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**INSTALLER: THESE INSTRUCTIONS CONTAIN IMPORTANT SAFETY INFORMATION AND MUST BE FORWARDED TO THE BOAT OWNER.**

These instructions describe how to install **SAFE-T HELMS** for a **PERFORMANCE TILT** steering system. Instructions for installing steering cables are also included.

In addition to this kit the following components are required for a complete **PERFORMANCE TILT** system.

- PERFORMANCE TILT MECHANISM
- STEERING CABLE SSC 62- LENGTH for Quick Connect helms (two required for dual helms)
- STEERING CABLE SSC72-LENGTH, for standard helms. (Two required for dual helms)
- STEERING WHEEL, (maximum diameter 16 inches.) see Teleflex catalog.
- ENGINE CONNECTION KIT, see Teleflex catalog. (use engine makers kit for dual cable systems.)

### WARNING

BEFORE STARTING INSTALLATION READ THESE INSTRUCTIONS AND ENGINE MAKERS INSTRUCTIONS THOROUGHLY. FAILURE TO FOLLOW EITHER OF THESE INSTRUCTIONS OR INCORRECT ASSEMBLY CAN RESULT IN LOSS OF CONTROL AND CAUSE PROPERTY DAMAGE OR INJURY.

DO NOT SUBSTITUTE PARTS FROM OTHER MANUFACTURERS, THEY MAY CAUSE A SAFETY HAZARD FOR WHICH TELEFLEX INC., USA CANNOT ACCEPT RESPONSIBILITY. USE TELEFLEX STEERING CABLES ONLY WITH THIS HELM.

TO AVOID EXCESSIVE STEERING LOADS, AND TO GET THE BEST STEERING PERFORMANCE, THE OUTBOARD MOTOR OR OUTDRIVE TRIM TABS AND TILT POSITION MUST BE ADJUSTED AS INSTRUCTED IN THE MOTOR MANUFACTURERS OPERATION MANUAL. FAILURE TO DO SO CAN EFFECT THE PERFORMANCE OF THE BOAT AND ITS SAFE OPERATION.

DO NOT ATTACH ANY ELECTRICAL GROUND WIRES TO THE HELM. THIS WOULD RESULT IN AN ELECTROLYTIC REACTION TO THE STEERING CABLE THAT MAY RESULT IN CABLE FAILURE OR GREATLY REDUCED SERVICE LIFE.

**NOTE:** Helms and cable assemblies are supplied lubricated ready for installation, do not add any lubricant to either assembly. Use of other lubricants can cause damage to the steering cable, resulting in the cable seizing or premature wear. Keep the cable clean during installation. Dirt will damage the system and cause premature wear. Do not take the plastic sleeve off the end of the cable until you are ready to install it into the helm.

### WARNING

HELMS MUST NOT BE DISASSEMBLED FOR ANY REASON. REMOVAL AND REPLACEMENT OF THE HARDWARE WHICH LOCKS THE STEERING SHAFT TO THE HELM ASSEMBLY MAY LEAD TO TOTAL FAILURE OF THE SYSTEM WHICH COULD RESULT IN PERSONAL INJURY OR PROPERTY DAMAGE.

### PREPARATION FOR INSTALLATION

Locate the position for the steering wheel on the console or dashboard. The steering cable can enter the helm from either port or starboard. The dimensions shown in Figures 1 & 2 must be maintained to ensure proper clearances.

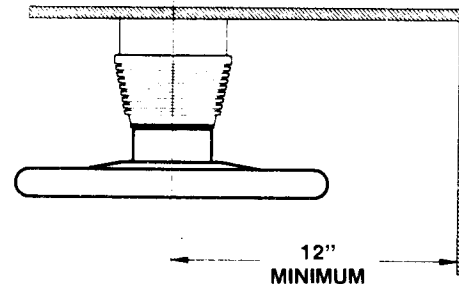


Figure 1

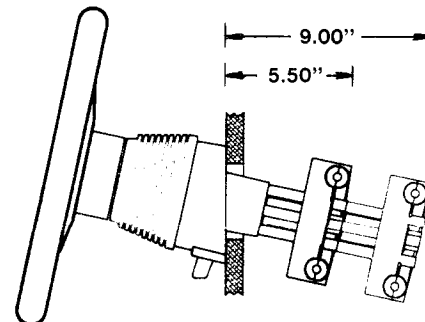


Figure 2

Position the template, Figure 3, on the console or dashboard, at the position previously marked. Drill three holes 5/16 inches diameter and one hole 2-7/8 inches diameter.

