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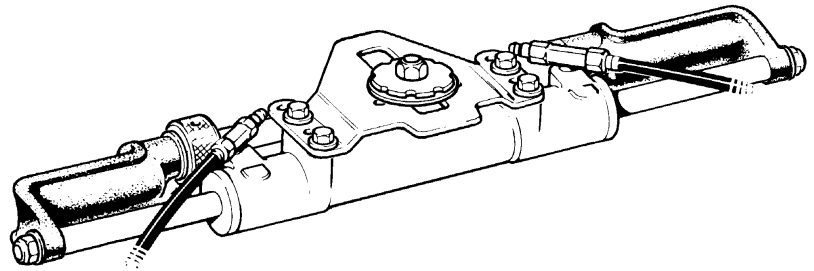
CAPILANO™

SEASTAR™

INSTALLATION INSTRUCTIONS

AND OWNER'S MANUAL

www.seastarsolutions.com



SEASTAR™

Hydraulic Steering for Outboard
Powered Vessels


Standard Front Mount Cylinder HC5340, HC5342
Side Mount Cylinder HC5370.



SEASTAR
SOLUTIONS®




*Before you do it your way,
please try it our way*

Notice to Boat Manufacturer or Installer

Throughout this publication, Warnings and Cautions (accompanied by the International Hazard Symbol ) are used to alert the manufacturer or installer to special instructions concerning a particular service or operation that may be hazardous if performed incorrectly or carelessly.

Observe Them Carefully!

These “safety alerts” alone, cannot eliminate the hazards that they signal. Strict compliance to these special instructions when performing the installation and maintenance plus “common sense” operation are major accident prevention measures.

 DANGER	 WARNING	 CAUTION	NOTICE
Immediate hazards which WILL result in severe personal injury or death.	Hazards or unsafe practices which COULD result in severe personal injury or death.	Hazards or unsafe practices which COULD result in minor injury or product or property damage.	Information which is important to proper installation or maintenance, but is not hazard-related.

WARNING

Cleaning fluids containing ammonia, acids or any other corrosive ingredients MUST NOT be used for cleaning any part of this Hydraulic Steering System. Failure to comply will cause serious damage to the steering system, resulting in possible loss of steering, causing property damage, personal injury and/or death.

INTRODUCTION

Before proceeding with the installation, read these instructions thoroughly. SeaStar Solutions 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.

NOTICE

*Due to a small amount of internal oil slip, a “master spoke” or “centered” steering wheel cannot be maintained with a hydraulic steering system. For best results, use an equal distance spoke steering wheel.
SeaStar Pro hydraulic steering eliminates the “need” for a steering wheel mounted trim switch.*

WARNING

Do not use a wire coil type trim switch with a hydraulic steering system. Wire coil can wind up tight around the steering wheel shaft and prevent further steering!

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BEFORE OPERATING YOUR BOAT

Ensure that the following check list is carried out

- 1 Perform system pressure test by turning helm all the way to hard over and then forcing the helm another 1/4 to 1/2 turn. This should be done in both directions. This will pressurize the system. Any weakness in the system should show up at this time.
- 2 Confirm that extruded nylon tubing has **NOT** been substituted for SeaStar Hydraulic Steering Hose.
- 3 Confirm that there is no interference between the steering cylinder and the transom, splashwell or jackplate or any combination of these parts by performing these simple steps:
 - With engine fully tilted, turn steering from hard over to hard over and confirm that no interference occurs. If you are using a hydraulic jack plate this also must be performed at the top and bottom position of the jack plate.
(If interference is present, it must be eliminated with Trim limiting switches and/or jack plate lift restrictors. Contact jack plate manufacturer for advice if required.)
 - Confirm that the steering cylinder can be stroked fully in both directions as well as full tilt and trim without stretching and/or kinking the hydraulic hoses.
 - Confirm that the hydraulic hoses are not subjected to chafing or rubbing.
 - Stretched, kinked or chafed hose will fail over a period of time.

! WARNING

Failure to comply with above may result in loss of steering, causing property damage and/or personal injury

Before attempting installation, ensure that the splashwell of your boat has the following minimum dimensions.

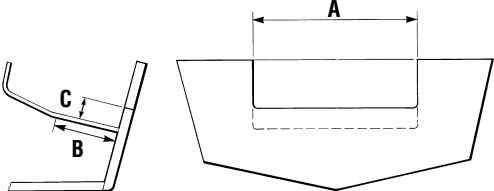
Minimum Splashwell Dimensions

# OF ENGINES	A	B	C	MIN. ENGINE CENTER DISTANCE
1	26" (660mm)	9" (230mm)	5.5" (140mm)	N/A
2	52" (1320mm)	9" (230mm)	6.5" (165mm)	26" (660mm)

NOTE:

a) Dimensional restrictions also apply to external motor mount brackets.

b) Maximum engine center distance for twin engine applications is 36" (914mm) using the standard tiebar. Dimension 'A' would have to be increased proportional to the tiebar length.



Front Mount Cylinder(s)

(part # HC5340 & HC5342)

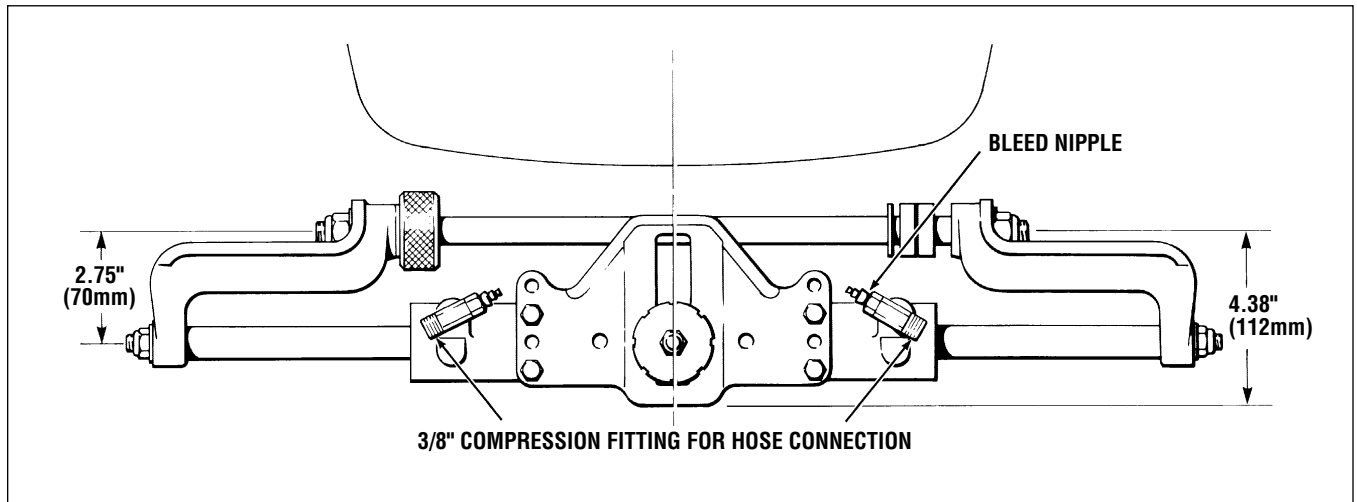


Figure 1

Side Mount Cylinder(s)

(part # HC5370)

Side mount cylinders require a minimum clearance of 14" (355mm) from the end of the tilt tube to the motorwell wall (gunwale) for proper installation. Minimum engine centers for twin engine applications are 26".

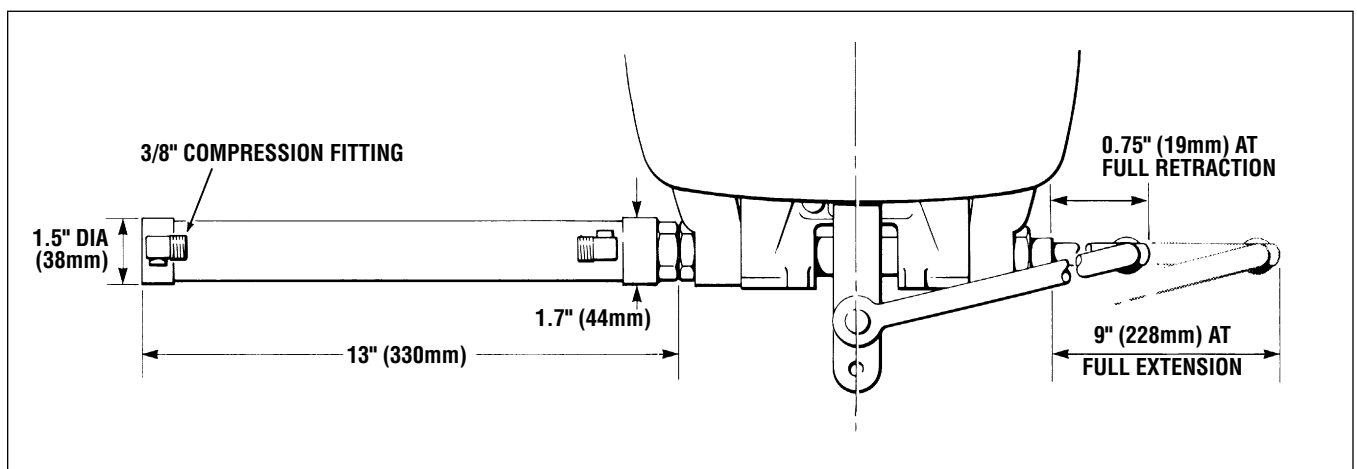


Figure 2

CAUTION

DO NOT use the SeaStar Pro 2.0 helm pump with a side mount cylinder as it is incompatible with all unbalanced cylinders.

Horse Power Limitations

Single Cylinder, Single Engine	300 HP
Single Cylinder, Twin Engine	
Non Counter Rotating	
Side Mount	300 HP
Front Mount	450 HP
Counter Rotating	600 HP
Twin Cylinders, Twin Engine	600 HP

Tools

You will need the following tools to complete your installation.

- 3" (77mm) diameter Hole Saw or Key Hole Saw and a
- 5/16" (8mm) dia. Drill.
- 7/16", 9/16", 5/8" and 3/4" Open End type Wrench/Spanner.
- 15/16" Socket for SeaStar Helms.

Additional tools needed**20° Mount Wedge**

- Key Hole or Sabre Saw
- 5/16" (8mm) dia. Drill
- 1/2" Wrench/Spanner, Box or Open End type
- 7/16" Socket and Drive

Cylinder, Front Mount Type

- 3/4" Wrench/Spanner, Box or Open End type, 2 required.
- 3/32", 3/16" and 7/32" Allen Key/Wrench

Cylinder, Side Mount Type

- 1-5/16" Wrench/Spanner, Open or Adjustable type
- 3/16" Allen Key/Wrench

⚠ CAUTION

Lightly lubricate threaded fasteners before installing. This will prevent them from seizing.

Lubricate support rod and all moving parts with a quality marine grease such as OMC Triple Guard, Quicksilver Anti-corrosion, Yamaha Marine Grease or Equivalent.

DO NOT remove protective caps from fittings and fitting ports until hose or tube connections are made. Contaminants in the steering system may cause premature wear and steering malfunctions.

DO NOT use the SeaStar Pro 2.0 Helm Pump with side mount cylinder HC5370 or the splashwell cylinder HC5380 as it is incompatible with all unbalanced cylinders.

MOUNTING THE HELM

Mount the SeaStar/SeaStar Pro helm to the dash board as required for your model-application. Refer to fig. 4, 6, 8 or 9 and use appropriate mounting template.

The helm may be mounted with the helm shaft horizontal, vertical or any angle in between.

The filler plug must always be in the uppermost position.

⚠ CAUTION

If more than one steering station is installed, the fill-vent plug on all but the uppermost helm must be replaced with a non-vent plug which is included in a dual station fitting kit as shown on page 14.

Determine desired mounting position. Ensure that the steering wheel will not interfere with other functional equipment. Check for adequate space behind dash for fitting and line connections.

⚠ CAUTION

If a 20° mounting wedge is used, cut out dash as per mounting wedge template and mount helm directly to the 20° wedge.

⚠ WARNING

Use self-locking fasteners provided only; substituting non-self locking fasteners can result in loosening or separation of equipment and loss of steering control.

NOTICE

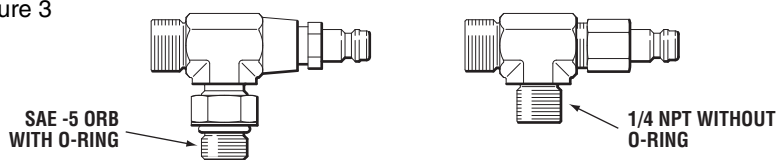
Tilt helm mounting instructions supplied separately with tilt helm.

Do not exceed 110 in./lbs. (12 Nm) torque on helm and wedge nuts and bolts.

Install elbow fittings (pre-installed on SeaStar Pro) supplied with helm to ports marked S and P. See Caution below.

NPT fitting installations only. Apply a liquid, Teflon based pipe sealant onto the threads going into a helm pump and/or steering cylinder. Tighten fitting "**hand-tight**". Using a wrench tighten an **additional 1-1/2 turns**. Continue to **tighten** until desired orientation is met.

Figure 3



⚠ CAUTION

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

NOTICE

Ports marked R are for the connection of additional helm and auto pilot compensating lines. Straight connectors may be substituted.

Use a pipe sealant such as Loctite P.S.T. or equivalent on all pipe threads. Do not use "tape" sealers.

Mount helm to dashboard or console and lightly **grease taper of helm shaft**.

Mount steering wheel to helm.

⚠ CAUTION

Tighten steering wheel shaft nut before filling and purging the steering system. Tighten nut to 150 in./lbs. (17 Nm). Do not exceed 200 in./lbs. (22 Nm).

Standard Helm Mounting Configuration (Max. wheel size 28")

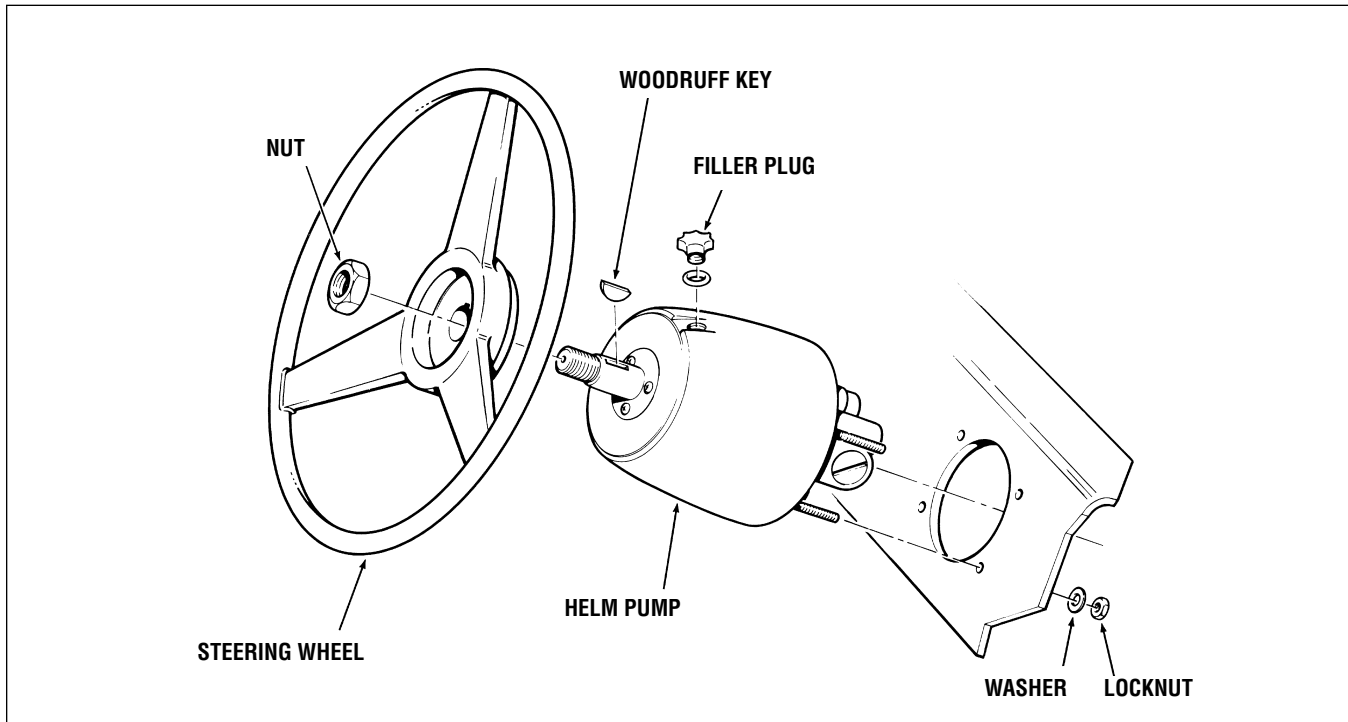


Figure 4

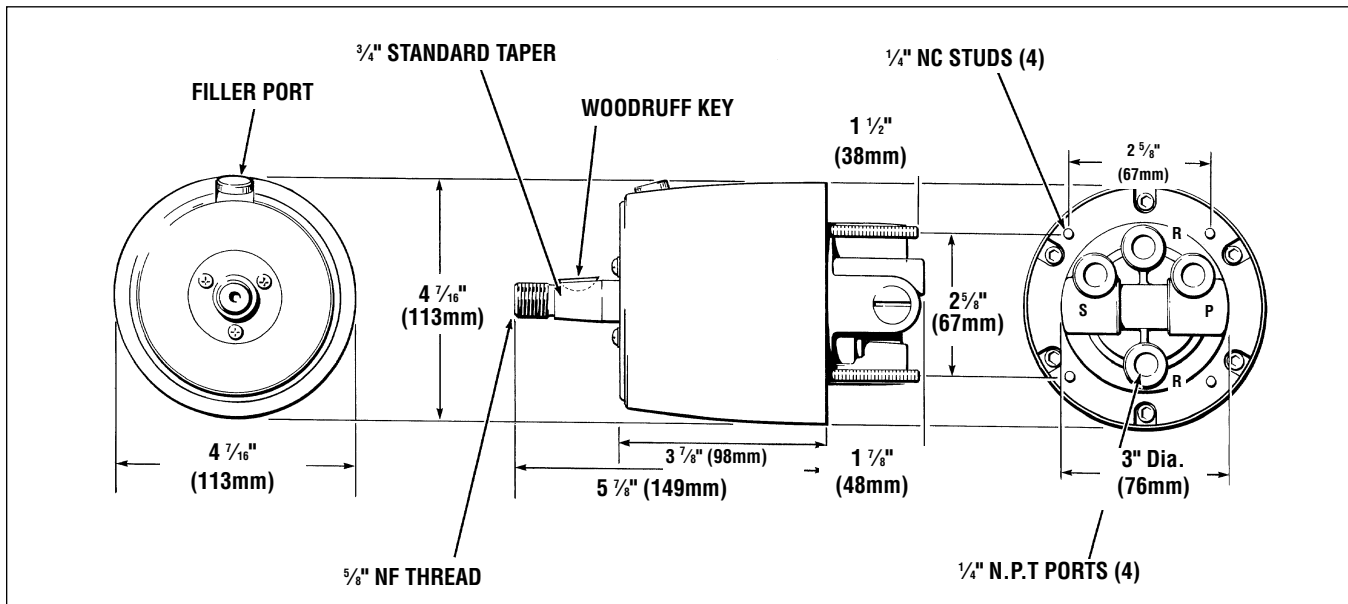


Figure 5

Back Mount Kits

- a) Used to retrofit a new SeaStar/SeaStar Pro standard helm in the old 4.5" (115mm) diameter hole.
- b) or reduce the helm protrusion from the dash by the thickness of the dash.
- c) or retrofit new SeaStar/SeaStar Pro standard helm into hole cutouts for mechanical and hydraulic steering as per chart.

