Diagnosing Hydraulic Problems

1

Problems

A pressure test is a key check when you need to determine if a problem is caused by something that is inside or outside of the transmission.

Low automatic transmission pressures can cause excess slipping or clutch or band failure. Excess pressure can cause harsh shift, high fluid temperatures, and excess leaking. Either of these require that the oil pan, valve body, or transmission be removed for inspection and repair.

2

Specifications

Line pressure is normally effected by throttle position and the gear range. Governor pressure is effected by speed.

Engine Speed, 1,000 rpm	
Line Pressure, idle:	54-60 psi
Line Pressure, WOT:	90-96 psi
Line Pressure, Rev:	145-175 psi
Governor, idle, 0 mph:	0-1.5 psi
Governor, 10 mph:	10 psi

Pressure that are lower than specifications are usually caused by leaking seals or a worn oil pump. Higher than normal pressures are usually caused by a faulty pressure regulator.

3

Spec., Solenoid Control

These specifications for an electronic transmission require that the current to the Pressure Control Solenoid be measured.

PCS Current	Pressure
1.1 amp	65-80 psi
0.9 amp	82-130 psi
0.7 amp	145-222 psi
0.5 amp	190-276 psi
0.3 amp	225-300 psi
0 amp	243-210 psi

Pressure is controlled by the transmission control module and the PCS. Improper pressure might be a mechanical or electrical fault. Line pressure should change between some gear ranges, Drive and Reverse for example.

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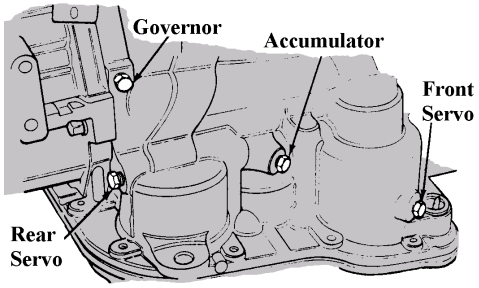
Test Port(s)



Some transmissions have one test port, usually for line pressure. Four test ports are shown for this transmission. These plugs can be removed so a pressure gauge can be attached to the port.

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Mechanical Pressure Gauges

This gauge set has a 0-100 psi gauge and a set of adaptors to connect to different pressure ports. It can be used to read pressures up to 100 psi, but it will be damaged if the transmission is shifted into reverse with higher pressure.

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Gauge Sets

This set contains a group of adapters, a 0-100 psi and a 0-400 psi gauge. The 0-400 gauge is used to measure pressures higher than 100 psi. The 0-100 psi gauge gives more accurate readings for the lower pressures.

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Electronic Pressure Gauge

The transducer of this digital/ electronic gauge set is threaded into the pressure port, and the cable connects it to the gauge/ analyzer unit. As many as four transducers and cables can be connected at the same time to accurately measures from 0 to 5000 psi. Electric cables are a safer means than hydraulic hoses to transmit pressure signals.

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Preliminary Checks

To make sure that your tests will be accurate, You should:

1. Verify the fluid is in good condition with the correct level.

2. Gearshift linkage is correct.

3. Electrical connections to the transmission/ transaxle are clean and secure.

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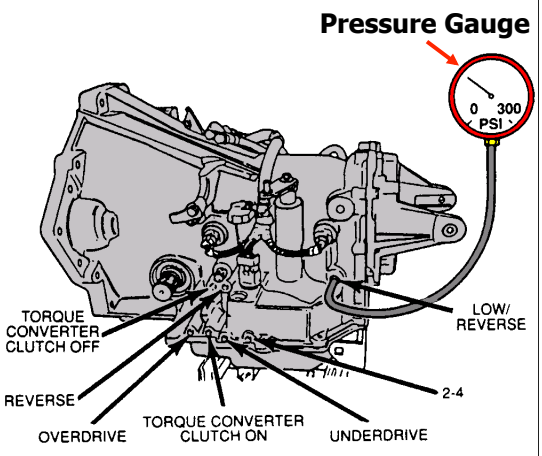
Pressure Check

A 0-300 psi gauge is connected to the Low/ Reverse test port, and the vehicle is operated as required to measure the pressure.



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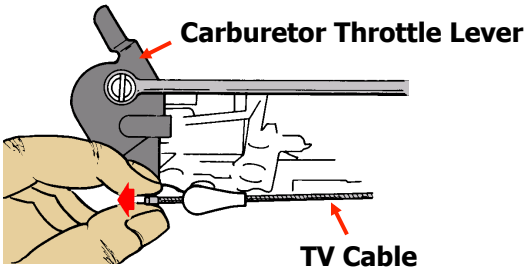
TV Pressure



With the engine operating at the specified speed, the throttle cable can be pulled to the left so the TV valve will move to a wide open throttle position. Line pressure should increase as you pull the TV cable. Some throttle links need to be disconnected from the throttle lever to make this check.

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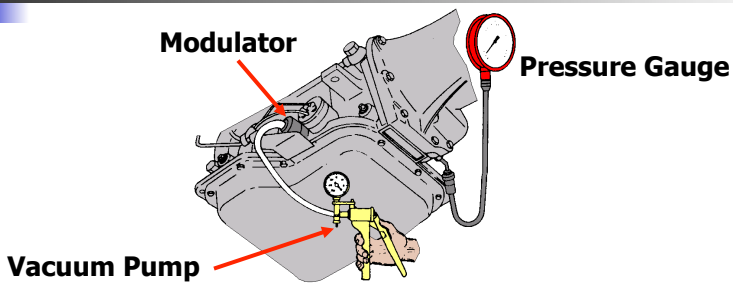
Vacuum Modulator Check



Connecting a hand vacuum pump to the modulator lets you control the modulator vacuum. 18-22 in. of vacuum is the same as idle speed vacuum. 0 vacuum is the same as WOT. Line pressure should increase as the vacuum signal is reduced.

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Governor Pressure

If there is a governor pressure port, governor pressure should increase about 1 psi for every speed increase of 1 mph. With some transmissions, line pressure should decrease as governor pressure increases. Governor pressure is checked with the vehicle lifted and the drive wheels rotating or with the vehicle on a road test.

Caution: Make sure the gauge hose is routed away from exhaust pipes or manifolds and all moving parts. A ruptured hose spilling ATF on an exhaust pipe can cause a fire.

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Electronic Transmissions

Many technicians connect a scan tool to the vehicle during a pressure test. The scan tool can let you:

1. Watch what information the transmission control module, TCM, is receiving and what commands it is sending to the transmission during the test.

2. Change line pressure by changing the electronic pressure control, EPC, command.

3. Determine if any diagnostic trouble codes, DTCs, are set due to hydraulic, electrical, or mechanical malfunctions during the tests.

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