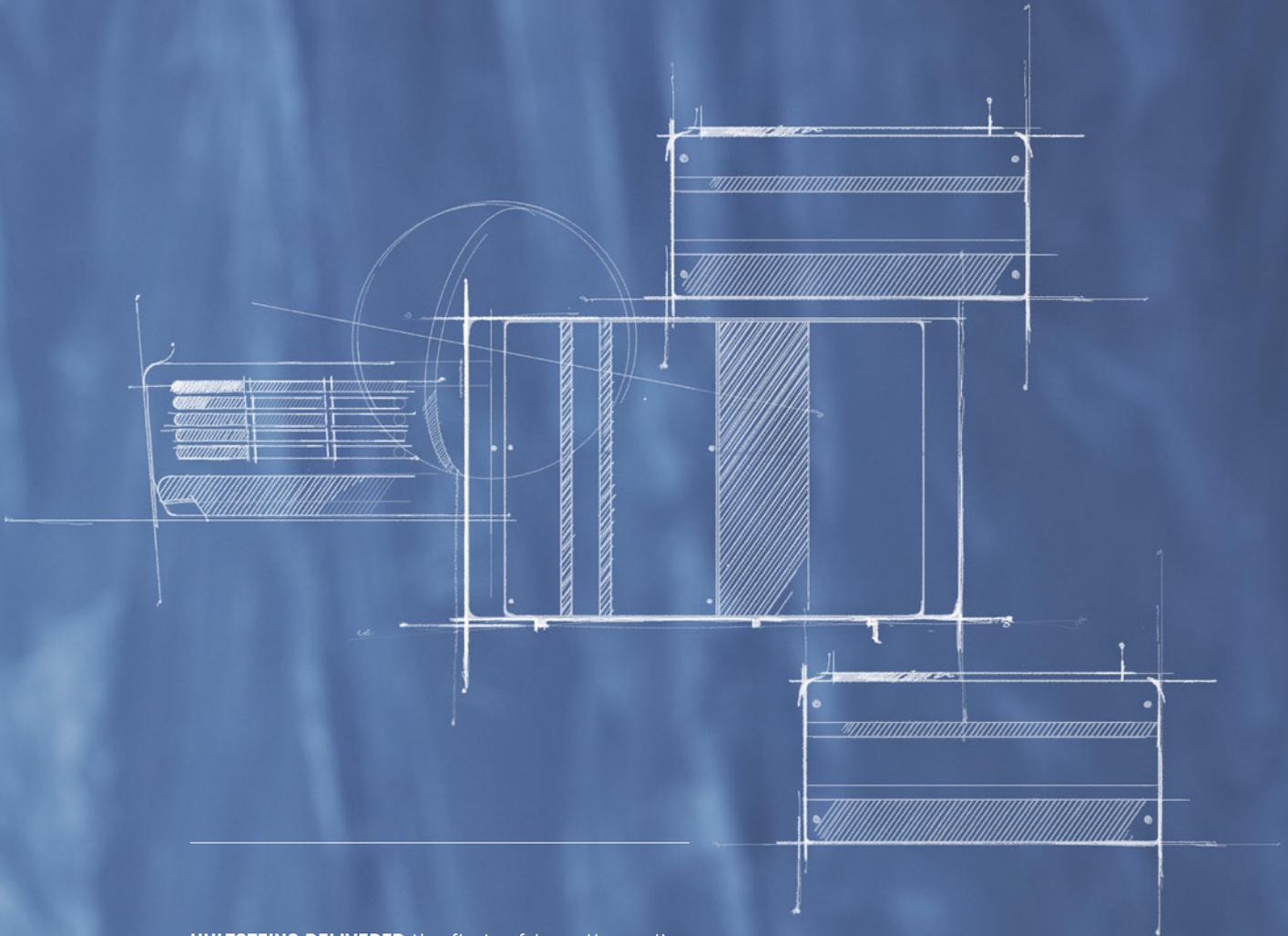


# INSTALLATION

HYDRAULIC / ELECTRIC

## ECOFRIDGE TOPLINE 13/16





**HULTSTEINS DELIVERED** the first refrigeration unit with hydraulic technology in 1962. Producing transport refrigeration with hydraulics was totally unique, and since then we have continued to drive the market forward with innovative solutions.

The result is reliable, fuel-efficient and environmentally-friendly refrigeration units which provide maximum customer benefit on the road.



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# DIESEL FREE REFRIGERATION



Refrigeration in constant motion requires unique solutions.

## REMEMBER TO

**CHECK THE GOODS** at the time of delivery for transport damage and the number of packages, and also check that the contents match the attached material specification sheet. Contact Hultsteins immediately if there are any discrepancies.

The unit has been tested and the phase sequence set correctly at the factory. Read all the instructions before installation and note that any work on the refrigerant circuit must only be carried out by qualified personnel.

We recommend leaving the installation instructions with the customer together with the other documents after completing installation.



**Eye protection**



**Hand protection**



**P.P.E**

**FOR YOUR SAFETY** Always wear protective glasses to avoid the risk of eye damage which can be caused by coolants and battery acid.

Keep your hands away from the fans and belts when the unit is running. This also applies when opening and closing the compressor service valve.

Holes drilled in the unit may weaken components and fires or explosions may occur if the drill comes in contact with electrical cables. Drilling should therefore be avoided unless absolutely necessary.

The fins on the condenser and evaporator are sharp, so work gloves should be used to prevent accidents and cutting injuries.

To ensure the function and durability of hoses and electrical cables, they should be clamped in such a way that they are not exposed to unnecessary movement and wear. Hoses and cables must not be stretched or bent so they become damaged and must not be clamped or lie against the brake lines or sharp edges. Use chafe protection if there is such a risk.

**IF AN ACCIDENT HAPPENS** The refrigerant is classed as a safe coolant, but relevant safety measures must always be taken into account when handling units where the refrigerant is used. If the coolant is released into the atmosphere in its liquid form, it will evaporate quickly and freeze everything it comes into contact with.

In case of a cold injury, treat and heat the exposed body area immediately to avoid more serious injury. If the coolant comes into contact with the eyes, rinse immediately with large amounts of water and seek medical treatment. In the event of contact with the skin, rinse with large amounts of lukewarm water and remove any items of clothing that have been in contact with the coolant. Wrap the injured areas with a sterile, dry bandage and seek medical care immediately. Wash clothing thoroughly before wearing again. If the coolant is inhaled, move the patient to a place with fresh air and, if necessary, perform CPR or mouth-to-mouth resuscitation. Stay with the patient until health care professionals arrive.

### POSSIBLE DEVIATIONS FROM THE INSTALLATION INSTRUCTIONS

*There may be other models of pumps, nipples, hoses and installation kits than those described in the installation instructions. This may be due to the type of vehicle, model year or specific requests from the customer. In these cases, a loose sheet of instructions is attached to the folder belonging to the unit.*

