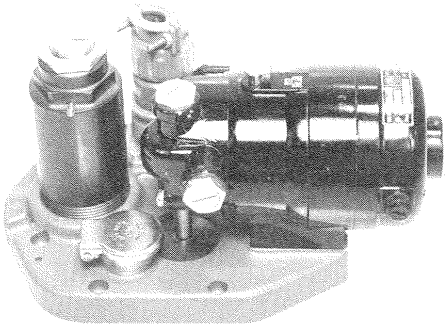
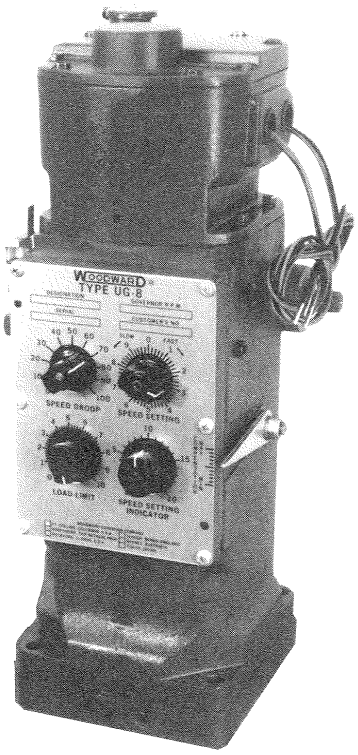
WOODWARD

Product Manual 03013
(Revision T)
Original Instructions





Shutdown Solenoid for UG Governor

Installation and Operation 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.

Translated Publications

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The original source of this publication may have been updated since this translation was made. Be sure to check manual *26311* , *Revision Status & Distribution Restrictions of Woodward Technical Publications*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions—Changes in this publication since the last revision are indicated by a black line alongside the text.

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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.

Chapter 1.
Operation and Adjustment

Description

A shutdown solenoid is available for use on dial type UG8, UG32, and UG40 governors. Two basic models are available. One will cause shutdown when energized, and the other will cause shutdown when de-energized.

Vibration-resistant models are available for both styles.

The energize and de-energize models are available with a latch that requires manual resetting for restarting the engine. Vibration-resistant models are not built with the latching feature.

⚠WARNING

The shutdown solenoid must not be used as an overspeed protection device. Overspeed protection must come from a unit entirely separate from the UG governor. Failure of a governor or governor-related part of the system control can cause a life- or engine-threatening overspeed condition. In these cases, it is possible that the shutdown solenoid could not stop the runaway condition.

If voltage is available, the engine may be started without manual reset of the solenoid if the solenoid with latch is of the energize-to-run type.

All shutdown solenoids move the load-limit strap down to effect shutdown.

The solenoid can be supplied with various coils to accommodate the more common dc voltages. If operation on ac is desired, rectifiers can be incorporated in the cover assembly to rectify either 110 or 220 volts to dc. In addition, other ac voltages can be adapted on special order.

The special governor cover, required for mounting the unit, is available with or without accommodations for a speed-adjusting motor.

Operation

De-energize to Shut Down Model

The de-energize to shut down models shown in Figures 1 and 2 will shut the engine down on loss of current to the solenoid. The solenoid plunger moves up to allow the engine to run. To start an engine when no current is available, lift the solenoid plunger manually by means of the shutdown-latch knob (see Figure 1). As it approaches the top of its stroke, the lock pin may be pressed in to latch the shutdown-latch knob just below its upper position. This permits starting and running the engine. ***Operating with the latch pin holding the solenoid at the top of its stroke eliminates the possibility of using the solenoid to shut down the engine.***

When current is applied to the solenoid, it will move to its full upward position, unloading the lock pin, which is moved outward by the circular latch spring. With loss of current, the load spring will cause the solenoid plunger to move down, lifting the governor pilot valve and closing off fuel.

⚠WARNING **During start-up, if for any reason the solenoid has no current and the lock-in is latched, the solenoid will be inoperative. This will eliminate any safety systems which may use the solenoid to shut down the engine.**

A de-energize to shut down model can be supplied without the latching feature, generally for operation in automatic plants. The vibration-resistant de-energize to shut down model is available only in non-latching design. The non-latching solenoids present an “energize to run” limitation on the engine, a condition which is required in many plants.

Energize to Shut Down Model

The energize to shut down model shown in Figures 3 and 4 will shut the engine down as current is applied (even momentarily in the case of the latching model).

The solenoid plunger moves downward through a tapered plunger stop, which contains seven spring-loaded steel balls. The binding action of the steel balls against the shutdown rod prevents the solenoid from returning. To restart the engine, return the plunger to its original position by pressing the reset button, which forces the steel balls away from the plunger and allows the spring force to push the load-limit strap and the solenoid plunger to the uppermost positions.

The energize to shut down system is available in non-latching designs for both the regular and the vibration-resistant models. The vibration-resistant model is not available in the latching mode.

The non-latching model requires a “shutdown current” to the solenoid until shutdown is complete.

Adjustments—Installation

Solenoid shutdown devices supplied on governors as original equipment are adjusted at the factory. It will be necessary to make the following adjustments on units which are to be installed on governors already in service.

NOTICE

When assembling or adjusting a shutdown solenoid, ALWAYS remove the cover and do the work away from the governor. IF ANY PART OF THE SOLENOID DEVICE SHOULD DROP INTO THE GOVERNOR, IT WILL REQUIRE EXTENSIVE DISASSEMBLY OF THE GOVERNOR.

