OWNER'S MANUAL

MANUAL P/N 17367

DRY CHEMICAL SMALL VEHICLE (SMVS) FIRE SUPPRESSION SYSTEM

MODELS: SMVS13ABC

THIS MANUAL WILL GIVE YOU A BRIEF DESCRIPTION OF HOW YOUR AMEREX DRY CHEMICAL SMVS FIRE SUPPRESSION SYSTEM OPERATES. IT OUTLINES PROCEDURES FOR THE VEHICLE OWNER AND OPERATOR(S) IN CASE OF A FIRE AND YOUR RESPONSIBILITIES REGARDING FIRE PROTECTION. IT IS EXTREMELY IMPORTANT THAT ALL WARNINGS, CAUTIONS AND NOTES IN THIS MANUAL BE CAREFULLY OBSERVED. FAILURE TO HEED THESE INSTRUCTIONS COULD RESULT IN SERIOUS INJURY. AMEREX ASSUMES NO LIABILITY FOR SERVICE OR MAINTENANCE OF THE FIRE SUPPRESSION SYSTEM BY PUBLISHING THIS MANUAL. FOR ADDITIONAL INFORMATION REFER TO THE AMEREX WEBSITE: WWW.AMEREX-FIRE.COM

WARNING! This is not a maintenance, recharge or inspection manual. All Amerex SMVS Fire Suppression Systems shall be installed, inspected and maintained in accordance with the requirements of the Amerex SMVS Fire Suppression Systems Installation, Operation, and Maintenance Manual, P/N 28300, and the requirements of local authorities having jurisdiction (AHJ). **FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

When maintenance is indicated, it should be performed by trained persons having proper equipment. Agent cylinders are pressure vessels and must be treated with respect and handled with care. They are mechanical devices and require periodic maintenance to be sure that they are ready to operate properly and safely. For all maintenance procedures, refer to the Amerex SMVS Fire Suppression Systems Installation, Operation, and Maintenance Manual, P/N 28300.

Amerex Corporation makes original factory parts available to ensure proper maintenance - **USE OF SUBSTITUTE PARTS RELEASES AMEREX OF ITS WARRANTY OBLIGATIONS**. Amerex parts have machined surfaces and threads that are manufactured to exacting tolerances. O-rings, hoses, nozzles and all metal parts meet precise specifications and are subjected to multiple in-house inspections and tests for acceptability. There are substitute parts available that may be incorrectly labeled as having third-party approvals; some of these are advertised as Amerex type. None of these meet the approval requirements and all of them void the Amerex warranty and third-party listing. **DO NOT SUBSTITUTE**.

Quality is Behind the Diamond

AMEREX CORPORATION
P.O. Box 81
7595 Gadsden Highway
Trussville, AL 35173
www.amerex-fire.com

Customer Service:
Phone: (205) 655-0854
customer.service@amerex-fire.com

Technical Service:
Phone: (205) 508-6400
techservices@amerex-fire.com

INSTALLATION

CONGRATULATIONS! The installation of an Amerex SMVS Fire Suppression System on your vehicle is a commendable step toward securing total fire protection for your valuable vehicle. Suppression systems have been shown to reduce equipment loss and equipment downtime, and most importantly, preserve human life.

This manual is provided to you, the vehicle owner, to explain the basics of the Amerex SMVS Fire Suppression System components and their operation, and how to use the system in case of a fire. It is imperative that all persons expected to operate the equipment on which the suppression system is installed read and understand this manual and become proficient in the suppression system use and operation.

In addition, this manual describes the owner's role in suppression system maintenance and in vehicle maintenance that will help to ensure proper fire prevention. The manual is not intended to provide detailed information concerning suppression system installation or diagnostics.

For all warranty information refer to the Amerex internet website:

https://amerex-fire.com/terms-and-conditions

COMMON VEHICLE HAZARDS

A complete hazard analysis must be performed for each piece of equipment being protected to determine the machine components that would require fire suppression and cooling of potential hot surfaces. Protection may include, but is not limited to:

- Front Engine compartments - The engine compartment contains many components which can be heated above the ignition temperature of the fuels that are present in the compartment. Examples are turbochargers, engine blocks, exhaust manifolds, and other heat exchangers.
- Transmission areas.
- Gearboxes.
- Battery compartments.
- Ancillary compartments.
- Electrical or high voltage components or compartments.

