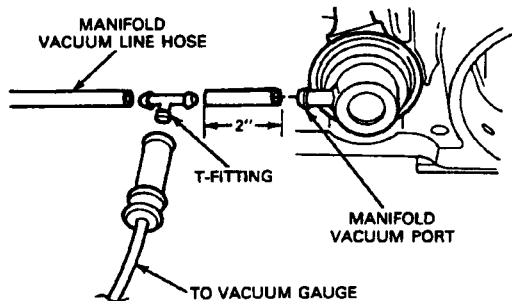


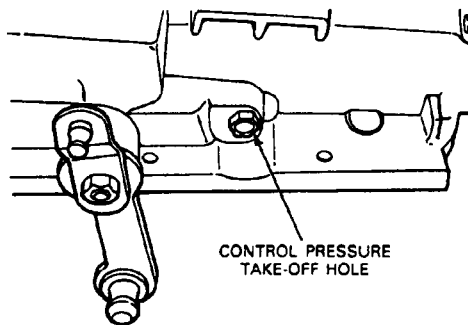
Engine Vacuum Procedure

1. Attach a tachometer to the engine and a Vacuum Gauge, Rotunda Number 059-00008, or equivalent to the transmission vacuum line at the manifold vacuum port.

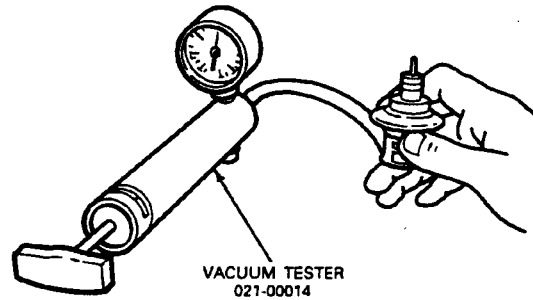


DIAPHRAGM CONNECTION

2. Attach a pressure gauge to the control pressure outlet at the transmission.



3. Firmly apply the parking brake and start the engine.
4. Check the throttle and downshift linkage for a binding condition. If linkage is satisfactory, check for vacuum leaks in the transmission diaphragm unit and its connecting tubes and hoses. Check all other vacuum-operated units (such as the power brake) for vacuum leaks.