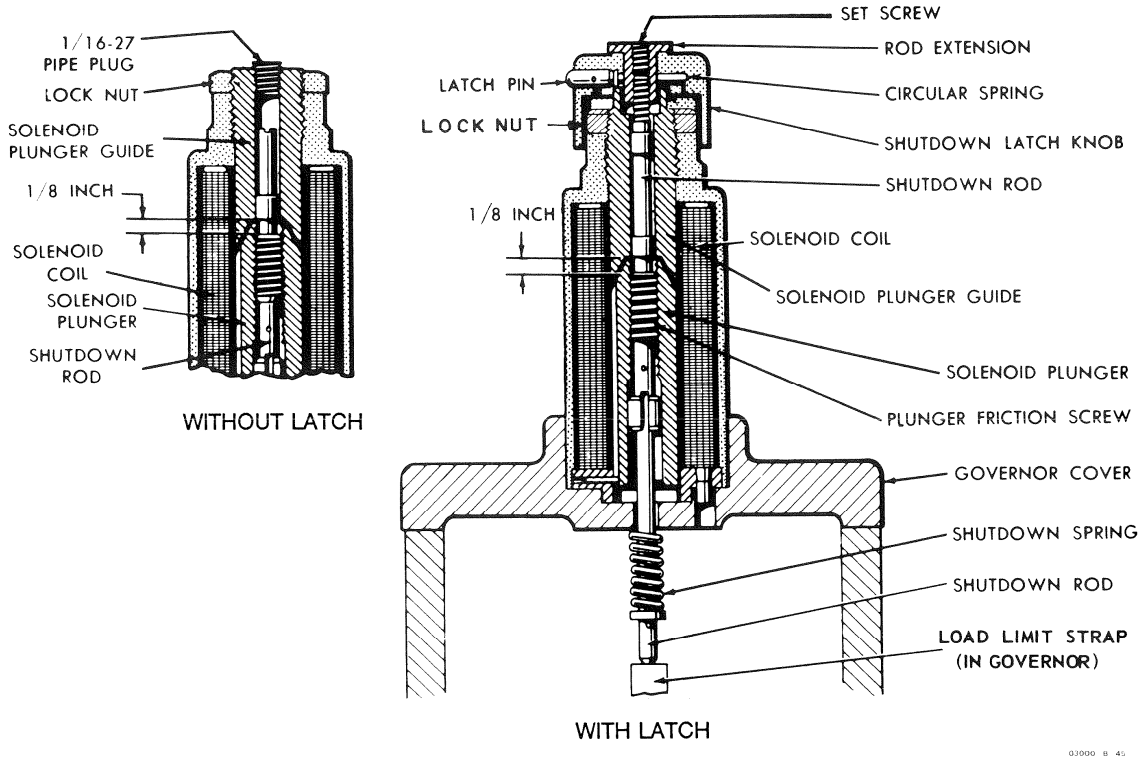

Figure 1. De-Energize to Shut Down Models

De-Energize to Shut Down Model

1. Position the shutdown rod assembly in the solenoid plunger with the end of the plunger friction screw 3 mm (1/8 inch) inside the solenoid plunger nose as shown in Figure 1. This adjustment is necessary only when the shutdown device has been disassembled for cleaning or replacing parts. New assemblies sent from the factory will have this adjustment completed.

2. Loosen the lock nut and, with the solenoid de-energized, turn the solenoid plunger guide clockwise until it is tight against the plunger. The plunger should now be seated against the governor cover. Back off the solenoid plunger guide 3 to 4 turns and tighten the lock nut.

3. Attach the cover assembly (including the shutdown device) to the governor case.

4. Remove the set screw from the hole in the rod extension. With the engine running and the governor in operation and controlling the speed, de-energize the solenoid and use a screwdriver to turn the shutdown rod assembly clockwise until the governor just starts to shut down, then screw the shutdown rod down one additional turn.

Steps 5, 6, and 7 pertain to the latching model. Skip to step 8 if adjusting a non-latching model.

5. De-energize the solenoid. Lift the shutdown latch knob and press in the latch pin so the pin remains engaged when the knob is released.

6. With a screwdriver in the slot of the shutdown rod to prevent it from turning, screw the rod extension clockwise until the solenoid plunger is pulled up against the solenoid plunger guide.

7. Energize the solenoid. Back off the rod extension until the latch pin releases. Then back off 1/4 turn more. Lock in place with the 10-32 set screw.

8. Check for normal operation with the solenoid energized and for shutdown when the solenoid is de-energized. Check the latching device to verify that it will latch up to allow starting and unlatch when the solenoid is energized.

