DEPARTMENT OF THE ARMY
TECHNICAL MANUAL

TM 9-8651

DEPARTMENT OF THE AIR
FORCE TECHNICAL ORDER

TO 36Y7-1-172

ORDNANCE MAINTENANCE

POWER BRAKE SYSTEMS

(BENDIX BK)

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
JANUARY 1956

This manual is correct to 29 July 1955

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DEPARTMENTS OF THE ARMY AND
THE AIR FORCE

WASHINGTON 25, D. C., *6 January 1956*

POWER BRAKE SYSTEMS (BENDIX BK)

***This manual supersedes TM 9-1827B, 1 May 1944.**

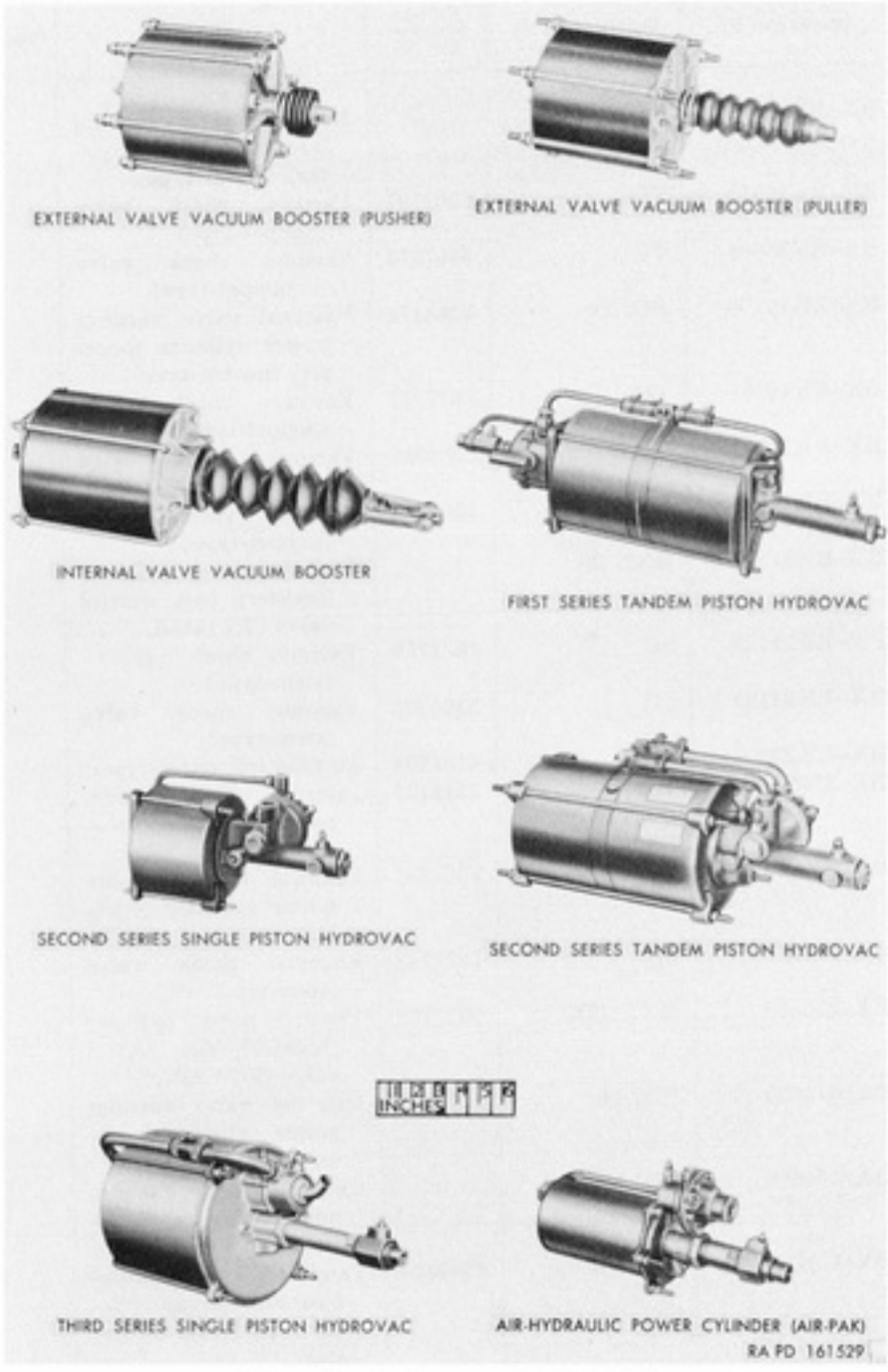


Figure 4. Brake power cylinder-types.

