INSTALLATION INSTRUCTIONS

Original Issue Date: **5/06**
Model: **10-20REOD/REOZD, 10-20EORD/EORZD, 9-16.5EFORD/EFORZD, 30-40EORZD, and 25-33EFORZD**
Market: **Industrial and Commercial/Recreational Mobile**
Subject: **Electronic Governor Kits GM46308-KP1 and GM49805-KP1**

Introduction

The microprocessor-based, digital governor provides isochronous governing by using the signal from the magnetic pickup to control the current input to the actuator.

The governor kit includes:

- Governor assembly GM17644-4 (DPG-2101-002)
- Magnetic pickup
- Governor actuator
- Governor harness
- Mounting hardware
- Digital Isochronous Governor Programming Kit with instructions (GM39344)

Note: A personal computer (PC) with PST software is required to set up the governor controller.

After installation and connection, the installer must use Parameter Setup Toll (PST) software to set the governor controller for the generator set engine model. Download the Parameter Setup Tool (PST) Software from the following website:

http://www.woodward.com/software/Download/SWProductDetail.cfm?FileID=201

Refer to step 3 of these instructions and to the instructions provided with the Programming Service Kit for more information.

See Figure 1 for kit selection.

Models	Kit Number
10-20REOD/REOZD	GM46308-KP1
10-20EORD/EORZD	
9-16.5EFORD/EFORZD	
30-40EORZD	GM49805-KP1
25-33EFORZD	

Figure 1 Kit Selection

Features and Specifications

The microprocessor-based, digital isochronous governor allows adjustment of set speed and gain. See Figure 2 for specifications and Figure 3 for the governor controller illustration.

Other features include:

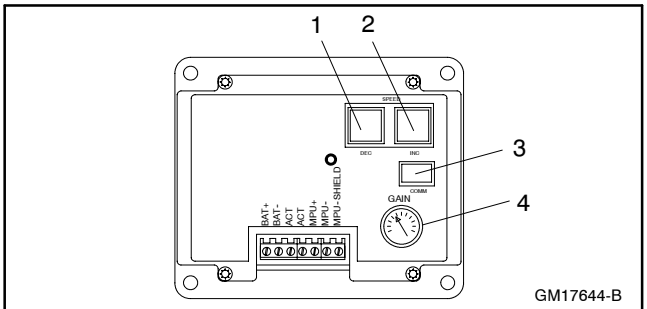
- 0.25% frequency control
- Reverse battery protection
- 9–30 VDC input
- Smoke control on startup

Keypad Functions

The governor controller keypad provides speed adjustment for increase/decrease speed and a gain potentiometer. See Figure 3.

Specifications	Value
Maximum controlled output current	7 amps
Maximum current surge	14 amps for 10 seconds
Input signal from magnetic pickup	2.0 VAC RMS min. during cranking
Ambient operating temperature	-40°C to +85°C (-40°F to +185°F)
Environmental protection	Oil, water, dust resistant via conformal coating and die cast enclosure
Electrical connections	Euro-style terminal strip

Figure 2 Specifications



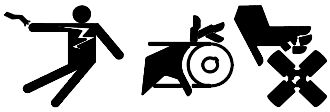
1. Speed decrease
2. Speed increase
3. RJ11 connector
4. Gain potentiometer

Figure 3 Governor Controller Functions

Safety Precautions

Observe the following safety precautions when installing the electronic governor kit.

⚠ 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 connected equipment, 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.

Installation Procedure

1. Remove the generator set from service.

1.1 Place the generator set master switch in the OFF position.

1.2 Disconnect the power to the battery charger, if equipped.

1.3 Disconnect the generator set engine starting battery(ies), negative (−) lead first.

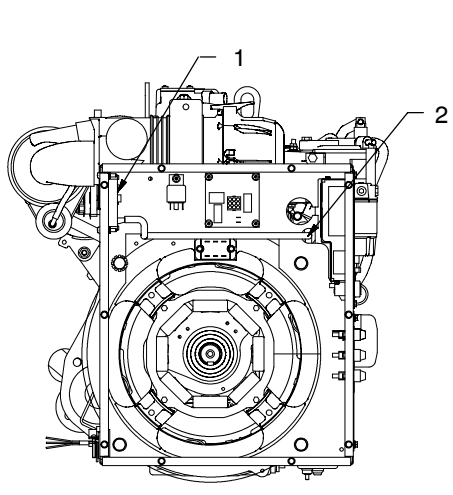
2. Install the governor kit.

