

Cause

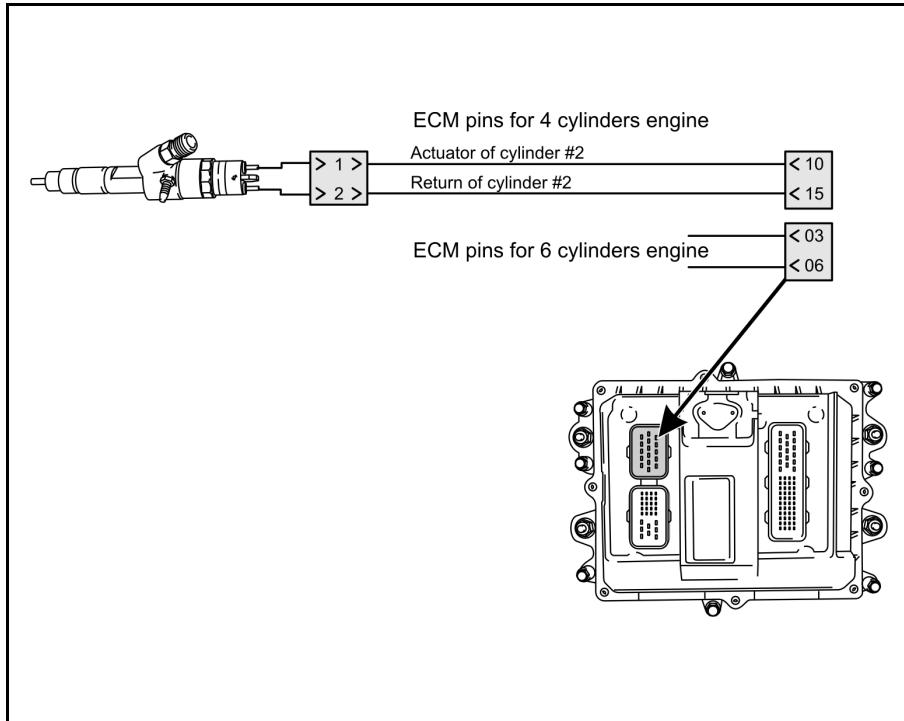
Short circuit to battery voltage on injector #2.

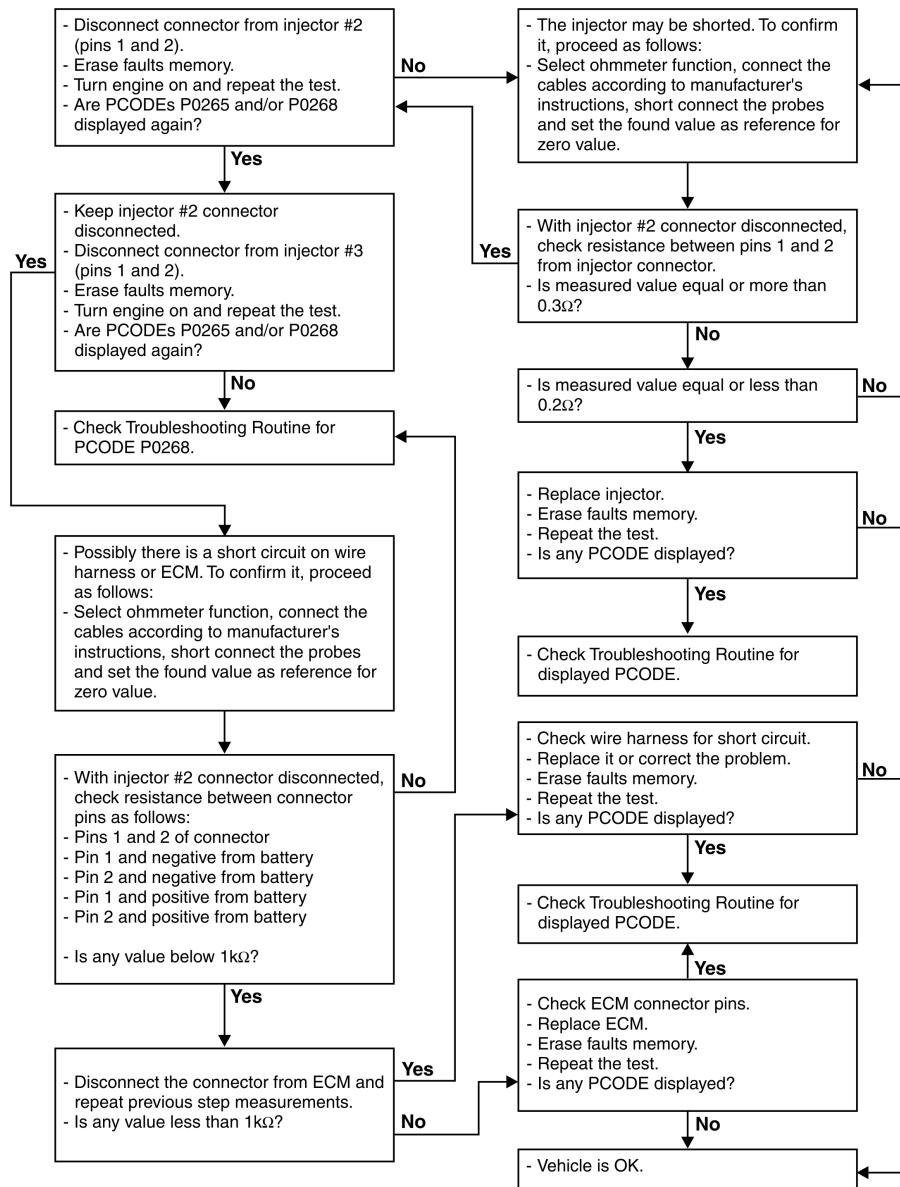
Details

A voltage high signal was detected coming from solenoid of injector on cylinder #2. There is possibly an alteration of coil's resistance or a short circuit on wire harness.

Strategy

Failure on monitoring of injector	Red light turns ON. Engine power is reduced by 80%.
• ECM uses this signal to check injectors' activation.	



Troubleshooting Routine

Cause

Short circuit on injector #3.

Details

A voltage low signal was detected coming from solenoid of injector on cylinder #3.
There is possibly an alteration of coil's resistance or a short circuit on wire harness.

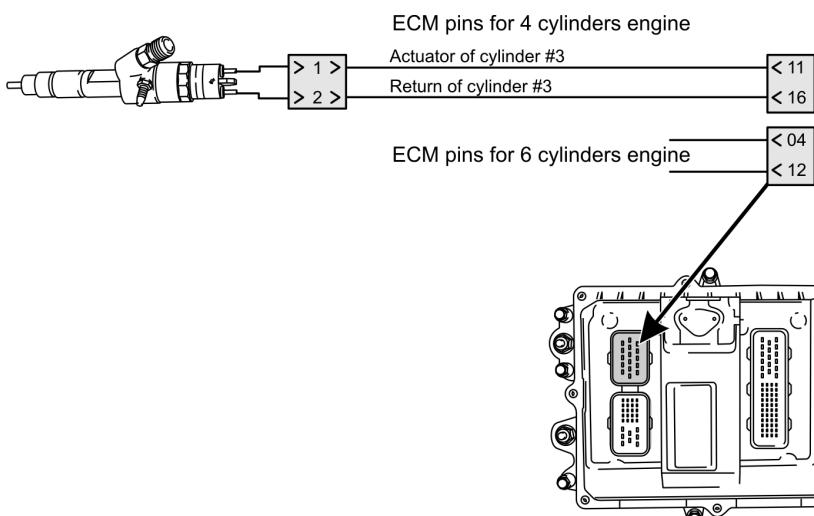
Strategy

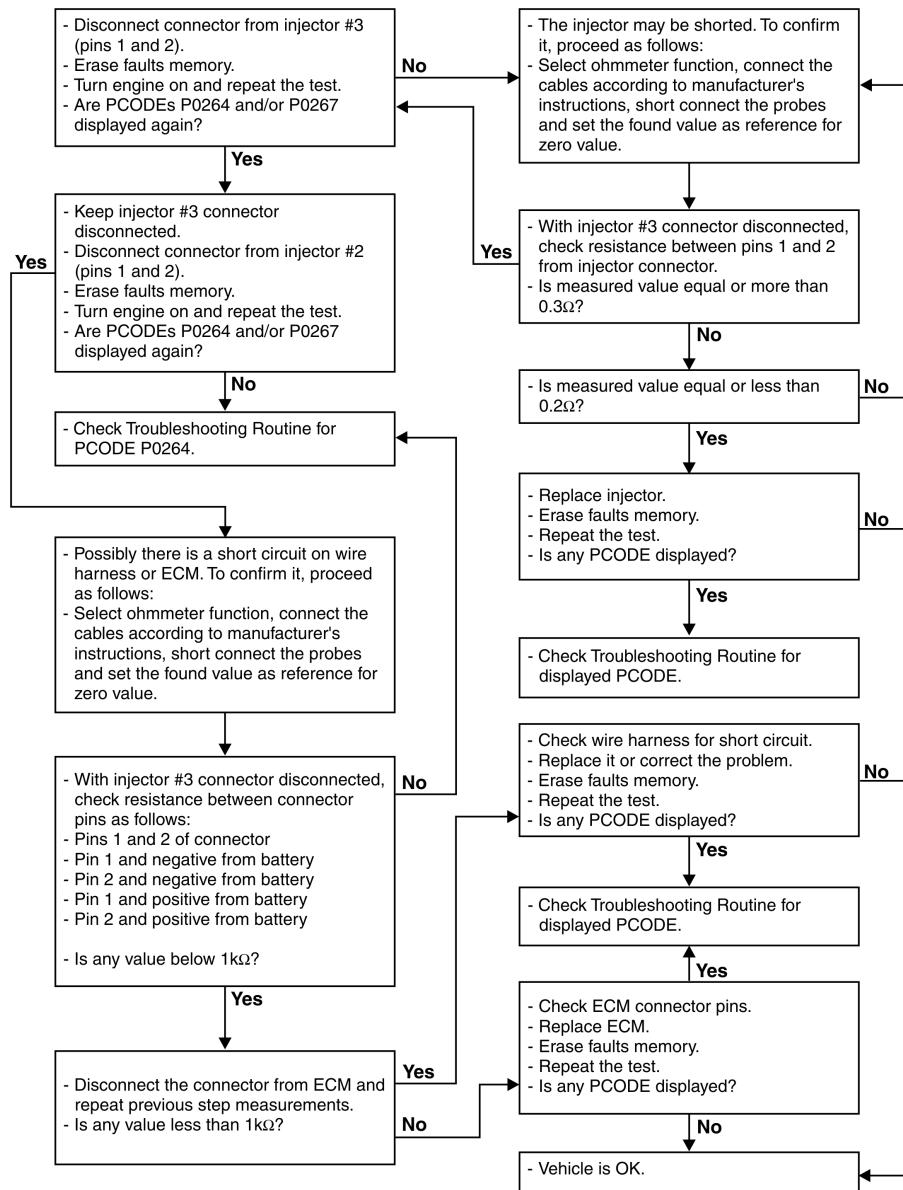
Failure on monitoring
of injector

Red light turns ON.

Engine power is reduced by 80%.

- ECM uses this signal to check injectors' activation.



Troubleshooting Routine

Cause

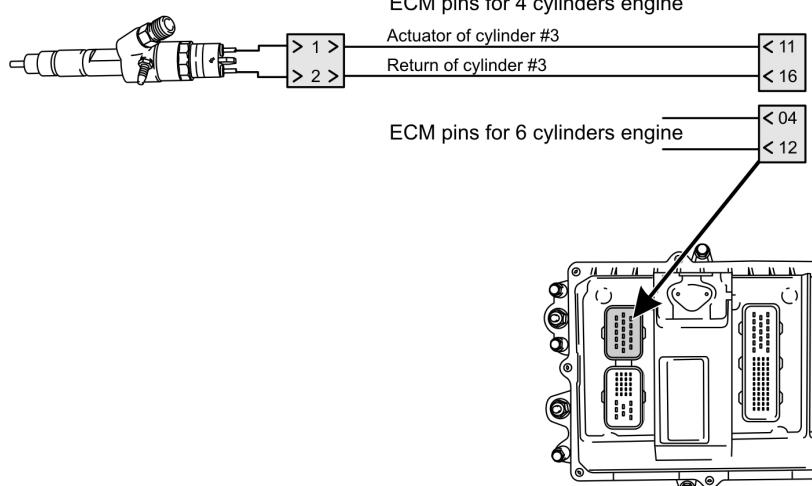
Short circuit to battery voltage on injector #3.

