Published: Jan 30, 2008

Automatic Transmission

Overview

This section is intended to provide a means for the technician to diagnose transmission component faults, rather than replacing the entire unit.

However, there are a number of situations where the replacement of the unit is the only practical solution, and this section will cover the diagnosis necessary to gather the information required for transmission replacement to be authorized by the warranty prior approval program (WPAP) where it applies, as well as covering the diagnostic trouble codes (DTCs) stored by the control module.

The basic checks of the transmission (fluid condition and level, etc) should be carried out first, and this will mean using the approved diagnostic system or other equipment with data logging facility to monitor temperatures, etc.

For information on the operation of the transmission, refer to the relevant workshop manual section.

Inspection and verification

1 . Verify the customer concern.

2 . Visually inspect for obvious mechanical or electrical faults.

Mechanical	Electrical
• Fluid condition • Fluid level • Fluid leaks • Fluid cooler • External linkages • Gear selector lever	• Fuses • Wiring harnesses • Electrical connector(s) • Transmission control module (TCM) • Engine control module (ECM) • Controller area network (CAN) circuits

3 . If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

4 . Use the approved diagnostic system or a scan tool to retrieve any DTCs before moving onto the DTC index.

Because the DTCs are stored in more than one module, a complete vehicle read is recommended

Make sure that all DTCs are cleared following rectification.

Preliminary inspection

1 . As much information as possible should be obtained from the owner/driver about the fault in order to assist with the diagnosis. Time spent on this will reduce the necessity for extensive road testing and possible missed diagnosis.

The information required for WPAP is still useful as an aid to diagnosis, even where the system is not in operation

Required information for WPAP (where applicable)

- The nature of the fault (loss of drive, slip, judder, gear shift quality, noise, etc)
- The frequency with which the fault occurs
- The conditions under which the fault occurs, including temperature (coolant and ambient), selected gear, road speed, engine speed, and any specific conditions
- Check and rectify non-transmission related DTCs before continuing with transmission diagnosis

2 . Record the vehicle details, including:

- Service history
- The transmission serial number
- The transmission software level

3 . Visually inspect the transmission for fluid leaks, damage, etc.

4 . Check the transmission fluid condition.

NOTE:

Fluid condition is a good indicator of the transmission internal condition. If the fluid is burnt and/or contaminated, this would usually mean the internal damage to the transmission is at such a level that unit replacement is the best option. Compare the fluid drained from the transmission with fresh fluid for color and odor.

5 . Check the transmission fluid level. Refer to the relevant workshop manual section.

NOTE:

This is crucial to the operation of the transmission, and the procedure must be closely followed to avoid inaccurate diagnosis, with the resultant possible rejection of a warranty claim.

6 . Check the engine idle speed and throttle sensor using the approved diagnostic system or a scan tool.

7 . Check the transmission selector cable adjustment. Refer to the relevant workshop manual section.

8 . Check the transmission range sensor adjustment.

A comprehensive procedure for transmission range sensor setting is accessible through the approved diagnostic system.

If any faults are found and rectified in the above sequence, clear any DTCs and test the vehicle for normal operation.

If a failure condition is found indicating the need to renew the transmission assembly, the request must go through the warranty prior approval program (where applicable) before work is begun.

DTC index

NOTE:

Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

DTC	Description	Possible causes	Action
	Throttle/Pedal	• Throttle position sensor wiring high resistance • Throttle position sensor sensing circuits (Throttle	

