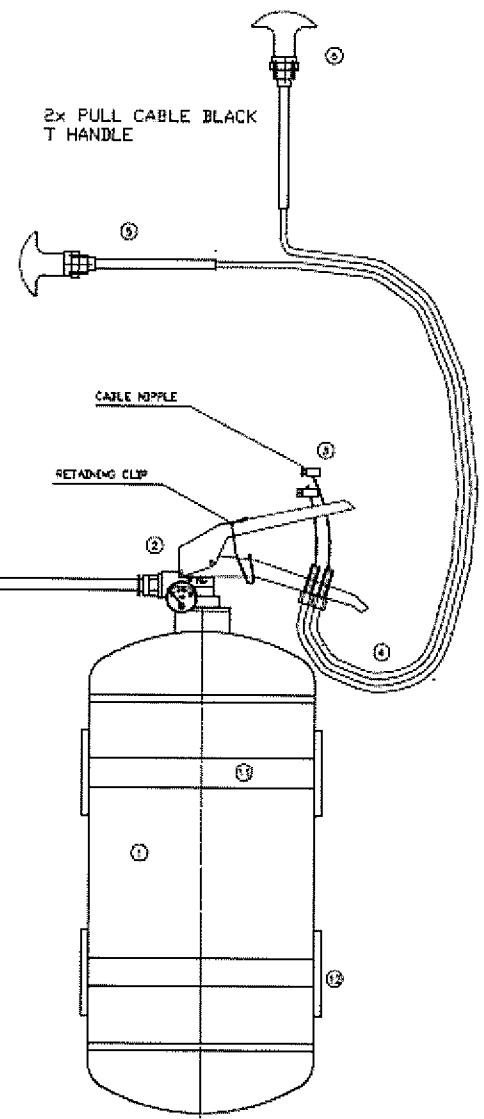
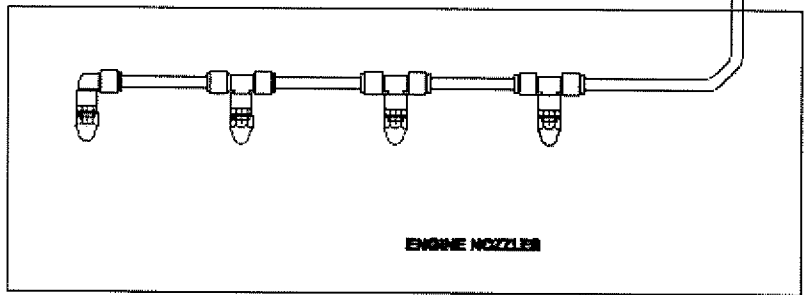
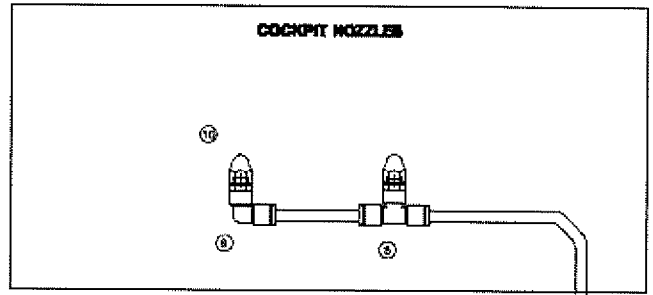


TUV Automotive GmbH, D-85748 Garching
 extinguisher test department AM-UA-T1
 expert: Dipl.-Ing. Knut Wartenberg
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[Handwritten signature]



COMPONENTS			
1	diameter bottle	8	T bolt
2	mechanical cable	9	T bolt
3	fitting clamp	10	nozzle
4	internal pull activation cable	11	fitting band
5	external pull activation cable	12	retaining bracket
6	Self aluminium tube	13	
7	3 way joint		

