

by Lance Wiggins

Controlling the JATCO RE5R05A

Part 2 of 3

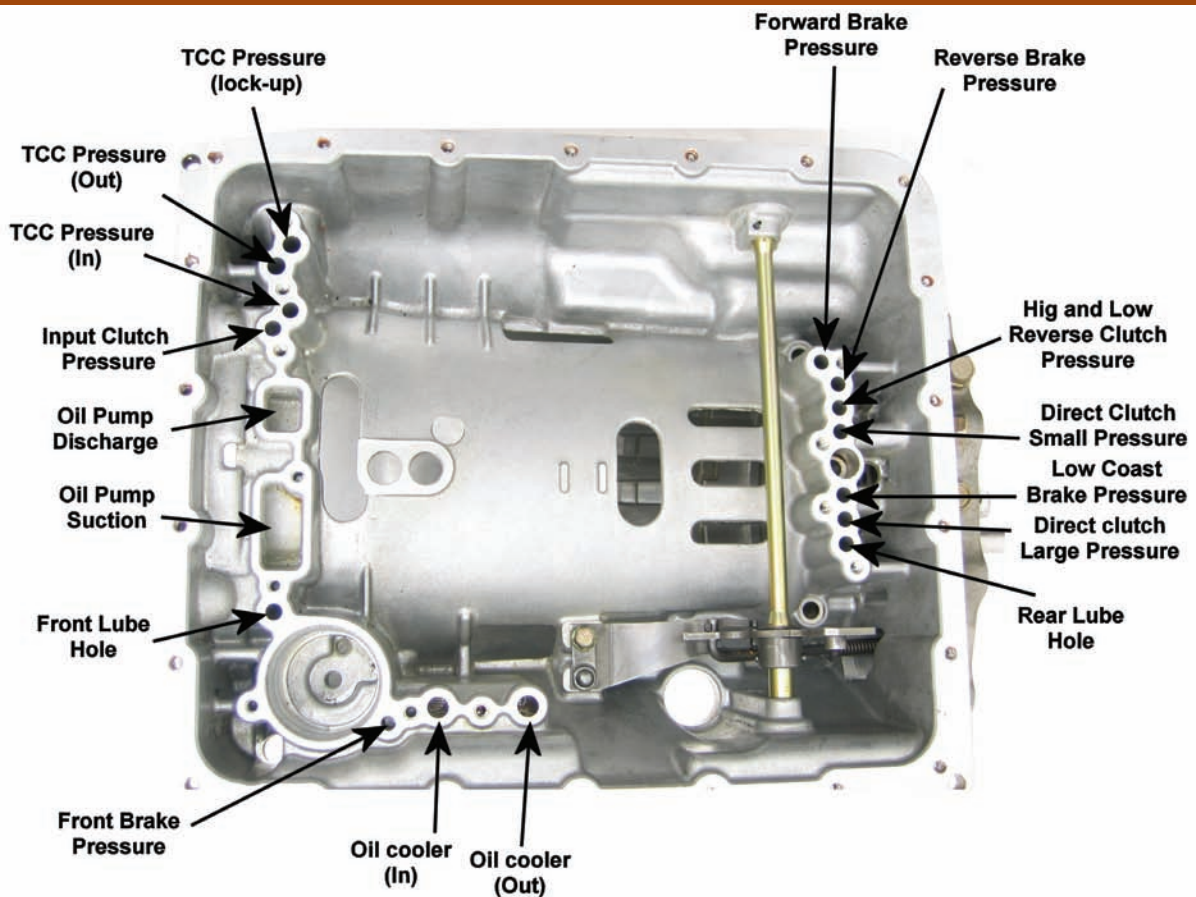


Figure 1

So you're back for more... good. In this issue of *GEARS*, we're going to go through the valve body, TCM and solenoids of the JATCO RE5R05A. I'd like to thank Dalyn and Mike at WIT (Whatever It Takes) for the core and their help in getting this information: Thanks guys. Now let's get started:

The Valve Body

For the most part this valve body is pretty simple, but if you look in a factory service manual, you'd discover

there's no valve body breakdown. The descriptions of the valves, springs and pistons are wrong, and there are more parts in the valve body than there are descriptions. I'm sure you can imagine how frustrating that could be, but never fear... ATRA is here!