### HELM MOUNTING BRACKET INSTALLATION.

Secure the helm mounting bracket (item 3) in position using hex bolts (item 4), large flat washers (item 6) and locknuts (item 8). See Figure 4.

Before the helm can be attached to the mounting bracket the routing of the steering cables must be determined.

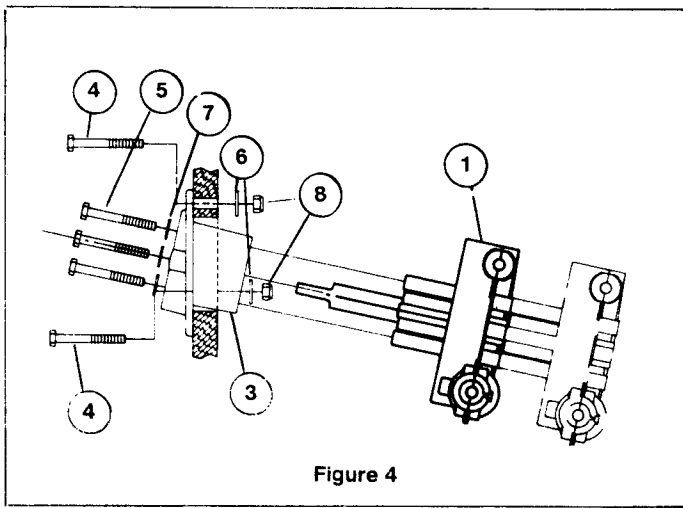


Figure 4

### STEERING CABLE ROUTING

The cable(s) should, if possible, be routed to the starboard side of the boat in order to balance engine torque. When routing the cable(s) select a path with the minimum number of bends, making the bends as large as possible. **DO NOT MAKE BENDS LESS THAN 8" RADIUS.** Sharp or frequent bends will result in hard steering and premature cable wear. When necessary to pass through a bulkhead, a 1-1/2 inch dia. hole is required. Cable(s) should be clamped or tied for support at regular intervals.

#### CAUTION

*CABLES MUST NOT BE BUNDLED WITH ELECTRICAL WIRES OR REST ON SHARP EDGES WHICH COULD CAUSE CHAFING.*

### HELM INSTALLATION

Insert shaft of helm (item 1) through hole in the Mounting Bracket orienting in the proper direction for steering cable entry and attach the helm securely to the mounting bracket using washers (item 7) and hex bolts (item 5) threaded into the helm. See Figure 4.

**At this time refer to the instructions packed with the tilt mechanism hardware kit and install the tilt mechanism and the steering wheel.**

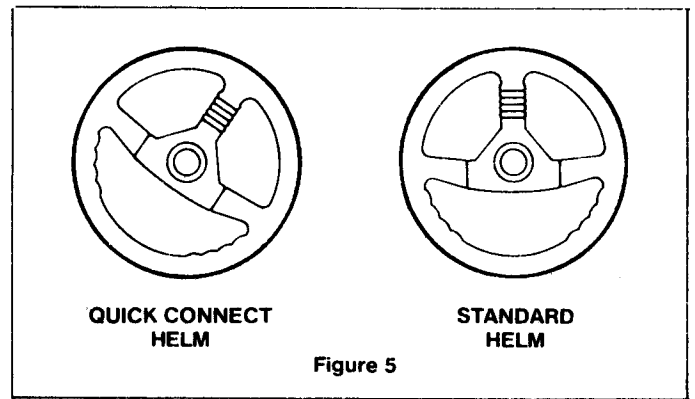
### STEERING CABLE INSTALLATION.