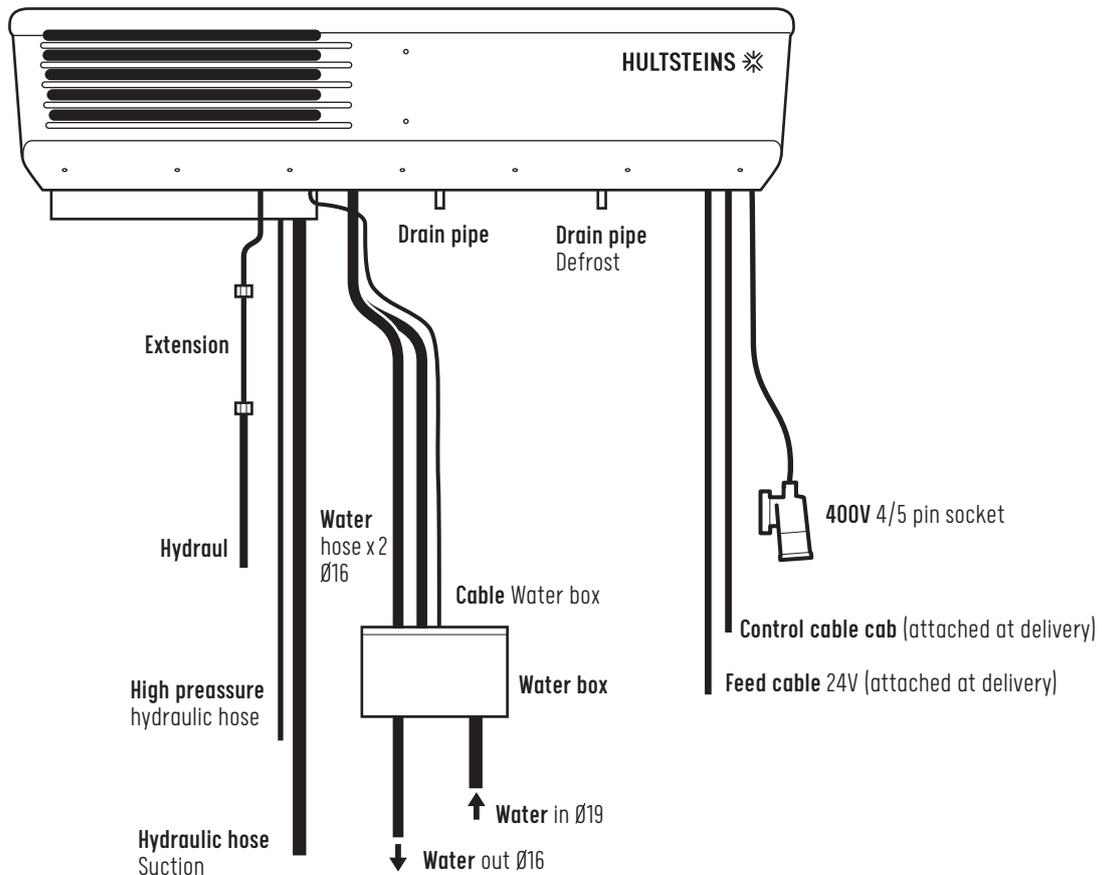
### SYMBOLS FOUND IN THE INSTALLATION INSTRUCTIONS

 **Note - important detail**

 **Time**

 **Photograph**

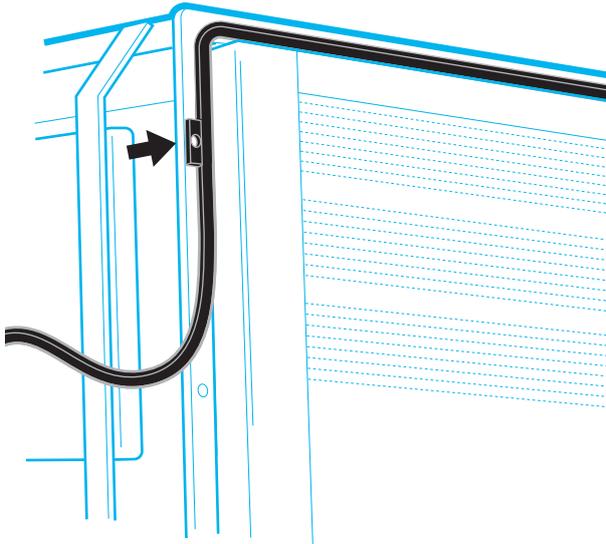
# INSTALLATION INSTRUCTIONS



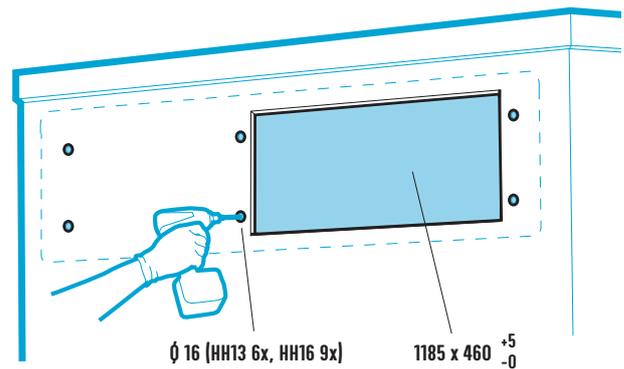
# INSTALLING ON THE BODY

**1**

**INSTALL THE ATTACHED SEALING WASHERS** over the holes through the body. The other sealing strip is installed on delivery.

**2**

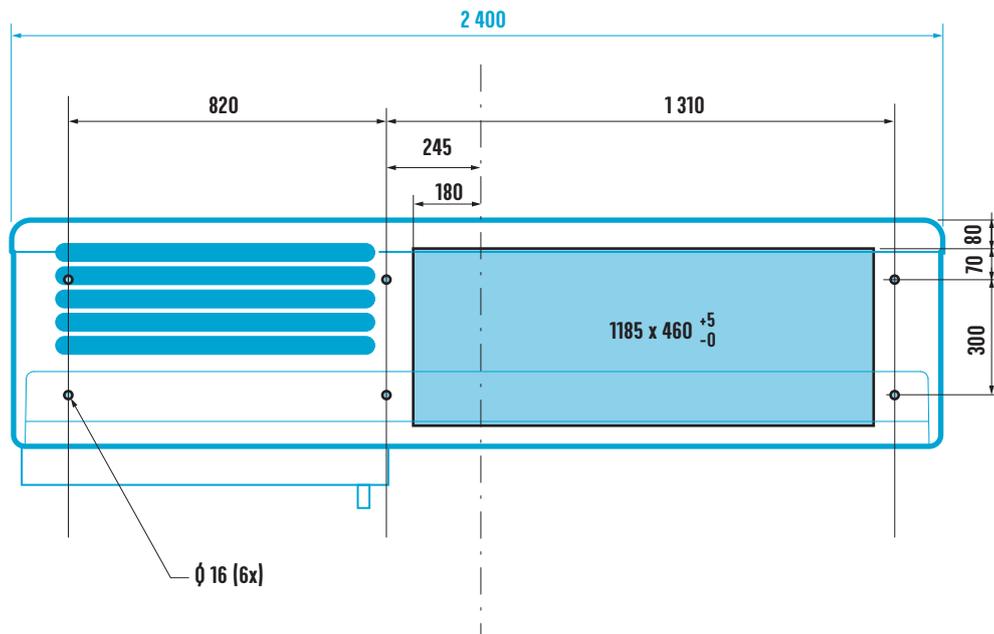
**DRILL THROUGH** the holes according to the drilling dimensions. See mounting drawing s page 8.



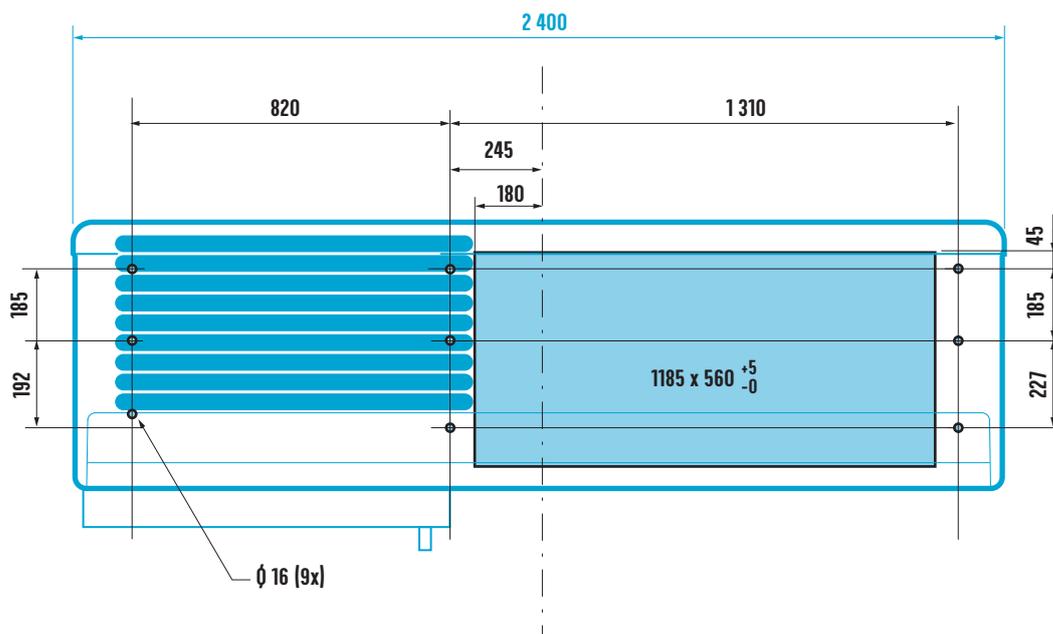
**!** The surface behind the machine should be free of strips, etc. If there are any strips, the machine must be shimmed to an even level.