COMPONENTS		REV.	DATE
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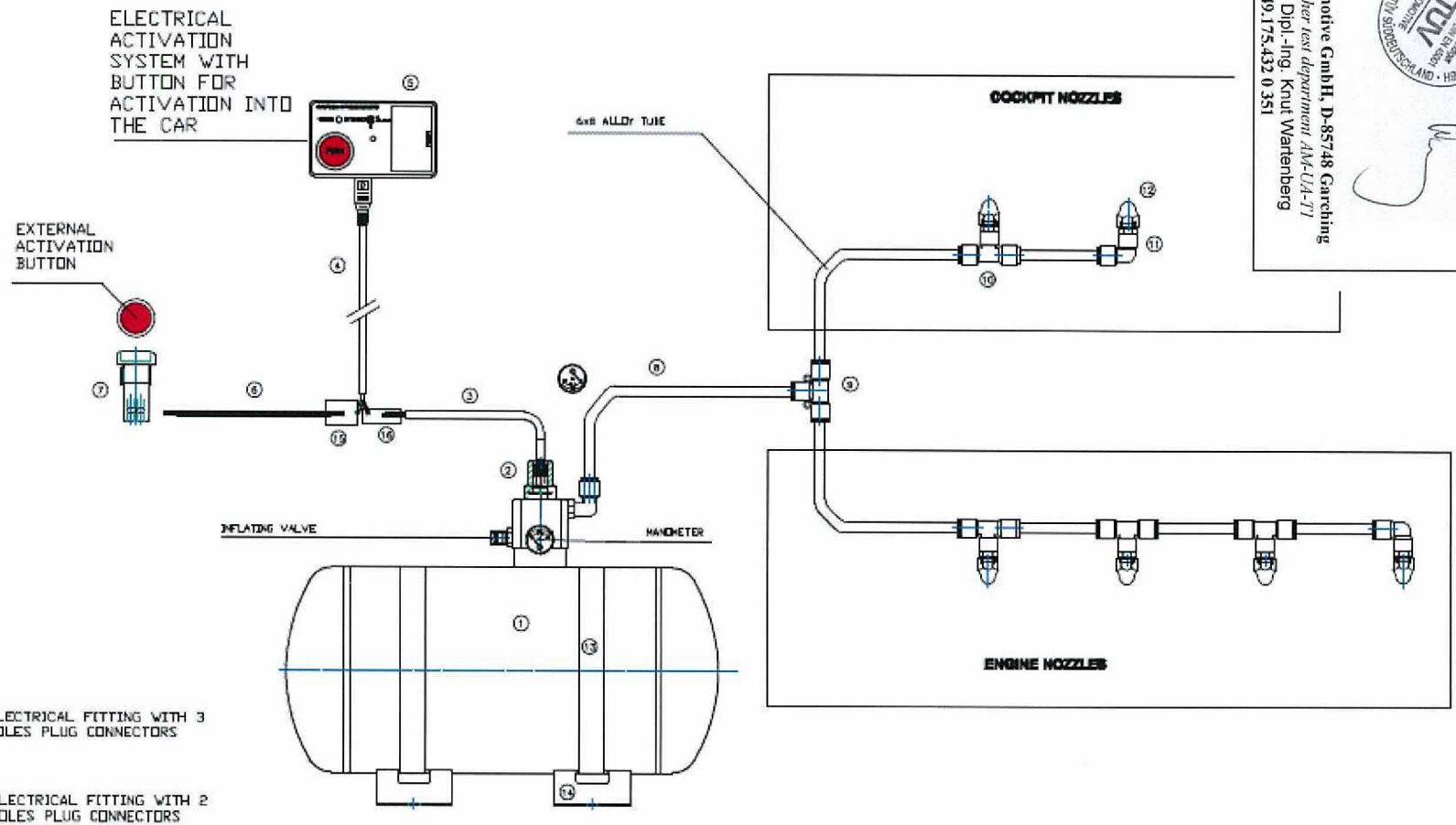
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- 15 ELECTRICAL FITTING WITH 3 POLES PLUG CONNECTORS
- 16 ELECTRICAL FITTING WITH 2 POLES PLUG CONNECTORS


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 extinguisher test department AM/UA-77
 expert: Dipl.-Ing. Knut Wartenberg
 ☎ +49.175.432 0 351

COMPONENTS

1	aluminum bottle	8	6x8 aluminum tube
2	aluminum valve	9	3 way joint
3	jack cable	10	T joint
4	sigma cable	11	L joint
5	activation box	12	nozzle
6	black-red cable	13	fitting band
7	external button	14	fitting bracket
Pos	Nome	Pos	Nome

