I. L. 2315
Filing No. 15-000

PATH

Westinghouse

Class 15-066 Pressure Governor

INSTRUCTIONS

The Class 15-066 pressure governor is used in connection with automatic starters for automatic control of motor-driven pumps, air compressors, etc. The pressure governor can be used on any liquid or gas system. The material of the Bourdon tube is selected to suit the pressure medium; as, bronze for air, steam or water, and steel for ammonia. For pressures of 1000 lb. and over, only steel tubes are furnished

INSTALLATION

Loosen the screw at the front of the case and remove the cover.

Do not snap the gauge pointer, pull on the gauge tube, or handle the moving parts roughly.

Mount the governor on a vertical surface as free from vibration as possible and with the dial upright.

Connect the governor through an independent pipe to the storage tank, or connect it to the storage tank pipe, a sufficient distance from the pump so that the governor will indicate water level in the tank and not delivery pressure of the pump. This distance depends upon the diameter of the pump line to the tank, and varies according to local conditions for each installation.

After the governor has been installed, make connections according to Fig. 5 and 6. Connections for d-c governors are shown in Fig. 5 (a) and (b). Connections for a-c governors are shown in Fig. 6 (a) and (b).

To prevent fluctuations of pressure in the discharge pipe from affecting the operation, connect the governor to an independent pipe from the storage tank. See Fig. 1. When gauges are used with steam, or other pressure medium of high temperature, they must be connected to a siphon or equivalent piping filled with liquid so that live steam will never reach the gauge.

In cases where the pressure fluctuates to such an extent that the contact arm and indicating hand swing back and forth, it becomes necessary to install a needle valve in the pressure pipe leading to the governor. Starting with the needle valve wide open, it should be closed gradually until the oscillations of the gauge hand are barely noticeable. To make sure that the passage in the needle valve has not been clogged by dirt, the valve should be periodically opened and gradually closed again to its original setting.

When the use of a needle valve will not satisfactorily prevent oscillations of the contact arm and gauge hand, a combination cushion chamber and pressure snubber as shown in Fig. 2 should be installed. The cushion chamber should be installed in a vertical position with the drain cock "S" at the bottom and the plug "J" at the top. The pressure snubber should be connected in a vertical position, *female end up;* to the upper of two nipples extending from the side of the cushion tank. The bottom (male end) of pressure snubber should be connected to the main through a needle valve "E" and ¼ in. piping. The pressure governor should be connected from the lower of the two nipples extending from the side of the cushion tank with ¼ in. piping.

When installing the pressure snubber care should be taken not to use heavy wrenches or use an excess of "pipe dope" on connections.

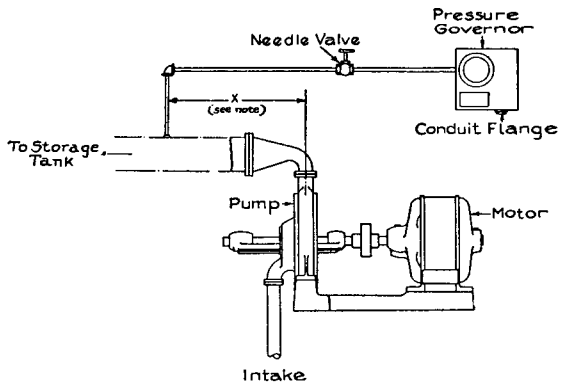
OPERATION:

When the equipment has been installed in accordance with the above, to establish or renew air cushion the following procedure should be followed:

1. Close valve "E"
2. Remove plug "J"
3. Open cock "S"
4. Replace plug "J"
5. Close cock "S"
6. Open valve "E"

When pressure is turned on, the gauge hand should rise without a sudden jar or shock. If gauge hand rises too quickly and the shock continues to go through to the gauge, remove the No. 2 plunger from the snubber and replace the No. 3 plunger in its place. (Spare plungers are furnished with pressure snubber.) To replace plungers unscrew part "B" from "A" and insert plunger "C" in part "B."

The head of each plunger "C" is slotted on both top and bottom. The slots act as ports through which the fluid passes. The fluid rise in the annular orifice formed between the stem of the plunger and the tube in part "B" passes through ports in the plunger head and fills the upper body "A" and passes out through the port in the upper part of "A."



Note:—The distance "X" must be sufficient to insure that the governor will indicate water level and not delivery pressure at the pump.

FIG. 1—PRESSURE GOVERNOR CONNECTED FOR CONTROL OF MOTOR-DRIVEN PUMP

The plunger "C" rises and falls with pump pulsations, which together with the frictional resistance of the stem in the annular orifice of "B" absorbs the pulsations. The action of the stem also clears the end of the orifice in port "B" of all sediment. The sediment collects in the recesses around the orifice from which it may be removed when necessary.

