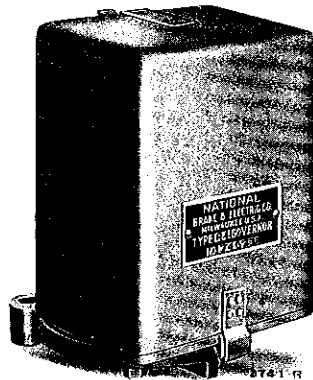


WESTINGHOUSE ✦ TRACTION ✦ BRAKE COMPANY

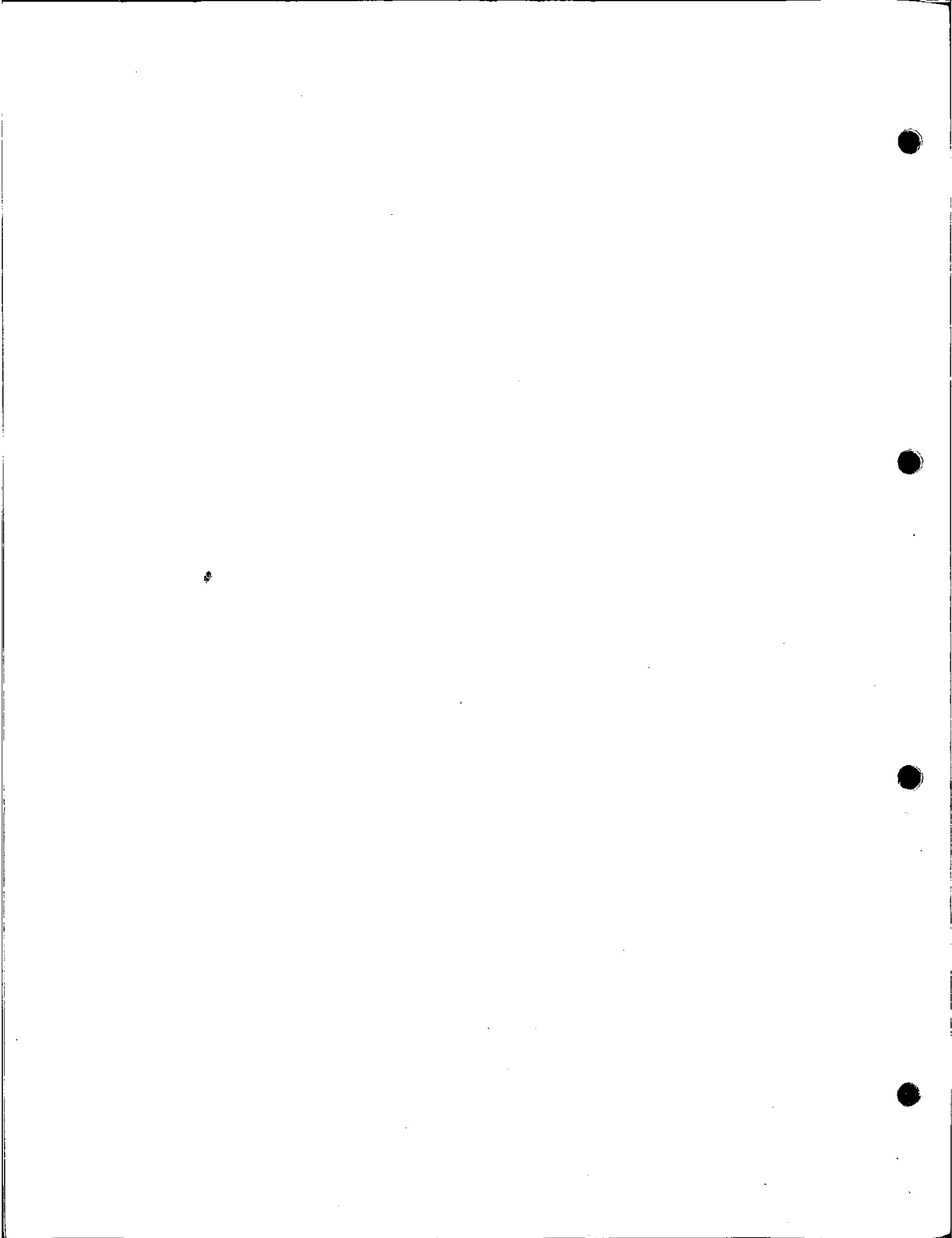
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TYPES R-4 & R-5 GOVERNORS



National Types "R-4" and "R-5" Governors

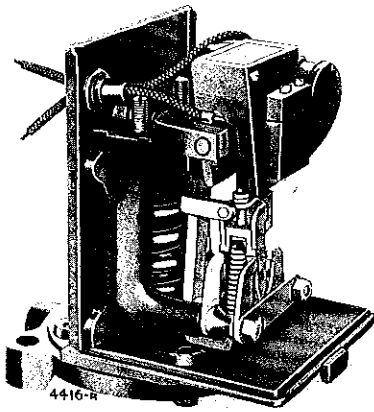
These governors are designed for controlling electric motor driven air compressors, either as a main line governor or as a pilot governor, as shown in table on page 6.

