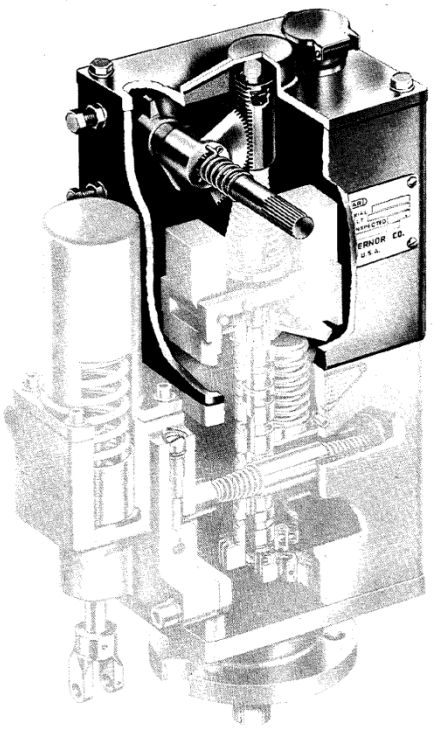
WOODWARD

Product Manual 36615
(Revision B)
Original Instructions



PG Governor
Lever-Type Speed Setting

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:

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 Out-of-date translations are marked with ⚠.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.

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
Lever-Type Speed Setting

Introduction

This manual is one of several covering various components of the type PG governor, and can be combined with other “sectional” manuals to describe fully a particular PG governor model.

This manual covers operation, repair, adjustment, and parts lists of the lever-type speed setting for short column PG governors (Figure 1). This type of speed setting (one of many arrangements available for use on PG governors) allows a method of adjusting speed rapidly over a wide range by means of linkage connected from the governor lever to a remote throttle.