## INSTALLING ON THE BODY

### HH13 DRILLING DIMENSIONS headboard. All dimensions are in mm.



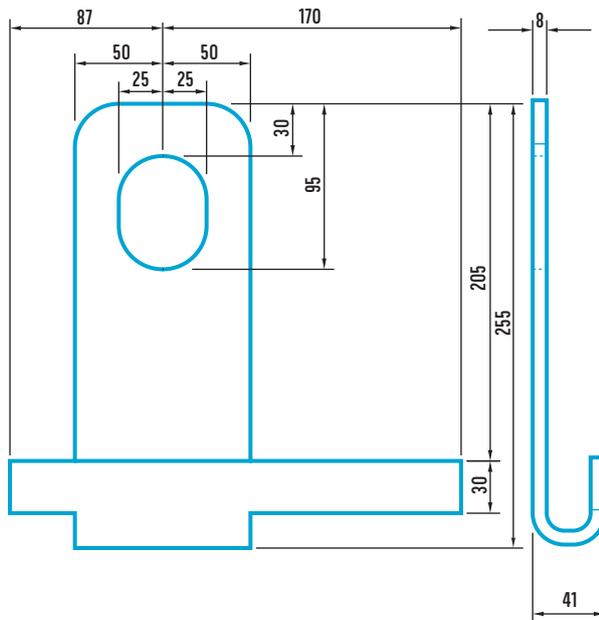
### HH16 DRILLING DIMENSIONS headboard. All dimensions are in mm.



# INSTALLING ON THE BODY

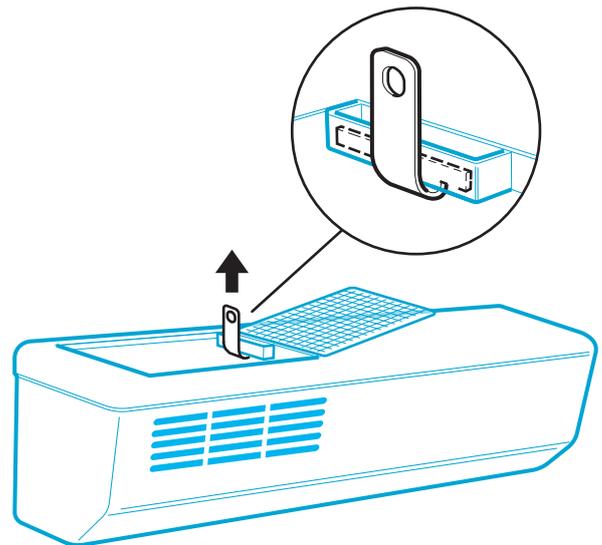
3

**DRAWING** lifting yoke. Dimensions in mm.  
Not supplied with the unit.



4

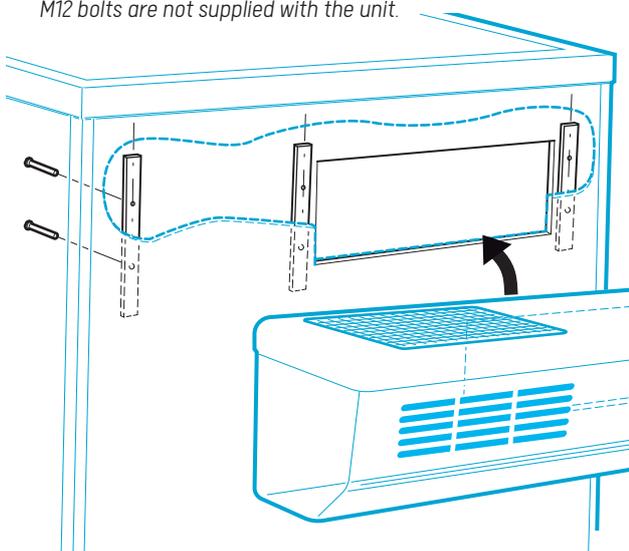
**LIFT THE REFRIGERATION UNIT** with the lifting yoke designed for the unit.



5

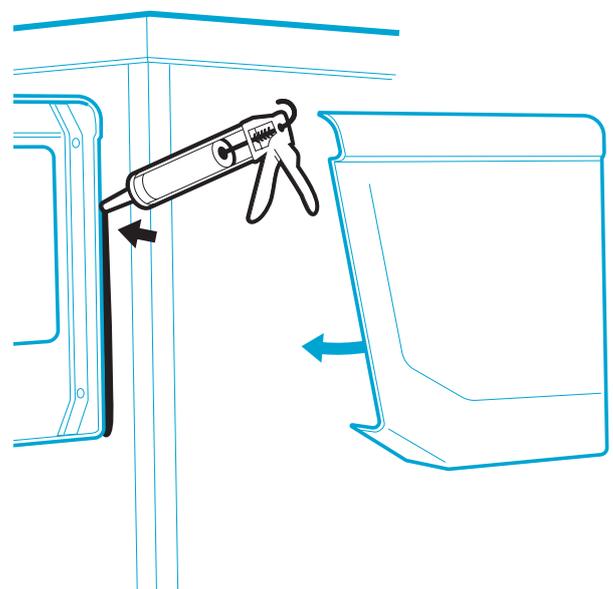
**INSTALL THE UNIT** against the headboard on the body. The length of the M12 bolts are determined by the thickness of the headboard +30 mm.

*M12 bolts are not supplied with the unit.*



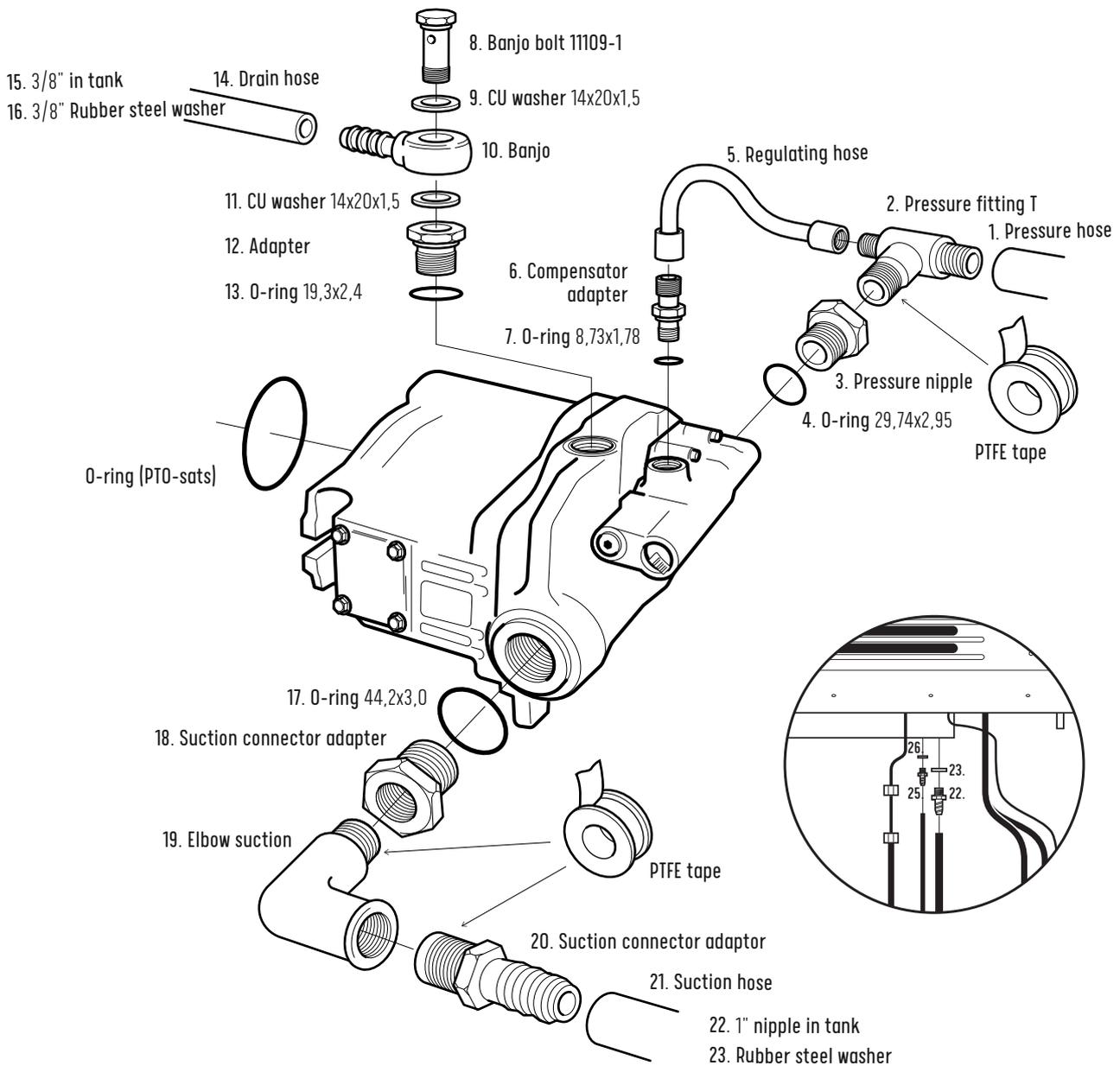
6

**SEAL THE JOINTS** on the top and left panel between the body and the unit's refrigeration box with suitable sealant to eliminate water leaks. Do not seal the underside.



