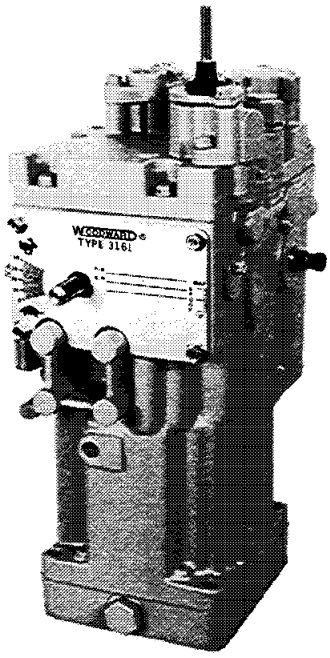
WOODWARD

Product Manual 03103
(Revision NEW)
Original Instructions



3161 Governor

Manual Shutdown Device

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

Chapter 1.
General Information

Introduction

This manual, 03103, describes the installation and operation of the Manual Shutdown Device available for field installation on the 3161 Governor.

Description

The Manual Shutdown Device (Figure 2-2) is installed on top of the right front corner of the 3161 cover. To initiate a shutdown (see Figure 1-1), the threaded shutdown handle can be pushed down, or tilted in any direction to make contact with the limit/shutdown rod. As the handle is tilted, the flat disc of the shutdown handle lowers the limit/shutdown pilot valve, allowing control oil to drain to sump, thus causing shutdown.

The Manual Shutdown Device can also be used in conjunction with the electric and/or pressure shutdown devices as shown in Figures 2-3, 2-4, and 2-5.

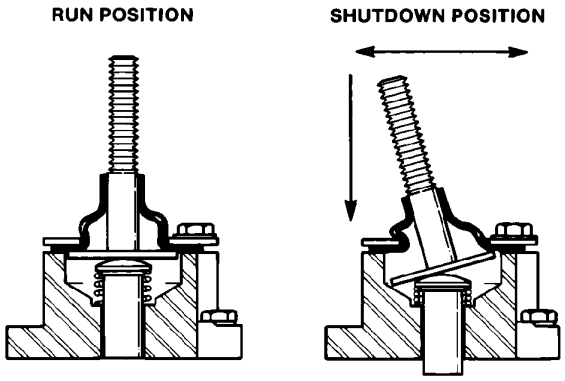


Figure 1-1. Schematic of the Manual Shutdown Device

References

03101	3161 Governor
03102	3161 Governor product specification
03104	3161 Governor, Pressure Shutdown Device
03105	3161 Governor, Electric Shutdown Device
03106	3161 Governor, Pneumatic Speed Setting Device
03107	3161 Governor, Speed Adjusting Motor with Manual Speed Adjust
03108	3161 Governor, Air Pressure Fuel Limiter
03109	3161 Governor, Load Limit Control
25075	Commercial Preservation Packaging for Storage of Mechanical-Hydraulic Controls

