

PIERCE

Long Range Universal Governor

(EITHER LEFT-HAND OR RIGHT-HAND MOUNTED)

The Pierce Universal Governor has been manufactured to exacting standards to provide a governor which will accurately control the speeds of your engine to obtain the most satisfactory performance from your equipment. When installing the governor, carefully follow the instructions for Installation and Adjustment. To add further in checking your installation and servicing the governor after it has been in use, check the following trouble-shooting hints.

ENGINE SPEED FALLS OFF TOO GREATLY WHEN LOAD IS APPLIED:

1. Governor improperly adjusted.
2. Friction in throttle linkage.
3. Load too great for engine at operating speed.
4. Engine worn-compression low.
5. Timing slow.
6. Governor shaft speed too slow.
7. Springs in carburetor or throttle mechanism opposing governor action.
8. Governor worn internally.

ENGINE OVER-RUNS TOO GREATLY WHEN LOAD IS REMOVED:

1. Governor belt slipping.
2. Governor shaft speed too slow.
3. Friction in throttle linkage.
4. Friction in carburetor (or valve body).
5. Governor improperly adjusted.

6. Springs in carburetor or throttle mechanism opposing governor action.
7. Governor worn internally.

GOVERNOR SURGES UNDER LOAD:

1. Governor improperly adjusted.
2. Friction in throttle linkage.
3. Governor belt slipping.
4. Carburetor mixture too lean or too rich.
5. Timing set too fast.
6. Faulty ignition.
7. Governor running too fast.
8. Governor worn internally.

GOVERNOR SURGES AT NO-LOAD:

1. Governor improperly adjusted.
2. Friction in throttle linkage.
3. Governor belt slipping.
4. Carburetor mixture too lean or too rich.
5. Timing set too fast.
6. Faulty ignition.
7. Governor worn internally.

This governor is calibrated to operate at speeds of 1600 to 2800 RPM. Operating at lower governor shaft speeds might result in sluggish governor action. Operating at a higher governor shaft speed might damage the governor internally and will VOID THE WARRANTY. Maintain oil level in the governor as specified in the installation and adjustment instructions. DO NOT OVER-FILL.

THE PIERCE COMPANY, INC.



UPLAND, INDIANA, U.S.A.

MANUFACTURER OF GOVERNORS SINCE 1913

GOVERNOR PULLEY: This governor is designed to give best performance at GOVERNOR shaft speeds from 1600 to 2800 RPM, when the ENGINE is running at desired speeds. To determine proper pulley size for the governor, use the following formula:

$$\frac{\text{Eng RPM}}{\text{Gov RPM}} \times \text{Dia of Eng Pulley} = \text{Dia of Gov Pulley}$$

If the governor is driven from an auxiliary pulley

other than the crankshaft pulley, determine the speed of the auxiliary pulley by this formula:

$$\text{Eng RPM} \times \frac{\text{Dia Eng Pulley}}{\text{Dia Aux Pulley}} = \text{Aux RPM}$$

With the Auxiliary pulley speed established, determine the proper governor pulley size with the first formula, substituting the auxiliary pulley speed for the engine speed. Mount correct pulley on governor before installing governor on engine. Be certain that both pulleys are for the same size belt.

Shortcut: When mounting on a gen set, the better regulation is achieved at high gov speed:

- ~ For 1800 RPM ENGINE speed: Dia of Eng Pulley x 0.7 = Dia of Gov Pulley
- ~ For 3600 RPM ENGINE speed: Dia of Eng Pulley x 1.45 = Dia of Gov Pulley

PIERCE UNIVERSAL GOVERNOR—INSTALLATION AND ADJUSTMENT INSTRUCTIONS

MOUNTING: Determine the best point on the carburetor side of the engine to permit driving the governor from the fan belt or an auxiliary belt.