## HYDRAULIC PUMP PVE 21

Other pump, nipple and hose models are available.



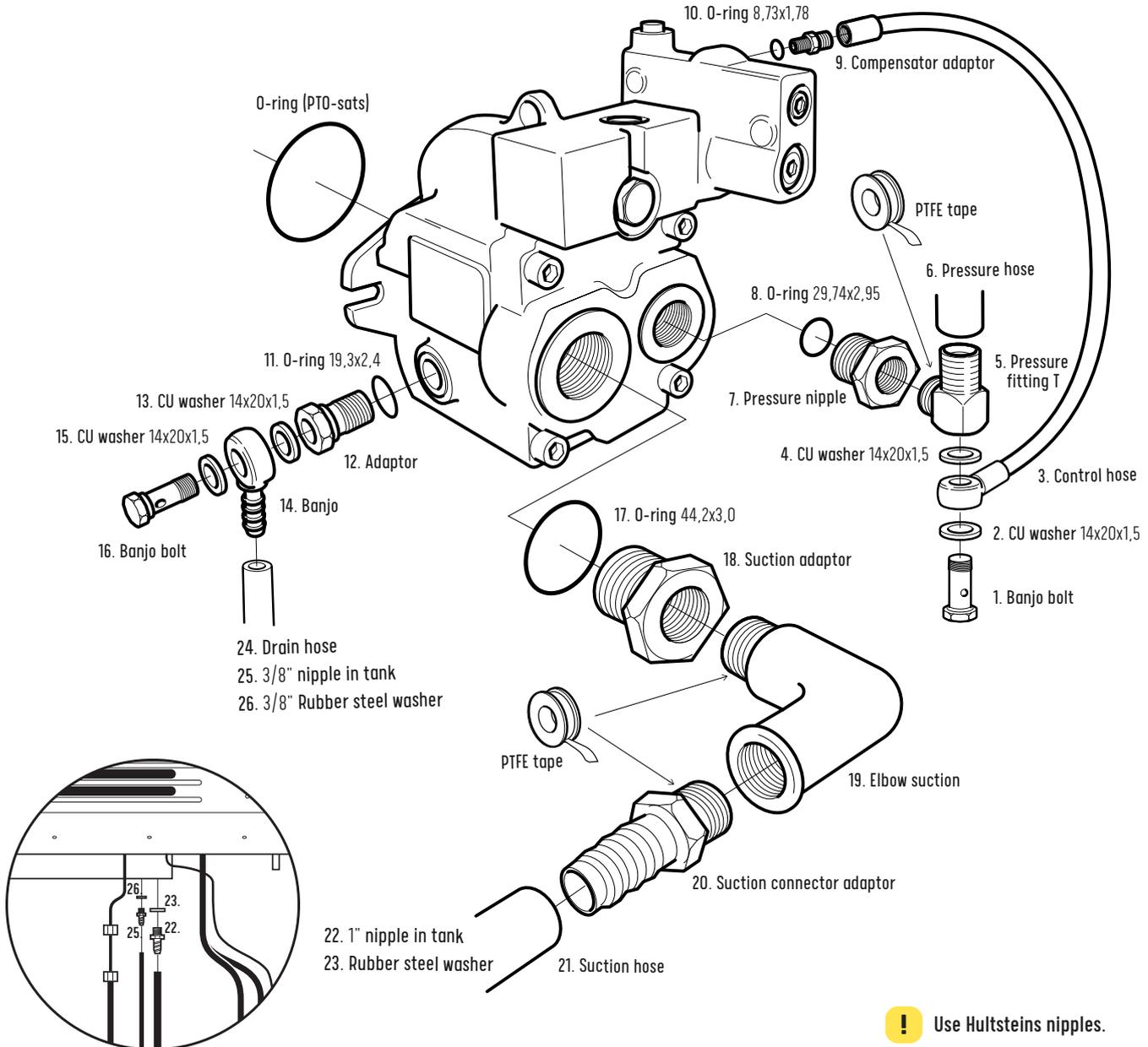
**!** Use Hultsteins nipples.

### PUMP PVE NIPPLES

1. Pressure hose	50001	10. Banjo	11109	19. Elbow suction	11104
2. Pressure fitting T	11103	11. CU washer 14x20x1,5	11109-2	20. Suction connector adaptor	6000726
3. Pressure nipple	11101	12. Adapter	11111	21. Suction hose	50021
4. O-ring 29,74x2,95	6000890	13. O-ring 19,3x2,4	6000889	22. 1" nipple in tank	11123-1
5. Regulating hose	50008	14. Drain hose	50031	23. Rubber steel washer	60001052
6. Compensator adaptor	11105	15. 3/8" in tank	11116	25. 3/8" nipple in tank	11116
7. O-ring 8,73x1,78	6000888	16. 3/8" Rubber steel washer	60001306	26. 3/8" Rubber steel washer	60001306
8. Banjo bolt	11109-1	17. O-ring 44,2x3,0	6000891		
9. CU washer 14x20x1,5	11109-2	18. Suction connector adaptor	11102		

# HYDRAULIC PUMP DANFOSS KRR/KRL 045

Other pump, nipple and hose models are available.



**!** Use Hultsteins nipples.

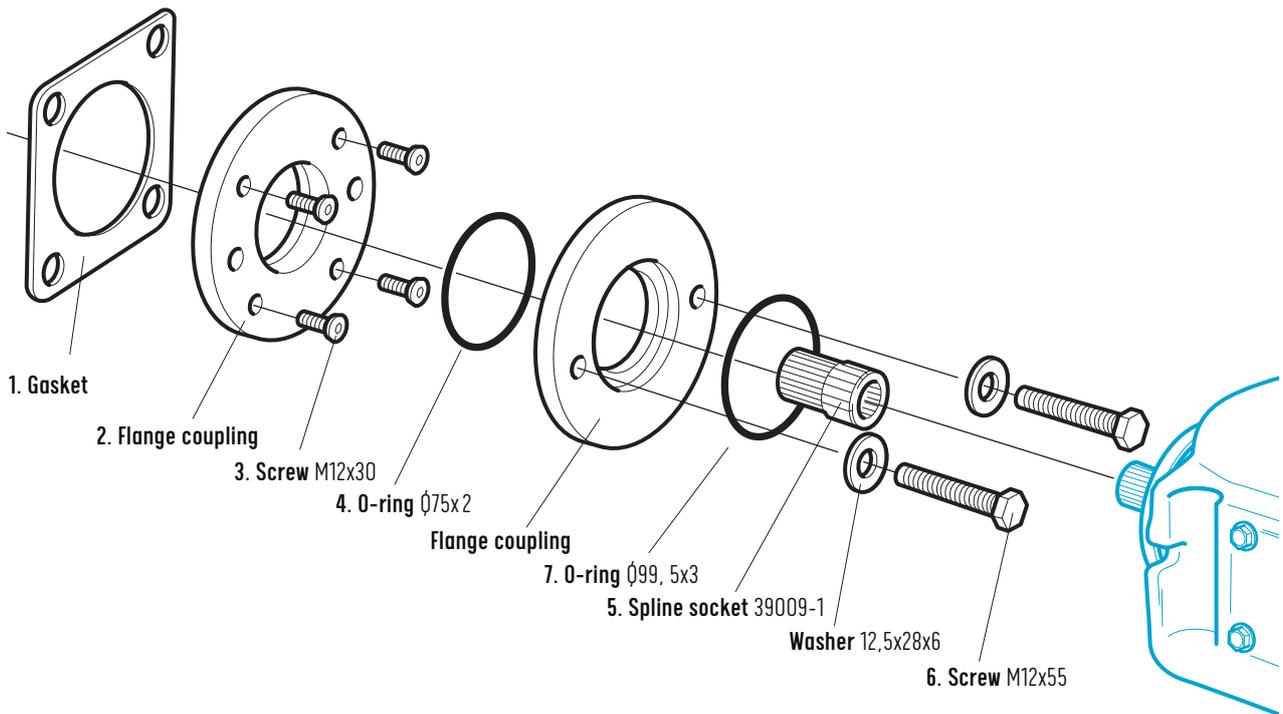
## PUMP KRR/KRL 045 NIPPLES

1. Banjo bolt	11109-1	10. O-ring 8.73x1.78	6000888	19. Elbow suction	11104
2. CU washer 14x20x1.5	11109-2	11. O-ring 19.3x2.4	6000889	20. Suction connector adaptor	6000726
3. Control hose	50008-2	12. Adaptor	11111	21. Suction hose	50021
4. CU washer 14x20x1.5	11109-2	13. CU washer 14x20x1.5	11109-2	22. 1" nipple in tank	11123-1
5. Pressure fitting T	11107	14. Banjo	11109	23. Rubber steel washer	60001052
6. Pressure hose	50001	15. CU washer 14x20x1.5	11109-2	24. Drain hose	50031
7. Pressure nipple	11101	16. Banjo bolt	11109-1	25. 3/8" nipple in tank	11116
8. O-ring 29.74x2.95	6000890	17. O-ring 44.2x3.0	6000891	26. 3/8" Rubber steel washer	60001306
9. Compensator adaptor	11105	18. Suction adaptor	11102		

