

SPN	FMI	J1939 Lamp	Suspect Parameter	Condition Which Causes the Fault	Likely Causes / Impact of Failure	Level 1 Text	Level 2 Text	Derate Limit (% Power) or (rpm)	Derate Rate (%/min) or (rpm/sec)	Recovery Rate (%/min) or (rpm/sec)	Snapshot Buffer
27	3	W	Engine Exhaust Gas Recirculation Valve Position	EGR Valve Position Voltage OOR High	Open circuit in the harness, either signal or ground. Sensor failure.	Engine System	EGR sensor circuit fault.	25%	20%/min	20%/min	0
27	4	W	Engine Exhaust Gas Recirculation Valve Position	EGR Valve Position Voltage OOR Low	Sensor signal shorted to ground. Sensor failed.	Engine System	EGR sensor circuit fault.	25%	20%/min	20%/min	0
27	7	W	Engine Exhaust Gas Recirculation Valve Position	EGR Valve Not Responding or Out of Adjustment	EGR Valve actuator mismatch error	Engine System	EGR Valve not responding or out of adjustment.	25%	20%/min	20%/min	0
94	3	W	Engine Fuel Delivery Pressure	Fuel Pressure Voltage OOR High	Pressure sensor harness has an open in the ground circuit or a short in the harness to high voltage. Pressure sensor fault						0
94	4	W	Engine Fuel Delivery Pressure	Fuel Pressure Voltage OOR Low	Pressure sensor not connected or open in the signal line. Pressure sensor supply connection open. Harness shorted to ground. Pressure sensor failure						0
94	18	W	Engine Fuel Delivery Pressure	Fuel Pressure Low - Moderately Severe Level	Low pressure in the fuel supply pump circuit. Restriction in the low pressure system due to a plugged filter or pump failure. This probably doesn't need to be a stop alarm. It could be on the second low level on Rail Pressure	Engine System	Fuel pressure low. Check fuel supply and filters	20%	5%/min	5%/min	0
97	0	S						50% Shutdown after 30 seconds	20%/min	20%/min	0
97	3	W	Water In Fuel Indicator	Water In Fuel Voltage OOR High	Open circuit in the harness, either signal or ground. Water in fuel sensor failure.	Engine System	Water separator sensor voltage high.				0
97	4	W	Water In Fuel Indicator	Water In Fuel Voltage OOR Low	Water in fuel sensor signal shorted to ground. Water in fuel sensor failed.	Engine System	Water separator sensor voltage low.				0
97	16	S	Water In Fuel Indicator	Water In Fuel Detected	Water has been detected in the separator bowl.	Engine System	Engine Water Separator Full. Drain water separator.	50%	20%/min	20%/min	1
100	1	S	Engine Oil Pressure	Oil Pressure Low - Most Severe Level	Oil pressure low due to low or no oil present.	Engine System	Oil Pressure Extremely low. Check engine oil level.	60% Shutdown after 30 seconds	20%/min	20%/min	1
100	2	W	Engine Oil Pressure	Oil Pressure Detected At Zero Engine Speed	Oil pressure detected at zero engine speed due to open ground in the sensor circuit.	Engine System	Oil Pressure Detected At Zero Engine Speed				0
100	3	W	Engine Oil Pressure	Oil Pressure Voltage OOR High	Pressure Sensor harness has an open in the ground circuit or a short in the harness to high voltage. Pressure Sensor Fault						0
100	4	W	Engine Oil Pressure	Oil Pressure Voltage OOR Low	Pressure Sensor not connected or open in the signal line. Pressure sensor supply connection open. Harness shorted to ground. Pressure sensor failure. Due to hardware limitations, this fault may be tripped erroneously at elevations over 16,000 feet when the engine is not running.						0
100	18	W	Engine Oil Pressure	Oil Pressure Low - Moderately Severe Level	Oil pressure low due to low or no oil present.	Engine System	Oil Pressure low. Check engine oil level.	20%	5%/min	5%/min	1
101	0	S	Engine Crankcase Pressure	Pressure much higher than threshold	Blowby filter is restricted and bypass is not functioning. Potential for oil leakage past engine seals.	Engine System	Engine Crankcase Pressure High. Check blowby filter.	50%	20%/min	20%/min	0
101	3	W	Engine Crankcase Pressure	Crankcase Pressure Voltage OOR High	Pressure sensor harness has an open in the ground circuit or a short in the harness to high voltage. Pressure sensor failure	Engine System	Crankcase pressure sensor voltage high				0
101	4	W	Engine Crankcase Pressure	Crankcase Pressure Voltage OOR Low	Pressure sensor not connected or open in the signal line. Pressure sensor supply connection open. Harness shorted to ground. Pressure sensor failure.	Engine System	Crankcase pressure sensor voltage low				0
101	16	W	Engine Crankcase Pressure	Pressure higher than threshold	Blowby filter is restricted. Engine power cylinder failures that create high blowby. Or turbo seal failure. Service reminder.	Engine System	Engine Crankcase Pressure High. Check blowby filter.				0
102	3	W	Engine Intake Manifold #1 Pressure	Boost Pressure Voltage OOR High	Pressure Sensor has an open in the ground circuit or a short in the harness to high voltage. Pressure sensor failure	Engine System	Intake manifold pressure sensor voltage high	25%	20%/min	20%/min	0

102	4	W	Engine Intake Manifold #1 Pressure	Boost Pressure Voltage OOR Low	Pressure sensor not connected or open in the signal line. Pressure sensor supply connection open. Harness shorted to ground. Pressure sensor failure	Engine System	Intake manifold pressure sensor voltage low	25%	20%/min	20%/min	0
102	7	W	Engine Intake Manifold #1 Pressure	Boost Pressure Model Mismatch during engine running/ Measurement Crosscheck Mismatch at key off or key on, not running	Boost pressure invalid due to an in-range failure of the Boost Pressure sensor or Turbo Speed sensor. Model computation does not agree with MAP reading.	Engine System	Intake manifold pressure sensor fault.	25%	20%/min	20%/min	3
103	0	W	Engine Turbocharger 1 Speed	Turbo Speed High - Most Severe Level	Due to high altitude or erratic VTG operation. 160krpm	Engine System	Turbocharger speed extremely high. Reduce engine speed and load.	50%	20%/min	20%/min	0
105	0	S	Engine Intake Manifold 1 Temperature	Manifold Air Temperature High - Most Severe Level	Cooling system performance has degraded or failed. 123°C Refers to Mixed temperature.	Engine System	Intake manifold air temperature high. Reduce engine speed and load. Check cooling system for debris.	60% Shutdown after 30 seconds	20%/min	20%/min	1
105	3	W	Engine Intake Manifold 1 Temperature	Manifold Air Temperature Voltage OOR High	Open circuit in the harness, either signal or ground. Manifold air temperature sensor failure.	Engine System	Intake manifold air temperature sensor voltage high	25%	20%/min	20%/min	0
