

# Installation and Maintenance Manual

## HYDRAULIC CYLINDER FOR INBOARD ENGINES UC 378



CE

# WFLUX





## Dear Customer,

We would like to thank you for choosing an **ULTRAFLEX** SpA product.

**ULTRAFLEX** SpA has been a leader in steering systems for pleasure and professional boats for many years.

All **ULTRAFLEX** SpA products are designed and manufactured to ensure the best performance. To ensure your safety and to maintain a high quality level, **ULTRAFLEX** SpA products are guaranteed only if they are used with original spare parts (see attached document "Application Spare Parts").

**ULTRAFLEX** SpA and Quality Management System is certified CISQ-IQNet by the Italian Shipping Registry (RINA), in conformity with the UNI EN ISO 9001:2000 rule. **ULTRAFLEX** SpA certification No. 6669/02/S (former 420/96).

The quality management system involves all the company resources and processes starting from the design, in order to:

- ensure product quality to the customer;
- maintain and improve the quality standards constantly;
- pursue a continuous process improvement to meet the market needs and to increase the customer satisfaction;
- constantly test the products to verify their conformity with the 2013/53/EU.



"Established in 1989 **UFLEX** USA is a leader in steering and control systems for the marine industry. With full manufacturing capabilities in Sarasota, Florida, **UFLEX** USA can support all sectors of the marine industry regardless of volume and/or product requirements. And, as an affiliate of the **ULTRAFLEX** Group, **UFLEX** USA has tremendous resources to draw upon for new product development in hydraulics, electronics and many other technologies.

Innovative product design and unparalleled dedication to quality customer service and products continue to be cornerstone of **UFLEX** USA's growth. Today our products can be found as originally installed equipment on many of the most widely known and respected boat brands in the world.

Aftermarket parts can be sourced from trained and experienced distributor network throughout North and South America.

Our dedication to providing the highest quality products and service is only matched by our commitment to developing new products employing the latest materials and technology to enhance our customer's boating experience. From steering wheels to sophisticated electronic controls, **UFLEX** USA has everything you need to make sure that your boat looks and perform it's best for many, many years."

**UFLEX USA**

Sarasota, FL 34243 - 6442 Parkland Drive

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## MANUAL USE AND SYMBOLS USED

THE INSTALLATION AND MAINTENANCE MANUAL is the document accompanying the product from its sale to its replacement and discharge. The manual is an important part of the product itself. It is necessary to read carefully the manual, before ANY ACTIVITY involving the product, handling and unloading included.

In this manual the following symbols are used to ensure the user safety and to guarantee the correct operation of the product:

**⚠ DANGER**

Immediate hazards which CAUSE severe personal injury or death.

**⚠ WARNING**

Denotes that a hazard exists which can result in injury or death if proper precautions are not taken.

**⚠ CAUTION**

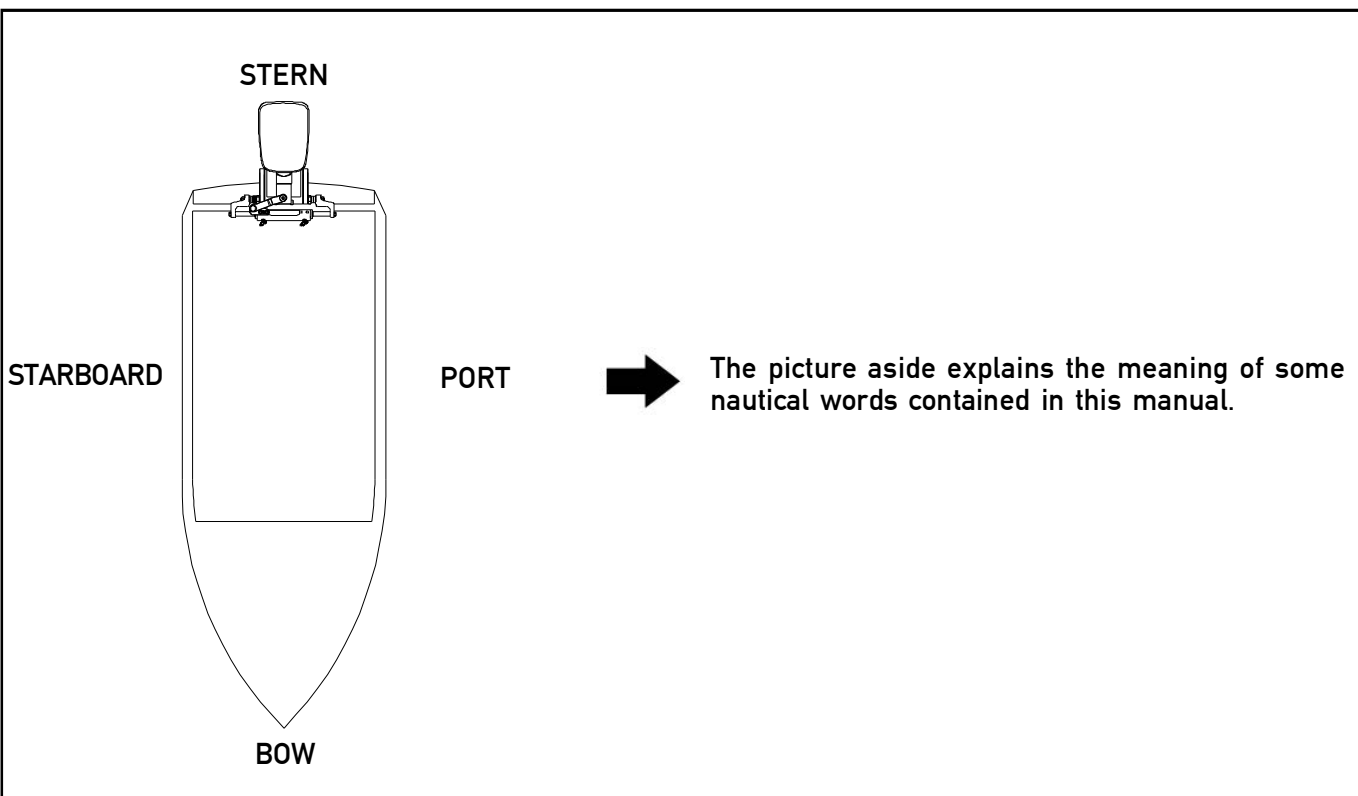
Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the craft or components or to the environment.

**NOTICE**

Important information for the correct installation and for maintenance, that does not cause any damage.



The symbol aside indicates all the operations which must be carried out by qualified or skilled staff, in order to avoid hazards. We recommend training the staff in charge of the product installation and checking their knowledge.



## INTRODUCTION

This installation and maintenance manual represents an important part of the product and must be available to the people in charge of its use and maintenance.

The user must know the content of this manual.

**UFLEX USA** declines all responsibility for possible mistakes in this manual due to printing errors.

Apart from the essential features of the described product, **UFLEX USA** reserves the right to make those modifications, such as descriptions, details and illustrations, that are considered to be suitable for its improvement, or for design or sales requirements, at any moment and without being obliged to update this publication.

ALL RIGHTS ARE RESERVED. Publishing rights, trademarks, part numbers and photographs of **UFLEX USA** products contained in this manual are **UFLEX USA** property.

Great care has been taken in collecting and checking the documentation contained in this manual to make it as complete and comprehensible as possible. Nothing contained in this manual can be interpreted as warranty either expressed or implied - including, not in a restricted way, the suitability warranty for any special purpose. Nothing contained in this manual can be interpreted as a modification or confirmation of the terms of any purchase contract.