P012100	Position Sensor A Circuit Range/Performance	position 1 or Throttle position 2) short circuit to power • Throttle position sensor failure • Range/Performance Kickdown at low pedal openings	Check for pedal position sensor DTCs. Configure the module using the approved diagnostic system.
P021900	Engine Overspeed Condition	• Engine speed implausible	Check for engine management DTCs.
P050000	Vehicle Speed Sensor A	• Vehicle speed signal not detected	Check for ABS DTCs. Check the CAN circuits. Refer to the electrical guides.
P050100	Vehicle Speed Sensor A Range/Performance	• Range/Performance	Check for input/output sensor DTCs. Check the CAN circuits. Refer to the electrical guides.
P056100	System Voltage Unstable	• Power supply voltage is out of range when the engine is running	Check the battery and charging system. Refer to the relevant workshop manual section.
P056200	System Voltage Low	• Supply voltage to TCM very low	Check the battery condition and state of charge. Check the TCM supply circuits. Refer to the electrical guides.
P056300	System Voltage High	• Power supply voltage is too high if the engine is running and there has been no jump-start or transmission limp-home event	Check the battery and charging system. Refer to the relevant workshop manual section. Check if the vehicle has been jump-started.
P060100	Internal Control Module Memory Check Sum Error	• Checksum error	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P060300	Internal Control Module Keep Alive Memory (KAM) Error	• Keep-alive memory (KAM) error	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P060500	Internal Control Module Read Only Memory (ROM) Error	• Read only memory (ROM) error	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P061300	TCM Processor	• Processor	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P062F00	Internal Control Module EEPROM Error	• EEPROM error	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P064200	Sensor Reference Voltage A Circuit Low	• Reference voltage circuit short circuit to ground • Reference voltage circuit high resistance	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P064300	Sensor Reference Voltage A Circuit High	• Reference voltage circuit short circuit to power	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P065700	Actuator Supply Voltage A Circuit / Open	• Supply voltage circuit high resistance	Refer to the guided diagnostic routine for this code on the approved diagnostic system.

P065800	Actuator Supply Voltage A Circuit Low	• Supply voltage circuit short circuit to ground	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P065900	Actuator Supply Voltage A Circuit High	• Supply voltage circuit short circuit to power	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P066800	PCM / ECM / TCM Internal Temperature Sensor A Circuit Low	• Temperature sensor circuit high resistance • Temperature sensor circuit short circuit to ground	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P066900	PCM / ECM / TCM Internal Temperature Sensor A Circuit High	• Temperature sensor circuit short circuit to power	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P070500	Transmission Range Sensor A Circuit (PRNDL Input)	• Signal implausible	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P071000	Transmission Fluid Temperature Sensor A Circuit	• Temperature rise rate too low	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P071100	Transmission Fluid Temperature Sensor A Circuit Range/Performance	• Sensor circuits: short circuit to each other	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P071200	Transmission Fluid Temperature Sensor A Circuit Low	• Sensor circuit high resistance • Sensor circuit short circuit to ground	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P071300	Transmission Fluid Temperature Sensor A Circuit High	• Sensor circuit short circuit to power	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P071600	Turbine/Input Shaft Speed Sensor A Circuit Range/Performance	• Sensor circuit high resistance • Sensor circuit short circuit to ground	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P071700	Turbine/Input Shaft Speed Sensor A Circuit No Signal	• Sensor circuit short circuit to power	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P072000	Output Shaft Speed Sensor Circuit	• Sensor circuit short circuit to power • Sensor circuit high resistance • Sensor circuit short circuit to ground	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P072122	Output Shaft Speed Sensor Circuit Range/Performance	• Range/Performance Signal amplitude	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P072127	Output Shaft Speed Sensor Circuit Range/Performance	• Range/Performance • Signal rate of change above threshold	Refer to the guided diagnostic routine for this code on the approved diagnostic system.

