SERVICE BULLETIN

Original Issue Date: **11/01**
Model: **15–3250 kW**
Market: **Industrial**
Subject: **Warranty Startup Procedure Requirements**

Some generator set models with electronic control modules (ECM) may limit or prohibit adjusting the engine speed or testing the warning and shutdown faults. This type of testing is typically required by the NFPA 110 standard for emergency power supply systems or by other governing agencies. Completion of the shutdown and warning tests does not affect the warranty coverage. Figure 9 shows if the fault warning or fault shutdown tests are feasible.

Related Documents

- Startup Notification K-625
- Startup and Onsite Test Procedure K-3322

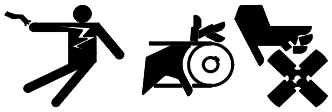
The engine ECM or other generator set controls may impact the following shutdowns and warnings. The letter (A or B) in parentheses identifies the fault category in Figure 9.

- Overspeed (governor control) shutdown
- Overcrank shutdown
- High coolant temperature shutdown (A)
- High coolant temperature warning (A)
- Low coolant temperature warning (A)
- Low oil pressure shutdown (A)
- Low oil pressure warning (A)
- Battery charger fault warning (B)
- Low battery voltage warning (B)
- Low fuel (level or pressure) warning (B)

Use the information in Figure 9 through Figure 19 to test the engine sensor/switch faults. The information in this bulletin provides a guideline for warranty startup requirements. Use this data during troubleshooting of the generator set.

Safety Precautions

⚠ WARNING



Accidental starting.
Can cause severe injury or death.

Disconnect the battery cables before working on the generator set. Remove the negative (–) lead first when disconnecting the battery. Reconnect the negative (–) lead last when reconnecting the battery.

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Shut down the generator set. (2) Place the controller in Out of Service mode. (3) Press the emergency stop button. (4) Disconnect the power to the battery charger, if equipped. (5) Remove the battery cables, negative (–) lead first. Reconnect the negative (–) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

(APM802 Controller)

Routing	Service Manager	Sales Manager	Parts Manager	Technician No. 1	Technician No. 2	Technician No. 3	Return This to
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Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Move the generator set master switch to the OFF position. (2) Disconnect the power to the battery charger. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent starting of the generator set by an automatic transfer switch, remote start/stop switch, or engine start command from a remote computer.

(Decision-Maker® 3+ and 550 Controllers)

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) Press the generator set off/reset button to shut down the generator set. (2) Disconnect the power to the battery charger, if equipped. (3) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

(Decision-Maker® 3000, 3500, and 6000 Controllers)

Disabling the generator set. Accidental starting can cause severe injury or death. Before working on the generator set or equipment connected to the set, disable the generator set as follows: (1) If the controller is not already in the MAN (manual) mode, press the Controller Mode button and then press the MAN mode button. (2) If the generator set is running, press and hold the Manual–Stop button for at least 2 seconds to stop the generator set. (3) Press the Controller Mode button and then press the controller Off mode button. (4) Disconnect the power to the battery charger, if equipped. (5) Remove the battery cables, negative (-) lead first. Reconnect the negative (-) lead last when reconnecting the battery. Follow these precautions to prevent the starting of the generator set by the remote start/stop switch.

(Decision-Maker® 8000 Controller)

The Decision-Maker® 8000 controller can be remotely controlled. Accidental starting can cause severe injury or death. In the event that maintenance needs to be done to the generator set, check the following to ensure that the engine cannot be started remotely: (1) Disconnect remote control via RS-232 line. (2) Disconnect input REMOTE START/STOP or disconnect output STARTER and outputs GCB CLOSE/OPEN.

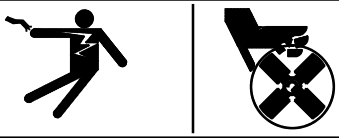
⚠ WARNING

Explosion.
Can cause severe injury or death.
Relays in the battery charger cause arcs or sparks.

Locate the battery in a well-ventilated area. Isolate the battery charger from explosive fumes.

Battery short circuits. Explosion can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage. Disconnect the battery before generator set installation or maintenance. Remove all jewelry before servicing the equipment. Use tools with insulated handles. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery. Never connect the negative (-) battery cable to the positive (+) connection terminal of the starter solenoid. Do not test the battery condition by shorting the terminals together.

⚠ WARNING



Hazardous voltage. Moving parts.
Can cause severe injury or death.

Operate the generator set only when all guards and electrical enclosures are in place.

Short circuits. Hazardous voltage/current can cause severe injury or death. Short circuits can cause bodily injury and/or equipment damage**.** Do not contact electrical connections with tools or jewelry while making adjustments or repairs. Remove all jewelry before servicing the equipment.

⚠ WARNING

Hot engine and exhaust system.
Can cause severe injury or death.

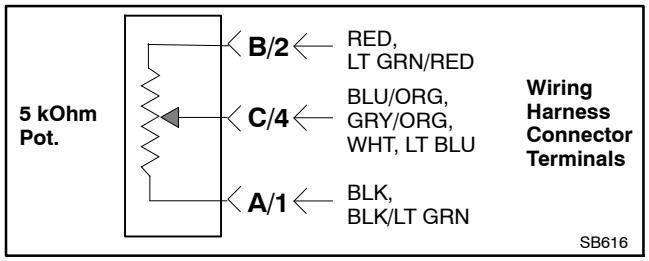
Do not work on the generator set until it cools.

Test Method 1

Remove the sensor lead and ground the lead to the engine block ground or connect a jumper wire from the sensor terminal to the engine block ground.

Test Method 2

Test faults using a 5 kOhm, 10-turn, 3-watt potentiometer (part no. X-6136-36) and the illustration shown in Figure 1. Before starting the generator set, turn the potentiometer fully counterclockwise. While the generator set is running, turn the potentiometer clockwise until the unit shuts down.

