

## INSTALLATION INSTRUCTIONS

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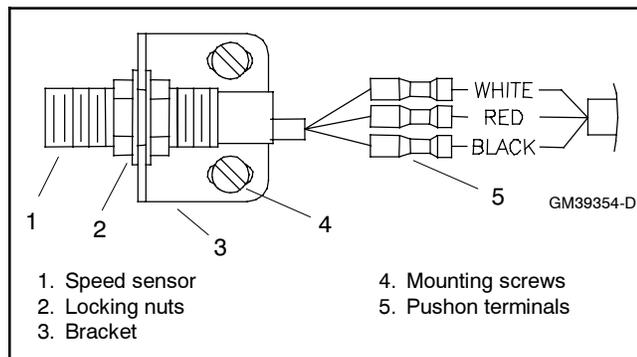
Model: **20-300 kW Generator Sets**

Market: **Industrial and Marine**

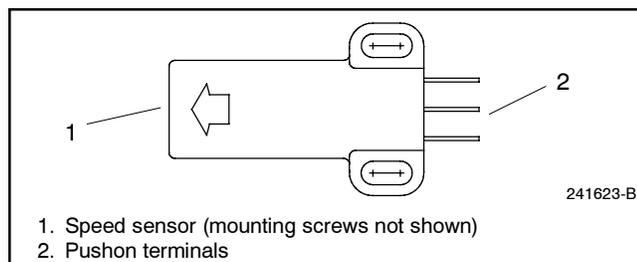
Subject: **Speed Sensor Service Kit GM70486**

### Introduction

Speed sensors GM30120, 241623, and 241927 are no longer available as service parts, see Figure 1 and Figure 2. The GM70486 service kit with instructions provides the means to install a replacement speed sensor for the discontinued speed sensor. The service kit works for both permanent magnet generators (PMG) (FR™ II) and wound field (FR™ III) models.



**Figure 1** Speed Sensor GM30120



**Figure 2** Speed Sensor 241623 (241927 Kit)

### Special Tools and Service Manuals

The following items are necessary for installing the kit. The service manuals are recommended.

- Wire cutter/stripper/crimper
- Feeler gauge with 0.36-0.71 mm (0.014-0.028 in.) sizes
- TP-6353 Fast-Response™ II Service Manual (PMG)
- TP-6349 Fast-Response™ III Service Manual (Wound Field Alternators)

### Safety Precautions

Observe the following safety precautions while performing this procedure.

#### ⚠ WARNING



**Accidental starting.**  
**Can cause severe injury or death.**

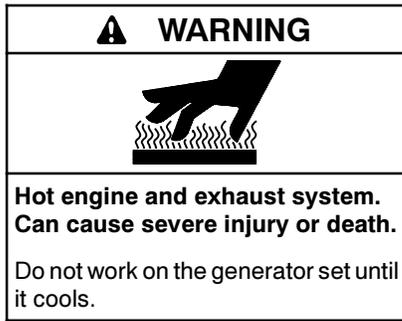
Disconnect the battery cables before working on the generator set. Remove the negative (-) lead first when disconnecting the battery. Reconnect the negative (-) lead last when reconnecting the battery.

**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.

(Decision-Maker® 1, 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 and 6000 Controllers)



**Servicing the alternator. Hot parts can cause severe injury or death.** Avoid touching the alternator field or exciter armature. When shorted, the alternator field and exciter armature become hot enough to cause severe burns.

## Procedure

### 1. Remove the generator set from service.

1.1 Place the generator set master switch to the OFF/RESET position (Decision-Maker® 1, 3+, and 550).

OR

Press the generator set master control OFF/RESET button (Decision-Maker® 3000 or 6000).