Here's what we did: After a completely disassembling and cleaning the case, I identified and traced the fluid passages (figure 1). This is a huge help when checking the valve body passages. I identified the valve body clutch passages (figure 2) and from there I

was off to the races.

The trick to this is to separate the two halves and trace the worm tracks until you end up at the valve. Remember, there are only three types of valves: servo, regulator and switch, so once I had the names of the valves, identifying them was easier. And now, after many hours of sweat, blood and tears, ATRA and *GEARS* are proud to provide a complete valve body breakdown for the RE5R05A (figure 3a, 3b, 3c).

1. (a) Pressure Regulator Valve,



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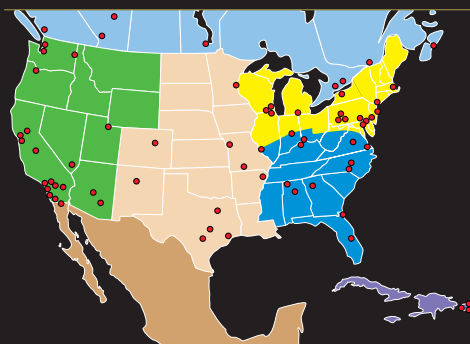
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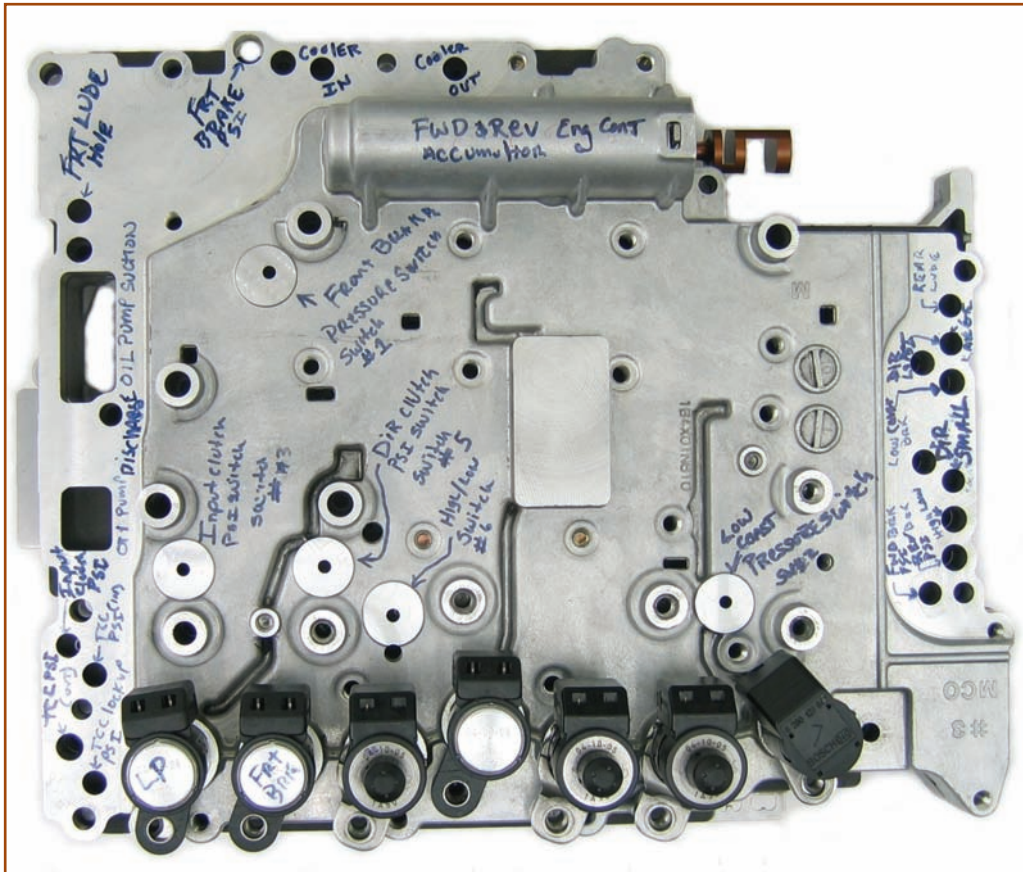


