WOODWARD

Product Manual 54116
(Revision A)
Original Instructions

Installation Kit for EPG 5xx/17xx Electric Actuator on Detroit Diesel I-71 3, 4, and 6 Cylinder Engines

8924-584, 8924-591, 8924-862, 8924-868

Kit Installation Manual

IMPORTANT

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.

DEFINITIONS

- **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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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*.

Installation Kit for EPG 5xx/17xx Electric Actuator on Detroit Diesel I-71 3, 4, and 6 Cylinder Engines

Introduction

These instructions apply to the Woodward EPG 512/524/1712/1724 electric actuators as installed on a Detroit Diesel I-71 engine. Applicable Woodward part numbers are:

8924-584	right-hand exhaust, 6-cylinder engines
8924-591	left-hand exhaust, 6-cylinder engines
8924-862	left-hand exhaust, 3/4-cylinder engines
8924-868	right-hand exhaust, 3/4-cylinder engines

The kit does not include the actuator, the wiring harness, or the magnetic pickup used by the electronic control system. A bushing is supplied to facilitate the installation of a magnetic pickup in the flywheel housing.

The actuator, when mounted on the engine, operates the injector rack on the engine. The bent fuel rod from the actuator will attach to the lever on the fuel rack with the standard stud and cotter pin.

When the installation is complete, the linkage at minimum fuel should look about as it does in Figure 1. The actuator must be able to move the fuel rack between the high and low fuel requirements without binding the rack. Let the maximum stop on the actuator provide the maximum stop for the rack to be sure that the rack does not stick at maximum fuel. The length of the fuel rod link should be adjusted to supply the desired 15 to 30 degree rotation of the actuator.

Rotating the actuator output against the actuator spring load will not damage the actuator.

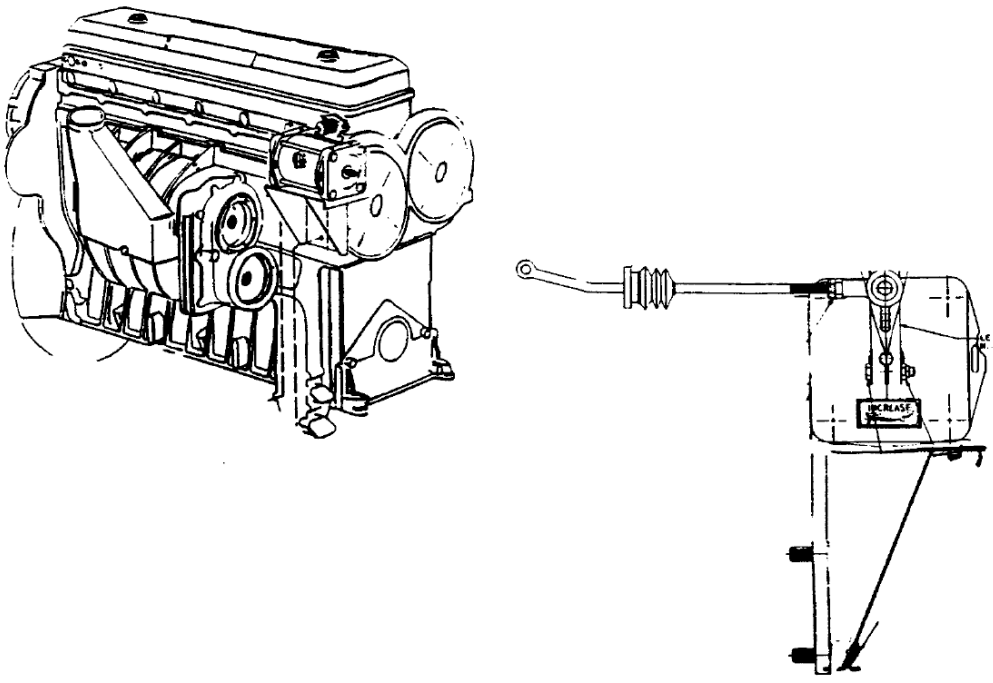

Figure 1. Linkage at Minimum Fuel

Actuator Mounting

1. Determine the governor control housing cover location at the front of the engine. Locate the actuator bracket over the engine boss as shown and attach with four 0.375-16 x 0.750 cap screws and lock washers.