1.2 Disconnect the battery charger, if equipped.

1.3 Disconnect the battery, negative lead first.

### 2. Removing the old speed sensor.

2.1 Open the doors on the enclosure, if equipped.

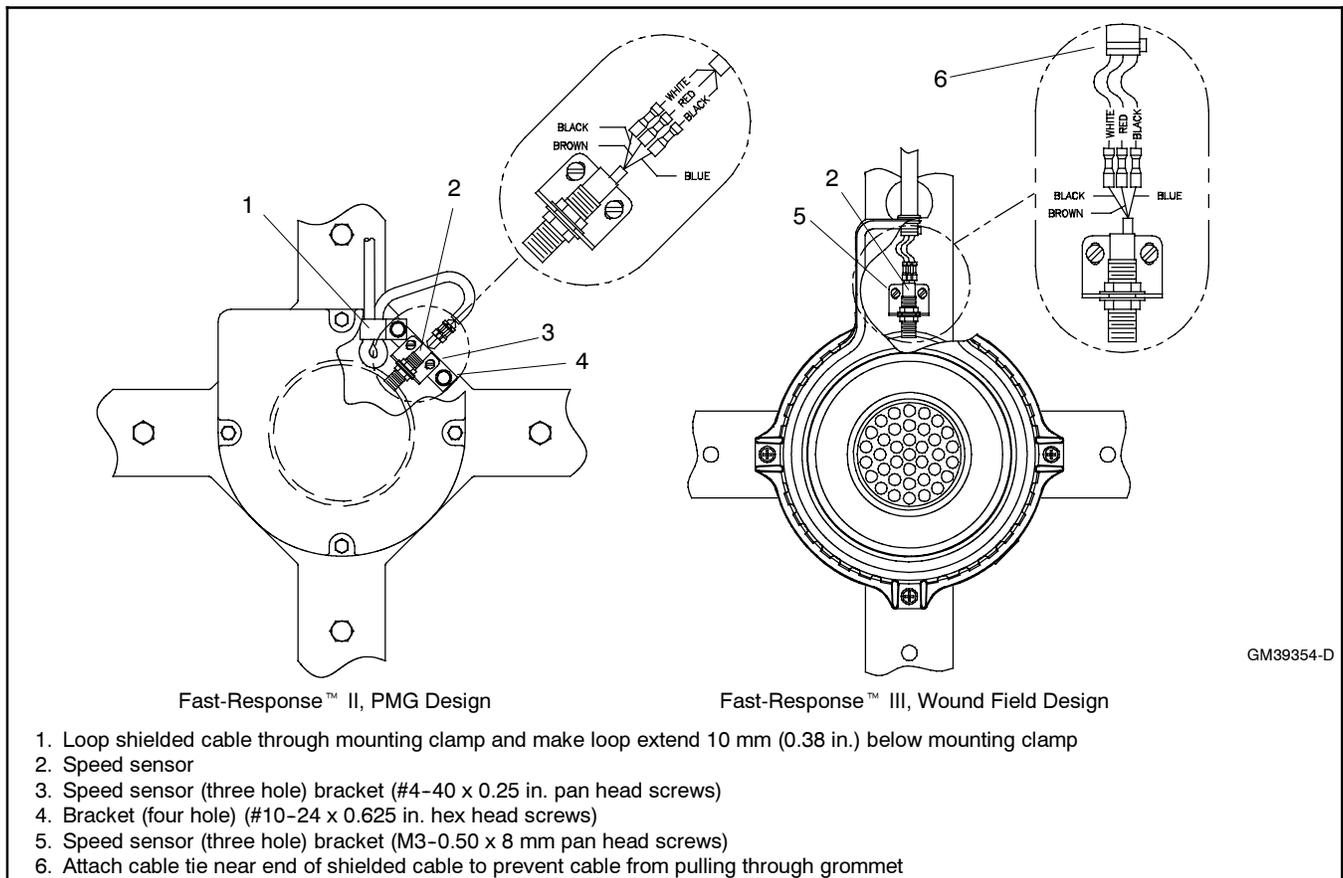
2.2 Remove the junction box rear access panel and screws.

2.3 Remove the LED circuit board cover (FR™ II) or rotating rectifier assembly cover (FR™ III). Refer to the respective service manual for additional information.

2.4 Disconnect the speed sensor wiring at the three pushon terminals. See Figure 1 or Figure 2.

2.5 Remove the two screws to remove the speed sensor. The speed sensor, shims (if used), and three-hole bracket will not be reused. Save the screws as they may be reused.

2.6 If the unit has the Fast Response™ II design alternator, remove the four-hole flat bracket. The four-hole flat bracket will not be reused. Save the screws and mounting clamp (Figure 3, Item 1) that is securing the speed sensor wiring as these parts will be reused.



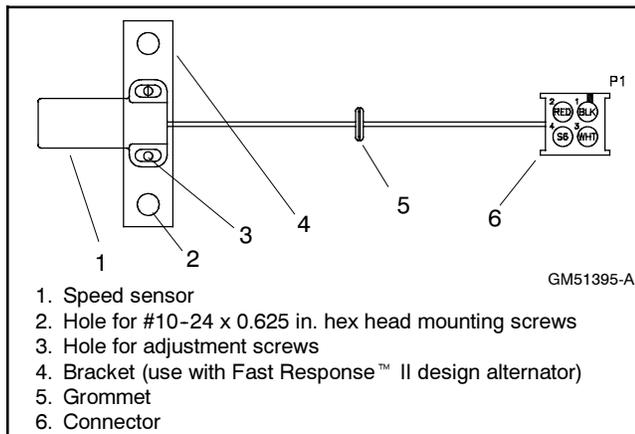
**Figure 3** Existing Speed Sensor and Mounting Designs

### 3. Installing the new speed sensor.

3.1 If the unit has the Fast Response™ II design alternator, mount the new bracket (Figure 4, Item 4) from the speed sensor kit and replace the existing mounting clamp (Figure 3, Item 1) securing the speed sensor wiring harness to the generator set end bracket using the original screws.

