AUTOMATIC TRANSMISSION

A

TROUBLESHOOTING

GENERAL NOTES

1. Troubles occuring with the ECT can be caused by either the engine, ECT electrical control or the a matic transmission itself. These three areas should be distinctly isolated before proceeding v troubleshooting.

2. Troubleshooting should begin with the simpliest operation, working up in order of difficulty, but init determine whether the trouble lies within the engine, electrical control or transmission.

3. Proceed with the inspection as follows:

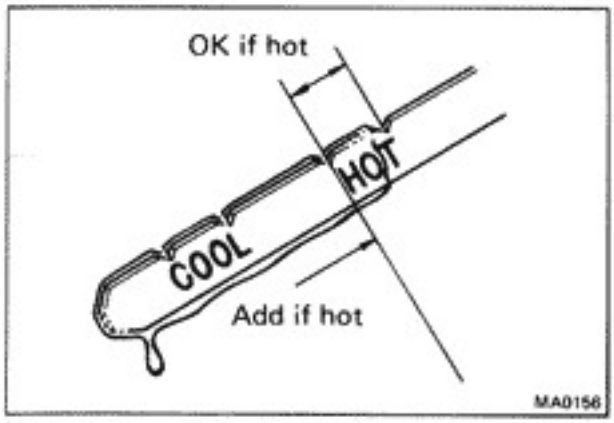
Read Diagnostic Code (See page AT-8)	Read the diagnostic code (trouble code) from overdriv dicator light or super monitor display, and perform rep accordingly.
Preliminary Check	Check following: • Fluid level • Throttle cable mark • Shift linkage • Neutral start switch • Idling rpm ("N" or "P" range 650 rpm) • Tire inflation pressure
Stall Test (See page AT-22)	Check engine, torque converter, clutch and brake.
Time Lag Test (See page AT-23)	Check Automatic Transmission Assembly • Check clutch, brake and gear for wear.
Electric Control System Check (See page AT-6)	
Measure Line Pressure (See page AT-24)	Check valve body and fluid circuit leakage.
Road Test	Confirm if trouble lies within ATM. If noisy or vibrating, cause possibly with either comp sor, engine, propeller shaft, tires, etc.

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Fluid discolored or smells burnt	Fluid contaminated	Replace fluid	MA-10
	Torque converter faulty	Replace torque converter	AT-103
	Transmission faulty	Disassemble and inspect transmission	AT-45
Vehicle does not move in any forward range or reverse	Manual linkage out of adjustment	Adjust linkage	AT-5
	Valve body or primary regulator faulty	Inspect valve body	AT-83
	Park lock pawl faulty	Inspect park pawl	AT-37
	Torque converter faulty	Replace torque converter	AT-103
	Converter drive plate broken	Replace drive plate	AT-44
	Oil pump intake screen blocked	Clean screen	AT-28
	Transmission faulty	Disassemble and inspect transmission	AT-45
Shift lever position incorrect	Manual linkage out of adjustment	Adjust linkage	AT-5
	Manual valve and lever faulty	Inspect valve body	AT-83
	Transmission faulty	Disassemble and inspect transmission	AT-45
Harsh engagement into any drive range	Throttle cable out of adjustment	Adjust throttle cable	AT-5
	Valve body or primary regulator faulty	Inspect valve body	AT-83
	Accumulator pistons faulty	Inspect accumulator pistons	AT-112
	Transmission faulty	Disassemble and inspect transmission	AT-45
Delayed 1-2, 2-3 or 3-OD up-shift, or down-shifts from 4-3 or 3-2 then shifts back to 4 or 3	Electric control faulty	Inspect electric control	AT-6
	Valve body faulty	Inspect valve body	AT-83
	Solenoid valve faulty	Inspect valve body	AT-83
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-5
	Throttle cable out of adjustment	Adjust throttle cable	AT-5
	Valve body faulty	Inspect valve body	AT-83
	Solenoid valve faulty	Inspect valve body	
	Transmission faulty	Disassemble and inspect transmission	AT-45

TROUBLESHOOTING (Cont'd)

Problem	Possible cause	Remedy	Page
Drag, binding or tie-up on 1-2, 2-3 or 3-OD up-shift	Manual linkage out of adjustment	Adjust linkage	AT-5
	Valve body faulty	Inspect valve body	AT-83
	Transmission faulty	Disassemble and inspect transmission	AT-45
No Lock-up in 2nd, 3rd or OD	Electric control faulty	Inspect electric control	AT-6
	Valve body faulty	Inspect valve body	AT-83
	Solenoid valve faulty	Inspect valve body	AT-83
	Transmission faulty	Disassemble and inspect transmission	AT-45
Harsh down-shift	Throttle cable out of adjustment	Adjust throttle cable	AT-5
	Throttle cable and cam faulty	Inspect throttle cable and cam	AT-37
	Accumulator pistons faulty	Inspect accumulator pistons	AT-11
	Valve body faulty	Inspect valve body	AT-83
	Transmission faulty	Disassemble and inspect transmission	AT-45
No down-shift when coasting	Valve body faulty	Inspect valve body	AT-83
	Solenoid valve faulty	Inspect solenoid valve	AT-19
	Electric control faulty	Inspect electric control	AT-6
Down-shift occurs too quickly or late while coasting	Throttle cable faulty	Inspect throttle cable	AT-37
	Valve body faulty	Inspect valve body	AT-83
	Transmission faulty	Disassemble and inspect transmission	AT-45
	Solenoid valve faulty	Inspect solenoid valve	AT-19
	Electric control faulty	Inspect electric control	AT-6
No. OD-3, 3-2 or 2-1 kickdown	Solenoid valve faulty	Inspect solenoid valve	AT-19
	Electric control faulty	Inspect electric control	AT-6
	Valve body faulty	Inspect valve body	AT-83
No engine braking in "2" or "L" range	Solenoid valve faulty	Inspect solenoid valve	AT-19
	Electric control faulty	Inspect electric control	AT-6
	Valve body faulty	Inspect valve body	AT-83
	Transmission faulty	Disassemble and inspect transmission	AT-45
Vehicle does not hold in "P"	Manual linkage out of adjustment	Adjust linkage	AT-5
	Parking lock pawl cam and spring faulty	Inspect cam and spring	AT-37



ATF INSPECTION

1. **CHECK FLUID LEVEL (See page MA-13)**
2. **CHECK FLUID CONDITION**

   If the ATF smells burnt or is black, replace it.
3. **REPLACE ATF (See page MA-10)**

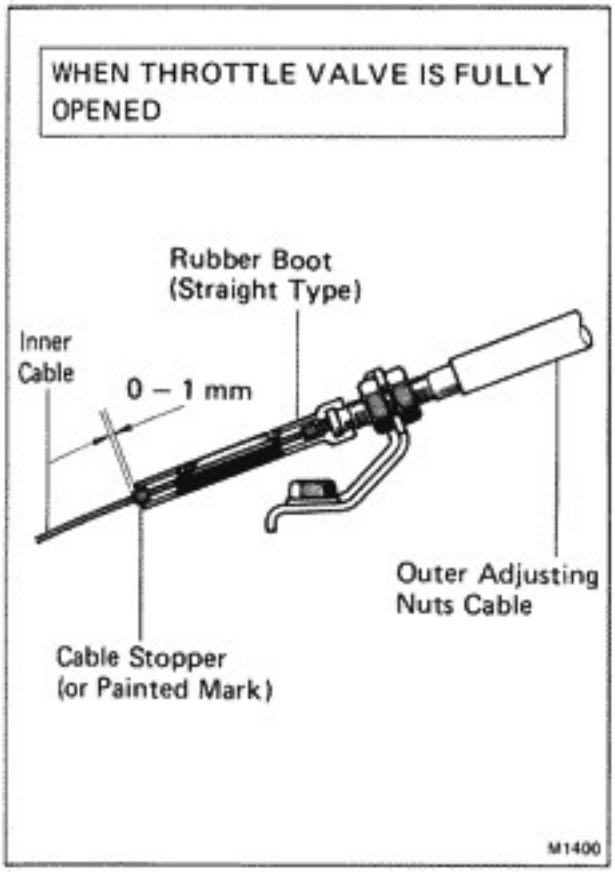
ADJUSTMENTS

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.

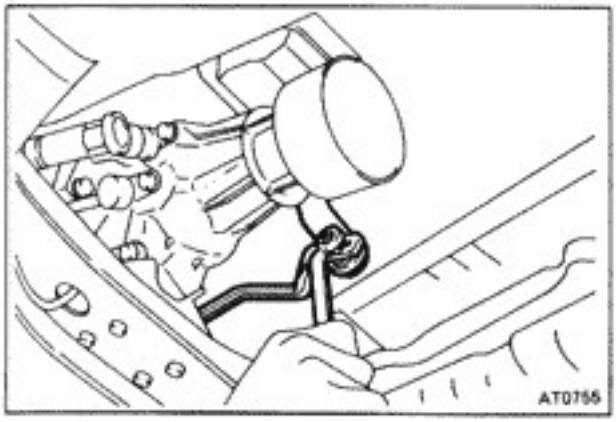
   Distance: 0 — 1 mm (0 — 0.04 in.)
   (b) Tighten the adjusting nuts.
   (c) Recheck the adjustments.



ADJUSTMENT OF FLOOR SHIFT LINKAGE

ADJUST SHIFT LINKAGE

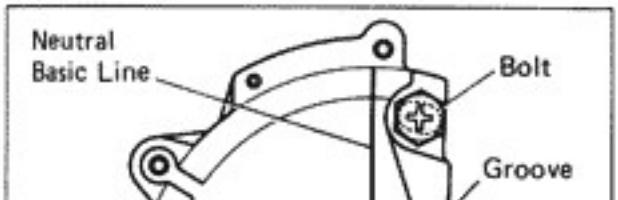
(a) Loosen the nut on the shift linkage.
(b) Push the manual lever fully rearward.
(c) Return the lever two notches to the NEUTRAL position.
(d) Set the shift selector in "N".
(e) While holding the selector lightly toward the "R" range side, tighten the shift linkage nut.



ADJUSTMENT OF NEUTRAL START SWITCH

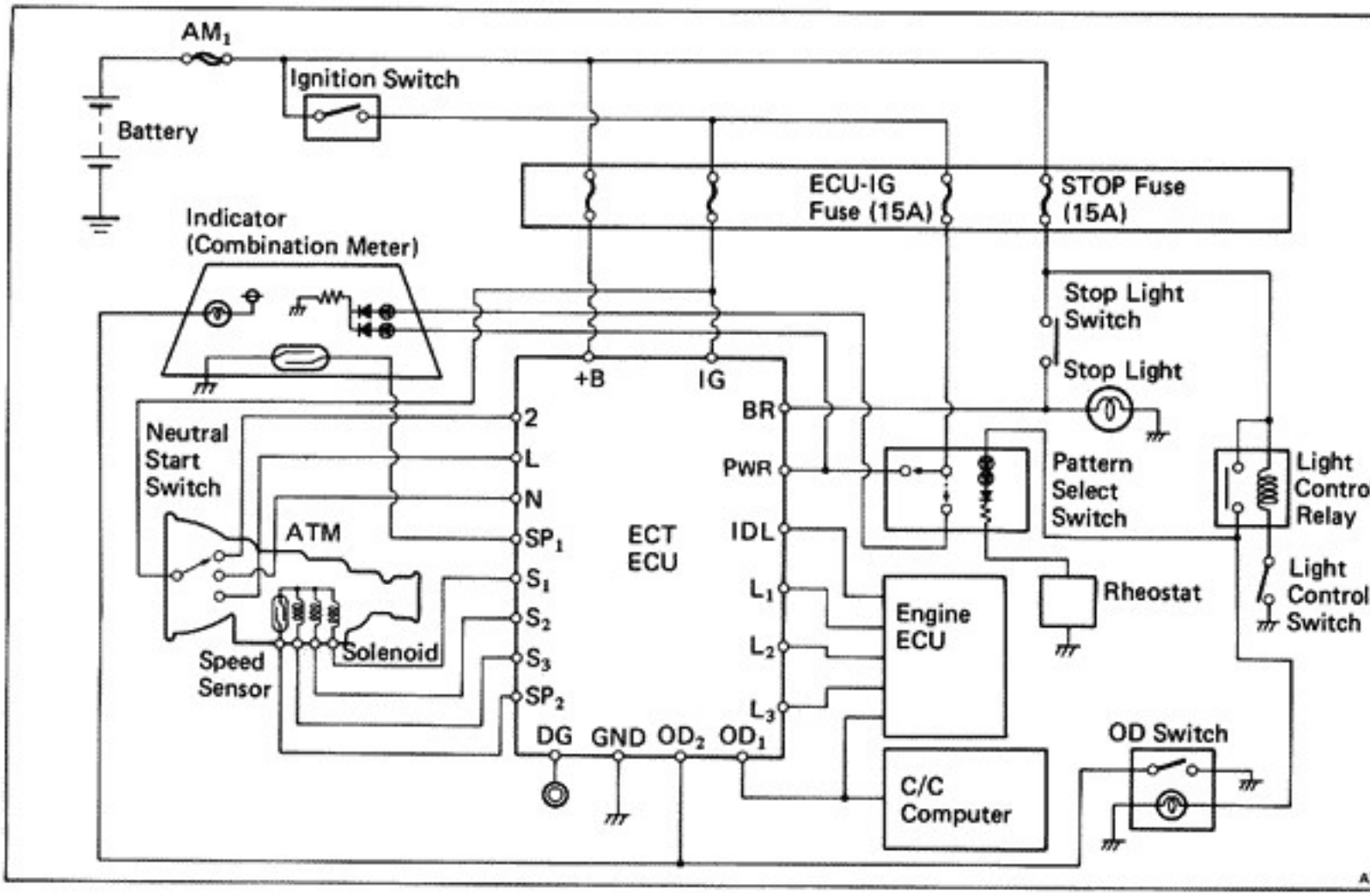
If the engine will start with the shift selector in any range other than "N" or "P", adjustment is required.

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.

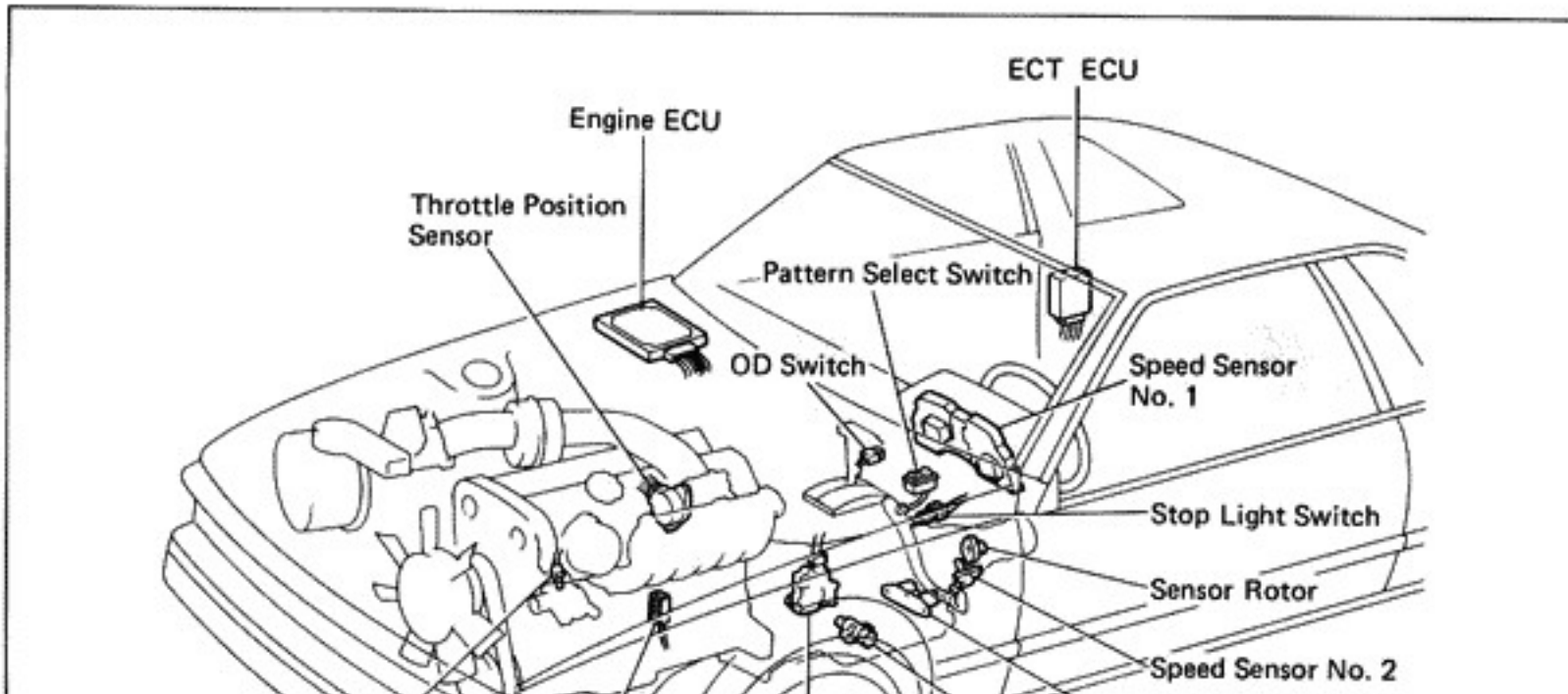


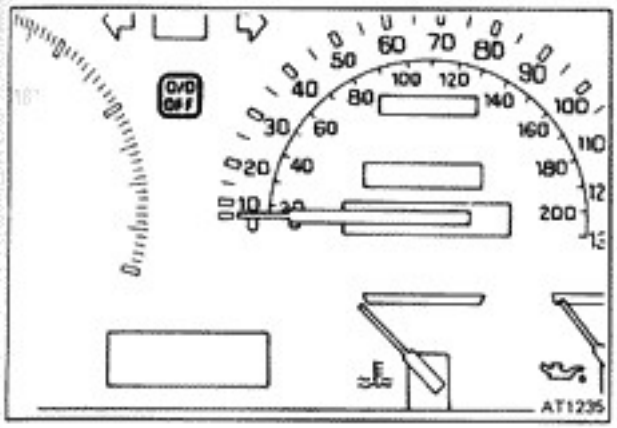
ELECTRIC CONTROL

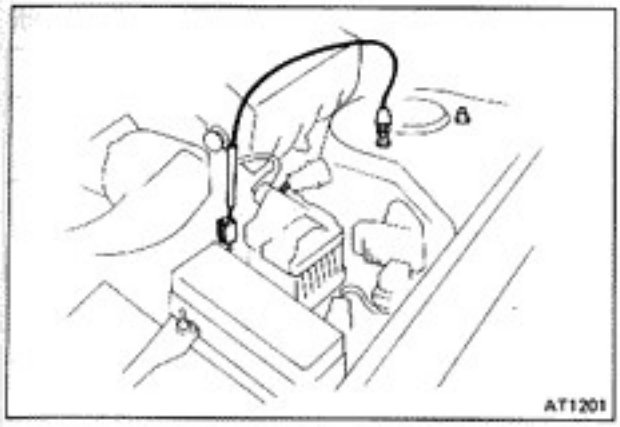
CIRCUIT

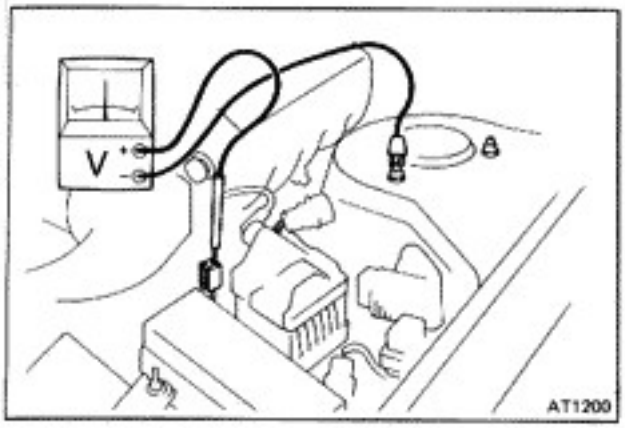


COMPONENTS









TROUBLESHOOTING OF ELECTRICAL CONTROL CIRCUIT

Description

1. A self-diagnosis function is built into the electrical control system. Warning is indicated by the overdrive OFF indicator light.

   NOTE: Warning and diagnostic codes can be read only when the overdrive switch is ON. If OFF, the overdrive light is lit continuously and will not blink.

   (a) If a malfunction occurs within the speed sensors (No. 1 or 2) or solenoids (No.1 or 2), the overdrive OFF light will blink to warn the driver.

   However, there will be no warning of a malfunction with solenoid No. 3.

   (b) The diagnostic code can be read by the number of blinks of the overdrive indicator light when DG terminal and body ground are short-circuited. (See page AT-8)

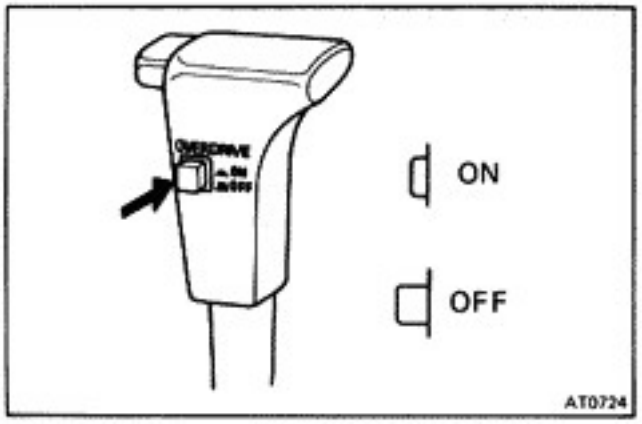
   (c) The throttle position sensor or brake signal are not indicated, but inspection can be made by checking the voltage at DG terminal.

   (d) The signals to each gear can be checked by measuring the voltage at DG terminal.

2. The diagnostic code (trouble code) is retained in memory by the CPU (of ECT ECU) and due to back-up voltage, is not canceled out when the engine is turned off. Consequently, after repair, it is necessary to turn the ignition switch off and remove the fuse STOP (15A) or disconnect the ECT ECU connector to cancel out the diagnostic (trouble) code. (See page AT-10)

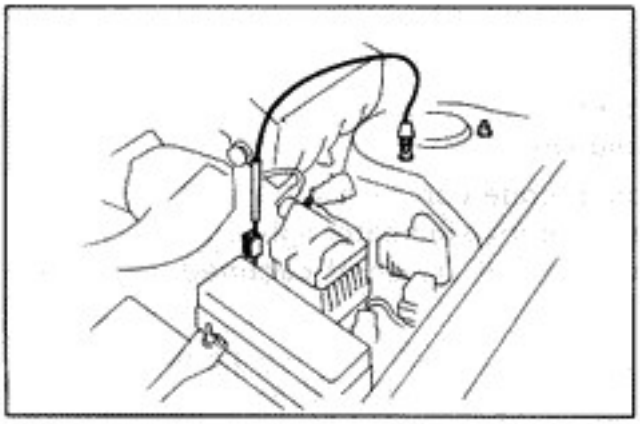
   NOTE:

   - Low battery voltage will cause faulty operation of the diagnosis system. Therefore, always check the battery first.
   - Use a voltmeter and ohmmeter that have an impedance of at least 10 KΩ/V.

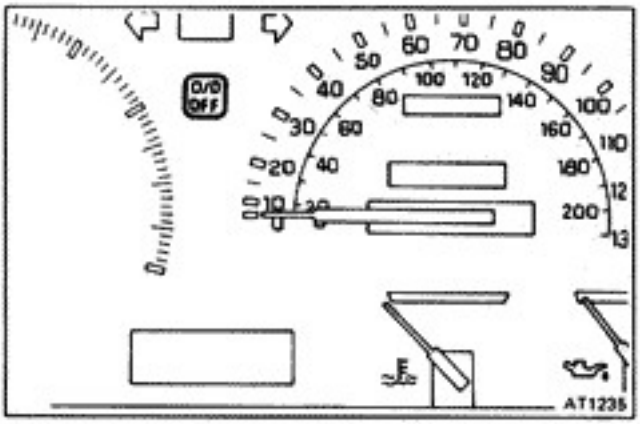


OUTPUT OF DIAGNOSTIC CODE

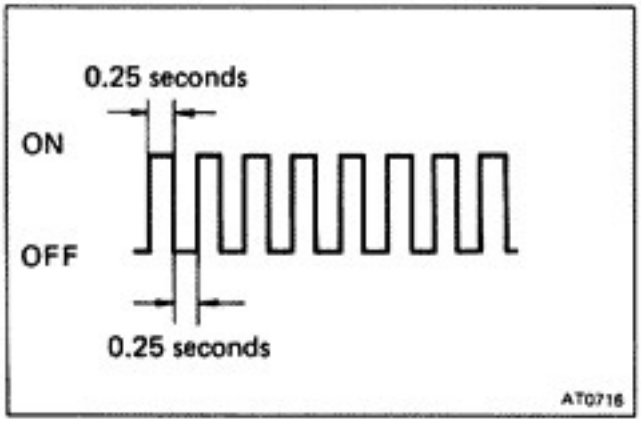
1. Turn the ignition switch and OD switch ON. Do not the engine.



2. Using a service wire, short the DG terminal and ground.

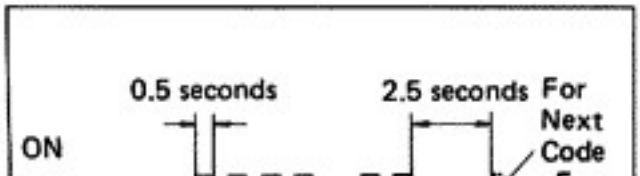


3. Read the diagnostic code as indicated by the numb flashes of the "OD OFF light".



Diagnostic Codes Indication

(a) If the system is operating normally (no malfunct the light will blink once every 0.25 seconds.



(b) In event of a malfunction, the light will blink onc ery 0.5 seconds. The first number of blinks will e the first digit of a two digit diagnostic code.

After a 1.5 seconds pause, the 2nd number of b

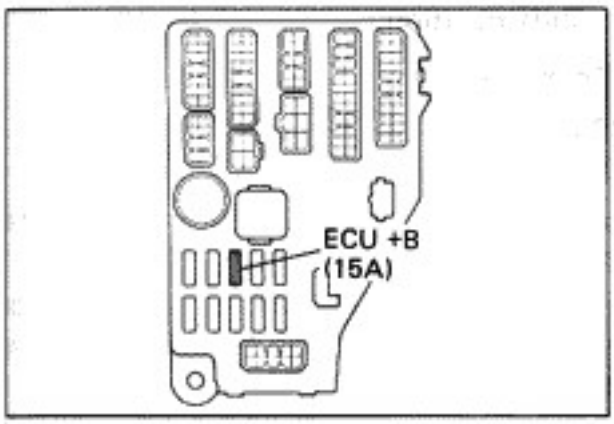
NOTE: In event of a number of trouble codes, indication will begin from the smaller value and continue in order to the larger.

4. After the diagnosis check, remove the service wire from the DG terminal.

Diagnostic Code

Code No.	Light Pattern	Diagnosis System
42		Defective No. 1 speed sensor (in combination meter) Severed wire harness or short circuit
61		Defective No. 2 speed sensor (in ATM) Severed wire harness or short circuit
62		Severed No. 1 solenoid or short circuit Severed wire harness or short circuit
63		Severed No. 2 solenoid or short circuit Severed wire harness or short circuit
64		Severed No. 3 solenoid or short circuit Severed wire harness or short circuit

NOTE: If codes 62, 63 or 64 appear, there is an electrical malfunction with the solenoid.
Causes due to mechanical failure such as a stuck switch will not appear.

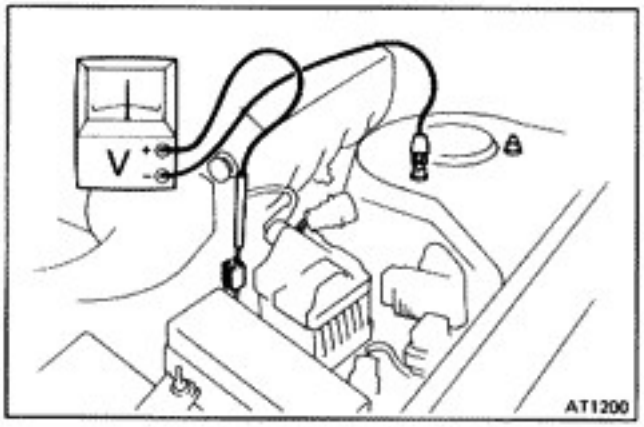


CANCEL OUT DIAGNOSTIC CODE

1. After repair of the trouble area, the diagnostic code retained in memory by the ECT ECU must be canceled out by removing the fuse ECU +B (15A) for 10 seconds or more depending on ambient temperature (the lower the temperature, the longer the fuse must be left out) with the ignition switch off.

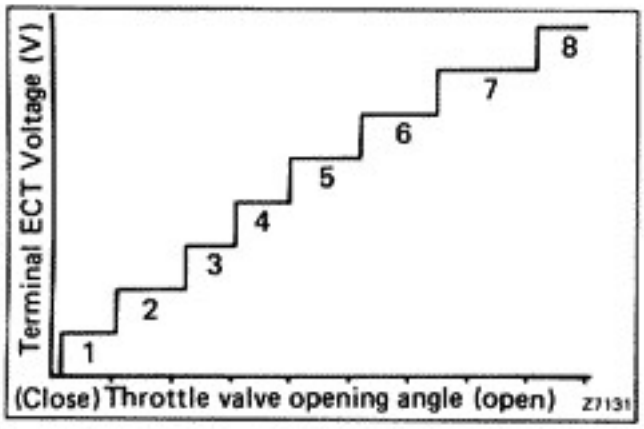
   NOTE:

   - Cancellation can also be done by removing the battery negative (−) terminal, but in this case other memory systems (clock, radio ETR, etc.) will also be canceled out.
   - The diagnostic code can also be canceled out by disconnecting the ECT ECU connector.
   - If the diagnostic code is not canceled out, it will be retained by the ECT ECU and appear along with a new code



INSPECT TERMINAL ECT VOLTAGE

1. Inspect the throttle position sensor system.
   (a) Turn the ignition switch to ON. Do not start the en
   (b) Connect a voltmeter to the DG terminal and
   ground.



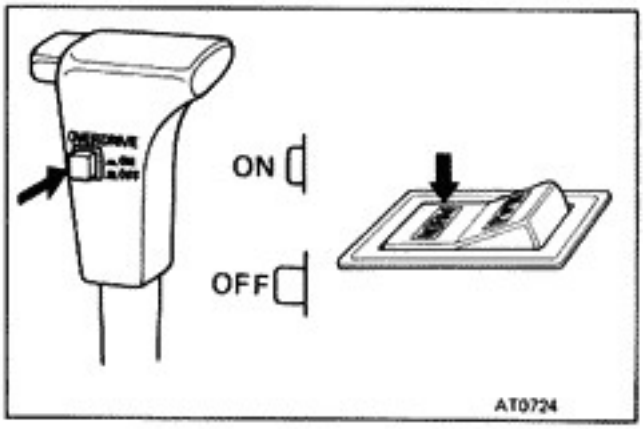
   (c) While slowly depressing the accelerator pedal, c
   that DG terminal voltage rises in sequence.

If the voltage is in proportion to the throttle opening a
and does not change, there is a malfunction with the t
tle position sensor or circuit.

2. Inspect brake signal.
   (a) Depress the accelerator pedal to where DG ter
   indicates 8V.
   (b) Depress the brake pedal and check the voltage
   ing for DG terminal.

Brake pedal depressed ... 0V
Brake pedal released 8V

If not as indicated, there is a malfunction with eithe
stop light switch or circuit.



3. Inspect each up shift position.
   (a) Warm up the engine.

Coolant temperature: 80°C (176°F)

   (b) Turn the OD switch ON.
   (c) Place the pattern select switch in "Normal" an
   shift selector in "D" range.
   (d) During a road test (above 10 km/h or 6 mph) c
   that voltage at the DG terminal is as indicated b
   for each up-shift position.

Terminal ECT (V)	Gear position
0	1st
2	2nd
3	2nd Lock-up
4	3rd

(e) If voltage rises from 0V to 7V in the sequence shown, the control system is okay.

(f) The voltage could rise anywhere between 0V — 8V before the vehicle reaches 10 km/h or 6 mph in first gear. The voltage jump depends on what percent the throttle valve is opened. This is a normal reading.
Above 10 km/h or 6 mph, the voltmeter indicates the current gear.

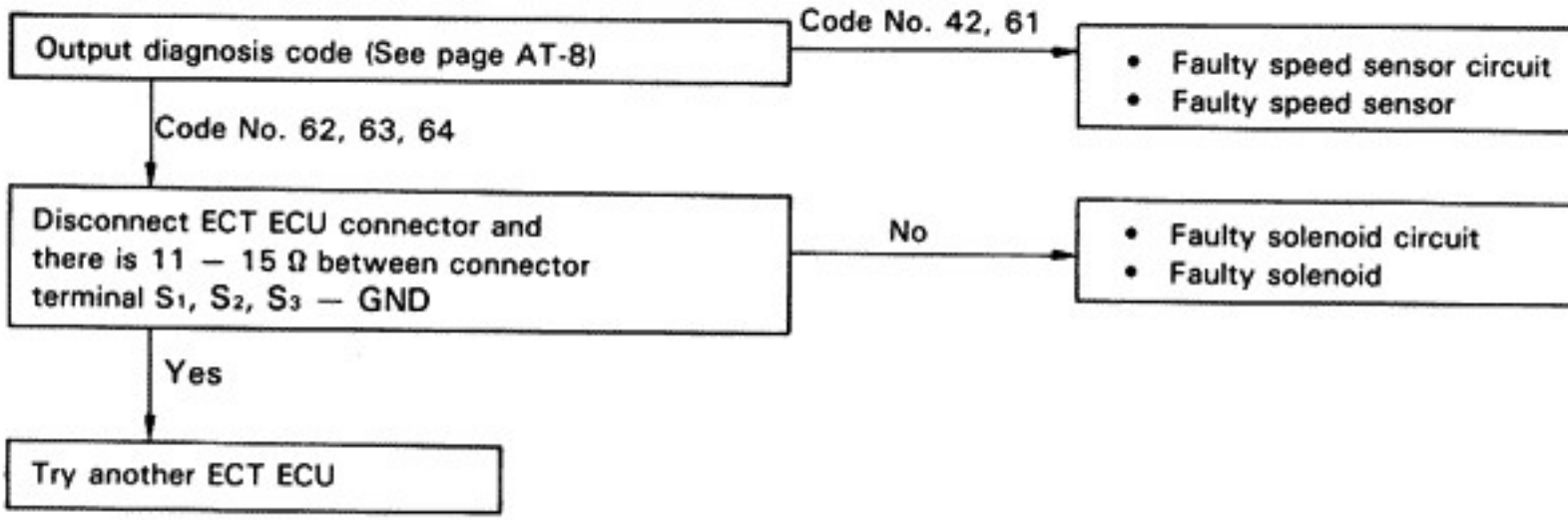
NOTE: Determine the gear position by a light shock or change in engine rpm when shifting.

TROUBLESHOOTING

NOTE:

- If diagnostic code No. 42, 61, 62 or 63 occur, the overdrive indicator light will begin to blink imm ately to warn the driver. However, an impact or shock may cause the blinking to stop althoug code will still be retained in the ECT ECU memory until canceled out.
- There is no warning for diagnostic code No. 64.
- In event of a simultaneous malfunction of both speed sensors No. 1 and No. 2, no diagnostic will appear and fail-safe will not function. However, when driving in "D" range, the transmissio not up-shift from first gear regardless of the vehicle speed.

Trouble No. 1 Blinking overdrive indicator light (while driving)



Trouble No. 2 No shifting

Warm up engine
Coolant temp: 80°C (176°F)
ATF temp: 50 — 80°C (122 — 176°F)

Output diagnostic code
(See page AT-8)

Diagnosis code → Proceed to trouble No. 1 (AT-12)

No indicate

Connect a voltmeter to the DG terminal and body.
Does DG terminal voltage vary with changes in throttle opening?

Yes

No

Is voltage between ECT ECU terminals BR and GND as follows?
0V: Brake pedal released
12V: Brake pedal depressed

No → Brake signal faulty

Yes

- Computer power sourse and earth faulty
- Throttle position signal faulty
- DG terminal wire open or short

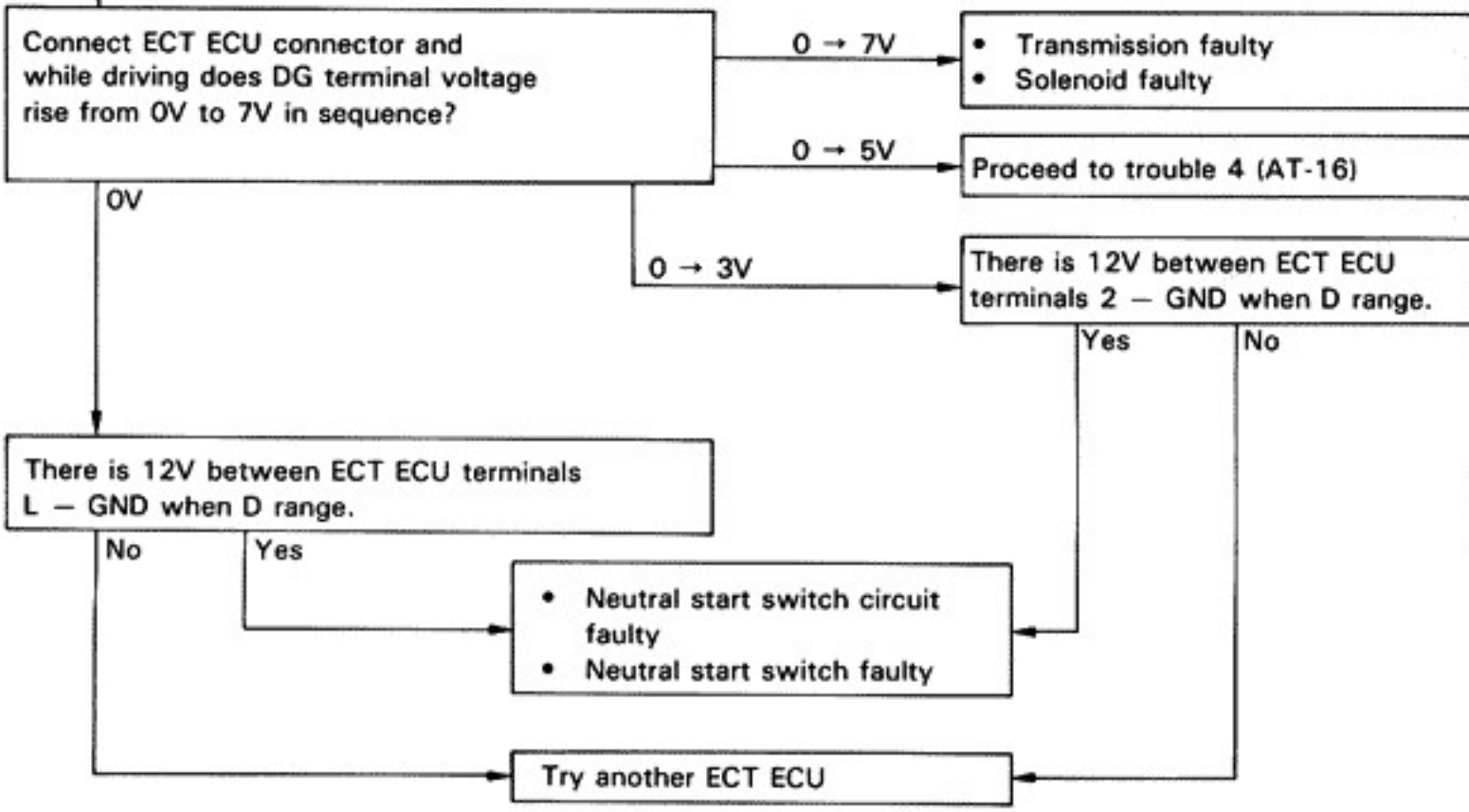
Disconnect ECT ECU connector and road test.
Does the transmission operate in the respective gear when in the following ranges while driving?
D range ..... Overdrive
2 range ..... 3rd gear
L range ..... 1st gear

No → Transmission faulty

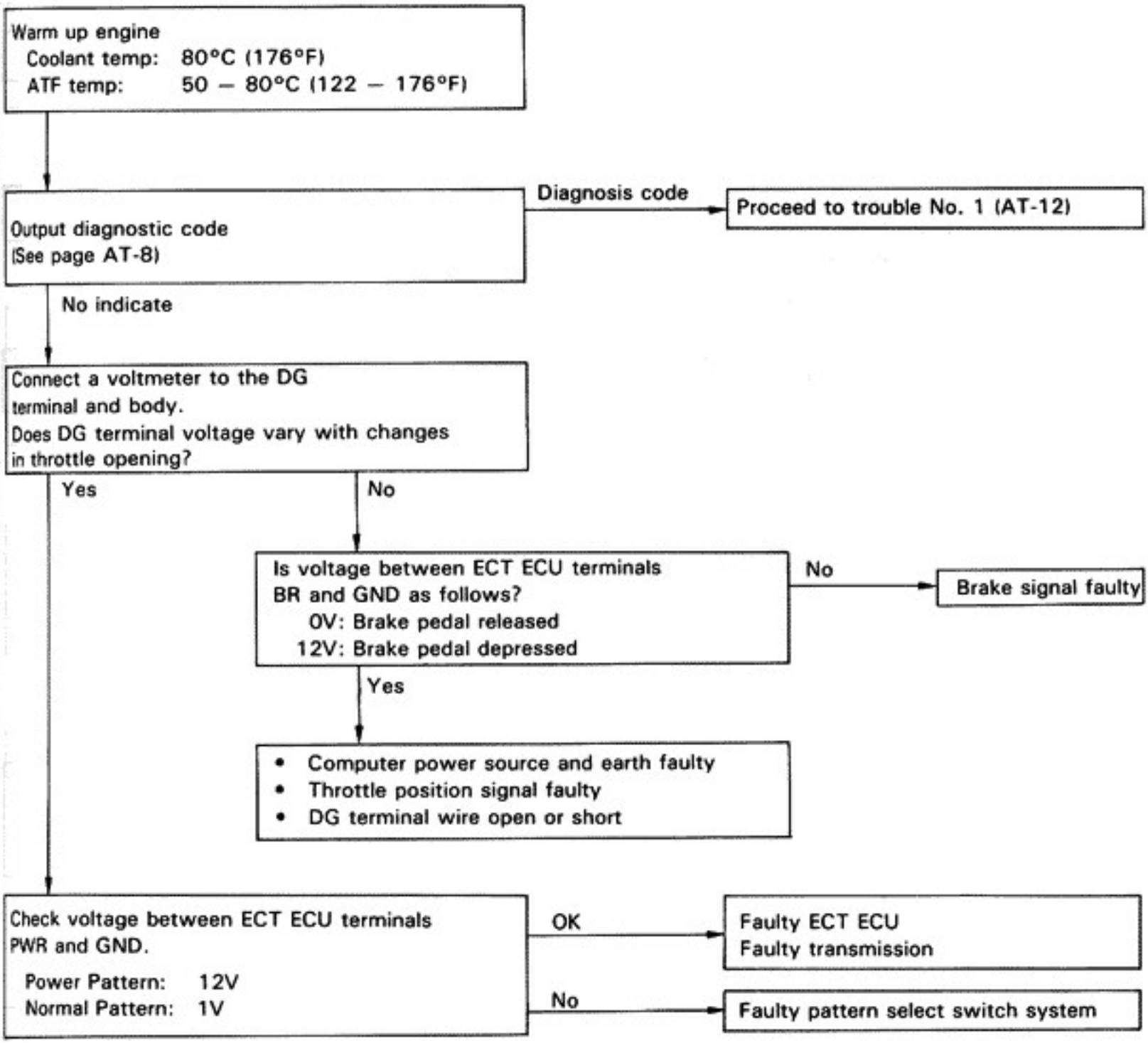
Yes

Continued on page AT-14

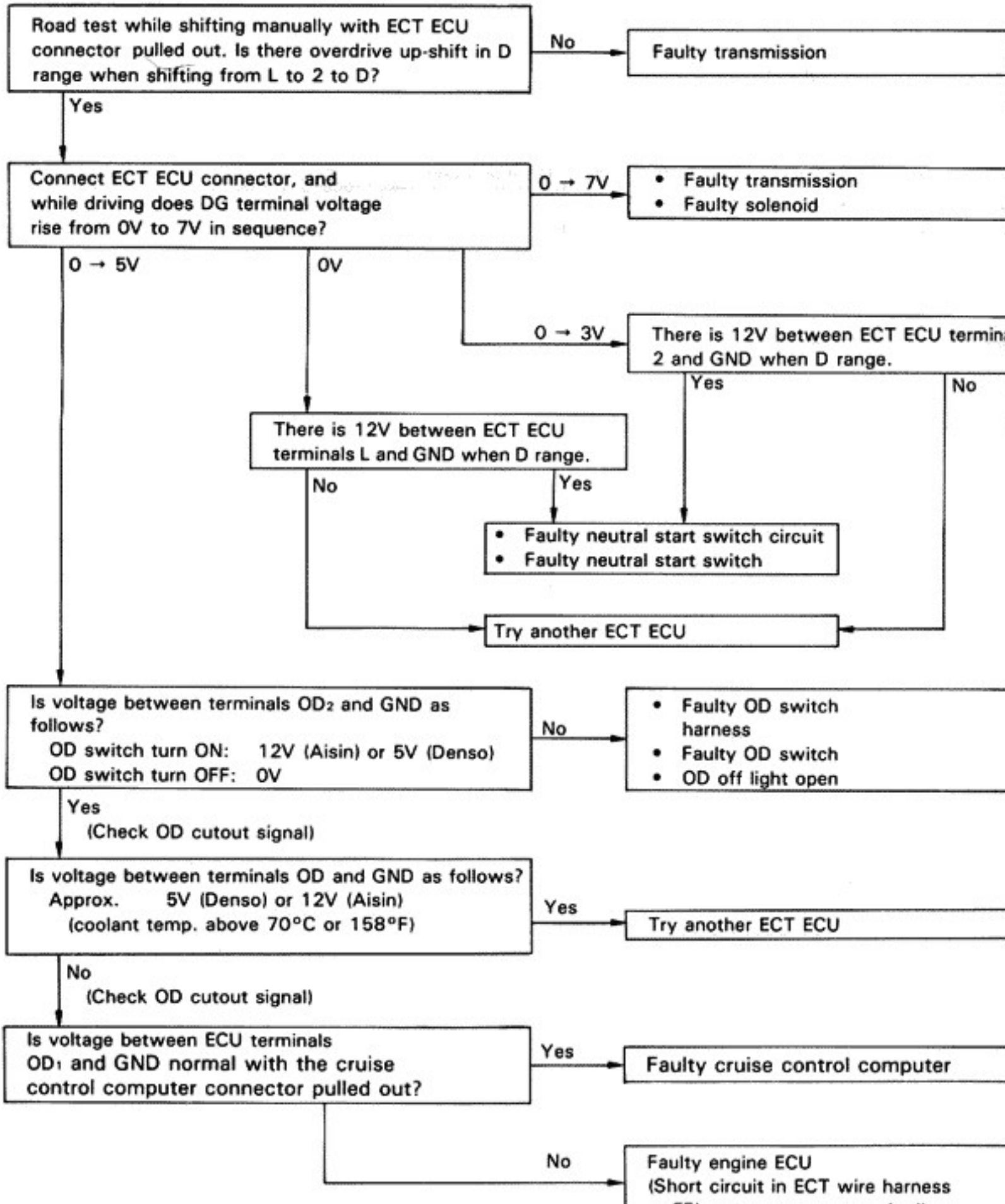
Continued from page AT-13



Trouble No. 3 Shift point too high or too low



Trouble No. 4 No up-shift to overdrive (After warm-up)



Trouble No. 5 No lock-up (After warm-up)

Warm up engine
Coolant temp: 80°C (176°F)
ATF temp: 50 — 80°C (122 — 176°F)

↓

Read diagnostic code (See page AT-8)

Output diagnostic code → Proceed to trouble No. 1 (AT-12)

↓ No indicated

Road test
Connect a voltmeter to DG terminal and body ground. Is there 7, 5 or 3V in the lock-up range while driving?

Yes →
- No. 3 solenoid stuck
- Faulty transmission
- Faulty lock-up mechanism

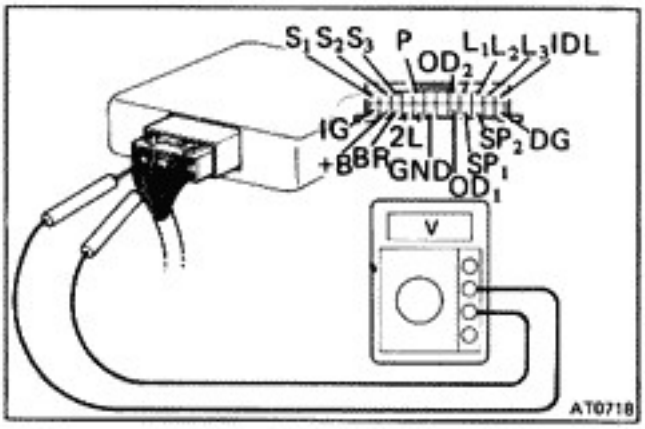
↓ No

Is voltage between ECT ECU BR and GND terminal as follows?
Brake pedal depressed : 12V
Brake pedal released : 0V

Yes →
- Faulty computer power source and earth.
- Faulty throttle position signal

↓ No

Faulty brake signal



INSPECTION OF ELECTRIC CONTROL COMPONENTS

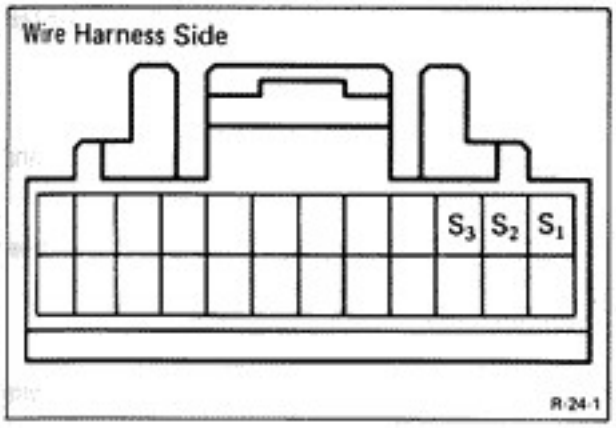
1. INSPECT VOLTAGE OF ECT COMPUTER CONNECT

(a) Remove the glove box.

(b) Turn on the ignition switch.

(c) Measure the voltage at each terminal.

Terminal	Measuring condition	Voltage (V)	
		DENSO type computer	AISIN type compute
L_1 — GND	Throttle valve fully closed	5	12
	Throttle valve fully closed to fully open	5 to 0	12 to 0
	Throttle valve fully open	0	←
L_2 — GND	Throttle valve fully closed	5	12
	Throttle valve fully closed to fully open	5 to 0 to 5	12 to 0 to 12
	Throttle valve fully open	5	12
L_3 — GND	Throttle valve fully closed	5	12
	Throttle valve fully closed to fully open	5 to 0 to 5 to 0 to 5	12 to 0 to 12 to 0 to
	Throttle valve fully open	5	12
IDL — GND	Throttle valve fully closed	0	←
	Throttle valve opening above 1.5°	12	←
SP_1 — GND	Standing still	5 or 0	12 or 0
	Engine running, vehicle moving	2.5	6
BR — GND	When brake pedal is depressed	12	←
	When brake pedal is not depressed	0	←
2 — GND	2 range	9 to 16	←
	Except 2 range	0 to 2	←
L — GND	L range	9 to 16	←
	Except L range	0 to 2	←
S_1 — GND	—	12	←
S_2, S_3 — GND	—	0	←
OD_1 — GND	Coolant temp. below 65°C (149°F)	0	←
	Coolant temp. above 75°C (167°F)	5	12
OD_2 — GND	OD main switch turn ON	5	12
	OD main switch turn OFF	0	←
IG — GND	Standing still	12	←
SP_2 — GND	Standing still	5 or 0	←
	Engine running	4	←



2. INSPECT SOLENOID

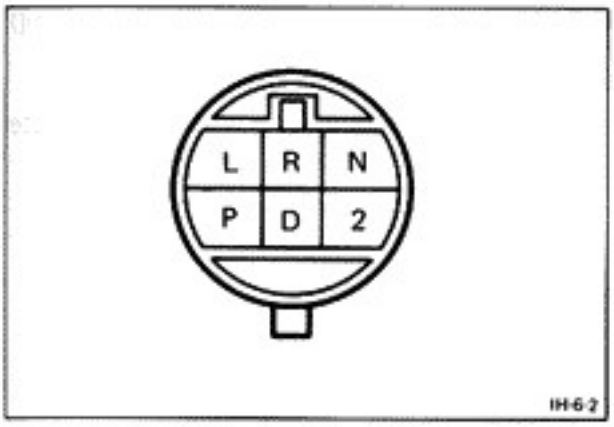
(a) Disconnect the connector from the ECT ECU.

(b) Measure the resistance between S_1, S_2, S_3 and ground.

STD: 11 — 15Ω

(c) Apply battery voltage to the solenoid. At this time, check that an operation noise can be heard from the solenoid.

NOTE: If there is foreign matter in the solenoid valve, there will be no fluid control even with solenoid operation.

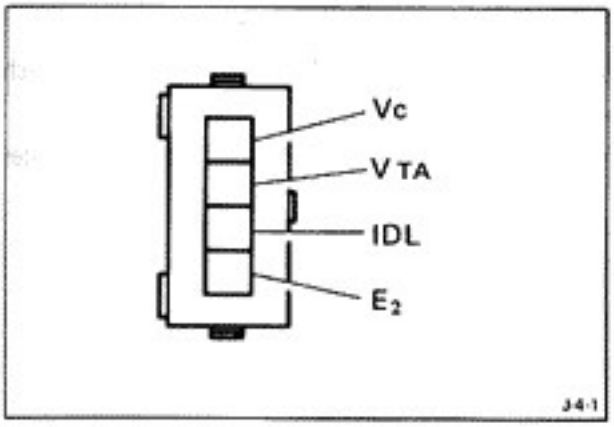


3. INSPECT NEUTRAL START SWITCH

(a) Shift the lever into the L or 2 range.

(b) Disconnect the connector near the starter motor.

(c) Check that there is continuity between L, 2 and ground.



4. INSPECT THROTTLE POSITION SENSOR

Using an ohmmeter, check the resistance between each terminal.

Terminal	Throttle valve condition	Resistance (kΩ)
IDL — E_2	Fully closed	0
	Open	Infinity
V_C — E_2	—	3 — 7
V_{TA} — E_2	Fully closed	0.2 — 0.8
	Fully open	3.3 — 10

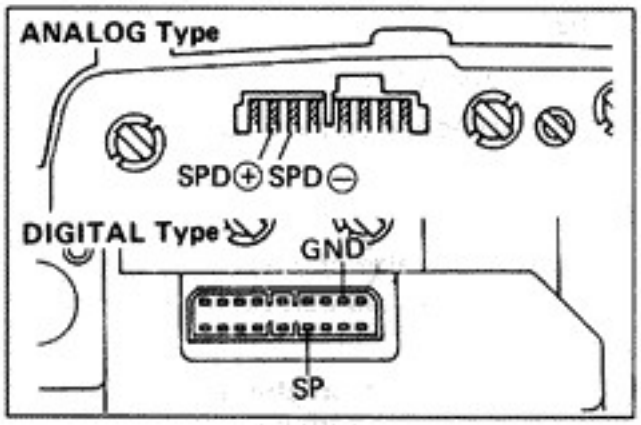
5. INSPECT BRAKE SIGNAL

Check that the brake light comes on when the brake pedal is depressed.

6. INSPECT SPEED SENSOR NO.2

(a) Jack up the rear wheel on one side.

(b) Connect an ohmmeter between the connector and ground.



7. INSPECT SPEED SENSOR NO.1 IN COMBINATION ME

[Analog Type]

(a) Remove the combination meter.

(b) Connect an ohmmeter between terminals SPD ⊕ SPD ⊖.

(c) Revolve the meter shaft and check that the meter dle repeatedly deflects from 0Ω to ∞Ω.

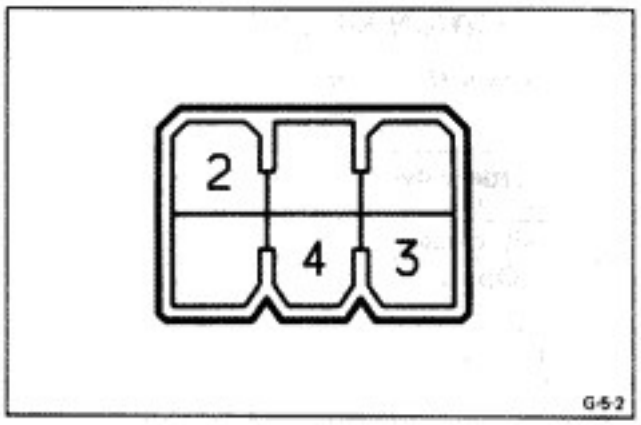
[Digital Type]

(a) Remove the combination meter with connected harness.

(b) Connect a voltmeter between terminals SP and G

(c) Turn the ignition switch ON.

(d) Revolve the meter shaft and check that the voltm needle repeatedly defects from 0V to 2V.

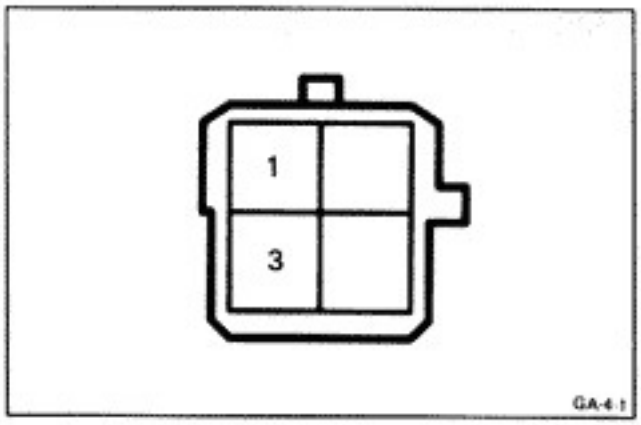


8. INSPECT PATTERN SELECTION SWITCH

Inspect that there is continuity between 2 and terminal.

NOTE: As there are diodes inside, be careful of the te probe polarity.

Terminal / Pattern	2	4	3
NORM	○	○	
PWR	○		○



9. INSPECT OD SWITCH

Inspect that there is continuity between 1 and 3.

Terminal / S/W position	1	3
ON		
OFF	○	○

10. INSPECT LOCK-UP MECHANISM

(a) Warm up the coolant and ATF.

(b) Connect a voltmeter to the DG terminal and b ground.

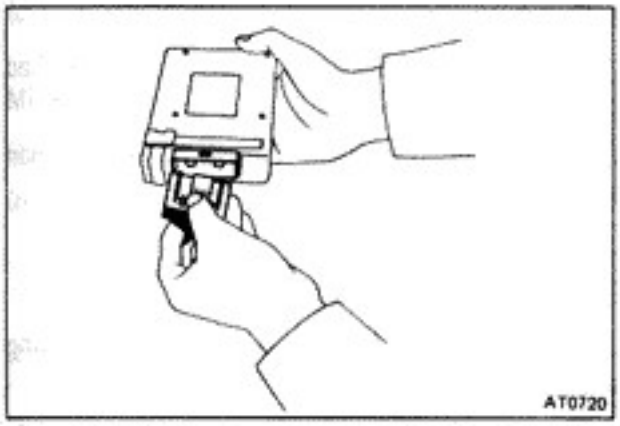
INSPECTION OF MANUAL SHIFTING

NOTE: With this inspection, it can be determined whether the trouble lies within the electrical circuit or a mechanical trouble in the transmission.

1. DISCONNECT ECT ECU CONNECTOR

(a) Remove the glove box.

(b) Disconnect the ECT ECU connector.



2. INSPECT MANUAL DRIVING OPERATION

(a) While driving, check that there is respective gear change in each drive range.

Shift position	D range	2 range	L range	R range	P range
Gear position	OD	3rd	1st	Reverse	Pawl Lock

(b) Vehicle moves in reverse in "R" range.

(c) Vehicle does not move in "N" range.

(d) Parking pawl locks in "P" range.

If not as specified, check the transmission.

NOTE: If a problem is indicated with the ECT even if this check is as specified, the trouble lies within the electrical circuit.

