

INSTALLATION INSTRUCTIONS

Original Issue Date: 2/17

Model: **15-60REOZK with Decision-Maker® 3000 Controllers Only**

Market: **Industrial**

Subject: **Electronic Governor Kit GM90661-KP1**

Introduction

The electronic governor kit provides isochronous governing by using the signal over CAN to control the current input to the actuator. This kit is intended for use with units having the Decision-Maker® 3000 controller only.

Note: The electronic governors are shipped unprogrammed and have no manual adjustments. After installation, the governor requires downloading software and changes to the default settings.

The electronic governor kit includes an:

- **Actuator** (locate on top of injection pump).
- **Electronic governor** (locate inside the junction box). See Figure 1 for specifications.

Specs	
Supports	CAN/J1939 bus interface
Operating Temperature	-40° to 85°C (-40° to 185°F)
Power Input	9-30 VDC, Reverse polarity protected
Output to Actuator	Pulse-width-modulated, 6 A max.
Auxiliary Outputs	200 mA max.

Figure 1 Governor Specifications

Read the entire procedure before beginning. Install the software onto a PC. Carefully follow these instructions and any additional instructions that appear on the screen during the download procedure. The instructions provided here assume you know how to operate a PC.

Loading incorrect or incomplete files may cause permanent damage to the governor controller's logic circuit board. Verify that the downloaded files contain the settings for your specific generator set and engine. Do not attempt to modify the data files.

Required Tools and Equipment

Obtain the APECS Programming Interface Harness Kit GM100177-KP1. See Figure 2.



Figure 2 Interface Harness

A PC with SiteTech™ software is required to make the electronic governor functional. Use your SecurID to access Kohler Power Resource Center, click on the TechTools button, and follow the instructions to download the files. Refer to TP-6701 SiteTech™ Software Operation Manual for more information.

A PC with Kohler ACT Tool software is also required to make the electronic governor functional. Use your SecurID to access Kohler Power Resource Center, click on the TechTools button, and follow the instructions to download the files.

Have **two 8 mm wrenches** available for adjusting the throttle arm, a **TP Torx Plus®** driver for removing the actuator cover, and a **flex joint/universal joint** for installing the actuator.

Torx Plus® is a registered trademark of Acument® Intellectual Properties, LLC.

Safety Precautions

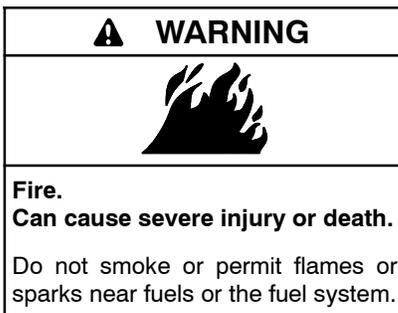
WARNING



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) 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.



Servicing the fuel system. A flash fire can cause severe injury or death. Do not smoke or permit flames or sparks near the fuel injection system, fuel line, fuel filter, fuel pump, or other potential sources of spilled fuels or fuel vapors. Catch fuels in an approved container when removing the fuel line or fuel system.

Installation Procedure

1. Remove the generator set from service.

- 1.1 Press the generator set OFF/RESET button to shut down the generator set.
- 1.2 Disconnect the power to the battery charger, if equipped.

- 1.3 Disconnect the generator set engine starting battery(ies), negative (-) lead first.
- 1.4 If equipped with an enclosure, remove enclosure doors as needed to service the engine.

2. Install the actuator.

- 2.1 Before removing the mechanical governor head and replacing it with the actuator (324516), clean the surrounding area. Clean outside of the fuel injection pump with dry compressed air before removing the governor control cover. Place a suitable container underneath the fuel injection pump to catch any fuel that may spill when removing the governor control cover.

Note: Dispose of all waste materials (engine oil, fuel, filter, etc.) in an environmentally safe manner and in accordance with all applicable laws.

- 2.2 Remove lead 70 from the existing mechanical governor and tape the end of the lead and tuck inside the plastic conduit.
 - 2.3 Remove the fuel return line and the return line connector assembly from the governor cover using care not to allow dirt to enter the injection pump. Remove and discard the return line connector O-ring. Set aside the return line connector.
 - 2.4 Loosen the three cover screws.
- Note:** A universal joint or flex socket is needed to remove the rear-most screw.
- 2.5 Remove the governor control cover assembly (see the following NOTE). Save the screws for later use. See Figure 3.

