



**Product Manual 54005**  
**(Revision A)**  
Original Instructions

## **EG-3P Actuator Installation on Detroit Diesel V-149 Engine**

**Kit Installation Manual**



### General Precautions

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.



### Revisions

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### 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.



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## Warnings and Notices

### 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**

**Overspeed /  
Overtemperature /  
Overpressure**

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**

**Personal Protective  
Equipment**

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- Eye Protection
- Hearing Protection
- Hard Hat
- Gloves
- Safety Boots
- Respirator

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

#### **WARNING**

**Start-up**

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

#### **WARNING**

**Automotive  
Applications**

On- and off-highway Mobile Applications: Unless Woodward's control functions as the supervisory control, customer should install a system totally independent of the prime mover control system that monitors for supervisory control of engine (and takes appropriate action if supervisory control is lost) to protect against loss of engine control with possible personal injury, loss of life, or property damage.

**NOTICE****Battery Charging  
Device**

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.

## Electrostatic Discharge Awareness

**NOTICE****Electrostatic  
Precautions**

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.

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*.

Follow these precautions when working with or near the control.

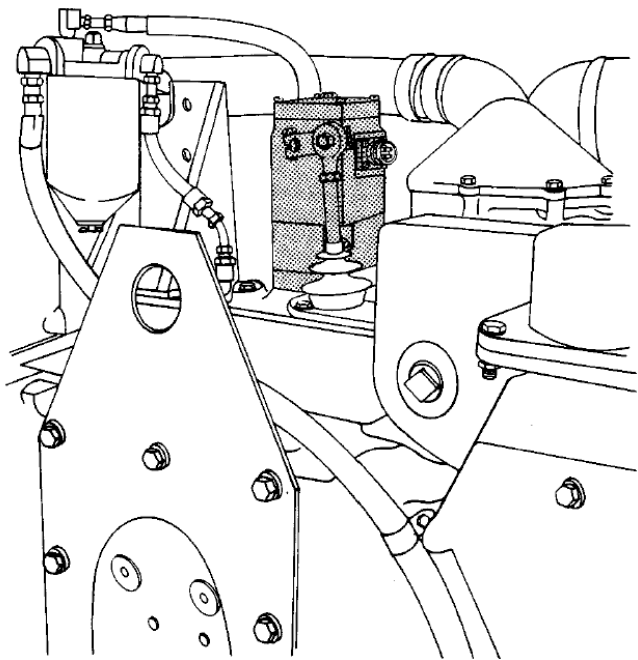
1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
  - Do not touch any part of the PCB except the edges.
  - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
  - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

# EG-3P Actuator Installation on Detroit Diesel V-149 Engine

## Introduction

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

For information about electric controls, see manuals:  
25070, Electric Governor Installation Guide  
82516, EG-3P Product Specification  
82560, EG-3P Manual



## Parts List

The installation kit is for use on the Detroit Diesel V-149 engines with drives designed for the Woodward SG governor. The parts are sold in kit number 8956-142 which includes item 1 through 9. Items may be purchased separately.

When ordering replacement parts, give the following information.

- Manual Number 54005
- Part reference number, name of part, or description of part

Ref. No.	Part Name .....	Quantity
54005-1	Stud-Body .....	2
54005-2	Nut-0.312-24 Hex (.438 A/F) .....	2
54005-3	Washer -0.312 Helical Spring Lock .....	2
54005-4	Gasket - Drain Adapter .....	1
54005-5	Plate - Control Rod DDAD V-149 .....	1
54005-6	Rod - 0.312-24 x 6.000 Connecting .....	1
54005-7	Screw - 0.312-24 x 1.750 Hex Head Cap...1	
54005-8	Washer - 0.312 H. Collar Lock .....	2
54005-9	Spacer- 0.344 ID x 0.610 Long .....	1

**IMPORTANT**

Items 10 through 20 are not made available by Woodward. They are normally included by the engine manufacturer as part of the SG governor installation arrangement.

