OPERATION MANUAL

FIRE FIGHTING TRUCK

SLF 2250/4000

Hydromatic Stinger

rosenbauer

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- *Safety Precautions*
- *Piping Diagram*
- *Stinger operation manual*

Introduction

ROSENBAUER and its affiliates thank you for your confidence in our products and is sure that delivered products will provide quick, reliable, quality service in the years to come.

Several models whose principal components are identical are dealt with in this operation manual. Besides, this includes optional features. Your unit may therefore differ from some of the descriptions and illustrations.

This operation manual is designed to provide clear answers to essential questions concerning the operation and maintenance of this product.
To ensure continuous operational reliability, we strongly recommend that all service, inspection and maintenance work listed in this manual be carried out on time.
For this purpose, Rosenbauer service stations are at your disposal.

ATTENTION !

Please read this manual carefully before starting operation.
Obey all instructions and hints.
Only personnel familiar with this manual, the vehicle, inclusive equipment, according operation, local safety regulations and accident prevention may operate this unit.
Rosenbauer is not liable for any injury or damage caused by personnel unfamiliar with the operational procedures described in this manual, failing to comply with the operation manual and/or failing to comply with regulations, subsequent procedures, safety and accident prevention.

For more information kindly contact the Rosenbauer After Sales Service Department or your nearest Rosenbauer representative.

Manufacturer and After-Sales-Service Address

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AUSTRIA

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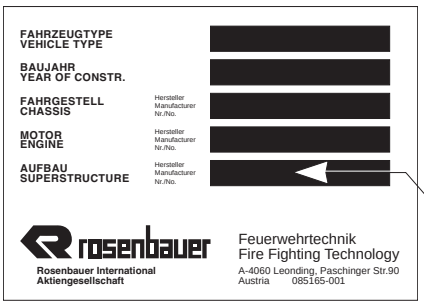


Works Order Number

Identifying the works order number is important.
It is stamped at the type plate on the "Superstructure" plate located near the co-driver entrance.

X	2	S	0	3	4	1

Works order number of your vehicle

List of Conventional Signs

* *This sign indicates optional equipment that means:*
The described position may not be installed on your unit, but it is a customer specific installation.

CAUTION !
This warning indicates possible danger to life and health of persons.

ATTENTION !
This warning indicates other dangers.

Warning Signs

- *This warning sign indicates possible danger to the life and health of persons involved.*

- *This warning sign indicates electrical hazards.*

- *This warning sign indicates fire hazards.*

- *This warning sign indicates danger of cauterization.*

DN *Note: For all valve descriptions DN stands for Internal Diameter*

Prohibition Signs

- *No smoking*

- *Handling of open flames is prohibited.*

- *Keep your distance! Be extremely careful!*

Mandatory Signs

- *Use ear protection.*

- *Wear helmet.*

- *Wear protective eye glasses.*

- *Wear protective work boots.*

- *Wear protective work gloves.*

ATTENTION !

All superstructural components (e.g. hinged steps, doors, ladder, etc.), are to be used for their intended purpose only.
For example:
Jumping out of the crew cabin onto the last step, transportation of heavy equipment on a hinged step or fixing ropes to the ladder, are all contrary to their intended purpose.

ATTENTION !

The vehicle should be operated by trained and certified personnel.

When driving on inclines, uneven or slippery roads / surfaces, as well as during cures or expecting a lane change, a prudent and precautionary driving style should be used.

The instructions in the chassis operators manual should be strictly followed, in particular when driving in off-road conditions.

ATTENTION !

Always use similar tyres when changing or replacing a tyre to allow maximum driving performance!
It is strictly prohibited to use retreaded tyres.
When changing the tyre type call for written approval from Rosenbauer.

For further technical data please refer to the chassis manufacturers manual.

Technical Data

Chassis	
Manufacturer and type:	Scania G480 LB RHD
Engine:	Scania DC 13 07 Euro 5
Performance:	352 kW at 1800 rpm
Voltage of consumers:	24 Volt
Batteries:	2 x 12 Volt / 180 Ah
Generator:	28 Volt / 150 Ampere
Transmission:	Allison HD4500
Power Take Off (P.T.O.) I:	Chelsea 870C for the hydr. oil pumps
Ratio:	n_{engine} x 1.33
Rotating direction:	counterclockwise
Performance:	175 kW at 1800 $rpm_{(engine\ speed)}$
Torque:	698 Nm
Power Take Off (P.T.O.) II:	N 100 for water pump
Ratio:	n_{engine} x 1.28
Rotating direction:	counterclockwise
Torque:	1700 Nm
Wheel base:	5700 + 1350 mm
Tyres:	315/80 R 22.5
Powered axle:	8 x 4
Cabin:	1 + 1 men
Dimensions:	Length ..... 11600 mm
	Width ..... 2510 mm
	Height ..... 3800 mm
Permissible weight:	Front axle I ..... 7100 kg
	Front axle II ..... 7100 kg
	Rear axle I ..... 10500 kg
	Rear axle II ..... 10500 kg
	Gross vehicle weight ..... 35200 kg
Ramp angles:	Angle of approach ..... 18 °
	Ramp angle ..... 15 °
	Angle of departure ..... 11 °

Water tank

Manufacturer:	*ROSENBAUER*
Capacity:	*2250 l*
Maximum tank pressure:	*0.2 bar*
Material:	*GFK* *glass fibre reinforced plastic*
Manhole:	*removable ø 600 mm cover*
Overflow:	*2 x with over- and under pressure diaphragm*
Tank level indicator:	*fludometer*
Hydrant fill connection:	*DN 65 butterfly valve with SART 65 female coupling and a non return valve on the tank flange. These connections are on the left and right hand sides.*
Pump fill connection:	*DN 50 ball valve*
Suction connection:	*DN 200 butterfly valve*
Tank roof:	*GFK with anti-slip coating*
Drainage:	*DN 50 ball valve*

Foam compound tank

Manufacturer:	*ROSENBAUER*
Capacity:	*4000 l*
Maximum tank pressure:	*0.2 bar*
Material:	*GFK* *glass fibre reinforced plastic*
Location:	*integrated into the front part of the tank*
Manhole:	*removable ø 600 mm cover*
Overflow:	*with lamellar case*
Tank level indicator:	*fludometer* *and visual gauge on the left and right hand sides*
Suction connection:	*DN 80 butterfly valve*
Pump fill connection:	*DN 40 ball valve*
Drain connection:	*DN 40 ball valve with SART 65 female coupling on the left hand sides*

Pump

Manufacturer and type:	*ROSENBAUER N 100* *with pump pressure governor*
Material casing:	*bronze*
Material impeller:	*bronze*
Design:	*single stage*
Rotating direction:	*counterclockwise*
Pump shaft seal:	*axial face seal on the pressure side* *double seal rings on the suction side*
Performance	
at tank suction operation:	*10000 l/min at 10 bar*
at 2.7 m suction height:	*7000 l/min at 10 bar*
Closing pressure:	*0 l/min at 13.5 bar*
Maximum pump speed:	*1750 rpm*
Operating ability:	*from -15˚ C to +50˚ C ambient temperature*
Allowed fluids:	*fire fighting water or drinking water*
Fluid temperature range:	*from +4 °to +60 °C*
Tank suction connection:	*DN 200 butterfly valve*
Drafting connection:	*DN 125 butterfly valves with Storz 125 coupling left and right hand sides*
Hydrant/supply connection:	*4 x DN 50 ball valves with SART 65 female couplings on the left and right hand sides*

Pump

Pressure outlets:	*DN 125 butterfly valves with Storz 125 couplings on the left and right hand sides*
	3 x DN 65 butterfly valves with SART 65 male couplings on the left and right hand sides
Hose reel:	*DN 40 ball valve*
Roof turret:	*DN 100 butterfly valve*
Stinger turret:	*DN 100 butterfly valve*
Water tank pump fill line:	*DN 50 ball valve*
Internal flushing valve:	*DN 40 ball valve*
Priming line:	*DN 40 ball valve*
Pump drainage:	*DN 25 ball valve*
Drive:	*propeller shaft from vehicles P.T.O. II*

Pump gearbox for N 100

Manufacturer and type:	*ROSENBAUER gearbox N 100*
Ratio	
with reversal of rotation:	*Z1=64 : Z2=79 -> i=0,81 from counterclockwise to clockwise*
without reversal of rotation:	*Z1=53 : Z2=64 : Z3=79 -> i_{tot}=0.67 *
Casing material:	*light alloy*

Priming pump

Manufacturer and type:	*ROSENBAUER KAP 600 Double Piston Priming Pump*
Material:	*light alloy*
Method of operation:	*displacement*
Type of drive:	*double V-belt via the N 100 pump shaft*
Control:	*electrically with automatic control*
Lubrication:	*oil bath lubrication*
Performance of the priming pump:	*100 l to 75% vacuum within 10 sec*

Foam compound pump

Manufacturer and type:	*BEINLICH ZPD 4-517-MEN-L*
Performance at tank suction operation:	*700 l/min at 16 bar*
Foam compound viscosity:	*up to 300 cSt*
Maximum pump speed:	*1500 rpm*
Material:	
Pump casing:	*bronze*
Pump shaft and gears:	*high-grade steel*
Rotating direction of pump:	*counterclockwise*
Design:	*gear pump*
Tank suction line:	*DN 100 butterfly valve*
Foam compound drafting connection:	*DN 65 ball valve with SART 65 female coupling on the left and right hand sides in the pump compartment*
Pressure outlets:	
Supply for all foam proportioners:	*DN 65 ball valve*
Supply for the foam proportioner of the RM 60 C:	*DN 40 ball valve*
the Singer turret:	*DN 40 ball valve*
Foam compound discharge:	*DN 65 ball valve with SART 65 male coupling on the left and right hand sides*
Foam compound tank pump fill line:	*DN 50 ball valve*
Drainage:	*DN 25 ball valve*
Priming:	*DN 25 ball vlave*
Drive:	*hydraulic motor Sauer Danfoss M50AW1N1M200VB*
Displacement:	*50 cm³/U powerd by hydraulic pump Sauer Danfoss 90R100KA5CD80L3C7E03GBA292924*
Capacity:	*max. 100 cm³/U powerd via P.T.O. II*

Foam proportioning system

used for the turrets
and Storz 125 outlets:

Type:	*ACR 6"*
Number:	*4*
Material:	*bronze*
Proportioning rate:	*0% to 7%*

used for the left, right,
rear and front outlets:

Type:	*ACR 2½"*
Number:	*6*
Material:	*bronze*
Proportioning rate:	*0% to 7%*

used for the Rapid Intervention System
on the right and left hand sides:*

Type:	*ACR 1.5"*
Number:	*1*
Material:	*bronze*
Proportioning rate:	*0% to 7%*

Stinger

Manufacturer and type:	*ROSENBAUER Stinger*
Maximum height:	*approx. 20 m (ground to turret nozzle)*
Mechanical radius:	*21 m (centre of turret base to nozzle)*
Maximum turret range:	*13,5 m (centre of vehicle to the nozzle)*
Rotation range:	*360 °*
Turret type:	*Rosenbauer RM 65 C Chem Chor*
Nozzle:	*HSD 6000 CCN*
Performance with boom in transport position or with Stinger supported by the outriggers	
full output:	*approx. 4800 l/min at 13.5 bar*
reduced output:	*approx. 2200 l/min at 13.5 bar*
Throwing range:	*approx. 90 m with water full output* *approx. 70 m with reduced output*
Control:	*electrohydraulically via radio remote control*
Nozzle slewing range:	
Elevation:	*180 °*
Rotation:	*180 °*
Drive:	*hydraulic oil pump connected to the P.T.O.*

For further details please refer to the separate operation manual of Stinger.

Roof turret

Type:	*ROSENBAUER RM 60 C*
Location:	*mounted on the roof of superstructure*
Material:	*light alloy*
Nozzle:	*HSD 7000*
Performance with	
full output:	*7000 l/min at 10 bar*
reduced output:	*3000 l/min at 10 bar*
Trowing range:	*approx. 80 m with full output* *approx. 55 m with reduced output*
Control:	*remotely controlled from driver´s cabin via control handle* *or manually from the vehicle´s roof*
Slewing range:	
Elevation:	*-15 °to +70 °*
Rotation:	*270 °*

Rapid Intervention System

Manufacturer and type:	*ROSENBAUER high pressure hose reel 06*
Material:	*ABS/PE plastic*
Brake:	*friction brake*
Rewinding device:	*manually by crank and electrically*
Locations:	*in the rear left and right* locker compartments*
Nozzle:	*ROSENBAUER RB 101*
Performance:	*115 - 230 - 360 - 475 l/min at 7 bar*
Equipment:	*with a 60 m DN 25 non-collapsible rubber hose*

Surrounding illumination

Search lights:	*14 x 24 VDC / 10 Watt*
Location:	*6 projectors on the left and right hand sides* *2 projectors in the rear of the vehicle*

External supply

Power supply:	*230 VAC / 50 or 60 Hz for the battery charging unit*
Battery charging unit:	*FRONIUS Acctiva Twin*
Compressed air supply:	
Location:	*via the combined power supply connection at the driver´s cabin entrance*

Vehicle supply air compressor installation

Manufacturer and type:	*AGRE MK 282*

For further technical data please refer to the separate operation manual.

Technical Description

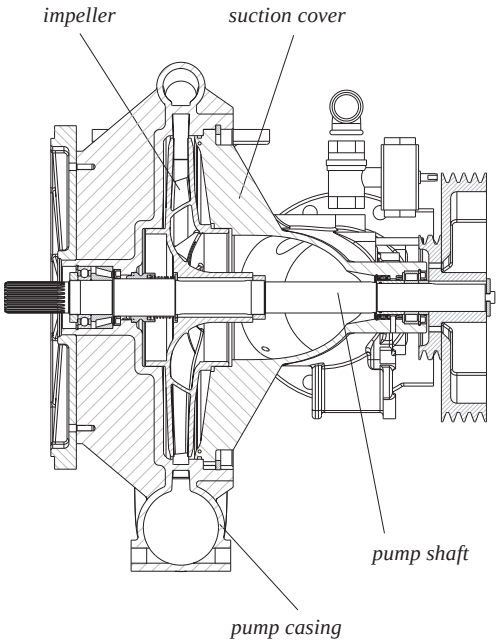
Water pump

The pump consists mainly of the pump pressure casing, impellers, pump shaft, diffusers, and pump shaft sealing.
The water penetrates the impeller via the suction inlet. This process is called axial feed, since the water flows in the direction of the central axis.
The water which enters through the suction inlet is then seized by the impeller (impeller blades); thereby the water is deflected by 90 ° and flung out of the impeller in the direction vertically to the shaft. This is called radial discharge.

The water delivery depends mainly on the effect of centrifugal force, therefore this type of pump is called a centrifugal pump.
Between the impeller and the diffuser, there is a small gap and the diffuser, fixed on the pump casing, is stationary. The gap is necessary in order to prevent the impeller and diffuser from touching.

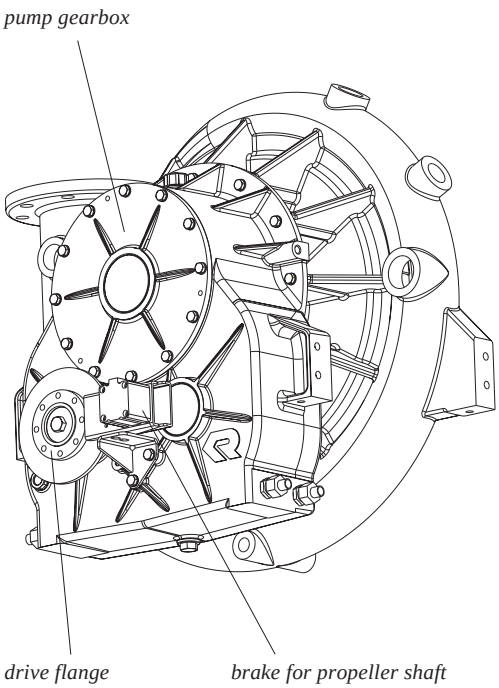
The energy of a streaming liquid is composed of velocity and pressure forces and the energy of velocity can be transformed into pressure. The water is discharged from the impeller at high velocity and this transformation of velocity into pressure takes place in the diffuser.
The cross sectional area through which the water passes from entering the diffuser until leaving it, is enlarged gradually. The velocity decreases while the streaming quantity remains unchanged.
The pipe cross sections are dimensioned as to be large enough that the proportion of the velocity of the total energy at the pressure outlet of the pump is so small that it can be ignored in comparison to the proportion of pressure. Therefore only the suction lift of the pump (which is the sum of the indications on the manometer and vacuummeter) is mentioned.
Be certain that the pump is not operated with closed valves for a long period; a temperature increase results.
Disengage the pump if no water is discharged for a long period!

ATTENTION !
It is strictly prohibited to make any modifications on pump without approval of ROSENBAUER.



Water pump

The Rosenbauer pump N 100 is a single-stage high volume pump with spiral casing and diffusor.
Because of the low nominal pump speed, the pump is best suited for direct connection (without a pump gearbox) to a low rpm engine, therefore a dramatic reduction of noise and harmful emission is achieved.
The hydraulic dimensioning and the high efficiency makes a very flat pump-curve with a differantial pressure between rated- and close off pressure of only 2 bar at constant output. Based on the T-type suction cover, the pump has very compact dimensions and can be integrated into pipework very easily. The stainless steel pump shaft is supported on the suction side by a cylinder roller bearing and on the pressure side by a taper and a ball bearing.
A maintenance free axial face seal seals the pump on the pressure side and on suction side two shaft seals are installed.
The pump shaft is directed through the suction cover and ends in a belt drive to drive auxiliary units.
The centrifugal water pump with diffuser and impeller are made of corrosion resistant light alloy or bronze.



Drive and gearbox

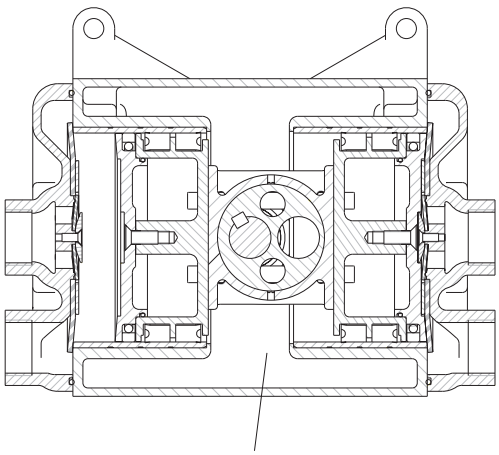
The pump is either driven by the vehicles power take off or by a separate pump engine. If necessary, a pump gearbox delivers the required capacity by a set ratio in relation to the engine speed and output capacity. If necessary, the pump gearbox is equipped with a separate cooler whereby discharged water cools down the gearbox oil.

Computing maximum lift

Lift is measured from the surface of the static source to the centerline of the pump. The height of possible lift is not affected by the angle of the intake hose, but depends on the vacuum that the pump (priming pump) can produce and the atmospheric pressure.
Theoretically, at sea level a pump can lift water 10 m (33.8 feet). A perfect vacuum is impossible with a fire pump and there will be loss due to friction, so the maximum lift is nearer to 6 - 7.6 m (20 to 25 feet).
The height that water can be lifted decreases with altitude by about 0.3 m (1 foot) for each 300 m (1000 feet) of elevation.
The weather also affects drafting, but to a smaller degree.

Priming system KAP 600

Since a centrifugal pump is not a self suction pump, a priming pump system is installed, which removes air from the pump allowing the subsequent vacuum to fill the pump with water. The piston priming pump is mounted with a pivot on the suction cover. It is driven by two V-belts and a belt tightening device. The priming pump has to be engaged only for the priming procedure.
The housing and the pistons are made of corrosion resistant light alloy. The cylinder liners are made of stainless steel.
Two pistons, provided with sealing and guide rings, are fitted together in a single unit. This double piston is driven by a sliding pad, which is driven by an eccentric shaft.
The moving parts are oil bath lubricated and suction and pressure valves are concentrically arranged in the cylinder heads (valve covers).



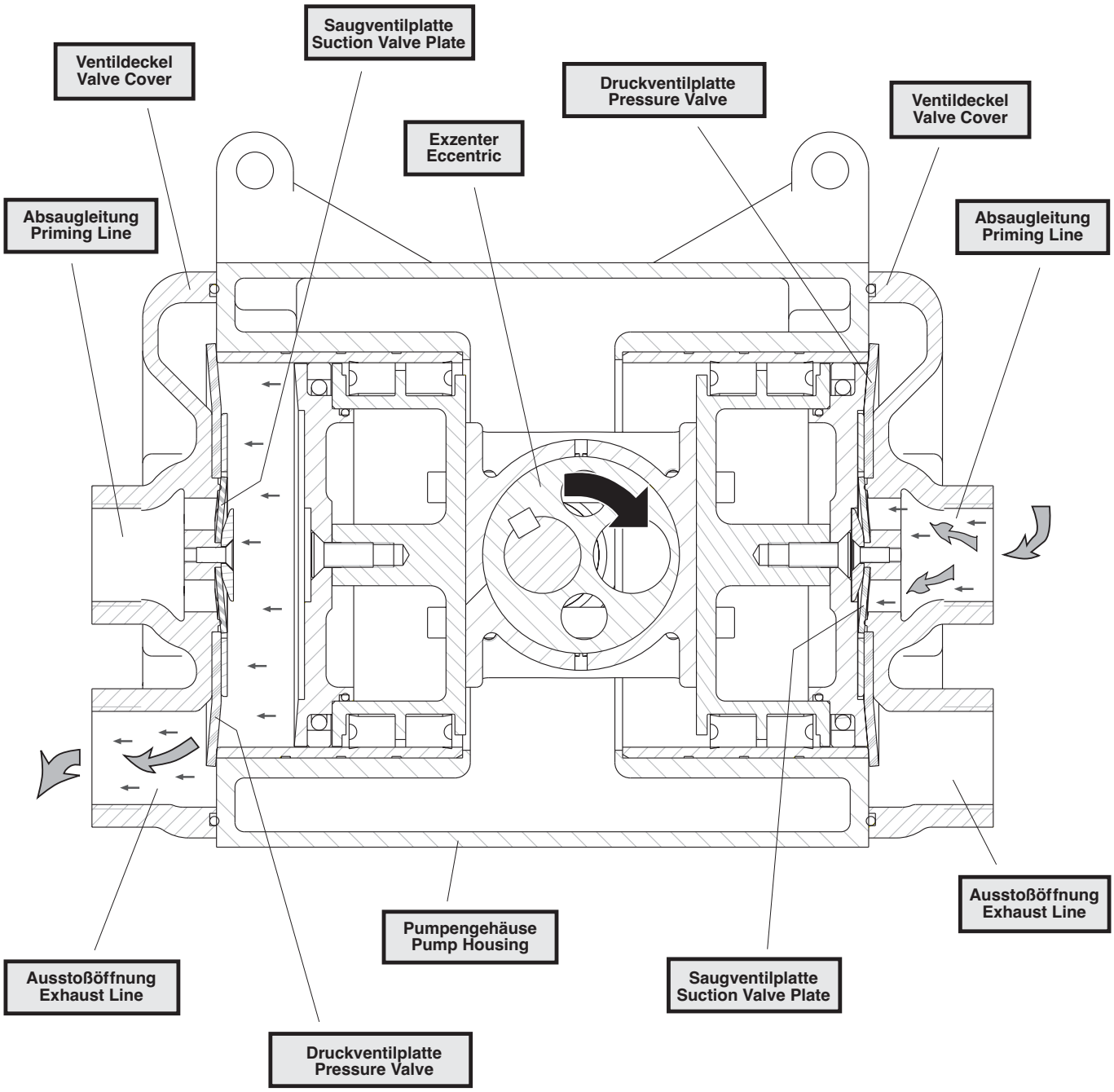
priming pump

Working principle:

Upon engaging the priming pump (**) the ball valve mounted in the suction line will be opened. At the same time, the V-belts for driving the piston priming pump are tightened by a pneumatic cylinder. The priming pump now has approximately twice the speed of the centrifugal pump.
The rotating eccentric moves the piston to and fro. By the movements of the piston the vacuum (priming stroke) and simultaneous pressure (pressure stroke) are produced. The diaphragm-design valves are concentrically placed in the suction covers. The pump system is evacuated and water is forced into the water pump.
As soon as water is discharged from the piston priming pump the priming procedure is completed (**). The suction valve closes and the V-belts are released from tension via a pneumatic cylinder. When the water column breaks, this procedure is to be repeated.

** *As an option the priming pump is controlled automatically.*

Cutaway view of piston priming pump



Overheating protection system

The pump case is equipped with a temperature sensor which controls the overheating protection system.
The overheating protection valve opens and the pilot lamp (H62) illuminates on the external pump control panel when 60 °Celsius is exceeded. Water is discharged by the overheating protection valve until the pump housing is cooled down below 50 °Celsius.*

Counteraction: Open a pressure discharge valve for a short period (until the temperature falls short of 50 °C) to cool down the pump or reduce the pump speed to idle.

ATTENTION !
To avoid critical operational circumstances and to react immediately the operator must in easy reach of the pump control panel.

CAUTION !
Keep pump drainage area clear. Remember the possibility of hot water being expelled!

Superstructure System Control
***LCS** Logic **C**ontrol **S**ystem*

This operation and control system is designed to facilitate the operation and supervision of several systems, mounted on the fire fighting vehicle.
*The main operating system is a **CAN** Bus (**C**ontroller **A**rea **N**etwork) with a seriel data rate of 250 kB/sec. Data with high priority will be sent first.*
The fire fighting superstructure will be controlled via a display in the drivers cabin and in the pump compartment.*

Foam compound pump

The foam compound pump is a gear pump designed for a working pressure of 16 bar.
The pump is mainly used as a foam compound pump, installed on Hydromatic pump units.

Drive
The pump is driven by a hydraulic motor, which is controlled electronically.

Priming system of foam compound pump
A gear pump is a self suction pump, which removes air from the pump and the vacuum created serves to fill the pump with foam compound; but -

ATTENTION !
The foam compound pump must not be operated with empty/dry condition longer than 20 seconds. Neglecting this warning may result in damage of the internal parts of the gear pump.

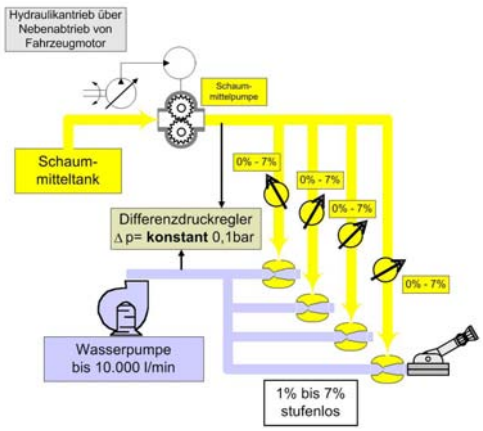
General description of the Hydromatic installation

Water supply

Water is delivered from a ROSENBAUER Centrifugal Pump.
The DRE electronics ensures that the pump pressure is regulated to a value adjusted before, the so called "Nominal Value". This is independent of the discharged amount.
The DRE electronics engages the priming pump if necessary.

Foam compound supply

Foam compound is delivered by a gear pump, driven by a separate hydraulic motor. The foam compound is pumped to every single pressure outlet via a separate piping system.
The electronic for the hydraulic oil pump ensures that the foam compound pump pressure is regulated to a value, 0.5 bar higher than that preadjusted at the water side. This is also independent of the discharged amount. Only foam compound actually consumed, is sucked out of the foam compound tank or the external foam compound container.

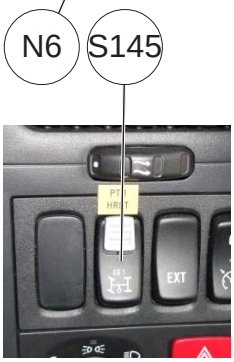


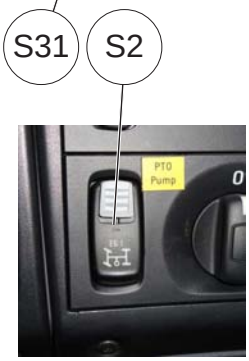
Water/Foam proportioning

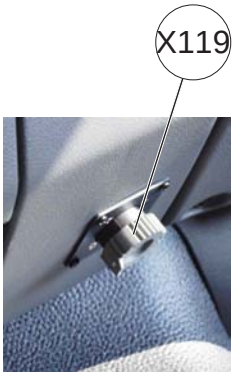
Foam compound is proportioned at every pressure outlet by a separate ACR Pressure Proportioner.
At every single pressure outlet it is possible to deliver water or water/foam-mixture with adjustable proportioning rates.

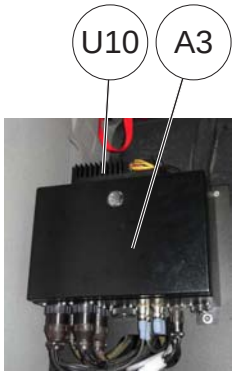
ATTENTION !

To avoid critical operational circumstances and to react immediately the operator must in easy reach of the pump control panel.









