

Getting to Know the 42-48RE Series Transmissions part 1



by Dave Skora

The 42-48RE series transmission that appears in 1996-up RWD Dodge trucks is unique in that it's basically a hydraulically-controlled transmission; at least for the first three gears. It still uses governor pressure to move the shift valves, just like the old Torqueflite transmissions that came before it. Only 4th gear is electronically controlled.

What makes it unique is that it doesn't have a mechanical governor. Instead, it uses a solenoid to control governor pressure.

What does this mean to you? It means that, whenever you have a shifting problem through the first three gear ranges, your first test is to connect a gauge and check governor pressure (figure 1). Governor pressure should be about zero PSI at a stop, and rise almost equal to vehicle speed.

If governor pressure is working properly, forget about the computer controls: They're working fine. The shift problem is in the transmission. Check it out the same way you did the old Torqueflite transmissions. It's almost identical to them, in every way.

But if governor pressure isn't right,

well, then you probably have a computer system problem. So let's look at the governor pressure control system and see how it works on these transmissions.

Overview of the Governor System

The electronic governor system consists of these four main components:

1. Output Speed Sensor (OSS) (figure 2) — provides the computer with a signal that it uses to determine road speed. If the computer doesn't receive an OSS signal, the computer won't open the governor solenoid, keeping governor pressure at zero PSI.
2. Governor solenoid (figure 3) — controls governor pressure to the shift valves. The computer controls governor position by sending a duty cycled signal to the solenoid. The higher the duty cycle, the lower governor pressure will be. When the governor solenoid is turned off, governor

pressure will go to max which is equal to line pressure.

3. Governor pressure transducer (figure 3) — provides a governor pressure feedback signal to the computer. The computer uses the transducer signal to monitor and adjust governor pressure.
4. Computer — provides a duty cycled signal to the governor solenoid to control governor pressure.

The computer monitors the output speed sensor to determine vehicle road speed. As the vehicle speed increases, the computer adjusts the signal to the governor solenoid, to increase governor pressure. The governor pressure transducer provides the computer with a pressure signal, to allow the computer to monitor and adjust pressure, based on vehicle speed.

At about 40 MPH, the computer shuts the governor solenoid off: At this speed, the first two shifts should have been completed, so governor pressure is only there to keep the shift valves shifted. Turning the solenoid off applies mainline pressure to the shift valves, so they remain shifted.

Now let's take a closer look at the individual components, and see how each one works.

Output Speed Sensor (OSS)

The output speed sensor is mounted to the rear of the transmission. It's an AC generating sensor: A toothed wheel mounts to the output shaft, and rotates past the output speed sensor.

The output speed sensor has two wires to it. To check the output speed sensor signal, connect your meter to the two leads, one lead to each wire. As the teeth pass the sensor, it creates an

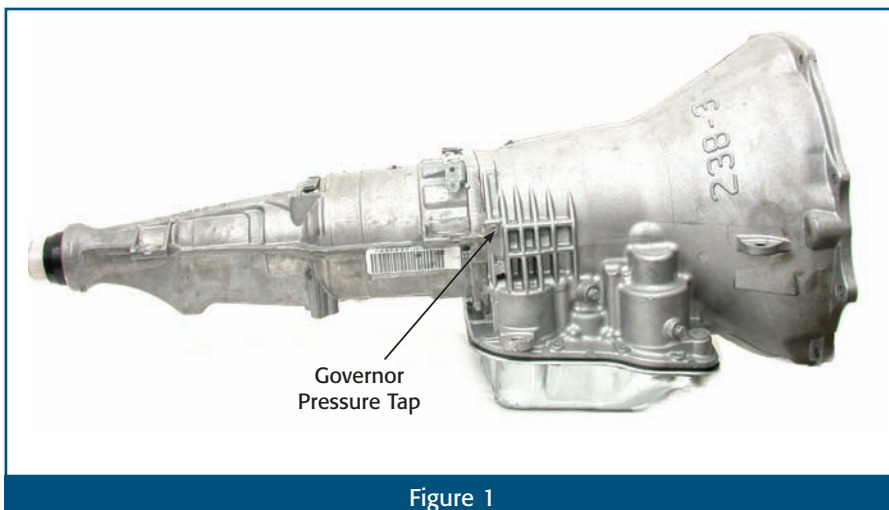


Figure 1

Quality. Warranty. Value. Equals peace of mind.

