



## **MULTI-FLO AFFF SYSTEMS**

FIA HOMOLOGATION NUMBER: - EX003.98

### *Installation Instructions*

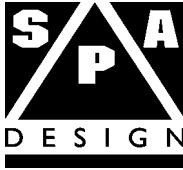
**Please read carefully before  
attempting to install  
your system.**



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## Firefighter/ Firesense-Response AFFF Multi-flo Systems covered by this manual

<input type="checkbox"/>	<b>LWE 75 SR3</b>	3.375 Ltr Electrical Dual Chamber
<input type="checkbox"/>	<b>LWE 75 SR3 SL</b>	3.375 Ltr Electrical Dual Chamber Slimline
<input type="checkbox"/>	<b>LWE 75 SR3 CF</b>	3.375 Ltr Dual Chamber Carbon Electrical
<input type="checkbox"/>	<b>MFM 75 A</b>	3.375 Ltr Alloy Mechanical
<input type="checkbox"/>	<b>MFM 75 A-SL</b>	3.375 Ltr Alloy Mechanical Slimline
<input type="checkbox"/>	<b>MFM 75 S</b>	3.375 Ltr Steel Mechanical
<input type="checkbox"/>	<b>MFM 75 CF</b>	3.375 Ltr Carbon Mechanical
<input type="checkbox"/>	<b>MFE 75 A</b>	3.375 Ltr Alloy Electrical
<input type="checkbox"/>	<b>MFE 75 A-SL</b>	3.375 Ltr Alloy Electrical Slimline
<input type="checkbox"/>	<b>MFE 75 CF</b>	3.375 Ltr Carbon Electrical
<input type="checkbox"/>	<b>MFE 75 CFO</b>	3.375 Ltr Carbon Electrical Oval
<input type="checkbox"/>	<b>MFM 400 A</b>	4.0 Ltr Alloy Mechanical
<input type="checkbox"/>	<b>MFM 400 A-SL</b>	4.0 Ltr Alloy Mechanical Slimline
<input type="checkbox"/>	<b>MFM 400 S</b>	4.0 Ltr Steel Mechanical
<input type="checkbox"/>	<b>MFM 400 CF</b>	4.0 Ltr Carbon Mechanical
<input type="checkbox"/>	<b>MFE 400 A</b>	4.0 Ltr Alloy Electrical
<input type="checkbox"/>	<b>MFE 400 A-SL</b>	4.0 Ltr Alloy Electrical Slimline
<input type="checkbox"/>	<b>MFE 400 CF</b>	4.0 Ltr Carbon Electrical
<input type="checkbox"/>	<b>MFE 400 CFO</b>	4.0L Oval Carbon Fibre Bottle System Electrical
<input type="checkbox"/>	<b>GGR 75 A</b>	3.375 Ltr Gas Gen Alloy Bottle System
<input type="checkbox"/>	<b>GGR 75 CF</b>	3.375 Ltr Gas Gen Carbon Fibre Bottle System
<input type="checkbox"/>	<b>GGR 400 A</b>	4.0L Gas Gen Alloy Bottle System
<input type="checkbox"/>	<b>GGR 400 CF</b>	4.0L Gas Gen Carbon Fibre Bottle System
<input type="checkbox"/>	<b>GGO 75 CF</b>	3.375 Ltr Gas Gen Oval Carbon Fibre Bottle System
<input type="checkbox"/>	<b>GGO 400 CF</b>	4.0L Gas Gen Oval Carbon Fibre Bottle System



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Thank you for purchasing a Firefighter/ Firesense-Response AFFF Multi-flo System (which has been FIA homologated).

It is important that you read the following instructions carefully before attempting to install your fire suppression system.

The performance of this system could be effected if it is in anyway modified or tampered withit may make void its homologation. Please ensure that should any parts need to be replaced, only genuine SPA Firefighter/Firesense-Response components are used.

Should you require any assistance, please do not hesitate in contacting SPA Design on 01543 434580.

#### IMPORTANT NOTE

The purpose of this along with any other vehicle fire suppression system is to provide sufficient time in which to control the fire to enable the occupants to leave the vehicle. In ideal conditions, the fire will be extinguished completely but this can not be guaranteed. The main purpose is to curb the intensity of either an engine or cockpit fire to provide the means for the occupants to leave the vehicle or for outside assistance to be given.



# ***C O N T E N T S***

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# ***ELECTRICAL FITTING INSTRUCTIONS***

Unpack all parts and check components against 'kit list'.

