



HYDRAULIC SPORT & SPORT PLUS TILT HELMS



EN

SeaStar / SeaStarPro / BayStar Sport & Sport Plus Hydraulic Steering Tilt Helm Pumps

Installation and owner's manual — Book 5.2

To the Installer and End User (Owner)

Thank you for choosing SeaStar steering systems by Dometic. This Installation and Owner's Manual contains all the information that you and others will require for the safe installation and use of your steering system and **MUST** remain on board the boat. Throughout this manual, information for the safe installation and operation of the steering system will be distinguished in one of the following ways;

⚠ WARNING

Hazards or unsafe practices which could result in severe personal injury or death.

Failure to adhere to a warning may lead to loss of steering control. Loss of steering control may result in unpredictable boat behavior, leading to ejection from boat causing property damage, personal injury and/or death.

⚠ CAUTION

Hazards or unsafe practices which could result in minor injury or product or property damage.

NOTICE

Important information in regards to installation, use and maintenance of the steering components.

NOTICE

Dometic Marine Canada Inc. is referred to as Dometic throughout this publication.

⚠ WARNING

DO NOT use BayStar on vessels that exceed a MAXIMUM horsepower rating of 150HP (total), or on smaller HP outboard engines that use a wing nut type transom mount clamping screws.

⚠ WARNING

BayStar is NOT recommended in applications with high steering effort. High performance 150HP engines and any engine using a 4-3/4" gear case such as Command Thrust MUST use SeaStar products.

These safety alerts alone cannot eliminate all of the hazards that may be present while on the water. Dometic recommends that all users of the steering system take an accredited 'boating safety course', follow safe boating practices and are made aware of the environment that they will be in.

To assist in future troubleshooting, note your helm pump part number here:

HH_____.

SAFETY INFORMATION

⚠ WARNING

The safety information provided below is intended to inform you of the dangers that may be present before, during and after the installation. It is critical that you read and understand ALL the points noted.

The safe operation of the steering system is dependant upon proper installation and maintenance, common sense, safe judgment and the knowledge/expertise of the operator. Every installer/user of the steering system should know the following requirements 'before' installing/using the steering system.

If you have any questions regarding any of these warnings, contact Dometic.

To reduce risk of severe injury or death. Always wear a Coast Guard Approved personal flotation device (PFD) and use an engine shut-off cord (lanyard).

Before installation

1. Read and understand the Installation and Owner's Manuals provided with your steering components.
2. Ensure that all components required to complete the installation are on hand (including hoses, fittings, oil and the proper tools required for the installation).
3. SeaStar components are highly engineered and safety tested to ensure system integrity, DO NOT substitute any component with non-SeaStar components as this may compromise system performance/reliability.

Installation

⚠ CAUTION

-4 helm pumps are fitted with positionable O-ring style hose fitting ports (referred throughout this manual as ORB). -4 fittings are exactly the same as -3 fittings. Do NOT attempt to install an NPT pipe fitting into a -4 helm hose fitting port. Doing so will lead to irreparable damage to the helm. ONLY use Dometic O-ring style hose fittings (ORB).

1. Install components as directed in all Installation Manuals (including helm pumps, hoses and fitting kits).
2. DO NOT modify or substitute any component in any way without written consent from Dometic.
3. Comply with all system ratings/regulations (boat/engine, U.S.C.G.).
 - Cylinder MUST be compatible with engine(s)/rudder(s) and/or outdrive(s) installed.
 - Cylinder MUST be rated for use on the engine(s) installed (outboard applications).
4. Confirm that there is no interference between the steering cylinder(s), tiebars and the transom, splashwell, outboard engine or jackplate or any combination of these parts by performing the following steps;
 - a) With engine fully tilted DOWN, turn steering wheel from hard over to hard over and confirm that no interference occurs.
 - if using a hydraulic jack plate the above must also be performed at all the positions of the jack plate.
 - b) Repeat step 4a) with engines tilted UP.
 - c) Perform step 4a) with each engine in DOWN/UP positions confirming that independent TRIM/TILT can be done without any interference.
5. Confirm that the steering cylinder can be fully stroked in both directions as well as full tilt and trim without stretching, chafing, rubbing and/or kinking of the hydraulic hoses.
6. Confirm that extruded nylon tubing has NOT been substituted for SeaStar Steering Hose. Outboard applications only.
7. DO NOT use a wire coil type trim switch with a hydraulic steering system as the wire can wind up tight around the steering wheel shaft and prevent further steering.
8. Conduct Oil Level and System Check as outlined in your steering cylinder manual.

Safety Information Continued

WARNING

The safety information provided below is intended to inform you of the dangers that may be present before, during and after use. It is critical that you read and understand ALL the points noted.

Prior to every use

1. Check Fluid level in highest helm pump (refer to your steering cylinder manual for proper fluid level setting).
2. Verify immediate steering response when turning steering wheel(s). (Ensure engine turns when steering wheel is turned.)
3. Visually inspect all steering hoses and fittings for wear, kinking and/or leaks.
4. Check for binding, loose, worn or leaking steering components.

DO NOT OPERATE BOAT IF ANY COMPONENT IS NOT IN PROPER WORKING CONDITION.

During use

1. WEAR A COAST GUARD-APPROVED PERSONAL FLOTATION DEVICE (PFD).
2. ATTACH ENGINE SHUT-OFF CORD (LANYARD) TO YOUR PDF.
3. Never allow anyone not familiar with the operation of the steering system operate the boat at any time.
4. Know and adhere to the operator restrictions for your area including;
 - Federal Laws/Regulations,
 - State Laws/Regulations and
 - Municipal Laws/Regulations.

DO NOT OPERATE BOAT IF ANY COMPONENT IS NOT IN PROPER WORKING CONDITION.

After use

1. Rinse off steering system thoroughly using 'fresh, clean water only'.
 - Cleaning fluids containing ammonia, acids or any other corrosive ingredients **MUST NOT** be used for cleaning any part of the hydraulic steering system.

Maintenance

1. Maintain steering system at a minimum of twice per year.
 - See Maintenance section in your steering cylinder manual.

Keep our waters clean for all current and future users. Dispose of ALL fluids in accordance with your local regulations.

Important Labels

⚠ WARNING

The safety information provided below is intended to inform you of the warning information on your products. Contact Dometic if labels are missing.

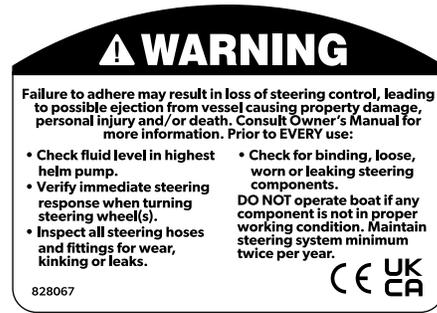


Figure 1. Warning Decal, Sport Plus Tilt Helm Pumps.

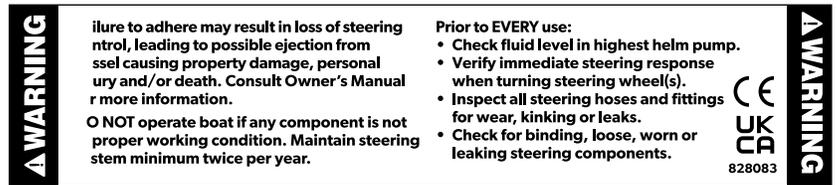


Figure 2. Warning Decal, Sport Tilt Helm Pumps.

INTRODUCTION

The SeaStar/BayStar Steering System is the smoothest and most efficient hydraulic steering system available today. They have been designed for normal pleasure and commercial use where standard rigging arrangements are used. Before proceeding with the installation of this tilt helm, read these instructions thoroughly. Dometic cannot accept responsibility for installations where instructions have not been followed, where substitute parts have been used, or where modifications have been made to our products.

This Installation and Owner's Manual covers ALL SeaStar and BayStar, Sport and Sport Plus Tilt helms. Any differences between the helms will be noted where required.

NOTICE

Due to a small amount of internal oil slip, a "master spoke" or "centered" steering wheel (such as those used in automobiles) will not maintain a straight ahead wheel setting. For best results, use an "equal distance spoke" steering wheel.

NOTICE

Help protect your boating environment by ensuring that all used oil is disposed of properly.