Figure 2

- (b) Pressure Regulator Plug, (c) Pressure Regulator Sleeve: Adjusts the oil discharged from the oil pump to the optimum levels (line pressure) for normal operation.
- 2. Front Brake Control Valve: When the front brake is applied, this valve adjusts line pressure to optimum levels (front brake pressure) and supplies it to the front brake. (In 1st, 2nd, 3rd, and 5th gears, it adjusts the clutch pressure.)
- 3. Accumulator Control Valve: Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve for normal operation.
- 4. Pilot Valve A: Adjusts the line pressure and produces the constant pressure (pilot pressure) required

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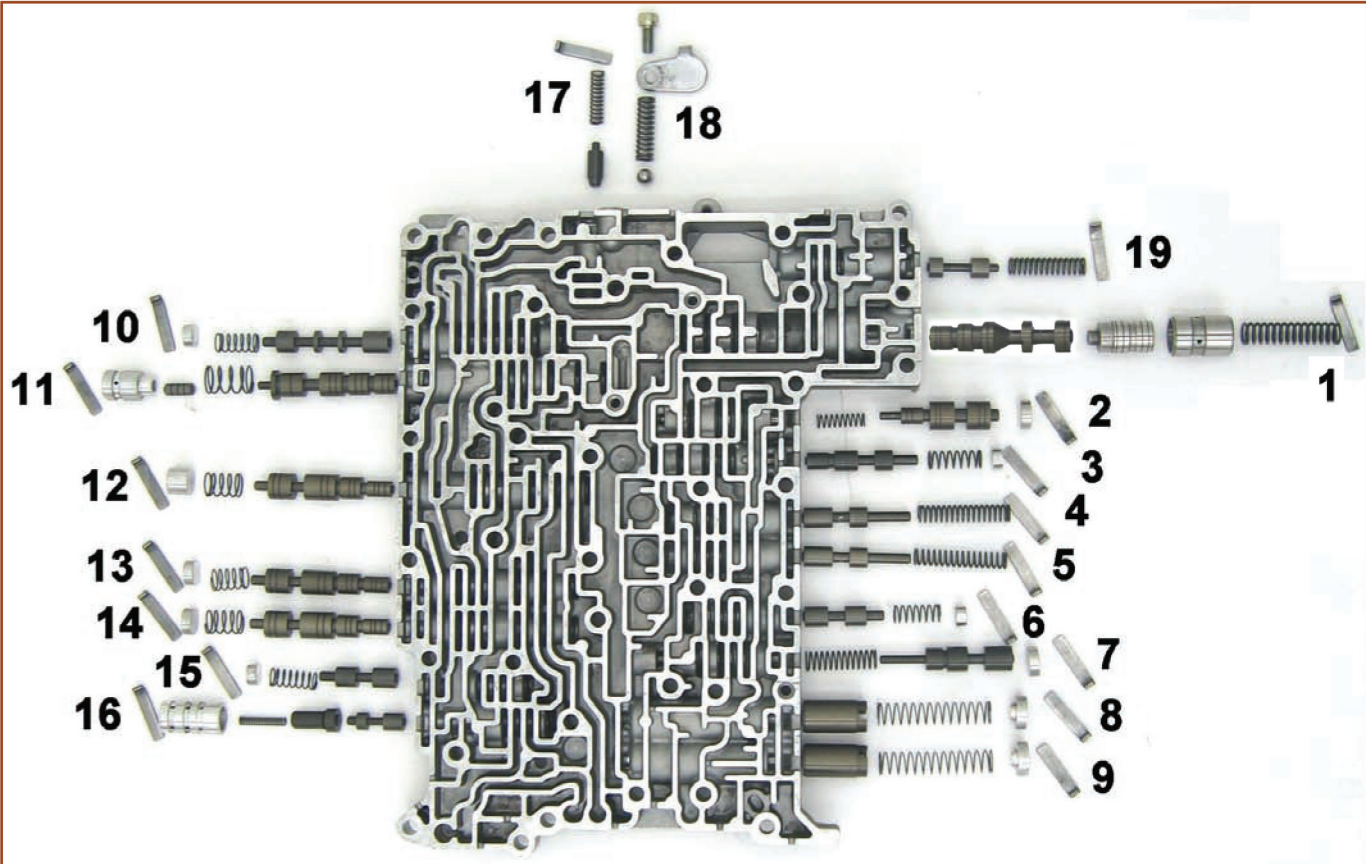


Figure 3a

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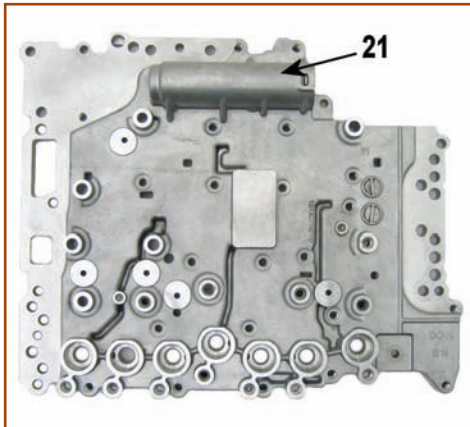


Figure 3c

for line pressure, shifting, and lockup control.

