



## P1177 · Ford

### Synchronization Fault

P1177 on Ford vehicles indicates a synchronization fault between the camshaft and crankshaft signals, meaning the powertrain control module (PCM) has detected a mismatch in the expected timing relationship. The PCM monitors these signals to ensure the engine's valve and piston motion stay coordinated, and this code sets when the correlation falls outside the allowed window.

| SYSTEM     | CODE TYPE     | SEVERITY | FIX DIFFICULTY | AREA                  |
|------------|---------------|----------|----------------|-----------------------|
| Powertrain | Ford specific | High     | Professional   | Fuel and air metering |

### Symptoms you may notice

- Illumination of the check engine light, often with no other noticeable symptoms
- Rough idle or stumbling, especially when the engine is cold
- Engine misfire or hesitation during acceleration
- Hard starting or extended cranking before the engine fires
- Reduced engine power or limp mode in some cases
- Poor fuel economy or increased emissions

### Common causes, most likely first

- 1 Worn or stretched timing chain or belt, causing the camshaft to drift out of sync with the crankshaft
- 2 Faulty camshaft position sensor or crankshaft position sensor, sending erratic signals to the PCM
- 3 Damaged or corroded wiring or connectors in the camshaft or crankshaft sensor circuits
- 4 A failing variable camshaft timing (VCT) solenoid or phaser, disrupting the camshaft's commanded position
- 5 Contaminated or low engine oil affecting VCT operation and sensor performance
- 6 PCM software issue or internal fault, though this is less common



## How to diagnose and fix it

- 1 Use a scan tool to retrieve all stored codes and freeze-frame data, then verify the P1177 is current and not history
- 2 Inspect the camshaft and crankshaft sensor wiring and connectors for damage, corrosion, or loose pins
- 3 Check engine oil level and condition, and perform an oil and filter change if the oil is dirty or the level is incorrect
- 4 Test the camshaft and crankshaft position sensors with a multimeter or oscilloscope to confirm signal integrity
- 5 Verify timing chain or belt alignment using factory procedures, looking for stretch or skipped teeth
- 6 Test the VCT solenoid for proper operation and clean or replace it if sticking or clogged
- 7 If all else fails, reflash or replace the PCM after confirming no other faults exist

## Before you replace the timing chain

- A stretched timing chain is a common cause on high-mileage Ford engines, but always rule out sensor and wiring faults first because they are cheaper and easier to fix.  
Dirty engine oil can clog VCT solenoids and cause synchronization faults, so regular oil changes with the correct viscosity are critical on Ford VCT engines.
- The P1177 code can sometimes be set by a weak battery or charging system issue that causes voltage spikes and disrupts sensor signals.
- After replacing timing components, the PCM may need a relearn procedure or a drive cycle to clear the code and confirm the repair.  
Do not ignore this code, as prolonged driving with a synchronization fault can lead to severe engine damage if the timing chain fails completely.

## Can I keep driving with P1177?

It is not safe to continue driving with a P1177 code because a synchronization fault can lead to sudden engine stall or catastrophic timing chain failure. Have the vehicle towed to a repair shop for diagnosis and repair.

## Tools that help

- OBD-II scan tool with live data and graphing capabilities
- Digital multimeter
- Oscilloscope for sensor signal analysis
- Timing light or factory timing tools
- Basic hand tools (wrenches, sockets, screwdrivers)



## Reading P1177

- P** Powertrain: engine, transmission and emissions.
- 1** Manufacturer-specific code (Ford): its meaning depends on the make.
- 1** Fuel and air metering.
- 77** The exact fault within that area.

## Often seen with

**P1178** Linear Oxygen Sensor Pump Current Open · **P1178** Long Term Fuel Trim Too Lean Banks 1 And 2 (AMFR) · **P1178** O2 Sensor Signal Circuit Slow Switching From Rich to Lean Ba · **P0016** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor A) · **P0017** Crankshaft/Camshaft Position Correlation (Bank 1 Sensor B) · **P0018** Crankshaft Position - Camshaft Position Correlation (Bank 2 · **P0019** Crankshaft Position - Camshaft Position Correlation (Bank 2

## 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-p1177/>