2. Install the actuator on the bracket with the clockwise arrow toward the front of the engine. (The actuator lever will be placed on the end of the actuator with the counterclockwise arrow.) Install the actuator with four 0.250-20 x 0.625 cap screws and 0.064 thick washers (1082-005, 1010-805). These instructions are for installation on the side shown in Figure 1. When installing on the other side of the engine, use the opposite end of the actuator.

3. Assemble the boot-mounting adapter assembly onto the threaded fuel rod, then add the rod end and jam nut. Do not tighten the jam nut at this time. If may be necessary to turn the rod end for final adjustment of the length. Attach the rod end to the lever with a high collar lock washer on both sides of the rod end ball. Use a 0.250-28 x 1.00 cap screw and elastic hex nut to attach the rod end to the lever. Attach the round end of the fuel rod to the hardened pin on the rack with a cotter pin.

4. Adjust the length of the fuel rod so the lever will be about vertical when the rack is at minimum fuel. Move the actuator shaft about 2 degrees forward (against the return spring) and attach the lever to the shaft with a 0.250-28 x 1.000 cap screw, two 0.250 flat washers, and an elastic hex nut. The actuator should now provide the maximum fuel stop and the rack will provide the minimum fuel stop. If the rack provides the maximum fuel stop, remove the lever from the actuator, advance the actuator shaft to the maximum stop and replace the lever on the shaft with the rack held just below maximum. The actuator must have a minimum of 15 degrees motion between minimum fuel and the maximum stop.

IMPORTANT

If properly attached, the actuator shaft will move at least 15 degrees (preferably more than 30 degrees) between the minimum-and maximum-fuel stops. The minimum stop is determined by the fuel rack and the actuator provides the maximum stop. Check the installation to make sure the fuel-setting rod moves from minimum- to maximum-fuel stops without binding.

5. Tighten the jam nut on the threaded rod. Do not cause the rod end to bind when tightening the jam nut.

Wiring Suggestions

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 (10.7 m) from the control box to the actuator and a total of 140 ft (43 m) in the circuit.

The 24 V actuator will allow the maximum distances to be 35 ft (10.7 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 feed from the battery to the control box must be direct, not through a distribution point.

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.

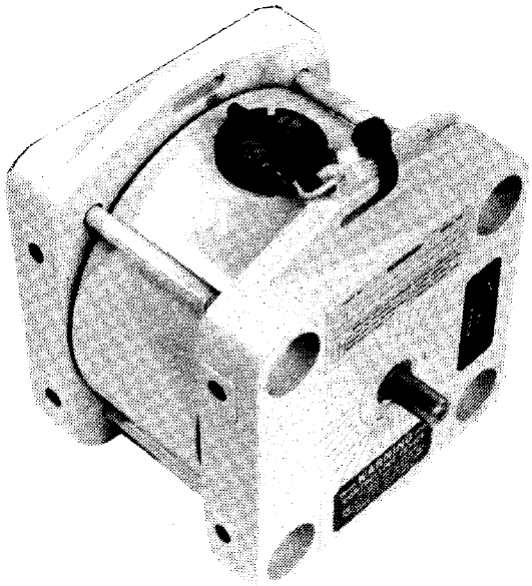

Figure 2. Actuator with Wiring Attached
(Note the tie of the actuator wire to the slot in the side of the actuator.)

Kit Parts List

Item	Quantity
Washer, 0.265 x 0.500 x 0.064	4
Washer, 0.250 hi collar lock	2
Washer, 0.375 lock	4
Screw, 0.250-20 x 0.625 cap	4
Screw, 0.375-16 x 0.750 cap	4
Screw, 0.250-28 x 1.000 cap	2
Nut, 0.250-28 thin, hex jam	1
Nut, 0.250-28 Elastic lock	2
Rod End, size 4	1
Rod, bent fuel (RH or LH)	1
Lever	1
Bracket, EPG to DD I-71	1
Adapter, boot mounting	1
Boot, rubber	1

