

PG Governor
Basic Load Control System

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

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual **26311**, *Revision Status & Distribution Restrictions of Woodward Technical Publications*, on the *publications* page of the Woodward website:

www.woodward.com/publications

The latest version of most publications is available on the *publications* page. If your publication is not there, please contact your customer service representative to get the latest copy.



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 Out-of-date translations are marked with ⚠.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

Basic Load Control System

General

With most governor applications, the primary function of the governor is to schedule fuel to the engine in sufficient amounts to maintain a constant engine speed under varying load conditions. In certain governors (including most locomotive governors and some marine governors), a secondary objective is to maintain a definite horsepower output of the engine for each specific speed setting of the governor. For each speed setting of these governors, not only is a predetermined engine speed desired but also a predetermined amount of fuel for the engine.

To achieve these objectives, the load control system incorporated within the governor adjusts the load on the engine to a predetermined value for each specific speed setting of the governor. For example, control of load on railroad engines is obtained by adjusting the strength of the generator field excitation current so that a definite, predetermined load is absorbed by the traction motors at each setting. In this instance, the load control system operates through a servo which adjusts a rheostat in the excitation circuit. In marine propulsion units having adjustable pitch propellers, the load control system acts through a servo which varies the propeller pitch to change the engine load.

A simplified schematic of the basic load control system is shown in Figure 1. The speed setting servo piston position determines the loading on the speeder spring and hence the governor speed setting. The governor ballhead compares the actual governor speed (proportional to engine speed) with the established speed setting. If they are not equal, the governor pilot valve plunger is moved from its central position to initiate a repositioning of the governor power piston to which the engine fuel linkage is connected. If the engine speed is slower than desired, the power piston moves up to increase fuel; if the engine speed is faster than desired, the power piston moves down to decrease fuel.

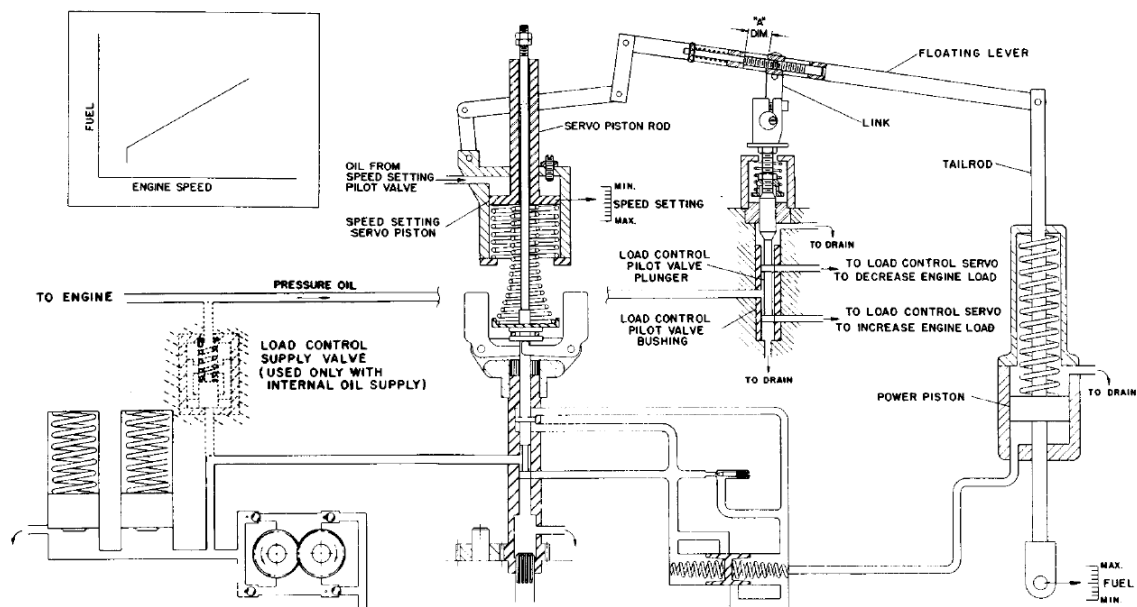


Figure 1. Schematic of Basic Load Control System

One end of a floating lever is attached to the speed setting servo piston rod; the other end is connected to the power piston tailrod. The load control pilot valve plunger controls the servo which adjusts engine loads, and is suspended from the floating lever. It is readily seen from the schematic drawing that, for each speed setting, there is but one fuel setting at which the load control pilot valve plunger is centered.

