

**Monday, September 23, 2013**

**C13, C15, and C18 Engines / Diagnostic Trouble Codes**

**Diagnostic Trouble Codes**

Table 1 lists the diagnostic trouble codes that apply to the engines that are covered in this manual. Use the Caterpillar Electronic Technician (ET) in order to determine the codes that are active or logged. Then refer to the appropriate troubleshooting procedure for more information. **Note:** A requirement for all troubleshooting is that the troubleshooting is based on active and/or passive diagnostic trouble codes. Do not troubleshoot based on flash codes alone.

Table 1

<b>List of Diagnostic Trouble Codes</b>			
<b>J1939 Code and Description</b>	<b>CDL Code and Description</b>	<b>Troubleshooting Procedure</b>	<b>Flash Codes</b>
N/A	486-3 Engine Fan Reverse Switch : Voltage Above Normal	Refer to the Machine Troubleshooting Guide	N / A
N/A	486-4 Engine Fan Reverse Switch : Voltage Below Normal	Refer to the Machine Troubleshooting Guide	N / A
N/A	544-2 Engine Cooling Fan Speed Sensor : Erratic, Intermittent, or Incorrect	Troubleshooting, "Cooling Fan Speed - Test"	
N/A	544-8 Engine Cooling Fan Speed Sensor :	Troubleshooting, "Cooling Fan Speed - Test"	

	Abnormal Frequency, Pulse Width, or Period		
N/A	1076-5 Engine Cooling Fan Bypass Solenoid : Current Below Normal	Troubleshooting, "Cooling Fan Control - Test"	N / A
N/A	1076-6 Engine Cooling Fan Bypass Solenoid : Current Above Normal	Troubleshooting, "Cooling Fan Control - Test"	N / A
N/A	1937-2 Engine Coolant Flow Switch : Erratic, Intermittent, or Incorrect	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
29-2 Accelerator Pedal Position 2 : Erratic, Intermittent, or Incorrect	774-2 Secondary Throttle Position Sensor: Erratic, Intermittent, or Incorrect	Troubleshooting, "Speed Control - Test"	N / A
29-3 Accelerator Pedal Position 2 : Voltage Above Normal	774-3 Secondary Throttle Position Sensor: Voltage Above Normal	Troubleshooting, "Speed Control - Test"	N / A
29-4 Accelerator Pedal Position 2 : Voltage Below Normal	774-4 Secondary Throttle Position Sensor: Voltage Below Normal	Troubleshooting, "Speed Control - Test"	N / A
29-8 Accelerator Pedal Position 2 : Abnormal Frequency, Pulse Width, or Period	774-8 Secondary Throttle Position Sensor: Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "Speed Control - Test"	N / A
91-2 Accelerator Pedal Position 1 : Erratic, Intermittent, or Incorrect	91-2 Throttle Position Sensor : Erratic, Intermittent, or Incorrect	Troubleshooting, "Speed Control - Test"	N / A
91-3 Accelerator Pedal	91-3 Throttle Position Sensor	Troubleshooting, "Speed Control - Test"	N /

Position 1 : Voltage Above Normal	: Voltage Above Normal		A
91-4 Accelerator Pedal Position 1 : Voltage Below Normal	91-4 Throttle Position Sensor : Voltage Below Normal	Troubleshooting, "Speed Control - Test"	N / A
91-8 Accelerator Pedal Position 1 : Abnormal Frequency, Pulse Width, or Period	91-8 Throttle Position Sensor : Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "Speed Control - Test"	N / A
100-3 Engine Oil Pressure : Voltage Above Normal	100-3 Engine Oil Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
100-4 Engine Oil Pressure : Voltage Below Normal	100-4 Engine Oil Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
101-3 Engine Crankcase Pressure : Voltage Above Normal	101-3 Crankcase Air Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
101-4 Engine Crankcase Pressure : Voltage Below Normal	101-4 Crankcase Air Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
101-13 Engine Crankcase Pressure : Calibration Required	101-13 Crankcase Air Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Calibration Required - Test"	N / A
108-3 Barometric Pressure : Voltage Above Normal	3528-3 Atmospheric Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
108-4 Barometric Pressure : Voltage Below Normal	3528-4 Atmospheric Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 5 2

108-21 Barometric Pressure : Calibration Required	3528 -21 Atmospheric Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Supply - Test"	N / A
109-3 Engine Coolant Pressure : Voltage Above Normal	2302-3 Engine Coolant Pump Outlet Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
109-4 Engine Coolant Pressure : Voltage Below Normal	2302-4 Engine Coolant Pump Outlet Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
110-3 Engine Coolant Temperature : Voltage Above Normal	110-3 Engine Coolant Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	1 3 3
110-4 Engine Coolant Temperature : Voltage Below Normal	110-4 Engine Coolant Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	1 3 3
157-3 Engine Injector Metering Rail #1 Pressure : Voltage Above Normal	1797-3 Fuel Rail Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 3 3
157-4 Engine Injector Metering Rail #1 Pressure : Voltage Below Normal	1797-4 Fuel Rail Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 3 3
168-3 Battery Potential / Power Input 1 : Voltage Above Normal	168-3 Electrical System Voltage : Voltage Above Normal	Troubleshooting, "Electrical Power Supply - Test"	4 2 2
168-4 Battery Potential / Power Input 1 : Voltage Below Normal	168-4 Electrical System Voltage : Voltage Below Normal	Troubleshooting, "Electrical Power Supply - Test"	4 2 2
172-3	2526-3	Troubleshooting, "Sensor Signal	1

Engine Air Inlet Temperature : Voltage Above Normal	Air Inlet Temperature Sensor : Voltage Above Normal	(Analog, Passive) - Test"	3 3
172-4 Engine Air Inlet Temperature : Voltage Below Normal	2526-4 Air Inlet Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	1 3 3
174-3 Engine Fuel Temperature 1 : Voltage Above Normal	174-3 Fuel Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	1 6 5
174-4 Engine Fuel Temperature 1 : Voltage Below Normal	174-4 Fuel Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	1 6 5
190-8 Engine Speed : Abnormal Frequency, Pulse Width, or Period	190-8 Engine Speed Sensor : Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "Speed/Timing - Test"	1 4 1
411-3 Engine Exhaust Gas Recirculation Differential Pressure : Voltage Above Normal	3387-3 EGR Differential Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
411-4 Engine Exhaust Gas Recirculation Differential Pressure : Voltage Below Normal	3387-4 EGR Differential Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
411-13 Engine Exhaust Gas Recirculation Differential Pressure : Calibration Required	3387-13 EGR Differential Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Calibration Required - Test"	N / A
412-3 Engine Exhaust Gas Recirculation Temperature : Voltage Above Normal	3386-3 EGR Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A

412-4 Engine Exhaust Gas Recirculation Temperature : Voltage Below Normal	3386-4 EGR Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
441-3 Auxiliary Temperature #1 : Voltage Above Normal	1836-3 Auxiliary Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	
441-4 Auxiliary Temperature #1 : Voltage Below Normal	1836-4 Auxiliary Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	
442-3 Auxiliary Temperature #2 : Voltage Above Normal	3683-3 Auxiliary Temperature Sensor #2 : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
442-4 Auxiliary Temperature #2 : Voltage Below Normal	3683-4 Auxiliary Temperature Sensor #2 : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
597-3 Brake Switch : Voltage Above Normal	298-3 Service Brake Pedal Switch : Voltage Above Normal	Refer to the Machine Troubleshooting Guide	N / A
597-4 Brake Switch : Voltage Below Normal	298-4 Service Brake Pedal Switch : Voltage Below Normal	Refer to the Machine Troubleshooting Guide	N / A
625-14 Proprietary Data Link : Special Instruction	246-14 Proprietary CAN Data Link:Special Instruction	Troubleshooting, "Data Link Configuration Status - Test"	N / A
626-5 Engine Start Enable Device 1 : Current Below Normal	2417-5 Ether Injection Control Solenoid : Current Below Normal	Troubleshooting, "Ether Starting Aid - Test"	N / A
626-6 Engine Start Enable	2417-6 Ether Injection Control	Troubleshooting, "Ether Starting Aid - Test"	N /

Device 1 : Current Above Normal	Solenoid : Current Above Normal		A
630-2 Calibration Memory : Erratic, Intermittent, or Incorrect	268-2 Programmed Parameter Fault : Erratic, Intermittent, or Incorrect	Troubleshooting, "Configuration Parameters"	5 2 7
631-2 Calibration Module : Erratic, Intermittent, or Incorrect	253-2 Personality Module : Erratic, Intermittent, or Incorrect	Troubleshooting, "ECM Software - Install"	N / A
637-11 Engine Timing Sensor : Other Failure Mode	261-11 Engine Timing Offset fault	Troubleshooting, "Timing - Calibrate"	1 4 3
637-13 Engine Timing Sensor : Calibration Required	261-13 Engine Timing Calibration : Calibration Required	Troubleshooting, "Timing - Calibrate"	1 4 3
639-9 J1939 Network #1 : Abnormal Update Rate	247-9 SAE J1939 Data Link : Abnormal Update Rate	Troubleshooting, "Data Link - Test"	
639-14 J1939 Network #1 : Special Instruction	247-14 SAE J1939 Data Link : Special Instruction	Troubleshooting, "Data Link - Test"	
651-5 Engine Injector Cylinder #01 : Current Below Normal	1-5 Cylinder #1 Injector : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 1 / 1 3 9
651-6 Engine Injector Cylinder #01 : Current Above Normal	1-6 Cylinder #1 Injector : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 1 / 1 3 9
652-5 Engine Injector	2-5 Cylinder #2 Injector :	Troubleshooting, "Injector Solenoid - Test"	1 1

Cylinder #02 : Current Below Normal	Current Below Normal		2 / 1 3 9
652-6 Engine Injector Cylinder #02 : Current Above Normal	2-6 Cylinder #2 Injector : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 2 / 1 3 9
653-5 Engine Injector Cylinder #03 : Current Below Normal	3-5 Cylinder #3 Injector : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 3 / 1 3 9
653-6 Engine Injector Cylinder #03 : Current Above Normal	3-6 Cylinder #3 Injector : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 3 / 1 3 9
654-5 Engine Injector Cylinder #04 : Current Below Normal	4-5 Cylinder #4 Injector : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 4 / 1 3 9
654-6 Engine Injector Cylinder #04 : Current Above Normal	4-6 Cylinder #4 Injector : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 4 / 1 3 9
655-5 Engine Injector	5-5 Cylinder #5 Injector :	Troubleshooting, "Injector Solenoid -	1 1