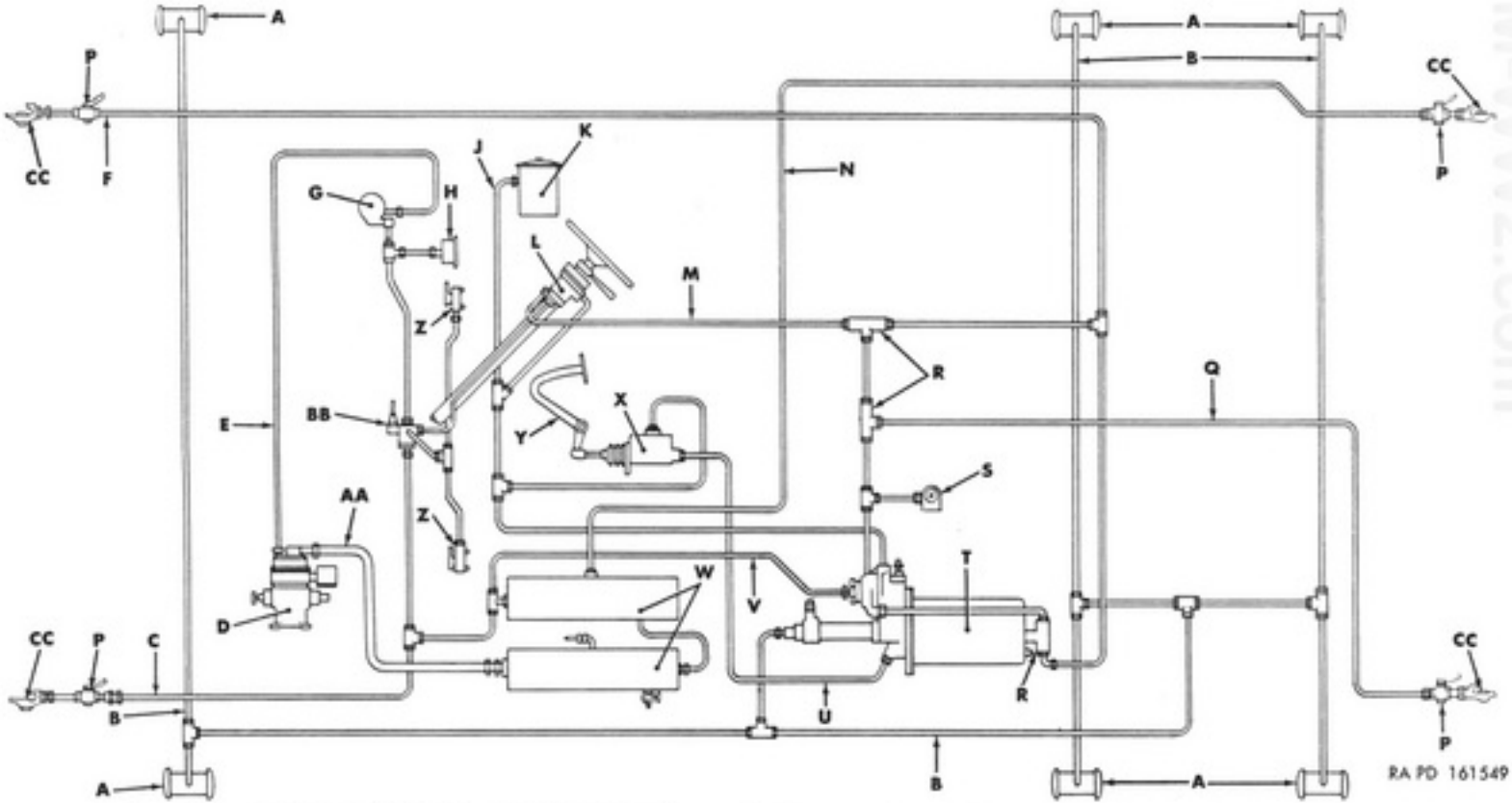


Figure 24. Typical air-hydraulic cylinder (Air-Pak) power brake system for truck-tractor installation—schematic diagram.