Switches and pilot lamps of fire fighting superstructure in the cabin

A3 *control box with fuses - electrics of fire fighting system*

E18 *search light*

N6 *front display - for further information please see next pages*

S2 *switch: P.T.O. (Power Take Off) I for the water pump* **
S31 *switch: chassis battery main switch*
S145 *switch: P.T.O. (Power Take Off) II for the hydraulic pump* **

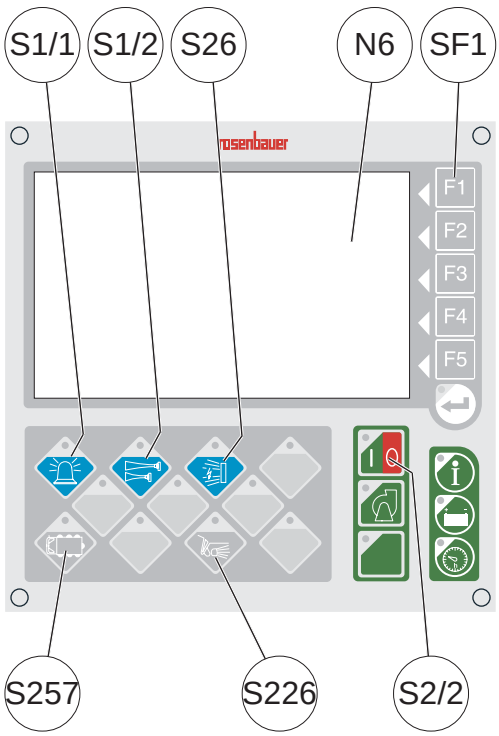
U10 *voltage converter for radio system*
U18 *public address system* ***
U21 *radio* ***
U24 *FM radio* ***

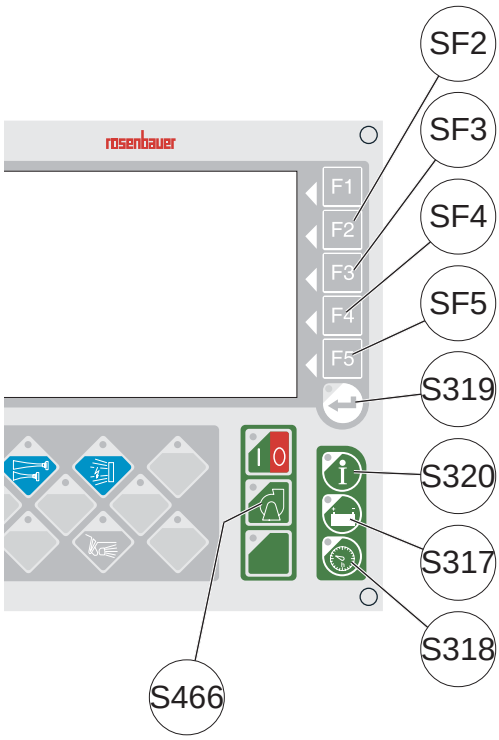
X119 *socket for the CAN BUS diagnostic - for authorized personnel only*

** *for further information please refer to the chassis manufacturers manual*
*** *for further information please refer to the manufacturer´s operation manual*

Note:
For operation of optional installed systems (radio or speaker systems as well as units bought by the customer), please refer to corresponding operation manual.

ATTENTION !
Due to possible interference effects to the vehicle, use only allowed mobile phones and hand radios.





Display in driver´s cabin - switches and pilot lamps of fire fighting superstructure in the cabin

N6 display

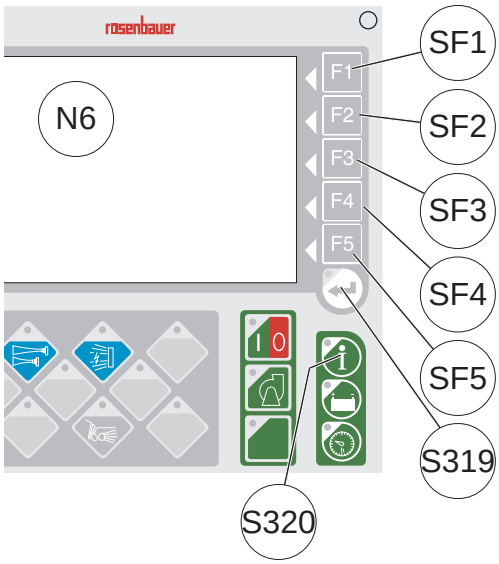
SF1 switch: function
SF2 switch: function
SF3 switch: function
SF4 switch: function
SF5 switch: function

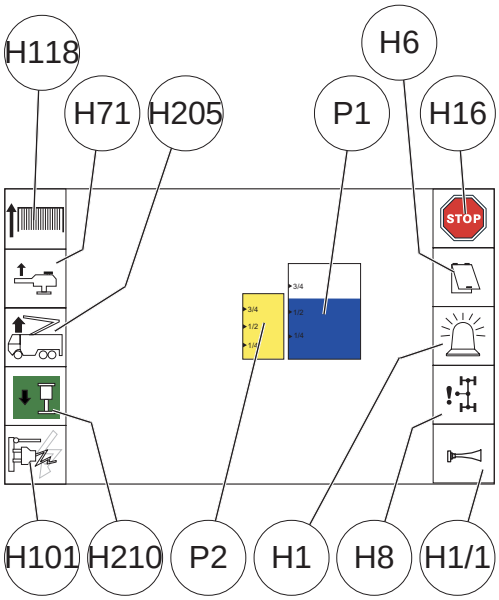
*S1 alarm switch: all rotating beacons on ***
*- the alarm signal sounds as long as the horn of the vehicle is pressed **
S1/2 alarm switch: the "Martin" alarm signal starts operating continuously - only active when switch (S1/1) is engaged
S2/2 switch: water pump ON / OFF
S26 switch: additional alarm lights on front grill
*- only active with switch (S1/1) engaged ***
S226 switch: rear view camera and maneuvering lights
*S257 switch: close-illumination ***
S317 switch: to voltage gauge menu
S318 switch: to working hour counter menu
S319 switch: enter button
*S320 switch: return to main display ***
*S466 switch: to pump control menu ***

*** by using this switch another menu will be shown on screen*
- for further operation please use switch (SF1) to (SF5)

Note:
A diode is installed above each switch which illuminates when the corresponding switch is engaged or a function is engaged belonging to the sub-menu.
If another menu is required, the diode gives information that a function is engaged in a corresponding sub-menu.

The description includes optional equipment which is possibly not installed on your vehicle.





Operation display in driver´s cabin - main display

After engaging the ignition or pressing switch (S320) the main menu screen will be shown on display (N6).

Note:
The acoustical warning tone triggered by 25% and 10% water or foam agent levels can be cancelled by pressing switch (S319).

The main menu shows the various warning symbols which indicate the open/close status of the shutters, doors, rear hatch and cabin doors. Important tank (water, foam compound, diesel) levels, warning lights, rear view lights and surrounding field illumination, etc. are also shown.*

The following indications are displayed in the information sector on the left and right sides:

H1 pilot lamp: indicates engaged optical warning system

H1/1 pilot lamp: indicates operation status of public address system - active if optical warning system is engaged

H6 pilot lamp: indicates open doors or shutters

H8 pilot lamp: indicates an engaged P.T.O.

H16 OK to drive lamp: indicates with "OK" or "STOP" if all doors are closed, P.T.O. is off, alternator disengaged, traffic indicator lamp is off, light mast in transport position, roof turret in transport position or the surrounding field illumination is off.
If for any of the afore mentioned "STOP" is displayed, and the handbrake is released, a warning will sound, which can be silenced by pressing switch (SF1).
When the fault is solved, the display will change from "STOP" to "OK", meaning it is okay to drive.

H71 pilot lamp: indicates roof turret not in transport position

H101 pilot lamp: indicates external power supply connected

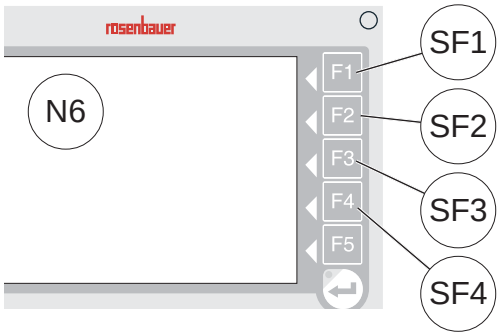
H118 pilot lamp: indicates extended roof railing

H205 pilot lamp: Stinger not in transport position

H210 pilot lamp: extending legs not in transport postition

P1 water tank level gauge

P2 foam compound tank level gauge

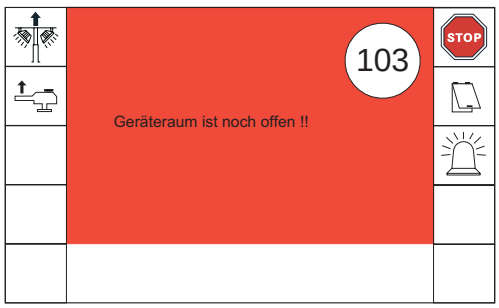


Operation display in driver's cabin - main display

Pressing switches (SF1) to (SF4) will give precise indication as to the cause of the fault lamp lighting.

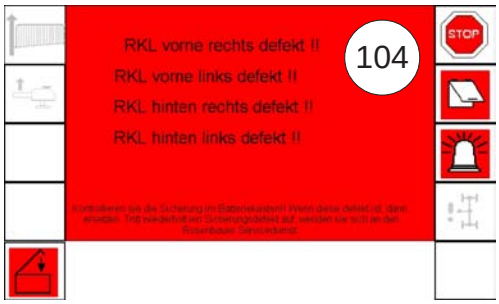
If after pressing switch (SF1) display (101) is shown, then everything is off and vehicle can be driven.

If after pressing switch (SF1) display (102) is shown, the vehicle is not ready to be driven due to the items listed in the display. Switch off items in this list to be able to drive the vehicle.



After pressing switch (SF2) display (103) will be shown -> the menu gives information which doors are open.

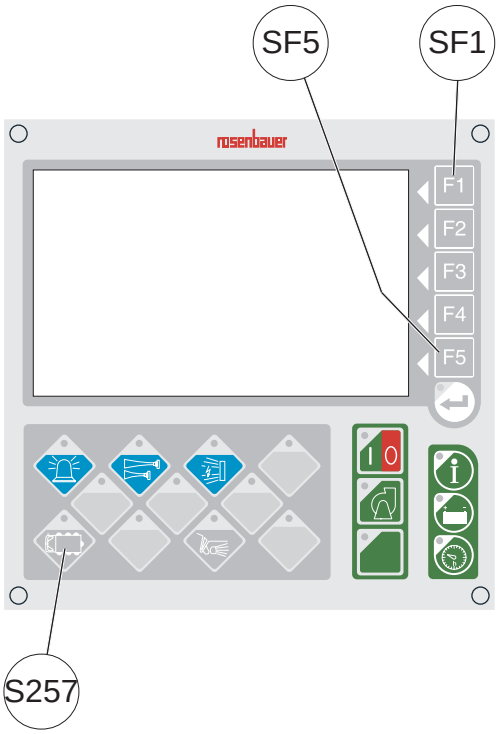
Operation display in driver's cabin - main display

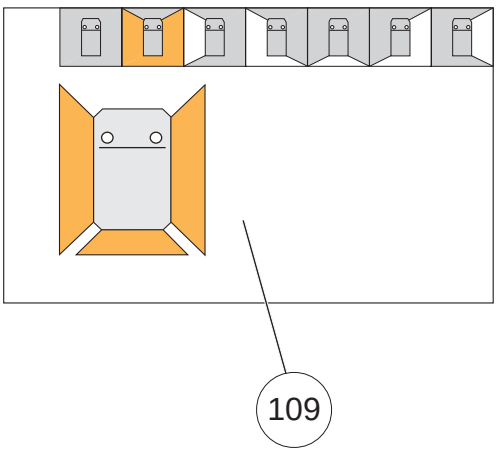


After pressing switch (SF3) display (104) will be shown -> the menu gives information about engaged optical warning lights and in case which warning lights is/are defective.

After pressing switch (SF4) display (105) will be shown if a P.T.O. is engaged.

After pressing switch (SF4) display (106) will be shown if no P.T.O. is engaged.

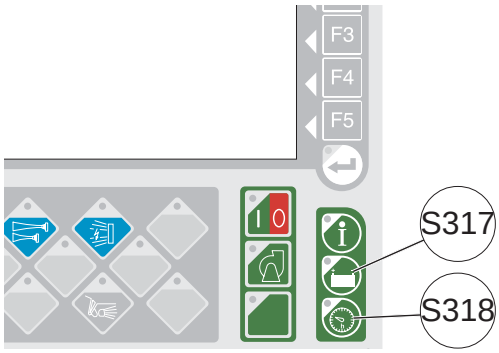


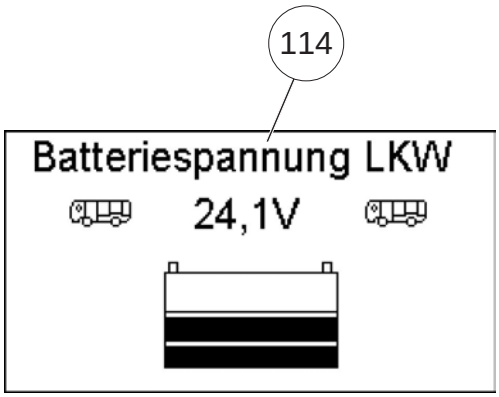


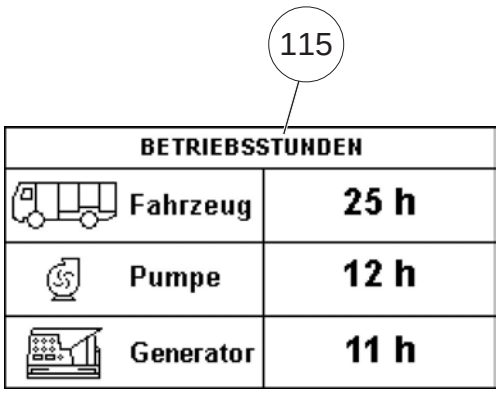
Operation display in driver´s cabin - extras

*S257 switch: surrounding field illumination ***
When switch (S257) is pressed, screen (109) is displayed and all surrounding field lights are activated. By using switch (SF1), the various options can be chosen. The white surface at the top of screen (109) shows which area is illuminated. By pressing the switch (SF1) once, the next option is chosen.
Switch (SF5) turning the tunnel lights ON/OFF.
To disengage the surrounding field illumination press switch (S257) again, as long as the surrounding field illumination sub-menu (109) is displayed.

** *The screen remains shown for approx. 30 seconds after the main menu screen is shown.*





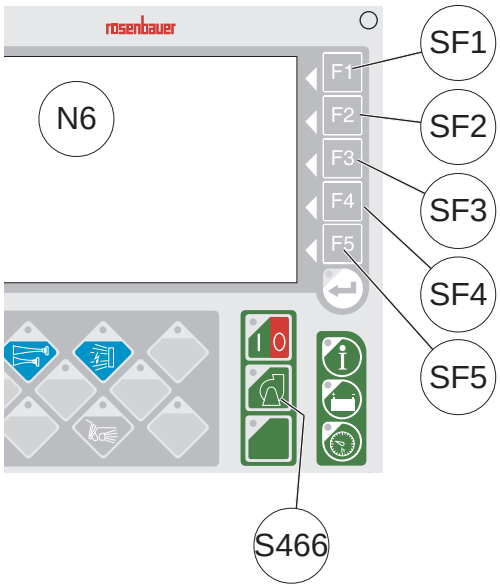


Operation display in driver´s cabin - information

*S317 switch: battery voltage information ***
When switch (S317) is pressed, screen (114) is displayed. Screen (114) gives information about the actual battery voltage.

*S318 switch: operation hours ***
When switch (S318) is pressed, screen (115) is displayed. Screen (115) displays the various operation hours, vehicle and pump.

*** The screen remains shown for approx. 30 seconds after the main menu screen is shown.*



Operation display in driver´s cabin - pump control menu

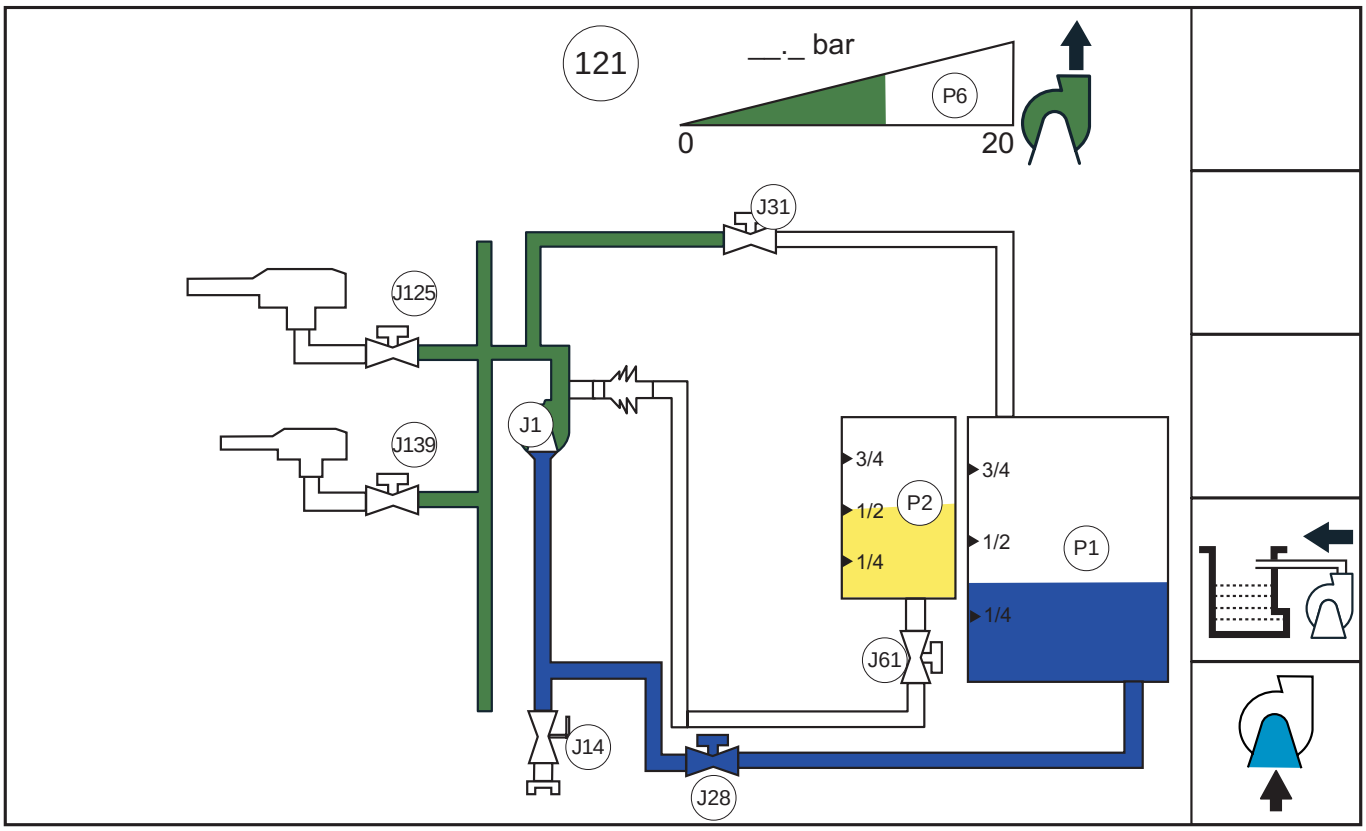
After engaging the P.T.O. or pressing switch (S466) the pump control menu (121) will be shown on display (N6).

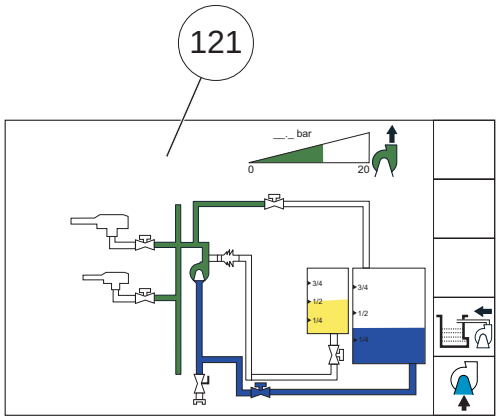
The pump control menu shows the pump system, including piping, pressure outlets, tank (water, foam compound) levels and pilot lamps as well as selected foam compound proportioning rate and actual pump pressure.

The switches (SF1) to (SF5) will provide the following features:

SF1 switch: not in use
SF2 switch: not in use
SF3 switch: not in use
SF4 switch: open water tank pump fill valve (stand-by operation)
SF5 switch: manual control of the priming pump

The following description shows the actual shape of the pump and the firefighting systems. The identification marks are described on the next page.





Operation display in driver´s cabin - pump control menu

J1	*normal pressure pump*
J14	*water drafting valve*
J28	*water tank suction valve*
J31	*water tank fill valve via pump*
J61	*foam compound tank suction valve*
J125	*roof turret valve*
J139	*stinger turret valve*

P1	*water tank level gauge **
P2	*foam compound tank I level gauge **
P6	*pump pressure gauge*

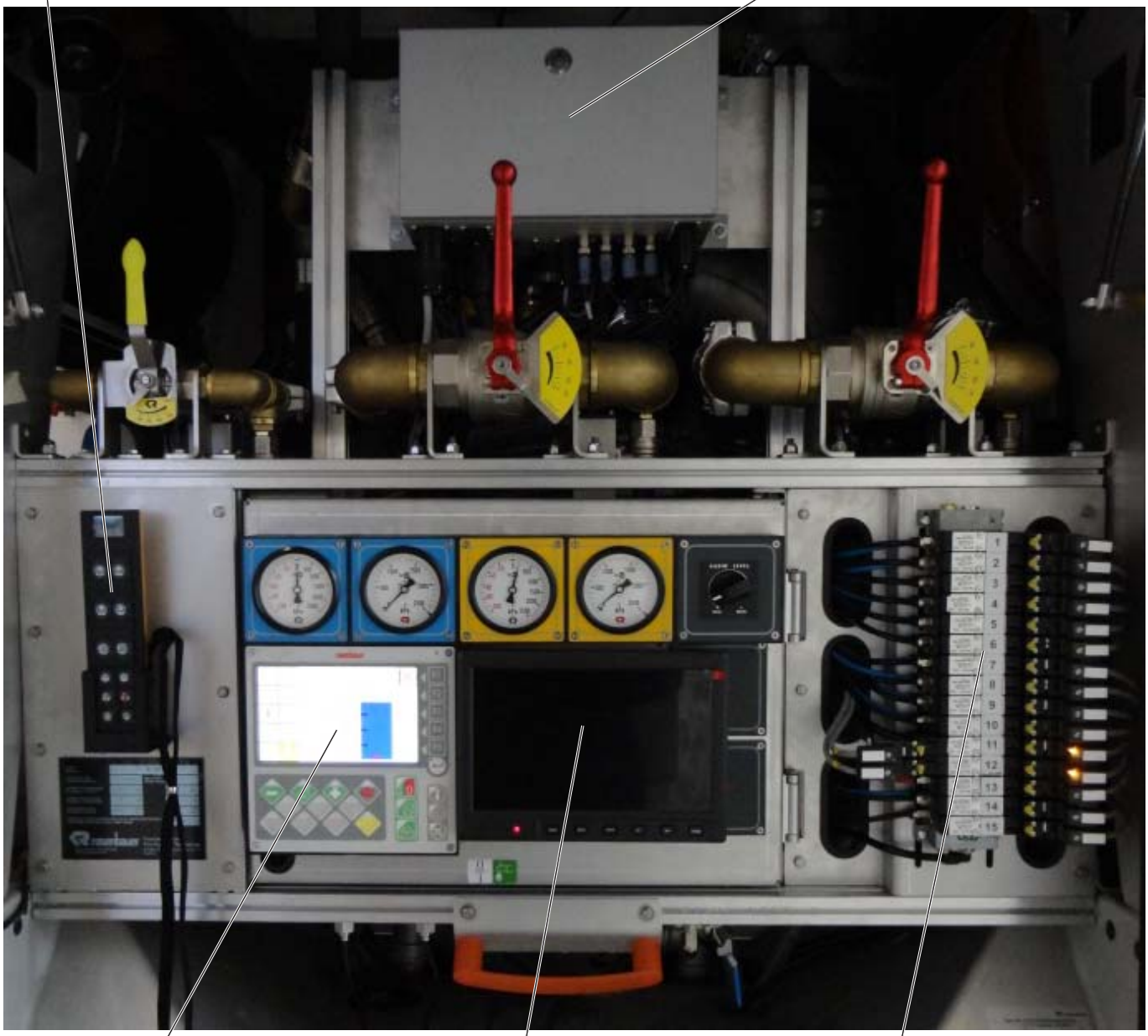
Note:
Depending on the state of the system the piping diagram and the symbols of the firefighting system are shown in different colors.

** *The tank fill levels are equipped with a optical warning which is shown as soon as the tank level drops below 1/3.*

Overview of the external pump control panel

*Roof turret remote control - for further information please refer to the "*Roof Turret Operation*" chapter in this manual*

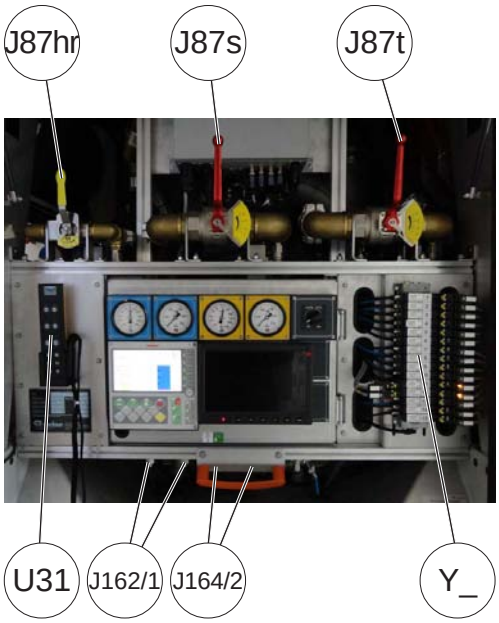
A25 control box with fuses - electrics of hydromatic system

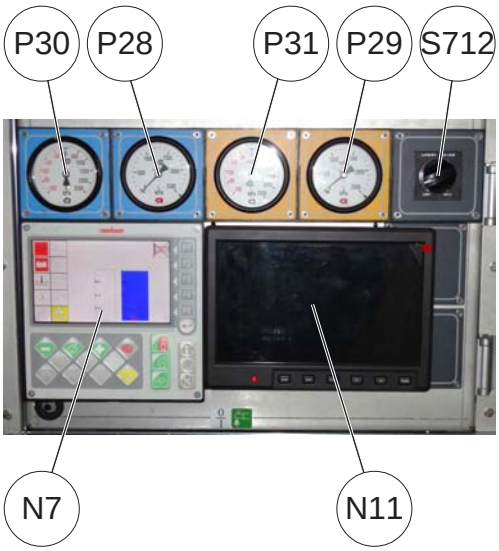


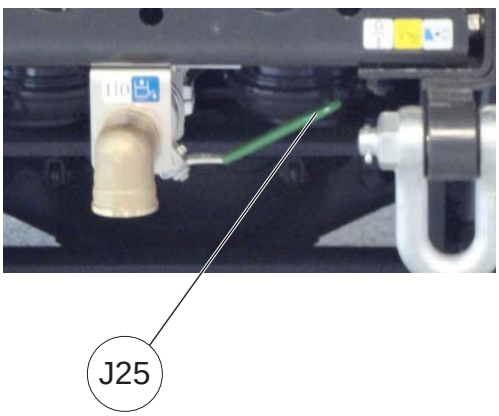
Display - for further information please read the following pages

Display for singer cameras - for further information please refer tot he separate operation manual

*pneumatic solenoids - for further information please refer to the "*Pneumatic Installation*" chapter in this manual*







Switches and indications on the pump control panel

J25 *water tank drain valve*
J87hl *foam proportioning valve for left rapid intervention system*
J87s *foam proportioning valve for the RM 65 C stinger turret*
J87t *foam proportioning valve for the RM 60 C roof turret*
J164/1 *water side manometer drain / flush valves*
J164/2 *foam side manometer drain / flush valves*

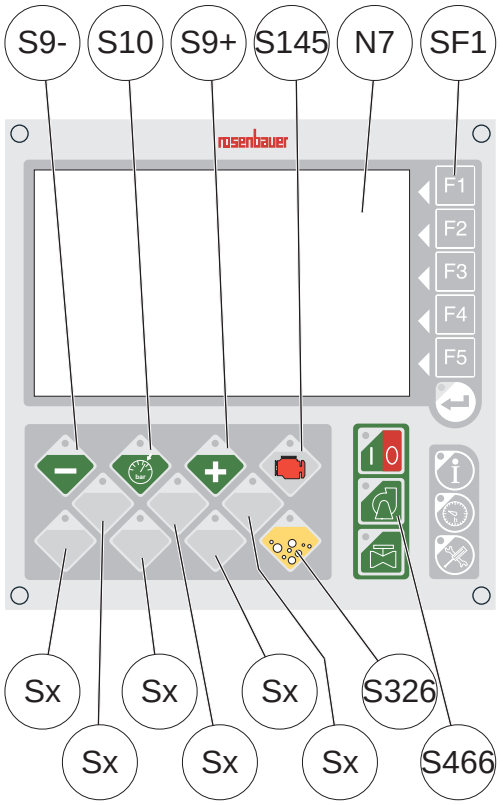
N7 *rear display - for further information please see next pages*
N11 *display for camera and infra-red camera on the stinger*

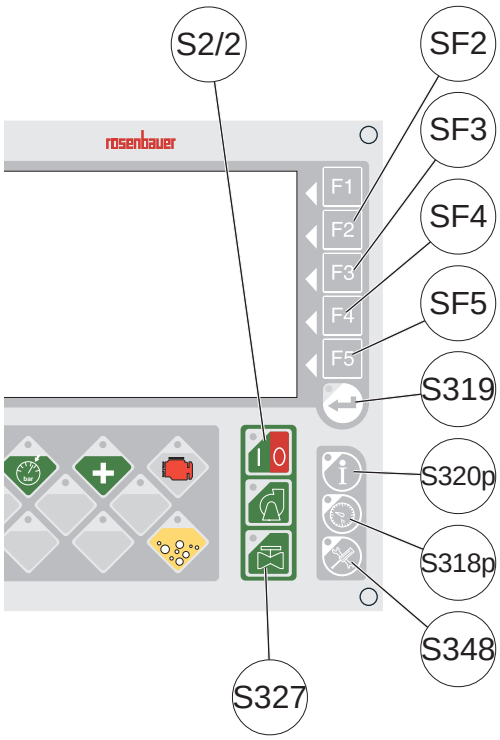
P28 *normal pressure gauge: indicates system water pressure on the discharge side of the water pump*
P29 *foam compound pressure gauge: indicates system foam compound pressure on the discharge side of the foam compound pump*
P30 *water pressure / vacuum gauge: indicates supply pressure of hydrant / nurse truck (black sector) or vacuum (red sector)*
P31 *foam compound pressure / vacuum gauge: indicates supply pressure of foam pump / nurse truck (black sector) or vacuum (red sector)*

S712 *potentiometer: volume control of radio loudspeaker*

U31 *Roof turret´s remote control - for further information please refer to the "Roof Turret Operation" chapter in this manual*

*Y_* *pneumatic solenoids - for further information please refer to the "*Pneumatic Installation*" chapter in this manual*





Display on the pump control panel

N7 display

SF1 switch: function
SF2 switch: function
SF3 switch: function
SF4 switch: function
SF5 switch: function

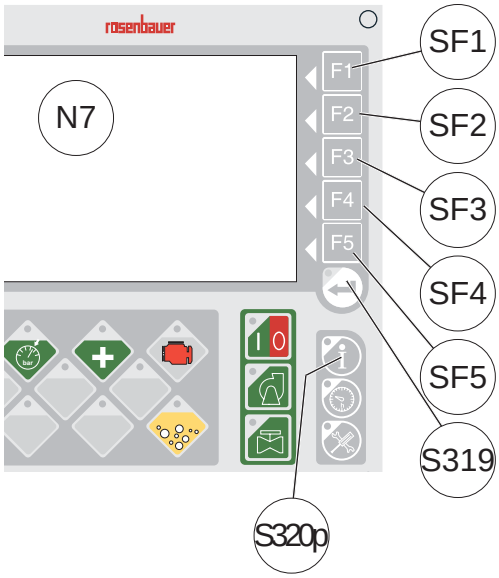
S2/2 switch: water pump ON / OFF
S9- switch: manual throttle decreasement
S9+ switch: manual throttle increasement
*S10 switch: pump pressure governor ***
S145 switch: hydraulic oil pump for foam compound pump ON / OFF - only active when foam operation menu is shown
*S257 switch: close-illumination */***
S318p switch: to working hour counter menu
S319 switch: enter button
*S320p switch: return to main display ***
*S326 switch: to foam operation menu ***
*S327 switch: to menu pressure outlets ***
*S348 switch: to maintenance menu ***
*S466 switch: to pump control menu ***

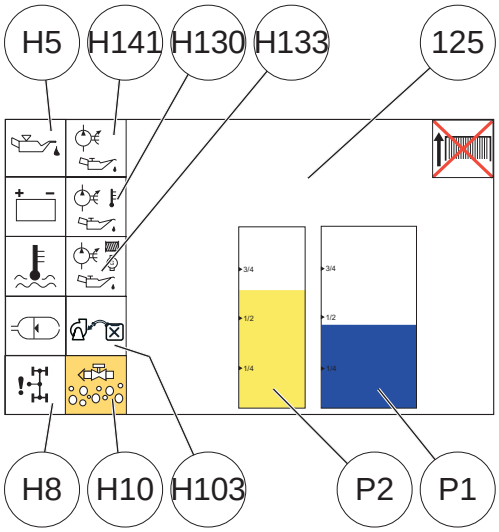
Sx switch: not in use

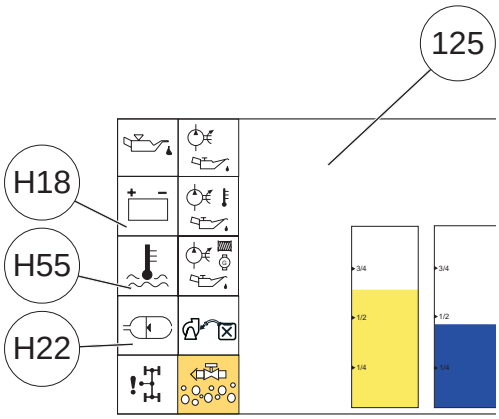
*** by using this switch another menu will be shown on screen - for further operation please use switch (SF1) to (SF5)*

Note:
A diode is installed above each switch which illuminates when the corresponding switch is engaged or a function is engaged belonging to the sub-menu.
If another menu is required, the diode gives information that a function is engaged in a corresponding sub-menu.

