

## **PG Base Assemblies**

**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.



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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 Base Assemblies

## Introduction

The base assemblies described in this manual are essential to the operation of all PG governors—the governor is incomplete without its base. Refer to the applicable governor manual for information on how the base assemblies relate to the governor.

Five types of base assemblies are covered in this manual:

- PG standard
- PG-UG8 standard
- PG-UG8-90° (base rotated 90° with respect to PG-UG8 standard)
- PG-UG40
- PG extended square

All PG base assemblies have essentially the same basic components. The difference between units is the base configuration and the type of drive shaft used (see Figure 1). Special drive shafts and bases (not covered in this manual) are available to facilitate adapting the governor to a particular engine or turbine configuration. Contact Woodward for special installations. The PG standard base uses a serrated or a special drive shaft; the PG-UG8, PG-UGB-90°, and PG-UG40 base may use either a serrated or keyed drive shaft; and the PG extended square base uses only a keyed drive shaft. A standard base arrangement is shown on the cover of this bulletin.

The drive shaft, driven by a mechanical connection to the engine or turbine, rotates the governor oil pump drive gear, flyweight heads, and pilot valve bushing.

For a detailed theory of operation of the governing system, refer to the applicable governor manual.

## Maintenance/Overhaul

### General

At all times, use care in handling the base assembly—be particularly careful to avoid striking the drive shaft. Do not drop or rest the base on the drive shaft. Such treatment could damage the drive shaft, bearing, and seal.

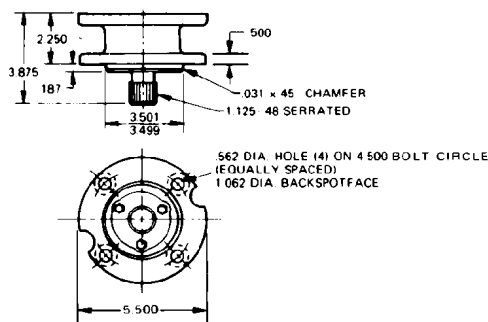
Generally, the base assembly should operate maintenance-free for several years. About the only maintenance needed prior to a general overhaul is the replacement of the oil seal around the drive shaft, if it leaks excessively. Refer to the disassembly procedure and parts breakdowns (Figures 2 & 3).

### Disassembly

Disassemble the base assembly in the sequence of index numbers assigned in Figure 2 or 3. Circled index numbers do not require further disassembly unless repair or replacement of the part is required.

Clean the exterior surface of the base with a clean cloth moistened with cleaning solvent (Federal Specification P-D-680 or similar).

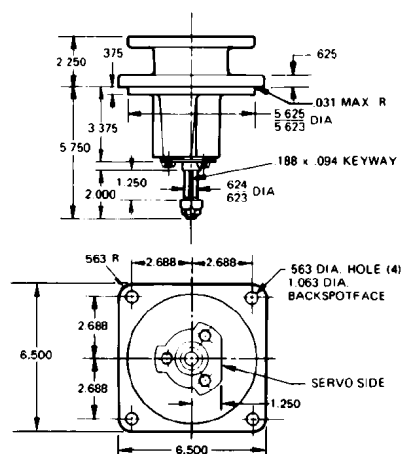
INCH	MM	INCH	MM
7.750	198.8	1.531	38.9
6.500	165.1	1.500	38.1
6.750	146.1	1.260	31.8
5.500	114.4	1.125	28.6
6.250	133.4	1.093	27.8
4.999	126.97	1.062	27.0
4.997	126.92	0.906	23.0
4.781	121.4	0.875	22.2
4.500	114.3	0.781	19.8
4.125	104.8	0.625	15.9
3.718	94.4	0.6245	15.86
3.501	88.92	0.624	15.85
3.500	88.9	0.582	14.3
3.499	88.87	0.546	13.9
3.375	87.7	0.500	12.7
3.250	82.6	0.437	11.1
3.248	82.5	0.406	10.3
2.875	73.0	0.312	8.0
2.750	69.9	0.250	6.4
2.500	63.5	0.188	4.8
2.488	62.7	0.187	4.7
2.260	57.2	0.094	2.4
2.218	56.2	0.062	1.6
2.031	51.8	0.031	0.8
2.000	50.8	0.015	0.4