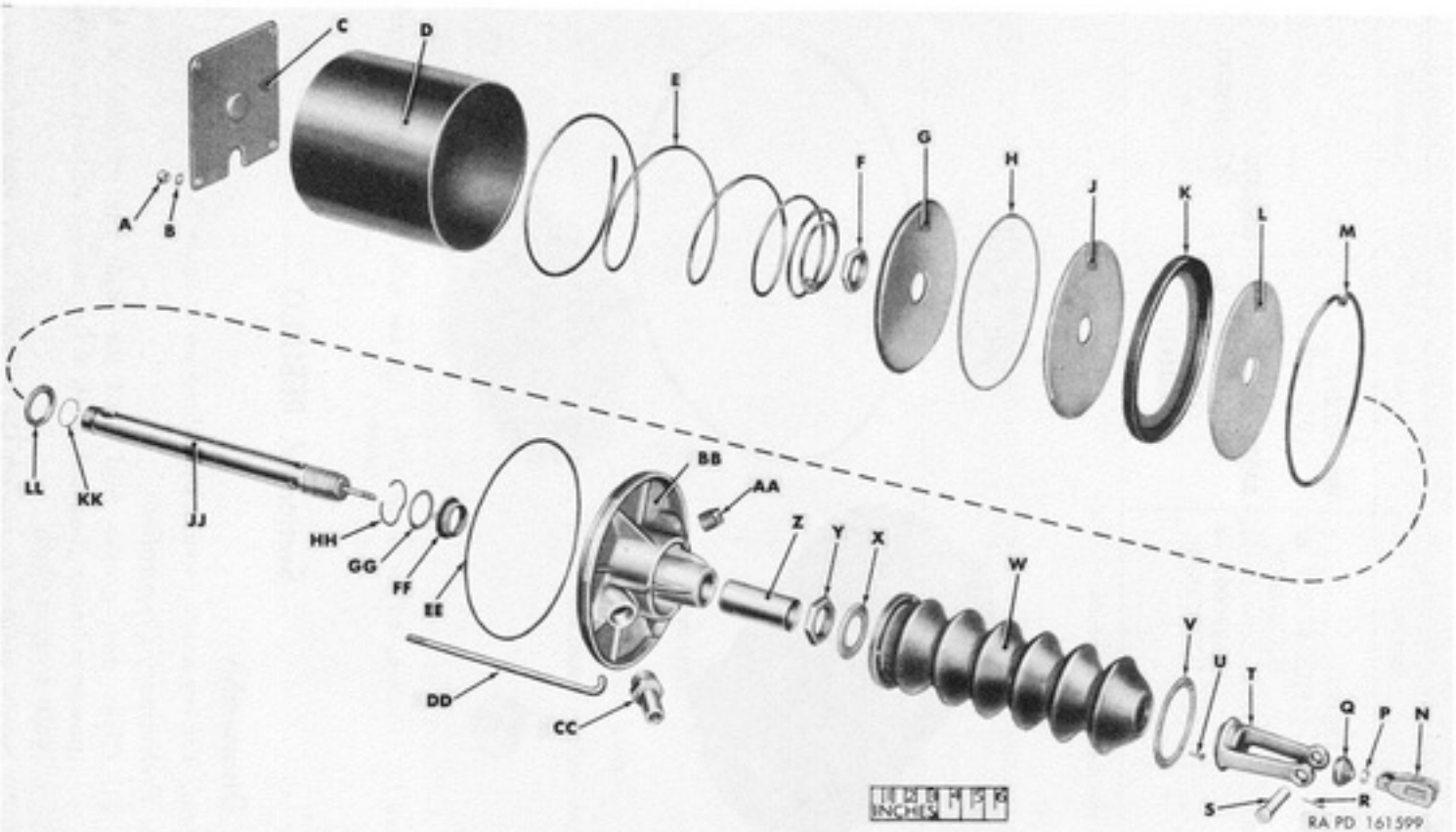
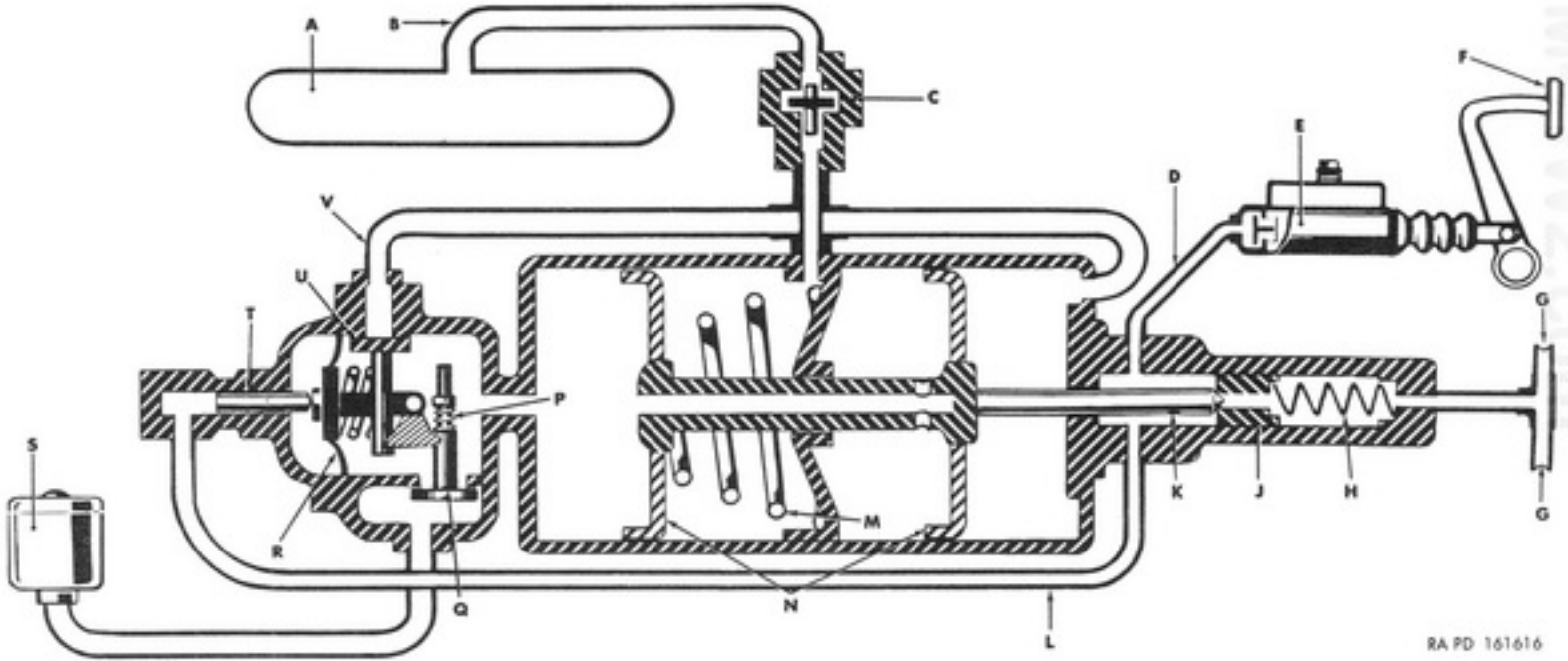


