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2019 Ford F 150 Manual - Service & Repair Workshop Guide

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	  Guided Routine available in the on-line Workshop Manual.

No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST U : P0521, P0524, P06DD, P06DE

Normal Operation and Fault Conditions

Refer to the DTC (diagnostic trouble code) Fault Trigger Conditions.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) P0521:00	Engine Oil Pressure Sensor/Switch 'A' Circuit Range/Performance: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects signal variation outside of the module parameters on the hardwired input from the engine oil pressure sensor.
PCM (powertrain control module) P0524:00	Engine Oil Pressure Too Low: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects low engine oil pressure.
PCM (powertrain control module) P06DD:00	Engine Oil Pressure Control Circuit Performance/Stuck Off: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects the engine oil pressure control solenoid valve is stuck off.
PCM (powertrain control module) P06DE:00	Engine Oil Pressure Control Circuit Stuck On: No Sub Type Information	This DTC (diagnostic trouble code) sets when the PCM (powertrain control module) detects the engine oil pressure control solenoid valve is stuck on.

No	GO to U3

U3 MONITOR THE ENGINE OIL PRESSURE PID (PARAMETER IDENTIFICATION) WITH THE ENGINE OFF

- Ignition OFF.
  - Wait at least 60 seconds.
- KOEO (key on, engine off)
- Using the diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Access the PCM (powertrain control module) and monitor the EOP_PRESS (Engine Oil Pressure) (kPa) PID (parameter identification)
- Wait approximately 30 seconds.

Does the engine oil pressure read approximately 0.0 psi (kPa) - 3.6 psi (25 kPa)?

Yes	GO to U4

No	VISUALLY CHECK the wiring harness and electrical connector for signs of damage. REPAIR as necessary. If there on no signs of damage, INSTALL a new engine oil pressure sensor. REFER to: Engine Oil Pressure (EOP) Sensor (303-14C Electronic Engine Controls - 3.5L EcoBoost (BM), Removal and Installation).

U4 CHECK THE ENGINE OIL PRESSURE AT IDLE

- Start the engine.
- Run the engine at idle for 2 minutes.
- Using the diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Access the PCM (powertrain control module) and monitor the ECT (Engine Coolant Temperature) (Deg C) PID (parameter identification)
  until the engine coolant temperature is equal or greater than 157.9 °F (70 °C).
- Access the PCM (powertrain control module) and monitor the EOPDC_CMD (Engine Oil Pressure Control Duty Cycle - Commanded) (% Duty Cycle) PID (parameter identification)
  Wait until the PID (parameter identification) display is greater than 60% DC (oil pump commanded low).
- Access the PCM (powertrain control module) and monitor the EOP_PRESS (Engine Oil Pressure) (kPa) PID (parameter identification)

Is the PID (parameter identification) equal or greater than 8.7 psi (60 kPa)?

No	GO to U7

U7 CARRY OUT THE VARIABLE OIL PRESSURE ACTUATOR UNBLOCK SEQUENCE AND RECHECK THE OIL PRESSURE

- Access the PCM (powertrain control module) and control the RPM_DSD (Desired Idle Speed (RPM)) (Rpm) PID (parameter identification)
- Set the desired engine speed to 1800 RPM (revolutions per minute) .
- Access the PCM (powertrain control module) and control the EOPDC_CMD (Engine Oil Pressure Control Duty Cycle - Commanded) (% Duty Cycle) PID (parameter identification)
- Command the PID (parameter identification) from MIN to MAX. Wait 15 seconds. Repeat this step 3 times waiting 15 seconds between steps.
- Access the PCM (powertrain control module) and control the EOPDC_CMD (Engine Oil Pressure Control Duty Cycle - Commanded) (% Duty Cycle) PID (parameter identification)
- Set the PID (parameter identification) to 0% and wait 10 seconds.
- Access the PCM (powertrain control module) and monitor the EOP_PRESS (Engine Oil Pressure) (kPa) PID (parameter identification)

Is the EOP_PRESS PID (parameter identification) display equal or greater than 31.2 psi (215 kPa)?

