GROUP 11 SELF-DIAGNOSTIC SYSTEM

1. OUTLINE

When any abnormality occurs in the ADVANCED CAPO system caused by electric parts malfunction and by open or short circuit, the MCU diagnoses the problem and sends the error codes to the cluster and also stores them in the memory.

2. MONITORING

1) Active fault

21093CD66 21093CD66A 21093CD66B

· The active faults of the MCU or engine ECM can be checked by this menu.

2) Logged fault

21093CD66C 21093CD66D 21093CD66E

· The logged faults of the MCU or engine ECM can be checked by this menu.

3) Delete fault

21093CD66F 21093CD66G 21093CD66H

· The logged faults of the MCU or engine ECM can be deleted by this menu.

3. MACHINE ERROR CODES TABLE

Error code		Description
HCESPN	FMI	
101	3	Hydraulic oil temperature sensor circuit - Voltage above normal, or shorted to high source.
	4	Hydraulic oil temperature circuit - Voltage below normal, or shorted to low source.
105	0	Working pressure sensor data above normal range.
	1	Working pressure sensor data below normal range.
	2	Working pressure sensor data error.
	4	Working pressure sensor circuit - Voltage below normal, or shorted to Low source.
108	0	Travel oil pressure sensor data above normal range.
	1	Travel oil pressure sensor data below normal range.
	2	Travel oil pressure sensor data error.
	4	Travel oil pressure sensor circuit - Voltage below normal, or shorted to low source.
120	0	Main pump 1 (P1) pressure sensor data above normal range.
	1	Main pump 1 (P1) pressure sensor data below normal range.
	2	Main pump 1 (P1) pressure sensor data error.
	4	Main pump 1 (P1) pressure sensor circuit - Voltage below normal, or shorted to low source.
121	0	Main pump 2 (P2) pressure sensor data above normal range.
	1	Main pump 2 (P2) pressure sensor data below normal range.
	2	Main pump 2 (P2) pressure sensor data error.
	4	Main pump 2 (P2) pressure sensor circuit - Voltage below normal, or shorted to low source.
122	0	Overhead pressure sensor data above normal range.
	1	Overhead pressure sensor data below normal range.
	2	Overhead pressure sensor data error.
	4	Overhead pressure sensor circuit - Voltage below normal, or shorted to low source.
123	0	Negative 1 pressure sensor data above normal range.
	1	Negative 1 pressure sensor data below normal range.
	2	Negative 1 pressure sensor data error.
	4	Negative 1 pressure sensor circuit - Voltage below normal, or shorted to low source.
124	0	Negative 2 Pressure sensor data above normal range.
	1	Negative 2 Pressure sensor data below normal range.
	2	Negative 2 Pressure sensor data error.
	4	Negative 2 Pressure sensor circuit - Voltage below normal, or shorted to low source.
125	0	Pilot pump (P3) pressure sensor data above normal range.
	1	Pilot pump (P3) pressure sensor data below normal range.
	2	Pilot pump (P3) pressure sensor data error.
	4	Pilot pump (P3) pressure sensor circuit - Voltage below normal, or shorted to low source.
127	0	Boom up pilot pressure sensor data above normal range.
	1	Boom up pilot pressure sensor data below normal range.
	2	Boom up pilot pressure sensor data error.
	4	Boom up pilot pressure sensor circuit - Voltage below normal, or shorted to low source.
133	0	Arm in/out & bucket in pilot pressure sensor data above normal range.
	1	Arm in/out & bucket in pilot pressure sensor data below normal range.
	2	Arm in/out & bucket in pilot pressure sensor data error.
	4	Arm in/out & bucket in pilot pressure sensor circuit - Voltage below normal, or shorted to low source.

※ Some error codes are not applied to this machine.