Ref. No.	Part Name .....	Quantity
54005-10	Hex Head Screw .....	1
54005-11	Washer .....	1
54005-12	Lever - 0.82 Radius .....	1
54005-13	Rod End Size 5 R.H. Thread .....	1
54005-14	Jam Nut 0.312-24 RH. Thread .....	1
54005-15	Accordion Boot - Connecting Rod .....	1
54005-16	Jam Nut 0.312-24 LH. Thread .....	1
54005-17	Rod End - Size 5 L.H. thread .....	1
54005-18	Gasket - Control Rod Plate Assy. ....	1
54005-19	Bolt and Washer 1/4 - 20 x 1.000 .....	1
54005-20	Bolt and Washer 1/4 - 20 x 0.750 .....	2
54005-21	through 25 NUMBERS NOT USED .....	2

### Optional Parts Available from Woodward

Ref. No.	Part Name .....	Quantity
54005-26	Kit - EG-3P Connector Assembly .....	1
	Kit includes the following parts which may be ordered separately:	
54005-27	Plug - Elec Conn. Size 14.5 Straight .....	1
54005-28	Clamp - Cable MS 3057-6A .....	1
54005-29	Bushing - Cable Clamp MS 3420-6 .....	1
54005-30-35	NUMBERS NOT USED	

Ref. No.	Part Name .....	Quantity
54005-36	Magnetic Pickup Assembly .....	1
	Kit includes the following parts which may be ordered separately:	
54005-37	Plug - MS 3106-A 105-L-45 .....	1
54005-38	Clamp - MS 3057-4A Cable .....	1
54005-39	Bushing - MS 3420-4 Cable Clamp .....	1
54005-40	Magnetic Pickup .....	1

### Actuator Installation

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

1. Remove the SG governor from engine.
2. Install two hold down studs (1) in the actuator pad.
3. Remove the SG control rod plate.
4. Install new control rod plate (5) (see Figure 2).
5. Install new connecting rod.(6)
6. Install the accordion boot.
7. Install drain adapter gasket (4) over hold down studs.
8. Install rod end (13) and spacer (9) on output lever (12).

9. Install the EG-3P on the engine.
10. Connecting linkage must move freely.
11. Install output lever (12) to the output shaft and adjust.
12. Install the oil line from the oil reservoir to either of two 1/8" pipe tapped inlet holes marked with an "S" on the base of the actuator. A minimum of 5 psi (34 kPa) oil supply pressure is needed. The supply should be filtered engine oil.
13. Include overspeed shutdown equipment separate from the speed control governor.

**IMPORTANT**

Use approximately 21° actuator output shaft travel from no fuel to full fuel. 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.

## Magnetic Pickup Installation

1. Install the magnetic pickup in the flat surface used for the engine support bracket on the right side of engine. Drill an access hole in the engine support bracket and flywheel housing for the magnetic pickup. See Figure 3, Views A and B for location and dimensions of magnetic pickup hole.

The magnetic pickup is listed in the optional parts list.

2. 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.

**IMPORTANT**

Find 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).

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

Figure 1, Views A and B shows the linkage arrangement and reference numbers. Figure 1, View C, shows the new control rod plate. Figure 2 shows the control rod plate in relation to the EG-3P actuator. Figure 3 shows the location of the magnetic pickup and dimensions for drill and tap. Figure 4 shows the connector assembly. Figure 5 shows the magnetic pickup assembly.