The description includes optional equipment which is possibly not installed on your vehicle.







<u>Display on the pump control panel - main menu</u>

After engaging the ignition or pressing switch (S320p) the main menu screen (125) will be shown on display (N7).

<u>Note:</u>
The acoustical warning tone triggerd by 25% and 10% water or foam agent levels can be cancelled by pressing switch (S319).

The following indications are displayed:

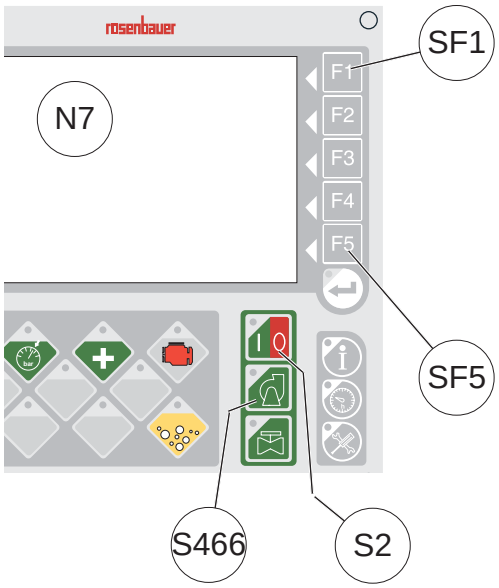
H5 pilot lamp: indicates oil pressure of drive engine to low
H8 pilot lamp: indicates an engaged P.T.O.
H10 pilot lamp: indicates foam operation engaged
H18 pilot lamp: low drive engine battery charge
H22 pilot lamp: low air pressure
H55 pilot lamp: high drive engine coolant temperature
H103 pilot lamp: indicates open foam compound drafting valve
H130 pilot lamp: high temperature of hydraulic oil
H133 pilot lamp: hydraulic oil filter dirty
H141 pilot lamp: low hydraulic oil pressure

*P1 water tank level gauge ***
*P2 foam compound tank level gauge ***

*** The tank level gauges are equipped with a low level warning. If the water or foam compound tank content is less than one third, a warning call-sign starts blinking in the respective tank.*

The switches (SF1) to (SF5) will provide the following features:

SF1 switch: deactivation of automatical rais of roof railing
SF2 switch: not in use
SF3 switch: not in use
SF4 switch: not in use
SF5 switch: not in use

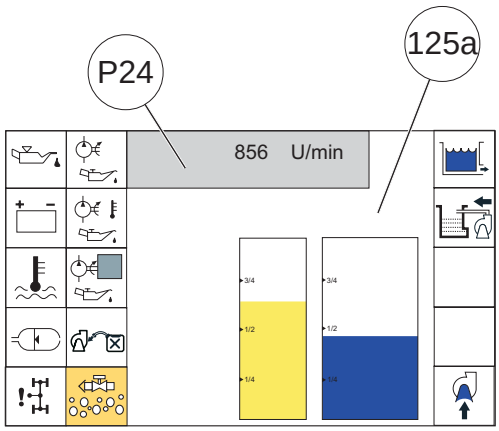


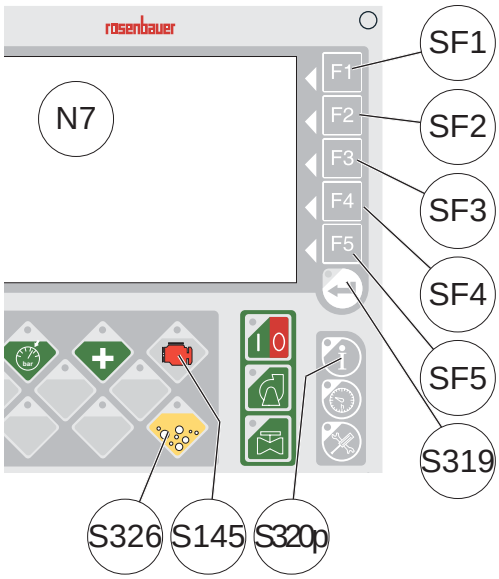
After engaging the water pump or pressing switch (S466) the pump main menu screen (125a) will be shown on display (N7).

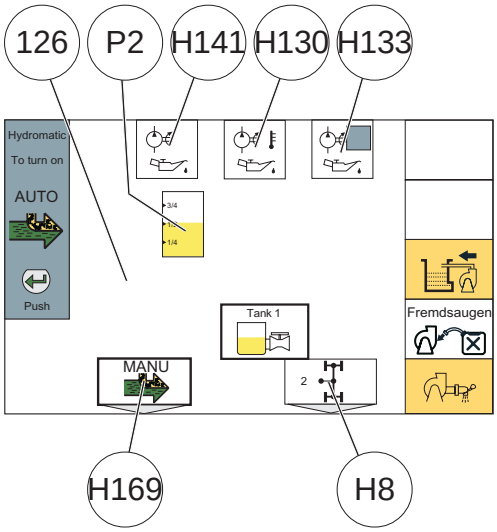
On the pump main menu (125a) additionally to the main menu (125) the drive engine speed indicator (P24) is shown and switches (SF1) and (SF5) change there functions:

SF1 switch: open / close water tank suction valve
SF2 switch: open water tank pump fill valve (standby operation)
SF5 switch: engage the priming pump

All other indicators stay like in the main menu (125).







Display on the pump control panel - main menu

After pressing switch (S326) the foam operation menu screen (126) will be shown on display (N7).

The following indications are displayed:

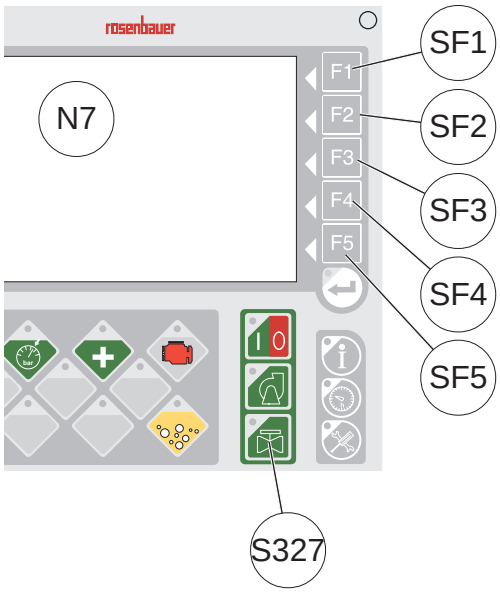
H8 *pilot lamp: indicates switch (S145) is activ / P.T.O. is engage if green highlighted*
H130 *pilot lamp: indicates high temperature of hydraulic oil*
H133 *pilot lamp: indicates hydraulic oil filter dirty*
H141 *pilot lamp: indicates low hydraulic oil pressure*
H169 *pilot lamp: indicates manuel foam compound pump operation*
P2 *foam compound tank level gauge */***

**** *The tank level gauges are equipped with a low level warning. If the water or foam compound tank content is less than one third, a warning call-sign starts blinking in the respective tank.*

S145 *switch: hydraulic oil pump for foam compound pump ON / OFF - only active when foam operation menu is shown*

The switches (SF1) to (SF5) will provide the following features:

SF1 *switch: not in use*
SF2 *switch: not in use*
SF3 *switch: fill foam compound tank via hydromatic system*
SF4 *switch: source of foam (foam tank / external supply)*
SF5 *switch: Prime the foam compound pump system*



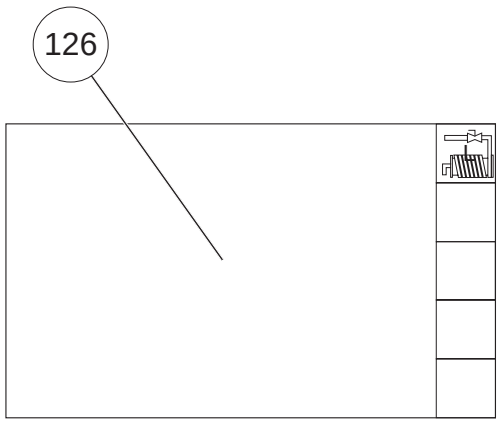
Display on the pump control panel - pressure outlet menu

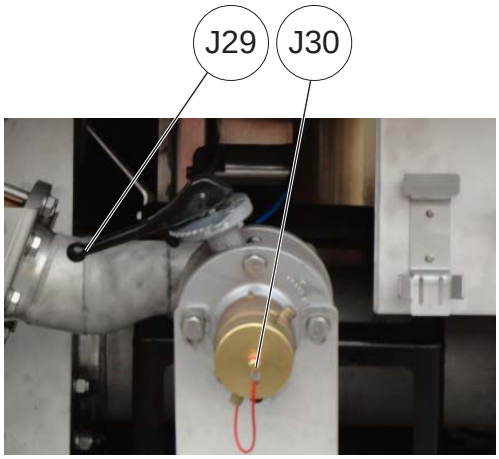
After pressing switch (S327) the pressure outlet menu screen (126) will be shown on display (N7).

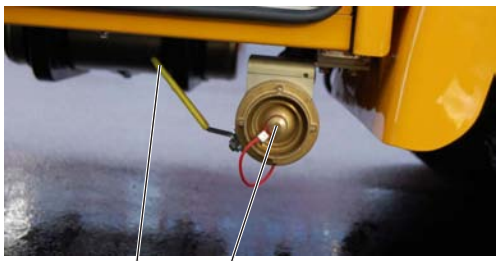
Note:
The screen remains shown for approx. 30 seconds after the main menu screen is shown.

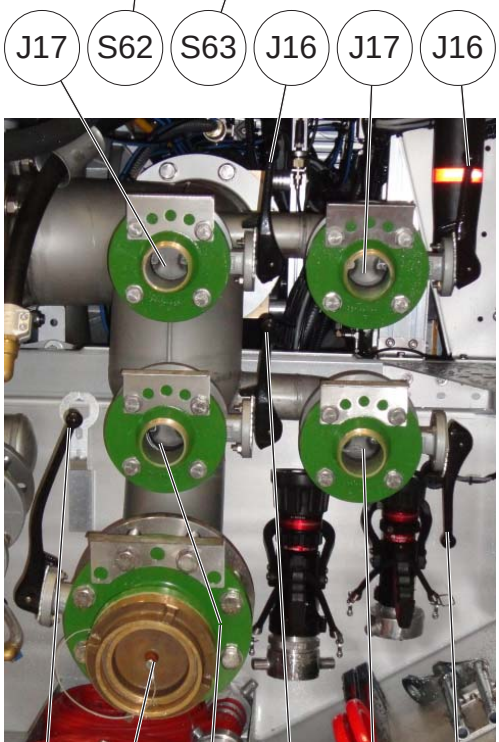
The switches (SF1) to (SF5) will provide the following features:

SF1 switch: open / close left hose reel
SF2 switch: not in use
SF3 switch: not in use
SF4 switch: not in use
SF5 switch: not in use



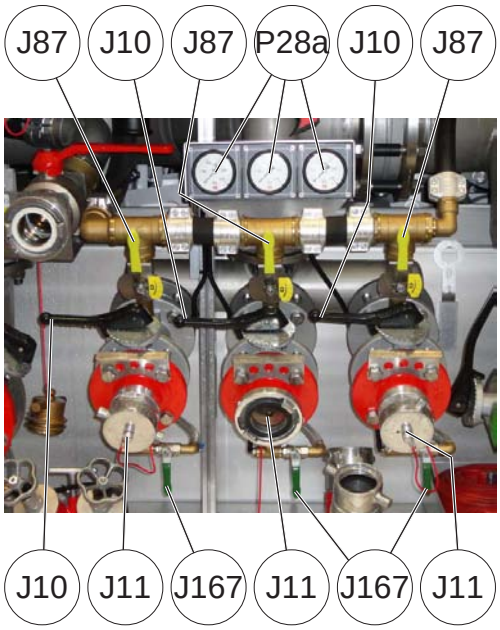






Controls and connections on the left hand side

J14	*water drafting valve*
J15	*water drafting connection*
J16	*hydrant supply valve*
J17	*hydrant supply connection*
J29	*water tank hydrant fill valve*
J30	*water tank hydrant fill connection*
J62	*foam compound tank drain-/fill valve*
J63	*foam compound tank drain-/fill connection*



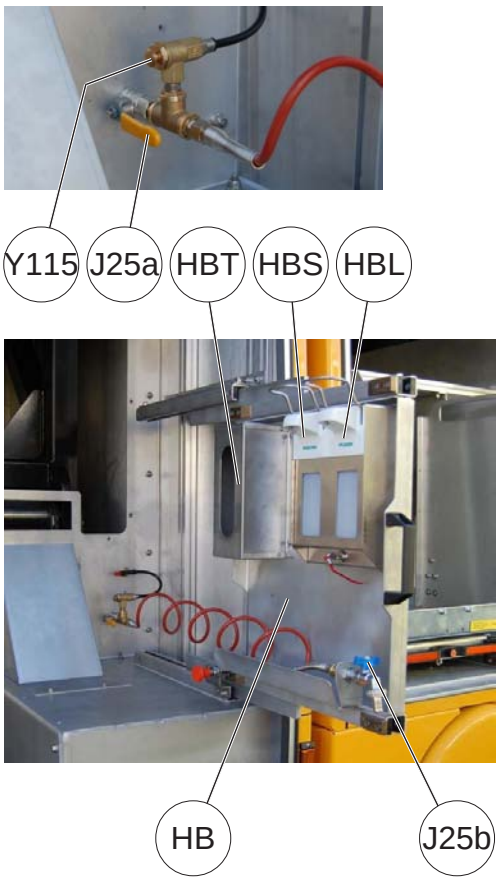
Controls and connections on the left hand side

J10 *discharge valve*
J11 *pressure outlet*
J41 *foam compound pressure valve*
J42 *foam compound pressure outlet*
J46 *foam compound drafting/flushing valve*
J47 *foam compound drafting/flushing connection*
J87 *foam proportioning valves for pressure outlets*
J167 *pressure relief and drainage valve*

P28a *normal pressure gauge: indicates water pressure on the discharge (J11)*

Controls and connections on the right hand side

J14 *water drafting valve*
J15 *water drafting connection*
J16 *hydrant supply valve*
J17 *hydrant supply connection*

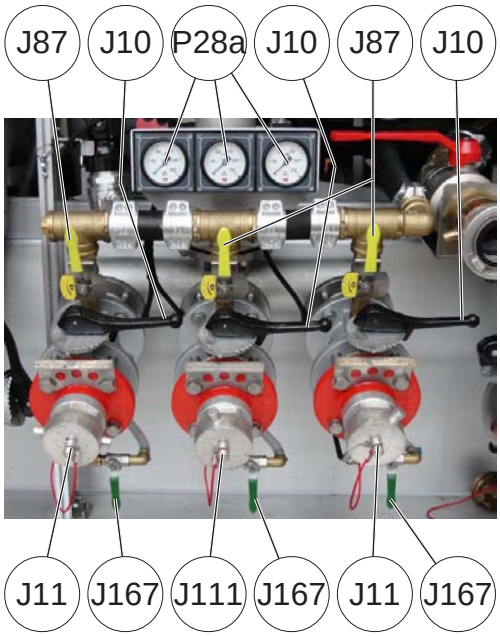


Hygienic board - installation on the left or right side

HB *hygienic board - for extending the board unlock the lock on the rail on bottom*
HBL *compressed air pistole - supplied by the chassis auxiliary compressed air circuit **
HBS *soap dispenser*
HBL *lotion dispenser*
HBT *paper box*

J25a *main valve for hygienic board*
J25b *water valve - supplied by the water tank for cleaning purposes*

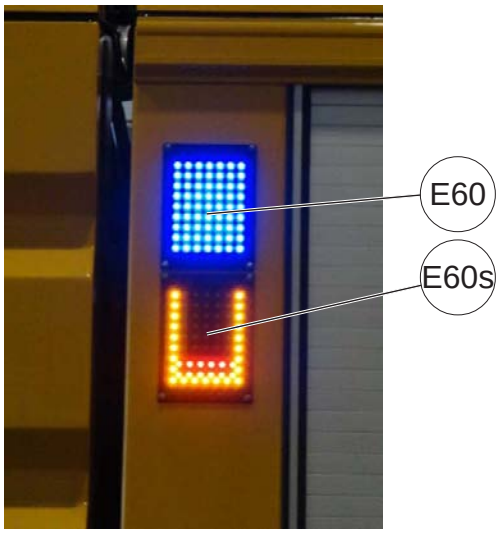
Y115 *purge valve*
Note:
Close the main valve (J25a), open valve (J25b) and purge water line by using purge valve (Y115).



Controls and connections on the right hand side

J10 *discharge valve*
J11 *pressure outlet*
J41 *foam compound pressure valve*
J42 *foam compound pressure outlet*
J46 *foam compound drafting/flushing valve*
J47 *foam compound drafting/flushing connection*
J87 *foam proportioning valves for pressure outlets*
J167 *pressure relief and drainage valve*

P28a *normal pressure gauge: indicates water pressure on the discharge (J11)*



External water tank content indicators

placed behind the water tank on the left and right hand sides

E60 visual water tank level indicator

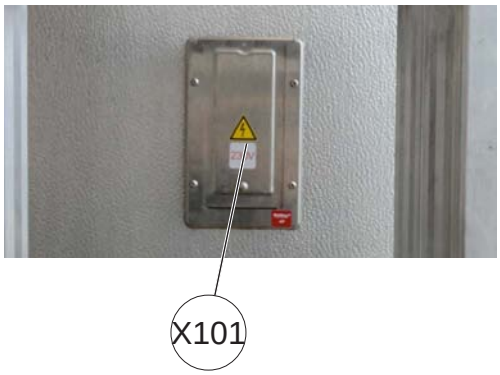
Note:
When tank is full, the indicators (E60) illuminates completely blue.
When tank level drops, the indicator extinguishes cosrresponding.
The integrated LED´s shows a container with the current tank content. If the tank is empty the indicator (E60) illuminates red on the bottom.
The external indicators are active with engaged ignition.

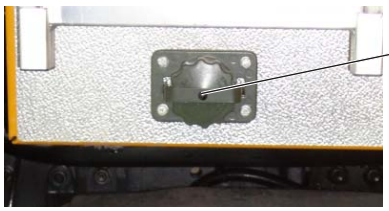
External foam tank content indicators

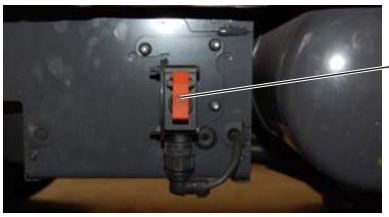
placed behind the water tank on the left and right hand sides

E60s visual foam tank level indicator

Note:
When tank is full, the indicators (E60s) illuminates completely yellow.
When tank level drops, the indicator extinguishes cosrresponding.
The integrated LED´s shows a container with the current tank content. If the tank is empty the indicator (E60s) illuminates red on the bottom.
The external indicators are active with engaged ignition.







Power supply

A13 *230 Volt AC terminal*
Components powered via supply socket (X100) - description of the fuses: F1-battery charging unit and vehicle air supply compressor

Q1 *FI-safety cutout for 230 Volt AC terminal (A13)*

M66 *air compressor MK 282 - for further information please refer to manufacturer´s operation manual*

S31 *battery main switch*
Note: Only disengage (S31) when the drive engine and the ignition is disengaged.
Never disengage the battery main switch as long as the drive engine or the ignition is engaged.

U9 *battery charging unit for chassis batteries - for further information please refer to manufacturer´s operation manual*

X101 *combined supply socket for compressed air and 230 Volt AC power supply - please see (A13)*
Notes:
The power supply connection (X101) will be automatically disconnected as soon as the drive engine is started.
To prevent damage of the vehicle and/or the supply socket an automatic rewinding cable drum must be provided in the garage.

X108 *24 Volt battery starting socket*

ATTENTION !
Only fill with cleaned, dried, oil-free air of max. 80 °Celsius and of 8.5 - 10 bar pressure range!

CAUTION !
Connect socket with earthing contact and the garage fault current breaking system with max. 30 mA rated fault current.

Controls and connections at the stinger control panel

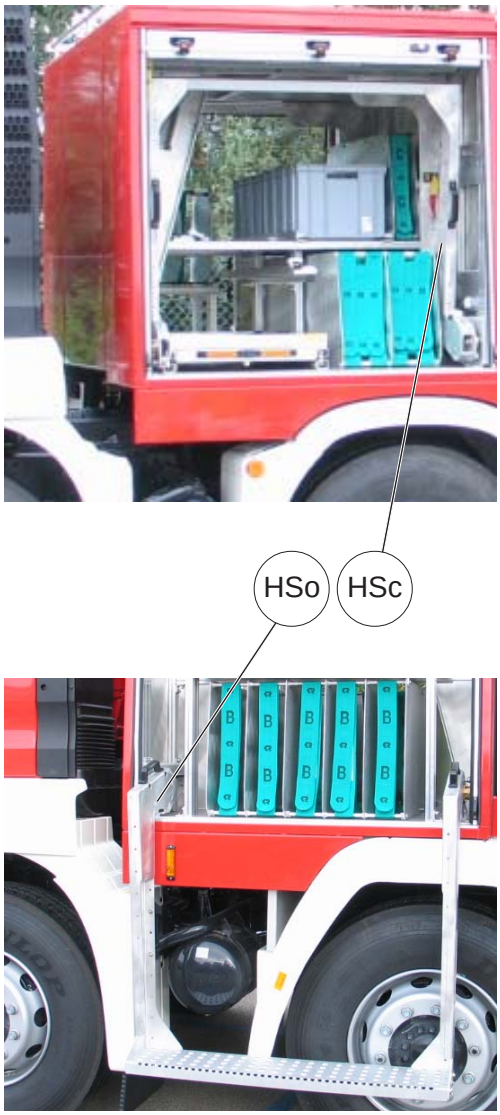
H54 pilot lamp: P.T.O. engagement
H130 pilot lamp: indicates overheated hydraulic oil
H133 pilot lamp: hydraulic filter dirty
H205 pilot lamp: condition of the boom
H210 pilot lamp: left support jack down
H211 pilot lamp: right support jack down
H212 pilot lamp: left support jack in transport position
H213 pilot lamp: right support jack in transport position

S502 switch: emergency operation selector
S540a emergency stop switch for the boom
S593a switch: retract / extend left support jack
S593b switch: retract / extend right support jack
S697 toggle switch: boom / support jacks
S698 switch: P.T.O. engagement
S699 switch: emergency operation engagement

70 microfon for radio (U22)
*U22 radio ****

**** for further information please refer to the manufacturer´s operation manual*

Note:
For further information please refer to the separate operation manual.



Hinged steps included in the front left and right locker compartments

HSc hinged step in closed condition
HSo hinged step in opened condition

Note:
To open the hinged step use a grasp mounted on the step and fold it slowly out of the compartment.

Preparation for Use

CAUTION !

Before operating the vehicle pay attention to the following:

- *Have the safety and support of the fixing devices been checked?*
- *Are the hinged ladders locked ?*
- *Are the supply cables (power supply, compressed air) disconnected ?*
- *Have the wheels and their air pressure been checked ?*
- *Are all roller shutters closed ?*
- *Are all doors and hinged steps closed ?*
- *Is the stinger in transport position?*
- *Is the roof turret in transport position ?*
- *Is the roof railing in transport position ?*

Equipment incorrectly prepared for operation is unsafe for use. If something is found that needs attention, have it checked before it leaves for operation. Even minor mechanical defects can lead to accidents, or personnel injury.

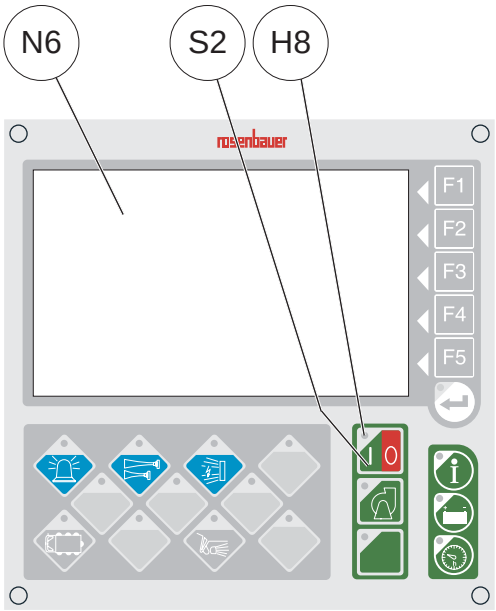
For further instructions concerning maintenance, please refer to the "Inspection, Maintenance and Service Procedures" *chapter in this manual.*

ATTENTION !

Pay attention to the spring and load force when opening or closing a hinged step or a compartment door. Generally guide hinged steps or compartment doors slowly to their rest positions. To avoid injuries grasp hinged steps or compartment doors at suitable positions.
Do not let hinged steps or compartment doors fall!

Notice: *Open roller shutters before swivelling out hose reel or equipment panels.*

The hinged steps on the left and right hand sides have a maximum capacity of 250 kg per unit.



