

## Best Practices - Developed by the Surface Haulage Safety Task Force in Cooperation with MSHA

### BRAKE SYSTEMS

Modern machines have at least three brake systems: **Service, secondary (emergency), and parking**. Many machines are also equipped with a retarding brake system. The operator must fully understand the function and limitations of these individual brake systems as well as how and when to use them.

Before and during haulage operations, each brake system needs to be evaluated by the equipment operator for proper function. *Any deviation from normal operation must be corrected.*

- The **service brake** system is the main braking system used to stop the machine and hold it stationary.
- The **secondary (emergency) brake** system is a backup system in case something happens to the service brake system. (In many cases, it is of lesser braking capacity and should only be used to stop the machine in an emergency).
- The **parking brake** system is a brake intended to hold a stopped machine in place. (The parking brake on some machines also serves as the secondary brake). If the parking brake is used to stop the machine, it must always be tested for parking capacity after such an incident.

To test for parking capabilities, the machine may be loaded with a rated load on the bottom end of the maximum grade on which it was designed to park. Unless otherwise specified by the manufacturer, the maximum grade is usually 15 percent. Many operator's manuals also describe a "stall test" to evaluate the parking brake.

The retarder is a dynamic brake used to control the machine's speed while operating on downgrades. The retarder may be used as part of the service brake system to control the machine's speed down to 5 mph (or less).

The manufacturer's manual is the primary source of information for safe operation of any machine.

Brake maintenance is to be performed in accordance with the manufacturer's instructions.

Any malfunction, defect, or improper operation is to be checked by an authorized person to correct the problem.

U.S. Department of Labor  
Mine Safety and Health Administration