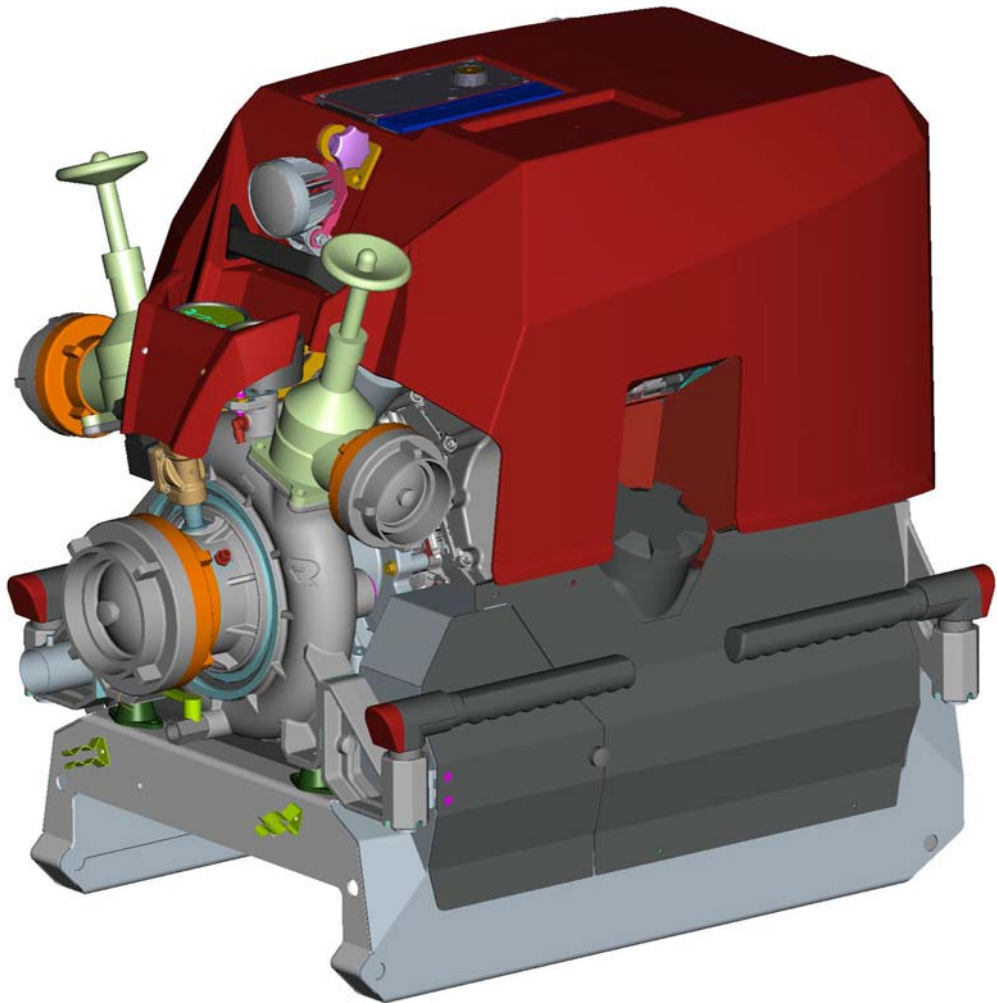


Operation manual



FOX (4th generation)

Portable fire pump

Item number: 11033A-003
Release: 04/2017 (Rev.02)
Language: English
Abbreviation: JWin

 **rosenbauer**

Table of contents

1 Legal notice	4
1.1 Copyright	4
1.2 Manufacturer and customer service address	4
2 Declaration of conformity	5
2.1 Declaration of conformity	5
3 Introduction	6
3.1 Preface	6
3.2 Liability and injury	6
3.3 Identification	7
3.4 Use of the operation manual	8
3.4.1 Validity	8
3.4.2 Signs and Symbols	8
4 Safety	10
4.1 Intended use	10
4.2 Markings and warning signs	10
4.3 Other regulations	10
4.4 Training and qualifications	11
4.5 General safety instructions	12
4.6 List of conventional signs	13
4.6.1 Meaning of the warning signs	13
4.6.2 Meaning of the prohibitory signs	15
4.6.3 Meaning of the caution signs	16
4.7 Warning notes	17
5 Product description	25
5.1 Area of application	25
5.1.1 Requirements for supply facilities	25
5.2 Designation	25
5.3 Engine	26
5.4 Pump	27
5.5 Carrying frame	28
5.6 Tank	28
5.7 Priming pump Professional	29
6 Technical description	31
6.1 Valves and actuators	31
6.2 Display unit pilot lamps	34
6.3 Governor	38
6.4 Optional equipment	39
7 Operation	45
7.1 Preparation for initial operation	45
7.2 Preparation for start-up	46

7.2.1 Positioning the portable fire pump	46
7.3 Starting the engine	47
7.3.1 Switch on ignition	48
7.3.2 Starten mittels Elektrostarter (Ausführung Arma- turenbrett AR1)	48
7.4 Priming from an open water source	50
7.4.1 Activate drafting operation from open water source	51
7.5 Hydrant operation	52
7.6 Monitoring during operation	54
7.7 Switching off the engine	55
7.8 Flush/drain	57
7.9 Transporting the portable fire pump	58
7.9.1 Manual transport	58
7.9.2 Transport by means of the transport wheels (option- al)	59
7.10 Tilting the engine cover	60
7.11 Fuelling and refuelling:	61
7.11.1 Fuelling operation when engine is running	62
8 Servicing and cleaning	64
8.1 Engine component overview	64
8.2 Service plan	68
8.2.1 Oil change interval	68
8.2.2 Inspection procedures	68
8.2.3 Checking for signs of leakage	69
8.2.4 Lubrication service	70
8.3 Lubrication chart	71
8.4 Torque list	71
8.5 Inspection procedures	72
8.6 Service procedures	78
8.6.1 General guidelines for handling electronic compo- nents	84
8.6.2 Storage and transport	86
9 Troubleshooting	87
9.1 Faults and their solutions - pump	87
9.2 Faults and their solutions - engine	88
10 Environmental protection	90
10.1 Disposal of hazardous substances	90
11 Technical data	91
11.1 Noise measurements	93
12 List of spare parts	95
12.1 List of spare parts	95
13 List of abbreviations	96

ORIGINAL OPERATION MANUAL

1 Legal notice

1.1 Copyright

All rights to this manual and its attachments lie with Rosenbauer International AG.

The documents are only entrusted to the recipient for their personal use. Reproduction, reprinting (electronically or mechanically), translations in other languages or all other duplication, also of parts of the manual, are only allowed with written permission.

Information from this manual may not be passed on to or made accessible to third persons, in particular competitors.

1.2 Manufacturer and customer service address



Rosenbauer International AG
Paschinger Strasse 90
4060 Leonding, Austria

Telephone: +43 732 6794 - 0
Fax: +43 732 6794 - 312
Email: service@rosenbauer.com
Internet: www.rosenbauer.com

The Rosenbauer customer service department or one of our worldwide representatives will gladly assist you if you need further information.

2 Declaration of conformity

2.1 Declaration of conformity

According to EC Machinery Directive 2006/42/EC, Annex II, part 1A

Herewith declares

Rosenbauer International AG

Fire fighting technology

A - 4060 Leonding, Paschinger Str. 90

Address: Postbox 176, 4021 Linz, Austria

Telephone: +43 (0)732 / 6794-0

that the

portable fire pump for fire fighting operations

Type

FOX portable fire pump (4th generation)

Serial number

PC116

complies with the following regulations:

- 1) 2006/42/EC - EC Machinery Directive
- 2) 2014/30/EU - Directive on the harmonization of regulations relating to electromagnetic compatibility
- 3) ECE R10 - Electromagnetic compatibility for vehicles

The following harmonized standards (or parts thereof) have been applied:

- 1) EN 14466:2005+A1:2008, ÖNORM EN 14466:2005+A1:2008, DIN EN 14466:2005+A1:2008
- 2) EN 1028-1:2002+A1:2008, EN 1028-2:2002+A1:2008
- 3) EN 55012:2007+A1:2009, EN 61000-6-2:2005, EN 61000-4-2:2009, EN 61000-4-3:2006+A2:2010, EN 61000-4-4:2012, EN 61000-4-6:2014, EN 61000-4-8:2010

3 Introduction

3.1 Preface

You must read this operation manual in full before starting the portable fire pump.

Also observe the documents of the corresponding manufacturers supplied in addition to this manual.

All personnel who will operate and maintain the portable fire pump must be qualified (see training and qualification).

The operation manual is to be stored carefully (for later reference).

3.2 Liability and injury

Due to the information in this manual Rosenbauer fundamentally accepts no liability for direct damage or consequential damage, which arise from incorrect operation or maintenance, as well as by unauthorised changes of components or this manual.

The product may only be operated by persons who are familiar with the manual, the product as well as the national laws, guidelines and regulations pertaining to work, safety and accident prevention.

Rosenbauer assumes no responsibility for injury to persons or material damage, which are caused by untrained personnel, also through non-compliance with the regulations regarding work, safety and accident prevention.

If this manual contains a technical error or a typographical error, Rosenbauer reserves the right to make change at any time and without notice.

This manual may contains figures and descriptions, that are not built into the delivered product.

No claims may be made for products that have already been delivered from the information, figures and descriptions in this manual.

For your own safety only use spare parts and accessory products from Rosenbauer. Rosenbauer accepts no liability for the use of other products and the resulting damage!

Check the delivery immediately for transport damage and completeness.

- Faults and damages must be documented in writing immediately.
- Photograph damaged components.
- Send written damage report to the manufacturer - see chapter "Manufacturer and customer service address".

3.3 Identification

Identifying the serial number is important when referring to the manufacturer in regards to spare parts and technical issues.

The serial number of the portable fire pump is located on the operator side, facing away from the area of the engine frame, on the chassis type plate.

P	C	1	1	6	L					
---	---	---	---	---	---	--	--	--	--	--

- ▶ Enter the serial number of the portable fire pump in the table.

3.4 Use of the operation manual

3.4.1 Validity

This manual contains information needed for the operation of the product. This manual contains descriptions of special equipment as well as some abstractions and exemplary illustrations. The actual equipping of your product may therefore differ in part from the descriptions and illustrations.

3.4.2 Signs and Symbols

Highlighted Text

To simplify legibility and clarity, there are marked various pieces of information.

These symbols indicate the following meaning:

- ▶ Perform action in the hierarchy to be maintained as described.
- ✓ Reactions to the actions performed (results).
- Lists.
- ⇒ Further Information about this topic.



Notes for additional information to operate the unit.



Read/obey additional information in the manufacturer documentation.

Figures

Where necessary, the text is illustrated with drawings. A caption is provided below the illustration. The reference from the text to a position within the illustration is given by inserted figures (e.g. S1).

Warning notices

The safety information warns the user of risk and informs them how these risks can be avoided.

Safety information stands at the beginning of a chapter before handling instructions from which a dangerous situation can occur. Further safety information is found at the start of this manual.

Safety instructions that must be followed without fail are highlighted as follows:

DANGER!

This symbol warns of an extremely dangerous situation, in which non-observation of the danger warning will lead to death or serious irreversible injury.

WARNING!

This symbol warns of a dangerous situation, in which non-observation of the danger warning can lead to death or serious irreversible injury.

CAUTION!

This symbol warns of a dangerous situation, in which non-observation of the danger warning can lead to slight reversible injury.

NOTICE

This symbol warns of situations, in which non-observation of the warning can lead to material damage.

Additionally the information in the operation manual in the “Technical data” chapter and the safety information in the supplier documentation supplied must be observed.

4 Safety

4.1 Intended use

The portable fire pump:

- may only be used in fire fighting operations
- may only be used with drinking water and fire fighting water (wastewater-capable)
- may only be operated under supervision
- must not be permanently installed in fire vehicles
- is not suitable for use in areas with explosion hazards proper.

4.2 Markings and warning signs

Safe use is only possible, if all necessary information for a safety operation are observed. These informations are especially including safety- and warning instructions.

In addition to the instructions in this operating manual read and observe all the safety- and warning signs affixed to the product.

- ▶ Replace missing or damaged signs.
- ▶ Keep the safety- and warning signs clean and legible.

4.3 Other regulations

In addition to this manual the relevant national legislation, regulations and directives in the latest version are to be observed (e.g. guidelines for personal protective equipment, road traffic regulations, country-specific training regulations for the fire department, accident prevention guidelines, fire department duty regulations, occupational medicine and technical environmental rules, country legislation for fire and disaster protection).

4.4 Training and qualifications

Operator errors caused by inadequate qualifications can cause serious accidents or jeopardise the success of the operation. Safe operations can be assured only when operation and consistent maintenance of the product is performed exclusively by specially trained personnel.

Only qualified training by experienced firefighting experts and continuous practice of operating procedures ensure safe operations.

A one-off briefing is not enough!

The portable fire pump may only be operated by persons who have successfully completed training as a machine operator in firefighting (fire trucks / fire pumps).

Persons without qualified training may not operate the product.

The operator is responsible for defining responsibilities and supervision of personnel as well as for adequate instruction and training according to applicable regulations.

Even during operation, make sure that persons without technical knowledge never operate the product.

Personnel must exhibit physical and mental aptitude. Minors and persons without qualified training may not operate the product.

Modifications and conversions to the product may be performed only with written authorisation from Rosenbauer and must be performed by a manufacturer-authorized person.

4.5 General safety instructions

The following instructions give an overview of how the product is used safely. This general overview will be supplemented by the safety instructions in the individual chapters.

Take note of general danger possibilities that could occur when handling machines.

Use the prescribed personal protective equipment.

Make sure that the product corresponds to the respective valid safety regulations and the local fire departments guidelines and is always ready for use.

On contact with dangerous chemicals (e.g. dry powder) make sure that the manufacturer's safety datasheets and information is followed.

Dry powder and foam compound can endanger the environment.

- ▶ Do not dispose of dry powder and foam compound in bodies of water or in the sewage system.

Foam compound and dry powder in particular are very corrosive.

- ▶ Carefully clean the product of extinguishing agent residue after every operation.

When working inside the water or extinguishing agent tank, always ensure good ventilation and ensure the safety of this work by having an additional person outside the tank.

Should emergencies occur where people are injured, appropriate first aid measures must be taken and, if necessary, emergency personnel are to be called to provide professional treatment.

Observe the operation and maintenance manuals of additional products.

If you cannot rectify faults yourself or repairs cannot be performed by specially trained workshop personnel, Rosenbauer or the nearest Rosenbauer service partner must be contacted immediately.

4.6 List of conventional signs

4.6.1 Meaning of the warning signs




	Danger from electricity.
	Impending risk of explosion.
	Risk from oxidising materials.
	Risk of harmful or irritating materials.
	Impending risk of explosion.
	Impending acid burn risk.
	Impending hearing damage.
	Risk of inhalation of toxic vapours.
	Risk from hot fluids and vapours.
	Risk from hot surfaces.

Safety

List of conventional signs

	Impending crushing risk.
	Danger from high pressure.
	Threat of environmental contamination.
	Impending shearing risk.
	Impending risk of tripping.
	Risk of hand injury.








4.6.2 Meaning of the prohibitory signs

	Handling fire and naked flames forbidden!
	Do not touch or reach in!
	Do not stay in the danger area!

Safety

List of conventional signs

4.6.3 Meaning of the caution signs

	Use hearing protection.
	Wear safety goggles or a safety mask.
	Wear a protective helmet.
	Wear protective gloves.
	Wear a protective suit.
	Maintain distance. Special caution.
	Observe environmental protection.

4.7 Warning notes

**DANGER!**

Danger of fatal injury or health hazard due to inhalation of toxic exhaust fumes!

Combustion engines working in enclosed areas build toxic exhaust fumes. In the case of working in enclosed areas, obey the following:

- ▶ Extract the exhaust fumes outside using exhaust hoses.
 - ▶ Make sure for adequate ventilation.
-



WARNING!

Danger of injury and accidents!

Danger of injury and accidents due to malfunctioning or improper used safety devices!

- ▶ Do not override safety and protective devices.
- ▶ Do not manipulate or render safety and protective devices.
- ▶ Check safety and protective devices for proper function.



Danger of shearing in the area of the extinguishing equipment!

Body parts can be cut off.

- ▶ Do not linger in the danger zone.



Personal injuries and damage to property can occur due to a restricted view of movable machine parts.

- ▶ Do not linger in the danger zone.
- ▶ Follow the training and operation manual.



Mortal danger or serious injuries can arise through failure to use protective equipment.

- ▶ Wear protective equipment.



Potentially fatal injuries due to the engine taking in flammable gases!

- ▶ Do not operate the engine in areas with a heavy concentration of flammable vapors such as e. g. diesel, gas or propane.
- ▶ When handling flammable liquids and gases, always shut off the engine immediately.



Danger of crushing and shearing of limbs due to moving or rotating parts!