Engaging the Water Pump

Engaging the water pump from the driver´s cabin

- *Stop the vehicle.*
- *Shift gear into neutral.*
- *Apply parking brake.*
  - ◊ *Uncontrolled movement of vehicle could cause personnel injury.*
- *Let engine idle - release accelerator pedal.- Engage the P.T.O. (Power Take Off I) for the water pump:*
  - ◊ *Press P.T.O.-switch (S2).*
  - ◊ *Integrated pilot lamp and pilot lamp (H8) on the pump control panel will illuminate.*
  - ◊ *The pump control menu will be shown on display (N6).*

Disengaging the water pump

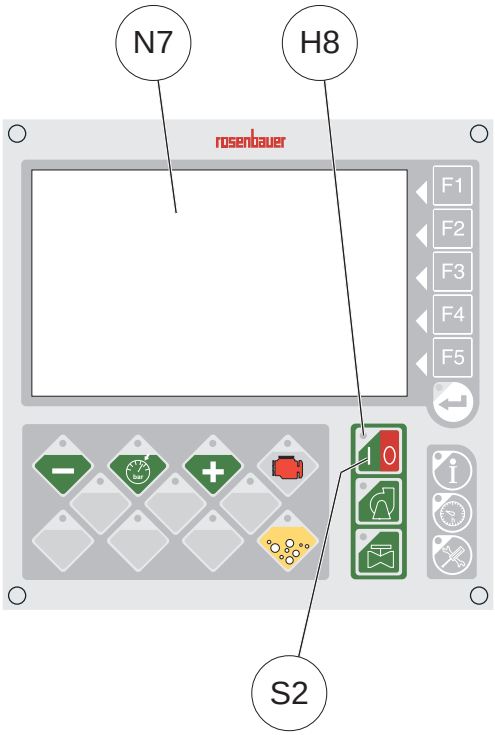
- *Let engine idle.*
- *Disengage the P.T.O. (Power Take Off) for the water pump:*
  - ◊ *Press switch (S2).*
  - ◊ *Integrated pilot lamp and pilot lamp (H8) on the pump control panel extinguish.*

  Note:
  If the P.T.O. was engaged from the rear pump control panel, press switch (S2) once to activate the front display. Again press switch (S2) to disengage the P.T.O. from the front display.

Engaging the P.T.O. I from chassis manufacturer installed P.T.O. switch

- *For further procedure please refer to chassis manufacturers operation manual.*

  Note:
  If the P.T.O. I was engaged from the chassis manufacturer installed P.T.O. I switch it must be disengaged from there.



Engaging the water pump from the pump control panel

- *Stop the vehicle.*
- *Shift gear into neutral.*
- *Apply parking brake.*
  - ◊ *Uncontrolled movement of vehicle could cause personnel injury.*
- *Let engine idle - release accelerator pedal.- Engage the P.T.O. (Power Take Off I) for the water pump:*
  - ◊ *Press P.T.O.-switch (S2).*
  - ◊ *Integrated pilot lamp and pilot lamp (H8) on the pump control panel will illuminate.*
  - ◊ *The pump main menu will be shown on display (N7).*

Disengaging the water pump

- *Let engine idle.*
- *Disengage the P.T.O. (Power Take Off) for the water pump:*
  - ◊ *Press switch (S2).*
  - ◊ *Integrated pilot lamp and pilot lamp (H8) on the pump control panel extinguish.*

  Note:
  If the P.T.O. was engaged from the rear pump control panel, press switch (S2) once to activate the front display. Again press switch (S2) to disengage the P.T.O. from the front display.

ATTENTION !

Avoid operating the pump without water for longer than 3 minutes. Operation without water supply can result in damage of the pump shaft seal as well as valves of priming pump.

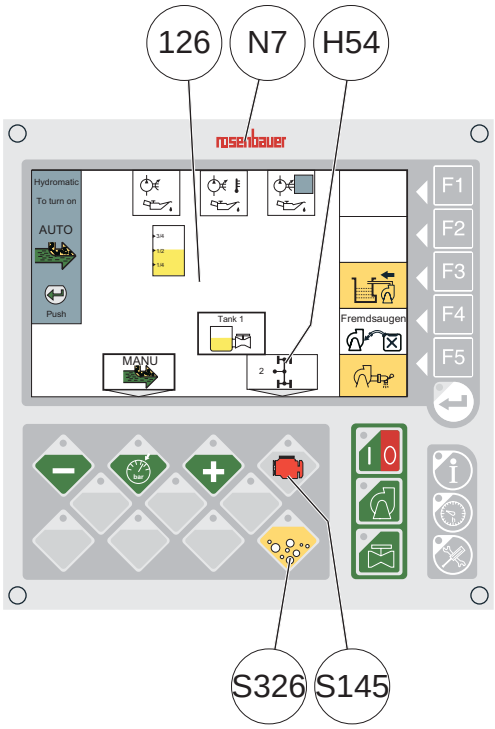
If the P.T.O. is engaged, the engine speed is limited according to the maximum speed of the water pump.

Before engaging the P.T.O., please refer to the operation manual of the chassis-manufacturer !

If the vehicle will not be moved during pump operation, the transmission has to be shifted into "NEUTRAL"!
Neglecting this warning can result in damage of the transmission.

Unconditionally observe the described shifting sequences !

When remaining in the presence of a working pump for prolonged periods of time, the operator should wear proper ear protection.



Engaging the Hydraulic Oil Pumps

Engaging the P.T.O. II from the pump control panel

- *Stop the vehicle.*
- *Shift gear into neutral.*
- *Apply parking brake.*
  - ◊ *Uncontrolled movement of vehicle could cause personnel injury.*
- *Let engine idle.*

- *Call up the foam operation menu at the pump display:*
  - ◊ *Press switch (S326).*
  - ◊ *Picture (126) is shown at the display (N7).*

- *Engage P.T.O.:*
  - ◊ *Press switch (S145).*
  - ◊ *The integrated pilot lamp and the pilot lamp (H54) on the pump control panel will illuminate.*

Disengaging the P.T.O. II

- *Let engine idle.*
- *Disengage P.T.O.:*
  - ◊ *Press again switch (S145) at the foam opration menu (126).*
  - ◊ *Pilot lamps (H54) extinguishes.*

Engaging the P.T.O. II from chassis manufacturer installed P.T.O. switch

- *For further procedure please refer to chassis manufacturers operation manual.*

Note:

If the P.T.O. was engaged from the chassis manufacturer installed P.T.O. switch it must be disengaged from there.

ATTENTION !

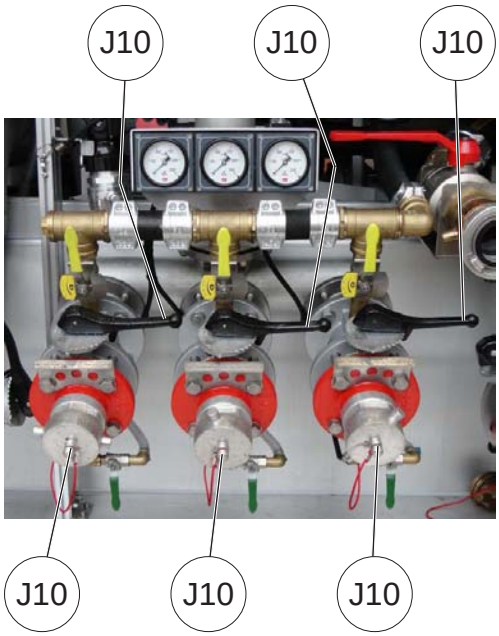
The foam compound pump must not be operated without any liquid for a period longer than 20 seconds. Dry operation may result in damage of the internal parts of the gear pump.

Before engaging the P.T.O., please refer to the operation manual of the chassis-manufacturer !

If the vehicle will not be moved during pump operation, the transmission has to be shifted into "NEUTRAL"!
Neglecting this warning can result in damage of the transmission.

Unconditionally observe the described shifting sequences !

When remaining in the presence of a working pump for prolonged periods of time, the operator should wear proper ear protection.

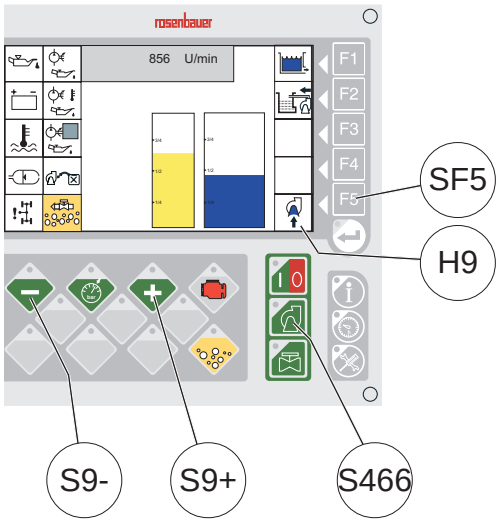


Tank Suction Operation

- *Connect pressure hoses to the pressure outlets (J11) on the left and/or right hand sides.*

- *Engage the water pump:*
  - ◊ *Please refer to the* "Engaging the Water Pump" *chapter.*
  - ◊ *The water tank suction valve opens automatically.*
  - ◊ *The priming pump is engaged automatically until a pressure of 2 bar is achieved (visible on water pressure gauge (P28)). If required the engine accelerate automatically.*
  - ◊ *The pilot lamp (H9) remains illuminated as long as the priming pump is engaged.*
  - ◊ *In case the pressure drops below 2 bar the priming pump will be re-engaged automatically.*

- *Open the left and/or right discharge valve(s) (J10) slowly and start fire fighting.*
- *Adjust required discharge pressure:*
  - ◊ *Press switch (S9+) to increase the pump speed.*
  - ◊ *Press switch (S9-) to decrease the pump speed.*



Notes:
If the automatic priming process fails the pump system can be evacuated by using switch (SF5) until a pressure (max. 2 bar) is achieved (visible on water pressure gauge (P28)).
A priming process can be disengaged by pressing switch (SF5).

Call up pump main menu by using switch (S466).

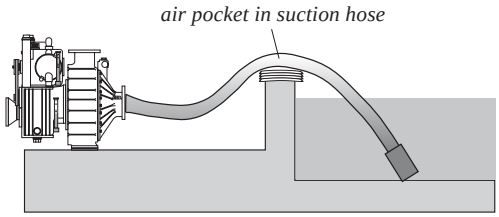
ATTENTION !
The pump pressure should exceed 2 bar, otherwise the priming pump will not be disengaged by the water pressure.

Drafting Operation from Open Water Source

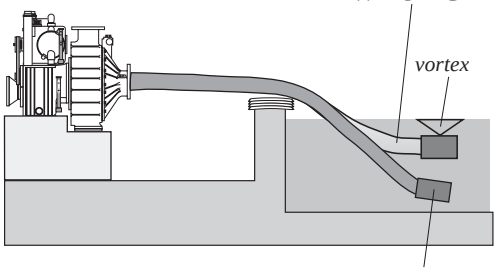
- *When pumping by draft, water is sucked from a supply such as a pond, lake, or river.*
- *Manoeuvre as close as possible to water supply.*
- *Apply parking brake.*

- *Connect suction- and pressure hoses.*
  - ◊ *The suction hose with attached strainer should be at least 20 cm under the water surface (Do not place the strainer in sand or mud as dirt reduces the service life of the pump system!).*

WRONG



WRONG



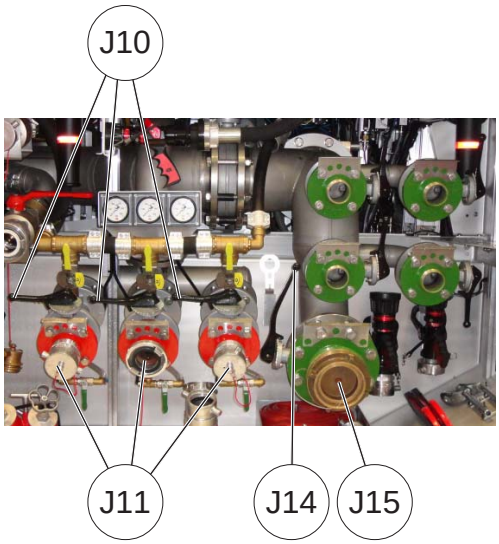
CORRECT

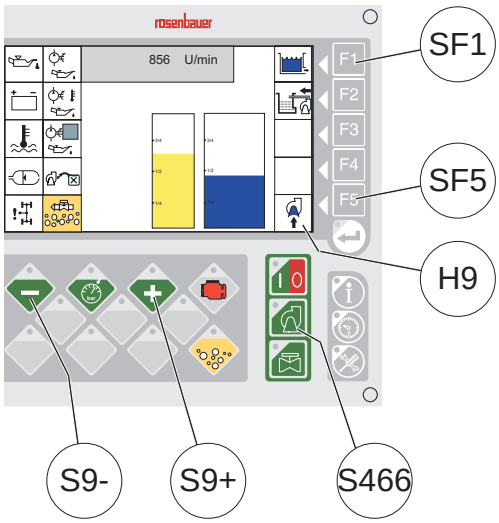
ATTENTION !

When the suction height is increased, the pump capacity is reduced, which means that the nozzle diameter must be reduced to maintain a low discharge rate and constant pressure. When operating with great suction heights, high pump speeds and large nozzle diameters the pump may cavitate. Cavitation sounds like marbles are being pumped through the system, and a slight pressure drop is visible at the manometer.
Cavitation must be avoided by all means, because the internal parts of the pump might be damaged by this excessive load.
Remedy: Decrease speed, water discharge, or suction height.
With DRE-operation cavitation is indicated by a signal on displays.

Never operate the pump without a strainer or suction screen, or at full speed without a nozzle - cavitation may occur.
Watch the declining water level of the water source.
When operating in drafting or hydrant mode with a water discharge of more than 2500 l/min, use both drafting connections. If this warning is ignored, the pump may cavitate and severely damage the internal parts of the pump.

<u>Note:</u>
Avoid operating the pump without water for longer than 3 minutes. Operation without water supply can result in damage of the pump shaft seal.





Drafting operation from open water source

- *Connect pressure hoses to the pressure outlets (J11) on the left and/or right hand sides.*
- *Connect suction hoses to connection(s) (J15) on the left and/or right hand sides.*
- *Open drafting valve(s) (J14) on the left and/or right hand sides.*
- *Engage the water pump:*
  - ◊ *Please refer to the* "Engaging the Water Pump" *chapter.*
  - ◊ *The water tank suction valve opens automatically.*
- *Close the water tank suction valve:*
  - ◊ *Press switch (SF1).*

  Note:
  Press switch (SF1) during the water pump is engaged; this is to prevent automatically opening of the water tank suction valve.
  - ◊ *The priming pump is engaged automatically until a pressure of 2 bar is achieved (visible on water pressure gauge (P28)). If required the engine accelerate automatically.*
  - ◊ *The pilot lamp (H9) remains illuminated as long as the priming pump is engaged.*
  - ◊ *In case the pressure drops below 2 bar the priming pump will be re-engaged automatically.*

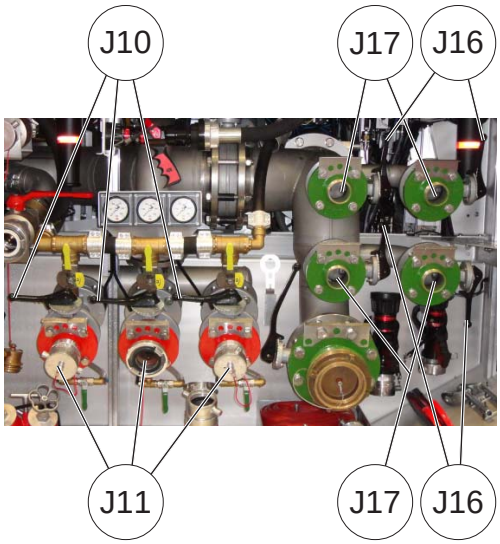
- *Open the left and/or right discharge valve(s) (J10) slowly and start fire fighting.*
- *Adjust required discharge pressure:*
  - ◊ *Press switch (S9+) to increase the pump speed.*
  - ◊ *Press switch (S9-) to decrease the pump speed.*

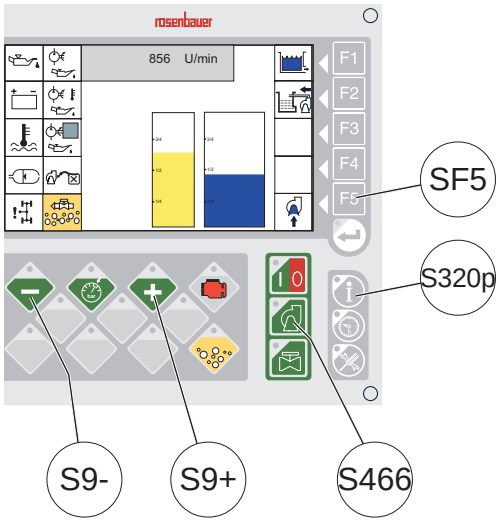
Note:
If the automatic priming process fails the pump system can be evacuated by using switch (SF5) until a pressure (max. 2 bar) is achieved (visible on water pressure gauge (P28)).
A priming process can be disengaged by pressing switch (SF5).

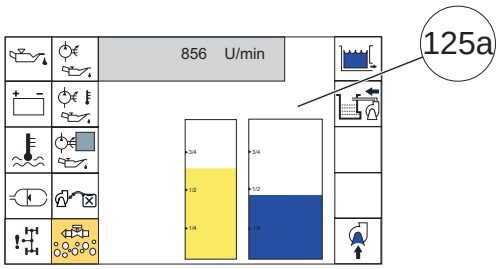
Call up pump main menu by using switch (S466).

ATTENTION !

Avoid operating the pump without water for longer than 3 minutes. Operation without water supply can result in damage of the pump shaft seal.
The pump pressure should exceed 2 bar, otherwise the priming pump will not be disengaged by the water pressure.







Hydrant / Supply Operation

- *Connect the supply hoses to the left and/or right connection(s) (J17).*
- *Open supply valve(s) (J16).*

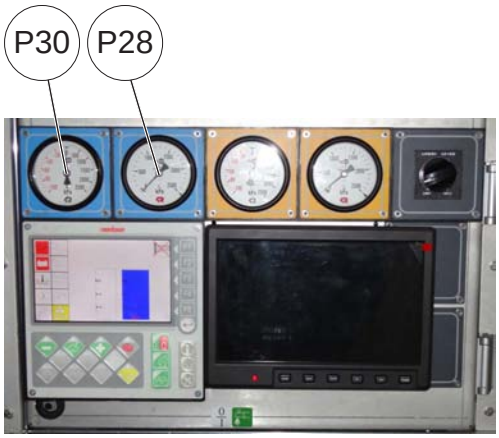
- *Connect pressure hoses to the pressure outlets (J11) on the left and/or right hand sides.*
- *Open at least one discharge valve (J10) to pull down pressure peaks.*

- *Open the hydrant valve slowly.*

- *When the water has reached the pump, it can be engaged:*
  - ◊ *Please refer to the* "Engaging the Water Pump" *chapter.*
  - ◊ *Call up pump main menu (125a) by pressing switch (S466).*
  - ◊ *Press switch (SF1) during the water pump is engaged; this is to prevent automatically opening of the water tank suction valve and an overflow of supply water into the water tank.*

- *Adjust required discharge pressure:*
  - ◊ *Press switch (S9+) to increase the pump speed.*
  - ◊ *Press switch (S9-) to decrease the pump speed.*

- *Open further discharge valve(s) (J10) and start fire fighting.*



ATTENTION !

The pressure indicated at the manometer (P28) must not exceed 16 bar !

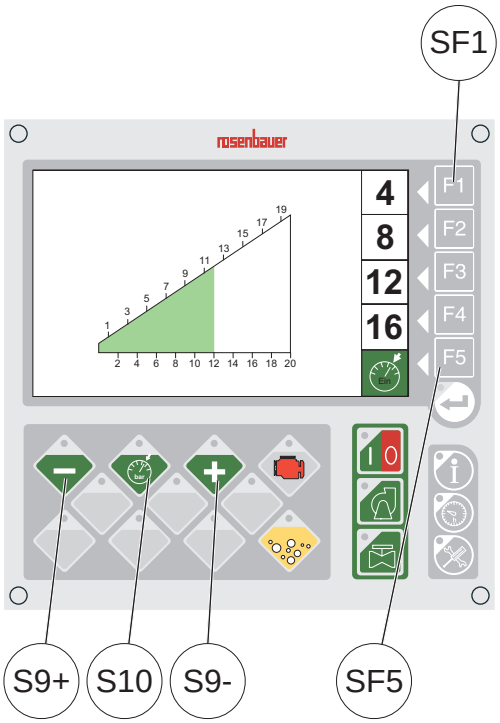
The pressure indicated at the manovacuummeter (P30) must not drop below 2 bar, otherwise the supply hose will collapse and restrict water flow.

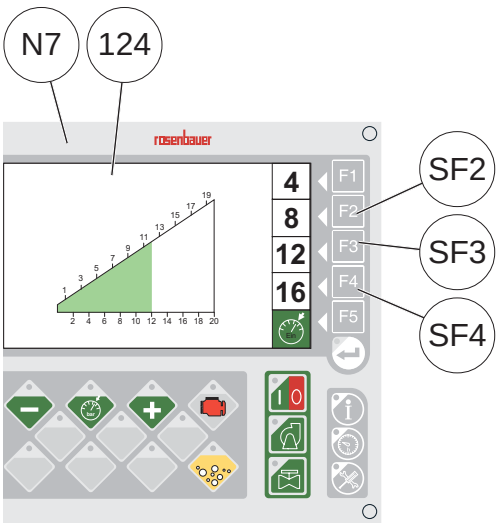
The priming pump must not be engaged - that means that the pump pressure should exceed 2 bar, otherwise the priming pump will not be disengaged by the water pressure.
A priming process can be disengaged by pressing switch (S3).
When operating the pump system, let the drive engine idle to conserve power and pressurized air supply.
Before connecting a hose to the hydrant, open the hydrant valve to allow discharge, until clean water flows out of the hydrant.

CAUTION !

Do not operate the pump with closed pressure outlets - dangerous increase of temperature will result!
Water and foam compounds are conducting electricity!
Remain a safe distance from electricity conductors!
Some materials will increase in volume and/or weight when mixed with water.
Because of the possibility of chemical reactions, some materials must not come into contact with water!
FAILURE TO FOLLOW THIS PROCEDURE COULD CAUSE PERSONAL INJURY!
When the flow of water through the fire hose or pipe is suddenly stopped, the resulting surge is referred to as "water hammer".
Water hammer can often be heard as a distinct, sharp clank, very much like a hammer striking a pipe. This sudden stoppage results in a change in the direction of energy and this energy is instantaneously multiplied many times. These excessive pressures can cause considerable damage to water mains, plumbing, fire hoses, and fire pumps.
Nozzle controls, hydrants, and valves should be operated slowly to prevent water hammer.

- *Before opening a handline discharge valve make sure that the nozzles are held tightly - danger of water hammer effect!*
- *Release pressure before disconnecting a hose!*
- *Use nozzles for fire fighting purposes only.*
- *Never aim the jet at people.*





Pump Pressure Governor

<u>DRE operation (pump pressure governor):</u>
If the pump is equipped with an automatic pump pressure governor (DRE), the pump pressure can be kept constant, independent of the amount of water discharged.

- *Operate pump as mentioned in the*
  - "Tank Suction Operation" *or*
  - "Drafting Operation from Open Water Source" *or*
  - "Supply Operation / Hydrant Operation" *chapter.*

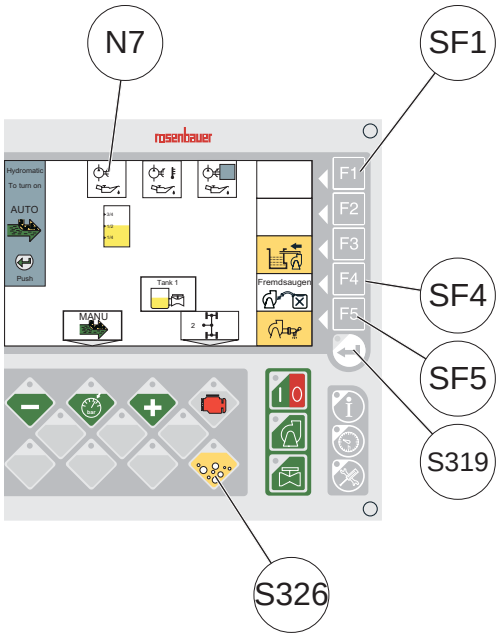
- *Engage the pump pressure governor:*
  - *Press switch (S10) -> screen (124) will be shown on display (N7). The pilot lamp in switch (S10) illuminates. The pump speed is controlled by the DRE to reach the actually adjusted pressure at variable discharge amounts.*
  - *Preselect a desired discharge pressure by using switches (SF1) to (SF4). Other pressure values from the range of capacity are to be adjusted by pressing switch (S9+) to increase the pressure, and switch (S9-) to decrease the pressure.*
  - *A signal in the displays starts blinking when the pump is cavitating.*

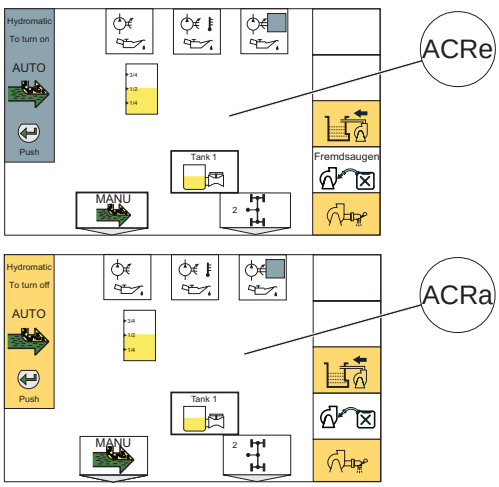
<u>Note:</u>
To return to the pump pressure governor menu you can use switch (S10) at any different menu.

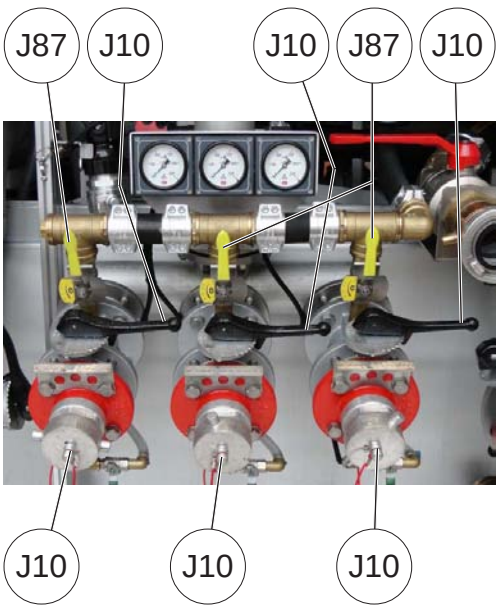
<u>Disengaging the pump pressure governor:</u>
- *Call up the pump pressure governor sub-menu:*
  - *Press switch (S10) -> screen (124) will be shown on display (N7).*
- *Press switch (SF5).*
  - *The pilot lamp in switch (S10) extinguishes.*

<u>Note:</u>
When changing from automatic to manual mode, the drive engine is no longer electronically controlled and keeps running with its current speed, therefore it must be manually returned to idle. Press switch (S9-) until the drive engine idles.

- *If desired carry on pump operation manually as described before.*







Foam Operation

Procedure from the foam compound tank

- *Provide pressure hoses with foam branch pipes.*
- *Operate the pump system as described in the*
  - "Tank Suction Operation" *or*
  - "Drafting Operation from Open Water Source" *or*
  - "Hydrant / Supply Operation" *chapters.*

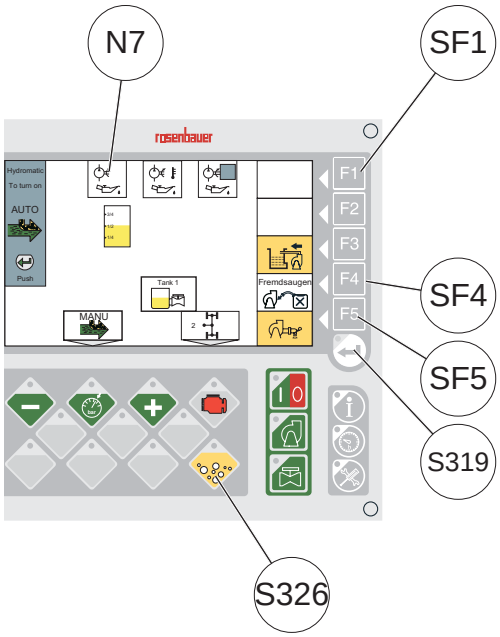
- *Engage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pump" *chapter.*

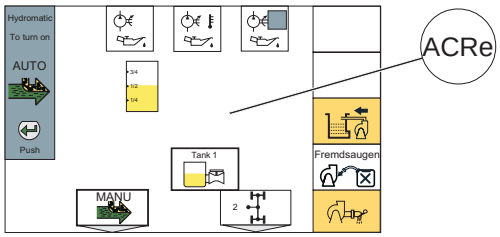
- *Call up the foam operation menu:*
  - *Press switch (S326) -> screen (ACRe) will be shown on display (N7).*
- *Preselect the foam compound tank suction valve by using switch (SF4):*
  - *Usually the foam compound tank is selected.*
- *Start the "AUTOMATIC" mode:*
  - *Press enter button (S319) -> screen (ACRa) will be shown on display (N7).*
  - *The external foam compound suction valve will be opened.*
  - *The supply valve for the foam proportioner will be opend.*

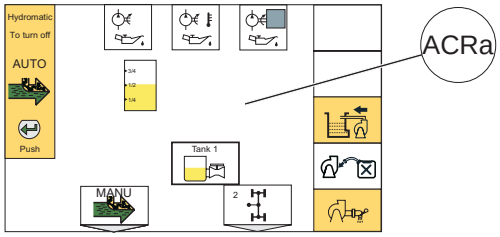
- *Prime the foam compound pump:*
  - *Press switch (SF5) until foam compound is discharged at the priming line.*
- *The proportioning rate may be adjusted separately for every single pressure outlet by using the proportioning valves (J87).*
  - *Do not open proportioning valves (J87) at the pressure outlets where no water is being discharged, no hose is connected or the concerned valve (J10) is closed.*
  - *Foam compound is sucked out of the foam compound tank and will be provided to the water system with an overpressure of approx. 0.5 bar.*

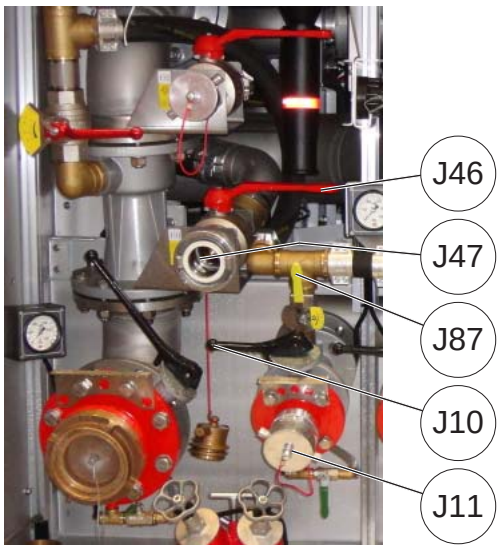
Note:
Please obey information shown on display (N7). Depending on importance, information can be cancelled by pressing enter button (S319). Warnings retains until the operator takes remedial measures. If the foam compound tank content is less than 150 l, a low content warning will be displayed, at 20 l the foam compound pump will be disengaged.