STEERING MANUFACTURER	HELM MODEL TYPE	SYSTEM	BACKPLATE KIT REQ
SEASTAR SOLUTIONS	SAFE-T	MECHANICAL	YES
	BIG-T	MECHANICAL	YES
	ROTARY	MECHANICAL	YES
	RACK AND PINION	MECHANICAL	NO
	SYTEN	HYDRAULIC	YES
MORSE	ROTARY	MECHANICAL	NO
	RACK AND PINION	MECHANICAL	NO

Back Mount Kit Square
(part # HA5418)

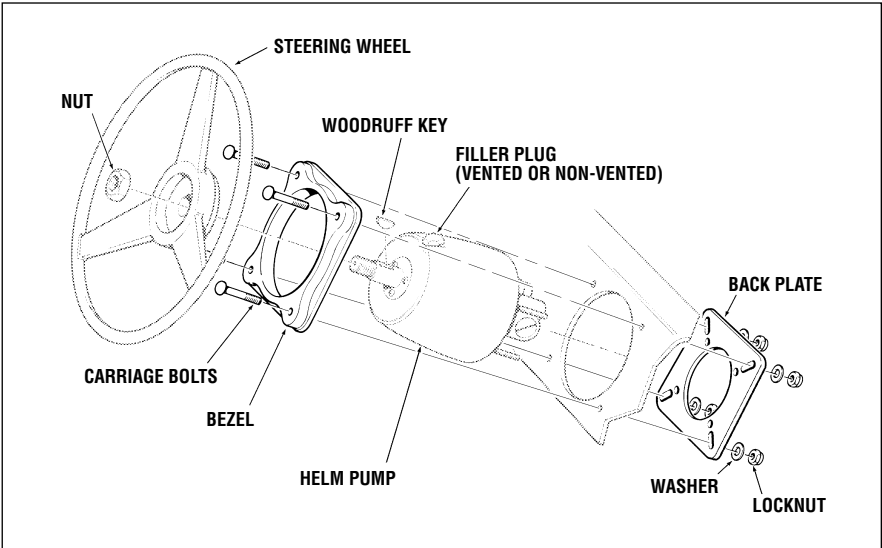


Figure 6

Rear Mount Helms

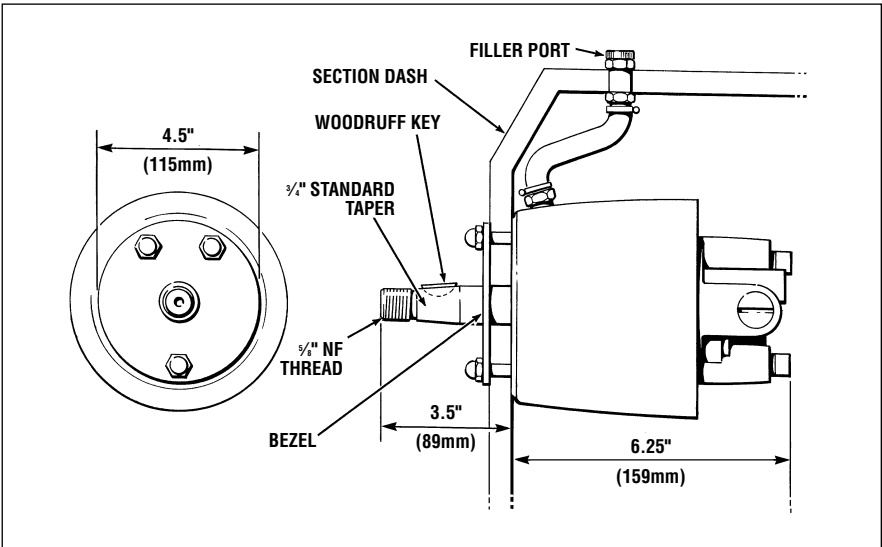


Figure 7

Back Mount Kit Round
(part # HA5417)

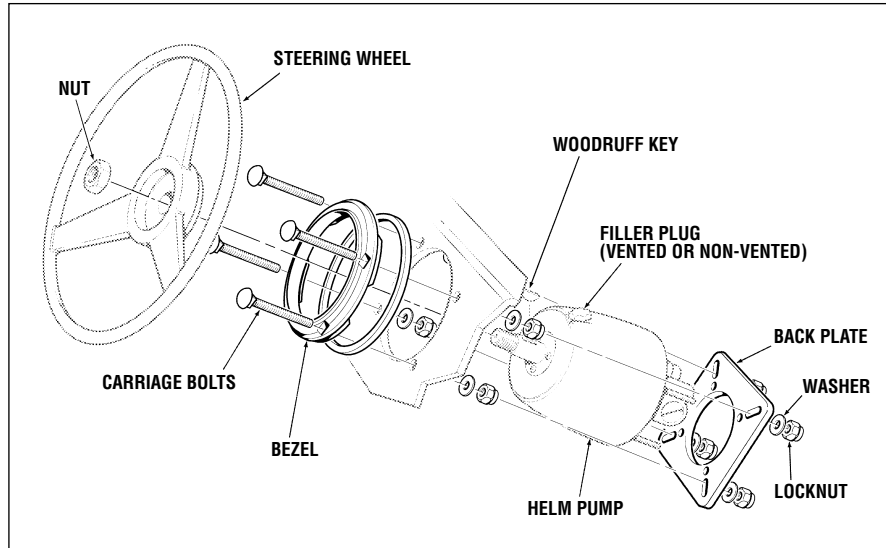


Figure 8

20° Wedge (part # HA5419 & HA5408 c/w Drain kit)

This kit is designed to mount the helm at a 20° angle to the mounting surface. Four possible mounting configurations are available.

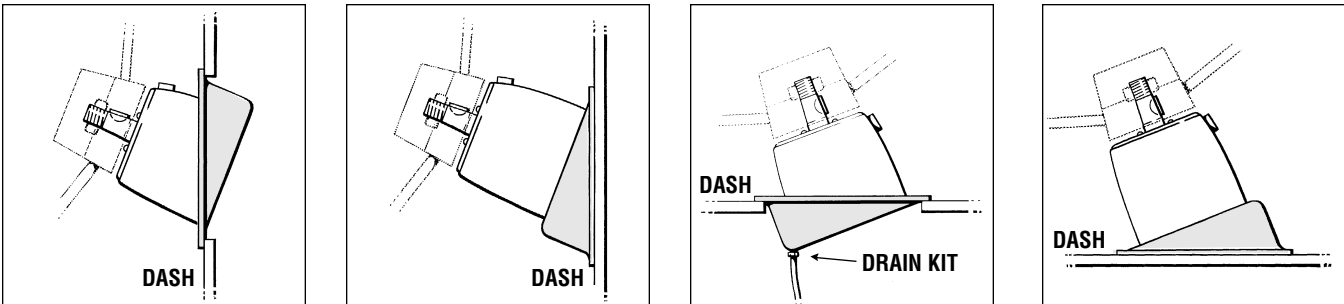


Figure 9

▲ For this configuration use HA5408

HYDRAULIC HOSE INSTALLATION

⚠ CAUTION

For twin steering station installations, e.g.: tower boats, use SeaStar Pro outboard hose or a combination of 3/8" O.D. copper tube (for the long runs).

Plan ahead: Future installation of an auto pilot or extra steering station can be simplified by installing two pairs of shorter hose kits.

Connect them with union coupling fittings, part no. HF5530.

Tee fittings can now be installed with ease at a later date.

Bulkhead union fitting kits are available to facilitate hose runs through transoms and splashwells.

Part No. HF5512, up to 3/4" (19 mm) splashwell, single cylinder

Part No. HF5513, up to 3" (76 mm) transom, single cylinder

Part No. HF5514, up to 3/4" (19 mm) splashwell, twin cylinders

Part No. HF5515, up to 3" (76 mm) transom, twin cylinders

* Part No. H081XX, Standard Pigtail hose kit

* Part No. H082XX, Sea Star Pro Pigtail hose kit

*XX = hose length in even foot increments

Route hydraulic hose from helm to cylinder(s) along gunwale or builder installed harness tube. **Do not remove protective fitting caps until connection of hose fitting to helm and cylinder is made.**

Use shortest convenient path for routing hoses.

Route hoses with a gradual rise from the SeaStar helm pump to the SeaStar Cylinder(s) along the gunwale or builder installed conduit.

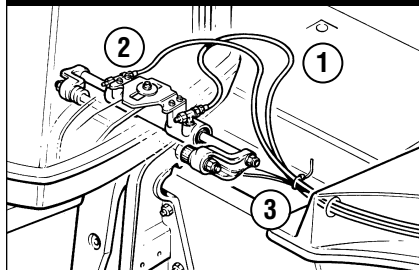
Do not bend Hydraulic hoses tighter than a 2-1/2" (6 cm) radius.

NOTICE

For replacement installations use old steering cable or hose to pull new hoses through difficult to reach areas.

Thread hose fitting onto fitting at rear of Helm pump and tighten or torque to 15 ft-lbs. Thread cylinder end of hydraulic hose onto steering cylinder fitting (tee / elbow) and torque or tighten to 15 ft-lbs.

⚠ WARNING



- 1 Minimum bend radius 3".
- 2 DO NOT adjust angle of fittings without first consulting manufacturer.
- 3 Hoses should be secured to the control cable harness as they enter the splashwell through the boot.

Hydraulic hoses must be protected from chafing and any possible contact or interference with assembly screws or sharp edges of any type. The hydraulic hoses should be secured wherever possible. SeaStar Solutions recommends the use of a rigging tube, PVC piping or conduit for the safe secure installation of hydraulic hoses.

Do not allow hoses to hang free in an area where they could become a safety hazard.

Do not install hoses in such a way that they will become exposed to high heat areas such as engine manifolds or highly corrosive areas such as battery fumes or electrical connections.

Continuous kinking, chafing, rubbing or twisting may eventually weaken hose(s) to a point where it could rupture from normal steering pressure causing loss of steering, resulting in damage to boat and/or personal injury. Visually inspect hoses and fittings for wear and/or damage.

⚠ CAUTION

Prevent mix-up in hose connections by marking both ends of one hose with masking or electrical tape. For two steering stations or an auto pilot installation, a third (compensating) line must be installed and identified. See Fig. 12 Page 14.

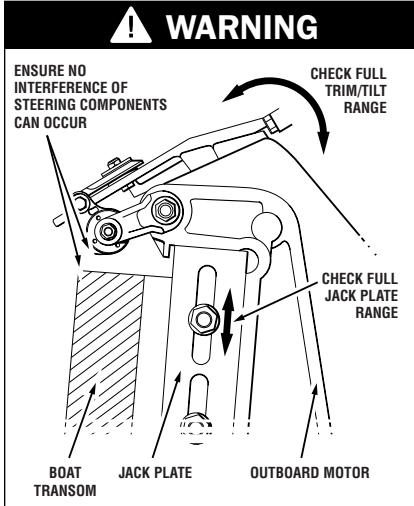
Provide sufficient hose length to allow full uninterrupted steering motion including trim and tilt. If your splashwell is rated for a dual application you must provide enough steering hose to rig either twin or single engines.

⚠ WARNING

Do not use extruded nylon tubing for outboard motor applications.

CYLINDER MOUNTING

Cylinder Installation Warning



Operational interference of the steering cylinder/cylinder fittings and jackplates/transom/splashwell can occur under certain conditions. Check installation thoroughly throughout the full range of Motor Tilt, Jack Height and Trim before making final installation.

If interference does occur, contact:

SeaStar Solutions for additional information/options.

Telephone: **(604) 270-6899** or **(941) 488-6744**

If interference is not eliminated total steering loss can occur, causing property damage and/or personal injury.

Front Mount Cylinder (Part# HC5342)

On pages 23 to 60 of this instruction booklet you will find the assembly drawing for your specific application.

NOTICE

Before beginning installation, verify that all mounting hardware is included and that the tiller arm bolt hole and tilt tube are clean and free of rust and or burrs. Grease all assemblies with quality marine grease prior to assembly.

CAUTION

Only your specific application drawing will illustrate the correct placement and orientation of items 1,2 and 14.

Single Engines

Study your drawing carefully. Items 1 through 20 are required for all applications. Slide the well greased support rod (item 12) into the thoroughly cleaned and rust free engine tilt tube.

Grease item no.'s 1, 5, 6, 7 and 8 and assemble item no.'s 1 through 10 (except item 2), as illustrated on your drawing.

NOTICE

Do not tighten the flat head socket cap screw (item 10) until the slider plate assembly is complete. This screw may have to be moved up and down during assembly of slider plate.

Once the assembly is complete, continue as follows:

Tighten flat head socket cap screw (item 10).

CAUTION

Do not pinch slide washers (item 5) on slide bushing (item 7). Slide bushing must fit properly inside the holes of slide washers.

Tighten the threaded notched washer (item 4) with a punch or screw driver.

CAUTION

Do not create any burrs on the threaded notched washer while tightening with screw driver or punch.

Tighten the 3/8" Nylok® nut (item 3) firmly against the threaded notched washer. Make certain that item 4 and 10 do not loosen while tightening the Nylok® nut.

Connect the slider plate assembly to the cylinder (item 11) with the 4 hex head cap screws (item 2).

⚠ CAUTION

Refer to your installation drawing for selecting the correct orientation and mounting holes on the slider plate.

Mount the spacers and adjusting ring nut (items 13, 14 and 16) to the support rod (item 12).

⚠ CAUTION

Refer to your installation drawing for the correct placements of spacers on both sides of engine tilt tube.

NOTICE

Coat the support bracket (item 15) holes with a quality marine grease prior to assembly.

Attach and connect support brackets (item 15) to the support rod (item 12) and the cylinder rod, using the washers, nuts and bolts (items 17, 18, 19 and 20), as illustrated on your application drawing.

⚠ WARNING

Do not substitute self locking type fasteners with non-locking type fasteners, or loss of steering may occur.

Eliminate support rod free play by turning the adjusting ring nut (item 16) counter clockwise. Do not use a wrench of any type on the adjusting ring nut. Turn by hand only. Lock the ring in place by securely tightening the set screw.

Check the cylinder assembly for smooth operation, making certain that no binding or interference is present. For cylinders not yet connected to hydraulic hoses, etc., check cylinder assembly by moving engine from engine stop to engine stop. For cylinders already connected to hydraulic hoses, etc., check cylinder assembly by turning steering wheel from stop to stop.

⚠ WARNING

Tilt engine(s) fully up and down to ensure that no parts of the cylinder assembly contact any part of the splashwell surface or engine-transom mounting bolts. If the cylinder does contact the engine mounting bolts, try turning the engine mounting bolts around by placing mounting bolt inside the transom. If interference still occurs DO NOT OPERATE VESSEL and contact your local marine repair facility or SeaStar Solutions for the correct installation procedures. Failure to rectify or correct interference may result in cylinder, splashwell and or engine damage resulting in personal injury or property damage.

FAILING TO CHECK FOR INTERFERENCE MAY RESULT IN CYLINDER, SPLASHWELL AND/OR ENGINE DAMAGE.

⚠ WARNING

Do not connect hose to bleed nipple end of the cylinder Tee fitting, unless bleed nipple is reinstalled on other side of the Tee fitting. Complete removal of bleed nipple will result in steering loss.

⚠ CAUTION

With non feed back steering systems such as SeaStar, incorrect torque/trim tab setting can still have an adverse effect on the overall performance of your boat. It is highly recommended that the tab(s) be set to the optimum setting, ie: minimum torque at top speed. On high performance boats, where this tab has been removed or is out of the water, a skeg type torque eliminator may be required if high torque is causing a steering/performance type problem at top speed.

Proceed to Page 14, Hose Connection.

Front Mount Cylinder Twin Engines One or two cylinder applications

The step-by-step instructions for twin engines are the same as those for single engines, with the exception of the additional Tie Bar Kit parts. The countersunk washer, item 9, is not used for twin engine applications.

Study your specific application drawing carefully. Item No.'s 1 through 22 (except items 8 & 9), and item No.'s 51 through 62, are required for all applications. When installing twin cylinders you will end up with spares of items 8 and 9.

For twin engine, single cylinder applications the cylinder may be mounted on either the starboard or port engine.

Slide the **well greased** support rod (item 12) into the thoroughly cleaned and rust free engine tilt tube.

Assemble item No.'s 1 through 10, item No.'s 51 through 55, and item 62, to the tiller arm.

Start the slider plate assembly by mounting the extension plate (item 55) to the underside of the tiller arm, using the flat head socket cap screw (item 63). Do not tighten the flat head socket cap screw at this time since this screw may have to be moved up and down during assembly of the slider plate.

Next, mount the clamp (item 51), over the tiller arm and into the extension plate (item 55), as illustrated on drawing.

Grease item no.'s 1, 5, 6, 7, and 8 before assembling.

Stack item no.'s 8, 7, 5, 6, 1, 5, 4, and 3 on top of the tiller arm and secure to the flat head socket cap screw (item 10).

Secure the slider plate assembly to the tiller arm as follows:
Tighten flat head socket cap screw (item 10).

CAUTION

Be absolutely certain that the bottom tiller arm surface contacts the extension plate slot surface squarely. Extension plate must not be slanted or cocked.

Tighten the threaded notched washer (item 4) using a punch or screw driver.

CAUTION

While tightening item 4, make certain that item 8 is fitted and seated squarely into the extension plate counter bore. Do not allow the bottom washer (item 52) to jam in the counter bore at an angle.

Do not create any burrs on the threaded notched washer while tightening.

Tighten the 3/8" Nylok® nut (item 3) firmly against the threaded notched washer (item 4).

Tighten the clamp (item 51) to the extension plate with 1/4" Nylok® nuts (item 62).

⚠ CAUTION

The extension plate (item 55) must fit properly onto the tiller arm. If the extension plate is slightly cocked or slanted (sideways) steering will be hard and damage to cylinder parts may occur.

Connect the slider plate assembly to the cylinder (item 11) with the 4 hex. head screws (item 2).

⚠ CAUTION

Refer to your installation drawing for selecting the correct mounting holes on the slider plate.

Mount the spacers and adjusting ring nut (items 13, 14 and 16) to the support rod (item 12).

⚠ CAUTION

Refer to your installation drawing for the correct placement of spacers on both sides of engine tilt tube.

NOTICE

Coat the support bracket holes with a quality marine grease prior to assembly.

Attach and connect support brackets (item 15) to the support rod (item 12) and the cylinder rod, using the washers, nuts, and bolts (items 17, 18, 19 and 20), as illustrated on your application drawing

⚠ WARNING

Do not substitute self locking type fasteners with non-locking type fasteners, or total loss of steering may occur.

Eliminate support rod free play by turning the adjusting ring nut (item 16) counter clockwise. Do not use a wrench of any type on the adjusting ring nut. Turn by hand only. Lock the ring nut in place by securely tightening the set screw.

Connect the tie bar (items 56, 57, 58, 59, 60 and 61) to extension plates as illustrated on drawings.

Refer to page 13 for instructions on how to shorten tie bar.

Check the cylinder assembly for smooth operation, making certain that no binding or interference is present. For cylinders not yet connected to hydraulic hoses, check cylinder assembly by moving engine from engine stop to engine stop. For cylinders already connected to hydraulic hoses, check cylinder assembly by turning steering wheel from stop to stop.

⚠ WARNING

Tilt engine(s) fully up and down to ensure that no parts of the cylinder assembly contacts any part of the splashwell surfaces or engine-transom mounting bolts. If the cylinder does contact the engine mounting bolts, try turning the engine mounting bolts around by placing mounting bolt inside the transom. If interference still occurs DO NOT OPERATE VESSEL and contact your local marine repair facility or SeaStar Solutions for the correct installation procedure's. Failure to rectify or correct interference may result in cylinder, splashwell and or engine damage resulting in personal injury or property damage.

FAILING TO CHECK FOR INTERFERENCE MAY RESULT IN CYLINDER AND/OR SPLASHWELL, AND /OR ENGINE DAMAGE.

Proceed to Page 14, Hose Connection.

CYLINDER MOUNTING

SIDE MOUNT

Side Mount Cylinder (Part # HC5370)

All applications

⚠ WARNING

DO NOT use the SeaStar Pro 2.0 Helm Pump with side mount cylinder HC5370 or the splashwell cylinder HC5380 as it is incompatible with all unbalanced cylinders.

Refer to page 68 and 69 for all Side Mount Cylinder drawings.

All linkages for connecting the cylinder extension rod to the tiller arm are engine manufacturer items and must be purchased by the installer, builder or owner.

This cylinder is mounted to the tilt tube in the same manner as a push-pull steering cable.

This unbalanced cylinder can exert a greater force while pushing the cylinder rod out of the cylinder barrel. By mounting cylinder on the appropriate side, engine torque, and steering loads can be balanced.

Slide the **well greased** extension rod (item 2) into the thoroughly cleaned and rust free engine tilt tube as illustrated on pages 68 & 69.

Attach cylinder rod end to extension rod by inserting it into mating hole of extension rod.

Align holes in cylinder rod and extension rod and insert special pin (item 3) through hole joining both rods together. If the holes do not align properly, rotate the extension rod 180°.

⚠ WARNING

Do not modify or change the pin or the hole in the cylinder rod and extension rod. Any modification can greatly reduce the strength and integrity of this attachment point and result in total loss of steering, causing property damage and/ or personal injury.

While holding the pin in place, slide the rod and pin assembly into the tilt tube.

Attach cylinder to tilt tube by threading the hex portion of the cylinder end to the tilt tube until fully engaged and tightened.

Resistance will be apparent due to the anti-vibration pellet.

If applicable, connect the tie bar (items 57 to 61) to the tiller arms as illustrated on page 69.

Refer to page 13 for instructions on how to shorten the bar.

Proceed to Page 14, Hose Connection.

NOTICE

Side mount Cylinder HC5370 should be mounted on the port side threaded portion of the tilt tube. Mounting the HC5370 on the starboard side of the tilt tube will decrease the efficiency and increase your steering effort."

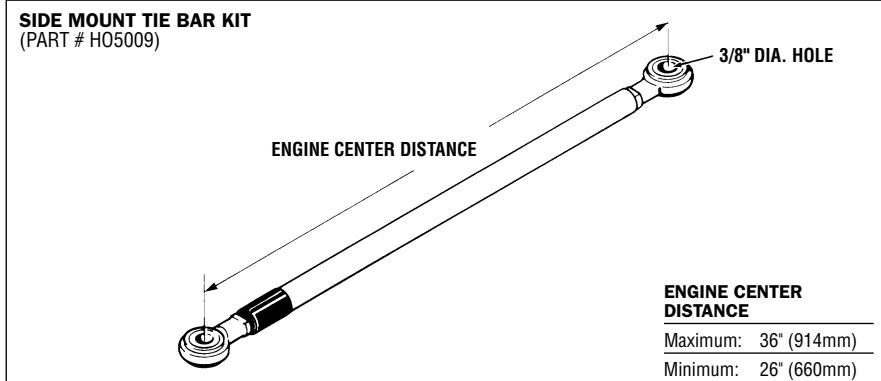


Figure 10

Tie Bar Instructions

Cut the tie bar and tie bar tube to length using the following formula.

$$X = CD - 1" (25\text{mm})$$

$$Y = CD - 4" (101\text{mm})$$

CAUTION

The CD dimension must include allowance for engine toe in/out as required, or recommended by the engine manufacturer. Failing to observe toe in/out recommendations may result in harder than normal steering effort.