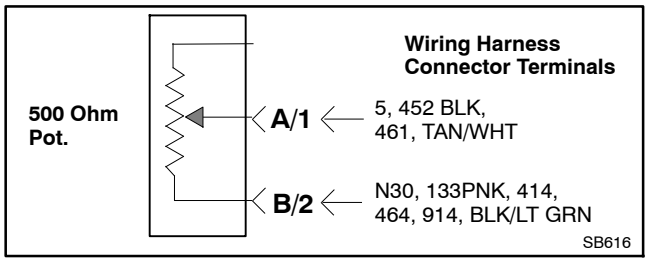


A/1	B/2	C/4
Black	Red	Blue/Orange
Black	Red	Gray/Orange
Black	Red	White
Black/Light Green	Light Green/Red	Light Blue

Figure 1 Coolant Temp. and Oil Pressure Test

Test Method 3

Test coolant temperature faults using a 500 ohm, 10-turn, 3-watt potentiometer (part no. X-6136-37) and the illustration shown in Figure 2. Turn potentiometer fully counterclockwise before starting the generator set. While the generator set is running, turn the potentiometer clockwise until the unit shuts down. The mating connector to the engine wiring harness connector is Packard Electrical Division part no. 12066016.

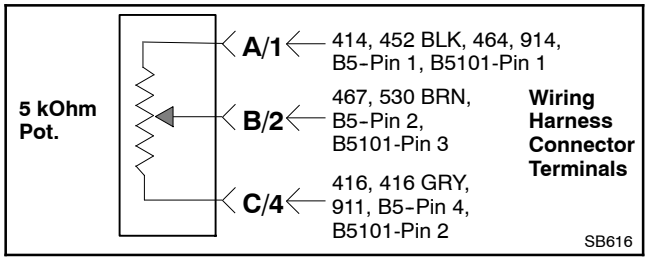


A/1	B/2
Lead 5	Lead N30
Lead 452 Black	Lead 133 Pink
Lead 461	Lead 414
Lead 461	Lead 464
Lead 461	Lead 914
Tan/White	Black/Light Green

Figure 2 Coolant Temperature Test

Test Method 4

Test oil pressure faults using a 5 kOhm, 10-turn, 3-watt potentiometer (part no. X-6136-36) and the illustration shown in Figure 3. Before starting the generator set, turn the potentiometer fully counterclockwise. While the generator set is running, turn the potentiometer clockwise until the unit shuts down.

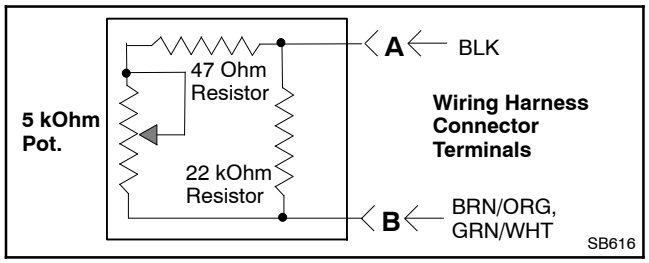


A/1	B/2	C/4
Lead 414	Lead 467	Lead 416
Lead 452 Black	Lead 530 Brown	Lead 416 Gray
Lead 464	Lead 467	Lead 416
Lead 914	Lead 467	Lead 416
Lead 914	Lead 467	Lead 911
B5-Pin 1	B5-Pin 2	B5-Pin 4
B5101-Pin 1	B5101-Pin 3	B5101-Pin 2
B701-Pin 1	B701-Pin 3	B701-Pin 2

Figure 3 Oil Pressure Test

Test Method 5

Test coolant temperature faults using a 5 kOhm, 10-turn, 3-watt potentiometer (part no. X-6136-36), 47 ohm 1/2-watt resistor, and 22 kOhm 1/2-watt resistor using the illustration shown in Figure 4. Before starting the generator set, turn the potentiometer fully counterclockwise. While the generator set is running, turn the potentiometer clockwise until the unit shuts down.

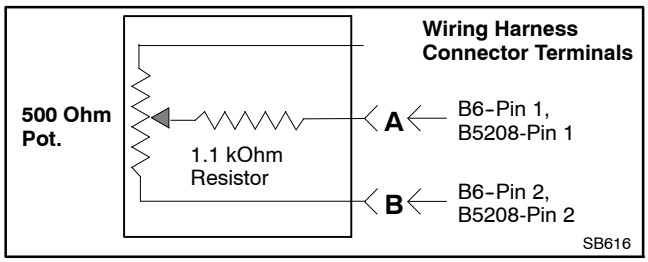


A	B
Lead 1 Black	Lead 2 Brown/Orange
Lead 1 Black	Lead 2 Green/White

Figure 4 Coolant Temperature Test

Test Method 6

Test coolant temperature faults using a 500 ohm, 10-turn, 3-watt potentiometer (part no. X-6136-37) and a 1.1 kOhm 1/2-watt resistor, using the illustration shown in Figure 5. Turn potentiometer fully counterclockwise before starting the generator set to simulate a low coolant temperature warning. While the generator set is running, turn the potentiometer clockwise until the unit shuts down.



A	B
B6-Pin 1	B6-Pin 2
B5208-Pin 1	B5208-Pin 2
B708, Pin 1	B708, Pin 2

Figure 5 Coolant Temperature Test

Test Method 7 (400-1000REZCK, 500-1000REZK only)

Use this test to produce faults or warnings with the following 4-20 mA sensors connected to the Decision-Maker® 8000:

- Coolant Temperature Sensor
- Oil Pressure Sensor

Note: On the 1300REZCK, disconnect the coolant temperature and oil pressure sensors to produce a loss of communication fault.

