



Installation Manual

EG-3P Actuator

**Installation of the Woodward EG-3P Actuator
on the Detroit Diesel I-71 Engine**

Manual 54008

WARNING—DANGER OF DEATH OR PERSONAL INJURY



WARNING—FOLLOW INSTRUCTIONS

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.



WARNING—OUT-OF-DATE PUBLICATION

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WARNING—OVERSPEED PROTECTION

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.



WARNING—PROPER USE

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.

CAUTION—POSSIBLE DAMAGE TO EQUIPMENT OR PROPERTY



CAUTION—BATTERY CHARGING

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.



CAUTION—ELECTROSTATIC DISCHARGE

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).
- Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.
- Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.

IMPORTANT DEFINITIONS

- A **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- A **CAUTION** indicates a potentially hazardous situation which, if not avoided, could result in damage to equipment or property.
- A **NOTE** provides other helpful information that does not fall under the warning or caution categories.

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Introduction

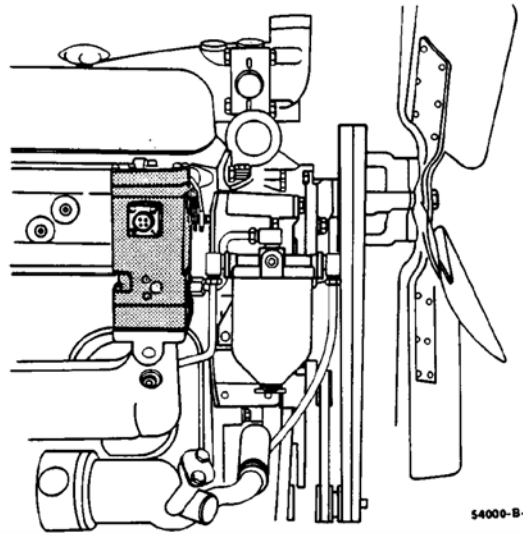
These instructions are for the conversion from the Woodward SG governor to the Woodward EG-3P actuator.

For information concerning electric controls, see manuals:

25070 *Electronic Control Installation Guide*

82510 *Magnetic Pickups and Proximity Switches for Electronic Controls*

82560 *EG-3P Actuator*



Parts List

The installation kit is for use on the Detroit Diesel I-71 engine with drives designed for the SG governor. The parts are sold in kit number 8956-166 which includes items 1 through 15. Items may be purchased separately.



NOTE

When ordering installation replacement parts, give the following information.

1. Manual number 54008
2. Part reference number, name of part, or description of part.

Linkage Kit

(see Figures 1 & 2)

Item	Description	Quantity
54008-1	Washer .250 Hi Collar Lock	2
54008-2	Screw - .250-28 x 100 Hex Head Cap.....	2
54008-3	Lever	1
54008-4	Nut .250-28 Elastic Hex (Thin)	2
54008-5	Rod End - Size 4	1
54008-6	Nut Hex .250-28	1
54008-7	Rod	1
54008-8	Boot – Rubber	1
54008-9	Boot Adapter Assy	1
54008-10	Stud - .312 x 2.500 Body.....	2
54008-11	Washer .312 Helical Spring Lock	2
54008-12	Nut .312-24 Hex (.438 AF)	2
54008-13	Drain Adapter Gasket.....	1
54008-14	Cotter Pin 062 x .500 Long	1
54008-15	Bushing - Magnetic Pickup.....	1
54008-16 through 19	Not Used

Optional EG-3P Connector Assembly Kit

(see Figure 3)

Item	Description	Quantity
54008-20	Kit - EG-3P Connector Assembly	1
	Kit includes the following parts which may be ordered separately:	
54008-21	Plug – Elec. Conn. Size 14.S Straight.....	1
54008-22	Clamp - MS 3057-6A Cable	1
04008-23	Bushing - MX 3420-6 Cable Clamp.....	1

Optional MPU Assembly Kit

(see Figure 4)

Item	Description	Quantity
54008-24	Magnetic Pickup Assembly	1
	Kit includes the following parts which may be ordered separately:	
54008-25	Plug - MS 3106-A 105-L-45	1
54008-28	Clamp - MS 3057-4A Cable	1
04008-27	Bushing - MS 3420-4 Cable Clamp.....	1
04008-28	Magnetic Pickup.....	1

Figures 1 and 2 show the recommended linkage connections and part reference numbers. Figure 3 shows the four-pin connector assembly. Figure 4 shows the magnetic pickup assembly.

