

Understanding The New Venture 243 Transfer Case, Part II

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In last month's article we left off with an overview of the basic operation and electronic components of the NV243 transfer case. We continue here with a look at the diagnostics and trouble code access. Obviously it is impossible to put 50 pages of tech into a few pages of this magazine. You can purchase a really excellent book on the subject that GM has published. The title is All Wheel Drive Four Wheel Drive and is GM publication number 14003.04-2. Owning and reading this manual will make you the local expert on GM transfer cases and fatten up your bottom line.

Whenever the ignition is turned on, the TCCM makes a series of checks. If these checks result in the TCCM seeing a problem, a diagnostic trouble code will be set.

RAM/ROM Check

When the ignition is turned on, the computer (TCCM) compares a calculated checksum for internal program memory with a similar calculation that is stored in the program. This makes sure that the software is operating correctly. If the comparison is not within the computer's parameters, the TCCM will set CODE 4, RAM/ROM failure. Generally, when you see such a code it will indicate that the TCCM must be replaced.

Data Memory Retention Check

If the RAM standby power supply is interrupted, the DTC memory will be cleared. After the TCCM tests the RAM/ROM it will

1

Code Number 2 Only

Code Number 1 And 3

Trouble Code Sequences

Fault Code	Number of Flashes	Fault Condition
1	1	Ram Standby Power Lost
2	2	Encoder Fault
3	3	TCCM Motor Circuit
4	4	RAM/ROM Failure

look to see whether the same data memory is stored as when the ignition was last turned off. If the power to the RAM was interrupted and the DTC memory was cleared, the TCCM will set DTC I (RAM Standby Power Failure). This code will clear automatically if the ignition is cycled five successive times.

Encoder Signal Check

Every time the ignition is turned on, the computer (TCCM) checks the signal from the encoder to see what gear the transfer case is in. If the transfer case is parked in neutral, the TCCM automatically

shifts it into 4WD high. Any other position will illuminate the transfer-case status lamps on the dash to alert the driver. This may seem unnecessary, but remember that the manufacturer has to deal with many owners who know nothing about how the vehicle works and don't care enough to read the owner's manual. We have seen several older units that the driver left parked in low range and the spouse got into the vehicle the next day and proceeded down the interstate at 60 mph. I can tell you that at 2-1 reduction in low, the valves will pass the space shuttle on the way up. *continues page 26*

Encoder Switch Monitor

Each time the transfer case shifts, the TCCM checks the encoder switch (part of the electric shift motor) for the correct shift pattern. Any time the encoder shows a position other than the next correct shift position, it ticks off 4 counts on an error counter internal to the TCCM. After 32 counts are received (8 successive errors), the TCCM will go into a default shift position where only shifts between 2WD and 4W low can be made, and DTC

2 will be set. To keep the TCCM insulated from random encoder faults created by rough roads, vibrations, electrical noise and contamination, the counter will drop back one count for each time the encoder functions properly. The TCCM must see a 25% failure rate for it to rate the encoder as permanently bad and set the code.

