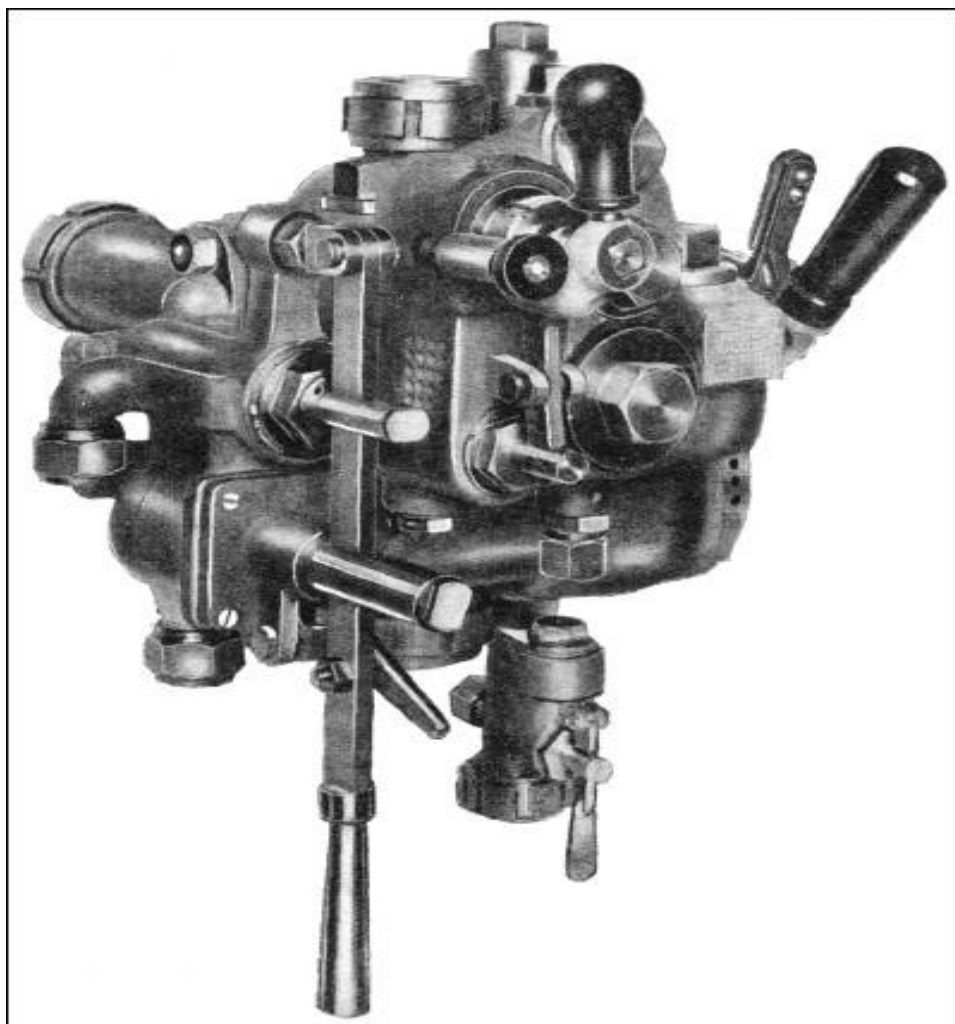


***VACUUM AUTOMATIC BRAKE EJECTOR  
FOR STEAM LOCOMOTIVES***



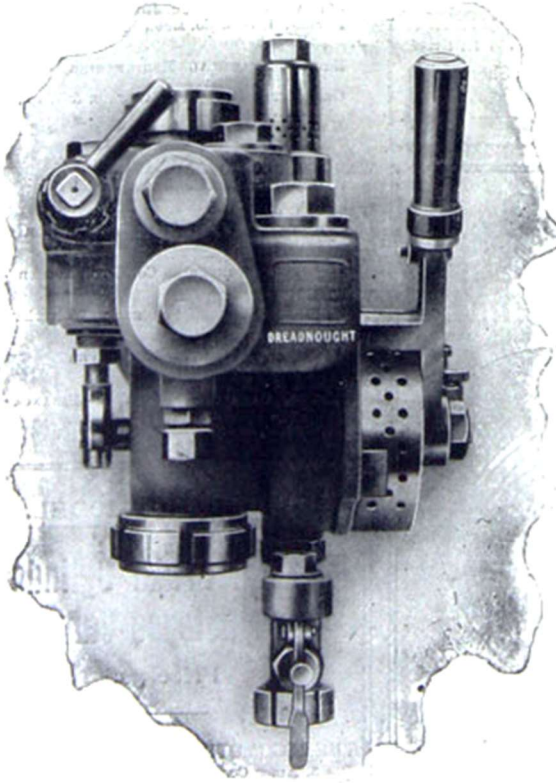
***DREADNOUGHT TYPE*  
*2 in 1 Brake ejector***



# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



Primetech has developed a replacement for the Gresham and Craven Dreadnought Ejector in association with Indian Railways for the function on the heritage steam locomotive

A detailed black and white technical illustration of the Dreadnought Ejector, a mechanical device with various pipes, valves, and a central cylindrical body. The word "DREADNOUGHT" is visible on the side of the main body. The illustration is set against a light, textured background.

## The "DREADNOUGHT" Ejector

(GRESHAM'S PATENT).

— **Self - Regulating.** —

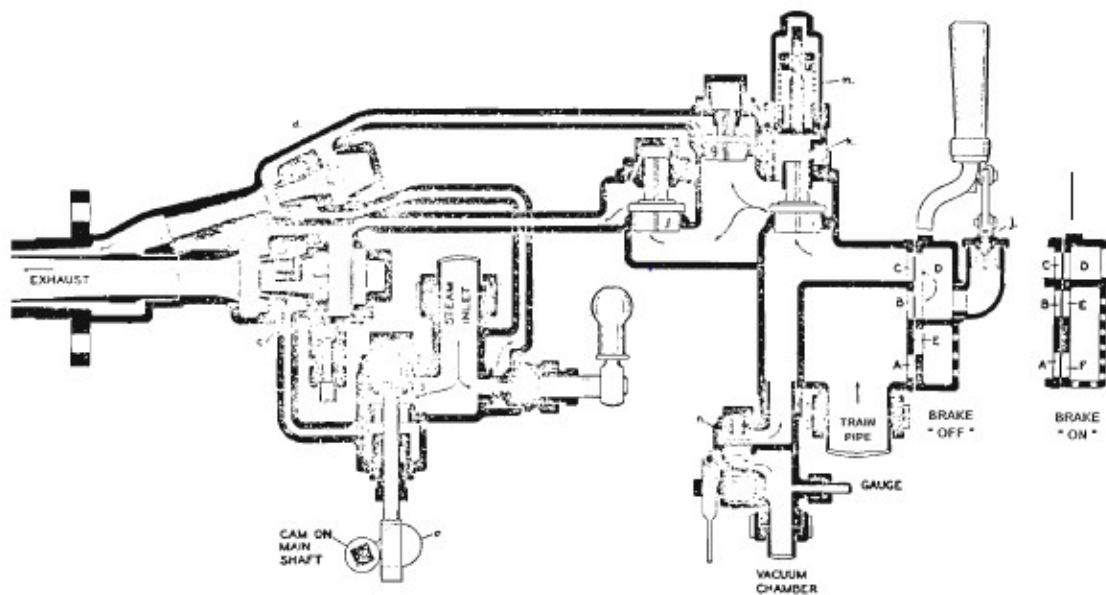
Requires no complicated steam reducing valve.  
Works at any boiler pressure with ONE setting of steam valve.  
Works down to 90 lbs. pressure.  
Vacuum automatically maintained constant.  
**Greatly increased capacity.**  
**Economy in steam consumption.**  
Rapid production of vacuum.  
Power to maintain a good vacuum against leakage  
Simplicity of construction.  
Interchanges with our Standard Type "C" Ejector.

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**THE VACUUM BRAKE CO. LTD.**  
32, Queen Victoria Street, E.C.  
**GRESHAM & CRAVEN, Ltd., Manchester.**

network in India. This product is now available for sale to heritage Railways worldwide.

## OPERATION



The diagram above illustrates the ejector in the "Brake Off" position, the cam (a) on the main shaft being raised to open the large ejector steam valve (b) and admit steam to the large cone (c). At the same time steam passes to the small cone (d) through the small ejector steam valve (e). This valve is set by hand so as to wire draw and reduce the steam pressure to about 120 lbs., which is the pressure at which this cone is designed to give its greatest efficiency.