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SYSTEM INSTALLATION OVERVIEW

STEP 1

STEERING CYLINDER INSTALLATION:

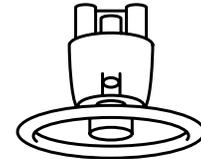
Install your steering cylinder as per the Installation manual provided with your cylinder.



STEP 2

TILT HELM INSTALLATION:

Install your Tilt Helm as per the detailed installation instructions on page 5 to page 9 of this manual.



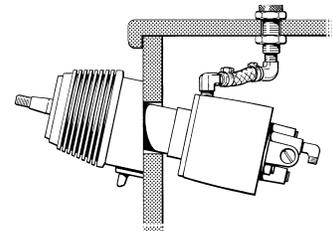
⚠ CAUTION

-4 helm pumps are fitted with positionable O-ring style hose fitting ports (referred throughout this manual as ORB). -4 fittings are exactly the same as -3 fittings. Do NOT attempt to install an NPT pipe fitting into a helm hose fitting port. Doing so will lead to irreparable damage to the helm. ONLY use Dometic O-ring style hose fittings (ORB).

STEP 3

REMOTE FILL INSTALLATION:

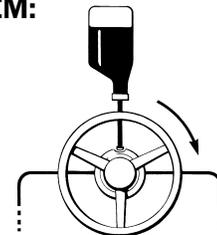
Using page 10 in this manual, install the remote fill hardware.



Step 4

FILLING AND PURGING OF STEERING SYSTEM:

Using the Fill and Purge instructions provided in your steering cylinder manual, fill and purge the steering system.



Step 5

OIL LEVEL AND SYSTEM CHECK:

Using the "Oil level and system checks" provided in your steering cylinder manual, confirm proper operation of your steering system.

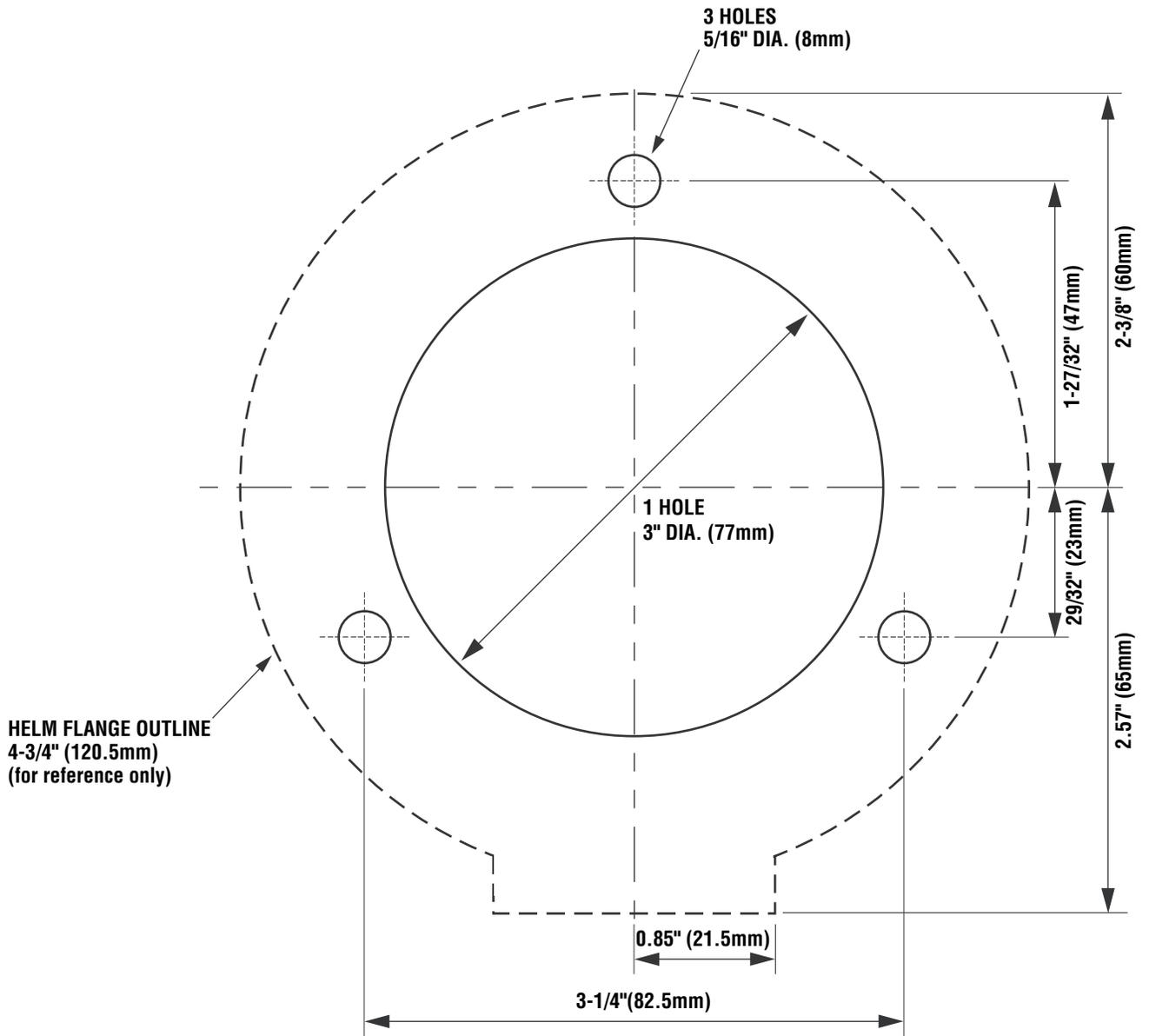
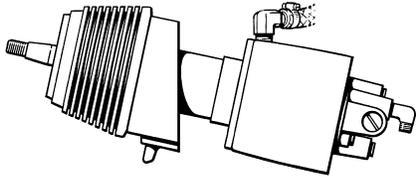
⚠ WARNING

Oil Level and System Check is critical to the safe operation of your boat, failure to follow this important step may lead to loss of steering control resulting in property damage, personal injury and/or death.

SPORT TILT HELM MOUNTING TEMPLATE

NOTICE

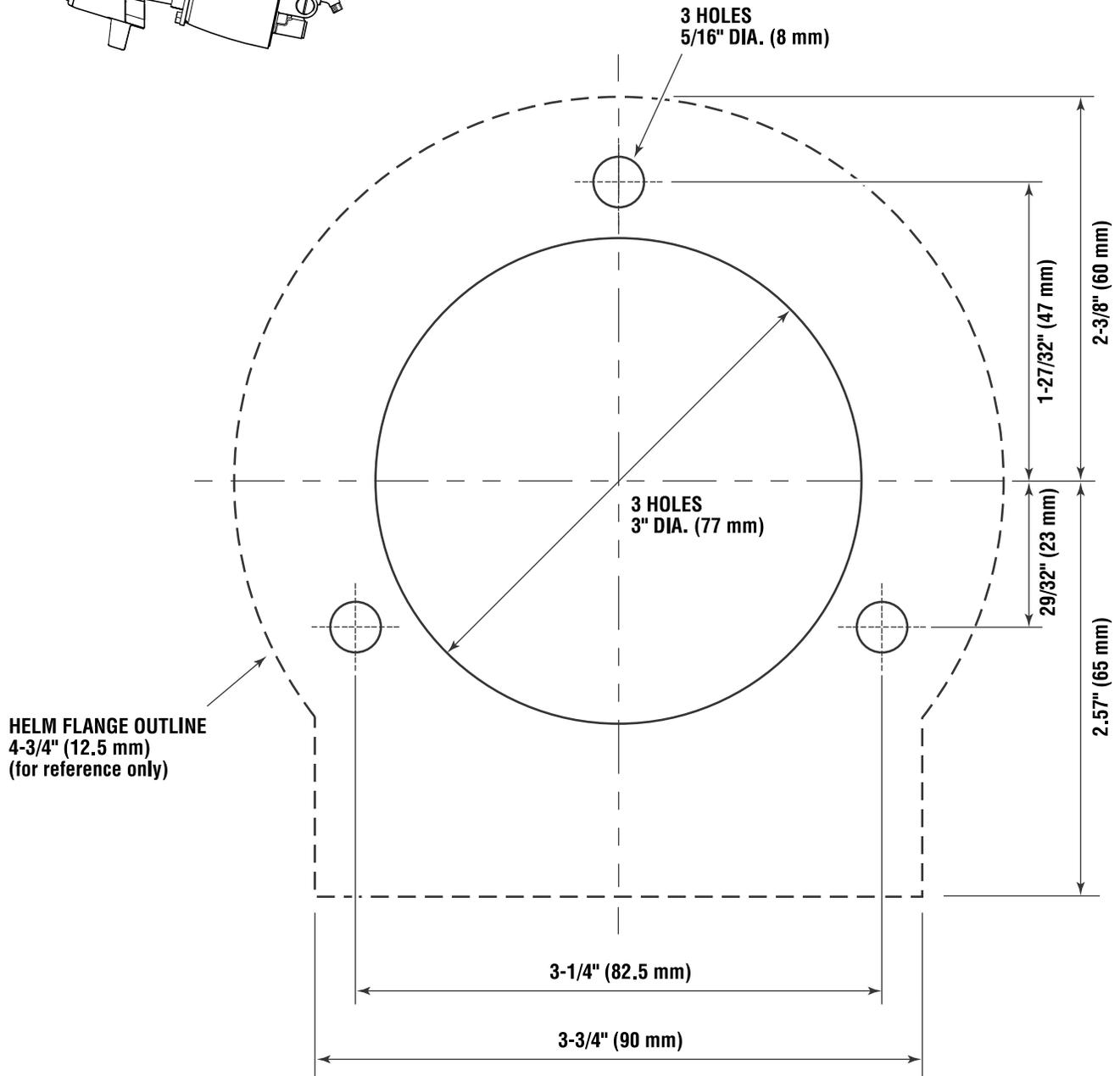
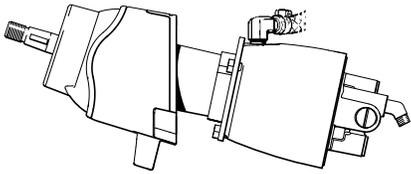
If you must photocopy this mounting template for use, check ALL measurements using a measuring device prior to using as a template.