P072164	Output Shaft Speed Sensor Circuit Range/Performance	• Range/Performance • Signal plausibility failure	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P072900	Gear 6 Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073000	Incorrect Gear Ratio	• Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073100	Gear 1 Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073200	Gear 2 Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073300	Gear 3 Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073400	Gear 4 Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073500	Gear 5 Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P073600	Reverse Incorrect Ratio	• Incorrect ratio Slip too high between input and output shaft speeds	Check for speed sensor DTCs. Check the sensor circuits. Refer to the electrical guides.
P074000	Torque Converter Clutch Solenoid Circuit / Open	• Solenoid circuit high resistance	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P074100	Torque Converter Clutch Solenoid Circuit Performance/Stuck Off	• Solenoid circuit stuck off	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P074800	Pressure Control Solenoid A Electrical	• Solenoid current too high/low	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P075113	Shift Solenoid A Performance/Stuck Off	• Performance • Stuck off • Solenoid circuit high resistance	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
	Shift Solenoid A	• Performance • Stuck off • Solenoid circuit high	

P075114	Shift Solenoid A Performance/Stuck Off	• Solenoid circuit high resistance • Solenoid circuit short circuit to ground	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P075200	Shift Solenoid A Stuck On	• Stuck on	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P075300	Shift Solenoid A Electrical	• Solenoid circuit short circuit to power	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P077800	Pressure Control Solenoid B Electrical	• Solenoid current too high	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P078000	Shift malfunction	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078123	1 - 2 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open	Check the fluid level and condition. Check for associated DTCs.
P078162	1 - 2 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078164	1 - 2 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078262	2 - 3 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078264	2 - 3 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078323	3 - 4 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open	Check the fluid level and condition. Check for associated DTCs.
P078362	3 - 4 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078364	3 - 4 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078423	4 - 5 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open	Check the fluid level and condition. Check for associated DTCs.

P078462	4 - 5 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P078464	4 - 5 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P079800	Pressure Control Solenoid C Electrical	• Solenoid current too high	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P081C00	Park Input Circuit	• Park lock signal fault	Check the gear selector input circuits. Refer to the electrical guides.
P082600	Up and Down Switch Circuit	• Implausible signal	Check the up and down switch circuits. Refer to the electrical guides.
P082923	5-6 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open	Check the fluid level and condition. Check for associated DTCs.
P082962	5-6 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P082964	5-6 Shift	• Input/Output shaft ratio too high during a shift Clutch does not open or close	Check the fluid level and condition. Check for associated DTCs.
P085000	Park / Neutral Switch Input Circuit	• Starter inhibit signal fault	Check the starter inhibit circuits. Refer to the electrical guides.
P089700	Transmission Fluid Deteriorated	• Temperature too high over too long a time	Renew the fluid.
P092800	Gear Shift Lock Solenoid/Actuator Circuit A / Open	• Solenoid circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P092900	Gear Shift Lock Solenoid/Actuator Circuit A Range/Performance	• Solenoid circuit short circuit to ground • Solenoid circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P093000	Gear Shift Lock Solenoid/Actuator Circuit A Low	• Solenoid circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P093100	Gear Shift Lock Solenoid/Actuator Circuit A High	• Solenoid circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.
P093800	Hydraulic Oil Temperature Sensor Range/Performance	• Range/Performance Signal not plausible	Refer to the guided diagnostic routine for this code on the approved diagnostic system.
P096013	Pressure Control Solenoid A Control Circuit / Open	• Control circuit high resistance	Refer to the guided diagnostic routine for this code on the approved diagnostic system.

P096014	Pressure Control Solenoid A Control Circuit / Open	• Control circuit high resistance • Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P096200	Pressure Control Solenoid A Control Circuit Low	• Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P096300	Pressure Control Solenoid A Control Circuit High	• Control circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.
P096413	Pressure Control Solenoid B Control Circuit / Open	• Control circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P096414	Pressure Control Solenoid B Control Circuit / Open	• Control circuit high resistance • Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P096600	Pressure Control Solenoid B Control Circuit Low	• Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P096700	Pressure Control Solenoid B Control Circuit High	• Control circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.
P096813	Pressure Control Solenoid C Control Circuit / Open	• Control circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P096814	Pressure Control Solenoid C Control Circuit / Open	• Control circuit high resistance • Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P097000	Pressure Control Solenoid C Control Circuit Low	• Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P097100	Pressure Control Solenoid C Control Circuit High	• Control circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.
P178300	Transmission Overtemperature Condition	• Valve body module shut-down detected on last drive cycle	Check the fluid level and condition. Check for associated DTCs.
P271600	Pressure Control Solenoid D Electrical	• Solenoid current too high	Check the solenoid circuits. Refer to the electrical guides.
P271813	Pressure Control Solenoid D Control Circuit / Open	• Control circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P271814	Pressure Control Solenoid D Control Circuit / Open	• Control circuit high resistance • Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P272000	Pressure Control Solenoid D Control Circuit Low	• Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P272100	Pressure Control Solenoid D Control Circuit High	• Control circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.