Note: When the actuator is fully loose, have rags handy as there will be fuel spilled from the reservoir. Figure 4 shows the fuel rack/metering assembly with the cover removed. The fork on the electronic governor cradles this arm and moves it to govern the speed. On a mechanical governor, the solenoid defaults to an extended position when not powered so that it pushes against the spring tension; this metering assembly turns off fuel. **Take great care when replacing the actuator.** If the linkage is missed, the engine may “runaway” as it would be in the full-fuel position. If you push on this arm with your finger, you’ll see it actuate and feel the tension.

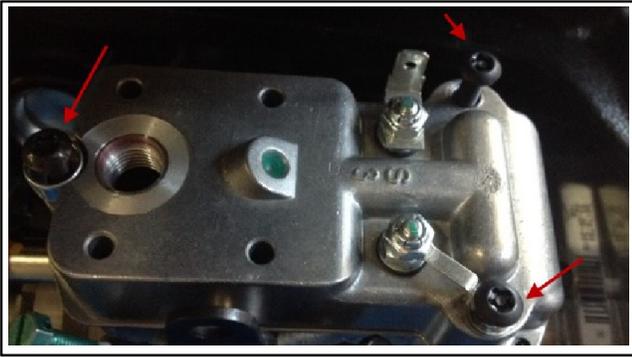


Figure 3 Actuator Screws (qty. 3)

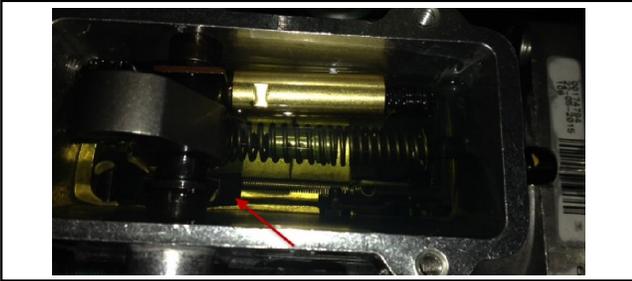


Figure 4 Actuator

Note: To prevent any damage, properly install the metering valve drive coupling to the governor linkage on the pump as described below.

- 2.6 Install the new cover seal (part of the actuator components) into the groove of the integrated actuator cover assembly.
- 2.7 Position the actuator head similar to Figure 5. Slightly lift the front portion of the actuator cover.
- 2.8 Carefully slide the integrated actuator cover toward the rear of the pump body until the mounting holes between the integrated actuator cover and pump body begin to align. Once in place, you'll see that the actuator is offset from the mounting holes and feel that there is spring tension pushing on the cover. If you push on the cover, you'll feel the tension which means that there is good contact with the linkage. See the slight offset in Figure 6.
- 2.9 Reuse the three cover mounting screws to assemble the integrated actuator cover to the pump body. Tighten the screws to 4–5 Nm (35–45 in. lb.).

Note: A universal joint or flex socket is needed to install the rear-most screw.

- 2.10 Locate the 2 leads in the engine harness near the governor. These leads may be yellow and orange or blue and green (depending on the generator set model).



Figure 5 Actuator (Cover Design Similar)

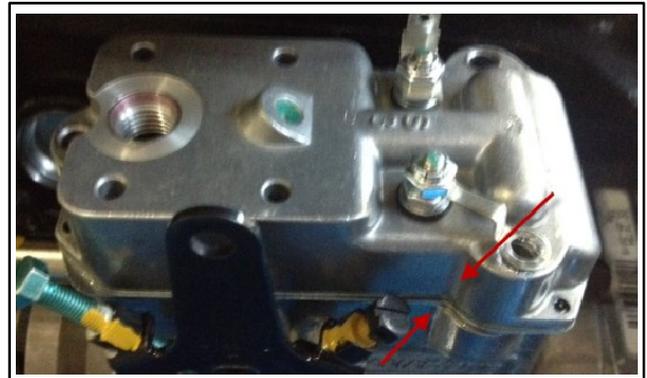


Figure 6 Actuator (Cover Design Similar)

- 2.11 Connect the two leads to the two screws at the actuator. It doesn't matter which leads attach to which screws.
- 2.12 Install a new O-ring (part of the actuator components) on the return line connector assembly. Apply a light coating of all-purpose grease to the O-ring and install the connector. Tighten to 4.9–6 Nm (43–53 in. lb.).
- 2.13 Install the fuel return line to the return line connector.