Rev.	Emissione	Mag.	Aut.
Rev.	Descrizione	Mag.	Control/Approvato
EXTINGUISHER KIT-ELECTRICAL ACTIVATION (OFF FOAM) - 4.0L ALLOY ELECTRICAL SYSTEM -			SCALA 1:1 DATA 2/06/2009 CHECK: HRZ AI
GRUPPO HAPPY RACER S.p.A. Via Vittorio Veneto II, 6 Torino			Elaborazione <small>© 2009 Happy Racer S.p.A. - Tutti i diritti sono riservati.</small>

FITTING INSTRUCTION FOR FIRE EXTINGUISHER SYSTEMS TYPE HR 1

Thank you for purchasing a FIA approved Gruppo Happy Racer fire system. It is important that you read these instructions carefully before attempting to install your extinguisher system.

It is not allowed to modify the system in any way. By doing so, you could seriously affect its performance. Furthermore the FIA homologation wouldn't be valid after any modification.

If you need to replace parts, only genuine Gruppo Happy Racer components are to use.

If you have any difficulties or questions installing your system, please do not hesitate to contact Gruppo Happy Racer.

Important note: The purpose of the fire protection system is to provide the evacuation of the driver/co-driver or allow outside assistance within 30 seconds in which the fire can be under control. Ideally, the fire will be totally extinguished, but this cannot be guaranteed in all cases.

FITTING INSTRUCTION

Unpack the kit carefully and check that all components are complete. Lay out the components so that each may be identified. Remove the extinguisher from its mounting bracket by undoing the over centre clips. Search the best position for the extinguisher to be mounted. Hold in mind that the extinguisher label, showing its contents and the pressure gauge is easily visible. Mount the extinguisher bracket securely onto the vehicle floor and fix the bottle with the 2 metal straps.

SYSTEM with ELECTRICAL ACTIVATION

Mount the control unit (activation box) with the integrated red pushbutton and 9 volt battery in the cockpit so that it is easily to reach from the driver/co-driver when sitting in the normal driving position and wearing fully fastened seat belts. The flexible pushbutton is for the outside of vehicle as it is waterproof. It should be fitted at the lower left part of the windscreen mounting. Don't forget to indicate the pushbutton with the included circular sticker according ISC annex J, article 253.7.2.3.

- Wiring of system

The Gruppo Happy Racer control unit has an own electric power supply to provide the current needed to operate the system. The control unit is to be wired independently from the vehicle's electrical on-board-system. Make the electrical connections as shown in the enclosed drawing.

Then make following checks after wiring with a voltmeter:

"Jack cable" number 3 (see drawing) **not connected (!)** with the valve at the bottle:

Switch at the control unit in ON position – during pushing the pushbutton is pushed, there is a voltage of not less than 7 Volt at the end of the jack cable plug into the valve of the bottle. When the switch is in the OFF-CHECK position and the pushbutton is pushed, the measured current at the plug must not exceeded 1mA.

Once the system has been wired a final test check should be carried out if everything is in order. Before you start this check procedure, ensure that the bottle and the control unit **are connected**.

You must switch the operating switch at the control unit into the **TEST (!!!)** position.

Pressing the red pushbutton (first the inside, later the outside one) will show the following:

- 1 function that the pushbutton gives a signal
- 2 Continuity of connections between the control unit and the extinguisher; the red lamp in the control unit will light up if there are no breaks
- 3 Battery efficiency: the red lamp will light up if the charging status of the battery is sufficient to guarantee extinguisher operation.

IMPORTANT: You are advised to limit duration and frequency of controls, because the check by pressing the pushbutton costs battery lifetime. The use of a 9 Volt transistor-type alkaline-manganese battery (IEC 6LF22) is to use. Don't modify the cable junctions, don't insert the plug of the "signal cable" number 4 into the control unit falsely (plug is to insert with flat side on top).

- Operating

When the operating switch at the control unit is switched into the ON position, the system is ready to be used. By pressing either the outside or inside pushbutton the extinguisher will be activated and the whole extinguishant will come out. When it is not necessary to use the system (paddock, transfer journeys, servicing and closed parks for rallies) you are advised to turn off the operating switch into **TEST** position to avoid accidentally activation.