Consider the load control system in a governor when the load control pilot valve plunger is “centered”—control lands exactly cover the ports in the pilot valve bushing. This condition occurs whenever the load on the engine is equal to the horsepower output of the engine as programmed for the existing speed setting. Assume that the load on the engine increases. The engine slows down, the ballhead lowers the governor pilot valve, and the power piston moves up to give the engine the additional fuel needed to carry the increased load at the set speed. As the power piston moves up, it lifts one end of the floating lever, lifting the load control pilot valve plunger above its centered position. Pressure oil now flows to the load control servo to decrease engine load (in a railroad governor, the field coil excitation is decreased to decrease generator load; in a marine propulsion unit, the pitch of the adjustable propeller is decreased to reduce load). With the load reduced, the new, higher power piston position now provides more fuel to the engine than is needed to maintain the set speed. Consequently, the engine speed rises above the set speed and the governor ballhead effects a lowering of the power piston and a decrease in fuel, at the same time lowering the load control pilot valve plunger.

The reduction in engine load and of fuel to the engine occurs simultaneously until the engine speed has returned to the set speed and the power piston has returned to its original position, thereby centering the load control pilot valve plunger again. With the pilot valve re-centered, movement of the load control servo is stopped.

In responding to the increased load and the resulting underspeed of the engine, by temporarily increasing the fuel setting, the governor has operated the load control pilot valve in the direction to reduce the engine load so that the horsepower demand on the engine has returned to the designed value for the existing speed setting of the governor. The governor action described has taken place entirely because of the increase in load with no change having been made in governor speed setting.

When the engine load decreases, similar movements occur, but in the opposite directions.

When an increase in governor speed setting is made, the speed setting servo piston moves down and lowers the left hand end of the floating lever, also lowering the load control pilot valve plunger. This causes pressure oil to flow to the load control servo at the same time that the increase in governor speed setting is causing the power piston to move up to increase fuel to raise the engine speed. As the power piston moves up, it raises the right hand end of the floating lever and also raises the load control pilot valve plunger. This action continues until the power piston is at its proper new position for fuel required at the higher speed setting and the load control pilot valve plunger is re-centered after changing the load control servo to its new position to provide the desired engine load at the higher engine speed.

Similar movements occur, but in the opposite direction, when the governor speed setting is decreased.

A typical fuel versus engine speed curve is shown in the inset of Figure 1. The slope of the curve is determined by the point along the floating lever at which the load control pilot valve link is connected. The load control system will maintain this fuel versus speed relationship throughout the entire speed range except momentarily during transient conditions.

Special load control schemes are often used on governors of engine with turbo supercharges. These various load control systems are described in other manuals.



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.

Load Control Linkage Disassembly, Assembly, and Adjustments

Disassembly

When disassembling the load control system components, proceed as follows (reference numbers correspond to parts in Figure 3):

1. Disconnect the floating lever assembly by removing two pins (40).
2. Compress snap ring (32) to remove spring retainer (31), snap ring and springs (29) and (30). (Some models have only one spring).
3. Push knob (47) towards movable fulcrum pin (38) far enough to allow pin (46) to be pushed out of the hole through knob (47) and adjusting screw (44). Remove lock wire (43) or cotter pin (41) and turn adjusting screw (44) through movable fulcrum pin. Remove floating lever assembly (42).
4. Loosen upper lock nut (28) and remove adjusting block (34), washer (33) and the lock nut from the pilot valve plunger.
5. Lift pilot valve plunger far enough to remove lower lock nut (28) while holding spring collar (27) with a wrench.

NOTICE

To avoid damaging oil seal (62), do not lift plunger higher than necessary.

6. Hold pilot valve plunger down against snap ring (67) and use Woodward tool 360692 or equivalent (see Figure 2) to thread spring collar (27) off of plunger stem. Remove overriding piston (26).
7. Remove hex head cap screws (25) and lock washers (24) and slip overriding cylinder (19) off of pilot valve stem. Press cylinder head (61) out of cylinder (if necessary).

