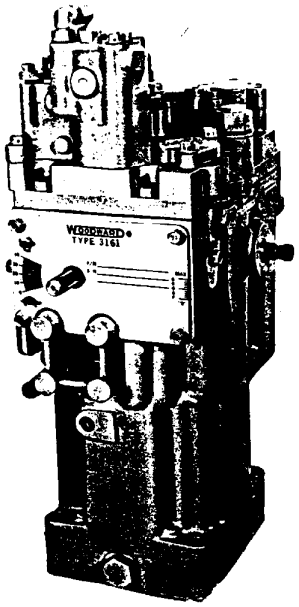
WOODWARD

Product Manual 03106
(Revision NEW)
Original Instructions



3161 Governor

Pneumatic Speed Setting Device

Operation Manual

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

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.

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.

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, be sure to check the *publications page* on the Woodward website:
www.woodward.com/publications
The current revision and distribution restriction of all publications are shown in manual *26311*.

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.

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.

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.

NOTICE

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*.

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Chapter 1.
General Information

Introduction

This manual describes the operation, repair, and calibration of the Pneumatic Speed Setting Device available for the 3161 governor. This device is installed and calibrated at the factory.

IMPORTANT

As used in this manual, "prime mover" refers to either engines or turbines or other types of prime movers as applicable.

Description

The Pneumatic Speed Setting Device is used to raise or lower the speed of the prime mover. Control air pressure supplied to the speed setting bellows from an external air supply, and supply oil from the governor, are used to operate the device.

⚠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.

References

03101	3161 Governor
03102	3161 Governor product specification
03103	3161 Governor, Manual Shutdown Device
03104	3161 Governor, Pressure Shutdown Device
03105	3161 Governor, Electric Shutdown Device
03107	3161 Governor, Speed Adjusting Motor with Manual Speed Adjust
03108	3161 Governor, Air Pressure Fuel Limiter
03109	3161 Governor, Load Limit Control
25075	Commercial Preservation Packaging for Storage of Mechanical-Hydraulic Controls

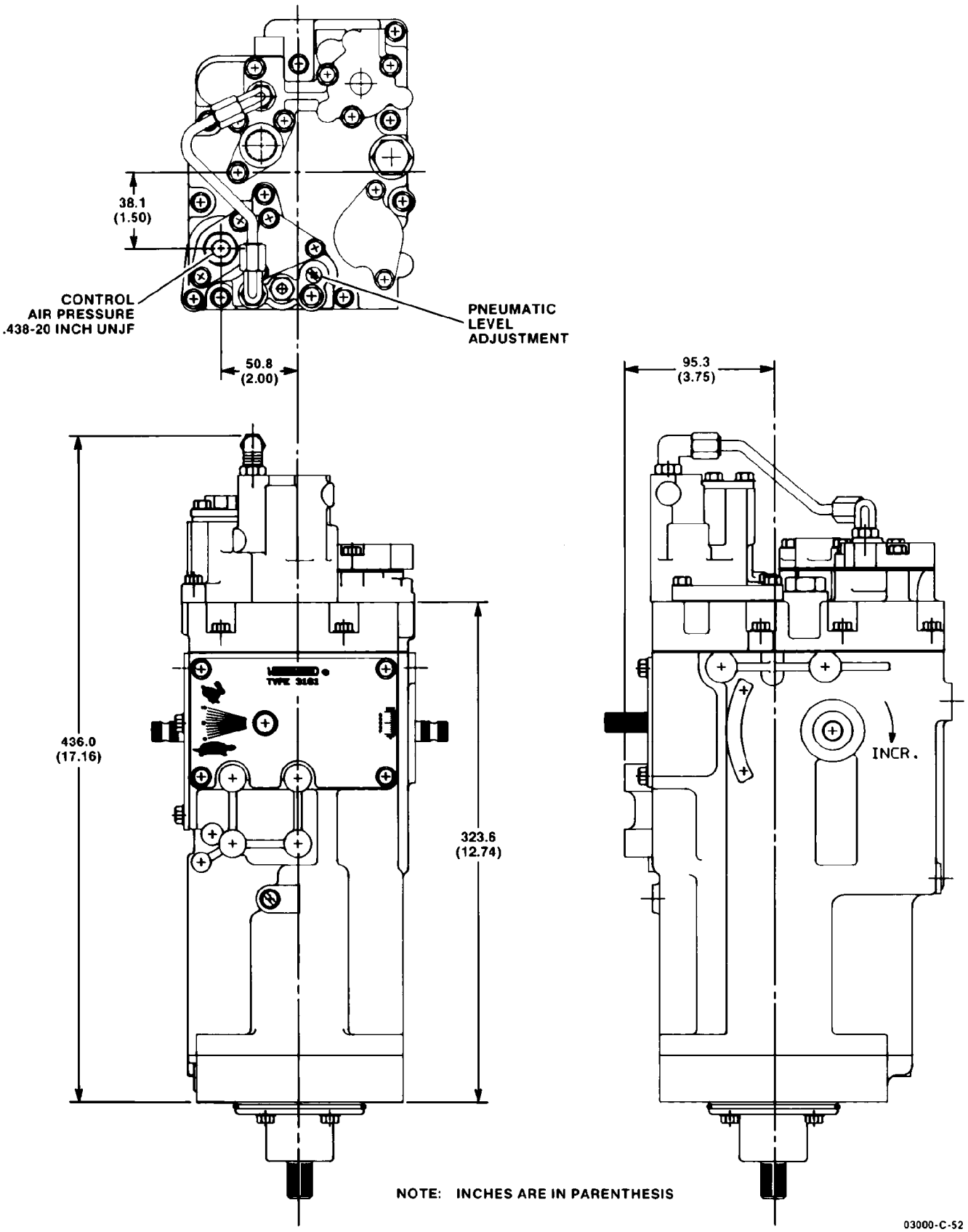


Figure 1-1. Outline Drawing of 3161 Governor with Pneumatic Speed Setting Device

Chapter 2.
Principles of Operation

The Pneumatic Speed Setting device uses external control air pressure and governor oil pressure to set governor speed (see Figure 2-1).

