

Bulletin: TAIB-0837

Date: February 13, 2012

Bulletin Type: Service

Topic: Transmission Upshift Complaints with No Transmission Fault Codes

Issue Description:

Eaton Automated Transmission will not make an upshift in auto mode until the throttle is released or transmission is upshifted manually. During the concern, the gear display will indicate a solid current gear and with no upshift or downshift arrows, as well as no flashing “F” or transmission service light. Engine may also be unresponsive to throttle input. The Transmission ECU (TECU) may not log fault codes. These complaints are shifting related, but vehicle systems can contribute to the concern.

Root Cause:

It has been determined that any one of the following OEM vehicle interface conditions will cause a transmission upshift complaint:

- Engine issues (fault codes, engine over temp, fuel system, etc.) causing derated engine power
- Incomplete exhaust after-treatment “regen” cycle resulting in derated engine power
- Engine software changes overwriting automated transmission settings
- Engine governed rpm parameter below the transmission shift point rpm
- Engine software compatibility issues
- Changes in transmission and/or engine programmable parameters (governed RPM, road speed limits, etc.)
- Engine accessories (cooling fan, AC, PTO, etc.) not operating properly.
- Data link (J1939) availability/message priority issues or faults

- Other modules setting data link faults or overloading the link
- Intermittent data link failures
- Unintended ABS/Traction/Stability Control events.

Background Information:

Engine:

Automated transmissions rely on engine broadcasted torque, speed and throttle data to determine when to shift the transmission. When engine conditions occur that cause low torque output (engine faults, coolant over temp, etc.) the transmission shift calculations will change. Similarly, accessory loads that are not operating properly (engine cooling fan and AC compressor on when commanded off) are not figured into reported net torque correctly, causing biased shift calculations.

Emissions:

Vehicles equipped with exhaust after-treatment systems (2010 emissions and newer) require proper maintenance and a periodic regen cycle. If a regen cycle is required and not properly completed, the system will notify the driver with warning indicators and derate the engine resulting in degraded shift performance.

Data link J1939:

Automated transmission also relies on data link integrity to communicate shift commands to the engine. If the data link hardware degrades, intermittently fails, or is overloaded with messages from other modules (ABS, collision prevention, satellite, etc.), the engine may not receive transmission messages, resulting in degraded shift performance.

ABS/Traction/Stability Control:

Unintended ABS, traction and stability control events can result in the ABS module taking command of the throttle from the driver as well as inhibit transmission communication to the engine. If the ABS system experiences an unintended event due to erratic or incorrect data (wheel speed sensor, brake switch input, etc.), the ABS and/or Stability Control system may take throttle command away from the driver and override transmission shift commands and result in degraded shift performance.

Field Strategy:

Prior to performing a transmission repair, diagnose and resolve the OEM vehicle interface issues listed below:

- Engine fault codes and other engine systems (emissions, EGR, boost, fuel and air intake) for possible issues.
- Engine cooling system faults and engine coolant over temp issues.
- After-treatment systems faults and perform a system regen cycle if required.

- Software issues such as customer-programmable parameters, engine parameter settings, software updates and software compatibility issues. Reference Eaton Engine Configuration Guide TAIB0910.
- Engine accessory loads not functioning properly such as a cooling fan, A/C or PTO that may cause a “parasitic” load that the engine is not calculating to determine net torque.
- Vehicle data link fault codes, hardware, wiring, module grounds and other modules interfering with data link operation. Aftermarket accessory modules such as collision prevention, GPS and lane changing assist devices may also induce an issue to the vehicle data link.
- ABS/Traction/Stability Control faults including faulty wheel speed, data link or brake switch inputs.

Affected Models/Population:

AutoShift, UltraShift and UltraShift *Plus*, Automated transmissions.

Warranty Information:

Warranty Parts:

- NA
- NA

Warranty Labor:

- As allowed by Eaton Real Time Warranty only

Warranty Coverage:

No repair or replacement of a non-Eaton component will be covered without direct authorization from Eaton Real Time Warranty

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