Figure 74. Model R76-6 internal valve vacuum power cylinder (booster)—partially disassembled view.



A	Intake manifold	H	Hydraulic piston return spring	Q	Atmospheric poppet closed
B	Constant vacuum line	J	Hydraulic piston	R	Diaphragm
C	Vacuum check valve	K	Push rod	S	Remote air filter
D	Hydraulic inlet line	L	Hydraulic relay line	T	Relay piston
E	Master cylinder	M	Power piston return spring	U	Vacuum poppet closed
F	Brake pedal	N	Piston	V	Vacuum control line
G	Hydraulic outlet	P	Poppet return spring		

Figure 91. Vacuum-hydraulic power cylinder (first series Hydrovac) in hold (lap) position—schematic diagram.

(3) Remove the plug ((1) above) from the vise, and remove and discard the plug gasket (B). Remove the connector (N) and gasket (M) from the plug. Discard the gasket.

(4) Remove the two bleeder valves (C) and the inlet plug (A) and plug gasket (B) from the housing (D). Discard the gasket.

c. Removal of Push Rod Guide and Seals (fig. 98). Remove the push rod guide, the guide seal, the sealing cup, and cup retaining washer from the bore of the slave cylinder housing. Remove the snap ring. Discard the guide, seal, sealing cup, and snap ring.