- ▶ Do not reach into or grasp moving or rotating parts.
- ▶ Observe a safety distance to the danger zone.
- ▶ Use protective equipment.



Potentially fatal injuries and danger of explosion!

Danger of explosion occurs at operation of the unit in explosive areas..

- ▶ Do not operate the unit in explosive areas.



Explosion risk from flammable fuel!

When working on fuel systems the fuel may ignite and cause life-threatening injuries..

- ▶ Do no smoke.
 - ▶ Keep fuel away from naked flame.
 - ▶ If you are handling fuel keep a fire extinguisher to hand.
-



Danger of serious injury and damage due to explosion, fire and chemical burns!

When charging vehicle batteries, a highly explosive electrolytic gas mixture (hydrogen and oxygen) is released; it is easily flammable and may release highly acidic battery acid.

- ▶ Wear safety goggles whenever servicing a battery.
 - ▶ Follow safety instructions on the outside of the battery.
 - ▶ Do not smoke.
 - ▶ Avoid fire, open flame and sparks.
 - ▶ Avoid sparks when handling cables and electrical devices, and through electrostatic discharge.
 - ▶ Do not connect the minus pole of the battery jumper cable near to the discharged battery (generates sparks).
 - ▶ Always remove negative battery ground cables first and install them last to avoid sparks.
 - ▶ The vehicles must not touch (sparks will occur on connecting the positive poles).
 - ▶ Never short-circuit the battery.
 - ▶ Ventilate batteries thoroughly before any external start.
 - ▶ When connecting the connecting lead, do not bend over the battery.
 - ▶ Avoid skin and eye contact with any battery acid that escapes.
 - ▶ Keep unauthorized persons clear of the battery.
 - ▶ Ensure that the battery voltage matches.
 - ▶ Never disconnect the batteries while the engine is running.
-

Safety

Warning notes

Serious injury to persons and damage due to water hammer effect!

If water delivery via a pipe or hose is interrupted abruptly, a pressure impact known as the water hammer effect occurs; this is noticeable as a harsh noise (like a hammer hitting a pipe). This water hammer can cause severe injury when handling fire-fighting equipment, as well as damage to lines, hoses, pumps, valves or other pieces of equipment.

- ▶ Perform adjustments of nozzles, hydrants, valves etc. slowly.
- ▶ Before opening a discharge outlet, keep a tight hold on the tips and nozzles.
- ▶ Before uncoupling a hose, relieve the pressure.
- ▶ In case of danger for persons (e.g. due to a burst hose) immediately reduce the pump speed or close the affected discharge outlet. Switch off the pump system if needed.

Danger to life from electric shock!



Water, fire fighting foam and metallic components conduct electricity.

- ▶ Do not point turrets or nozzles (extinguishing agent jet) directly at high-voltage lines or other electrical installations.
- ▶ Observe the safety distance from voltage-carrying parts at all times.
- ▶ Foam ban for firefighting involving electrical systems.
- ▶ Do not handle or use metal ladders near high-voltage lines or other electrical installations.

Safety distance with C/HP-nozzle for fire fighting on low-voltage systems

Voltage	Extinguishing system	Extinguishing agent	Safety distance
up to 1 kV	C-nozzle	Water spray jet, dry powder, extinguishing gas	1 m (3 ft)
	C-nozzle	Full water jet	5 m (16 ft)
	HP- nozzle	Full water jet	5 m (16 ft)

Safety distance with C/HP-nozzle for fire fighting on high-voltage systems

Voltage	Extinguishing system	Extinguishing agent	Safety distance
1 kV - 380 kV	C-nozzle	Water spray jet, dry powder, extinguishing gas	5 m (16 ft)
	C-nozzle	Full water jet	10 m (32 ft)
	HP-nozzle	Full water jet	10 m (32 ft)
	Water turret	Full water jet	30 m (98 ft)
		Water spray jet	10 m (32 ft)

 **CAUTION!**

Danger of injury for the operator due to performing action in wrong order!

- ▶ Individual operating instructions must be done in the prescribed order.



Danger of hearing damage due to extended presence in the vicinity of the running pump!

- ▶ Use hearing protection.
- ▶ Do not linger in the danger zone.



Burning hazard from touching the hot engine or engine attachments!

- ▶ Do not remain in the danger area.
- ▶ Do not touch the hot areas of the engine.
- ▶ Do not touch any parts of the exhaust system.
- ▶ Carrying handles may become hot.
- ▶ Wait until all parts have cooled down.



Burning hazard from the hot cooling system!

- ▶ Only carry out maintenance work after the portable fire pump has been shut down and the cooling system has cooled down.



Danger of injury due to burns!

A short circuit releases powerful currents that can considerably heat up and even melt metals.

- ▶ Use only jump start cables in line with ISO 6722 and NATO connector.
- ▶ In case of jump start cables with crocodile clips, ensure correct polarity.
- ▶ Never short-circuit battery poles or the jump start cable.
- ▶ Avoid unintended connecting of the positive pole and electrically conductive vehicle parts by tools, watches, jewelry etc.
- ▶ Do not connect the jump-start cable to fuel, hydraulics or brake lines.



Crushing or injury risk from moving parts!

By not fastening or storing in the end position, movable components may cause injury or damage.

- ▶ Grip flaps and steps only where suitable.
- ▶ Fully open the respective roller shutters before opening swivel trays, swivel reels and extensions.
- ▶ Spring and inertia forces during opening and closing of the device compartment flap and rear entrance flap are to be observed.

Injury to persons and material damage due to unexpected releasing of connecting couplings!

- ▶ Before start of operation (pressure), check all connecting couplings with a coupling wrench to ensure tight seating.
-

Water under high pressure!



Lingering in front of nozzle discharges could result in serious injuries.

- ▶ Do not linger in front of nozzle discharges.
 - ▶ Never aim the nozzle at persons or equipment.
 - ▶ Before starting fire fighting, close all cabin doors and windows inside the vehicle.
-

Danger of burns due to touching the hot pump system and hot water discharge!



Operating the pump with closed discharge outlets causes the temperature of the pump to rise quickly.

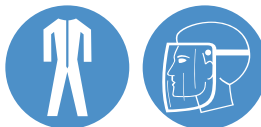
- ▶ Do not operate pump under full load with discharge outlets closed.
 - ▶ Do not touch any parts of the hot pump system.
 - ▶ Do not linger in the pump system danger zone.
-

Danger to health due to extinguishing agents!



- ▶ Observe the safety data sheets of the extinguishing agent manufacturer.
-

Danger to health due to extinguishing agents!



The contamination with extinguishing agents can cause health problems.

- ▶ Observe wind direction, to avoid a inhalation or contamination by extinguishing agent.
 - ▶ Wear protective gear.
 - ▶ Wear safety goggles.
 - ▶ Avoid direct contact with extinguishing agent.
 - ▶ If necessary, take first aid measures.
-

Injury to persons and damage to property in critical operational conditions!

A delayed reaction to critical operating conditions can cause serious injury and property damage. To immediately be able to respond, the operator must fulfil the following conditions:

- ▶ Always stay within easy reach of the controls.
 - ▶ Control instruments must always remain in the line of vision.
-



Environmental and health hazard due to lubrication oils!

Lubrication, transmission and hydraulic oils can cause permanent water pollution and endanger fauna and flora of all types.

- ▶ Avoid skin contact with hazardous oils.
 - ▶ Avoid ground contact with lubrication oils.
 - ▶ Collect used oils sorted by type and recycle.
 - ▶ Observe local oil disposal regulations.
-



Danger of burning!

- ▶ Do not grip onto switched-on or recently switched-off search lights.
-



Danger of crushing!

Danger of crushing due to pneumatic cylinders and drives.

- ▶ Do not grasp moving parts.
 - ▶ Do not reach into the danger zone.
-

NOTICE

Damage due to cavitation!

The pump capacity is reduced with increasing suction height. When operating with great suction heights, high pump speeds and very high discharge rates, the pump may cavitate. Cavitation causes extreme pressure and temperature peaks which can destroy the pump. Cavitation may sound like marbles are being pumped through the system. Cavitation must be avoided by all means, because the pump internal parts (e. g. impeller) might be damaged by this excessive load. A constricted suction hose while external drafting may result in loss of the water flow.

- ▶ In external drafting operations from open water never run the pump without a strainer.
 - ▶ If cavitation occurs, reduce pump speed, suction height or water discharge.
 - ▶ Never run the pump at high speed with a free outlet.
 - ▶ Monitor all display instruments of the pump.
 - ▶ Watch declining water level of the water source.
 - ▶ Use non-collapsible hose for drafting operation.
-

Material damage due to the non-observance of optical or acoustic warning signals!

- ▶ Monitor all optical and acoustic warning signals, measured value indicators and pilot lamps.
 - ▶ Follow all training and the operating manual.
-

Failure of the portable fire pump due to depleted battery!

The battery of the portable fire pump discharges in continuous occupation, with the engine off and the ignition switched off or on.

- ▶ Check battery charge status periodically (every three months).
 - ▶ Recharge or replace battery with low charge level.
 - ▶ The leakage current on the electrical components of the portable fire pump is approx. 0.5 mA.
-

Danger due to water over flow!

Some materials expand and/or increase their weight when saturated with water. Certain materials must not come into contact with water due to the danger of chemical reactions.

- ▶ In case of danger, immediately stop operation with water.
-

Material damage due to use of extinguishing agent!

A mixture of dry powder and foam compound concentrate is highly corrosive and difficult to remove.

- ▶ Never mix dry powder and foam compound concentrate.
-

5 Product description

5.1 Area of application

The portable fire pump may only be used when in perfect technical condition and by qualified personnel for the following purposes:

- Firefighting in conjunction with extinguishing water
- Rescue of people from emergencies
- Implementation of technical assistance

The security, reliability and performance of the portable fire pump is only guaranteed if the operating conditions are met.

Incorrect use of the portable fire pump could cause personal injury or damage to property.

Only persons authorised by the manufacturer may perform modifications, conversions and repairs. Unauthorised changes, conversions or improper use will nullify all manufacturer liability for any resulting damage.

5.1.1 Requirements for supply facilities

Water supply

The portable fire pump must be supplied from a tank, an open water source or a hydrant. An exact description of the supply takes place in chapter "Operation".

5.2 Designation

Assignment of the Rosenbauer designation for the standardized designation.

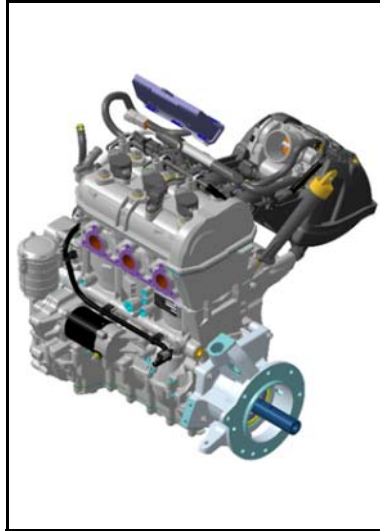
Rosenbauer identification	Standardised designation EN1028
FOX portable fire pump, 4th gen.	PFPN 10 - 1000 PFPN 10 - 1500

Product description

Engine

5.3 Engine

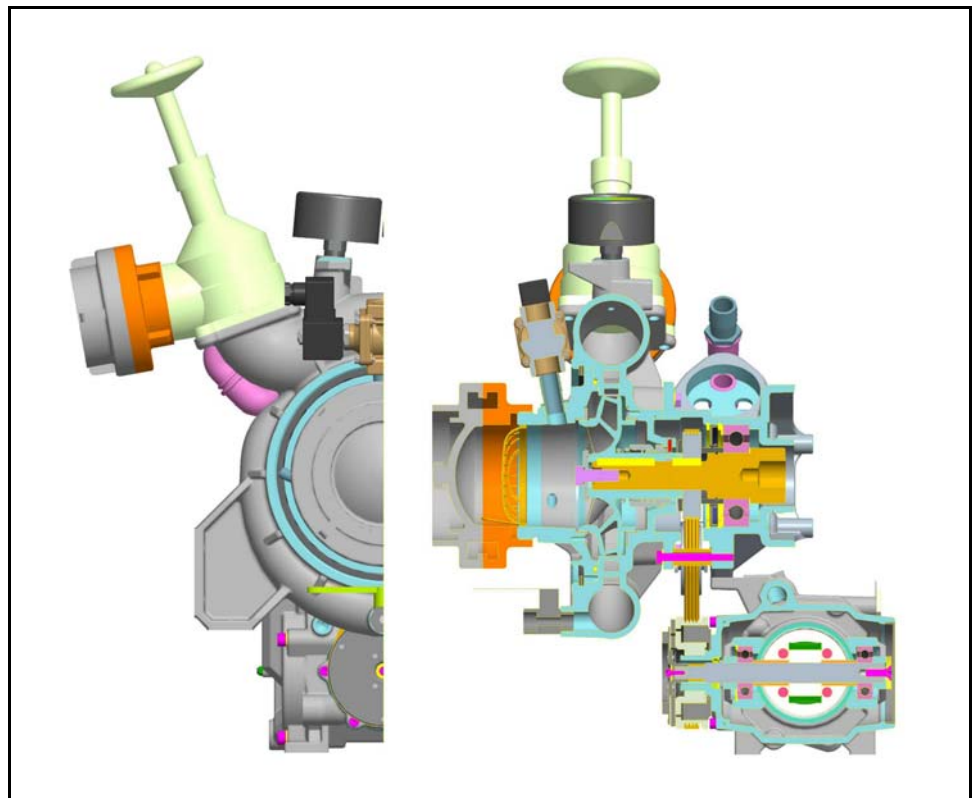
The propulsion engine of the portable fire pump is a 3-cylinder, 4-cycle gasoline engine by Rotax, of type 903 ACE. The engine is a water-cooled alloy engine with 4 valves per cylinder. The cooling water and the lubricating oil is cooled via a closed cooling circuit by means of a water/water and a water/air heat exchanging device with an electric fan.



Propulsion engine

5.4 Pump

The single-stage centrifugal pump, consisting essentially of the impeller, main casing and bearing block, is made of a high corrosion resistance light alloy. The pump shaft is of stainless steel. The pump is provided with a central suction inlet with suction sieve, fixed coupling and blank cap. Both discharge outlets are equipped with screw-down valves, non-return valves and pressure relief devices. The drain cock is positioned at the lowest point of the main casing. The pump shaft is sealed by an axial mechanical shaft seal. In the upper area of the main casing is the electric exhaust valve, which is controlled automatically via the LCS2.0 control and instrument panel or via the priming pump in manual gas operation.



Product description

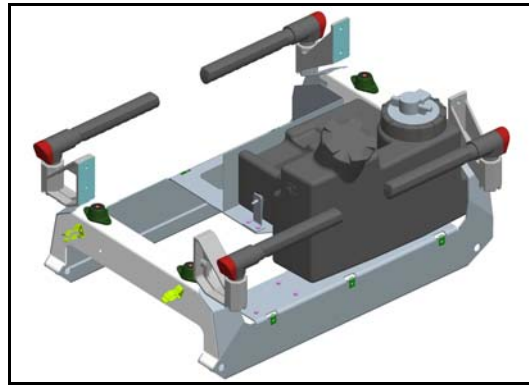
Carrying frame

5.5 Carrying frame

The motor-pump unit is fastened to the carrying frame by four elastic rubber-metal bearings. Four horizontal, fold-out, rubber-covered handles are integrated into the ends of the carrying frame. The handles can be locked in a longitudinal or perpendicular direction, depending on the carrying method used. The carrying frame can be equipped with transport wheels and LED scene lighting.

5.6 Tank

The tank is made of fuel-resistant plastic. It is positioned beneath the engine, so that no fuel can run onto the hot engine when refuelling. For extra safety, the tank is equipped with a safety lock. When opening, first air flows into the tank, so that a pressure equalization between the tank and the surroundings occurs. The tank is fully drained by pumping dry. For safety reasons (damage in rough terrain), no drain cock is located on the bottom of the tank.



Carrying frame with tank

5.7 Priming pump Professional

Because centrifugal pumps are not self suction pumps, the required vacuum is created by an installed priming system. The priming pump is driven by a v-belt and only has to be engaged for the priming process. The priming pump is a manually or automatically controlled double-piston pump, which is made of corrosion-resistant light alloy. The pistons provided with sealing and guide rings are screwed to an unit and are operated via a ball bearing eccentric, by means of a sliding pad. The moving parts of the pump are oil bath lubricated. The suction and pressure valves are concentrically arranged in the valve covers.

Functionality

When the priming pump is activated the solenoid valve mounted in the suction line will be opened. The priming pump is driven over a v-belt from the pump shaft. The rotating eccentric sets the piston in a back and forth movement. Through the piston movement a vacuum (priming process) or an excess pressure (exhaust process) is produced. Rubber membranes serve as valves, which are concentrically arranged in the valve covers. Through this suction process the air will be sucked out from the pump and the suction hoses and water sucked in, that the centrifugal pump will be flooded. If water is exhausted from the priming pump, the suction line is to be closed. Closure of the suction valve takes place automatically.