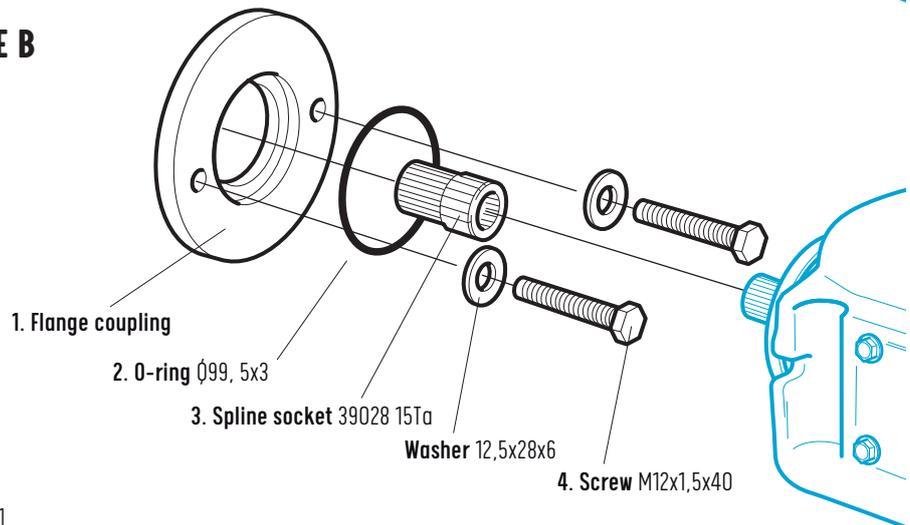
## INSTALLING THE PTO SET

### PTO INSTALLATION SET **DIN5462/ISO7653**

The illustration shows Axle DIN5462 Flange ISO7653  
(other installation types are available)



### PTO INSTALLATION SET **SAE B**



#### **DIN5462/ISO7653**

1.	1 pc	Gasket	60001031
2.	1 set	Flange coupling	39009-2
3.	4 pcs	Screw M12x30	6000913
4.	1 pc	O-ring Ø75x2	6000615
5.	1 pc	Spline socket	39009-1
6.	2 pcs	Screw M12x55	6000912
7.	1 pc	O-ring Ø99, 5x3	6000616

#### **SAE-B**

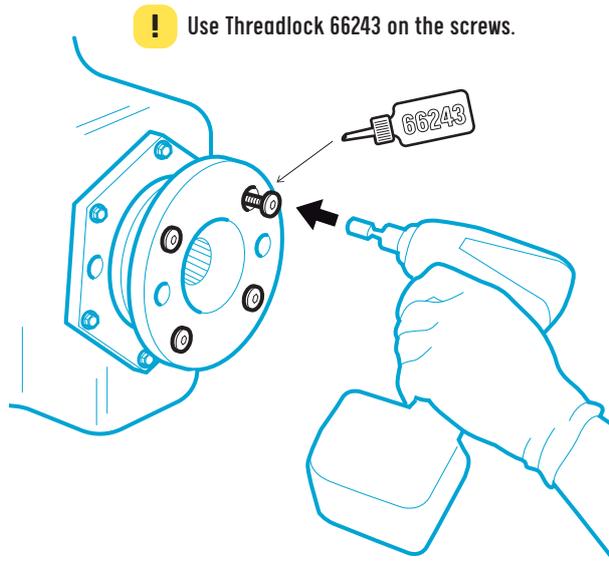
1.	1 set	Flange coupling	39009-2
2.	1 pc	O-ring Ø99, 5x3	6000616
3.	1 pc	Spline socket	39028 15T
4.	2 pcs	Screw M12x1,5x40	6000910

## PUMP INSTALLATION

### 7

#### INSTALL THE ADAPTER ON THE VEHICLE'S PTO.

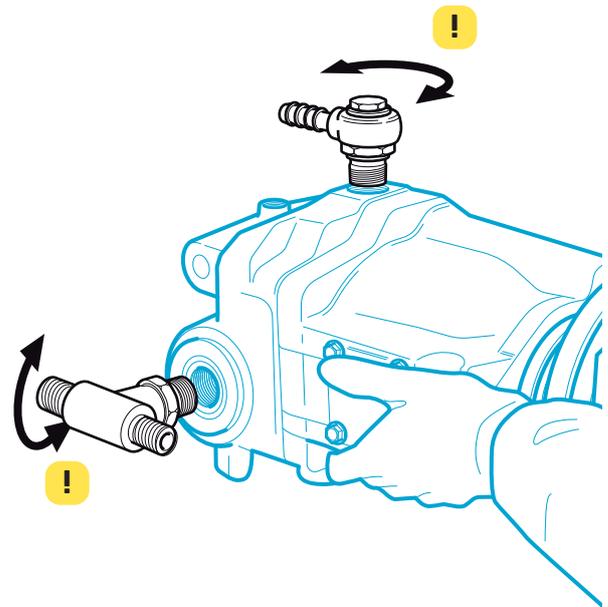
Screw with 4 countersunk M12, 75 Nm.



(only certain models depending on the pump)

