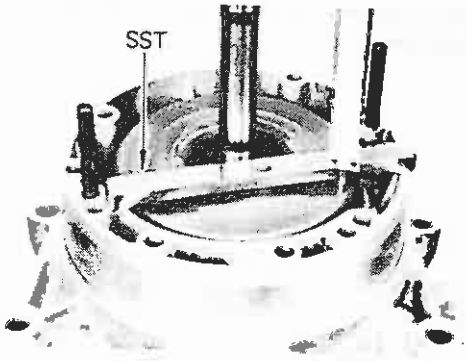


21. IF DEFECTIVE PRY AND SHIFT COLLAR

Using a hammer and chisel, pry and shift the collar.

22. IF DEFECTIVE DRIVE OUT ROLL PIN AND REMOVE MANUAL VALVE LEVER SHAFT

Using a hammer and punch, drive out the pin.

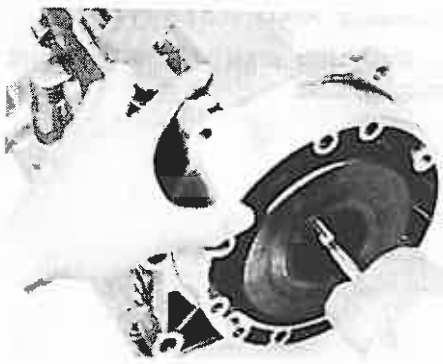


23. MEASURE DISTANCE BETWEEN CASE TIP AND FRONT CLUTCH

(a) Set SST on the overdrive case as shown in the figure.

SST 09350-20013

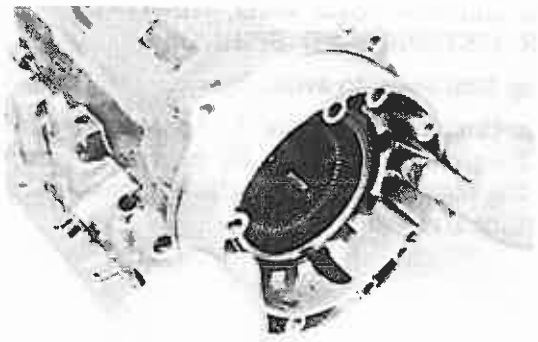
(b) Make a note of the finding for reassembly.



24. TURN TRANSMISSION OVER AND REMOVE OVERDRIVE CLUTCH

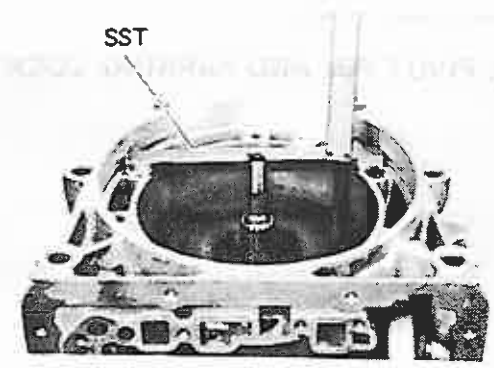
Grasp the shaft and pull out the overdrive clutch assembly.

Watch for bearings and races on both sides of the assembly.



25. REMOVE OVERDRIVE CASE AND BRAKE

Hold both sides of the overdrive case and pull it out from the transmission case. Watch for bearings and races on both sides of the assembly.

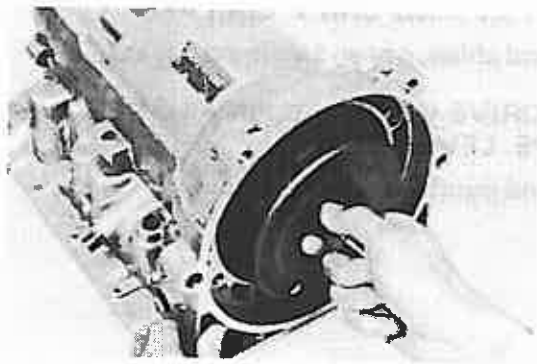


26. MEASURE DISTANCE BETWEEN CASE TIP AND FRONT CLUTCH

(a) Set SST on the overdrive case as shown in the figure.

SST 09350-20013

(b) Make a note of the finding for reassembly.

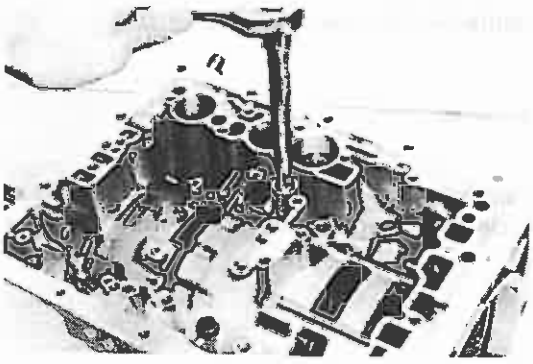


27. REMOVE FRONT CLUTCH AND BEARINGS

Grasp the shaft and pull out the front clutch assembly. Watch for bearings and races on both sides of the assembly.

28. REMOVE REAR CLUTCH

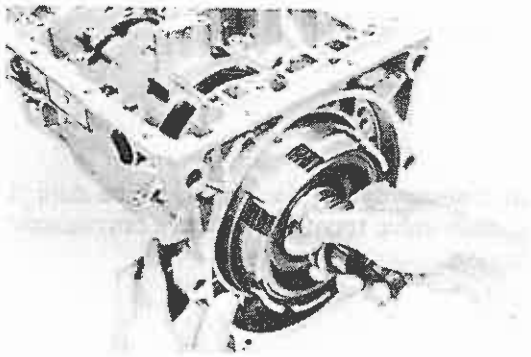
Grasp the clutch hub and pull it out from the case.



29. REMOVE CENTER SUPPORT BOLTS

Remove the two center support bolts.

NOTE: After removing one bolt, the other one will be loose.

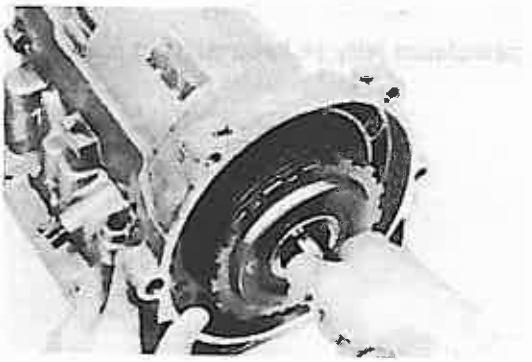


30. REMOVE CENTER SUPPORT AND SUN GEAR ASSEMBLY

From the case front opening, grasp the assembly and pull out.

31. REMOVE REACTION PLATE RETAINING RING

Using a long screwdriver, compress the snap ring and lift it above the groove with a wire hook.



32. REMOVE REAR PARTS GROUP

Grasp the intermediate shaft and pull out the rear parts group.

If the brake apply tube and rear thrust bearing and races do not come out with the assembly, remove them from the case.

33. BASIC DISASSEMBLY IS COMPLETE

COMPONENT GROUP DISASSEMBLY, INSPECTION AND ASSEMBLY

The instructions here are organized so that you work on only one component group at a time. This will help avoid confusion of similar-looking parts from different subassemblies being on your workbench at the same time.
The component groups are inspected and repaired from the converter housing side.

As much as possible, complete the inspection, repair, assembly before proceeding to the next component group. If a component group cannot be assembled because parts are being ordered, be sure to keep all parts of that group in a separate container while proceeding with disassembly, inspection, repair and assembly of other component groups.
Recommended ATF type DEXRON® II

GENERAL CLEANING NOTES:

1. All disassembled parts should be washed clean and the fluid passages and holes blown through with compressed air to make sure that they are not clogged.
2. The recommended automatic transmission fluid or kerosene should be used for cleaning.
3. When using compressed air to dry parts, keep face away to avoid spraying solvent in your face.

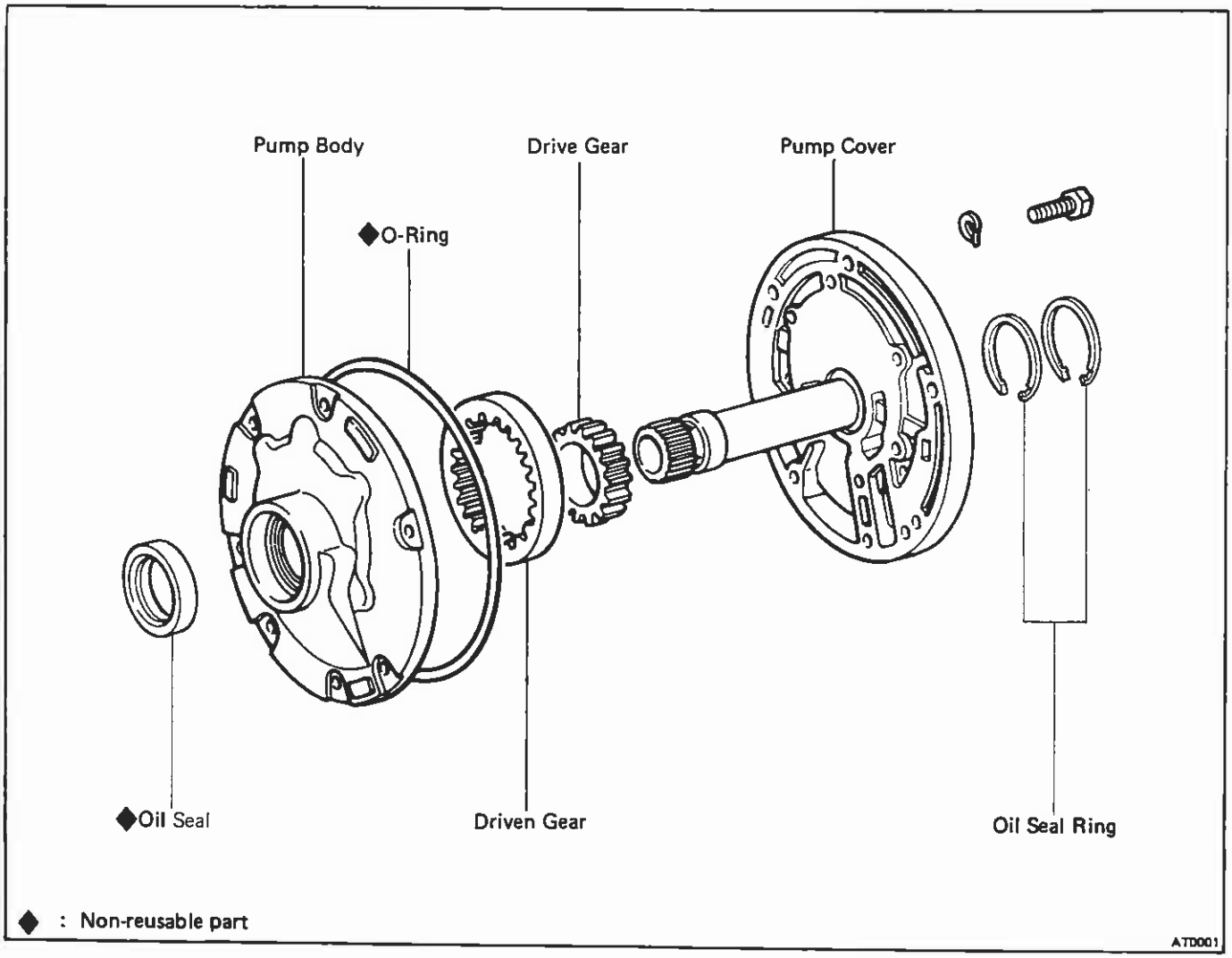
PARTS ARRANGEMENT:

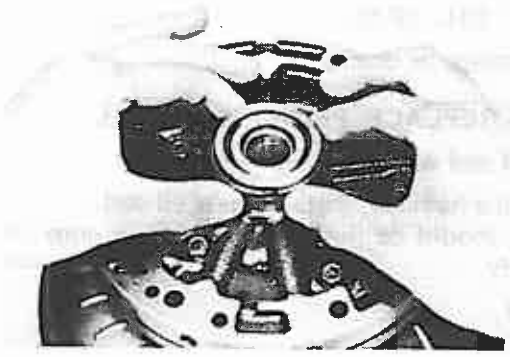
1. After cleaning, the parts should be arranged in proper order to allow performing the inspection, repairs, and reassembly with efficiency.
2. New brakes and clutches that are to be used for replacement must be soaked in transmission fluid for at least two hours before assembly.
3. When disassembling a valve body, be sure to keep each valve together with the corresponding spring.

GENERAL ASSEMBLY:

1. All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with transmission fluid prior to reassembly.
2. If a worn bushing is to be replaced, the replacement must be made with the subassembly containing that bushing.
3. All gaskets and rubber O-rings should be replaced.
4. Check thrust bearings and races for wear or damage. Replace if necessary.
5. Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.
6. Use petroleum jelly to keep parts in place.

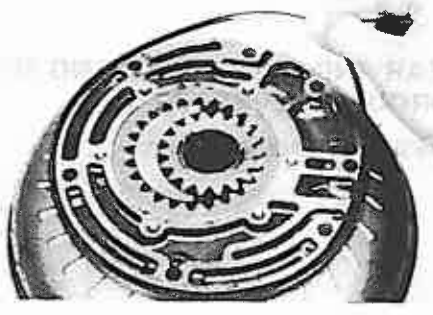
Oil Pump





DISASSEMBLY OF OIL PUMP

1. USE TORQUE CONVERTER AS WORK STAND
2. REMOVE TWO OIL SEAL RINGS FROM PUMP COVER
3. REMOVE PUMP COVER



4. REMOVE O-RING FROM PUMP
5. LIFT PUMP OFF CONVERTER AND REMOVE OIL PUMP DRIVE GEAR AND DRIVEN GEAR

   Identify the top and bottom and keep in assembly order.

INSPECTION OF OIL PUMP

1. CHECK BODY CLEARANCE OF DRIVEN GEAR

Push the driven gear to one side of the body. Using a feeler gauge, measure the clearance.

Standard body clearance :	**0.07 – 0.15 mm (0.0028 – 0.0059 in.)**
Maximum body clearance:	**0.3 mm (0.012 in.)**

2. CHECK TIP CLEARANCE OF BOTH GEARS

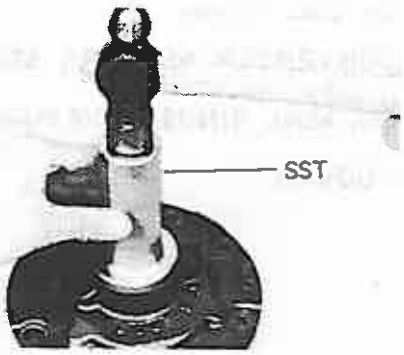
Measure between the gear teeth and the cresent-shaped part of the pump body.

Standard tip clearance :	**0.11 – 0.14 mm (0.0043 – 0.0055 in.)**
Maximum tip clearance:	**0.3 mm (0.012 in.)**

3. CHECK SIDE CLEARANCE OF BOTH GEARS

Using a steel straightedge and a feeler gauge, measure the side clearance of both gears.

Standard side clearance :	**0.02 – 0.05 mm (0.0008 – 0.0020 in.)**
Maximum side clearance:	**0.1 mm (0.004 in.)**



4. INSPECT FRONT OIL SEAL

Check for wear, damage or cracks.

5. IF NECESSARY, REPLACE FRONT OIL SEAL

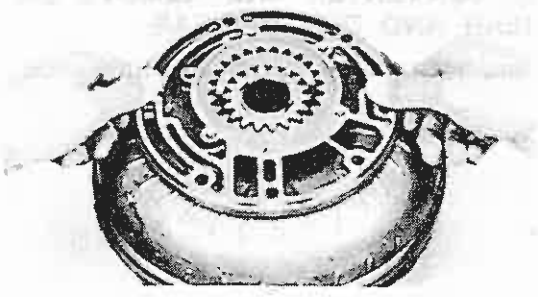
(a) Pry off the oil seal with a screwdriver.

(b) Using SST and a hammer, install a new oil seal. The seal end should be flush with the outer edge of the pump body.

SST 09350-20013

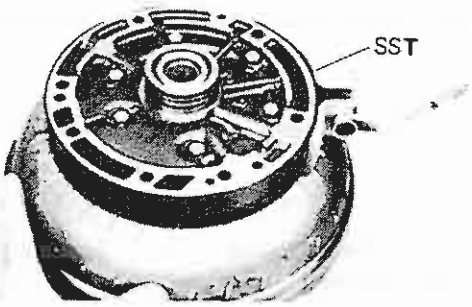
ASSEMBLY OF OIL PUMP

(See page AT-35)



1. INSTALL DRIVEN GEAR AND DRIVE GEAR AND SET PUMP BODY ON TORQUE CONVERTER

Make sure the top of the gears is facing upward.



2. **LOOSELY INSTALL PUMP COVER**

Align the bolt holes and drop the pump cover into place.
Install the six bolts with wave washers finger tight.

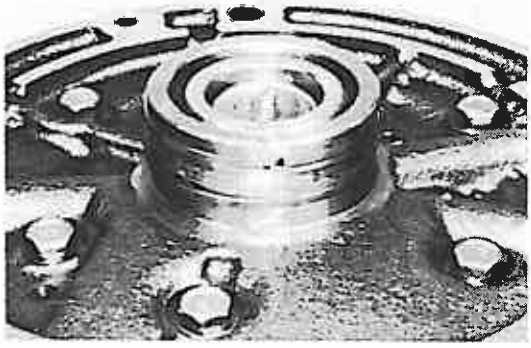
3. **ALIGN PUMP AND PUMP COVER**

Install the SST around the pump and cover.
Tighten SST to align the pump and cover.

SST 09350-20013

4. **TIGHTEN SIX PUMP COVER BOLTS**

Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)

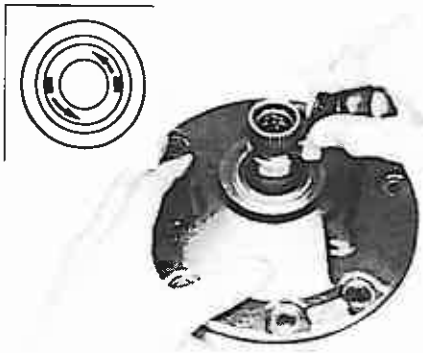


5. **INSTALL TWO OIL SEAL RINGS ON PUMP COVER**

Spread the rings apart and slide them into the groove.
Hook both ends by hand.
Wipe off excess petroleum jelly.

6. **INSTALL NEW O-RING ON PUMP COVER**

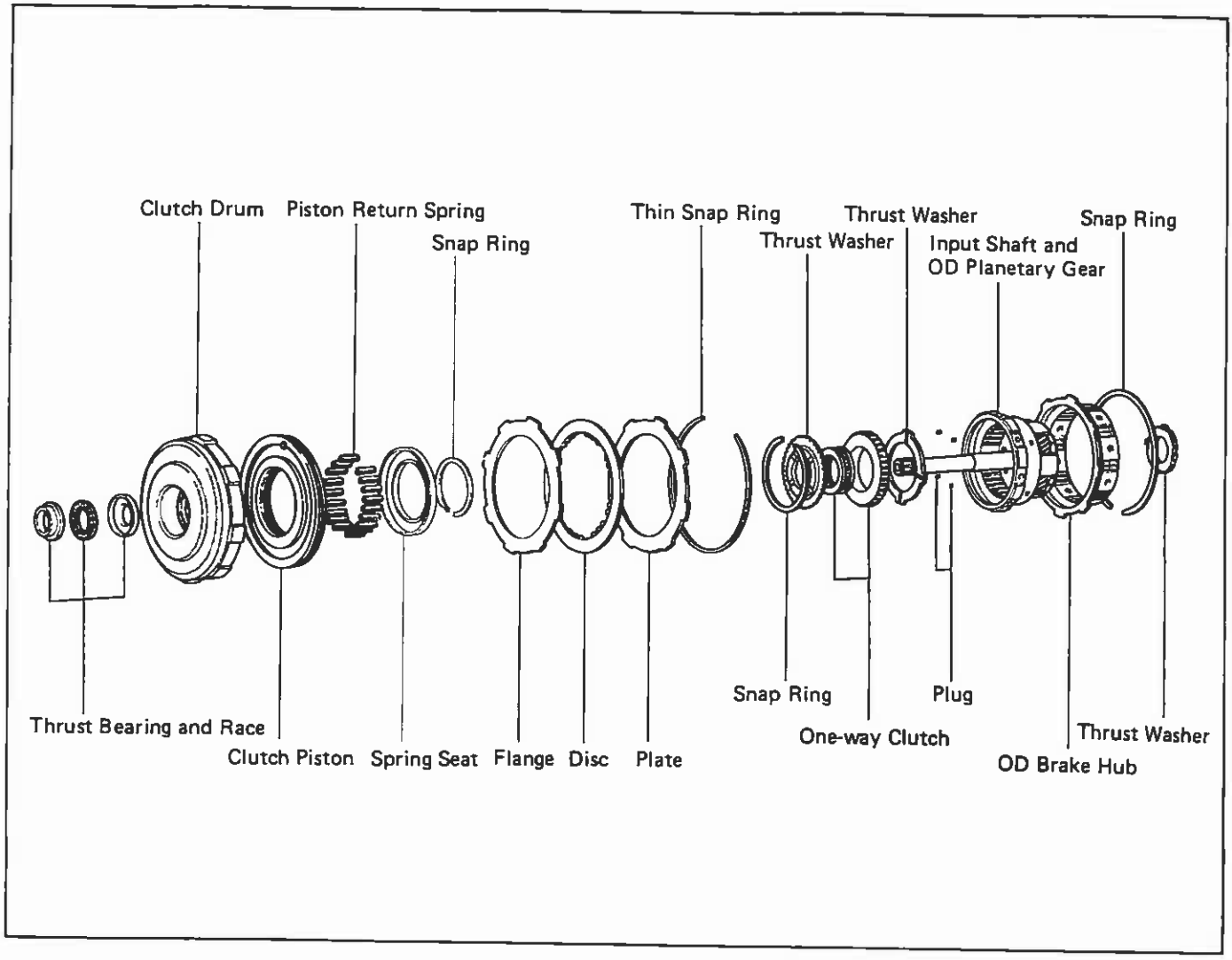
Make sure the O-ring is not twisted and is fully seated in the groove.

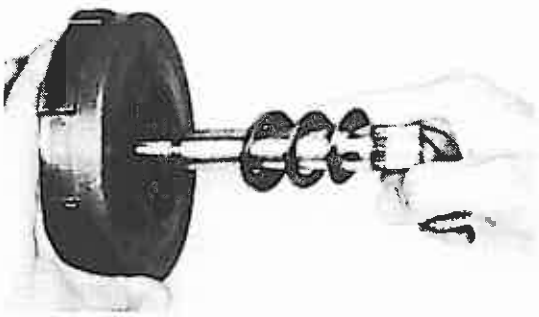


7. **CHECK PUMP DRIVE GEAR ROTATION**

Turn the drive gear with a screwdriver and make sure that it rotates smoothly.

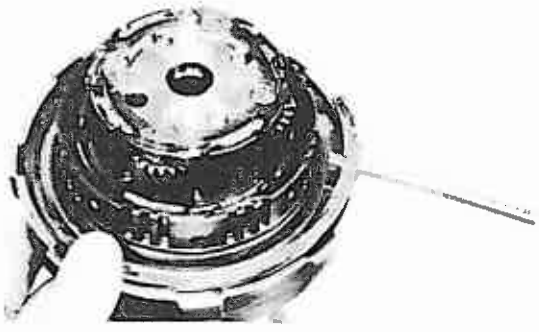
Overdrive Input Shaft and Clutch



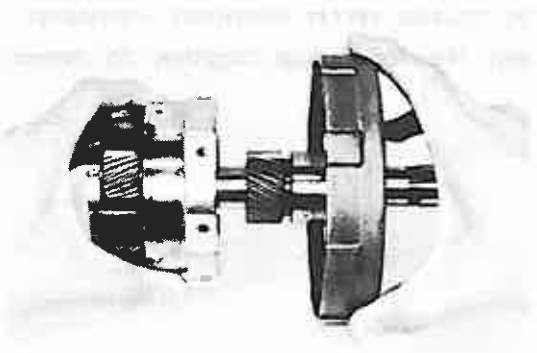


DISASSEMBLY OF OVERDRIVE INPUT SHAFT AND CLUTCH

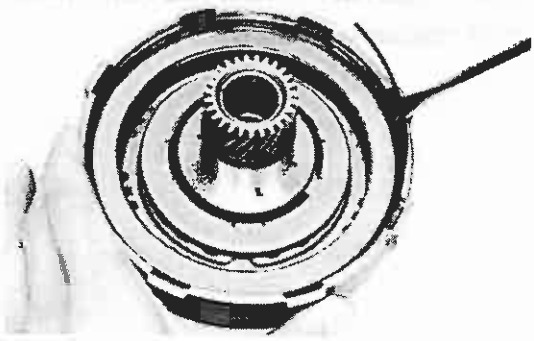
1. REMOVE THRUST BEARINGS AND RACES FROM OVERDRIVE INPUT SHAFT
   (a) Slide off the thrust bearing and race from the clutch side by hand. Note the position of the races.
   (b) Using a screwdriver, pry off the thrust washer from the planetary gear side.



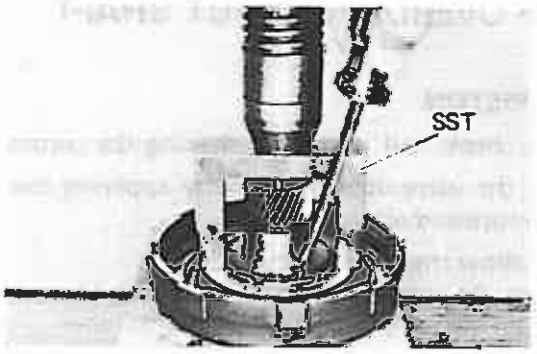
2. REMOVE SNAP RING AND HUB FROM OVERDRIVE CLUTCH ASSEMBLY



3. PULL OVERDRIVE CLUTCH ASSEMBLY FROM INPUT SHAFT



4. REMOVE SNAP RING, FLANGE, DISC AND PLATE

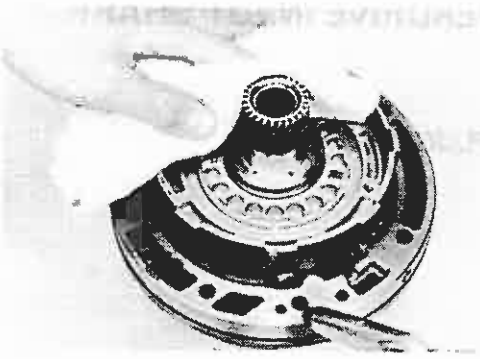


5. COMPRESS PISTON RETURN SPRINGS AND REMOVE SNAP RING

Place SST on the spring retainer and compress the springs with a shop press. Using a screwdriver, remove the snap ring.

SST 09350-20013

6. REMOVE SPRING RETAINER AND EIGHTEEN SPRINGS



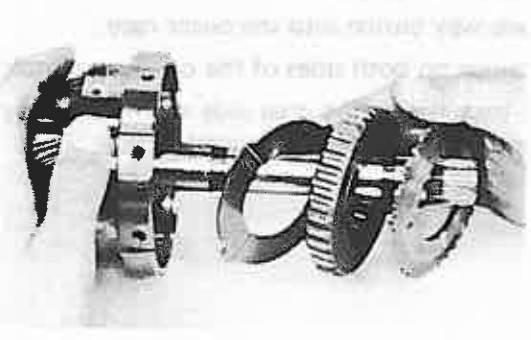
7. ASSEMBLE OVERDRIVE CLUTCH ON OIL PUMP AND BLOW OUT PISTON

(a) Slide the overdrive clutch onto the oil pump.

(b) Apply compressed air to the oil pump to remove the piston. (If the piston does not come out completely, use needle-nose pliers to remove it.)

(c) Remove the overdrive clutch from the oil pump.

8. REMOVE CLUTCH PISTON O-RINGS

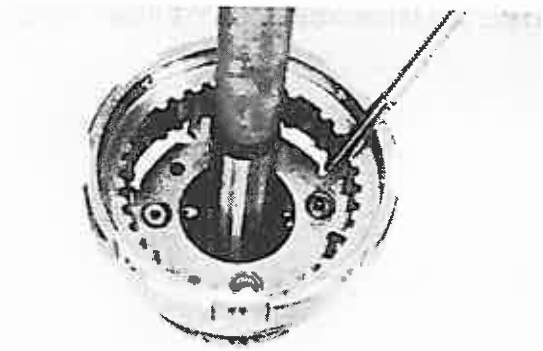


9. REMOVE SNAP RING FROM OVERDRIVE PLANETARY GEAR ASSEMBLY

Using a screwdriver, compress the snap ring and lift out.

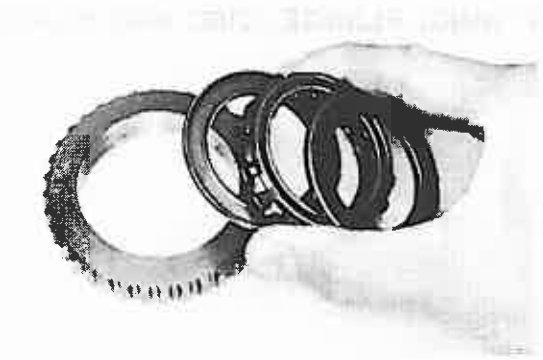
10. REMOVE THRUST WASHERS AND ONE-WAY CLUTCH FROM PLANETARY GEAR ASSEMBLY

CAUTION: Be careful not to lose the four plugs.



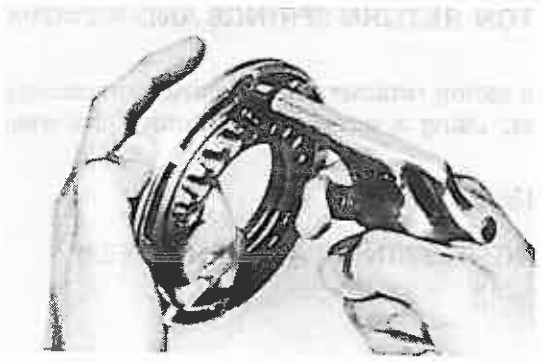
11. REMOVE FOUR PLUGS WITH MAGNET FINGER

CAUTION: Keep the four plugs together to prevent losing them.



12. REMOVE ONE-WAY CLUTCH FROM OUTER RACE

Note the direction of the one-way clutch.



INSPECTION OF OVERDRIVE INPUT SHAFT AND CLUTCH

INSPECT CLUTCH PISTON

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

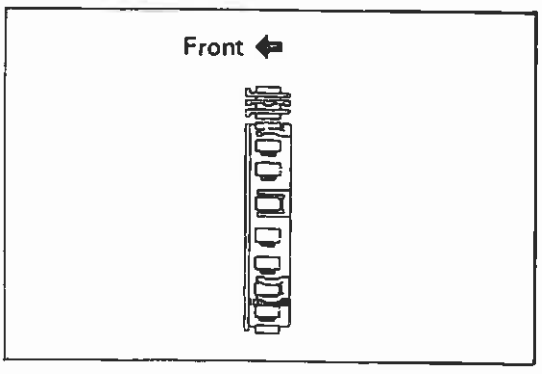
(b) Check that the valve does not leak by applying low-pressure compressed air.

NOTE: Do not allow the discs to dry out.
Prepare new discs by soaking them at least two hours in ATF.

ASSEMBLY OF OVERDRIVE INPUT SHAFT AND CLUTCH

(See page AT-38)

1. INSTALL FOUR PLUGS

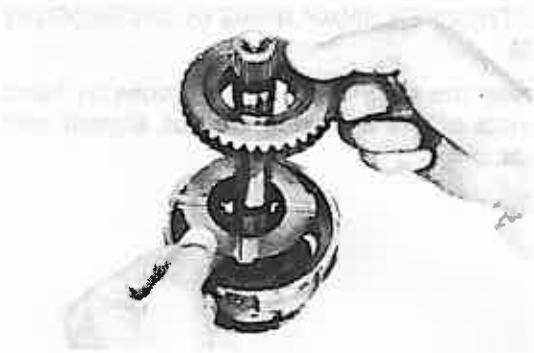


2. ASSEMBLE ONE-WAY CLUTCH

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

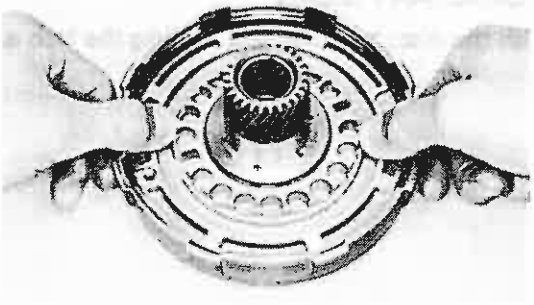
(b) Install a retainer on both sides of the one-way clutch.

NOTE: Be sure that the spring cage side of the one-way clutch faces toward the front of the transmission.

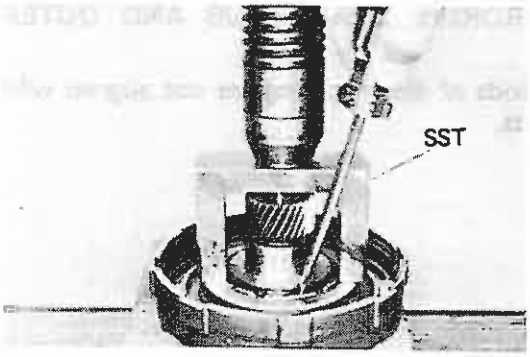


3. INSTALL THRUST WASHER AND ONE-WAY CLUTCH
   (a) Install the thrust washer, facing the grooves upward.
   (b) Install the one-way clutch in correct direction.

4. INSTALL THRUST WASHER AND SNAP RING
   NOTE: Install the thrust washer, with the oil groove facing upward.



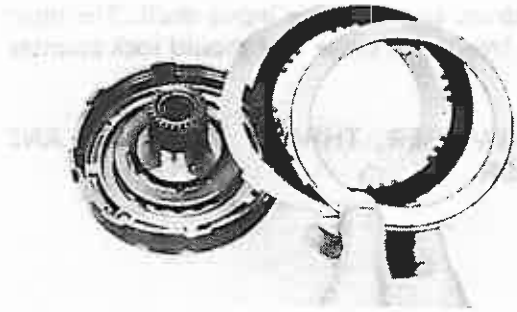
5. INSTALL CLUTCH PISTON IN OVERDRIVE CLUTCH DRUM
   (a) Install new O-rings on the piston. Coat the O-ring with ATF.
   (b) Press the piston into the drum with the cup side up, being careful not to damage the O-ring.



