

Technical Bulletin 067 – Zero 175 Installation Guide

Rev1 05/06/2023

The Lifeline Zero 175 fire suppression system (UK Patent No. 2578666) is homologated to FIA 8876-2022 and using Monnex™ fire suppression powder. Monnex™ has been tested rigorously on fuels from numerous industries including aviation, as well as testing against industrial chemicals, showing its versatility and effectiveness. Monnex™ is the most trusted high performance firefighting powder.

The information below provides a guide to installing your chosen system. Due to the complexity of the vehicles this system is used in, it is difficult to define the exact positions of the bottle and the accompanying ancillaries required for the installation; this document provides “best practise” advice suitable for most vehicles. 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 or the plug and lead sets until you are certain of the location of the cylinder, connectors, nozzles, switches and power pack.

Other References (Available at www.lifeline-fire.co.uk)	
TB001	System Care, maintenance, and Service
TB006	Monnex MSDS
TB068	Zero 175 – Kit Content and Spares

1 Cylinder Installation

Mount the cylinder transversally or longitudinally in the car, and within the safety cell/roll cage. We recommend it being placed behind the seat, on the floor, to provide adequate protection to the tubing when entering and exiting the vehicle.

Avoid positions where the cylinder is likely to be damaged, abraded or exposed to extreme heat.

The Homologation and maintenance labels must be visible for scrutineering.

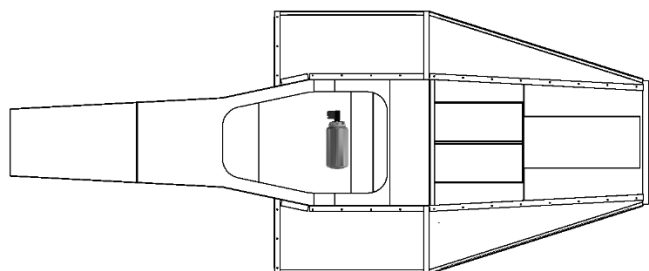
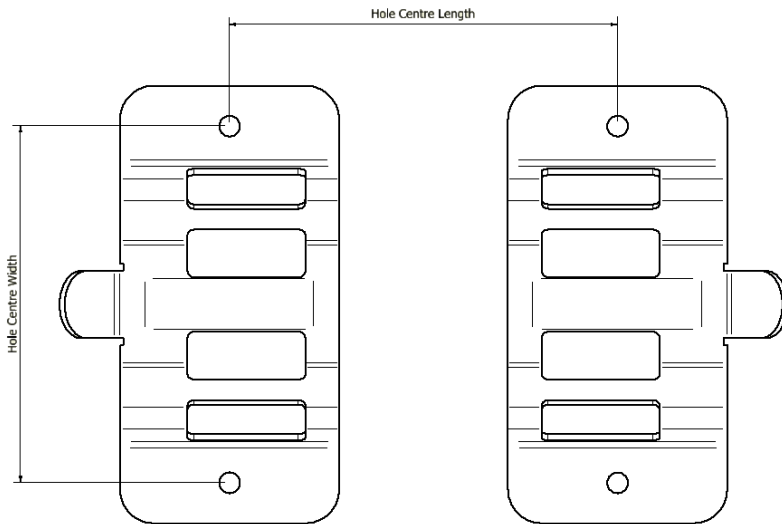


Figure 1 Cylinder position is free within the safety cell/roll cage

Secure the cylinder bracket to the car using M6 nuts and bolts. Use vibration washers or nyloc nuts. Do not use self-tapping screws. The use of anti-vibration mounts appropriate for the vehicle is highly recommended.



Figure 2 Example of Anti-Vibration Mounts



Hole Centres	
Length	115mm
Width	105 ± 2mm

Figure 3 Hole centre positions for bracket mounting

It is permitted to use bracket and straps of your own design provided it conforms to Appendix J, Art. 253 of the FIA International Sporting Code.

Thread the T-Bolt steel straps through the slots on the bracket. Place the cylinder inside the straps and tighten the straps using an 11mm socket. Ensure the cylinder is secure but do not overtighten.

Ensure that you have access to plug in the actuator wire once it has been strapped in position.

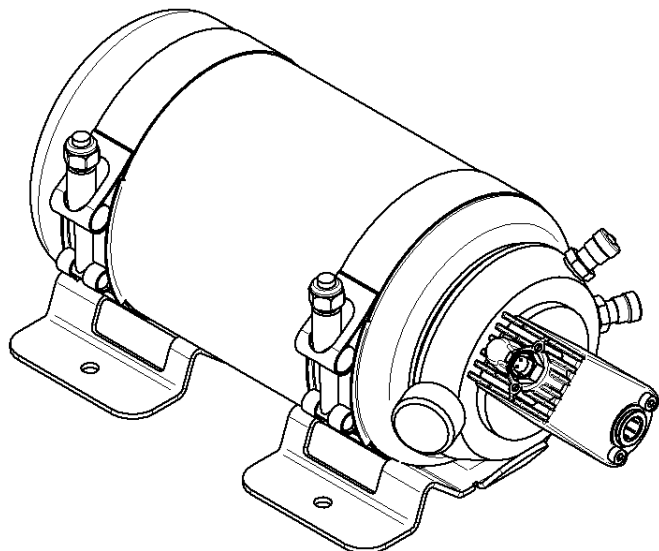


Figure 4 Image of bottle strapped in to the brackets

2 Nozzle Mounting

Zero 175 contains 4 nozzles. Each nozzle is a piece of 200mm stainless steel tubing with the end crimped and cut to give the suppressant the desired discharge pattern for maximum coverage. The active part of the nozzle tube is a 50mm long shaped section with the extra 150mm length of the tube to allow for positioning of the nozzle. Be careful when fitting not to crush the crimped end of the nozzle as this can compromise the efficiency of the system.