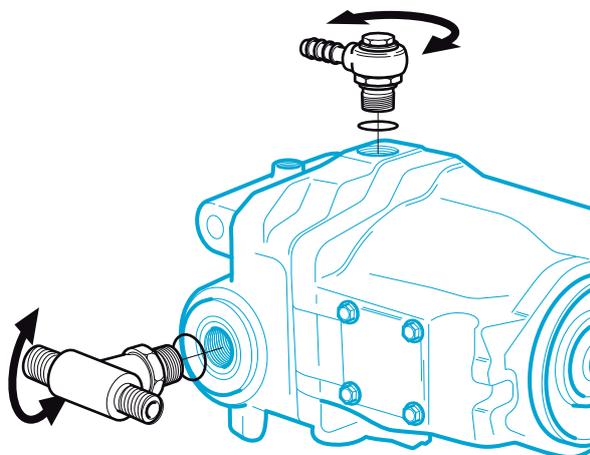
### 8

**HOLD THE PUMP IN PLACE** to see how the pump connectors must be angled.



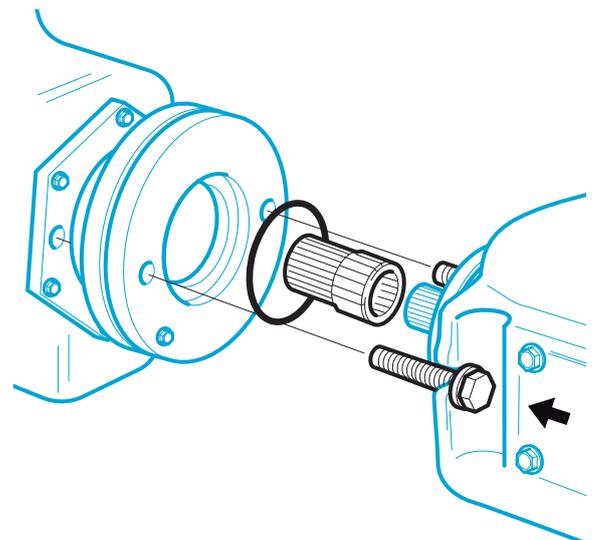
### 9

**INSTALL THE CONNECTORS** at these angles.



### 10

**INSTALL THE PUMP** with a suitable splined shaft.

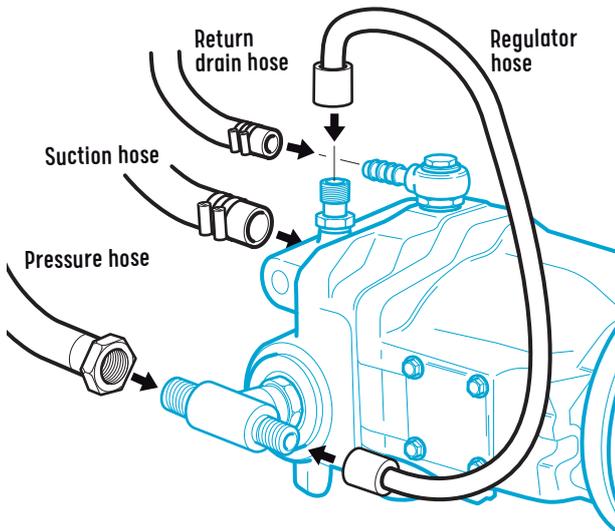


**!** **NOTE:** The spline socket must be lubricated with engine oil before installation.

## WATER HEATING

**11**

**INSTALL THE HYDRAULIC HOSES** between the pump and the unit.

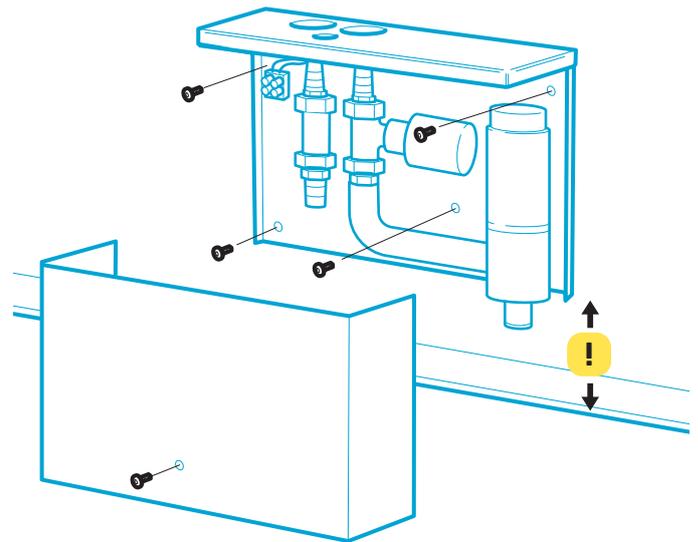


**!** Make sure that the hoses do not lie against sharp edges, etc. and that they are fixed securely (hoses move).

**📷** Photograph the pump.

**12**

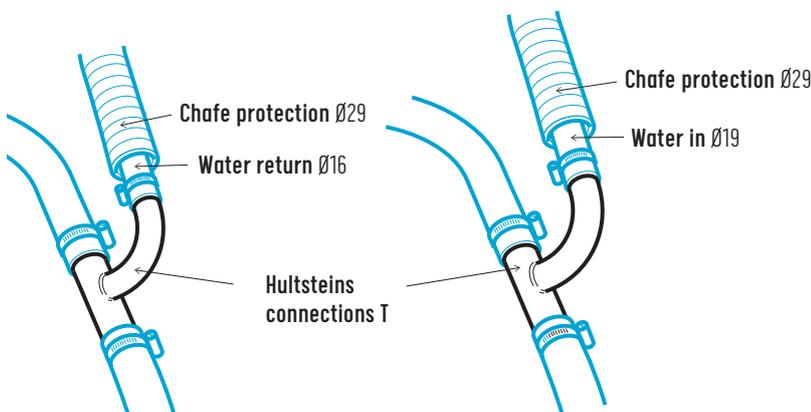
**INSTALL THE WATER BOX** as low as possible on the headboard.



**13**

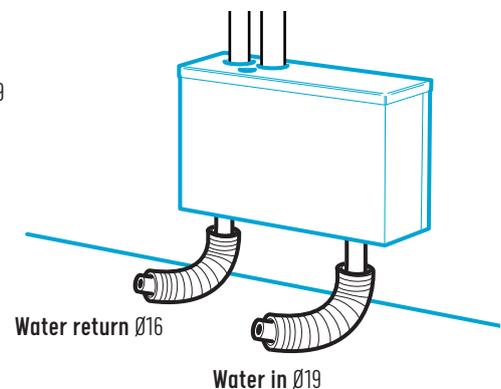
**CONNECT THE HOSES** Connect the return hose  $\varnothing 16$  on the pipe in the bottom of the water box to the bottom of the expansion tank using a suitable T or H connector.

Connect the hose  $\varnothing 19$  on the pump in the water box to the T-connector to the cab heater intake. **Follow the vehicle manufacturer's instructions.**



**!** Chafe protection must be used on the water hoses so the hoses do not rub against sharp or hot surfaces.

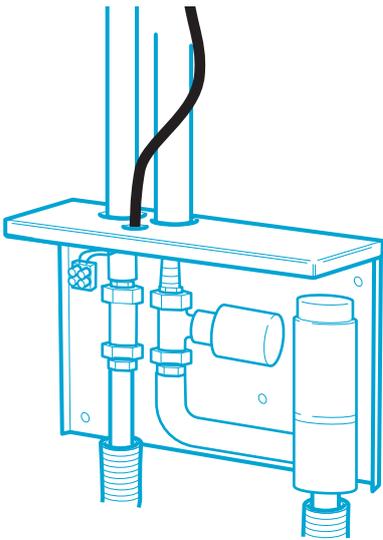
**📷** Photograph the water connectors.



# INSTALLING THE ELECTRICS

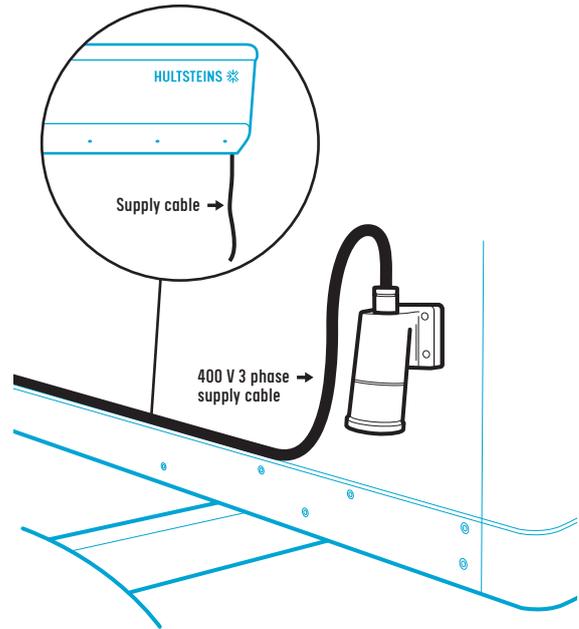
**14**

**CONNECT THE ELECTRICS** to the water box - the cable can be found under the unit. **White** is minus and **Yellow 6** is plus which is connected to the **red cable** in the water box.



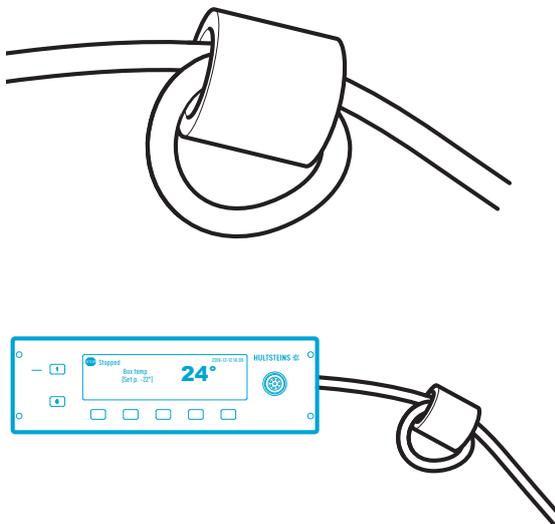
**15**

**PULL DOWN THE CABLE** for the 400V intake and install the intake at the appropriate location.



**16**

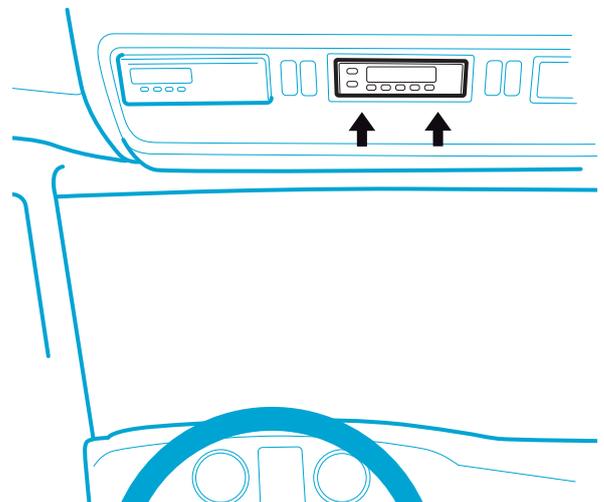
**FERRITE SHOULD BE MOUNTED** on the cable according to picture approx. 10 cm from the control panel in the cab.



