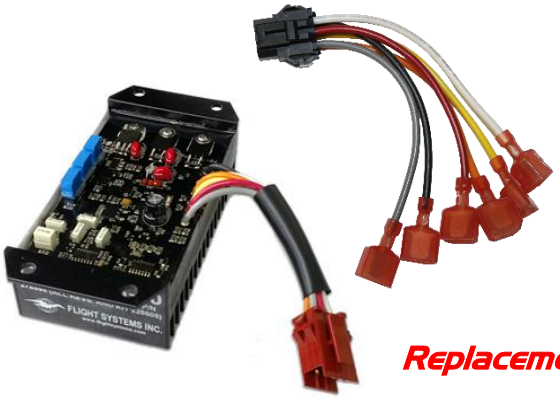


USER INSTRUCTIONS for Flight Systems 72-278598-00

Replacement for Kohler 278598 (A thru G) and kit 228605

Replacement for Kohler 239311 and kit 228602, adapter sold separately.

Installation

- Remove the original regulator and save the mounting hardware.
- With a DVM of good quality, make the following resistance checks:

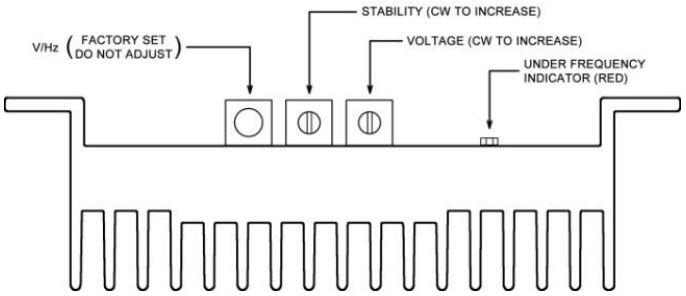
DVM Negative Lead	DVM Positive Lead	Resistance Reading
White Wire P10-2	Black Wire P10-1	3.5 Ohms, Approximately
Engine Frame	Black Wire P10-1	> 5 Megohms or Infinity
Yellow Wire P10-3	Orange Wire P10-5	1.7 Ohms
Yellow Wire P10-3	Red Wire P10-4	0.2 Ohms

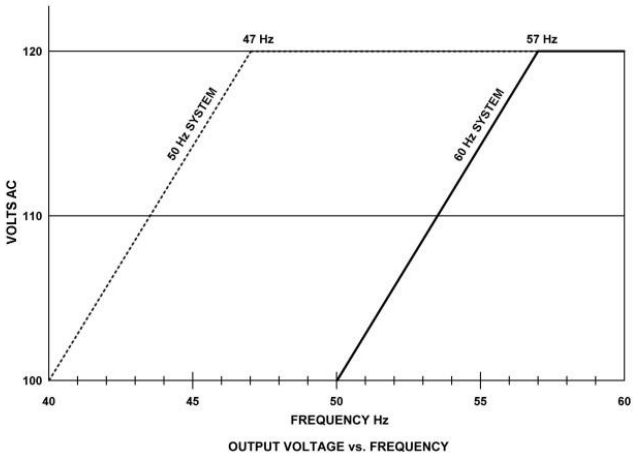
- Install the new regulator using the existing hardware. Make sure that the adjustments are accessible and that there is no obstruction to airflow. The heat sink is electrically isolated.
- Firmly mate the six-pin connector. If using 239311 adapter, wire the new regulator according to this chart:

Wire Color	Connection		Wire Color	Connection
Gray	Pot (Pin 66)		Orange	Pin 55
Red	Pin 44		White	Field -
Yellow	Pin 33		Black	Field +