WARNING

At the time of installation and any other time thereafter, the threaded rod must always fully cover inspection hole 1, but never inspection hole 2. Failing to observe this warning may result in one engine becoming separated from the steering system causing result in property damage and/or personal injury. The SeaStar tie bar is designed for use on SeaStar Solutions cylinders only. It may not be compatible with other cylinders.

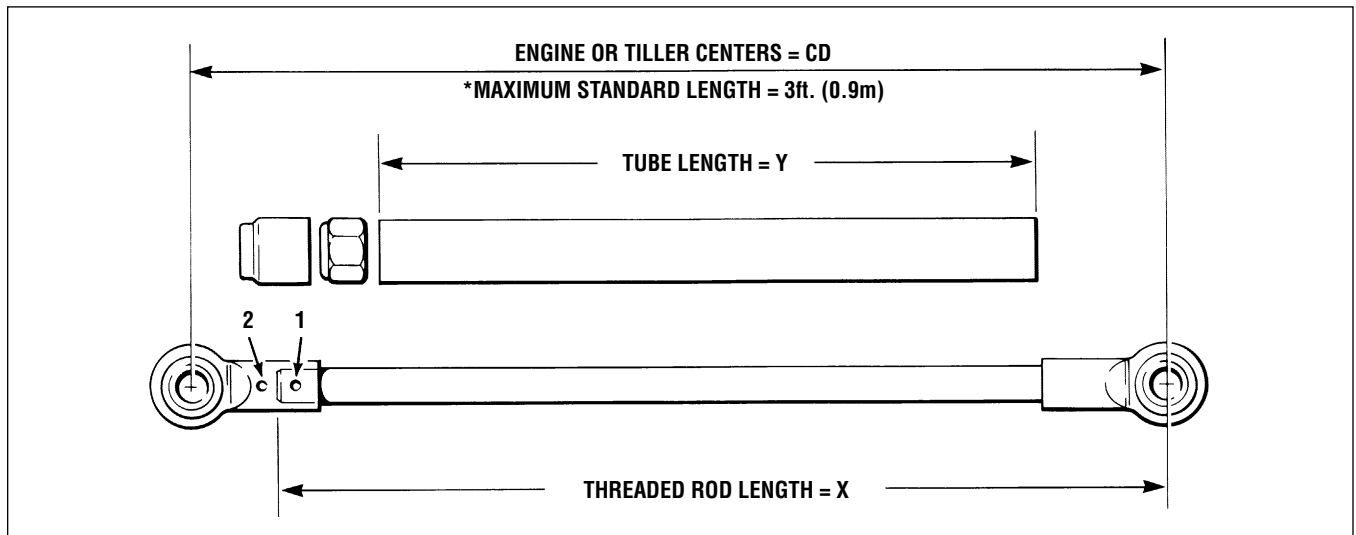
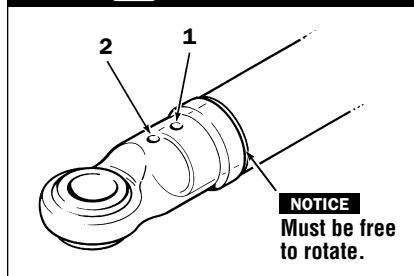


Figure 11

Twin Engine, Tie Bar Systems

WARNING



At the time of installation and any time thereafter, the threaded rod must always fully cover inspection hole 1, but never inspection hole No. 2. Failing to observe this warning may result in one engine becoming separated from the steering system and result in property damage and/or personal injury.

HOSE CONNECTION

⚠ WARNING

Do not connect hose to bleed nipple end of the cylinder Tee fitting, unless bleed nipple is reinstalled on other side of the Tee fitting. Complete removal of bleed nipple will result in steering loss.

Refer to illustrations below for the correct connection of hoses from helm pump to cylinder.

⚠ CAUTION

Start hose nut by hand. After a few turns, firmly tighten the hose fitting nut with a 3/4" wrench. Do not over tighten. Maximum 140 in./lbs.

Move engine from engine stop to engine stop with engine(s) in the normal and tilt position to confirm that no binding or hang up of hoses occurs after the system is filled with oil.

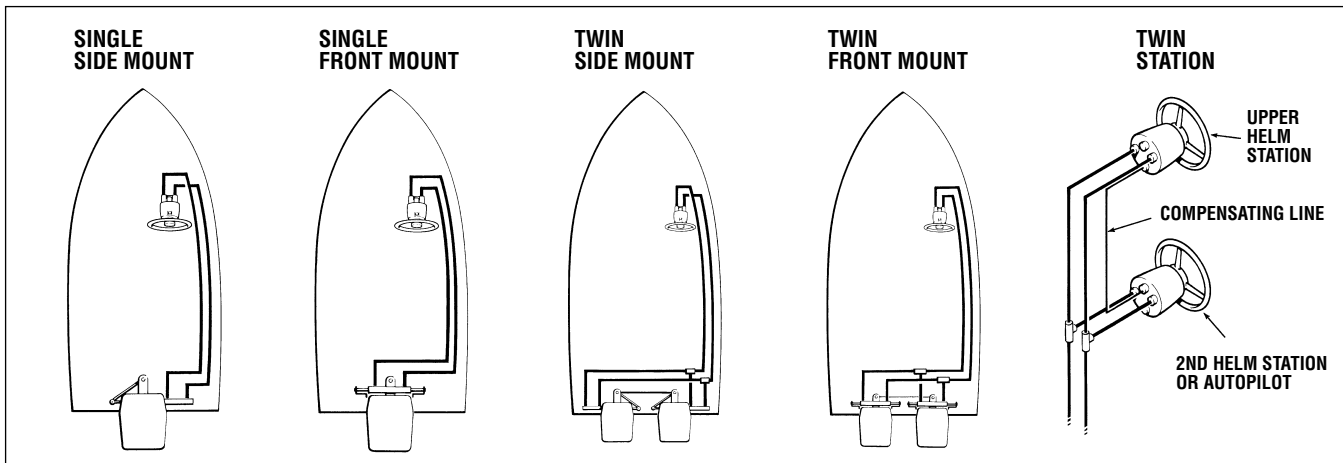
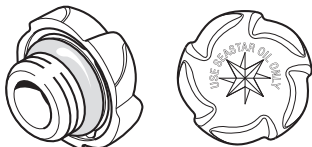


Figure 12

Fill Plugs for SeaStar Helms

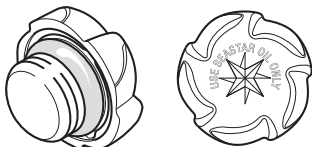
VENT PLUG - Part No. HA5431



SUPPLIED WITH SEASTAR HELM PUMP

- MUST BE USED WITH HELM PUMP ON ALL SINGLE STEERING STATION SYSTEMS.
- MUST BE USED ON UPPER MOST HELM PUMP ON MULTI STEERING STATION SYSTEMS.

NON-VENT PLUG - Part No. HA5432



- MUST BE USED ON ALL HELM PUMPS OTHER THAN UPPER MOST HELM PUMP ON MULTI STEERING STATION SYSTEMS.
- THIS NON-VENT PLUG IS SUPPLIED WITH ADDITIONAL STATION FITTING KIT NO. HF5501 AND HF5502.

Hydraulic Fluid

Recommended oils for your steering system are:

SeaStar Hydraulic Fluid, part no. HA5430 (1 quart), HA5440 (1 Gal.)

Texaco H015

Shell Aero 4

Esso Univis N15

Chevron Aviation Fluid A

Mobil Aero HFA

Fluids meeting Mil H5606 specifications.

Automatic transmission fluid Dexron II may be used in an emergency.

⚠ CAUTION

Never use brake fluid. Any non-approved fluid may cause irreparable damage, loss of steering, and cancellation of warranty.

In cases of extreme emergency any non-toxic, non-flammable fluid may provide temporary steering.

FILLING AND PURGING THE SYSTEM

Read First

These instructions show how to fill and purge a Single Station Front Mount Cylinder System. The same steps apply to Single Station Side Mount Systems, the difference being which bleeder to open and close and the direction the cylinder rod moves. These variations are shown in inset diagrams at each step. For twin station and/or twin cylinder filling and purging instructions read instructions on page 19-20 first and then proceed with instructions on page 16.

This procedure requires two people. One person may not be able to remove all the air from the system which will result in spongy, unresponsive steering.

During the entire filling procedure, oil **must** be visible in the filler tube. **Do not** allow the oil level to disappear into the helm pump, as this may introduce air into the system and increase your filling time.

Hydraulic Oil Requirements

2 bottles (2 quarts or litres) for single station and single cylinder systems.

1 additional bottle for each additional helm, cylinder, or auto pilot.

NOTICE

These instructions will result in hydraulic oil flushed in and out of the system. Oil can be re-used if filtered through a fine mesh screen such as used for gasoline. If unable to filter oil, an additional bottle of oil is required.

NOTICE

"Bleeder" may refer to cylinders fitted with bleed tee fittings or bleed screws. If fitted with bleed tee fitting, open bleeder by unscrewing bleed nipple nut two turns.

If cylinder is fitted with bleed screws, open bleeder by removing bleed screw completely. Loosening bleed screw only, will not cause sufficient oil flow to purge system.

NOTICE

Filling the helm full of oil can be done faster if oil is poured into the helm prior to connecting filler tube (Part #HA5438) and oil bottle to the helm.

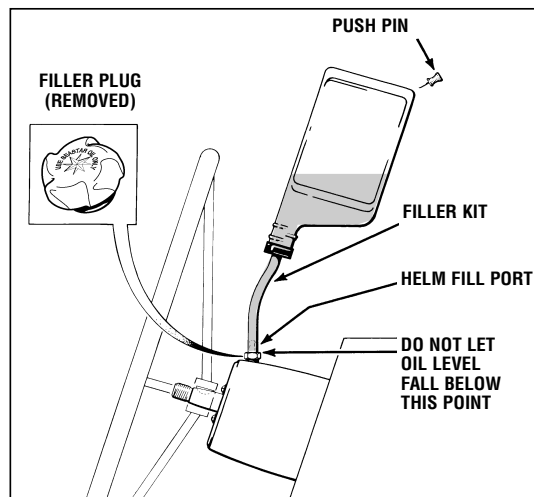
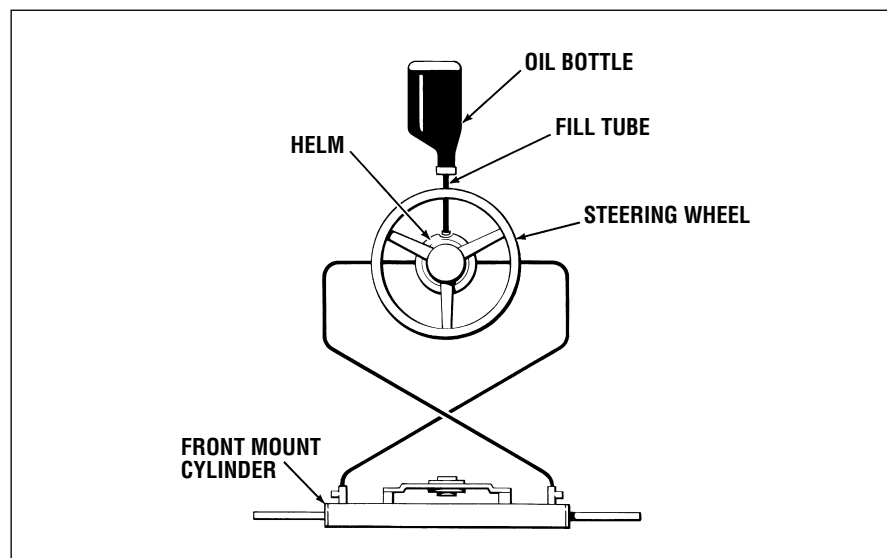
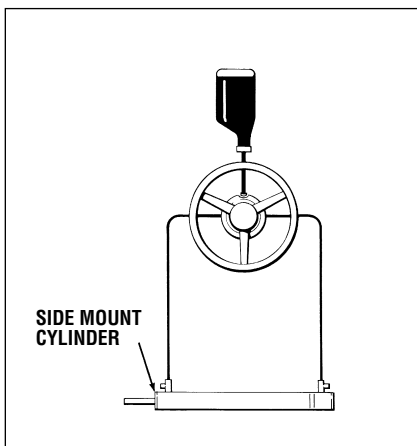


Figure 13

Single Station One Cylinder

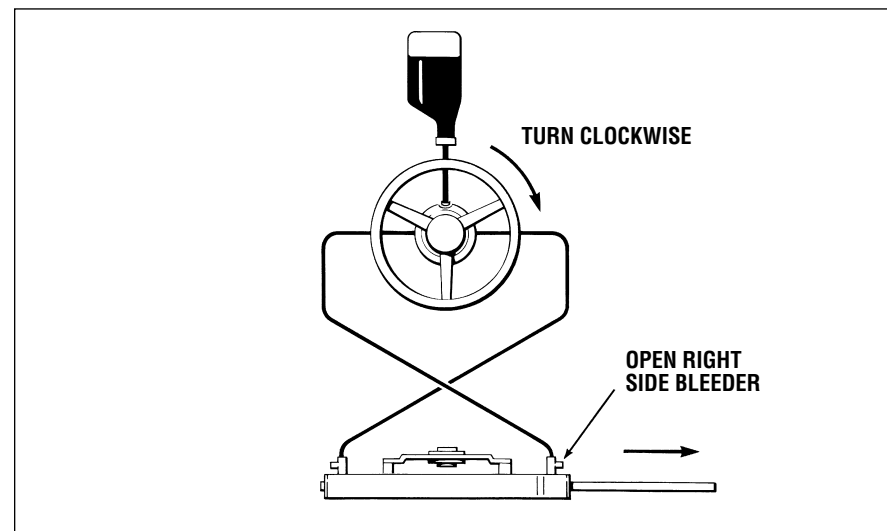
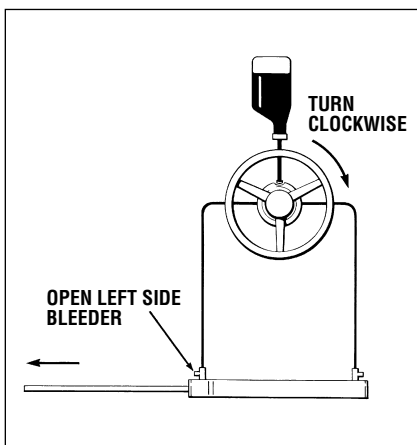
Step 1

- Screw the threaded end of the filler tube into the helm filler hole.
- Remove the cap from the oil bottle and holding upright screw into the filler tube bottle cap. Poke hole in the bottom of the bottle.
- Fill the helm pump full of oil (Oil should always be visible in the filler tube). Use the next bottle at any time throughout the procedure when the oil level drops in the filler tube. Do not proceed with step two until helm is full of oil.



Step 2

- Turn the steering wheel clockwise until the cylinder rod is fully extended on the right side of the cylinder.
- Open right side bleeder.

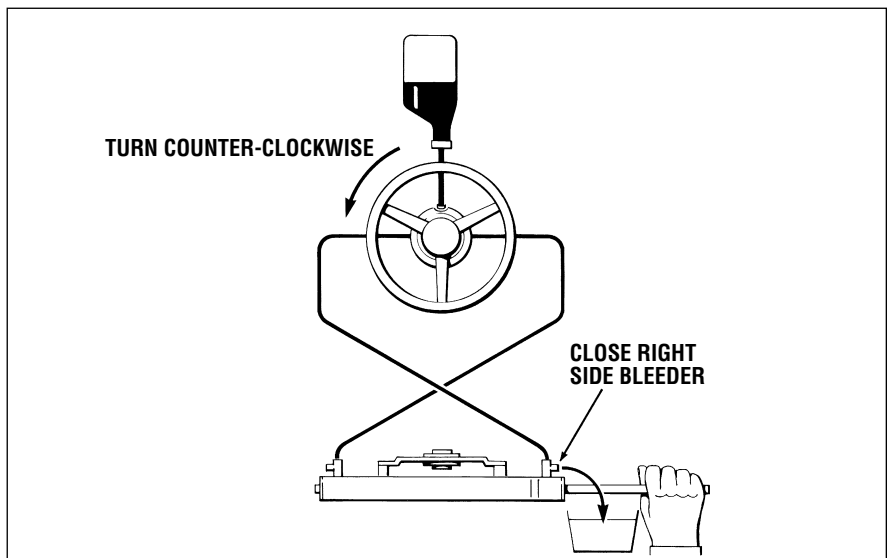
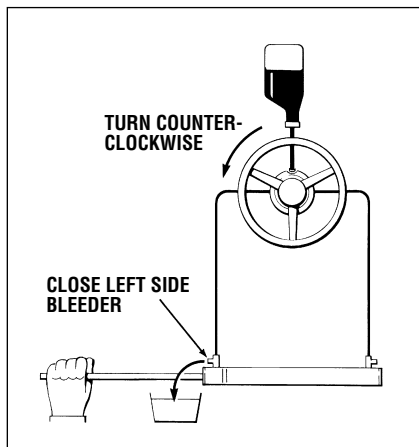


Step 3

- Holding the cylinder rod (to prevent it from moving back into the cylinder) turn the steering wheel counter-clockwise until a steady stream of air free oil comes out of the bleeder. (Drain out approx. 1/2 bottle of oil or as required)

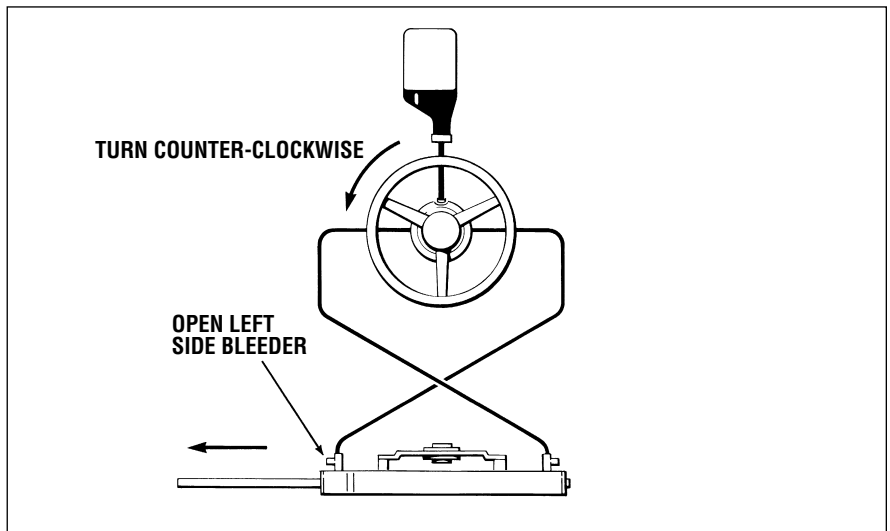
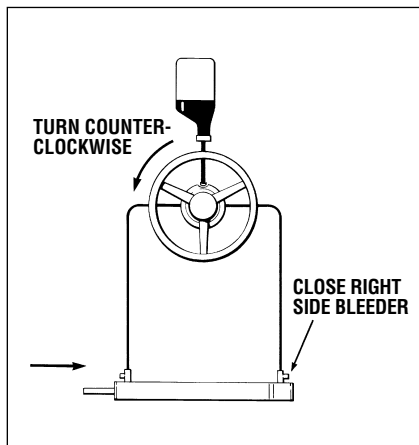
Do not use vise grips to stop cylinder rod from moving

- While continuing to turn the wheel close the right side bleeder and let go of the cylinder rod.



Step 4

- Continue turning the steering wheel counter-clockwise until the cylinder rod is fully extended to the left. (Steering wheel will come to a stop)
- Open the left bleeder.



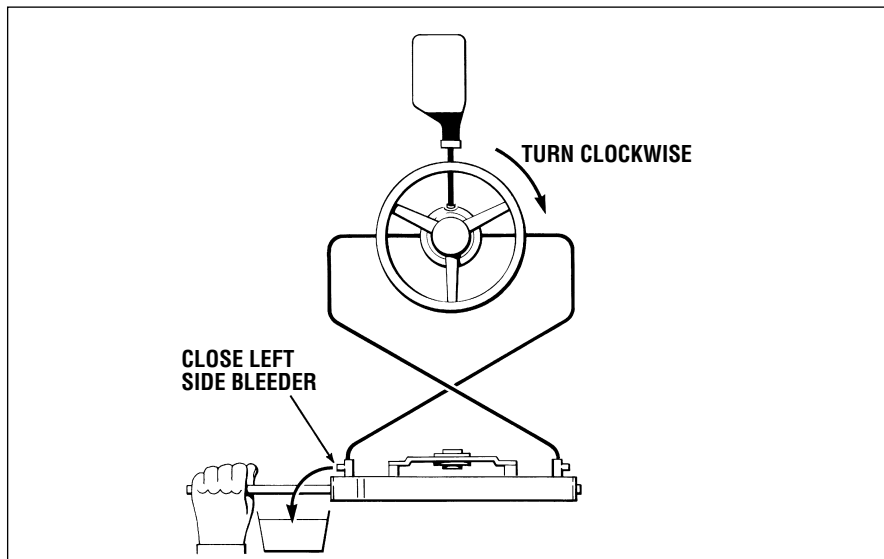
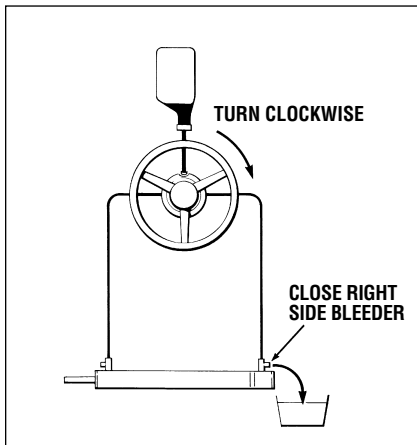
HYDRAULIC STEERING

FILLING AND PURGING

Step 5

- Holding the cylinder rod to prevent it from moving back into the cylinder turn the steering wheel clockwise until a steady stream of air free oil comes out of bleeder.
- While continuing to turn the wheel close the left side bleeder and let go of the cylinder rod.