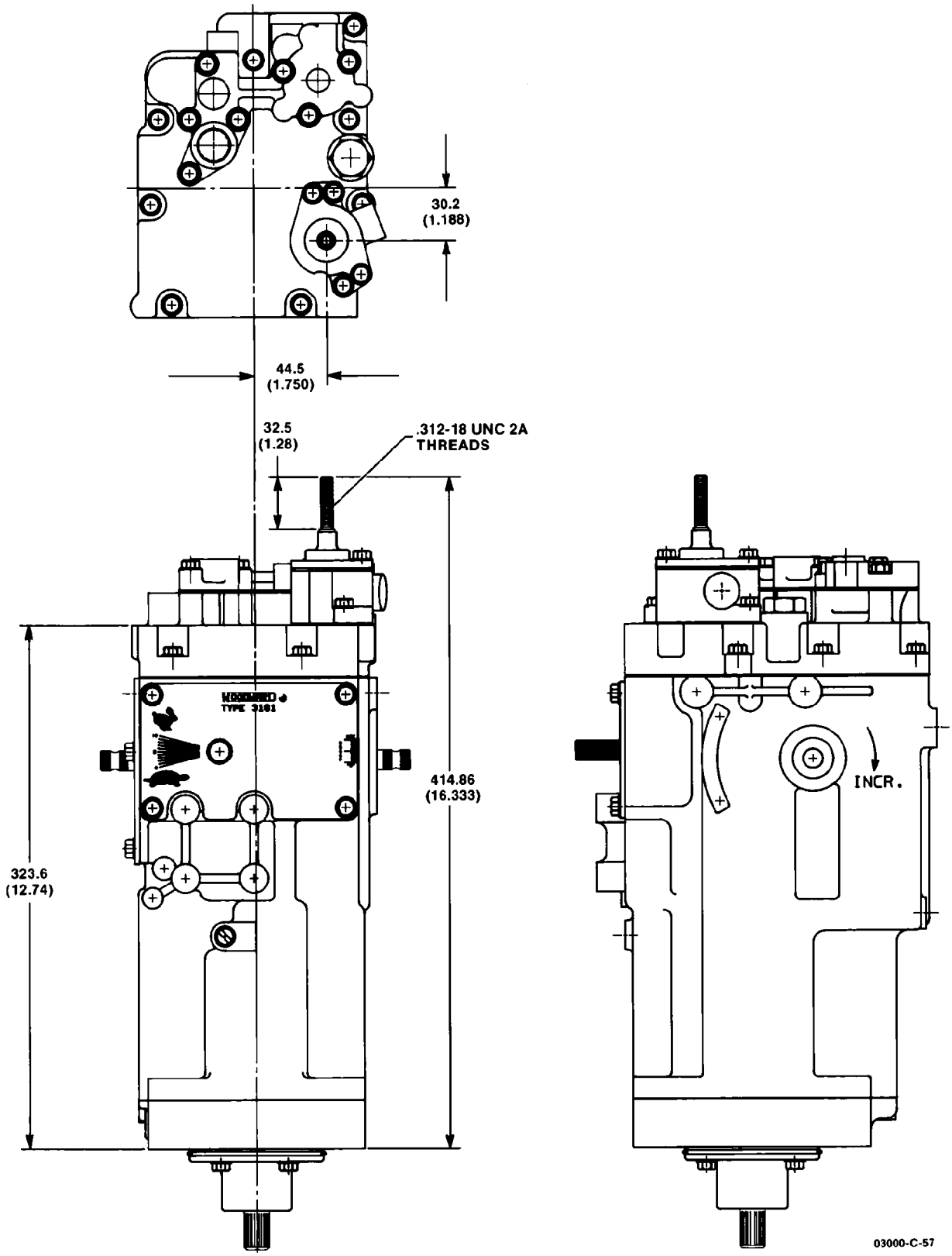


Figure 1-2. Outline Drawing of 3161 Governor with Manual Shutdown Device

Chapter 2.
Installation

Introduction

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

IMPORTANT **If the Manual Shutdown Device was purchased for installation on a governor already in service, no adjustment to the governor 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), or remove shutdown device(s) if so equipped.

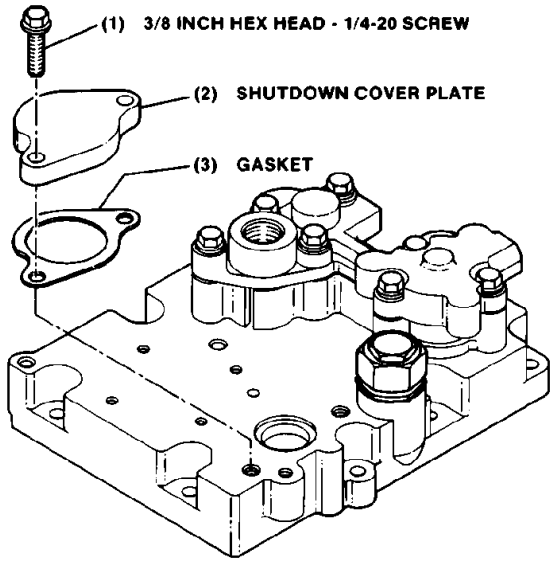


Figure 2-1. Governor Cover

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.

⚠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.

Installation Procedure

Manual Shutdown (on plain cover)

(Figure 2-2)

1. Remove two screws (1) and shutdown cover plate (2) from the governor cover. Do not remove gasket (3) from the cover unless replacement with a new gasket is necessary (see Figure 2-1).

2. With gasket (3) in place on the cover, install the manual shutdown device on the governor cover. Torque screws to 10 N·m (90 lb-in).

See Test Procedures at the end of Chapter 3.