Cylinder #05 : Current Below Normal	Current Below Normal	Test"	5 / 1 3 9
655-6 Engine Injector Cylinder #05 : Current Above Normal	5-6 Cylinder #5 Injector : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 5 / 1 3 9
656-5 Engine Injector Cylinder #06 : Current Below Normal	6-5 Cylinder #6 Injector : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 6 / 1 3 9
656-6 Engine Injector Cylinder #06 : Current Above Normal	6-6 Cylinder #6 Injector : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 6 / 1 3 9
678-3 ECU 8 Volts DC Supply : Voltage Above Normal	41-3 8 Volt DC Supply : Voltage Above Normal	Troubleshooting, "Sensor Supply - Test"	N / A
678-4 ECU 8 Volts DC Supply : Voltage Below Normal	41-4 8 Volt DC Supply : Voltage Below Normal	Troubleshooting, "Sensor Supply - Test"	N / A
723-8 Engine Speed Sensor #2 : Abnormal Frequency, Pulse Width, or Period	342-8 Secondary Engine Speed Sensor : Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "Speed/Timing - Test"	N / A
1072-5 Engine (Compression)	2533-5 Compression Brake	Troubleshooting, "Retarder - Test"	N / A

Brake Output #1 : Current Below Normal	Low/High Solenoid #1 : Current Below Normal		A
1072-6 Engine (Compression) Brake Output #1 : Current Above Normal	2533-6 Compression Brake Low/High Solenoid #1 : Current Above Normal	Troubleshooting, "Retarder - Test"	N / A
1073-5 Engine (Compression) Brake Output #2 : Current Below Normal	2535-5 Compression Brake Medium/High Solenoid #1 : Current Below Normal	Troubleshooting, "Retarder - Test"	N / A
1073-6 Engine (Compression) Brake Output #2 : Current Above Normal	2535-6 Compression Brake Medium/High Solenoid #1 : Current Above Normal	Troubleshooting, "Retarder - Test"	N / A
1176-3 Engine Turbocharger 1 Compressor Inlet Pressure : Voltage Above Normal	2738-3 Turbocharger #1 Compressor Inlet Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
1176-4 Engine Turbocharger 1 Compressor Inlet Pressure : Voltage Below Normal	2738-4 Turbocharger #1 Compressor Inlet Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
1231-9 J1939 Network #2 : Abnormal Update Rate	2348-9 SAE J1939 Data Link #2 : Abnormal Update Rate	Troubleshooting, "Data Link - Test"	
1231-14 J1939 Network #2 : Special Instruction	2348-14 SAE J1939 Data Link #2 : Special Instruction	Troubleshooting, "Data Link - Test"	
1235-9 J1939 Network #3 : Abnormal Update Rate	5856-9 SAE J1939 Data Link #3:Abnormal Update Rate	Troubleshooting, "Data Link - Test"	
1235-14 J1939 Network #3 : Special Instruction	5856-14 SAE J1939 Data Link #3: Special Instruction	Troubleshooting, "Data Link - Test"	

1347-5 Engine Fuel Pump Pressurizing Assembly #1 : Current Below Normal	1779-5 Fuel Rail #1 Pressure Valve Solenoid : Current Below Normal	Troubleshooting, "Fuel Injection Pump - Test"	N / A
1347-6 Engine Fuel Pump Pressurizing Assembly #1 : Current Above Normal	1779-6 Fuel Rail #1 Pressure Valve Solenoid : Current Above Normal	Troubleshooting, "Fuel Injection Pump - Test"	N / A
1348-5 Engine Fuel Pump Pressurizing Assembly #2 : Current Below Normal	1780-5 Fuel Rail #2 Pressure Valve Solenoid : Current Below Normal	Troubleshooting, "Fuel Injection Pump - Test"	N / A
1348-6 Engine Fuel Pump Pressurizing Assembly #2 : Current Above Normal	1780-6 Fuel Rail #2 Pressure Valve Solenoid : Current Above Normal	Troubleshooting, "Fuel Injection Pump - Test"	N / A
1385-3 Auxiliary Temperature #1 : Voltage Above Normal	1836-3 Auxiliary Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
1385-4 Auxiliary Temperature #1 : Voltage Below Normal	1836-4 Auxiliary Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
1387-3 Auxiliary Pressure #1 : Voltage Above Normal	1835-3 Auxiliary Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
1387-4 Auxiliary Pressure #1 : Voltage Below Normal	1835-4 Auxiliary Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
1761-3 Aftertreatment 1 Diesel Exhaust Fluid Tank Level : Voltage Above	3130-3 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Level Sensor :	Troubleshooting, "DEF Tank Sensor - Test"	

Normal	Voltage Above Normal		
1761-4 Aftertreatment 1 Diesel Exhaust Fluid Tank Level : Voltage Below Normal	3130-4 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Level Sensor : Voltage Below Normal	Troubleshooting, "DEF Tank Sensor - Test"	
2630-3 Engine Charge Air Cooler Outlet Temperature : Voltage Above Normal	3372-3 Engine Charge Air Cooler #1 Outlet Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
2630-4 Engine Charge Air Cooler Outlet Temperature : Voltage Below Normal	3372-4 Engine Charge Air Cooler #1 Outlet Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Passive) - Test"	N / A
2791-5 Engine Exhaust Gas Recirculation (EGR) Valve Control : Current Below Normal	3405-5 EGR Valve Control : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
2791-6 Engine Exhaust Gas Recirculation (EGR) Valve Control : Current Above Normal	3405-6 EGR Valve Control : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
2813-5 Engine Air Shutoff Command Status : Current Below Normal	3239-5 Air Shutoff Relay : Current Below Normal	Troubleshooting, "Air Shutoff - Test"	N / A
2813-6 Engine Air Shutoff Command Status : Current Above Normal	3239-6 Air Shutoff Relay : Current Above Normal	Troubleshooting, "Air Shutoff - Test"	N / A
2948-3 Engine Intake Valve Actuation System Oil Pressure : Voltage Above Normal	1924-3 Intake Valve Actuation System Oil Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 8 2

2948-4 Engine Intake Valve Actuation System Oil Pressure : Voltage Below Normal	1924-4 Intake Valve Actuation System Oil Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	
2949-5 Engine Intake Valve Actuation System Oil Pressure Control Valve : Current Below Normal	1922-5 Intake Valve Actuation System Oil Pressure Solenoid : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	1 8 1
2949-6 Engine Intake Valve Actuation System Oil Pressure Control Valve : Current Above Normal	1922-6 Intake Valve Actuation System Oil Pressure Solenoid : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	1 8 1
2949-7 Engine Intake Valve Actuation System Oil Pressure Control Valve : Not Responding Properly	1922-7 Intake Valve Actuation System Oil Pressure Solenoid : Not Responding Properly	Troubleshooting, "Variable Valve Actuator Response - Test"	1 8 2
2950-5 Engine Intake Valve Actuator #1 : Current Below Normal	1901-5 Intake Valve Actuator #1 : Current Below Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 1 / 1 7 9
2950-6 Engine Intake Valve Actuator #1 : Current Above Normal	1901-6 Intake Valve Actuator #1 : Current Above Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 1 / 1 7 9
2950-7 Engine Intake Valve Actuator #1 : Not Responding Properly	1901-7 Intake Valve Actuator #1 : Not Responding Properly	Troubleshooting, "Variable Valve Actuator Response - Test"	1 1 1 /

			1 7 9
2951-5 Engine Intake Valve Actuator #2 : Current Below Normal	1902-5 Intake Valve Actuator #2 : Current Below Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 2 / 1 7 9
2951-6 Engine Intake Valve Actuator #2 : Current Above Normal	1902-6 Intake Valve Actuator #2 : Current Above Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 2 / 1 7 9
2951-7 Engine Intake Valve Actuator #2 : Not Responding Properly	1902-7 Intake Valve Actuator #2 : Not Responding Properly	Troubleshooting, "Variable Valve Actuator Response - Test"	1 1 2 / 1 7 9
2952-5 Engine Intake Valve Actuator #3 : Current Below Normal	1903-5 Intake Valve Actuator #3 : Current Below Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 3 / 1 7 9
2952-6 Engine Intake Valve Actuator #3 : Current Above Normal	1903-6 Intake Valve Actuator #3 : Current Above Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 3 / 1 7 9
2952-7 Engine Intake Valve Actuator #3 : Not	1903-7 Intake Valve Actuator #3 : Not Responding	Troubleshooting, "Variable Valve Actuator Response - Test"	1 1 3 / /

Responding Properly	Properly		1 7 9
2953-5 Engine Intake Valve Actuator #4 : Current Below Normal	1904-5 Intake Valve Actuator #4 : Current Below Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 4 / 1 7 9
2953-6 Engine Intake Valve Actuator #4 : Current Above Normal	1904-6 Intake Valve Actuator #4 : Current Above Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 4 / 1 7 9
2953-7 Engine Intake Valve Actuator #4 : Not Responding Properly	1904-7 Intake Valve Actuator #4 : Not Responding Properly	Troubleshooting, "Variable Valve Actuator Response - Test"	1 1 4 / 1 7 9
2954-5 Engine Intake Valve Actuator #5 : Current Below Normal	1905-5 Intake Valve Actuator #5 : Current Below Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 5 / 1 7 9
2954-6 Engine Intake Valve Actuator #5 : Current Above Normal	1905-6 Intake Valve Actuator #5 : Current Above Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 5 / 1 7 9
2954-7 Engine Intake Valve Actuator #5 : Not	1905-7 Intake Valve Actuator #5 : Not Responding	Troubleshooting, "Variable Valve Actuator Response - Test"	1 1 5 / /

Responding Properly	Properly		1 7 9
2955-5 Engine Intake Valve Actuator #6 : Current Below Normal	1906-5 Intake Valve Actuator #6 : Current Below Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 6 / 1 7 9
2955-6 Engine Intake Valve Actuator #6 : Current Above Normal	1906-6 Intake Valve Actuator #6 : Current Above Normal	Troubleshooting, "Variable Valve Actuator - Test"	1 1 6 / 1 7 9
2955-7 Engine Intake Valve Actuator #6 : Not Responding Properly	1906-7 Intake Valve Actuator #6 : Not Responding Properly	Troubleshooting, "Variable Valve Actuator Response - Test"	1 1 6 / 1 7 9
3031-3 Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature : Voltage Above Normal	3134-3 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Temperature Sensor : Voltage Above Normal	Troubleshooting, "DEF Tank Sensor - Test"	
3031-4 Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature : Voltage Below Normal	3134-4 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Temperature Sensor : Voltage Below Normal	Troubleshooting, "DEF Tank Sensor - Test"	
3216-11 Aftertreatment #1 Intake NOx : Other Failure Mode	3655-11 Aftertreatment #1 Intake NOx Level Sensor : Other Failure Mode	Troubleshooting, "Sensor (Data Link Type) - Test"	
3216-12 Aftertreatment #1 Intake NOx : Failure	3655-12 Aftertreatment #1 Intake NOx Level Sensor :	Troubleshooting, "Sensor (Data Link Type) - Test"	



