

AXIOM

# TRANSMISSION

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## AUTOMATIC TRANSMISSION (4L30-E)

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## 7A-2 AUTOMATIC TRANSMISSION (4L30-E)

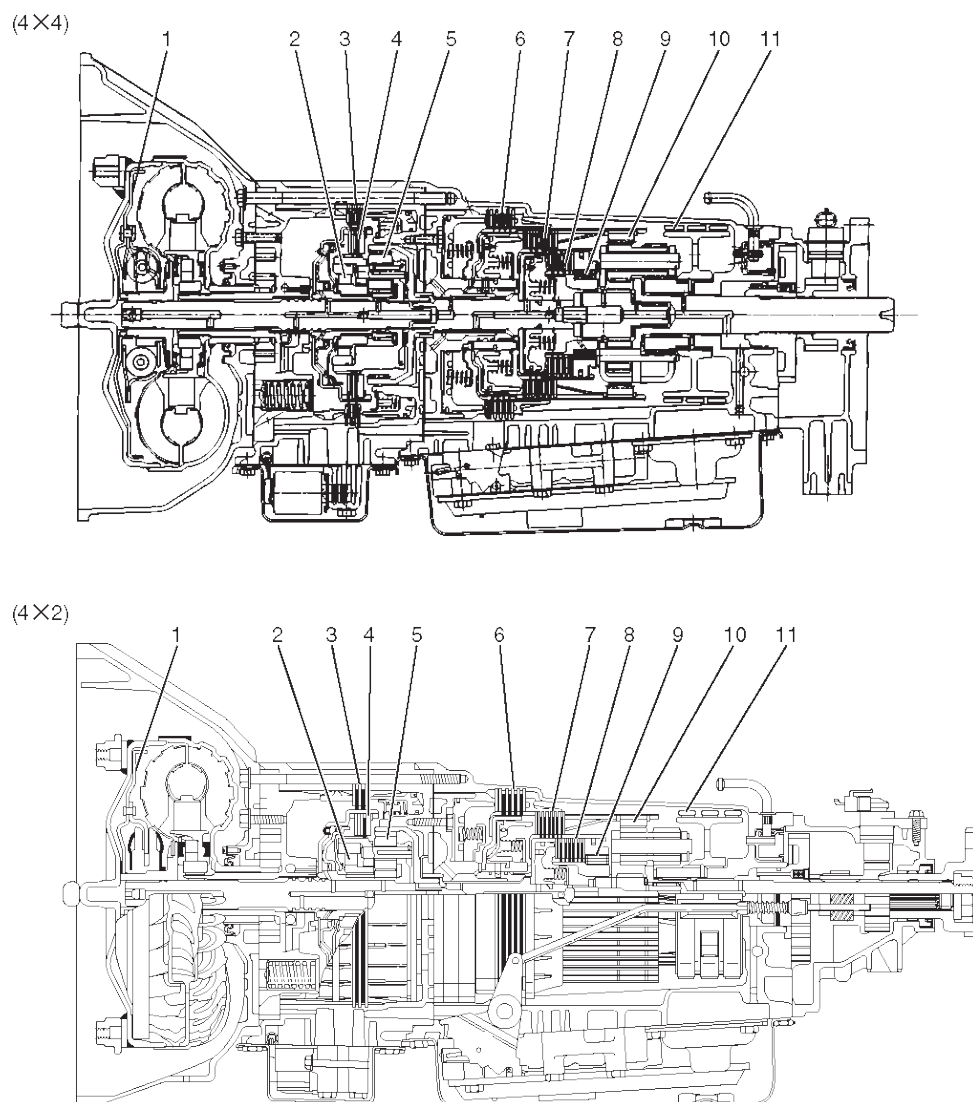
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### Service Precaution

**WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO THE SRS COMPONENT AND WIRING LOCATION VIEW IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO THE SRS SERVICE INFORMATION. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS.**

**CAUTION: Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application. ISUZU will call out those fasteners that require a replacement after removal. ISUZU will also call out the fasteners that require thread lockers or thread sealant. UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (Paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.**

## Construction

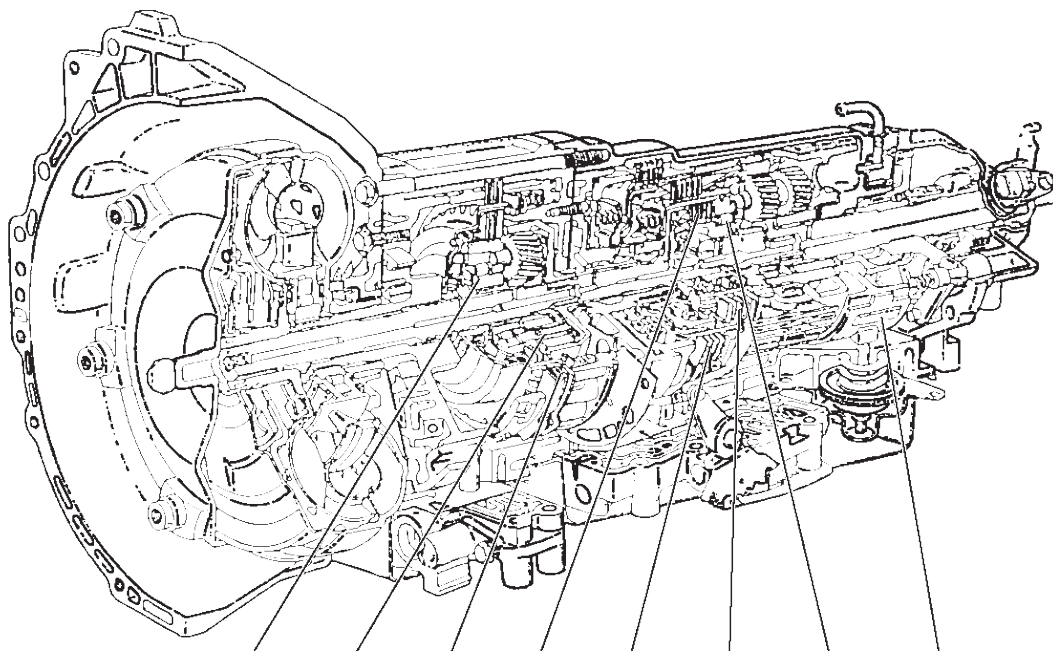


A07R100002

### Legend

- |                                                 |                                                     |
|-------------------------------------------------|-----------------------------------------------------|
| (1) Torque Converter Clutch (TCC)               | (6) Reverse Clutch (RC)                             |
| (2) Overdrive Free Wheel (One Way Clutch) (OFW) | (7) Second Clutch (C2)                              |
| (3) Fourth Clutch (C4)                          | (8) Third Clutch (C3)                               |
| (4) Overrun Clutch (OC)                         | (9) Principle Sprag Assembly (One Way Clutch) (PFW) |
| (5) Overdrive Unit                              | (10) Ravigneaux Planetary Gear Set                  |
|                                                 | (11) Brake Band (B)                                 |

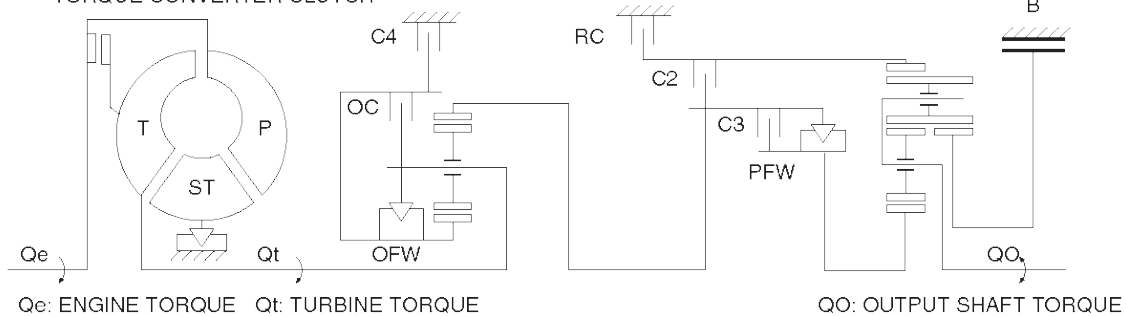
## Range Reference Chart



| RANGE | GEAR    | SOL<br>A<br>N.C. | SOL<br>B<br>N.O. | O/DRIVE<br>FREE<br>WHEEL<br>(OFW) | O/RUN<br>CLUTCH<br>(OC) | FOURTH<br>CLUTCH<br>(C4) | THIRD<br>CLUTCH<br>(C3) | REVERSE<br>CLUTCH<br>(RC) | SECOND<br>CLUTCH<br>(C2) | PRINCIPLE<br>SPRAG<br>ASM<br>(PFW) | BAND<br>ASM<br>(B) | ENGINE<br>BRAKING | TORQUE<br>CONV.<br>CLUTCH |
|-------|---------|------------------|------------------|-----------------------------------|-------------------------|--------------------------|-------------------------|---------------------------|--------------------------|------------------------------------|--------------------|-------------------|---------------------------|
| P-N   |         | OFF              | ON               |                                   | APP                     |                          |                         |                           |                          |                                    |                    | NO                | NO                        |
| R     | REVERSE | OFF              | ON               | LD                                | APP                     |                          |                         | APP                       |                          | LD                                 |                    | NO                | NO                        |
| D     | 1ST     | OFF              | ON               | LD                                | APP                     |                          |                         |                           |                          | LD                                 | APP                | NO                | NO                        |
|       | 2ND     | ON               | ON               | LD                                | APP                     |                          |                         |                           | APP                      | FW                                 | APP                | YES               | ECCC                      |
|       | 3RD     | ON               | OFF              | LD                                | APP                     |                          | APP                     |                           | APP                      | NE                                 |                    | YES               | ECCC                      |
|       | 4TH     | OFF              | OFF              | FW                                |                         | APP                      | APP                     |                           | APP                      | NE                                 |                    | YES               | ECCC                      |
| 3     | 1ST     | OFF              | ON               | LD                                | APP                     |                          |                         |                           |                          | LD                                 | APP                | NO                | NO                        |
|       | 2ND     | ON               | ON               | LD                                | APP                     |                          |                         |                           | APP                      | FW                                 | APP                | YES               | ECCC                      |
|       | 3RD     | ON               | OFF              | LD                                | APP                     |                          | APP                     |                           | APP                      | NE                                 |                    | YES               | ECCC                      |
| 2     | 1ST     | OFF              | ON               | LD                                | APP                     |                          | APP                     |                           |                          | LD                                 | APP                | YES               | NO                        |
|       | 2ND     | ON               | ON               | LD                                | APP                     |                          |                         |                           | APP                      | FW                                 | APP                | YES               | ECCC                      |
| L     | 1ST     | OFF              | ON               | LD                                | APP                     |                          | APP                     |                           |                          | LD                                 | APP                | YES               | NO                        |

LD : LOCKED IN DRIVE    FW : FREEWHEELING    NE : NOT EFFECTIVE    APP : APPLIED

## TORQUE CONVERTER CLUTCH



## Normal Operation Of 2002 4L30-E Transmission

### Torque Converter Clutch (Electronically Controlled Capacity Clutch : ECCC)

#### Application Conditions:

The clutch apply is controlled by moving the converter clutch control valve by commanding Torque Converter Clutch (TCC) solenoid using the PWM signal.

The TCC is normally applied in 2nd, 3rd and 4th gears only when all of the following conditions exist:

- The engine coolant temperature is above 70°C (158°F) and ATF temperature is above 18°C (64.5°F).
- The shift pattern requests TCC apply.

Moreover, TCC is always applied in 2nd, 3rd and 4th gears when the transmission oil temperature is above 135°C (275°F).

This mode should be canceled at 125°C (257°F).

### ATF Warning Lamp

The ATF warning lamp will be constantly on (not flashing) if the transmission oil temperature is above 145°C (293°F).

The ATF warning lamp goes off again when the transmission oil temperature is below 125°C (257°F).

### Reverse Lock Out

With the selector lever in reverse position, the PCM will not close the PWM solenoid until the vehicle is below 11 km/h (6.8 mph), thus preventing reverse engagement above this speed.

## Diagnosis

### Introduction

The systematic troubleshooting information covered by this Section offers a practical and systematic approach to diagnosing 4L30-E transmission, using information that can be obtained from road tests, electrical diagnosis, oil pressure checks or noise evaluation.

The key to correcting a complaint is to make use of all of the available symptoms and logically letting them direct you to the cause.

When dealing with automatic transmission complaints, it is best to gather as many symptoms as possible before making the decision to remove the transmission from the vehicle.

Frequently, the correction of the complaint does not require removal of the transmission from the vehicle.

### Driver Information

To analyze the problem fill out a complete description of the owner's complaint.

Please draw a circle around the right information and complete the following form. (The next page is an example of a completed form). You can draw a circle around many numbers if you are not sure.

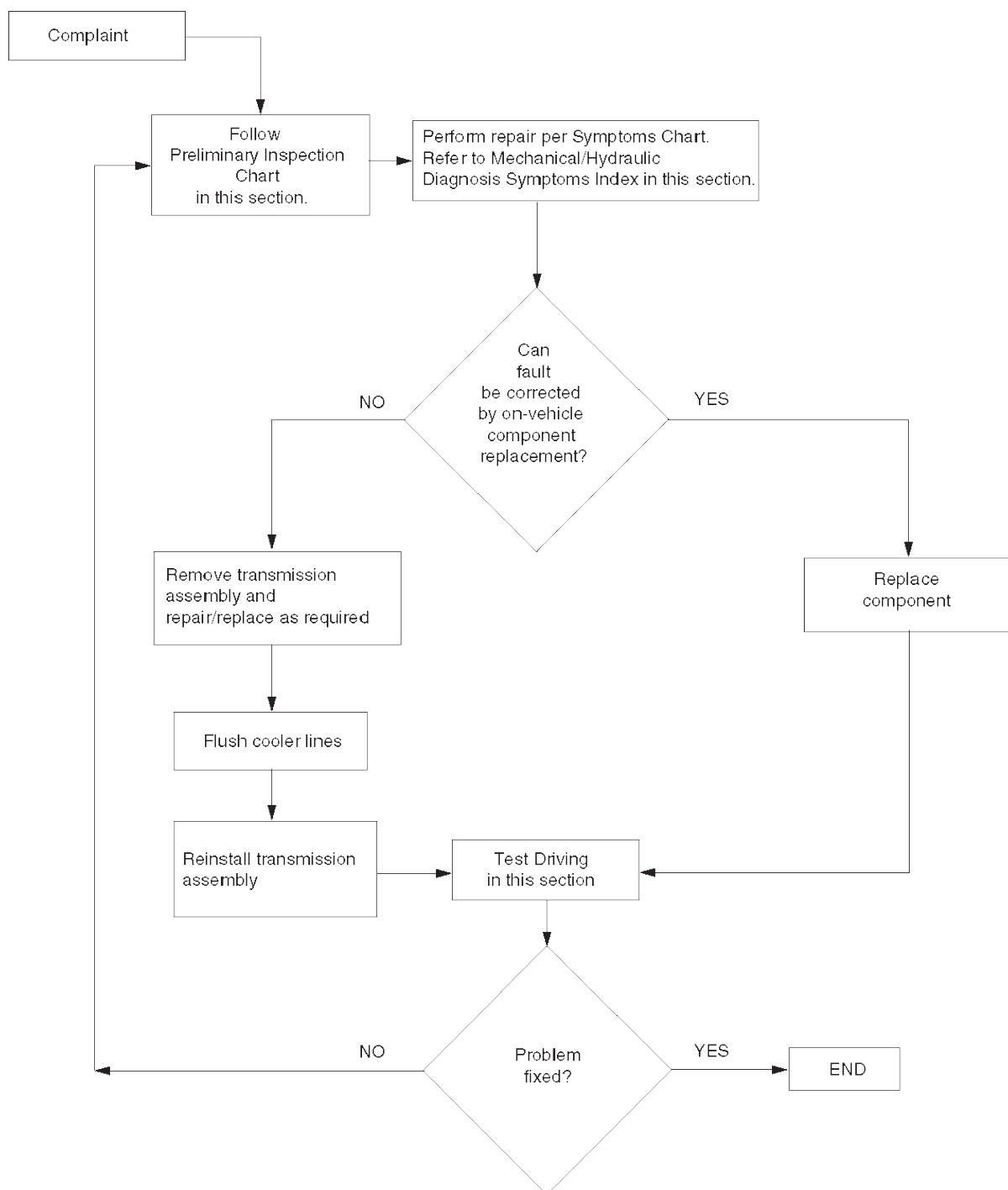
**7A-6 AUTOMATIC TRANSMISSION (4L30-E)**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A - Today's date :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Month : .....                                                                                                                   | Day : .....                                                                                                                                                                        | Year : .....                                                                                                                                      |
| <b>B - End User Name, Address :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
| <b>C - Date of Problem :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
| Month : .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                 | Day : .....                                                                                                                                                                        |                                                                                                                                                   |
| Year : .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
| <b>D - Mileage :</b><br>..... Miles / Km                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>E - With Ignition ON is CHECK TRANS Indicator :</b><br>1- Flashing      2- Not Flashing                                      |                                                                                                                                                                                    | <b>F - Car load when problem occurred :</b><br>1 - Towing a trailer      2- ..... people OR ..... Kg                                              |
| <b>G - Weather conditions when problem :</b><br>1- Clear      2- Cloudy<br>3- Rain      4- Snow<br>5- Unstable      6- Any                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>H - Weather Temperature when problem:</b><br>1- Hot      2- Warm<br>3- Cool      4- Cold<br>5- Unstable      6- Any          | <b>I - Road Conditions when problem :</b><br>1- Any      2- Inter City<br>3- Outside City      4- Highway<br>5- Uphill      6- Downhill<br>7- Unpaved      8- Snow<br>9 - Others : | <b>J - Frequency of the Problem :</b><br>1- Always      2- Occasional :<br>..... times/day,<br>..... times/month<br>3- Only Once      4- Others : |
| <b>K - Engine Condition :</b><br>1- Always      2- At Cold<br>3- During Warming up<br>4- After Warming or Hot<br>5- Others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>L - Engine Speed when the problem occurred :</b><br>1- Idling      2- Starting<br>3- Stalling      4- High RPM<br>5- Low RPM | <b>M - Transmission Condition when it occurred :</b><br>1- Any      2- Idling<br>3- Starting      4- Driving<br>5- Accelerating      6- Coasting<br>7- In corner      8- Shifting  |                                                                                                                                                   |
| <b>N - If there is a Transmission driveability problem BEFORE THE CHECK TRANS INDICATOR WAS FLASHING :</b><br>1- No Power      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>2- No shift      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>3- Shift Shock      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>4- Shift Slip      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>5- Shift Delayed      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>6- Shift Point too high      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>7- Shift Point too low      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>8- TCC Shudder      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>9- Noise      in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>Noise type :    1- Buzz      2- Whine      3- Clunk      4- Rattle      5- Whistle //    6- light      7- medium      8- heavy<br>10- Other : ..... in Range : All - P - R - N - D - 3 - 2 - L      during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1 |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
| <b>O - Other customer concern and comments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
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| <b>P - Isuzu Vehicle Code :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | .....                                                                                                                           | <b>Q - VIN Number</b>                                                                                                                                                              | .....                                                                                                                                             |
| <b>R - Date of Vehicle Registration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Month : .....                                                                                                                   | Day : .....                                                                                                                                                                        | Year : .....                                                                                                                                      |
| <b>S - Trans. model :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | .....                                                                                                                           | <b>T - A/T Serial Number :</b>                                                                                                                                                     | .....                                                                                                                                             |
| <b>U - Your name :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | .....                                                                                                                           |                                                                                                                                                                                    |                                                                                                                                                   |
| <b>V - Dealer Name, Address, Phone</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |
| <br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                 |                                                                                                                                                                                    |                                                                                                                                                   |

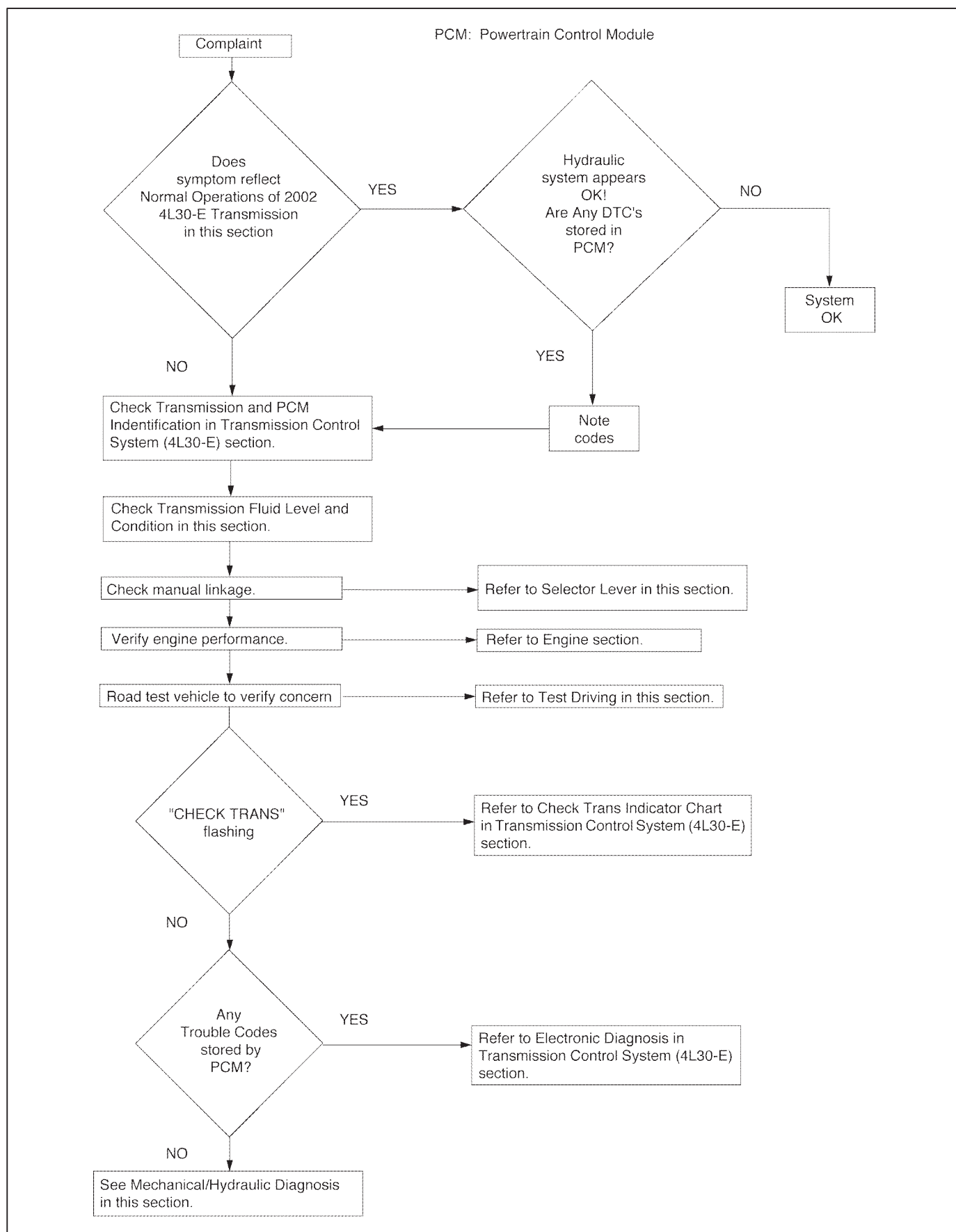
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Example of form completed.

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| A - Today's date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Month : April.....                                                                                             | Day : 13.....                                                                                                                                          | Year : 1994.....                                                                                                               |
| B - End User Name, Address :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Dave Smith<br>6584, Arlington road<br>Plymouth MI 48170<br>USA                                                 |                                                                                                                                                        |                                                                                                                                |
| C - Date of Problem :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Month : April.....                                                                                             | Day : 8.....                                                                                                                                           | Year : 1994.....                                                                                                               |
| D - Mileage :<br>12230 Miles / Km                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | E - With Ignition ON is CHECK<br>TRANS Indicator :<br>1- Flashing 2- Not Flashing                              | F - Car load when problem occurred :<br>1- Towing a trailer 2- 2 people OR ..... Kg                                                                    |                                                                                                                                |
| G - Weather conditions when problem :<br>1- Clear 2- Cloudy<br>3- Rain 4- Snow<br>5- Unstable 6- Any                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | H - Weather Temperature when problem :<br>1- Hot 2- Warm<br>3- Cool 4- Cold<br>5- Unstable 6- Any              | I - Road Conditions when problem :<br>1- Any 2- Inter City<br>3- Outside City 4- Highway<br>5- Uphill 6- Downhill<br>7- Unpaved 8- Snow<br>9- Others   | J - Frequency of the Problem :<br>1- Always 2- Occasional<br>..... times/day,<br>..... times/month<br>3- Only Once 4- Others : |
| K - Engine Condition :<br>1- Always 2- At Cold<br>3- During Warming up<br>4- After Warming or Hot<br>5- Others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | L - Engine Speed when the problem occurred :<br>1- Idling 2- Starting<br>3- Stalling 4- High RPM<br>5- Low RPM | M - Transmission Condition when it occurred :<br>1- Any 2- Idling<br>3- Starting 4- Driving<br>5- Accelerating 6- Coasting<br>7- In corner 8- Shifting | this means do not<br>take this into account                                                                                    |
| N - If there is a Transmission driveability problem BEFORE THE CHECK TRANS INDICATOR WAS FLASHING :<br>1- No Power in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>2- No shift in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>3- Shift Shock in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>4- Shift Slip in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>5- Shift Delayed in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>6- Shift Point too high in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>7- Shift Point too low in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>8- TCC Shudder in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>9- Noise in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1<br>Noise type : 1- Buzz 2- Whine 3- Clunk 4- Rattle 5- Whistle // 6- light 7- medium 8- heavy<br>10- Other : ..... in Range : All - P - R - N - D - 3 - 2 - L during a : upshift : 1-2 / 2-3 / 3-4 or downshift : 4-3 / 3-2 / 2-1 |                                                                                                                |                                                                                                                                                        |                                                                                                                                |
| O - Other customer concern and comments :<br><br>(This is just an example). Shift shock very harsh overall during a downshift. Not sure if it's the 4-3 or 3-2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                |                                                                                                                                                        |                                                                                                                                |
| P - Isuzu Vehicle Code :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 94 UCR                                                                                                         | Q - VIN Number                                                                                                                                         | 4S2CV58ZXM4324047                                                                                                              |
| R - Date of Vehicle Registration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Month : November.                                                                                              | Day : 18.....                                                                                                                                          | Year : 1993.....                                                                                                               |
| S - Trans. model :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4L30-E                                                                                                         | T - A/T Serial Number :                                                                                                                                | 96 358 654                                                                                                                     |
| U - Your name :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Joe Spring                                                                                                     |                                                                                                                                                        |                                                                                                                                |
| V - Dealer Name, Address, Phone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Kent Helfrich<br>Home-town ISUZU<br>900 - 999 - 9999                                                           |                                                                                                                                                        |                                                                                                                                |

**General Diagnosis Procedure**

## Preliminary Inspection Chart



## Checking Transmission Fluid Level and Condition

Checking fluid level and condition (color and odor) at regular intervals will provide early diagnosis information about the transmission. This information may be used to correct a condition that, if not detected early, could result in major transmission repairs.

**IMPORTANT:** When new, automatic transmission fluid is red in color. As the vehicle is driven, the transmission fluid will begin to look darker in color. The color may eventually appear light brown.

A dark brown color with burnt odor may indicate excessive fluid deterioration and signal a need for fluid change.

### Fluid Level

When adding or changing fluid, use only DEXRON®-III. Refer to *Maintenance and Lubrication in General Information section for maintenance information and servicing interval.*

#### CAUTION: DO NOT OVERFILL.

Overfilling will cause foaming, loss of fluid, abnormal shifting and possible damage to the transmission.

1. Park the vehicle on level ground and apply the parking brake firmly.
2. Check fluid level with engine running at idle.

NOTE: Be sure that transmission fluid temperature is below 30°C (86°F).

3. Move the selector lever through all gear ranges.
4. Move the selector lever to "Park".
5. Let engine idle for 3 minutes and open the overfill screw (1).
6. Add released transmission fluid until it flows out over the overfill screw opening.
7. Let engine idle until a fluid temperature between 32°C (90°F) and 57°C (135°F) is reached, then close the overfill screw (1).

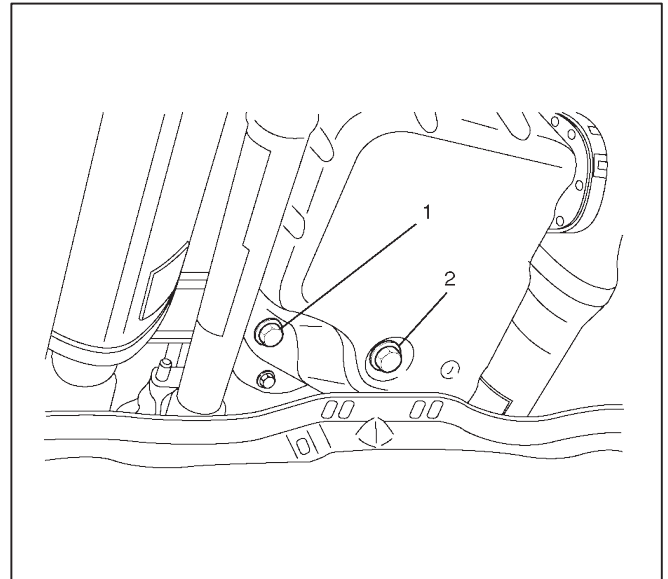
**Torque: 38 N•m (28 lb ft)**

NOTE: To prevent fluid leaks, the overfill screw and oil drain screws gasket must be replaced each time these screws are removed.

NOTE: Check transmission fluid temperature with scan tool.

Minimum fluid level → 57°C (135°F)

Maximum fluid level → 32°C (90°F)



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**CAUTION: Do not open overfill screw with engine stopped.**

**CAUTION: DO NOT CHECK FLUID LEVEL UNDER THESE CONDITIONS:**

- Immediately after driving at sustained highway speeds.
- In heavy city traffic during hot weather.
- If vehicle is towing a trailer.

If the vehicle has been operated under these conditions, shut the engine off and allow the vehicle to "cool" for thirty (30) minutes. After the cool down period, restart the vehicle and continue from step 2 above.

**Fluid Condition**

|                             | FLUID CONDITION                                                                                                                                          |                                                                                             |                                                                                                                                                                                                      |                                                                                                         |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                             | NORMAL*                                                                                                                                                  |                                                                                             | CONTAMINATED                                                                                                                                                                                         |                                                                                                         |
| COLOR                       | RED OR LIGHT BROWN                                                                                                                                       | BROWN                                                                                       | NON-TRANSPARENT / PINK                                                                                                                                                                               | BROWN                                                                                                   |
| DRAIN REQUIRED?             | NO                                                                                                                                                       | YES                                                                                         | YES                                                                                                                                                                                                  | YES                                                                                                     |
| CONTAMINATION               | NONE                                                                                                                                                     | Very small amount of foreign material in bottom of pan                                      | Contamination by coolant or other source                                                                                                                                                             | Large pieces of metal or other foreign material in bottom of pan                                        |
| CORRECT LEVEL AND CONDITION | 1. LOW LEVEL:<br>A. Add fluid to obtain proper level & check for external leaks.<br>B. Correct cause of leak.<br>2. HIGH LEVEL:<br>– Remove excess fluid | – Remove both pans<br>– Change filter<br>– Flush cooler<br>– Add new fluid<br>– Check level | – Repair/replace radiator cooler<br>– Transmission overhaul required<br>– Check for:<br>• Damaged plates and seals<br>• Contaminated solenoids<br>– Flush cooler<br>– Add new fluid<br>– Check level | – Transmission overhaul required<br>– Flush cooler and cooler lines<br>– Add new fluid<br>– Check level |

\*Fluid should be changed according to maintenance schedule.

**Test Driving**

Some 4L30-E automatic transmission complaints will require a test drive as a part of the diagnostic procedure. Some codes will not set unless the vehicle is moving. The purpose of the test drive is to duplicate the customer's complaint condition and set a current Powertrain Control Module (PCM) trouble code. Perform this procedure before each 4L30-E automatic transmission repair, and again after repairs are made.

**IMPORTANT:**

- Duplicate the condition under which the customer's complaint was observed.
- Depending on the complaint, the line pressure gauge and the scan tool may be required during the test drive.
- During the test drive, it is important to record all necessary data from the areas being monitored, for use in diagnosis. Also listen for and note any unusual noises.

The following procedure should be used to test drive 4L30-E automatic transmission complaint vehicles:

1. Turn the ignition ON without starting the engine. Check that the "CHECK TRANS" lamp comes on for approximately 2 seconds and then goes out and remains out.
  - If the lamp is flashing, GO TO **Check Trans Indicator** in Transmission Control System (4L30-E) section.

- If no serial data is present, GO TO **OBD System Check**. Refer to *Driveability and Emissions in Engine* section.

- If the lamp stays ON or stays OFF, GO TO "**Check Trans**" **Check** in Transmission Control System (4L30-E) section.

2. Drive the vehicle. During the test drive, be sure that the transmission achieves normal operating temperature (approx. 20 minutes).

Allow the transmission to go through all of its gear ranges, checking shift timing and firmness. Duplicate the owner's complaint condition as closely as possible during the test drive.

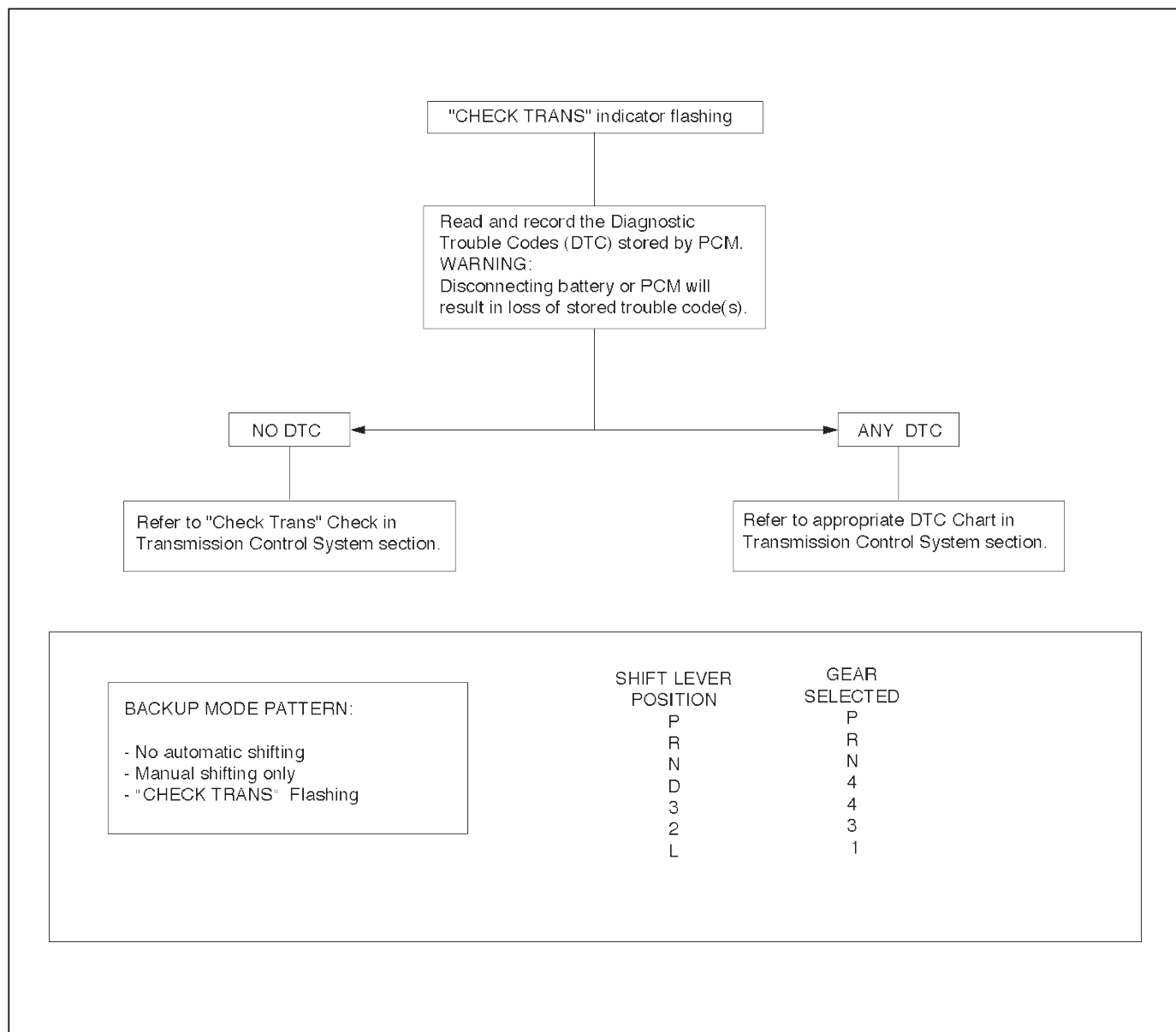
3. If, during the test drive, the "CHECK TRANS" lamp comes on, use the scan tool to check for trouble codes.
4. If, during the test drive, a problem is felt, but the "CHECK TRANS" lamp does not come on and no trouble codes are present, drive the vehicle with the PCM disconnected (manually shifting the vehicle).
  - In Manual L, the vehicle operates in first gear.
  - In Manual 2, the vehicle operates in third gear.
  - In Manual 3 or "D", the vehicle operates in fourth gear.

If the problem still exists with the PCM disconnected, refer to *Mechanical/Hydraulic Diagnosis in this section*.

5. If no problem has been found at this point, check all underhood connections that supply power to the PCM and ignition fuses. Physically and visually inspect all the PCM harness connectors for loose or corroded terminals. Inspect the PCM ground points.

## Mechanical / Hydraulic Diagnosis Check Trans Indicator Chart

**Perform Preliminary Inspection First!**



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When the "CHECK TRANS" indicator is flashing, it indicates that a problem related to the transmission, the Powertrain Control Module (PCM), or the vehicle harness has occurred.

The system is now operating in a "BACKUP MODE" where the risk of further damaging the transmission has been reduced. The vehicle may be shifted manually.

If the initial problem is intermittent or seldom, switching the engine OFF/ON might allow normal operation again until the problem reoccurs.

## Mechanical / Hydraulic Diagnosis Symptoms Index

Perform Preliminary Inspection First!

| CHART | SYMPTOMS                                                                |
|-------|-------------------------------------------------------------------------|
| 1     | NO ENGINE START IN NEUTRAL OR PARK                                      |
| 2     | NO FORWARD GEARS IN ANY RANGE/NO REVERSE                                |
| 3     | NO ENGINE BRAKE IN ANY RANGE                                            |
| 4     | POOR SHIFTING IN ALL GEARS (ALL HARSH OR ALL SOFT)                      |
| 5a    | DELAYS IN DRIVE AND REVERSE                                             |
| 5b    | DELAYS IN REVERSE ONLY                                                  |
| 6     | DIAGNOSTIC TROUBLE CODE (DTC) P0730                                     |
| 7     | HARSH 1–2 SHIFT                                                         |
| 8     | HARSH 3–4 SHIFT                                                         |
| 9a    | 3–2 DOWNSHIFT COMPLAINT                                                 |
| 9b    | HARSH SHIFT WHEN SHIFTING INTO “D” OR ACCELERATING FROM STOP            |
| 9c    | COASTDOWN HARSH SHIFT OR CLUNK AT 3–2 DOWNSHIFT                         |
| 10    | INTERMITTENT 4TH TO 2ND GEAR DOWNSHIFT AT STEADY SPEED                  |
| 11    | ENGINE FLARE AT SHIFTING DURING TURNING ONLY (USUALLY WITH WARM ENGINE) |
| 12    | ENGINE FLARE DURING 1–2 OR 2–3 SHIFT                                    |
| 13    | SHUDDER ONLY DURING TORQUE CONVERTER CLUTCH (TCC) APPLYING              |
| 14    | POSSIBLE CAUSES OF TRANSMISSION NOISE                                   |
| 15a   | POSSIBLE CAUSES OF LOW LINE PRESSURE                                    |
| 15b   | POSSIBLE CAUSES OF HIGH LINE PRESSURE                                   |
| 16    | POSSIBLE CAUSES OF TRANSMISSION FLUID LEAKS                             |

NOTE: Numbers with parenthesis on the following charts refer to *Parts List at end of this section*.

### Chart 1: No Engine Start In Neutral Or Park

| Step | Action                                                                                  | Yes                       | No                       |
|------|-----------------------------------------------------------------------------------------|---------------------------|--------------------------|
| 1    | Does engine start when shift lever moved from drive to neutral mostly in hot condition? | Go to <i>Step 2</i>       | Go to <i>Step 3</i>      |
| 2    | Does engine start in park at any condition?                                             | Re–test vehicle           | Go to <i>Step 4</i>      |
| 3    | Does engine also not start in neutral when shift lever moved from park to neutral?      | Go to <i>Step 4</i>       | Go to <i>Step 5</i>      |
| 4    | Check mode switch (63) setting. Readjust if necessary.<br>Problems fixed?               | Re–test vehicle           | Go to <i>Step 5</i>      |
| 5    | Check start circuit of mode switch (63) open in neutral.<br>Was open found?             | Locate and repair open(s) | Replace mode switch (63) |

**7A-14 AUTOMATIC TRANSMISSION (4L30-E)****Chart 2: No Forward Gears In Any Range/No Reverse**

| Step | Action                                                                                                                                                                                                                                             | Yes                 | No                                                                              |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                                                                                             | Go to <i>Step 2</i> | Use Chart 15a:<br>Possible Causes<br>of Low Line<br>Pressure in this<br>section |
| 2    | 1. Check internal linkage:<br>– Manual linkage (58) not moving manual valve (326).<br>2. Check for internal mechanical damage:<br>– Turbine shaft (506) broken loose.<br>– Overrun roller clutch (516) broken loose.<br><br>Was the problem found? | Repair or replace   | —                                                                               |

**Chart 3: No Engine Brake In Any Range**

| Step | Action                                                                                                                                                                                                                                                                                                                                                              | Yes                 | No                                                                              |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                                                                                                                                                                                                              | Go to <i>Step 2</i> | Use Chart 15a:<br>Possible Causes<br>of Low Line<br>Pressure in this<br>section |
| 2    | 1. Check for overrun clutch leaks caused by:<br>– Damaged piston lip (513)<br>– Check ball defective (504)<br>2. Check for overrun lockout valve (705) stuck by foreign material.<br>3. Check for leaks at turbine shaft (506) caused by:<br>– Teflon seal rings damaged (508)<br>– Excessive wear of turbine shaft bearing surfaces.<br><br>Was the problem found? | Repair or replace   | —                                                                               |

**Chart 4: Poor Shifting In All Gears (All Harsh Or All Soft)**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes                         | No                                                                   |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                                                                                                                                                                                                                                                                                                                              | Go to <i>Step 2</i>         | Go to <i>Step 3</i>                                                  |
| 2    | 1. Check for these conditions which could affect clutch apply time:<br>– Defective band apply solenoid (323).<br>– Defective servo or/and accumulator piston.<br>– Excessive clutch piston travel.<br>2. Check of possible causes of internal leaks:<br>– Cut or damaged sealing ring(s)<br>– Damaged sealing gasket(s)<br>– Check ball missing or out of location in 2nd and 3rd clutch pistons.<br>3. Check for causes of burned clutch plates or band.<br>Was the problem found? | Repair or replace           | —                                                                    |
| 3    | Was the line pressure high?                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Go to <i>Step 4</i>         | Use Chart 15a: Possible Causes of Low Line Pressure in this section  |
| 4    | Does DTC P0705 set?                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Diagnose those DTC(s) first | Use Chart 15b: Possible Causes of High Line Pressure in this section |

**Chart 5a: Delays In Drive And Reverse**

NOTE: A short delay (less than 3 seconds) when first engaging drive or reverse after allowing vehicle to sit overnight is normal.

| Step | Action                                                                                                 | Yes                                                                                                                                  | No                                                                   |
|------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal? | More than 3 second delay in drive and reverse with engine off 1 hour or less.<br>Teflon seals (508) on turbine shaft damaged. Repair | Use Chart 15a: Possible Causes of Low Line Pressure in this section. |

**Chart 5b: Delays In Reverse Only**

| Step | Action                                                                                                                                                                                                            | Yes                 | No                                                                   |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                                                            | Go to <i>Step 2</i> | Use Chart 15a: Possible Causes of Low Line Pressure in this section. |
| 2    | Main case valve body gasket (88) damaged.<br>– Reverse check ball (85) in valve body (84) missing or out of location.<br>– Check for restrictions at valve body transfer plate orifice.<br>Was the problem found? | Repair              | —                                                                    |

**Chart 6: Diagnostic Trouble Code (DTC) P0730**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes                                                     | No                                                                               |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Go to <i>Step 2</i>                                     | Use Chart 15b:<br>Possible Causes<br>of High Line<br>Pressure in this<br>section |
| 2    | 1. 1st and 2nd gear missing or 3rd and 4th gear missing.<br>Check appropriate shift valve. If OK replace solenoid.<br>2. No engine brake in any range (All ranges in Drive and Reverse<br>are OK).<br>Check for suspected conditions modifying delays to clutch<br>apply:<br>– Overrun clutch seal damaged.<br>– Excessive overrun clutch piston travel.<br>– Defective 3–4 accumulator piston.<br>– Causes of internal leaks.<br>– Causes of burned clutch plates.<br>3. 1st and 4th gear missing or 2nd and 3rd gear missing.<br>Shift solenoid A stuck. Replace shift solenoid A.<br>4. DTC P0730 is set in D range 1st gear above 3500 rpm.<br>Go to <i>Step 3</i> .<br>5. DTC P0730 is set in D range 3rd gear between 55-80 mph.<br>NOTE: Perform this test within safe and legal limits.<br>Check for suspected conditions modifying delays to clutch<br>apply:<br>– 4th clutch seal damaged.<br>– Excessive 4th clutch piston travel.<br>– Defective 3–4 accumulator piston.<br>– Causes of internal leaks.<br>– Causes of burned clutch plates.<br>Was the problem found? | Repair or replace                                       | —                                                                                |
| 3    | Check 3rd gear in “D” in winter mode.<br>Does vehicle move?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Shift solenoid A<br>stuck. Replace<br>shift solenoid A. | Go to <i>Step 4</i>                                                              |
| 4    | Check for suspected conditions modifying delays to clutch apply:<br>– 2nd clutch seal damaged.<br>– Excessive 2nd clutch piston travel.<br>– Defective accumulator piston.<br>– Causes of internal leaks.<br>– Check ball missing or out of location in 2nd clutch.<br>– Seals cut, damaged or missing.<br>– Gaskets defective.<br>– Causes of burned clutch plates.<br>Was the problem found?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Repair or replace                                       | —                                                                                |

**Chart 7: Harsh 1–2 Shift**

| Step | Action                                                                                                 | Yes                                                                                      | No                                                                    |
|------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal? | Check for 1–2 accumulator valve (320) stuck by foreign material in main case valve body. | Use Chart 15b: Possible Causes of High Line Pressure in this section. |

**Chart 8: Harsh 3–4 Shift**

| Step | Action                                                                                                                                                                             | Yes                 | No                                                                   |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                             | Go to <i>Step 2</i> | Use Chart 15b: Possible Causes of High Line Pressure in this section |
| 2    | 1. Check for 3–4 accumulator valve (407) stuck in adapter case valve body (401).<br>2. Check for 3–4 accumulator piston (18) stuck in adapter case (20).<br>Was the problem found? | Repair or replace   | —                                                                    |

**Chart 9a: 3–2 Downshift Complaint**

| Step | Action                                                                                                 | Yes                  | No                                                                  |
|------|--------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal? | Go to <i>Step 2</i>  | Use Chart 15a: Possible Causes of Low Line Pressure in this section |
| 2    | Does DTC P1850 set?                                                                                    | Diagnose P1850 first | Replace band apply solenoid (PWM) (323)                             |

**Chart 9b: Harsh Shift When Shifting Into “D” Or Accelerating From Stop**

| Step | Action                                                                                                 | Yes                  | No                                                                   |
|------|--------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal? | Go to <i>Step 2</i>  | Use Chart 15b: Possible Causes of High Line Pressure in this section |
| 2    | Does DTC P1850 set?                                                                                    | Diagnose P1850 first | Replace band apply solenoid (PWM) (323)                              |

**Chart 9c: Coastdown Harsh Shift Or Clunk At 3-2 Downshift**

| Step | Action                                                                                                 | Yes                     | No                                                                               |
|------|--------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal? | Go to <i>Step 2</i>     | Use Chart 15b:<br>Possible Causes<br>of High Line<br>Pressure in this<br>section |
| 2    | Does DTC P1850 set?                                                                                    | Diagnose P1850<br>first | Replace band<br>apply solenoid<br>(PWM) (323)                                    |

**Chart 10: Intermittent 4TH TO 2ND Gear Downshift At Steady Speed**

| Step | Action                                                                                                                                                                                                                  | Yes                                                    | No                       |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|
| 1    | Check for consistent speed sensor reading with scan tool.<br>Was the reading correct?                                                                                                                                   | Replace mode<br>switch for<br>intermittent<br>contact. | Go to <i>Step 2</i>      |
| 2    | 1. Check for wiring harness damage or short to ground. If OK, go to (2).<br>2. Check transmission speed sensor connections. If OK, go to (3).<br>3. Replace transmission speed sensor.<br>Was the replacement complete? | —                                                      | Replace speed<br>sensor. |

**Chart 11: Engine Flare At Shifting During Turning Only (Usually With Warm Engine)**

| Step | Action                                                         | Yes                                              | No |
|------|----------------------------------------------------------------|--------------------------------------------------|----|
| 1    | Check for oil leaks at transmission.<br>Was the problem found? | Replace<br>transmission oil<br>filter and gasket | —  |

**Chart 12: Engine Flare During 1-2 Or 2-3 Shift**

| Step | Action                                                                                                                                                                      | Yes                 | No                                                                              |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------|
| 1    | Check line pressure. Refer to <i>Line Pressure Test in this section</i> .<br>Was line pressure normal?                                                                      | Go to <i>Step 2</i> | Use Chart 15a:<br>Possible Causes<br>of Low Line<br>Pressure in this<br>section |
| 2    | 1. Check for a stuck 1-2 accumulator valve (320).<br>2. Check for servo piston (106) leaks.<br>3. Check for a stuck band apply solenoid (323).<br>Was line pressure normal? | Repair or replace   | —                                                                               |

**Chart 13: Shudder Only During Torque Converter Clutch (TCC) Applying**

| Step | Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Yes                                                                                                                                                   | No                                                                   |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 1    | <p>1. TCC shudder is one of the most commonly misdiagnosed conditions in an automatic transmission. The key to diagnosing TCC shudder is to note when it happens and under what conditions. Once the TCC has been fully applied, it is nearly impossible to make it shudder. TCC shudder (short burst of noise normally less than 1 second) will only occur during clutch applying. It is not a steady state condition.</p> <p>2. Drive until whole drivetrain is at normal operating temperature.</p> <ul style="list-style-type: none"> <li>– On 4WD vehicles, the test must be performed with transfer case selector lever in “2H” position.</li> <li>– Shudder is a short burst of noise normally less than 1 second in duration, and can be induced by the following maneuver:</li> </ul> <p>3. From coast condition at 50 mph in “D” range (Normal mode), depress the throttle to 1/4-1/3 throttle. If present, shudder will occur within 5 seconds together with TCC application. (The scan tool may be used to determine the exact time of TCC applying)</p> <p>Was the problem found?</p> | <p>Replace transmission fluid and filter (remove both pans) and flush cooler lines.</p> <p>Replace converter assembly and O-ring on turbine shaft</p> | <p>Perform mechanical inspection of other drivetrain components.</p> |