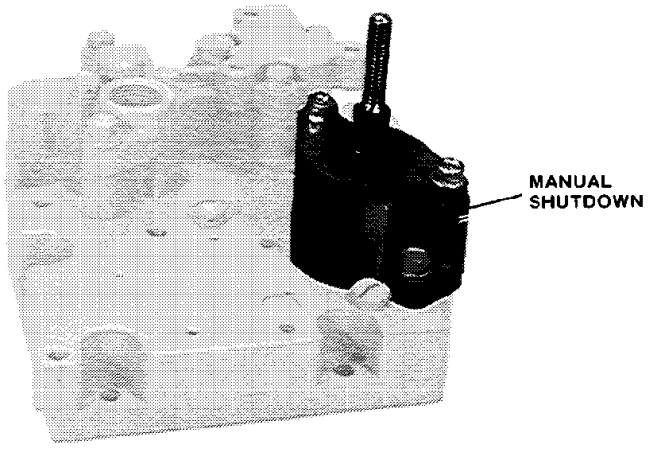


Figure 2-2. Manual Shutdown

Manual Shutdown with Pressure Shutdown

(Figure 2-3)

When installing the Manual Shutdown on a cover that has a Pressure Shutdown already in place:

1. Remove two screws and the shutdown cover plate from the Pressure Shutdown. Do not remove the gasket unless replacement with a new gasket is necessary.

2. Install the Manual Shutdown in place of the shutdown cover plate on the Pressure Shutdown. Torque the 1/4-20 screws to 10 N·m (90 lb-in).

See Test Procedures at the end of Chapter 3.

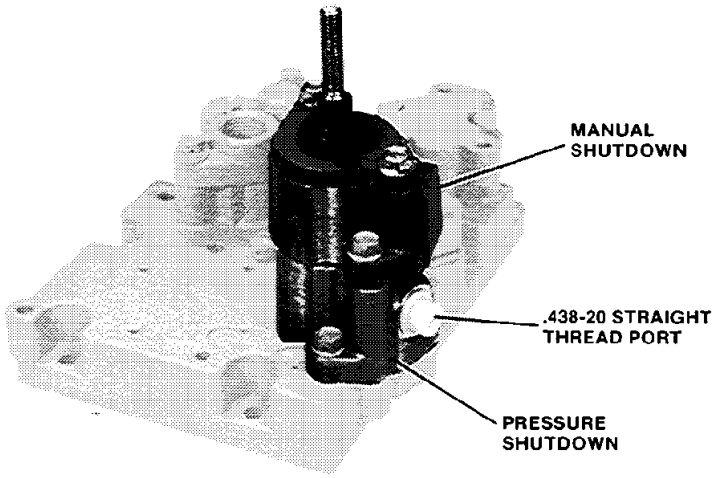


Figure 2-3. Manual Shutdown with Pressure Shutdown

Manual Shutdown with Electric Shutdown

(Figure 2-4)

When installing the Manual Shutdown on a cover that has an Electric Shutdown already in place:

1. Remove two screws and the shutdown cover plate on the Electric Shutdown. Do not remove the gasket unless replacement with a new gasket is necessary.

2. Install the Manual Shutdown in place of the shutdown cover plate on the Electric Shutdown. Torque the 1/4-20 screws to 10 N·m (90 lb-in).

See Test Procedures at the end of Chapter 3.

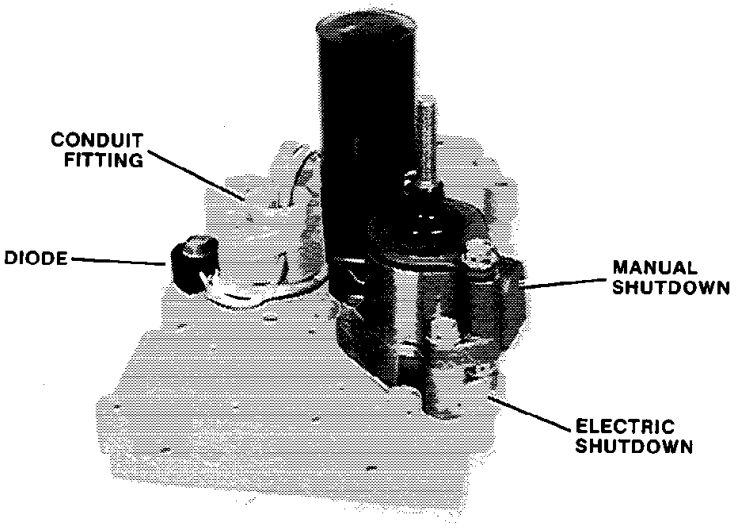


Figure 2-4. Manual Shutdown with Electric Shutdown

Manual Shutdown with Pressure Shutdown and Electric Shutdown

(Figure 2-5)

When installing the Manual Shutdown on a cover that has a Pressure Shutdown and Electric Shutdown:

1. Remove two screws and the shutdown cover plate on the Pressure Shutdown. Do not remove the gasket unless replacement with a new gasket is necessary.

