

Brake Lock Up Causes Fire in Trucks



The S-cam brake is a design commonly used in trucks. **Figure 1** is a rendering of the basic concept of the S-cam brake. In **figure 1A**, the rotating S-cam is in the position where the brake has not been applied by a brake actuator. In **figure 1B**, the S-cam has rotated as a result of the air brake actuator such that it presses the shoes that support the brake lining against the brake drum, resulting in increased friction and braking.

Figure 2 is a view of a road tractor showing the results of a fire that started in the area of one of the brakes. The truck was moving when the driver no-

ticed a problem with one of the right rear brakes on the tractor. He called his dispatcher and was advised to release the brake chamber linkage and proceed to a maintenance facility. On the way to the facility, the right rear tires caught fire and the tractor and trailer were damaged. The driver had disconnected the brake chamber linkage, assuming that the S-cam would return to the no-brake position (**Figure 1A**). In fact, the brake was locked and continued driving, eventually caused frictional heating and a fire.

Figure 3 is a view of the brake system from the wheel, indicated by the red arrow

in **Figure 2** that caused the fire. Thermal patterns indicated this to be the brake drum that had a problem. Upon removal of the brake drum, one of the brake shoe rollers fell out. The blue arrow in **Figure 3** shows the position of the missing roller. The red arrow in **Figure 3** shows the S-cam to be in a position nearly overriding the brake shoe roller. With the S-cam in this position, it has exceeded the travel expected in the design. In this position, the S-cam will not return to the released position (**Figure 4**), causing uncontrollable brake pressure, severe frictional heating and a fire.

Figure 5 shows severe thermal damage to the brake lining as a result of the jammed S-cam. The root cause of the failure involves worn out brake linings and drum. The linings and the drum had insufficient thickness to prevent the S-cam from traveling into the jammed position.

This is a maintenance-related item, which is the responsibility of the entity performing the maintenance. The dispatcher also bears some responsibility in instructing the operator to drive the vehicle to the maintenance facility. ❗

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