The snubber should be given an occasional cleaning to prevent an accumulation of excess sediment.

ADJUSTMENT

The stationary contacts may be set for any pressure between 20 and 80 per cent of the maximum value on the dial. There are three markings on the contact base, representing ¼, ½, and ¾ of the full dial reading. For example, when the contact arm C, Fig. 3, on a 160 lb. gauge points to the ¼ mark, the gauge will show a pressure of 40 lb. The desired position of these contacts will have to be found by gradual adjustment. Coarse adjustment is made by loosening the clamping screws A and B, and sliding contacts to approximate position desired. Care should then be taken that A and B are tightened securely. Final adjustment is made with contact screws L and K. With contacts adjusted at a minimum, the moving contact arm still has $\frac{1}{16}$ in. or more space to swing between the contacts.

A pressure governor for d-c operation is pictured in Fig. 3. It contains the 1531 single pole contactor shown in Fig. 4. For a-c operation the pressure governor includes in addition a two-pole auxiliary relay. See Figs. 5 and 6 for connections. Referring to Fig. 3, the slight movement of the Bourdon pressure tube at varying pressure is transmitted to contact arm C. With C in the position as shown (cutting-in position), coil U of the contactor is energized and closes the control circuit to the automatic starter at D.

As the pressure increases, it tends to straighten out the Bourdon tube, causing the contact arm C to move towards the tip of the adjusting screw K. When the arm C touches this contact tip, it shorts out the coil U, causing the contactor to open the control circuit. With decreasing pressure, contact arm C moves toward L until contact between C and L is again made.

CARE AND MAINTENANCE

To protect the gauge and contact mechanism, the cover should not be removed unless necessary for inspection or adjustment as described above.

A very fine file is the most suitable for cleaning the silver contacts of the gauge mechanism. The use of emery cloth or any other abrasive is to be avoided.

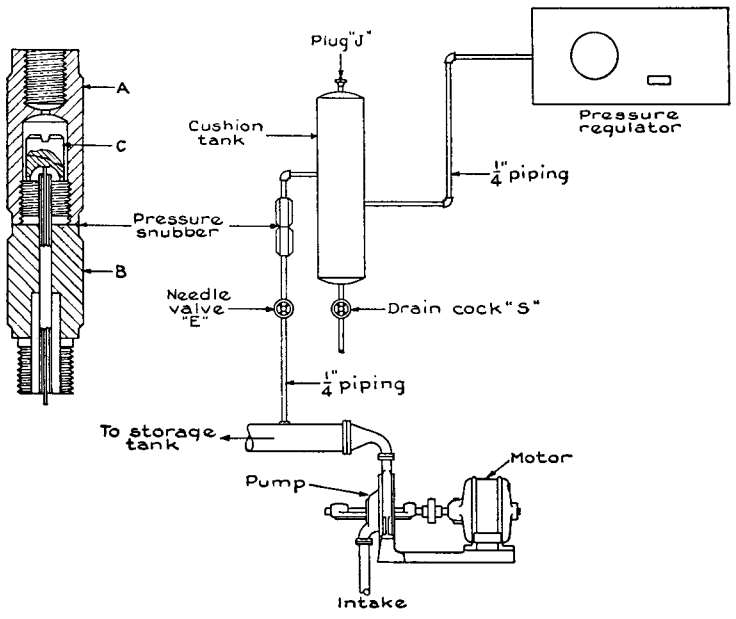


FIG. 2—INSTALLATION SHOWING USE OF CUSHION TANK

Should the governor fail to operate when contact is made between movable arm C and the contact tips of adjusting screws K or L, look for open circuits in the relay coil.

Do not use oil on any parts of the gauge mechanism.

In case of any improper operation which cannot be corrected by carefully checking every detail of these instructions, communicate with the nearest office of the Company.

RENEWAL PARTS FOR GOVERNOR

Renewal parts are not furnished for the pressure governor. If parts become sufficiently worn or out of alignment to prevent satisfactory operation, the governor should be returned to the factory for repair.

CARE AND ADJUSTMENT

1531 Contactor (Fig. 4)

A slight humming may be expected in an a-c solenoid, similar to that in a transformer and other alternating-current apparatus. This noise level can, in many cases, be improved by periodic cleaning of the sealing surfaces: that is, the surface of the end of the plunger and the surface of the seat against which the end of the plunger comes in contact.

If the contactor does not open when the solenoid is de-energized, see that the contact tips are clean and free from blisters and that no movable parts are binding.

