

DIAGNOSIS AND TESTING

40/41TE TRANSAXLE GENERAL DIAGNOSIS

NOTE: Before attempting any repair on a 40/41TE four-speed automatic transaxle, check for Diagnostic Trouble Codes (DTC's) using the scan tool. Refer to the appropriate Transmission Diagnostic article.

Transaxle malfunctions may be caused by these general conditions:

- Poor engine performance
- Improper adjustments
- Hydraulic malfunctions
- Mechanical malfunctions
- Electronic malfunctions

Diagnosis of these problems should always begin by checking the easily accessible variables: fluid level and condition, gearshift cable adjustment. Then perform a road test to determine if the problem has been corrected or that more diagnosis is necessary. If the problem persists after the preliminary tests and corrections are completed, hydraulic pressure checks should be performed.

ROAD TEST

Prior to performing a road test, verify that the fluid level, fluid condition, and linkage adjustment have been approved.

During the road test, the transaxle should be operated in each position to check for slipping and any variation in shifting.

If the vehicle operates properly at highway speeds, but has poor acceleration, the converter stator overrunning clutch may be slipping. If acceleration is normal, but high throttle opening is needed to maintain highway speeds, the converter stator clutch may have seized. Both of these stator defects require replacement of the torque converter and thorough transaxle cleaning.

Slipping clutches can be isolated by comparing the "Elements in Use" chart with clutch operation encountered on a road test. This chart identifies which clutches are applied at each position of the selector lever.

A slipping clutch may also set a DTC and can be determined by operating the transaxle in all selector positions.

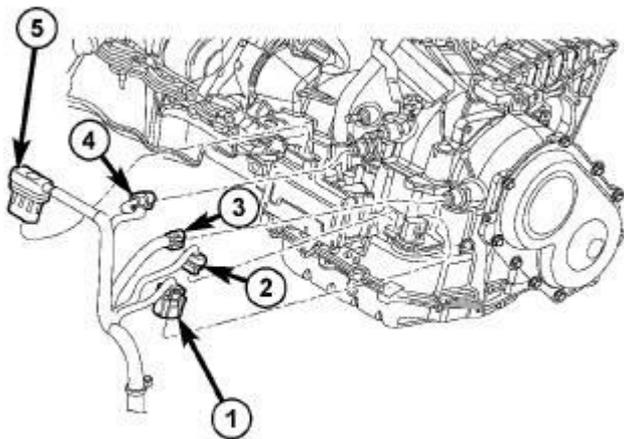
ELEMENTS IN USE AT EACH POSITION OF SELECTOR LEVER

Shift Lever Position	INPUT CLUTCHES			HOLDING CLUTCHES	
	Underdrive	Overdrive	Reverse	2/4	Low/Reverse
P - PARK	-	-	-	-	X
R - REVERSE	-	-	X	-	X
N - NEUTRAL	-	-	-	-	X
OD -	-	-	-	-	-

OVERDRIVE					
First	X	-	-	-	X
Second	X	-	-	X	-
Direct	X	X	-	-	-
Overdrive	-	X	-	X	-
D - DRIVE*	-	-	-	-	-
First	X	-	-	-	X
Second	X	-	-	X	-
Direct	X	X	-	-	-
L - LOW*	-	-	-	-	-
First	X	-	-	-	X
Second	X	-	-	X	-
Direct	X	X	-	-	-
* Vehicle upshift and downshift speeds are increased when in these selector positions.					

The process of elimination can be used to detect any unit which slips and to confirm proper operation of good units. Road test analysis can diagnose slipping units, but the cause of the malfunction cannot be determined. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

HYDRAULIC PRESSURE TESTS



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Fig. 4: ELECTRICAL CONNECTORS AT CASE
 Courtesy of CHRYSLER LLC

NOTE: Before performing the hydraulic pressure tests be certain to disconnect the Variable Line Pressure (VLP) electrical connector (2) at the transmission. Check for and clear any codes that may have been set after performing any hydraulic pressure tests and connecting the Variable Line Pressure (VLP) electrical connector.