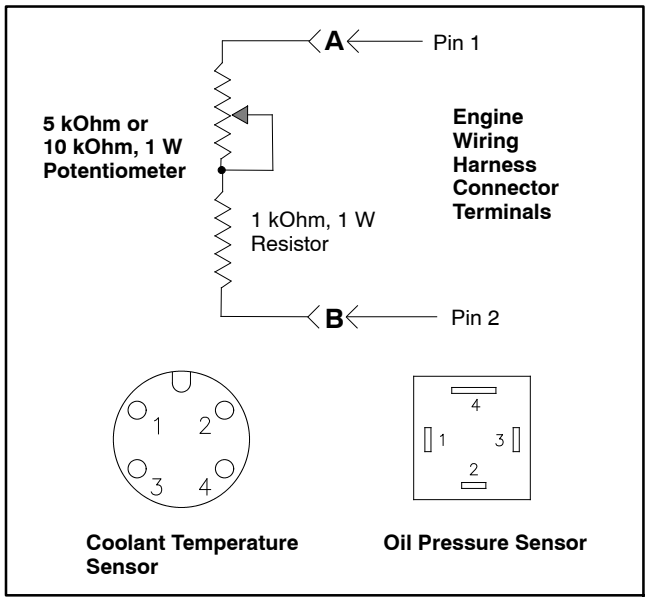


Figure 6 Engine Harness Connections

1. Disconnect the engine wiring harness from the sensor.

2. Connect a 5 kOhm or 10 kOhm, 1 W, 10-turn, potentiometer/resistor and a 1 kOhm, 1 W resistor to the engine harness pins 1 and 2 as shown in Figure 6.

3. Use the potentiometer to create a fault or warning condition.

   a. **For the coolant temperature sensor** - While monitoring the coolant temperature reading, adjust the potentiometer to achieve a reading below the low coolant temperature warning level. Confirm the warning appears within the specified time. Start and run the generator set. While running, adjust the potentiometer to achieve a reading between the high coolant temperature warning and shutdown levels. Confirm that the high temperature warning appears. Adjust further to achieve a reading above the shutdown level. Confirm the high temperature shutdown occurs.

   b. **For the oil pressure sensor** - Start and run the generator set. While running, adjust the potentiometer to achieve a reading between the low oil pressure warning and shutdown levels. Confirm that the low oil pressure warning appears. Adjust further to achieve a reading below the shutdown level. Confirm the low oil pressure shutdown occurs.

      Note: These faults have a 5 second delay before the fault is triggered. Also, oil pressure is not monitored until 30 seconds after crank disconnect.

Test Method 8 (400–1300REZCK, 500–1000REZK only)

Use this test to produce faults with the following switches:

- High Fuel Pressure Switch
- Low Fuel Pressure Switch

When tripped, the high and low fuel pressure switches send a signal to the controller base box. The high and low fuel pressure switches must be reset manually. Neither of the switches will return to their former position automatically.

1. To test the high and low fuel pressure faults, adjust the setpoint dial until a fault is produced.
   - **Low Fuel Pressure Switch** – turn the pressure switch setpoint counterclockwise until the switch trips.
   - **High Fuel Pressure Switch** – turn the pressure switch setpoint clockwise until the switch trips.
2. Reset the switch to the original setting. Turn the dial until the desired trip pressure is opposite the white arrow (mark) on the yellow dial face. See Figure 1-1 and Figure 1-2.

   Note: The yellow dial face displays increments in inches of water column.

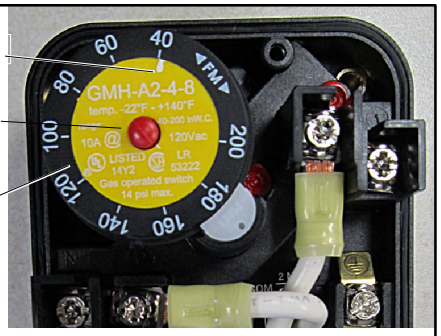
Switches	Settings
High Pressure (GMH-A2)	150 mbar (60 in. W. C.)
Low Pressure (GML-A2)	50 mbar (20 in. W. C.)

Figure 1-1 Fuel Pressure Switch Settings

3. To reset the high or low pressure switch, wait until the pressure returns to the normal operating level. Then, press and release the clear cover over the red reset button. See Figure 1-2.

   Note: When pressing the reset button, removing the cover is not necessary.

4. Reset the fault on the controller.



1. White arrow
2. Reset button
3. Dial

Figure 1-2 Switch Adjustments

Test Method 9, Overcrank Test (Typical)

Use the following procedure to test cyclic engine cranking and overcrank fault shutdown protection. This overcrank test method is typically used with the following controllers:

- Decision-Maker® 3+
- Decision-Maker® 550
- Decision-Maker® 3000
- Decision-Maker® 3500
- Decision-Maker® 6000

Note: See test 10 and 11 for overcrank test methods used with the Decision-Maker® 8000 and APM802 controllers (400–1300REZCK, 500–1000REZK and KD800–3250 generator sets).

1. **On gas-fueled generator sets,** disconnect the coil wire at the distributor cap and ground it or disconnect the ignition system.
2. **On diesel-fueled generator sets,** unplug the fuel injector harness from ECM on DD/MTU engines with DDEC/MDEC or disconnect wire no. 70 from the injector pump solenoid on all other models.
3. Use the generator set master switch (or master control button) to place the unit in the RUN mode. Observe 15–second on-off cranking cycles and maximum 75-second elapsed time from start of cranking to overcrank shutdown. Observe the controller fault lamp and display for an overcrank shutdown.
4. Use the generator set master switch (or master control button) to place the unit in the OFF/RESET mode.
5. **On gas-fueled generator sets,** reconnect the ignition coil wire or reconnect the ignition system.
6. **On diesel-fueled generator sets,** plug in the fuel injector harness from ECM on DD/MTU engines with DDEC/MDEC or reconnect wire no. 70 to the injector pump solenoid on all other models.