STALL TEST

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

CAUTION:

(a) Perform the 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 four 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: 2,100 ± 150 rpm

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

EVALUATION

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

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

NOTE: If more than 600 rpm below the spec value, the torque converter could be at faul

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

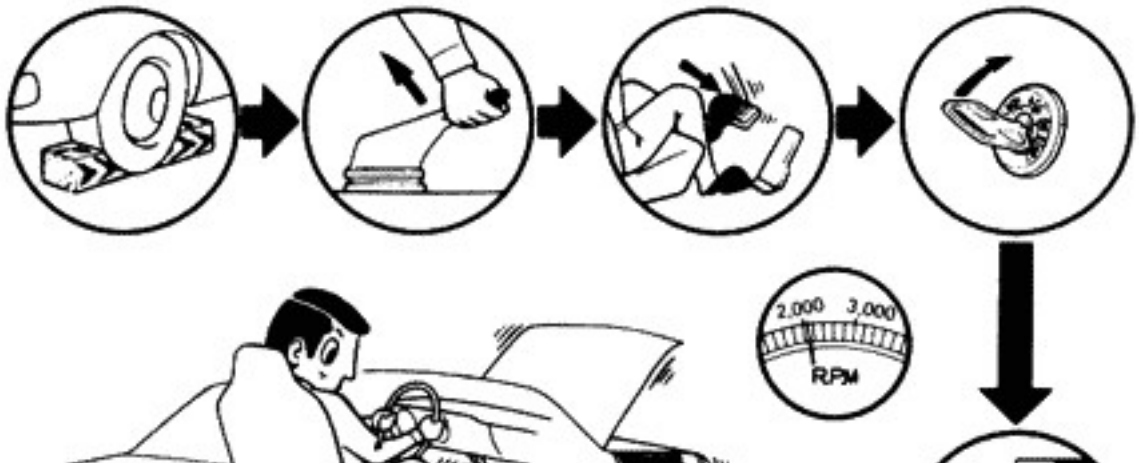
- Line pressure too low
- Front clutch slipping
- One-way clutch No. 2 not oper properly
- OD one-way clutch not operating pro

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

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

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

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



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.

CAUTION:

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

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

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

MEASURE TIME LAG

(a) Fully apply the parking brake.

(b) Start the engine.

Check idling speed (A/C OFF)

"N" range 650 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**

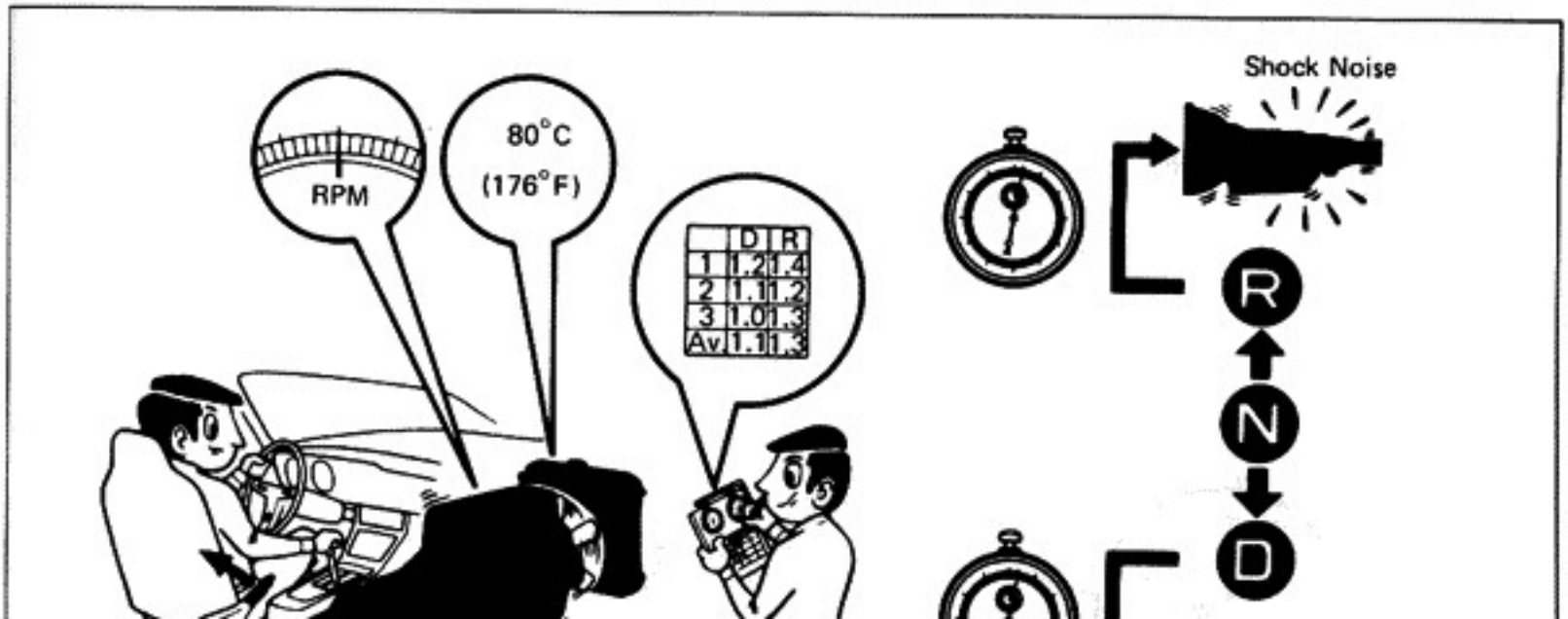
(d) In same manner, measure the time lag for "N" → "R".

Time lag: **Less than 1.5 seconds**

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) Remove the transmission case test plug and mount the hydraulic pressure gauge.

SST 09992-00093 Oil pressure gauge

CAUTION: Perform the test at normal operating fluid temperature (50 — 80°C or 122 — 176°F).

2. MEASURE LINE PRESSURE

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

(b) Start the engine and check idling rpm.

(c) Shift into "D" range, 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 table.

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

Engine speed rpm	Line pressure kg/cm² (psi, kPa)	
	"D" range	"R" range
Idling	3.7 — 4.1 (53 — 58) (363 — 402)	5.1 — 5.7 (73 — 81) (500 — 559)
Stall	10.6 — 13.0 (151 — 185) (1,040 — 1,275)	14.3 — 19.0 (203 — 270) (1,402 — 1,863)

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

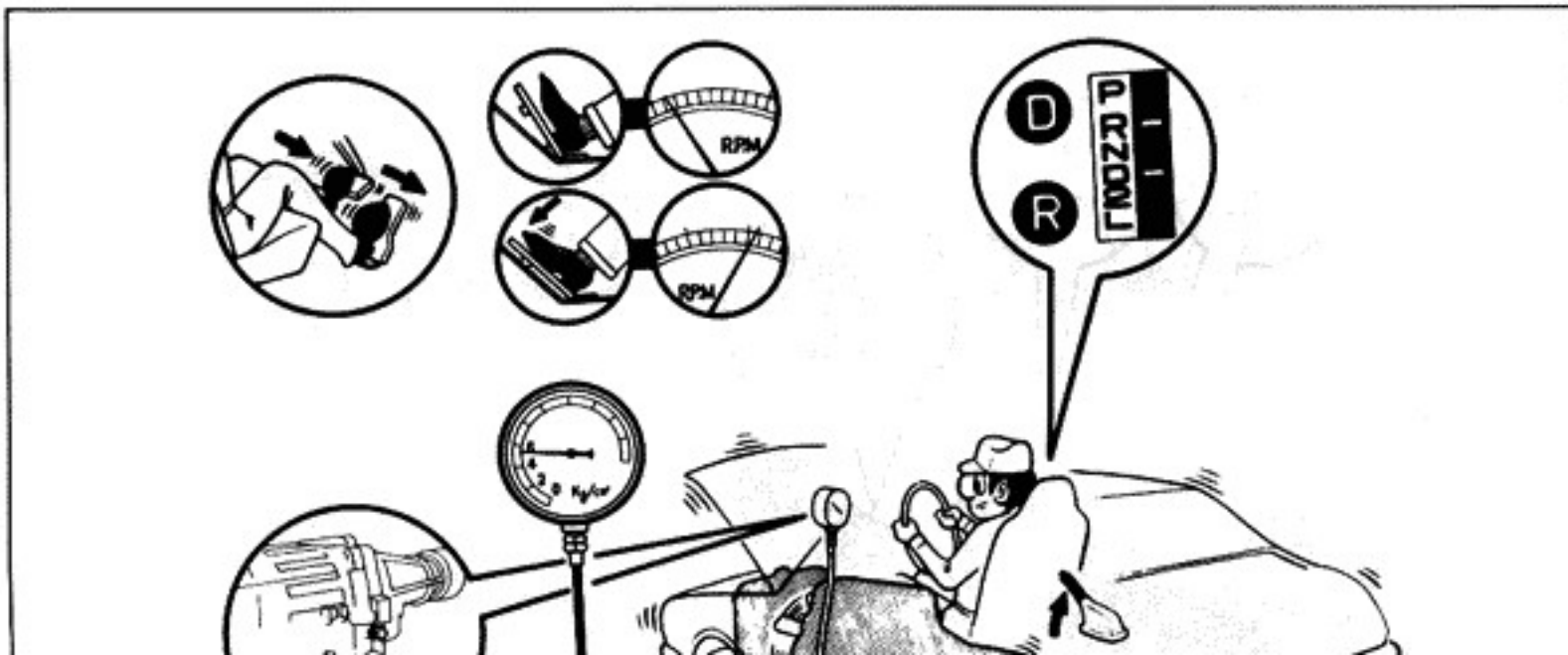
EVALUATION

(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

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



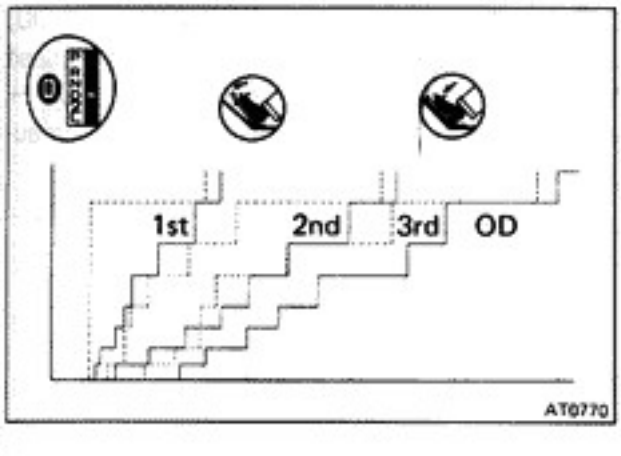
ROAD TEST

CAUTION: Perform the test at normal operating fluid temperature (50 — 80°C or 122 — 176°F).

1. **"D" RANGE TEST IN NORM, AND PWR PATTERN RANGES**

Shift into "D" range and hold the accelerator pedal constant at 50 % and 100 % throttle valve opening positions.

Push in one of the pattern selector buttons and check the following:



(a) 1-2, 2-3, 3-OD and lock-up up-shifts should take place, and shift points should conform to those shown in the automatic shift diagram.

NOTE:

(1) There is no 3rd up-shift or lock-up when coolant temperature is below 35°C (95°F) and speed is under 48 km/h (30 mph).

(2) There is no OD up-shift or lock-up when coolant is below 63°C (145°F) and speed is under 63 km/h (39 mph), or if there is a 10 km/h (6 mph) difference between the set cruise control speed.

EVALUATION

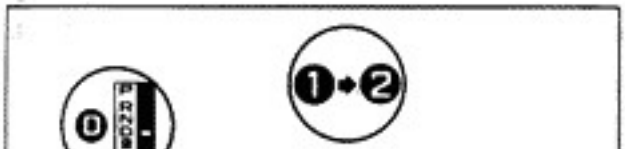
(1) If there is no 1 → 2 up-shift:
- No.2 solenoid is stuck
- 1-2 shift valve is stuck

(2) If there is no 2 → 3 up-shift:
- No.1 solenoid is stuck
- 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

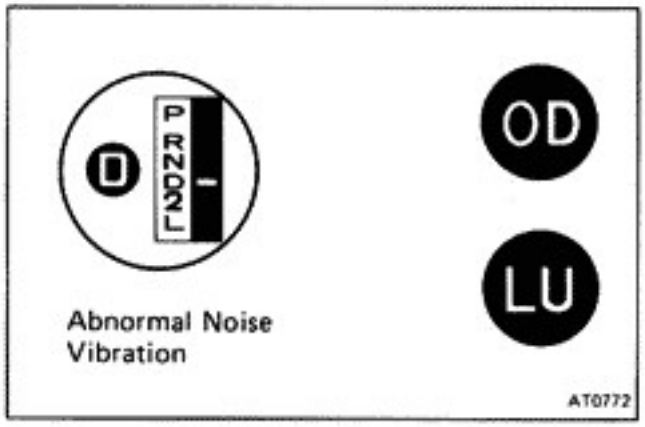
(4) If the shift point is defective:
- Throttle valve, 1-2 shift valve, 2-3 shift valve, 3-OD shift valve etc., are defective.

(5) If the lock-up is defective:
- No.3 solenoid is stuck
- Lock-up relay valve is stuck



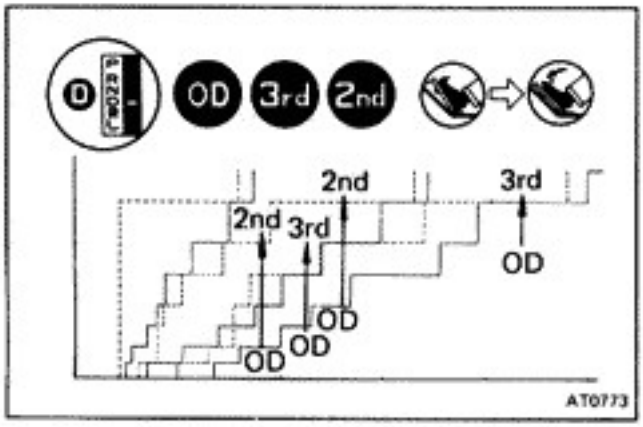
(b) In the same manner, check the shock and the slip at 1 → 2, 2 → 3 and 3 → OD up-shifts.

EVALUATION



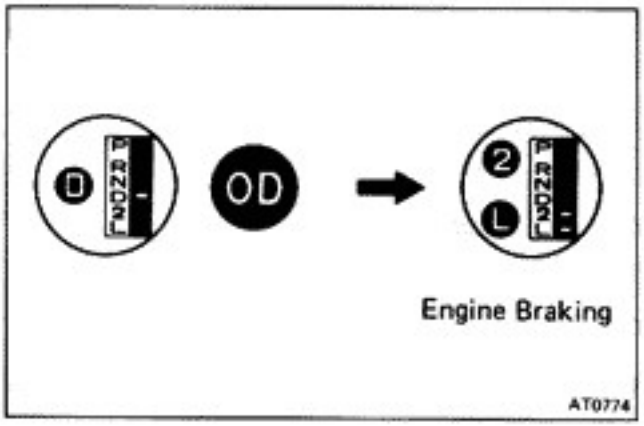
(c) Run in the OD gear of the "D" range and with lock-up in operation, and check for abnormal nois vibration.

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



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

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

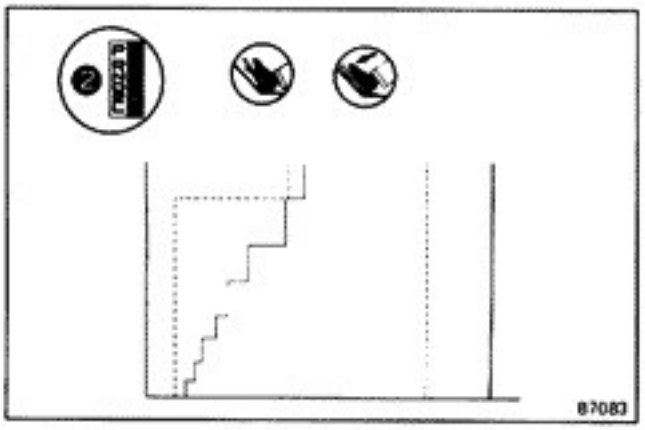


(f) While running in "D" range OD gear, shift to "2" "L" ranges and check the engine braking effec each of these ranges.

EVALUATION

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

(2) If there is no engine braking effect at "L" rang
- Brake No. 3 is defective



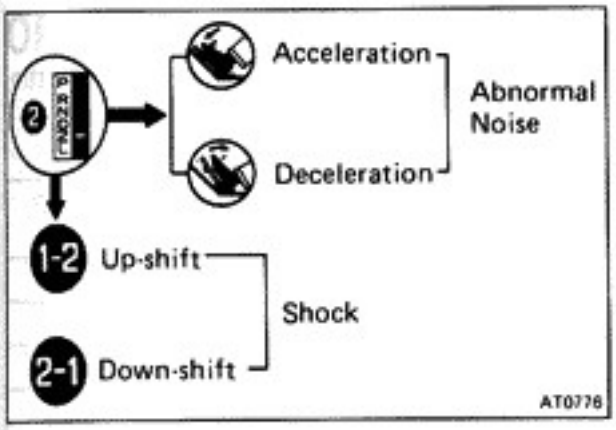
2. "2" RANGE TEST, WITH NORM AND PWR PATTER

Shift into "2" range and while driving with the accel tor pedal held constant at specified point (throttle va opening 50 % and 100 %) and push in one of the patt selectors, check on the following points.

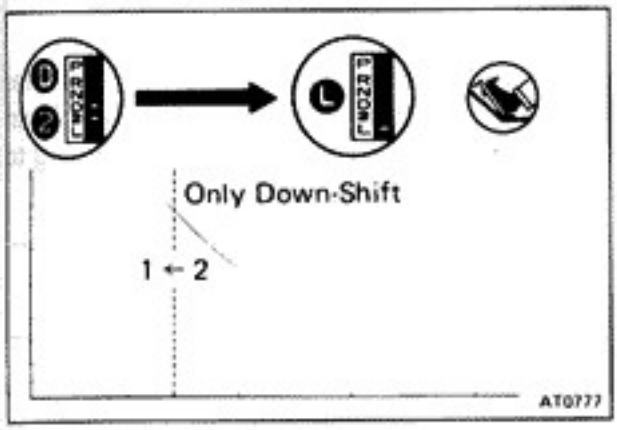
(a) At each of the above throttle openings, check to that 1 → 2 up-shift take place and also that the s points conform to those shown on the automatic s diagram.

NOTE: There is no OD and no lock-up in "2" range

(b) While running in "2" range, 2nd gear, release the celerator pedal and check the engine braking eff



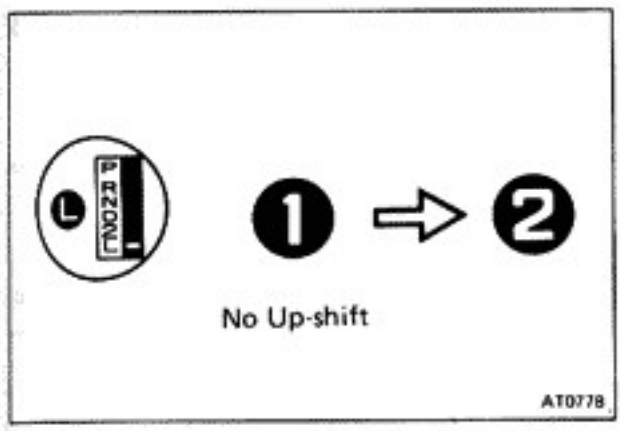
(c) Check for 2 → 1 down-shift and abnormal noise at acceleration and deceleration, and for shock at up-shift and down-shift.



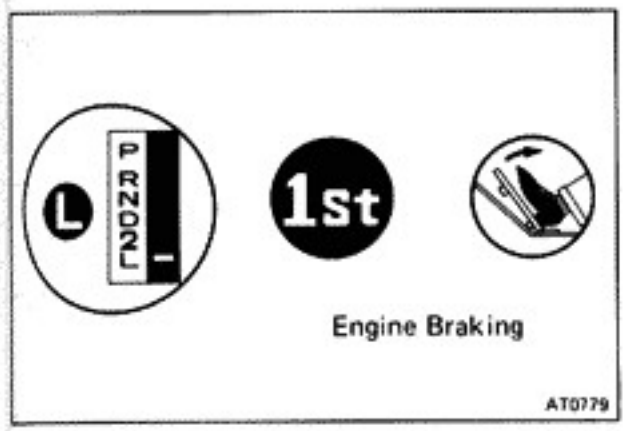
3. "L" RANGE TEST

(a) While running above 80 km/h (50 mph) in the "D" range, release your foot from the accelerator pedal and shift into "L" range.

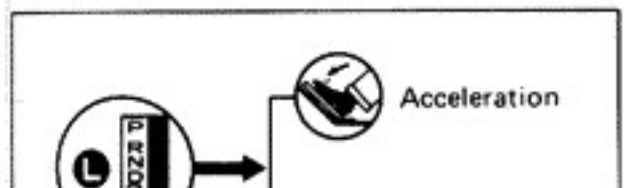
Then check to see that the 2 → 1 down shift point conforms to 53 km/h (33 mph).



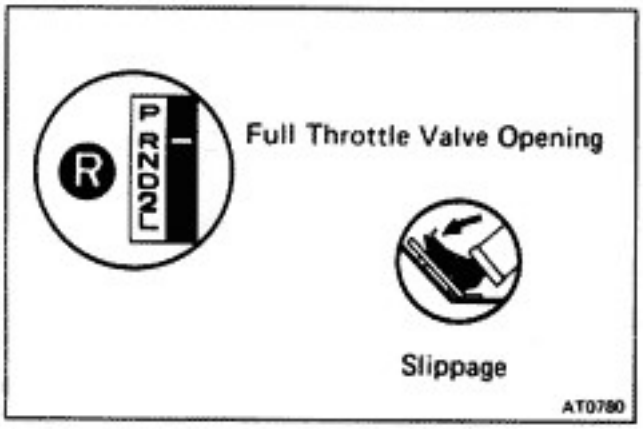
(b) While running in the "L" range, check to see that there is no up-shift to 2nd gear.



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

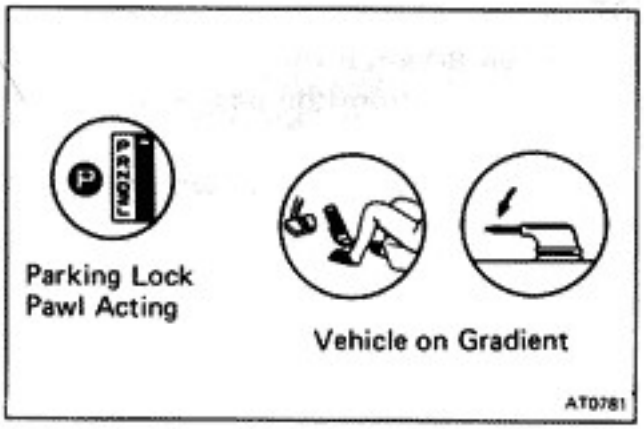


(d) Check for abnormal noise at acceleration and deceleration.



4. **"R" RANGE TEST**

Shift into "R" range and, while starting at full thro
check for slipping.



5. **"P" RANGE TEST**

Stop the vehicle on a gradient (more than 9 %) and
shifting into "P" range, release the parking brake. T
check to see that the parking lock pawl is functionin
prevent the vehicle from moving.

OPERATING MECHANISM FOR EACH GEAR

1. TRANSMISSION SYSTEM

○ .... Operating

Shift lever position	Gear position	C_0	C_1	C_2		B_0	B_1	B_2	B_3		F_0	F_1	F_2
				I.P	O.P				I.P	O.P			
P	Parking	○											
R	Reverse	○		○	○				○	○			
N	Neutral	○											
D	1st	○	○								○		○
	2nd	○	○					○			○	○	
	3rd	○	○		○			○			○		
	OD		○		○	○		○					
2	1st	○	○								○		
	2nd	○	○				○	○			○	○	
	3rd	○	○		○			○			○		
L	1st	○	○						○	○	○		○
	*2nd	○	○				○	○			○	○	

* Down shift only in "L" range, 2nd gear — no up shift.

2. SOLENOID SYSTEM

Possible gear positions in accordance with solenoid operating conditions.

Range	NORMAL			SOLENOID NO. 1 MALFUNCTIONING			SOLENOID NO. 2 MALFUNCTIONING			BOTH SOLENOIDS MALFUNCTIONING		
	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear	Solenoid valve		Gear
	No.1	No.2	Position	No.1	No.2	Position	No.1	No.2	Position	No.1	No.2	Position
"D" range	ON	OFF	1st	X	ON (OFF)	3rd (OD)	ON	X	1st	X	X	OD
	ON	ON	2nd	X	ON	3rd	OFF (ON)	X	OD (1st)	X	X	OD
	OFF	ON	3rd	X	ON	3rd	OFF	X	OD	X	X	OD
	OFF	OFF	OD	X	OFF	OD	OFF	X	OD	X	X	OD
"2" range	ON	OFF	1st	X	ON (OFF)	3rd (OD)	ON	X	1st	X	X	3rd
	ON	ON	2nd	X	ON	3rd	OFF (ON)	X	3rd (1st)	X	X	3rd
	OFF	ON	3rd	X	ON	3rd	OFF	X	3rd	X	X	3rd
"L" range	ON	OFF	1st	X	OFF	1st	ON	X	1st	X	X	1st
	ON	ON	2nd	X	ON	2nd	ON	X	1st	X	X	1st

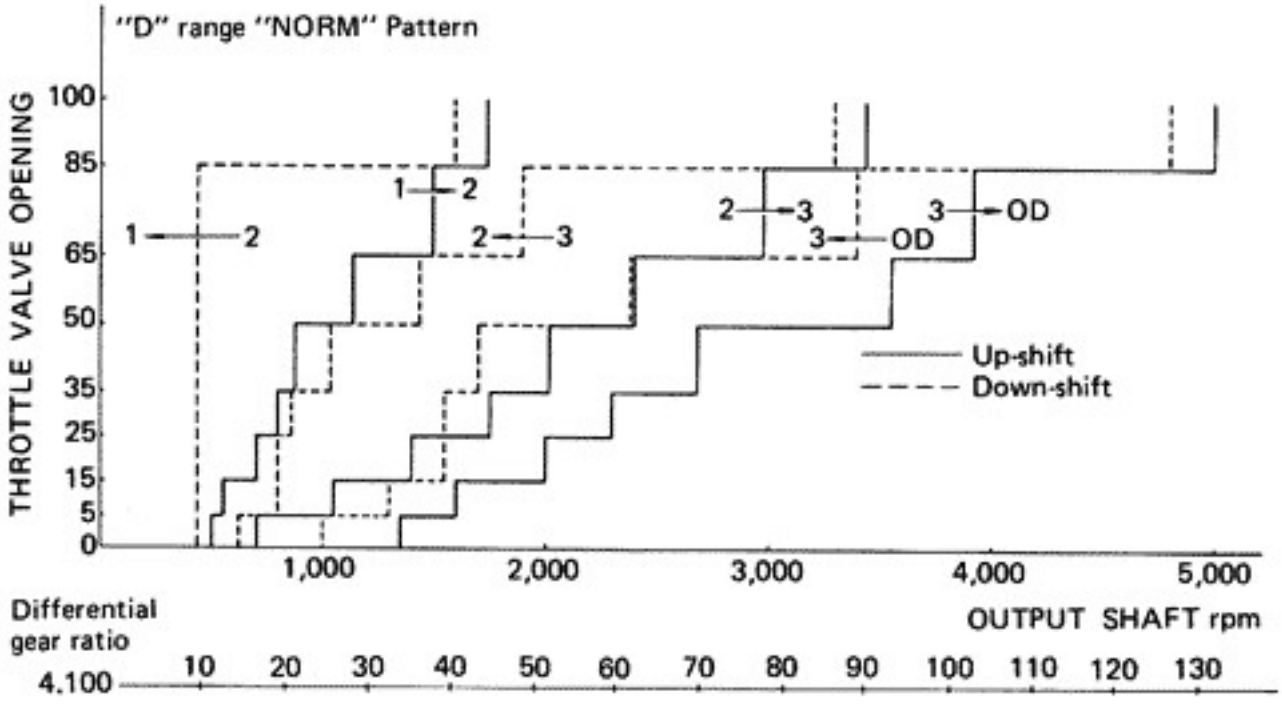
( ): No fail safe function X: Malfunctions

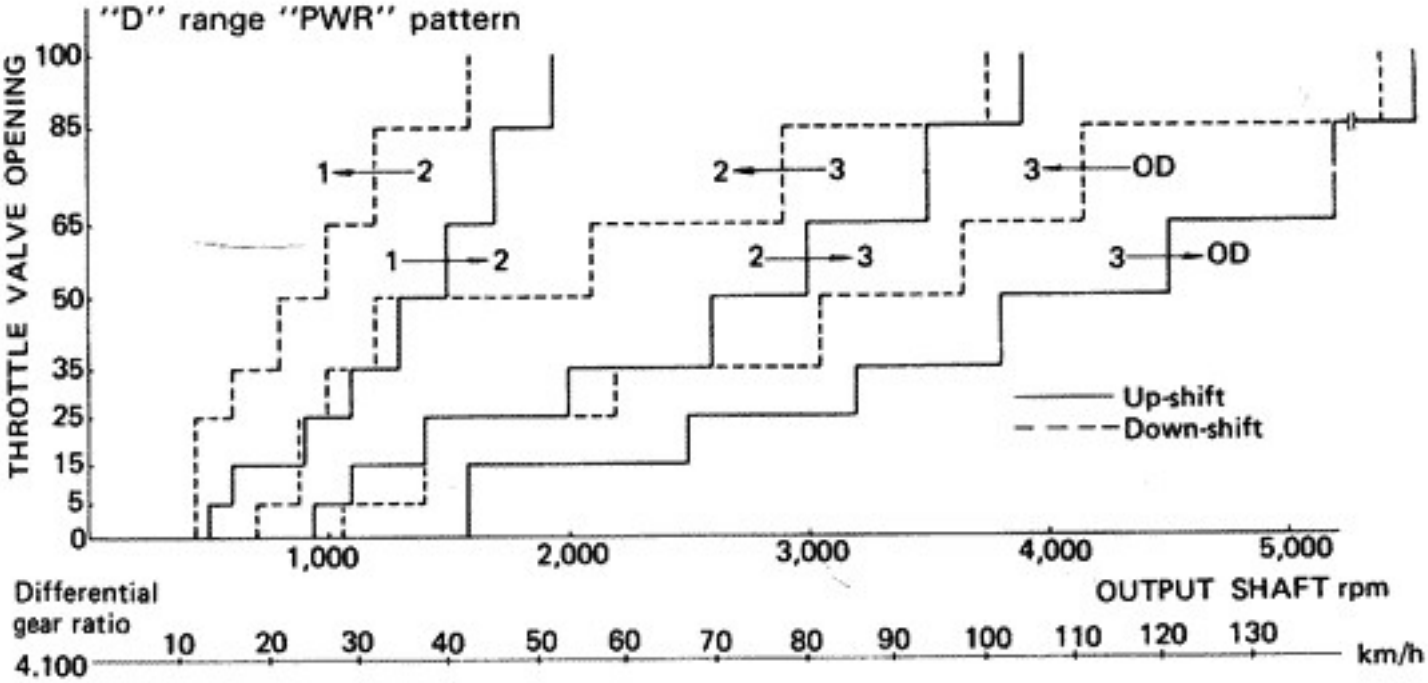
AUTOMATIC SHIFT DIAGRAM

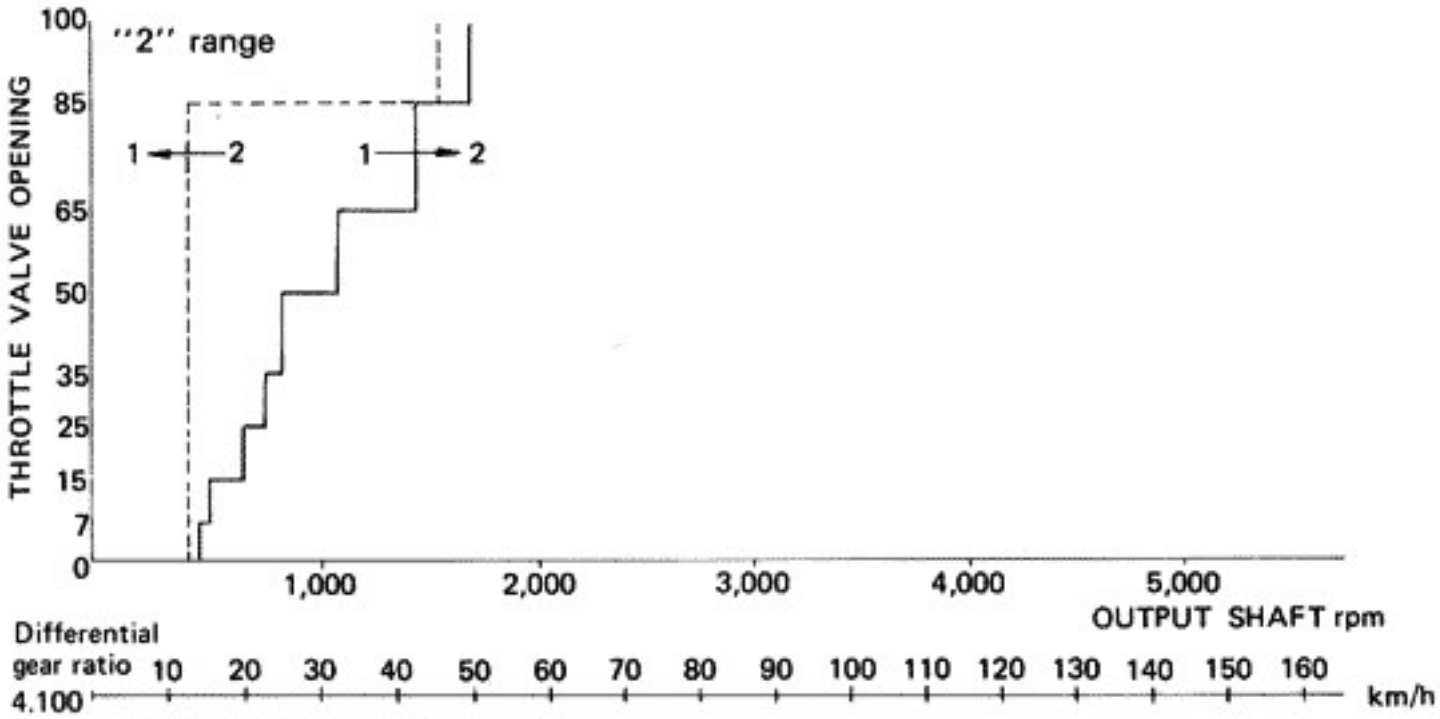
		Throttle valve fully open [ ] Fully closed km/h (mph							
		1–2	2–3	3–OD	[3–OD]	[OD–3]	OD–3	3–2	2–1
D range	NORM	47–52 (29–32)	92–101 (57–63)	135–144 (84–89)	[36–40 (22–25)]	[26–30 (16–19)]	130–138 (81–86)	88–96 (55–60)	42–4 (26–2
	PWR	52–57 (32–35)	105–114 (65–71)	152–161 (94–100)	[42–46 (26–29)]	[28–32 (17–20)]	146–155 (91–96)	101–109 (63–68)	42–4 (26–2
2 range	NORM PWR	47–52 (29–32)	112–121 (70–75)	–	–	–	–	102–110 (63–68)	42–4 (26–2
L range	NORM PWR	–	–	–	–	–	–	–	51–5 (32–3

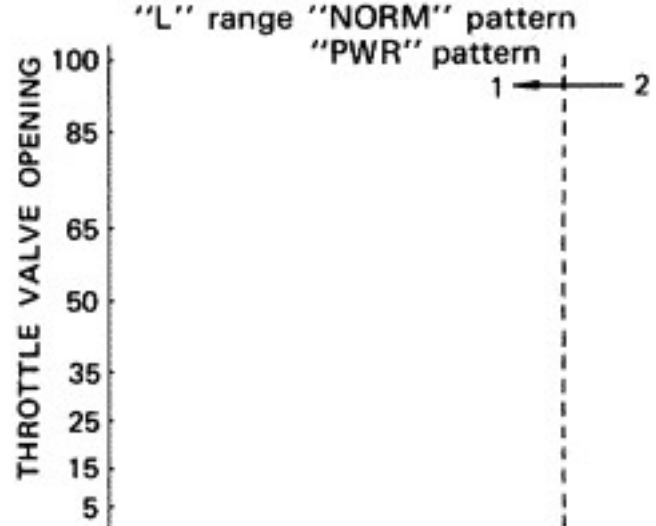
		Throttle valve opening 5 % km/h (mph)					
		Lock-up ON			Lock-up OFF		
		2nd	3rd (*)	OD	2nd	3rd (*)	OD
D range	NORM PWR	–	53–58 (33–36)	53–58 (33–36)	–	49–54 (30–34)	49–54 (30–34)
2 range	NORM PWR	–	–	–	–	–	–
L range	NORM PWR	–	–	–	–	–	–

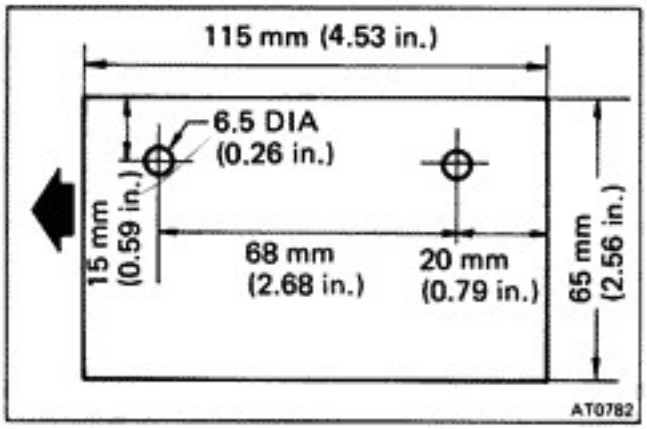
(*): OD switch OFF




"D" range "PWR" pattern
THROTTLE VALVE OPENING
100
85
65
50
35
25
15
5
0
1 → 2
2 → 3
3 → OD
1 ← 2
2 ← 3
3 ← OD
Up-shift
Down-shift
1,000
2,000
3,000
4,000
5,000
OUTPUT SHAFT rpm
Differential gear ratio
4.100
10 20 30 40 50 60 70 80 90 100 110 120 130
km/h


"2" range
THROTTLE VALVE OPENING
100
85
65
50
35
25
15
7
0
1 → 2
1 ← 2
1,000
2,000
3,000
4,000
5,000
OUTPUT SHAFT rpm
Differential gear ratio
4.100
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
km/h


"L" range "NORM" pattern
"PWR" pattern
THROTTLE VALVE OPENING
100
85
65
50
35
25
15
5
1 → 2



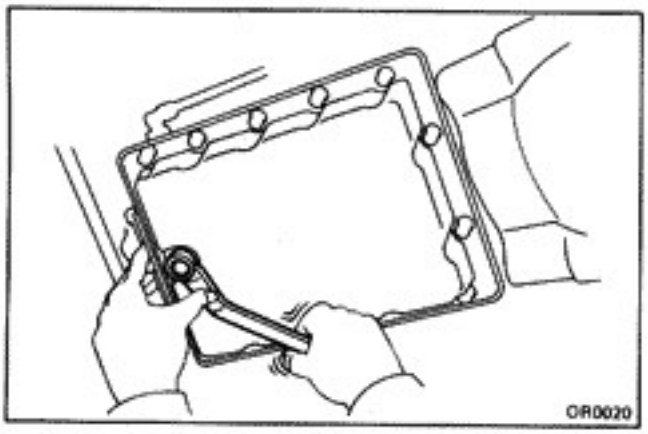
ON-VEHICLE REPAIR

REMOVAL OF SOLENOID OR VALVE BODY

1. MAKE PLATE TO RETAIN ACCUMULATOR PISTONS

A retainer is helpful for holding accumulator pistons in case during removal and installation of the valve bo

The plate may be made from aluminum or plastic.

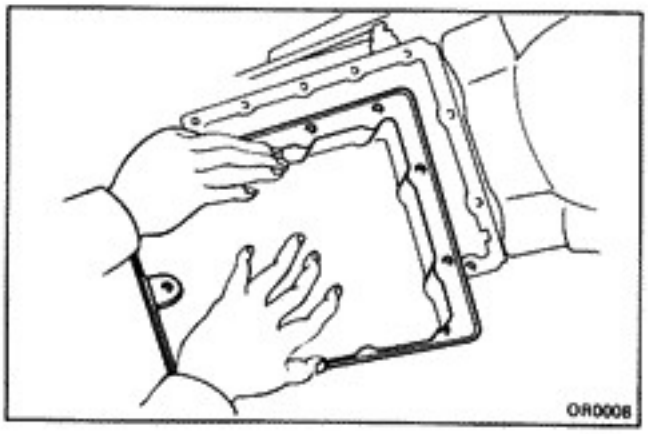


2. CLEAN TRANSMISSION EXTERIOR

To help prevent contamination, clean the exterior of transmission.

3. DRAIN TRANSMISSION FLUID

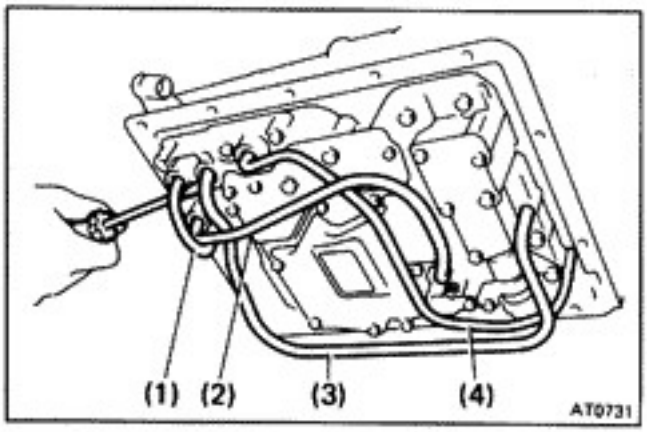
Remove the drain plug and drain fluid into a suitable c tainer.



4. REMOVE OIL PAN, FILLER TUBE AND GASKET

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

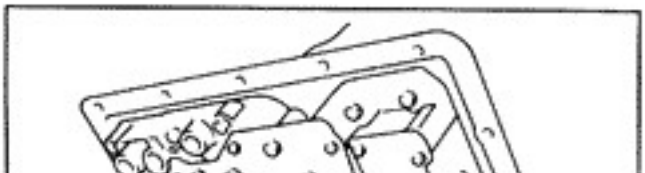
Remove all pan bolts, and carefully remove the pan ass bly. Discard the gasket.



5. REMOVE OIL TUBES

(a) Remove the four tubes in the numerical order sho

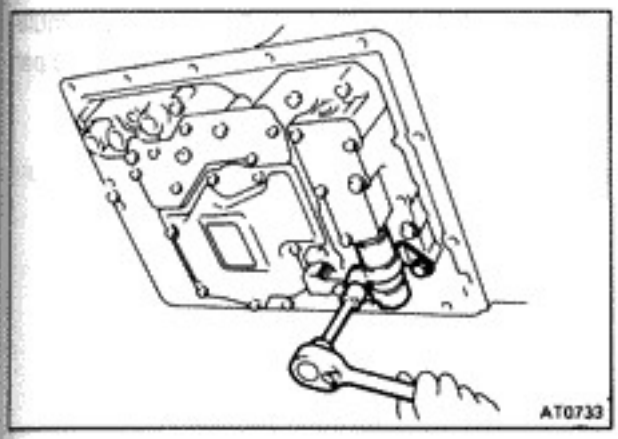
(b) Pry up both tube ends with a large screwdriver remove the tubes.



6. DISCONNECT TWO CONNECTORS FROM SOLENOI

(a) Disconnect the solenoid wire from clamp.

(b) Disconnect the two connectors.



7. WHEN REPLACING SOLENOID

(a) For the No. 3 solenoid,

(1) Remove the two bolts.

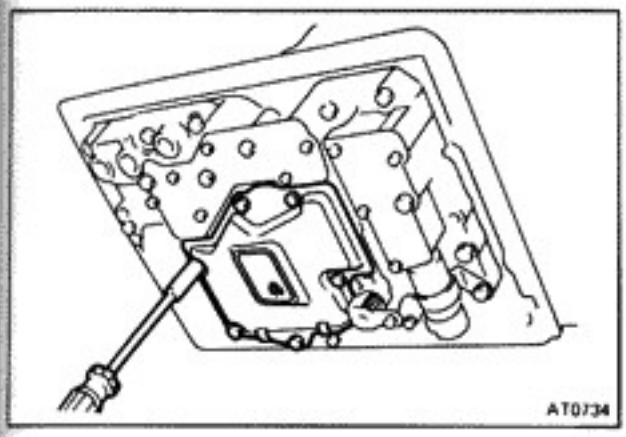
(2) Remove the solenoid.

(b) For the No. 1 and 2 solenoids,

(1) Remove the three bolts.

(2) Remove the solenoid with gasket.

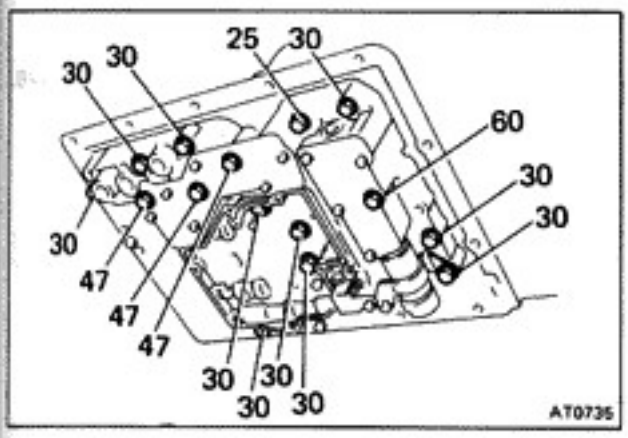
NOTE: Be careful not to remove the two valve springs.



8. REMOVE OIL STRAINER

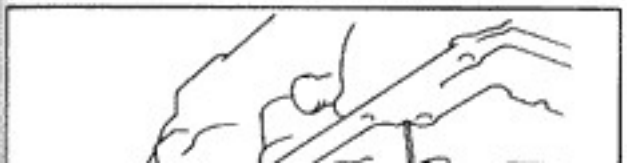
Remove the six bolts, and the oil strainer.

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

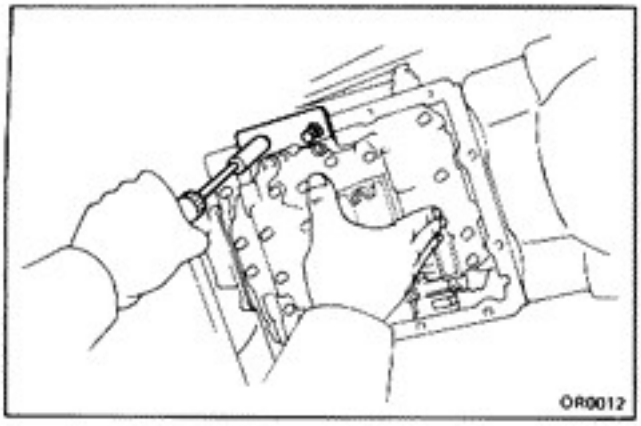


9. REMOVE VALVE BODY

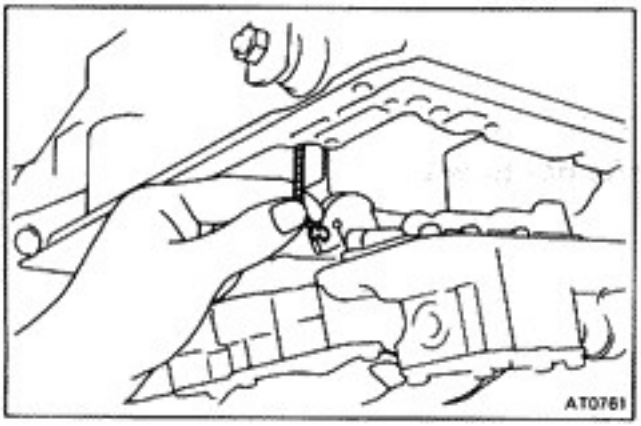
(a) Remove the fifteen bolts.



(b) Remove the B_2 and C_2 accumulator piston springs.



(c) Lower valve body slightly, and install the accum tor piston retaining plate. Hold in place with two bolts, finger tight.



(d) Disconnect the throttle cable from the cam and move the valve body.

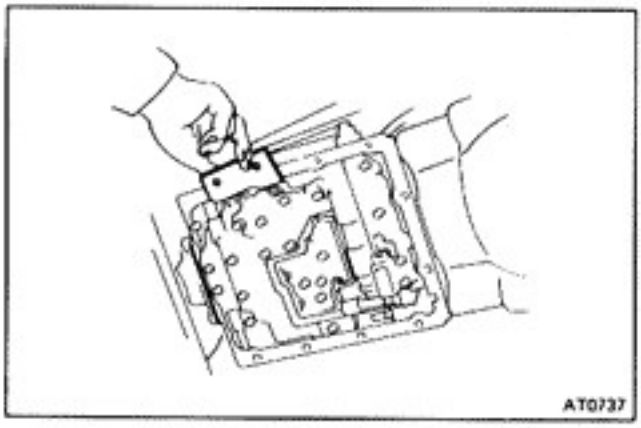
DISASSEMBLY, INSPECTION AND ASSEMBLY OF VALVE BODY

(See page AT-83)

INSTALLATION OF VALVE BODY

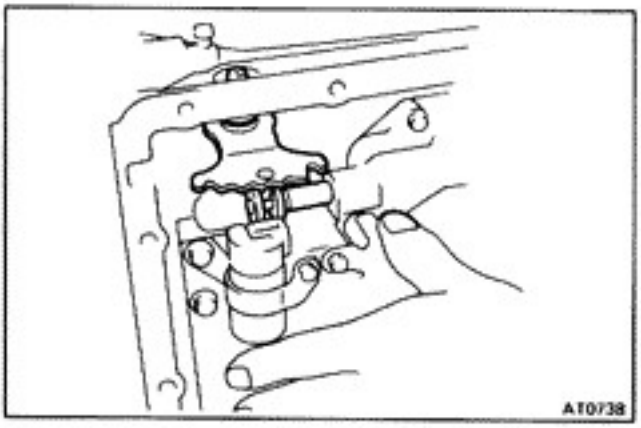
1. CONNECT THROTTLE CABLE TO CAM

Push the cable fitting into the cam.



2. REMOVE ACCUMULATOR RETAINING PLATE

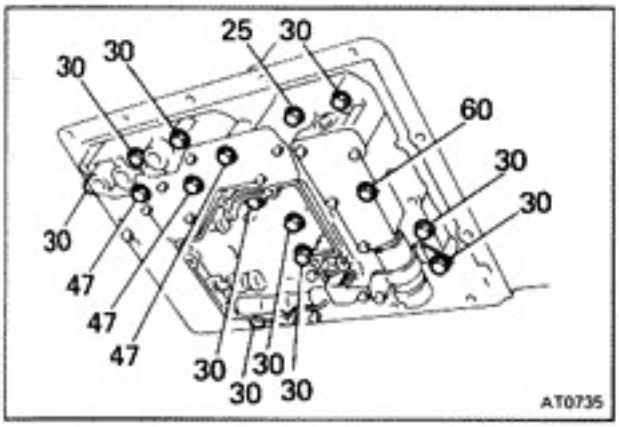
Remove the two pan bolts, and slide out the plate.



3. INSTALL VALVE BODY

(a) Align the manual valve lever with the manual va

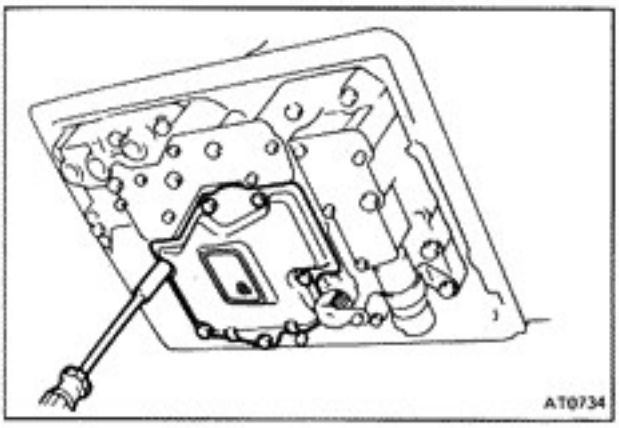
(b) Install the B_2 and C_2 accumulator piston springs



4. INSTALL VALVE BODY BOLTS

Install the bolts as shown. Tighten the bolts evenly.

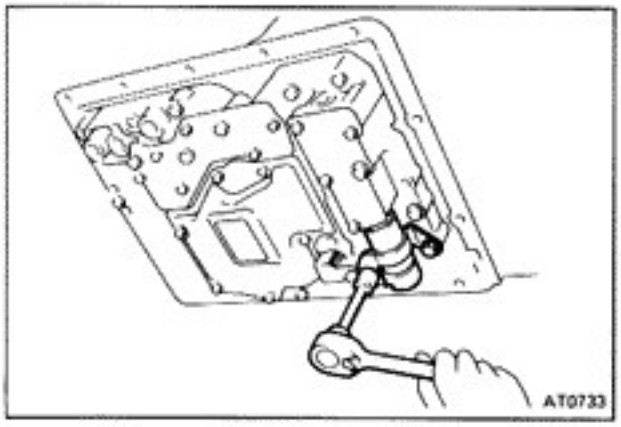
Torque: 100 kg-cm (7 ft-lb, 10 N·m)



5. INSTALL OIL STRAINER

Be sure the strainer is clean. Torque the six bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



6. WHEN REPLACING SOLENOID

(a) For the No. 3 solenoid,

- Install the solenoid into the bore.
- Tighten the two bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

(b) For the No. 1 and 2 solenoids,

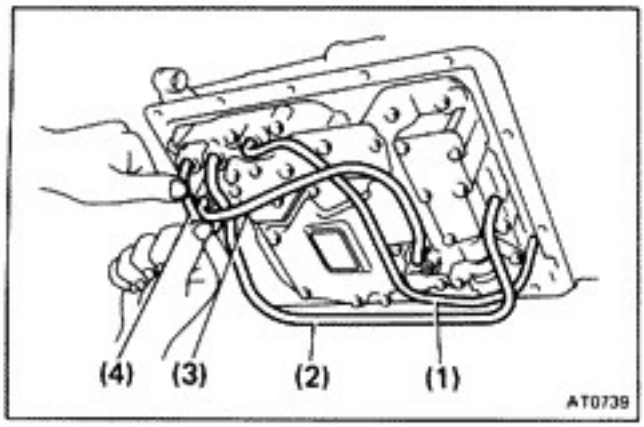
- Make sure that the two valve spring are installe correctly.
- Install the solenoid over the gasket and install th center of the bolt.
- Tighten the three bolts.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)

7. CONNECT TWO CONNECTORS TO EACH SOLENOID

(a) Connect the two connectors to each solenoid.

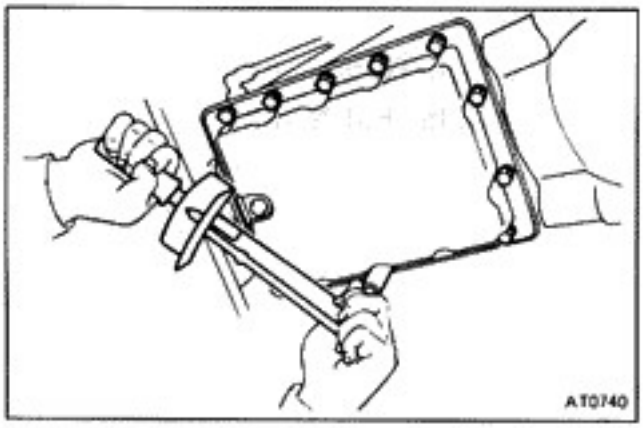
(b) Clamp the solenoid wire.



8. INSTALL FOUR OIL TUBES

Press the tubes by hand into the positions indicated i
merical order shown.

**CAUTION: Make sure that the oil tubes or the two r
nets do not interfere with the oil pan.**



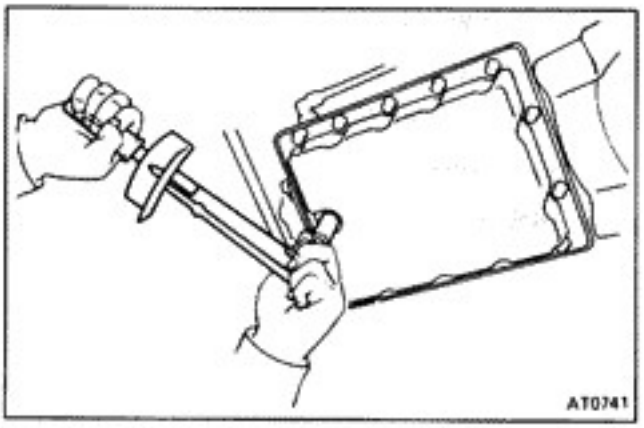
9. INSTALL PAN WITH NEW GASKET

Be sure the pan is clean and the two magnets are in pl

CAUTION: Do not use gasket sealer.

Tighten the bolts evenly.

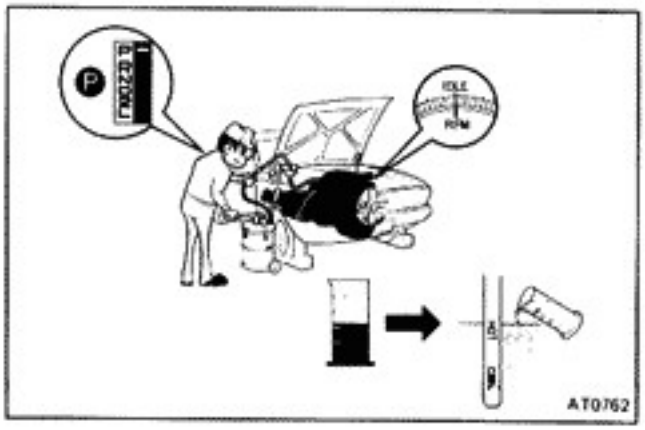
Torque: 45 kg-cm (39 in.-lb, 4.4 N·m)



10. INSTALL DRAIN PLUG

Torque the drain plug.

Torque: 205 kg-cm (15 ft-lb, 20 N·m)



11. FILL TRANSMISSION WITH ATF

Add only about four quarts of ATF.

CAUTION: Do not overfill.

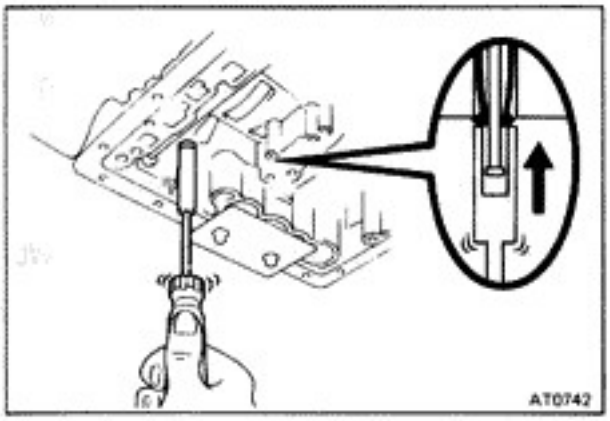
Fluid type: ATF DEXRON® II

12. CHECK FLUID LEVEL
(See page MA-13)

REMOVAL OF THROTTLE CABLE

1. REMOVAL AIR CLEANER

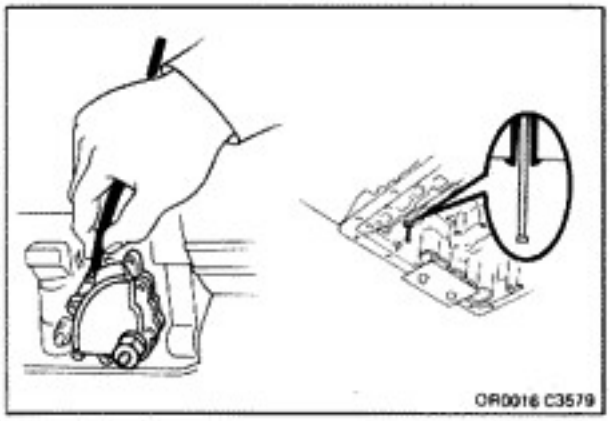
2. DISCONNECT THROTTLE CABLE



3. **REMOVE VALVE BODY (See page AT-32)**

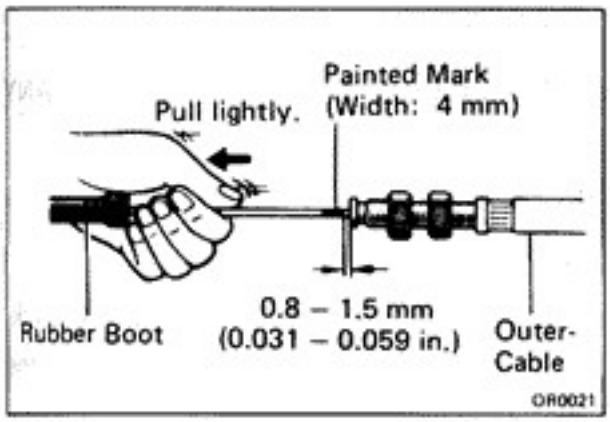
4. **PUSH THROTTLE CABLE OUT OF TRANSMISSION CASE**
   Using a 10-mm socket, push the throttle cable out.

