



Modern Automotive Technology Chapter 58

Automatic Transmission Service



*North Montco
Technical Career Center*

Learning Objectives

- Troubleshoot an automatic transmission.
- Explain the types of problems common to an automatic transmission.
- Describe the tests needed to locate automatic transmission problems.
- Make basic external adjustments on an automatic transmission.
- Locate and repair automatic transmission leaks.
- Cite and observe safety rules while working on transmissions.
- Troubleshoot electronically controlled automatic transmissions.
- transmissions.

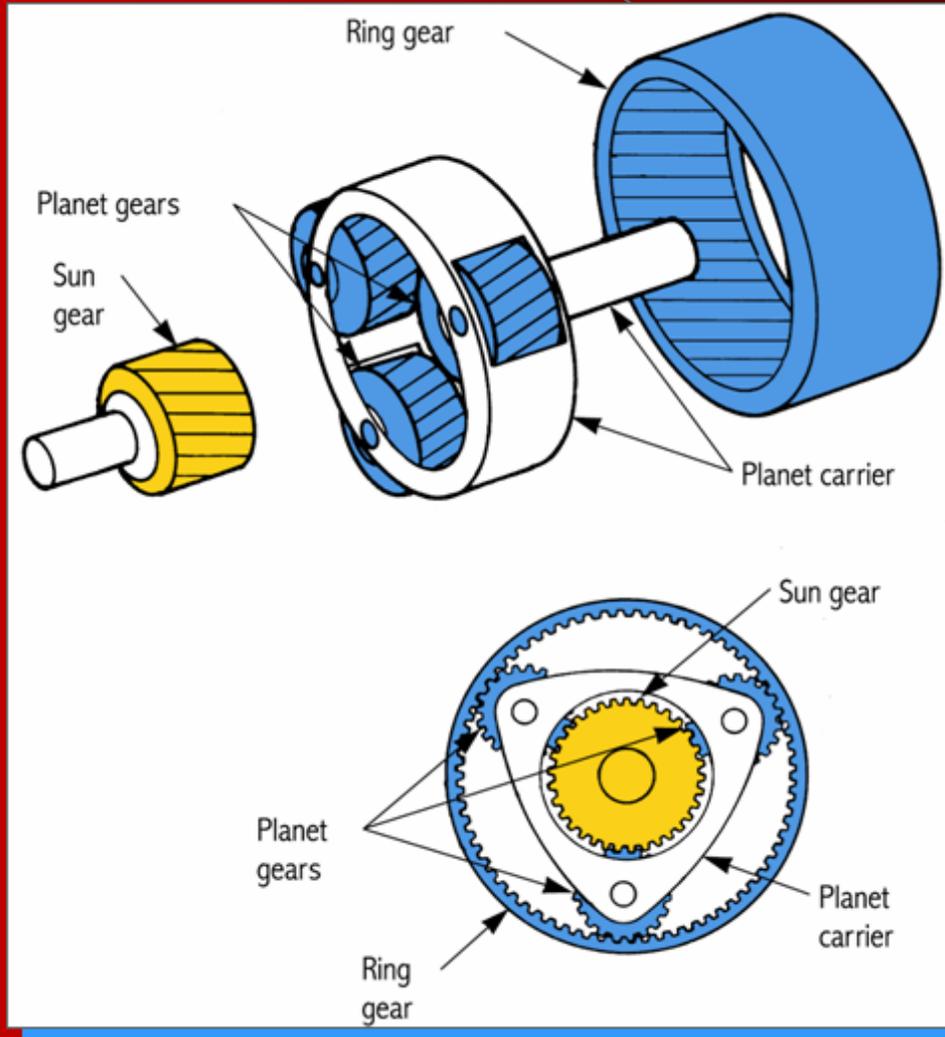


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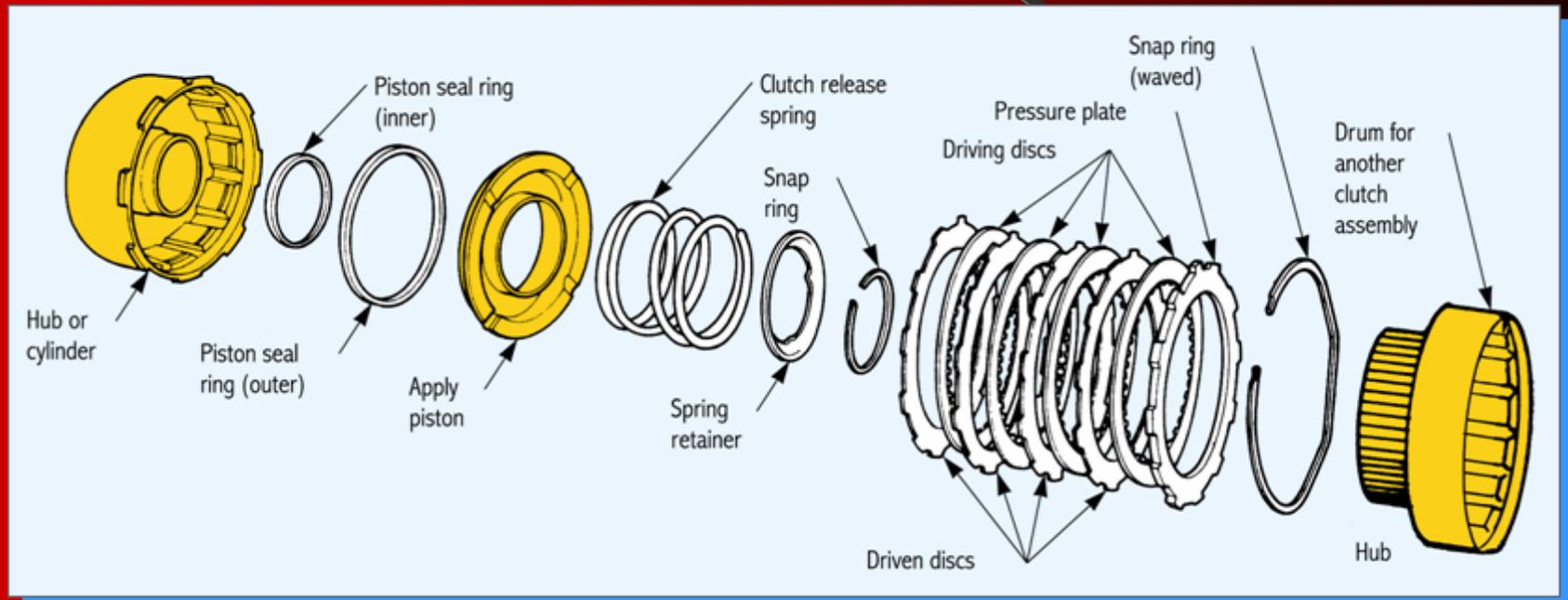
1. Noises from an automatic transmission may result from planetary gear troubles, damaged bearings, faulty torque converter, or loose components.
2. Burned Transmission Oil (Fluid) will be dark or black; darkness is normally caused by band and clutch friction material failure.



