WOODWARD

Product Manual 54047
(Revision A)
Original Instructions

8924-655 Installation Kit

for EPG 1712/1724 Electric Actuator on the White/Hercules D-4800 Engine

Installation Manual

IMPORTANT

DEFINITIONS

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

WARNING

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

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The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

NOTICE

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

NOTICE

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

8924-655 Installation Kit for EPG 1712/1724 on the White/Hercules D-4800 Engine

Introduction

These instructions apply to the EPG model 1712/1724 (12 or 24 V) electric actuator manufactured by Woodward as mounted on the White/Hercules D-4800 diesel engine driving a generator set.

The mounting kit is Woodward part number 8924-655. The kit does not Include the actuator, wiring from the electronic control, or the magnetic pickup utilized by the electronic control system.

Woodward equipment associated with the installations includes:

- 12 volt actuator, part number 8256-017
- 24 volt actuator, part number 8256-016
- 12 volt speed control, part number 8290-040
- 24 volt speed control, part number 8290-038
- 15 ft (4.6 m) wiring harness, part number 8924-621
- 25 ft (7.6 m) wiring harness, part number 8924-620
- Magnetic pickup, part number 5430-929

The 1712/1724 actuator, as mounted on the diesel engine, operates the shutdown shaft on the RoosaMaster DB-2 injection pump which comes with the engine. No modification of the speed-setting lever is required when attaching the 1712/1724 actuator. The speed-setting lever is locked into a maximum-fuel position while using the electric actuator.

The shutdown lever must be positioned at about 30 degrees from vertical when in the minimum-fuel position. If it is necessary to reposition the shutdown lever, loosen but do not remove the lever. To loosen the lever, remove the socket head screw in the center of the lever and the second screw In the bolt circle surrounding the center, Reposition the lever and tighten both screws.

⚠WARNING

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The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

Actuator Mounting

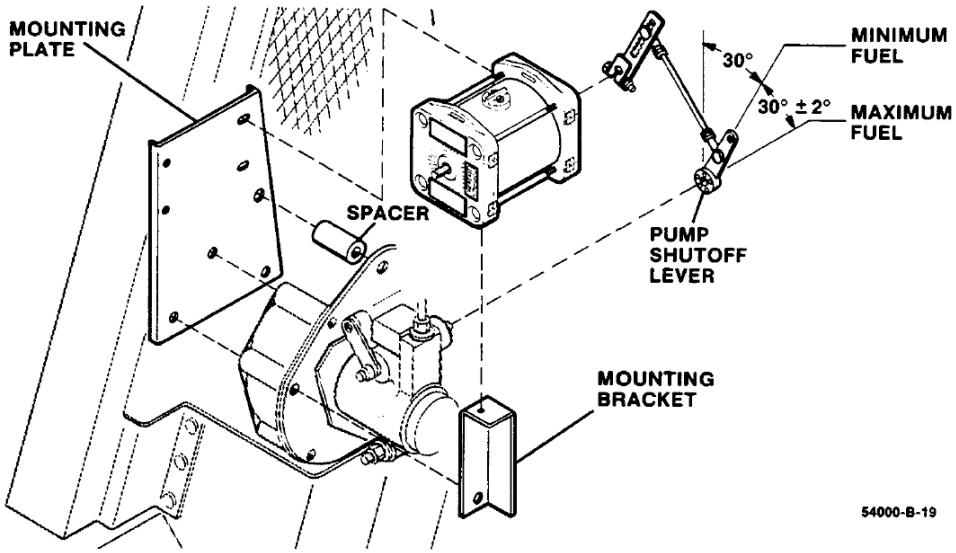

Figure 1. The Actuator Bracket Mounts on the Gear Housing at the Front of the Engine

1. Place the actuator mounting plate from the kit on the front of the engine as shown. The plate will mount on the gear housing on the side of the engine where the injection pump is located. The smooth side of the plate goes toward the engine and pump. The wide end of the plate goes down. Identify the three bolts and the engine stud which will hold the plate to the engine.