	Failure		
3226-11 Aftertreatment #1 Outlet NOx : Other Failure Mode	3609-11 Aftertreatment #1 Outlet #1 NOx Level Sensor : Other Failure Mode	Troubleshooting, "Sensor (Data Link Type) - Test"	
3226-12 Aftertreatment #1 Outlet NOx : Failure	3609-12 Aftertreatment #1 Outlet #1 NOx Level Sensor : Failure	Troubleshooting, "Sensor (Data Link Type) - Test"	
3241-3 Exhaust Gas Temperature 1 : Voltage Above Normal	3485-3 Aftertreatment #1 Exhaust Gas Temperature #1 Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 8 5
3241-4 Exhaust Gas Temperature 1 : Voltage Below Normal	3485-4 Aftertreatment #1 Exhaust Gas Temperature #1 Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 8 5
3242-3 Particulate Trap Intake Gas Temperature : Voltage Above Normal	2452-3 DPF #1 Intake Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3242-4 Particulate Trap Intake Gas Temperature : Voltage Below Normal	2452-4 DPF #1 Intake Temperature Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3251-2 Particulate Trap Differential Pressure : Erratic, Intermittent, or Incorrect	2458-2 DPF #1 Differential Pressure Sensor : Erratic, Intermittent, or Incorrect	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3251-3 Particulate Trap Differential Pressure : Voltage Above Normal	2458-3 DPF #1 Differential Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3251-4 Particulate Trap Differential Pressure :	2458-4 DPF #1 Differential Pressure Sensor :	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A

Voltage Below Normal	Voltage Below Normal		
3251-13 Particulate Trap Differential Pressure : Out of Calibration	2458-13 DPF #1 Differential Pressure Sensor : Out of Calibration	Troubleshooting, "Sensor Calibration Required - Test"	N / A
3358-3 Engine Exhaust Gas Recirculation Inlet Pressure : Voltage Above Normal	3385-3 EGR Intake Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3358-4 Engine Exhaust Gas Recirculation Inlet Pressure : Voltage Below Normal	3385-4 EGR Intake Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3358-13 Engine Exhaust Gas Recirculation Inlet Pressure : Calibration Required	3385-13 EGR Intake Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Calibration Required - Test"	1 9 7
3358-21 Engine Exhaust Gas Recirculation Inlet Pressure : Data Drifted Low	3385-21 EGR Intake Pressure Sensor : Data Drifted Low	Troubleshooting, "Sensor Supply - Test"	N / A
3360-3 Aftertreatment 1 Diesel Exhaust Fluid Controller : Voltage Above Normal	3820-3 Aftertreatment #1 Diesel Exhaust Fluid Controller : Voltage Above Normal	Troubleshooting, "Electrical Power Supply - Test"	
3360-4 Aftertreatment 1 Diesel Exhaust Fluid Controller : Voltage Below Normal	3820-4 Aftertreatment #1 Diesel Exhaust Fluid Controller : Voltage Below Normal	Troubleshooting, "Electrical Power Supply - Test"	
3360-12 Aftertreatment 1 Diesel Exhaust Fluid Controller : Failure	3820-12 Aftertreatment #1 Diesel Exhaust Fluid Controller : Failure	Troubleshooting, "Sensor (Data Link Type) - Test"	

3361-5 Catalyst Dosing Unit : Current Below Normal	3821-5 Aftertreatment #1 Diesel Exhaust Fluid Dosing Valve Actuator : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	
3361-6 Catalyst Dosing Unit : Current Above Normal	3821-6 Aftertreatment #1 Diesel Exhaust Fluid Dosing Valve Actuator : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	
3361-7 Catalyst Dosing Unit : Not Responding Properly	3821-7 Aftertreatment #1 Diesel Exhaust Fluid Dosing Valve Actuator : Not Responding Properly	Troubleshooting, "DEF Module Does Not Respond"	
3361-11 Catalyst Dosing Unit : Other Failure Mode	3821-11 Aftertreatment #1 Diesel Exhaust Fluid Dosing Valve Actuator : Other Failure Mode	Troubleshooting, "DEF Module Does Not Respond"	
3361-14 Catalyst Dosing Unit : Special Instruction	3821-14 Aftertreatment #1 Diesel Exhaust Fluid Dosing Valve Actuator : Special Instruction	Troubleshooting, "DEF Module Does Not Respond"	
3363-5 Aftertreatment 1 Diesel Exhaust Fluid Tank Heater : Current Below Normal	3126-5 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Heater Coolant Diverter Solenoid : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	
3363-6 Aftertreatment 1 Diesel Exhaust Fluid Tank Heater : Current Above Normal	3126-6 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Heater Coolant Diverter Solenoid : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	
3363-7 Aftertreatment 1 Diesel Exhaust Fluid Tank Heater : Not	3126-7 Aftertreatment #1 SCR Catalyst Reagent Tank #1 Heater Coolant	Troubleshooting, "DEF Temperature Is Low"	

Responding Properly	Diverter Solenoid : Not Responding Properly		
3479-5 Aftertreatment #1 Fuel Pressure Control : Current Below Normal	2461-5 ARD Fuel Pressure #1 Control : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
3479-6 Aftertreatment #1 Fuel Pressure Control : Current Above Normal	2461-6 ARD Fuel Pressure #1 Control : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
3480-3 Aftertreatment #1 Fuel Pressure #1 : Voltage Above Normal	2460-3 ARD Fuel Pressure #1 Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3480-4 Aftertreatment #1 Fuel Pressure #1 : Voltage Below Normal	2460-4 ARD Fuel Pressure #1 Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3484-5 Aftertreatment #1 Ignition : Current Below Normal	2465-5 Aftertreatment #1 Ignition Transformer Primary : Current Below Normal	Troubleshooting, "ARD Ignition - Test"	N / A
3484-6 Aftertreatment #1 Ignition : Current Above Normal	2465-6 Aftertreatment #1 Ignition Transformer Primary : Current Above Normal	Troubleshooting, "ARD Ignition - Test"	N / A
3487-5 Aftertreatment #1 Air Pressure Control : Current Below Normal	2489-5 ARD Air Pressure Control Actuator : Current Below Normal	Troubleshooting, "ARD Combustion Air - Test"	N / A
3487-6 Aftertreatment #1 Air Pressure Control : Current Above Normal	2489-6 ARD Air Pressure Control Actuator : Current Above Normal	Troubleshooting, "ARD Combustion Air - Test"	N / A
3487-13 Aftertreatment #1 Air Pressure Control : Out	2489-13 ARD Air Pressure Control Actuator : Out of	Troubleshooting, "ARD Combustion Air Valve - Replace"	

of Calibration	Calibration		
3488-3 Aftertreatment #1 Air Pressure Actuator Position : Voltage Above Normal	2490-3 ARD Air Pressure Control Actuator Position Sensor : Voltage Above Normal	Troubleshooting, "ARD Combustion Air - Test"	N / A
3488-4 Aftertreatment #1 Air Pressure Actuator Position : Voltage Below Normal	2490-4 ARD Air Pressure Control Actuator Position Sensor : Voltage Below Normal	Troubleshooting, "ARD Combustion Air - Test"	N / A
3509-3 Sensor Supply Voltage 1 : Voltage Above Normal	262-3 5 Volt Sensor DC Power Supply : Voltage Above Normal	Troubleshooting, "Sensor Supply - Test"	5 1 6
3509-4 Sensor Supply Voltage 1 : Voltage Below Normal	262-4 5 Volt Sensor DC Power Supply : Voltage Below Normal	Troubleshooting, "Sensor Supply - Test"	5 1 6
3510-3 Sensor Supply Voltage 2 : Voltage Above Normal	2131-3 5 Volt Sensor DC Power Supply #2 : Voltage Above Normal	Troubleshooting, "Sensor Supply - Test"	5 1 6
3510-4 Sensor Supply Voltage 2 : Voltage Below Normal	2131-4 5 Volt Sensor DC Power Supply #2 : Voltage Below Normal	Troubleshooting, "Sensor Supply - Test"	5 1 6
3511-11 Sensor Supply Voltage 3 : Other Failure Mode	3482-11 Sensor Supply #3 : Other Failure Mode	Troubleshooting, "DEF Pump Sensor Supply - Test"	
3516-12 Catalyst Reagent Concentration : Failure	3100-12 Aftertreatment #1 SCR Catalyst Tank Reagent Quality Sensor : Failure	Troubleshooting, "Sensor (Data Link Type) - Test"	
3563-3 Engine Intake Manifold #1 Absolute Pressure : Voltage Above Normal	1785-3 Intake Manifold Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	1 9 7
3563-4	1785-4	Troubleshooting, "Sensor Signal	1

Engine Intake Manifold #1 Absolute Pressure : Voltage Below Normal	Intake Manifold Pressure Sensor : Voltage Below Normal	(Analog, Active) - Test"	9 7
3563-13 Engine Intake Manifold #1 Absolute Pressure : Calibration Required	1785-13 Intake Manifold Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Calibration Required - Test"	1 9 7
3563-21 Engine Intake Manifold #1 Absolute Pressure : Data Drifted Low	1785-21 Intake Manifold Pressure Sensor : Data Drifted Low	Troubleshooting, "Sensor Supply - Test"	N / A
3609-3 DPF #1 Intake Pressure : Voltage Above Normal	3464-3 DPF #1 Intake Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3609-4 DPF #1 Intake Pressure : Voltage Below Normal	3464-4 DPF #1 Intake Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3609-13 DPF #1 Intake Pressure : Calibration Required	3464-13 DPF #1 Intake Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Calibration Required - Test"	N / A
3609-21 DPF #1 Intake Pressure : Data Drifted Low	3464-21 DPF #1 Intake Pressure Sensor : Data Drifted Low	Troubleshooting, "Sensor Supply - Test"	N / A
3659-5 Engine Injector Cylinder #1 Actuator #2 : Current Below Normal	2602-5 Cylinder #1 Injector Actuator #2 : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 1 / 1 3 9
3659-6 Engine Injector Cylinder #1 Actuator #2 : Current Above Normal	2602-6 Cylinder #1 Injector Actuator #2 : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 1 / 1 3