Planetary Gearset



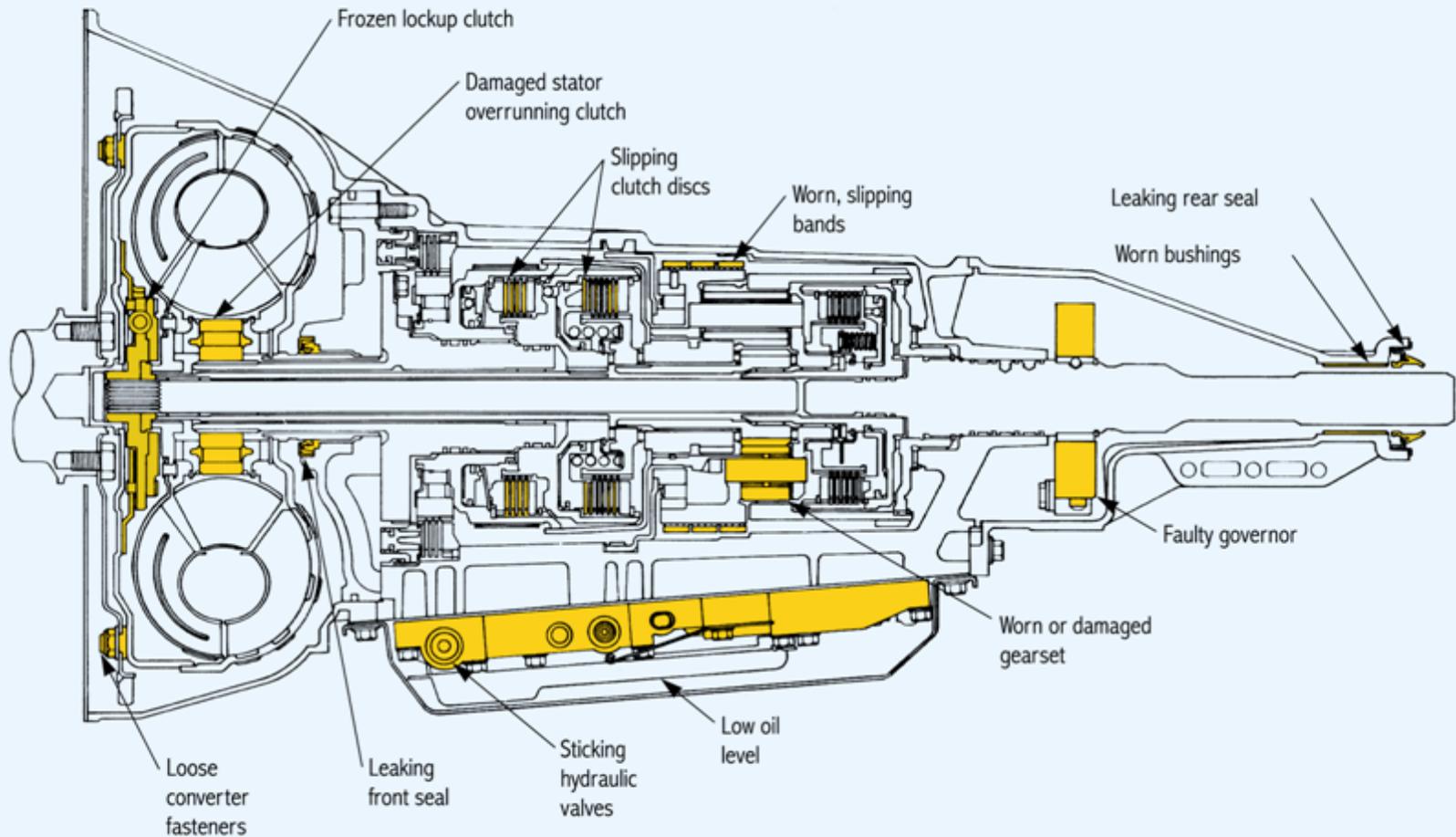
Clutch Construction



Driving discs are splined to hub. Driven discs are locked in the drum



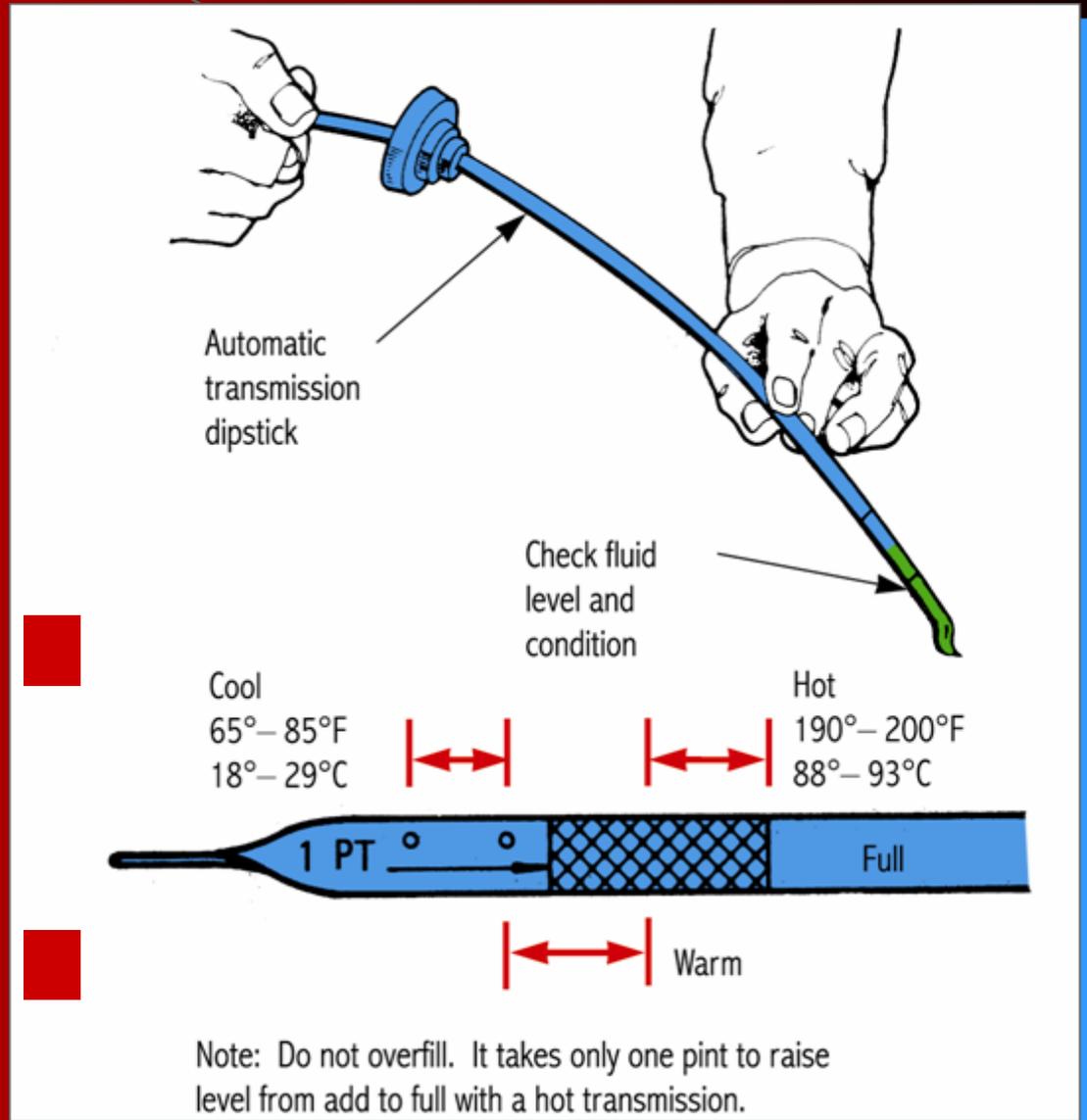
Transmission Problems



Check Oil Level

Feel, inspect, and smell fluid

Do not overfill. It only takes a pint of fluid to raise the level from *add* to *full*



Oil Condition

- Burned oil will be black or brown
 - caused by friction material failure due to slippage and overheating