Vibration-Resistant De-Energize to Shut Down Model

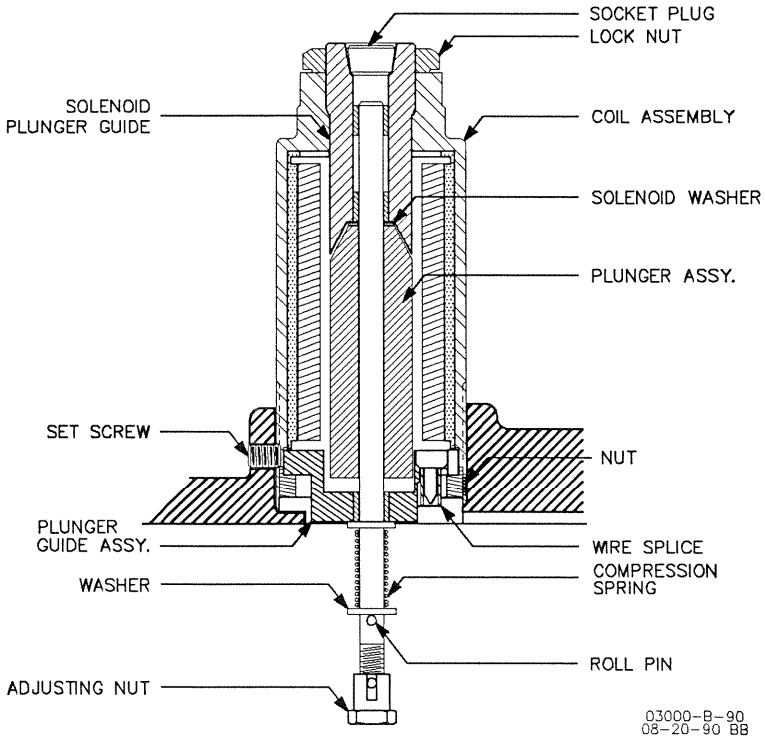

Figure 2. Vibration-Resistant De-energize to Shut Down

1. Install the shutdown solenoid in the cover with the Plunger Guide Assembly slightly below the surface of the inside of the cover. Thread the adjusting nut onto the solenoid plunger rod as far as it will go. DO NOT LOCK WITH THE ROLL PIN AT THIS TIME.

2. Turn the solenoid plunger guide down until the rod just moves a little farther out of the bottom of the solenoid assembly. Then back off the plunger guide four full turns and lock with the lock nut.

3. With the engine running and the governor controlling engine speed, place the cover and gasket on the governor. If the engine does not shut down, remove the cover, screw the adjusting nut out one full turn, and replace the cover assembly on the governor.

4. Continue this procedure until the engine shuts down when then the cover is placed on the governor.

NOTICE

Completely remove the cover from the governor and make the adjustments in the adjusting nut away from the governor to prevent accidentally dropping the adjusting nut into the operating governor. Extensive damage to the governor can occur should the nut drop off the end of the shaft. Should the adjusting nut thread out more than 5 turns before causing shutdown, loosen the set screw and thread the entire shutdown solenoid farther into the governor cover, then start the adjusting nut setting again.

5. When the governor shuts the engine down when the cover is placed on the governor, remove the cover a final time and thread the adjusting nut until the roll pin can be pressed into the shaft, locking the adjusting nut into place. Do not risk dropping the roll pin into the governor while making this final installation.

6. Complete the wiring to the plug on the cover and check that the application of the required voltage causes the plunger to retract.

7. Install the cover-solenoid assembly onto the governor and check that the engine shuts down when the solenoid is de-energized, and that the engine can start and run with the solenoid energized. Check for normal operation with the solenoid de-energized, making sure that the governor is not sluggish in adding fuel to pick up load.

   If the governor is sluggish in adding fuel to pick up load, check for excessive drag in the movement of the solenoid plunger, a misaligned shutdown rod, a bent plunger guide, or solidified preservative lubricant on any of the moving parts.

Energize to Shut Down Model

1. Position the shutdown rod assembly in the solenoid plunger with the end of the plunger friction screw 3 mm (1/8 inch) inside the plunger nose as shown in Figure 2. This adjustment is necessary only when the shutdown device has been disassembled for cleaning or replacing parts. New assemblies from the factory will have this adjustment completed.

2. Attach the cover assembly (including the shutdown device) to the governor case.

3. Unscrew the knurled reset button retainer and remove the reset button and spring. Loosen the lock nut. Turn the plunger stop down until the solenoid plunger is tight against the solenoid plunger guide. Back off 3 to 4 turns. Tighten the lock nut.

4. With the governor in operation and controlling engine speed, energize the solenoid and turn the slotted shutdown rod clockwise until shutdown occurs. Turn clockwise one more turn past the point of shutdown, and install the spring, reset button, and reset button retainer.

5. Check for normal operation with the solenoid de-energized, making sure that the governor is not sluggish in adding fuel to pick up load.

6. Energize the solenoid. After shutdown, check to see that the governor remains inoperative until the latch is released by pressing the reset button. Recheck for normal operation.

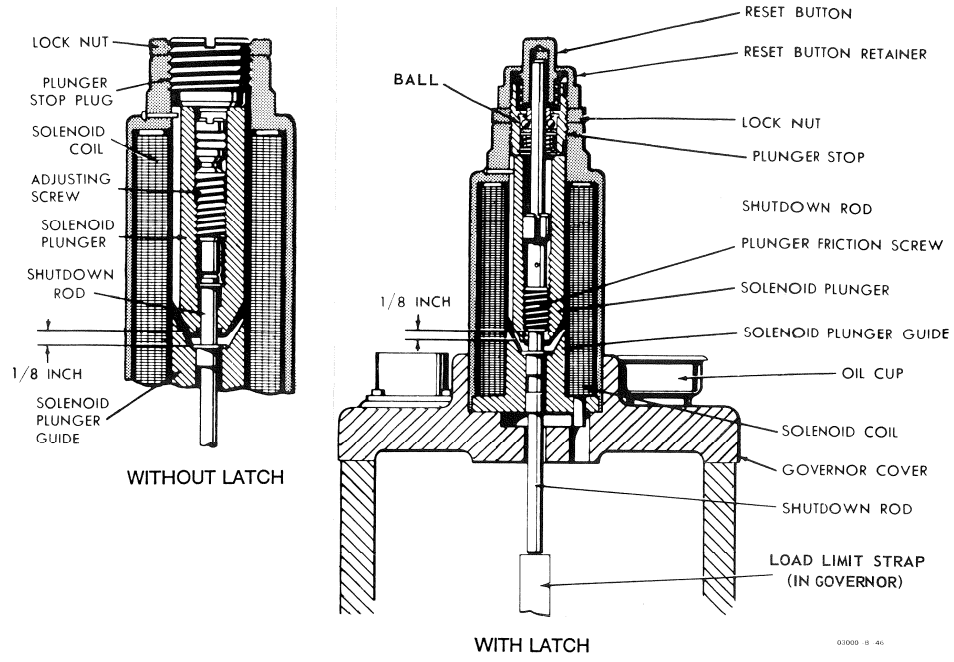

Figure 3. Energize to Shut Down Models

The energize to shut down model without the latching feature is adjusted in the following manner: Remove the plunger stop plug and, with the unit running, energize the solenoid. With the governor in operation and controlling speed, turn the slotted shutdown rod clockwise until shutdown occurs. Turn clockwise one more turn past the point of shutdown. Replace the plunger stop plug and screw it down until the solenoid plunger is tight against the solenoid plunger guide. Back off 3 to 4 turns on UG5.7, UG8, and UG12.8 governors or 4 turns on UG32 or UG40 governors. Lock in place with the lock nut. Make the final check as described in steps 5 and 6 above.

