

NISSAN · POWERTRAIN

P1687

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P1687 · Nissan

A/T FI Signal B High Input

P1687 on a Nissan means the automatic transmission control module (TCM) has detected an abnormally high voltage on the 'FI Signal B' circuit, which is a feedback line from the engine control module (ECM) carrying fuel injection or throttle-related data used for shift scheduling. The TCM expects this signal to toggle within a specific voltage window, and a sustained high reading tells it the circuit is shorted to power, open, or the ECM is not sending the expected pulse.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Nissan specific	Medium	Professional	Computer and output circuits

Symptoms you may notice

- The service engine soon light or automatic transmission warning lamp illuminates steadily.
- Often no symptoms besides the warning light, especially during light-throttle driving.
- Harsh or delayed upshifts as the TCM defaults to a fail-safe shift schedule.
- The transmission may hold a gear longer than normal or refuse to enter overdrive.
- A slight stumble or hesitation on acceleration if the ECM signal is intermittent.
- In some cases the vehicle enters limp mode with reduced engine power.

Common causes, most likely first

- A chafed or shorted FI Signal B wire in the engine-to-transmission harness, often near the bellhousing or exhaust heat.
- Corroded or loose pins at the TCM connector or the ECM connector on the FI Signal B terminal.
- A failed TCM that misreads a correct signal as high voltage.
- An ECM that is not outputting the FI Signal B pulse due to an internal fault.
- Water intrusion into the TCM connector or harness loom causing a short to battery voltage.
- Aftermarket electrical accessories tapped into the FI signal circuit, such as alarm or remote-start wiring.



How to diagnose and fix it

- 1 Scan all modules and record freeze-frame data for P1687, then clear the code and test-drive to confirm it returns under the same conditions.
- 2 Inspect the engine-to-transmission harness for chafing, heat damage, or pinched sections, especially around the bellhousing and exhaust manifold.
- 3 Disconnect the TCM and ECM connectors and check the FI Signal B terminal for corrosion, backed-out pins, or water intrusion.
- 4 Measure voltage on the FI Signal B circuit with the key on and engine running; compare against the factory specification for your Nissan model.
- 5 Perform a wiggle test on the harness while watching live data for the FI Signal B parameter to catch an intermittent short.
- 6 If the circuit tests good, substitute a known-good TCM and recheck; if the code persists, test or replace the ECM.
- 7 After repair, clear codes and verify the transmission shifts through all gears with no pending or stored P1687.

What the FI Signal B circuit actually does

- Many technicians replace the TCM first, but a chafed FI Signal B wire near the exhaust heat shield is the most common root cause on older Nissan models.
- P1687 can set intermittently from a loose battery ground or a weak alternator diode that spikes voltage on the signal line, so check charging system ripple before condemning the TCM.
- The FI Signal B line is a shared data path, so a fault in the ECM's fuel injection output can set this code even though the transmission itself is healthy.
- Aftermarket remote starters and alarm systems tapped into the engine harness are a frequent cause of a high-voltage reading on this circuit.
- A TCM that has logged P1687 may still shift normally after a battery disconnect, leading owners to believe the fault is fixed when the underlying wire damage remains.

Can I keep driving with P1687?

You can usually drive the vehicle to a shop, but expect harsh shifts and possible limp mode; avoid heavy throttle and towing until the circuit is diagnosed, because a failed TCM can leave the transmission stuck in a single gear.

Tools that help

- OBD-II scan tool with Nissan-specific live data and freeze-frame capability
- Digital multimeter with back-probe pins
- Factory service information with connector pinouts and voltage specifications
- Wire terminal pick and crimping tools
- Insulated test leads for wiggle testing



Reading P1687

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (Nissan): its meaning depends on the make.
- 6** Computer and output circuits.
- 87** The exact fault within that area.

Often seen with

P1686 Control Unit Error Programming · **P1778** Solenoid EV7 Electrical Malfunction · **P1686** A/T FI Signal B Low Input · **P1686** Metering Oil Pump Stepping Motor Cont Circuit · **P1688** Metering Oil Pump Stepping Motor Cont Circuit · **P1778** Transmission Reverse IP Circuit · **P1686** A/T FI Signal B Low Input · **P1686** Driver 5 Line 6 · **P1688** Internal Fuel Injection Pump Controller Failure · **P1686** No SKIM Bus Message Received · **P1688** Internal Fuel Injection Pump Controller Failure · **P0700** Transmission Control System Malfunction · **P0720** Output Speed Sensor Circuit Malfunction

See it working

Watch the animated explainer [Master the Four-Stroke Engine Cycle](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/nissan-p1687/>