MOUNTING BRACKET: Devise a mounting bracket which will hold the governor rigidly in line with the driving pulley. A piece of heavy angle iron will usually be adequate. Drill holes to meet with governor mounting slots.

MOUNTING FLANGE: (Fig. 1) Locate flange in most desirable position, being certain that the oil cup is always upward. (OR see LUBE OPTION on page 3.) Relocation of flange is accomplished by removing body screws and turning flange on shaft per Fig. 1 & 2.

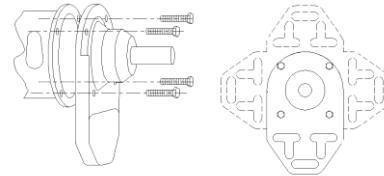


FIG. 2

FIG. 1

SPRING AND LEVER ASSEMBLY: It is usually desirable to have the spring and lever assembly located on the side of the governor farthest from the engine block for ease of adjustment. If it is necessary to relocate the lever assembly, proceed as follows, referring to Fig. 3, 4, 5 & 6.

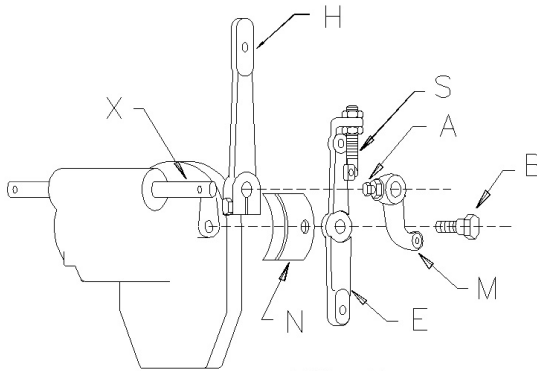


FIG. 3

1. Release spring tension.
2. Loosen set screw **A** so that spring lever **M** may be removed.
3. Remove shoulder screw **B** and remove complete assembly.
4. Reposition stop screws **C** and **D** as shown in Fig. 4.

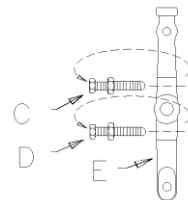


FIG. 4

5. Remove throttle lever **H** and install on opposite side of governor.
6. Remove plug screw from speed change lever pad on opposite side of governor and install in tapped hole from which shoulder stud **B** was removed.

PIERCE Universal Governor

Installation & Adjustment Instructions

7. Install speed change lever and spring lever assembly on opposite side of governor, securing with set screw **A** and shoulder stud **B**. **NOTE:** Be certain that stop bracket **N** is properly located between speed change lever **E** and governor body.

8. It is possible to locate the throttle lever **H** on either side of the governor body, regardless of the position of the spring lever assembly. However, if it is to be used on the same side as the speed change lever assembly, it must be located between the spring lever **M** and the governor body.

MOUNTING GOVERNOR TO ENGINE: Mount governor on bracket using $\frac{3}{8}$ -inch machine bolts, with lock washer under nut. Do not tighten nuts tightly. Draw tension on belt by moving governor on bracket until belt can be depressed approximately $\frac{1}{2}$ inch when pressing between pulleys. Now tighten mounting bolts to secure governor in this position.

NOTE: The length of the carburetor lever (from center of shaft to center of hole) must be no more than $\frac{7}{8}$ inch. If the carburetor lever is longer, it will be necessary to drill an additional hole in the carburetor lever the center of which falls $\frac{3}{4}$ inch from the center of the carburetor shaft.

LINKING GOVERNOR TO CARBURETOR: Loosen lock screw in governor throttle lever **H**. Position throttle lever **H** so that a rod connecting the throttle lever with the carburetor lever will meet the throttle lever at a 90° angle. Tighten lock screw on governor lever. Place some tension on governor spring. The governor throttle lever **H** is now in wide open throttle position. The throttle lever **H** can now be moved only in one direction — toward closed throttle. Check direction of rotation on carburetor lever to see that its travel is in the same direction. If this is not the case, it is necessary to reverse the direction of travel of the carburetor lever OR of the governor lever (by rotating the governor lever 180 degrees around the rocker shaft).