INSTALLATION OF THROTTLE CABLE

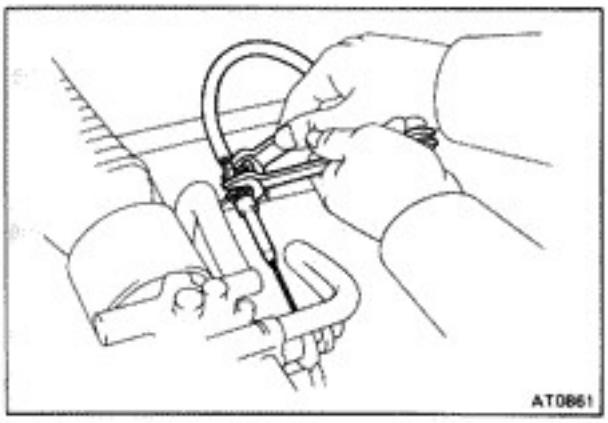


1. **INSTALL CABLE IN TRANSMISSION CASE**
   Be sure to push it in all the way.

2. **INSTALL VALVE BODY (See page AT-34)**



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.



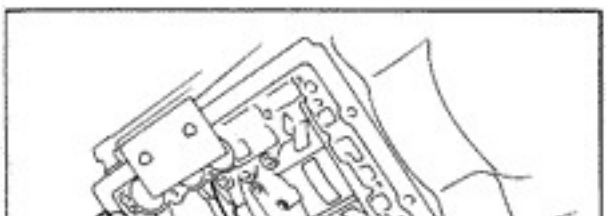
4. **CONNECT THROTTLE CABLE**
   (a) Connect the cable to the throttle linkage.
   (b) Connect the cable housing to the bracket on the valve cover.

5. **ADJUST THROTTLE CABLE (See page AT-5)**

6. **INSTALL AIR CLEANER**

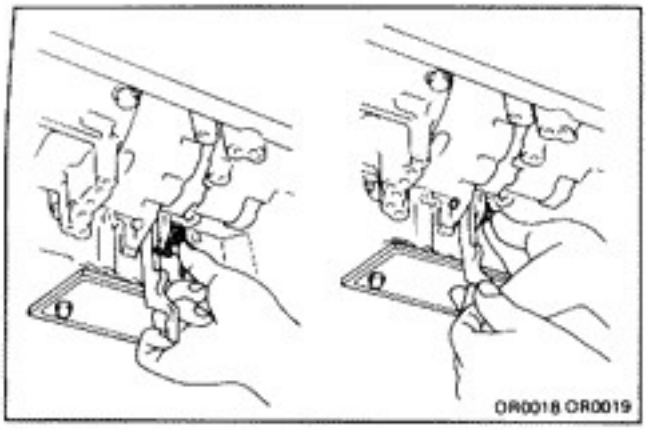
7. **TEST DRIVE VEHICLE**

REMOVAL OF PARKING LOCK PAWL



1. **REMOVE VALVE BODY (See page AT-32)**

2. **REMOVE PARKING LOCK PAWL BRACKET**
   Remove the two bolts and the bracket.


OR0018 OR0019

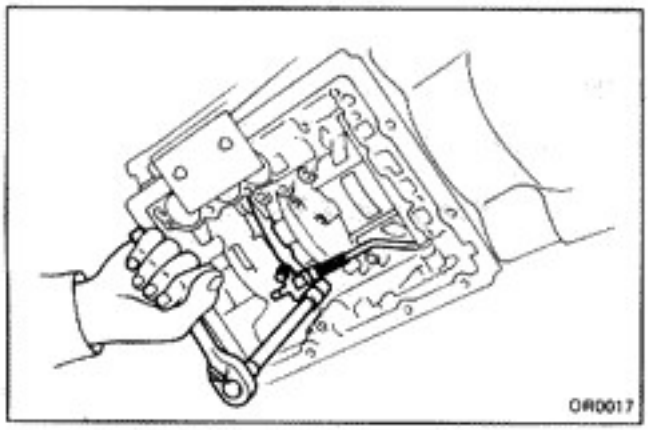
3. REMOVE SPRING FROM PARKING PAWL PIVOT PI

4. REMOVE PARKING PAWL PIVOT PIN AND PARKIN LOCK PAWL

INSTALLATION OF PARKING LOCK PAWL

1. INSTALL PARKING LOCK PAWL AND PARKING PA PIVOT PIN

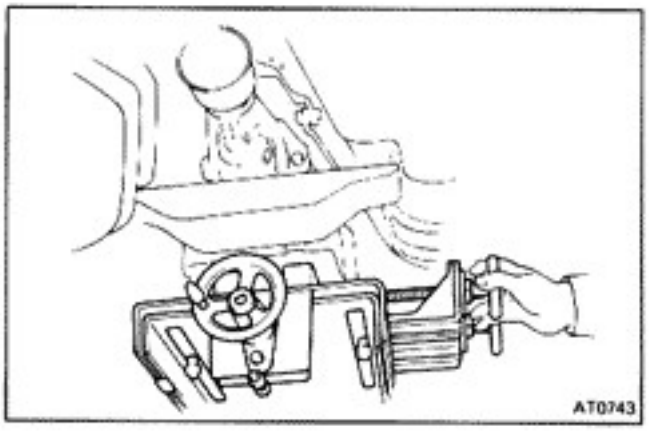
2. INSTALL PIVOT SPRING


OR0017

3. INSTALL PARKING LOCK PAWL BRACKET
   (a) Push lock rod fully forward.
   (b) Install two bolts finger tight.
   (c) Check that the parking lock 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-34)


AT0743

REMOVAL OF EXTENSION HOUSING

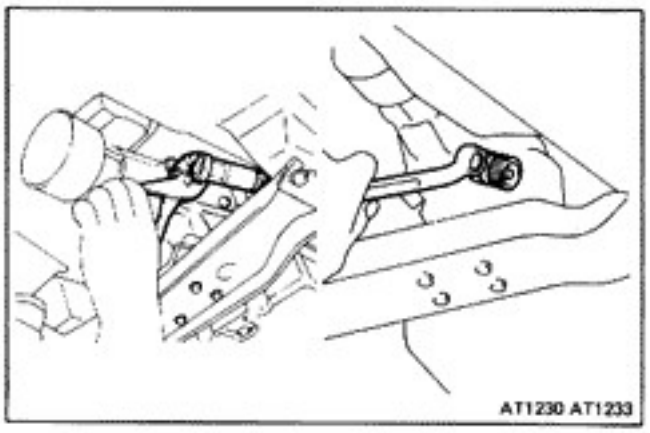
1. RAISE VEHICLE AND POSITION PAN TO CATCH FLUID THAT MAY DRIP

2. REMOVE PROPELLER SHAFT

3. JACK UP TRANSMISSION SLIGHTLY

   Securely support the transmission on a transmission

   Lift the transmission slightly to remove weight from rear support member.


AT1230 AT1233

4. DISCONNECT SPEEDOMETER CABLE

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

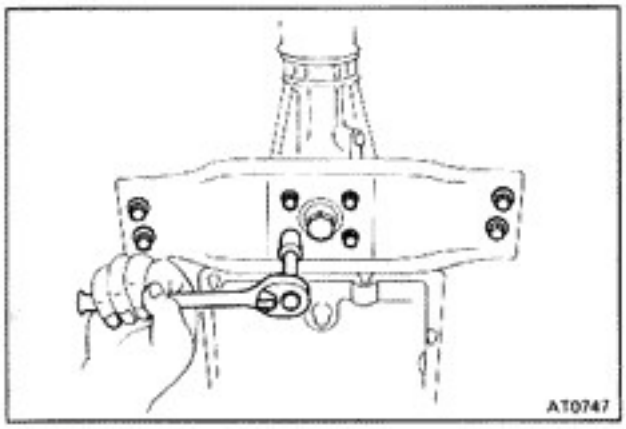
5. REMOVE SPEEDOMETER DRIVEN GEAR

   Remove one bolt and locking tab. Pry out the speed ter driven gear with a screwdriver.

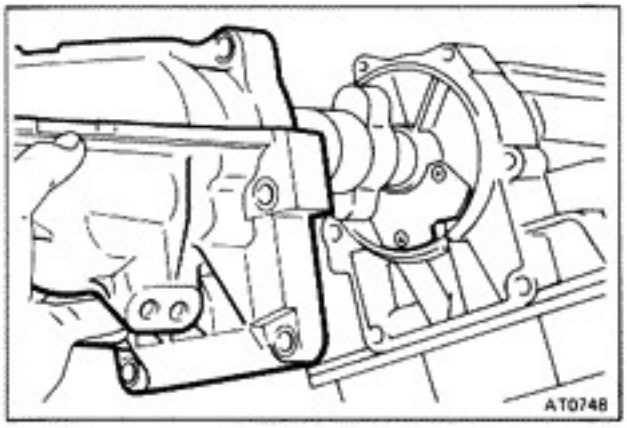
6. REMOVE SPEED SENSOR

7. REMOVE REAR SUPPORT MEMBER

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

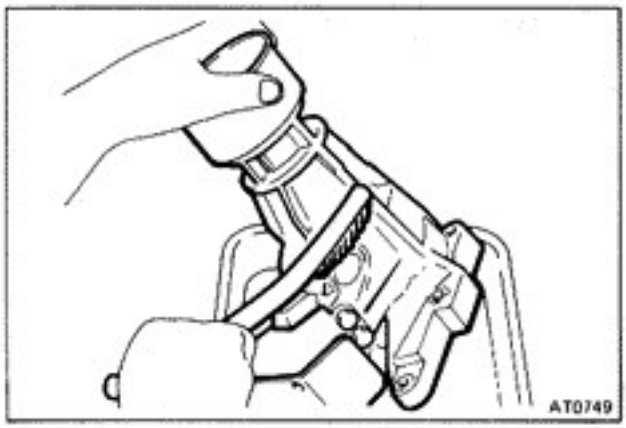


(b) Remove the eight bolts and support.



8. 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.



9. CLEAN AND INSPECT COMPONENTS

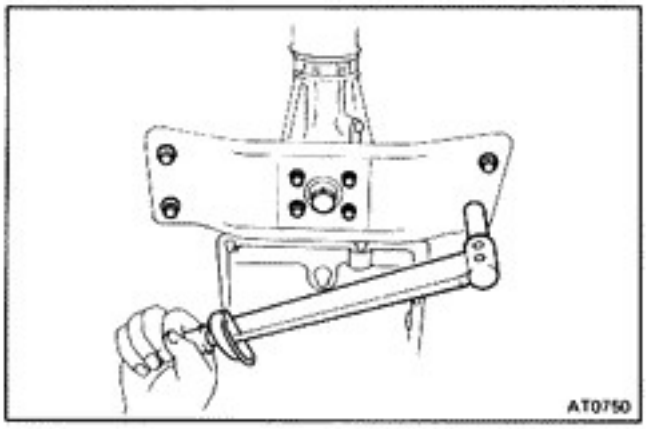
(a) Wash components in clean solvent, and dry with compressed air.

(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-103)

1. INSTALL NEW GASKET AND EXTENSION HOUSING ON

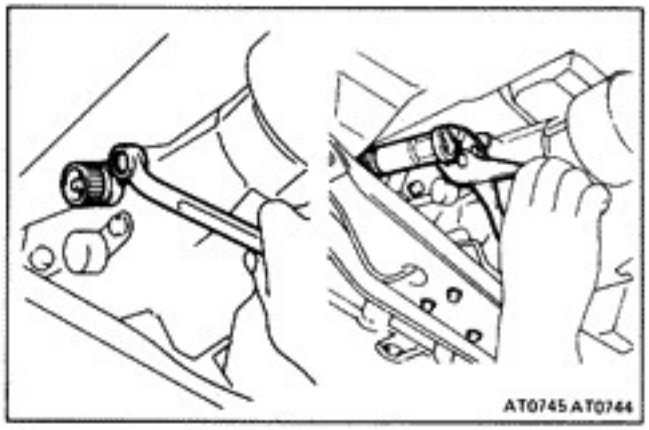


2. INSTALL REAR SUPPORT MEMBER

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

(b) Install the ground strap and rubber exhaust ha

3. INSTALL PROPELLER SHAFT



4. INSTALL SPEED SENSOR

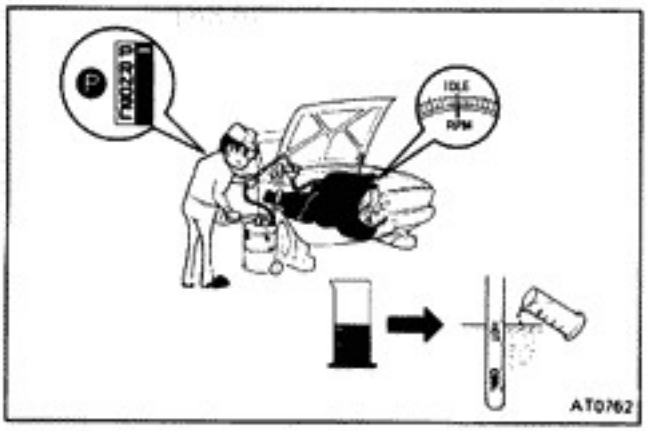
5. INSTALL SPEEDOMETER DRIVEN GEAR

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

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

6. CONNECT SPEEDOMETER CABLE

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



7. LOWER VEHICLE AND CHECK FLUID LEVEL
(See page MA-13)

Start the engine, shift the selector into each gear,
check the fluid level with the transmission in "P" ra
Add fluid as necessary.

CAUTION: Do not overfill.

Fluid type: ATF DEXRON® II

REMOVAL OF ROTOR SENSOR

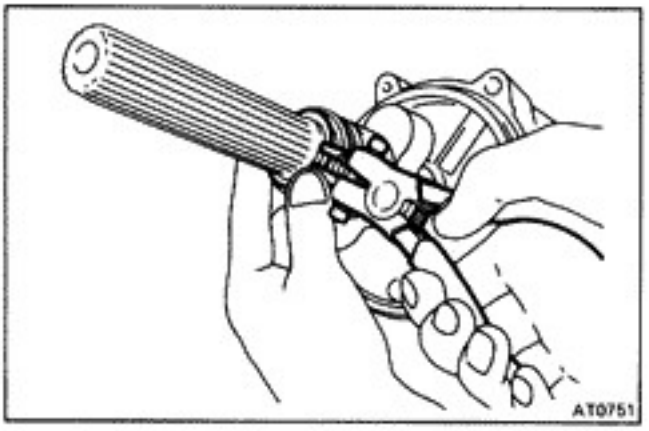
1. REMOVE EXTENSION HOUSING (See page AT-38)

2. REMOVE SPEEDOMETER DRIVE GEAR

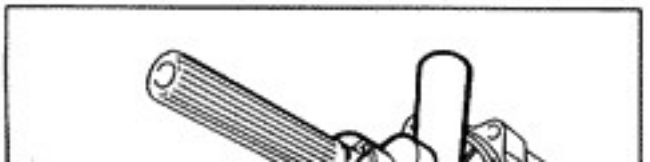
(a) Using snap ring pliers, remove the snap ring.

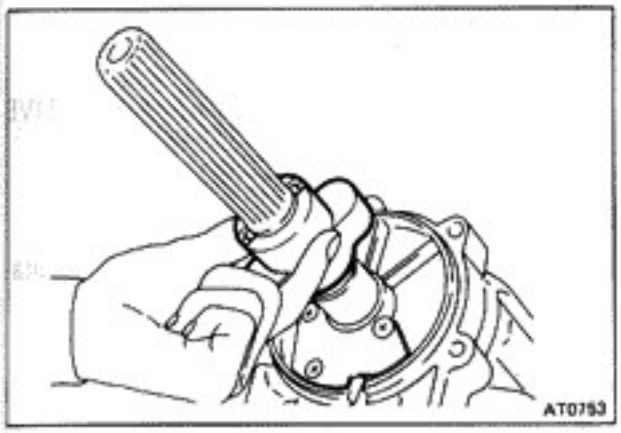
(b) Slide off the speedometer gear.

(c) Remove the lock ball.



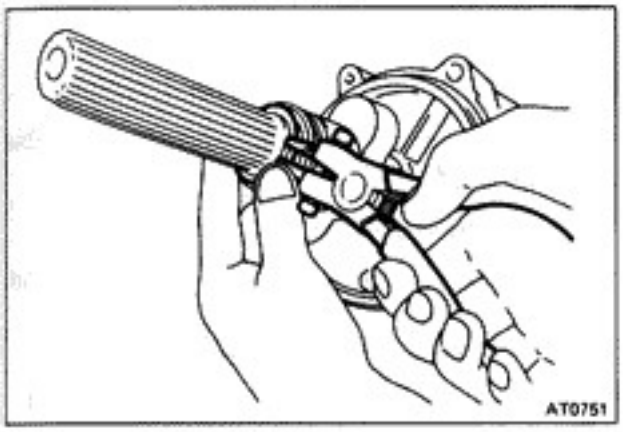
3. REMOVE ROTOR SENSOR FROM OUTPUT SHAFT





INSTALLATION OF ROTOR SENSOR

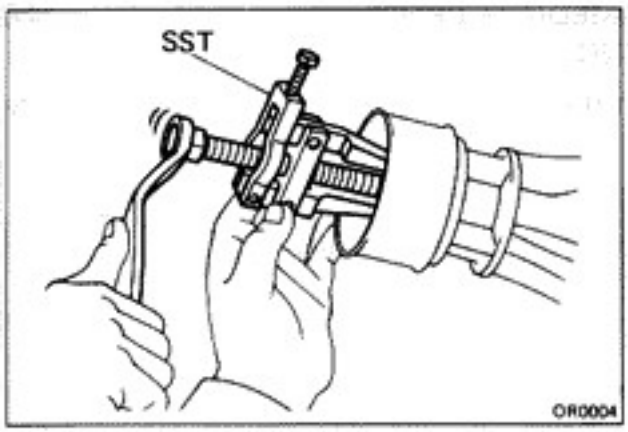
1. **INSTALL ROTOR SENSOR ON OUTPUT SHAFT**
   (a) Make sure that the key is installed in the groove.
   (b) Install the rotor sensor on the shaft.



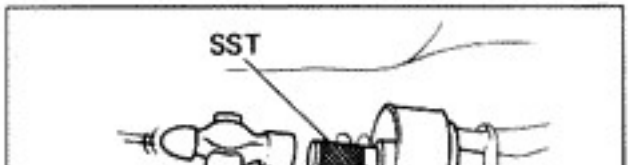
2. **INSTALL SPEEDOMETER DRIVE GEAR**
   (a) Slide the lock ball and the speedometer gear on the shaft.
   (b) Using snap ring pliers, install the outer snap ring.
3. **INSTALL EXTENSION HOUSING (See page AT-39)**

REPLACEMENT OF REAR OIL SEAL

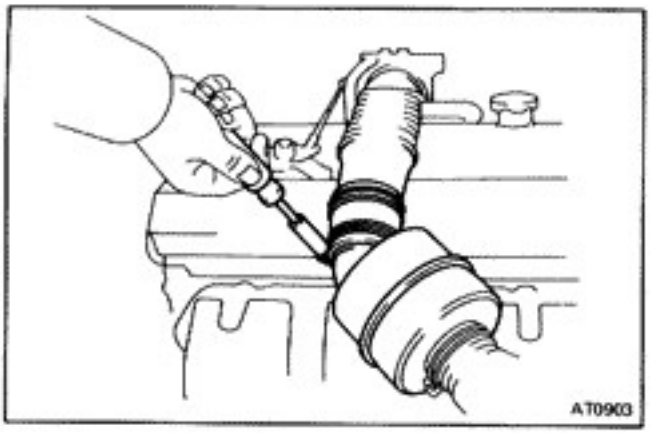
1. **RAISE VEHICLE, AND POSITION PAN TO CATCH ANY FLUID THAT MAY DRIP**
2. **REMOVE PROPELLER SHAFT**



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**



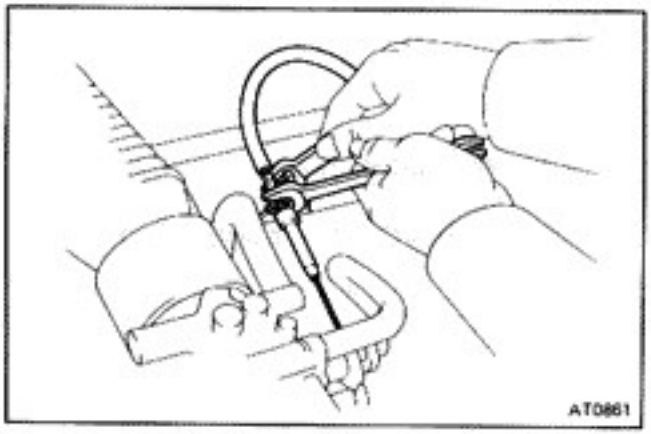
REMOVAL OF TRANSMISSION

1. **DISCONNECT BATTERY CABLE FROM NEGA TERMINAL**

2. **DRAIN COOLANT**

   Open the radiator drain cock and drain coolant into a s ble container.

3. **DISCONNECT UPPER RADIATOR HOSE**

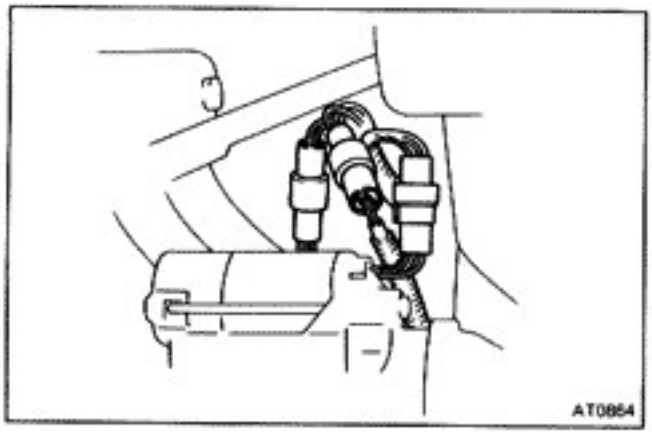


4. **DISCONNECT AIR INTAKE CONNECTOR**

5. **DISCONNECT TRANSMISSION THROTTLE CABLE**
   (a) Loosen the adjusting nuts, and disconnect the housing from the bracket.
   (b) Disconnect the cable from the throttle linkage.
   (c) Disconnect the throttle cable from the engine rear

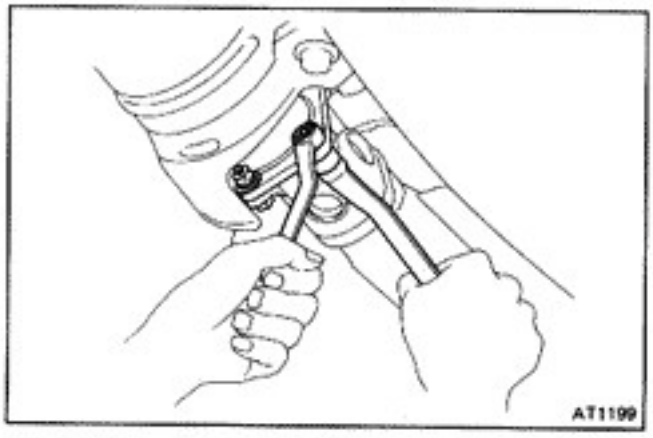
6. **RAISE VEHICLE AND DRAIN TRANSMISSION**

   CAUTION: Be sure the vehicle is securely support



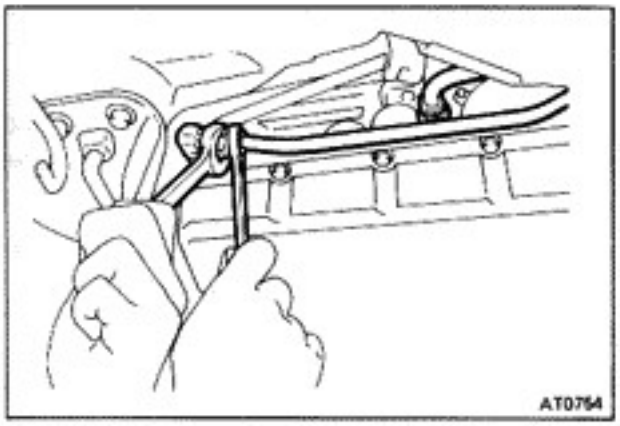
7. **DISCONNECT THREE WIRING CONNECTORS**

   Disconnect the three connectors located near the sta



8. **REMOVE INTERMEDIATE PROPELLER SHAFT TOGET CENTER BEARING**
   (a) Disconnect the propeller shaft from the intermed shaft.
   (b) Remove the center bearing.
   (c) Remove the intermediate shaft.

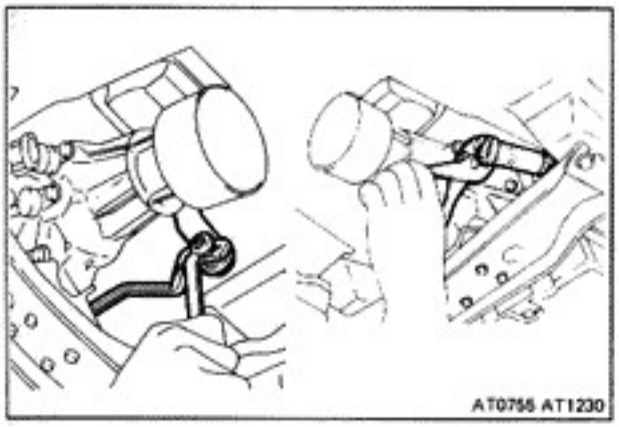
9. **DISCONNECT EXHAUST PIPE FROM TAIL PIPE**
   (a) Disconnect the pipe at the rear side of the conve
   (b) Remove the two rubber hangers.



10. DISCONNECT TWO OIL COOLER LINES

(a) Remove the oil cooler pipe clamp from the transmission case.

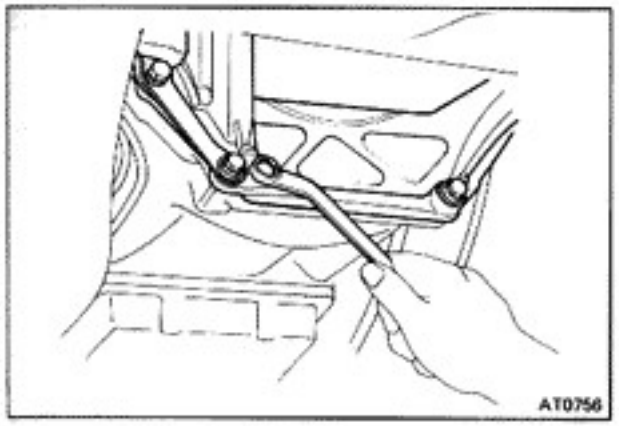
(b) Disconnect the two oil cooler pipes from the transmission case.



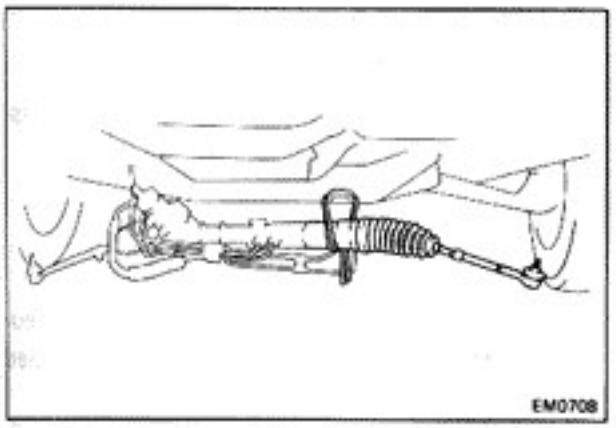
11. DISCONNECT MANUAL SHIFT LINKAGE

Disconnect the shift linkage at the rear connection.

12. DISCONNECT SPEEDOMETER CABLE



13. REMOVE EXHAUST PIPE BRACKET AND CONVERTER COVER BOTH STIFFENER PLATES FROM TRANSMISSION HOUSING AND CYLINDER BLOCK



14. REMOVE POWER STEERING GEAR HOUSING

(a) Remove the sliding yoke from gear housing.

(b) Disconnect both tie rod ends with SST.

SST 09611-22012

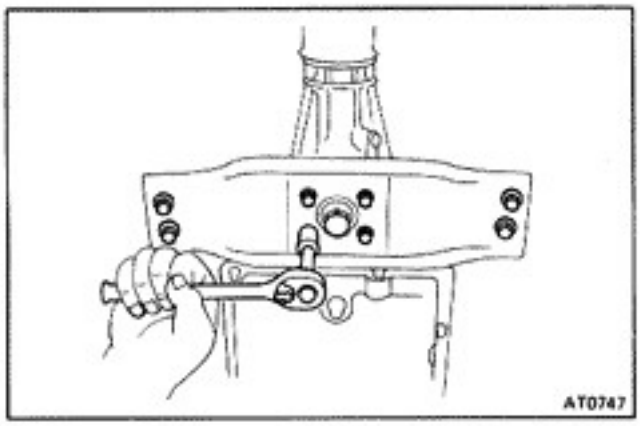
(c) Remove the fluid line clamps.

(d) Remove the four bolts and remove the two brackets and rubber insulator.

(e) Remove the gear housing from the crossmember and suspend it with strings.

15. 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.



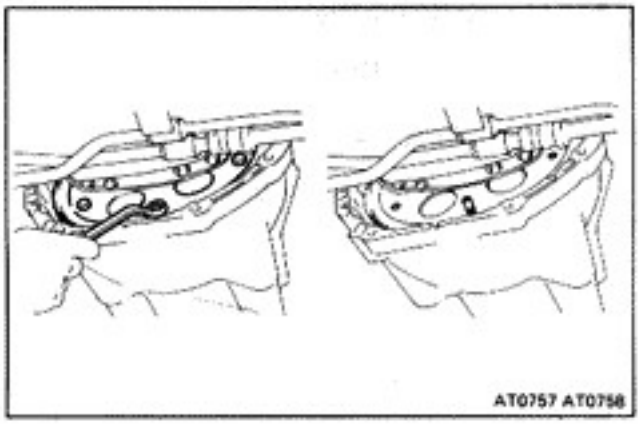
16. REMOVE REAR SUPPORT MEMBER

(a) Remove the ground cable.

(b) Install a wooden block between cowl panel
cylinder head rear end to prevent damage to the he
hose.

(c) Remove the eight bolts, and remove the rear supp
member.

17. REMOVE ENGINE UNDER COVER



18. REMOVE SIX TORQUE CONVERTER MOUNTING BO

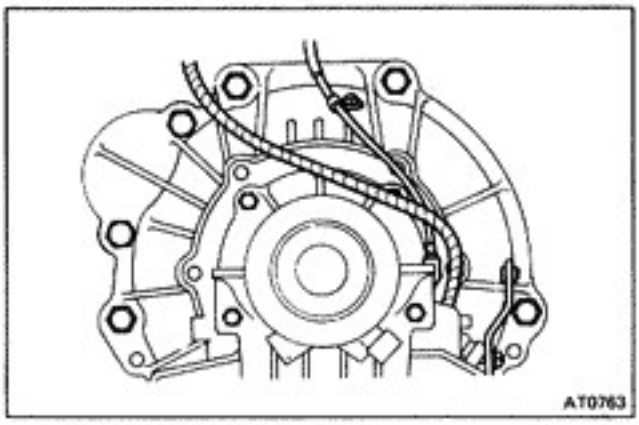
Turn the crankshaft to gain access to each bolt.

Remove the six bolts.

19. INSTALL GUIDE PIN IN TORQUE CONVERTER

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

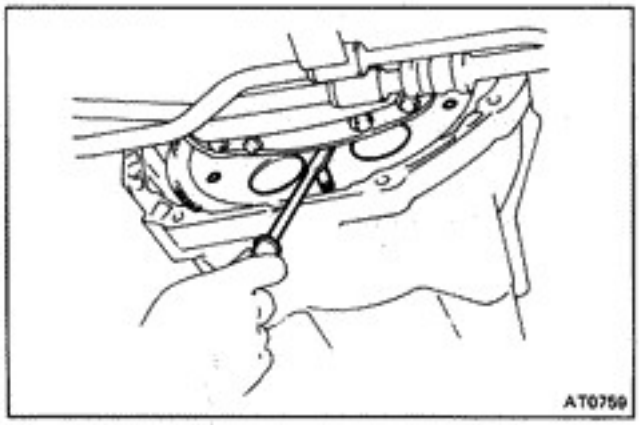
If necessary, a guide pin can be made by cutting off
head of a bolt.



20. REMOVE TRANSMISSION HOUSING MOUNTING BO

(a) Remove the starter.

(b) Remove the transmission housing mounting bo



21. PRY ON END OF GUIDE PIN TO BEGIN MOVING TRANSMISSION WITH CONVERTER TOWARD REA

The guide pin helps keep the converter with the tr
mission.

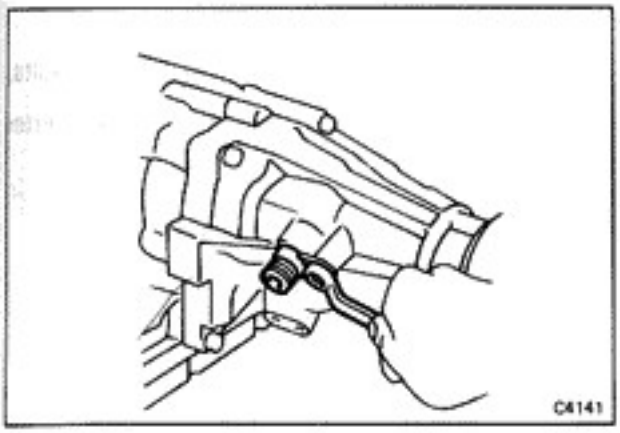
22. REMOVE TRANSMISSION ASSEMBLY

Draw out the transmission down and toward the re

**CAUTION: Be careful not to snag the throttle cable or
tral start switch cable. Keep the oil pan positi
downward.**

23. PLACE PAN UNDER CONVERTER HOUSING, AND REMOVE CONVERTER

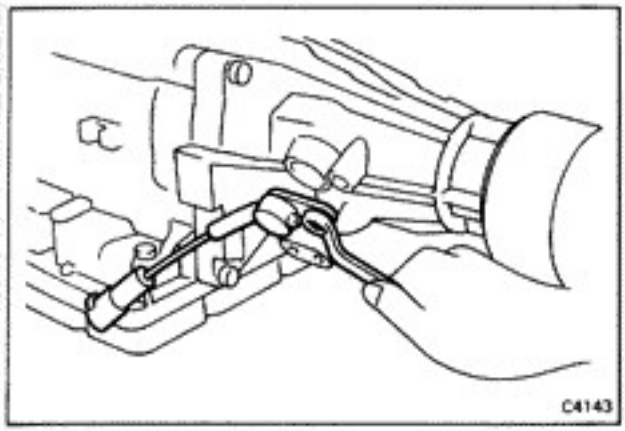
Pull the converter straight off, and allow the fluid to
into the pan.



DISASSEMBLY OF TRANSMISSION

SEPARATE BASIC SUBASSEMBLY

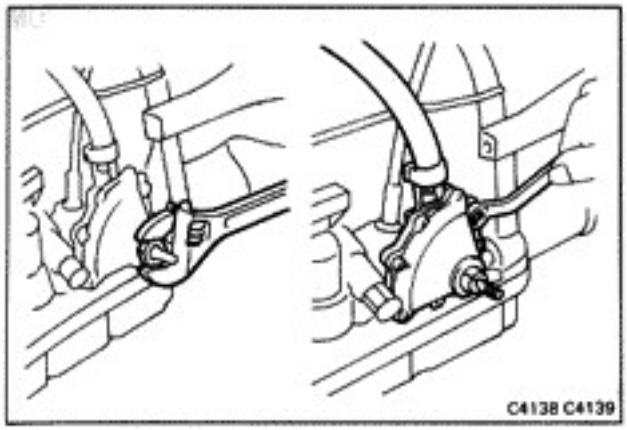
1. REMOVE SPEEDOMETER DRIVEN GEAR



2. REMOVE SPEED SENSOR

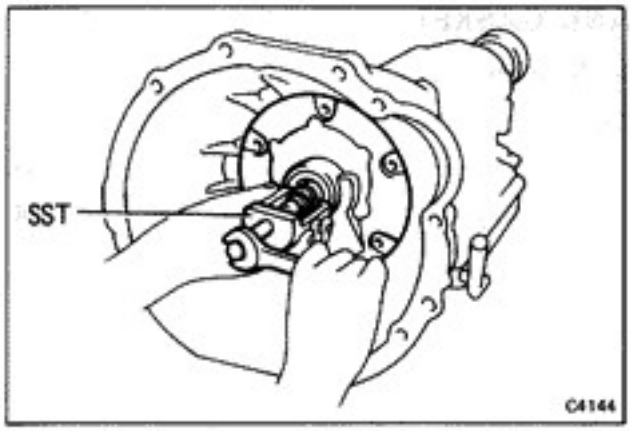
(a) Disconnect the wiring connector.

(b) Remove the speed sensor.



3. REMOVE SHIFT HANDLE

4. REMOVE NEUTRAL START SWITCH



5. REMOVE OIL PUMP

(a) Remove the seven bolts.

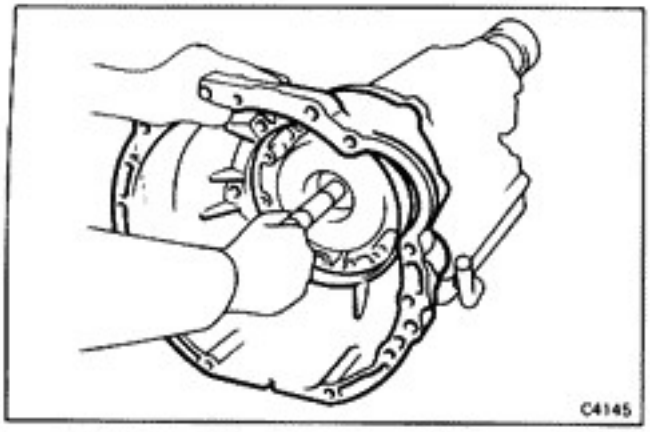
(b) Position SST on the shaft in back of the spline.

SST 09610-20012

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

(c) Grasp the front pump stator shaft and pull the pump from the case.

6. WATCH FOR BEARING BEHIND OIL PUMP

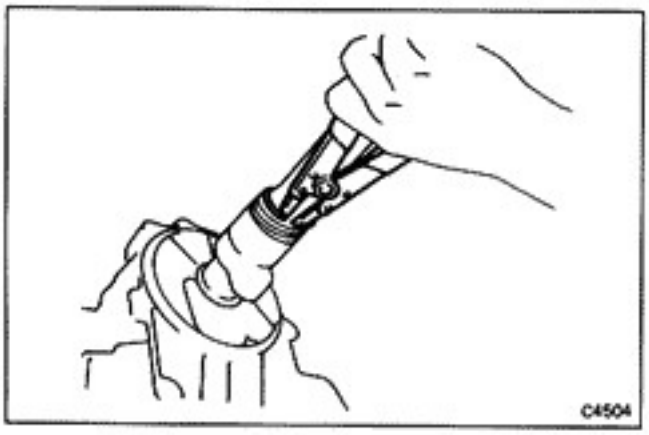


7. REMOVE CONVERTER HOUSING

(a) Remove the two 12-mm bolts and four 10-mm b

(b) Hold the input shaft while removing the conv housing.

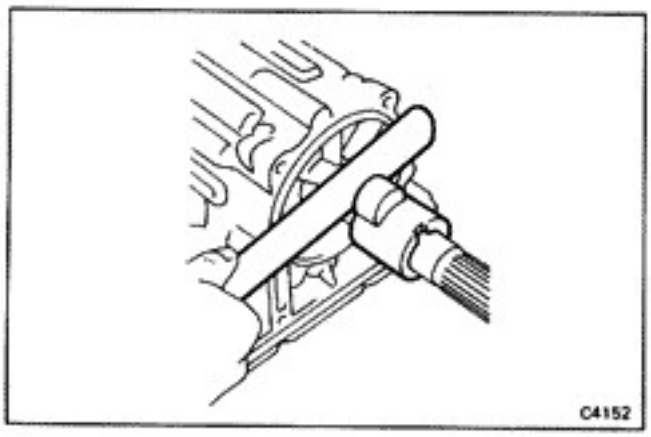
8. REMOVE EXTENSION HOUSING AND GASKET



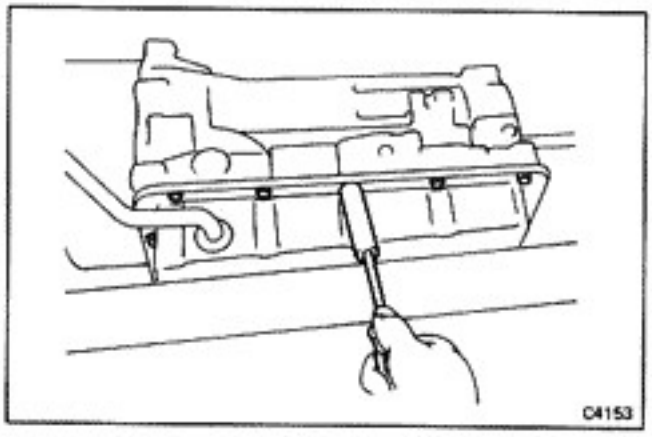
9. REMOVE SPEEDOMETER DRIVE GEAR

(a) Remove the snap ring.

(b) Remove the drive gear and the steel ball.



10. REMOVE SENSOR ROTOR, KEY AND SNAP RING F OUTPUT SHAFT



11. REMOVE PAN AND GASKET

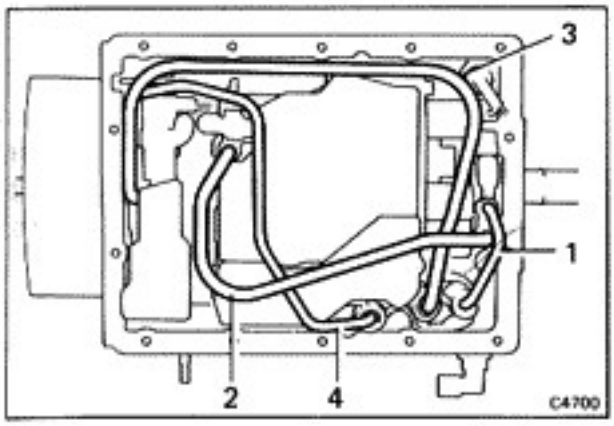
(a) Remove the fourteen bolts.

(b) Remove the pan by lifting the transmission cas

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

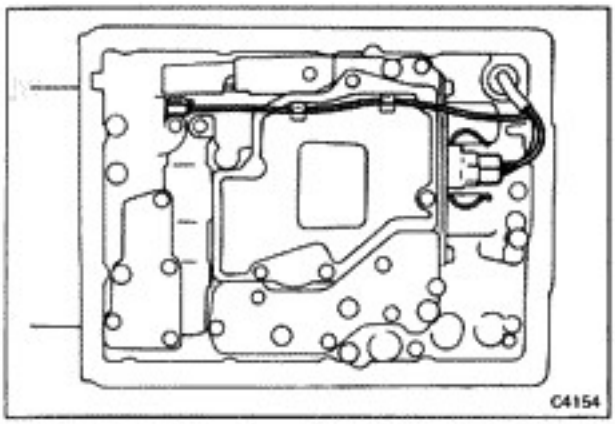
12. EXAMINE PARTICLES IN PAN

Remove the magnet and use it to collect any steel ch Look carefully at the chips and particles in the pan an the magnet to anticipate what type of wear you will



13. TURN TRANSMISSION OVER AND REMOVE TUBES

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



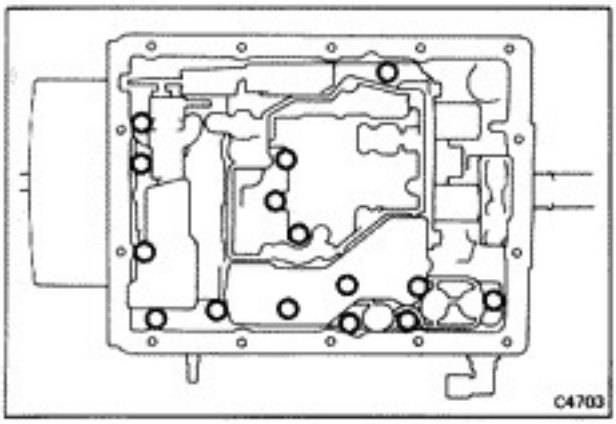
14. REMOVE SOLENOID WIRING

(a) Disconnect connector from the No. 1 and 2 solenoid and the No. 3 solenoid.

(b) Remove the grommet from the transmission case.

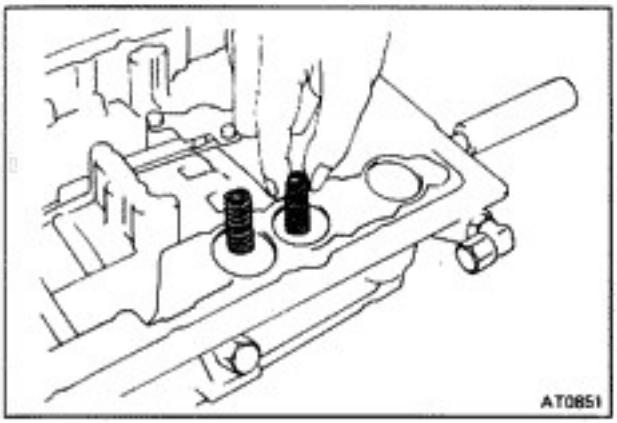
(c) Pull the wiring out of the transmission case.

15. REMOVE STRAINER



16. REMOVE VALVE BODY

(a) Remove the fifteen bolts.

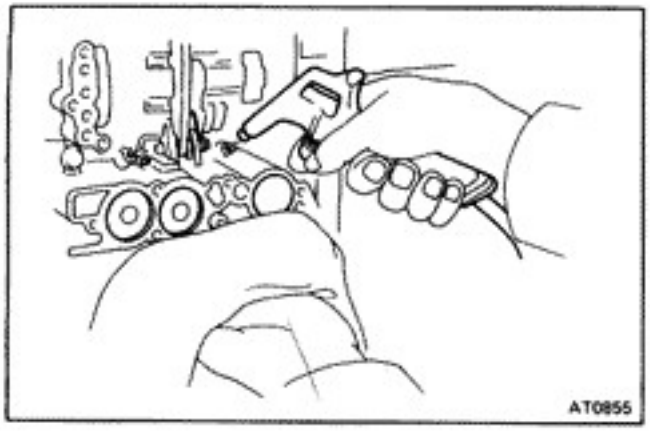


(b) Remove the B_2 and C_2 accumulator piston springs.

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

17. REMOVE THROTTLE CABLE AND RETAINER

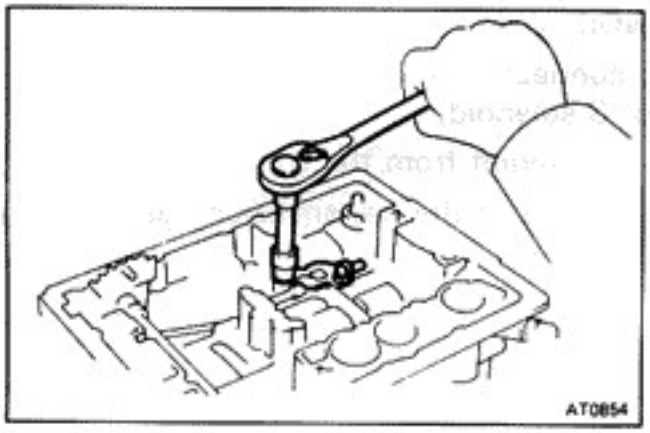
Using a 10-mm socket, push the plastic throttle cable retainer out of the transmission case.



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

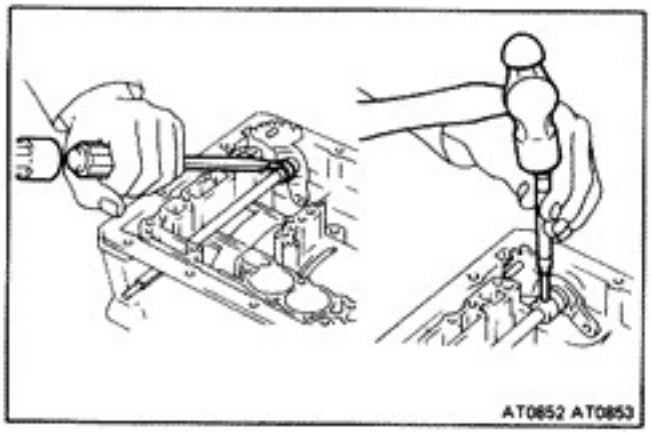
WARNING: Keep face away to avoid injury.

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



19. REMOVE PARKING LOCK ROD

20. REMOVE SPRING, PIVOT PIN AND PARKING LOCK PA

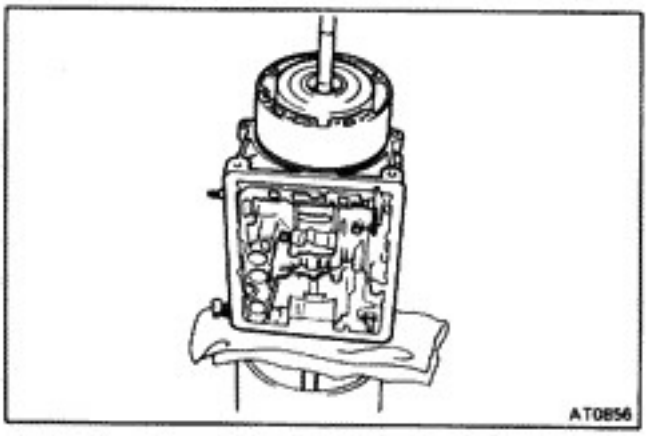


21. IF NECESSARY, REMOVE MANUAL LEVER SHAFT

(a) Using a hammer and screwdriver, pry and shift collar.

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

(c) Slide the shaft out case and remove the detent pl



22. PLACE TRANSMISSION CASE ON CYLINDER

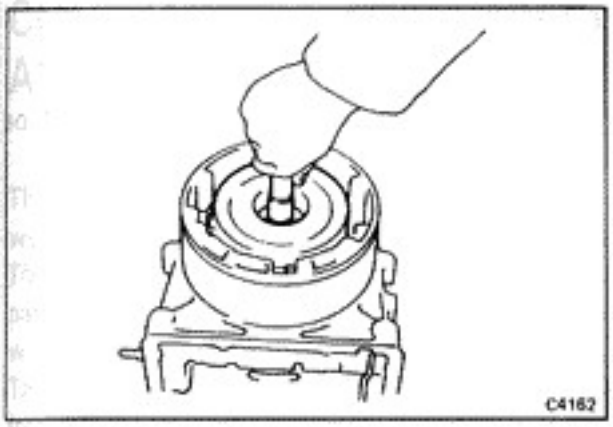
Place the transmission on a cylindrical stand for more cient work.

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

23. MEASURE DISTANCE BETWEEN TOP OF CASE A CLUTCH DRUM

Set SST on the case as shown in the figure.

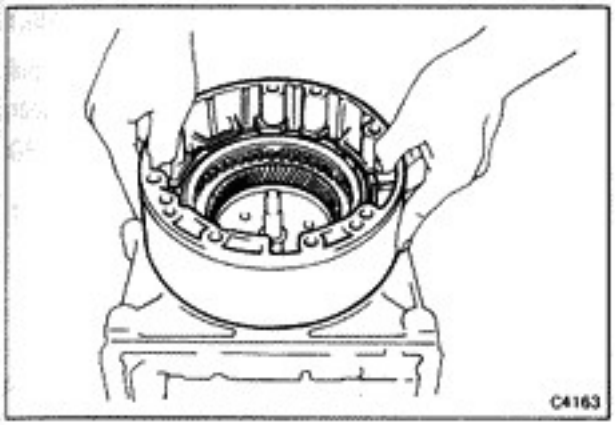
SST 09350-20013 (09370-12010)



24. REMOVE OVERDRIVE CLUTCH

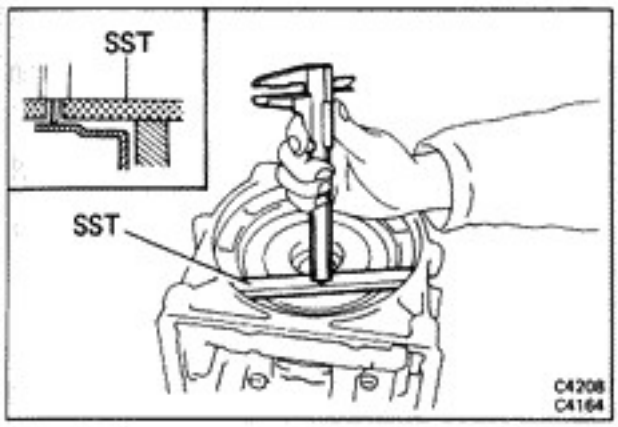
Grasp the shaft and pull out the overdrive clutch assembly.

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

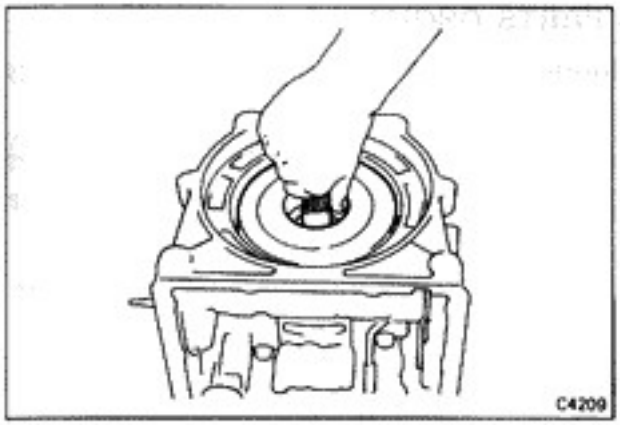


26. MEASURE DISTANCE BETWEEN TOP OF CASE AND CLUTCH DRUM

Set SST on the case as shown in the figure.

SST 09350-20013 (09370-12010)

Make a note of the finding for reassembly.



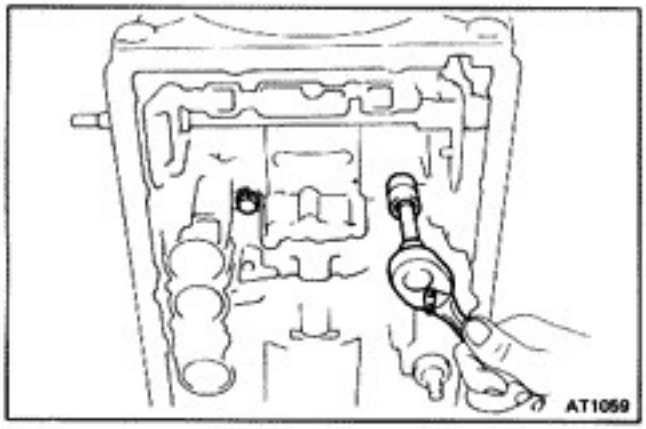
27. REMOVE FRONT CLUTCH AND BEARINGS

Grasp the shaft and pull out the front clutch assembly.

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

28. REMOVE REAR CLUTCH

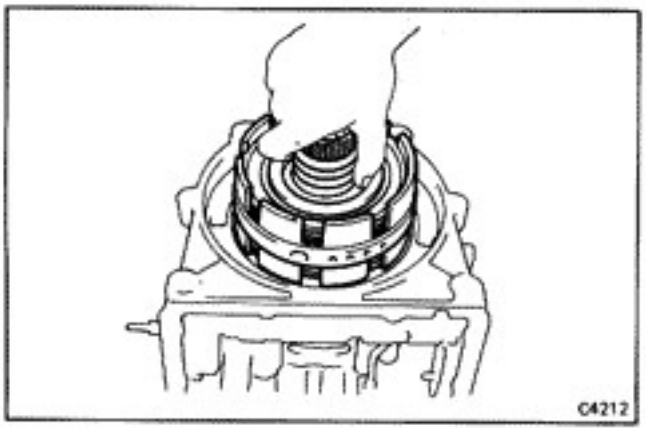
Grasp the clutch hub and pull it out from the case.



29. REMOVE CENTER SUPPORT BOLTS

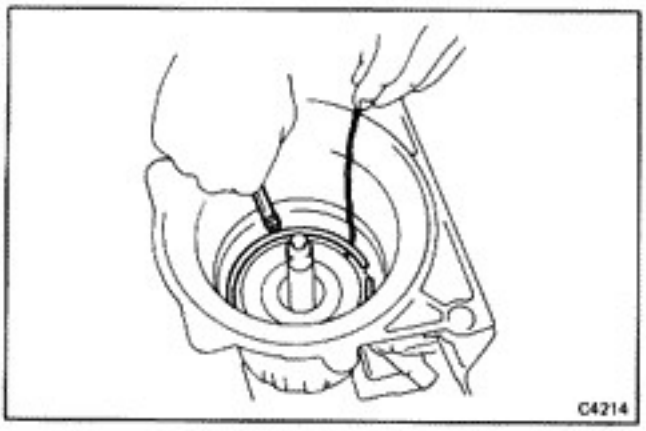
Remove the two center support bolts.

NOTE: After removing one bolt, the other one w
loose.



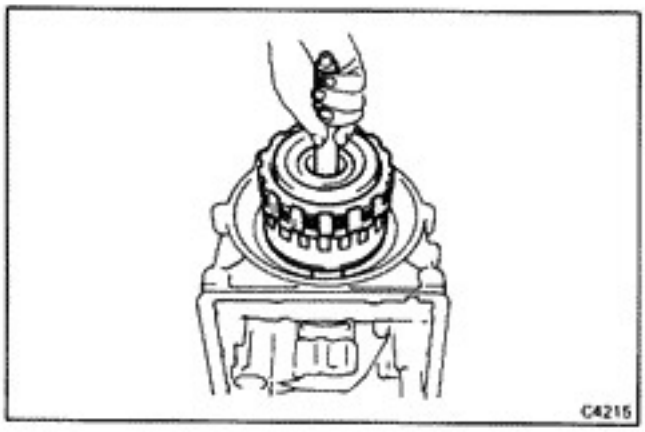
30. REMOVE CENTER SUPPORT AND SUN GEAR ASSE

From the case front opening, grasp the assembly an
it out. Watch for the bearing race on the end of the sun



31. REMOVE REACTION PLATE RETAINING RING

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



32. REMOVE REAR PARTS GROUP

Grasp the intermediate shaft and pull out the rear
group.

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

Watch for the bearing and race in the transmission

33. BASIC DISASSEMBLY IS COMPLETE

The transmission in now in basic component subas
blies. Next, disassemble, clean, inspect, repair and as
ble each of these component groups.

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.

GENERAL CLEANING

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. Cleaning solvent used should be the recommended ATF or kerosene.
3. When using compressed air to dry parts, keep face away to avoid spraying solvent in your face.

