WOODWARD

Product Manual 03105
(Revision B)
Original Instructions

3161 Governor

Electric Shutdown Device for the 3161 Governor (Energize to Shutdown/Energize to Run)

Installation and Operation 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.

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, be sure to check the *publications page* on the Woodward website:

www.woodward.com/publications

The current revision and distribution restriction of all publications are shown in manual *26311*.

The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

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*.

Contents

Illustrations and Tables

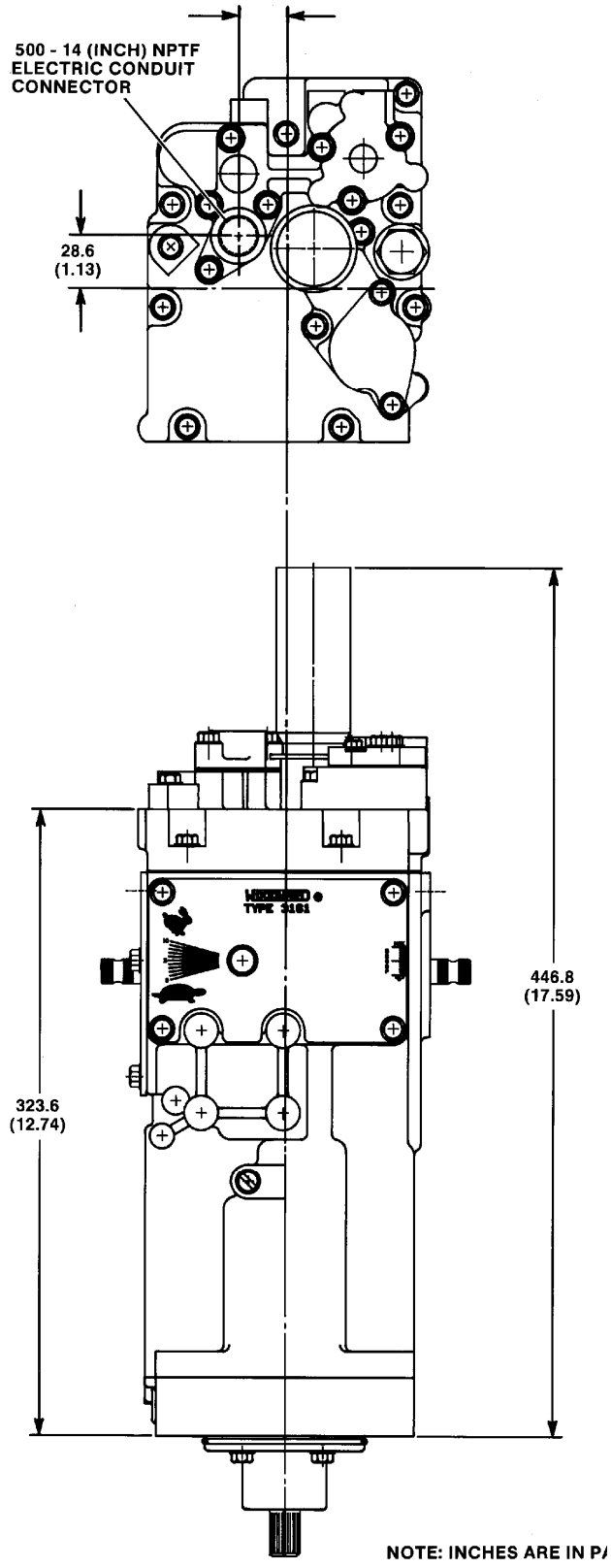

Figure 1-1. Outline of the 3161 Governor with Electric Shutdown Device

Chapter 1.
General Information

Introduction

This manual describes the installation and operation of the Woodward Electric Shutdown Device available for installation on the 3161 governor.

Description

The Electric Shutdown Device (Figure 2-2) is installed on top of the right front corner of the 3161 cover. The device is a solenoid that positions a shutdown lever and limit/shutdown pilot valve.

Energize to Shutdown Version

As the solenoid is energized, the left end of the shutdown lever is raised, pivots on a pin, and lowers the right end of the lever onto the limit/shutdown pilot valve, resulting in governor shutdown (Figure 1-2).

Energize to Run Version

As long as the solenoid is energized, the left side of the lever is forced down. Through the pivot pin, this keeps the right side of the lever lifted, so the shutdown is not engaged. When the solenoid is de-energized, the return spring forces the right side of the lever down, resulting in governor shutdown (Figure 1-3).

The Electric Shutdown Device can be used by itself or in conjunction with Manual or Pressure Shutdown Devices, as shown in Figures 2-3, 2-4, and 2-5.

⚠WARNING **The Electric Shutdown Device must be used only as a normal shutdown device. A separate overspeed trip shutdown device must be added to provide overspeed protection.**

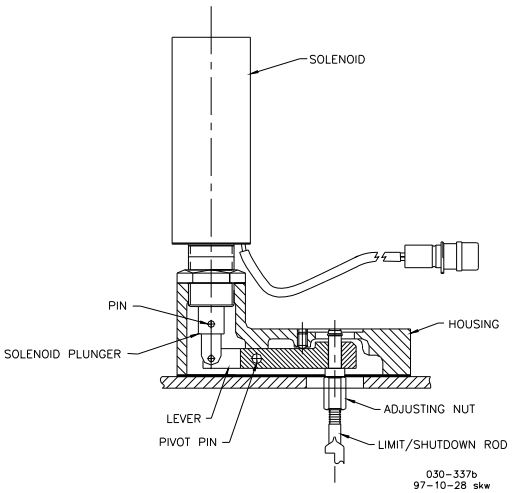

Figure 1-2. Schematic of Electric Shutdown Device (Energize to Shutdown)