### **WARNING**

To ensure the correct product and component operation, the product must be installed by qualified staff. In case of part damage or malfunction, please contact the qualified staff or our Technical Assistance Service.

### TECHNICAL ASSISTANCE SERVICE

#### North - South - Central America:

#### **UFLEX USA**

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## WARRANTY

- 1. Two Year Limited Warranty.** **UFLEX USA, Inc.** warrants that all products manufactured by **UFLEX USA, Inc.** or **ULTRAFLEX S.p.A.** and sold by **UFLEX USA** to the retail purchaser ("Purchaser") that for two (2) years after the date of manufacture to be free from defects due to material or workmanship, subject to the exclusions below. Improper installation **AVOIDS** this warranty. Installation should only be attempted by a trained and qualified technician.
- 2. Exclusions.** This limited warranty does not cover and does not extend to any of the following:
  - (a) Failure caused by normal wear and tear, climatic conditions, misuse, neglect, lack of proper maintenance, accident, fire or other casualty damage, racing, overloading, negligence, modification, beaching or grounding of vessel, collision, impact, towing, acts of war or hostilities;
  - (b) components not manufactured by **UFLEX USA, Inc.**, or its affiliates;
  - (c) cost of removal or reinstallation of any component (including components manufactured by **UFLEX USA, Inc.**) or disassembly or reassembly of the unit containing the component;
  - (d) components not manufactured by **UFLEX USA, Inc.** or **ULTRAFLEX S.p.A.**, whether or not warranted by the other manufacturer;
  - (e) any product which has not been properly installed.



3. **Limitations.** THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS SHALL BE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND **UFLEX USA, INC.**'S SOLE AND EXCLUSIVE LIABILITY UNDER THIS WARRANTY. LABOR FOR REPLACEMENT IS NOT INCLUDED. **UFLEX USA, Inc.**'s obligation under this warranty is limited to the repair or replacement (at **UFLEX USA, Inc.**'s sole election) of any covered item found to be defective, when delivered by Purchaser pursuant to written authorization and instructions from **UFLEX USA, Inc.**, shipping prepaid to **UFLEX USA, Inc.**'s plant or other designated repair facility. Repaired or replaced items are warranted as provided herein for the unexpired portion of the applicable warranty period. THIS WARRANTY, AND THE RIGHTS AND REMEDIES UNDER IT, IS EXCLUSIVE AND IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE, WHETHER ARISING BY LAW, CUSTOM, CONDUCT OR USAGE OF TRADE. PURCHASER'S REMEDIES SHALL BE LIMITED AS STATED HEREIN AND **UFLEX USA, INC.** SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES OR LOSSES RESULTING FROM DEFECTS. THE RETAIL SELLER IS NOT A CO-WARRANTOR AND IS NOT AUTHORIZED BY **UFLEX USA, INC.** TO AMEND OR MODIFY THIS LIMITED WARRANTY IN ANY MANNER.
4. **Transferability of Warranty.** This limited warranty may not be transferred to subsequent purchasers.
5. **Miscellaneous.** **UFLEX USA, Inc.** is an affiliate of **ULTRAFLEX S.p.A.** **UFLEX USA, Inc.**, reserves the right to make changes in the design and construction of its products at any time, without notice and without any obligation to incorporate such changes into products of prior manufacture. This limited warranty applies to new components sold by **UFLEX USA, Inc.**. This limited warranty contains the entire agreements between **UFLEX USA, Inc.** and Purchaser and supersedes all prior agreements, discussions, negotiations, commitments and representations, whether oral or written, between them regarding **UFLEX USA, Inc.**'s warranty. If any provision of this limited warranty, or the application of it, is determined to be invalid or unenforceable for any reason, the remainder of this limited warranty and the application of it shall not be affected.
6. **Ultron 3000 and PowerC.** The Ultron 3000 and "PowerC - User and Installation Manual" describes activities, operations, technical specifications which must be followed during the installation and/or usage of the product, in order to keep a valid warranty. Descriptions and drawings in that manual are suitable to allow installation and use of the product to skilled persons. In case of doubt and/or for any information, please contact our Technical Service.

All communications and notices from Purchaser regarding this limited warranty should be sent to: **UFLEX USA, INC.**, 6442 Parkland Drive, Sarasota, FL 34243; (941) 351-2628.

## Return policy

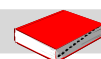
Any product that is presumed defective should be reported to **UFLEX USA** within 48 hours of receipt or discovery in the field. Upon notification **UFLEX USA** will attempt to troubleshoot the problem with our customer over the phone. If we are unable to resolve the problem **UFLEX** will issue a Return Goods Authorization number and we require that the product in question be returned to **UFLEX** with all its parts in its original packaging. The product should be returned freight prepaid to:

**UFLEX USA**  
RGA Department - RGA #  
6442 Parkland Drive  
Sarasota, Florida 34243

Upon receipt **UFLEX** will examine the product to determine the cause of the defect. If the product is determined to have a defect in workmanship or material, it will be repaired at our discretion.

Our warranty does not cover labor, towing or other expenses. Further, it does not cover products that have been improperly installed, damaged in installation, misapplied, or misused.

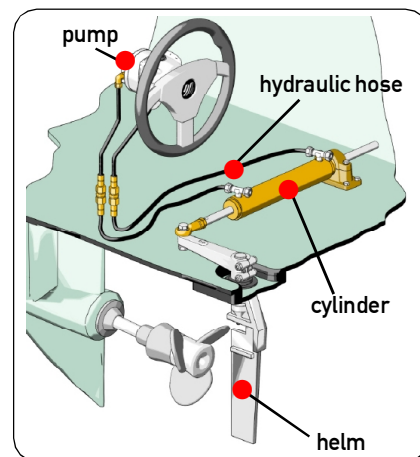
Our products are not intended for use in racing applications.



# 1 PRODUCT DESCRIPTION

## 1.1 Hydraulic steering system operation

All **UFLEX** hydraulic steering systems are designed in conformity with UNI-EN-ISO 10592 and A.B.Y.C. P21 regulations. All **UFLEX** steering systems can operate at temperatures between  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ) and  $+77^{\circ}\text{C}$  ( $+170^{\circ}\text{F}$ ). All the components are made for the marine environment, using materials and working processes which offer long life and safety under the most extreme conditions. A hydraulic steering system consists of a steering pump, a cylinder tied to the rudder or to the outboard or sterndrive engine and the connecting hoses (see picture). Under normal operating conditions, a turn of the steering wheel will pump the oil, which flows in through the hoses to the cylinder, according to the turn direction. With the consequent cylinder movement the oil will flow to the pump through the hoses and at the same time moves the engine or the helm which are connected to the cylinder. The pumps equipped with a valve which prevents outgoing fluid from returning along the same hose, allow the operation of the steering systems with two or more steering stations. The cylinders are double acting and may be balanced or unbalanced. In the unbalanced cylinders the two chambers have different volumes and so they need a different number of turns of the steering wheel and a different rotation effort. The balanced cylinders have same number of steering wheel turns in order to move the helm from the center to the end stroke in the two opposite directions. A well balanced steering system needs a correct choice of the pump for the cylinder.



**UFLEX** produces different pump models, which have different capacity ( $\text{cm}^3$  of oil moved each steering wheel turn) and for each type of installation. While choosing the pump it is important to consider the cylinder volume. The number of starboard and port turns is determined by the ratio between the cylinder volume and the pump capacity.

