CATERPILLAR®

RENR1360

Service Manual

3126B and 3126E Truck Engines

BKD1-Up, G3E1-Up, DPF1-Up, 1AJ1-Up, 8YL1-UP
CKM1-Up, CRP1-Up, 7AS1-UP, 8SZ1-UP, 9SZ1-Up

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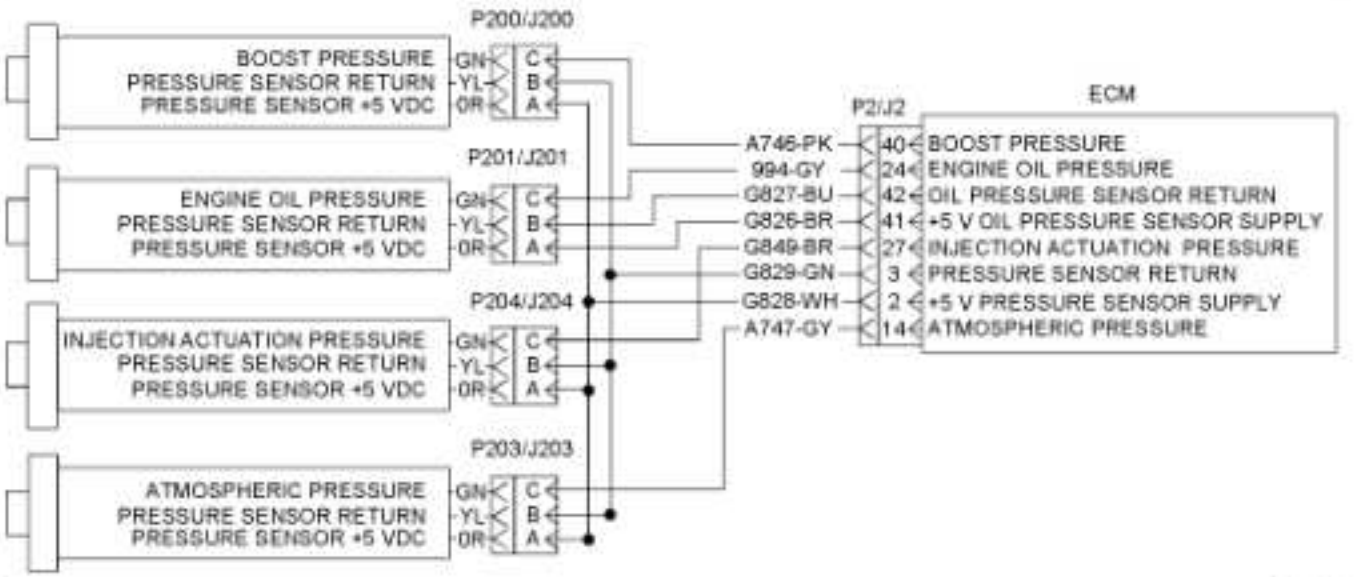


Illustration 16 g01151304

Schematic for the +5 V pressure sensor supply

Test Step 1. Inspect the Electrical Connectors and the Wiring

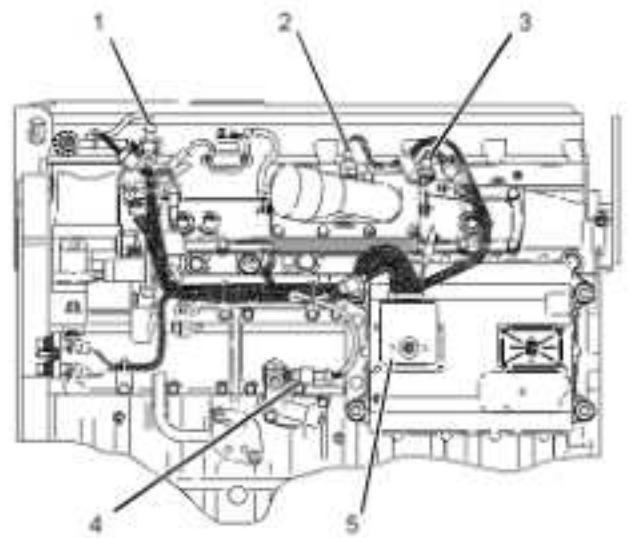


Illustration 17 g01151317

Left side engine view (typical example)

(1) Injection actuation pressure sensor
(2) Atmospheric pressure sensor
(3) Boost pressure sensor
(4) Engine oil pressure sensor (option)
(5) J2/P2 ECM connector

A. Thoroughly inspect ECM connector (5). Also inspect the connectors for pressure sensors (1), (2), (3), and (4). Refer to Troubleshooting, "Electrical Connectors - Inspect" for details.