- Milky oil indicates coolant mixing with the oil
 - caused by oil cooler leaking antifreeze into the oil
- Varnish is a light brown coating
 - oil is broken down, requiring oil change and possible transmission repair

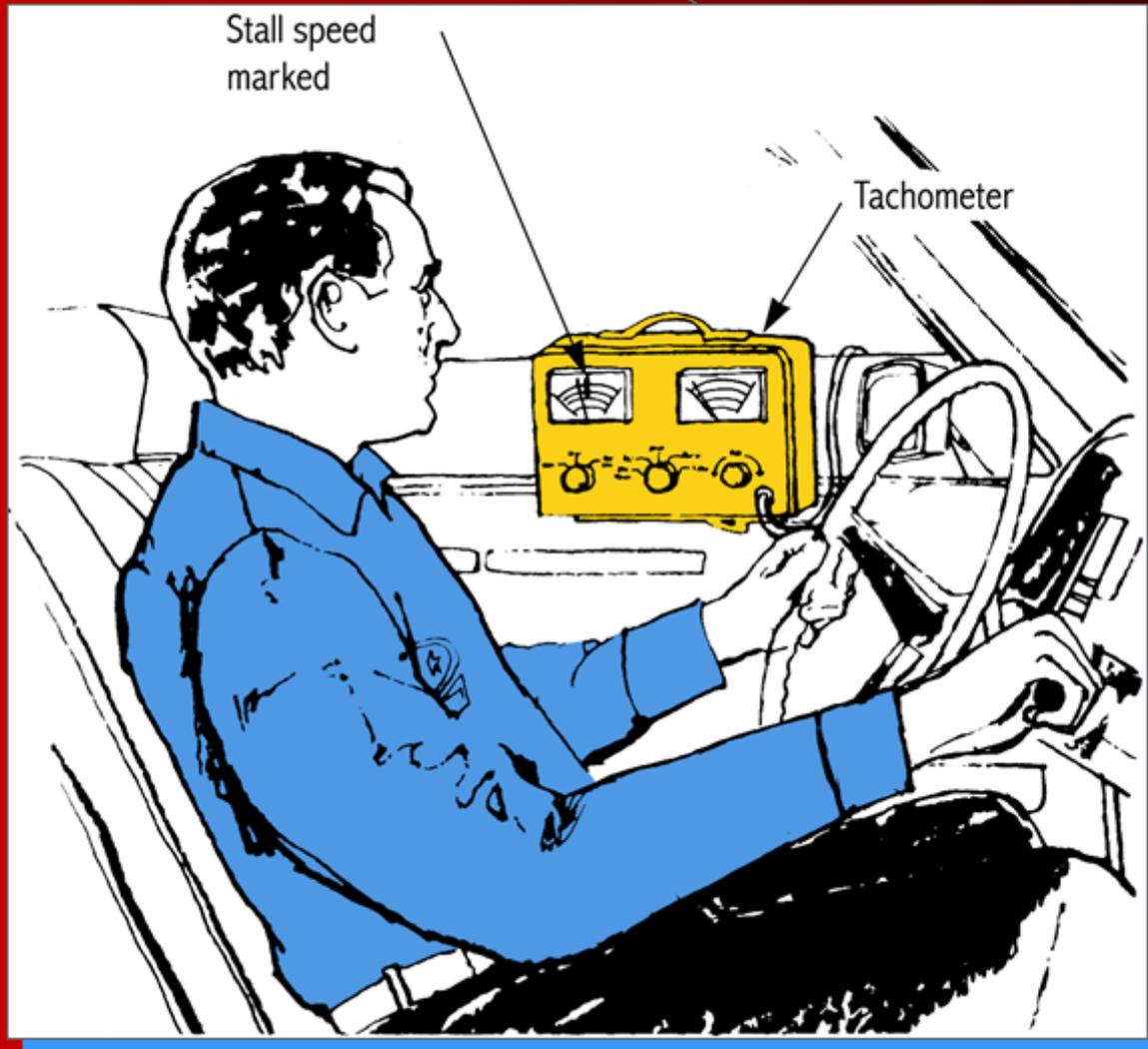


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3. A Stall Test can be used to detect transmission slippage or a malfunctioning torque converter.
4. An Air Test can be used to further isolate problems in automatic transmission circuits.