Details

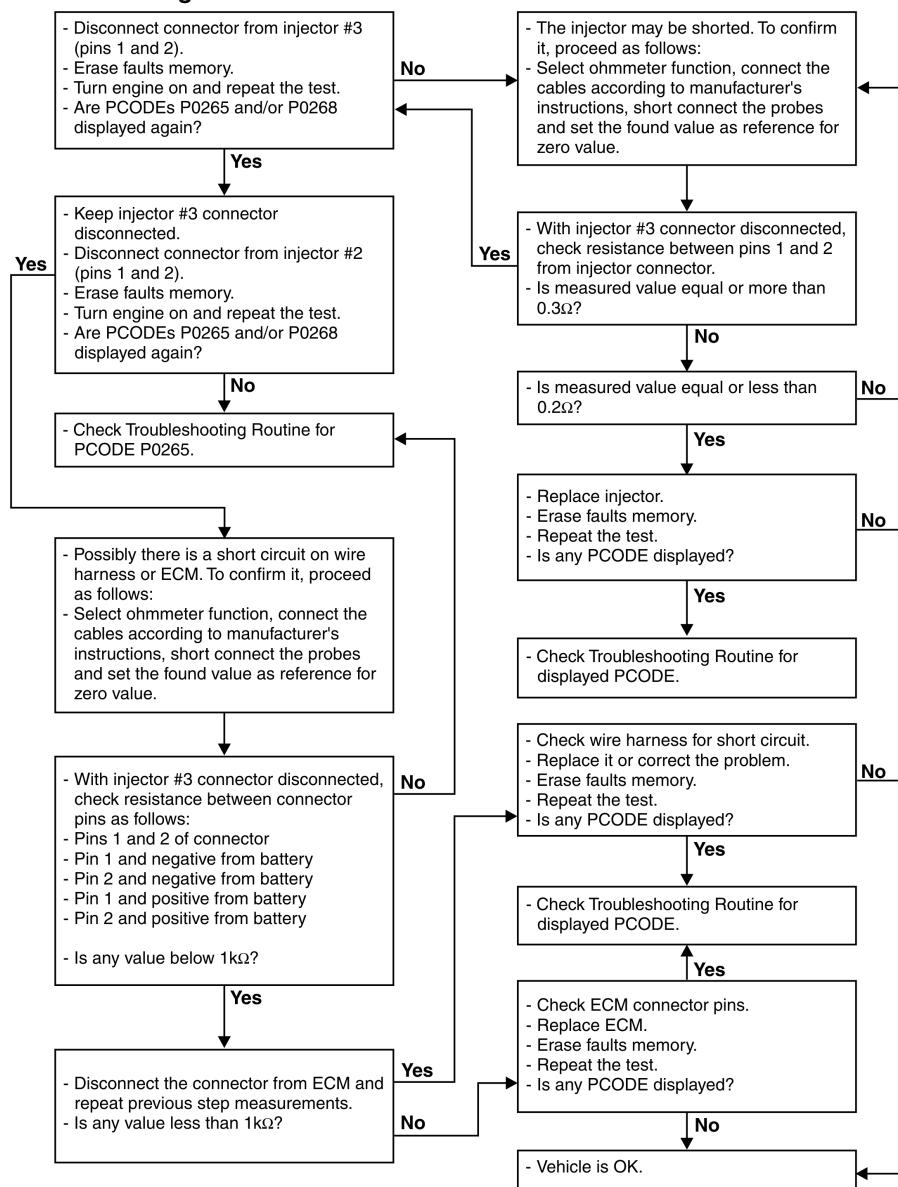
A voltage high signal was detected coming from solenoid of injector on cylinder #3. There is possibly an alteration of coil's resistance or a short circuit on wire harness.

Strategy

Failure on monitoring of injector	Red light turns ON. Engine power is reduced by 80%.
• ECM uses this signal to check injectors' activation.	



Troubleshooting Routine



Cause

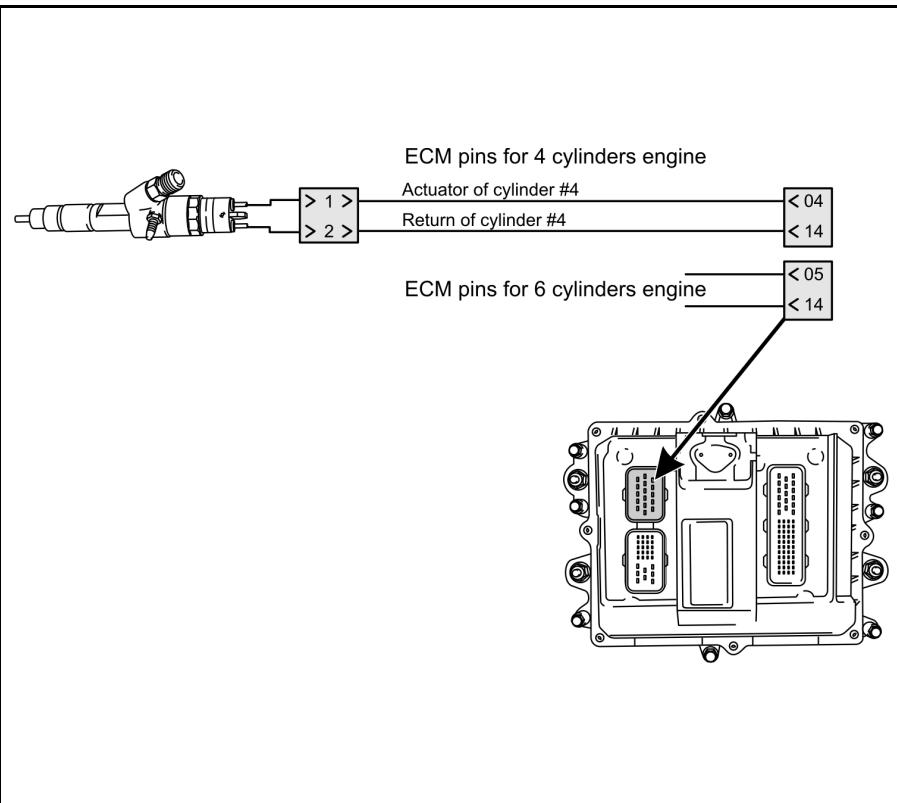
Short circuit on injector #4.

Details

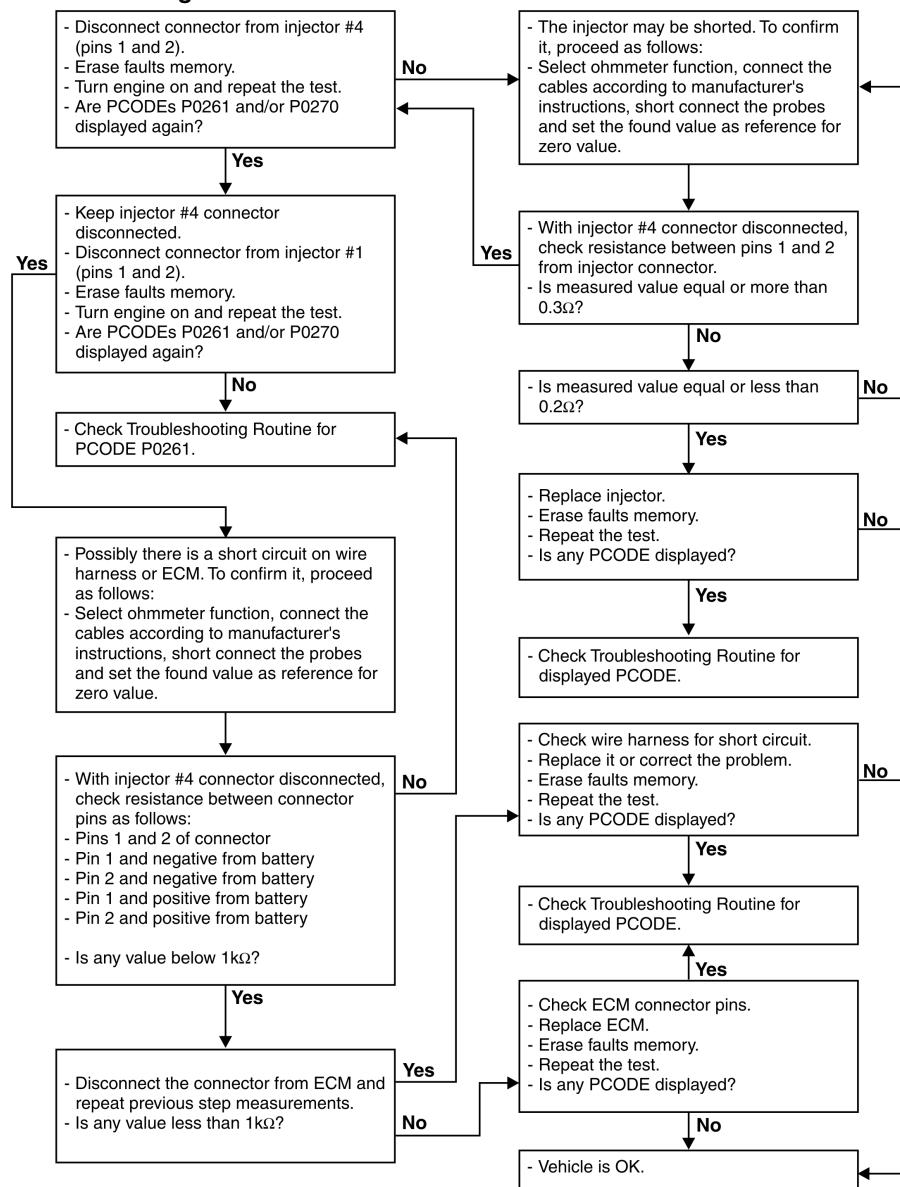
A voltage low signal was detected coming from solenoid of injector on cylinder #4.
There is possibly an alteration of coil's resistance or a short circuit on wire harness.

Strategy

Failure on monitoring of injector	Red light turns ON. Engine power is reduced by 80%.
<ul style="list-style-type: none">ECM uses this signal to check injectors' activation.	



Troubleshooting Routine



Cause

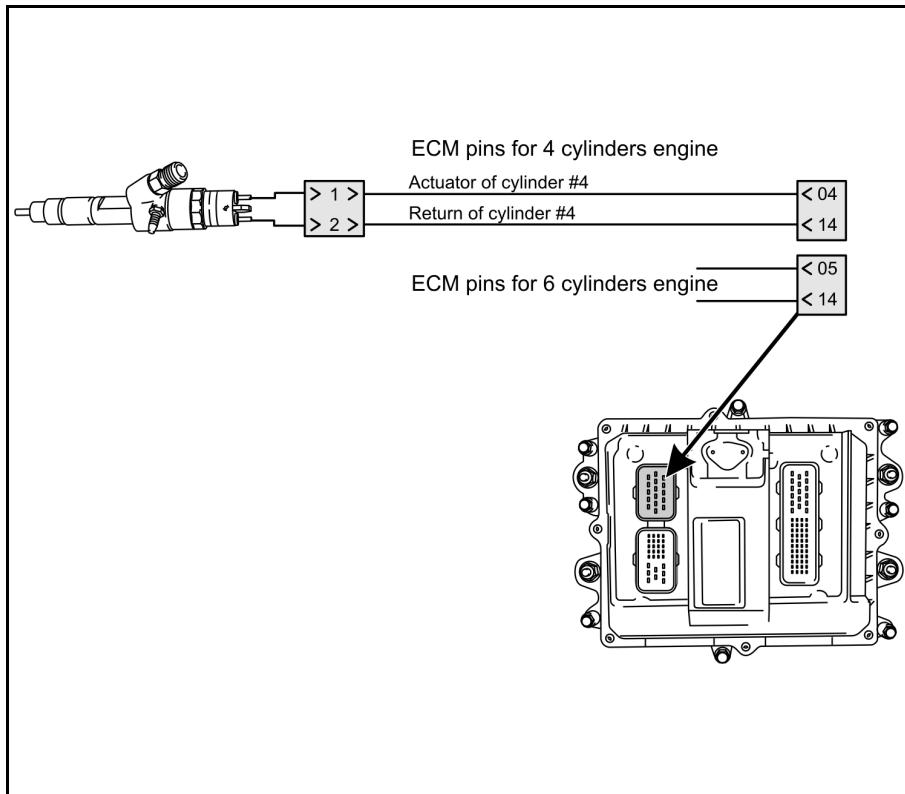
Curto circuito para tensão da bateria no injetor 4.