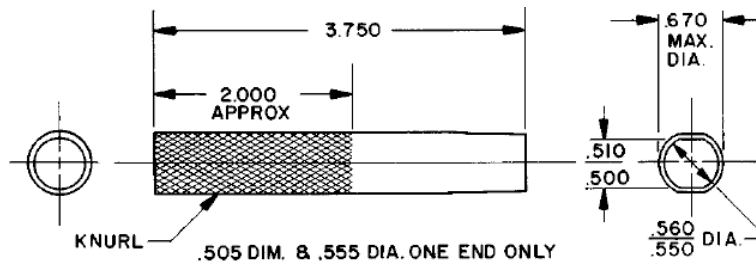


Figure 2. Woodward Tool 360692

8. Remove oil seal (62), gasket (63), spring (65), pilot valve plunger (64), load control bushing (66), and snap ring (67) from the bushing.
9. Disassembly of other parts of the governor associated with the basic load control system is described in other manuals.

Cleaning and Inspection

Discard old cotter pins, lock wire, gaskets, O-ring, and oil seal. Clean all other parts in a dry cleaning solvent. If necessary, scrub parts with a soft brush. Use clean compressed air to clean all passages and to remove solvent. Store parts in clean containers until reassembled.

Examine all parts for signs of wear, rust, pitting, scoring or nicks. Polish slightly corroded, scored or nicked parts with crocus cloth and oil. Discard parts with excessive wear or pitting.

Assembly

Assemble the load control linkage and position the spring seat on the threaded stern of the load control pilot valve plunger in this manner:

1. Install snap ring (67) in load control bushing (66).
2. Put load control bushing into the column bore; install load control pilot valve plunger (64), spring (65), gasket (63), and oil seal (62). (In some governor models, a spacer is used in place of the oil seal.)
3. Press the cylinder head (61) into the cylinder (pc. 19) (if not already installed).
4. Place O-ring (71) in the counterbore in the column; slip cylinder (19) over pilot valve stem and tighten down with hex head screws (25) and washers (24).
5. Install overriding piston (26).
6. Hold pilot valve plunger down against snap ring (67) and use Woodward tool 360692 or equivalent (see Figure 2) to thread spring seat (27) onto plunger stem. Turn spring seat down until it touches overriding piston; then back off 1/4 turn. (Plunger will begin to rise if spring seat is turned down further on thread after touching piston.)

Lift pilot valve plunger sufficiently far to permit holding spring seat with a wrench while locking spring seat in position with locknut (28).

NOTICE

To avoid damaging oil seal, do not lift plunger higher than necessary.

7. Install springs (29 and 30), spring retainer (31), and retaining ring (32).
8. Thread locknut (28) onto pilot valve plunger stem and install washer (33).
9. Assemble the floating lever (42) (riveted assembly) and parts 34, 35, 37, 38, 39, 44, 89, 45, 46, and 47.
10. Thread adjusting block (34) of the floating lever assembly about 10 turns onto the pilot valve plunger; lock in place with locknut (28).
11. Attach ends of floating lever assembly to power piston tailrod (14) and pivot pin link (48).

Test Stand Adjustments

(The overriding (“O”) solenoid, usually used in railroad governors, must not be energized while making load control adjustments, and the adjusting screw in the top of the “O” solenoid should be at least two and one-half turns off the bottom).

1. Use adjusting screw knob (47) in floating lever to set “A” dimension to 1/2 inch.
2. Loosen lock screw (35) and position eccentric (37) so that screwdriver slot is horizontal and on the side furthest from the adjusting screw knob (as shown in Figure 1).
3. Set the governor speed setting at idle speed (or the selected low reference speed); adjust the governor power piston position to the height programmed for idle (or low reference) speed.
4. If the load control servo indicator (or pitch indicator of marine units) is now at either “Maximum Field” or “Minimum Field” (minimum or maximum pitch on marine units), the load control pilot valve plunger (64) is not “centered”—the control lands do not exactly cover the ports in the bushing (66).