An increase in control air pressure causes the speed setting bellows (19) to expand. The bellows pushes down on the end of speed-setting lever (29) at the left of the pivot point, raising the right end of the speed setting lever. Supply oil flows through the orifice of the speed setting pilot valve plunger (16) into a cavity below the pilot valve plunger. When oil flow from nozzle (23) is restricted, the pilot valve plunger is raised, allowing the control oil pressure to increase, and push down on the speed setting piston (5) to increase governor speed. As the speed setting piston moves down, feedback spring (6) is compressed and pushes the speed setting lever away from the nozzle. Oil leaves the cavity below the speed setting pilot valve plunger, and pilot valve loading spring (15) returns the speed setting pilot valve plunger to a "null" position. The speed setting piston takes a position that is proportional to the air pressure supplied to the speed setting bellows.

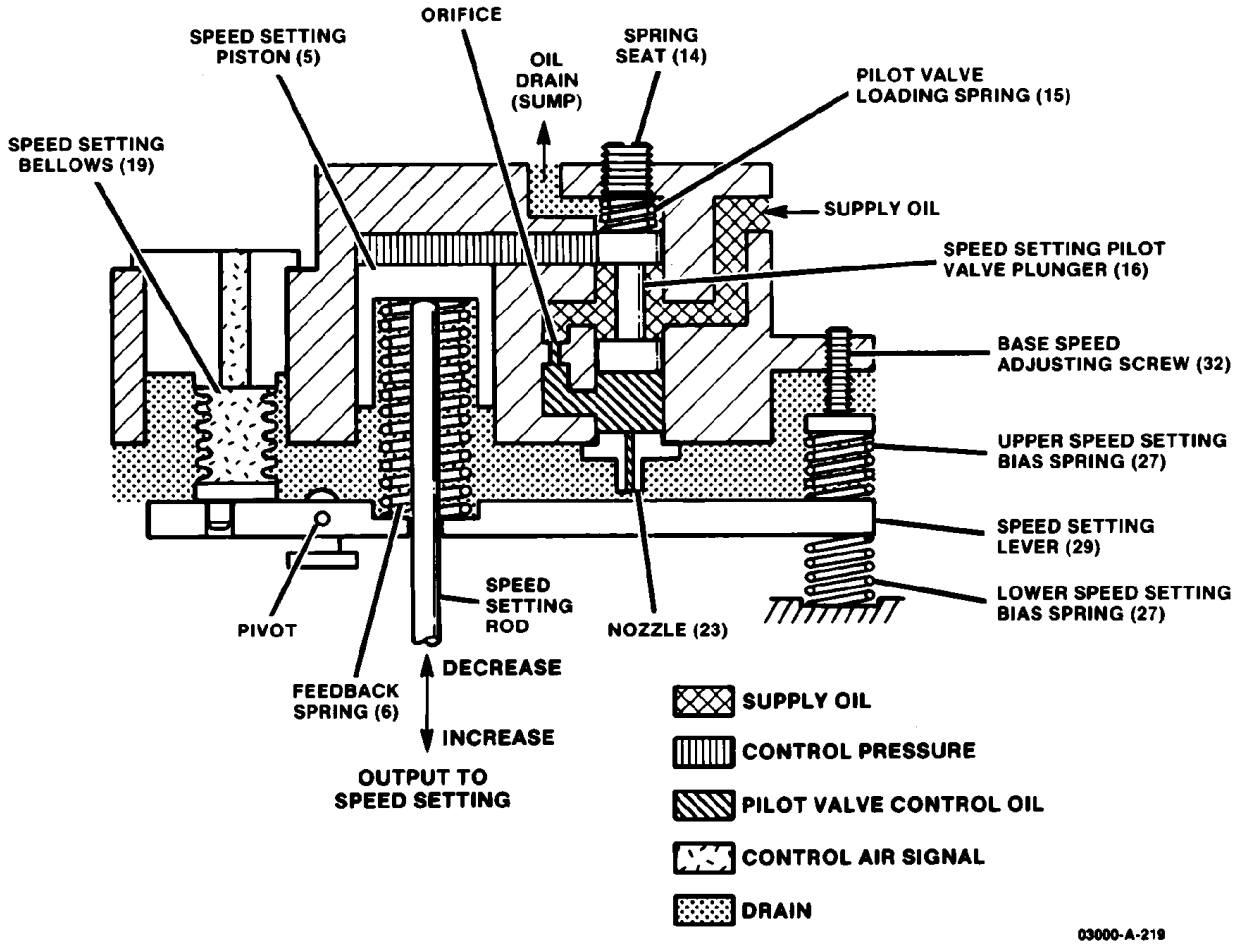


Figure 2-1. Schematic of the Pneumatic Speed Setting Device

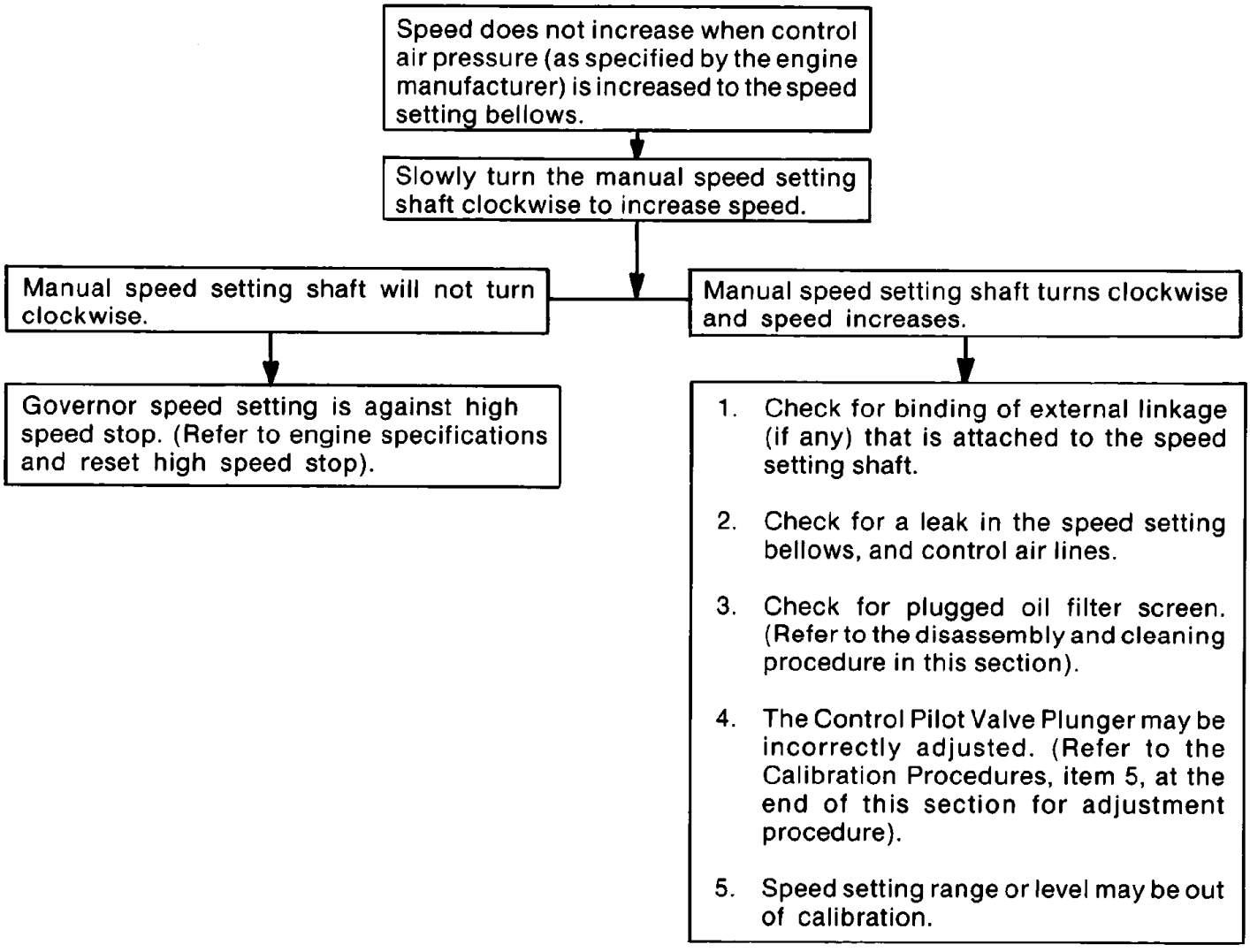
Chapter 3.
Troubleshooting, Repair, and Calibration