Fill and purge is now complete.



Note: Refer to page 20 for oil level and system check, when properly bled, steering wheel turns will be;

	Front Mount	Side Mount
SeaStar I	4.75	4.9/5.8
SeaStar II	3.5	3.5/4.1
SeaStar Pro	4.1	N/A

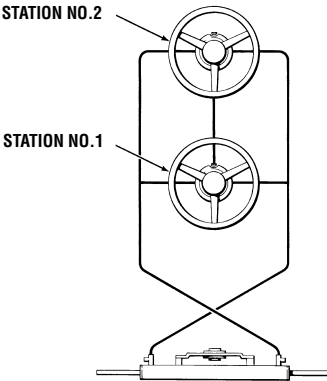
Twin Station Single Cylinder

Perform steps 1 through 5 at station no. 1. Then repeat steps 1-5 at station no. 2.

Oil requirements 4-5 bottles.

Note: Refer to Oil Level and System Check Page 20.

When properly bled, steering wheel turns will be as shown in the chart.



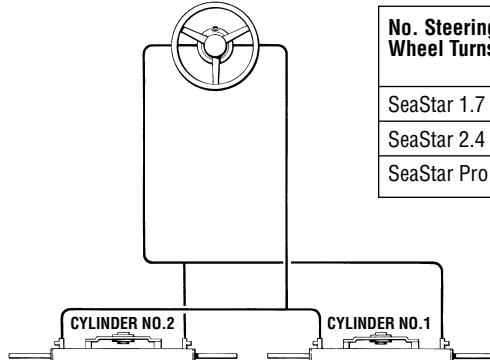
No. Steering Wheel Turns	Front Mount	Side Mount
SeaStar 1.7	4.5	4.9/5.8
SeaStar 2.4	3.25	3.5/4.1
SeaStar Pro 2.0	4.0	N/A

Single Station Twin Cylinder

When performing steps 1 through 5, perform instructions in each step first on cylinder no. 1 and then on cylinder no. 2, before proceeding to the next step. ie: Perform instructions referring to right side of cylinder first on cylinder no. 1 and then on cylinder no. 2.

Oil requirements 4-5 bottles.

Note: Refer to Oil Level and System Check on Page 20. Steering wheel turns will be as shown in the chart.

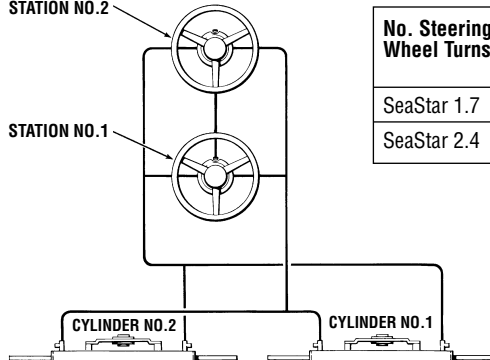


No. Steering Wheel Turns	Front Mount x 2	Side Mount x 2
SeaStar 1.7	9.2	10.7
SeaStar 2.4	6.5	7.5
SeaStar Pro 2.0	7.8	9

Twin Station Twin Cylinder

Follow same procedure as instructed for single station-twin cylinders, beginning at station no. 1, and repeat entire procedure at station no. 2.

Note: When properly bled, steering wheel turns will be as shown in the chart.



No. Steering Wheel Turns	Front Mount x 2	Side Mount x 2
SeaStar 1.7	9.2	10.7
SeaStar 2.4	6.5	7.5

OIL LEVEL AND SYSTEM CHECK

CAUTION

Side mount / splashwell mount cylinders are unbalanced. The oil level in the helm must be set with the cylinder rod fully retracted. Failing to observe this caution will result in a oil spill at the helm. Turning the wheel to port (left) will retract the cylinder rod.

CAUTION

Ensure that the cylinder can be fully stroked in both directions and in all tilt and trim positions without stretching or kinking the hydraulic hoses.

CAUTION

Failure to check for interference may result in cylinder, splashwell and/or engine damage.

Helm mounted with wheel shaft completely horizontal must be filled to bottom of filler hole at all times. Do not allow oil level to drop more than 1/4" (6.3mm)

Helms mounted on a 20° angle or with wheel shaft vertical, oil level should be within 1/2" (12.7mm) of hole. Check oil level periodically.

At this time the steering system must be checked for proper connections of hose, tube and fittings, possible leaks, and air removal. To do so, turn steering wheel (any one on a multi-steering station) and pressurize very hard to port. Apply enough force to the wheel to exceed pressure relief valve pressure.

You will not harm the helm of the system. While pressure is maintained on steering wheel, check all port (left) fittings and line connections for leaks. If no leaks are obvious your steering system is ready for use. If leaks are found, correct before using. Failure to correct leak will lower oil level in system and could result in loss of steering. Repeat procedure by turning wheel to starboard. Watch the oil level in the helm pump when the steering wheel reaches either hard over positions. If there is no obvious drop in oil level, air has been removed. If there is an obvious drop in oil level, you are compressing air and further filling and purging is required. Repeat Steps 1 through 5.

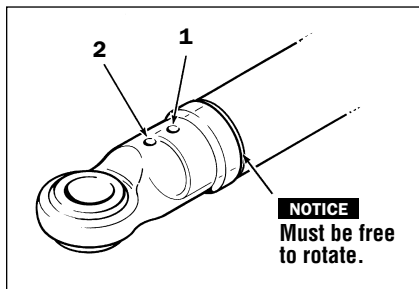
If interference occurs during engine tilt or trim between steering cylinder and splashwell or jackplate, contact your engine manufacturer for trim restrictors or a Tilt Stop Switch.

MAINTENANCE

⚠ WARNING

Twin Engine, Tie Bar Systems

At the time of installation and any time thereafter, the threaded rod must always fully cover inspection hole 1, but never inspection hole No. 2. Failing to observe this warning may result in one engine becoming separated from the steering system and result in property damage and/or personal injury.



FAILURE TO COMPLY WITH MAINTENANCE CHECKS MAY RESULT IN LOSS OF STEERING, CAUSING PROPERTY DAMAGE AND/OR PERSONAL INJURY

Maintenance requirements will vary with usage and climate.

Inspection by a qualified marine mechanic is required:

- A** A minimum of two times a year.
- B** At the first sign or indication that the steering system is not operating normally or correctly.
- 1** Check the oil level in the helm pump. This should always be within 1/2" of the bottom of the filler hole.
- Note:** The special hydraulic oil is not available from your local service station. Order a spare bottle (HA5430) from your SeaStar Solutions dealer.
- 2** Check the outboard engine tilt tube for salt deposits and corrosion. Clean and regrease as required.
- 3** Clean and grease the cylinder slider assembly. Use a quality marine grease, (Quicksilver 2-4-C, OMC Triple Guard or equivalent). Slider assembly must be greased at all times. Do not operate boat if slider assembly is dry and free of grease. See below.
- 4** Check mechanical linkages and connections. Tighten loose parts and replace badly worn parts.
- 5** Check for leaks. See page 20 for how to check for leaks.
- 6** Check hoses for chafing/rubbing marks, and replace if required.
- 7** Check cylinder shaft for nicks and scratches. A damaged cylinder shaft can cause seal failure and leaks. Replacing seals to a damaged cylinder shaft will not stop leaks. A damaged cylinder shaft must be replaced immediately.

Failure to comply with maintenance checks may result in loss of steering, causing property damage and/or personal injury.

LUBRICATING INSTRUCTIONS

⚠ CAUTION

Grease rod and support bracket holes once a year.

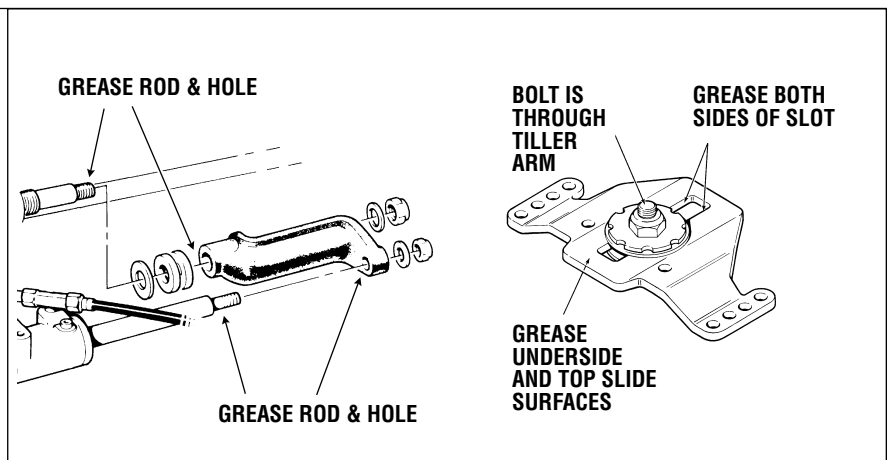


Figure 14

TROUBLESHOOTING GUIDE

WARNING

Whenever in the following text, a solution calls for removal from vessel and/or dismantling of steering system components, such work must only be carried out by a qualified marine hydraulic mechanic. SeaStar Solutions offers the following as a guide only and is not responsible for any consequences resulting from incorrect dismantling repairs.

Seastar hydraulic steering will provide years of safe reliable performance with a minimum of service if properly installed with correct cylinder.

Seastar steering systems have been designed with protection against over-pressure situations, by a pressure relief valve, to minimize the possibility of total loss of steering.

Most faults occur when the installation instructions are not followed and usually show up immediately upon filling the system. Provided below, are the most common faults encountered and their likely cause and solution.

Sometimes when returning the wheel from a hardover position, a slight resistance may be felt and a clicking noise may be heard. This should not be mistaken as a fault, as it is a completely normal situation caused by the releasing of the lockspool in the system.

FAULT	CAUSE	SOLUTION
1. During Filling, the helm becomes completely jammed.	Blockage in the line between the helm(s) and the cylinder(s).	Make certain that hose has not collapsed during installation. If so, the collapsed section must be removed and re-fitted with a new piece with the aid of tube connectors. Check fittings for incomplete holes. Fittings with incomplete holes, however, are not common.
2. System is very difficult to fill. Air keeps burping out top of helm even after system appears full.	Cylinder(s) has been mounted upside down. This causes air to be trapped in the cylinder(s). Air in system.	Mount cylinder(s) correctly, according to cylinder installation instruction. Ports should always be kept in uppermost position. Review filling instructions.
3. Steering is stiff and hard to turn, even when the vessel is not moving.	Knurled adjusting nut on tilt tube over tightened. Restrictions in hose, piping or fittings. Cylinder interfering with engine cowling.	To test, disconnect cylinder(s) from the tiller arm and turn the steering wheel. If it turns easily, correct above-mentioned problems. Please note that excessively loose connections to tiller arm or tie-bar can also cause mechanical binding. Find restriction and correct. Note: A kinked hose will cause restriction. Loose adjusting nut.

FAULT	CAUSE	SOLUTION
3. Continued	Air in oil. Wrong oil has been used to fill steering system, like A.T.F. (automatic transmission fluid, or any other oil with a high viscosity factor).	See filling instructions supplied with helm units. Drain system and fill with recommended oils.
4. One helm unit in system is very bumpy and requires too many turns from hardover to hardover.	Dirt in inlet check of helm pump.	Dismantle helm pump and remove contaminant from make-up checks.
5. Steering is easy to turn at the dock, but becomes hard to turn when vessel is underway.	Steering wheel is too small. Incorrect setting of trim tab(s) engine.	Fit larger wheel if possible, see installation instructions. If the problem cannot be rectified by the above mentioned solution, proceed with next cause and solution or consult factory. Adjust tab(s).
6. Engine drifts to port or starboard while vessel is underway, even when wheel is not being turned.	Dirt in check valves.	Remove check valve plugs. These are the larger plugs on either side on rear of helm. Clean ball seats and balls and re-assemble. Note: Be prepared to lose a certain amount of oil during this procedure. Have a small can available. Refill system when check balls have been re-assembled.
7. Turning one wheel causes second steering wheel to rotate.	See fault No. 6.	See fault No. 6.
8. Seals will sometimes leak if steering system is not vented at uppermost helm.		The Seastar helm has a field replaceable wheel shaft seal which can readily be replaced by removing the steering wheel and seal cover held in place by three small screws. Quad ring no. 210 is found in Seastar helm seal kit HS5151. NOTE: Seal kits are available for Seastar cylinders, however, these must only be used by a qualified marine mechanic.

TECHNICAL INFORMATION

Bolt Torque Specifications

Values are stated in: **in/lbs (N.m)**

Bolt Size	18-8SS	Brass
2-56	2.5 (.282)	2.0 (.226)
2-64	3.0 (.338)	2.5 (.282)
3-48	3.9 (.440)	3.2 (.361)
3-56	4.4 (.497)	3.6 (.407)
4-40	5.2 (.587)	4.3 (.486)
4-48	6.6 (.740)	5.4 (.610)
5-40	7.7 (.869)	6.3 (.712)
5-44	9.4 (1.06)	7.7 (.869)

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.

Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass
6-32	9.6 (1.08)	4.9 (.554)	5/16"-18	132.0 (14.91)	107.0 (12.10)
6-40	12.0 (1.35)	9.9 (1.12)	5/16"-24	142.0 (16.04)	116.0 (13.11)
8-32	20.0 (2.25)	16.0 (1.81)	3/8"-16	236.0 (26.66)	192.0 (21.71)
8-36	22.0 (2.48)	18.0 (2.03)	3/8"-24	259.0 (29.20)	212.0 (23.97)
10-24	23.0 (2.59)	19.0 (2.14)			
10-32	32.0 (3.61)	26.0 (2.94)			
1/4"-20	75.0 (8.47)	62.0 (7.01)			
1/4"-28	94.0 (10.6)	77.0 (8.70)			

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

Bolt Size	18-8SS	Brass
7/16"-14	31.0 (42.00)	26.0 (35.25)
7/16"-20	33.0 (44.74)	27.0 (36.61)
1/2"-13	43.0 (58.30)	35.0 (47.45)
1/2"-20	45.0 (61.01)	37.0 (50.17)
9/16"-12	57.0 (77.28)	47.0 (63.72)
9/16"-18	63.0 (85.42)	51.0 (69.15)

Bolt Size	18-8SS	Brass	Bolt Size	18-8SS	Brass
5/8"-11	93.0 (126.09)	76.0 (103.04)	1"-8	287.0 (389.12)	235.0 (318.62)
5/8"-18	104.0 (141.00)	85.0 (115.24)	1"-14	259.0 (351.16)	212.0 (287.43)
3/4"-10	128.0 (173.55)	104.0 (141.00)			
3/4"-16	124.0 (168.12)	102.0 (138.29)			
7/8"-9	194.0 (236.03)	159.0 (215.58)			
7/8"-14	193.0 (261.67)	158.0 (214.22)			

NOTICE Torque values for 18-8 stainless steel and brass bolts are taken from a torque guide by ITT Harper. All results correspond well with basic bolt equations, using a bolt factor of 0.2 and a factor of 3/4 for a reusable connection.

Helm Pump

SeaStar I
SeaStar II
SeaStar Pro

DISPLACEMENT

1.7 cu. in. (27.8 cc)
2.4 cu. in. (39.3 cc)
2.0 cu. in. (33.0 cc)

RELIEF VALVE

1000 PSI (68 Bar)
1000 PSI (68 Bar)
1500 PSI (102 Bar)

PORTS

1/4" NPT
1/4" NPT
1/4" NPT

Helm Pump Shaft

SeaStar I
SeaStar II
SeaStar Pro

TAPER

3/4" Standard, 1" per ft.
3/4" Standard, 1" per ft.
3/4" Standard, 1" per ft.

THREAD

5/8"NF
5/8"NF
5/8"NF

KEY SIZE

3/16"
3/16"
3/16"

Cylinder

Front Mount
Side Mount

INSIDE DIAMETER

1.262" (32.56 mm)
1.250" (31.70 mm)

STROKE

10" (254 mm)
8" (203 mm)

Front Mount
Side Mount

VOLUME

8.13 cu. in. (133.2 cc)
8.25/9.8 cu. in. (135.1/160.8 cc)

TORQUE @ 1000 psi (70 Bar) H.O.

N/A
7142/8502 in/lbs (82.1/97.7 Kg)

Fittings

SeaStar cylinders and all other fittings are 3/8" compression type fittings. Threads are 9/16" x 24 extra fine. A brochure on all SeaStar fittings is available from SeaStar Solutions.

NOTICE Regarding adjustment of Bleeder Tee Fitting (part# 409620) on steering cylinder HC5340-42. If interference occurs between the splashwell and hydraulic hose or hose fitting the fittings can be adjusted but must be removed completely prior to establishing desired orientation. SeaStar

Solutions recommends that once a fitting has been backed off (turned in a counter rotational direction) it is important to remove the fitting completely to avoid leakage. Remove the fitting, clean the threads and re-apply PST (pipe sealant with Teflon). This will ensure that the fitting does not leak

once re-oriented to desired angle. **The fitting must be torque to a min of 17-ft lbs. and then oriented to the desired angle. Max torque is 55-ft lbs.** DO NOT adjust fitting so that it points to the Starboard or in the direction that the hydraulic hose enters the splashwell.

SeaStar I, II, & Pro Hose

Inside diameter – 5/16" (8 mm)

APPLICATIONS

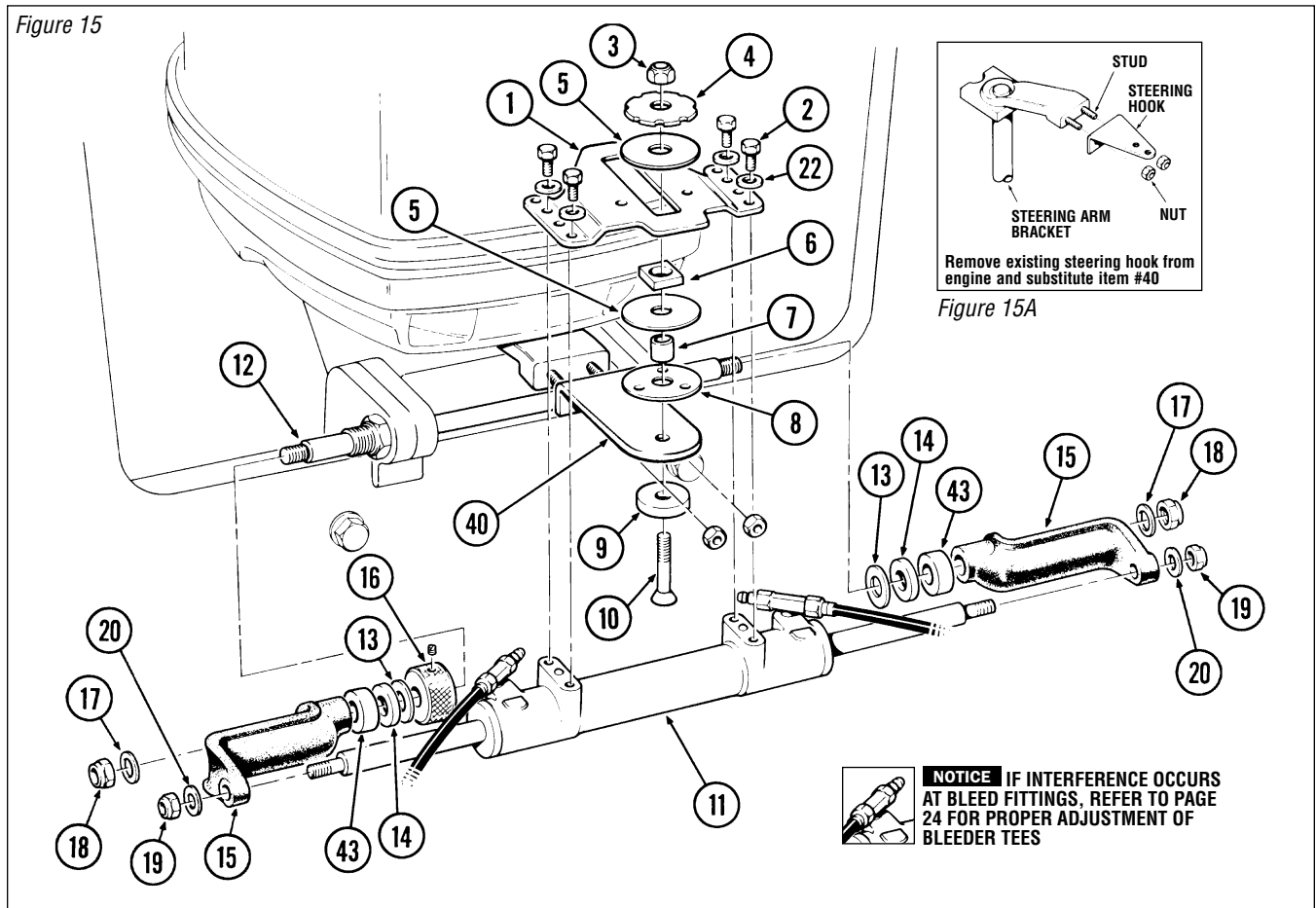
WARNING Refer to page 24 for correct torque specifications of all installation hardware.