**Example:** if the pump has a capacity of  $28 \text{ cm}^3$  [ $1.7 \text{ cu.in.}$ ] and the cylinder has a volume of  $120 \text{ cm}^3$  [ $7.3 \text{ cu.in.}$ ], the formula looks like this:  $120/28=4.2$ . Accordingly, the steering wheel will turn 4.2 times before the cylinder will completely turn from one side to the other. In case of installations with double cylinders connected in parallel the cylinder volume must be added. Applications with less than 4 turns are not recommended, as they need a higher effort, also applications with more than 8 turns are also not recommended, as the response of the boat to steer is slowly.

## 1.2 Warnings for the product correct use

### DANGER

Do not modify the steering cylinder in any way to fit it to your application, otherwise the cylinder will no longer operate in safety and it will endanger the boat and the occupants.

### WARNING

All **UFLEX** steering systems must not be installed on boats equipped with engines whose maximum horsepower is higher than the horsepower rating approved by boat manufacturer.

### WARNING

The UC 378 cylinder must not be installed on race boats.

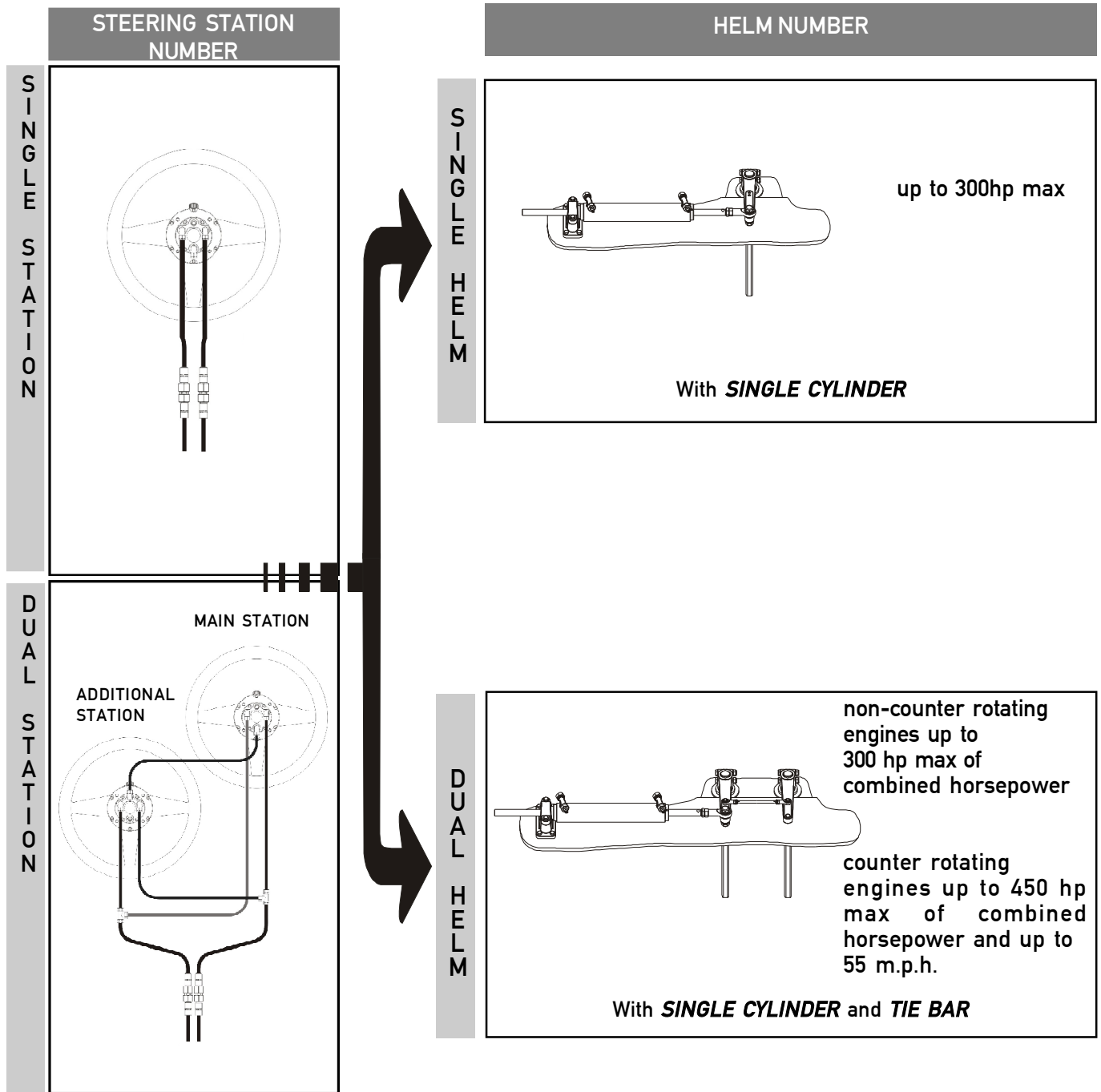
### WARNING

In dual helm applications horsepower must not exceed 450hp and boat speed must not exceed 55 m.p.h.



### 1.3 System configurations

The hydraulic cylinder for inboard engine UC 378 model can be installed with different configurations according to the number and the type of engines used with a single or dual engine steering system. The possible configurations are:



**NOTICE**

Dual engine installations require the use of a tie bar.  
 Dual station installations require the use of 2 helms with non-return valve.



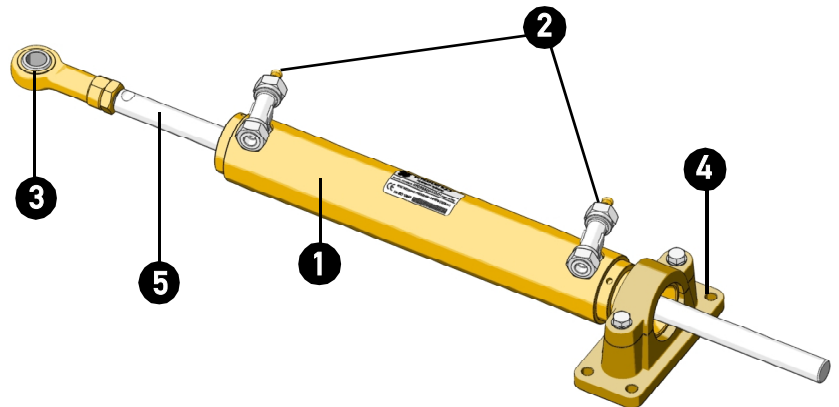


## 1.4 Cylinder description

UC 378 is a hydraulic inboard cylinder which has been designed and manufactured to be used as a component in the hydraulic steering systems, as described in the previous paragraph.

