

## HYDRAULIC TIE BAR KIT INSTALLATION INSTRUCTIONS

### DESCRIPTION AND APPLICATION:

The Hydraulic Tie Bar is intended to hydraulically link two steering cylinders together by locking hydraulic fluid between both steering cylinders.

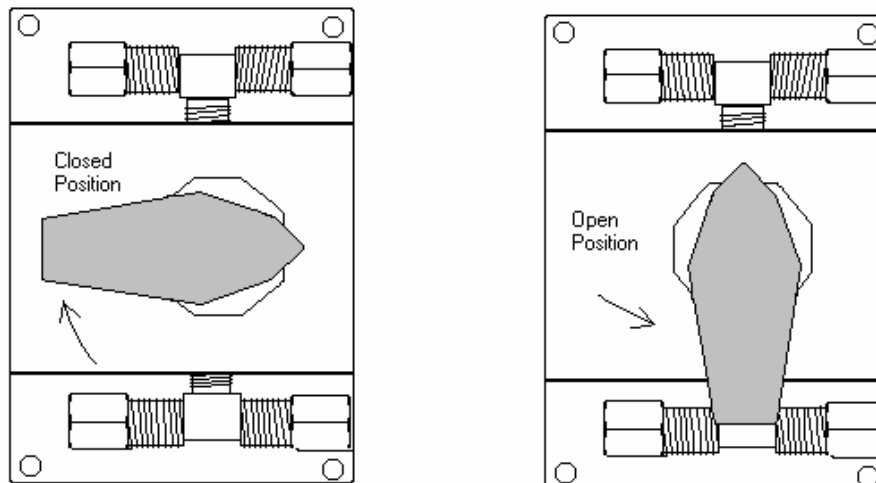
It should only be used in applications where a mechanical tie bar is not possible and only when there is sufficient distance between the engines to avoid contact with each other in the event that the engines become misaligned.

This system can only be used with balanced cylinders i.e. the volume in each chamber of the cylinder is equal to the other and where the volumes of the cylinders are equal to each other.

This system is recommended for use with the UP25 (1.5 Cubic Inch) or UP28 (1.7 Cubic Inch) hydraulic helms and is intended for use with premade hoses (KIT OB or KIT OBBHR). It should not be used with nylon tubing. Higher cubic inch helms may cause the system to be difficult to steer.

Due to high fluid pressure it may be necessary to periodically realign the toe of the engines to the original alignment specifications. Critical information relative to this alignment process is listed below. **THE ALIGNMENT PROCEDURE SHOULD ONLY BE PERFORMED WHILE THE VESSEL IS NOT UNDERWAY AND WHEN THE ENGINES ARE OFF!**

Hydraulic Tie Bar



### MOUNTING THE HYDRAULIC TIE BAR

1. Select a location to mount the Hydraulic Tie bar that will allow connection of 4 hoses with smooth entrance and exit bend radius and easy access for regular engine realignment. The mounting location should be free and clear of any objects that could inadvertently open the valve while the vessel is underway.
2. Attached the Hydraulic Tie Bar to a bulkhead using four through bolts with Nyloc washers.

### **⚠** WARNING!

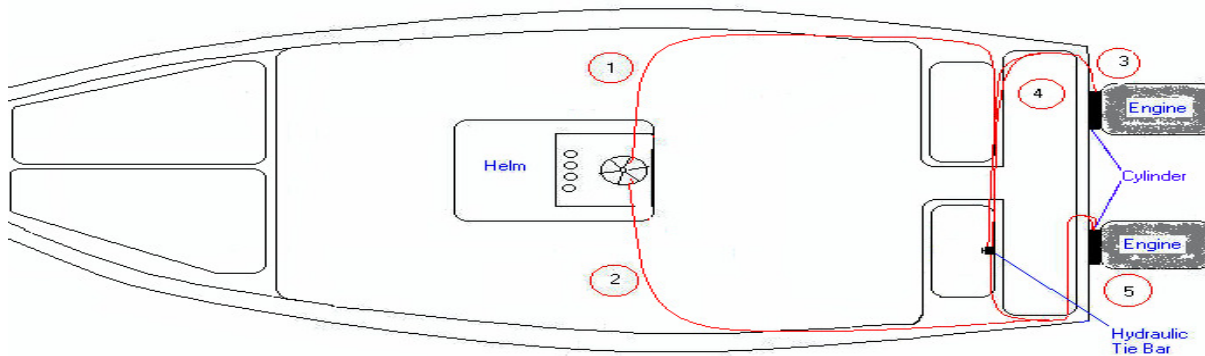
Select a mounting location for the Hydraulic Tie Bar that would not be subject to accidental opening of the valve by unsecured equipment or by any other means. Keep any and all equipment that could come in contact with the Hydraulic Tie Bar secured. A total loss of steering could occur causing serious injury to the vessel and its occupants.