			9
3660-5 Engine Injector Cylinder #2 Actuator #2 : Current Below Normal	2604-5 Cylinder #2 Injector Actuator #2 : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 2 / 1 3 9
3660-6 Engine Injector Cylinder #2 Actuator #2 : Current Above Normal	2604-6 Cylinder #2 Injector Actuator #2 : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 2 / 1 3 9
3661-5 Engine Injector Cylinder #3 Actuator #2 : Current Below Normal	2606-5 Cylinder #3 Injector Actuator #2 : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 3 / 1 3 9
3661-6 Engine Injector Cylinder #3 Actuator #2 : Current Above Normal	2606-6 Cylinder #3 Injector Actuator #2 : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 3 / 1 3 9
3662-5 Engine Injector Cylinder #4 Actuator #2 : Current Below Normal	2608-5 Cylinder #4 Injector Actuator #2 : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 4 / 1 3 9
3662-6 Engine Injector Cylinder #4 Actuator #2 : Current Above Normal	2608-6 Cylinder #4 Injector Actuator #2 : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 4 / 1 3

			9
3663-5 Engine Injector Cylinder #5 Actuator #2 : Current Below Normal	2610-5 Cylinder #5 Injector Actuator #2 : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 5 / 1 3 9
3663-6 Engine Injector Cylinder #5 Actuator #2 : Current Above Normal	2610-6 Cylinder #5 Injector Actuator #2 : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 5 / 1 3 9
3664-5 Engine Injector Cylinder #6 Actuator #2 : Current Below Normal	2612-5 Cylinder #6 Injector Actuator #2 : Current Below Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 6 / 1 3 9
3664-6 Engine Injector Cylinder #6 Actuator #2 : Current Above Normal	2612-6 Cylinder #6 Injector Actuator #2 : Current Above Normal	Troubleshooting, "Injector Solenoid - Test"	1 1 6 / 1 3 9
3695-2 Particulate Trap Regeneration Inhibit Switch : Erratic, Intermittent, or Incorrect	3184-2 DPF Regeneration Inhibit Switch : Erratic, Intermittent, or Incorrect	The Forced regeneration switch is installed and the disable regeneration switch is held for longer than 1 minute or the Forced regeneration switch is <b>NOT</b> installed and the disable regeneration input through the Datalink is received for longer than 1 minute.	N / A
3696-2 Particulate Trap Regeneration Force Switch : Erratic, Intermittent, or	3183-2 DPF Regeneration Force Switch : Erratic, Intermittent, or Incorrect	The Forced regeneration switch signal is not recognized by the ECM. The switch may not be configured properly for the application or there is a problem with the module it is connected to.	



Incorrect			
3697-5 Particulate Trap Lamp Command : Current Below Normal	1090-5 N/A	Troubleshooting, "Indicator Lamp - Test"	N / A
3697-6 Particulate Trap Lamp Command : Current Above Normal	1090-6 N/A	Troubleshooting, "Indicator Lamp - Test"	N / A
3698-5 Exhaust System High Temperature Lamp Command : Current Below Normal	1091-5 N/A	Troubleshooting, "Indicator Lamp - Test"	N / A
3698-6 Exhaust System High Temperature Lamp Command : Current Above Normal	1091-6 N/A	Troubleshooting, "Indicator Lamp - Test"	N / A
3837-3 Aftertreatment 1 Secondary Air Pressure : Voltage Above Normal	3493-3 Aftertreatment #1 Secondary Air Pressure Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3837-4 Aftertreatment 1 Secondary Air Pressure : Voltage Below Normal	3493-4 Aftertreatment #1 Secondary Air Pressure Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
3837-13 Aftertreatment 1 Secondary Air Pressure : Calibration Required	3493-13 Aftertreatment #1 Secondary Air Pressure Sensor : Calibration Required	Troubleshooting, "Sensor Calibration Required - Test"	N / A
3837-21 Aftertreatment 1 Secondary Air Pressure : Data Drifted Low	3493-21 Aftertreatment #1 Secondary Air Pressure Sensor : Data Drifted Low	Troubleshooting, "Sensor Supply - Test"	N / A

4077-3 Aftertreatment #1 Fuel Pressure #2 : Voltage Above Normal	2497-3 ARD Fuel Pressure #2 Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
4077-4 Aftertreatment #1 Fuel Pressure #2 : Voltage Below Normal	2497-4 ARD Fuel Pressure #2 Sensor : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
4212-5 Fan Drive Bypass Command Status : Current Below Normal	291-5 Engine Cooling Fan Solenoid : Current Below Normal	Troubleshooting, "Cooling Fan Control - Test"	N / A
4212-6 Fan Drive Bypass Command Status : Current Above Normal	291-6 Engine Cooling Fan Solenoid : Current Above Normal	Troubleshooting, "Cooling Fan Control - Test"	N / A
4212-13 Fan Drive Bypass Command Status : Out of Calibration	1551-13 Engine Demand Fan System : Out of Calibration	Troubleshooting, "Cooling Fan - Calibrate"	N / A
4214-5 Engine Fan Reverse Actuator : Current Below Normal	485-5 Engine Fan Reversing Solenoid : Current Below Normal	Refer to the Machine Troubleshooting Guide	N / A
4214-6 Engine Fan Reverse Actuator : Current Above Normal	485-6 Engine Fan Reversing Solenoid : Current Above Normal	Refer to the Machine Troubleshooting Guide	N / A
4215-3 Ground-Level Shutdown Activated : Voltage Above Normal	267-3 Remote Shutdown Input : Voltage Above Normal	Troubleshooting, "Shutdown (Ground Level) - Test"	N / A
4215-4 Ground-Level Shutdown Activated : Voltage Below Normal	267-4 Remote Shutdown Input : Voltage Below Normal	Troubleshooting, "Shutdown (Ground Level) - Test"	N / A
4265-5 Aftertreatment #1 Transformer Secondary	3180-5 Aftertreatment #1 Ignition Transformer	Troubleshooting, "ARD Ignition - Test"	N / A

Output : Current Below Normal	Secondary : Current Below Normal		
4301-3 Aftertreatment #1 Fuel Injector #1 Heater Control : Voltage Above Normal	3182-3 Aftertreatment #1 Fuel Injector #1 Heater : Voltage Above Normal	Troubleshooting, "ARD Nozzle Heater - Test"	N / A
4301-4 Aftertreatment #1 Fuel Injector #1 Heater Control : Voltage Below Normal	3182-4 Aftertreatment #1 Fuel Injector #1 Heater : Voltage Below Normal	Troubleshooting, "ARD Nozzle Heater - Test"	N / A
4301-5 Aftertreatment #1 Fuel Injector #1 Heater Control : Current Below Normal	3182-5 Aftertreatment #1 Fuel Injector #1 Heater : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
4301-6 Aftertreatment #1 Fuel Injector #1 Heater Control : Current Above Normal	3182-6 Aftertreatment #1 Fuel Injector #1 Heater : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
4334-3 Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure : Voltage Above Normal	3090-3 Aftertreatment #1 SCR Dosing Reagent Pressure Sensor : Voltage Above Normal	Troubleshooting, "DEF Pump Pressure Sensor - Test"	
4334-4 Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure : Voltage Below Normal	3090-4 Aftertreatment #1 SCR Dosing Reagent Pressure Sensor : Voltage Below Normal	Troubleshooting, "DEF Pump Pressure Sensor - Test"	
4334-7 Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure : Not Responding Properly	3090-7 Aftertreatment #1 SCR Dosing Reagent Pressure Sensor : Not Responding Properly	Troubleshooting, "DEF Pressure Does Not Respond"	
4337-8 Aftertreatment 1 Diesel Exhaust Fluid Dosing	3096-8 Aftertreatment #1 SCR Dosing Reagent	Troubleshooting, "DEF Pump - Replace"	

Temperature : Abnormal Frequency, Pulse Width, or Period	Temperature #1 Sensor : Abnormal Frequency, Pulse Width, or Period		
4354-5 Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 : Current Below Normal	3110-5 Aftertreatment #1 SCR Catalyst Reagent Line Heater #1 : Current Below Normal	Troubleshooting, "DEF Line Heater - Test"	
4354-6 Aftertreatment 1 Diesel Exhaust Fluid Line Heater 1 : Current Above Normal	3110-6 Aftertreatment #1 SCR Catalyst Reagent Line Heater #1 : Current Above Normal	Troubleshooting, "DEF Line Heater - Test"	
4355-5 Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 : Current Below Normal	3111-5 Aftertreatment #1 SCR Catalyst Reagent Line Heater #2 : Current Below Normal	Troubleshooting, "DEF Line Heater - Test"	
4355-6 Aftertreatment 1 Diesel Exhaust Fluid Line Heater 2 : Current Above Normal	3111-6 Aftertreatment #1 SCR Catalyst Reagent Line Heater #2 : Current Above Normal	Troubleshooting, "DEF Line Heater - Test"	
4356-5 Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3 : Current Below Normal	3112-5 Aftertreatment #1 SCR Catalyst Reagent Line Heater #3 : Current Below Normal	Troubleshooting, "DEF Line Heater - Test"	
4356-6 Aftertreatment 1 Diesel Exhaust Fluid Line Heater 3: Current Above Normal	3112-6 Aftertreatment #1 SCR Catalyst Reagent Line Heater #3 : Current Above Normal	Troubleshooting, "DEF Line Heater - Test"	
4360-3 Aftertreatment #1 SCR Catalyst Intake Gas Temperature : Voltage Above Normal	3105-3 Aftertreatment #1 SCR Catalyst Intake Gas Temperature Sensor : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	
4360-4 Aftertreatment #1 SCR	3105-4 Aftertreatment #1 SCR	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	

Catalyst Intake Gas Temperature : Voltage Below Normal	Catalyst Intake Gas Temperature Sensor : Voltage Below Normal		
4374-5 Aftertreatment #1 Diesel Exhaust Fluid Pump Motor Speed : Current Below Normal	3118-5 Aftertreatment #1 SCR Catalyst Reagent Pump Motor Speed Sensor : Current Below Normal	Troubleshooting, "DEF Pump Motor - Test"	
4374-6 Aftertreatment #1 Diesel Exhaust Fluid Pump Motor Speed : Current Above Normal	3118-6 Aftertreatment #1 SCR Catalyst Reagent Pump Motor Speed Sensor : Current Above Normal	Troubleshooting, "DEF Pump Motor - Test"	
4374-8 Aftertreatment #1 Diesel Exhaust Fluid Pump Motor Speed : Abnormal Frequency, Pulse Width, or Period	3118-8 Aftertreatment #1 SCR Catalyst Reagent Pump Motor Speed Sensor : Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "DEF Pump - Replace"	
4376-5 Aftertreatment 1 Diesel Exhaust Fluid Return Valve : Current Below Normal	3862-5 Aftertreatment #1 Diesel Exhaust Fluid Return Valve Solenoid : Current Below Normal	Troubleshooting, "DEF Return Valve - Test"	
4376-6 Aftertreatment 1 Diesel Exhaust Fluid Return Valve : Current Above Normal	3862-6 Aftertreatment #1 Diesel Exhaust Fluid Return Valve Solenoid : Current Above Normal	Troubleshooting, "DEF Return Valve - Test"	
4376-7 Aftertreatment 1 Diesel Exhaust Fluid Return Valve : Not Responding Properly	3862-7 Aftertreatment #1 Diesel Exhaust Fluid Return Valve Solenoid : Not Responding Properly	Troubleshooting, "DEF Pump - Replace"	
5276-5 Engine Exhaust Manifold Bank #1 Flow Balance Valve Actuator Control : Current Below Normal	3409-5 Engine Exhaust Manifold Bank #1 Flow Balance Valve Solenoid : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A