SPORT PLUS TILT HELM MOUNTING TEMPLATE

NOTICE

If you must photocopy this mounting template for use, check ALL measurements using a measuring device prior to using as a template.



MOUNTING/INSTALLATION

Re-Positionable ORB Hose Fitting Installation/Realignment

⚠ CAUTION

-4 helm pumps are fitted with positionable O-ring style hose fitting ports (referred throughout this manual as ORB). -4 fittings are exactly the same as -3 fittings. Do NOT attempt to install an NPT pipe fitting into a -4 helm hose fitting port. Doing so will lead to irreparable damage to the helm. ONLY use Dometic O-ring style hose fittings (ORB).

Re-Positionable Pump Fitting Installation

⚠ WARNING

Failure to properly tighten the lock-nut (item 1) may lead to loss of steering control. Loss of steering control may result in unpredictable boat behavior, collision with an obstacle and/or ejection from vessel, leading to property damage, personal injury and/or death.

NOTE: for straight ORB fittings simply torque fitting to 18 ft-lbs (24.4 N-m). Fitting re-orientation not required.

1. Back off lock nut (item 1), counter-clockwise, until it stops.

NOTE: O-ring must be fully on sealing surface and cannot contact any threads. Do not use Teflon tape or any liquid pipe sealant with ORB fittings.

2. Thread fitting into helm port until fitting washer (item 2) contacts the face of the helm port. Tighten hand tight. **DO NOT USE A WRENCH.**
3. Re-position fitting to desired orientation by turning it counter-clockwise to a MAXIMUM of 1 full turn.
4. While holding the fitting body securely with a wrench, torque the lock nut (item 1) to **18 ft-lbs (24.4 N-m)**.
5. With helm installation on dash completed, hold the fitting body securely with a wrench, torque the hose end nut to **15 ft-lbs (20.3 N-m)**.
6. Purge system per applicable instruction manual.

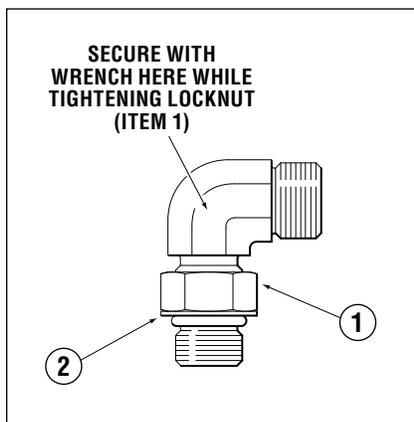


Figure 3.

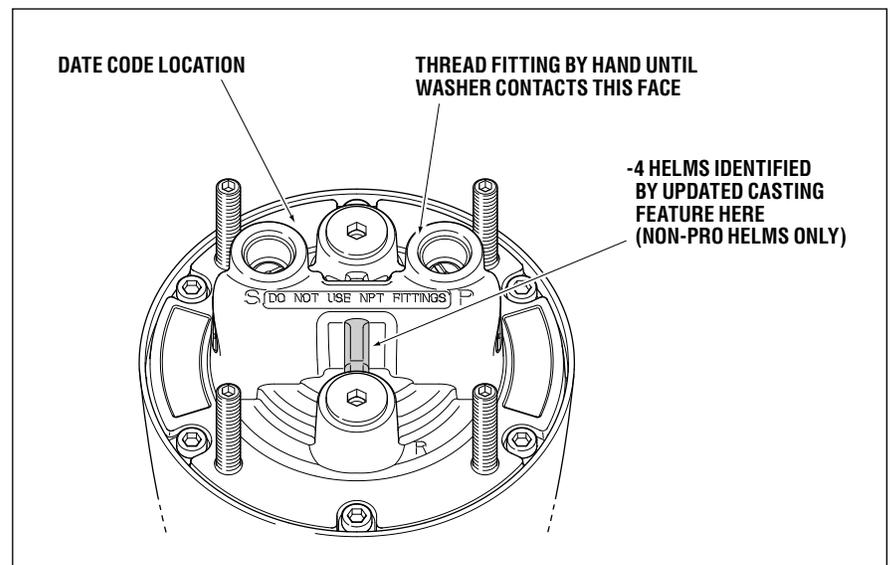


Figure 4.

⚠ WARNING

Dometic recommends that the hose and hose fittings are checked on a regular basis to ensure the safe operation of the steering system.

Sport Tilt Helm

⚠ WARNING

Use self-locking fasteners provided **ONLY**; substituting non-self locking fasteners can result in loosening or separation of equipment leading to loss of steering control causing property damage and/or personal injury. **DO NOT** exceed **110 in-lbs. (12.4 N-m)** torque on helm nuts and bolts.

NOTICE

If the helm pump shaft is difficult to locate into the tilt mechanism coupling, loosen the TOP screw in the coupling (figure 5a) by no more than 1/4 of a turn. Once connected, ensure that this screw is tightened to the correct torque before installing the bezels.

NOTICE

ONLY if the tilting function is confirmed to function, continue to page 10 to complete the remote fill kit installation and page 5 for hose connection.

STEP 1. Using the template provided (page 3) confirm that the location of the Tilt Helm will allow unrestricted operation of the steering wheel in **ALL** tilt positions and will **NOT** interfere with any adjacent equipment, as well as hardware behind the dash.

STEP 2. Tape the template to the dash and use a center punch for locating the holes on the dash. Double check to ensure unrestricted operation of the steering wheel in **ALL** tilting positions. Drill the 3" diameter center hole and the three mounting bolt holes as shown in the template.

STEP 3. Mount tilt plate (Item 1) to the dash using the three 1/4-20 UNC x 2" carriage bolts (Item 2), washers (Item 3) and self-locking nuts (Item 4). Torque nuts to 110 in-lbs (12.4 N-m).

STEP 4. Install ORB fittings into rear of helm as required on page 5. Note the ideal fitting angles permitting the most efficient hose routing, minimizing bends and avoiding features behind the dash. Make hose connections once helm has been successfully mounted.

STEP 5. Install the remote fill brass fitting, hose and clamp to helm as per the section on Remote Fill installation. Complete the remaining remote fill installation steps once the tilt helm has been successfully mounted.