Before the steering cable is installed the steering wheel should be positioned as shown in Figure 5, so that it is in the correct orientation when the installation is completed.

#### SINGLE CABLE - QUICK CONNECT HELM

**STEP 1.** Remove the pin from the cable entry of the helm. **DO NOT REMOVE TAG FROM THE PIN.** Remove the protective sleeve from the cable end, making sure that dirt does not get onto the lubricated cable end.

**STEP 2.** Feed the cable end into the **LOWER** Helm entry spigot until it contacts the internal gear, then turn the steering wheel to draw the cable fully into the helm, (see Figure 6). Continue turning the steering wheel until the end fitting of the cable is entered into the entry spigot, and the steering wheel cannot be turned further. During this you may hear a click as the locking mechanism engages. Turn the steering wheel fully in the other direction until it cannot be turned any further, check that the cable end fitting is retained inside the entry spigot.



**STEP 3.** Replace the pin as shown in Figure 7, making sure that it is fully seated. **DO NOT REMOVE TAG FROM PIN.**

**STEP 4.** Turn the steering wheel fully to both extremes of rotation and check that the cable fitting is retained in the entry spigot.

**STEP 5.** Feed the Spent Travel Tube (item 2) over the exposed cable and thread the Retaining Nut onto spigot. Tighten the nut hand tight.

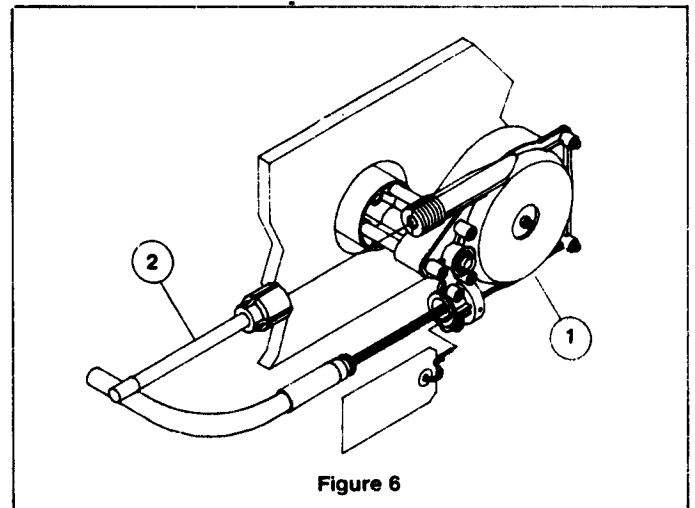
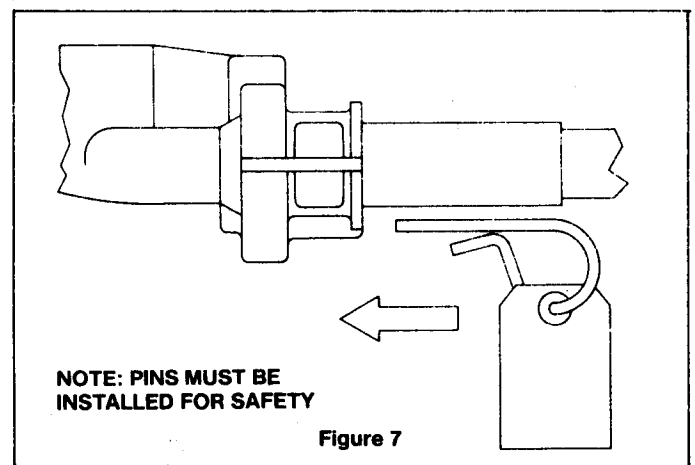


Figure 6



### SINGLE CABLE - STANDARD HELM.

**STEP 1.** Remove the Protective sleeve from the Steering cable, making sure that dirt does not get onto the lubricated cable end. Feed the cable end into the lower Helm entry spigot until it contacts the internal gear, then turn the steering wheel to draw the cable fully into the helm. Continue turning the steering wheel until the end fitting on the cable is flush with the entry spigot.