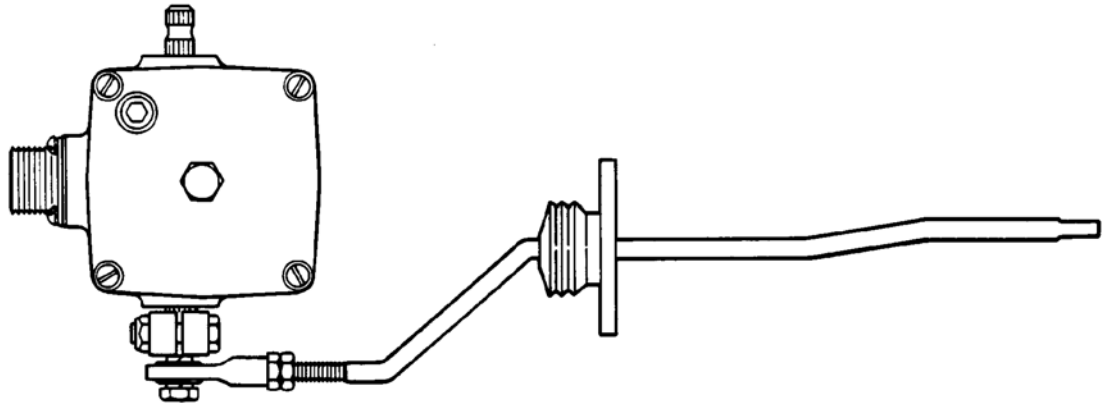


Figure 1. Fuel Rod and Boot Assembly

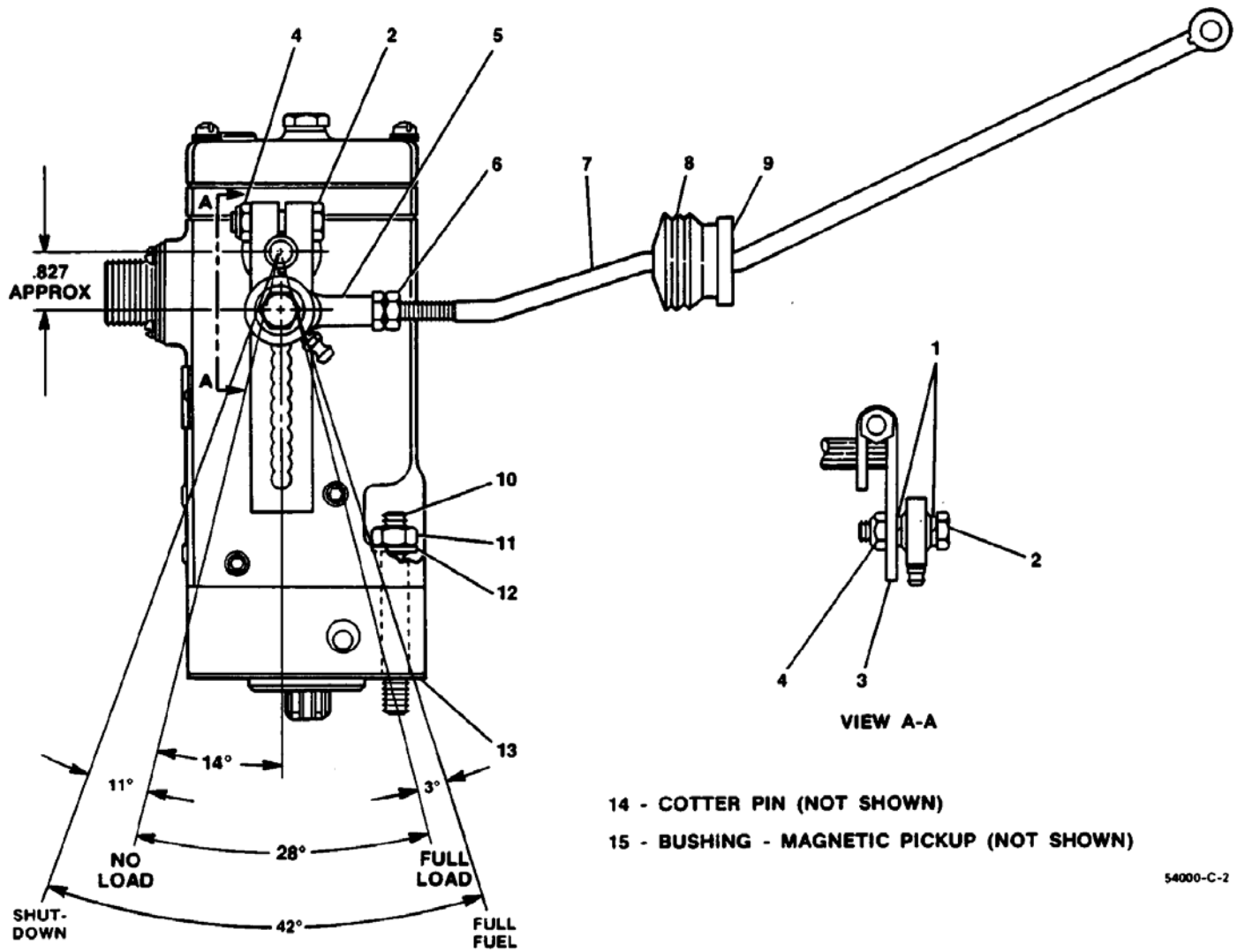
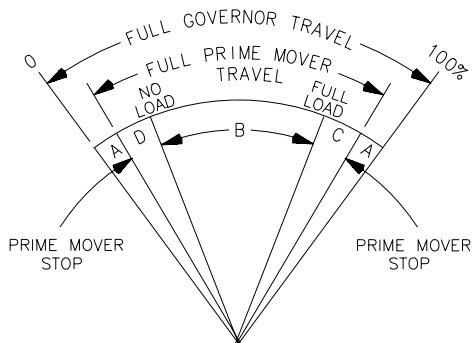