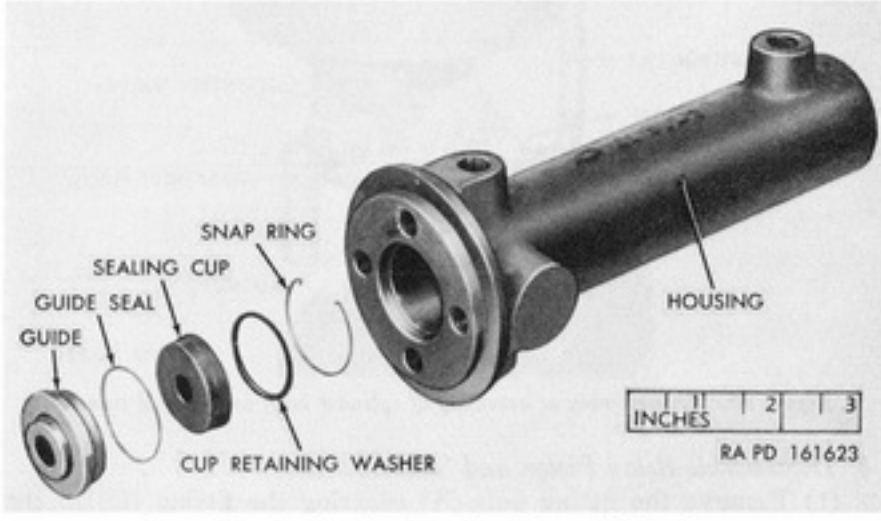


Figure 98. Push rod guide and seals—exploded view.

99. Removal and Disassembly of Control Valve

Note. The key letters noted in parentheses are in figure 100, except where otherwise indicated.

a. Remove Cylinder Body and Control Valve From Relay Piston Sleeve.

(1) Place the control valve and cylinder body (C, fig. 93) in a vise with the jaws of the vise bearing against the relay piston sleeve and the cylinder body positioned above the vise (fig. 99).

(2) Unscrew the fitting nut of the vacuum control line from the control valve, and remove the line.

(3) Grasp the cylinder body with both hands and unscrew it from the control valve. Remove the plate (B, fig. 94). Remove the lubrication plug (C, fig. 94) from the cylinder body.

(4) Unscrew and remove the air inlet elbow.

CHAPTER 11
VACUUM-HYDRAULIC POWER CYLINDER (THIRD SERIES HYDROVAC)

Section I. DESCRIPTION AND DATA

144. Description

a. General. The vacuum-hydraulic power cylinder (third series Hydrovac Model HS32–13–110), shown in figures 145 and 146, is a self-contained power brake unit consisting of a single piston vacuum power cylinder, a hydraulically actuated control valve, and a hydraulic slave cylinder. The principal differences between the third series Hydrovac and the second series single piston Hydrovac (ch. 10) are in the size of the unit; the hydraulic piston in the slave cylinder is attached to the push rod of the power piston; no hydraulic piston return spring is required; and the relay piston operates in a removable sleeve in the end plate.

b. Model Designation Interpretations. Model designations for third series Hydrovacs are translated in the same manner as those for second series Hydrovacs (par. 118*b*).

Note. The Bendix BK commercial designation "Model C" for all third series Hydrovacs is not an ordnance model number.

c. Vacuum Power Cylinder. The vacuum power cylinder consists of a single piston attached to a push rod and operating within a cylinder body. The push rod is attached to and actuates the hydraulic piston in the slave cylinder. The end plate serves to close the cylinder body, and also houses the relay piston and supports the control valve and slave cylinder.

d. Control Valve. The control valve includes a hydraulically operated diaphragm and vacuum and atmospheric poppets in a valve housing. A vacuum control line connects the valve housing to the vacuum cylinder body. Air at atmospheric pressure, which actuates the power piston, is supplied from an external air filter through the air inlet in the valve housing cover.

e. Slave Cylinder. The slave cylinder consists of a hydraulically and mechanically operated piston attached to the push rod and operating within a cylinder housing. A residual line check valve is enclosed within the hydraulic outlet fitting cap.

f. Difference Within Model. Two units of the Model HS32–13–110 third series Hydrovac are covered in this chapter. The only difference