If the pilot valve plunger is not centered, loosen locknut (28) and lock screw (35), slip a long screwdriver under the indicator washer (33), and pry up to raise pilot valve plunger approximately 1/2” (13 mm). Now, use a thin, 7/16 open-end wrench to turn locknut (28) and thereby thread plunger stem into adjusting block (34) if servo indicator is at “Maximum Field”, or out of block if indicator is at “Minimum Field”.

After each adjustment, release pilot valve plunger and observe load control servo indicator. Continue to adjust until the indicator movement stops at a point other than either end of its stroke or just barely creeps, tighten locknut (28), and recheck.

5. Set the pointer (20) on the indicator washer (33); loosen screw (22) and position scale (20) so that pointer indicates exactly "0".

If the governor is destined for marine service or for railroad service which does not require maximum or minimum field start, go to step 7.

If it is to be set for Maximum or Minimum Field Start (whichever the engine manufacturer specifies), proceed thus:

6. Loosen lock screw (35) and turn eccentric (37) so that the pointer (20) is exactly opposite the Maximum or Minimum Field Start mark as specified on indicator scale.
7. Move speed control to maximum speed; adjust power piston position to the exact height specified for maximum speed setting. Pointer (20) should now indicate "0", and the load control servo position indicator should be stationary at some point other than either end of its stroke.
8. If the load control servo position indicator shows the servo to be in—or moving towards—the minimum position, the pilot valve plunger is above center. (The indicator pointer (20) should confirm this.) Lower the plunger by using the adjusting screw knob (47) to move the adjusting block in the direction to decrease the "A" dimension; move the block only enough to bring the pointer half way to the zero mark on the scale. Adjust the eccentric (37) to bring the pointer the rest of the way back to zero (and thus center the pilot valve plunger).

If the load control servo position indicator shows the servo to be in—or moving towards—the maximum position, the pilot valve plunger is below center. (The indicator pointer should confirm this). Raise the plunger by using the adjusting screw knob to move the adjusting block in the direction to increase the "A" dimension; move the block only enough to bring the pointer half way to the zero mark on the scale. Adjust the eccentric to bring the pointer the rest of the way back to zero.

9. Return to the idle or low reference speed and power piston positions used in step 4.

In a railroad governor being set for Minimum or Maximum Field Start, the pointer should be at the corresponding mark on the indicator scale, and the load control servo indicator should show servo to be in the corresponding minimum or maximum position. If it is not, go back to step 3 and repeat adjustments.

In a marine governor or in a railroad governor not being set for Minimum or Maximum Field Start, the indicator pointer should be at zero and the servo position indicator stationary at a point other than at the end of its stroke. If it is not, go back to step 3 and repeat the adjustments.

(If the governor has an overriding solenoid, it may now be adjusted. With the solenoid de-energized and oil pressure available to the load control pilot valve, turn the solenoid plunger stop plug down until the load control plunger rises. Then back off the stop plug until the load control plunger starts down; back it off an additional half turn and lock in position with the locknut).

IMPORTANT

Later model governors do not have items 1, 58, or 59, and the following adjusting procedures are not applicable.

Adjusting on Engine

If a governor test stand is not available for making final adjustments on the load control linkage, the adjustments may be made with the governor mounted on the engine. Proceed in this manner:

(The overriding ("O") solenoid, usually used in railroad governors, must not be energized while making load control adjustments, and the stop plug in the top of the "O" solenoid should be at least two and one-half turns off the bottom).

With the Engine Shut Down:

1. Use adjusting screw knob (47) in floating lever linkage to set "A" dimension to 1/2 inch (12.7 mm).
2. Loosen the lock screw (35) and position the eccentric so that the screwdriver slot is horizontal and on the side furthest from the adjusting screw knob (as shown in Figure 1).

With the Engine Running:

3. Adjust governor speed setting to idle speed position.

IMPORTANT

The governor power piston must be at least 0.156" (3.96 mm) from the bottom of its stroke. This can be checked, if necessary, by using a dial indicator to measure movement of the power piston tailrod.

Position speed indicator scale so that pin in speed setting fulcrum assembly points to "idle".

4. Loosen locknut (28) and lock screw (35). Put the bit end of a long screwdriver under the head of the lock screw (35); with the shank of the screwdriver resting atop the spring guard, pry up to bring locknut (28) above the spring retainer (31). Use a thin, 7/16" open-end wrench to turn the locknut (28) and thread the plunger stem into the adjusting block (34).