105	4	W	Engine Intake Manifold 1 Temperature	Manifold Air Temperature Voltage OOR Low	Manifold air temperature sensor signal shorted to ground. Manifold air temperature sensor failed.	Engine System	Intake manifold air temperature sensor voltage low	25%	20%/min	20%/min	0
105	15	W	Engine Intake Manifold 1 Temperature	Manifold Air Temperature High - Least Severe Level	Cooling system performance has degraded or failed. 120°C	Engine System	Intake manifold air temperature high. Reduce engine speed and load. Check cooling system for debris.				0
105	16	W	Engine Intake Manifold 1 Temperature	Manifold Air Temperature High - Moderately Severe Level	Cooling system performance has degraded or failed. 121.5°C Refers to Mixed temperature.	Engine System	Intake manifold air temperature high. Reduce engine speed and load. Check cooling system for debris.	20%	5%/min	5%/min	1
107	0	S	Engine Air Filter Differential Pressure	Pressure drop across air intake system exceeds 11kPa for more than 0.5 sec	Restricted air filter, other restrictions in air inlet system, in-range sensor failure	Engine System	Engine Air Filter is Restricted. Clean or replace air filter.	60%	60%/min	60%/min	0
107	15	W	Engine Air Filter Differential Pressure	Pressure drop across air intake system exceeds 1st threshold table(6.25kPa) for more than 30 sec	Restricted air filter, other restrictions in air inlet system, in-range sensor failure	Engine System	Engine Air Filter is Restricted. Clean or replace air filter.				0
107	16	W	Engine Air Filter Differential Pressure	Pressure drop across air intake system exceeds 2nd threshold table (7.5kPa) for more than 30 sec	Restricted air filter, other restrictions in air inlet system, in-range sensor failure	Engine System	Engine Air Filter is Restricted. Clean or replace air filter.	20%	5%/min	5%/min	0
108	2	W	Barometric Pressure	Barometric Pressure Invalid	Sensor is in range but incorrect based on MAP and Exhaust Pressure or Air Inlet Pressure readings. Internal sensor failure.	Engine System	Barometric pressure sensor fault.				0
108	7	W	Barometric Pressure	Sensor cross check	Internal sensor failure	Engine System	Barometric pressure sensor fault.				0
110	0	S	Engine Coolant Temperature	Coolant Temperature High - Most Severe Level	Cooling system performance has degraded or failed. 116°C	Engine System	Engine Coolant Temperature High. Reduce engine speed and load. Check cooling system for debris.	60% Shutdown after 30 seconds	20%/min	20%/min	1
110	3	W	Engine Coolant Temperature	Coolant Temperature Voltage OOR High	Open circuit in the harness, either signal or ground. Coolant temperature sensor failure	Engine System	Coolant temperature sensor voltage high				0
110	4	W	Engine Coolant Temperature	Coolant Temperature Voltage OOR Low	Coolant temperature sensor signal shorted to ground. Coolant temperature sensor failed.	Engine System	Coolant temperature sensor voltage low				0
110	15	W	Engine Coolant Temperature	Coolant Temperature High - Least Severe Level	Cooling system performance has degraded or failed. 113°C	Engine System	Engine Coolant Temperature High. Reduce engine speed and load. Check cooling system for debris.				0
110	16	W	Engine Coolant Temperature	Coolant Temperature High - Moderately Severe Level	Cooling system performance has degraded or failed. 114°C	Engine System	Engine Coolant Temperature High. Reduce engine speed and load. Check cooling system for debris.	20%	5%/min	5%/min	1
110	17	W	Engine Coolant Temperature	Coolant Temperature Low - Least Severe Level	Engine temperature has not risen into the normal operating range under operating conditions. Likely due to stuck open thermostat. Engine is likely operating in an AECD state.	Engine System	Engine Coolant Temperature Low. Check cooling system.				1

111	1	S	Engine Coolant Level	Coolant level below the loss switch while coolant temp is >95°C	Low coolant, open circuit	Engine System	Coolant Level extremely low. Engine Power Limited. Add coolant and inspect for leakage.	50% Shutdown after 30 seconds	20%/min	20%/min	0
111	7	W	Engine Coolant Level	Switches indicate that coolant level is below the loss switch but not below the service switch	Open circuit on the loss switch; wires to switches swapped	Engine System	Coolant level circuit fault. Coolant level monitor without function. Verify coolant level.				0
111	17	W	Engine Coolant Level	At power-up, if coolant temp is >20°C and coolant level is below the service switch	Low coolant, open circuit	Engine System	Coolant level below the service switch. Add Coolant.				0
157	1	S	Engine Injector Metering Rail 1 Pressure	Rail pressure is 25Mpa under setpoint for 3 sec	Rail pressure relief valve opened, can be due to failed relief valve, non functioning SCV, major leak Impact - major power loss, high PM can fill DPF	Engine System	Fuel rail pressure extremely low. Engine power limited.	50%	20%/min	20%/min	0
157	2	S	Fuel Pressure	Fuel Pressure In Range Invalid	Fuel pressure sensor excitation voltage open, Pressure sensor failure.	Engine System		50%	20%/min	20%/min	5
157	3	S	Fuel Pressure	Fuel Pressure Voltage OOR High	An open in the ground circuit of the fuel pressure system. Short in the harness to high voltage or sensor failure.	Engine System	Fuel pressure sensor voltage high.	50%	20%/min	20%/min	5
157	4	S	Fuel Pressure	Fuel Pressure Voltage OOR Low	Fuel pressure sensor not connected or open in the signal line. Pressure sensor supply connection open. harness shorted to ground. Pressure sensor failure.	Engine System	Fuel rail pressure sensor voltage low. Engine power limited.	50%	20%/min	20%/min	5
157	12	S	Fuel Pressure	Defective Rail Pressure Sensor	Bad intelligent device or component			50%	20%/min	20%/min	5
157	16	W	Engine Injector Metering Rail 1 Pressure	Rail pressure is 10Mpa over setpoint for 15 sec	Non-functioning SCV Inlet fuel pressure high at low rail pressure settings will supercede. Impact - can lead to blown relief valve.	Engine System	Fuel rail pressure high.				0
157	17	W	Engine Injector Metering Rail 1 Pressure	Rail Pressure Not Developed During Cranking (10Mpa within 8 sec)	During start, the engine is not able to develop starting rail pressure setpoint. Injector feed tube leak. Fuel is not being supplied to the engine. Inlet fuel pressure low fault.	Engine System	Fuel rail pressure low during starting. Check fuel level and filters.				0