5276-6 Engine Exhaust Manifold Bank #1 Flow Balance Valve Actuator Control : Current Above Normal	3409-6 Engine Exhaust Manifold Bank #1 Flow Balance Valve Solenoid : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5423-5 Aftertreatment #1 Fuel Pump Relay Control : Current Below Normal	3427-5 Aftertreatment Fuel Pump Relay : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5423-6 Aftertreatment #1 Fuel Pump Relay Control : Current Above Normal	3427-6 Aftertreatment Fuel Pump Relay : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5424-5 Aftertreatment #1 Fuel Flow Diverter Valve Control : Current Below Normal	3413-5 ARD Fuel Flow Diverter Actuator : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5424-6 Aftertreatment #1 Fuel Flow Diverter Valve Control : Current Above Normal	3413-6 ARD Fuel Flow Diverter Actuator : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5425-5 Aftertreatment #1 Fuel Pressure #2 Actuator Control : Current Below Normal	3391-5 ARD Fuel Pressure #2 Control Actuator : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5425-6 Aftertreatment #1 Fuel Pressure #2 Actuator Control : Current Above Normal	3391-6 ARD Fuel Pressure #2 Control Actuator : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	N / A
5491-5 Aftertreatment #1 DEF Line Heater Relay : Current Below Normal	3822-5 Aftertreatment #1 Diesel Exhaust Fluid Line Heater Relay : Current Below Normal	Troubleshooting, "DEF Line Heater - Test"	

5491-6 Aftertreatment #1 DEF Line Heater Relay : Current Above Normal	3822-6 Aftertreatment #1 Diesel Exhaust Fluid Line Heater Relay : Current Above Normal	Troubleshooting, "DEF Line Heater - Test"	
5576-2 Aftertreatment #1 Identification : Erratic, Intermittent, or Incorrect	3468-2 Aftertreatment #1 Identification Number Module : Erratic, Intermittent, or Incorrect	Troubleshooting, "Aftertreatment Identification Module - Test"	N / A
5576-8 Aftertreatment #1 Identification : Abnormal Frequency, Pulse Width, or Period	3468-8 Aftertreatment #1 Identification Number Module : Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "Aftertreatment Identification Module - Test"	N / A
5576-14 Aftertreatment #1 Identification : Special Instruction	3468-14 Aftertreatment #1 Identification Number Module : Special Instruction	Troubleshooting, "Data Link Configuration Status - Test"	N / A
5578-3 Engine Fuel Delivery Absolute Pressure : Voltage Above Normal	289-3 Fuel Pressure Sensor - Before Fuel Filter : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
5578-4 Engine Fuel Delivery Absolute Pressure : Voltage Below Normal	289-4 Fuel Pressure Sensor - Before Fuel Filter : Voltage Below Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
5578-21 Engine Fuel Delivery Absolute Pressure : Data Drifted Low	289-21 Fuel Pressure Sensor - Before Fuel Filter : Data Drifted Low	Troubleshooting, "Sensor Supply - Test"	N / A
5580-3 Engine Filtered Fuel Delivery Absolute Pressure : Voltage Above Normal	460-3 Fuel Pressure Sensor - After Fuel Filter : Voltage Above Normal	Troubleshooting, "Sensor Signal (Analog, Active) - Test"	N / A
5580-4 Engine Filtered Fuel	460-4 Fuel Pressure Sensor -	Troubleshooting, "Sensor Signal	N / A

Delivery Absolute Pressure : Voltage Below Normal	After Fuel Filter : Voltage Below Normal	(Analog, Active) - Test"	A
5580-21 Engine Filtered Fuel Delivery Absolute Pressure : Data Drifted Low	460-21 Fuel Pressure Sensor - After Fuel Filter : Data Drifted Low	Troubleshooting, "Sensor Supply - Test"	N / A
5758-11 Aftertreatment #1 Intake Gas Sensor Power Supply : Other Failure Mode	3621-11 Engine Exhaust NOx Level Sensor Power Supply : Other Failure Mode	Troubleshooting, "Electrical Power Supply - Test"	
5759-11 Aftertreatment #1 Outlet Gas Sensor Power Supply : Other Failure Mode	3619-11 Aftertreatment #1 Outlet #1 NOx Level Sensor Power Supply : Other Failure Mode	Troubleshooting, "Electrical Power Supply - Test"	
5965-5 Aftertreatment 1 Diesel Exhaust Fluid Control Module Relay Control : Current Below Normal	3838-5 Aftertreatment #1 Diesel Exhaust Fluid Dosing Control Module Relay : Current Below Normal	Troubleshooting, "Solenoid Valve - Test"	
5965-6 Aftertreatment 1 Diesel Exhaust Fluid Control Module Relay Control : Current Above Normal	3838-6 Aftertreatment #1 Diesel Exhaust Fluid Dosing Control Module Relay : Current Above Normal	Troubleshooting, "Solenoid Valve - Test"	
5966-5 Aftertreatment 1 Diesel Exhaust Fluid Control Module Power Supply : Current Below Normal	3965-5 Aftertreatment #1 Diesel Exhaust Fluid Control Module Power Supply #1 : Current Below Normal	Troubleshooting, "DEF Control Module Power - Test"	
5966-6 Aftertreatment 1 Diesel Exhaust Fluid Control Module Power Supply : Current Above Normal	3965-6 Aftertreatment #1 Diesel Exhaust Fluid Control Module Power Supply #1 : Current Above Normal	Troubleshooting, "DEF Control Module Power - Test"	



6309-6 Aftertreatment #1 Diesel Exhaust Fluid Control Module Power Supply #2 : Current Above Normal	3966-6 Aftertreatment #1 Diesel Exhaust Fluid Control Module Power Supply #2 : Current Above Normal		
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**Monday, September 23, 2013**

**C13, C15, and C18 Engines/ Event Codes**

## **Event Codes**

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Table 1 is a list of the event codes for the engine. The event codes are cross-referenced with the appropriate procedure that can be used to troubleshoot the code.

Event codes are generated when abnormal operating conditions exist. A further explanation of event codes and the engine monitoring system are described after Table 1.

**Note:** A requirement for all troubleshooting is that the troubleshooting is based on active and/or passive diagnostic trouble codes. Do not troubleshoot based on flash codes alone.

Table 1

<b>Diagnostic Trouble Codes</b>			
<b>J1939 Code and Description</b>	<b>CDL Code and Description</b>	<b>Troubleshooting Procedure</b>	<b>F l a s h</b>

			<b>h C o d e s</b>
N/A	E265 (1) User Defined Shutdown	Troubleshooting, "Engine Shutdown Occurrence"	N / A
N/A	E265 (2) User Defined Shutdown	Troubleshooting, "Engine Shutdown Occurrence"	N / A
N/A	E265 (3) User Defined Shutdown	Troubleshooting, "Engine Shutdown Occurrence"	N / A
N/A	E268 (3) Unexpected Engine Shutdown	Troubleshooting, "Engine Shutdown Occurrence"	N / A
N/A	E563 (3) Low Engine Coolant Flow	Troubleshooting, "Low Engine Coolant Flow"	N / A
N/A	E1217 (3) Delayed Engine Shutdown Override	The "Delayed Engine Shutdown" has been overridden. The engine will shut down, no troubleshooting required.	N / A
97-15 Water In Fuel Indicator : High - least severe (1)	E232 (1) High Fuel/Water Separator Water Level	Troubleshooting, "Fuel Water Separator Has Water"	N / A
97-16 Water In Fuel Indicator : High - moderate severity (2)	E232 (2) High Fuel/Water Separator Water Level	Troubleshooting, "Fuel Water Separator Has Water"	N / A
100-17	E360 (1)	Troubleshooting, "Oil Pressure Is Low"	1

Engine Oil Pressure : Low - least severe (1)	Low Engine Oil Pressure		5 7
100-18 Engine Oil Pressure : Low - moderate severity (2)	E360 (2) Low Engine Oil Pressure	Troubleshooting, "Oil Pressure Is Low"	1 5 7
100-1 Engine Oil Pressure : Low - most severe (3)	E360 (3) Low Engine Oil Pressure	Troubleshooting, "Oil Pressure Is Low"	1 5 7
101-15 Engine Crankcase Pressure : High - least severe (1)	E1036 (1) High Crankcase Pressure	Troubleshooting, "Crankcase Pressure Is High"	N / A
101-16 Engine Crankcase Pressure : High - moderate severity (2)	E1036 (2) High Crankcase Pressure	Troubleshooting, "Crankcase Pressure Is High"	N / A
102-18 Engine Intake Manifold #1 Pressure : Low - moderate severity (2)	E1045 (2) Low Intake Manifold Pressure	Troubleshooting, "Intake Manifold Air Pressure Is Low"	1 3 5
105-15 Engine Intake Manifold #1 Temperature : High - least severe (1)	E539 (1) High Intake Manifold Air Temperature	Troubleshooting, "Intake Manifold Air Temperature Is High"	1 3 3
105-16 Engine Intake Manifold #1 Temperature : High - moderate severity (2)	E539 (2) High Intake Manifold Air Temperature	Troubleshooting, "Intake Manifold Air Temperature Is High"	1 3 3
105-0 Engine Intake Manifold #1 Temperature : High - most severe (3)	E539 (3) High Intake Manifold Air Temperature	Troubleshooting, "Intake Manifold Air Temperature Is High"	N / A
107-15 Engine Air Filter 1	E583 (1) High Air Inlet #1	Troubleshooting, "Inlet Air Is Restricted"	N / A