The cylinder with mobile rod is installed directly to the arm of the helm through the proper ball joint on the end part of the cylinder. On the opposite side it is fixed directly to the boat through a support with plate (see par. 3.2). For the dual helm application, the single cylinder must be mounted with a tie bar (see par. 1.3). The following picture shows the main cylinder components:

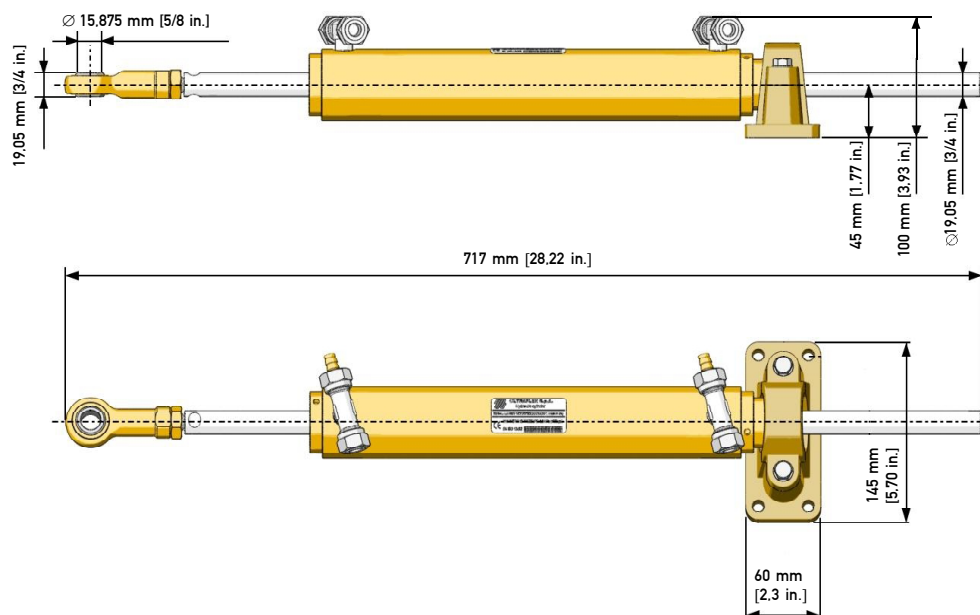
- 1 Cylinder body
- 2 Bleeders
- 3 Ball joint
- 4 Support with mounting brackets
- 5 Rod



## 1.5 Technical features

SPECIFICATIONS	UC 378
Volume	376 cc - 23 cu. in
Output force	1177 kg - 2595 lbs (@70 bar)
Torque	187.6 Kg/m - 16347 lbs/in. (@70 bar)
Inside diameter	50 mm - 1.96"
Stroke	228 mm - 8.97"
Oil	OIL15

### Overall dimensions:



## 2 TRANSPORT

### 2.1 General warnings

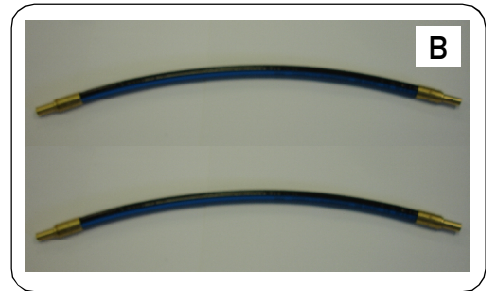
The product weight with its packaging is 9kg (19 pounds) and so it can be handled manually.

**⚠ WARNING**

The staff in charge of handling must operate with protective gloves and safety shoes.

### 2.2 Packaging contents

Before using the equipment check that the product has not been damaged during transport. Also make sure that all the standard components are in the packaging (see list). In case of damage, notify the claim to the forwarder and inform the supplier.



- A) Cylinder
- B) 2 flexible hoses for cylinder-system connection
- C) 2 fittings for flexible hose-system connection with a 12mm (0.5") hose.

**⚠ CAUTION**

The packaging must be disposed of according to the existing laws.



# 3 INSTALLATION

## 3.1 Necessary tools



Open end wrench  
22 mm (0.86")



Open end wrench  
24 mm (0.94")



Torque wrench

## 3.2 Cylinder installation



**⚠ DANGER**

An arm (1) shorter than the one indicated could move the helm instead of the cylinder up to the end stroke by causing the breaking of the steering guide and the following loss of boat control.

**⚠ WARNING**

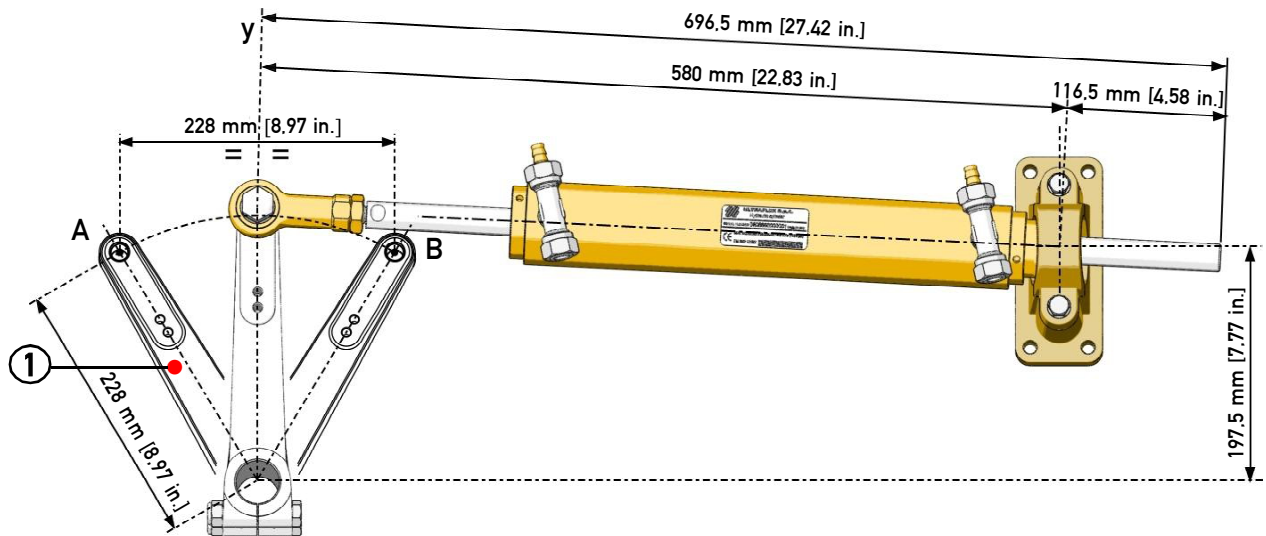
A longer arm (1) reduces the steering angle.

**NOTICE**

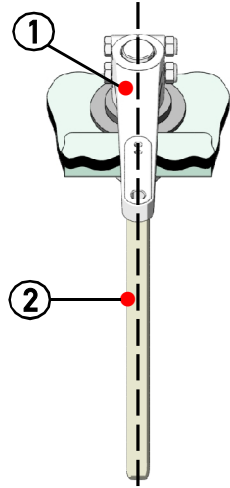
If the arm is not already mounted, see the mounting instructions of the arm manufacturer.

**NOTICE**

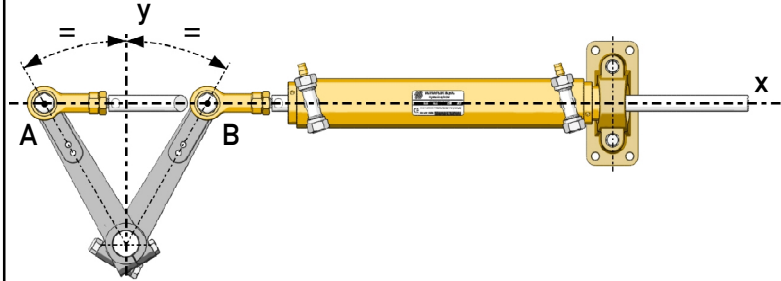
If the arm corresponds to the dimensions shown in the picture, follow the assembly drawing below, otherwise follow the indications on the following page.