SYSTEM with ECHANICAL ACTIVATION

These systems are operating with pull cables. Each kit is supplied with two cables, one being 2 meters in length.

- Installation

Decide upon the best position for the pull cables to be mounted. Hold in mind that the cable mounted in the cockpit has to be accessible to driver and co-driver when sitting in the normal driving position and wearing fully fastened seat belts. The external cable is normally mounted at the lower left part of the windscreen mounting. When installing the pull cable on a saloon car, ensure that you leave sufficient clearance for the bonnet to fully open. Don't forget to indicate the cable knob with the included circular sticker according ISC annex J, article 253.7.2.3.

The pull cables should be routed so that there are no sharp bends or S-shapes in the cable, this will ensure easy operation for the cables. The end of the cable should be passed through the levers of the extinguisher head and secured using the cable clamps attached to the end of the cables. It is recommended to leave a small amount of slack in the cable to prevent accidentally activating of the extinguisher. It is recommended that the cables are periodically lubricated and checked to prevent seizure.

NOZZLES

It is important that the correct nozzles, supplied with the system, are used. The nozzles will produce an atomized foam spray. This foam spray, with its controlled particle size, has excellent fire extinction property. It covers the area foreseen to protect with a milky foam substance which has a cooling effect and does also control re-ignition. The foam is easily to clean with water. The nozzles produce a 90° full cone spray pattern with an effective discharge range of approximately 1 meter. This is to consider when locating the nozzles.

Each kit is supplied with the necessary number of nozzles and T-pieces to allow the correct number of nozzles to be fitted either into the engine compartment or into the cockpit.

Cockpit nozzle location for closed cars: two nozzles are to be mounted in the cockpit. It is recommended to mount the nozzles under the dashboard, pointing in direction of the footwell area of both the driver and co-driver compartment, or - if there is no co-driver – one nozzle under the driver's side dashboard and one nozzle to the top of the main roll bar (main hoop – door pillar) respectively to the roof, pointing inwards and downwards towards the footwell area of the driver.

Cockpit nozzle location for single seater open car: two nozzles are to be mounted in the cockpit. It is recommended to mount the nozzles under the dashboard, aiming at the driver's midriff. Special care should be taken to ensure that the nozzles will not spray into the driver's face.

Engine nozzle location for closed cars: four nozzles are to be mounted in the engine compartment, two positioned on each side of the engine. It is recommended that the nozzles are mounted diagonally apart and approximately 200 mm below the bonnet shut line.

Engine nozzle location for single seater open cars: four nozzles are to be mounted in the engine compartment, one positioned on each side of the engine.

Gruppo Happy Racer nozzles are designed so that they can be mounted through a bulkhead or to a specially made bracket. Nozzles should be mechanically secured in their position and not be simply supported by their own pipe work.

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TUBING

Each extinguisher kit is supplied with an aluminium tube. The system has been designed and homologated to use this type of tube. Under no circumstances the tubing should be changed for another type.

- Tube connections

To enable a simple installation, the extinguisher and nozzles use push-in fittings for the tube. To attach the tube to the fitting, ensure that the end of the tube is cut square. After bending the outside diameter must have retained its circular shape. Insert the tube into the fitting, pushing firmly until it clicks. You should then be unable to pull the tubing back out of the fitting (check it).

To remove the tubing, push the tube into the fitting and pull the green collar on the fitting in the same direction. Once this is done, pull the tube from the fitting.