5. Pilot Valve B: Adjusts the line pressure and produces the constant pressure (pilot pressure) required for shifting.
6. Low Coast Brake Switching Valve: During engine braking, this valve supplies the line pressure to the low coast brake reducing valve.
7. Low Coast Brake Reducing Valve: When the low coast brake is applied, this valve adjusts the line pressure to optimum levels (low coast brake pressure) and supplies it to the low coast brake.
8. N-R Accumulator: Produces stabilizing pressure for N-R ranges.
9. N-D Accumulator: Produces stabilizing pressure in N-D ranges.
10. Torque Converter Lubrication Valve: Operates during lockup to switch the torque converter, cooling and lubrication systems' oil paths.
11. Torque Converter Regulator Valve: To prevent too much pressure from reaching the torque converter, line pressure is adjusted to optimum levels; this is called torque converter operating pressure.
12. High and Low Reverse Clutch Control Valve: When the high and low reverse clutch is applied, this valve adjusts line pressure to optimum levels (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch.

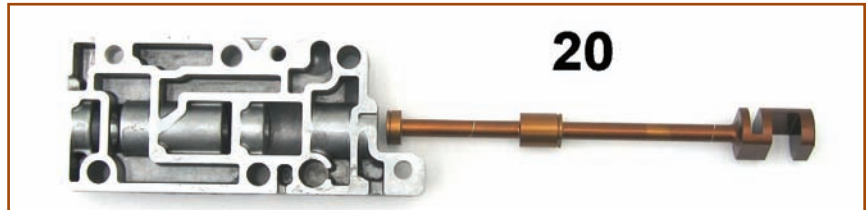


Figure 3b

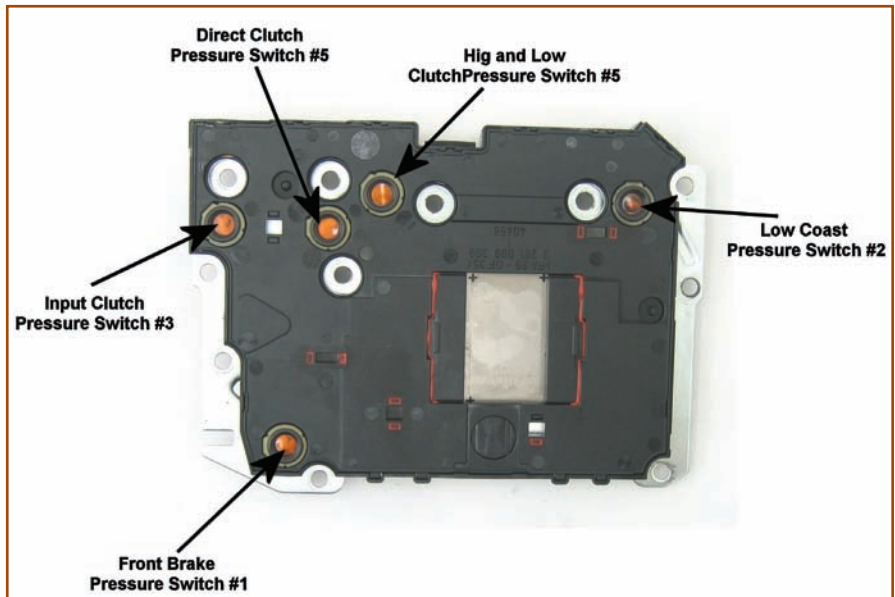


Figure 4

- (In 1st, 3rd, 4th and 5th gears, it adjusts the clutch pressure.)
13. Input Clutch Control Valve: When the input clutch is applied, this valve adjusts line pressure to optimum levels (input clutch pressure) and supplies it to the input clutch. (In 4th and 5th gears, it adjusts the clutch pressure.)
14. Direct Clutch Control Valve: When the direct clutch is applied, this valve adjusts line pressure to optimum levels (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th gears, it adjusts the clutch pressure.)
15. Direct Clutch Piston Switching Valve: Operates in 4th gear and switches the direct clutch coupling capacity.
16. (a) TCC Control Valve, (b) TCC Control Plug, (c) TCC Control Sleeve: Applies or releases the converter clutch. By performing the lockup operation transiently, it provides a smooth converter clutch apply.
17. Cooler Bypass Valve: Allows excess oil to bypass cooler circuit without being fed into it.

