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◀ Product: TRUCK ENGINE
Model: 3126B TRUCK ENGINE 7AS
Configuration: 3126B Truck Engine 7AS13353-UP

Troubleshooting

3126B and 3126E On-highway Engines

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Engine Cranks but Will Not Start

SMCS - 1000-035

Probable Causes

- Theft deterrent
- Diagnostic codes
- Air inlet shutoff (if equipped)
- Engine oil pressure
- Software for the Engine Control Module (ECM)
- Engine speed/timing signal
- Keyswitch
- Communication problems with the ECM
- Aftermarket engine protection devices
- Power to ECM
- Personality module
- ECM
- Hydraulic Electronic Unit Injectors (HEUI)
- Injection actuation pressure control system
- Fuel supply

- Combustion problem

Recommended Actions

Theft Deterrent

If the display screen on Messenger indicates that the theft deterrent is enabled, passwords must be entered before the engine will start.

Diagnostic Codes

Connect the Caterpillar Electronic Technician (ET) to the data link connector. Check for active diagnostic codes. Certain diagnostic codes may prevent the engine from starting.

Troubleshoot any diagnostic codes that are present before continuing with this procedure.

Air Inlet Shutoff (If Equipped)

If the engine was shut down due to the air inlet shutoff system, the air inlet shutoff must be manually reset.

Engine Oil Pressure

Check the engine oil level. Engine oil is used to activate the high pressure hydraulic pump.

Ensure that the engine oil meets Caterpillar recommendations. Refer to Operation and Maintenance Manual for further details.

Check for air in the high pressure oil system.

Crank the engine for 30 seconds. Allow time for the starting motor to cool. Crank the engine up to five times in order to purge the air from the high pressure oil system.

Software for the ECM

Verify that the correct flash file has been installed in the ECM. If necessary, install the latest flash file into the ECM. Refer to Troubleshooting, "Flash Programming".

Note: A new ECM is not programmed. The engine will not start until the ECM software has been installed. Also, the ECM will not communicate until the software has been installed.

Engine Speed/Timing Signal

Check the engine speed/timing signal.

Observe the engine rpm on Cat ET while the engine is being cranked. This may require Cat ET to be powered directly by the vehicle batteries or this may require Cat ET to be powered directly by a separate power source. If necessary, use the **167-9225** Harness (SERVICE TOOL ADAPTER).

If Cat ET displays 0 rpm and the engine is being cranked, there is a problem in the circuit for the primary engine speed/timing sensor or in the circuit for the secondary engine speed/timing sensor. Refer to Troubleshooting, "Engine Speed/Timing Sensor Circuit - Test".

If an engine rpm is present, check the sensor installation. If the sensor is not properly installed, the sensor may read engine speed but the sensor may not be able to sense the tooth pattern. The ability to sense the tooth pattern is necessary to determine the cylinder position. Engine rpm is present when the engine rpm is 50 rpm or more.

Keyswitch

Use Cat ET to check the status of the keyswitch.

Access the status for "Ignition Key Switch".

Slowly cycle the keyswitch on and off while the status of the keyswitch is being monitored on the Cat ET status screen. The status should indicate the correct state of the switch.

Note: If the "Idle Shutdown Timer" or the "PTO Shutdown Timer" is used, the status for the keyswitch may indicate that the keyswitch is on even though the keyswitch is turned to the OFF position.

Communication problems with the ECM

Check the communications between the ECM and Cat ET. Ensure that the keyswitch is in the ON position. Attempt to access one of the status screens on Cat ET.

If Cat ET indicates that the ECM will not communicate, check the aftermarket engine protection devices for a problem.

Aftermarket Engine Protection Devices

Check aftermarket engine protection devices. These devices usually interrupt power to the ECM. If power is interrupted, the ECM will not be able to communicate with Cat ET.

Check for the correct installation of the aftermarket engine protection device.

Check for the correct operation of the aftermarket engine protection device.

Verify that the ECM is receiving battery voltage.

ECM Power Supply

Check the electrical power supply to the ECM. Check the power connection and the ground connection at the ECM.

Verify that the ECM is receiving battery voltage when the keyswitch is turned on. Also, check for battery voltage at the ECM during engine cranking. Ensure that the voltage is adequate while the engine is being cranked.

Refer to Troubleshooting, "Ignition Key Switch Circuit and Battery Supply Circuit - Test" for information that is related to the keyswitch, the battery circuit, and the starting circuit.

ECM

The ECM may be operating incorrectly. Temporarily connect a test ECM. Refer to Troubleshooting, "Replacing the ECM". If the engine starts with the test ECM, connect the original ECM and verify that the problem returns. If the problem returns with the original ECM, replace the original ECM.

Hydraulic Electronic Unit Injectors (HEUI)

Ensure that the valve cover connector is fully connected. Check the connector for corrosion and for debris.

Injection Actuation Pressure Control System

Crank the engine and monitor the status for "Injection Actuation Pressure" and "Injection Actuation Output". The high pressure oil system is operating properly if the pressure output is a minimum of 6 MPa (875 psi).

Connect Cat ET and check for a 164-11 Injection Actuation Pressure system fault. If this event code has been logged recently, refer to Troubleshooting, "Injection Actuation Pressure System - Test".

If the pressure is higher than the actual pressure that is being indicated, then disconnect the injection actuation pressure sensor and try to start the engine. If the engine starts, refer to Troubleshooting, "Injection Actuation Pressure Sensor - Test".

Fuel Supply

Check the fuel quality. Refer to the Operation and Maintenance Manual for information on fuel quality. Refer to Systems Operation/Testing and Adjusting for the correct procedure for testing the quality of the fuel.

Check the fuel pressure. Refer to Systems Operation/Testing and Adjusting, "Fuel System Pressure - Test".

Ensure that the fuel system has been primed. Refer to the engine's Operation and Maintenance Manual for the correct procedure.

Check for fuel supply lines that are restricted.

Check the fuel filters.

Cold weather adversely affects the characteristics of the fuel. Refer to the Operation and Maintenance Manual for information on improving the characteristics of the fuel during cold weather operation.

Combustion Problem

Check for mechanical problems that may affect combustion of the fuel.

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