ATTENTION !
Before closing a discharge outlet, always close the corresponding foam proportioning valve. Failure to comply will cause an overflow of foam compound to the water system.









<u>Procedure with an external foam compound container</u>

- *Provide pressure hoses with foam branch pipes.*
- *Operate the pump system as described in the*
  - ◊ "Tank Suction Operation" *or*
  - ◊ "Drafting Operation from Open Water Source" *or*
  - ◊ "Hydrant / Supply Operation" *chapters.*

- *Engage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pump" *chapter.*

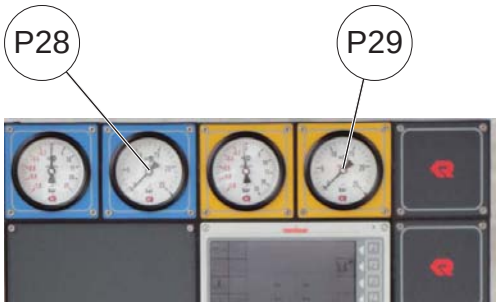
- *Connect the foam compound drafting hose to foam compound drafting connection (J47) and put the other end into a container filled with foam compound.*

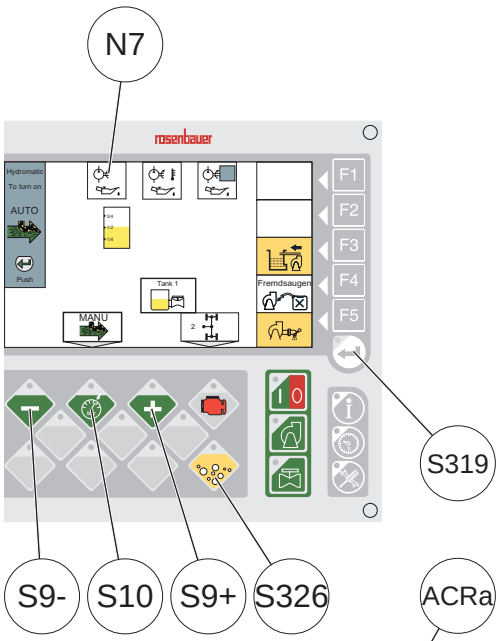
- *Call up the foam operation menu:*
  - ◊ *Press switch (S326) -> screen (ACRe) will be shown on display (N7).*
- *Preselect the external foam compound container by using switch (SF4):*
  - ◊ *Usually the foam compound tank is selected.*
- *Start the "AUTOMATIC" mode:*
  - ◊ *Press enter button (S319) -> screen (ACRa) will be shown on display (N7).*
  - ◊ *The external foam compound suction valve will be opened.*
  - ◊ *The supply valve for the foam proportioner will be opend.*

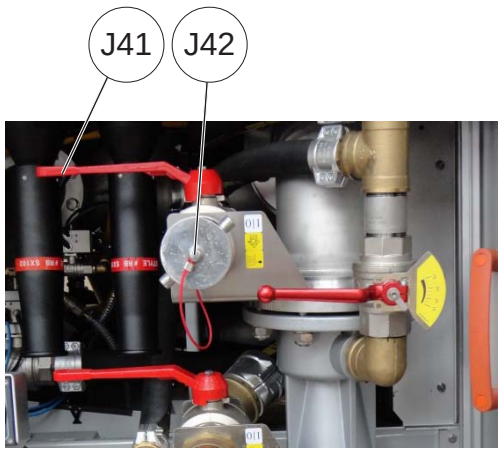
- *Prime the foam compound pump system.*
  - ◊ *Press switch (SF5) until foam compound is discharge at the priming line.*
- *The proportioning rate may be adjusted separately for every single pressure outlet by using the proportioning valves (J87).*
  - ◊ *Do not open proportioning valves (J87) at the pressure outlets where no water is being discharged, no hose is connected or the concerned valve (J10) is closed.*
  - ◊ *Foam compound is sucked out of the foam compound tank and will be provided to the water system with an overpressure of approx. 0.5 bar.*

<u>Notes:</u>
Please obey information shown on display (N7). Depending on importance, information can be cancelled by pressing enter button (S319). Warnings retains until the operator takes remedial measures.

ATTENTION !
Take care for sufficient foam compound supply. Dry operation may result in damage of the internal parts of the gear pump.
Before closing a discharge outlet, always close the corresponding foam proportioning valve. Failure to comply will cause an overflow of foam compound to the water system.







Manual foam compound pump operation

The foam compound pump is to be controlled manually with:
- *reserve pumping -> using the foam comp. pressure outlet*
- *foam compound tank filling -> via the foam compound pump*
- *failure of the pressure sensor > emergency operation*

- *Operate the pump system as described in the*
  - "Foam Operation from the Foam Compound Tank" *or*
  - "Foam Operation from an External Foam Compound Container" *chapter.*

- *Disengage the "AUTOMATIC" mode:*
  - *Press switch (S319) again.*
- *Select the "MANUAL" mode:*
  - *Press switch (S10).*
  - *The supply valve for the foam proportioner will be opend. The current foam compound pump speed will be shown on display (N7).*
- *Read the water pressure on gauge (P28), add 0.5 bar to the water pressure -> nominal foam pump pressure. Adjust the foam compound pump to the nominal foam pump pressure visible on gauge (P29):*
  - *Press switch (S9+) to increase the foam comp. pump speed.*
  - *Press switch (S9-) to decrease the foam comp. pump speed.*

Use of the foam compound pressure outlet:
- *Connect pressure hose to the foam compound pressure outlet (J42).*
- *Open valve (J41).*
  - *The supply valve for the foam compound proportioner will be closed and only discharge operation from the foam compound pressure outlet (J42) is possible.*

ATTENTION !

- *When foam concentrate has been used, please obey instructions found in the* "Flushing after Foam Operation" *chapter.*

- *The water pump must not be operated without any liquid for a period longer than 3 minutes.*
- *The foam compound pump must not be operated without any liquid for a period longer than 20 seconds. Dry operation may result in damage of the internal parts of the gear pump.*

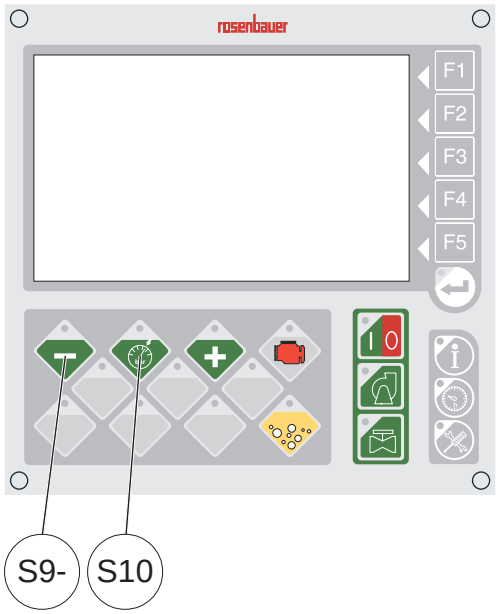
Watch out during Pump Operation

- *The operator´s stand should be always in reach of machinist. Continuously monitor:*
  - ◊ *Water- and foam compound tank content*
  - ◊ *Fuel, coolant temperature and oil pressure*
  - ◊ *In case of unusual noise (e.g. cavitation, etc.), reduce the pump speed to idle and then disengage it.*

CAUTION !

If danger to personnel arises from the pumping process, (e.g. burst hose) immediately reduce the pump speed to idle and close the corresponding pressure outlet. Disengage pump if required.

Disengaging the Pump System



- *If engaged, disengage the pump pressure governor:*
  - ◊ *Check, if the pilot lamp in switch (S10) illuminates, press switch (S10).*
- *Reduce the pump pressure:*
  - ◊ *Press switch (S9-) until the engine idles.*
  - ◊ *Press switch (S9-) in the foam operation menu until the foam compound pump idles.*

- *After foam operation, or operation with seawater or mucky water, the pump has to be flushed:*
  - ◊ *Please refer to the "*Flushing after Foam Operation*" chapter.*

- *Disengage the water pump:*
  - ◊ *Please refer to the* "Engaging the Water Pump" *chapter.*

- *Disengage all active functions on the pump control panel:*
  - ◊ *Press switches (S_) with integrated pilot lamps illuminates to call up the menus and disengage the funktions.*

- *Uncouple pressure and suction hoses.*

- *Drain the entire pump system:*
  - ◊ *Please refer to the "*Operation in Cold Climates*" chapter in this manual.*
- *Drying the priming pump:*
  - ◊ *Please refer to the "*Operation in Cold Climates*" chapter.*

- *Close all drain valves, pressure outlets, etc. again.*
- *Prepare the pump system for the next use.*

ATTENTION !

Uncouple suction hoses before releasing pressure of rising fire mains - max. permissible pressure for suction hoses is 3 bar.

Stinger and Stinger Turret Operation

- *Engage the P.T.O. for hydraulic oil pump:*
  ◊ *Please refer to the* "Engaging the Hydraulic Oil Pump".

ATTENTION !

*When activating a boom function and the water pump is not engaged, the engine speed will increase to high idle. **
When the water pump is engaged the engine speed is to be increased on the pump control panel or via the remote control.

Note:
The pilot lamp (H66) is installed at any hinged ladder of the vehicle. This pilot lamp (H66) indicates activated stinger. Do not enter the roof whiles operation the stinger !

- *For further information please refer to the separate boom operation manual.*

CAUTION !

Minimum distance 1 m to overhead lines until 1 kV
Minimum distance to high-voltage line:
3 m 1 kV - 110 kV, 4 m 110 kV - 220 kV, 5 m 220 kV - 380 kV

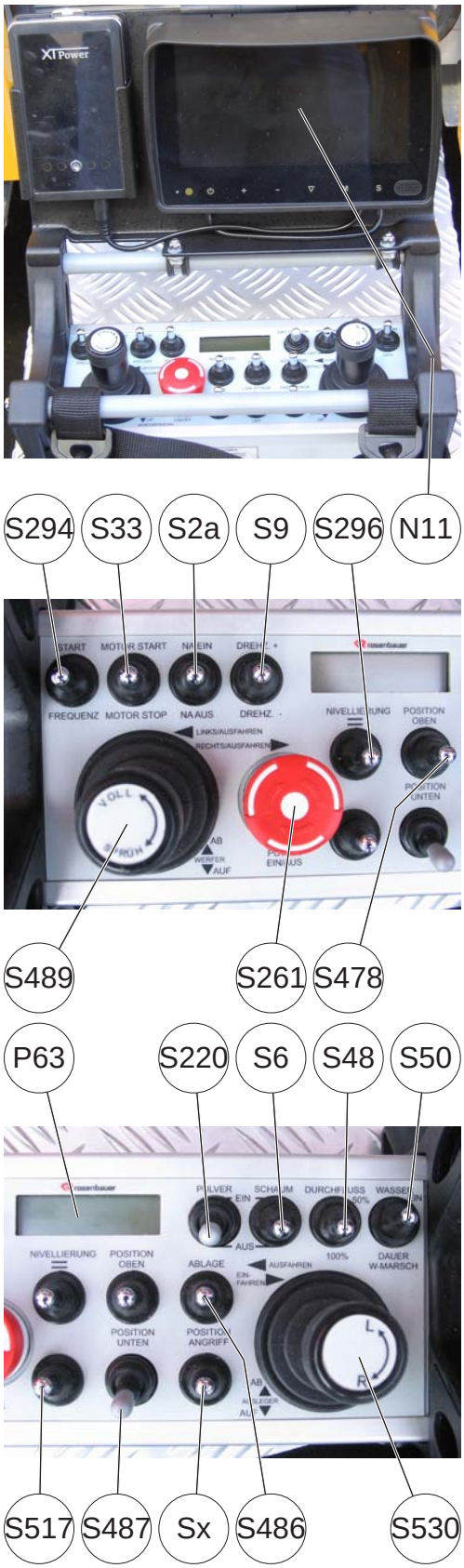
Sight contact with the turret discharge is absolutely essential!
Never point the discharge jet at anybody.
DANGER OF INJURY TO PERSONNEL!

ATTENTION !

Bring the nozzle to a upright position before activating or parking the boom or use the automatic levelling function.
This is to prevent the cabin and/or the turret from damage caused by the sweeping down nozzle.

CAUTION !

Do not enter the roof whiles operation the stinger !
Before activating the turret control please make sure to have enough operation area available.



Description of the radio remote control unit

The boom and the turret is controlled via radio remote control.
The switches for turret control are integrated in boom´s remote control.
The turret can be also controlled from the light mast remote control.

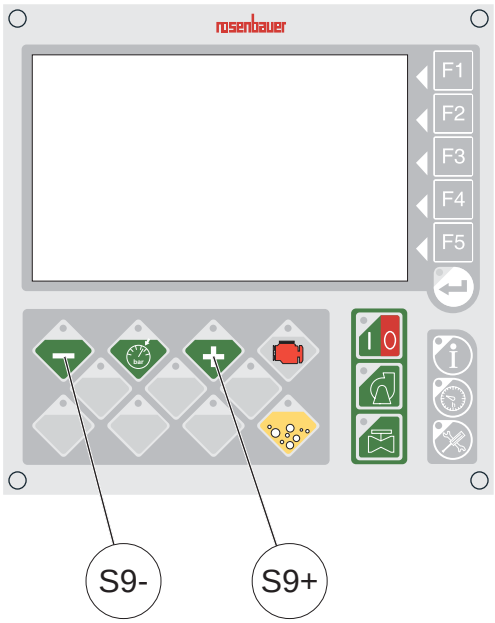
P63 display of the remote control

S2a switch: P.T.O. ON / OFF
S6 switch: foam operation ON / OFF
S9 switch: pump speed increase / decrease
S33 switch: engine start / stop
S48 switch: flow 50% / 100%
S50 switch: water toggle / HFO (hands free operation)
*S220 switch: powder ON / OFF **
S261 main switch and/or emergency stop switch
S294 switch: start / frequency
S296 switch: auto level
S478 switch: high attack position / low attack position
S486 switch: auto stow / fast attack position
S487 switch: piecing tool ON / OFF
S489 Joystick of turret RM 65C / piercing tool
S517 switch: piercing tool penetaration
S530 Joystick of boom
Sx switch: not in use

N11 Display and accumulator for singer camera - for further information please refer tot he separate operation manual

For further information please refer to separate operation manual.

CAUTION !
Sight contact with the turret is absolutely essential!
Never point the discharge jet at anybody.
DANGER OF INJURY TO PERSONNEL!



Boom turret - operation with water

- *Operate the pump as mentioned in the*
  - "Tank Suction Operation" *or*
  - "Drafting Operation from Open Water Source" *or*
  - "Hydrant / Supply Operation" *pump panel operation chapter.*

- *Prepare the boom for operation:*
  - *Move the boom out of parking position and bring it to the attack position - keep free space for turret pipe - please refer to the "*Boom Operation*" chapter.*

- *Move the turret to desired position.*

- *Open turret discharge valve:*
  - *Tilt and hold switch (S50) to the "ON" position as long as water discharge is desired.*
  - *OR Tilt switch (50) to the "HFO" position for permanent discharge .*

- *The required discharge pressure and throwing range is controlled via pump pressure governor or manually by using switch (S9_) on the pump control panel or switch on the remote control.*

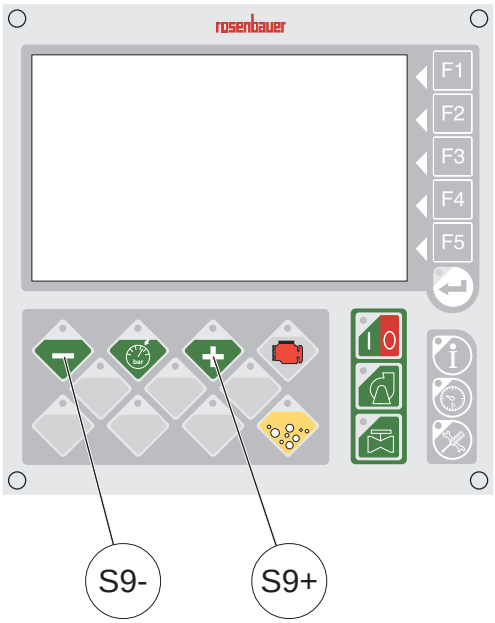
- *If required reduce to half discharge rate by using switch (S48).*
- *During operation the discharge jet is infinitely variable from full- to spray-jet by turning joystick (S489).*

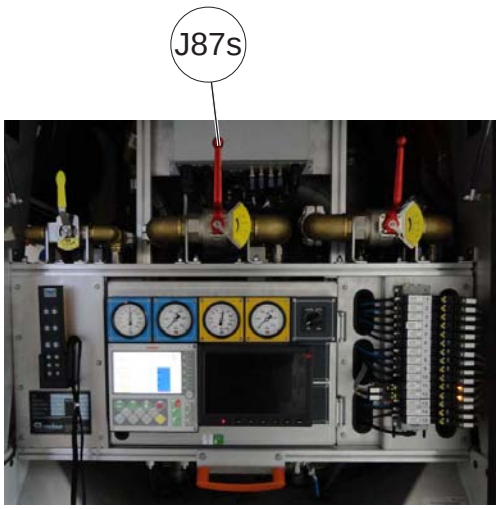
Temporary stopping of turret operation:
- *Close turret discharge valve.*

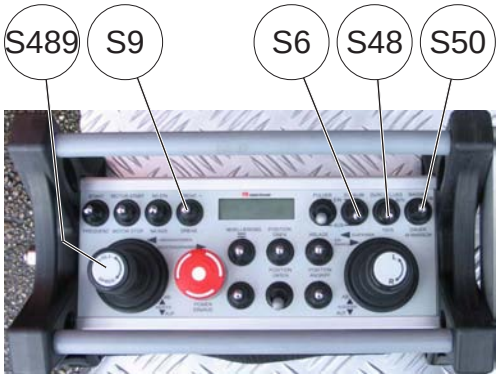
Stopping of turret operation:
- *Reduce the engine speed/pump pressure.*
- *Close turret discharge valve.*
- *Move the boom to transport position.*

ATTENTION !
To prevent damage of the vehicles roof installations, always use the AUTO STOW function to return the boom to the transport position.

CAUTION !
Sight contact with the turret is absolutely essential!
Never point the discharge jet at anybody.
DANGER OF INJURY TO PERSONNEL!







Boom turret - operation with foam

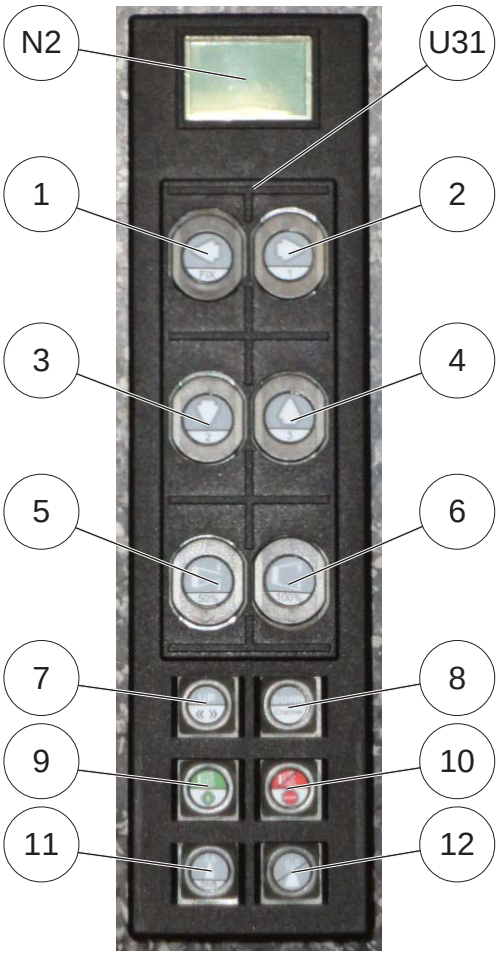
- *Preselect the desired foam proportioning rate:*
  - ◊ *Shift foam proportioning valve (J87s) on pump control panel to the desired position.*
- *Operate the pump as mentioned in the*
  - ◊ "Foam Operation" *pump panel operation chapter.*
- *Prepare the boom for operation:*
  - ◊ *Move the boom out of parking position and bring it to the attack position - keep free space for turret pipe - please refer to the "*Boom Operation*" chapter.*
- *Move the turret to desired position.*
- *Preset foam pressure valve of boom turret:*
  - ◊ *Tilt switch (S6) to the "ON" position.*
- *Open turret discharge valve and foam pressure valve:*
  - ◊ *Tilt and hold switch (S50) to the "ON" position as long as water/foam discharge is desired.*
  - ◊ *OR Tilt switch (50) to the "HFO" position for permanent discharge .*
- *The required discharge pressure and throwing range is controlled via pump pressure governor or manually by using switch (S9_) on the pump control panel or switch (S9) on the remote control.*
- *If required reduce to half discharge rate by using switch (S48).*
- *During operation the discharge jet is infinitely variable from full- to spray-jet by turning joystick (S489).*

Stopping of turret operation:

- ◊ *Reduce the engine speed/pump pressure.*
- ◊ *Close turret discharge valve.*
- ◊ *Flush the pump system - please refer to the* "Flushing after Foam Operation" *maintenance chapter.*
- ◊ *Move the boom to transport position.*

ATTENTION !

To prevent damage of the vehicles roof installations, always use the AUTO STOW function to return the boom to the transport position.
The pump system must be flushed after every foam operation.
Please refer to the "Flushing after Foam Operation" *chapter.*



Description of the radio remote control unit of the RM 65 C

The remote control unit is stowed in the pump compartment.

1 switch: roof turret turn to the left
2 switch: roof turret turn to the right
3 switch: lower roof turret
4 switch: raise roof turret
5 switch: roof turret deflector adjustment switch -> full jet
6 switch: roof turret deflector adjustment switch -> spray
7 switch: manual throttle increasement
8 switch: manual throttle decreasement
9 START - switch: permanent roof turret discharge
10 STOP - switch: permanent roof turret discharge
11 switch: ON / shift switch (Press for 3 sec.)
12 switch: OFF (Press for 3 sec.)

In combination with the shift switch (11), the following switches change there function:

1+11 switch: open foam compound pressure valve for turret line
5+11 switch: reduce to half output
6+11 switch: full output
9+11 START - switch: engage the roof turret
10+11 STOP - switch: disengage the roof turret

N2 display of remote control

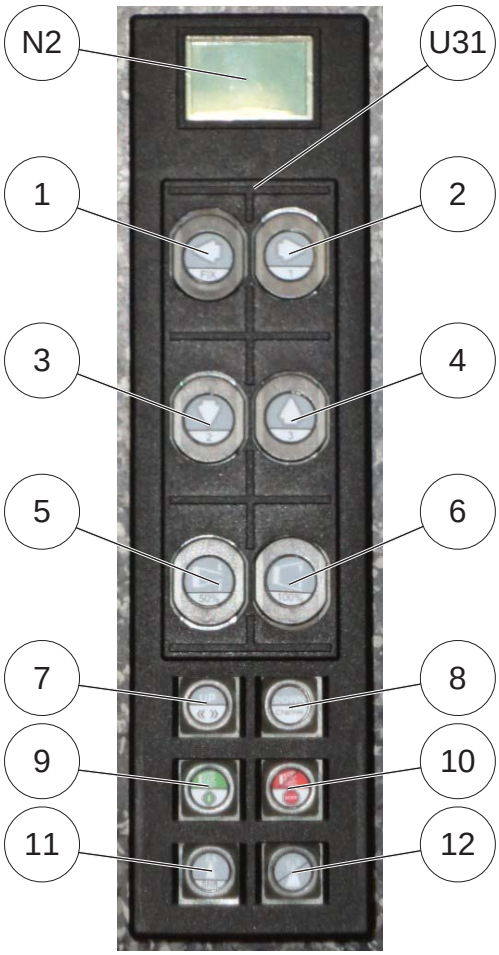
U31 remote control

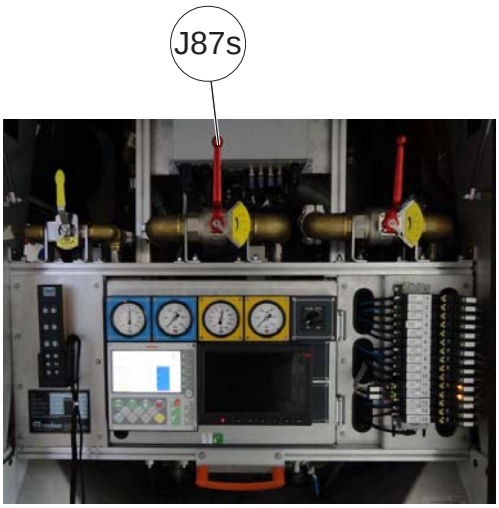
For further information please refer to the separate operation manual.

ATTENTION !
Operate the roof turret with closed roof hatch only !

CAUTION !
Sight contact with the turret is absolutely essential!
Never point the discharge jet at anybody.
DANGER OF INJURY TO PERSONNEL!

Before activating the turret control please make sure to have enough operation area available. The turret moves automatically into the same position like the control handle is pointing to.





<u>Roof turret RM 65 C - operation with water or water/foam</u>

Water operation:

- *Operate the pump as mentioned in the*
  - ◊ "Tank Suction Operation" *or*
  - ◊ "Drafting Operation from Open Water Source" *or*
  - ◊ "Hydrant / Supply Operation" *pump panel operation chapter.*

Water/foam operation:

- *Adjust the foam proportioning rate for the turret:*
  - ◊ *Bring adjustment lever (J87s) to the desired position.*
- *Operate the pump as mentioned in the*
  - ◊ "Foam Operation" *pump panel operation chapter.*

- *Engage the remote control (U31):*
  - ◊ *Press **only** switch (11) for 3 seconds.*
  - ◊ *The remote control is activated.*

- *Choose the operating device:*
  - ◊ *Press shift switch (11) + (7) until the roof turret is choosen.*
  - ◊ *The symbol of the "turret 1" appears on the display (N2).*

  <u>Note:</u> This is only necessary if more operating devices are controled by one remote control (U31) (e.g. light mast, roof turret and the bumper turret).

- *Engage the roof turret:*
  - ◊ *Press shift switch (11) + (9) to engage the roof turret.*
- *Direct the turret to the desired position by using switches (1), (2), (3) and (4).*

- *Open the turret discharge valve:*
  - ◊ *Press switch (9).*

- *Open the foam compound pressure valve for turret line:*
  - ◊ *Press switch (11) + (1).*

- *Adjust required discharge pressure:*
  - ◊ *Press switch (7) to increase the pump speed.*
  - ◊ *Press switch (8) to decrease the pump speed.*

- *To reduce to half discharge rate press switch (11) + (5).*
- *To go back to full discharge rate press switch (11) + (6).*
- *To generate spray pattern, press switch (6) or for full jet press switch (5). This can be done whilst discharging.*

Roof turret RM 65 C - operation with water or water/foam

Temporary stopping of turret operation:

- *If open, close the foam compound pressure valve for turret line:*
  - ◊ *Press switch (11) + (1) again.*

- *Close turret discharge valve:*
  - ◊ *Press switch (10).*

Stopping of turret operation:

- *If open, close the foam compound pressure valve for turret line:*
  - ◊ *Press switch (11) + (1) again.*

- *Disengage the roof turret and the pump:*
  - ◊ *Let engine idle.*
  - ◊ *Press switch (10).*
  - ◊ *Press shift switch (11) + (10) to disengage the roof turret. The turret moves to it's transport position.*
  - ◊ *Disengage the pump - please refer to the* "Engaging the Pump" *chapter.*

- *Disngage the remote control (U31):*
  - ◊ *Press **only** switch (12) for 3 seconds.*
  - ◊ *The remote control is disengaged.*

For further information please refer to the separate operation manual.

ATTENTION !
On designs without a turret pipe, AFFF foam compound should be used, otherwise the foam quality is poor !
The pump system must be flushed after every foam operation. Please refer to the "Flushing after Foam Operation" *chapter.*

Roof Turret RM 60 C

Description of RM 60 C

The electronically controlled RM 60 C turret, mounted on the vehicles roof is designed for water operation as well as for water/ foam operation.