Error code		Description
HCESPN	FMI	
135	0	Swing pilot pressure sensor data above normal range.
	1	Swing pilot pressure sensor data below normal range.
	2	Swing pilot pressure sensor data error.
	4	Swing pilot pressure sensor circuit - Voltage below normal, or shorted to low source.
138	0	Attachment pilot pressure sensor data above normal range.
	1	Attachment pilot pressure sensor data below normal range.
	2	Attachment pilot pressure sensor data error.
	4	Attachment pilot pressure sensor circuit - Voltage below normal, or shorted to low source.
140	5	Pump EPPR valve circuit - Current below normal, or open circuit.
	6	Pump EPPR valve circuit - Current above normal.
141	5	Boom priority EPPR valve circuit - Current below normal, or open circuit.
	6	Boom priority EPPR valve circuit - Current above normal.
143	5	Travel EPPR valve circuit - Current below normal, or open circuit.
	6	Travel EPPR valve circuit - Current above normal.
144	5	Attachment flow EPPR valve circuit - Current below normal, or open circuit.
	6	Attachment flow EPPR valve circuit - Current above normal.
145	5	Remote cooling fan EPPR valve circuit - Current below normal, or open circuit.
	6	Remote cooling fan EPPR valve circuit - Current above normal.
150	5	Left rotate EPPR valve circuit - Current below normal, or open circuit.
	6	Left rotate EPPR valve circuit - Current above normal.
151	5	Right rotate EPPR valve circuit - Current below normal, or open circuit.
	6	Right rotate EPPR valve circuit - Current above normal.
152	5	Left tilt EPPR valve circuit - Current below normal, or open circuit.
	6	Left tilt EPPR valve circuit - Current above normal.
153	5	Right tilt EPPR valve circuit - Current below normal, or open circuit.
	6	Right tilt EPPR valve circuit - Current above normal.
166	5	Power max solenoid circuit - Current below normal, or open circuit.
	6	Power max solenoid circuit - Current above normal.
167	5	Travel speed solenoid circuit - Current below normal, or open circuit.
	6	Travel speed solenoid circuit - Current above normal.
168	5	Attachment pressure solenoid circuit - Current below normal, or open circuit.
	6	Attachment pressure solenoid circuit - Current above normal.
169	5	Attachment conflux solenoid circuit - Current below normal, or open circuit.
	6	Attachment conflux solenoid circuit - Current above normal.
170	5	Arm regeneration solenoid circuit - Current below normal, or open circuit.
	6	Arm regeneration solenoid circuit - Current above normal.
171	5	Attachment safety solenoid circuit - Current below normal, or open circuit.
	6	Attachment safety solenoid circuit - Current above normal.
181	5	Remote cooling fan reverse solenoid circuit - Current below normal, or open circuit.
	6	Remote cooling fan reverse solenoid circuit - Current above normal.
301	5	Fuel level sensor circuit - Voltage above normal, or shorted to high source.
	6	Fuel level sensor circuit - Voltage below normal, or shorted to low source.
304	3	Engine coolant temperature sensor circuit - Voltage above normal, or shorted to high source.
	4	Engine coolant temperature sensor circuit - Voltage below normal, or shorted to low source.
310	8	Engine speed signal error - Abnormal frequency or pulse width.
322	3	Engine preheat relay circuit - Voltage above normal, or shorted to high source.
	4	Engine preheat relay circuit - Voltage below normal, or shorted to low source.
325	3	Fuel warmer relay circuit - Voltage above normal, or shorted to high source.
	4	Fuel warmer relay circuit - Voltage below normal, or shorted to low source.

※ Some error codes are not applied to this machine.