3. Remove the air cleaner assembly.

Removal of the air cleaner assembly is required as a means to shut down the engine should the actuator linkage be improperly installed in Step 2.

Note: Controllers are factory adjusted to minimum RPM. However, for safety, the engine should be capable of being disabled if an overspeed condition should occur.

Note: The best practice when replacing the actuator is to remove the air cleaner piping such that the junction box cover can be used to cut off air supply to the engine in the event of a runaway due to improper governor installation.

- 3.1 Remove the air cleaner cover.
- 3.2 Remove the air cleaner element.
- 3.3 Remove the air cleaner base.

4. Install the governor kit.

- 4.1 Remove the junction box cover and mount the electronic governor (GM90652) in the junction box

using 2 each screws (M933-06030-60, plain washers (M125A-06-80), and nuts (M6923-06-80). See Figure 7 (15-30REOZK) or Figure 8 (40-60REOZK).

- 4.2 Connect governor harness GM90770 to terminal strip TB12 in the junction box using Figure 9. Do not plug the governor harness connector to the electronic governor at this time.

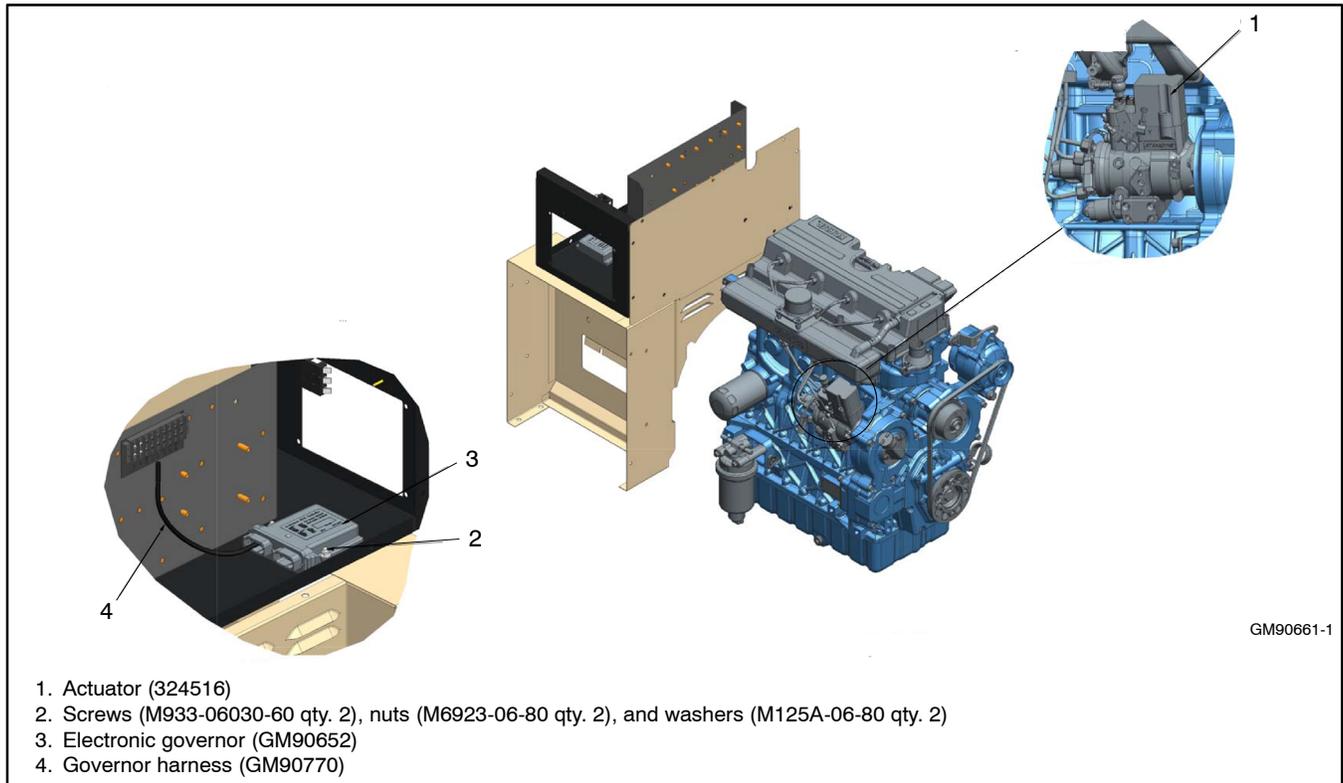


Figure 7 Installed Electronic Governor Kit. 15-30REOZK

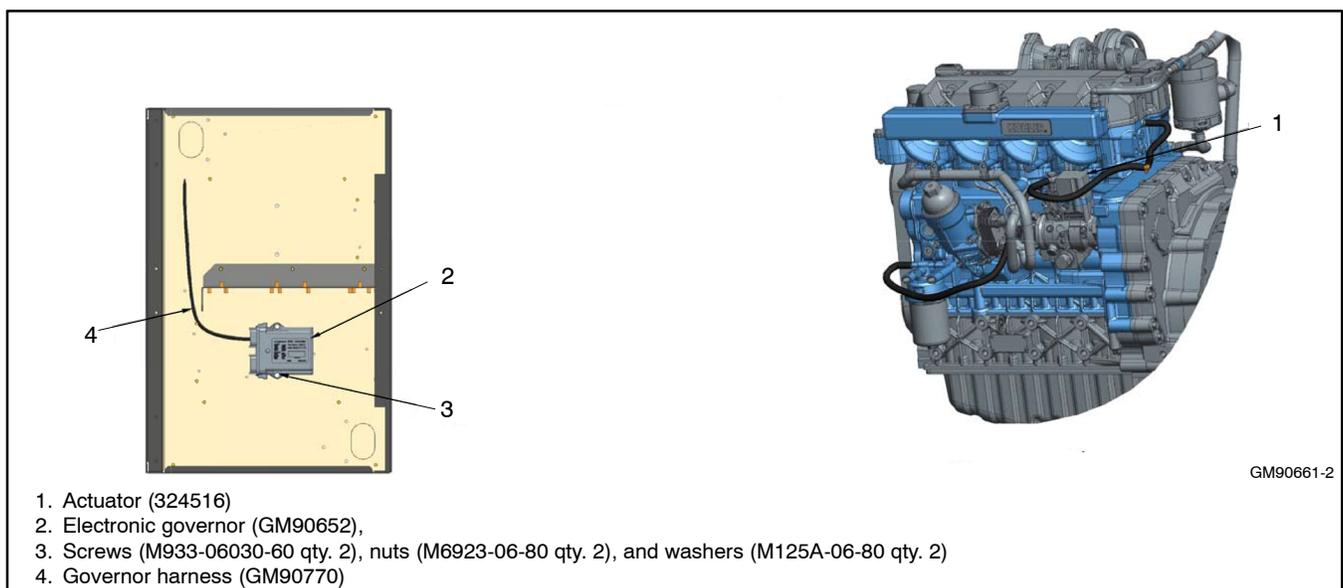


Figure 8 Installed Electronic Governor Kit, 40-60REOZK

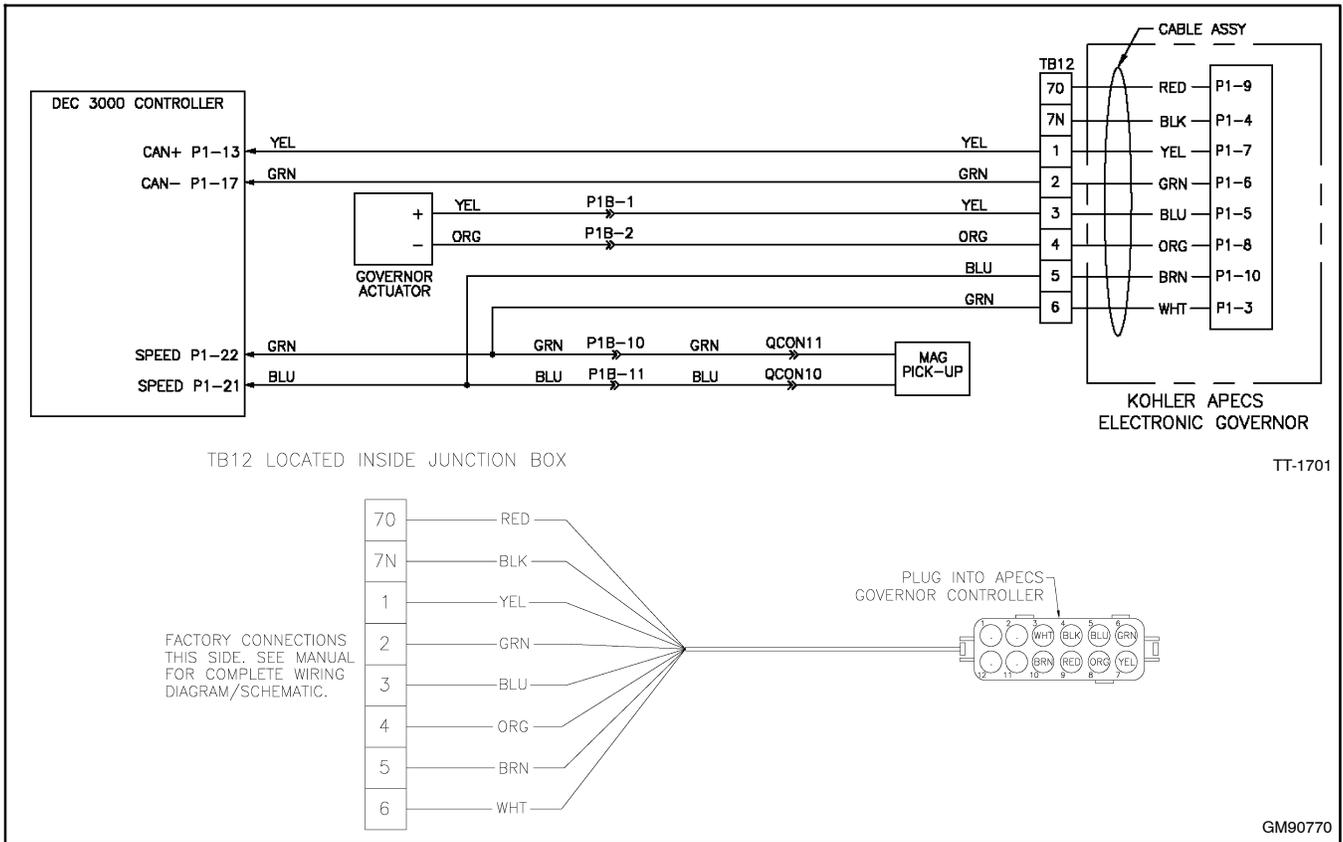


Figure 9 Electronic Governor Wiring Diagram and Wiring Harness GM90770, Typical

- 4.3 Connect the grey male connector on the interface harness to the grey receptacle on the electronic governor. See Figure 10.
- 4.4 Connect the grey female connector on the interface harness to the grey connector on the existing harness inside the junction box. See Figure 10.
- 4.5 Connect the 7N terminal on the interface harness to 7N on the TB12 terminal strip. TB12 terminal strip is located inside of the junction box. See Figure 10.
- 4.6 Connect the P terminal on the interface harness to P on the TB12 terminal strip. See Figure 10.
- 4.7 Connect the USB connector on the interface harness to the personal computer. See Figure 10.
- 4.8 Use a USB cable to connect the personal computer to the generator set controller. The USB cable must have a male USB type-A connector on the PC side and a male mini-B connector on the device side. See Figure 11.

Note: Be sure that the cable has a mini-B connector. Micro-B connectors will not connect to the device.