Test Method 10, Overcrank Test (400–1300REZCK, 500–1000REZK only)

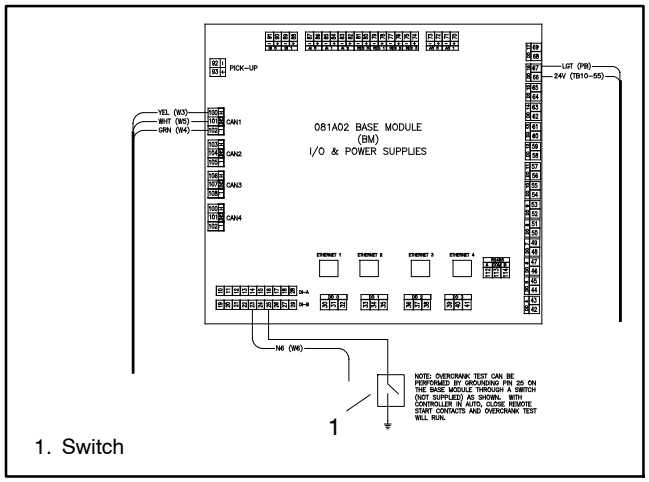
This procedure allows cyclic engine cranking and Start Fail (overcrank) shutdown protection on models 400–1300REZCK and 500–1000REZK with Decision-Maker® 8000 controllers. When the maximum number of crank cycles is exceeded, the controller issues a Start Fail alarm.

1. Temporarily disconnect a lead from the starter solenoid(s).
2. Use one of the following methods to run the overcrank test.
   a. With the controller in AUT mode, close the remote start contacts.
   b. With the controller in MAN mode, press the green START button.
3. Allow the generator set to cycle through the on-off cranking cycles until an overcrank fault is produced (typically six cycles).

Test Method 11, Overcrank Test (KD800–3250 only)

This procedure allows testing for overcrank on KD series models with APM802 controllers. When the maximum number of three attempts or crank cycles is exceeded, the controller issues an overcrank shutdown.

1. Ground pin 25 on the base module through a switch (not supplied). See Figure 7.
2. With the controller in AUTO mode, close the remote start contacts to run the overcrank test.
3. Allow the generator set to cycle through the on-off cranking cycles until an overcrank fault is produced (typically three cycles).



1. Switch

Figure 7 Overcrank Test on APM802

Test Method 12, Overspeed Test (Typical)

Use the following procedure to test overspeed fault shutdown protection. Some models with electronic engine controls may limit or prohibit adjusting the engine speed or testing engine faults.

Note: See tests 13, 14 and 15 for overcrank test methods used on DD/MTU-powered models with MDEC or ADEC engine controls, 400–1300REZCK, 500–1000REZK, and KD800–3250 generator sets.

1. Check whether the model has an ECM-controlled engine with engine controller logic that prevents manual overspeeding.
2. Start the generator set (refer to the generator set operation manual) and manually increase the engine speed. Observe the controller fault lamp and display for an overspeed shutdown when the frequency reaches 70 Hz (60 Hz models).
3. Use the generator set master switch (or master control button) to place the unit in the OFF/RESET mode to reset the controller overspeed fault. The NOT-IN-AUTO lamp should light.

Test Method 13, Overspeed Test (DD/MTU-Powered Models with MDEC or ADEC Engine Controls)

This procedure allows testing for overspeed on DD/MTU-powered models with MDEC or ADEC engine controls. Use the following procedure to unlock Menu 20—Factory Setup and perform the overspeed test. Before using this test method, upgrade the application software to version 2.47 or higher if not already installed.

Note: Only applicable for the Decision-Maker® 550 and Decision-Maker® 6000 controllers.

1. Go to Menu 20—Factory Setup
2. Arrow down to the FINAL ASSEMBLY CLOCK NO. display. Record the clock number on the controller display.
3. Arrow right to ENTER CODE display.
4. Use the controller keypad to enter the clock number previously recorded and press ENTER.
5. Arrow down to TEST OVERSPEED SHUTDOWN?
6. Press the YES key and press ENTER.
7. After testing is complete, lock Menu 20 using the following steps.
8. Go the Menu 20—Factory Setup.
9. Arrow down to the SETUP LOCK display.
10. Press the YES key lock the setup and prevent alternations to Menu 20—Factory Setup.

Figure 10 provides the Decision-Maker® 550 and 6000 controller factory settings for warning and shutdown faults.

Engine setpoints are also available in Menu 2, Engine Monitoring with the Decision-Maker® 550 and 6000 controllers.

Note: The following information is subject to change.

Test Method 14, Overspeed Test (400-1300REZCK, 500-1000REZK only)

This procedure allows testing for overspeed on models 400-1300REZCK and 500-1000REZK with Decision-Maker® 8000 controllers.

1. Place the generator set in OFF mode.
2. Locate the Overspeed setpoint under the Engine Protections menu and change the Overspeed setpoint to 0%.
3. Use one of the following methods to start the generator set. As the engine speed increases, an overspeed fault should be produced.
   a. With the controller in AUT mode, close the remote start contacts.
   b. With the controller in MAN mode, press the green START button.
4. After the fault appears, place the generator set in Off mode, clear the overspeed fault, and return the Overspeed setpoint to the original setting.

Test Method 15, Overspeed Test (KD800-3250 only)

This procedure allows testing for overspeed on KD series models with APM802 controllers. See Figure 8.

1. Install an SPST switch and wiring between TB10-9 and TB10-10 with switch in the open position.
2. Start the generator set. While the engine is running, close the SPST switch to simulate an overspeed shutdown.
3. After the test is complete, remove the SPST switch.