158	12	W	Keyswitch Battery Potential	ECU Cannot Power Down	Internal failure in ECU prevents the ECU from powering down. Impact - run down battery eventually	Engine System	ECU Cannot Power Down				0
168	1	W	Battery Potential/ Power Input	If engine is in run mode and unswitched battery voltage supply is <10v	Low voltage to the ECU. Voltage is < 10 V. Impact - possible loss of injections	Electrical System	Battery voltage low.				0
168	16	W	Battery Potential/ Power Input	Battery Voltage Above Normal- Moderately Severe Level	High voltage to the ECU. Voltage is > 16 V.		Battery voltage				5
168	18	W	Battery Potential/ Power Input	Battery voltage below normal operating level-Moderately Severe Level	Check charging system, alternor drive belt, and batteries.	Electrical System	Battery voltage low.				0
174	0	S	Engine Fuel Temperature	Fuel Temperature High - Most Severe Level	Cooling system performance has degraded or failed. Pump damage can occur. 77°C	Engine System	Fuel temperature High. Engine power limited. Check cooling system for debris.	20% Shutdown after 30 seconds	5%/min	5%/min	1
174	3	W	Engine Fuel Temperature	Fuel Temperature Voltage OOR High	Open circuit in the harness, either signal or ground. Fuel temperature sensor failure. Default temperature used. Starting may be affected						0
174	4	W	Engine Fuel Temperature	Fuel Temperature Voltage OOR Low	Fuel temperature sensor signal shorted to ground. Fuel temperature sensor failed.						0
174	16	W	Engine Fuel Temperature	Fuel Temperature High - Moderately Severe Level	Cooling system performance has degraded or failed. 73°C	Engine System	Fuel temperature High. Check cooling system for debris.				0
189	31	W	Engine Rated Speed	A condition exists which is causing the engine to derate.	One of the speed derate conditions exists on the engine.	Engine System	A condition exists which is causing the engine to derate. Engine speed limited.				0
190	0	S	Engine Speed	Engine Speed High - Most Severe Level	Engine has exceeded overspeed threshold. 3600 RPM	Engine System	Engine Speed High. Reduce engine speed.				0
190	16	S	Engine Speed	Engine speed over spec has been detected.	Engine has exceeded overspeed threshold. 3000 RPM	Engine System	Engine Speed High. Reduce engine speed.				0
412	0	S	Exhaust Gas Recirculation Temperature	EGR Temperature High - Most Severe Level	* High loads with poor EGR cooling. 250°C	Engine System	EGR temperature high. Reduce engine speed and load. Check cooling system for debris.	60%	20%/min	20%/min	3

412	3	W	Exhaust Gas Recirculation Temperature	Voltage from the EGR temperature sensor is higher than the normal temperature sensor range. Conditions must be met: Coolant Temperature above 80C, Delay Time 5 min (warmed up), Intercooler Outlet Temperature 5C, MAT 25C.	EGR temperature sensor failure.	Engine System	EGR temperature sensor voltage high.					0
412	4	W	Exhaust Gas Recirculation Temperature	EGR Temperature Voltage OOR Low	EGR temperature sensor signal shorted to ground. Temperature sensor failed							0
412	15	W	Exhaust Gas Recirculation Temperature	EGR Temperature High - Least Severe Level	* High loads with poor EGR cooling. 230°C	Engine System	EGR temperature high. Reduce engine speed and load. Check cooling system for debris.	5%	Immediate	5%/min		3
412	16	W	Exhaust Gas Recirculation Temperature	EGR Temperature High - Moderately Severe Level	* High loads with poor EGR cooling. 240°C	Engine System	EGR temperature high. Reduce engine speed and load. Check cooling system for debris.	20%	5%/min	5%/min		3
611	3	W	System Diagnostic Code	Short to battery on the injector lines	A low side on Bank 1 is shorted to battery, Impact - would likely not inject on that cylinder (software does not shutoff drive) OR the high side on Bank 1 is shorted to battery. Impact - would likely not inject on that bank (software does not shutoff drive)	Engine System	Fuel injector circuit voltage high.					5
611	4	W	System Diagnostic Code	Short to ground on the injector lines	A low side on Bank 1 is stuck on, which may lead to more than one injector on Bank 1 being actuated at once, or the high side on Bank 1 is shorted to ground. Impact - would likely not inject on that bank (software shuts off drive)	Engine System	Fuel injector circuit voltage low.					5
612	3	W	System Diagnostic Code #2	Short to battery on the injector lines	A low side on Bank 2 is shorted to battery, or the high side on Bank 2 is shorted to battery.	Engine System	Fuel injector circuit shorted to battery.					5
612	4	W	System Diagnostic Code #2	Short to ground on the injector lines	A low side on Bank 2 is stuck on, which may lead to more than one injector on Bank 2 being actuated at once, or the high side on Bank 2 is shorted to ground. Impact: Disable injection on this injector bank	Engine System	Fuel injector circuit shorted to ground.					5
613	3	W	System Diagnostic Code #3	Wiring Fault	Wiring Harness Shorted to Battery	Engine System	Wiring Fault Detected in Engine High Pressure Pump Drive Circuit					0
613	4	W	System Diagnostic Code #3	Wiring Fault	Wiring Harness Shorted to ground	Engine System	Wiring Fault Detected in Engine High Pressure Pump Drive Circuit					0
613	31	W	System Diagnostic Code #3	Internal ECU Failure.	Failure detected in ECU High Pressure Pump Drive Circuit	Engine System	Failure detected in ECU High Pressure Pump Drive Circuit					0
629	12	W	Controller	Bad Intelligent Device or Component	Bad EEPROM.	Engine System	Engine control unit fault. Restart engine to attempt vehicle recovery.					0
636	2	W	Engine Position Sensor	Engine Position Sensor Noise Detected	Noise is being detected on the engine position sensor. The connections to the sensor or the sensor has an intermittent failure The sensing target is damaged	Engine System	Camshaft position sensor fault.					4
636	5	W	Engine Position Sensor (Cam)	Engine Position Sensor Current Below Normal Or Open Circuit	Open or intermittent harness or connector problem. Detected in Harness Diagnostics Mode.	Engine System	Camshaft position sensor circuit fault.					0
636	6	W	Engine Position Sensor (Cam)	Engine Position Sensor Current Above Normal Or Grounded Circuit	The harness is shorted to ground. Detected in Harness Diagnostics Mode.	Engine System	Camshaft position sensor circuit fault.					0
