

PG-200/PG-300 Governor

Applications

The PG-200/PG-300 governors are designed to control speed and provide auxiliary PG limiting and control functions for large engines or turbines which require work capacity beyond the standard PG Governor. With 237 or 422 J (175 or 311 ft-lb) of work capacity over 40 degrees of output, the unit allows direct control of many engines without modification of the fuel system or use of auxiliary amplifiers.

Standard Features

The basic PG-200/-300 is an assembly of a case, accumulator, and hydraulic amplification unit. It is designed to accept a PGA, PGL, PG-PL, PGD, or PGG column assembly to provide high work output and diverse auxiliary features.

An eccentric-gear oil pump and an enlarged accumulator supply 1379 kPa (200 psi) operating oil for the PG-200 and 2482 kPa (360 psi) oil for the PG-300. Pressure oil to or from the large power cylinder is regulated by an internal relay piston to position governor output. Excess pressure oil from the accumulator is bypassed to sump through a pressurizer valve. This valve permits a heat exchanger to be added without modification of the PG200/-300. The valve also protects units equipped with heat exchangers by returning accumulator bypass oil to sump should oil flow through the heat exchanger become restricted.

A reducing valve supplies 758 to 827 kPa (110 to 120 psi) oil to the actual governing section of the PG200/-300, which uses standard PG parts. A centrifugal-ballhead/pilot-valve assembly regulates the control pressure oil to and from a standard PG 16 J (12 ft-lb) power cylinder used to position the relay piston. Governor stability is provided by an adjustable needle valve and buffer-compensation system.

All speed setting and auxiliary functions such as load control, fuel limiting, load limiting, speed droop, shutdowns, etc., are provided on the various PG column assemblies.

Optional Features

Heat Exchanger

A remote heat exchanger is used to lower governor-oil temperature in applications exceeding 93 °C (200 °F) maximum operating temperature.

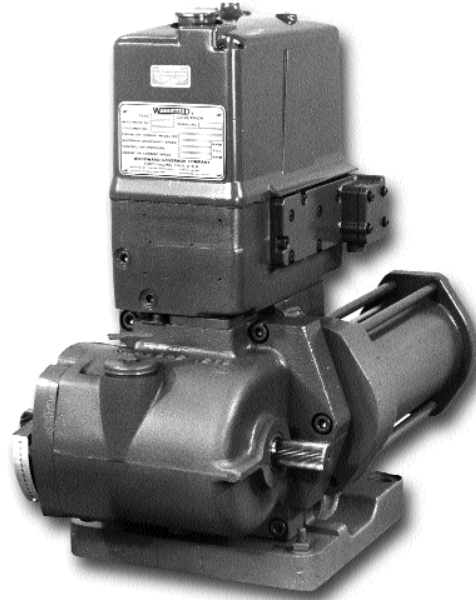
The PG-300 normally uses the heat exchanger due to the heat generated with the 2482 kPa (360 psi) internal oil pressure. Many PG-200 installations do not require the addition of a heat exchanger.

Booster Servomotor

A Booster Servomotor assists the governor pump to achieve rapid starting. Pressure oil from the booster moves the servo piston toward the maximum-fuel position. The booster servomotor is detached from the PG-200/-300 and is actuated by a starting air pressure of 1034 to 1379 kPa (150 to 200 psi).

Vibration Resistant Accumulator

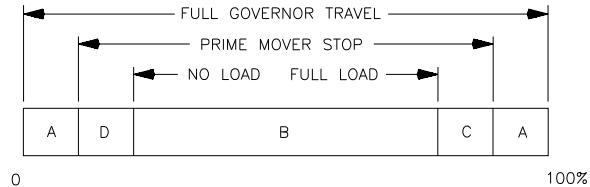
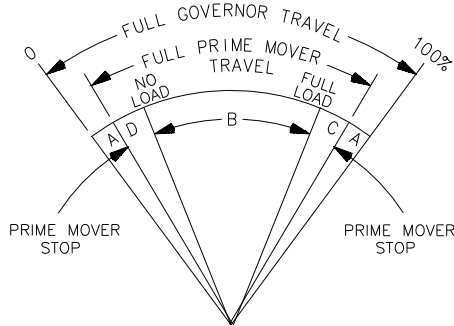
A vibration-resistant accumulator is available to replace the standard accumulator on installations which suffer extreme vibration or shock. The special accumulator does not change the operation of the governor system.