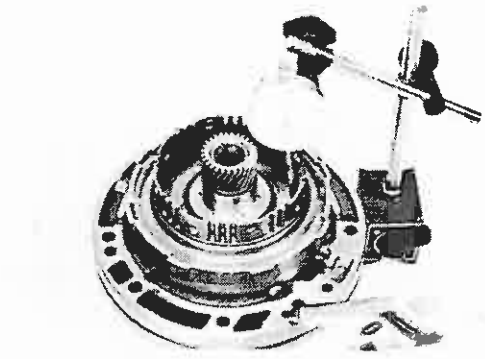
6. INSTALL EIGHTEEN PISTON RETURN SPRINGS AND SET RETAINER AND SNAP RING IN PLACE

7. COMPRESS RETURN SPRINGS AND INSTALL SNAP RING IN GROOVE
   (a) Place SST on the spring retainer, and compress the springs on a shop press.
   SST 09350-20013
   (b) Install the snap ring with a screwdriver.

8. INSTALL PLATE, DISC AND FLANGE WITHOUT ASSEMBLING THIN INNER SNAP RING
   NOTE: Install the thinner snap ring after measuring the piston stroke.
   Using low-pressure compressed air, blow all excess ATF from the disc.
   CAUTION: High-pressure air will damage the disc.
   Install in order: Plate-disc-flange (flat end down)



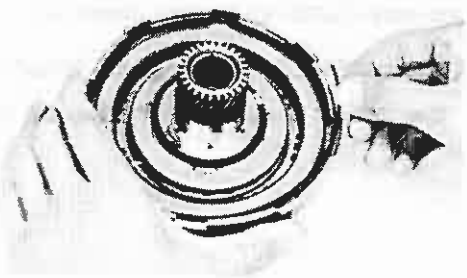
9. CHECK PISTON STROKE OF OVERDRIVE CLUTCH
   (a) Install the overdrive brake hub and outer snap ring.
   (b) Install the front clutch drum onto the oil pump body. With a dial indicator, measure the stroke applying and releasing the compressed air (4 — 8 kg/cm², 57 — 114 psi or 392 — 785 kPa) as shown.



Standard piston stroke : 1.47 — 2.28 mm (0.0579 — 0.0898 in.)

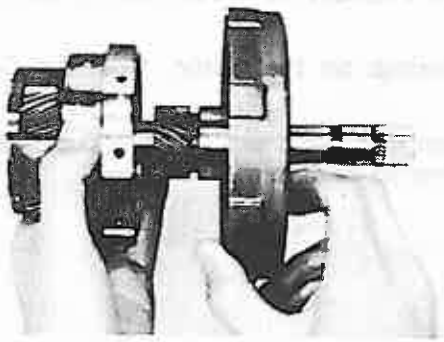
If the stroke exceeds limit, the clutch pack is probably worn, If the stroke is less than the limit, parts may be mis-assembled or there may be excess ATF on the discs.

   (c) Remove the overdrive clutch outer snap ring and hub to allow installation of the thin thinner snap ring.



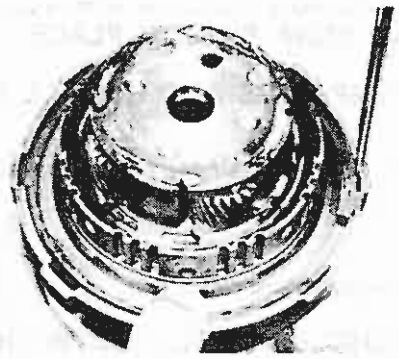
10. **INSTALL THIN THINNER SNAP RING IN OVERDRIVE CLUTCH DRUM**

Compress and lower the snap ring into the groove by hand. Check that the ends of the snap ring are not aligned with one of the cutouts.



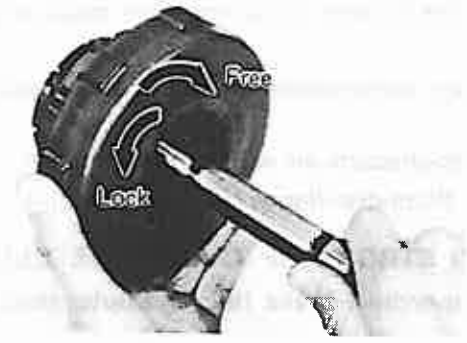
11. **ASSEMBLE OVERDRIVE CLUTCH DRUM AND OVERDRIVE PLANETARY GEAR**

Mesh the hub with the disc, twisting and jiggling the hub as required.



12. **INSTALL OVERDRIVE BRAKE HUB AND OUTER SNAP RING**

Check that the ends of the snap ring are not aligned with one of the cutouts.

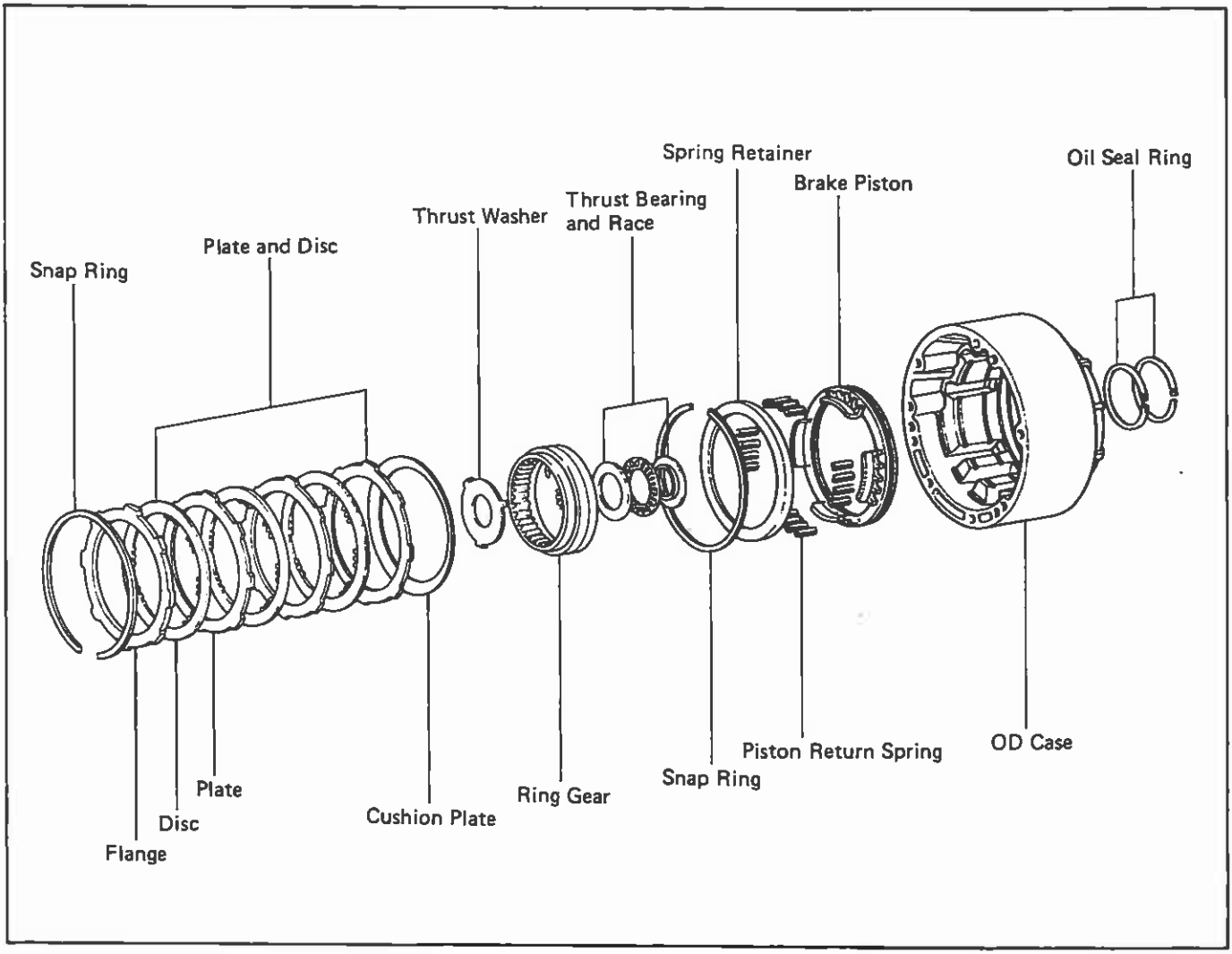


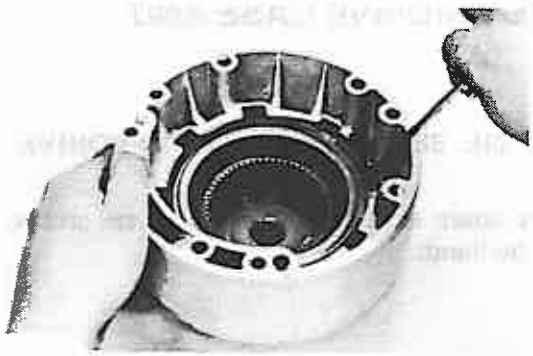
13. **CHECK OPERATION OF ONE-WAY CLUTCH**

Hold the clutch drum and turn the input shaft. The input shaft should turn freely clockwise and should lock counter-clockwise.

14. **KEEP THRUST WASHER, THRUST BEARINGS AND RACE TOGETHER**

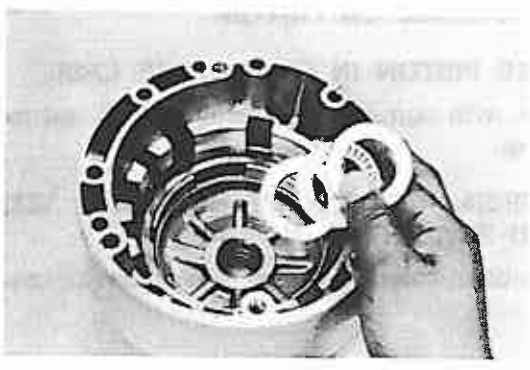
Overdrive Case and Brake





DISASSEMBLY OF OVERDRIVE CASE AND BRAKE

1. REMOVE OUTER SNAP RING FROM OVERDRIVE CASE
2. REMOVE CLUTCH FLANGE, DISCS PLATES AND CUSHION PLATE
3. REMOVE RING GEAR AND THRUST WASHER



4. REMOVE THRUST BEARING AND RACES FROM OVERDRIVE CASE

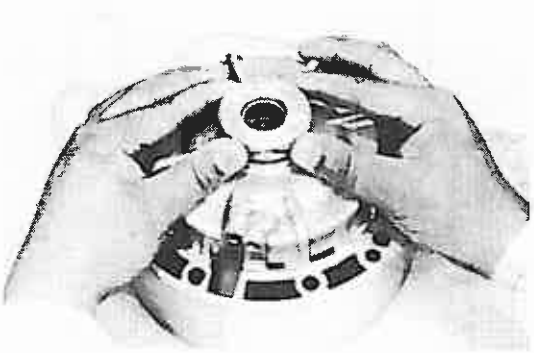
   Note the position of the races.

5. REMOVE SNAP RING, SPRING RETAINER AND SIXTEEN RETURN SPRINGS

6. REMOVE BRAKE PISTON

Blow compressed air through the case hole as shown in the figure to pop out the brake piston.

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



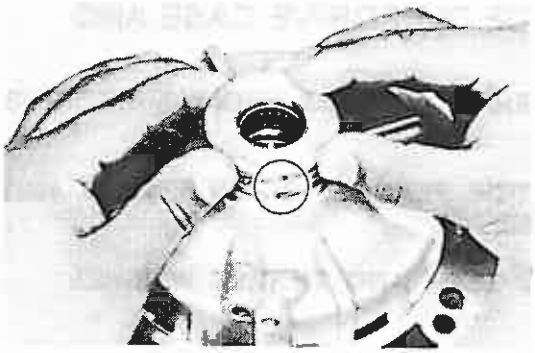
7. REMOVE TWO OIL SEAL RINGS FROM OVERDRIVE CASE

8. REMOVE O-RINGS FROM PISTON

INSPECTION OF OVERDRIVE CASE AND BRAKE

NOTE: Do not allow the discs to dry out.

Prepare new discs by soaking them at least two hours in ATF.

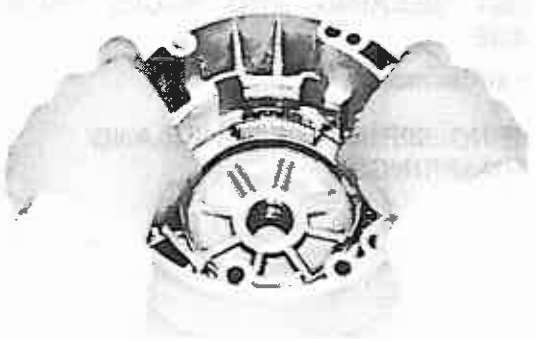


ASSEMBLY OF OVERDRIVE CASE AND BRAKE

(See page AT-43)

1. INSTALL TWO OIL SEAL RINGS ON OVERDRIVE CASE

Spread the rings apart and slide them into the groove. Hook both ends by hand.



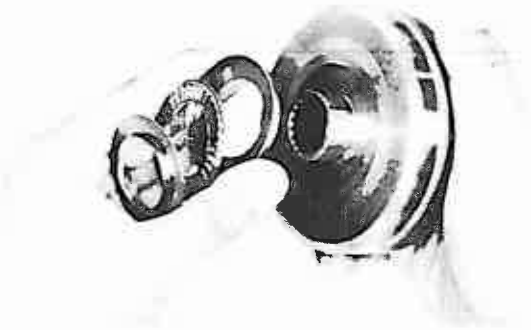
2. INSTALL NEW O-RINGS ON PISTON

3. INSTALL BRAKE PISTON IN OVERDRIVE CASE

Install the piston with cup side up, being careful not to damage the O-rings.

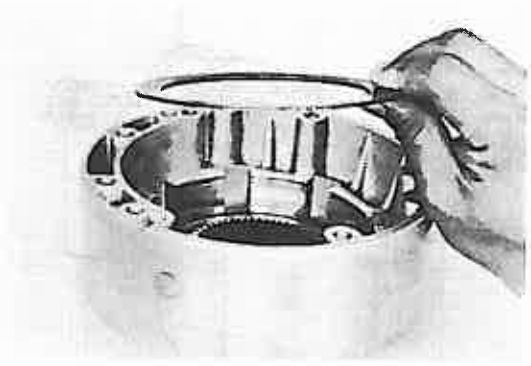
4. INSTALL SIXTEEN RETURN SPRINGS AND SET RETAINER AND SNAP RING IN PLACE

Check that the ends of snap ring are not aligned with one of the cutouts.



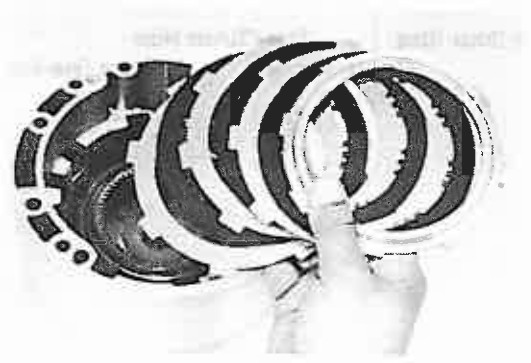
5. **INSTALL THRUST BEARING AND RACES TO RING GEAR AND SET RING GEAR IN OVERDRIVE CASE**

NOTE: Make sure that the races are installed in correct direction.



6. **INSTALL CUSHION PLATE**

Install the cushion plate with rounded end downward.



7. **INSTALL DISCS, PLATES AND FLANGE**

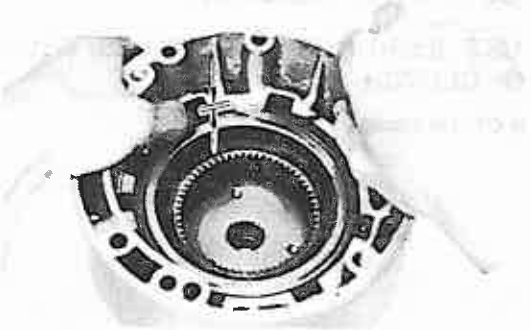
Using low-pressure compressed air, blow all excess ATF from the discs.

CAUTION: High-pressure air will damage the discs.

Install in order: Plate-disc-plate-disc-plate-disc-flange (flat side down)

8. **INSTALL SNAP RING**

Check that the ends of the snap ring are not aligned with one of the cutouts.



9. **MEASURE BRAKE CLEARANCE**

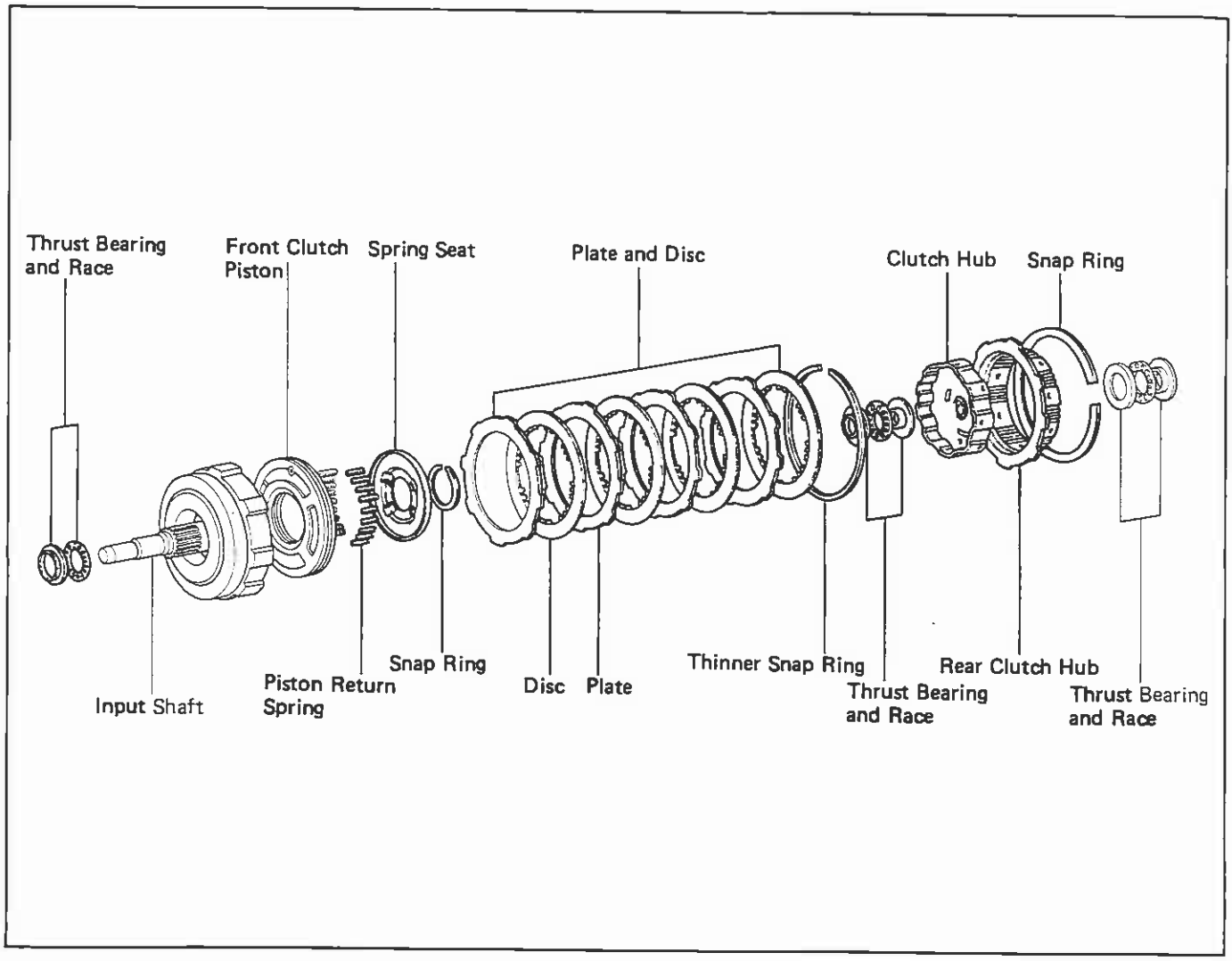
Measure the distance between the snap ring and flange.

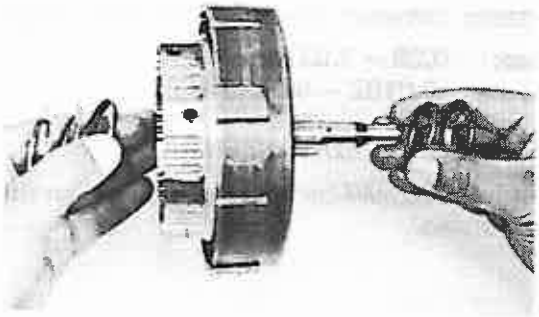
Standard clearance: 0.26 — 1.83 mm (0.0102 — 0.0720 in.)

10. **KEEP THRUST WASHER FOR ASSEMBLY**

The thrust washer left over will be installed later, when the transmission is assembled.

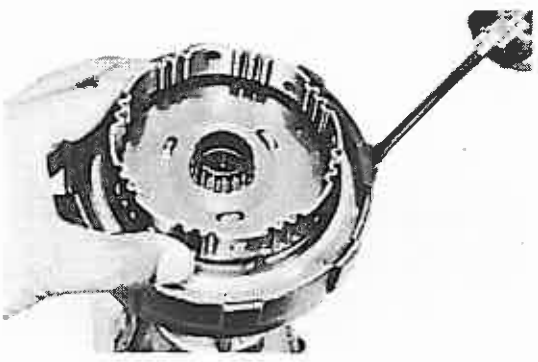
Front Clutch



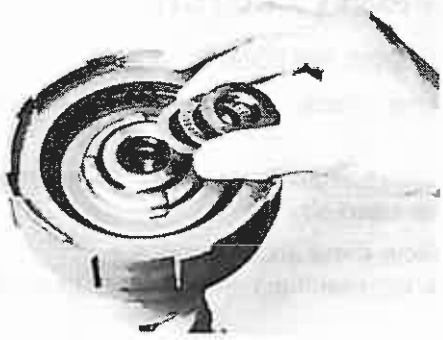


DISASSEMBLY OF FRONT CLUTCH

1. **REMOVE THRUST BEARINGS AND RACES FROM BOTH SIDES OF CLUTCH**
   Note the position of the races.



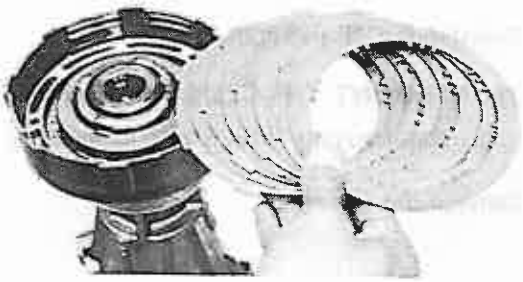
2. **USE EXTENSION HOUSING AS WORK STAND**
3. **REMOVE SNAP RING FROM FRONT CLUTCH DRUM**
4. **REMOVE FRONT AND REAR CLUTCH HUB**
   Lift out the two clutch hubs together.



5. REMOVE THRUST BEARING AND RACES

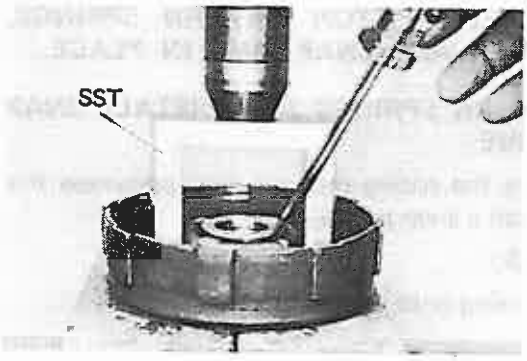
Note the position of the races.

6. REMOVE CLUTCH PLATE



7. REMOVE THINNER SNAP RING

8. REMOVE REMAINING CLUTCH PLATES AND DISCS



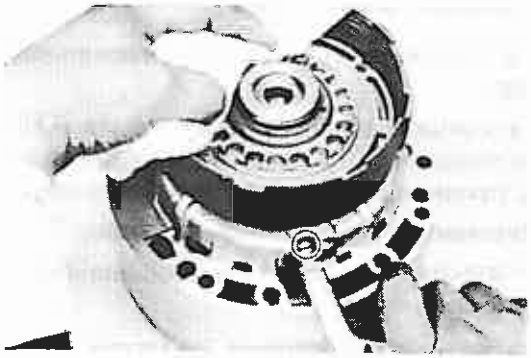
9. COMPRESS PISTON RETURN SPRINGS AND REMOVE SNAP RING

Place SST on the spring retainer and compress the springs with a shop press.

Remove the snap ring with a screwdriver.

SST 09350-20013

10. REMOVE SPRING RETAINER AND EIGHTEEN SPRINGS



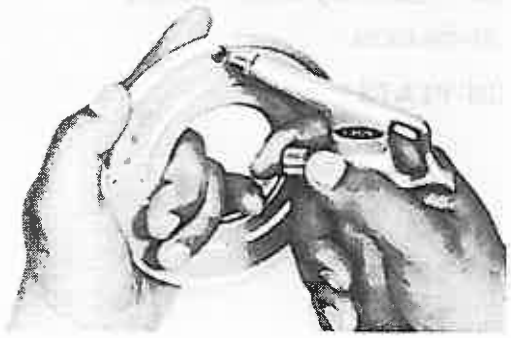
11. ASSEMBLE FRONT CLUTCH ON OVERDRIVE CASE AND BLOW OUT PISTON

(a) Slide the front clutch onto the overdrive case.

(b) Apply compressed air to the overdrive case to remove the piston. (If the piston does not come out, use pliers to remove it.)

(c) Remove the front clutch from the overdrive case.

12. REMOVE O-RINGS FROM PISTON



INSPECTION OF FRONT CLUTCH

INSPECT FRONT CLUTCH PISTON

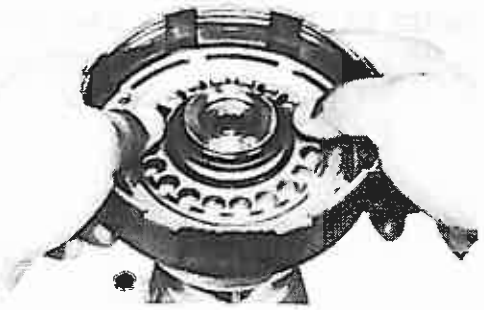
(a) Check that the check ball is free by shaking the piston.

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

NOTE: Do not allow the discs to dry out.
Prepare new discs by soaking them at least two hours in ATF.

ASSEMBLY OF FRONT CLUTCH

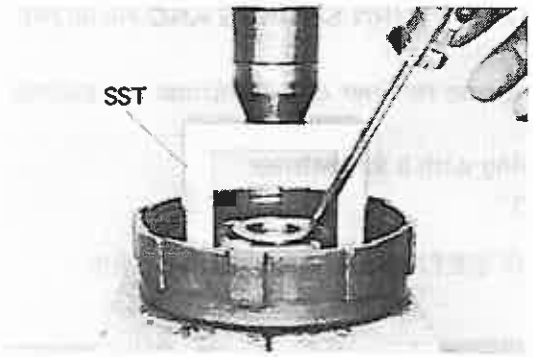
(See page AT-46)



1. INSTALL NEW O-RINGS ON PISTON

2. INSTALL PISTON IN FRONT OF CLUTCH DRUM

Press the piston into the housing with the cup side up (check ball down).
Be careful not to damage the O-rings.



3. INSTALL EIGHTEEN PISTON RETURN SPRINGS, SPRING RETAINER AND SNAP RING IN PLACE

4. COMPRESS RETURN SPRINGS AND INSTALL SNAP RING IN GROOVE

(a) Place SST on the spring retainer, and compress the springs on with a shop press.

SST 09350-20013

(b) Install a snap ring with a screwdriver.

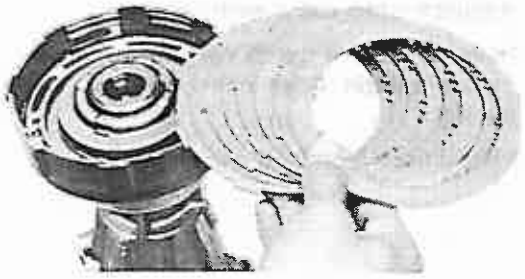
5. INSTALL DISCS AND PLATES WITHOUT ASSEMBLING THINNER SNAP RING

NOTE: Install the thinner snap ring after measurement the piston clearance.

Using low-pressure compressed air, blow all excess ATF from the discs. For measurement of the clutch pack, install all plates and discs (temporarily without thinner snap ring):

CAUTION: High-pressure air will damage the discs.

Install in order: Plate-disc-plate-disc-plate-disc-plate-disc (no snap ring)



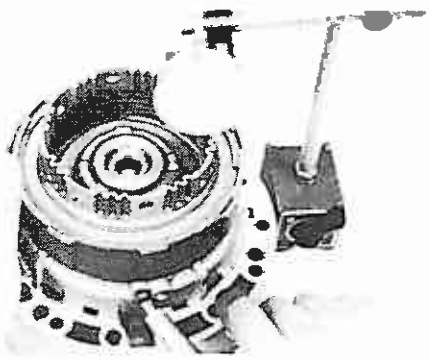
6. CHECK PISTON STROKE OF FRONT CLUTCH

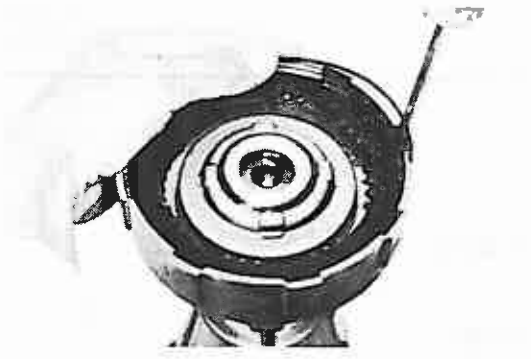
(a) Install the rear clutch hub and the outer snap ring.

(b) Install the front clutch drum onto the overdrive case. With a dial indicator, measure the stroke applying and releasing the compressed air (4 – 8 kg/cm², 57 – 114 psi or 392 – 785 kPa) as shown.

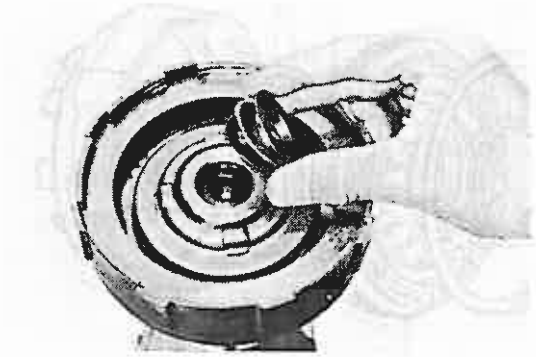
Standard piston stroke : 1.32 – 2.66 mm (0.0520 – 0.1047 in.)

If the stroke exceeds limit, the clutch pack is probably worn. If stroke is less than limit, parts may be misassembled or there may be excess ATF on the discs.





7. INSTALL THINNER SNAP RING IN CLUTCH DRUM
   (a) Remove the snap ring, rear clutch hub and one disc to allow installation of the thinner snap ring.
   (b) Compress and lower the snap ring into the groove by hand. Check that ends of the snap ring are not aligned with one of the cutouts.
8. INSTALL DISC

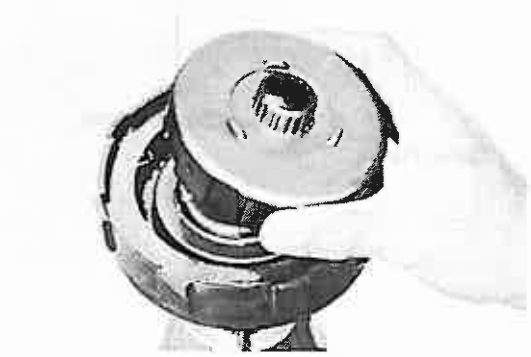


9. INSTALL INNER THRUST BEARING AND RACES

   IMPORTANT: Coat parts with petroleum jelly to hold them in place.

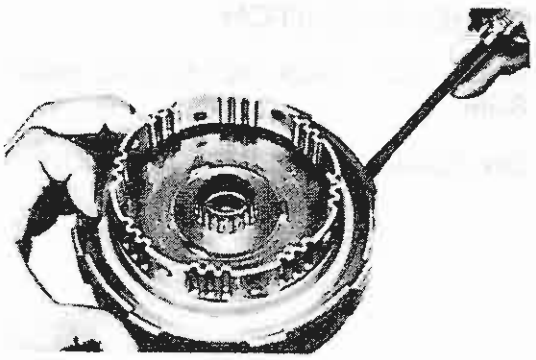
   Install the inner race, needle bearing and outer race. Press them into place.

   NOTE: Face the lip of race toward the front of the clutch body.



10. INSTALL FRONT CLUTCH HUB

    Align the disc lugs with hub teeth. Make sure the hub meshes with all discs and is fully inserted.



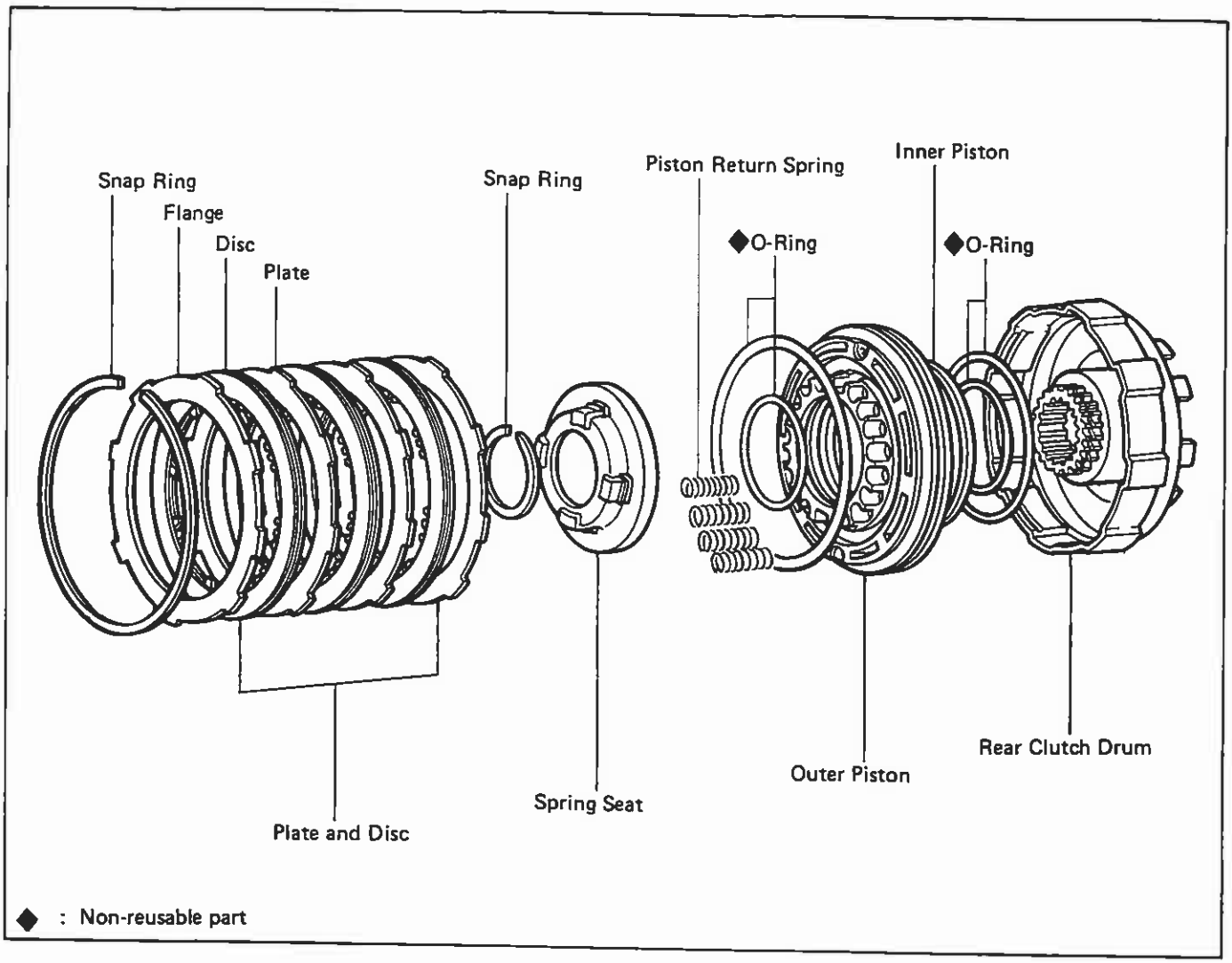
11. INSTALL REAR CLUTCH HUB AND OUTER SNAP RING

    Check that the snap ring ends are not aligned with one of the cutouts.