TECHNICAL SPECIFICATION of the EXTINGUISHANT AFFF

USAGE	Racing cars, including saloon, single seaters and other cars
CONTENTS	Foam solutions, 15% with de-ionised water
DISCHARGE AREAS	Engine compartment and drivers' compartment
DISCHARGE TYPE	The product is stored in a container, and discharged through atomising nozzles as a very fine mist. Upon settling, it turns to milky white liquid
COMPOSITION	Multi purpose synthetic foam based solution, based on salts of alkyl-ether sulphates, together with solvents and foam stabilisers
APPEARANCE	Clear amber liquid in solution
ODP (ozone depletion potential)	None
PH	6-8
CLOUD POINT	None
FREEZING POINT	-20°C
FLASH POINT	>100°C
MAX STORAGE TEMP	+49°C
SUSPENDED SEDIMENT	Less than 0.2%
PHYSIOLOGICAL PROPERTIES	Harmless, non-toxic liquid in solution

MAINTENANCE

To ensure that you get the best possible performance from your fire system, the following checks and maintenance procedures should be carried out:

- regularly check of the pressure gauge – the pointer must not be in the lower red sector
- regularly check of the nozzles for obstructions
- regularly check of the bottle for damage and loose fixation
- regularly check of the tubes and fittings for loose fixation and leak tightness

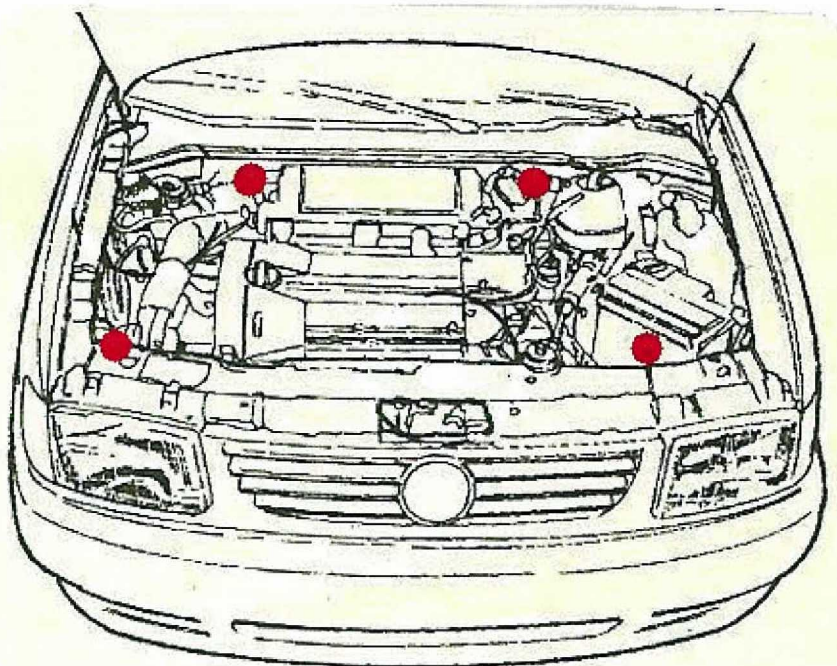
Your system should be serviced every two years. A service date is written on extinguisher label. It is up to you to ensure that the service is carried out at the correct intervals. Servicing of the extinguisher must only be carried out by Gruppo Happy Racer or one of its official agents. You will need to send the bottle along with nozzles to be serviced

If your system is discharged, it must be returned only to Gruppo Happy Racer or one of its agents for refilling.

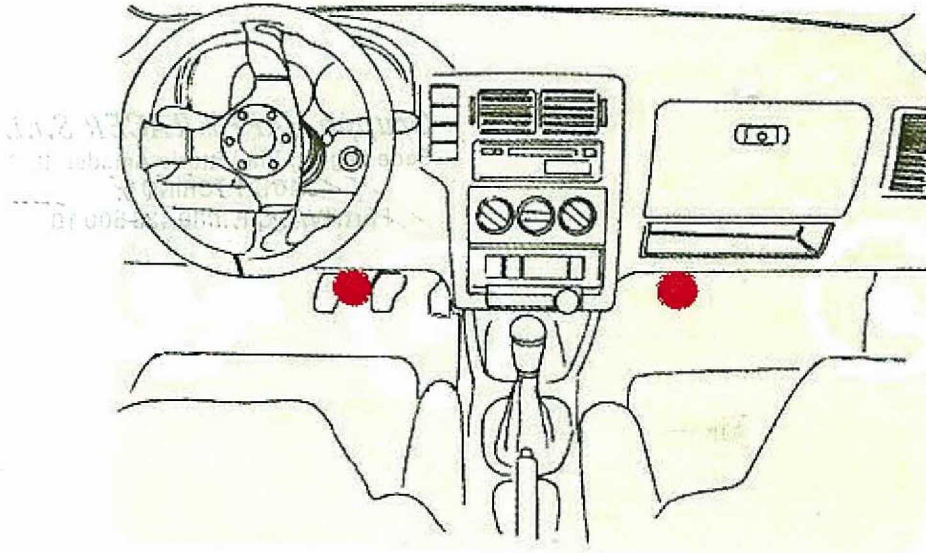
Your Gruppo Happy Racer fire system will be rejected from scrutineering if:

- the pointer of the pressure gauge is in the lower red sector
- the tamper-proof label is not intact
- non-genuine Gruppo Happy Racer parts are used
- the content of the extinguishant is below the specified weight
- the extinguisher label is worn or damaged
- the extinguisher is not within the service date
- the system is in poor condition
- the nozzles are not in reasonable positions

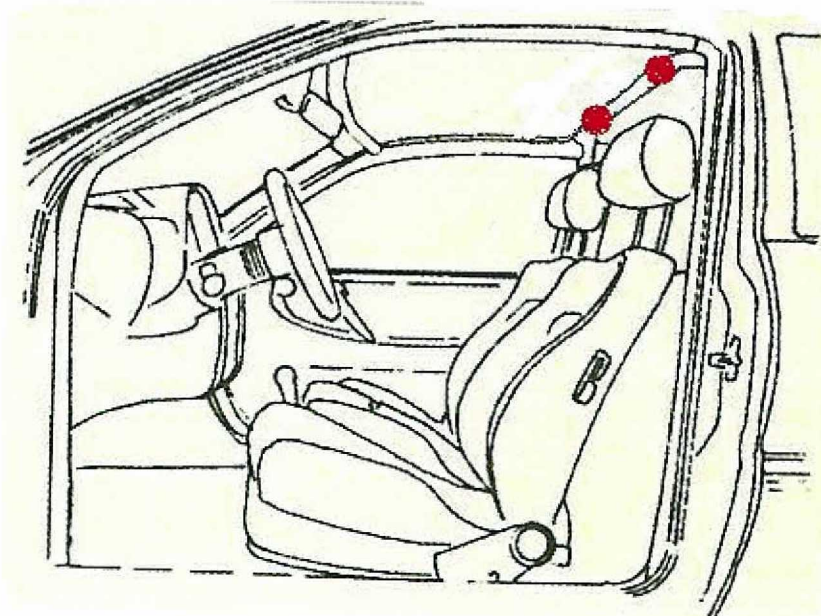
SAMPLE of the NOZZLE POSITION in the ENGINE COMPARTMENT



SAMPLE of the NOZZLE POSITION in the COCKPIT (CARS with FRONT ENGINE)

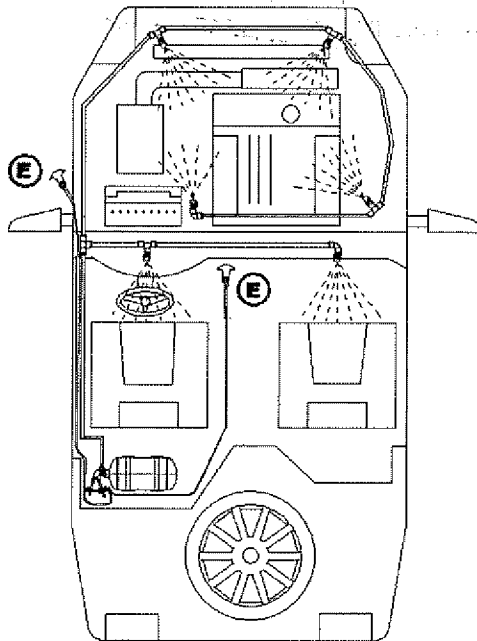


SAMPLE of NOZZLE POSITION in the COCKPIT (CARS with REAR ENGINE)