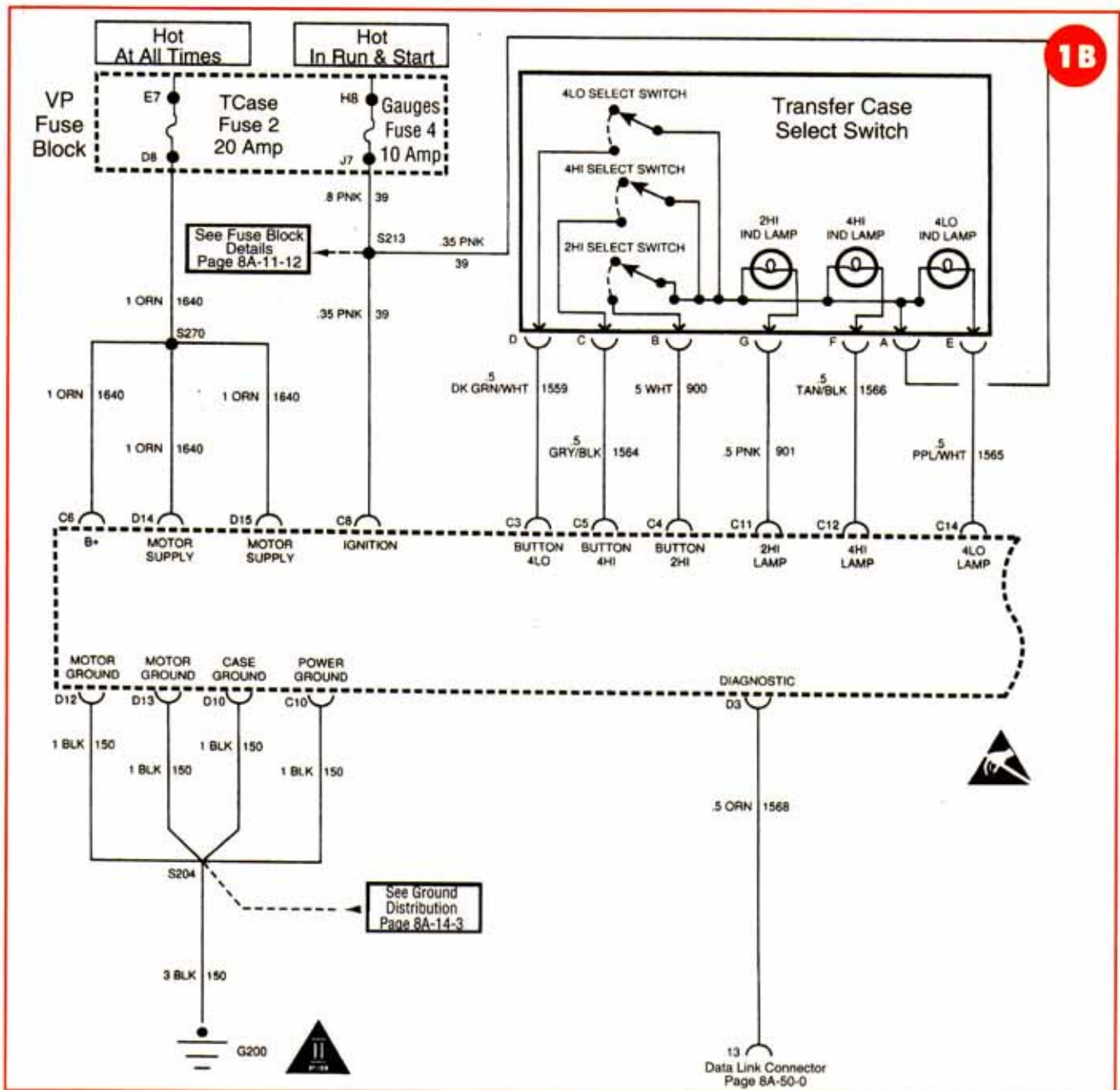
Motor Checks

The TCCM constantly checks the electric shift motor and circuits in

the on and off condition. If any of the following conditions show up and the motor cannot function properly, DTC 3 (TCCM motor circuit) will be set.

Any short or open in supply circuit 60, ground circuit 150, circuits 1552 or 1553, any of the associated wire connectors, a ground fault or short inside the motor itself, or one of the two motor relays not functioning correctly will cause a DTC 3 to set.

continues page 28



Relay Voltage Check

If the TCCM does not see the correct voltage after going on or off, the shift will be canceled and a DTC 3 will show up. The failure of the TCCM to see both relays with the proper voltage after they turn off will cause the TCCM to turn on both relays, which will remain on even with the ignition off. The status lights will flash, indicating a code set that needs attention. If this condition persists it will result in a possible dead battery in the vehicle

due to the continuous power draw. I'll bet a lot of batteries and alternators will change hands by the unknowing trying to solve this problem.

By now I am sure that your next question is, "How do we read and clear codes?" The accompanying diagram of the diagnostic link will identify terminal J. Connecting a jumper wire between terminals J and A, or J and a good ground, and turning the ignition to the run position will enable the diagnostic

routine, and the status lights for 4-wheel-drive on the dash will begin to flash any stored DTCs. There will be a rapid flash signifying the code and a 3-second break with the codes repeated. This will continue until the ignition is turned off or the ground at terminal J is removed. Clearing codes to verify whether they return or after a repair is completed also is very simple. Turn off the ignition and remove the TCCM 20-amp fuse located in the

continues page 30

