

PG Governor Speed Adjusting Motor

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

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 Governor Speed Adjusting Motor

Purpose

The speed adjusting motor is used to provide a means of remote speed adjustment for the PG Dial governor. It enables the switchboard operator to match the frequency of an alternator to that of other alternators, or to change load distribution when operating with other units in the droop mode.

Installation

See Figure 1 for placement of the speed adjusting motor and its drive components. Most motors are split-field, series-wound reversible type. These motors run on either ac or dc power, and are available for 115 and 230 volts. Motors for dc operation only are available for 24, 125, and 250 volts. Figure 2 shows the proper way to wire the motor into an electrical circuit. Housings and connections are available to mount the motor on the right, left, or back side of the governor. Figure 1 shows a rear mounted motor with the cover removed.

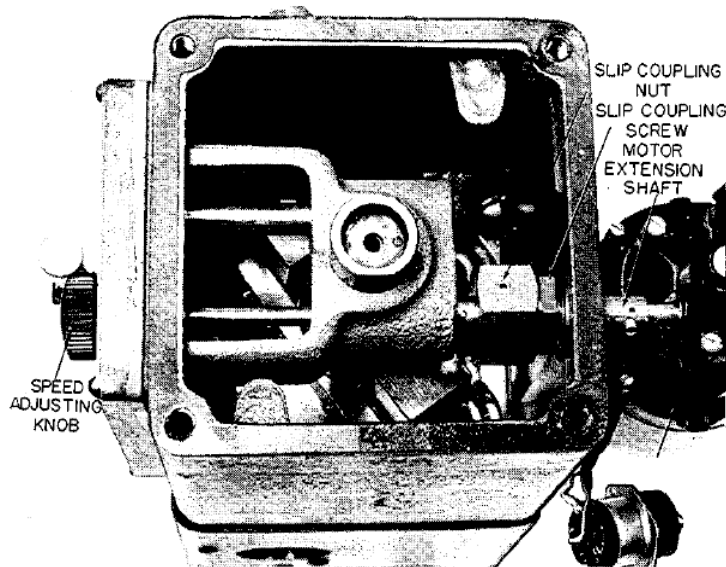


Figure 1. Motor and Drive Train

Adjustment

A friction-type slip coupling on the motor shaft (see Figure 3) allows the speed setting to be adjusted by the knob on the governor panel as well as by the motor. If there is too little friction, the motor drive will slip. With too much friction, the manual drive will turn with extreme difficulty.

If the coupling requires adjustment, follow this procedure: Loosen set screw 6 in nut 7. Tighten screw 8 in nut 7 to increase friction, or loosen screw to decrease friction. If screw 8 cannot be tightened to 3.0 to 3.5 lb-in (0.3 to 0.4 N·m) torque, either replace the fiber washer or place a shim between spring 21 and screw 8.

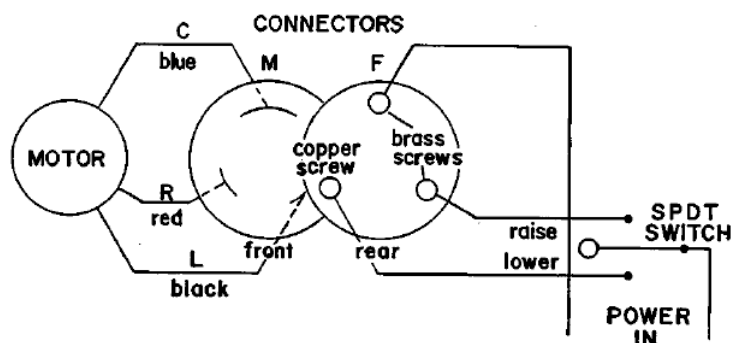


Figure 2. Suggested Wiring Circuit for Rear Mounted and Left Mounted Motors.
Reverse Red and Black Connections for Right Mounted Motors.

Information and Parts Replacement

When requesting information about governor or speed adjusting motor operation, or when ordering parts, the following information must accompany the request.