**Chart 14: Possible Causes Of Transmission Noise**

**CAUTION:** Before checking transmission for what is believed to be transmission noise, ensure presence and positioning of insulating plugs, pads etc. Also make sure that noise does not come from other drivetrain components.

| Condition                                             | Possible cause                        | Correction                                                     |
|-------------------------------------------------------|---------------------------------------|----------------------------------------------------------------|
| Whine or Buzz                                         | Oil level low                         | Fill with ATF, check for external leaks.                       |
|                                                       | Plugged or restricted oil filter      | Inspect oil filter.<br>Replace oil filter or ATF as necessary. |
|                                                       | Damaged oil filter gasket             | Replace oil filter gasket.                                     |
| Knocking noise from front of transmission.            | Loose bolts (Converter to flex plate) | Tighten to specifications.                                     |
|                                                       | Cracked or broken flex plate          | Replace flex plate.                                            |
|                                                       | Converter damaged                     | Replace converter.                                             |
| Knocking noise while driving, mostly on acceleration. | Transmission mount loose or broken    | Tighten mount bolts or replace transmission mount.             |
|                                                       | Cooler line mounts loose or broken    | Tighten or replace cooler line mounts.                         |
|                                                       | Cooler lines touching body or frame   | Repair or replace as necessary.                                |
| Knocking noise when vehicle is stationary.            | Loose flex plate mounting bolts       | Tighten to specifications.                                     |
|                                                       | Cracked or broken flex plate          | Replace flex plate.                                            |
|                                                       | Damaged converter                     | Replace converter.                                             |

**Chart 15a: Possible Causes of Low Line Pressure**

| Step | Action                                                                                                                                                                 | Yes                                                                         | No                   |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------|
| 1    | Check oil level.<br>Was the problem found?                                                                                                                             | Fill with ATF                                                               | Go to <i>Step 2</i>  |
| 2    | Check for defective throttle position sensor.<br>Was the problem found?                                                                                                | Replace throttle position sensor                                            | Go to <i>Step 3</i>  |
| 3    | Check for plugged, loose, or damaged oil filter (79).<br>Was the problem found?                                                                                        | Inspect oil filter, tighten bolts or replace oil filter (79)                | Go to <i>Step 4</i>  |
| 4    | Check for a stuck force motor plunger (404). (Adapter case valve body)<br>Was the problem found?                                                                       | Replace force motor plunger (404)                                           | Go to <i>Step 5</i>  |
| 5    | Check for a stuck feed limit valve (412). (Adapter case valve body)<br>Was the problem found?                                                                          | Replace feed limit valve (412)                                              | Go to <i>Step 6</i>  |
| 6    | Check for loose converter bolts (4 & 5).<br>Was the problem found?                                                                                                     | Tighten converter bolts (4 & 5)                                             | Go to <i>Step 7</i>  |
| 7    | Check for a stuck pressure regulator valve (217). (Oil pump)<br>Was the problem found?                                                                                 | Replace pressure regulator valve (217)                                      | Go to <i>Step 8</i>  |
| 8    | Check for a stuck boost valve (213). (Oil pump)<br>Was the problem found?                                                                                              | Replace boost valve (213)                                                   | Go to <i>Step 9</i>  |
| 9    | Check for blocked intermediate oil passages to pressure regulator valve. (Oil pump)<br>Was the problem found?                                                          | Replace oil pump                                                            | Go to <i>Step 10</i> |
| 10   | Check for defective oil pump (9, 201, 202 & 228).<br>Was the problem found?                                                                                            | Replace oil pump                                                            | Go to <i>Step 11</i> |
| 11   | Check for internal leaks.<br>– Check balls missing or out of location in valve bodies<br>– Seals cut or damaged<br>– Gaskets defective, etc.<br>Was the problem found? | Install balls, or correct ball location<br>Replace seals<br>Replace gaskets | —                    |

**Chart 15b: Possible Causes Of High Line Pressure**

NOTE: If transmission is operating in backup mode, high line pressure will be present.

| Step | Action                                                                                                                                                                 | Yes                                                                         | No                    |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------|
| 1    | Check for defective throttle position sensor.<br>Was the problem found?                                                                                                | Replace throttle position sensor.                                           | Go to <i>Step 2</i> . |
| 2    | Check for a stuck force motor plunger (404). (Open circuit/intermittent) (Adapter case valve body)<br>Was the problem found?                                           | Replace force motor plunger (404)                                           | Go to <i>Step 3</i>   |
| 3    | Check for a stuck feed limit valve (412). (Adapter case valve body)<br>Was the problem found?                                                                          | Replace force motor plunger (412)                                           | Go to <i>Step 4</i>   |
| 4    | Check converter bolts (4 & 5).<br>Was the problem found?                                                                                                               | Tighten converter bolts (4 & 5)                                             | Go to <i>Step 5</i>   |
| 5    | Check for a stuck pressure regulator valve (217). (Oil pump)<br>Was the problem found?                                                                                 | Replace pressure regulator valve (217)                                      | Go to <i>Step 6</i>   |
| 6    | Check for a stuck boost valve (213). (Oil pump)<br>Was the problem found?                                                                                              | Replace boost valve (213)                                                   | Go to <i>Step 7</i>   |
| 7    | Check for internal leaks.<br>– Check balls missing or out of location in valve bodies<br>– Seals cut or missing<br>– Gaskets defective, etc.<br>Was the problem found? | Install balls, or correct ball location<br>Replace seals<br>Replace gaskets | —                     |

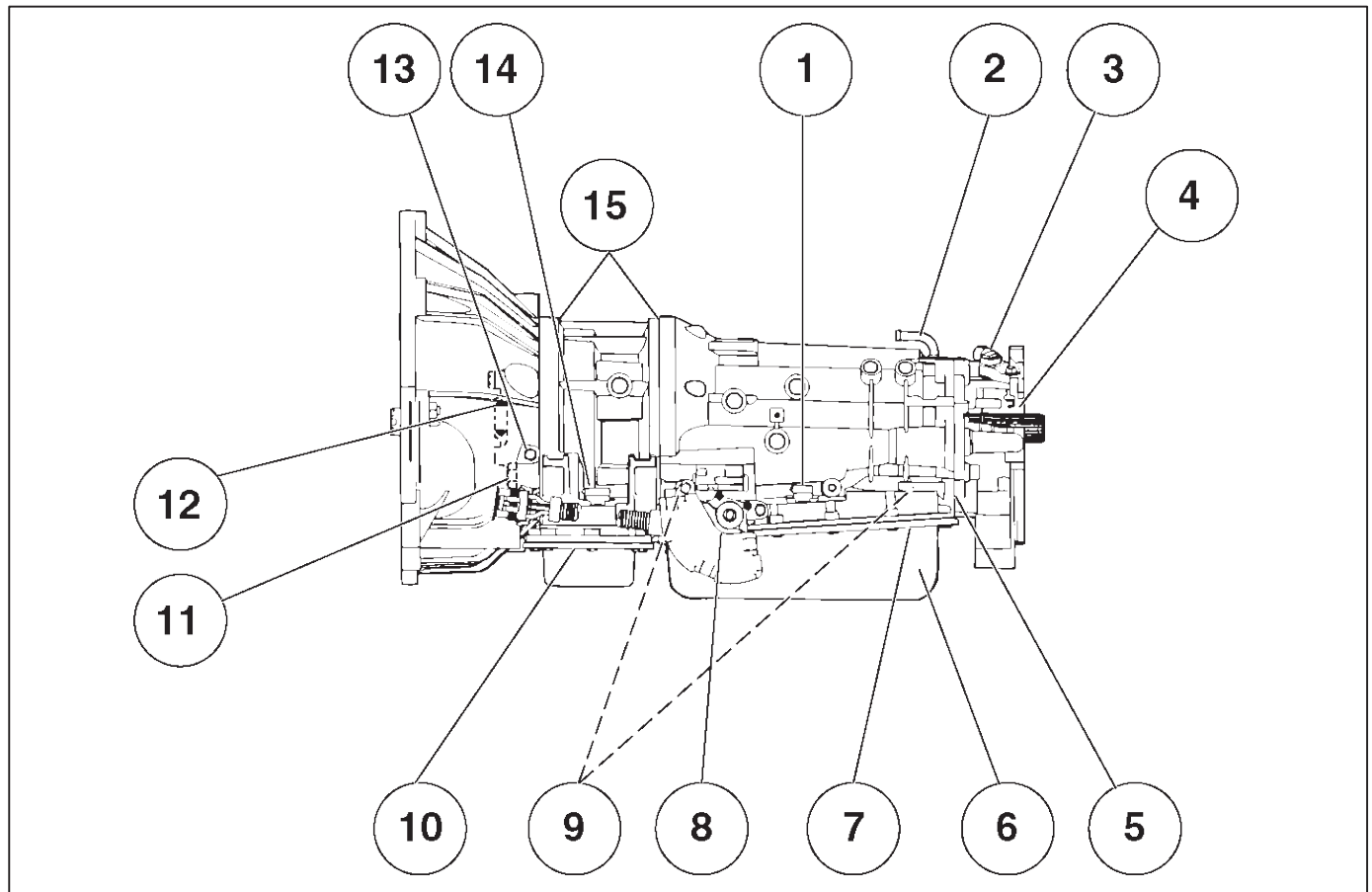
### Chart 16: Possible Causes Of Transmission Fluid Leaks

Before attempting to correct an oil leak, the actual source of the leak must be determined. In many cases, the source of the leak may be difficult to determine due to "wind flow" around the engine and transmission. The suspected area should be wiped clean before inspecting for the source of the leak.

Oil leaks around the engine and transmission are generally carried toward the rear of the vehicle by the air stream. In determining the source of an oil leak, the following two checks should be made:

1. With the engine running, check for external line pressure leaks.
2. With the engine off, check for oil leaks due to the raised oil level caused by drainback of converter oil into the transmission.

### Possible Causes Of Fluid Leaks Due To Sealing Malfunction



240RX008

#### Legend

- |                                             |                                                              |
|---------------------------------------------|--------------------------------------------------------------|
| (1) Electrical Connector (Main Case) Seal   | (9) Oil Cooler Connectors (2)                                |
| (2) Transmission Vent (Breather)            | (10) Oil Pan Gasket (Adapter Case)                           |
| (3) Speed Sensor O-Ring                     | (11) Converter housing attaching bolts not correctly torqued |
| (4) Extension (Adapter) Lip Seal            | (12) Converter Housing Lip Seal                              |
| (5) Extension (Adapter) to Main Case Gasket | (13) Line Pressure Tap Plug                                  |
| (6) Overfill and Oil Drain Screws Gasket    | (14) Electrical Connector (Adapter Case) Seal                |
| (7) Oil Pan Gasket (Main Case)              | (15) Adapter Case Seal Rings (2)                             |
| (8) Selector Shaft Seal                     |                                                              |

## Stall Test

The stall test allows you to check the transmission for internal abrasion and the one way clutch for slippage. Torque converter performance can also be evaluated. The stall test results together with the road test results will identify transmission components requiring servicing or adjustment.

### Stall Test Procedure:

1. Check the level of the engine coolant, the engine oil, and the automatic transmission fluid. Replenish if necessary.
2. Block the wheels and set the parking brake.
3. Connect a tachometer to the engine.
4. Start the engine and allow it to idle until the engine coolant temperature reaches 70 – 80°C (158 – 176°F).
5. Hold the brake pedal down as far as it will go.
6. Place the selector in the “D” range.
7. Gradually push the accelerator pedal to the floor. The throttle valve will be fully open.  
Note the engine speed at which the tachometer needle stabilizes.

**Stall Speed : 2,100 ±150 rpm**

NOTE: Do not continuously run this test longer than 5 seconds.

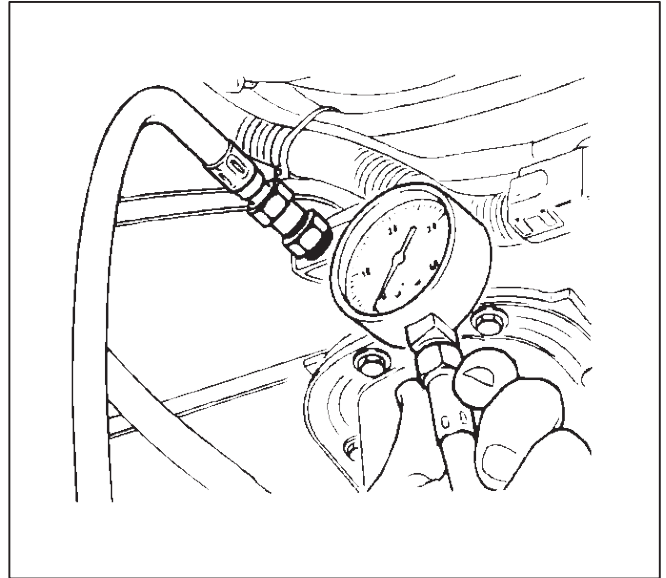
8. Release the accelerator pedal.
9. Place the selector in the “N” range.
10. Run the engine at 1,200 rpm for one minute. This will cool the transmission fluid.
11. Repeat Steps 7 – 10 for the “3”, “2”, “L” and “R” ranges.

## Line Pressure Test

The line pressure test checks oil pump and control valve pressure regulator valve function. It will also detect oil leakage.

### Line Pressure Test Procedure:

1. Check the level of the engine coolant, the engine oil, and the automatic transmission fluid. Replenish if required.
2. Block the wheels and set the parking brake.
3. Remove the pressure detection plug at the left side of the transmission case.  
Set J-29770-A pressure gauge and adapter to the pressure detection plug hole.



4. Start the engine and allow it to idle until the engine coolant temperature reaches 70 – 80°C (158 – 176°F).
5. Hold the brake pedal down as far as it will go.
6. Place the selector in the “D” range.
7. Note the pressure gauge reading with the engine idling.
8. Gradually push the accelerator pedal to the floor. The throttle valve will be fully open.  
Note the pressure gauge reading with the accelerator pedal fully depressed.

NOTE: Do not continuously run this test longer than 5 seconds.

9. Release the accelerator pedal.
10. Place the selector in the “N” range.
11. Run the engine at 1,200 rpm for one minute. This will cool the transmission fluid.
12. Repeat Steps 7 – 11 for the “3”, “2”, “L”, and “R” ranges.
13. Install a pressure detection plug to the transmission case, applying recommended thread locking agent (LOCTITE 242) or its equivalent to thread of plug. Make sure that thread is cleaned before applying locking agents.
14. Tighten the pressure detection plug to the specified torque.

**Torque: 9 – 14N·m (7 – 10lb ft)**

**7A-24    AUTOMATIC TRANSMISSION (4L30-E)**

| MODE                   | LEVER POSITION | ENGINE SPEED | LINE PRESSURE |           | FORCE MOTOR CURRENT (mA) |
|------------------------|----------------|--------------|---------------|-----------|--------------------------|
|                        |                |              | kPa           | PSI       |                          |
| NORMAL/POWER           | D,3,2,L        | IDLE         | 590 – 730     | 86 – 106  | 680 – 720                |
| WINTER                 | D              | IDLE         | 300 – 390     | 44 – 57   | 1,020 – 1,060            |
| NORMAL/POWER<br>WINTER | REVERSE        | IDLE         | 460 – 630     | 67 – 91   | 880 – 920                |
| NORMAL/POWER           | D, 3, 2, L     | STALL SPEED  | 1,250 – 1,380 | 181 – 200 | 70 – 110                 |
| WINTER                 | D              | STALL SPEED  | 1,250 – 1,380 | 181 – 200 | 70 – 110                 |
| NORMAL/POWER<br>WINTER | REVERSE        | STALL SPEED  | 1,400 – 1,580 | 203 – 229 | 340 – 380                |

**Shift Speed Chart**

|                      |             |
|----------------------|-------------|
| Transfer gear ratio: | High: 1.000 |
| Rear axle ratio:     | 4.300       |

**“Normal mode”****Upshift**

| Range         | Throttle opening | 1 → 2<br>(First Gear) (Second Gear)<br>km/h (mph) | 2 → 3<br>(Second Gear) (Third Gear)<br>km/h (mph) | 3 → 4<br>(Third Gear) (Fourth Gear)<br>km/h (mph) |
|---------------|------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| D<br>(Drive)  | Fully opened     | 53 ~ 59 (33 ~ 37)                                 | 110 ~ 116 (68 ~ 72)                               | 166 ~ 172 (103 ~ 107)                             |
|               | Half throttle    | 32 ~ 38 (20 ~ 24)                                 | 57 ~ 63 (35 ~ 39)                                 | 99 ~ 105 (61 ~ 65)                                |
| 3<br>(Third)  | Fully opened     | 53 ~ 59 (33 ~ 37)                                 | 110 ~ 116 (68 ~ 72)                               | —                                                 |
|               | Half throttle    | 32 ~ 38 (20 ~ 24)                                 | 57 ~ 63 (35 ~ 39)                                 | —                                                 |
| 2<br>(Second) | Fully opened     | 53 ~ 59 (33 ~ 37)                                 | —                                                 | —                                                 |
|               | Half throttle    | 32 ~ 38 (20 ~ 24)                                 | —                                                 | —                                                 |

**Downshift**

| Range         | Throttle opening | 1 ← 2<br>(First Gear) (Second Gear)<br>km/h (mph) | 2 ← 3<br>(Second Gear) (Third Gear)<br>km/h (mph) | 3 ← 4<br>(Third Gear) (Fourth Gear)<br>km/h (mph) |
|---------------|------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| D<br>(Drive)  | Fully opened     | 45 ~ 51 (28 ~ 32)                                 | 97 ~ 103 (60 ~ 64)                                | 155 ~ 161 (96 ~ 100)                              |
|               | Half throttle    | 14 ~ 20 (9 ~ 12)                                  | 33 ~ 39 (20 ~ 24)                                 | 64 ~ 70 (40 ~ 43)                                 |
|               | Fully closed     | 13 ~ 19 (8 ~ 12)                                  | 19 ~ 25 (12 ~ 16)                                 | 27 ~ 33 (17 ~ 21)                                 |
| 3<br>(Third)  | Fully opened     | 45 ~ 51 (28 ~ 32)                                 | 97 ~ 103 (60 ~ 64)                                | —                                                 |
|               | Half throttle    | 14 ~ 20 (9 ~ 12)                                  | 33 ~ 39 (20 ~ 24)                                 | —                                                 |
|               | Fully closed     | 13 ~ 19 (8 ~ 12)                                  | 19 ~ 25 (12 ~ 16)                                 | —                                                 |
| 2<br>(Second) | Fully opened     | 45 ~ 51 (28 ~ 32)                                 | 92 ~ 98 (57 ~ 61)                                 | —                                                 |
|               | Half throttle    | 14 ~ 20 (9 ~ 12)                                  | 92 ~ 98 (57 ~ 61)                                 | —                                                 |
|               | Fully closed     | 13 ~ 19 (8 ~ 12)                                  | 92 ~ 98 (57 ~ 61)                                 | —                                                 |
| L<br>(First)  | —                | 48 ~ 54 (30 ~ 34)                                 | —                                                 | —                                                 |

**“Power mode”****Upshift**

| Range         | Throttle opening | 1 → 2<br>(First Gear) (Second Gear)<br>km/h (mph) | 2 → 3<br>(Second Gear) (Third Gear)<br>km/h (mph) | 3 → 4<br>(Third Gear) (Fourth Gear)<br>km/h (mph) |
|---------------|------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| D<br>(Drive)  | Fully opened     | 53 ~ 59 (33 ~ 37)                                 | 110 ~ 116 (68 ~ 72)                               | 174 ~ 180 (108 ~ 112)                             |
|               | Half throttle    | 41 ~ 47 (25 ~ 29)                                 | 84 ~ 90 (52 ~ 56)                                 | 136 ~ 142 (84 ~ 88)                               |
| 3<br>(Third)  | Fully opened     | 53 ~ 59 (33 ~ 37)                                 | 110 ~ 116 (68 ~ 72)                               | —                                                 |
|               | Half throttle    | 41 ~ 47 (25 ~ 29)                                 | 84 ~ 90 (52 ~ 56)                                 | —                                                 |
| 2<br>(Second) | Fully opened     | 53 ~ 59 (33 ~ 37)                                 | —                                                 | —                                                 |
|               | Half throttle    | 41 ~ 47 (25 ~ 29)                                 | —                                                 | —                                                 |

**Downshift**

| Range         | Throttle opening | 1 ← 2<br>(First Gear) (Second Gear)<br>km/h (mph) | 2 ← 3<br>(Second Gear) (Third Gear)<br>km/h (mph) | 3 ← 4<br>(Third Gear) (Fourth Gear)<br>km/h (mph) |
|---------------|------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| D<br>(Drive)  | Fully opened     | 45 ~ 51 (28 ~ 32)                                 | 104 ~ 110 (65 ~ 68)                               | 163 ~ 169 (101 ~ 105)                             |
|               | Half throttle    | 22 ~ 28 (14 ~ 17)                                 | 57 ~ 63 (35 ~ 39)                                 | 108 ~ 114 (67 ~ 71)                               |
|               | Fully closed     | 13 ~ 19 (8 ~ 12)                                  | 23 ~ 29 (14 ~ 18)                                 | 46 ~ 52 (29 ~ 32)                                 |
| 3<br>(Third)  | Fully opened     | 45 ~ 51 (28 ~ 32)                                 | 104 ~ 110 (65 ~ 68)                               | —                                                 |
|               | Half throttle    | 22 ~ 28 (14 ~ 17)                                 | 57 ~ 63 (35 ~ 39)                                 | —                                                 |
|               | Fully closed     | 13 ~ 19 (8 ~ 12)                                  | 23 ~ 29 (14 ~ 18)                                 | —                                                 |
| 2<br>(Second) | Fully opened     | 45 ~ 51 (28 ~ 32)                                 | 92 ~ 98 (57 ~ 61)                                 | —                                                 |
|               | Half throttle    | 22 ~ 28 (14 ~ 17)                                 | 92 ~ 98 (57 ~ 61)                                 | —                                                 |
|               | Fully closed     | 13 ~ 19 (8 ~ 12)                                  | 92 ~ 98 (57 ~ 61)                                 | —                                                 |
| L<br>(First)  | —                | 48 ~ 54 (30 ~ 34)                                 | —                                                 | —                                                 |

**“Winter mode”**

|                               |                            |
|-------------------------------|----------------------------|
| D range, winter mode ON → OFF | 31 ~ 37 km/h (19 ~ 23 mph) |
|-------------------------------|----------------------------|

**Lockup Speed Chart**

|                     |             |
|---------------------|-------------|
| Transfer gear ratio | High: 1.000 |
| Rear axle ratio     | 4.300       |

| D range Throttle<br>opening 6% | Mode   | ECCC Apply           |                      |                      | ECCC Release         |                      |                      |
|--------------------------------|--------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                                |        | 2nd<br>Km/h<br>(mph) | 3rd<br>Km/h<br>(mph) | 4th<br>Km/h<br>(mph) | 2nd<br>Km/h<br>(mph) | 3rd<br>Km/h<br>(mph) | 4th<br>Km/h<br>(mph) |
|                                | Normal | 57 ~ 63<br>(35 ~ 39) | 42 ~ 48<br>(26 ~ 30) | 43 ~ 49<br>(27 ~ 31) | 52 ~ 58<br>(32 ~ 36) | 32 ~ 38<br>(20 ~ 24) | 41 ~ 47<br>(25 ~ 29) |
|                                | Power  | 57 ~ 63<br>(35 ~ 39) | 67 ~ 73<br>(42 ~ 45) | 57 ~ 63<br>(35 ~ 39) | 52 ~ 58<br>(32 ~ 36) | 32 ~ 38<br>(20 ~ 24) | 49 ~ 55<br>(30 ~ 34) |

## Changing Transmission Fluid

There is no need to change the transmission fluid unless the transmission is used under one or more of the following heavy duty conditions.

- A. Repeated short trips
- B. Driving on rough roads
- C. Driving on dusty roads
- D. Towing a trailer

If the vehicle is used under these conditions, change the fluid every 20,000 miles (32,000 km).

1. Place a large drain pan under the oil pan.
2. Remove the transmission oil drain screw (2) and drain fluid.
3. Tighten drain screw (2).

**Torque: 38 N•m (28 lb ft)**

4. Remove the transmission overfill screw (1) and fill transmission through overfill screw opening, using DEXRON®-III ATF.

NOTE: Add transmission fluid until it flows out over the overfill screw opening.

5. Let engine idle until a fluid temperature between 32°C (90°F) and 57°C (135°F) is reached.
6. Add transmission fluid until it flows out over the overfill screw opening, then close the overfill screw (1).

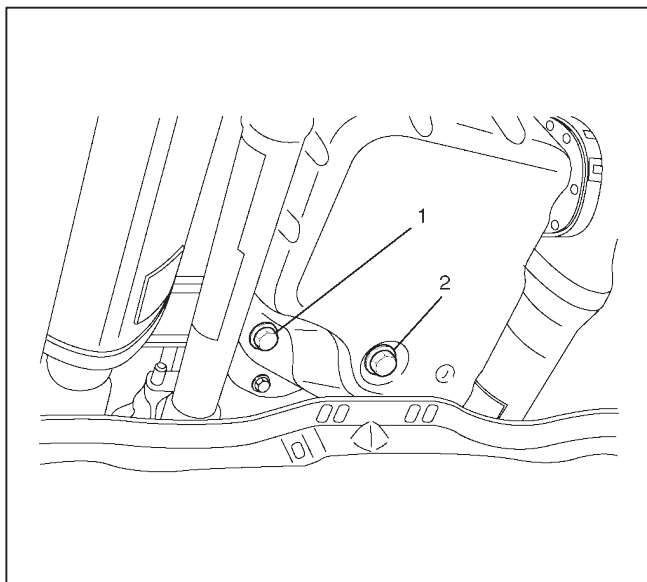
**Torque: 38 N•m (28 lb ft)**

NOTE: To prevent fluid leaks, the overfill screw and oil drain screws gasket must be replaced each time these screws are removed.

NOTE: Check transmission fluid temperature with scan tool.

7. Reset "Oil Life Monitor" data by using Tech 2.

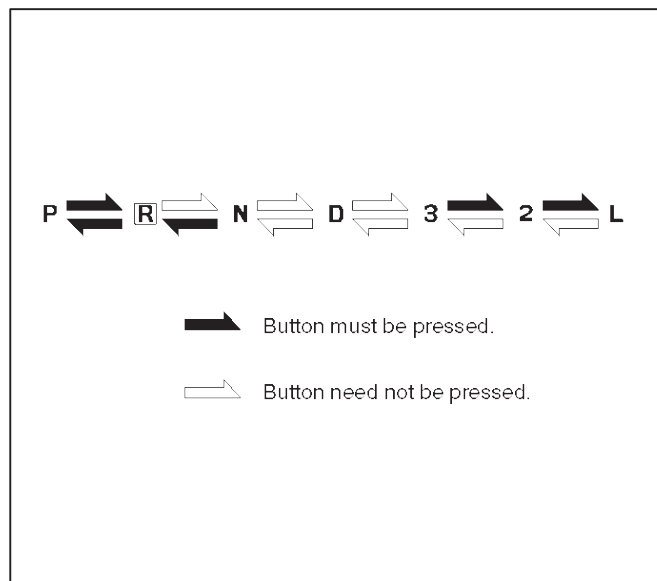
Refer to *Tech 2 OBD II Connection in Transmission Control System (4L30-E) section.*



## Selector Lever

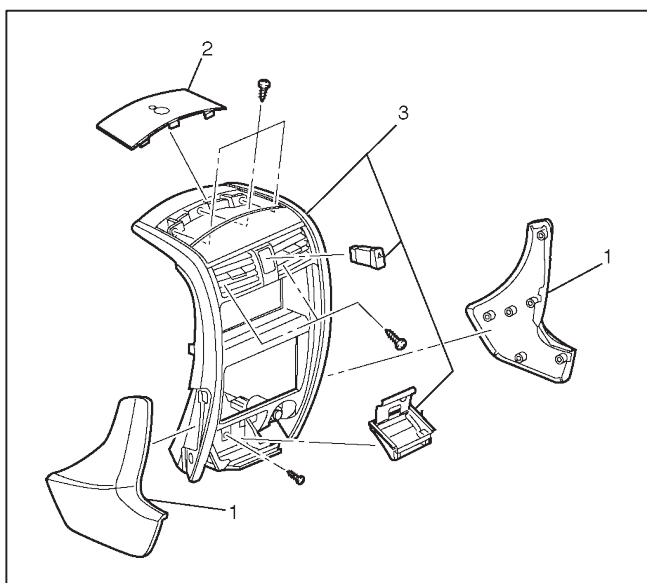
### Inspection

1. Make sure that when the selector lever is shifted from "P" to "L", a "clicking" can be felt at each shift position. Make sure that the gear corresponds to that of the position plate indicator.
2. Check to see if the selector lever can be shifted as shown in illustration.



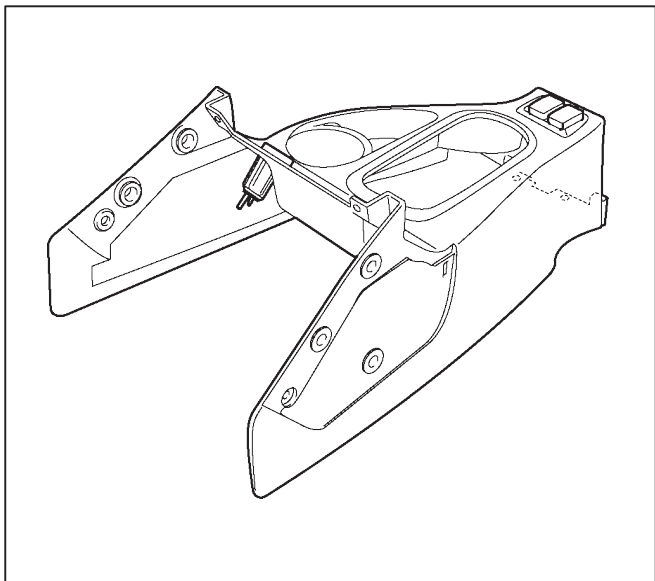
### Removal

1. Disconnect battery ground cable.
2. Set ignition Key in "LOCK" position and selector lever in "P" position.
3. Remove knee pads (1), cluster upper cover (2) and center cluster assembly (3).

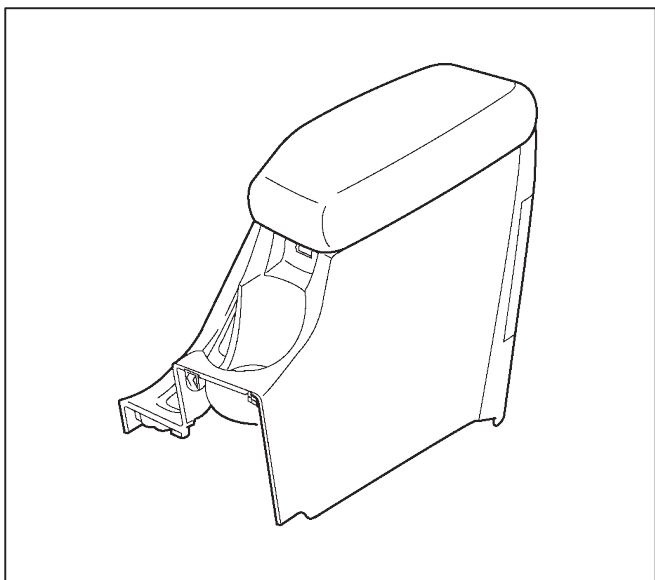


## 7A-28 AUTOMATIC TRANSMISSION (4L30-E)

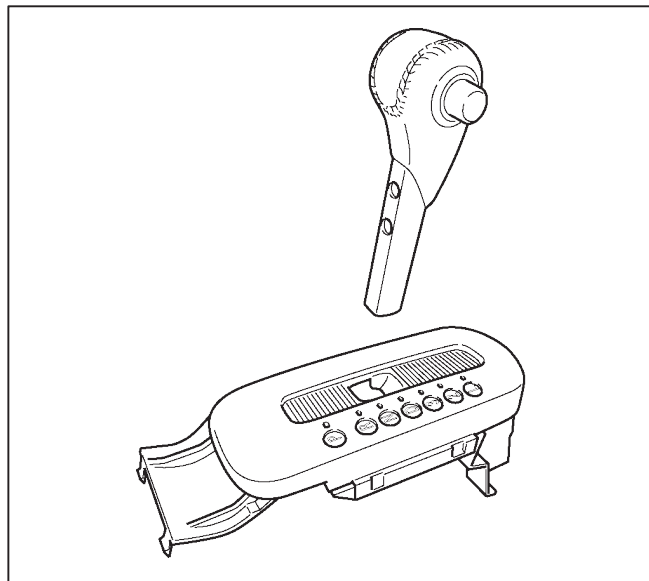
4. Remove rear console.



5. Remove front console.



6. Remove selector lever knob and cover assembly.



7. Disconnect select cable.

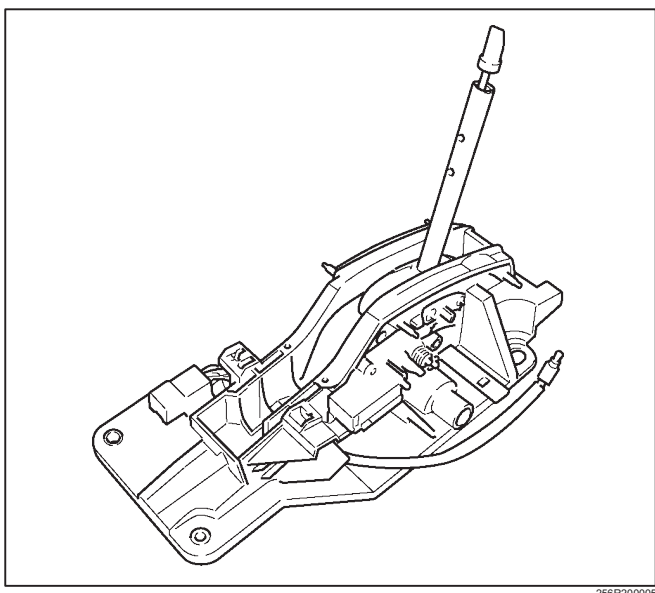
- Refer to *Select Cable* in this section.

8. Disconnect shift lock cable.

- Refer to *Shift Lock Cable* in this section.

9. Disconnect harness connector.

10. Remove selector lever subassembly.



256R200005

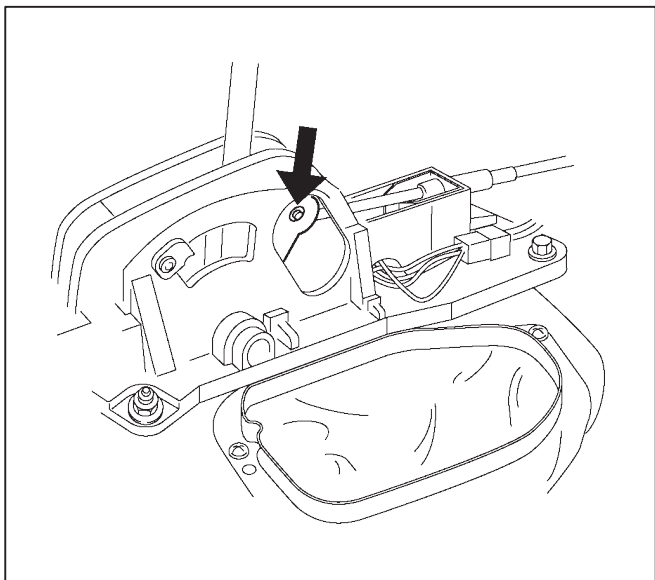
## Installation

1. Install selector lever subassembly.
2. Connect harness connector.
3. Connect shift lock cable.
  - Refer to *Shift Lock Cable* in this section.
4. Connect select cable.
  - Refer to *Select Cable* in this section.
5. Install selector lever knob and cover assembly.
6. Install front console.
7. Install rear console.
8. Install center cluster assembly, cluster upper cover and knee pads.
9. Connect negative (-) battery cable.
10. After installation, make sure that the selector lever operates normally, and that each selector position is properly indicated. (The red mark shows through the window.)

## Select Cable

### Removal

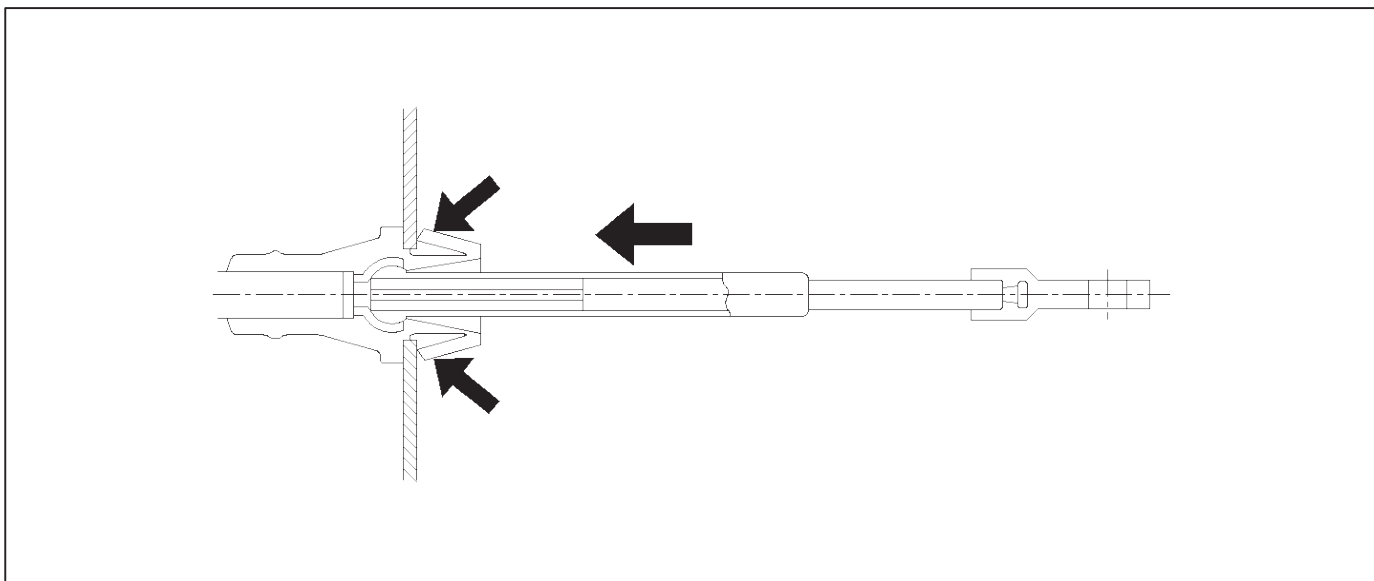
1. Set selector lever in "P" position.
2. Remove knee pads, cluster upper cover, center cluster assembly, rear console, front console, selector lever knob and cover assembly.
  - Refer to *Selector Lever* in this section.
3. Disconnect inner cable by pulling projection on pin.



256R200006

## 7A-30 AUTOMATIC TRANSMISSION (4L30-E)

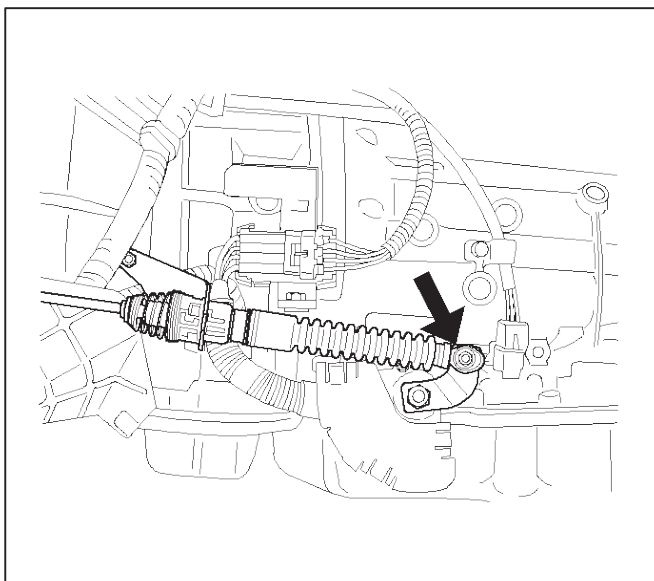
4. Press down claws and disconnect cable assembly.



A07RW017

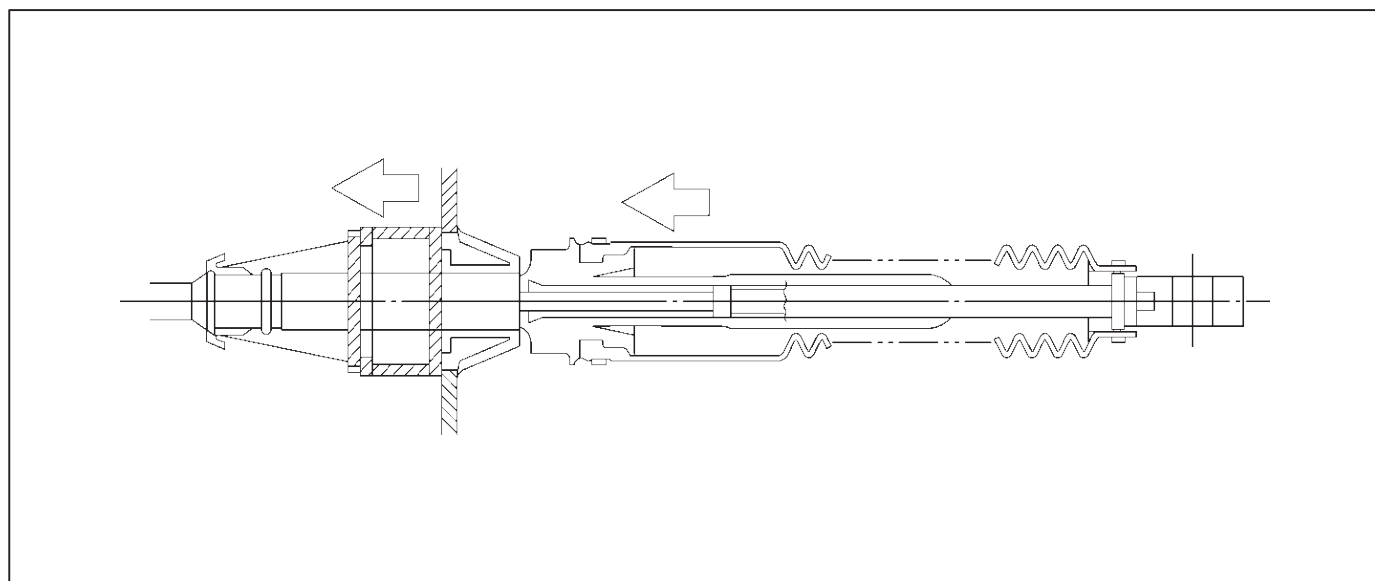
5. Remove nuts that fasten grommet in select cable assembly.

6. Disconnect inner cable.



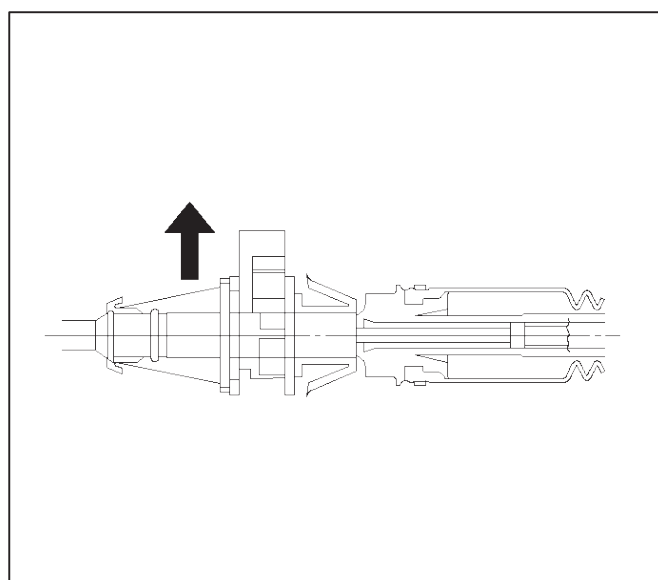
210RW013

7. Slide sleeve and disconnect cable assembly.



A07RW082

8. Pull lock.

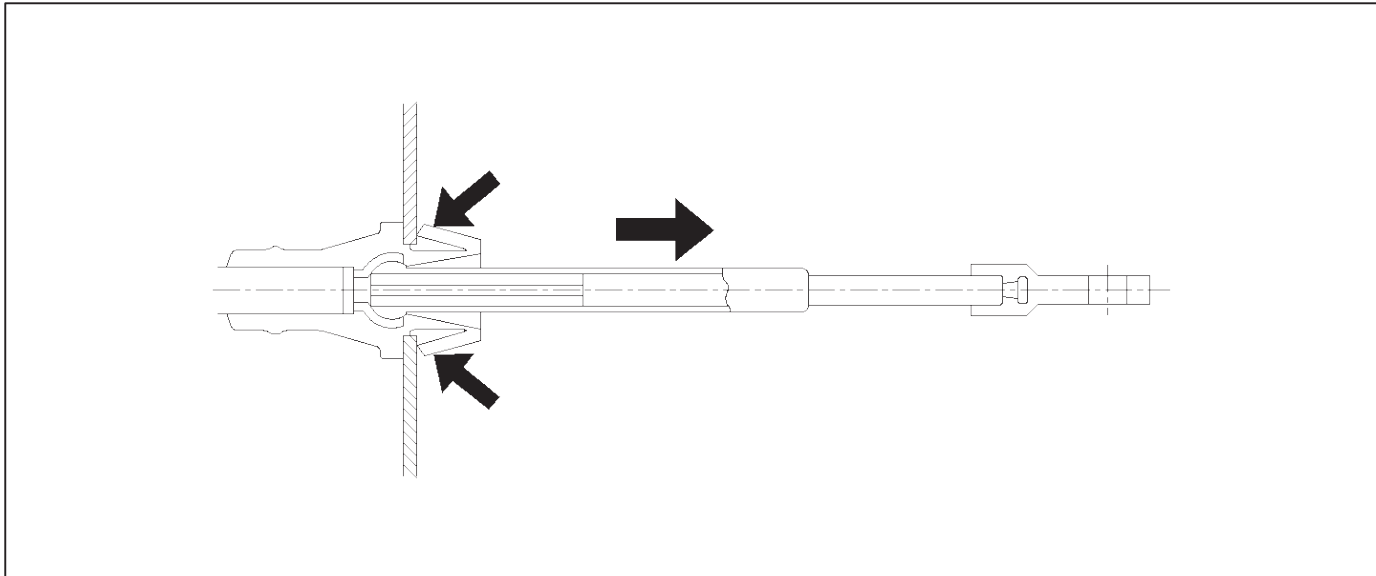


A07RW015

9. Draw select cable assembly into the interior side.

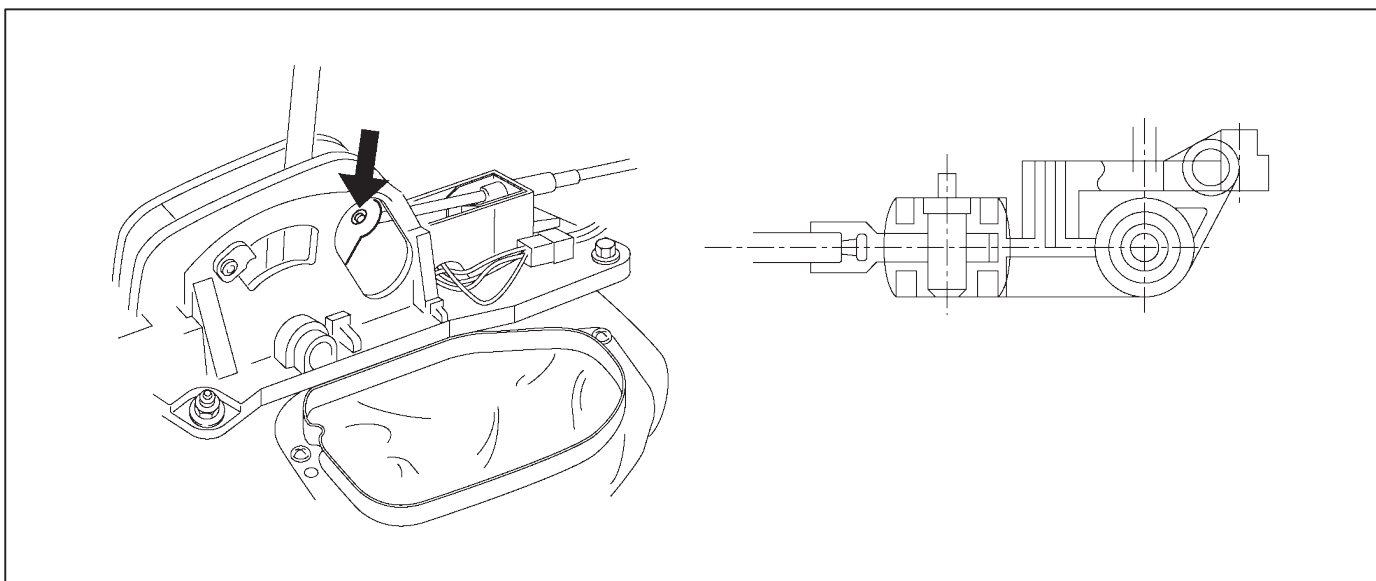
## Installation

1. Set selector lever in "P" position.
2. Let out select cable transmission side end from floor hole.
3. Fit outer cable into bracket in selector lever assembly.



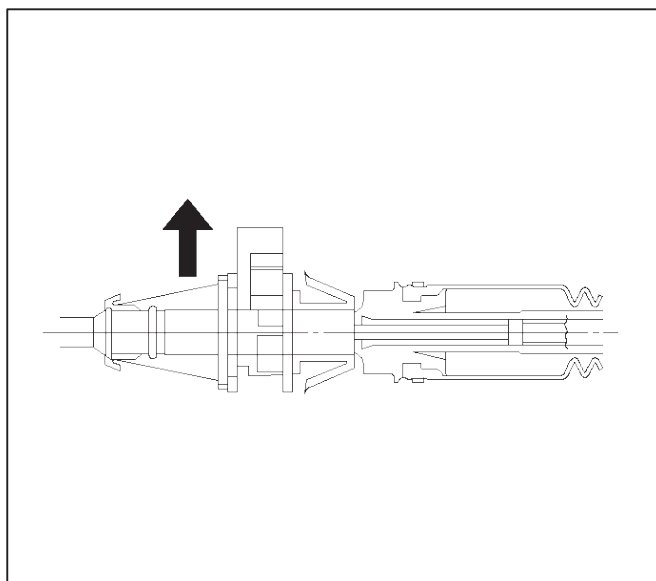
A07RW016

4. Set inner cable end in selector lever and push pin into selector lever hole and inner cable end.



256R200007

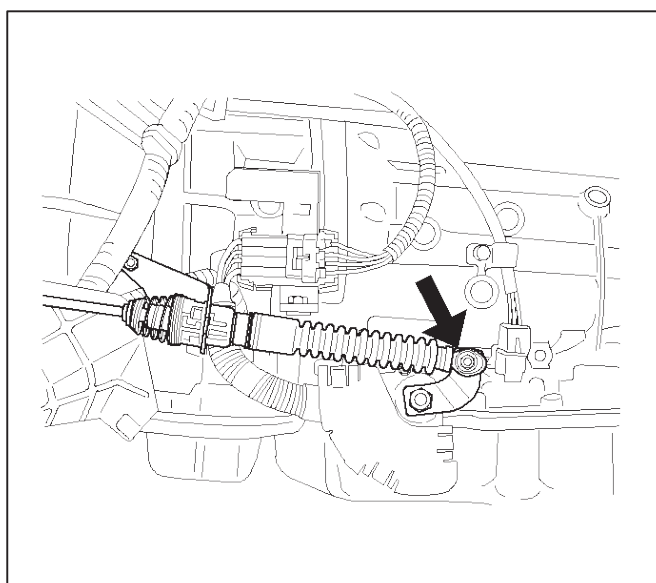
5. Check that lock projects.