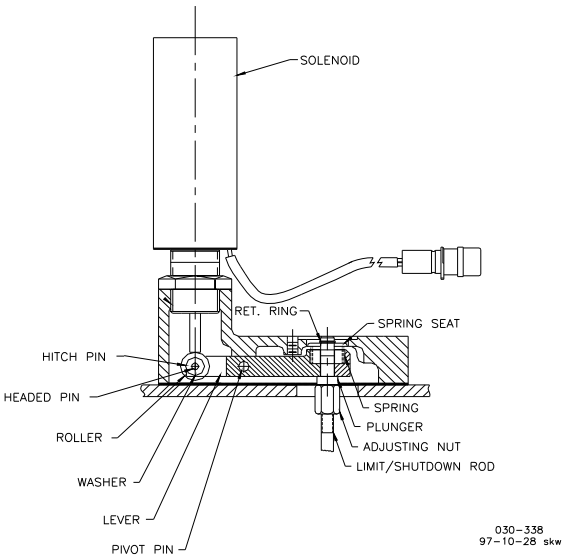

Figure 1-3. Schematic of Electric Shutdown Device (Energize to Run)

References

03101	*3161 Governor*
03102	*3161 Governor* (product specification)
03103	*3161 Governor, Manual Shutdown Device*
03104	*3161 Governor, Pressure Shutdown Device*
03106	*3161 Governor, Pneumatic Speed Setting Device* (factory installed only)
03107	*3161 Governor, Speed Adjusting Motor with Manual Speed Adjustment* (factory installed only)
03108	*3161 Governor, Air Pressure Fuel Limiter* (factory installed only)
03109	*3161 Governor, Load Limit Control* (factory installed only)
25075	*Storage of Mechanical-Hydraulic Controls*

Chapter 2.
Installation

Introduction

This chapter covers the installation of the Electric Shutdown Device and the adjustments of the Shutdown Nut. The 3161 governor and the Electric Shutdown Device are precision instruments and should be handled carefully.

IMPORTANT

The Electric Shutdown Device was calibrated and tested at the factory. If the device was purchased for installation on a governor already in service, NO FURTHER ADJUSTMENT IS NECESSARY.

Shutdown Nut Adjustment

Check the adjustment of the shutdown nut on governors that have been overhauled. Use the following steps.

1. Remove all dirt, grease, water or any other foreign material from the governor cover.

2. Remove two 3/8 inch hex head 1/4-20 screws (1), shutdown cover plate (2), and gasket (3) from the governor cover (Figure 2-1). Remove the shutdown device(s) if so equipped.

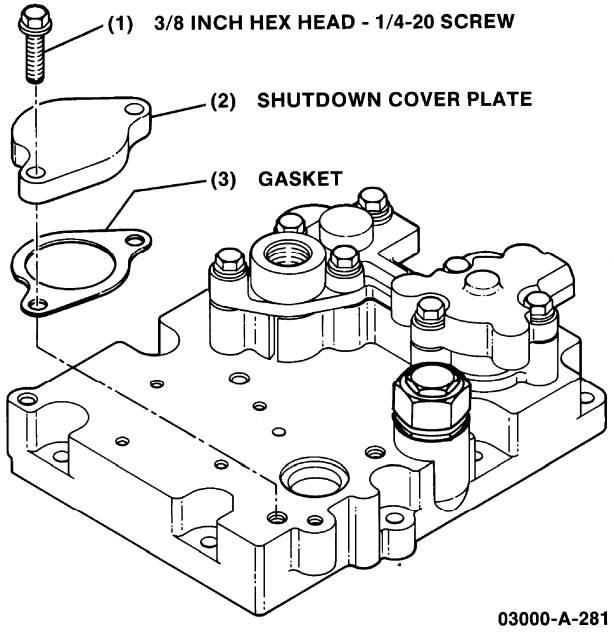

Figure 2-1. Governor Cover

⚠WARNING

Rotate the output shaft of the governor to the minimum fuel position and adjust the prime mover linkage to cause shutdown.

3. Start the prime mover. With the governor operating, place a straightedge across the opening in the cover and across the shutdown nut.

WARNING

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.

4. Turn the nut counterclockwise until the governor just starts to cause shutdown, then turn it one full turn clockwise.

Installation Procedure

Electric Shutdown Device on Plain Cover

Use this section when installing the Electric Shutdown Device on a plain cover (no other shutdown device already on the cover):

1. Remove two screws (1), shutdown cover plate (2), and cover plate gasket (3), from the governor cover (Figure 2-1).

2. Refer to Figures 2-2 (Electric Shutdown Device), 4-1 (Parts for ETS Electric Shutdown Device), and 4-2 (Parts for ETR Electric Shutdown Device). Place gasket (5) on the governor cover. Place the Electric Shutdown Device on the cover and secure it with three screws (4).

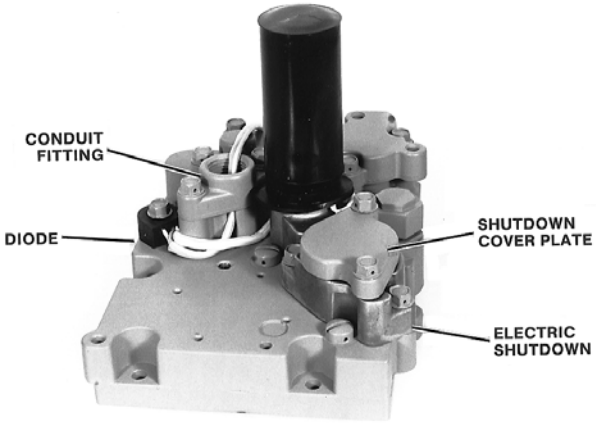

Figure 2-2. Electric Shutdown Device

3. Attach the diode (if provided) to the cover as shown in Figure 2-2. Thread the electrical leads from the diode (16) up through the conduit fitting on the cover.

4. Install the shutdown cover plate and gasket on the Electric Shutdown Device and secure it with two screws. Torque all 1/4-20 screws to 90 lb-in (10.2 N·m).

PROCEED TO THE **ELECTRIC SOLENOID AND DIODE TEST** PROCEDURE IN CHAPTER 3.