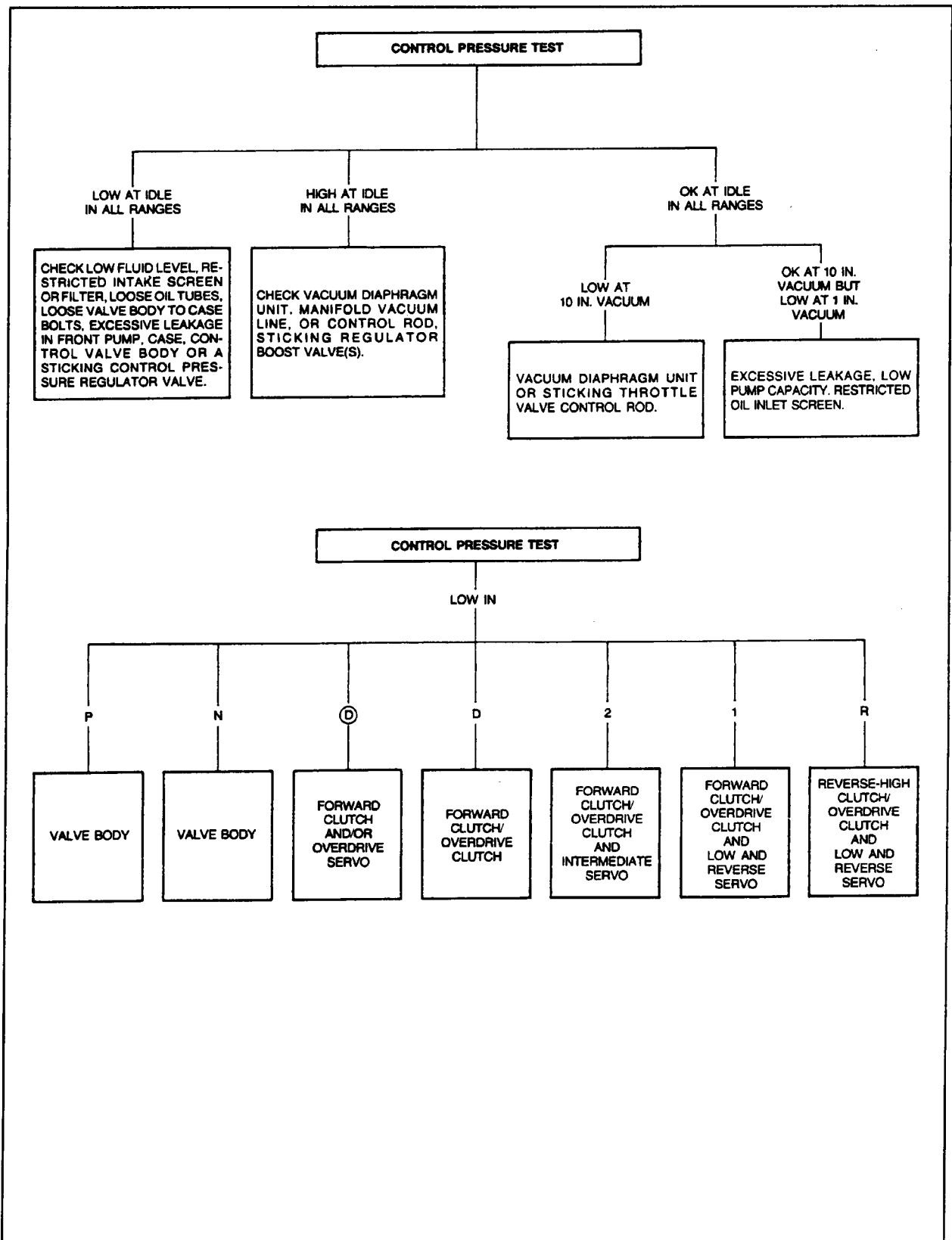


Refer to the two control pressure diagnostic guides to show what components are inoperative when the control pressure test is not within specifications. Do not proceed with the main diagnosis guide until you have made any repairs, as required, and the control pressure is within specifications as listed in the Performance Specifications Book or Special Specifications Issue of the Technical Service Bulletin.

Vacuum Pump Method

Install an adjustable vacuum source. Disconnect and temporarily plug the vacuum line at the vacuum diaphragm unit. Apply both the parking and service brakes. Start the engine and vacuum pump. Set the vacuum at 15 inches, read and record the control pressure in all selector positions. Run the engine up to 1000 rpm, and reduce the vacuum to 10 inches. Read and record the control pressure in \odot , D-2 and 1. Keep the engine at 1000 rpm and reduce the vacuum to 1 inch. Read and record the control pressure in \odot , D-1, 2 and R.

Refer to the two control pressure diagnosis charts to show what components are inoperative when the control pressure test is not within specification. Do not proceed with the main diagnosis chart until serviced as required, and the control pressure is within specification as listed in the Performance Specifications Book or Special Specifications Issue of the Technical Service Bulletin.





Vacuum Supply Test

The vacuum supply to the vacuum diaphragm unit and the diaphragm itself must be checked. To check the supply, disconnect the vacuum line at the diaphragm unit and connect it to a vacuum gauge. With the engine idling, the gauge must have a steady acceptable vacuum reading for the altitude at which the test is being performed. If the vacuum reading is low, check for a vacuum leak or poor engine vacuum. If the vacuum reading is OK, rapidly accelerate the engine momentarily. The vacuum reading must drop rapidly at acceleration and return immediately upon release of the accelerator. If the vacuum reading does not change or changes slowly, the transmission vacuum line is plugged, restricted or connected to a reservoir supply. Correct as required.