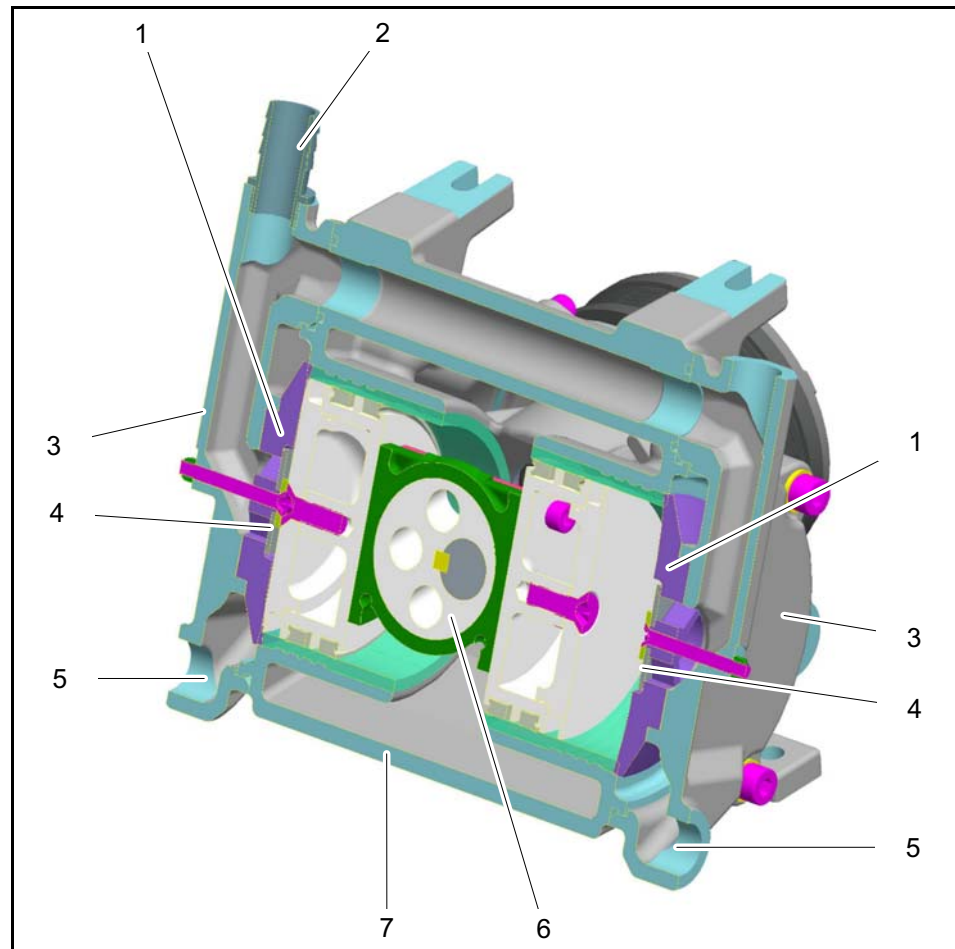
Automatic priming

If water is exhausted at the priming pump, the suction line will be closed. The magnetic clutch is deactivated, whereby the power transmission is interrupted. The eccentric shaft ceases to be driven as a result and the piston stands still - the priming process is complete. When the water column breaks, this process will be repeated automatically when the automatic priming is active.

Product description

Priming pump Professional

Structure of the priming pump

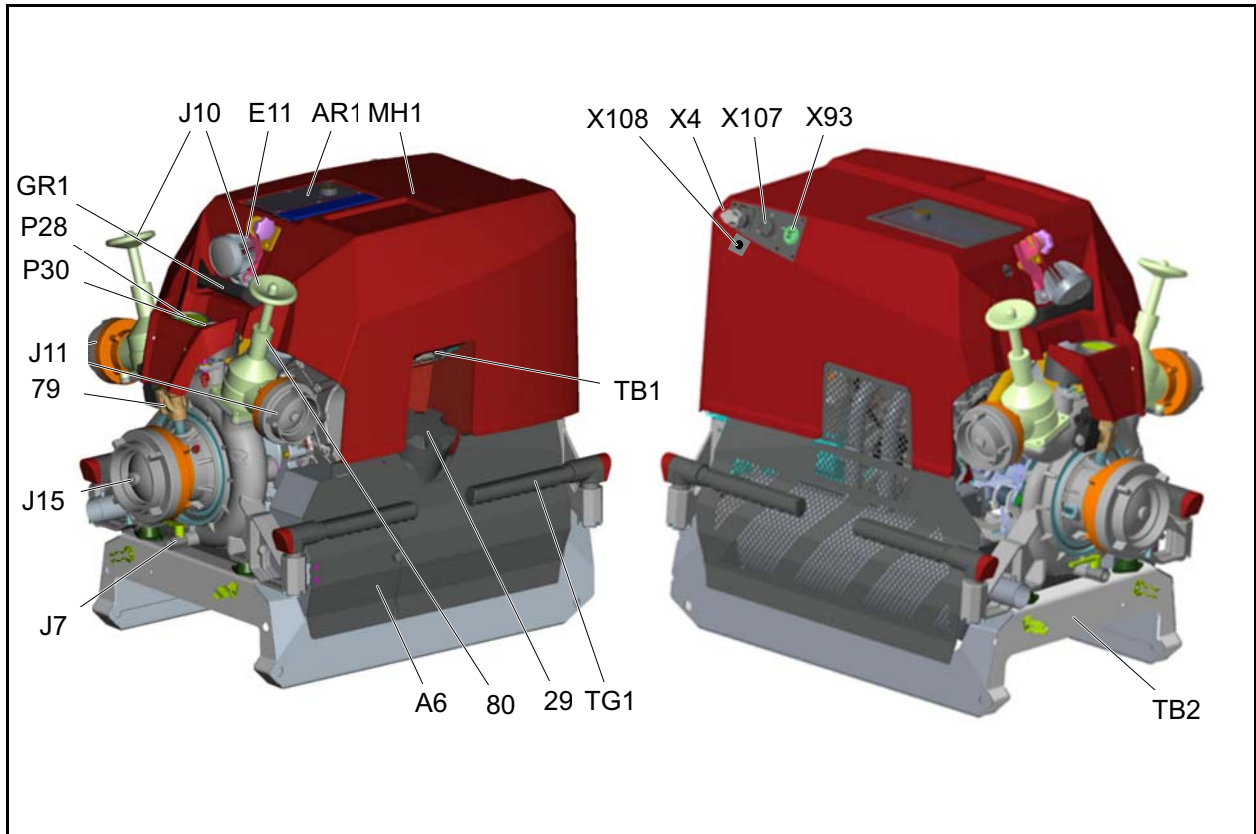


Priming pump

- | | |
|---|----------------------|
| 1 | Pressure valve plate |
| 2 | Suction line |
| 3 | Valve cover |
| 4 | Suction valve plate |
| 5 | Exhaust line |
| 6 | Eccentric |
| 7 | Main casing |

6 Technical description

6.1 Valves and actuators

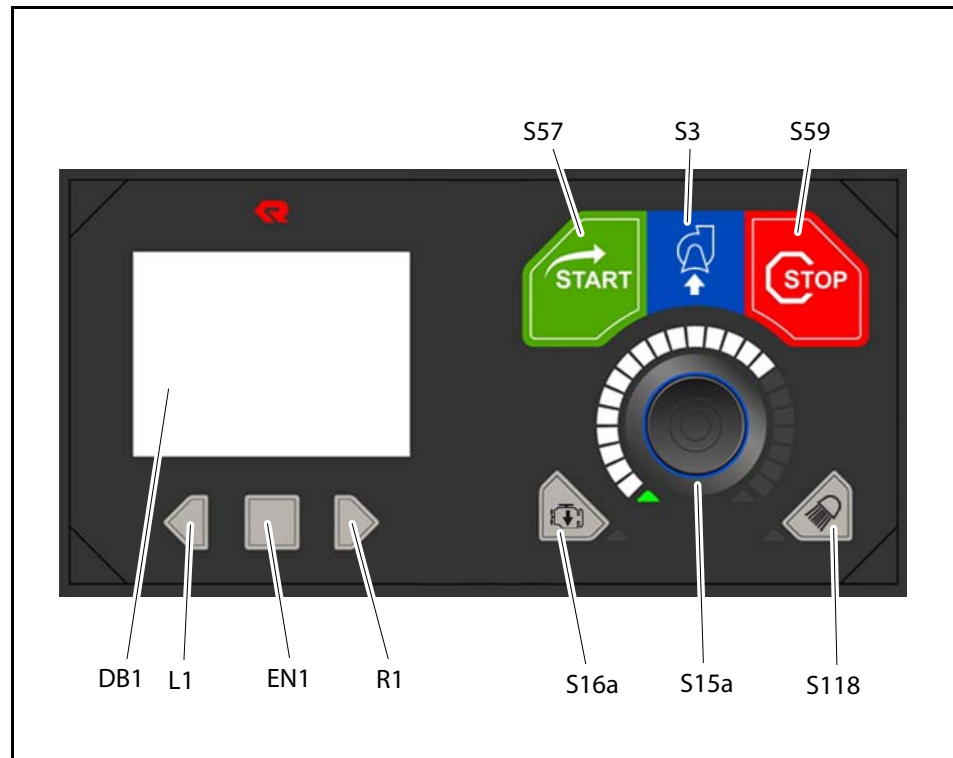


29	Fuel tank cap	X107	Beos charging socket (n.v.)
79	Purge valve	X108	RLS socket
80	Spindle limit		
A6	Battery box		
AR1	LCS 2.0 control panel		
E11	Working light		
EC1	Handle		
J7	Drain valve		
J10	Screw-down valve		
J11	Pressure outlet		
J15	External drafting connection		
MH1	Engine cover		
P28	ND pressure gauge		
P30	Vacuum gauge		
TB1	Tank filling lighting		
TB2	Supporting frame lighting		
TG1	Carry handle		
X4	Fire CAN connection		
X93	USB charging socket		
X107	Magcode charging socket		
X108	Charging socket DIN 14690 (n.v.)		

Technical description

Valves and actuators

LCS 2.0 control panel



DB1	Display screen
EN1	Acknowledge error message
L1	Back one screen page
R1	Forward one screen page
S3	Priming pump
S15a	Speed adjustment dial
S16a	Idle speed
S57	Ignition on / start the engine
S59	Ignition off / shut down the engine
S118	Illumination (E11 - Working light, TB1 - Tank filling lighting, TB2 - Support frame lighting (optional))

Display unit

Using the display unit, the operator can open the main status information of the portable fire pump. The information is presented on the display.

Below the screen are three function switches. The left (L1) and right (R1) function switches can be used to scroll one screen forward or back.

Error messages can be acknowledged with the middle (EN1) function switch.

Control panel

The control panel consists of a potentiometer (S15a) and five function switches.

The upper switches are for starting (S57) and stopping (S59). The middle switch activates the priming pump (S3).

The lower left switch sends the portable fire pump into no-load condition (S16a).

With the lower right switch, the lighting (S118) is turned on or off.

6.2 Display unit pilot lamps

Screen page 1 - function displays



Page indicator:

The page indicator is only for orientation. It indicates the number of pages and highlights the requested page.



Pump pressure control (optional):

The control display illuminates green when the pump pressure control is activated, and the actual and target pressure lie within the tolerances. Should the actual pressure deviate from the target pressure by more than 0.3 bar, the light is illuminated orange.



Priming pump:

The control display illuminates green when the suction process has been successfully completed (pressure > 1.5 bar). During the priming process, the indicator illuminates orange.



Intake pressure monitoring system (optional):

The control display illuminates green when the pump pressure control is activated, and the pressure lies above 1.5 bar for the first time on the input side of the pump. If the intake pressure should fall below 1.5 bar in operation, the indicator illuminates orange and the discharge pressure is lowered automatically.



Illumination:

The control display illuminates green when at least one floodlight is activated.



RLS illumination (optional):

The control display illuminates green as soon as power is available at the socket (X108).



USB connections (optional):

The control display illuminates green as soon as power is available in the USB socket (X93).



Engine speed:

The engine speed gauge shows the current speed of the engine. The engine speed is shown in the adjacent text field.



Intake pressure (optional with pump pressure governor):

Displays the current intake pressure.



Discharge pressure (optional with pump pressure governor):

Displays the current discharge pressure.



Pressure ramp:

Visualizes the current discharge pressure as a ramp. With activated pump pressure control, the set pressure is displayed as a rising vertical line.

Screen page 2 - status displays



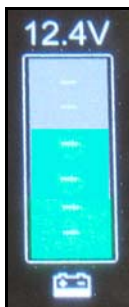
Fuel tank fluid level:

The current fuel tank fluid level is represented by a percentage above the fuel gauge image. Alternatively the indicator can also be represented in litres, gallons and UK gallons.



Engine temperature:

The current temperature of the engine coolant is displayed on the image display in degrees Celsius. Alternatively the indicator can also be represented in degrees Fahrenheit.



Battery voltage:

The current voltage of the battery is displayed above the image display.

Screen page 3 - Information displays



Current fuel consumption

The current actual fuel consumption is displayed next to the image display in l/h.



Time remaining until reserve:

The remaining time until the fuel reserve is reached is displayed next to the image display in min. .



Intake air temperature:

The current intake air temperature is shown next to the image display in degrees Celsius. Alternatively the indicator can also be represented in degrees Fahrenheit.

Technical description

Display unit pilot lamps

Screen page 4 - Service indicators



Operating hours:

The hours of operation of the portable fire pump are shown next to the image display.



Software version:

The current software version is displayed next to the image display.



Service interval hours:

The operating hour-dependent service interval is shown next to the picture display. It displays the operating hours remaining until the next service.



Service interval date:

The date-dependent service interval is shown next to the picture display. It displays the date of the next service.

Error messages:

In this area of the display, error messages are displayed in the order in which they occur. The most recently output error message is displayed at the bottom left of the screen.



Cavitation:

In order to prevent possible cavitation, the speed for the supplied discharge pressure is monitored. If cavitation occurs, a warning is given. The portable fire pump cannot automatically change its preset values, this must be performed by the operator. This warning is only shown in combination with the pump pressure governor (optional).



Battery charge level:

The battery charge level warning light lights up during operation if there is a fault in the charging of the battery.



Engine temperature:

The engine coolant warning light is illuminated during operation when the coolant temperature exceeds 100 °C.



Engine fault:

The MIL warning light indicates an engine fault. If active, immediately contact the service workshop.



Engine oil pressure:

The engine oil pressure warning light illuminates during operation when the engine oil pressure is too low.



Intake pressure monitoring system warning:

If the intake pressure drops below 1.5 bar (incl. tolerance) with intake pressure monitoring system active the warning light is activated. The engine speed is then automatically reduced until the intake pressure has risen back to 1.5 bar.



Fuel reserve:

If the fuel level of the tank falls to below 15% a warning window will appear to alert the operator to the need for refuelling. The warning window automatically goes out when the fuel tank level goes over 15% (3 litres).



Ventilation warning:

If after 30 secs the automatic priming interrupts the priming process, since no vacuum was achieved, the warning light is activated. When the priming process restarts the warning goes out.



Service due warning:

If the operating hours until the next service are reached, the warning lights are activated. However, if the date of the next service is reached no warning is activated.

6.3 Governor



The pump pressure or speed are varied with the governor (S15a).

- ⇒ Turn the dial clockwise to increase the pump pressure or engine speed.
- ⇒ Turn the dial anti-clockwise to decrease the pump pressure or engine speed.

LEDs are positioned around the dial, which illuminate or go out in succession if the pump pressure is changed.

6.4 Optional equipment

Exhaust gas hose



⚠ DANGER!

Inhalation of toxic exhaust fumes can cause death or serious damage to health!

During operation of internal combustion engines in confined spaces, toxic gases build up. In order to properly discharge the hot exhaust gases, use the provided, standardized exhaust gas hose. The hose outlet should not be within the area of operation. An exhaust gas hose that is too short or too long may cause the device to trap heat and thus endanger the machine and subsequently also the operator. An exhaust gas hose compliant with DIN 14572, with a minimum diameter of 50 mm and a maximum length of 1.5 metres must be used. If no exhaust gas hose is used, then position the unit so that the exhaust gases can be freely discharged from the device. Operation in the immediate vicinity of flammable material and substances is prohibited. The exhaust system becomes hot during operation. Allow the exhaust gas hose to cool down after operation before it is removed. If operation of internal combustion engines in enclosed spaces is necessary, note the following:

- ▶ Extract the exhaust gases by means of the exhaust gas hose.
- ▶ Ensure there is adequate ventilation.

with 2 wooden handles, in accordance with DIN14572, W=50 mm, L=1500 mm



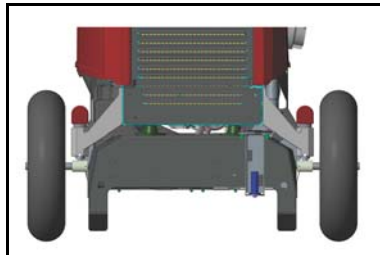
Exhaust gas hose DIN 14572

Technical description

Optional equipment

Transport wheel set

For manoeuvring and for one-man transport, the portable fire pump can be equipped with two transport wheels.