Electric Shutdown Device with Manual Shutdown

Use this section when installing the Electric Shutdown Device on a cover that has a Manual Shutdown already in place:

1. Remove two screws, and lift the Manual Shutdown and shutdown gasket from the governor cover.

2. Refer to Figures 2-3 (Electric Shutdown Device with Manual Shutdown), 4-1 (Parts for ETS Electric Shutdown Device), and 4-2 (Parts for ETR Electric Shutdown Device). Place gasket (5) on the governor cover. Place the Electric Shutdown Device on the cover and secure it with three screws.

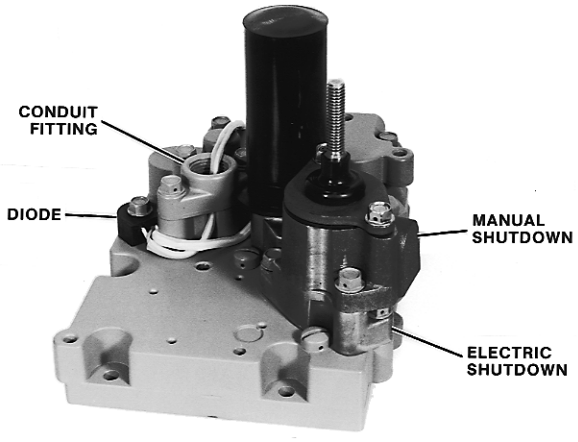

Figure 2-3. Electric Shutdown Device with Manual Shutdown

3. Attach the diode (16) to the cover as shown in Figure 2-3. Thread the electrical leads from the diode up through the conduit fitting on the cover.

4. Install the Manual Shutdown with gasket on the Electric Shutdown Device and secure it with two screws. Torque all 1/4-20 screws to 90 lb-in (10.2 N·m).

PROCEED TO THE **ELECTRIC SOLENOID AND DIODE TEST** PROCEDURE IN CHAPTER 3.

Electric Shutdown Device with Pressure Shutdown

Use this section when installing the Electric Shutdown Device on a cover that has a Pressure Shutdown already in place:

1. Remove two screws, and lift the Pressure Shutdown and shutdown gasket from the governor cover.

2. Refer to Figures 2-4 (Electric Shutdown Device with Pressure Shutdown), 4-1 (Parts for ETS Electric Shutdown Device), and 4-2 (Parts for ETR Electric Shutdown Device). Place gasket (5) on the governor cover. Place the Electric Shutdown Device on the cover and secure it with three screws.

3. Attach the diode (16) to the cover as shown in Figure 2-4. Thread the electrical leads from the diode up through the conduit fitting on the cover.

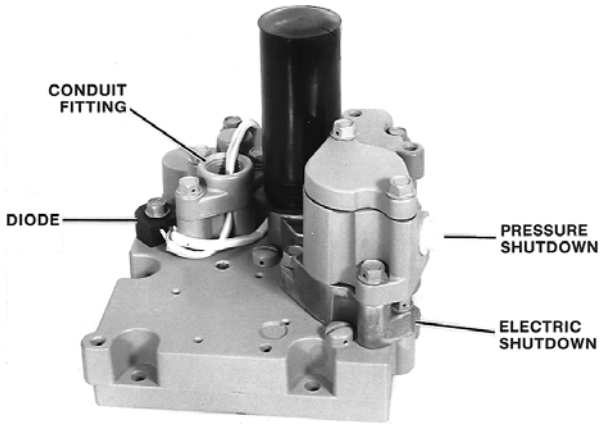

Figure 2-4. Electric Shutdown Device with Pressure Shutdown

4. Install the Pressure Shutdown and shutdown gasket on the Electric Shutdown Device and secure it with two screws. Torque all 1/4-20 screws to 90 lb-in (10.2 N·m).

PROCEED TO THE **ELECTRIC SOLENOID AND DIODE TEST** PROCEDURE IN CHAPTER 3.

Electric Shutdown Device with Manual Shutdown and Pressure Shutdown

Use this section when installing the Electric Shutdown Device on a cover that has both a Manual Shutdown and a Pressure Shutdown already in place:

1. Remove two screws from the Pressure Shutdown. Remove the Pressure and Manual shutdowns as one unit. Remove the shutdown gasket.

2. Refer to Figures 2-5 (Electric Shutdown Device with Manual and Pressure Shutdown), 4-1 (Parts for ETS Electric Shutdown Device), and 4-2 (Parts for ETR Electric Shutdown Device). Place gasket (5) on the governor cover. Place the Electric Shutdown Device on the cover and secure it with three screws.

3. Attach the diode (16) to the cover as shown in Figure 2-5. Thread the electrical leads from the diode up through the conduit fitting on the cover.

4. Install the Manual and Pressure Shutdowns with shutdown gasket on the Electric Shutdown Device. Secure them with two screws. Torque all 1/4-20 screws to 90 lb-in (10.2 N·m).

PROCEED TO THE **ELECTRIC SOLENOID AND DIODE TEST** PROCEDURE IN CHAPTER 3.

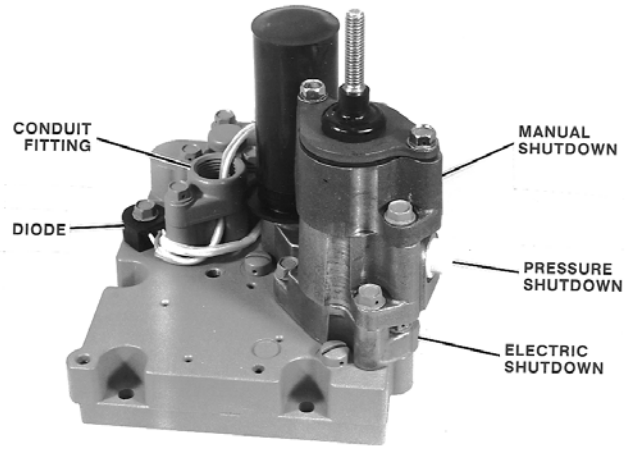

Figure 2-5. Electric Shutdown Device with Manual Shutdown and Pressure Shutdown

Chapter 3.
Repair and Test Procedures

Introduction

This chapter provides instruction for troubleshooting, repair, and calibration of the Electric Shutdown Device.