Vibration-Resistant Energize to Shut Down Model, without Latch

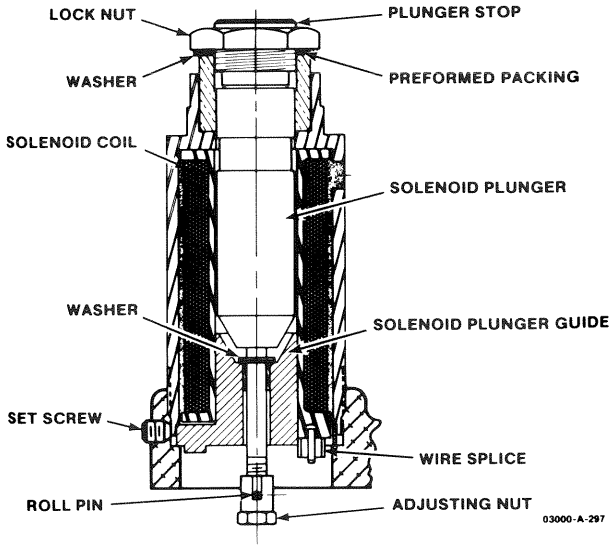

Figure 4. Vibration-Resistant Energize to Shut Down, without Latch

1. With the governor controlling and the governor cover removed: Loosen the locknut. Turn the plunger stop all the way in to immobilize the plunger, and run the adjusting nut all the way in to secure a starting position.

2. Install the cover and gasket on the governor.

NOTICE

Completely remove the cover from the governor and make the adjustments in the adjusting nut away from the governor to prevent accidentally dropping the adjusting nut into the operating governor. Extensive damage to the governor can occur should the nut drop off the end of the shaft. Should the adjusting nut thread out more than 5 turns before causing shutdown, loosen the set screw and thread the entire shutdown solenoid farther into the governor cover, then start the adjusting nut setting again.

3. With the engine running and the governor controlling engine speed, place the cover and gasket on the governor. If the engine does not shut down, remove the cover, screw the adjusting nut out one full turn, and replace the cover assembly on the governor.

4. Continue this procedure until the engine shuts down when then the cover is placed on the governor.

5. When the governor shuts the engine down when the cover is placed on the governor, remove the cover a final time and thread the adjusting nut until the roll pin can be pressed into the shaft, locking the adjusting nut into place. Do not risk dropping the roll pin into the governor while making this final installation.

6. Back out the plunger stop four turns and lock in place with the lock nut.

7. Complete the wiring to the plug on the cover and check that the application of the required voltage causes the plunger to extend from the solenoid.

8. Install the cover-solenoid assembly onto the governor and check that the engine shuts down when the solenoid is energized, and that the engine can start and run with the solenoid de-energized. Check for normal operation with the solenoid energized, making sure that the governor is not sluggish in adding fuel to pick up load. If the governor is sluggish in adding fuel to pick up load, check for excessive drag in the movement of the solenoid plunger, a misaligned shutdown rod, a bent plunger guide, or solidified preservative lubricant on any of the moving parts.

Solenoid Suppression Diodes

Solenoid coils used by Woodward, whether operated on ac or dc, have two diodes wired in the circuit as shown in Figure 5.

Diodes rectify ac to supply dc to the solenoid coils and also to provide shock hazard protection when used on ac when the ac is disconnected at the peak of a cycle (counter EMF is generated when the power is removed from the coil).

The diodes should be used on dc power solenoid coils because of the counter EMF.

IMPORTANT **Open or shorted diodes impair operation of the shutdown solenoid.**

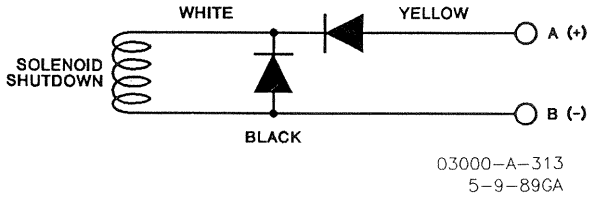

Figure 5. Solenoid Suppression Diode

Chapter 2.
Parts Lists

Parts Information

When ordering replacement parts, include the following information:
1. Governor serial number and part number shown on the nameplate.
2. Manual number (this is manual 03013).
3. Part reference number and part name from parts list.

NOTICE

Damage may result if any parts are allowed to drop into the governor. Use extreme caution when working on the shutdown solenoid. Any part that should drop into the governor must be retrieved before attempting to operate the governor.