    NOTE: Note the position of the thrust bearing and races, and keep them together until assembly.

12. KEEP THRUST BEARINGS AND RACES TOGETHER

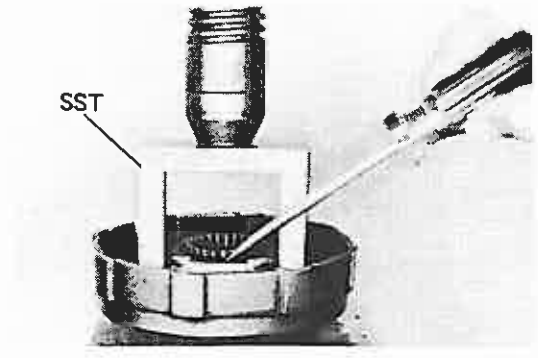
Rear Clutch



◆ : Non-reusable part

DISASSEMBLY OF REAR CLUTCH

1. REMOVE OUTER CLUTCH PACK RETAINING SNAP RING FROM DRUM
2. REMOVE CLUTCH FLANGE, DISCS AND PLATES



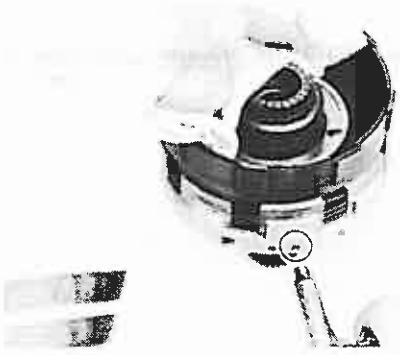
3. COMPRESS PISTON RETURN SPRINGS AND REMOVE SNAP RING

   Place SST on the spring retainer and compress the springs with a shop press

   Using screwdriver and pliers, remove the snap ring.

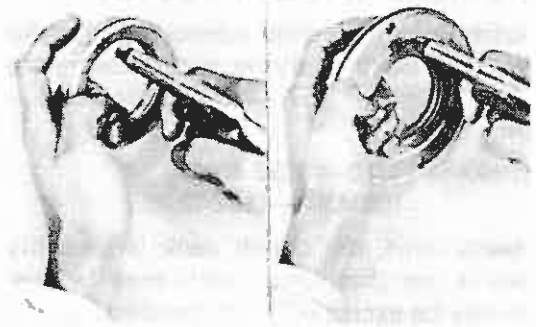
   SST 09350-20013

4. REMOVE SPRING RETAINER AND EIGHTEEN RETURN SPRINGS



5. ASSEMBLE REAR CLUTCH ON CENTER SUPPORT AND BLOW OUT PISTON
   (a) Slide the rear clutch onto the center support.
   (b) Apply compressed air to the center support to remove the piston.
   If piston does not come out completely, use pliers to remove it.
   (c) Remove the front clutch from the center support.

6. REMOVE O-RINGS FROM REAR CLUTCH PISTON



INSPECTION OF REAR CLUTCH

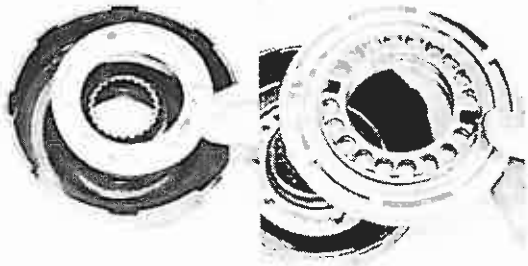
INSPECT REAR CLUTCH PISTON

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

NOTE: Do not allow the discs to dry out.
Prepare new discs by soaking them at least two hours in ATF.

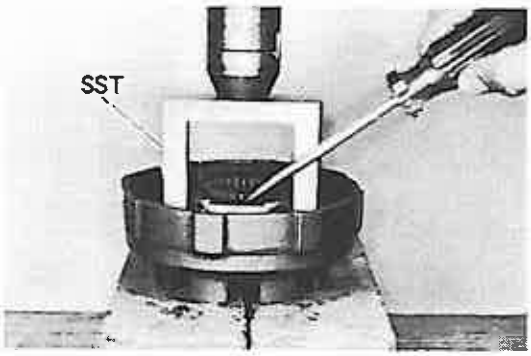
ASSEMBLY OF REAR CLUTCH

(See page AT-50)



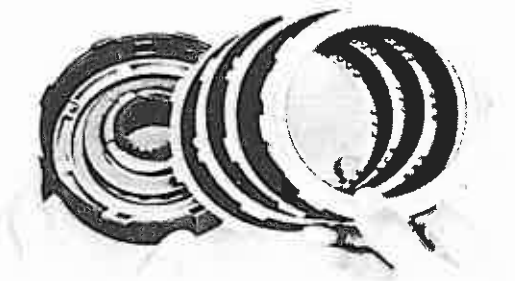
1. INSTALL NEW O-RINGS ON PISTON

2. INSTALL REAR CLUTCH INNER AND OUTER PISTON IN DRUM
   (a) Press the inner piston into the drum with the cup side up, being careful not to damage the O-rings.
   (b) Press the outer piston on the inner one with the cup side up, being careful not to damage the O-rings.

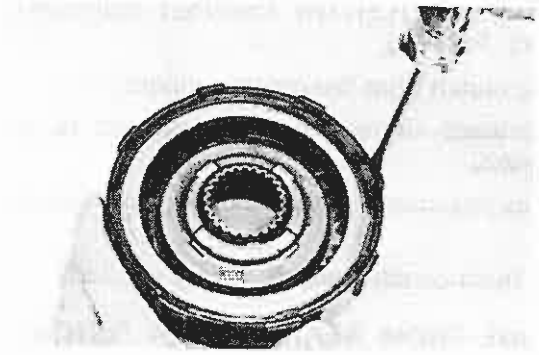


3. INSTALL EIGHTEEN PISTON RETURN SPRING AND SET RETAINER WITH SNAP RING IN PLACE

4. COMPRESS RETURN SPRINGS AND INSTALL SNAP RING IN GROOVE
   (a) Place SST on the spring retainer, and compress the springs on a shop press.
   SST 09350-20013
   (b) Install the snap ring with a screwdriver.

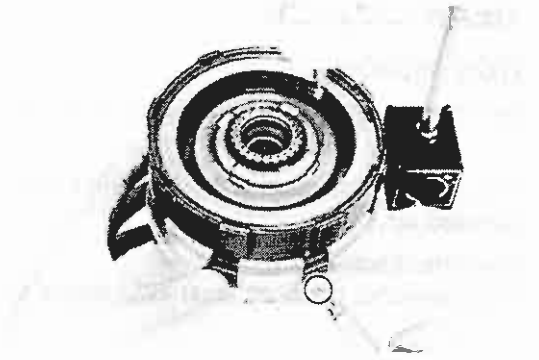


5. INSTALL DISCS, PLATES AND FLANGE
   Using low-pressure compressed air, blow all excess ATF from discs.
   CAUTION: **High-pressure air will damage the discs.**
   Install in order: Plate-disc-plate-disc-plate-disc-flange (flat end down)



6. **INSTALL SNAP RING**

Check that the snap ring ends are not aligned with one of the cutouts.



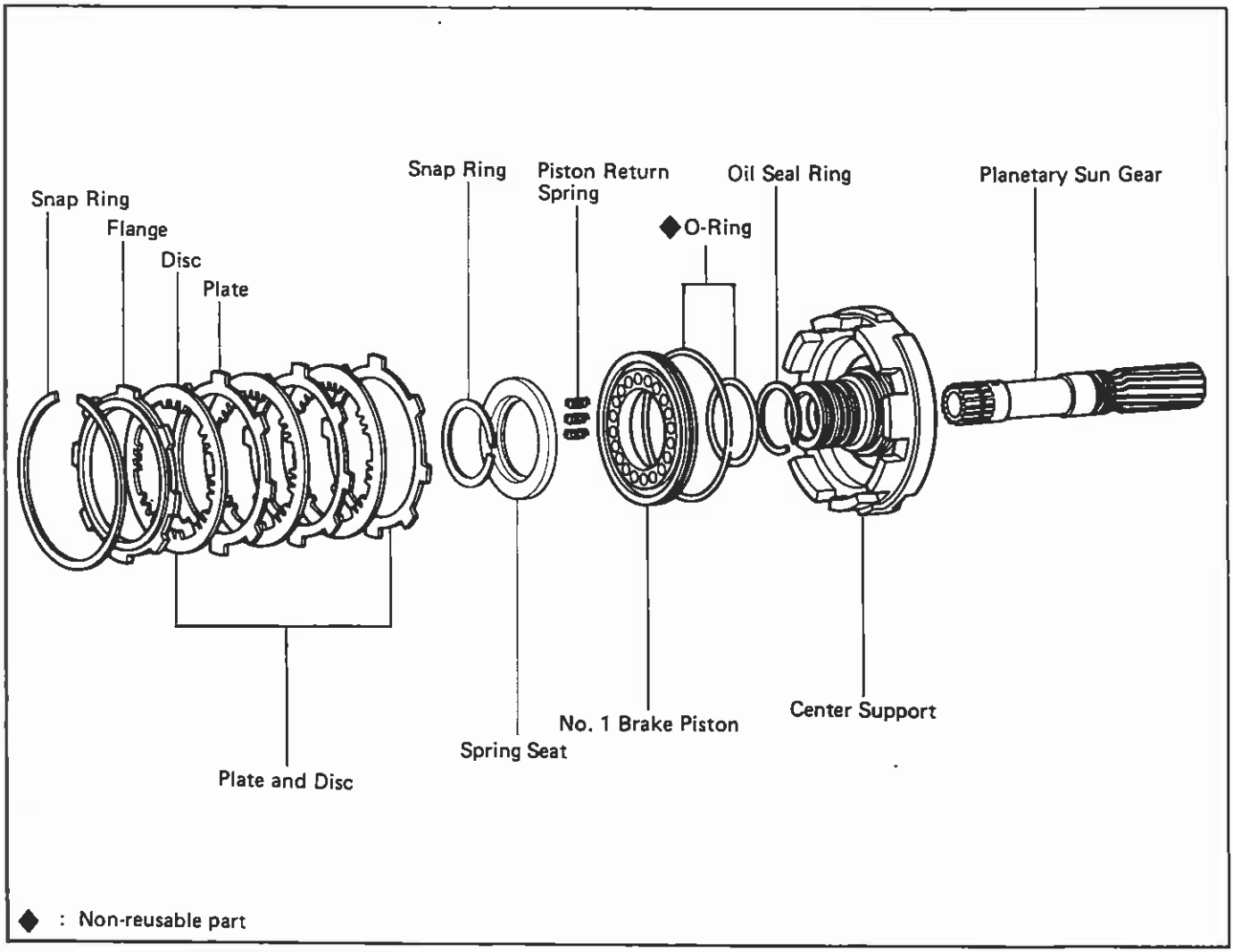
7. **CHECK PISTON STROKE OF REAR CLUTCH**

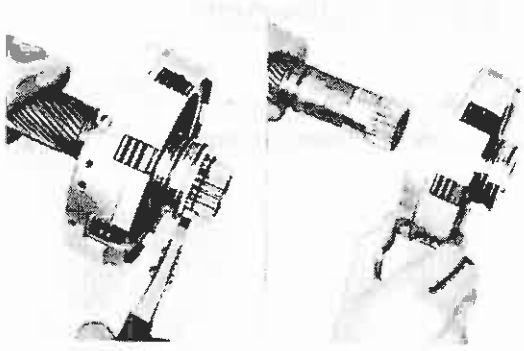
Install the rear clutch onto the center support. With a dial indicator, measure the stroke applying and releasing the compressed air (4 — 8 kg/cm², 57 — 114 psi or 392 — 785 kPa) as shown.

Standard piston stroke : 1.10 — 1.30 mm (0.0433 — 0.0512 in.)

If the stroke exceeds limit, the clutch pack is probably worn. If the stroke is less than limit, parts may be misassembled or there may be excess ATF on the discs.

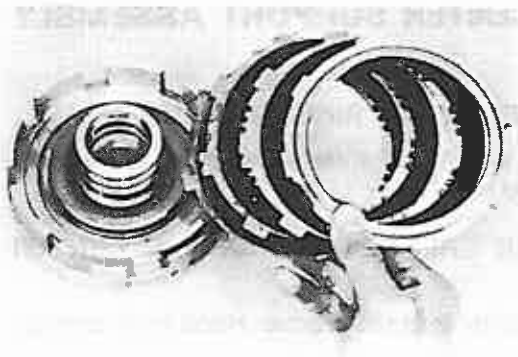
Center Support Assembly



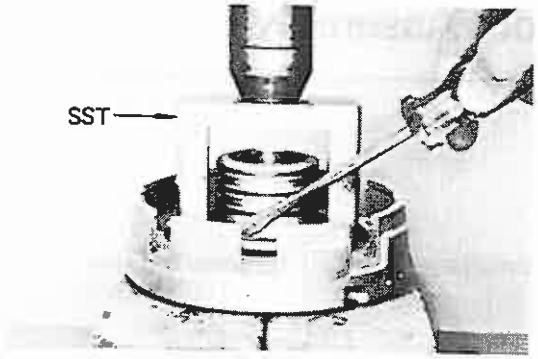


DISASSEMBLY OF CENTER SUPPORT ASSEMBLY

1. REMOVE SNAP RING FROM END OF SUN GEAR SHAFT
2. PULL CENTER SUPPORT ASSEMBLY FROM SHAFT



3. REMOVE SNAP RING FROM FRONT OF CENTER SUPPORT ASSEMBLY
4. REMOVE CLUTCH FLANGE, DISCS AND PLATES

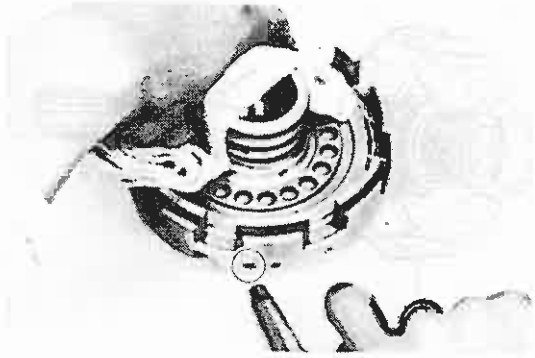


5. COMPRESS PISTON RETURN SPRINGS AND REMOVE SNAP RING

Place the SST on the spring retainer and compress the springs with a shop press.
Using a screwdriver, remove the snap ring.

SST 09350-20013

6. REMOVE SPRING RETAINER AND SIXTEEN SPRINGS



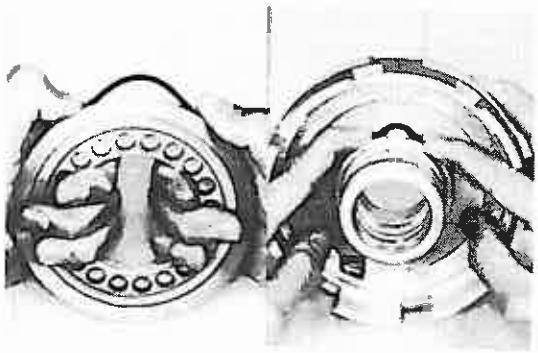
7. REMOVE NO. 1 BRAKE PISTON

Blow the compressed air through the center support oil hole to remove the No. 1 brake piston.

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

8. REMOVE NO. 1 BRAKE PISTON O-RINGS

Remove both the inner and outer O-ring from the piston and center support.



9. REMOVE THREE OIL SEAL RINGS FROM CENTER SUPPORT

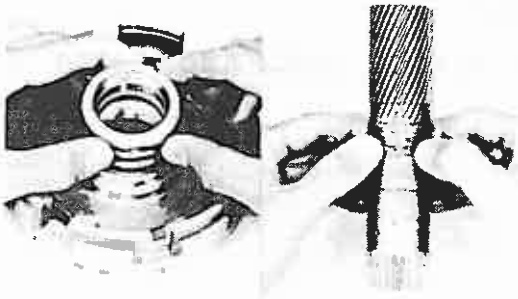
10. REMOVE TWO OIL SEAL RINGS FROM SUN GEAR

INSPECTION OF CENTER SUPPORT ASSEMBLY

NOTE: Do not allow the discs to dry out.
Prepare new discs by soaking them at least two hours in ATF.

ASSEMBLY OF CENTER SUPPORT ASSEMBLY

(See page AT-53)

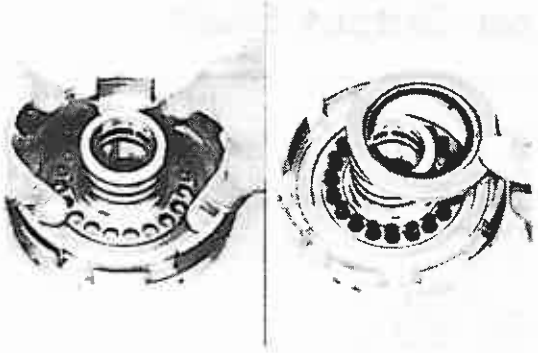


1. INSTALL TWO OIL SEAL RINGS ON SUN GEAR

Spread the rings apart and slide them into the groove. Hook both ends by hand.

2. INSTALL THREE OIL SEAL RINGS ON CENTER SUPPORT

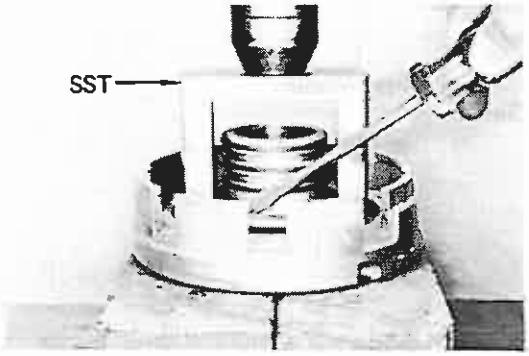
Spread apart and slide into the groove. Hook both ends by hand.



3. INSTALL NEW O-RINGS ON PISTON AND CENTER SUPPORT

4. INSTALL NO. 1 BRAKE PISTON IN CENTER SUPPORT

Press the No. 1 brake piston into the center support with the cup side up, being careful not to damage the O-rings.



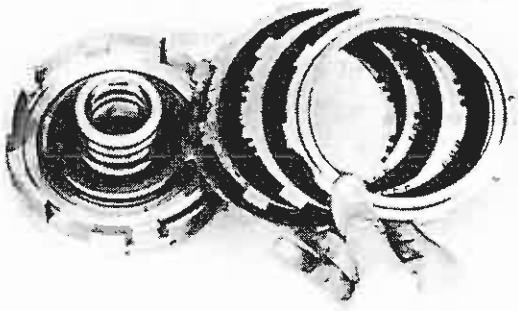
5. INSTALL SIXTEEN PISTON RETURN SPRINGS AND SET RETAINER WITH SNAP RING IN PLACE

6. COMPRESS RETURN SPRINGS AND INSTALL SNAP RING IN GROOVE

(a) Place SST on the spring retainer, and compress the springs on a shop press.

SST 09350-20013

(b) Install a snap ring with a screwdriver.



7. INSTALL NO. 1 BRAKE PLATES, DISCS AND FLANGE

Using low-pressure compressed air, blow all excess ATF from the discs.

CAUTION: **High-pressure air will damage the discs.**

Install in order: Plate-disc-plate-disc-plate-disc-flange (flat end down)

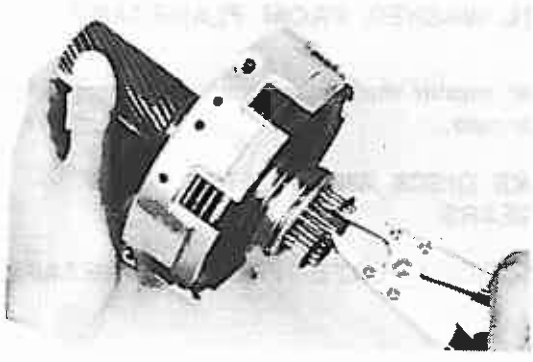
8. INSTALL SNAP RING IN CENTER SUPPORT

Check that ends of the snap ring are not aligned with one of the cutouts.

9. CHECK PISTON STROKE OF NO. 1 BRAKE

With a dial indicator, measure the stroke applying and releasing the compressed air (4 – 8 kg/cm², 57 – 114 psi or 392 – 785 kPa) as shown.

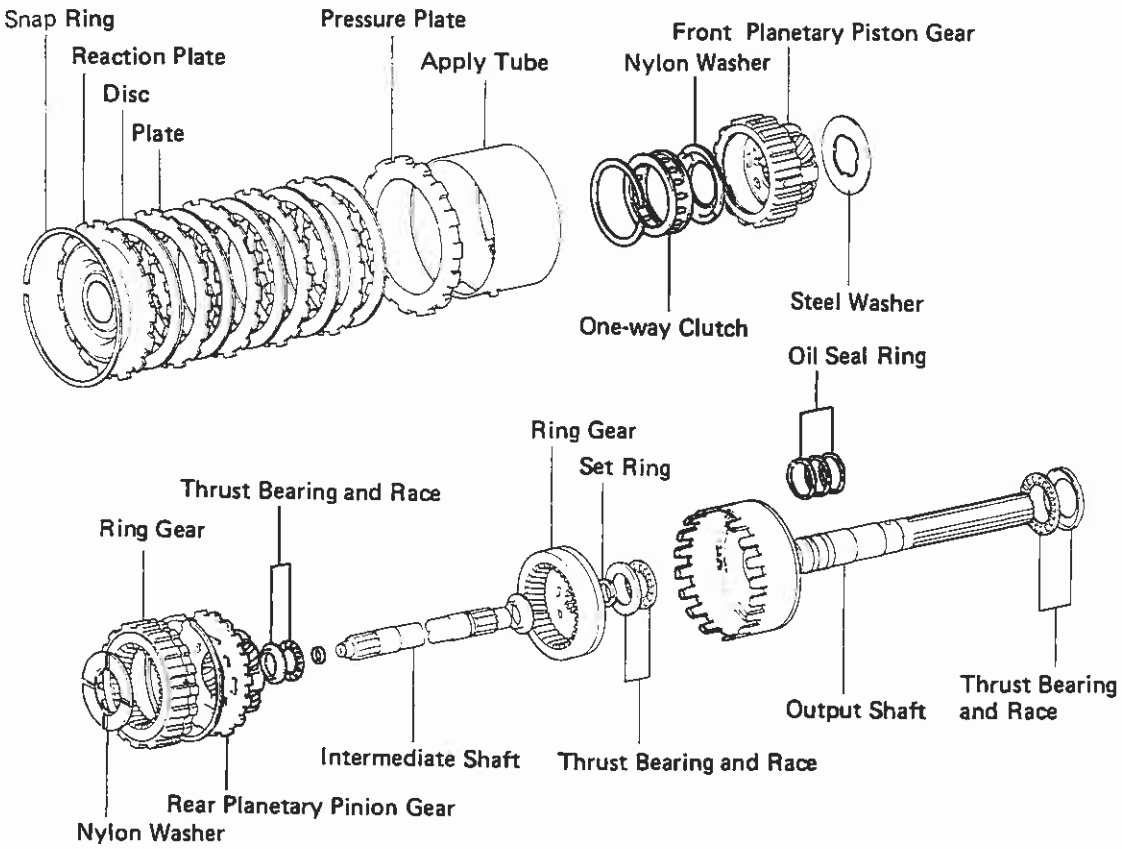
Standard piston stroke : 1.00 – 1.20 mm (0.0394 – 0.0472 in.)



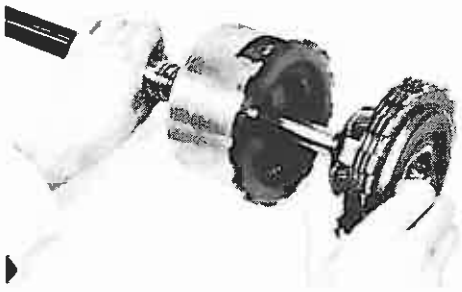
10. ASSEMBLE CENTER SUPPORT AND SUN GEAR SHAFT

11. INSTALL SNAP RING ON END OF SUN GEAR SHAFT

Planetary Gear Output Shaft



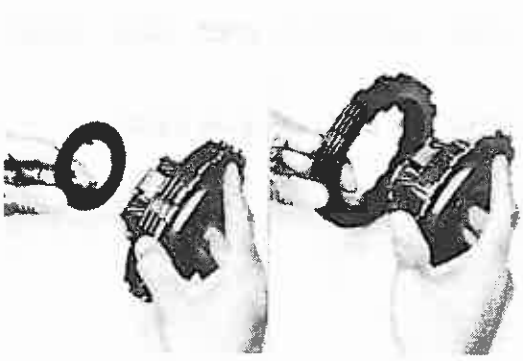
DISASSEMBLY OF PLANETARY GEAR OUTPUT SHAFT



1. **REMOVE NO. 3 BRAKE DISC/PLATE PACK AND FRONT PLANETARY PINION GEARS**

   Grasp the components and pull off the front end of the output shaft.

   Be careful to avoid dropping the bearing on the output shaft.

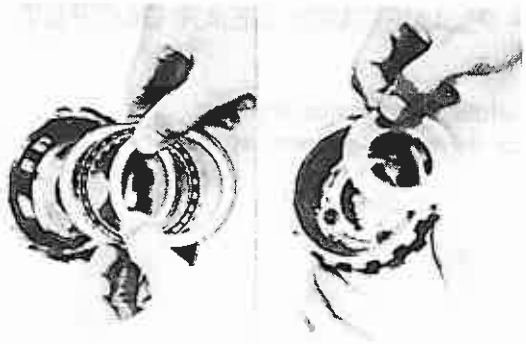


2. **REMOVE STEEL WASHER FROM PLANETARY GEARS**

   NOTE: The steel washer may have stuck to the inside of the planetary gear case.

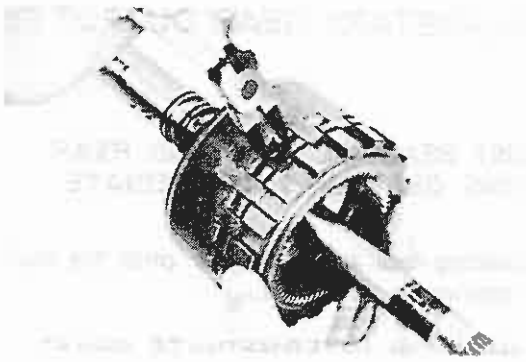
3. **REMOVE BRAKE DISCS AND PLATES FROM PLANETARY GEARS**

4. **REMOVE REACTION PLATE FROM PLANETARY GEARS**



5. REMOVE SNAP RING AND ONE-WAY CLUTCH FROM PLANETARY GEARS

6. REMOVE NYLON THRUST WASHER FROM PLANETARY GEARS



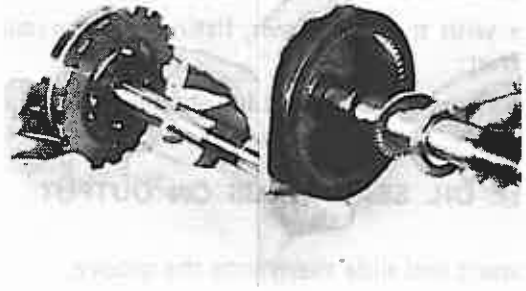
7. REMOVE APPLY TUBE AND CLUTCH PRESSURE PLATE

8. COMPRESS SHAFT SNAP RING AND REMOVE FRONT PLANETARY RING GEAR
   (a) While pulling up the ring gear, compress the snap ring with needle-nose pliers and remove it from the groove.
   (b) Pull out the ring gear by hand.

9. REMOVE INTERMEDIATE SHAFT, REAR PINION GEARS WITH RING GEAR FROM OUTPUT SHAFT ASSEMBLY

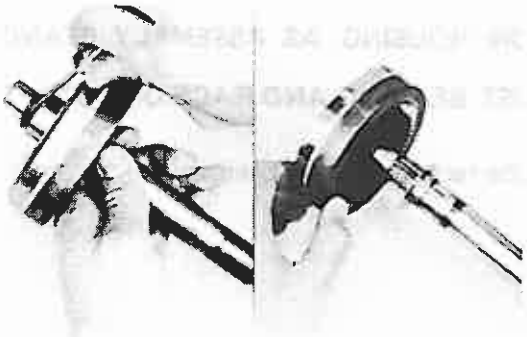
10. REMOVE THRUST BEARING AND RACES FROM OUTPUT SHAFT ASSEMBLY
    Note the position of the races.

11. REMOVE THREE OIL SEAL RINGS FROM OUTPUT SHAFT



12. REMOVE NYLON THRUST WASHER AND REAR PINION GEARS FROM INTERMEDIATE SHAFT ASSEMBLY

13. REMOVE RACE AND THRUST BEARING FROM INTERMEDIATE SHAFT
    Note the position of the race.

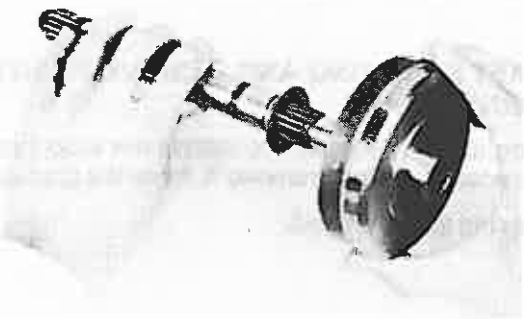


14. INVERT INTERMEDIATE SHAFT AND REMOVE SET RING

15. REMOVE REAR PLANETARY RING GEAR AND BEARING RACE FROM INTERMEDIATE SHAFT
    Note the position of the race.

INSPECTION OF PLANETARY GEAR OUTPUT SHAFT

NOTE: Do not allow the discs to dry out.
Prepare new discs by soaking them at least two hours in ATF.



ASSEMBLY OF PLANETARY GEAR OUTPUT SHAFT

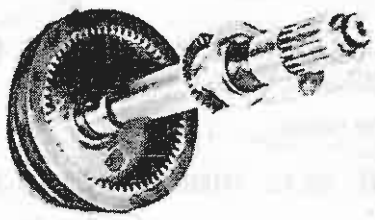
(See page AT-56)

1. INSTALL THRUST BEARING RACE AND REAR PLANETARY RING GEAR ON INTERMEDIATE SHAFT

   Slip the thrust bearing race and ring gear onto the shaft with the exterior splines up, as shown.

2. INSTALL SET RING ON INTERMEDIATE SHAFT

   Push down and wind the set ring into place. Check to make sure it is secure.



3. TURN OVER INTERMEDIATE SHAFT AND INSTALL THRUST BEARING AND RACE

   Make sure the flat side of the race is against the bearing.

4. INSTALL PINION GEAR ASSEMBLY NYLON THRUST WASHER ON REAR PLANETARY CARRIER

   Install the washer with the lugs down, fitting into the rear planetary gear carrier.

   CAUTION: Make sure the different lug shapes match the openings on the plate.

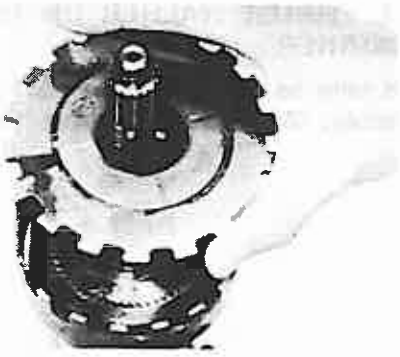
5. INSTALL THREE OIL SEAL RINGS ON OUTPUT SHAFT

   Spread the rings apart and slide them into the groove. Hook both ends by hand.

6. USE EXTENSION HOUSING AS ASSEMBLY STAND

7. INSTALL THRUST BEARING AND RACE ON OUTPUT SHAFT

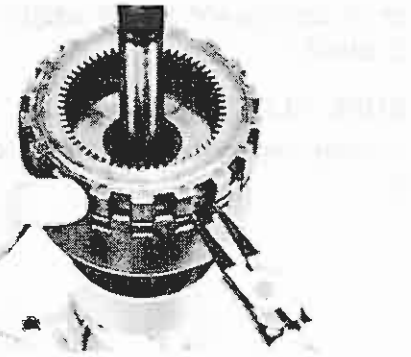
   Hold the cup of the race toward the bearing.



8. **INSTALL INTERMEDIATE SHAFT ASSEMBLY IN OUTPUT SHAFT**

9. **INSTALL REAR PLANETALY CARRIER IN OUTPUT SHAFT**

Slide the carrier into place, and make sure that the lugs interlock.



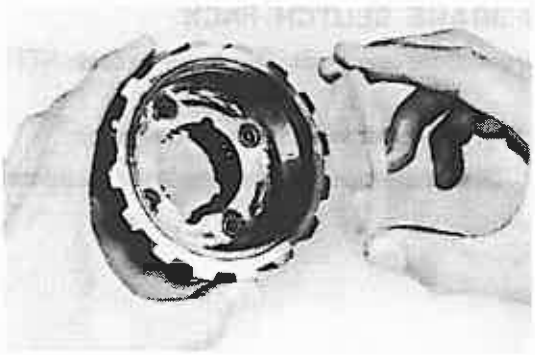
10. **SET FRONT PLANETARY RING GEAR IN PLACE**

Slide the snap ring downward, and align the lugs with the notches.
Align the ends of the snap ring with the wide gap between the teeth.