Error code		Description
HCESPN	FMI	
340	3	Potentiometer (G/A) circuit - Voltage above normal, or shorted to high source.
	4	Potentiometer (G/A) circuit - Voltage below normal, or shorted to low source.
341	5	Governor actuator circuit - Current below normal, or open circuit.
	6	Governor actuator circuit - Current above normal.
501	0	Transmission oil pressure sensor data above normal range.
	1	Transmission oil pressure sensor data below normal range.
	2	Transmission oil pressure sensor data error.
	4	Transmission oil pressure sensor circuit - Voltage below normal, or shorted to low source.
503	0	Brake pressure sensor data above normal range.
	1	Brake pressure sensor data below normal range.
	2	Brake pressure sensor data error.
	4	Brake pressure sensor circuit - Voltage below normal, or shorted to low source.
505	0	Working brake pressure sensor data above normal range.
	1	Working brake pressure sensor data below normal range.
	2	Working brake pressure sensor data error.
	4	Working brake pressure sensor circuit - Voltage below normal, or shorted to low source.
506	3	Working brake lamp circuit - Voltage above normal, or shorted to high source.
	4	Working brake lamp circuit - Voltage below normal, or shorted to low source.
520	3	Ram lock lamp circuit - Voltage above normal, or shorted to high source.
	4	Ram lock lamp circuit - Voltage below normal, or shorted to low source.
525	5	Ram lock solenoid circuit - Current below normal, or open circuit.
	6	Ram lock solenoid circuit - Current above normal.
530	0	Travel F pilot pressure sensor data above normal range.
	1	Travel F pilot pressure sensor data below normal range.
	2	Travel F pilot pressure sensor data error.
	4	Travel F pilot pressure sensor circuit - Voltage below normal, or shorted to low source.
531	0	Travel R pilot pressure sensor data above normal range.
	1	Travel R pilot pressure sensor data below normal range.
	2	Travel R pilot pressure sensor data error.
	4	Travel R pilot pressure sensor circuit - Voltage below normal, or shorted to low source.
701	3	Hourmeter circuit - Voltage above normal, or shorted to high source.
	4	Hourmeter circuit - Voltage below normal, or shorted to low source.
705	0	MCU input voltage high.
	1	MCU input voltage low.
707	1	Alternator node I voltage low.
714	3	Acc. dial circuit - Voltage above normal, or shorted to high source.
	4	Acc. dial circuit - Voltage below normal, or shorted to low source.
715	3	Rotate signal input circuit - Voltage above normal, or shorted to high source.
	4	Rotate signal input circuit - Voltage below normal, or shorted to low source.
716	3	Tilt signal input circuit - Voltage above normal, or shorted to high source.
	4	Tilt signal input circuit - Voltage below normal, or shorted to low source.
722	3	Travel alarm (buzzer) circuit - Voltage above normal, or shorted to high source.
	4	Travel alarm (buzzer) circuit - Voltage below normal, or shorted to low source.
830	12	MCU internal memory error.
840	2	Cluster communication data error.
841	2	ECM communication data error.
843	2	Option #1 (CAN 2) communication data error.
850	2	RCM communication data error.

※ Some error codes are not applied to this machine.

4. ENGINE FAULT CODE

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
111 629 12	Error internal to the ECM related to memory hardware failures or internal ECM voltage supply circuits.	Engine will not start.
115 190 2	No engine speed signal detected at both engine position sensor circuits.	Engine will die and will not start.
121 190 10	No engine speed signal detected from one of the engine position sensor circuits.	None on performance.
122 102 3	High voltage detected on the intake manifold pressure circuit.	Derate in power output of the engine.
123 102 4	Low voltage detected on the intake manifold pressure circuit.	Derate in power output of the engine.
131 91 3	High voltage detected at the throttle position signal circuit.	Severe derate (power and speed). Limp home power only.
132 91 4	Low voltage detected at the throttle position signal circuit.	Severe derate (power and speed). Limp home power only.
133 974 3	High voltage detected at the remote throttle position signal circuit.	None on performance if remote throttle is not used.
134 974 4	Low voltage detected at the remote throttle position signal circuit.	None on performance if remote throttle is not used.
135 100 3	High voltage detected at the oil pressure circuit.	No engine protection for oil pressure.
141 100 4	Low voltage detected at the oil pressure circuit.	No engine protection for oil pressure.
143 100 18	Oil pressure signal indicates oil pressure below the low oil pressure engine protection limit.	Progressive power and speed derate with increasing time after alert. If engine protection shutdown feature is enable, engine will shut down 30 seconds after red lamp starts flashing.
144 110 3	High voltage detected at the coolant temperature circuit.	Possible white smoke. Fan will stay on if controlled by the electronic control module (ECM). No engine protection for coolant temperature.
145 110 4	Low voltage detected at the coolant temperature circuit.	Possible white smoke. Fan will stay on if controlled by electronic control module (ECM). No engine protection for coolant temperature.
147 91 8	A frequency of less then 100Hz was detected at the frequency throttle signal pin of the actuator harness connector at the ECM.	Calibration dependent power and speed derate.
148 91 8	A frequency of more than 100Hz was detected at the frequency throttle signal pin of the actuator harness connector at the ECM.	Calibration dependent power and speed derate.
151 110 0	Coolant temperature signal indicates coolant temperature above 104˚C (220˚F).	Progressive power derate with increasing time after alert. If engine protection shutdown feature is enabled, engine will shut down 30 seconds after red lamp starts flashing.