- Governor serial number (shown on nameplate) and information stamped on motor nameplate. This information is needed because the reference numbers given in this manual do not identify the exact part number required by any one governor.
- Manual number (this is manual 36014)
- Part reference number, name of part, or description of part

The motor should not be replaced until the failure of the remote speed adjustment is known to be a defect in the motor. First check the slippage on the coupling, the manual speed setting gear train for binding, and the wiring to the motor for low (or no) voltage or poor connections.

Ref. No.	Part Name	Quantity
36014-1	Shaft	1
36014-2	Gear	1
36014-3	Taper Pin—6/0 x 3/4	2
36014-4	Bushing	2
36014-5	Bushing	1
36014-6	Set Screws—10-32 x 1/4	2
36014-7	Nut	1
36014-8	Screw	1
36014-9	Motor	1
36014-10	Cover	1
36014-11	Wire Marker – C	1
36014-12	Wire Marker – L	1
36014-13	Wire Marker – R	1
36014-14	Plug	1
36014-15	Screw -10-32 x 1/2	4
36014-16	Washer -10 shakeproof	4
36014-17	Felt washer	1
36014-18	Washer	1
36014-19	Spring	1
36014-20	Fiber Washer	1
36014-21	Spring	1
36014-22	Fiber Washer	1
36014-23	Washer – splitlock	2
36014-24	Screw - 8-32 x 3/8	2
36014-25	Connector	1

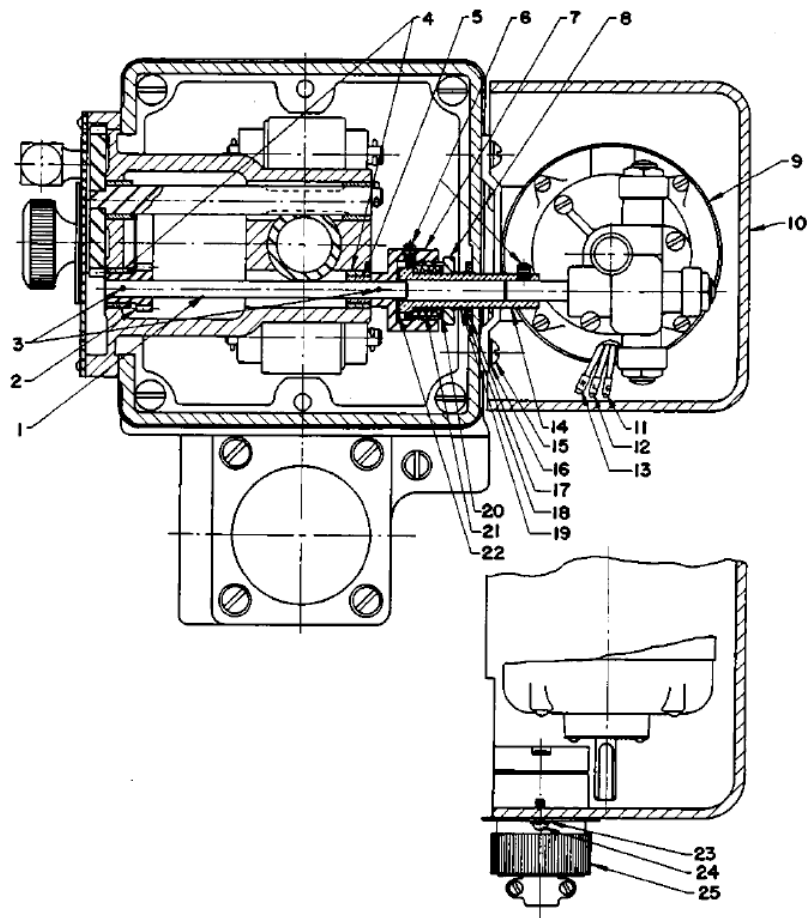


Figure 3. Motor and Drive Assembly, Rear Mounted Drive

IMPORTANT

Left or right hand mounted motors will vary slightly in parts needed.

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication **36014F**.



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