**STEP 2.** Thread the Steering Cable Coupler Nut onto the lower entry spigot and tighten securely. **NOTE:** The coupler nut has a locking ring in the threads. Make sure the nut is drawn up fully and that the locking ring is engaged. Threads will not be visible when correctly installed. If you do not tighten this nut fully there will be excessive play in the steering wheel.

**STEP 5.** Feed the Spent Travel Tube (item 2) over the exposed cable and thread the Retaining Nut onto spigot. Tighten the nut hand tight.

**STEP 6.** Rotate the steering wheel several times from stop to stop, and watch the movement of the Steering Cable output ram. Turning the steering wheel clockwise should cause the ram to extend.

### CONNECTION TO THE ENGINE.

For engine-mounted steering systems, slide the output ram through the engine support tube. Thread the Cable Coupler Nut fully onto the support tube. **NOTE:** The Coupler Nut has a locking ring in the threads. Make sure the Coupler Nut is drawn up fully and the locking ring is engaged. If you do not tighten this nut fully there will be excessive play in the steering wheel. Connect the cable output ram to the engine tiller arm as shown in the instructions packed with the connection kit.

#### CAUTION

*ENSURE THAT THE CABLE OUTPUT END IS NOT BENT WHEN INSTALLING. IF NECESSARY REMOVE ENGINE FROM THE BOAT.*

For boat-mounted steering systems, attach cable to boat and engine in accordance with instructions furnished with connection kits.

### DUAL CABLE - QUICK CONNECT HELM.

**STEP 1.** Remove the pins from the cable entries of helm, **DO NOT REMOVE TAGS FROM PINS.**

**STEP 2.** Push both the output rams of the cables to the fully retracted position. Make sure that they stay fully retracted during installation into the helm. Remove the protective sleeves from Steering Cables, make sure that dirt does not get onto the lubricated cable ends. Hold both the cables together at the helm end with the faces of the conduit fittings flush, as shown in Figure 8.

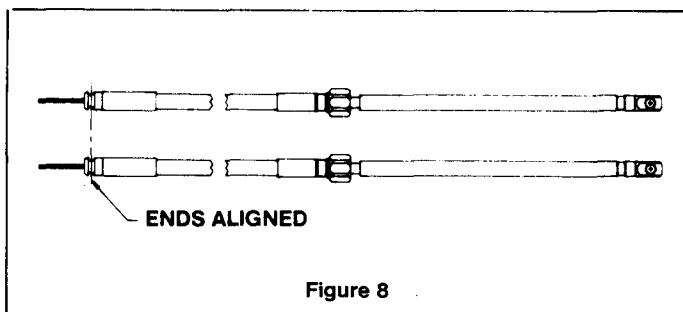


Figure 8

**STEP 3.** Feed the cable ends into the **LOWER** entry spigots, keeping the conduit fittings aligned, until they contact the internal gears. Then turn the steering wheel to draw the cables fully into the helm. Continue turning steering wheel until end fittings of cables are entered into the entry spigots, and the steering wheel cannot be turned further. During this you may hear a click as the locking mechanism engages. Turn the steering wheel fully in the other direction until it cannot be turned any further, check that the cable end fitting are retained inside the entry spigots.

#### WARNING

IT IS POSSIBLE THAT ONE CABLE MAY NOT BE FULLY ENGAGED AT THIS TIME. CHECK THAT BOTH CABLES ARE FULLY ENGAGED BY PUSHING EACH CABLE FULLY HOME, TO SEAT THEM PROPERLY.

**STEP 4.** Replace the pins as shown in Figure 7, making sure that they are fully seated. If one pin cannot be inserted, that cable is not fully seated in the helm. Push on the cable to ensure that it is fully home. Replace pins as shown in figure 7. **DO NOT REMOVE TAGS FROM PINS.**

**STEP 5.** Feed the Spent Travel Tubes (item 2) over the exposed cable ends and thread the Retaining Nuts onto spigots. Tighten nuts hand tight.