2. Remove the nuts from the two 0.375 inch bolts and the 0.375 inch engine stud identified. The 0.500 inch bolt will be replaced with the 0.500-13 x 4 inch bolt included in the kit. The 0.375 bolt nearest the block will be re-used. A 0.375-16 x 4 inch bolt is supplied with the kit to replace the bolt farther from the block.

3. Place the 0.500-13 x 4 inch bolt in the engine casting. Add the 0.812 x 1 inch spacer to the bolt.

4. Place the mounting plate in position over the 0.500 bolt end and the 0.375 engine stud.

5. Attach the plate with the 0.500-13 nut and 0.500 split lock washer from the kit. Replace the 0.375 nut removed earlier from the engine stud.

6. Replace the shorter 0.375 bolt which was removed earlier and attach the nut.

7. Insert the 4-inch bolt through the mounting bracket brace, through the flat washer, the engine shoe, and the mounting bracket. Add the 0.375 lockwasher and nut supplied with the kit.

8. Place the actuator against the smooth side of the mounting plate with the counterclockwise shaft extending toward the engine, in line with the injection pump shutdown lever (located on the engine side of the pump). The location of the electrical terminal connection is unimportant, except as it affects the wiring of the unit. Establish a location that will make wiring convenient. Avoid locating the terminal on top of the actuator as this will expose the wiring to dirt and possible damage from stepping on the actuator while servicing the engine.

9. Install the actuator on the mounting plate with the four 0.250-20 x 0.500 inch hex-head screws, flat washers, and split lock washers supplied. The actuator attaches without a gasket between the mounting plate and the actuator. Torque the screws to 80 to 100 lb-in (9.0 to 11.3 N·m).

10. Attach the mounting bracket brace to the actuator with a 0.250-20 screw, flat washer, and lockwasher. Torque to 80 to 100 lb-in (9.0 to 11.3 N·m).

11. Torque the four nuts which hold the bracket to the engine shoe to more than 375 lb-in (42 N·m).

12. Assemble the 0.250-28 threaded rod, supplied with the kit, with two jam nuts and two rod ends. Do not tighten the jam nuts. (The rod is not a turnbuckle, and a rod end must be turned to lengthen or shorten the effective length of the rod.)

13. Attach one rod end to the shutdown lever on the side of the Injection pump. Installation order: Put a .250-28 x 1.250 cap screw through the hole in the lever, add a high collar split lock washer, the rod end, another split lock washer, and an elastic locknut. Torque to 25 lb-in (2.8 N·m). (The rod end goes on the engine side of the shutdown lever.)

14. Attach the actuator lever to the counterclockwise shaft so it will be in line with the shutdown lever to which the actuating rod was attached. The short side of the actuator lever goes toward the actuator. The actuator shaft is at minimum fuel position and the lever should be attached 30 degrees from vertical, toward the injection pump. The actuator lever, when installed, should be parallel with the shutdown lever when both levers are at a minimum-fuel position (see Figure 1).

15. Insert a 0.250-28 x 1.250 inch hex-head screw through the lever, tighten with a 0.250-28 elastic locknut. Two washers are used. Torque to 73 to 87 lb-in (8.2 to 9.8 N·m).

16. Adjust the rod length so the minimum fuel position on the pump shutdown lever will cause the actuator lever to move about 2 degrees toward the pump. The actuator shaft will move about 35 degrees toward maximum-fuel position. Use as much of this motion as possible, not less than 25 degrees, while moving the shutdown lever to the maximum-fuel stop.

17. Attach the rod end in the hole selected with the last 0.250-28 x 1.250 screw, a high-collar lockwasher, the rod end, a second lockwasher, and an elastic stop nut. Torque to 25 lb-in (2.8 N·m).