Details

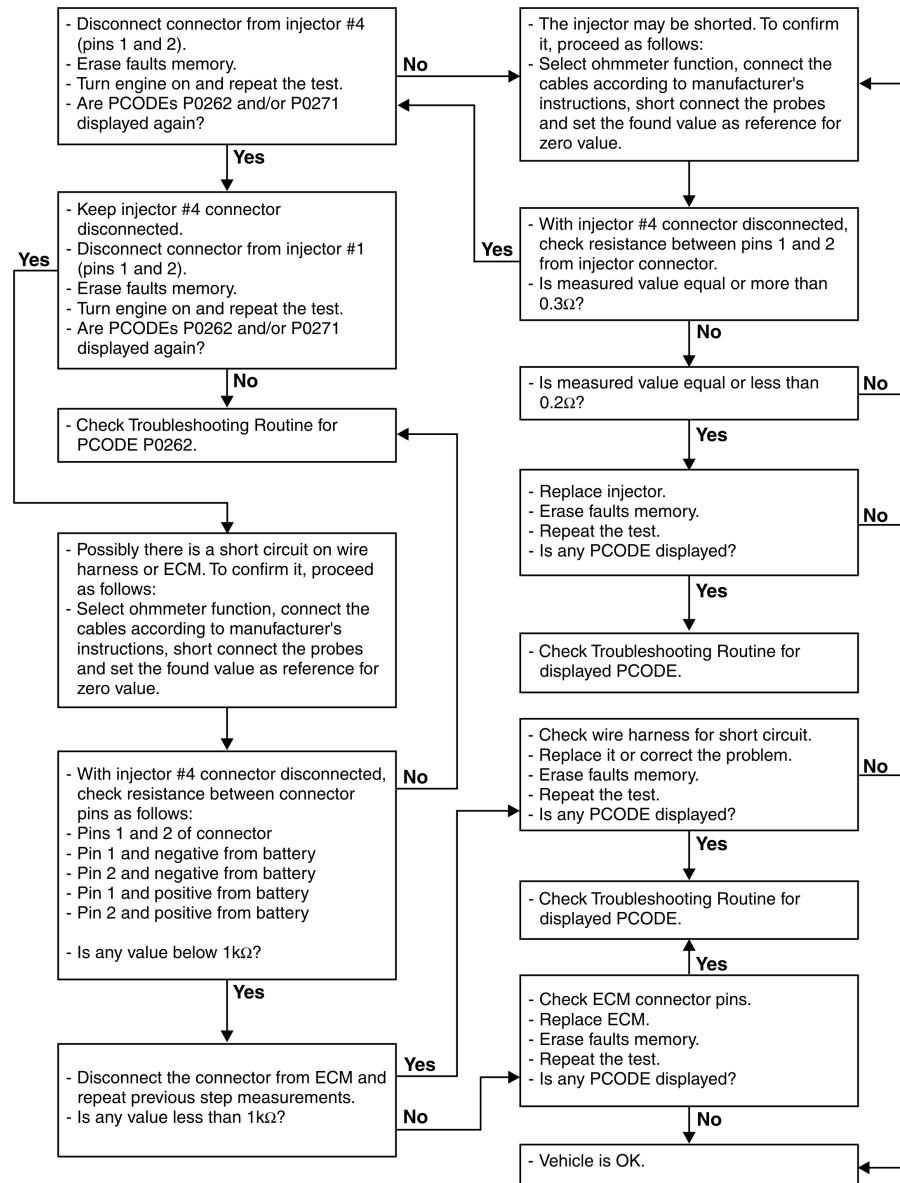
A voltage high signal was detected coming from solenoid of injector on cylinder #4. There is possibly an alteration of coil's resistance or a short circuit on wire harness.

Strategy

Failure on monitoring of injector	Red light turns ON. Engine power is reduced by 80%.
• ECM uses this signal to check injectors' activation.	



Troubleshooting Routine



Cause

Short circuit to ground on injector #5.

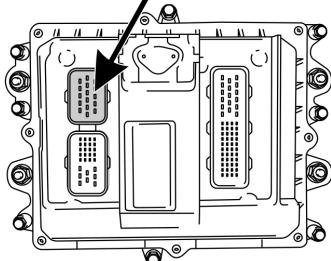
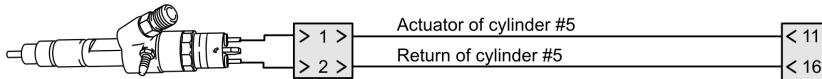
Details

A voltage low signal was detected coming from solenoid of injector on cylinder #5.
There is possibly a biased coil's resistance or a short circuit on wire harness.

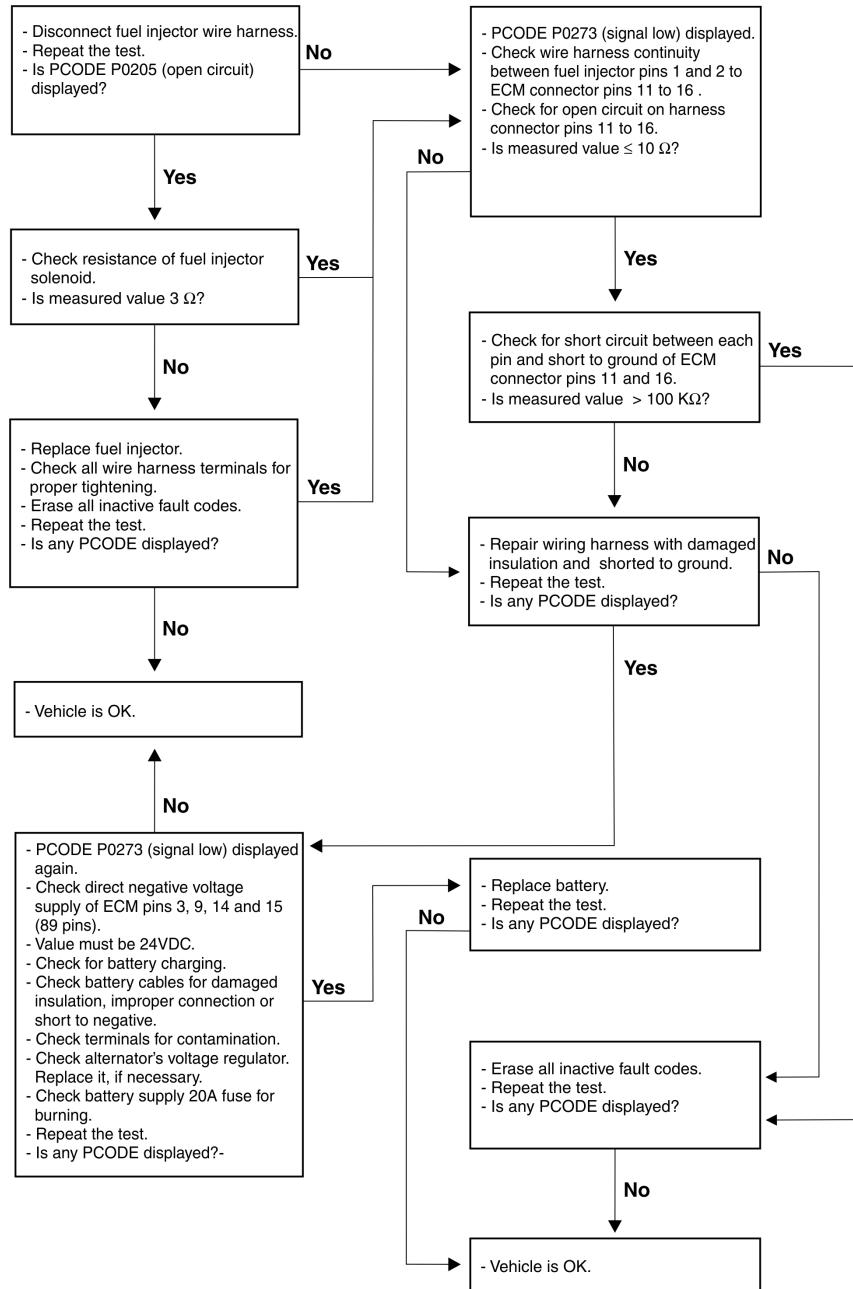
Strategy

Failure on monitoring of injector	Red light turns ON.
	Engine power is reduced by 80%.
<ul style="list-style-type: none">ECM uses this signal to check injectors' activation.	

ECM pins for 4 & 6 cylinders engine



Troubleshooting Routine



Cause

Short circuit to battery voltage on injector #5.

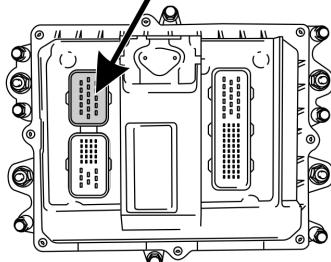
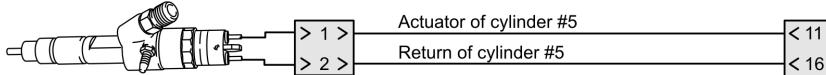
Details

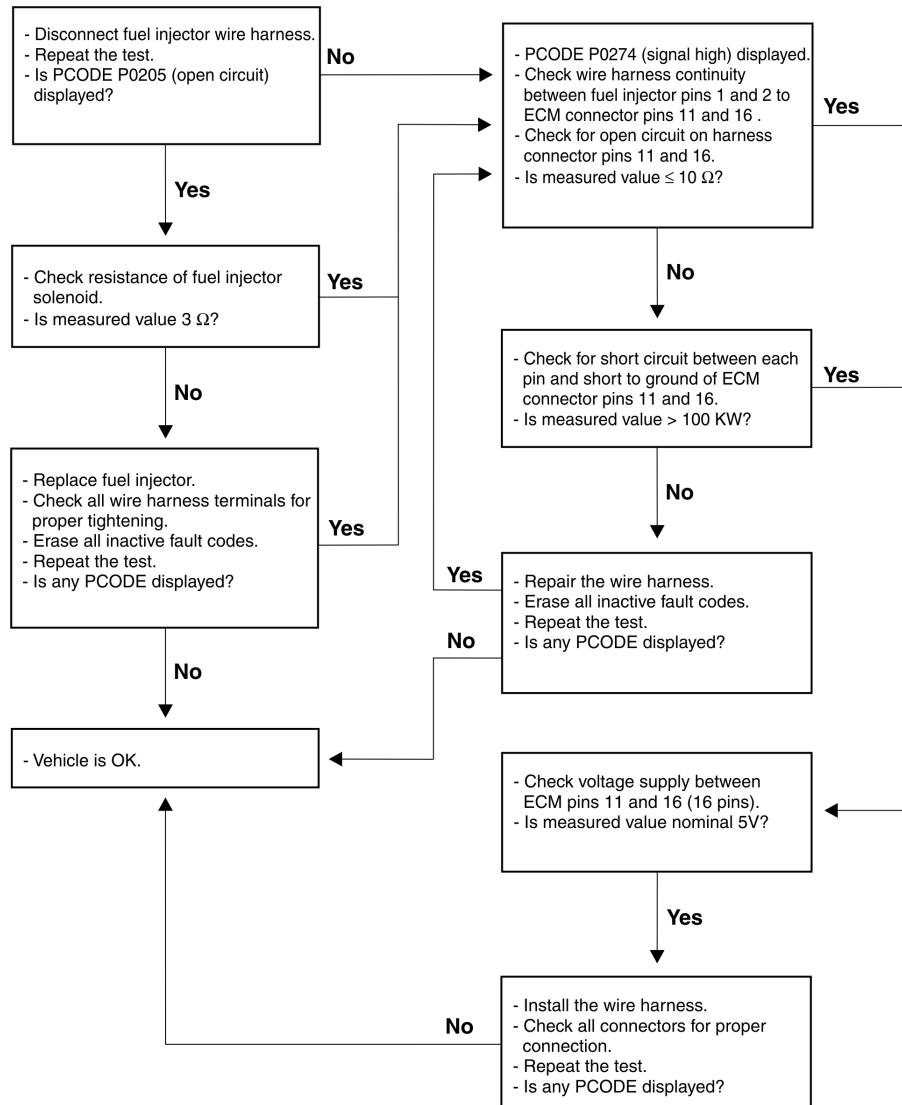
A voltage high signal was detected coming from solenoid of injector on cylinder #5. There is possibly a biased coil's resistance or a short circuit on wire harness.

Strategy

Failure on monitoring of injector	Red light turns ON. Engine power is reduced by 80%.
• ECM uses this signal to check injectors' activation.	

ECM pins for 4 & 6 cylinders engine



Troubleshooting Routine

Cause

Short circuit to ground on injector #6.

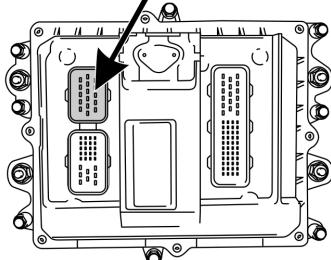
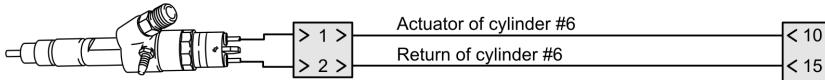
Details

A voltage low signal was detected coming from solenoid of injector on cylinder #6.
There is possibly a biased coil's resistance or a short circuit on wire harness.