Under the influence of both cones air is drawn rapidly from the train pipe past the large ejector air clack (f), the small ejector air clack (g) main air clack (h), and through cavity "D" in the air disc by way of ports "C" and "B," these ports being in full register in this position of the handle. At the same time air is drawn from the vacuum chamber on the engine and tender past release valve (n).

In the "Running Position" of the handle cam (a) lowers the large ejector steam valve (b), on to its seat, thus cutting off the supply of steam to the large ejector. The connection between the small cone and the train pipe through cavity "D" in the air disc remains open and the small ejector maintains the working Vacuum while the train is running. Operation of the auxiliary application valve (j) in this position admits air to the train pipe and enables light brake applications to be made for controlling the train speed.

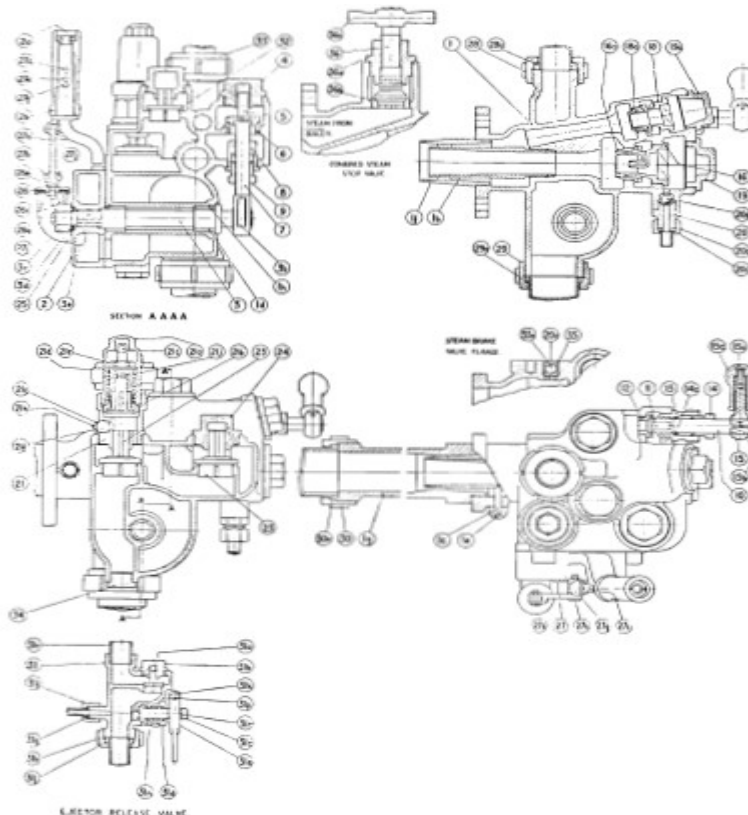
As the handle is moved towards the "Brake On" position the connection through cavity "D" is progressively closed. At the same time ports "E" and "F" in the air disc gradually uncover ports "B" and "A" in the ejector face and air is admitted to the train pipe to apply the brake. This air is prevented from passing to the engine and tender vacuum chambers by the non-return valve in release valve (n).

# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



In the full "Brake On" position, ports "A" and "B" in the ejector face are completely open to atmosphere through ports "F" and "E" in the disc and the brake is rapidly applied. At the same time the wall of cavity (D) cuts off the connection between ports "B" and "C" so that the small ejector is isolated from the train pipe and draws only on the engine and tender vacuum chambers past release valve (n). In this way the maximum possible locomotive brake power is assured in emergency applications. The air passages in the ejector are so arranged that, in all cases, air from the train pipe is drawn past two gunmetal clacks before coming in contact with the steam. When steam is cut off from the cones and a vacuum is left in the train pipe, these clacks prevent moisture, and more especially smokebox gases, being drawn into the train pipe. The ball valve (k), located below the relief valve (m) communicates with the chamber between the two ejector clacks and the main clack. When a vacuum is created in the instrument the ball is drawn to its seat, but falls off as soon as steam is shut off and the vacuum drops. Should clacks (f) and (g) be leaking, it provides an outlet for any vapour or steam. Should the main clack (h) leak it admits of air from the atmosphere being drawn into the train pipe, and so prevents any tendency to draw vapour and smokebox gases through clacks (f) and (g).

