Technical Bulletin 047 – SFI 17.1 Mechanically Activated Systems – Installation Guide

Rev1 01/05/2020

The Lifeline Zero 360 5lbs and 10lbs Mechanical systems are certified to meet SFI specification 17.1. A plumbed-in fire extinguisher system is mainly designed to delay the development of the fire and consequently give the driver more time to exit the car. This system is not designed to put out the fire and prevent the car from burning.
The information below provides a guide to installing your chosen system. Unfortunately, due to the variety of vehicles being raced the exact location of the components of the systems cannot be defined by Lifeline; this document provides "best practise" advice suitable for most vehicles. Always consult with your series and class safety regulations to ensure that your installation complies with these regulations. If you feel that your installation cannot follow these guidelines, please contact Lifeline Technical for further guidance.

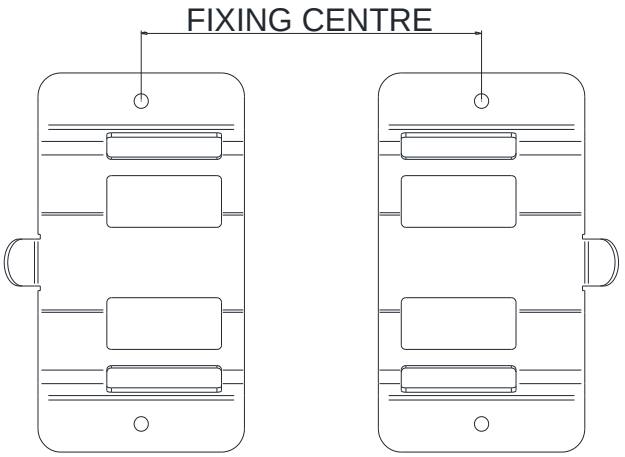
Fully read and understand the instructions below before starting installation. Plan your installation carefully referring to the tables below and the system drawings. Do not cut the supplied tubing until you are certain of the location of the cylinder, connectors and nozzles.

Other References	
TB001	System Care, maintenance and Service
TB003	Novec ™ 1230 MSDS
TB049	Zero 360 SFI – Kit Content and Spares

Section 1 – Cylinder, Bracket and Straps

Item	Fixing Type and No.	Location and Fitting Guide
Cylinder and Bracket -	4xM6 nut, bolt and washers. Vibration washers and/or Nylocs are highly recommended. The use of self-tapping screws is not permitted. Anti-Vibration Mounts on all 4 fixing points are highly recommended. It is permitted to replace the bracket and straps with your own design provided it conforms to your series' regulations.	It is recommended to mount transversally in the car and must be within the safety cell/roll cage. The cylinder may also be mounted longitudinally or vertically but **must not be mounted with the head pointed downwards or towards the front of the car as the system may not function correctly.** Refer to Section 6 for recommended cylinder ordination. Servicing label, SFI label and pressure gauge must be visible for inspection. Avoid positions where cylinder is likely to be damaged, abraded or be exposed to excessive heat.

Item	Fixing Type and No.	Location and Fitting Guide



Model	Fixing Centre
5lbs	9-5/16" – 9-7/16" (236 - 240mm)
10lbs	8-15/16" – 9-1/8" (227 – 231mm)

Figure 1 - Bracket Fixing Centres

Straps	2x T-Bolt straps/cylinder	Thread through provided slots in brackets and around the cylinder. Tighten T-bolts taking care not to over tighten and damage the cylinder.

Section 2 – Delivery Network – Tube and Connectors

Item	Fixing Type	Location and Fitting Guide
5/16" Tubing	Cable ties or P'clips as required	Referring to section 3 and 6, cut tube to pre-measured length using a dedicated tube cutter, ensuring that there are no sharp edges and that the tube remains circular. Do not use a hack saw or similar tool; this will leave a jagged edge which will damage seals in the connectors. Form the tube using a pipe bender taking care not to create a kink which could restrict flow. Minimum bend radius of the tube is shown in the table; Lifeline recommend doubling this figure, where possible, to avoid kinking. **Use as few bends as possible for smooth flow of suppressant and best performance.**

<table>
<tr><th>Item</th><th>Fixing Type</th><th>Location and Fitting Guide</th></tr>
<tr><td></td><td></td><td>The pipe lengths to each of the engine bay nozzles should be kept as equal as possible for best suppressant discharge.