※ Some fault codes are not applied to this machine.

111Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
153 105 3	High voltage detected at the intake manifold temperature circuit.	Possible white smoke. Fan will stay on if controlled by electronic control module (ECM). No engine protection for coolant temperature.
154 105 4	Low voltage detected at the intake manifold temperature circuit.	Possible white smoke. Fan will stay on if controlled by electronic control module (ECM). No engine protection for coolant temperature.
155 105 0	Intake manifold temperature signal indicates temperature above 87.8˚C (190˚F).	Progressive power derate with increasing time after alert. If engine protection shutdown feature is enabled, engine will shut down 30 seconds after red lamp starts flashing.
187 620 4	Low voltage detected on the ECM voltage supply line to some sensors (VSEN2 supply).	Engine will run derated. No engine protection for oil pressure and coolant level.
198 612 3	High voltage detected at the ICON lamp circuit when low voltage was expected by the ECM.	The ICON system will be disabled. Only mandatory shutdown will be enabled.
199 612 4	Less than 6 VDC (low voltage) detected at the ICON lamp circuit when high voltage was expected by the ECM.	The ICON system will be disabled. Only mandatory shutdown will be enabled.
211 1484 31	Additional machine diagnostic codes have been logged. Check other ECM's for diagnostic codes.	None on engine performance.
212 175 3	High voltage detected at the oil temperature circuit.	No engine protection for oil temperature.
213 175 4	Low voltage detected at the oil temperature circuit.Low voltage detected at the oil temperature circuit.	No engine protection for oil temperature.
214 175 0	Oil temperature signal indicates oil temperate above 123.9˚C (225˚F).	Progressive power derate with increasing time after alert. If engine protection shutdown feature is enabled, engine will shut down 30sec after the red lamp starts flashing.
219 1380 17	Low oil level was detected in the CentinelTM makeup oil tank.	None on performance. CentinelTM deactivated.
221 108 3	High voltage detected at the ambient air pressure circuit.	Derate in power output of the engine.
222 108 4	Low voltage detected at the ambient air pressure circuit.	Derate in power output of the engine.
223 1265 4	Incorrect voltage detected at the CentinalTM actuator circuit by the ECM.	None on performance. CentinelTM deactivated.
227 620 3	High voltage detected on the ECM voltage supply line to some sensors (VSEN2 supply).	Engine will run derated. No engine protection for oil pressure and coolant level.
234 190 0	Engine speed signal indicates engine speed is greater than 2650 rpm.	Fuel shutoff valve is closed unit the engine speed drops. The fuel shutoff valve will open when engine speed falls below 2000 rpm.
235 111 1	Coolant level signal indicates coolant level is below the normal range.	Progressive power derate with increasing time after alert. If engine protection shutdown feature is enabled, engine will shut down 30 seconds after red lamp starts flashing.