THE LINKAGE ROD AND BALL JOINT ASSEMBLY should be of such length that the ball joint connecting screws will match the holes in the governor throttle lever and the carburetor lever when both are in the wide open position. **Note: for best performance, the throttle rod should be at right angles to both levers at mid-travel.** Cut a piece of $\frac{1}{4}$ -inch rod $1\frac{5}{8}$ inch shorter than the distance between the holes in the governor lever and the carburetor lever. Thread the rod with $\frac{1}{4}$ -28 thread 1 inch back from each end. Then, when assembled with ball joints and $\frac{1}{4}$ -28 locking nuts you should be able to adjust length as noted on page 4.

LUBRICATION: Ref. Fig. 8. This governor is manually lubricated. Before starting engine, remove pipe plug **K**. Pour oil into oil cup **L** until it runs out of housing. Use same grade motor oil as used in the engine crankcase. Replace pipe plug **K** and secure snugly. Check oil weekly.

LUBE OPTION: If it is necessary to rotate the body for lever access, you can remove the oil cup, insert 3.25 oz (100 cc) oil **[NO MORE]**, and replace the oil cup with a $\frac{1}{8}$ -inch pipe plug, thus sealing the governor.

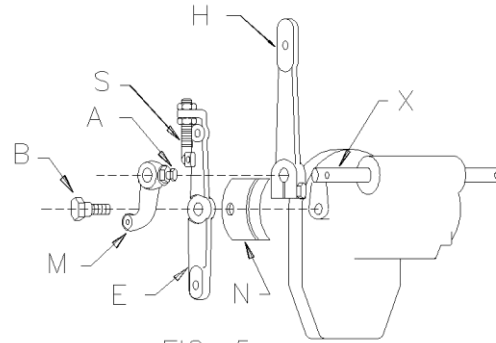


FIG. 5

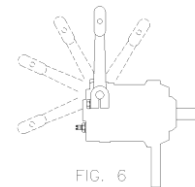
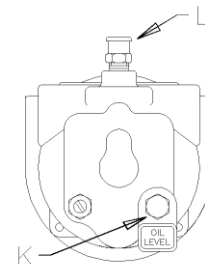
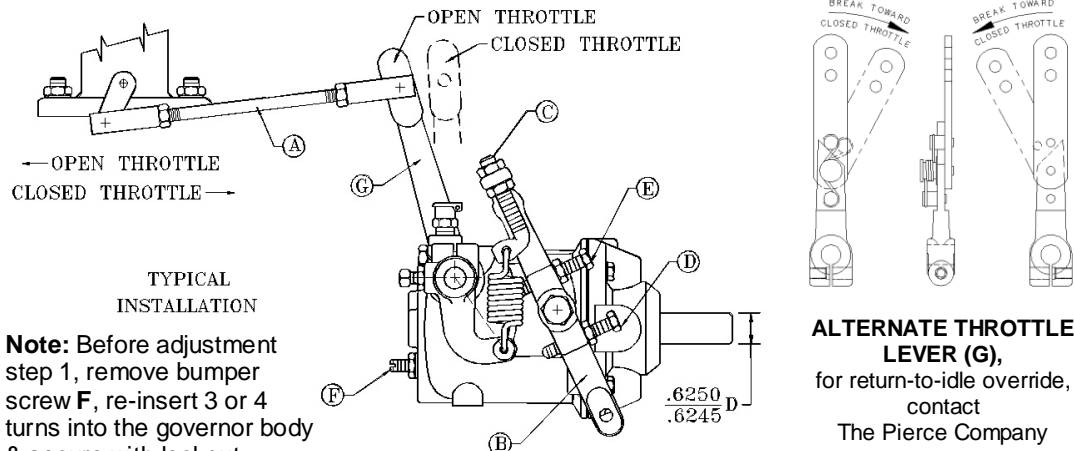


FIG. 6



ADJUSTING GOVERNOR



Note: Before adjustment step 1, remove bumper screw **F**, re-insert 3 or 4 turns into the governor body & secure with locknut.