Differential Pressure : High - least severe (1)	Differential Pressure		A
107-16 Engine Air Filter 1 Differential Pressure : High - moderate severity (2)	E583 (2) High Air Inlet #1 Differential Pressure	Troubleshooting, "Inlet Air Is Restricted"	N / A
110-15 Engine Coolant Temperature : High - least severe (1)	E361 (1) High Engine Coolant Temperature	Troubleshooting, "Coolant Temperature Is High"	1 6 8
110-16 Engine Coolant Temperature : High - moderate severity (2)	E361 (2) High Engine Coolant Temperature	Troubleshooting, "Coolant Temperature Is High"	1 6 8
110-0 Engine Coolant Temperature : High - most severe (3)	E361 (3) High Engine Coolant Temperature	Troubleshooting, "Coolant Temperature Is High"	N / A
110-17 Engine Coolant Temperature : Low - least severe (1)	E199 (1) Low Coolant Temperature	Troubleshooting, "Coolant Temperature Is Low"	
111-17 Engine Coolant Level : Low - least severe (1)	E2143 (1) Low Engine Coolant Level	Troubleshooting, "Coolant Level Is Low"	N / A
111-18 Engine Coolant Level : Low - moderate severity (2)	E2143 (2) Low Engine Coolant Level	Troubleshooting, "Coolant Level Is Low"	N / A
111-1 Engine Coolant Level : Low - most severe (3)	E2143 (3) Low Engine Coolant Level	Troubleshooting, "Coolant Level Is Low"	N / A
168-31 Battery Potential / Power Input #1	E441 (1) Idle Elevated to Increase Battery Voltage	Troubleshooting, "Idle Speed is High"	N / A

174-15 Engine Fuel Temperature 1 : High - least severe (1)	E363 (1) High Fuel Supply Temperature	Troubleshooting, "Fuel Temperature Is High"	1 6 5
174-16 Engine Fuel Temperature 1 : High - moderate severity (2)	E363 (2) High Fuel Supply Temperature	Troubleshooting, "Fuel Temperature Is High"	N / A
174-0 Engine Fuel Temperature 1 : High - most severe (3)	E363 (3) High Fuel Supply Temperature	Troubleshooting, "Fuel Temperature Is High"	N / A
190-15 Engine Speed : High - least severe (1)	E362 (1) Engine Overspeed	Troubleshooting, "Engine Overspeeds"	1 4 1
190-0 Engine Speed : High - most severe (3)	E362 (3) Engine Overspeed	Troubleshooting, "Engine Overspeeds"	1 4 1
247-13 Engine Total Hours of Operation : Out of Calibration	E861 (1) Clock Manual Alignment Required	Use Cat ET to synchronize the ECM hour meters. At the top menu, click on "Service", and "Synchronize Service Hour Meters" from the drop-down menu. Next, click the "Synchronize" button to synchronize all the service hour meters on the machine. A pop-up dialog box will inform you of a successful synchronization of each ECM.	N / A
411-15 Engine Exhaust Gas Recirculation Differential Pressure : High - least severe (1)	E1094 (1) High EGR Differential Pressure	Troubleshooting, "NOx Reduction System (NRS) - Test"	N / A
411-17 Engine Exhaust Gas Recirculation Differential Pressure : Low - least severe (1)	E1093 (1) Low EGR Differential Pressure	Troubleshooting, "NOx Reduction System (NRS) - Test"	N / A
412-15 Engine Exhaust Gas Recirculation Temperature : High -	E1092 (1) High EGR Temperature	Troubleshooting, "NRS Exhaust Gas Temperature Is High"	N / A

least severe (1)			
412-16 Engine Exhaust Gas Recirculation Temperature : High - moderate severity (2)	E1092 (2) High EGR Temperature	Troubleshooting, "NRS Exhaust Gas Temperature Is High"	N / A
441-15 Auxiliary Temperature 1 : High - least severe (1)	E445 (1) High Auxiliary Temperature	Troubleshooting, "Symptom Troubleshooting" The troubleshooting procedure will depend on the symptoms.	N / A
441-16 Auxiliary Temperature 1 : High - moderate severity (2)	E445 (2) High Auxiliary Temperature	Troubleshooting, "Symptom Troubleshooting" The troubleshooting procedure will depend on the symptoms.	N / A
441-0 Auxiliary Temperature 1 : Low - most severe (3)	E445 (3) High Auxiliary Temperature	Troubleshooting, "Symptom Troubleshooting" The troubleshooting procedure will depend on the symptoms.	N / A
593-31 Engine Idle Shutdown has Shutdown Engine : Low - most severe (3)	E1171 (1) Engine Idle Shutdown Occurred	Troubleshooting, "Engine Shutdown While Idling"	N / A
594-31 Engine Idle Shutdown Driver Alert Mode	E1172 (2) Engine Idle Shutdown Pending	Troubleshooting, "Engine Shutdown While Idling"	N / A
594-31 Engine Idle Shutdown Driver Alert Mode	E1172 (3) Engine Idle Shutdown Pending	Troubleshooting, "Engine Shutdown While Idling"	N / A
1387-15 Auxiliary Pressure #1 : Low - most severe (3)	E443 (1) High Auxiliary Pressure	Troubleshooting, "Symptom Troubleshooting" The troubleshooting procedure will depend on the symptoms.	N / A
1387-16 Auxiliary Pressure #1 : Erratic, Intermittent, or Incorrect	E443 (2) High Auxiliary Pressure	Troubleshooting, "Symptom Troubleshooting" The troubleshooting procedure will depend on the symptoms.	N / A
1387-1	E443 (3)	Troubleshooting, "Symptom	N

Auxiliary Pressure #1 : Voltage Above Normal	High Auxiliary Pressure	Troubleshooting" The troubleshooting procedure will depend on the symptoms.	/ A
1664-31 Engine Automatic Start Failed	E225 (2) Engine Overcrank	Troubleshooting, "Engine Overcrank Occurrence"	
1761-17 Aftertreatment 1 Diesel Exhaust Fluid Tank Level : Low - least severe (1)	E954 (1) Low Aftertreatment #1 SCR Catalyst Reagent Tank #1 Level	Troubleshooting, "DEF Tank Level Is Low"	
1761-18 Aftertreatment 1 Diesel Exhaust Fluid Tank Level : Low - moderate severity (2)	E954 (2) Low Aftertreatment #1 SCR Catalyst Reagent Tank #1 Level	Troubleshooting, "DEF Tank Level Is Low"	
1761-1 Aftertreatment 1 Diesel Exhaust Fluid Tank Level : Low - most severe (3)	E954 (3) Low Aftertreatment #1 SCR Catalyst Reagent Tank #1 Level	Troubleshooting, "DEF Tank Level Is Low"	
2659-15 Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate : High - least severe (1)	E1096 (1) High EGR Mass Flow Rate	Troubleshooting, "NOx Reduction System (NRS) - Test"	N / A
2659-17 Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate : Low - least severe (1)	E1095 (1) Low EGR Mass Flow Rate	Troubleshooting, "NOx Reduction System (NRS) - Test"	N / A
2948-7 Engine Intake Valve Actuation System Oil Pressure : Not Responding Properly	E1101 (2) Intake Valve Actuation System Oil Pressure #1 Not Responding to Command	Troubleshooting, "Variable Valve Actuator Response - Test"	
2948-17 Engine Intake Valve Actuation System Oil	E488 (2)	Troubleshooting, "Variable Valve Actuator Response - Test"	

Pressure : Low - moderate severity (2)			
3031-7 Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature : Not Responding Properly	E1441 (2) Aftertreatment #1 Diesel Exhaust Fluid Tank Temperature Not Responding	Troubleshooting, "DEF Temperature Is Low"	
3031-16 Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature : High - moderate severity (2)	E960 (2) High Aftertreatment #1 SCR Catalyst Reagent Tank #1 Temperature	Troubleshooting, "DEF Tank Temperature Is High"	
3031-18 Aftertreatment 1 Diesel Exhaust Fluid Tank Temperature : Low - moderate severity (2)	E1398 (2) Low Aftertreatment #1 SCR Catalyst Reagent Tank #1 Temperature	Troubleshooting, "DEF Temperature Is Low"	
3216-7 Aftertreatment #1 Intake NOx : Not Responding Properly	E1431 (2) Invalid Aftertreatment #1 Intake NOx Level	Troubleshooting, "NOx Sensor - Test"	
3217-16 Aftertreatment #1 Intake O2 : High - moderate severity (2)	E1407 (2) High Aftertreatment #1 Intake O2 Concentration	Troubleshooting, "Clean Emissions Module Has High Oxygen Level"	
3226-7 Aftertreatment #1 Outlet NOx : Not Responding Properly	E1432 (2) Aftertreatment #1 Outlet #1 NOx Level	Troubleshooting, "NOx Sensor - Test"	
3227-16 Aftertreatment #1 Outlet O2 : High - moderate severity (2)	E1408 (2) High Aftertreatment #1 Outlet O2 Concentration	Troubleshooting, "Clean Emissions Module Has High Oxygen Level"	
3242-15 Particulate Trap Intake Gas Temperature : High - least severe (1)	E1008 (1) High DPF #1 Intake Temperature	Troubleshooting, "Diesel Particulate Filter Temperature Is High"	N / A



3242-16 Particulate Trap Intake Gas Temperature : High - moderate severity (2)	E1008 (2) High DPF #1 Intake Temperature	Troubleshooting, "Diesel Particulate Filter Temperature Is High"	N / A
3242-18 Particulate Trap Intake Gas Temperature : Low - moderate severity (2)	E1014 (2) Low DPF #1 Intake Temperature	Troubleshooting, "Diesel Particulate Filter Temperature Is Low"	N / A
3362-14 Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Input Lines : Special Instruction	E114 (1) Aftertreatment #1 Diesel Exhaust Fluid Dosing Unit Input Lines Not Purged	Troubleshooting, "DEF Does Not Purge"	
3473-31 Aftertreatment #1 Failed to Ignite	E1025 (2) Aftertreatment #1 Failed to Ignite	Troubleshooting, "ARD Failed to Ignite"	N / A
3474-14 Aftertreatment #1 Loss of Combustion : Special Instruction	E1026 (1) Aftertreatment #1 Loss of Combustion	Troubleshooting, "ARD Loss of Combustion"	N / A
3474-31 Aftertreatment #1 Loss of Combustion	E1026 (2) Aftertreatment #1 Loss of Combustion	Troubleshooting, "ARD Loss of Combustion"	N / A
3480-15 Aftertreatment #1 Fuel Pressure #1 : High - least severe (1)	E1050 (1) High Aftertreatment #1 Fuel Pressure #1	Troubleshooting, "ARD Fuel Pressure Is High"	N / A
3480-16 Aftertreatment #1 Fuel Pressure #1 : High - moderate severity (2)	E1050 (2) High Aftertreatment #1 Fuel Pressure #1	Troubleshooting, "ARD Fuel Pressure Is High"	N / A
3480-17 Aftertreatment #1 Fuel Pressure #1 : Low -	E1052 (1) Low Aftertreatment #1 Fuel Pressure #1	Troubleshooting, "ARD Fuel Pressure Is Low"	N / A

