FAULT DIAGNOSIS

Introduction

Automatic transmission malfunctions may be caused by four general conditions, poor engine performance, incorrect adjustments, hydraulic malfunctions and mechanical malfunctions. Diagnosis of these problems should always begin by checking the easily accessible variables, fluid level and condition, selector linkage adjustment and throttle linkage adjustment. Perform a road test to determine whether the problem has been corrected or that more diagnosis is required. If the problem exists after the preliminary tests and corrections are completed, hydraulic pressure tests should be performed.

FLUID LEVEL AND CONDITION

To check fluid level

Remove the rear engine cover in the cab.

Before removing the dipstick, wipe all dirt off the protective cap and top of the filler tube.

With the selector lever in "N" (neutral), engine running at idle speed and the fluid at normal operating temperature, approximately 79.4°C (175°F), the fluid level is correct if it is between the "Add ½ liter" and "Full" marks on the dipstick.

Refit the dipstick and rear engine cover.

Fluid condition

Low level fluid can cause a variety of conditions because it allows the pump to take in air as well as fluid. As in any hydraulic system, air bubbles make the fluid spongy. Pressures will be low, build up slowly and cause slipping, overheating and rapid wear of the clutches and bands.

If the fluid level is too high the drive gears churn up foam and cause the same conditions which occur with a low level fluid.

In both cases the air bubbles can cause overheating, fluid oxidation and the formation of lacquer or varnish which can interfere with normal valve, clutch and servo operation. Foaming can also result in fluid escaping from the transmission vent where it may be mistaken for a leak.

At the same time as checking the fluid level it is important to check the condition of the fluid. The fluid naturally darkens with use, and this does not indicate that it must be renewed. When the fluid smells burned, and is contaminated with metal or friction material particles, a complete transmission overhaul is needed and because the torque converter cannot be flushed, it should be renewed. If there is any doubt about the condition of the fluid on the dipstick, siphon out a sample for a more detailed examination.

Incorrect Idling Speed

Idling speed too low
Low line pressure at idle, causing slip in the rear clutch when moving off in "D" or slip in the front clutch and/or low/reverse band in "R".

Idling speed too high
High line pressure at idle, causing fierce engagement of "D" or "R" from "N".

Selector Linkage

Normal operation of the neutral safety switch provides a quick check to confirm proper selector linkage adjustment.

Move the selector lever into "P", if the starter will operate the "P" position is correct.

After checking "P" position, move the selector into "N", if the starter will also operate the linkage is correctly adjusted. If adjustment is required refer to Section G110.

Throttle Linkage

The throttle rod adjustment is very important to correct transmission operation. This adjustment positions a valve which controls shift speed, shift quality and part throttle downshift sensitivity. If the setting is too short, early shifts and slippage between shifts may occur. If the setting is too long, shifts may be delayed and part throttle may be very sensitive. Refer to Section G110 for adjustment.

DESCRIPTION AND MODIFICATIONS

This may seem a little out of place but I have heard about problems with people stealing work and selling it - for example on eBay.

If you're reading this and you bought this manual anywhere then you have been ripped off.

Please contact me via my email mikejamson@hotmail.com Otherwise I can be found on the dodge50 facebook page, if not then get in contact with Greg and he can pass the message on to me.

I have note done this pdf manual for my own personal gain and wish to see the community of 50 series owners benefit from the information here, and I do not want to see the community get taken advantage of and somebody else gain from it unfairly.

The information in pdf format will hopefully allow more of these wonderful trucks to stay on the road by providing information to everybody.

This has been quite a long and involved process to scan the manual and to convert it into a pdf format. I do aplogise as I have used several different scanners and several different computers to do it, so there are no doubt some errors hidden throughout, as well as some editing errors.

I have aimed to balance quality and file size and hope that this balance meets to everybody's approval.

If you see an error please let me know and I will fix it as soon as I can.

Road Test

Prior to performing a road test, be certain that the fluid level and condition, idling speed, selector linkage and throttle linkage have been checked and approved.

During the road test the transmission should be operated in each position to check for slipping and any variation in shifting. Note whether the shifts are harsh or spongy and check the speeds where the upshifts and downshifts occur. Approximate shift speeds are shown in Data.

Observe closely for slipping or engine speed flare-up. Slipping or flare-up in any gear usually indicates clutch, band, or overrunning clutch problems. If the condition is far advanced, an overhaul will probably be necessary to restore normal operation.

In most cases, the clutch or band that is slipping can be determined by noting the transmission operation in all selector positions and by comparing which internal units are applied in those positions. The "Clutch and Band Application Chart" provides a basis for road test analysis.