Ref.	Part Description	Quantity
03013-1	Cable Clamp	1
03013-2	Plug	1
03013-3	Screw, 4-40 x 5/16" Fil Hd	4
03013-4	Receptacle	1
03013-5	Cover	1
03013-6	Set Screw, 10-32 x 1/4"	1
03013-7	Screw, 10-32 x 3/4" Fil Hd	4
03013-8	Split Lock Washer, No. 10	4
03013-9	Grommet	1
03013-10	Motor Seal Spring	1
03013-11	Oil Cup	1
03013-12	Bodine Motor	1
03013-13	Solenoid Case	1
03013-14	Load Spring	1
03013-15	Insulating Paper	1
03013-16	Solenoid Coil	1
03013-17	Parallel Connector	2
03013-18	Wire, White Flamenol O.D.	AR
03013-19	Wire Strap, 2 Wires	2
03013-20	Screw, Fil Hd 8-32 x 1/4"	2
03013-21	Clear Tubing 3/4" Long	2
03013-22	Air Gap Washer	1
03013-23	Solenoid Plunger	1
03013-24	Solenoid Plunger Locking Pin	1
03013-25	Not Used	
03013-26	Solenoid Plunger Guide	1
03013-27	Shutdown Spring	1
03013-28	Washer, Shutdown Spring Ret.	1
03013-29	Roll Pin, 1/16" x 1/4"	1
03013-30	Plunger Friction Screw	1
03013-31	Shutdown Rod	1
03013-32	Roll Pin	1
03013-33	Plunger Guide Bushing	2
03013-34	Solenoid Plunger Guide	1
03013-35	Latch Spring	1
03013-36	Snap Ring	1
03013-37	Shutdown Latch Knob	1
03013-38	Lock Pin	1
03013-39	Rod Extension	1
03013-40	Lock Wire	AR
03013-41	1/16 Pipe Plug	1
03013-42	Jam Nut	1
03013-43	Solenoid Plunger Guide	1
03013-44	Shutdown Rod	1
03013-45	Solenoid Case	1
03013-46	Solenoid Plunger Guide	1
03013-50	Ball Loading Spring	1
03013-51	Washer	1
03013-52	Latch Spring	1
03013-53	Shutdown Push Button	1
03013-54	Push button Retainer	1
03013-55	Plunger Stop Plug	1
03013-56	O Ring	2
03013-57	Adjusting Screw	1
03013-58	Snap Ring	1
03013-59	Shutdown Rod	1
03013-60	Solenoid Plunger	1
03013-61	Soldering Shield Washer	2
03013-62	Varnished Tubing 3/16" long	2
03013-63	Shutdown Rod	1
03013-64	Latch Rod	1
03013-65	Snap Ring	1
03013-66	Washer Assembly	1
03013-67	Ball	7
03013-68	Bushing, Ball Release	1
03013-69	Plunger Stop	1
03013-70	Diodes (Figure 4) (not shown in parts breakdown)	2
03013-71	Plunger Stop Assembly	1
03013-72	O-Ring, .739" ID x .070"	1
03013-73	Washer, .875" x 1.125" x .047"	1
03013-74	Plunger Assembly	1
03013-75	Roll Pin, .062" Dia. x .312", S.S.	1
03013-76	Solenoid Coil Assembly	1
03013-77	Solenoid Plunger Guide Assm.	1
03013-78	Adjusting Nut	1
03013-79	Not Used	
03013-80	Not Used	

Ref.	Part Description	Quantity	Ref.	Part Description	Quantity
03013-81	Socket Plug	1	03013-128	Cable Assembly	1
03013-82	Lock Nut	1	03013-129	Motor Gasket	1
03013-83	Solenoid Plunger Guide	1	03013-130	Motor	1
03013-87	Coil Assembly	1	03013-131	Lock Washer, No. 6	4
03013-85	Plunger Guide Assembly	1	03013-132	Cap Screw, 0.312-18 x 0.875	4
03013-86	Wire Splice	2	03013-133	Resistor Assembly	2
03013-87	Solenoid Nut	1	03013-134	Shakeproof Washer #4	2
03013-88	Solenoid Washer	1	03013-135	Soc. Hd. Screw, 4-40 x 0.750	2
03013-89	Plunger Assembly	1	03013-136	Gasket	1
03013-90	Roll Pin	2	03013-137	Cover	1
03013-91	Spring	1	03013-138	Oil Cup	1
03013-92	Spring Seat Washer	2	03013-139	Screw	4
03013-93	Adjusting Nut	1	03013-140	Screw, 10	4
03013-121	Motor Housing	1	03013-141	Pressure Pad	1
03013-122	Soc. Hd. Cap Screw, 10-32	8	03013-142	Printed Circuit Board	1
03013-123	Lock Washer, #10	8	03013-143	Housing Gasket	1
03013-124	Cable Assembly	1	03013-144	Cable Assembly	1
03013-125	Potting Stop	1	03013-145	Grommet	2
03013-126	Wire Protector Bushing	2	03013-146	Plug	1
03013-127	Potting Stop	1	03013-147	Wiring Harness	1