least severe (1)			
3480-18 Aftertreatment #1 Fuel Pressure #1 : Low - moderate severity (2)	E1052 (2) Low Aftertreatment #1 Fuel Pressure #1	Troubleshooting, "ARD Fuel Pressure Is Low"	N / A
3483-11 Aftertreatment #1 Regeneration Status : Other Failure Mode	E1305 (1) Initial Assembly Aftertreatment #1 Procedure Required	Troubleshooting, "ARD Is Disabled"	
3487-7 Aftertreatment #1 Air Pressure Control : Not Responding Properly	E1041 (1) ARD Air Pressure Control Actuator Not Responding to Command	Troubleshooting, "ARD Combustion Air - Test"	
3516-16 Catalyst Reagent Concentration : High - moderate severity (2)	E1365 (2) Aftertreatment 1 Diesel Exhaust Fluid Concentration : High - moderate severity (2)	Troubleshooting, "DEF Concentration Is Incorrect"	
3516-18 Catalyst Reagent Concentration : Low - moderate severity (2)	E1364 (2) Aftertreatment 1 Diesel Exhaust Fluid Concentration : Low - moderate severity (2)	Troubleshooting, "DEF Concentration Is Incorrect"	
3530-31 Aftertreatment #1 Regeneration Manually Disabled	E1040 (2) ARD Manually Disabled	Troubleshooting, "ARD Is Disabled"	N / A
3609-15 DPF #1 Intake Pressure : High - least severe (1)	E1156 (1) High DPF #1 Intake Pressure	Troubleshooting, "Diesel Particulate Filter Has High Inlet Pressure"	N / A
3609-17 DPF #1 Intake Pressure : Low - least severe (1)	E1154 (1) Low DPF #1 Intake Pressure	Troubleshooting, "Diesel Particulate Filter Has Low Inlet Pressure"	
3609-18	E1154 (2)	Troubleshooting, "Diesel Particulate Filter	N

DPF #1 Intake Pressure : Low - moderate severity (2)	Low DPF #1 Intake Pressure	Has Low Inlet Pressure"	/ A
3616-15 DPF Active Regeneration Inhibited Due to Engine Not Warmed Up : High - least severe (1)	E1300 (1) Aftertreatment Regeneration Cannot Start Due to Low Engine Temperature	Troubleshooting, "ARD Is Disabled"	
3703-31 Particulate Trap Active Regeneration Inhibited Due to Inhibit Switch	E993 (2) DPF Active Regeneration Inhibited Due to Inhibit Switch	Troubleshooting, "ARD Is Disabled"	N / A
3711-31 Particulate Trap Active Regeneration Inhibited Due to Low Exhaust Gas Temperature	E593 (2) Aftertreatment Insufficient Temperature to Complete Regeneration	Troubleshooting, "ARD Temperature Is Low"	N / A
3712-15 DPF Active Regeneration Inhibited Due to System Fault Active : High - least severe (1)	E1301 (1) Aftertreatment Regeneration Cannot Start Due to System Fault	Troubleshooting, "ARD Is Disabled"	
3714-31 Particulate Trap Active Regeneration Inhibited Due to Temporary System Lockout	E992 (3) DPF Active Regeneration Inhibited Due to Temporary System Lockout	Troubleshooting, "Diesel Particulate Filter Collects Excessive Soot"	N / A
3715-31 Particulate Trap Active Regeneration Inhibited Due to Permanent System Lockout	E991 (3) DPF Active Regeneration Inhibited Due to Permanent System Lockout	Troubleshooting, "Diesel Particulate Filter Collects Excessive Soot"	N / A
3716-31 DPF Active Regeneration Inhibited	E1300 (2) Aftertreatment Regeneration Cannot	Troubleshooting, "ARD Is Disabled"	N / A

Due to Engine Not Warmed Up	Start Due to Low Engine Temperature		
3719-16 Particulate Trap #1 Soot Load Percent : High - moderate severity (2)	E995 (2) High DPF #1 Soot Loading	Troubleshooting, "Diesel Particulate Filter Collects Excessive Soot"	N / A
3719-0 Particulate Trap #1 Soot Load Percent : High - most severe (3)	E995 (3) High DPF #1 Soot Loading	Troubleshooting, "Diesel Particulate Filter Collects Excessive Soot"	N / A
3720-15 Particulate Trap #1 Ash Load Percent : High - least severe (1)	E997 (1) High DPF #1 Ash Loading	Troubleshooting, "Diesel Particulate Filter Has High Ash Load"	N / A
3720-16 Particulate Trap #1 Ash Load Percent : High - moderate severity (2)	E997 (2) High DPF #1 Ash Loading	Troubleshooting, "Diesel Particulate Filter Has High Ash Load"	N / A
3750-15 DPF #1 Conditions Not Met for Active Regeneration : High - least severe (1)	E1302 (1) Aftertreatment Regeneration Cannot Start Due to Conditions Not Met	Troubleshooting, "ARD Is Disabled"	N / A
3750-31 DPF #1 Conditions Not Met for Active Regeneration	E1239 (1) DPF #1 Conditions Not Met for Active Regeneration	Troubleshooting, "ARD Is Disabled"	N / A
3750-17 DPF #1 Conditions Not Met for Active Regeneration : Low - least severe (1)	E1239 (2) DPF #1 Conditions Not Met for Active Regeneration	Troubleshooting, "ARD Is Disabled"	N / A
3750-18 DPF #1 Conditions Not Met for Active Regeneration : Low - moderate severity (2)	E1239 (3) DPF #1 Conditions Not Met for Active Regeneration	Troubleshooting, "ARD Is Disabled"	N / A

3837-17 Aftertreatment 1 Secondary Air Pressure : Low - least severe (1)	E1170 (1) Low Aftertreatment #1 Secondary Air Pressure	Troubleshooting, "ARD Combustion Supply Air Pressure Is Low"	N / A
4077-15 Aftertreatment #1 Fuel Pressure #2 : High - least severe (1)	E1051 (1) High Aftertreatment #1 Fuel Pressure #2	Troubleshooting, "ARD Fuel Pressure Is High"	N / A
4077-16 Aftertreatment #1 Fuel Pressure #2 : High - moderate severity (2)	E1051 (2) High Aftertreatment #1 Fuel Pressure #2	Troubleshooting, "ARD Fuel Pressure Is High"	N / A
4077-17 Aftertreatment #1 Fuel Pressure #2 : Low - least severe (1)	E1053 (1) Low Aftertreatment #1 Fuel Pressure #2	Troubleshooting, "ARD Fuel Pressure Is Low"	N / A
4077-18 Aftertreatment #1 Fuel Pressure #2 : Low - moderate severity (2)	E1053 (2) Low Aftertreatment #1 Fuel Pressure #2	Troubleshooting, "ARD Fuel Pressure Is Low"	N / A
4215-31 Ground-Level Shutdown Activated	E678 (1) Ground Level Shutdown	Troubleshooting, "Shutdown (Ground Level) - Test"	N / A
4334-16 Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure : High - moderate severity (2)	E930 (2) High Aftertreatment #1 SCR Dosing Reagent Pressure	Troubleshooting, "DEF Pressure Is High"	
4334-18 Aftertreatment 1 Diesel Exhaust Fluid Doser Absolute Pressure - moderate severity (2)	E931 (2) Low Aftertreatment #1 SCR Dosing Reagent Pressure	Troubleshooting, "DEF Pressure Is Low"	
4360-16 Aftertreatment #1 SCR Catalyst Intake Gas	E946 (2) High Aftertreatment #1 SCR Catalyst	Troubleshooting, "SCR Catalyst Inlet Temperature Sensor - Test"	

Temperature : High - moderate severity (2)	Intake Gas Temperature		
4360-17 Aftertreatment #1 SCR Catalyst Intake Gas Temperature : Low - least severe (1)	E947 (1) Low Aftertreatment #1 SCR Catalyst Intake Gas Temperature	Troubleshooting, "SCR Catalyst Inlet Temperature Sensor - Test"	
4360-18 Aftertreatment #1 SCR Catalyst Intake Gas Temperature : Low - moderate severity (2)	E947 (2) Low Aftertreatment #1 SCR Catalyst Intake Gas Temperature	Troubleshooting, "SCR Catalyst Inlet Temperature Sensor - Test"	
4364-2 Aftertreatment #1 SCR Catalyst Conversion Efficiency : Erratic, Intermittent, or Incorrect	E1410 (2) Invalid Aftertreatment #1 SCR Conversion Efficiency	Troubleshooting, "NOx Conversion Is Low"	
4364-18 Aftertreatment #1 SCR Catalyst Conversion Efficiency : Low - moderate severity (2)	E1309 (2) Low Aftertreatment #1 SCR Catalyst Conversion Efficiency	Troubleshooting, "NOx Conversion Is Low"	
5246-15 Aftertreatment SCR Operator Inducement Severity : High - least severe (1)	E1389 (1) Aftertreatment #1 SCR Operator Inducement	Troubleshooting, "SCR Warning System Problem"	
5246-16 Aftertreatment SCR Operator Inducement Severity : High - moderate severity (2)	E1389 (2) Aftertreatment #1 SCR Operator Inducement	Troubleshooting, "SCR Warning System Problem"	
5246-0 Aftertreatment SCR Operator Inducement Severity : High - most severe (3)	E1389 (3) Aftertreatment #1 SCR Operator Inducement	Troubleshooting, "SCR Warning System Problem"	
5392-31 Aftertreatment Diesel	E1370 (2) Aftertreatment #1	Troubleshooting, "DEF Pressure Is Low"	