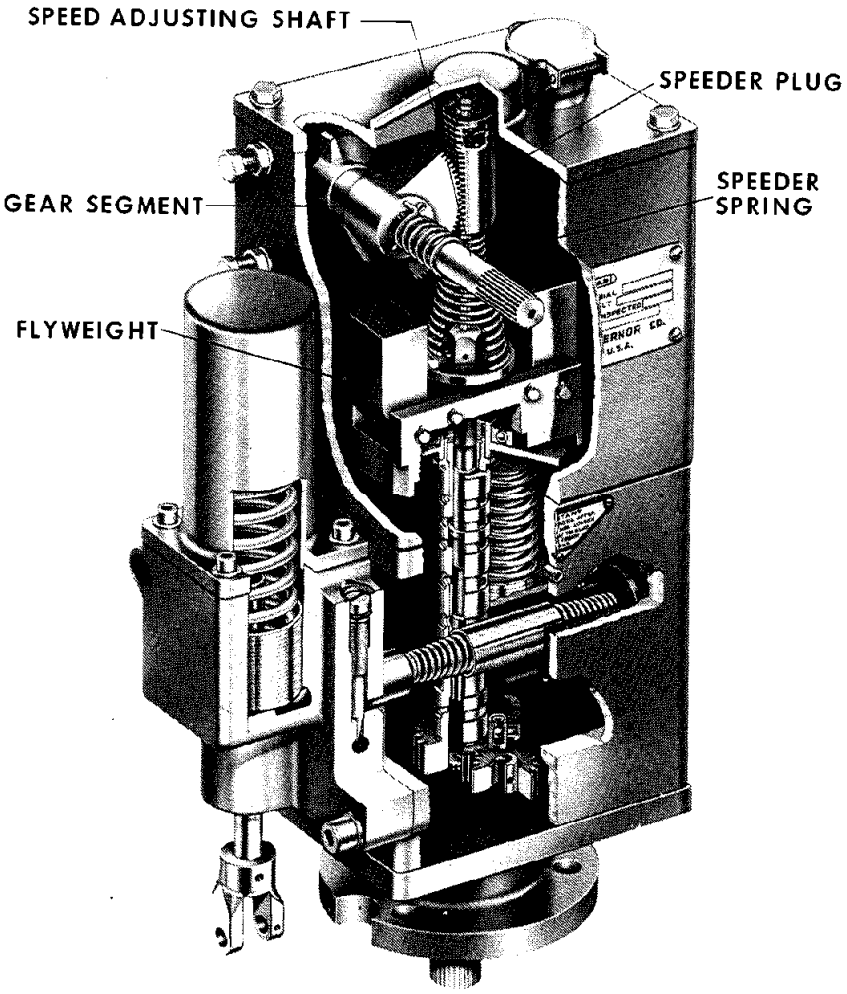

Figure 1. PG Lever Speed Setting Cutaway

Operation

Refer to the schematic (Figure 2). The governor speed setting is determined by the compression of the speeder spring; the speeder spring compression is determined by the position of the speeder plug, which is raised or lowered by rotation of the speed adjusting shaft. Refer to the Woodward manual covering PG governor basic elements for a description of the effect of a speed setting change on operation of the basic elements.

⚠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.

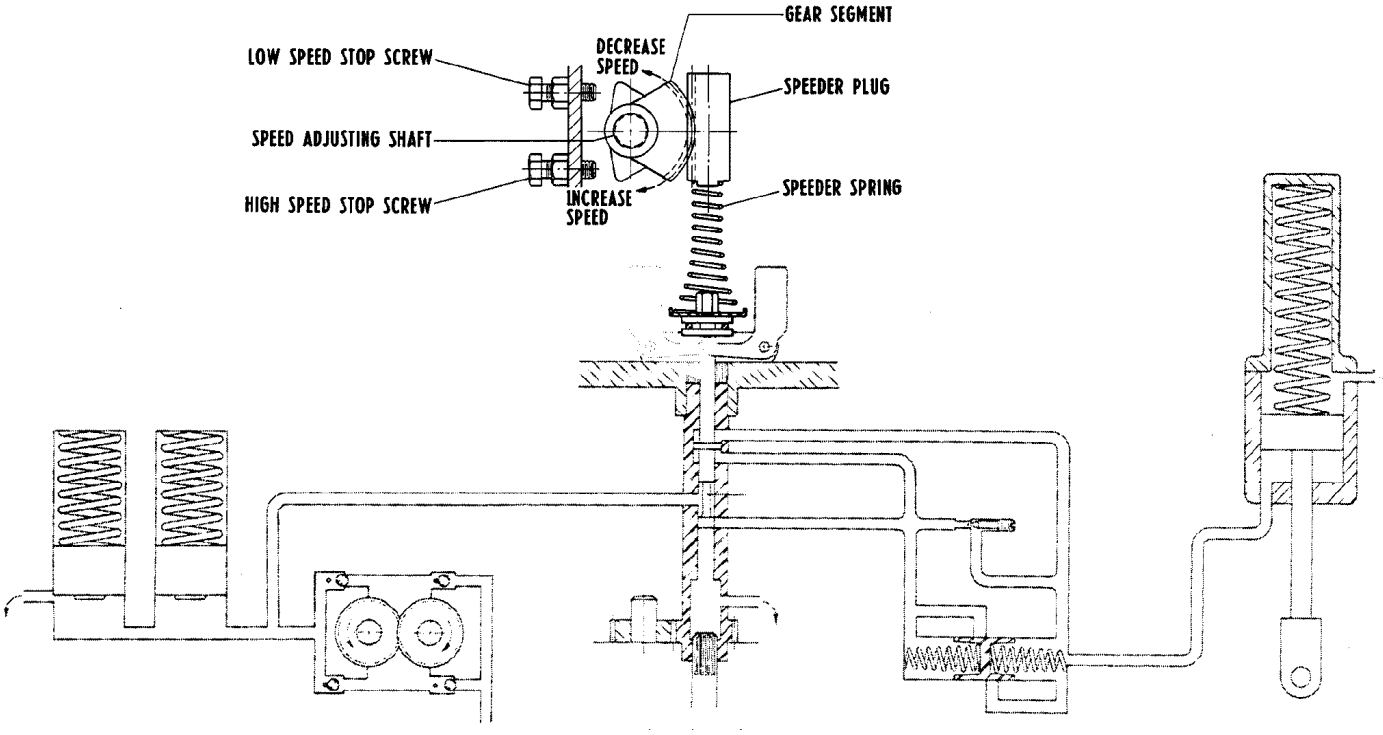

Figure 2. Lever Speed Setting

Maintenance

General

When requesting information concerning operation, or when ordering replacement parts, it is essential that the following information be included:

- Serial number (shown on nameplate)
- Manual number (this is manual 36615) and part reference number an shown in this manual
- A description, or name, of the parts

The best mechanic available (preferably one experienced with small, precision assemblies) should be assigned to all governor repair work. Governor repair should be performed in a separate area kept free from dirt, grit, or corrosive vapors.