- Remove the bottle from its plinth by undoing the over-centre clips. Decide the best position for the extinguisher – IT IS RECOMMENDED THAT THE BOTTLE SHOULD BE MOUNTED IN THE FORE AND AFT DIRECTION IN THE VEHICLE. The extinguisher label, detailing contents, etc and also the pressure gauge should be visible. Mount the plinth securely to the vehicle and put the bottle back into place. (*Refer to Figure 3.*)
- Mount the power pack in a clearly visible position.
- Switch with red plastic shroud to be fitted in the cockpit so that it is in easy reach of both the driver and/or co-driver when sitting in the normal driving position and wearing fully fastened seatbelts.
- The other switch with flexible red membrane (waterproof) is to be fitted to the outside of the vehicle, close to the exterior master switch (for activation by the Marshals).
- Once the system has been wired as per wiring diagrams (*refer to Figure 1 / 2*), the following tests should be carried out to check the system is fitted correctly and will operate when required. (*See Page 5*)

## SPA DESIGN FIREFIGHTER/ FIRESENSE- RESPONSE ELECTRICAL DETAILS

The SPA FireFighter/ Firesense-Response system uses actuators to operate valves located within the pressurised container that contains the extinguishant. These are triggered remotely using a battery-powered power pack.

In order to guarantee reliable operation the connectors used are 1P67 and the actuators used are of a military specification with the system / battery test electronics integrated into the power pack. The actuators are designed to either operate individually, or to be wired in series if two firing heads are used.

The power pack electronics can test the continuity of the wiring, and also provides a high current pulse test to ensure system integrity before use. Unlike other systems, the battery test will not destroy or put an excessive drain on the battery during this critical test. These tests are performed using a three way switch on the power pack box and should be performed before each usage of the system, since the system is only as good as the battery that powers it and the integrity of the wiring loom and its connectors.

To check the condition of the battery. press and hold up the switch on the power pack box. **Every two seconds you will see a YELLOW light flash.**

If the light flashes very dimly the battery must be replaced.

**IF IN DOUBT REPLACE THE BATTERY !!!!**

To check the continuity of the wiring, ensure that the switch on the power pack box is in the **SYSTEM INACTIVE** to ensure that the extinguisher is not fired.

Press the internal firing button and check that the **RED** light comes on, press the external firing button, and check that this also makes the **RED** light come on.

The external button must be positioned close the the exterior master switch.

**DO** ensure that the wiring cables do not run next to looms especially if they contain ignition or battery cables

**DO** ensure that any exposed connections that are likely to get water sprayed are protected.

**DO NOT** allow cables to run through sharp edged apertures without protection

**DO NOT** fix cables to any surface that is likely to see excessive temperatures.

# ***MECHANICAL SYSTEM***

This SPA Firefighter/Firesense-Response system is a mechanically operated AFFF foam system. The system uses two T-handle pull cables, one 6ft long and one 12 ft long.

## ***FITTING INSTRUCTIONS***

Unpack all parts and check components against 'kit list'.

- Remove the bottle from it's plinth by undoing the over-centre clips. Decide the best position for the extinguisher – IT IS RECOMMENDED THAT THE BOTTLE SHOULD BE MOUNTED IN THE FORE AND AFT DIRECTION IN THE VEHICLE. The Unit label, detailing contents, etc and also the pressure gauge should be visible. Mount the plinth securely to the vehicle and put the bottle back into place. (*refer to Figure 3*).
- Insert the end of the decabon tube into the push-in fitting on the lever-valve and lay the length of the tube from the cylinder to the chosen location; plug the nozzle onto the free end of tube and orientate this to point the nozzles onto anticipated fire sources.
- Mount the 6-ft cable in the cockpit within reach of the driver and / or co-driver when sitting in the normal driving position wearing seat-belts. The other end of the cable is to be threaded

through one of the adjusting screws on the handle of the lever-valve (on the cylinder). Then threaded through one of the holes in the other handle and the clamp screw made secure on cable against the underside in such a way that movement of the red pull handle will close the handles of the lever-valve, BUT allowing 6mm of free-play. CAUTION: do not allow this testing to actually move the handles or the valve may open and release the extinguishant (**keep the safety pin in place**).

- Mount the 12-ft cable on the outside of the vehicle (close to the exterior master switch is the recommended position). Lay the cable inside the vehicle and connect to the lever-valve as above.
- Pull cables should be fitted in such a way that no kinks or 'S' bends are formed, which could cause malfunction.
- Removing the safety pin from the lever-valve leaves the system ready for use.
- **SAFETY WARNING Failure to remove safety pin will render the system inoperable when required.**

## ***A.F.F.F. NOZZLES***

It is important that all of the nozzles provided in the fire system kit are used.