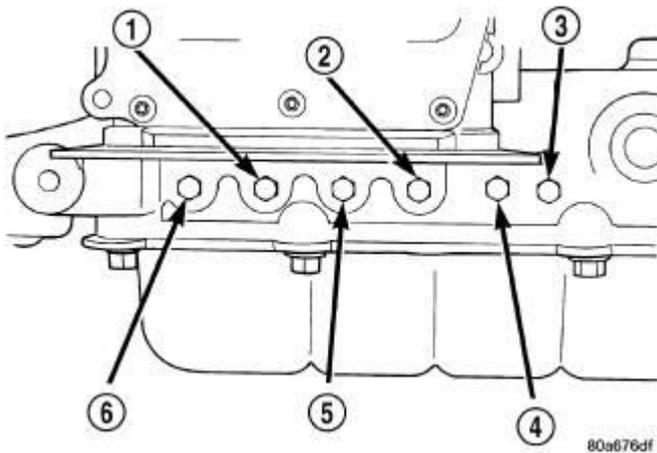


Fig. 5: Pressure Taps
 Courtesy of CHRYSLER LLC

1 - OVERDRIVE CLUTCH
2 - TORQUE CONVERTER OFF
3 - LOW/REVERSE CLUTCH
4 - 2/4 CLUTCH
5 - REVERSE CLUTCH
6 - UNDERDRIVE CLUTCH

Pressure testing is a very important step in the diagnostic procedure. These tests usually reveal the cause of most hydraulic transaxle problems.

Before performing pressure tests, be certain that fluid level and condition, and shift cable adjustments have been checked and approved. Fluid must be at operating temperature 150 to 200° F. (66 to 93° C).

Install an engine tachometer, raise vehicle on hoist which allows front wheels to turn, and position tachometer so it can be read.

Attach 300 psi Gauge C-3293-SP to port(s) (1) overdrive clutch, (2) torque converter off, (3) low/reverse clutch, (4) 2/4 clutch, (5) reverse clutch, (6) underdrive clutch required for test(s) being conducted. Use Adapter Set L-4559 to adapt gauge(s) to transaxle.

TEST ONE-SELECTOR IN LOW (1st GEAR)

1. Attach pressure gauge to the low/reverse clutch tap.
2. Move selector lever to the (L) position.
3. Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed to 20 mph.
4. Low/reverse clutch pressure should read 115 to 145 psi.
5. This test checks pump output, pressure regulation and condition of the low/reverse clutch hydraulic circuit and shift schedule.

TEST TWO-SELECTOR IN DRIVE (2nd GEAR)

NOTE: This test checks the underdrive clutch hydraulic circuit as well as the shift schedule.

1. Attach gauge to the underdrive clutch tap.
2. Move selector lever to the 3 position.
3. Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 30 mph.
4. In second gear the underdrive clutch pressure should read 110 to 145 psi.

TEST TWO A-SELECTOR IN OD (4th Gear)

NOTE: This test checks the underdrive clutch hydraulic circuit as well as the shift schedule.

1. Attach gauge to the underdrive clutch tap.
2. Move selector lever to the (OD) position.
3. Allow wheels to rotate freely and increase throttle opening to achieve an indicated speed of 40 mph.
4. Underdrive clutch pressure should read below 5 psi. If not, then either the solenoid assembly or PCM/TCM is at fault.

TEST THREE-OVERDRIVE CLUTCH CHECK (3rd and 2nd Gear)

1. Attach gauge to the overdrive clutch tap.
2. Move selector lever to the (OD) position.
3. Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 20 mph. Vehicle should be in 3rd gear.
4. Overdrive clutch pressure should read 74 to 95 psi.
5. Move selector lever to the (3) position and increase indicated vehicle speed to 30 mph.
6. The vehicle should be in second gear and overdrive clutch pressure should be less than 5 psi.
7. This test checks the overdrive clutch hydraulic circuit as well as the shift schedule.