1. ↑ Place tension on governor spring with screw **E** or with manual control attached to speed change lever **B**. (This forces the governor into its wide-open-throttle position.) Install linkage **A** from governor throttle lever to the carburetor lever, adjusting the length of the linkage to hold the carburetor just slightly off the wide open stop (up to 1/16").
2. Release all spring tension, and operate the throttle lever manually to check for binding or lost motion in the linkage. Make corrections as needed to assure smooth, friction-free operation of this linkage.
3. Start engine and allow to warm up to normal operating temperature.
4. Tighten spring with screw **E** or with manual control attached to speed change lever **B** to desired no-load speed.
5. Check the speed "droop" by loading and unloading the engine.
 - IF** the drop in engine speed ("droop") between no-load and full-load is too much, lower speed 100 RPM or so with speed change lever **B**, then raise speed back up to the desired no-load RPM with the regulation eye-screw **C**.
 - IF** governor tends to surge under load, lower the speed 100 RPM or so with regulation eye-screw **C**, then raise speed back up to the desired no-load RPM with speed change lever **B**.

Repeat either of these adjustments as necessary to achieve the desired performance.

BUMPER SCREW: The bumper screw **F** is ONLY used to remove a no-load surge.

FOR CONSTANT SPEED OPERATION, If a no load surge is encountered, turn bumper screw **F** in slowly until surge is removed.

FOR VARIABLE SPEED OPERATION, the bumper screw may be used to removed a no-load surge at the **low speed ONLY**.

NEVER turn bumper screw in far enough to **increase** no-load speed.

WARNING: Operating this governor at a GOVERNOR shaft speed over 2800 RPM voids warranty.