**17**

**INSTALL THE CONTROL PANEL** in the cab in a suitable radio slot or according to the customer's requirements.

The control cable in the cab is included, 7 wires + screen.



## STARTING THE UNIT

### 18

**PULL THE CABLES** out through the bulkhead by the vehicle's switchboard. Lay the cables in a  $\varnothing 21$  protective sleeve and then route them together with the water hoses to the headboard, then on to the refrigeration unit's switchboard where they are connected.

PANEL	CONTROL CABLE CAB	SWITCHBOARD
1	Screen	31 install protective hose on screen
2	Red 0.75	32
3	White 0.75	33
4	White	34
5	Blue	35
6	Green 0.75	36
7	Yellow 0.75	37

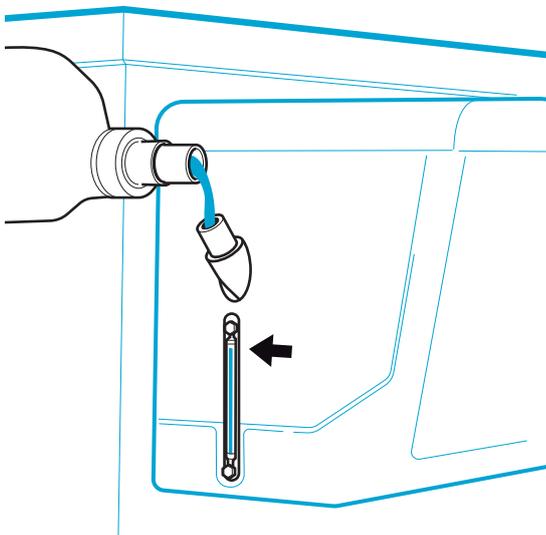
**FEEDER CABLE** Grey 24V 10A via ignition to 1 in switchboard. (Unit with two zones 20A fuse). Black to minus terminal.



 Photograph the fuse location.

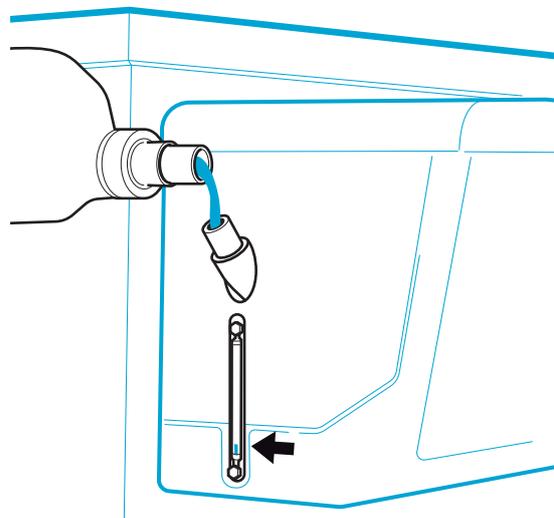
### 19

**FILL THE REFRIGERATION UNIT WITH ENGINE OIL** type Synthetic 5W-30 to the top of the gauge tube.



### 20

**START THE VEHICLE ENGINE** and run for a minute without starting the refrigeration unit. Then switch off the engine and top up the oil to a level just above the lower edge of the gauge tube.



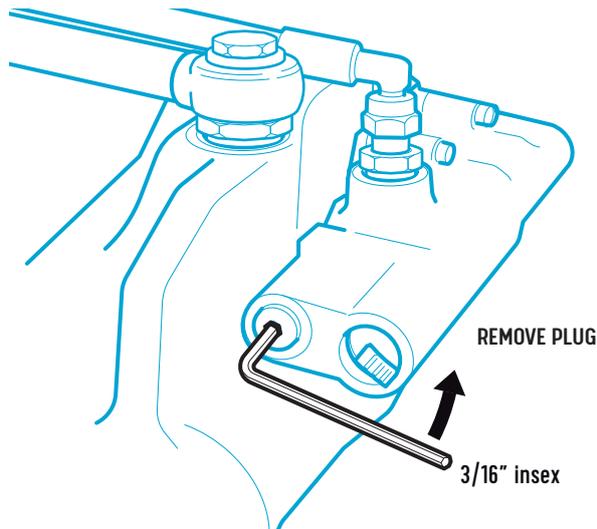
 Run the vehicle engine for 1 minute.

# ADJUSTING PVE PUMP SPEED

## 21 PVE PUMP

### ADJUST THE SPEED OF UNITS WITH A PVE PUMP.

Loosen the hex plug on the pump with a 3/16" hex key.

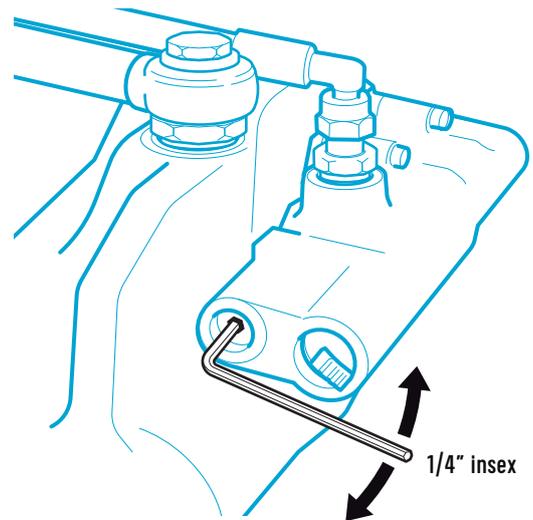


**!** NOTE: The plug may only be loosened and installed when the vehicle engine is switched off.

## 22 PVE PUMP

### START THE VEHICLE ENGINE and set the idle speed to 1200 rpm.

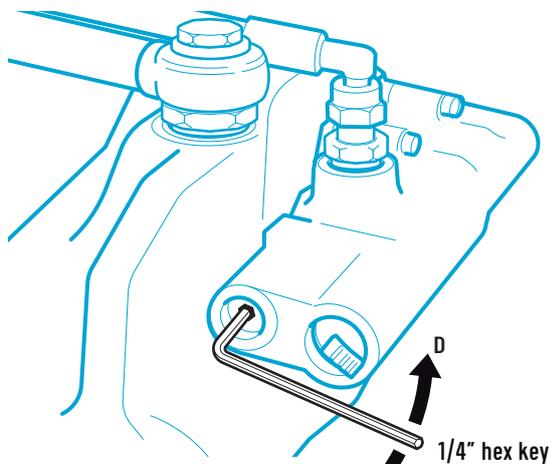
Use a 1/4" hex key and turn the screw clockwise to increase the speed of the refrigeration unit. Screw anti-clockwise to decrease the speed.



I = increase speed clockwise  
D = decrease speed anti-clockwise

## 23 PVE PUMP

ADJUST THE HYDRAULIC PUMP until the correct speed is achieved on the refrigeration unit. That is to say, the same speed as for electric operation (1500 rpm).



I = increase speed clockwise  
D = decrease speed anti-clockwise

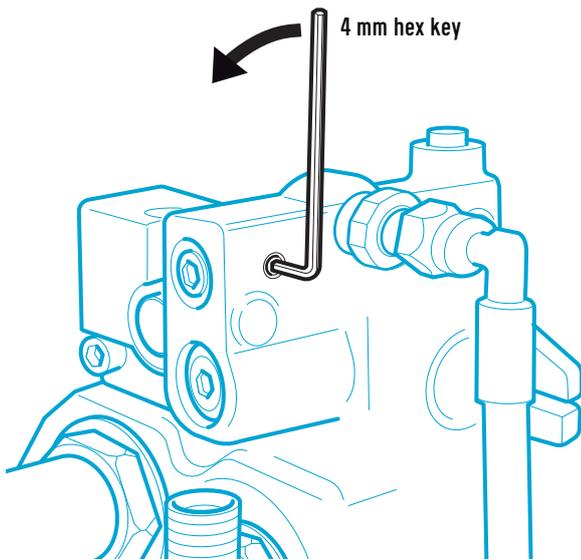
**!** NOTE: The plug may only be loosened and installed when the vehicle engine is switched off.