Transport wheel set

Scope of delivery:

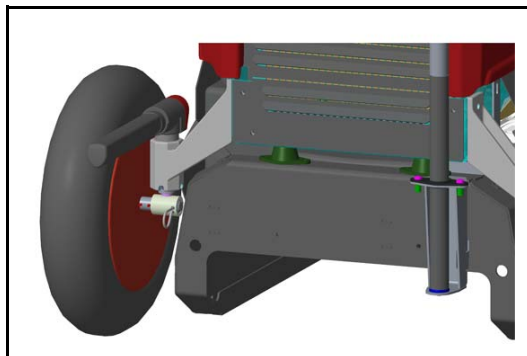
- 2 pcs. air-filled tyres
- 2 pcs. axle for air-filled tyres
- 2 pcs. axle bearings
- 6 pcs. roll pins
- 2 pcs. clevis pins
- 2 pcs. 400 mm accessory cord

Mounting the axle bearing during retrofitting:

- ▶ Push carrying handle (TG1) on cooler side down against spring tension and knock out both roll pins.
- ▶ Push carrying handle down, insert axle bearing and knock in both roll pins. While doing so make sure that the hole for the clevis pin in the axle bearing, points outwards with carrying handle folded in. The slots of both roll pins be arranged offset approx. 180°.

Mounting the transport wheels:

- ▶ Swivel out carrying handle (TG1) on cooler side by 180°.
- ▶ Insert wheel with axle into axle bearing and secure with cotter pin.
 - ▶ Tie clevis pin to carrying frame with accessory cord at a suitable position.



mounted transport wheel

Fuel cannister

The fuel cannister is to be used for filling the portable fire pump. It has a capacity of 20 litres. Thus, an empty tank can be completely filled with one cannister. The fuel in the portable fuel cannister is to be changed at least

twice a year (depletion or replacement), because conditions for storage (vibration, high temperature fluctuations) reduce the knock resistance of the fuel.



Fuel canister

Filler neck

The filler neck, which is an attachment for the fuel canister, must always be used when refuelling.



Filler neck

Tool kit

consists of:

- Tool bag
- TORX TX20 angle screwdriver
- TORX TX30 angle screwdriver
- Spark plugs applicator 5/8 square 16 mm
- 3 pcs. spark plugs
- Oil draining hose M22 x 1.5

Technical description

Optional equipment

RLS1000 LED lighting system

The RLS1000 light head can be attached by means of optional adapters on the carrying frame. This requires at least two extensions.

To ensure operational safety, the RLS1000 can be turned on only when the engine is running and the battery voltage is greater than 11.5 V (see symbol - function indicators *RLS illumination*).

Scope of delivery:

- Adapter support
- Socket

Assembly:

- ▶ Fix the adapter support to both rear slots on the carrying frame by suspending the straps.
- ▶ Insert the lighting head into the adapter support with extension and connect cable to socket.
 - ⇒ The extensions can be individually locked by twisting, to prevent accidental loosening or falling out of the lighting head.



RLS1000 frame holder



Opening the covering hood is not possible when using the lighting system with adapter support!



Read/observe the supplementary supplier documentation.

5-key control panel

Additional programmable special functions on the portable fire pump can be operated with the keys.

- Competition mode
 - *Training*
 - *Competition*
- Pressure preselection keys (only in conjunction with pump pressure governor option)
 - Pressure selection 4, 6, 7, 8, 10, 12 and 15bar



Key panel

Competition mode operation - Variety 1 "Carinthia"

Activate *Competition* function:

- ▶ Start engine "Starting the engine"
- ▶ Press the *Competition* function switch.
 - ✓ Red LED flashes.
- ▶ Switch off the engine. "Switching off the engine"
 - ✓ Red LED illuminates, the display is black.
- ▶ Press the Engine start (S57) function switch.
 - ✓ The *Competition mode* is started.

Activate *Training* function:

- ▶ Start engine "Starting the engine"
- ▶ Press the *Training* function switch.
 - ✓ Red LED flashes.
- ▶ Switch off the engine. "Switching off the engine"
 - ✓ Red LED illuminates, the display remains active.
- ▶ Press the Engine start (S57) function switch.
 - ✓ The *Training mode* is started.

The following operating steps are performed automatically:

- The engine is started.
- The priming pump is started.
- When the discharge pressure is reached, the speed is increased automatically.

Technical description

Optional equipment



Please refer to a separate document for information on operating the other varieties.



If the discharge pressure should be limited, either the speed is to be reduced via governor, or the pump pressure governor is to be activated via the pressure preselection keys with a fixed discharge pressure.

7 Operation

7.1 Preparation for initial operation



The sequence of the described processes is to be maintained without exception!

Before initial start-up, check the correct fluid level of all consumables.

- ▶ Oil in priming pump.
 - ⇒ For further information refer to Chapter "Priming pump"
- ▶ Coolant in compensation tank of the pump engine.
 - ⇒ For further information refer to Chapter "Engine coolant inspection"
- ▶ Fuel in tank.
 - ▶ The portable fire pump is delivered in empty state, fill the fuel tank before initial start-up.
 - ⇒ For further information refer to Chapter "Fuelling and refuelling:"
- ▶ Oil in pump engine.
 - ⇒ For further information refer to Chapter "Engine oil level control"

7.2 Preparation for start-up



WARNING!

Potentially fatal injuries due to the engine taking in flammable gases!

- ▶ Do not operate the engine in areas with a heavy concentration of flammable vapors such as e. g. diesel, gas or propane.
- ▶ When handling flammable liquids and gases, always shut off the engine immediately.



The sequence of the described processes is to be maintained without exception!

Before each start-up it should be checked that all operating materials (oil etc.) are full.

- ▶ Carry out complete visual checks.
- ▶ Check all relevant indicators and instruments for function and condition.
- ▶ Fill the fuel tank.
 - ⇒ For further information, please refer to the chapter "Fuelling/refuelling".
- ▶ Check condition of suction screen fitted in the suction connection.
- ▶ Wear personal protection equipment.
 - ⇒ For further information refer to Chapter "Servicing and cleaning".

7.2.1 Positioning the portable fire pump

- ▶ Ensure that the portable fire pump is stable.
- ▶ It must be ensured that no flammable materials are located in the vicinity of the portable fire pump (wood, dry grass, etc.).
- ▶ While being operated, the portable fire pump may only be tilted a maximum of 35° in the direction of the suction inlet and operator, and 15° in the direction of the radiator and exhaust.
- ▶ If the portable fire pump is placed on loose surfaces or if it is tilted during operation, it must be secured against slipping and falling over.

7.3 Starting the engine



WARNING!

Potentially fatal injuries due to the engine taking in flammable gases!

- ▶ Do not operate the engine in areas with a heavy concentration of flammable vapors such as e. g. diesel, gas or propane.
- ▶ When handling flammable liquids and gases, always shut off the engine immediately.



WARNING!

Shear hazard in the area of the extinguishing device!

Body parts can be sheared off.

- ▶ Do not remain in the danger area.



WARNING!

Serious injuries can arise through failure to use protective equipment.

- ▶ Wear protective equipment.



DANGER!

Inhalation of toxic exhaust fumes can cause death or serious damage to health!

During operation of internal combustion engines in confined spaces, toxic gases build up. In order to properly discharge hot exhaust gases, use the provided, standardised exhaust hose. If operation of internal combustion engines in enclosed spaces is necessary, note the following:

- ▶ Extract the exhaust gases by means of the exhaust gas hose.
- ▶ Ensure there is adequate ventilation.

NOTICE

Unplanned event

The portable fire pump can be controlled at all times, even in critical operating states (e.g. burst hose). The approach depends on the situation and is the operator's responsibility.

Variety1:

- ▶ Press *S16 a Idle* function switch.
 - ✓ The speed of the portable fire pump is automatically reduced to approx. 1700 min⁻¹.
- ▶ Close screw-down valve (J10).
 - ⇒ Engine cooling is maintained due to the water/air cooler..

Variety 2:

- ▶ Press the *Engine shut down S59* function switch.
 - ✓ The portable fire pump is immediately shut down.
 - ⇒ Engine cooling is interrupted by switching the engine off.



For safety reasons, the portable fire pump may only be operated with a closed engine hood (MH1).

7.3.1 Switch on ignition



- ▶ Briefly actuate *Engine start (S57)* function switch.
 - ▶ With (fully) switched off control panel, first the control panel will be activated - display illuminates.
 - ▶ With another brief press of a button, or with the control panel switched on the ignition is activated.

7.3.2 Starten mittels Elektrostarter (Ausführung Armaturenbrett AR1)



- ⇒ With ignition switched on.
- ▶ Press the *Engine start (S57)* function switch, to start the engine, then immediately release the switch.
 - ✓ Engine is running.
- ⇒ When the ignition is switched off.
- ▶ Actuate the *Engine start (S57)* function switch for approx. 5 seconds to start the engine, then release the switch immediately.
 - ✓ Engine is running.

NOTICE

Starting without control panel is switched on

For a shortened start procedure, by a continuous actuation (approx. 5 sec.) of the *Engine start* function switch (S57) the portable fire pump can be put into operation. The portable fire pump is then operated with a predefined speed of 1700 min⁻¹. A speed change can only be undertaken with a control panel which with ready for operation.

Starting with defective control panel

Depending on the control panel defect, by a continuous actuation (approx. 5 sec.) of the *Engine start* function switch (S57) the portable fire pump can be put into operation. The portable fire pump is then operated with a predefined speed of 3500 min⁻¹. A speed change cannot be undertaken in this mode. Immediately rectify the fault, to ensure the safety and operational readiness.



The max. permissible dry cycle time of the portable fire pump is 3 minutes. After this time has expired info appears on the display screen (DB1) which must be acknowledged with the middle function switch (EN1). Further operation is the operator's responsibility and can lead to damage to the mechanical shaft seals.

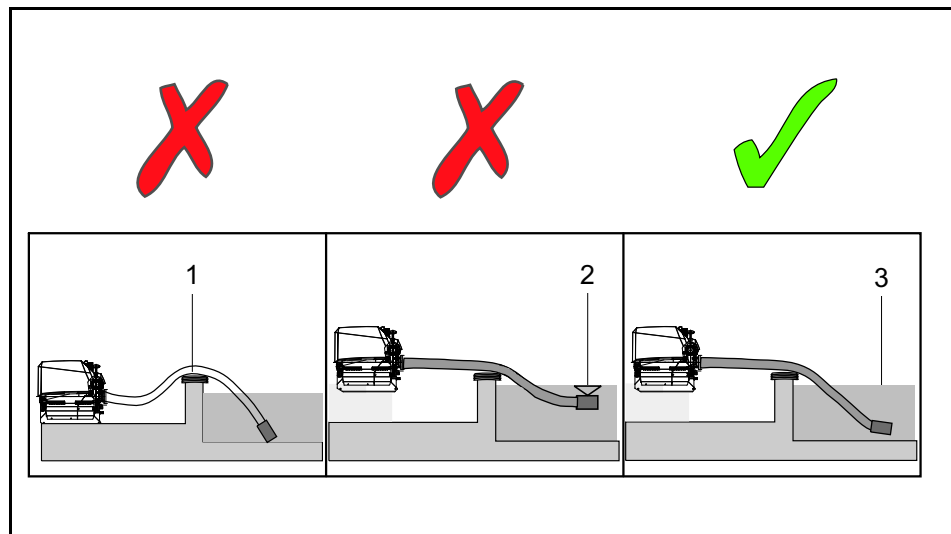
7.4 Priming from an open water source

NOTICE

Damage due to cavitation!

The pump capacity is reduced with increasing suction height. When operating with great suction heights, high pump speeds and very high discharge rates, the pump may cavitate. Cavitation causes extreme pressure and temperature peaks which can destroy the pump. Cavitation may sound like marbles are being pumped through the system. Cavitation must be avoided by all means, because the pump internal parts (e. g. impeller) might be damaged by this excessive load. A constricted suction hose while external drafting may result in loss of the water flow.

- ▶ In external drafting operations from open water never run the pump without a strainer.
- ▶ If cavitation occurs, reduce pump speed, suction height or water discharge.
- ▶ Never run the pump at high speed with a free outlet.
- ▶ Monitor all display instruments of the pump.
- ▶ Watch declining water level of the water source.
- ▶ Use non-collapsible hose for drafting operation.



Position the suction hose ready for intake from an open water source

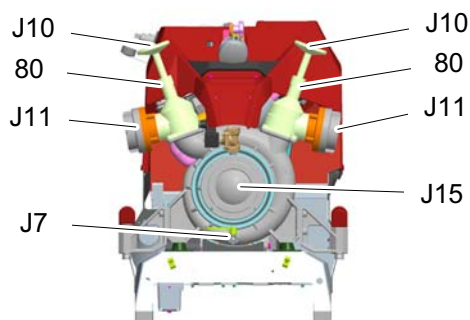
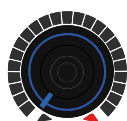
- 1 Air in hose
- 2 Vortex
- 3 Correct position of the suction hose



The suction hose with strainer should be at least 20 cm under water. Do not place the suction hose in mud or on sand. Contaminants shorten the service life of the pump unit!

7.4.1 Activate drafting operation from open water source

- ▶ Bring the portable fire pump into a good position in relation to the water source.
 - ⇒ Observe the inclination of the engine (max. 35° in the direction of the suction inlet and operator, and 15° in the direction of the radiator and exhaust).
 - ⇒ Do not place the pump on anything flammable (grass, leaves, straw, etc.).
- ▶ Close drain cock (J7).
- ▶ Close pressure outlets (J11).
- ▶ Connect suction and pressure hoses.
 - ⇒ The suction hose with strainer should be under water at least 20 cm (do not place in mud or on sand).
 - ⇒ At the drafting point, the drop in water level must be observed.
- ▶ Starting the pump engine - see "Starting the engine".
- ▶ Ventilate the pump and suction hose.
 - ⇒ Automatic priming is activated by briefly pressing the *priming pump* function switch (S3). With a pressure of approx. 1.5 bar, the priming will be automatically completed. The priming pump will then be run dry.
 - ⇒ If the priming process lasts longer than 30 sec. the priming pump automatically shuts down, a message appears on the display.
- ▶ Open the discharge outlets (J10) and increase speed by means of the *governor* (S15a) until the desired pressure is reached.



7.5 Hydrant operation

NOTICE

Damage to the pump system due to use of contaminated water!

Contaminated water can cause damage to the pump due to deposits.

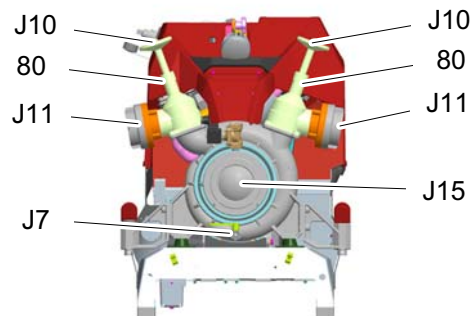
- ▶ Before connecting the pressure hoses to the hydrant, open the hydrant and allow water to escape until only clean water flows.

- ▶ Bring the portable fire pump into a good position in relation to the water source.
 - ⇒ Observe the inclination of the engine (max. 35° in the direction of the suction inlet and operator, and 15° in the direction of the radiator and exhaust).
 - ⇒ Do not place the pump on anything flammable (grass, leaves, straw, etc.).
- ▶ Connect pressure hoses to the pressure outlets (J11).
- ▶ Connect pressure hoses from the hydrant to the external drafting connection (J15).
- ▶ Open pressure outlets (J10).
- ▶ Slowly open the hydrant valve
- ▶ Starting the pump engine - see "Starting the engine".
- ▶ Increase speed using the *dial* (S15a) until the desired pressure is reached.



Hydrant operation via the pump pressure governor with intake pressure monitoring system (optional)

- ▶ Start up the portable fire pump as described in the chapter "Hydrant Operation".
- ▶ Activate the pump pressure governor by pressing the *dial* (S15a). The intake pressure monitoring system activates as soon as an intake pressure of 1.5 bar is achieved for the first time. The discharge pressure is reduced as soon as the intake pressure falls below 1.5 bar, thus preventing the pressure hose from being sucked empty at the pressure inlet.



Pumping

NOTICE

Do not operate the pump in the cavitation area!

Cavitating of the pump is perceptible as a noise (similar to pebbles being pumped).

- ▶ Never operate the portable fire pump without suction head or suction filter.