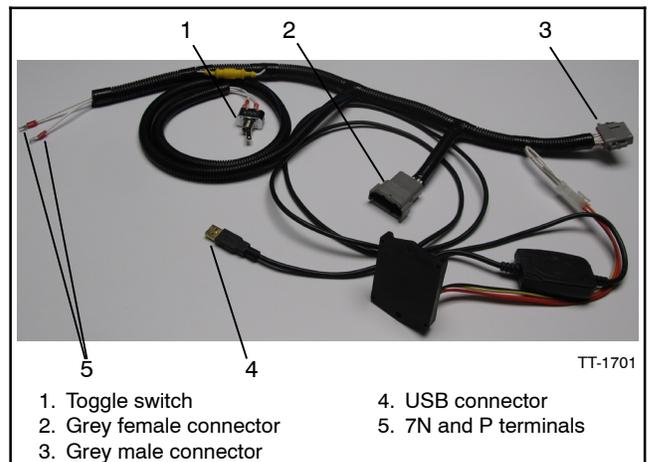


Figure 10 Interface Harness



Figure 11 USB Cable

4.9 Use SiteTech™ version 4.3.xx or newer and under the **Genset Personality Profile** parameter, change the **ECM Model** to **Woodward APECS ECM**. See Figure 12.

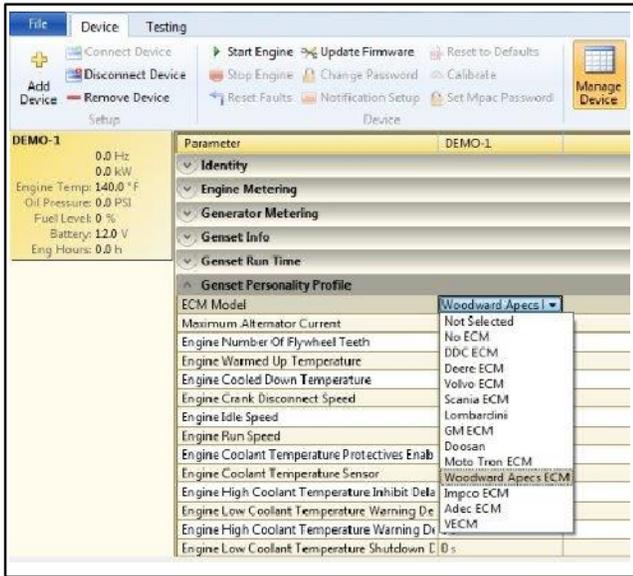


Figure 12 Genset Personality Profile Parameter

4.10 Turn the toggle switch (on the interface harness) to ON (I). See Figure 10.

4.11 Start the Kohler ACT Tool on the personal computer and accept the license agreement. See Figure 13.

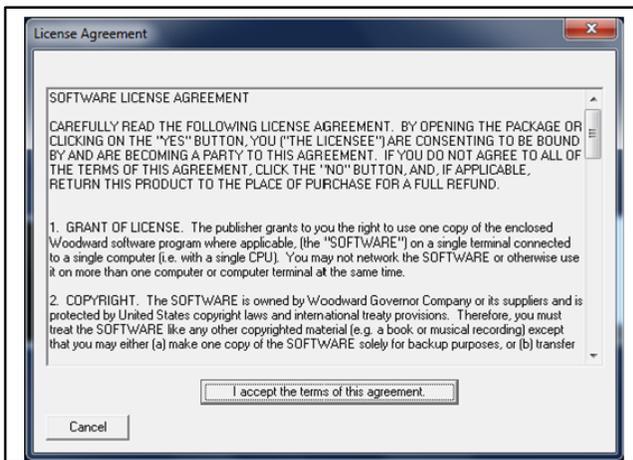


Figure 13 License Agreement Screen

4.12 Find the COM port that the USB is plugged into. See Figure 14. Then select "OK".

4.13 The KOHLER main screen appears. Select "Download KACT Calibration" See Figure 15.

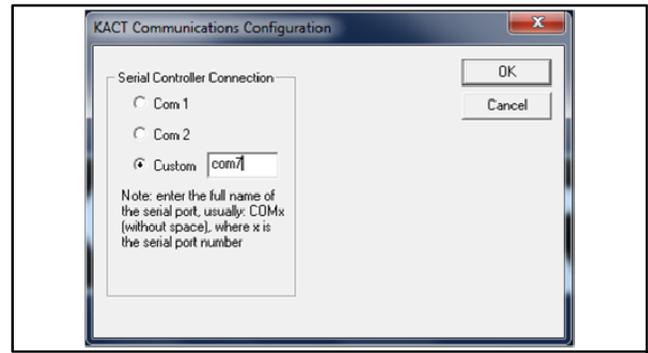


Figure 14 KACT Communications Configuration

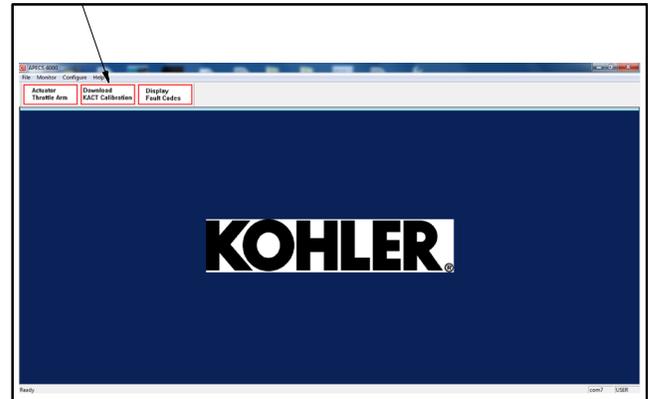


Figure 15 Main Screen

4.14 Select the appropriate calibration file for your particular model and select "OPEN".

The appropriate file is dependent on your generator set model. For example **Dec3000_15REOZK_60_12_S**, the file naming structure contains the following information:

- Controller (Dec 3000)
- Model (15REOZK etc.)
- Hz (60 or 50)
- Battery volts (12)
- Application (P for Prime or S for Standby)

4.15 When the calibration file was downloaded successfully, select "OK". See Figure 16.

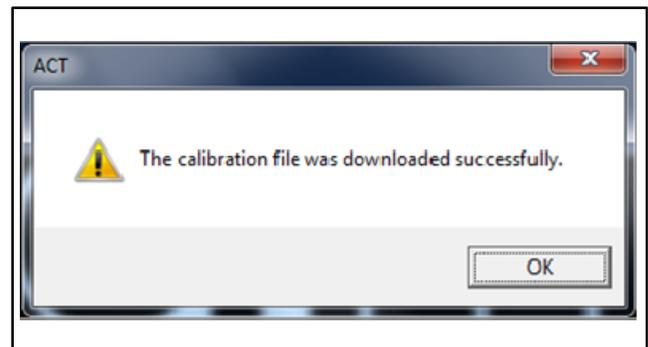


Figure 16 Downloaded Successfully Screen

Parts List

Electronic Governor Kit

Kit: GM90661-KP1		
Qty.	Description	Part Number
1	Governor, electronic	GM90652
