

DESCRIPTIVE PUBLICATION
C23

“WESTINGHOUSE”

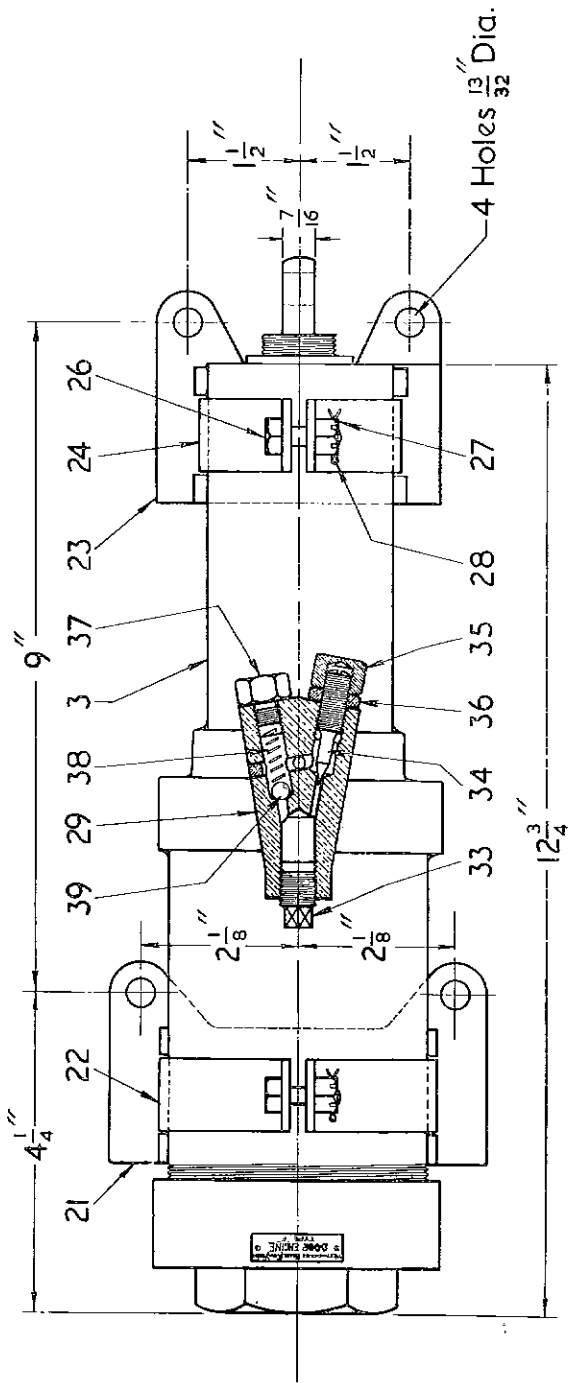
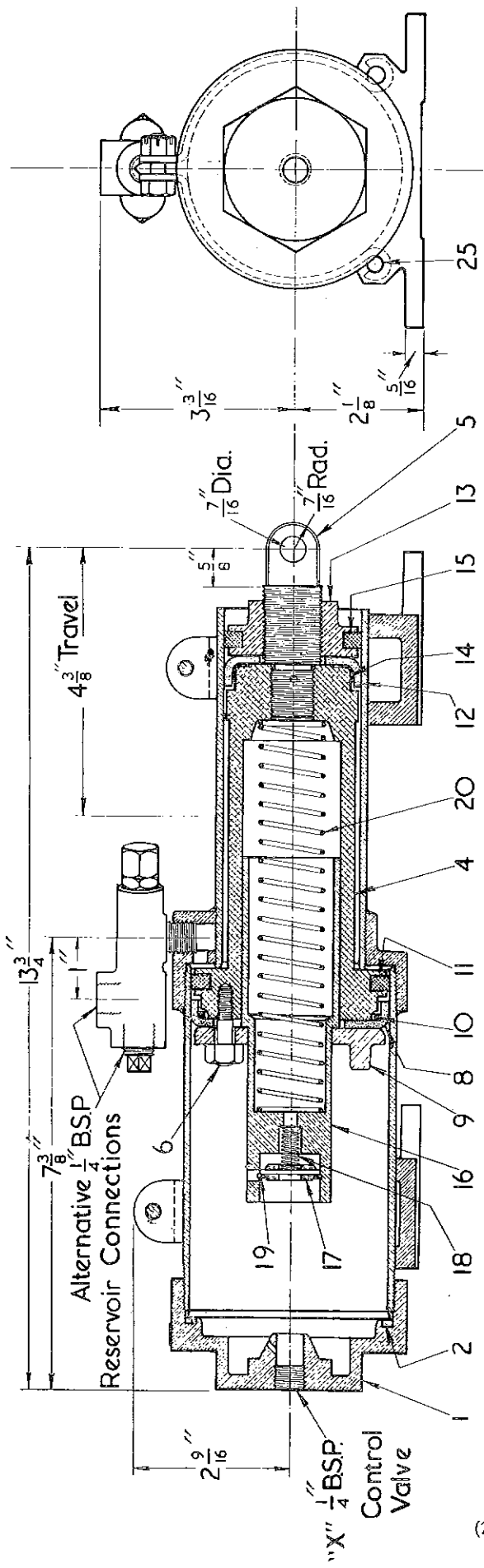