- ▶ Start up the portable fire pump as described in the chapter "Priming from an open water source."



The highest delivery pressure of the pump, indicated at the pressure gauge, is 17 bar (P28) with a maximum inlet pressure of 17 bar.

The supply pressure indicated at the water pressure vacuum gauge (P30) must not drop below 1 to 2 bar; otherwise, the supply hose will collapse and restrict water flow.

The maximum inclination of the portable fire pump only applies when the oil is filled to the maximum level.

If water is not discharged when the pump is running, the water in the pump and the pump itself heats up. This can be prevented by regular water discharge.

Do not use the portable fire pump in potentially explosive atmospheres!

7.6 Monitoring during operation

The LCS (Logic Control System) monitors:

- engine starting/stopping, speed adjustment,
- fuel capacity, cooling water temperature, oil pressure, etc.
- ▶ The speed of the engine can be changed using the *governor* (S15a). Optionally once this is reached, it is saved by pressing the governor (S15a). The pump will then always regulate itself to this set pressure.

The operator must always be within reach of the pump control panel.

When a defect occurs, it is displayed on the screen.

- ▶ The operator must take appropriate measures to avoid damage.
- ▶ In case of abnormal noises reduce the engine speed, or shut down the portable fire pump, if possible, to prevent damage.

7.7 Switching off the engine



At high ambient temperatures (> 35°C) and an engine temperature of above 95°C allow the engine to cool down before switching it off in operation.

To do this operate the portable fire pump at approx. 2000-2500 min⁻¹ in suction state (higher cooling performance) for approx. 3-5 minutes, to regulate the engine temperature at approx. 85°C. The temperature display of the engine coolant is displayed on page display of the display unit.



The display remains active for 2 mins after the portable fire pump has been switched off. After 60 mins operation will be completely switched off.

It is not absolutely necessary to fully switch off operation by a long press of the *Engine shut down* function switch (S59). In some circumstances this can lead to an engine fault.



- ▶ Set engine to idling speed.
 - ⇒ Observe engine temperature.
- ▶ Press the *Engine shut down* function switch (S59).
 - ✓ The engine is switched off.
- ▶ Close hydrant valve if operating the hydrant.
- ▶ Disconnect pressure hoses between the hydrant and the external drafting connection (J15).
- ▶ Close pressure hoses.
- ▶ To release pressure in the risers, proceed as follows:
 - ▶ Open the pressure valve(s) (J10) completely.
 - ▶ Pull out the discharge relief valve(s) (80).
 - ▶ Open the pressure valve(s) (J10) until it stops.
 - ✓ Pressure is released through the pump and suction connection.
- ▶ Drain pumps.
 - ▶ Open drain cock (J7).
- ▶ Suck priming pump dry.
 - ▶ Start engine and priming pump by pressing the *Priming Pump* function button (S3) down for a few seconds.
- ▶ When no more water is discharging: close the drain cock (J7) again.
- ▶ Prepare the pump for its next use.

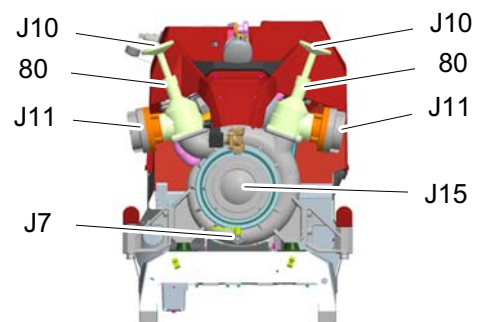


Shutting down temporarily

- ▶ Set engine to idling speed.
 - ⇒ Observe engine temperature.
- ▶ Close pressure valve(s) (J10)
- ▶ Press the *Engine shut down* function switch (S59).
 - ✓ The engine is switched off.

Operation

Switching off the engine



Disconnect the suction hoses before releasing the pressure from the riser pipes. The maximum pressure for suction hoses is 3 bar.

After operating the pump with salt water or dirty water, the pump must be flushed with clean water!

7.8 Flush/drain



A thorough flushing with seawater or dirty water is to be carried out after each operation.

If seawater or dirty water was sucked up with the priming pump, it is important to rinse with clean water to prevent damage to the piston.

After rinsing, the entire portable fire pump must be drained.



- ▶ Put the portable fire pump into operation and run at idle speed.
 - ⇒ See "Starting the engine".
- ▶ Feed pump with clean water or suck water from a clean water source.
- ▶ Press the *priming pump* function switch (S3) for approx. 10 seconds .
- ▶ Fully open the pressure valve(s) (J10) and rinse until clean water comes out.
- ▶ After completion of the rinsing process, drain the priming pump dry.
- ▶ Actuate the *priming pump* function switch (S3) for one second.
 - ✓ The priming pump is sucked dry.

Drain the screw-down valves

Additionally, open the valves via the spindle limit (80).

- ▶ Pull spindle limit (80) and open valves to the stopper.
 - ✓ The valves are fully open.
 - ✓ The water held inside is automatically expelled.
- ▶ Re-close the valves.
 - ✓ The screw-down valves are drained.



When shutting down the portable fire pump after use, open the screw-down valves half a revolution in order to relieve the seals.

7.9 Transporting the portable fire pump



CAUTION!

Risk of injury to operating personnel during transport

Unfolded handles represent a tripping hazard!

- ▶ Fold the unfolded handles after use.
-



If possible, always carry with 4 people and lift from the knees to reduce the risk of back injuries.

Carrying over long distances can lead to excessive strain.

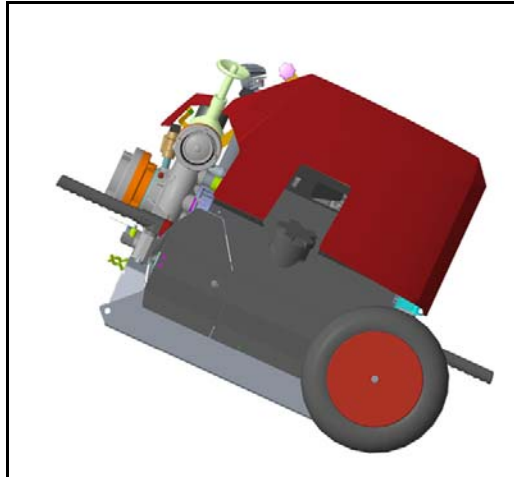
After using the portable fire pump allow it cool down before transporting it away, to allow possible absorbed radiation heat (depending on the operation duration) on the carrying handles to be dissipated.

7.9.1 Manual transport

- ▶ To carry the portable fire pump, 4 people are required (total weight approx. 166 kg).
 - ▶ The carrying handles (TG1-4) of the portable fire pump are designed so that they can be put into position both longitudinally and transversely to the unit. For this purpose, the carrying handles are pressed down and then rotated to the desired position.

7.9.2 Transport by means of the transport wheels (optional)

For manoeuvring and for one-man transport, the portable fire pump can be equipped with two transport wheels. The carrying handles are swung in the direction of travel. The portable fire pump can then be lifted and moved by an operator.



Portable fire pump with transport wheels



An additional operator is needed for slopes and downhill gradients.

7.10 Tilting the engine cover



CAUTION!

Danger of burning!

- ▶ Do not grip onto switched-on or recently switched-off search lights.



There is a danger of crushing when closing the engine cover!

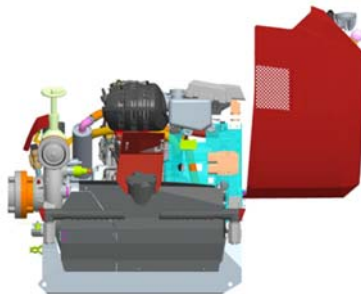
- ▶ Only touch the engine cover where appropriate (EC1).
- ▶ Move the cover carefully and with caution.
- ▶ Observe a safe distance from the danger area.
- ▶ Use protective equipment.



During operation, opening the engine cover (MH1) is prohibited for safety reasons.

For various testing, maintenance and repair work, the cover (MH1) can be opened with the handle (GR1) in the direction of the engine.

- ▶ Ensure sufficient space behind and above the portable fire pump when opening.
- ▶ Spotlight (E11) placed in vertical position.
- ▶ Lift and tilt the cover (MH1) with the handle (GR1).



7.11 Fuelling and refuelling:



To perform a safe refuelling operation, it is essential to comply with all security measures.



WARNING!

Risk of fire and explosion!

- ▶ When refuelling with a fuel canister, the filler neck must always be used, after being securely locked onto the canister.
- ▶ In all parts (canister and filler neck), it must be ensured that no damage is present. In case of damage in the area of the fuel tank, the lining around the filler neck or the air cooler (fan), refuelling during operation is prohibited.
- ▶ During refuelling, ensure that a deployable fire extinguisher (fire classes A and B) is available. The minimum size of the fire extinguisher must be 5 kg.
- ▶ When the fuel tank cap is open, smoking is absolutely prohibited in the vicinity of the portable fire pump. Fire and open flames are also prohibited.
- ▶ By spillage or overfilling of fuel during refuelling, an explosive atmosphere in the area immediately around or above the puddle may result.



CAUTION!

Environmental and health hazard due to fuel!

Fuels can create long-term water contamination, and endanger creatures and plants of all kinds

- ▶ Do not inhale fuel fumes.
- ▶ Avoid skin contact with fuel.
- ▶ Treat spilled fuel with a suitable desiccant and dispose of in an environmentally sound manner.



NOTICE

Engine damage can be caused by incorrect fuel!

- ▶ The portable fire pump can be fuelled only with premium petrol (min. 95 RON), E10 or Aspen four-stroke. Observe pictograms of the portable fire pump.

Operation

Fuelling and refuelling:

Limited shelf life of fuel

- ▶ The fuel in the tank of the portable fire pump must be utilised within six months. Otherwise deposits (sediments and precipitation) can occur.
 - ▶ The fuel in the fuel canister is to be changed at least twice a year (depletion or replacement), because conditions for storage (vibration, high temperature fluctuations) reduce the knock resistance of the fuel.
-

Change fuel

If the fuel should be changed in the tank, make sure that there is no mixing of various sorts of fuel.

- ▶ Deplete fuel in tank, or extract with a suitable pump.
-



Always use a freshly filled fuel for performance checks to prevent performance losses.

7.11.1 Fuelling operation when engine is running

Before refuelling:

- ▶ Verify if it is necessary to refuel (e.g. by observing fuel warning lamp).
- ▶ Check the immediate environment and create as much space as possible. (Free space for unhindered escape from the danger zone must be ensured).
- ▶ Fuelling is prohibited in a horizontal radius of 0.5 m to the filler neck and vertically to the ground if an ignition source is present.
- ▶ Ensure that a deployable fire extinguisher (fire classes A and B, minimum size 5 kg) is available.
- ▶ When refuelling, filling aids (fuel canister with filler) must be used.
- ▶ A second qualified person must be present during fuelling operations, in order to help in the event of an emergency.
- ▶ For refuelling, make sure that the angle of inclination of the portable fire pump is less than 15° from the horizontal.
- ▶ Ensure there is adequate lighting.
- ▶ The covering hood must be closed. The air flow blows dangerous fumes away from hot spots.



Refuelling:

- ▶ Prepare the fuel canister as shown (opened and with filler neck fitted correctly).
- ▶ Ensure that no ambient disturbances can arise.
- ▶ Ensure secure footing during refuelling (e.g. spillages - hot surfaces - engine).
- ▶ Open fuel tank cap (29).
- ▶ Fill the tank, but do not overfill!
- ▶ Set down the canister and close, then close the tank with the fuel tank cap (29).
- ▶ Set the engine to the desired speed.

After refuelling

- ▶ Store fuel canisters at a safe distance from the portable fire pump.

8 Servicing and cleaning

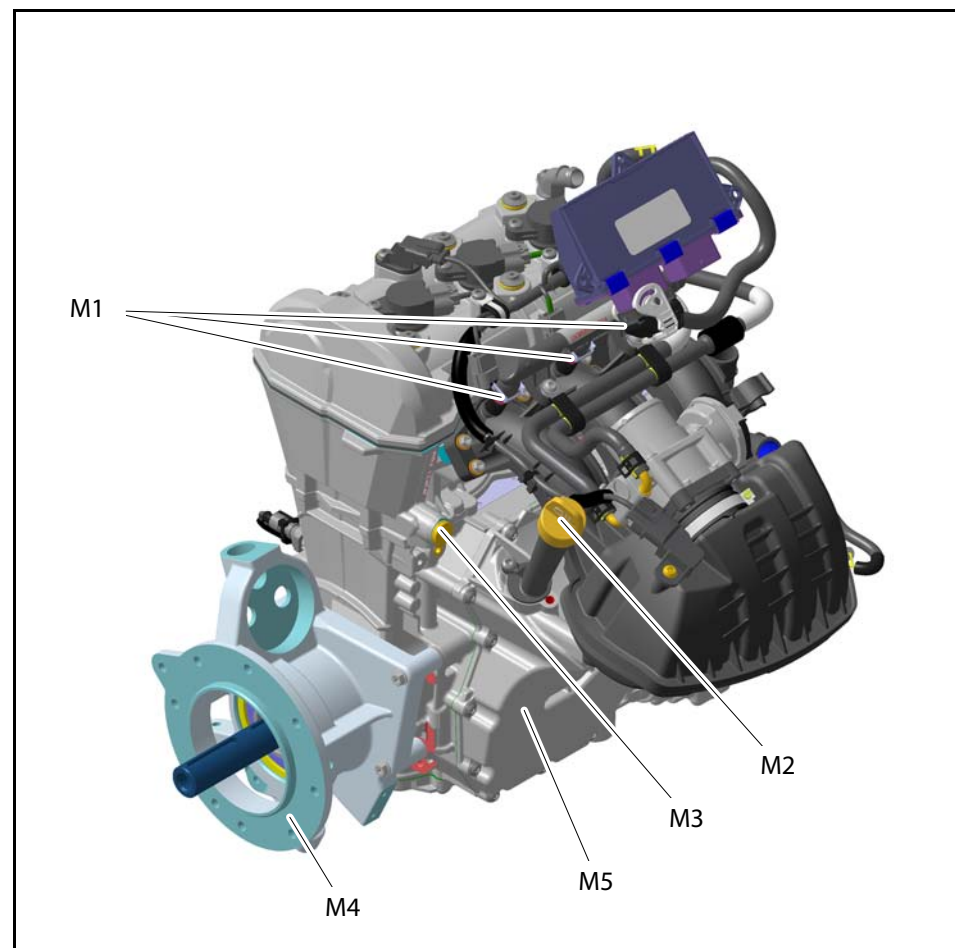
Rosenbauer Original Service

- ▶ In order to guarantee safe operation and to extend the service life of the product all prescribed service intervals should be kept.
 - ⇒ Only technology which is regularly maintained by specialists can meet the high demands.

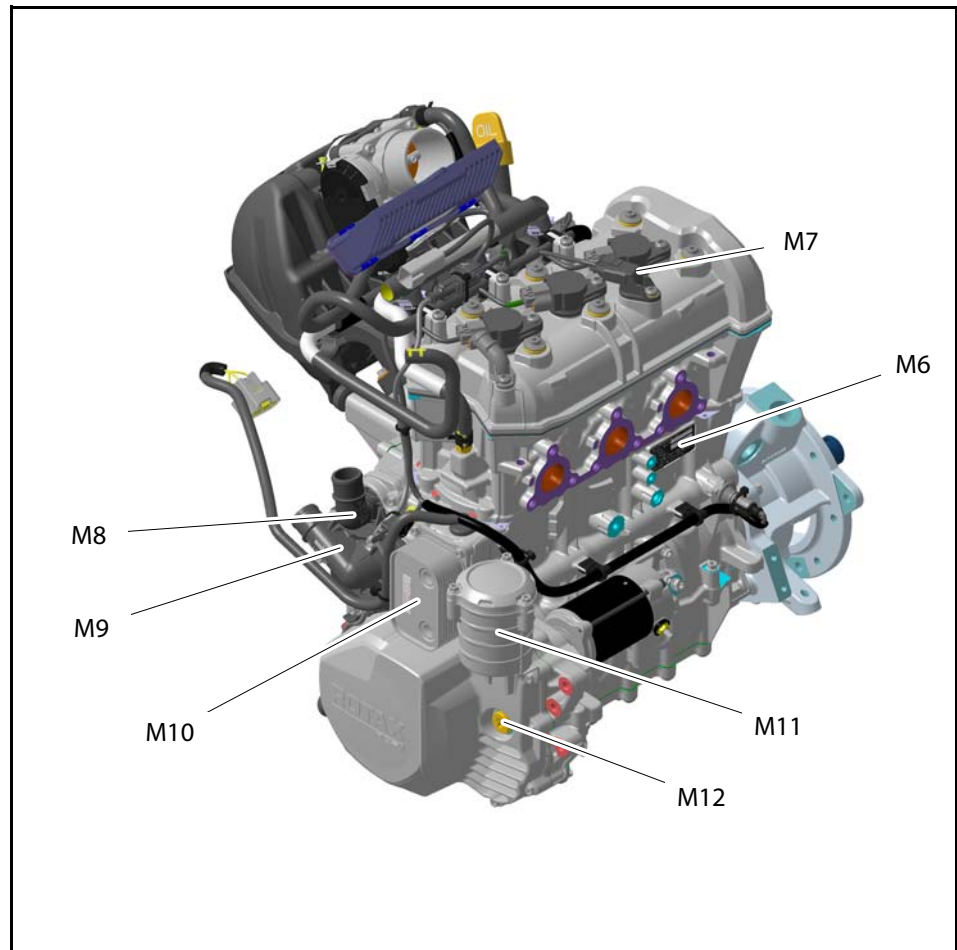
Rosenbauer service partners will gladly provide you with comprehensive advice about inspections and Service PLUS, as well as about the exact scope and costs of testing and maintenance work.