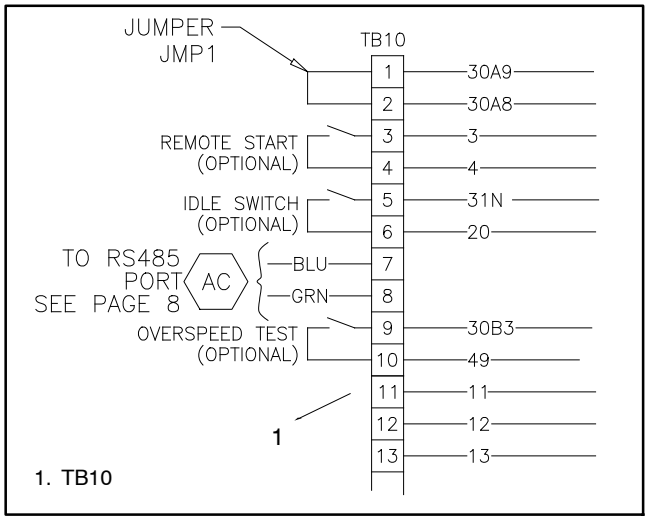


Figure 8 Overspeed Test on APM802

Model	Engine	Governor Type	Fault Warning and Shutdown Tests			
			Overspeed	Overcrank	Engine Sensors (A)	External Sensors (B)
Gas						
25–150REZG	GM/PSI	Electronic, E-Controls	No	Yes	Yes*	Yes
25–125RZG/RZGB		Electronic Barber-Colman	Yes			
25–125RZG/RZGB		Electronic, Woodward	No			
25–150RZG/RZGB		Electronic, E-Controls				
25–150REZGB/RZGB						
30–125REZGT						
50/125/150REZGC/ RZGC						
80/100REZGD/RZGD						
100REZGE/RZGE						
180–400REZX	Doosan	Electronic, E-Controls	No	Yes	Yes*	Yes
180–400REZXB						
180–400RZX						
180–400RZXB						
400–1000REZCK	Kohler, Powered by Dresser-Rand	Electronic	Yes	Yes	Yes	Yes
500–1000REZK						
1300REZCK					No	
Diesel						
15–60REOZK/ 20REOZK-C	Kohler KDI	Mechanical and Electronic	Yes	Yes	Yes*	Yes
30–48REOZK4		ECM Control				
35–55REOZT4						
KD800–KD2500	Kohler KD	Electronic	Yes	Yes	Yes	Yes
20/30REOZJC	John Deere	Electronic	Yes	Yes	Yes	Yes
20–230REOZJB		Mechanical				
20–230REOZJB		Electronic				
40–200REOZJC		ECM Control	No		Yes*	
40/50REOZJE		Mechanical	Yes			
50–275REOZJD		ECM Control	No			
80–275REOZJE						
80–200REOZJF						
80–150REOZJ4			Yes	Yes	Yes	
90–175REOZT4						
125/180REOZJG		ECM Control	No	Yes	Yes*	
300–500REOZJ						
350–500REOZJB						
275/300REOZV	Volvo	ECM Control	No	Yes	Yes*	Yes
350/400REOZVC						
450/500REOZVB						
500REOZVC						
550/600REOZV						
550/600REOZVB						
230–300REOZDB	DD/MTU	ECM Control with DDEC	No	Yes	Yes*	Yes
230–450REOZDD						
350/400REOZDC						
450REOZDB						
650–2000REOZDB		ECM Control w/MDEC	Yes (see Test Method 7 for details)			
650–2250REOZDC		ECM Control w/ADEC				
700–1000REOZDD						
700–1000REOZDE						
1250–2250REOZDD						
2500/2800REOZDB						
2500REOZDC						
3000/3250REOZD						
600–2000REOZM	Mitsubishi	Electronic	Yes	Yes	Yes	Yes
600–2000REOZMB						
750–2000REOZMD						
750–2000ROZMC	Mitsubishi	Electronic	Yes	Yes	Yes	Yes

* Units with Decision-Maker® 550, 3000, 3500, 6000, 8000, and APM802 controllers may require user-supplied potentiometers to simulate sensor function. The potentiometer value and connector vary by engine manufacturer/model.

Figure 9 Feasibility of Fault Warning and Shutdown Tests

Model	Engine	Freq.	High Coolant Temperature Shutdown, °C (°F)	High Coolant Temperature Warning, °C (°F)	Low Oil Pressure Shutdown, kPa (psi)	Low Oil Pressure Warning, kPa (psi)
Gas						
25–150REZG	GM/PSI	50/60	111 (232)	103 (218)	55 (8)	104 (15)
25–150RZG/RZGB					103 (15)	138 (20)
25–150REZGB/RZGB					55 (8)	104 (15)
30–125REZGT		60				
50/125/150REZGC/RZGC		50/60				
80/100REZGD/RZGD						
180–400REZX	Doosan	60	111 (232)	103 (218)	55 (8)	104 (15)
180–400REZXB						
180–400RZX		50/60				
180–400RZXB						
400–1000REZCK	Kohler Powered by Dresser-Rand	60	96 (205)	92 (198)	360 (52)	390 (57)
1300REZCK						
500–1000REZK						
Diesel						
15–60REOZK/ 20REOZK-C	Kohler KDI	60	110 (230)	103 (218)	83 (12)	138 (20)
30–48REOZK4				107 (225)		
35–55REOZT4						
KD800–KD2500	Kohler KD Series	Idle 50/60	105 (221)	102 (216)	198 (29)	223 (32)
		50			290 (42)	315 (46)
		60			333 (48)	358 (52)
20/30REOZJC	John Deere	60	111 (232)	103 (218)	103 (15)	138 (20)
20–230REOZJB		50/60				
40–60REOZJC		60	113 (236)	111 (232)	124 (18)	152 (22)
40/50REOZJE			110 (230)	103 (218)	103 (15)	138 (20)
80–200REOZJC			111 (232)			
50–275REOZJD			113 (236)	111 (232)	124 (18)	152 (22)
80–275REOZJE						
80–200REOZJF						
80–150REOZJ4			116 (241)	115 (239)	117 (17)	138 (20)
90–175REOZT4						
125/180REOZJG			113 (236)	111 (232)	124 (18)	152 (22)
300REOZJ						
350–500REOZJ			110 (230)	105 (221)	152 (21)	165 (24)
350–500REOZJB						
275/300REOZV	Volvo	50/60	104 (219)	98 (208)	248 (36)	317 (46)
350/400REOZVC						
450/500REOZVB			106 (223)	101 (214)	269 (39)	303 (44)
500REOZVC						
550/600REOZV						
550/600REOZVB						
230–300REOZDB	DD/MTU	50/60	106 (223)	99 (210)	207 (30)	241 (35)
230–450REOZDD		60				
350/400REOZDC		50/60				
450REOZDB						
650–2000REOZDB		50/60	102 (216)	97 (207)	393 (57)	441 (64)
650–1000REOZDC		60			503 (73)	552 (80)
700–1000REOZDD		50/60				
700–1000REOZDE						
1250–2250REOZDC			104 (219)	102 (216)	359 (52)	393 (57)
1250–2250REOZDD						
2500/2800REOZDB						
2500REOZDC		60				
3000/3250REOZD		50/60				