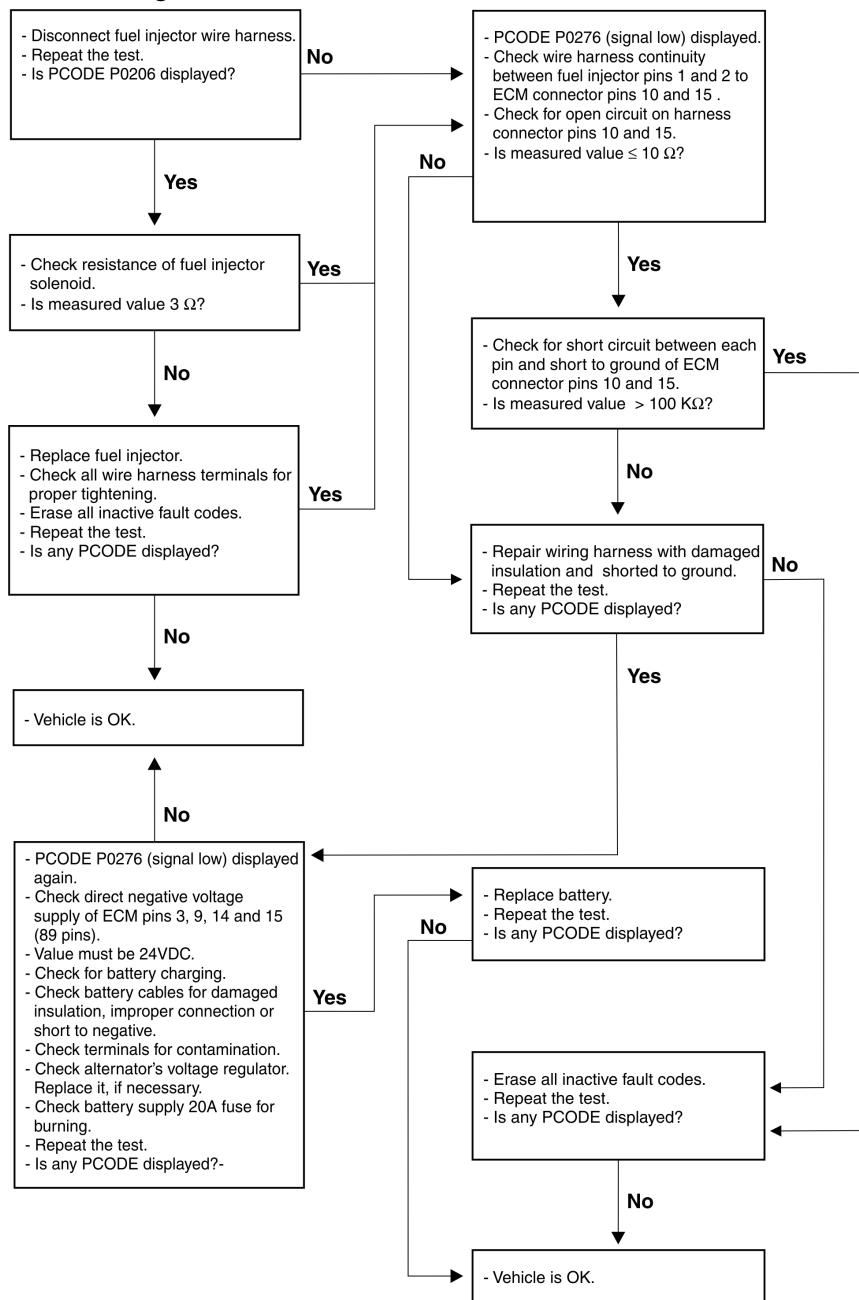
Strategy

Failure on monitoring of injector	Red light turns ON. Engine power is reduced by 80%.
• ECM uses this signal to check injectors' activation.	

ECM pins for 4 & 6 cylinders engine



Troubleshooting Routine



Cause

Short circuit to battery voltage on injector #6.

Details

A voltage high signal was detected coming from solenoid of injector on cylinder #6. There is possibly a biased coil's resistance or a short circuit on wire harness.

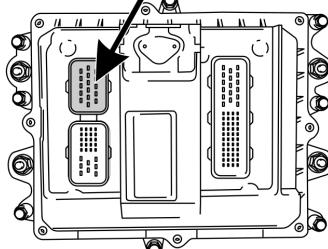
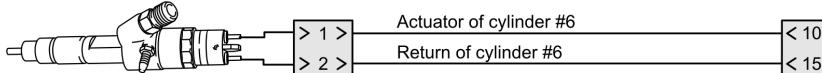
Strategy**Failure on monitoring of injector**

Red light turns ON.

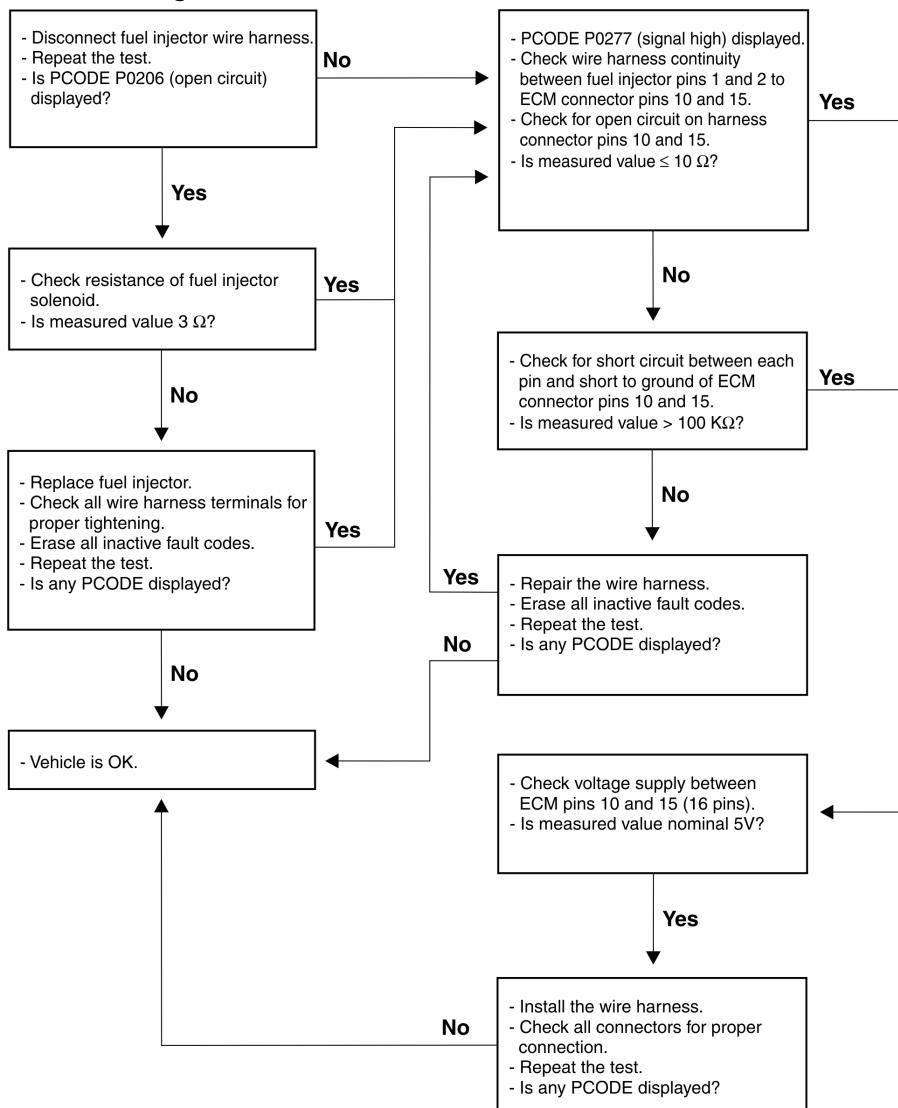
Engine power is reduced by 80%.

- ECM uses this signal to check injectors' activation.

ECM pins for 4 & 6 cylinders engine



Troubleshooting Routine



Cause

Engine speed exceeded maximum limit (overspeed).

Details

The signal from rpm sensor (crankshaft) is above the value programmed for engine protection (3200 rpm). Engine actual running conditions, reading error from sensor or a defective wire harness may have generated this code.

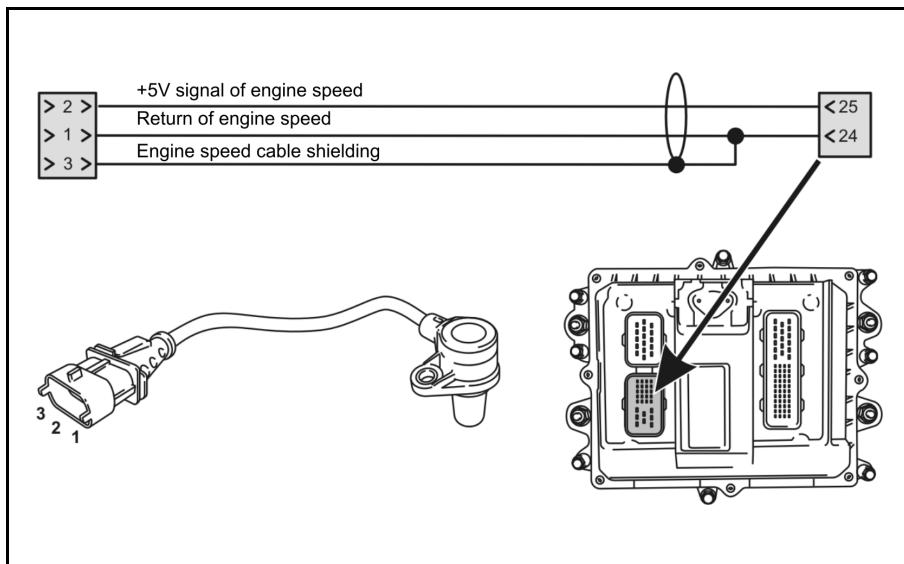
Before starting the test, check sensor for signs of contamination.

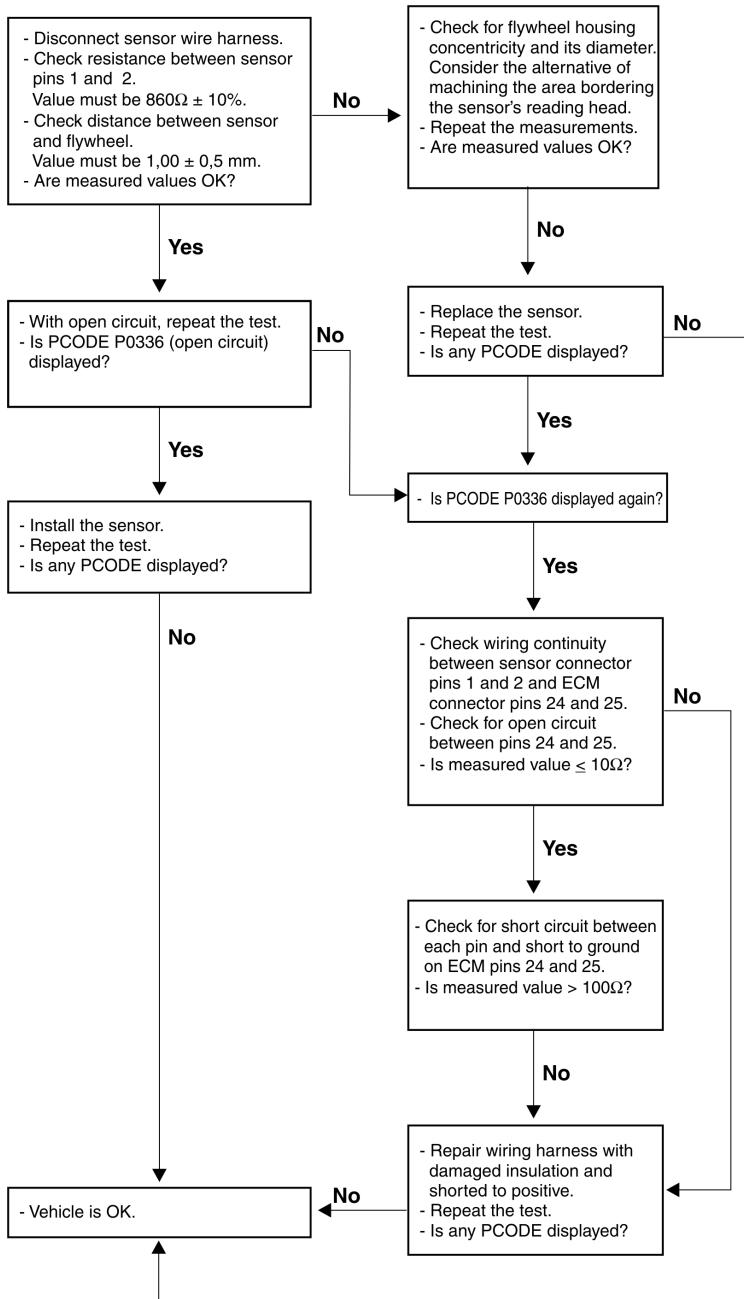
Strategy

Yellow light turns ON	Above 3200 rpm; In case of lacking signal from just one sensor; Lack of fuel.
Red light blinks	In case of lacking signal from both sensors. Engine turns off.

