

GENERIC · POWERTRAIN

P0603

OBD-II DIAGNOSTIC TROUBLE CODE (DTC)

P0603

Internal Control Module KAM Error

P0603 indicates the engine control module (ECM) has detected a fault in its keep-alive memory (KAM), which is the non-volatile storage that retains adaptive learning values and certain configuration data when the ignition is off. The ECM sets this code when a self-test of the KAM circuit or its contents fails, meaning the module cannot reliably store or retrieve critical data.

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

Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms.
- Rough or erratic engine operation if adaptive learning values are lost and the ECM reverts to default parameters.
- Intermittent stalling or poor idle quality after the engine is restarted.
- Transmission shift quality may degrade as the transmission control module (TCM) loses learned shift adaptives.
- Occasional no-start condition if the ECM cannot retrieve essential configuration data.
- Other unrelated trouble codes may be stored simultaneously due to corrupted memory.

Common causes, most likely first

- 1 A failing or degraded battery that cannot maintain stable voltage to the ECM's memory circuit.
- 2 Poor electrical connections at the battery terminals, grounds, or ECM harness connectors, causing voltage drops.
- 3 An internal fault within the ECM itself, such as corrupted memory or a failed KAM circuit component.
- 4 A blown fuse or faulty relay that supplies constant power to the ECM's keep-alive memory.
- 5 Wiring damage (opens, shorts, or corrosion) in the circuit that provides constant battery power to the ECM.
- 6 Voltage spikes or electrical interference from other components affecting the ECM's memory integrity.



How to diagnose and fix it

- 1 Perform a battery test with a conductance tester and load test; replace the battery if it fails or is marginal.
- 2 Inspect and clean battery terminals, ground straps, and ECM connectors for corrosion or looseness.
- 3 Check all fuses and relays that supply constant power to the ECM, verifying voltage at the ECM connector with the key off.
- 4 Use a scan tool to clear the code and perform a relearn or adaptive reset procedure if the manufacturer requires it.
- 5 Perform a voltage drop test on the ECM's power and ground circuits to identify excessive resistance.
- 6 If all external circuits and power supplies are good, reprogram or replace the ECM as the final step.
- 7 After repair, drive the vehicle through a complete drive cycle to confirm the code does not return.

KAM errors often misdiagnosed as ECM failure

- A weak battery that still starts the engine can cause P0603 because the ECM's keep-alive memory requires a stable, uninterrupted voltage even during cranking.
Many technicians replace the ECM prematurely when the real cause is a corroded ground connection or a failing ignition switch that interrupts power to the ECM.
- P0603 can be set by a voltage spike from jump-starting the vehicle incorrectly or from a faulty alternator with excessive ripple.
- Some vehicles require a specific relearn procedure after clearing P0603; skipping it can cause drivability issues that mimic a recurring fault.

The code may appear only intermittently, making it essential to check for stored history codes and freeze-frame data before assuming a hard failure.

Can I keep driving with P0603?

The vehicle is generally safe to drive with P0603, but performance and shift quality may be affected, and the engine could stall unexpectedly. Avoid long trips and have the fault diagnosed promptly, especially if drivability symptoms are present.

Tools that help

- OBD-II scan tool with bidirectional control and relearn capabilities
- Digital multimeter with voltage drop testing function
- Battery conductance tester and load tester
- Fuse puller and test light
- Electrical contact cleaner and dielectric grease
- Vehicle-specific service information for ECM pinout and relearn procedures



Reading P0603

- 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.
- 03** The exact fault within that area.

Often seen with

P0600 Serial Communication Link Malfunction · **P0601** Internal Control Module Memory Checksum Error · **P0602** Control Module Programming Error · **P0604** Internal Control Module RAM Error · **P0606** PCM Processor Fault

See it working

Watch the animated explainer [How ABS Works: Anti-Lock Brakes in X-Ray](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/p0603/>