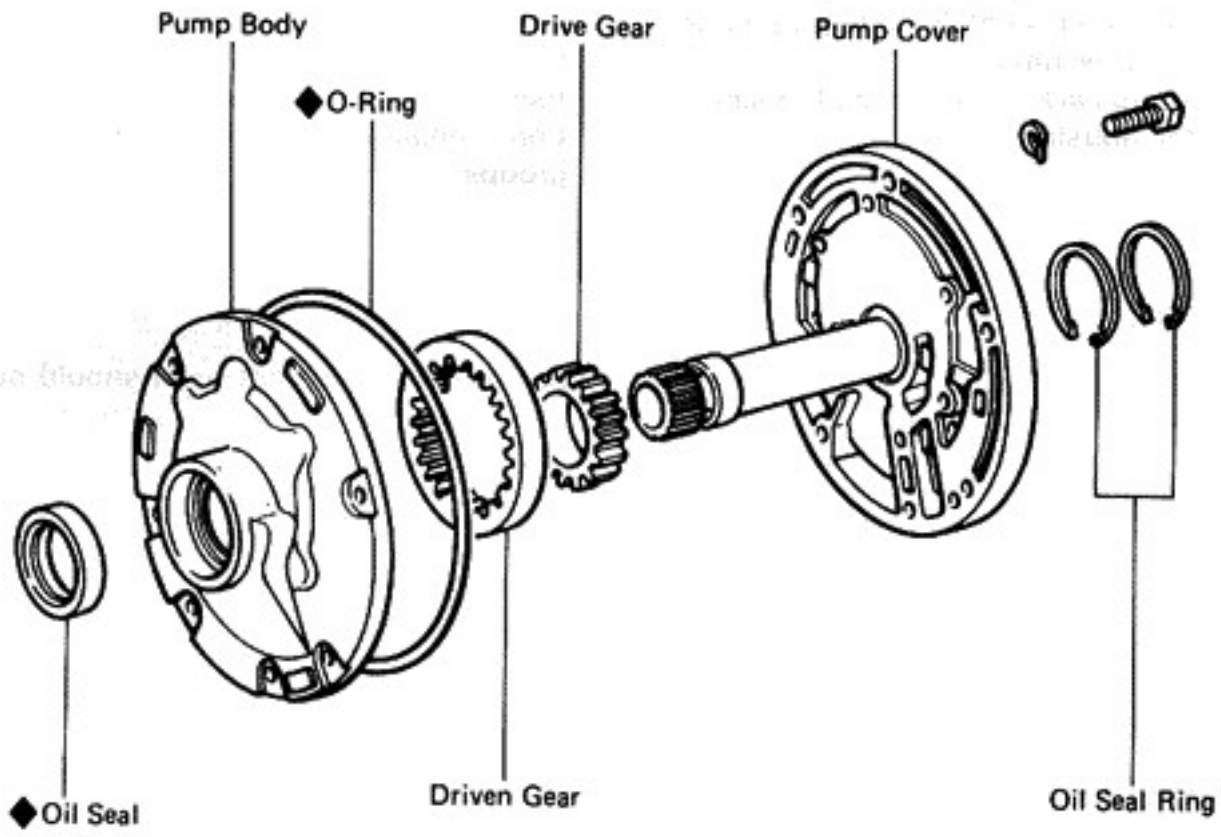
PARTS ARRANGEMENT

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.

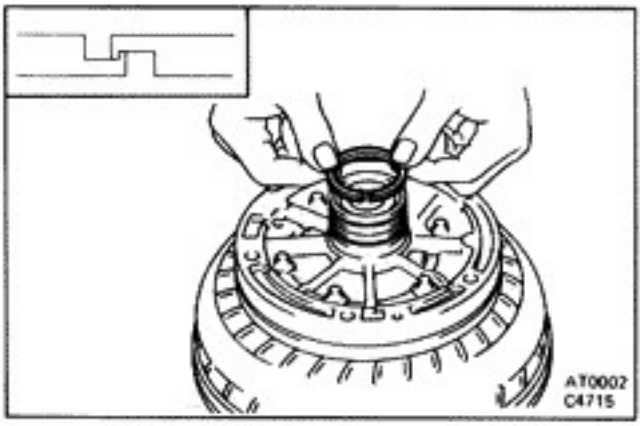
GENERAL ASSEMBLY

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

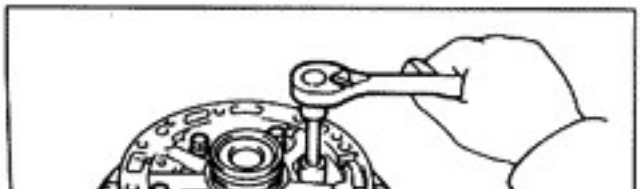


◆ Non-reusable part

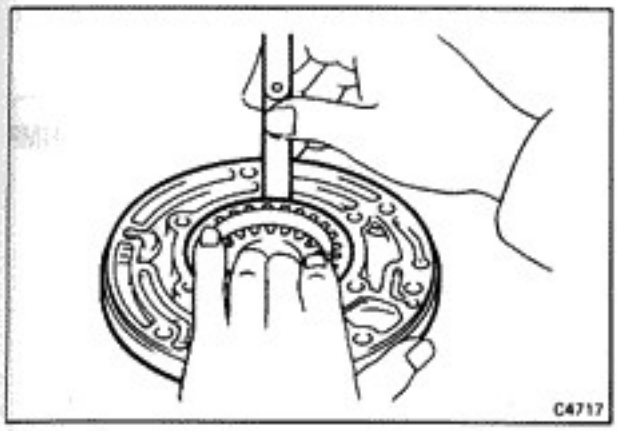


DISASSEMBLY OF OIL PUMP

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



3. REMOVE PUMP COVER
4. REMOVE O-RING FROM PUMP
5. LIFT PUMP OFF CONVERTER AND REMOVE OIL P



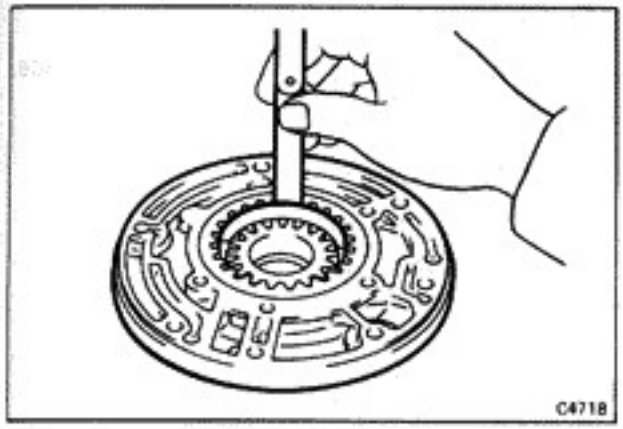
INSPECTION OF OIL PUMP

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.)**

If the body clearance is greater than the maximum, replace the drive gear, driven gear or pump body.

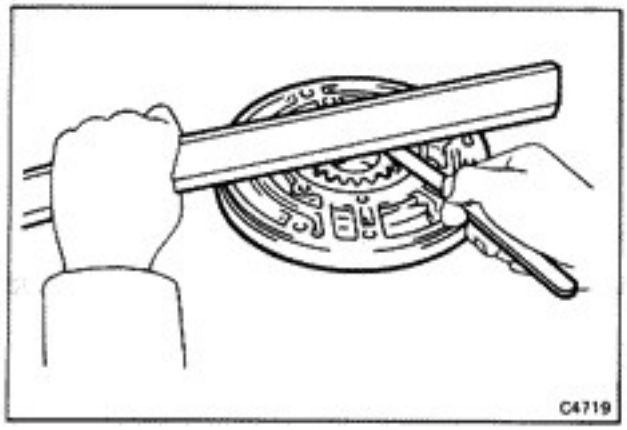


2. CHECK TIP CLEARANCE OF BOTH GEARS

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.)**

If the tip clearance is greater than the maximum, replace the drive gear, driven gear or pump body.

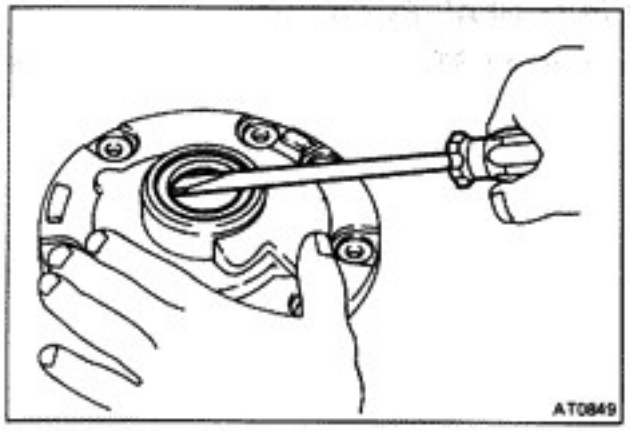


3. CHECK SIDE CLEARANCE OF BOTH GEARS

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.)**

If the side clearance is greater than the maximum, replace the drive gear, driven gear or pump body.

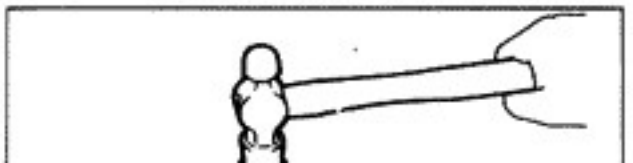


4. INSPECT FRONT OIL SEAL

Check for wear, damage or cracks.

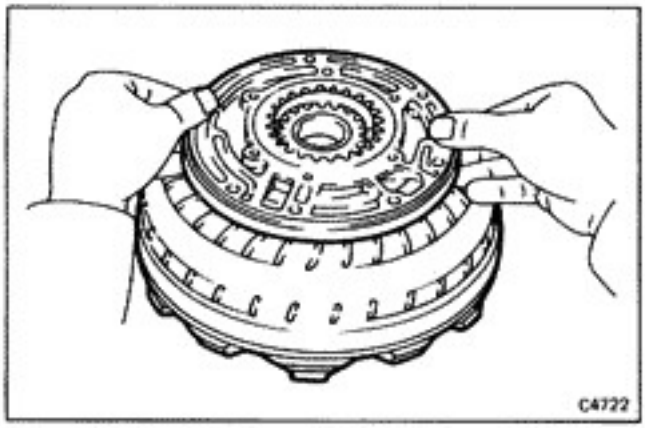
5. IF NECESSARY, REPLACE FRONT OIL SEAL

(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 (09388-20010)

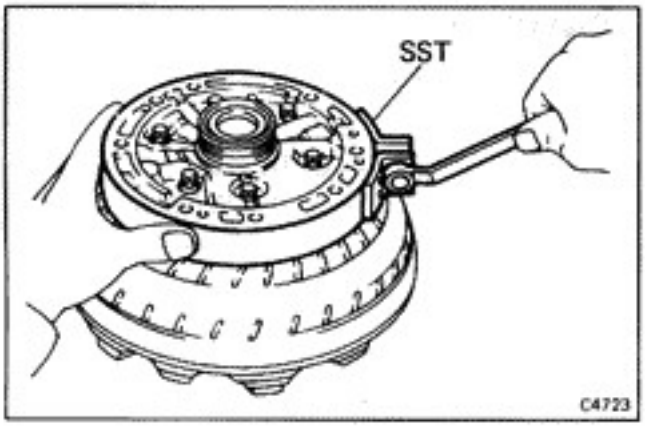


ASSEMBLY OF OIL PUMP

(See page AT-52)

1. **INSTALL DRIVEN GEAR AND DRIVE GEAR AND SET P 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 pl
   Install the six bolts with wave washers finger tight.

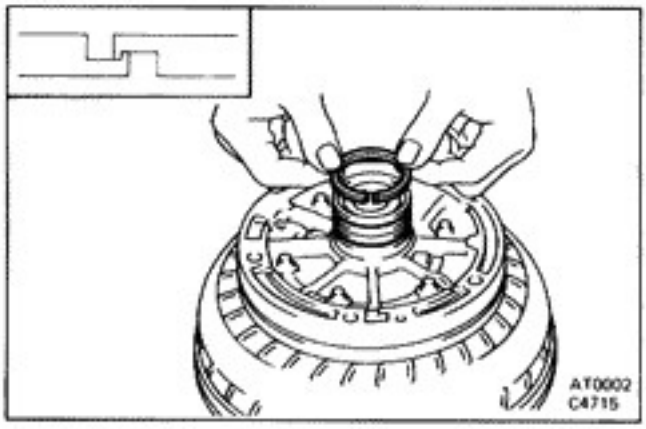
3. **ALIGN PUMP AND PUMP COVER**

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

   SST 09350-20013 (09363-20010)

4. **TIGHTEN SIX PUMP COVER BOLTS**

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

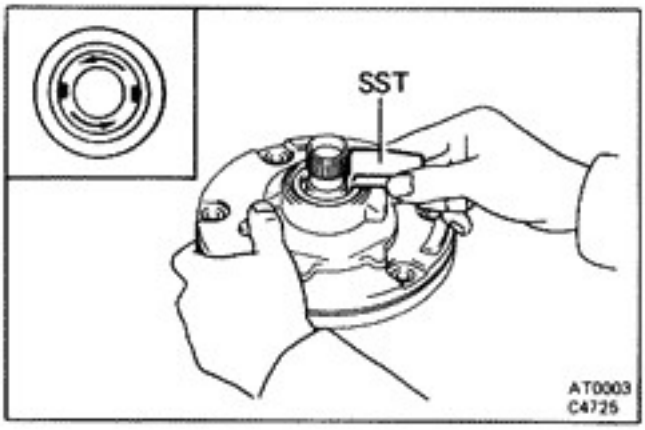


5. **INSTALL TWO OIL SEAL RINGS ON PUMP COVER**

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

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

   Make sure a new O-ring is not twisted and is fully se
   in the groove.

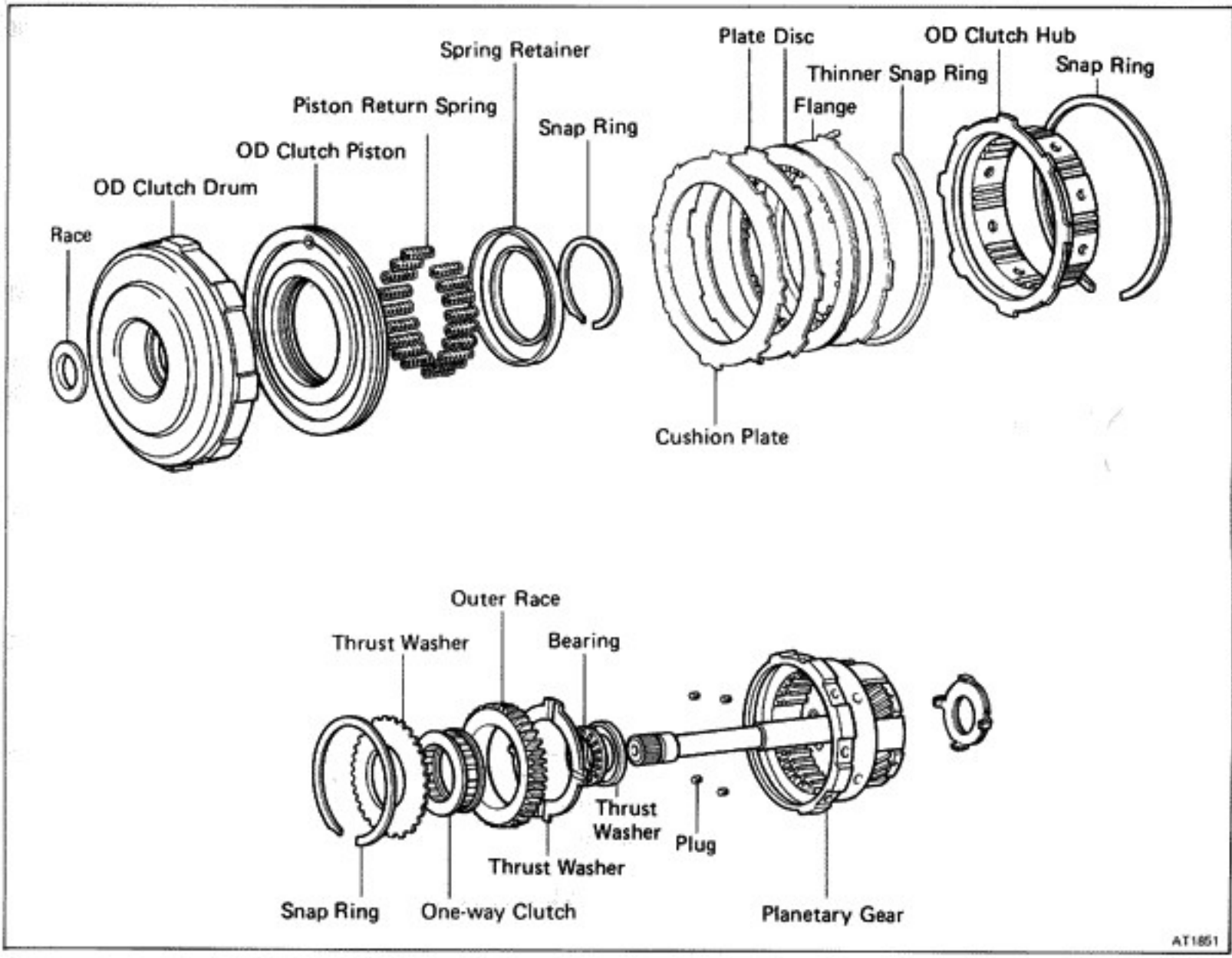


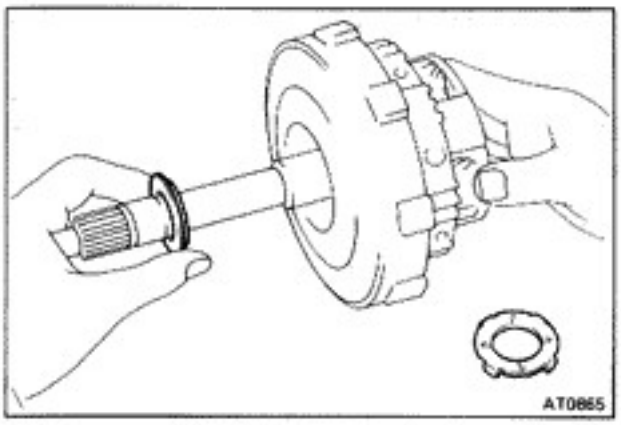
7. **CHECK PUMP DRIVE GEAR ROTATION**

   Turn the drive gear with SST and make sure that it rot
   smoothly.

   SST 09350-20013 (09397-22020)

Overdrive Input Shaft and Clutch



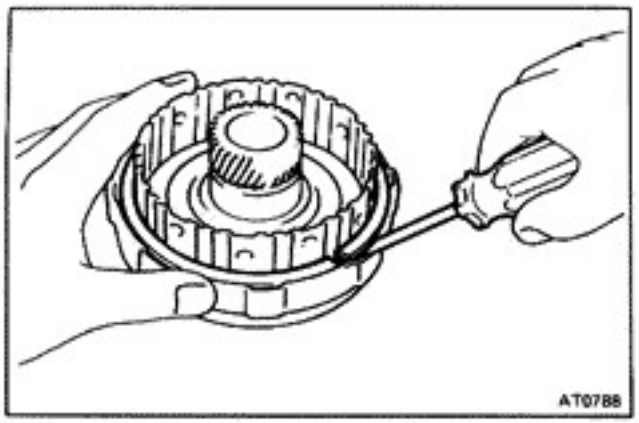


DISASSEMBLY OF OVERDRIVE INPUT SHAFT AND CLUTCH

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.

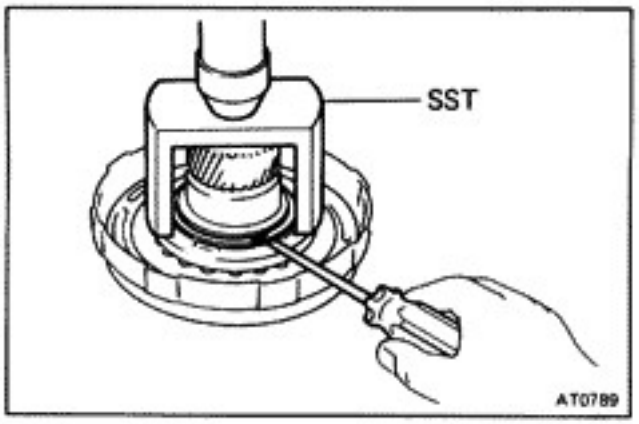
2. **PULL OVERDRIVE CLUTCH ASSEMBLY FROM INPUT SHAFT**

   CAUTION: Be careful that the thrust bearing and race do not fall out.



4. **REMOVE SNAP RING AND HUB FROM OVERDR CLUTCH ASSEMBLY**

5. **REMOVE THINNER SNAP RING, FLANGE, DISC A PLATE**

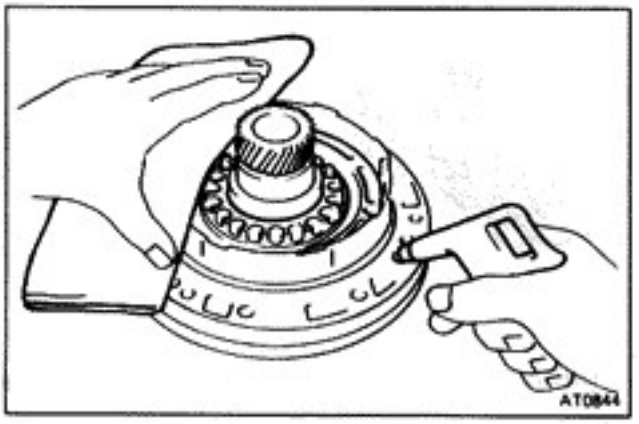


6. **COMPRESS PISTON RETURN SPRINGS AND REM SNAP RING**

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

   SST 09350-20013 (09369-20040)

7. **REMOVE SPRING RETAINER AND EIGHTEEN SPRIN**



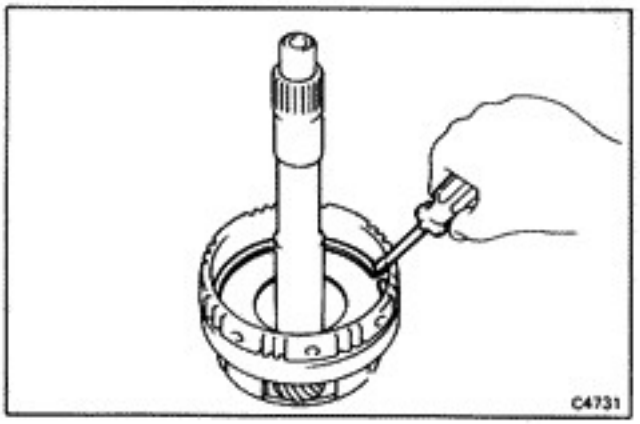
8. **ASSEMBLE OVERDRIVE CLUTCH ON OIL PUMP A BLOW OUT PISTON**

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

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

   (c) Remove the overdrive clutch from the oil pump

9. **REMOVE CLUTCH PISTON O-RINGS**



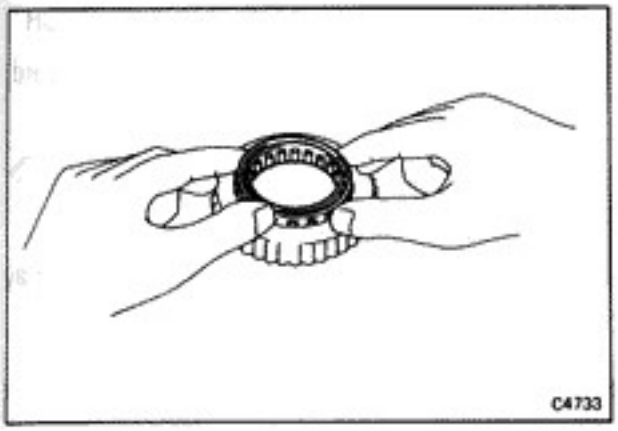
10. **REMOVE SNAP RING FROM OVERDRIVE PLANETA GEAR ASSEMBLY**

11. **REMOVE THRUST WASHERS AND ONE-WAY CLU FROM PLANETARY GEAR ASSEMBLY**

    CAUTION: Be careful not to lose the four plugs.

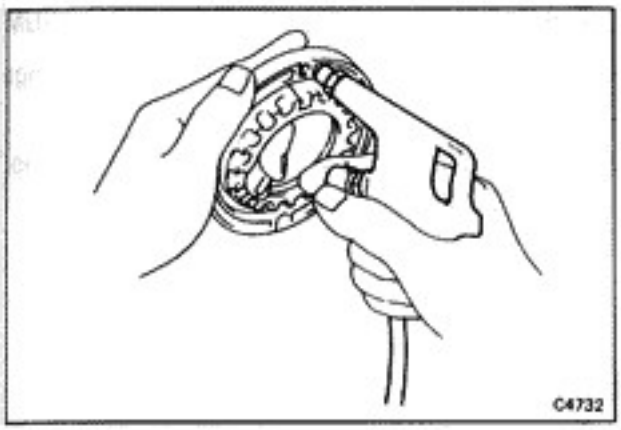
12. **REMOVE FOUR PLUGS WITH MAGNETIC FINGER**

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



13. REMOVE ONE-WAY CLUTCH FROM OUTER RACE

Note the direction of the one-way clutch.



INSPECTION OF OVERDRIVE INPUT SHAFT AND CLUTCH

1. 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.

2. INSPECT DISC, PLATE AND FLANGE

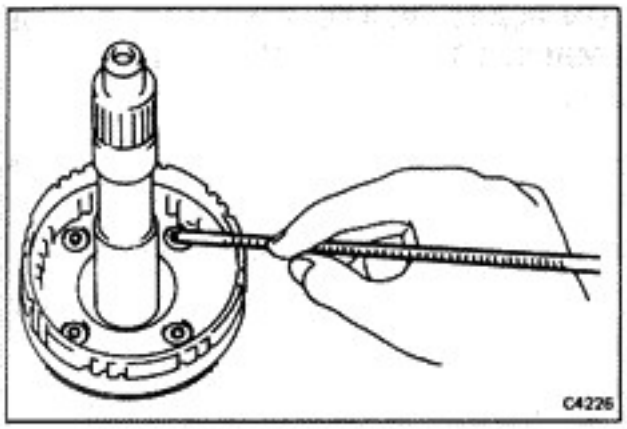
Check that the sliding surface of disc is not worn or burnt.

If the disc is worn or burnt, replace disc.

Then check that the sliding surfaces of plate and flange are not worn or burnt.

If necessary, replace them.

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-55)

1. INSTALL FOUR PLUGS

2. INSTALL THRUST WASHER AND BEARING

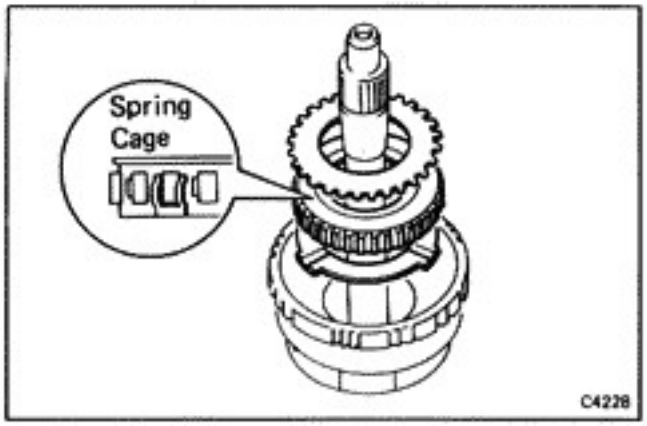
(a) Coat parts with petroleum jelly to hold them in place.

(b) Slide bearing and then thrust washer facing lip outward.

3. 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.



4. INSTALL THRUST WASHER AND ONE-WAY CLUT

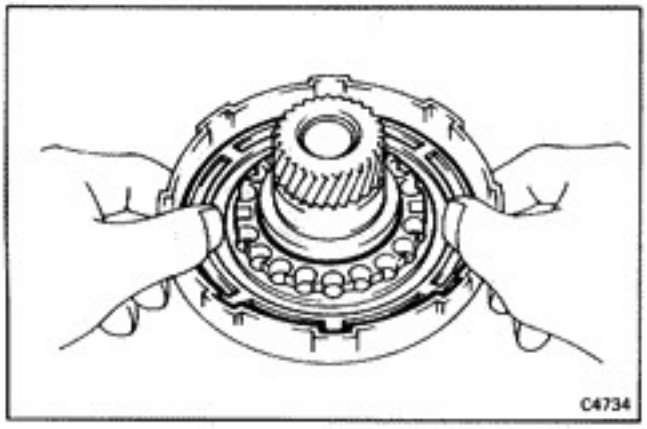
(a) Install the thrust washer, facing the grooves upv

(b) Install the one-way clutch in correct direction.

(c) Install the thrust washer.

(d) Install the snap ring.

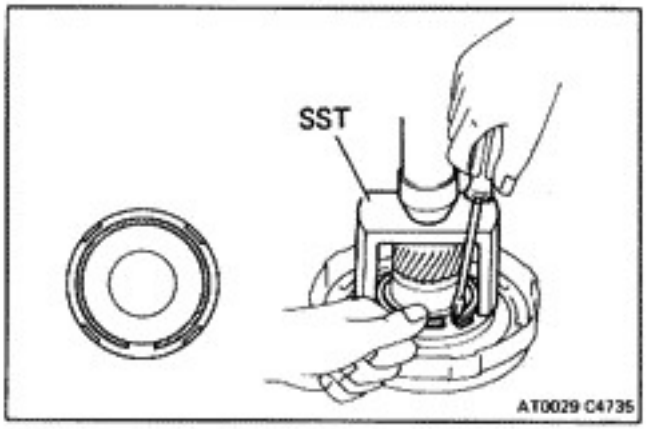
NOTE: Be sure that the spring cage side of the one clutch faces toward the front of the transmission.



5. INSTALL CLUTCH PISTON IN OVERDRIVE CLUTCH D

(a) Install new O-rings on the piston. Coat the O- with ATF.

(b) Press the piston into the drum with the cup sid being careful not to damage the O-ring.



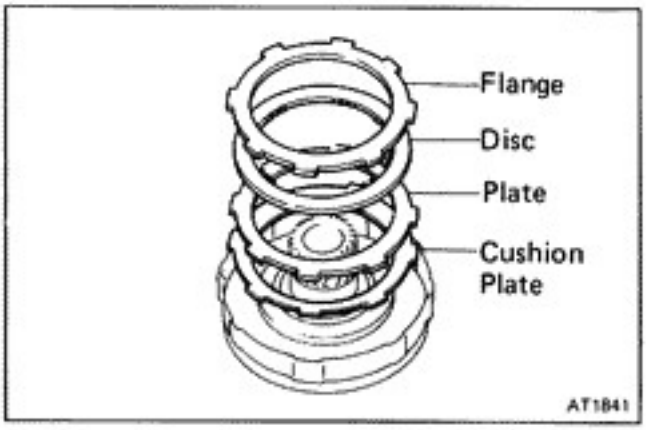
6. INSTALL EIGHTEEN PISTON RETURN SPRINGS AND RETAINER AND SNAP RING IN PLACE

7. COMPRESS RETURN SPRINGS AND INSTALL SNAP IN GROOVE

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

SST 09350-20013 (09369-20040)

(b) Install the snap ring with a screwdriver.



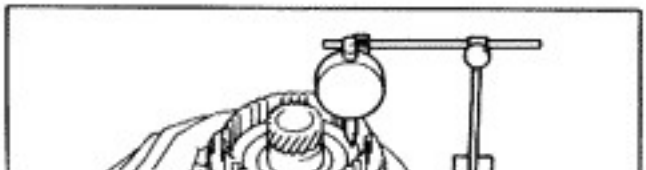
8. INSTALL CUSHION PLATE, PLATE, DISC AND FLA WITHOUT ASSEMBLING THINNER SNAP RING

(a) Do not assemble the thinner snap ring yet.

(b) Using low-pressure compressed air, blow all ex ATF from the disc.

CAUTION: High-pressure air will damage the disc.

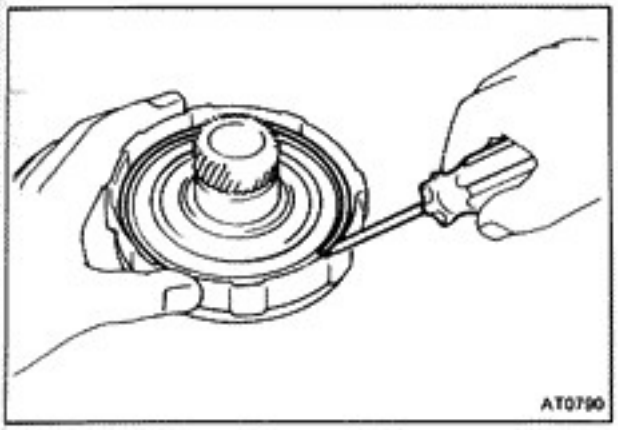
Install in order: Cushion plate-plate-disc-flange (flat down)



9. CHECK PISTON STROKE OF OVERDRIVE CLUTCH

(a) Install the overdrive clutch hub and outer snap

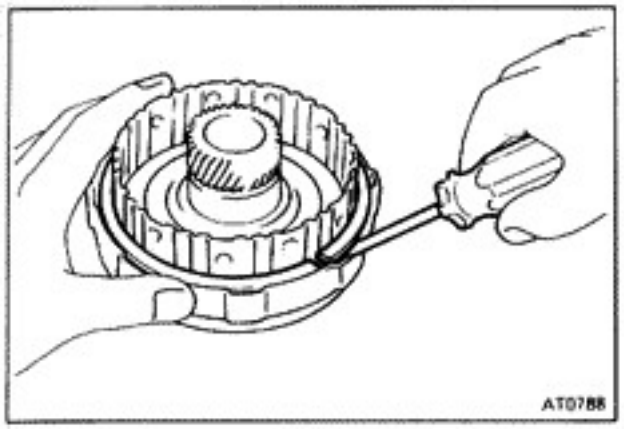
(b) Install the front clutch drum onto the oil pump b With a dial indicator, measure the stroke applying releasing the compressed air (4 — 8 kg/cm², 5



10. INSTALL THINNER SNAP RING IN OVERDRIVE CLUTCH DRUM

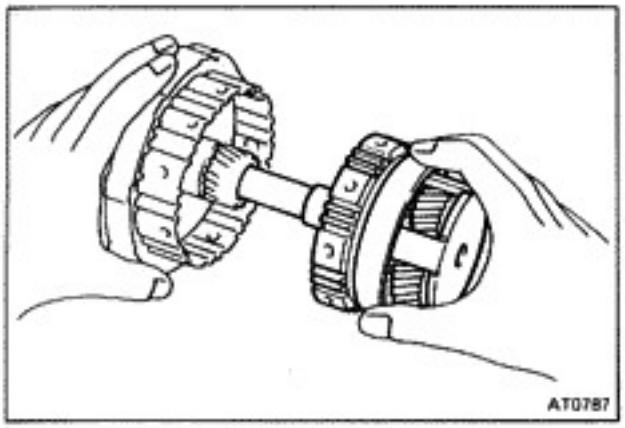
(a) Remove the overdrive clutch outer snap ring and hub to allow installation of the thinner snap ring.

(b) 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.



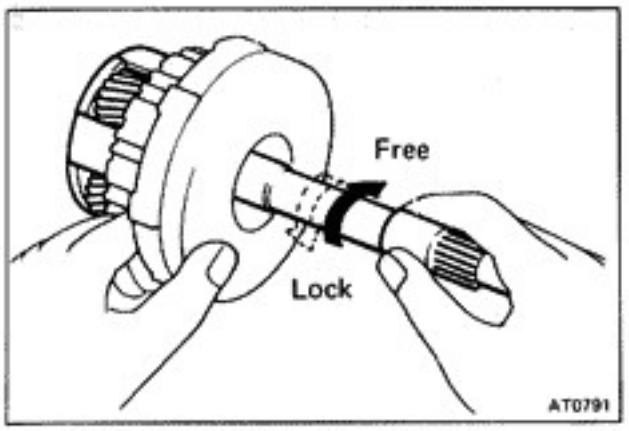
11. INSTALL HUB AND OUTER SNAP RING

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



12. ASSEMBLE OVERDRIVE CLUTCH DRUM AND OVERDRIVE PLANETARY GEAR

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

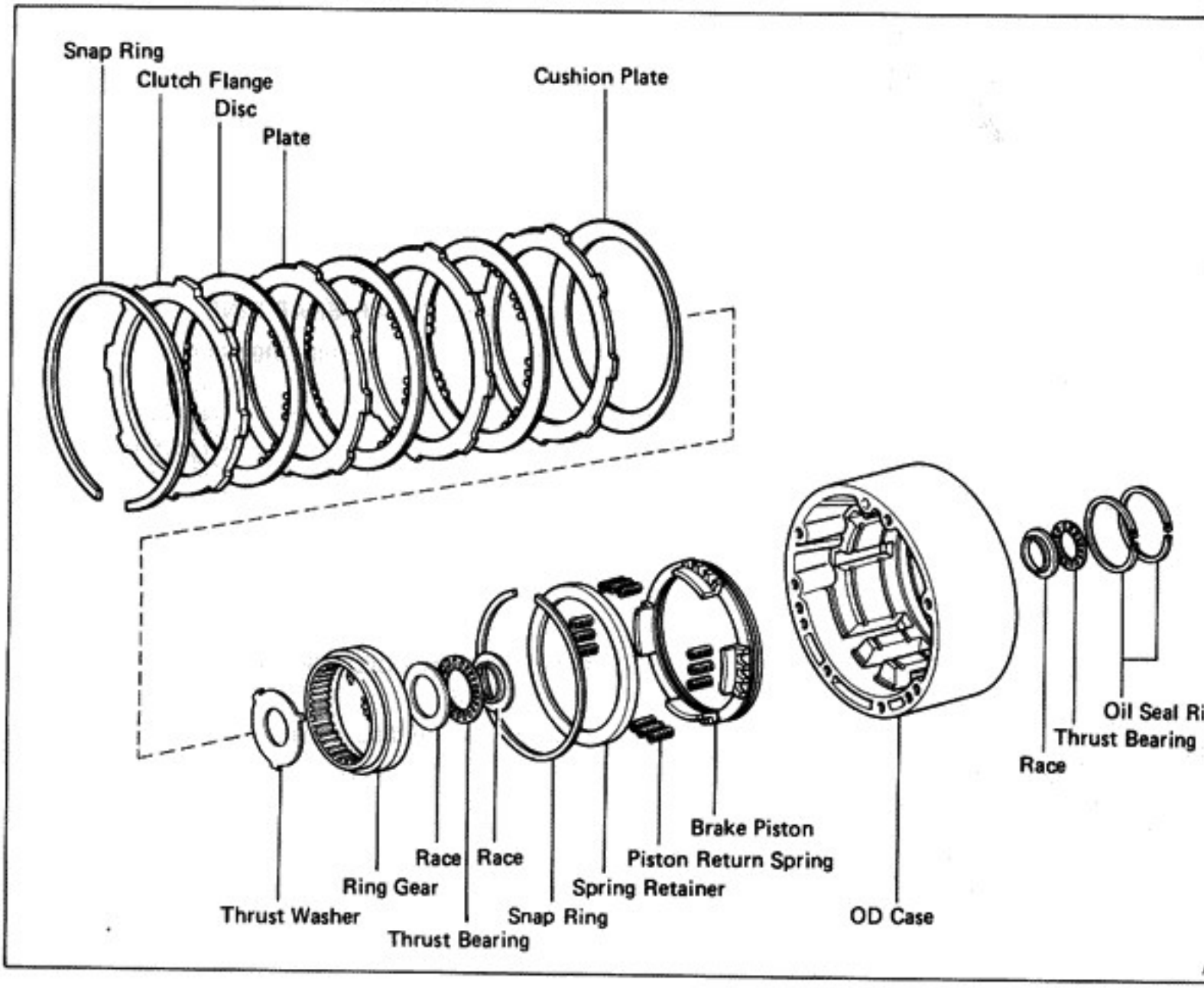


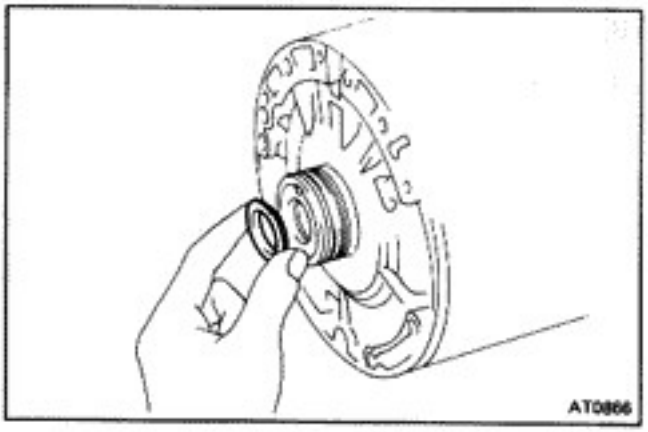
13. CHECK OPERATION OF ONE-WAY CLUTCH

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

14. KEEP THRUST WASHER, THRUST BEARINGS AND RACE TOGETHER

Overdrive Case and Brake



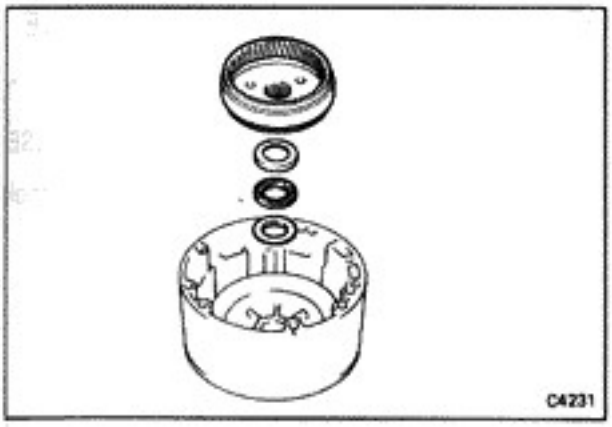


DISASSEMBLY OF OVERDRIVE CASE AND BRA

1. REMOVE RACE FROM OVERDRIVE

2. REMOVE OUTER SNAP RING FROM OVERDRIVE CA

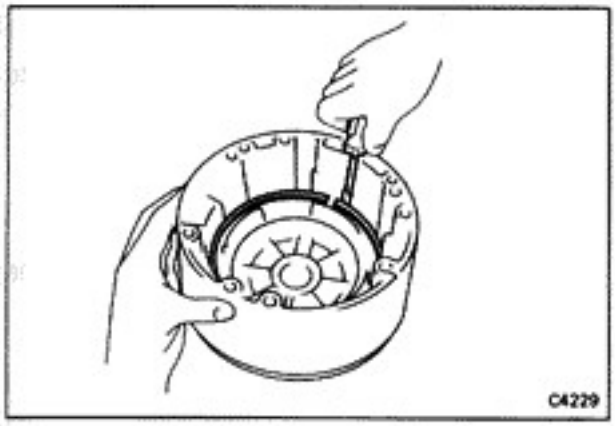
3. REMOVE CLUTCH FLANGE, DISCS PLATES A CUSHION PLATE



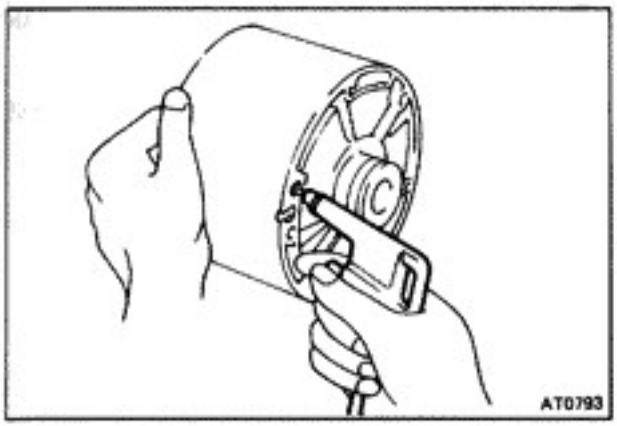
4. **REMOVE RING GEAR AND THRUST WASHER**

5. **REMOVE THRUST BEARING AND RACES FROM OVERDRIVE CASE**

Note the position of the races.



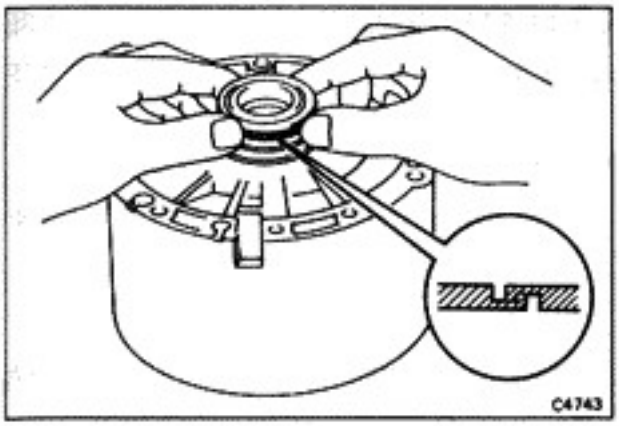
6. **REMOVE SNAP RING, SPRING RETAINER AND RETURN SPRINGS**



7. **REMOVE BRAKE PISTON**

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

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



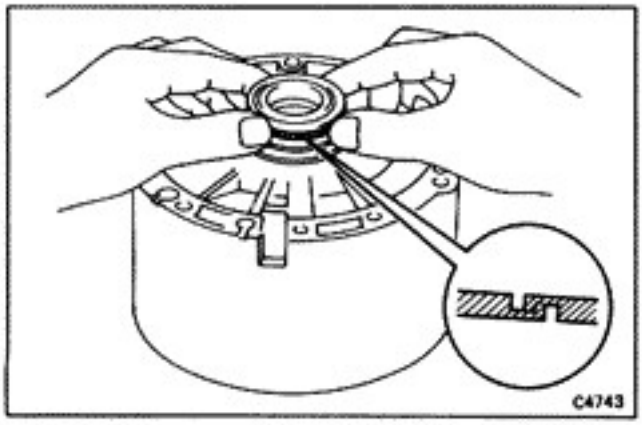
8. **REMOVE TWO OIL SEAL RINGS FROM OVERDRIVE CASE**

9. **REMOVE O-RINGS FROM PISTON**

INSPECTION OF OVERDRIVE CASE AND BRAKE

INSPECT DISC, PLATE AND FLANGE

Check that the sliding surface of disc is not worn or burnt.



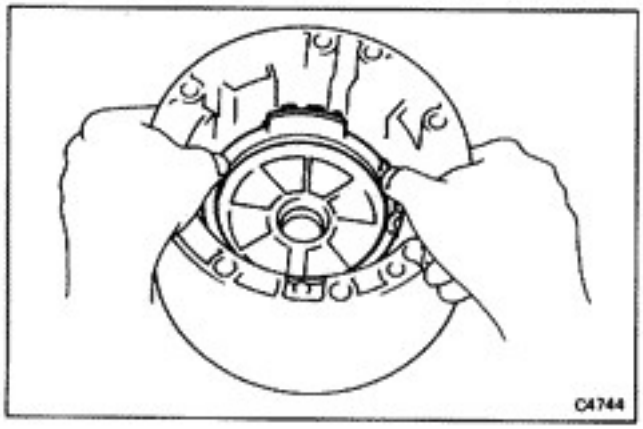
ASSEMBLY OF OVERDRIVE CASE AND BRA

(See page AT-60)

1. **INSTALL TWO OIL SEAL RINGS ON OVERDRIVE C**

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

2. **INSTALL NEW O-RING ON PISTON**

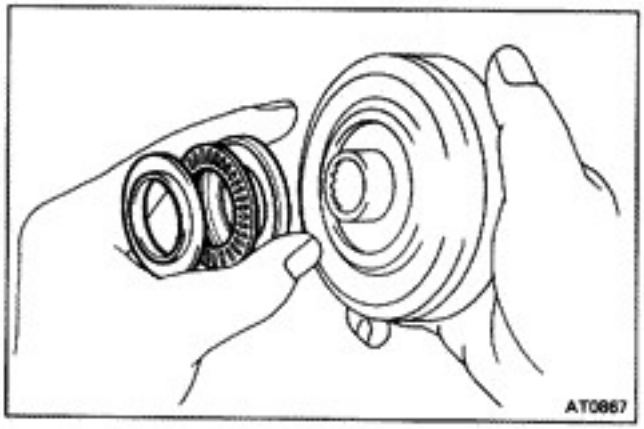


3. **INSTALL BRAKE PISTON IN OVERDRIVE CASE**

   Install the piston with cup side up, being careful n damage the O-rings.

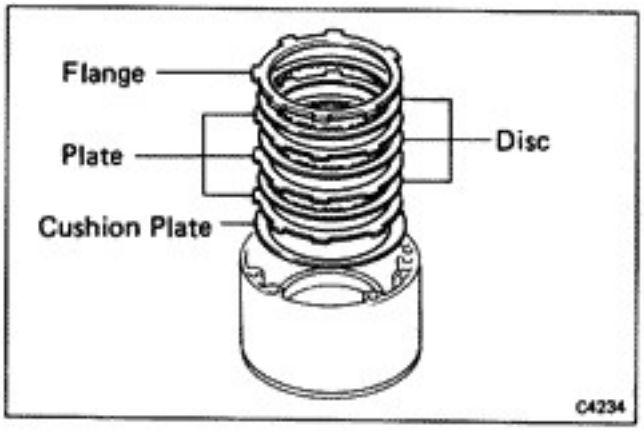
4. **INSTALL TWELVE RETURN SPRINGS AND SET RETAINER AND SNAP RING IN PLACE**

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



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

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



6. **INSTALL CUSHION PLATE, DISCS, PLATES AND FLA**

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

   CAUTION: High-pressure air will damage the discs

   Install in order: Cushion plate (rounded end down)-p disc-plate-disc-plate-disc-flange (flat side down)

7. **INSTALL SNAP RING**

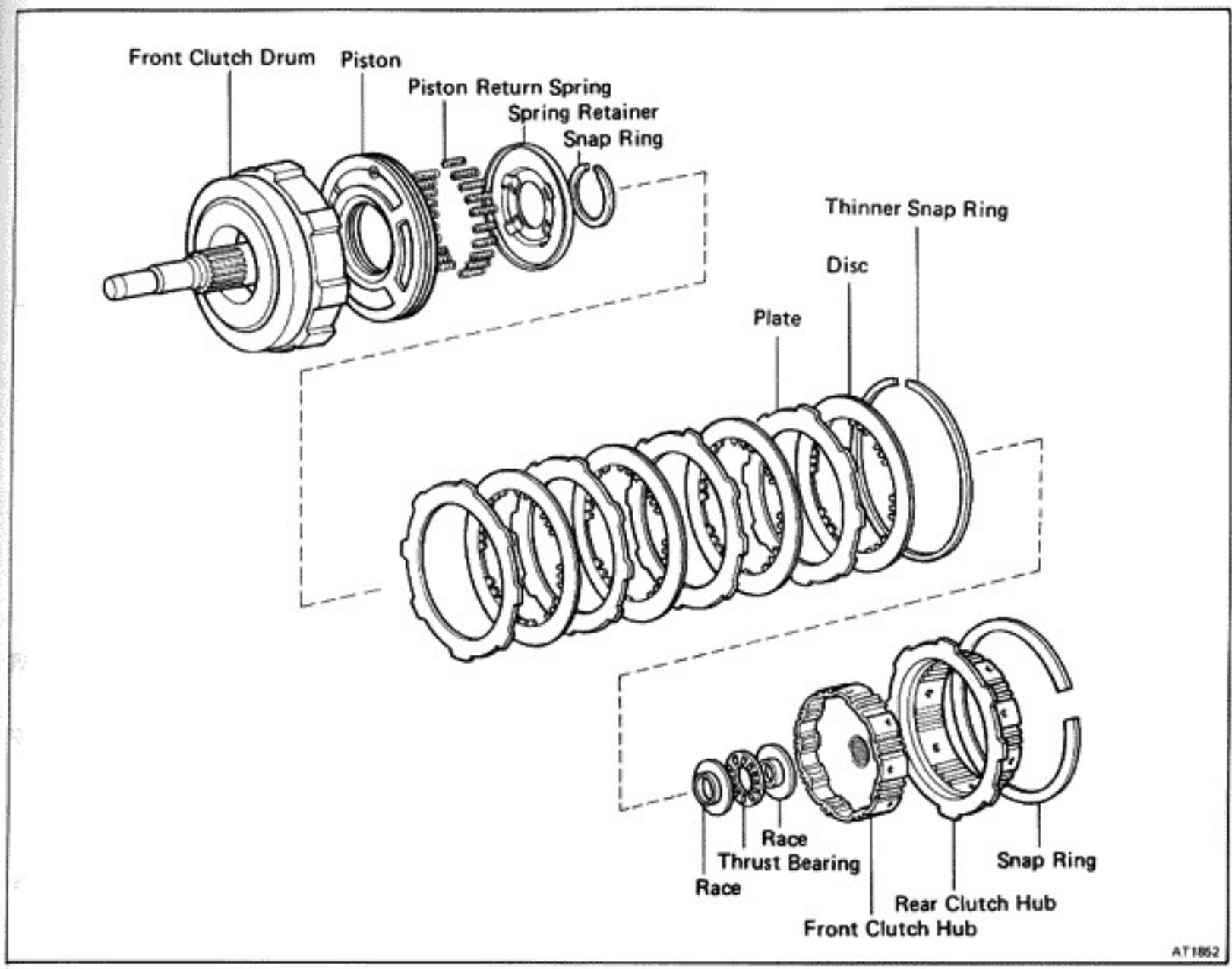
   Check that the ends of the snap ring are not aligned one of the cutouts.

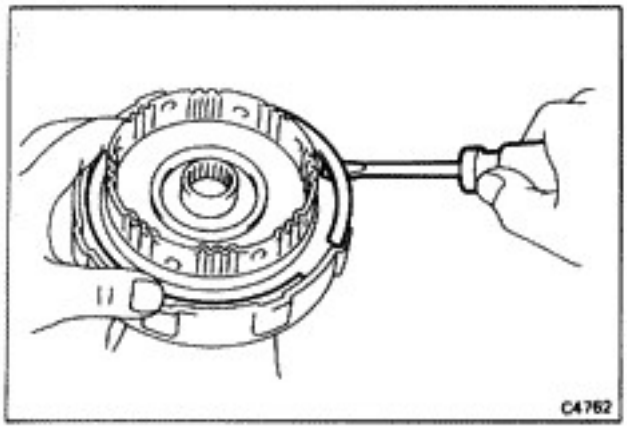
8. **MEASURE BRAKE CLEARANCE**

   Measure the distance between the snap ring and fla

   Standard clearance: 0.40 — 1.38 mm (0.0157 — 0.0543 in.)

Front Clutch

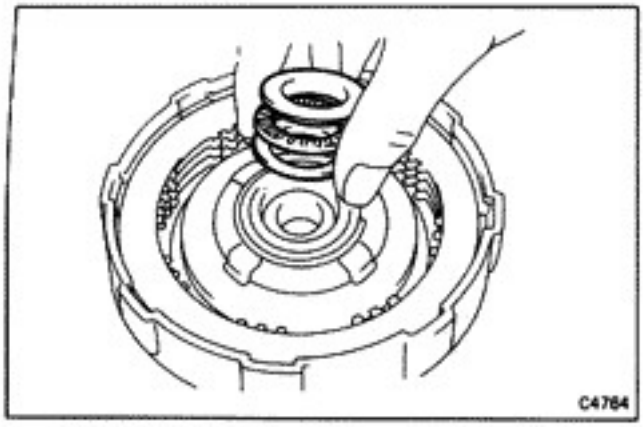




DISASSEMBLY OF FRONT CLUTCH

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**

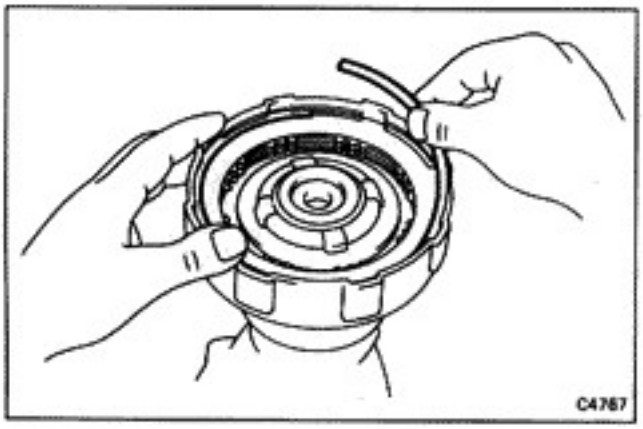
4. **REMOVE FRONT AND REAR CLUTCH HUB**
   Lift out the two clutch hubs together.



5. REMOVE THRUST BEARING AND RACES

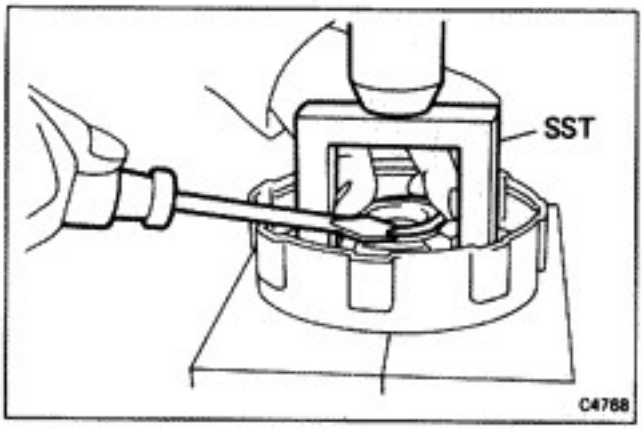
Note the position of the races.

6. REMOVE DISC



7. REMOVE THINNER SNAP RING

8. REMOVE REMAINING CLUTCH PLATES AND DISCS

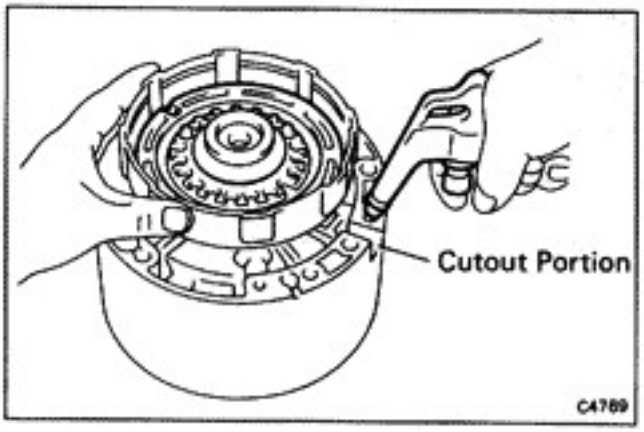


9. COMPRESS PISTON RETURN SPRINGS AND REM SNAP RING

Place SST on the spring retainer and compress the spr with a shop press.
Remove the snap ring with a screwdriver.

SST 09350-20013 (09369-20040)

10. REMOVE SPRING RETAINER AND EIGHTEEN SPRIN



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

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

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

(c) Remove the front clutch from the overdrive cas

12. REMOVE O-RINGS FROM PISTON

INSPECTION OF FRONT CLUTCH

1. INSPECT FRONT CLUTCH PISTON

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

2. INSPECT DISC, PALTE AND FLANGE

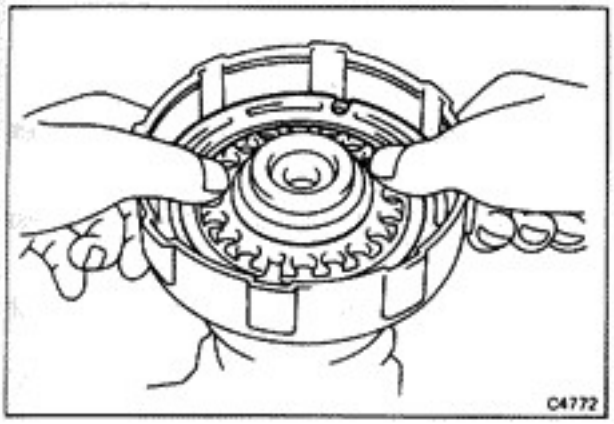
Check that the sliding surface of disc is not worn or burnt.

If the disc is worn or burnt, replace all discs.

Then check that the sliding surfaces of plate and flange are not worn or burnt.

If necessary, replace them.

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



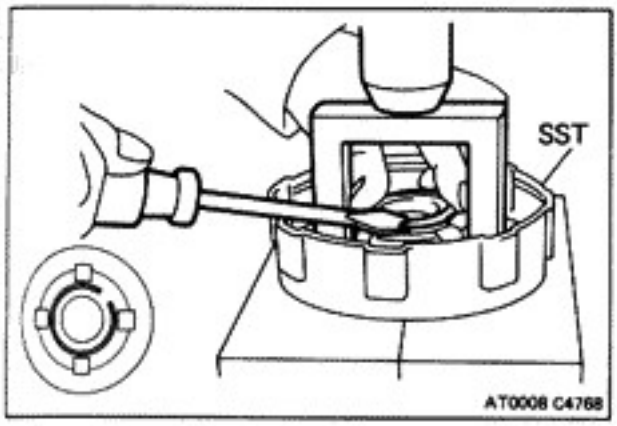
ASSEMBLY OF FRONT CLUTCH

(See page AT-63)

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 TWENTY 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 with a shop press.

