



PNEUMATIC EQUIPMENT FOR  
INTERCONNECTION OF AIR  
AND MAGNETIC TRACK BRAKES  
FOR TRAMWAYS

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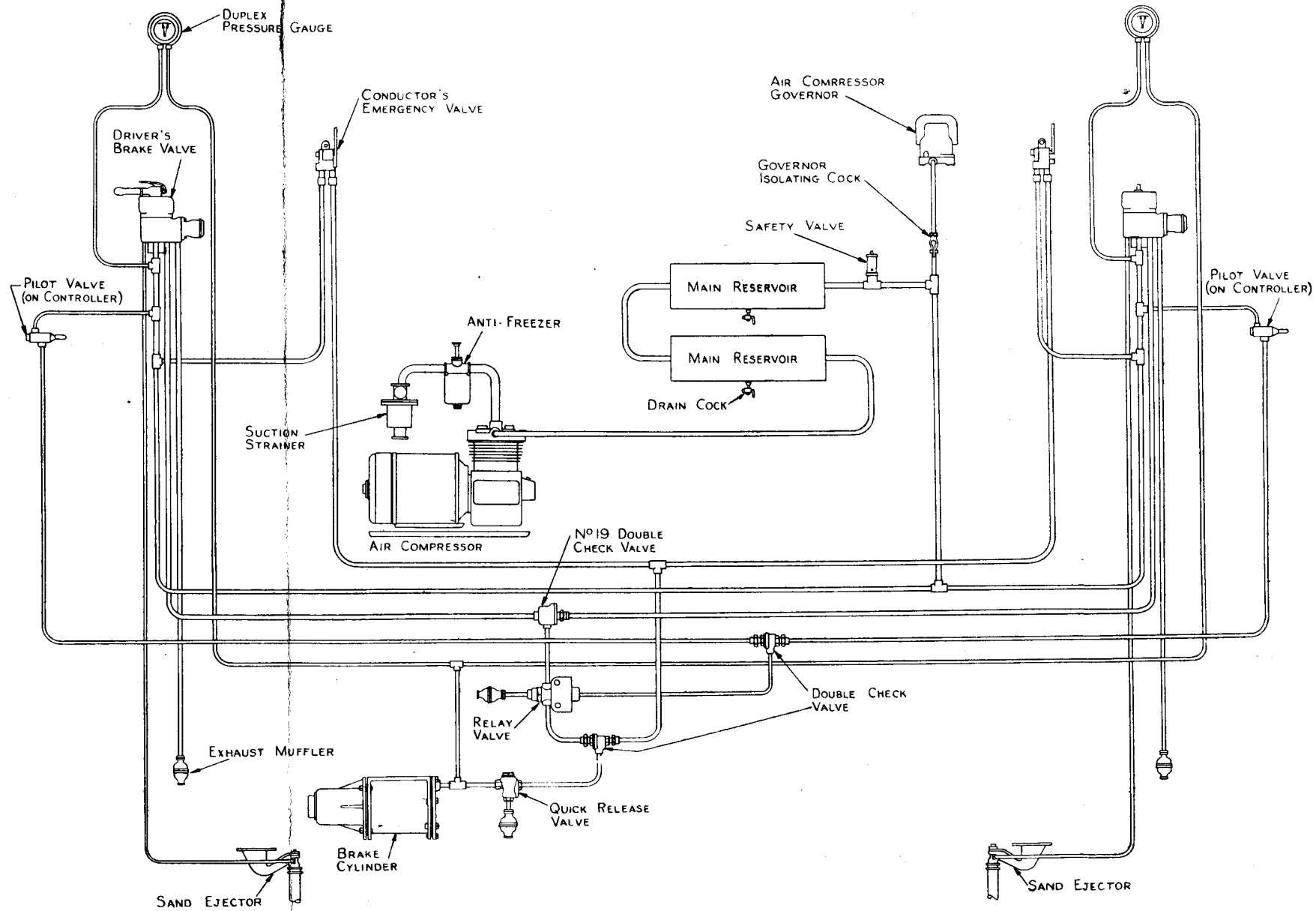


FIG. 1.

## PNEUMATIC EQUIPMENT FOR INTERCONNECTION OF AIR AND MAGNETIC TRACK BRAKES

**Railwear.** Excessive railwear, particularly at regular stopping places, and the consequent heavy renewals expense, due to the use of track brakes, has caused grave concern to many Tramway Managers. This has been evidenced by the expression of speakers at meetings such as at the Annual Conference of the Tramways, Light Railways and Transport Association in May, 1932. It is becoming more generally realised that the use of the air-operated wheel brake for service stops offers many advantages, with the magnetic track brakes retained for use in emergency. With our system, whereby the air wheel brakes and the magnetic track brakes are interlocked as described below, the ideal arrangement is obtained.