Disassembly

Refer to Figure 3.

Top Cover

1. Remove cover screws (2) and washers (3).

2. Remove cover (4) and gasket (5).

Column Assembly

1. Mark relative position of segment gear (14) to speeder plug (12).

2. Back out four fillister head screws (6) located at the lower inside corners of the column, and lift column (17), gasket (25), lockwashers (7), and screws (6) vertically from the power case.

3. Back off hex head screws (19 and 20) and nuts (21). Remove cotter pins (23) holding segment gear (14). Push the speed adjusting shaft (24) in until the speed stop arm (16) slides off of the serrations. Rotate the speed adjusting shaft until the speeder plug gear teeth come out of mesh with those in the segment gear and lift out speeder plug (12).

4. Use a plastic or soft hammer to drive the speed adjusting shaft (24) out of the column. The shaft will carry a needle bearing (10), an O-ring (9), and a retainer (8) with it when removed. Support speed stop arm (16), spacer (15), segment gear (14), and torsion spring (13) as the shaft is driven out.

5. Reinsert the shaft and use it to drive out remaining needle bearing (10), O-ring (9), and retainer (8) from the opposite side of the column.

Inspection and Cleaning

After disassembly, clean all parts in solvent and carefully inspect for wear. Discard all gaskets. Most of the repair work consists of cleaning and polishing the governor parts. Take care that no lint or other foreign matter is left on the parts.

Assembly

Column Assembly

Press needle bearing (10) which was removed last into the column with its O-ring (9) and retainer (8). Install speed adjusting shaft (24), torsion spring (13), segment gear (14), spacer (15), and speed stop arm (16). Now press second bearing (10) into the column. Install other O-ring (9) and retainer (8).

1. Engage speeder plug (12) with segment gear (14) in the same relative position as they were before disassembly.

2. Position speed stop arm (16) and insert cotter pins (23).

3. Install new case-column gasket (25).

4. Place lockwashers (7) and fillister head screws (6) in the holes in the lower flange of the column. Align dowel pins (18) with the holes in the power case. Take care that the speeder spring check plug (as shown in manual 36600 or 36602) is seated in the top of the bore in the speeder plug—not resting on the check plug stop pin in the speeder plug. Secure with screws (6) and lockwashers (7).

5. Install speed limit stop screws (19 and 20) and lock nuts (21).

6. Install cover (4) with new gasket (5). Secure with screws (2) and lockwashers (3).

Speed Limit Adjustment

When adjusting the speed setting, check to see that all linkage from the governor to the engine fuel racks (or metering valve) has been properly adjusted, is free from binding, lost motion, etc. Make certain that the engine is at idle speed or lower when the governor is set for low speed.

Adjust high and low speed limit stop screws (19 and 20) on the engine and secure with lock nuts (21). If it is necessary to go to a higher or lower limit than is allowed by the stop screws, indexing of gear segment (14) on shaft (24) may be changed. Remove cover (4), pull cotter pins (23), and slide the segment off the shaft. Reposition as required on the shaft, reassemble, and recheck speeds.

Ref. No.	Part Name	Quantity
36615-1	Oil filler cup	1
36615-2	5/16”-24 x 3/4” hex hd. mach, screw	4
36615-3	5/16” shakeproof lockwasher	4
36615-4	Cover	1
36615-5	Column-to-cover gasket	1
36615-6	5/16”-24 x 5/8” fil. hd. mach. screw	4
36615-7	5/16” split ring lockwasher	4
36615-8	Retainer	2
36615-9	O-ring	2
36615-10	Needle bearing	2
36615-11	Spring check pin	1
36615-12	Speeder plug	1
36615-13	Torsion spring	1
36615-14	Segment gear	1
36615-15	Spacer	1
36615-16	Speed stop arm	1
36615-17	Column	1
36615-18	Dowel pin	1
36615-19	3/8”-24 a 1” hex hd. screw	1
36615-20	3/8”-24 x 1 1/4” hex hd. screw	1
36615-21	3/8”-24 hex nut	2
36615-22	Lockwire	10” (25 cm)
36615-23	Cotter pin	2
36615-24	Speed adjusting shaft	1
36615-25	Case-column gasket	1
36615-26	6-32 x 1/4” rd. hd. screw	4
36615-27	Nameplate	1