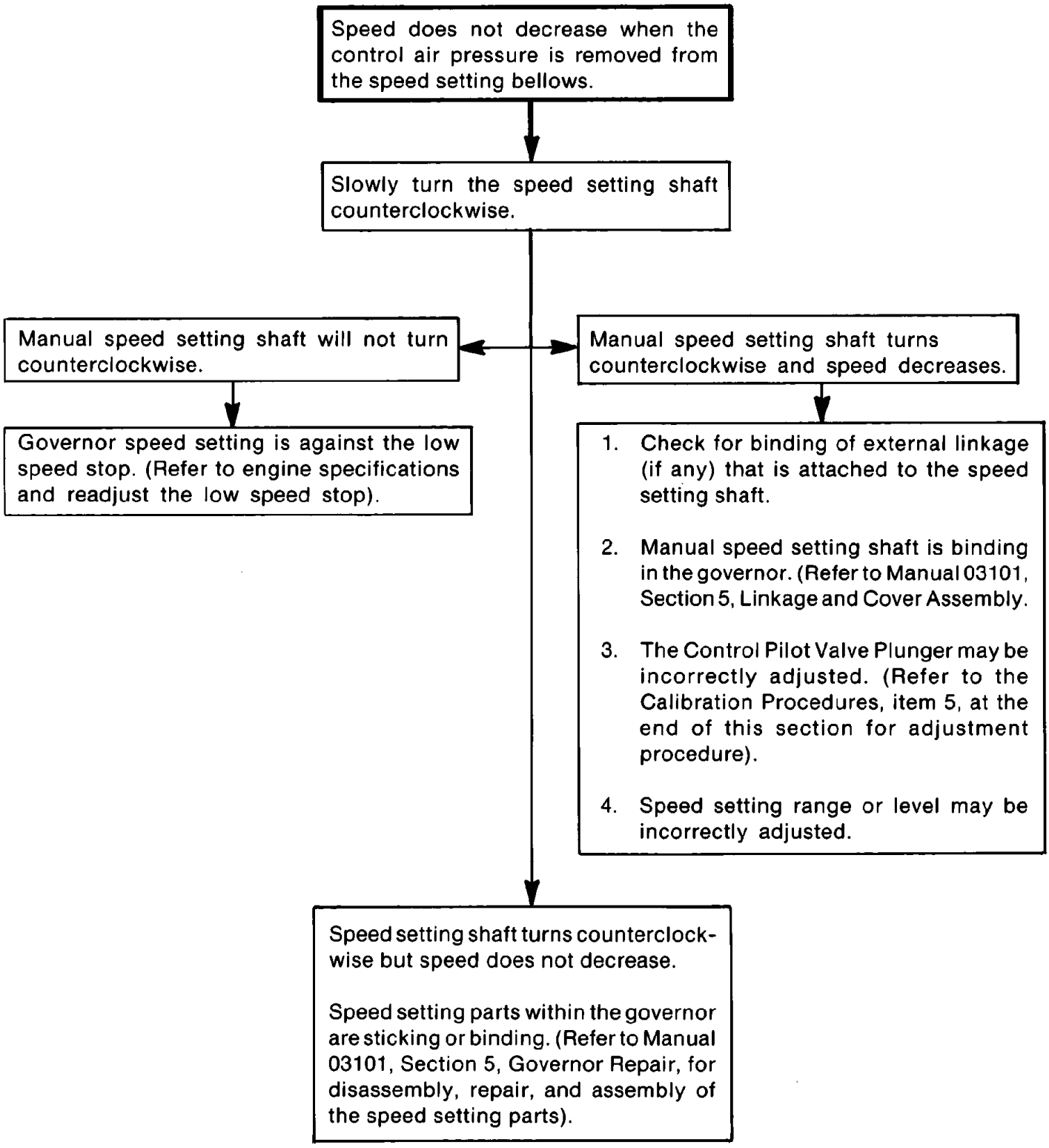
Troubleshooting

Use the following troubleshooting guide to troubleshoot the Pneumatic Speed Setting Device.

If any area of the Pneumatic Speed Setting Device Is disassembled, it will require calibration before being returned to service on the prime mover. See the Calibration Procedures at the end of this chapter to calibrate the Pneumatic Speed Setting Device. Refer to manual 03101 to calibrate the governor.

⚠WARNING **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.**




Speed does not decrease when the control air pressure is removed from the speed setting bellows.
Slowly turn the speed setting shaft counterclockwise.
Manual speed setting shaft will not turn counterclockwise.
Governor speed setting is against the low speed stop. (Refer to engine specifications and readjust the low speed stop).
Manual speed setting shaft turns counterclockwise and speed decreases.
1. Check for binding of external linkage (if any) that is attached to the speed setting shaft.
2. Manual speed setting shaft is binding in the governor. (Refer to Manual 03101, Section 5, Linkage and Cover Assembly.
3. The Control Pilot Valve Plunger may be incorrectly adjusted. (Refer to the Calibration Procedures, item 5, at the end of this section for adjustment procedure).
4. Speed setting range or level may be incorrectly adjusted.
Speed setting shaft turns counterclockwise but speed does not decrease.
Speed setting parts within the governor are sticking or binding. (Refer to Manual 03101, Section 5, Governor Repair, for disassembly, repair, and assembly of the speed setting parts).

Disassembly

Remove the governor from the prime mover.

NOTICE

This governor is a precision device and should be treated as such. Set the governor upright on wooden blocks to protect the drive shaft. Do not drop or set the governor on the drive shaft as this may cause damage to the drive shaft, bearings, seals, and other parts inside the governor.

Do not disassemble the device any further than necessary. All disassembly and repair should be done by personnel experienced in repair and calibration of precision controls. In all repair work, it is essential that tools, the work area, and parts be kept clean.