This signal is used by ECM to calculate:

- Engine speed;
- Position of piston in the cylinder;
- Start of injection angle;
- Timing of signals from camshaft / crankshaft.



Troubleshooting Routine

Cause
Rotation sensor defective

Details

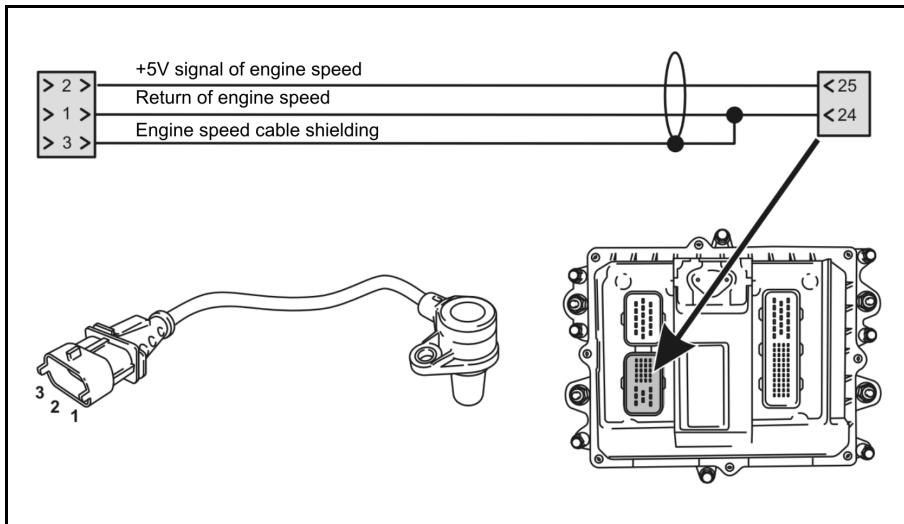
Possibly the circuit or crankshaft rotation sensor is in an open circuit condition or it is not placed according specification (before proceeding with troubleshooting, check if distance between sensor and flywheel is within 0.49 ~ 1.5 mm). Check the sensor tip for contamination and for a voltage supply failure. If necessary, disassemble it from flywheel and check the sensor reading window for dirty build up.

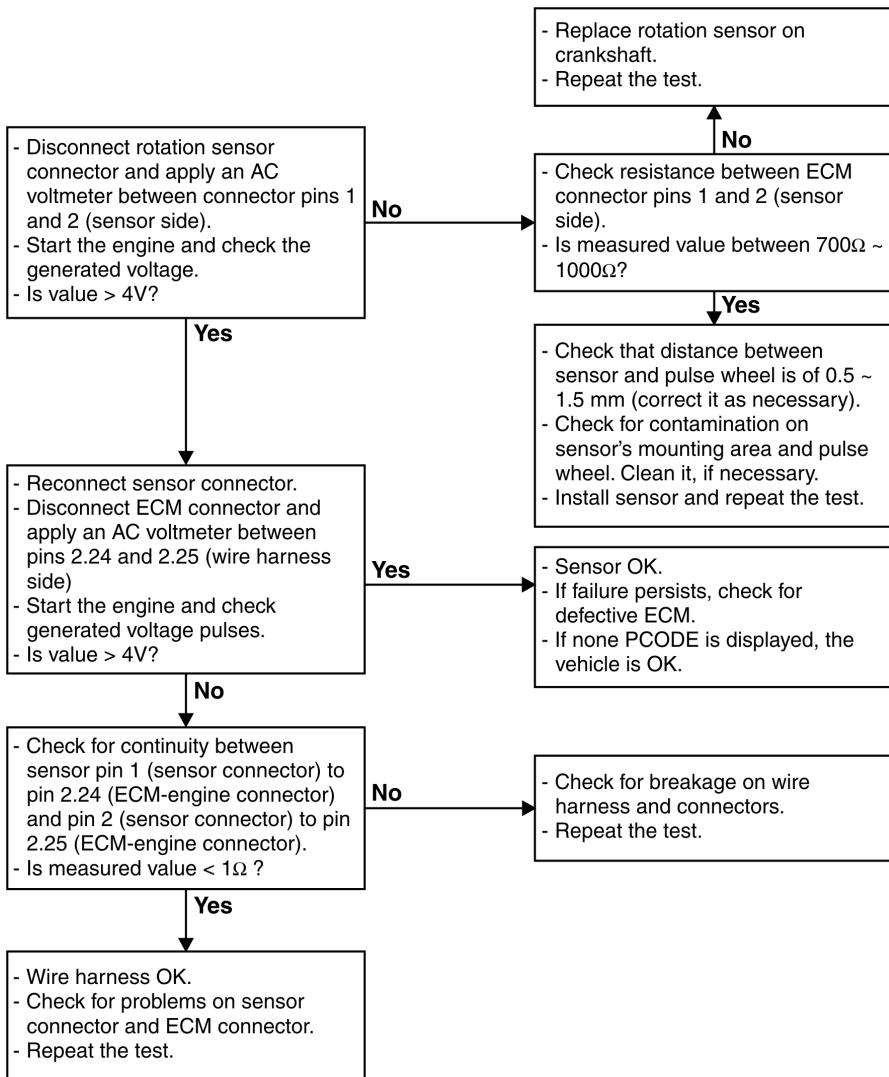
Strategy

Yellow light turns ON	Above 3200 rpm; In case of lacking signal from just one sensor; Lack of fuel.
Red light blinks	In case of lacking signal from both sensors. Engine turns off.

This signal is used by ECM to calculate:

- Engine speed;
- Position of piston in the cylinder;
- Start of injection angle;
- Timing of signals from camshaft / crankshaft.



Rotation Sensor (Crankshaft)

Cause

Defective rotation sensor

Details

Possibly the circuit or camshaft rotation sensor is in an open circuit condition or it is not placed according specification (before proceeding with troubleshooting, check if distance between pulse generator sensor mounted at idle gear is within 0.46 ~ 1.5 mm. Check it for dirty build up at the tip of the sensor and for a voltage supply failure.

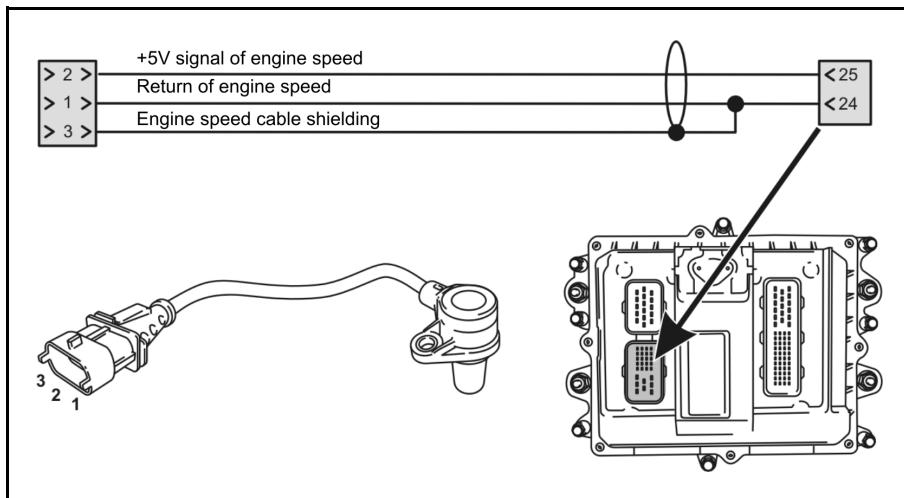
If necessary, disassemble camshaft drive sprocket and check the pulse generator teeth for damage or dirty build up.

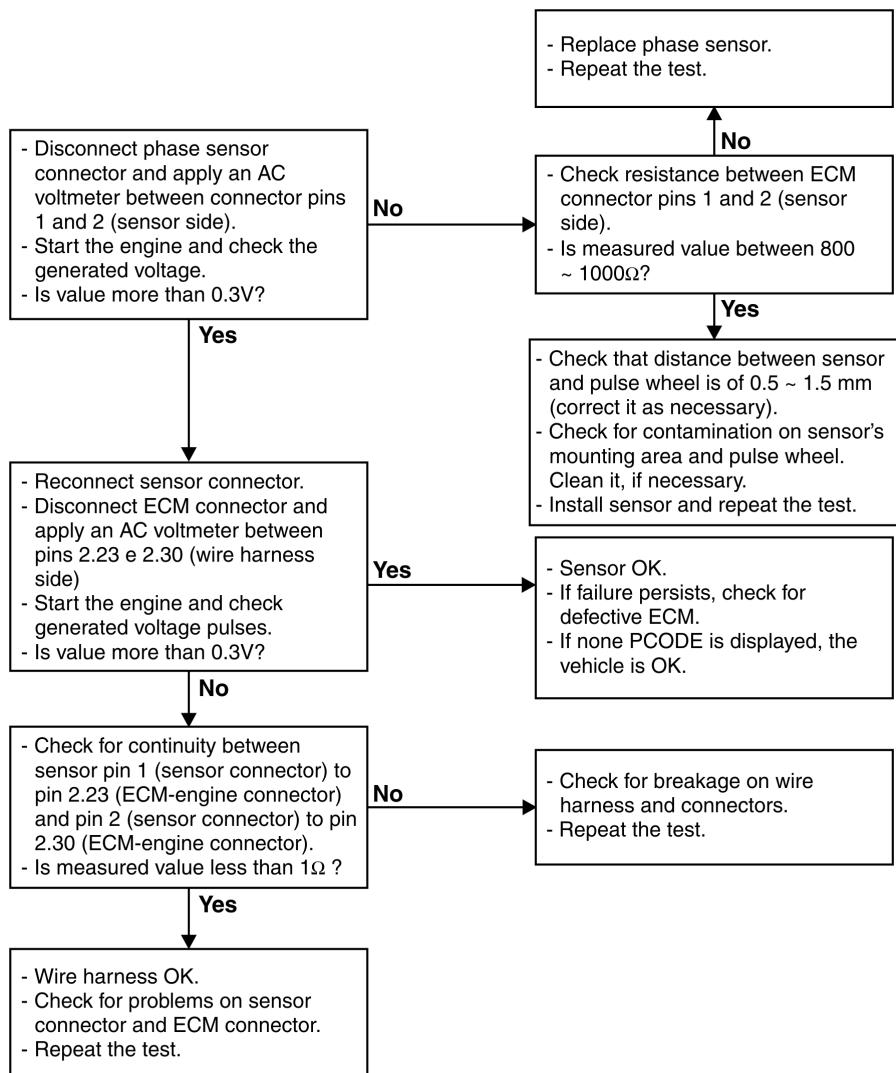
Strategy

Yellow light turns ON	Above 3200 rpm; In case of lacking signal from just one sensor; Lack of fuel.
Red light blinks	In case of lacking signal from both sensors. Engine turns off.

This signal is used by ECM to calculate:

- Engine speed;
- Position of piston in the cylinder;
- Start of injection angle;
- Timing of signals from camshaft / crankshaft.



Troubleshooting Routine

Cause
Vehicle speed signal above maximum limit.

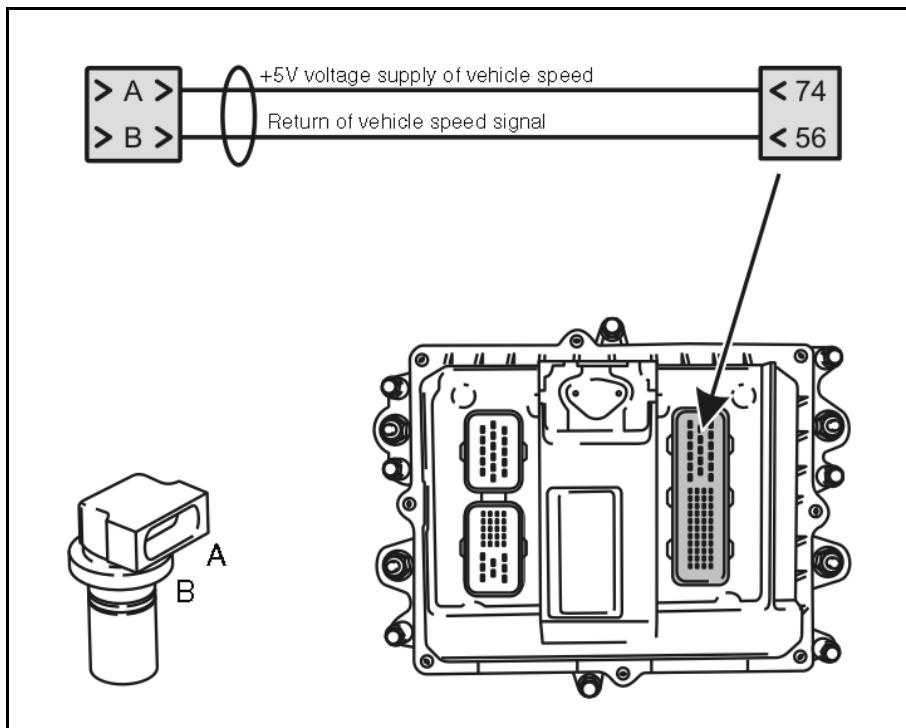
Details

The signal from vehicle speed sensor is above the programmed value in one of the conditions for cruise control, fuel economy or protection in low gears. Engine actual running conditions, reading error from sensor or a defective wire harness may have generated this code.