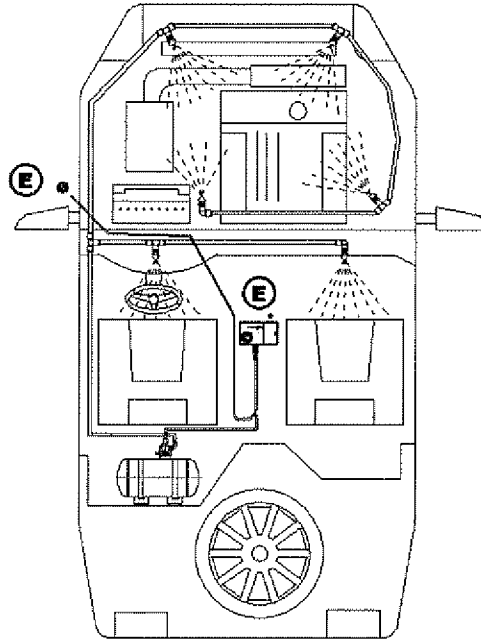


BOTTLE, TUBES, NOZZLES and ACTIVATORS - INSTALLATION OVERVIEW

ELECTRICAL ACTIVATION



MECHANICAL ACTIVATION



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**FIRE EXTINGUISHER SYSTEMS TYPE HR 1
KIT CONTENTS****VARIANT A – VARIANT B****VERSION “a”:**

- 1 STEEL BOTTLE WITH MECHANICAL ACTIVATION
- 2 INOX FITTING BRACKET
- 2 INOX BAND FOR THE BOTTLE
- 2 ALUMINIUM TUBE, LENGTH 4m
- 2 ACTIVATION PULL-CABLE
- 6 NOZZLES
- 2 “L” JOINT
- 1 “THREE WAY” JOINT
- 4 “T” JOINT
- 2 “E” STICKERS
- FITTING MANUAL

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Part. IVA / C.F. 08943350010

VERSION "b":

- 1 ALLOY BOTTLE WITH MECHANICAL ACTIVATION
- 2 INOX FITTING BRACKET
- 2 INOX BAND FOR THE BOTTLE
- 2 ALUMINIUM TUBE, LENGTH 4m
- 2 ACTIVATION PULL-CABLE
- 6 NOZZLES
- 2 "L" JOINT
- 1 "THREE WAY" JOINT
- 4 "T" JOINT
- 2 "E" STICKERS
- FITTING MANUAL

Gruppo HAPPY RACER S.r.l.
Sede Legale: Via Vittorio Amedeo II, 6
10121 TORINO
Part. IVA/C.F. 08943350010

VERSION "c":

- 1 STEEL BOTTLE WITH ELECTRICAL ACTIVATION
- 2 INOX FITTING BRACKET
- 2 INOX BAND FOR THE BOTTLE
- 2 ALUMINIUM TUBE, LENGTH 4m
- 1 ACTIVATION BOX
- 1 SIGNAL CABLE
- 1 CABLE FOR THE CONNECTION TO THE VALVE
- 1 CABLE FOR THE CONNECTION WITH EXTERNAL ACTIVATION BUTTON
- 1 EXTERNAL WATERPROOF BUTTON
- 1 FIREPROOF SHEET (2m LENGTH)
- 6 NOZZLES
- 2 "L" JOINT
- 1 "THREE WAY" JOINT
- 4 "T" JOINT
- 2 "E" STICKERS
- FITTING MANUAL

Gruppo HAPPY RACER S.r.l.

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10121 TORINO

Part. IVA/C.F. 08943350010

VERSION “d”:

- 1 ALLOY BOTTLE WITH ELECTRICAL ACTIVATION
- 2 INOX FITTING BRACKET
- 2 INOX BAND FOR THE BOTTLE
- 2 ALUMINIUM TUBE, LENGTH 4m
- 1 ACTIVATION BOX
- 1 SIGNAL CABLE
- 1 CABLE FOR THE CONNECTION TO THE VALVE
- 1 CABLE FOR THE CONNECTION WITH EXTERNAL ACTIVATION BUTTON
- 1 EXTERNAL WATERPROOF BUTTON
- 1 FIREPROOF SHEET (2m LENGTH)
- 6 NOZZLES
- 2 “L” JOINT
- 1 “THREE WAY” JOINT
- 4 “T” JOINT
- 2 “E” STICKERS
- FITTING MANUAL

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