**STEP 6.** Rotate the steering wheel several times from stop to stop, and watch the movement of the Steering Cable output rams. Turning the steering wheel clockwise should cause the rams to extend.

### DUAL CABLE - STANDARD HELM.

**STEP 1.** Push both the output rams of the cables to the fully retracted position. Make sure that they stay fully retracted during installation into the helm. Remove the protective sleeves from the Steering Cables, make sure that dirt does not get onto the lubricated cable ends. Hold both the cables together at the helm end with the faces of the conduit fittings flush, as shown in Figure 8.

**STEP 2.** Feed the cable ends into the lower Helm entry spigots until they contact the internal gears, then turn the steering wheel to draw the cables fully into the helm. Continue turning the steering wheel until the end fittings on the cables are flush with the entry spigots.

**STEP 3.** Thread the Steering Cable Coupler Nuts onto the lower entry spigots and tighten securely. **NOTE:** The coupler nuts have locking rings in the threads. Make sure the nuts are drawn up fully and that the locking rings are engaged. Threads will not be visible when correctly installed. If you do not tighten these nuts fully there will be excessive play in the steering wheel.

**STEP 5.** Feed the Spent Travel Tubes (item 2) over the exposed cable ends and thread the Retaining Nuts onto spigots. Tighten nuts hand tight.

**STEP 6.** Rotate the steering wheel several times from stop to stop, and watch the movement of the Steering Cable output rams. Turning the steering wheel clockwise should cause the rams to extend.

## CONNECTION TO ENGINE.

The steering cables can now be connected to the engine, using a connection kit available from the engine maker or an approved equivalent.

### CAUTION

*ENSURE THAT THE CABLE OUTPUT ENDS ARE NOT BENT WHEN INSTALLING THEM. IF NECESSARY REMOVE THE ENGINE FROM THE BOAT.*

Adjustment of the connection kit is critical to the operation of two cable systems. If the instructions are not followed exactly the steering will be heavy and could be subject to accelerated wear. Adjustments must be made and tested with the boat under operating conditions. To fine tune the system, install the connection kit without adjusting the second cable tube. Turn the steering wheel so that you get a feel of the load to move the engine. Move the engine from side to side and check the amount of free play in the cables. Adjust the connection kit tube until as much of the free play is removed as possible **WITHOUT INCREASING THE LOAD AT THE STEERING WHEEL**. Tighten both adjusting nuts and test drive the boat. Readjust the connection kit if necessary.

PARTS LIST			
Item	Description	Single	Dual
1	Helm	1	1
2	Spent travel tube	1	2
3	Helm mounting bracket	1	1
4	Hex bolt 1/4 x 2-1/8	3	3
5	Hex bolt 1/4 x 5-1/2	3	3
6	Large washer	3	3
7	Flat washer	3	3
8	Locknut	3	3

## MAINTENANCE NOTES

1. After a few hours of operation and at frequent intervals thereafter, check all fasteners and the complete steering system for security and integrity.

### DANGER

**LOOSENING OR LOSS OF ONE OR MORE FASTENERS MAY CAUSE FAILURE OF THE STEERING SYSTEM RESULTING IN LOSS OF STEERING CONTROL AND COULD CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.**

2. Keep all moving parts free from build-up of salt and other foreign material. This will affect their operation and create steering problems. Pay particular attention to the hinge tube of outboard motors. Periodically remove the cable, clean hinge tube thoroughly and lubricate with a waterproof grease.

3. Inspect periodically for corrosion. Any parts affected by corrosion must be replaced. When replacing hardware, self-locking hardware **MUST** be used.

