HYDRAULIC PRESSURE TEST

Hydraulic test pressures range from a low of one psi (6.895 kPa) governor pressure, to 300 psi (2068 kPa) at the rear servo pressure port in reverse.

An accurate tachometer and pressure test gauges are required. Oil Pressure Gauge C-3292A has a 100 psi range and is used at the accumulator, governor, and front servo ports. Oil Pressure Gauge C-3293-SP has a 300 psi range and is used at the rear servo and overdrive ports where pressures exceed 100 psi.

Pressure Test Port Locations

Test ports are located at both sides of the transmission case.

Line pressure is checked at the accumulator port (3) on the right side of the case. The front servo pressure port (4) is at the right side of the case just behind the filler tube opening.

The rear servo (1) and governor pressure (2) ports are at the right rear of the transmission case. The overdrive clutch pressure port (5) is at the left rear of the case.

Test One - Transmission In Manual Low

This test checks pump output, pressure regulation, and condition of the rear clutch and servo circuit. Both test gauges are required for this test.

1. Connect tachometer to engine. Position tachometer so it can be observed from driver seat if helper will be operating engine. Raise vehicle on hoist that will allow rear wheels to rotate freely.
2. Connect 100 psi Oil Pressure Gauge C-3292A to accumulator port. Then connect 300 psi Oil Pressure Gauge C-3293-SP to rear servo port.

3. Disconnect throttle and gearshift cables from levers on transmission valve body manual shaft.

4. Have helper start and run engine at 1000 rpm.

5. Move transmission shift lever fully forward into 1 range.

6. Gradually move transmission throttle lever from full forward to full rearward position and note pressures on both gauges:
   • Line pressure at accumulator port should be 54-60 psi (372-414 kPa) with throttle lever forward and gradually increase to 90-96 psi (621-662 kPa) as throttle lever is moved rearward.
   • Rear servo pressure should be same as line pressure within 3 psi (20.68 kPa).

**Test Two - Transmission In 2 Range**

This test checks pump output, line pressure and pressure regulation. Use 100 psi Oil Pressure Gauge C-3292A for this test.

1. Leave vehicle in place on hoist and leave Oil Pressure Gauge C-3292A connected to accumulator port.

2. Have helper start and run engine at 1000 rpm.

3. Move transmission shift lever one detent rearward from full forward position. This is 2 range.

4. Move transmission throttle lever from full forward to full rearward position and read pressure on gauge.

5. Line pressure should be 54-60 psi (372-414 kPa) with throttle lever forward and gradually increase to 90-96 psi (621-662 kPa) as lever is moved rearward.

**Test Three - Transmission In D Range Third Gear**

This test checks pressure regulation and condition of the clutch circuits. Both test gauges are required for this test.

1. Turn OD switch off.

2. Leave vehicle on hoist and leave Oil Pressure Gauge C-3292A in place at accumulator port.

3. Move Oil Pressure Gauge C-3293-SP over to front servo port for this test.

4. Have helper start and run engine at 1600 rpm for this test.

5. Move transmission shift lever two detents rearward from full forward position. This is D range.

6. Read pressures on both gauges as transmission throttle lever is gradually moved from full forward to full rearward position:
   • Line pressure at accumulator in D range third gear, should be 54-60 psi (372-414 kPa) with throttle lever forward and increase as lever is moved rearward.
   • Front servo pressure in D range third gear, should be within 3 psi (21 kPa) of line pressure up to kickdown point.

**Test Four - Transmission In Reverse**
This test checks pump output, pressure regulation and the front clutch and rear servo circuits. Use 300 psi Oil Pressure Gauge **C-3293-SP** for this test.

1. Leave vehicle on hoist and leave Oil Pressure Gauge **C-3292A** in place at accumulator port.

2. Move 300 psi Oil Pressure Gauge **C-3293-SP** back to rear servo port.

3. Have helper start and run engine at 1600 rpm for test.

4. Move transmission shift lever four detents rearward from full forward position. This is Reverse range.

5. Move transmission throttle lever fully forward then fully rearward and note reading at Oil Pressure Gauge **C-3293-SP**.

6. Pressure should be 145 - 175 psi (1000-1207 kPa) with throttle lever forward and increase to 230 - 280 psi (1586-1931 kPa) as lever is gradually moved rearward.