STEP 6. Mount the helm pump from behind the dash to the mounting plate so that the four helm mounting holes align with the applicable holes in the tilt mounting plate. Helm fill port must now be at top dead center position. Insert the four 1/4-20 UNC x 2-1/2" hex head bolts (Item 5) through the mounting plate to secure them to the helm pump. Torque bolts to 110 in-lbs (12.4 N-m).

STEP 7. Attach the helm shaft to the tilt mechanism (Item 6) by lining up the coupling slot with the helm shaft tongue and secure with the #10-24 UNC x 7/8" cap screw (Item 7). Torque both cap screws to 20–24 in-lbs (2.5 N-m).

STEP 8. Install the two PHMS 5/16-18 UNC x 3/4" screws (Item 8), and star washers (Item 9) to secure the tilt mechanism to the dash plate. Torque screws to 160–180 in-lbs (19.2 N-m).

STEP 9. Install boot latch (Item 10) onto the tilt latch of tilt mechanism.

STEP 10. Position the tilt unit in the middle position and mount the lower bezel (Item 11) to the tilt mechanism ensuring that the boot latch (Item 10) is held into the slots provided in the lower bezel (Item 11). Secure the bezel with the two PHMS #8-32 UNC x 1" (Item 12). Torque screws to 16 in-lbs (1.8 N-m).

STEP 11. Install boot cover (Item 13) over lip 1 of the tilt mechanism flange and around lip 2 of the lower bezel.

STEP 12. Grease steering shaft taper and threads with a good quality marine grease.

STEP 13. Install woodruff key (Item 14) and wheel shaft nut (Item 15). Tighten wheel shaft nut prior to continuing on with instructions. Torque wheel shaft nut to 150 in-lbs (16.9 N-m), **DO NOT** exceed 200 in-lbs (22.6 N-m).

STEP 14. Confirm proper function of the tilt mechanism:

- Push the tilt latch forward to unlock the tilt mechanism
- Check **ALL** positions of the tilt and confirm that the latch locks in place for each position, tilt lever will click back into the locked position.
- Ensure operation of the wheel does not interfere with the dash or adjacent equipment.

⚠ WARNING

Use the self-locking fasteners provided **ONLY**; substituting non-self locking fasteners can result in loosening or separation of equipment leading to loss of steering control causing property damage and/or personal injury.

For Replacement Parts refer to page 11.

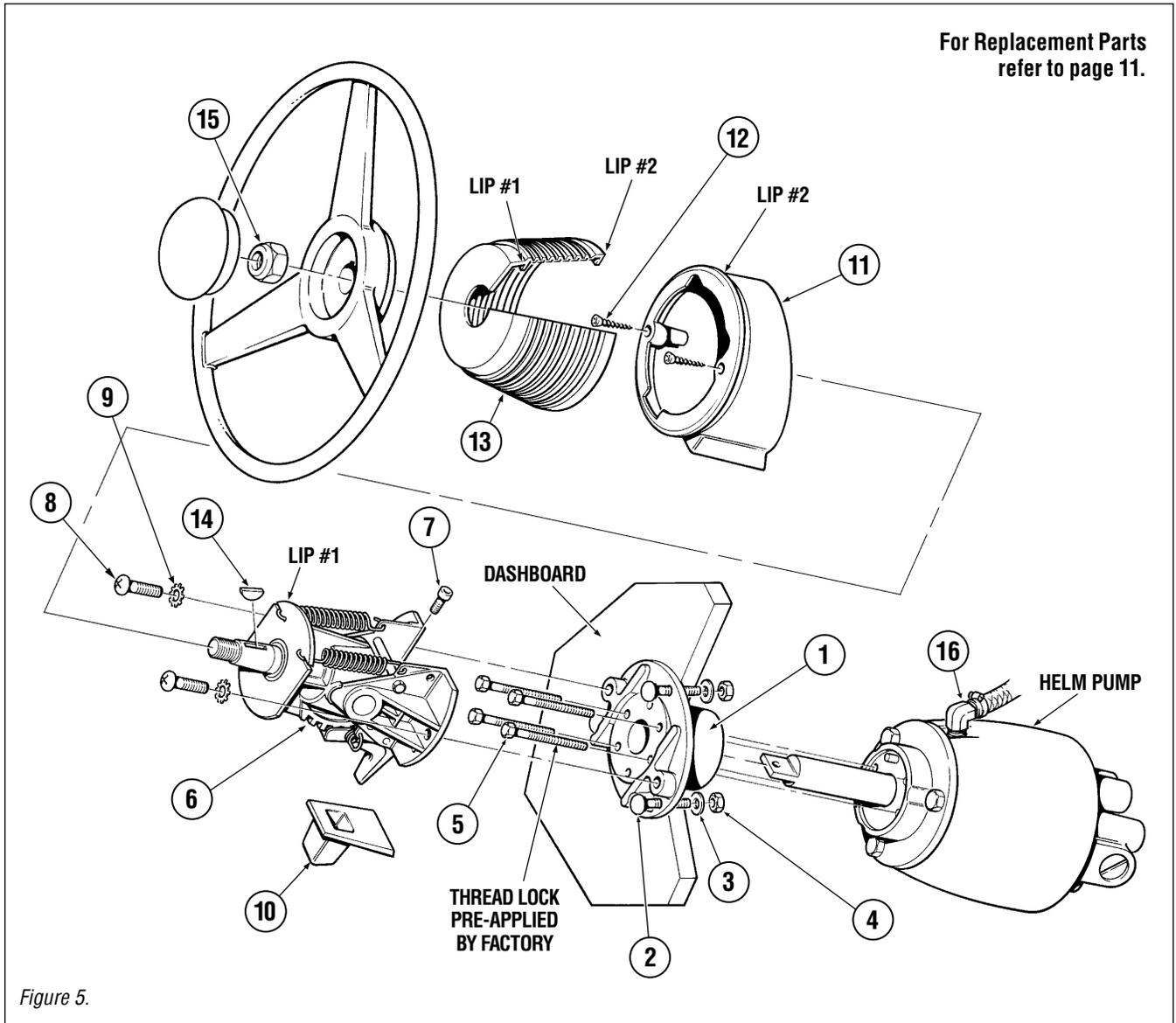


Figure 5.

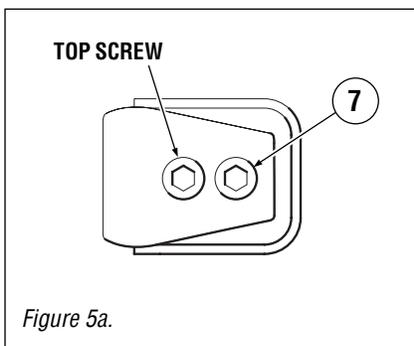


Figure 5a.

ITEM	QTY	DESCRIPTION
1	1	Tilt Plate
2	3	CB 1/4" NC x 2"
3	3	Washer, 1/4" Flat SS
4	3	Nut, 1/4" NC, Nyloc®
5	4	HHCS 1/4" NC x 2-1/2" SS
6	1	Tilt Mechanism
7	1	SCHS #10-24 x 7/8" SS
8	2	PHMS 5/16" NC x 3/4"

ITEM	QTY	DESCRIPTION
9	2	Washer, Star
10	1	Boot Latch
11	1	Bezel, Lower
12	2	#8-32 x 1"
13	1	Bellows
14	1	Shaft Key
15	1	Wheel Shaft Nut
16	1	Remote Fill Connection

Sport Plus Tilt Helm

STEP 1. Using the template provided (page 4) confirm that the location of the Tilt Helm will allow unrestricted operation of the steering wheel in **ALL** tilt positions and will **NOT** interfere with any adjacent equipment, as well as hardware behind the dash.

STEP 2. Tape the template to the dash and use a center punch for locating the holes on the dash. Double check to ensure unrestricted operation of the steering wheel in **ALL** tilting positions. Drill the 3" diameter center hole and the three mounting bolt holes as shown in the template.

STEP 3. Mount tilt plate (Item 1) to the dash using the three 1/4-20 UNC x 2" carriage bolts (Item 2), washers (Item 3) and self-locking nuts (Item 4). Torque nuts to 110 in-lbs (12.4 N-m).

STEP 4. Install ORB fittings into rear of helm as required on page 5. Note the ideal fitting angles permitting the most efficient hose routing, minimizing bends and avoiding features behind the dash. Make hose connections once helm has been successfully mounted.