- ⇒ Further information is also available on the homepage, www.rosenbauer.com.

8.1 Engine component overview



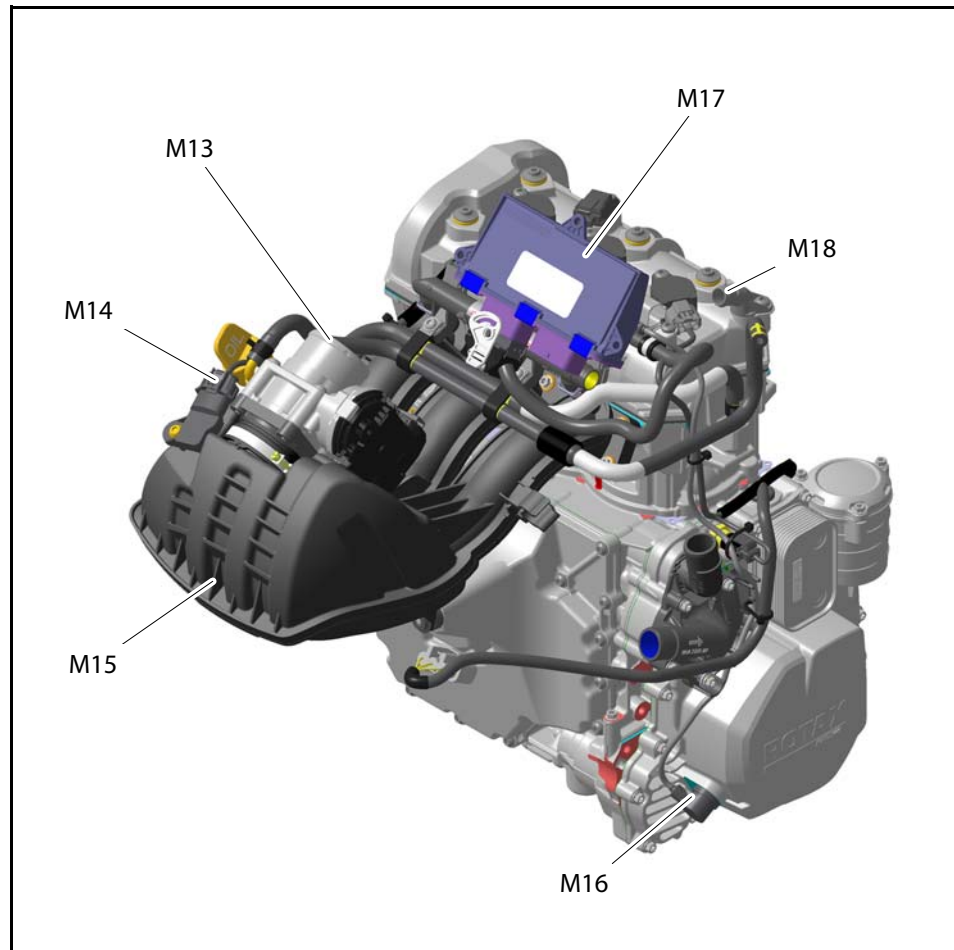
M1	Injection valves
M2	Oil dipstick
M3	Chain tensioner
M4	Pump flange
M5	Oil tank



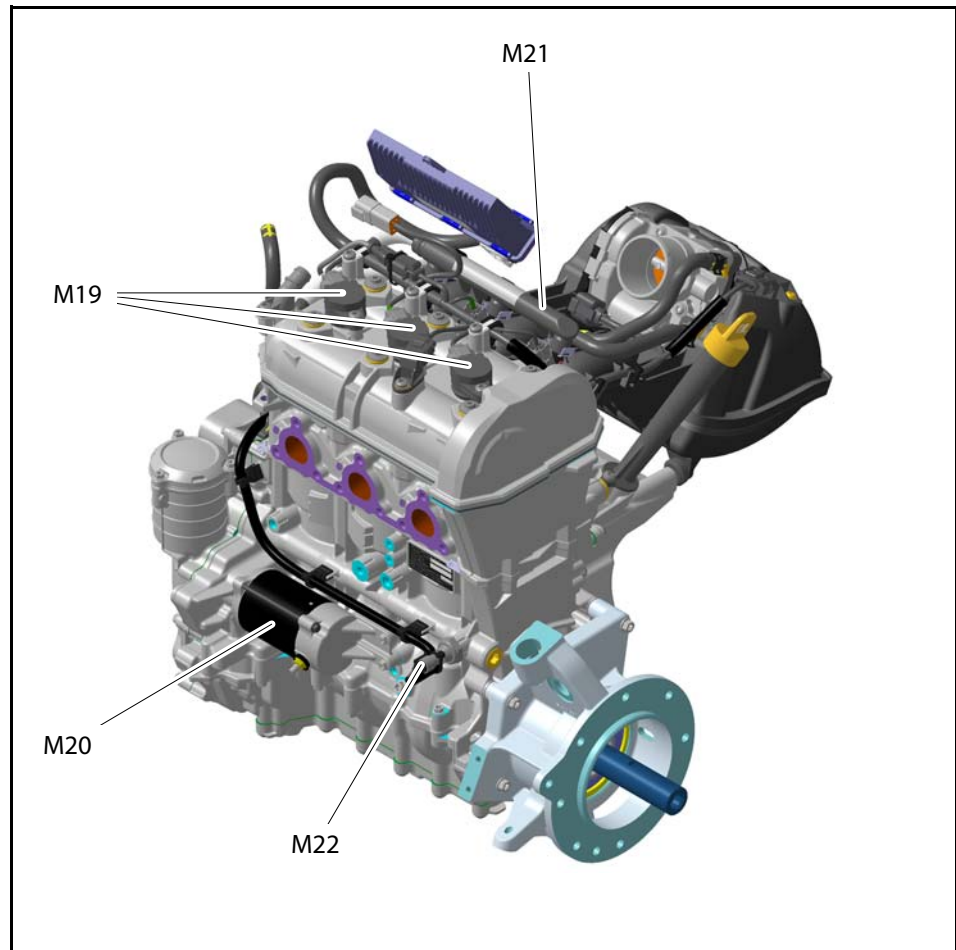
- M6 Type plate
- M7 Camshaft sensor
- M8 Thermostat housing
- M9 Water pump housing
- M10 Oil-water heat exchanger
- M11 Oil filter housing
- M12 Oil pressure regulator

Servicing and cleaning

Engine component overview



- | | |
|-----|---------------------------------|
| M13 | Throttle valve joints |
| M14 | Pressure and temperature sensor |
| M15 | Airbox |
| M16 | Engine speed sensor |
| M17 | Control device |
| M18 | Crankcase ventilation |



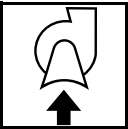
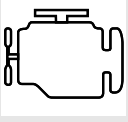
- | | |
|-----|---------------------|
| M19 | Ignition coil |
| M20 | E-Starter |
| M21 | Fuel distributor |
| M22 | Oil pressure switch |

Servicing and cleaning

Service plan

8.2 Service plan

8.2.1 Oil change interval

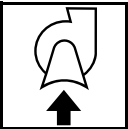
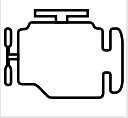
Symbol	Work specification	Monthly	Semi-annually	Annually	After 10 Operating hours	After 50 Operating hours	Every 2 years	After 100 Operating hours	Operator	Authorised Specialist personnel
	Priming pump ^a			•		•				•
	Engine ^b			•	• ^c	•				•

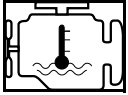
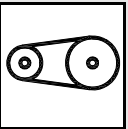
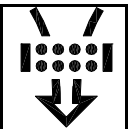
a. Whichever comes first

b. Whichever comes first

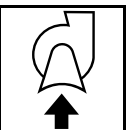
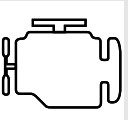
c. one-off fuel change after the first 10 operating hours

8.2.2 Inspection procedures

Symbol	Work specification	Daily	Monthly	Every six months	Annual	After 50 operating hours	Every two years	After 100 operating hours	Operator	Authorized Experts
	Check oil level of the priming pump		•							•
	Check oil level of the engine		•							•

Symbol	Work specification	Daily	Monthly	Every six months	Annual	After 50 operating hours	Every two years	After 100 operating hours	Operator	Authorized Experts
	Check the coolant in the engine				•	•				•
	V-belt of the priming pump				•				•	
	check air filter				•	•			•	

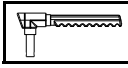
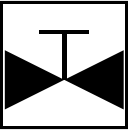
8.2.3 Checking for signs of leakage

Symbol	Work specification	Daily	Monthly	Every six months	Annual	After 50 operating hours	Every two years	After 100 operating hours	Operator	Authorized Experts
	Priming pump		•						•	•
	Engine		•						•	•

Servicing and cleaning

Service plan

8.2.4 Lubrication service

Symbol	Work specification	Daily	Monthly	Every six months	Annual	After 50 operating hours	Every two years	After 100 operating hours	Operator	Authorized Experts
	Carrying handles				•				•	
	Shaft of pressure valves			•					•	

8.3 Lubrication chart

Description	Medium	Dosing	Unit
Priming pump	Engine oil SAE 30	0.65 (0.17)	Litres (gallons)
	Engine oil 15W40		
	API/SF		
	MIL-L-46152 B		
	Ford M2C-9011		
	GM 6048 M		
Engine	5W40 engine oil - fully synthetic 4-stroke engine oil ^a	2 - 2.5 l	Litres
Expansion tank for coolant	VOLVO VCS coolant (initial filling)	3.5	Litres
	OAT based, NAP-free		
	VW TL 774D/F (G12+)		
	VW TL 774G (G12++)		
	OMV Coolant SF		
	CARIX Premium Long Life		
Carrying handles	Multi-purpose grease according NLGI II		
Shaft of the pressure valves	Multi purpose grease according NLGI II		

a. or equivalent engine oil with API classification foam

8.4 Torque list

Tightening torques acc. to DIN 13-1 are to be complied with.



In particular the connecting elements are to be checked.

8.5 Inspection procedures

Testing and inspection procedures

Assessment and inspection work may only be carried out by correspondingly trained fire-fighting personnel, who are familiar with the portable fire pump.

The work must be carried out regularly, especially after each use, to ensure optimum operational safety of the portable fire pump.

All components, locks and fittings of holding and storage systems have to be checked if they are in a good condition and verify safe storage. Any deviation, damage or defects must be corrected immediately or repaired.



Observe the operating instructions of the individual pieces of equipment and units!

Portable fire pump

- ▶ Check the entire portable fire pump for damage or other defects.
 - ▶ If damage to the lining parts in the area of the filler neck (tank filling lighting TB1, fuel tank cap 29) is present, further operation or start-up is prohibited.
- ▶ Put the portable fire pump into operation and check for proper functioning.
- ▶ Check the operation and status of all valves, instruments and gauges.
- ▶ Check the cleanliness of the suction filter in the suction hose.
- ▶ Check cleanliness of the strainers in the supply line.

V-belt for priming pump drive

Check V-belt carefully for signs of mechanical damage at least once a year. Avoid contact between V-belt and all lubricants.



Reduced performance or failure of the transmission because of oil on the V-belt.

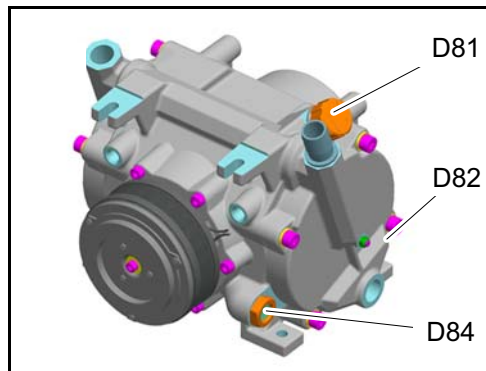
With oil contaminated V-belts or V-belt pulleys can not transmit the required driving force and slip through.

Avoid oil pollution of the V-belts and V-belt pulleys.

Clean with oil contaminated V-belts and V-belt pulleys.

Priming pump

All moving parts are oil-bath lubricated.



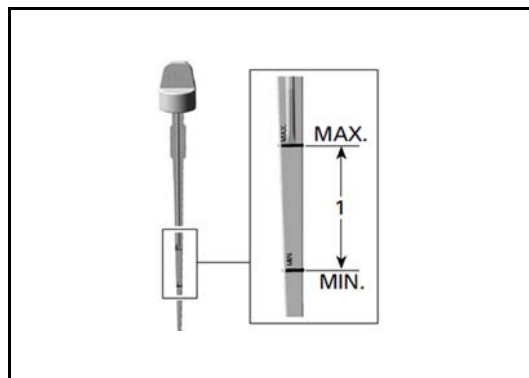
D81	Oil filler plug
D82	Oil drain plug
D84	Oil level sight glass

Check oil level:

- ▶ Check the oil level of the priming pump with the sight glass.
 - ✓ The oil level must be between the top and bottom markings.
- ▶ If required add oil up to the upper mark.
- ⇒ Refer to chapter "Change the priming pump oil".

Engine oil level control

- ▶ Position the portable fire pump on an even surface.
- ▶ Start the engine and let it idle for at least 20-30 seconds.
- ▶ Switch off the engine.
- ▶ Unscrew the oil dipstick (M2) and wipe it clean.
- ▶ Screw the oil dipstick (M2) in again and tighten it.
- ▶ Unscrew the oil dipstick (M2) and take a reading of the oil level.
 - ✓ The oil level should be just below or at the MAX marking.
- ▶ If necessary, refill engine oil.
 - ⇒ The oil quantity between the MIN and MAX marking is around 500 ml.



Servicing and cleaning

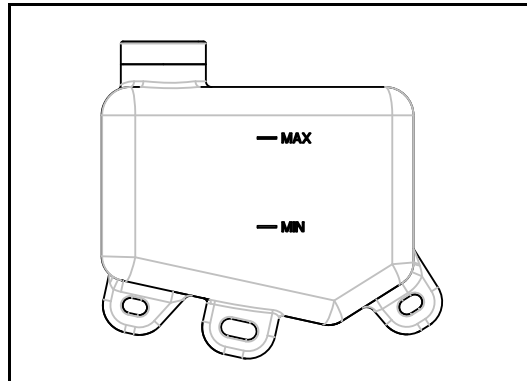
Inspection procedures

Engine coolant inspection

- ▶ Remove the pressure cap from the compensation tank at room temperature. The coolant should be between the MIN and MAX markings in the compensation tank.
- ▶ If necessary, fill the tank with coolant and fit the pressure cap.
 - ⇒ Use VOLVO VCS coolant for the initial filling.



Coolants may not be mixed together.



Temperature stability control

- ▶ Remove the pressure cap from the compensation tank.
- ▶ With the coolant probe, check the temperature status. This should be at least $-20\text{ }^{\circ}\text{C}$.

Leak testing

The check for leak tightness should be done every 3 months, after a complete drainage of the portable fire pump.

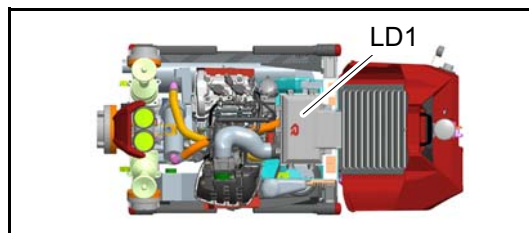
- ▶ Drain pump carefully.
 - ▶ Open drain cock (J7).
- ▶ Close the suction inlet (J15) with a blank cap.
 - ⇒ When checking suction hoses, connect them to the suction inlet and close the end with a blank cap.
- ▶ Close pressure valve(s) (J10)
- ▶ Actuate *Priming pump* function switch (S3) to activate the priming pump.
- ✓ If only the pump is checked, a vacuum of 0.8 bar is reached in a few seconds.
- ▶ The pump is tight enough, if the vacuum does not drop below 0.1 bar within one minute.
 - ⇒ If 0.8 bar cannot be reached, the pump should be put under pressure by water induction. A pressure of 3-6 bar connected to the suction inlet is sufficient.
- ✓ The leak check is carried out.
- ▶ Release vacuum after the leak check.
 - ▶ Briefly open the pressure outlet(s) (J10) or drainage (J7).