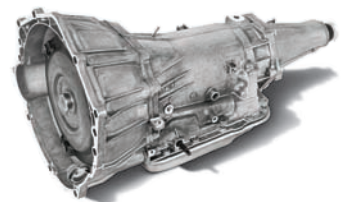
GM Transmissions: With the strength of GM squarely behind you.

- New toll-free Powertrain Contact Center for all your questions
- New 3-year/100,000-mile nationwide limited warranty* (parts & labor)

GM remanufactured transmissions feature OE quality that incorporates all the latest engineering updates. Built specifically for each GM vehicle with Plug-n-Play design for low hoist time. Typically available the same or next day. Contact your GM dealer or call: **866-453-4123**.

Goodwrench.com

*36 months or 100,000 miles, whichever comes first. ©2006 GM Corp. All rights reserved.



GM Parts

AC signal that varies with output shaft speed.

Governor Pressure Solenoid

The governor pressure solenoid creates and adjusts governor pressure from mainline oil. When de-energized, the solenoid channels full mainline pressure to the governor circuit. As the computer increases duty cycle to the solenoid, the solenoid exhausts mainline pressure away from the governor circuit. When the duty cycle approaches its limit, governor pressure should drop to about zero PSI.

The governor pressure solenoid is a low-resistance solenoid; it has about 3.8-4.0 ohms resistance at 70°F. The computer controls the solenoid operation by sending a duty cycled signal to the solenoid.

Governor Pressure Transducer

The governor pressure transducer is actually two sensors in one; the transducer itself, and a transmission oil temperature sensor (figure 4). The temperature sensor is a pull-down thermistor: It receives a 5-volt signal, which grounds through the sensor.

The transducer is a potentiometer; that is, it's a three-wire sensor. The wires are:

- 5-volt reference
- ground
- sensor signal

As governor pressure changes, the transducer voltage signal varies with it. At zero PSI governor pressure, the transducer voltage signal will be about 0.60 volts. When governor pressure is high — maximum pressure is 100 PSI — signal voltage will be high; about 4.8 to 4.9 volts.

IMPORTANT: If governor pressure exceeds 100 PSI, the transducer signal will rise above limits. This will set a trouble code indicating the sensor is shorted.

Closed Loop Feedback System

The governor pressure control system on the 42-48RE transmissions is a closed loop feedback system; a system of sense and adjust. Here's what