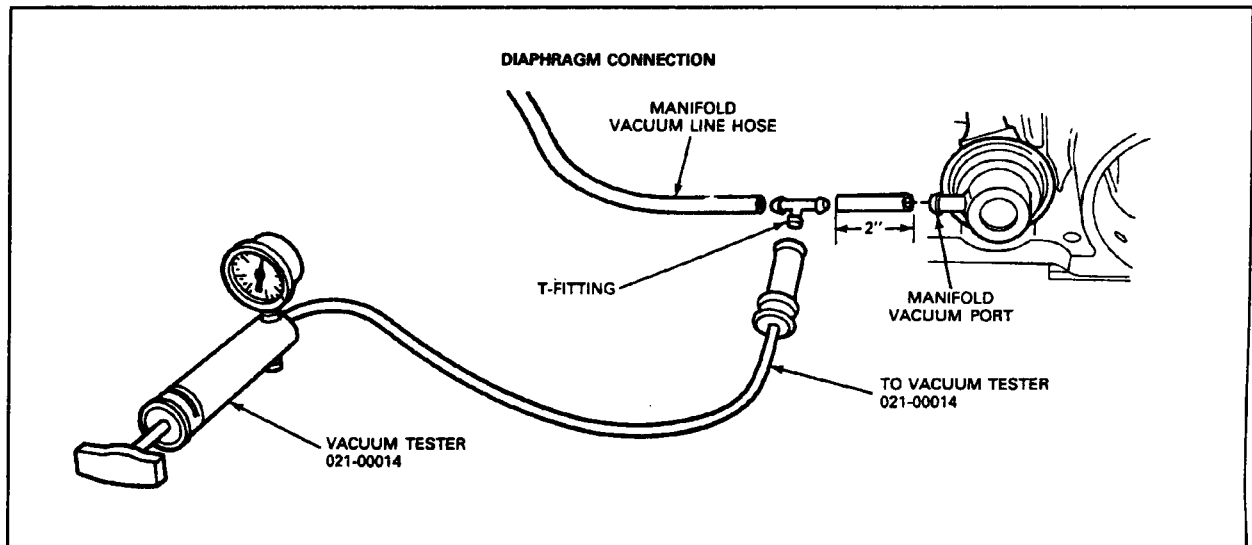
Vacuum Diaphragm Test—On Vehicle

To check the vacuum diaphragm unit, start the vacuum pump and set the regulator knob so that the vacuum gauge reads 18 inches with the end of the vacuum hose blocked off. Then connect the vacuum hose to the diaphragm unit. If the gauge still reads 18 inches, the vacuum diaphragm unit is not leaking. If the reading does not remain at 18 inches, but drops, the vacuum diaphragm unit is leaking. Replace the vacuum diaphragm unit. Also, if automatic transmission fluid is present in the vacuum side of the diaphragm or in the vacuum hose, the diaphragm is leaking and must be replaced.

Vacuum Diaphragm Test—Off Vehicle

To check the vacuum unit for diaphragm leakage, remove the unit from the transmission. Use a Vacuum Tester, Rotunda Number 021-00014, or equivalent. Adjust the tester until the vacuum gauge reads 18 inches with the end of the vacuum hose blocked off.

Connect the vacuum hose to the manifold vacuum port as shown. If the gauge still reads 18 inches, the vacuum unit diaphragm is not leaking. A second leakage check can be made as the hose is removed from the transmission vacuum unit. Hold a finger over the end of the control rod. When the hose is removed the internal spring of the vacuum unit should push the control rod outward. If the vacuum diaphragm needs replacing, install a new unit that has been released for service. Vacuum diaphragm assembly identification is given at end of this section.