Use the following troubleshooting guide to troubleshoot the Electric Shutdown Device. Determine first if you have an ETS (energize to shutdown) or ETR (energize to run) Electric Shutdown Device.

Troubleshooting for ETS Electric Shutdown Device

This section describes troubleshooting for the ETS (energize to shutdown) Electric Shutdown Device.

If the governor does not shut down the prime mover when the Electric Shutdown Device is energized, follow this procedure to correct the problem.

Problem	Action
Is the correct voltage available to the shutdown? Is correct polarity observed?	Supply the correct voltage with the correct polarity (+ to red, – to black).
Is the shutdown nut on the limit/shutdown rod set correctly?	Readjust the shutdown nut. Refer to Chapter 2, Shutdown Nut Adjustment.
Is the solenoid set to allow the correct stroke of the solenoid plunger?	Reset the solenoid. Refer to Assembly Procedure, step 6.
Are the solenoid coil (14) and diode (16) functioning correctly? Refer to Electric Solenoid and Diode Test.	Replace the solenoid and diode if they are not functioning correctly.
Is the linkage from the governor to the prime mover set correctly?	Refer to the prime mover specifications for proper setting of the linkage.

If the governor does not allow the prime mover to start, follow this procedure to correct the problem.

Problem	Action
Is the Electric Shutdown Device energized?	If the Electric Shutdown Device is tied into a failsafe system., be sure that no condition exists which calls for start prevention. If the Electric Shutdown Device is NOT part of a failsafe system, de-energize the shutdown device.
Is the shutdown nut adjusted correctly?	Readjust the shutdown nut. Refer to Chapter 2, Shutdown Nut Adjustment.
Is the solenoid (14) adjusted correctly?	Readjust the solenoid. Refer to Assembly Procedure, step 6.
Is the shutdown lever (8) adjusted correctly?	Readjust the shutdown lever. Refer to Assembly Procedure and Figure 3-3.
Is the shutdown linkage inside the governor stuck or binding?	Repair or adjust the linkage.
Is the linkage from the governor to the prime mover adjusted correctly?	Refer to the prime mover specifications for proper setting of the linkage.

Troubleshooting for ETR Electric Shutdown Device

This section describes troubleshooting for the ETR (energize to run) Electric Shutdown Device.

If the governor does not shut down the prime mover when the Electric Shutdown Device is de-energized, follow this procedure to correct the problem.

Problem	Action
Is the shutdown nut on the limit/shutdown rod set correctly?	Readjust the shutdown nut. Refer to Chapter 2, Shutdown Nut Adjustment.
Is the solenoid set to allow the correct stroke of the solenoid plunger?	Reset the solenoid. Refer to Assembly Procedure, step 6.
Is the shutdown lever (8) adjusted to allow enough stroke to cause shutdown?	Adjust the lever adjustment screw (3). Refer to Figure 3-3.
Is the linkage from the governor to the prime mover set correctly?	Refer to the prime mover specifications for proper setting of the linkage.

If the governor does not allow the prime mover to start, follow this procedure to correct the problem.

Problem	Action
Is the Electric Shutdown Device energized to the correct voltage? Is correct polarity observed?	If the Electric Shutdown Device is tied into a failsafe system., be sure that no condition exists which calls for start prevention. Check the part of the control system that controls the solenoid signal. Supply the correct voltage with the correct polarity (+ to red, – to black).
Is the shutdown nut adjusted correctly?	Readjust the shutdown nut. Refer to Chapter 2, Shutdown Nut Adjustment.
Is the solenoid (14) adjusted correctly to allow the correct stroke of the solenoid plunger?	Readjust the solenoid. Refer to Assembly Procedure, step 6.
Is the shutdown lever (8) adjusted correctly to allow enough stroke to release the shutdown linkage?	Readjust the shutdown lever. Refer to Assembly Procedure and Figure 3-3.
Is the shutdown linkage inside the governor stuck or binding?	Repair or adjust the linkage.
Are the solenoid coil (14) and diode (16) functioning correctly? Refer to Electric Solenoid and Diode Test.	Replace the solenoid and diode if they are not functioning correctly.
Is the linkage from the governor to the prime mover adjusted correctly?	Refer to the prime mover specifications for proper setting of the linkage.

Electric Solenoid and Diode Test

(See Figure 3-1.)

Before disassembling the Electric Shutdown Device, determine if the solenoid and diode are operational by doing the following test:

1. Disconnect the green and yellow leads from the power supply.

2. Using an ohmmeter, connect the (+) positive lead to the yellow wire and the (–) negative lead to the green wire. The resistance should read 100 to 1000 Ω. If it reads less than 100 or greater than 1000 Ω, or if when the leads are reversed resistance is less than 20 kΩ, cut the white wires leading from the solenoid and proceed to steps A and B.

   If resistance (as measured in step 2 above) is between 100 and 1000 Ω, reverse polarity and measure resistance. Resistance should be 20 kΩ to infinity. If resistance is less than 20 kΩ, cut the white wires leading from the solenoid and proceed to steps A and B.

IMPORTANT

Resistance measurements taken with high impedance meters (DVOMs, Fluke 8020A etc.) will read higher than the same measurements taken with low impedance meters (VOMs, Simpson 260, 270, etc).

Step A

(a) Measure resistance of the solenoid coil.

(b) If coil resistance is less than 50 Ω, replace the solenoid and diode. If coil resistance is greater than 60 Ω, replace the solenoid. (Refer to the Assembly Procedure, step 6, to install and adjust the new solenoid.)

Step B

(a) Check for continuity between the (–) green and (–) #2 white wire. With (+) positive lead on the yellow wire, and the (–) negative lead on the #1 white wire, measure and compare the reading when meter lead polarity is changed. Reading with (+) yellow and (–) #1 white should be low (40 to 1000 Ω), and (–) yellow and (+) #1 white should be high (20 kΩ to infinity). If the readings are not within these limits, replace the diode.

