

# INSTALLATION INSTRUCTIONS

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## 230301 LT Rotary Steering System

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**NOTICE : THIS INSTRUCTIONS CONTAIN IMPORTANT SAFETY INFORMATION AND MUST BE FORWARDED TO BOAT OWNER.**

### INTRO

These instructions show how to install the following products for Rotary Steering System. See Fig 1.

PRODUCT NUMBER	DESCRIPTION
230301	LT Rotary Steering System

In addition, please check the following components are prepared.

COMPONENT	DESCRIPTION
Installation Kit	See Fig 2.
Steering Cable	See Fig 3. (2500XX)
Steering Wheel	See Fig 4. ( Not included )

And following tools are required. See Fig 5.

TOOL	DESCRIPTION
Spanner	1/4", 5/16"
Driver	Cross Head Type
Hand Drill	φ 5mm[0.2"], φ 6.8mm[0.26"]
Hand Saw	φ 64mm[2.5"] General

Please mind some warning as next :

**CAUTION**

CAUTION - Hazards or unsafe practices which COULD result in minor or moderate injury if the warning is ignored

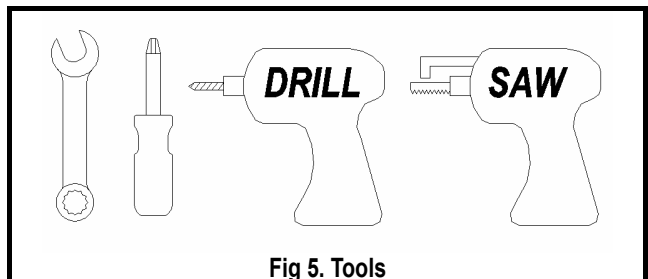
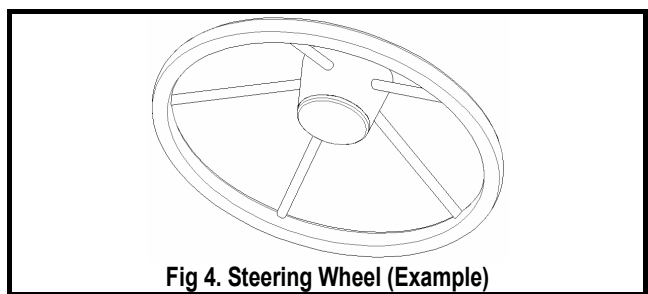
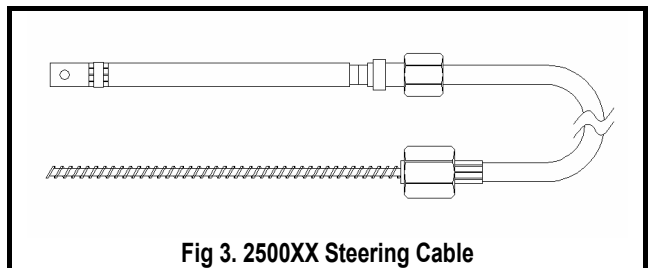
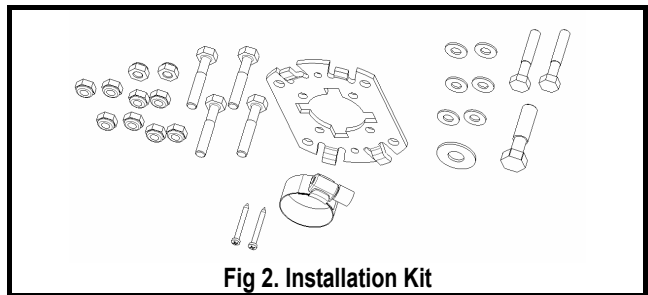
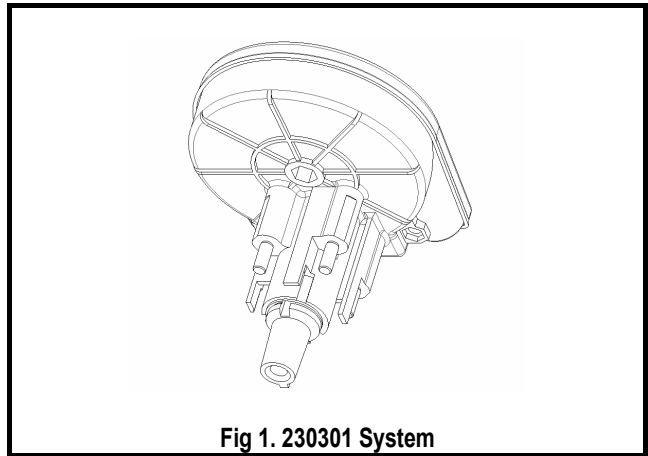
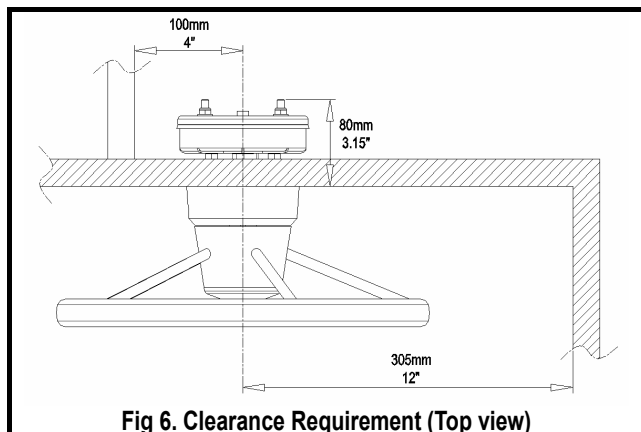
**Safety Symbols**, to alert and indicate the level of risk for the identified procedure.