MECHANICAL GOVERNORS

HOW TO FIND THE GOVERNOR PULLEY DIAMETER

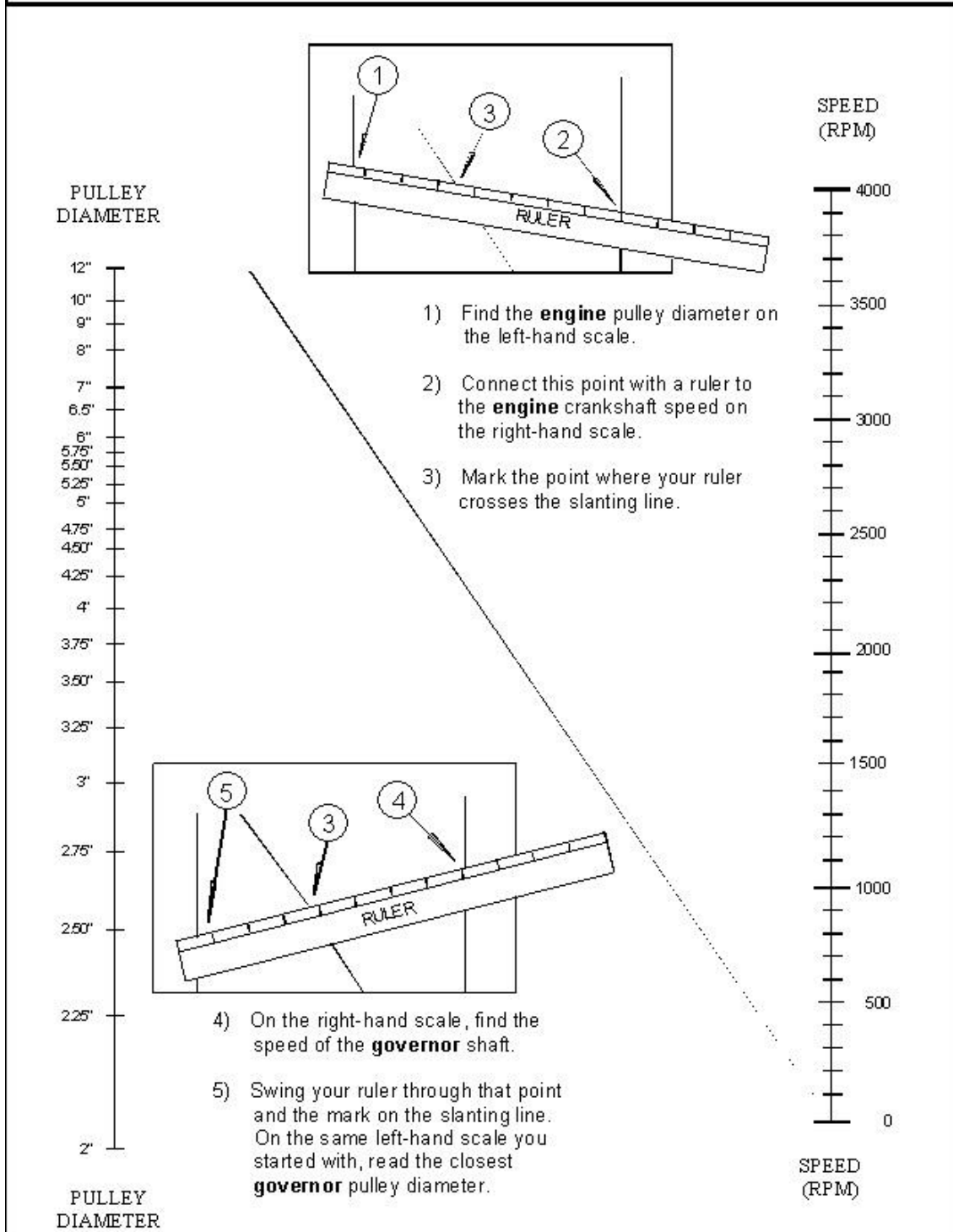


FIG. 15—PULLEY SIZE CALCULATION CHART

PRODUCT BULLETIN – MECHANICAL GOVERNORS

Unnecessary product returns are costly to your company as well as to Pierce. Many of these returns indicate *possible* assembly and adjustment errors by customer personnel.

When installing and adjusting a mechanical governor, two points of instruction are much more essential than they seem on the outset:

1. The length of the linkage that connects the governor output lever to the carburetor lever can **ONLY** be determined **AFTER** the governor is **COMPLETELY** installed in place on the engine. Here are some linkage-setting instructions common to most mechanical governor installations:
 - a. Without the engine running, adjust the governor to apply some tension on the governor spring. This forces the governor output lever to the “wide open throttle” position. That’s the only position noteable on the governor; closed-throttle position is not discernable on the governor. That’s why it is necessary to set rod length – in the next two steps – at wide open throttle.
 - b. Attach the throttle linkage to *either* the governor or the carburetor lever first.
 - c. **THEN**, adjust the length of the linkage so that, when it is attached at the other end, the carburetor lever is also held at the “wide open throttle” position; just slightly off the carburetor’s wide open stop (up to 1/16 inch) is preferable.
 - d. Attach the linkage securely, remove the governor spring tension, move the linkage by hand, and be sure it moves freely through the full travel of the carburetor lever **WITHOUT RESISTANCE**. No other engine components can touch this connecting linkage - wiring, hoses, etc.