A07RW015

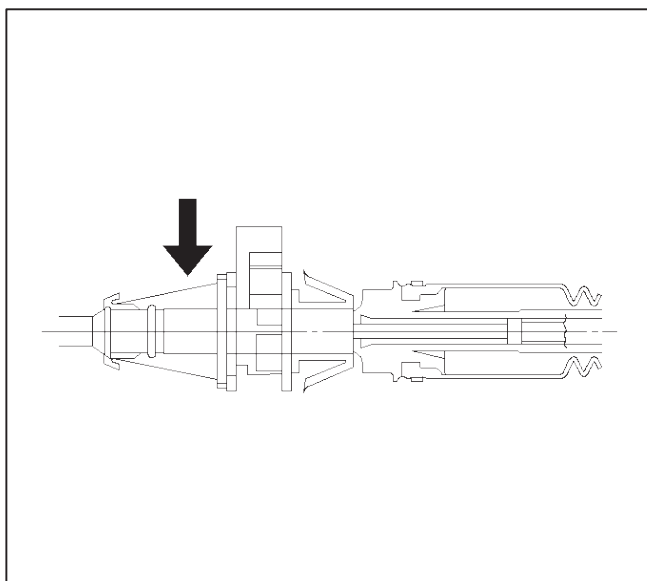
6. Connect adjust end fitting attachment to the bracket on transmission.

7. Set select lever "P" position and connect inner cable to select lever.



210RW013

8. Push lock into adjust end fitting attachment.



A07RW014

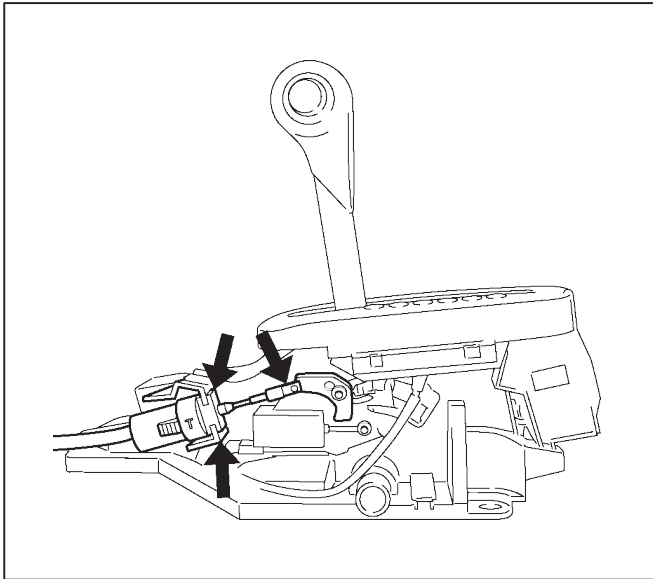
9. Install grommet.

10. About following installation steps, refer to *Selector Lever in this section*.

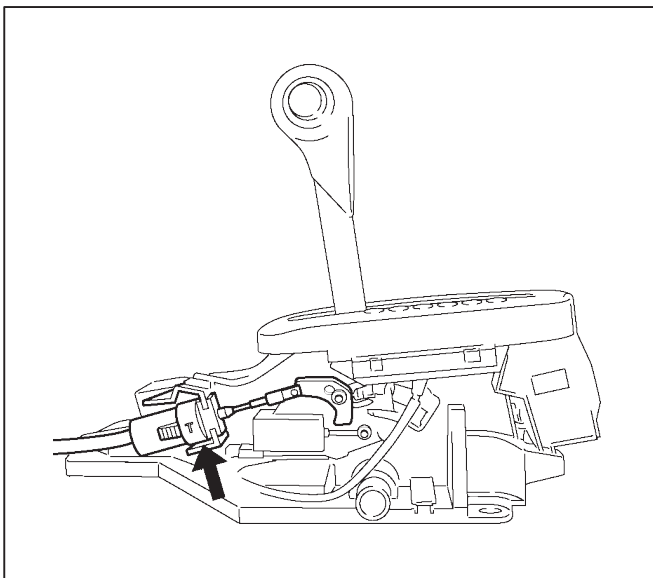
## Shift Lock Cable

### Removal

1. Set ignition key in "LOCK" position and selector lever in "P" position.
2. Remove knee pads, cluster upper cover, center cluster assembly, rear console, and front console.
  - Refer to *Selector Lever* in this section.
3. Disconnect inner cable from selector lever assembly then push claw and disconnect cable assembly.

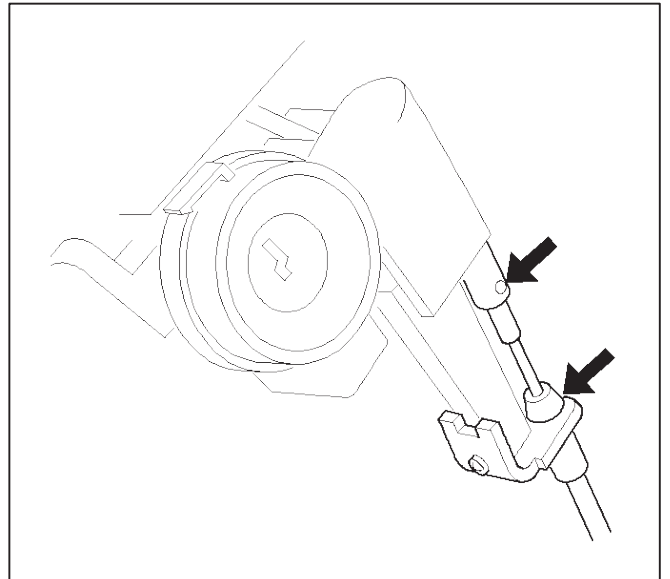


4. Disconnect lock adjust.



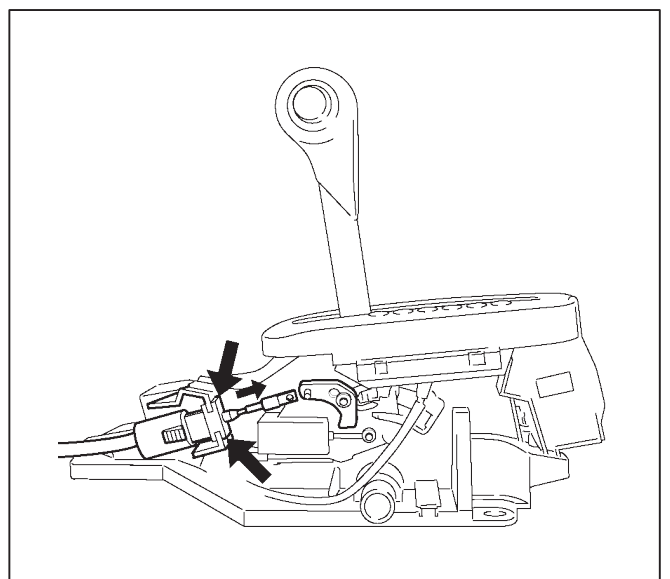
5. Remove instrument panel lower cover and steering column cover.

6. Remove spring pin and disconnect inner cable.
  - Disconnect outer cable from bracket.

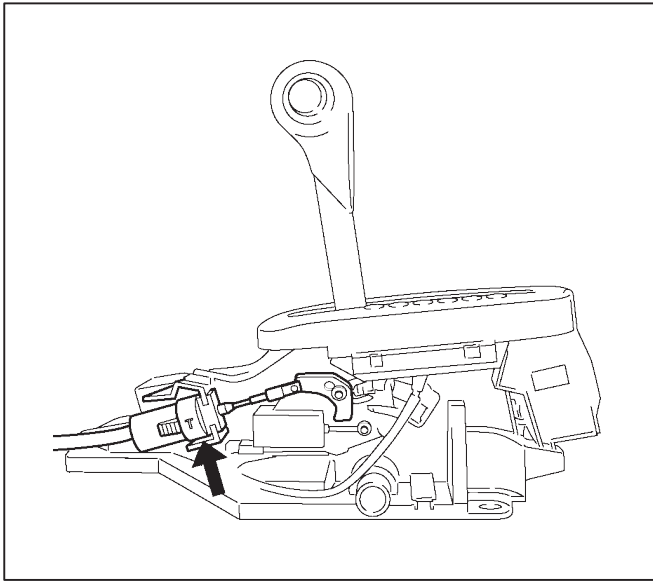


### Installation

1. Set ignition key in "LOCK" position and selector lever in "P" position.
2. Connect outer cable to bracket near steering lock.
  - Connect inner cable to steering lock and install spring pin.
3. Install steering column cover and instrument lower cover.
4. Install adjust body of cable assembly to bracket in selector lever assembly.
  - Install inner cable to lever, pulling inner cable with outer cable.



5. Check that cable moves smoothly, lightly pulling outer cable rearward.
6. Connect lock adjust, aligning "T" mark in the "Up" position.



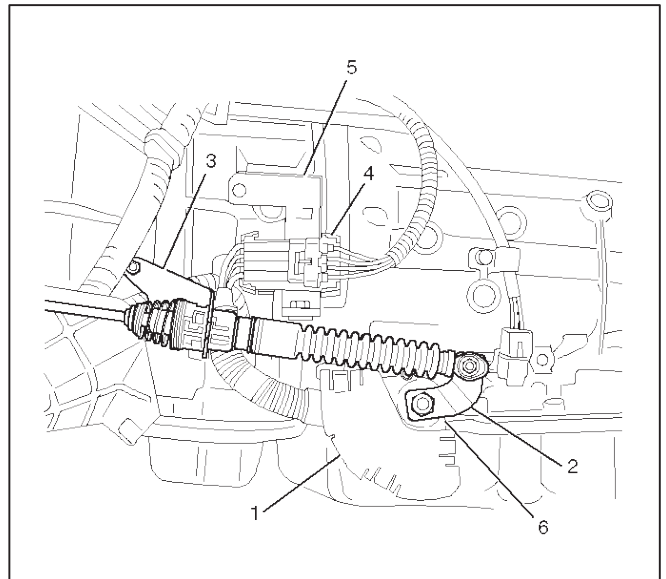
256R200003

7. About following installation steps, refer to *Selector Lever in this section*.
8. Check the shift lock operation:
  - a. Selector lever should not be moved out of "P" position with ignition key in "Lock" position.
  - b. Selector lever can be moved out of "P" position with ignition key in "ON" position only when brake pedal is depressed.
  - c. ignition key can be turned to "LOCK" position only when selector lever is in "P" position (key can be pulled out).
9. If a. and c. fail, readjust cable. If b. fails, readjust connector wiring and brake pedal switch.

## Mode Switch

### Removal

1. Place selector lever in neutral.
2. Disconnect battery ground cable.
3. Remove mode switch cover (1) (V6).
4. Disconnect selector lever (2) from the mode switch.
5. Remove bracket with cable (3).
6. Disconnect transmission harness from the mode switch connector (4).
7. Remove bracket with mode switch connector from the transmission case.
8. Remove mode switch connector (4) from the bracket (5).
9. Remove two mode switch bolts and nut then remove mode switch (6).



210RW014

## Installation

To install, follow the removal steps in the reverse order, noting the following points;

### 1. Torque

**Mode switch bolt: 13 N•m (113 lb in)**

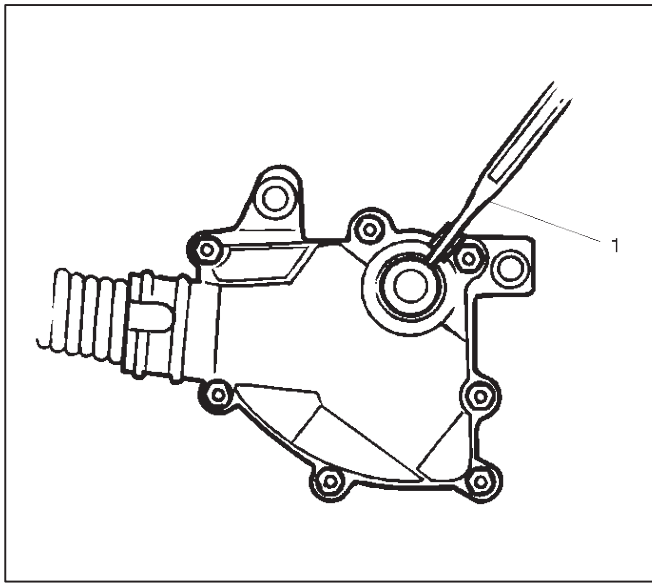
**Selector lever nut: 23 N•m (17 lb ft)**

### 2. Mode switch setting procedure

Perform either of the following adjustment procedures:

#### Procedure 1

- Place selector lever in neutral.
- Remove selector lever from the mode switch.
- Remove the mode switch cover.
- Loosen the two 10 mm screws.
- Rotate the mode switch until the slot in the mode switch housing aligns with the selector shaft bushing, and insert a 3/32 in. (2.4 mm) drill bit or punch (1) into the slot.
- Tighten the screws to 13 N•m (113 lb in).
- After completing adjustment, snap the mode switch cover into place.
- Reinstall the selector lever.

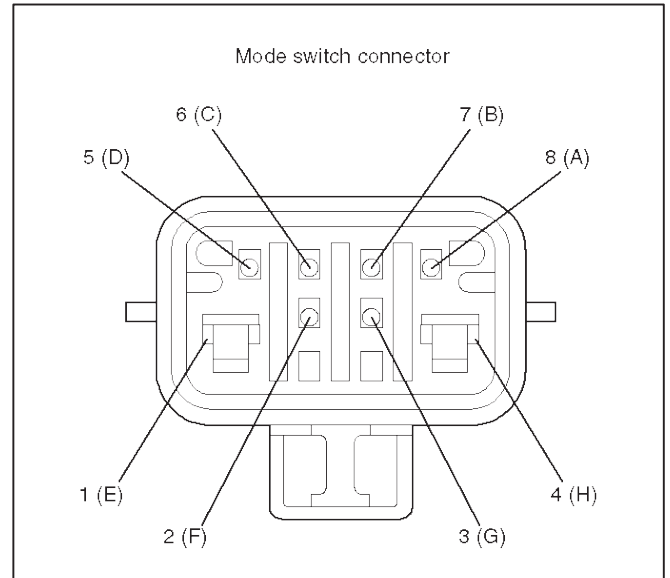


249RW001

#### Procedure 2

- Place selector lever in neutral.
- Disconnect transmission harness connector from mode switch connector.
- Remove mode switch connector with bracket from the transmission case.
- Connect multimeter (resistance mode) to terminals 1(E) and 4(H) on mode switch connector.
- Loosen two mounting screws.
- Rotate mode switch slightly in both directions to determine the range (approx. 5 degrees) of electrical contact.
- Position mode switch in middle of contact range.
- Tighten two mounting screws.

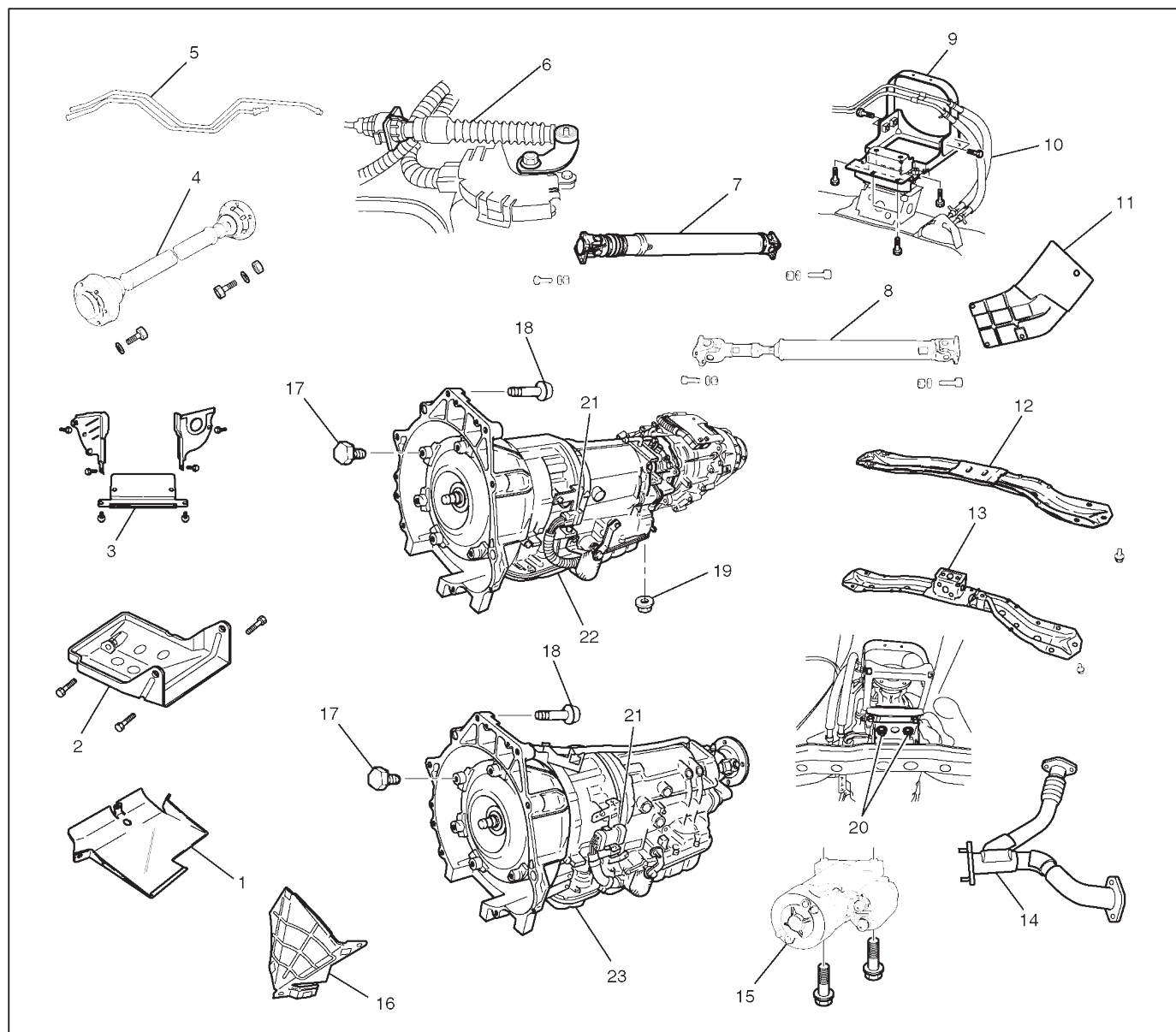
- Remove multimeter and install mode switch harness connector with bracket to the transmission case.
- Connect transmission harness connector to mode switch connector.



F07RW003

## Transmission Assembly

### Transmission and Associated Parts



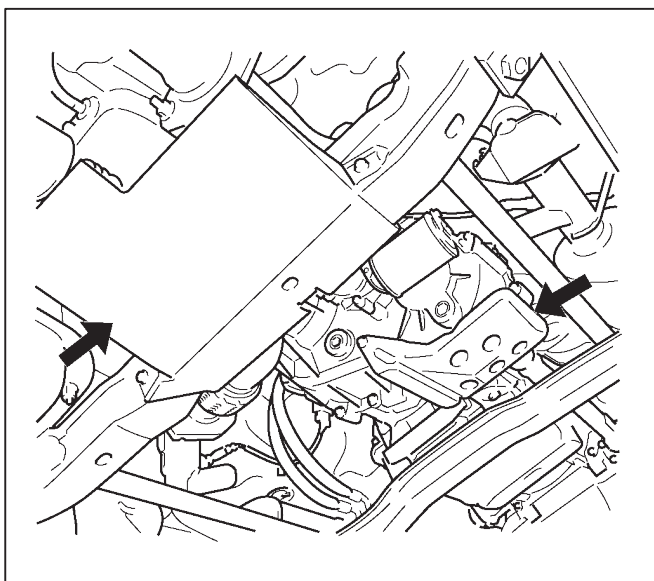
240R200005

#### Legend

- |                                                              |                                                         |
|--------------------------------------------------------------|---------------------------------------------------------|
| (1) Fairing Plate                                            | (12) Third Crossmember (4×4)                            |
| (2) Transfer Protector (4×4)                                 | (13) Third Crossmember (4×2)                            |
| (3) Under Cover                                              | (14) Center Exhaust Pipe (4×4)                          |
| (4) Front Propeller Shaft (4×4)                              | (15) Starter                                            |
| (5) Transmission Oil Cooler Pipe                             | (16) Harness Heat Protector                             |
| (6) Select Cable                                             | (17) Torque Converter Bolt                              |
| (7) Rear Propeller Shaft (4×2)                               | (18) Engine-Transmission Bolt                           |
| (8) Rear Propeller Shaft (4×4)                               | (19) Rear Mount Nut (4×4)                               |
| (9) Rear Mount Rubber and Propeller Protector Assembly (4×2) | (20) Rear Mount Nut (4×2)                               |
| (10) Fuel Pipe                                               | (21) Harness Connector                                  |
| (11) Fuel Pipe Heat Protector                                | (22) Transmission Assembly with Transfer Assembly (4×4) |
|                                                              | (23) Transmission Assembly (4×2)                        |

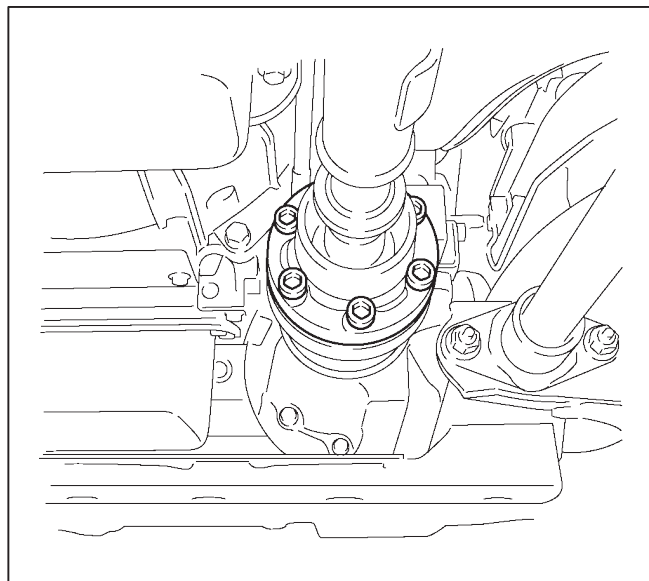
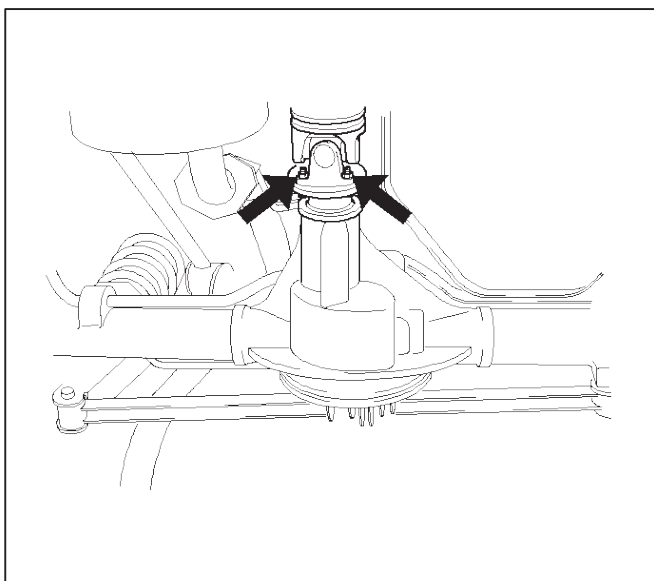
## Removal

1. Disconnect battery ground cable.
2. Remove transfer protector (4×4) and fairing plate.

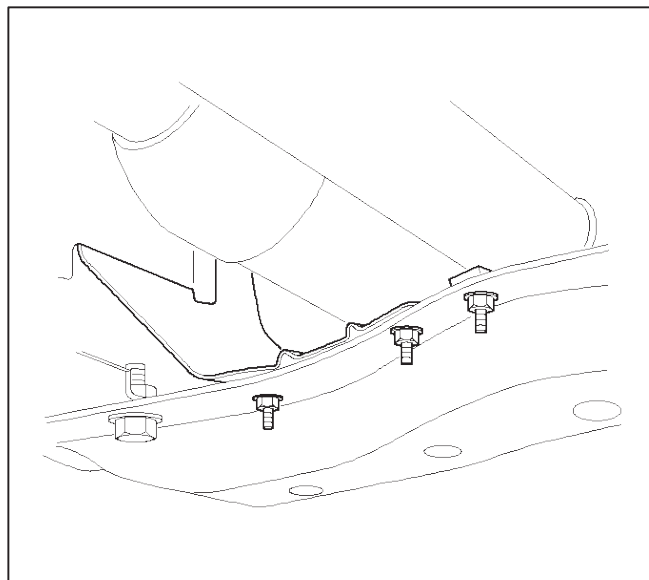


3. Remove rear propeller shaft and front propeller shaft (4×4).

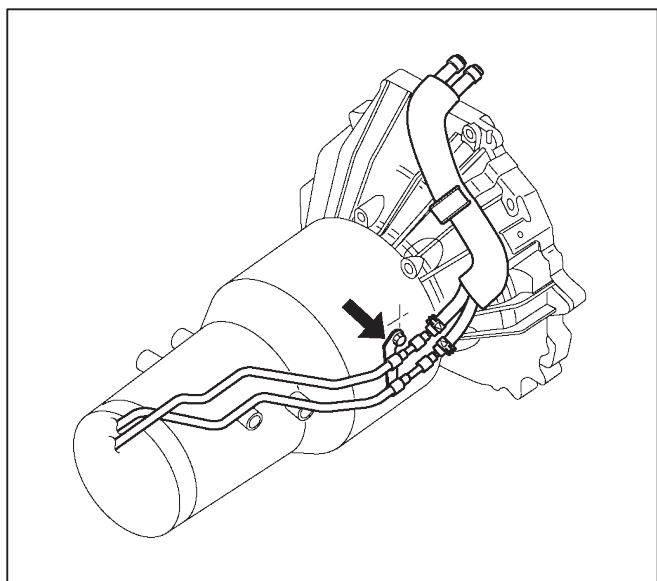
NOTE: Apply alignment marks on the flange at both front and rear sides.



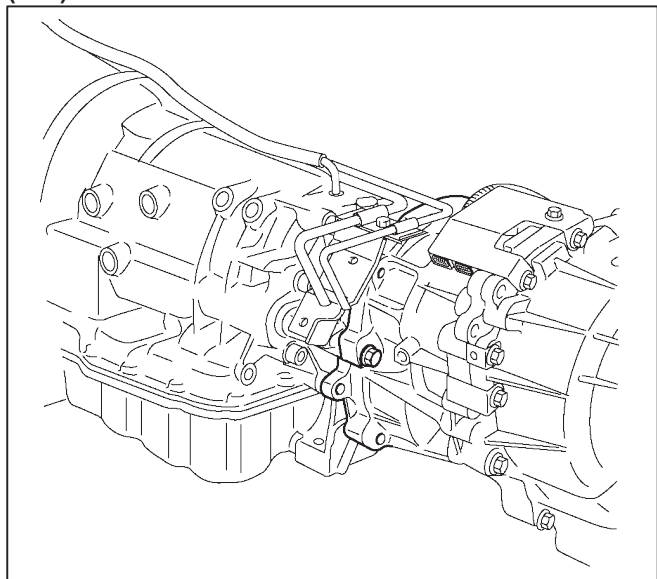
4. Remove center exhaust pipe (4×4).
5. Remove fuel pipe heat protector and clip from third crossmember.
6. Disconnect fuel pipe bracket from third crossmember.



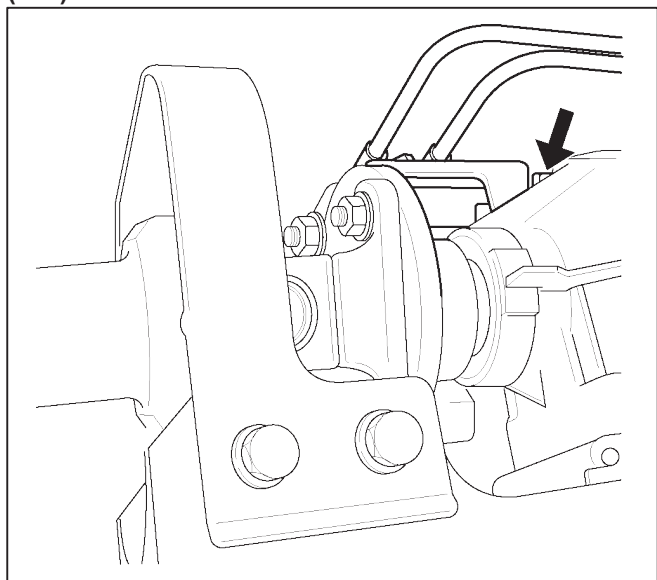
7. Disconnect fuel pipe bracket from transmission side.



**(4×4)**

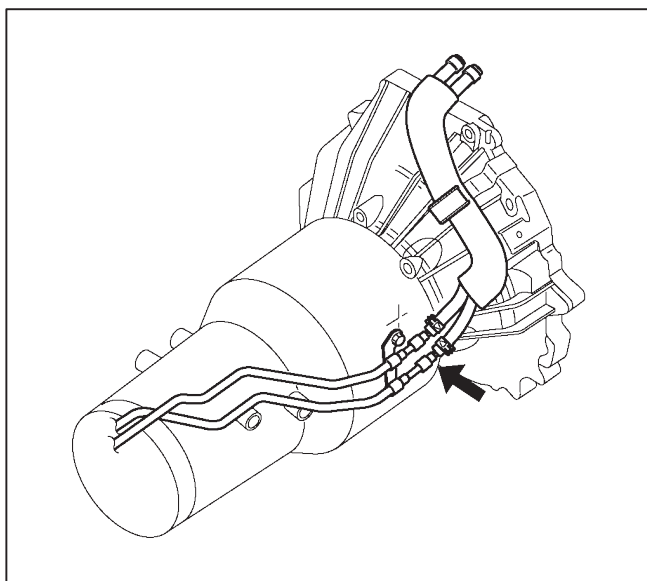


**(4×2)**



### Fuel hose connector removal procedure

If removal of the fuel hose connector is required for transmission servicing and/or replacement, follow the steps below.

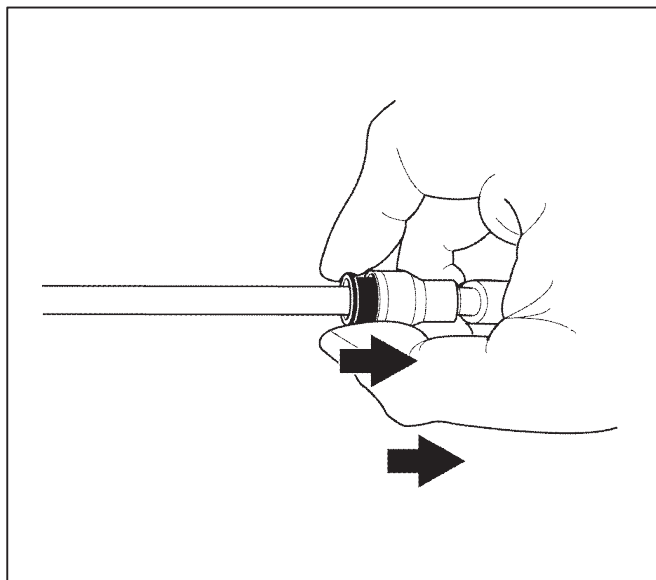


### NOTE:

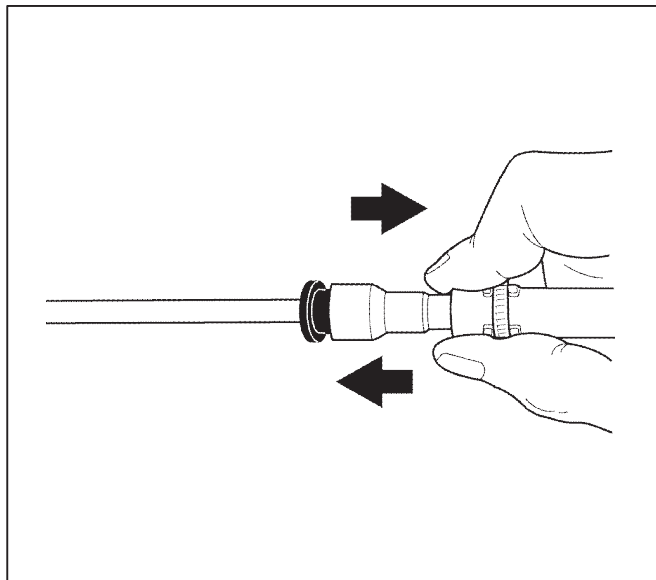
- An O-ring is used as a seal between the fuel pipe and the connector. Take care not to damage the contact surfaces during the removal procedure. Do not allow the surface to become contaminated with dirt or other foreign material.
- Perform the entire removal procedure with your hands. Do not use tools.

1. **Separating the connector and fuel pipe**

1. Clean the fuel pipe and connector to remove mud and other dirt.
2. Pull the black plastic piece toward the connector. Hold the piece near the connector. Pull the connector from the fuel pipe.  
If the connector and fuel pipe are stuck together, jiggle the connector back and forth to loosen the connector. Do not yank the connector from the fuel pipe.

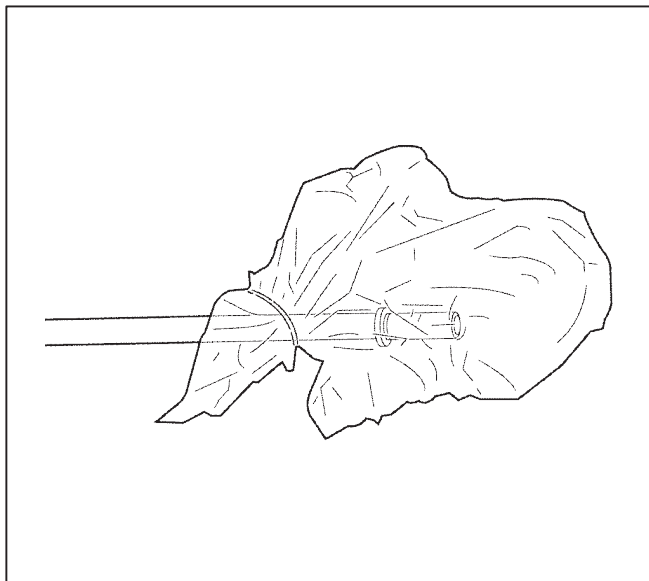


141RY00002



141RY00003

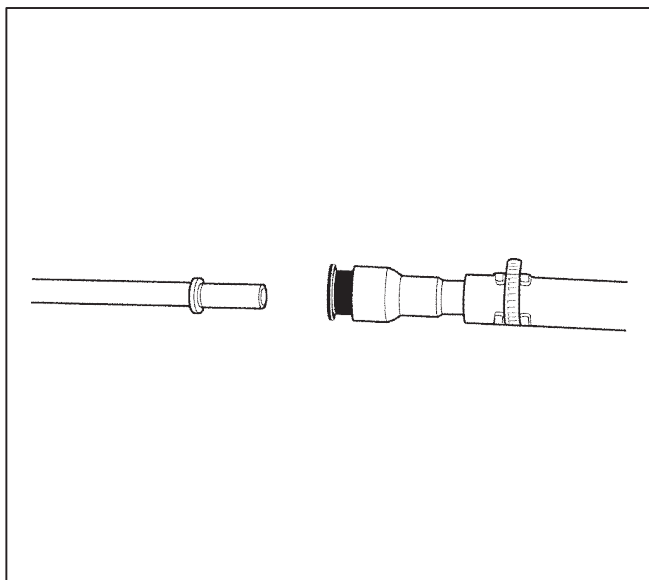
3. Tie a vinyl bag around the connector and fuel pipe to protect them from dirt.



141RY00004

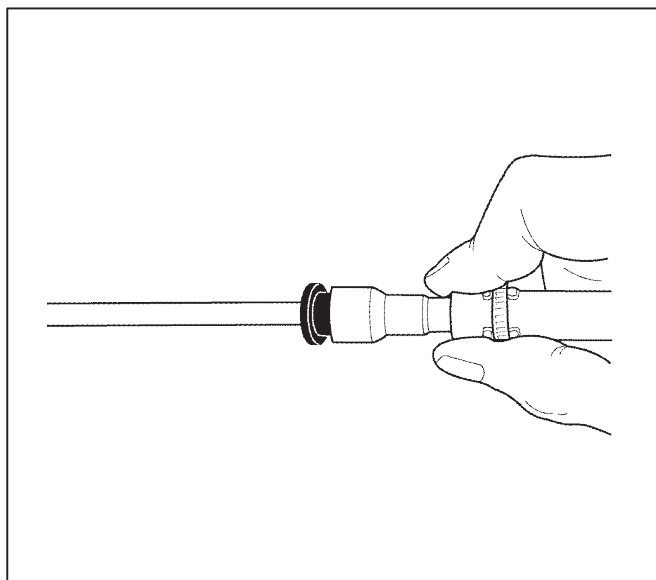
2. **Joining the connector and fuel hose**

1. Remove the vinyl bag from the connector and fuel hose. Check that the contact surfaces are undamaged and free of dirt and other foreign material. Clean if necessary.
2. Align the axis of the fuel pipe and connector. Push the connector into the fuel pipe until a distinct click is heard.



141RY00005

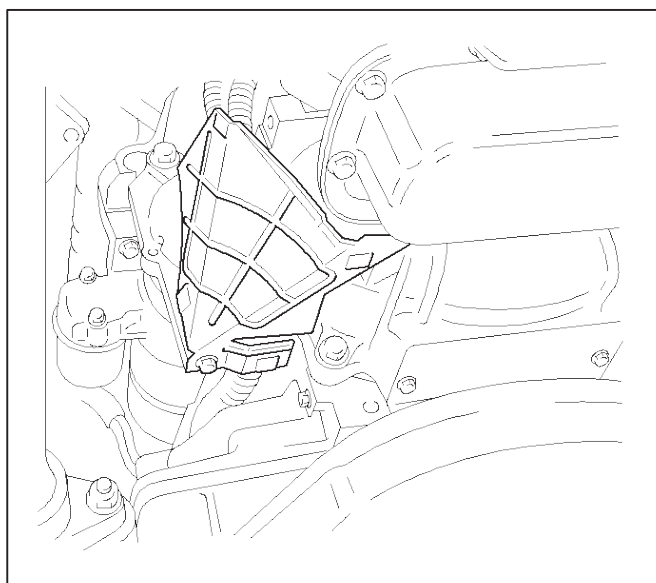
3. Gently pull on the connector to check that it is securely latched.



141RY00006

8. Disconnect transmission harness connector and clip.  
Connector : Adapter case, mode switch, main case, magnetic sensor, transfer switch (4×4), 2-4 actuator (4×4) and car speed sensor.

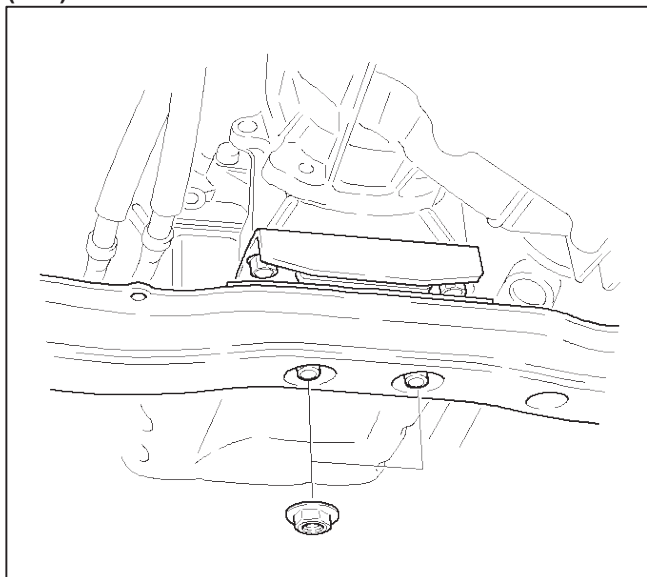
9. Remove harness heat protector.



815RW002

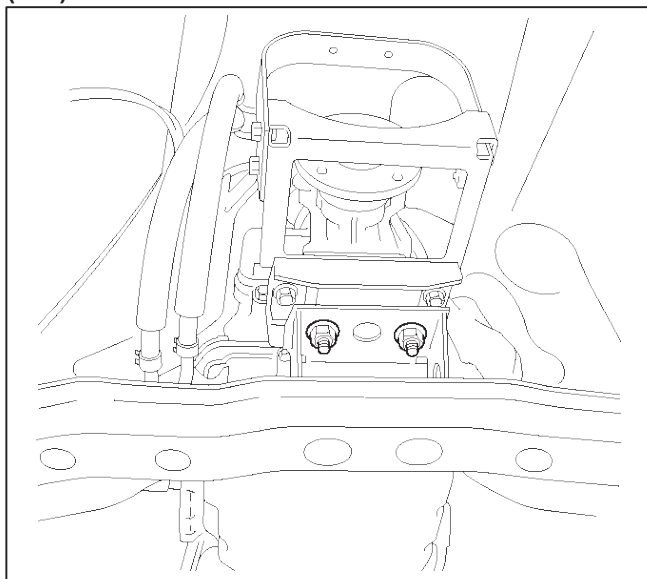
10. Support transmission with a jack.  
Remove rear mount nuts from third crossmember.

(4×4)



F07RW008

(4×2)



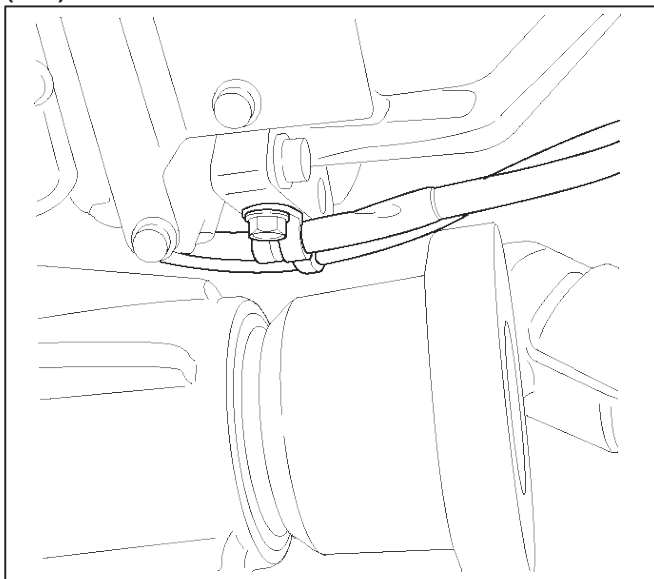
F07R100005

11. Remove third crossmember.  
12. Disconnect transmission oil cooler pipes from A/T side.  
13. Remove oil pipe clamp and bracket from the converter housing.

## 7A-42 AUTOMATIC TRANSMISSION (4L30-E)

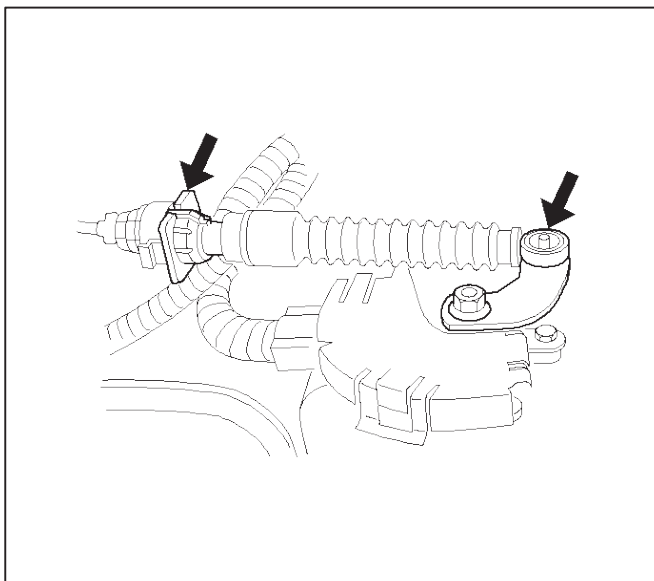
14. Loosen oil cooler pipe clamp bolt at the engine mount side.

(4×4)



253RY001

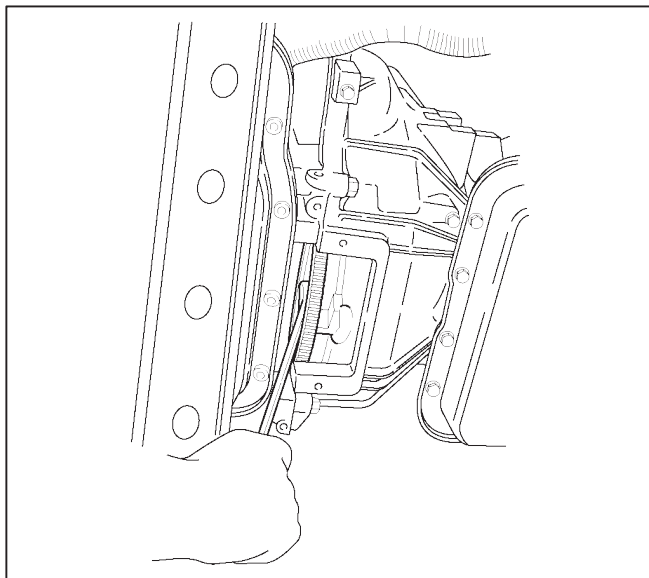
15. Remove select cable by disconnecting inner cable from select lever and removing outer cable with bracket.



256RW025

16. Remove starter.  
17. Remove under covers from the transmission and engine.

18. Remove flex plate torque converter fixing bolts (6 pieces) by turning crankshaft.

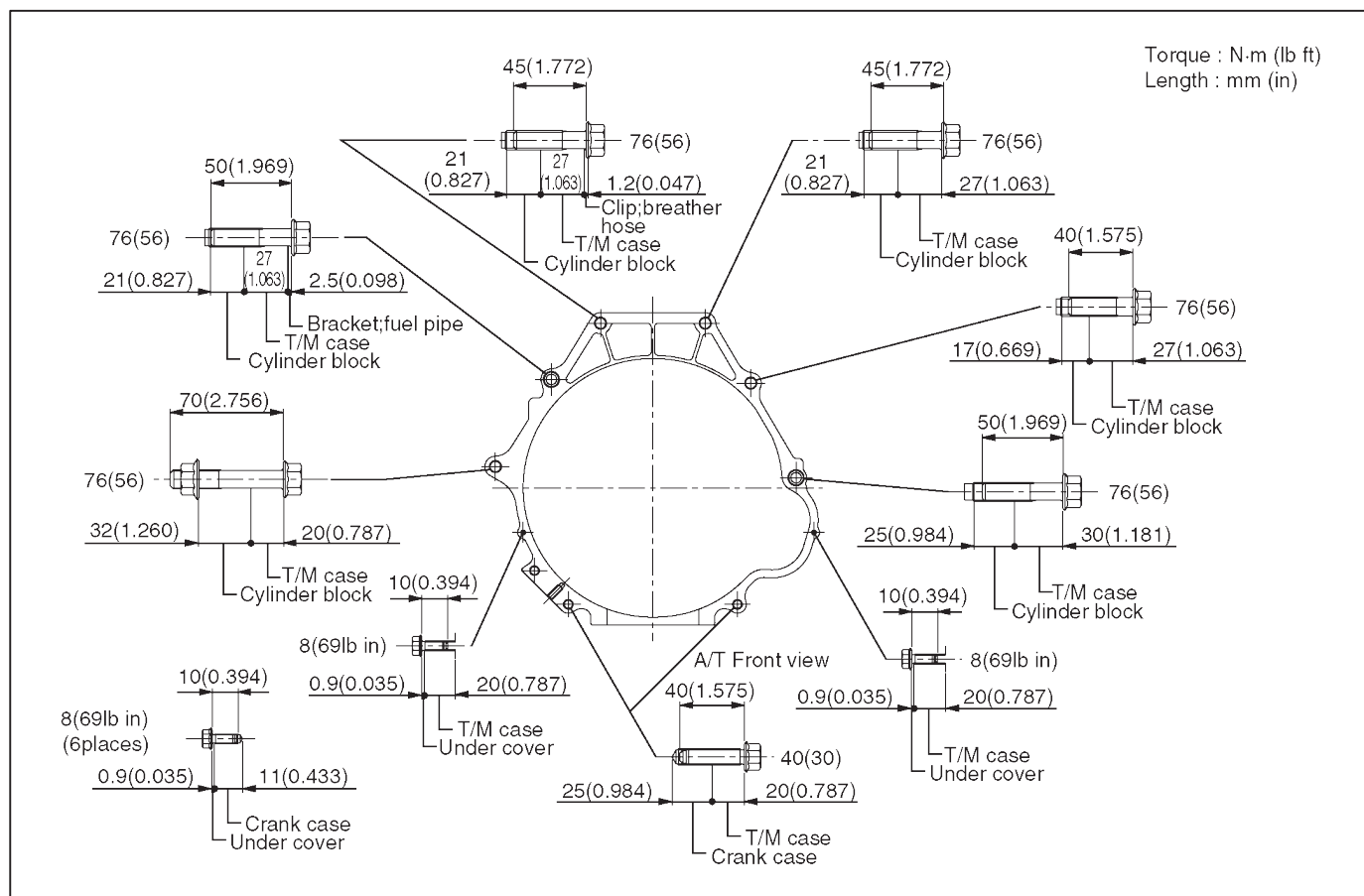


240RX010

19. Remove engine transmission fixing bolts.  
20. Pull out transmission assembly from the engine.  
21. Remove the rear mount rubber and propeller protector assembly if required (4×2).

## Installation

1. Slowly raise transmission jack until front of the transmission assembly is aligned with rear of the engine. Attach the transmission assembly to the engine.
2. Tighten engine transmission bolts as shown in the figure.