The vacuum relief valve (m) is a spring loaded valve which limits the degree of vacuum carried in the train pipe. When the point is reached at which it is set, atmospheric pressure above the valve overcomes the tension in the spring and the valve opens to admit air to the space above the main clack (h) thus preventing the creation of a higher vacuum in the train pipe. The release valve (n) enables atmosphere to be admitted direct to the vacuum chambers so that the locomotive brake can be released by hand when the locomotive is uncoupled and when steam is not available.





# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



## 30/20 mm DREADNOUGHT EJECTOR LIST OF PARTS

Part No.	Description.
1'	Body, Left hand.
1x'	Body, Right hand.
1b	Inner Exhaust barrel.
1c	Grub screw for Inner Exhaust barrel.
1d	Shaft bushes (2 per ejector).
1e	Cap nut for Inner Exhaust barrel.
1f	Inside fixing Exhaust barrel.
1gt	Outside (alternative to 1f).
1h	Pins for shaft bushes (2 per ejector).
2S	AIR DISC AND HANOLE COMPLETE WITH AUXILIARY APPLICATION VALVE. LEFT HAND Ejector. (Items 2. 2a. 2b. 25, 26. 26a. 26b. 26c. 27,27a. to 27j).
2XS	AIR DISC AND HANDLE COMPLETE WITHAUXILIARY APPLICATION VALVE, RIGHT HAND Ejector. (Items 2. 2a, 2b, 25, 26, 26a, 26b, 26c, 27, 27a. to 27j).
2T	AIR DISC AND HANDLE. LEFT HAND Ejector (Items 2, 2a, 2b).
2XT	AIR DISC AND HANDLE. RIGHT HAND Ejector (Items 2, 2a, 2b).
2	Air Disc and handle only, Left hand Ejector.
2X	Air Disc and handle only, Right hand Ejector.
2a	Air Disc and handle only, handle washer.
2b	Air Disc and handle only, wood handle.
3S	MAIN SHAFT COMPLETE WITH CAM, NUT AND WASHER. (Items 3, 3b, 3c, 3d. and 3e).
3	Main Shaft only.
3b	Main Shaft Cam
3c	Main Shaft Nut
3d	Main Shaft, Spring washer.
3e	Main Shaft, Locating pin.
4	Large Ejector steam valve guide nut.

# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



Part No.	Description
5	Large Ejector steam valve
6	Large Ejector steam valve Seating.
7	Large Ejector steam valve Spindle.
8	Large Ejector steam valve Packing Box.
9	Large Ejector steam valve Gland.
10S	SMALL Ejector STEAM VALVE COMPLETE WITH HANDLE. SEATING. PACKING BOX AND GLAND. (Items 10. 11. 12, 13, 14,14a, 15, 15a, 15b, and 15c).
10	Small Ejector Steam Valve Spindle.
11	Small Ejector Steam Valve Spindle end.
12	Small Ejector Steam Valve Seating.
13	Small Ejector Steam Valve Packing Box.
14	Small Ejector Steam Valve Gland.
14a	Small Ejector Steam Valve Packing box ring.
15S	SMALL EJECTOR STEAM VALVE HANDLE COMPLETE. (Items 15, 15a, 15b. 15c).
15	Small Ejector Steam Valve handle only.
15a	Small Ejector Steam Valve handle screw.
15b	Small Ejector Steam Valve handle rivet pin.
15c	Small Ejector Steam Valve handle Wood Handle.
16S	LARGE Ejector COMPLETE. (Items 16 and 16a).
16	Large Cone, inner part.
16a	Large Cone, outer part.
18S	SMALL Ejector COMPLETE. (Items 18.18a).
18	Small Cone, inner part.
18a	Small Cone, outer part.
19	Large Ejector cap.
19a	Small Ejector cap.

# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



Part No	Description
20S	DRIP CONNECTION COMPLETE WITH NUT AND BALL. (Items 20, 20a, 20c and 20d).
20	Drip connection only.
20T	DRIP CONNECTION UNION NUT AND RING. (Items 20a and 20c).
20a	Drip Connection Union Nut.
20c	Drip Connection Union Nut Brazing Ring.
20d	Drip Connection ball 1/2" dia
21S	RELIEF VALVE COMPLETE. (Items 21 to 21j).
21	Relief Valve body.
21a	Relief Valve cap.
21b	Relief Valve seating.
21c	Relief Valve spindle.
21d	Relief Valve spring nut
21e	Relief Valve nut.
21f	5/8" Air lock ball valve.
21g	Cage for Air tock ball valve.
21h	Set Screw for Air lock ball valve.
21j	Relief Valve Spring.
23	Large Air Clacks. (2 per Ejector).
24	Large Ejector Air Clack Guide.
25	Auxiliary Application Valve Body.
26S	AUXILIARY APPLICATION VALVE. COMPLETE WITH EYE – BOLT, WASHER AND GUIDE. (Items 26 to 26c).
26	Auxiliary Application Valve Only.
26a	Auxiliary Application Valve guide.
26b	Auxiliary Application Valve eye - bolt.
26c	Auxiliary Application Valve Washer.

# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



27 S	AUXILIARY APPLICATION VALVE LEVER.COMplete WITH LINK AND PINS. LEFT HAND EJECTOR. (Items 27 to 27j).
27 x S	AUXILIARY APPLICATION VALVE LEVER. SPRING AND HANDLE. LEFT HAND EJECTOR. (Items 27, 27d, 27e, 27f, 27g).
27 T	SPRING AND HANDLE. LEFT HAND EJECTOR. (Items 27, 27c, 27d, 27e, 27f, 27g).
27XT	AUXILIARY APPLICATION VALVE LEVER. SPRING AND HANDLE. RIGHT HAND EJECTOR. (Items 27, 27c, 27d, 27e, 27f, 27g).
27	Auxiliary Application Valve handle only. Left hand Ejector.
27 X	Auxiliary Application Valve Right hand Ejector
27 a	Auxiliary Application Valve link
27 b	Auxiliary Application Valve link pins (2 per ejector)
27 c	Auxiliary Application Valve flat spring
27 d	Screw for wood pad of auxiliary application Valve Lever.
27 e	Screw for wood pad of auxiliary application.
27 f	Screw for wood pad of auxiliary application Valve Lever.
27 g	Wood pad for Auxiliary Application Valve Lever.
27 h	Auxiliary Application Valve Lever Pin.
27 i	Split Pins for Auxiliary Application Valve (4 per ejector).
28 S	UNION NUT AND RING FOR STEAM INLET. (Items 28 and 28a).
28	Union nut only for steam inlet.
28a	Brazing ring for steam inlet.
29s	UNION NUT AND RING FOR TRAIN PIPE. (Items 29 and 29a).
29	Union nut only for train pipe
29a	Brazing ring for train pipe
30s	UNION NUT AND RING FOR EXHAUST PIPE (Item 30 and 30a)
30	Union nut only for exhaust pipe
30a	Brazing ring for Exhaust pipe
32	Small Air Clack



# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



Part No	Description
33	Small Air Clack Guide
34	Vacuum Chamber Pipe plug(When release valve is not used)
31S	Release Valve Complete (Items 31 to 31r)
31	Release Valve body
31a	Release Valve body air clack
31b	Release Valve body air clack guide
31c	Release Valve body spindle
31d	Release Valve body spindle guide nut
31e	Release Valve body lever
31fs	Release Valve Gauge Connection Union Nut and Ring (Items 31f and 31g)
31f	Release valve gauge connection union nut.
31g	Brazing Ring for release valve gauge connection unit.
31hs	Release Valve Vacuum Chamber Pipe Union Nut and Ring (Items 31 h and 31)
31h	Release Valve Vacuum Chamber pipe union nut
31j	Brazing Ring for release valve gauge connection unit Union Nut
31k	Release Valve lever pin
31m	Release valve spring
31n	Release valve connecting nipple
31p	Release valve Lever split pin
31r	Release valve spindle bearing pin
35	Ball cage for ejector steam brake valve flange
35a	Ball seating for ejector steam brake valve flange
20d	Brass ball for ejector steam brake valve flange
36s	Combined Stop Valve Spindle Complete with guide handle and seating (Items 36 to 36c)

# VACUUM AUTOMATIC BRAKE EJECTOR FOR STEAM LOCOMOTIVES



36	Combined Stop Valve Spindle.
36a	Combined Stop Valve Spindle guide.
36b	Combined Stop Valve Spindle seating
36c	Combined Stop Valve Spindle handle.
	Type of Body must be specified. Outside diameter of exhaust pipe should be given
	Spares for the 20/13 mm. Ejector are equivalent to the 30, 20 mm , and should be specified to the same item numbers. Increased by 100. EXAMPLES:-102XT = Air disc and handle for 20/13 mm. Ejector, right hand. 118 = Small cone inner part. for 20/13mm, Ejector