STEP 5. Install the remote fill brass fitting, hose and clamp to helm as per the section on Remote Fill installation. Complete the remaining remote fill installation steps once the tilt helm has been successfully mounted.

STEP 6. Mount the helm pump from behind the dash to the mounting plate so that the four helm mounting holes align with the applicable holes in the tilt mounting plate. Helm fill port must now be at top dead center position. Insert the four 1/4-20 UNC x 2-1/2" hex head bolts (Item 5) through the mounting plate to secure them to the helm pump. Torque bolts to 110 in-lbs (12.4 N-m).

STEP 7. Attach the helm shaft to the tilt mechanism (Item 6) by lining up the coupling slot with the helm shaft tongue and secure with the #10-24 UNC x 7/8" cap screw (Item 7). Torque both cap screws to 20–24 in-lbs (2.5 N-m).

STEP 8. Install the two PHMS 5/16-18 UNC x 3/4" screws (Item 8), and star washers (Item 9) to secure the tilt mechanism to the dash plate. Torque screws to 160–180 in-lbs (19.2 N-m).

STEP 9. Install boot latch (Item 10) onto the tilt latch of tilt mechanism.

STEP 10. Position the tilt unit in the middle position and fit the upper bezel (Item 11) onto the tilt mechanism, ensuring the three bosses of the upper bezel fit within the mating bores of the tilt mechanism flange (Lip #1). Secure with three screws 8-32 X 1/2. Torque screws to 16 in-lbs (1.8 N-m), ensuring cover is fully seated after screws are torqued down.

STEP 11. Fit the lower bezel (Item 12) over the upper bezel, making sure the tabs at top dead center engage both notches on the mounting plate. Secure with two screws 8-32 x 1/2. Torque screws to 16 in-lbs (1.8 N-m).

STEP 12. Grease steering shaft taper and threads with a good quality marine grease.

STEP 13. Install woodruff key (Item 14) and wheel shaft nut (Item 15). Tighten wheel shaft nut prior to continuing on with instructions. Torque wheel shaft nut to 150 in-lbs (16.9 N-m), **DO NOT** exceed 200 in-lbs (22.6 N-m).

STEP 14. Confirm proper function of the tilt mechanism:

- Push the tilt latch forward to unlock the tilt mechanism
- Check **ALL** positions of the tilt and confirm that the latch locks in place for each position, tilt lever will click back into the locked position.
- Ensure operation of the wheel does not interfere with the dash or adjacent equipment.

NOTICE

If the helm pump shaft is difficult to locate into the tilt mechanism coupling, loosen the TOP screw in the coupling (figure 6a) by no more than 1/4 of a turn. Once connected, ensure that this screw is tightened to the correct torque before installing the bezels.

NOTICE

Ensure that tilt latch boot (Item 10) is properly fitted into the slots provided in the lower bezel.

NOTICE

ONLY if the tilting function is confirmed to function, continue to page 10 to complete the remote fill kit installation and page 5 for hose connection.

⚠ WARNING

Use the self-locking fasteners provided **ONLY**; substituting non-self locking fasteners can result in loosening or separation of equipment leading to loss of steering control causing property damage and/or personal injury.

For Replacement Parts refer to page 12.

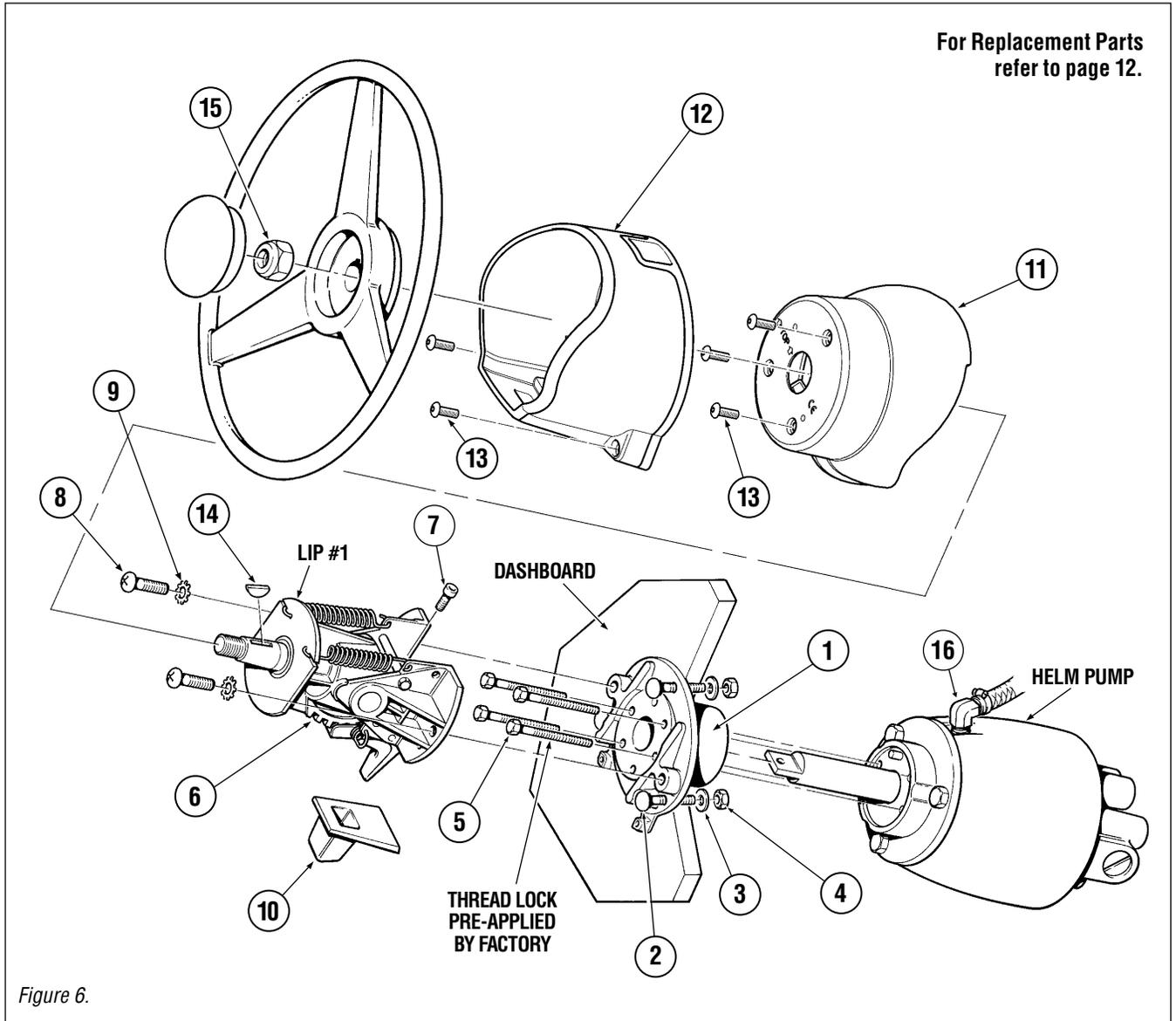


Figure 6.

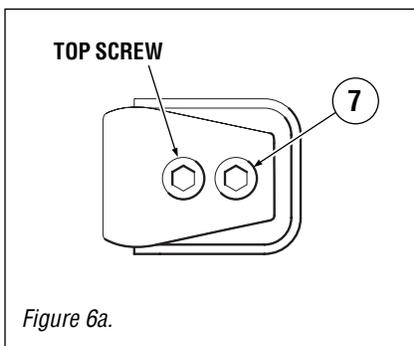


Figure 6a.