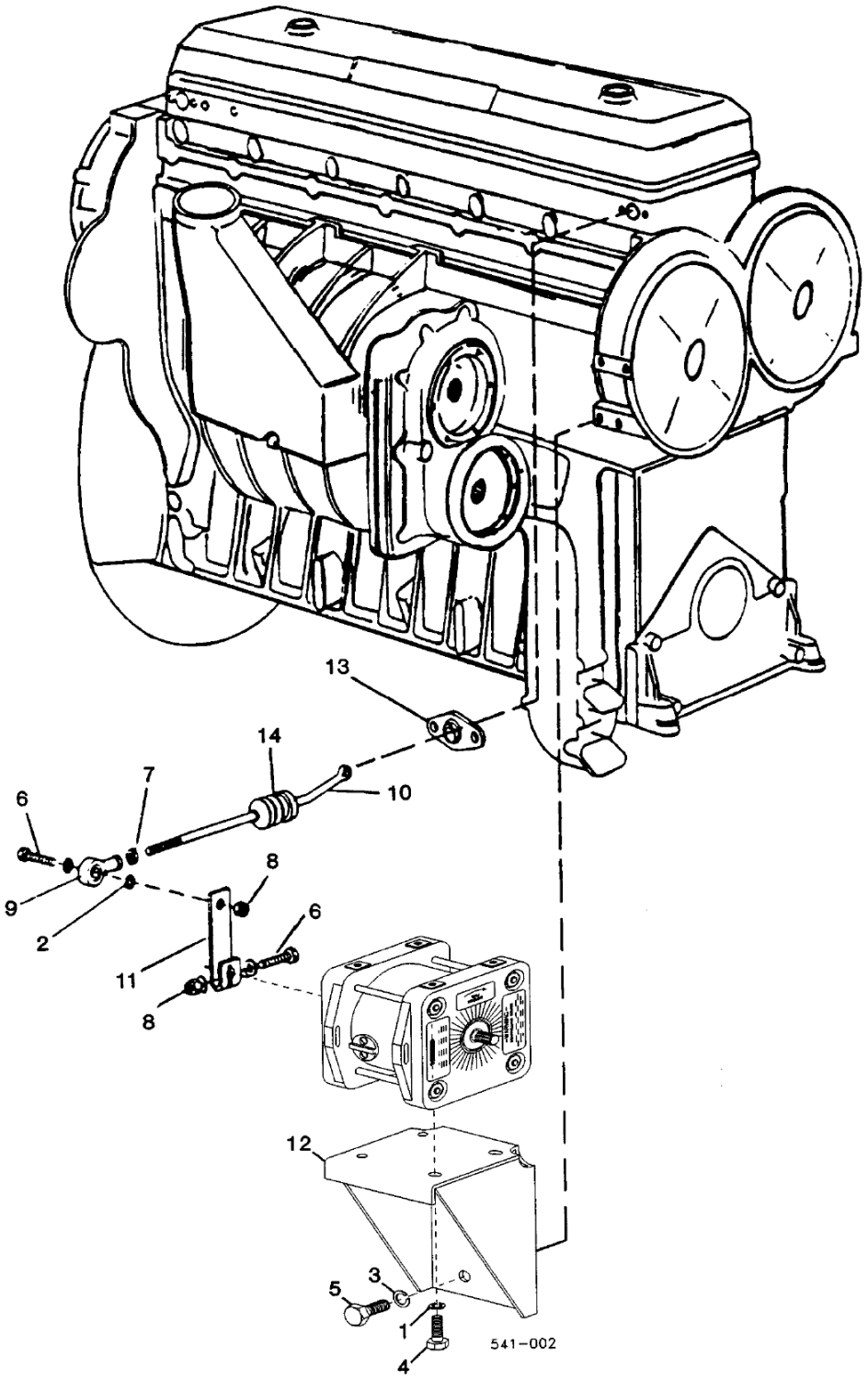

Figure 3. Woodward EPG to I-71 DD Engine

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Please reference publication 54116A.

WOODWARD

PO Box 1519, Fort Collins CO 80522-1519, USA
1000 East Drake Road, Fort Collins CO 80525, USA
Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

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