**1** Check if the arm (1) and the helm blade (2) are aligned, then center them to the longitudinal axis.



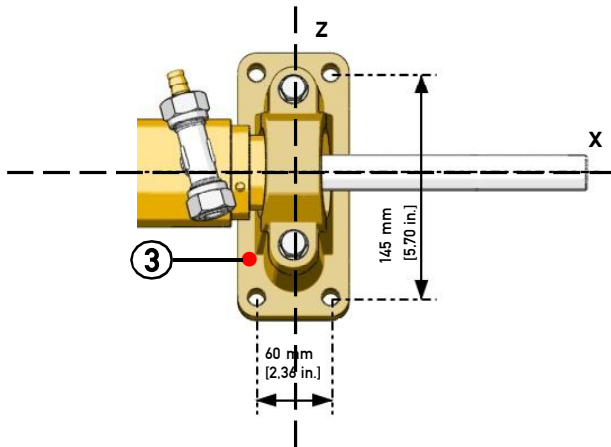
**2** Mount it by looking for the "x" imaginary line parallel to the transom. It joins the arm hole in the two "A" and "B" end stroke positions of the cylinder when the angles between the two "A" and "B" positions and the "y" longitudinal axis are the same ones. This line will be the mounting axis of the cylinder.



**3** Check if the "z" axis of the bracket (3) is perpendicular to the "x" axis of the cylinder. Fix the bracket (3) on a proper support with 4 screws diam. 8 mm (5/16") and 4 stainless steel self-locking nuts fit to bear the forces at stake (screws and nuts are not supplied).

**NOTICE**

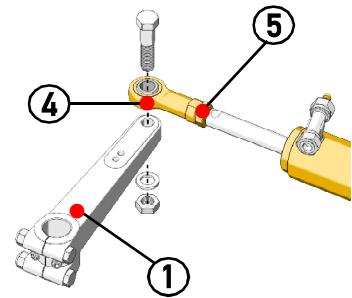
The oil fittings must be always in high position.



**4** Connect the joint (4) to the arm (1); the arm must be under the joint; (follow the instructions of the arm manufacturer).

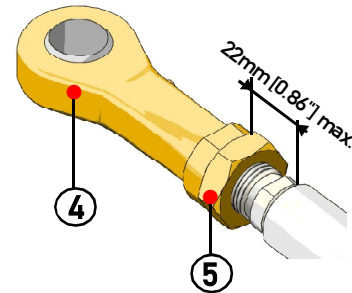
**WARNING**

The ball joint (4) must be locked by means of the safety lock nut (5) with a torque of  $100 \pm 10 \text{ Nm}$  ( $73.8 \pm 7.38 \text{ lb-ft}$ ) (22mm -0.86" wrenches and 24mm-0.94" wrenches).



**WARNING**

Fine adjustment must not exceed the value shown in the picture.



**CAUTION**

Check if the cylinder in the two "A" and "B" end stroke positions is aligned in horizontal position (parallel to the transom). Move the helm forward and backward in order to check the free movement of the cylinder and if these positions are perfectly symmetrical to the "y" axis as shown in picture 2. Be sure the movement of the ball joints is not hindered.

**DANGER**

Check if the cylinder and not the helm moves up to the end stroke.

In case of connection of the two helms with tie bar, the cylinder can be connected directly to the tie bar or to one of the helm arms; follow the instructions given with the arms and/or with the tie bar.



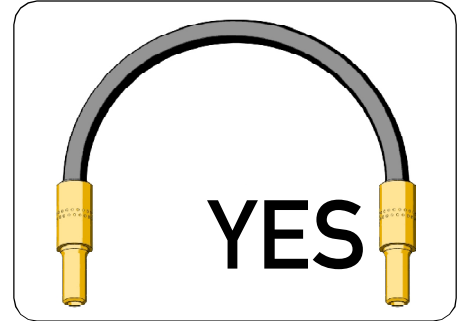
### 3.3 Hose installation



The two fittings mounted on the cylinder body are already oriented and are ready to be used.

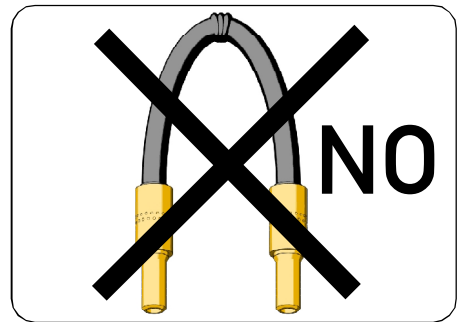
**⚠ DANGER**

The fittings mounted on the cylinder cannot be oriented. If they are unscrewed, they could be broken and the cylinder is no more usable.

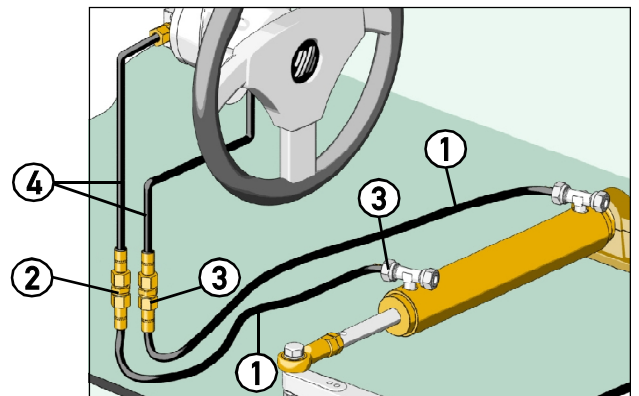


**⚠ WARNING**

An excessive hose bend could result in its internal breaking which will cause a bad operation of the system. In this case it is necessary to replace the damaged hose.



Connect the flexible hoses supplied (1) to the cylinder and to the fittings supplied (2) by tightening the nuts with ogive (3) by means of an open end wrench 22 mm (0.86") with a torque of 45-50 Nm (33.2-36.9 lb-ft). Connect the rigid tubes (4) to the pump (2) and to the fittings (2) in the same way.



**NOTICE**

The installation of the rigid tubes (4) (cutting, bending and routing) must be carried out by specialized staff by following the instructions of the manufacturer. If copper or steel tubes are used, rinsing is required.