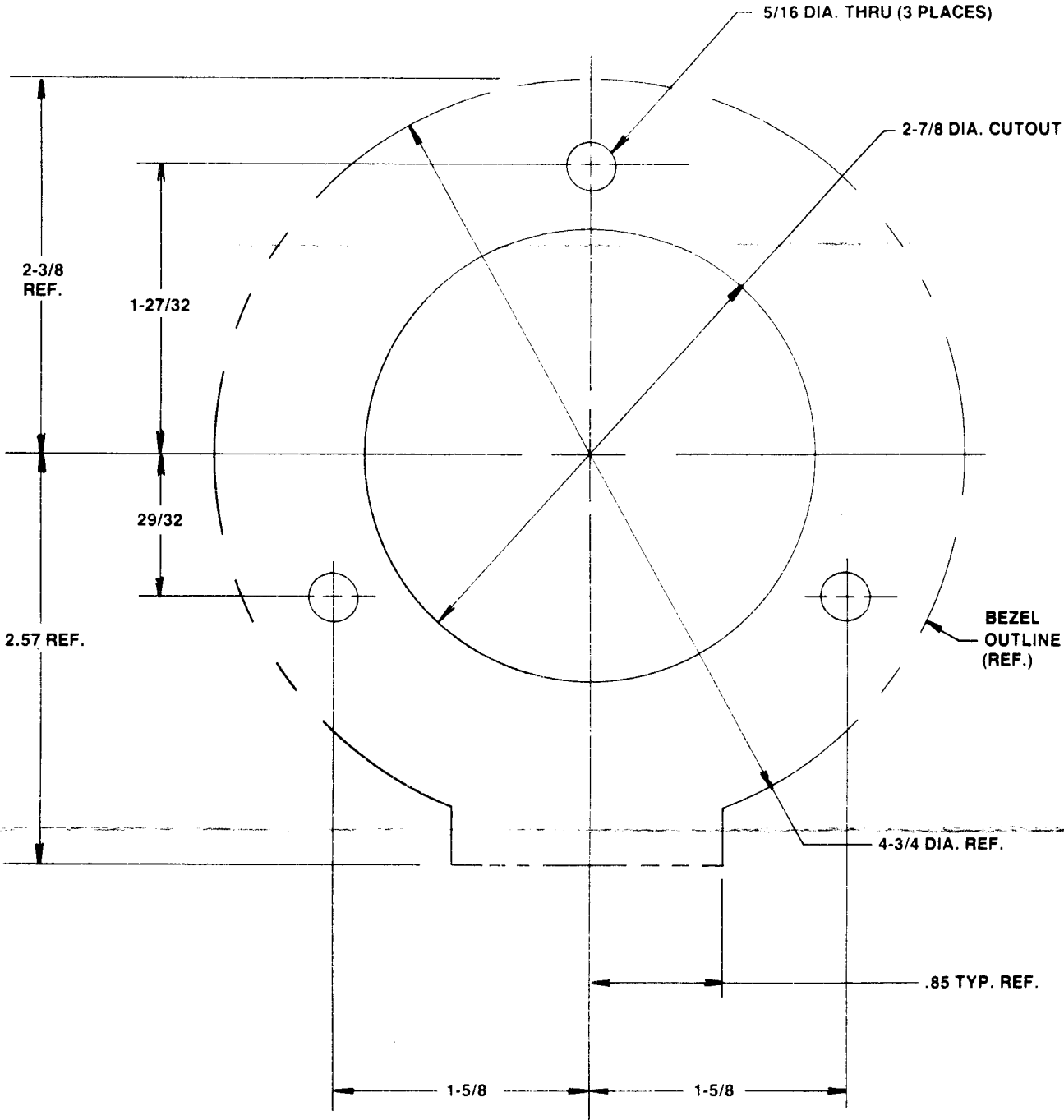
4. Inspect steering cable periodically for cracks or other damage. If any are found the cable must be replaced.

### DANGER

**DO NOT COVER CRACKS WITH TAPE OR OTHER SEALANTS, THIS WILL CREATE A HAZARD IN WHICH THE CABLE CAN FAIL SUDDENLY WITHOUT WARNING, RESULTING IN LOSS OF STEERING CONTROL.**

KEEP THESE INSTRUCTIONS WITH YOUR BOAT FOR FUTURE REFERENCE.

SH915XX SERIES PERFORMANCE TILT SYSTEM



TEMPLATE

Figure 3