**CAUTION**

1. Read this document thoroughly before installation.
2. Do not substitute parts without PRETECH's confirmation.
3. Every condition in this document must be fulfilled.
4. Do not disassemble any parts of the product.

Incorrect installation or usage of foreign parts may cause operation failure which can result damage or injury to boat or person. PRETECH will not be responsible for any cases that are conformity to the conditions of this instruction.

### CHECK CLEARANCE



To avoid interference & difficulty in assembling, check the clearance requirements. And check the clearance for Steering wheel's operation as Fig 6.

### DRILL ON DASH

After checking clearance, locate holes on dash.  
 Templates can be used to mark. See **Drawing A**.  
 If necessary, enlarge the center hole to accommodate the steering helm assembly.  
**ONE HOLE MUST BE TOP CENTER.**

### MOUNT BRACKET

Use fasteners as next :

FASTENER	DESCRIPTION
Hex Head Screw	1/4-28 UNF, L 0.75", 4EA
Flat Washer	1/4", 4EA
Lock Nut	1/4, 4EA

And see Fig 8.

▲CAUTION Nuts tightening torque		
MIN. TORQUE	23.0 [lbf-in]	(2.6 [N-m])
MAX. TORQUE	33.6 [lbf-in]	(3.8 [N-m])

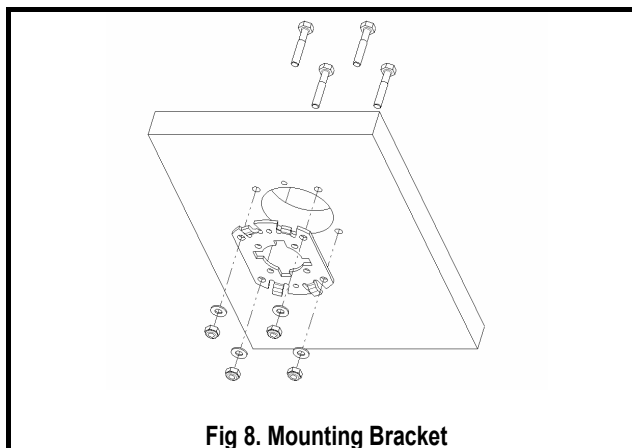


Fig 8. Mounting Bracket

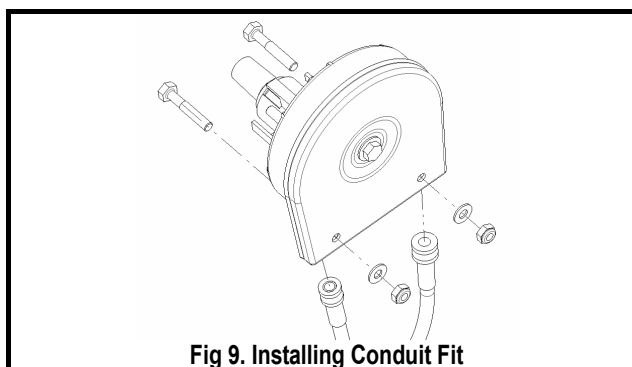


Fig 9. Installing Conduit Fit

### INSTALL CONDUIT FIT

Use fasteners as next :

FASTENER	DESCRIPTION
Hex Head Screw	1/4-28 UNF, L 0.75", 4EA
Flat Washer	1/4", 4EA
Lock Nut	1/4-28 UNF, 4EA

And see Fig 9.

▲CAUTION Nuts tightening torque		
MINI. TORQUE	23.0 [lbf-in]	(2.6 [N-m])
MAX. TORQUE	33.6 [lbf-in]	(3.8 [N-m])

Feed cable through, turning wheel to pull cable end through rotary assembly.  
 Check steering direction, making sure that when wheel is turned to the right, the boat will turn to the right.  
 Install spent tube cable cover by slipping it over the cable end, then securing it in the same manner as cable jacket like you did.

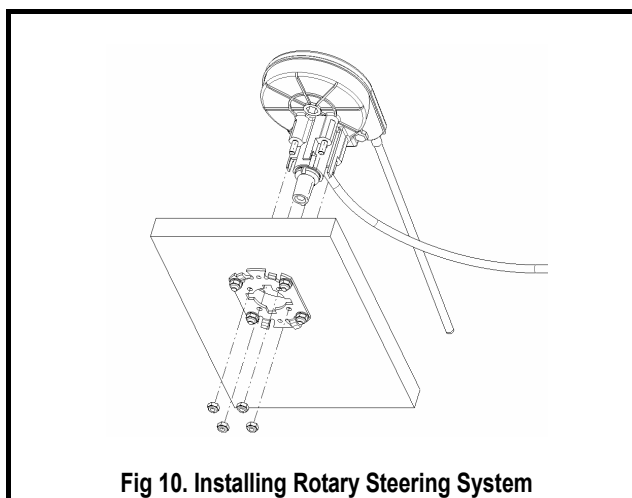


Fig 10. Installing Rotary Steering System

### INSTALL ROTARY STEERING SYSTEM

Use fasteners as next :

FASTENER	DESCRIPTION
Lock Nut	1/4-28 UNF, 4EA

And see Fig 10.

▲CAUTION Nuts tightening torque		
MINI. TORQUE	45.2 [lbf-in]	(5.1 [N-m])
MAX. TORQUE	67.3 [lbf-in]	(7.6 [N-m])

### INSTALL FRICTION RING & BEZEL

Insert Friction Ring to shaft axis, then enforce the friction screw.  
 After that, align with screws' location on the bracket and the bezel.  
 See Fig 11 and use fasteners as next :