On tramcars fitted with magnetic track braking in addition to air brakes, it is sometimes desirable to arrange that the air brakes cannot be applied when magnetic braking is taking place, in order to prevent skidding. The equipment described in this leaflet provides the necessary interconnection of the air and magnetic brakes and is arranged so that when the magnetic brake is applied, either the driver cannot make an air brake application, or if the air brakes are already applied, they are automatically released.

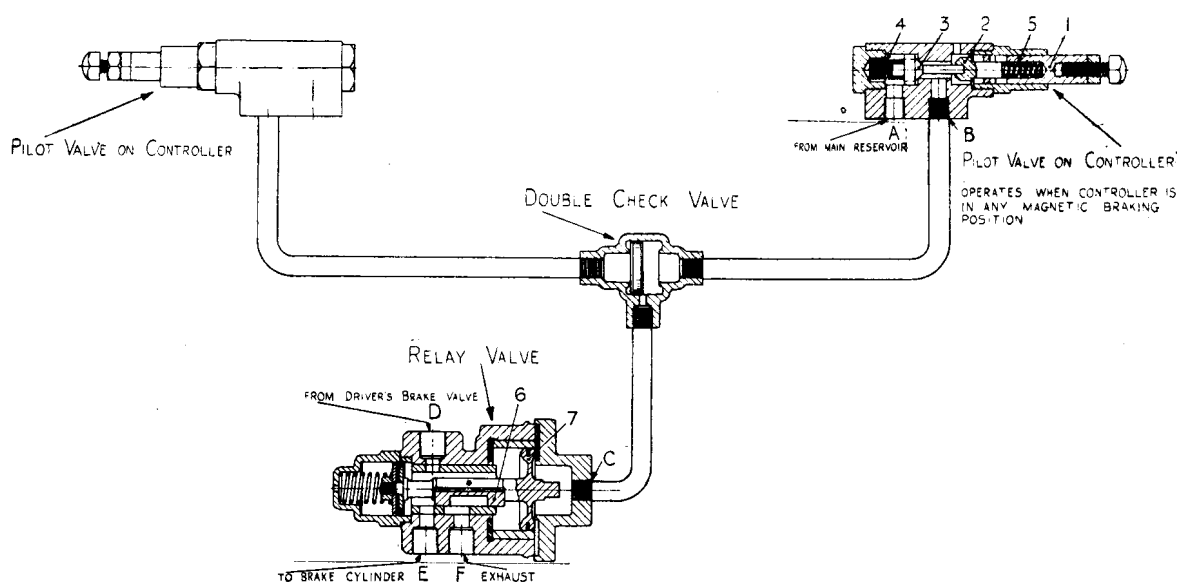


FIG. 2.

**Pilot Valves.** A small pilot valve is fitted on each controller and a cam on the controller handle spindle is arranged to depress the plunger 1 of this valve when the controller handle is in any magnetic braking position.

Boss A is connected to the main reservoir, and boss B to the relay valve which will be described later. A double check valve is used at the point where the pipes from the two pilot valves join the common pipe to the relay valve, and serves to blank off the pilot valve on the non-operative controller.

The pilot valves contain an exhaust valve 2 carried on the end of plunger 1 and an inlet valve 3. In the position shown, valve 3 is held closed by the main reservoir pressure and the small spring 4, while the exhaust valve is open to atmosphere through the small hole shown at the top of the pilot valve body.

When the controller handle is moved to a magnetic braking position and the cam comes into operation, plunger 1 closes exhaust valve 2 through spring 5. The stem of valve 3 engages with valve 2, so that as this valve closes valve 3 is opened, allowing main reservoir air to flow to the relay valve connection.

**Relay Valve.** The two pilot valves are connected through the double check valve to boss C of the relay valve, which consists essentially of a differential piston operating a slide valve 6.

Boss D is in connection with the driver's brake valves through the No. 19 Double Check Valve; boss E is connected to the brake cylinder, and passage F leads to the atmosphere.

In the normal position shown, the slide valve blanks off the exhaust port and air from the driver's brake valve entering at D passes direct to the brake cylinder connection E. If the operative controller is moved to a magnetic braking position the corresponding pilot valve immediately allows

main reservoir air to enter the relay valve at C, where it acts on piston 7, forcing it over to the left and so moving the slide valve to the left.

The slide valve covers the port leading to the brake cylinder at E and connects it to passage F, putting the brake cylinder into communication with the atmosphere and releasing the brake should it be applied. The relay valve being in this position will also prevent the operation of the air brake should the driver's brake valve handle be moved to application position while the controller handle is in any magnetic braking position.

Immediately the controller handle is moved away from the magnetic braking positions, air will exhaust from the chamber at the right of the piston 7, through the exhaust hole in the pilot valve; the piston and slide valve will move over to the right and normal air braking will be obtainable.