APPLICATIONS

SINGLE ENGINE

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
HONDA	1992-TO DATE	30-50 HP	HC5342	H05015	HO5043 & HO5009	HO5043

Figure 15



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809900	2	Support Bracket
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.
ADAPTER KIT# H05015			
40	815728	1	Adapter Plate Honda
43	770423	2	Support Rod Spacer
REPLACEMENT HARDWARE MOUNTING KIT# 724021			
Includes all mounting hardware excluding the Support Rod part# 730229.			

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
HONDA	1993-TO DATE	30-50 HP	HC5342	H05015	H05043 & H05009	H05043

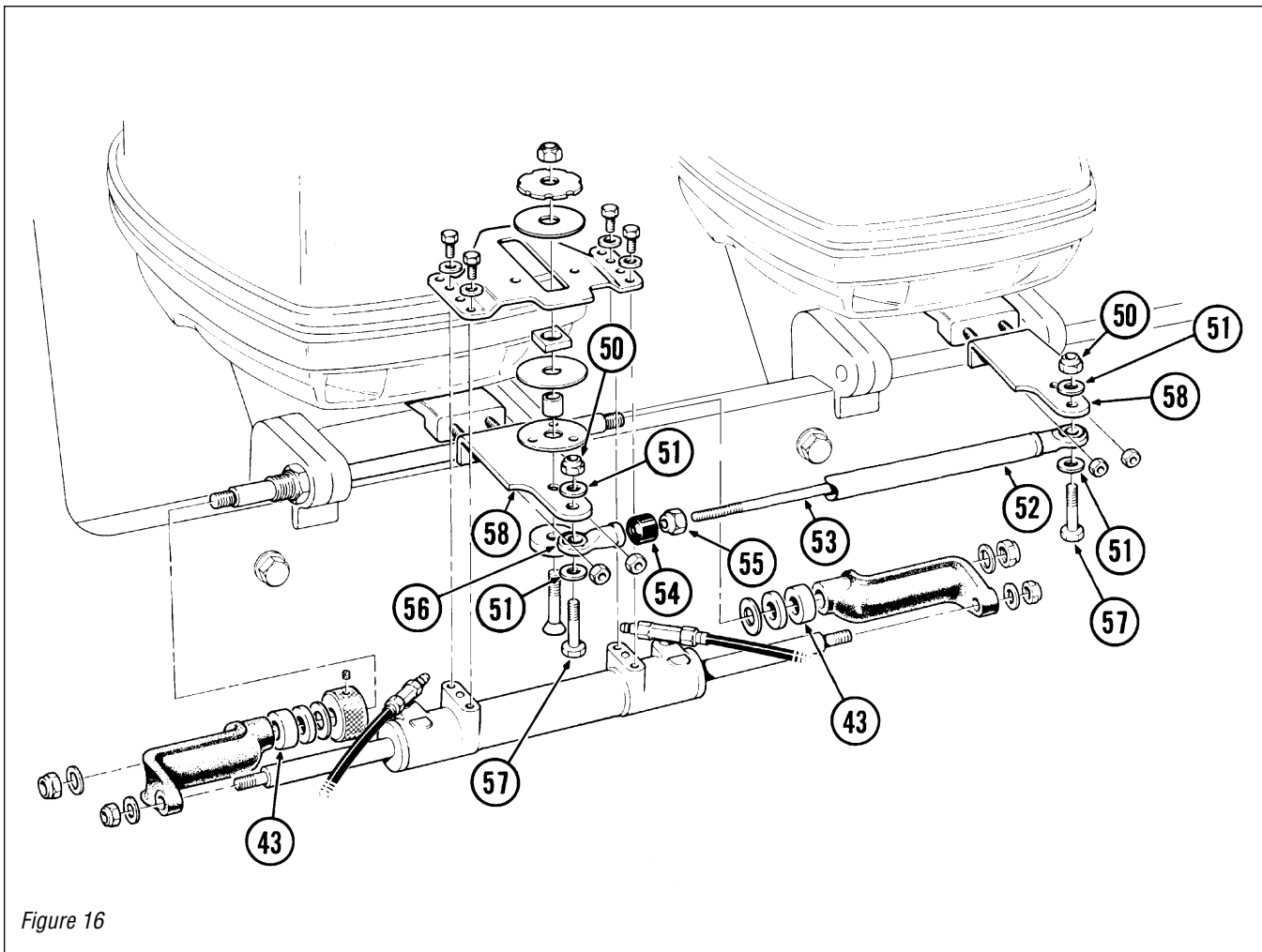


Figure 16

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05009			
50	113529	2	Nut 3/8" NF Nylok®
51	113622	4	Washer 3/8" dia.
52	722721	1	Stringer Tube
53	722523	1	Threaded Rod c/w Ball Joint
54	N/A	1	Obsolete—No longer required
55	192126	1	Nut 1/2" NF Nylok®
56	116527	1	Ball Joint
57	726825	2	Screw 3/8" NF x 1-3/4" Hex Head

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05043			
43	770423	2	Support Rod Spacer
58	815728	2	Adapter Plate Honda

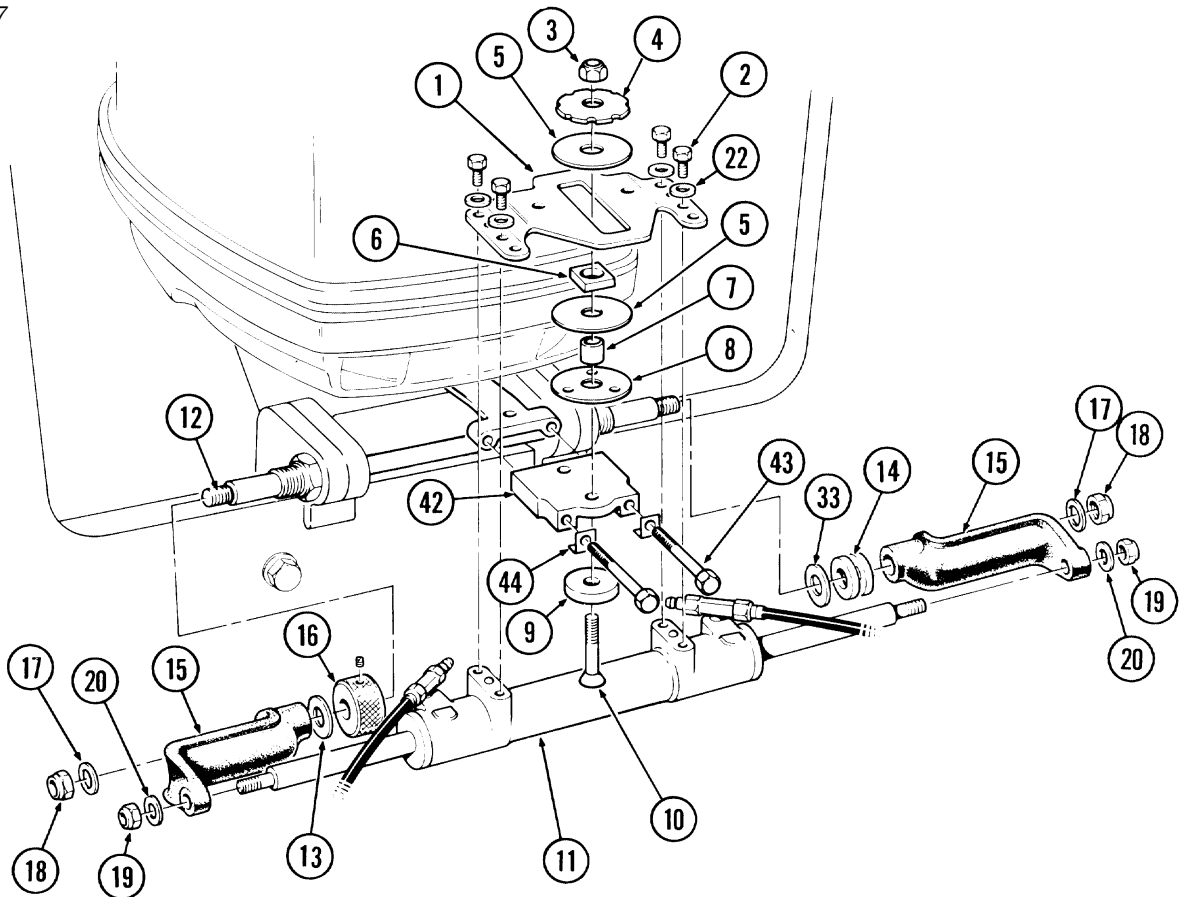
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
HONDA	1996-TO DATE	75-90 HP	HC5342	H05028	H05044 & H05009	H05044

Figure 17



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nyloc
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	728924	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809924	2	Support Bracket
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nyloc
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# H05028.

42	689828	1	Adapter Plate Honda 75/90
43	752927	2	Screw M10-1.25x90 Hex Head
44	823673	2	Locking Tab Washer M10

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
HONDA	1996-TO DATE	75-90 HP	HC5342	H05028	H05044 & H05009	H05044

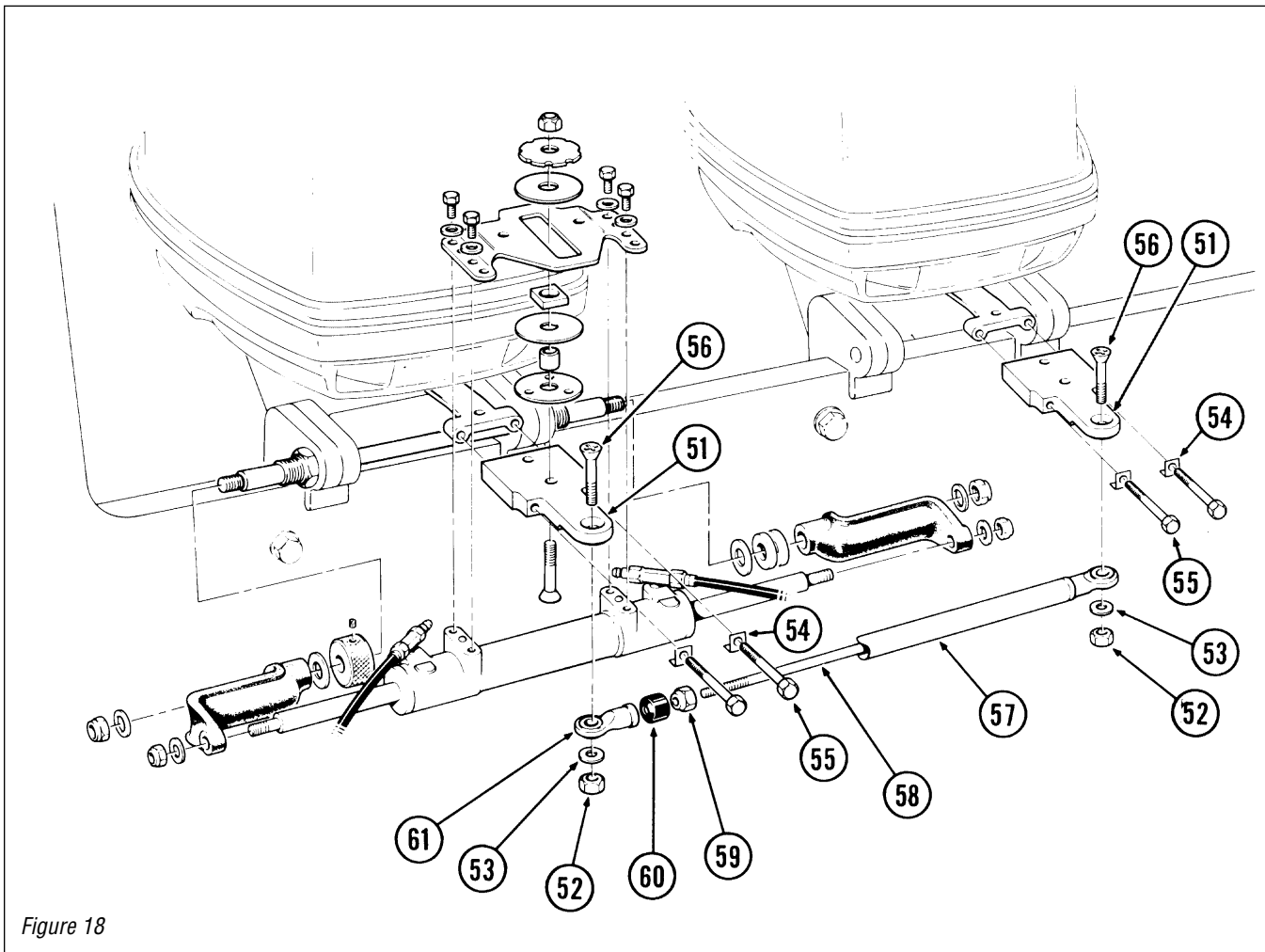


Figure 18

ITEM	PART #	QTY	DESCRIPTION
51	687723	2	Extension Plate Honda
52	113529	2	Nut 3/8" NF Nyloc
53	113622	4	Washer 3/8" dia.
54	823673	4	Locking Tab Washer M10
55	752927	4	Screw M10-1.25x90 HHCS NLP
56	734925	2	Screw 3/8" x 13/4" Flat Head
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	192126	1	Nut 1/2" NF Nyloc
60	746123	1	Plastic Cap
61	116527	1	Ball Joint

ITEM	PART #	QTY	DESCRIPTION
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APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
HONDA	1998-TO DATE	115-130 HP	HC5342	H05028	H05044A & H05009	H05044A

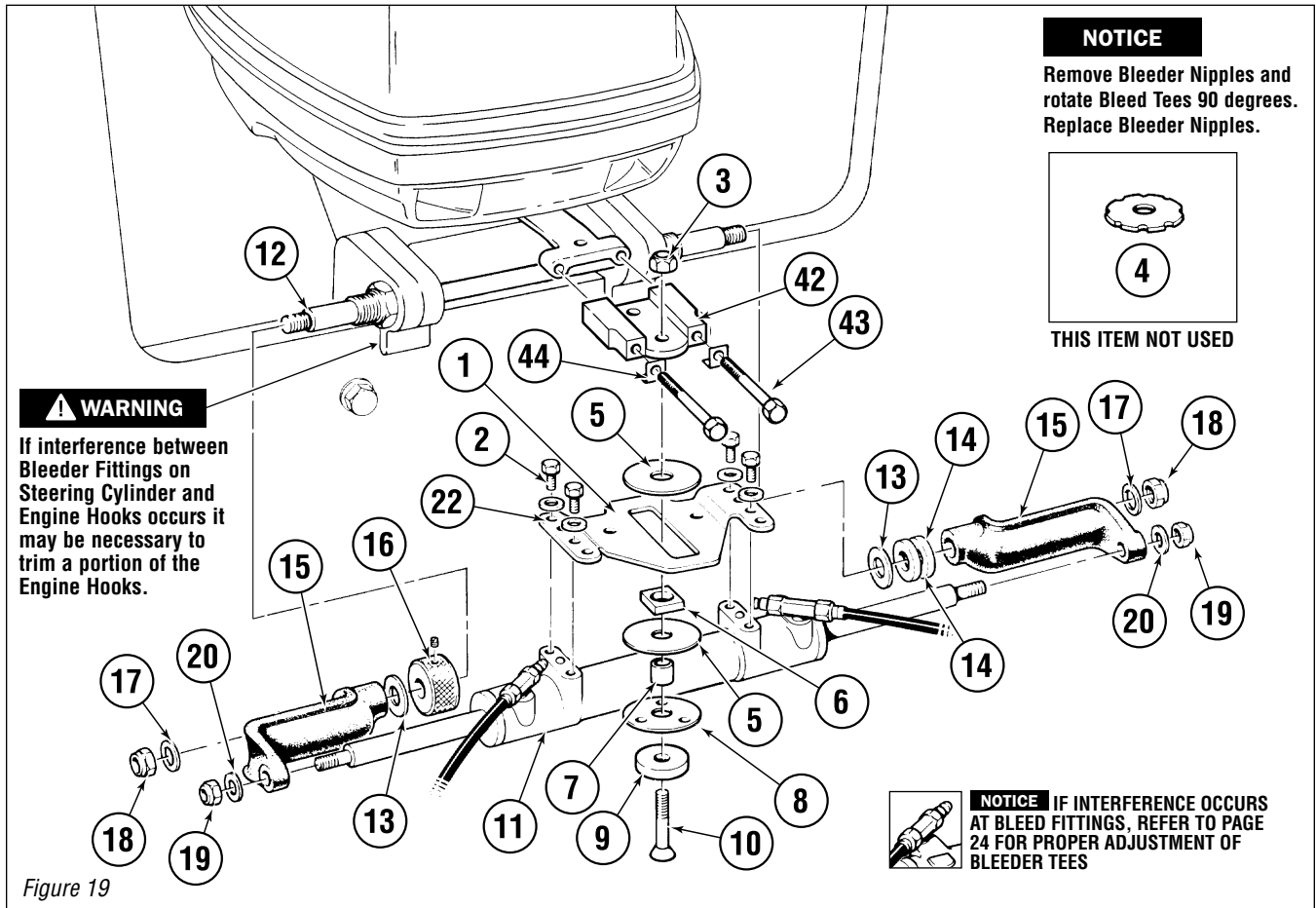


Figure 19

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer (not used)
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1-5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tees
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	995876	2	Spacer
15	809900	2	Support Bracket

ITEM	PART #	QTY	DESCRIPTION
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT # H05028

42	689828	2	Adapter Plate, Honda
43	752927	2	Screw M10-1.25 x 90 Hex Head
44	823673	2	Locking Tab Washer M10

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	SINGLE	ENGINE ADAPTER PLATES	
					TWIN c/w tie-rod	TWIN w/o tie-rod
HONDA	1998-TO DATE	115-130 HP	HC5342	H05028	H05044A & H05009	H05044A

NOTICE

Remove Bleeder Nipples and rotate Bleed Tees 90 degrees. Replace Bleeder Nipples.

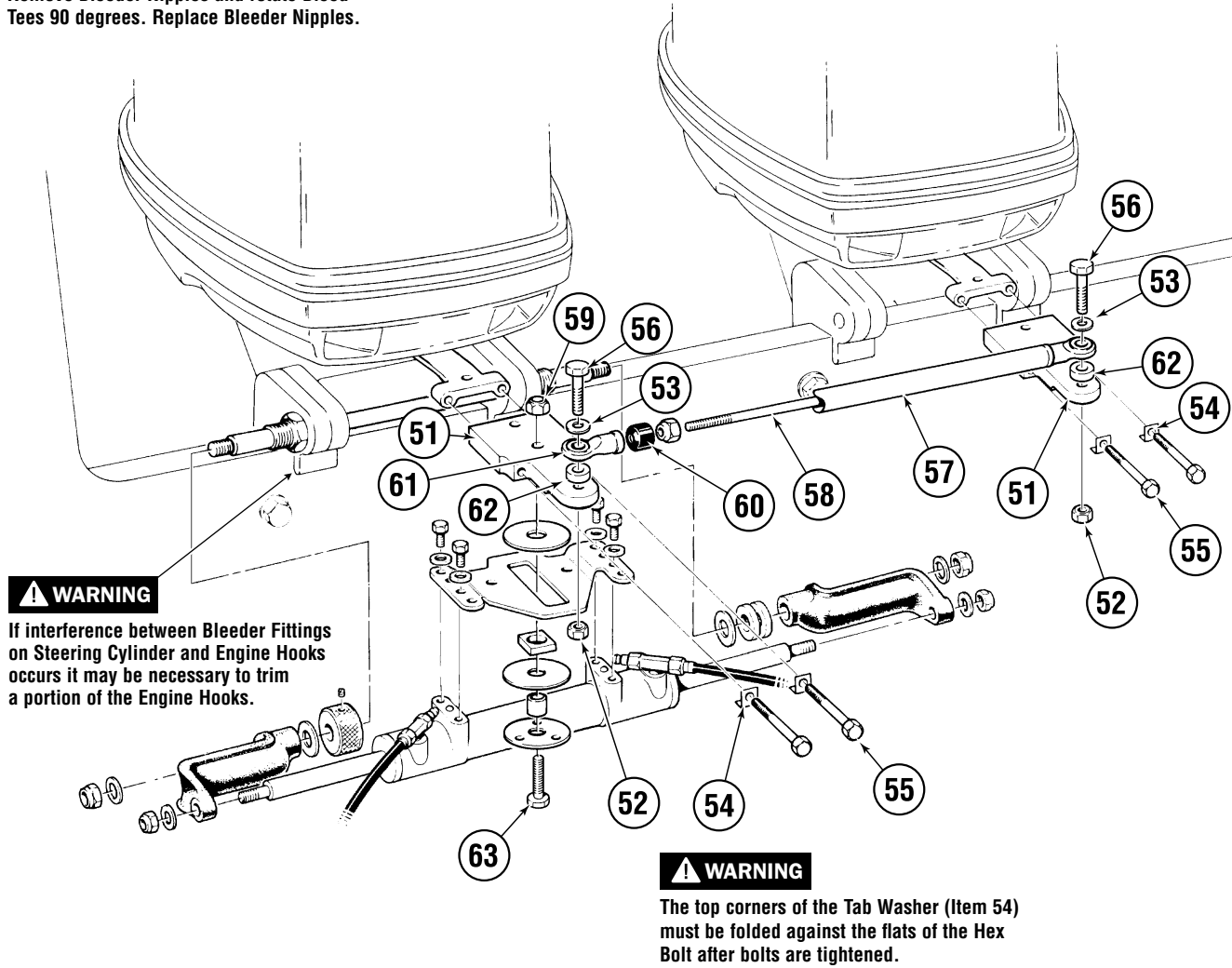


Figure 20

ITEM	PART #	QTY	DESCRIPTION
51	687723	2	Extension Plate Honda
52	113529	2	Nut 3/8" NF Nylok®
53	113622	4	Washer 3/8" dia.
54	823673	4	Locking Tab Washer M10
55	752927	4	Screw M10-1.25 x 90 HHCS NLP
56	726825	2	Screw, 3/8" NF x 1-3/4", HHCS
57	722721	1	Stringer Tube