In general, contact tips do not require attention during their normal life. If prominent copper beads form on the surfaces of the main contacts or if the tips turn a dark color because of overheating, the contact surfaces should be dressed with a fine file. The interlock contacts are silver and should be replaced before the tips are completely worn down to their supports.

To replace the main movable tips, shunts, or springs, push in on bayonets (D), Fig. 4, and give them one-quarter turn. Remove screws (H), and new tips and shunts can then be assembled. Give bayonets (D) another quarter turn, and springs (J) can be removed and new ones installed.

When renewing the main tips, the contact surfaces between the tips and shunts must be cleaned with a fine file to insure a good contact and reduce heating at this point.

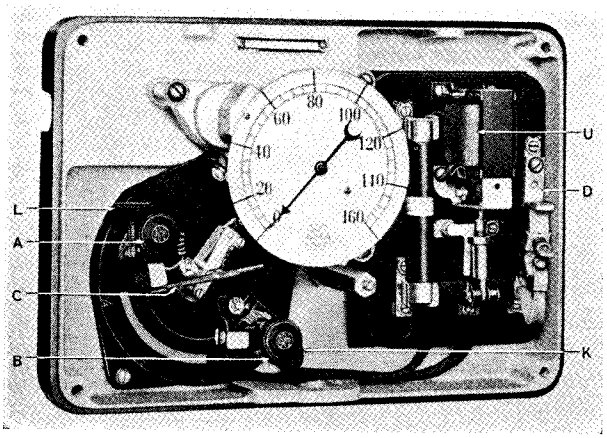


FIG. 3—CLASS 15-066 PRESSURE GOVERNOR

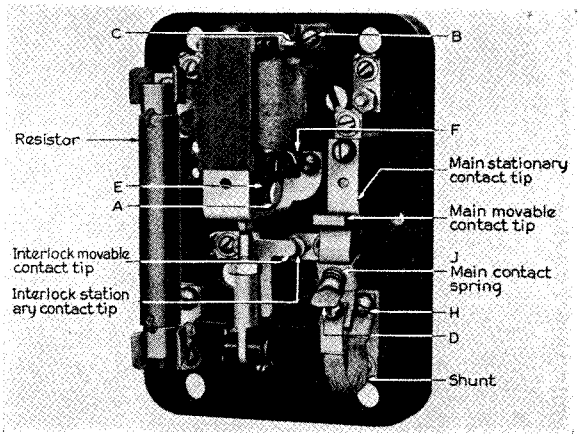


FIG. 4—SINGLE-POLE A-C. CONTACTOR

TABLE OF CONNECTIONS FOR APPLYING CLASS 15-066 PRESSURE GOVERNOR TO VARIOUS CONTROL DEVICES

Control Device	Connect 1 of Gov. to	Connect 2 of Gov. to	Connect 3 of Gov. to
11-200 Sizes 1, 2, 3 and 4—2 and 3 phase	L3	1	3
11-200 Size 1—1 phase	L2	L1	3
11-200 Size 1 with built-in 3-position switch—2 and 3 phase	L3	1	A
11-200 Size 1 with built-in 3-position switch—1 phase	L2	L1 (1)	A
11-200 Sizes 2, 3 and 4 with built-in 3-position switch	L3	1	A
11-203 Sizes 1, 2, 3 and 4	5	1	3
11-203 Sizes 2, 3 and 4 with separate control circuit	4	1	3
11-203 Size 1 with built-in 3-position switch	5	1	A
11-204 Size 1	5	1	3
11-204 Size 1 with built-in 3-position switch	5	1	A
11-205 Size 1	5	1	3
11-205 Sizes 2, 3 and 4	5	1	3
11-206 Sizes 1, 2, 3 and 4	5	1	3
11-206 Sizes 2, 3 and 4 with separate control circuit	4	1	3
11-206 Size 1 with built-in 3-position switch	5	1	A
11-500	11	L2	9
11-600 with 45F and 47F5 or 55F and 57F5 contactors *	L3	9	7
11-600 with 35F05, 45F0 or 300F0 contactors *	11	9	7
11-600 with 72F2 and 75F2, 82F2 and 85F2 or 65F5 and 67F5 contactors *	L3	9	7
14-250 with 45F, 55F, or 65F5 contactors	L2	7	9
14-250 with 35F05 or 300F0 contactors	Y	7	9
14-250 with F11, F22, or F24 breakers (remove lead x to 7) *	Y	X	7
15-825 Sizes 0 and 1—2 poles	L2 (4)	1	3
15-825 Sizes 0 and 1—4 poles	L3 (4)	1	3
15-825 Sizes 2, 3 and 4—2 and 3 phase	L3	1	3
15-825 Sizes 2, 3 and 4—1 phase	L2	1	3
8502 Size 1	L2	3	1
8502 Size 1 in combination with fusible disconnect switch	5	3	1
8512	L1	9	7

* Connect jumper from 7 to 8.