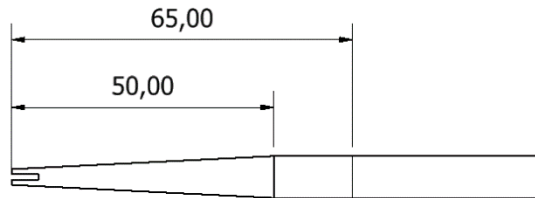


Figure 5 Active nozzle section and minimum usable size

2.1 Cockpit Nozzle

The cockpit nozzle should be mounted as such that there are no obstructions that can restrict the flow of suppressant.

The Nozzle **must not** be pointed at the head of the driver. **There must be one nozzle in the cockpit.** We recommend the nozzle is mounted on either the left or right side of the cockpit angled inwards for optimum coverage.

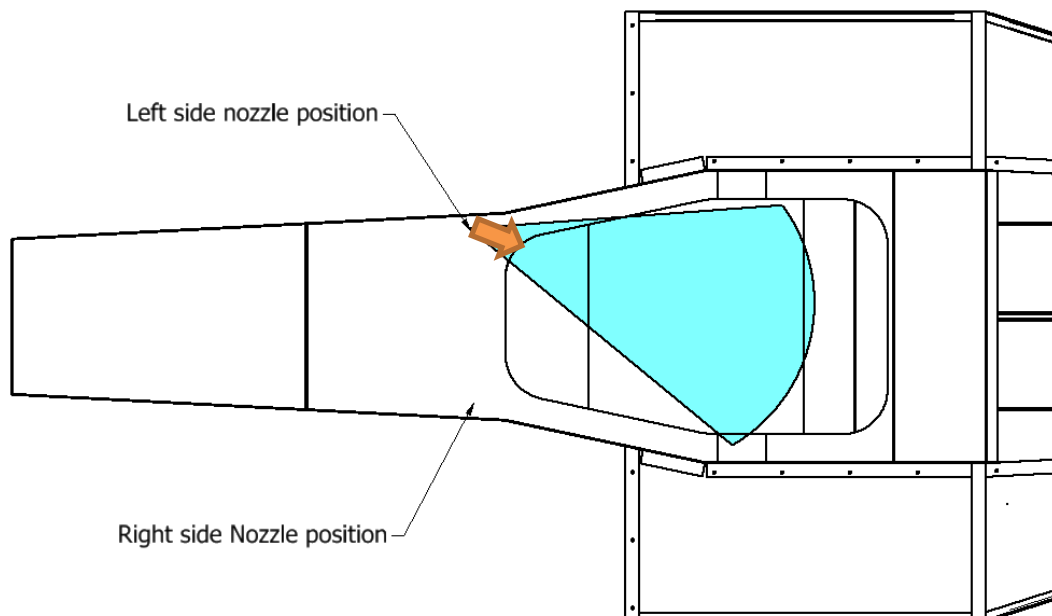


Figure 6 Cockpit Nozzle position and coverage

Excessive obstruction around the nozzle could reduce the effectiveness of the extinguisher.

2.2 Engine and Sidepod Nozzles

The Engine nozzle and sidepod nozzle positions are recommended to be positioned upstream of the airflow through the sidepod and air box, unobstructed and allowing coverage of any high-risk components within the sidepods.

2.2.1 Engine Nozzle

The engine nozzle should be directed at the top of the engine in one of the positions shown in figure 7 so that maximum coverage can be provided by the nozzle.

As stated previously, it is imperative that the nozzles are not obstructed and have a clear path to the high ignition risk areas to maximise the effectiveness of the extinguisher.