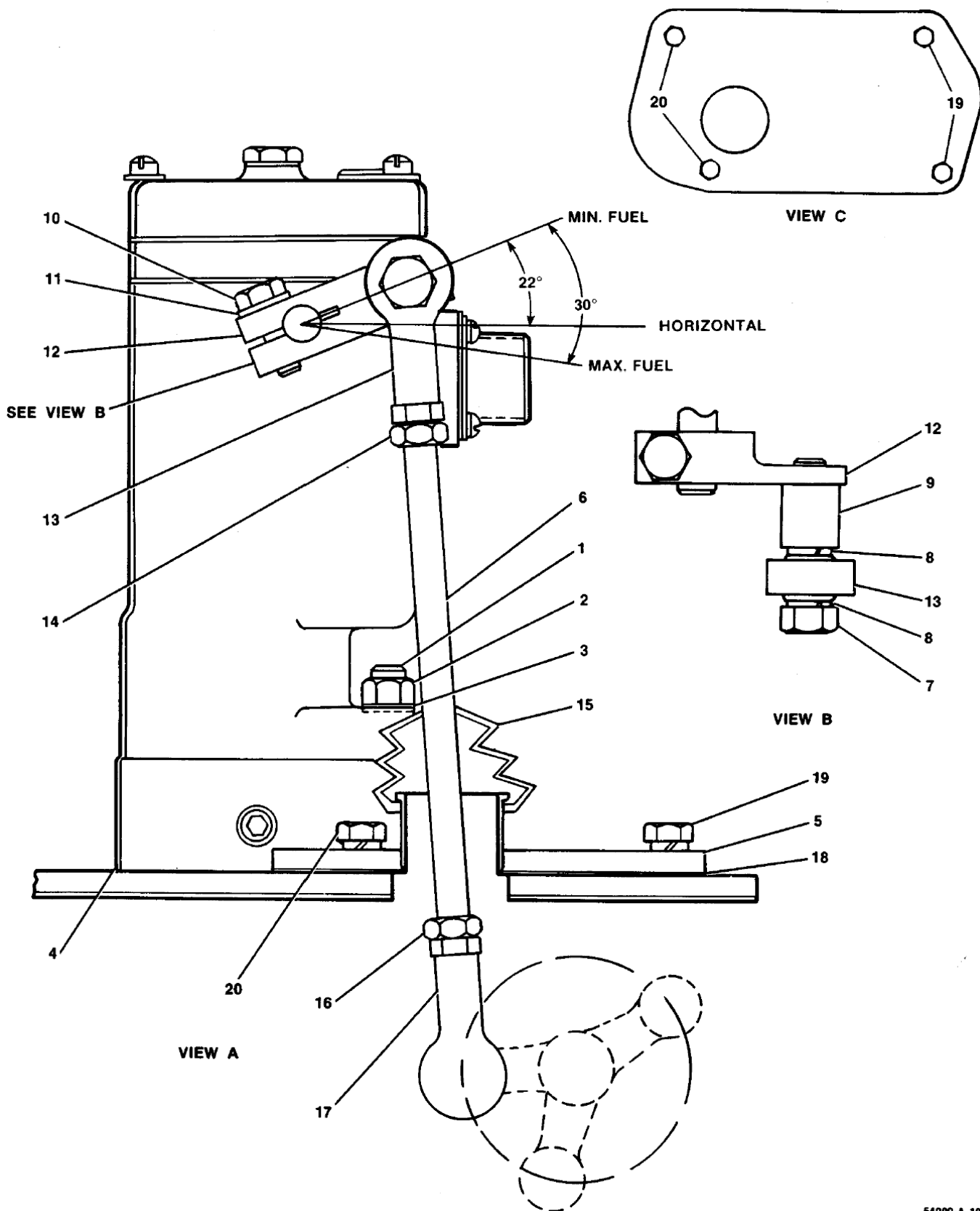


Figure 1. Linkage Arrangement



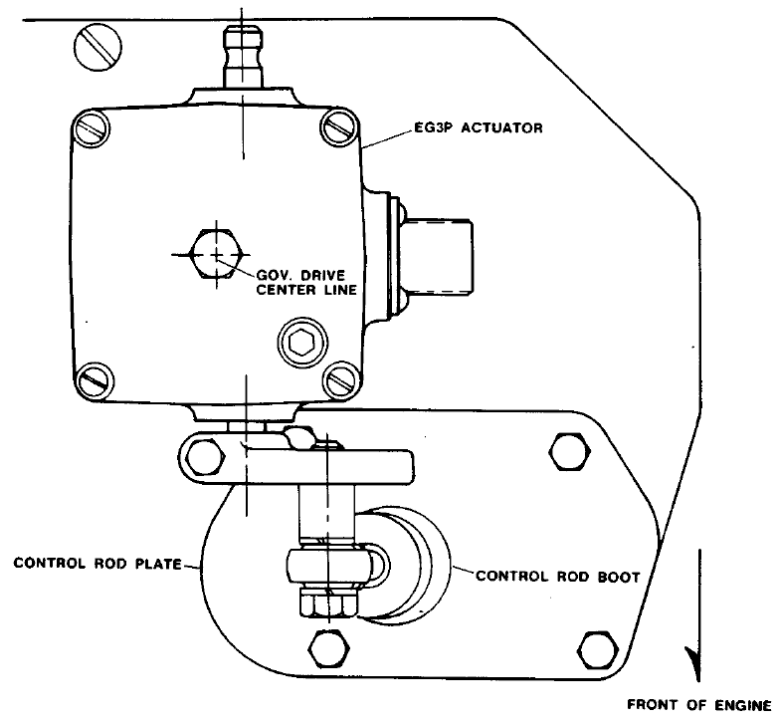
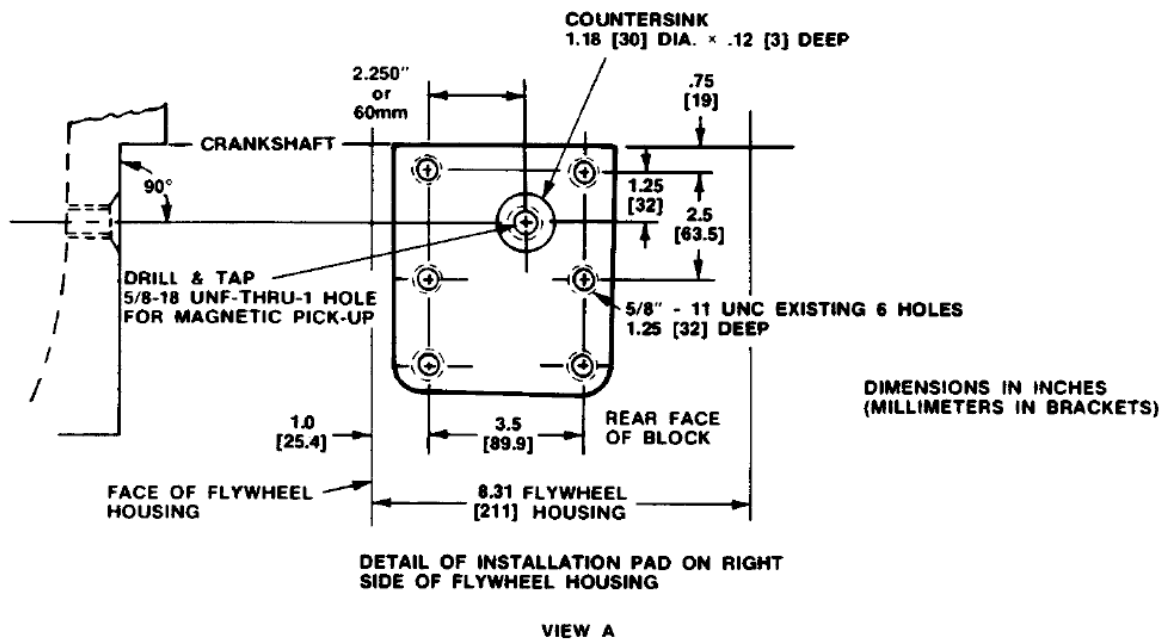
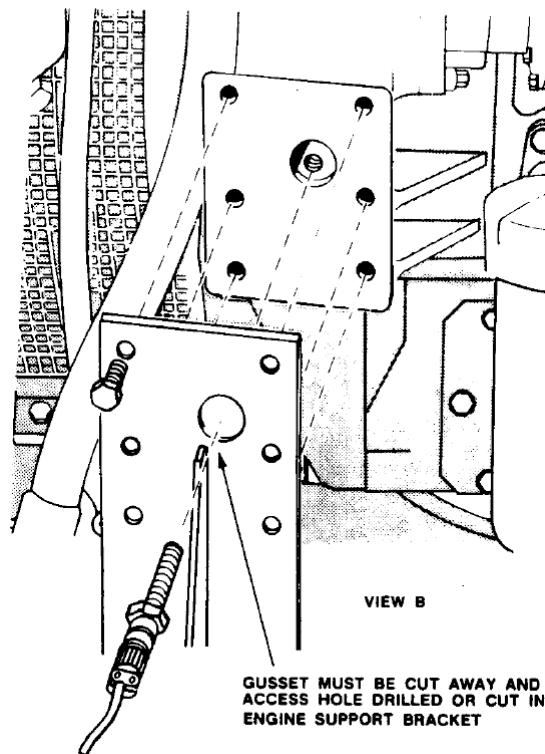


Figure 2. View of Control Rod Plate in Relation to EG-3P Actuator



**ILLUSTRATION OF ENGINE  
SHOWING INSTALLATION BRACKET**



**Figure 3. Magnetic Pickup Installation**  
(location of magnetic pickup in installation pad on right side of flywheel housing)