The nozzles will produce a fine atomised spray with the AFFF emerging as a milky white foam substance, which forms a film barrier starving the fire of oxygen. This foam spray has the capability of excellent fire out times and has a cooling effect, which can control re-ignition. When locating the nozzles it should be noted that there

is a 90° cone pattern with a 1/2 metre range. The nozzle is designed to mount through a bulkhead if desired or mounting brackets. Nozzles should not simply be supported by their own pipe work.

Nozzles should be checked for damage/possible blockage. They should also be tested to ensure that they are in good working order.

Depending on the class of racing / rallying, (which is the competitors responsibility) e.g. International rallying, which needs a 4 lt system, the engine bay must have 3 nozzles installed, with one each side of the motor and 3 nozzles installed in the cockpit.

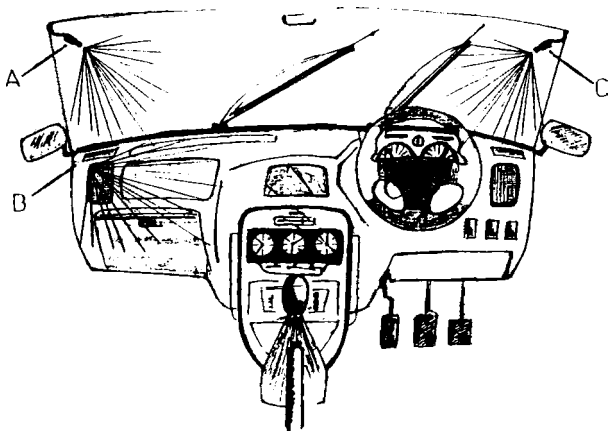
For open cars, the system must include at least one nozzle which should be aimed at the drivers midriff with special care being taken not to spray into the drivers face.

For saloon /closed cars a minimum of 3 nozzles must be fitted (again depending on the system) within the cockpit area. Nozzles should be fitted either to the top of the roll bar main hoop (door B pillar) pointing inwards and downwards towards the foot of the diagonally opposite front roll bar hoop base (door A post) or either under the dashboard aiming at the drivers midriff.

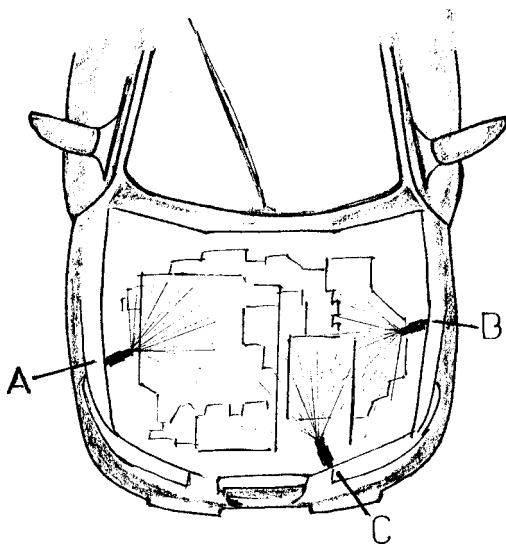
These are only guide lines for competitors using SPA DESIGN fire suppression systems.

**IF IN DOUBT, ASK!!!**

Please refer to Figure 4/5 (for example) of nozzle location.



EXAMPLE OF ENGINE NOZZLE LOCATION



# **TUBING**

Each Firefighter/Firesense-Response System kit is supplied with Decabon tubing which is plastic coated aluminium tube which can be moulded and flexed to suit this application. The Firefighter/Firesense-Response system has been designed and homologated using this type of tube of 6mm dia. DO NOT substitute this tube for any other type.

## **TUBE CONNECTIONS**

All fittings for tube to nozzles and bottle are of the push-in type. Insert the tube into the fitting, push firmly until it clicks. Once in you should not be able to pull it out.

To remove the tubing, push the tube into the fitting and at the same time push the black collet back towards the fitting and then pull the tube from the fitting.

## **KIT LISTS**

### **4 LTR MULTI-FLO SINGLE CHAMBER ELECTRICAL**

Electrical system comes fitted with firing head.