**Test Five - Governor Pressure**

This test checks governor operation by measuring governor pressure response to changes in vehicle speed. It is usually not necessary to check governor operation unless shift speeds are incorrect or if the transmission will not downshift. The test should be performed on the road or on a hoist that will allow the rear wheels to rotate freely.

1. Move 100 psi Oil Pressure Gauge **C-3292A** to governor pressure port.

2. Move transmission shift lever two detents rearward from full forward position. This is D range.

3. Have helper start and run engine at curb idle speed. Then firmly apply service brakes so wheels will not rotate.

4. Note governor pressure:
   - Governor pressure should be no more than 20.6 kPa (3 psi) at curb idle speed and wheels not rotating.
   - If pressure exceeds 20.6 kPa (3 psi), a fault exists in governor pressure control system.

5. Release brakes, slowly increase engine speed, and observe speedometer and pressure test gauge (do not exceed 30 mph on speedometer). Governor pressure should increase in proportion to vehicle speed. Or approximately 6.89 kPa (1 psi) for every 1 mph.

6. Governor pressure rise should be smooth and drop back to no more than 20.6 kPa (3 psi), after engine returns to curb idle and brakes are applied to prevent wheels from rotating.

7. Compare results of pressure test with analysis chart.

**Test Six - Transmission In Overdrive Fourth Gear**

This test checks line pressure at the overdrive clutch in fourth gear range. Use 300 psi Oil Pressure Gauge **C-3293-SP** for this test. The test should be performed on the road or on a chassis dyno.

1. Remove tachometer; it is not needed for this test.

2. Move 300 psi Oil Pressure Gauge to overdrive clutch pressure test port. Then remove other gauge and reinstall test port plug.

3. Lower vehicle.

4. Turn OD switch on.
5. Secure test gauge so it can be viewed from driver’s seat.

6. Start engine and shift into D range.

7. Increase vehicle speed gradually until 3-4 shift occurs and note gauge pressure.

8. Pressure should be 524-565 kPa (76-82 psi) with closed throttle and increase to 690-896 kPa (100-130 psi) at 1/2 to 3/4 throttle. Note that pressure can increase to around 965 kPa (140 psi) at full throttle.

9. Return to shop or move vehicle off chassis dyno.

**PRESSURE TEST ANALYSIS CHART**

<table>
<thead>
<tr>
<th>TEST CONDITION</th>
<th>INDICATION</th>
</tr>
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<tbody>
<tr>
<td>Line pressure OK during any one test</td>
<td>Pump and regulator valve OK</td>
</tr>
<tr>
<td>Line pressure OK in R but low in D, 2, 1</td>
<td>Leakage in rear clutch area (seal rings, clutch seals)</td>
</tr>
<tr>
<td>Pressure low in D Fourth Gear Range</td>
<td>Overdrive clutch piston seal, or check ball problem</td>
</tr>
<tr>
<td>Pressure OK in 1, 2 but low in D3 and R</td>
<td>Leakage in front clutch area</td>
</tr>
<tr>
<td>Pressure OK in 2 but low in R and 1</td>
<td>Leakage in rear servo</td>
</tr>
<tr>
<td>Front servo pressure in 2</td>
<td>Leakage in servo; broken servo ring or cracked servo piston</td>
</tr>
<tr>
<td>Pressure low in all positions</td>
<td>Clogged filter, stuck regulator valve, worn or faulty pump, low oil level</td>
</tr>
<tr>
<td>Governor pressure too high at idle speed</td>
<td>Governor pressure solenoid valve system fault. Refer to diagnostic book.</td>
</tr>
<tr>
<td>Governor pressure low at all mph figures</td>
<td>Faulty governor pressure solenoid, transmission control module, or governor pressure sensor</td>
</tr>
<tr>
<td>Lubrication pressure low at all throttle positions</td>
<td>Clogged fluid cooler or lines, seal rings leaking, worn pump bushings, pump, clutch retainer, or clogged filter.</td>
</tr>
<tr>
<td>Line pressure high</td>
<td>Output shaft plugged, sticky regulator valve</td>
</tr>
<tr>
<td>Line pressure low</td>
<td>Sticky regulator valve, clogged filter, worn pump</td>
</tr>
</tbody>
</table>