

**PG Shutdown Solenoid
Dial and Lever**

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

If the cover of this publication states "Translation of the Original Instructions" please note:

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Warnings and Notices

Important Definitions



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER**—Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING**—Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION**—Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE**—Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT**—Designates an operating tip or maintenance suggestion.

WARNING

**Overspeed /
Overtemperature /
Overpressure**

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

WARNING

**Personal Protective
Equipment**

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

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

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

WARNING

Start-up

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

WARNING

**Automotive
Applications**

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

NOTICE**Battery Charging
Device**

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electrostatic Discharge Awareness

NOTICE**Electrostatic
Precautions**

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

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

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual **82715**, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control.

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

PG Shutdown Solenoid

General Information

This PG shutdown solenoid is designed for use on PGD (dial) and PGL (lever) governors that have spring return servos. The solenoid is available in either an energize or a de-energize mode to initiate shutdown. Solenoid coils are available to accommodate most common dc voltages. Power required is 6 W. For ac operation, a separately mounted transformer and rectifier assembly converts 110 or 220 Vac to 12 Vdc.



This shutdown solenoid must NOT be used for overspeed shutdown. Use only for shutdown from low oil pressure, high oil or water temperature, etc.

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.

Operation

In Figure 1A, the solenoid operated shutdown device is energized in the normal operating mode of the governor and de-energized to shut down. In this arrangement, the valve seat ball is located on the lower valve seat. With the unit energized to run, the shutdown plunger rod presses the valve seat ball tightly against the lower valve seat so no oil escapes from it. When the solenoid is de-energized, the solenoid plunger allows the shutdown plunger rod to move back approximately 1/16 inch (1.6 mm), releasing the valve seat ball and allowing the trapped oil to flow through the valve opening to sump.

In Figure 1B, the device shown will shut down the unit when the solenoid is energized. As the solenoid is energized, the solenoid plunger moves the shutdown plunger rod downward, unseating the valve seat ball.

The schematic diagram (Figure 2) also shows schematically how the shutdown solenoid operates.

Adjustments

If for any reason it is necessary to readjust the solenoid shutdown device, follow one of the following procedures (see Figure 1).

Energize to Shutdown Arrangement

Loosen stop plug (1), remove plunger stop plug (2), and energize the solenoid. Use a screwdriver and turn adjusting screw (4) down until the governor starts to shut down. Turn the adjusting screw down 1-1/4 turns further. Install the plunger stop plug, and screw the plug down tight. Back off the plunger stop plug 2 turns and lock in place with the lock nut (1).

De-energize to Shutdown Arrangement

Loosen stop plug (1), remove stop plug (2), and energize the solenoid. Use a screwdriver and turn adjusting screw (4) down until the ball contacts the lower seat. Screw down 1/4 turn further (forcing the solenoid plunger up). Insert the plunger stop plug and turn it down tight. Back off the plunger stop plug 2 turns, and lock in place with the lock nut.

