

DRY SYSTEMS TECHNOLOGIES®

OPERATION AND MAINTENANCE MANUAL

DST DRY SYSTEM®

SAFETY SHUTDOWN SYSTEM

M301-022-01

DRY SYSTEMS TECHNOLOGIES®

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Compressed air or hydraulic oil may operate the Safety Shutdown system. The components of the Safety Shutdown system are designed to operate with either media. Both systems are fail-safe, that is pressure is required to operate. Refer to the appropriate schematic for component identification.

SYSTEM FEATURES

The Safety Shutdown System is activated automatically by any one of the following events:

High Coolant Temperature
High Exhaust Gas Temperature
Low Engine Oil Pressure
Fire Suppression System Activated (Optional for underground metal/non-metal mines)

In addition, the system can be shut down manually by activating the Stop Valve.

As an additional feature, the Intake Air Supply can be closed by activating the Emergency Intake Air Shut-off Valve.

SYSTEM DESCRIPTION (PNEUMATIC SYSTEM)

The schematic for the pneumatic system must be referred to. Compressed air is supplied from an engine driven on-board air compressor. The same air source is used to start the engine and any other pneumatic feature with which the machine is equipped. A large air tank is used to store sufficient air to provide pressure to start the engine.

The air supply for the Safety Shutdown system is filtered and passes through a regulator to maintain a pressure ranging 80-100 PSI. A gauge indicates the air pressure.

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SYSTEM DESCRIPTION (HYDRAULIC SYSTEM)

The schematic for the hydraulic system must be referred to. Hydraulic oil is supplied from an engine driven hydraulic pump. The same hydraulic source is used to start the engine and any other hydraulic feature with which the machine is equipped. A large accumulator is used to store sufficient oil to provide pressure to start the engine.

The hydraulic supply for the Safety Shutdown system is filtered and passes through a regulator to maintain a pressure ranging 80-100 PSI. A Gauge indicates the hydraulic pressure.

STARTING THE SYSTEM

By activating the Override Valve M30-558-01, the complete system will be pressurized. Once sufficient pressure is obtained, the Control Valve will open and supply continuous system pressure. Since the low oil pressure shut down valve is open while the engine is stopped, the override valve is attached to the oil shut down valve. At system pressure, this valve will close as long as the override valve is held, allowing the system to pressurize for starting. The Fuel Injection Pump Shut-off Cylinder will open and allow fuel supply to the engine. The starting valve can then be actuated, supplying air to the starter pilot valve. The Starting Valve is spring loaded and will return to its closed position when released. Once the Start Valve and override valve are released, the low oil pressure shutdown feature will be activated.

MANUAL SYSTEM SHUT-DOWN

A Stop Valve M30-547-01 is mounted in the operator's cab. This valve is normally closed. By activating this valve, the system will be de-pressurized and cause the Control Valve to close and the engine fuel supply to be cut off. This valve will be used every time the operator routinely stops the engine. A check valve will prevent the Intake Air Shut-off Valve from being closed during routine stops.

MANUAL EMERGENCY SHUT-DOWN

The system is equipped with a separate Intake Air Shut-off valve that can be manually closed by activating the Emergency Intake Shut-off Valve. This will immediately shut off the Intake air supply to the engine. Use the Emergency Shutdown Valve ONLY IF THE ENGINE DOES NOT SHUT DOWN USING THE REGULAR STOP PROCEDURE OR UNDER OVERSPEED CONDITIONS.

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AUTOMATIC TEMPERATURE SHUT-DOWN FEATURE

There are two Temperature Sensing Valves, one for high exhaust gas temperature set at 285°F (M30-551-01) or a sprinkler head (M250-541-01) and one for high coolant temperature set at 210°F (M30-552-01). Both operate automatically. If the operating temperature exceeds the pre-set limit, the valve will open and vent the system. An Orifice prevents re-pressurization of the system if the Temperature Sensing Valve is in an open position. Once the pressure starts dropping, the pilot of the Control Valve will open, causing the system to vent. This will prevent an automatic restart, if any Temperature Sensing Valve is open. The optional Trip Indicators (M30-546-01) will tell the operator which valve is open.

AUTOMATIC LOW OIL PRESSURE SHUT-DOWN FEATURE

If the oil pressure falls below a pre-set limit, the engine will shut down. The Low Oil Pressure Shutdown Valve will vent the system and cause a shutdown like the temperature valves, described above. Because the stopped engine has no oil pressure, this valve would prevent restarting of the engine. For this reason, an Override Valve is incorporated. The low Oil Pressure Shutdown valve is pilot operated to run from the Override Valve, which will prevent venting of the system until oil pressure is reached.

AUTOMATIC FIRE SUPPRESSION SHUT-DOWN FEATURE

The shut down system can be connected to the automatic fire suppression system. In case of a fire, a signal is given from the Fire Suppression Shutdown Valve that will cause the Safety Shutdown system to vent and shut down as described above.