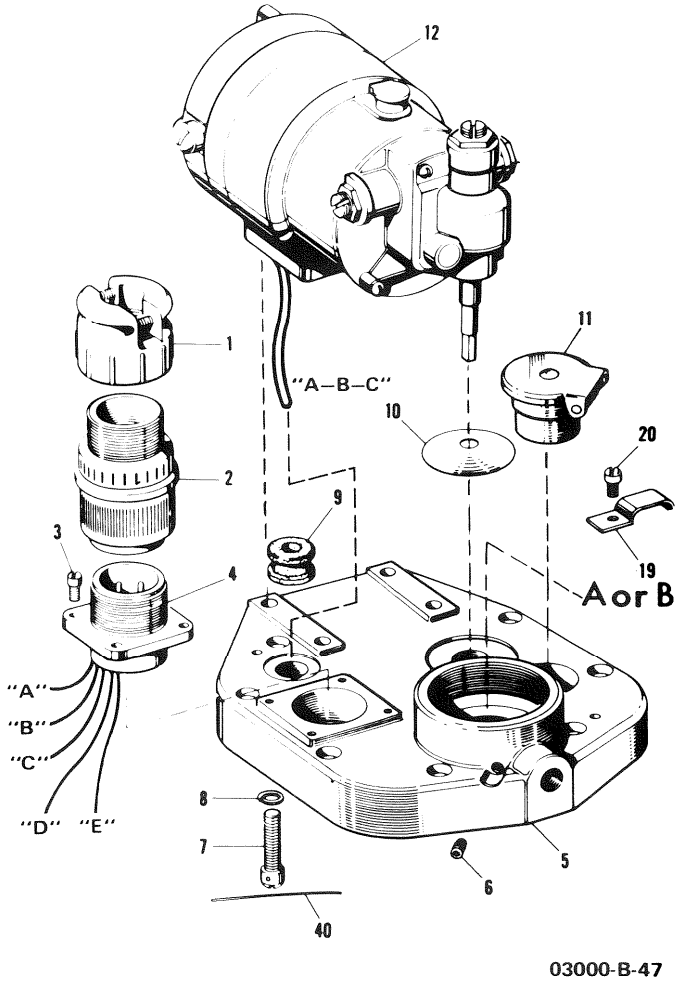

Figure 6. Cover Assembly (with speed setting motor)

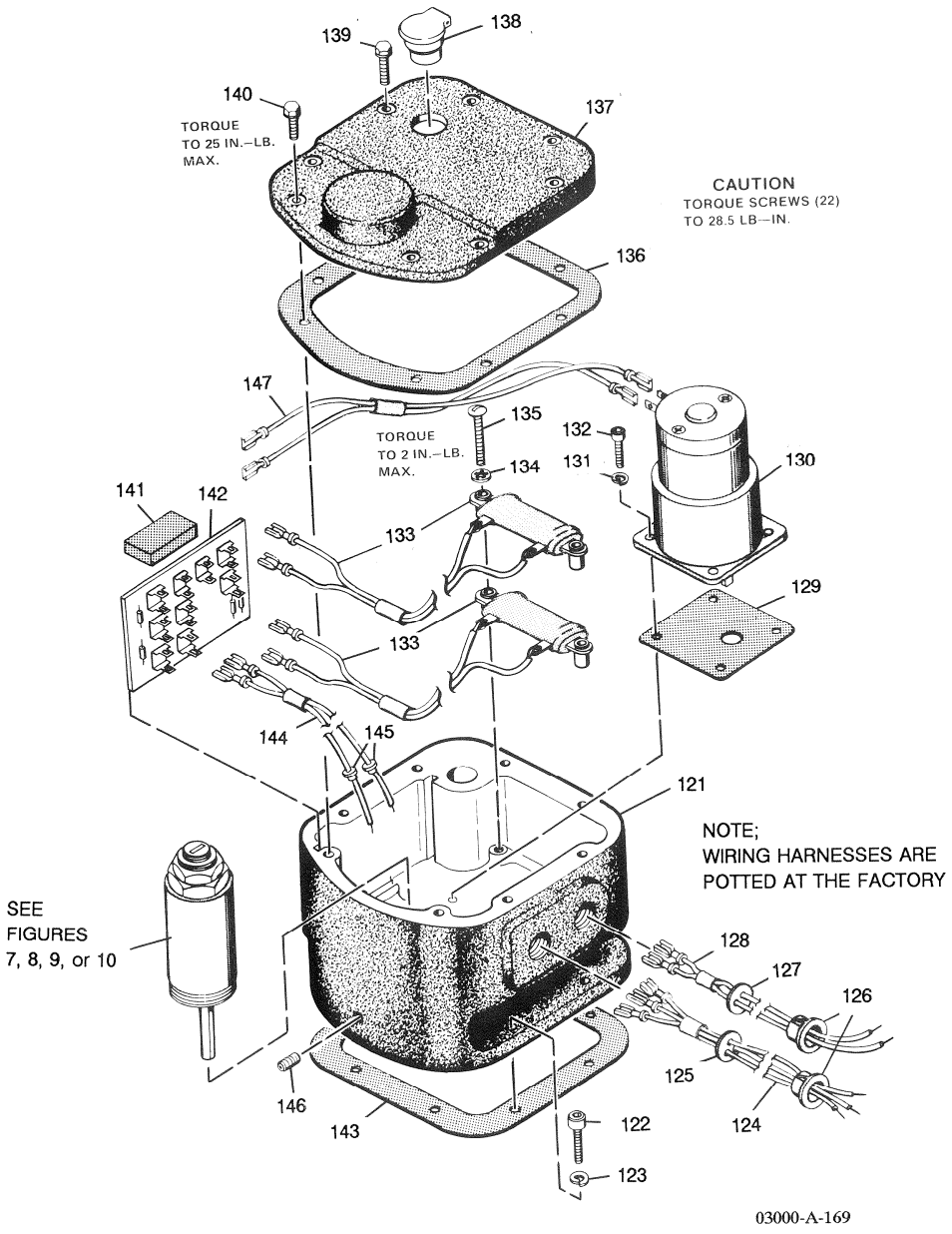

Figure 6a. PM Motor Assembly (see manual 03035)