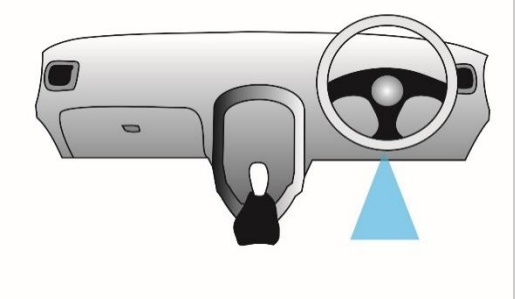
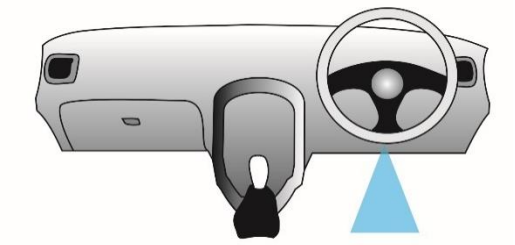
<table><tr><th>Tube Material</th><th>Minimum Bend Radius</th></tr><tr><td>Aluminium</td><td>1” (25mm) when using pipe bending tool</td></tr><tr><td>Coated Steel</td><td>1” (25mm) when using pipe bending tool</td></tr></table>
Secure the tube using cable ties and saddles or P’clips.</td></tr>
<tr><td>Connectors</td><td>N/A</td><td>Where required, drill a Ø ½” (13mm) hole to fit the bulkhead connector(s). Loose lay tubing in the vehicle and start pushing the tube into the connectors. Push the tube until a positive click is felt as the tube goes past the sealing o’ring. Once home it should be impossible to pull the tube free without depressing the release ring on the connector.

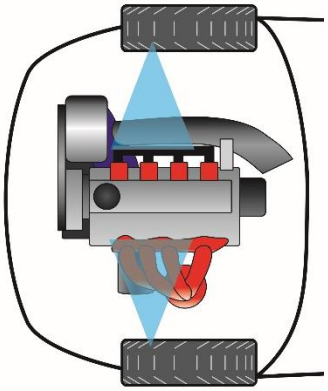
When using Steel Tubing, a circular groove must be cut into the tube using a pipe cutter. It must be 0.276” (7mm) from the end of the tube and about 0.02” (0.5mm) deep as in the image. When correctly cut, it should not be possible to pull the nozzle or connector off the tube and it should not be loose on the tube.

 
Figure 2 - Groove cut in tube for Push Fittings</td></tr>
</table>

Section 3 – Nozzles

The supplied nozzles are optimised for your system and produce 3 jets in a 120º spray pattern. Do not use any nozzle other than Lifeline nozzles designed for the system you have. It is recommended that all supplied nozzles are fitted. The below guide shows best practice, always consult your series/class regulations to confirm that your nozzle layout will comply with their rules.

System Type	Cockpit	Engine and Fuel Cell Compartment
5lbs with 2 nozzles	1 nozzle should be placed under the dashboard pointed downwards into the footwell. Do not point at the driver's head. **The nozzle must be rigidly mounted to a bracket and not supported by tubing alone**. The tubing should be supported at least 3" - 4" behind the nozzle using P-Clips.  Figure 3 - Nozzle Position within Cockpit	If placed in the engine compartment, carefully consider the position of the nozzle to cover the most likely source of ignition; induction, exhaust, fuel pump, injector rail, carburettors, oil lines etc. If placed over the fuel cell, position the nozzle to cover areas of potential fuel leaks such as outlets, inlets, filler pipe etc. **The nozzle must be rigidly mounted to a bracket and not supported by tubing alone**. The tubing should be supported 3" – 4" behind each nozzle using P-Clips.
10lbs with 4 nozzles	At least 1 nozzle should be placed under the dashboard pointed downwards into the footwell. Do not point at the driver's head. **The nozzle must be rigidly mounted to a bracket and not supported by tubing alone**. The tubing should be supported at least 3" - 4" behind the nozzle using P-Clips.  Figure 4 - Nozzle Position within Cockpit	Place at least 2 nozzles in the engine compartment. It is recommended to place one on either side of the engine block while considering the most likely sources of ignition; induction, exhaust, fuel pump, injector rail, carburettors, oil lines etc. The fourth nozzle may be placed over the fuel cell to cover areas of potential fuel leaks such as outlets, inlets, filler pipe etc., or used as an auxiliary nozzle in the engine compartment or cockpit. **The nozzles must be rigidly mounted to a bracket and not supported by tubing alone**. The tubing should be supported 3" – 4" behind each nozzle using P-Clips.