(b) With (+) positive lead on the green wire and (–) negative lead on the #1 white wire, measure and compare the reading when meter lead polarity is changed. Reading with (+) green and (–) #1 white should be low (40 to 1000 Ω) and (–) green and (+) #1 white should be high (20 kΩ to infinity). If the readings are not within these limits, replace the diode.

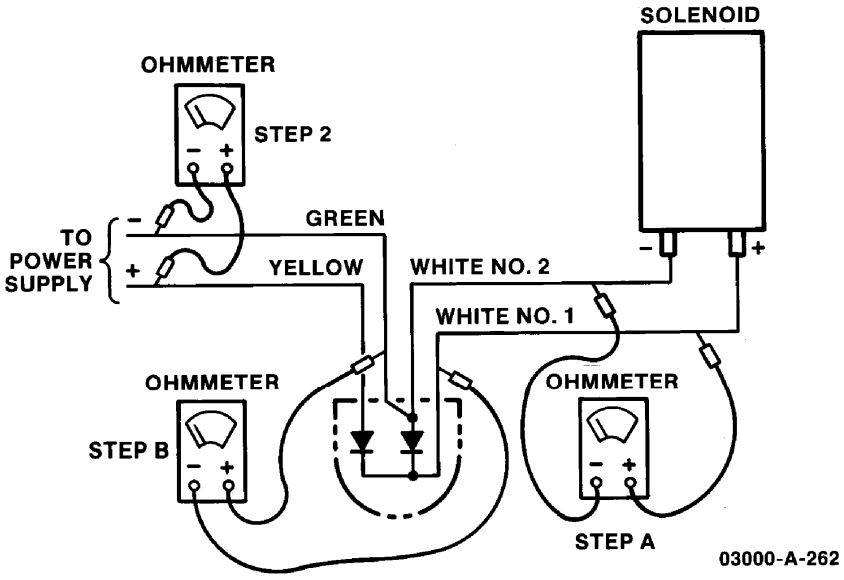

Figure 3-1. Test Schematic for Electric Shutdown

IMPORTANT **If the solenoid and diode have been checked and found to be functional, or have been replaced, further disassembly of the device may not be needed. If additional repair is necessary, proceed next to Disassembly.**

Before attempting the disassembly of the Electric Shutdown Device, remove all dirt, grease, water and other contaminants from the device.

⚠CAUTION **Wear approved eye protection to prevent possible eye injury during disassembly, cleaning, and assembly of parts.**

Disassembly

(Refer to Figures 4-1 and 4-2.)

1. Turn the control switch to the OFF position. Disconnect the Electric Shutdown Device from the power supply.

2. Remove the 3/8 inch hex head 1/4-20 screw (17) from the diode on the governor cover.

3. Push the wire leads down through the conduit fitting.

4. Remove the shutdown cover plate and any other shutdown device from the Electric Shutdown Device.

5. Remove three screws (4) and the Electric Shutdown Device from the governor cover.

6. Refer to Figure 3-2. Press pin (1) from the shutdown housing (2). Remove two washers (10) and the shutdown lever assembly.

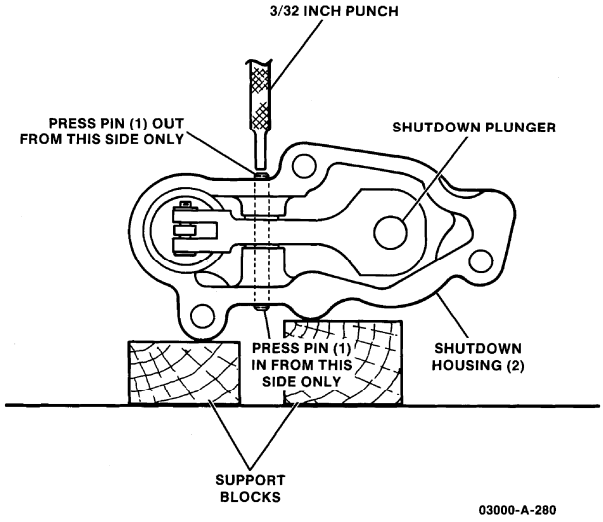

Figure 3-2. Removing Pin from Shutdown Housing

7. For ETS (energize to shutdown) version, remove retaining ring (7) and shutdown plunger (9). For ETR (energize to run) version, remove spring seat (21) and spring (22), then remove retaining ring (7) and shutdown plunger (9).

8. For ETS version, remove cotter pin(s) (12), washer(s) (11), headed pins (6/20), and shutdown link (13). For ETR version, remove cotter pin (12), washer (11), headed pin (6), and roller (24).

Cleaning

Clean parts with solvent and a stiff brush to remove foreign particles.

⚠CAUTION **Follow the manufacturer's instructions or restrictions regarding the use of solvents. If no instructions are available, handle with care. Use cleaning solvent in a well ventilated area away from fires or sparks.**

Dry parts with clean, lint-free wipes, or blow dry with clean dry air.

Handle parts that have been machined to a close tolerance carefully, to prevent damage caused by contact with other parts or objects.

Part Inspection

(Refer to Figures 4-1 and 4-2.)

Solenoid (14/19/25) and Diode (16).

These parts were tested before disassembly began. No further testing is required.

Pin (1).

Inspect pin (1) for wear in area of contact with lever (8).

Headed Pins (6/20).

Inspect pin(s) (6/20) for wear in the area of contact with shutdown link (13) or roller (24).

Shutdown Plunger (9).

Inspect shutdown plunger for wear and damage in the area of contact with shutdown nut.

Solenoid Shutdown Link (13).

Inspect link for wear or elongation of pin holes.

Solenoid Shutdown Roller (24)

Inspect roller for wear on OD from solenoid plunger and on ID from pin.

Assembly

To prepare to assemble the Electric Shutdown Device, lay the parts in an orderly fashion on a clean dry work surface.

Use only new gaskets and cotter pins. Careful and precise assembly methods will save time, and help to ensure correct operation of the shutdown.

Torque all 1/4-20 screws to 90 lb-in (10.2 N·m).