**3.4 Type of installation**



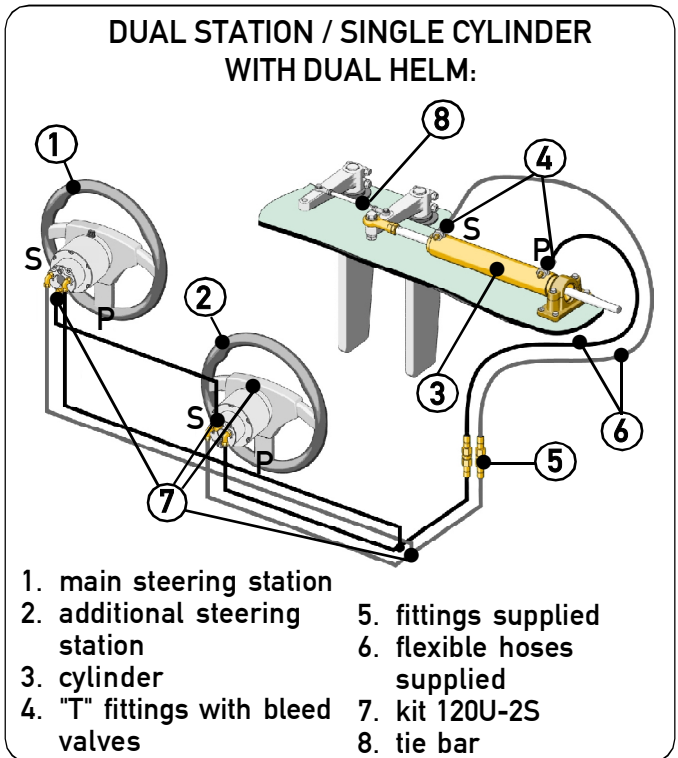
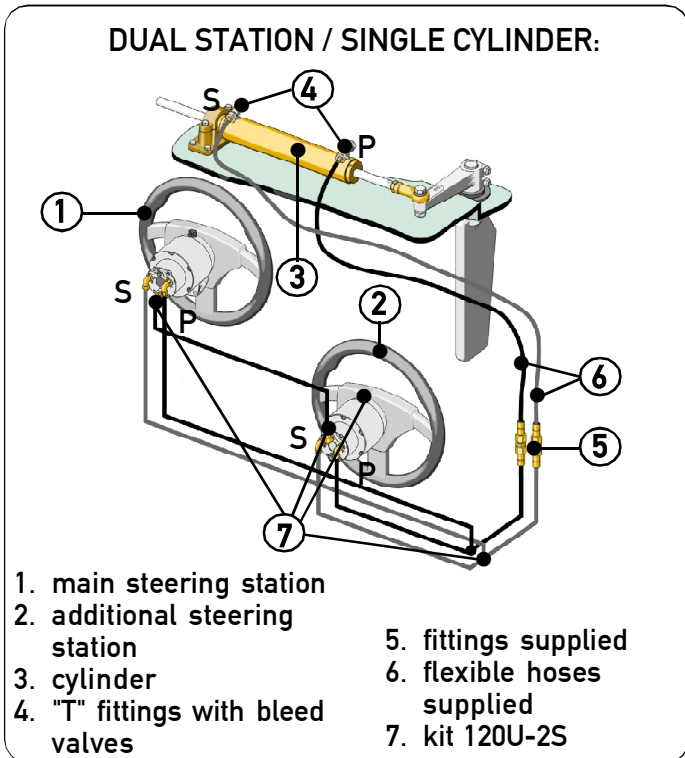
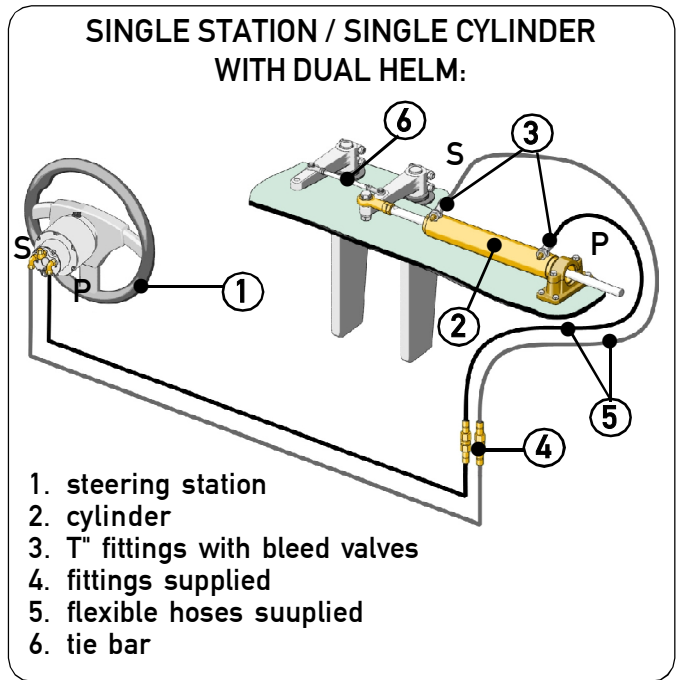
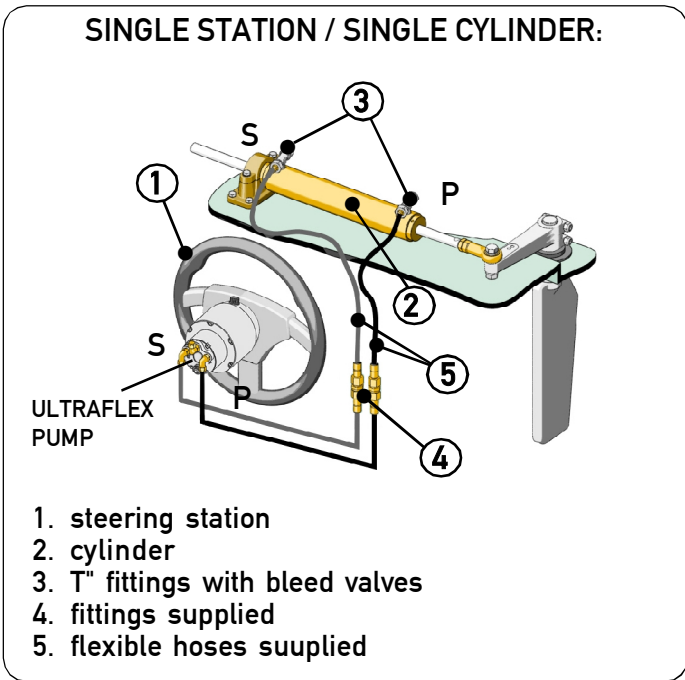
**NOTICE**

With reference to the boat, the hose which is connected to the port side (P) of the pump must be always connected to the fitting of the side port (P), while the hose which is connected to the starboard side (S) of the pump must be connected to the fitting of the starboard side (S).

**CAUTION**

Connect hoses as shown in the following pictures:

The UC 378 hydraulic cylinder for inboard engines can be installed with different configurations according to the number and the type of engines used with a single or dual steering system. The possible configurations are:





### 3.5 Filling and purging

After the first installation and after maintenance operations it is necessary to fill the system with hydraulic oil. This operation must avoid the air in the system, to ensure the good system operation. The hydraulic system must be filled from the highest point of the system, which means from the upper steering station.

**⚠ CAUTION**

To avoid air bubbles in the oil, it is necessary to fill the tank slowly.

**⚠ WARNING**

The filling and bleeding operations must be carried out at least by two operators.

**⚠ DANGER**

Use **UFLEX** oil or other compatible oils.

COMPATIBLE OILS
AGIP OSO 15
MOBIL DTE 11M
SHELL TELLUS T15
ESSO NUTO H15
Q8 HAYDN 15

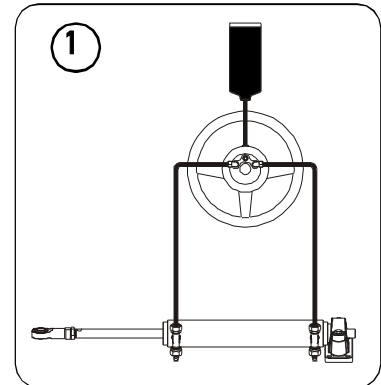
TECHNICAL FEATURES	
Viscosity at 100°C	3.3 cSt
Viscosity index	96
Flash point V.A.	190°C
Yield point	-30°C
Volumic mass 15°	0.860 kg/l

In the days after the filling, check the oil level; if necessary top off the system. At the beginning the oil level can lower, as small amounts of air can be released in a homogeneous way. According to the types of installation, it is necessary to carry out the different bleeding procedures, as it follows.