**Note:** The bracket from the speed sensor kit is NOT used with the wound field design alternator.

3.2 Mount the new speed sensor using the original screws, do not final tighten the screws at this time.

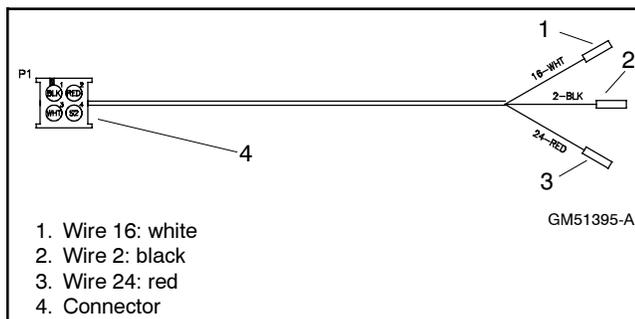


**Figure 4** Speed Sensor GM51395

3.3 Locate the existing generator set wiring harness with three female pushon terminals. Cut off each terminal and strip wire ends 9 mm (3/8 in.).

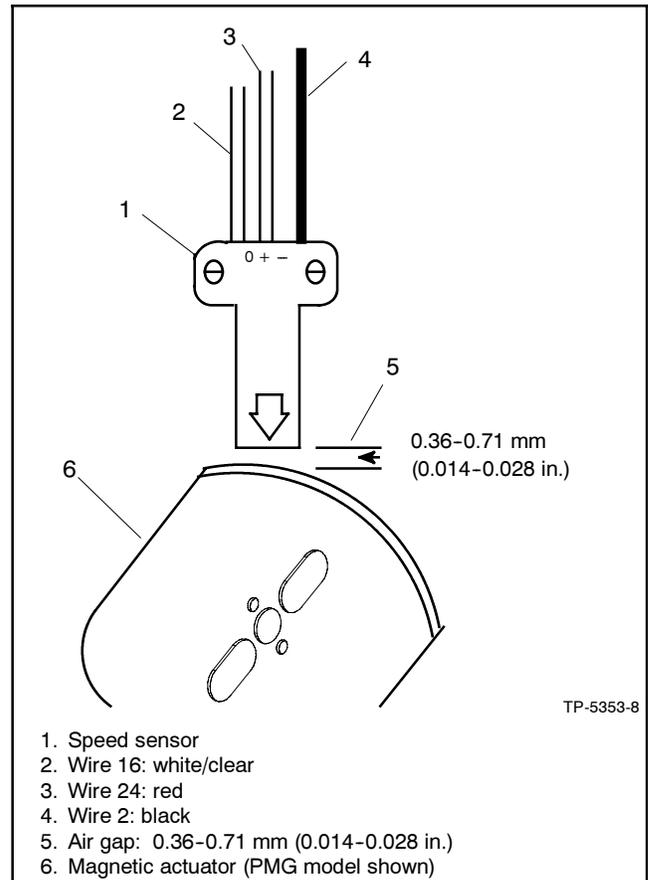
3.4 Match the wire colors (white, black, and red) and crimp the stripped wire ends to the speed sensor harness GM70485. See Figure 5.

3.5 Plug the speed sensor connector (Figure 4, Item 6) in the speed sensor harness connector (Figure 5, Item 4). Each connector is keyed to mate only one way.



**Figure 5** Speed Sensor Harness GM70485

3.6 Loosen the adjustment screws (Figure 4, Item 3) and adjust the air gap using a feeler gauge and specifications from Figure 6. Final tighten the adjustment screws.



**Figure 6** Speed Sensor Air Gap

3.7 Position the grommet (Figure 4, Item 5) to align with the notch in the LED circuit board cover (FR™ II) or rotating rectifier assembly cover (FR™ III).

3.8 Use cable ties as needed to secure the wiring harness.

3.9 Install the LED circuit board cover (FR™ II) or rotating rectifier assembly cover (FR™ III) using the original screws.

3.10 Replace the junction box rear access panel and screws.

3.11 Close the doors on the enclosure, if equipped.

- 4. Restore power to the generator set.**
  - 4.1 Place the generator set master switch to the OFF/RESET position (Decision-Maker® 1, 3+, and 550 only).
  - 4.2 Reconnect the battery, negative lead last.
  - 4.3 Reconnect the battery charger, if equipped.
- 5. Test run the generator set.**
  - 5.1 Start the generator set per the Operation Manual instructions.

- 5.2 Test run the generator set to determine that if functions correctly.
- 5.3 STOP the generator set.

## Parts List

### Speed Sensor Service Kit

Kit: GM70486		
Qty.	Description	Part Number
1	Harness, speed sensor	GM70485
1	Speed pickup (with mounting bracket)	GM51395