



P1390 · Ford

Octane Adjust Out of Self-Test Range

P1390 on Ford vehicles means the powertrain control module (PCM) ran its octane adjust self-test and found the octane adjust value outside the expected range. The computer compared the knock sensor signal and ignition timing behaviour against a stored window during a specific self-test routine, and the result did not fall where Ford expects it to.

SYSTEM	CODE TYPE	SEVERITY	FIX DIFFICULTY	AREA
Powertrain	Ford specific	Low	Intermediate	Ignition system and misfire

Symptoms you may notice

- Illuminated check engine light, often with no other symptoms
- Slight loss of power or sluggish acceleration under load
- Occasional engine ping or rattle on acceleration with lower-octane fuel
- Rough idle or mild hesitation in some cases
- Poor fuel economy if the PCM has pulled timing to protect the engine
- No drivability complaint at all in many instances

Common causes, most likely first

- 1 Low-octane or poor-quality fuel in the tank during the self-test window
- 2 Faulty knock sensor or damaged knock sensor wiring/connector
- 3 Carbon buildup or mechanical noise in the engine mimicking knock
- 4 PCM calibration or software issue needing a Ford update
- 5 Loose or corroded PCM connector pins affecting the knock sensor circuit
- 6 Engine coolant temperature or intake air temperature sensor bias skewing the self-test conditions
- 7 Rare internal PCM fault in the knock control or self-test circuitry



How to diagnose and fix it

- 1 Verify fuel octane and quality; if recently filled with low-octane fuel, run the tank down and refill with the recommended grade before retesting
- 2 Scan all modules and record freeze-frame data to confirm the exact conditions when P1390 set
- 3 Inspect the knock sensor and its wiring for chafing, corrosion, or loose connections, and check sensor mounting torque
- 4 Check for mechanical engine noise or excessive carbon buildup that could be interpreted as knock
- 5 Verify engine coolant temperature and intake air temperature sensor readings against actual conditions with a scan tool
- 6 Check for and install any available Ford PCM calibration updates for the vehicle
- 7 If all else passes, perform a pinpoint test of the knock sensor circuit and PCM self-test routine per Ford service information

What Ford's octane self-test really checks

- P1390 is a self-test result, not a live knock fault; the PCM runs this test under specific conditions and stores the code when the octane adjust value falls outside the calibrated window.
- Many P1390 codes are set after a single tank of low-octane fuel, so correcting the fuel and clearing the code often resolves it without any parts replacement.
- A noisy accessory drive, exhaust heat shield, or loose engine mount can create vibration the knock sensor picks up, mimicking knock and skewing the self-test.
- Technicians sometimes replace the knock sensor unnecessarily when the real problem is a skewed coolant temperature sensor or a PCM calibration that needs updating.
- This code does not always mean the engine is damaged; it means the PCM could not verify the octane adjust value within its expected range during the self-test.

Can I keep driving with P1390?

You can generally keep driving with P1390 because it is a self-test result and the PCM still protects the engine, but avoid heavy load or towing and use the recommended octane fuel until the code is diagnosed and cleared.

Tools that help

- OBD-II scan tool with Ford-specific software and freeze-frame capability
- Digital multimeter for circuit and sensor checks
- Knock sensor socket and torque wrench
- Fuel octane tester or fuel quality test kit
- Ford service information or pinpoint test procedures



Reading P1390

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (Ford): its meaning depends on the make.
- 3** Ignition system and misfire.
- 90** The exact fault within that area.

Often seen with

P0171 System Too Lean (Bank 1) · **P0300** Random/Multiple Cylinder Misfire Detected · **P0325** Knock Sensor 1 Circuit Malfunction (Bank 1) · **P0327** Knock Sensor 1 Circuit Low Input (Bank 1) · **P0328** Knock Sensor 1 Circuit High Input (Bank 1)

See it working

Watch the animated explainer [How an Automatic Transmission Works, Gear by Gear](#) on Auto Veteran to see the parts involved moving.

Full guide, related articles and animations: <https://www.autoveteran.tech/dtc-codes/ford-p1390/>