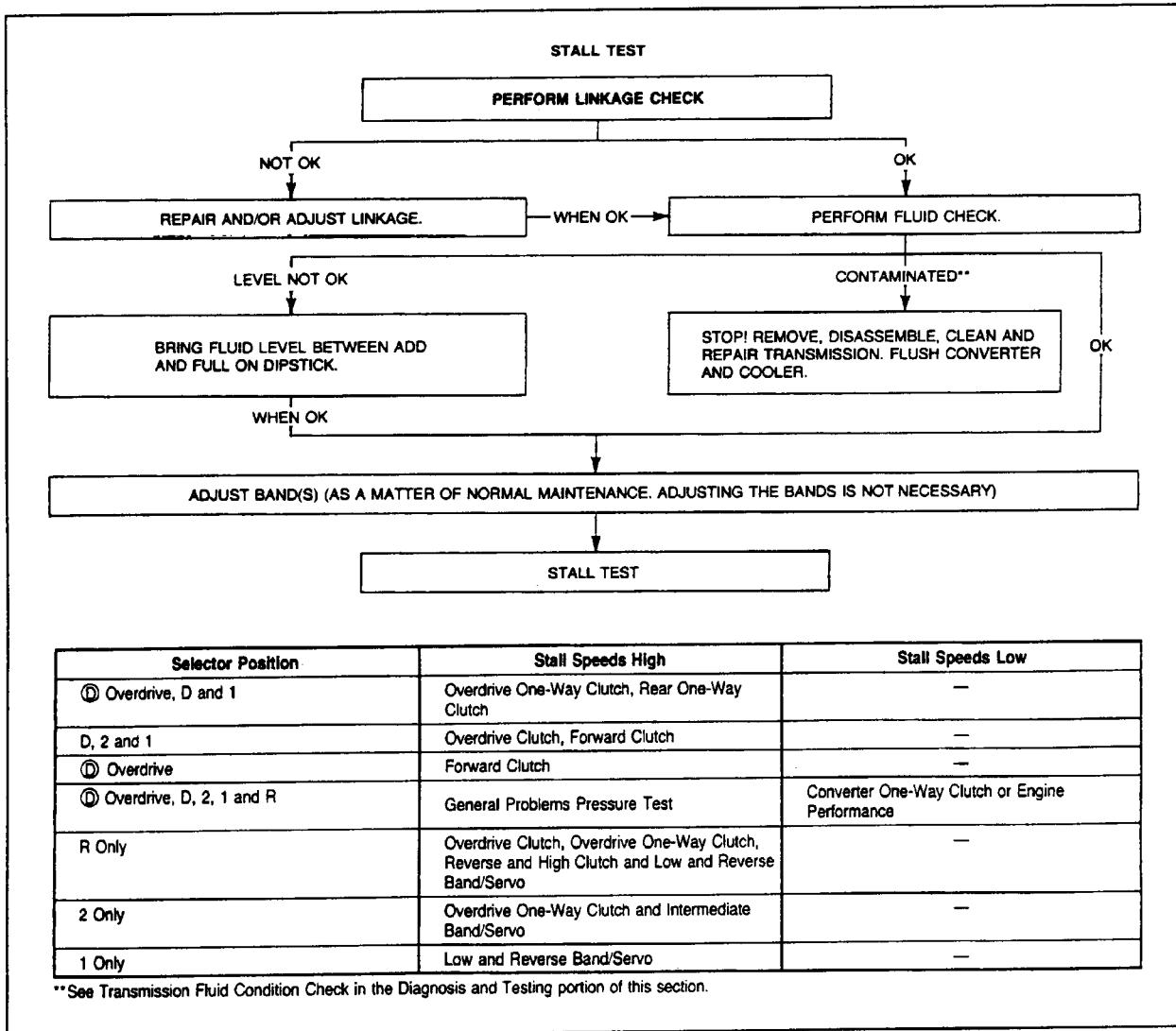
Converter Clutch Test

NOTE: Engine coolant temperature must be above 53°C (128°F) and below 116°C (240°F). This temperature can be obtained after approximately 15 minutes of highway driving. Since most converter clutch shifts are difficult to feel (much less noticeable than a 1-2 or 2-3 upshift) a tachometer and / or vacuum gauge must be connected to the engine.

To check the converter clutch for engagement / disengagement, drive the vehicle at approximately 80 km/h (50 mph) and while maintaining this speed tap the brake pedal with the left foot. The engine rpm and vacuum should increase when the clutch disengages, with light brake pedal application, and decrease when the pedal is released and the clutch engages. If the converter clutch does not engage, see Diagnosis portion of this section.

Stall Test

The stall test checks converter one-way clutch operation and installation, the holding ability of the forward clutch, reverse clutch, the low-reverse bands, the planetary one-way clutch and engine performance.



The test should be done only with the engine coolant and transmission fluid at proper levels and at operating temperature.

Apply the service and parking brakes firmly for each stall test.

- Find the specified stall rpm for the vehicle by referring to the Performance Specification Book or Special Specifications Issue of the Technical Service Bulletin. Use a grease pencil to mark the rpm on the dial of a tachometer.
- Connect the tachometer to the engine.
- In each of the following ranges, D, 2, 1, R, press the accelerator to the floor and hold it just long enough to let the engine get to full rpm. While making this test, do not hold the throttle open for more than five seconds at a time.

- Note the results in each range.
- After each range, move the selector lever to N (Neutral) and run the engine at 1000 rpm for about 15 seconds to cool the converter before making the next test.

CAUTION: If the engine speed recorded by the tachometer exceeds the maximum limits given in Specifications, release the accelerator immediately, because clutch or band slippage is indicated.

Governor Check

The governor can be checked at the same time as the Control Pressure Test is performed and in the same manner.