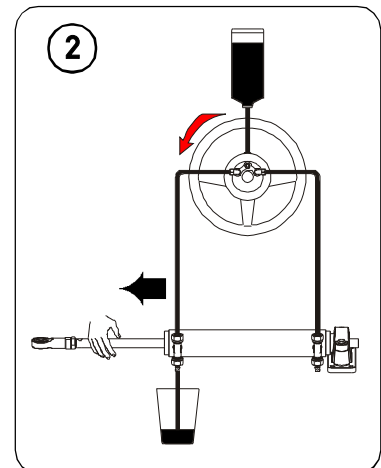


### 3.5.1 Single steering station/ single cylinder

- Unscrew the two bleed valves and manually push the cylinder body to one side until it stops as shown in picture 1.
- Position the oil bottle as explained in the picture.



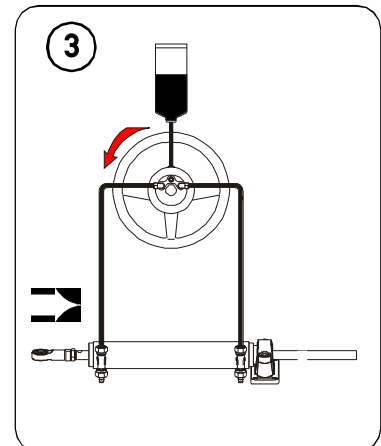
- Close the bleed valve on the cylinder end stroke side and put a purged oil tank near the other bleed valve (as shown in picture 2).
- Turn the steering wheel slowly (as shown in picture 2) so that the oil can come out of hoses.



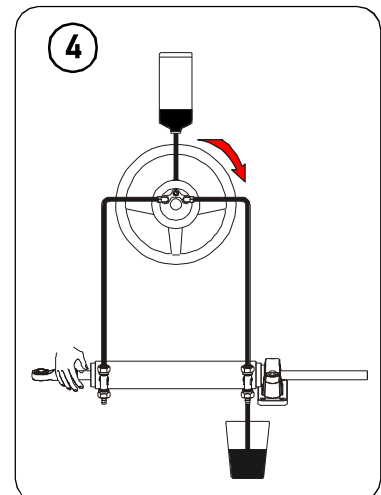
**NOTICE**

Hold the cylinder body with the hand to prevent movements caused by the air present in the cylinder chamber (picture 2).

- When the oil comes out of the bleed valve (without air bubbles), close the bleed valve and continue to turn the steering wheel in the same direction to fill the cylinder chamber (picture 3). During this phase the cylinder body will move to the opposite direction up to the end stroke.



- Open the other bleed valve and move purged oil tank to the other side. Holding the cylinder body in this position, turn the steering wheel as shown in picture 4, until oil without air bubbles comes out of the bleed valve. Then close the bleed valve.



- Repeat the entire procedure to ensure the absence of air in the system.





### 3.5.2 Dual steering station/ single cylinder

- Manually unscrew the two bleed valves on the cylinder "T" fittings and push the cylinder up to the end stroke.
- Position the oil bottle near the (upper) main steering station according to what is previously described.

**⚠ WARNING**

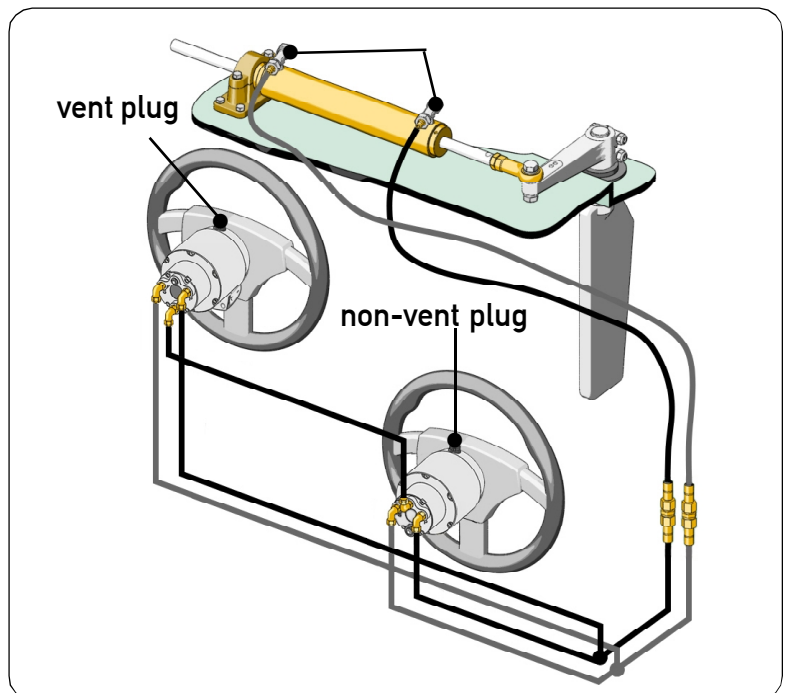
Wait until the oil reaches the lower tank and both tanks are filled.

- Follow the same bleeding procedure described in paragraph 3.5 starting from the lower station and repeat it for the upper station.

**⚠ WARNING**

For the (lower) additional steering station tank use only the non-vent plug (supplied with the "kit 120U-2S"). For the (upper) main steering station tank use only the vent plug.

- Repeat the procedure at least 3 times to ensure the absence of air in the system.



### 3.6 General recommendation

**⚠ WARNING**

It is very important to check the absence of air in the system before using the boat! We recommend trying to manually move the engine towards port and starboard, making sure that there is no movement of the cylinder body on the main cylinder shaft.

If the cylinder body moves more than 1/6 inches (15mm), there is still air in the system. The air presence in the system can cause bad responses to the controls and so it can cause damage, injuries or death.



## 4 SAFETY WARNINGS

This section shows the safety rules which must be followed for the correct equipment operation. We recommend reading carefully this section and also the other manuals supplied with the steering system components.

### 4.1 Safety warnings during use and installation

RESPECT STRICTLY the following safety rules:

**UFLEX** declines all responsibility in case the user does not follow these rules and it is not responsible for negligence during the use of the system.

#### DANGER

- **DO NOT PUT HANDS BETWEEN THE MOVING PARTS.**
- Do not disable the safety devices.
- Do not modify or add devices to the system, without **UFLEX** written authorisation or technical intervention which will prove the modification.
- Do not use the equipment for a purpose different from the one it has been designed for, which is specified in the installation and maintenance manual.
- Do not let non-specialized staff perform the installation.
- Do not disassemble the hydraulic connections before bleeding the oil in the system completely. The hoses can contain high pressure oil.

#### WARNING

- Do not put the feet on the cylinder.
- Check the system after the installation and the purging but before operating the vessel. Turn the steering wheel until the cylinder/s reaches/reach the end stroke. Turn the steering wheel to the opposite direction. Repeat on each installed helm to verify the correct installation and the system operation.
- Carefully use sealing fluid (such as Loctite). If it reaches the hydraulic system, it may cause damage and mechanical failure.
- Do not use teflon tape or adhesive tape to seal the fittings, as this material may be injected, by causing the system fail.
- During the system installation, prevent foreign matters from entering the system. Even a little object may cause lasting damage that are not detected immediately.
- Avoid too narrow bend radius of hoses.
- Avoid the hose contact with edges or sharp corners.
- Avoid the hose contact with heat sources.

### 4.2 Clothing

#### WARNING

During installation, inspection or maintenance,

IT IS STRICTLY FORBIDDEN to wear necklaces, bracelets or clothes which could get caught in the moving parts.

# 5 MAINTENANCE

## 5.1 Ordinary maintenance

### WARNING

Poor installation and maintenance may result in loss of steering and cause property damage and/or personal injury. Maintenance requirements change according to climate, frequency and the use. Inspections are necessary at least every year and must be carried out by specialized marine mechanics. Check the cylinder fittings and the seals and the helm gaskets to prevent leaks. Replace them if necessary.

