WOODWARD

Installation Manual

8924-642 Installation Kit

**for EPG 1712/1724 Electric Actuator
on the Caterpillar D3306B Engine
(for use on engines equipped with Caterpillar
mechanical governor with shutdown lever)**

Manual 54101

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*.

8924-642 Installation Kit for EPG 1712/1724 on the Caterpillar D3306B Engine

Introduction

These instructions apply to the EPG 1712/1724 (12 or 24 V) electric actuator manufactured by Woodward as mounted on a Caterpillar D3306B diesel engine/generator equipped with a Caterpillar mechanical governor with a shutdown lever. The mounting kit is Woodward part number 8924-642.

The kit does not include the actuator, the wiring harness, or the magnetic pickup utilized by the electronic control system.

The actuator, when mounted on the diesel engine, operates the shutdown lever (C.T.Co. part number 1N9954). Before installing the actuator, spring 1W6520 on the manual shutdown lever must be disabled, but left in place to maintain spacing. The engine-priming pump, if used, must be moved to allow actuator mounting and the speed-setting lever may have to be rotated out of the way of the linkage and locked at 110% of rated speed.

To the best of our knowledge this kit will fit the engine for which it is designed. However, engine manufacturers may make changes and add engine options without notifying us. If problems arise call our Technical Assistance Group, phone 800-523-2831 or +1 (970) 482-5811 and we will try to help.

Actuator Mounting

The following information should be used with Figure 2 to provide satisfactory installation of the actuator.

Install the actuator on the mounting bracket before installing the bracket on the engine block.

Attach the actuator to the mounting bracket as shown in the illustration. No gasket or washer is used between the actuator and the bracket surface. Torque the screws to 73 to 87 lb-in (8.2 to 9.8 N·m). ***Note the direction of the rotation arrow***.

Linkage Instructions

Assemble the rod ends and jam nuts on the 0.250-28 threaded rod. Do not tighten the jam nuts at this time. The rod does not work as a turnbuckle and it is necessary to turn a rod end for final adjustment of the length.

The actuator will be at the minimum-fuel position and the shutdown lever in maximum-fuel position when both are relaxed. Both levers should be at about 10 o'clock when the assembly is complete. If the shutdown lever is not at minimum-fuel position at 10 O'clock the lever should be moved on the shutdown shaft.

The actuator lever should move a minimum of 25 degrees between minimum and maximum fuel (30 degrees will provide better stability). Response can be delayed if too little shaft movement is used, as this creates a deadband in the electronic control between the 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 actuator shaft approaches maximum-fuel stop on maximum-fuel signal. The shutdown lever must provide the minimum- and maximum-fuel stops.

On the original installation add the rod end to the actuator lever in the location shown. To increase the amount of shutdown-lever motion; move the rod end farther from the actuator shaft. To reduce the amount of shutdown-lever motion, move the rod end closed to the actuator shaft.

When establishing the final length of the threaded rod, be sure about the same amount of rod is threaded into each rod end. At least five full threads of the threaded rod should be engaged in each rod end. Do not cause the rod ends to bind when tightening the jam nuts after establishing the proper rod length.

The mechanical speed setting must be locked in the maximum position before using the EPG. The maximum governor setting must be high enough to allow the engine to accept full load.

Avoid pressure washing the EPG actuator, particularly the clockwise end of the actuator as water can enter the actuator through the sealed bearing.

⚠WARNING

The threaded rod could thread out of a rod end if it is not locked. Since the rod could move without changing speed control or stability until it comes loose, it is extremely important that the jam nuts on the threaded rod be kept tight.

Wiring Suggestions

If possible use 12 AWG (3.0 mm²), stranded, insulated wire in the circuit from the battery to the control and from the control to the actuator. 14 AWG (2.0 mm²) wire can be used but distances in the circuit must be shortened. Wires from the control to the actuator must be shielded. Use either shielded wire or twisted, three-conductor wire ***grounded at the control end only***.

Using 12 AWG (3.0 mm²) wire in the circuit for the 12 V actuator allows a maximum distance of 35 ft (11 m) from the control box to the actuator and 35 ft (11 m) from the battery to the control box. If 14 AWG (2.0 mm²) wire is used, the maximum distances are 10 ft (3 m) from the control box to the actuator and 10 ft (3 m) from the battery to the control box.

The 24 V actuator will allow a maximum distance of 75 ft (23 m) from the control box to the actuator and 75 ft (23 m) from the battery to the control box. If 14 AWG (2.0 mm²) wire is used in the 24 V system, the maximum distance will be 35 ft (11 m) from the control box to the actuator and 35 ft (11 m) from the battery to the control box.

The wire from the battery to the control must be direct from the battery posts to the control, 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.

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 (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.

Polarity of the actuator connections is not important, and the wires can be interchanged.

Protect the actuator electrical connections from accidental damage while servicing the engine.