2. Install the Manual Shutdown in place of the shutdown cover plate on the Pressure Shutdown. Torque the 1/4-20 screws to 10 N·m (90 lb-in).

See Test Procedures at the end of Chapter 3.

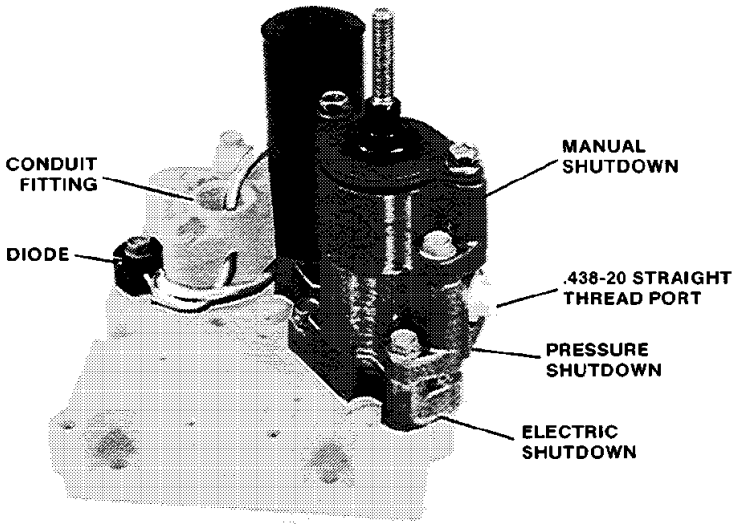


Figure 2-5. Manual Shutdown with Pressure and Electric Shutdown

Chapter 3.
Repair and Test Procedures

Repair Procedure

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

Disassemble the shutdown according to the following instructions. Reference numbers in parentheses are assigned to each part in the exploded view (Figure 4-1).

⚠CAUTION

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

Disassembly

(Figure 4-1)

1. Remove two 3/8 inch hex head 1/4-20 screws (7) and lift the shutdown assembly and gasket (5) from the governor cover.
2. Remove two screws (1) from the shutdown cover plate.
3. Remove cover plate (2), boot (3), and shutdown handle (4) as one unit.
4. Remove boot (3) and shutdown handle (4) from the shutdown cover plate (2).
5. Remove boot (3) from shutdown handle (4).
6. Remove shutdown plunger (9) and spring (8) from housing (6).

Cleaning

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

⚠CAUTION

Observe manufacturer's instructions or restrictions regarding the use of solvents. If no instructions are available, handle with care. Use the 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

(Figure 4-1)

Shutdown Handle (4)—Inspect for damage to 0.312-18 threads, Renew threads that have minor damage.

Rubber Boot (3)—Inspect rubber boot for cracks and tears. Replace the boot if any damage is found.

Shutdown Spring (6)—Inspect spring for rust and corrosion. Replace the spring if any damage is found.

Shutdown Plunger (9)—Inspect the shutdown plunger for wear on area of contact with the shutdown nut. Replace plunger if wear area exceeds 1.02 mm (0.040 inch) depth.

Assembly

(Figure 4-1)

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

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

Torque all 1/4-20 screws to 10 N·m (90 lb-in).

1. Apply a small amount of white petroleum jelly just below the threads on shutdown handle (4). Carefully slip boot (3) over the threads and onto the handle.

2. Install the handle and boot through shutdown cover plate (2).

3. Install spring (8) and shutdown plunger (9) in shutdown housing (6).

4. Install shutdown cover plate assembly (items 2, 3, 4) and secure it to housing (6) with two screws (1).

5. Install the shutdown assembly with gasket (5) on the governor cover. Secure the assembly with two screws (7).

Test Procedures

⚠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.

With the overspeed shutdown devices correctly installed and operational, start the prime mover.

⚠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.

1. Hold the Manual Shutdown lever in the shutdown position. The governor output shaft must 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 Manual Shutdown device.
   c. correct adjustment of the fuel linkage from the governor output shaft to the prime mover.
   d. correct installation and/or adjustment of other shutdown devices used on the governor (if any).

2. If the governor was equipped with other shutdown devices (electric and/or pressure) prior to the installation of the Manual Shutdown, check these devices to be sure they are operational.