18. Tighten the locknuts on the actuator rod against both rod ends.

IMPORTANT

If properly attached, the actuator shaft will move at least 25 degrees (preferably more than 30 degrees) between the minimum- and maximum-fuel stops, which are determined by the engine injector pump, not the electric actuator. Check the installation to make sure the fuel-setting rod moves from minimum- to maximum-fuel stops without binding. Should less than 25 degrees of electric-actuator shaft movement be available between the minimum- and maximum-fuel stops, move the rod end into a hole nearer the actuator shaft. Should too much actuator shaft movement be used, move the rod end farther from the actuator shaft.

Response can be delayed if too little shaft movement is used, as this creates a deadband in the electric control between electrical signal and actual location of the actuator. If less than optimal rotation of the actuator shaft must be used, locate the lever so the shaft approaches maximum-fuel stop on maximum-fuel signal.

Wiring Suggestions

Wiring from the magnetic pickup to the governor must be in shielded cable. Other pairs should be twisted together.

Use a minimum of 14 AWG (2.0 mm²), stranded, insulated wire from the battery to the control box to the actuator. Using 14 AWG (2.0 mm²) wire, the 12 V actuator will operate with a maximum of 10 ft (3 m) between the control box and the actuator. The total distance in the wiring circuit from the battery to the control box to the actuator must not exceed 40 ft (12 m).

Using 12 AWG (3.0 mm²) wire in the circuit for the 12 V actuator allows these maximum distances to be 35 ft (11 m) from the control box to the actuator and a total of 140 ft (43 m) in the circuit.

The 24-volt actuator will allow the maximum distances to be 35 ft (11 m) between the control box and the actuator for 14 AWG (2.0 mm²) wire and a total of 140 ft (43 m) in the system. Using 12 AWG (3.0 mm²) wire with the 24 V actuator will permit 70 ft (21 m) between the control box and the actuator and 280 ft (85 m) in the circuit.

The wire used must not be kinked, and ties should be of a non-conducting material. Use only new, well insulated, stranded wire in the installation. The wire is not supplied in the mounting kit, but special harnesses are available from Woodward.

Wiring Terminal Fittings

Attach AMP 52941 or AMP 52961 crimp-on number 6, slotted, insulated terminals or equivalent on the control-box end of 12 AWG (3.0 mm²) wires from the actuator and the battery. If 14 AWG (2.0 mm²) wire is used, attach AMP 52935 or AMP 52955 crimp-on slotted, number 6, insulated terminals or equivalent.

The actuator end of the wires should be fitted with a number 8 ring terminal, AMP 35108 or equivalent for 12 AWG (3.0 mm²) wire or AMP 32236 or equivalent for 14 AWG (2.0 mm²) wire.

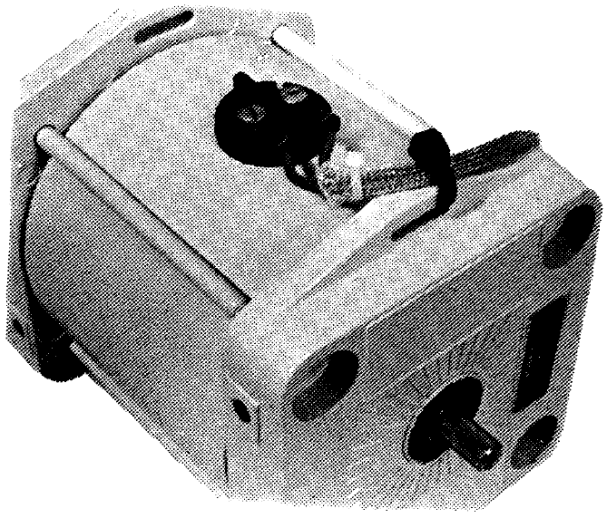

Figure 2. 1712 Actuator with Wiring Attached
(Note the tie of the actuator wire to the slot in the side of the actuator.)

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Send comments to: icinfo@woodward.com

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