Performing a Stall Test

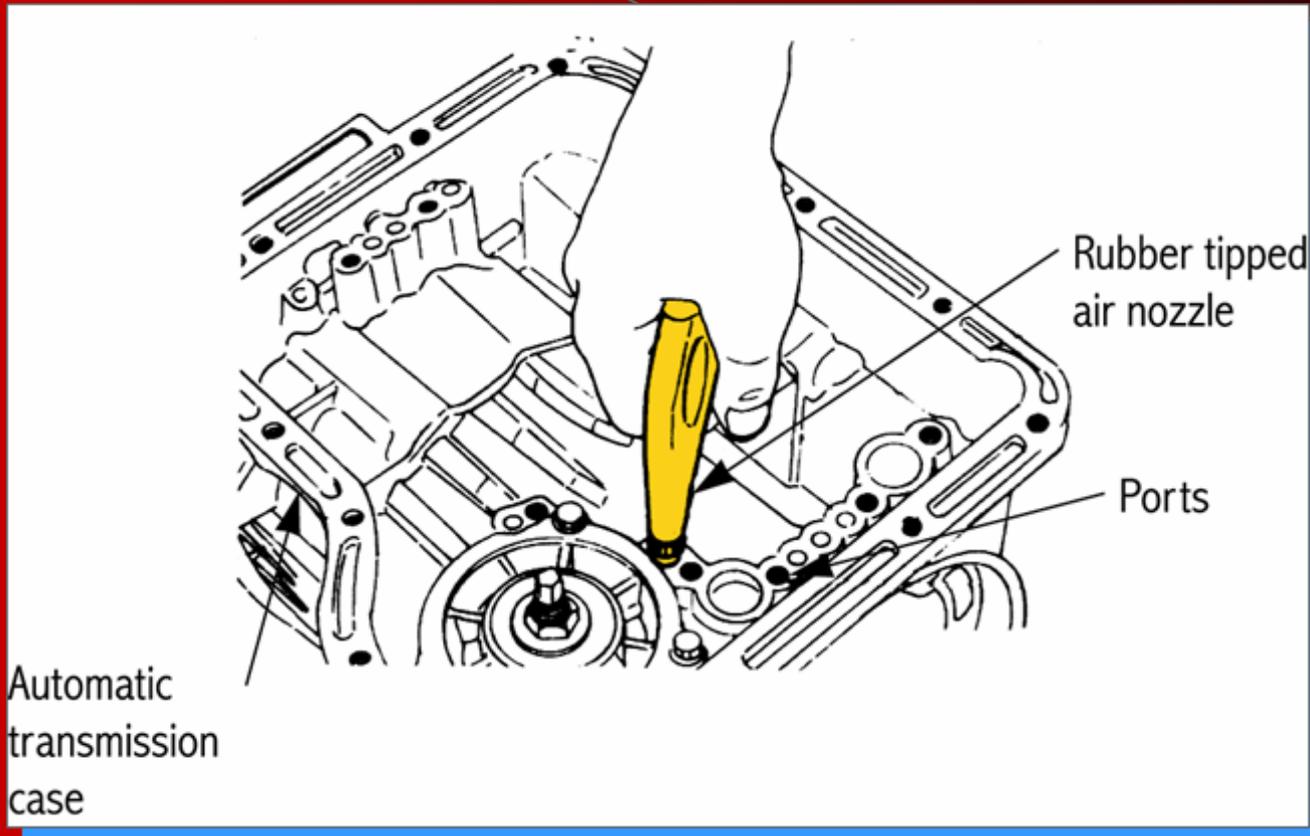


Stall Test Results

- Engine speed should level out at a specified rpm
- Repeat briefly in each gear position
- Engine speed too high
 - transmission is slipping
- Engine speed too low
 - torque converter or engine performance problem



Performing an Air Test



Only use regulated air pressure.

A dull thud should be heard.

Hissing sound indicates a leak



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5. Hydraulic Circuit Diagrams show how the oil passages inside an automatic transmission are connected to each other.
6. A Vacuum Test is used to check the operation of the vacuum modulator valve.

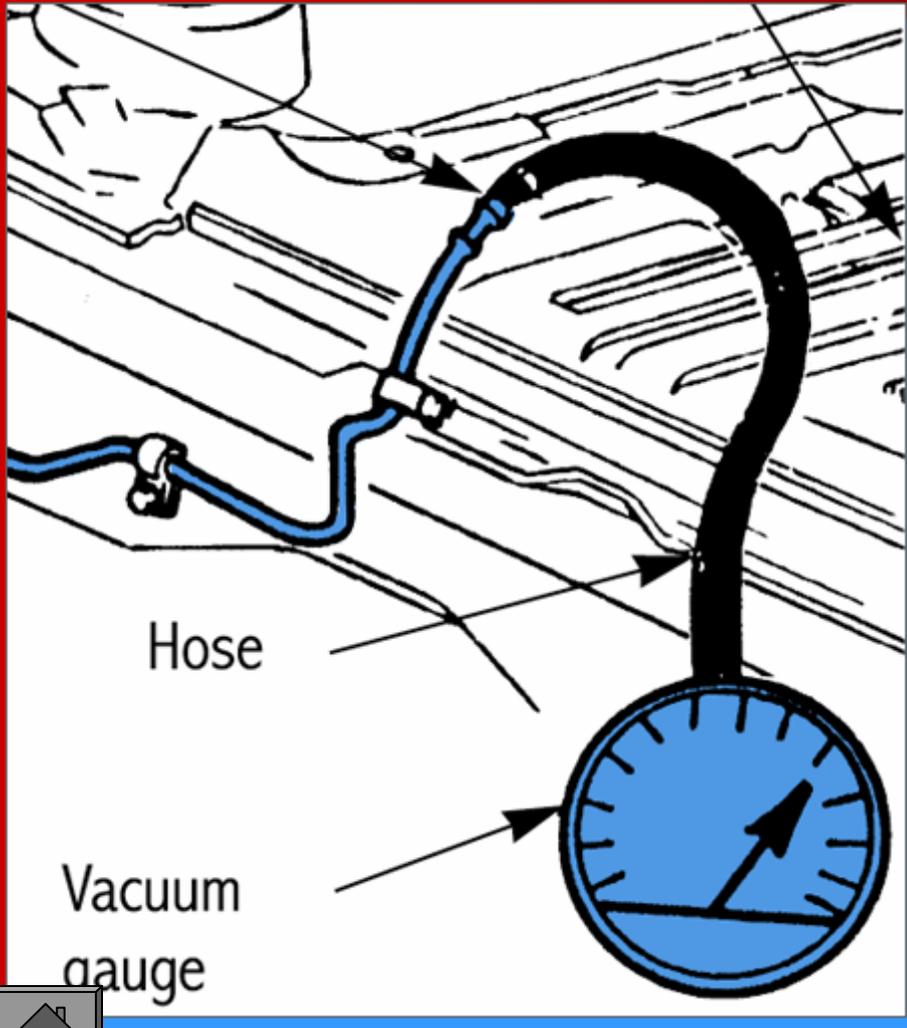


Vacuum Test

- Measures vacuum reaching the valve
- To test:
 - connect a vacuum gauge to the modulator line with a T-fitting
 - with engine idling, reading should match manifold vacuum (high and steady)
- If reading is low, a vacuum leak may be present, the line may be blocked, or the modulator diaphragm may be ruptured