636	8	W	Engine Position Sensor (Cam)	Engine Position Sensor Signal Missing	The signal from the engine position sensor is missing. The connections to the sensor are open circuit. The sensor has failed.	Engine System	Camshaft position sensor missing signal.					4
636	10	W	Engine Position Sensor (Cam)	Engine Position Sensor Pattern Error Detected	The signal from the engine position sensor does not have the proper pulse pattern. The sensing target is damaged. The sensor is improperly installed.	Engine System	Camshaft position sensor fault.					4
637	2	W	Timing Sensor (Crank)	Timing Sensor Noise Detected	Noise is being detected on the engine position sensor on the crankshaft. The intermittent failure of the connections to the sensor or the sensor itself. The sensing target is damaged.	Engine System	Crankshaft position sensor circuit fault.	50%	20%/min	20%/min		4
637	5	W	Timing Sensor (Crank)	Timing Sensor Current Below Normal Or Open Circuit	Open or intermittent harness or connector problem. Detected in Harness Diagnostics Mode.	Engine System	Crankshaft position sensor circuit fault.					0

637	6	W	Timing Sensor (Crank)	Timing Sensor Current Above Normal Or Grounded Circuit	The harness is shorted to ground. Detected in Harness Diagnostics Mode.	Engine System	Crankshaft position sensor circuit fault.					0
637	7	W	Timing Sensor (Crank)	Timing Sensor / Engine Position Sensor Mismatch	The relationship between the two engine position signals is not correct. The signal polarity is incorrect possibly due to miss wiring, CAM or Crank target possibly not properly installed.	Engine System	Engine speed sensing fault.					4
637	8	W	Timing Sensor (Crank)	Timing Sensor Signal Missing	The signal from the engine position sensor on the crankshaft is missing. The connections to the sensor are open circuit. The sensor has failed.	Engine System	Crankshaft position sensor communication fault.	50%	20%/min	20%/min		4
637	10	W	Timing Sensor (Crank)	Timing Sensor Pattern Error Detected	The signal from the engine position sensor on the crankshaft does not have the proper pulse pattern. The sensing target is damaged. The sensor is improperly installed.	Engine System	Camshaft position sensor fault.	50%	20%/min	20%/min		4
651	2	W	Engine Injector Cylinder #1	Injector #1 Part Number is Invalid	The injector part number entered is not valid	Engine System	Injector #1 fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
651	5	W	Engine Injector Cylinder #1	The current to the injector in cylinder #1 is less than expected	Open circuit in the injector wiring, on either connection. injector solenoid failure. Impact: Dead cylinder	Engine System	injector #1 circuit current low.					5
651	6	W	Engine Injector Cylinder #1	The injector fuel flow at Cylinder #1 is lower than expected.	Injector has internal short	Engine System	injector #1 circuit current high.					5
651	13	W	Injector Cylinder #1	Injector #1 QR Code string error	The injector part number is correct, but the QR/Calibration string formed is not what is expected.	Engine System	injector #1 calibration fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
651	18	W	Engine Injector Cylinder #1	The injector fuel flow at Cylinder #1 is lower than expected.	Injector is not working. Injector flow limiter is closed. Pump mistimed. Impact: Dead cylinder	Engine System	The injector fuel flow at Cylinder #1 is lower than expected.					5
652	2	W	Engine Injector Cylinder #2	Injector #2 Part Number is Invalid	The injector part number entered is not valid	Engine System	Injector #2 fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
652	5	W	Engine Injector Cylinder #2	The current to the injector in cylinder #1 is less than expected	Open circuit in the injector wiring, on either connection. Injector solenoid failure. Impact-dead cylinder	Engine System	injector #2 circuit current low.					5
652	6	W	Engine Injector Cylinder #2	The injector fuel flow at Cylinder #2 is lower than expected.	Injector has internal short	Engine System	injector #2 circuit current high.					5
652	13	W	Injector Cylinder #2	Injector #2 QR Code string error	The injector part number is correct, but the QR/Calibration string formed is not what is expected.	Engine System	injector #2 calibration fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
652	18	W	Engine Injector Cylinder #2	The injector fuel flow at Cylinder #2 is lower than expected.	Injector is not working. Injector flow limiter is closed. Pump mistimed. Impact - dead cylinder	Engine System	The injector fuel flow at Cylinder #2 is lower than expected.					5
653	2	W	Engine Injector Cylinder #3	Injector #3 Part Number is Invalid	The injector part number entered is not valid	Engine System	Injector #3 fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
653	5	W	Engine Injector Cylinder #3	The current to the injector in cylinder #3 is less than expected	Open circuit in the injector wiring, on either connection. Injector solenoid failure. Impact-dead cylinder	Engine System	injector #3 circuit current low.					5
653	6	W	Engine Injector Cylinder #3	The injector fuel flow at Cylinder #3 is lower than expected.	Injector has internal short	Engine System	injector #3 circuit current high.					5
653	13	W	Injector Cylinder #3	Injector #3 QR Code string error	The injector part number is correct, but the QR/Calibration string formed is not what is expected.	Engine System	injector #3 calibration fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
653	18	W	Engine Injector Cylinder #3	The injector fuel flow at Cylinder #3 is lower than expected.	Injector is not working. Injector flow limiter is closed. Pump mistimed. Impact - dead cylinder	Engine System	The injector fuel flow at Cylinder #3 is lower than expected.					5
654	2	W	Engine Injector Cylinder #4	Injector #4 Part Number is Invalid	The injector part number entered is not valid	Engine System	Injector #4 fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
654	5	W	Engine Injector Cylinder #4	The current to the injector in cylinder #4 is less than expected	Open circuit in the injector wiring, on either connection. Injector solenoid failure. Impact-dead cylinder	Engine System	injector #4 circuit current low.					5
654	6	W	Engine Injector Cylinder #4	The injector fuel flow at Cylinder #4 is lower than expected.	Injector has internal short	Engine System	injector #4 circuit current high.					5
654	13	W	Injector Cylinder #4	Injector #4 QR Code string error	The injector part number is correct, but the QR/Calibration string formed is not what is expected.	Engine System	injector #4 calibration fault.	1200 rpm	600 rpm/sec	0 rpm/sec		0