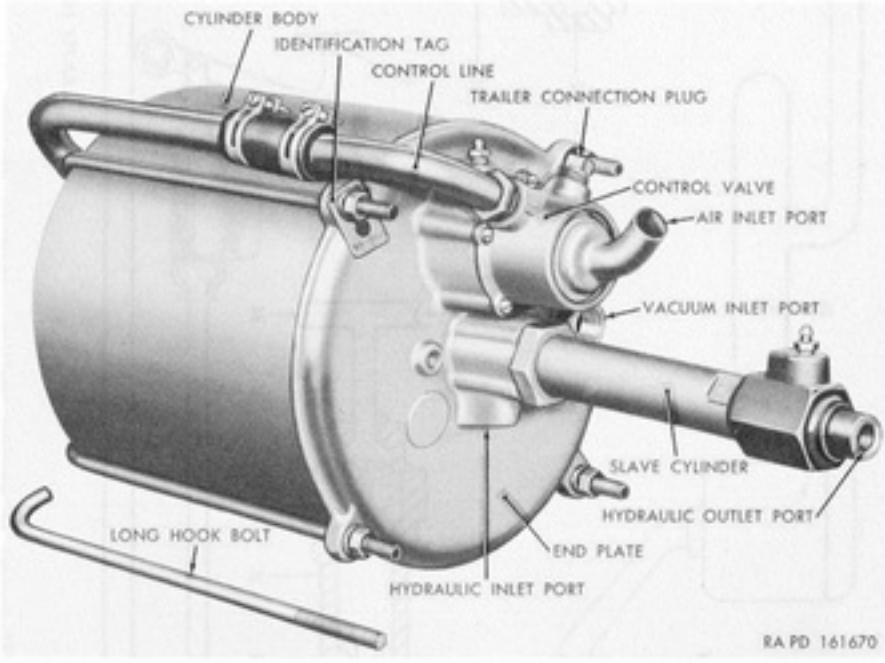


Figure 145. Vacuum-hydraulic power cylinder (third series Hydrovac)—slave cylinder end view.

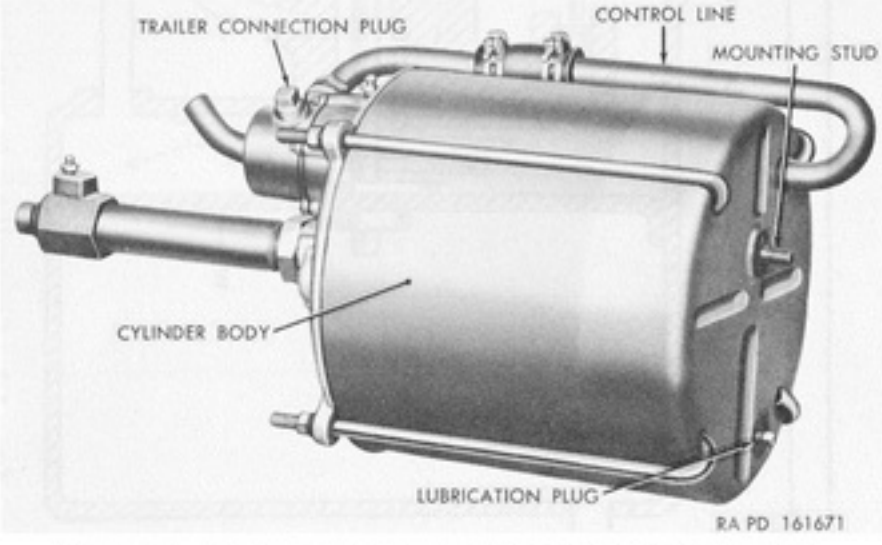


Figure 146. Vacuum-hydraulic power cylinder (third series Hydrovac)—cylinder body end view.

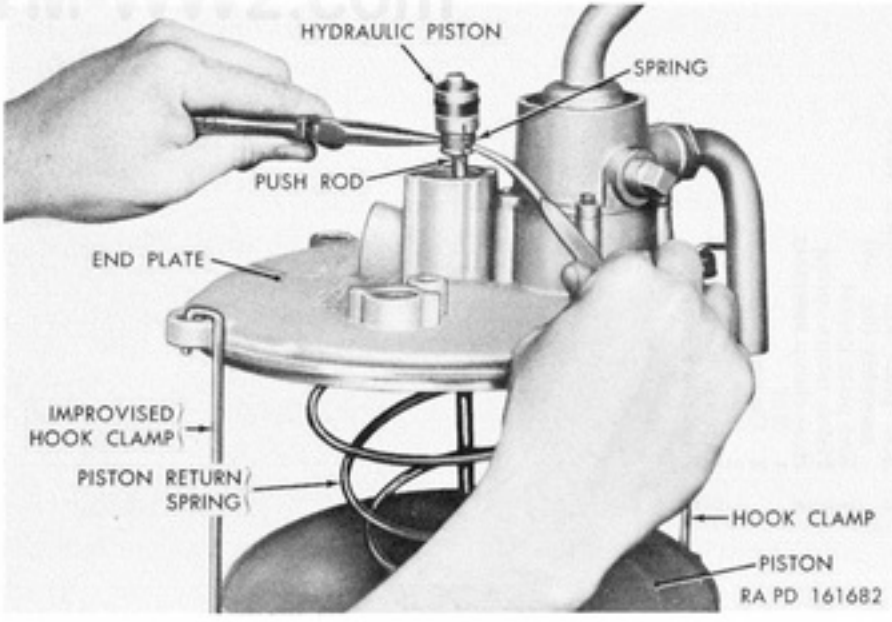


Figure 157. Removing hydraulic piston from vacuum-hydraulic power cylinder (third series Hydrovac).

against spring tension while removing the screws. Remove the housing assembly, diaphragm assembly (T), and spring (S). Remove the gasket (U). Discard the diaphragm and gasket.