1 *foam pipe **
2 *deflector **
9 *non aspirating nozzle*

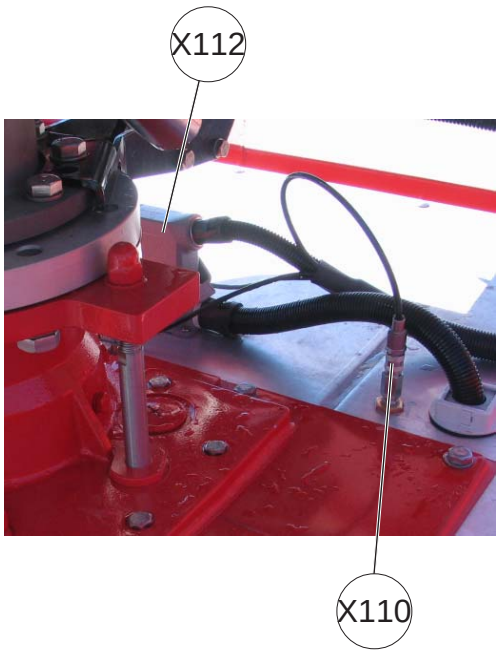
E17 *turret search light*

H66 *pilot lamp: indicates active turret*

P1 *water tank level gauge **
P2 *foam compound tank level gauge **
P28 *pressure gauge: indicates water pressure at the turret*

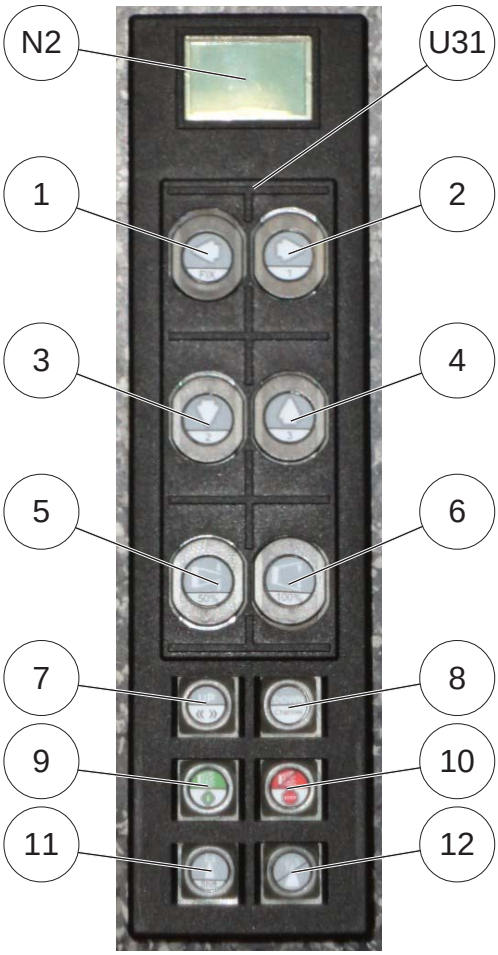
S5 *switch: turret discharge and foam compound tank suction valve **
S9 *switch: throttle control for drive engine (water pump) **
S48 *switch: discharge reduction **
- *"0" position -> full discharge*
- *"I" position -> half discharge*

S49 *switch: deflector adjustment **
- *"left" position -> spray*
- *"right" position -> full jet*



X110 *compressed air supply connection*
X112 *power supply connection*
X120 *socket for speaker system **
Note:
*For access open the protection cap. A second socket is placed in the cabin. **

Z119 *handwheel for elevation*
Z120 *handwheel for rotation*



Description of the radio remote control unit of the RM 60 C

The remote control unit is stowed in the pump compartment.

1 switch: roof turret turn to the left
2 switch: roof turret turn to the right
3 switch: lower roof turret
4 switch: raise roof turret
5 switch: roof turret deflector adjustment switch -> full jet
6 switch: roof turret deflector adjustment switch -> spray
7 switch: manual throttle increasement
8 switch: manual throttle decreasement
9 START - switch: permanent roof turret discharge
10 STOP - switch: permanent roof turret discharge
11 switch: ON / shift switch (Press for 3 sec.)
12 switch: OFF (Press for 3 sec.)

In combination with the shift switch (11), the following switches change there function:

1+11 switch: open foam compound pressure valve for turret line
5+11 switch: reduce to half output
6+11 switch: full output
9+11 START - switch: engage the roof turret
10+11 STOP - switch: disengage the roof turret

N2 display of remote control

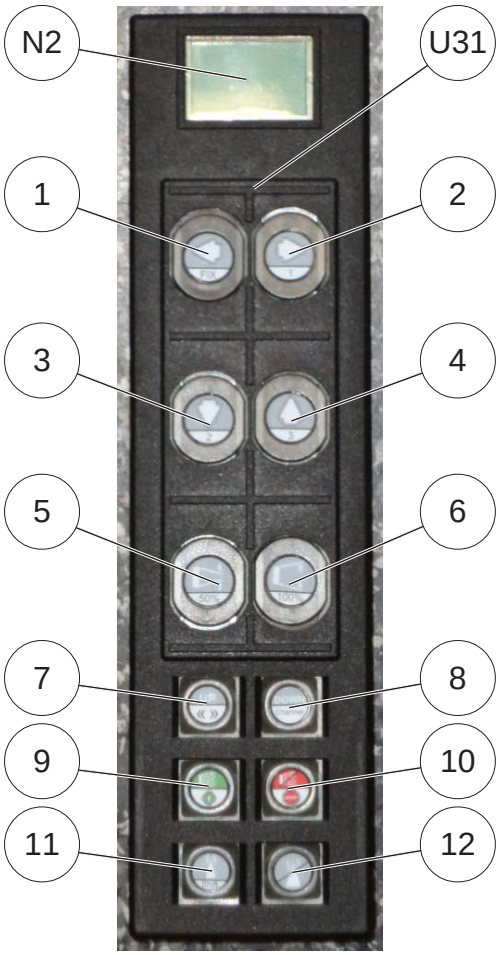
U31 remote control

For further information please refer to the separate operation manual.

ATTENTION !
Operate the roof turret with closed roof hatch only !

CAUTION !
Sight contact with the turret is absolutely essential!
Never point the discharge jet at anybody.
DANGER OF INJURY TO PERSONNEL!

Before activating the turret control please make sure to have enough operation area available. The turret moves automatically into the same position like the control handle is pointing to.



<u>Roof turret RM 60 C - operation with water or water/foam</u>

Water operation:

- *Operate the pump as mentioned in the*
  - ◊ "Tank Suction Operation" *or*
  - ◊ "Drafting Operation from Open Water Source" *or*
  - ◊ "Hydrant / Supply Operation" *pump panel operation chapter.*

Water/foam operation:

- *Adjust the foam proportioning rate for the turret:*
  - ◊ *Bring adjustment lever (J87t) to the desired position.*
- *Operate the pump as mentioned in the*
  - ◊ "Foam Operation" *pump panel operation chapter.*

- *Engage the remote control (U31):*
  - ◊ *Press **only** switch (11) for 3 seconds.*
  - ◊ *The remote control is activated.*

- *Choose the operating device:*
  - ◊ *Press shift switch (11) + (7) until the roof turret is choosen.*
  - ◊ *The symbol of the "turret 1" appears on the display (N2).*

  <u>Note:</u> This is only necessary if more operating devices are controled by one remote control (U31) (e.g. light mast, roof turret and the bumper turret).

- *Engage the roof turret:*
  - ◊ *Press shift switch (11) + (9) to engage the roof turret.*
- *Direct the turret to the desired position by using switches (1), (2), (3) and (4).*

- *Open the turret discharge valve:*
  - ◊ *Press switch (9).*

- *Open the foam compound pressure valve for turret line:*
  - ◊ *Press switch (11) + (1).*

- *Adjust required discharge pressure:*
  - ◊ *Press switch (7) to increase the pump speed.*
  - ◊ *Press switch (8) to decrease the pump speed.*

- *To reduce to half discharge rate press switch (11) + (5).*
- *To go back to full discharge rate press switch (11) + (6).*
- *To generate spray pattern, press switch (6) or for full jet press switch (5). This can be done whilst discharging.*

Roof turret RM 60 C - operation with water or water/foam

Temporary stopping of turret operation:

- *If open, close the foam compound pressure valve for turret line:*
  - ◊ *Press switch (11) + (1) again.*

- *Close turret discharge valve:*
  - ◊ *Press switch (10).*

Stopping of turret operation:

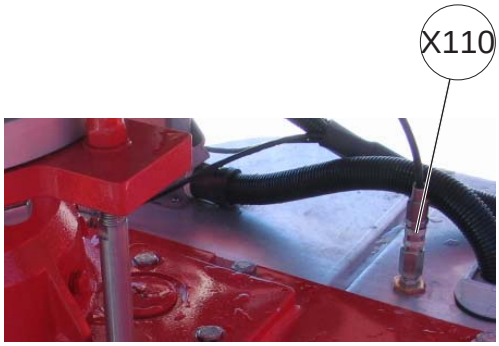
- *If open, close the foam compound pressure valve for turret line:*
  - ◊ *Press switch (11) + (1) again.*

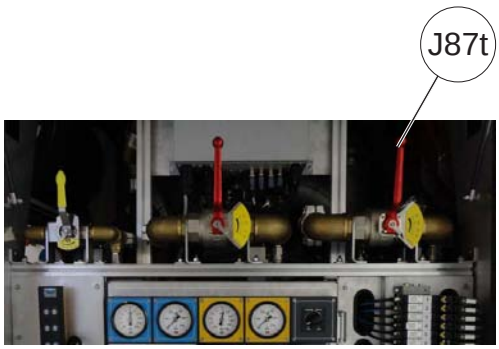
- *Disengage the roof turret and the pump:*
  - ◊ *Let engine idle.*
  - ◊ *Press switch (10).*
  - ◊ *Press shift switch (11) + (10) to disengage the roof turret. The turret moves to it's transport position.*
  - ◊ *Disengage the pump - please refer to the* "Engaging the Pump" *chapter.*

- *Disngage the remote control (U31):*
  - ◊ *Press **only** switch (12) for 3 seconds.*
  - ◊ *The remote control is disengaged.*

For further information please refer to the separate operation manual.

ATTENTION !
On designs without a turret pipe, AFFF foam compound should be used, otherwise the foam quality is poor !
The pump system must be flushed after every foam operation. Please refer to the "Flushing after Foam Operation" *chapter.*





ATTENTION !

The pump system must be flushed after every foam operation. Please refer to the "Flushing after Foam Operation" *chapter.*
Emergency operation is allowed whilst vehicle is parked and strictly by personnel familiar with system !
Pay attention when working on the vehicle´s roof - danger of falling!
The system must be repaired immediately!

Roof turret RM 60 C - emergency operation with water or foam

If an electric component for the roof turret control is defective the turret can be controlled manually from vehicle´s roof.

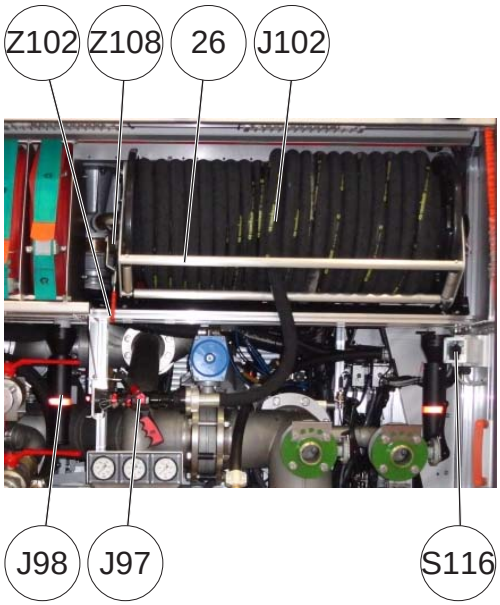
- *Disngage the remote control (U31):*
  - *Press **only** switch (12) for 3 seconds.*
  - *The remote control is disengaged.*

- *Direct the turret to desired position:*
  - *Operate the switch (S49) whilst moving the turret out from transport lock by using handwheel (Z119) for elevation until the turret´s covering can not contact the transport lock. **
  - *For rotating movements use handwheel (Z120).*
  - *If switch (S49)* will not release the turret disconnect the compressed air supply connection (X110) and open transport lock - push back the pneumatic cylinder by hand.*
    Note: Start with elevating out from the transport lock.

- *Water operation:*
  - *Operate the pump as mentioned in the* "Tank Suction Operation" *or* "Drafting Operation from Open Water Source" *or* "Hydrant / Supply Operation" *pump panel operation chapter.*
  - *Turn switch (S5) to the green position OR **
  - *Activate pneumatic solenoid (Y126) for the roof turret supply valve. Please refer to the* "Pneumatic Installation" *chapter.*

- *Foam operation:*
  - *Operate the pump as mentioned in the* "Foam Operation" *pump panel operation chapter.*
  - *Adjust the foam proportioning rate for the turret by bringing adjustment lever (J87t) to the desired position.*
  - *Turn switch (S5) to the yellow position OR **
  - *Activate pneumatic solenoid (Y126) for the roof turret supply valve and (Y126a) for the foam compound supply valve - please refer to the* "Pneumatic Installation" *chapter.*

- *Adjust required discharge pressure and throwing range by using switch (S9). **
- *For half discharge turn switch (S48) to the "I" position. **
- *To adjust the discharge jet operate switch (S49). **

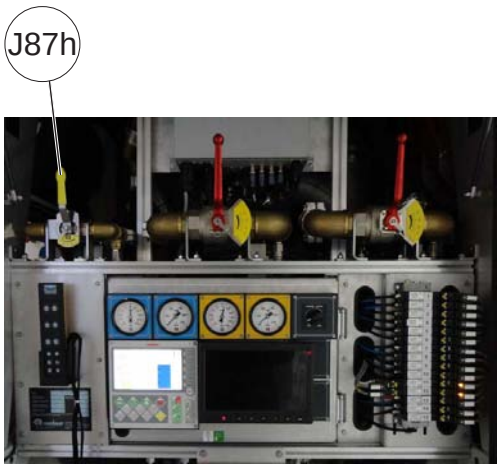


Rapid Intervention System

The vehicle is equipped with a hose reel in the rear left locker compartment.
The hose reels can be operated either with water or with water / foam compound mixture.

ATTENTION !

The hose reels are connected to the pressure outlet of the centrifugal pump; the pressure is up to 16 bar. Higher pressure peaks are also possible, therefore it is strictly prohibited to aim the jet of the nozzle at any persons; severe injuries may occur !
It is strictly advised to use the installed rapid intervention device for fire fighting only. Any other use is strictly prohibited by Rosenbauer.
In cases of misuse, Rosenbauer is not liable for any injury or damage.

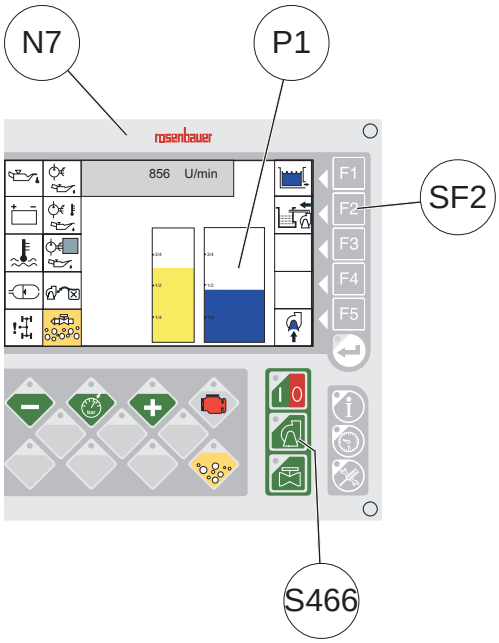


26 hose guide frame
J97 multi-purpose nozzle
J98 foam extension - not shown
J87h foam proportioning adjustment lever for the hose reel
J102 left hose reel with non collapsible rubber hose
*J167h drainage valve for the hose reel piping **

S116 left rewinding switch: -> for rewinding purposes always release the brake (Z102), hold switch in the "1" position whilst guiding the hose carefully and without tension then apply brake (Z102) again

Z99 hose reel crank for manual rewinding - not shown
Z102 hose reel-brake lever
Z108 connection for hose reel crank

<u>Manually rewinding of the hose:</u>
- *Release hose reel brake (Z102).*
- *Put on the hose reel crank (Z99) to connection (Z108).*
  - ◊ *Rewind the hose as to be only very slightly tensioned and guide it exactly.*
- *Lock brake (Z102) again.*



Filling the Water Tank via the Pump

- *Operate the pump as mentioned in the*
  - ◊ "Drafting Operation from Open Water Source" *or*
  - ◊ "Hydrant / Supply Operation" *pump panel operation chapter.*

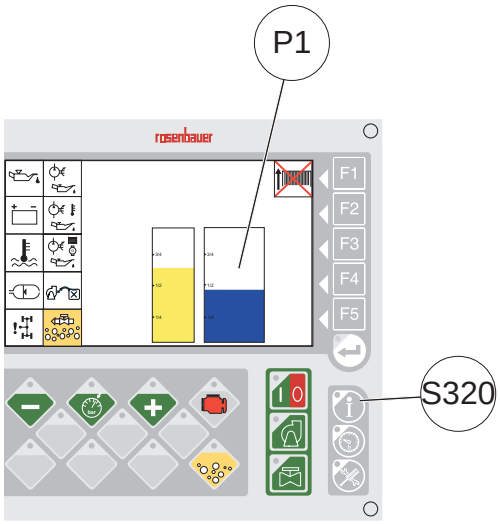
- *Call up the pump main menu:*
  - ◊ *Press switch (S466) -> screen (125a) will be shown on display (N7).*

- *Open the tank fill valve:*
  - ◊ *Press switch (SF2).*

- *Observe water tank level gauge(s) (P1).*
- *When the water tank is full, reduce pump speed and close the fill valve.*
  - ◊ *Press switch (SF2) again.*

ATTENTION !

Before filling the water tank, the drain valve must be closed!
The maximum fill pressure is 5 bar!
By opening the tank fill valve, it is possible to run the system in "By-Pass mode" to prevent the system from overheating. Therefore, open the tank suction and the tank fill valves.
Condition: No foam compound or mud in the pump.

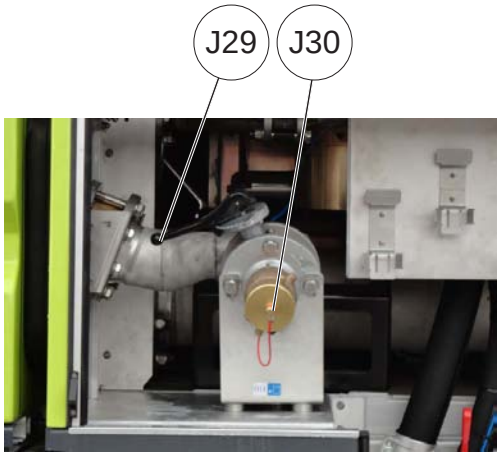


Filling the Water Tank via Tank Supply Lines

- *Connect supply hoses to the left and/or right connections (J30).*
- *Open hydrant valve slowly.*
- *Open left and/or right tank fill valve(s) (J29).*
- *If not already shown, call up the main menu (125) on display (N7):*
  ◊ Press switch (S320).
- *Observe water tank level gauge (P1).*
- *When the water tank is full, close fill valve(s) (J29).*

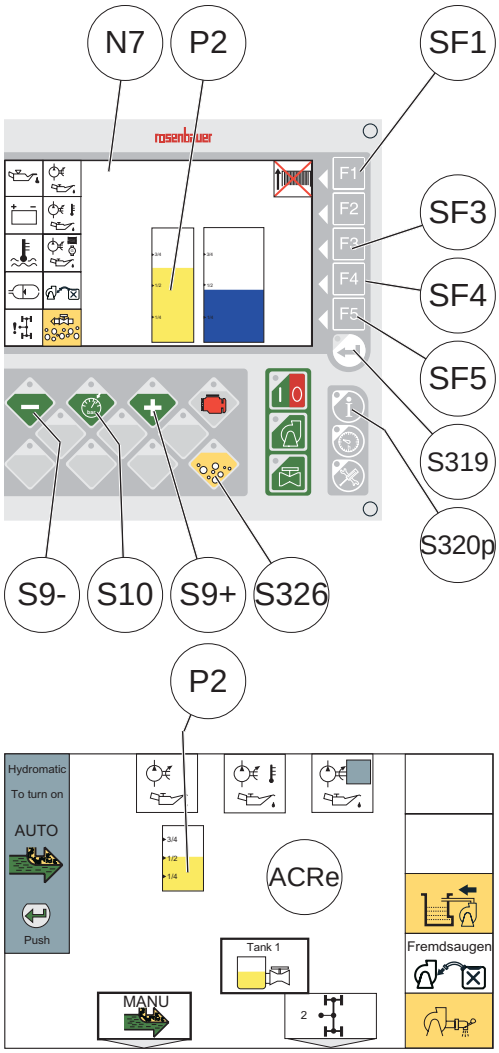
<u>Uncoupling the supply hoses:</u>

- *Close the hydrant valve.*
- *Release pressure by opening the tank fill valve(s) (J29).*
- *Uncouple the supply hoses and secure the fill connection with its blind coupling.*



ATTENTION !

Before filling the water tank, the drain valve must be closed!
The maximum tank filling pressure must not be more than 5-7 bar. In case of higher pressure, decrease the supply pressure accordingly.
When the water tank is overfilled, reduce the water flow to maximum 2000 l/min.
Completely filling the tank (overfilling) with too much pressure may cause damages at a later stage.
It is strictly prohibited to make any modifications or adjustments on the tank filling lines (screens), overflows and manholes (spring -pretension).
Before connecting the supply hoses to the hydrant, allow water discharge until clear water flows out of the hydrant.



Filling the Foam Compound Tank

<u>With the foam compound pump</u>

- *Connect the foam compound drafting hose to foam compound drafting connection (J47) and put the other end into a container filled with foam compound.*

- *Engage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pump" *chapter.*

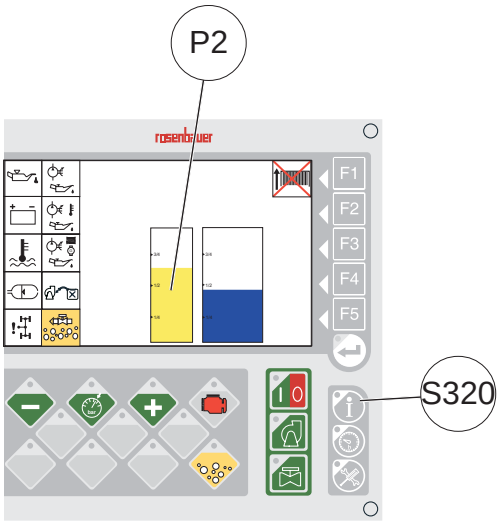
- *Call up the foam operation menu:*
  ◊ *Press switch (S326) -> screen (ACRe) will be shown on display (N7).*
- *Preselect the external foam compound container by using switch (SF4):*
  ◊ *Usually the foam compound tank is selected.*

- *Prime the foam compound pump system.*
  ◊ *Press switch (SF5) until foam compound is discharge at the priming line.*

- *Select foam compound tank fill operation:*
  ◊ *Press switch (SF3).*
  ◊ *The foam compound pump will be increased to a preprogrammed speed (fill performance approx. 200 l/min). If the foam compound tank is nearly full (80%), the pump speed will be reduced; when the tank is full the pump will be disengaged.*
  ◊ *Observe foam compound tank level gauge (P2).*
  ◊ *Filling procedure can be disengaged anytime by pressing switch (SF3) again.*

- *Disengage the Hydromatic system as mentioned in the* "Disengaging the Pump System" *chapter.*

<u>Note:</u>
Please obey information shown on display (N7). Depending on importance, information can be cancelled by pressing enter button (S319). Warnings retain until the operator takes remedial measures.

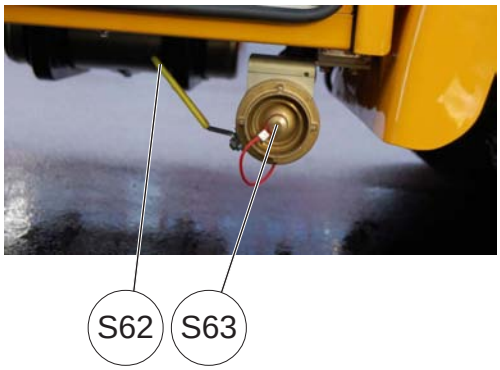


Filling the foam compound tank with an external foam compound pump

- *Connect the supply hose (foam compound) to the fill connection (J63).*
- *Engage the external foam compound pump (please refer to the operation manual of foam compound pump manufacturer).*
- *Open the foam compound tank fill valve (J62).*

- *If not already shown, call up the main menu (125) on display (N7):*
  ◊ Press switch (S320).

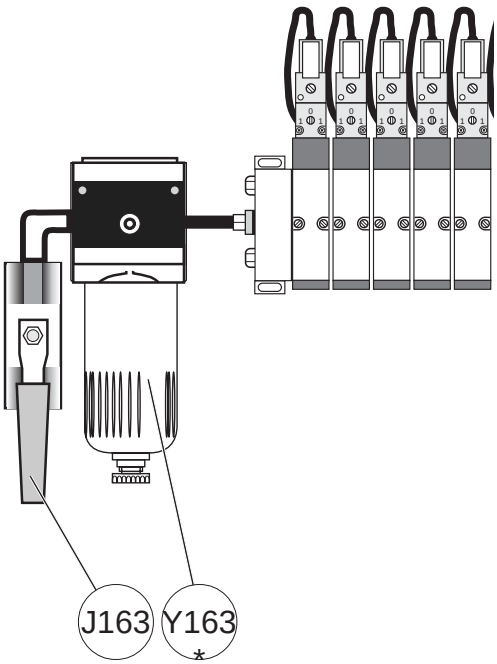
- *Check the foam tank level gauge(s) (P2) during filling or open foam tank cover to watch the rise and stop filling on time.*
- *When the foam compound tank is full close valve (J62).*
- *Stop delivery of foam compound and uncouple the hose.*



Note:
The foam compound tank can be drained also by means of connections (J63). Provide a suitable collecting container.

ATTENTION !
The maximum fill pressure is 5 bar!
Before starting foam compound tank filling make sure that drain valve is closed.
Always provide the foam compound tank fill/drain connection (J63) with blind couplings.

*Please take care that the foam compound tank must be drained completely as soon as the brand of foam compound is changed. Furthermore the foam proportioning systems must be flushed and cleaned before refilling the foam compound tank - please refer to the "*Flushing after Foam Operation*" chapter.*

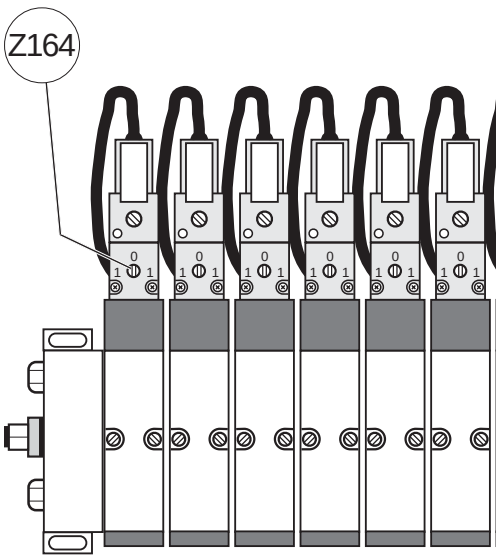


Compressed Air Supply

In the pump installation, a shut-off-valve (J163) and a pneumatic service unit (Y163) for the pneumatic system are installed.*
For further information, please refer to the "Service Procedures" *maintenance chapter.*
The shut-off-valve (J163) disconnects the fire fighting pneumatic system from the chassis.

ATTENTION !

The shut-off-valve (J163) must be open at all times for normal pump operation!
If the shut-off-valve (J163) is closed, the solenoids cannot be switched manually!
The shut-off-valve (J163) may be closed only for service and repair works!



Emergency control of Electro Pneumatic Solenoids

In the case of a failed electric switch, the pneumatic solenoid concerned can be switched manually if compressed air is still available.

Procedure:
The solenoids are mounted in the pump compartment.
For identification, the solenoids are described according to their purpose.
Turn little lever (Z164) by 180 ° clockwise: the solenoid is then activated.

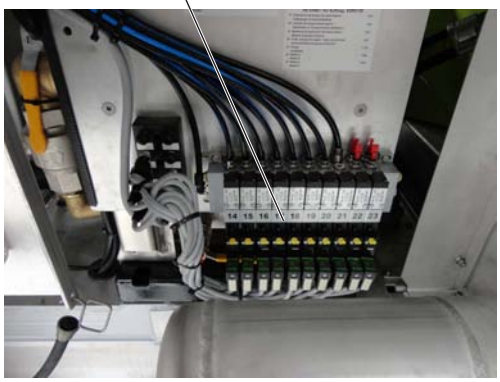
solenoids near the pump control panel

Emergency control of electro pneumatic solenoids

The pneumatic solenoids near the pump control panel in the order from left to right:

Y7 solenoid for drainage water pump
Y9 solenoid for priming pump
Y28 solenoid for water tank suction valve
Y31 solenoid for water tank fill valve - filling via pump
Y103 solenoid for normal pressure hose reel
Y126 solenoid for stinger turret valve
Y128 solenoid for pressurized foam supply valve
Y133 solenoid for roof turret valve
Y135 solenoid for pressurized foam supply valve
Y167 solenoid for drainage
Y277 solenoid for left roof railing
Y277 solenoid for right roof railing
Y164 solenoid in space
Y51 solenoid for filter flushing valve
Y115A solenoid for purg valve

solenoids near the hydraulic tank



The pneumatic solenoids near the hydraulic tank in the order from left to right:

Y257 solenoid for plate heat exchanger for hydraulic oil cooling
Y38 solenoid for foam compound pump drain valve
Y46 solenoid for foam compound drafting valve
Y50 solenoid for internal flushing valve
Y61 solenoid for foam compound tank suction valve
Y64 solenoid for foam tank filling valve via foam pump
Y67 solenoid for foam compound priming valve
Y81 solenoid for foam compound supply valve for foam proportioner
Y115 solenoid for purge valve

Note:
The pneumatic solenoids are also described by a sign located in the pump panel.

Emergency Control of Pneumatic Actuators

In case compressed air is not available, or a solenoid fails the pneumatic actuators can be operated manually to open or close the valve concerned.

Procedure:

- *Close shut-off-valve (J163).*
  ◊ *Pressure is released from the pumps pneumatic system.*
- *Put emergency tool (90) on drive of pneumatic actuator.*
- *Turn emergency tool (90) by 90 ° clockwise to operate valve.*

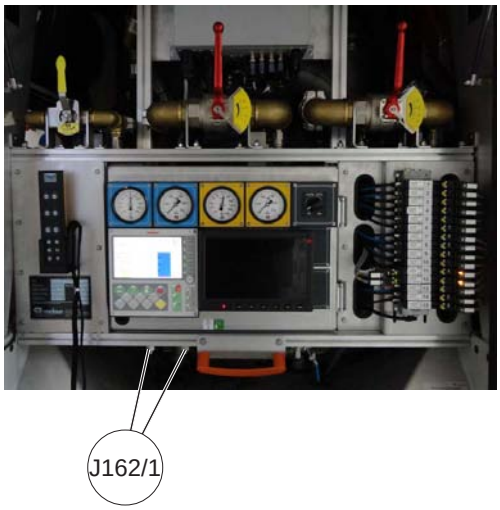
Note: *After closing the shut-off valve (J163), all pneumatic actuators must be operated manually.*

The pneumatic system has to be repaired immediately after use.