11. **INSTALL FRONT PLANETARY RING GEAR WITH SNAP RING**

While pushing down the ring gear, squeeze the snap ring end with needle nose pliers and install it into the groove.

NOTE: When the snap ring is fully seated, the gap is the width of one lug.

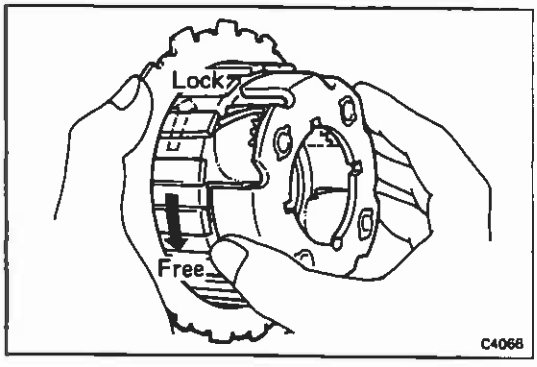


12. **INSTALL NYLON THRUST WASHER IN FRONT OF PLANETARY PINION GEAR**

Face the lugs downward and match them with the slots in back of the planetary gear.

13. **INSTALL ONE-WAY CLUTCH**

(a) Push the end bearing into place with the cup side up.
(b) Install the one-way clutch into the outer race facing the spring cage toward the front.
(c) Install the end bearing.
(d) Install the snap ring.



14. **TEMPORARILY INSTALL REACTION PLATE ON PLANETARY**

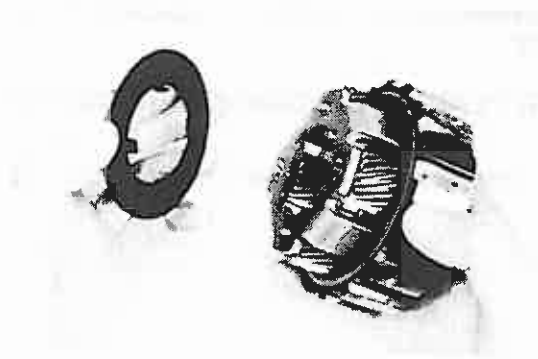
Insert the plate into place for testing the one-way clutch.

15. **TEST ONE-WAY CLUTCH**

The planetary gear must rotate freely counterclockwise and lock clockwise.

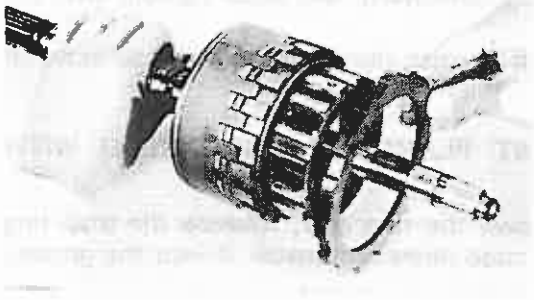
If the clutch does not work correctly, it must be replaced.

16. **REMOVE REACTION PLATE**



17. **INSTALL STEEL THRUST WASHER ON FRONT PLANETARY CARRIER**

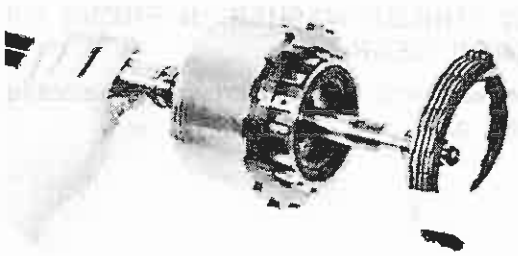
Apply petroleum jelly to the washer to hold it in place during later assembly. Match the lugs with the planetary carrier.



18. **INSTALL FRONT PLANETARY GEAR ASSEMBLY TO INTERMEDIATE SHAFT**

19. **INSTALL PRESSURE PLATE**

Install the pressure plate, facing the flat surface toward the intermediate shaft.

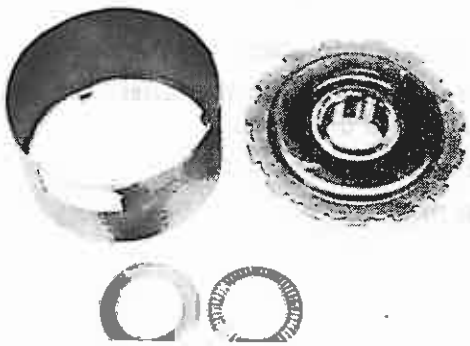


20. **INSTALL NO. 3 BRAKE CLUTCH PACK**

Using low-pressure compressed air, blow all excess ATF from the discs.

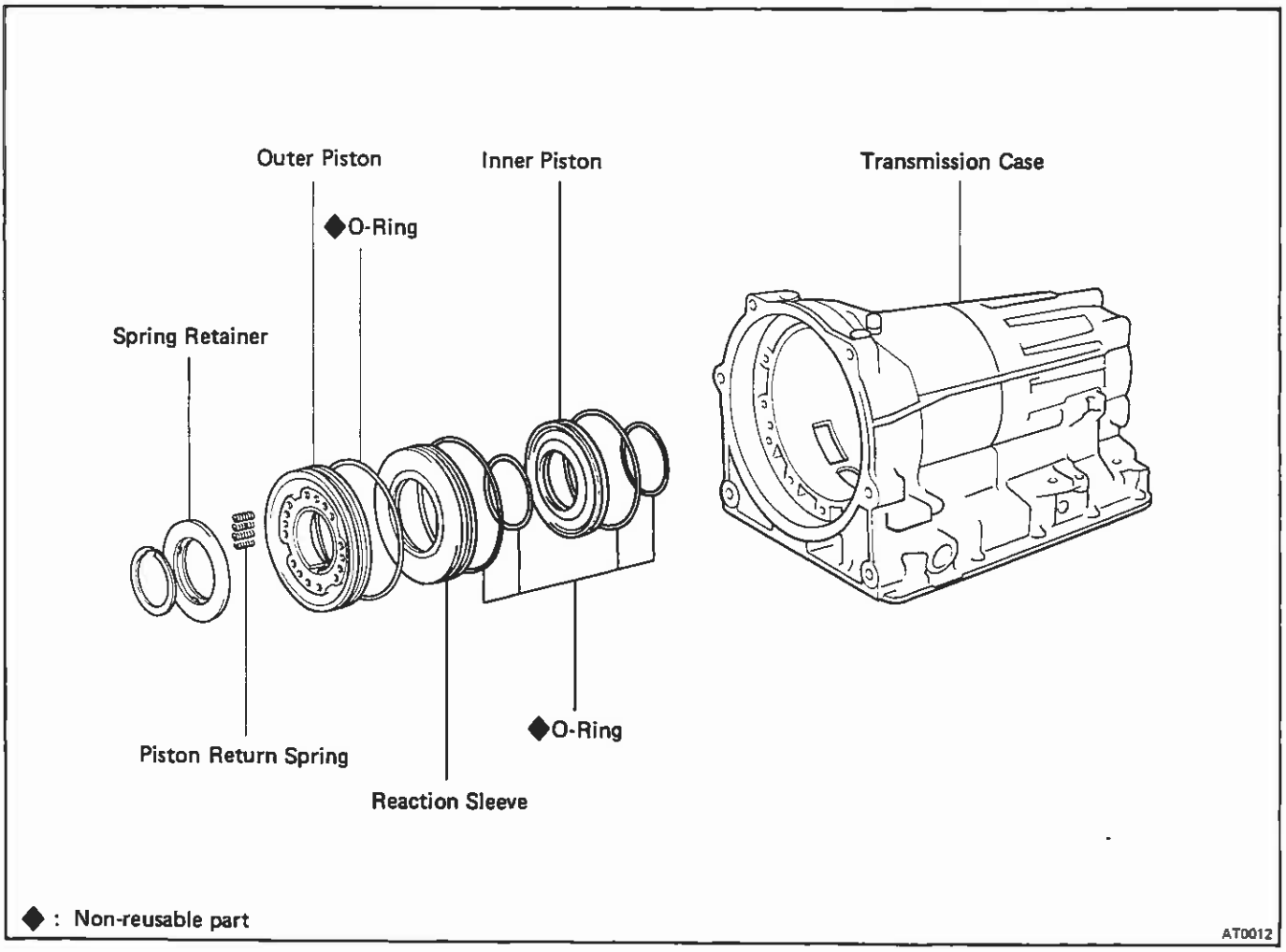
CAUTION: High-pressure air will damage the discs.

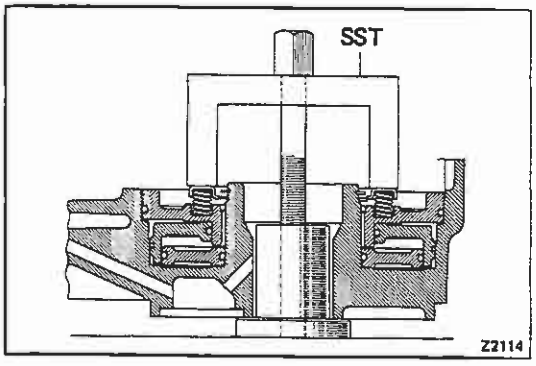
Install in order; Disc-plate-disc-plate-disc-plate-disc-plate -disc

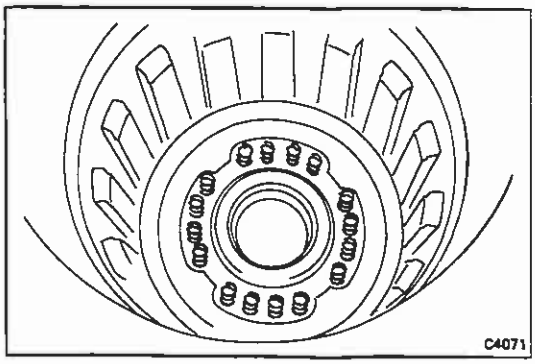


21. **KEEP INNER RACE, APPLY TUBE, THRUST BEARING AND RACE TOGETHER**

Transmission Case and Rear Brake Pistons







DISASSEMBLY OF TRANSMISSION CASE AND REAR BRAKE PISTONS

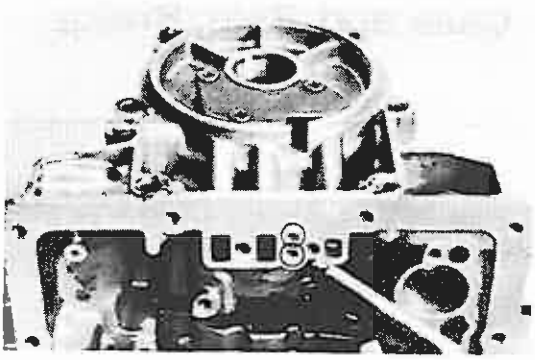
1. COMPRESS RETURN SPRINGS AND REMOVE SPRING RETAINER SNAP RING

   (a) Install the SST. Gradually and evenly tighten the bolts to compress the springs, being careful not to damage the transmission case with SST.

   SST 09350-20013

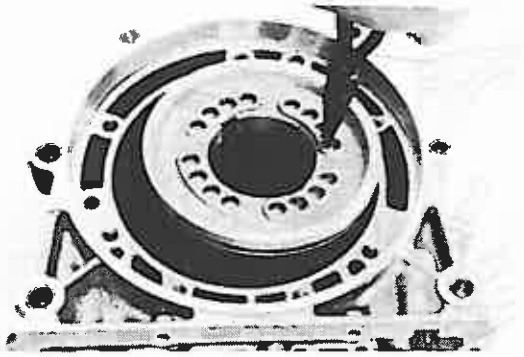
   (b) Using a screwdriver and hook, remove the snap ring.

2. REMOVE SPRING RETAINER AND SIXTEEN SPRINGS



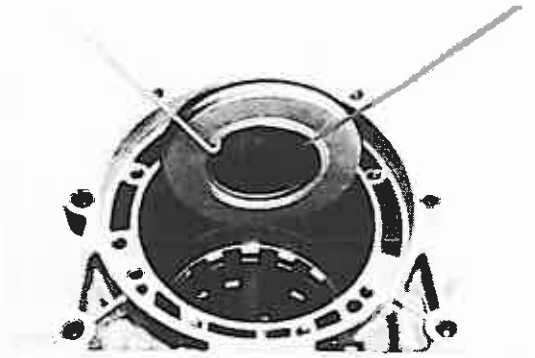
3. REMOVE OUTER PISTON AND REACTION SLEEVE WITH COMPRESSED AIR

Turn the case over face down on a workbench. Place several clean shop rags under the case to catch the piston and sleeve. To pop out the pistons and sleeve, apply compressed air to the outer and inner piston oil holes.



If the piston and sleeve do not pop out with the compressed air:

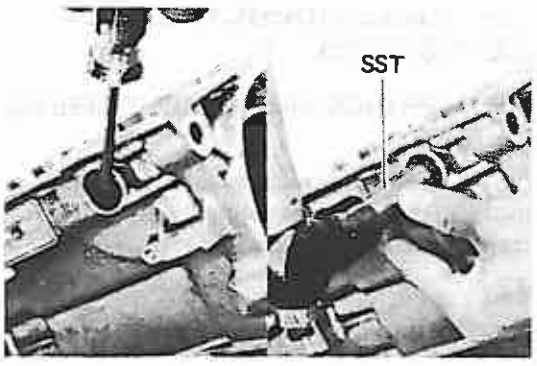
(a) Using needle-nose pliers, lift out the piston from the case.



(b) Insert two long hooks behind the reaction sleeve and gradually lift it out of the case.

(c) Using hooks, lift the inner piston out of the case in the same manner.

4. REMOVE O-RINGS FROM OUTER AND INNER PISTONS AND REACTION SLEEVE



INSPECTION OF CASE COMPONENT GROUP

REPLACEMENT OF MANUAL SHAFT OIL SEALS

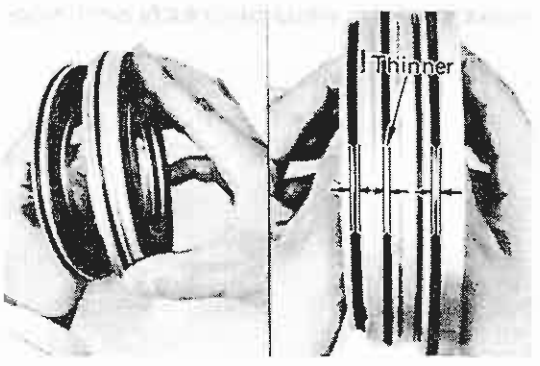
(a) Remove the manual shaft oil seals with a screwdriver.

(b) Drive in new left and right oil seals with SST.

SST 09350-20013

ASSEMBLY OF TRANSMISSION CASE AND REAR BRAKE PISTONS

(See page AT-61)



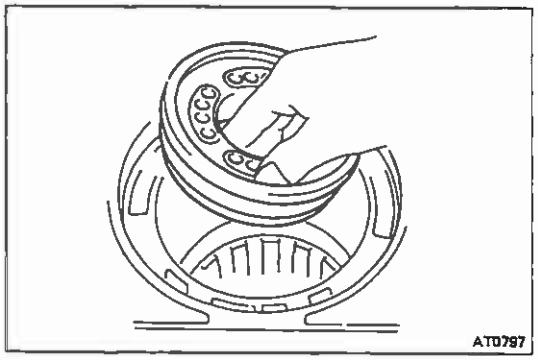
1. INSTALL NEW O-RINGS ON REACTION SLEEVE AND PISTONS

CAUTION: The thinner O-ring goes on the outside of the reaction sleeve.

2. INSTALL INNER AND OUTER PISTONS IN REACTION SLEEVE

(a) Push the inner piston into the cupped side of the reaction sleeve.

(b) Push the outer piston onto the other side of the reaction sleeve.



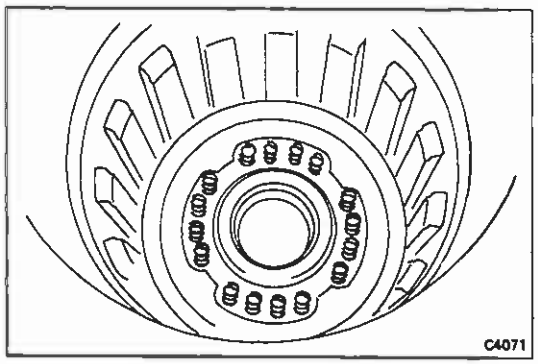
3. **INSTALL PISTONS AND SLEEVE IN CASE**

CAUTION: Be careful not to damage the O-rings.

Hold the assembly with the outer piston upward (spring seats visible), and push the assembly into its bore in the case.

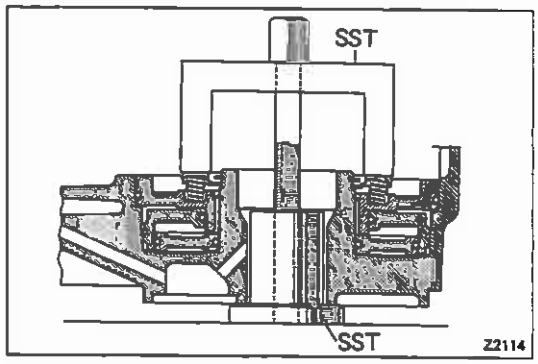
4. **INSTALL SST BASE UNDER CASE**

SST 09350-20013



5. **INSTALL SIXTEEN PISTON RETURN SPRINGS AND SET RETAINER WITH SNAP RING IN PLACE**

NOTE: The springs are visible through the cutout in the case. Which helps position them more easily.



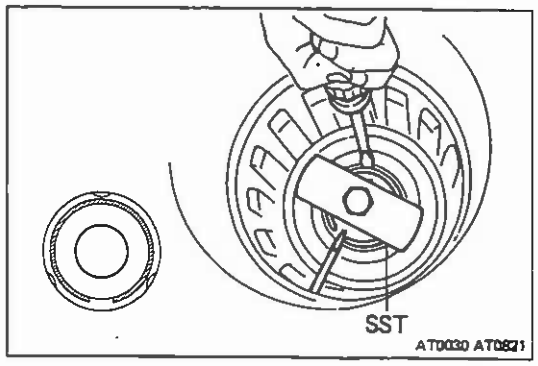
6. **COMPRESS PISTON RETURN SPRINGS TO ALLOW INSTALLATION OF SNAP RING**

CAUTION: Do not overtighten the bolt and bend the spring retainer.

(a) Carefully position the spring compressor on the spring retainer.

(b) Gradually and evenly tighten the bolt to compress the springs, being careful not to damage the transmission case with SST.

SST 09350-20013



7. **INSTALL SNAP RING**

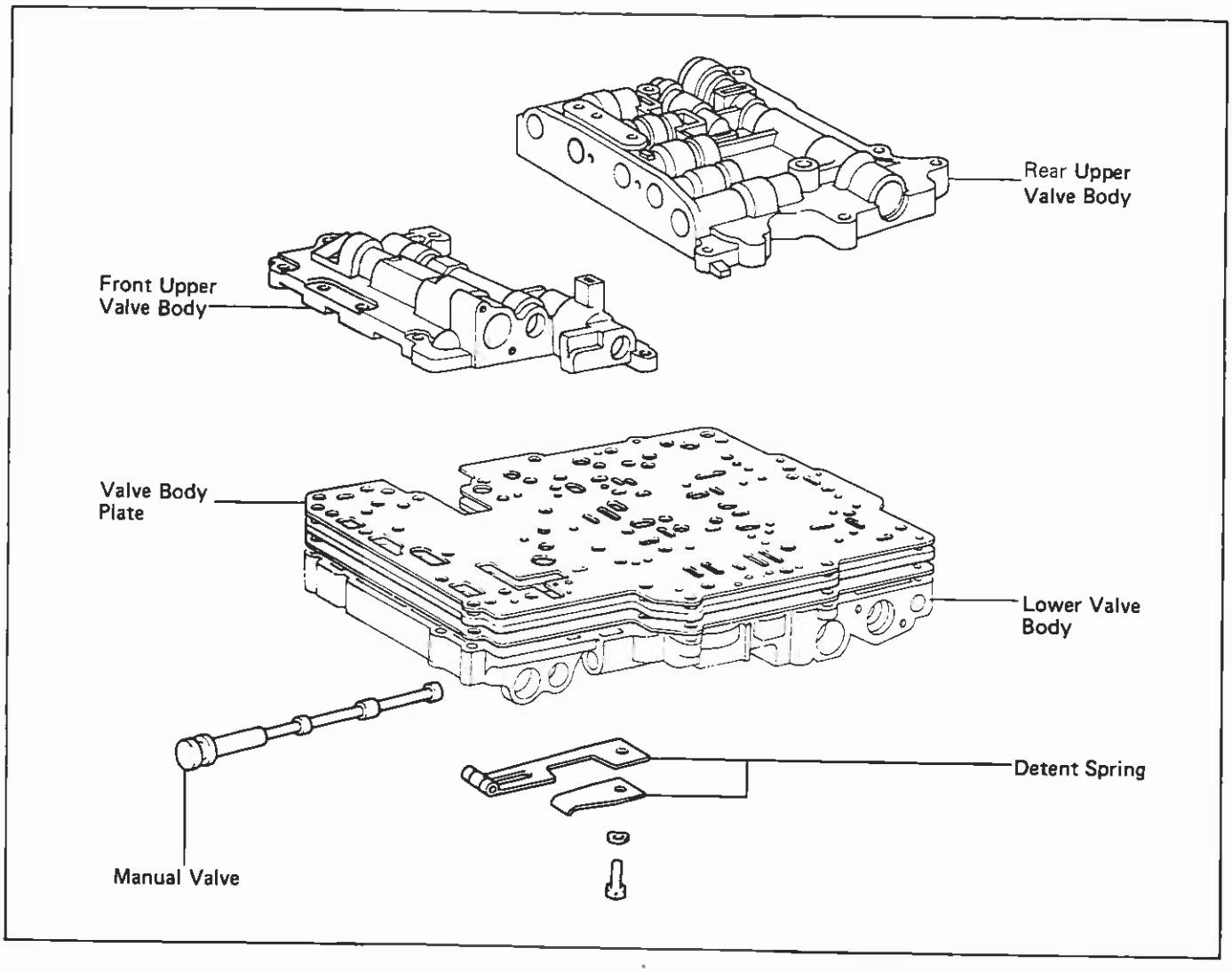
(a) Push the ring into place with your fingers. Visually check to make sure it is fully seated and centered by the three lugs on the spring retainer.

(b) Remove the SST.

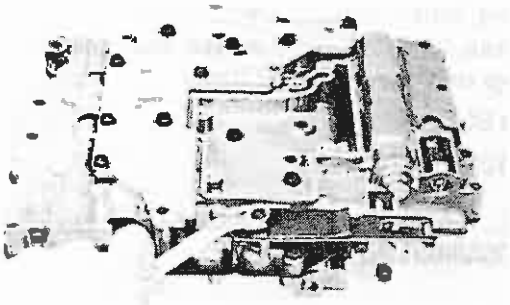
SST 09350-20013

8. **KEEP MANUAL VALVE LEVER, PARKING LOCK PAWL AND ACCUMULATOR**

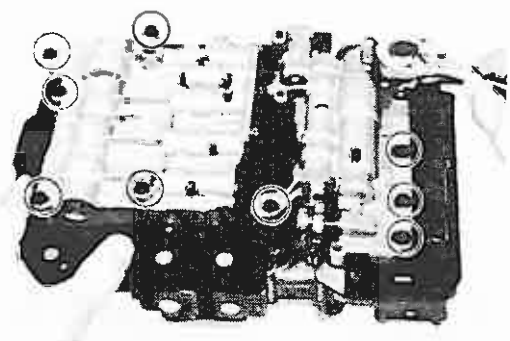
Valve Body



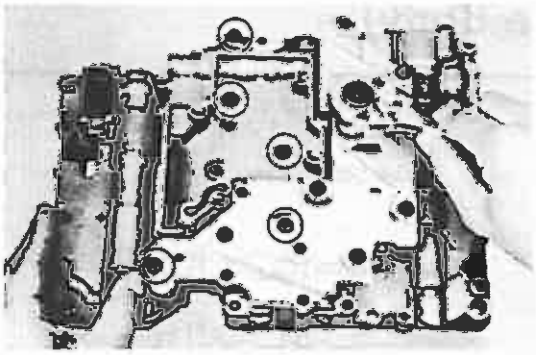
(Disassembly of Valve Body)



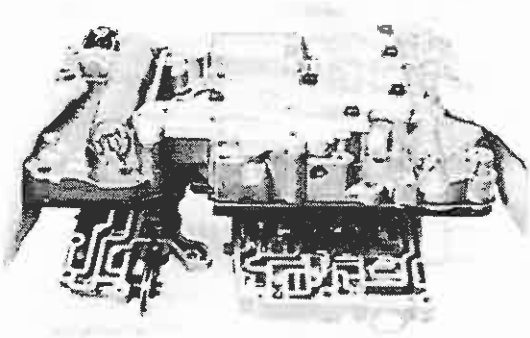
1. UNBOLT AND REMOVE DETENT SPRING
2. REMOVE MANUAL VALVE



3. TURN ASSEMBLY OVER AND REMOVE TEN BOLTS FROM UPPER FRONT VALVE BODY AND UPPER REAR VALVE BODY

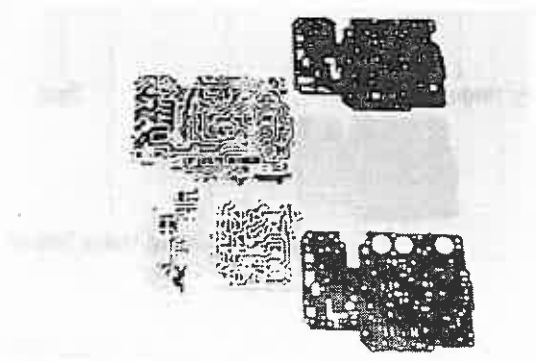


4. TURN ASSEMBLY OVER AND REMOVE SET BOLTS FROM LOWER VALVE BODY



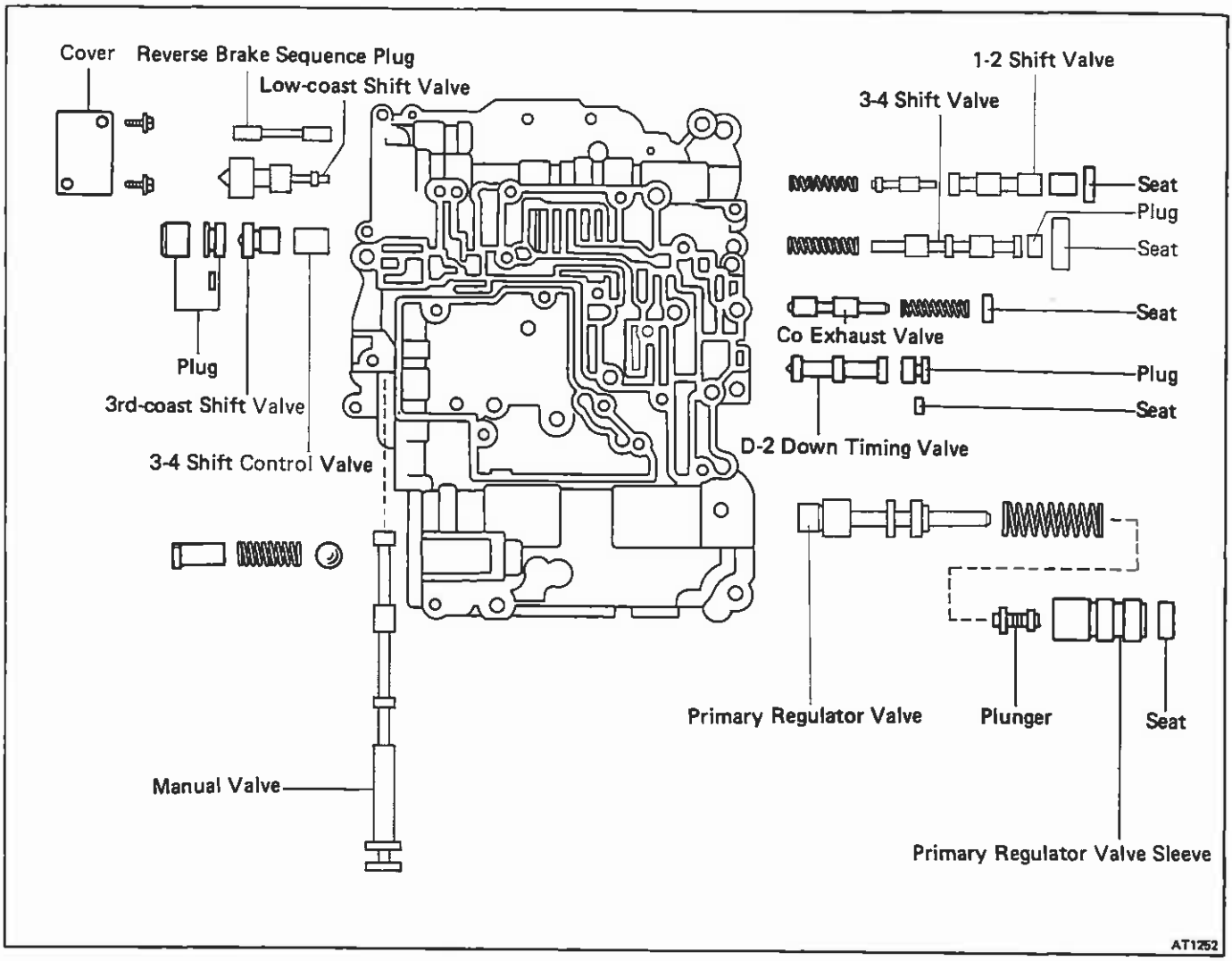
5. LIFT OFF LOWER VALVE BODY AND PLATE AS SINGLE UNIT

(a) Hold the lower valve body and plate together so that the check valve and ball do not fall out.

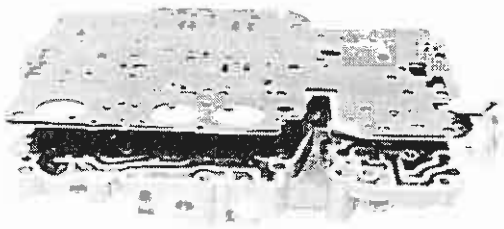


(b) Turn the lower valve body over and set it on the workbench.

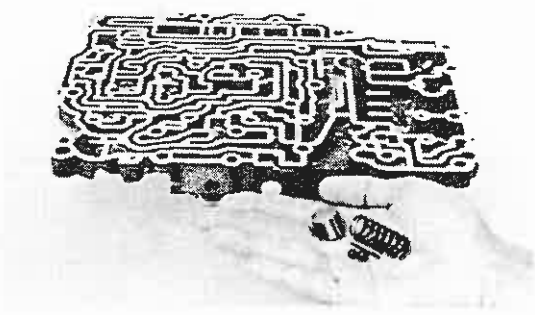
(Lower Valve Body)



DISASSEMBLY OF LOWER VALVE BODY

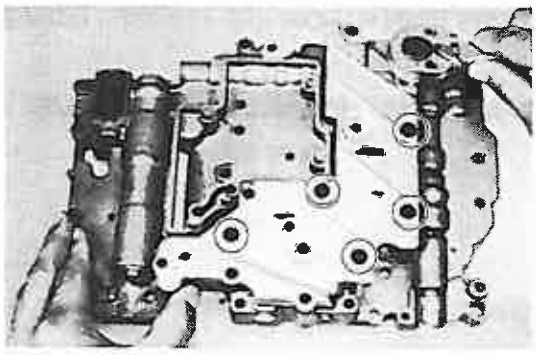


1. REMOVE LOWER VALVE BODY PLATE AND GASKETS

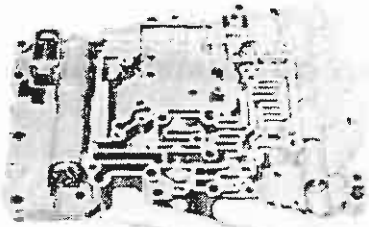


2. REMOVE CHECK BALLS, COOLER BY-PASS CHECK VALVE AND SPRINGS

Note the position of the check balls and valve.

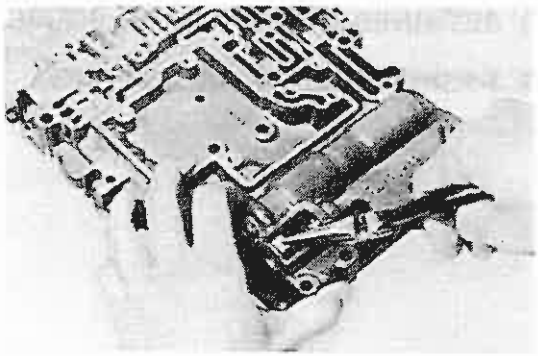


3. TURN ASSEMBLY OVER, REMOVE SET BOLTS AND REMOVE LOWER BODY COVER AND GASKETS



4. REMOVE CHECK BALLS

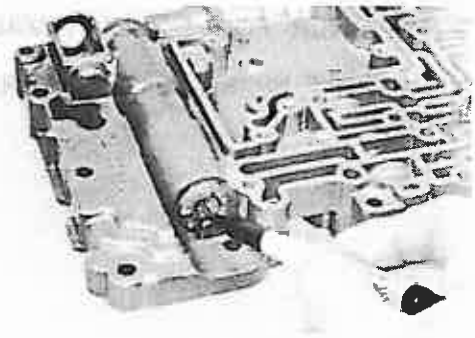
Remove the check balls, being careful not to scratch the grooves. Keep the balls together to prevent losing them.



5. REMOVE SPRING RETAINER FROM PRESSURE RELIEF ASSEMBLY

CAUTION: Cover the spring with your hand. Then, with needle-nose pliers, slowly pull out the spring seat, being careful not to bend the spring.

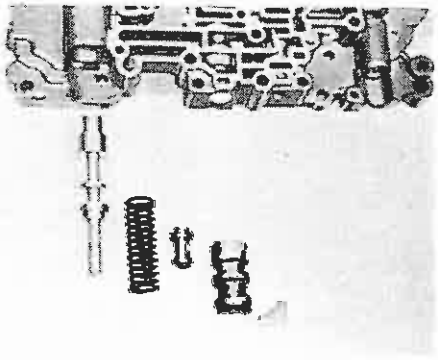
6. REMOVE PRESSURE RELIEF SPRING AND BALL



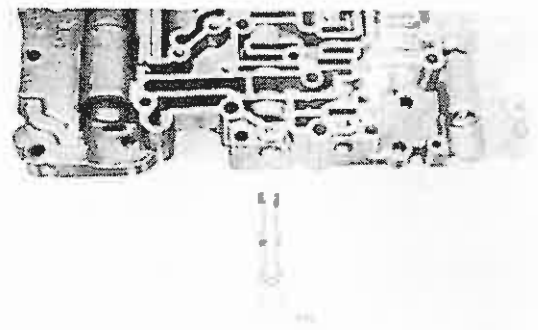
7. REMOVE SPRING RETAINER FROM PRIMARY REGULATOR VALVE

WARNING: Highly compressed spring inside – keep away from face.