Vacuum Test



Connect a vacuum gauge to the modulator line with a T-fitting; with engine idling, reading should match manifold vacuum (high and steady)

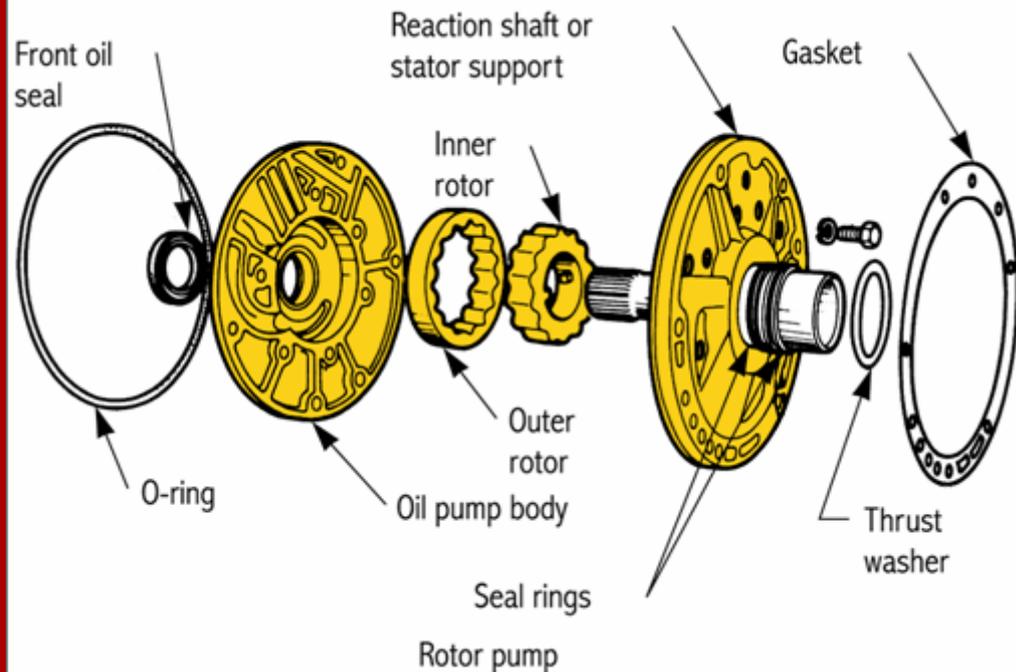
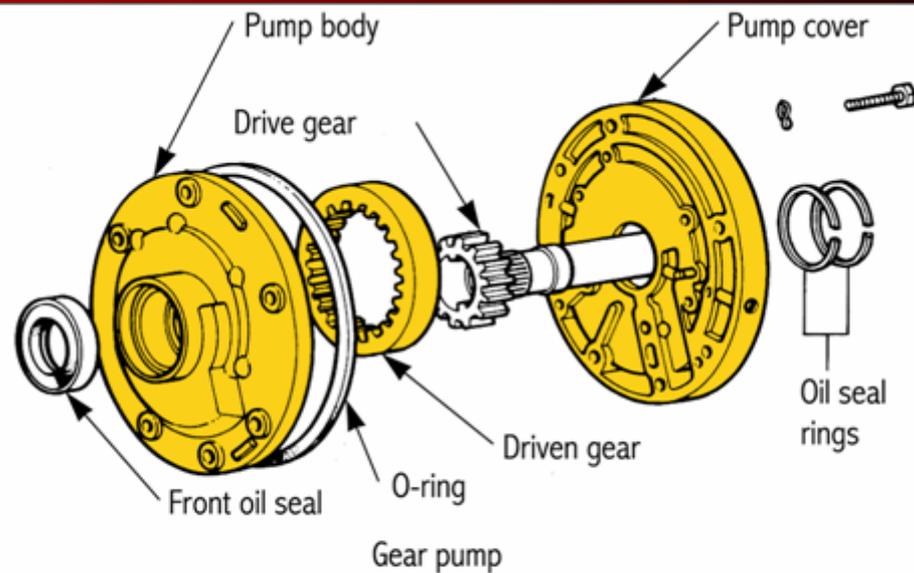


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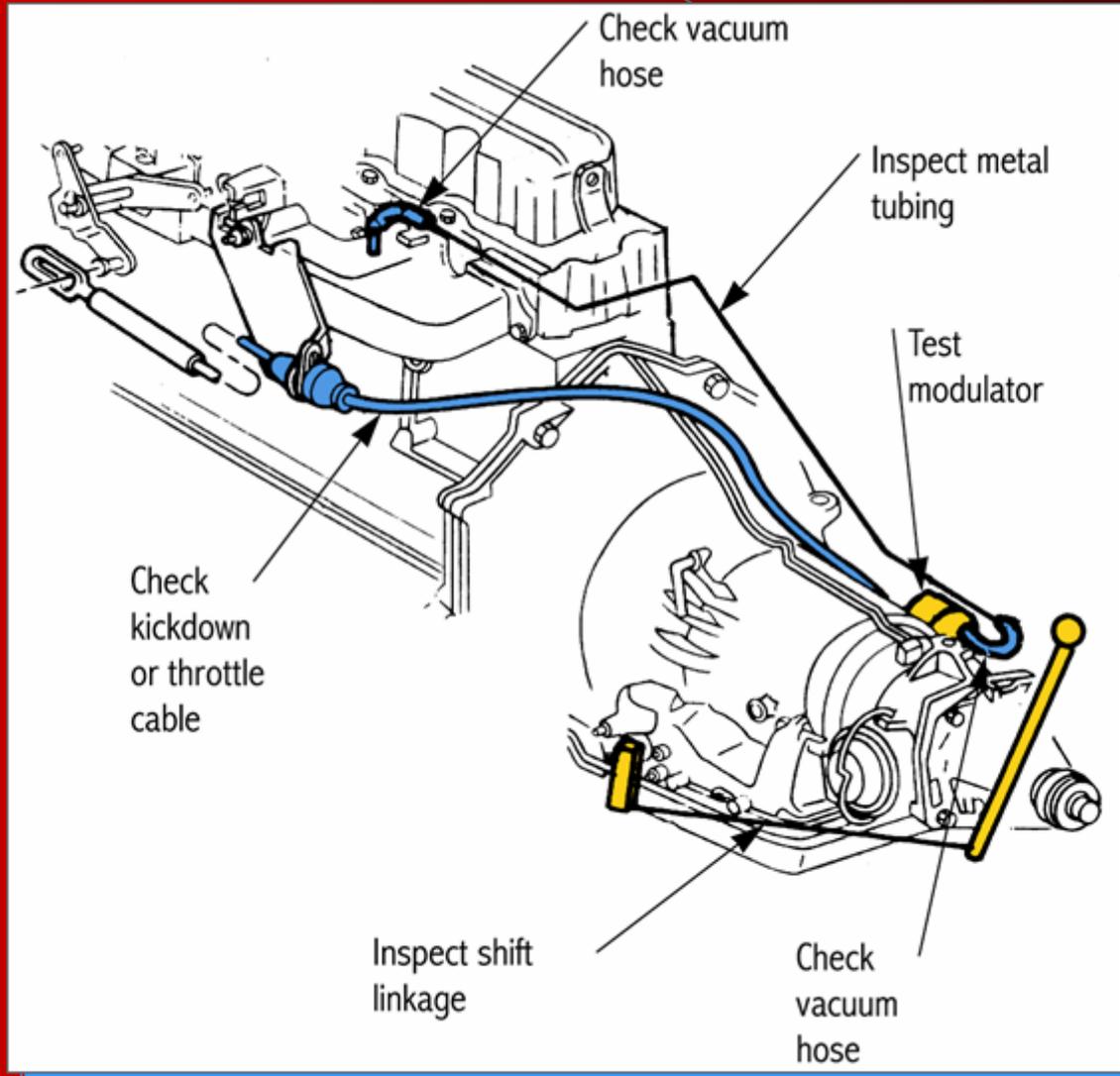
7. Low Fluid Level may cause the oil pump to pump air.
8. Automatic Transmission Slippage is frequently caused by misadjusted linkage, worn clutches or bands, or valve body problems.