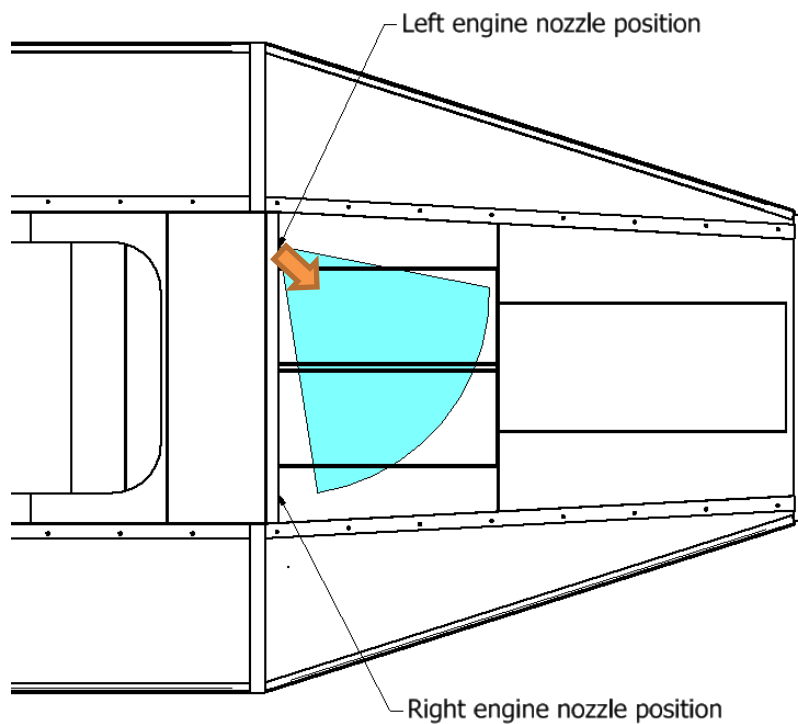
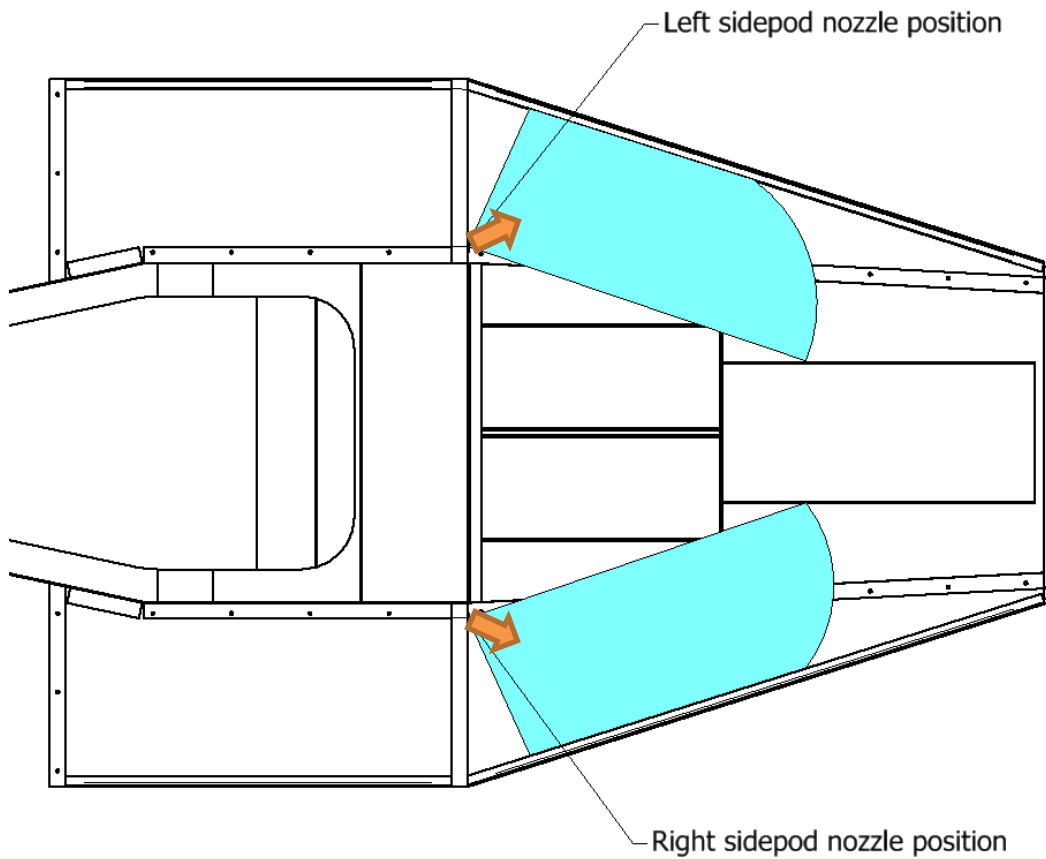


Figure 7 Engine nozzle positions and coverage

2.2.2 Sidepod Nozzles

The recommended position for the sidepod nozzles is shown in figure 8. The position of the sidepod nozzles provide as much coverage of the side of the engine and sidepod area that is not covered by the engine nozzle. When positioning these nozzles, direct them at the so that you achieve maximum coverage of all ignition sources, or dedicated to a specific high-risk source. As stated previously, it is important to keep the nozzles unobstructed to allow maximum coverage of the suppressant when discharged.

Figure 8 Sidepod nozzle position and coverage



2.3 Nozzle mounting

When mounting the nozzles, it is important to ensure the flat edge of the nozzle is parallel to the floor of the car.

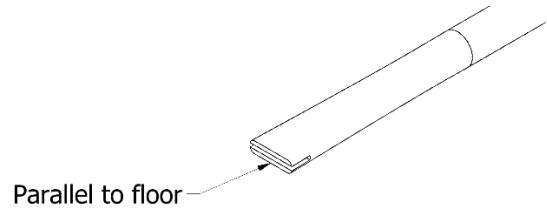


Figure 9 Correct orientation of nozzles

There is a bulkhead fitting provided in the kit to assist with positioning of the nozzle. Cut a groove using a pipe cutter 7mm from the end of the tube that is 0.5mm deep. If done correctly it should not be possible to pull the tube from the push fit connector, and it should not be loose on the tube.