2.1 Remove the controller cover.

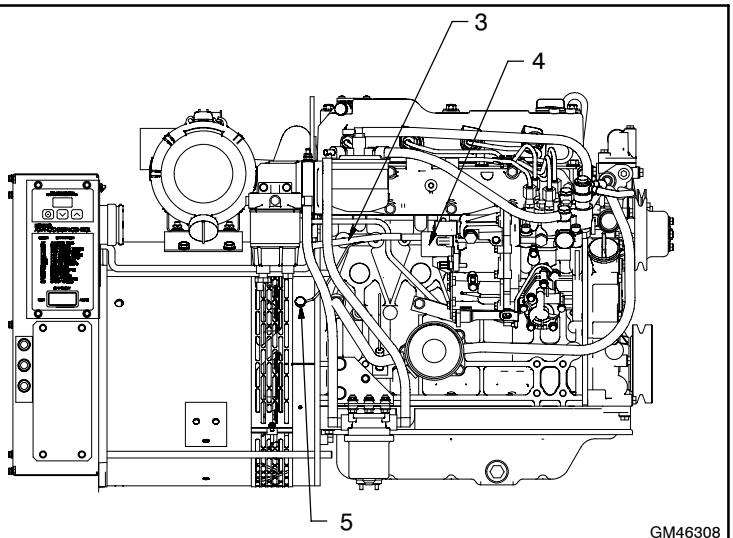
2.2 Use the 4 screws (M7985A-05025-20), 4 washers (X-22-9), 4 nuts (M934-05-50), and 4 spacers (X-400-145) to mount the governor controller (GM17644-4) inside the junction box. See Figure 4 or Figure 5.

Note: Place the spacer between the governor controller and the junction box. Place the washer between the junction box and the nut.

2.3 Connect the governor harness (GM46172) to the governor's terminal strip. See Figure 6 and Figure 7.



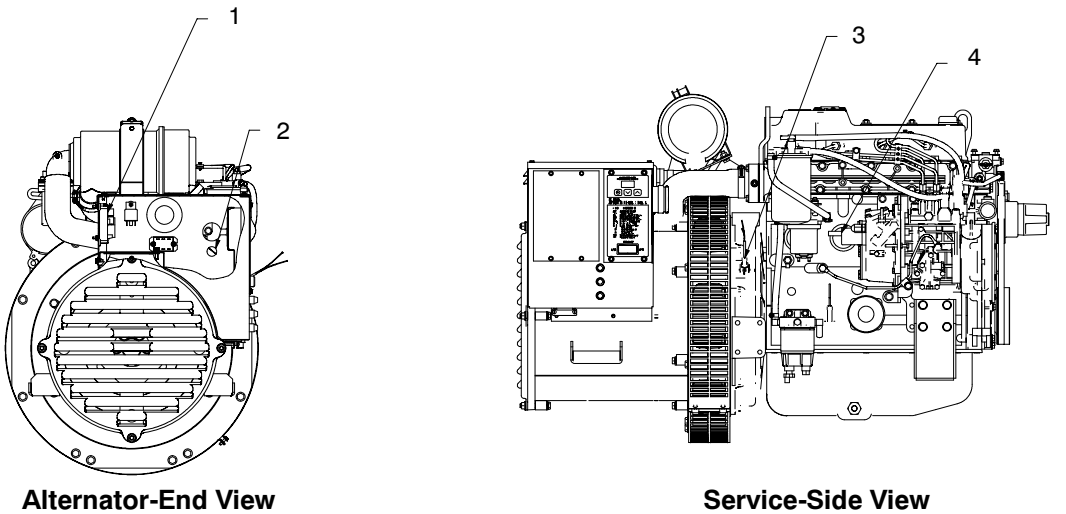
Alternator-End View



Service-Side View

1. Governor controller (GM17644-4)
2. Remove the existing plastic cap.
3. Governor harness (GM46172)
4. Remove the existing stop solenoid and install the actuator (GM38364).
5. Magnetic pickup GM11708 (drill and tap existing hole to 3/8-24 UNF). See Figure 8.