**STANDARD PG BASE ASSEMBLY**  
(SERRATED DRIVE SHAFT-STANDARD,  
SPLINED DRIVE SHAFT-SPECIAL)

36600-A-128

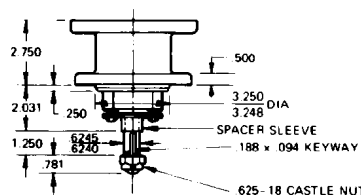
## KEYED DRIVE SHAFT ONLY



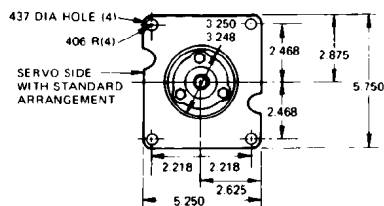
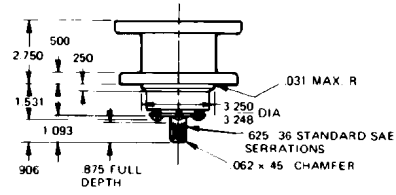
**PG EXTENDED SQUARE BASE ASSEMBLY**

36600-A-128

## KEYED DRIVE SHAFT

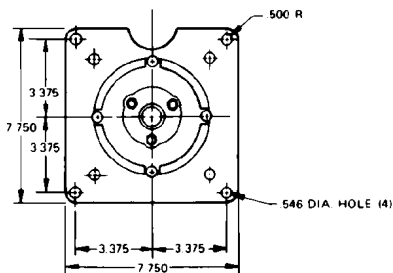
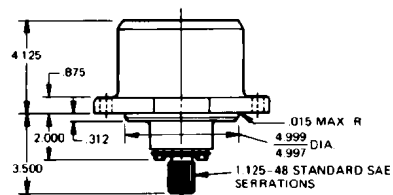


## SERRATED DRIVE SHAFT

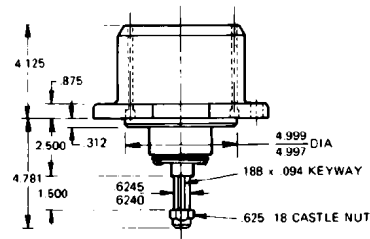


**PG-UG8 AND PG-UG8-90° BASE ASSEMBLY**

## SERRATED DRIVE SHAFT



## KEYED DRIVE SHAFT



**PG-UG40 BASE ASSEMBLY**

Figure 1. PG Base Assemblies

Discard gasket, seal, cotter pin, retaining ring, etc, removed in the process of disassembly.

Wash all parts with cleaning solvent. Use a non-metallic brush or jet of compressed air to clean slots and holes.

Dry all parts after cleaning with a jet of clean, dry air.

## Inspection

Visually inspect parts for evidence of wear, pitting, scoring, nicks, cracks, or other damage.

Inspect the bearing in accordance with standard practice. Replace the bearing when there is any detectable roughness or stickiness.

If the base has a serrated or splined drive shaft, ensure that it engages or slips freely into the internal splines or serrations of the drive. If the base has a keyed drive shaft, the drive gear must slip on the shaft freely and should be checked to ensure that it meshes properly with its mating gear, without binding or excessive backlash.

## Repair or Replacement

Repair of small parts is impractical and should generally be limited to removal of nicks and burrs from mating flanges, replacement of the bearing, and light burnishing of mating parts.

Polish slightly corroded areas with a fine grit (600 grit) abrasive cloth or paper and oil.

## Reassembly

Assemble the base assembly in reverse order of the index numbers assigned in Figures 2 and 3.

Obtain new gasket, seal, retaining ring, cotter pin, etc, to replace those discarded during disassembly.

Do not overtighten screws (2) and/or (102). Apply 15 to 30 lb-in (1.7 to 3.4 N·m) torque.