⚠CAUTION

Wear approved eye protection to prevent possible eye injury during disassembly, cleaning, and assembly of parts.

Disassemble the device according to the following instructions, Reference numbers in parentheses are assigned to each part in the exploded view (Figure 4-1).

1. Remove oil supply tube (49) from fitting (50). Remove screws (21 and 10) and lift the speed setting device from the governor cover.

2. Remove lower speed setting bias spring (27) and gasket (24) from the governor cover.

3. Remove screws (46) and orifice plate cover (45). Remove upper gasket (44), orifice plate (43) and lower gasket (42).

IMPORTANT

Normally (unless the governor is overhauled) parts 36 through 40 do not have to be removed.

4. Remove three screws (1) and servo cover (2). Use screw (1) to pull plug (3) from housing (22). Remove piston (5) and spring (6).

5. Remove plug (8). DO NOT remove speed adjusting screw (32) unless replacement of the screw is necessary.

6. Remove plug (12), spring seat (14), spring (15), and speed setting plunger (16).

IMPORTANT

DO NOT remove spring seat (14) and ball (11) from plug (12), unless it is necessary to replace parts (22, 16, or 15).

For disassembly, refer to Figure 3-1.

Clamp spring seat (14) in a vise. Turn plug (12) counterclockwise to remove the plug from the spring seat. Turn the plug over and with a 1/8 inch punch and an arbor press, press ball (11) from the plug. (Ball (71) will be reinstalled after the unit has been calibrated).

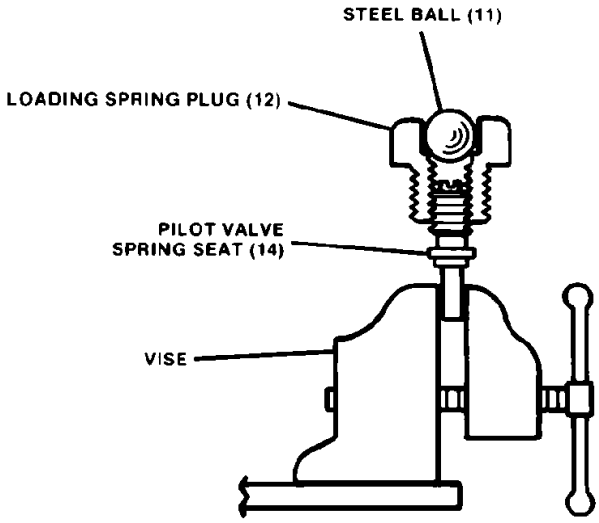


Figure 3-1. Removing Pilot Valve Spring Seat (14) and Steel Ball (11) from Loading Spring Plug (12)

7. Remove two screws (17) and strap (18).

8. Remove bellows (19) from housing (22).

9. Turn housing (22) upside down. Remove screw (30). Lift up on speed setting lever (20) and remove upper speed setting bias spring (27), spring seat (26), and steel ball (25).

10. Remove plug (35) and pin (33). Remove speed setting lever (29) and washer (31).

11. Do not remove nozzle (23) unless damage is apparent.

Cleaning

Clean parts with solvent and a stiff brush to remove foreign particles.