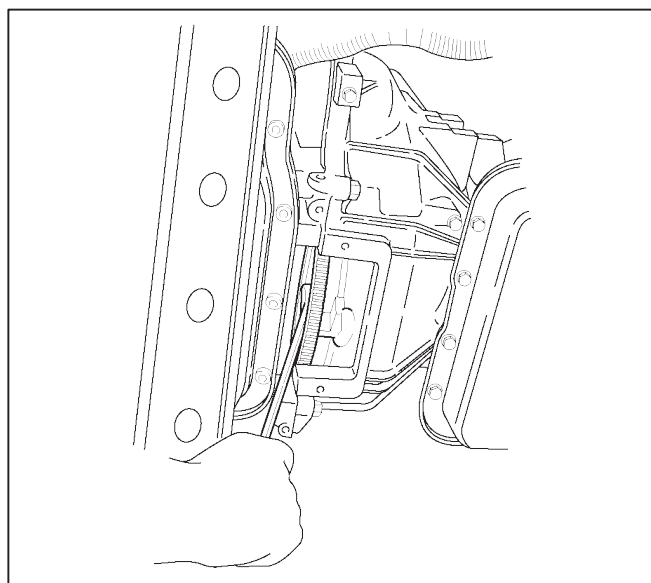


F07R200004

3. Align the flex plate torque converter bolt boss with flex plate hole by turning the torque converter. Install flex plate torque converter bolts (6 pieces) by turning the crankshaft.

**Torque: 54 N·m (40 lb ft)**

**NOTE:** Do not reuse the flex plate torque converter bolt.



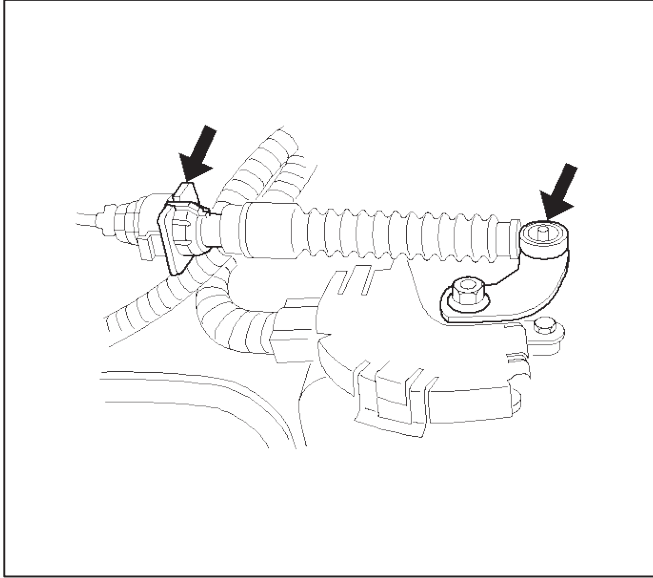
240RX010

## 7A-44 AUTOMATIC TRANSMISSION (4L30-E)

4. Install under covers to the transmission and engine.
5. Install starter.

**Torque: 40 N•m (30 lb ft)**

6. Install select cable by connecting inner cable to select lever and installing outer cable with bracket.

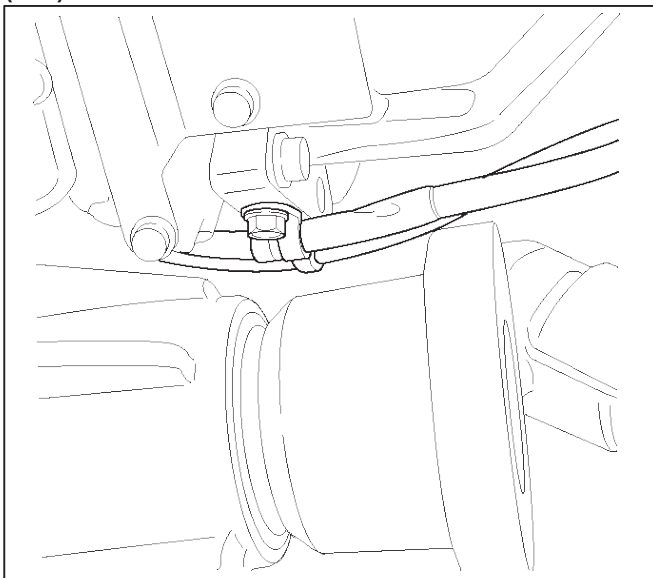


7. Connect transmission oil cooler pipes to A/T.

**Torque: 44 N•m (33 lb ft)**

8. Install oil cooler pipe clamp and bracket to the converter housing.

**(4×4)**



9. Tighten oil cooler pipe clamp bolt at the engine mount side.

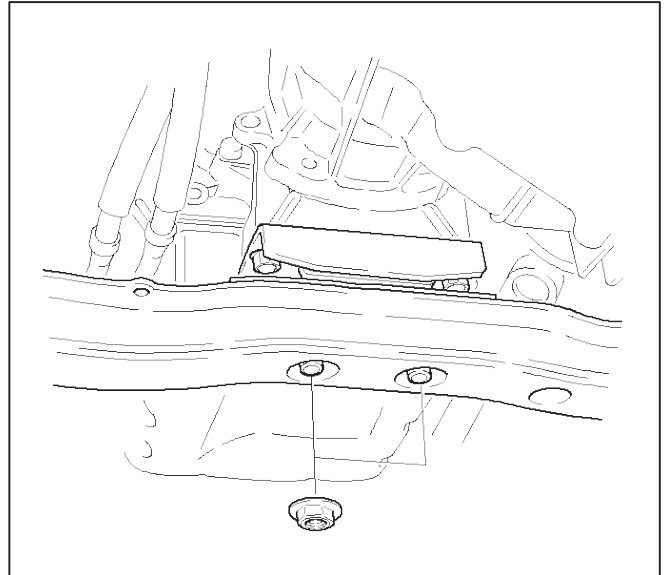
10. Install third crossmember.

**Torque: 116 N•m (85 lb ft)**

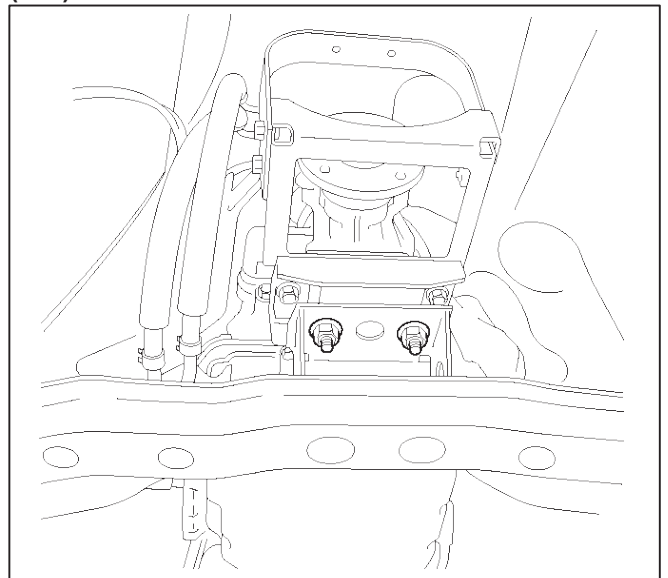
11. Install rear mount nuts.

**Torque: 50 N•m (37 lb ft)**

**(4×4)**

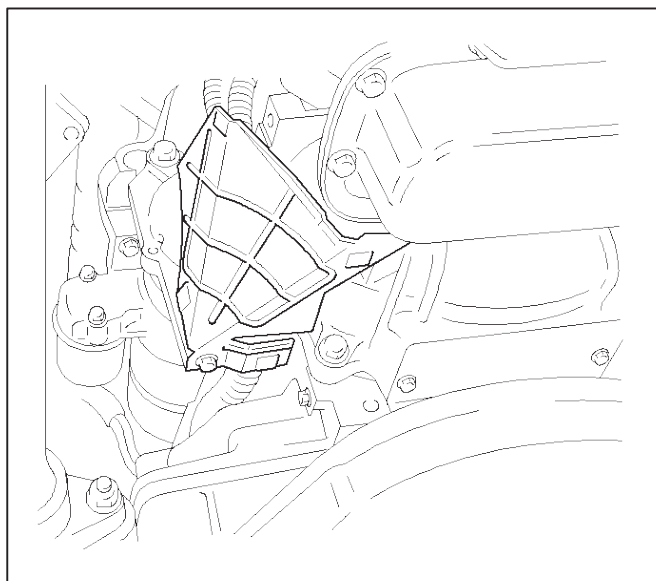


**(4×2)**



12. Install harness heat protector.

**Torque: 6 N•m (52 lb in)**

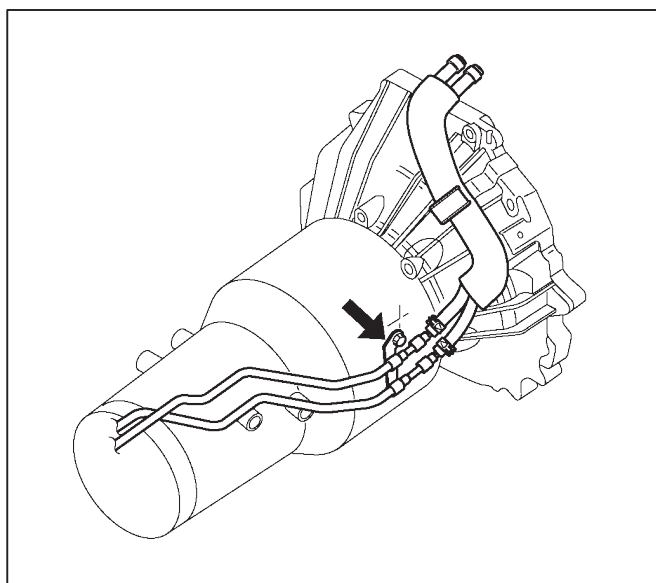


815RW002

13. Connect transmission harness connector and clip.  
Connector : Adapter case, mode switch, main case, magnetic sensor, transfer connectors (4×4) and car speed sensor.

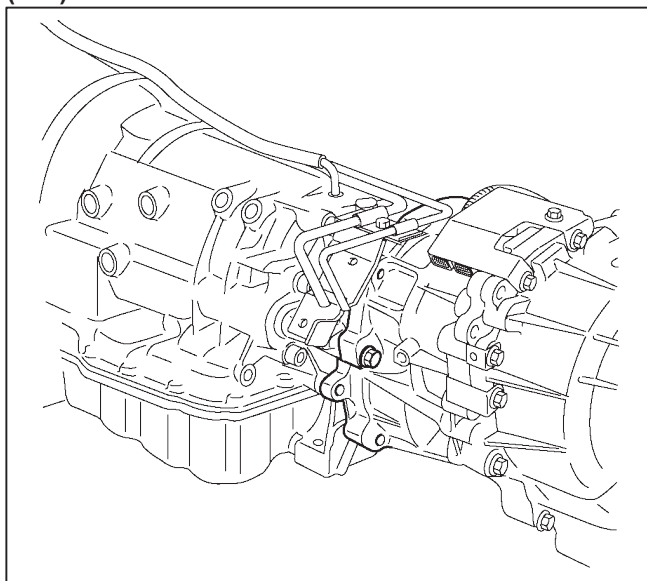
14. Connect fuel pipe bracket to transmission side.

NOTE: See "NOTE" of removal steps.



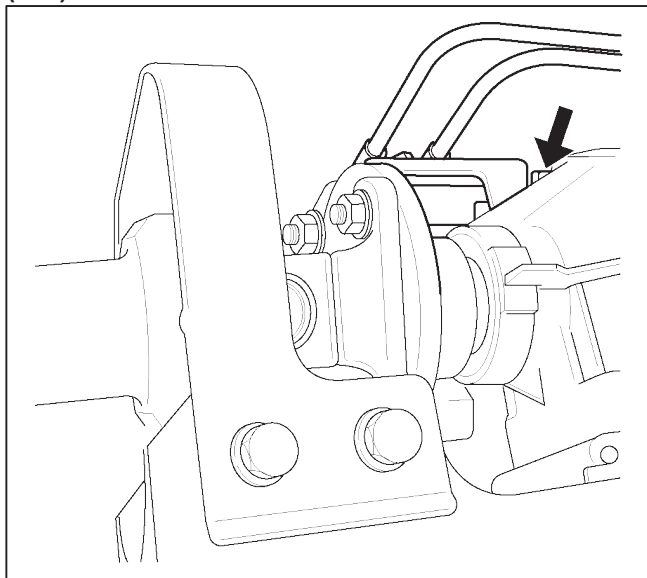
141R200003

**(4×4)**



240R200010

**(4×2)**



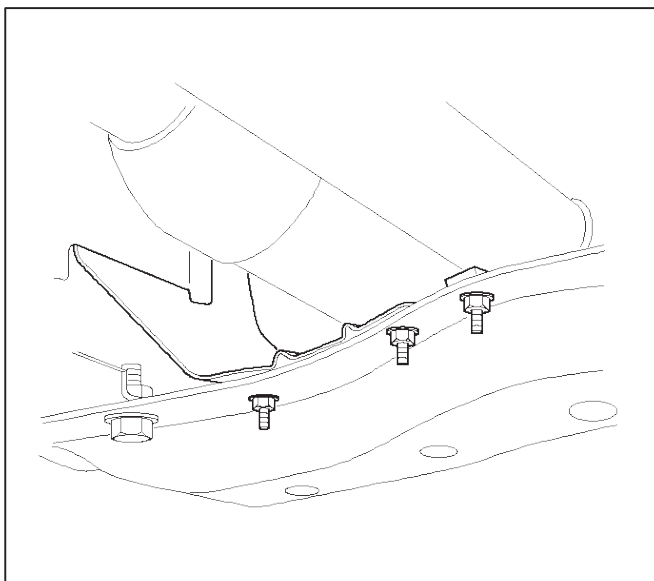
141R200002

## 7A-46 AUTOMATIC TRANSMISSION (4L30-E)

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15. Install fuel pipe heat protector and clip.

16. Connector fuel pipe bracket to third crossmember.



141RW004

17. Install center exhaust pipe (4×4).

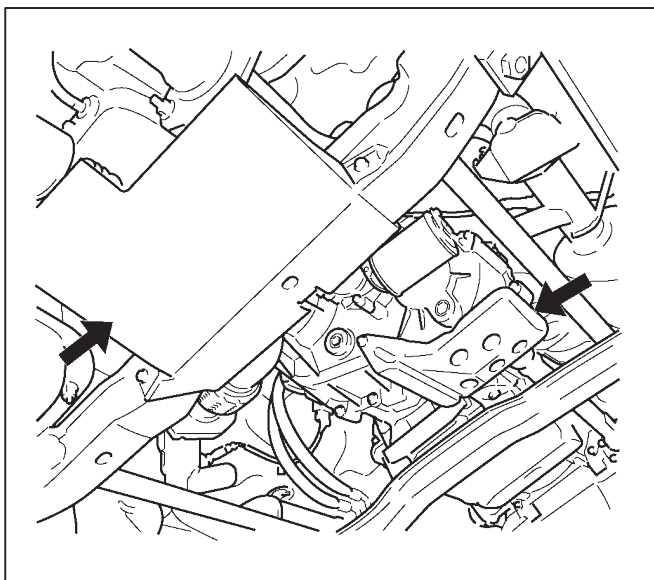
**Torque: 43 N•m (32 lb ft)**

18. Install front propeller shaft (4×4) and rear propeller shaft.

**Torque: 63 N•m (46 lb ft)**

19. Install transfer protector (4×4) and fairing plate.

**Torque (transfer protector bolt): 37 N•m (27 lb ft)**

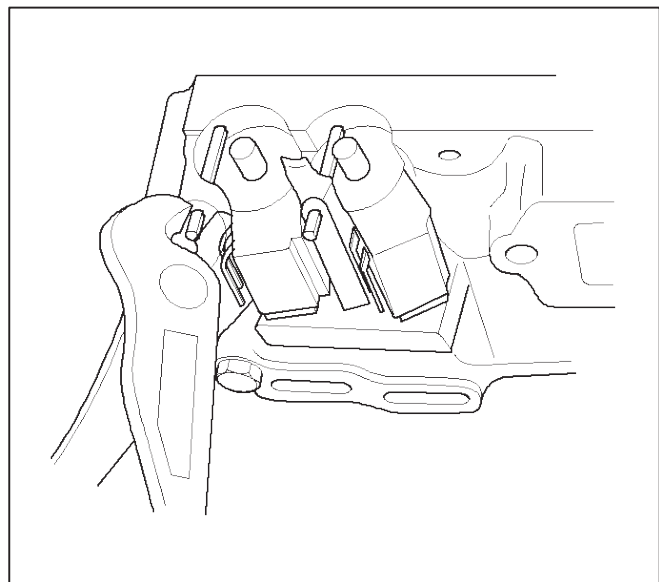


150R20001

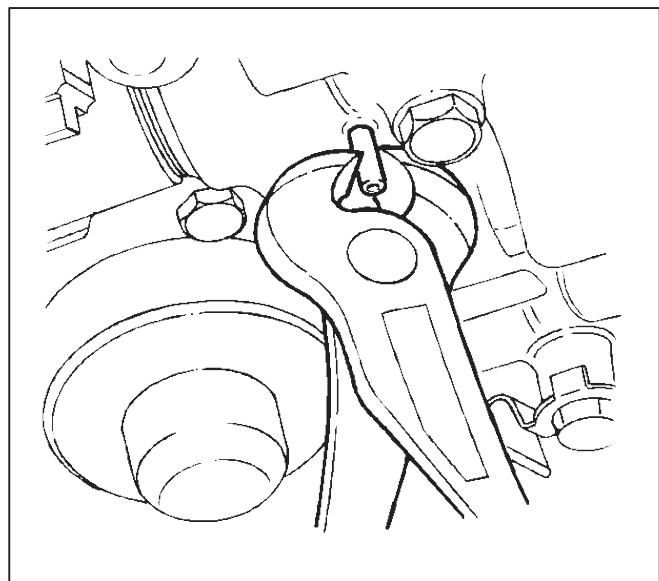
## Solenoid (Main Case Valve Body)

### Removal

1. Raise the vehicle and support it on jack stands.
2. Disconnect battery ground cable.
3. Remove transfer protector (4×4).
4. Drain fluid.
5. Support transfer case with a jack and remove third crossmember.
6. Remove sixteen 10 mm screws, main case oil pan, magnet, and gasket.
7. Remove three 13 mm screws, oil filter.
8. Disconnect wiring harness from band control solenoid and shift solenoids. Pull only on connectors, not on wiring harness.
9. Remove spring pin for shift solenoid A, shift solenoid B, and band control solenoid respectively, using suitable pliers taking care not to damage solenoids.



210RW010

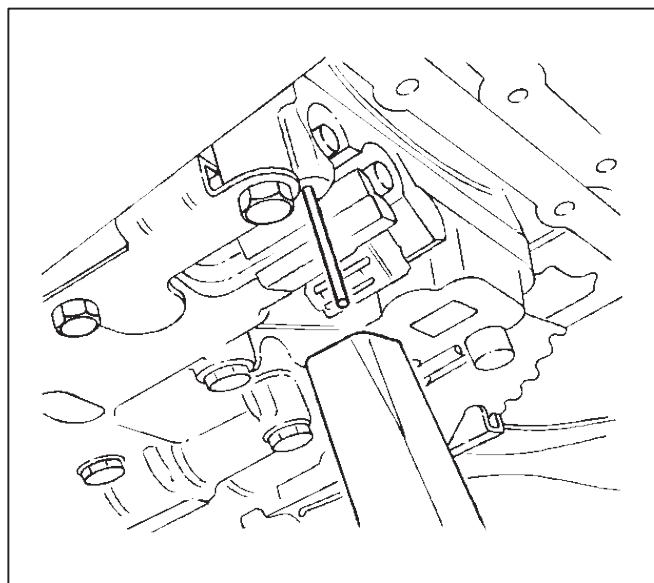


244RW003

10. Remove shift solenoid A, shift solenoid B, band control solenoid, and gaskets from main case valve body. Do not pull on wiring harness. Remove solenoids by grasping the metal tip.

### Installation

1. Install shift solenoid A, shift solenoid B, band control solenoid with new gaskets to main case valve body respectively.
2. Carefully install spring pin with hammer to avoid damage to valve body, etc.



243RW004

3. Connect wiring harness to solenoids.
4. Install oil filter with a new gasket and the three 13 mm screws. Tighten the screws to the specified torque.  
**Torque: 20 N•m (15 lb ft)**
5. Install magnet, main case oil pan with new gasket, sixteen 10 mm screws. Tighten the screws to the specified torque.  
**Torque: 11 N•m (96 lb in)**
6. Install third crossmember and rear mount nuts. Tighten the nuts and bolts to the specified torque.  
**Third crossmember bolt: 116 N•m (85 lb ft)**  
**Rear mount nut: 50 N•m (37 lb ft)**
7. Install the transfer protector. Tighten the bolts to the specified torque (4×4).  
**Torque: 37 N•m (27 lb ft)**
8. Fill transmission through the overfill screw hole of oil pan, using ATF DEXRON®-III. Refer to *Changing Transmission Fluid* in this section.
9. Connect the battery ground cable.

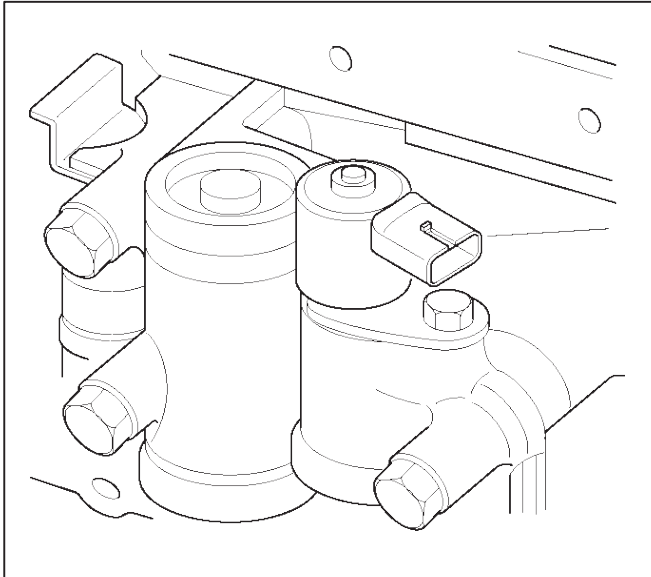
## Solenoid (Adapter Case Valve Body)

### Removal

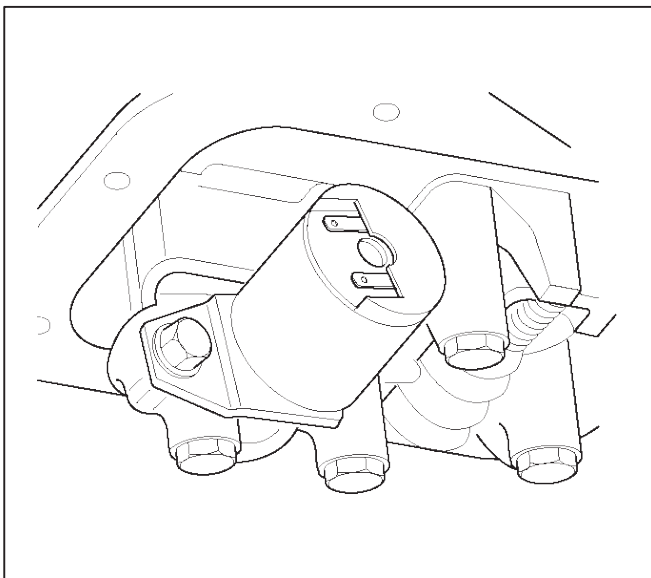
1. Raise the vehicle and support it on jack stands.
2. Disconnect battery ground cable.
3. Drain fluid.
4. Remove adapter case oil pan twelve fixing 10 mm screws, adapter case oil pan, and gasket.

NOTE: Oil pan still contains transmission fluid. Place a large drain container under the oil pan and drain the fluid carefully.

5. Disconnect wiring harness from force motor solenoid and converter clutch PWM solenoid. Pull only on connectors, not on wiring harness.
6. Remove 11 mm bolt, bracket and converter clutch PWM solenoid with two O-rings.



7. Remove 11 mm bolt, retainer, and force motor solenoid.



### Installation

1. Install force motor solenoid, retainer, and 11 mm bolt to adapter case valve body. Tighten the bolt to the specified torque.

**Torque: 10 N•m (87 lb in)**

2. Install converter clutch PWM solenoid with two O-rings, bracket, and 11 mm bolt to adapter case valve body. Tighten the bolt to the specified torque.

**Torque : 10 N•m (87 lb in)**

3. Connect wiring harness assembly to solenoids.
4. Install adapter case oil pan, new gasket, and twelve 10 mm screws. Tighten the screws to the specified torque.

**Torque : 11 N•m (96 lb in)**

5. Fill transmission through overfill screw hole oil pan, using ATF DEXRON®-III. Refer to *Changing Transmission Fluid* in this section.
6. Connect battery ground cable.

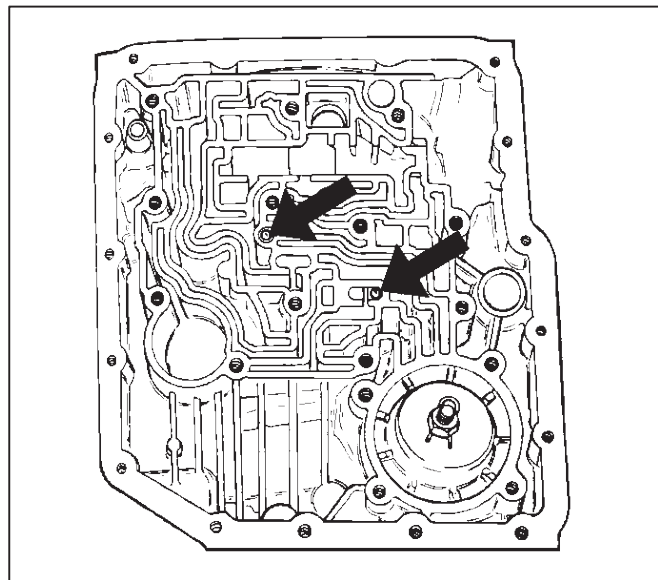
## Valve Body Assembly (Main Case)

### Removal

1. Raise the vehicle and support it on jack stands.
2. Disconnect battery ground cable.
3. Remove transfer protector (4×4).
4. Drain fluid.
5. Support transfer case with a jack and remove third crossmember.
6. Remove sixteen 10 mm screws, main case oil pan, magnet and gasket.
7. Remove three 13 mm oil filter fixing screws, then remove oil filter.
8. Remove two 13 mm manual detent fixing screws, then remove roller and spring assembly.
9. Disconnect wiring harness from band control solenoid and shift solenoids. Pull only on connectors, not on wiring harness.
10. Remove four 13 mm servo cover fixing screws, then remove servo cover and gasket.
11. Remove seven 13 mm valve body fixing screws.
12. Remove main case valve body with manual valve link and transfer plate. Note the position of the link (long end into valve, short end into range selector lever).
13. Remove transfer plate gasket from main case.
14. Remove two check balls from main case.

### Installation

1. Install two check balls to main case.



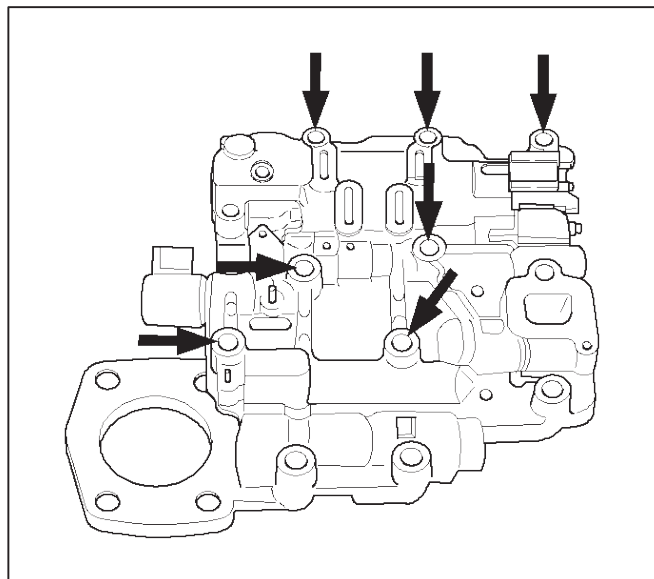
2. Inspect electrical 7 way connector and seal of main case. Replace if necessary.

3. Use two J-25025-B guide pin to install main case.
  - Install valve body assembly and manual valve link.

NOTE: Valve must be extended as the short end of manual valve link is connected to the range selector lever. Long end of link goes into valve.

4. Install seven 13 mm screws, and tighten them to the specified torque.

**Torque: 20 N•m (15 lb ft)**



5. Remove two guide pins from main case.
6. Install servo cover gasket, cover, and four 13 mm screws. Tighten the screws to the specified torque.

**Torque: 25 N•m (18 lb ft)**

7. Connect wiring harness to band control and shift solenoids.
8. Install roller and spring assembly to manual detent.
  - Install two 13 mm screws, and tighten them to the specified torque.

**Torque: 20 N•m (15 lb ft)**

9. Install oil filter and three 13 mm screws. Tighten the screws to the specified torque.

**Torque : 20 N•m (15 lb ft)**

10. Install oil pan gasket, magnet, oil pan and sixteen 10 mm screws. Tighten the screws to the specified torque.

**Torque: 11 N•m (96 lb in)**

11. Install third crossmember and rear mount. Tighten the bolts and nuts to the specified torque.

Torque

**Third crossmember bolt: 116 N•m (85 lb ft)**

**Rear mount nut: 50 N•m (37 lb ft)**

12. Install transfer protector. Tighten the bolts to the specified torque (4×4).

**Torque: 37 N•m (27 lb ft)**

13. Fill transmission through overfill screw hole of oil pan, using ATF DEXRON®-III. Refer to *Changing Transmission Fluid* in this section.

14. Connect battery ground cable.

## Valve Body Assembly (Adapter Case)

### Removal

1. Raise the vehicle and support it on jack stands.
2. Disconnect battery ground cable.
3. Drain fluid.
4. Remove twelve 10 mm adapter case oil pan fixing screws, adapter case oil pan, and gasket.

NOTE: Oil pan still contains transmission fluid. Place a large drain container under the oil pan.

Drain the fluid carefully.

5. Disconnect wiring harness from force motor solenoid and converter clutch solenoid. Pull only on connectors, not on wiring harness.
6. Remove seven 13 mm screws from adapter case valve body assembly, then remove transfer plate, two gaskets, and adapter case valve body.

### Installation

1. Inspect electrical 4 way connector and seal of adapter case. Replace if necessary.
2. Install gasket, transfer plate, and gasket.
3. Install adapter case valve body and seven 13 mm screws. Tighten the screws to the specified torque.

**Torque: 20 N•m (15 lb ft)**

4. Connect wiring harness assembly to converter clutch solenoid and force motor.
5. Install oil pan gasket, oil pan, and twelve 10 mm screws. Tighten the screws to the specified torque.

**Torque: 11 N•m (96 lb in)**

6. Fill transmission through the overfill screw hole of oil pan, using ATF DEXRON®-III. Refer to *Changing Transmission Fluid* in this section.
7. Connect battery ground cable.

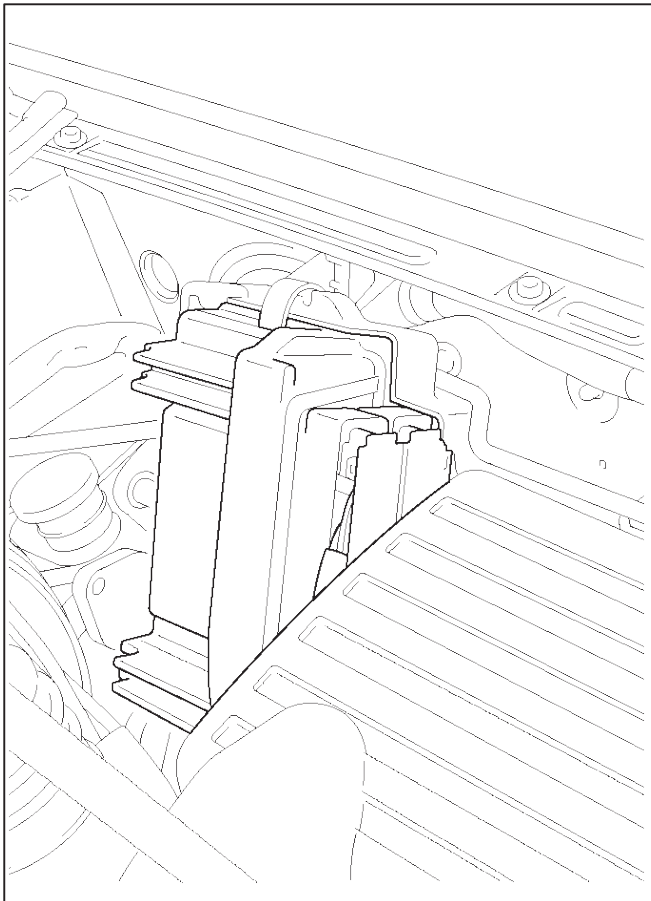
## Powertrain Control Module (PCM)

### Removal

1. Disconnect battery ground cable.
2. Disconnect PCM wiring harness connectors from PCM.
3. Remove PCM from bracket.

### Installation

1. Install PCM to bracket.
2. Connect PCM wiring harness connectors to PCM.
3. Connect battery ground cable.



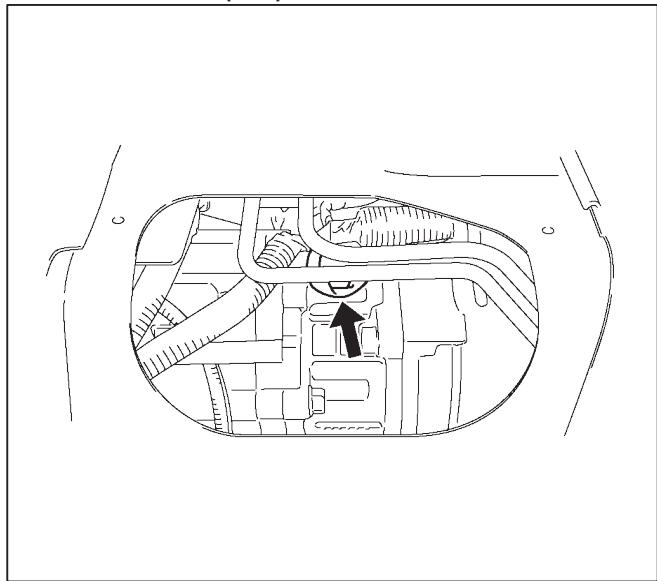
825R100018

## Speed Sensor (Extension Assembly)

### Removal

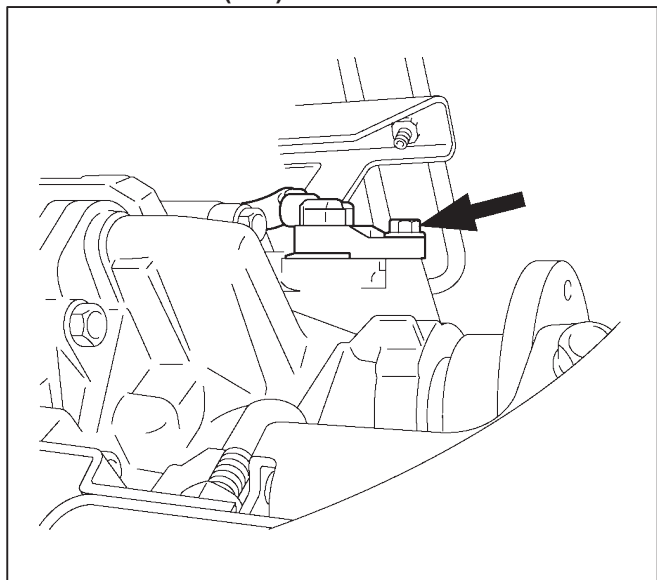
1. Raise the vehicle and support on jack stands.
2. Disconnect battery ground cable.
3. Disconnect speed sensor harness connector from speed sensor.
4. Remove one 10 mm screw and speed sensor with O-ring.

#### Sensor Location (4×4)



241R200002

#### Sensor Location (4×2)



241R200001

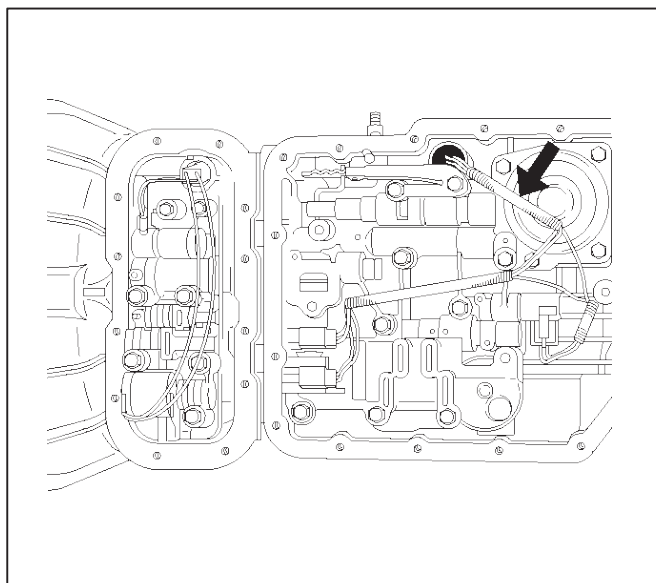
### Installation

1. Inspect the speed sensor O-ring, and replace it if necessary.
2. Install speed sensor assembly and 10 mm screw.  
**Torque: 9 N•m (78 lb in)**
3. Connect speed sensor harness connector to speed sensor.
4. Connect battery ground cable.

## Transmission Oil Temperature Sensor (Main Case)

### Removal

1. Raise the vehicle and support it on jack stands.
2. Disconnect battery ground cable.
3. Drain fluid.
4. Remove sixteen 10 mm main case oil pan fixing screws, main case oil pan, and gasket.
5. Disconnect wiring harness from shift solenoids, band apply solenoid, and 7 way connector of main case. Pull only on connectors, not on wiring harness.
6. Remove wiring harness assembly with transmission oil temperature sensor.



### Installation

1. Install wiring harness assembly with transmission oil temperature sensor to band apply solenoid, shift solenoids, and 7 way connector of main case.
2. Install oil pan gasket, oil pan, and sixteen 10 mm fixing screws. Tighten the screws to the specified torque.

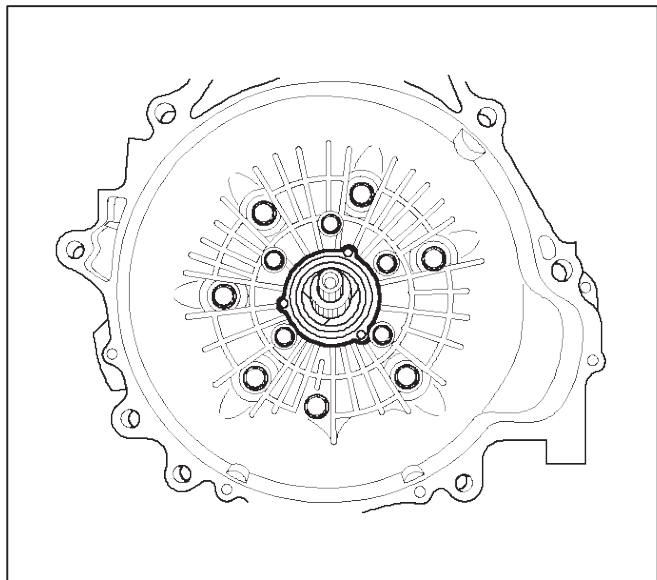
**Torque: 11 N•m (96 lb in)**

3. Fill transmission through the overfill screw hole of oil pan, using ATF DEXRON®-III.  
Refer to *Changing Transmission Fluid in this section*.
4. Connect battery ground cable.

## Front Oil Seal (Converter Housing)

### Removal

1. Remove transmission assembly from the vehicle. Refer to *Transmission Assembly in this section*.
2. Remove torque converter from converter housing.
3. Remove three screws and oil seal ring from converter housing.



### Installation

1. Apply clean ATF to the new oil seal ring lip.
  - Install oil seal ring to converter housing. Tighten the screws to the specified torque.

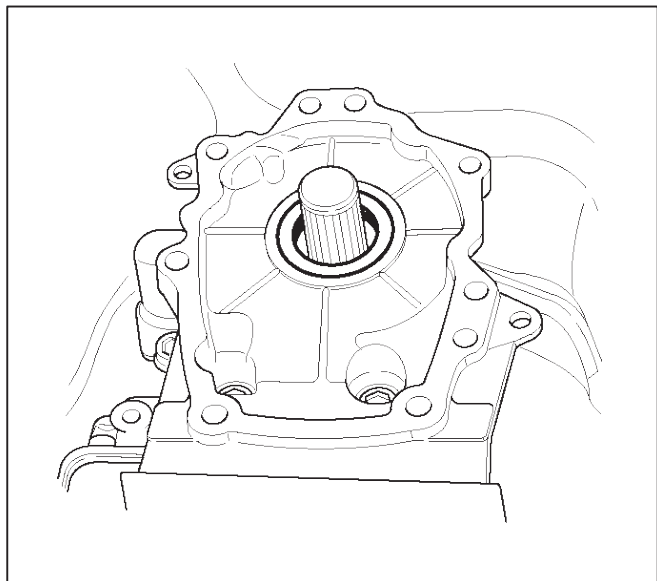
**Torque: 3 N•m (26 lb in)**

2. Install torque converter to converter housing.
3. Install transmission assembly to the vehicle. Refer to *Transmission Assembly in this section*.

## Rear Oil Seal (Extension Assembly)

### Removal

1. Remove transfer case assembly (4×4) or extension assembly (4×2) from the vehicle. Refer to *Transfer Case in Drive Line/Axle section (4×4)*.
2. Remove rear oil seal from transmission extension assembly.



### Installation

1. Use J-36797 extension assembly oil seal installer, and install the rear oil seal to the transmission extension assembly.
2. Install the transfer case assembly (4×4) or extension assembly (4×2) to the vehicle. Refer to *Transfer Case in Drive Line/Axle section (4×4)*.

## Transmission (4L30-E)

### Disassembly

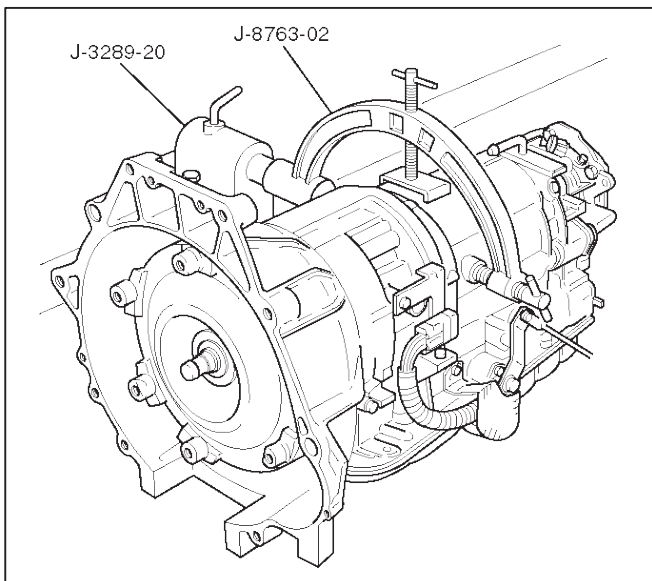
NOTE: During the disassembly and reassembly, perform the following:

- Wash each part thoroughly, and blow air through each oil passage and groove to eliminate blockage.
- Seal rings, roll pins, and gaskets should be replaced.
- When assembling the components, apply DEXRON®-III Automatic Transmission Fluid (ATF) to each seal, rotating part, and sliding part.
- Do not dip part facings, such as clutch or brake drive plates, in cleaner when washing it.  
Also, always coat parts with new ATF two or three times after cleaning with solvent.

1. Remove torque converter (1).

- Drain fluid from torque converter.
- Attach J-8763-02 holding fixture to the transmission and set it on J-3289-20 holding fixture base.

NOTE: Do not overtighten the tool, as case damage may result.



420RW021

2. Remove O-ring (2) from turbine shaft.
3. Remove two 10mm mode switch screws, selector lever nut, cover, and mode switch (3).
4. Remove twelve 10mm adapter case oil pan (4) fixing screws, adapter oil pan, and gasket.
5. Disconnect electrical wiring connections (5) from solenoids and 4 way connector of adapter case. Pull on connectors only, not on wiring harness.
6. Remove seven 13mm adapter case valve body (6) fixing screws, adapter case valve body assembly, transfer plate, and two gaskets.
  - Remove wiring harness and 4 way connector.
7. Remove sixteen 10mm main case oil pan (7) fixing screws, main oil pan, magnet, and gasket.
8. Remove three 13mm oil filter (8) fixing screws and oil filter.

9. Remove two 13mm manual detent (9) fixing screws, roller and spring, and manual detent.

10. Disconnect wiring harness assembly (10) from band apply solenoid, shift solenoids, and main case 7 way connector.

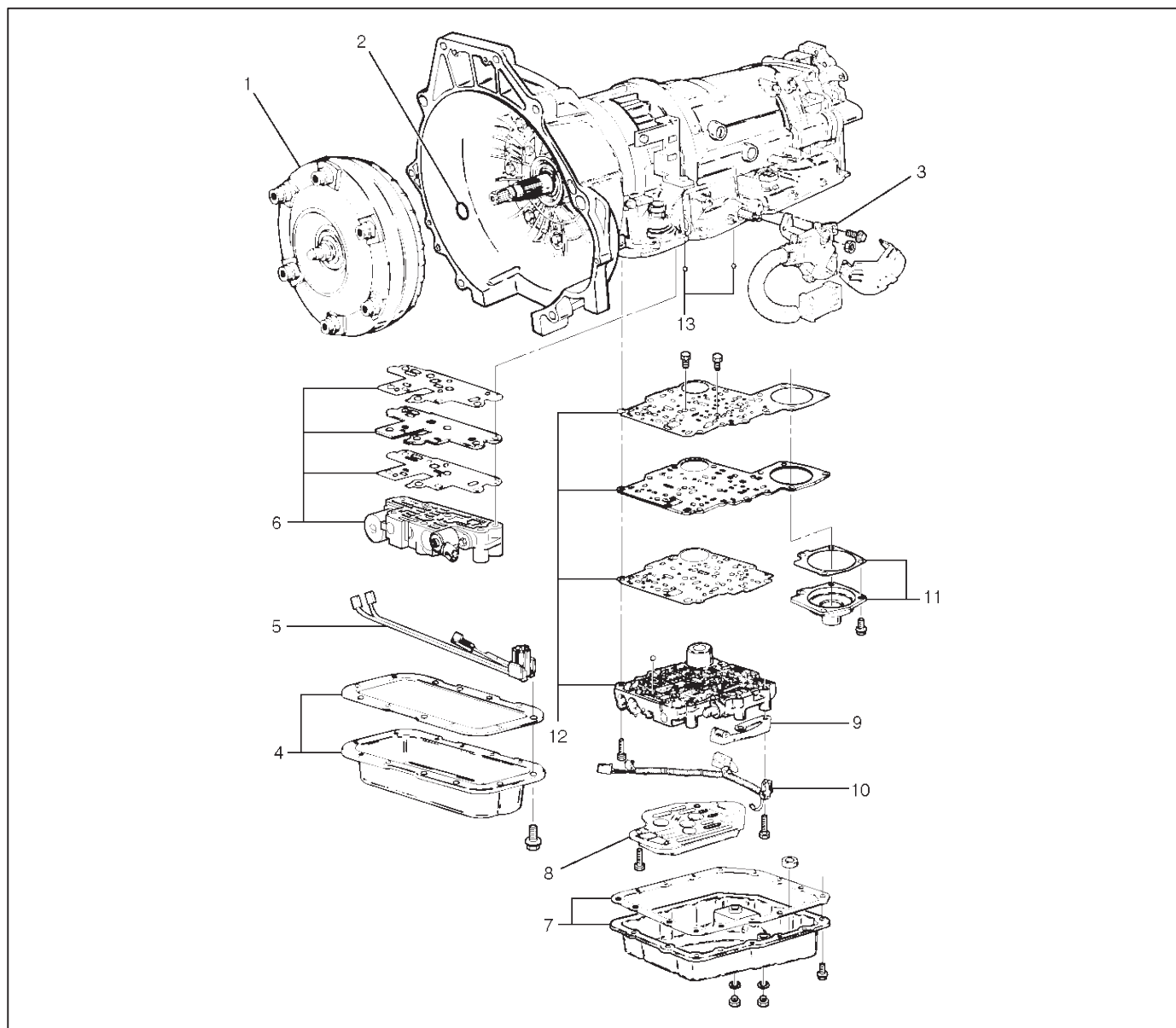
Pull on connectors only, not on wiring harness.

11. Remove four 13mm servo cover (11) fixing screws, servo cover, and gasket.

12. Remove seven 13mm valve body screws from main case.

- Remove wiring harness assembly (5) from the adapter case side.
- Remove main valve body assembly (12) with manual valve link and transfer plate. Note the position of the link (long end into valve, short end into range selector lever).
- Remove 7 way connector.
- Remove gasket transfer plate from main case.

13. Remove two check balls (13) from main case.



240RY001

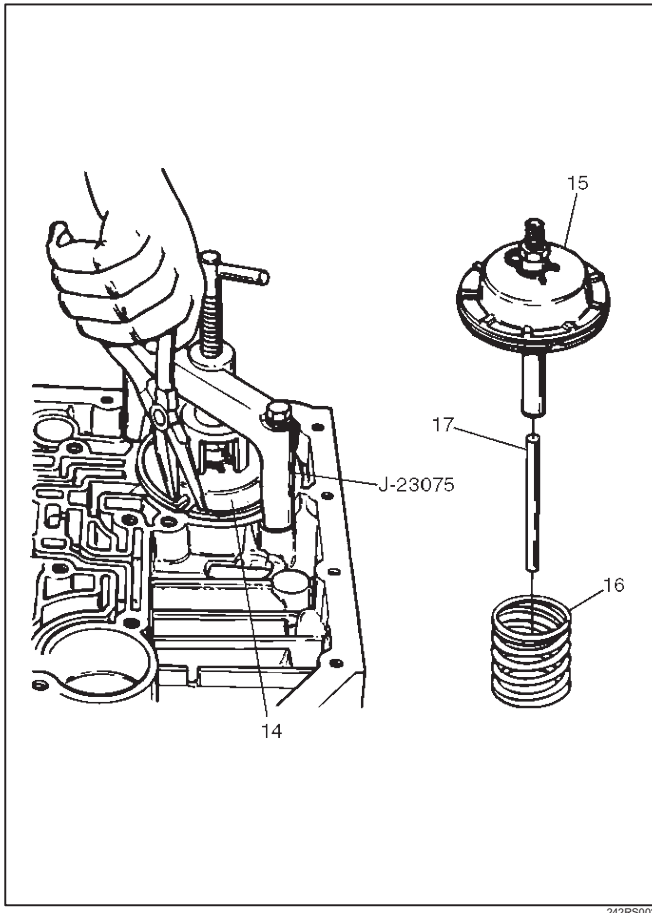
14. Turn transmission to vertical position to drain fluid.

Return back to horizontal position when drained.

- Install J-23075 servo piston spring compressor with offset to the rear of case.
- Compress servo piston assembly.
- Remove servo piston retaining ring (14).
- Slowly release servo piston assembly (15).
- Remove tool.

## 7A-56 AUTOMATIC TRANSMISSION (4L30-E)

15. Remove servo piston assembly (15), return spring (16), and servo apply rod (17).



16. Rotate transmission to horizontal position, pan side down.

- Remove one 10mm screw, and speed sensor (18) with "O" ring.