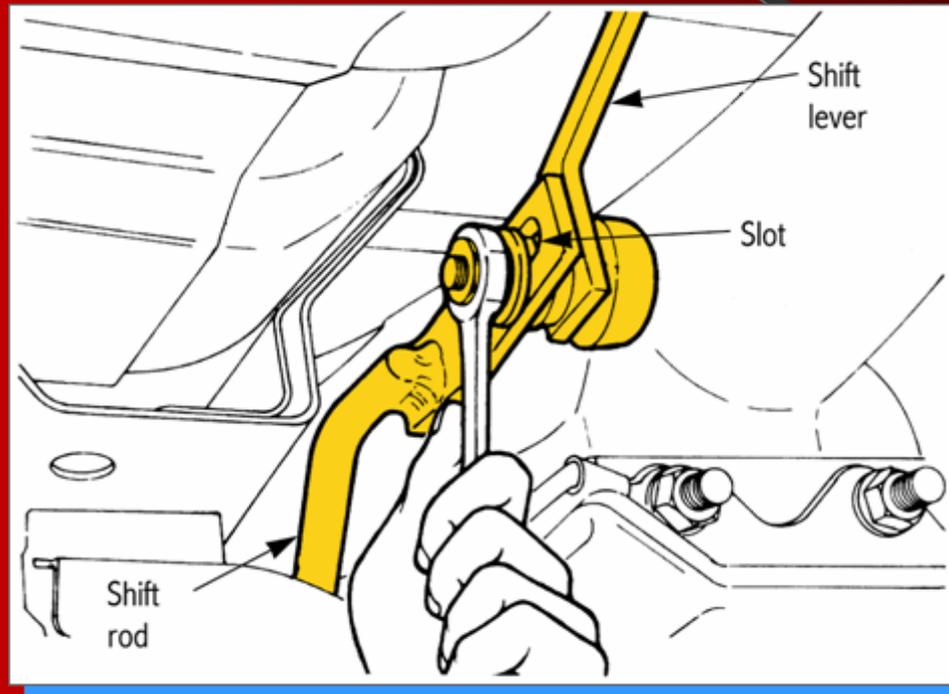
Oil Pumps



Check Linkages, Cables, and Lines



Shift Linkage Adjustment



Position the shifter and the lever on the transmission in the same gear



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9. Pressure Tests are used to determine whether oil pressures in the various transmission circuits are normal.
10. Incorrect Shift Pints can be caused by a faulty vacuum modulator circuit, engine performance problem, damaged governor, or trouble with hydraulic valves, servos, or pistons.

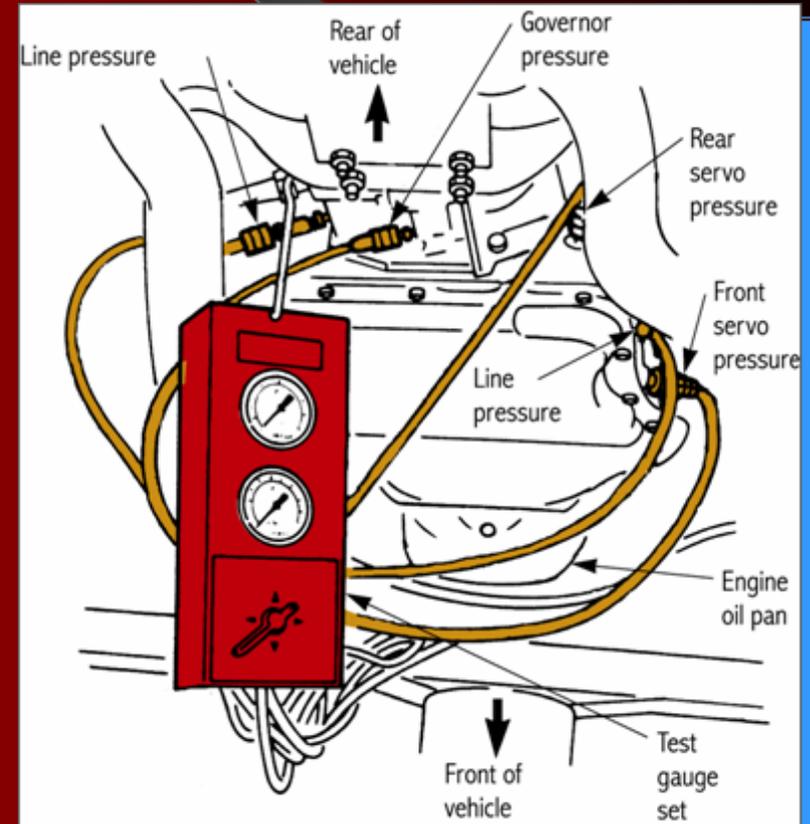
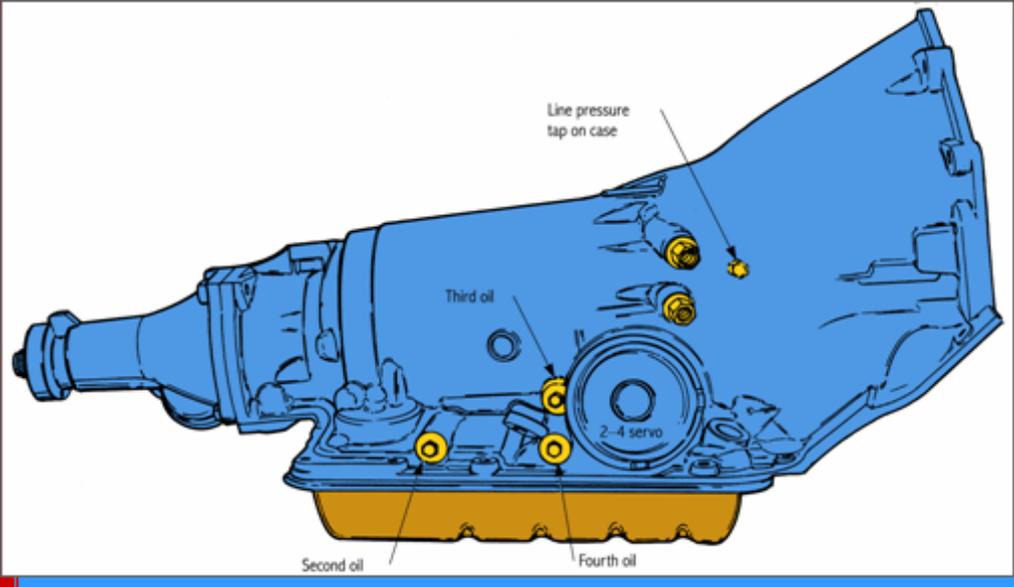