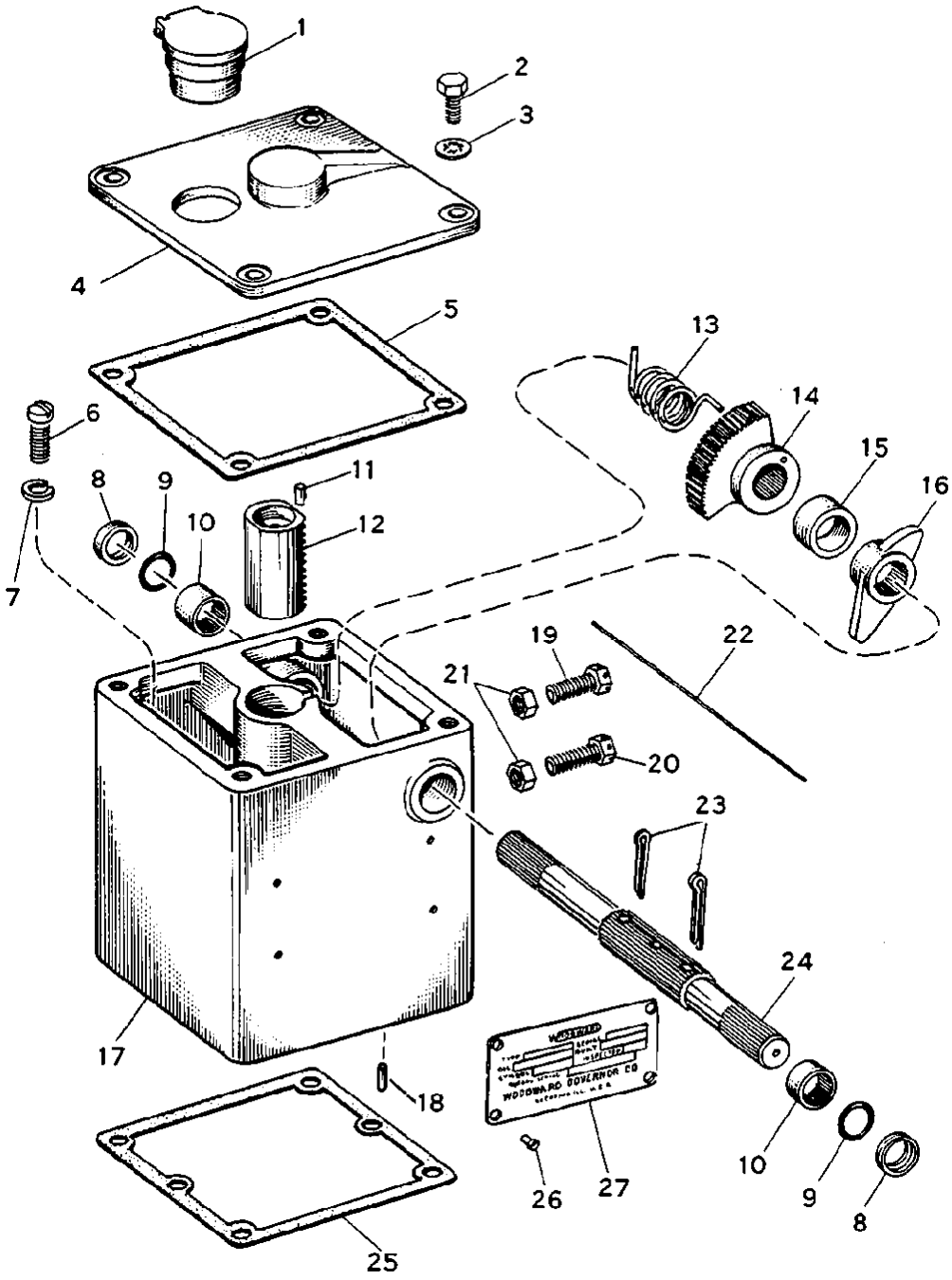

Figure 3. PG Lever-Type Speed Setting Exploded View

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

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