CAUTION !

Before opening the pressure supply, make sure that the emergency tool is removed from the valve-drive - danger of jamming!

Flushing after Foam Operation



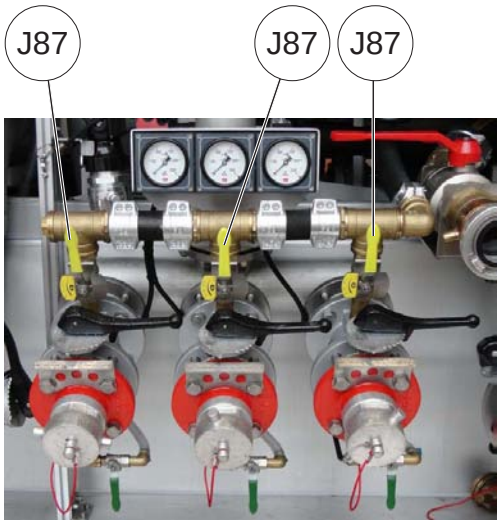
ATTENTION !

To ensure the pump operates without malfunctions, it is important to flush the system parts (pressure outlets) which are in touch with a water-foam mixture.

- *Operate the pump system as mentioned in the*
  - "Tank Suction Operation" *or*
  - "Drafting Operation from Open Water Source" *or*
  - "Hydrant / Supply Operation" *chapters.*

- *Keep all proportioner valves (J87)/(J87_)* closed.*
- *Open the pressure outlets that have been in use with a water-foam mixture.*

- *Flush the roof turret:*
  - *Operate the roof turret with water as mentioned in the "*Roof turret Operation with water*" chapter.*



- *Open flushing valves (J164/1) for the water-side pressure gauges.*
- *Increase pump pressure to approx. 5 bar.*
- *Carry on flushing until clean water is discharged.*

- *Before completion of flushing, flush the priming pump:*
  - *Reduce pump speed to idle (pump pressure below 2 bar).*
  - *The priming pump will engage automatically.*
  - *Carry on flushing until clean water is discharged.*

ATTENTION !

The Flushing procedure must be done carefully after each foam operation, as well as after operation with seawater or mucky water.
Drain the pump system when flushing is finished.

Flushing the HYDROMATIC system

The Flushing procedure must be done carefully after each foam operation, as well as after operation with seawater or mucky water.
Drain the pump system when flushing is finished.

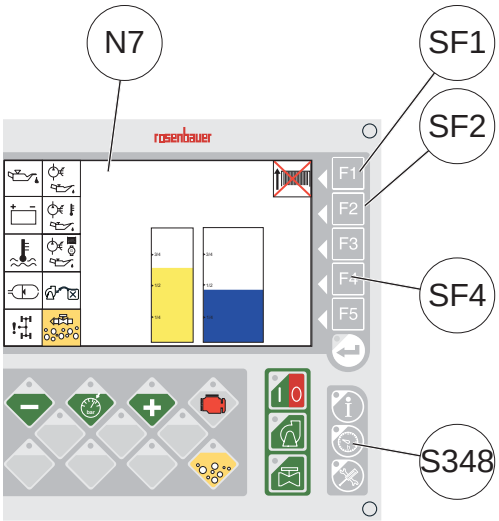
Options:

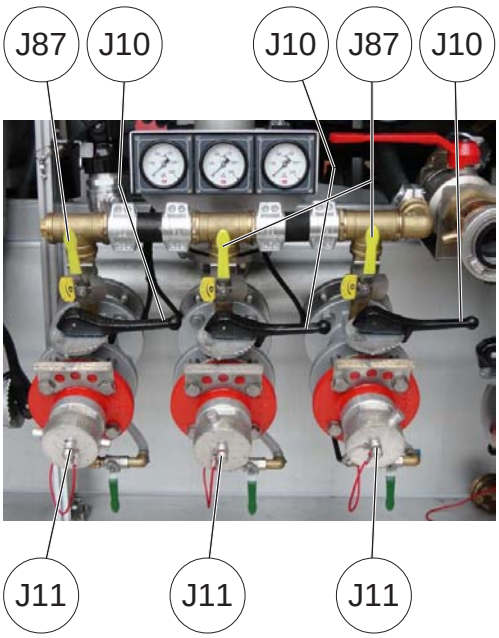
- *Flush the foam pump and all proportioners by means of the internal flushing line.*
  - ◊ *In this case the water required for flushing is pumped by the water pump.*

- *Flush the foam pump and all proportioners by means of the foam compound external intake / flushing line.*
  - ◊ *In this case the water required for flushing is taken from an external water container.*

Refer to the following pages for a detailed description of the individual flushing options.

ATTENTION !
Flushed components (proportioners and foam pump) must be drained.





Flushing the HYDROMATIC system

- *Flush the foam compound pump and all proportioners by means of the internal flushing line.*

  ◊ *In this case the water required for flushing is pumped by the water pump.*

- *Operate the pump system as mentioned in the*
  ◊ "Tank Suction Operation" *or*
  ◊ "Drafting Operation from Open Water Source" *or*
  ◊ "Hydrant / Supply Operation" *chapter in this manual.*

- *Engage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pumps" *chapter.*

- *Call up the maintenace menu (MM):*
  ◊ *Press switch (S348).*
  ◊ *The maintenance menu (MM) is shown on display (N7).*

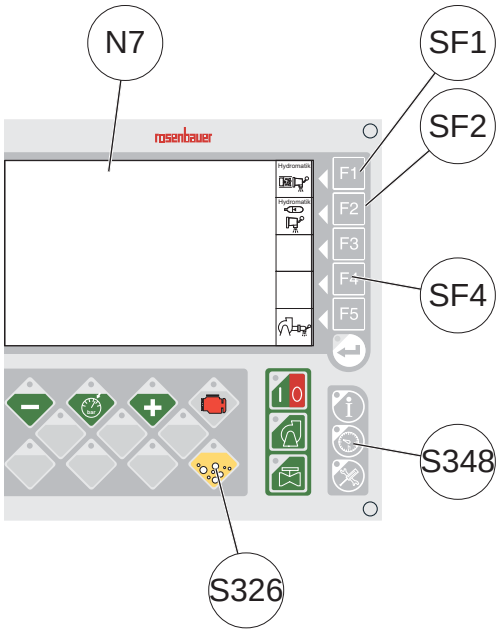
- *Open the internal flushing valve:*
  ◊ *Press switch (SF1).*

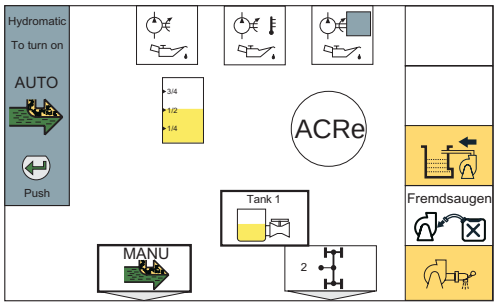
The ventilation valve of the foam compound pump opens to flush out most of the foam compound from the pump. After that the ventilation valve close and the supply valve of foam proportioner opens.

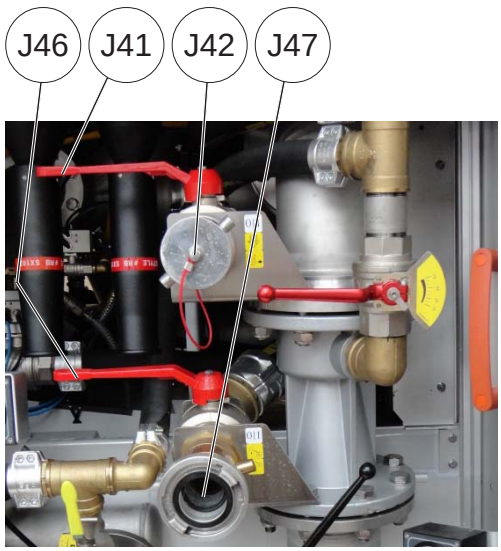
- *Completely open all pressure outlets and the proportioner valves (J87) / (J87_) upstream.*

- *Operate the roof turret with highest proportioning rate as described in the "* Roof Turret Operation*" chapter in this manual.*

- *Continue to flush until clean water flows out of all pressure outlets.*







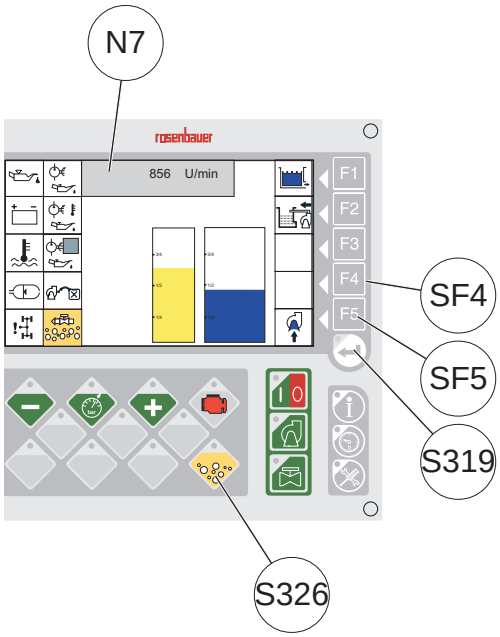
- *Connect a hose to connection (J42) and open valve (J41) until clear water is discharged.*

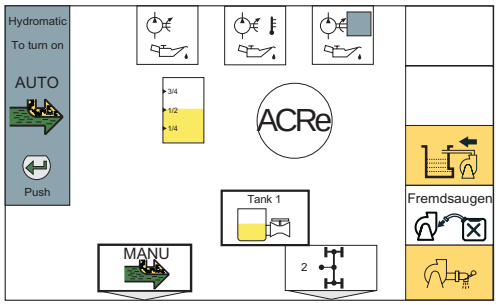
- *Flush the foam compound suction line:*
  - ◊ *Press switch (S326) -> screen (ACRe) will be shown on display (N7).*
  - ◊ *Preselect the external foam compound container by using switch (SF4).*
  - ◊ *Open the foam suction valve by pressing switch (S319) and open valve (J46).*
  - ◊ *Continue to flush until clean water flows out of connection (J47).*
  - ◊ *Press again switch (S319).*

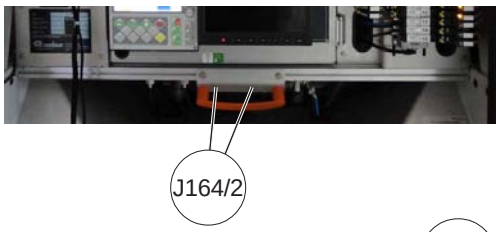
- *Open flushing valves (J164/2) for the foam-side pressure gauges.*

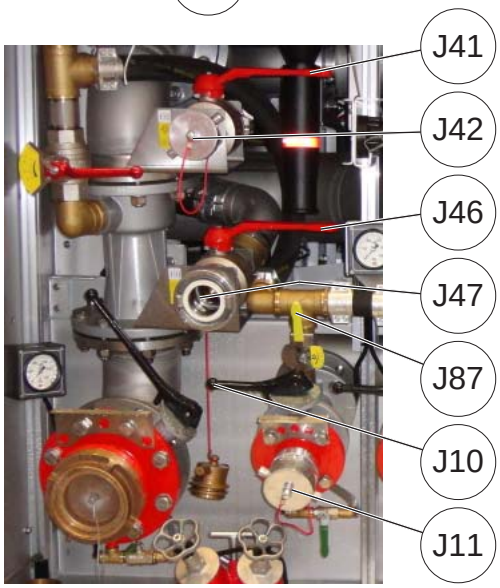
- *Close the internal flushing valve:*
  - ◊ *Call up the maintenance menu (MM) and press again switch (SF1).*

- *Disengage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pumps" *chapter.*









Flushing the HYDROMATIC system

- *Flush the foam pump and all proportioners by means of the foam compound drafting-/flushing line.*

  ◊ *In this case the water required for flushing is taken from an external water container.*

- *Operate the pump system as mentioned in the*
  ◊ "Tank Suction Operation" *or*
  ◊ "Drafting Operation from Open Water Source" *or*
  ◊ "Hydrant / Supply Operation" *chapter in this manual.*

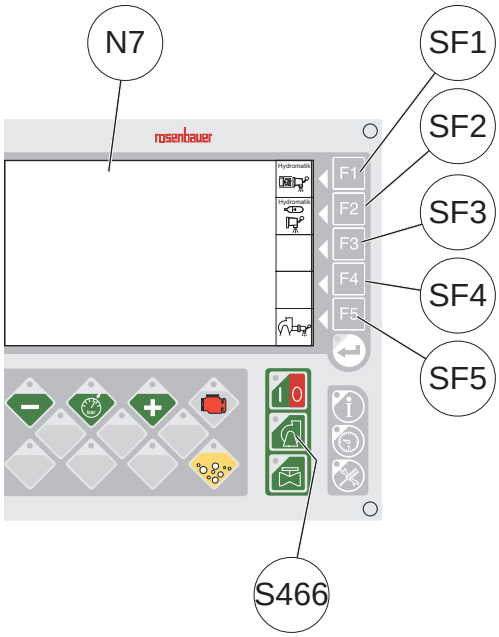
- *Couple the foam suction hose to the foam drafting-/flushing connection (J47) and put the other end in a container with clean water.*
- *Open foam suction valve (J46).*
- *Engage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pumps" *chapter.*

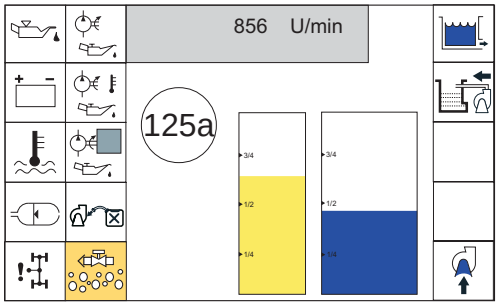
- *Call up the foam operation menu:*
  ◊ *Press switch (S326) -> screen (ACRe) will be shown on display (N7).*
- *Preselect the external foam compound container by using switch (SF4):*
  ◊ *Usually the foam compound tank is selected.*
- *Select "AUTOMATIC" or "MANUAL" mode:*
  The foam pressure valve is opened.
  ◊ *In manual mode, adjust the foam compound pump speed using switches (S9-) and (S9+).*
- *Prime the foam pump and intake line.*
  ◊ *Press switch (SF5) until water is discharged from the ventilation line.*

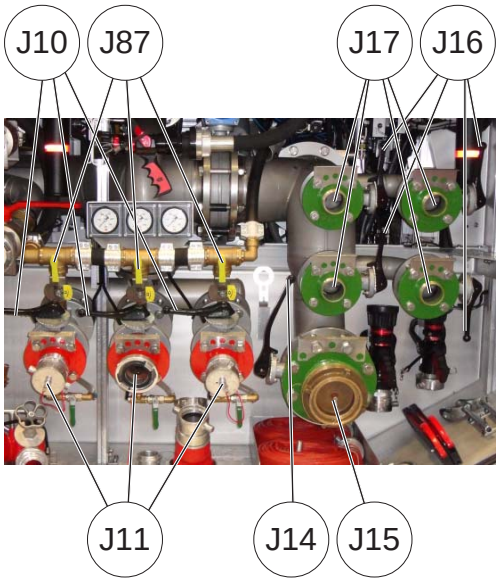
- *Connect a hose to connection (J42) and open valve (J41) until clear water is discharged.*
- *Completely open all pressure outlets and the proportioner valves (J87) / (J87_) upstream.*
- *Operate the roof turret with highest proportioning rate as described in the "* Roof Turret Operation*" chapter in this manual.*

- *Continue to flush until clean water flows out of all pressure outlets.*
- *Open flushing valves (J164/2) for the foam-side pressure gauges.*

- *Close the drafting-/flushing valve:*
  ◊ *Press switch (S319), close valve (J46) and disconnect foam suction hose from connection (J47).*
- *Disengage the foam compound pump as mentioned in the* "Engaging the Hydraulic Oil Pumps" *chapter.*







Drainage of the Pump System / Operation in Cold Climates

To protect the fire fighting equipment against frost damage and corrosion, it is necessary to ensure that the system is drained especially carefully during the cold season (temperatures around and below 0 °C).

◊ *For draining the HYDROMATIC system, please refer to the "Draining the HYDROMATIC System" chapter on the following pages.*

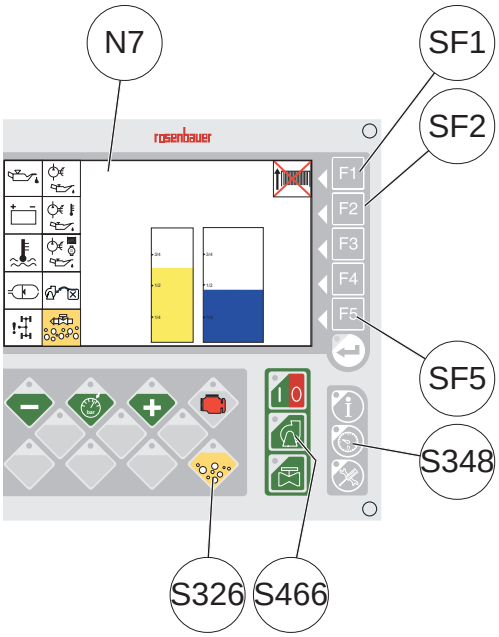
- *Call up the maintenance menu:*
  - ◊ *Press switch (S348).*
  - ◊ *The maintenance menu (MM) is shown on display (N7).*
- *Open the pump drain valve:*
  - ◊ *Press switch (SF5).*

  - ◊ *Open the external water inlet (J14/15), (J16/17) at left and right.*
  - ◊ *Open all pressure outlet valves.*
  - ◊ *Open drain valves (J164/1) waterside pressure gauges.*

  Note:
  The turret line is drained automatically by way of the pump system.
- *Drainage of tank fill line:*
  - ◊ *Remove blind coupling of tank fill connection (J30).*
  - ◊ *Open tank fill valve (J29).*
  - ◊ *Close tank fill valve (J29) and secure the fill connection with its blind coupling.*

- *Wait until the entire pump system is drained.*
- *Close all drain valves, pressure outlets etc. once again.*
- *Drying the priming pump:*
  - ◊ *Engage the P.T.O. (from the external pump control panel) whilst pressing switch (SF1) in the pump operation menu (125a) until the P.T.O. is engaged.*
    This ensures that the water tank suction valve keeps closed, otherwise the pump is filled with water again.
  - ◊ *Let the priming pump work for approx. 5 seconds.*
  - ◊ *Disengage the P.T.O.*

ATTENTION !
To maintain the functionality of the fire fighting equipment body at temperatures below freezing, appropriate measures must be taken (e.g. activate water tank heater, store the vehicle in a frost-free fire station building etc.).



Draining the HYDROMATIC system

<u>Draining / purge procedure of all foam proportioners</u>
Check valves are built into the foam supply lines to the proportioners. These valves prevent foam from flowing out of the lines and draining. Draining can therefore only be done with compressed air.

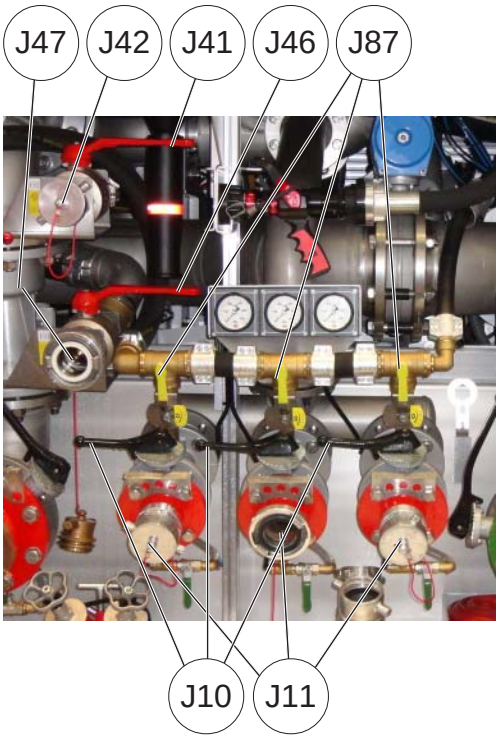
<u>Procedure:</u>

- *Let drive engine idle to considerate compressed air supply.*

- *Open all pressure outlets at the sides:*
  - ◊ *Uncouple the blind couplings on connections (J11) and open pressure valves (J10).*

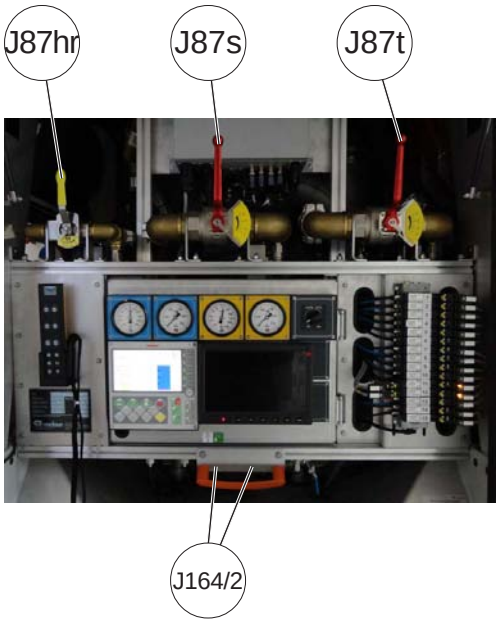
- *Remove the blind couplings from connection (J42) and (J47).*
- *Open foam compound pressure valve (J41).*

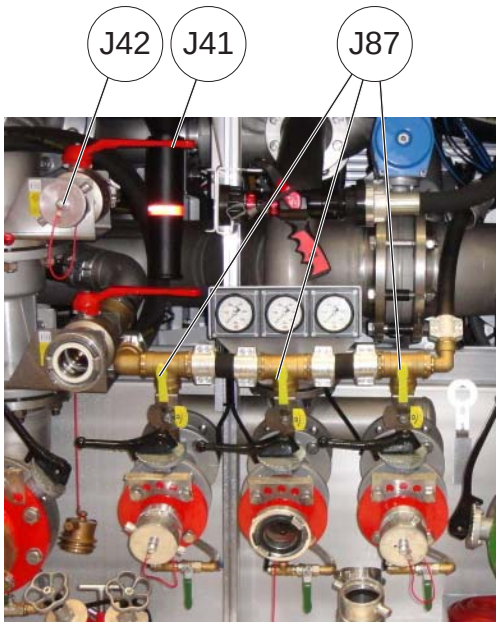
- *Call up the maintenance menu:*
  - ◊ *Press switch (S348).*
  - ◊ *The maintenance menu (MM) is shown on display (N7).*
- *Open the pump drain valve:*
  - ◊ *Press switch (SF5).*
- *Wait until the entire pump system is drained.*
- *Close the pump drain valve:*
  - ◊ *Press again switch (SF5).*



- *Supply the pipe system with compressed air:*
  - ◊ *Hold switch (SF2) in the maintenance menu (MM).*
  - ◊ *The purge valve and the foam compound supply valve to the proportioners are opened.*
    The pipes of the HYDROMATIC system are supplied by compressed air from the vehicle.

<u>Note:</u>
After release switch (SF2), the drain valve of the foam compound pump and the priming valve opens for a short time.
The remaining compressed air can relieve the pipe system.





Draining the HYDROMATIC system

- *Drain the foam proportioners:*
  - ◊ *In sequence, completely open and then close again the individual proportioner valves (J87) / (J87_) on the left and right side and start purge operation as mentioned before.*
  - ◊ *Repeat this procedure until the system is drained.*

- *Drain the foam proportioner of the roof turret:*
  - ◊ *Choose the highest proportioning rate as described in the "* Roof turret operation - Foam operation*" chapter in this manual*
  - ◊ *Open the turret dischare valve as mentioned in the "*Roof turret operation - Foam operation*" chapter with preset foam operation.*

- *Drain the foam compound pressure outlet:*
  - ◊ *Uncouple the blind couplings on connection (J42).*
  - ◊ *Open valve (J41).*

- *Drain the pressure gauge lines on the foam side:*
  - ◊ *Open flushing valves (J164/2).*

- *Wait until the entire pump system is drained.*
- *Close all drain valves, pressure outlets etc. once again.*

- *Prepare the pump system for the next use.*

ATTENTION !

At no time open the water tank suction -, the water tank pump fill - or the foam compound tank suction valve during purge procedure (as long as compressed air overpressure is in the piping system). Compressed air can severely damage the water and foam compound tank. After each purge procedure the compressed air overpressure must be completely released via the pump drain valve.

Checking Procedures

Checking procedures may be done by fire brigade personnel familiar with the vehicle and pumping system.
These activities must be performed after each operation to ensure optimal reliability of the vehicle.

- *Check all locks, holding devices and equipment for good condition and safe support.*
  Any discrepancies, defects or faults should be immediately corrected or repaired.

CAUTION !

Equipment improperly prepared for operation is unsafe for use. If something is noticed and requires attention, have it checked before it leaves for operation. Even minor mechanical defects can lead to accidents or personal injury.
Pay attention to the operation manuals of equipment and apparatus carried in the vehicle.

CAUTION !

Bevor starting any operation on the vehicles roof alway install all deliverd as desired roof rails to there dedicated brackets - danger of falling !

Inspection procedures - Chassis and superstructure

- *Check vehicle exterior for dents or damage.*
- *Visually check for missing bolts, loose or damaged hoses and damaged wires.*
- *Inspect wheel hugs, axles, transfer casing, and transmission for signs of lubrication leakage.*
- *Clean all lights, reflectors and mirrors, and check for broken glass.*
- *Check under the vehicle for fuel, oil, or coolant leakage.*
- *Check V-belts of the drive and pump engines.*
- *Inspect chassis according to instructions listed in the manufacturers manual.*
- *Check operation and general condition of cabin / compartment doors and roller shutters. Visually inspect seals around doors for looseness and/or damage.*
- *Inspect all glass for cracks and discoloration. Check operation of sliding windows in cab.*
- *Check operation and condition of seat adjusting mechanism.*
- *Take inventory of removable equipment. Replace any missing or damaged items.*

Inspection procedures - Chassis and superstructure

Wheels and tyres

- *Visually inspect each tyre for correct inflation. If the tyre appears to be low in pressure, refer truck to maintenance. Recommended air pressure must be maintained in every tyre. Inflate to correct pressure (refer to sticker on mudguard) when tyres are cold.*
- *Inspect tyres for uneven wear, chinks, or cuts.*
- *Inspect rims for damage and inspect lugnuts.*
- *To prevent damage, tyres must not be cleaned with a high pressure steam jet.*
- *High ambient temperature causes higher tyre pressure. For this reason reduce the top speed accordingly !*

ATTENTION !

When changing a tyre, retighten wheel securing nuts after driving a distance of 50 km.
Please refer to chassis manufacturers handbook for specified tightening torque.

Inspection procedures - Chassis and superstructure

In the cabin

- *Observe operation of all gauges.*
- *Operate windshield washer and wiper.*
- *Operate beacon lights and alarm system.*
- *Operate traffic guidance light and check proper operation.*
- *Turn on all truck lights and check for correct function.*
- *Operate the horn, heater, and defroster.*
- *Operate the communication system.*
- *Check fuel level, add fuel if necessary.*
- *Check level of windshield washing agent, add if necessary.*

Brakes

- *Check brakes for proper function.*
- *Check for uneven or spongy action, dragging, squealing, or chatter when braking.*
- *Test parking brake for proper function.*
- *Check air system for leaks.*

Inspection procedures - Pump system

- *Inspect all fire fighting equipment for corrosion, damage or other defects.*
- *Engage the water and foam compound pumps and check that it functions correctly.*
- *Check function and condition of valves, instruments and gauges.*
- *Check turret conditions.*
- *Inspect hose reel operation. Follow procedures listed below:*
  - ◊ *Pull hoses from reels and inspect brake lever to ensure brake function is sufficient.*
  - ◊ *Visually inspect hoses for cuts or damage.*
  - ◊ *Check hose couplings for tight connection and defects.*
- *Check levels in water and foam compound tanks visually.*
  - ◊ *Check non return valves of the water tank fill connections.*
- *Check condition of the screen fitted on the suction connection.*

Maintenance Procedures

Maintenance procedures may be done by fire brigade personnel familiar with the vehicle and pump system.
These activities must be performed after each operation to ensure optimal reliability of the vehicle.

- *Refill the fuel tank and tanks of fire fighting agents.*

- *If the compartments and driver´s cabin require cleaning, do not use a high pressure hose or running water. Loose dirt should be removed with a vacuum cleaner, after that, use moist cloths.*

- *Use moist towels to clean the control panel. Excess water can damage electric components. Do not use solvents.*

Maintenance Procedures - Washing the vehicle

Wash the vehicle frequently with cold or lukewarm, but never hot, water. Do not use household soap or detergent. The use of a reliable car shampoo will assist in dissolving traffic film.

When a hose is used, the water should not be turned onto the body at full pressure, as this tends to drive the grit and dirt into the paintwork. If the high-pressure fog gun is used for washing the vehicle, it must be operated with no greater than 6 bar of pressure with "Water Fog Spray" and never at "Water Straight Stream". High pressure cleaning equipment must not be used; the danger of damage to the paintwork is enormous.

After the surplus of dirt has been washed off, clean the body with a sponge and plenty of water. At the same time it is advisable to wash the windshield wiper blades by using clean water. Incorporate the wheelhouses into the washing procedure. Pay attention to open drainage holes. Rinse off with cold water, then rub down with a clean chamois leather.

ATTENTION !
Should the vehicle become contaminated by dry chemical powder, it is imperative to remove the powder with compressed air. Do not clean the powder with water. Washing with water can accelerate the corrosion process of the vehicle.
Dry chemical powder in combination with moisture is a strong oxidant, especially on galvanized, bare aluminium and bronze surfaces.