After each adjustment release the pilot valve plunger and observe the load control servo indicator. Continue to adjust until the indicator movement stops at a point other than either end of its stroke or just barely creeps, tighten locknut (28) and lock screw (35). The pilot valve is now centered.

5. Set the pointer (20) on the indicator washer (33); loosen screw (22) and position scale (20) so that pointer indicates exactly "0".
6. Set the governor speed setting to maximum speed position; scribe mark on speed indicator scale opposite pin in speed setting fulcrum assembly.

With the Engine Shut Down:

7. Use the manual speed setting tool (58) to position the speed setting servo piston at the idle speed level (as indicated by the pointer and speed indicator scale).

8. Use fuel jack assembly (1) to position governor power piston (18) to give the fuel rack setting prescribed for idle speed.

IMPORTANT

If possible, apply external leverage to the governor rod end—or to fuel linkage at a point close to the governor—to help lift the governor power piston to the height required.

If the governor is being used on a marine engine or a railroad engine which does not require Maximum or Minimum Field Start, go to step 10.

If it is to be set for Maximum or Minimum Field Start (whichever the engine manufacturer specifies), proceed thus:

9. Loosen lock screw (35) and turn eccentric (37) so that pointer (20) is exactly opposite the Maximum or Minimum Field Start mark (as specified) on indicator scale.
10. Use the manual speed setting tool to position the speed setting servo piston at the scribe line (see preceding step 6) indicating maximum speed.
11. Use fuel jack assembly to position governor power piston to give fuel rack position prescribed for maximum speed. (As in step 8, apply external leverage if possible.)
12. Pointer (20) should now show load control pilot valve plunger to be centered (pointer at "0"). If it is not, center it in this manner:

If the plunger is above center, use the adjusting screw knob (47) to move the adjusting block in the direction to decrease the "A" dimension; move the block only enough to bring the indicating pointer halfway to zero. Adjust the eccentric (37) to bring the pointer the rest of the way back to zero (and thereby center the plunger).

If the plunger is below center, use the adjusting screw knob (47) to move the adjusting block in the direction to increase the "A" dimension; move the block only enough to bring the indicating pointer halfway to zero. Adjust the eccentric (37) to bring the pointer the rest of the way back to zero (and thereby center the plunger).

13. Using the manual speed setting tool and fuel jack assembly, return to idle speed and idle fuel rack settings of steps 7 and 8.

The steps in the next paragraphs require oil pressure in the governor; therefore the engine should be started to build up governor oil pressure, or an external source of oil pressure should be connected to the governor.

In a railroad governor being set for Minimum or Maximum Field Start, the pointer should be at the corresponding mark on the indicator scale, and the load control servo indicator should show servo to be in the corresponding minimum or maximum position. If it is not, go back to step 7 and repeat adjustments.

In a marine governor or in a railroad governor not being set for Minimum or Maximum Field Start, the indicator pointer should be at zero and the load control servo position indicator stationary at a point other than at the end of its stroke. If it is not, go back to step 7 and repeat the adjustments.

(If the governor has an overriding solenoid, it may now be adjusted. With the solenoid de-energized and oil pressure available to the load control pilot valve, turn the solenoid plunger stop screw down until the load control plunger rises. Then back off the stop plug until the load control plunger starts down; back it off an additional half turn and lock in position with the locknut.)

Parts Replacement

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

- Governor serial number (shown on name plate). The serial number is needed since the reference numbers shown in this manual do not identify the exact part number required for any one governor
- Manual number (this is manual number 36630)
- Part reference number, name of part, or description of part