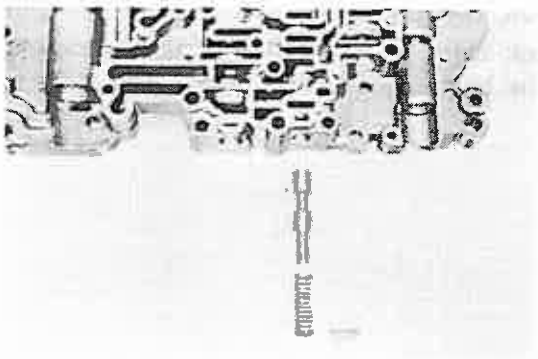
To remove the retainer, hold the valve body face down, and press in on the valve sleeve. The retainer will drop out. Slowly relieve spring compression.



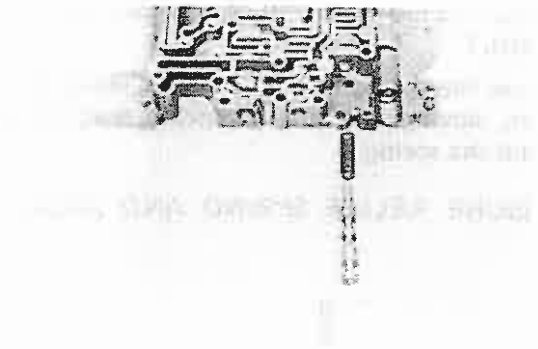
8. REMOVE SLEEVE, PLUNGER, SPRING AND PRIMARY REGULATOR VALVE



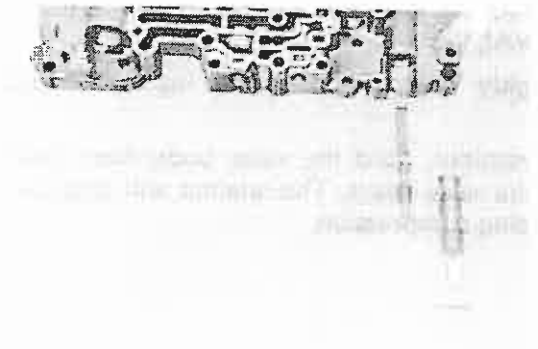
9. REMOVE PLUG RETAINER FOR D-2 DOWN TIMING VALVE
10. REMOVE PLUG AND D-2 DOWN TIMING VALVE



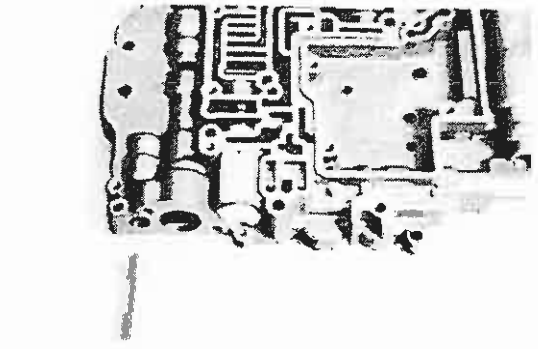
11. REMOVE SPRING RETAINER FOR Co EXHAUST VALVE
12. REMOVE SPRING AND Co EXHAUST VALVE



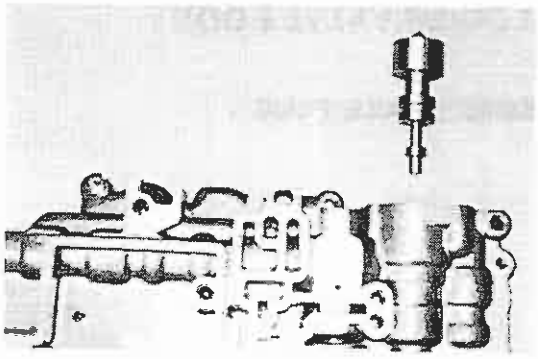
13. REMOVE PLUG RETAINER FOR 3-4 SHIFT VALVE
14. REMOVE PLUG, 3-4 SHIFT VALVE AND SPRING



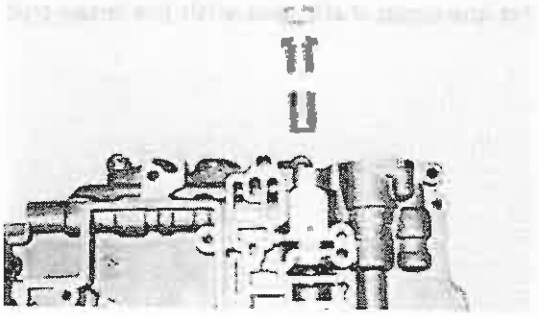
15. REMOVE PLUG RETAINER FOR 1-2 SHIFT VALVE
16. REMOVE PLUG, 1-2 SHIFT UPPER AND LOWER VALVE AND SPRING



17. REMOVE COVER PLATE
18. REMOVE REVERSE BRAKE PLUG



19. REMOVE LOW-COAST SHIFT VALVE



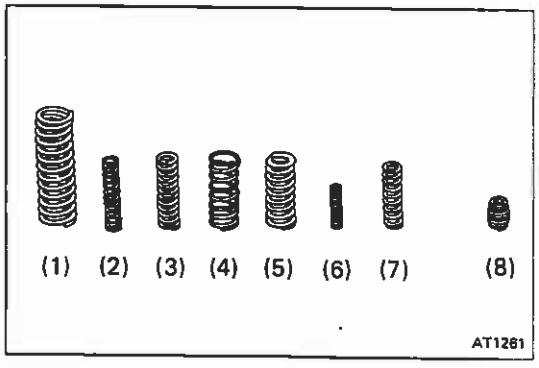
20. REMOVE LOCATING PIN FOR THIRD-COAST SHIFT VALVE

21. REMOVE PLUGS, THIRD-COAST SHIFT VALVE AND 3-4 SHIFT CONTROL VALVE

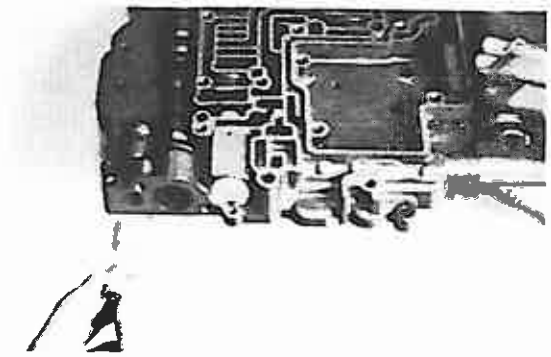
INSPECTION OF LOWER VALVE BODY

INSPECT VALVE SPRINGS

Check for damage, squareness, rust and distorted coils. Measure the spring free length and replace if less than that shown below.



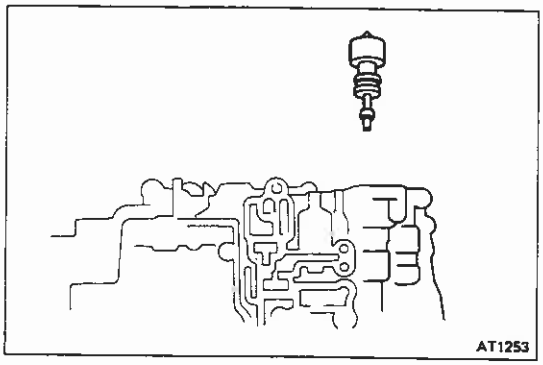
	Free length mm (in.)
(1) Primary regulator valve	60.13 (2.3673)
(2) 1-2 shift valve	34.62 (1.3630)
(3) 3-4 shift valve	35.18 (1.3850)
(4) Check valve (for oil cooler)	33.32 (1.3118)
(5) Pressure relief valve ball	32.14 (1.2654)
(6) Damping ball	20.00 (0.7874)
(7) Overdrive clutch exhaust	31.09 (1.2240)
(8) Cooler return	13.70 (0.5394)



ASSEMBLY OF LOWER VALVE BODY

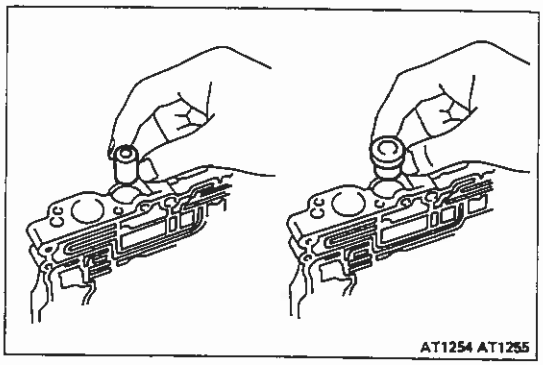
(See page AT-66)

1. INSTALL REVERSE BRAKE PLUG



2. INSTALL LOW-COAST SHIFT VALVE

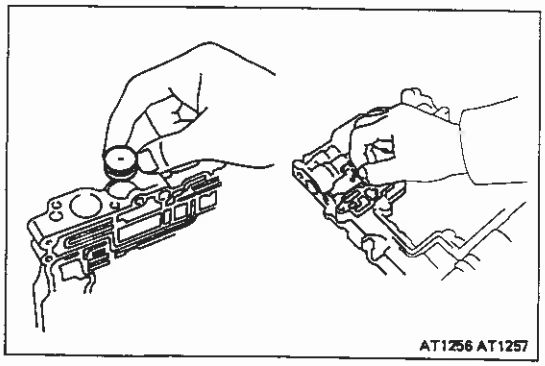
Carefully insert the low-coast shift valve with the small end first.



3. INSTALL 3-4 SHIFT CONTROL VALVE AND THIRD-COAST SHIFT VALVE

(a) Insert the 3-4 shift control valve with the cup side first.

(b) Insert the 3rd-coast shift valve with the small end first.

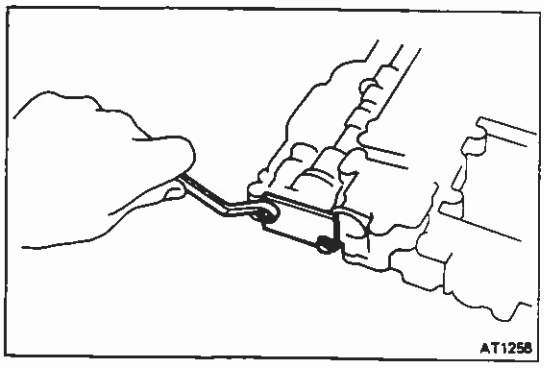


4. INSTALL TWO PLUGS AND LOCATING PIN

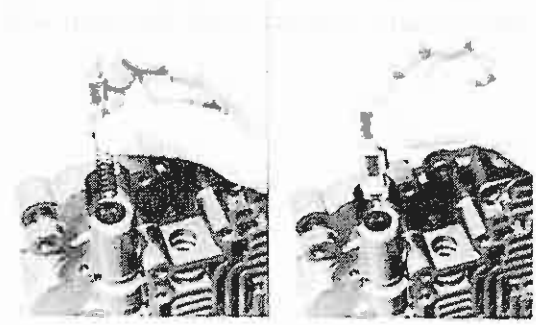
(a) Insert the inside plug with the smaller end first.

(b) Insert the locating pin.

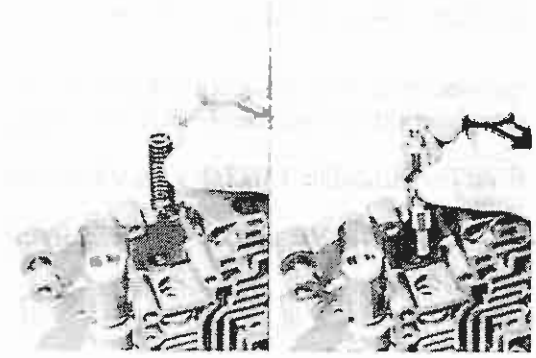
(c) Insert the outside plug.



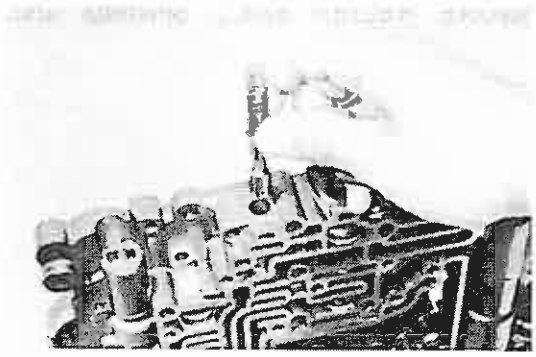
5. INSTALL COVER PLATE



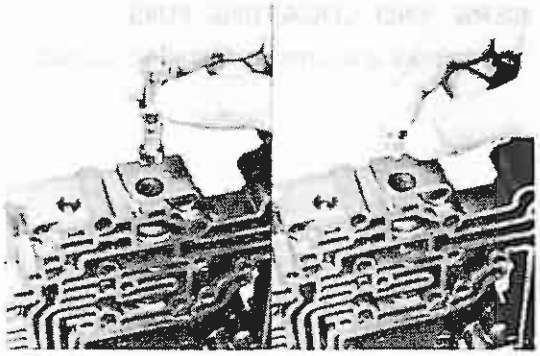
6. **INSERT SPRING, 1-2 SHIFT VALVE AND PLUG**
   Set the valve body on edge and carefully insert the spring, 1-2 shift lower and upper valve (smaller one first) and plug.
7. **INSTALL 1-2 SHIFT VALVE PLUG RETAINER**



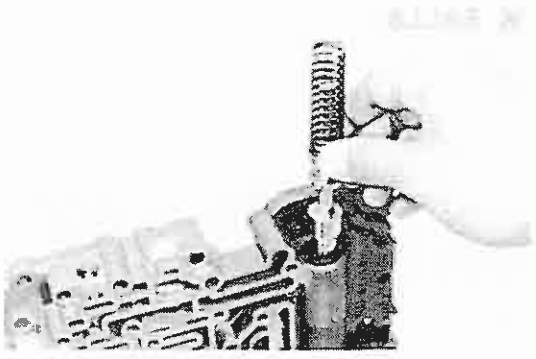
8. **INSERT SPRINGS, 3-4 SHIFT VALVE AND PLUG**
   Set the valve body on edge and carefully insert the spring, 3-4 shift valve (small end first) and plug.
9. **INSTALL 3-4 SHIFT VALVE PLUG RETAINER**



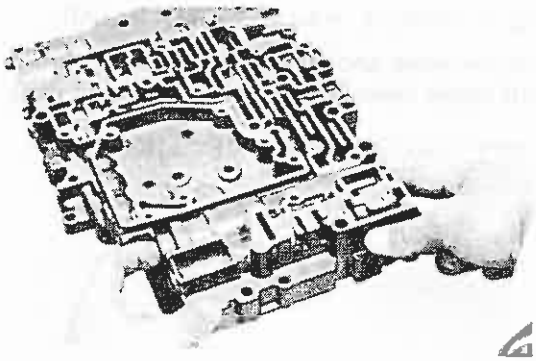
10. **INSTALL Co EXHAUST VALVE AND SPRING**
    Insert the valve with the round end first, and then insert the spring.
11. **INSTALL Co EXHAUST VALVE SPRING RETAINER**
    NOTE: Make sure the retainer fully covers the end of the spring.



12. **INSTALL D-2 DOWN TIMING VALVE AND PLUG**
    Insert the D-2 down timing valve with the small end first and then the plug with the large end first.
13. **INSTALL D-2 DOWN TIMING VALVE RETAINER**

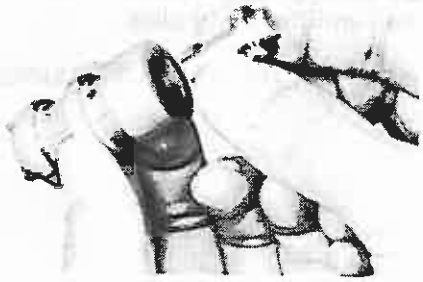


14. **INSERT PRIMARY REGULATOR VALVE AND SPRING**
    Set the valve body on the edge and drop in the valve, large end first, and the spring.



15. CHECK VALVE POSITION

Make sure that the primary regulator valve fits flush with the valve body.



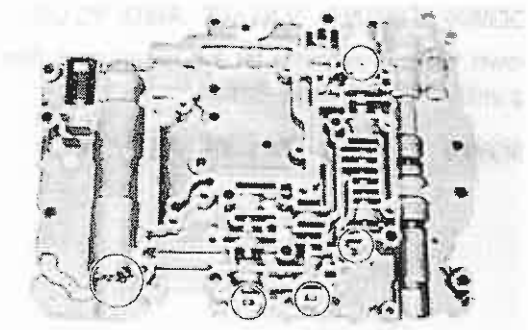
16. INSERT REGULATOR VALVE PLUNGER INTO SLEEVE

Insert with the rounded end first. Make sure that it is fully inserted: the plunger should be recessed inside the sleeve.

17. INSERT SLEEVE WITH PLUNGER INTO VALVE BODY

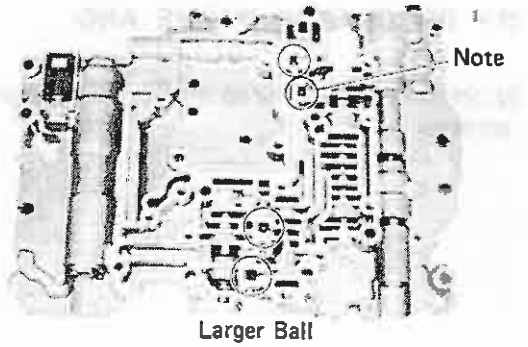
18. INSTALL REGULATOR VALVE SPRING RETAINER

19. INSTALL PRESSURE RELIEF BALL, SPRING AND RETAINER

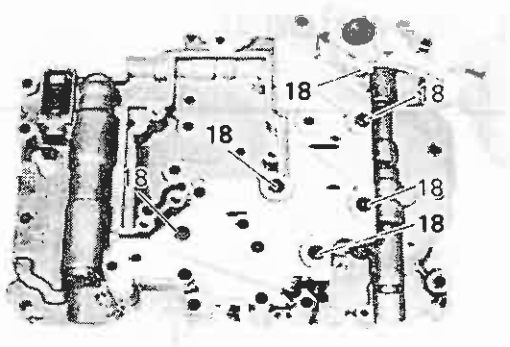


20. CHECK RETAINERS AND LOCATING PINS

Make sure that the retainers and pins are installed correctly.



21. INSTALL CHECK BALLS



22. **INSTALL LOWER BODY COVER**

Install in following order;

Gasket-plate-gasket-cover.

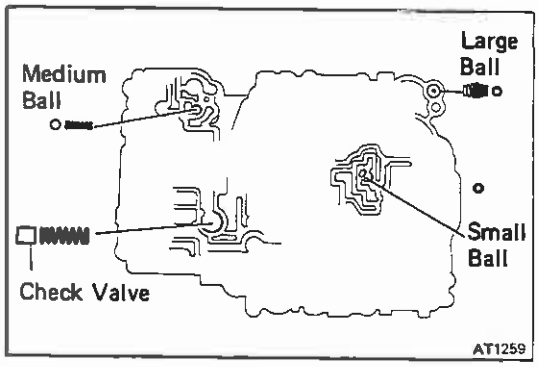
NOTE: The two gaskets are not interchangeable.

23. **INSTALL LOWER BODY COVER SET BOLTS**

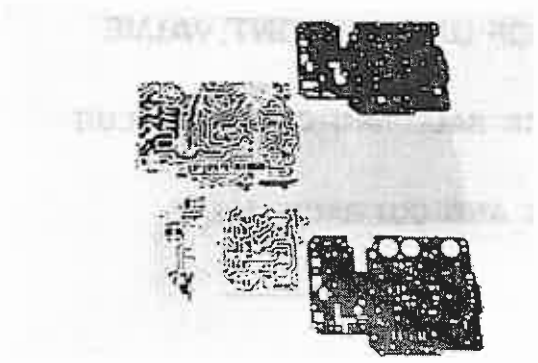
Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)

24. **IDENTIFY CHECK BALLS AND SPRING**

Note the different size of the three rubber check balls and three springs.



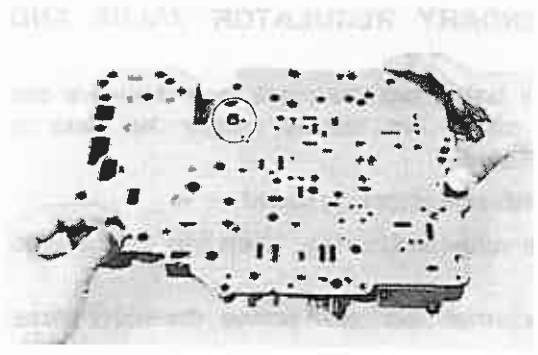
25. **INSTALL SMALL CHECK BALL, SPRING, MEDIUM CHECK BALL, COOLER RETURN SPRING, LARGE BALL AND COOLER BY-PASS CHECK VALVE**



26. **INSTALL LOWER VALVE BODY GASKET**

Note that the two gaskets are not interchangeable. The gasket must lay flat on the valve body.

CAUTION: Make sure that the new gasket matches the old one.

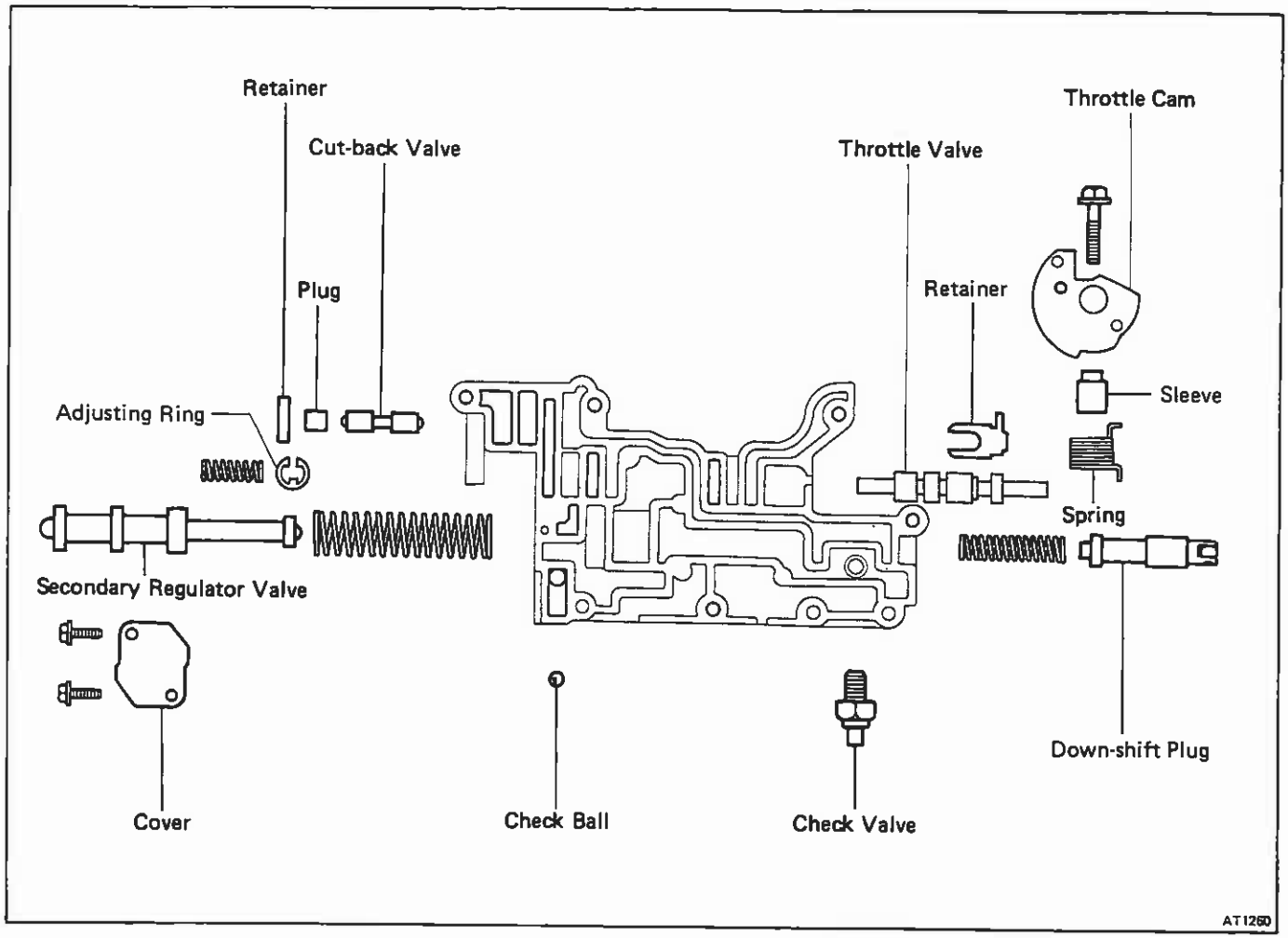


27. **INSTALL LOWER VALVE BODY PLATE**

Set the plate into place. Temporarily install two short bolts finger tight to compress the plate against the spring-loaded check valve.

NOTE: Use the bolts for the oil strainer.

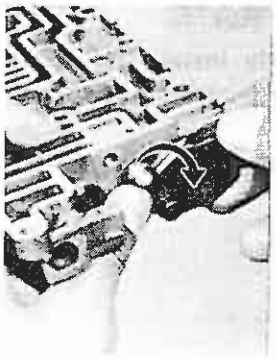
(Upper Front Valve Body)

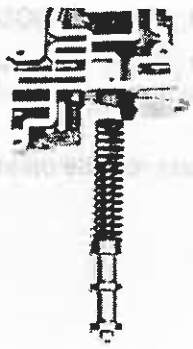


DISASSEMBLY OF UPPER FRONT VALVE BODY

1. REMOVE CHECK BALL AND CUT-BACK PLUG RETAINER

2. REMOVE PLUG AND CUT-BACK VALVE





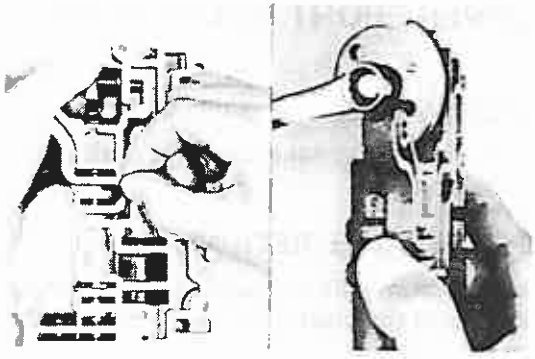
3. REMOVE SECONDARY REGULATOR VALVE AND SPRING

   (a) Remove one bolt from the plate over the valve and loosen the other one. Slowly rotate the plate to uncover the valve.

   WARNING: **The valve is spring loaded.**

   (b) Remove the valve and spring. Keep the spring with the valve.

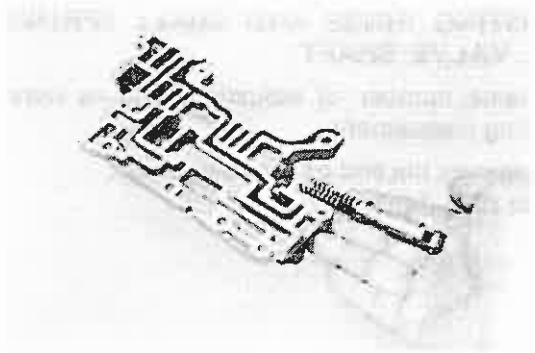
   (c) Remove the other bolt and remove the cover plate.



4. **PUSH DOWN-SHIFT PLUG INTO VALVE BODY AND TEMPORARILY HOLD IN THROTTLE VALVE**

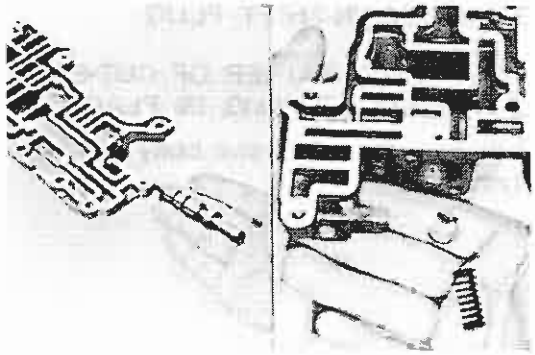
   Temporarily hold the throttle valve in position with the cut-back valve plug retainer.

5. **REMOVE THROTTLE CAM**



6. **REMOVE DOWN-SHIFT PLUG AND SPRING**

   Press on the down-shift plug so that the temporary retainer falls out.



7. **PULL OUT THROTTLE VALVE RETAINER**
8. **REMOVE THROTTLE VALVE**
9. **REMOVE SPRING AND ADJUSTING RINGS**

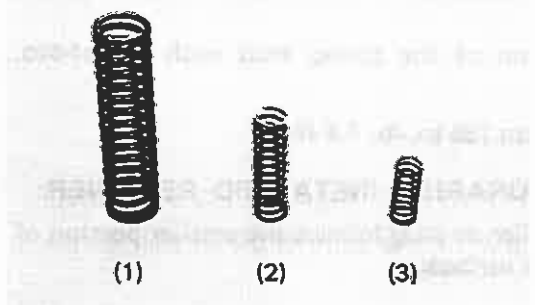
   Note the number of adjusting rings installed.

INSPECTION OF UPPER FRONT VALVE BODY

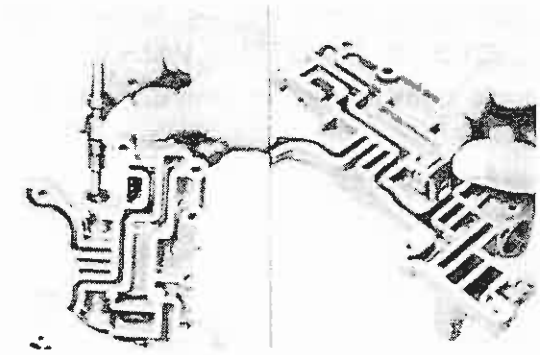
INSPECT VALVE SPRINGS

Check for damage, squareness, rust and collapsed coils.

Measure the spring free length and replace if less than that shown below.



	Free length mm (in.)
(1) Secondary regulator valve	71.27 (2.8059)
(2) Down-shift plug	39.71 (1.5634)
(3) Throttle valve	21.94 (0.8638)



ASSEMBLY OF UPPER FRONT VALVE BODY

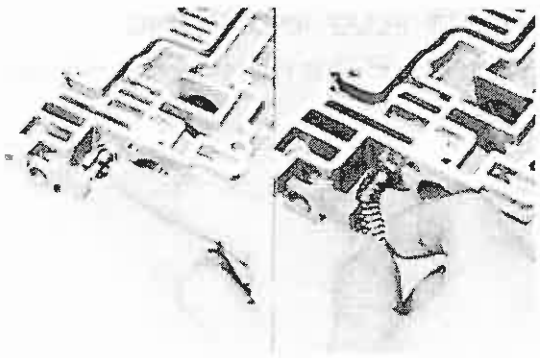
(See page AT-74)

1. INSERT THROTTLE VALVE

   Note arrangement in the photo. Make sure that the valve is inserted fully into the bore.

2. INSTALL THROTTLE VALVE RETAINER

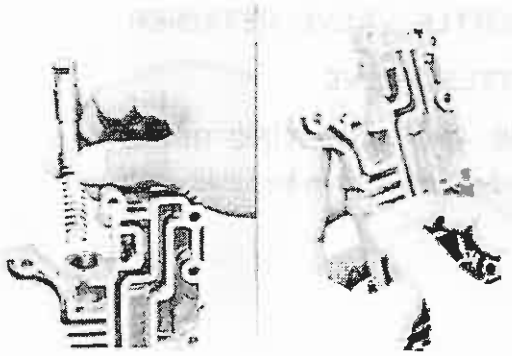
   Coat the clip with petroleum jelly to keep it in place. Note the position of the tabs in the photo. Slip the retainer into place in the valve body.



3. INSTALL ADJUSTING RINGS AND SMALL SPRING ON THROTTLE VALVE SHAFT

   (a) Install the same number of adjusting rings as were removed during disassembly.

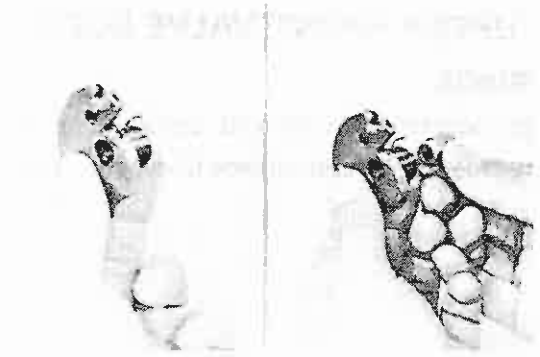
   (b) Slip the spring over the end of the valve shaft. Compress and slide if into place.



4. INSERT SPRING AND DOWN-SHIFT PLUG

5. TEMPORARILY INSTALL RETAINER OF CUT-BACK PLUG TO HOLD DOWN-SHIFT PLUG IN PLACE

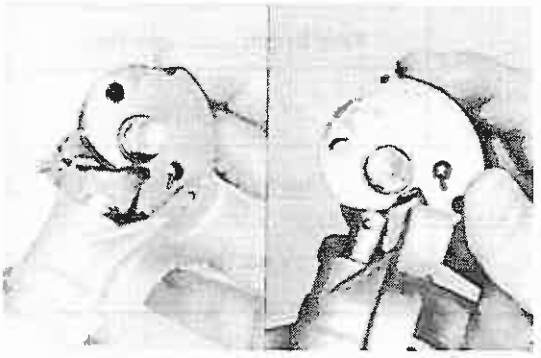
   Push the down-shift plug into the valve body and temporarily install the retainer.



6. ASSEMBLE THROTTLE CAM

   (a) Install the spring with the hook through the hole in the cam.

   (b) Insert the sleeve through one side of the cam.



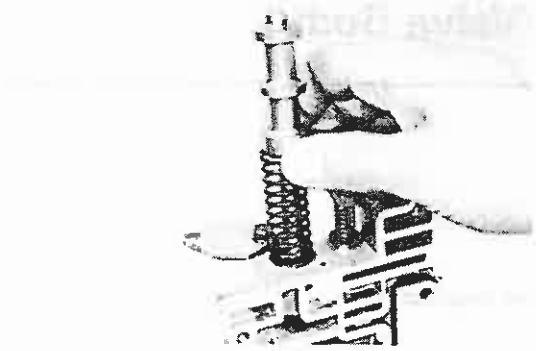
7. INSTALL CAM ASSEMBLY ON UPPER FRONT VALVE BODY

   Check the position of the spring ends with the photo. Tighten the bolt.

   Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)

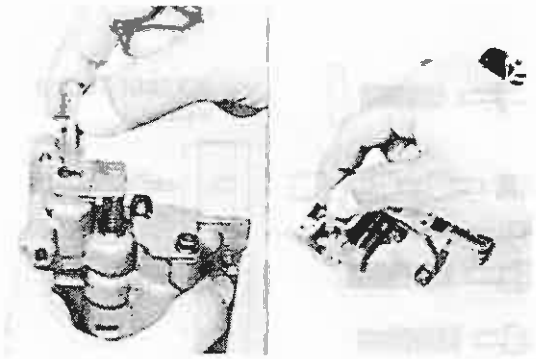
8. REMOVE TEMPORARILY INSTALLED RETAINER

   Make sure the roller or plug follows the smaller portion of the cam (flat edge surface).



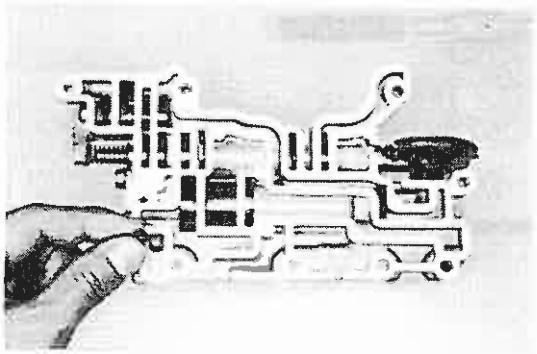
9. INSTALL SECONDARY REGULATOR VALVE
   (a) Partially install the cover plate and insert the spring and secondary regulator valve.
   (b) Compress the spring and swing the cover plate into place.
   (c) Install the second bolt in the cover plate and tighten both bolts.

   Torque: 55 kg-cm (48 in.-lb, 5.4 N-m)



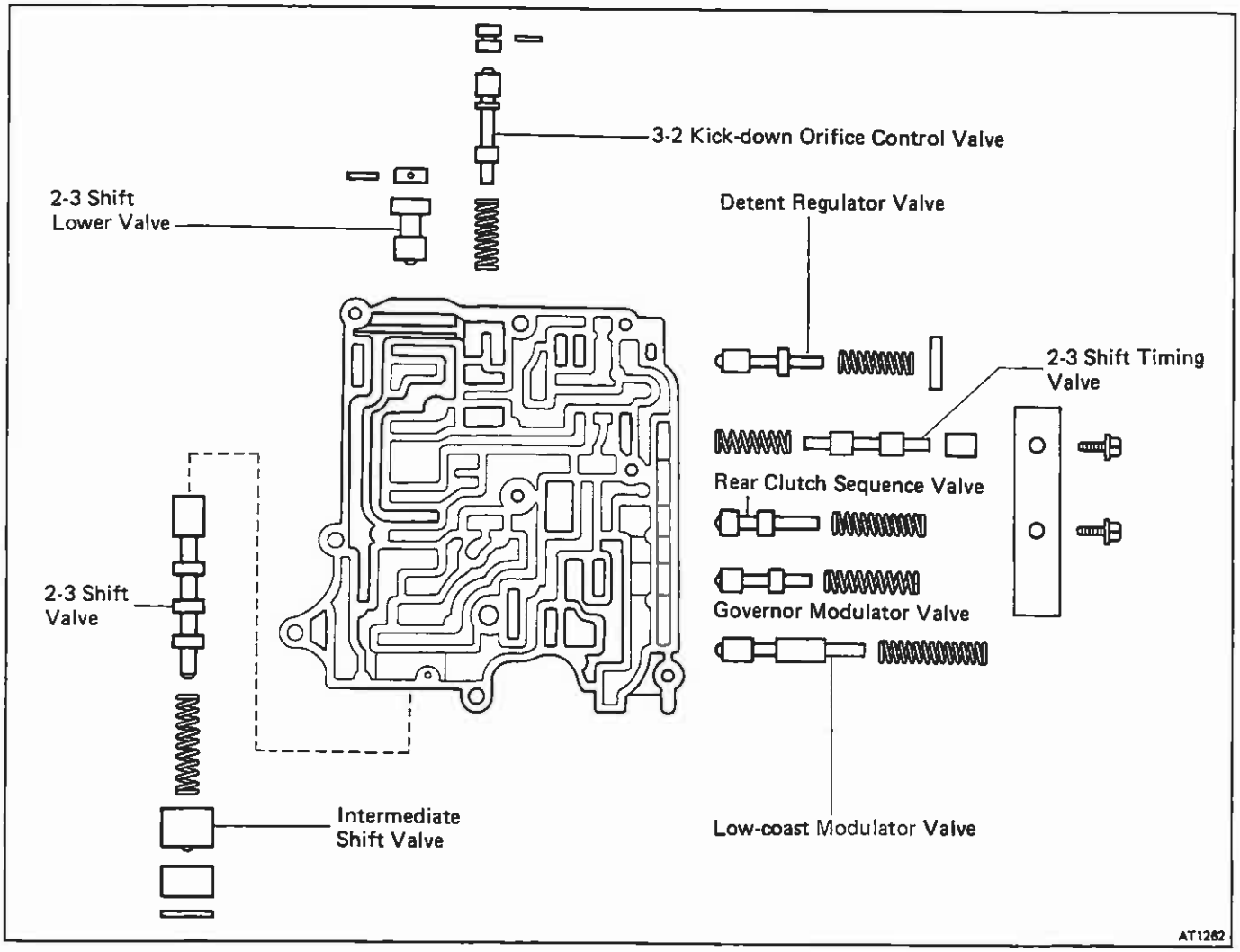
10. INSERT CUT-BACK VALVE AND PLUG
    Install the valve with the smaller end first.

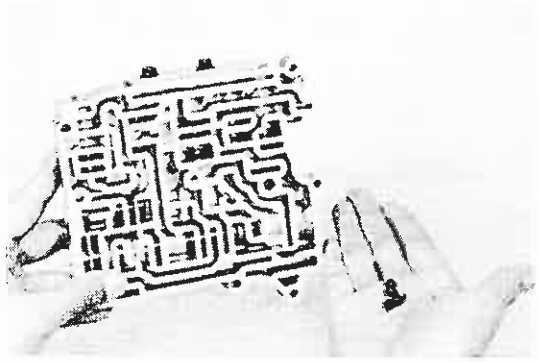
11. INSTALL CUT-BACK VALVE RETAINER
    Coat with petroleum jelly to keep it in place.



12. INSTALL CHECK BALL
    Drop the rubber check ball into place as shown in the figure.

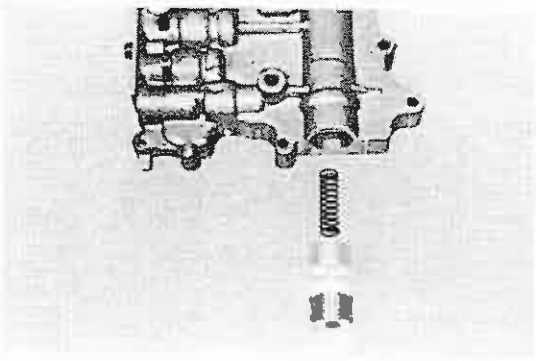
(Upper Rear Valve Body)



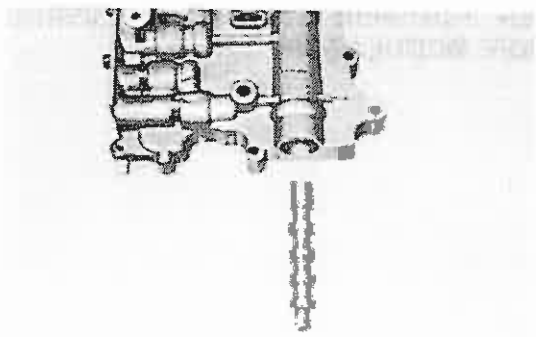


DISASSEMBLY OF UPPER REAR VALVE BODY

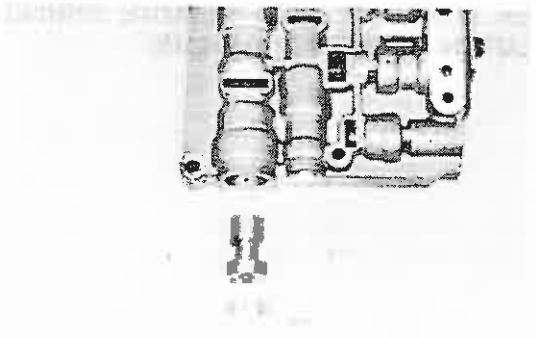
1. REMOVE CHECK BALLS WITH TWEEZERS
   (4 rubber balls, 1 steel ball)



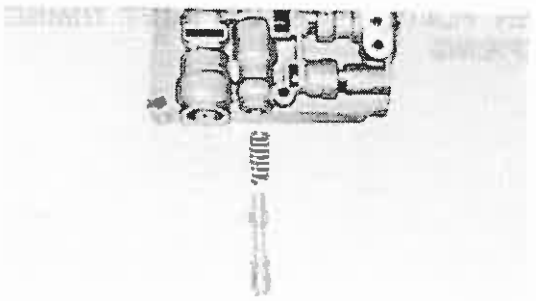
2. REMOVE INTERMEDIATE SHIFT VALVE LOCATING PIN
3. REMOVE PLUG, INTERMEDIATE SHIFT VALVE AND SPRING



4. REMOVE 2-3 SHIFT VALVE
   (a) Remove the 2-3 shift valve.



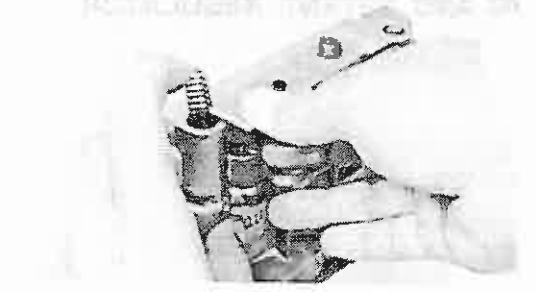
   (b) Remove the 2-3 shift lower valve locating pin.
   (c) Remove the plug and 2-3 shift lower valve.



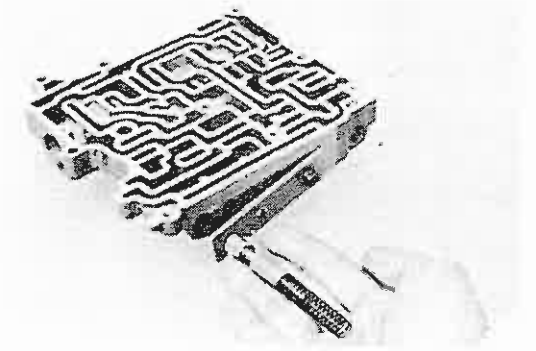
5. REMOVE 3-2 KICK-DOWN ORIFICE CONTROL VALVE
   (a) Remove the 3-2 kick-down orifice control valve locating pin.
   (b) Remove the plug, 3-2 kick-down orifice control valve and spring.

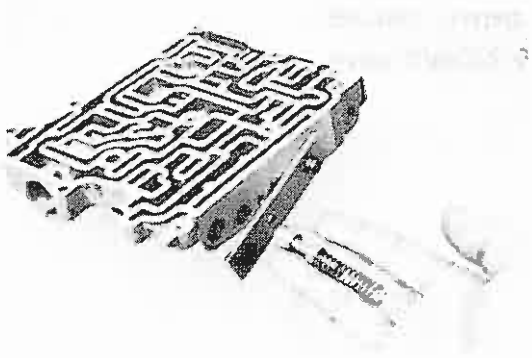
6. REMOVE ONE BOLT FROM VALVE BODY SIDE COVER

7. SLIGHTLY ROTATE COVER TO SHOW LOW-COAST MODULATOR VALVE ONLY
   Hold your hand over the spring.

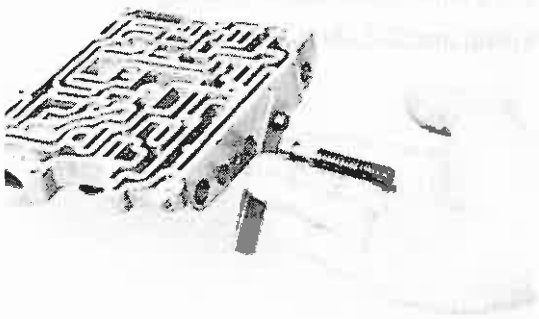


8. REMOVE SPRING AND LOW-COAST MODULATOR VALVE

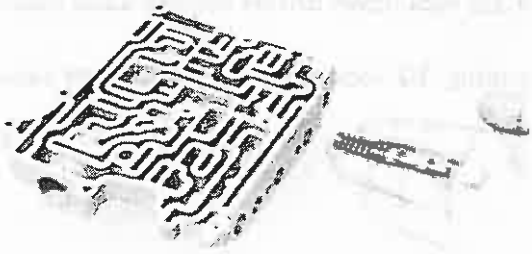




9. ROTATE COVER FURTHER AND REMOVE SPRING AND GOVERNOR MODULATOR VALVE



10. ROTATE COVER FURTHER AND REMOVE SPRING AND REAR CLUTCH SEQUENCE VALVE



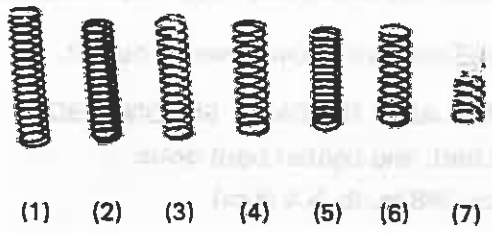
11. REMOVE COVER PLATE, PLUG, 2-3 SHIFT TIMING VALVE AND SPRING

12. REMOVE DETENT REGULATOR VALVE RETAINER
13. REMOVE SPRING AND DETENT REGULATOR VALVE

INSPECTION OF UPPER REAR VALVE BODY

INSPECT VALVE SPRINGS

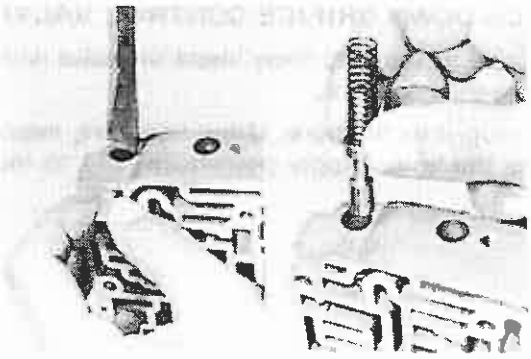
Check for damage, squareness, rust and collapsed coils. Measure the spring free length and replace if less than that shown below.



	Free length mm (in.)
(1) Low-coast modulator valve	42.35 (1.6673)
(2) Rear clutch sequence valve	37.55 (1.4783)
(3) Governor modulator valve	36.07 (1.4201)
(4) 2-3 shift valve	34.09 (1.3421)
(5) Detent regulator valve	30.43 (1.1980)
(6) 2-3 shift timing valve	29.82 (1.1740)
(7) 3-2 kick-down orifice control valve	25.17 (0.9909)

ASSEMBLY OF UPPER REAR VALVE BODY

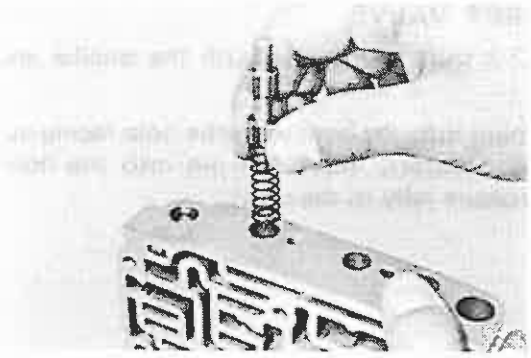
(See page AT-78)



1. INSTALL DETENT REGULATOR VALVE, SPRING AND RETAINER

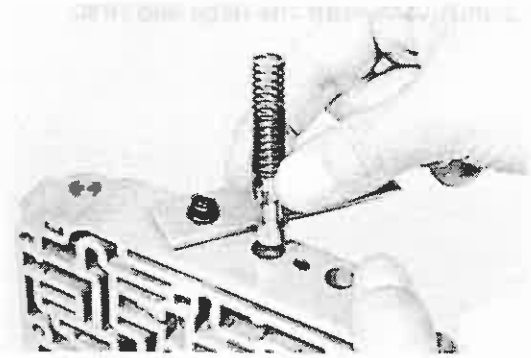
   Insert the valve, round end first, and then the spring. Compress the spring and allow the retainer to fall into place.

   NOTE: Make sure that the retainer fully covers the end of the spring.



2. INSTALL SPRING AND 2-3 SHIFT TIMING VALVE

   Insert the valve spring, and then the valve.

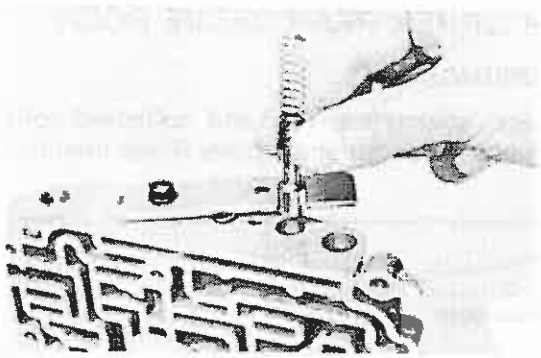


3. INSTALL VALVE BODY SIDE COVER WITH ONE BOLT

   Compress the intermediate modulator spring and install the end bolt finger tight.

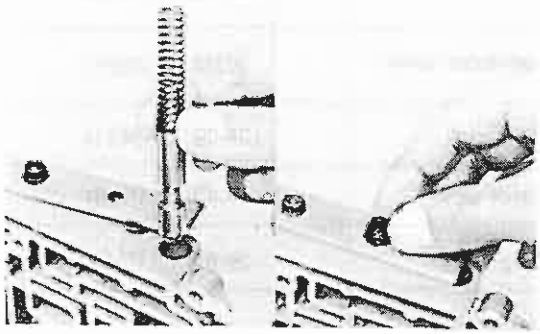
4. INSERT REAR CLUTCH SEQUENCE VALVE AND SPRING

   Insert the valve with the round end first. Then insert the spring.
   Compress the spring and rotate the cover to hold it.



5. **INSERT GOVERNOR MODULATOR VALVE AND SPRING**

Insert the valve with the round end first. Then insert the spring.
Compress the spring and rotate the cover further to hold the spring.



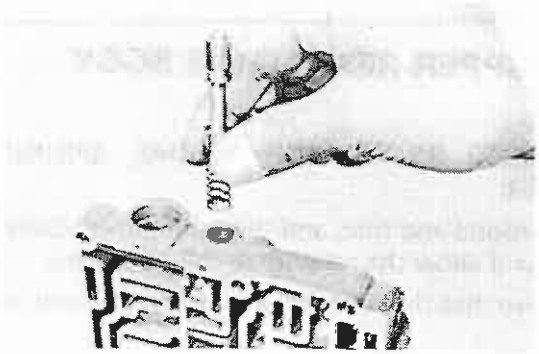
6. **INSERT LOW MODULATOR VALVE AND SPRING**

Insert the valve with the round end first. Then insert the spring.
Compress the spring and swing cover over to hold it.

7. **POSITION COVER AND INSTALL SECOND BOLT**

Install the second bolt, and tighten both bolts.

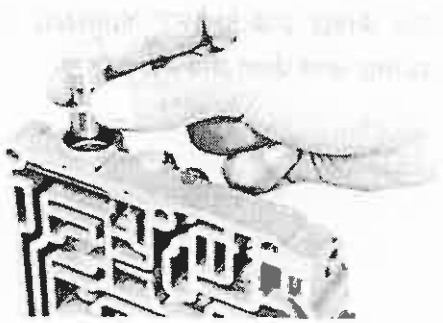
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



8. **INSERT 3-2 KICK-DOWN ORIFICE CONTROL VALVE**

(a) Insert the valve spring, and then insert the valve with the longer bevelled end first.

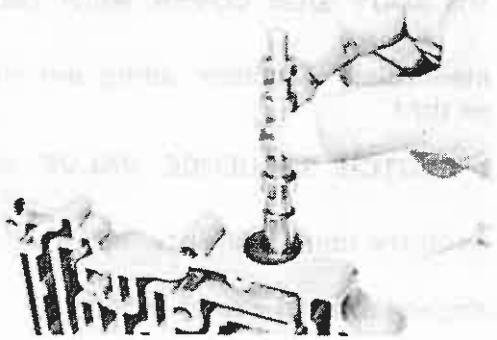
(b) Install the plug into the bore. Using tweezers, insert the pin into the hole. (Apply petroleum jelly to the pin.)



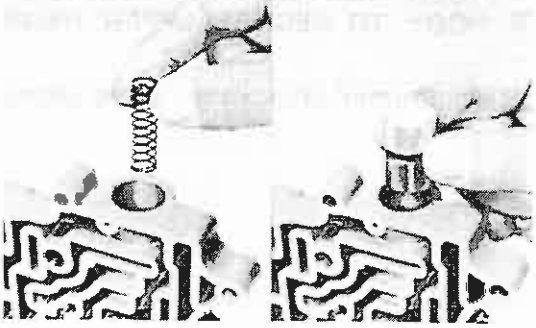
9. **INSERT 2-3 SHIFT VALVE**

(a) Insert the 2-3 shift lower valve with the smaller end first.

(b) Install the plug into the bore with the hole facing upward. Using tweezers, insert the pin into the hole. (Apply petroleum jelly to the pin.)



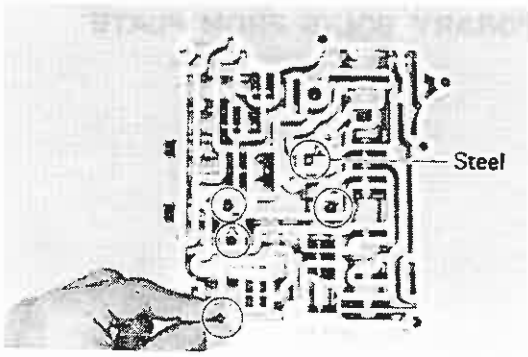
(c) Insert the 2-3 shift valve with the large end first.



10. INSERT SPRING AND INTERMEDIATE SHIFT VALVE INTO BORE

Insert the valve with the round end up.

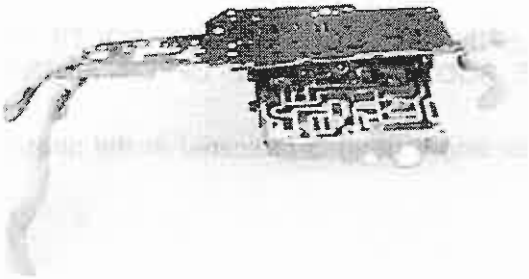
11. INSERT PLUG AND LOCATING PIN



12. INSTALL CHECK BALLS AS SHOWN

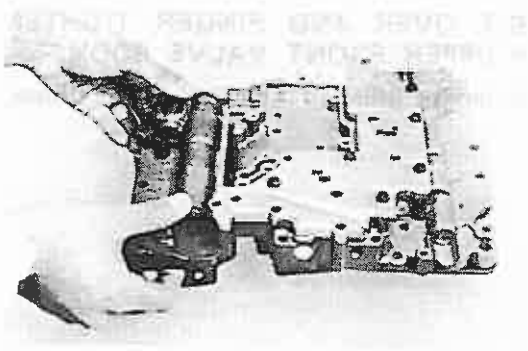
Install the steel ball in position shown in the figure.
The four rubber balls are identical and may be installed in any other of the positions.

(Assembly of Valve Body)



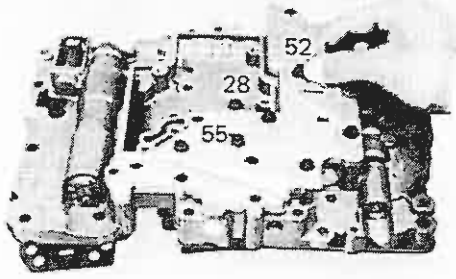
1. POSITION NEW GASKET ON UPPER REAR VALVE BODY

Make sure that the new gasket matches the old gasket before installation. Align the gasket at the lower left corner.



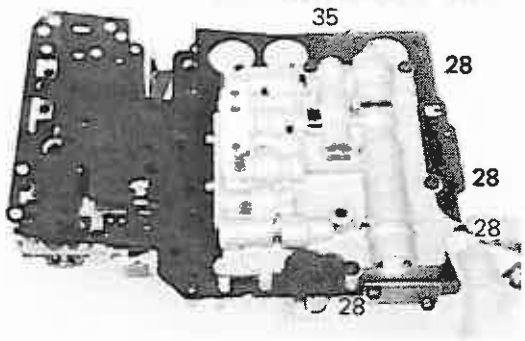
2. PLACE LOWER VALVE BODY WITH PLATE ON TOP OF UPPER REAR VALVE BODY

Align the left edge.



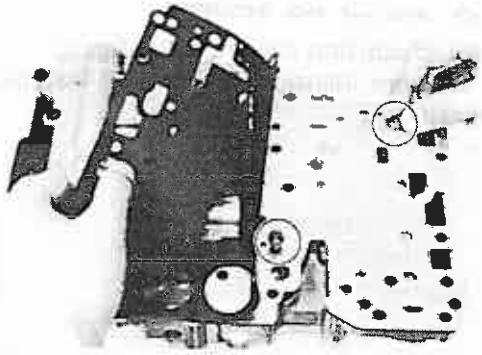
3. **INSTALL AND FINGER TIGHTEN THREE BOLTS IN LOWER VALVE BODY TO SECURE UPPER REAR VALVE BODY**

NOTE: Each bolt length (mm) is indicated in the photo.

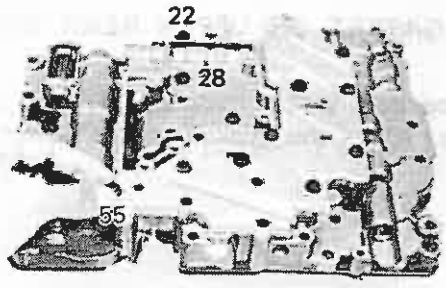


4. **TURN ASSEMBLY OVER, CHECK GASKET ALIGNMENT AND FINGER TIGHTEN FIVE BOLTS IN UPPER REAR VALVE BODY**

NOTE: Each bolt length (mm) is indicated in the figure.



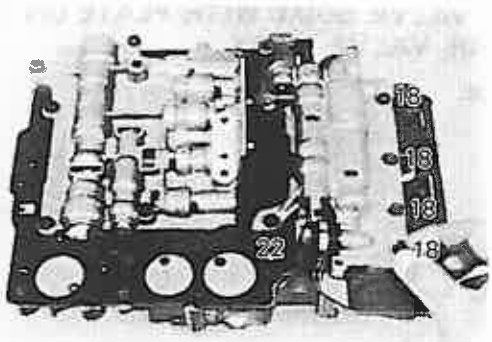
5. **REMOVE TEMPORARY BOLTS FROM PLATE**



6. **PLACE LOWER AND UPPER REAR VALVE BODY ASSEMBLY ON TOP OF UPPER FRONT VALVE BODY**

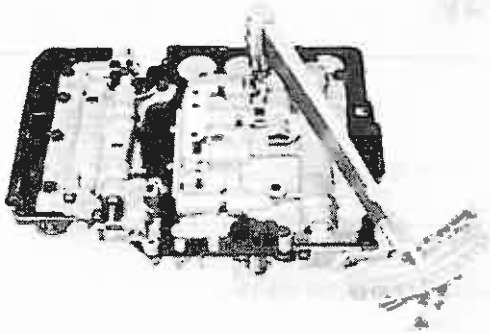
7. **INSTALL AND FINGER TIGHTEN SET BOLTS IN LOWER VALVE BODY TO SECURE UPPER FRONT VALVE BODY**

NOTE: Each bolt length (mm) is indicated in the photo.



8. **TURN ASSEMBLY OVER AND FINGER TIGHTEN FIVE BOLTS IN UPPER FRONT VALVE BODY**

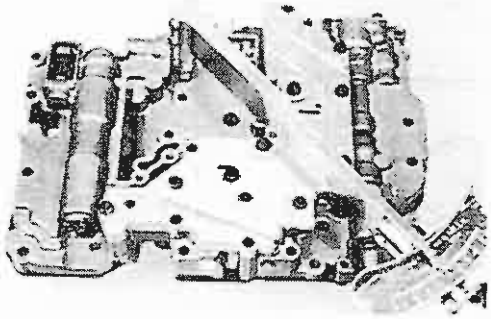
NOTE: Each bolt length (mm) is indicated in the photo.



9. **TIGHTEN BOLTS IN UPPER FRONT AND REAR VALVE BODIES**

Recheck the alignment of the gaskets. Tighten the bolts.

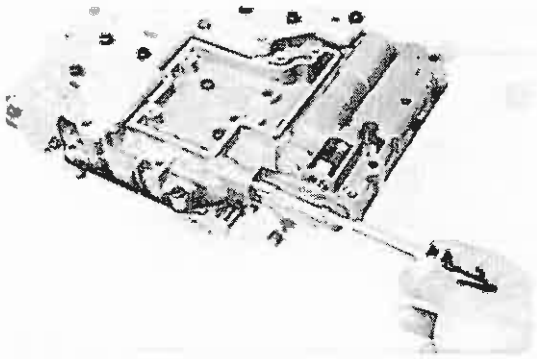
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



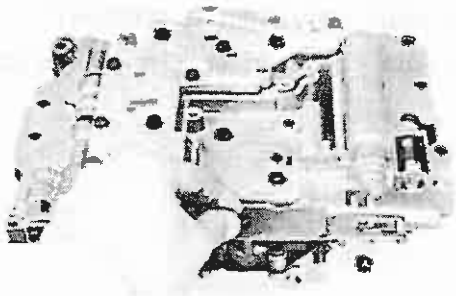
10. **TURN ASSEMBLY OVER AND TIGHTEN BOLTS IN LOWER VALVE BODY**

Tighten the bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



11. **INSERT MANUAL VALVE**

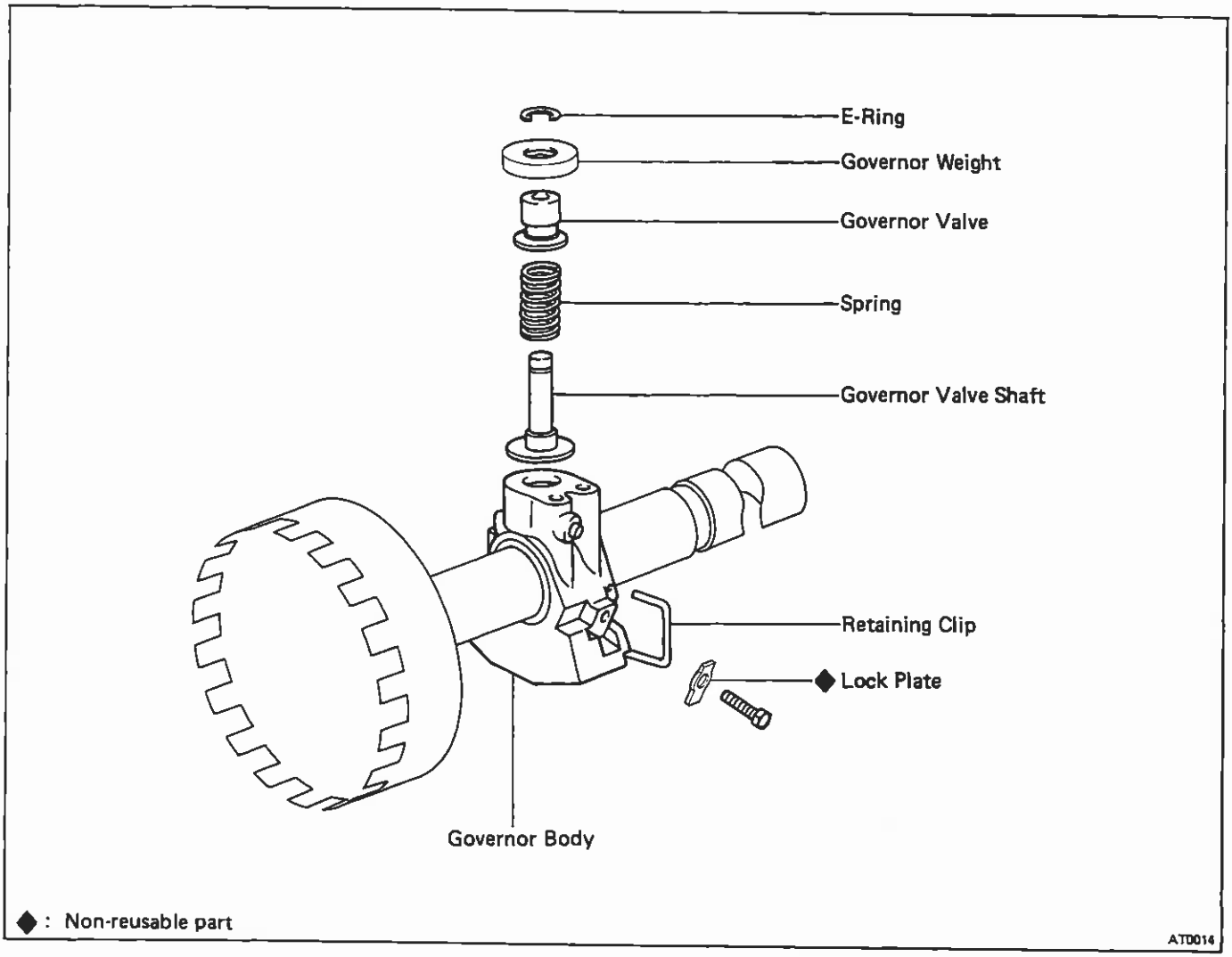


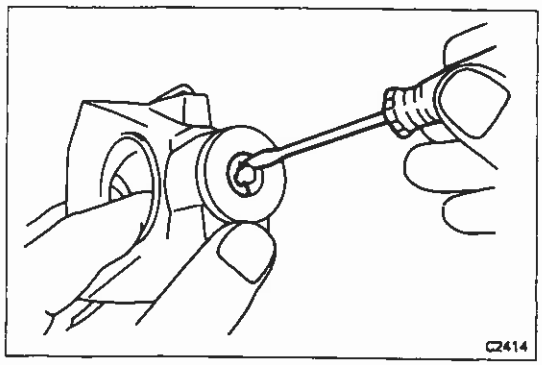
12. **INSTALL DETENT SPRING**

Tighten the bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

Governor Body





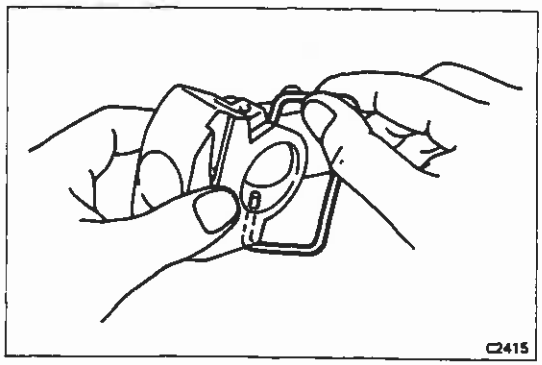
DISASSEMBLY OF GOVERNOR BODY

1. REMOVE E-RING AND GOVERNOR WEIGHT

   Remove the E-ring with a screwdriver. Lift off the governor weight.