TEST FOUR-SELECTOR IN OVERDRIVE (4th Gear)

1. Attach gauge to the 2/4 clutch tap.
2. Move selector lever to the (OD) position.
3. Allow vehicle front wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 30 mph. Vehicle should be in 4th gear.
4. The 2/4 clutch pressure should read 75 to 95 psi.
5. This test checks the 2/4 clutch hydraulic circuit.

TEST FIVE-SELECTOR IN OVERDRIVE (4th Gear-CC on)

1. Attach gauge to the torque converter clutch off pressure tap.
2. Move selector lever to the (OD) position.
3. Allow vehicle wheels to turn and increase throttle opening to achieve an indicated vehicle speed of 50 mph. Vehicle should be in 4th gear, CC on.

CAUTION: Both wheels must turn at the same speed.

4. Torque converter clutch off pressure should be less than 5 psi.
5. This test checks the torque converter clutch hydraulic circuit.

TEST SIX-SELECTOR IN REVERSE

1. Attach gauges to the reverse and LR clutch tap.
2. Move selector lever to the (R) position.
3. Read reverse clutch pressure with output stationary (foot on brake) and throttle opened to achieve 1500 rpm.
4. Reverse and LR clutch pressure should read 165 to 235 psi.
5. This test checks the reverse clutch hydraulic circuit.

TEST RESULT INDICATIONS

1. If proper line pressure is found in any one test, the pump and pressure regulator are working properly.
2. Low pressure in all positions indicates a defective pump, a clogged filter, or a stuck pressure regulator valve.
3. Clutch circuit leaks are indicated if pressures do not fall within the specified pressure range.
4. If the overdrive clutch pressure is greater than 5 psi in 4 of Test Three, a worn reaction shaft seal ring or a defective solenoid assembly is indicated.
5. If the underdrive clutch pressure is greater than 5 psi in 4 of Test Two A, a defective solenoid assembly or PCM/TCM is the cause.

PRESSURE CHECK SPECIFICATIONS

Gear Selector Position	Actual Gear	Pressure Taps					Low/Reverse Clutch
		Underdrive Clutch	Overdrive Clutch	Reverse Clutch	Torque Converter Clutch Off	2/4 Clutch	
PARK 0 mph *	PARK	0-2	0-5	0-2	60-110	0-2	115-145
REVERSE 0 mph *	REVERSE	0-2	0-7	165-235	50-100	0-2	165-235
NEUTRAL 0 mph *	NEUTRAL	0-2	0-5	0-2	60-110	0-2	115-145
LOW 20 mph #	FIRST	110-145	0-5	0-2	60-110	0-2	115-145
3 30 mph #	SECOND	110-145	0-5	0-2	60-110	115-145	0-2
3 45 mph #	DIRECT	75-95	75-95	0-2	60-90	0-2	0-2
OD 30 mph #	OVERDRIVE	0-2	75-95	0-2	60-90	75-95	0-2
OD	OVERDRIVE						

50 mph #	WITH TCC	0-2	75-95	0-2	0-5	75-95	0-2
* Engine speed at 1500 rpm							
# CAUTION: Both front wheels must be turning at the same speed.							