Maintenance Procedures - Washing the vehicle

At less frequent intervals, after washing and leathering the vehicle thoroughly, apply an approved body polish to impart a brilliant, water-resistant and lasting finish to the paintwork. Never rub the vehicle down with a dry cloth when it is dirty because this causes cracks in the paintwork which progressively destroy it. Do not try to polish with crude oil or grease because this may cause serious damage to paintwork in a short period of time.
Any tar or asphalt spots on the body may be removed with a tar cleaner and the use of a soft cloth.

Chrome plated parts
Great care should be taken that the chrome plated parts of your vehicle are kept clean and free from rust. These parts should be cleaned periodically with an approved chrome cleaner.

Upholstery
Upholstery of the PVC-type can be suitably cleaned with a reliable interior cleaner. Never use polishes, oils, petroleum, or a dry cleaning fluid.

Cleaning of 3M Scotchcal™ and Controltac™ films

Cleaner:
Logos and text made of Scotchcal and Controltac films can be cleaned with normally available car cleaning products, as long as these do not contain abrasive particles or organic thinners.

Cleaning:
*Please refer to the "*Washing the vehicle*" chapter.*

Car wash:
Scotchcal and Controltac films are car wash safe.

ATTENTION !
It is not allowed to wash a vehicle within the first 48 hours after decals are applied.

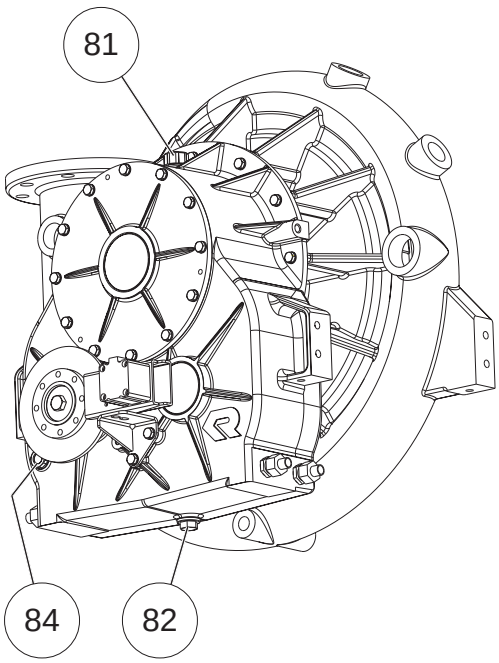
Service Procedures

Service and repair procedures must be done by specialists.
These activities must be performed according to manufacturer set intervals.

ATTENTION !

Obey all operation and service manuals of chassis, optional equipment and apparatus carried in the vehicle unconditionally. Negligence can cause damage and ultimately, loss of warranty.

Observe service intervals and officially ordered terms and note executed jobs in a report.



81 *oil filler plug*
82 *oil drain plug*
84 *oil level plug*

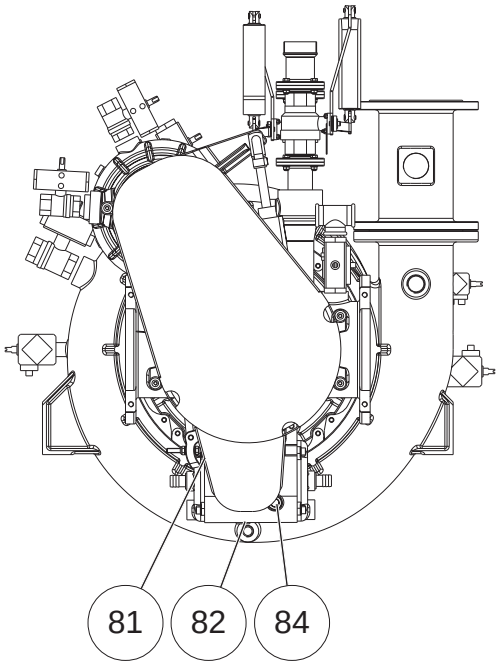
Service procedures - Lubrication of pump gearbox *

Always drain the oil while the housing is warm, as the oil will flow freely and will carry foreign particles with it.
For drainage, remove the oil drain plug (82).
After reinstalling the drain plug (82), remove the oil level plug (84) and fill with oil. Correct oil level is achieved when the oil is level with the bottom of the oil level plug opening, reinstall oil level plug (84) when oil level is correct.
Oil change: after 50-100 working hours
at least every two years

Oil quantity: *7.2 ltr.*
Oil type: *SAE 90 transmission oil*
API / GL 4
MIL-L-2105

ATTENTION !

For oil change, please obey current disposal regulations.



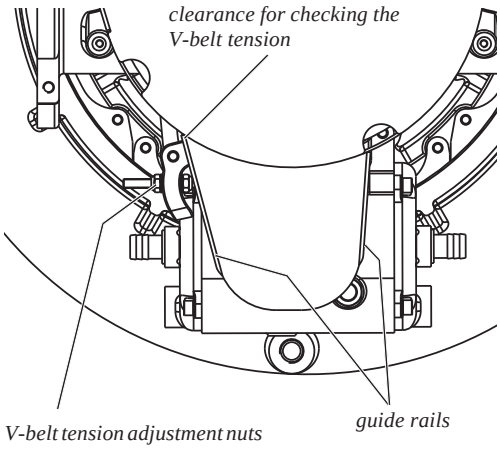
81 *oil filler plug*
82 *oil drain plug*
84 *oil level gauge*

Service procedures - Lubrication of priming pump

All moving parts of the priming pump are oil bath lubricated. The oil has to be changed once a year. Always drain the oil while the priming housing is warm, as the oil will flow freely and will carry foreign particles with it. For drainage, remove the oil drain plug (82). After reinstalling the drain plug (82), remove the oil filler plug (81) and fill with oil. Correct oil level is achieved when the oil is level with the upper mark of the oil level gauge (84), reinstall oil filler plug (81) when oil level is correct.
Oil change: after 25-50 working hours
at least once a year

Oil filling capacity: 1.0 ltr
Recommended oil: SAE 30 (Engine oil)
API / SF
MIL-L-46 152 B
FORD M2C 9011
GM 6048 M

ATTENTION !
Avoid contact between priming pump drive V-belt and all lubricants - danger of belt sliding!
After an oil change please obey current disposal regulations.

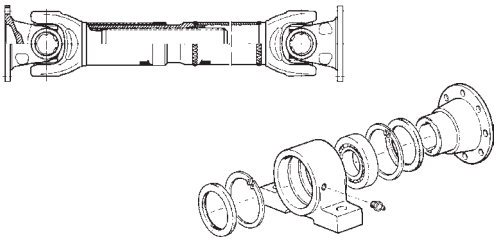


ATTENTION !
If a V-belt is worn, always change both.
Only use original spare belts.
Rsb. Art. Nr.: 084225

Service procedures - Checking and replacing rubber valve plates

To guarantee the reliable operation of the double piston priming pump, the valve plates have to be checked for damages once a year. Therefore dismantle the valve plate housing and check rubber valve plates for damages (cracks, brittleness, etc.).

V-belts of priming pump drive
Check V-belt carefully for signs of mechanical damage at least once a year.
Avoid contact between the V-belt and all lubricants!
Further check the correct tension of the V-belts. This is to be done whilst the N100 pump is disengaged and the priming pump is engaged. Press against the belt (in the middle of the belt) with a force of 50 N. The free play of the belt must be 10 mm. Adjust the tension by using the adjustment nuts. Further adjust both guide rails of the priming pump to a clearance of 2 mm between guide rails and V-belt.
Note:
If the priming pump is disengaged, the V-belts must touch the cover therefore allowing the pulleys to run free.



Service procedures - Propeller shaft

The pump is driven by the Power Take Off of the vehicle by means of propeller shafts. The propeller shafts and their supports must be checked for the solid seating of the bolts and smooth-running of the shafts at periodical intervals.

Interval: yearly
Lubricant: grease according DIN 51825-K2K-30
rosenbauer article number: 004824

Note:
If maintenance free propeller shafts and intermediate shafts are in use no grease nipples are installed. No further greasing needed.

ATTENTION !
The propeller shaft must stand still with engine running and disengaged pump !
Slight spin of the P.T.O. results in damage of the pump sealing !
Directly spraying onto universal joints with high-pressure steam cleaner is forbidden!

Martin compressor

Service procedures

Martin compressor for alarm system
The compressor of alarm system is arranged in driver´s cabin. It has to be serviced as following:

Blower part: Put in some drops of special-oil in red wick-oiler monthly. (free of resin and acid, solidifying point below -40 °C, never use engine oil)

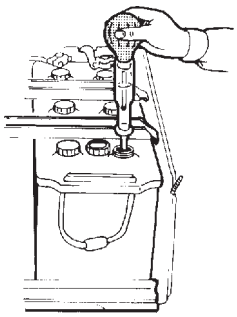
Greasing of bearing on motor-side:
Unsrew bearing cap and grease with ball bearing grease once a year (lithium-soaps e.g. Calypsol H 729 GF or Esso Beacon 325)

Service procedures - Battery

Charged batteries lose capacity without a closed circuit.
This static-discharge amounts daily to 0.2 - 1% of the capacity, depending on the age of the battery and the temperature.

ATTENTION !

Discharged batteries are damaged because they sulphate. The service life is thus reduced.
It is also very important to check the battery every 3 months and if necessary, charge it.



Please notice the following during charging:

- *The density of the acid decreases with increasing temperature (0.01 kg/dm³ per 15 °temperature difference).*
- *Disconnect the negative pole.*
- *Charging current should amount to max. 1/10 of capacity (e.g. battery 110 Ah - max. charging current = 11 A).*
- *After charging, check the density of the acid by using a refractometer or acid-siphon.*
- *If necessary use distilled water to bring the level of the acid between the min. and max. markings on the battery.*

CAUTION !

Batteries contain acid which is hazardous to skin and eyes.
When working on batteries, smoking and the use of open flames is strictly prohibited.
When servicing a battery, safety goggles must be worn.
Safety instructions on the outside of the battery must be followed.
Never short-circuit the battery!
Battery disconnecting instructions:

- *Disconnect external power supply and ventilate the battery compartment for 15 minutes to remove explosive gases.*
- *Switch off the main battery switch, and deactivate any consumers located "outside" the main battery switch.*
- *Always remove the ground connection FIRST, and connect it LAST, to avoid causing sparks. When batteries are connected in series, always remove the "-" pole that is connected to the chassis FIRST. Next, remove the connection between the two batteries, and LASTLY, disconnect the "+" pole. Installation connections are carried out in reverse order.*

Note:
Due to the chemical process that takes place during charging, (during driving or stationary charging) the battery heats up. Because of this process, water in the electrolyte is converted to hydrogen and oxygen. If these gases are in correct proportions, an explosive mixture forms. Any spark, for example by disconnecting the "+" pole first or by short-circuiting due to a tool, or a cigarette, etc. is enough to detonate the gas and cause the battery to explode.

Starting Aid (Jump Starting)

ATTENTION !

Jump starting is allowed only with a 24 voltage battery-package in direct connection (jumper cables)!
Before disconnecting the jumper cables engage a large current consumer (e.g. heating system) on the "giver vehicle" in order to dampen voltage spikes.
Never attempt to start the vehicle with a quick charger - this will surely result in damage to the electrical system.

Service procedures - Battery

If your vehicle is equipped with a battery charging socket, it is possible to charge the batteries by means of a positively polarized plug without dismounting the batteries.
Precondition:
Use only electronically controlled charging units.

ATTENTION !

To avoid damage to the alternator and radio installed in the vehicle, it is absolutely necessary to switch off the main battery switch only after the engine of the vehicle has been shut off.
Before connecting a battery charging unit to the charging socket, please switch off the main battery switch. similarly switch it off when the vehicle is stored in the garage.

Battery charge and acid-density in kg/dm³ at 20 °C:

Charge	*Acid-density at battery gen.*	*Acid-density at tropic batt.*	*Action*
Charged	*1,28*	*1,23*	*none*
1/2 charged	*1,20*	*1,16*	*charge necessary*
empty	*1,12*	*1,08*	*charge immediately*

Batteries, which show maintenance mistakes, are not replaced by the manufacturer.
We cannot cover the cost of such batteries !

Service procedures - Water and foam compound tank

The water tank has to be emptied and carefully cleaned at least once a year. Ferruginous foreign particles have to be removed completely.
The foam compound tank has to be completely drained and carefully cleaned at least every two years.

CAUTION !
For any work in connection with recoating or whenever using chemicals inside of the tank ALWAYS USE BREATHING APPARATUS OR FRESH AIR MASK AND PROVIDE WATCHMAN OUTSIDE THE TANK.

Torque list:

Bolting to glass fibre-tank:
(flange and threaded bushes; approx. 20% of steel value)

M 8	*8.8*	*5 Nm*
M 10	*8.8*	*10 Nm*
M 12	*8.8*	*17 Nm*
M 16	*8.8*	*40 Nm*
M 20	*8.8*	*80 Nm*

Sub frame:

M 10	*10.9*	*65 Nm*
MB-screw steel to steel		
M 10	*10.9*	*58 Nm*
cast aluminum-bracket to sub frame		
M 8	*8.8*	*24 Nm*
silent bloc to cast aluminum-bracket		

Propeller shaft:

M 8	*10.9*	*36 Nm*
steel to steel		
M 10	*10.9*	*72 Nm*
steel to steel		

The bolting (under the screw head and on the thread) must not be oiled under any circumstances and invariably tighten by using a torque wrench !

Chassis-thrust plate:

M 12 x 1.25	*10.9*	*125 Nm*
M 14 x 1.5	*10.9*	*195 Nm*

Superstructure (according to DIN/ ÖNORM):

flat headed screw		*12 Nm*
M 8	*8.8*	*21 Nm*
M 10	*8.8*	*42 Nm*
M 12	*8.8*	*72 Nm*
M 14	*8.8*	*114 Nm*
M 16	*8.8*	*174 Nm*

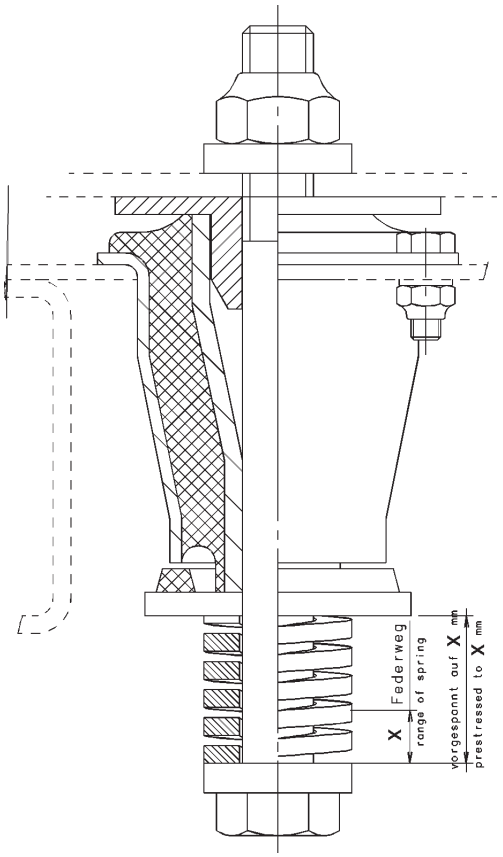
Service procedures - Chassis

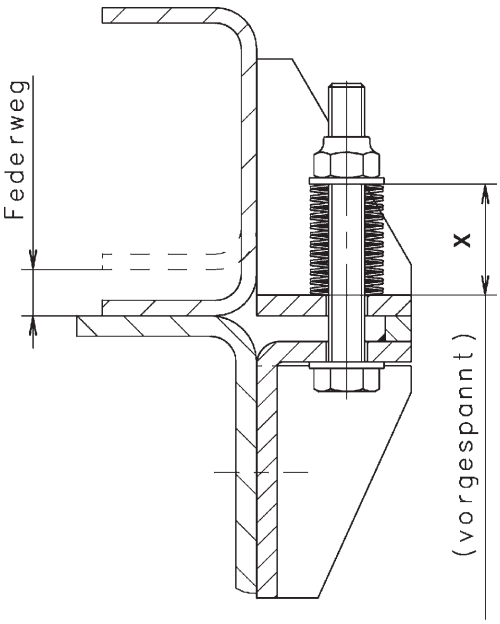
All screws and bolts between the superstructure and chassis frame must be re-tightened after the first 500 km and then regularly checked at least every 5000 km or at least every year. Replace damaged parts of the suspension immediately.

Check if the bolts are tight (please refer to torque list).
The vehicle is operated in extreme temperature, driving and atmospheric conditions; therefore check the hollow protection and underseal of the complete vehicle at least once a year and repair if necessary.
Check for any rust spots or damages and repair them immediately. At the same time apply corrosion protection for any replaced or repaired part. An approved corrosion preventing plastic paint for this purpose, may be obtained from Rosenbauer International Aktiengesellschaft.

Roller shutters

On roller shutters, the sliding-guide rail must be lubricated with Teflon spray Rsb. art.no. 535553 or equal quality, at regular intervals (every 6 months).





Service procedures - Mounting devices for body, water- and foam compound tank - sub frame / chassis

The sub frame is bolted fixedly to the chassis but bolted flexibly in other areas by means of spring loaded elements.

The original pre-adjusted flexible element, see reading (x) must not be changed or bolted to "block" condition under any circumstances.

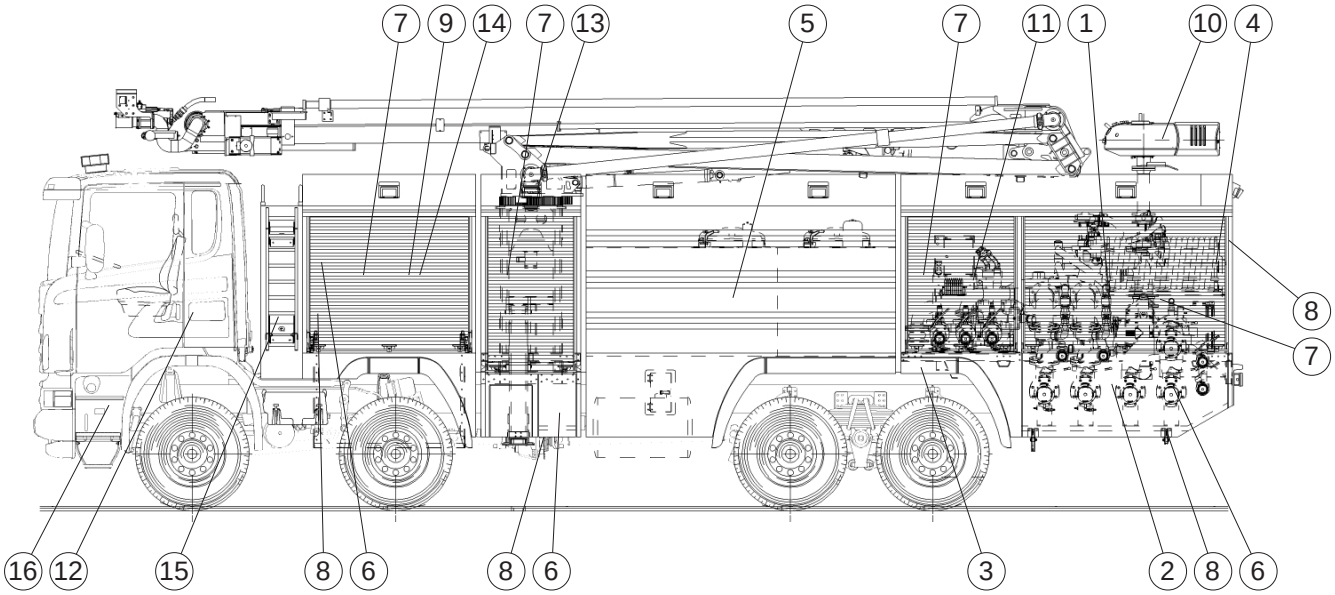
During regular service and maintenance procedures these flexible elements have to be checked for free movement, rust and to ensure that the unit is not "stuck" in the area of the bolt and spring.

The "free movement" can turn into a "stuck" condition by soiling, dirt, corrosion etc. and might cause damages to the body and sub frame.

Remedy:

- *Check flexible elements regularly according to the maintenance manual.*
- *If necessary, dismantle the unit, clean and grease the parts or change damaged items.*
  ATTENTION! Check pre-adjusted reading (x) before dismantling!
- *Install unit and adjust to the correct (x) reading.*
  Use grease (Article No.: 004824) only

Service procedures - Maintenance chart



ITEM	COMPONENT	LUBRICANT	VOLUME	OIL CHANGE HOURS/TERM		GREASE-INTERVALL	CHECK
1	Pump gearbox [2] *	transm. oil SAE 90	7.2 ltr.	50-100	every two years	-	M
2	Priming pump [1] N100	engine oil SAE 30	1.0 ltr.	25-50	J	-	M
	Valve plates	-	-	-	-	-	J
	drive-belts	-	-	-	-	-	J
3	Propeller shaft	Multi purp. grease according NLGI II	-	-	-	J	J
4	Hose reel hub	Multi purp. grease according NLGI II	-	-	-	M	-
5	Tank - inside walls	-	-	-	-	-	J
6	Hinges and steps	Multi purp. grease according NLGI II	-	-	-	H	-
7	Roller shutters	Teflon spray art.no.: 535553	-	-	-	H	-
8	Gas struts	-	-	-	-	-	H
9	Fixing devices	Multi purp. grease	-	-	-	J	J
10	Roof turret RM 60						
	Elevation device	Klüber	-	-	-	H	-
	Rotation device	Klüberplex SK 12	-	-	-	H	-
	Nozzle, Deflector	according NLGI I	-	-	-	H	-
11	Hydrostatic drive Rsb. Art. Nr.: 067009 ->	Hydraulic oil Castrol Vario HDX	8 ltr.	-	J	-	M
12	Compressor f. alarm sys.	deliver. special oil	-	-	-	J	-
13	Stinger	Please refer to separate Stinger operation manual					
14	Equipment	Please refer to manufacturers manual					
15	Compressor MK 282	Please refer to manufacturers manual					
16	Chassis	Please refer to manufacturers manual					

M ..... monthly
H..... every six month
J ..... once a year

[1]) SAE 30, API / SF, MIL-L-46152 B, FORD M2C 9011, GM 6048 M
[2]) SAE 90, API / GL 4, MIL-L-2105, FORD M2C-28-B

Problems and their Solutions

Propulsion problems: *please refer to manufacturers manual*
Pump problems: *please refer to the list below; this list is not a complete list, but it may help to locate the source of the problem*

FAILURE	PROBABLE CAUSE	CORRECTIVE ACTION
Pump does not operate	- Pump not engaged	Engage pump
	- Priming pump disengaged	Engage priming pump
	- Suction lift to high	Reduce suction lift
	- Suction strainer not under water	Place suction strainer under water
	- Suction strainer obstructed	Clean suction strainer
	- Suction hose defective or gasket not installed properly or damaged	Change suction hose, install gaskets properly or change them
	- Suction screen obstructed	Clean suction screen
	- Drafting valve closed	Open drafting valve
	- Drain valve not closed	Close drain valve
	- Discharge valve leaks due to impurity or gasket damage	Clean discharge valve (rinse with clean water) or change gasket
	- V-belt oily or turned-off	Clean resp. change the V-belt
Poor priming performance	- Inlet- and/or outlet valves of the priming pump are damaged	Change inlet- and/or outlet valves
Pump is noisy and vibrates	- Suction lift too high	Reduce suction lift
	- Pump cavitates	Reduce engine speed and nozzle diameter, clean suction strainer and suction screen
Poor pump performance	- Suction strainer is obstructed	Clean suction strainer
	- Suction hose defective, gaskets not properly installed or damaged	Change suction hose, install gaskets properly or change them
	- Suction screen obstructed	Clean suction screen
	- Engine does not perform	Check engine
	- Discharge valves not fully opened	Open discharge valve

ATTENTION !
If any assistance is necessary do not hesitate to call your nearest "Rosenbauer" representative or contact the "Rosenbauer" Service Department.

Safety Instructions for Hydraulic Installations

Observe national regulations in country of deployment according hydraulic installation.

Refer to the product documentation for technical specifications of your product / equipment.

Never modify Rosenbauer factory settings of hydraulic valves.

To avoid contamination and wear and tear in the hydraulic system, a suitable filter system must be fitted to the return line.

ATTENTION !
Hoses should not be used longer than six years, including a storage period of no longer than two years.

Regular inspection of hydraulic hoses

DIN 20066:2002-10 stipulates regular inspections of all hydraulic hoses in a hydraulic system. The vehicle owner, or Rosenbauer Customer Service acting on the owner's behalf, is responsible for performing this inspection at least once a year while the hydraulic system is not running.

The following inspection criteria apply for the inspection:
- *Damage of external layer to intermediate layer (chafing, cuts, tears, porosity).*
- *Brittleness of the outer layer (tears in the hose material).*
- *Deformation that does not reflect the natural shape of the hydraulic hose, in depressurized or pressurized state, or in case of bending, e.g. layers separating, bubbling, signs of crushing, kinks.*

Regular inspection of hydraulic hoses

- *Leakages in hoses, hose lines or fittings.*
- *Hoses bulging out of fittings.*
- *Damage or deformation of fittings that impact function and rigidity of fittings or the connection between hose and fitting.*
- *Corroded fittings that impact function and rigidity.*
- *If free movement of the hydraulic hose lines is still possible, check whether fitting new system components or units has caused crushing, shearing or chafing.*
- *Have hydraulic hoses been coated ?*
  (Explanation: impossible to detect labels, cracks)
- *Have storage time or service lifetime been exceeded ?*
- *After checking, moving, refitting, are all covers fitted and functional ?*
- *Are all connections tight ?*
- *Are additional tear-off mechanisms fitted or required ?*

Replacing hydraulic hoses

If you need to replace a hose, the replacement hose must comply with requirements with respect to length, diameter and quality (DIN EN 853, DIN EN 854, DIN EN 856, DIN EN 857).
Hoses of this type are used by, and can be ordered from, Rosenbauer Customer Service.

Rosenbauer AG cannot accept any responsibility for incorrect fitting of hydraulic hoses.

CAUTION !

DIN 20066:2002-10 stipulates a maximum service lifetime for hydraulic hoses.
Rosenbauer recommends replacing all hoses with new hoses after a maximum service life of six years (irrespective of damage). Rosenbauer Customer Service will be pleased to provide expert advice.

Handling and Storing Electronic Components

(DRE and Electronics)

Storing, packing, and transporting

Electronics with Housing:

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. Precautions regarding anti-electrostatic problems are not necessary.

Printed Cards/chip boards:

Components like printed cards must be properly packed (wrapped) into anti-electrostatic foil !

Printed cards are extremely sensitive to mechanical damage and 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 transportation are as follows:

Temperature: -40 °Celsius to +100 °Celsius

Humidity: 20 % up to 95 %

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

Working on vehicles with electronic equipment:

Installation jobs and test works:

Before carrying out work on electric components and electronics (except test procedures), switch off power supply (master switch in position "OFF" or disconnect battery).

Handling and storing electronic components

To avoid electrostatical problems while running test on electronics, proceed as follows:

- *Install rubber strip on chassis and lay it on the ground or*
- *Connect discharge hose to pressure outlet (wet hose or fill it with water)*
- *Touch part of the chassis before touching the electronics*

For all operations where the technician and electronic are both on the chassis, no precautions are necessary.

ATTENTION !

If ARC-Welding work on chassis or superstructure is necessary, avoid damages from welding work in electronic circuits by disconnecting all plugs (connectors) from the electronics.

Drilling and grinding works:

Make sure that all electronics and connectors are properly protected against grinding or drilling chips, etc.

Painting works:

Protect electronics, connectors, and plugs against paint and paint spray and all other aggressive liquids.

ATTENTION !

Neglecting these recommendations will result in loss of warranty!

Tilting of Cabin

- *Stop vehicle on level ground.*
- *Apply parking brake.*
- *Ensure, there is plenty of space in front and above the cabin.*
- *Remove all loose parts from the cabin.*
- *Lift the stinger boom.*
- *Open the front grill.*

- *For further tilting procedure please refer to chassis manufacturers manual.*

ATTENTION !
The vehicle has to be stopped safely on level ground.
Remove the starting key.
Clear the area in front of and above the cabin.
For tilting, refer to chassis manufacturers operation manual.

Lowering of cabin

- *Carry out lowering of cabin in reverse order.*

CAUTION !
On cabins with mechanical locks, no pilot lamps are installed on the driver´s control panel. Ensure that cabin locks are applied after each tilting procedure.
Neglecting this warning can result in serious damages and personal injuries.

Repetitive Test Cycle for Electrical Components

Repetitive tests are only to be carried out by certified electricians.
These tests are to be carried out according to the specifications listed in the component test manual.

Electrical systems (230 volts / 400 volts) are to be tested regularly.

- *1st test at 3 years*
- *2nd test at 2 years after 1st test*
- *3rd test and further tests every year after that*

- *Alternators are to be tested for at least 1 hour every six months at at least 50% of nominal capacity, or if not, at least with the maximum allowed permanent engine rpm.*

- *All carried out certifications and tests are to be recorded in a logbook.*

The installed FI protection is to be tested under load every six months (press test button on the FI protection).

Hints for Disposal

For all used parts and materials resulting from repairs and operation of this unit, we request non-pollutant disposal.

Oil:	*Please obey current disposal regulations.*
Foam compound:	*Obey Safety Data Sheet according to DIN 52900, ÖNORM Z1008.*
Sacrificial anodes:	*Disposal at nonferrous metal site.*
Rubber- and plastic parts:	*Please obey current disposal regulations.*
Metal parts:	*Please obey current disposal regulations.*
Paint- and coating material:	*Please obey current disposal regulations.*
Adhesive material:	*Please obey current disposal regulations.*
Fuel:	*Fuel must not get into sewerage or the gutter.*
Battery and battery acid:	*Please obey current disposal regulations.*
Dry powder:	*Disposal according to manufacturers regulations.*