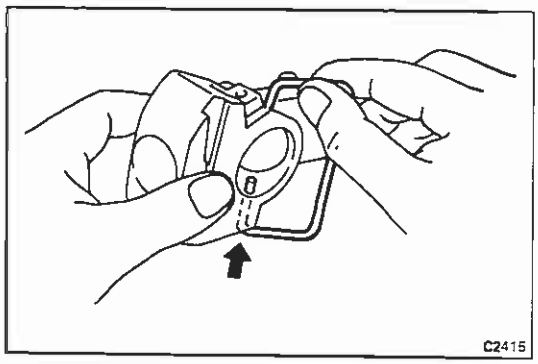
2. REMOVE GOVERNOR VALVE

   Slide it down through the bore.



3. REMOVE RETAINING CLIP

   Remove the end, indicated by an arrow, being careful not to scratch the governor body.

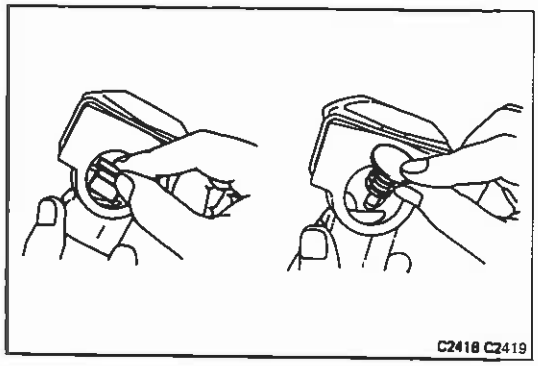


ASSEMBLY OF GOVERNOR BODY

(See page AT-86)

1. INSTALL RETAINING CLIP

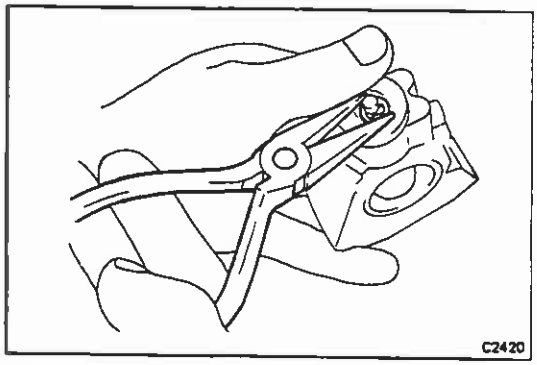
   Install the clip end, indicated by an arrow, being careful not to scratch the governor body.



2. INSTALL GOVERNOR VALVE, SPRING AND SHAFT

   (a) Slide down the governor valve through the bore.

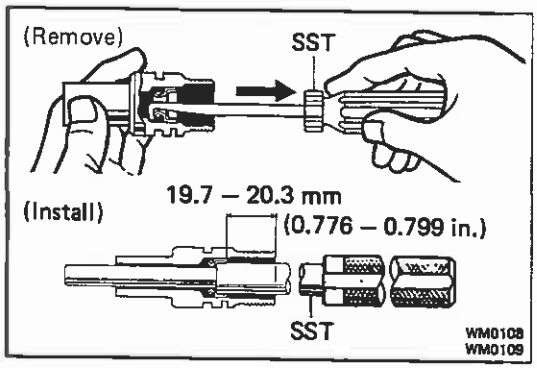
   (b) Slide down the spring and shaft through the bore.



3. INSTALL GOVERNOR WEIGHT AND E-RING ON SHAFT

   Compress the spring, and install the E-ring on the shaft with needle-nose pliers. Make sure that it is fully seated in the groove.

   NOTE: Make sure that the valve moves smoothly.



Extension Housing

INSPECTION OF SPEEDOMETER GEAR AND EXTENSION HOUSING

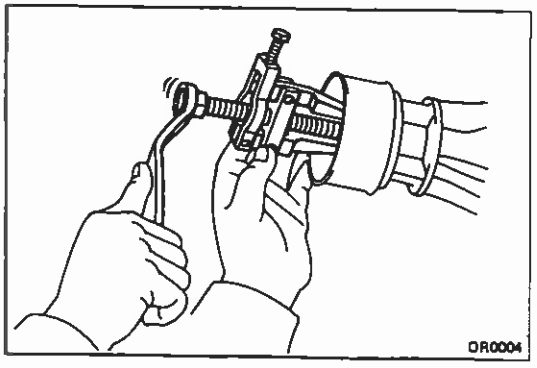
1. IF NECESSARY, REPLACE SPEEDOMETER GEAR OIL SEAL

   (a) Using SST, remove the oil seal.

   SST 09921-00010

   (b) Using SST, install a new oil seal.

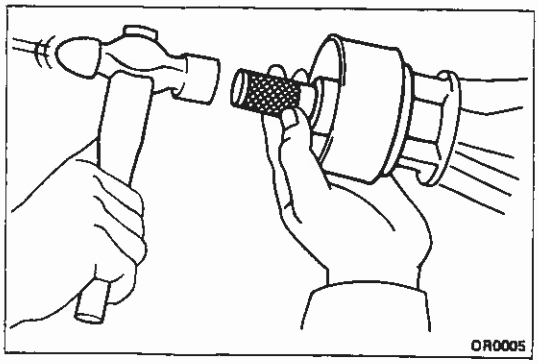
   SST 09201-60011



2. IF NECESSARY, REPLACE OIL SEAL AND DUST SEAL

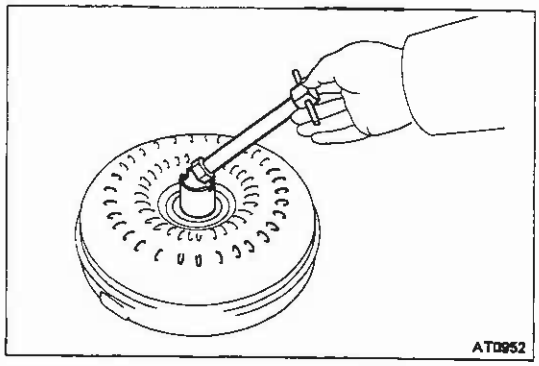
   (a) Using SST, remove the oil seal.

   SST 09308-10010



(b) Using SST, drive in a new oil seal and dust seal.

SST 09325-20010



Torque Converter

CLEAN TORQUE CONVERTER

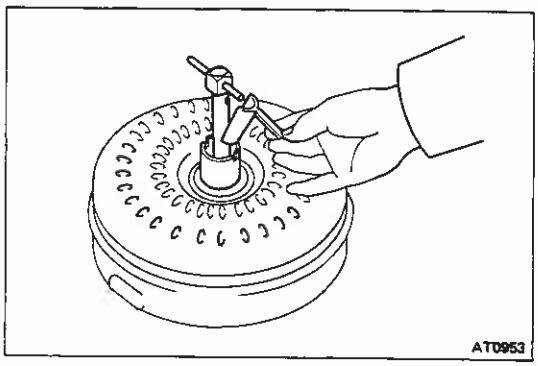
If the transmission is contaminated, the torque converter and transmission cooler should be thoroughly flushed, using Toyota Transmission Cleaner.

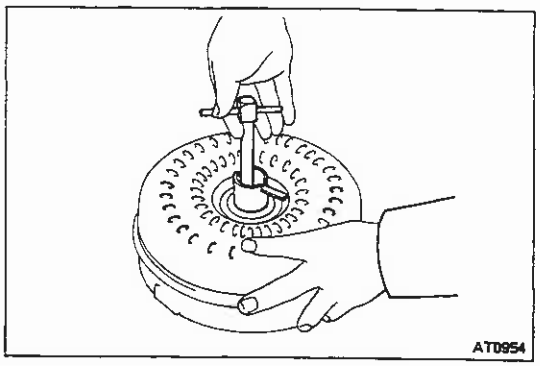
INSPECTION OF TORQUE CONVERTER

1. INSERT SST IN END OF TORQUE CONVERTER

Insert a turning tool in the inner race of the one-way clutch. Insert the stopper so that it fits in the notch of the converter hub and other race of the one-way clutch.

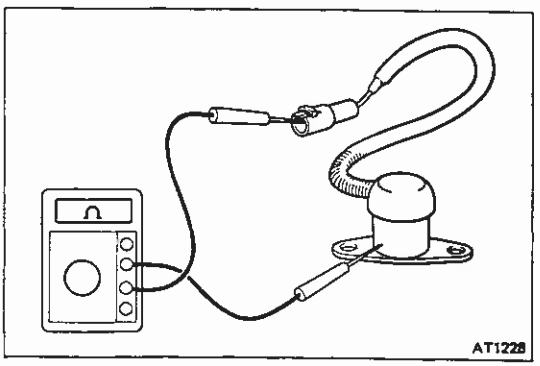
SST 09350-20013





2. TEST ONE-WAY CLUTCH

The clutch should lock when turned counterclockwise, and should rotate freely and smoothly clockwise. Less than 25 kg-cm (22 in.-lb, 2.5 N·m) of torque should be required to rotate the clutch clockwise. If necessary, clean the converter and retest the clutch. Replace the converter if the clutch still fails the test.

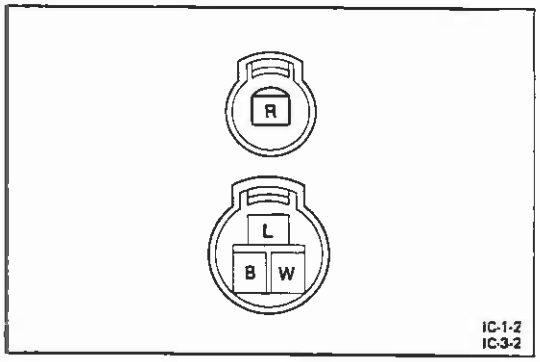


Electrical Parts

1. INSPECT OVERDRIVE SOLENOID

Check resistance between the terminals.

Standard resistance: About 13 Ω



2. **INSPECT NEUTRAL START SWITCH**

(a) Check that there is continuity between terminals B and W in "P" and "N" ranges.

(b) Check that there is continuity between terminals L and R in the "R" range.

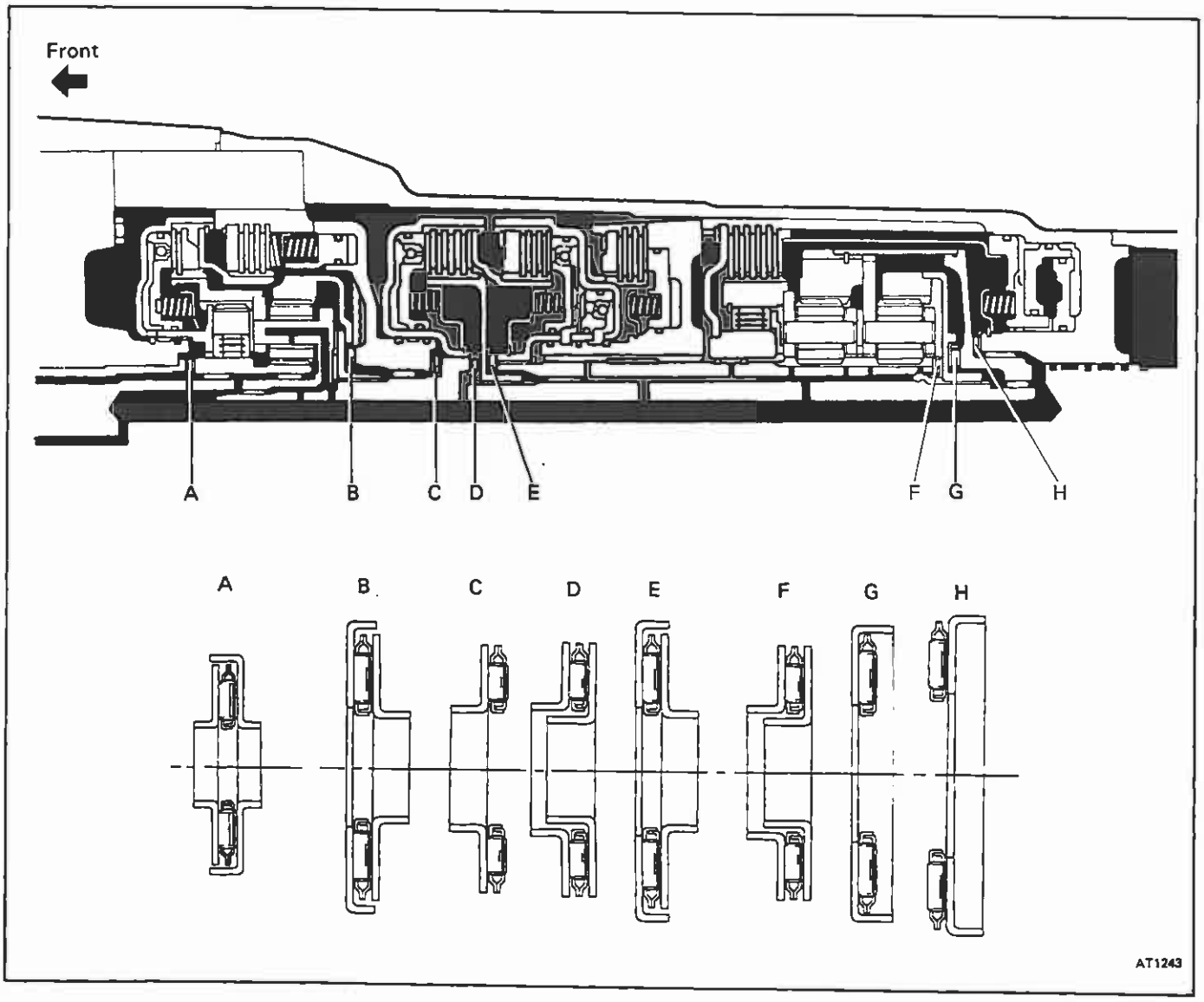
ASSEMBLY OF TRANSMISSION

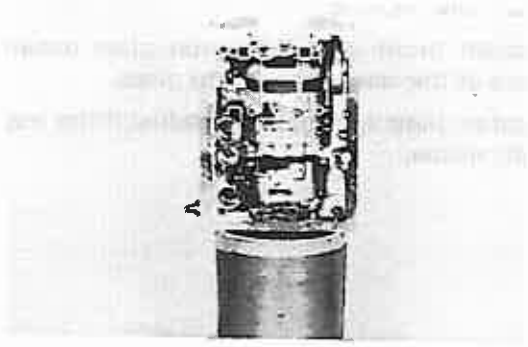
Disassembly, inspection and assembly of each component group have been indicated in the preceding chapter. This chapter deals with assembly of A40D transmission.

Before assembly, make sure again that all component groups are assembled correctly. If something wrong is found in a certain component group during assembly, inspect and repair this group immediately. Recommended ATF type DEXRON II.

GENERAL ASSEMBLY NOTE:

1. The automatic transmission is composed of highly precision-finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage or affect performance.
2. Do not use adhesive cements on gaskets and similar parts.
3. Before assembling new clutch discs, soak them in automatic transmission fluid for at least two hours.
4. When assembling the transmission, be sure to use new gaskets and O-rings.
5. Apply automatic transmission fluid on sliding or rotating surfaces of the parts before assembly.
6. Dry all parts by blowing with compressed air. Never use shop rags.
7. Use petroleum jelly to keep the small parts in their places.
8. Be sure to install the thrust bearings and races in the correct direction and position.

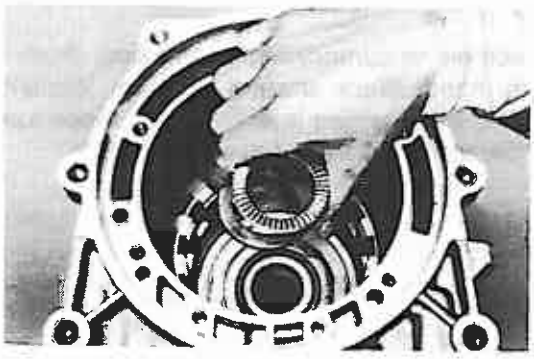




1. **PLACE TRANSMISSION CASE ON CYLINDER**

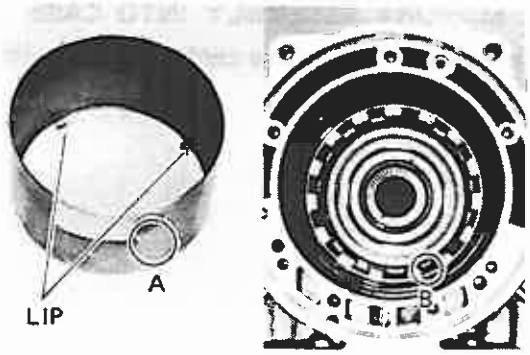
Place the transmission on a cylindrical stand for more efficient work.

CAUTION: Place shop rags between the case and stand to avoid damaging the case.



2. **INSTALL THRUST WASHER AND BEARING**

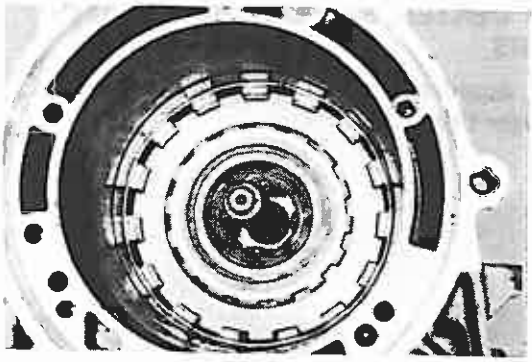
Install the thrust washer, facing the cup side downward.



3. **INSTALL APPLY TUBE IN CASE**

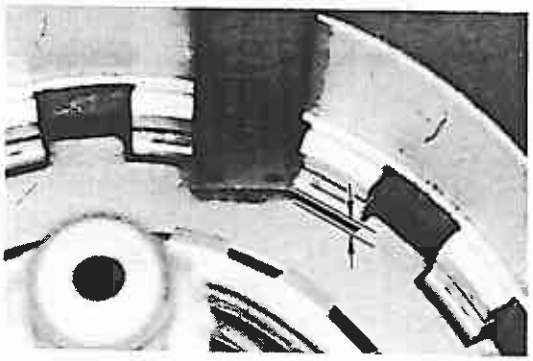
Install the tube aligning its locking tab (part A) with part B of the case.

NOTE: Make sure that the lips of the tube end are completely inserted onto the outer piston.



4. **PARTIALLY INSERT OUTPUT SHAFT ASSEMBLY INTO CASE**

Before installing the output shaft, align the tab of the clutch plates with each plate.

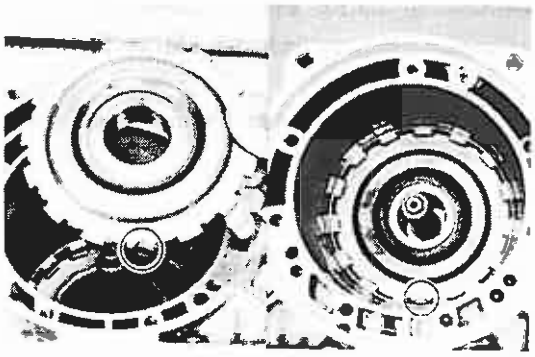


5. **CHECK CLUTCH PACK CLEARANCE**

With the case in upright position, make sure that the clutch pack is lower than the ledge below the snap ring groove.

If the clutch pack is not lower than the ledge, components may be misassembled or there may be excess ATF on the discs.

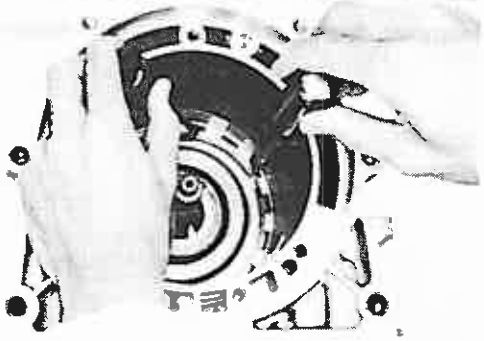
Standard clearance : 0.61 — 2.64 mm (0.0240 — 0.1039 in.)



6. INSTALL REACTION PLATE

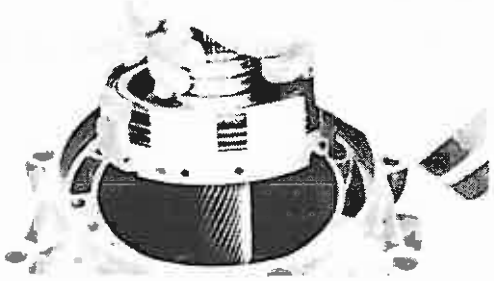
Position the notched tooth of the reaction plate toward the valve body side of the case. Push it into place.

NOTE: The reaction plate is correctly installed if the snap ring groove is fully visible.



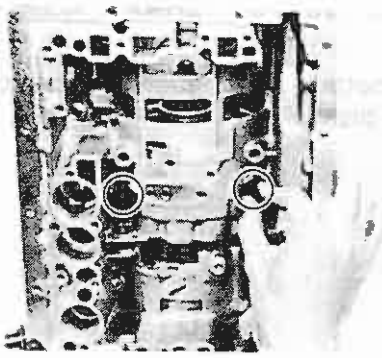
7. INSTALL SNAP RING

Use a large screwdriver to compress the snap ring. Push it into the place by hand. Work around the case. Visually check to make sure that the ring is fully seated. Make sure that the ends of the snap ring are between the lugs.



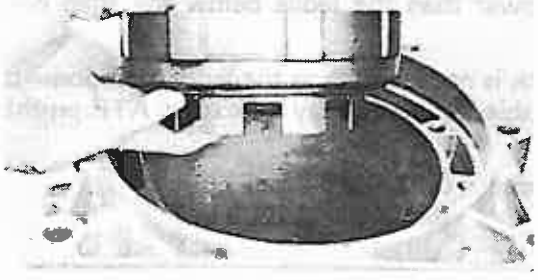
8. PUSH CENTER SUPPORT ASSEMBLY INTO CASE

Align the oil hole and bolt hole of the center support with those of the body side and insert.



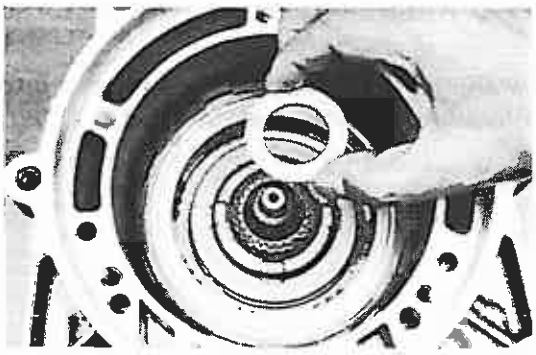
9. INSTALL TWO CENTER SUPPORT BOLTS WITH WAVE WASHERS

Align the center support with holes in the case and install the two bolts finger tight.



10. INSTALL REAR CLUTCH IN CASE

Rotate the clutch to mesh the hub with the center support.



11. CHECK FOR CORRECT INSTALLATION OF REAR CLUTCH

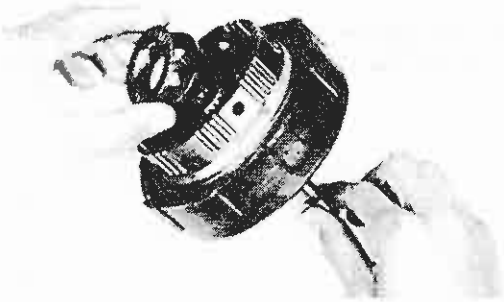
If the rear clutch is fully meshed with the center support, the splined center of the clutch will be flush with the end of the sun gear shaft.

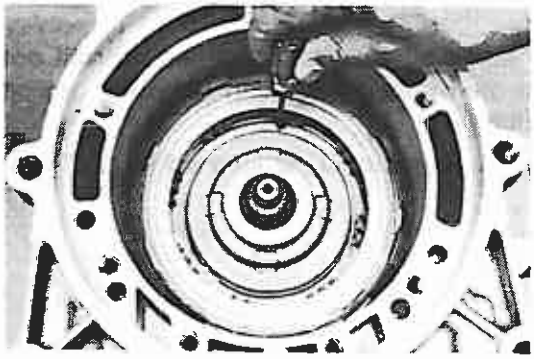
12. INSTALL NEEDLE BEARING RACE OVER SPLINED END OF REAR CLUTCH IN CASE

Coat parts with petroleum jelly to keep them in place. Position lip of the race toward the rear clutch.

13. INSTALL THRUST BEARING AND RACE ON FRONT CLUTCH

Coat parts with petroleum jelly to keep them in the place. Position the lip of the race outward.

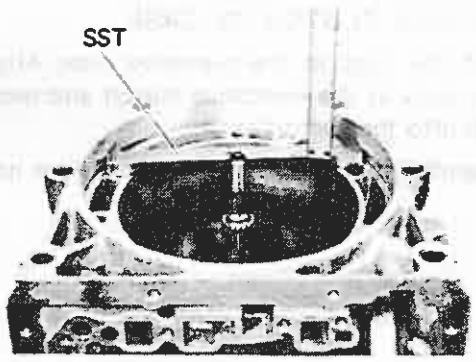




14. INSTALL FRONT CLUTCH ASSEMBLY IN CASE

Align the flukes of the rear clutch discs and mesh them with the front clutch hub. Push the front clutch assembly into the case.

CAUTION: Be careful that the thrust bearing does not fall out.

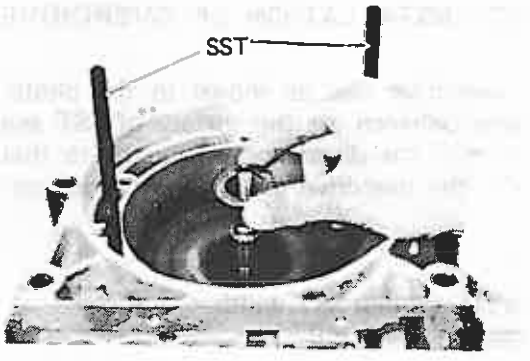


15. CHECK CORRECT INSTALLATION OF FRONT CLUTCH

Set SST on the transmission case as shown in the photo. Measure the distance between the top surface of the SST and front clutch assembly. If the distance corresponds to that during, the front clutch is installed correctly.

SST 09350-20013

Height: Measured value minus SST width = Approx. 34 mm (1.34 in.)



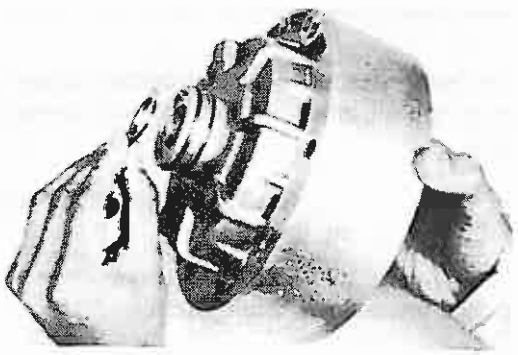
16. INSTALL SST ON CASE

Finger tighten the SST on the transmission case.

SST 09350-20013

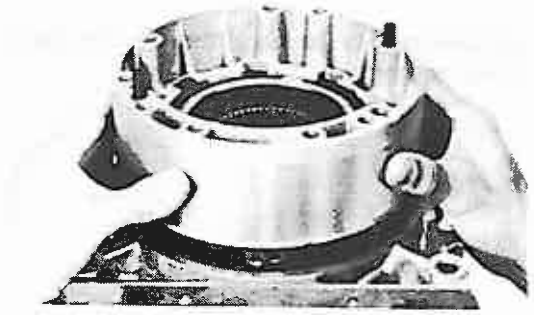
17. INSTALL THRUST BEARING ON FRONT CLUTCH

Coat the thrust bearing with petroleum jelly and set it into place.



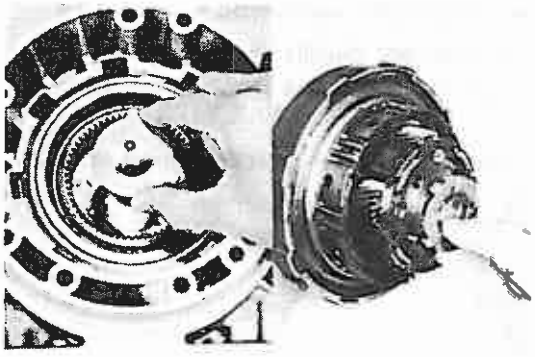
18. INSTALL THRUST WASHER ON OVERDRIVE CASE END

Coat the thrust washer with petroleum jelly and set it into place, facing the lip side toward the overdrive case.



19. INSERT OVERDRIVE CASE INTO TRANSMISSION CASE

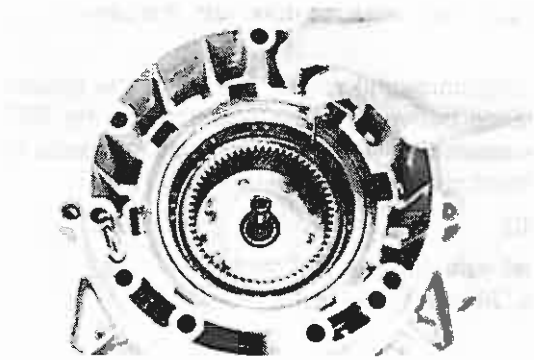
Insert the overdrive case gently through the two guide pins with the circled part in the photo facing in the direction indicated.



20. INSTALL TWO THRUST WASHERS

Coat the thrust washers with petroleum jelly. Install one thrust washer on the overdrive case and the other one on the overdrive clutch.

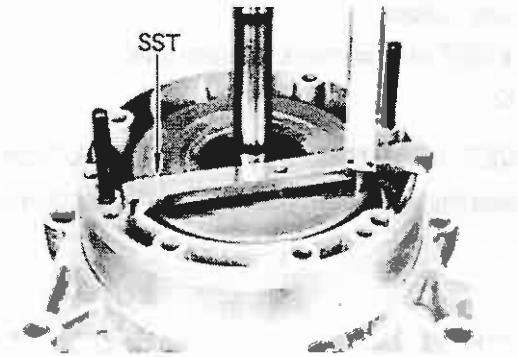
NOTE: The washer lugs should be inserted in the holes.



21. INSTALL OVERDRIVE CLUTCH IN CASE

Align the flukes of the discs in the overdrive case. Align the flukes with the slots of the overdrive clutch and press the overdrive clutch into the overdrive case.

CAUTION: Be careful that the thrust washer does not fall out.

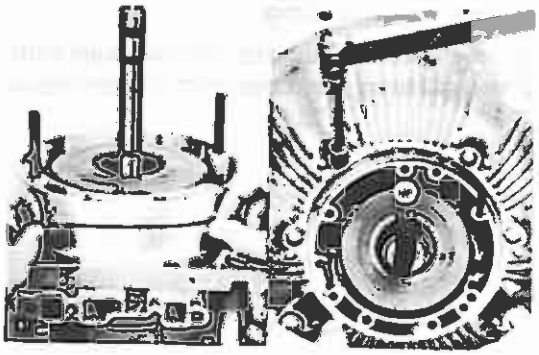


22. CHECK CORRECT INSTALLATION OF OVERDRIVE CLUTCH

Set SST on the overdrive case as shown in the photo. Measure the distance between the top surface of SST and the overdrive clutch. If the distance corresponds to that during disassembly, the overdrive clutch is installed correctly.

SST 09350-20013

Height: Measured value minus SST width = Approx. 2 mm (0.08 in.)

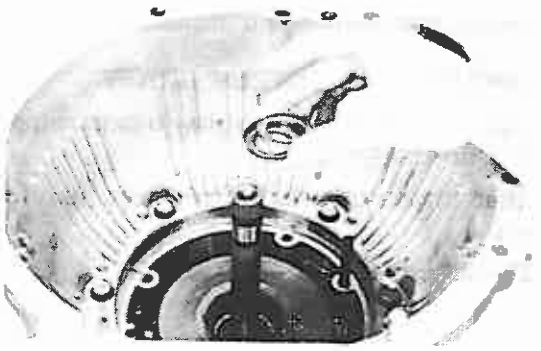


23. INSTALL O-RING ON OVERDRIVE CASE

24. INSTALL CONVERTER HOUSING

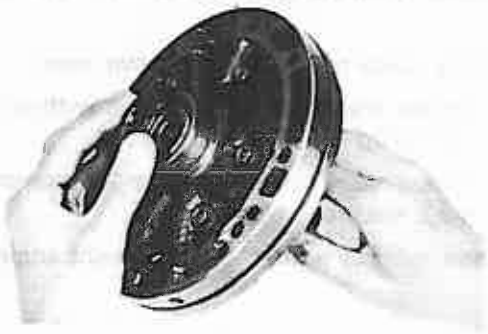
Install the two 12-mm bolts and four 10-mm bolts and tighten them.

Torque: 12 mm 580 kg-cm (42 ft-lb, 57 N·m)
10 mm 345 kg-cm (25 ft-lb, 34 N·m)



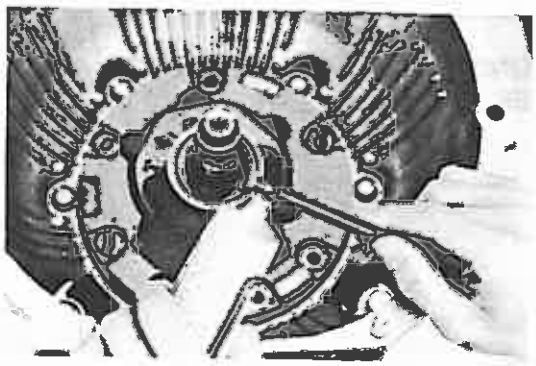
25. INSTALL THRUST WASHER AND BEARING ON OVERDRIVE CLUTCH

Coat the thrust washer with petroleum jelly. Install the thrust washer facing the lip side outward together with the bearing.



26. INSTALL THRUST WASHER ON FRONT OIL PUMP

Coat the thrust washer with petroleum jelly and install the lip side toward the pump body.



27. INSTALL FRONT OIL PUMP

(a) Install the oil pump gently through the two guide pins, being careful that the thrust washer does not fall out.

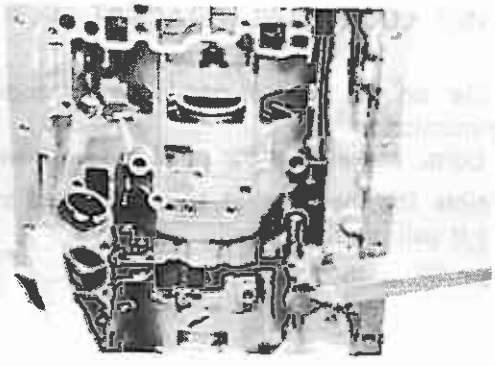
(b) Coat the five set bolts with seal packing and finger tighten them.