Parts List for Figures 3 and 4

Ref. No.	Part Name.....Quantity	Ref. No.	Part NameQuantity
36630-1	Fuel Jack Assy. (Adjusting Tool) 1	36630-46	Adjusting Screw Pin1
36630-2	O-ring, Spring Guard Seal 1	36630-47	Adjusting Screw Knob1
36630-3	Spring Guard Seal Ring..... 1	36630-48	Pivot Pin Link1
36630-4	Spring Guard Seal Spring..... 1	36630-49	Speed Setting Piston Fulcrum Assy1
36630-5	Screw, Phillips Head, 10-32 x 3/8..... 1	36630-50	Restoring Lever.....2
36630-6	Washer, No. 10..... 1	36630-51	Cover Gasket1
36630-7	Piston Gap Scale..... 1	36630-52	Cover Dowelling Bushing.....1
36630-8	Spring Guard 1	36630-53	Shakeproof Washer, 5/16.....8
36630-9	Screw, Socket Head, 1/4-28 x 1/2 4	36630-54	Cover Bolt4
36630-10	Washer, 1/4 Shakeproof..... 4	36630-55	Oil Filler Cup1
36630-11	Spring Guard Gasket..... 1	36630-56	Cover, No Pointers.....1
36630-12	Power Spring 1	36630-57	Restoring Link Pin, 1/8 x 47/641
36630-13	Fuel Indicator Pin (in Tail Rod) 1	36630-58	Manual Speed Setting Tool1
36630-14	Power Piston Tail Rod 1	36630-59	Manual Speed Setting Stud.....1
36630-15	Tail Rod Flex-Loc Nut, 3/8-24..... 1	36630-60	Spacer (if no Oil Seal)1
36630-16	Tail Rod Lift Nut..... 1	36630-61	Overriding Cylinder Head.....1
36630-17	Washer, 3/8 Shakeproof..... 1	36630-62	Load Control Plunger Oil Seal.....1
36630-18	Power Piston and Rod Assembly 1	36630-63	Load Control Oil Seal Gasket.....1
36630-19	Overriding Cylinder..... 1	36630-64	Load Control Pilot Valve Plunger1
36630-20	Load Control Indicator Scale and Pointer Assembly..... 1	36630-65	Load Control Pilot Valve Bushing Spring.....1
36630-21	Washer, 13/64 x 7/16 x 1/32..... 1	36630-66	Load Control Pilot Valve Bushing.....1
36630-22	Screw, Phillips Head, 10-32 x 1/4..... 1	36630-67	Internal Snap Ring1
36630-23	Taper Screw, 1/4-28 2	36630-68	1/8" Pipe Plug.....2
36630-24	Split Lock Washer, 17/64..... 2	36630-69	Pin1
36630-25	Cap Screw, Hex Head, 1/4-28 x 1 2	36630-70	Plug.....1
36630-26	Overriding Piston 1	36630-71	O-ring1
36630-27	Load Control Valve Spring Collar 1	36630-72	Straight Half Union, 3/8 NPT-1/2 Tube2
36630-28	Lock Nut, 5/16-24 2	36630-73	90° Elbow, 3/8 NPT—1/2 Tube2
36630-29	Inner Load Control Valve Spring..... 1	36630-74	Nameplate Screws, 8-32 x 1/44
36630-30	Outer Load Control Valve Spring..... 1	36630-75	Nameplate.....1
36630-31	Load Control Spring Retainer 1	36630-76	Column and Insert Assembly1
36630-32	Spring Retainer Snap Ring 1	36630-77	Screw, Hex Head Cap, 5/16 x 4-23/324
36630-33	Load Control Indicator Washer 1	36630-78	Screw2
36630-34	Adjusting Block..... 1	36630-79	Plug.....1
36630-35	Cap Screw, Socket Head, 1/4-28 x 3/4..... 1	36630-80	1/4-28 Socket Head Screw.....1
36630-36	Cotter Pin, 1/6 x 3/8..... 7	36630-81	Gasket.....1
36630-37	Load Control Valve Eccentric 1	36630-82	Bushing1
36630-38	Movable Fulcrum Pin..... 1	36630-83	Washer.....1
36630-39	Link..... 2	36630-84	Screw1
36630-40	Headed Pin, 3/16 x 25/32 3	36630-85	Gasket.....1
36630-41	Cotter Pin, 1/16 x 1/2 1	36630-86	Cover1
36630-42	Adjustable Floating Lever Assy 1	36630-87	17/64 x 27/64 x 1/16 Lock Washer.....8
36630-43	Lock Wire, 0.035 x 2..... 1	36630-88	1/4-28 x 3/4 Socket Head Screw.....8
36630-44	Floating Lever Adjusting Screw 1	36630-89	Copper Washer1
36630-45	Spring 1		