17. Remove seven 8mm extension housing hexagon socket head screws, extension housing assembly (19), and gasket.

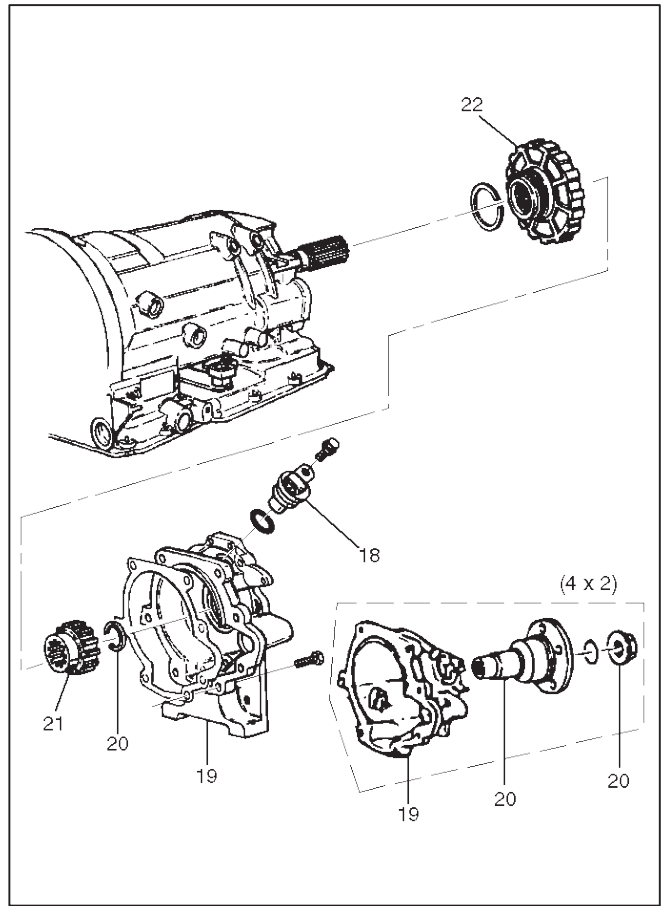
18. Remove retaining ring (20). (4×4)

NOTE: Use extra long, needle-nose pliers.

- Remove flange nut (20). (4×4)
- Remove flange and O-ring (20). (4×2)

19. Remove speed wheel (21).

20. Remove wheel parking lock (with seal ring) (22).

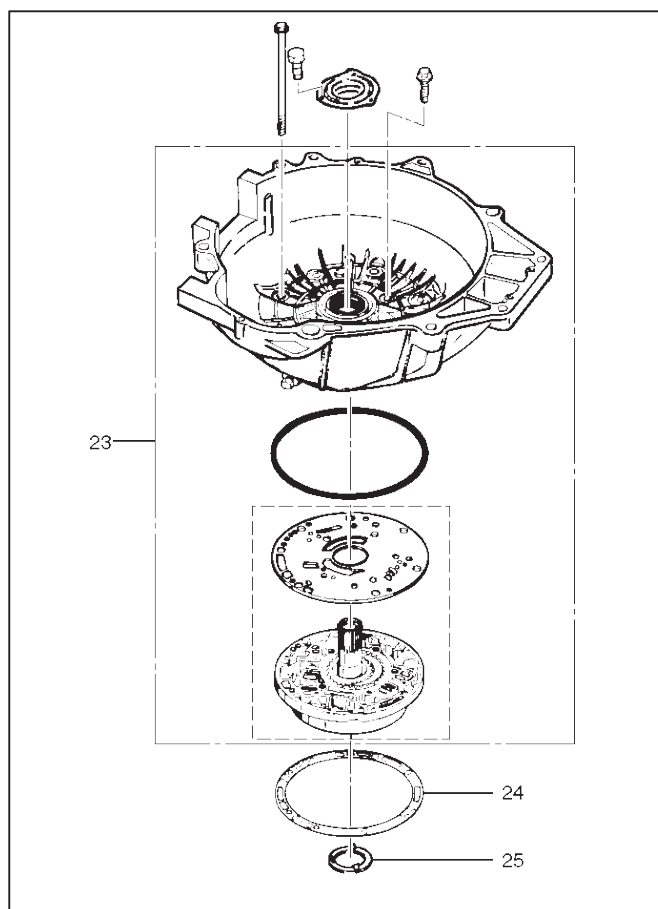


21. Rotate transmission to vertical position, converter housing up.

- Loosen the converter housing and oil pump assembly fixing screws, but do not remove the five 13 mm inner screws if oil pump disassembly is required.
- Remove seven outer screws.
- Remove converter housing and oil pump assembly (23).

22. Remove gasket (24).

23. Remove selective thrust washer (25).



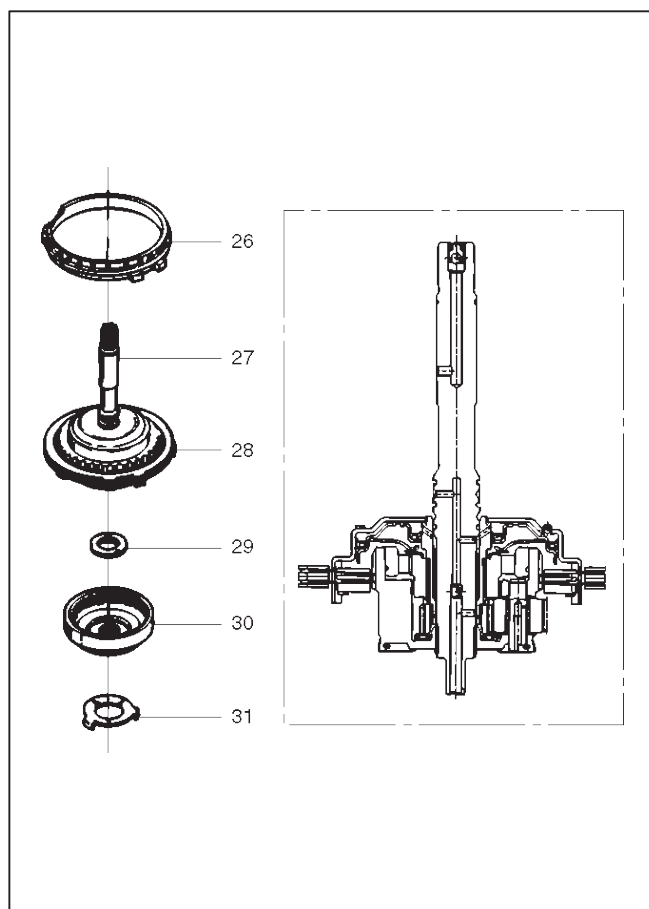
24. Remove fourth clutch retainer (26).

25. Grasp turbine shaft and lift out the overrun clutch housing assembly (27) and fourth clutch plates (28).

26. Remove thrust bearing assembly (29).

27. Remove overdrive internal gear (30).

28. Remove thrust washer (31).



29. Remove adapter case and center support assembly (with fourth clutch piston) (32).

30. Remove seal ring (33).

31. Remove selective thrust washer (34) and two O-ring seals (35) from main case.

32. Use J-23327 and J-23327-90 compressor to compress the fourth clutch spring retainer and springs (37).

- Release snap ring (36) from groove.
- Remove clutch compressor and snap ring (36).

33. Remove retainer and spring assembly (37).

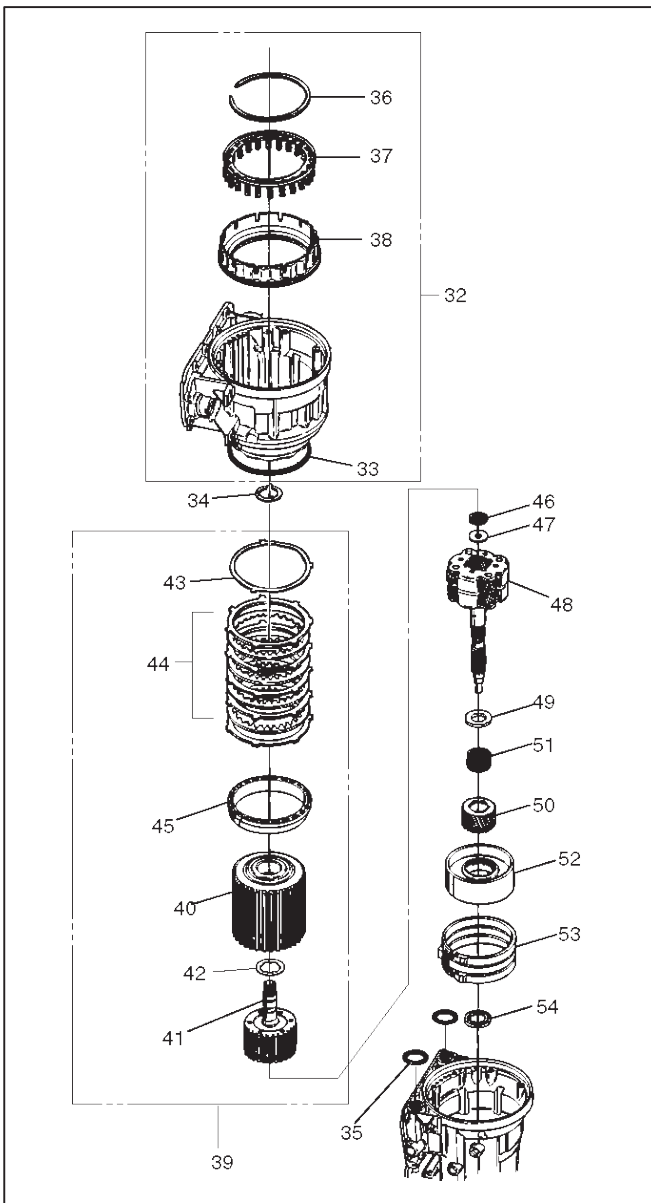
34. Insert two converter housing/main case screws to hold adapter case while pulling out fourth clutch piston (38).

- Remove fourth clutch piston assembly (38) from the adapter case.
- Remove converter housing/main case screws.

35. Grasp intermediate shaft, twist and pull out the second and third clutch drum assemblies with reverse clutch plates (39) while holding onto output shaft.

## 7A-58 AUTOMATIC TRANSMISSION (4L30-E)

36. Separate second (40) and third clutch (41) assemblies.
37. Remove thrust washer (42).
38. Remove reverse clutch plates (43 and 44) and reverse clutch pressure plate (45).
39. Remove bearing (46) and washer (47).
40. Remove planetary carrier assembly (48).
41. Remove thrust bearing (49).
42. Remove reaction sun gear (50)
43. Remove needle bearing (51).
44. Remove brake drum (52).
45. Remove brake band (53).
46. Remove thrust bearing (54).



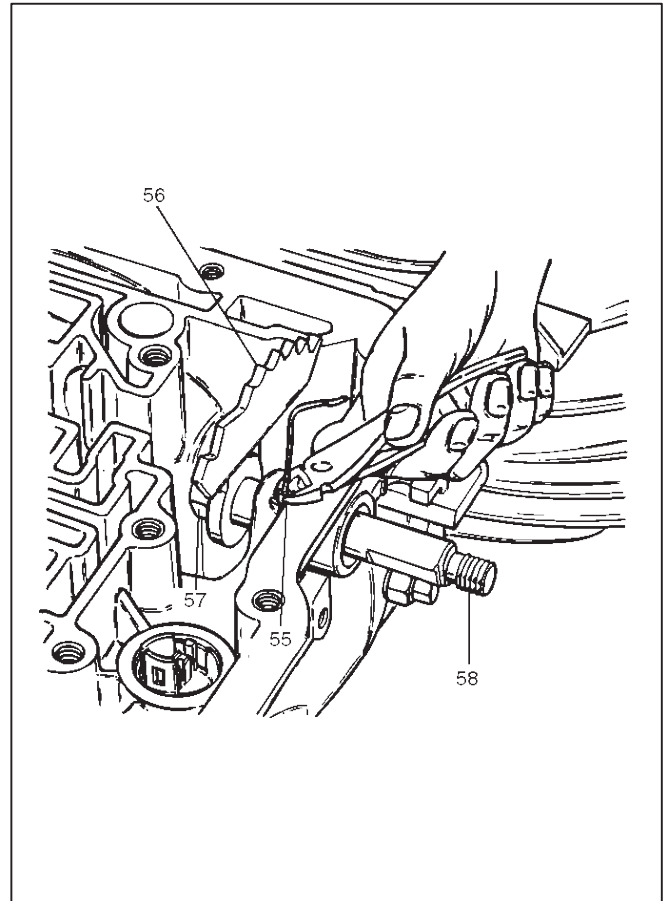
47. Rotate case to horizontal position, valve body side facing up.

- Remove spring pin (55), using cutting pliers, then remove parking lock and selector lever assembly (56).

NOTE: Insert wire in the center of the spring pin to prevent it from collapsing during removal. Be aware of pin height. Protect machined face of main case.

48. Remove parking lock and range selector lever 17 mm nut (57).
49. Remove parking lock and range selector lever (56), and actuator assembly.
50. Remove selector shaft (58).

NOTE: Inspect the shaft for burrs before removing to prevent damaging seal. If necessary, remove burrs by lightly sanding with an oilstone.



## Reassembly

1. Inspect selector shaft seal, and replace it if necessary.

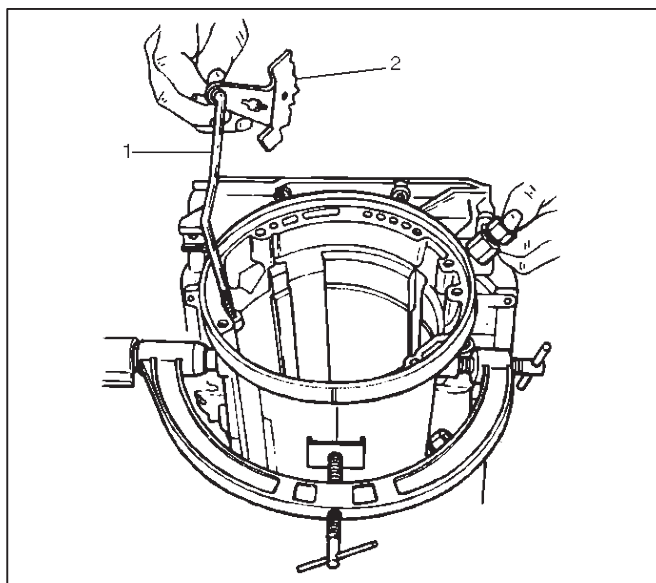
NOTE: Use a seal installer when replacing the seal.

- Install selector shaft.

NOTE: Spring pin groove must be positioned inside the case.

2. Install spring pin. Be sure the selector shaft can move freely. Do not push the pin flush with the case surface. Leave enough height for removal.
3. Install actuator assembly (1).
4. Install parking lock and range selector lever (2) and new 17 mm nut. Tighten the nut to the specified torque.

**Torque: 22 N•m (16 lb ft)**



249RS005

5. Rotate main case to vertical position, extension end facing down.

- Install brake band assembly (3).

NOTE: Be sure to align servo pin area with the servo hole.

6. Install thrust bearing (4).

NOTE: The case bushing acts as a guide for the thrust bearing.

7. Install brake drum (5).

8. Install reaction sun gear (6).

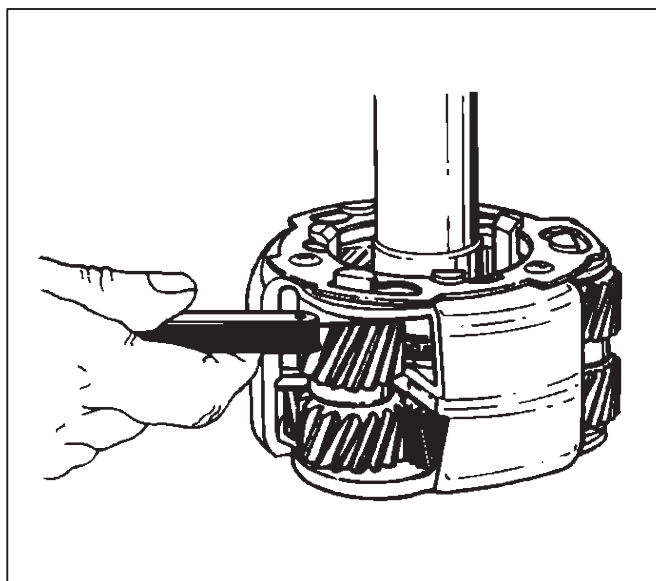
9. Install needle bearing (7).

10. Inspect planetary carrier assembly (8) for wear and damage. If necessary replace it.

- Measure pinion end play clearance with a feeler gauge.

**Clearance: 0.13mm–0.89mm (0.005 in–0.035 in)**

If clearance is outside specified value, replace the planetary carrier assembly.



248RS001

11. Install the thrust bearing (9) on the output shaft.

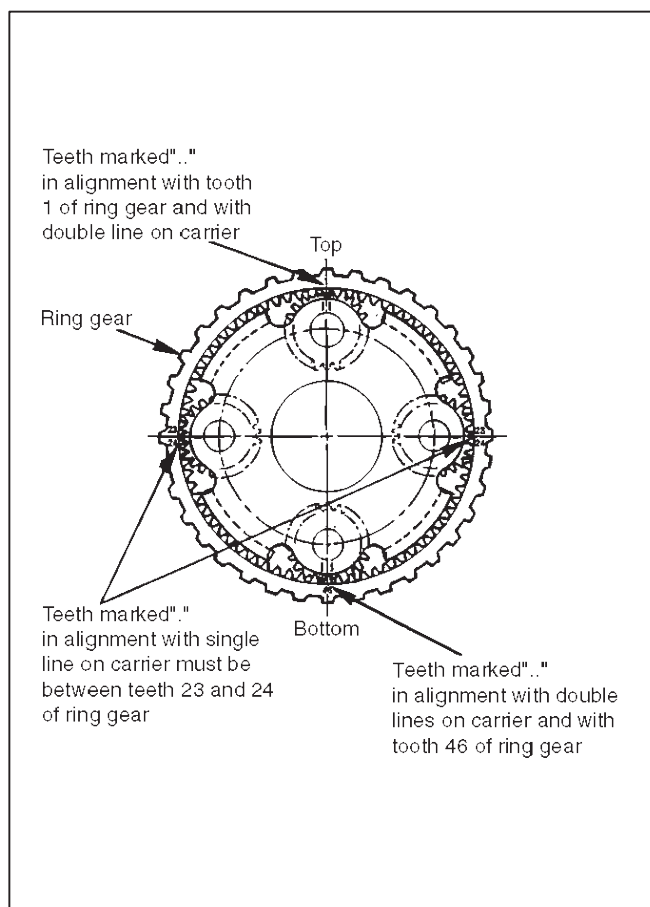
NOTE: Use petroleum jelly to hold the thrust bearing in place.

12. Align planetary pinions. Each pinion is marked with double points to indicate the master tooth space and exactly opposite with a single point to indicate the master tooth. The markings on the planetary carrier consist of double lines which are to be lined up with the double points on two opposite pinions; the single lines are to be lined up with the single points on the other two pinions.

- After all four pinions are lined up, slide on the third clutch assembly. Rotate third clutch and check mark alignment. Considering that the ring gear tooth between the double points of one planetary pinion is tooth number 1, count the teeth to check that the single points on the two adjacent pinions are between teeth 23 and 24 of the ring gear, and that the ring gear tooth between the double points of the opposite pinion is tooth number 46. If the ring gear and pinions are not lined up, remove, and realign them.

13. Install planetary carrier (8) with third clutch (12).

NOTE: Do not force. When properly aligned, the parts will fit together easily.



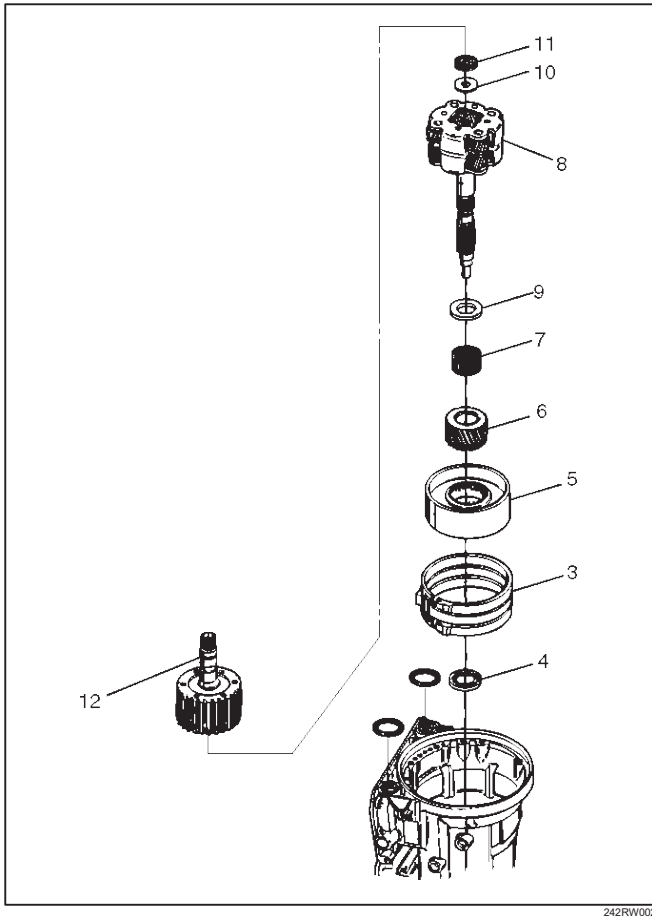
248RS002

14. Remove the third clutch (12).

15. Install bearing (11) and washer (10).

## 7A-60 AUTOMATIC TRANSMISSION (4L30-E)

NOTE: Use petroleum jelly to hold the washer and bearing in place.



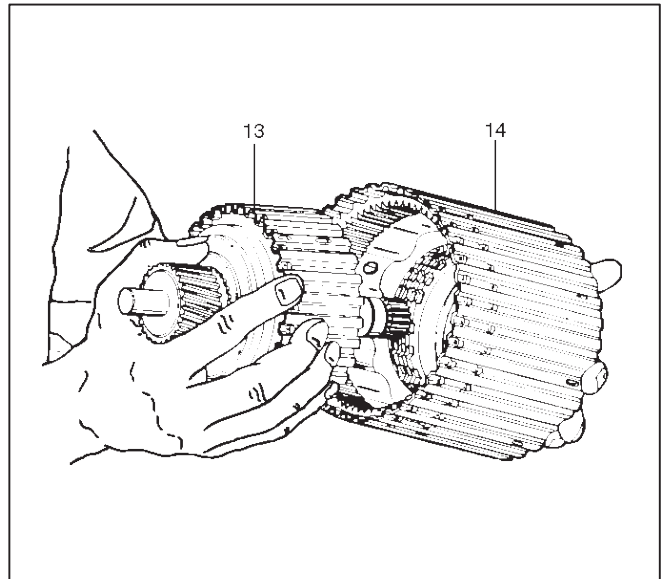
16. Carefully align the second clutch plate inner tangs.

- Install thrust washer, tangs pointing downward, and locating tang positioned in slot on second clutch hub.

NOTE: Use petroleum jelly to hold thrust washer in place.

17. Install third clutch and intermediate shaft assembly (13) into the second clutch drum (14).

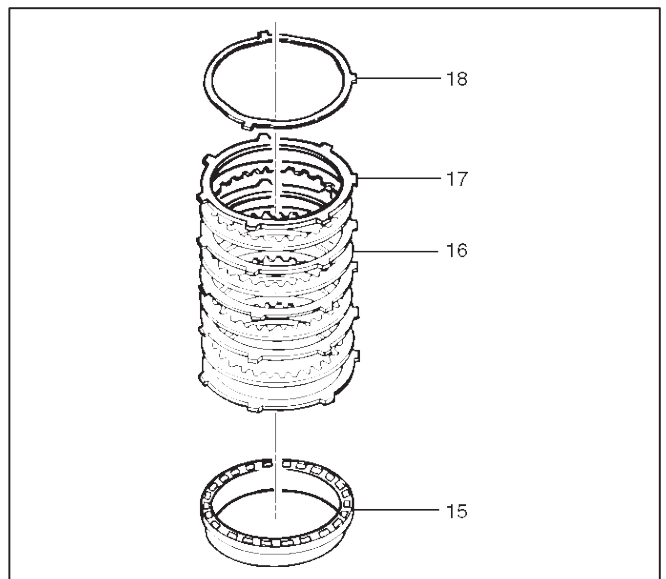
18. Install second and third clutch assemblies into the main case. Twist output shaft and clutch assemblies to ensure proper fit.



19. Install pressure plate (15) with lip side up, tang facing valve body face.

20. Install reverse clutch plates. Start with a steel plate (17) and alternate with a lined plate (16).

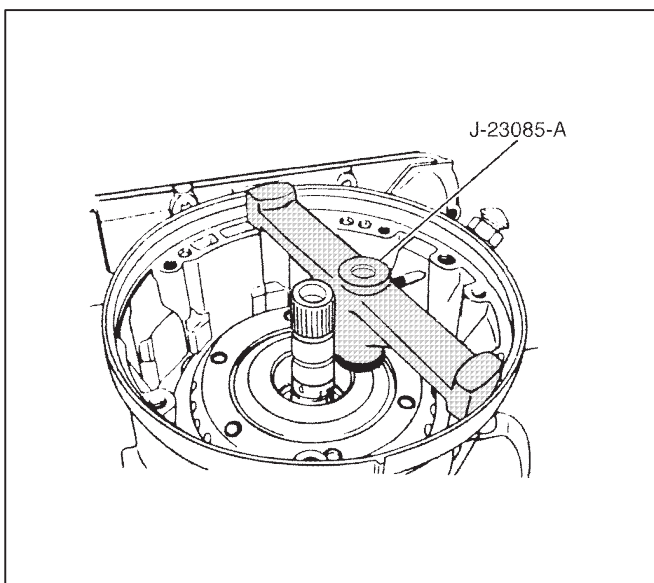
21. Install waved clutch plate (18) with center tang facing valve body side.



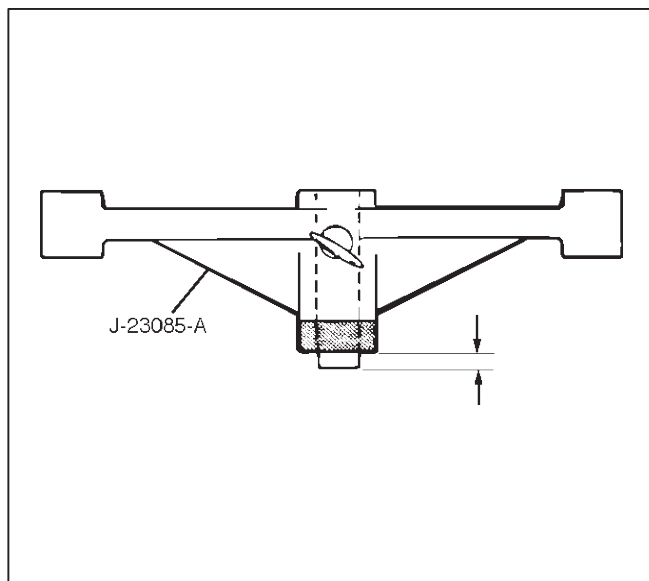
## 22. Second clutch end play measurement

1. Install the J-23085-A Selective washer gauging tool (with spacer ring) on the case flange and against the intermediate shaft.
2. Position the inner shaft of the gauging tool against the thrust surface of the second clutch hub.
3. Tighten thumb screw. Remove the tool.
4. Fit the spacer ring on the inner shaft of the tool.
5. Measure the gap, and select the appropriate washer as shown in the chart.

| Selective Thrust Washer                                                                                      |         |
|--------------------------------------------------------------------------------------------------------------|---------|
| Gap: mm(in)                                                                                                  | Color   |
| 1.53 – 1.63 (0.060 – 0.064)                                                                                  | Yellow  |
| 1.72 – 1.82 (0.068 – 0.072)                                                                                  | Red     |
| 1.91 – 2.01 (0.075 – 0.079)                                                                                  | Black   |
| 2.10 – 2.20 (0.083 – 0.087)                                                                                  | Natural |
| 2.29 – 2.39 (0.090 – 0.094)                                                                                  | Green   |
| 2.48 – 2.58 (0.098 – 0.102)                                                                                  | Blue    |
| FOLLOWING THE PROCEDURE SHOULD<br>RESULT IN FINAL END-PLAY FROM 0.36 mm TO<br>0.79 mm (0.014 in TO 0.031 in) |         |



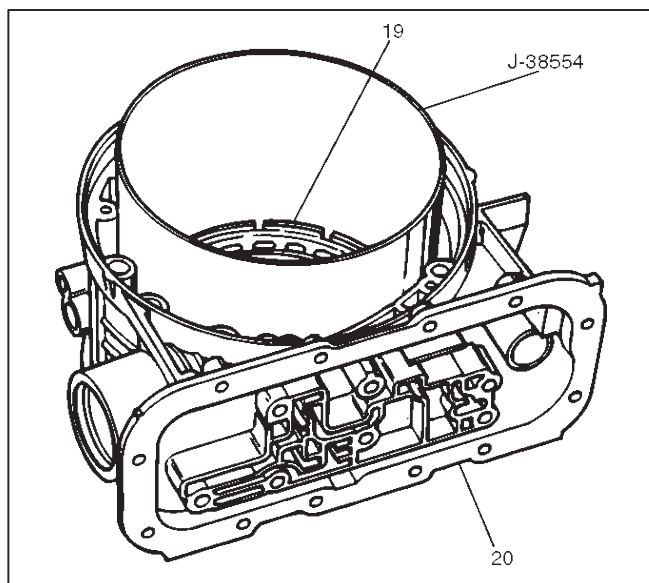
247R100001



247RS004

## 23. Inspect fourth clutch piston seals and replace if necessary.

- Lubricate J-38554 fourth clutch piston fitter and install it on fourth clutch piston (19).
- Install fourth clutch piston (19) in adapter case (20).
- Remove fitter.



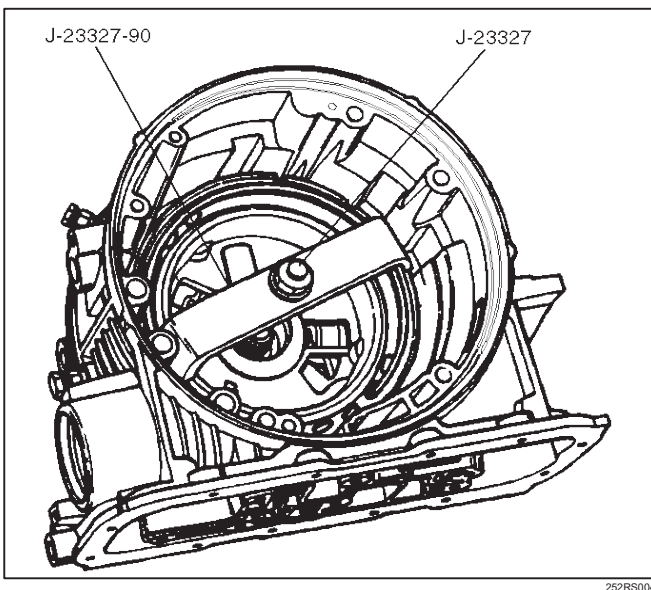
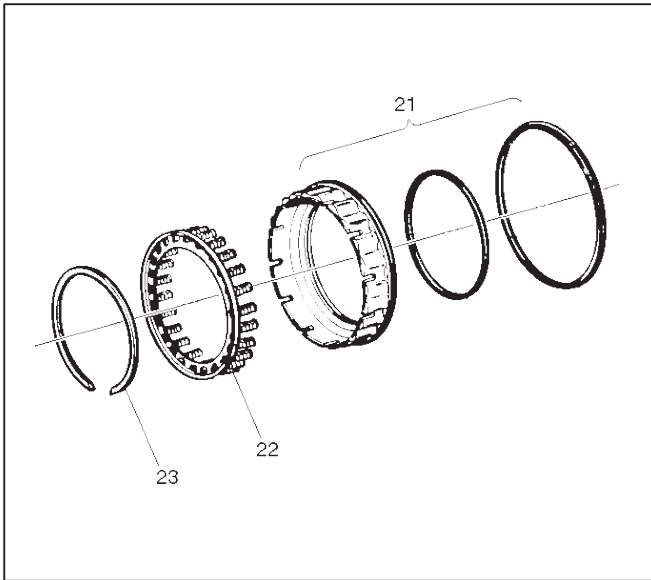
252RS003

## 7A-62 AUTOMATIC TRANSMISSION (4L30-E)

24. Install retainer and spring assembly (22) into fourth clutch piston (21).

25. Install snap ring (23) in adapter case.

- Install J-23327 and J-23327-90 fourth clutch spring compressor.
- Seat snap ring in groove.
- Remove compressor.

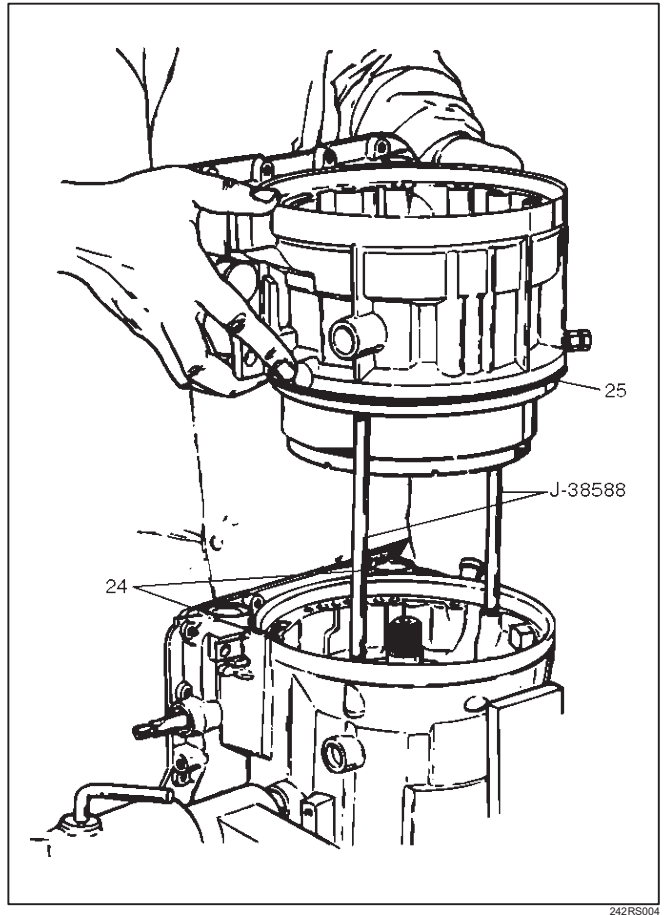


26. Install selective washer using petroleum jelly.

27. Install two O-ring seals (24) in main case and adapter case/main case seal ring (25).

28. Install J-38588 guide pins.

- Install adapter case and center support assembly to main case.



29. Install thrust washer (26) into adapter case, with tangs pointing downwards.

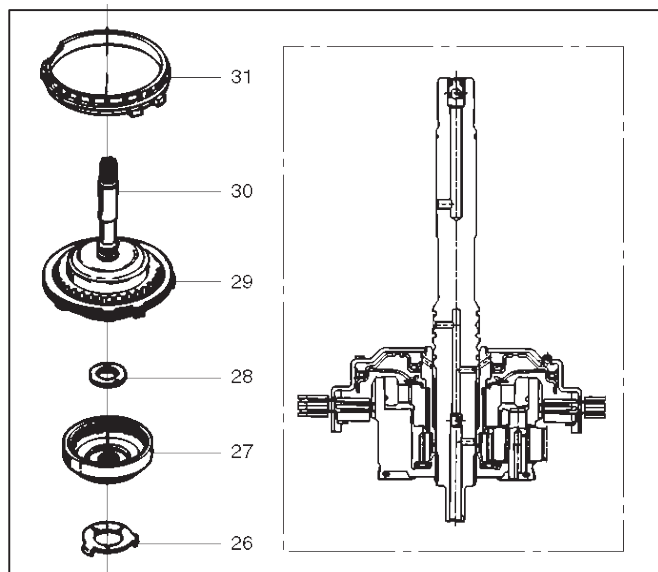
30. Preassemble overdrive internal gear (27) and thrust bearing assembly (28) onto the turbine shaft and overrun clutch assembly.

NOTE: Install bearing assembly, black side up. Use petroleum jelly to keep assembly in place.

31. Install overdrive carrier (30) and internal gear assembly into adapter case.

32. Install fourth clutch plates (29) in the following order: Steel, Lined, Steel, Steel, Lined, Steel. Steel plates go in with short tang facing towards valve body surface.

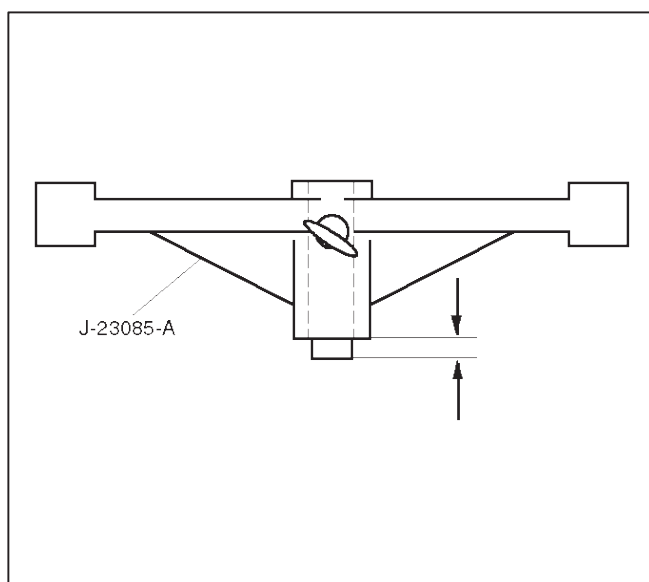
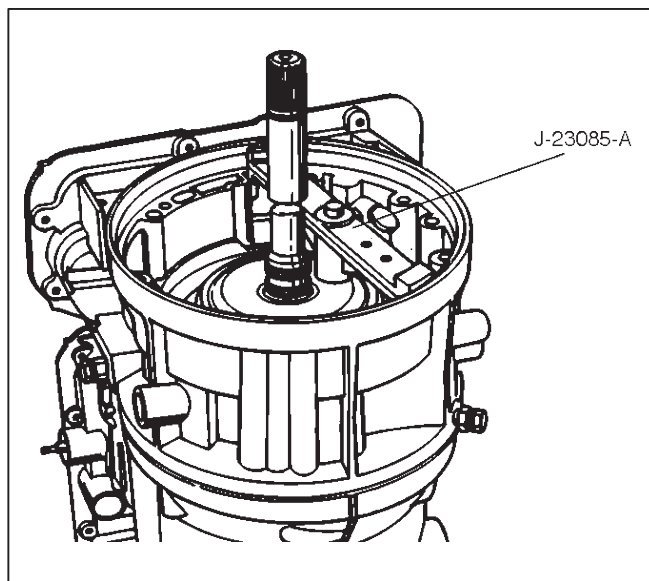
33. Install fourth clutch retainer (31) with the notch facing up and positioned towards valve body surface.



#### 34. Overdrive clutch end play measurement

1. Install the J-23085-A selective washer gauging tool on the adapter case flange and against the input shaft.
2. Position the inner shaft of the tool against the thrust surface of the overrun clutch housing.
3. Tighten thumb screw. Remove the tool.
4. Measure gap. Select appropriate size washer as shown in the chart.
5. Set selective thrust washer aside.

| Selective Thrust Washer                                                                             |         |
|-----------------------------------------------------------------------------------------------------|---------|
| Gap: mm(in)                                                                                         | Color   |
| 1.53 – 1.63 (0.060 – 0.064)                                                                         | Yellow  |
| 1.72 – 1.82 (0.068 – 0.072)                                                                         | Red     |
| 1.91 – 2.01 (0.075 – 0.079)                                                                         | Black   |
| 2.10 – 2.20 (0.083 – 0.087)                                                                         | Natural |
| 2.29 – 2.39 (0.090 – 0.094)                                                                         | Green   |
| 2.48 – 2.58 (0.098 – 0.102)                                                                         | Blue    |
| FOLLOWING THE PROCEDURE SHOULD RESULT IN FINAL END-PLAY FROM 0.1 mm TO 0.8 mm (0.004 in TO 0.03 in) |         |



35. Install selective washer (32).

NOTE: Use petroleum jelly to hold selective washer in place.

36. Install gasket (33).

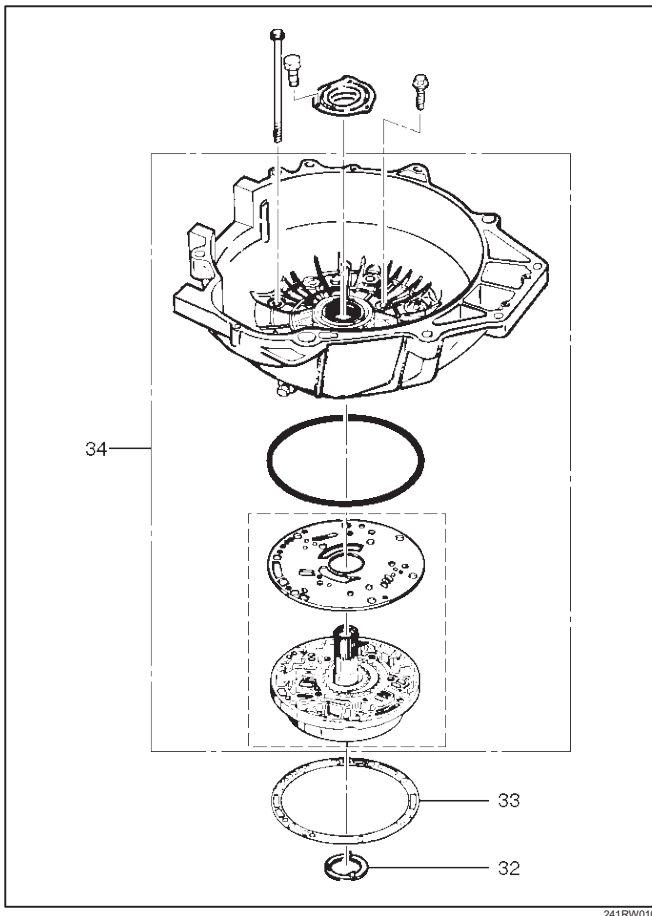
37. Install converter housing and oil pump assembly (34) to adapter case.

- Fit and tighten seven outer 13 mm screws.

**Torque: 39 N•m (29 lb ft)**

## 7A-64 AUTOMATIC TRANSMISSION (4L30-E)

- Ensure free rotation of oil pump using J-23082-01 oil pump rotation tool.



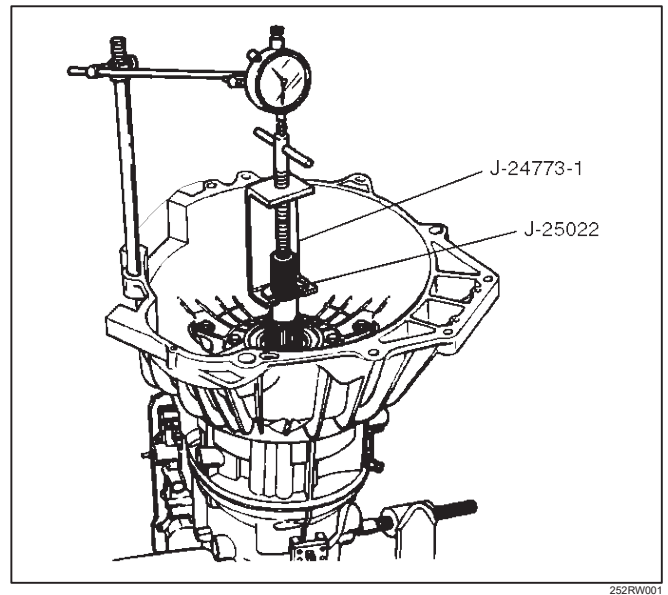
### 38. Overdrive clutch end play measurement

1. Fit J-25022 and J-24773-1 turbine shaft puller on turbine shaft.
2. Position axial play checking tool on converter housing mating face.
3. Pull turbine shaft upwards with puller until first resistance is met. (due to weight of overdrive assembly).
4. Maintain shaft in this position and set indicator to zero.
5. Pull turbine shaft further upwards with puller. Read end play shown on indicator.

**End play: 0.1mm – 0.8mm (0.004 in – 0.031in)**

6. Remove axial play checking tool and puller.

**NOTE:** If end play is not correct, repeat selective washer selection.



39. Inspect extension housing oil seal and replace if necessary, using J-36797 extension housing oil seal installer.

- Rotate transmission to horizontal position, with valve body side down.
- Inspect parking wheel seal ring. Replace if necessary.
- Install wheel parking lock assembly (35).

40. Install speed wheel (36) and snap ring (37). (4×4)

**NOTE:** Use extra long, needle-nose pliers.

41. Install flange, O-ring and nut. (4×2)

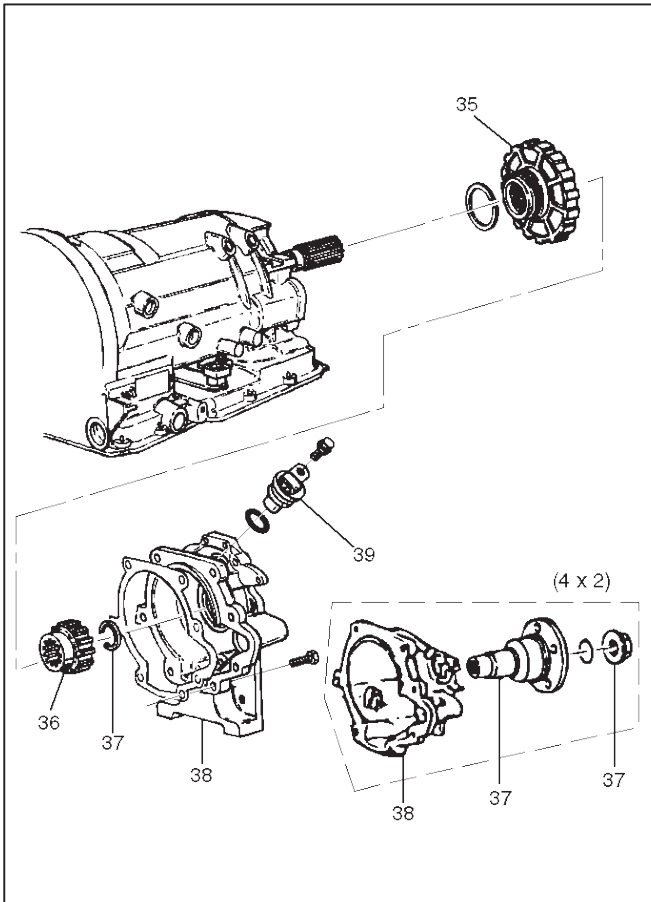
42. Install gasket onto extension assembly with a thin coating of oil.

- Install extension housing assembly (38), and align parking pawl shaft.
- Install actuator assembly into extension assembly.
- Install seven 8 mm hexagon socket head screws.

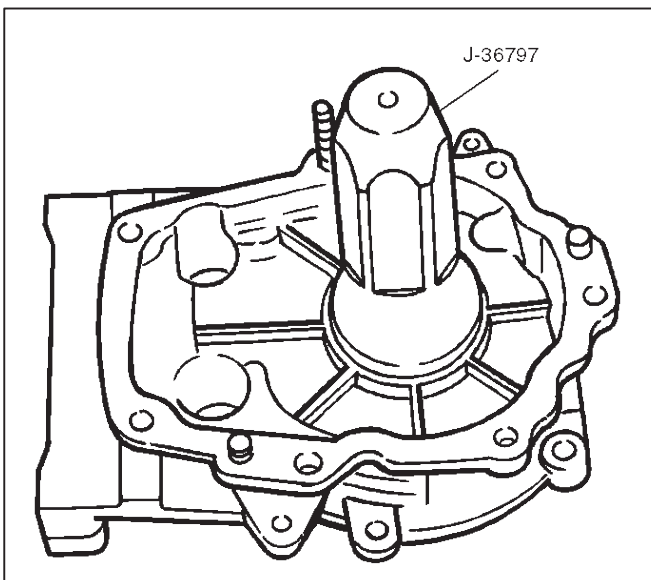
**Torque: 32 N•m (24 lb ft)**

43. Inspect speed sensor O-ring. Replace if necessary.
- Install speed sensor assembly (39) and 10 mm screw.

**Torque: 9 N·m (78 lb in)**



241RW013



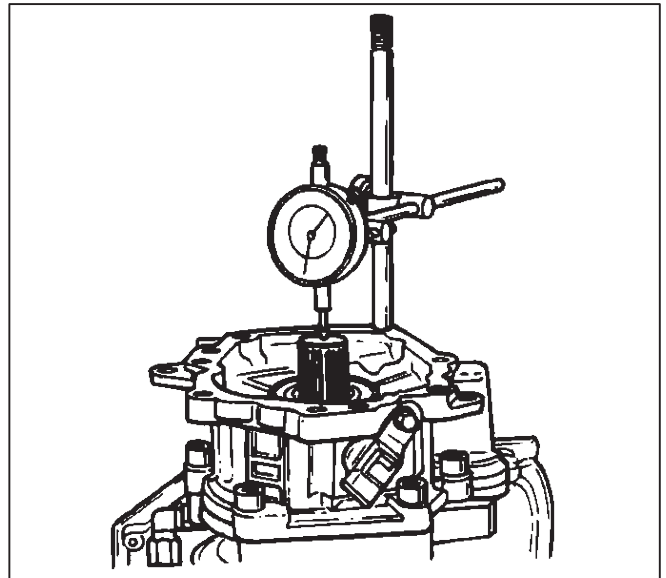
241RS004

44. Main case end play measurement

1. Attach axial play checking tool on the extension housing and set indicator to zero on output shaft.
2. Manually push output shaft upwards.