654	18	W	Engine Injector Cylinder #4	The injector fuel flow at Cylinder #4 is lower than expected.	Injector is not working. Injector flow limiter is closed. Pump mistimed. Impact - dead cylinder	Engine System	The injector fuel flow at Cylinder #4 is lower than expected.					5
676	5	W	Engine Glow Plug Relay	The current to the glow plug relay is less than expected	Open circuit in harness; open circuit in relay coil; short to battery on driver circuit Impact: loss of glow plug use	Engine System	Cold start aid with restricted function.					0
676	6	W	Engine Glow Plug Relay	The current to the Glow Plug Relay is higher than expected	Short circuit to ground in harness or relay	Engine System	Cold start aid with restricted function.					0
676	14	W	Glow Plug Relay	Glow Plug Relay Output Low When Relay Active.	Glow Plug relay output is low when the relay is energized by the ECU. Open circuit or failed relay	Engine Starting System	Cold start aid with restricted function.					0

1761	1	W	DEF Tank Level	DEF Tank is empty	DEF Tank Empty. SCR Inducement.			40% 1500 rpm	5%/min 300 rpm/sec	49%/min Immediate	0
1761	3	W	DEF Tank Level	Sensor voltage is higher than expected	Sensor Disconnected, Wiring fault, shorted to high source, sensor failure / Loss of level sensing, Level will be held at last value, and carried over a key cycle. SCR Inducement						0
1761	4	W	DEF Tank Level	Sensor voltage is lower than expected	Short to ground, sensor failure / Loss of level sensing, Level will be held at last value, and carried over a key cycle. SCR Inducement						0
1761	17	W	DEF Tank Level	Tank Level reading is lower than approximately 10%	DEF Tank Level Low. SCR Inducement.						0
1761	18	W	DEF Tank Level	Tank Level reading is 0%	DEF Tank Level Very Low. SCR Inducement			25%	5%/min	49%/min	0
2003	9	S	Source Address 3	No CAN message (TSC) received from source address 3 (EQT) within timeout period		Communication System	Transmission control unit communication fault. Restart engine to attempt vehicle recovery				0
2630	0	S	Charge Air Cooler Outlet Temperature	Charge Air Cooler Temperature High - Most Severe Level	Air cooler is plugged or radiator needs to be cleaned. Occurs at 91°C. Refers to Fresh Air Temperature.	Engine System	Charge air cooler temperature high. Reduce engine speed and load. Check cooling system for debris.	60%	20%/min	20%/min	1
2630	3	W	Charge Air Cooler Outlet Temperature	Charge Air Cooler Sensor Voltage OOR High	Open circuit in the harness, either signal or ground. Temperature sensor fault						0
2630	4	W	Charge Air Cooler Outlet Temperature	Charge Air Cooler Sensor Voltage OOR Low	Temperature Sensor signal shorted to ground. Sensor failed						0
2630	15	W	Charge Air Cooler Outlet Temperature	Charge Air Cooler Temperature High - Least Severe Level	Air cooler is plugged or radiator needs to be cleaned. Occurs at 88°C. Refers to Fresh Air Temperature.	Engine System	Charge air cooler outlet temperature high. Check cooling system for debris.				0
2630	16	W	Charge Air Cooler Outlet Temperature	Charge Air Cooler Temperature High - Moderately Severe Level	Air cooler is plugged or radiator needs to be cleaned. Occurs at 89.5°C. Refers to Fresh Air Temperature.	Engine System	Charge air cooler outlet temperature high. Reduce engine speed and load. Check cooling system for debris.	20%	5%/min	5%/min	1
2659	1	W	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	Adaptive learn correction factor exceeded. The NOx based EGR flow correction logic in the software has reached its maximum correction and the NOx conversion efficiency monitor/fault is about to set.	EGR venturi coking.	Engine System	EGR system error.	25%	20%/min	20%/min	0
2659	2	W	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	EGR model mismatch between delta temperature and/or delta pressure	In-range EGR delta P sensor failure or EGR Venturi coking or EGR cooler fouling	Engine System		25%	20%/min	20%/min	3
2659	3	W	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	EGR Delta Pressure Sensor Voltage OORH	Wiring fault, shorted to high source or pressure sensor fault. Will run open loop EGR control; Diagnostic AECD with a derate.	Engine System	EGR Delta Pressure sensor voltage high	25%	20%/min	20%/min	0
2659	4	W	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	EGR Delta Pressure Sensor Voltage OORL	Wiring fault. Harness shorted to ground or pressure sensor fault. Will run open loop EGR control; Diagnostic AECD with a derate.	Engine System	EGR Delta Pressure Sensor Voltage Low	25%	20%/min	20%/min	0
2659	15	W	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	EGR Flow Higher Than Expected - Least Severe Level	EGR flow detected with valve closed. EGR will run Open-Loop.	Engine System	EGR system error.	25%	20%/min	20%/min	3
2659	17	W	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	EGR Flow Lower Than Expected - Least Severe Level	No EGR flow detected with valve open. Most likely caused by clogged cooler or broken valve shaft. EGR will run Open-Loop.	Engine System	EGR system error.	25%	20%/min	20%/min	3
2659	18	P	Engine Exhaust Gas Recirculation (EGR) Mass Flow Rate	Adaptive learn correction factor nearly exceeded. The NOx based EGR flow correction logic in the software has reached its maximum allowable correction.	EGR venturi coking.	Engine System	EGR system error.				0
2790	16	W	Turbocharger Compressor Outlet Temperature	Compressor Outlet Temperature High - Moderately Severe Level	High compressor outlet temperature due to high ambient temperatures or intercooler restriction.	Engine System	Turbocharger outlet temperature high. Reduce engine speed and load.	50%	20%/min	20%/min	0
2791	5	W	Engine Exhaust Gas Recirculation (EGR) Valve Control	The current to the EGR Valve is less than expected	Open circuit in harness	Engine System	EGR valve circuit fault.				0
2791	6	W	Engine Exhaust Gas Recirculation (EGR) Valve Control	The current to the EGR Valve is higher than expected	Short circuit	Engine System	EGR valve circuit fault.				0

3711	31	W	Diesel Particulate Filter Active Regeneration Inhibited Due to Low Exhaust Gas Temperature	DOC inlet temperature target not reached during ETM	Very low ambient, and/or parasitics; elevated idle is disabled; application requirements not met. In range sensor failure.	Exhaust Filter System	Exhaust Filter inlet temperature not reached. Active Exhaust Filter Cleaning unavailable.					6