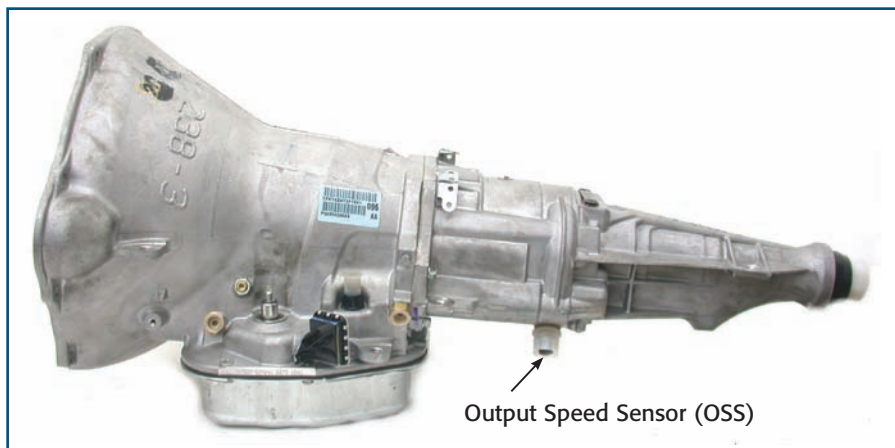


Figure 2

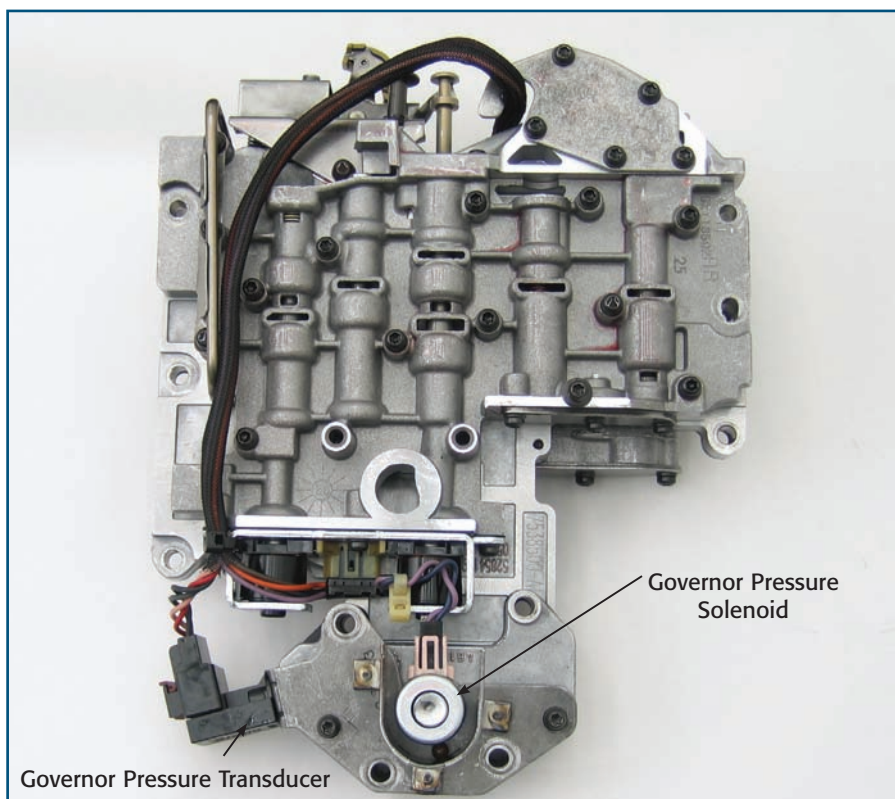


Figure 3

that means:

The computer determines what governor pressure should be, based on vehicle speed. At, say, 25 MPH, the computer knows that governor pressure should be right around 25 PSI. The computer then sends a signal to the governor solenoid, to adjust governor pressure to 25 PSI.

The computer watches the signal from the governor transducer, to monitor governor pressure. If pressure is right, based on vehicle speed, the computer continues to maintain its present signal to the solenoid. But if governor

pressure varies from the intended levels, the computer adjusts its signal to compensate. Once governor pressure is where it belongs, the computer continues to maintain those pressures.

This continuous sense and adjust from a closed loop system is a valuable tool for diagnosing the system operation. What it means to you is that the desired pressure from the computer control signal and the actual pressure from the transducer should equal the pressure that you measure using a pressure gauge. That creates three possible conditions:



Chrysler A-604/A-606

Low-Reverse Piston Retainer Reinforcement Plate

US Patent No. D373 370 5619888

Problem: The retainer tends to distort in the area around the feed hole.

Solution:

Our US patented Low-Reverse Piston Retainer Reinforcement Plate will eliminate the following worries:

- Coasting 2-1 downshift clunks or chatters
- Delayed forward and reverse engagements
- Chatter or slipping in first gear and reverse gears
- False code 24: Low/Reverse Pressure Switch
- Repeat Fail-Safe Mode

By adding this reinforcement plate you are increasing the clamping force of the retainer to gasket and case, thus eliminating leakage in this area.

Toledo Trans-Kit™ Low-Reverse Piston Retainer Reinforcement Plate is available in the following kits:

Cork & Rubber
FarPak™
Ultracork™

Overhaul Kits
8095
8095F
8095U

Banner Kits
8095B
8095FB
8095UB

Master Kits
8095M
8095FM
8095UM

Super Kit
8095S

For a complete listing of Toledo Trans-Kit™ automatic transmission repair kits and components, contact your nearest distributor today.