(3) Unscrew the nut of the vacuum control line (C) from the housing, and remove the line.

(4) Remove the snap ring (R) securing the cover (Q) in the housing, and remove the cover, spring (P), and gasket (N). Discard the snap ring, spring, and gasket.

(5) Remove the pipe plug (G).

(6) Remove and discard the jamnut (M) and lead washer (L) securing the atmospheric poppet (J) on the stem of the vacuum poppet (D). Remove and discard the washer (K) and poppet (J). Remove and discard the vacuum poppet (D) from the inner side of the housing.

(7) Remove the relay piston sleeve (X) from the plate, using a suitable wrench (fig. 160). Remove and discard the sleeve gasket (Y).

(8) Remove and discard the snap ring (V) securing the stop washer (W) in the bore of the relay piston sleeve (X), and remove the washer.

(9) Push the piston (AA) and cup (Z) from the sleeve (X). Remove and discard the two cups.

(10) Remove the bleeder valve (B) from the end plate.

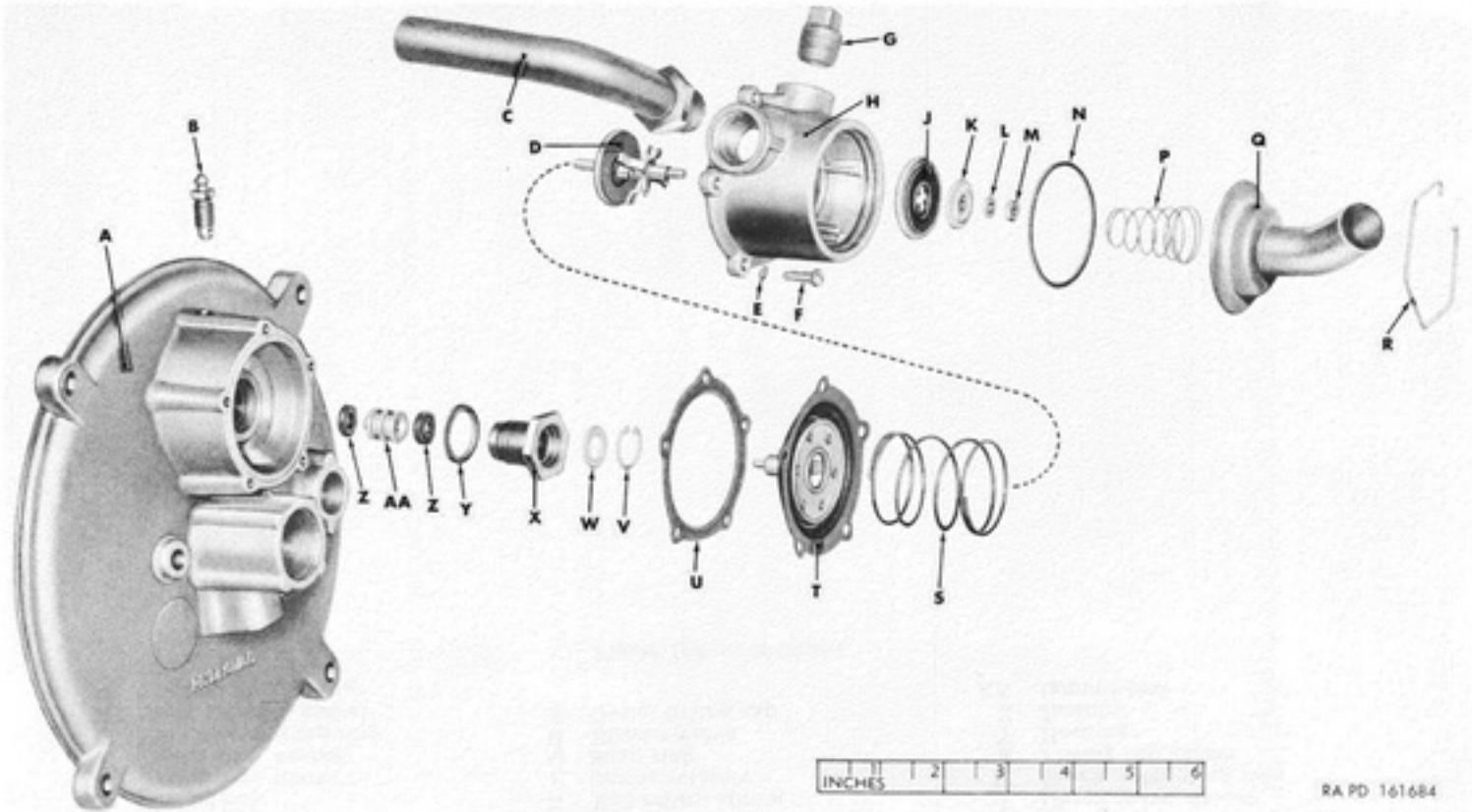


Figure 159. Vacuum-hydraulic power piston (third series Hydrovac) control valve—exploded view.