Raise the vehicle with an axle or frame hoist so that the rear wheels are clear of the floor. Disconnect and plug the vacuum line to the vacuum diaphragm unit. Connect the line from the adjustable vacuum source to the vacuum diaphragm unit.

CAUTION: Never exceed 96 km/h (60 mph) speedometer speed.

Place the transmission in "O" or "D" range no load on the engine, and apply 10 inches of vacuum to the vacuum diaphragm unit. Increase the speed slowly and watch the speedometer. Check the km/h (mph) at which the control pressure cutback occurs. It should occur between 13-19 km/h (5-15 mph). Decrease the vacuum at the vacuum diaphragm to 0-2 inches. Control pressure cutback should occur between 18-28 km/h (7-20 mph).

NOTE: After each test, move the selector to N (Neutral) and run the engine at 1000 rpm to cool the transmission.

The governor is good if the cutback occurs within these specifications. If the cutback does not occur within specifications, check shift speed to verify that it is the governor and not a stuck cutback valve, then service or replace the governor.

Transmission Fluid Cooler Flow Check

The linkage, fluid level and control pressure must be within specifications before performing this flow check.

Remove the transmission dipstick from the filler tube. Place a funnel in the transmission filler tube. Raise the vehicle; remove the cooler return line from its fitting in the case. Attach a hose to the cooler return line and fasten the free end of the hose in the funnel installed in the filler tube.

Start the engine and set idle speed at 1000 rpm with the transmission in N (Neutral).

Observe the fluid flow at the funnel. When the flow is "solid" (air bleeding has been completed), the flow should be liberal. If there is not a liberal flow at 1000 rpm in N (Neutral), low pump capacity, main circuit system leakage, stuck converter charge relief valve or cooler system restriction is indicated.

To separate transmission trouble from cooler system trouble, observe the flow at the transmission case converter-out fitting.

Shift Point Checks

Road Test

This check will determine if the electronics, governor and shift control valves are functioning properly.

Check the light throttle upshifts with selector in overdrive range O. (Approximately 10 inches Hg vacuum.) The transmission should start in first gear, shift to second gear, shift to third gear, shift to fourth gear (overdrive) and then lock the converter clutch. The converter lockup is often difficult to feel, therefore a vacuum gauge and tachometer should be used to determine lockup shift points. Refer to the Ford Performance Specifications Book or the Special Specifications Issue of the Technical Service Bulletin for actual shift point vehicle speed.

When the selector lever is in D position, the transmission will make all automatic upshifts except the 3-4.

When the selector is at 2 (Second), the transmission can operate only in second gear.

With the transmission in third gear and road speed over 72 km/h (45 mph) the transmission should shift to second gear when the selector lever is moved from D (Drive) or 2 (Second) to 1 (First). **This check will determine if the governor pressure and shift control valves are functioning properly.**

If the vehicle is traveling at approximately 72 km/h (45 mph) and the selector lever is moved from O (Overdrive) to 1 or D to 1 (closed throttle), the transmission will immediately downshift to second gear. As road speed drops below 48 km/h (30 mph) the transmission will downshift to first gear.

For a coastdown from approximately 72 km/h (45 mph) with the transmission in O position and at closed throttle, the downshift sequence is as follows: converter clutch unlocks electronically when the accelerator pedal is released, as vehicle speed drops, 4-3, 3-2 and finally 2-1 downshifts happen.

In Shop

A shift test can be performed in the shop to check shift valve operation, governor circuits, shift delay pressures, throttle boost and downshift valve action.

Raise the vehicle with an axle or frame hoist so that the rear wheels are clear of the floor. Disconnect and plug the vacuum line from the engine to the diaphragm. Connect the line from the adjustable vacuum source to the vacuum diaphragm unit.

CAUTION: Never exceed 96 km/h (60 mph) speedometer speed.

1. To check the shift valves and governor circuits, apply 18 inches of vacuum to the transmission vacuum diaphragm unit. Place the transmission in O (Overdrive) and make a minimum throttle 1-2, 2-3, 3-4, and lockup shift. If the shift points are within specification, the 1-2, 2-3 converter clutch and 3-4 shift valves and governor are OK.

If the shift points are not within specification, perform a governor check to isolate the problem.

NOTE: After each test, move the selector lever to Neutral, run the engine at 1000 rpm to cool the transmission.