Figure 10 Groove cut in tube for push fitting

When securing the nozzles, a bracket with $\varnothing 16\text{mm}$ hole will be required for the bulkhead fitting. 2 x 19mm spanner will be needed to tighten the locknuts. If the nozzles require further securing, as long as this doesn't obstruct the nozzle, you can do so.

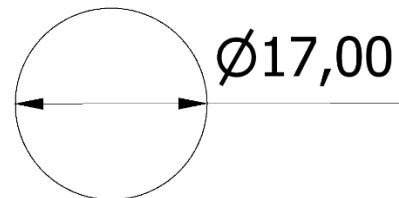


Figure 11 Hole diameter for bulkhead bracket

3 Delivery Network

3.1 Tubing

Connect the Zero 175 cylinder to the nozzles following the schematic below and using the fittings provided in the kit. Ensure that the correct size tubing is used as per the diagram. Try to use similar lengths of tube from the cross piece to the engine and sidepod nozzles to distribute the suppressant as equally as possible. We recommend fixing the tubing if you can to the safety. This allows a good chance for the tubing to survive an incident which may then require the suppression system to be used.

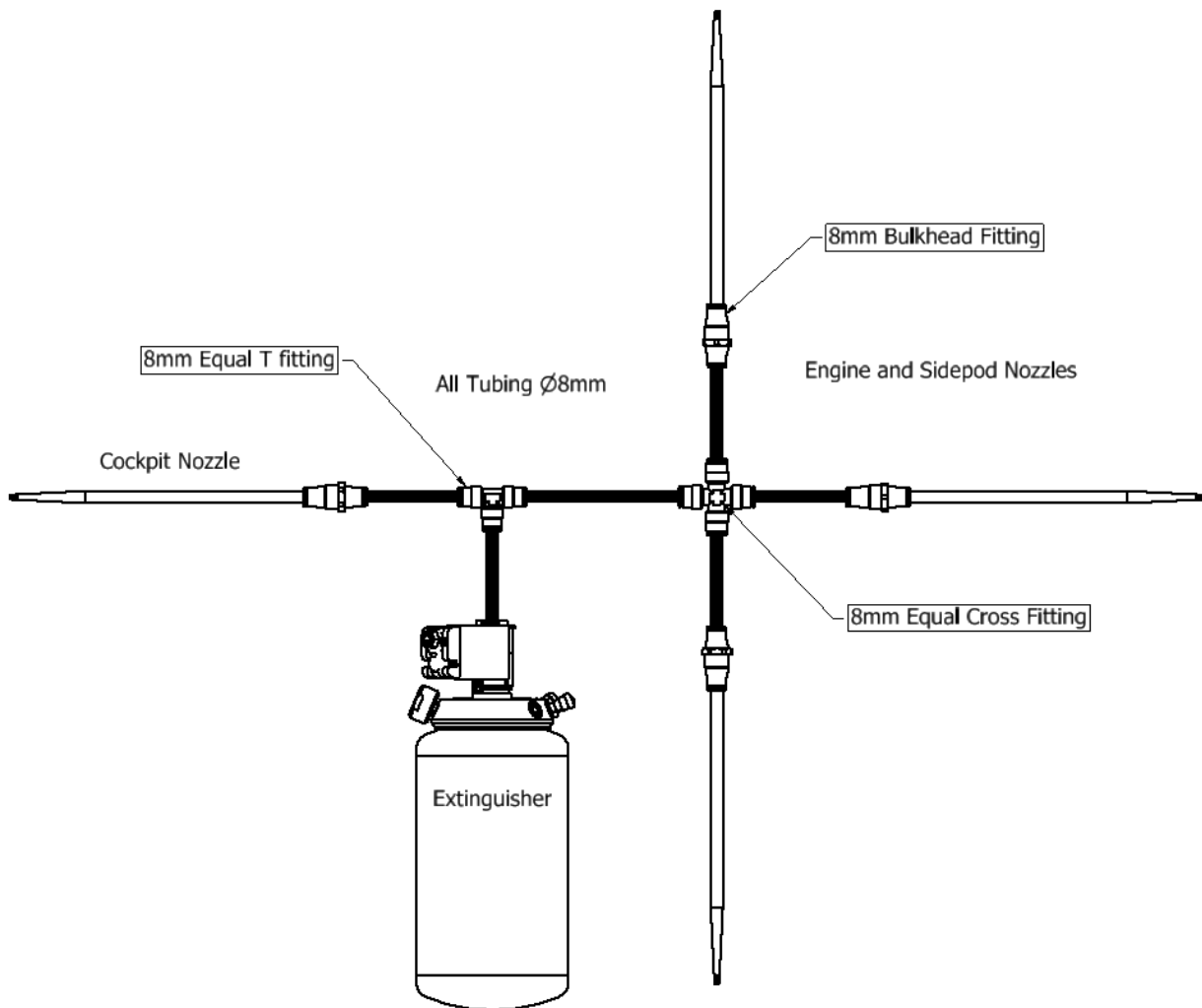


Figure 32 System Delivery Network

Other fittings are available and can be purchased separately upon request.