ITEM	PART #	QTY	DESCRIPTION
58	722523	1	Threaded Rod c/w Ball Joint
59	192126	1	Nut 1/2" NF Nylok®
60	N/A	1	Obsolete—No longer required
61	116527	1	Ball Joint
62	710921	2	Spacer
63	198767	1	HHCS, 3/8" NF x 1-5/8", SS, Fully Threaded

APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES			
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod	
JOHNSON/EVINRUDE	1977 TO 1990	90-300 HP	HC5342	NOT REQ.	HO5001A	HO5030A	Com. Eng. Com. Eng. Com. Eng.
	1977 TO 1990	65-155 HP	HC5342	NOT REQ.	HO5001A	HO5030A	
	1991-TO 1992	250HP	HC5342	NOT REQ.	HO5001A	HO5030A	
	1991-TO DATE	300HP	HC5342	NOT REQ.	HO5001A	HO5030A	
	1991-TO DATE	100-155 HP	HC5342	NOT REQ.	HO5001A	HO5030A	

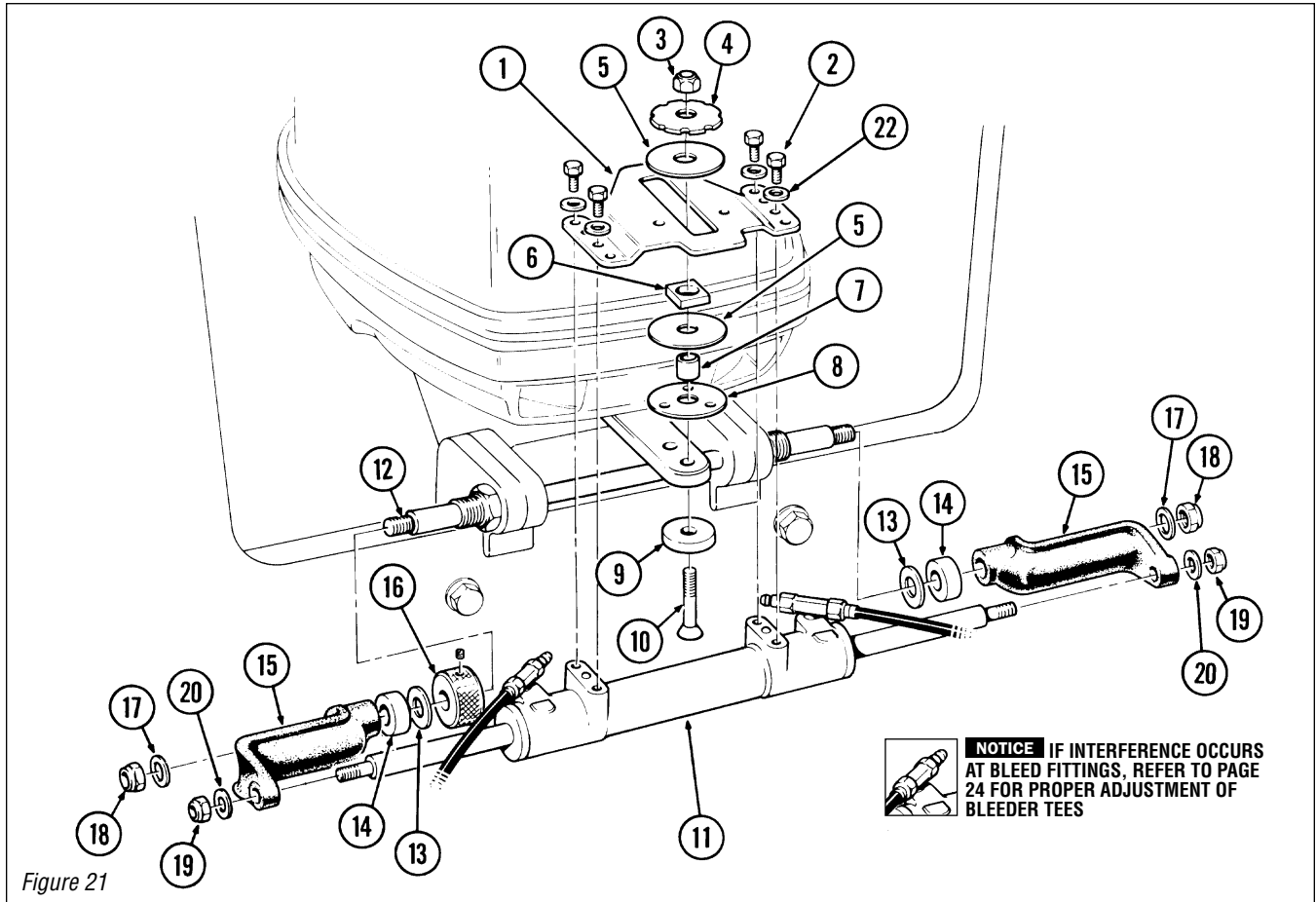


Figure 21

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES			
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod	
JOHNSON/EVINRUDE	1977 TO 1990	90-300 HP	HC5342	NOT REQ.	HO5001A	HO5030A	
	1977 TO 1990	65-155 HP	HC5342	NOT REQ.	HO5001A	HO5030A	Com. Eng.
	1991-TO 1992	250HP	HC5342	NOT REQ.	HO5001A	HO5030A	Com. Eng.
	1991-TO DATE	300HP	HC5342	NOT REQ.	HO5001A	HO5030A	Com. Eng.
	1991-TO DATE	100-155 HP	HC5342	NOT REQ.	HO5001A	HO5030A	

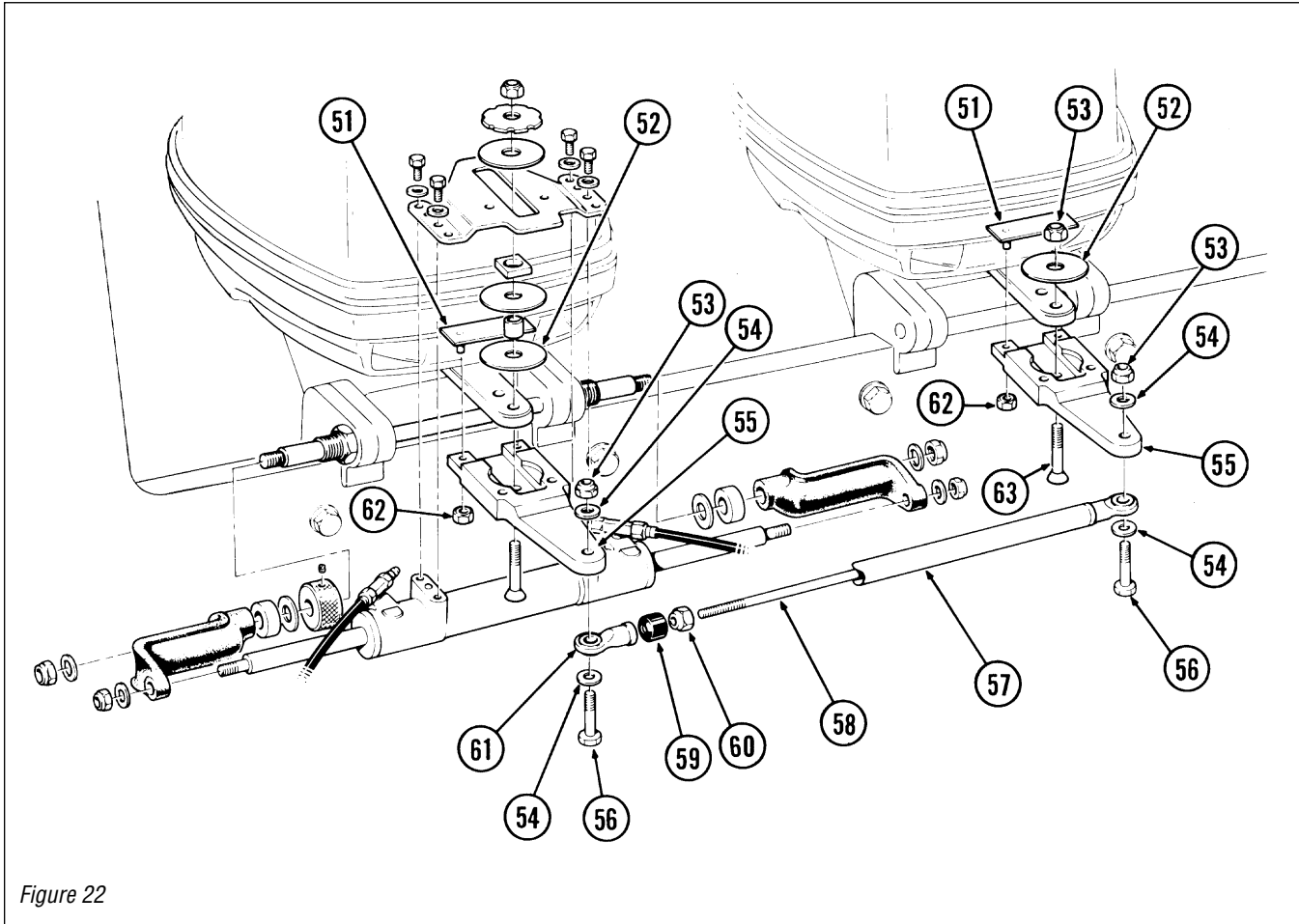


Figure 22

ITEM	PART #	QTY	DESCRIPTION
51	722829	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	4	Washer 3/8" dia.
55	723028	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head

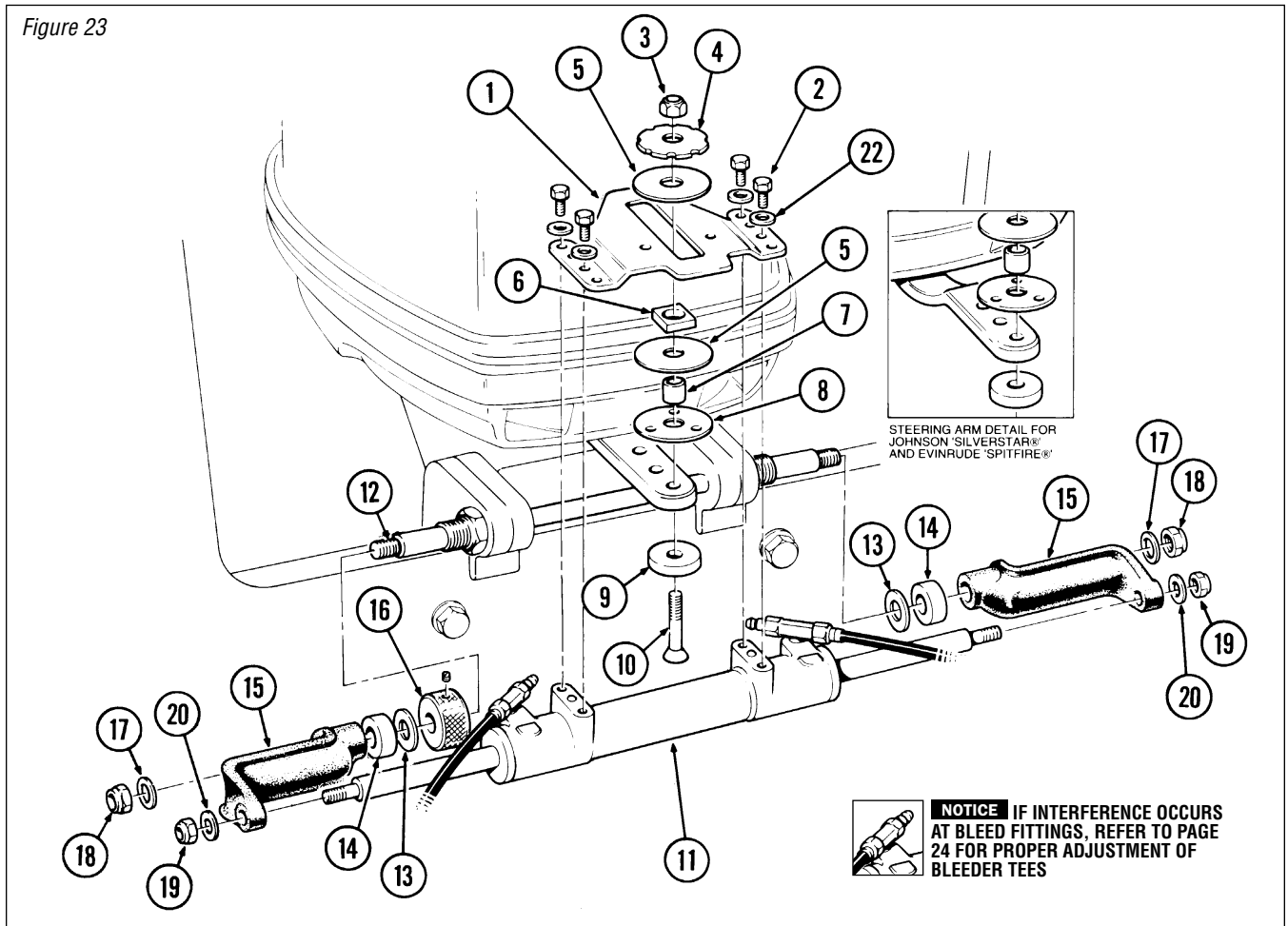
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES			
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod	
JOHNSON/EVINRUDE	1991-TO DATE	90-225 HP	HC5342	NOT REQ.	HO5071A	HO5072A	Silverstar/Spitfire Jet Powered
	1991-TO DATE	150-175 HP	HC5342	NOT REQ.	HO5071A	HO5072A	
	1991-TO DATE	80-105 HP	HC5342	NOT REQ.	HO5071A	HO5072A	

Figure 23



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES			
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod	
JOHNSON/EVINRUDE	1991-TO DATE	90-225 HP	HC5342	NOT REQ.	H05071A	H05072A	Silverstar/Spitfire Jet Powered
	1991-TO DATE	150-175 HP	HC5342	NOT REQ.	H05071A	H05072A	
	1991-TO DATE	80-105 HP	HC5342	NOT REQ.	H05071A	H05072A	

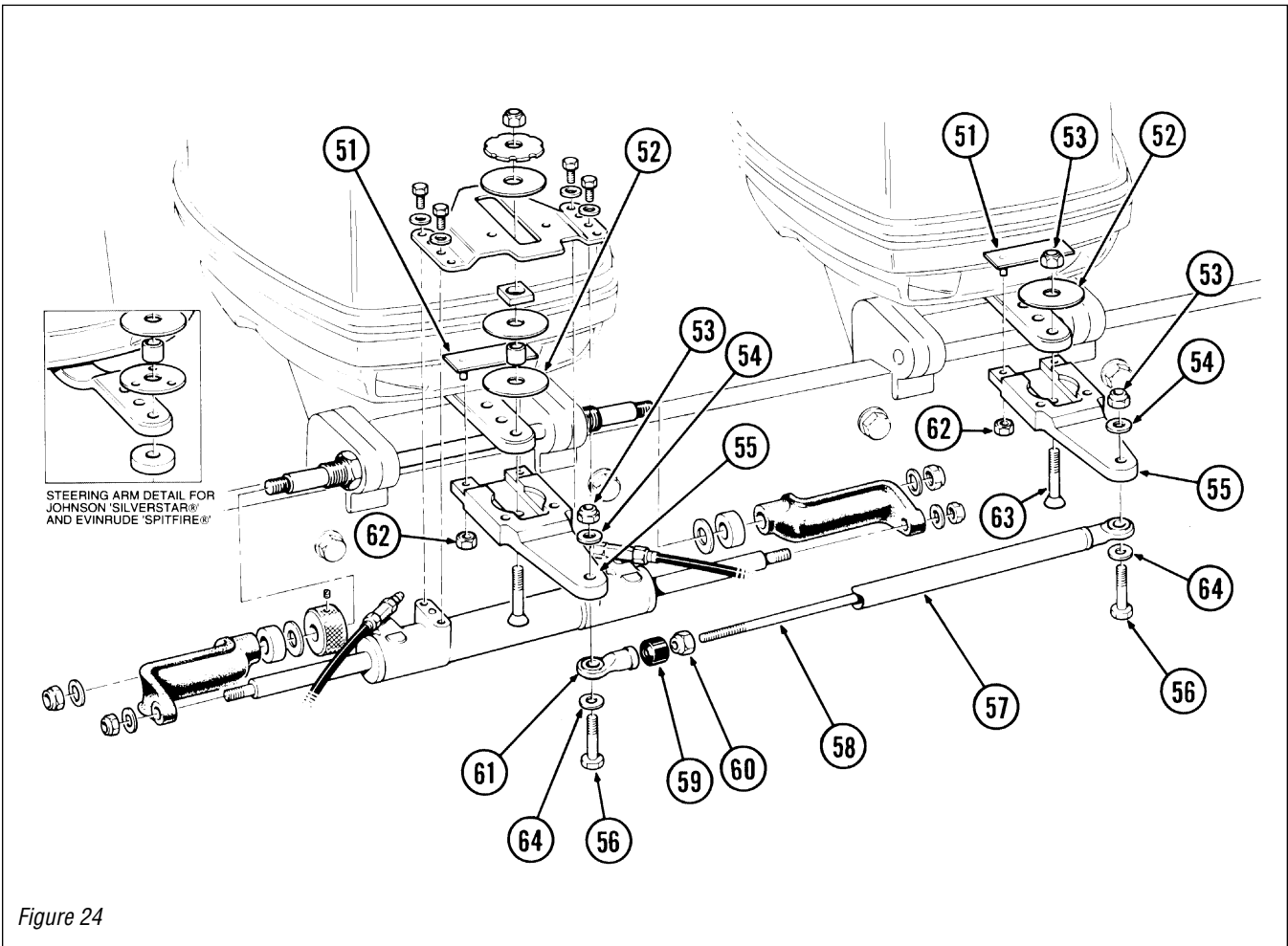


Figure 24

ITEM	PART #	QTY	DESCRIPTION
51	722829	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	2	Washer 3/8" dia.
55	739524	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	746123	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head
64	113600	2	Washer 3/8", Fender, SS

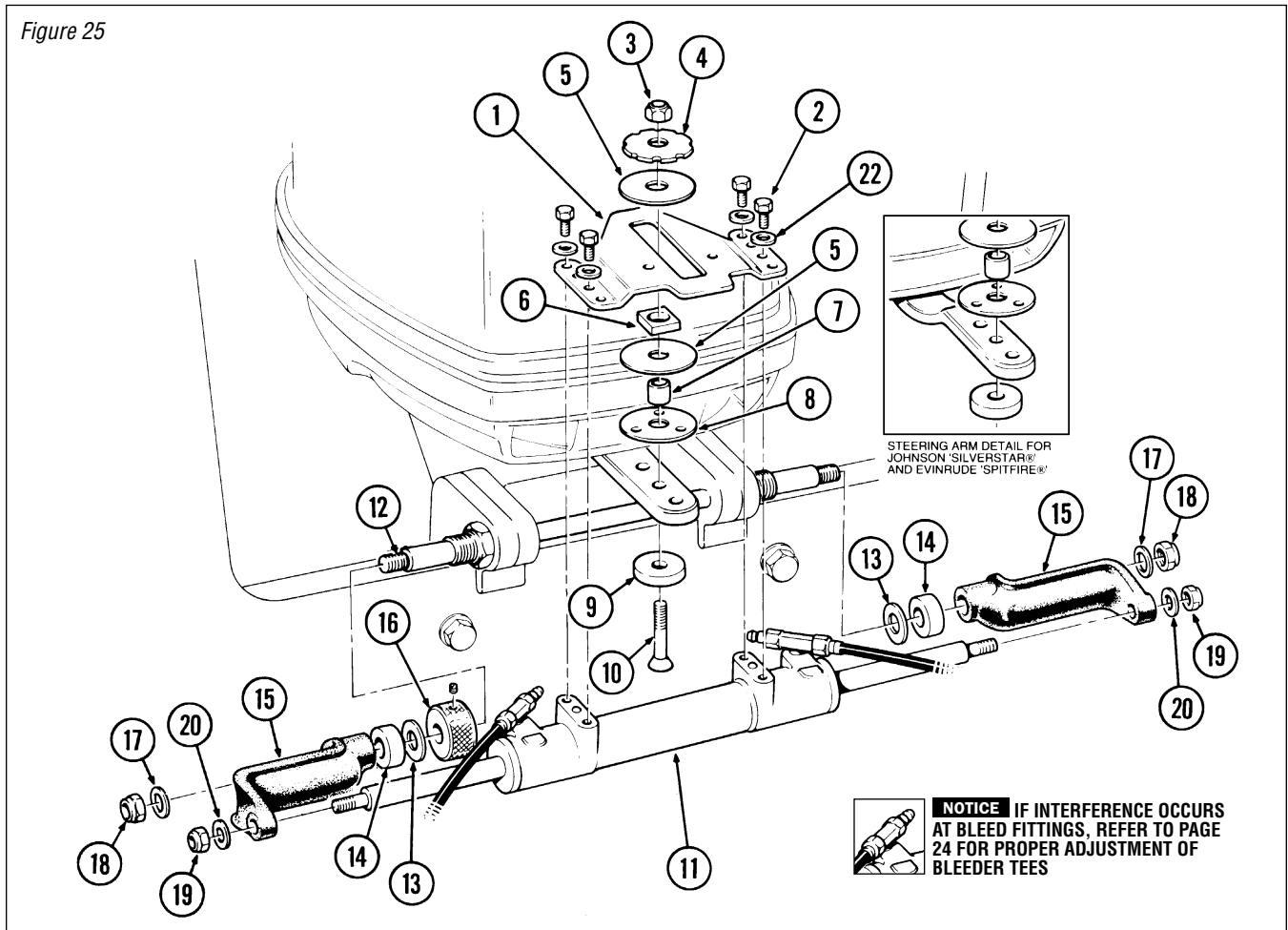
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
JOHNSON/EVINRUDE	1993-TO DATE	250 HP	HC5342	NOT REQ	H05073A & H05009	H05073A