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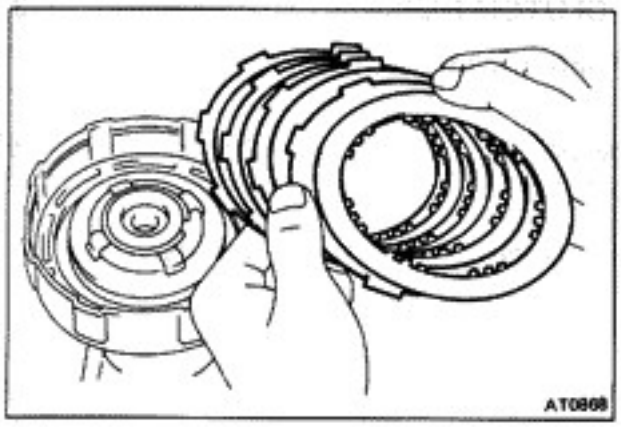
(b) Install the snap ring with a screwdriver.



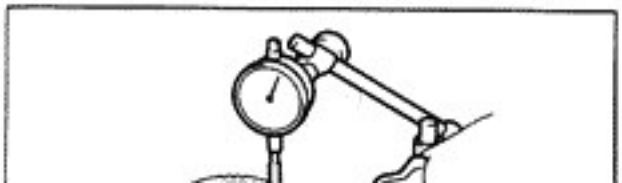
5. INSTALL DISCS AND PLATES WITHOUT ASSEMBLING THINNER SNAP RING

(a) Do not assemble the thinner snap ring yet.

(b) 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.

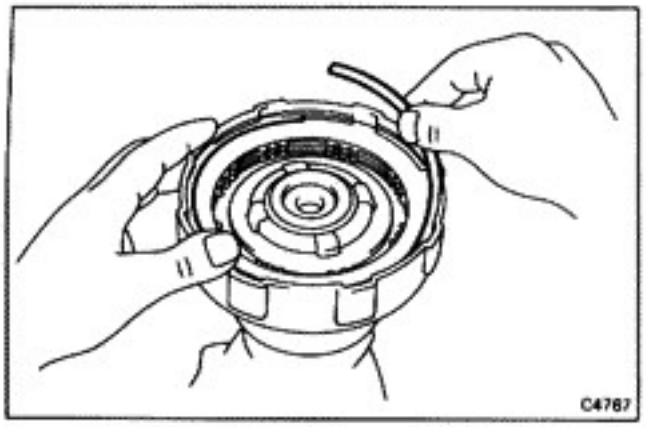
Install in order: Plate-disc-plate-disc-plate-disc-plate (no snap ring)-disc



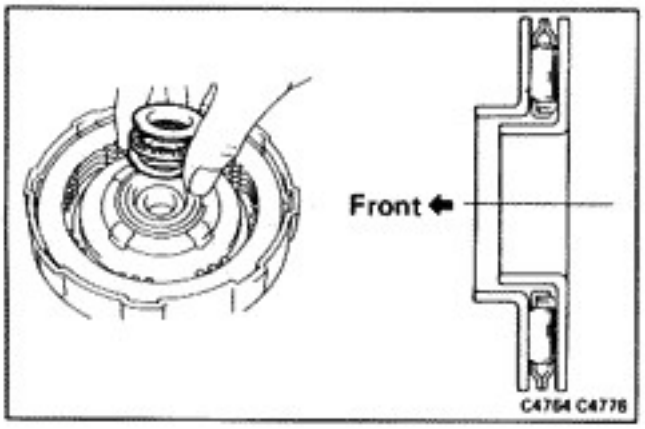
6. CHECK PISTON STROKE OF FRONT CLUTCH

(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 —

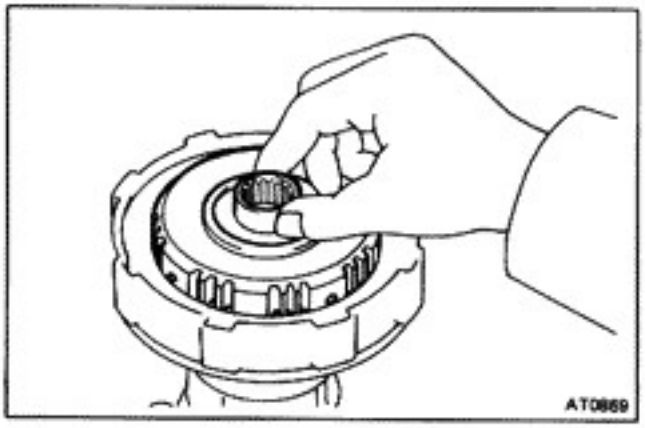


7. **INSTALL THINNER SNAP RING IN CLUTCH DRUM**
   (a) Remove the outer snap ring, rear clutch hub and
   to allow installation of the thinner snap ring.
   (b) Compress and lower the snap ring into the groov
   hand. Check that the ends of the snap ring are
   aligned with one of the cutouts.

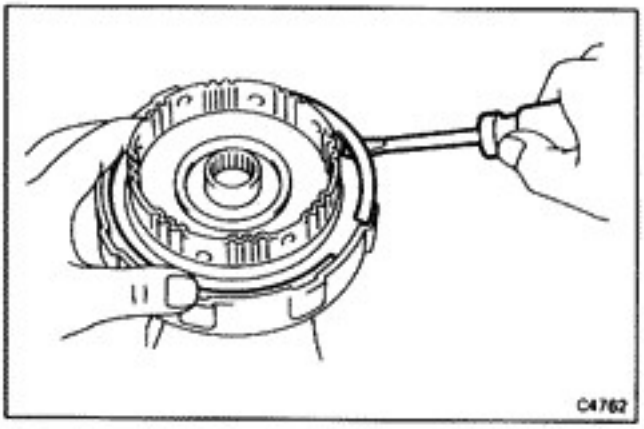


8. **INSTALL DISC**

9. **INSTALL INNER THRUST BEARING AND RACES**
   **IMPORTANT: Coat parts with petroleum jelly to hold t
   in place.**
   Install the inner race, needle bearing and outer race. P
   them into place.
   NOTE: Face the lip of race toward the front of the cl
   body.



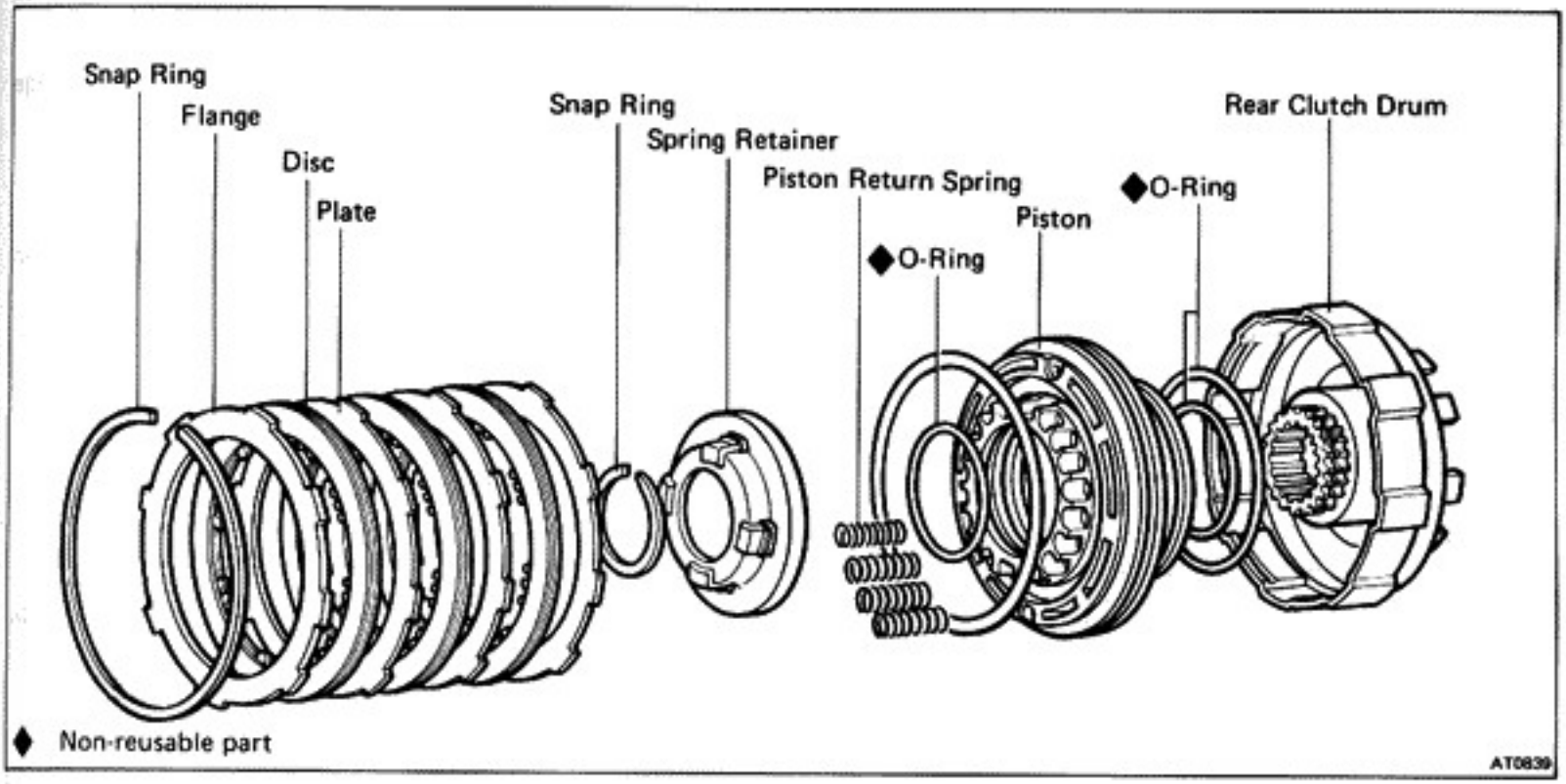
10. **INSTALL FRONT CLUTCH HUB**
    Align the disc lugs with the hub teeth. Make sure the
    meshes with all discs and is fully inserted.

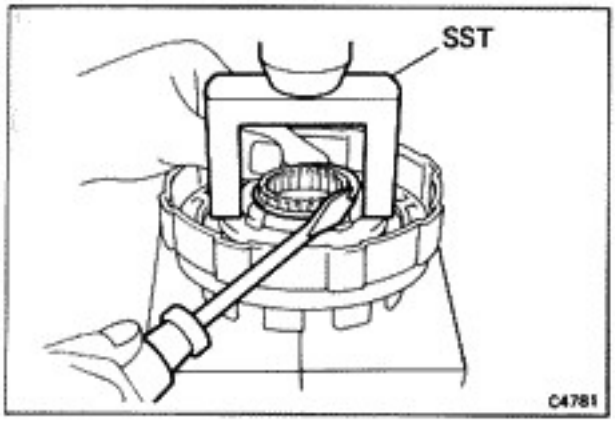


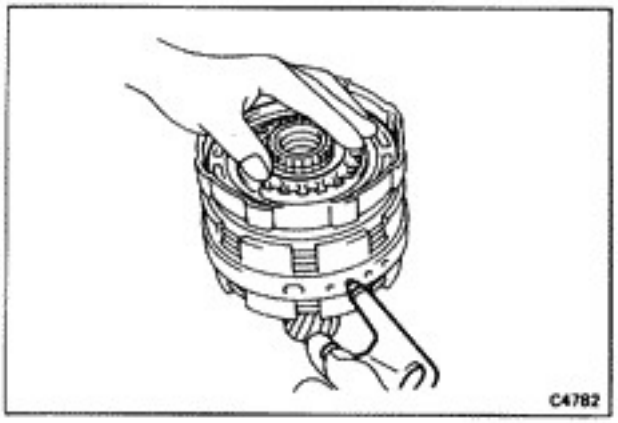
11. **INSTALL REAR CLUTCH HUB AND OUTER SNAP R**
    Check that the snap ring ends are not aligned with on
    the cutouts.
    NOTE: Note the position of the inner thrust bearing
    races, and keep them together until assembly.

12. **KEEP THRUST BEARINGS AND RACES TOGETHER**

Rear Clutch







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 a screwdriver, remove the snap ring.

   SST 09350-20013

4. **REMOVE SPRING RETAINER, SNAP RING AND EIGHTEEN RETURN SPRINGS**

5. **ASSEMBLE REAR CLUTCH ON CENTER SUPPORT AND BLOW OUT PISTON**

   (a) Slide rear clutch onto the center support.

   (b) Apply compressed air to center support to remove the piston. (If the piston does not come out, 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

2. INSPECT DISC, PLATE AND FLANGE

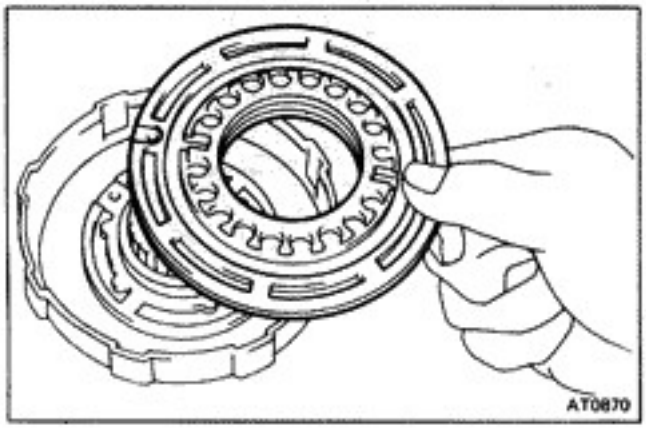
Check that the sliding surface of disc is not worn or bu

If the disc is worn or burnt, replace all discs.

Then check that the sliding surfaces of plate and fla are not worn or burnt.

If necessary, replace them.

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



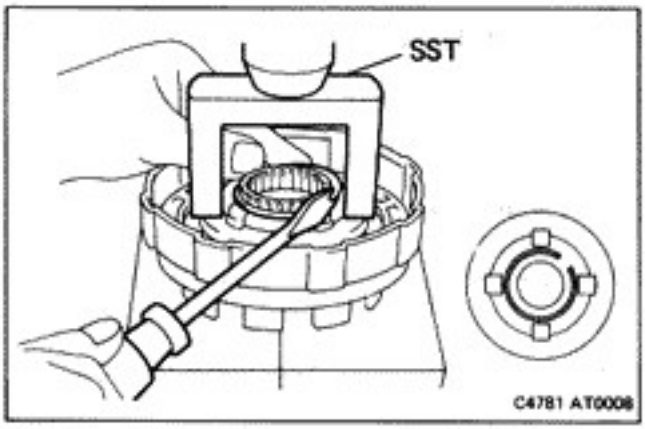
ASSEMBLY OF REAR CLUTCH

(See page AT-67)

1. INSTALL NEW O-RINGS ON PISTON

2. INSTALL REAR CLUTCH PISTON IN DRUM

Press rear clutch piston into drum with the cup side being careful not to damage the O-rings.



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

4. COMPRESS RETURN SPRINGS AND INSTALL SNAP R IN GROOVE

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

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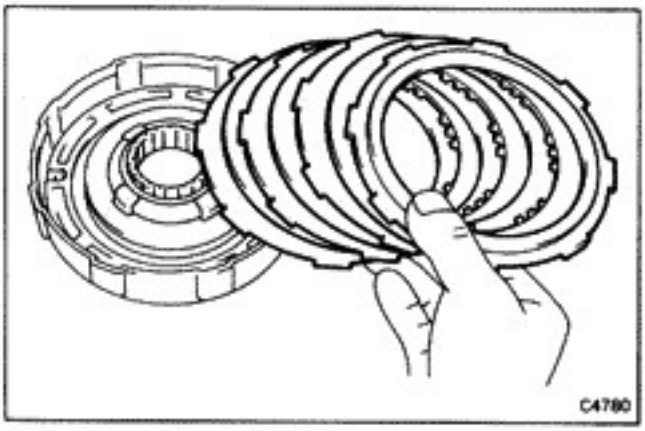
(b) Install the snap ring with snap ring pliers.



5. INSTALL DISCS, PLATES AND FLANGE

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

CAUTION: High-pressure air will damage the discs

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

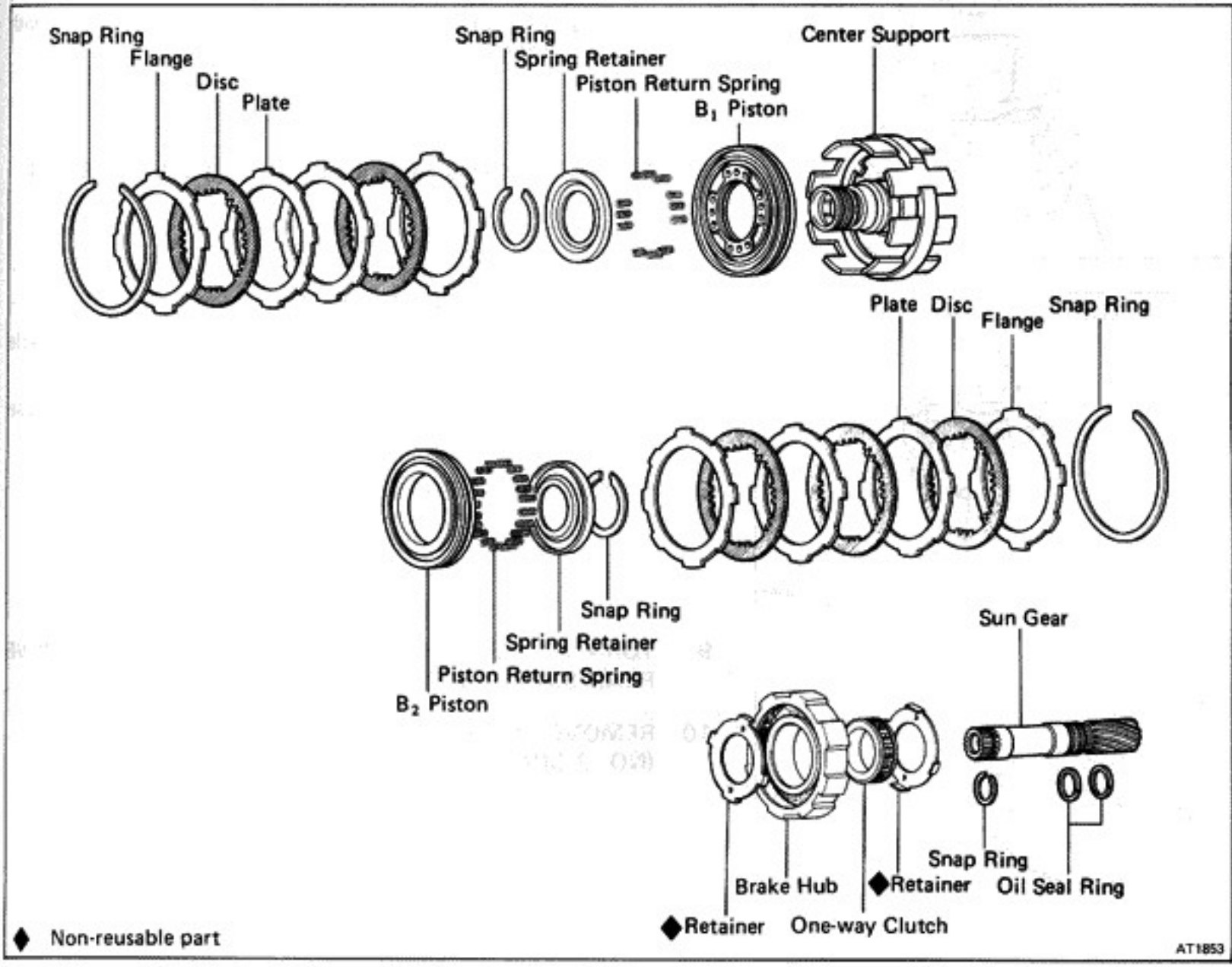
6. INSTALL SNAP RING

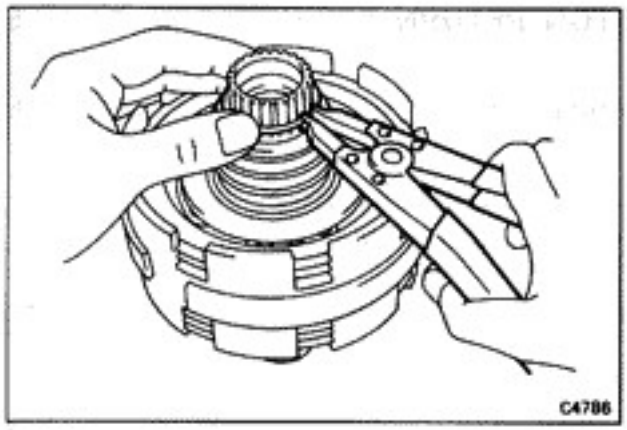
Check that the snap ring ends are not aligned with on the cutouts.

7. CHECK PISTON STROKE OF REAR CLUTCH

Install the rear clutch onto the center support. With a indicator, measure the stroke applying and releasing compressed air (4 — 8 kg/cm², 57 — 114 psi or 39

Center Support Assembly

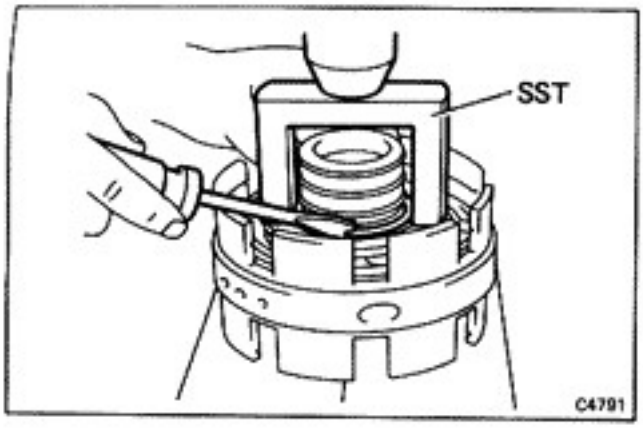




DISASSEMBLY OF CENTER SUPPORT ASSEMBLY

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

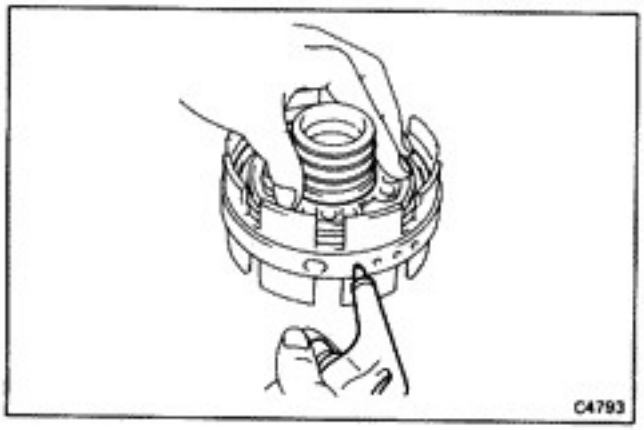
3. REMOVE SNAP RING FROM FRONT OF CENTER SUPPORT ASSEMBLY (NO. 1 BRAKE)
4. REMOVE CLUTCH FLANGE, DISCS AND PLATES (NO. 1 BRAKE)



5. **COMPRESS PISTON RETURN SPRINGS AND REM SNAP RING**

Place SST on spring retainer and compress the springs a shop press.
Using a screwdriver, remove the snap ring.
SST 09350-20013 (09369-20040)

6. **REMOVE SPRING RETAINER AND TWELVE SPRING**

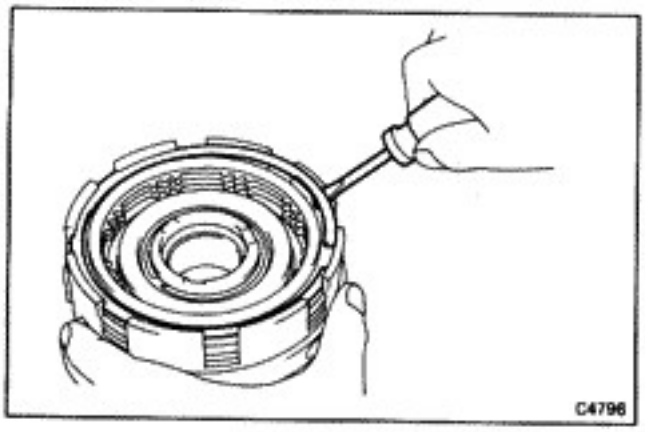


7. **REMOVE NO. 1 BRAKE PISTON**

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

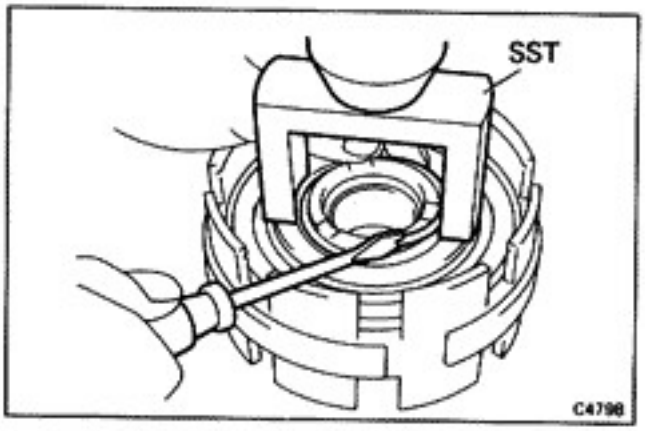
If the piston does not pop out, lift it out with needle-n pliers.

8. **REMOVE NO. 1 BRAKE PISTON O-RINGS**



9. **TURN CENTER SUPPORT ASSEMBLY OVER AND REMO REAR SNAP RING (NO. 2 BRAKE)**

10. **REMOVE CLUTCH FLANGE, DISCS AND PLATES (NO. 2 BRAKE)**



11. **COMPRESS PISTON RETURN SPRINGS AND REMO SNAP RING**

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

Using a screwdriver, remove the snap ring.

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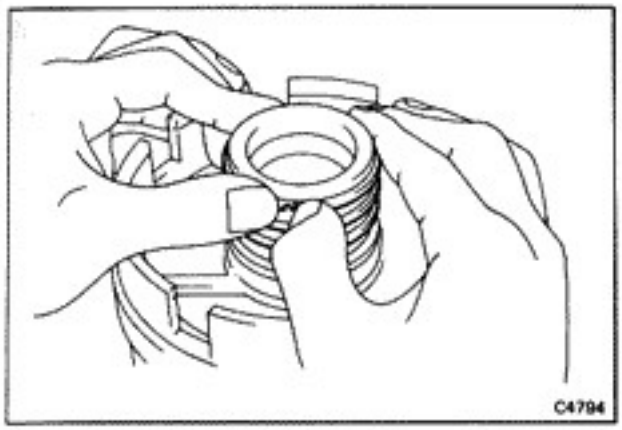
12. **REMOVE SPRING RETAINER AND TWENTY SPRINGS**

13. **REMOVE NO. 2 BRAKE PISTON**

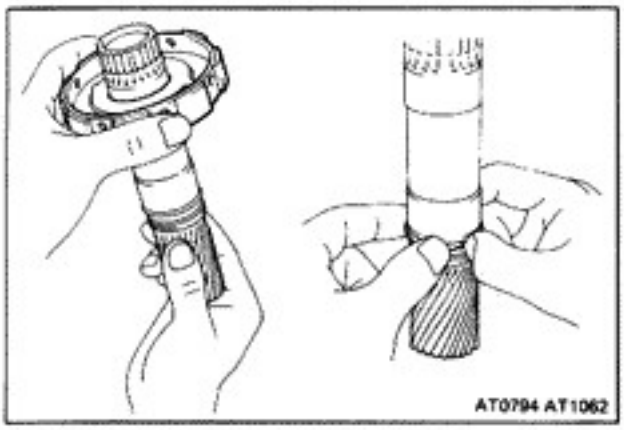
Blow compressed air through the center support oil h to remove the No. 2 brake piston.

If the piston does not pop out, lift it out with needle-no pliers.



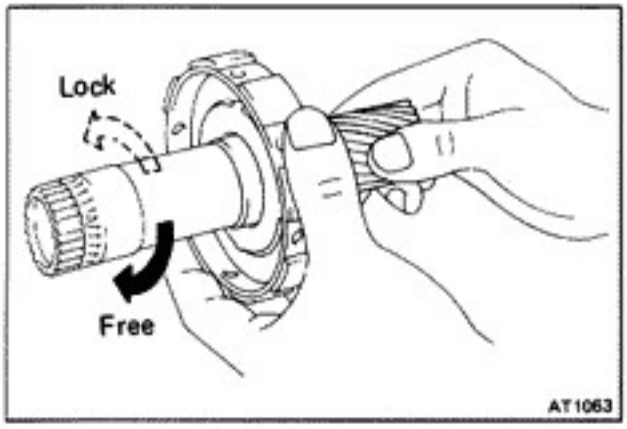
15. REMOVE THREE OIL SEAL RINGS FROM CENTER SUPPORT

CAUTION: Do not spread the ring ends too much.



16. REMOVE ONE-WAY CLUTCH ASSEMBLY AND OIL SEAL RINGS FROM SUN GEAR

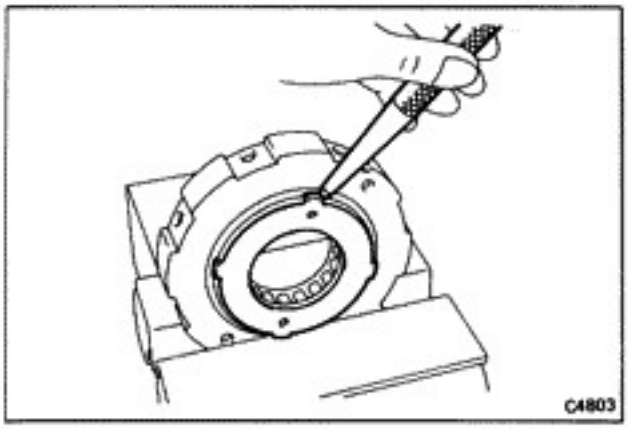
INSPECTION OF CENTER SUPPORT ASSEMBLY



1. CHECK OPERATION OF ONE-WAY CLUTCH

Hold the No. 2 brake hub and turn the sun gear. The sun gear should turn freely counterclockwise and should lock clockwise.

If the one-way clutch does not work properly, replace it.



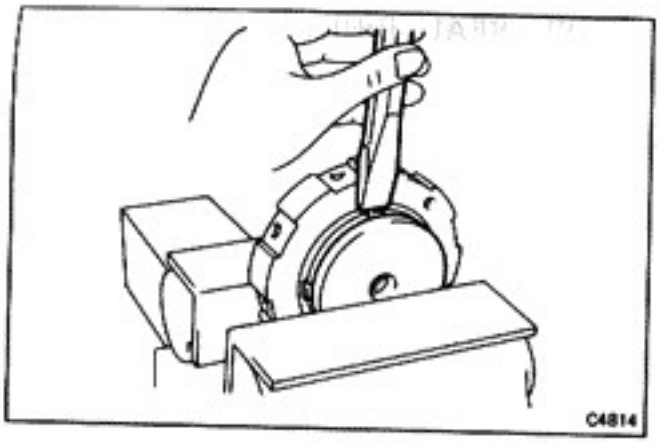
2. IF NECESSARY, REPLACE ONE-WAY CLUTCH

(a) Bend several tabs back with a tapered punch.

(b) Pry off the retainer with a screwdriver. Leave the other retainer on the hub.

(c) Remove the one-way clutch.

(d) Install the one-way clutch into the brake hub, facing the spring cage toward the front.



(e) Hold the brake hub in a vise with soft jaws, an
ten the ears with a chisel.

(f) Check to make sure that the retainer is cente

3. INSPECT DISC, PLATE AND FLANGE

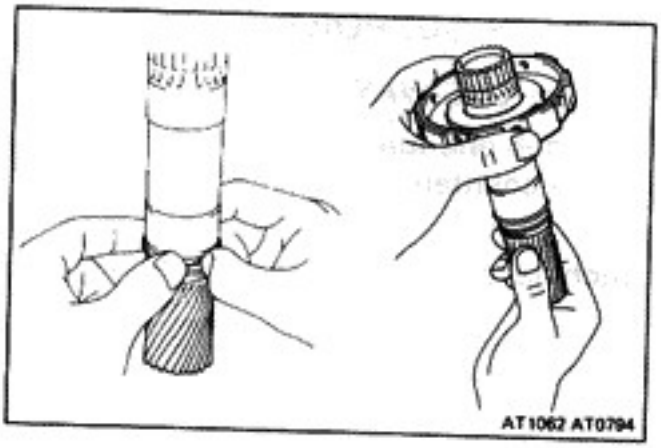
Check that the sliding surface of disc is not worn or b

If the disc is worn or burnt, replace all discs.

Then check that the sliding surfaces of plate and fl
are not worn or burnt.

If necessary, replace them.

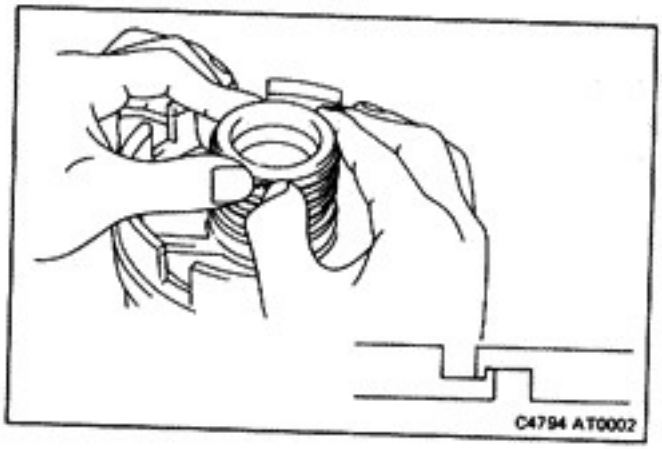
NOTE: Do not allow the discs to dry out.
Prepare new discs by soaking them at least two hours in



ASSEMBLY OF CENTER SUPPORT ASSEMBL

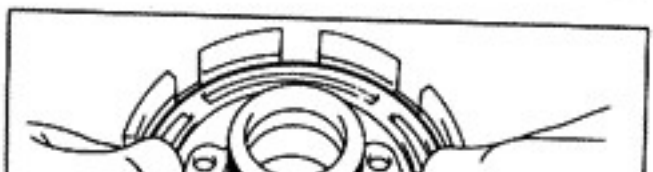
(See page AT-69)

**1. INSTALL TWO OIL SEAL RINGS AND ONE-WAY CLU
ASSEMBLY ON SUN GEAR**



2. INSTALL THREE OIL SEAL RINGS ON CENTER SUPPO

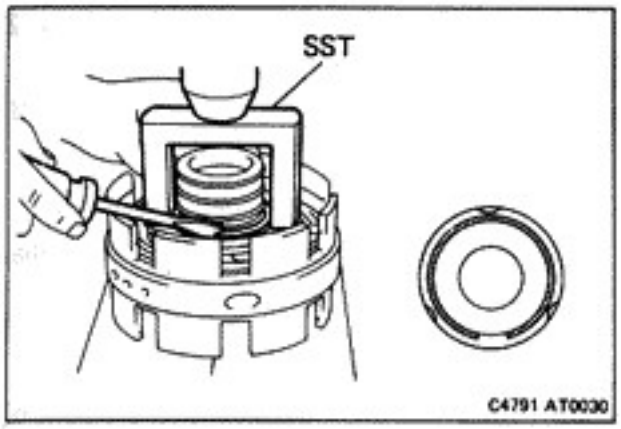
Spread the rings apart and slip them into the groove
Hook both ends by hand.



3. INSTALL NEW O-RINGS ON PISTON

4. INSTALL NO. 1 BRAKE PISTON IN CENTER SUPPORT

Press the No. 1 brake piston into



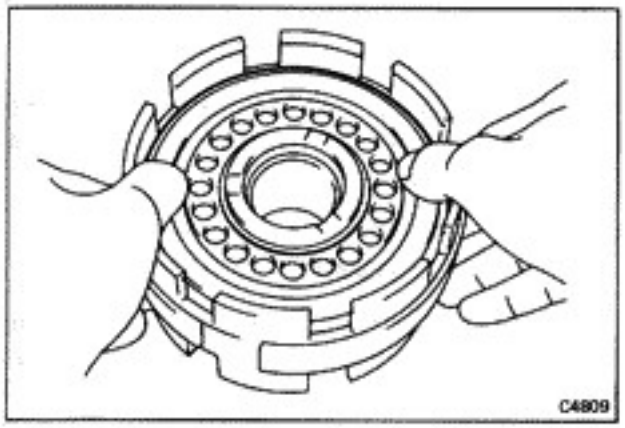
5. INSTALL TWELVE PISTON RETURN SPRINGS AND SET RETAINER WITH SNAP RING IN PLACE

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 (09369-20040)

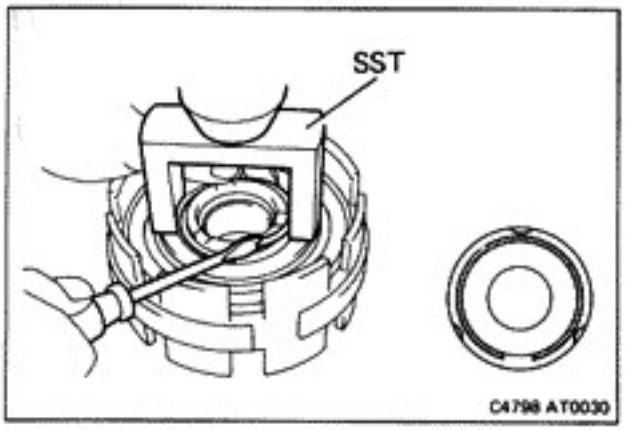
(b) Install the snap ring using a screwdriver.



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

8. TURN CENTER SUPPORT OVER AND INSTALL NO. 2 BRAKE PISTON

Press the No. 2 brake piston into the center support with the cup side up, being careful not to damage the O-rings.



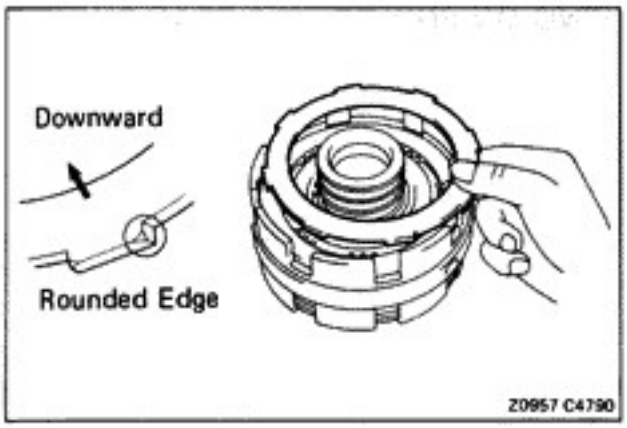
9. INSTALL TWENTY PISTON RETURN SPRINGS AND SET RETAINER WITH SNAP RING IN PLACE

10. 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 (09369-20040)

(b) Install the snap ring with a screwdriver.



11. TURN CENTER SUPPORT OVER AND INSTALL NO. 1 BRAKE PISTON PLATE, DISC AND FLANGE

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

CAUTION: High-pressure air will damage the disc.

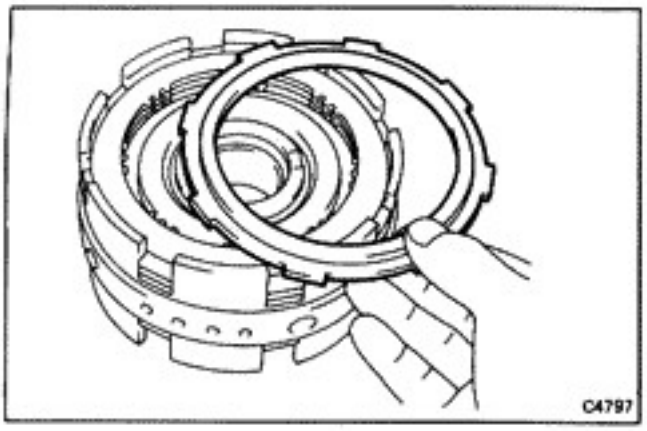
Install in order: Plate-disc-plate-plate-disc-flange (rounded edge down)

12. INSTALL SNAP RING IN CENTER SUPPORT

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

13. 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

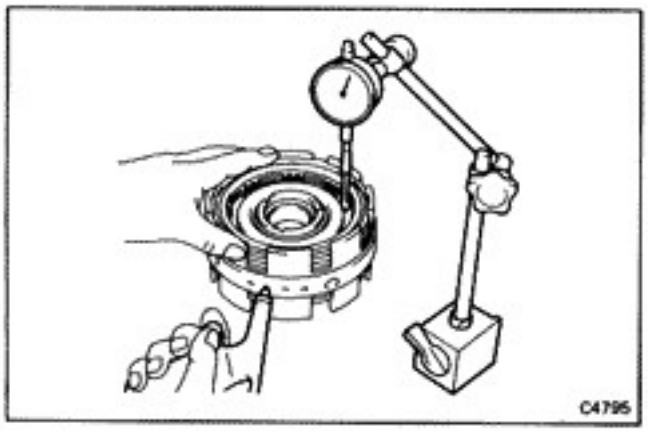


14. TURN CENTER SUPPORT OVER AND INSTALL N BRAKE PLATES, DISCS AND FLANGE

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

CAUTION: High-pressure air will damage the disc.

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



15. INSTALL SNAP RING IN CENTER SUPPORT

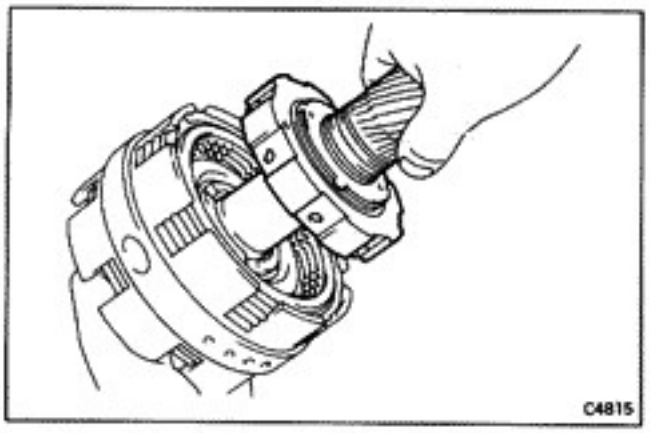
Check that the snap ring ends are not aligned with o the cutouts.

16. CHECK PISTON STROKE OF NO. 2 BRAKE

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

Standard piston stroke: 1.01 — 2.25 mm (0.0398 — 0.0886 in.)

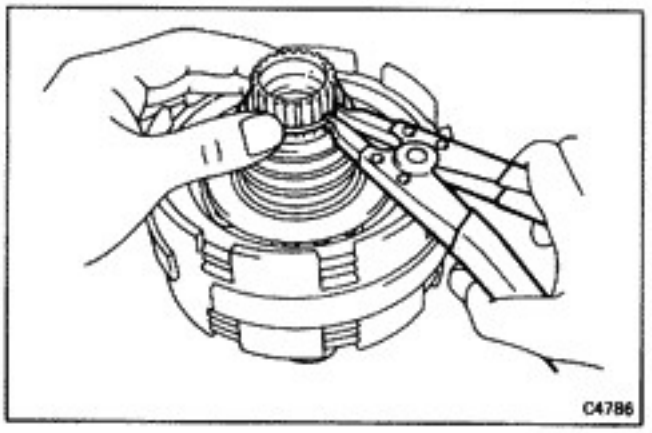
If the stroke exceeds the limit, the clutch pack is prob worn. If the stroke is less than the limit, parts may be assembled or there may be excess ATF on the disc



17. ASSEMBLE CENTER SUPPORT AND SUN GEAR SH

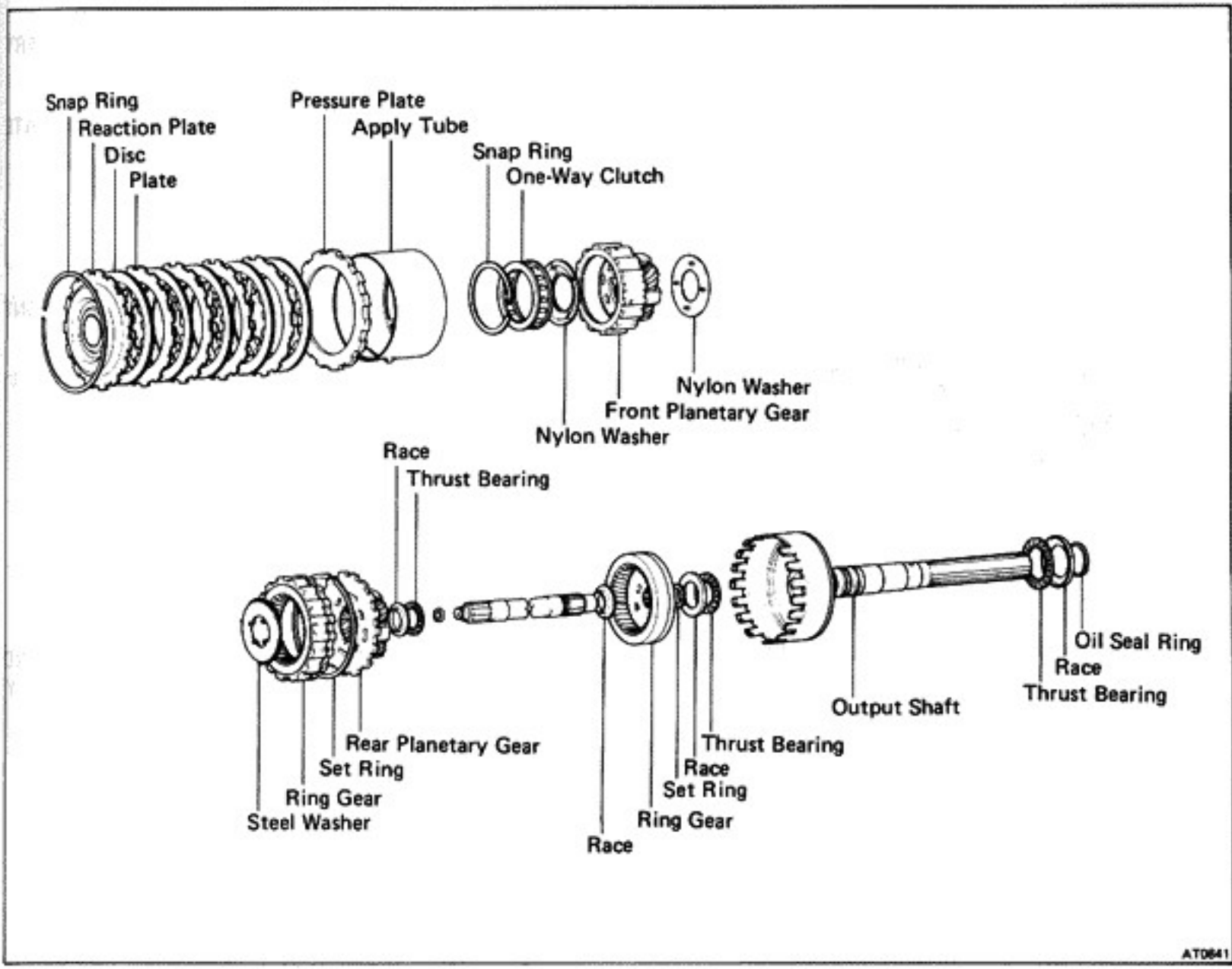
(a) Align the brake No. 2 disc flukes.

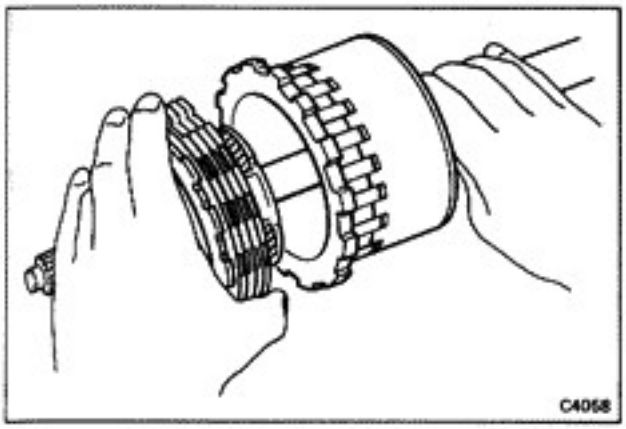
(b) Mesh the brake hub with the discs, twisting an gling the hub as required.



18. INSTALL SNAP RING ON END OF SUN GEAR SHAF

Planetary Gear Output Shaft





DISASSEMBLY OF PLANETARY GEAR OUTPUT SHAFT

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

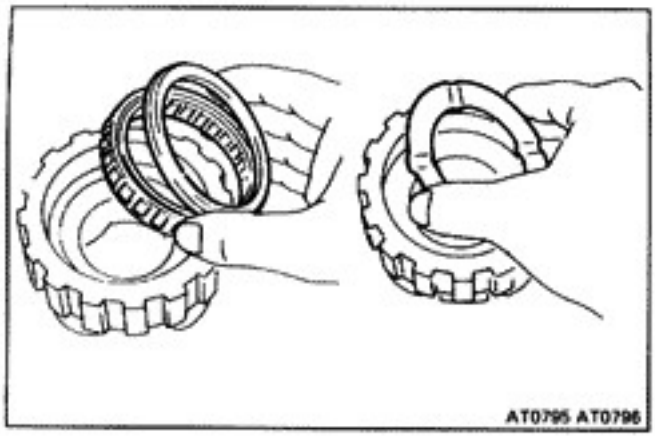
   Grasp the components and pull off the front end of the output shaft.
   Be careful to avoid dropping the bearing on the output shaft.

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

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

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

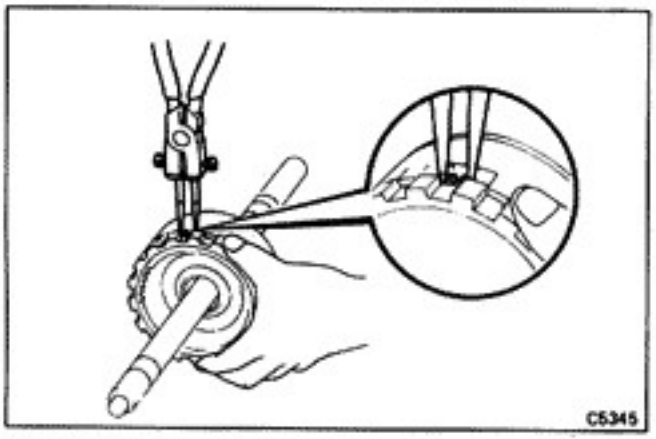
4. **REMOVE REACTION PLATE FROM PLANETARY GEARS**



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

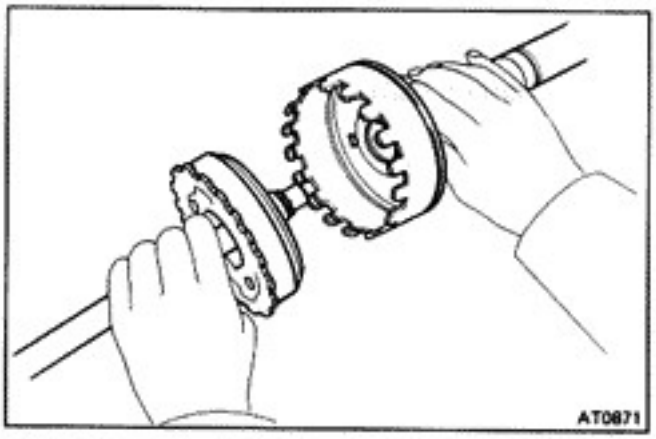
6. **REMOVE NYLON THRUST WASHER FROM PLANET GEARS**

7. **REMOVE APPLY TUBE AND CLUTCH PRESSURE P**

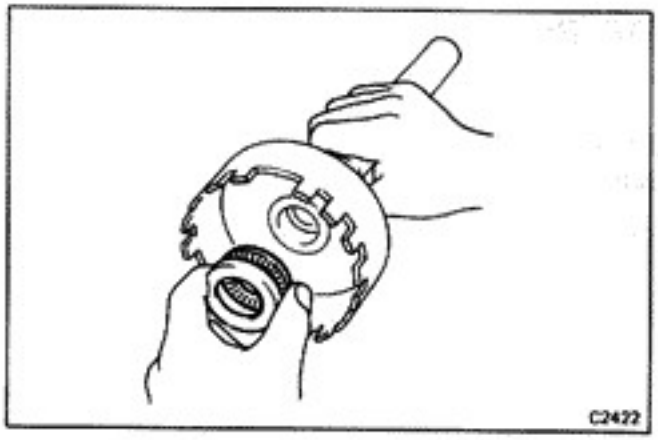


8. **COMPRESS SHAFT SNAP RING AND REMOVE FR PLANETARY RING GEAR**

   While pulling up the ring gear, compress the snap ring snap ring pliers and pull out the ring gear by hand.



9. **REMOVE INTERMEDIATE SHAFT, RING GEAR PLANETARY GEAR FROM OUTPUT SHAFT ASSEM**



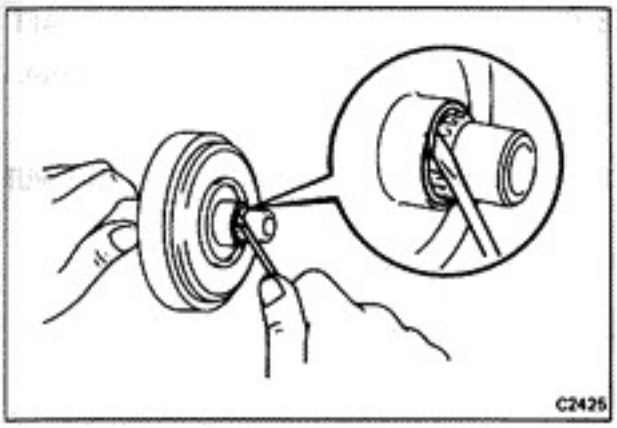
10. **REMOVE THRUST BEARING AND RACES FROM OUT SHAFT ASSEMBLY**

    Note the position of the races.

11. **REMOVE THREE OIL SEAL RINGS FROM OUTPUT SH**

12. **REMOVE STEEL THRUST WASHER AND REAR PI GEARS FROM INTERMEDIATE SHAFT ASSEMBLY**

13. **REMOVE RACE AND THRUST BEARING FROM**



14. INVERT INTERMEDIATE SHAFT AND REMOVE SET RING

15. REMOVE REAR PLANETARY RING GEAR AND BEARING RACE FROM INTERMEDIATE SHAFT

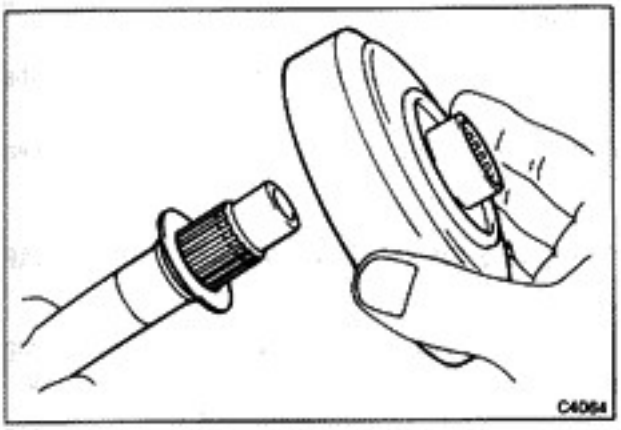
Note the position of the race.

INSPECTION OF PLANETARY GEAR OUTPUT SHAFT

INSPECT DISK, PLATE AND FLANGE

Check that the sliding surface of disc is not worn or burnt.
If the disc is worn or burnt, replace all discs.
Then check that the sliding surface of plate is not worn or burnt.
If necessary, replace them.

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

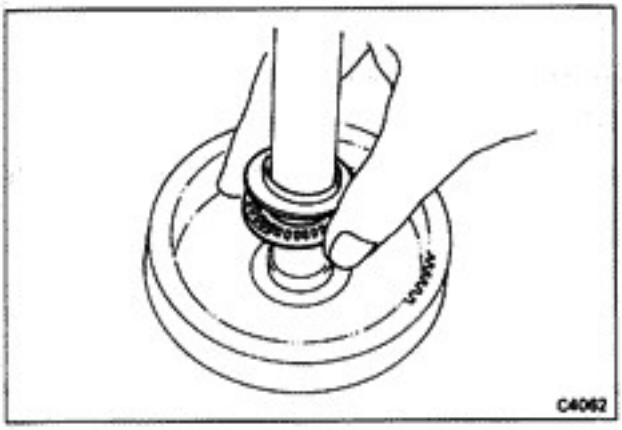


ASSEMBLY OF PLANETARY GEAR OUTPUT SHAFT

(See page AT-75)

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

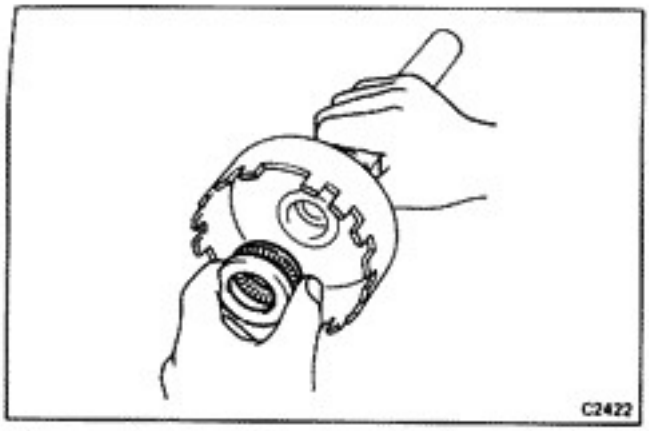
Push down and wind the set ring into place. Check to make sure it is secure.

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 AND STEEL THRUST WASHER ON REAR PLANETARY CARRIER

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



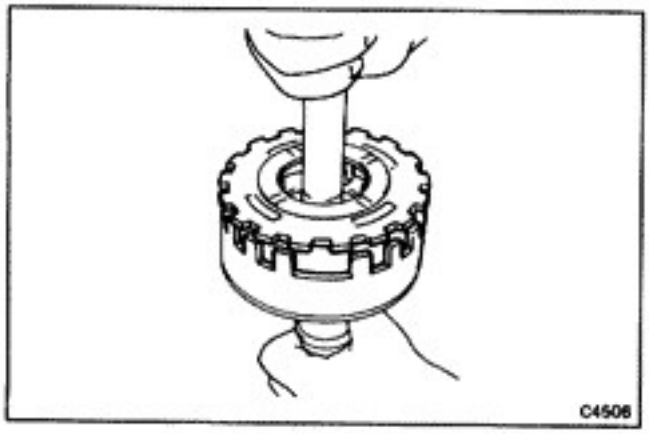
5. INSTALL THREE OIL SEAL RINGS ON OUTPUT SHA

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

6. INSTALL THRUST BEARING AND RACE ON OUT SHAFT

Hold the cup of the race toward the bearing.

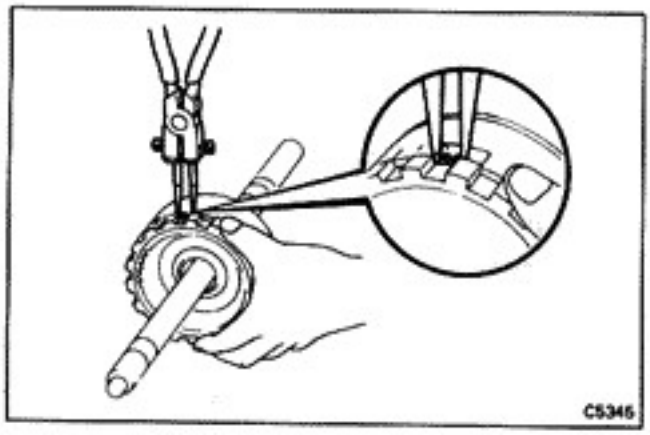
7. USE EXTENSION HOUSING AS ASSEMBLY STAND



8. INSTALL INTERMEDIATE SHAFT ASSEMBLY IN OUTPUT SHAFT

9. INSTALL REAR PLANETARY CARRIER IN OUTPUT SHAFT

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



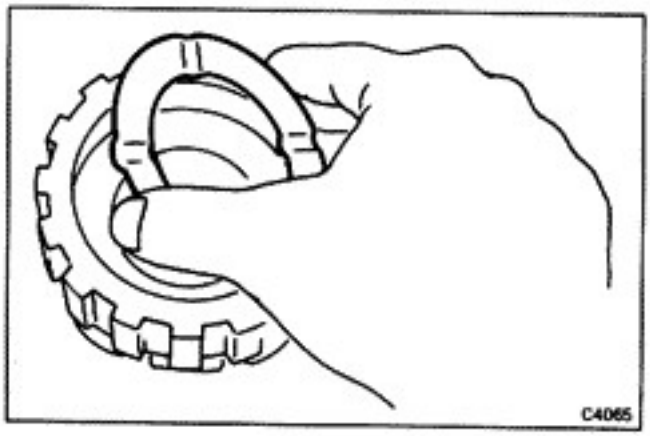
10. SET IN PLACE FRONT PLANETARY RING GEAR

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

11. INSTALL FRONT PLANETARY RING GEAR WITH SI RING

While pushing down the ring gear, squeeze the snap end with snap ring pliers and install it into the groov

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

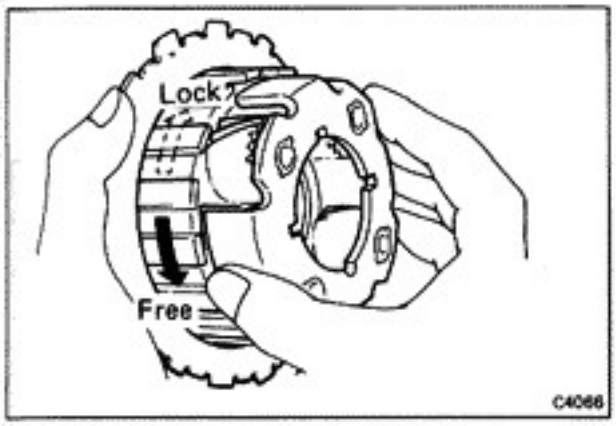


12. INSTALL NYLON THRUST WASHER IN FRONT PLANETARY PINION GEAR

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

13. INSTALL ONE-WAY CLUTCH

Install the one-way clutch into the outer race, facing spring cage toward the front.