1 x Base

2 x Straps

1 x Rectangular Strengthening Support Bracket

1 x SP007H – Power Pack (Hirschmann as standard)

2 x SP005H – Plug & Lead

1 x SP011 – Internal Fire Button

1 x SP012 – External Fire Button

5 x SP016 - Decabon Tubing (Mtr)

6 x SP030 – 6mm Nozzle

5 x SP015 – 6mm Tee

1 x SP020 – Bulkhead Fitting

1 x SP017 – ‘E’ location sticker

## **4 LTR MULTI-FLO SINGLE CHAMBER MECHANICAL**

Mechanical System comes fitted with Lever Valve

- 1 x Base
- 2 x Straps
- 1 x Rectangular Strengthening Support Bracket
- 1 x SP018 - 6ft Pull Cable
- 1 x SP019 – 12ft Pull Cable
- 6 x SP030 – 6mm Nozzle
- 5 x SP015 – 6mm Tee Piece
- 1 x SP020 – Bulkhead Fitting
- 5 x SP016 – 6mm Decabon Tubing (Mtr)
- 1 x SP017 – ‘E’ Location Sticker

## **3.375 LTR MULTI-FLO DUAL CHAMBER ELECTRICAL (PART No: LWE 75 SR3)**

Electrical System comes fitted with firing heads.

- 1 x Base
- 2 x Straps
- 1 x Rectangular Strengthening Support Bracket
- 1 x SP007H – Power Pack
- 3 x SP005H – Plug and Lead
- 4 x SP030 – 6mm Nozzle
- 2 x SP015 – 6mm Tee Piece
- 1 x SP020 – Bulkhead Fitting
- 1 x SP011 – Internal Fire Button
- 1 x SP012 – External Fire Button
- 5 x SP016 – 6mm Decabon (Mtr)
- 1 x SP017 – ‘E’ location Sticker

# **SAFETY DATA SHEET FOR AFFF** **(Aqueous Film Forming Foam)**

<b>APPLICATION</b>	Autosport industry – including saloon, single seaters and other racing cars.
<b>CONTENTS</b>	Light Water, Meg and Water
<b>COMPOSITION</b>	Water, Diethylene Glycol, Fluordalkyl, Synthetic Detergents and Fluorochemicals.
<b>APPEARANCE</b>	Clear liquid with an amber colour
<b>pH</b>	Approx. 8.50
<b>BOILING POINT</b>	100°C (initial)
<b>VAPOUR PRESSURE</b>	Approx. 17.6 mm Hg Calc @ 20°C
<b>WATER SOLUBILITY</b>	Miscible
<b>FREEZING POINT</b>	- 10°C
<b>PHYSICOLOGICAL PROPERTIES</b>	Non-harmful.

# ***MAINTENANCE***

To ensure maximum possible performance from your SPA Fire Fighter / Firesense Response system, the following checks and maintenance procedures should be carried out.

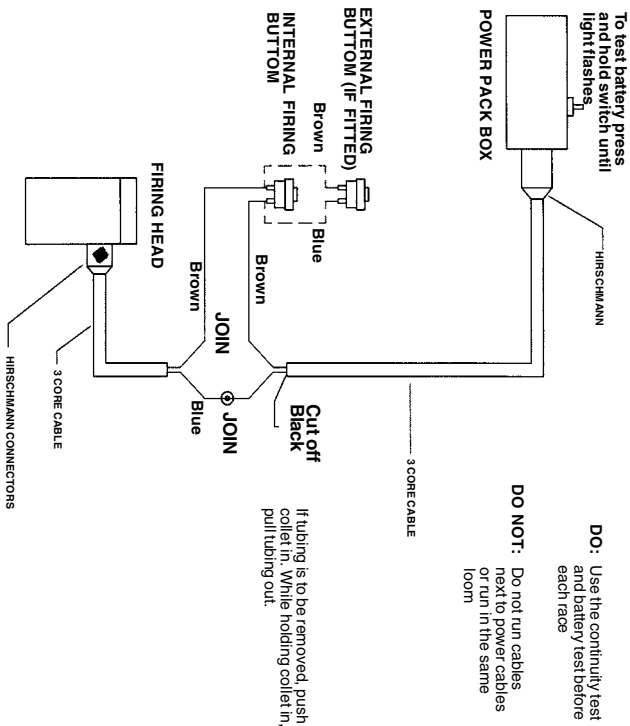
- Regularly check the pressure gauge to ensure they are in the green section.
- Regularly check nozzles for debris or any obstructions externally and internally.
- Regularly check the integrity of the pipe work and fitting.
- Regularly check the cylinder for physical damage or corrosion.
- Regularly check the mounting base and retaining straps are secure.
- Regularly check your power pack control box and condition of the internal alkaline battery, the battery should be changed preferably every 6 months or if system has been fired off.
- Regularly check your wiring and electrical connectors for any damage.
- If the system has been activated the nozzles and pipe work should be washed through with fresh water and then cleared with an air line if possible to avoid residue of the extinguishant crystallizing in the pipe work or nozzles.
- Your SPA fire suppression system must be serviced every 2 years, a service due date is written on the contents label located on your cylinder. It is up to you to ensure the services are carried out at the correct intervals.
- If your system has been discharged or requires a 2-year service you must return it to SPA or an approved agent of SPA fire suppression systems.