Yes	GO to U8

No	CHECK the oil pressure using a mechanical gauge. REFER to: Engine - Flex Fuel – Ethanol/Full Hybrid Electric Vehicle (FHEV)/Gasoline (303-00 Engine System - General Information, Diagnosis and Testing).

U8 CLEAR AND CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear all history PCM (powertrain control module) diagnostic trouble codes (DTCs)
- Ignition ON.
  - Wait 20 seconds.
- Start the engine and run at idle for 30 seconds.
- Hold the accelerator WOT (wide open throttle) for 30 seconds.
- Using a diagnostic scan tool, retrieve all PCM (powertrain control module) diagnostic trouble codes (DTCs).

V1 CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve all PCM (powertrain control module) diagnostic trouble codes (DTCs)

Are any PCM (powertrain control module) diagnostic trouble codes (DTCs) present?

Yes	GO to V2

No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.

V2 CLEAR AND CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, clear all PCM (powertrain control module) diagnostic trouble codes (DTCs)
- Using a diagnostic scan tool, retrieve all PCM (powertrain control module) diagnostic trouble codes (DTCs)

Are any PCM (powertrain control module) diagnostic trouble codes (DTCs) present?

Yes	GO to V3

No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.

V3 MONITOR THE ENGINE OIL PRESSURE CONTROL OUTPUT CIRCUIT FAULT PID (PARAMETER IDENTIFICATION)

- Ignition ON.
- Using the diagnostic scan tool, view PCM (powertrain control module) Parameter Identifications (PIDs).
- Access the PCM (powertrain control module) and monitor the EOPC_CIRC_F (Engine Oil Pressure Control Output Circuit Fault) PID (parameter identification)

Is the PID (parameter identification) reading True?

Yes	GO to V4

Is any voltage present?

Yes	REPAIR the circuit.

No	GO to V6

V6 CHECK THE OIL PRESSURE CONTROL SOLENOID CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C175T-60	Ω	C1890-2

Is the resistance less than 3 ohms?

Yes	GO to V7

No	REPAIR the circuit.

V7 CHECK THE OIL PRESSURE CONTROL SOLENOID CIRCUIT FOR A SHORT TO GROUND

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C1890-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

- corrosion (install new connector or terminals – clean module pins)
- damaged or bent pins - install new terminals/pins
- pushed-out pins - install new pins as necessary

- Reconnect **all** connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	REPAIR the circuit or connector as needed.

No	The system is operating correctly at this time. The concern may have been caused by loose module or solenoid connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST W : P06E9

Normal Operation and Fault Conditions

Refer to the DTC (diagnostic trouble code) Fault Trigger Conditions.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) P06E9:00	Engine Starter Performance: No Sub Type Information	No engine rotation detected during crank event

Possible Sources

- Battery
- Battery Cables
- IPC (instrument panel cluster)
- Starter
- BJB (battery junction box) starter relay
- Wiring, terminals or connectors

W1 VERIFY THE ENGINE CRANKS

- Place the ignition switch in the START position.

No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.

X2 REPROGRAM THE PCM (POWERTRAIN CONTROL MODULE)

- Reprogram the PCM with the latest software.
  REFER to: Module Programming(418-01A Module Configuration, General Procedures).
- Rerun the self test.

Did DTC (diagnostic trouble code) P1001 return?

Yes	 Guided Routine available in the on-line Workshop Manual.

No	The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition.

PINPOINT TEST Y : P112A

Normal Operation and Fault Conditions

REFER to: Module Controlled Functions - System Operation and Component Description(419-10 Multifunction Electronic Modules, Description and Operation).

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) P112A:00	Too Many Engine Starts During Factory/Transport Mode: No Sub Type Information	This DTC (diagnostic trouble code) sets when the factory/transport mode has not been deactivated.