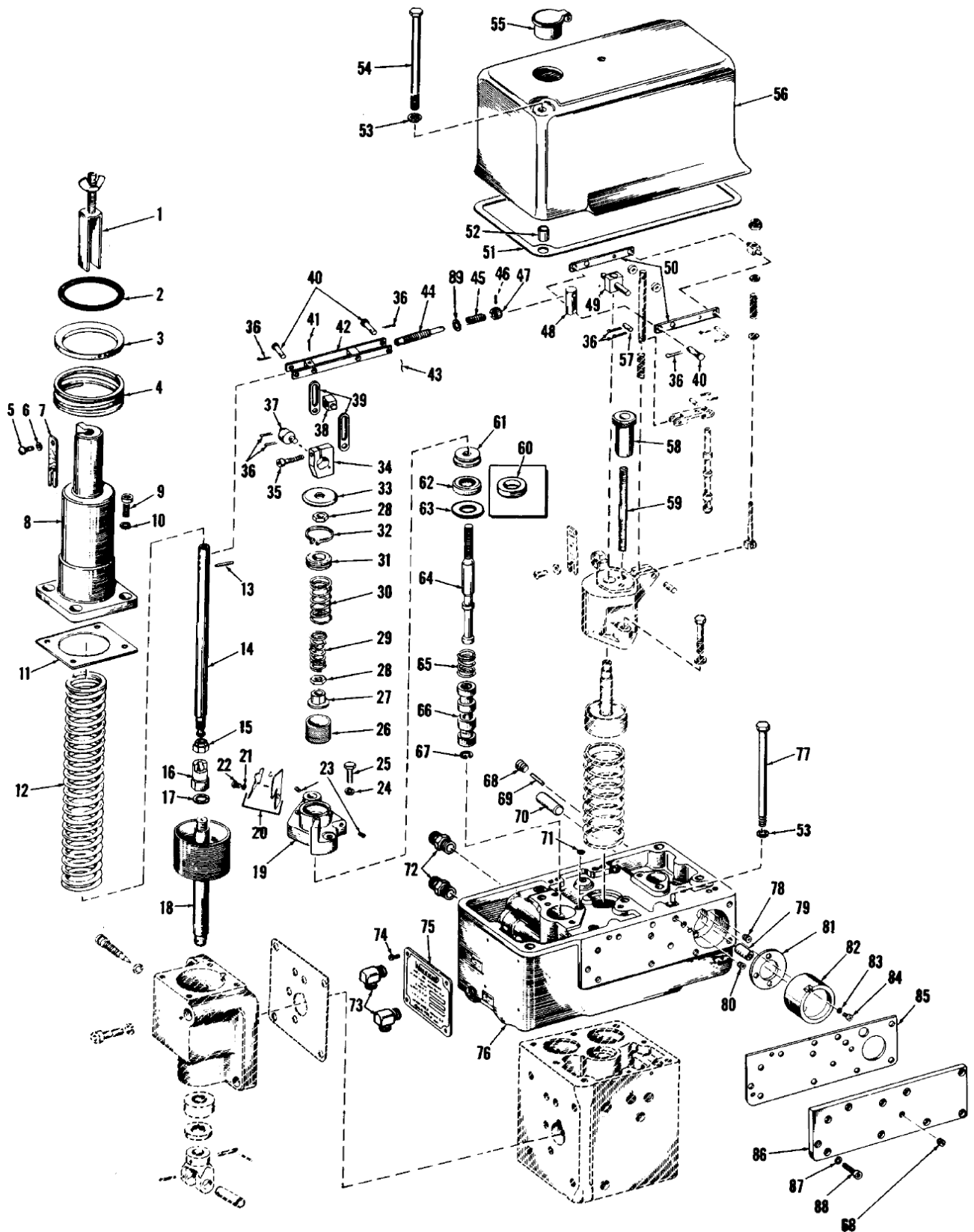


Figure 3. Exploded View

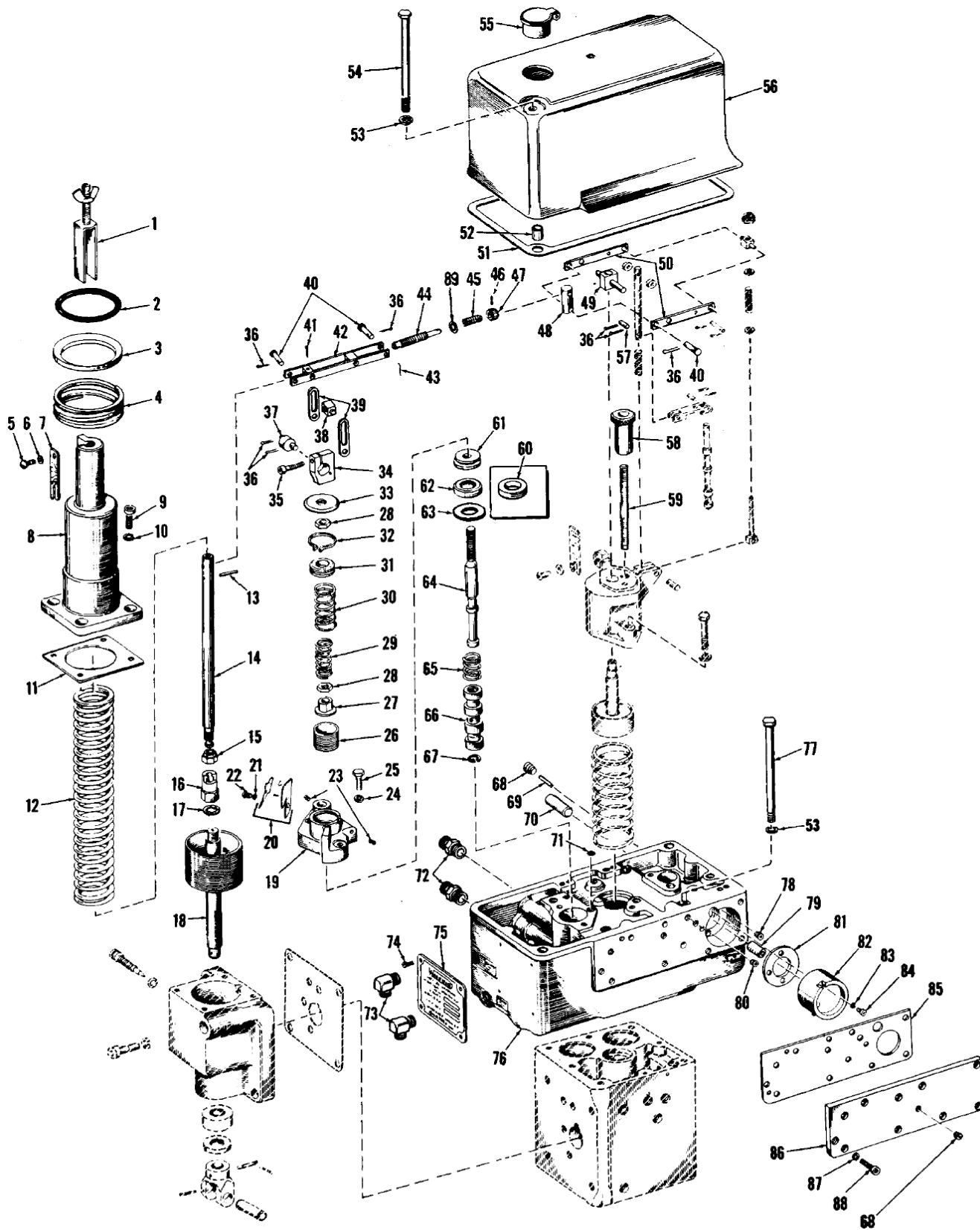


Figure 4. Exploded View

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication **36630F.**



PO Box 1519, Fort Collins CO 80522-1519, USA
1000 East Drake Road, Fort Collins CO 80525, USA
Phone +1 (970) 482-5811 • Fax +1 (970) 498-3058

Email and Website—www.woodward.com

**Woodward has company-owned plants, subsidiaries, and branches,
as well as authorized distributors and other authorized service and sales facilities throughout the world.**

Complete address / phone / fax / email information for all locations is available on our website.