Adjustment

- The adjustments have been factory pre-set to nominal values at final test but may need slight trimming. *DO NOT remove the BLUE seal*. A small screwdriver will be needed. Set the DVM to "AC VOLTS" on the proper range and connect to an AC receptacle (or extension cord) on the craft or vehicle. The generator voltage is also present at the regulator connector between the RED wire and the YELLOW wire.
- Make sure the shore or utility power source is disconnected. Start the generator and allow it to warm up at no load. If the voltage is unstable, adjust the STABILITY potentiometer (the pot in the center) CW until it becomes stable, but not more than necessary, as this will slow the response of the regulator to sudden load changes.
- The VOLTS potentiometer has been factory set to 120 VAC for generators *without* an external voltage adjustment (10K pot). If your generator has an external voltage adjustment, set it at its mid-point and then re-adjust the regulator as necessary for 120 VAC. Further fine adjustment (if needed) can then be done with the external potentiometer.
- The V/Hz potentiometer (BLUE seal) has been factory set at 57 Hz. DO NOT attempt to adjust unless you have the proper knowledge and equipment. The generator voltage will be reduced proportionately if the engine speed falls below 95% of rated RPM or 57 Hz on a 60 Hz system. For a 50 Hz system, a setting of 47 Hz is used (see illustration). When the frequency is below the V/Hz set point (knee), the red U/F LED will be illuminated, indicating under-frequency and that the voltage is being reduced. This feature protects appliances from under-frequency as well as helping the engine to recover more quickly when a heavy load is suddenly applied to the generator. It is normal for the U/F LED to come on briefly when a heavy load is suddenly applied. NOTE: The U/F LED is located on the edge of the regulator adjacent to the VOLTS potentiometer (see illustration). It is very small and may not be visible through the urethane potting material when not illuminated. If for some reason adjustment becomes necessary, use this procedure: Set the DVM for Hz and force the engine to run at the desired under-speed RPM (by governor adjustment or other mechanical means). Turn the V/Hz potentiometer CW until the U/F LED comes on, then CCW until it just goes off. The voltage should return to 120 VAC. Return engine to normal rated speed.

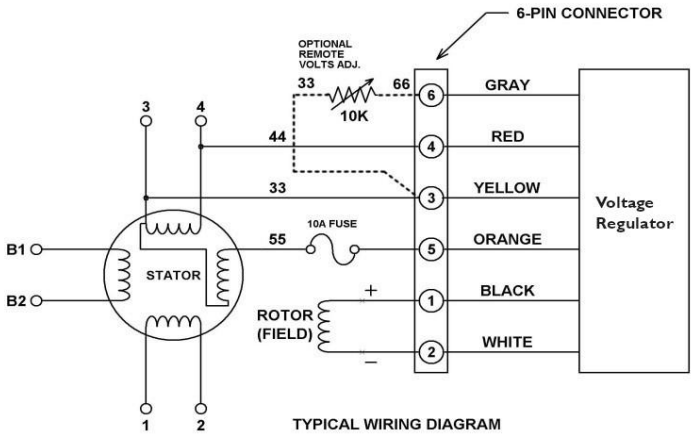




Troubleshooting (Kohler Models 5E/4EF, 7.3E/6EF are used as an example)

Engine starting, stopping, field flash and safety features are all functions of the Kohler Controller Circuit Board. Faults such as high coolant temperature, low coolant level, high engine temperature or low oil pressure can cause relay K4 to energize, LED 4 to light, and engine shut down to occur 5-10 seconds after starting. Low or no AC voltage at B1-B2 (battery charging) can cause the engine to shut down as soon as the start switch is released (LED1 does not light). This procedure assumes that the engine is running properly with no issues. If not, perform service as needed on the engine and/or controller before proceeding.

- Check the 10A fuse F3 that supplies power to the regulator on ORANGE.
- Perform the resistance checks in the table above under INSTALLATION.
- Check that the 12VDC field flash voltage is present at the regulator between (BLACK, Pos.) and (WHITE, Neg.) during cranking. If not, the controller is likely faulty.
- Disconnect the regulator plug P10. If using the 239311 adapter, disconnect WHITE and BLACK, instead. Separately excite the field by connecting a 12-volt battery, in series with a 10-amp fuse, to the field circuit with BLACK positive. If the generator does not produce AC voltage, the fault is likely in the generator. If it produces AC voltage, the fault is likely in the regulator.



If you are replacing the regulator in a setup where power and sensing are isolated, take WIRE 66 from the generator and add it to WIRE 33 (YELLOW) wire. You can also remove the in-line diode on wire 66. It is no longer needed.

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