- 237 and 422 J (175 and 311 ft-lb) maximum work capacity over 40 degrees of output
- PG auxiliary features available
- Pressure compensation
- Self-contained oil supply
- Compliant with applicable CE directives—Machinery Directive

Specifications

Work Capacities



- A - OVERTRAVEL TO INSURE PRIME MOVER STOPS ARE REACHED.
 B - NO LOAD TO FULL LOAD TRAVEL - NORMALLY 2/3 OF FULL GOVERNOR TRAVEL IS RECOMMENDED.
 C - TRAVEL REQUIRED TO ACCELERATE THE PRIME MOVER.
 D - TRAVEL REQUIRED TO DECELERATE OR SHUT DOWN PRIME MOVER.
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MAXIMUM WORK CAPACITY OVER FULL GOVERNOR TRAVEL OF 42° IS * . SEE ABOVE FOR RECOMMENDED GOVERNOR OUTPUT TRAVEL. IN SPECIAL APPLICATIONS MIN AND MAX PRIME MOVER STOPS MAY BE OUTSIDE THE GOVERNOR STOPS.

Maximum work capacity over full governor travel of 40 degrees angular travel is 237 J (175 ft-lb) for the PG-200 and 422 J (311 ft-lb) for the PG-300. See above for recommended governor-output travel.

Terminal Shaft

PG-200	1.125 inch (28.58 mm) diameter 48 serration terminal shaft on both sides
PG-300	1.500 inch (38.10 mm) diameter 60 serration terminal shaft on both sides

Mounting

PG-200/-300	Have identical mounting dimensions. See outline drawing for dimensions. Mounting must be vertical.
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Construction

Case and Base	Are of cast ductile iron
Internal Parts	Are mild and case-hardened steel

Weight

PG-200/-300	About 159 kg (350 lb). The weight of a unit depends on the PG governor and options selected.
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Governor Drive

Standard Drive Shaft	1.125-48 inch (28.58 mm) serrated.
Keyed and Splined Drive Shafts	Available. All drive shafts are solid case-hardened steel. See outline drawing for dimensions.

Drive Characteristics

Rotation	Is reversible within a maximum speed range of 200 to 1600 rpm
Recommended Speed Range	400 to 1000 rpm
Drive Power	1865 W (2.5 hp) is required at maximum speed and normal operating temperatures. The PG-300 can require additional power.

Oil Requirements

Normal Operating Conditions	SAE 10 to 50 oil (depending on operating temperature). 100 to 200 SUS viscosity is recommended. Most units operate with the same weight and grade of oil used in the engine being controlled.
Capacity	The self-contained oil system holds about 6.2 L (6.5 qt[US])

Operating Temperature

Continuous Operating Temperature	60 to 93 °C (140 to 200 °F).
Ambient Temperature	-29 to +99 °C (-20 to +210 °F). Contact Woodward for operation beyond these limits. Hydraulic-fluid pour point must be below the lowest expected starting temperature.