When cutting the 8mm tube, use 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 below. Use as few bends as possible for smooth flow of suppressant and best performance.

Tube Ø	Minimum Bend Radius
8mm	30mm when using pipe bending tool

Secure the tube using cable ties and saddles or P'clips. Tubes passing through a bulkhead must be protected with a rubber grommet.

3.2 Tube Connectors

The cylinder, cockpit nozzle, T-Piece and adaptors use push fit connectors. To fit, push the tubes firmly into the connectors ensuring they are fully inserted past the internal o-ring seal. Applying light assembly lubricant to the end of each tube can aid fitting.

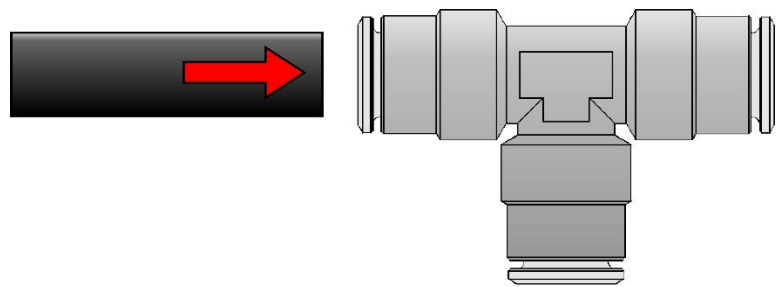


Figure 13 Connecting tube push fit connectors

To disconnect the tubing, compress the silver collet around the tube and pull the tube out.

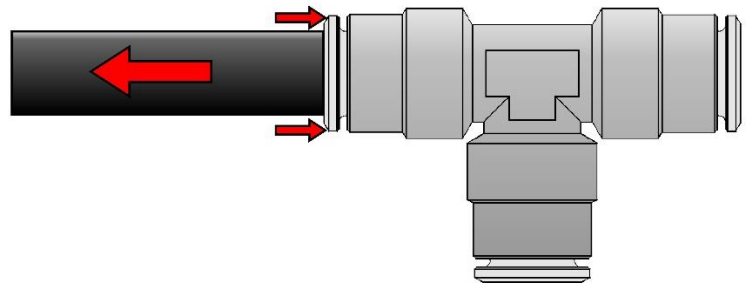


Figure 144 Disconnecting tube push fit connectors

4 Electrical Activation

The electrical system for Zero 175 MUST be independent of other vehicle systems. This is so the extinguisher can still fire in the event of an electrical failure. The system may be integrated into a vehicle wiring loom if it remains an independent circuit.

Do not connect the extinguisher circuit to a common ground or power source. Integrating the electrical system into other electrical circuits will cause the extinguisher to malfunction and it will likely fire.

Do not disassemble or modify the Control Box. This assembly is homologated by the FIA and must be used as supplied. Modifying the control box may cause the system to malfunction.

4.1 Control Box & Activation Switches

The Control Box must be located where it can be reached by the driver/co-driver. E.g. centre of dashboard or centre console area.

Ensure that the LED indicator lights are visible to the driver. Use M4 countersunk bolts to secure the Control Box.

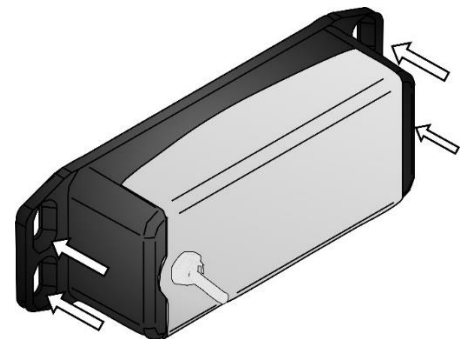


Figure 15 Control Box mounting slots

One activation switch must be located inside the cockpit, within reach of the driver & co-driver, when seated with harnesses on. It is recommended to mark this switch with the small circular “E” sticker that is supplied, or other label marked “FIRE”, “EXTINGUISHER” etc.

The second switch must be located externally directly next to the electrical cut-off switch in accordance with FIA regulations. The circular “E” sticker must be placed next to the external switch.

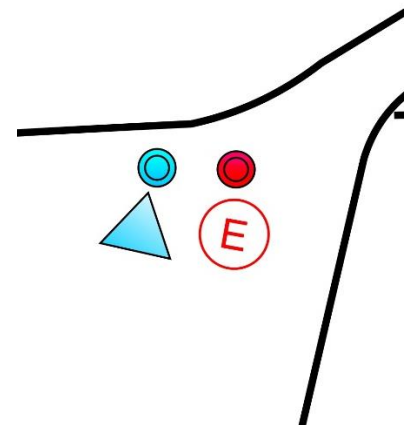


Figure 16 Locate the external switch next to the electrical cut off

Use a Ø13.6 panel cut out and the supplied lock nut to secure the switches.