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Use the following formulas to calculate the correct oil change intervals. Scheduled oil sampling should be used to provide the most accurate oil change interval.

The formulas require information to be collected from the electronic service tool. Enter the values from the electronic service tool for "Total Distance" and "Total Fuel".

English

Total Distance _____ (miles)
/ Total Fuel _____ (gallons)
= Overall MPG _____
Overall MPG _____
X 50
X Oil Pan Capacity in Quarts _____
= Recommended Interval _____

Metric

Total Distance_____ (kilometers)
/ Total Fuel _____ (liter)
= Overall KPL _____
Overall KPL _____
X 200
X Oil Pan Capacity in Liters _____
= Recommended Interval _____

Note: The recommended capacities for oil pans that follow are for truck engines.

- The capacity for the shallow oil pan is 21 L (22 qt).
- The capacity for the deep oil pan is 28 L (30 qt).

Record the drain interval that the owner is currently using.

_____ Drain interval

_____ Miles or Kilometers since the last oil change.

Expected Result:

The customer has not exceeded the suggested oil change interval and an oil change does not need to be performed.

Results:

- Yes – Proceed to Test Step 11.
- No – Before you proceed, ask the customer to authorize an oil change with a new oil filter. Oil changes are not covered by the warranty. After the engine oil and the oil filter have been changed, operate the engine until normal operating temperature has been reached. Run the engine up and down through the operating rpm range for 10 to 15 minutes. This will purge any trapped air or debris that is in the system. If the problem still exists or if the problem reoccurs in a short period or time, proceed to Test Step 11.

Test Step 11. Check the System with the "Injection Actuation Pressure Test"

A. Install 8T-0852 Pressure Gauge on the high pressure oil rail.

B. Connect the electronic service tool to the service tool connector.

C. Access the "Injection Actuation Pressure Test" in the "Diagnostics Menu" of the electronic service tool and begin the test.

Note: The "Injection Actuation Pressure Test" can increase the injection actuation pressure or the "Injection Actuation Pressure Test" can decrease the injection actuation pressure. The test adjusts the oil pressure in steps. Depending on the interface which you are using, you may have either three steps or four steps.

Table 173

Step	Manual Pressure gauge	Electronic Service Tool	Difference
1			
2			
3			
4			

Expected Result:

The pressure that is measured with the pressure gauge for each step and the pressure that is displayed on the electronic service tool for each step are within 1379 kPa (200 psi).

Results:

- Yes – The injection actuation pressure sensor is operating properly. Proceed to Test Step 12.
- No – The injection actuation pressure sensor may be faulty. Replace the sensor and repeat this test step. If the problem still exists, verify the accuracy of the pressure gauge. Reinstall the original sensor and proceed to Test Step 12.

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Table 192

Table For The PTO Kickout Status Screen On ET		
ET	**Meaning or Possible Cause**	**Troubleshooting**
No Engine Speed	Intermittent engine speed signal or lost engine speed signal.	Refer to Troubleshooting, "Speed/Timing Circuit - Test".
Switch Turned Off	The PTO On/Off switch is turned OFF or the switch circuit has an open circuit condition.	Refer to Troubleshooting, "Clutch Pedal Position Switch Circuit - Test".
"Brake Pedal Depressed"	The service brake pedal is depressed or the service brake switch circuit has an open circuit condition.	Proceed with the test procedure.
"Clutch Pedal Depressed"	The clutch pedal is depressed or the clutch pedal switch circuit has an open circuit condition. Also, the switch could be incorrectly adjusted.	Refer to Troubleshooting, "Cutch Pedal Position Switch Circuit - Test".
Vehicle Speed ≥ Limit	The vehicle speed has exceeded the PTO Vehicle Speed Limit or the vehicle speed signal is erratic or intermittent.	Refer to Troubleshooting, "Vehicle Speed Circuit - Test" if a problem with the signal exists.
Neutral	The transmission is not in neutral or the transmission neutral switch circuit has an open circuit condition.	Refer to Troubleshooting, "Neutral Switch Circuit - Test".
"No Occurrence" or "Not Kicked Out"	The PTO has not been enabled since the ECM has been powered up.	Operate the vehicle in the PTO mode in order to create the problem again.