(c) Using a screwdriver, remove the SST, and install the two set bolts coated with seal packing.

SST 09350-20013

(d) Tighten the set bolts gradually and uniformly.

Torque: 215 kg-cm (16 ft-lb, 21 N·m)

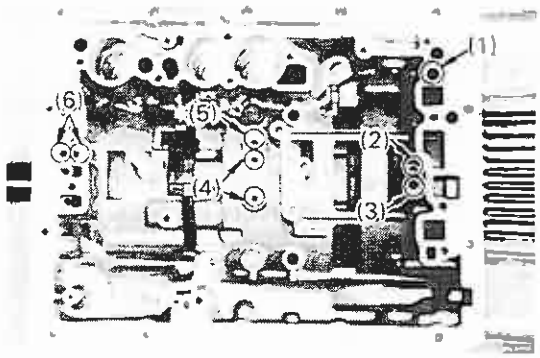


28. TIGHTEN TWO CENTER SUPPORT BOLTS

Tighten the bolts alternately in 70 kg-cm (61 in.-lb, 6.9 N·m) increments.

Torque: 260 kg-cm (19 ft-lb, 25 N·m)

NOTE: First tighten the accumulator side bolt.

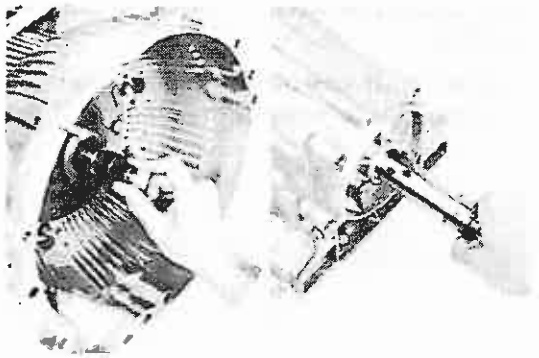


29. CHECK OPERATION OF PISTONS

Blow low-pressure compressed air into the passages indicated on the photo and listen for noise from piston movement.

(1) Overdrive clutch
(2) Overdrive brake
(3) Front clutch
(4) Rear clutch
(5) Brake No. 1
(6) Brake No. 3

If pistons do not move, disassemble and inspect.

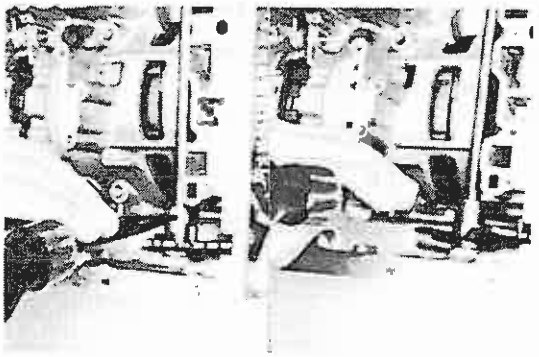


30. CHECK INPUT SHAFT AND OUTPUT SHAFT

(a) Make sure that the input shaft has play in axial direction and that it turns.

(b) Make sure that the output shaft has thrust play in axial direction.

Thrust play: 0.3 – 0.9 mm (0.012 – 0.035 in.)



31. INSTALL MANUAL VALVE LEVER SHAFT INTO CASE

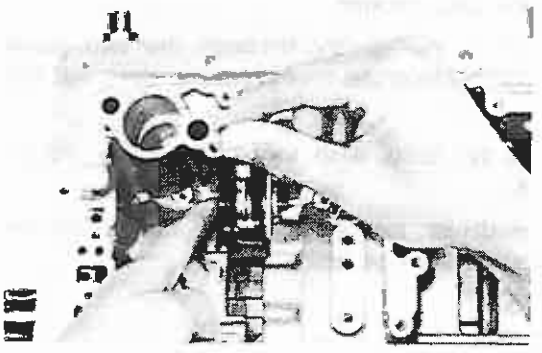
(a) Assemble a new collar to the manual valve lever.

NOTE: Always replace the collar and roll pin with a new one. Never reuse a pin after it has been removed.

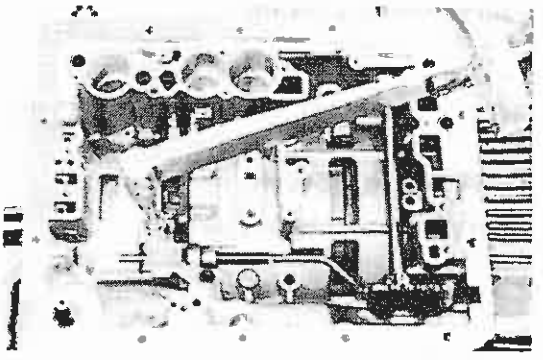
(b) Install the manual valve lever shaft to the transmission case through the manual valve lever.

(c) Drive in a new roll pin with the slot at right angle to the shaft.

(d) Match the collar hole to the lever staking hollow and stake the collar to the lever.



32. INSTALL PARKING LOCK PAWL, PIVOT PIN AND SPRING IN CASE

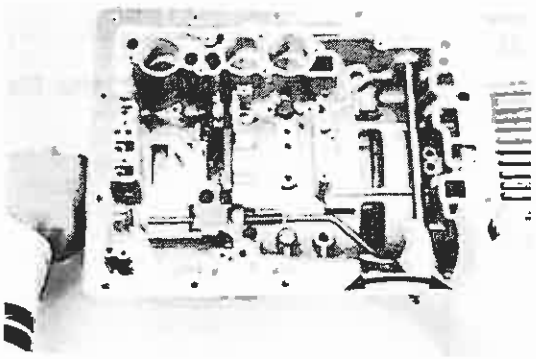


33. INSTALL PARKING LOCK PAWL BRACKET ON CASE

Make sure the collar on the control rod is facing toward the front of the transmission.
Tighten the two bolts. Make sure the pawl moves freely.

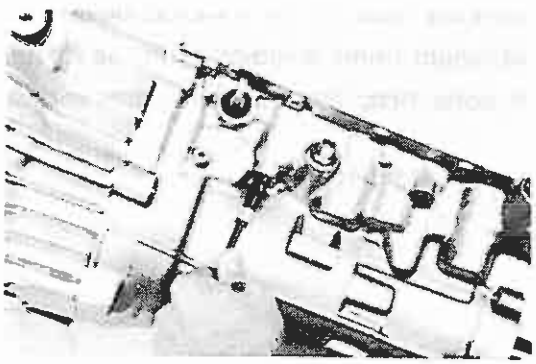
NOTE: It is possible for the bracket to be installed too far forward, where it will bind the pawl.

Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)



34. CHECK OPERATION OF PARKING LOCK PAWL

Make sure the planetary gear output shaft is locked when the manual valve lever is in the "P" range.

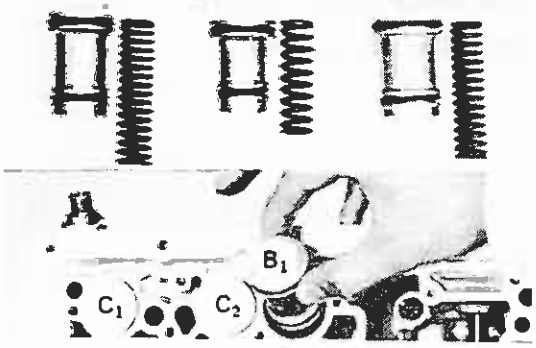


35. INSTALL NEW O-RING ON THROTTLE CABLE FITTING

36. INSTALL THROTTLE CABLE IN CASE

Push the cable through the case, being careful not to damage the O-ring. Check for full seating.

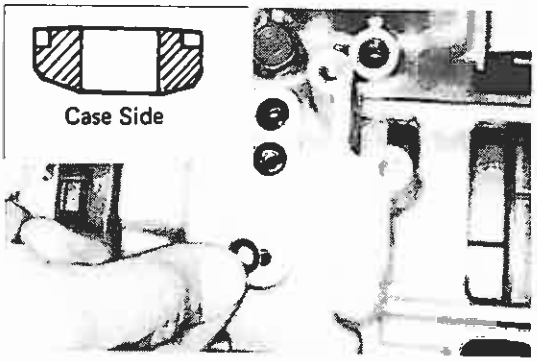
CAUTION: **In subsequent work, do not roll the case over the cable and break the cable fitting.**



37. INSTALL ACCUMULATOR PISTON AND SPRINGS

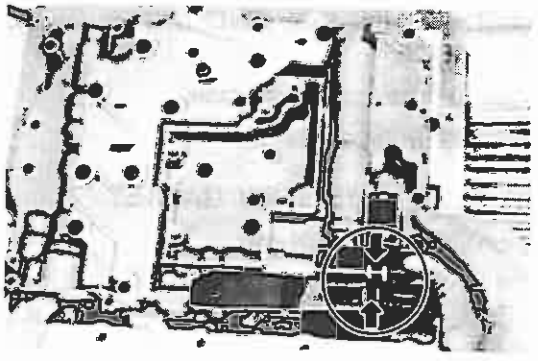
mm (in.)

	Free length	Outer diameter	Wire diameter
B-1	66.68 (2.6252)	16.36 (0.6441)	2.60 (0.1024)
C-2	61.21 (2.4098)	16.54 (0.6512)	2.50 (0.0984)
C-1	68.56 (2.6992)	17.53 (0.6902)	2.03 (0.0799)



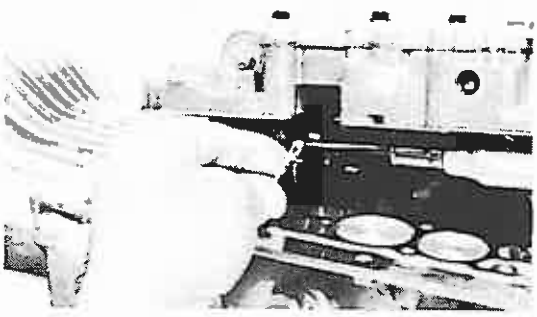
38. INSTALL NEW O-RINGS ON TRANSMISSION

Make sure to assemble the O-rings in the correct direction.



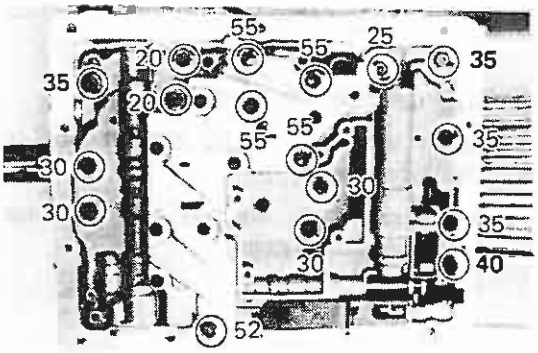
39. PLACE VALVE BODY ON TRANSMISSION

Make sure the accumulator pistons are pressed fully into the bore. Align the manual valve with the pin on the manual shift lever, and lower valve body into place.



40. LIFT SIDE OF VALVE BODY AND ATTACH THROTTLE CABLE

While holding the cam down with your fingers, slip the cable end into the slot.

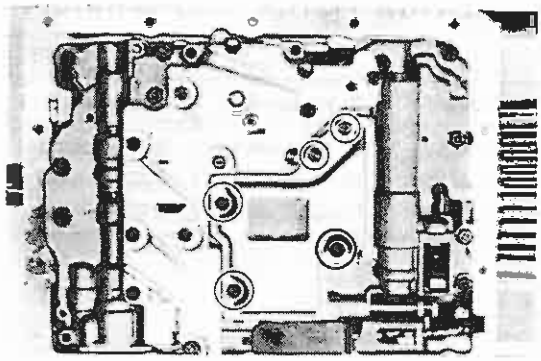


41. INSTALL SEVENTEEN BOLTS IN VALVE BODY

NOTE: Each bolt length (mm) is indicated in the figure.

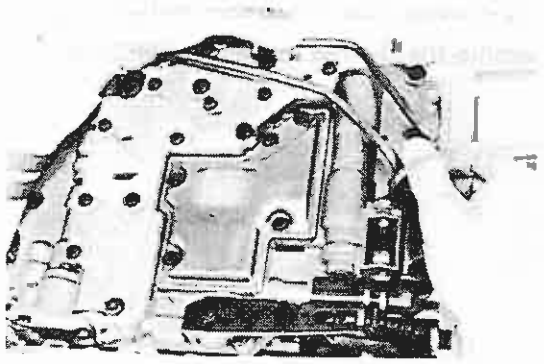
Finger tighten all bolts first, then tighten them with a torque wrench.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)



42. INSTALL OIL STRAINER AND BOLTS

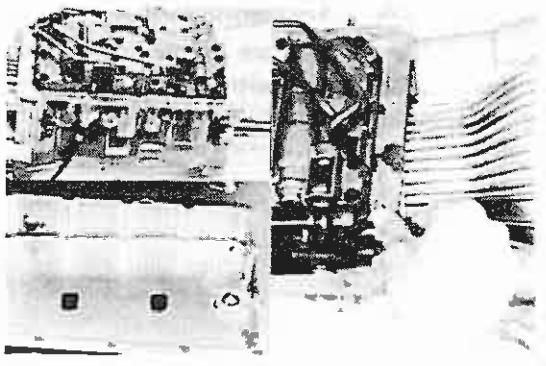
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



43. INSTALL OIL TUBES

Press the tubes by hand into the positions indicated in the figure.

CAUTION: Be careful not to bend or damage the tubes.



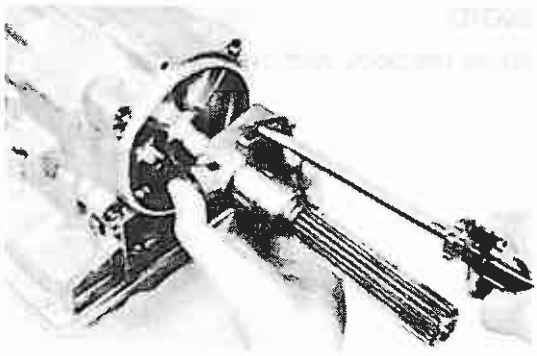
44. PLACE TWO MAGNETS IN PAN AND INSTALL OIL PAN WITH NEW GASKET

Align the cut out part of the gasket and case.

Torque: 45 kg-cm (39 in.-lb, 4.4 N·m)

45. INSTALL DRAIN PLUG WITH NEW GASKET

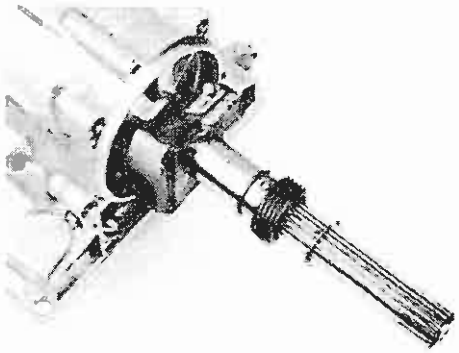
Torque: 205 kg-cm (15 ft-lb, 20 N·m)



46. INSTALL GOVERNOR BODY ON OUTPUT SHAFT

(a) While lifting the retaining clip with a large screwdriver, slide the governor body and insert the retaining clip end into the hole on the output shaft.

(b) Install the lock bolt and then stake the lock plate.

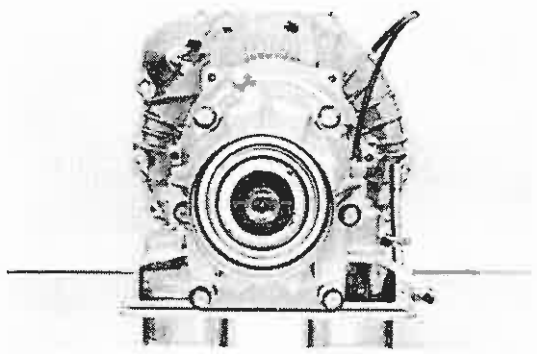


47. INSTALL SPEEDOMETER DRIVE GEAR

(a) Install the snap ring and lock ball.

(b) Slide the speedometer gear on the shaft.

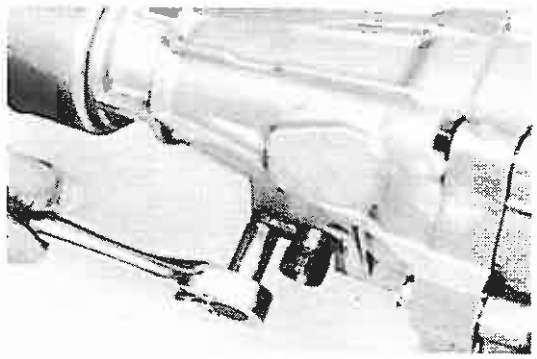
(c) Using snap ring pliers, install the outer snap ring.



48. INSTALL REAR EXTENSION HOUSING WITH NEW GASKET

Do not use gasket sealer. Install the housing with four long bolts and two short bolts. Tighten the bolts.

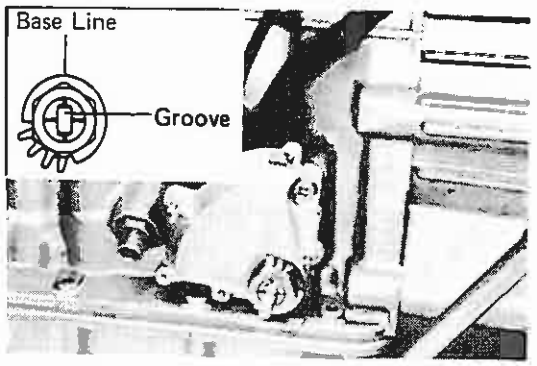
Torque: 345 kg-cm (25 ft-lb, 34 N·m)



49. INSTALL O-RINGS, BUSHING AND SPEEDOMETER DRIVEN GEAR TO SHAFT SLEEVE

50. INSTALL SPEEDOMETER DRIVEN GEAR ASSEMBLY IN EXTENSION HOUSING

Insert the shaft sleeve assembly into the housing. Install the lock plate with the bolt and lock washer.



51. INSTALL NEUTRAL START SWITCH

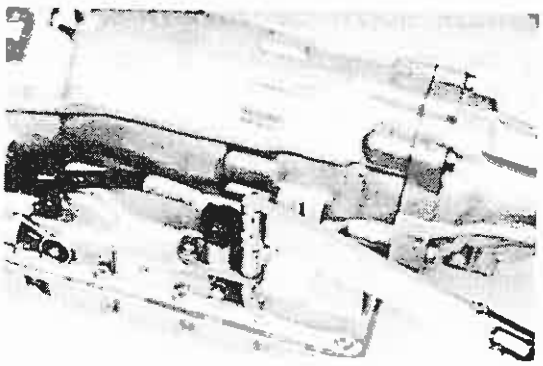
(a) Slide the neutral start switch onto the control shaft.

(b) Install the grommet facing the groove toward the switch body and then install the washer and nut.

(c) Move the switch so that the slit in the switch and neutral base line match up. Tighten the bolt and nut.

Torque: 70 kg-cm (61 in.-lb, 6.9 N·m) Nut
55 kg-cm (48 in.-lb, 5.4 N·m) Bolt

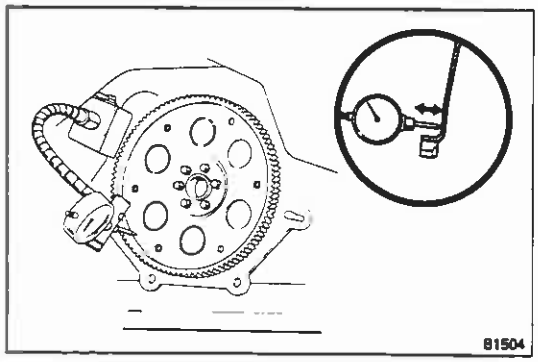
52. INSTALL SHIFT HANDLE



53. **INSTALL SOLENOID**

Install the solenoid on the body with two O-rings.

INSTALLATION OF TRANSMISSION

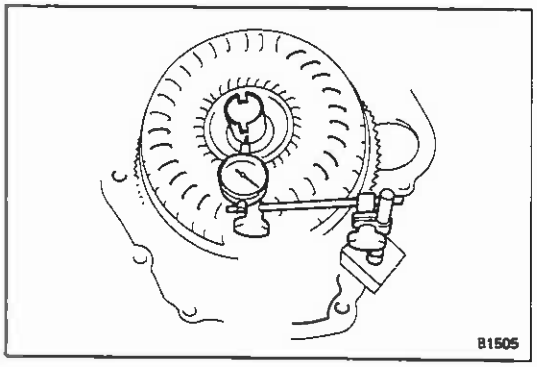


1. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

Set up a dial indicator and measure drive plate runout.

If runout exceeds 0.20 mm (0.0079 in.) or if the ring gear is damaged, replace the drive plate. If installing a new drive plate, note the orientation of spacers and tighten the bolts.

Torque: 850 kg-cm (61 ft-lb, 83 N·m)



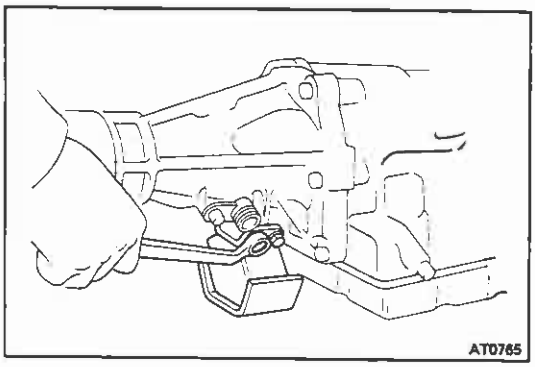
2. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

(a) Temporarily mount the torque converter to the drive plate. Set up a dial indicator.

If runout exceeds 0.30 mm (0.0118 in.), try to correct by reorienting the installation of the converter. If excessive runout cannot be corrected, replace the torque converter.

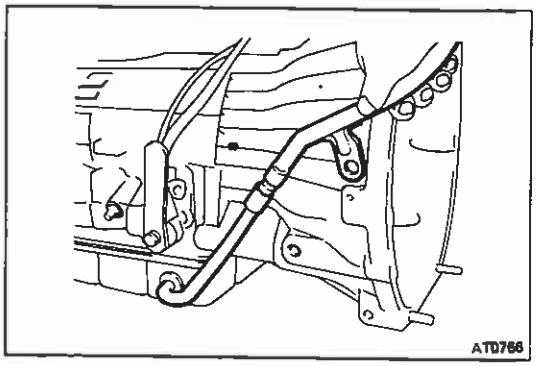
NOTE: Mark the position of the converter to ensure correct installation.

(b) Remove the torque converter.



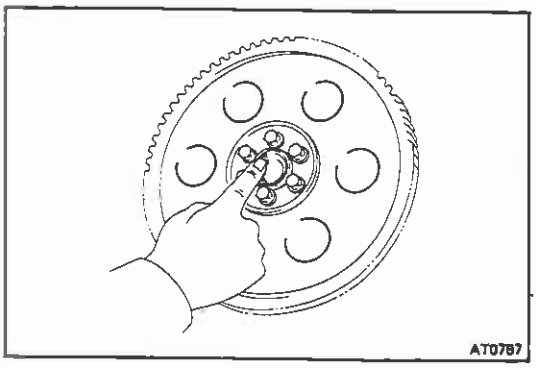
3. INSTALL REAR TRANSMISSION MOUNT ON EXTENSION HOUSING

Inspect the rubber mount for deterioration, and replace if necessary.

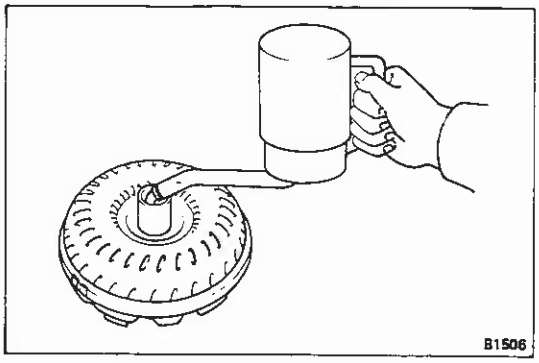


4. INSTALL FILLER TUBE

Replace the O-ring and push the tube into place.



5. APPLY GREASE TO CENTER HUB OF TORQUE CONVERTER AND PILOT HOLE IN CRANKSHAFT

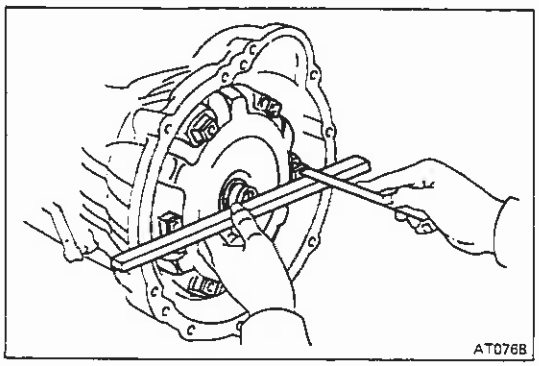


6. **INSTALL TORQUE CONVERTER IN TRANSMISSION**

If the torque converter has been drained and washed, refill with fresh ATF.

ATF capacity: 2.0 liters (2.1 US qts, 1.8 Imp. qts)

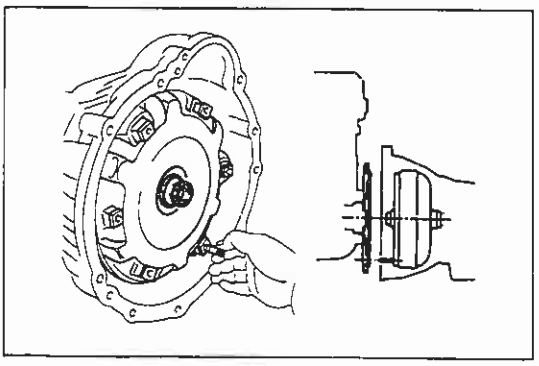
Fluid type: ATF DEXRON® II



7. **CHECK TORQUE CONVERTER INSTALLATION**

Using calipers and a straight edge, measure from the installed surface to the front surface of the transmission housing.

Correct distance: 20 mm (0.79 in.)



8. **INSTALL GUIDE PIN IN TORQUE CONVERTER**

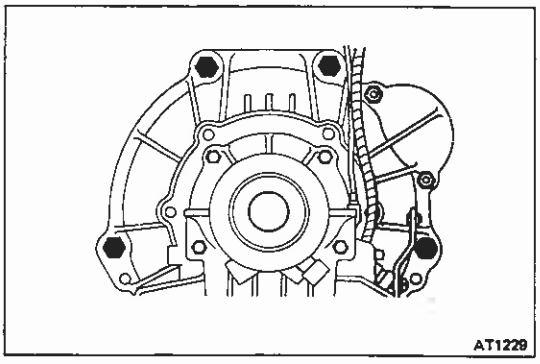
9. **ALIGN TRANSMISSION AT INSTALLATION POSITION**

CAUTION: Be careful not to tilt the transmission forward because the torque converter could slide out.

(a) Align the guide pin with one of the drive plate holes.

(b) Align two sleeves on the block with the converter housing.

(c) Temporarily install one bolt.

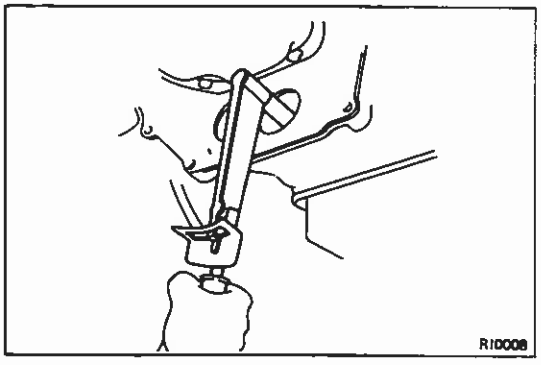


10. **INSTALL TRANSMISSION HOUSING MOUNTING BOLTS**

(a) Install the starter.

(b) Install the transmission housing mounting bolts.

Torque: 650 kg-cm (47 ft-lb, 64 N·m)



11. **INSTALL SIX TORQUE CONVERTER BOLTS**

(a) Remove the guide pin.

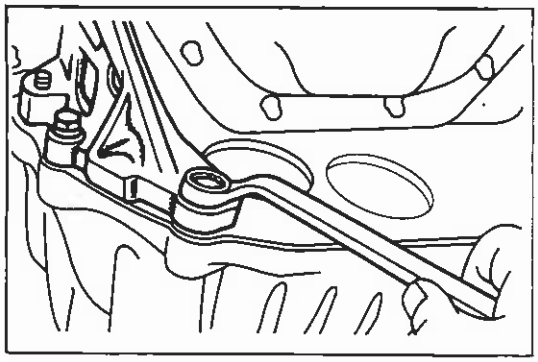
(b) Install the six bolts finger tight. Turn the crankshaft to gain access.

(c) Tighten the bolts evenly.

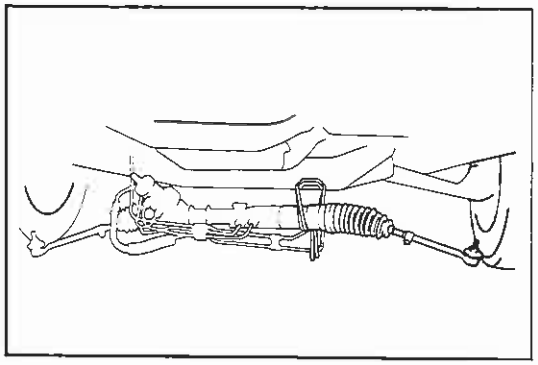
Torque: 185 kg-cm (13 ft-lb, 18 N·m)

12. **INSTALL RUBBER PLUG IN SERVICE HOLD**

13. **INSTALL ENGINE UNDERCOVER**

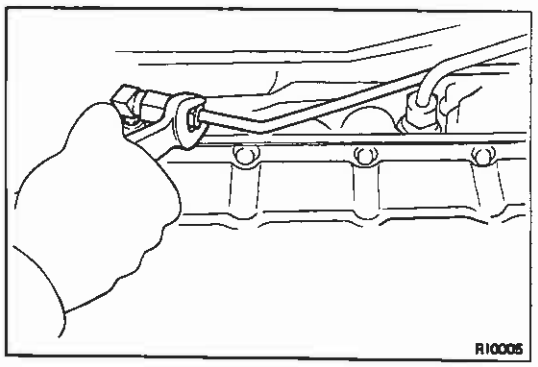


14. INSTALL LEFT AND RIGHT STIFFENER PLATES



15. INSTALL POWER STEERING GEAR HOUSING
    (a) Install two rubber cushions to the gear housing and place the gear housing onto the crossmember.
    (b) Install two brackets and tighten the four bolts.
    Torque: 475 kg-cm (34 ft-lb, 47 N·m)
    (c) Install the clamp of the power steering pressure lines to the crossmember.
    (d) Connect both tie rod ends.
    Torque: 600 kg-cm (43 ft-lb, 59 N·m)
    (e) Install the clamp of the automatic transmission oil cooler pipe to the cylinder block.
    (f) Install the clamp of the power steering oil cooler.

16. INSTALL FRONT EXHAUST PIPE
    (a) Install the pipe to the exhaust manifold over two gaskets and tighten the three bolts.
    Torque: 630 kg-cm (46 ft-lb, 62 N·m)
    (b) Connect the front pipe to the rear pipe over the gasket.
    (c) Install the pipe clamp to the transmission housing.

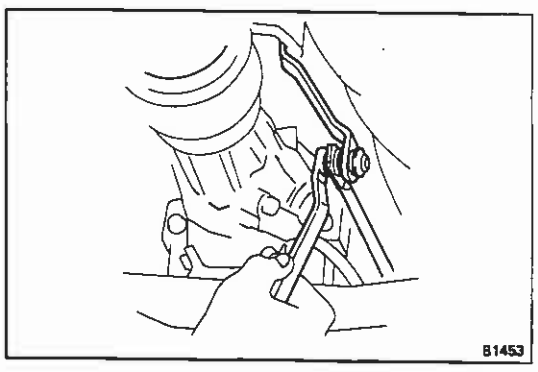


17. CONNECT OIL COOLER LINES
    Torque: 350 kg-cm (25 ft-lb, 34 N·m)

18. CONNECT COOLING LINE BRACKET
    Torque: 650 kg-cm (47 ft-lb, 64 N·m)

19. INSTALL SLIDING YOKE TO GEAR HOUSING AND SHAFT

20. CONNECT SPEEDOMETER CABLE

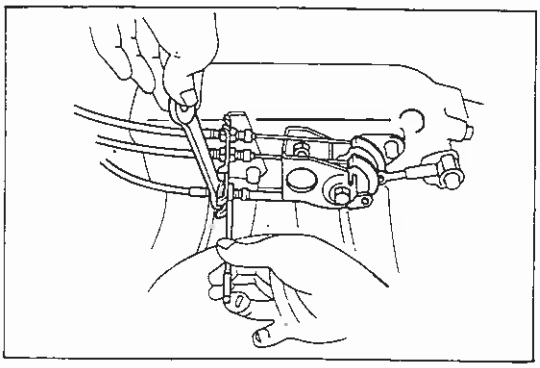


21. CONNECT MANUAL SHIFT LINKAGE

22. INSTALL INTERMEDIATE SHAFT WITH CENTER BEARING TO PROPELLER SHAFT

23. CONNECT WIRING CONNECTORS TO NEUTRAL START AND BACK-UP LIGHT SWITCHES

Connect the three connectors located near the starter.



24. CONNECT TRANSMISSION THROTTLE VALVE

(a) Connect the cable to the carburetor linkage.

(b) Put the guide grommet into position and install the clip.

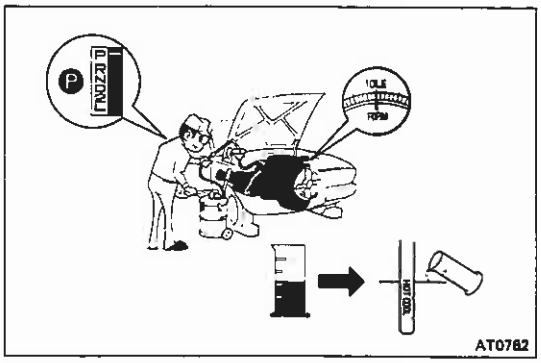
(c) Connect the cable housing to the bracket on the valve cover.

25. ADJUST THROTTLE CABLE (See page AT-4)

26. INSTALL AIR INTAKE CONNECTOR

27. CONNECT UPPER RADIATOR HOSE

28. CONNECT BATTERY CABLE TO NEGATIVE (–) TERMINAL



29. FILL TRANSMISSION WITH ATF AND CHECK FLUID LEVEL
(See page MA-14)

Add about 4.0 liters (4.2 US qts, 3.5 Imp. qts).

Fluid type: ATF DEXRON® II

Total capacity: 6.3 liters (6.7 US qts, 5.5 Imp. qts)

30. PERFORM ROAD TEST

Check for abnormal noise, slippage, correct shift points and smooth operation.