P272500	Pressure Control Solenoid E Electrical	• Solenoid current too high	Check the solenoid circuits. Refer to the electrical guides.
P272713	Pressure Control Solenoid E Control Circuit / Open	• Control circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P272714	Pressure Control Solenoid E Control Circuit / Open	• Control circuit high resistance • Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P272900	Pressure Control Solenoid E Control Circuit Low	• Control circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
P273000	Pressure Control Solenoid E Control Circuit High	• Control circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.
P275900	Torque Converter Clutch Pressure Control Solenoid Electrical	• Pressure control solenoid fault	Check the solenoid circuits. Refer to the electrical guides.
P276100	Torque Converter Clutch Pressure Control Solenoid Control Circuit / Open	• Pressure control solenoid circuit high resistance	Check the solenoid circuits. Refer to the electrical guides.
P276200	Torque Converter Clutch Pressure Control Solenoid Control Circuit Range / Perf	• Pressure control solenoid circuit current too low	Check the solenoid circuits. Refer to the electrical guides.
P276300	Torque Converter Clutch Pressure Control Solenoid Control Circuit High	• Pressure control solenoid circuit short circuit to power	Check the solenoid circuits. Refer to the electrical guides.
P276400	Torque Converter Clutch Pressure Control Solenoid Control Circuit Low	• Pressure control solenoid circuit short circuit to ground	Check the solenoid circuits. Refer to the electrical guides.
U000188	High Speed CAN Communication Bus	• Bus off	The module setting this code has disabled CAN transmission. Check for other bus off codes. Check the module and circuits. Refer to the electrical guides. Refer to the warranty policy and procedures manual if a module is suspect.
U010087	Lost Communication With ECM/PCM "A"	• Missing message	Check the ECM and circuits. Refer to the electrical guides.
U010287	Lost Communication with Transfer Case Control Module	• Missing message	Check the transfer case control module and circuits. Refer to the electrical guides.
U010487	Lost Communication With Cruise Control Module	• Missing message	Check the speed control module and circuits. Refer to the electrical guides.
U012287	Lost Communication With Vehicle Dynamics Control	• Missing message	Check the ABS module and circuits. Refer to the electrical guides.

	Module		
U012687	Lost Communication With Steering Angle Sensor Module	• Missing message	Check the steering angle sensor and circuits. Refer to the electrical guides.
U012887	Lost Communication With Park Brake Control Module	• Missing message	Check the parking brake control module and circuits. Refer to the electrical guides.
U013887	Lost Communication with All Terrain Control Module	• Missing message	Check the all-terrain control module and circuits. Refer to the electrical guides.
U015587	Lost Communication With Instrument Panel Cluster (IPC) Control Module	• Missing message	Check the instrument cluster and circuits. Refer to the electrical guides.
U030055	Internal Control Module Software Incompatibility	• Module is not configured	Configure the module using the approved diagnostic system.
U040186	Invalid Data Received from ECM/PCM A	• Signal invalid	Check the engine speed at the instrument cluster. Check for ECM DTCs.
U041686	Invalid Data Received From Vehicle Dynamics Control Module	• Signal invalid	Check for ABS DTCs.
U30004A	Control Module	• Incorrect component installed Mismatch between configuration data and read configuration	Configure the module using the approved diagnostic system.