Amerex SMVS Fire Suppression Systems shall NOT be considered satisfactory protection for the following:

- *Chemicals containing their own oxygen supply*
- *Combustible metals such as sodium, potassium, magnesium, titanium, and zirconium*
- *Deep seated or burrowing fires in ordinary combustibles where dry chemical cannot reach point of combustion*
- *Explosions*
- *Lithium-ion batteries*
- *Rear Engine Vehicles*

PROTECTION

Vehicles are susceptible to fires because they contain fuel sources (diesel, gasoline, hydraulic oil, debris, insulation, etc.) and overheat/ignition sources (manifolds, turbochargers, battery boxes, wiring harnesses, electric motors, etc.) co-existing in high pressure, high vibration, and long operating shift environments. Areas likely to produce fire are called "Hazard Areas" and have been identified by your Amerex certified distributor. fire suppression options are designed to protect those high risk hazard areas. A third nozzle can be used to protect an enclosed area or local hazard such as a battery compartment or transmission. Portable fire extinguishers or additional fixed fire suppression systems may be necessary for additional protection.

HOW THE SYSTEM WORKS - TYPICAL FIRE SCENARIO

The following steps outline a typical scenario for an installation utilizing **automatic fire detection** and **electrical system actuation**. This example details normal automatic actuation of the SMVS Fire Suppression System.

(1) Fire starts in a protected area.

Fig. 1

(2) Once the Linear Heat Detection Cable (LHD) which is installed in the hazard area (Fig. 2) experiences elevated temperatures at or above its set temp 356°F (180° C) for an extended period of time, the insulation within the LHD cable will melt causing the circuit to close. The closed circuit will send a signal to the SMVS Control Panel (Fig. 3) to go into alarm and discharge the system automatically.

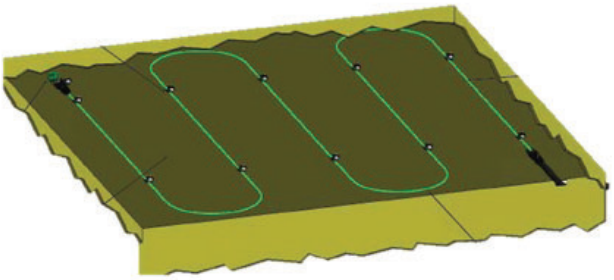

Fig. 2

Fig. 3

(3) The completed circuit activates the releasing circuit to open the agent cylinder valve allowing pressurized fire suppression agent to flow into the distribution hoses leading to the discharge nozzles (Fig. 4). The pressure of the fire suppression agent causes the protective dust caps located on the nozzles to be blown off, then discharges agent into the protected area to suppress the fire.

Fig. 4

HOW THE SYSTEM WORKS - MANUAL OPERATION

The following steps outline the procedure for manual actuation of the SMVS Fire Suppression System.

In Case of Fire:

Fig. 5

(1) Bring the vehicle to a safe and controlled stop (Fig. 5), and set the brakes. **Turn off the vehicle**!

(2) To manually activate the SMVS Fire Suppression System, locate the Manual Push Button along the path of egress. Pull the ring safety pin and press the red "**FIRE**" button (Fig. 6).

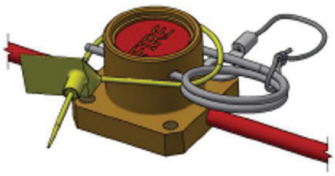

Fig. 6

(3) Get away from the equipment, taking the hand portable fire extinguisher with you, and assisting others to exit the vehicle as appropriate.

(4) Call First Responders.

(5) Stand by with the hand portable fire extinguisher and watch for signs of reignition.

Reasons Behind The Actions:

A running piece of equipment can continue to pump fuel or hydraulic fluid, adding to the fire. Its cooling fan creates wind currents that can reduce the effectiveness of the suppression system discharge. Its electrical system or other hot spots can continue to reignite the fire. Powering the vehicle down reduces the possibility of reignition. By getting away from the equipment, the operator, as well as others, are protected from possible explosions or heat injuries.

What To Expect:

Discharge of the fire suppression system is noisy and can produce a cloud of extinguishing chemical. Breathing the chemical is unpleasant and may cause some irritation. If automatic activation of the suppression system occurs on a vehicle equipped with automatic vehicle shutdown, be prepared to utilize the shutdown delay feature as required to bring the vehicle to a safe stop.

WARNING!: **Vehicles equipped with the optional vehicle engine shut-down may experience loss of power and/or steering and braking. Once a fire condition is detected, the delay button on the panel may be depressed repeatedly as needed to delay engine shut-down and allow sufficient time to bring the vehicle to a safe and controlled stop. All potential operators must be thoroughly instructed in the use of this feature.**

CAUTION!: **Vision may be temporarily obstructed following system discharge. Vehicles equipped with Amerex Fire Suppression Systems should be evaluated. Visual warnings such as "CAUTION: VEHICLE EQUIPPED WITH AUTOMATIC FIRE SUPPRESSION SYSTEM. KEEP BACK 200 FEET" may be required on rear of vehicle.**

After The Fire Has Been Extinguished:

DO NOT restart the equipment until it has been serviced and cleaned. Use a water stream, compressed air or pressure washer to remove chemical residue.