⚠ CAUTION

Observe manufacturer's instructions or restrictions regarding the use of solvents. If no instructions are available, handle with care. Use the cleaning solvent in a well ventilated area away from fires or sparks.

Dry parts with clean, lint-free wipes, or blow dry with clean, dry air.

Handle parts that have been machined to a close tolerance carefully, to prevent damage caused by contact with other parts or objects.

Part Inspection

(Refer to Figure 4-1.)

Springs (27, 6, 15, 38)—Inspect springs for rust and corrosion and replace if any damage is found.

Bearings (28)—Inspect bearings for dirt and worn areas. Replace them if they do not run smooth.

Speed Setting Lever (29)—Inspect lever in the area of contact with nozzle (23).

Nozzle (23)—Inspect the nozzle for damage caused by speed setting lever (29). Replace it if any damage is found.

Pin (33)—Inspect pin in the area of contact with bearings (28), and replace if any wear is visible.

Housing (22)—Inspect for wear in the bore caused by speed setting piston (5). Also check for wear in the speed setting bushing caused by speed setting plunger (16).

Speed Setting Piston (5)—Inspect the piston for uneven wear, nicks, and scratches. Polish the piston carefully with a fine grit paper to remove any burrs from the edges.

Speed Setting Plunger (16)—Inspect sharp corners for nicks and scratches. Replace the plunger if any damage is found.

Speed Setting Bellows (19)—Inspect the bellows for dirt and damage.

Orifice Plate (43)—Inspect to be sure that the orifice is open and the plate is not damaged.

Assembly

To prepare to assemble the pneumatic speed setting device, lay the parts in an orderly fashion on a clean, dry work surface.

Lubricate all O-rings with white petroleum jelly to facilitate assembly.

Use only new O-rings, seals, and gaskets. Careful, precise assembly methods will save time, and help to ensure correct calibration and operation of the device.

Torque all 1/4-20 screws to 10 N·m (90 lb-in).

Assembly Procedures

(Refer to Figures 3-2, 3-3, and 4-1.)

1. Press nozzle (23) in place using a tool as shown in Figure 3-2. Be careful not to damage the nozzle or housing (22).

2. Place speed setting plunger (16) in housing (22) with the spring seat up.

IMPORTANT

Remove spring seat (14) and ball (11) from loading spring plug (12) if speed setting plunger (16), loading spring (15), or housing (22) was replaced.

For disassembly, refer to Figure 3-1.

Clamp spring seat (14) in a vise. Turn plug (12) counterclockwise to remove the nut from the spring seat. Turn the plug over, and with a 1/8 inch punch and an arbor press, press ball (11) from the plug. (Ball (11) will be reinstalled after the unit has been calibrated).

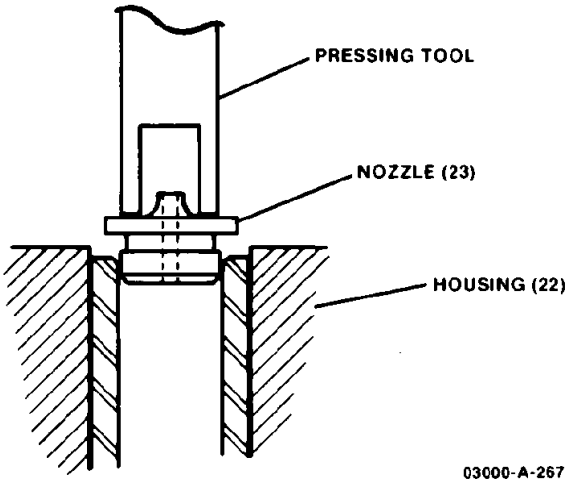


Figure 3-2. Method of Pressing Nozzle (23) into Housing (22)

3. Turn spring seat (14) counterclockwise 4 or 5 turns, up through the bottom of plug (12). Put O-ring (13) on plug (12).

4. Install spring (15) on spring seat (14). Place plug (12), with seat (14) and spring (15), in housing (22).

5. Use a 1/8 inch Allen wrench to turn set screw (32) up through the bottom of housing (22). Turn the screw counterclockwise until it is half way into the housing.

6. Install O-ring (7) on plug (8). Screw the plug into housing (22).

7. Place bearings (28) in speed setting lever (29). Start pin (33) into housing (22). As pin (33) just emerges on the inside of the housing, place washer (31, if so equipped) on the pin from inside the housing. Place lever (29) in the housing and push pin (33) through bearings (28) and lever (29).

8. Install O-ring (34) on plug (35) and place in housing (22).

9. Fill spring seat (26) with white petroleum jelly to hold steel ball (25) in place during installation.

10. Use white petroleum jelly to slick spring seat (26) to upper bias spring (27) for installation into housing (22). Raise lever (29) and install spring, spring seat, and ball on set screw (32).

11. Install screw (30) through lever (29) into housing (22). If the nozzle has been replaced, it must be reseated. To seat nozzle: Turn screw (30) in 1/2 turn after the seating surface on lever (29) has made contact with the nozzle, then turn the screw counterclockwise 1 to 1-1/2 turns (Figure 3-3).

    If the nozzle has not been replaced, run the screw in until the lever lightly contacts the nozzle, then back it out one full turn. Reseating a nozzle that has already been seated, will damage the nozzle.

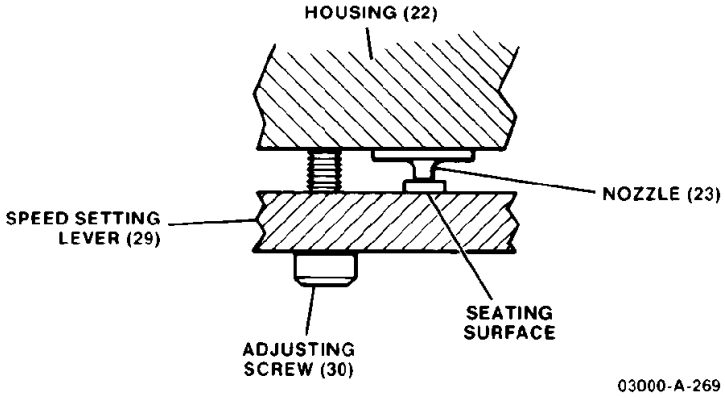


Figure 3-3. Method of Seating Nozzle (23) with Lever (29)

12. Place speed setting spring (6) in housing (22) and seat it in lever (29). Place speed setting piston over spring (6). Be sure the piston moves freely in housing (22).