Figure 2. Linkage Connections to EG-3P Actuator

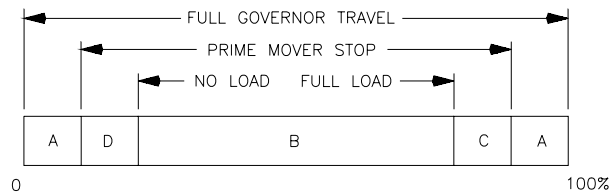
Actuator Installation

See Figures 1 and 2 to install the EG-3P actuator on the engine.

1. Remove the SG governor from the engine.
2. Install hold down studs (10) in the actuator pad.
3. Install drain adapter gasket (13) and the EG-3P actuator on the hold down studs.
4. Install boot adapter assembly (9), boot (8), jam nut (6), and rod end (5) on new fuel rod (7).
5. Attach fuel rod (7) to the engine fuel rack. Use cotter pin (14).
6. Install the actuator on the engine. The linkage must move freely.
7. Attach the terminal lever to the actuator, and adjust travel.



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- A - OVERTRAVEL TO INSURE PRIME MOVER STOPS ARE REACHED.
 B - NO LOAD TO FULL LOAD TRAVEL - NORMALLY 2/3 OF FULL GOVERNOR TRAVEL IS RECOMMENDED.
 C - TRAVEL REQUIRED TO ACCELERATE THE PRIME MOVER.
 D - TRAVEL REQUIRED TO DECELERATE OR SHUT DOWN PRIME MOVER.

Maximum work capacity over full governor travel of 42 degrees is 4.5 ft-lbs. See above for recommended governor output travel. In special applications min and max prime mover stops may be outside the governor stops.



WARNING—MINIMUM/MAXIMUM FUEL POSITIONS

Be sure to allow sufficient undertravel at the min-fuel position so the governor can create a shutdown, and also 3 to 4 degrees overtravel between full load and maximum fuel to ensure better transient performance.

Adjustment of the fuel linkage must provide for control of fuel from SHUTDOWN to FULL FUEL within the limits of the 42 degrees of governor output shaft travel. It must also provide for approximately 28 degrees output shaft travel between NO LOAD and FULL LOAD. Adjust the linkage so the maximum stop of the actuator will prevent the fuel rack from traveling beyond the full fuel position. The fuel injectors must move freely.