CLUTCH AIR PRESSURE TESTS

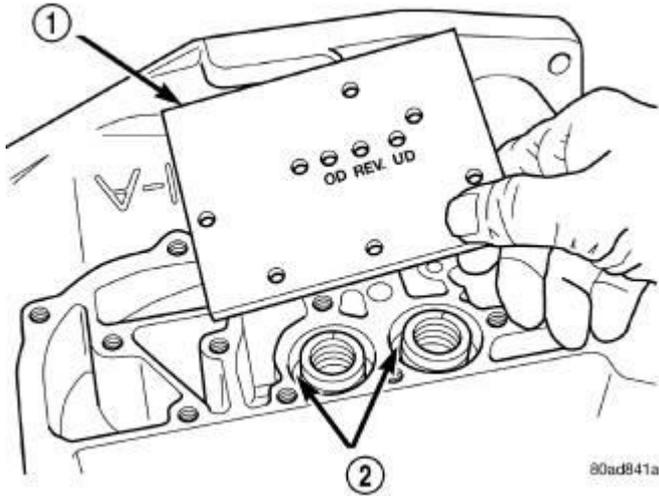


Fig. 6: Air Pressure Test Plate
 Courtesy of CHRYSLER LLC

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|---------------------------------------|
| 1 - AIR PRESSURE TEST PLATE TOOL 6056 |
| 2 - ACCUMULATORS |

Inoperative clutches can be located using a series of tests by substituting air pressure for fluid pressure using Air Pressure Test Plate 6056 (1) .

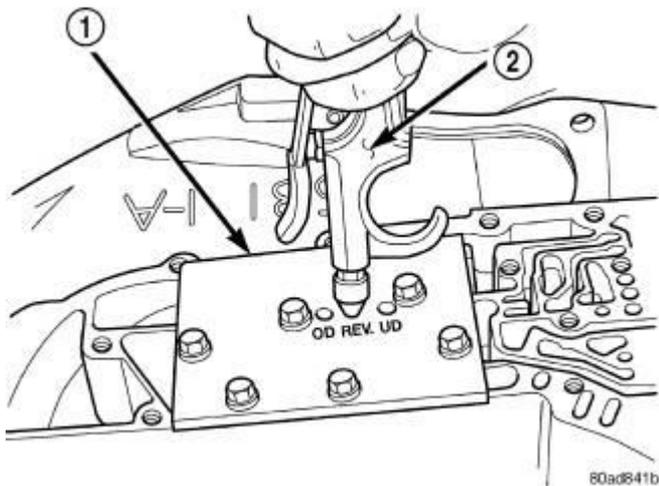


Fig. 7: Testing Reverse Clutch
 Courtesy of CHRYSLER LLC

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|----------------------------------|
| 1 - AIR PRESSURE TEST PLATE 6056 |
| 2 - AIR NOZZLE |

The clutches may be tested by applying air pressure (2) to their respective passages. The valve body must be removed and Air Pressure Test Plate 6056 (1) installed. To make air pressure tests, proceed as follows:

NOTE: The compressed air supply must be free of all dirt and moisture. Use a pressure of 30 psi.

Remove oil pan and valve body. See **Transmission and Transfer Case/Automatic - 41TE/VALVE BODY - Removal.**

OVERDRIVE CLUTCH

Apply air pressure to the overdrive clutch apply passage and watch for the push/pull piston to move forward. The piston should return to its starting position when the air pressure is removed.

REVERSE CLUTCH

Apply air pressure to the reverse clutch apply passage and watch for the push/pull piston to move rearward. The piston should return to its starting position when the air pressure is removed.

2/4 CLUTCH

Apply air pressure to the feed hole located on the 2/4 clutch retainer. Look in the area where the 2/4 piston contacts the first separator plate and watch carefully for the 2/4 piston to move rearward. The piston should return to its original position after the air pressure is removed.

LOW/REVERSE CLUTCH

Apply air pressure to the low/reverse clutch feed hole (rear of case, between 2 bolt holes). Then, look in the area where the low/reverse piston contacts the first separator plate. Watch carefully for the piston to move forward. The piston should return to its original position after the air pressure is removed.

UNDERDRIVE CLUTCH

Because this clutch piston cannot be seen, its operation is checked by function. Air pressure is applied to the low/reverse and the 2/4 clutches. This locks the output shaft. Use a piece of rubber hose wrapped around the input shaft and a pair of clamp-on pliers to turn the input shaft. Next apply air pressure to the underdrive clutch. The input shaft should not rotate with hand torque. Release the air pressure and confirm that the input shaft will rotate.

