

Product Manual 36642 (Revision A) Original Instructions



Dynamic Brake Control for PG Governors

Operation Manual



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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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.

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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 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

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.

Battery Charging Device

Electrostatic Discharge Awareness

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

Dynamic Brake Control for PG Governors

Operation

Control of locomotive dynamic braking is achieved by overriding the normal PG governor load control function to "lower", "raise", or "hold" generator field excitation.

The Dynamic Brake Control comprises two solenoid valves situated between the load control pilot valve and the load regulator. *Assuming the overriding solenoid is de-energized for normal running, it must be energized for dynamic braking, thus positioning the load control pilot valve above center (see Figure 1). The "increase" excitation line is then open to drain, and the "decrease" line is open to pressure oil.

IMPORTANT *—On many applications, the overriding solenoid is energized for normal running, in which case it will be de-energized for dynamic braking.



Figure 1. Dynamic Brake Control Schematic

Dynamic Brake Control for PG Governors

With solenoid valves S1 and S2 de-energized and the overriding solenoid energized, the load regulator vane servo will move to decrease generator field excitation and thus reduce the degree of locomotive braking effort. If solenoid valve S1 is then energized, both sides of the vane servo are opened to drain, movement of the servo is arrested, and the level of field excitation is held constant.

With the S1, S2, and overriding solenoids energized, pressure oil is fed to the increase excitation line via an adjustable needle valve. The vane servo will move to increase generator field excitation at a rate dependent on the needle valve setting and thereby increase locomotive braking effort.

To revert to normal governor load control, the S1, S2, and overriding solenoids are de-energized.



Figure 2. Solenoids S1 and S2

Setting Instructions

Assuming the overriding solenoid is de-energized for normal running, set as follows:

- 1. Supply oil to the governor load control system.
- 2. Energize the overriding solenoid.
- 3. Adjust S1 (when de-energized).

Turn the solenoid plunger down until the pressure in the decrease line begins to drop. Backup one turn and lock in place.

Energize S1—pressure should drop to zero.

4. Adjust S2 (when de-energized). Open the needle valve four turns.

Read the pressure in the increase line—should be zero.

Turn the solenoid plunger down until pressure begins to increase. Back up one turn and lock in place.

Energize S2— pressure should increase to supply pressure.

Information and Parts Replacement

When requesting additional information concerning operation or when ordering parts, the following must accompany the request:

- Governor serial number (shown on name plate). The serial number is needed since the reference numbers in this manual do not identify the exact part number required.
- Manual number (this is manual number 36642)
- Part number reference, name of part, or description of part

Ref. No.	Part Name	Quantity
36642-1	Nut - 0.750 Jam	2
36642-2	Plug - Plunger Stop	2
36642-3	Case Solenoid	2
36642-4	Insulator - Paper	2
36642-5	Spring - Load	2
36642-6	Plunger - Brake Valve	2
36642-7	Screw - 4-40 Fillister Head	4
36642-8	Ring - 0.187 Snap	2
36642-9	Rod - Solenoid Plunger	2
36642-10	Washer - Solenoid	2
36642-11	Receptacle - 5 Pin	1
36642-12	Coil - Solenoid	2
36642-13	Bushing - Stainless Steel	4
36642-14	Plate - Solenoid Plunger Guide	2
36642-15	Screw - 10-32 Socket Head 1. 25	Long 16
36642-16	Washer – No.10 Splitlock	6
36642-17	Plug - Solenoid Plunger	2
36642-18	Washer— 0.50 OD	4
36642-19	Cover - Dynamic Brake	1
36642-20	Gasket - Valve Cover	1
36642-21	Plunger - Brake Valve	2
36642-22	Spring	2
36642-23	Bushing - Brake Valve	2
36642-24	Spring - Bushing Load	2
36642-25	Seat - Buffer Spring	2
36642-26	Screw – 0.25-28 Tapered Socket	Hd9
36642-27	Gasket - Connector	1
36642-28	Body - Dynamic Brake Valve	1
36642-29	Valve - Needle	1



Figure 3. Parts for Dynamic Brake Control

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Send comments to: icinfo@woodward.com

Please reference publication 36642A.



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