Figure 25



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
JOHNSON/EVINRUDE	1993-TO DATE	250 HP	HC5342	NOT REQ	H05073A & H05009	H05073A

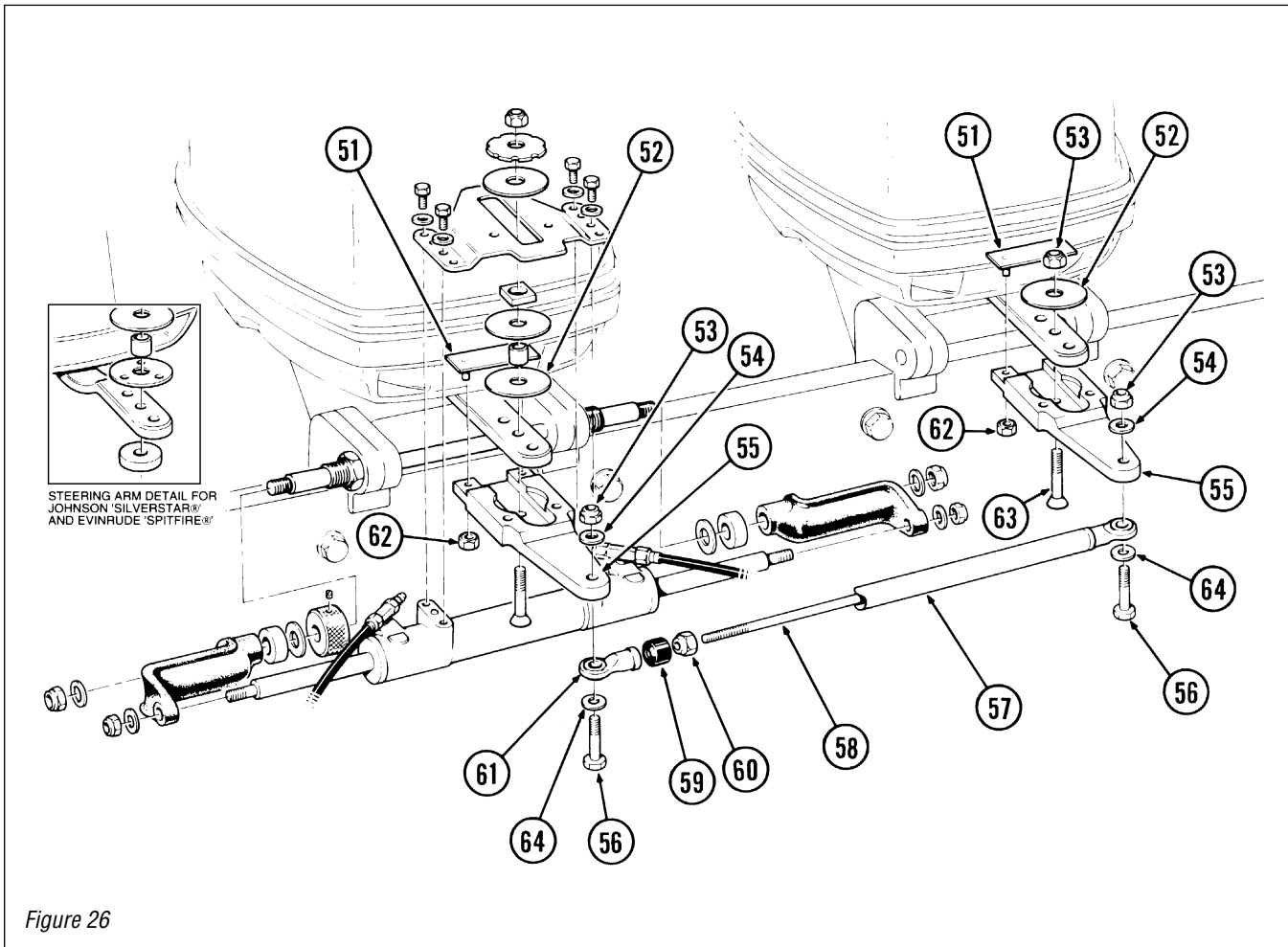


Figure 26

ITEM	PART #	QTY	DESCRIPTION
51	722829	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	2	Washer 3/8" dia.
55	835120	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	746123	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head
64	113600	2	Washer 3/8", Fender, SS

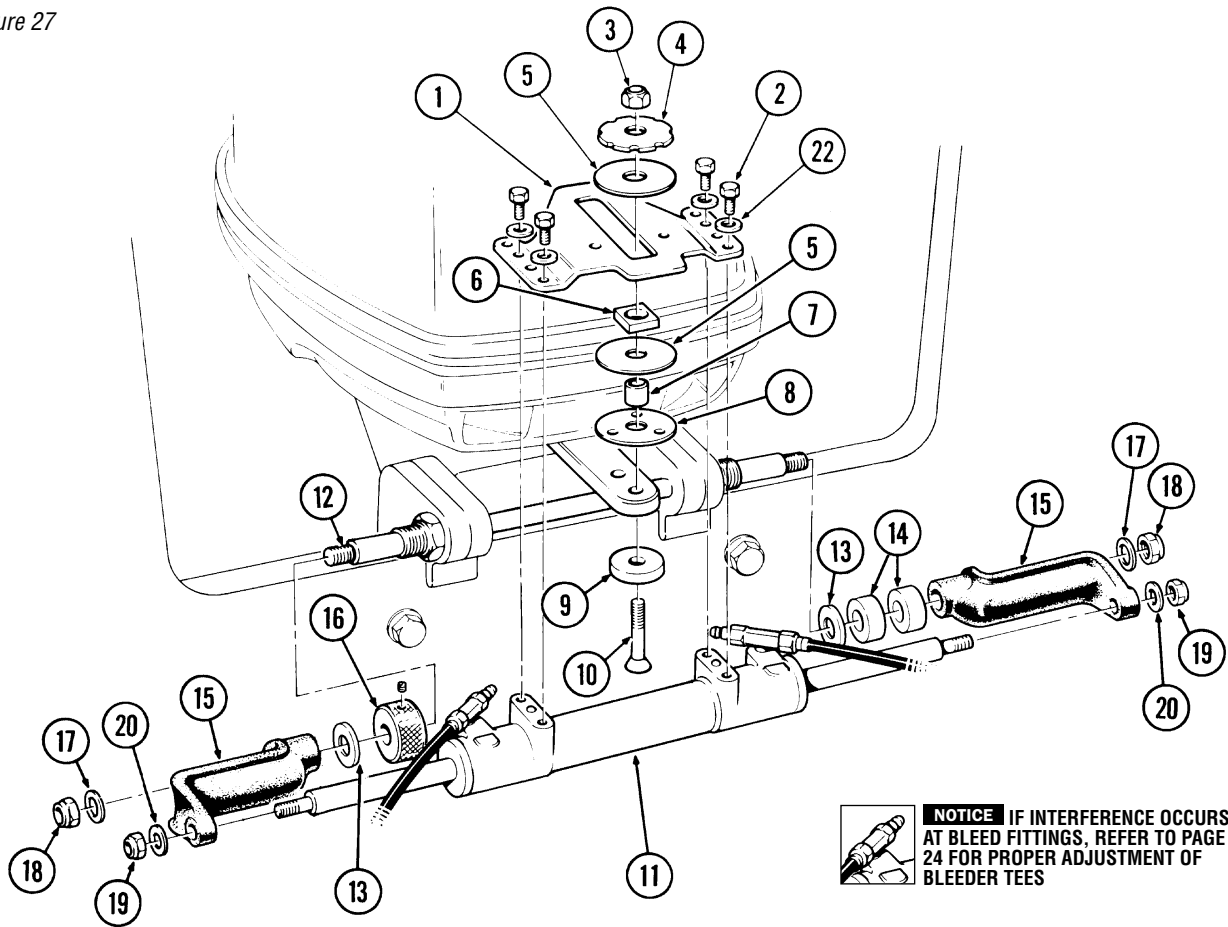
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY/MARINER	1984 ONLY	150-200 HP	HC5342	NOT REQ	HO5002	N/A

Figure 27



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY/MARINER	1984 ONLY	150-200 HP	HC5342	NOT REQ	H05002	N/A

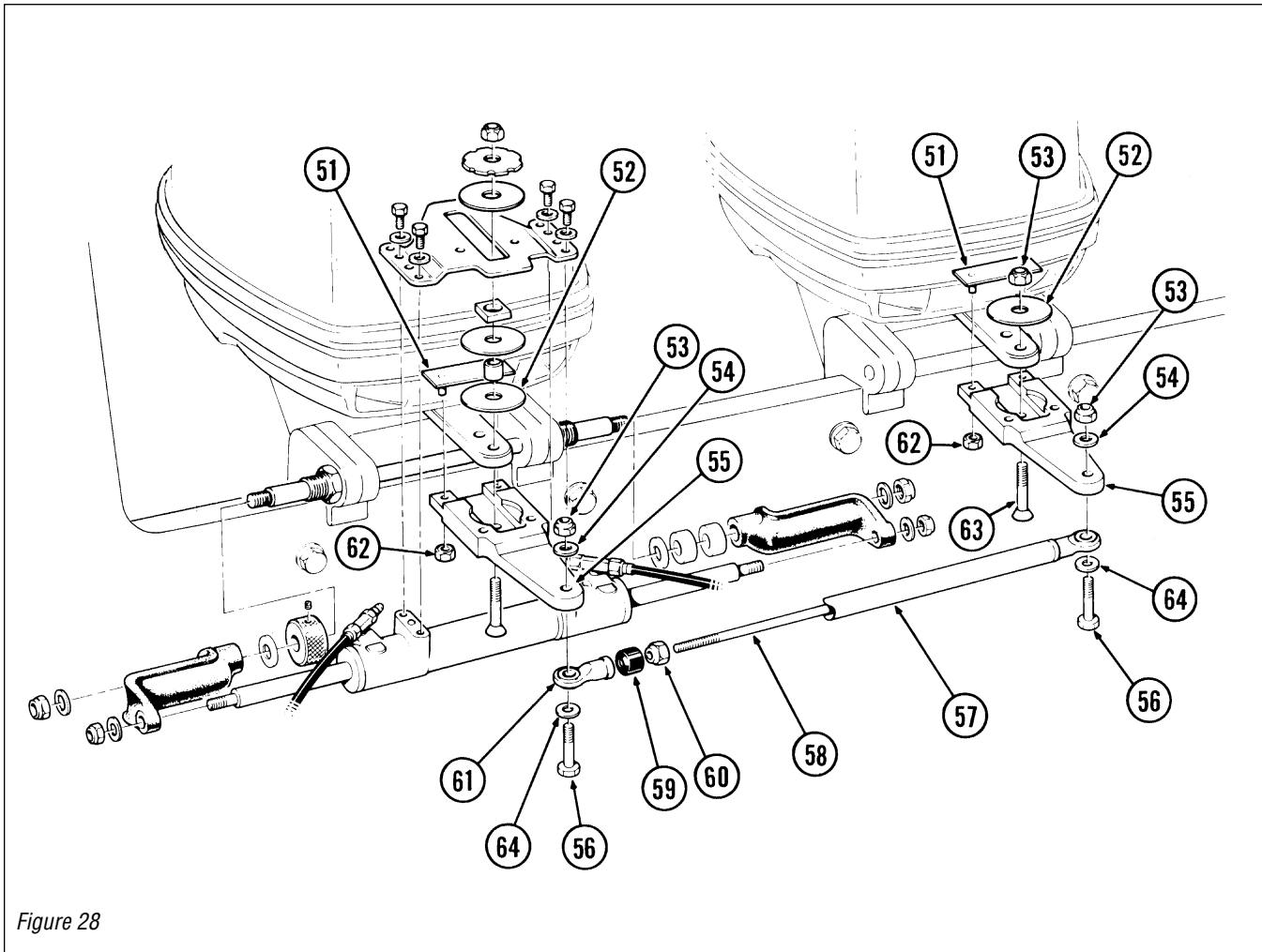


Figure 28

ITEM	PART #	QTY	DESCRIPTION
51	722928	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	2	Washer 3/8" dia.
55	725324	2	Extension Plate
56	186520	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head
64	113600	2	Washer 3/8", Fender, SS

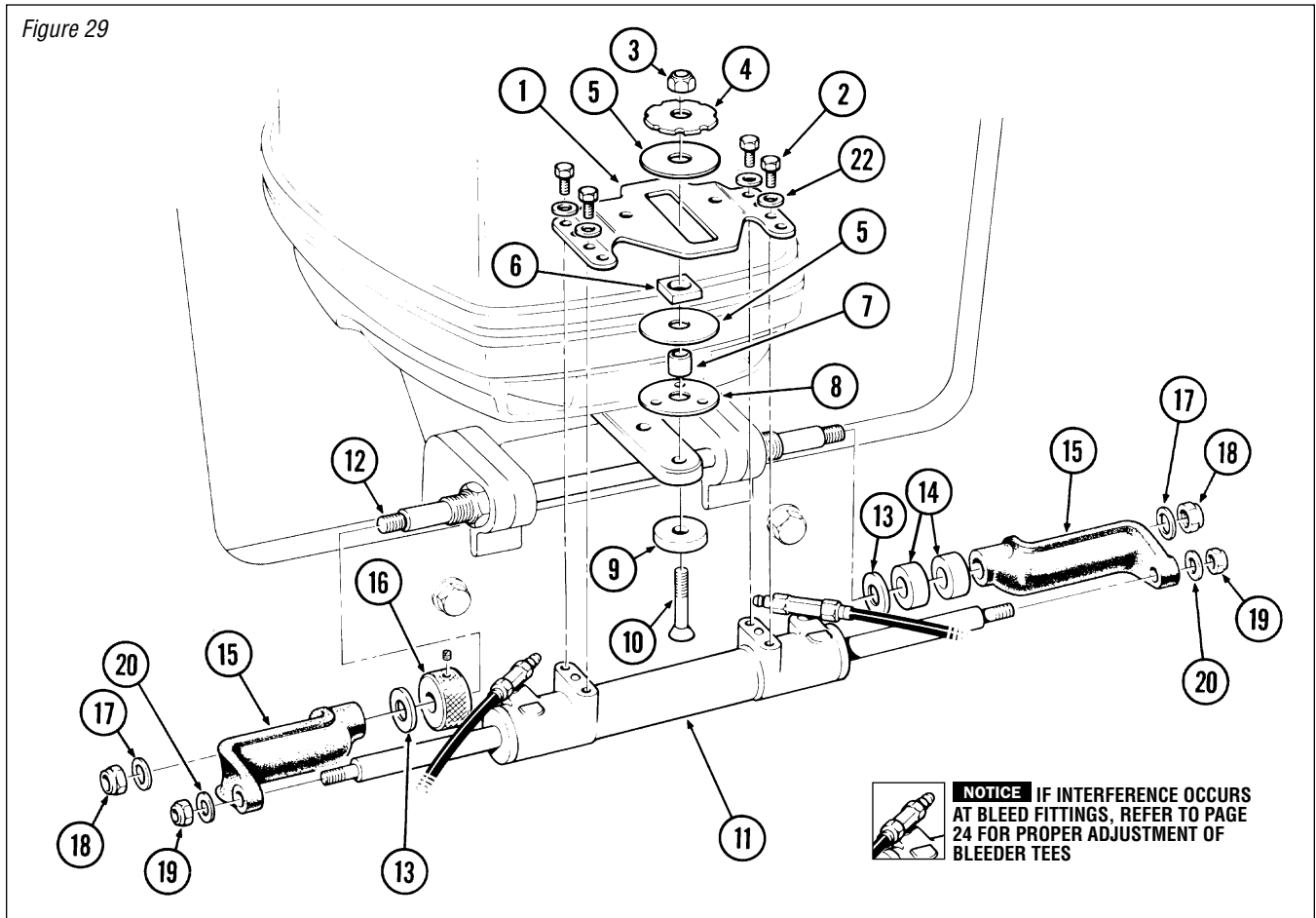
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY/MARINER	1984 ONLY	90-115 HP	HC5342	NOT REQ.	HO5071A	HO5072A
	1985-1988	115-220 HP	HC5342	NOT REQ.	HO5071A	HO5072A
	1989 ONLY	100-115 HP	HC5342	NOT REQ.	HO5071A	HO5072A

Figure 29



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY/MARINER	1984 ONLY	90-115 HP	HC5342	NOT REQ.	H05071A	H05072A
	1985-1988	115-220 HP	HC5342	NOT REQ.	H05071A	H05072A
	1989 ONLY	100-115 HP	HC5342	NOT REQ.	H05071A	H05072A

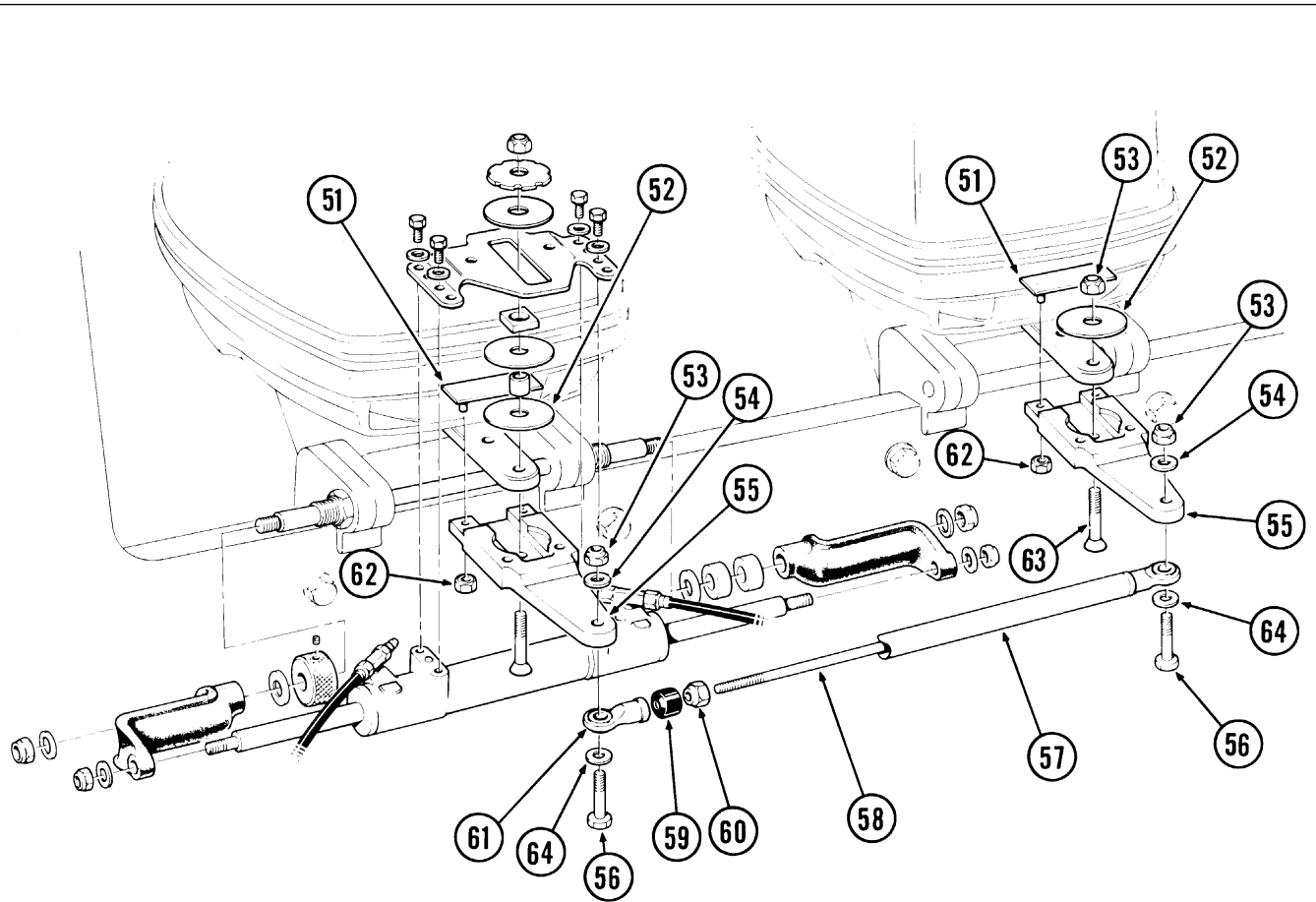


Figure 30

ITEM	PART #	QTY	DESCRIPTION
51	722829	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	2	Washer 3/8" dia.
55	739524	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head
64	113600	2	Washer 3/8", Fender, SS

APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY/MARINER	1989 ONLY	135-250 HP	HC5342	H05035	HO5008A	HO5038A
	1990 ONLY	75-250 HP	HC5342	H05035	HO5008A	HO5038A
	1991-TO DATE	75-275 HP	HC5342	H05035	HO5008A	HO5038A