TORQUE CONVERTER HOUSING FLUID LEAKAGE

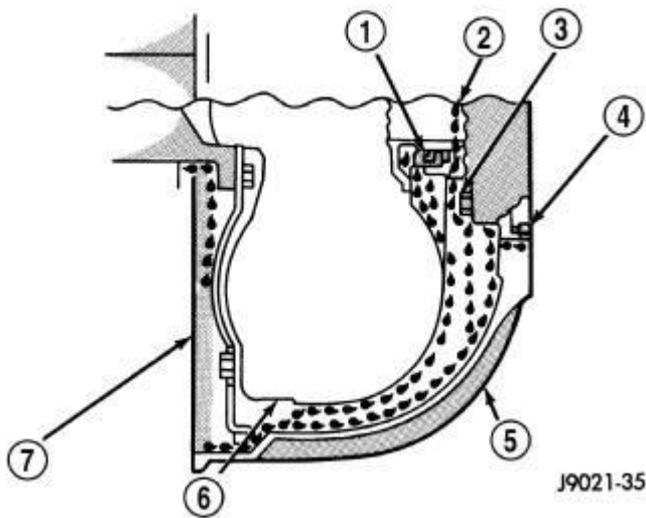


Fig. 8: Converter Housing Leak Paths
 Courtesy of CHRYSLER LLC

1 - PUMP SEAL
2 - PUMP VENT
3 - PUMP BOLT
4 - PUMP GASKET
5 - CONVERTER HOUSING
6 - CONVERTER
7 - REAR MAIN SEAL LEAK

When diagnosing converter housing fluid leaks, three actions must be taken before repair:

1. Verify proper transmission fluid level.
2. Verify that the leak originates from the converter housing area and is transmission fluid.
3. Determine the true source of the leak.

Fluid leakage at or around the torque converter area may originate from an engine oil leak. The area should be examined closely. Factory fill fluid is red and, therefore, can be distinguished from engine oil.

Some suspected converter housing fluid leaks may not be leaks at all. They may only be the result of residual fluid in the converter housing, or excess fluid spilled during factory fill, or fill after repair. Converter housing leaks have several potential sources inspect pump seal (1), pump vent (2), pump bolts (3), pump gasket (4), converter housing (5), converter (6) and a rear main seal leak (7). Through careful observation, a leak source can be identified before removing the transmission for repair.

Pump seal leaks tend to move along the drive hub and onto the rear of the converter. Pump O-ring or pump body leaks follow the same path as a seal leak. Pump attaching bolt leaks are generally deposited on the inside of the converter housing and not on the converter itself. Pump seal or gasket leaks usually travel down the inside of the converter housing.

TORQUE CONVERTER LEAKAGE

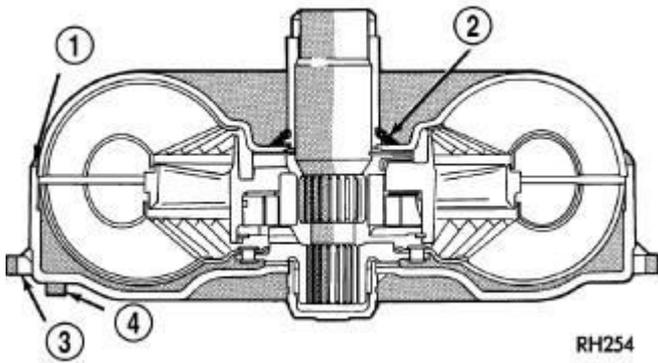


Fig. 9: Converter Leak Points - Typical
 Courtesy of CHRYSLER LLC

1 - OUTSIDE DIAMETER WELD
2 - TORQUE CONVERTER HUB WELD
3 - STARTER RING GEAR
4 - LUG

Possible sources of torque converter leakage are:

- Torque converter weld leaks at the outside diameter weld (1) .
- Torque converter hub weld (2).