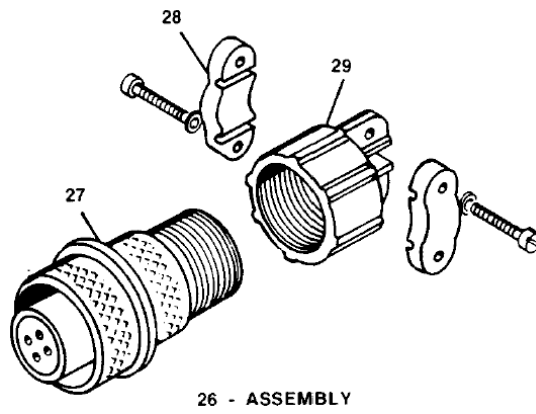
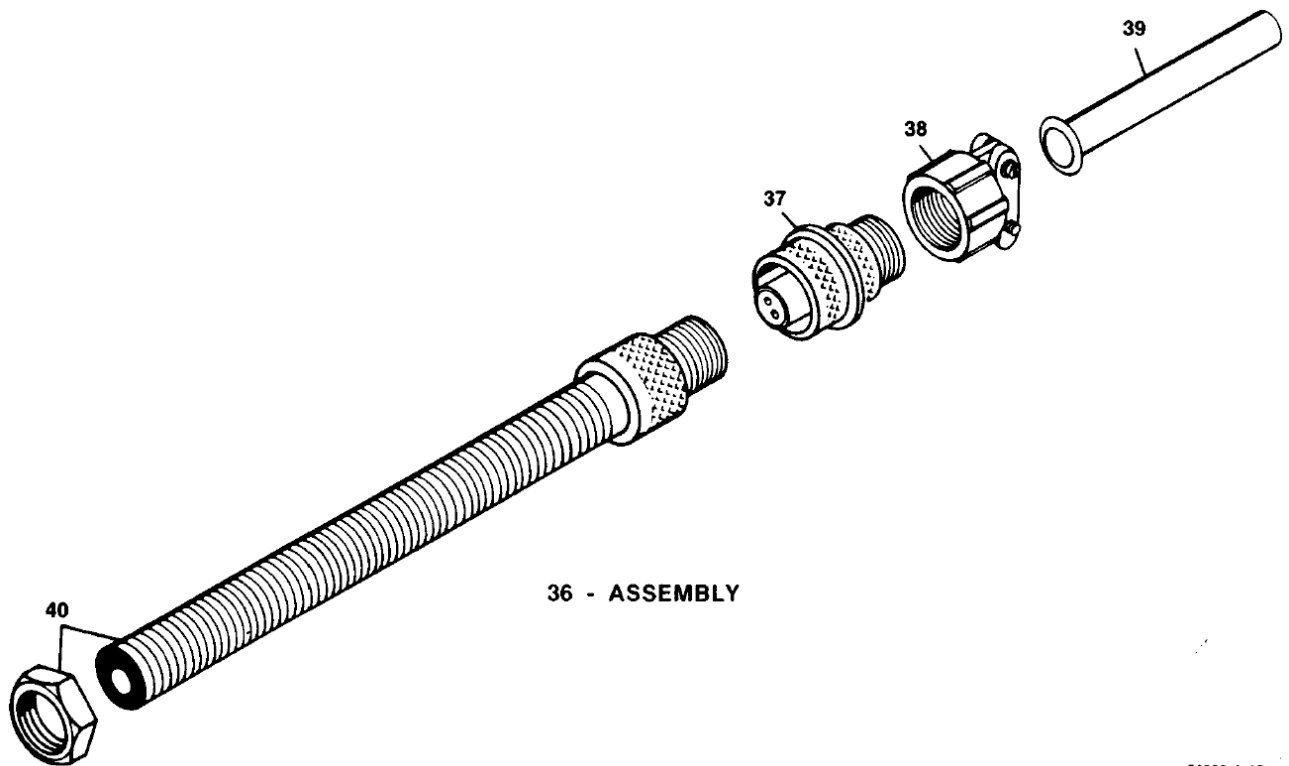


Figure 4. EG-3P Connector Assembly



54000-A-17

Figure 5. Magnetic Pickup Assembly

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