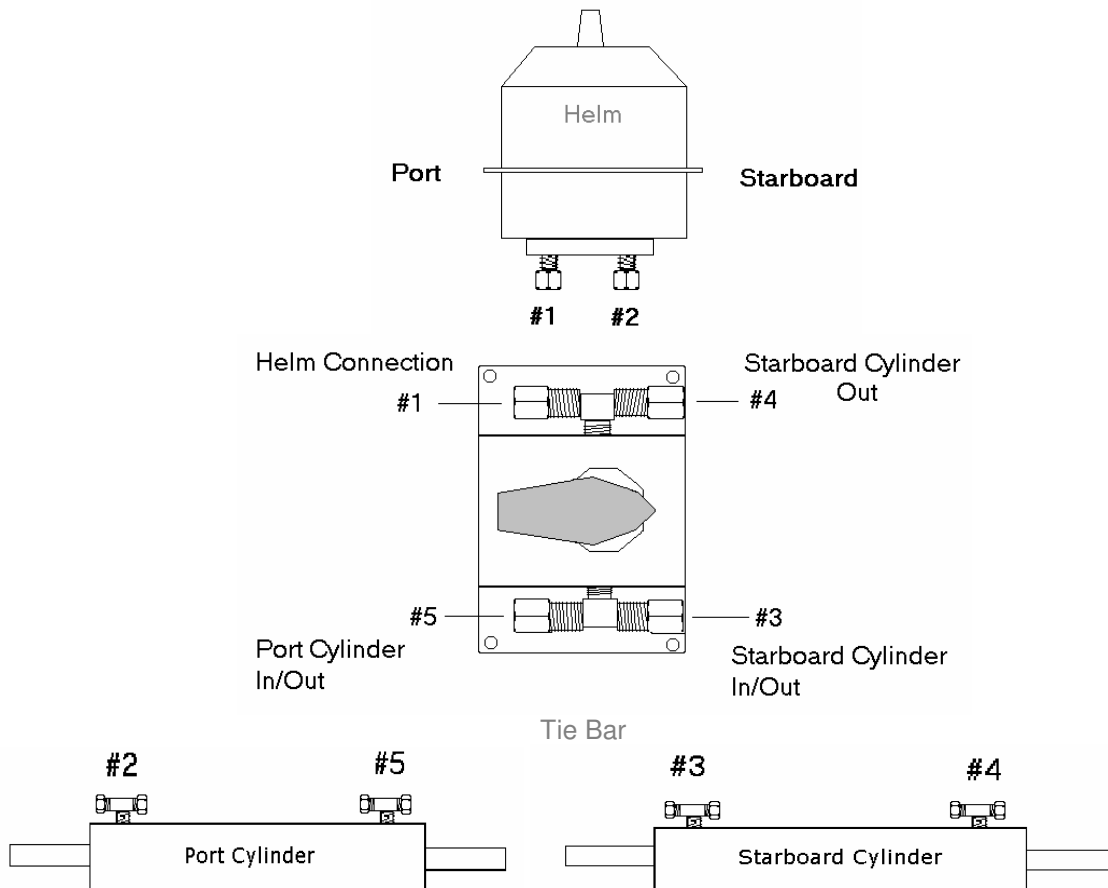
## WARNING!

Serious injury can occur if the Hydraulic Tie Bar valve is opened while the vessel is underway. A total loss of steering will occur causing serious injury to the vessel and its occupants.

## HOSE CONNECTION INSTRUCTION

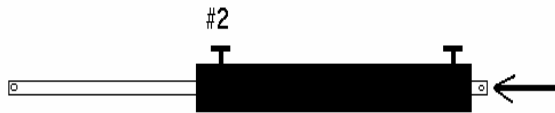


- Hose #1 connects to the helm pump and to the hydraulic tie bar.
- Hose #2 connects to the helm and to the Port steering cylinder.
- Hose #3 connects from the hydraulic tie bar to the Starboard steering cylinder.
- Hose #4 connects from the hydraulic tie bar to the Starboard steering cylinder.
- Hose #5 connects from the hydraulic tie bar to the Port steering cylinder.