## ***NOTES***

Please ensure that you monitor the following, as you **may not** pass scrutineering **if**:

- The needle on the gauge is in the red section
- The bottle contents label is worn, damaged or unreadable.
- The unit is not within the service date.
- The system is in a poor condition

# SPA FIRE-FIGHTER/FIRESENSE-RESPONSE ELECTRICAL SYSTEM WIRING SCHEMATIC SINGLE CHAMBER



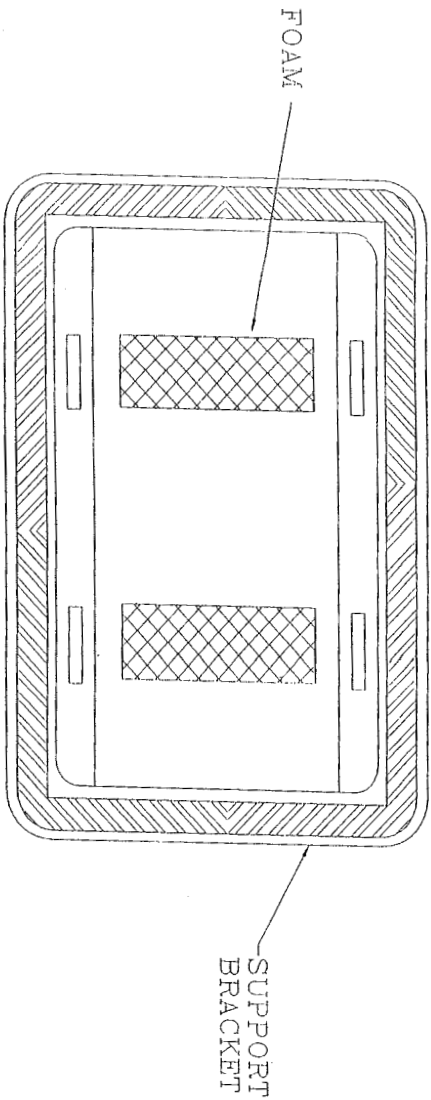
- To test the battery, push and hold lever switch upwards in the "Battery Check" position until green light flashes.
- If the extinguisher tubing is to be removed, push the black collet in and pull the tubing out at the same time.