Pressure Tests

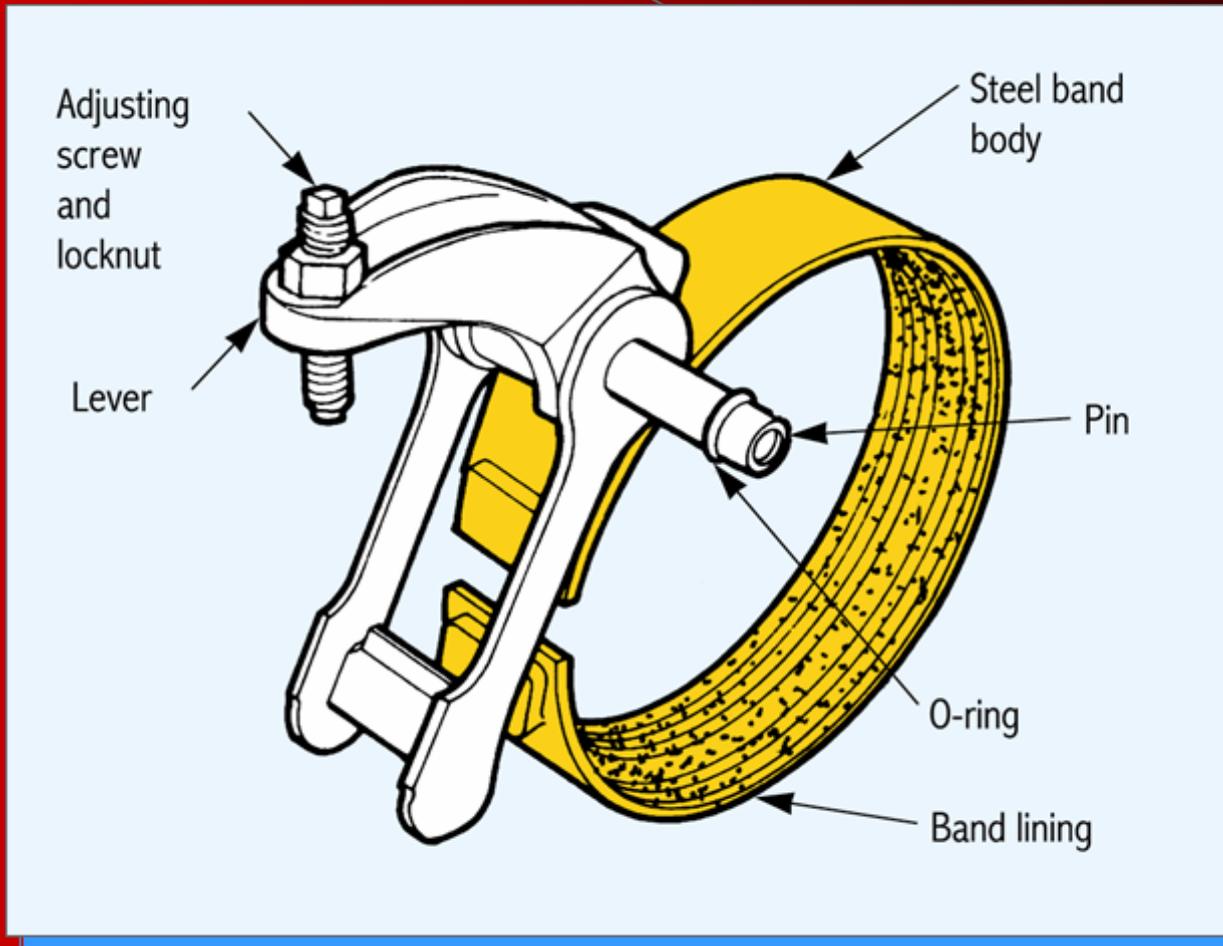
- To test:
 - connect a 300 psi (2000 kpa) gauge to the line pressure port
 - run engine to operating temperature
 - while applying the brakes, shift through all the gears while noting the pressures
 - compare the readings to specs