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
237 644 2	Duty cycle of the throttle input signal to the primary or secondary engine for multiple unit synchronization is less than 3 percent or more than 97 percent.	All engines(primary and secondary) are shut down with increasing time after alert if hard-coupled. Only secondary engines are shut down with increasing time after alert if soft-coupled.
241 84 2	The ECM lost the vehicle speed signal.	Engine speed limited to maximum engine speed without vehicle speed sensor parameter value Cruise Control. Gear-Down Protection and Road Speed Governor will not work (automotive only).
242 84 10	Invalid or inappropriate vehicle speed signal detected. Signal indicates an intermittent connection or VSS tampering.	Engine speed limited to maximum engine speed without vehicle speed sensor parameter value Cruise Control. Gear-Down Protection and Road Speed Governor will not work (automotive only).
245 647 4	Less than 6 VDC detected at fan clutch circuit when on. Indicates an excessive current draw from the ECM or faulty ECM output circuit.	The fan may stay on at all times.
254 647 4	Less than 6 VDC detected at FSO circuit when on. Indicates an excessive current draw from the ECM or a faulty ECM output circuit.	The ECM turns off the FSO supply voltage. The engine will shut down.
255 632 3	Externally supplied voltage detected going to the fuel shutoff solenoid supply circuit.	None on performance. Fuel shutoff valve stays open.
285 639 9	The ECM expected information from a multiplexed device but did not receive it soon enough or did not receive it at all.	At least one multiplexed device will not operate properly.
286 639 13	The ECM expected info from a multiplexed device but only received a portion of the necessary information.	At least on multiplexed device will not operate properly.
287 91 19	The machine vehicle electronic control unit (VECU) detected a fault with its throttle pedal.	The engine will only idle.
288 974 19	The machine vehicle electronic control unit (VECU) detected a fault with its remote throttle.	The engine will not respond to the remote throttle.
293 1083 3	High voltage detected at the machine temperature sensor signal pin of the 31-pin machine connector.	No engine protection for machine temperature.
294 1083 4	Low voltage detected at the machine temperature sensor signal pin of the 31-pin machine connector.	No engine protection for machine temperature.
295 108 2	An error in the ambient air pressure sensor signal was detected by the ECM.	Engine is derated to no air setting.
297 1084 3	High voltage detected at the machine pressure sensor signal pin of the 31-pin machine connector.	No engine protection for machine pressure.
298 1084 4	Low voltage detected at the machine pressure sensor signal pin of the 31-pin machine connector.	No engine protection for machine pressure.
299 1384 31	Engine shutdown by device other than key switch before proper engine cool down resulting in filtered load factor above maximum shutdown threshold.	No action taken by the ECM.

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
311 651 6	Current detected at No.1 injector when voltage is turned off.	The injector for cylinder number 1 is turned off.
312 655 6	Current detected at No.5 injector when voltage is turned off.	The injector for cylinder number 5 is turned off.
313 653 6	Current detected at No.3 injector when the voltage is turned off	The injector for cylinder number 3 is turned off.
314 656 6	Current detected at No 6 injector when the voltage is turned off.	The injector for cylinder number 6 is turned off.
315 652 6	Current detected at No.2 injector when the voltage is turned off.	The injector for cylinder number 2 is turned off.
319 251 2	Real time clock lost power.	None on performance. Data in the ECM will not have accurate time and date information.
321 654 6	Current detected at No.4 injector when the voltage is turned on.	The injector for cylinder number 4 is turned off.
322 656 5	Injector solenoid driver cylinder 1 circuit-current below normal, or open circuit. Current detected at injector number 1 when voltage is turned off.	The current to the injector is shut off. The engine can possibly misfire or run rough.
323 656 5	Injector solenoid driver cylinder 5 circuit-current below normal, or open circuit. Current detected at injector number 5 when voltage is turned off.	The current to the injector is shut off. The engine can possibly misfire or run rough.
324 656 5	Injector solenoid driver cylinder 3 circuit-current below normal, or open circuit. Current detected at injector number 3 when voltage is turned off.	The current to the injector is shut off. The engine can possibly misfire or run rough.
325 656 5	Injector solenoid driver cylinder 6 circuit-current below normal, or open circuit. Current detected at injector number 6 when voltage is turned off.	The current to the injector is shut off. The engine can possibly misfire or run rough.
331 656 5	Injector solenoid driver cylinder 2 circuit-current below normal, or open circuit. Current detected at injector number 2 when voltage is turned off.	The current to the injector is shut off. The engine can possibly misfire or run rough.
332 656 5	Injector solenoid driver cylinder 4 circuit-current below normal, or open circuit. Current detected at injector number 4 when voltage is turned off.	The current to the injector is shut off. The engine can possibly misfire or run rough.
341 630 2	Severe loss of data from the ECM.	Possible no noticeable performance effects OR engine dying OR hard starting. Fault information, trip information and maintenance monitor data may be inaccurate.
343 629 12	Internal ECM error.	Possible none on performance or severe derate.
349 191 16	A frequency greater than calibrated threshold was detected at the tail shaft governor signal pin of the 31-pin machine connector.	Calibration dependent power and speed derate.
352 620 4	Low voltage detected on the ECM voltage supply line to some sensors (VSEN 1 supply).	Engine is derated to no air setting.
386 620 3	High voltage detected on the ECM voltage supply line to some sensors (VSEN 1 supply).	Engine is derated to no air setting.