Figure 17 Activation Switch panel cut out

4.2 Wiring

Wire the system as per the wiring diagram on page 11. Connectors with flying cables are supplied, cut or extend these cables as required. Solder the joints and seal with glue lined heat shrink to protect from water ingress. There are four coloured wires in the circuit:

Blue & Brown: Connect to the switches, wiring the switches in parallel. Do **NOT** wire the switches in series, the system will not fire!

Black & White: Connect to the extinguisher.

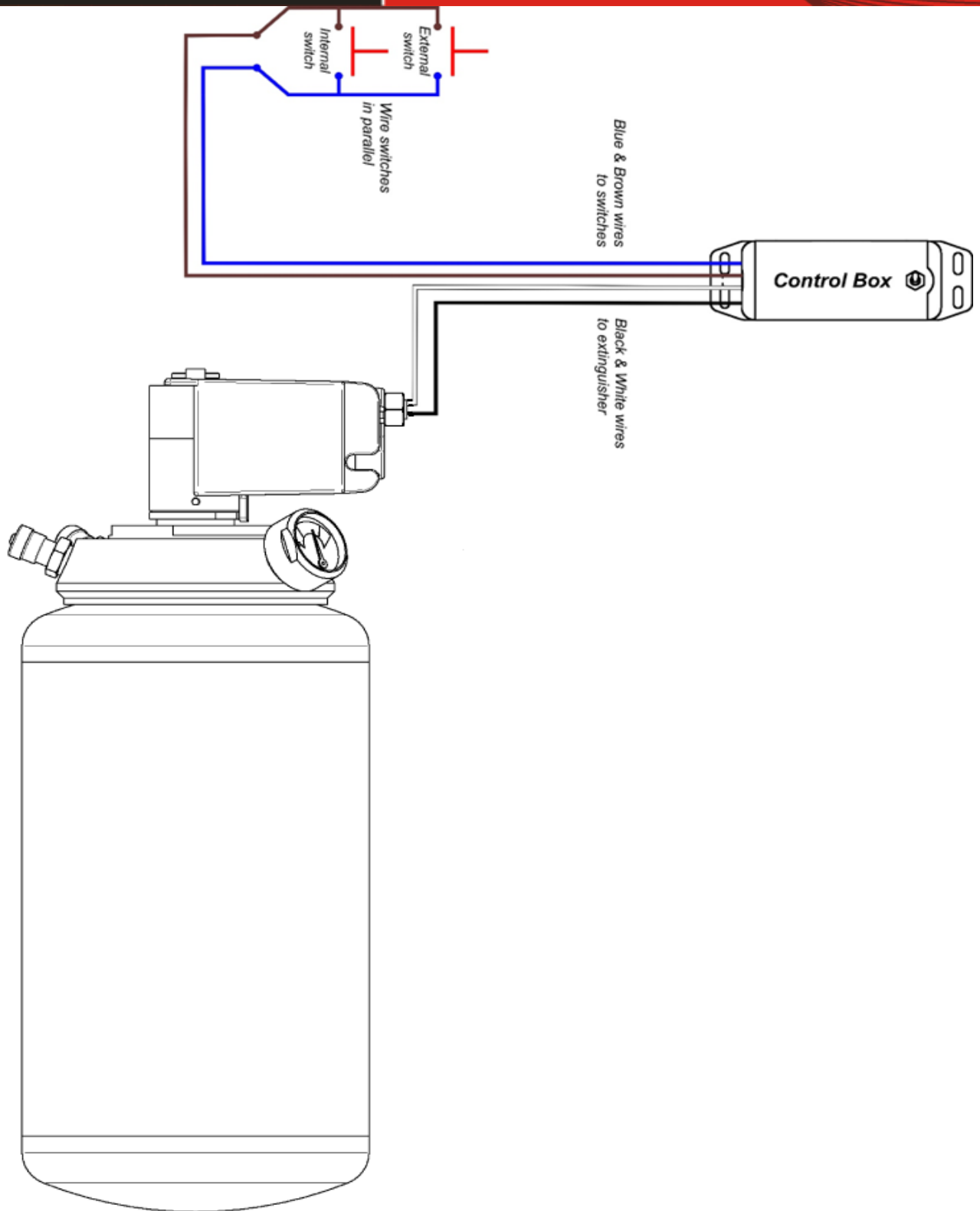


Figure 18 Zero 175 Wiring Diagram

5 System Checking and Maintenance

5.1 Electrical Test

The Control Box has two modes, Test and Armed. When the vehicle is not on circuit or on stage, set the Control Box to Test mode to prevent accidental activation. It is strongly recommended to test the system as described below before every session. This test will also be performed during scrutineering checks.

To test the integrity of the electrical system:

1. Set the Control Box to Test mode by using the switch.
2. Press one of the activation switches. The Control Box will then perform its test cycle.
3. If the system is correctly wired and the battery condition is good, the Amber LED will illuminate for 5 seconds and then go out.
4. If the Amber LED flashes, there is an error in the system:
 - a. 2 flashes = Low/Faulty Battery. The Battery must be replaced.
 - b. 3 flashes = Circuit Fault. Check that the wiring circuit is correct and that there are no breaks in the circuit.