FASTENER	DESCRIPTION
Tapping Screw	D3.1mm, Type-1, 2EA

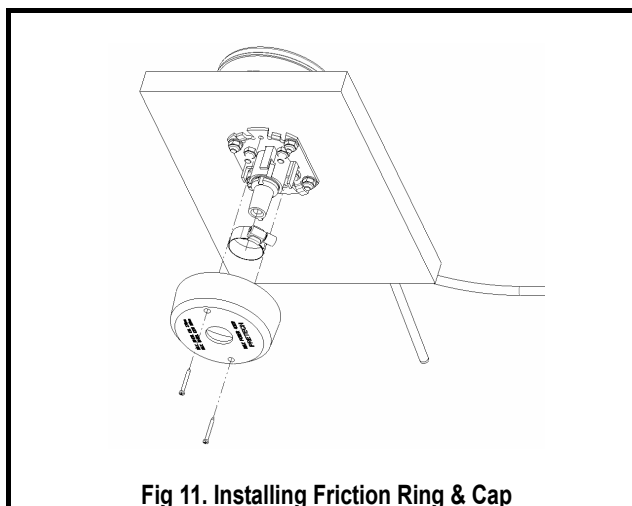


Fig 11. Installing Friction Ring & Cap

## INSTALL STEERING WHEEL

Use fasteners as next :

FASTENER	DESCRIPTION
Flat Washer	3/8", 1EA
Hex Head Screw	3/8-16 UNC, L1.5", 1EA

And see Fig 12.

(Shown steering wheel is just an example. It is not included.)

Hold the steering wheel while tightening to avoid cable damage to helm assembly.

Keep this torque range.

▲CAUTION Bolt tightening torque		
MINI. TORQUE	75.2 [lbf-in]	( 8.5 [N-m])
MAX. TORQUE	112.4 [lbf-in]	(12.7 [N-m])

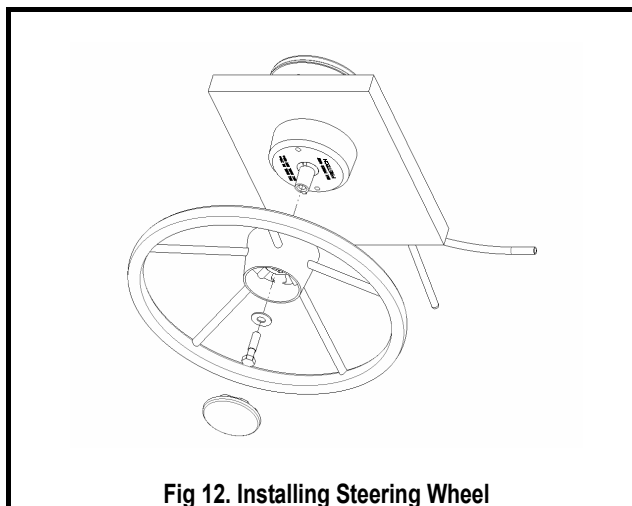


Fig 12. Installing Steering Wheel

## ROUTE CABLE

Keep minimum bending radius 8"(200mm) and clearance.

See Fig 13.

## INSTALL CABLE ON TILLER

Route cable with as few turns as possible, keeping bends to an 8" minimum radius.

Connect end of tiller using transom connection kit or stock steering tube.

Adjust as required for steering wheel center with tiller center.

Check steering direction.