Change air filter

The air filter of the portable fire pump engine should be replaced every 5 years. When using in regions with specially heavy dust loads the change, may take place earlier, depending on the contamination.

- ▶ Position the portable fire pump on an even surface.
- ▶ Open the engine cover (MH1).
- ▶ Remove the 9 pcs. fastening screws on the air filter cover (LD1).
- ▶ Remove air filter cover (LD1)
- ▶ Remove air filter
- ▶ Installation of the air filter takes place in reverse order, the screws on the air filter cover are to be fitted hand-tight.
 - ✓ Air filter has been changed.



Spark plugs

The spark plugs of the portable fire pump engine should be replaced every 150 operating hours or 3 years. The spark plug picture can give details of the ignition settings, as well as status and operating conditions of the engine.

Specification:

- ⇒ 3 pcs. NGK MR7BI-8
- ⇒ Iridium spark plugs
- ⇒ Electrode gap 0.7 - 0.8 mm (not adjustable)

Spark plug change:

- ▶ Position the portable fire pump on an even surface.
- ▶ Open the engine cover (MH1).
- ▶ Dismantle the fastening screws on the ignition coil (M19).
 - ▶ Use of TORX TX30 angle screwdriver.
- ▶ Remove ignition coil.
- ▶ Remove the spark plugs.
 - ▶ Use of spark plugs applicator 5/8 square 16 mm.
- ▶ The installation of the spark plugs is done in reverse order.
 - ⇒ Tightening torque of the spark plus 13 Nm (+/- 1 Nm).
 - ✓ Spark plugs have been changed.

Servicing and cleaning

Inspection procedures

Fuses and relays

The electrical circuits on the electrical unit of the portable fire pump are secured with fuses.

The fuse holder is located on the side away from the operator, behind the air filter box

The fuse holder is located on the side opposite the operator, behind the air filter box



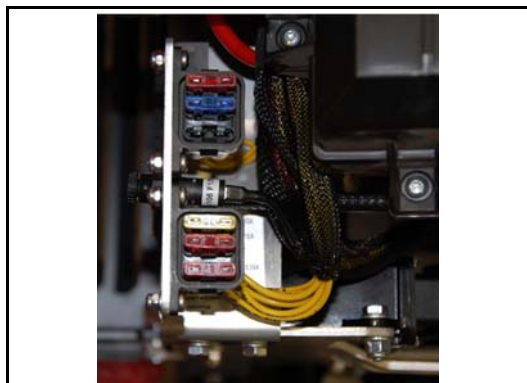
Before replacing the burnt out fuse, check the cause of the defect. Do not repair defective fuses and relays - fire risk. Only use prescribed fuses and relays.

Fuse allocation:

- F1-5 10A control
- F1-3 15A cooling fan
- F130 0.05A tank illumination
- F3-5 20 A main fuse
- F3-3 10A operation
- F3-1 10A charge

Relay allocation:

- K319 cooling fan relay
- K8 main relay
- KRLS RLS relay



Fuse allocation

Calibrate pressure sensors

The pressure sensors built into the portable fire pump are absolute pressure sensors and are therefore subject to fluctuations in the atmosphere air pressure (high difference, weather conditions etc.).



Before calibrating the pressure sensors ensure that the portable fire pump is in a depressurised state (drain valve J7 and screw-down valves J10 open, engine not started).

Calibrate pressure sensors to the ambient pressure:

- ▶ Change to the display unit on Screen page 1 - function displays.
- ▶ Press *Acknowledge error message* (EN1) function switch for approx. 3 sec. .
 - ✓ The pressure sensors are calibrated to the ambient pressure.

8.6 Service procedures

Service work is work that may only be carried out by specially authorised expert personnel.

This work is to be carried out or allowed to be carried out in accordance with the manufacturer's regulations.



Maintain service intervals, as well as officially prescribed testing schedules and create written records for them.

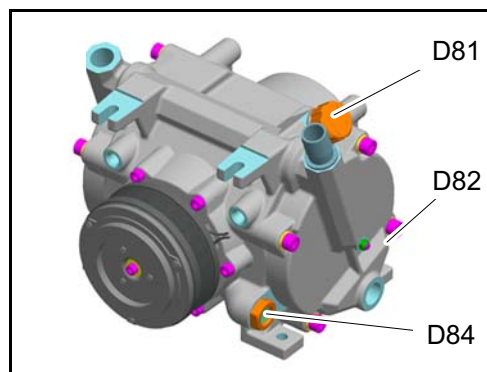


Observe the operating instructions of the individual pieces of equipment and units!

NOTICE

Neglecting these recommendations will result in loss of warranty.

Change the priming pump oil



D81	Oil filler plug
D82	Oil drain plug
D84	Oil level sight glass

Drain the oil

- ▶ Make the pump compartment accessible.
- ▶ Place a suitable container underneath the oil drain plug of the priming pump.
- ▶ Open oil drain plug and drain the oil.
 - ▶ Collect the old oil and dispose of it properly.
- ▶ Close oil drain plug
- ✓ Oil has been drained.



Observe the local regulations for oil disposal.

Top up oil

- ▶ Open oil filler plug
- ▶ Add oil using a suitable funnel and wait until it has run down.
 - ⇒ Oil quality and oil filling quantity, refer to chapter "Lubrication chart".
- ▶ Check that the oil level is between the MIN and MAX markings.
 - ▶ If the oil level is too low, add oil.
- ▶ Close oil filler plug.
- ✓ Oil has been changed.



Reduced performance or failure of the power transmission because of oil on the v-belt.

Oil contaminated v-belts or v-belt pulleys can not transmit the required driving force and slip through.

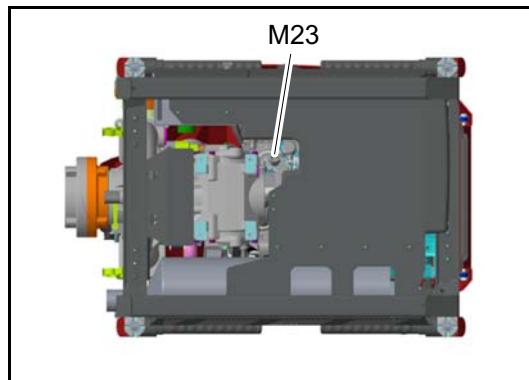
Avoid oil pollution of the v-belts and v-belt pulleys.

Clean v-belts and v-belt pulleys contaminated with oil.

Replace engine oil and oil filter



Engine oil and oil filter must always be replaced at the same time.



M23 Oil drain valve plug

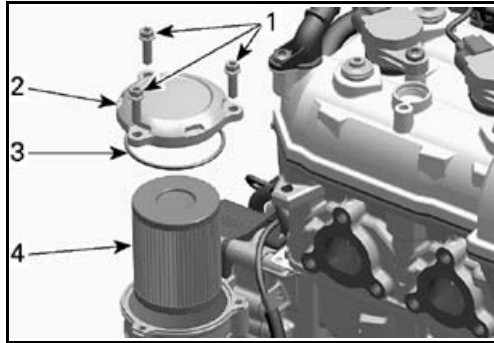
Drain the oil

- ▶ Securely place the portable fire pump in a raised position.
 - In order to drain the oil better, it is recommended to lift the exhaust side approx. 10 cm and place suitable auxiliary materials under it.
- ▶ Allow portable fire pump to warm up dry for approx. 2 mins.
- ▶ Pull out the oil dipstick (M2) to ventilate the oil pan.
- ▶ Unscrew sealing cap on oil drain valve (M23).
- ▶ Screw oil drain hose (tool set) approx. 2-3 turns on to oil drain valve (M23).
- ▶ Place collection container under the oil drain valve of the portable fire pump.

Servicing and cleaning

Service procedures

- ▶ Completely screw on oil drain hose and drain oil.
 - ▶ Collect the old oil and dispose of it properly.
- ▶ After approx. 1.7l used oil has flowed out, the 3 fastening screws (1) are opened on the oil filter housing (M11) and the oil filter (4) removed.
- ✓ Oil is drained.



Observe the local regulations for oil disposal.

Top up oil

- ▶ Fit the new O-Ring (3) to the oil filter cover (2) and oil the O-Ring and the sealing lip of the oil filter (4).
- ▶ Insert the oil filter (4) as depicted and fit the oil filter cover (2).
 - ⇒ Tightening torque of the fastening screws 9 Nm.
- ▶ Unscrew sealing cap on oil drain valve (M23).
- ▶ Add oil into the oil dipstick opening (M2) using a suitable funnel and wait until it has run down. Then reinsert the oil dipstick (M2).
 - ⇒ Oil quality and oil filling quantity, refer to chapter "Lubrication chart".
- ▶ For approx. 20 secs. put portable fire pump in operation idling.
- ▶ Check that the oil level is between the MIN and MAX markings.
 - ▶ If the oil level is too low, add oil.
- ✓ Oil has been changed.



Reduced performance or failure of the power transmission because of oil on the v-belt.

Oil contaminated V-belts or V-belt pulleys can not transmit the required driving force and slip through.

Avoid oil pollution of the V-belts and V-belt pulleys.

Clean V-belts and V-belt pulleys contaminated with oil.

Engine coolant change



CAUTION!

Burning hazard from the hot cooling system!

- ▶ Only carry out maintenance work after the portable fire pump has been shut down and the cooling system has cooled down.

NOTICE

Missing coolant

- ▶ The engine can be damaged through faulty or insufficient filling.

Usually no change of coolant is planned. However due to various reasons it may be necessary to carry out a change, or due to a deficiency a significant quantity of coolant may escape.

Filling / changing the coolant

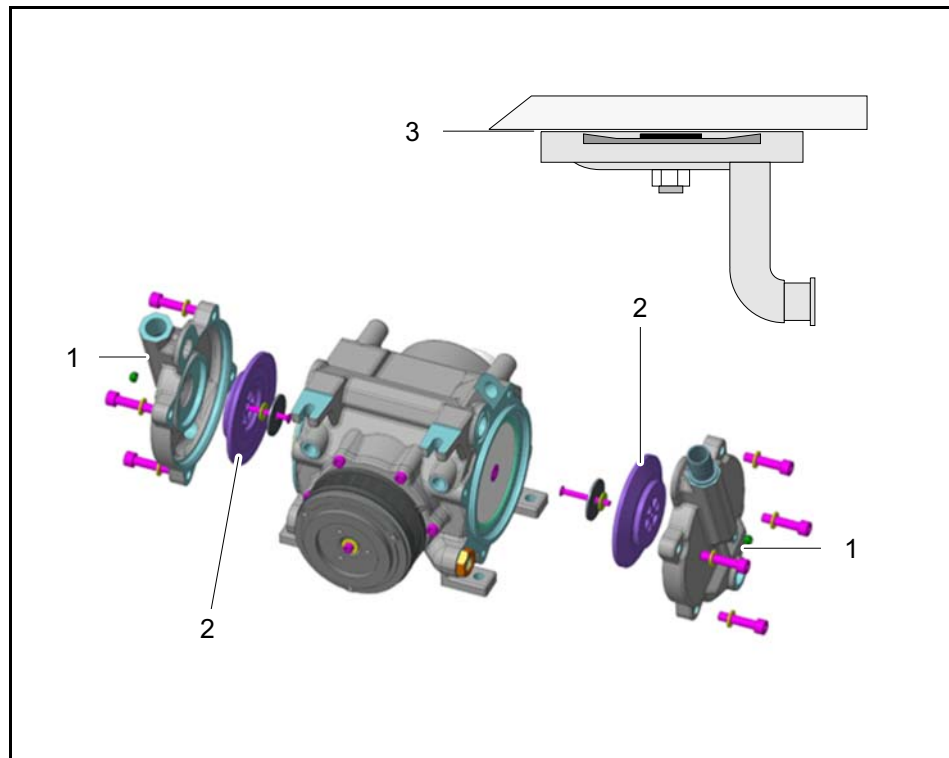
If damage occurs to the cooling system or the engine, this must be fixed before filling.

If coolant has been completely drained, before a restart of the portable fire pump, it must be ensured that at least 1.7 - 1.8 l of coolant were added.

If coolant has not been completely drained, before the first start of the portable fire pump, it must be ensured that the compensation tank has been completely filled with coolant (above MAX indicator).

- ▶ Put portable fire pump into idling mode and manually extract.
 - ⇒ Press the *priming pump* function switch (S3) for max. 3 mins .
- ▶ If the coolant level in the compensation tank drops add coolant.
- ▶ Watch the engine temperature, it may not rise above 95°C, if this should be the case, switch off the portable fire pump and allow it to cool for 10-15 mins.
 - ▶ Repeat process until 2.5 - 2.7 l of coolant is in the cooling circuit. If after three-times of repetition still the required 2.5 - 2.7 l is not in the cooling circuit, contact Rosenbauer customer service or the nearest Rosenbauer service centre.
- ▶ With approx. 2.5 - 2.7 l coolant in the suction state of the portable fire pump the speed can be increased to approx. 3000 - 3500 rpm, to add the remaining amount of approx. 3.3 - 3.5 l coolant. Observe engine temperature while doing so..

Check valve plates of the priming pump



- 1 Valve cover
- 2 Valve plate
- 3 Gap

To guarantee the full function of the priming pump, the valve plates must be checked for contamination and damage and replaced, if required, in the event of reduced performance.

⇒ To do so it is necessary to dismantle the priming pump.

Remove valve cover

The removal of the valve cover has to be done on both sides.

- ▶ Loosen the nuts of the valve cover and remove valve cover left and right.

Check valve plates

- ▶ Check inlet valve plates for dirt and damages.
- ▶ Check outlet valve plates for dirt and damage.

Mounting the valve cover

Installation of the valve cover is to be done on both sides.

- ▶ Mount inlet and outlet valve plates together with the valve cover.
- ▶ Install both valve covers, left and right.
- ▶ Secure screws with Loctite 542.

Check valve plates after the installation

- ▶ Place steel ruler on the top of the valve cover. The ruler must be applied on both sides of the cover.
- ▶ There must be a gap between the ruler and the mounting part, in the middle.

8.6.1 General guidelines for handling electronic components

NOTICE

Neglecting these recommendations will result in loss of warranty.

Working on vehicles fitted with electronic devices

Installation and measurement of electronic devices.

- ▶ Ensure power is switched off before working on electrical parts (except when measuring).
 - ▶ Switch off battery main switch (service switch) or disconnect battery.

Vehicles pick up electrostatic charge from the ground. If you are working from the ground, first carry out a potential equalisation.

Remedy:

- ▶ Mount an earthing strap made of conductive rubber on the vehicle.
 - ▶ Connect water filled or wet hose.
 - ▶ Grip conductive vehicle frame parts before touching electrical equipment.
- ⇒ If the technician and electronics are both on the vehicle, no special precautions are necessary.

Drilling, welding and milling work

NOTICE

If ACR-Welding work on chassis or superstructure is done:

- ▶ Disconnect all plugs (connectors) from the electronics.
 - ▶ Ground point as close as possible to the welding point.
-

- ▶ Ensure that the electronics and the plug connector are correspondingly protected against milling and drilling chips etc.

If welding on the vehicle:

- ▶ Disconnect the batteries
- ▶ Connect disconnected plus and minus cable to produce a conductive electrical connection.
- ▶ Connect protective equipment.
- ▶ Always weld with direct current, in the process watch out for the polarity of the electrodes.
- ▶ Earthing point as close as possible to welding point.
- ▶ Do not lay the cable of the welding device parallel to electrical lines on the vehicle.
- ▶ Avoid voltage peaks.
 - ▶ Ensure that the parts to be welded are well fixed to one another, e.g. use earthing clip for fixing.

Painting work or working with chemicals or aggressive substances:

NOTICE

Damage to electronic components

Due to high temperature in a paint box, electronics can be severely damaged.

- ▶ Expose electronics to max. 95 °C (203 °F) for a short period.
 - ▶ Dry time must not exceed 2 hours at 85 °C (185 °F).
-
- ▶ Protect the electronics, contacts and plug connector from paint spray mist and the effect of aggressive substances.

Storing, packing and transporting

Electronics with Housing:

Precautions regarding anti-electrostatic problems are not necessary. To protect them against soiling and climatic effects, a plastic foil must be used when packaging. Sufficient filling material must be used to avoid mechanical damage during shipment of unit.

Printed Cards/chips boards:

Components like printed cards must be properly packed (wrapped) into anti-electrostatic foil. The anti-electrostatic foil is enough to protect them from soiling to. Printed cards are extremely sensitive to mechanical damage. Therefore boxes, sufficient in size, with ample filling material must be used for shipment/transport. Shipment in "Jiffy-Bags" is not permissible. The same recommendations apply when carrying these items in tool boxes etc.