Type “F” Door Engine

WESTINGHOUSE BRAKE (AUSTRALASIA) PTY. LTD.

Head Office and Works: Concord West, N.S.W.
Postal Address: P.O. Box 21, Burwood, New South Wales

1953



THE TYPE F DOOR ENGINE

The Type F Door Engine is of the differential type and is suitable for the operation of single (two leaf) or double (four leaf) jack-knife doors. It is recommended that closing of the doors be effected by the inward movement of the piston, and observations throughout this publication, assume that such is the case.

On the closing stroke a fixed degree of cushioning is provided to slow up the final travel. On the opening stroke the piston speed can be adjusted to the maximum consistent with smooth operation of the doors.

In the construction of the Type F Door Engine particular care has been taken to ensure air-tightness of the packing cups, as air is in constant communication with the space between them. Such freedom from leakage is of paramount importance on air-braked vehicles, because of the necessity of an adequate air supply for braking purposes. Full information on equipment designed to safeguard the braking system against such losses is given in Descriptive Publication C.18 "Low Pressure Supply Unit."

OPERATION

The space between the two piston packing cups, 8 and 12, is in permanent communication with the supply reservoir via the check valve and choke 29. Because the diameter of cup 8 is greater than that of cup 12, the piston is displaced to the left when port X is open to atmosphere. When air from the supply reservoir is introduced to port X by means of the control valve there is a force equal to the pressure on the area of the small cup tending to move the piston to the right. The small and large cylinder bores have been so chosen that the door engine piston exerts approximately the same force in whichever direction it is selected to move by the control valve.

During the inward stroke of the piston, air flowing to the space between the pistons lifts the ball valve 39 and thus by-passes the needle valve 34. Thus no cushioning occurs on this stroke until check valve 17 contacts its seat in the end cover 1. When this occurs the main outlet for air from port X is closed and the air is forced to escape through a small by-pass choke, thus cushioning the final movement. During this cushioning the end of the cushion plunger 16 abuts on a land on the end cover 1, whilst the check valve 17 is allowed to float on spring 18 thus aligning itself under all conditions with the valve seat in the cover. The spring 20 is essentially a return spring for the cushion plunger 16 and does not contribute materially to the cushioning, which is wholly pneumatic.

During the outward stroke of the piston, air flowing from the space between the pistons, seats the ball valve 39 and is thus forced into the supply reservoir via the needle valve 34. This valve is adjusted to slow down the outward stroke to the desired speed.

INSTALLATION

Numerous schemes have been developed for the installation and operation of Type F Door Engines. These include pneumatic and electro-pneumatic control by the driver with or without optional passenger or conductor control; interlocks with the traction circuit on trolley buses; automatic step lighting and "door open" warning indicators, etc., etc. Some of the commoner installations are dealt with in Descriptive Publication C.8 and Supplements.

Westinghouse Brake (Australasia) Pty. Ltd. invites queries on installation problems and is pleased to offer any technical advice that may be required.

SPARE PARTS

Westinghouse Brake (Australasia) Pty. Ltd. supplies spare parts for the Type F Door Engine and the $\frac{3}{4}$ " Check Valve and Choke. Spare parts should be ordered by description and piece numbers as shown in Publications Section 16, Lists 1 and 2.