Model	Engine	Freq.	High Coolant Temperature Shutdown, °C (°F)	High Coolant Temperature Warning, °C (°F)	Low Oil Pressure Shutdown, kPa (psi)	Low Oil Pressure Warning, kPa (psi)
600-1000REOZM	Mitsubishi	50/60	103 (218)	99 (210)	276 (40)	379 (55)
600-1000REOZMB		60				
750-1000REOZMD						
750-1000ROZMC		50/60				
1250-2000REOZM			98 (208)	92 (198)	296 (43)	393 (57)
1250-2000REOZMB		60				
1250-2000REOZMD						
1250-2000ROZMC		50/60				

Figure 10 Factory Shutdown and Warning Setpoints

Model	Engine	Governor Type	High Coolant Temp. Fault Warning		Low Coolant Temp. Fault Warning		Low Oil Pressure Fault Warning	
			Test	Connections	Test	Connections	Test	Connections
Gas								
25-150REZG	GM	ECM Control	3	A-Tan/White B-Black/Lt. Green	1	Lead 35A	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
25-150RZG/RZGB		Electronic	1	Lead 40A			1	Lead 41A
80/100REZGB/RZGB		ECM Control	3	A-Tan/White B-Black/Lt. Green	1	Lead 35A	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
180-400REZX	Doosan	ECM Control	3	A-Tan/White B-Black/Lt. Green	1	Lead 35A	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
180-400RZX								
Diesel								
20/30REOZJC	John Deere	ECM Control	1	Lead 40A	1	Lead 35A	1	Lead 41A
20-230REOZJB		Mech./Elect.						
40-60REOZJC		ECM Control	3	A-Lead 461 B-Lead 414			4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-180REOZJC			1	Lead 40A			1	Lead 41A
80-275REOZJD			3	A-Lead 461 B-Lead 414			4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-275REOZJE								
200REOZJC								
275/300REOZV	Volvo	ECM Control	5	A-Lead BLK B-Lead GRN/WHT	1	Lead 35A	2	A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 GRY/ORG
350/400REOZVC								
450/500REOZVB				A-Lead 1 BLK B-Lead 2 BRN/ORG				A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 BLU/ORG
550/600REOZV								
230-300REOZDB	DD/MTU Series 60	ECM Control	3	A-Lead 452 BLK B-Lead 133 PNK	1	Lead 35A	4	A/1-Lead 452 BLK B/2-Lead 530 BRN C/4-Lead 416 GRY
230-450REOZDD								
350/400REOZDC								
450REOZDB								
650-2000REOZDB	DD/MTU		6	Harness Marker B6 A-Pin 1 B-Pin 2	6	Harness Marker B6 A-Pin 1 B-Pin 2	4	Harness Marker B5 A/1-Pin 1 B/2-Pin 2 C/4-Pin 4
650-2250REOZDC								
700-1000REOZDD								
600-2000REOZM	Mitsubishi	Electronic	1	Lead 40A	1	Lead 35A	1	Lead 41A
600-2000REOZMB		ECM Control						
BLK Black; BLU Blue; BRN Brown; GRY Gray; GRN Green; ORG Orange; PNK Pink; WHT White								

Figure 11 Fault Warning Test Method for Decision-Maker® 3+

Model	Engine	Governor Type	High Coolant Temp. Fault Shutdown		Low Oil Pressure Fault Shutdown	
			Test	Connections	Test	Connections
Gas						
25-150REZG	GM	ECM Control	3	A-Tan/White B-Black/Lt. Green	2	A-Black./Lt. Green B-Lt. Green/Red C-Lt. Blue
25-150RZG/RZGB		Electronic	1	Lead 34	1	Lead 13
80/100REZGB/RZGB		ECM Control	3	A-Tan/White B-Black/Lt. Green	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
180-400REZX	Doosan	ECM Control				
180-400RZX						
Diesel						
20/30REOZJC	John Deere	ECM Control	1	Lead 34	1	Lead 13
20-230REOZJB		Mech./Elect.				
40-60REOZJC		ECM Control	3	A-Lead 461 B-Lead 414	4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-180REOZJC			1	Lead 34	1	Lead 13
80-275REOZJD			3	A-Lead 461 B-Lead 414	4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-275REOZJE						
200REOZJC						
275/300REOZV	Volvo	ECM Control	1	Lead 34	2	A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 GRY/ORG
350/400REOZVC						
450/500REOZVB			5	A-Lead 1 BLK B-Lead 2 BRN/ORG		A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 BLU/ORG
550/600REOZV						
230-300REOZDB	DD/MTU Series 60	ECM Control	3	A-Lead 452 BLK B-Lead 133 PNK	4	A/1-Lead 452 BLK B/2-Lead 530 BRN C/4-Lead 416 GRY
230-450REOZDD						
350/400REOZDC						
450REOZDB						
650-2000REOZDB	DD/MTU		6	Harness Marker B6 A-Pin 1 B-Pin 2	4	Harness Marker B5 A/1-Pin 1 B/2-Pin 2 C/4-Pin 4
650-2250REOZDC						
700-1000REOZDD						
600-2000REOZM	Mitsubishi	Electronic	1	Lead 34	1	Lead 13
600-2000REOZMB		ECM Control				
BLK Black; BLU Blue; BRN Brown; GRY Gray; GRN Green; ORG Orange; PNK Pink; WHT White						