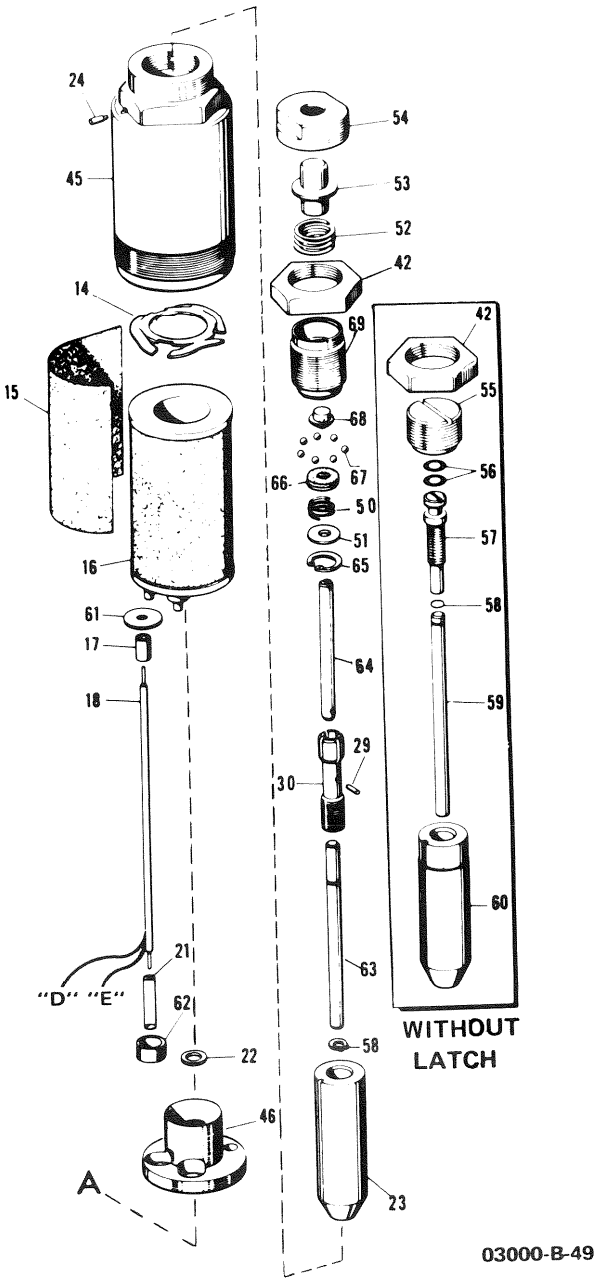

Figure 7. Energize to Shut Down with Latch

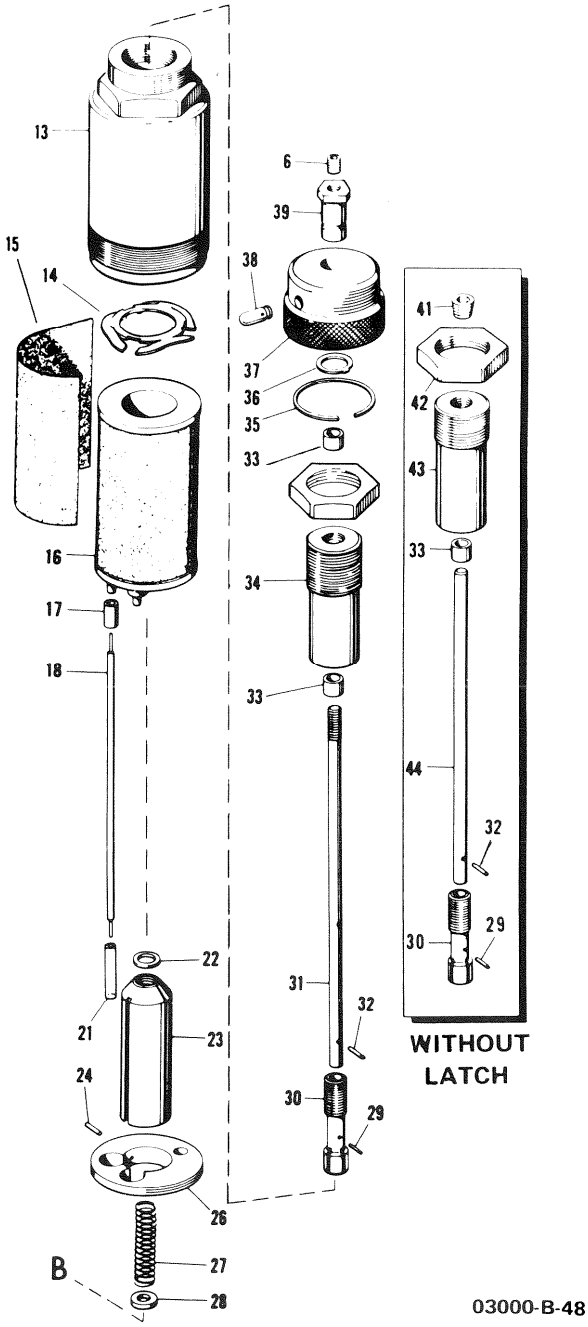

Figure 8. De-Energize to Shut Down with Latch

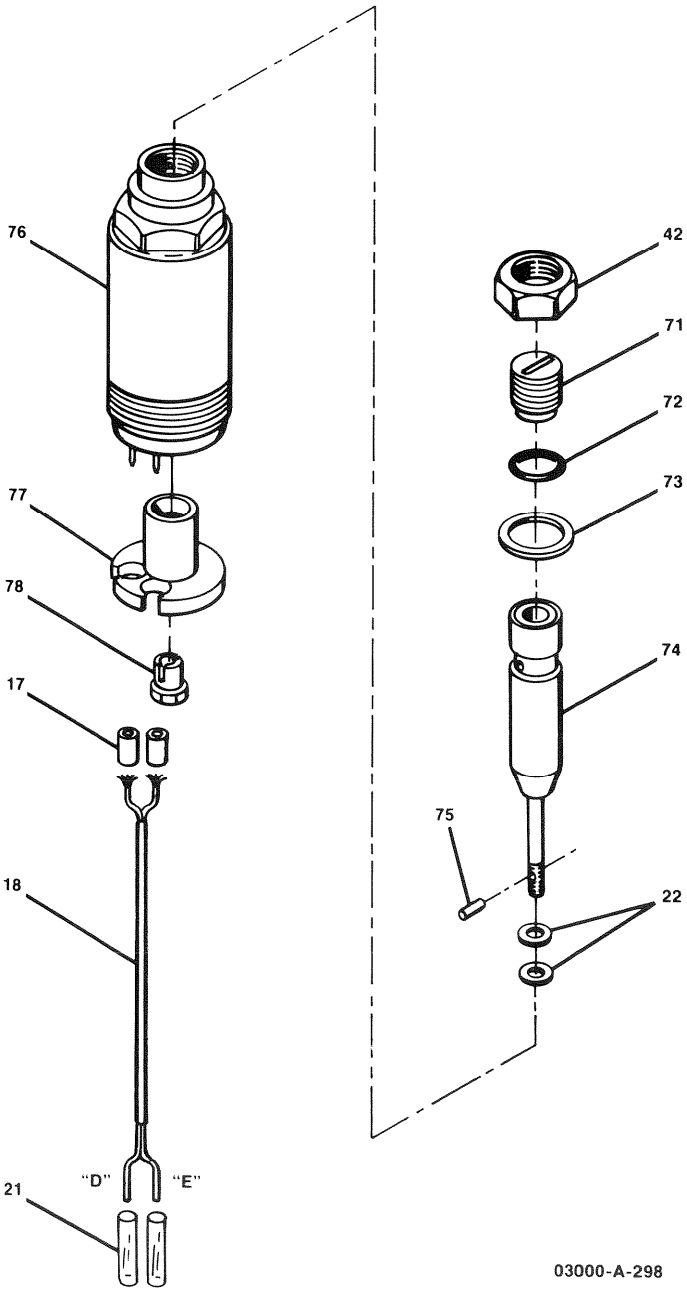

Figure 9. Vibration Resistant Energize to Shut Down, without Latch

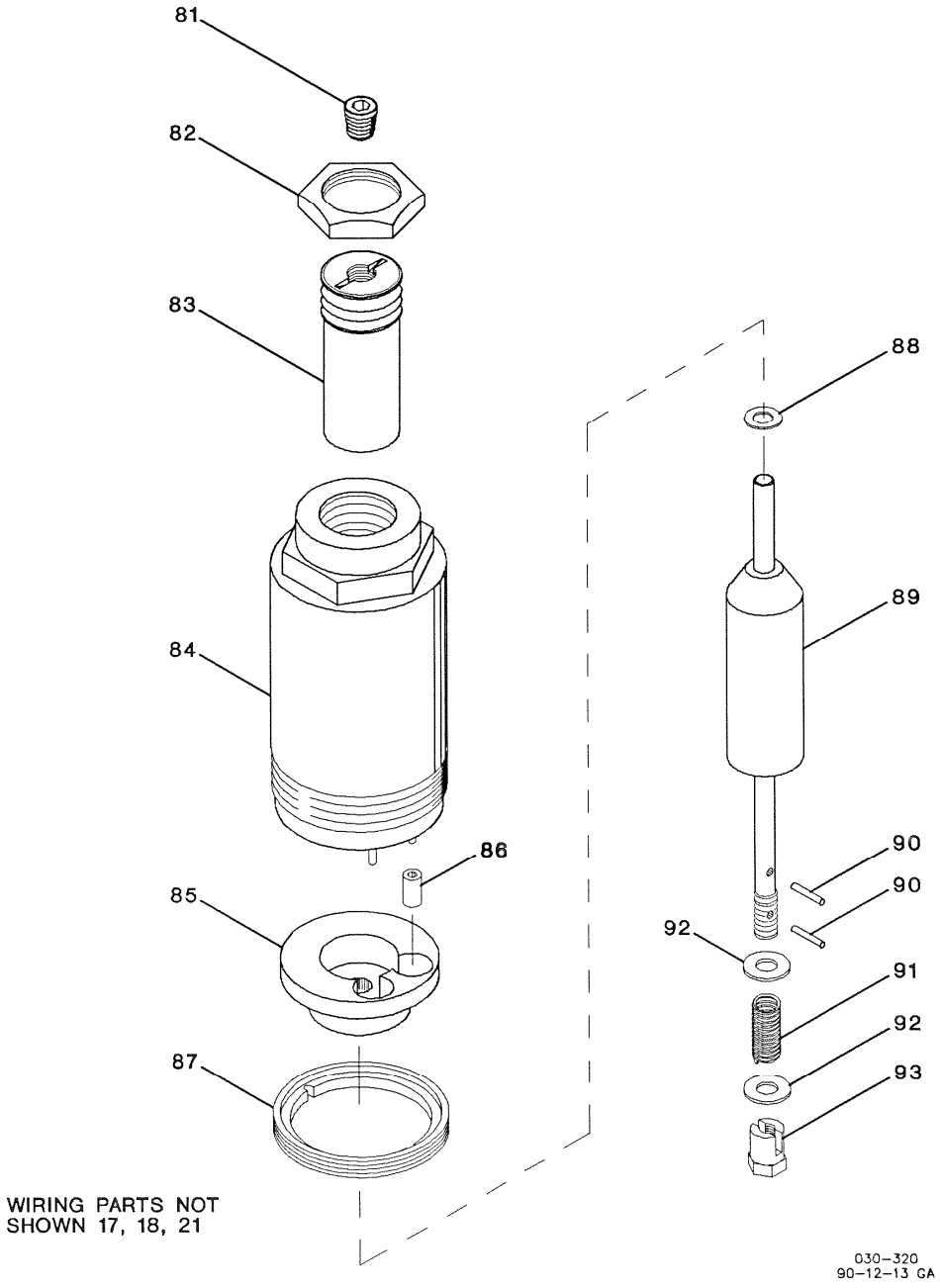

Figure 10. Vibration Resistant De-energize to Shut Down, with Latch

Chapter 3.
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 03013T.

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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.

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