**End play: 0.36mm – 0.80mm (0.014 in – 0.031in)**

3. Remove axial play checking tool.
4. If end play is not correct, repeat selective washer selection.



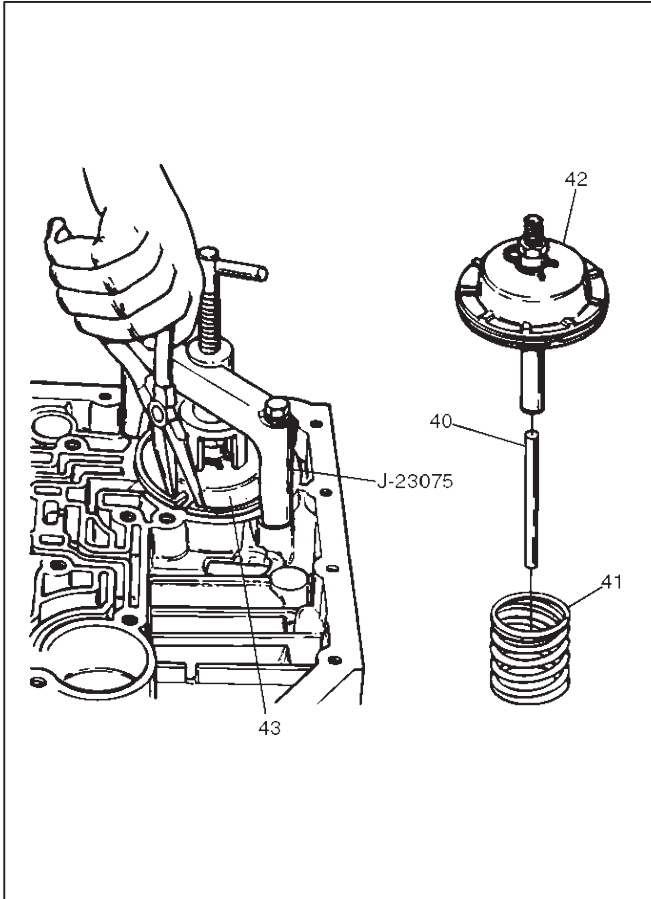
241RS005

45. Inspect servo piston seal ring. Replace if necessary.

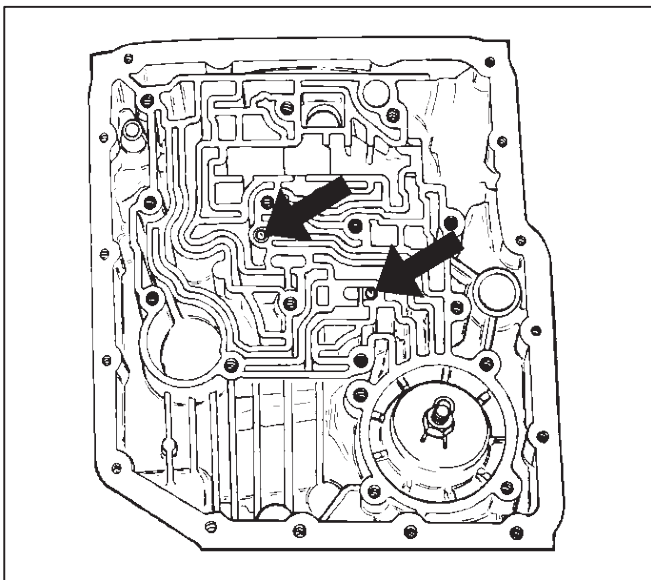
- Ensure brake band is correctly positioned. Rotate output shaft if necessary.
- Install J-38428 servo piston fitter in servo bore.
- Install apply rod (40), round end toward band, return spring (41) and piston assembly (42).

46. Install the J-23075 servo spring compressor with offset to rear of case.

- Compress servo piston seal ring, using fitter while tightening the tool screw.
- Install servo piston retaining ring (43).
- Remove tool.
- Adjust the brake band by tightening the servo adjusting screw to 4.5 N·m (39.8 lb in) torque. Be certain the lock nut is loose, then back-off the screw five turns exactly. Hold piston sleeve with wrench and tighten lock nut to 18.5 N·m (13.6 lb ft) torque. Be certain the adjusting screw does not turn.



47. Install two check balls (44).



48. Inspect main case electrical connector and seal, replace if necessary.

- Install electrical 7 way connector/main case and wiring harness.

49. Install two J-25025-B guide pins into main case.

- Install main case valve body complete assembly (45) and manual valve link.

NOTE: Valve must be extended as the short end of manual valve link is connected to the range selector lever. Long end of link goes into valve.

- Install seven 13 mm screws.

**Torque: 20 N•m (15 lb ft)**

- Remove two guide pins.

50. Install servo cover gasket, cover (46) and four 13 mm screws.

**Torque: 25 N•m (18 lb ft)**

51. Connect wiring harness (47) to band control, shift solenoids, and main case 7 way connector.

52. Install manual detent roller and spring assembly (48) with clip.

- Install two 13 mm screws.

**Torque: 20 N•m (15 lb ft)**

53. Install oil filter (49), and three 13 mm screws.

**Torque: 20 N•m (15 lb ft)**

54. Install oil pan gasket, magnet, main oil pan (50), and sixteen 10 mm screws.

**Torque: 11 N•m (96 lb in)**

55. Inspect adapter case electrical connector and seal. Replace if necessary.

- Install electrical 4 way connector and harness assembly (52) in bottom of adapter case.

56. Install gasket, transfer plate, and gasket.

- Install adapter case valve body (51) and seven 13 mm screws.

**Torque: 20 N•m (15 lb ft)**

57. Connect wiring harness assembly (52) to converter clutch PWM solenoid, force motor, and 4 way connector.

58. Install oil pan gasket, adapter case oil pan (53), and twelve 10 mm screws.

**Torque: 11 N•m (96 lb in)**

- Rotate transmission, with bottom pan facing down.

59. Install mode switch (54), two 10 mm screws, selector lever nut, and cover.

**10 mm screw**

**Torque: 13 N•m (113 lb in)**

**Nut**

**Torque: 23 N•m (17 lb ft)**

- Adjust using setting tool, refer to *Mode Switch in this section*.

60. Install O-ring (55) on turbine shaft.

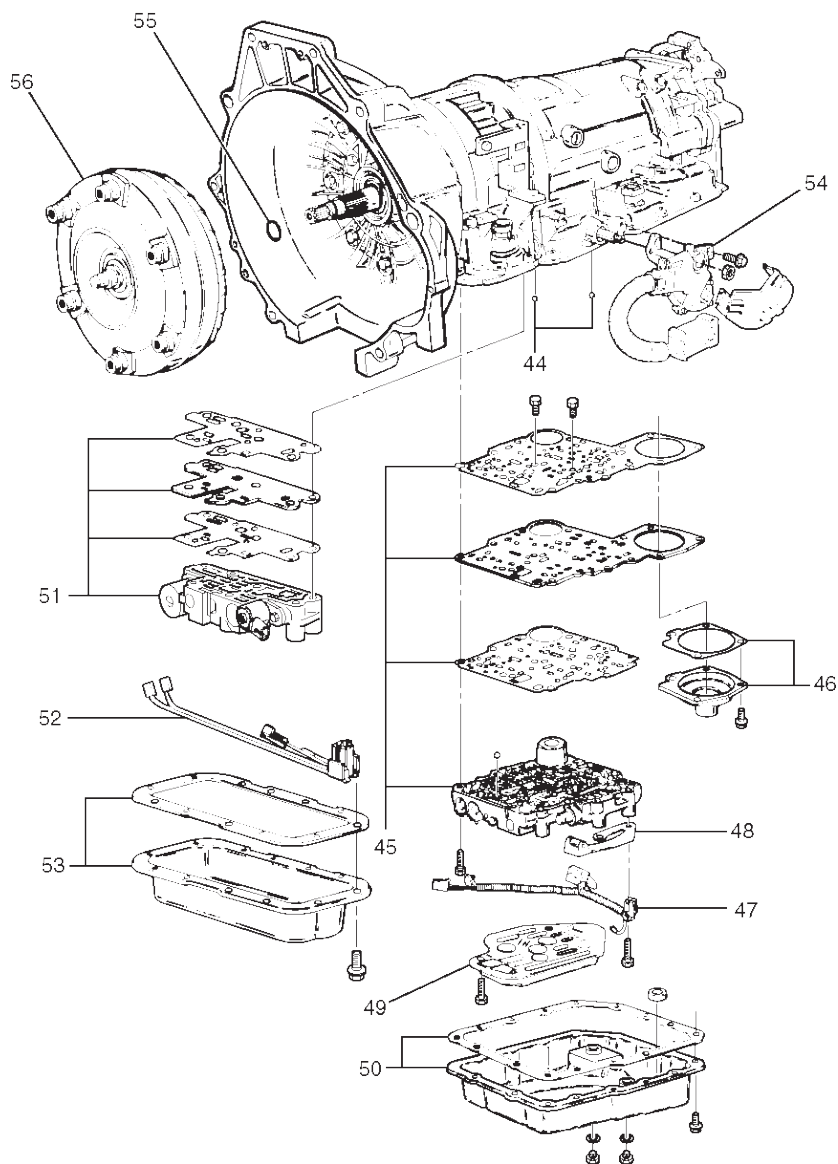
61. Install torque converter (56).

The converter assembly must be replaced under any of the following conditions:

- Evidence of damage to the pump assembly.
- Metal particles are found after flushing the cooler lines.
- External leaks in hub weld area.
- Converter pilot broken, damaged, or poor fit into crankshaft.

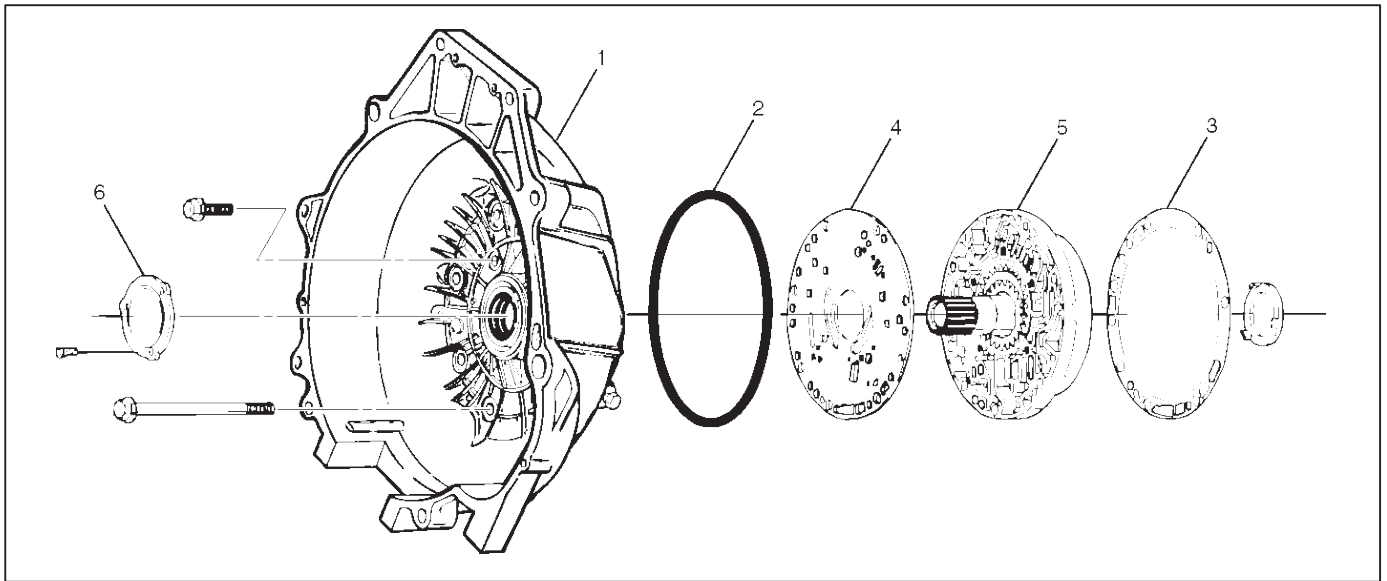
- e. Converter hub scored or damaged.
- f. Internal failure in stator.
- g. Contamination from engine coolant.
- h. Excess end play.
- Rotate transmission, bell housing up. Spin converter to insure proper fit.

62. Fill transmission through the overfill screw hole of oil pan, using ATF DEXRON®-III. Refer to *Changing Transmission Fluid* in this section.



## Converter Housing And Oil Pump Assembly

### Disassembled View



241RY001

#### Legend

- (1) Converter Housing
- (2) Outer Seal Ring
- (3) Gasket

- (4) Wear Plate
- (5) Oil Pump Assembly
- (6) Oil Seal Ring

### Disassembly

1. Remove oil pump assembly from converter housing.
2. Remove outer seal ring.
3. Remove gasket.
4. Remove wear plate.
5. Remove oil seal ring.

- Tighten five inner 13mm bolts in an alternating pattern.

**Torque: 20 N•m (15 lb ft)**

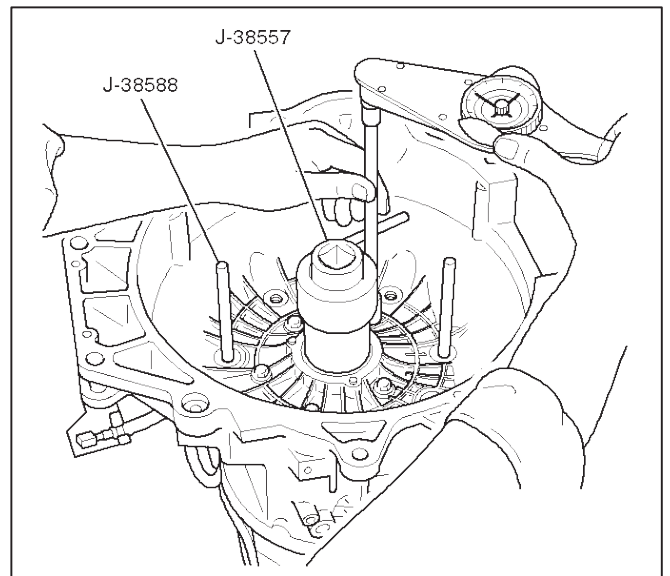
### Inspection And Repair

#### Visual Check:

If any damage, deformation, or local wear is found in a converter housing, outer seal ring, wear plate, or oil seal ring, replace it.

### Reassembly

1. Install wear plate onto oil pump assembly.
2. Install converter housing onto complete oil pump assembly. Align with two short J-38588 guide pins on outer bolt holes.
  - Loosely install five 13mm bolts.
  - Center converter housing using J-38557 centering tool.



241RW002

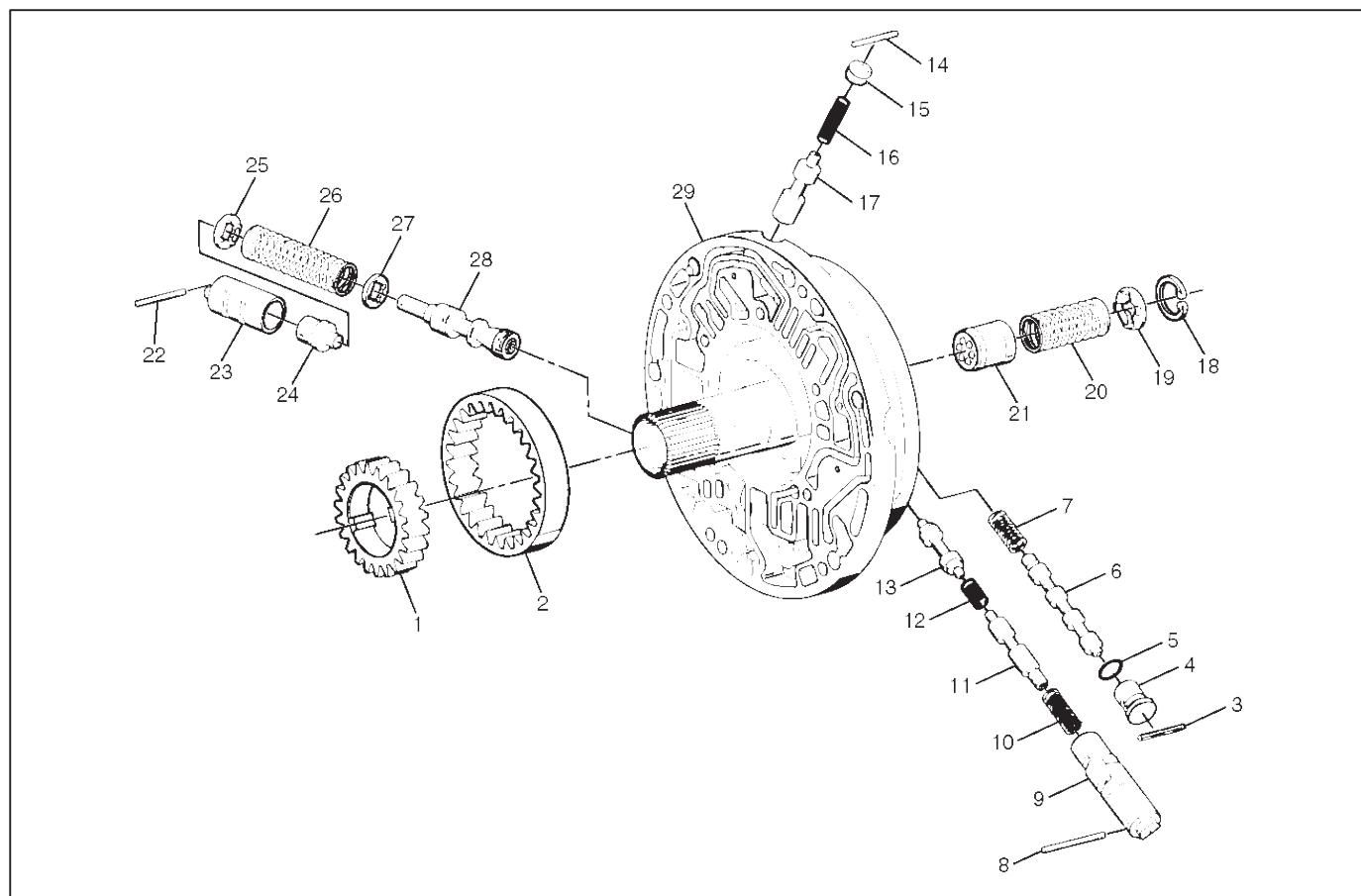
3. Install oil seal ring (3 screws).

**Torque: 3 N•m (26 lb in)**

4. Install gasket.
5. Install outer seal ring.

## Oil Pump

### Disassembled View



241RY002

#### Legend

- |                                           |                                         |
|-------------------------------------------|-----------------------------------------|
| (1) Oil Pump Drive Gear                   | (15) Enable Valve Spring Guide          |
| (2) Oil Pump Driven Gear                  | (16) Enable Valve Spring                |
| (3) Pin                                   | (17) Enable Valve                       |
| (4) Plug                                  | (18) Snap Ring                          |
| (5) Seal Ring                             | (19) Spring Seat                        |
| (6) Torque Converter Clutch Control Valve | (20) Throttle Signal Accumulator Spring |
| (7) Converter Clutch Control Valve Spring | (21) Throttle Signal Accumulator Piston |
| (8) Pin                                   | (22) Sleeve Pin                         |
| (9) Converter Clutch Regulator Sleeve     | (23) Boost Valve Sleeve                 |
| (10) Converter Clutch Regulator Spring    | (24) Boost Valve                        |
| (11) Converter Clutch Regulator Valve     | (25) Spring Seat                        |
| (12) Isolator Spring                      | (26) Pressure Regulator Valve Spring    |
| (13) Isolator Valve                       | (27) Spring Seat                        |
| (14) Pin                                  | (28) Pressure Regulator Valve           |
|                                           | (29) Oil Pump Assembly                  |

### Disassembly

1. Remove oil pump drive gear (1) and driven gear (2).
2. Remove pin (3) from oil pump assembly (29).
3. Remove plug (4) and seal ring (5), torque converter clutch control valve (6) and spring (7).
4. Remove pin (8) from oil pump assembly (29).
5. Remove torque converter regulator sleeve (9), converter clutch regulator spring (10), converter clutch regulator valve (11), isolator spring (12) and isolator valve (13).
6. Remove pin (14) from oil pump assembly (29).
7. Remove enable valve spring (16), spring guide (15) and enable valve (17).
8. Remove snap ring (18) from oil pump assembly (29).

9. Remove spring seat (19), spring (20) and throttle signal accumulator piston (21).
10. Remove sleeve pin (22) from oil pump assembly (29).
11. Remove boost valve sleeve (23), boost valve (24), spring seat (25), valve spring (26), spring seat (27), and pressure regulator valve (28).

## **Inspection And Repair**

### **Visual Check:**

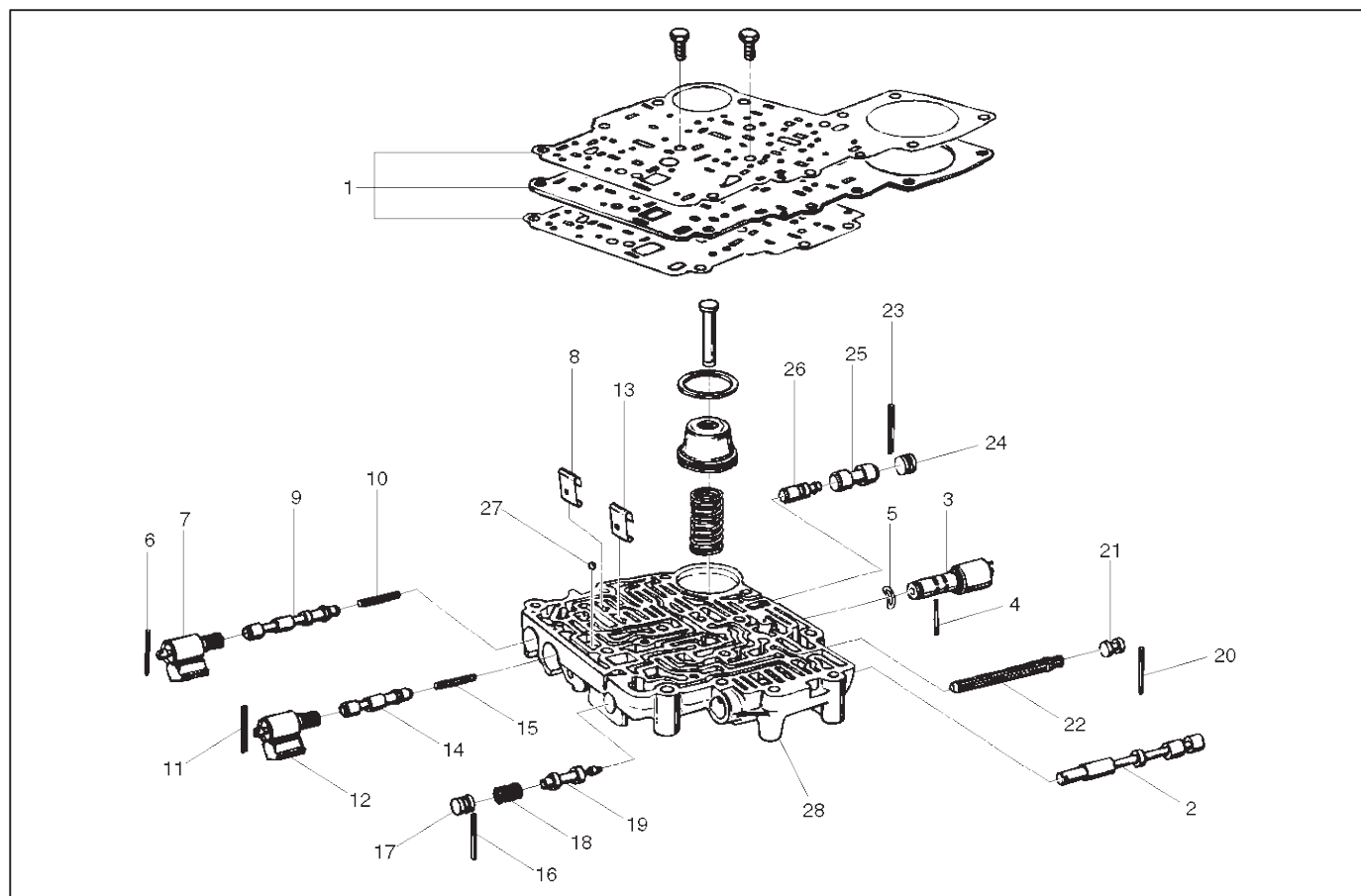
If any damage, deformation or wear is found, replace the damaged part.

## **Reassembly**

1. Lubricate and preinstall pressure regulator spring seat (27) on valve (28), with the flat side against shoulder.
2. Install pressure regulator valve (28) and spring seat (27) assembly, valve spring (26), and spring seat (25) with the flat side away from spring to oil pump assembly (29).
3. Assemble boost valve (24) into sleeve (23).
4. Install boost valve and sleeve assembly, and sleeve pin (22) to oil pump assembly (29).
5. Install throttle signal accumulator piston (21), spring (20), and spring seat (19), with the flat side away from the spring, and snap ring (18) to oil pump assembly (29).
6. Install enable valve (17), spring guide (15), enable valve spring (16) and retainer pin (14) to oil pump assembly (29).
7. Assemble torque converter regulator spring (10) and torque converter regulator valve (11) into sleeve (9).
8. Install isolator valve (13), isolator valve spring (12) and the torque converter regulator sleeve and valve assembly into the oil pump assembly (29).
9. Install torque converter clutch control valve spring (7), torque converter clutch control valve (6), plug (4) and seal ring (5), and retainer pin (3) to oil pump assembly (29).
10. Install oil pump driven gear (2) and drive gear (1).

## Main Case Valve Body

### Disassembled View



244RS010

#### Legend

- |                                |                                    |
|--------------------------------|------------------------------------|
| (1) Gaskets and Transfer Plate | (15) Spring                        |
| (2) Manual Valve               | (16) Spring Pin                    |
| (3) Band Control Solenoid      | (17) Plug                          |
| (4) Pin                        | (18) Spring                        |
| (5) Waved Washer               | (19) Low Pressure Control Valve    |
| (6) Spring Pin                 | (20) Spring Pin                    |
| (7) Solenoid A                 | (21) Plug                          |
| (8) Retainer                   | (22) Band Control Screen Assembly  |
| (9) 1-2/3-4 Shift Valve        | (23) Spring Pin                    |
| (10) Spring                    | (24) Plug                          |
| (11) Spring Pin                | (25) 1-2 Accumulator Valve         |
| (12) Solenoid B                | (26) 1-2 Accumulator Control Valve |
| (13) Retainer                  | (27) Check Ball                    |
| (14) 2-3 Shift Valve           | (28) Main Case Valve Body          |

### Disassembly

1. Remove two 11mm bolts from valve body (28), then remove gaskets and transfer plate (1).
2. Remove manual valve (2).
3. Push in band control solenoid (3) to compress waved washer (5), and remove pin (4).
4. Remove band control solenoid (3) and waved washer (5).
5. Remove spring pin (6) with a 3 mm dia punch.
6. Remove solenoid A (7) by grasping the metal tip. Do not grasp the connector housing.
7. Remove retainer (8), 1-2/3-4 shift valve (9), and spring (10).
8. Remove spring pin (11) with a 3 mm dia punch.
9. Remove solenoid B (12) by grasping the metal tip. Do not grasp the connector housing.

## 7A-72 AUTOMATIC TRANSMISSION (4L30-E)

10. Remove retainer (13), 2-3 shift valve (14), and spring (15).
11. Remove spring pin (16), plug (17), spring (18), and low pressure control valve (19).
12. Remove spring pin (20), plug (21), and band control screen assembly (22).
13. Remove spring pin (23), plug (24), 1-2 accumulator valve (25), and 1-2 accumulator control valve (26).
14. Remove check ball (27) from valve body (28).

### Inspection And Repair

Inspect for the following, and replace any damaged or worn parts:

1. Damage or wear to each valve.
2. Damage in oil passages.
3. Cracks or damage to valve body.
4. Valve operations.
5. Spring fatigue.

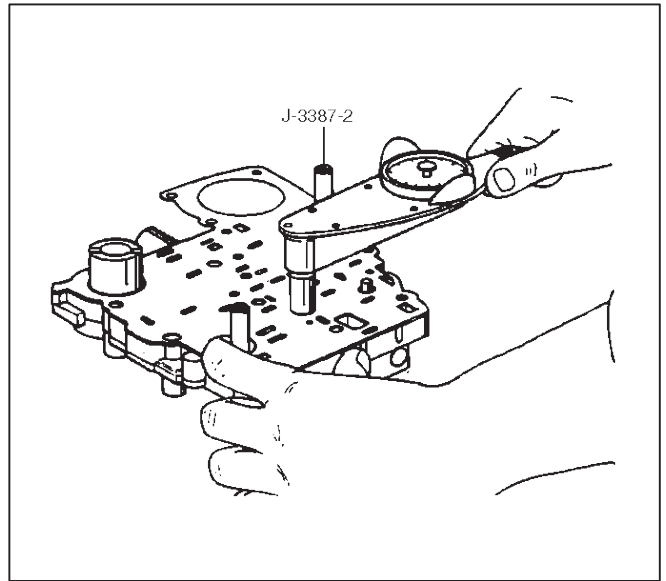
### Reassembly

1. Install 1-2 accumulator control valve (26), 1-2 accumulator valve (25), plug (24), and spring pin (23).
2. Install band control screen assembly (22), plug (21), and spring pin (20).
3. Install low pressure control valve (19), spring (18), plug (17), and spring pin (16).
4. Install spring (15), 2-3 shift valve (14), retainer (13), solenoid B (12), and spring pin (11).
5. Install spring (10), 1-2/3-4 shift valve (9), retainer (8), solenoid A (7), and spring pin (6).
6. Install waved washer (5), band control solenoid (3), and pin (4).
7. Install manual valve (2).
8. Install check ball (27) to valve body (28).

9. Install gasket (valve body/transfer plate) and transfer plate using two J-3387-2 guide pins.

- Install two 11mm bolts.

**Torque: 13 N•m (113 lb in)**

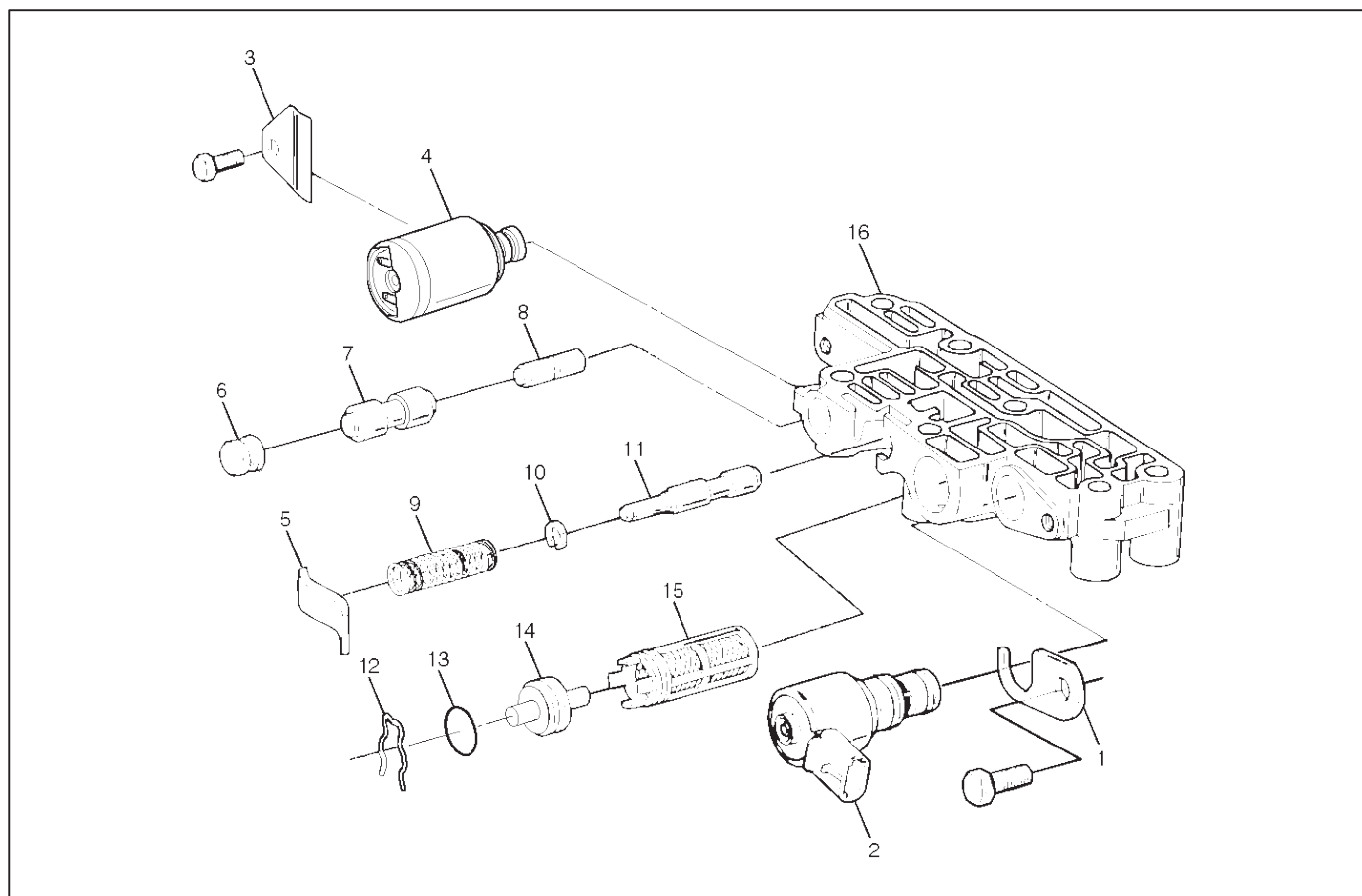


- Install gasket (transfer plate/main case).

244RS004

## Adapter Case Valve Body

### Disassembled View



243RY001

#### Legend

- |                                   |                                  |
|-----------------------------------|----------------------------------|
| (1) Bracket                       | (9) Spring                       |
| (2) Converter Clutch PWM Solenoid | (10) Retaining Ring              |
| (3) Retainer                      | (11) Feed Limit Valve            |
| (4) Force Motor Solenoid          | (12) Plug Retainer               |
| (5) Retainer                      | (13) O-Ring                      |
| (6) Plug                          | (14) Plug                        |
| (7) 3/4 Accumulator Valve         | (15) Force Motor Screen Assembly |
| (8) 3/4 Accumulator Control Valve | (16) Adapter Case Valve Body     |

### Disassembly

- Remove 11mm bolt from valve body.
  - Remove bracket (1) and converter clutch PWM solenoid (2).
- Remove 11mm bolt and retainer (3) from valve body.
  - Remove force motor solenoid (4).
- Remove retainer (5), plug (6), 3/4 accumulator valve (7), and 3/4 accumulator control valve (8).
- Remove spring (9), retaining ring (10), and feed limit valve (11).
- Remove plug retainer (12), O-ring (13), plug (14), and force motor screen assembly (15).
  - Use 5 mm bolt to pull plug.

### Inspection And Repair

Inspect for the following, and replace any damaged or worn parts:

- Damage or wear to each valve.
- Damage in oil passages.
- Cracks or damage to valve body.
- Valve operations.
- Spring fatigue.

## **Reassembly**

1. Install force motor screen assembly (15), plug (14), O-ring (13), and plug retainer (12).
2. Install feed limit valve (11), retaining ring (10), and spring (9).
3. Install 3/4 accumulator control valve (8), 3/4 accumulator valve (7), plug (6), and retainer (5).
4. Install force motor solenoid (4).
  - Place solenoid terminals pointing towards mating face.
  - Install retainer (3) and bolt.

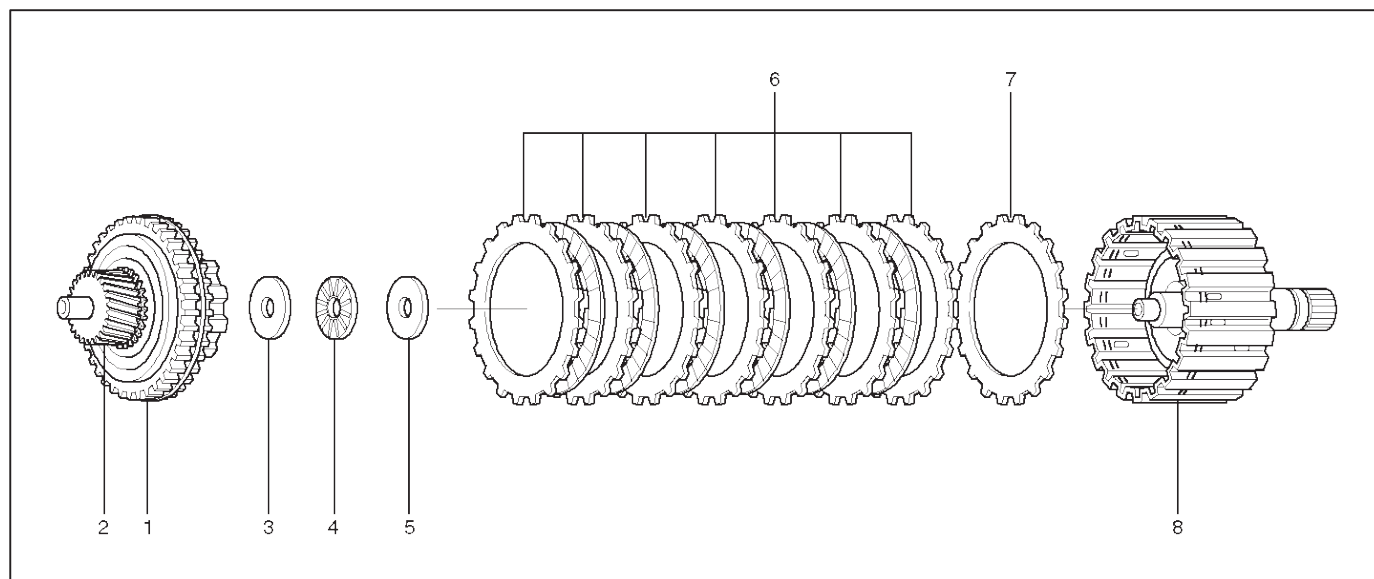
**Torque: 10 N•m (87 lb in)**

5. Install converter clutch PWM solenoid (2) with two O-rings (2) and bracket (1) to valve body.
  - Install bolt.

**Torque: 10 N•m (87 lb in)**

## Third Clutch And Sprag Unit

### Disassembled View



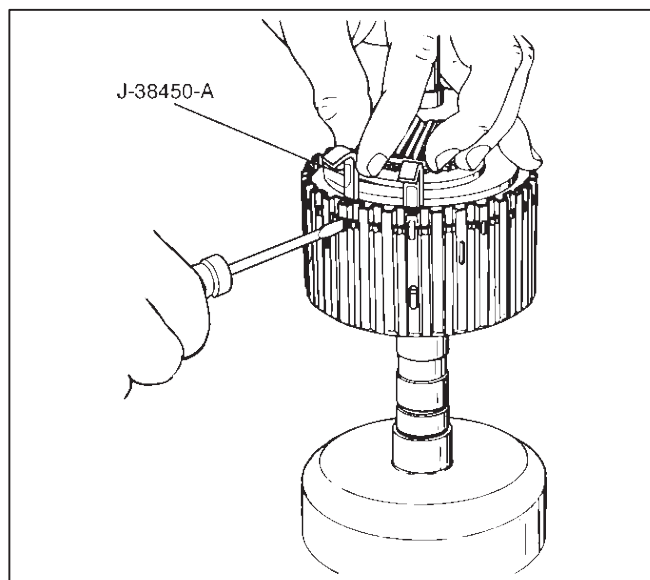
248RW001

#### Legend

- |                                            |                                       |
|--------------------------------------------|---------------------------------------|
| (1) Retaining Ring                         | (5) Thrust Washer                     |
| (2) Input Sun Gear and Sprag Unit Assembly | (6) Clutch Plates                     |
| (3) Retaining Washer                       | (7) Third Clutch Spring Cushion Plate |
| (4) Bearing                                | (8) Third Clutch Drum Assembly        |

### Disassembly

1. Place the third clutch drum and intermediate shaft assembly upright, using the overdrive internal gear as a support.
2. Locate the ends of the retaining ring. Depress one end of the ring using a small screwdriver instead of the depressor handle provided with the tool J-38450-A. Slide one blade down between the third clutch drum and the retaining ring.
3. Remove a screwdriver and repeat this step for the other end of retaining ring.
4. Install the remaining four blades approximately (five) notches apart using a screwdriver to depress the retaining ring.
5. Pull up on input sun gear and sprag unit assembly (1 and 2) to release the retaining ring from third clutch drum assembly (8).
6. Remove the tool blades.



248RX001

7. Remove retaining washer (3), bearing (4), thrust washer (5), and clutch plates (6 and 7) from the third clutch drum assembly (8).

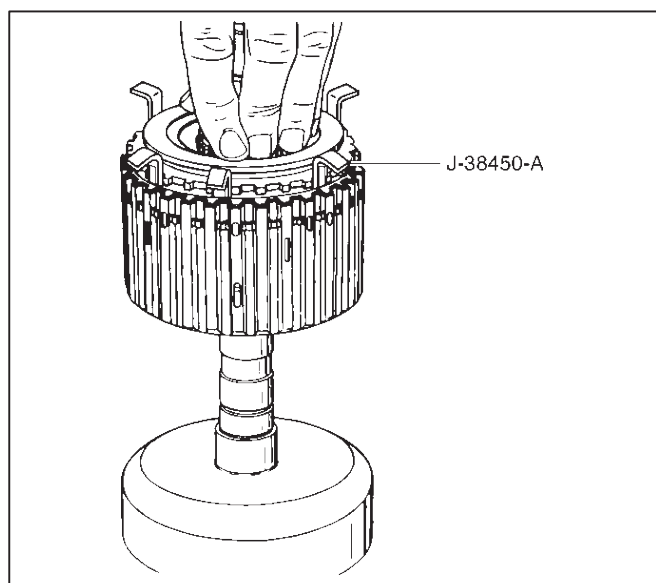
### Inspection And Repair

#### Visual Check:

If any damage, deformation or wear is found, replace the damaged part.

## Reassembly

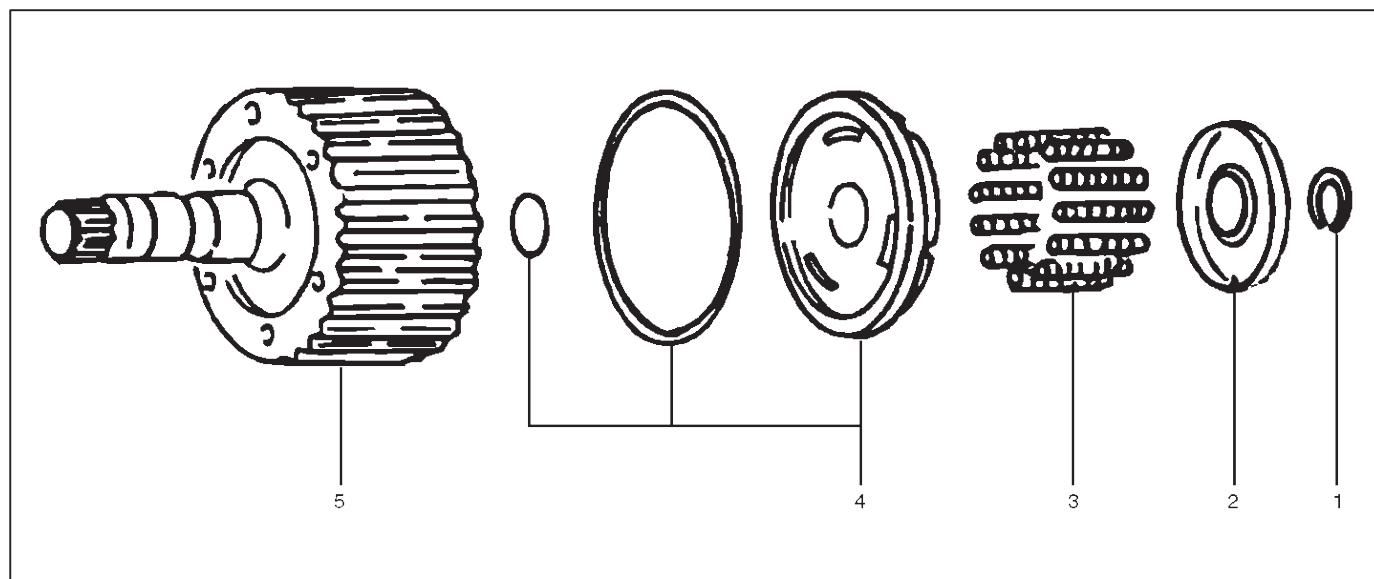
1. Place third clutch drum and intermediate shaft assembly upright, using the overdrive internal gear as a support.
2. Install third clutch spring cushion plate (7), bevel face down.
3. Install third clutch plates (6) into third clutch drum assembly (8). Start with the steel clutch plate and alternate with lined plates.
4. Install thrust washer (5), bearing (4), and retaining washer (3).
5. Fully engage the hub splines of the input sun gear and sprag unit assembly (2) into the third clutch inner tangs.
  - Simultaneously rotate the outer sprag race to engage into the third clutch drum assembly (8).
6. Place J-38450-A blades between the retaining ring and the third clutch drum approximately (five) notches apart, and one blade at each end of the retaining ring (1). Push down on sprag assembly until the assembly is seated into the third clutch drum assembly (8).
7. Remove the tool blades and engage retaining ring into groove of third clutch drum.



248RX002

## Third Clutch

### Disassembled View



248RS006

#### Legend

- (1) Retaining Ring
- (2) Spring Seat

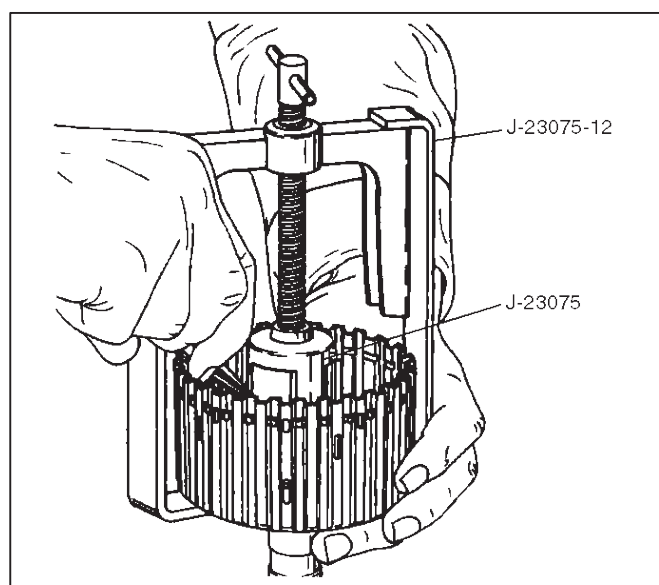
- (3) Springs
- (4) Piston Assembly
- (5) Third Clutch Drum

### Disassemble

1. Compress spring seat using the J-23075 spring compressor and J-23075-12 adapter tool.

NOTE: Do not over-stress the springs and seat. This will cause damage to the spring seat.

- Remove the tool.
- Remove retaining ring (1).



248RS007

2. Release the spring seat (2).

NOTE: Do not let the spring seat catch in the ring groove.

- Remove spring seat (2) and springs (3).

3. Remove piston assembly (4) from third clutch drum (5).

### Inspection And Repair

#### Visual check:

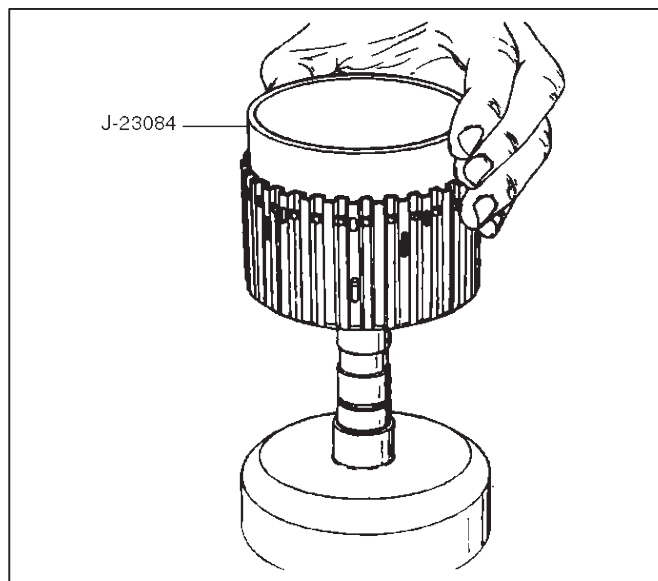
If any damage, deformation or wear is found, replace the damaged part.

#### Operation check:

Shake the piston and listen for check ball movement indicates proper check ball operation. Replace the piston if the check ball is missing or falls out.

### Reassembly

1. The lip of the piston seal must point toward the front of the transmission. Lubricate the seal lip with transmission fluid.
  - Install piston assembly (4) into the third clutch drum (5). Use the J-23084 third clutch piston installer to protect the outer seal during installation.
  - Remove the seal installer.



248RS008

2. Install twelve springs (3) and spring seat (2).

3. Place retaining ring (1) onto spring seat.

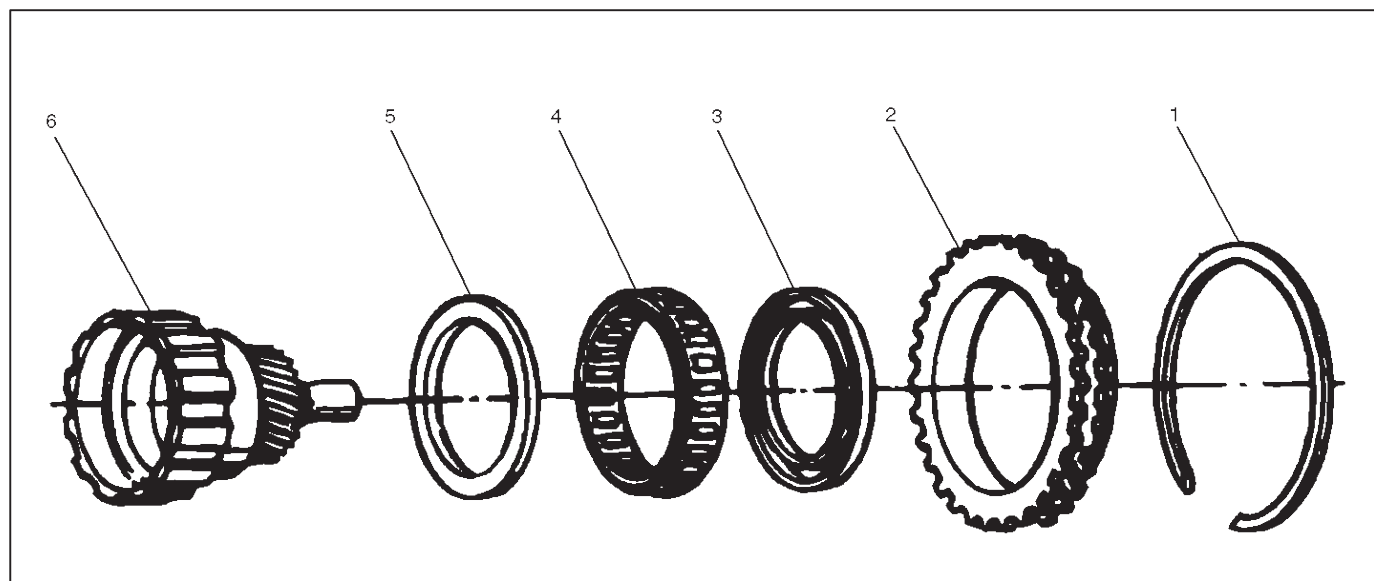
- Compress the piston springs, using the J-23075 piston spring compressor and J-23075-12 adapter.

**CAUTION: Do not over stress the springs and seat. Do not let the spring seat catch in the ring groove. This may cause damage to the spring seat.**

- Install spring seat retaining ring (1).
- Remove the piston spring compressor and adapter.

## Sprag Unit

### Disassembled View



248RS009

#### Legend

- (1) Retaining Ring
- (2) Sprag Outer Race
- (3) Ring

- (4) Sprag Assembly
- (5) Ring
- (6) Third Clutch Hub and Sun Gear Assembly

### Disassembly

1. Remove the sprag outer race, retaining ring, and sprag assembly from the third clutch hub and sun gear assembly.
2. Remove the rings and sprag assembly from the sprag outer race.

