

GENERIC · POWERTRAIN

P0601

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0601

Internal Control Module Memory Checksum Error

P0601 means the engine control module (ECM) or powertrain control module (PCM) has detected a checksum error in its own internal memory, indicating that the data stored in its non-volatile memory has become corrupted. The computer runs a self-test on its memory at key-on and during operation, and when the calculated checksum does not match the expected value, it sets this code and may illuminate the check engine light.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Generic (all makes)	High	Professional	Computer and output circuits

Symptoms you may notice

- Check engine light illuminated, often with no other noticeable symptoms
- Intermittent stalling or rough running as the module struggles to execute corrupted data
- Failure to start or crank, especially in cases where the memory corruption affects startup routines
- Erratic transmission shifting or other drivability issues if the corrupted memory affects control strategies
- Multiple unrelated trouble codes stored simultaneously due to the module's inability to process data correctly
- No symptoms besides the warning light in many cases, particularly when the corruption is in a non-critical memory area

Common causes, most likely first

- Internal memory corruption within the ECM/PCM due to age, heat, or voltage spikes
- Low battery voltage or a weak battery that causes the module to write incorrect data during power-up
- Poor electrical connections at the ECM/PCM harness or ground points leading to voltage fluctuations
- A failed or failing ECM/PCM internal flash memory or processor
- Electrical interference or a short in the wiring harness that damages the module's memory
- Software or calibration corruption from an interrupted reprogramming event or a failed update
- Water intrusion or physical damage to the ECM/PCM circuit board



How to diagnose and fix it

- 1 Verify battery voltage and condition; a weak battery is a common cause of memory corruption and should be charged or replaced first
- 2 Check all ECM/PCM power and ground connections for corrosion, looseness, or damage, and clean or repair as needed
- 3 Inspect the wiring harness for chafing, shorts, or signs of water intrusion that could affect module operation
- 4 Clear the code and perform a road test to see if it returns; an intermittent low-voltage event may not recur
- 5 If the code persists, check for technical service bulletins (TSBs) or manufacturer-specific reprogramming procedures that may address known memory issues
- 6 Reprogram or reflash the ECM/PCM with the latest calibration using a factory scan tool if a software update is available
- 7 Replace and reprogram the ECM/PCM if internal memory failure is confirmed, as this is the final step after all electrical checks pass

Before you replace the engine computer

- A weak or failing battery is one of the most overlooked causes of P0601; the voltage dip during cranking can corrupt the module's memory, so always load-test the battery before condemning the ECM.
- P0601 does not always mean the ECM is permanently damaged; clearing the code after fixing a voltage supply issue often resolves the problem without any parts replacement.
- Corroded or loose ground connections at the engine block or chassis can create voltage spikes that mimic internal memory failure, so inspect and clean all grounds thoroughly.
- Some vehicles require a relearn or reprogramming procedure after battery replacement to prevent memory checksum errors, and skipping this step can cause the code to return.
- A failed reprogramming attempt or an interrupted software update can leave the ECM in a state where it sets P0601; in such cases, a successful reflash with a stable power supply is the correct repair.

Can I keep driving with P0601?

It is not safe to continue driving with P0601 because the engine computer may behave unpredictably, causing stalling or loss of power that could lead to a crash. Have the vehicle towed to a repair shop for diagnosis rather than risking a breakdown or unsafe operation.

Tools that help

- OBD-II scan tool with live data and code-clearing capability
- Digital multimeter for voltage and continuity checks
- Battery load tester
- Factory service information or wiring diagrams for the specific vehicle
- Factory scan tool or J2534 pass-through device for reprogramming



Reading P0601

- P** Powertrain: engine, transmission and emissions.
- 0** Generic (SAE) code: it means the same thing on every OBD-II vehicle.
- 6** Computer and output circuits.
- 01** The exact fault within that area.

Often seen with

P0602 Control Module Programming Error · **P0603** Internal Control Module KAM Error · **P0604** Internal Control Module RAM Error · **P0605** Internal Control Module ROM Error · **P0606** PCM Processor Fault

See it working

Watch the animated explainer [How Hydraulic Brakes Work: Pedal to Caliper](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0601/>