Exhaust Fluid Dosing Unit Loss of Prime	Diesel Exhaust Fluid Dosing Unit Loss of Prime		
5480-16 Aftertreatment 1 Diesel Exhaust Fluid Controller Temperature : High - moderate severity (2)	E1430 (2) High Aftertreatment #1 Diesel Exhaust Fluid Controller Temperature	Troubleshooting, "DEF Control Module Temperature Is High"	
5562-1 Supplemental Fan Speed : Low - most severe (3)	E1190 (3) Low Aftertreatment Cooling Fan Speed	Troubleshooting, "Aftertreatment Cooling Fan - Test"	
5577-2 Aftertreatment #2 Identification : Erratic, Intermittent, or Incorrect	3469-2 Aftertreatment #2 Identification Number Module:Erratic, Intermittent, or Incorrect	Troubleshooting, "Aftertreatment Identification Module - Test"	
5577-8 Aftertreatment #2 Identification Number Module:Abnormal Frequency, Pulse Width, or Period	3469-8 Aftertreatment #2 Identification Number Module:Abnormal Frequency, Pulse Width, or Period	Troubleshooting, "Aftertreatment Identification Module - Test"	
5577-14 Aftertreatment #2 Identification : Special Instruction	3469-14 Aftertreatment #2 Identification Number Module:Special Instruction	Troubleshooting, "Data Link Configuration Status - Test"	
5580-16 Engine Filtered Fuel Delivery Absolute Pressure : High - moderate severity (2)	E96 (2) High Fuel Pressure	Troubleshooting, "Fuel Pressure Is High"	
5580-18 Engine Filtered Fuel Delivery Absolute	E198 (2) Low Fuel Pressure	Troubleshooting, "Fuel Pressure Is Low"	N / A

Pressure : Low - moderate severity (2)			
5588-14 Proprietary Network #2 : Special Instruction	E1132 (2) Inconsistent Configuration Detected	Troubleshooting, "Data Link Configuration Status - Test"	N / A
5798-7 Aftertreatment 1 Diesel Exhaust Fluid Dosing Unit Heater Temperature : Not Responding Properly	E1427 (1) Aftertreatment #1 SCR Dosing Pump Temperature Not Responding	Troubleshooting, "DEF Temperature Is Low"	N / A
6322-31 Aftertreatment #1 SCR Desulfation Too Frequent	E1465 (1) Aftertreatment #1 SCR Desulfation Too Frequent	Troubleshooting, "Desulfation Is Frequent "	N / A
6588-31 Operator Shutdown With High Exhaust Temperature	E1466 (1) Operator Forced Shutdown with High Exhaust Temperature	Troubleshooting, "Engine Shutdown Occurrence"	

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**Event Code** - "E" identifies the code as an event code. "XXX(X)" represents a numeric identifier for the event code. The fourth "(X)" assigns one of three levels to the active event code according to the severity of the abnormal system condition. Next is a code description. Refer to the following example:

- E360(1) Low Oil Pressure
- E360(2) Low Oil Pressure
- E360(3) Low Oil Pressure

The definition for the levels of severity for an event are defined below:

**Level 1** - Level 1 alerts the operator that an engine system requires attention. The operator should check that the involved system condition or the operator should perform maintenance on the involved system at the earliest possible time.

**Level 2** - Level 2 requires a change in the operation of the engine or the performance of a maintenance procedure. Failure to correct the problem that caused this warning may result in damaged the engine components.



**Level 3** - Level 3 requires an immediate safe shutdown of the engine in order to avoid damage to the engine or injury to personnel around the engine. The problem that caused the event must be corrected before engine operation can resume.

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An active event code represents a problem with engine operation. **Correct the problem as soon as possible.**

Active event codes are listed in ascending numerical order. The code with the lowest number is listed first.

Illustration 1 is an example of the operating range of a sensor.

[http://2.bp.blogspot.com/-C6IFXTY561I/UkDb2DmEtul/AAAAAAADkc/vAtv\\_Eix4Lg/s1600/g01365757.g](http://2.bp.blogspot.com/-C6IFXTY561I/UkDb2DmEtul/AAAAAAADkc/vAtv_Eix4Lg/s1600/g01365757.g)

[if http://2.bp.blogspot.com/-C6IFXTY561I/UkDb2DmEtul/AAAAAAADkc/vAtv\\_Eix4Lg/s1600/g01365757.gif](http://2.bp.blogspot.com/-C6IFXTY561I/UkDb2DmEtul/AAAAAAADkc/vAtv_Eix4Lg/s1600/g01365757.gif)

Example of the typical operating range of a sensor

(1) This area represents the normal operating range of the engine parameter.

(2) In these areas, the engine is operating in an unsafe operating range of the monitored parameter. An event code will be generated for the monitored parameter. The sensor circuit does not have an electronic problem.(3) In these areas, the signal from the sensor is outside of the operating range of the sensor. The sensor circuit has an electronic problem. A diagnostic code will be generated for the sensor circuit.

Refer to Troubleshooting, "Diagnostic Trouble Codes" for additional information on diagnostic codes.

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When the Electronic Control Module (ECM) generates an event code, the ECM logs the code in permanent memory. The ECM has an internal diagnostic clock. The ECM will record the following information when an event code is generated:

- The hour of the first occurrence of the code
- The hour of the last occurrence of the code
- The number of occurrences of the code

Logged events are listed in chronological order. The most recent event code is listed first. This information can be helpful for troubleshooting intermittent problems. Logged codes can also be used to review the performance of the engine.

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A code is cleared from memory when one of the following conditions occur:

- The code does not recur for 100 hours.
- A new code is logged and there are already ten codes in memory. In this case, the oldest code is cleared.
- The service technician manually clears the code.

Always clear logged event codes after investigating and correcting the problem which generated the code.

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For the basic troubleshooting of the engine, perform the following steps in order to diagnose a malfunction:

Obtain the following information about the complaint:

- The event and the time of the event
- Determine the conditions for the event. The conditions will include the engine rpm and the load.
- Determine if there are any systems that were installed by the dealer or by the customer that could cause the event.
- Determine whether any additional events occurred.

Verify that the complaint is not due to normal engine operation. Verify that the complaint is not due to error of the operator.

Narrow the probable cause. Consider the operator information, the conditions of operation, and the history of the engine.

Perform a visual inspection. Inspect the following items:

- Fuel supply
- Oil level
- Oil supply
- Wiring
- Connectors

Be sure to check the connectors. This step is important for problems that are intermittent. Refer to Troubleshooting, "Electrical Connectors - Inspect".

If these steps do not resolve the problem, refer to Table 1 for the procedure to troubleshoot the event code.

**Monday, September 23, 2013**

**C13, C15, and C18 Engines/ Diagnostic Capabilities/ Configuration Parameters**

**Diagnostic Capabilities**

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The engines Electronic Control Module (ECM) can monitor the circuitry between the ECM and the engines components. The ECM can also monitor the engines operating conditions. If the ECM detects a problem, a code is generated.

There are two categories of codes:

- Diagnostic code
- Event code

**Diagnostic Code** - A diagnostic code indicates an electrical problem such as a short circuit or an open circuit in the engines wiring or in an electrical component.

**Event Code** - An event code is generated by the detection of an abnormal engine operating condition. For example, an event code will be generated if the oil pressure is too low. In this case, the event code indicates the symptom of a problem. Generally, event codes indicate abnormal operating conditions or mechanical problems rather than electrical problems.

Codes can have two different states:

- Active
- Logged

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An active code indicates that a problem is present. Service the active code first. For the appropriate troubleshooting procedure for a particular code, refer to the following troubleshooting procedure:

- Troubleshooting, "Diagnostic Trouble Codes"
- Troubleshooting, "Event Codes"

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The codes are logged and stored in the ECM memory. The problem may have been repaired and/or the problem may no longer exist. If the system is powered, an active diagnostic code may be generated whenever a component is disconnected. If the component is reconnected, the code is no longer active but the code may become logged.

Logged codes may not indicate that a repair is needed. The problem may have been temporary. Logged codes may be useful to help troubleshoot intermittent problems. Logged codes can also be used to review the performance of the engine and of the electronic system.

An additional status screen is available for the Enhanced Troubleshooting Indicator ETI. The screen is accessed through Caterpillar Electronic Technician (ET).

## Configuration Parameters

Use this procedure if the diagnostic code in Table 1 is active.

Table 1

<b>Codes</b>			
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That Relate to Configuration Parameters			
J1939 Code	CDL Code	Code Description (code descriptions may vary)	Comments
630-2	268-2	Programmed Parameter Fault : Erratic, Intermittent, or Incorrect	The engine Electronic Control Module (ECM) detects that one or more of the programmable parameters have not been programmed. The ECM may use a default torque map or the ECM may limit the engine to low idle. The code is active only.
Follow the troubleshooting procedure in order to identify the root cause of the problem.			

The Caterpillar Electronic Technician (ET) can be used to view certain parameters that can affect the operation of the engine. Cat ET can also be used to change certain parameters. Some parameters cannot be changed and some applications do not allow any changes to the programmable monitoring system. The parameters are stored in the Electronic Control Module (ECM). Some of the parameters are protected from unauthorized changes by passwords. Parameters that can be changed have a tattletale number. The tattletale number shows if a parameter has been changed.

The parameters are divided into two different types:

**Customer Specified Parameters** - Customer passwords may be required to change the values of customer specified parameters.

**System Configuration Parameters** - System configuration parameters affect the emissions of the engine or the power of the engine. Factory passwords may be required to change the values of system configuration parameters.

<http://4.bp.blogspot.com/-PvAtd5ywW5k/UkDbdoV2kJI/AAAAAAAAADkM/gDdrulrGSgE/s1600/Configuration+Parameters1.jpg>

<http://4.bp.blogspot.com/-PvAtd5ywW5k/UkDbdoV2kJI/AAAAAAAAADkM/gDdrulrGSgE/s1600/Configuration+Parameters1.jpg>

Typical configuration  
screen

Connect to Cat ET.

Select the Service tab.

Select the Configuration tab to view the configuration parameters.

If an ECM is replaced, the appropriate parameters must be copied from the old ECM. Copy the parameters with the "Copy Configuration" feature of the Cat ET. The "Copy Configuration" tab is below the "Configuration" tab. Alternatively, the settings can be recorded on paper and then programmed into the configuration screen that is for the new module.

## NOTICE

**Changing the parameters during engine operation can cause the engine to operate**

**erratically and can cause engine damage.Only change the settings of the parameters when the engine is STOPPED.**

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<http://2.bp.blogspot.com/-LTdxM5N6r1w/UkDbd41VYqI/AAAAAAAAADkQ/pxFzCMTwJdA/s1600/Configuration+Parameters2.jpg>

<http://2.bp.blogspot.com/-LTdxM5N6r1w/UkDbd41VYqI/AAAAAAAAADkQ/pxFzCMTwJdA/s1600/Configuration+Parameters2.jpg>

If a programmable parameter has not been programmed, the ECM will generate a 268-2 or 630-2 diagnostic code. The programmable parameter that is not programmed will be listed under the code. Illustration 2 shows the parameters that are not programmed under the 268-2 code. The unprogrammed parameters will be set to default. Certain aspects of the engines performance and engine monitoring may be affected.If "Injector Trim" is displayed below a 268-2 or 630-2 diagnostic code on Caterpillar Electronic Technician (ET), refer to Troubleshooting, "Injector Trim File - Install".