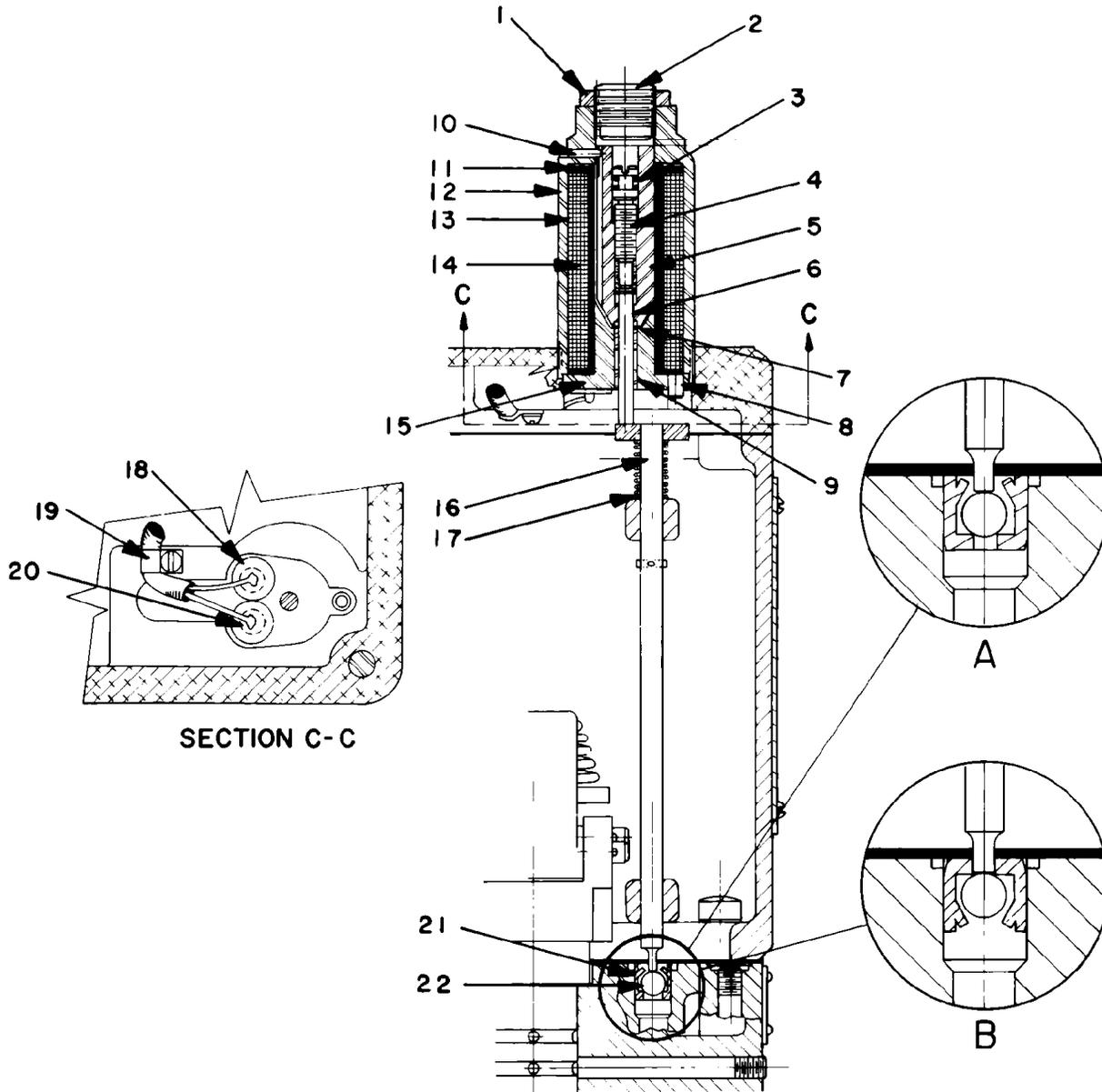


Figure 1. Cutaway View of PG Solenoid Shutdown

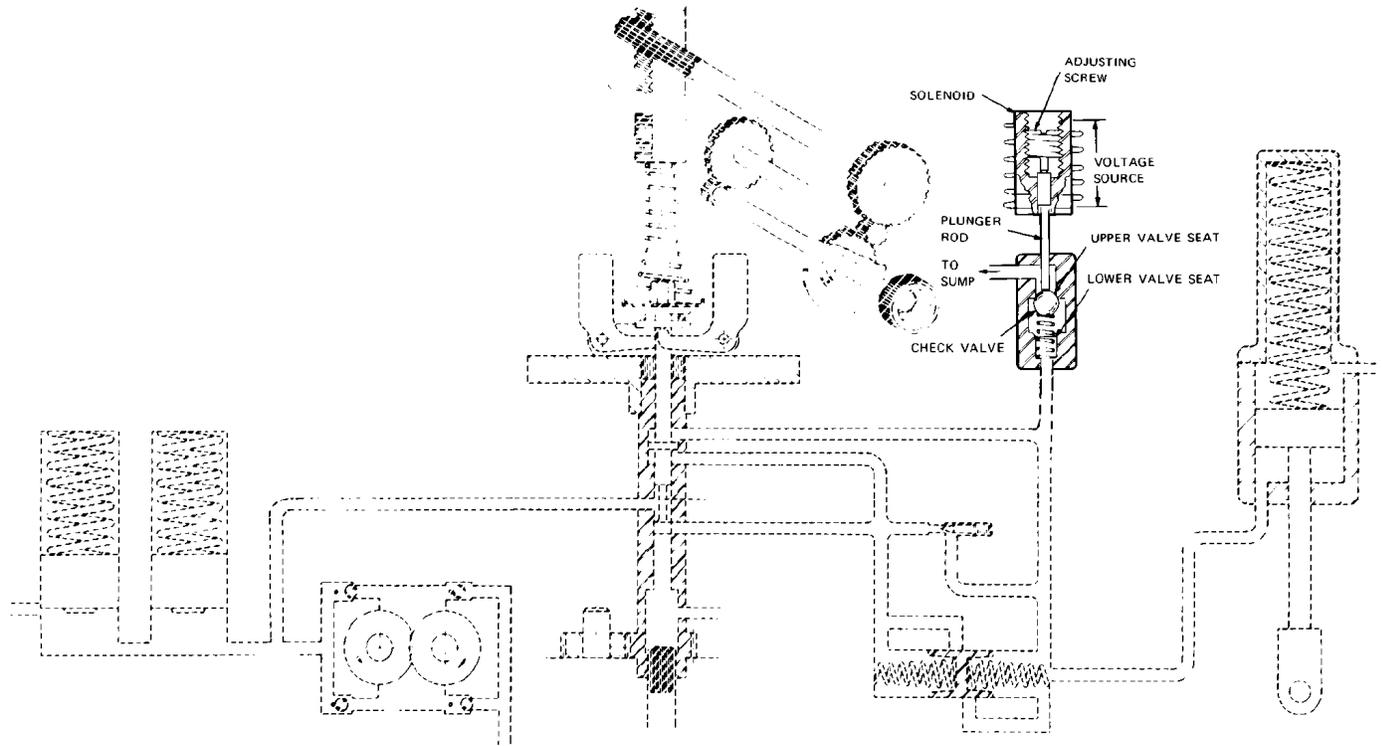


Figure 2. Schematic Diagram of PGD with Solenoid Shutdown

Replacement Parts Information

When ordering replacement parts, it is essential to include the following information:

- Governor serial number and part number shown on nameplate
- Manual number (this is manual 36685)
- Parts reference number in parts list and description of part or part name

The numbers assigned are used as reference numbers and are not specific Woodward part numbers. Woodward will determine the exact part number for your particular governor.

Parts List for Shutdown Solenoid

Ref. No.	Part Name	Quantity
36685-1	Jam nut, 3/4-32.....	1
36685-2	Plunger stop plug.....	1
36685-3	O-ring.....	2
36685-4	Adjusting screw.....	1
36685-5	Solenoid plunger.....	1
36685-6	Solenoid plunger rod.....	1
36685-7	Solenoid plunger washer	1
36685-8	Not used	
36685-9	Plunger guide locating pin	1
36685-10	Solenoid locking pin.....	1
36685-11	Wane spring washer	1
36685-12	Solenoid case	1
36685-13	Insulating paper	1
36685-14	Solenoid coil	1
36685-15	Solenoid plunger guide assy.....	1
36685-16	Shutdown rod.....	1
36685-17	Compression spring.....	1
36685-18	Soldering shield washer, 1/2 OD	2
36685-19	Wire strap	1
36685-20	Teflon tube.....	2
36685-21	Check valve	1
36685-22	Not used	
36685-23	Washer	1
36685-24	Screw.....	1
36685-25	Cover	1
36685-26	Screw.....	2
36685-27	Washer	2
36685-28	Cover	1
36685-29	Screw.....	2
36685-30	Washer	2
36685-31	Washer	4
36685-32	Terminal block	1
36685-33	Screw.....	2
36685-34	Washer	2
36685-35	Terminal box.....	1
36685-36	Soc. hd. set screw, 10-32 x 0.250.....	1
36685-37	Snap ring	1
36685-38	Pin	1
36685-39	Wire	AR