If the system is showing no faults, it can be set to Armed mode using the switch on the Control Box. The Red LED will now flash every 3 seconds. If the LED does not flash, there is a fault in the system and the system will not fire!

5.2 Control Box Battery

Lifeline recommend removing the Control Box battery between events to extend battery life.

To change the battery, remove the 4 Pozi screws on the rear of the Control Box. The battery is attached to the lid by a cable tie, cut this cable tie to release the battery from the lid. Replace the battery, using a small cable tie to secure it to the lid and reconnect to the battery terminal.

Only use alkaline PP3 batteries to spec 6LR61.

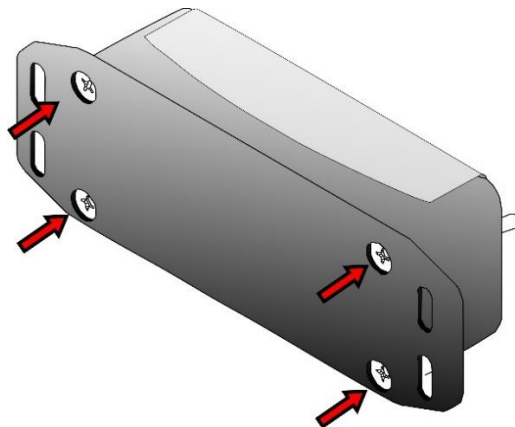


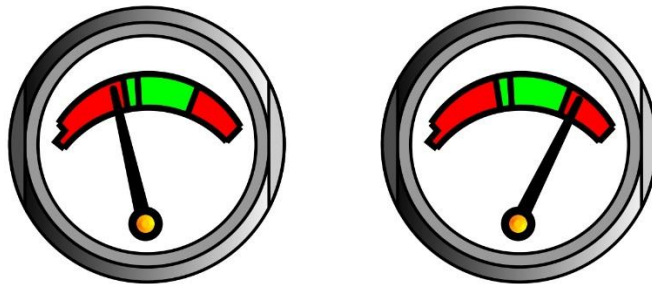
Figure 19 Remove the 4 screws at the rear of the Control Box to change battery

5.3 Extinguisher Pressure Check

1. Check that the cylinder is in date and has been serviced every two years as required
2. Check the weight of the extinguisher against that shown on the serial label. Lifeline use regularly calibrated highly accurate scales and it can be expected that some variance will be found from the weight as shown when using other equipment
3. Check the pressure gauges are in the green area of the scale. Some fluctuation can be observed in high and low temperatures, this is normal.



Extinguisher systems with a pressure gauge showing the above readings shall be considered OK



Extinguisher systems with a pressure gauge showing the above readings shall be considered NOT OK
(ref FIASDH-17-010)

5.4 Cylinder Maintenance

Check that the cylinder has a valid maintenance label. The cylinder must be serviced every two years by Lifeline or an approved Lifeline service agent. Do not attempt to service the system yourself or have the system serviced by a non-Lifeline approved service agent, this will void the system's validity and potentially cause injury.

Regularly check the weight of the extinguisher against that shown on the label. Some variances will be found when using difference weight equipment. If the system measures significantly underweight, return the system to Lifeline for repair.