Assembly Procedure for ETS Version

Refer to Figures 3-3 and 4-1, and do the following for the energize to shutdown version:

1. Connect one end of shutdown link (13) to the solenoid plunger with headed pin (6), washer (11), and cotter pin (12) [old style solenoid], or using headed pin (20) only [new style solenoid].

2. Connect shutdown lever (8) to shutdown link (13) with headed pin (6), washer (11), and cotter pin (12).

3. Install shutdown plunger (9) in shutdown lever (8) with retaining ring (7). Be sure plunger moves freely in the lever.

4. Install the shutdown lever assembly in shutdown housing (2). Be sure washers (10) are on pin (1) on each side of lever (8). Start and press pin in from the side shown in Figure 3-2.

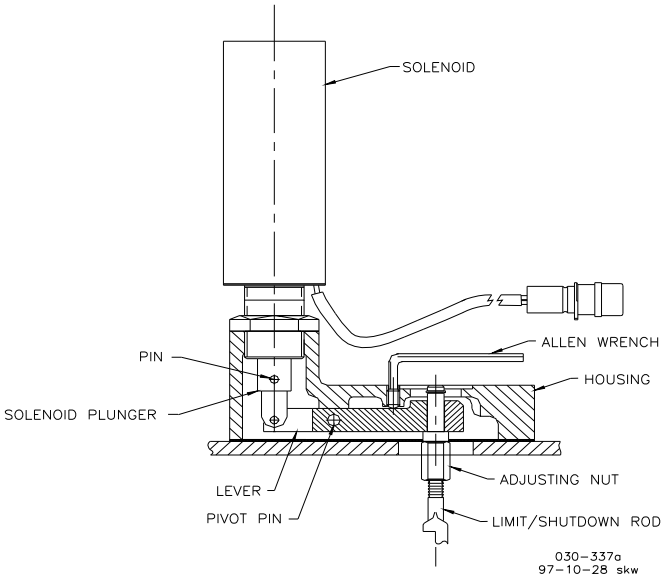

Figure 3-3. Shutdown Plunger Adjustment (ETS)

5. Hold shutdown housing (2) against gasket (5) on a flat surface. Adjust set screw (3) until plunger (9) just contacts the flat surface, then turn the set screw counterclockwise 1/4 turn.

6. Apply thread locking compound to the threads of shutdown solenoid (14/19). Turn the solenoid in (clockwise) until it stops, then counterclockwise one turn. Tighten solenoid jam nut against shutdown housing (2). Torque to 45 to 55 lb-ft (61 to 75 N·m).

7. Install gasket (5) and the shutdown device on the governor cover. Secure with three screws (4).

8. Attach diode (16) (if used) to the governor cover with screw (17). Thread the yellow and green wires up through the conduit fitting.

Assembly Procedure for ETR Version

Refer to Figures 3-4 and 4-2, and do the following for the energize to run version:

1. Assemble roller (24) to one end of the shutdown lever (23) with headed pin (6), washer (11), and hitch pin (12).

2. Install shutdown plunger (9) in shutdown lever (23) with retaining ring (7). Be sure plunger moves freely in the lever. Place spring (22) into socket in shutdown lever, and place the spring seat (21) in the inside of the hole in the shutdown housing (2) (align the cutout on the spring seat with the set screw socket in the shutdown housing).

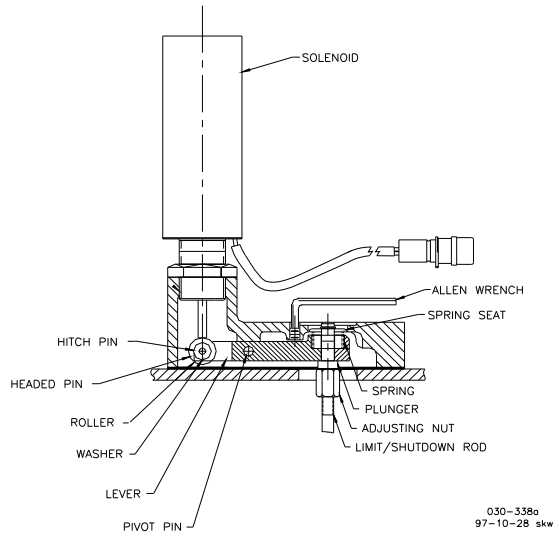

Figure 3-4. Shutdown Plunger Adjustment (ETR)

3. Install the shutdown lever assembly in the shutdown housing (2), making sure the spring seats into the spring seat. Be sure washers (10) are on pin (1) on each side of lever (23). Start and press pin in from the side shown in Figure 3-2.

4. Hold shutdown housing (2) against gasket (5) on a flat surface. Adjust set screw (3) until plunger (9) just contacts the flat surface, then turn the set screw counterclockwise 1/4 turn.

5. Energize the solenoid.

6. Apply thread locking compound to the threads of shutdown solenoid (25). Turn the solenoid clockwise until the shutdown lever touches the set screw. Turn the solenoid clockwise 1/4 additional turn. Tighten solenoid jam nut against shutdown housing (2). Torque to 45 to 55 lb-ft (61 to 75 N·m).

7. Install gasket (5) and the shutdown device on the governor cover. Secure with three screws (4).

8. Attach diode (16) (if used) to the governor cover with screw (17). Thread yellow and green wires up through the conduit fitting.

Test Procedure

Be sure the power supply to the shutdown is de-energized. Connect the Electric Shutdown Device to the power supply with polarity as shown in Figure 3-1.

WARNING

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.

With the overspeed shutdown device(s) correctly installed and operational, start the prime mover.

1. For ETS (energize to shutdown) solenoids: Energize the solenoid. The governor output shaft should rotate to the minimum fuel position, causing prime mover shutdown.

2. For ETR (energize to run) solenoids: De-energize the solenoid. The governor output shaft should rotate to the minimum fuel position, causing prime mover shutdown.

If shutdown does not occur, check the following:

a. Shutdown nut adjustment.

b. Correct installation of the Electric Shutdown Device.

c. Correct adjustment of the fuel linkage from the governor output shaft to the prime mover.

d. Correct installation or adjustment of other shutdown devices used on the governor (if any).