CLUTCH AND BAND APPLICATION CHART

Lever Position	Gear Ratio	Start Safety	Parking Sprag	Clutches				Bands	
				Front	Rear	Over-running	Lock-up	(Kickdown) Front	(Low-Rev.) Rear
P– PARK		×	×						
R– REVERSE	2.21			×					×
N– NEUTRAL		×							
D– DRIVE First	2.45				×	×			
Second	1.45				×			×	
Direct	1.00			×	×		×		
2– SECOND First	2.45				×	×			
Second	1.45				×			×	
–LOW (First)	2.45				×				×

X = Applied

By observing that the rear clutch is applied in both the "D" first gear and "I" first gear positions, but that the overrunning clutch is applied in "D" first and the low and reverse band is applied in "I" first, if the transmission slips in "D" range first gear but does not slip in "I" first gear, the overrunning clutch must be the unit that is slipping. Similarly, if the transmission slips in any two forward gears, the rear clutch is the slipping unit.

Using the same procedure, the rear clutch and front clutch are applied in "D" third gear. If the transmission slips in third gear, either the front or the rear clutch is slipping. By selecting another gear which does not use one of these units, the unit which is slipping can be determined. If the transmission also slips in reverse, the front clutch is slipping. If the transmission does not slip in reverse, the rear clutch is slipping.

This process of elimination can be used to detect any unit which slips and to confirm proper operation of good units. However, although road test analysis can usually diagnose slipping units, the actual cause of the malfunction usually cannot be decided. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

Therefore, unless the condition is obvious the transmission should never be dismantled until hydraulic pressure tests have been performed.

DIAGNOSIS CHART—GENERAL

POSSIBLE CAUSE		CONDITION																				
		HARSH ENGAGEMENT FROM NEUTRAL TO D OR R	DELAYED ENGAGEMENT FROM NEUTRAL TO D OR R	RUNAWAY UPSHIFT	NO UPSHIFT	3-2 KICKDOWN RUNAWAY	NO KICKDOWN OR NORMAL DOWNSHIFT	SHIFTS ERRATIC	SLIPS IN FORWARD DRIVE POSITIONS	SLIPS IN REVERSE ONLY	SLIPS IN ALL POSITIONS	NO DRIVE IN ANY POSITION	NO DRIVE IN FORWARD DRIVE POSITIONS	NO DRIVE IN REVERSE	DRIVES IN NEUTRAL	DRAGS OR LOCKS	GRATING, SCRAPING GROWLING NOISE	BUZZING NOISE	HARD TO FILL, OIL BLOWS OUT FILLER TUBE	TRANSMISSION OVERHEATS	HARSH UPSHIFT	DELAYED UPSHIFT
Overrunning clutch inner race damaged.	32																	×				
Overrunning clutch worn, broken or seized.	31								×				×			×	×					
Planetary gear sets broken or seized.	30											×	×	×		×	×					
Rear clutch dragging.	29														×							
Worn or faulty rear clutch.	28	×	×						×				×	×	×							
Insufficient clutch plate clearance.	27														×					×		
Faulty cooling system.	26																			×		
Kickdown band adjustment too tight.	25															×				×		
Hydraulic pressure too high.	24	×																			×	
Breather clogged.	23																		×			
High fluid level.	22																		×			
Worn or faulty front clutch.	21		×	×	×	×		×		×				×								×
Kickdown servo band or linkage malfunction.	20			×	×	×	×	×														×
Governor malfunction.	19				×		×	×														×
Worn or broken reaction shaft support seal rings.	18		×	×	×	×		×		×				×								×
Governor support seal rings broken or worn.	17				×			×														×
Output shaft bearing and/or bushing damaged.	16																×					
Overrunning clutch not holding.	15								×				×									
Kickdown band out of adjustment.	14					×											×				×	×
Incorrect throttle linkage adjustment.	13			×	×	×	×	×	×												×	×
Engine idle speed too low.	12		×																			
Aerated fluid.	11		×	×		×		×	×	×	×							×	×			
Worn or broken input shaft seal rings.	10		×						×		×		×									
Faulty oil pump.	9		×					×	×	×	×	×								×		
Oil filter clogged.	8		×	×				×	×		×	×							×			
Incorrect gearshift control linkage adjustment.	7		×		×			×	×	×				×	×					×		
Low fluid level.	6		×	×	×	×		×	×	×	×	×	×					×		×		
Low-reverse servo, band or linkage malfunction.	5		×							×				×								
Valve body malfunction or leakage.	4	×	×	×	×	×	×	×	×	×	×	×	×	×	×			×				
Low-reverse band out of adjustment.	3									×				×		×	×					
Hydraulic pressures too low.	2		×	×	×	×		×	×	×	×	×	×	×						×	×	
Engine idle speed too high.	1	×																		×		