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
387 1043 3	High voltage detected on the ECM voltage supply line to the throttle (VTP supply)	Engine will only idle.
388 1072 11	Less than 6 VDC detected at the engine brake circuit 1 when on indicates an excessive current draw from the electronic control module (ECM) or faulty ECM output circuit.	Engine brake 1 can not be activated.
392 1073 11	Less than 6 VDC detected at the engine brake circuit 2 when on indicates an excessive current draw from the electronic control module (ECM) or faulty ECM output circuit.	Engine brake 2 can not be activated.
415 100 1	Oil pressure signal indicates oil pressure below the very low oil pressure engine protection limit.	Progressive power derate with increasing time from alert. If engine protection shutdown feature is enabled, engine will shut down 30 seconds after red lamp starts flashing.
418 097 15	Water has been detected in the fuel filter.	Possible white smoke, loss of power, or hard starting.
419 1319 2	An error in the intake manifold pressure sensor signal was detected by the ECM.	Engine is derated to no air setting.
422 111 2	Voltage detected simultaneously on both the coolant level high and low signal circuits OR no voltage detected on both circuits.	No engine protection for coolant level.
426 639 2	Communication between the ECM and the J1939 data link has been lost.	None on performance. J1939 devices may not operate.
428 97 3	High voltage detected at water-in-fuel sensor.	None on performance.
429 97 4	Low voltage detected at water-in-fuel sensor.	None on performance.
431 558 2	Voltage detected simultaneously on both the idle validation off-idle and on-idle circuits.	None on performance.
432 558 13	Voltage detected at idle validation on-idle circuit when voltage at throttle position circuit indicates the pedal is not at idle OR voltage detected at idle validation off-idle circuit when voltage at throttle position circuit indicates the pedal is at idle.	Engine will only idle.
433 102 2	Voltage signal at intake manifold pressure circuit indicates high intake manifold pressure but other engine characteristics indicate intake manifold pressure must be low.	Derate to no air setting.
434 627 2	Supply voltage to the ECM fell below 6.2 VDC for a fraction of a second OR the ECM was not allowed to power down correctly (retain battery voltage for 30 seconds after key off).	Possible no noticeable performance effects OR possibility of engine dying OR hard starting. Fault information, trip information and maintenance monitor data may be inaccurate.
435 100 2	An error in the oil pressure sensor signal was detected by the ECM.	None on performance. No engine protection for oil pressure.
441 168 18	Battery voltage below normal operating level.	Possible no noticeable performance effects OR possibility of rough idle.