2. If the governor was equipped with other shutdown devices (pressure or manual) prior to the installation of the Electric Shutdown Device, check these device(s) to be sure they are operational.

Chapter 4.
Replacement Parts

Electric Shutdown Assembly

When ordering replacement parts, include the following information:

- Manual number (this is manual 03105)
- Governor part number and serial number shown on the nameplate
- Part reference number and part name from parts list

Ref. No.	Part Name	Quantity
03105-1	Pin	1
03105-2	Shutdown housing	1
03105-3	Set screw 10-32 x .250	1
03105-4	Screw 250-20 x 1.0	3
03105-5	Gasket	1
03105-6	Headed Pin .124 x .531	1 (2 for old style solenoid)
03105-7	Retaining ring .225	1
03105-8	Shutdown lever	1 (ETS version)
03105-9	Shutdown plunger	1
03105-10	Washer .203 x .438	2
03105-11	Washer .149 x .375	1 (2 for old style solenoid)
03105-12	Cotter pin .062 dia x 375	1 (2 for old style solenoid)
03105-13	Shutdown link	1 (ETS version)
03105-14	Solenoid 24 Vdc (old style)	1 (ETS version)
03105-15	Solenoid boot	1
03105-16	Diode (optional)	1
03105-17	Screw .250-20 (for diode)	1
03105-18	Splice	2
03105-19	Solenoid 24 Vdc (new style)	1 (ETS version)
03105-20	Headed Pin	1 (new style sol.; ETS version)
03105-21	Spring seat	1 (ETR version)
03105-22	Spring	1 (ETR version)
03105-23	Shutdown lever	1 (ETR version)
03105-24	Roller	1 (ETR version)
03105-25	Solenoid 24 Vdc	1 (ETR version)

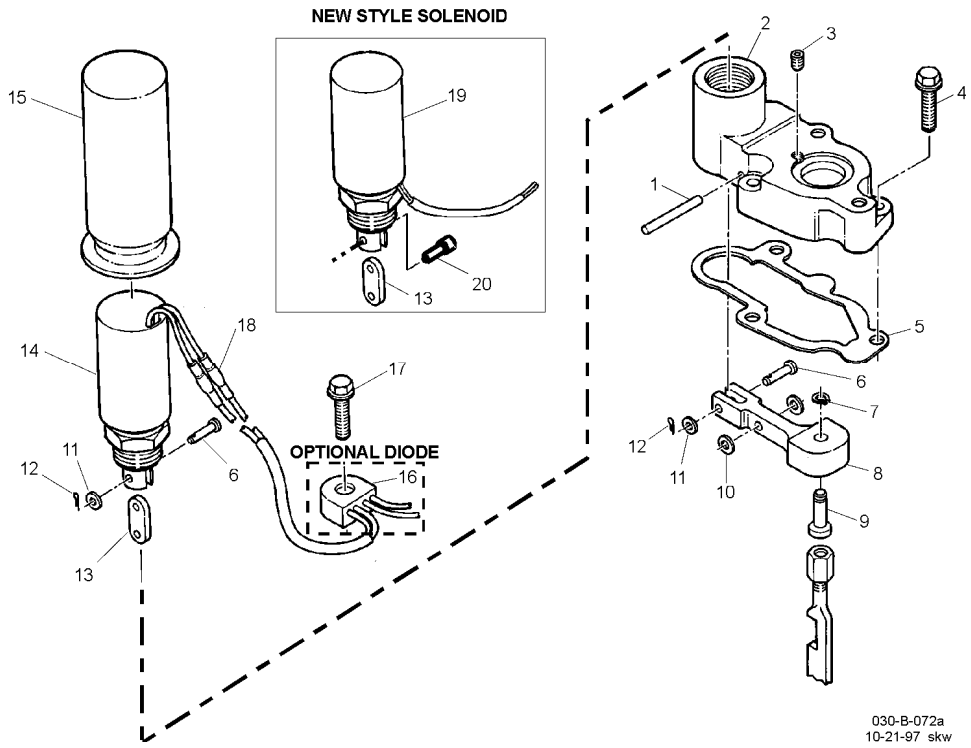

Figure 4-1. Parts for ETS Electric Shutdown Device

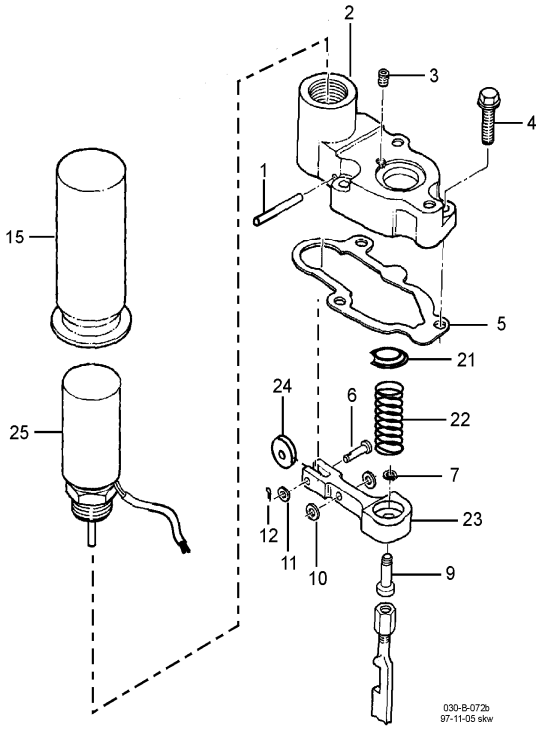

Figure 4-2. Parts for ETR Electric Shutdown Device

Chapter 5.
Product Support and Service Options

Product Support Options

If you are experiencing problems with the installation, or unsatisfactory performance of a Woodward product, the following options are available:

1. Consult the troubleshooting guide in the manual.
2. Contact the **OE Manufacturer or Packager** of your system.
3. Contact the **Woodward Business Partner** serving your area.
4. Contact Woodward technical assistance via email (**EngineHelpDesk@Woodward.com**) with detailed information on the product, application, and symptoms. Your email will be forwarded to an appropriate expert on the product and application to respond by telephone or return email.
5. If the issue cannot be resolved, you can select a further course of action to pursue based on the available services listed in this chapter.