Just “short-cutting” this one critical adjustment - with “preset” throttle linkages or careless adjustments or lack of observation - have generated warranty claim comments such as:

“Governor will not pick up load”	“Won’t rev up”
“Governor over-speeds”	“Would not respond”
“Cannot set governor speed”	“Not controlling speed”

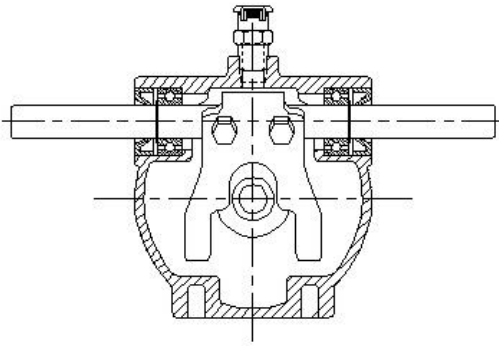
2. The “bumper screw” is used **ONLY** to eliminate a surge or “hunting” at maximum no-load speed. Before starting the engine, make sure the bumper screw thread is engaged only 3 or 4 turns (approx 1/8 inch) into the governor housing.

IF, after your normal startup and speed adjustment, you encounter a no-load surge, **THEN** the bumper screw can be turned slowly - while the engine is running - in a clockwise direction, until the surge **JUST** stops. The bumper screw **MUST NOT** be turned in far enough to **RAISE** the no-load speed.

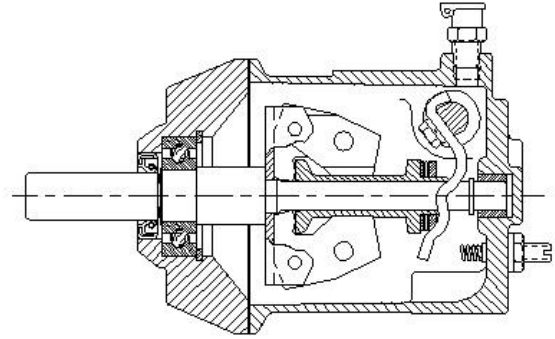
An incorrect adjustment here can generate warranty claim comments like:

“Engine surges when load is removed”
“Engine runs away or over-speeds when load is removed.”

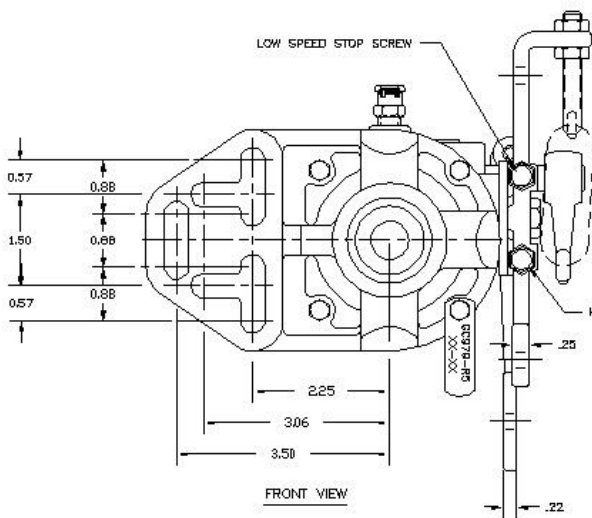
Something else to watch for: A mechanical governor has limited travel to move the throttle rod and carburetor lever. In operation, the governor output (rocker) shaft has 15° of movement. That means the linear travel available to move the throttle rod is only *¼ inch per inch of lever length*, at best. (i.e., a 4-inch-long lever will move the rod one inch). The movement required to move the carburetor from fully-open throttle to closed throttle **MUST NOT EXCEED** the available governor lever movement. It’s best to plan on using no more than 7/8 of the calculated useable governor lever travel.