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
442 168 16	Battery voltage below normal operating level.	None on performance.
443 1043 4	Low voltage detected on the ECM voltage supply line to the throttle(s) (VTP supply).	Engine will only idle.
465 1188 3	High voltage detected at the wastegate actuator number 1 circuit when no voltage was being supplied by the electronic control module (ECM).	Engine will run derated.
466 1188 4	Less than +6 VDC detected at the wastegate actuator number 1 circuit when on indicates an excessive current draw from the electronic control module (ECM) or faulty ECM output circuit.	Engine will run derated.
472 1380 2	Either high or low voltage detected on the crankcase oil level sensor circuit by the electronic control module (ECM).	None on performance. Centinel system deactivated.
474 1321 2	Either low voltage detected when +12 VDC are commanded or voltage detected when no voltafe is commanded.	Either the engine will not start or the engine will not have starter lockout protection.
475 1351 4	Low voltage was detected on the electronic air compressor circuit when high voltage was expected.	Air compressor will not shut off.
476 1351 3	High voltage or an open circuit detected at the electronic air compressor governor actuator circuit.	Air compressor runs continuously or not at all.
489 191 18	Auxiliary speed frequency on input pin indicated that the frequency is below a calibration dependent threshold.	Engine will only idle.
491 1189 3	High voltage detected at the wastegate actuator number 2 circuit when no voltage was being supplied by the electronic control module (ECM).	Engine will run derated.
492 1189 4	Less than +6 VDC detected at the wastegate actuator number 2 circuit when activated indicates an excessive current draw from the electronic control module (ECM) or faulty ECM output circuit.	Engine will run derated.
527 702 3	Less than 17.0 VDC detected at the dual output A signal pin of the 31-pin machine connector.	No action taken by the ECM.
528 093 2	Less than 17.0 VDC detected at the dual output B signal pin of the 31-pin machine connector.	No action taken by the ECM.
529 703 3	Less than 17.0 VDC detected at the dual output B signal pin at the ECM.	No action taken by the ECM.
536 718 11	Either low voltage detected on autoshift low gear actuator circuit when +12 VDC are commanded or voltage detected when no voltage is commanded.	Top 2 lockout solenoid will not function properly. Transmission will not shift properly.
537 717 11	Either low voltage detected on autoshift high gear actuator circuit when (+) 12 VDC are commanded or voltage detected when no voltage is commanded.	Top 2 shift solenoid will not function properly. Transmission will not shift properly.

※ Some fault codes are not applied to this machine.

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
538 719 11	Either low voltage detected on autoshift neutral gear actuator circuit when +12 VDC are commanded or voltage detected when no voltage is commanded.	Top 2 neutral actuator will not function properly. Transmission will not shift properly.
544 611 7	Autoshift failure ; at least three shift attempts were missed.	Top 2 transmission will not be controlled correctly. Transmission remains in manual mode.
551 558 4	No voltage detected simultaneously on both the idle validation off-idle and on-idle circuits.	Engine will only idle.
581 1381 3	High voltage detected at the fuel inlet restriction sensor signal pin.	Fuel inlet restriction monitor deactivated.
582 1381 4	Low voltage detected at the fuel inlet restriction sensor signal pin	Fuel inlet restriction monitor deactivated.
583 1381 18	Restriction has been detected at the fuel pump inlet.	Fuel inlet restriction monitor warning is set.
588 611 3	High voltage detected at the alarm circuit when low voltage was expected by the ECM.	The ICON system will be disabled. Only mandatory shutdown will be enabled. Engine can be started normally.
589 611 4	Less than +6 VDC detected at the engine start alarm circuit when high voltage was expected by the ECM.	The ICON idle control system will be disabled. Only mandatory shutdown will be enabled. Engine can be started normally.
596 167 16	High battery voltage detected by the battery voltage monitor feature.	Yellow lamp will be lit until high battery voltage condition is corrected.
597 167 16	ICONTM has restarted the engine three times within three hours due to low battery voltage (automotive only) OR low battery voltage detected by the battery voltage monitor feature.	Yellow lamp will be lit until low battery voltage condition is corrected. The ECM may increase idle speed and deactivate idle decrement switch if idle speedup is enabled. The engine will run continuously if ICONTM is active (automotive only).
598 167 1	Very low battery voltage detected by the battery voltage monitor feature.	Red lamp lit until very low battery voltage condition is corrected.
611 1383 31	Engine shutdown by operator before proper engine cool down resulting in filtered load factor above maximum shutdown threshold.	No action taken by the ECM.
951 166 2	A power imbalance between cylinders was detected by the ECM.	Engine may have rough idle or misfire.

※ Some fault codes are not applied to this machine.