ITEM	QTY	DESCRIPTION
1	1	Tilt Plate
2	3	CB 1/4" NC x 2"
3	3	Washer, 1/4" Flat SS
4	3	Nut, 1/4" NC, Nyloc®
5	4	HHCS 1/4" NC x 2-1/2" SS
6	1	Tilt Mechanism
7	1	SCHS #10-24 x 7/8" SS
8	2	PHMS 5/16" NC x 3/4"

ITEM	QTY	DESCRIPTION
9	2	Washer, Star
10	1	Boot Latch
11	1	Bezel, Upper
12	1	Bezel, Lower
13	5	BHSCS 8-32 x 1/2" SS
14	1	Shaft Key
15	1	Wheel Shaft Nut
16	1	Remote Fill Connection

Remote Fill Connection Installation

Remote Fill & Vent

NPT fitting installations ONLY:

- Apply a liquid, Teflon based pipe sealant onto the threads going into the pump
- Tighten fitting **HAND-TIGHT**
- using a wrench, tighten an additional 1.5 turns
- continue to tighten until desired orientation is met

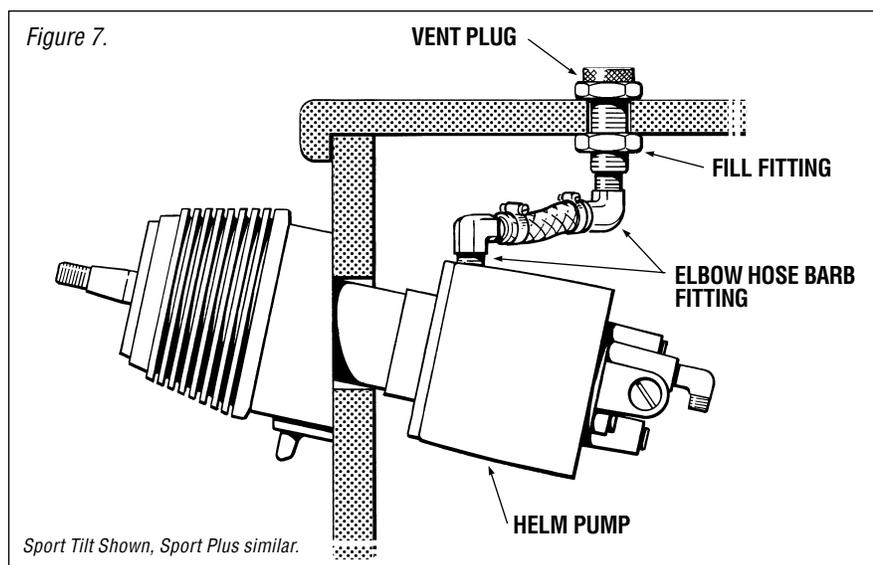
⚠ CAUTION

DO NOT attempt to install NPT pipe fittings into a cylinder and/or helm pump fitted with ORB hose fitting port. Doing so will lead to irreparable damage to the cylinder and/or helm port. ONLY use SeaStar ORB hose fittings provided by Dometic.

DO NOT use steel NPT fittings with SeaStar Helm Pumps, use brass NPT fittings ONLY.

This kit will provide means to fill and vent the steering system above the dash or console. A 7/8" hole will need to be drilled into the dash/console **ABOVE** the helm pump, prior to drilling any holes, confirm that you will not drill into any functioning equipment.

1. Locate desired location for placement of the helm fill plug onto of the dash/console. Look beneath the dash/console to confirm that there is sufficient space for the fill hose and fittings. Confirm that there is no interference with any other equipment. Mark the location and drill a 7/8" hole from above or below the dash/console.
2. Apply a liquid, Teflon based pipe sealant to the threads of the elbow fitting going into the helm pump, **DO NOT** use Teflon Tape, **ONLY** use the paste type pipe sealant. Screw the brass elbow barb fitting into the helm fill port. **DO NOT** install the plastic elbow fitting into the helm.



3. Attach the vinyl tubing to the elbow fitting that you just installed into the helm pump and secure with a hose clamp. A small amount of oil inside the vinyl tube will help slide it onto the elbow barb fitting.
4. Insert fill fitting from the top of the dash/console and secure with the jam nut.

NOTICE

A spacer may be required if mounting surface is less than 3/8" thick, this spacer is provided in this kit

5. Apply a liquid, Teflon based pipe sealant to the threads of the plastic elbow fitting that will be installed into the fill fitting. **DO NOT** use Teflon Tape; **ONLY** use the paste type pipe sealant.
6. Vinyl hose **MUST** have a gradual rise from the helm fitting to the fill fitting to allow air to rise. Cut vinyl tube to the required length and secure to the fill fitting with a hose clamp.

TIP: Measure twice; cut once.

Replacement Parts Continued

Sport & Sport Plus Tilt Helms

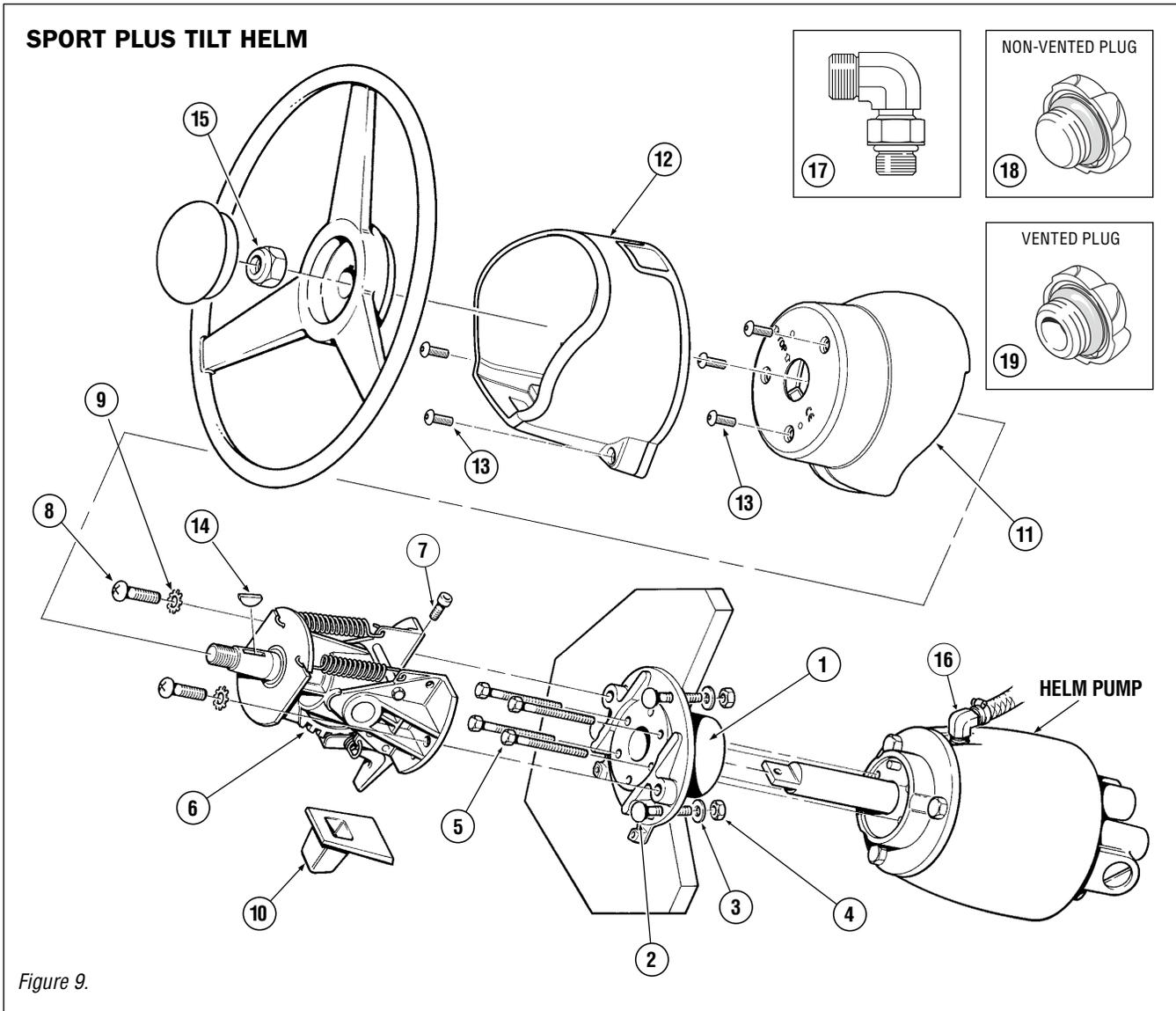


FIGURE #	ITEM #	KIT #	DESCRIPTION
8, 9	-	-	Helm pump assemblies — not sold separately
8	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	HA6123	Sport tilt helm replacement tilt mechanism with bezel, boot, bellows, and all mounting hardware
8	10, 11, 12, 13	18-HA6150	Sport tilt helm replacement bezel, boot, and bellows only
9	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	HA6423	Sport Plus tilt helm replacement tilt mechanism with bezels, boot, and all mounting hardware
9	10, 11, 12, 13	18-HA6450	Sport Plus tilt helm replacement bezels and boot only.
8, 9	19	HA5431	Replacement fill port plug (vented for systems using unbalanced cylinders, AP pumps or multi-helm installations)
8, 9	18	HA5432	Replacement fill port plug (non-vented)
8, 9	16	HA6450	Replacement remote filler kit
8, 9	17	HF6004	Replacement 90° ORB fittings
8, 9	14, 15	HP6032	Replacement shaft seal kit with wheel shaft nut and key

MAINTENANCE

Following the routine maintenance schedules noted below, in the time frame noted will ensure years of great service of your SeaStar steering system, as well as keep you and your passengers safe from the dangers that are present on the water. Always refer to ALL installation manuals provided with your helm, cylinders and any other part of your steering system for a complete list of routine maintenance procedures. If you are instructed to consult with ANY manual that you may not have, please contact Dometic for the proper manual.