Possible Sources

- Incorrect self-test procedure

module) P0605:00	(ROM) Error: No Sub Type Information	symptoms for further action. Check for aftermarket performance products. Refer to Flash EEPROM (electrically erasable programmable read only memory) , Programming the (VID) Block for a Replacement PCM (powertrain control module) .
PCM (powertrain control module) P0607:00	Control Module Performance: No Sub Type Information	Sets when the PCM (powertrain control module) detects the internal central processing unit (CPU) encounters an error. The PCM (powertrain control module) monitors itself and carries out internal checks of its own CPU. This DTC (diagnostic trouble code) sets if any of these checks returns an incorrect value. Reprogram or update the calibration. Check for other Diagnostic Trouble Codes (DTCs) and diagnose those first. Check for aftermarket performance products. Clear the Diagnostic Trouble Codes (DTCs), repeat the self-test.
PCM (powertrain control module) P062F:00	Internal Control Module EEPROM Error: No Sub Type Information	Sets when the PCM (powertrain control module) detects the read only memory (ROM) is corrupt. Check for other Diagnostic Trouble Codes (DTCs) and diagnose those first. Check for aftermarket performance products. Reprogram or update the calibration. Clear the Diagnostic Trouble Codes (DTCs) and repeat the self-test. If the DTC is retrieved again, carry out the passive PATS (passive anti-theft system) parameter reset. Clear the Diagnostic Trouble Codes (DTCs) and repeat the self-test.
PCM (powertrain control module) P0630:00	VIN Not Programmed or Incompatible - ECM/PCM: No Sub Type Information	Sets when the PCM (powertrain control module) detects various VID data that is out of a specified acceptable range. The PCM (powertrain control module) did not receive a valid vehicle identification number (VIN) during reprogramming. Check for all other module Diagnostic Trouble Codes (DTCs) or related symptoms. Diagnose all other module Diagnostic Trouble Codes (DTCs) before diagnosing this DTC (diagnostic trouble code) . Reprogram the BCM (body control module) , instrument cluster, and PCM (powertrain control module) using as built data. Refer to Flash EEPROM (electrically erasable programmable read only memory) , Programming The VID Block For A Replacement PCM (powertrain control module) , to reprogram the PCM (powertrain control module) .

		not allow reprogramming of the VID block, reflashing of the PCM (powertrain control module) is required.

Possible Sources

- Network communication concern
- PCM (powertrain control module)

Pinpoint Test Steps available in the on-line Workshop Manual.

PINPOINT TEST AA : P26C5, P26C6, P26C7, P26FE, P2BF5

Refer to Wiring Diagrams Cell 23for schematic and connector information.
Normal Operation and Fault Conditions There is an exhaust tailpipe actuator in the muffler outlet pipe to control exhaust noise. The PCM (powertrain control module) uses a PWM (pulse width modulation) circuit to control the operation of the tailpipe actuator. A second PWM (pulse width modulation) circuit is used by the tailpipe actuator to relay actuator position and faults back to the PCM (powertrain control module) . The PCM (powertrain control module) opens the actuators based on engine load, engine RPM (revolutions per minute) and vehicle speed. When the **exhaust mode** is in **Quiet** mode, the actuator is mostly closed (0 degrees). In **Normal and Sport** modes, the actuator partially opens (20-60 degrees) in partial throttle position. Putting the vehicle **exhaust mode** into **Baja, Track or Drag Strip** mode, forces the actuator to the full open position. Refer to the Owner's Literature for more information. **DTC Fault Trigger Conditions**

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) P26C5:00	Exhaust Flow Control Valve 'A' Control Circuit/Open: No Sub Type Information	This DTC (diagnostic trouble code) sets when an open is detected on the RH (right-hand) exhaust tailpipe actuator circuit.
PCM (powertrain control module) P26C6:00	Exhaust Flow Control Valve 'A' Control Circuit Low: No Sub Type Information	This DTC (diagnostic trouble code) sets when a short to ground is detected on the RH (right-hand) exhaust tailpipe actuator circuit.
PCM (powertrain control module) P26C7:00	Exhaust Flow Control Valve 'A' Control Circuit High: No Sub Type Information	This DTC (diagnostic trouble code) sets when a short to voltage is detected on the RH (right-hand) exhaust tailpipe actuator circuit.