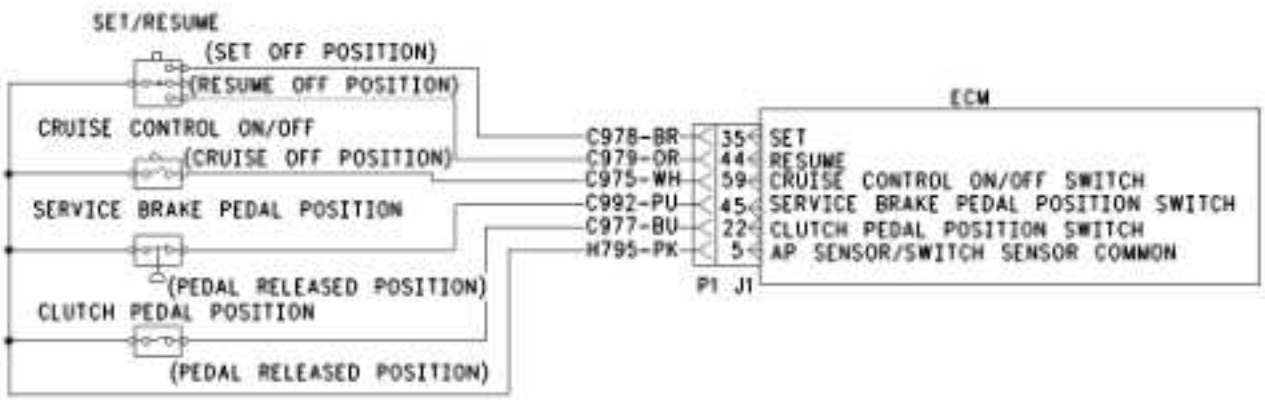


Illustration 164 g00643881

Schematic for cruise control switch, service brake pedal position (switch 1) and clutch pedal position switch

Test Step 1. Determine the Type of Problem.

A. Connect ET to the cab data link connector.

B. Turn the ignition key switch to the ON position.

C. If the vehicle will not allow setting a cruise speed, an idle speed or a PTO speed, check the following Customer Parameters:

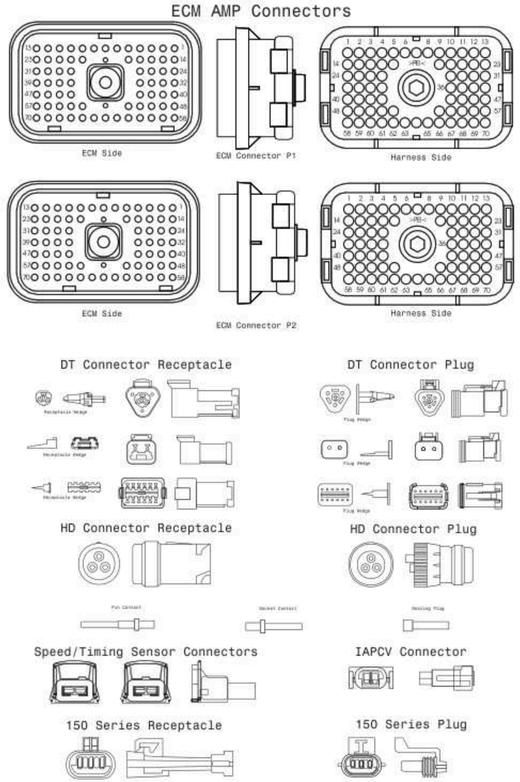
Cruise Control Parameters

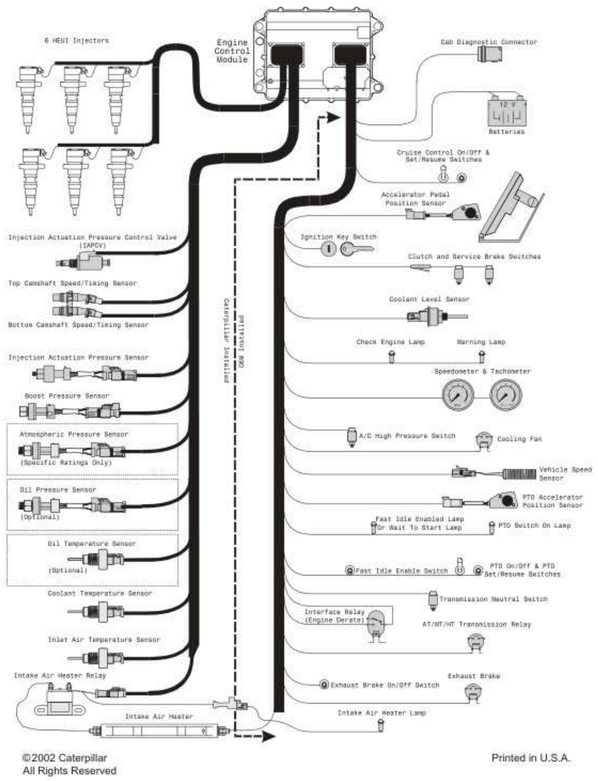
- "Low Cruise Control Speed Set Limit"
- "High Cruise Control Speed Set Limit"

Idle Parameters

- "Fast Idle RPM #1"

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Schematic

3126E Truck Engine Electrical System

DPF1-UP

Diagnostic Code Listing

PID-FMI	Description	Flash Codes	PID-FMI	Description	Flash Codes
0-00	No Detected Faults	99	102-04	Boost Press Sensor Short Circuit	25
1-11	Cylinder 1 Fault	72	102-07	Excessive Boost Pressure	35
2-11	Cylinder 2 Fault	72	105-03	Inlet Manifold Air Temp Sensor Open Circuit	38
3-11	Cylinder 3 Fault	73	105-04	Inlet Manifold Air Temp Sensor Short Circuit	38
4-11	Cylinder 4 Fault	73	108-03	Atmospheric Press Sensor Open Circuit	26
5-11	Cylinder 5 Fault	74	108-04	Atmospheric Press Sensor Short Circuit	26
6-11	Cylinder 6 Fault	74	110-00	High Coolant Temp Warning	61
22-13	Check Timing Sensor Calibration	42	110-03	Coolant Temp Sensor Open Circuit	27
30-08	Invalid PTO Throttle Signal	29	110-04	Coolant Temp Sensor Short Circuit	27
30-13	PTO Throttle Sensor Calibration	29	110-11	Very High Coolant Temp	61
41-03	8 Volt Supply Above Normal	21	111-01	Low Coolant Level Warning	62
41-04	8 Volt Supply Below Normal	21	111-02	Coolant Level Sensor Fault	12
42-11	Injection Actuation Press Control Valve Driver Fault	18	111-11	Very Low Coolant Level	62
43-02	Ignition Key Switch Fault	71	164-00	Injection Actuation Press Out of Range	17
64-02	Loss of Engine RPM Signal on Engine Speed and Timing Sensor Number 2	34	164-02	Injection Actuation Press Sensor Erratic	15
64-11	No Pattern on Engine Speed and Timing Sensor Number 2	34	164-03	Injection Actuation Press Open Circuit	15
70-05	Inlet Air Heater Open Circuit	49	164-04	Injection Actuation Press Short Circuit	15
70-06	Inlet Air Heater Short Circuit	49	164-11	Injection Actuation Press System	39
71-00	Idle Shutdown Override	01	168-02	Intermittent Battery Power to the ECM	51
71-01	Idle Shutdown Occurrence	47	190-00	Engine Overspeed Warning	35
71-14	PTO Shutdown Occurrence	47	190-02	Loss of RPM Signal on Engine Speed and Timing Sensor Number 1	34
84-00	Vehicle Overspeed Warning	41	190-11	No Pattern on Engine Speed and Timing Sensor Number 1	34
84-01	Loss of Vehicle Speed Signal	31	224-11	Theft Deterrent Enabled	00
84-02	Invalid Vehicle Speed Signal	36	224-14	Engine Cranking / Theft Deterrent Enabled	00
84-08	Vehicle Speed Out of Range	36	231-11	J1939 Data Link Fault	58
84-10	Vehicle Speed Rate of Change	36	232-03	5 Volt Supply Above Normal	21
91-08	Invalid Throttle Signal	32	232-04	5 Volt Supply Below Normal	21
91-13	Throttle Sensor Calibration	28	246-11	Service Brake Switch Number 1 Fault	00
100-03	Oil Press Sensor Open Circuit	24	247-11	Service Brake Switch Number 2 Fault	00
100-04	Oil Press Sensor Short Circuit	24	252-11	Incorrect Engine Software	59
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