Figure 12 Fault Shutdown Test Method for Decision-Maker® 3+

Model	Engine	Governor Type	High Coolant Temp. Fault Warning		Low Coolant Temp, Fault Warning		Low Oil Pressure Fault Warning	
			Test	Connections	Test	Connections	Test	Connections
Gas								
25-150RZG/RZGB	GM	Electronic	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	1	Lead 35A	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
Diesel								
15-60REOZK/ 20REOZK-C	Kohler KDI	Mechanical and Electronic	3	Lead 5 Lead N30	3	Lead 5 Lead N30	1	Lead 7C
20/30REOZJC	John Deere	Electronic	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	1	Lead 35A	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
20-230REOZJB		Mechanical	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	1	Lead 35A	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
20-230REOZJB		Electronic						
40/50REOZJE		Mechanical			2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)		
600-2000REOZM*	Mitsubishi	Electronic	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	1	Lead 35A	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
600-2000REOZMB*								
750-2000REOZMD†								
750-2000ROZMC†								
* Applies to Decision-Maker® 550 and 6000 controllers.								
† Applies to Decision-Maker® 550, 3000, and 6000 controllers.								
BLK Black; BLU Blue; BRN Brown; GRY Gray; GRN Green; ORG Orange; PNK Pink; WHT White								

Figure 13 Fault Warning Test Method for Decision-Maker® 550 and 3000 Controllers without Engine ECM Control

Model	Engine	Governor Type	High Coolant Temp. Fault Shutdown		Low Oil Pressure Fault Shutdown	
			Test	Connections	Test	Connections
Gas						
25-150RZG/RZGB	GM	Electronic	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
Diesel						
15-60REOZK/ 20REOZK-C	Kohler KDI	Mechanical and Electronic	3	Lead 5 Lead N30	1	Lead 7C
20/30REOZJC	John Deere	Electronic	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
20-230REOZJB		Mechanical	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
20-230REOZJB		Electronic				
40/50REOZJE		Mechanical				
600-2000REOZM*	Mitsubishi	Electronic	2	A-BLK (TB2-16) B-RED (TB2-2) C-WHT (TB2-1)	2	A-BLK (TB2-4) B-RED (TB2-18) C-WHT (TB2-3)
600-2000REOZMB*						
750-2000REOZMD†						
750-2000ROZMC†						
* Applies to Decision-Maker® 550 and 6000 controllers.						
† Applies to Decision-Maker® 550, 3000, and 6000 controllers.						
BLK Black; BLU Blue; BRN Brown; GRY Gray; GRN Green; ORG Orange; PNK Pink; WHT White						

Figure 14 Fault Shutdown Test Method for Decision-Maker® 550 and 3000 Controllers without Engine ECM Control

Model	Engine	Governor Type	High Coolant Temp. Fault Warning		Low Coolant Temp. Fault Warning		Low Oil Pressure Fault Warning	
			Test	Connections	Test	Connections	Test	Connections
Gas								
25-150REZG	GM/PSI	ECM Control	3	A-Tan/White B-Black/Lt. Green	1	Lead 35A	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
25-150REZGB/RZGB								
30-125REZGT 50/125/150REZGC/ RZGC								
80/100REZGD/RZGD								
180-400REZX	Doosan	ECM Control	3	A-Tan/White B-Black/Lt. Green	1	Lead 35A	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
180-400REZXB								
180-400RZX								
180-400RZXB								
Diesel								
30-48REOZK4	Kohler KDI	ECM Control	1	Lead 35A	1	Lead 35A	1	Lead 7
35-55REOZT4								
40-60REOZJC	John Deere	ECM Control	3	A-Lead 461 B-Lead 414	1	Lead 35A	4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-135REOZJC				A-Lead 461 B-Lead 914				A/1-Lead 914 B/2-Lead 467 C/4-Lead 911
50-275REOZJD				A-Lead 461 B-Lead 414				A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-275REOZJE								
80-200REOZJF								
80-150REOZJ4			6	Harness Marker B5208 A-Pin 1, BRN Signal B-Pin 2, GRY Return	6	Harness Marker B5208 A-Pin 1, BRN Signal B-Pin 2, GRY Return	4	Harness Marker B5101 A-Pin 1, BRN 5 VDC B-Pin 3, PPL Signal C-Pin 2, ORG Return
90-175REOZT4								
125/180REOZJG			3	A-Lead 461 B-Lead 414	1	Lead 35A	4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
150-180REOZJC				A-Lead 461 B-Lead 464				A/1-Lead 464 B/2-Lead 467 C/4-Lead 416
200REOZJC				A-Lead 461 B-Lead 914				A/1-Lead 914 B/2-Lead 467 C/4-Lead 416
300-500REOZJ				A-Lead 461 B-Lead 414				A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
350-500REOZJB								
275/300REOZV	Volvo	ECM Control	5	A-Lead 1 BLK B-Lead 2 GRN/WHT	1	Lead 35A	2	A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 GRY/ORG
350/400REOZVC								
450/500REOZVB				A-Lead 1 BLK B-Lead 2 BRN/ORG	1	Lead 35A	2	A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 BLU/ORG
500REOZVC								
550/600REOZV								
550/600REOZVB								
230-300REOZDB	DD/ MTU	ECM Control	3	A-Lead 452 BLK B-Lead 133 PNK	1	Lead 35A	4	A/1-Lead 452 BLK B/2-Lead 530 BRN C/4-Lead 416 GRY
230-450REOZDD								
350/400REOZDC								
450REOZDB								
650-2000REOZDB			6	Harness Marker B6 A-Pin 1 B-Pin 2	6	Harness Marker B6 A-Pin 1 B-Pin 2	4	Harness Marker B5 A/1-Pin 1 B/2-Pin 2 C/4-Pin 4
650-2250REOZDC								
700-1000REOZDD								
700-1000REOZDE								
1250-2250REOZDD								
2500/2800REOZDB								
2500REOZDC								
3000/3250REOZD								
BLK Black; BLU Blue; BRN Brown; GRY Gray; GRN Green; ORG Orange; PNK Pink; PPL Purple, WHT White								