DO NOT return the equipment to service until the suppression system has been serviced by an Amerex certified distributor, and until the source of the fire has been located and neutralized.

THE OWNER'S ROLE IN PROTECTING THE VEHICLE

Vehicle owners play the primary role in protecting the vehicle by being responsible for **FIRE PREVENTION.** Vehicle fire prevention includes:

VEHICLE HOUSEKEEPING: Inspect and clean vehicle regularly to remove accumulations of solid combustibles such as dry vegetation, paper, wood, coal dust, flammable liquids such as grease, fuel and oil. Pay particular attention to all hazard areas including the engine area, hydraulic manifolds and belly pan. Use high pressure water or steam spray when required.

VEHICLE MAINTENANCE: Proper vehicle maintenance is essential to maintain successful fire prevention. Ensure maintenance is always up-to-date on the vehicle.

Fig. 7

Fig. 8

Vehicle owners also play the primary role in protecting the vehicle by ensuring that the SMVS Fire Suppression System is used and maintained properly. This must be accomplished by:

TRAINING OPERATORS: All operators must be thoroughly trained in manual actuation of the suppression system, electrical monitoring or control panel interpretation and fire relay delay operation.

PROVIDING FOR VEHICLE MODIFICATION: Your Amerex certified distributor should be notified of **any** modifications to the vehicle so that potential changes in hazard can be identified and protected.

ENSURING DESIGN INTEGRITY: Your Amerex SMVS Fire Suppression System has been designed and installed by an Amerex certified distributor. **Never** attempt to modify the suppression system in any way or relocate any components. Enlist the help of your Amerex certified distributor when modifications or repairs are required.

SCHEDULING REGULAR MAINTENANCE: It is the vehicle owner's responsibility to schedule monthly inspections, and semi-annual maintenance. Amerex Corporation warrants only those systems that are properly maintained.

PERFORMING QUICK CHECKS: Fire suppression systems can become damaged in between routine inspections. An added measure of safety can be achieved through vehicle owner/operator self-inspections.

Fig. 9

MAINTENANCE

The Amerex SMVS Fire Suppression System is to be maintained and tested every six (6) months by an Amerex certified distributor. Amerex Corporation also recommends the following inspection and maintenance requirements to be performed by the OWNER / OPERATOR to ensure safe and reliable system performance.

Daily Inspection: OWNER / OPERATOR

- On systems with electronic display panels, verify that a green "OK" status LED is illuminated.
- Check pressure gauges on cylinders. Verify the pointer is in the green pie area.

Monthly Inspection: OWNER / OPERATOR

- Verify that all components are present and in their original location and securely fastened.
- Verify that all mechanical actuation devices are unobstructed by vehicle modifications or clutter.
- Verify that the maintenance tag or certificate is in place and up to date. Record the date of inspection and initials of inspector.
- Verify the physical condition of all components. Inspect for damage or conditions that may prevent operation.
- Inspect the agent cylinder pressure gauge(s). The yellow pointer on the agent cylinder pressure gauge must be in the green pie area (Fig. 10).
- All protective caps must be in place on nozzle tips. Nozzle outlets must be unobstructed and properly aimed at the hazard(s) which are intended to be protected.
- Verify that all "IN CASE OF FIRE" instruction labels are intact, clean and legible. Verify that all "CAUTION" labels are intact, clean and legible.

If any service is required as a result of monthly inspections, it should be done only by an authorized Amerex certified distributor.

Your Amerex SMVS Fire Suppression System will give you years of reliable protection if installed and maintained in accordance with the system design, installation and maintenance manual. Failure to heed the instructions and warnings in this owner's manual will void all warranties. When in doubt, always contact your Amerex certified distributor.