To keep a suitable oil level in the tank, fill and bleed the system as described in this manual in paragraph 3.5.

Check the hose and the entire system wear, the nut and bolt tightening every six months and make sure that they are not damaged.

Clean the system using water and non-abrasive soap.

### WARNING

Use only compatible hydraulic oils, indicated in the paragraph "technical features" and "filling and bleeding". Do not use brake oils or automatic transmission fluid (ATF) in any case.

## 5.2 Troubleshooting

### WARNING

Whenever the following checks need the removal and/or disassembly of the steering system components, such work must be carried by specialized staff. **UFLEX** offers general information only and is not responsible for any consequences resulting from incorrect disassembly.

PROBLEM	CAUSE	SOLUTION
During the filling, the steering system becomes completely jammed.	<ul style="list-style-type: none"> <li>Blockage in the hoses between steering system and cylinder.</li> </ul>	<ul style="list-style-type: none"> <li>Replace hoses.</li> </ul> <div style="background-color: black; color: white; padding: 5px; margin-top: 10px;"> <b>WARNING</b>                      The damaged hose must be replaced, otherwise it may cause loss of steering and severe personal injury or property damage.                 </div>
The system is very difficult to fill. Air keeps bubbling at the top of the steering system tank even after filling the system completely.	<ul style="list-style-type: none"> <li>Air in the system.</li> </ul>	<ul style="list-style-type: none"> <li>Repeat the filling and the bleeding procedure of the system.</li> <li>Install horizontally the hoses and in any case with a maximum inclination of 3cm each meter.</li> </ul>
	<ul style="list-style-type: none"> <li>Leaks from the cylinder bleeder.</li> </ul>	<ul style="list-style-type: none"> <li>Tighten the bleeder on the cylinder.</li> </ul>
	<ul style="list-style-type: none"> <li>Coiled hose.</li> </ul>	<ul style="list-style-type: none"> <li>Uncoil and straighten the hose.</li> </ul>
	<ul style="list-style-type: none"> <li>Helm has been mounted upside down.</li> </ul>	<ul style="list-style-type: none"> <li>Mount the helm with the filling hole in up position.</li> </ul>
The steering system is stiff and hard to turn, even when the boat is not moving.	<ul style="list-style-type: none"> <li>Restrictions in hoses or fittings.</li> </ul>	<ul style="list-style-type: none"> <li>Look for and remove the restriction.</li> </ul>
	<ul style="list-style-type: none"> <li>Air in oil</li> </ul>	<ul style="list-style-type: none"> <li>Repeat the filling and the bleeding procedure of the system.</li> </ul>

<p>The steering system is stiff and hard to turn, even when the boat is not moving.</p>	<ul style="list-style-type: none"> <li>• Wrong oil has been used.</li> </ul>	<ul style="list-style-type: none"> <li>• Drain the filling and bleeding system.</li> </ul> <p><b>⚠ WARNING</b>  <b>UFLEX</b> is not responsible for damage caused by fluids that are not recommended in this manual and so the warranty is cancelled.</p>
<p>The steering system is stiff and hard to turn, even when the boat is not moving, if unbalanced cylinders are used.</p>	<ul style="list-style-type: none"> <li>• Dirt in the valve.</li> </ul>	<p><b>⚠ WARNING</b>  Do not use the boat and contact a specialized technician for the valve cleaning.</p>
<p>The steering system is easy to turn at the dock but becomes hard to turn when the boat is in motion.</p>	<ul style="list-style-type: none"> <li>• The steering wheel is too small.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the steering wheel with a bigger one.</li> </ul> <p><b>⚠ WARNING</b>  Only within the maximum dimensions allowed by the helm.</p>
	<ul style="list-style-type: none"> <li>• Incorrect setting of the torque tab.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the torque tab.</li> </ul>
	<ul style="list-style-type: none"> <li>• Air in oil.</li> </ul>	<ul style="list-style-type: none"> <li>• Check the oil level and repeat the bleeding procedure as explained in this manual.</li> </ul>
<p>When the steering wheel is turned, the rod (movable rod cylinders) or the body (fixed cylinder rod) of the cylinder do not move.</p>	<ul style="list-style-type: none"> <li>• Air in the system.</li> </ul>	<ul style="list-style-type: none"> <li>• Repeat the filling and bleeding procedure of the system.</li> </ul>
	<ul style="list-style-type: none"> <li>• Oil leak.</li> </ul>	<ul style="list-style-type: none"> <li>• Look for the leak and contact specialized staff.</li> </ul>
	<ul style="list-style-type: none"> <li>• Helm mounted upside down.</li> </ul>	<ul style="list-style-type: none"> <li>• Mount the helm with the filling hole in up position.</li> </ul>
<p>Leaks from steering system fittings.</p>	<ul style="list-style-type: none"> <li>• Bad tightening or low torque of the fittings.</li> </ul>	<ul style="list-style-type: none"> <li>• Tighten the fittings with a maximum torque of 20Nm (15 in.lbs).</li> </ul>
	<ul style="list-style-type: none"> <li>• Lack of fitting sealant.</li> </ul> <p><b>⚠ WARNING</b>  Never use teflon tape or adhesive tape on any fitting.</p>	<ul style="list-style-type: none"> <li>• Drain and disassemble the steering system. Remove the fittings and remove the oil from threads. Put the sealant on the fittings and tighten them, install the helm.</li> </ul> <p><b>⚠ WARNING</b>  After this operation it is necessary to carry out another bleeding.</p>
<p>Leaks from the tank plug.</p>	<ul style="list-style-type: none"> <li>• Bad tightening of the plug.</li> </ul>	<ul style="list-style-type: none"> <li>• Tighten the plug.</li> </ul>
	<ul style="list-style-type: none"> <li>• The vent plug (black) on the additional helm is in the lower position.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the vent plug (black) with the plug for the additional helm kit (silver).</li> </ul>
	<ul style="list-style-type: none"> <li>• Worn and damaged seal.</li> </ul>	<ul style="list-style-type: none"> <li>• Replace the plug.</li> </ul>
	<ul style="list-style-type: none"> <li>• Too high oil level.</li> </ul>	<ul style="list-style-type: none"> <li>• Follow the procedure to maintain the suitable oil level, which is described in the pump manual.</li> </ul>



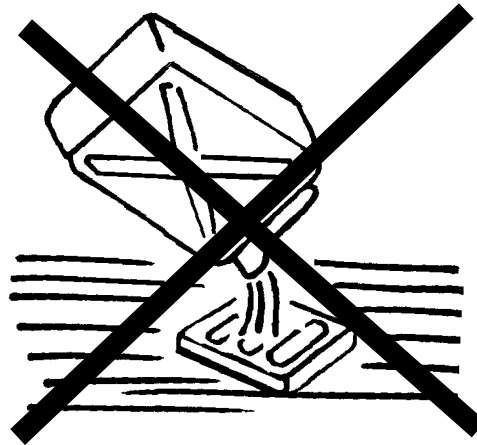
# 6 DISMANTLING

## 6.1 Dismantling

When for any reason, the steering system is put out of service, it is necessary to follow some rules in order to respect the environment.

Sheaths, pipelines, plastic or non-metallic components must be disassembled and disposed of separately.

*The steering system **CONTAINS POLLUTING OILS**  
which must be disposed of according to the rules in force in the country.*



## NOTES

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