# ADJUSTING DANFOSS PUMP SPEED

## 24 DANFOSS PUMP

### ADJUST THE SPEED OF UNITS WITH A DANFOSS PUMP.

Remove the locking screw on the pump using a 4 mm hex key.



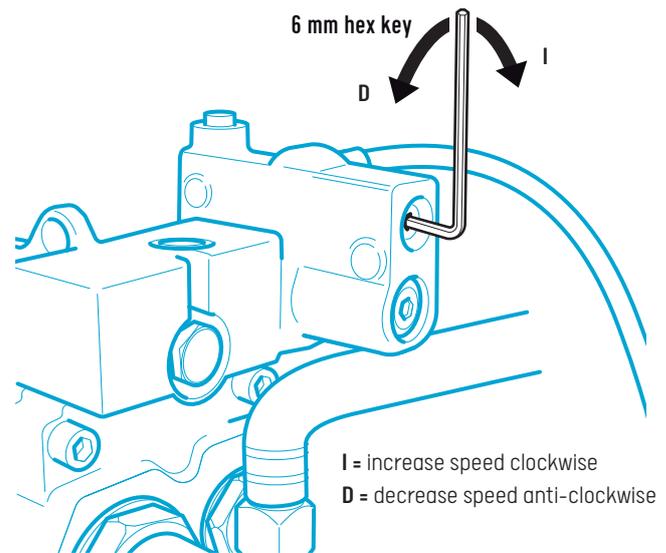
**!** NOTE: The locking screw must be removed before making any adjustments.

## 25 DANFOSS PUMP

**START THE VEHICLE ENGINE** and set the idle speed to 1200 rpm.

Use a 6 mm hex key and screw clockwise to increase the speed.

Screw anti-clockwise to decrease the speed of the refrigeration unit.



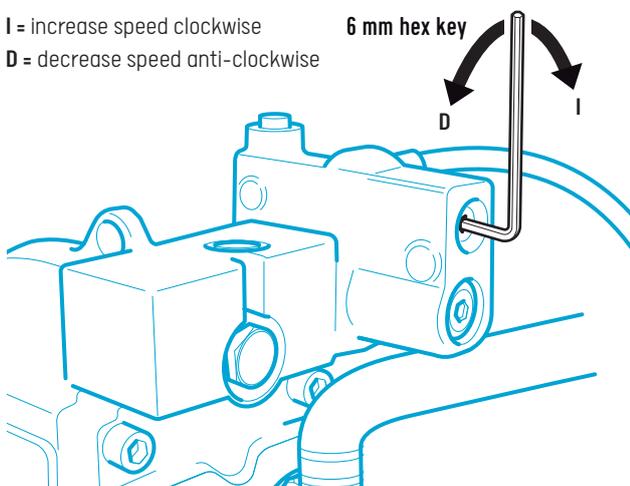
I = increase speed clockwise  
D = decrease speed anti-clockwise

## 26 DANFOSS PUMP

**ADJUST THE HYDRAULIC PUMP** until the correct speed is achieved on the refrigeration unit. That is to say, the same speed as for electric operation (1500 rpm).

I = increase speed clockwise

D = decrease speed anti-clockwise

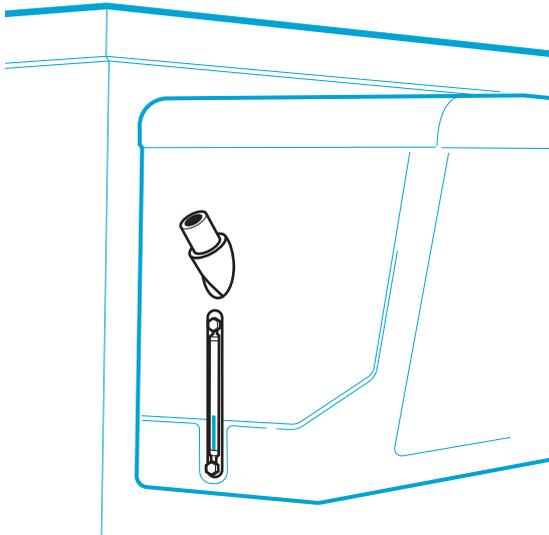


**!** NOTE: The locking screw must be removed before making any adjustments. See point 24.

# FUNCTION CHECK

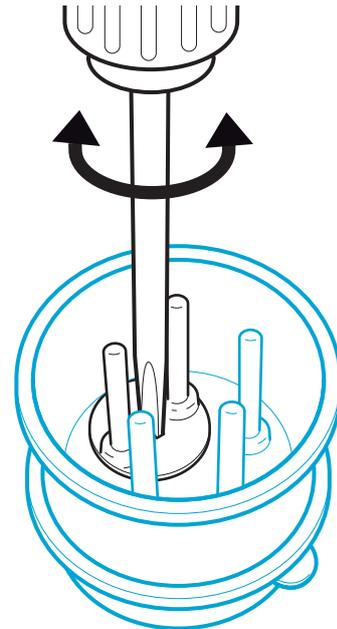
**27**

**CARRY OUT A FUNCTION CHECK** of the unit according to the checklist on page 21. Check the oil level of the refrigeration unit and install the oil filler cap. Check the cooling water level on the vehicle. Glycol according to the vehicle manufacturer's instructions.



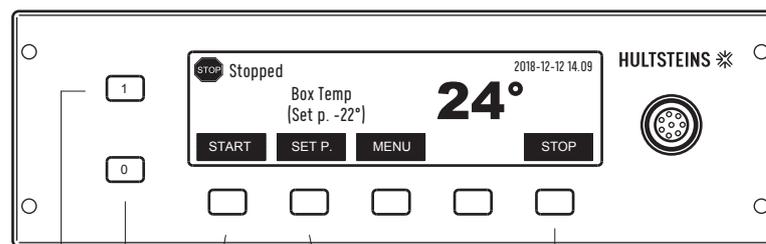
**28**

**USE A SCREWDRIVER** to adjust phase direction on the connector cable or intake.



**29**

**CONTROL PANEL**



On    Off    Start of operation    Temp adjustment    Stop of operation

Only auto operation

**!** FILL IN AND SEND BACK THE RETURN FORM ON THE NEXT PAGE TO HULTSTEINS.

IF YOU HAVE ANY QUESTIONS PLEASE CONTACT HULTSTEINS KYL AB +46 361 618 50  
[WWW.HULTSTEINS.COM](http://WWW.HULTSTEINS.COM)

# WARRANTY AND LIABILITY

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**HULTSTEINS** accepts no liability for defects or damage caused by incorrect installation, non-compliance with the installation instructions or modifications carried out without the authorisation of Hultsteins.

**THE INSTALLATION INSTRUCTIONS** are provided for information purposes only and should not be regarded as comprehensive.

**THE INSTRUCTIONS** are not intended to include all eventualities - always contact Hultsteins if you have any questions or when you need more information of any kind.

# RETURN FORM

UNIT

END USER

UNIT TYPE \_\_\_\_\_

NAME \_\_\_\_\_

UNIT NUMBER \_\_\_\_\_

ADDRESS \_\_\_\_\_

DEL. FROM HULTSTEINS \_\_\_\_\_

CITY \_\_\_\_\_

INSTALLATION DATE \_\_\_\_\_

TELEPHONE \_\_\_\_\_

VEHICLE TYPE \_\_\_\_\_

CHASSIS NO. \_\_\_\_\_

REG. NO. \_\_\_\_\_

## CHECKLIST

- 1. Check for possible damage to the unit.
- 2. Install the unit according to the instructions for the vehicle concerned.
- 3. Run the unit on hydraulic power. Check circulation and leaks.
- 4. Set the speed of the hydraulic pump.
- 5. Carry out a test run for cooling, heating and defrosting under hydraulic/diesel power.
- 6. Connect the mains power, check the phase sequence.
- 7. Carry out a test run for cooling, heating and defrosting under electric power.
- 8. Check the glycol level when performing work on the vehicle's water system.
- 9. Run a FNA/FRC test.
- 10. Fill in and sign this return form.
- 11. Write an installation report and insert it in the Hultsteins folder.
- 12. Photograph the headboard pump installation as well as the fuse location in the vehicle. Attach the images to this document.

Comments on this delivery \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature: \_\_\_\_\_

 Email the return form to [kyl@hultsteins.se](mailto:kyl@hultsteins.se) or post it to HULTSTEINS KYL AB, Fridhemsvägen 31, SE-553 02 Jönköping



**DIESEL** FREE REFRIGERATION





COOLNESS ON THE MOVE