14. TEMPORARILY INSTALL REACTION PLATE ON PLANETARY

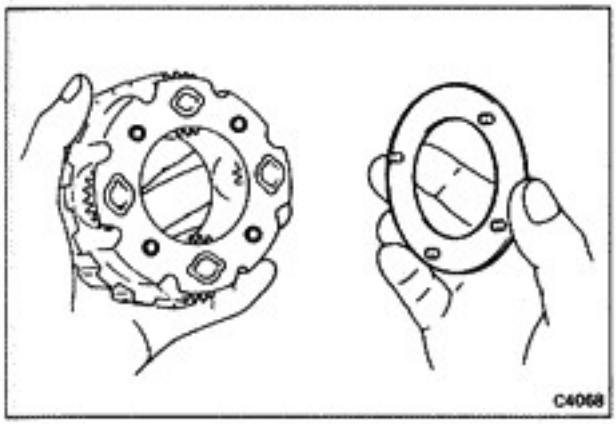
Insert the plate into place for testing of the one-way clutch.

15. TEST ONE-WAY CLUTCH

The planetary gear must rotate freely counterclockwise and lock clockwise.

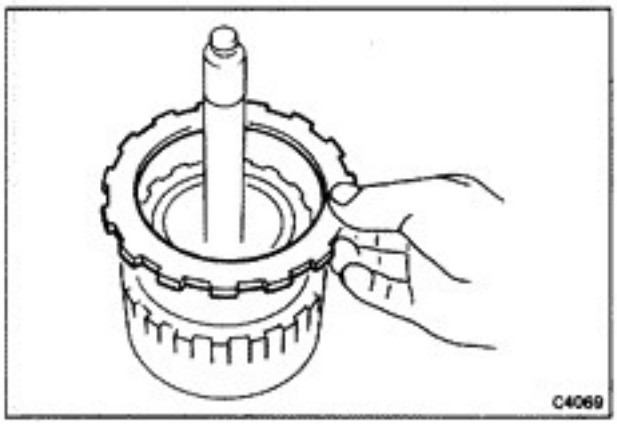
If the clutch does not work correctly, it must be replaced.

16. REMOVE REACTION PLATE



17. INSTALL NYLON THRUST WASHER ON FRONT PLANETARY CARRIER

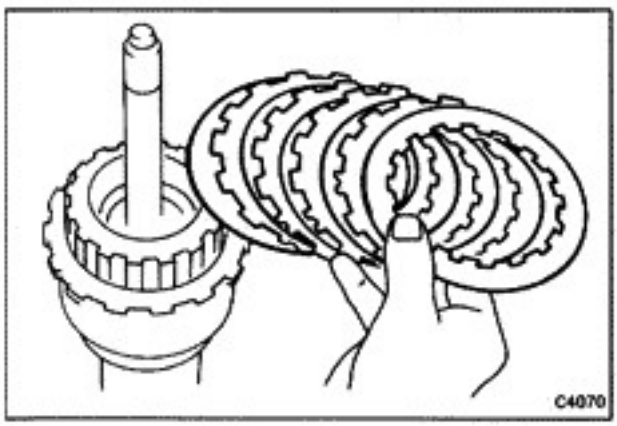
Apply petroleum jelly to the washer to hold it in place during later assembly. Match the lugs with the planetary carrier.



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

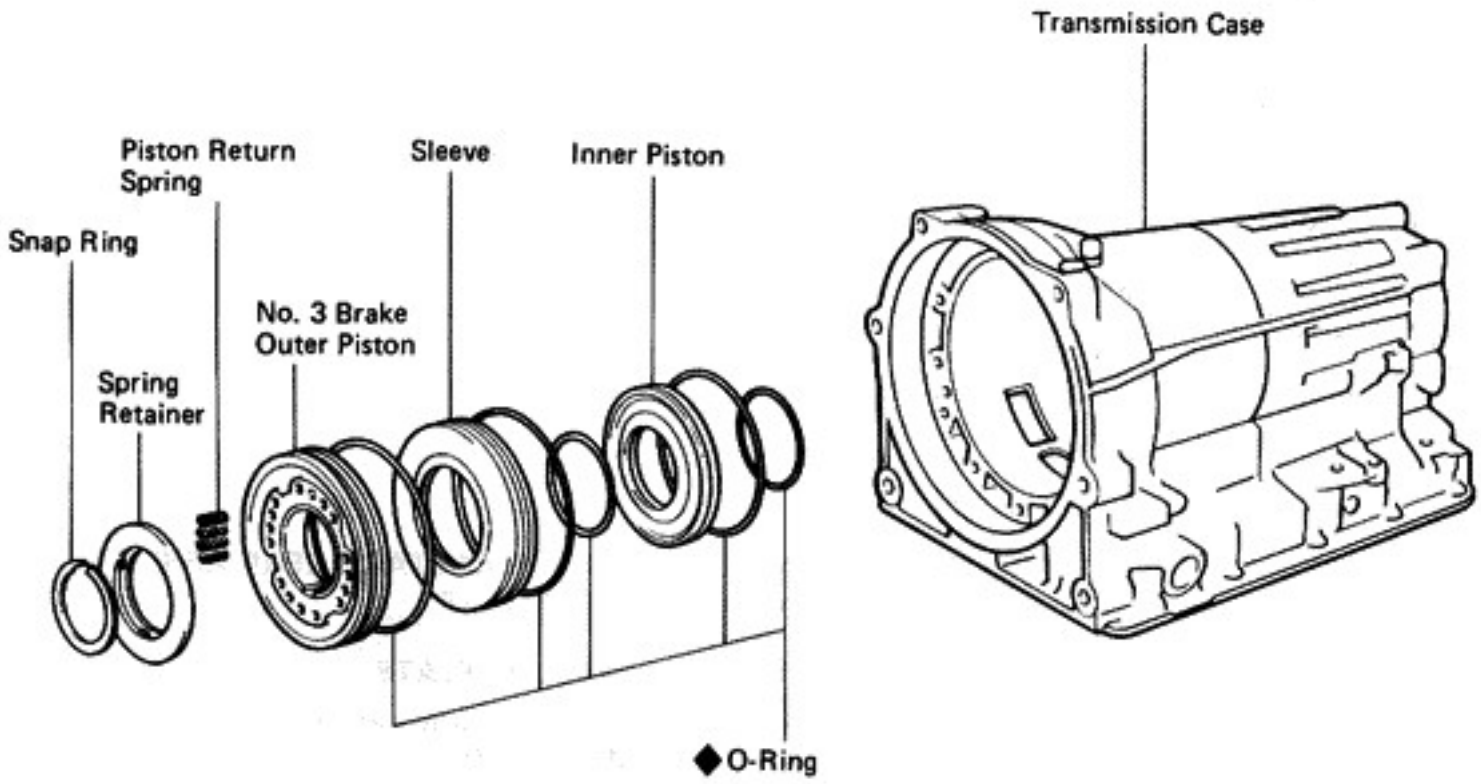
Using low-pressure compressed air, blow all excess ATF from discs.

CAUTION: High-pressure air will damage the discs.

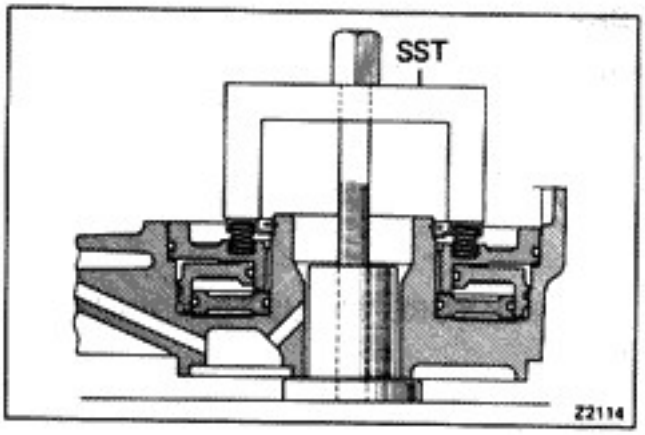
Install in order: Disc-plate-disc-plate-disc-plate-disc-plate-disc

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

Transmission Case and Rear Brake Pistons



◆ Non-reusable part



DISASSEMBLY OF TRANSMISSION CASE AN REAR BRAKE PISTONS

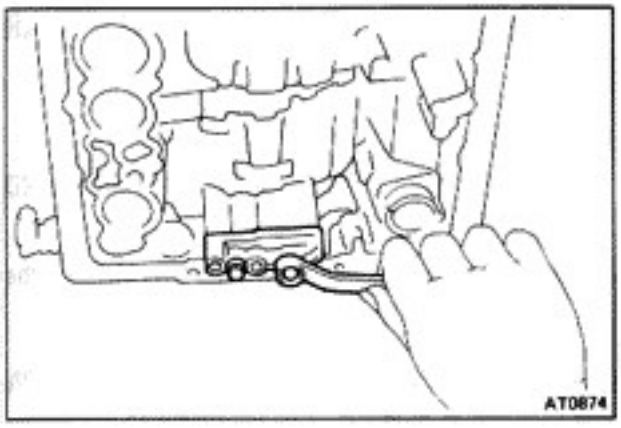
1. **COMPRESS RETURN SPRINGS AND REMOVE SPRIN RETAINER SNAP RING**

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

   SST 09350-20013 (09369-20040)

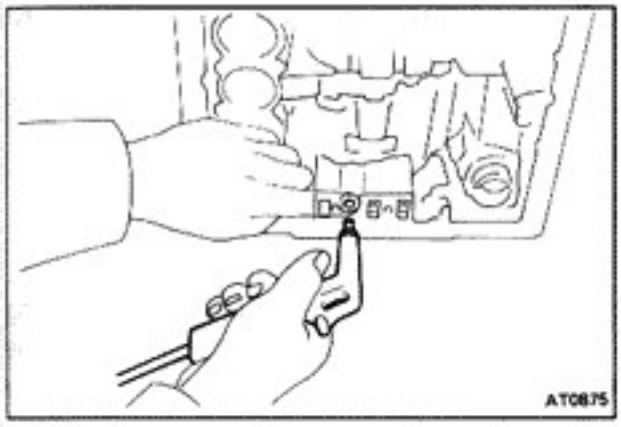
   (b) Using a screwdriver and hook, remove the snap ri

2. **REMOVE SPRING RETAINER AND SIXTEEN SPRINGS**

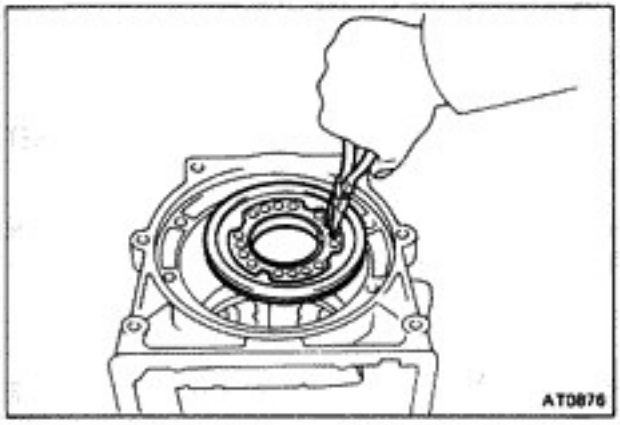


3. REMOVE OUTER PISTON AND REACTION SLEEVE WITH COMPRESSED AIR

(a) Remove the adapter.

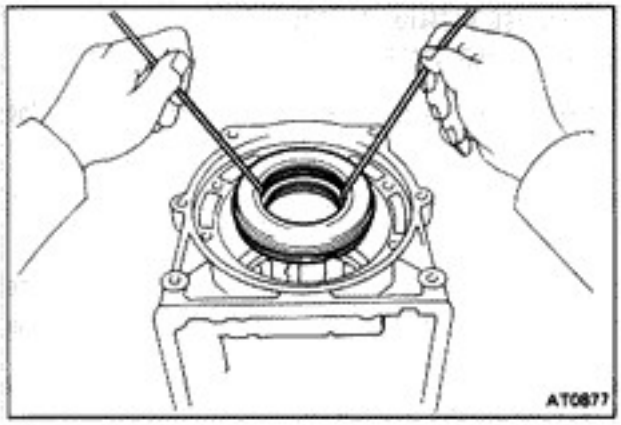


(b) Place several clean shop rags on the piston to catch the piston and sleeve. To pop them out, apply compressed air to the outer and inner piston oil holes.



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

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



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

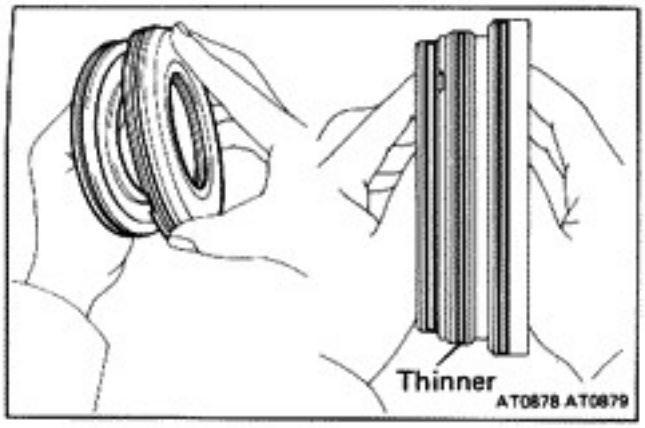
(e) Using hooks, lift the inner piston out of the case in the same manner.

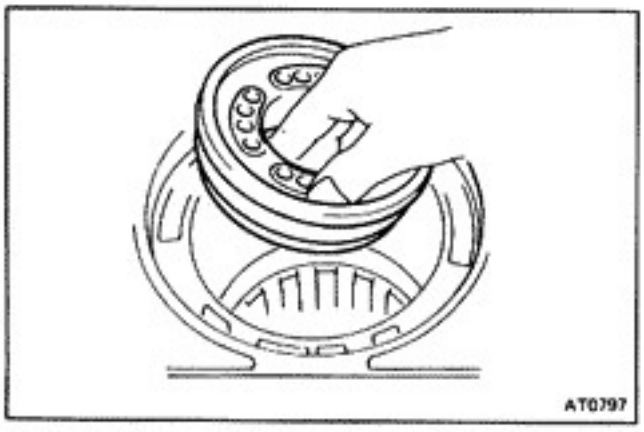
4. REMOVE O-RINGS FROM OUTER AND INNER PISTONS AND REACTION SLEEVE

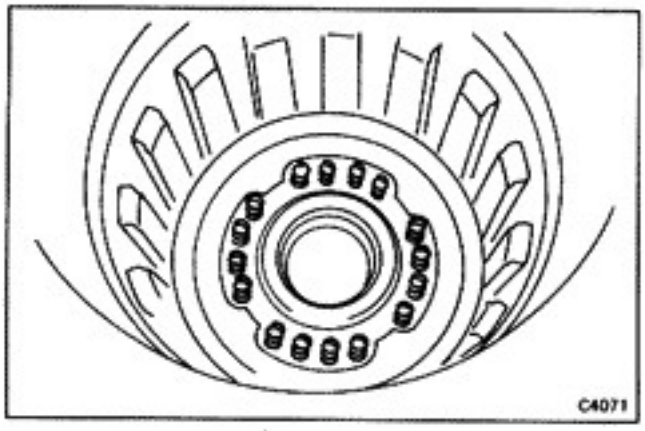
INSPECTION OF CASE COMPONENT GROUP

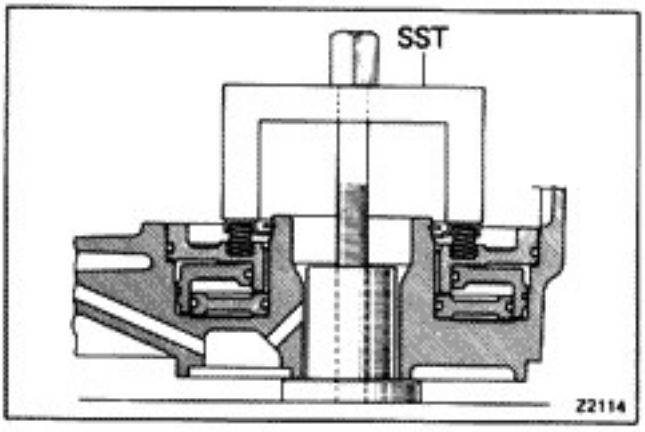
REPLACEMENT OF MANUAL SHAFT OIL SEALS

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









ASSEMBLY OF TRANSMISSION CASE AND RE BRAKE PISTONS

(See page AT-80)

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

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

2. **INSTALL INNER AND OUTER PISTONS IN REACT SLEEVE**

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

   (b) Push the outer piston onto the other side of the tion 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 (sp seats visible), and push the assembly into its bore in case.

4. **INSTALL SST BASE UNDER CASE**

   SST 09350-20013

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

   NOTE: The springs are visible through the cutout in 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 spring retainer.

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

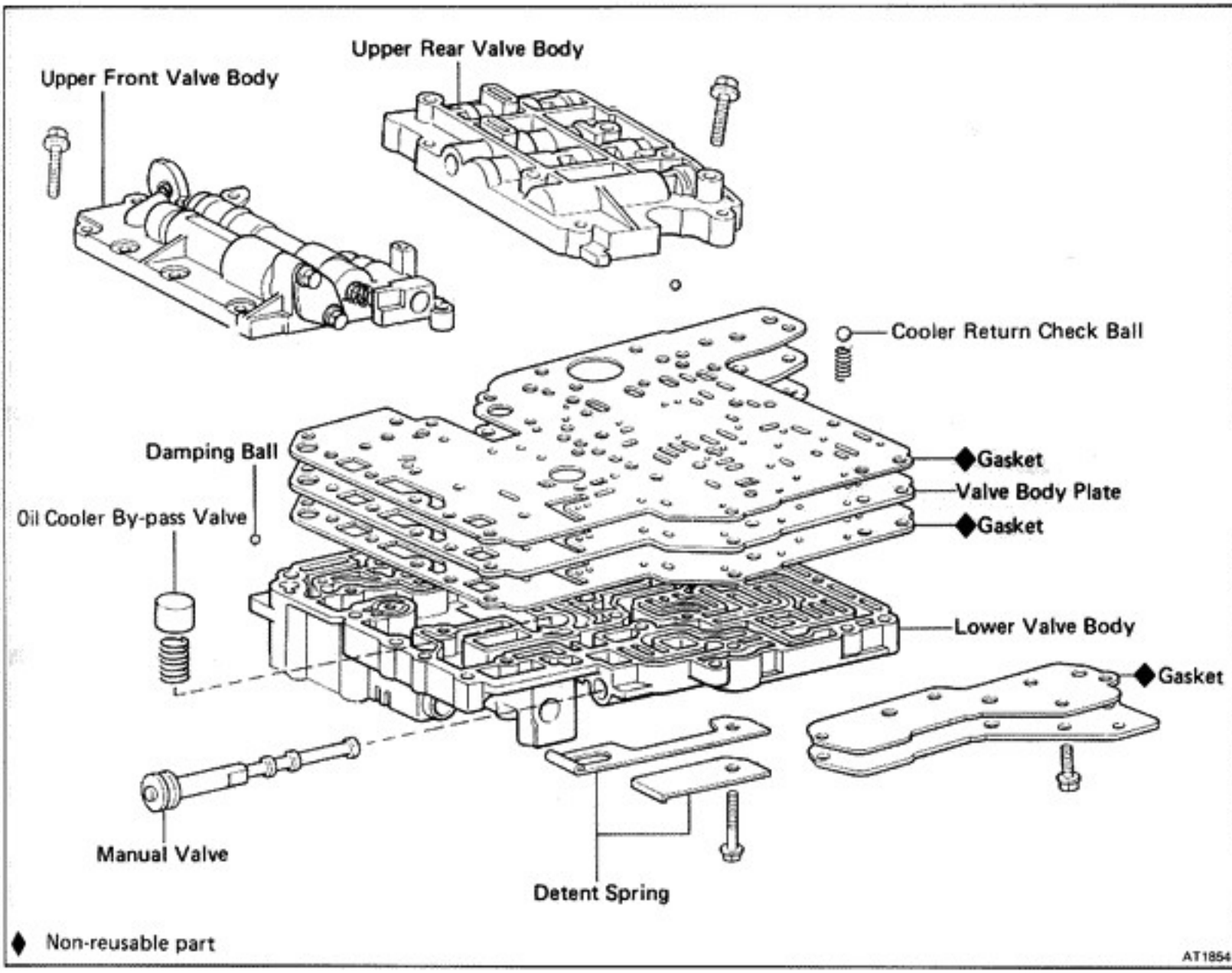
   (b) Gradually and evenly tighten the bolt to compress springs, being careful not to damage the transmis case with SST.

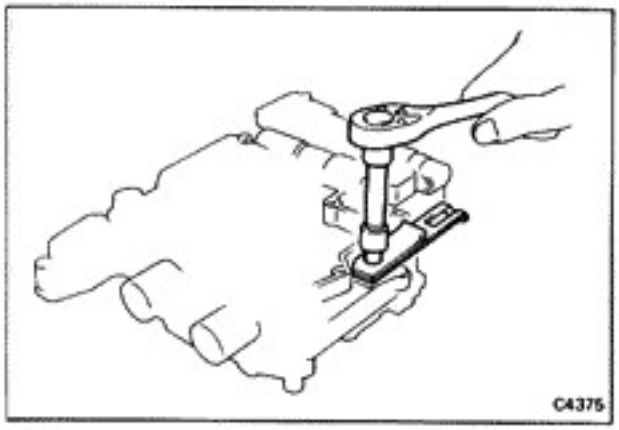
   SST 09350-20013 (09369-20040)

7. **INSTALL SNAP RING**

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

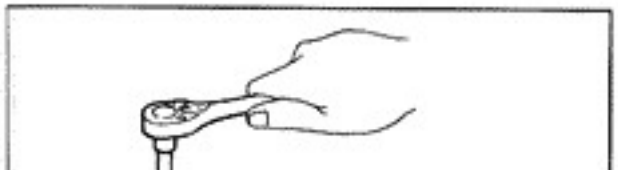
Valve Body



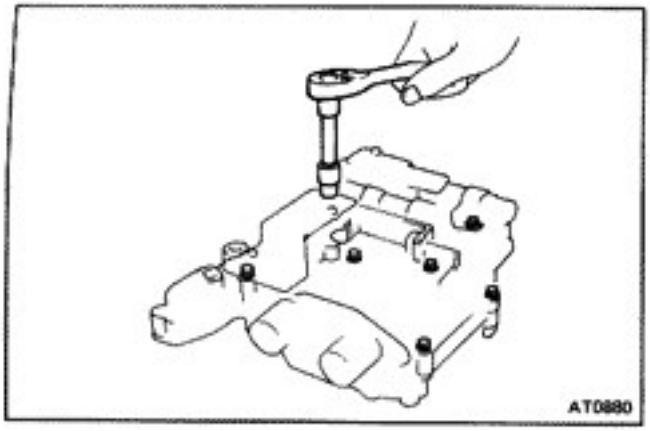


(Disassembly of Valve Body)

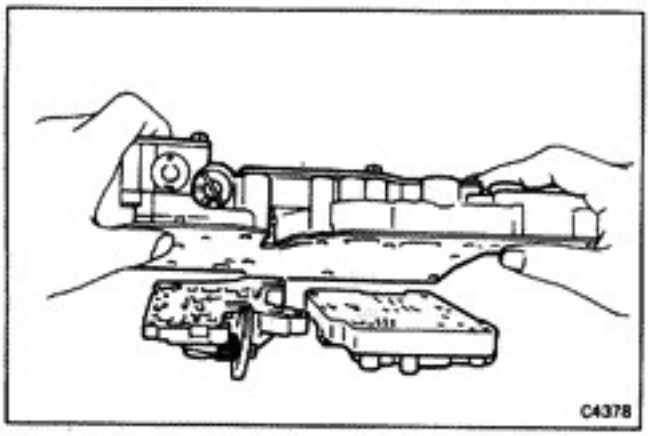
1. **UNBOLT AND REMOVE DETENT SPRING**
2. **REMOVE MANUAL VALVE**



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



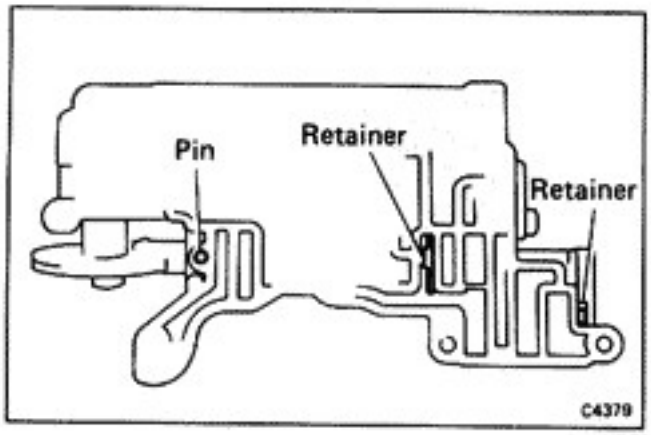
4. **TURN ASSEMBLY OVER AND REMOVE SET BOLT FROM LOWER VALVE BODY**



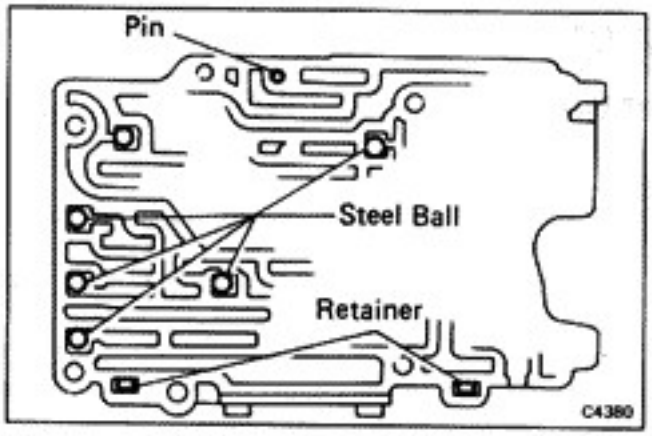
5. **LIFT OFF LOWER VALVE BODY AND PLATE AS SINGLE UNIT**

Hold valve body plate to lower valve body.

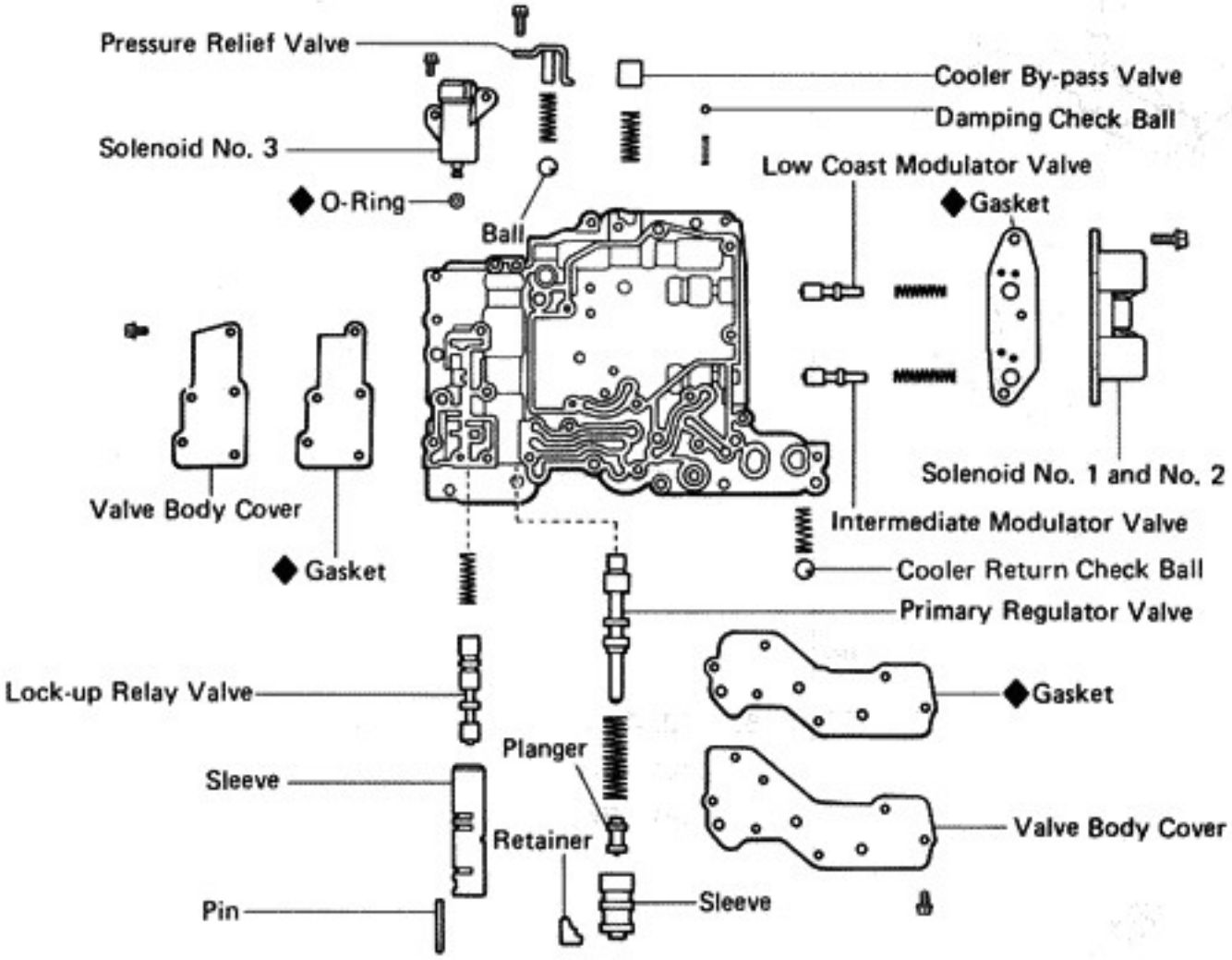
NOTE: Be careful that the check valve and balls d fall out.



6. **WATCH FOR STEEL BALLS, RETAINERS AND PIN VALVE BODY**

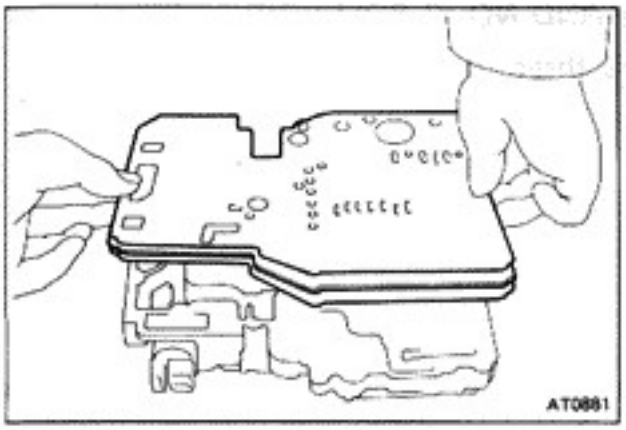


(Lower Valve Body)



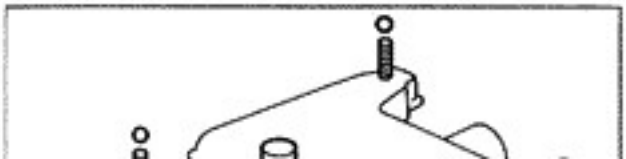
◆ Non-reusable part

AT1855

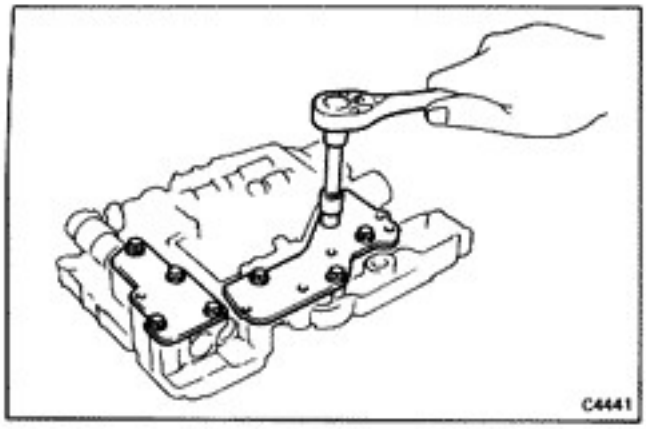


DISASSEMBLY OF LOWER VALVE BODY

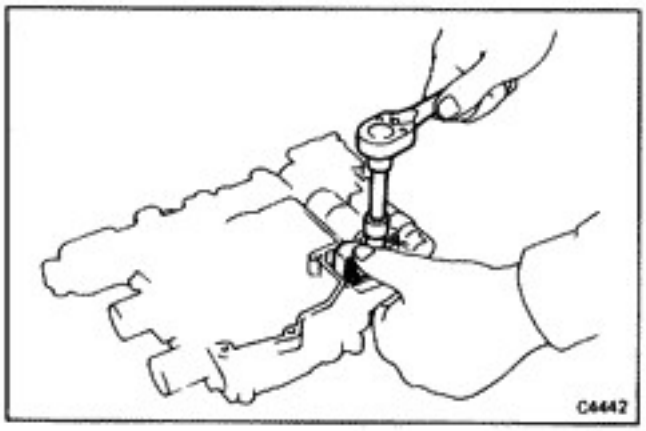
1. **REMOVE LOWER VALVE BODY PLATE AND GASKETS**



2. **REMOVE DAMPING CHECK BALL, COOLER RETURN CHECK BALL, COOLER BY-PASS VALVE AND SPRINGS**



3. TURN ASSEMBLY OVER, REMOVE SET BOLTS AN REMOVE TWO VALVE BODY COVERS AND GASK

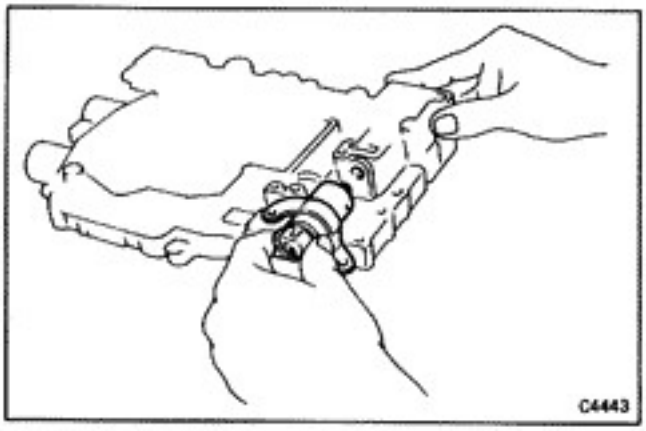


4. REMOVE PRESSURE RELIEF VALVE

(a) Remove the bolt and retainer.

(b) Remove the spring and steel ball.

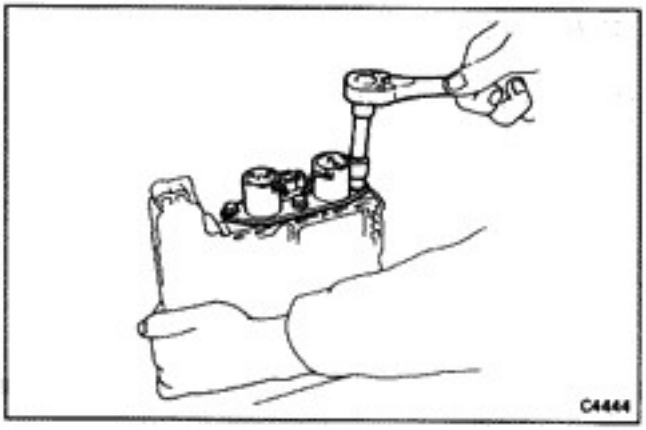
CAUTION: Cover the spring with your hand. Slowl move the bolt, being careful not to pop out the spr



5. REMOVE NO. 3 SOLENOID

(a) Remove the bolt.

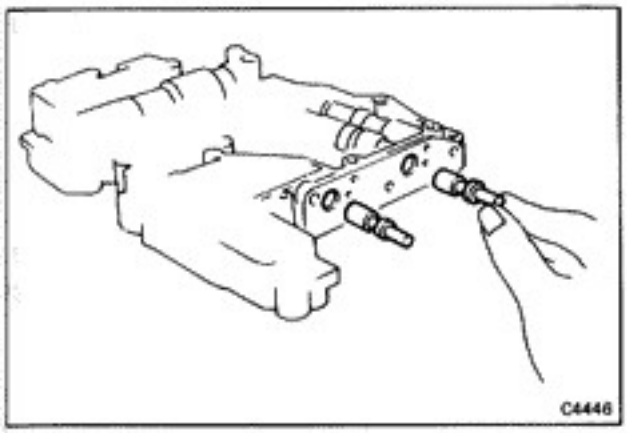
(b) Remove the solenoid from the bore.



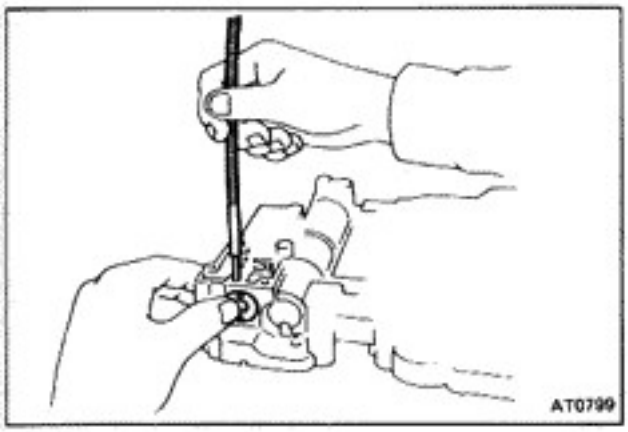
6. REMOVE NO. 1 AND NO. 2 SOLENOID

(a) Remove the three bolts, the solenoid and gask

(b) Remove the two springs from the bore.

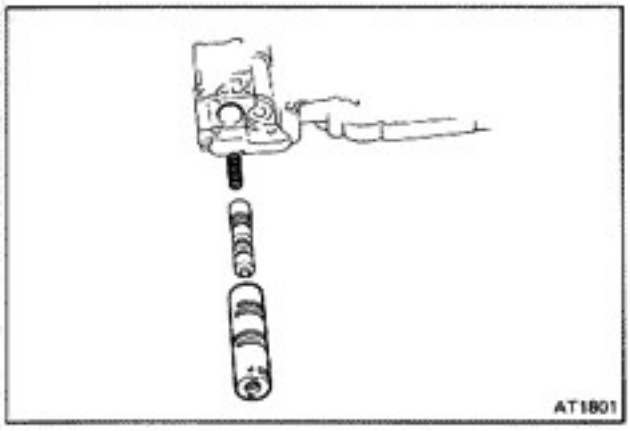


7. REMOVE LOW COAST MODULATOR VALVE AND INTERMEDIATE MODULATOR VALVE

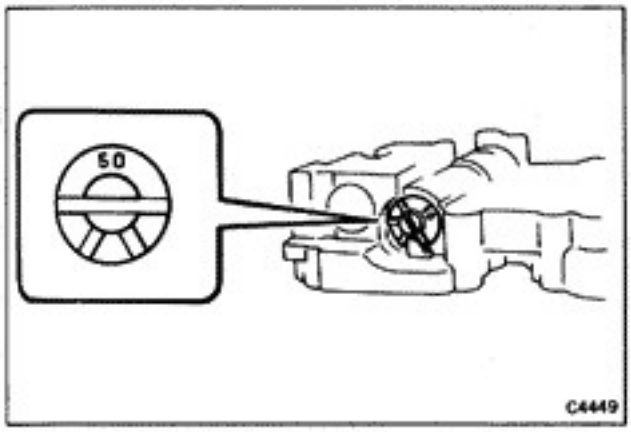


8. REMOVE LOCK-UP RELAY VALVE

(a) Remove the pin by pushing the sleeve.



(b) Remove sleeve with lock-up relay valve and spring



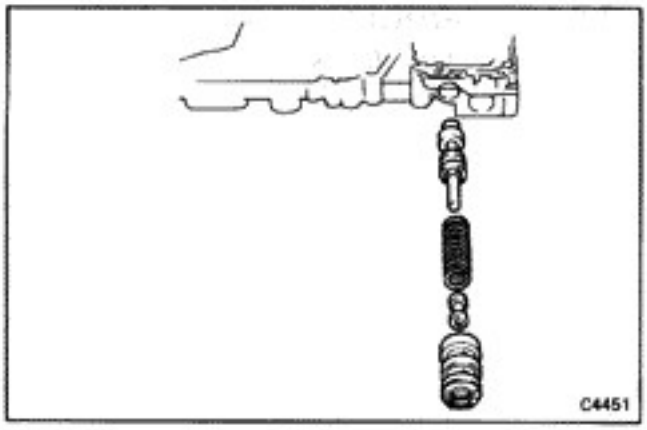
9. REMOVE SPRING RETAINER FROM PRIMARY REGULATOR VALVE

WARNING: Highly compressed spring inside — kee away from face.

(a) Place a mark on the bevel when the retainer is posi tioned.

NOTE: When reassembling, position the retainer in th same position.

(b) To remove the retainer, hold the valve body fac down, and press in on the valve sleeve. The retaine will drop out. Slowly relieve spring tension.



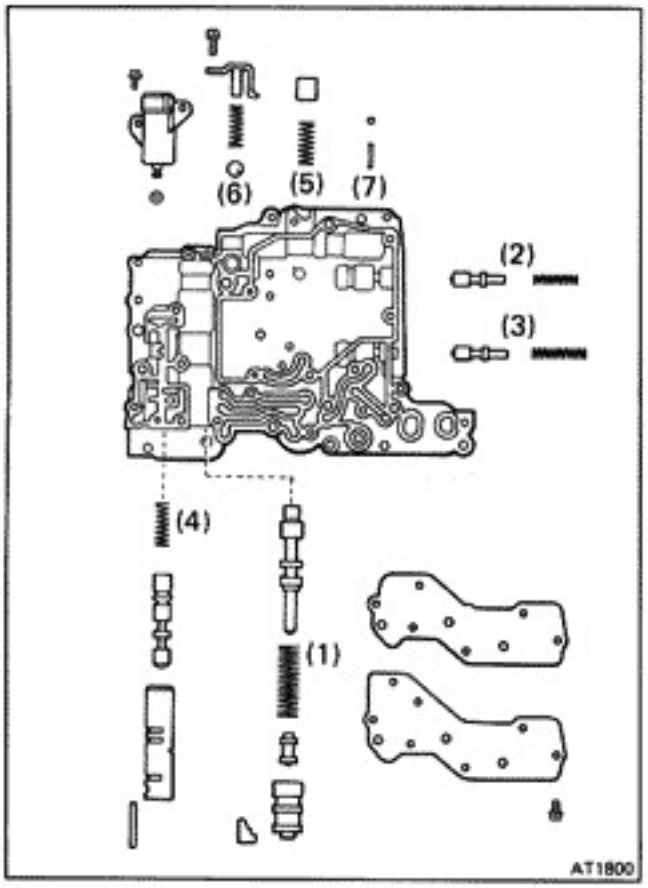
(c) Remove the sleeve, plunger, spring and primary r
lator valve.

INSPECTION OF LOWER VALVE BODY

INSPECT VALVE SPRINGS

Check for damage, squareness, rust and distorted c
Measure the spring free height and replace if less than
shown below.

Spring	Free height	mm (in.)	Coro
(1) Primary regulator valve	56.30	(2.2165)	Blu
(2) Low coast modulator valve	42.35	(1.6673)	Non
(3) Intermediate modulator valve	35.43	(1.3949)	Red
(4) Lock-up relay valve	32.60	(1.2835)	Gree
(5) Oil cooler by-pass valve	33.32	(1.3118)	Yello
(6) Pressure relief valve	32.14	(1.2654)	Non
(7) Damping check ball	20.00	(0.7874)	Non

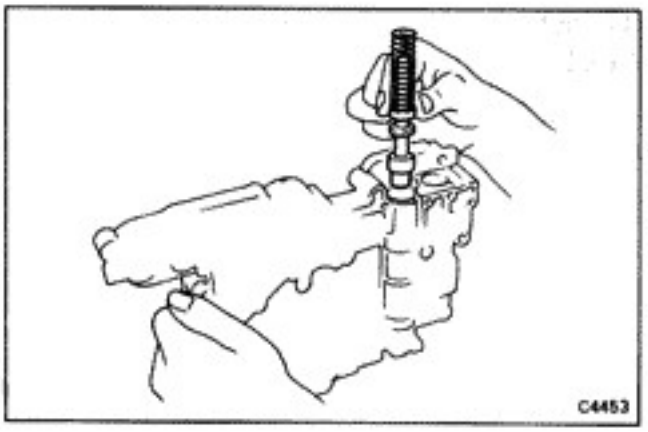


ASSEMBLY OF LOWER VALVE BODY

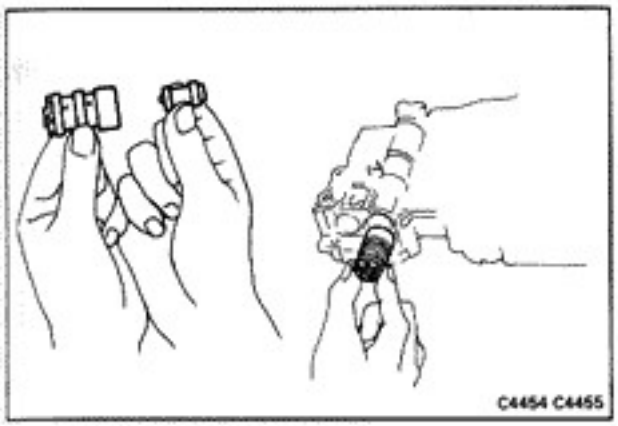
(See page AT-85)

1. INSERT PRIMARY REGULATOR VALVE AND SPRING

(a) Set the valve body on the edge and drop in the va
large end first, and the spring.



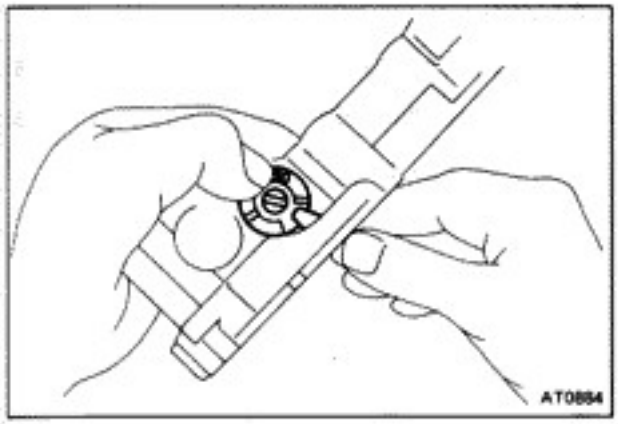
(b) Make sure that the primary regulator valve fits f
with the valve body.



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

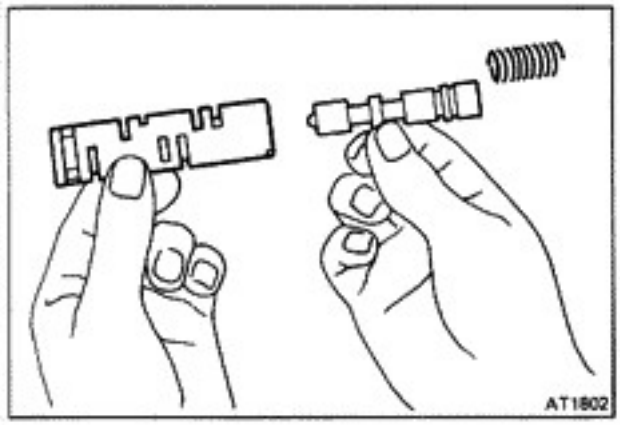
(d) Insert the sleeve with the plunger.

(e) Install the regulator valve sleeve retainer.



(f) Install the retainer on the bevel.

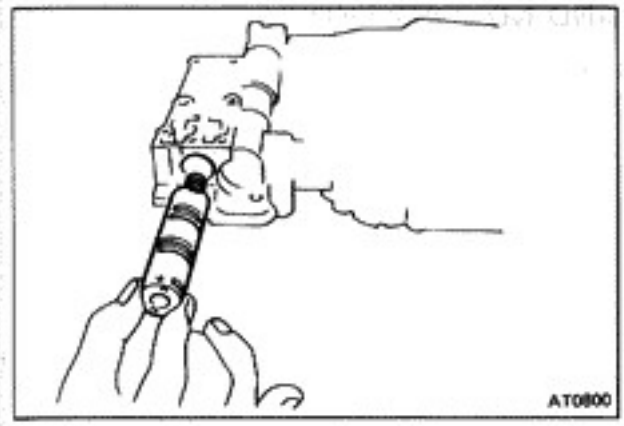
NOTE: Install the retainer to the same position of the sleeve, as when disassembling.



2. INSTALL LOCK-UP RELAY VALVE

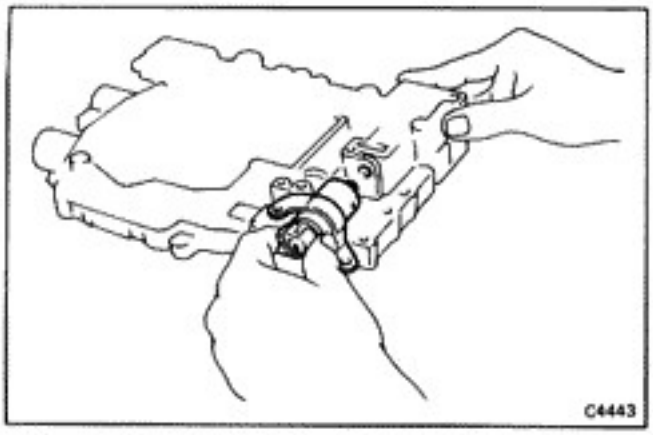
(a) Install the lock-up relay valve into the sleeve.

(b) Install the spring into the lock-up relay valve.



(c) Install the lock-up relay valve assembly into the bore.

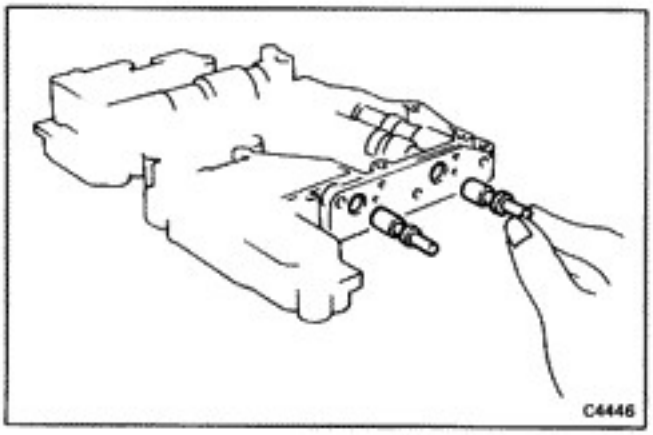
(d) Install the pin.



3. INSTALL NO.3 SOLENOID

(a) Install the No. 3 solenoid onto the lower valve b

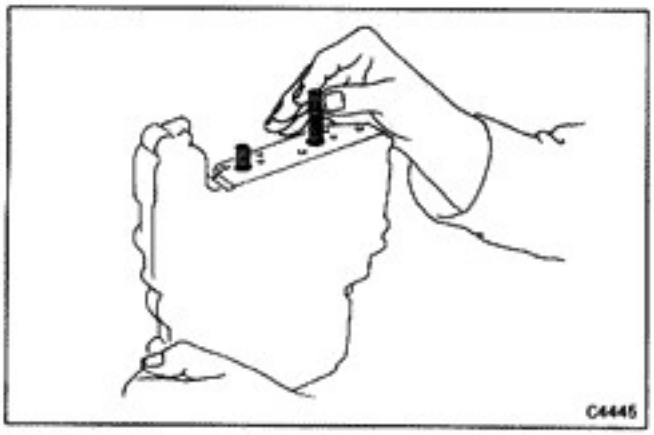
(b) Temporarily tighten the bolt.



4. INSTALL TWO VALVES

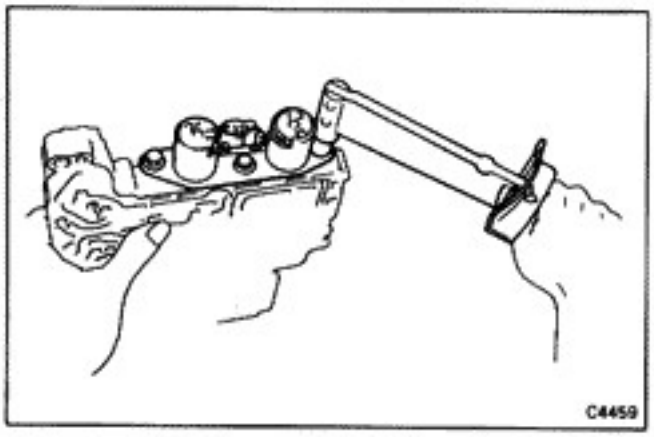
(a) Install the low coast modulator valve into the

(b) Install the intermediate modulator valve into the



5. INSTALL TWO VALVE SPRINGS

NOTE: Install the short spring in the right bore.



6. INSTALL NO.1 AND NO.2 SOLENOIDS

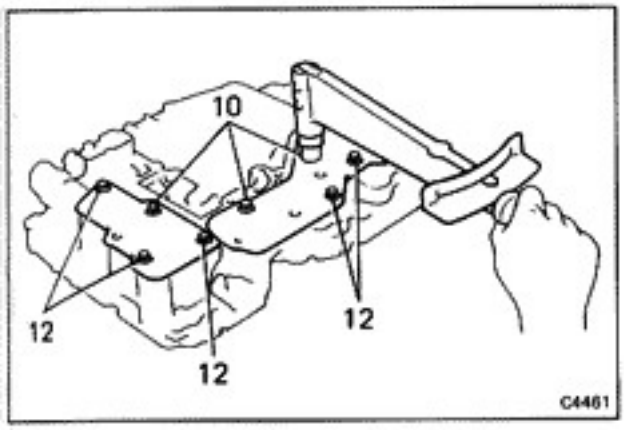
Install the solenoid over the gasket.
Tighten the three bolts.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)

7. INSTALL PRESSURE RELIEF VALVE

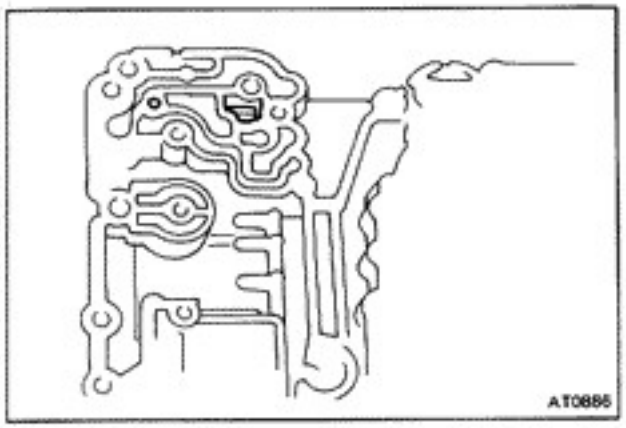
(a) Place the steel ball and spring onto the body.

(b) Install the retainer.



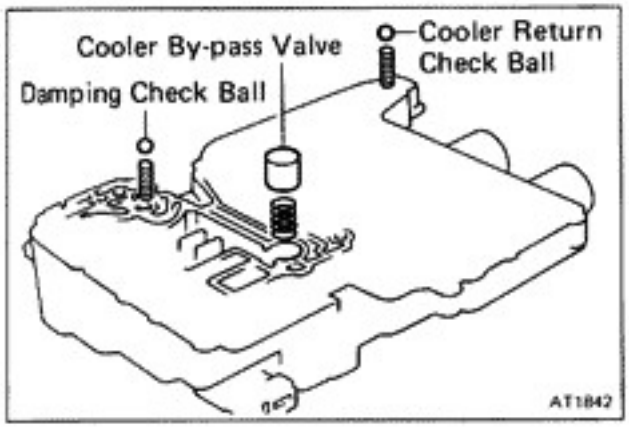
8. INSTALL TWO VALVE BODY COVERS

NOTE: Use the wave washer for the smaller cover.

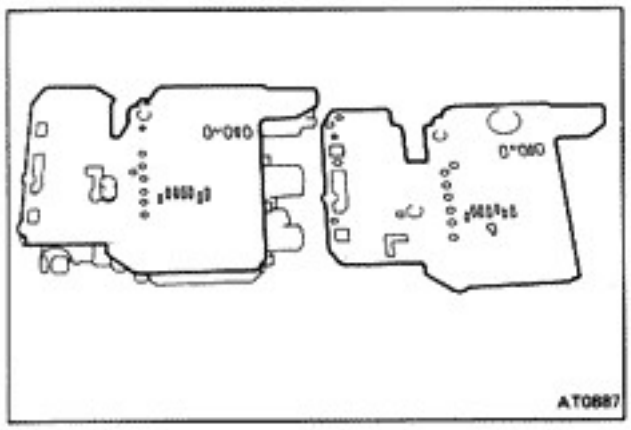


9. CHECK RETAINERS AND LOCATING PINS

Make sure that the retainers and pins are installed correctly.