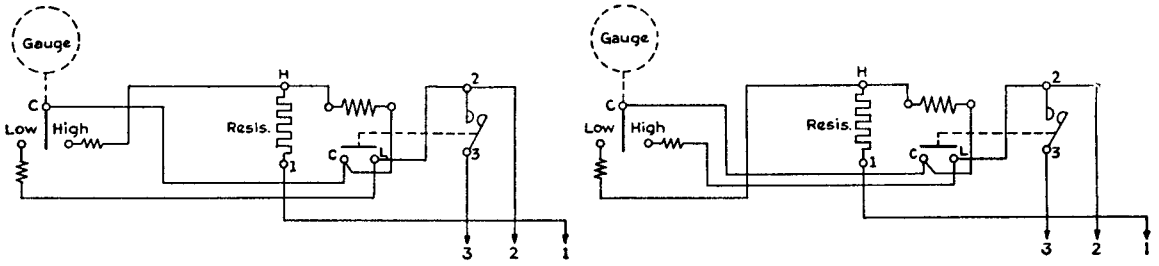
To replace the solenoid coil, first take out pins (A), disconnect the coil leads from the base and remove the solenoid by taking out the four screws (B). Then remove solenoid plunger (E) and cotter key (C). This will allow the side guides (F) to be slipped out and the coil removed.

To assemble, put the coil into the frame, slip the side guides back into place, and replace the cotter key. The plunger may then be replaced and the solenoid mounted back on the base.

RENEWAL PARTS FOR 1531 CONTACTOR

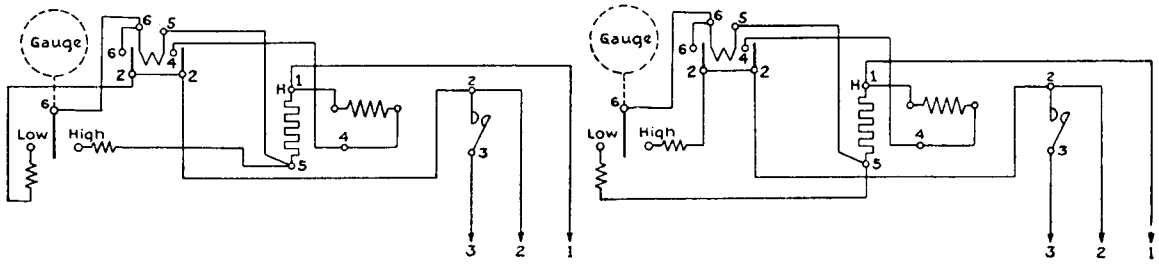
For renewal parts not listed in the following table, refer to the nearest Sales Office of the Westinghouse Electric and Manufacturing Company, giving complete nameplate rating of the contactor and describing the parts in detail. When ordering coils, give the Cat. No. marked on the coil. Order resistor by the K number and number of ohms printed on the label on the resistor.

	Cat. No.
Main Stationary Contact Tip	2486058
Main Movable Contact Tip	2455288
Interlock Contact Tip, Movable	4378061G1
Shunt	4378071G1
Main Contact Spring	2414326
Interlock Tip, Stationary	3614198G6



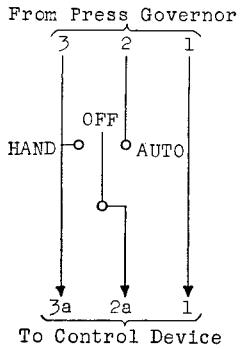
(*a*) *To cut in at low pressure, cut out at high pressure* (*b*) *To cut in at high pressure, cut out at low pressure*

FIG. 5—CONNECTIONS FOR D-C. PRESSURE GOVERNORS (FRONT VIEWS)



(*a*) *To cut in at low pressure, cut out at high pressure* (*b*) *To cut in at high pressure, cut out at low pressure*

FIG. 6—CONNECTIONS FOR A-C. PRESSURE GOVERNORS (FRONT VIEWS)



(*Connect Control Device to 1, 2a and 3a respectively instead of 1, 2 and 3*)

FIG. 7—CONNECTIONS FOR A 3-POSITION SWITCH HAVING "OFF", "HAND" AND "AUTOMATIC" POSITIONS

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Printed in U.S.A. (5-38)