OEM or Packager Support: Many Woodward controls and control devices are installed into the equipment system and programmed by an Original Equipment Manufacturer (OEM) or Equipment Packager at their factory. In some cases, the programming is password-protected by the OEM or packager, and they are the best source for product service and support. Warranty service for Woodward products shipped with an equipment system should also be handled through the OEM or Packager. Please review your equipment system documentation for details.

Woodward Business Partner Support: Woodward works with and supports a global network of independent business partners whose mission is to serve the users of Woodward controls, as described here:

- A **Full-Service Distributor** has the primary responsibility for sales, service, system integration solutions, technical desk support, and aftermarket marketing of standard Woodward products within a specific geographic area and market segment.
- An **Authorized Independent Service Facility (AISF)** provides authorized service that includes repairs, repair parts, and warranty service on Woodward's behalf. Service (not new unit sales) is an AISF's primary mission.
- A **Recognized Engine Retrofitter (RER)** is an independent company that does retrofits and upgrades on reciprocating gas engines and dual-fuel conversions, and can provide the full line of Woodward systems and components for the retrofits and overhauls, emission compliance upgrades, long term service contracts, emergency repairs, etc.

A current list of Woodward Business Partners is available at **www.woodward.com/directory**.

Product Service Options

Depending on the type of product, the following options for servicing Woodward products may be available through your local Full-Service Distributor or the OEM or Packager of the equipment system.

- Replacement/Exchange (24-hour service)
- Flat Rate Repair
- Flat Rate Remanufacture

Replacement/Exchange: Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a like-new replacement unit in minimum time (usually within 24 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime.

This option allows you to call your Full-Service Distributor in the event of an unexpected outage, or in advance of a scheduled outage, to request a replacement control unit. If the unit is available at the time of the call, it can usually be shipped out within 24 hours. You replace your field control unit with the like-new replacement and return the field unit to the Full-Service Distributor.

Flat Rate Repair: Flat Rate Repair is available for many of the standard mechanical products and some of the electronic products in the field. This program offers you repair service for your products with the advantage of knowing in advance what the cost will be.

Flat Rate Remanufacture: Flat Rate Remanufacture is very similar to the Flat Rate Repair option, with the exception that the unit will be returned to you in "like-new" condition. This option is applicable to mechanical products only.

Returning Equipment for Repair

If a control (or any part of an electronic control) is to be returned for repair, please contact your Full-Service Distributor in advance to obtain Return Authorization and shipping instructions.

When shipping the item(s), attach a tag with the following information:
- return number;
- name and location where the control is installed;
- name and phone number of contact person;
- complete Woodward part number(s) and serial number(s);
- description of the problem;
- instructions describing the desired type of repair.

Packing a Control

Use the following materials when returning a complete control:
- protective caps on any connectors;
- antistatic protective bags on all electronic modules;
- packing materials that will not damage the surface of the unit;
- at least 100 mm (4 inches) of tightly packed, industry-approved packing material;
- a packing carton with double walls;
- a strong tape around the outside of the carton for increased strength.

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*.

Replacement Parts

When ordering replacement parts for controls, include the following information:
- the part number(s) (XXXX-XXXX) that is on the enclosure nameplate;
- the unit serial number, which is also on the nameplate.

Engineering Services

Woodward's Full-Service Distributors offer various Engineering Services for our products. For these services, you can contact the Distributor by telephone or by email.

- Technical Support
- Product Training
- Field Service

Technical Support is available from your equipment system supplier, your local Full-Service Distributor, or from many of Woodward's worldwide locations, depending upon the product and application. This service can assist you with technical questions or problem solving during the normal business hours of the Woodward location you contact.

Product Training is available as standard classes at many Distributor locations. Customized classes are also available, which can be tailored to your needs and held at one of our Distributor locations or at your site. This training, conducted by experienced personnel, will assure that you will be able to maintain system reliability and availability.

Field Service engineering on-site support is available, depending on the product and location, from one of our Full-Service Distributors. The field engineers are experienced both on Woodward products as well as on much of the non-Woodward equipment with which our products interface.

For information on these services, please contact one of the Full-Service Distributors listed at **www.woodward.com/directory**.

Contacting Woodward's Support Organization

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory published at **www.woodward.com/directory**.

You can also contact the Woodward Customer Service Department at one of the following Woodward facilities to obtain the address and phone number of the nearest facility at which you can obtain information and service.

Products Used In Electrical Power Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany:	
Kempen	+49 (0) 21 52 14 51
Stuttgart	+49 (711) 78954-510
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Products Used In Engine Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany	+49 (711) 78954-510
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
United States	+1 (970) 482-5811

Products Used In Industrial Turbomachinery Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

For the most current product support and contact information, please visit our website directory at **www.woodward.com/directory**.

Technical Assistance

If you need to contact technical assistance, you will need to provide the following information. Please write it down here before contacting the Engine OEM, the Packager, a Woodward Business Partner, or the Woodward factory:

General

Your Name

Site Location

Phone Number

Fax Number

Prime Mover Information

Manufacturer

Engine Model Number

Number of Cylinders

Type of Fuel (gas, gaseous, diesel, dual-fuel, etc.)

Power Output Rating

Application (power generation, marine, etc.)

Control/Governor Information

Control/Governor #1

Woodward Part Number & Rev. Letter

Control Description or Governor Type

Serial Number

Control/Governor #2

Woodward Part Number & Rev. Letter

Control Description or Governor Type

Serial Number

Control/Governor #3

Woodward Part Number & Rev. Letter

Control Description or Governor Type

Serial Number

Symptoms

Description

If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 03105B.

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**Woodward has company-owned plants, subsidiaries, and branches,
as well as authorized distributors and other authorized service and sales facilities throughout the world.**

Complete address / phone / fax / email information for all locations is available on our website.

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