18. Line Pressure Relief Valve: Discharges excess oil from line pressure circuit.
19. Front Lubrication Valve: Allows lubrication from the Cool and Pump to flow into the front half of the transmission.
20. Manual Valve: Sends line pressure to each circuit according to the selector position. The circuits that don't receive line pressure drain back to the sump.
21. Main Accumulator Piston and Spring: Sends accumulated oil from the Manual Valve to the N-D and N-R Accumulator pistons. The Main Accumulator piston acts like a shock absorber for the N-D and N-R Accumulator pistons.

As you can see, without the right diagram or breakdown, the potential for problems is enormous.

The TCM

The TCM is actually the complete transmission computer system; that is, it combines the TCM, pressure switch-



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Controlling the JATCO RE5R05A

es, input speed sensors and the TR sensor connector and Solenoid connector, and bolts onto the valve body. This is becoming a common practice: almost all manufacturers seem to be heading in this direction. In a few years, there probably won't be anyone with a TCM that mounts outside the transmission.

So let's start with the pressure switches, located on the bottom of the TCM (figure 4). The switches act just like every other GM pressure switch; nothing too special there. Unfortunately, if one or more of the pressure switches fail, you're going to have to replace the TCM. There is an upside though: you'll get the pressure switches and the input speed sensors free when you buy the TCM (figure 5)!

Pressure Switch 1 (FR/B): Detects any fault in the front brake hydraulic pressure. When it detects a problem, it puts the system into failsafe mode.

Pressure Switch 2 (LC/B): Detects any fault in the low coast brake hydraulic pressure. When it detects a problem, it puts the system into failsafe mode.

Pressure Switch 3 (I/C): Detects any fault in the input clutch hydraulic pressure. When it detects a problem, it puts the system into failsafe mode.

Pressure Switch 4: This unit doesn't have a Pressure Switch 4... yet.

Pressure Switch 5 (D/C): Detects any fault in the direct clutch hydraulic pressure. When it detects a problem, it puts the system into failsafe mode.