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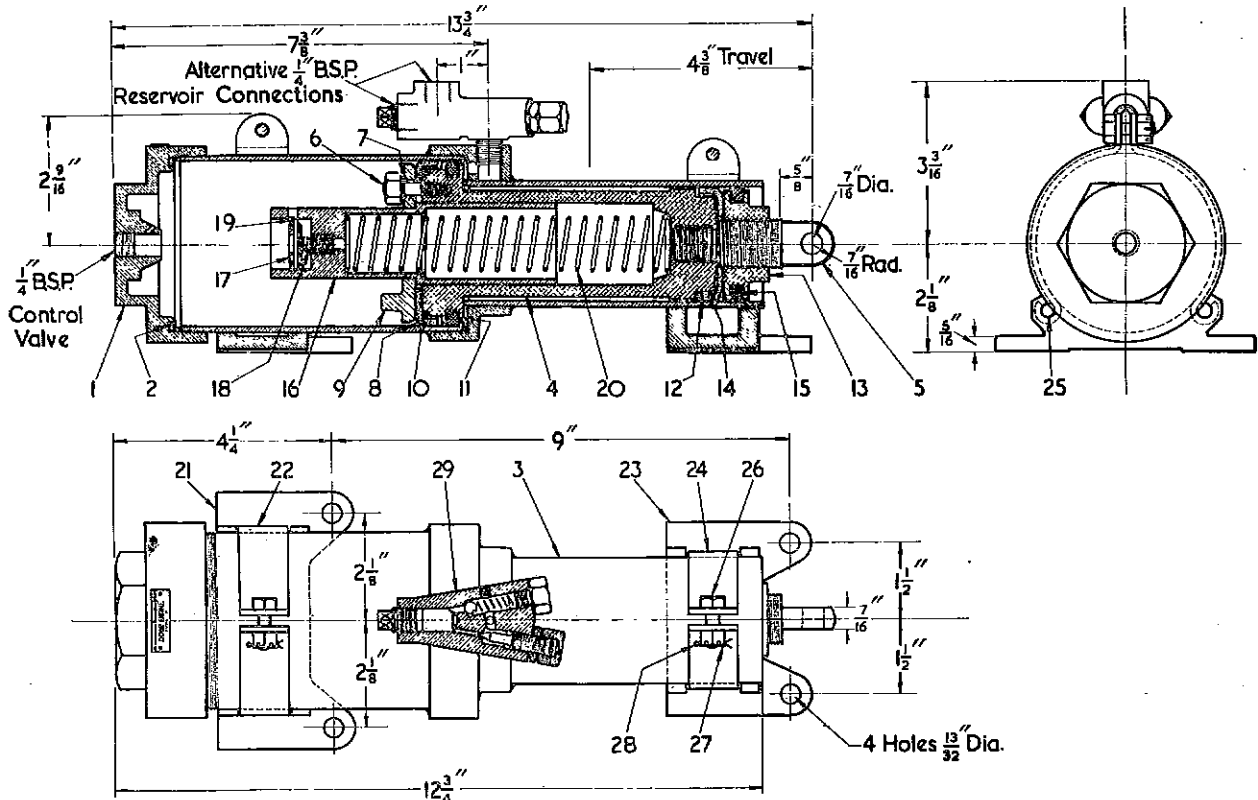
SECTION 16
LIST 2

Piece No. C-7961 Door Engine Complete

Weight 15lbs.

Piece No. C-7137 Door Engine less Check Valve and Choke

Weight 14lbs.



NOTE: Either or both of the Cradles Ref. 21 and 23 may be moved or reversed to suit specific mounting requirements.

Pc. No.	Ref. No.	Description	Pc. No.	Ref. No.	Description
C-7214		Engine Portion (includes one each of items 1 to 5, three each of items 6 and 7, and one each of items 8 to 20)	C-7126	13	Small Piston Follower
C-4922	1	End Cover	C-7127	14	Small Piston Packing Expander
C-7133	2	Cylinder Gasket	C-7109	15	Small Piston Follower Swab
C-7215	3	Cylinder Assembly	C-7119	16	Cushion Plunger
C-7125		Piston Complete (includes 4, 5, three of 6 and three of 7)	C-8060	17	Check Valve
C-7122	4	Piston Trunk	C-7135	18	Check Valve Spring
C-7124	5	Piston Trunk Eye	C-7132	19	Check Valve Retaining Ring
C-988	6	$\frac{1}{16}$ " B.S.W. Stud and Nut (three required)	C-7136	20	Cushion Spring
C-6413	7	$\frac{3}{16}$ " Washer (three required)	C-7129	21	Large Cradle
C-7110	8	Large Piston Packing Leather	C-7130	22	Large Strap (two required)
C-7120	9	Large Piston Follower	C-7128	23	Small Cradle
C-7138	10	Large Piston Packing Expander	C-7131	24	Small Strap (two required)
C-7108	11	Large Piston Trunk Swab	C-7134	25	Pin (four required)
C-7111	12	Small Piston Packing Leather	C-2523	26	$\frac{1}{4}$ " B.S.W. Bolt (two required)
			C-637	27	$\frac{1}{4}$ " B.S.W. Slotted Nut (two required)
			C-2376	28	$\frac{1}{16}$ " Split Pin (two required)
			C-7116	29	$\frac{5}{16}$ " Check Valve and Choke (for details see Section 16, List 1)

Orders should state **PIECE NUMBER** and **NAME** of Part

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