Control Characteristics

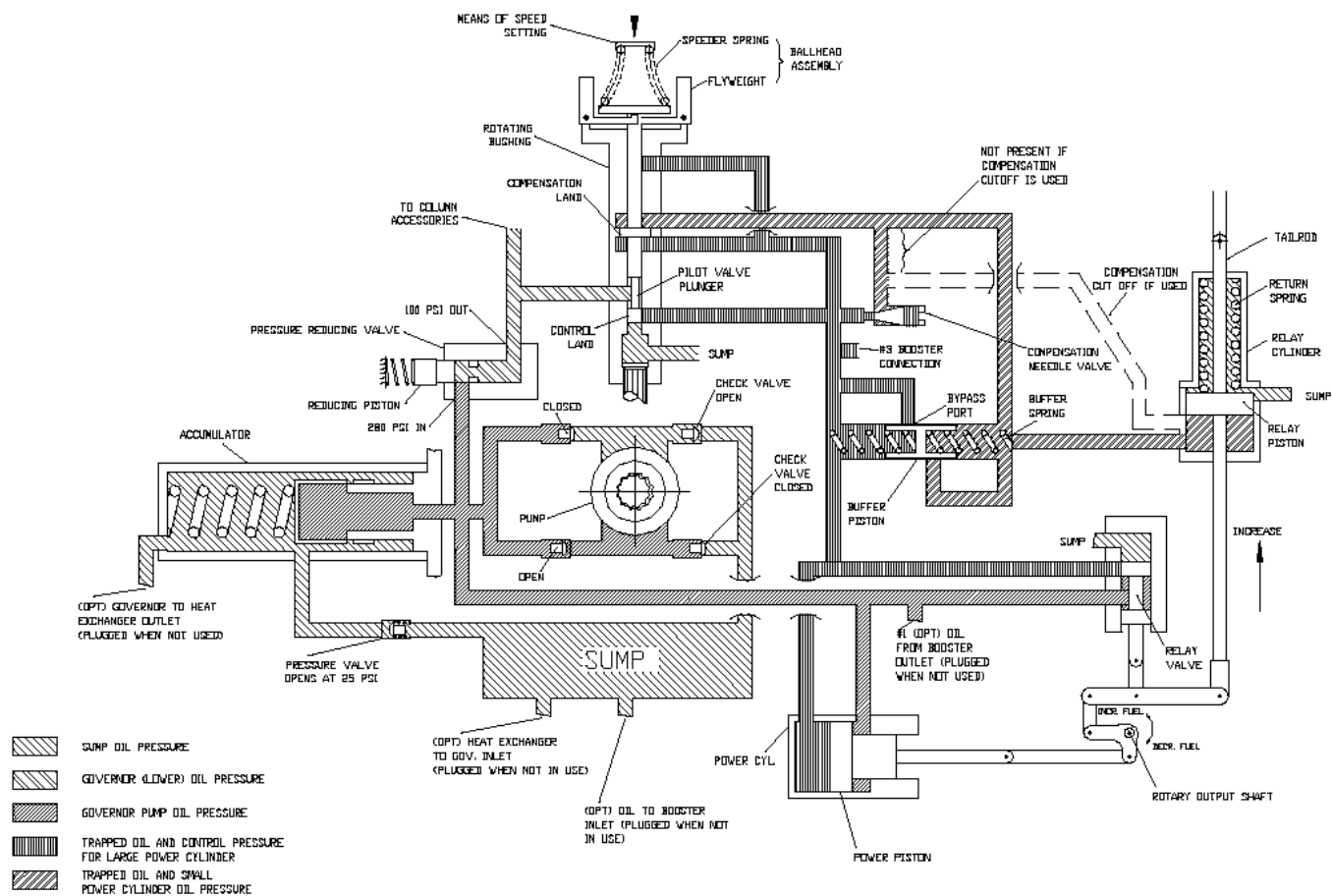
PG-200/-300	Provides steady-state control within 0.25% of rated speed under normal operating conditions.
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Regulatory Compliance

Other European Compliance:	
Machinery Directive	Compliant as partly completed machinery per 2006/42/EC.

References

Manual	Title
36036	Starting Fuel Limiter for PG Governors
36052	Magnetic Speed Pickups
36601	Absolute Manifold Pressure Bias Load Control and Fuel Limiter
36604	PGA Governor
36614	PG Governor Dial Type Speed Setting
36615	PG Governor Lever Type Speed Setting
36621	PG Governor Speed Droop Linkage
36630	Basic Load Control System for PG
36640	Extensible Tailrod for PG Governors
36641	Governor Oil Heat Exchanger
36650	Solenoid Operated Shutdown Assembly (Single Barrel Model)
36652	Automatic Safety Shutdown and Alarms
36653	Pressure Actuated Shutdown for PGD & PG-PL Governors
36661	Manifold Gauge Pressure Fuel Limiter
36662	Torque Limit Control with Speed Droop
36684	Booster Servomotor
36685	PG Shutdown Solenoid
36686	Pneumatic Load Balance System for PGA Governors
36691	Electronic Speed Setting for PG Governors (PG-TR)
36694	PG-PL Governors
36695	Manifold Air Pressure Bias Fuel Limiter (Single Barrel Model)
36703	PGE Locomotive Governor



PG-200/300 Schematic Diagram