10. INSTALL SPRINGS, DAMPING CHECK BALL, COOLER RETURN CHECK BALL AND COOLER BY-PASS CHECK VALVE



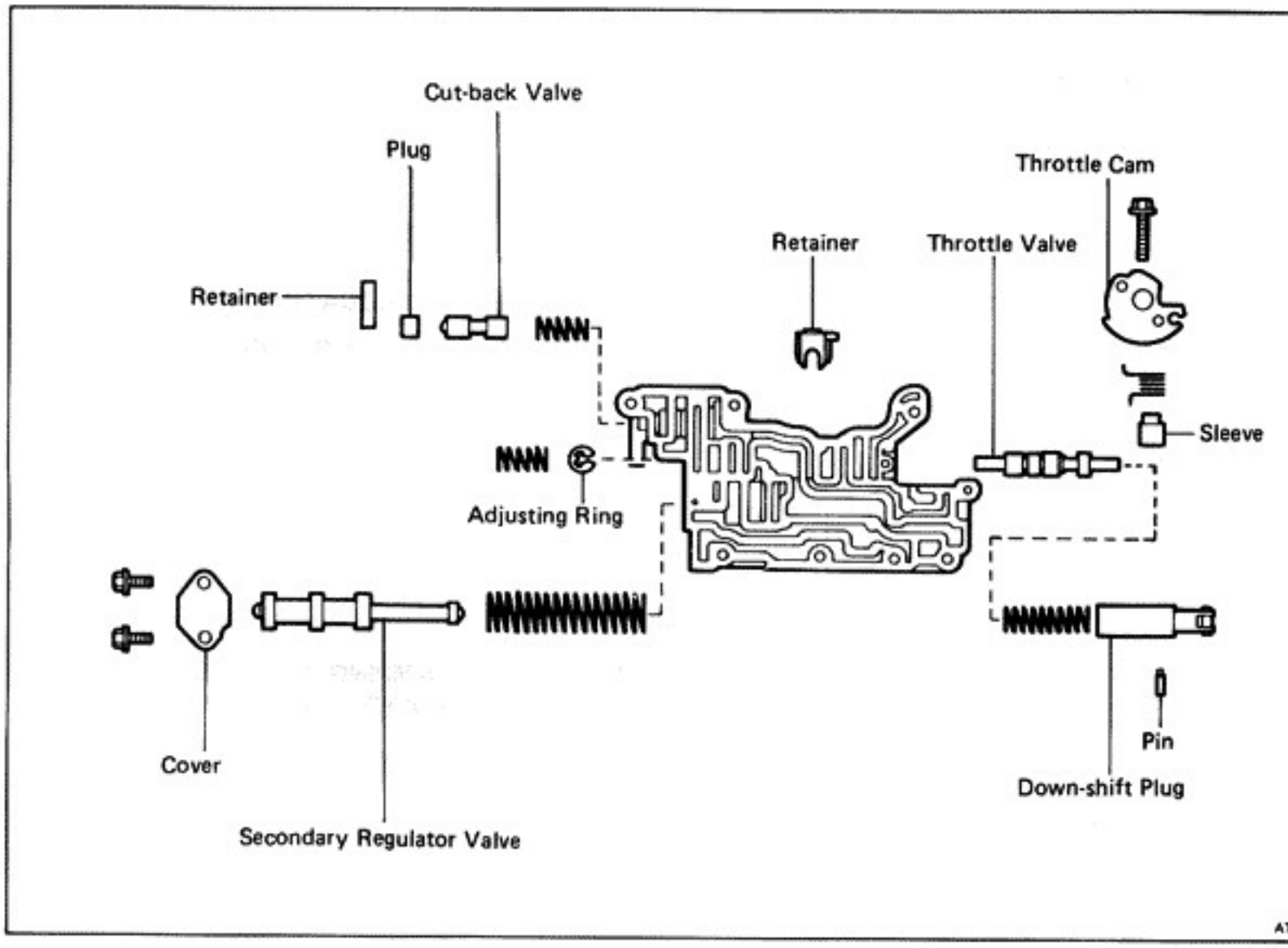
11. INSTALL LOWER VALVE BODY GASKET

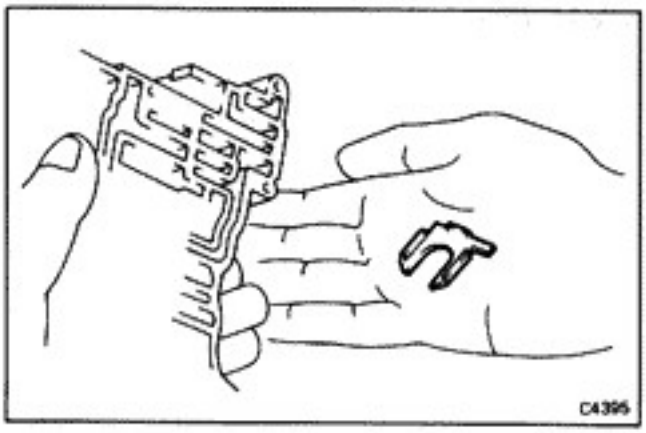
Note that the two gaskets are not interchangeable. The gasket must lay flat on the valve body.

12. INSTALL LOWER VALVE BODY PLATE

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

(Upper Front Valve Body)

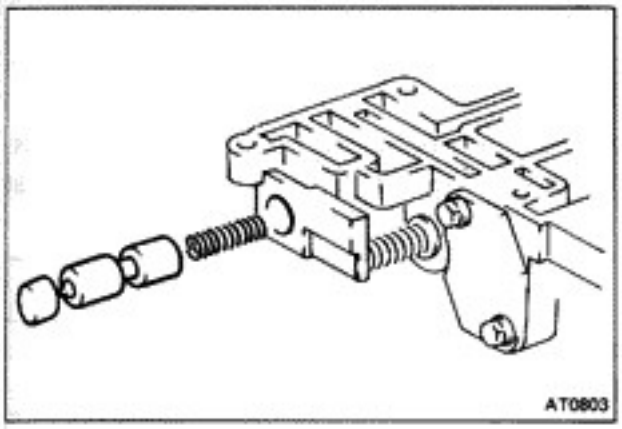




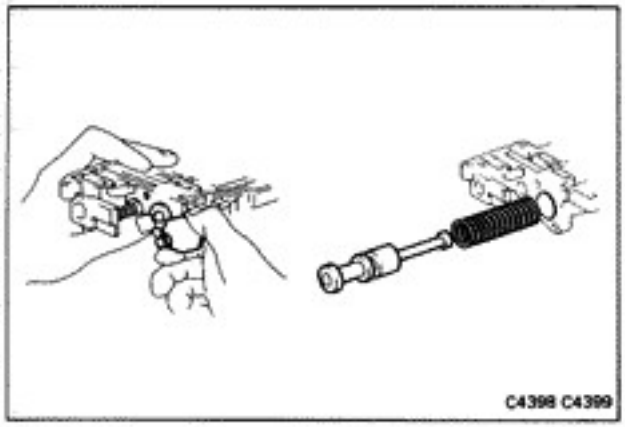
DISASSEMBLY OF UPPER FRONT VALVE BODY

1. **REMOVE THROTTLE VALVE RETAINER**

2. **REMOVE CUT-BACK PLUG RETAINER**



3. REMOVE PLUG AND CUT-BACK VALVE



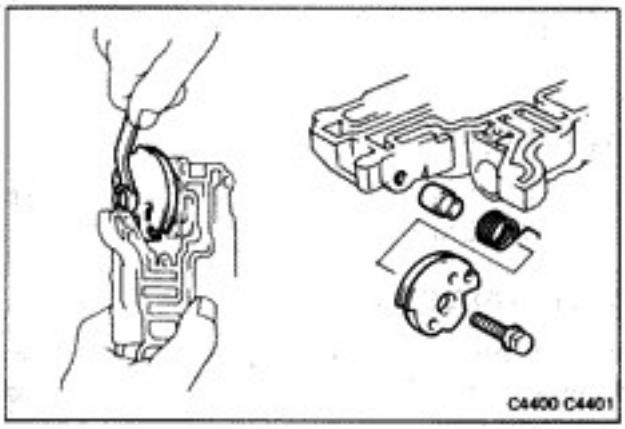
4. REMOVE SECONDARY REGULATOR VALVE AND SPRING

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

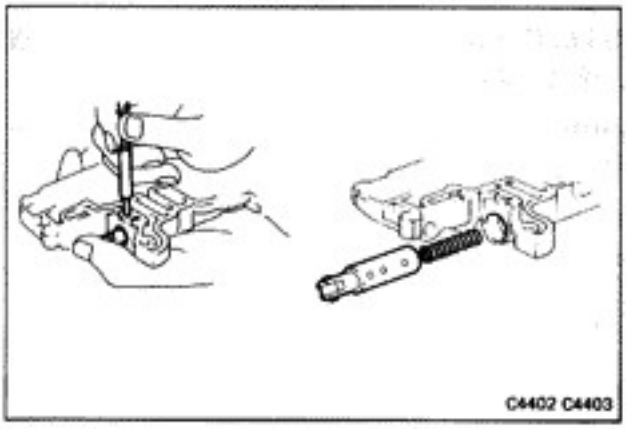
WARNING: Valve is spring-loaded.

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

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



5. REMOVE THROTTLE CAM



6. REMOVE DOWN-SHIFT PLUG AND SPRING

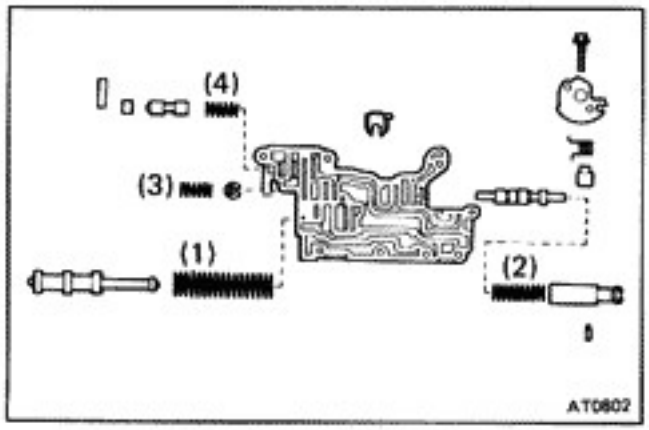
(a) Remove the pin by pushing the down-shift plug.

(b) Remove the down-shift plug with the sleeve and spring.

7. REMOVE THROTTLE VALVE AND SPRING

8. REMOVE ADJUSTING RINGS

Note the number of adjusting rings installed.

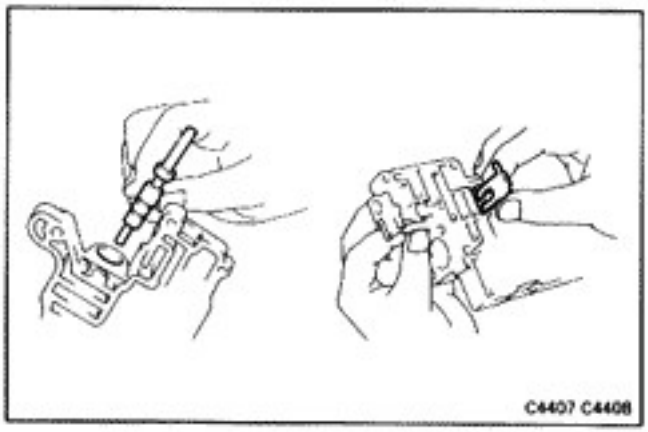


INSPECTION OF UPPER FRONT VALVE BODY

INSPECT VALVE SPRINGS

Check for damage, squareness, rust and collapsed c
Measure the spring free height and replace if less than
shown below.

Spring	Free height mm (in.)		Colo
(1) Secondary regulator valve	71.27	(2.8059)	Gree
(2) Down-shift plug	39.55	(1.5571)	Gree
(3) Throttle valve	19.24	(0.7575)	Non
(4) Cut-back valve	23.00	(0.9055)	Gree



ASSEMBLY OF UPPER FRONT VALVE BODY

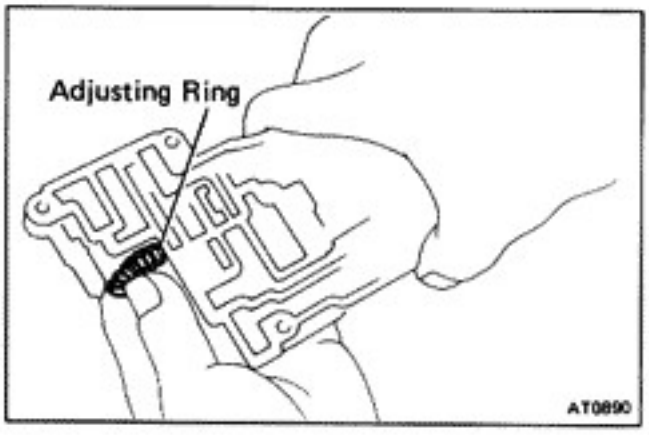
(See page AT-92)

1. INSERT THROTTLE VALVE

Note arrangement in the figure. Make sure that the v
is inserted fully into the bore.

2. INSTALL THROTTLE VALVE RETAINER

Coat the retainer with petroleum jelly to keep it in pl
Note position of tabs in the figure. Slip the retainer
place in the valve body.



3. INSTALL ADJUSTING RINGS AND SMALL SPRING THROTTLE VALVE SHAFT

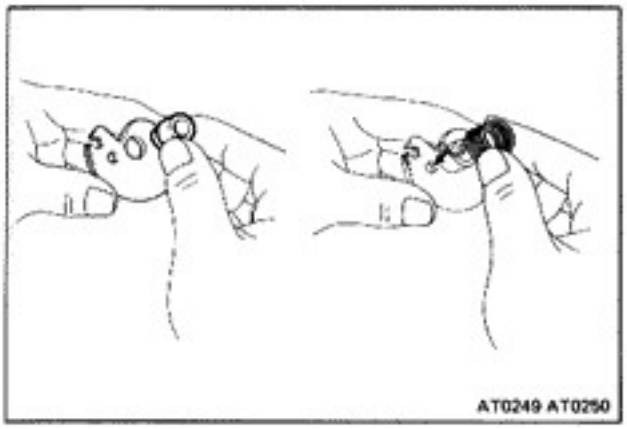
(a) Install the same number of adjusting rings as wer
moved during disassembly.

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

4. INSERT SPRING AND DOWN-SHIFT PLUG

(a) Push the down-shift plug into the bore.

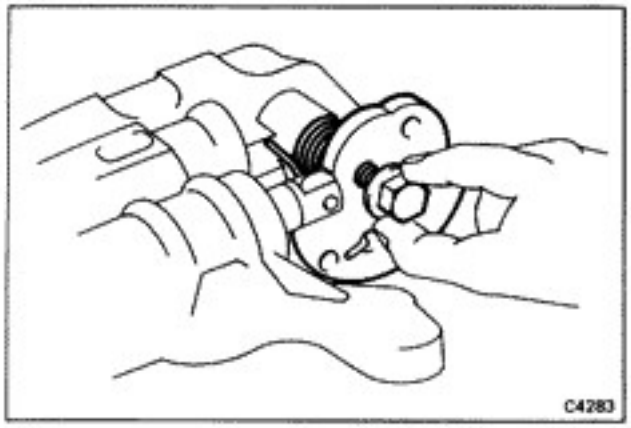
(b) Coat the pin with petroleum jelly and install it to
the sleeve.


AT0249 AT0250

5. ASSEMBLE THROTTLE CAM

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

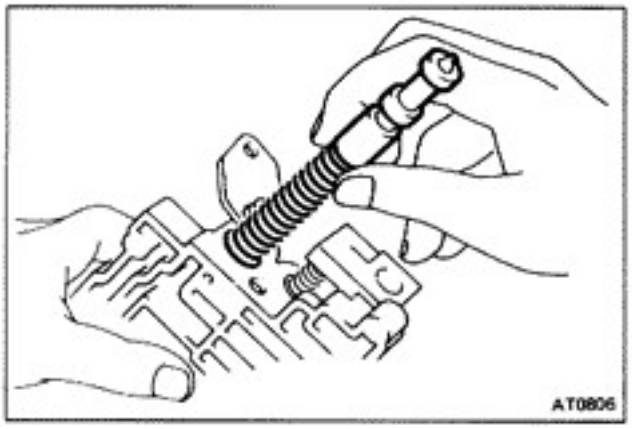
(b) Install the spring with the hook through the hole in the cam.


C4283

6. INSTALL CAM ASSEMBLY ON UPPER FRONT VALVE BODY

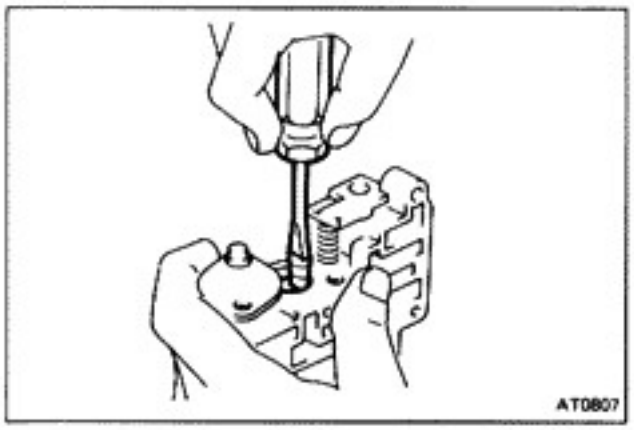
Check the position of the spring ends with the figure. Tighten the bolt.

Torque: 75 kg-cm (65 in.-lb, 7.4 N·m)


AT0806

7. INSTALL SECONDARY REGULATOR VALVE

(a) Partially install the cover plate and insert the spring and secondary regulator valve.


AT0807

(b) Compress the spring and swing the cover plate into place.

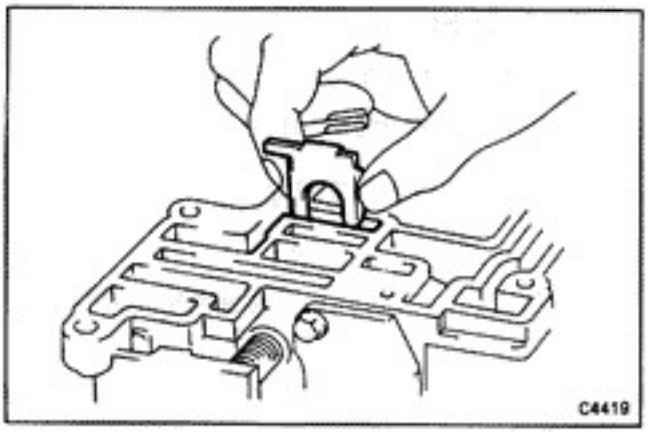
(c) Install the second bolt in the cover plate and tighten both bolts.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

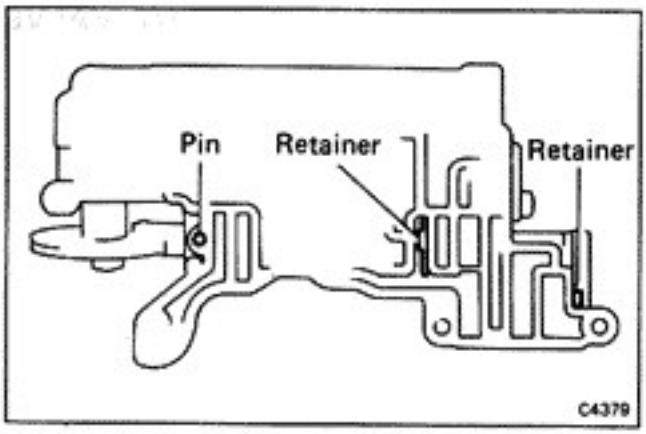
8. INSERT SPRING AND CUT-BACK VALVE

Install the valve with smaller end first.

9. INSTALL PLUG AND VALVE RETAINER

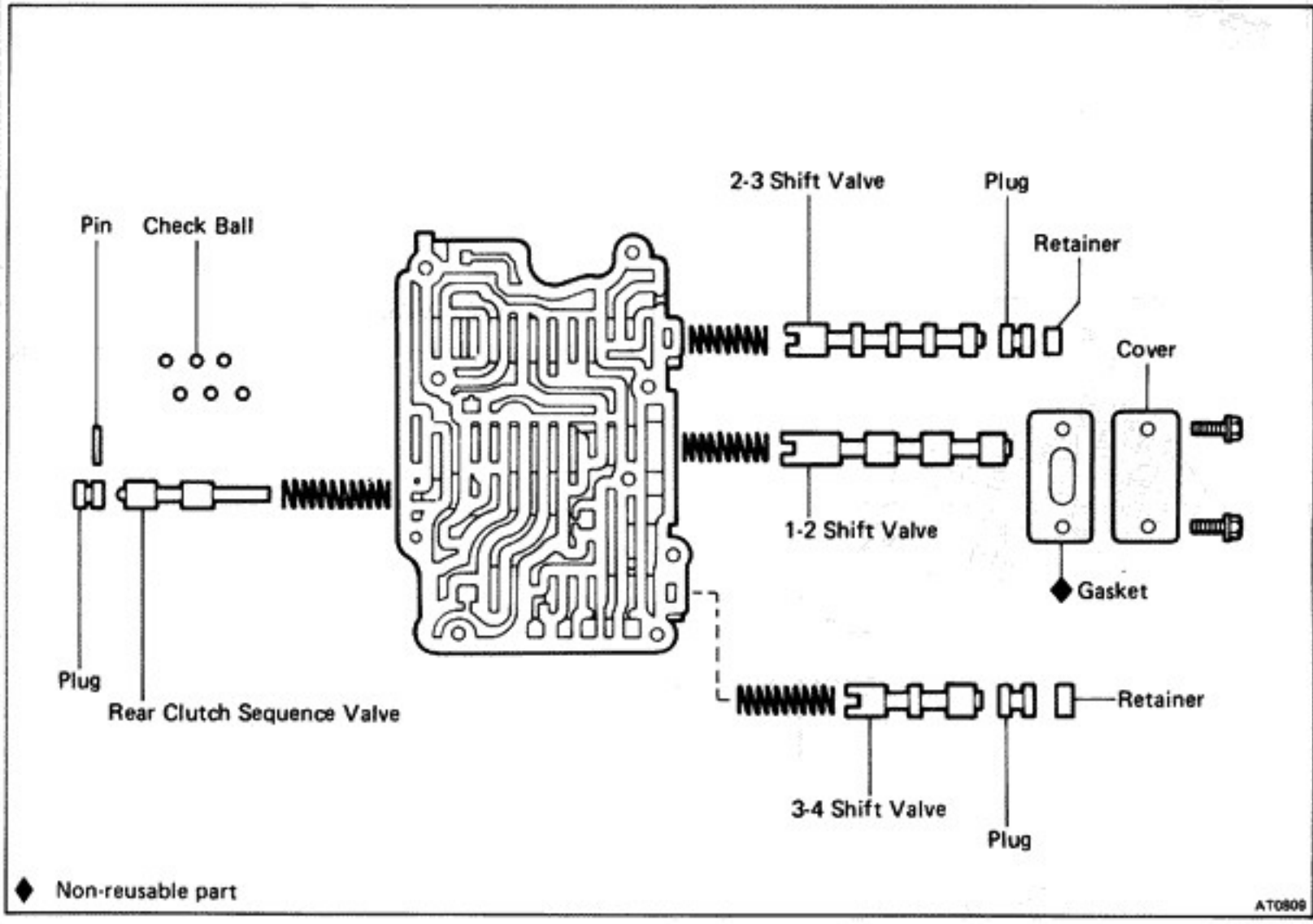


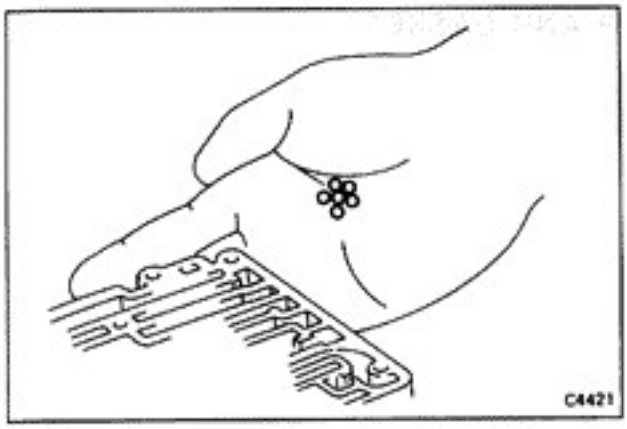
10. INSTALL THROTTLE VALVE RETAINER



11. MAKE SURE THAT SLEEVE IS HELD BY PIN

(Upper Rear Valve Body)



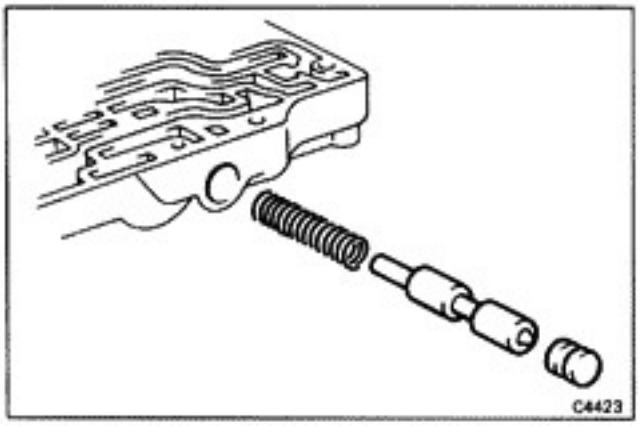


DISASSEMBLY OF UPPER REAR VALVE BODY

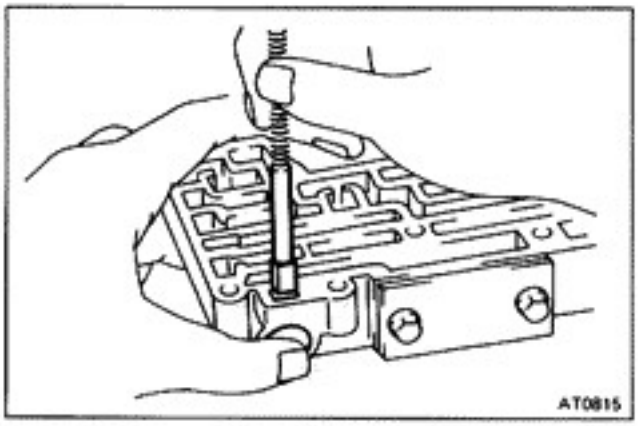
1. REMOVE SIX CHECK BALLS

2. REMOVE REAR CLUTCH SEQUENCE VALVE

(a) Remove the pin with a magnetic finger by pushing on the plug. Then remove the plug.

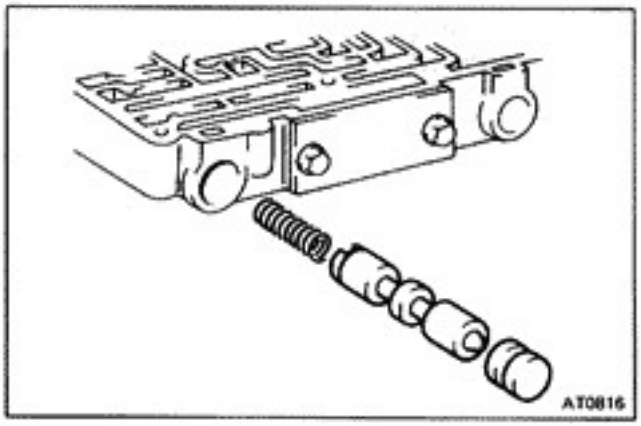


(b) Remove the rear clutch sequence valve and spri

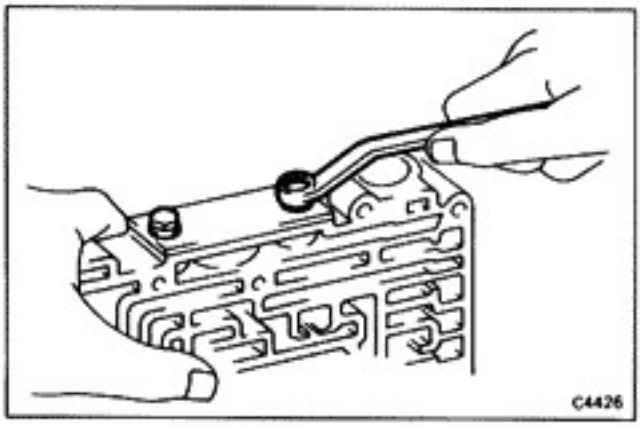


3. REMOVE 3-4 SHIFT VALVE

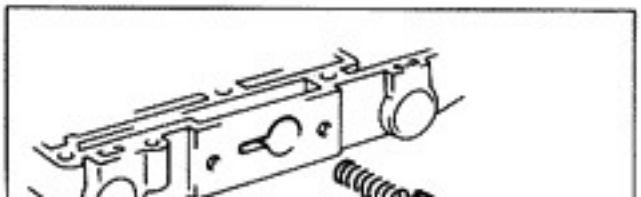
(a) Push the plug, remove the retainer with a magn finger.



(b) Remove the plug, valve and spring.

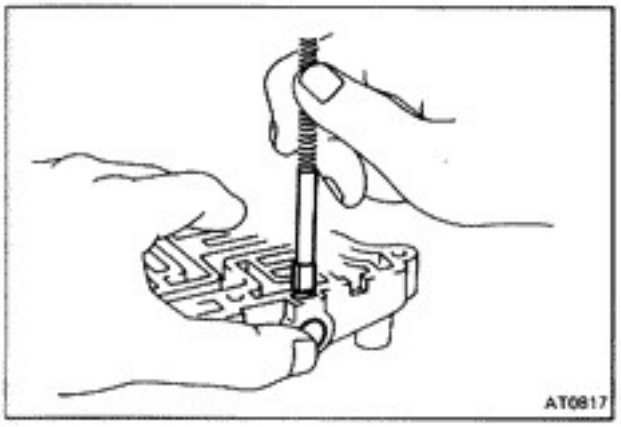


4. REMOVE COVER AND GASKET



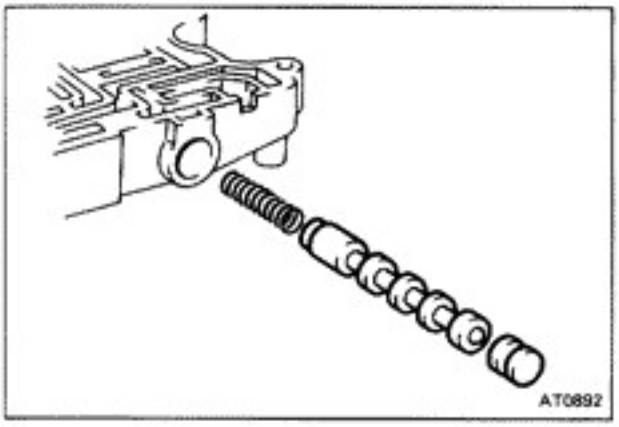
5. REMOVE 1-2 SHIFT VALVE

Remove the 1-2 shift valve and spring.

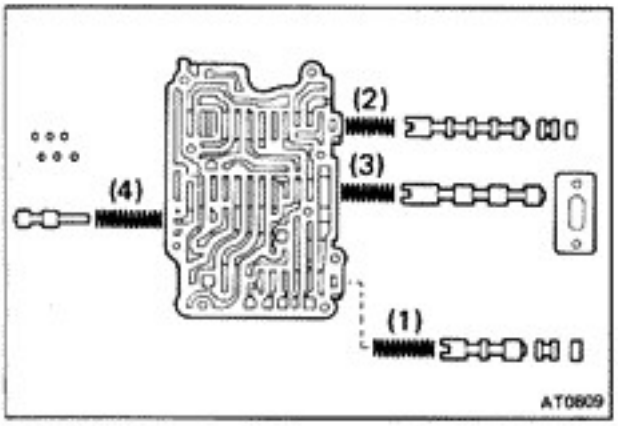


6. REMOVE 2-3 SHIFT VALVE

(a) Push the plug, remove the retainer with a magnetic finger.



(b) Remove the plug, 2-3 shift valve and spring.

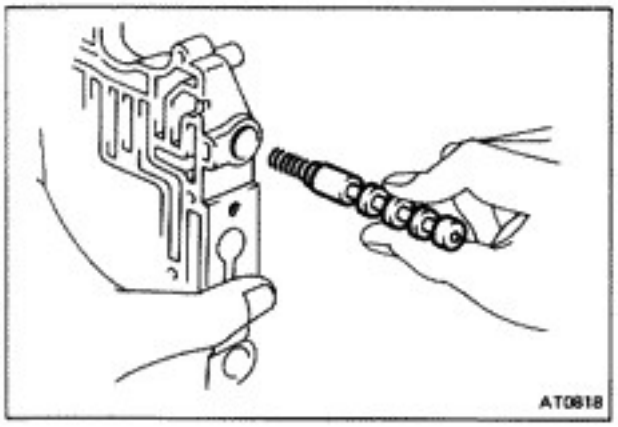


INSPECTION OF UPPER REAR VALVE BODY

INSPECT VALVE SPRINGS

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

Spring	Free height mm (in.)	Color
(1) 3-4 Shift valve	29.15 (1.1476)	Blue
(2) 2-3 Shift valve	29.15 (1.1476)	Blue
(3) 1-2 Shift valve	29.15 (1.1476)	Blue
(4) Rear clutch sequence valve	37.55 (1.4783)	None



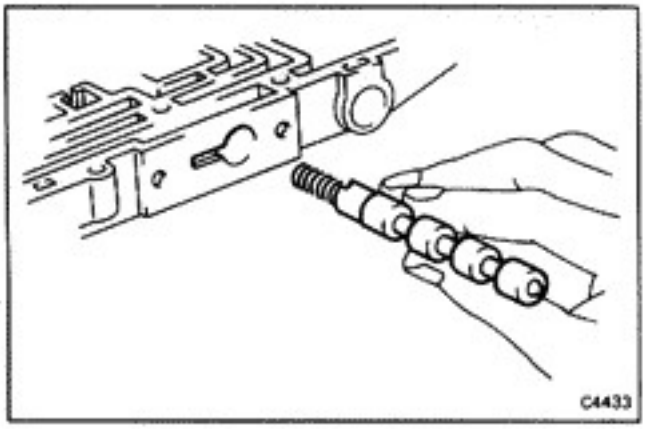
ASSEMBLY OF UPPER REAR VALVE BODY

(See page AT-97)

1. INSTALL 3-4 SHIFT VALVE

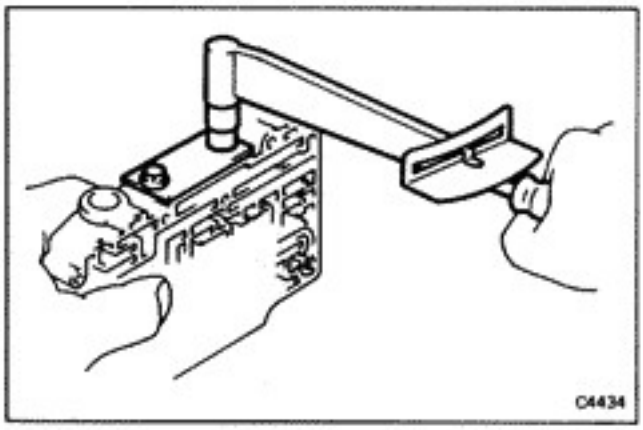
(a) Install the 3-4 shift valve and spring.

(b) Install the plug into the bore. Coat the retainer with petroleum jelly and install it.



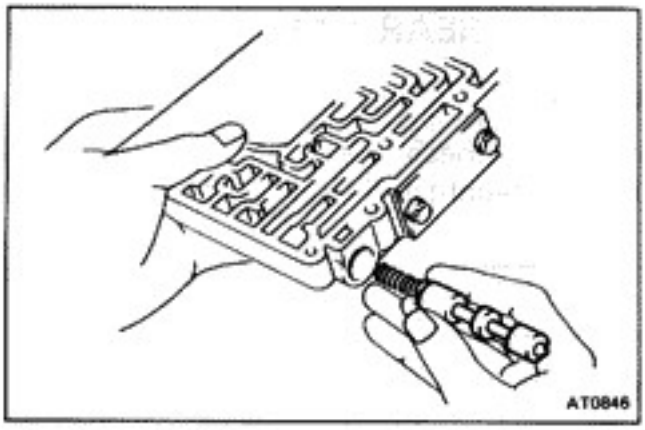
2. INSTALL 1-2 SHIFT VALVE

(a) Install the 1-2 shift valve and spring.



(b) Install the plate over the gasket.

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

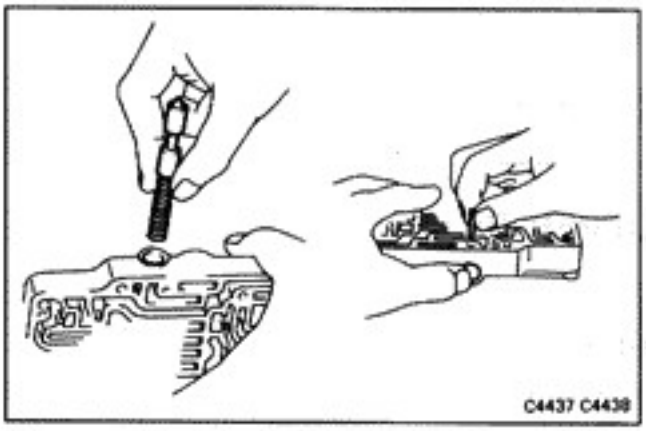


3. INSTALL 2-3 SHIFT VALVE

(a) Install the 2-3 shift valve and spring.

(b) Install the plug into the bore.

(c) Coat the retainer with petroletum jelly and inst

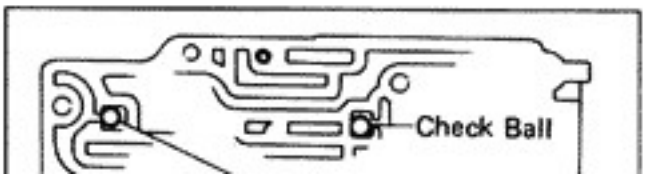


4. INSERT REAR CLUTCH SEQUENCE VALVE

(a) Install the valve spring, and the valve.

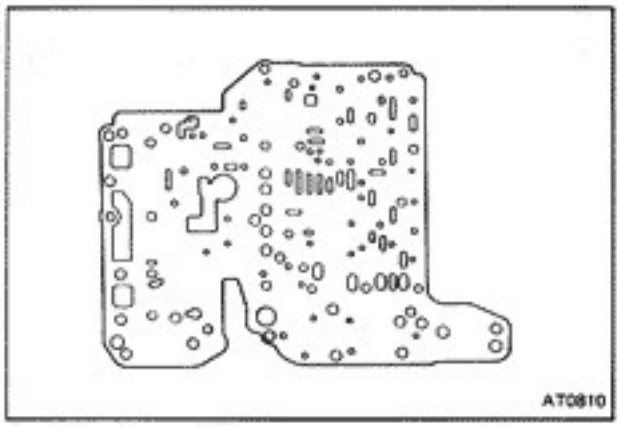
(b) Install the plug into the bore.

(c) Coat the pin with petroleum jelly and install it.



5. INSTALL CHECK BALLS AS SHOWN

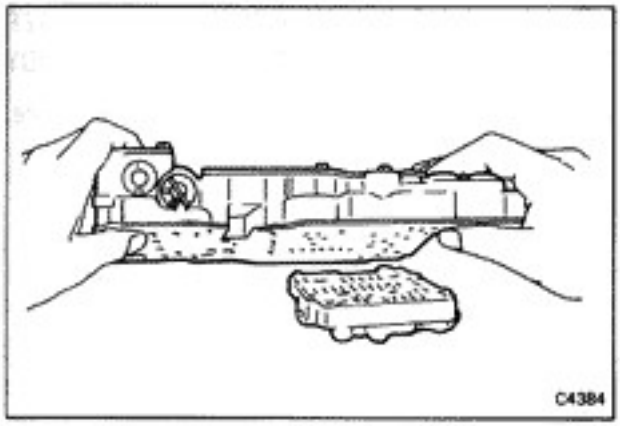
Install the six steel balls in the position shown in the fi



(Assembly of Valve Body)

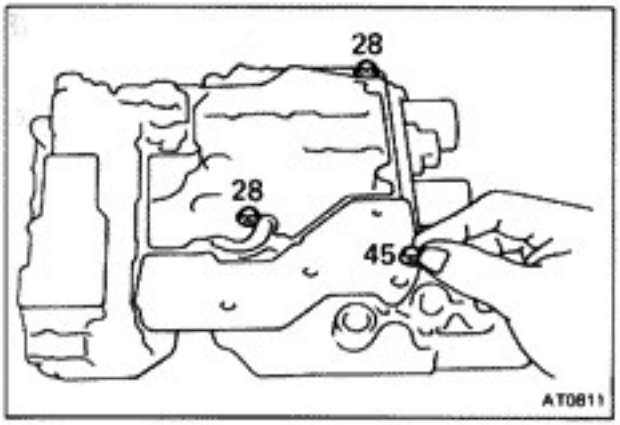
1. POSITION NEW GASKET ON UPPER REAR VALVE BODY

Align a new gasket at each bolt hole.



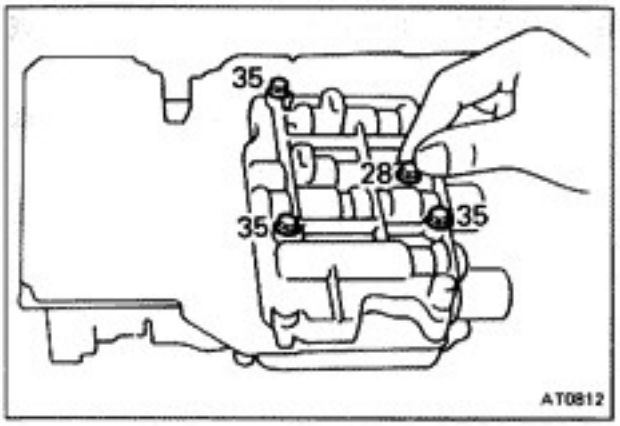
2. PLACE LOWER VALVE BODY WITH PLATE GASKET ON TOP OF UPPER REAR VALVE BODY

Align each bolt hole in the valve body and gasket.



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

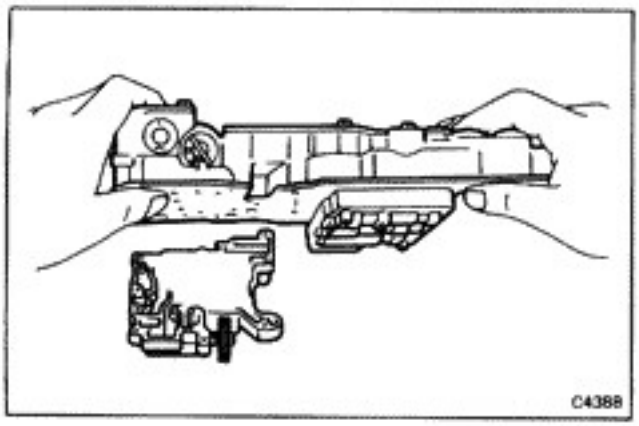
NOTE: Each bolt length (mm) is indicated in the figure.



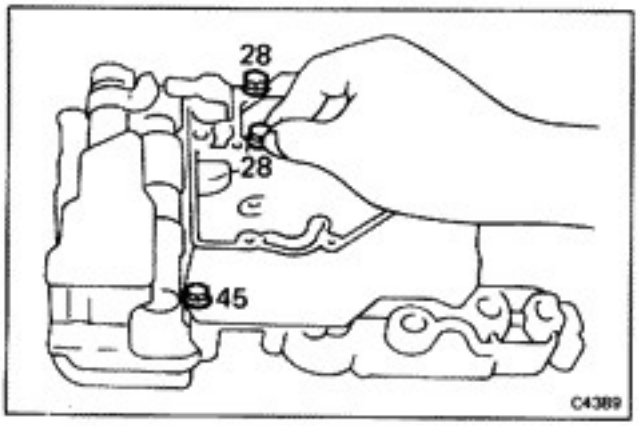
4. TURN ASSEMBLY OVER, CHECK GASKET ALIGNMENT AND FINGER TIGHTEN FOUR BOLTS IN UPPER REAR VALVE BODY

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

5. REMOVE TEMPORARY BOLTS FROM PLATE

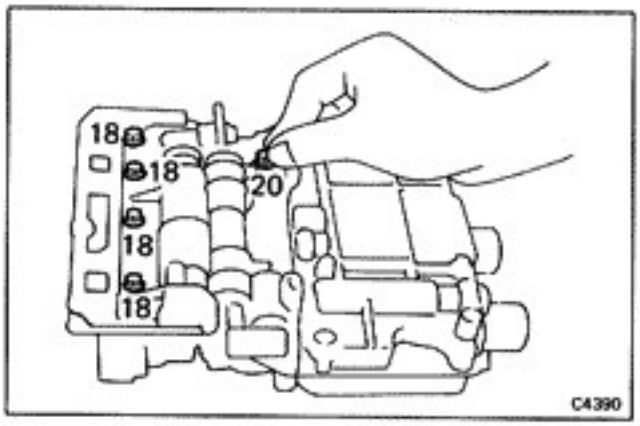


6. **PLACE LOWER AND UPPER REAR VALVE BODY ASSEMBLY ON TOP OF UPPER FRONT VALVE BO**



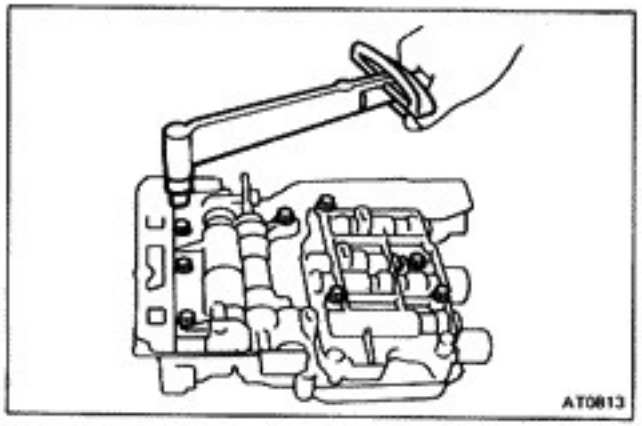
7. **INSTALL AND FINGER TIGHTEN SET BOLTS IN LO VALVE BODY TO SECURE UPPER FRONT VALVE B**

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



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

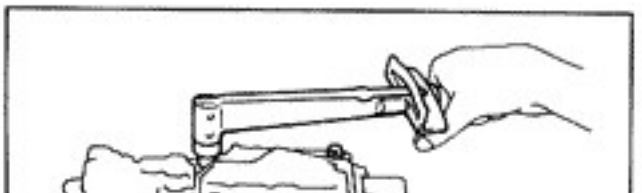
NOTE: Each bolt length (mm) is indicated in the fi



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

Recheck the alignment of the gaskets. Tighten the b

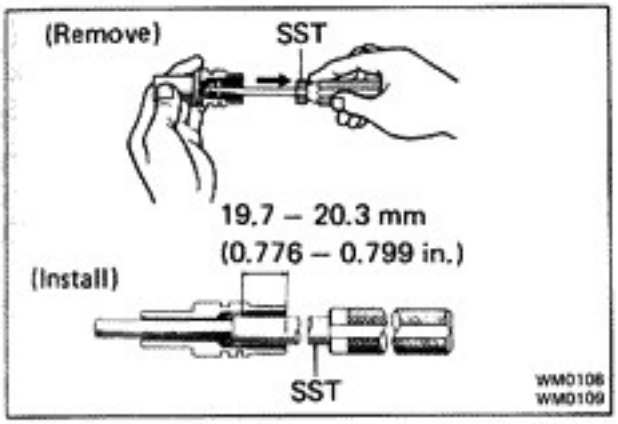
Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)



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)



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

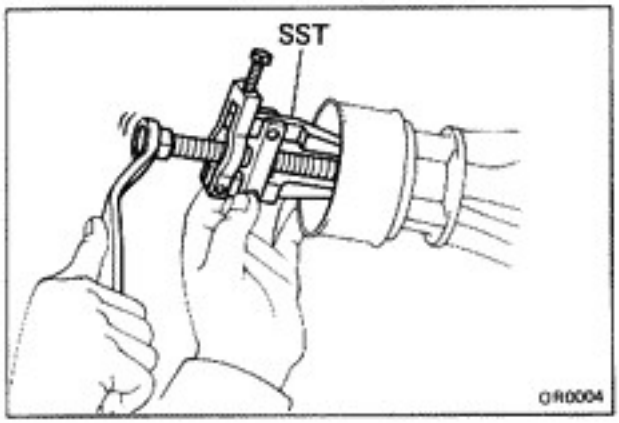
   (b) Using SST, install the new oil seal.

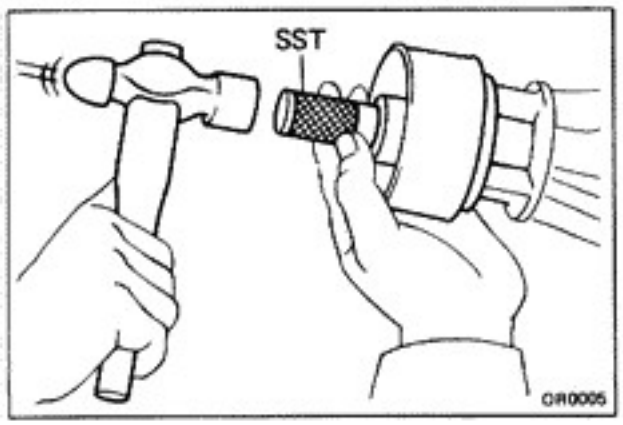
   SST 09201-60011

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.

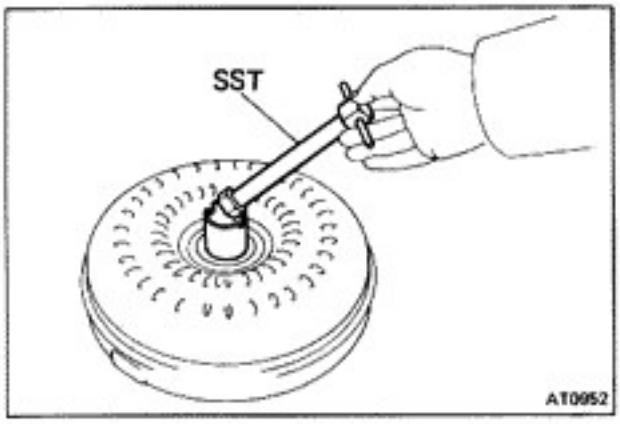
INSPECTION OF TORQUE CONVERTER

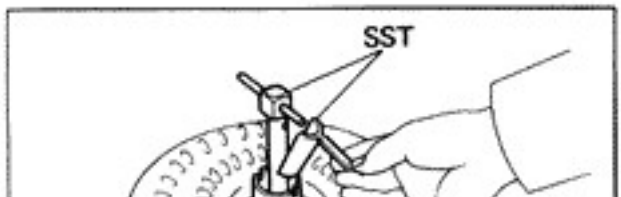
1. **INSERT SST IN END OF TORQUE CONVERTER**

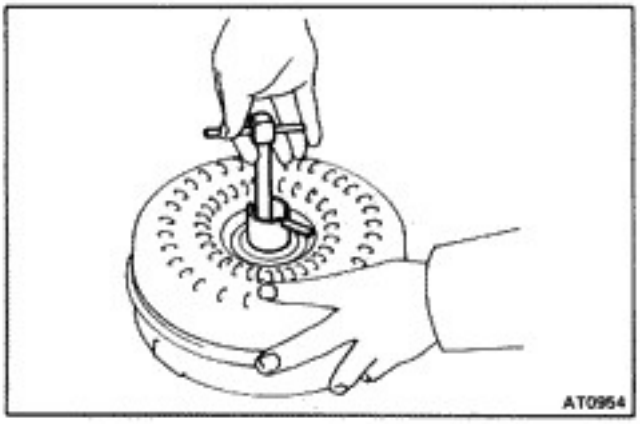
   (a) Insert a turning tool in the inner race of the one-way clutch.

   (b) Install the stopper so that it fits in the notch of the converter hub and other race of the one-way clutch.

   SST 09350-20013 (09397-22020)

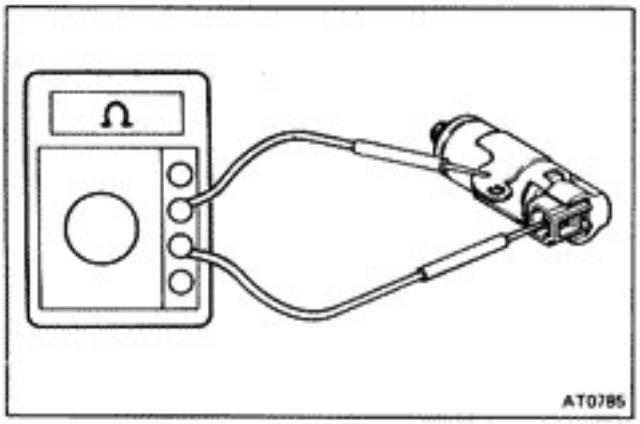






2. TEST ONE-WAY CLUTCH

The clutch should lock when turned counterclockwise, and should rotate freely and smoothly clockwise. Less than 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 clutch still fails the test.

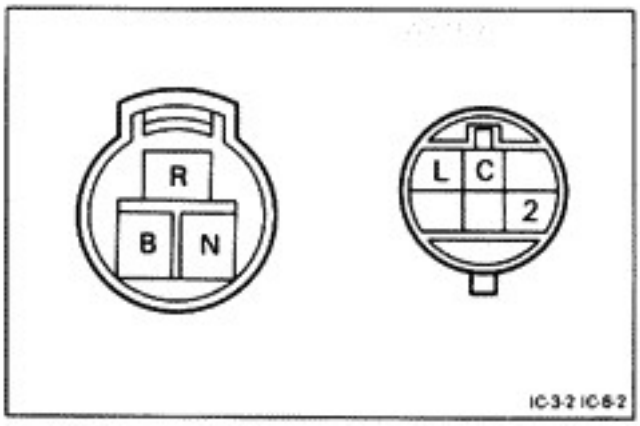


Electrical Parts

1. INSPECT SOLENOID

Check the resistance between the terminal and body

Standard resistance: 11 — 15 Ω

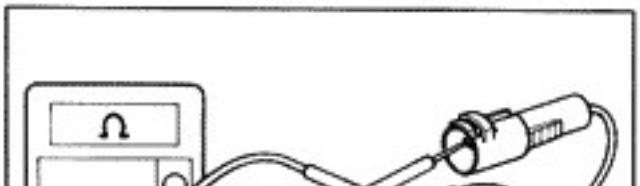


2. INSPECT NEUTRAL START SWITCH

Using an ohmmeter, check the continuity of the termi for each switch position shown in the table below.

If continuity between the terminals is not as specif replace the switch.

Terminal / Range	B	N	C	R	2	L
P	○—○					
R			○—○			
N	○—○					
2			○—○		○	
L			○—○			○



3. INSPECT SPEED SENSOR

Connect on ohmmeter to the speed sensor and check the meter deflects when the sensor is repeatedly brou close to the rotor sensor magnet and removed from

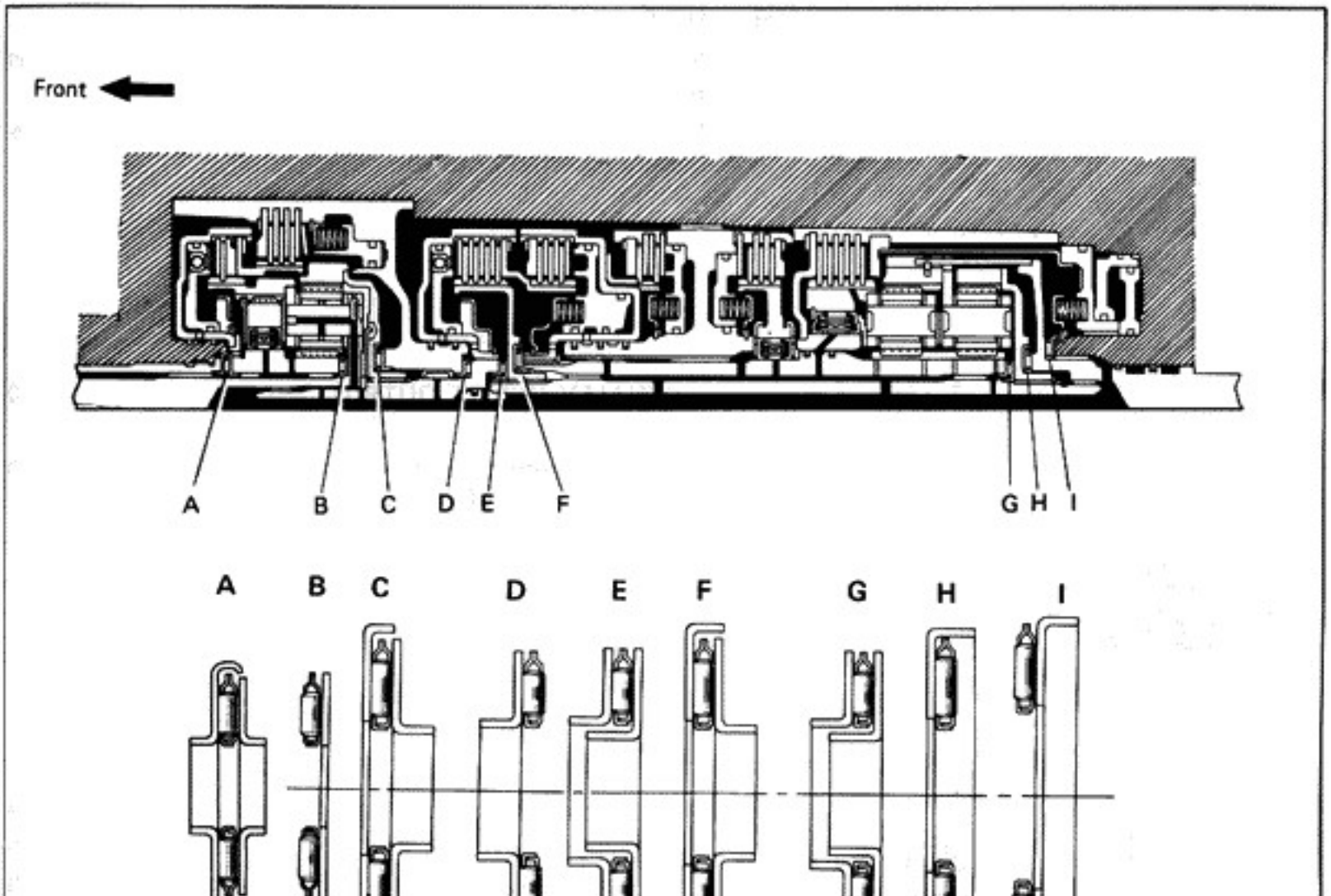
ASSEMBLY OF TRANSMISSION

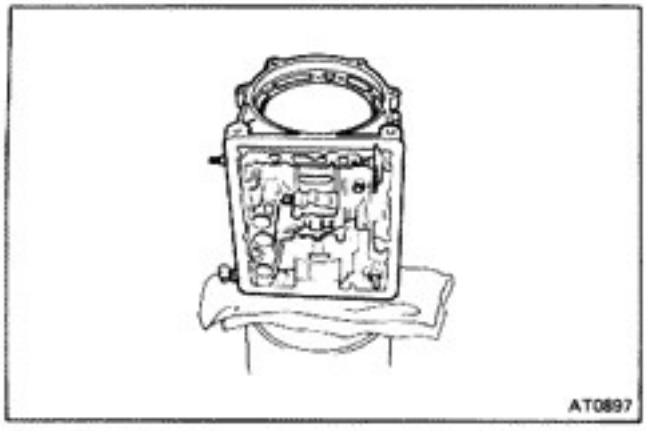
Disassembly, inspection and assembly of each component group have been indicated in the preceding chapter. This chapter deals with assembly of A43DE transmission.

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.

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.

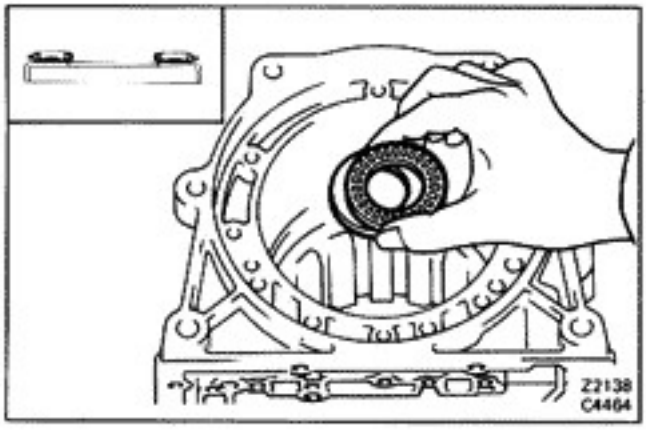




1. PLACE TRANSMISSION CASE ON CYLINDER

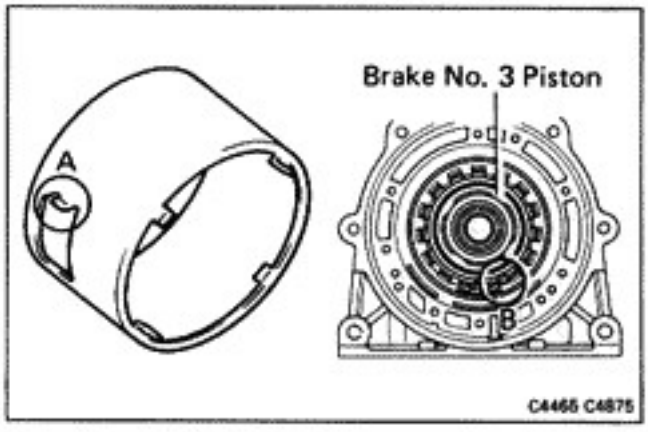
Place the transmission on a cylindrical stand for more cient work.