**RECOMMENDED:** Use the continuity test and battery test before each race.

**DO NOT:** Run the cables next to power cables, or in the same loom.

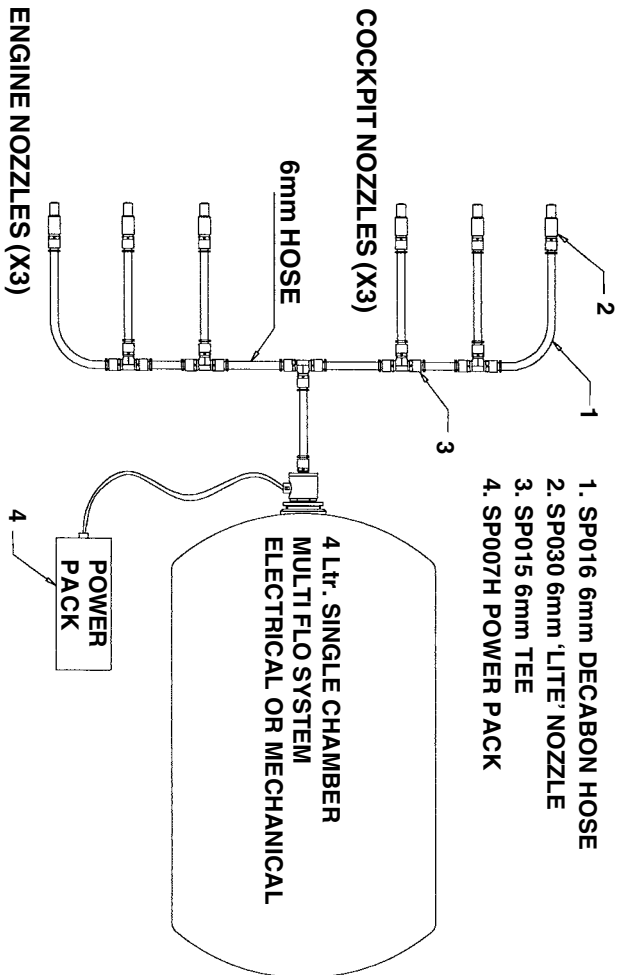


TOP VIEW



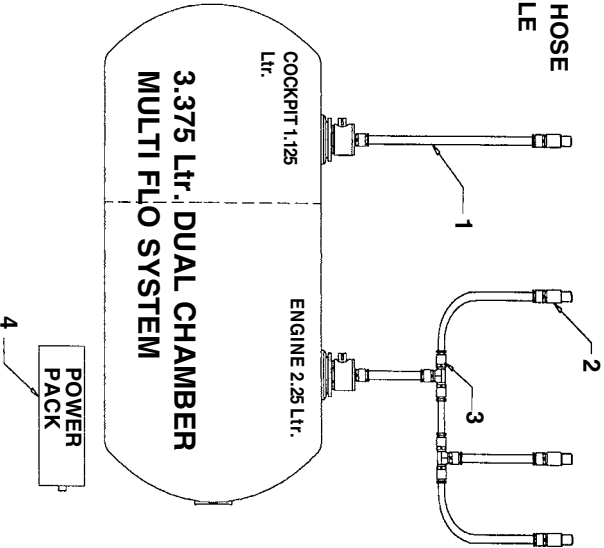
RECTANGULAR STRENGTHENING  
SUPPORT BRACKET

# NOZZLE LAYOUT FOR 4 LTR SINGLE CHAMBER

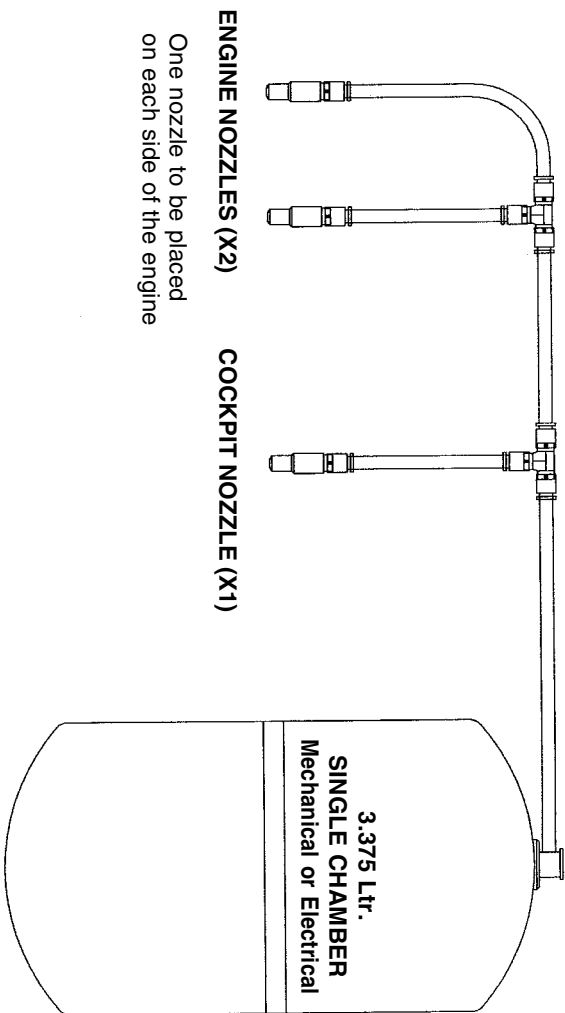


# NOZZLE LAYOUT FOR 3.375 LTR DUAL CHAMBER

1. SP016 6mm DECABON HOSE
2. SP030 6mm 'LITE' NOZZLE
3. SP015 6mm TEE
4. SP007H POWER PACK



## NOZZLE LAYOUT FOR 3.375 LTR SINGLE CHAMBER



One nozzle to be placed  
on each side of the engine

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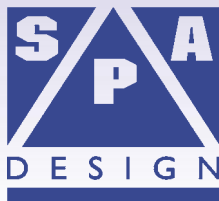
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# *Notes*



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