3719	0	S	Particulate Trap #1 Soot Load Percent	Soot level high-most severe level	Soot at the service only level. A derate will be applied.	Exhaust Filter Restricted	Exhaust Filter Restricted. Engine Power Limited. Contact service representative.	1810 rpm	600 rpm/sec	600 rpm/sec		6
3719	15	M	Particulate Trap #1 Soot Load Percent	Soot level high-least severe level	Light and fault may be dependant on application display		soot at the high level					6
3719	16	W	Particulate Trap #1 Soot Load Percent	Soot level high-moderately severe level	Engine power limited. Start parked filter cleaning on engine setting page	Exhaust Filter System	Exhaust Filter Restricted. Engine Power Limited. Start parked filter cleaning on engine settings page per Operators Manual.					6
4334	0	W	DEF Dosing Pressure Sensor	Supply module pressure above a maximum pressure at any time	Restriction in Return line (could be frozen or plugged by a different restriction), Pump speed higher than commanded (pump failure), an in-range pressure sensor failure, an in-range return line heater failure (line failed to thaw) / This fault sets once per key cycle unless it is reset by a DM11 request. Once set, the DEF system is shutdown until a key cycle or DM11 request. SCR Inducement							0
4334	1	W	DEF Dosing Pressure Sensor	Pressure sensor reading abnormally low	DEF tank empty, blocked or broken suction line, failed supply pump / unable to dose and engine derate. SCR Inducement							0
4334	3	W	DEF Dosing Pressure Sensor	Sensor voltage is higher than expected	Sensor Disconnected, Wiring fault, shorted to high source, sensor failure. SCR Inducement							0
4334	4	W	DEF Dosing Pressure Sensor	Sensor voltage is lower than expected	Short to ground, faulty sensor. SCR Inducement							0
4334	11	W	DEF Dosing Pressure Sensor	The supply module fails to relieve the system pressure during a shutdown sequence or prime re-attempt sequence	Mechanically failed reverting valve, blockage in DEF supply Line, mechanically failed DEF injector, mechanically failed pump / This fault sets once per key cycle unless it is reset by a DM11 request. Once set, the DEF system is shutdown until a key cycle or DM11 request. SCR Inducement							0
4334	16	W	DEF Dosing Pressure Sensor	Supply module pressure above threshold, only detected while dosing.	Incomplete defrost, pinched line, pump control issue or sensor in-range failure. SCR Inducement							0
4334	18	W	DEF Dosing Pressure Sensor	Pressure sensor reading abnormally low	Blocked or broken suction line, DEF dosing valve stuck open / engine derate. SCR Inducement							0
4334	31	W	DEF Dosing Pressure Sensor	DEF Supply Pressure exceeds a threshold during the detection mode state while priming the DEF system	Restriction in Return line (could be frozen or plugged by a different restriction), Pump speed higher than commanded (pump failure), an in-range pressure sensor failure, an in-range return line heater failure (line failed to thaw) / This fault sets once per key cycle unless it is reset by a DM11 request. Once set, the DEF system is shutdown until a key cycle or DM11 request. SCR Inducement							0
4341	5	W	DEF Dosing Unit Pressure Line Heater	Measured current is lower than expected when the output is active.	Wiring Fault (Open Circuit), shorted to high source on the supply side. Connector disconnected, faulty heater / Loss of ability to defrost DEF Line. SCR Inducement.							0
4341	6	W	DEF Dosing Unit Pressure Line Heater	Measured current Higher than expected when output is active	Wiring Fault (Short Circuit), Faulty heater. / Loss of ability to defrost DEF Line, Driver will be disabled until key cycle. SCR Inducement.							0
4343	5	W	DEF Line Heater - Suction Line (Supply Line)	Measured current is lower than expected when the output is active.	Wiring Fault (Open Circuit), shorted to high source on the supply side. Connector disconnected, faulty heater / Loss of ability to defrost DEF Line. SCR Inducement							0
4343	6	W	DEF Line Heater - Suction Line (Supply Line)	Measured current Higher than expected when output is active	Wiring Fault (Short Circuit), Faulty heater. / Loss of ability to defrost DEF Line, Driver will be disabled until key cycle. SCR Inducement							0
4345	5	W	DEF Line Heater - Return Line (Backflow Line)	Measured current is lower than expected when the output is active	Wiring Fault (Open Circuit), shorted to high source on the supply side. Connector disconnected, faulty heater / Loss of ability to defrost DEF Line. SCR Inducement							0

4345	6	W	DEF Line Heater - Return Line (Backflow Line)	Measured current Higher than expected when output is active	Wiring Fault (Short Circuit), Faulty heater. / Loss of ability to defrost DEF Line, Driver will be disabled until key cycle. SCR Inducement						0
4360	7	W	SCR Inlet Temperature Sensor	Sensor does not respond as expected.	Faulty Temperature Module / Will use backup model as long as SCR Outlet temperature is valid, SCR Inducement.						0
4360	12	W	SCR Inlet Temperature Sensor	Loss of Communication with the SCR Temperature Module, or the module indicates that there is an error with the temperature reading.	Faulty Temperature Module / Will use backup model as long as SCR Outlet temperature is valid, no loss of performance. SCR Inducement						6
4364	1	W	SCR Conversion Efficiency	Measured NOx out of SCR is not reduced compared to Measured NOx into the SCR, and a regeneration has been completed but did not correct the problem.	Poor DEF quality Malfunctioning DEF Injection system Malfunctioning SCR Catalyst DEF deposits in the DEF injection system Swapped NOx sensors. SCR Inducement.						0
4364	18	W	SCR Conversion Efficiency	Measured NOx out of SCR is not reduced compared to Measured NOx into the SCR	Poor DEF quality Malfunctioning DEF Injection system Malfunctioning SCR Catalyst DEF deposits in the DEF injection system Swapped NOx sensors. SCR Inducement.						0
4366	5	W	DEF Tank Heater Control Valve	Measured current is lower than expected when the output is active.	Wiring Fault (Open Circuit), Connector disconnected, faulty control valve / Loss of ability to defrost DEF Tank. SCR Inducement.						0