Before starting the test, check sensor for contamination. Clean it as necessary.

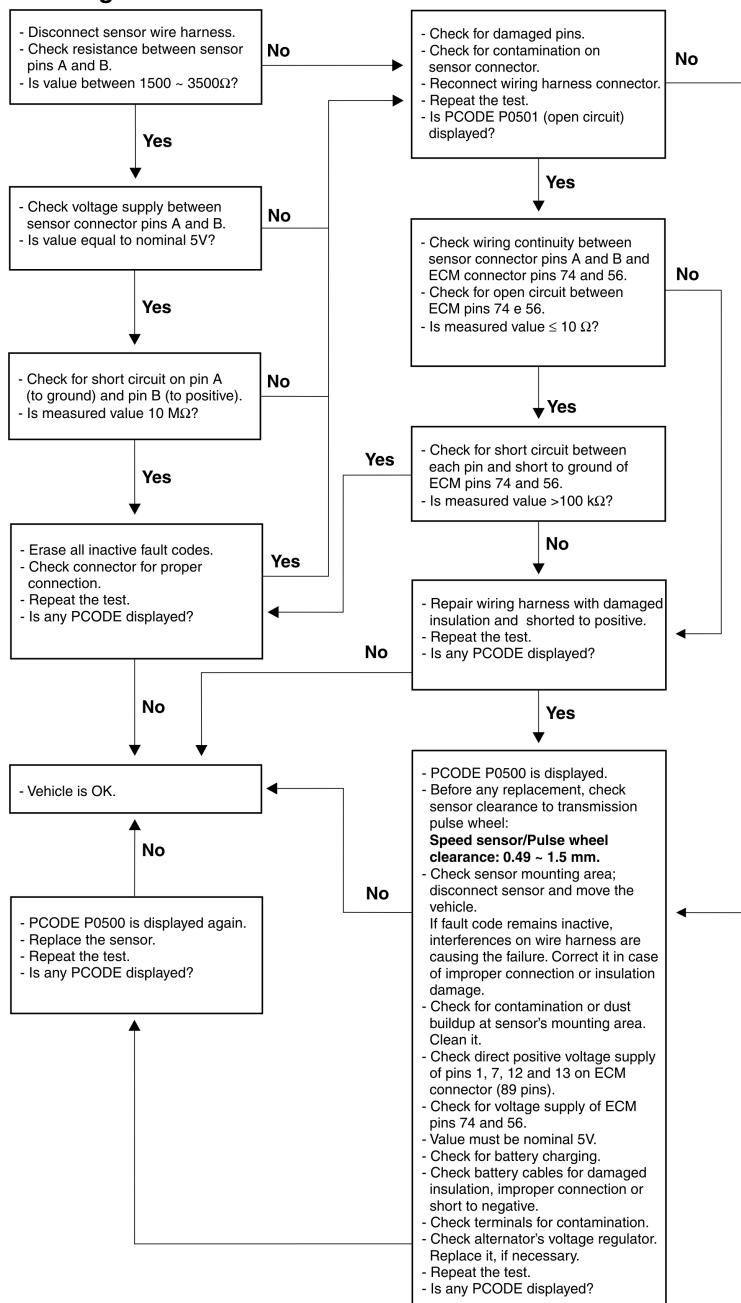
Strategy

Detection of defective sensor	Yellow light turns ON.
	Engine speed limited by parameter "maximum rotation without speed sensor".
• ECM uses this signal for engine protection.	



Vehicle Speed Sensor

Troubleshooting Routine



Cause

Vehicle speed was lost.

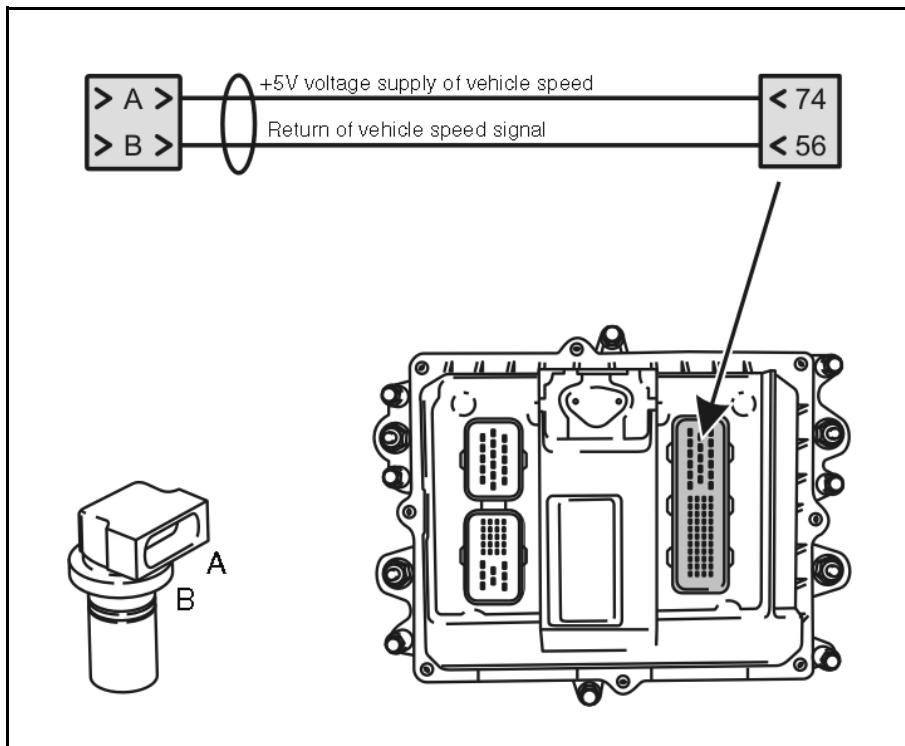
Details

Possibly the circuit or vehicle speed sensor is in an open circuit condition or it is not placed according specification (before proceeding with troubleshooting, check if distance between sensor and pulse generator whel is within 0.49 ~ 1.5 mm).

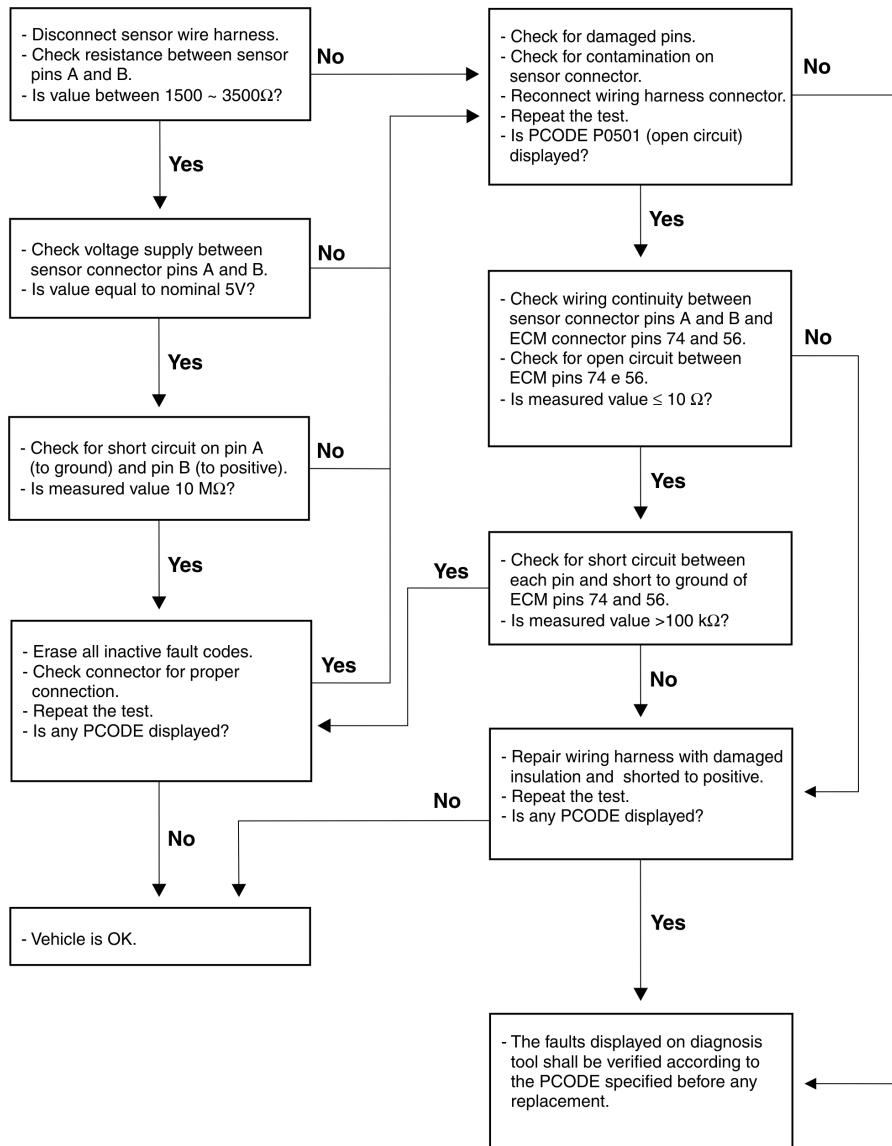
Strategy

Detection of defective sensor	Yellow light turns ON. Engine speed limited by parameter "maximum rotation without speed sensor".
--------------------------------------	--

- ECM uses this signal for engine protection.



Troubleshooting Routine



Cause

Vehicle speed low signal.

Details

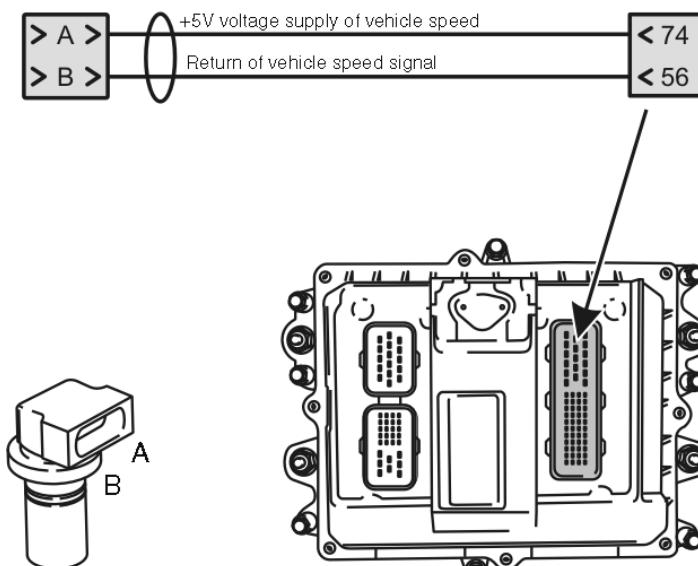
A signal low was detected from vehicle speed sensor. Engine actual running conditions, reading error from sensor or a defective wire harness (short circuit to ground) may have generated this code.

Before starting the test, check sensor for contamination. Clean it as necessary.