### Inspection And Repair

#### Visual Check:

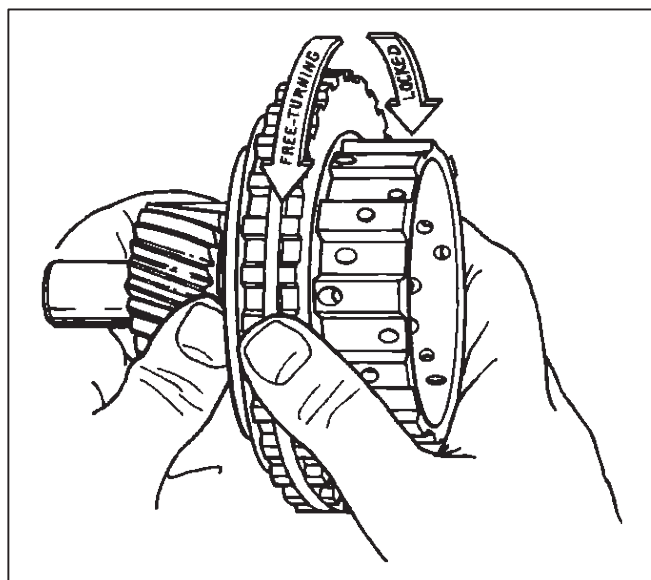
If any damage, deformation or wear is found, replace the damaged part.

### Reassembly

NOTE: Flared shoulder of the sprag cage faces the sun gear. This procedure must be followed exactly to be sure that the sprag assembly is installed properly.

1. Install rings and sprag assembly onto the third clutch hub and sun gear.
2. Install sprag outer race and retaining ring assembly over the sprag cage assembly.
  - Place third clutch hub and sun gear assembly on a flat surface, sun gear facing up. Place sprag outer race and sprag assembly over the sun gear assembly, push down and turn the input sun counterclockwise at the same time.

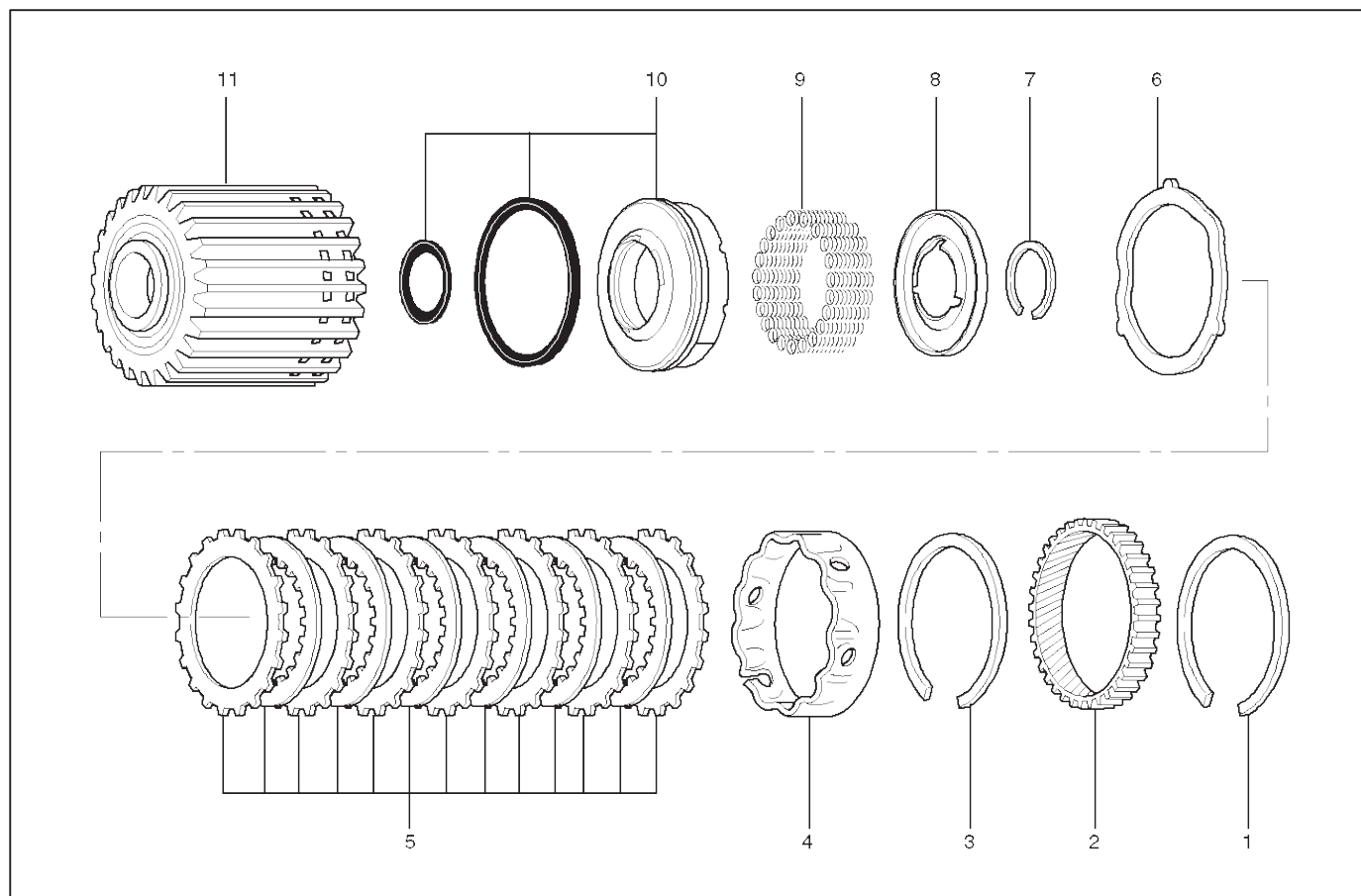
NOTE: Check correct rotation by holding the sun gear in your left hand and turning the outer race. The outer sprag race should turn freely towards you and should lock turning away from you.



248RS010

## Second Clutch

### Disassembled View



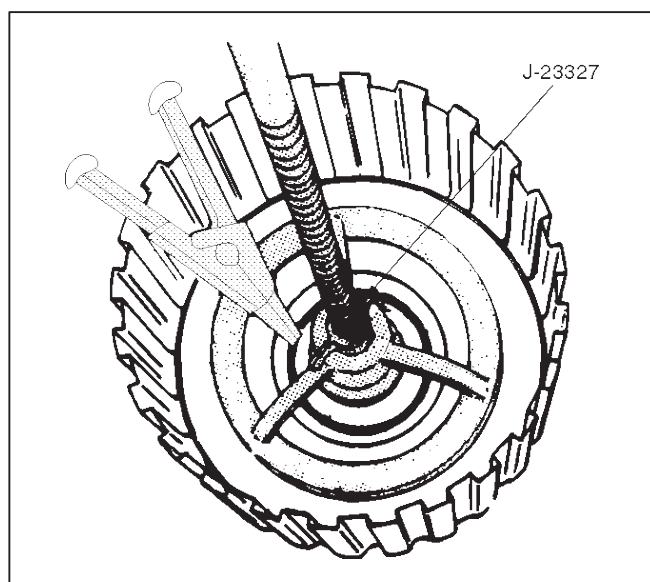
247RW001

#### Legend

- |                    |                         |
|--------------------|-------------------------|
| (1) Retaining Ring | (6) Waved Washer        |
| (2) Ring Gear      | (7) Retaining Ring      |
| (3) Retaining Ring | (8) Spring Seat         |
| (4) Spacer         | (9) Springs             |
| (5) Clutch Plates  | (10) Piston Assembly    |
|                    | (11) Second Clutch Drum |

### Disassembly

1. Remove retaining ring (1) from second clutch drum (11).
2. Remove ring gear (2), retaining ring (3), and spacer (4).
3. Remove clutch plates (5) and waved washer (6).
4. Remove retaining ring (7) using J-23327 compressor to compress the spring seat (8).
5. Remove spring seat (8), springs (9) and piston assembly (10) from second clutch drum (11).



247RS006

## Inspection And Repair

### Visual Check:

If any damage, deformation or wear is found, replace the damaged part.

### Operation Check:

Shake the piston and listen for check ball movement. Movement indicates proper check ball operation. Replace the piston if the check ball is missing or falls out.

## Reassembly

1. Install piston assembly (10) into the second clutch drum (11).

- Lubricate the lip seal with transmission fluid. Use the J-23080-A second clutch piston installer to protect the outer piston lip seal.

NOTE: Lip of the seal should point toward front of transmission.

- Remove the installer.

2. Install twenty-two piston springs (9) and spring seat (8) on the second clutch piston (10). Place retaining ring (7) onto spring seat.

- Use the J-23327 compressor to compress the piston springs.

NOTE: Do not let spring seat catch in ring groove.

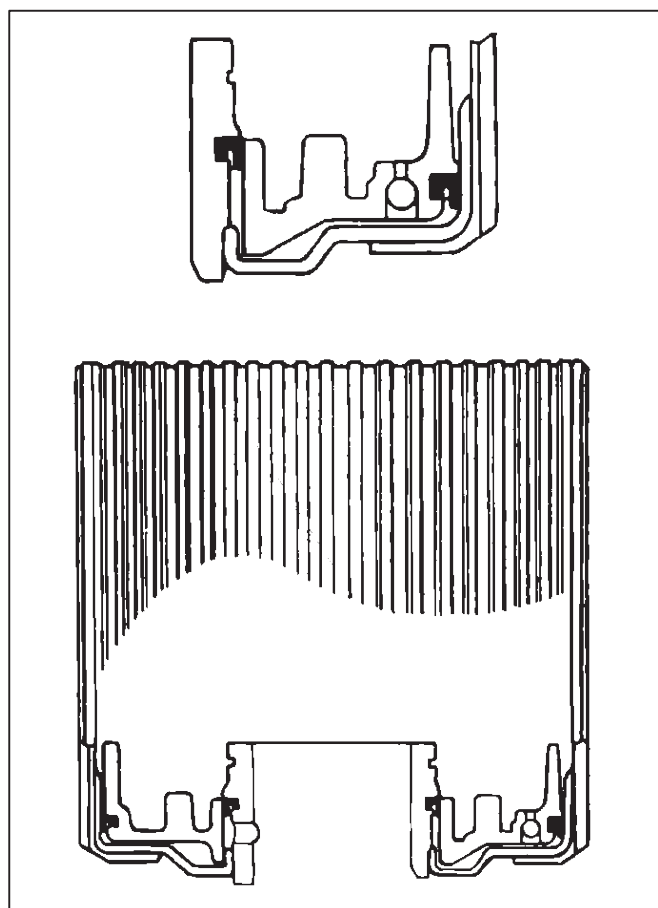
- Remove the compressor.

3. Install waved plate (6) and clutch plates (5). Start with a steel plate and alternate with lined plates.

- Align second clutch inner tangs.

4. Install spacer (4), with the fluted end toward clutch plates.

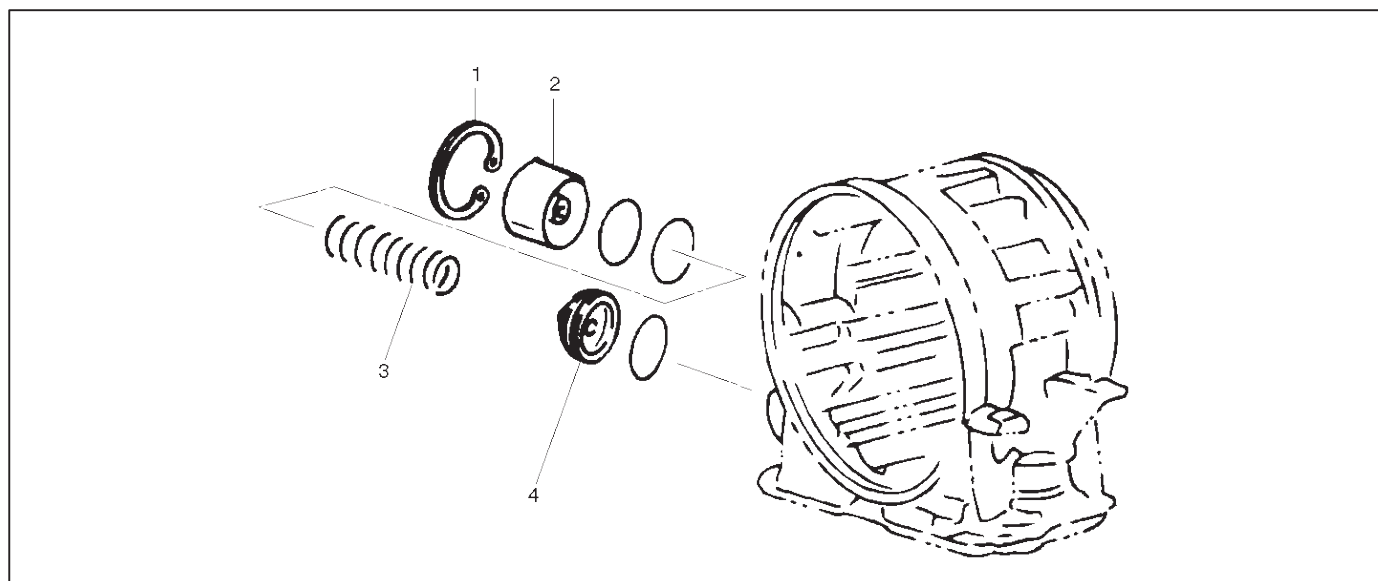
5. Install retaining ring (3), ring gear (2) and retaining ring (1).



247RS007

## 3-4 Accumulator Piston

### Disassembled View



244RS005

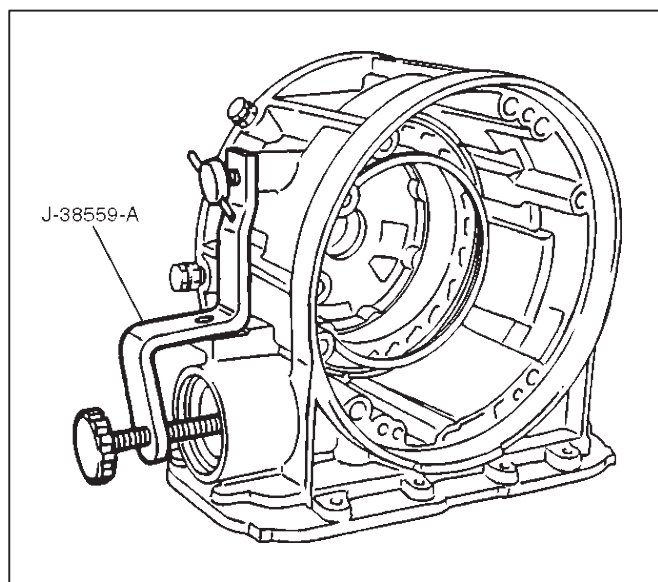
#### Legend

- (1) Snap Ring
- (2) Cover

- (3) Spring
- (4) Piston Assembly

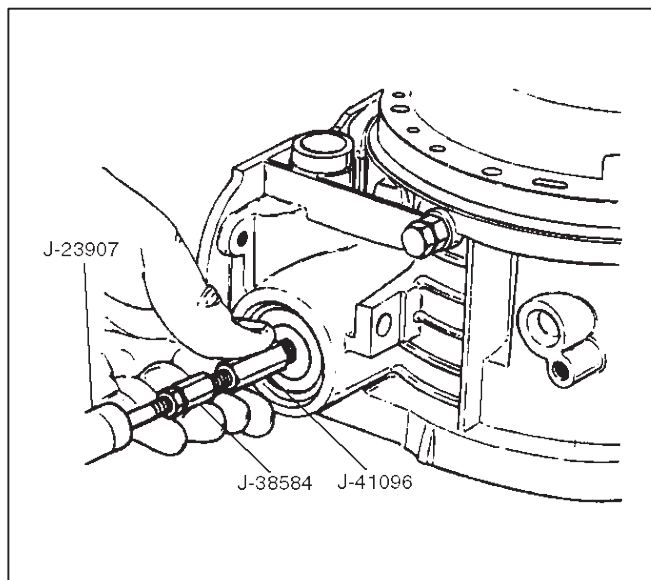
### Disassembly

1. Install the J-38559-A cover compressor on adapter case.
  - Compress piston cover then remove snap ring.



242RS007

2. Install the J-41096 cover remover and J-38584 adapter to center hole of cover.
  - Use the J-23907 slide hammer to remove cover.
3. Remove spring and piston assembly.



242RW001

## Inspection And Repair

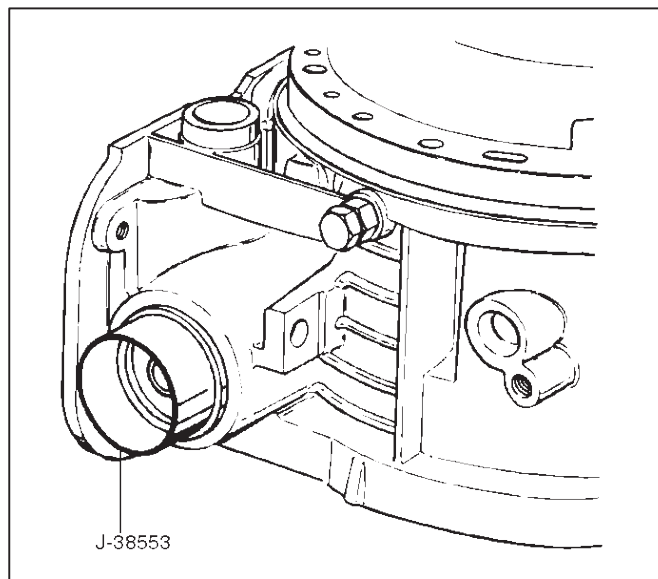
### Visual Check:

If any damage, deformation or wear is found, replace the damaged part.

## Reassembly

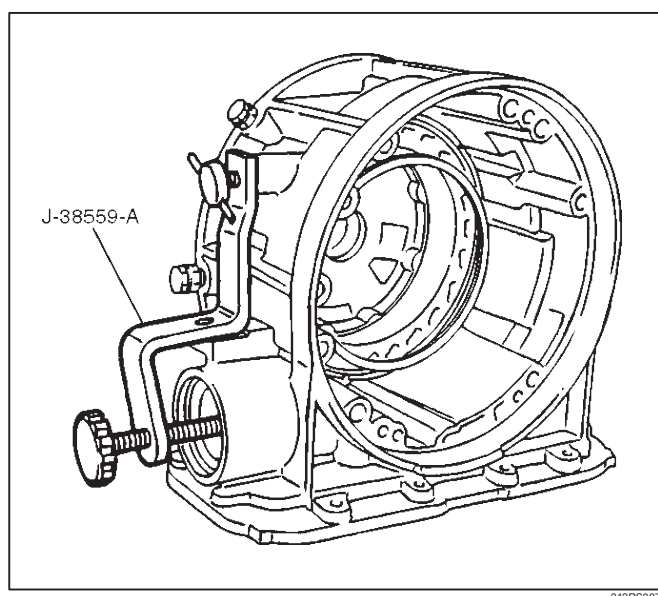
1. Place the J-38553 piston fitter into adaptor case and push the piston into position, using suitable diameter tube.

- Remove the piston fitter.



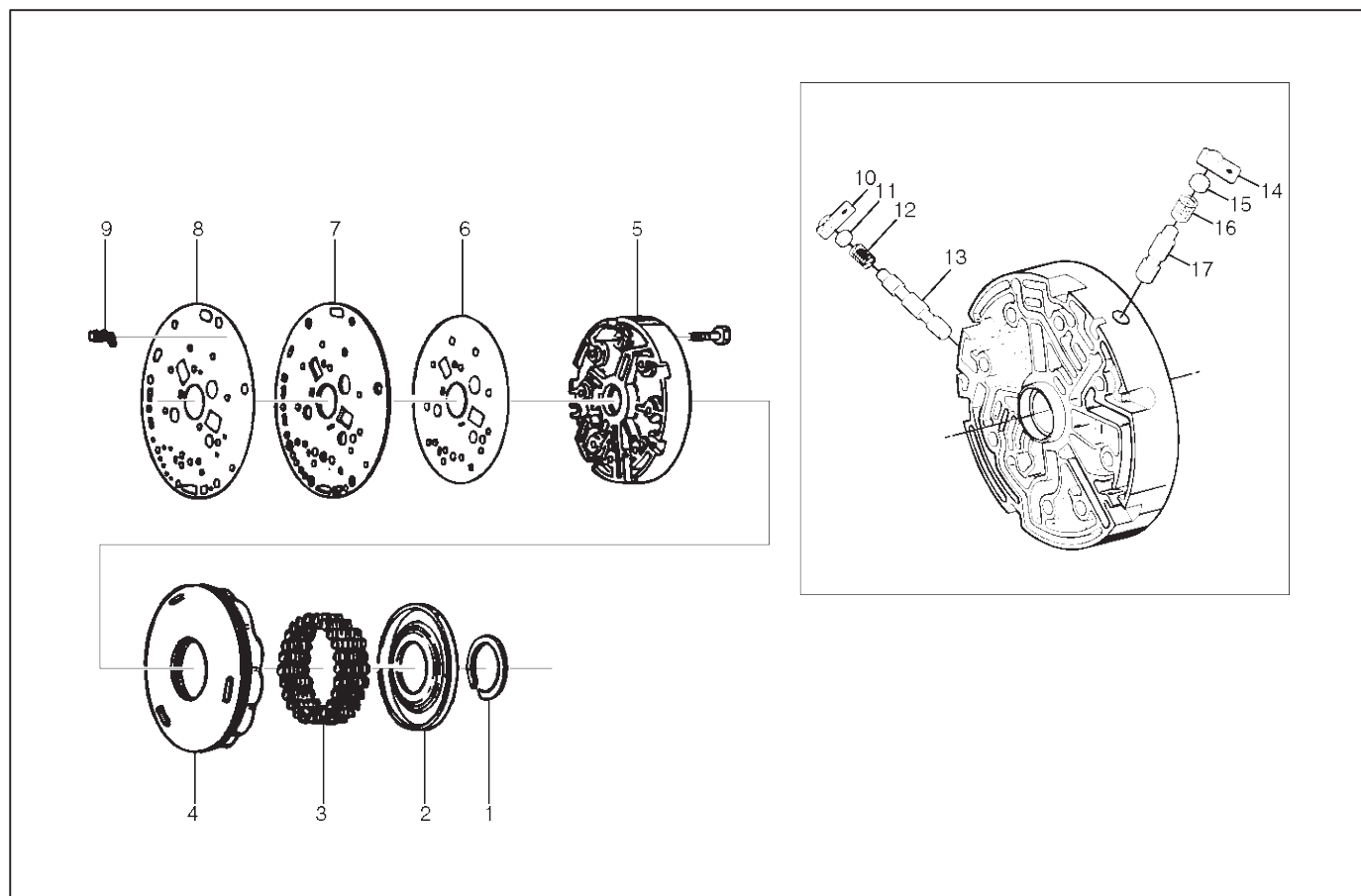
2. Install spring and cover.
3. Install snap ring, using the J-38559-A compressor tool.

- Install snap ring in groove.
- Remove the compressor tool.



## Reverse Clutch Piston And Center Support

### Disassembled View



#### Legend

- |                     |                                     |
|---------------------|-------------------------------------|
| (1) Retaining Ring  | (9) Restrictor                      |
| (2) Spring Seat     | (10) Retainer Plate                 |
| (3) Springs         | (11) Plug                           |
| (4) Piston Assembly | (12) Spring                         |
| (5) Center Support  | (13) Overrun Lock Out Valve         |
| (6) Gasket          | (14) Retainer Plate                 |
| (7) Transfer Plate  | (15) Plug                           |
| (8) Gasket          | (16) Spring                         |
|                     | (17) Reverse Lock Out Control Valve |

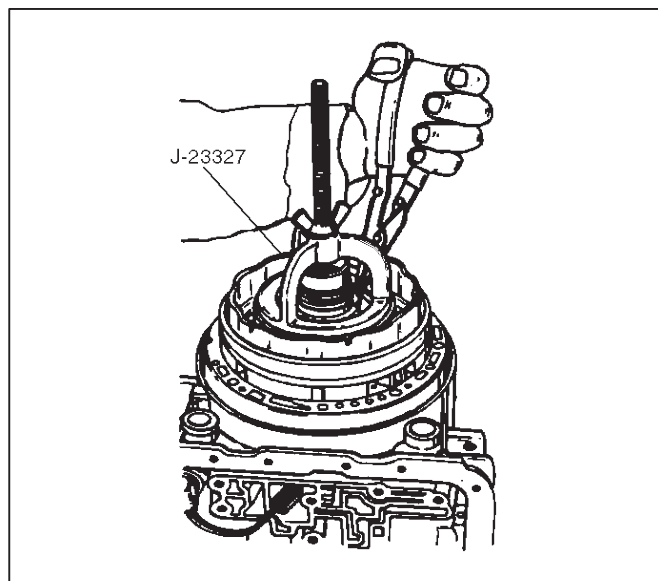
### Disassembly

1. Install the J-23327 compressor tool on spring seat, then compress the spring seat.

- Remove retaining ring (1).

NOTE: Do not over-stress the springs and seat, as this will cause damage to the spring seat.

- Remove the compressor tool.



2. Remove spring seat (2) and springs (3).
3. Remove piston assembly (4).
4. Remove 8 bolts from center support (5), then remove center support (5) from adapter case.
5. Remove gasket transfer plate/outer support (6), center support transfer plate (7), and gasket transfer plate/adapter case (8).
6. Remove restrictor (9) from adapter case housing.
7. Remove retainer plate (10), plug (11), spring (12), and overrun lock out valve (13) from center support (5).
8. Remove retainer plate (14), plug (15), spring (16) and reverse lock out valve (17) from center support (5).

## Inspection And Repair

### Visual Check:

If any damage, deformation or wear is found, replace the damaged part.

### Reassembly

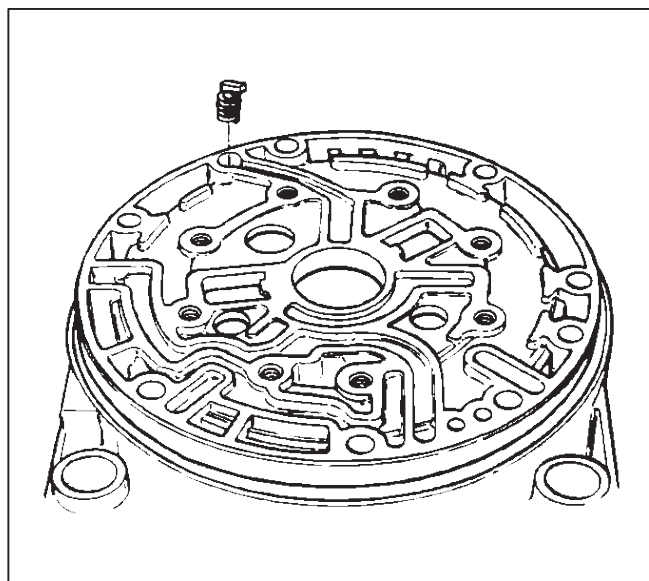
1. Install reverse lock out valve (17) and spring (16) to center support.

NOTE: Ensure correct assembly of valve. The spring should be located over the long small diameter end.

2. Install plug (15) and retainer plate (14).
3. Install overrun lock out valve (13) and spring (12) to center support.

NOTE: Ensure correct assembly of valve. The spring should be located over the long small diameter end.

4. Install plug (11) and retainer plate (10).
5. Place restrictor (9) in the lube overdrive channel in the adapter case housing.



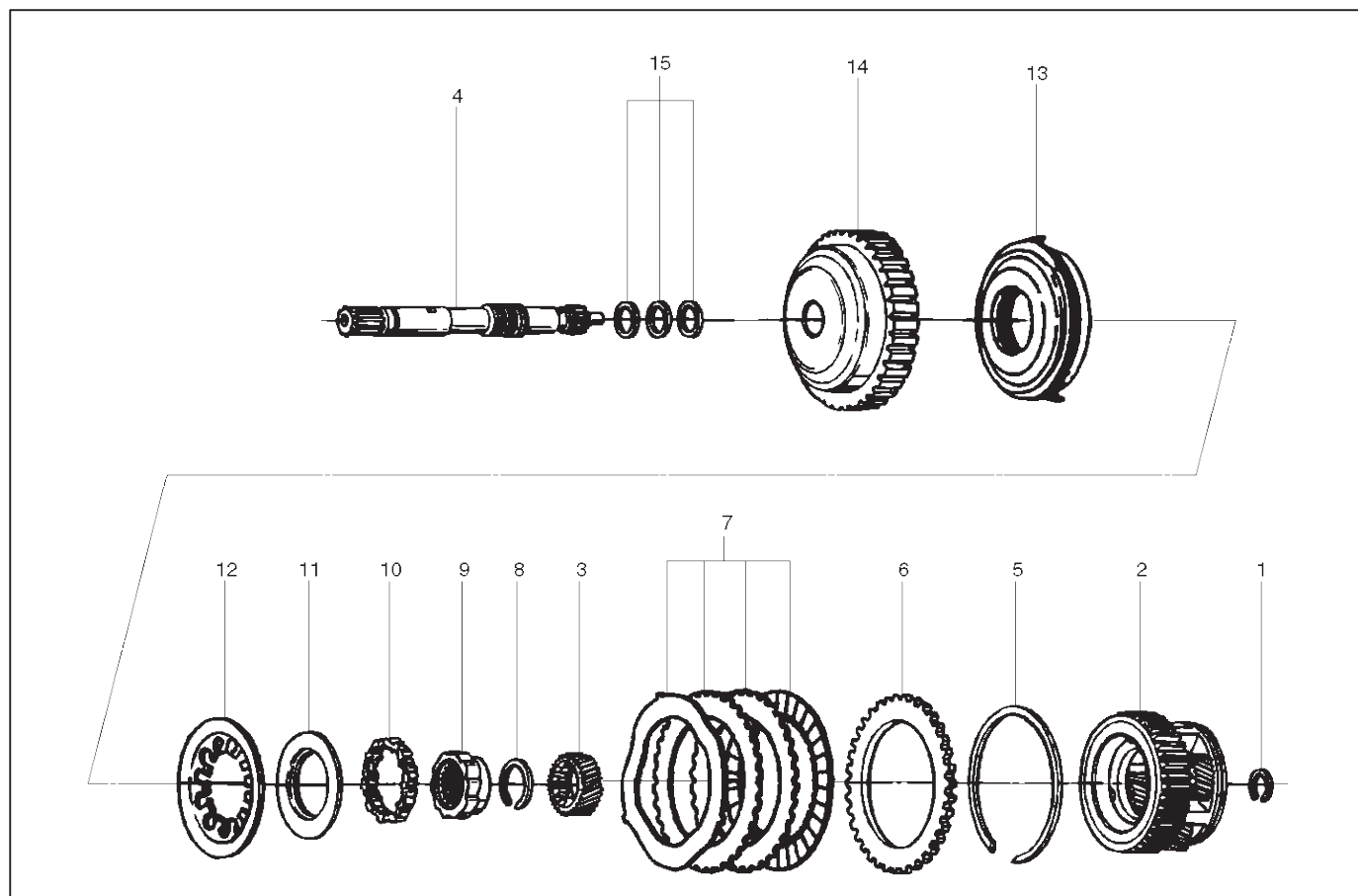
6. Install gasket transfer plate/adapter case (8), center support transfer plate (7), and gasket transfer plate/center support (6).
7. Install center support (5) with 8 bolts.

**Torque : 25 N•m (18 lb ft)**

8. Install piston assembly (4) into center support (5).
9. Install twenty four springs (3), spring seat (2), and retaining ring (1).
  - Install the J-23327 compressor and compress spring seat (2) and springs (3), then seat snap ring (1) in groove.
  - Remove the tool.

## Overrun Clutch And Turbine Shaft

### Disassembled View



252RW005

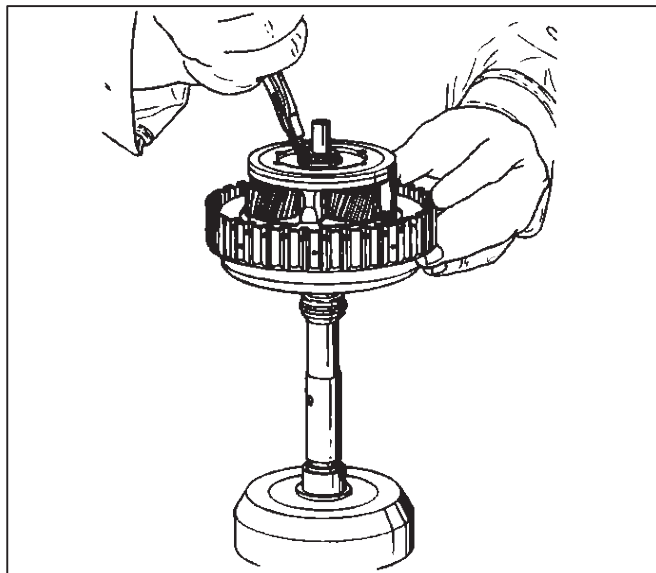
#### Legend

- |                                |                                             |
|--------------------------------|---------------------------------------------|
| (1) Snap Ring                  | (8) Snap Ring                               |
| (2) Overdrive Carrier Assembly | (9) Overrun Roller Clutch Cam               |
| (3) Sun Gear                   | (10) Roller Clutch Assembly                 |
| (4) Turbine Shaft              | (11) Overrun Clutch Release Spring Retainer |
| (5) Snap Ring                  | (12) Diaphragm Spring                       |
| (6) Backing Plate              | (13) Piston Assembly                        |
| (7) Clutch Plates              | (14) Overrun Clutch Drum                    |
|                                | (15) Turbine Shaft Seal Rings               |

## Disassembly

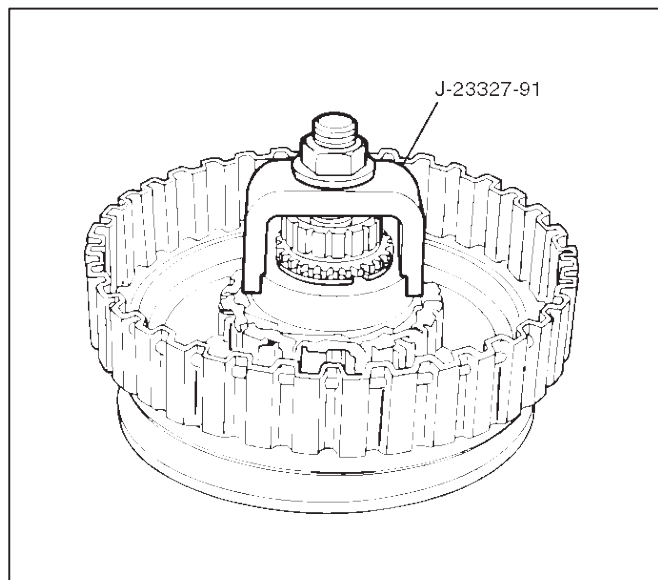
1. Position overrun clutch assembly upright, using the overdrive internal gear as a support.

- Remove snap ring (1).



252RS009

2. Remove overdrive carrier assembly (2), sun gear (3) and turbine shaft (4).
3. Remove snap ring (5), backing plate (6), and clutch plates (7).
4. Compress diaphragm spring with the J-23327-91 compressor, then remove snap ring (8).



252RS010

5. Remove overrun roller clutch cam (9) and roller clutch assembly (10).
6. Remove overrun clutch release spring retainer (11) and diaphragm spring (12).
7. Remove piston assembly (13) from overrun clutch drum (14).
8. Remove turbine shaft seal rings (15).

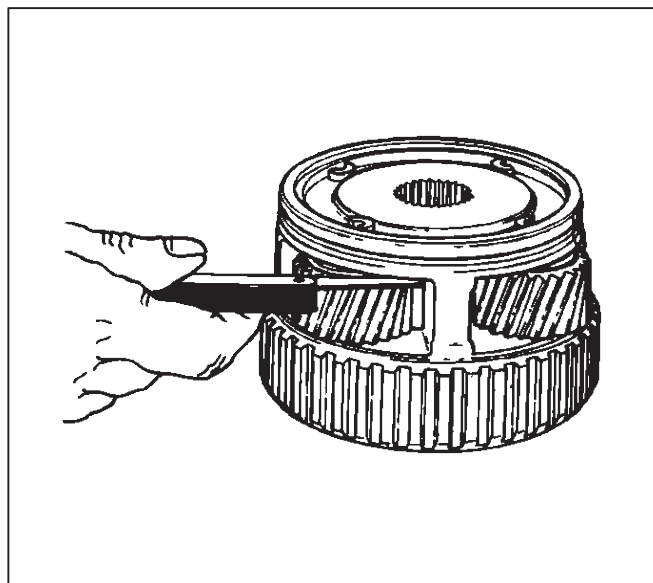
## Inspection And Repair

### Overdrive Carrier Check

- Check pinion end play with a feeler gauge.

**Clearance: 0.24mm–0.64mm (0.0094in–0.025in)**

If clearance is outside specified value, replace overdrive carrier assembly.



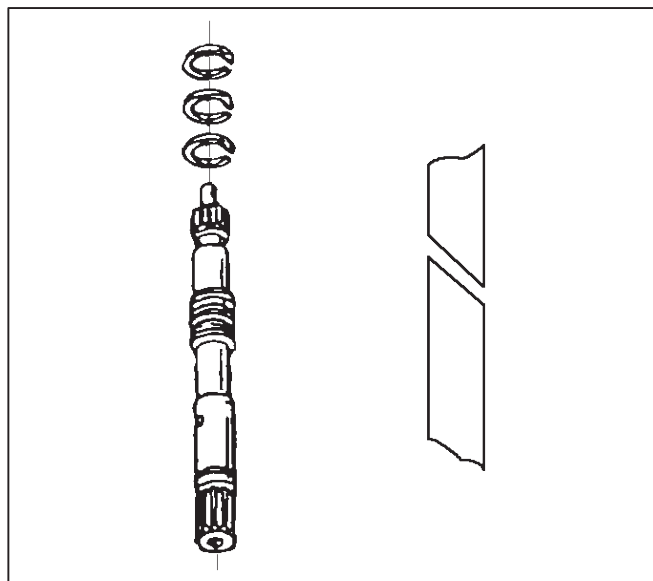
252RS011

### Visual Check:

If any damage, deformation or local wear is found, replace the damaged part.

## Reassembly

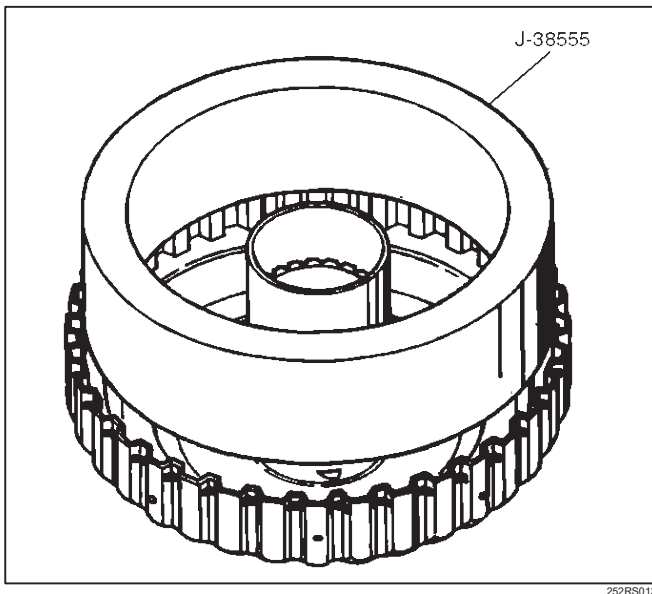
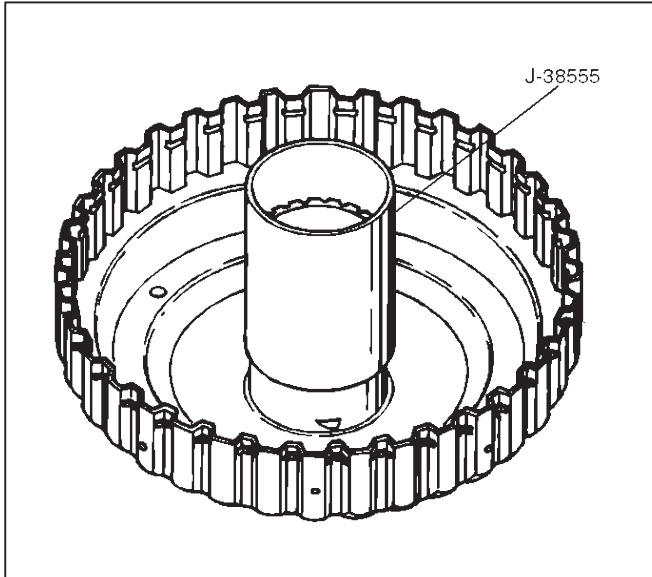
1. Install turbine shaft seal rings (15) with grease (petroleum jelly).



241RS008

## 7A-88 AUTOMATIC TRANSMISSION (4L30-E)

2. Install the J-38555 inner installer on the drum (14).
  - Pre-install piston assembly into J-38555 outer installer.
  - Install overrun clutch piston assembly (13). Use the outer installer while pushing piston into drum (14).
  - Remove the installer.



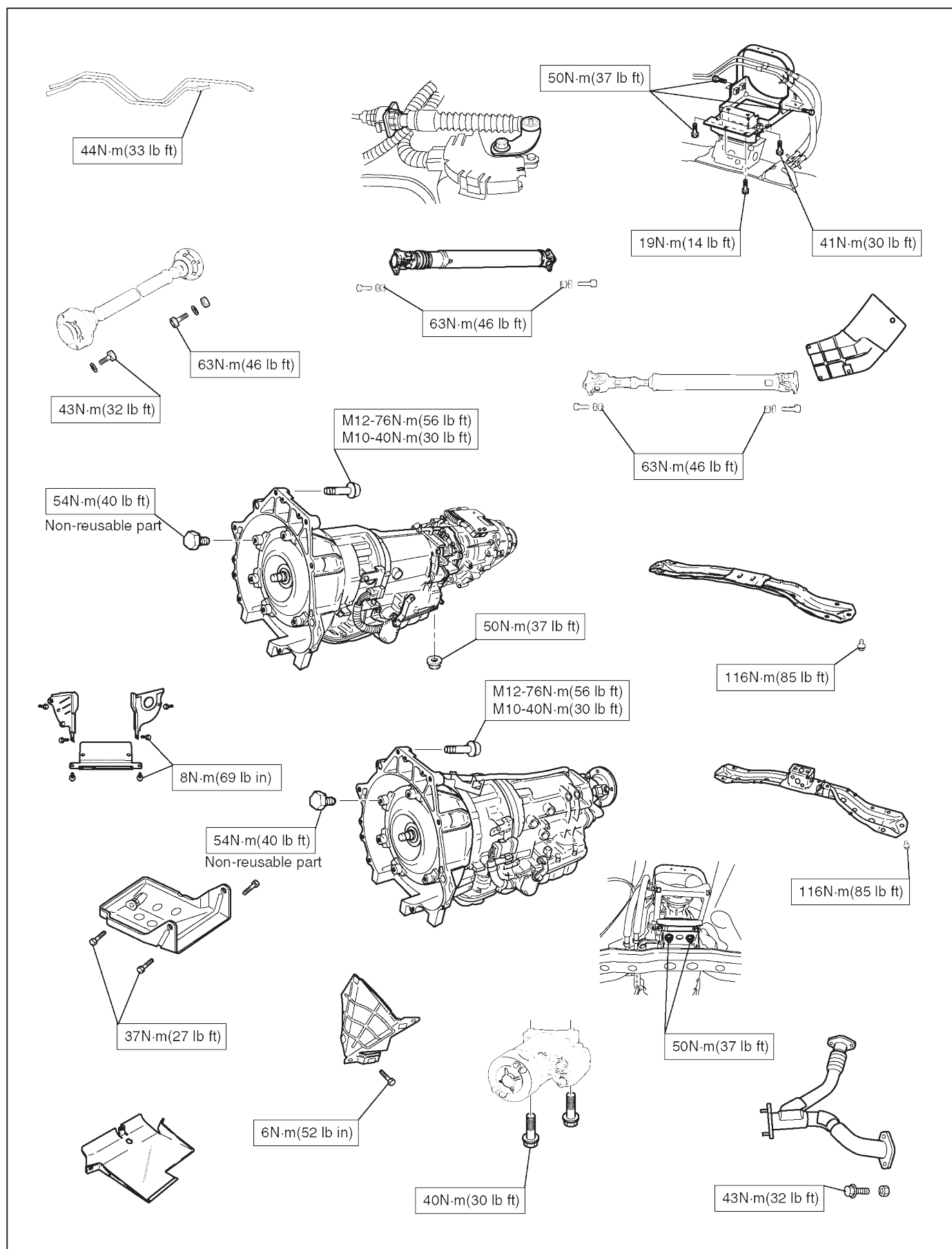
3. Install diaphragm spring (12).
  4. Install overrun clutch release spring retainer (11) (lip faces upwards), overrun roller clutch assembly (10), and cam (9).
  5. Place snap ring loosely on spring retainer.
    - Hold the J-23327-91 compressor in a vise and compress piston return spring with compressor.
    - Set snap ring (8) in ring groove.
    - Remove the compressor.
  6. Install clutch plates (7), start with steel plate and alternate with lined plates.
  7. Install backing plate (6).
  8. Install snap ring (5).
  9. Install overdrive sun gear with countersink pointing downwards.
  10. Install the overdrive carrier assembly (2).
- NOTE: Turn the assembly in a counter-clockwise direction only until roller clutch enters the outer race. After installation, rotate the assembly and listen for loose rollers.
11. Install turbine shaft (4) and snap ring (1).