Figure 4 Governor Controller, Actuator, and Magnetic Pickup Locations for Kit GM46308-KP1 (9–20 kW)

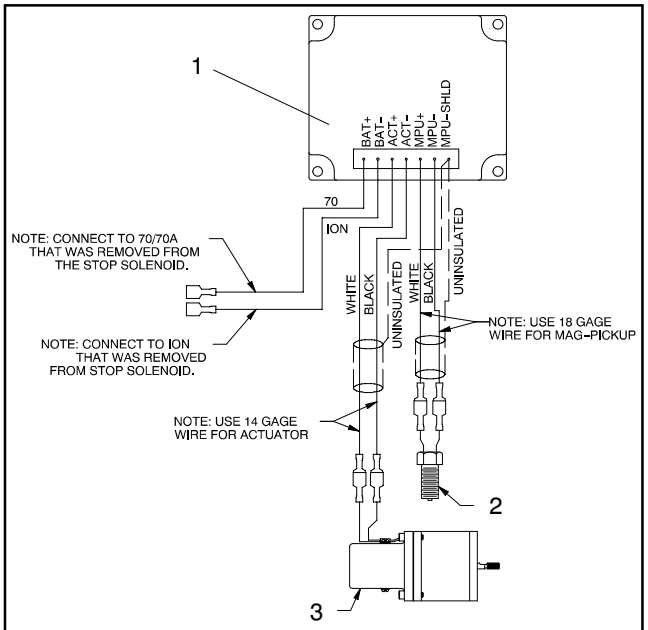


1. Governor controller (GM17644-4)
2. Governor harness (GM46172). Remove the existing plastic cap and route the harness through the hole.
3. Speed sensor plug (GM40901), pipe plug (X-75-51), and magnetic speed pickup (GM11708)
4. Remove the existing stop solenoid and install the actuator (GM38364).

Figure 5 Governor Controller, Actuator, and Magnetic Pickup Locations for Kit GM49805-KP1 (25–40 kW)

Governor Terminals	Connects to
MPU+ MPU–	White magnetic pickup lead (18 ga.) Black magnetic pickup lead (18 ga.)
MPU–SHLD	Uninsulated harness shield
ACT+ ACT–	White actuator lead (14 ga.) Black actuator lead (14 ga.)
BAT+ BAT–	Lead 70/70A Lead 10N

Figure 6 Governor Terminal Strip Connections



1. Governor control (GM17644-4)
2. Magnetic pickup (GM11708)
3. Actuator (GM38364)

Figure 7 Governor Connection Diagram

2.4 Before removing the engine's stop solenoid, clean the surrounding area. See Figure 4 or Figure 5 for the location. Clean the outside of the pump with solvent and dry with compressed air. Place a suitable container underneath the fuel injection pump to catch any fuel that may spill when removing the governor control cover. Dispose of waste in an environmentally accepted method.

2.5 Disconnect and remove the existing stop solenoid. Keep the existing O-ring.

2.6 Place a small amount of RTV sealant on the screw heads that hold the plate onto the actuator. To prevent possible oil leaks from the screw heads, install the O-ring over the screw heads where the RTV sealant was placed.

2.7 Install governor actuator GM38364 using the fasteners removed from the stop solenoid. See Figure 4 or Figure 5.

2.8 Tape the end of lead 12F and put it inside the conduit.

2.9 **For Kit GM46308-KP1 (9–20 kW):**
Drill the existing hole at the location shown in Figure 4 to a size of 8.51–8.64 mm (0.335–0.340 in.). Tap the hole to 3/8-24 UNF.

For Kit GM49805-KP1 (25–40 kW):
Remove the existing plug at the location shown in Figure 5, item 3.

2.10 **For Kit GM46308-KP1 (9–20 kW):**
Mount the magnetic pickup (GM11708) into the 3/8-24 tapped hole.

For Kit GM49805-KP1 (25–40 kW):
Install the speed sensor plug (GM40901) at the location shown in Figure 5. Install the magnetic pickup (GM11708) into the speed sensor plug's 3/8 in. diameter hole. Install the pipe plug (X-75-51) into the speed sensor plug's 1/4 in. diameter hole.

2.11 See Figure 8 and follow these steps to adjust the magnetic pickup:

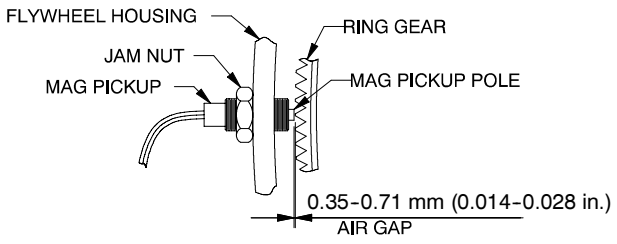
2.11.1 With the flywheel stationary, turn the magnetic pickup in until the pole face of the pickup bottoms out on a ring gear tooth.