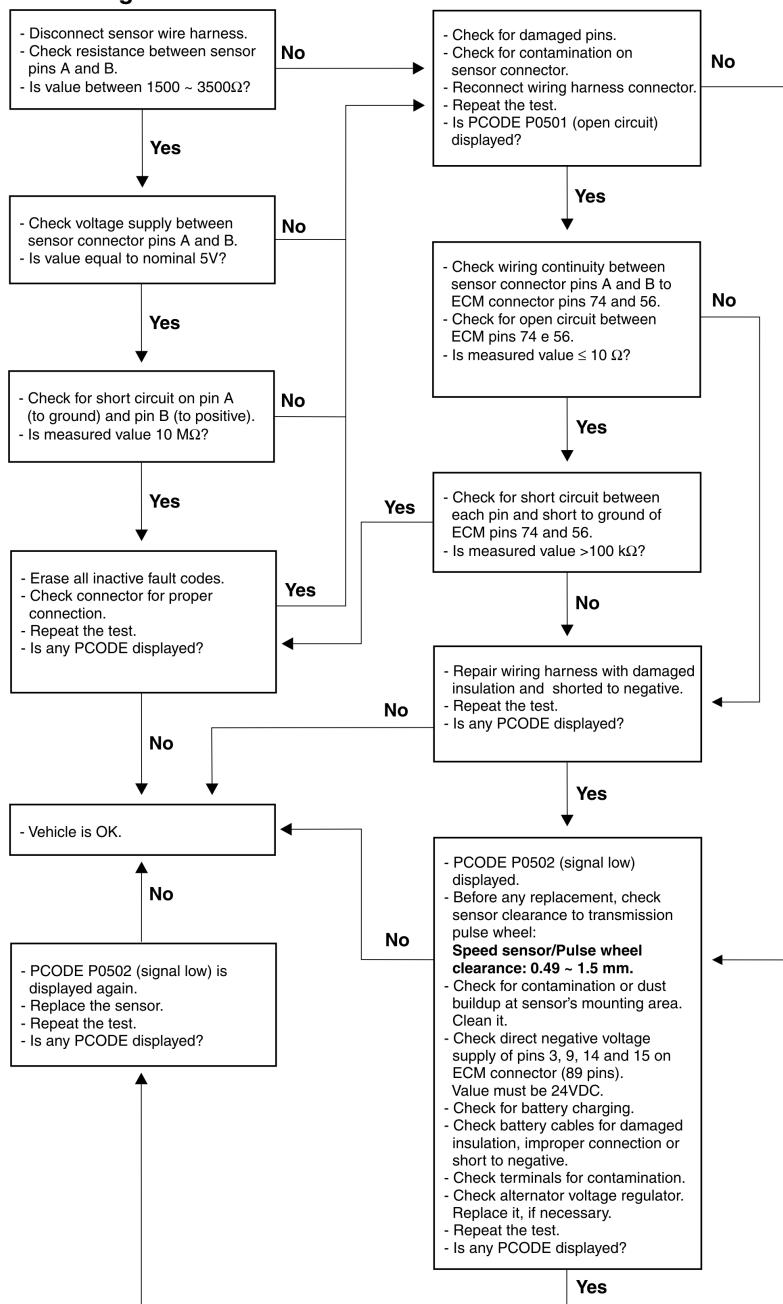
Strategy

Detection of defective sensor	Yellow light turns ON. Engine speed limited by parameter "maximum rotation without speed sensor".
--------------------------------------	--

- ECM uses this signal for engine protection.



Troubleshooting Routine



Cause

Vehicle speed high signal.

Details

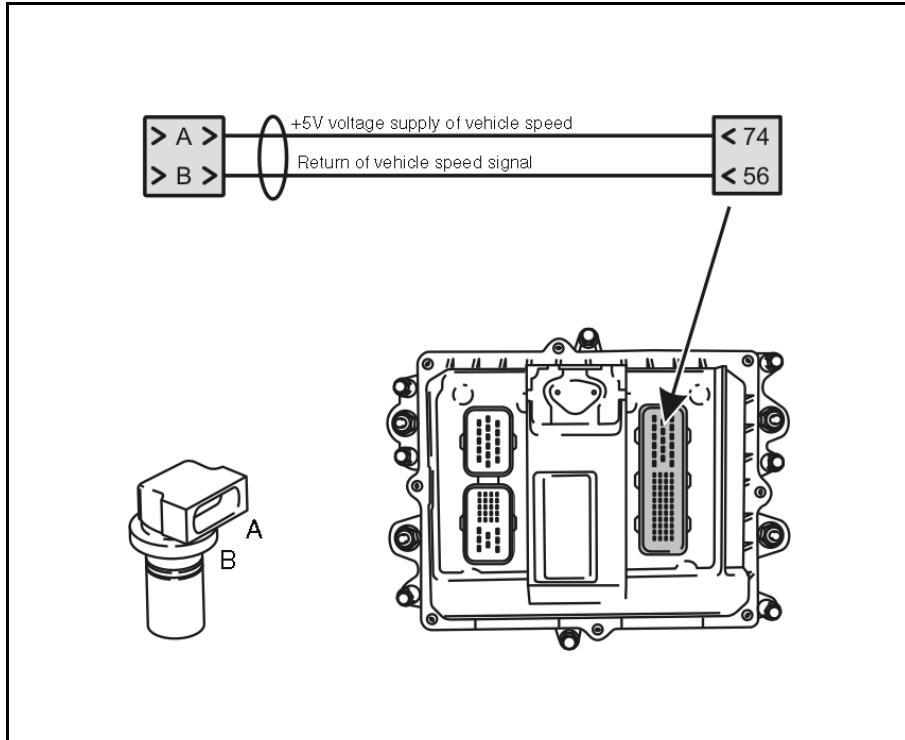
A signal high was detected from vehicle speed sensor. Engine actual running conditions, reading error from sensor or a defective wire harness may have generated this code (short circuit to positive).

Before starting the test, check sensor for contamination. Clean it as necessary.

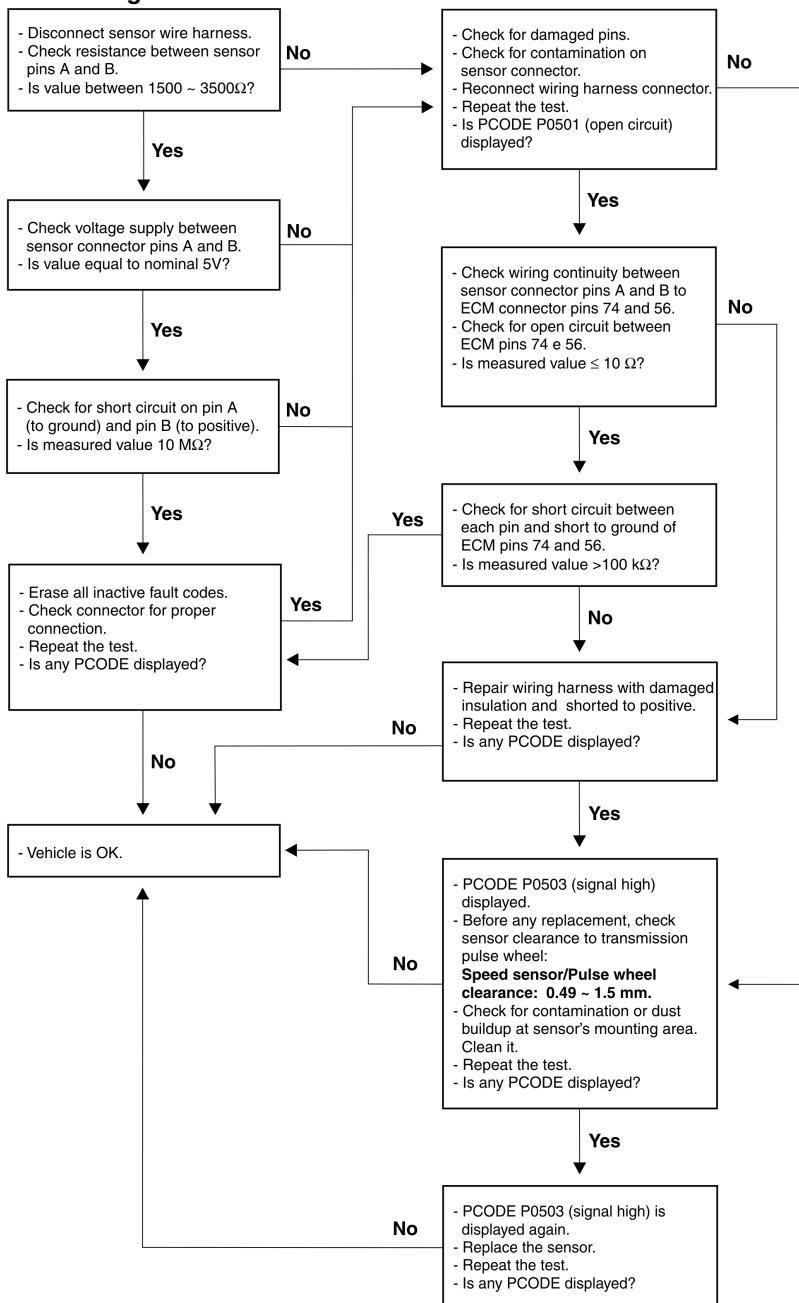
Strategy

Detection of defective sensor	Yellow light turns ON. Engine speed limited by parameter "maximum rotation without speed sensor".
-------------------------------	--

- ECM uses this signal for engine protection.



Troubleshooting Routine



Cause

Voltage on accelerator position sensor implausible with idle speed switch.

Details

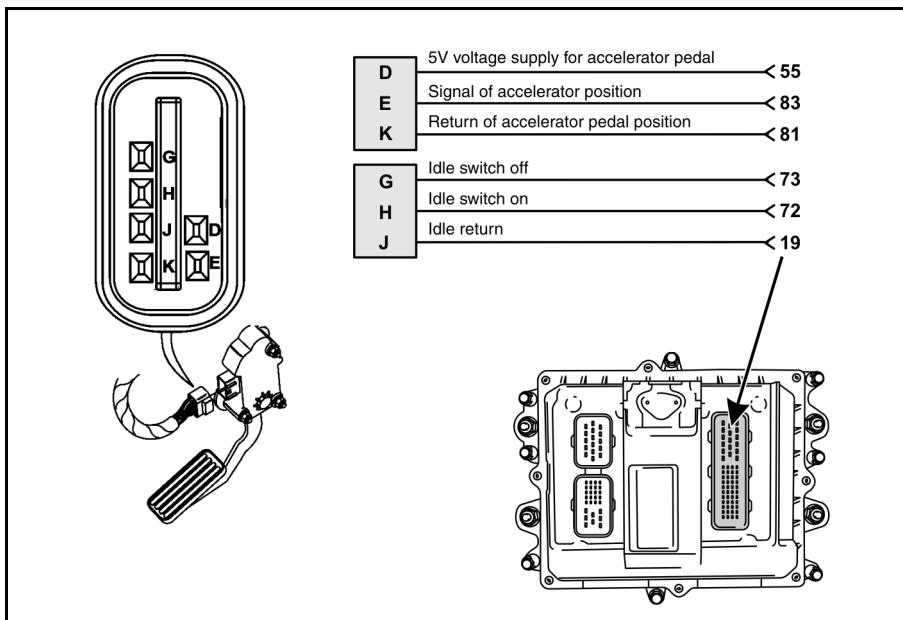
A voltage corresponding to idle speed position is detected on accelerator pedal position sensor , but no signal was detected coming from its validation switch. This voltage may be a signal oscillation or resulting from an improper connection between the sensor and its wire harness. Check that there is no incorrect connection of wiring on sensor wire harness or signs of tampering (wire cover removal, damaged insulation).

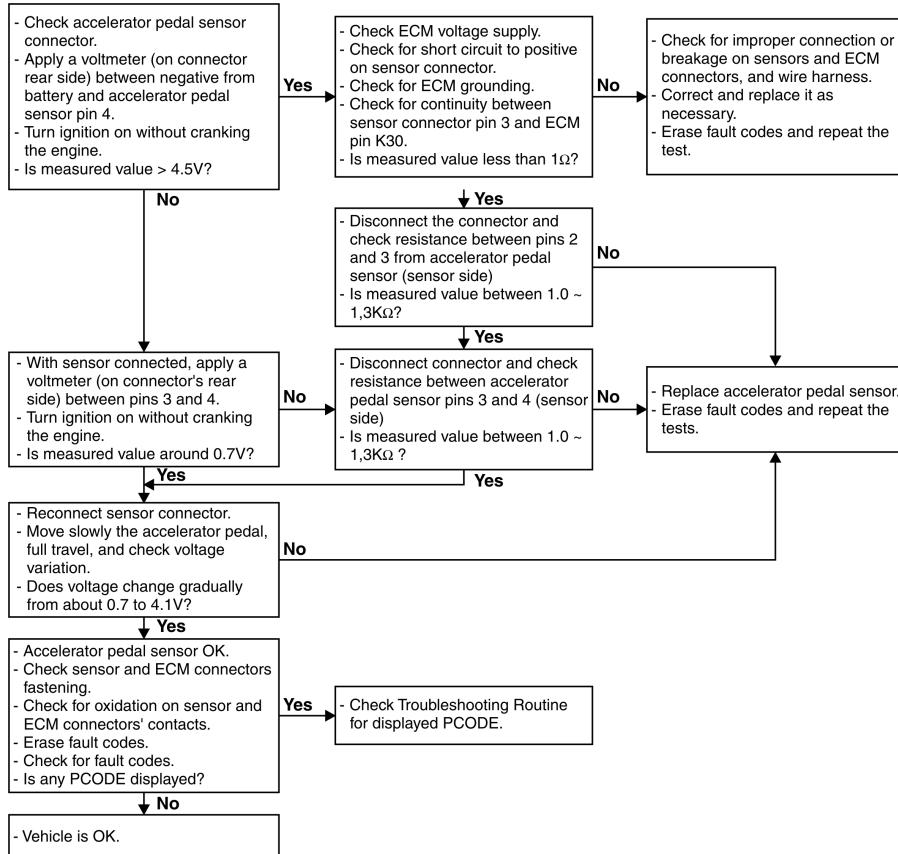
Strategy

If this signal is missing, engine speed will be fixed in 1200 rpm.