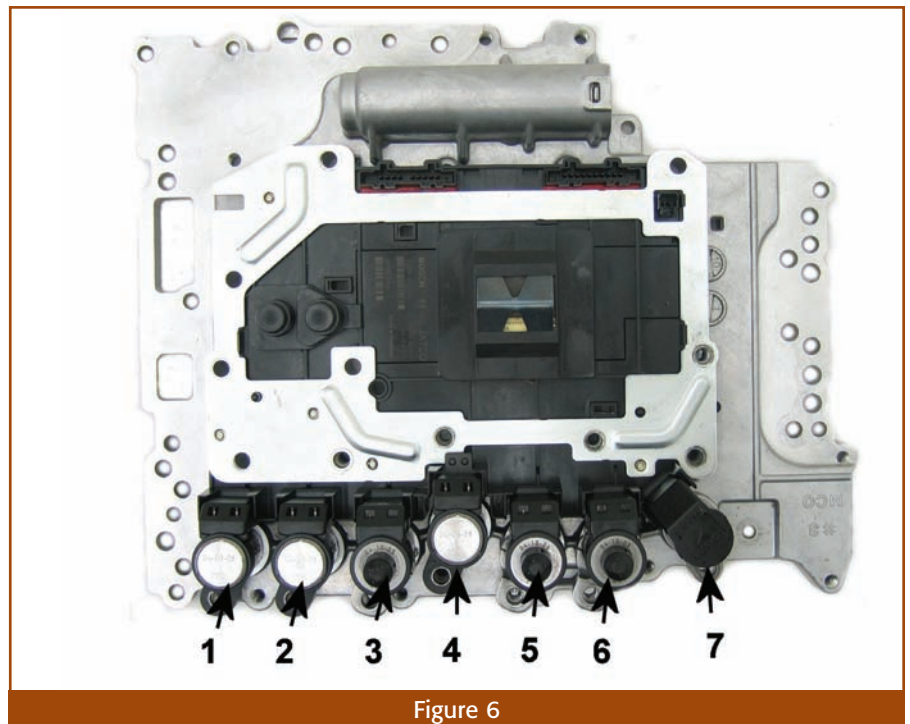
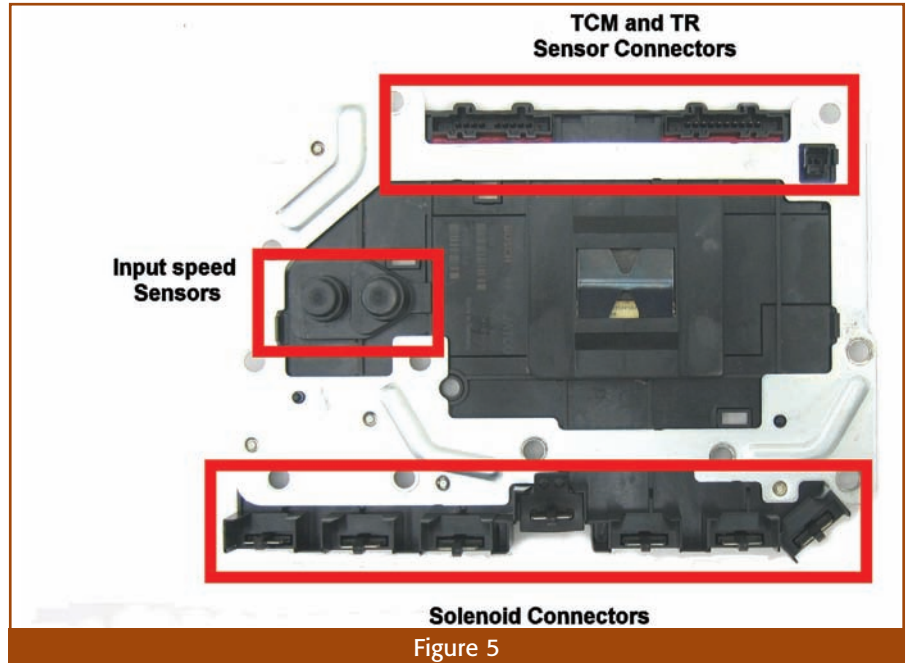
Pressure Switch 6 (HLR/C): Detects any fault in the high and low reverse clutch hydraulic pressure. When it detects a problem, it puts the system into failsafe mode.

The Solenoids

There are seven (7) solenoids (figure 6) on the valve body:

1. Line Pressure Solenoid
2. Low Coast Brake Solenoid
3. High and Low Solenoid
4. Front Brake Control Solenoid
5. Input Clutch Control Solenoid
6. Direct Clutch Control Solenoid
7. Torque Converter Clutch Solenoid

All of the solenoids operate and connect directly to the TCM. All of the solenoids *except* the TCC solenoid have 3.3 ohms resistance. The TCC



solenoid has 23 ohms resistance. The TCM controls all of them using a duty cycled signal.

When checking solenoid operation you'll need a CAN adapter for your scan tool or an interface adapter that checks the solenoid operation.

When checking the solenoid operation via your scan tool the data will read in amps. All of the solenoids operate between 0.0-0.8 amps.

Something interesting to look at is the operating range for these solenoids. For example, the TCC solenoid will run at 0.2-0.4 amps during slip and 0.4-0.7

amps when it's fully locked up.

The input clutch, front brake, direct clutch, and high and low clutch solenoids operate at 0.6-0.8 amps while *disengaging* the clutches (solenoids energized), and 0.0-0.05 amps when the clutches are *engaged* (solenoids de-energized).

That's enough for now; in the next issue of *GEARS*, we'll cover some of the internal components and rebuild tips... until next time...



Remember that Old-Time Service?



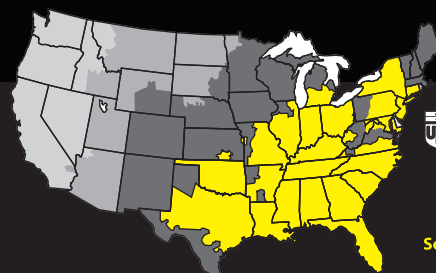
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