Pressure Test Setup



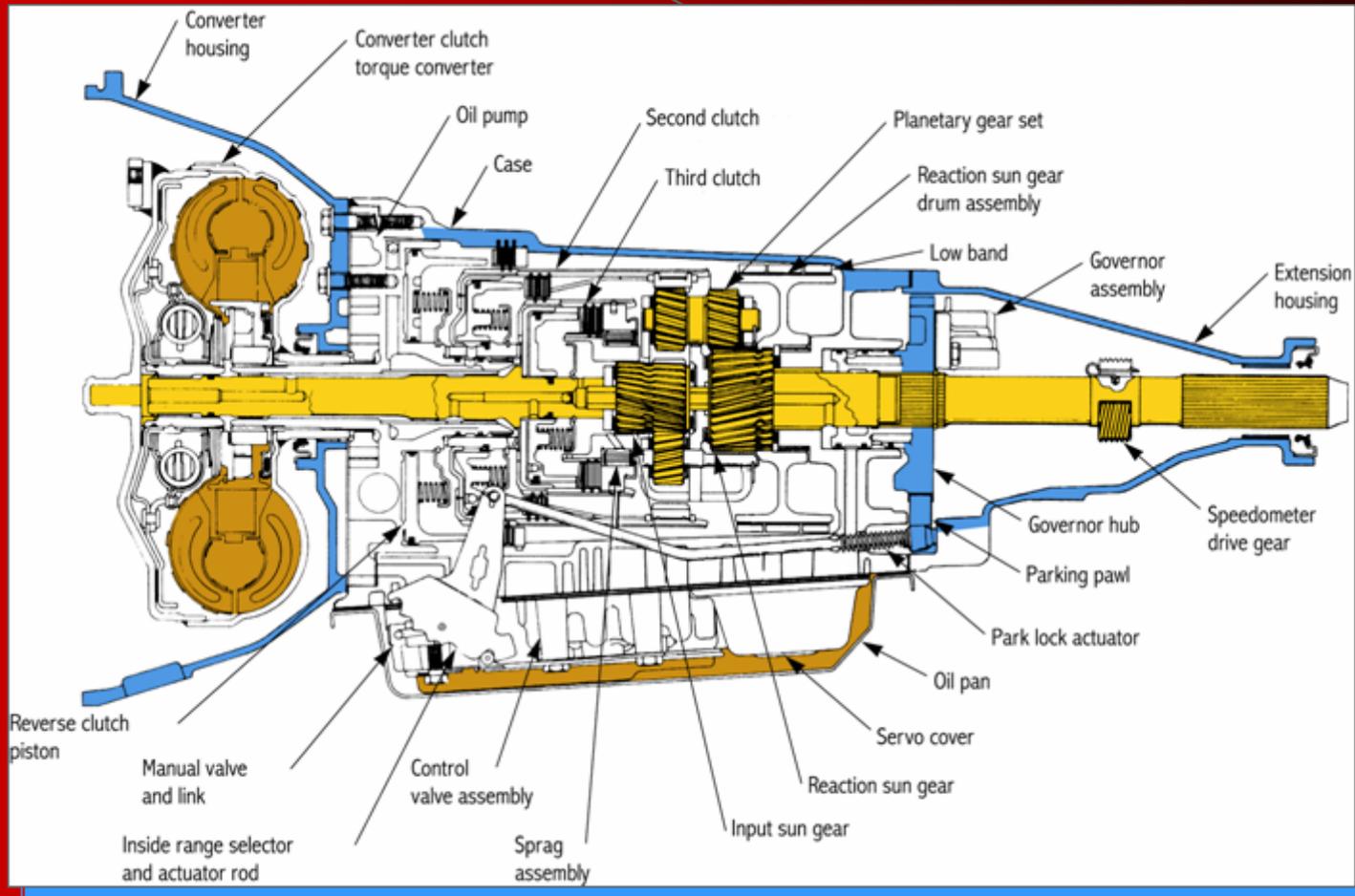
Band



One end is anchored to the case



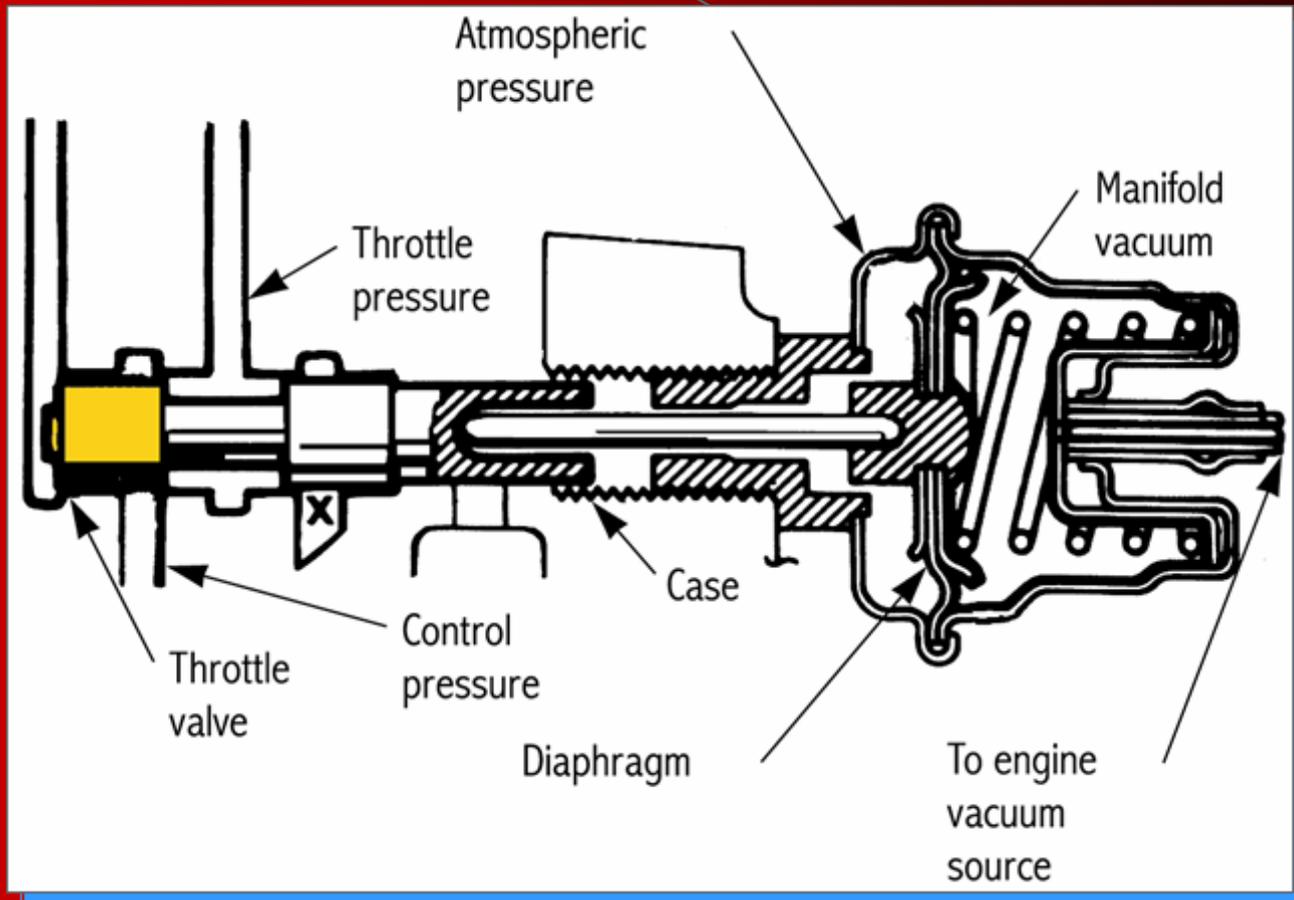
Transmission Rebuild



When rebuilding, refer to service manual procedures and diagrams



Vacuum Modulator Valve



Under high load, valve delays up shifts



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