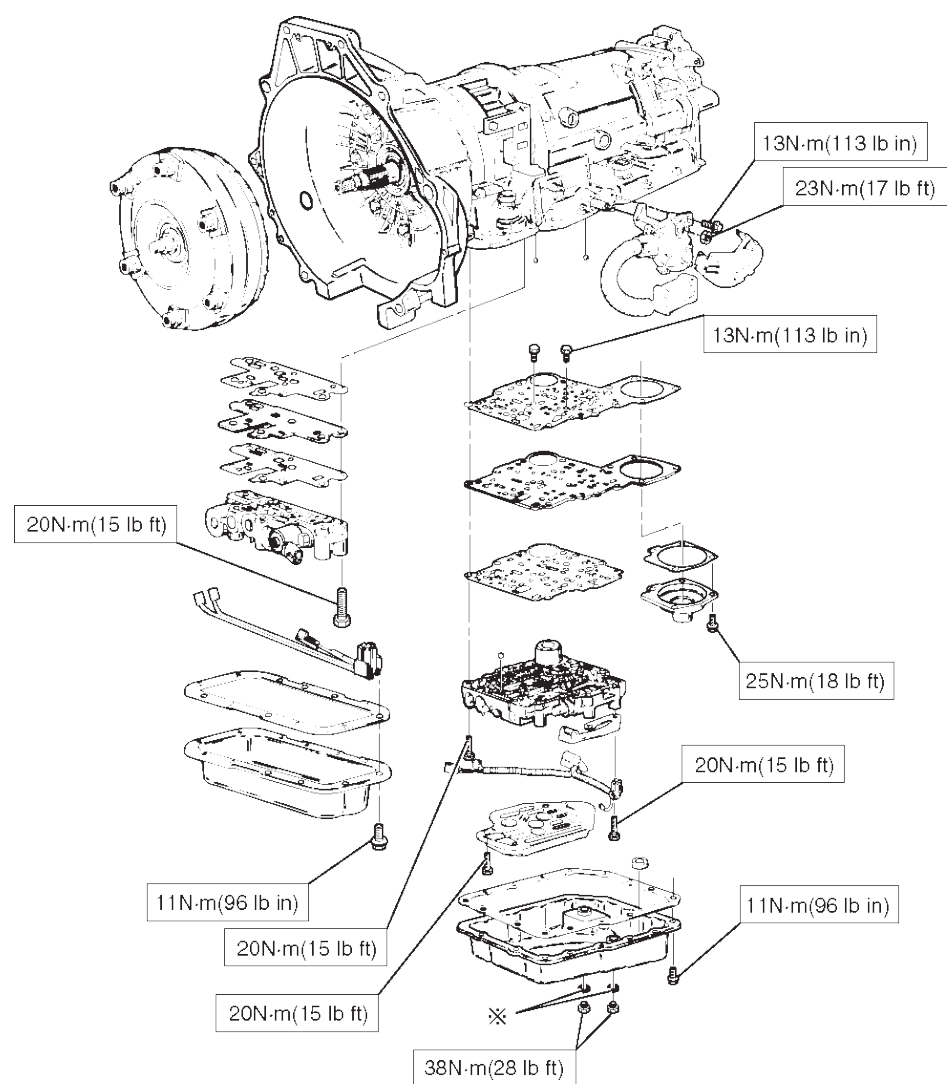
## Main Data And Specification

## General Specifications

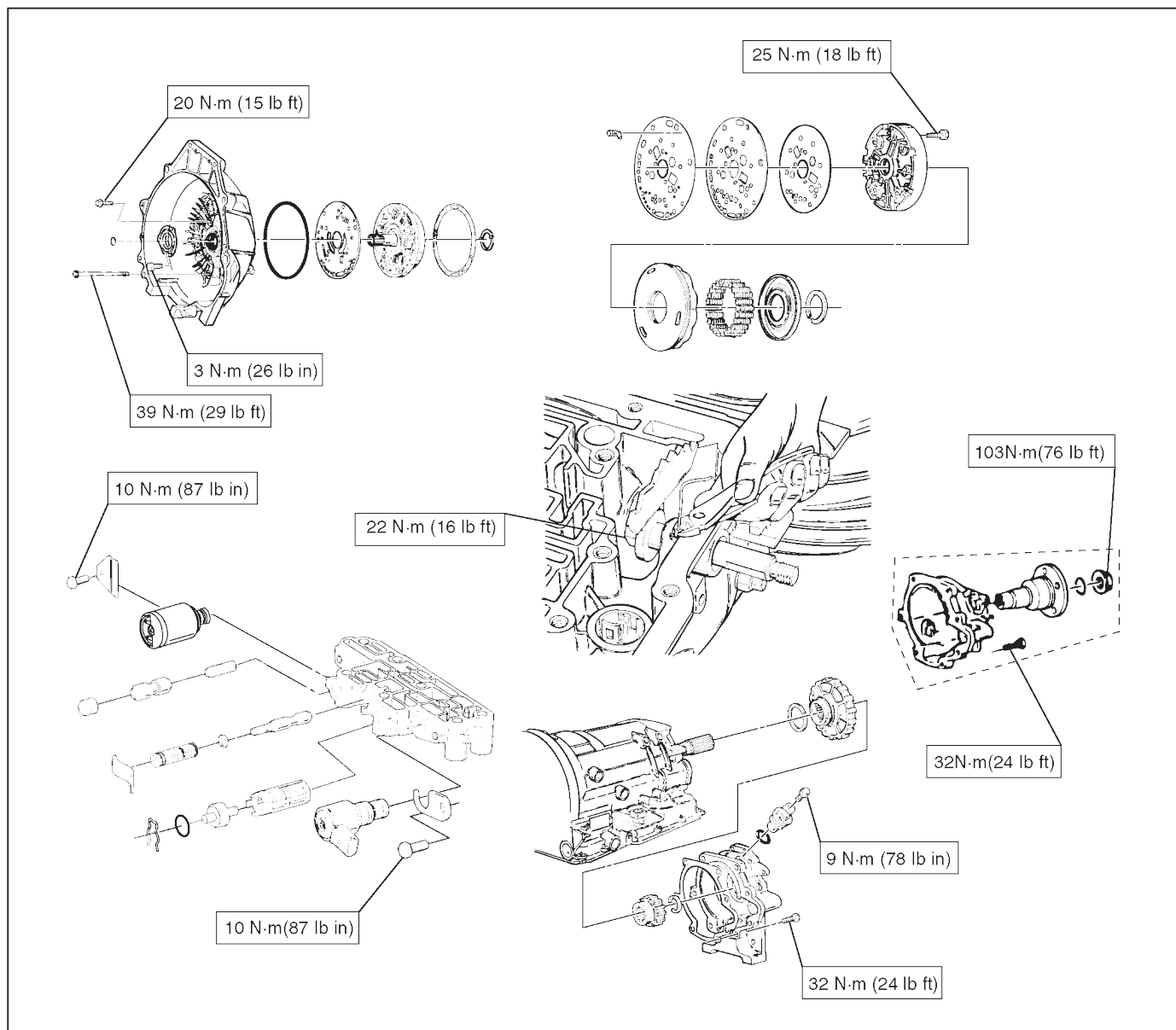
|                  |                               |                 |                                                                            | Remarks           |                   |
|------------------|-------------------------------|-----------------|----------------------------------------------------------------------------|-------------------|-------------------|
| Model            |                               |                 | THM 4L30–E                                                                 |                   |                   |
| Engine           |                               |                 | V6 3.5L 6VE1                                                               | DOHC              |                   |
| Type             |                               |                 | Automatic four speed overdrive in 4th gear lock–up clutch torque converter |                   |                   |
| Control systems  | Shift control                 |                 | Hydraulic                                                                  |                   |                   |
|                  | Shift pattern                 |                 | Electronic                                                                 |                   |                   |
|                  | Shift quality                 |                 | Electronic                                                                 |                   |                   |
|                  | Lock–up clutch                |                 | Electronic                                                                 |                   |                   |
| Gear ratio       | 1st                           |                 | 2.856                                                                      |                   |                   |
|                  | 2nd                           |                 | 1.618                                                                      |                   |                   |
|                  | 3rd                           |                 | 1.000                                                                      |                   |                   |
|                  | 4th (O/D)                     |                 | 0.723                                                                      |                   |                   |
|                  | Reverse                       |                 | 2.000                                                                      |                   |                   |
| Gear set         |                               |                 | Noiseless, high torque capability                                          |                   |                   |
| Oil used         | Name                          |                 | ATF DEXRON®–III                                                            |                   |                   |
|                  | Q'ty liter (qt)               |                 | 8.6 (9.1)                                                                  |                   |                   |
| Torque converter |                               |                 | 2,100 ± 150                                                                | Stall speed (rpm) |                   |
|                  | Reverse clutch                |                 | RC                                                                         | 4                 | Number of discs   |
|                  | Second clutch                 |                 | C2                                                                         | 6                 |                   |
|                  | Third clutch                  |                 | C3                                                                         | 6                 |                   |
|                  | Brake band                    |                 |                                                                            | Double wrap       |                   |
|                  | Fourth clutch                 |                 | C4                                                                         | 2                 | Number of discs   |
|                  | Overrun clutch                |                 | OC                                                                         | 1                 |                   |
|                  | Overdrive                     |                 | OFW                                                                        | 10                | Number of rollers |
|                  | Principal                     |                 | PFW                                                                        | 26                | Number of sprags  |
|                  | Ravigneaux planetary gear set | Input sun gear  |                                                                            | 30                | Number of teeth   |
|                  |                               | Pinion gear     |                                                                            | 19                |                   |
|                  |                               | Long pinion     |                                                                            | 23                |                   |
|                  |                               | Ring gear       |                                                                            | 90                |                   |
|                  |                               | Long pinion     |                                                                            | 19                |                   |
|                  |                               | Output sun gear |                                                                            | 46                |                   |
|                  | Overdrive planetary gear set  | Sun gear        |                                                                            | 31                |                   |
|                  |                               | Pinion gear     |                                                                            | 24                |                   |
|                  |                               | Ring gear       |                                                                            | 81                |                   |

# Torque Specifications

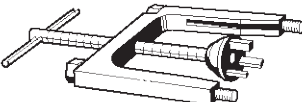
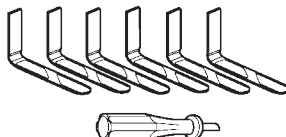
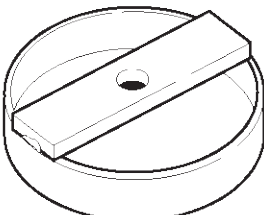
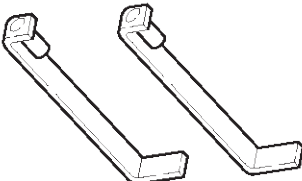
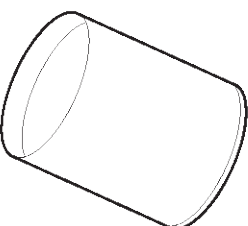
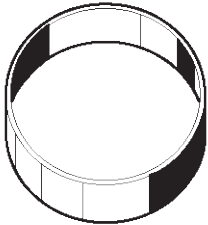
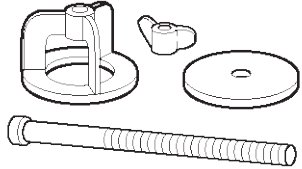
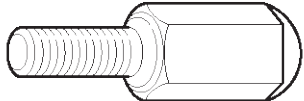
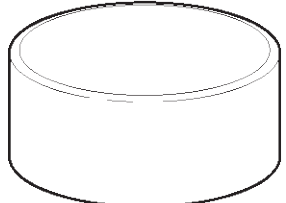
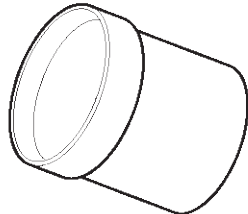




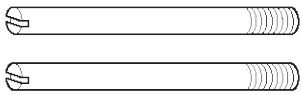
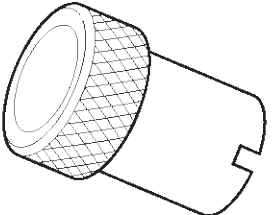
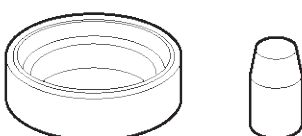
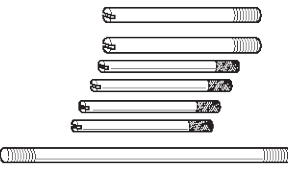
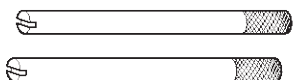
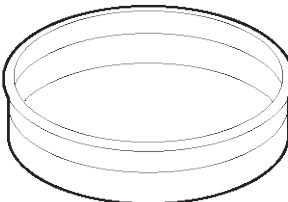
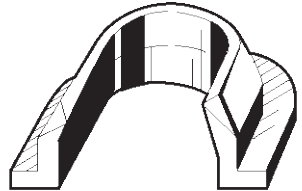
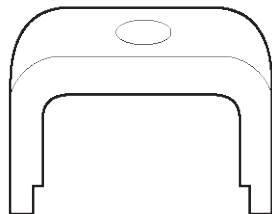
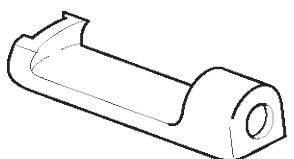
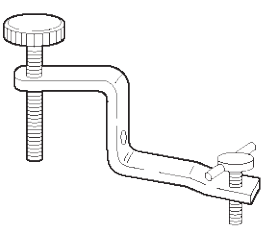
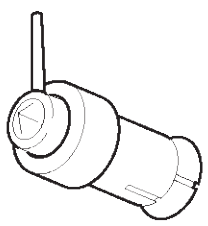
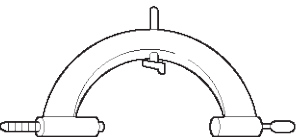
※ : Non-reusable part

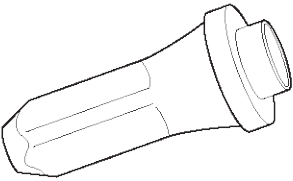
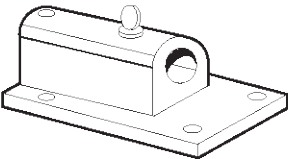
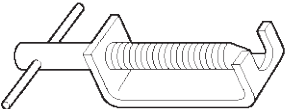
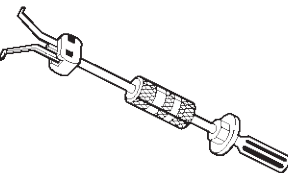


## Special Tools

| ILLUSTRATION                                                                                    | TOOL NO.<br>TOOL NAME                                                                | ILLUSTRATION                                                                                     | TOOL NO.<br>TOOL NAME                                                         |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <br>901RT071   | <b>J-23075</b><br>Spring compressor<br>(For servo piston)                            | <br>901RT077   | <b>J-23085-A</b><br>Selective washer<br>gauging tool                          |
| <br>901RX007   | <b>J-38450-A</b><br>Third clutch snap ring<br>compressor                             | <br>901RT078   | <b>J-23327-90</b><br>Fourth clutch spring<br>compressor<br>(Use with J-23327) |
| <br>901RT073  | <b>J-23075-12</b><br>Third clutch spring<br>compressor adapter<br>(Use with J-23075) | <br>901RT079  | <b>J-38553</b><br>3/4 Accumulator piston<br>fitter                            |
| <br>901RT074 | <b>J-23084</b><br>Third clutch piston<br>installer                                   | <br>901RT080 | <b>J-41096</b><br>Cover remover<br>(Use with J-38584)                         |
| <br>901RT075 | <b>J-23327</b><br>Third clutch spring<br>compressor                                  | <br>901RT081 | <b>J-38584</b><br>Slide hammer adapter<br>(Use with J-23907)                  |
| <br>901RT076 | <b>J-23080-A</b><br>Second clutch piston<br>installer                                | <br>901RT082 | <b>J-38554</b><br>Fourth clutch piston<br>fitter                              |

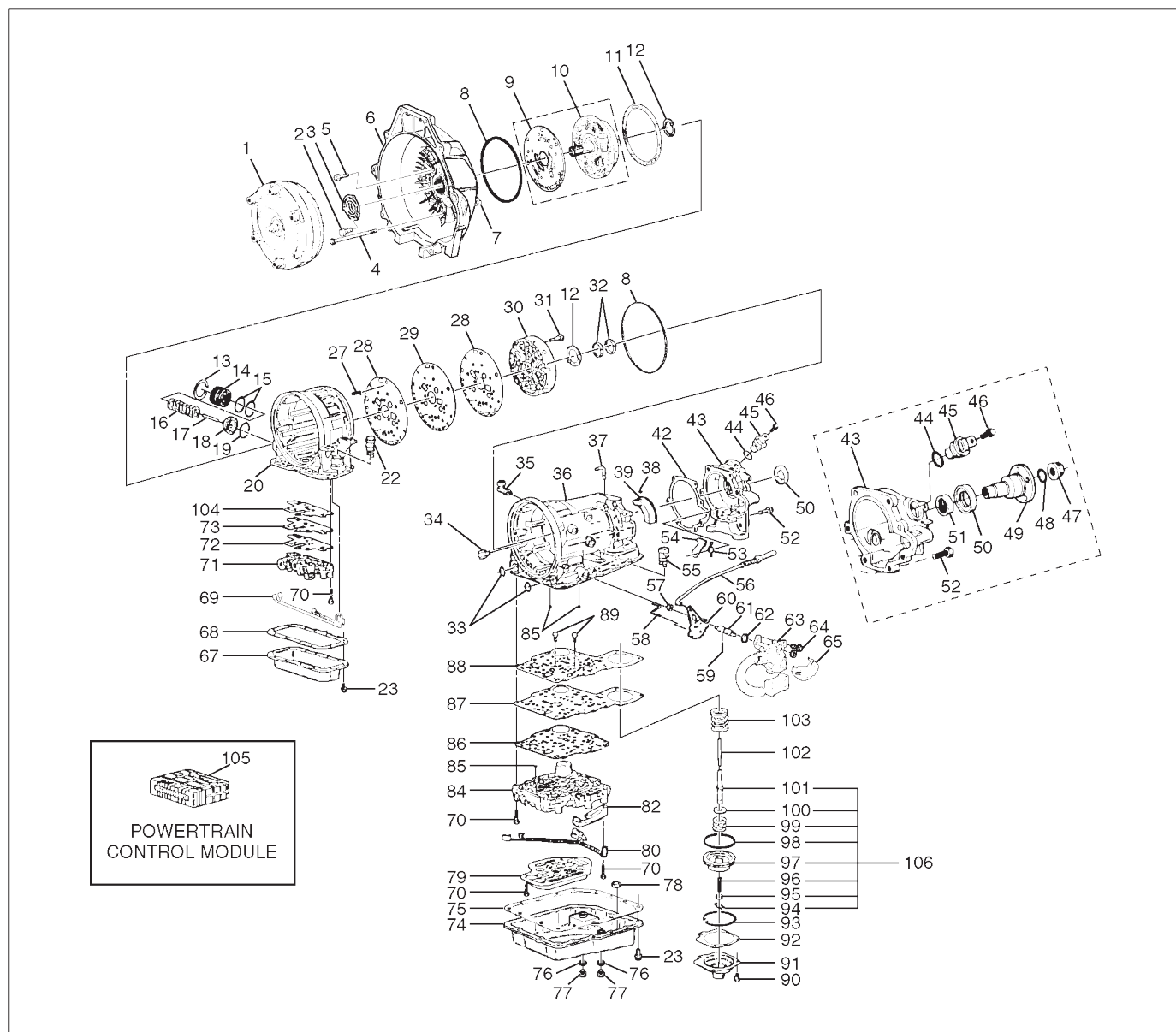
**7A-94 AUTOMATIC TRANSMISSION (4L30-E)**

| ILLUSTRATION                                                                                    | TOOL NO.<br>TOOL NAME                                                        | ILLUSTRATION                                                                                     | TOOL NO.<br>TOOL NAME                                          |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <br>901RT083   | <b>J-38588</b><br>Guide pins; adapter<br>case to main case                   | <br>901RT089   | <b>J-23082-01</b><br>Oil pump rotation tool                    |
| <br>901RT084   | <b>J-38555</b><br>Overrun clutch piston<br>seal installer set                | <br>901RT090   | <b>J-25025-B</b><br>Guide pins; valve body<br>to main case     |
| <br>901RT085  | <b>J-3387-2</b><br>Guide pins; gasket and<br>transfer plate to valve<br>body | <br>901RT091  | <b>J-38428</b><br>Servo piston fitter                          |
| <br>901RT086 | <b>J-25022</b><br>Turbine shaft puller<br>(Use with J-24773-1)               | <br>901RT092 | <b>J-23327-91</b><br>Overrun clutch spring<br>compressor       |
| <br>901RT087 | <b>J-23129</b><br>Oil seal remover<br>(Use with J-23907<br>and J-38584)      | <br>901RT093 | <b>J-38559-A</b><br>3/4 Accumulator piston<br>cover compressor |
| <br>901RT088 | <b>J-38557</b><br>Oil pump centering tool                                    | <br>901RT094 | <b>J-8763-02</b><br>Holding fixture                            |

| ILLUSTRATION                                                                                                   | TOOL NO.<br>TOOL NAME                                                   |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <br><small>901RT095</small>   | <b>J-36797</b><br>A/T extension assembly<br>oil seal installer (Inside) |
| <br><small>901RT096</small>   | <b>J-3289-20</b><br>Holding fixture base                                |
| <br><small>901RT097</small>  | <b>J-29770-A</b><br>Pressure gauge                                      |
| <br><small>901RT098</small> | <b>J-24773-1</b><br>End play fixture<br>(Use with J-25022)              |
| <br><small>901RT099</small> | <b>J-23907</b><br>Slide hammer                                          |

# 4L30-E Parts List

## Case And Associated Parts



### Legend

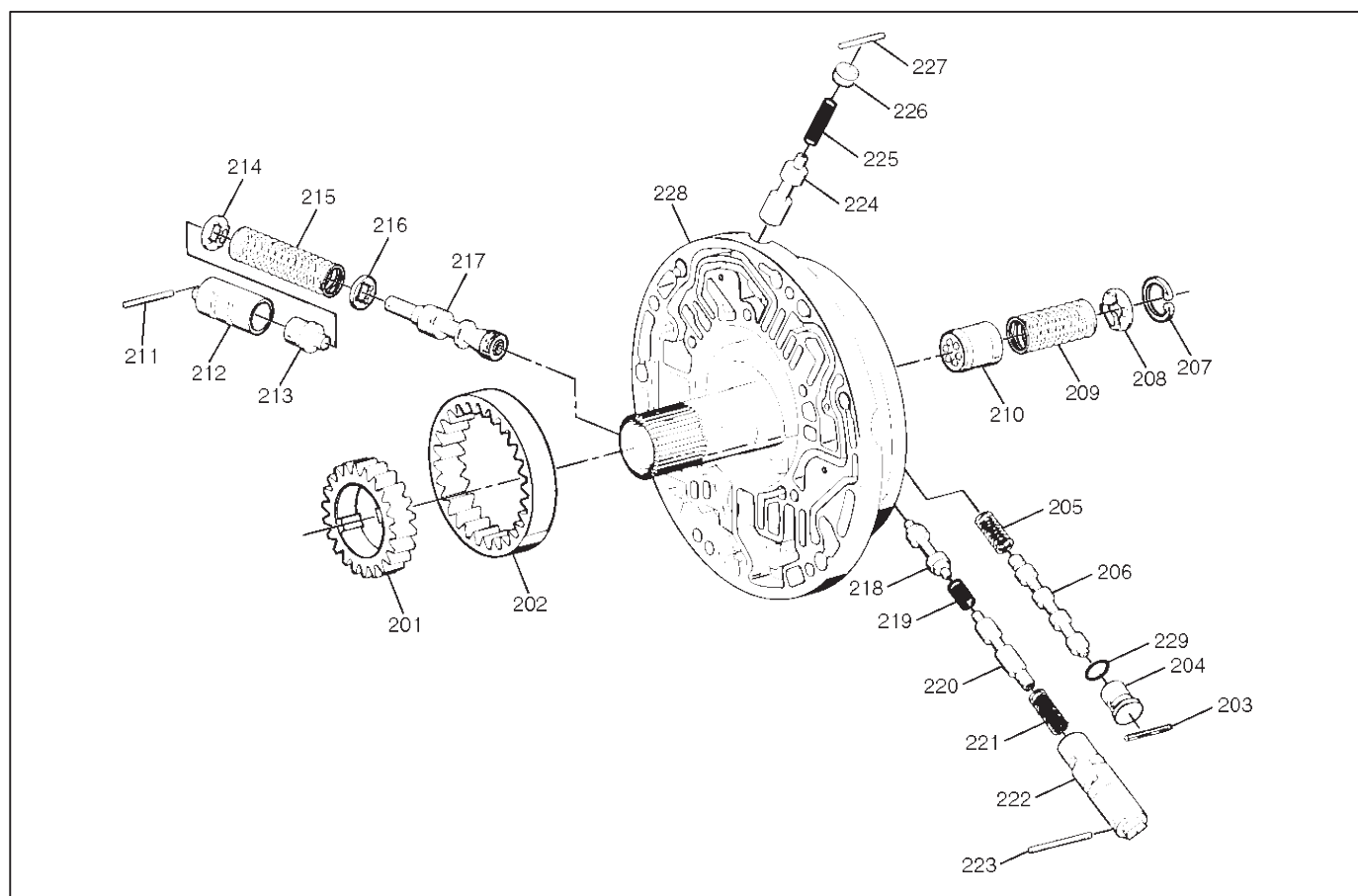
- |                                           |                                             |
|-------------------------------------------|---------------------------------------------|
| (1) Torque Converter                      | (17) Pin, 3-4 Accumulator Piston            |
| (2) Screw, Seal Ring Assembly             | (18) Piston, 3-4 Accumulator                |
| (3) Seal Ring Assembly, Converter Housing | (19) Ring, 3-4, Accumulator Piston          |
| (4) Screw, Converter Housing/Main Case    | (20) Case, Adapter                          |
| (5) Screw, Converter Housing/Oil Pump     | (22) Connector, Electrical/Adapter Case     |
| (6) Housing, Converter                    | (23) Screw, Pan                             |
| (7) Plug, Converter Housing               | (27) Restrictor, Oil                        |
| (8) Seal, O-Ring                          | (28) Gasket, Transfer Plate/Adapter         |
| (9) Wear Plate, Oil Pump Body             | (29) Plate, Transfer Adapter/Center Support |
| (10) Pump Assembly, Oil                   | (30) Support Assembly, Center               |
| (11) Gasket                               | (31) Screw, Center Support                  |
| (12) Washer, Thrust Selective             | (32) Ring, Oil Seal                         |
| (13) Ring, Snap                           | (33) Seal, O-Ring Main Case                 |
| (14) Cover, 3-4 Accumulator Piston        | (34) Fitting, Cooler                        |
| (15) Seal, O-Ring, 3-4 Accumulator        | (35) Fitting Assembly, Cooler               |
| (16) Spring, 3-4 Accumulator Piston       | (36) Case, Main                             |
|                                           | (37) Breather, Pipe                         |

---

|                                             |                                                |
|---------------------------------------------|------------------------------------------------|
| (38) Seal, O-Ring                           | (74) Pan, Bottom/Main Case                     |
| (39) Reservoir                              | (75) Gasket, Bottom Pan/Main Case              |
| (42) Gasket, Extension Case                 | (76) Gasket, Oil Drain or Overfill Screw       |
| (43) Extension Assembly                     | (77) Screw, Oil Drain or Overfill              |
| (44) Seal, O-Ring/Speed Sensor              | (78) Magnet, Chip Collector                    |
| (45) Sensor Assembly, Speed                 | (79) Filter Oil                                |
| (46) Screw, Speed Sensor                    | (80) Harness Assembly, Main Case               |
| (47) Nut, Output Shaft/Drive Flange         | (82) Roller and Spring Assembly, Manual Detent |
| (48) Seal, O-Ring/Drive Flange              | (84) Valve Body Assembly, Main Case            |
| (49) Flange, Drive                          | (85) Ball, Check                               |
| (50) Seal, Extension Assembly               | (86) Gasket, Main V.B./Transfer Plate          |
| (52) Screw, Extension/Main Case             | (87) Plate, Main V.B./Transfer                 |
| (53) Spring, Parking Pawl Lock              | (88) Gasket, Transfer/Main Case                |
| (54) Pawl, Parking Lock                     | (89) Screw, Transfer Plate on V.B.             |
| (55) Connector, Electrical/Main Case        | (90) Screw, Servo Cover                        |
| (56) Actuator Assembly, Parking Lock        | (91) Cover, Servo Piston                       |
| (57) Nut, Parking Lock Lever                | (92) Gasket, Cover/Servo Piston                |
| (58) Link, Manual Valve                     | (93) Ring, Retaining Servo Piston              |
| (59) Pin, Spring                            | (94) Clip, Servo Piston                        |
| (60) Lever, Parking Lock and Range Selector | (95) Nut, Servo Screw                          |
| (61) Shaft, Selector                        | (96) Screw, Servo Piston                       |
| (62) Seal, Selector Shaft                   | (97) Piston, Servo                             |
| (63) Mode Switch Assembly                   | (98) Seal, Ring/Servo Piston                   |
| (64) Screw and Conical Washer Assembly      | (99) Spring, Cushion/Servo Piston              |
| (65) Shield, Mode Switch                    | (100) Seat, Cushion Spring                     |
| (67) Pan, Bottom/Adapter Case               | (101) Sleeve, Servo Piston Adjust              |
| (68) Gasket, Bottom Pan/Adapter Case        | (102) Rod, Apply/Servo Piston                  |
| (69) Harness Assembly, Adapter Case         | (103) Spring, Return/Servo Piston              |
| (70) Screw, Valve Body                      | (104) Gasket, Adapter Case/Transfer Plate      |
| (71) Valve Body Assembly, Adapter Case      | (105) Powertrain Control Module                |
| (72) Gasket, Adapter Valve Body             | (106) Servo Piston Assembly                    |
| (73) Plate, Adapter Valve Body/Transfer     |                                                |

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# Pump Assembly

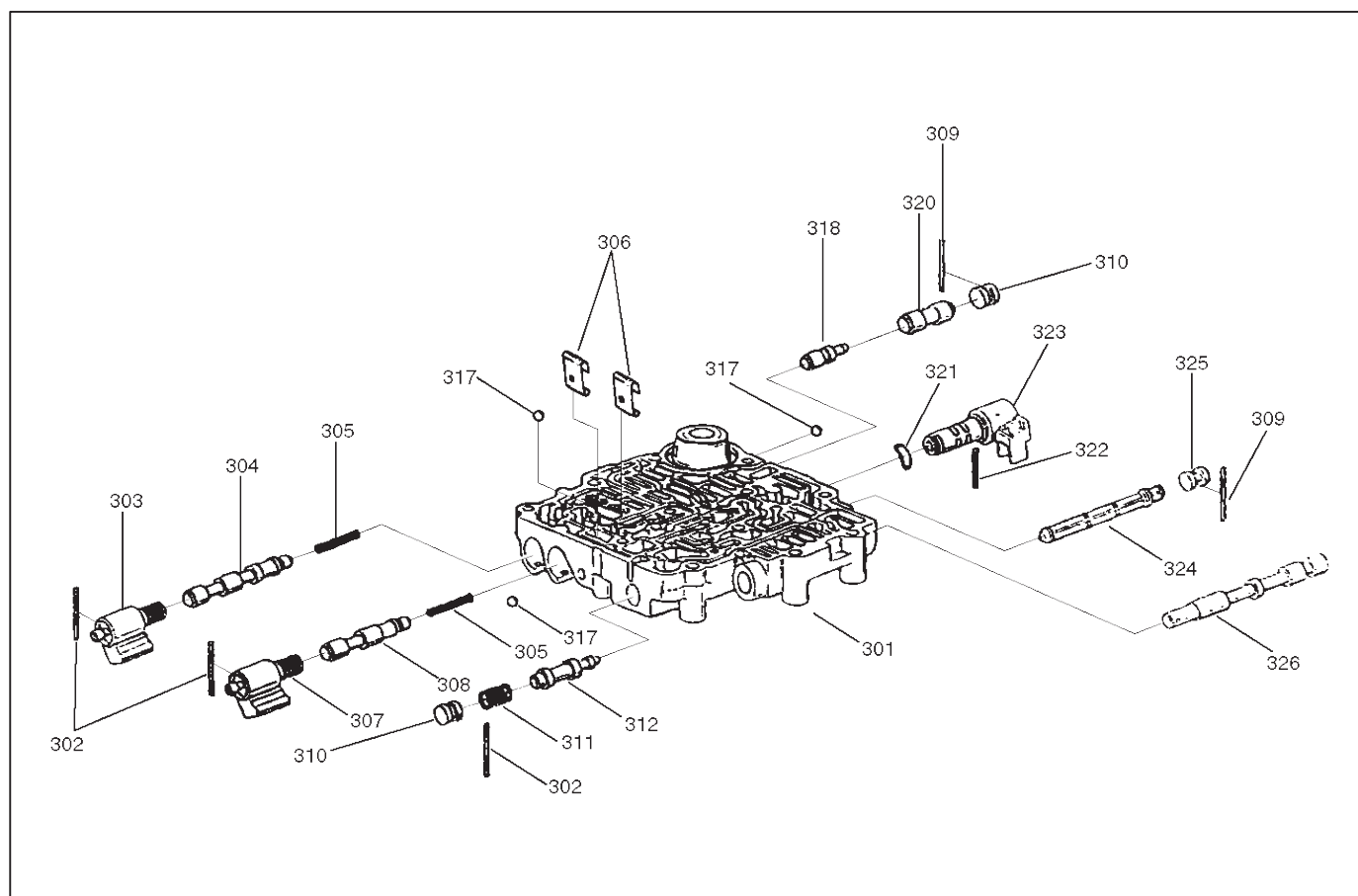


241RY003

## Legend

- |                                                |                                             |
|------------------------------------------------|---------------------------------------------|
| (201) Gear, Oil Pump Drive                     | (215) Spring, Pressure Regulator Valve      |
| (202) Gear, Oil Pump Driven                    | (216) Seat, Spring/Pressure Regulator Valve |
| (203) Pin, Plug Converter Clutch Control       | (217) Valve, Pressure Regulator             |
| (204) Plug, Converter Clutch Control Valve     | (218) Isolator Valve                        |
| (205) Spring, Converter Clutch Control Valve   | (219) Spring, Isolator                      |
| (206) Valve, Converter Clutch Control          | (220) Valve, Converter Clutch Regulator     |
| (207) Ring, Snap/Throttle Signal Accumulator   | (221) Spring, Converter Clutch Regulator    |
| (208) Seat, Spring/Throttle Signal Accumulator | (222) Sleeve, Converter Clutch Regulator    |
| (209) Spring, Throttle Signal Accumulator      | (223) Pin, Retainer Sleeve                  |
| (210) Piston, Throttle Signal Accumulator      | (224) Valve, Enable                         |
| (211) Pin, Boost Valve Sleeve                  | (225) Spring, Enable Valve                  |
| (212) Sleeve, Boost Valve                      | (226) Spring Guide, Enable Valve            |
| (213) Valve, Boost                             | (227) Pin, Enable Valve                     |
| (214) Seat, Spring/Pressure Regulator Valve    | (228) Pump Assembly                         |
|                                                | (229) Seal Ring, Plug                       |

## Valve Body Assemblies

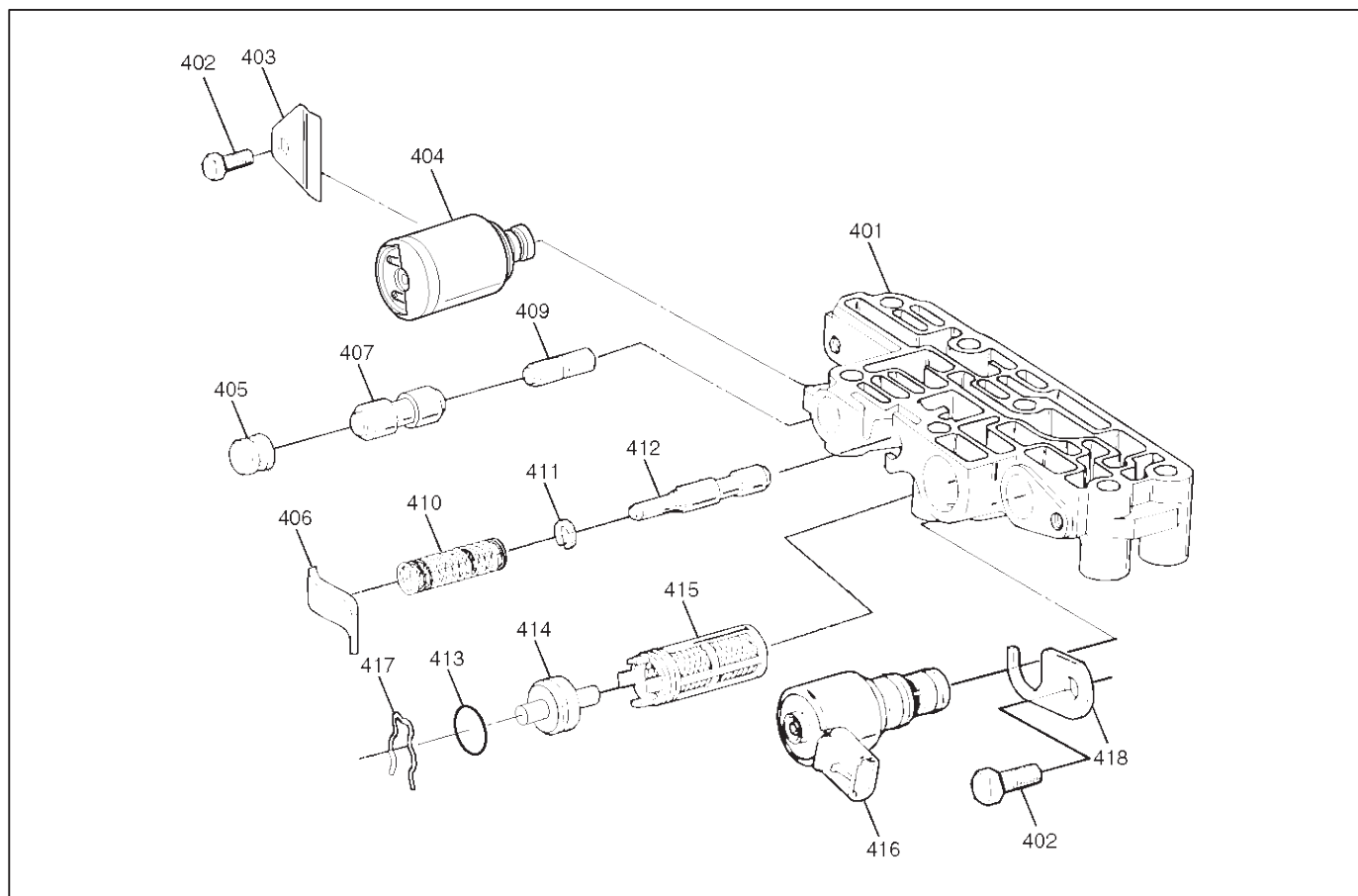


244RS009

### Legend

- |                                       |                                           |
|---------------------------------------|-------------------------------------------|
| (301) Body, Valve Main Case           | (311) Spring, Valve Low Pressure Control  |
| (302) Pin, Spring                     | (312) Valve, Low Pressure Control         |
| (303) Solenoid Assembly, ON/OFF N.C.  | (317) Ball, Check                         |
| (304) Valve, 1-2 and 3-4 Shift        | (318) Valve, 1-2 Accumulator Control      |
| (305) Spring, 1-2 and 3-4 (2-3) Shift | (320) Valve, 1-2 Accumulator              |
| (306) Retainer, Valve                 | (321) Washer, Waved PWM Solenoid          |
| (307) Solenoid Assembly, ON/OFF N.O.  | (322) Pin, Solenoid PWM                   |
| (308) Valve, 2-3 Shift                | (323) Solenoid Assembly, Band Control PWM |
| (309) Pin, Spring                     | (324) Screen Assembly, PWM Solenoid       |
| (310) Plug, Valve Bore                | (325) Plug, Screen                        |
|                                       | (326) Valve, Manual                       |

## 7A-100 AUTOMATIC TRANSMISSION (4L30-E)

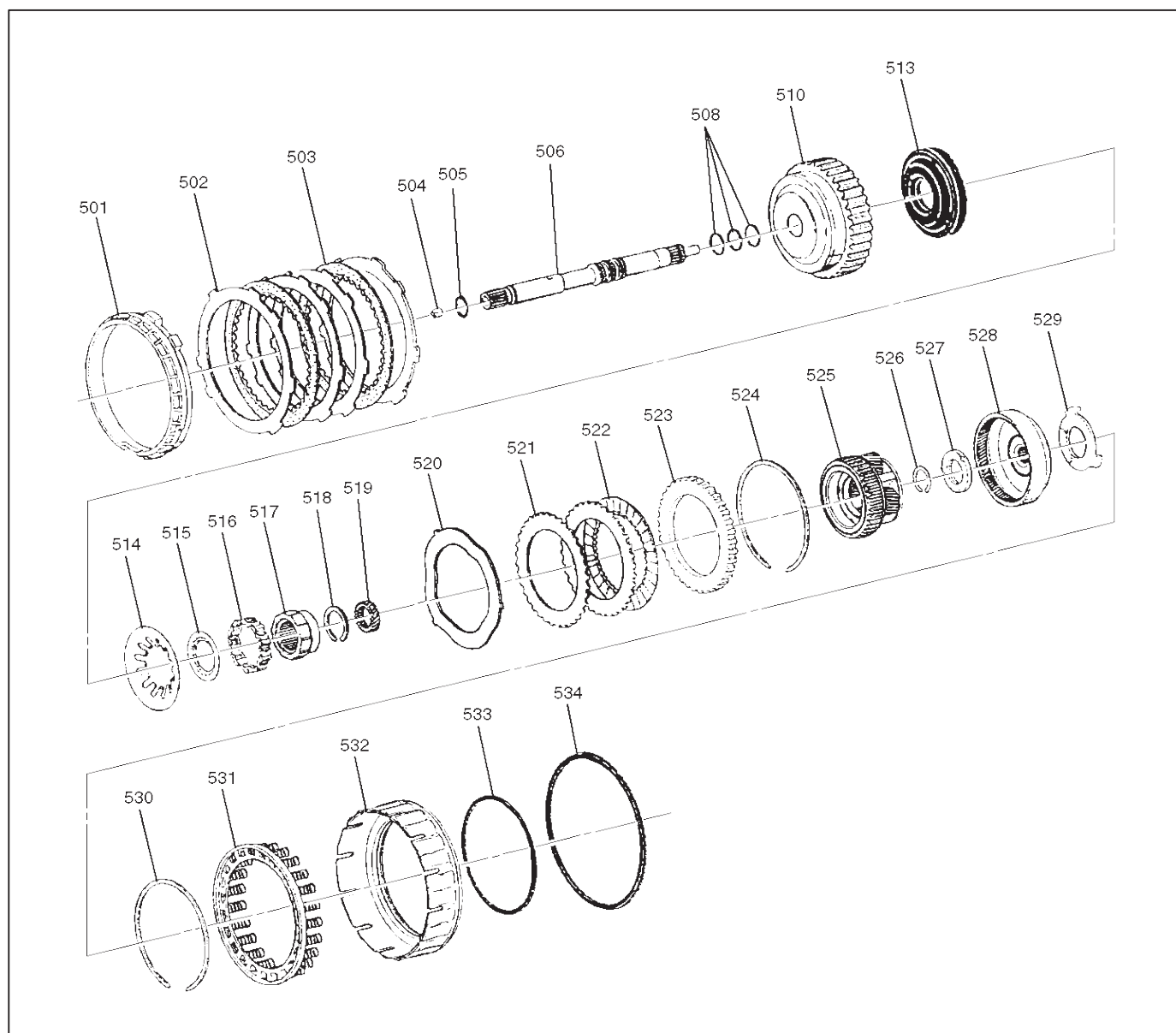


243RY002

### Legend

- |                                      |                                              |
|--------------------------------------|----------------------------------------------|
| (401) Body, Valve/Adapter Case       | (410) Spring, Feed Limit Valve               |
| (402) Screw, Solenoid Force Motor    | (411) Ring, Retainer                         |
| (403) Retainer, Force Motor          | (412) Valve, Feed Limit                      |
| (404) Solenoid, Force Motor          | (413) Seal, O-Ring Plug Filter               |
| (405) Plug, 3-4 Accumulator          | (414) Plug, Screen                           |
| (406) Plug and Spring Retainer       | (415) Screen Assembly, Force Motor           |
| (407) Valve, 3-4 Accumulator         | (416) Solenoid, Torque Converter Clutch, PWM |
| (409) Valve, 3-4 Accumulator Control | (417) Retainer, Screen Plug                  |
|                                      | (418) Bracket, PWM Solenoid                  |

## Overdrive Internal Components

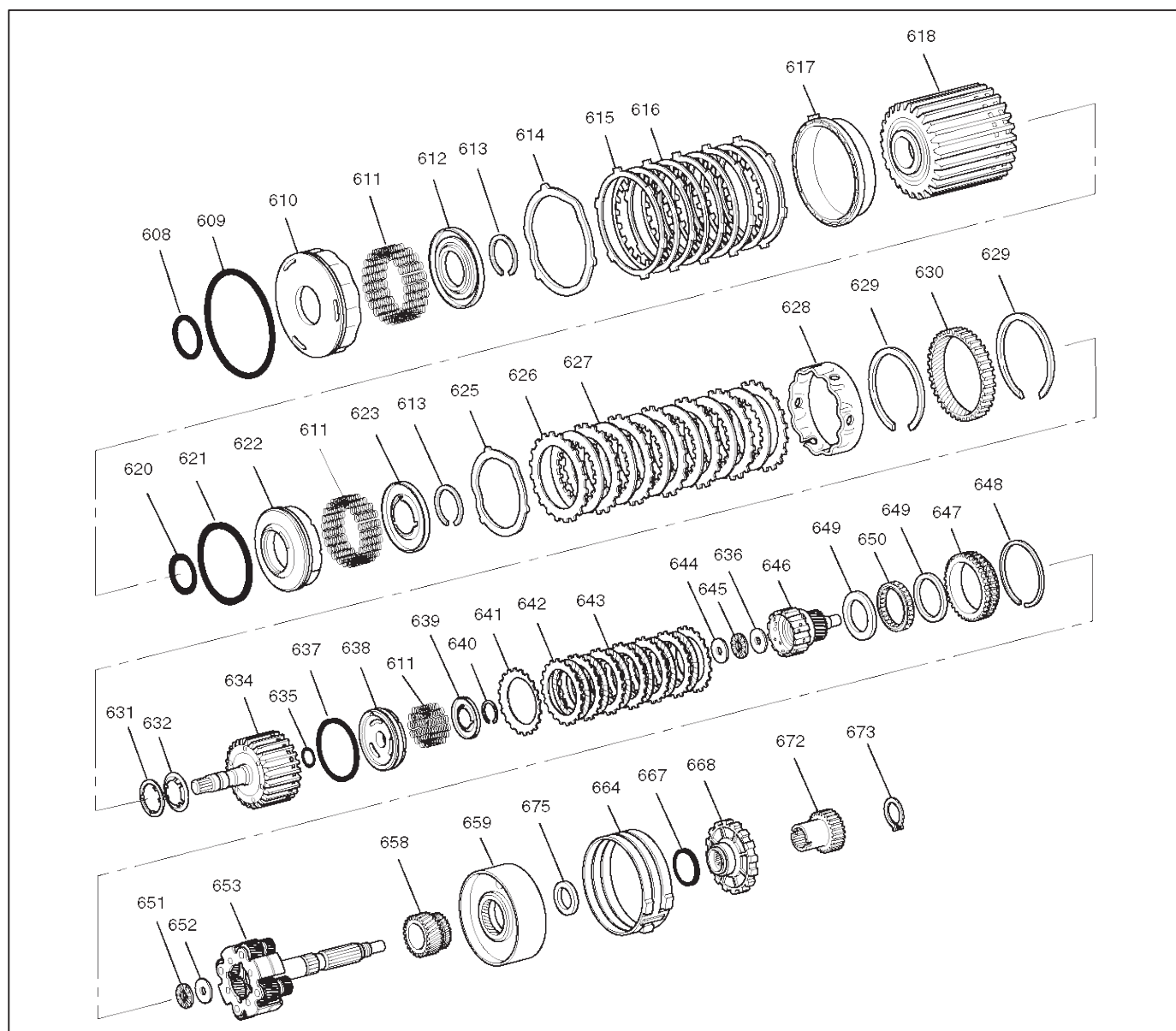


252RW003

**Legend**

- |                                               |                                                |
|-----------------------------------------------|------------------------------------------------|
| (501) Retainer, 4th Clutch                    | (520) Plate, Waved/Overrun Clutch              |
| (502) Plate, 4th Clutch (Steel)               | (521) Plate, Overrun Clutch (Steel)            |
| (503) Plate Assembly, 4th Clutch (Lined)      | (522) Plate Assembly, Overrun Clutch (Lined)   |
| (504) Retainer And Ball Assembly, Check Valve | (523) Plate, Backing/Overrun Clutch            |
| (505) Seal, O-Ring/Turbine Shaft              | (524) Ring, Snap/Overrun Clutch Housing        |
| (506) Shaft, Turbine                          | (525) Carrier Assembly, Overdrive Complete     |
| (508) Ring, Oil Seal/Turbine Shaft            | (526) Ring, Snap/Turbine Shaft/Carrier         |
| (510) Housing, Overrun Clutch                 | (527) Bearing Assembly, Thrust                 |
| (513) Piston, Overrun Clutch                  | (528) Gear, Overdrive Internal                 |
| (514) Spring, Overrun Clutch Release          | (529) Washer, Thrust/Internal Gear/Support     |
| (515) Retainer, Release Spring/Overrun Clutch | (530) Ring, Snap/Adapter/4th Clutch Spring     |
| (516) Roller Assembly, Overdrive Clutch       | (531) Retainer and spring assembly, 4th clutch |
| (517) Cam, Overdrive Roller Clutch            | (532) Piston, 4th Clutch                       |
| (518) Ring, Snap/Overrun Clutch Hub           | (533) Seal, 4th Clutch Piston (Inner)          |
| (519) Gear, Overdrive Sun                     | (534) Seal, 4th Clutch Piston (outer)          |

## Internal Components



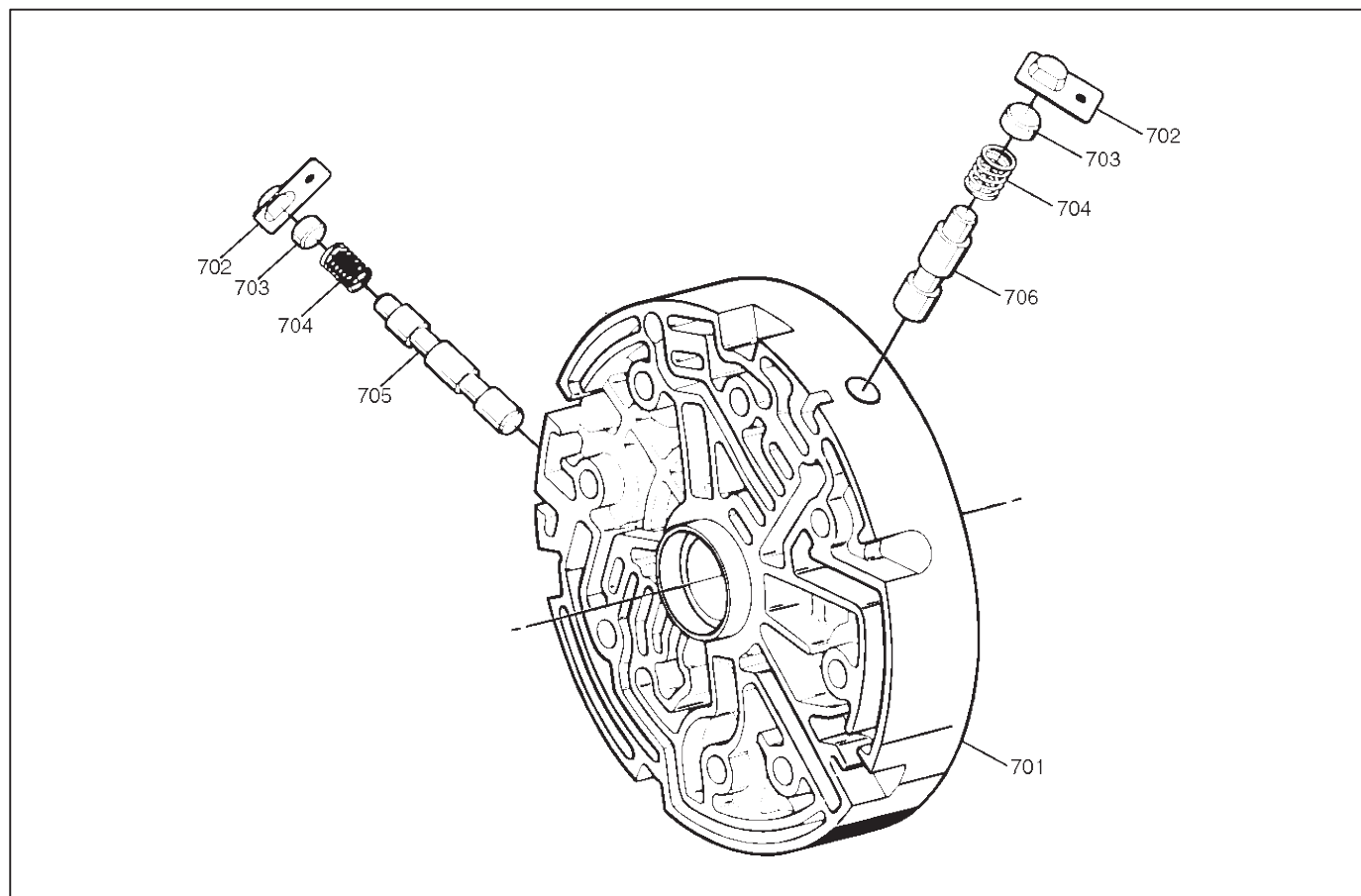
247RW002

### Legend

- |                                                |                                            |
|------------------------------------------------|--------------------------------------------|
| (608) Seal, Reverse Clutch Piston (Inner)      | (627) Plate Assembly, 2nd Clutch (Lined)   |
| (609) Seal, Reverse Clutch Piston (Outer)      | (628) Spacer, 2nd Clutch                   |
| (610) Piston, Reverse Clutch                   | (629) Ring, Retaining                      |
| (611) Spring, Piston Clutch                    | (630) Gear, Ring                           |
| (612) Seat, Spring/Reverse Clutch              | (631) Washer, Thrust/2nd Clutch/3rd Clutch |
| (613) Ring, Retaining                          | (632) Thrust Washer, Clutch Hub            |
| (614) Plate, Waved/Reverse Clutch              | (634) Drum Assembly, 3rd Clutch            |
| (615) Plate, Reverse Clutch (Steel)            | (635) Seal, 3rd clutch piston (Inner)      |
| (616) Plate Assembly, Reverse Clutch (Lined)   | (636) Washer, Retaining                    |
| (617) Plate, Reverse Clutch Pressure/Selective | (637) Seal, 3rd Clutch Piston (Outer)      |
| (618) Drum Assembly, 2nd Clutch                | (638) Piston 3rd Clutch                    |
| (620) Seal, 2nd Clutch Piston (Inner)          | (639) Seat, Spring/3rd Clutch              |
| (621) Seal, 2nd Clutch Piston (Outer)          | (640) Ring, Retaining                      |
| (622) Piston, 2nd Clutch                       | (641) Plate, Spring Cushion/3rd Clutch     |
| (623) Seat, Spring/2nd Clutch                  | (642) Plate, 3rd Clutch (Steel)            |
| (625) Plate, Waved/2nd Clutch                  | (643) Plate Assembly, 3rd Clutch (Lined)   |
| (626) Plate, 2nd Clutch (Steel)                | (644) Washer, Thrust/Input Sun             |
|                                                | (645) Bearing, Input Shaft/Gear Assembly   |

|                                       |                                     |
|---------------------------------------|-------------------------------------|
| (646) Gear Assembly, Input Sun        | (658) Gear, Reaction Sun            |
| (647) Race Assembly, Sprag            | (659) Drum, Reaction Sun            |
| (648) Ring, Retaining/Sprag           | (664) Band Assembly, Brake          |
| (649) Ring, Retaining                 | (667) Seal, Ring/Wheel Parking Lock |
| (650) Cage Assembly, Sprag            | (668) Wheel, Parking Lock           |
| (651) Bearing, Output Shaft/Input Sun | (672) Wheel, Speed                  |
| (652) Washer, Output Shaft/Input Sun  | (673) Ring, Retaining               |
| (653) Carrier Assembly, Planetary     | (675) Bearing, Thrust Assembly      |

## Center Support Assembly



242RY002

### Legend

|                      |                                      |
|----------------------|--------------------------------------|
| (701) Center Support | (704) Spring, Lockout                |
| (702) Retainer Plate | (705) Valve, Overrun Lockout         |
| (703) Plug, Lockout  | (706) Valve, Reverse Lockout Control |