Every trip, prior to engine start up and/or launch

- Check fluid level in helm pump (consult your steering cylinder installation manual for proper oil level setting)
- Hoses – Ensure hoses are in good condition and free of wear, kinks or any other signs of damage. If hose/tube shows signs of wear, they **MUST** be replaced prior to operation.
- Turn steering wheel(s) hard over to hard over to ensure engine(s), rudder(s) and/or outdrive(s) are responding to input from the wheel. If vessel is fitted with multiple steering stations, check ALL wheels and autopilot if equipped.

Every 100 hours or 3 months (whichever comes first)

- All points noted in Step #1.
- Check torque setting on ALL fasteners throughout the steering system. Refer to page 10 for torque specifications and tighten as required.

Every 6 months

- ALL points noted in Steps #1 and #2.
- Remove steering wheel from helm pump. Clean wheel shaft and apply a good quality marine grease. Reinstall steering wheel and wheel shaft nut, torque to 150 in-lbs (16.9 N-m).

NOTICE

Ensure wheel shaft nut is torque as per torque setting on page 6 and page 8.

WARNING

Failure to comply with the maintenance checks as noted above may result in loss of steering control and unpredictable boat behavior, which may result in person(s) being ejected from the boat or collision with obstacle(s) causing property damage, personal injury and/or death.

TROUBLESHOOTING GUIDE

FAULT	CAUSE	SOLUTION
1. Cannot get helm shaft to go into U-Joint.	<ul style="list-style-type: none">• U-Joint bolt is too tight.	<ul style="list-style-type: none">• Loosen the "Top" bolt no more than 1/4" to allow the Helm shaft to be installed.
2. Tilt will not lock into place.	<ul style="list-style-type: none">• Spring has come undone.• Spring has a broken tilt tooth.	<ul style="list-style-type: none">• Re-attach spring.• Replace tilt mechanism.
3. Fluid is leaking from where the elbow fitting is installed into the Helm pump fill port.	<ul style="list-style-type: none">• No pipe sealant installed onto threads. Hose clamp not tightened down.	<ul style="list-style-type: none">• Re-apply Teflon® based pipe sealant, NO TEFLON® TAPE. Tighten hose clamp fully.
4. Wheel is really hard to turn in both directions.	<ul style="list-style-type: none">• Tilt boot is rubbing on the steering wheel hub.	<ul style="list-style-type: none">• Confirm that the rubber boot is installed over both lips and is NOT rubbing on the wheel hub.
5. Cannot remove steering wheel.	<ul style="list-style-type: none">• Seized in place. No grease applied to shaft before wheel installation.	<ul style="list-style-type: none">• Using your knee under the wheel and your hand on top, with the wheel shaft nut installed one turn on shaft, lightly tap helm shaft to release wheel.
6. During filling, helm becomes completely jammed.	<ul style="list-style-type: none">• Blockage in the line between the helm(s) and cylinder(s).• PRO helm used with an unbalanced cylinder.• Tilt mechanism to helm pump wheel shaft nut, NOT installed properly.	<ul style="list-style-type: none">• Make certain hose/tubing has not collapsed during installation.• DO NOT use ANY PRO helm pump with ANY unbalanced cylinder.• Tighten and torque nut.
7. System is very difficult to fill. Air keeps burping out top of helm, even after system appears full.	<ul style="list-style-type: none">• System is not being bled properly/completely.• Cylinder is mounted upside down, trapping air in cylinder body.	<ul style="list-style-type: none">• Consult with your cylinder installation manual for proper bleeding. If boat is fitted with an autopilot, ensure the a/p pump is jogged back and fourth for several seconds during the bleeding procedure.• Install cylinder with bleed fittings pointing UP. If unable to mount cylinder in this position, you MUST disconnect cylinder, bleed system, then reinstall.

8. Steering is stiff and hard to turn, even when the vessel is not moving.	<ul style="list-style-type: none"> • Mechanical binding of rudder(s), outboard engine(s), or outdrive(s). • Restrictions in hose/tube. • Air in system. • Wrong fluid has been used. 	<ul style="list-style-type: none"> • Ensure rudder(s), outboard(s) or sterndrive(s) move freely with cylinder disconnected. • See fault 1. • See fault 2. • Only use SeaStar Steering Fluid.
9. One helm unit is very bumpy and requires too many turns hard over to hard over.	<ul style="list-style-type: none"> • Debris in inlet check of helm pump. 	<ul style="list-style-type: none"> • Contact Authorized repair facility, or, replace helm pump.
10. Steering is easy to turn at the dock, but, becomes hard to turn when underway.	<ul style="list-style-type: none"> • Steering wheel is too small. • Cylinder doesn't provide enough force to turn rudder(s). • Incorrectly set, or adjusted torque tab. • Mechanical interference. 	<ul style="list-style-type: none"> • Install larger wheel (MAX 28"). • Confirm cylinder installed is that for the boat. • Re-adjust torque tab. • See fault 3.
11. Turning one wheel causes the other wheel to turn on its own.	<ul style="list-style-type: none"> • Debris in inlet checks of helm pump. 	<ul style="list-style-type: none"> • Contact Authorized repair facility, or, replace helm pump.
12. Sport Plus Tilt Bezels are inhibiting tilt mechanism articulation.	<ul style="list-style-type: none"> • Bezels are not properly seated. 	<ul style="list-style-type: none"> • Remove steering wheel and both bezels. Reinstall the upper bezel ensuring it is seated properly on the flange, then reinstall 3x screws. • Reinstall the lower bezel, over the upper bezel, ensuring the lower bezel engages the top mounting tabs, then reinstall 2x screws. • Test tilt function in all five positions, ensuring that over-travel past the upper and lower positions does not cause the bezels to bind.

TECHNICAL INFORMATION

⚠ WARNING

Failure to adhere to the torque specifications below may lead to separation of components resulting in loss of steering control causing ejection from vessel, or collision with obstacles, leading to property damage, personal injury and/or death.

Bolt Torque Specifications

These are the recommended maximum torque values for reusable dry bolts. Bolts should be torqued to this value +0% -20%. For lubricated bolts, multiply the dry bolt torque values by .75.