4366	6	W	DEF Tank Heater Control Valve	Measured current Higher than expected when output is active	Wiring Fault (Short Circuit), Faulty Control Valve. / Loss of ability to defrost DEF Tank, Driver will be disabled until key cycle. SCR Inducement.						0
4366	16	W	DEF Tank Coolant Control Valve	DEF Tank Temperature is higher than expected	Coolant Control Valve Stuck Open or Shorted to Voltage Source, High ambient temperature / System will shut down and empty. SCR Inducement						0
4366	18	W	DEF Tank Coolant Control Valve	DEF Tank heating/defrosting time is excessive	Coolant Control Valve Stuck Shut, Insufficient Coolant Temperature (Engine Coolant System Problem) Insufficient Coolant Flow (Blocked Line) In-range tank temperature sensor failure / Inability to defrost DEF tank. SCR Inducement						0
4376	5	W	DEF Supply Module Reversing Valve	Measured current is lower than expected when the output is active.	Wiring Fault (Open Circuit), Connector disconnected, Faulty Reversing Valve. SCR Inducement.						0
4376	6	W	DEF Supply Module Reversing Valve	Measured current Higher than expected when output is active	Wiring Fault (Short Circuit), Faulty Reversing Valve						0
4376	14	W	DEF Supply Module Reversing Valve	While idling, if the temperature is above 1000 deg C, AND Pressure is above 100 kPa. After keyoff, and waiting an additional 10 sec, this fault sets if the pressure is above 75 kPa.	If you can build pressure - stuck in non reversing direction If you can't build pressure – blocked line between tank and supply module If there is no pressure change – in range sensor failure						0
4490	12	W	Specific Humidity	Sensor indicating an error condition	Sensor failure Impact to condensation AECD, Reduced accuracy of engine out Nox models, revert to T3 humidity model No derate required	Engine System	Compressor inlet sensor fault				0
4765	0	W	DOC Inlet Temperature	High Inlet Temperature. In-range sensor failure.	Unable to complete Regen	Exhaust Filter System					6
4765	12	W	Particulate Trap Intake Gas Temperature	Error reported from sensor	Thermocouple channel wires are open circuit or shorted to ground or power. Impact - dosing not allowed	Exhaust Filter System	Exhaust filter temperature sensor error.				6
4766	12	W	Particulate Trap Intermediate Gas Temperature	Error reported from sensor	Thermocouple channel wires are open circuit or shorted to ground or power. Impact - dosing not allowed, loss of unintended dosing diagnostic	Exhaust Filter System	Exhaust filter temperature sensor error.				6
4766	15	W	Particulate Trap Intermediate Gas Temperature	DOC Outlet Temperature High	System dosing more than expected, slow response time of sensors (sooted up), erratic fuel supply or nozzle performance; DOC over performance; see also unintended HC fault Impact - regeneration must retry	Exhaust Filter System	TBD				6

4766	16	W	Particulate Trap Intermediate Gas Temperature	DOC Outlet Temperature Higher than expected for too many times in one key cycle	System dosing more than expected, slow response time of sensors (sooted up), erratic fuel supply or nozzle performance; DOC over performance; see also unintended HC fault Impact - regeneration cannot complete	Exhaust Filter System	Exhaust filter temperature higher than expected. Active Exhaust Filter Cleaning unavailable.								0
4766	17	W	Particulate Trap Intermediate Gas Temperature	Desired temperature not reached after 900 seconds.	Face plugging, dosing injector not operating correctly; excessive DOC deactivation (poisoning); fuel coking in dosing line; undetected in-range failure of DOC inlet (reading too high) or outlet temp Impact: regen is aborted	Exhaust Filter System	Exhaust filter cleaning system fault. Not able to continue cleaning.								6
4766	18	W	Particulate Trap Intermediate Gas Temperature	Desired temperature not reached after 900 seconds and happens 10 times.	Face plugging, dosing injector not operating correctly; excessive DOC deactivation (poisoning); fuel coking in dosing line; undetected in-range failure of DOC inlet (reading too high) or outlet temp Impact: regen is aborted until power cycle Impact: regen is aborted	Exhaust Filter System	Exhaust filter cleaning system fault. Not able to continue cleaning.								6
4795	13	W	Diesel Particulate Filter	Calibration string does not match what is expected	Incorrect DOC, DPF or SCR string used. SCR Inducement.	Engine System	Exhaust Filter calibration data invalid. Engine power limited.	1200 rpm	600 rpm/sec	0 rpm/sec					0
5018	0	S	Aftertreatment Diesel Oxidation Catalyst System	Too many occurrences of DOC out >x°C DOC in when regen is not active and DOC in is >300°C	Turbo seals failure, injector misfire, leaking dosing nozzle, leaking coolant - check engine liquid levels Impact - engine power derate and inhibit active regen	Engine System	Unexpected temperature in Exhaust Filter Catalyst	50%	49%/min	49%/min					6
5018	16	W	Aftertreatment Diesel Oxidation Catalyst System	Too many occurrences of DOC out >x°C DOC in when regen is not active and DOC in is >300°C	Turbo seals failure, injector misfire, leaking dosing nozzle, leaking coolant - check engine liquid levels Impact - none	Engine System	Unexpected temperature in Exhaust Filter Catalyst	50%	49%/min	49%/min					6
5125	3	W	Sensor Supply Voltage 7	Sensor Supply Voltage OOR High	5V Supply shorted to a higher voltage. Refer to schematic for pinout information.	Engine System	Sensor Supply Voltage OOR High								0
5125	4	W	Sensor Supply Voltage 7	Sensor Supply Voltage OOR Low	5V Supply shorted to ground. Refer to schematic for pinout information.	Engine System	Sensor Supply Voltage OOR Low								0
5126	3	W	Sensor Supply Voltage 8	Sensor Supply Voltage OOR High	5V Supply shorted to a higher voltage. Refer to schematic for pinout information.	Engine System	Sensor Supply Voltage OOR High								0
5126	4	W	Sensor Supply Voltage 8	Sensor Supply Voltage OOR Low	5V Supply shorted to ground. Refer to schematic for pinout information.	Engine System	Sensor Supply Voltage OOR Low								0
5127	3	W	Sensor Supply Voltage 9	Communication Supply Voltage OOR High	Supply shorted to a higher voltage.	Engine System	Sensor Supply Voltage OOR High								0
5127	4	W	Sensor Supply Voltage 9	Communication Supply Voltage OOR Low	Supply shorted to ground.	Engine System	Sensor Supply Voltage OOR Low								0
5128	6	W	Sensor Supply Voltage 10	Current higher than expected when driver is active	Wiring fault (short circuit) or faulty solenoid										0
