



Installation Manual

8924-600 Installation Kit

**for EPG 1712/1724 Electric Actuator
on the Caterpillar D3406 Engine**

Manual 54086

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*.

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Introduction

These instructions apply to the EPG 1712/1724 (12 or 24 V) electric actuator manufactured by Woodward as mounted on a Caterpillar D3406 diesel engine driving a generator set. The mounting kit is Woodward part number 8924-600.

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. Before installing the electric actuator the collar and collar lever of the Caterpillar governor should be surface hardened to prevent excessive wear.

Actuator Mounting

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

Install the actuator bracket on the upper it threaded holes of the flywheel housing. Note the arrow points to increase fuel. The actuator shaft to be used points down.

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 78 to 87 lb-in (8.8 to 9.8 N·m).

Linkage Instructions

Assemble the rod end, collapsible link, and jam nuts on the 0.250-28 threaded rod.

The actuator will be at the minimum-fuel position. When the shutdown link is at minimum fuel the two levers should be almost parallel.

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. The collapsible link is used to allow continued operation of the solenoid shutdown. To increase the amount of actuator shaft movement move the rod end closer to the actuator shaft. To decrease the shaft movement move the rod end farther from the actuator shaft.

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

The mechanical speed setting must be locked in the maximum position. 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.

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 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.

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.

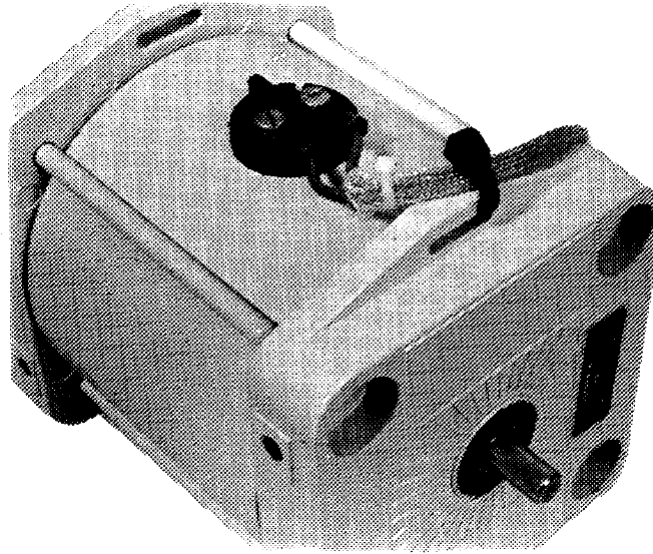


Figure 1. Actuator with Wiring Attached
(Note the tie of the actuator wire to the slot in the side of the actuator. The high-temperature tie included with the actuator should be used.)

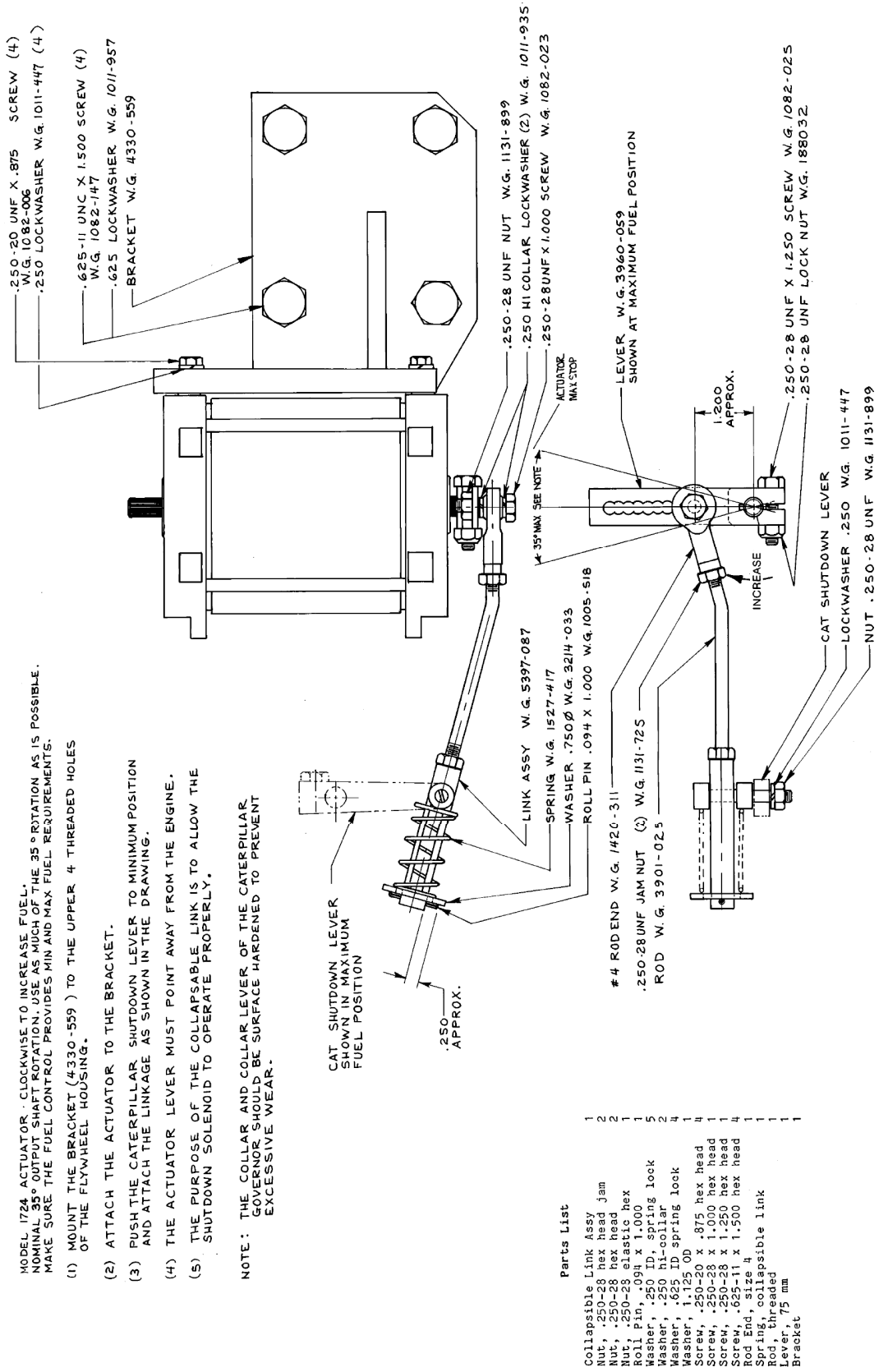


Figure 2. Wiring Schematic

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