General Requirements:

Maximum permissible limits for storage and transporting are as follows:

Temperature: -40° C to +100° C (-40° F to +212° F)

Humidity: 20% up to 95%

No condensation permissible.

It is essential to store electronic components either packed in protection foil (electronics with housing) or packed in anti-electrostatic foil (printed cards).

Servicing and cleaning

Service procedures

8.6.2 Storage and transport

The portable fire pump and the corresponding installation material must be stored and transported in its packaging. It must be handled carefully and cautiously.

Preserving and storing

If the portable fire pump is not operated for a longer period of time (> 3 months) the following advice must be observed.

- ▶ If there is risk of frost the portable fire pump must be carefully drained and then a dry suction process is to be carried out.
- ▶ Drain fuel injection system and fuel tank (deplete or pump away).
- ▶ Thoroughly clean the portable fire pump with moist cloths (use no running water or solvent).
- ▶ For storage without charge retention the battery is to be disconnected. The leakage current on the electrical components of the portable fire pump is approx. 0.5 mA.
 - ⇒ To prevent the generation of sparks, the earthing cable of the battery must always be removed first and connected last.

9 Troubleshooting

9.1 Faults and their solutions - pump

The following list offers an overview of possible faults on the pump. The list is not complete, but in the event of a malfunction it can be helpful in localising and rectifying the fault.

Failure	Cause	Remedy
Pump does not suck	The priming pump is not switched on	Switch on priming pump
	Suction lift too high	Reduce suction lift
	Suction strainer not below water	Place suction strainer below water
	Blocked suction strainer	Clean suction strainer
	Suction hose defective or suction seals poorly inserted or damaged	Insert or replace suction hose gaskets properly
	Blocked suction sieve	Clean suction sieve
	External suction valve closed	Open external suction valve
	Drain cock not closed	Close drain cock
	Pressure valve leaks are caused by foreign bodies or damaged valve seals	Clean pressure valve (rinse with purified water) or change the valve seal
	Torn or oily v-belt	Clean or replace V-belt
Pump suction weak	Input and/or exhaust valves of the priming pump are damaged	Change input and/or exhaust valves
Pump is noisy and vibrates	Suction lift too high	Reduce suction lift
	Pump cavitates	Reduce speed and nozzle diameter; clean suction strainer and suction sieve
Pump has low performance	Blocked suction strainer	Clean suction strainer
	Suction hose defective or suction seals poorly inserted or damaged	Insert or replace suction hose gaskets properly
	Blocked suction sieve	Clean suction sieve
	Engine power weak	Check the engine
	Pressure valve not fully opened	Open the pressure valve completely
Meter does not display anything	Meter defect	Replace meter
	Plug not connected	Connect plug
	PIN assignment incorrect	Correctly wire PIN assignment



If problems or repairs can not be clearly identified or solved please contact the customer service department or your Rosenbauer representative.

9.2 Faults and their solutions - engine

The following list offers an overview of possible faults on the engine. The list is not complete, but in the event of a malfunction it can be helpful in localising and rectifying the fault.

Failure	Cause	Remedy
Oil circuit	Low oil fluid level (from increase consumption / oil escape)	Add oil Check oil consumption max. 0.06 litres /hr. Check the engine for leaks
	Oil filter defective or dirty	Replace oil filter
	Wrong viscosity of the engine oil	Replace engine oil
	Blue smoke	Replace / renew valve shaft seals Replace / renew piston rings
	Oil/water heat exchanger leaky	Replace heat exchanger and / or seal Replace engine oil and coolant

Failure	Cause	Remedy
Cooling circuit	Coolant fluid level too low	Localise leaks and fix them Pressurise the cooling system (max. 1.1 bar) Add coolant
	Air in cooling system	Check / clean thermostat bleed hole Add coolant and ventilate the system
	Thermostat defective (does not open)	Replace thermostat
	Regular engine temperature >92 °C	Check pipe coil of water / heat exchanger for calcification
	Temperature sensor defective	Check resistance and replace is necessary Check electrical harness and repair if necessary
	Radiator cap defective	Check opening pressure (1.1 bar) and replace cap if required
	Cooling fan does not run	Air in cooling system (thermostatic switch malfunction) Check voltage supply (fuse, relay, etc.) Check temperature sensor and replace if necessary replace fan motor if necessary
Engine dies away / poor idling	Suction system leakage air	Check air filter box and connecting pieces for cracks and replace if necessary
	Spark plug electrode gap too large	Measure electrode gap. If the electrode gap is outside the tolerance, replace spark plugs.



If problems or repairs can not be clearly identified or solved please contact the customer service department or your Rosenbauer representative.

10 Environmental protection

10.1 Disposal of hazardous substances

Dispose of all materials and old parts that are produced through the handling and repair of this unit in an environmentally sound way.

Disposal of used oil, cooling water and fuels

Used oil, cooling water and fuels are water-polluting substances. Ensure the correct disposal of used oils and fuel.

- ▶ Never pour used oil, cooling water or fuel on the ground, in a body of water, in the sink or down the drain.
- ▶ Carefully collect and dispose of used oil.
- ▶ Observe local regulations.

Disposal of foam compound

Toxic foam compound is hazardous to health!

- ▶ Observe the material safety data sheets of the manufacturer of the foam compound.
- ▶ Do not dispose of foam compounds in bodies of water or in the sewage systems.
- ▶ Observe the manufacturer's disposal information.

Disposal of desiccant inserts, filter cartridges, boxes and inserts

Filter inserts, boxes and cartridges (oil filters, desiccant inserts of the air drier) are considered hazardous waste and must be disposed of properly.

- ▶ Observe local regulations.

Disposal of batteries

Since batteries are a pollutant, they must be disposed of properly.

- ▶ Never dispose of batteries with household waste!
- ▶ Observe local regulations.

Disposal of metal, rubber, and plastic parts

Improper disposal of metal, rubber and plastic parts will contaminate the environment.

- ▶ Observe local regulations.

Disposal of adhesives, paints and coating materials.

Improper disposal of adhesives, paints and coating materials will contaminate the environment.

- ▶ Observe local regulations.

Disposal of control devices

Control devices are hazardous waste and must be disposed of properly.

- ▶ Observe local regulations.

11 Technical data

Pump

Manufacturer	Rosenbauer International AG
Type	PFPN 10-1000 PFPN 10-1500
DIN EN	14466
Number of stages	Single-stage centrifugal pump
Nominal discharge	1500 l/min
Nominal supply pressure	10 bar
Geodetic nominal suction height	3 m
Ventilation	Double piston priming pump
Lubrication of the priming pump (content)	Oil bath lubrication (0.65 l SAE 30 engine oil)
Output of the priming pump	at 3.0 m suction lift - approx. 5 sec at 7.5 m suction lift - approx. 19 sec
Mounting of the pump shaft (extended crank shaft)	Deep groove ball bearings, output-end radial shaft seal
Shaft seal	Axial mechanical shaft seal
Permissible fluids	Extinguishing or drinking water

Engine

Manufacturer	BRP Rotax
Type	903 ACE
Operation type	Four-stroke, gasoline engine with electronic injection
Cylinder	3
valves per cylinder	4
Bore / stroke	74 / 69.7 mm
Cubic capacity	899.3 cc
Output	45 kW at 5200 ± 200 min ⁻¹ 48 kW at 5500 ± 200 min ⁻¹
Idle speed	1700 min ⁻¹
Torque	85 NM at 5200 ± 200 min ⁻¹
Fuel injection	Multiple point petrol injection with 46 mm heated individual throttle valve nozzles
Fuel	ROZ 95 Petrol E10 fuel (<= 10% ethanol) Aspen four-stroke

Technical data

Disposal of hazardous substances

Engine

Consumption	approx. 14 l (at a constant 1500 l/min at 10 bar (5200 min ⁻¹)) approx. 18 l (at a constant 1000 l/min at 15 bar (6000 min ⁻¹))
Engine control	BOSCH ME17
Ignition system	Electronic ignition system, ignition programme
Spark plug	NGK MR7BI-8
Electrode gap	0.7 – 0.8 mm (non-adjustable!)
Generator output	420 W
Starter system	12 V 0.8 kW electronic starter with restart lock
Battery	12V / 18 Ah / cold check current 250 A (VARTA Powersports AGM 518902026A514)
Lubrication system	Dry sump lubrication with exchangeable paper filter
Oil pump	3 gear pumps (2 x suction pumps and 1 x pressure pump)
Oil pressure	min. 0.6 bar at 100°C oil temperature and 1700 min ⁻¹ (idle) min. 0.4 bar at 100°C oil temperature and 4000 min ⁻¹ max. 6.0 bar at 100°C oil temperature and 6000 min ⁻¹
Engine oil	SAE 5W 40 fully synthetic
Engine oil volumes	3.5 l with the first filling (approx. 2-2.5 l for oil change with oil drain valve)
Cooling system	Liquid-cooled, integrated water pumps, 2-way thermostat
Coolant	50% water, 50% coolant
Cooling water pressure	max. 1.1 bar measured at the compensation tank
Coolant flow	min. 40 l/min at 5000 min ⁻¹ and fully opened thermostat
Thermostat opening temperature	75 °C

Unit

Dry weight	approx. 150 kg (without fluids)
Operating weight	approx. 166 kg (full 20 l tank)
Dimensions (L x W x H)	approx. 923 x 636 x 845
Volume	approx. 0.498 m ³
Operating range	-15 °C to +35 °C ambient temperature (EN14466)

11.1 Noise measurements

PFFN 10 - 1000

Sound pressure level, $L_{p(ST)}$ based on 20µPa, at the operating position	94.9 (dB)
Uncertainty factor, $K_{p(ST)}$	2 (dB)
Acoustic power emissions, L_{WA} based on 1µW	109.4 (dB)
Uncertainty factor, K_{WA}	2 (dB)

PFFN 10 - 1500

Sound pressure level, $L_{p(ST)}$ based on 20µPa, at the operating position	95.8 (dB)
Uncertainty factor, $K_{p(ST)}$	2 (dB)
Acoustic power emissions, L_{WA} based on 1µW	110.3 (dB)
Uncertainty factor, K_{WA}	2 (dB)

15 bar / 1000 l/min

Sound pressure level, $L_{p(ST)}$ based on 20µPa, at the operating position	100 (dB)
Uncertainty factor, $K_{p(ST)}$	2 (dB)
Acoustic power emissions, L_{WA} based on 1µW	114.5 (dB)
Uncertainty factor, K_{WA}	2 (dB)

The values are in accordance with the noise measurement of EN 14466: 2008, Annex E, determined by applying the standards EN ISO 3744 and EN ISO 11203

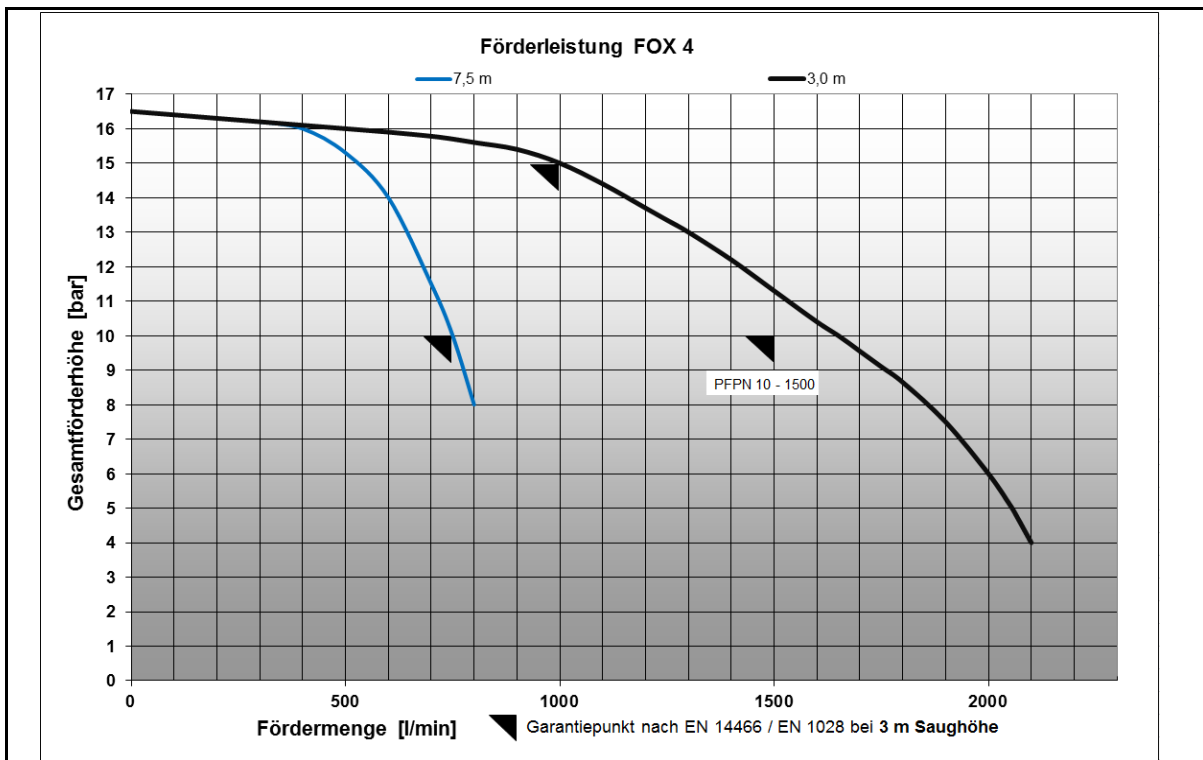


The sum of a measured noise value and its associated uncertainty factor represent the upper limit of the range of values that could occur during measurements.

Technical data

Noise measurements

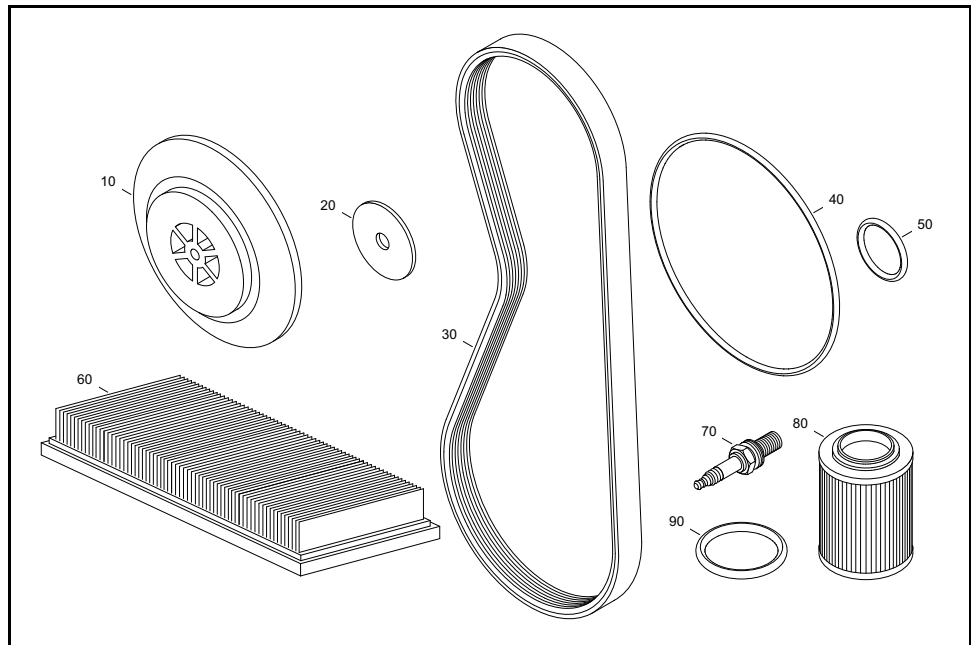
PFPN 10-1500 performance chart



- Flow rate [l/min]
- Total head discharge [bar]

12 List of spare parts

12.1 List of spare parts



Access to the online spare parts catalogue for the portable fire pump is provided under the following link.

<https://spareparts.rosenbauer.com/template/index.php>

User name: PC11X

Password: PC11X



When logging in make sure you check for capitals and lower case.

13 List of abbreviations

Fire fighting specific abbreviations

PTO	Power take off
NP	Normal pressure
HP	High pressure
AFFF	Aqueous film forming foam
KAP	Piston priming pump, priming pump
AT	Aluminium technology
HSD	O-stream nozzle
PP	Portable pump
UHPS	Ultra high pressure system
KTW	Plastics and drinking water
DVGW	German Association of Gas & Water Industry e.V.

General abbreviations

approx.	Approximately
e. g.	For example
ca.	circa
etc.	Et cetera
incl.	including
m	Meter
mm	Millimeter
dB	Decibel
min	Minute
s	Second
l	Liter
kg	Kilogram
l/min	Liters per minute
km/h	Kilometers per hour
kg/s	Kilogram per second

General abbreviations

lbs/s	Pounds per second
ft	Feet
GPM	Gallons per minute