Values are stated in: **in-lbs (N-m)**

Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass
2-56	2.5 (.282)	2.0 (.226)	6-32	9.6 (1.08)	4.9 (.554)	5/16"-18	132.0 (14.91)	107.0 (12.10)
2-64	3.0 (.338)	2.5 (.282)	6-40	12.0 (1.35)	9.9 (1.12)	5/16"-24	142.0 (16.04)	116.0 (13.11)
3-48	3.9 (.440)	3.2 (.361)	8-32	20.0 (2.25)	16.0 (1.81)	3/8"-16	236.0 (26.66)	192.0 (21.71)
3-56	4.4 (.497)	3.6 (.407)	8-36	22.0 (2.48)	18.0 (2.03)	3/8"-24	259.0 (29.20)	212.0 (23.97)
4-40	5.2 (.587)	4.3 (.486)	10-24	23.0 (2.59)	19.0 (2.14)			
4-48	6.6 (.740)	5.4 (.610)	10-32	32.0 (3.61)	26.0 (2.94)			
5-40	7.7 (.869)	6.3 (.712)	1/4"-20	75.0 (8.47)	62.0 (7.01)			
5-44	9.4 (1.06)	7.7 (.869)	1/4"-28	94.0 (10.6)	77.0 (8.70)			

Values are stated in: **ft-lbs (N-m)**

Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass
7/16"-14	31.0 (42.00)	26.0 (35.25)	5/8"-11	93.0 (126.09)	76.0 (103.04)	1"-8	287.0 (389.12)	235.0 (318.62)
7/16"-20	33.0 (44.74)	27.0 (36.61)	5/8"-18	104.0 (141.00)	85.0 (115.24)	1"-14	259.0 (351.16)	212.0 (287.43)
1/2"-13	43.0 (58.30)	35.0 (47.45)	3/4"-10	128.0 (173.55)	104.0 (141.00)			
1/2"-20	45.0 (61.01)	37.0 (50.17)	3/4"-16	124.0 (168.12)	102.0 (138.29)			
9/16"-12	57.0 (77.28)	47.0 (63.72)	7/8"-9	194.0 (236.03)	159.0 (215.58)			
9/16"-18	63.0 (85.42)	51.0 (69.15)	7/8"-14	193.0 (261.67)	158.0 (214.22)			

Helm Pump

	VALVE	TILT TYPE	DISPLACEMENT	RELIEF VALVE	PORTS*
HH4315-4	Regular	Sport	1.4 cu. in. (22.9 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH4316-4	Regular	Sport Plus	1.4 cu. in. (22.9 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6145-4	Regular	Sport	2.0 cu. in. (33.0 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6190-4	Pro	Sport	2.0 cu. in. (33.0 cc)	1500 PSI (10.3 MPa)	-5 ORB
HH6191-4	Regular	Sport	1.7 cu. in. (27.8 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6192-4	Regular	Sport	2.4 cu. in. (39.3 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6193-4	Regular	Sport	1.4 cu. in. (22.9 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6345-4	Regular	Sport Plus**	2.0 cu. in. (33.0 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6445-4	Regular	Sport Plus	2.0 cu. in. (33.0 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6489-4	Pro	Sport Plus	1.7 cu. in. (27.8 cc)	1500 PSI (10.3 MPa)	-5 ORB
HH6490-4	Pro	Sport Plus	2.0 cu. in. (33.0 cc)	1500 PSI (10.3 MPa)	-5 ORB
HH6491-4	Regular	Sport Plus	1.7 cu. in. (27.8 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6492-4	Regular	Sport Plus	2.4 cu. in. (39.3 cc)	1000 PSI (6.9 MPa)	-5 ORB
HH6493-4	Regular	Sport Plus	1.4 cu. in. (22.9 cc)	1000 PSI (6.9 MPa)	-5 ORB

* Helm fill/vent port is a 1/4" NPT port.

** Splined Wheel Shaft

Helm Pump Shaft

TAPER
3/4" Standard, 1" per ft.
** Splined

THREAD
5/8" NF
1/2" NF

KEY SIZE
3/16"
N/A

LIMITED WARRANTY

Owner's Limited Warranty Policy

This Warranty is made to a purchaser ("owner" or "you"), who acquires the Dometic Corporation ("Dometic")—manufactured product or component (the "Dometic product") for his or her own use.

1. WHAT'S COVERED

What does the Limited Warranty cover?

The Dometic products under this limited warranty are to be free from defects in material and workmanship at the time of sale and under normal use. If Dometic determines to its satisfaction that a Dometic product contains such a defect during the applicable Warranty Periods set out within **Section 4 COVERAGE PERIOD**, then Dometic shall, at Dometic's sole option, repair or replace the Dometic product, or refund the original purchase price.

Note: Where labor is included for a particular Dometic product covered under this Limited Warranty (See Section 4 COVERAGE PERIOD), Dometic is not responsible for additional labor charges associated with the removal, reinstallation, or replacement of any equipment or furnishings beyond the particular covered Dometic product. Any additional travel time is the owner's sole responsibility.

This Limited Warranty is made in lieu of all other express warranties, obligations, or liabilities on the part of Dometic. In those instances in which Dometic chooses to make a cash refund of the original purchase price, such refund shall effect the cancellation of the contract of sale without reservation of rights on the part of the owner. **Such refund shall constitute full and final satisfaction of all claims which the owner has or may have against Dometic resulting from any actual or alleged breach of warranty, either express or implied.**

IN NO EVENT SHALL DOMETIC BE LIABLE FOR EITHER INCIDENTAL OR CONSEQUENTIAL DAMAGES. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

ANY IMPLIED WARRANTY, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR ANY PURPOSE, IS LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

Dometic reserves the right to improve or change the design of any Dometic product without notice and with no obligation to make corresponding changes in Dometic products previously manufactured.

2. WHAT'S NOT COVERED

What does this Limited Warranty not cover?

We will have no obligations under this warranty for any product which:

- has been improperly installed;
- has been used in an installation other than as recommended in our installation or operation instructions or specifications;
- has failed or has been damaged due to an accident or abnormal operation including racing, misuse or alterations outside our factory;
- has been repaired or modified by entities other than Dometic;
- has been used on an engine/boat combination where the engine horsepower exceeds the rating established by the boat manufacturer;
- has been used with other or as specified in the Dometic's Owners Manual for the purchased product/product(s) which, in Dometic's opinion, are incompatible with the Dometic's product.

Installation and application of Dometic products are not warranted by Dometic because Dometic has no control or authority over the selection, location, application, or installation of Dometic products.

3. GETTING SERVICE

How do you get service?

Please read the following Warranty Procedure:

In order to obtain the benefits of this Warranty, the owner has the following three options during the applicable Warranty Coverage Period:

1. Preferred option: Have a Dometic authorized Servicing Dealer perform the work needed. The customer needs to contact Dometic Tech Support 800-730-4082, marinesupport@dometic.com for a recommendation as to the closest authorized Servicing Dealer. If the customer already knows of an authorized Servicing Dealer, the Servicing Dealer should be contacted directly.
2. Second option: If the customer contacts the Dometic Customer Service Department for an authorized Servicing Dealer and there are none in the particular area, Dometic may authorize the use of a local Servicing Dealer, in which event Dometic will work with the local Servicing Dealer to assist in any way possible.
3. Third option: The customer may send the Dometic product back to the factory to have the repair work done. Dometic will make every effort to return the equipment to the customer within a three-week time period. If the claim represents a valid warranty issue, Dometic will pay the freight both ways. Dometic prefers option one first, option two second, and option three only if option one or two are not available.

Refer to the **Dometic Tech Support** section below for contact information.

Any Dometic product returned in the manner described above will be examined by the Servicing Dealer and/or by Dometic. If it is found that the returned item was defective in material or workmanship at the time of sale, the Servicing Dealer will contact Dometic for Warranty coverage. Dometic shall, at Dometic's sole option, repair or replace the Dometic product, or refund the original purchase price. If Dometic determines that repairs to the Dometic product are to be made, then only authorized Dometic parts will be used.

Dometic does not authorize any person or company to create any Warranty obligations or liability on its behalf.

No action to enforce this Warranty shall be commenced later than ninety (90) days after the expiration of the applicable Warranty Coverage Period as set out within **Section 4 COVERAGE PERIOD**. Claims must be submitted in writing to the Dometic Marine Division Warranty Department.

4. COVERAGE PERIOD

What is the Warranty Coverage Period?

Dometic warrants its products for a period of two years from the date of original retail purchase. For Dometic products used commercially or in any rental or other income producing activity, Dometic warrants its products for a period of one year from the date of original retail purchase.

We will provide replacement product without charge for any Dometic product covered by this warranty, which is returned (freight prepaid) within the warranty period to the dealer from whom such products were purchased, or to us at the appropriate address. In any such case, Dometic products found to be defective and covered by this warranty from the date of original purchase will be replaced or repaired at Dometic' option, and returned to the customer.

Dometic' sole responsibility under this warranty is limited to the repair or replacement of product which is, in Dometic' opinion, defective. Dometic is not responsible for charges connected with the removal of such product or reinstallation of replacement or repaired parts.

Dometic Tech Support

Phone: 800-730-4082

Email: marinesupport@dometic.com

NOTE: The above Limited Warranty supersedes all previous versions and is a reproduced extract from Dometic publication: L-4940. Form No. 340124 05/18 REV B. Effective 01/01/2024.

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