5246	0	W	Aftertreatment SCR Operator Inducement Severity	Warning when 10 minutes remain prior to Inducement Derate condition	An emission fault is active. Engine power may be severely reduced within 10 minutes.	Engine Emission System Problem	An emission fault is active. Engine power may be severely reduced within 10 minutes								0
5246	13	W													0
5246	14	S	Aftertreatment SCR Operator Inducement Severity	Warning when 20 minutes remain prior to final inducement begins ramping in.	Engine Emission System Fault. Engine limited to idle only operation within 20 minutes.	Engine Emission System Problem	Engine limited to idle only operation within 20 minutes.								0
5246	15	W	Aftertreatment SCR Operator Inducement Severity	Warning when 30 minutes remain prior to Inducement Derate condition	An emission fault is active. Engine power may be severely reduced within 30 minutes.	Engine Emission System Problem	An emission fault is active. Engine power may be severely reduced within 30 minutes								0
5246	16	W	Aftertreatment SCR Operator Inducement Severity	Warning when 20 minutes remain prior to Inducement Derate condition	An emission fault is active. Engine power may be severely reduced within 20 minutes.	Engine Emission System Problem	An emission fault is active. Engine power may be severely reduced within 20 minutes								0
5246	31	S	Aftertreatment SCR Operator Inducement Severity	Warning when final inducement begins ramping in.	An emission fault is active. Engine limited to idle only operation.	Engine Emission System Problem	Engine limited to idle only operation.								0
5298	1	W	Aftertreatment Diesel Oxidation Catalyst Conversion Efficiency	Check DPF delta T at the end of a complete active deep clean regen and if DPF out T is greater than inlet by 100°C for too many occurrences	DOC catalyst deactivation, DOC poisoning, dosing injector too much fuel or not atomized; in-range temperature sensor failure Impact - inhibit active regen	Engine System	Exhaust Filter Catalyst Ineffective								6
5298	18	N	Aftertreatment Diesel Oxidation Catalyst Conversion Efficiency	Check DPF delta T at the end of a complete active deep clean regen and if DOC out T is greater than inlet by 100°C	DOC catalyst deactivation, DOC poisoning, dosing injector too much fuel or not atomized; in-range temperature sensor failure	Engine System	Exhaust Filter Catalyst Ineffective								6

5435	6	W	DEF Dosing Unit Pump	Measured current Higher than expected when output is active	Wiring Fault (Short Circuit), Faulty Supply Pump. SCR Inducement.														0
5435	9	W	DEF Dosing Unit Pump	Loss of communication	Wiring problem with the pump control line / Impact - may lead to other faults														0
5435	11	W	DEF Dosing Unit Pump	Inability for pump to build pressure when priming	Incomplete defrost, DEF tank empty, blocked or broken suction line, failed supply pump / unable to dose and engine derate. SCR Inducement														0
5435	14	W	DEF Dosing Unit Pump	DEF Supply Module Control Line feedback is above a threshold	Wiring failure in pump or wiring harness (wire is short circuited to battery or higher voltage) / Active inducement after 4 hours. SCR Inducement														0
5435	31	W	Diesel Exhaust Fluid Dosing Injector	DEF supply pressure is unstable.	Reverting valve stuck on, faulty pump, leak or restriction in pressure line or supply line. SCR Inducement														0
5571	5	W	High Pressure Common Rail Fuel Pressure Relief Valve	Circuit resistance is higher than expected	Open Circuit, Connector disconnected.							20%	5%/min	5%/min					0
5571	6	W	High Pressure Common Rail Fuel Pressure Relief Valve	Circuit resistance is lower than expected	Short circuit in wiring harness or across coil.							20%	5%/min	5%/min					0
5745	5	W	DEF Dosing Unit Heater	Measured current is lower than expected when the output is active.	Wiring Fault (Short Circuit), Faulty heater. / Loss of ability to defrost DEF Dosing Unit, Driver will be disabled until key cycle. SCR Inducement														0
5745	6	W	DEF Dosing Unit Heater	Measured current Higher than expected when output is active	Wiring Fault (Open Circuit), shorted to high source on the supply side. Connector disconnected, faulty heater / Loss of ability to defrost DEF Dosing Unit SCR Inducement														0
5745	18	W	DEF Dosing Unit Heater	In-range temperature sensor failure or wiring fault.	Bad supply module. SCR Inducement														0
5745	31	N	DEF Dosing Unit Heater	If the duty cycle received from the DEF Supply module is invalid, this fault will set. (This failure is only checked when the DEF System is not actively controlling pressure.)	Failed heater temperature sensor or wiring in the DEF supply module														0
520629	31	W	Illegal Input Map Structure	Illegal Input Map Structure	Illegal operation found. There is an incorrect input map structure. This should never be seen beyond development.	Engine System													0
522494	9	W	Engine Turbocharger 1 Compressor Inlet Sensor	No CAN message received within timeout period	CAN wiring issue to compressor inlet sensor, sensor failure, power supply issue	Engine System	Compressor inlet sensor communication fault.												0
522495	9	W	Engine Exhaust Filter Temperature Module	Loss of communication	Open or short circuit on the communication wire, open or short on either power supply. Failed device. SCR Inducement.	Exhaust Filter System	Exhaust filter temperature sensor communication fault												0
523653	1	W	ECU Power Input Supply Voltage #3	Low voltage detected on ECU supply #3.	Blown fuse or open circuit on ECU supply voltage #3. Engine will shutdown.							Shutdown immediately							0
523653	14	N		Removal of battery power, likely with a manual battery cut-off switch, prior to completely DEF injection system shutdown (line emptying).	Battery Disconnected prior to ECU completing shutdown. Any DEF remaining in the lines or supply module can freeze at sufficiently low temperatures and damage the hardware.														0
523665	1	W	ECU Power Input Supply Voltage #1	Low voltage detected on ECU supply #1.	Blown fuse or open circuit on ECU supply voltage #1. Engine will shutdown							Shutdown immediately							0
523666	1	W	ECU Power Input Supply Voltage #2	Low voltage detected on ECU supply #2.	Blown fuse or open circuit on ECU supply voltage #2. Engine will shutdown.							Shutdown immediately							0