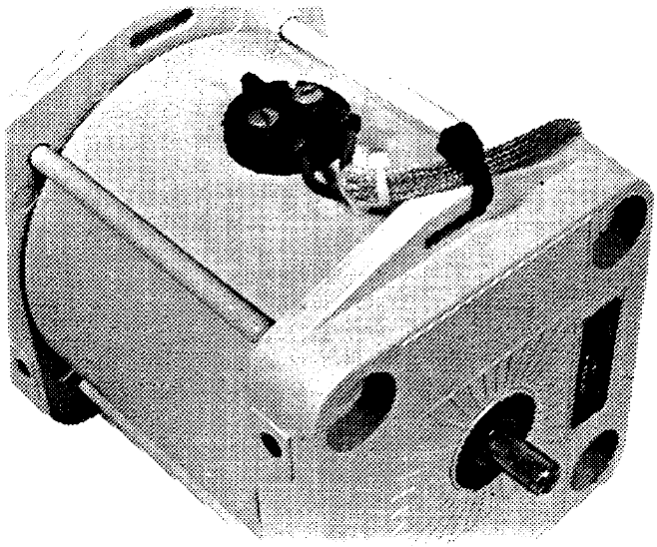

Figure 1. Actuator with Wiring Attached
(Note the tie of the actuator wire to the slot in the side of the actuator. The high-temperature tie included with the actuator should be used.)

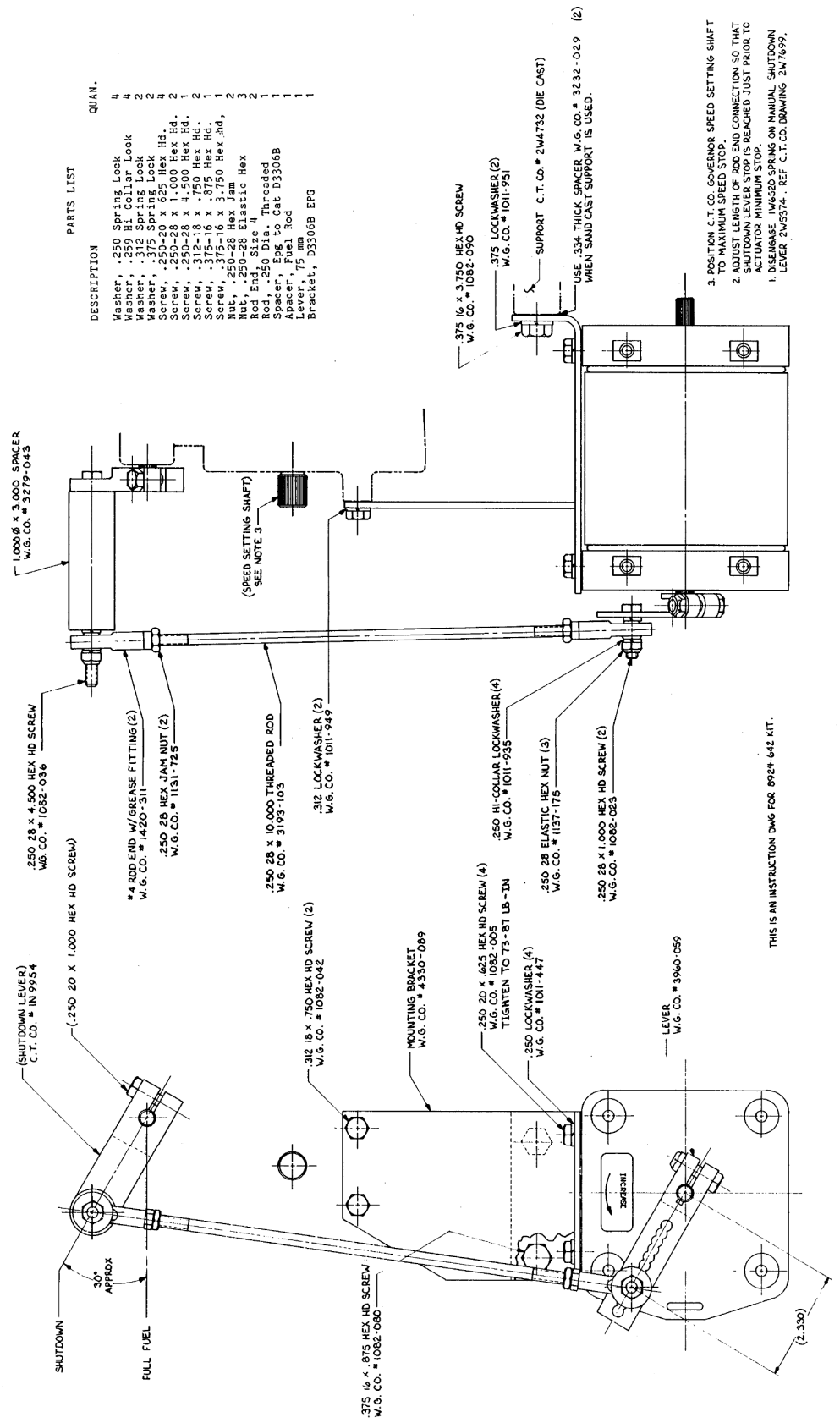

Figure 2. Wiring Schematic

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Send comments to: icinfo@woodward.com

Please reference publication 54101.

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