

ENGINE SHUTDOWN

AFEX FAQ's

FREQUENTLY ASKED QUESTIONS

1. **WHAT IS AN ENGINE SHUTDOWN?**

AFEX offers this optional feature for its fire suppression systems to interface with the equipment being protected and shut down the engine when the system is activated. This feature is available with both automatic and manual systems.

2. **WHAT ROLE DOES AN ENGINE SHUTDOWN FEATURE PLAY IN VEHICULAR FIRE SUPPRESSION SYSTEMS?**

Engine shutdown is especially useful in helping to limit damage from fires intensified by hydraulic fluids or fuel. If the fire was ignited by a ruptured hydraulic line or the failure of a fuel line component, a running engine will continue to feed the fire with fluid or fuel. This can turn a small fire, which initially is easy to extinguish, into an uncontrolled blaze.

This feature also shuts down the radiator fan. A fan can exhaust dry chemical agent from the engine compartment, reducing the fire suppression system's efficiency. A fan that continues to run may also provide enough oxygen to fuel the fire and intensify it.

3. **WHY IS IT IMPORTANT?**

When there is a fire, the equipment operator's first instinct is self-preservation. In his haste to escape, he often fails to turn off the engine. Automatically shutting down the engine as the system discharges can reduce or eliminate the fire's fuel source, increasing the probability of complete extinguishment of the fire.

4. **HOW DOES THE ENGINE SHUTDOWN WORK?**

This depends on the equipment. Typically, a normally closed pressure switch is spliced into the positive (+) electrical line of the equipment's fuel pump. The switch is

also piped into the actuation line of the fire suppression system. When the system is actuated, pressure from the nitrogen gas cartridge opens the switch, interrupting the electrical circuit to the fuel pump. This shuts down the pump, stopping the flow of fuel, which shuts down the engine.

Often, there are other electrical circuits that the pressure switch, either normally open or closed, can be spliced into to shutdown the engine. *It is recommended that the system installer consult a service technician for the equipment before splicing into any of the equipment's circuits.*

5. **HOW FAST DOES IT WORK?**

This depends on which circuit is being used to shutdown the engine. If spliced into the fuel pump, it generally takes five to eight seconds from system actuation.

6. **DOES THE OPERATOR HAVE CONTROL OVER THE SHUTDOWN FEATURE?**

Since the engine shutdown feature is engaged upon system activation, it can be avoided only by delaying system activation or if the alarm condition ceases to exist.

AFEX Circuit Monitor, PN A725000, has a timer and a "System Reset" button that allows the operator to delay the system discharge. It does not allow the operator to override the discharge. The monitor is non-latching, so if the alarm condition ends during the delay period, system discharge and thus engine shutdown will not occur.

With a manual system the operator has complete and sole control of the system discharge and thus the engine shutdown.

The equipment's operator needs to have proper training in operation of the fire suppression system and the optional features included with it.

AFEX Fire Suppression Systems

AFEX FAQ's Continued

Engine Shutdown Technology

7. WHAT FACTORS NEED TO BE CONSIDERED BEFORE INSTALLING THE ENGINE SHUTDOWN FEATURE?

When considering engine shutdown, by far the most important factor to consider is operator safety. Pay special attention to the issues of operator safety given the sudden loss of mobility as well as the impact on the equipment given the sudden loss of power. Also, consider potential safety problems resulting from an abrupt halt in hydraulic power.

Since stationary and track equipment operate at speeds less than 10 miles per hour, the loss of mobility is not much of a factor with regards to operator safety.

Rubber tired equipment is generally highly mobile and requires a thorough evaluation to determine whether or not to use the engine shutdown feature. Should engine shutdown occur while maneuvering over combustible materials or operating at higher speeds, a sudden loss of control could jeopardize the safety of the operator. Using the aforementioned A725000 Circuit Monitor with the delay timer and "System Reset" button gives the operator an opportunity to prepare for the shutdown and also allows him to delay it until he is ready.

EXAMPLES:

When the engine shuts down, all hydraulic control is lost. This may be a safety issue to the operator of a feller buncher with a tree in the air, or a shovel with a load of material in the bucket. However, it may not have much affect on the operator of a skidder or a drill.

The impact of the loss of steering and braking must also be taken into consideration. It is not as big a concern on a track dozer or excavator as it is with a wheel loader or haul truck. The addition of the A725000 Circuit Monitor and proper training of the operator can make engine shutdown a safe feature for these and other types of highly mobile equipment.

The environment the equipment works in is another factor to consider. A loader working in hot slag that shuts down and becomes immobile could cause big problems for the operator.

The above examples illustrate the importance of considering the type of equipment and its application.

Engine Shutdown Considerations for Heavy Equipment

AFEX offers Engine Shutdown Packages, Remote Actuators, and Circuit Monitors with Time Delay Function as accessories to the AFEX fire suppression systems in order to accommodate operating conditions that are unique to different machines. The following four categories each have special considerations when performing a hazard analysis.



Stationary Equipment (Little or No Mobility) Drills and Excavators

Overall Size and Volume of Hydraulic Fluids
Operator Control of Equipment is Less Critical



Wheeled Equipment (Medium Mobility) Wheel Loaders

Relatively Mobile
Large Volume of Hydraulic Fluids
Operator Control of Equipment Varies
with Application



Track Equipment (Low Mobility) Dozers and Excavators

Determine the Degree of Operator Control Needed
Operates at Low Speed



Wheeled Equipment (High Mobility) Haul Trucks

Highly Mobile, Can Reach 35 MPH
Operator Control of Equipment is Critical