13. Put O-ring (4) on plug (3). Place plug (3), with threaded hole up, in housing (22). Secure the plug with cover plate (2) and three screws (1).

14. Put O-ring (20) on speed setting bellows (19). Install bellows (19) in housing (22) with the orientation mark on the top of the bellows turned to the front of the governor (Figure 3-4). Secure bellows in housing with plate (18) and two screws (17).

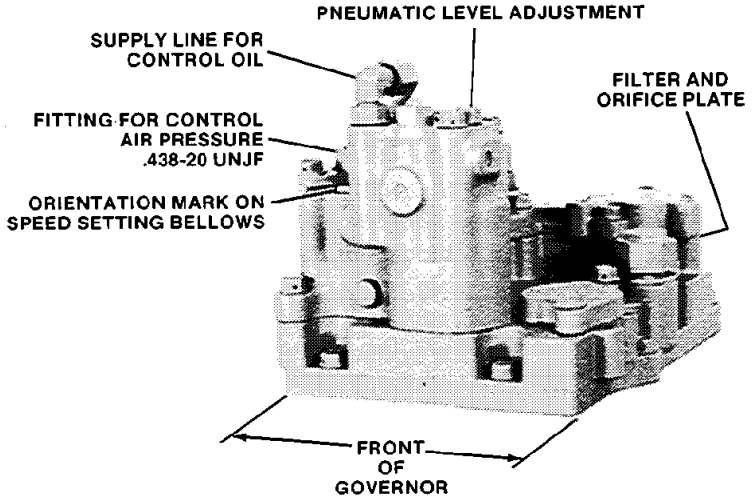


Figure 3-4. Pneumatic Speed Setting Device

NOTICE

Turn screws (17) down together to prevent damage to bellows (19) and plate (18).

15. Items 36 through 40 were not removed at time of disassembly.

16. Place gasket (24) in place on the governor cover. Set lower bias spring (27) in place on the cover. Carefully place the device on the cover, being sure the lower bias spring (27) is seated in speed setting lever (29).

17. Carefully place seal (9) on screw (10). Insert screw (10) through housing (22) and start it in the cover. Align gasket (24) with screw holes and install two screws (21). Torque screws (21 and 10) to 10 N·m (90 lb-in).

18. Install lower gasket (42), orifice plate (43), upper gasket (44), and cover (45) on governor cover (41). (Observe “orifice plate side” on gaskets 42 and 44.) Secure cover (45) with screws (46).

19. Attach oil supply tube (49) to fitting (50) on the speed setting housing.

20. Attach oil supply tube (49) to fitting (48) on the plate cover (45). Tighten all air and oil line connections to ensure against leakage.

Calibration Procedures on Governor Test Stand

Install the governor on a test stand. Fill the governor with 2.2 L (2.3 qt) of clean oil that has a viscosity of 100 to 300 SUS with an oil temperature for continuous governor operation of 60 to 93 °C (140 to 200 °F).

1. Turn the high and low speed stop screws counterclockwise two full turns. Set the speed setting bellows range adjustment at mid-point.

IMPORTANT

Find the orientation mark on the top edge of the bellows. Turn this mark to the front of the governor (Figure 3-4). This is approximately mid range. Turning this mark to the right side when facing the governor nameplate) increases the amount of speed change for a given air pressure change (rpm/psi). Turning the mark to the left side decreases the amount of speed change for a given air pressure.

2. With the governor running at 500 to 1000 rpm on the test stand, apply 345 kPa (50 psi) control air pressure to the speed setting bellows.

3. Turn pilot valve spring seat (14) counterclockwise five full turns.

4. Adjust spring seat (14) clockwise until the governor output shaft just moves to minimum position, then counterclockwise one full turn. Reduce control air pressure to 0.

5. Slowly increase and then decrease control air pressure. Speed must increase and decrease smoothly with no hysteresis.

6. Apply the specified low air pressure to the speed setting bellows. Turn speed adjusting screw (32) to obtain the specified low speed (clockwise to decrease).

7. Increase the control air to the pressure specified for high speed.
   a. If the speed is too high, lower the air to the specified low air pressure and rotate the bellows towards the right. Readjust the low speed at low air.
   b. If the speed is too low, drop air to low pressure, rotate the bellows towards the left and adjust the low speed at low air.
   c. Again increase the control air to the pressure specified for the high speed. If the speed range is still incorrect, repeat the above steps until the correct low speed and high speed is reached for the specified air pressure.
d. Install steel ball (11) in nut (12).

8. Set HIGH and LOW speed stops so the specified speed range cannot be exceeded in either direction by over or under pressure (see Figure 3-5).

9. Check device for external leaks.

Calibration Procedures with Governor on the Prime Mover

⚠WARNING

If the 3161 governor or the Pneumatic Speed Setting Device has been disassembled or repaired, IT MUST BE CALIBRATED. Woodward strongly recommends that this be done on a test stand.

Calibrating the governor on the prime mover can be extremely dangerous and is not recommended by Woodward.

Chapter 4.
Replacement Parts

When ordering replacement parts, include the following information:
1. Manual number (this is manual 03106).
2. Governor serial number and part number shown on the nameplate.
3. Part reference number and part name from parts list.