8. Install the oil line from the oil reservoir to either of two 1/8" pipe tapped inlet holes of the actuator. A minimum of 5 psi (34 kPa) oil supply pressure is recommended. The supply should be filtered engine oil.
9. Include overspeed shutdown equipment separate from the speed control governor.

Magnetic Pickup Installation

1. Remove the pipe plug in the flywheel housing adjacent to the flywheel teeth.
2. Install the 1.000 - 11 1/2 NPTF magnetic pickup bushing (15) in the flywheel housing.
3. Install the magnetic pickup (24) in the bushing. The magnetic pickup is listed in the optional parts list.
4. The distance between the pickup and the outside diameter of the gear should be approximately 0.040" (1.02 mm) at the closest point. This clearance must be kept through one full turn of the flywheel.



NOTE

Determine the distance by turning the magnetic pickup in until it just touches the gear tooth. Back it out about 3/4 turn (0.0555" [1.410 mm] per one 360° turn ccw).

5. Tighten the jam nut. Be careful not to turn the magnetic pickup.

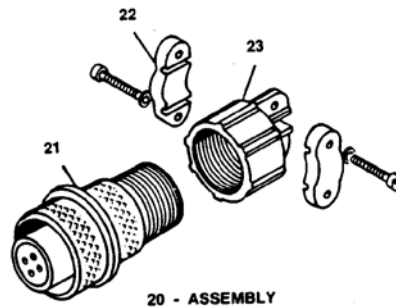


Figure 3. EG-3P Connector Assembly

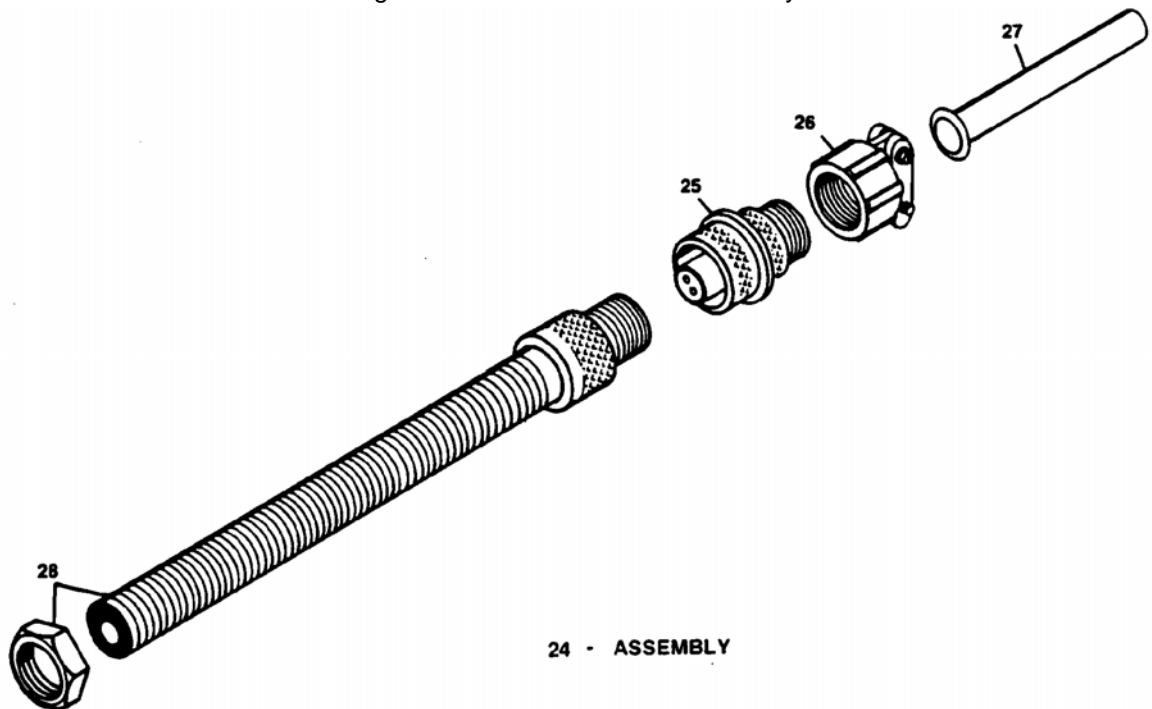


Figure 4. Magnetic Pickup Assembly

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