System Type	Cockpit	Engine and Fuel Cell Compartment
		 Figure 5 – Recommended Nozzle Position in Engine compartment

Section 4 – Activation – Mechanical

Item and System Type	Location and Fitting Guide
Pull Cable	The system is supplied with a Bowden pull cable, this is normally located on the dash near to the electrical cut-off switch and must be reachable by the driver seated with belts on. *Special care must be taken with routing to ensure no sharp bends or S-bends are introduced to the cable. This can significantly increase the effort required to pull the cable. Once the routing is decided upon, trial fit the cable without connecting to the extinguisher to test for smooth and easy operation. It is recommended that ½" of slack is left to prevent accidental firing and so that scrutineers can confirm the cables are free* **DO NOT REMOVE THE SAFETY PIN** until the pull cable has been fitted to the extinguisher. Either the pull cable or safety pin must be in place or the extinguisher will fire. To fit the cable to the extinguisher, pass the inner cable through the firing head through the small hole as shown. The cable can be fitted through either side of the head depending on your installation. The cable should pass through the head with ½" extending out of the head. Make sure the outer cable is secured in the counter bore by the two grub screws. It should be secure but do not overtighten.

Item and System Type	Location and Fitting Guide
	To shorten the cable, remove the inner cable from the outer and cut each to length with wire cutters. Ensure that the end is free from burrs and that the cable still passes smoothly through the head, sand or file the end of the cable as required. After the cable is correctly fitted the safety pin can be removed to arm the system.

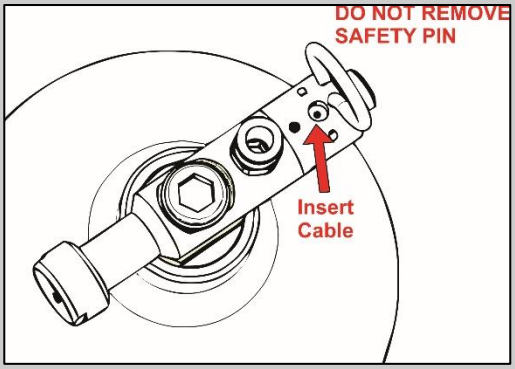


Figure 6 - Location of Pull Cable hole

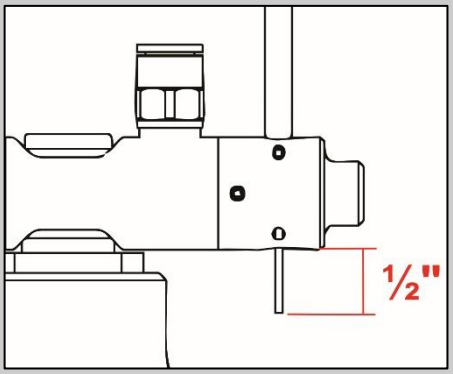


Figure 7 - Cable should extend 1/2" out of the head

Section 5 – System Checking and Maintenance

Item	Procedure
Pressure Gauge	Check that the pressure gauge is in the green zone, pressure in cylinders can vary with temperature due to the expansion and contraction of the suppressant; this is normal.
Pull Cable	**Leaving the safety pin in**, check movement of the cables by pulling the T-handle until slack is taken up and then push the T-handle fully back into its housing. If a restriction is felt that could be considered detrimental to the operation of the extinguisher, check cable routing and lubricate the cable until movement is smooth.
Servicing	In accordance with SFI specification 17.1, every system must be returned to a Lifeline service agent be serviced every two years. The date of next due service will be indicated on the cylinder label. For 5lbs Systems, the cylinder is not reusable and is also replaced during servicing by a Lifeline service agent. Every system has a maximum life of 6 years and can be refilled a maximum of 6 times during this life.