## Parts Replacement Information

When ordering replacement parts, it is essential that the following information be given:

- Governor type, model, part number, and serial number as given on nameplate
- Manual number (this is manual 36693)
- Part reference number as given in parts list and part name or description

The illustrated parts breakdown (Figures 2 and 3) shows all parts for standard PG base assemblies. Index numbers are assigned in disassembly sequence. Circled index numbers indicate items which do not require further disassembly unless repair or replacement is required.

## Parts List—Standard PG Base Assembly

Ref. No.	Part Name	Quantity
36693-1	Lockwire	AR
36693-2	Screw, hex hd cap, 1/4-28 x 5/8	3
36693-3	Bearing retainer	1
36693-4	Gasket	1
36693-5	Oil seal retainer	1
36693-6	Oil seal	1
36693-7	Retaining ring	1
36693-8	Bearing	1
36693-9	Drive shaft	1
36693-10	Pin	2
36693-11	Base	1

## Parts List—PG-UG8, PG-UG8-90°, PG-UG40, and PG Extended Square Bases

Ref. No.	Part Name	Quantity
36693-101	Lockwire (MS9226-3)	AR
36693-102	Screw, hex hd cap, 1/4-28 n 5/8 (MS5109-5)	1
36693-103	Bearing retainer	1
36693-104	Cotter pin (MS24665-372)	1
36693-105	Castellated nut, 1/4-28 (AN310-10)	1
36693-106	Spacer	1
36693-107	Bearing	1
36693-108	Key	1
36693-109	Drive shaft (keyed)	1
36693-110	Retaining ring	1
36693-111	Drive shaft (serrated or splined)	1
36693-112	Oil seal retainer	1
36693-113	Oil seal	1
36693-114	Gasket	1
36693-115	Plug	2
36693-116	Pin	2
36693-117	Base, PG-UG8 standard	1
36693-118	Base, PG-UG8-90°	1
36693-119	Base, PG-UG40	1
36693-120	Base, PG Extended Square	1