Note: The magnetic pickup must touch a ring gear tooth for proper adjustment.

2.11.2 Turn the magnetic pickup back out 1/4 to 1/2 turn to obtain the correct air gap measurement of 0.35–0.71 mm (0.014–0.028 in.).

2.11.3 Use a wrench to tighten the jam nut.

Note: Be careful not to turn the magnetic pickup while tightening the nut.



Note: With the flywheel not rotating, turn magnetic pickup in until pole face of magnetic pickup bottoms out on a ring gear tooth. Then back out 1/4 to 1/2 turn.

GM46308B

Figure 8 Magnetic Pickup Adjustment

2.12 Connect the terminals of the governor harness (GM46172) to the terminals of the magnetic pickup (GM11708). See Figure 7.

2.13 Connect the governor harness actuator leads (GM46172) to the actuator (GM38364). See Figure 7.

2.14 Replace the controller cover.

3. Set up the governor.

3.1 Check that the generator master switch is in the OFF position.

3.2 Reconnect the generator set engine starting battery, negative (–) lead last.

Note: Verify that the generator set master switch is in the OFF position. The generator set must not be running during this procedure.

3.3 To provide power to the governor, disconnect lead 70 on the wiring harness and connect a jumper from lead 70A to the positive connection on the starter solenoid. The governor controller should power up, indicated by a blinking green LED.

3.4 Use the cable provided with Governor Programming Kit GM39344 to connect the governor controller to a computer that has the universal PST software installed.

3.5 Open the data file for your specific generator set controller.

3.6 Click on the WRITE ALL button on the computer screen.

3.7 Disconnect the phone cable and remove power from the governor controller. Disconnect the jumper and reconnect lead 70.

4. Adjust the governor.

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

4.1 Move the controller master switch to the RUN position to start the generator set.

4.2 Adjust the frequency with the "INC/DEC" buttons on the controller to bring the generator frequency to the desired operating frequency, 60 or 50 Hz.

4.3 At no load, use the gain potentiometer on the governor controller to increase the overall gain until the engine begins to hunt. If the engine does not begin to hunt, momentarily disrupt the governor power supply. Then, decrease the overall gain until stable. For optimum performance, the engine should oscillate 3 to 5 diminishing cycles after being disrupted.

Note: Warm engines are normally more stable than cold engines. If the governor is adjusted on a warm engine, decrease the gain by 5% to ensure a stable engine when started cold.

5. Restore the generator set to service.

5.1 Check that the generator master switch is in the OFF position.

5.2 Check that the generator set engine starting battery is connected. Reconnect the engine starting battery, negative (−) lead last, if necessary.

5.3 Reconnect the power to the battery charger, if equipped.

Parts List

Electronic Governor (Isochronous)

Kit: GM46308-KP1		
Qty.	**Description**	**Part Number**
1	Pick-up, magnetic speed	GM11708
1	Controller, governor	GM17644-4
1	Actuator, electronic governor	GM38364
1	Harness, electronic governor	GM46172
4	Screw, pan head machine	M7985A-05025-20
4	Nut, hex (5mm)	M934-05-50
4	Washer, lock (0.20 ID x 0.373 in. OD)	X-22-9
4	Spacer (0.209 ID x 0.375 OD x 0.234 in.)	X-400-145
1	Programming kit	GM39344

Kit: GM49805-KP1		
Qty.	**Description**	**Part Number**
1	Pick-up, magnetic speed	GM11708
1	Controller, governor	GM17644-4
1	Actuator, electronic governor	GM38364
1	Harness, electronic governor	GM46172
4	Screw, pan head machine	M7985A-05025-20
4	Nut, hex (5mm)	M934-05-50
4	Washer, lock (0.20 ID x 0.373 in. OD)	X-22-9
4	Spacer (0.209 ID x 0.375 OD x 0.234 in.)	X-400-145
1	Plug, speed sensor	GM40901
1	Plug, pipe	X-75-51
1	Programming kit	GM39344

Programming Kit

Kit: GM39344		
Qty.	**Description**	**Part Number**
1	Cable, phone	GM34410
1	Connector, DB9	GM39345
1	CD, governor programming	GM39346
1	TT digital isochronous governor	TT-1399

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