Section 6 –System Illustrations

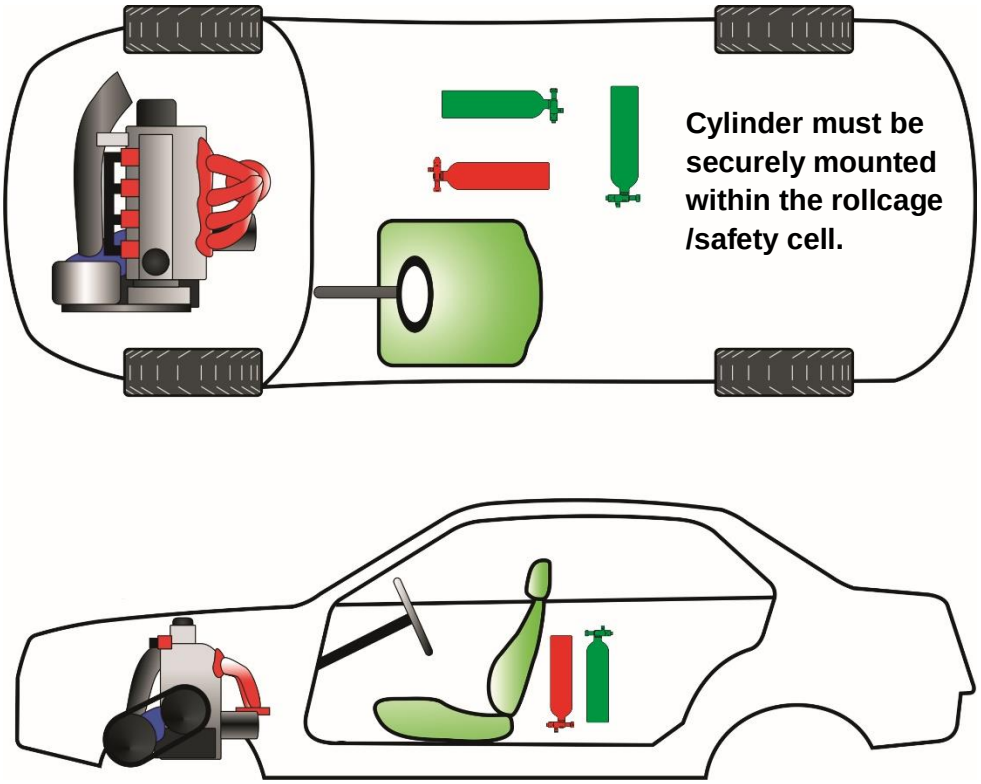


Figure 8 - Recommended cylinder orientation in car. Do not mount with the extinguisher head pointing down or forward.

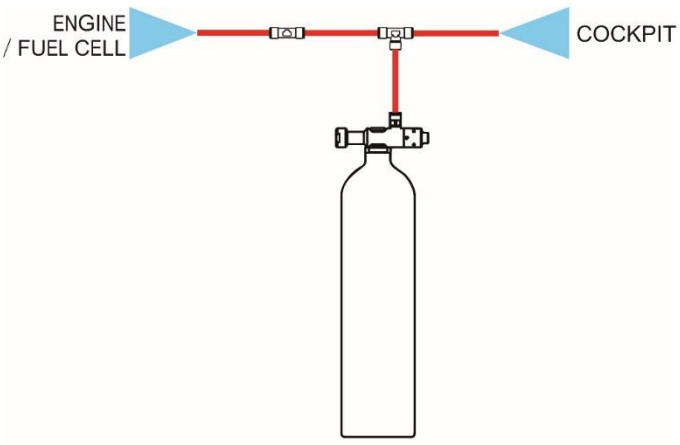


Figure 9 - System Schematic for Zero 360 SFI 5lbs with 2 nozzles

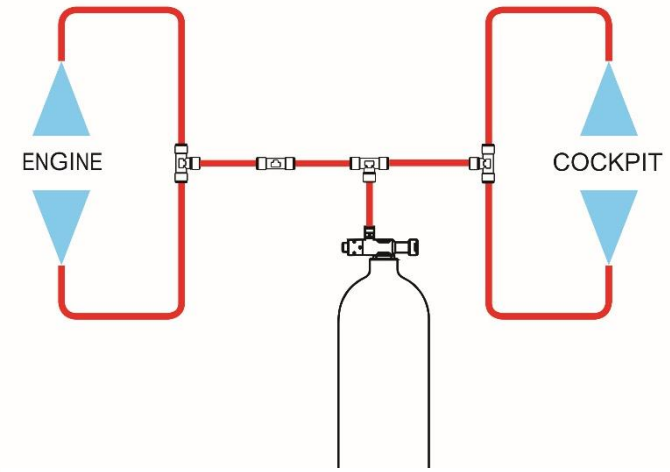


Figure 11 - System Schematic for Zero 360 SFI 10lbs with 4 nozzles, 2 nozzles in cockpit

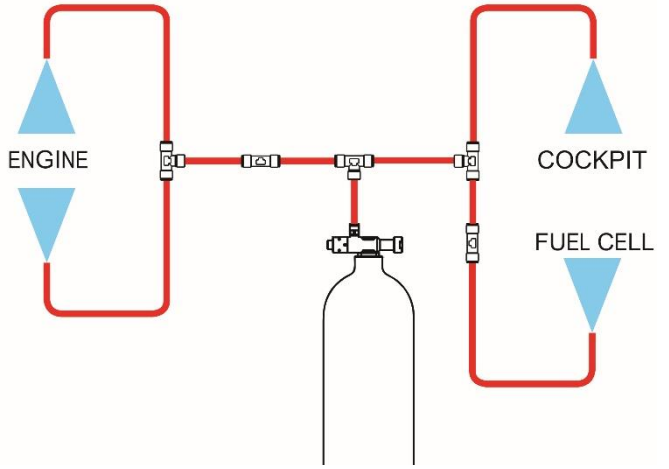


Figure 10 – System Schematic for Zero 360 SFI 10lbs with 4 nozzles, nozzles in cockpit and fuel cell

System Part Number31	
System Serial Number	
Date of Manufacture	
Service 1 Date	
Service 2 Date	
Service 3 Date	
Service 4 Date	
Service 5 Date	
Service 6 Date	
Notes	