Ref. No.	Part Name	Quantity
03106-1	Screw .250-20 x 1.0	3
03106-2	Cover plate	1
03106-3	Plug	1
03106-4	O-ring	1
03106-5	Speed setting piston	1
03106-6	Feedback spring	1
03106-7	O-ring	1
03106-8	Plug .250-28	1
03106-9	Stat-o-seal .250	1
03106-10	Screw .250-20 x 3.750	1
03106-11	Steel ball .312	1
03106-12	Plug	1
03106-13	O-ring	1
03106-14	Pilot valve spring seat	1
03106-15	Pilot valve loading spring	1
03106-16	Pilot valve plunger	1
03106-17	Screw .250-20 x 1.0	2
03106-18	Strap	1
03106-19	Speed setting bellows	1
03106-20	O-ring	1
03106-21	Screw .250-20 x 1.0	2
03106-22	Housing	1
03106-23	Nozzle	1
03106-24	Gasket	1
03106-25	Steel ball .250	1
03106-26	Spring seat	1
03106-27	Speed setting bias spring	2
03106-28	Flanged bearing	2
03106-29	Speed setting lever	1
03106-30	Screw 10-32 x .750	1
03106-31	Washer .141 id. x .031 thick	1
03106-32	Speed adjusting screw .250-28 x 1.250	1
03106-33	Pin	1
03106-34	O-ring	1
03106-35	Plug .250-28	1
03106-36	Rod guide	1
03106-37	Screw .250-20 x 1.0	2
03106-38	Loading Spring	1
03106-39	Spring seat	1
03106-40	Screw .250-28 x 4.50000	1
03106-41	Cover	1
03106-42	Lower gasket	1
03106-43	Orifice plate	1
03106-44	Upper gasket	1
03106-45	Orifice plate cover	1
03106-46	Screw .250-20 x 1.0	7
03106-47	O-ring	1
03106-48	Elbow	1
03106-49	Tube	1
03106-50	Elbow	1
03106-51	O-ring	1
03106-52	Retaining ring	1
03106-53	Speed setting rod	1

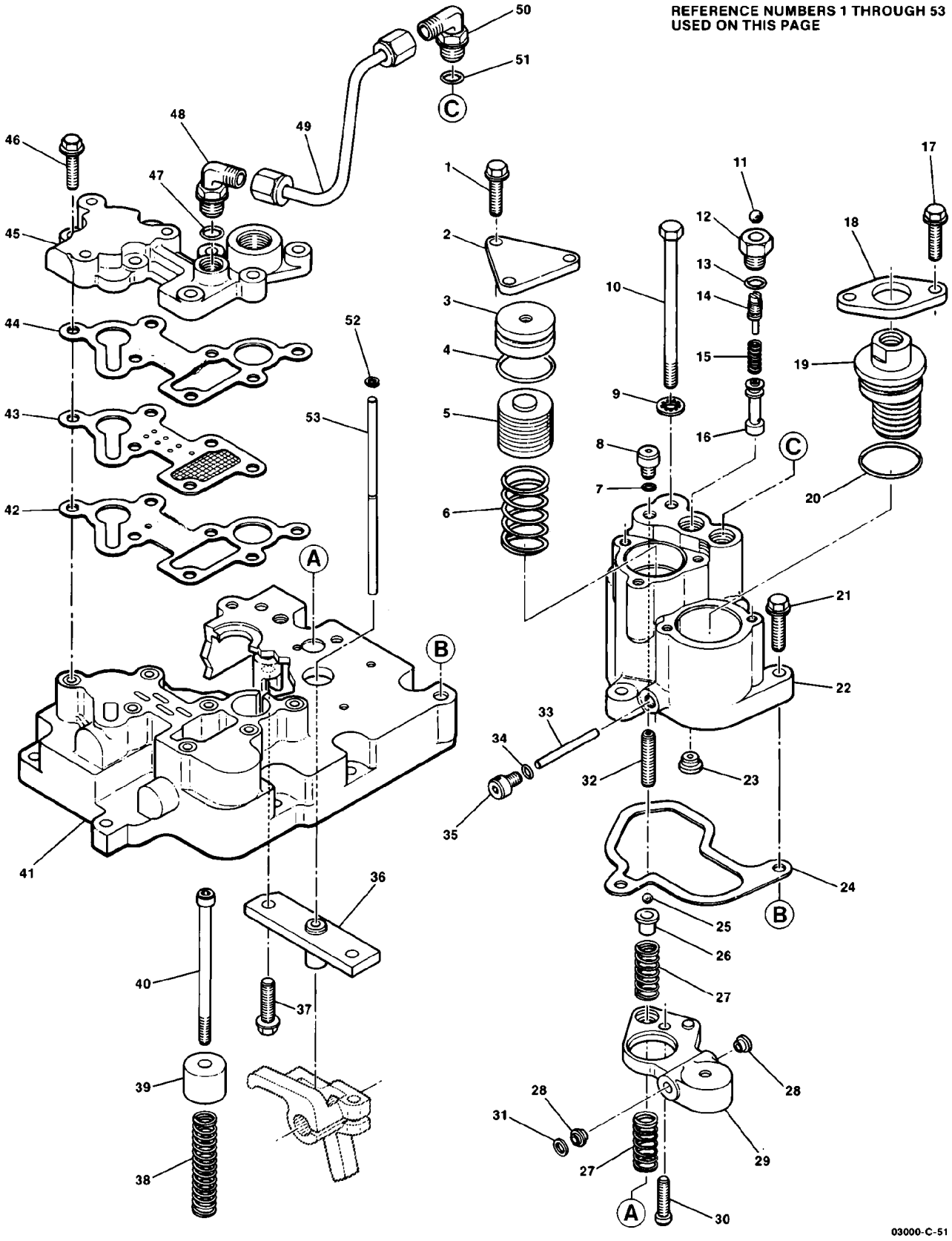


Figure 4-1. Exploded View of 3161 Pneumatic Speed Setting Device

Chapter 5.
Product Support and Service Options

Product Support Options

If you are experiencing problems with the installation, or unsatisfactory performance of a Woodward product, the following options are available:

1. Consult the troubleshooting guide in the manual.
2. Contact the **OE Manufacturer or Packager** of your system.
3. Contact the **Woodward Business Partner** serving your area.
4. Contact Woodward technical assistance via email (**EngineHelpDesk@Woodward.com**) with detailed information on the product, application, and symptoms. Your email will be forwarded to an appropriate expert on the product and application to respond by telephone or return email.
5. If the issue cannot be resolved, you can select a further course of action to pursue based on the available services listed in this chapter.