When used as a main line governor, it is connected directly in the motor circuit and is required to handle the full motor current, which limits its use as a main line governor to the current carrying capacity of its electrical portions.

When used as a pilot governor for motor compressors equipped with magnetic starter, it is not connected directly in the motor circuit, but instead, is connected in the control circuit of the starter, which permits its use with any size of motor compressor.

This governor, of the diaphragm type, is small in size, light in weight, rugged in construction, and extremely flexible in regard to the desired pressure regulation, being provided with adjustments that permit a minimum cutting-in pressure of 20 lbs. and maximum cutting-out pressures varying with the spring combinations as indicated in the table on page 6. A range changing adjustment is also provided so as to close or open the compressor motor circuit within pressure variations as shown in table on page 6.

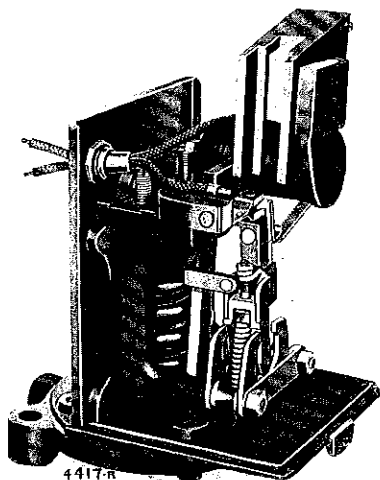
The switch portion is of the single pole, single break, quick action type, the arcing being suppressed by a powerful magnetic blowout. The contact members are of the sliding wedge type, and so designed as to handle the maximum current for which this governor is designed with temperatures well within limits considered good practice.



Governor with Cover Removed

An arc barrier is provided around the contacts to preclude any chance of the arc jumping to other metallic parts of the governor, the arc barrier being so arranged to permit its support to be rotated upward, exposing the switch members for inspection if desired. This barrier is provided with a renewable heat resisting liner.

The shifting of the movable switch member from closed to open position or vice versa, is accomplished by means of power stored in a strained



Governor with Cover Removed and
Arc Barrier Lifted to Expose Contacts

spring, one end of which is attached to the movable switch member, the other end to the diaphragm power arm.

In normal operation, the switch power spring will cause the disengagement of the movable contact from the stationary contact, but should the frictional, or any other resistance, between the face of the contact members be such that the energy available from the power spring of the movable contact is insufficient to cause the separation of the contacts, the diaphragm power arm will accordingly be moved ahead by the increasing air pressure in the diaphragm chamber, or until the projecting arm from the diaphragm power arm will engage the movable contact arm, the available power of the diaphragm thus being utilized for the disengagement of the contacts.

It should be noted, however, that when the movable contact member leaves the point of engagement with the stationary contact, the movement to full open position will be rapid, due to the fact that the power spring of the movable contact member will at this time be at such an angle as to give the maximum power to the movable switch member.

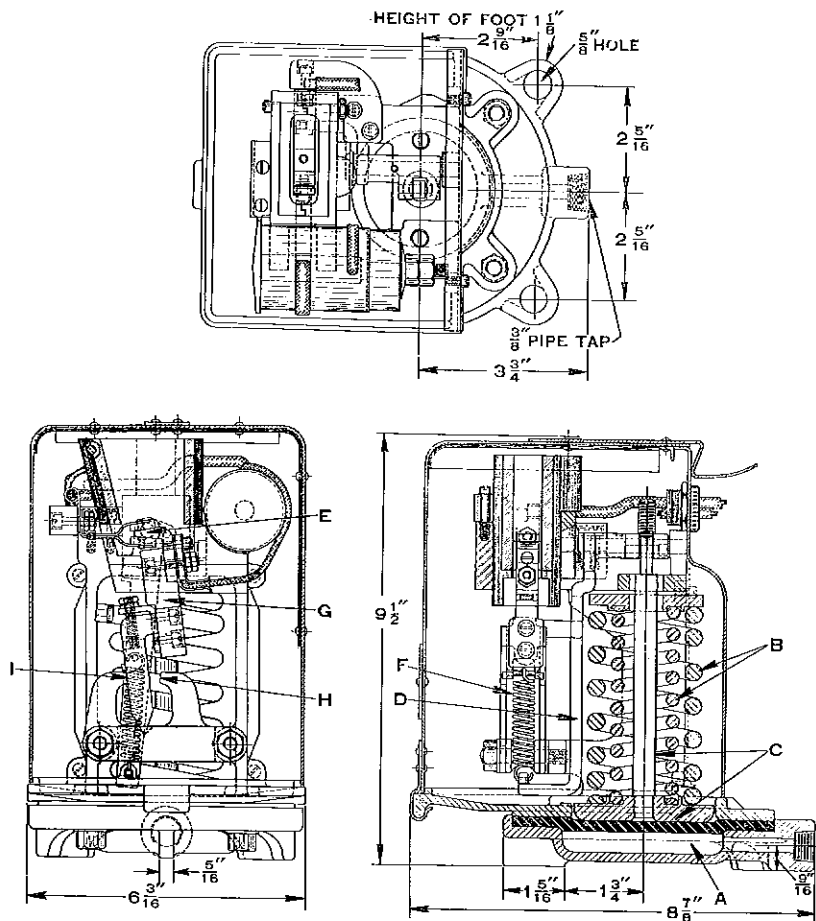
All working parts are enclosed in a sheet iron containing case. A detachable cover constitutes the top, sides and front of this containing case. The leads connecting the switch portion of governor to the power mains are brought through a suitable bushing supported in the back wall of the containing case. In cases where it may be desired to run conduit into the governor casing the bushing may be removed and suitable conduit substituted. Steel parts are copper plated to prevent rusting.