## PURGING INSTRUCTIONS

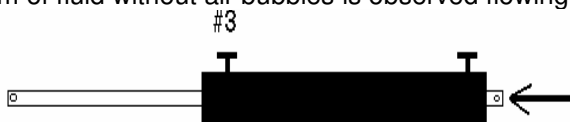
1. Attach the filling barb provided with the helm to the clear tube and fill cap of Oil 15.
2. Pour hydraulic oil into the helm until the helm is completely full and no air is showing in the clear tube between the helm and the oil bottle.
3. Turn the hydraulic tie bar valve to the open position.
4. On the Port cylinder, open the bleeder fitting on the Port side (#2).
5. Push the cylinder rod to the Port side to its fully extended position.
6. Slowly rotate the steering wheel in a counter clockwise direction pushing fluid into the cylinder and pushing air out.
7. Once a steady stream of fluid without air bubbles is observed flowing from the bleeder, close the bleeder fitting



1. Move to the Starboard cylinder and open the bleeder fitting on the Starboard side (#4)
2. Push the cylinder rod to the Starboard side to its fully extended position
3. Slowly rotate the steering wheel in a clockwise direction pushing fluid into the cylinder and pushing air out
4. Once a steady stream of fluid without air bubbles is observed flowing from the bleeder, close the bleeder fitting



1. Again, on the Starboard cylinder and open bleeder fitting on the Port side (#3)
2. Push the cylinder rod to the Port side to its fully extended position
3. Slowly rotate the steering wheel in a counter clockwise direction pushing fluid into the cylinder and pushing air out
4. Once a steady stream of fluid without air bubbles is observed flowing from the bleeder, close the bleeder fitting



1. Moving to the Port cylinder, open bleeder fitting on the Starboard side (#5)
2. Push the cylinder rod to the Starboard side to its fully extended position
3. Slowly rotate the steering wheel in a clockwise direction pushing fluid into the cylinder and pushing air out
4. Once a steady stream of fluid without air bubbles is observed flowing from the bleeder, close the bleeder fitting



Now that you have bled the system you will need to align the cylinders using the alignment instructions. Once the cylinders are aligned the steering system will need to be rotated fully to the Port and fully to the Starboard side 3 to 4 times. This circulation of fluid will purge any remaining air. If there is any air trapped in the system it will purge through the vented cap in the helm pump. The oil level should be checked often during the first few days after filling and top off if necessary.

## ALIGNNING THE ENGINES

When setting the alignment of the rudders and/or outboard motors the optimum method is to measure the toe in or out. The misalignment of the engines may not be visible to determine if the condition is toe in or out.

The hydraulic tie bar will align itself using the full stroke of the steering cylinders and/or the stop datum of the engine brackets.

Using the instructions provided below will allow the correction of either misalignment conditions.

1. Start the alignment by fully turning the steering wheel to the Starboard direction.
2. Once the steering wheel stops rotating, turn the hydraulic tie bar to the "Open" position
3. Turn the steering wheel to the Starboard direction again
4. Once the steering wheel stops rotating, turn the hydraulic tie bar to the "Closed" position
5. Continue re-alignment by turning the steering wheel to the Port direction.
6. Once the steering wheel stops rotating, turn the hydraulic tie bar to the "Open" position
7. Turn the steering wheel to the Port direction again
8. Once the steering wheel stops rotating, turn the hydraulic tie bar to the "Closed" position

By exercising this alignment procedure the vessel will steer in the appropriate manner for safe operation.

### **WARNINGS!**

This steering system can only be used when the engine is in compliance with the approved U.S. Coast Guard vessel horsepower rating.

When installing this steering cylinder to an engine mounted to an engine jack plate trim system, a manual clearance check must be made in all moveable positions after steering cylinder is completely installed.

Failure to comply with the installation manual for the correct engine application, cylinder clearance specifications, hose routing guide lines, and approved hydraulic fluids, may result in loss of steering, causing serious property damage and / or personal injury. Not for racing applications.

Before operating the vessel it is extremely important to check for adequate clearance of all parts of the steering system and boat.

## MAINTAINANCE AND SAFETY

1. Periodically clean and inspect the Tie Bar and Steering System for wear and tear, immediately replacing any items that appear to be substandard.
2. Do not substitute or replace parts with anything of other than factory provided parts and accessories.
3. Do not step or stand on the tie bar assembly or use it to tie a ski rope or tow line.
4. This product is not intended for racing applications.

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### European Contact:

**Uflex S.r.l.**  
Via Milite Ignoto, 8A  
16012 Busalla (GE) – Italy  
Tel: 011.39.010.962.01  
Fx: 011.39.010.962.0350  
Email: [ut@ultraflexgroup.it](mailto:ut@ultraflexgroup.it)  
[www.ultraflexgroup.it](http://www.ultraflexgroup.it)

### North American Contact:

**Uflex USA**  
6442 Parkland Drive  
Sarasota, FL 34243  
Tel: 941.351.2628  
Fx: 941.360.9171  
Email: [uflex@ulfexusa.com](mailto:uflex@ulfexusa.com)  
[www.ulfexusa.com](http://www.ulfexusa.com)

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