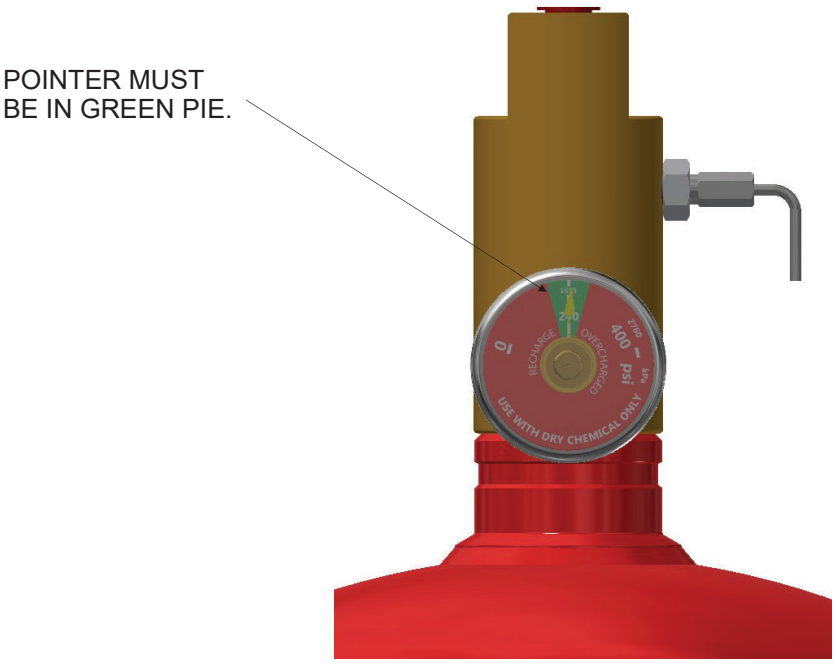

Fig. 10

ELECTRICAL CONTROLS

All installations of Amerex SMVS Fire Suppression Systems feature automatic fire detection and system actuation. The Amerex SMVS System includes one Linear Heat Detector for the engine compartment, one Manual Push Button, and one SMVS Control Panel. These components are connected to the SMVS Control Panel via the detection/actuation cables provided within the kit. The Manual Push Button provides the capability to manually trigger the system by hand via a "FIRE" push button. The SMVS Control Panel provides real-time feedback regarding the status of the suppression system. Pulling the safety pin and pressing the Manual Push Button will cause the fire suppression system to actuate. It is imperative that all equipment operators understand the meaning of panel displays and know what actions to take as a result of the indications given. The SMVS Control Panel should be checked frequently by the operator during routine equipment operations. The panel's LED indicators are explained in the following tables and illustrations. The following pages provide detailed information to better understand the panel's various LED indicators, flash codes, etc.

SMVS Control Panel Operations:

- **System OK**

  When the panel is plugged in to an operational configuration the system will illuminate the green "System OK" LED.

- **System Alarm**

  When either the heat detection circuit has detected fire or the Manual Push Button has been depressed, the following sequence will occur:

  - ◊ "System OK" LED will turn off.
  - ◊ The audible alarm will sound continuously.
  - ◊ The "FIRE" LED will illuminate.
  - ◊ The relay will engage after programmed delay (default is 0 seconds)
  - ◊ The "Relay Reset" LED will illuminate.
  - ◊ The "Service System" LED will illuminate.
  - ◊ The "Service System" LED will flash four times to indicate actuator trouble.

When the "FIRE" LED first comes on, it will flash a number of times to indicate which hazard zone is in alarm. The system will remain in alarm until the system has been serviced and the linear actuator has been replaced.

The Alarm flash codes are as follows:

ALARM SOURCE	NUMBER OF FLASHES
Heat Zone 1 Alarm	1
Heat Zone 2 Alarm	2
Both Zones in Alarm	3

Fig. 11

ELECTRICAL CONTROLS CON'T.

- **Service System**

  In the event of a system fault the following sequence of events will occur:

  - ◊ The "Service System" LED will illuminate.
  - ◊ The alarm will pulse.
  - ◊ The "Service System" LED will flash to signify the fault source.

  When a system fault is detected there is a five second delay before notification. For main power trouble, the delay for notification is 20 seconds. The source of the fault can be determined as follows:

TROUBLE SOURCE	NUMBER OF FLASHES
Main Power Trouble	1
Heat Zone 1 Trouble	2
Heat Zone 2 Trouble	3
Actuator Trouble	4
Backup Battery Trouble	5

Fig. 12

- **Alarm Silence**

  In the event of a system alarm or system service the audible alarm can be silenced with the "Alarm Silence" button. When the "Alarm Silence" button is depressed the "Alarm Silence" LED will illuminate and the other LEDs will continue to show the alarm or service system fault status. The alarm will remain silent for 6 hours and will then resound to remind personnel that a problem condition is present.

- **Push to Test**

  Momentarily pressing the "Push to Test" (Amerex Diamond) button will illuminate all LED's and sound the audible alarm. Pressing and holding the "Push to Test" button will illuminate all LED's, sound the audible alarm, and engage the shutdown relay after any programmed delay has timed out. This allows verification of system notification and relay functions. The "Push to Test" function will not cause system discharge.

  The control panel will also signify the programmed relay (default delay is 0 seconds). The relay delay is shown by the number of flashes of the "Relay Reset" LED displays. The programmed time delay can be determined as follows:

NUMBER OF FLASHES	RELAY DELAY
0	0 seconds
1	5 seconds
2	10 seconds
3	15 seconds

Fig. 13

- **Relay Reset**

  In the event of an alarm condition, pressing the "Relay Reset" button will reset the relay reset delay to the programmed delay time. The relay function can be also be maintained by continuously depressing the "Relay Reset" button.