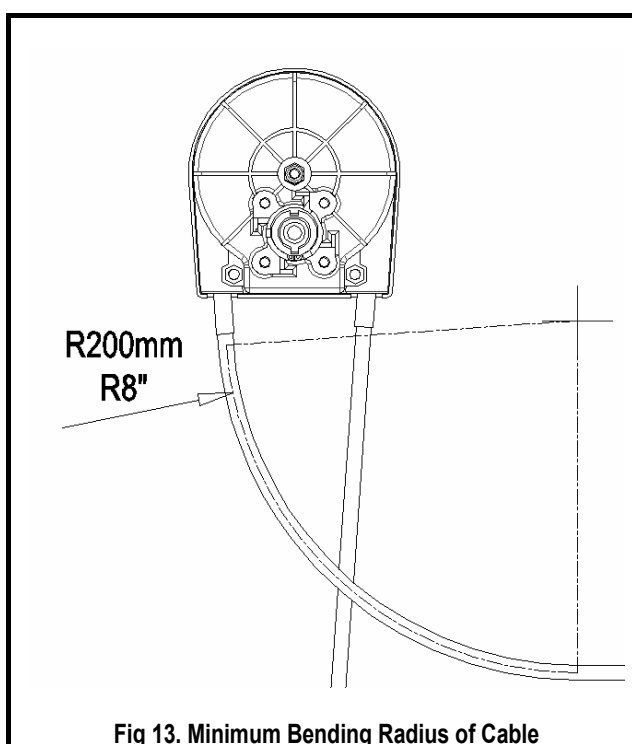


Fig 13. Minimum Bending Radius of Cable

## FINAL CHECKS-ALL CABLES

Before try to test operation, check following list especially.

No.	CHECK POINT
1	Cable radius NOT LESS than 8" minimum.
2	Turn wheel to determine that the direction of the wheel matches the direction of the rudder action.
3	Brake (if used) is adjusted to proper feel.
4	Check that the rudder or drive stops coincide with the cable travel.
5	All bolts and nuts are tightened to specifications.
6	
7	
8	
9	

### NOTE

Helm contains no internal field serviceable parts. Any attempt at disassembly of these units will void warranty of this product.

Instructions are for 90 degree mount helms only. 10 and 20 degree mounting and/or bezel kits are available. Please contact your dealer or PRETECH for information on purchase and installation.

Tilt helm assemblies are available. Please contact your dealer or PRETECH for information.

### LIMITED WARRANTY

PRETECH warranty to the first retail (end user) purchaser of this product, or a PRETECH product incorporated in another vendor's product that, for a period of one(1) year from the date of original purchase, such product will be free from defects in materials and workmanship.

**PRETECH MAKES NO WARRANTY AS TO THE MERCHANTABILITY OR FITNESS OF ITS PRODUCTS FOR A PARTICULAR PURPOSE.**

The above warranty does not apply to a product that has not been installed or maintained in accordance with PRETECH's instructions, been subjected to damage in an accident or abuse during operation, or repaired or modified by persons other than PRETECH.

This warranty is also void when PRETECH Products are installed on a boat or engine judged by PRETECH to be an inappropriate application of its product or when PRETECH products are used with other marine accessory products which in PRETECH's judgment are incompatible with the PRETECH product or adversely affect its performance or durability.

If any PRETECH product is used commercially for such purposes as rental or other income-producing activities then this warranty is limited to 90 days from the date of the original retail purchase.

PRETECH's responsibility in respect to warranty claims is limited solely to repair or replacement of products found by PRETECH to be defective. PRETECH DOES NOT PAY FOR LABOR CHARGES connected with removal of a product deemed to be defective or with installation of replacement or repaired product, or for any other incidental or consequential damage.

To make a claim under this warranty, return believed to be defective to your local marine dealer or PRETECH distributor, along with proof of purchase. IF your dealer or distributor feels that a warranty claim is justified, he/she should contact PRETECH giving a description of the product and requesting authorization to return it to the factory.

**MERCHANDISE SHOULD NOT BE RETURNED TO PRETECH UNTIL A RETURN GOODS AUTHORIZATION FORM IS RECEIVED.**

After receipt of an authorization form, he/she should return the product, freight prepaid, to PRETECH. If found to be defective, and if all return charges have been prepaid, PRETECH will repair or replace the product and return the freight prepaid.

### MAINTENANCE

It is recommended that the steering system be checked and serviced at least every 30 days in salt water areas and at least every 90 days in fresh water areas. Check and service the following ;

No.	CHECK POINT
1	<b>CABLE OUTPUT END :</b> Check all metal parts and the cable output end for corrosion. Remove any old grease from the cable ram and motor swivel connections using a mild solvent, such as kerosene. Spray the cleaned areas with a moisture-displacing lubricant such as WD-40 or equivalent and apply a light coat of a good quality marine grease. Do this with the cable ram fully extended.
2	<b>CABLE :</b> Check the entire cable conduit for cracks or abrasion of the plastic cover. Replace the cable if needed.
3	<b>HELM :</b> Check all bolts, nuts, and fasteners for tightness.
4	<b>WINTER STORAGE :</b> in winter storage or used infrequently, clean the cable ram per the previously mentioned instructions. Cycle the steering several times when applying lubricant. If at any time the steering system becomes stiff, has an excessive amount of freeplay or shows any change in its operating characteristics, it is recommended to have the system checked by authorized dealers.