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

1. INSTALLATION DU SYSTEME D'EXTINCTION / FIRE EXTINGUISHER SYSTEM INSTALLATION

101. INSTALLATION DANS L'HABITACLE / COCKPIT INSTALLATION

- a) Emplacement et orientation du corps

Location and orientation of body

Transversally or longitudinally, and within the safety cell/monocoque

- b) Emplacement et orientation des buses

Location and orientation of nozzles

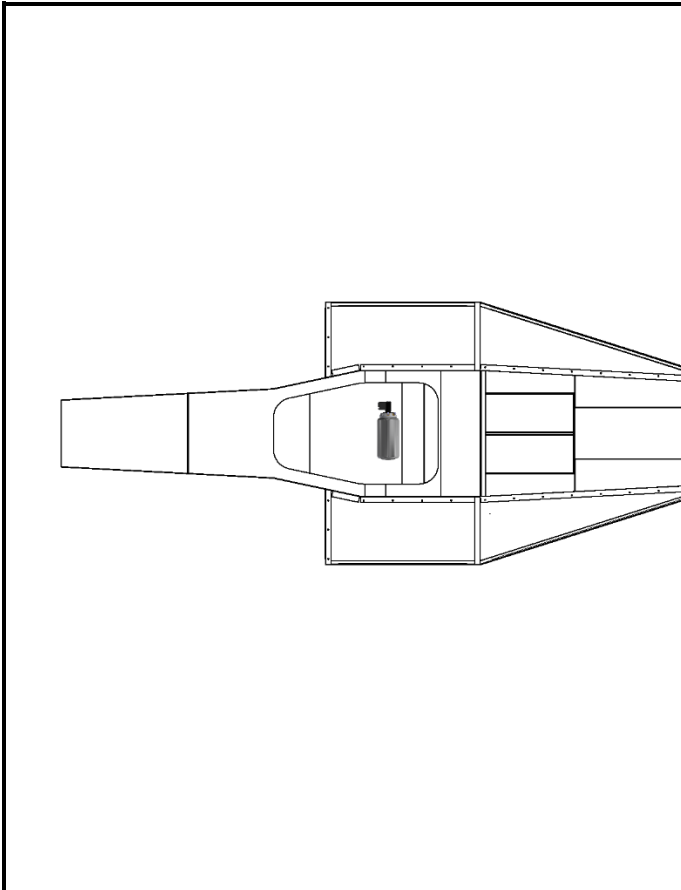
Aimed in to the centre of the cockpit

- c) Précaution à prendre lors de l'installation du système

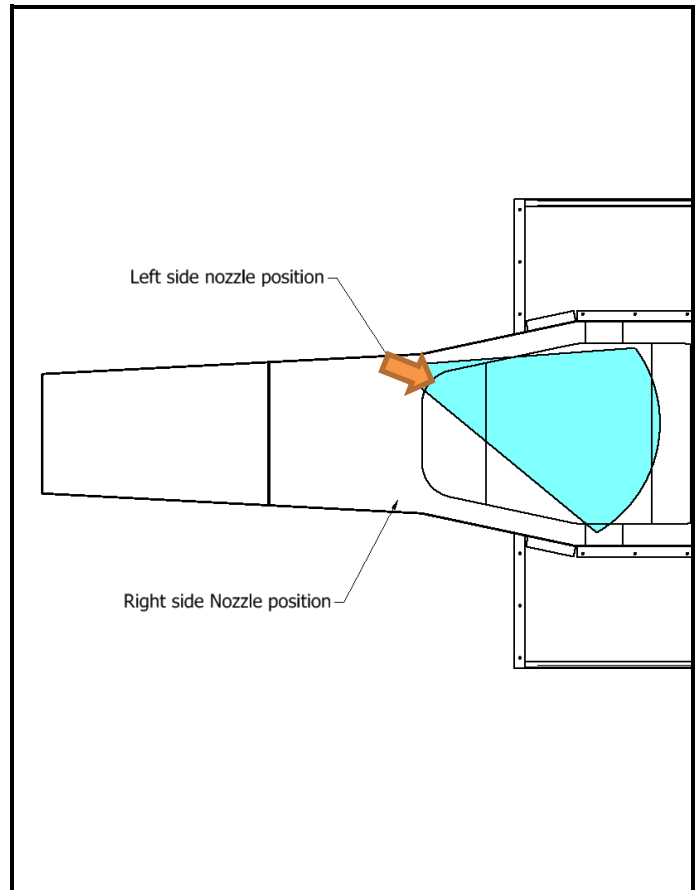
Special care to take with the installation of the system

**Ensure nozzle is not excessively obstructed. Ensure cylinder is not positioned where it could be damaged or exposed to extreme heat
See Lifeline Technical Bulletin 067 for detailed installation instructions**

E1-1) Installation dans l'habitacle (emplacement et orientation du corps)



E1-2) Installation dans l'habitacle (emplacement et orientation des buses)



102. INSTALLATION DANS LE MOTEUR / ENGINE INSTALLATION

- a) Emplacement et orientation du corps

Location and orientation of body

Transversally or longitudinally, and within the safety cell/monocoque

- b) Emplacement et orientation des buses

Location and orientation of nozzles

2 nozzles on either side of the engine, 3rd nozzle targeted at likely sources of ignition

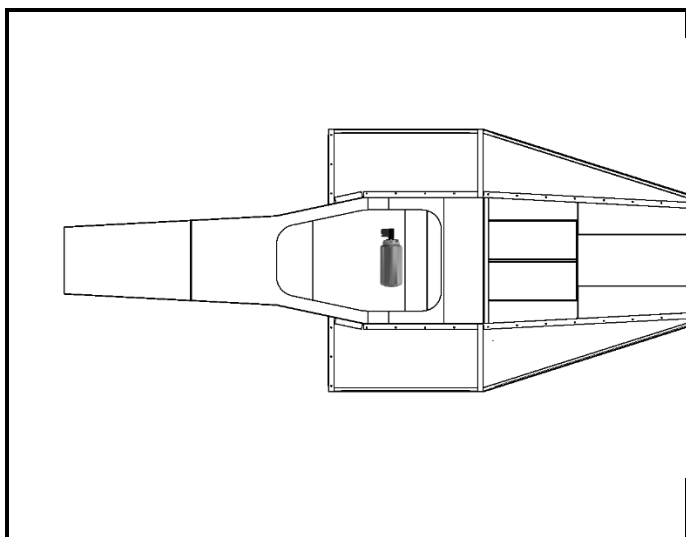
- c) Précaution à prendre lors de l'installation du système

Special care to take with the installation of the system

Nozzles must not be obstructed in any way. See Lifeline Technical Bulletin 067 for detailed installation instructions

E2-1) Installation dans le moteur (emplacement et orientation du corps)

Engine installation (location and orientation of body)



E2-2) Installation dans le moteur (emplacement et orientation des buses)

Engine installation (location and orientation of nozzles)