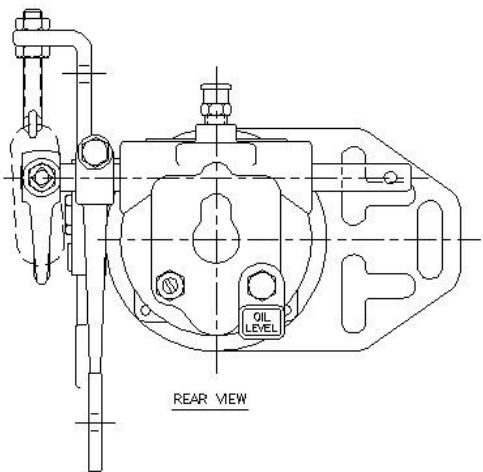
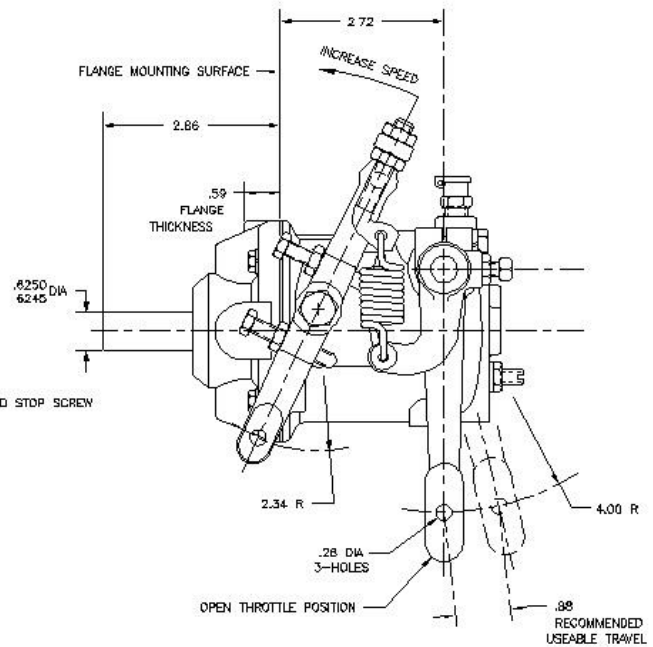
SECTION THROUGH ROCKER SHAFT AXIS