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



2. INSTALL THRUST WASHER AND BEARING

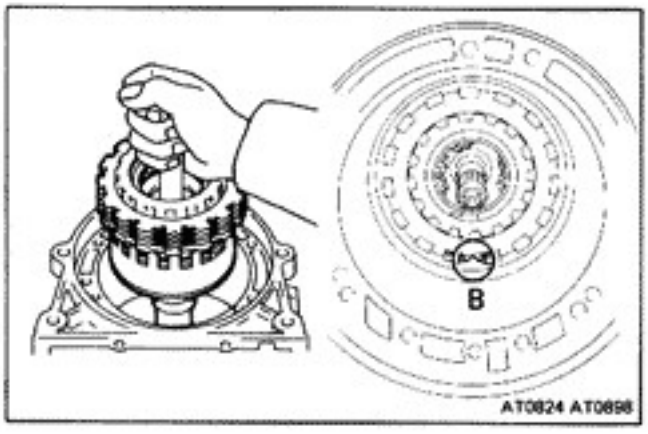
Install the thrust washer, facing the cup side downw



3. INSTALL APPLY TUBE IN CASE

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

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



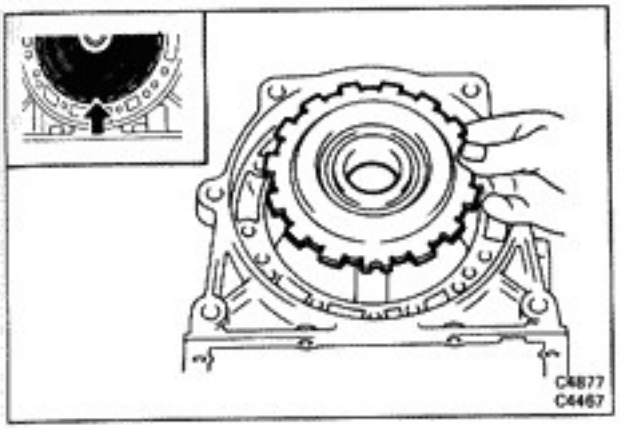
4. PARTIALLY INSERT OUTPUT SHAFT ASSEMBLY I CASE

Align the opening notch (part A) of the clutch plates the slot (part B) of the case.

5. CHECK CLUTCH PACK CLEARANCE

With the case in upright position, make sure that the cl pack is lower than the ledge below the snap ring gro

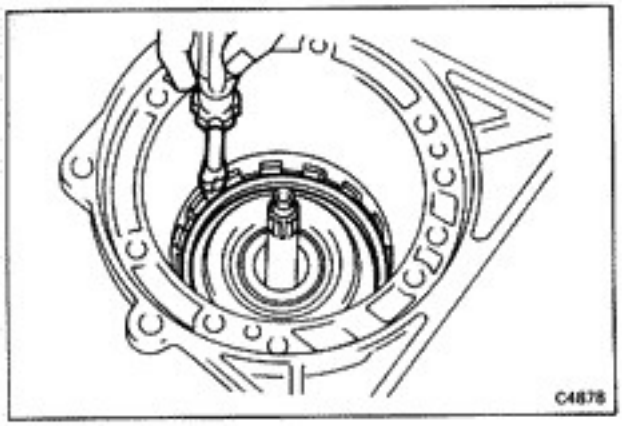
If the clutch pack is not lower than the ledge, compen



6. INSTALL REACTION PLATE

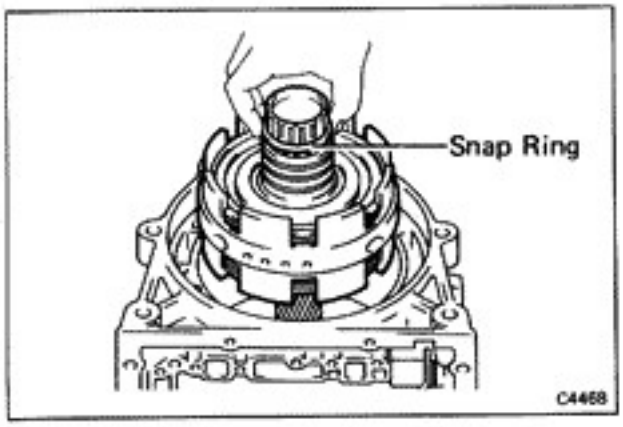
Position the notched tooth of the reaction plate toward the valve body side of the case. Push it into place.

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



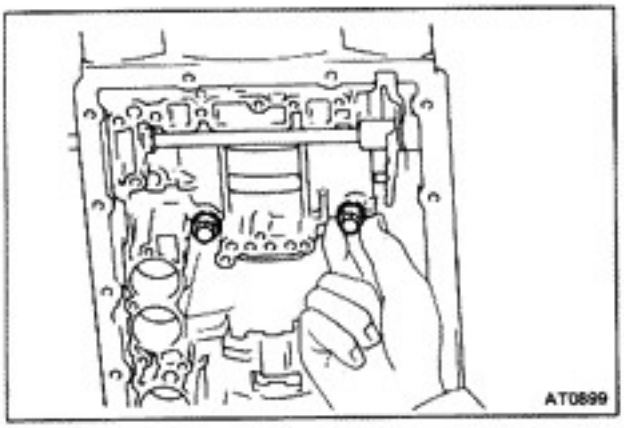
7. INSTALL SNAP RING

Use a large screwdriver to compress the snap ring. Push it into 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

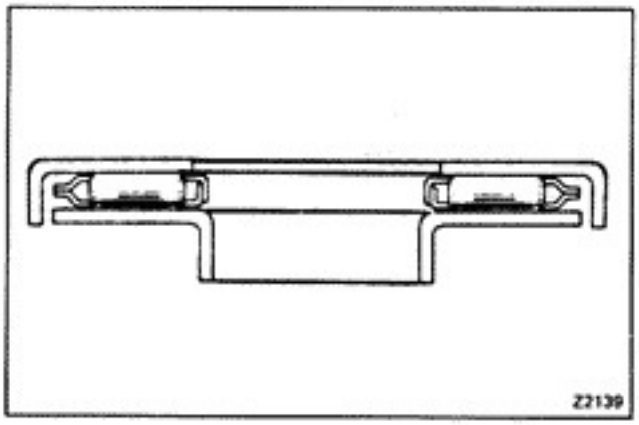
Align the center support with holes in the case and install the two bolts finger tight.

10. INSTALL REAR CLUTCH IN CASE

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

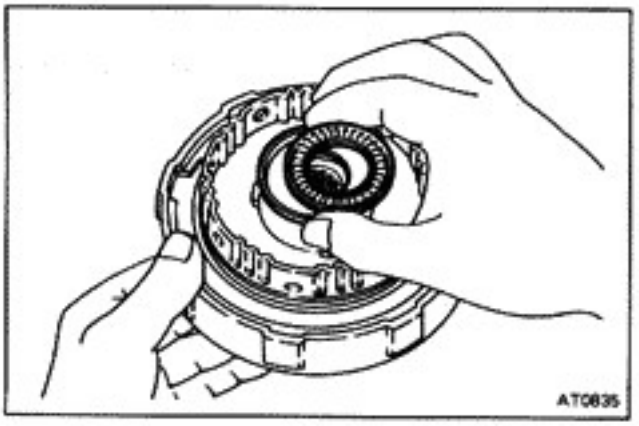
11. CHECK FOR CORRECT INSTALLATION OF REAR CLUTCH

If the rear clutch is fully meshed with the center support,



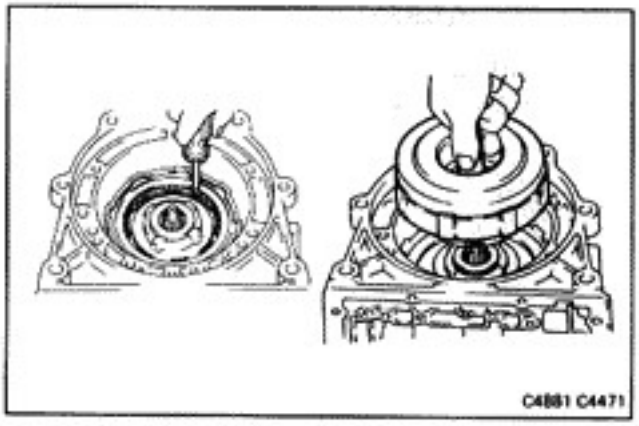
12. INSTALL NEEDLE BEARING RACE OVER SPLINED END REAR CLUTCH IN CASE

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



13. INSTALL THRUST BEARING AND RACE ON FRO CLUTCH

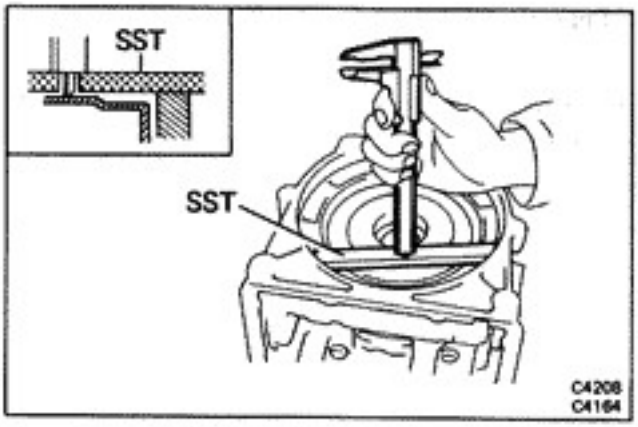
Coat the parts with petroleum jelly to keep them in
place. Position the lip of the race outward.



14. INSTALL FRONT CLUTCH ASSEMBLY IN CASE

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

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

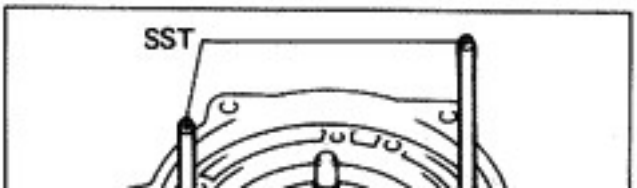


15. CHECK CORRECT INSTALLATION OF FRONT CLUTCH

Set SST on the transmission case as shown in the figu
Measure the distance between the top surface of the S
and front clutch assembly. If the distance corresponds
that during disassembly, the front clutch is installed c
rectly.

SST 09350-20013 (09370-12010)

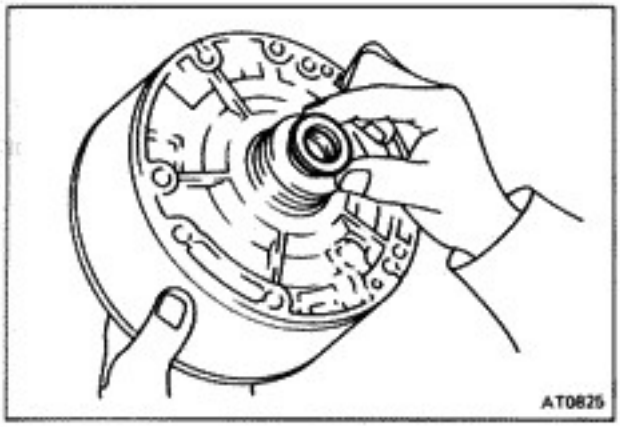
**Height: Measured value minus SST width =
Approx. 2mm (0.08 in.)**



16. INSTALL THRUST BEARING ON FRONT CLUTCH

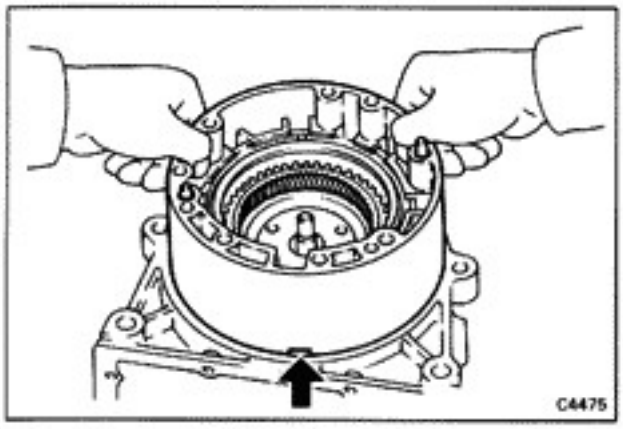
Coat the thrust bearing with petroleum jelly and set it i
place.

17. INSTALL SST ON CASE



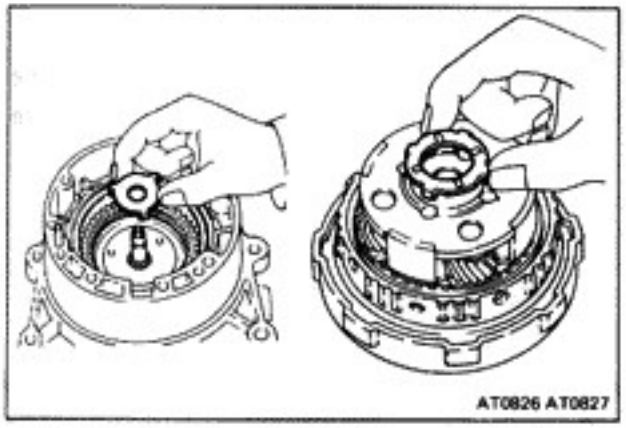
18. INSTALL THRUST WASHER ON OVERDRIVE CASE END

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

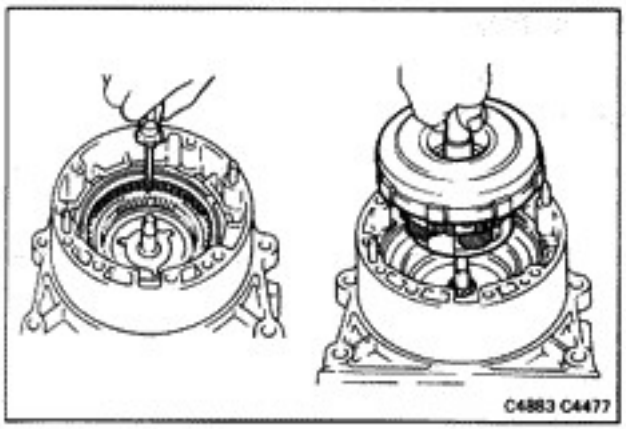
Insert the overdrive case gently through the two guide bolts (SST) with the circled part in the figure facing in the direction indicated.



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.

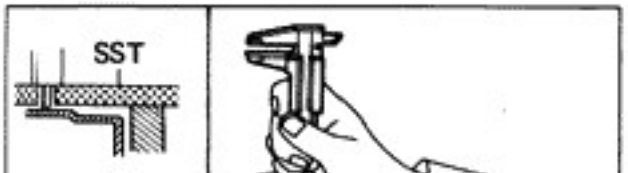
NOTE: The washer lugs should be inserted in the holes.



21. INSTALL OVERDRIVE CLUTCH IN CASE

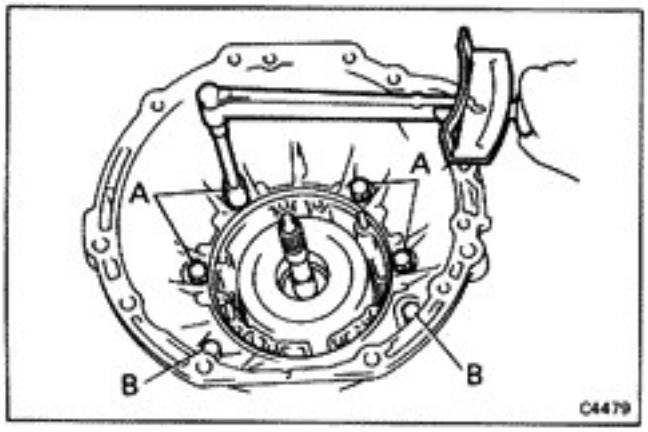
Align the flukes of the discs in the overdrive case. Align the flukes with the slots of the overdrive clutch and press the overdrive clutch into the overdrive case.

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 figure. Measure the distance between the top surface of SST and the

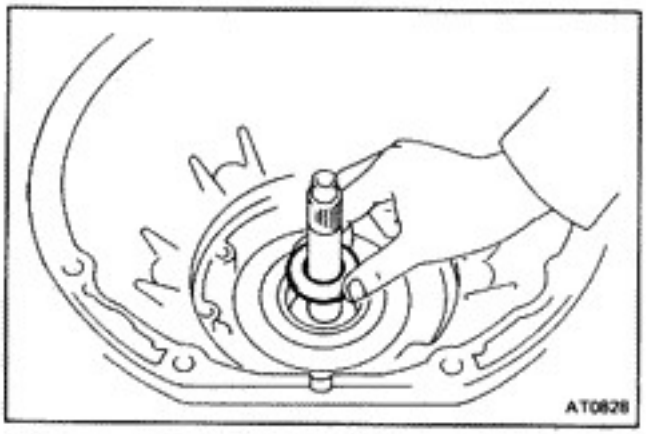


23. INSTALL O-RING ON OVERDRIVE CASE

24. INSTALL CONVERTER HOUSING

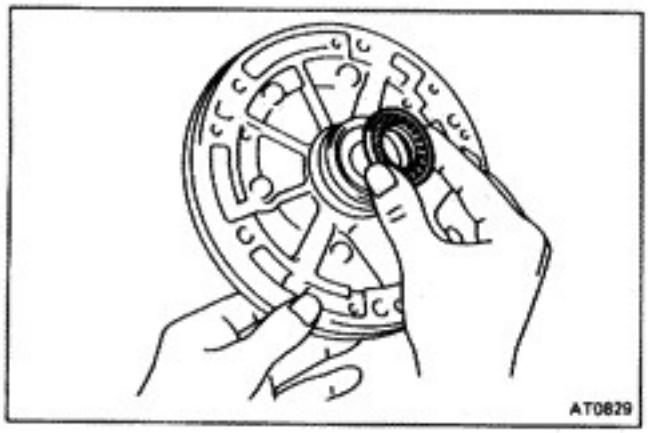
Install the two 12-mm bolts at B and four 10-mm bo
A and tighten them.

Torque: A bolts 345 kg-cm (25 ft-lb, 34 N·m)
B bolts 580 kg-cm (42 ft-lb, 57 N·m)



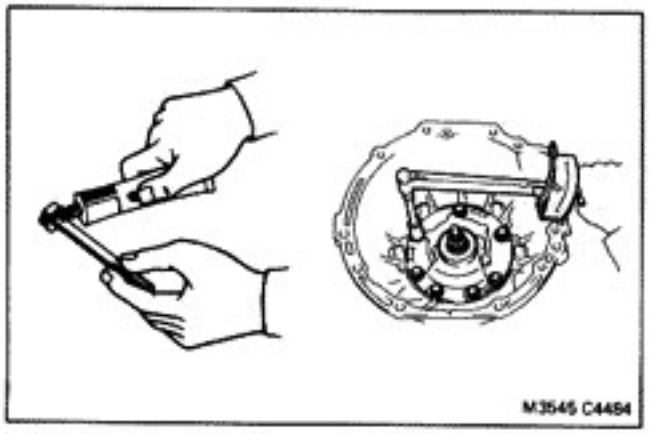
25. INSTALL RACE ON OVERDRIVE CLUTCH

Install the thrust washer, facing the lip side outwa



26. INSTALL THRUST BEARING ON FRONT OIL PUMP

Coat the thrust washer with petroleum jelly and insta
washer side toward the pump body together with
bearing.



27. INSTALL FRONT OIL PUMP

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

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

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

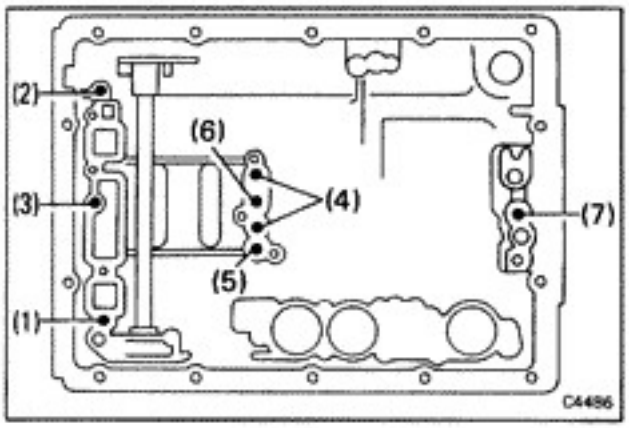
SST 09350-20013 (09362-30011)

(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,
N·m) increments.

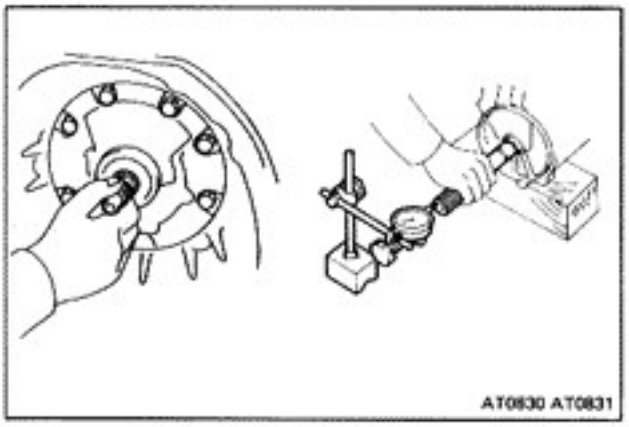


29. CHECK OPERATION OF PISTONS

Blow low-pressure compressed air into the passages indi cated on the figure and listen for noise from pistor movement.

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

If pistons do not move, disassemble and inspect.

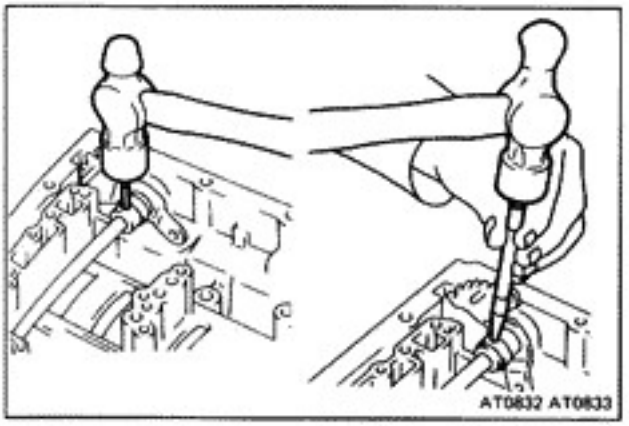


30. CHECK INPUT SHAFT AND OUTPUT SHAFT

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

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

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



31. IF NECESSARY, INSTALL MANUAL VALVE LEVER SHAF INTO CASE

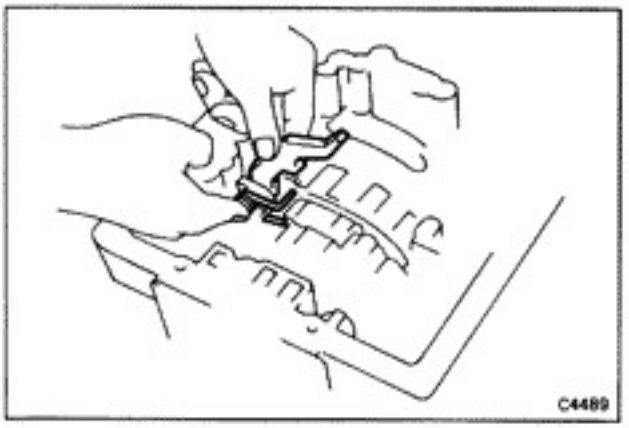
(a) Assemble a new collar to the manual valve lever.

NOTE: Always replace the collar with a new one.

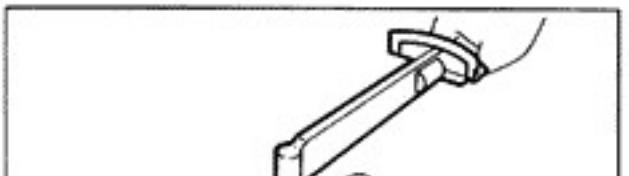
(b) Install the manual valve lever shaft to the transmis sion case through the manual valve lever.

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

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

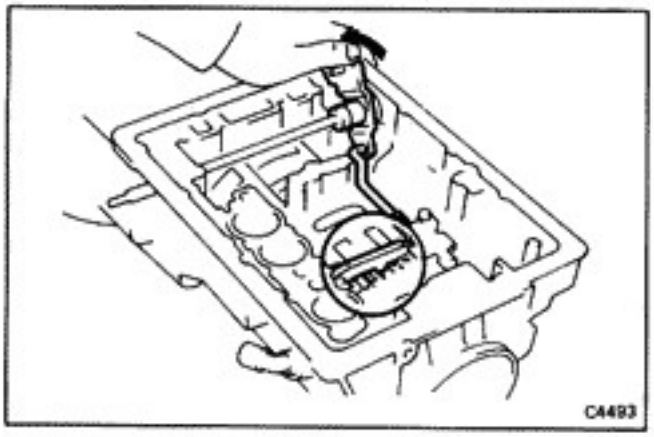


32. INSTALL PARKING LOCK PAWL, PIVOT PIN AND SPRING IN CASE



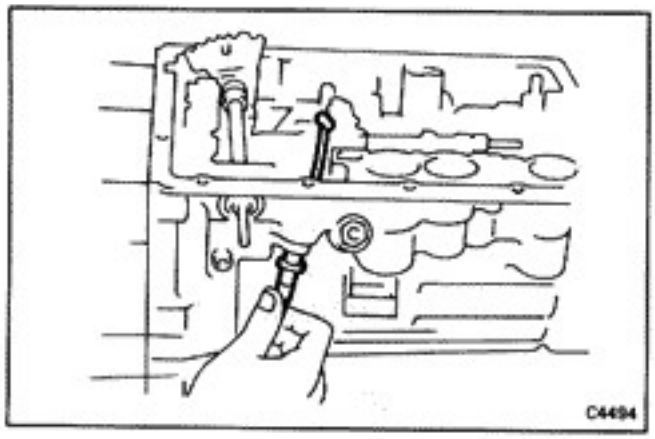
33. INSTALL PARKING LOCK PAWL BRACKET ON CASE

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



34. CHECK OPERATION OF PARKING LOCK PAWL

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

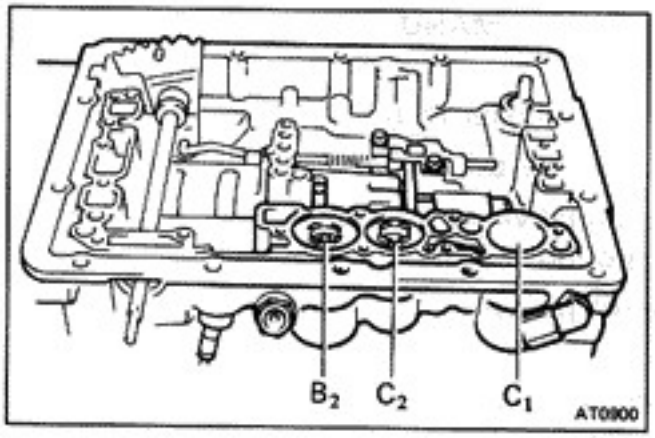


35. INSTALL NEW O-RING ON THROTTLE CABLE FITTI

36. INSTALL THROTTLE CABLE IN CASE

Push the cable through the case, being careful no
damage the O-ring. Check for full seating.

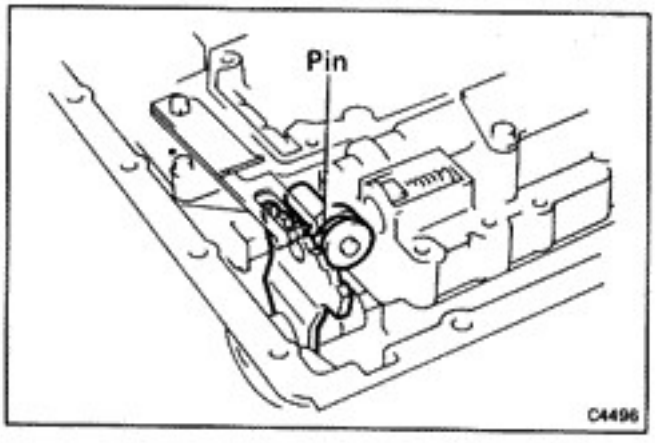
**CAUTION: In subsequent work, be careful not to rol
case over the cable and break the cable fitting.**



37. INSTALL ACCUMULATOR PISTON AND SPRINGS

mm

Spring		Free length	Outer diameter	Wire diameter	Colo
B_2	Upper	50.68 (1.9953)	20.00 (0.7874)	2.80 (0.1102)	Light G
	Lower	35.13 (1.3831)	16.16 (0.6362)	1.30 (0.0512)	Red
C_2	Upper	43.56 (1.7150)	14.30 (0.5630)	1.80 (0.0709)	Blue
	Lower	32.73 (1.2886)	14.80 (0.5827)	1.30 (0.0512)	Green
C_1		64.68 (2.5465)	17.50 (0.6890)	2.00 (0.0787)	None

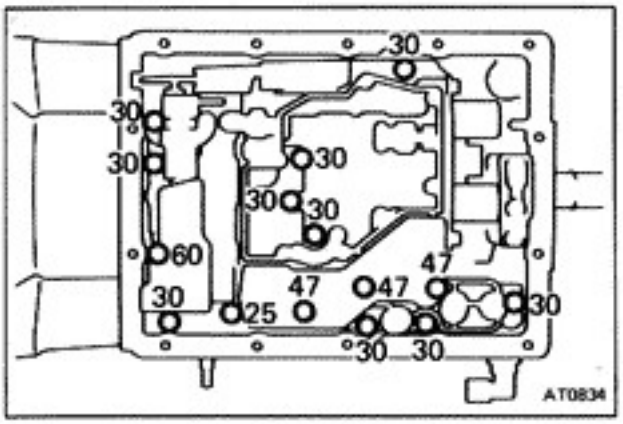


38. PLACE VALVE BODY ON TRANSMISSION

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

39. LIFT SIDE OF VALVE BODY AND ATTACH THROT
CABLE

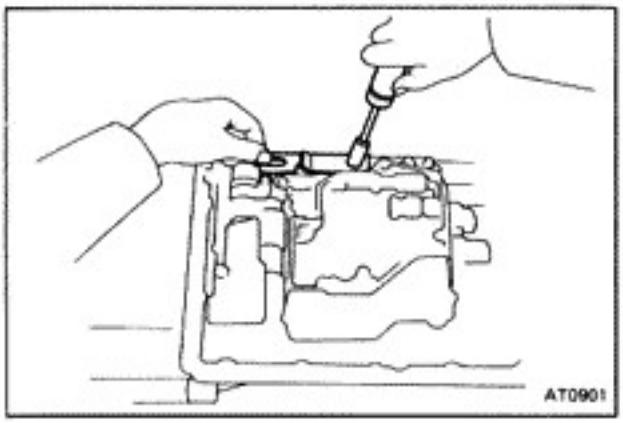
(a) While holding the cam down with your fingers,



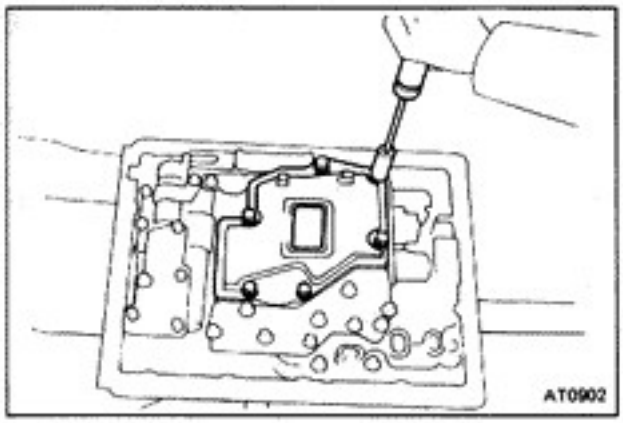
40. INSTALL FIFTEEN BOLTS IN VALVE BODY

Install the bolts as shown.

Torque: 100 kg-cm (7 ft-lb, 10 N·m)

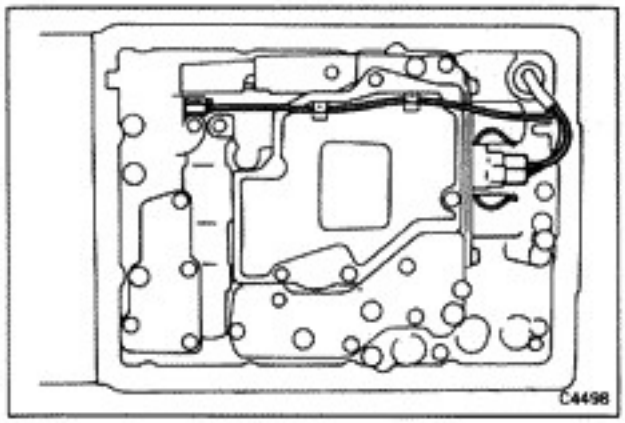


41. INSTALL DETENT SPRING



42. INSTALL OIL STRAINER

Torque: 55 kg-cm (48 in.-lb, 5.4 N·m)

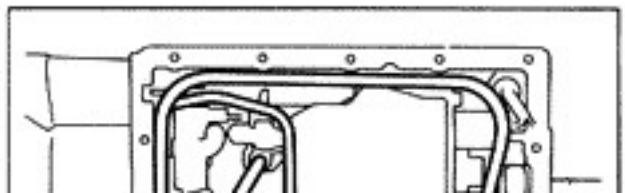


43. CONNECT SOLENOID WIRING TO EACH SOLENOID

(a) Push the solenoid wiring through in the transmission case and connect the terminals to each solenoid.

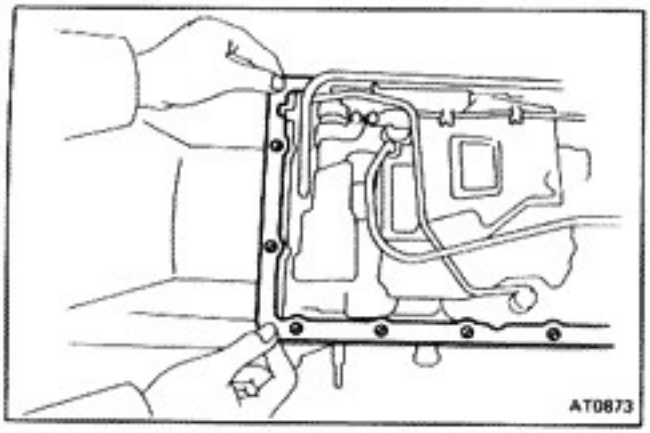
(b) Clamp the wiring to the oil screen.

(c) Install the gromet for the wiring with the plate.



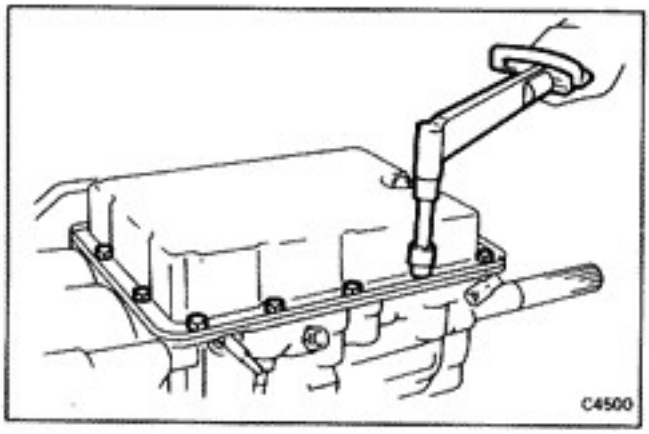
44. INSTALL OIL TUBES

Press the tubes by hand into the positions indicated in the figure. Make sure that the oil tubes do not interfere with the oil pan.



45. INSTALL TWO MAGNETS IN PAN AND INSTALL OIL WITH NEW GASKET

(a) Align the cut part of the gasket and case.



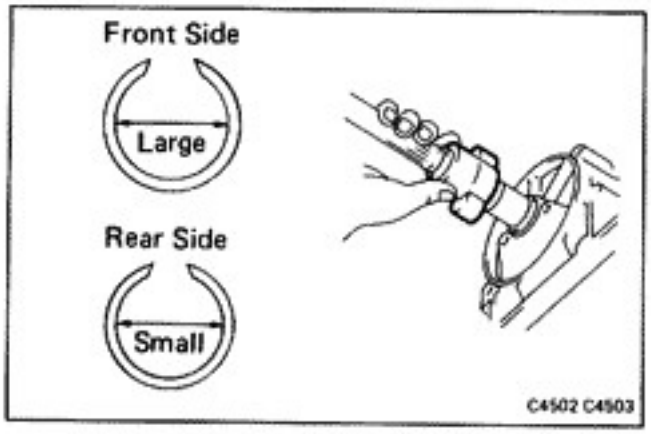
(b) Install the oil pan.

Torque: 45 kg-cm (39 in.-lb, 4.4 N·m)

CAUTION: Make sure that the two magnets do no terfere with the oil tubes or valve body.

46. INSTALL DRAIN PLUG WITH NEW GASKET

Torque: 205 kg-cm (15 ft-lb, 20 N·m)

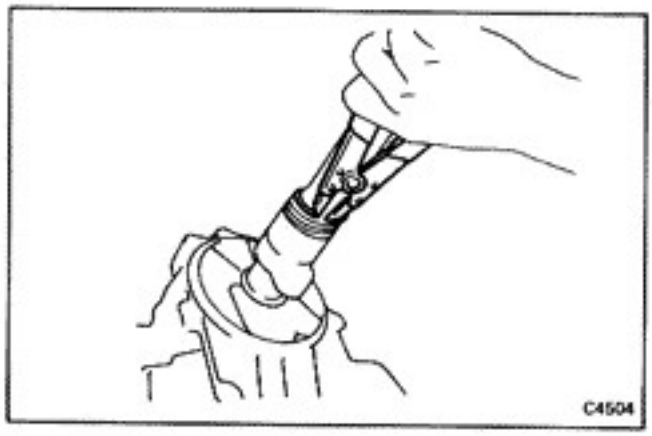


47. INSTALL SENSOR ROTOR AND SPEEDOMETER DR GEAR

NOTE: Install the larger diameter snap ring at the f side.

(a) Install the larger snap ring and woodruff key onto shaft.

(b) Install the sensor rotor.



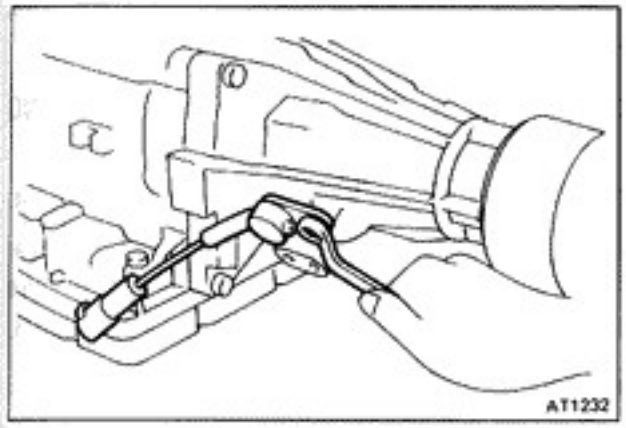
(c) Install the lock ball.

(d) Slide the speedometer gear on the shaft.

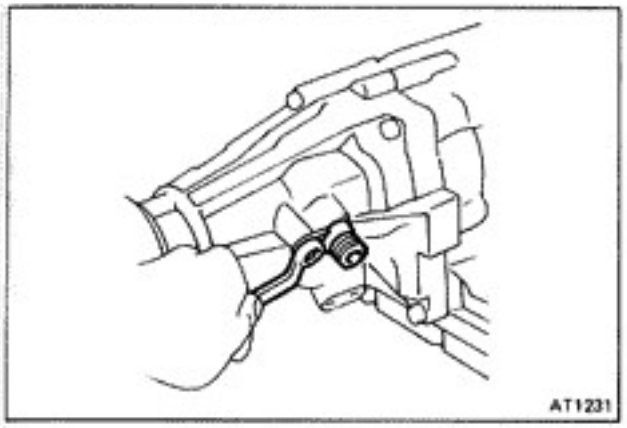
(e) Using snap ring pliers, install the outer snap rin

48. INSTALL EXTENSION HOUSING WITH NEW GASKE

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



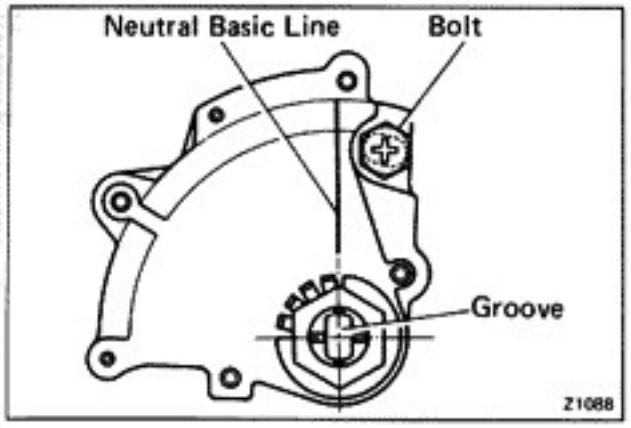
49. INSTALL SPEED SENSOR IN EXTENSION HOUSING



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

51. INSTALL SPEEDOMETER DRIVEN GEAR ASSEMBLY IN EXTENSION HOUSING

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



52. INSTALL NEUTRAL START SWITCH

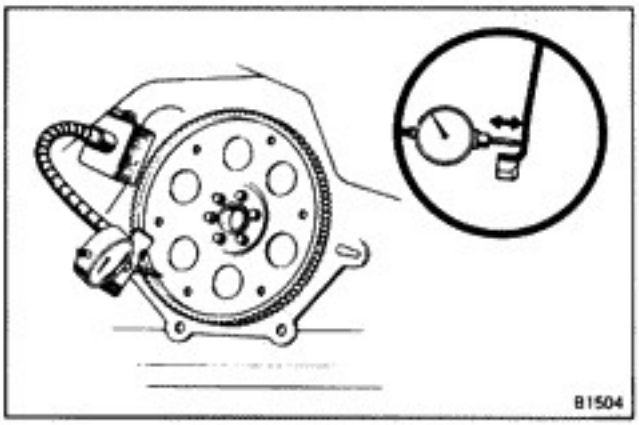
(a) Slide the neutral start switch onto the control shaft.

(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 basic line match up. Tighten the bolt and nut.

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

53. INSTALL SHIFT HANDLE



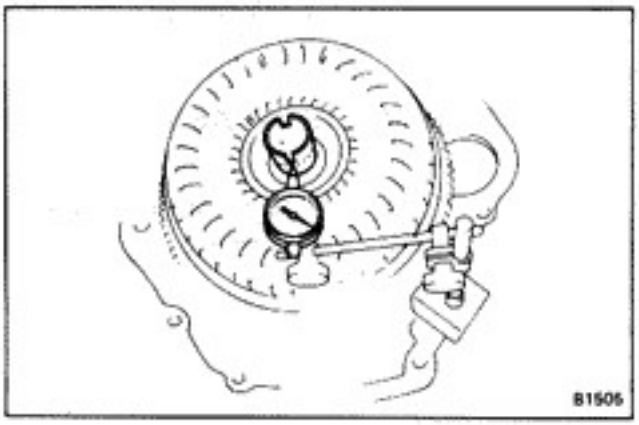
INSTALLATION OF TRANSMISSIO

1. MEASURE DRIVE PLATE RUNOUT AND INSPECT GEAR

Set up a dial indicator and measure the drive plate ru

If runout exceeds 0.20 mm (0.0079 in.) or if the ring is damaged, replace the drive plate. If installing a new plate, not the orientation of spacers and tighten the b

Torque: 650 kg-cm (47 ft-lb, 64 N·m)



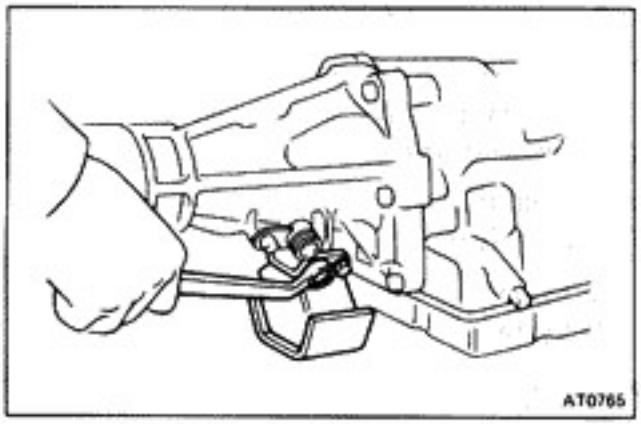
2. MEASURE TORQUE CONVERTER SLEEVE RUNOUT

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

If runout exceeds 0.30 mm (0.0118 in.), try to corre reorienting the installation of the converter. If exce runout cannot be corrected, replace the torque conve

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

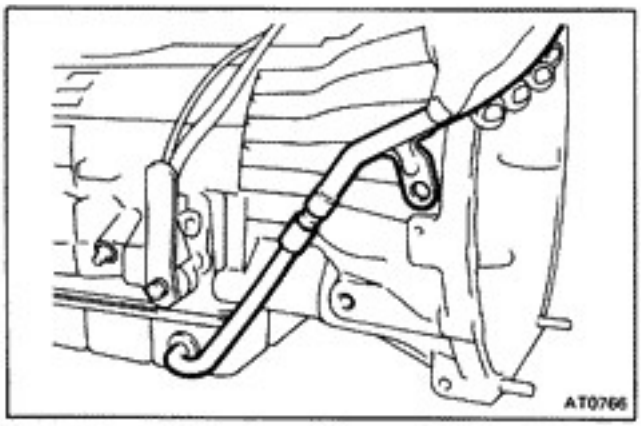
(b) Remove the torque converter.



3. INSTALL ENGINE REAR MOUNT INSULATOR EXTEN HOUSING

(a) Inspect the insulator for deterioration and re if necessary.

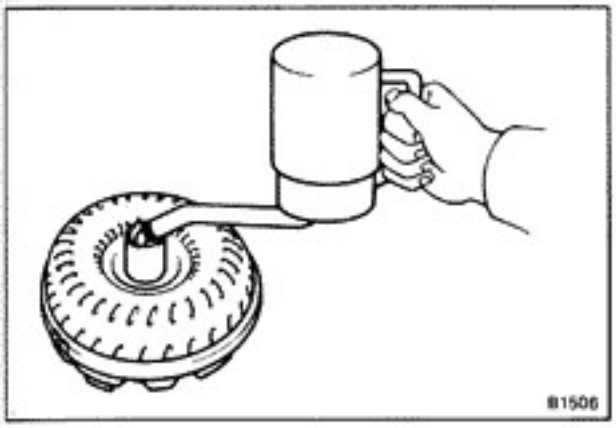
(b) Install the ground cable between mount and c



4. INSTALL FILLER TUBE

Replace a new O-ring and push the tube into place

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

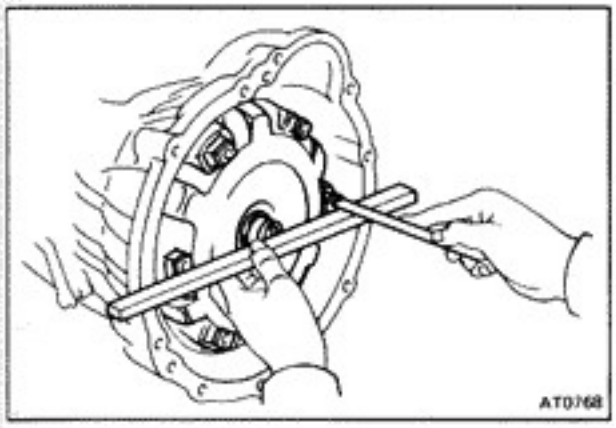


6. INSTALL TORQUE CONVERTER IN TRANSMISSION

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)

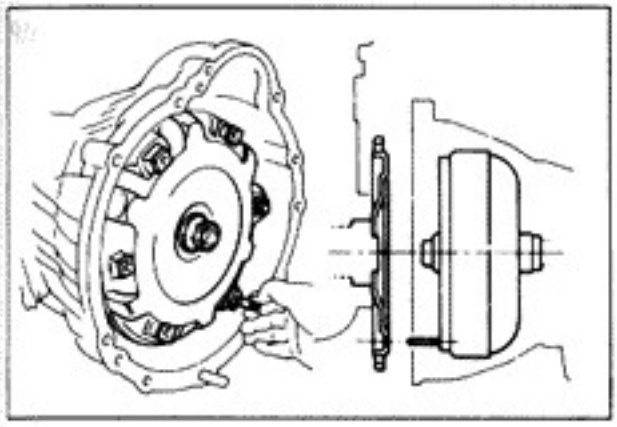
Fluid type: ATF DEXRON® II



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: 26 mm (1.02 in.)



8. INSTALL GUIDE PIN IN TORQUE CONVERTER

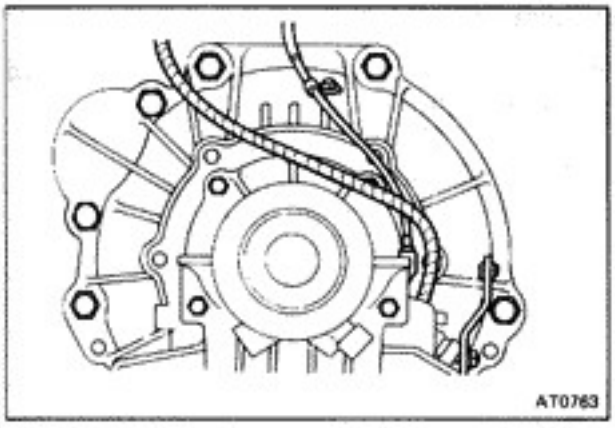
9. ALIGN TRANSMISSION AT INSTALLATION POSITION

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.

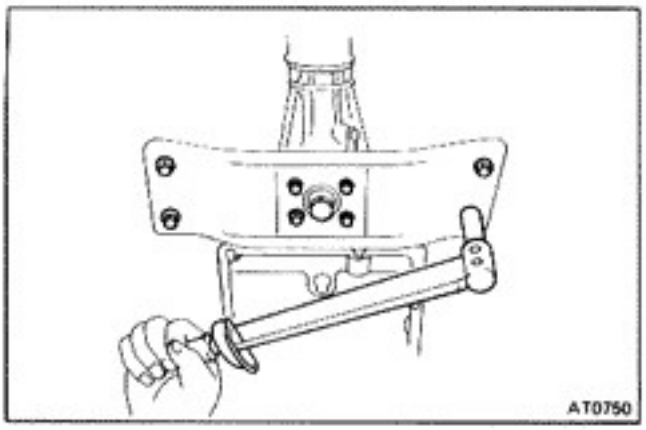
(b) Install the four transmission housing mounting bolts.

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.

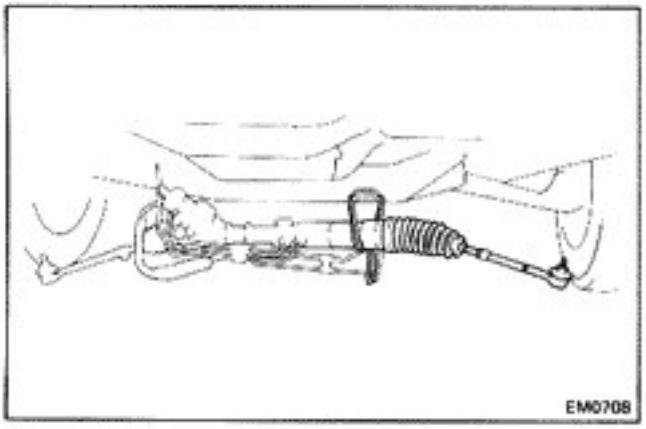


13. INSTALL REAR SUPPORT MEMBER ON BODY

(a) Install the two bolts at each end of the suppo

(b) Connect the ground strap.

14. LOWER TRANSMISSION, AND INSTALL FOUR REMAINING MOUNTING BOLTS



15. INSTALL POWER STEERING GEAR HOUSING

(a) Install the rubber cushions on the gear housin

(b) Install the gear housing on the crossmember.

(c) Install the brackets and tighten the four bolts.

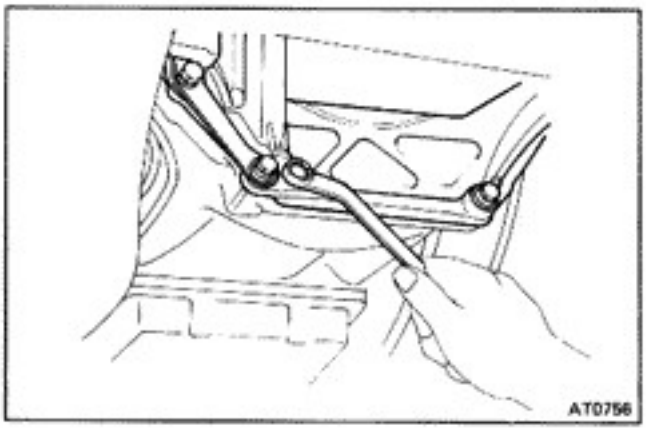
Torque: 770 kg-cm (56 ft-lb, 76 N·m)

(d) Install the clamps of fluid line.

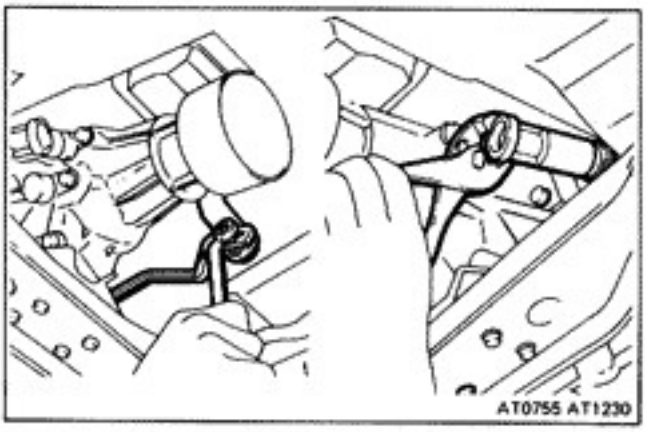
(e) Connect the both tie rod ends to the knuckle

Torque: 600 kg-cm (43 ft-lb, 59 N·m)

(f) Install the intermediate shaft.



16. INSTALL CONVERTER COVER, EXHAUST PIPE CL AND BOTH STIFFENER PLATES



17. CONNECT SPEEDOMETER CABLE

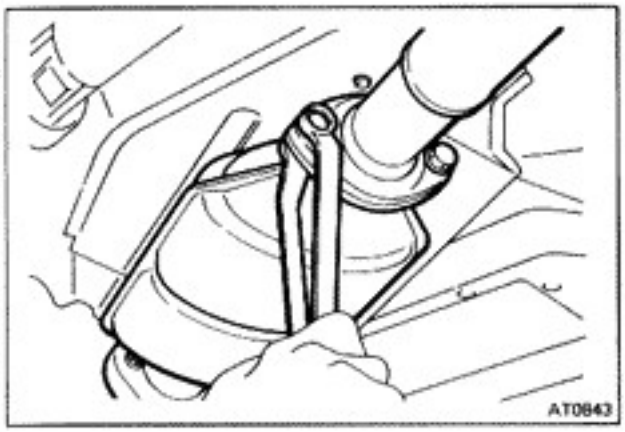
Be sure the felt dust protector and washer are on the of the cable. Tighten the collar with pliers.

18. CONNECT MANUAL SHIFT LINKAGE

19. CONNECT OIL COOLER LINES

Torque: 350 kg-cm (25 ft-lb, 34 N·m)

20. CONNECT COOLING LINE BRACKET



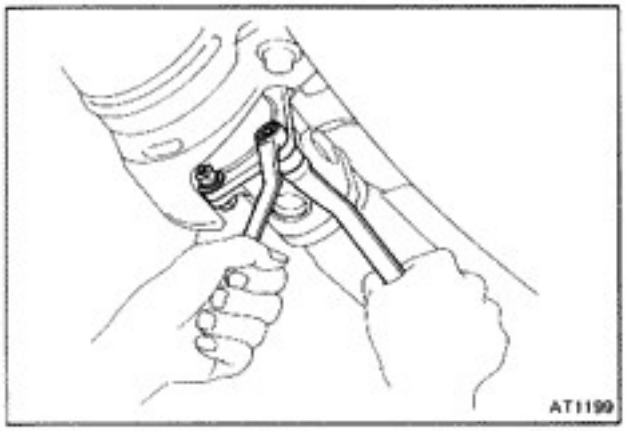
21. CONNECT TAIL PIPE AND FRONT PIPE

(a) Connect the pipe to the tail pipe.

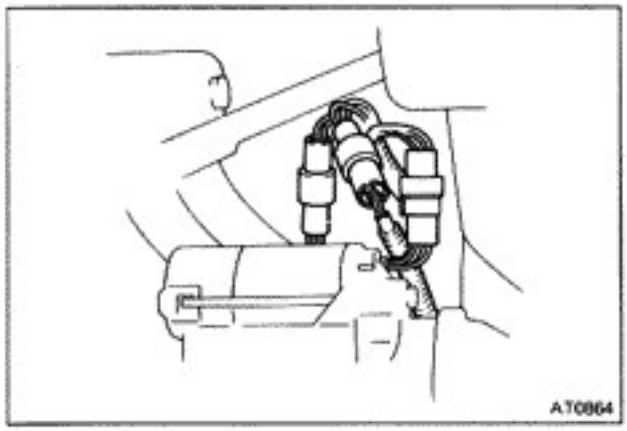
(b) Install the two rubber hangers.

(c) Install the pipe clamp to the transmission case.

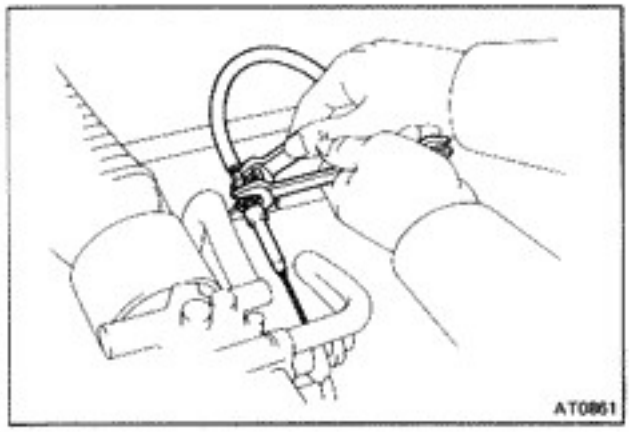
Torque: 440 kg-cm (32 ft-lb, 43 N·m)



22. INSTALL INTERMEDIATE PROPELLER SHAFT



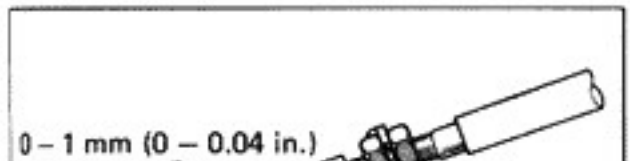
23. CONNECT WIRING CONNECTORS TO NEUTRAL START AND BACK-UP LIGHT SWITCHES



24. CONNECT TRANSMISSION THROTTLE CABLE

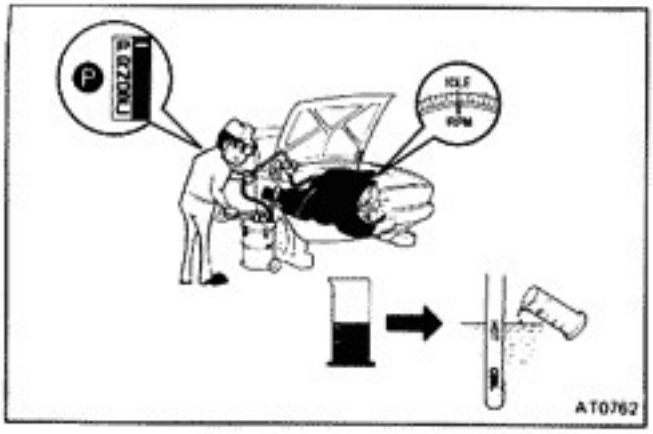
(a) Connect the cable to the throttle linkage.

(b) Connect the cable housing to the bracket.



25. ADJUST TRANSMISSION THROTTLE CABLE

26. CONNECT UPPER RADIATOR HOSE AND FILL WITH COOLANT

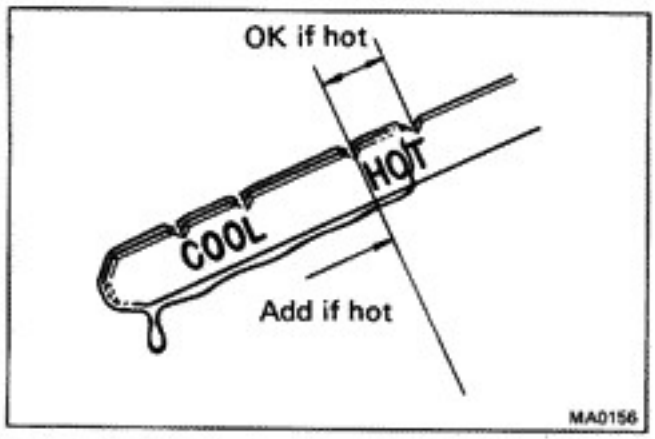


28. FILL TRANSMISSION WITH ATF

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

Fluid type: ATF DEXRON® II

Total capacity: 6.5 liters (6.9 US qts, 5.7 Imp. q



29. CHECK FLUID LEVEL (See page MA-13)

30. PERFORM ROAD TEST

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