Figure 15 Fault Warning Test Method for Decision-Maker® 550, 3000, 3500, and 6000 Controllers with Engine ECM Control

Model	Engine	Governor Type	High Coolant Temp. Fault Shutdown		Low Oil Pressure Fault Shutdown	
			Test	Connections	Test	Connections
Gas						
25-150REZG	GM/PSI	ECM Control	3	A-Tan/White B-BLK/Lt. Green	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
25-150REZGB/RZGB						
30-125REZGT						
50/125/150REZGC/ RZGC						
80/100REZGD/RZGD						
180-400REZX	Doosan	ECM Control	3	A-Tan/White B-BLK/Lt. Green	2	A-Black/Lt. Green B-Lt. Green/Red C-Lt. Blue
180-400REZXB						
180-400RZX						
180-400RZXB						
Diesel						
30-48REOZK4	Kohler KDI	ECM Control	1	Lead 35A	1	Lead 7
35-55REOZT4						
40-60REOZJC	John Deere	ECM Control	3	A-Lead 461 B-Lead 414	4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-135REOZJC				A-Lead 461 B-Lead 914		A/1-Lead 914 B/2-Lead 467 C/4-Lead 911
50-275REOZJD				A-Lead 461 B-Lead 414		A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
80-275REOZJE						
80-200REOZJF						
80-150REOZJ4			6	Harness Marker B5208 A-Pin 1, BRN Signal B-Pin 2, GRY Return	4	Harness Marker B5101 A-Pin 1, BRN 5 VDC B-Pin 3, PPL Signal C-Pin 2, ORG Return
90-175REOZT4						
125/180REOZJG			3	A-Lead 461 B-Lead 414	4	A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
150-180REOZJC				A-Lead 461 B-Lead 464		A/1-Lead 464 B/2-Lead 467 C/4-Lead 416
200REOZJC				A-Lead 461 B-Lead 914		A/1-Lead 914 B/2-Lead 467 C/4-Lead 416
300-500REOZJ				A-Lead 461 B-Lead 414		A/1-Lead 414 B/2-Lead 467 C/4-Lead 416
350-500REOZJB						
275/300REOZV	Volvo	ECM Control	5	A-Lead 1 BLK B-Lead 2 GRN/WHT	2	A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 GRY/ORG
350/400REOZVC						
450/500REOZVB				A-Lead 1 BLK B-Lead 2 BRN/ORG	2	A/1-Lead 4 BLK B/2-Lead 1 RED C/4-Lead 2 BLU/ORG
500REOZVC						
550/600REOZV						
550/600REOZVB						
230-300REOZDB	DD/MTU	ECM Control	3	A-Lead 452 BLK B-Lead 133 PNK	4	A/1-Lead 452 BLK B/2-Lead 530 BRN C/4-Lead 416 GRY
230-450REOZDD						
350/400REOZDC						
450REOZDB						
650-2000REOZDB			6	Harness Marker B6 A-Pin 1 B-Pin 2	4	Harness Marker B5 A/1-Pin 1 B/2-Pin 2 C/4-Pin 4
650-2250REOZDC						
700-1000REOZDD						
700-1000REOZDE						
1250-2250REOZDD						
2500/2800REOZDB						
2500REOZDC						
3000/3250REOZD						

BLK Black; BLU Blue; BRN Brown; GRY Gray; GRN Green; ORG Orange; PNK Pink; PPL Purple, WHT White

Figure 16 Fault Shutdown Test Method for Decision-Maker® 550, 3000, 3500, and 6000 Controllers with Engine ECM Control

Model	Engine	Governor Type	High Coolant Temp. Fault Warning		Low Coolant Temp. Fault Warning		Low Oil Pressure Fault Warning	
			Test	Connections	Test	Connections	Test	Connections
400–1300REZCK, 500–1000REZK	Kohler Powered by Dresser-Rand	ECM Control	7	Harness Connection at the Sensor A–Pin 1 B–Pin 2	7	Harness Connection at the Sensor A–Pin 1 B–Pin 2	7	Harness Connection at the Sensor A–Pin 1 B–Pin 2
KD800–KD2500	Kohler KD Series	ECM Control	6	Harness Marker B708 A–Pin 1 B–Pin 2	6	Harness Marker B708 A–Pin 1 B–Pin 2	4	Harness Marker B701 A–Pin 1 B–Pin 3 C–Pin 2

Figure 17 Fault Warning Test Method for Decision-Maker® 8000 and APM802 Controllers

Model	Engine	Governor Type	High Coolant Temp. Fault Shutdown		Low Oil Pressure Fault Shutdown	
			Test	Connections	Test	Connections
400–1300REZCK, 500–1000REZK	Kohler Powered by Dresser-Rand	ECM Control	7	Harness Connection at the Sensor A–Pin 1 B–Pin 2	7	Harness Connection at the Sensor A–Pin 1 B–Pin 2
KD800–KD2500	Kohler KD Series	ECM Control	6	Harness Marker B708 A–Pin 1 B–Pin 2	4	Harness Marker B701 A–Pin 1 B–Pin 3 C–Pin 2

Figure 18 Fault Shutdown Test Method for Decision-Maker® 8000 and APM802 Controllers

Model	Engine	Governor Type	Overcrank Fault Shutdown Test	Overspeed Fault Shutdown Test
400–1300REZCK, 500–1000REZK (Decision-Maker® 8000)	Kohler Powered by Dresser-Rand	ECM Control	10	14
KD800–KD2500 (APM802)	Kohler KD Series	ECM Control	11	15
DD/MTU-powered models with MDEC or ADEC engine controls. (Decision-Maker® 550 and 6000)	DD/MTU-powered models	MDEC or ADEC engine controls.	9	13
Typical for most other generator sets	–	–	9	12

Figure 19 Overcrank and Overspeed Fault Shutdown Test Methods

Availability is subject to change without notice. Kohler Co. reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler® generator set distributor for availability.