

What the heck is an AUTOMATIC AIR BRAKE?

WP Operating Department Training Manual - 1974

Every locomotive unit and car is equipped with automatic brake equipment. With this train brake system, an application of brakes occurs when the pressure in the brake pipe is reduced. The brake is not truly "automatic" as it requires knowledgeable and skillful manipulation by the engineer. The only time it is really automatic is when an accidental separation of the train and brake pipe occurs. An application of brakes will then come about due to the "fail-safe" characteristic of this system. The heart of the system is the "control valve" which performs three basic functions: 1. Apply brakes, 2. Release brakes and 3. Charge auxiliary reservoirs.

On freight cars, the control valves are known as AB valves, or an improved version as ABD valves. On locomotives with #24 equipment, the D-24 control valve is used; locomotives with #26 equipment, the 26F control valve is used. On older locomotives, the distributing valve serves the same purpose. In the figure, you will note that auxiliary reservoir air is used to apply the brakes on a car. On locomotives, air is admitted by the control valve which pilots a relay valve admitting air from main reservoir supply to the brake cylinders. Brake applications using the automatic brake are caused by reduction of pressure in the brake pipe.

There are two general types of brake pipe reductions:

- 1. Emergency Reduction:** An emergency reduction is an extremely rapid reduction of brake pipe pressure to zero. The rate of reduction cannot be controlled once the application is initiated.
- 2. Service Reduction:** A service reduction takes place at a slower rate and is controlled by the locomotive engineer. A minimum service reduction is 6 to 8 lbs. With 90 lb. brake pipe pressure, the maximum effective service reduction is 26 lbs. This 26 lb. reduction is called FULL SERVICE. With a full service reduction, the pressure will equalize between the auxiliary

reservoirs and the brake cylinders. With a 90 lb. brake pipe, the pressure will equalize at about 64 lbs., giving approximately a 64 lb. brake cylinder pressure. Since the pressure has equalized, it can be seen that any further service reduction cannot bring about more braking effort. The only way to increase braking effect beyond full service is to go on to an emergency application. With an emergency application, the pressure will equalize between the brake cylinders and the auxiliary and emergency reservoirs giving a higher brake cylinder pressure (approximately 77 lbs. with a 90 lb. brake pipe pressure).

Automatic train brakes incorporate separate reservoir sections and separate control valve portions for use in emergency applications. This is done so that an emergency application is available regardless of previous service applications that may have been made.