SECTION THROUGH MAIN SHAFT AXIS



FRONT VIEW



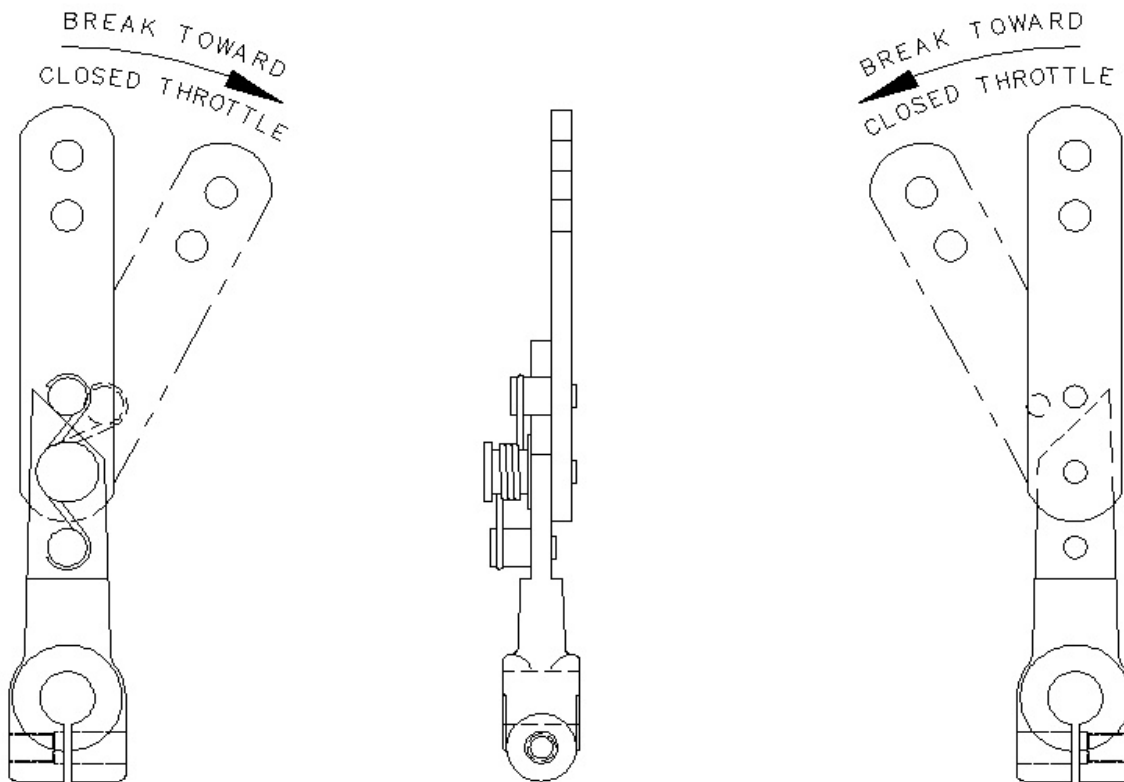
REAR VIEW

CUSTOMER INSTALLATION NOTES

- 1) THE SLOTTED MOUNTING FLANGE MAY BE LOCATED AT 90 DEGREE INTERVALS BY REMOVING THE 4 FLANGE-TO-BODY SCREWS, ROTATING THE FLANGE, AND RE-INSTALLING THE 4 FLANGE-TO-BODY SCREWS SECURELY.
- 2) WHEN THE FLANGE SLOTS ARE LOCATED AT EITHER THE RIGHT OR THE LEFT SIDE, THE SPEED CHANGE LEVER AND SPEED STOP BRACKET ARE TO BE INSTALLED ON THE SIDE OPPOSITE THE FLANGE SLOTS.
- 3) THE SHORT SPRING LEVER MUST BE INSTALLED ON THE SAME SIDE OF THE GOVERNOR THAT THE SPEED CHANGE LEVER IS LOCATED.
- 4) THE THROTTLE LEVER CAN BE INSTALLED ON EITHER SIDE OF THE GOVERNOR

THE PIERCE COMPANY, INC
 UNIVERSAL GOVERNOR
 MODEL GC979R5

AUXILIARY LEVER
FOR USE WITH
GC979R5 UNIVERSAL GOVERNOR



A8164 AUXILIARY LEVER ASSEMBLY

IN SOME CONSTANT-SPEED APPLICATIONS, IT IS DESIRABLE TO BE ABLE TO OVERRIDE THE GOVERNOR AND “BREAK” THE LINKAGE BACK TOWARD IDLE, KEEPING THE ENGINE RUNNING AT A REDUCED IDLE SPEED AND READY FOR IMMEDIATE USAGE. (THIS IS COMMON IN WELDER AND COMPRESSOR APPLICATIONS.)

WHEN THIS FEATURE IS NEEDED, THE A8164 AUXILIARY LEVER ASSEMBLY (PICTURED) IS DESIGNED TO REPLACE THE THROTTLE LEVER THAT COMES WITH THE GC979R5 UNIVERSAL GOVERNOR.

POSITION THE A8164 AUXILIARY LEVER SO THAT IT “BREAKS” TOWARD CLOSED-THROTTLE. YOU CAN THEN ATTACH YOUR OVERRIDE MECHANISM LINKAGE TO THE UNUSED HOLE ON THE AUXILIARY LEVER.

WARNING: IN NORMAL GOVERNOR OPERATING MODE, THE OVERRIDE LINKAGE **MUST NOT** IMPEDE MOVEMENT OF THE GOVERNOR-TO-THROTTLE LINKAGE IN ANY WAY, OR GOVERNOR OPERATION WILL BE ERRATIC AND UNACCEPTABLE.

TECHNICAL ASSISTANCE IS AVAILABLE AT THE PIERCE COMPANY, INC. MOST WEEKDAYS FROM NOON 'TIL 3:00 PM CENTRAL TIME. CALL 1-800-428-0207.

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