Yellow light is turned ON.

- This signal is used by ECM to validate idle speed and to change rpm according to driver's request.



Troubleshooting Routine

Cause

Oil pressure above maximum engine protection limit.

Details

The lubricating oil pressure is above the value programmed for engine protection (800 kPa). Engine actual running conditions, reading error from sensor or a defective wire harness may have generated this code.

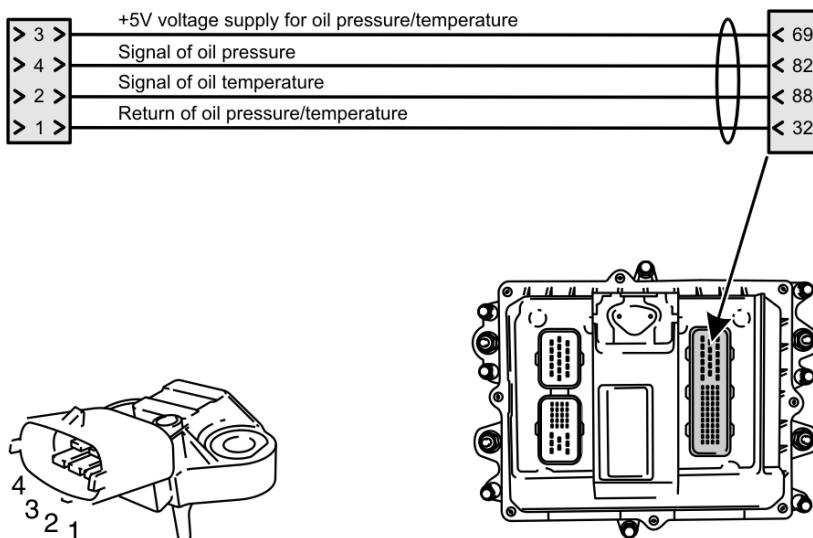
Before starting the test, check sensor for oil impregnation signs. Clean it as necessary.

Strategy**Detection of defective sensor**

Yellow light turns ON.

Engine stop - below 0.5 bar

- ECM uses this signal for engine protection.



Troubleshooting Routine

kPa	Volts
25	0.32 ($\pm 2\%$)
50	0.50 ($\pm 2\%$)
75	0.68 ($\pm 2\%$)
100	0.86 ($\pm 2\%$)
125	1.45 ($\pm 2\%$)
150	1.23 ($\pm 2\%$)
175	1.41 ($\pm 2\%$)
200	1.59 ($\pm 2\%$)
250	1.95 ($\pm 2\%$)
300	2.32 ($\pm 2\%$)
350	1.68 ($\pm 2\%$)
400	3.05 ($\pm 2\%$)
450	3.41 ($\pm 2\%$)
500	3.77 ($\pm 2\%$)
550	4.13 ($\pm 2\%$)
600	4.50 ($\pm 2\%$)
650	4.86 ($\pm 2\%$)

- Is sensor according to table?

Yes

- With open circuit, repeat the test.
- Is PCODE P0521 (open circuit) displayed?

No

- Check for damaged pins.
- Remove sensor and check it for contamination on temperature measuring area.
- Clean it as necessary.
- Connect sensor wiring.
- Repeat the test.
- Is PCODE P0521 (open circuit) displayed?

Yes

- Replace the sensor.
- Check for contamination or oil buildup at mounting area. Clean it.
- Repeat the test.
- Is any PCODE displayed?

Yes

Yes

- Erase all inactive fault codes.
- Check connector for proper connection.
- Repeat the test.
- Is any PCODE displayed?

No

- Vehicle is OK.

No

No

- Vehicle is OK.

Yes

- PCODE P0520 is displayed.
- Check wiring continuity between sensor connector pins 1 and 3 to ECM connector pins 32 and 69.
- Check for open circuit between ECM pins 32 and 88.
- Is measured value $\leq 10 \Omega$?

No

- Check for short circuit between each pin and short to ground of ECM pins 32, 69, 82 and 88.
- Is measured value $>100 \text{ k}\Omega$?

Yes

- Check direct positive voltage supply of pins 1, 7, 12 and 13 on ECM connector (89 pins).
- Check direct negative voltage supply of ECM pins 3, 9, 14 and 15. (89 pins).
- Value must be 24VDC.
- Check for battery charging.
- Check battery cables for damaged insulation, improper connection or short to negative.
- Check terminals for contamination.
- Check alternator voltage regulator. Replace it, if necessary.
- Repeat the test.
- Is any PCODE displayed?

No

- Repair wiring harness with damaged insulation and shorted to positive.
- Repeat the test.
- Is any PCODE displayed?

No

Cause

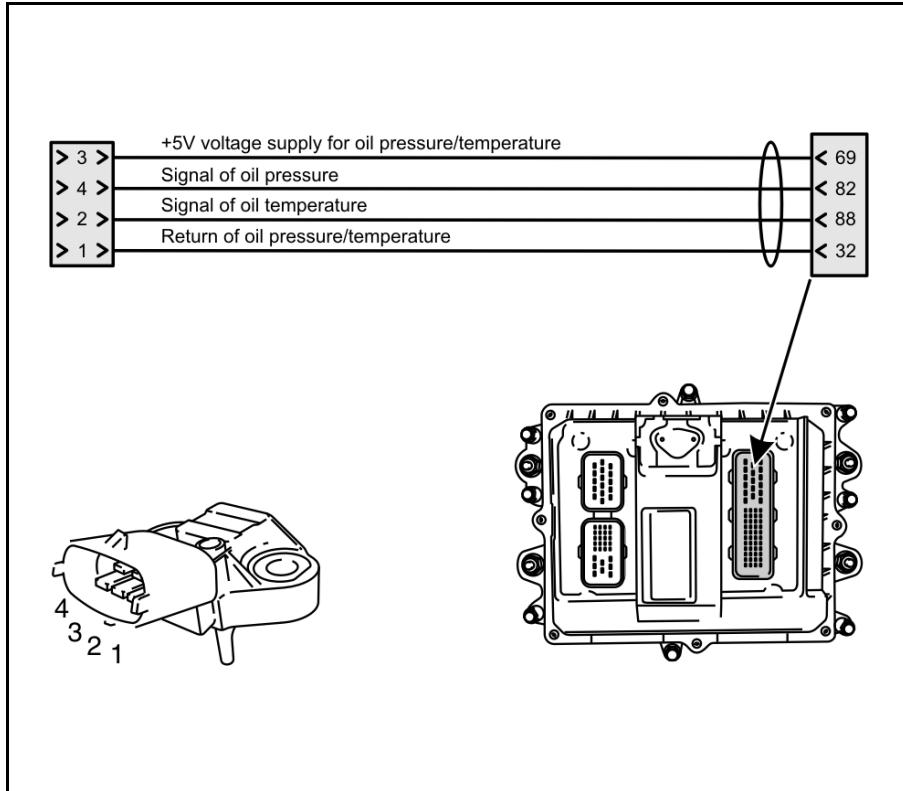
Signal from sensor de oil pressure is lost.

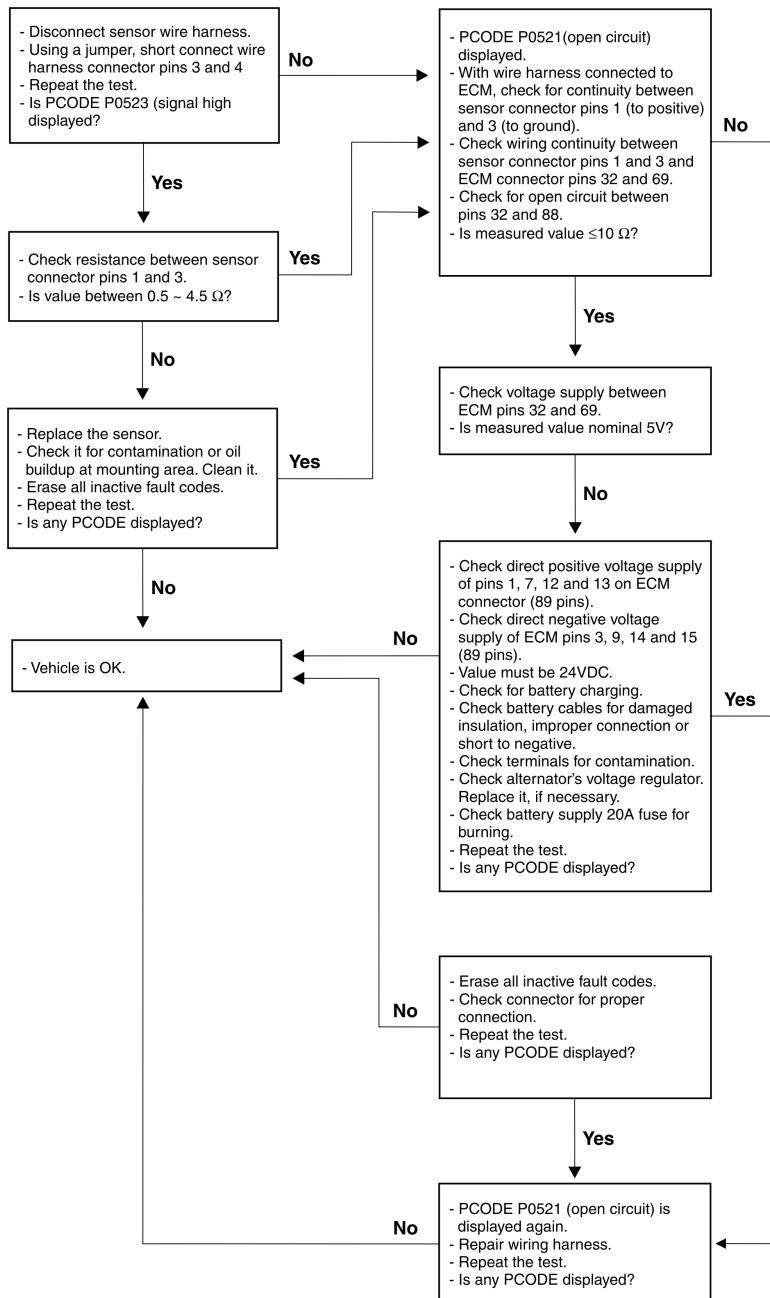
Details

Possibly the circuit or lubricating oil pressure sensor is in an open circuit condition, with no connection to ECM. Check it for a probable improper connection on wire harness connector. Create an inverse defect according to Troubleshooting Routine in order to locate the failure.

Strategy

Detection of defective sensor	Yellow light turns ON. Engine stop - below 0.5 bar.
• ECM uses this signal for engine protection.	



Troubleshooting Routine

Cause

Low voltage on sensor de oil pressure

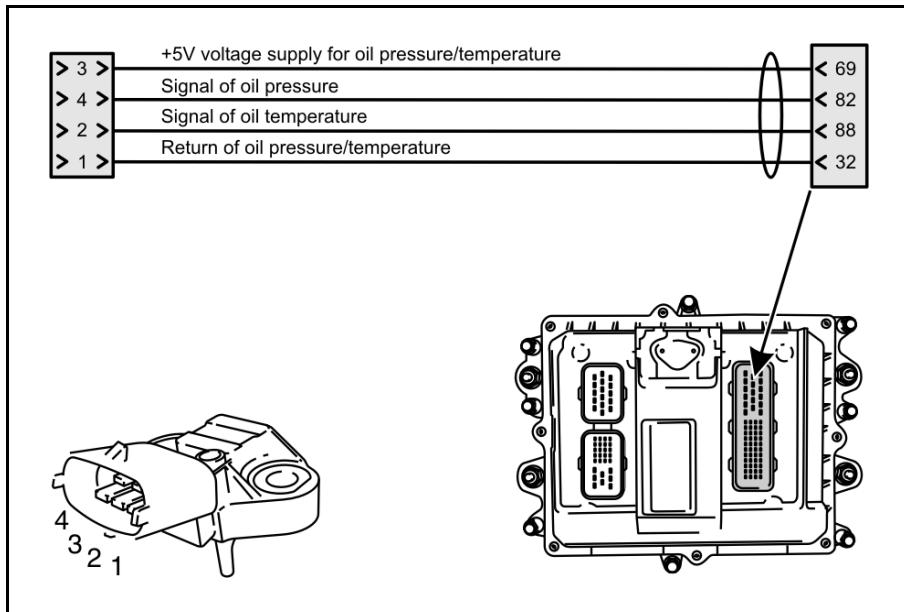
Details

A voltage low signal was detected (incompatible with signals from other sensors) coming from lubricating oil pressure sensor. There is possibly an alteration of sensor's resistance or a short circuit on wire harness.

Strategy

Detection of defective sensor	Yellow light turns ON. Engine stop - below 0.5 bar.
--------------------------------------	--

- ECM uses this signal for engine protection.



Troubleshooting Routine