application. EXAMPLE: A65–11–148 denotes an Air-Pak with 6.5-cubic inches slave cylinder displacement, requiring 110-psi hydraulic pressure to actuate the control valve, and delivering 1,480-psi hydraulic pressure at the slave cylinder outlet port on full application ("run-out") of the unit under 90-psi air pressure.

c. Compressed Air Cylinder. The compressed air cylinder consists of a piston operating within a cylinder body and actuating a push rod which is attached to the hydraulic piston of the slave cylinder. Movement of the piston in the compressed air cylinder is controlled by the control valve. The cylinder body is attached to the end plate on which the slave cylinder and control valve are mounted. A return

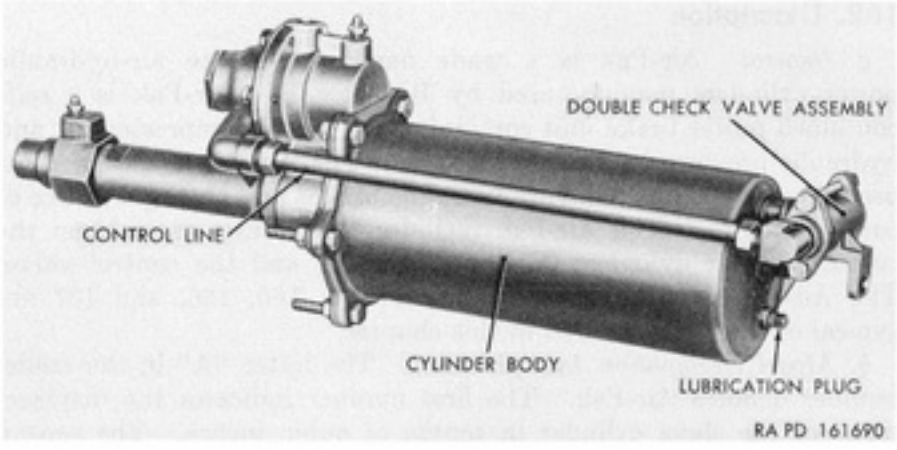


Figure 165. Model A65–11–148 air-hydraulic (Air-Pak) power cylinder—cylinder body end view.

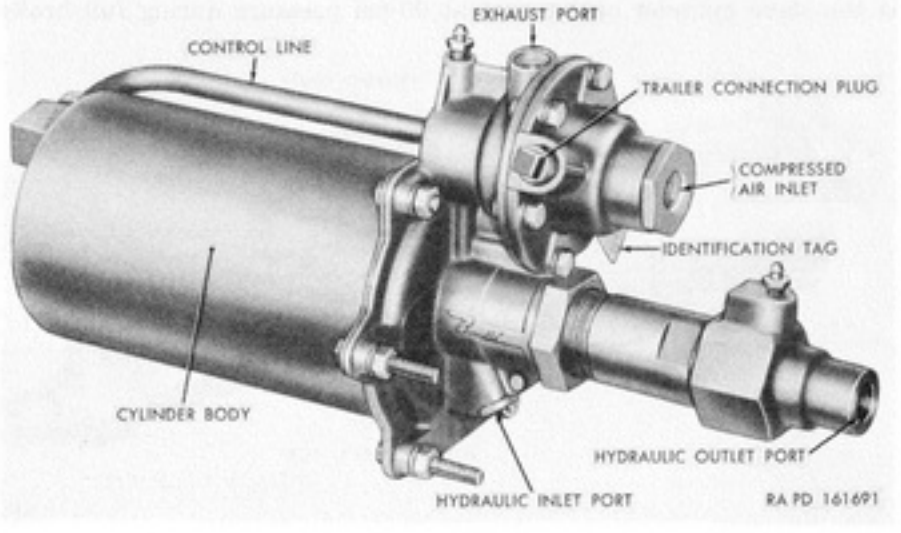


Figure 166. Model A35–15–154 air-hydraulic (Air-Pak) power cylinder—slave cylinder end view.