OPERATION

Assuming the electric and air portions to be properly connected to the proper sources, the starting of the compressor will cause pressure in diaphragm chamber "A" to increase until sufficient to overcome the resistance of springs "B". Diaphragm plate and stem "C" will be moved accordingly upward, and as power arm "D" is mechanically connected to diaphragm member "C", power arm "D" will be caused to rotate around fulcrum pin "E". The power arm "D" is so connected to the power spring "F" of movable contact arm "G", that a pre-determined movement of the lower end of power arm "D" will cause the center axis of movable contact power spring "F" to move to the right of the pivotal point of movable contact arm "G", which will accordingly shift contact

arm "G" to open position, against stop "H", thus opening the motor circuit.

After the pressure in storage reservoir and diaphragm chamber "A" has been sufficiently decreased, springs "B" will cause the downward movement of the diaphragm plate and rod "C", which will cause the shifting of the movable contact arm "G" to closed position, against stop "I". thus again starting the compressor motor.



Sectional Views of Governor

The method of changing the pressure settings is exceedingly simple, as an increase of tension on springs "B" will cause the governor to cut out at higher pressure, and decrease in tension will result in a lower cutting-out pressure. An increase of tension of the switch member power spring "F" will cause an increase of range between the cutting-in and cutting-out points. A decrease of tension will result in decrease in pressure between cutting-in and cutting-out point. We do not, however, recommend less than a 12 lb. range between cutting-in and cutting-out points.

R-4 AND R-5 GOVERNORS

TYPE	PIECE NUMBER	AIR PRESSURE-LBS.		PRESSURE RANGE LBS.	APPROX. NET WEIGHT LBS.	CURRENT CAPACITY		RECOMMENDED SERVICE
		MINIMUM CUT-IN	MAXIMUM CUT-OUT			A. C. SINGLE PHASE (PER POLE) AMPERES	D. C. (PER POLE) VOLTS	
R4-14	162613	20	90	12-20	20	28	110	500-600 Volts D. C. as main line governor for Traction Brake Compressors up to and including 25 cu. ft. displacement and for NI-2, NI-3, N2-5, N3-5, N4-5, NW2-5 Compressors. *Under 300 Volts D. C. as pilot governor for compressors with Magnetic Starters. 110 Volts A. C. Single Phase as main line governor for NI-2 compressor. 220 Volts A. C. Single Phase as main line governor for NI-2, NI-3, N2-5, NW1-3, N2-5, N3-5, N4-5, NW2-5 compressors. 110-220 Volts A. C. Single Phase as pilot governor for compressors with Magnetic Starters.
R4-14	166381	80	150	15-25	20	28	220	
R4-14	165870	130	180	18-30	20	28	220	FOR 110-220 VOLTS USE R-5-6 550
R4-18	168032	20	90	12-20	20	Use R4-14	2	500-600
R4-18	164819	80	150	15-25	20			
R4-18	167349	130	180	18-30	20			500-600 Volts D. C. as pilot governor for compressors with Magnetic Starters.
R5-6	168031	20	90	15-20	20	40	220	110
R5-6	164345	80	150	15-25	20			
R5-6	164333	130	180	18-30	20	40	220	110 220

*Can be used as a Pilot Governor on polyphase motor compressors with magnetic starters up to 440 volts. Above 440 volts it may be used, provided a low voltage control transformer is furnished with the magnetic starter.

Note: Although some of the R-4 and R-5 Governors as listed are suitable for maximum cutting-out pressure of 180 lbs., the maximum recommended operating pressure for NW Compressors is 165 lbs. under suitable intermittent service conditions.
Note:—440 Volt A. C. Single Phase motors not made.