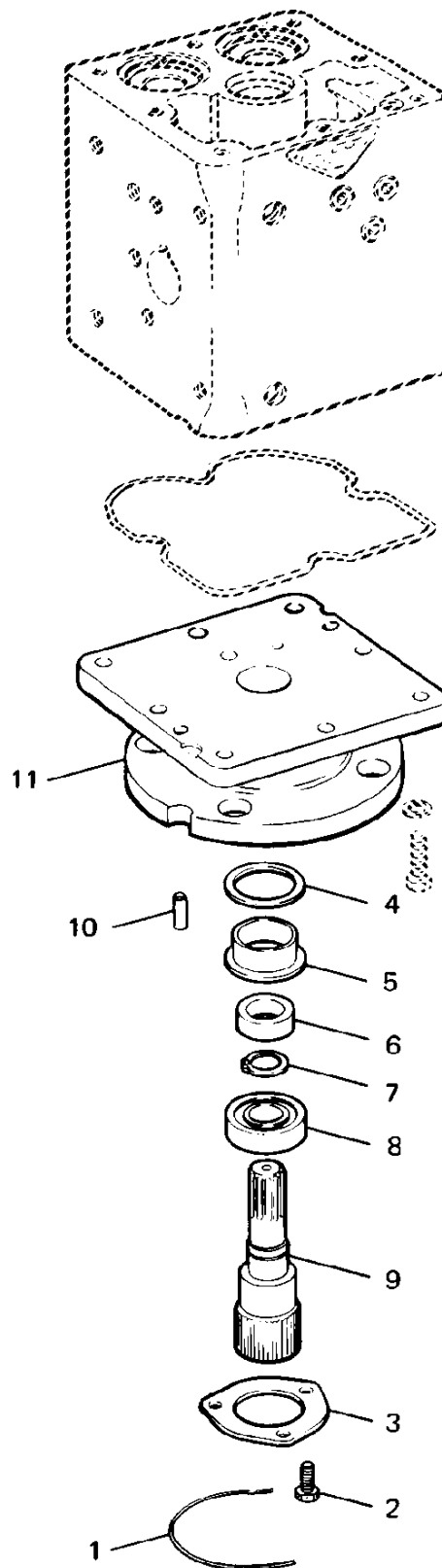


Figure 2. Standard PG Base Assembly



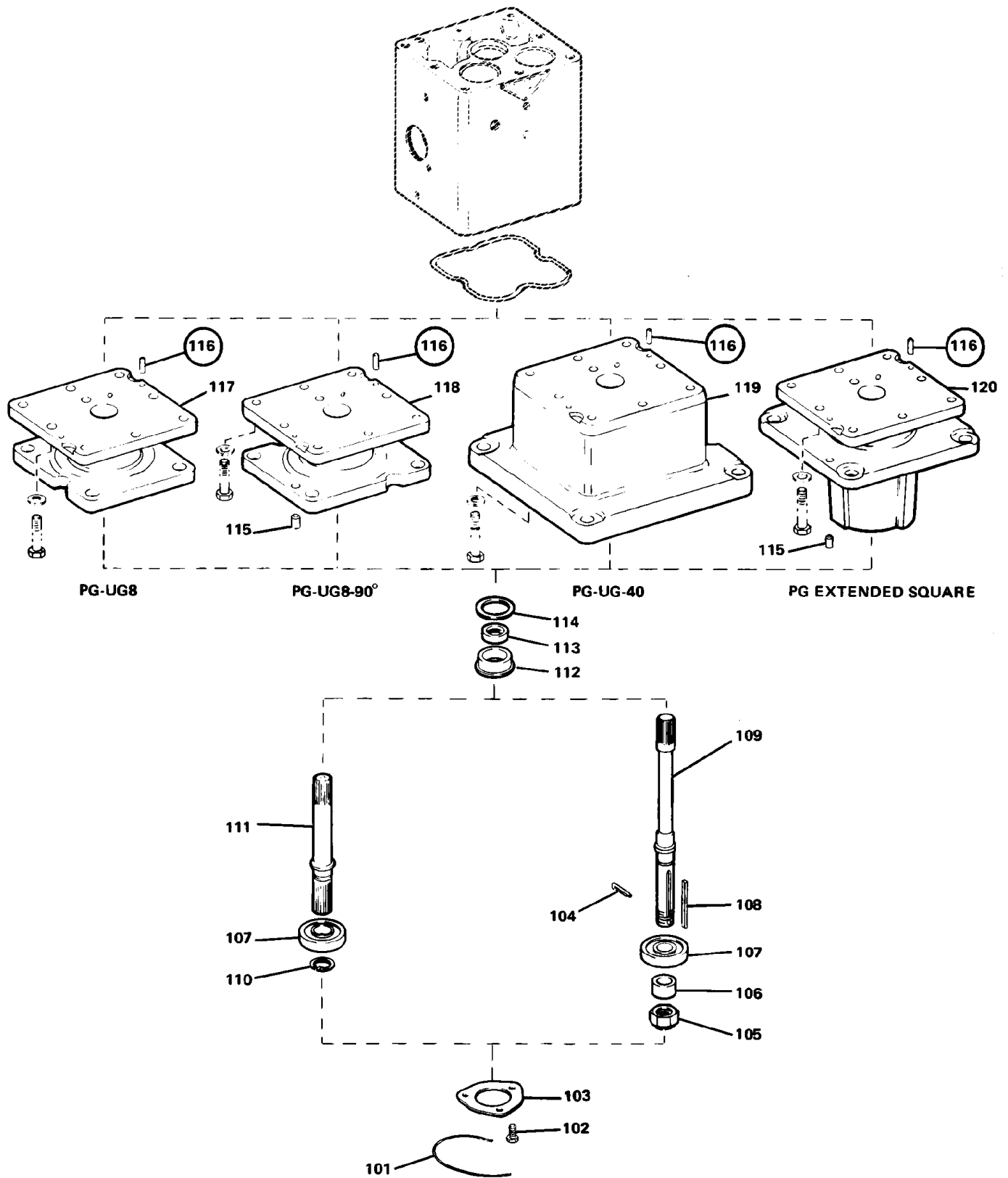


Figure 3. PG-UG8, PG-UG8-90°, PG-UG40, and PG Extended Square Bases

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**Please reference publication 36693D.**



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