1	Actuator, governor	324516
2	Washer, plain (#6 screw size)	M125A-06-80
2	Nut, hex (6 mm)	M6923-06-80
2	Screw, hex cap (M6 x 30 mm)	M933-06030-60
1	Harness, governor	GM90770
1	Seal, cover	included with actuator
1	O-ring	included with actuator

Troubleshooting

1. Remove the generator set from service.

- 1.1 Press the generator set OFF/RESET button to shut down the generator set.
- 1.2 Disconnect the power to the battery charger, if equipped.
- 1.3 Disconnect the generator set engine starting battery(ies), negative (-) lead first.
- 1.4 If equipped with an enclosure, remove enclosure doors as needed to service the engine.

2. Testing the Actuator.

If the electronic governor system fails to operate and the actuator is suspected to be the problem, perform the following tests.

- 2.1 Measure coil resistance (at room temperature): 2.05 ±0.25 ohms (12 VDC actuator).
- 2.2 Measure coil isolation to case: >3 Megohm.
- 2.3 Remove the actuator. Manually move the actuator through its range of motion. No binding or sticking should occur.
- 2.4 Install a diode Kohler part no. 294254 (Motorola MUR810 or equivalent) across the actuator terminals.
- 2.5 Apply a 12 VDC power supply to the actuator where the pos. (+) connects to the cathode of the diode.
- 2.6 The actuator should move to the full fuel position and operate smoothly throughout its entire stroke without any interruption in motion.
- 2.7 If the actuator passes these tests the problem is likely in the governor and/or fuel system.

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.

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