Chapter 4.
Replacement Parts

Manual Shutdown Assembly

When ordering replacement parts, include the following information:
1. Manual number (this is manual 03103).
2. Governor serial number and part number shown on the nameplate.
3. Part reference number and part name from parts list.

Ref. No.	Part Name	Quantity
03103-1	Screw .250-20 x 1.0	2
03103-2	Shutdown cover plate	1
03103-3	Boot	1
03103-4	Shutdown handle	1
03103-5	Gasket	1
03103-6	Shutdown housing	1
03103-7	Screw .250-20 x 1.0	2
03103-8	Spring	1
03103-9	Shutdown plunger	1

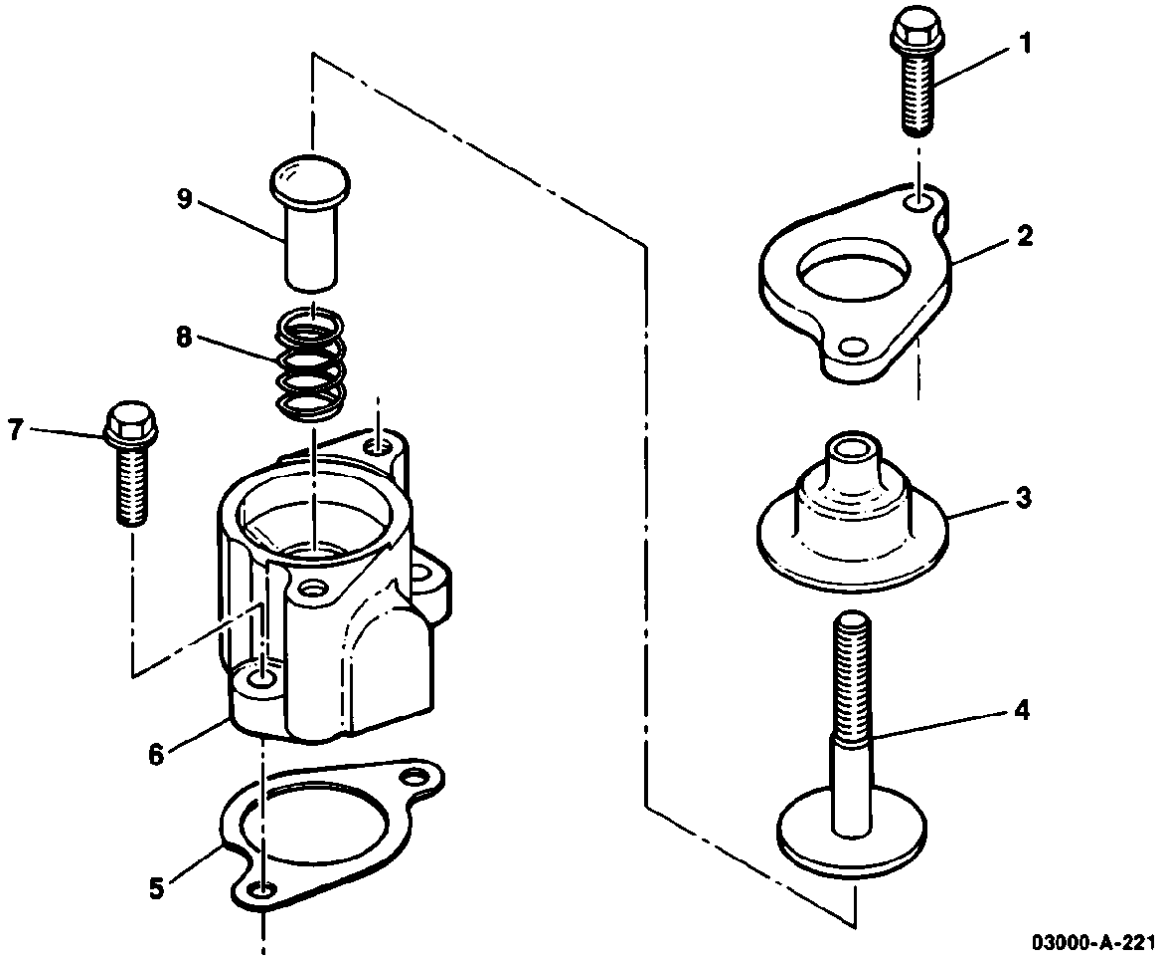


Figure 4-1. Parts for the Manual Shutdown Device

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 03103.

WOODWARD

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Email and Website—www.woodward.com

**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.

2012/9/Colorado