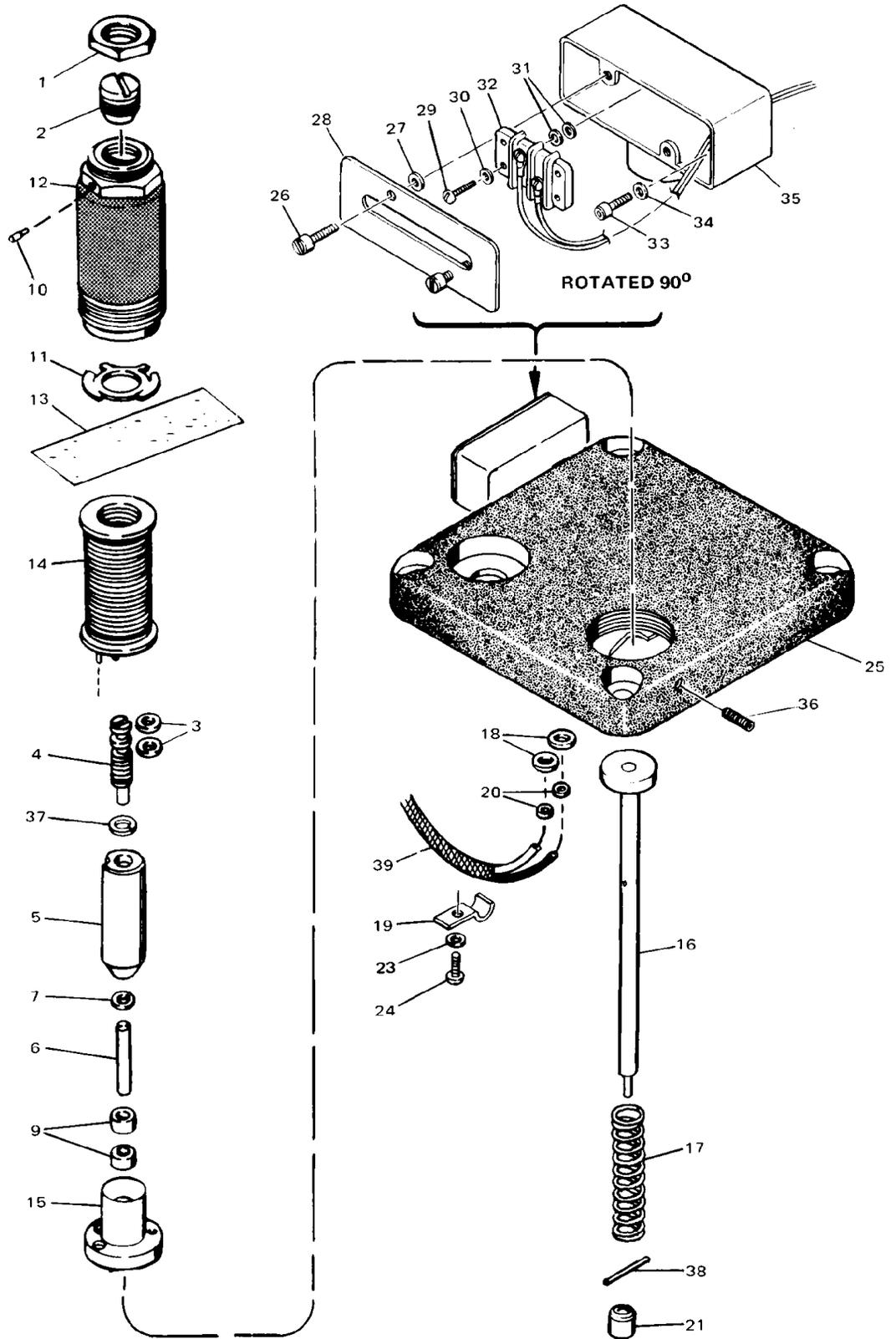


Figure 3. Exploded View of Solenoid Shutdown for PGD

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication **36685B**.



PO Box 1519, Fort Collins CO 80522-1519, USA
1000 East Drake Road, Fort Collins CO 80525, USA
Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

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