Seal Aftermarket Products

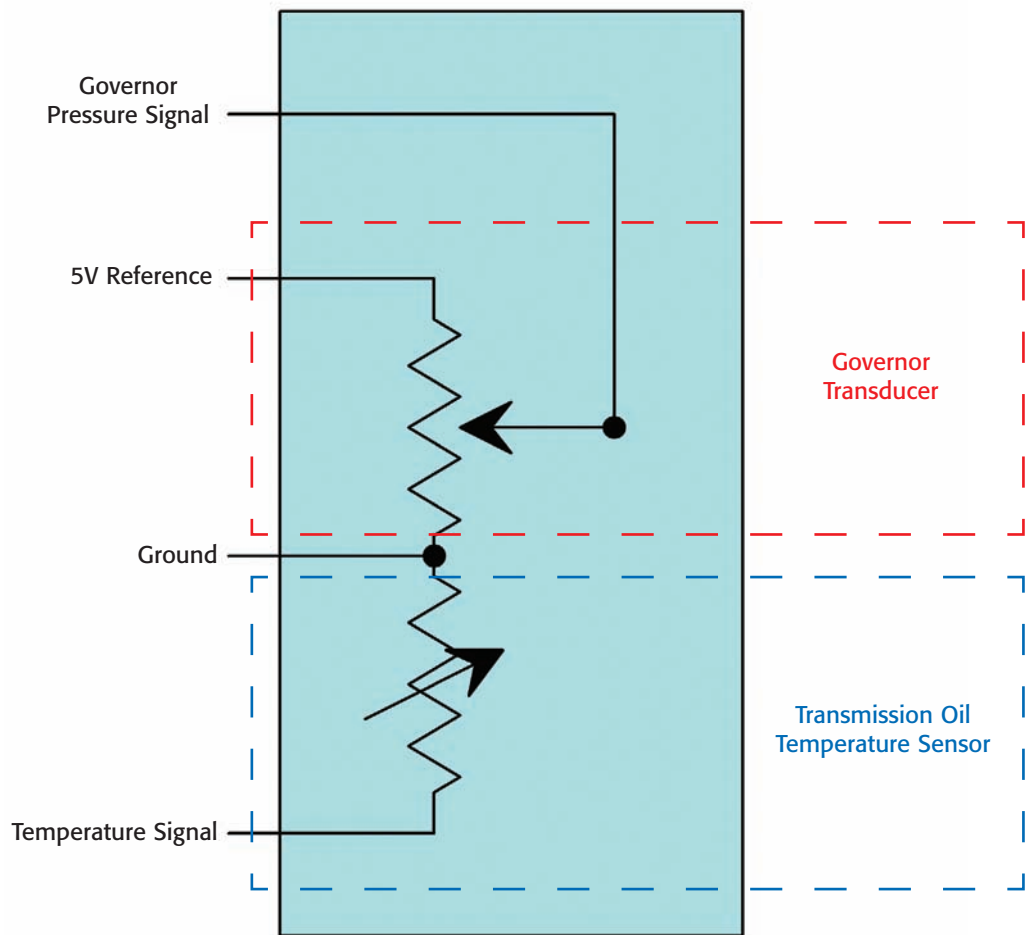


Figure 4

1. Desired = Actual = Gauge: The governor pressure control system is working properly. If the pressure isn't right for vehicle speed, look for a problem with the speed signal to the computer, or possibly a problem in computer itself.
2. Desired = Actual but doesn't match Gauge: The governor pressure control system is working properly, but the transducer is out of specs. Check the power and ground to the transducer; if they're okay, replace the transducer. For example, if desired and actual read zero on the scan tool but the governor gauge reads 20 psi, the transducer or transducer wiring is bad.
3. Actual and Gauge don't match Desired: The governor pressure control system isn't working

properly. Either the computer isn't receiving the signal from the transducer, or the solenoid isn't able to control pressure enough. Look for:

- a fluid leak allowing additional pressure into the governor circuit.
- a blockage in the governor pressure circuit.
- a faulty governor solenoid.

You can use your scan tool to compare the readings between the desired pressure and actual pressure, and compare them to the pressure as measured using a gauge connected to the governor pressure port.

Check the Codes

There are five diagnostic trouble codes associated with problems in the governor pressure system, and three others associated with 4th gear and lock

up operation. If any of these codes set, the computer will go into failsafe operation; that shuts the governor solenoid off, raising governor pressure to maximum. In failsafe, the transmission will start and operate in 3rd gear.

So, if the vehicle you're working on is starting in 3rd gear, you can assume the system's in failsafe. Your first step in the diagnostic process should be to check the codes. They'll usually point you in the right direction for diagnosing the problem.

That about covers the basic system and its operation. Next issue we'll take a closer look at specific system problems, and how to diagnose them. As with any system, the real key to diagnosing it is first to understand how it's supposed to work. From there, the actual diagnosis is a snap.



When Experience Counts



We are specialists in only one product...

REMANUFACTURED TRANSMISSIONS

PROVEN QUALITY

*Authorized remanufacturer for 3 OEMS -
Quality you can count on!*

UNMATCHED AVAILABILITY

Over 5,000 transmissions in stock ready to ship

DOMESTIC • IMPORT • MANUALS ALLISONS AND "BULLETPROOF" TRANSMISSIONS

NATIONWIDE WARRANTY

3 yr/75,000 nationwide warranty - parts & labor

EXCEPTIONAL SERVICE

*Experienced customer service staff available
6 days a week. Six warehouses nationwide
providing FAST delivery*



800-428-7726

WWW.ACCURATETRANS.COM