TOOLING TEMPLATE

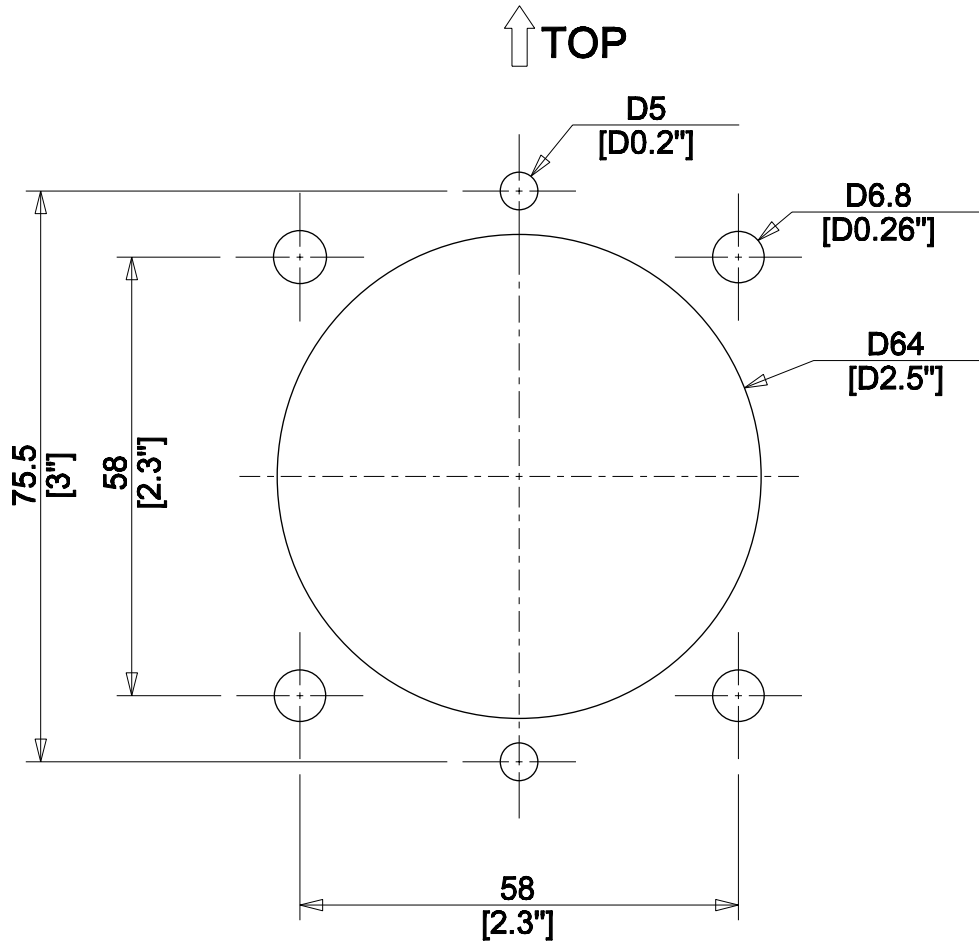
ED NO.

REVISION

LOCATION

DATE

# Drawing A. TOOLING TEMPLATE



MATERIAL	-		FINISH	-		CODE	MAN-0302	
PRE tech	SCALE	1/1	UNIT	mm[inch]		NAME	LTH_WALL	
	APP.	Kim, YC		2007			REMARK	MINI290 SYSTEM
DGN.	CHK.	Kim, DH		2007		1/1		
	DGN.			2007				