OEM or Packager Support: Many Woodward controls and control devices are installed into the equipment system and programmed by an Original Equipment Manufacturer (OEM) or Equipment Packager at their factory. In some cases, the programming is password-protected by the OEM or packager, and they are the best source for product service and support. Warranty service for Woodward products shipped with an equipment system should also be handled through the OEM or Packager. Please review your equipment system documentation for details.

Woodward Business Partner Support: Woodward works with and supports a global network of independent business partners whose mission is to serve the users of Woodward controls, as described here:

- A **Full-Service Distributor** has the primary responsibility for sales, service, system integration solutions, technical desk support, and aftermarket marketing of standard Woodward products within a specific geographic area and market segment.
- An **Authorized Independent Service Facility (AISF)** provides authorized service that includes repairs, repair parts, and warranty service on Woodward's behalf. Service (not new unit sales) is an AISF's primary mission.
- A **Recognized Engine Retrofitter (RER)** is an independent company that does retrofits and upgrades on reciprocating gas engines and dual-fuel conversions, and can provide the full line of Woodward systems and components for the retrofits and overhauls, emission compliance upgrades, long term service contracts, emergency repairs, etc.

A current list of Woodward Business Partners is available at **www.woodward.com/directory**.

Product Service Options

Depending on the type of product, the following options for servicing Woodward products may be available through your local Full-Service Distributor or the OEM or Packager of the equipment system.

- Replacement/Exchange (24-hour service)
- Flat Rate Repair
- Flat Rate Remanufacture

Replacement/Exchange: Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a like-new replacement unit in minimum time (usually within 24 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime.

This option allows you to call your Full-Service Distributor in the event of an unexpected outage, or in advance of a scheduled outage, to request a replacement control unit. If the unit is available at the time of the call, it can usually be shipped out within 24 hours. You replace your field control unit with the like-new replacement and return the field unit to the Full-Service Distributor.

Flat Rate Repair: Flat Rate Repair is available for many of the standard mechanical products and some of the electronic products in the field. This program offers you repair service for your products with the advantage of knowing in advance what the cost will be.

Flat Rate Remanufacture: Flat Rate Remanufacture is very similar to the Flat Rate Repair option, with the exception that the unit will be returned to you in "like-new" condition. This option is applicable to mechanical products only.

Returning Equipment for Repair

If a control (or any part of an electronic control) is to be returned for repair, please contact your Full-Service Distributor in advance to obtain Return Authorization and shipping instructions.

When shipping the item(s), attach a tag with the following information:
- return number;
- name and location where the control is installed;
- name and phone number of contact person;
- complete Woodward part number(s) and serial number(s);
- description of the problem;
- instructions describing the desired type of repair.

Packing a Control

Use the following materials when returning a complete control:
- protective caps on any connectors;
- antistatic protective bags on all electronic modules;
- packing materials that will not damage the surface of the unit;
- at least 100 mm (4 inches) of tightly packed, industry-approved packing material;
- a packing carton with double walls;
- a strong tape around the outside of the carton for increased strength.

NOTICE

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*.

Replacement Parts

When ordering replacement parts for controls, include the following information:
- the part number(s) (XXXX-XXXX) that is on the enclosure nameplate;
- the unit serial number, which is also on the nameplate.

Engineering Services

Woodward's Full-Service Distributors offer various Engineering Services for our products. For these services, you can contact the Distributor by telephone or by email.

- Technical Support
- Product Training
- Field Service

Technical Support is available from your equipment system supplier, your local Full-Service Distributor, or from many of Woodward's worldwide locations, depending upon the product and application. This service can assist you with technical questions or problem solving during the normal business hours of the Woodward location you contact.

Product Training is available as standard classes at many Distributor locations. Customized classes are also available, which can be tailored to your needs and held at one of our Distributor locations or at your site. This training, conducted by experienced personnel, will assure that you will be able to maintain system reliability and availability.

Field Service engineering on-site support is available, depending on the product and location, from one of our Full-Service Distributors. The field engineers are experienced both on Woodward products as well as on much of the non-Woodward equipment with which our products interface.

For information on these services, please contact one of the Full-Service Distributors listed at **www.woodward.com/directory**.

Contacting Woodward's Support Organization

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory published at **www.woodward.com/directory**.

You can also contact the Woodward Customer Service Department at one of the following Woodward facilities to obtain the address and phone number of the nearest facility at which you can obtain information and service.

Products Used In Electrical Power Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany:	
Kempen	+49 (0) 21 52 14 51
Stuttgart	+49 (711) 78954-510
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Products Used In Engine Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany	+49 (711) 78954-510
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
United States	+1 (970) 482-5811

Products Used In Industrial Turbomachinery Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
India	+91 (129) 4097100
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

For the most current product support and contact information, please visit our website directory at **www.woodward.com/directory**.

Technical Assistance

If you need to contact technical assistance, you will need to provide the following information. Please write it down here before contacting the Engine OEM, the Packager, a Woodward Business Partner, or the Woodward factory:

General

Your Name _____

Site Location _____

Phone Number _____

Fax Number

Prime Mover Information

Manufacturer _____

Engine Model Number _____

Number of Cylinders _____

Type of Fuel (gas, gaseous, diesel, dual-fuel, etc.) _____

Power Output Rating _____

Application (power generation, marine, etc.)

Control/Governor Information

Control/Governor #1

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #2

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #3

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Symptoms

Description _____

_____

If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 03106.

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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.

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