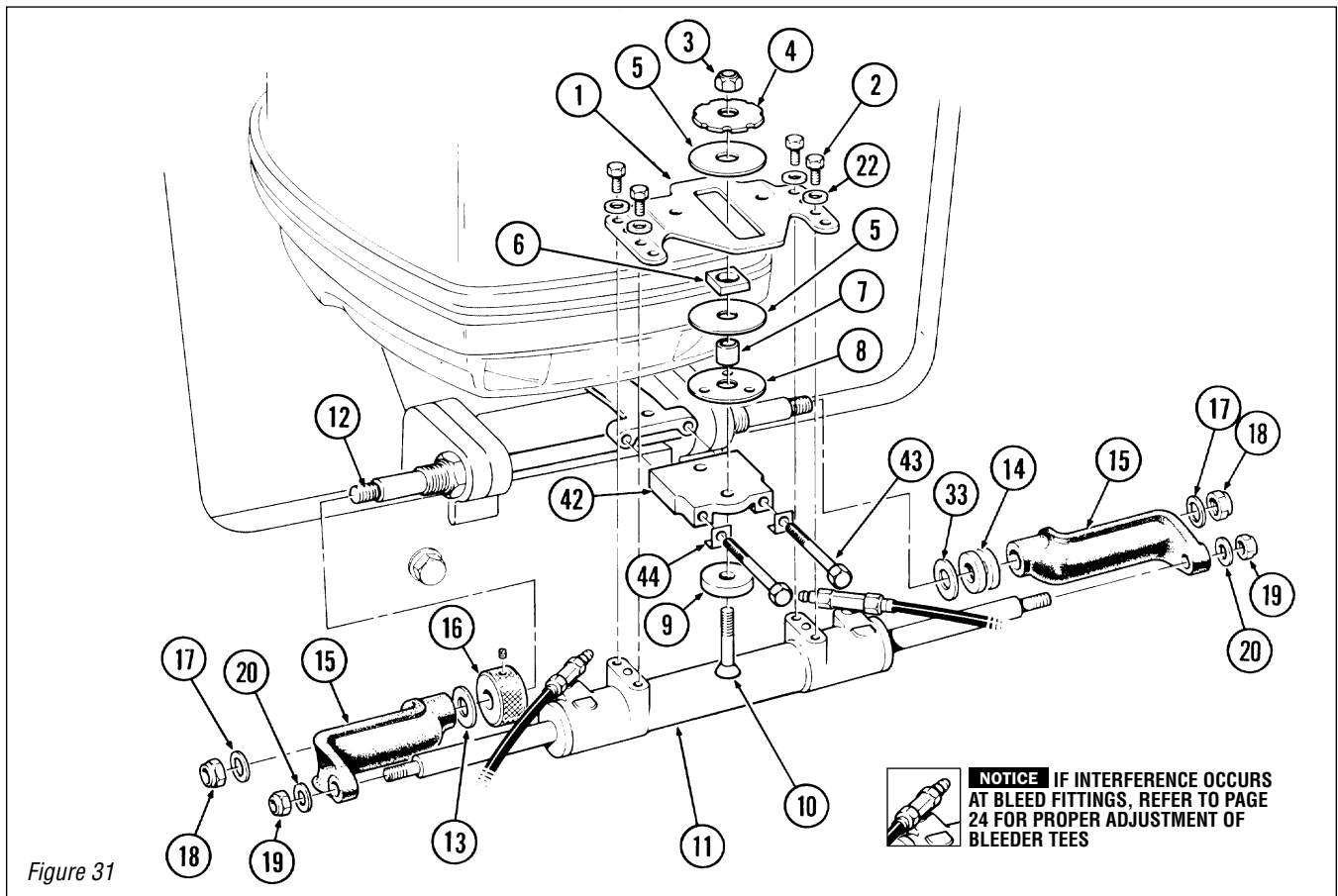


Figure 31

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer
15	809900	2	Support Bracket
16	436627	1	Adjusting Nut c/w Set Screw

ITEM	PART #	QTY	DESCRIPTION
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# H05035.

42	741327	1	Adapter Plate #MT
43	752021	2	Screw 5/16" x 31/2" Hex Head
44	203123	2	Locking Tab Washer

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY/MARINER	1989 ONLY	135-250 HP	HC5342	H05035	H05008A	H05038A
	1990 ONLY	75-250 HP	HC5342	H05035	H05008A	H05038A
	1991-TO DATE	75-275 HP	HC5342	H05035	H05008A	H05038A

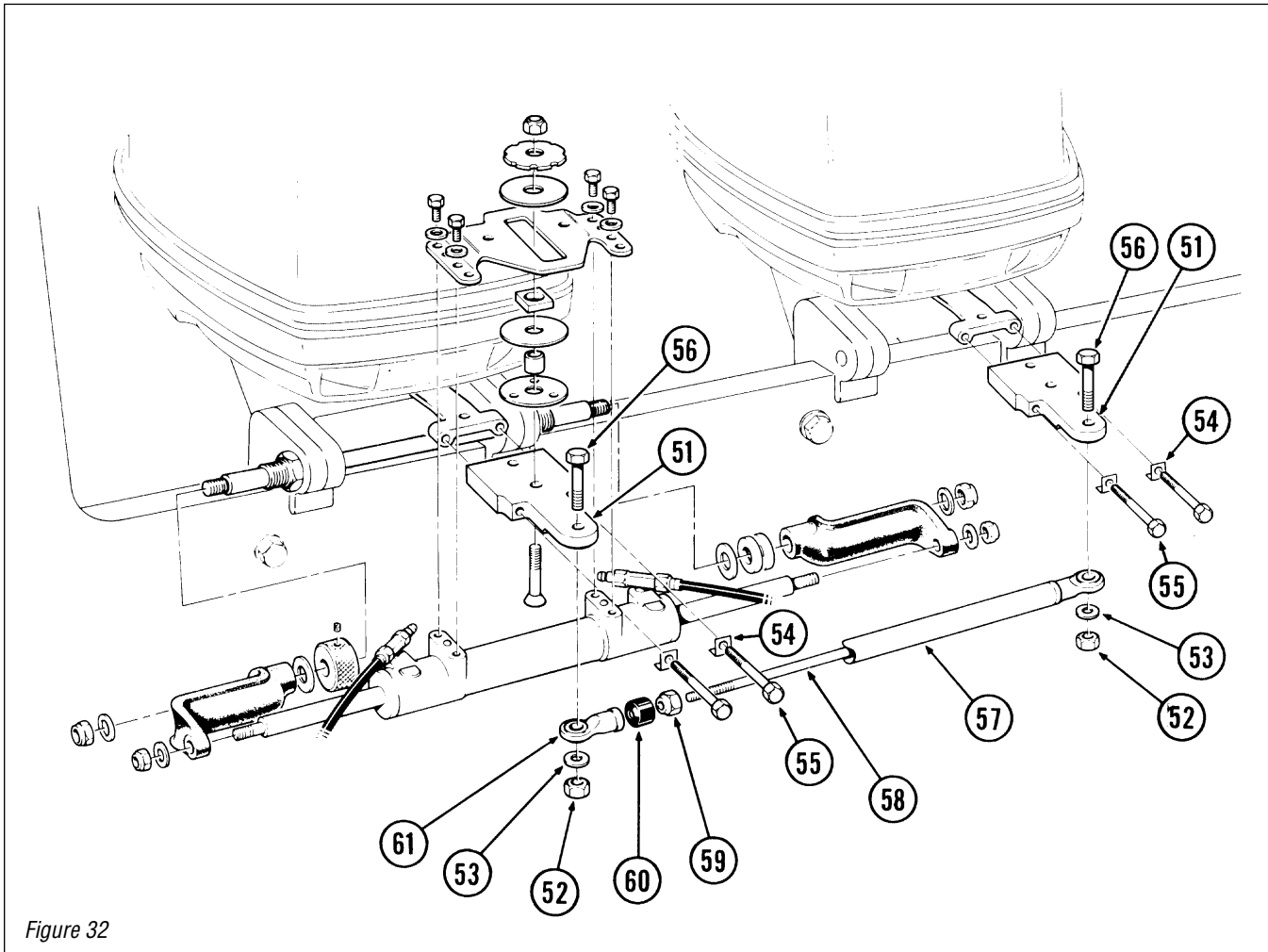


Figure 32

ITEM	PART #	QTY	DESCRIPTION
51	741127	2	Extension Plate MT
52	113529	2	Nut 3/8" NF Nylok®
53	113622	4	Washer 3/8" dia.
54	203123	4	Locking Tab Washer
55	752021	4	Screw 5/16" x 3-1/2" Hex Head
56	726826	2	HHCS 3/8" NF x 1-3/4" SS
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	192126	1	Nut 1/2" NF Nylok®
60	N/A	1	Obsolete—No longer required
61	116527	1	Ball Joint

ITEM	PART #	QTY	DESCRIPTION
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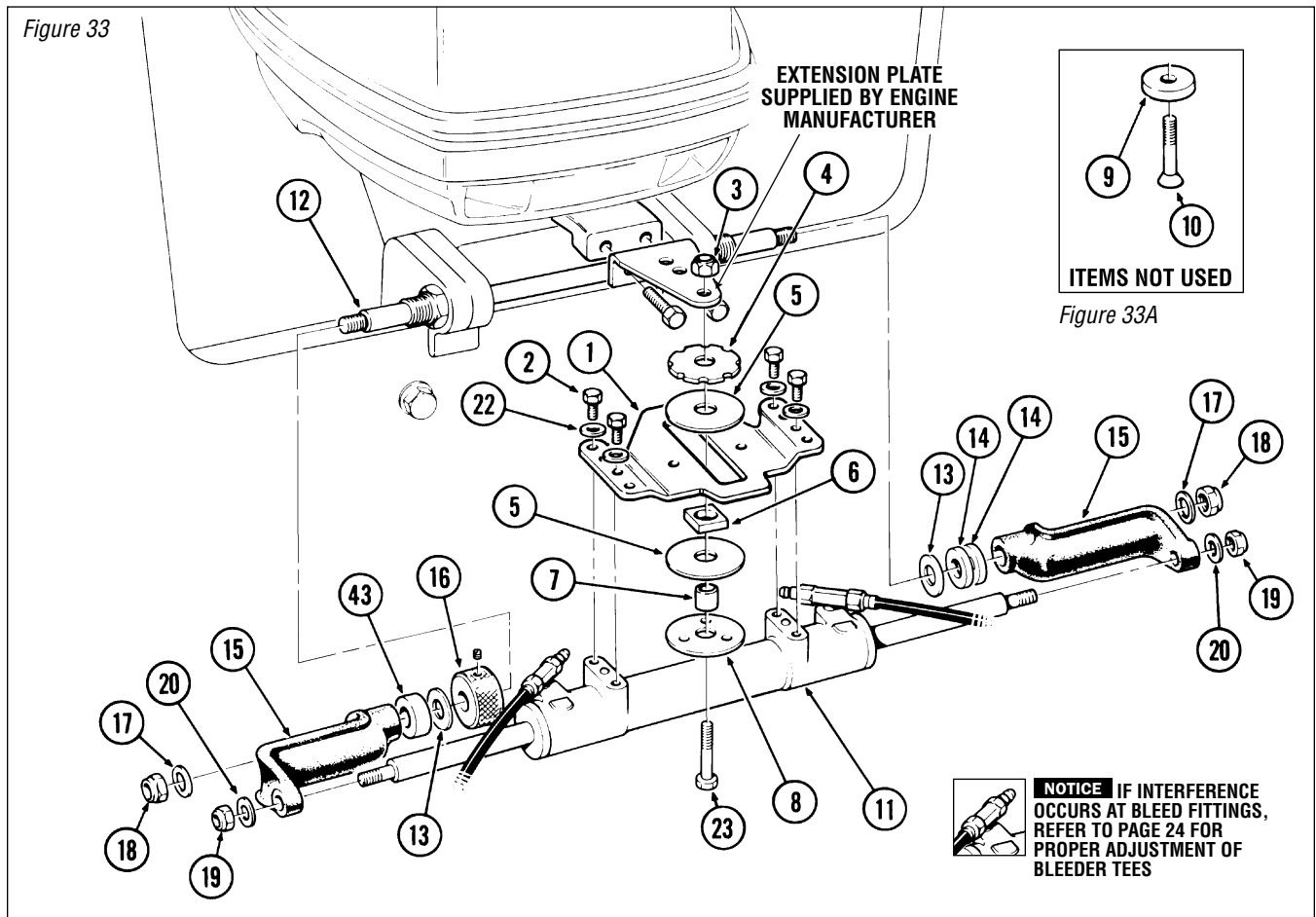
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY	1995-TO DATE	50 HP FOUR STROKE	HC5342	H05027	H05009 & H05029	H05029

Figure 33



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.
ADAPTER KIT# H05027			
23	116320	1	Screw 3/8" x 1 1/2" Hex Head
43	770423	1	Support Rod Spacer
REPLACEMENT HARDWARE MOUNTING KIT# 724021			
Includes all mounting hardware excluding the Support Rod part# 730229.			

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
MERCURY	1995-TO DATE	50 HP FOUR STROKE	HC5342	HO5033	HO5009 & HO5029	HO5029

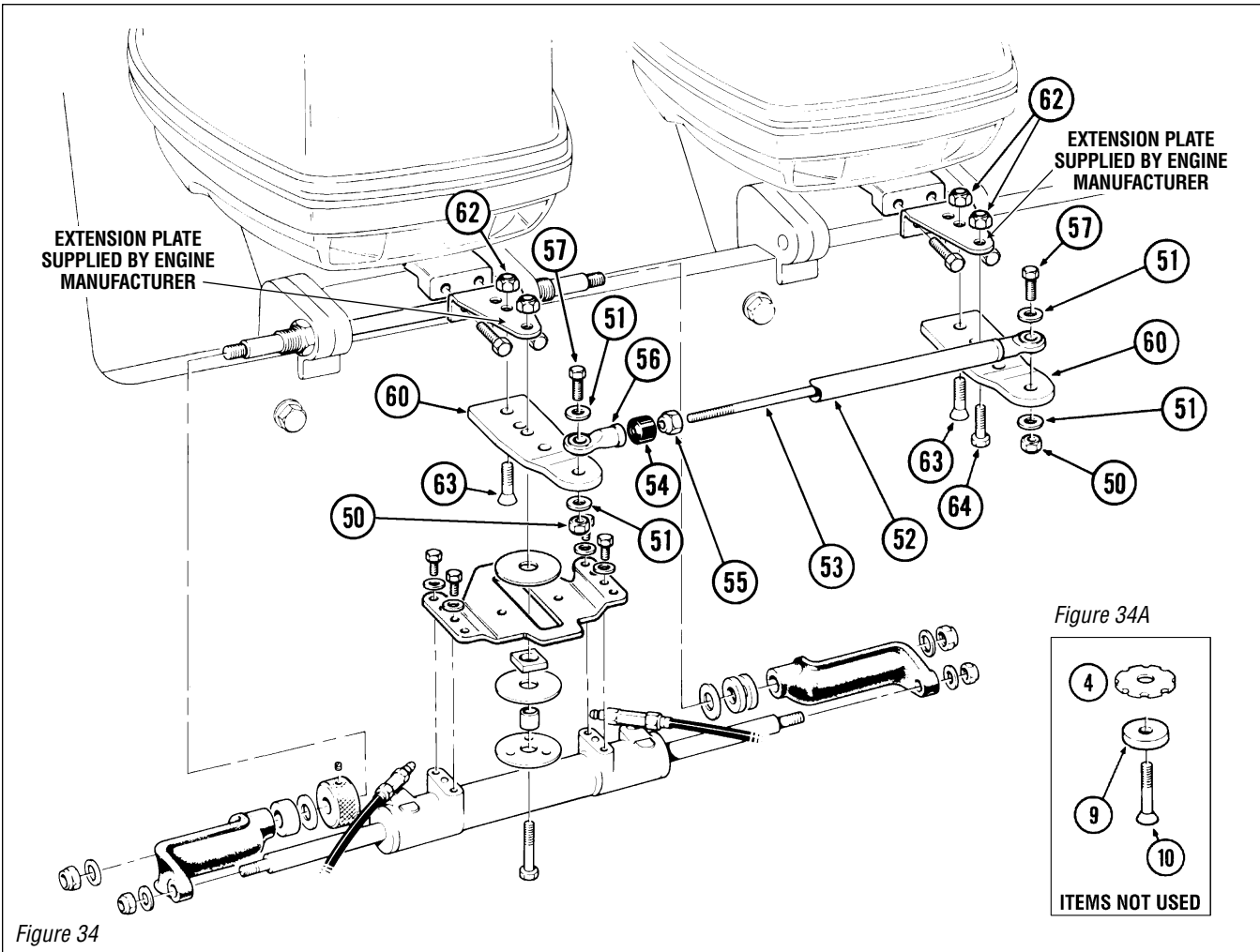


Figure 34

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# HO5009			
50	113529	2	Nut 3/8" NF Nylok®
51	113622	4	Washer 3/8" dia.
52	722721	1	Stringer Tube
53	722523	1	Threaded Rod c/w Ball Joint
54	N/A	1	Obsolete—No longer required
55	192126	1	Nut 1/2" NF Nylok®
56	116527	1	Ball Joint
57	726825	2	Screw 3/8" NF x 1-3/4" Hex Head

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# HO5029			
60	773328	2	Extension plate
62	113529	3	Nut 3/8" NF Nylok®
63	185921	2	Screw 3/8" NF x 1-5/8" Flat Head
64	113321	1	Screw 3/8" NF x 1-1/4" Hex Head

APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
SUZUKI	1986-TO DATE	115 HP 140 HP	HC5342 HC5342	H05025 H05025	N/A N/A	N/A N/A

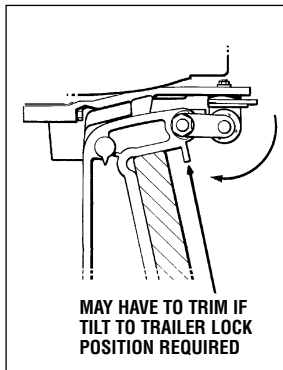


Figure 35A

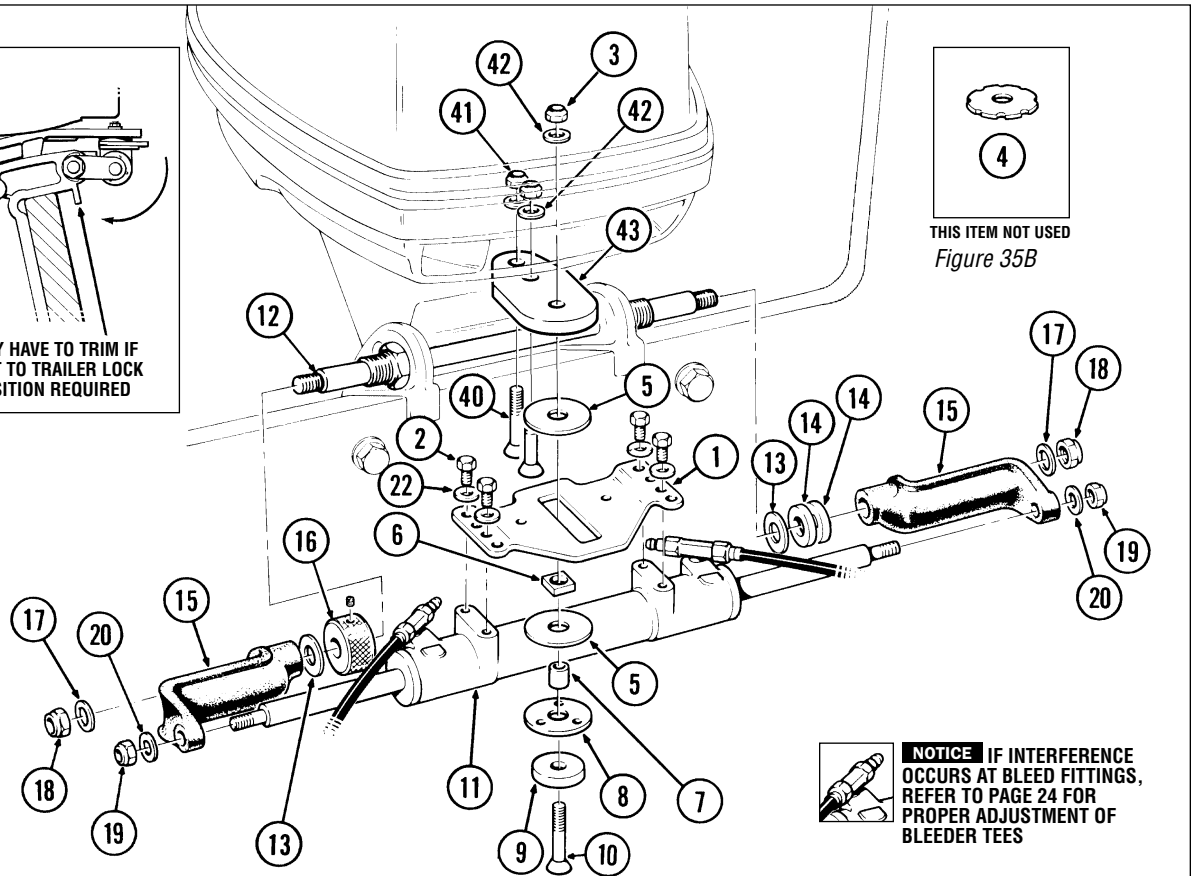


Figure 35

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer
15	809900	2	Support Bracket

ITEM	PART #	QTY	DESCRIPTION
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# H05025

40	734925	2	Screw 3/8" x 1 3/4" Flat Head
41	113529	2	Nut 3/8" NF Nylok®
42	113622	3	Washer 3/8" dia.
43	815521	1	Adapter Plate Suzuki

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

⚠ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

SUZUKI 115 & 140HP TWIN
NOT AVAILABLE AT THIS TIME

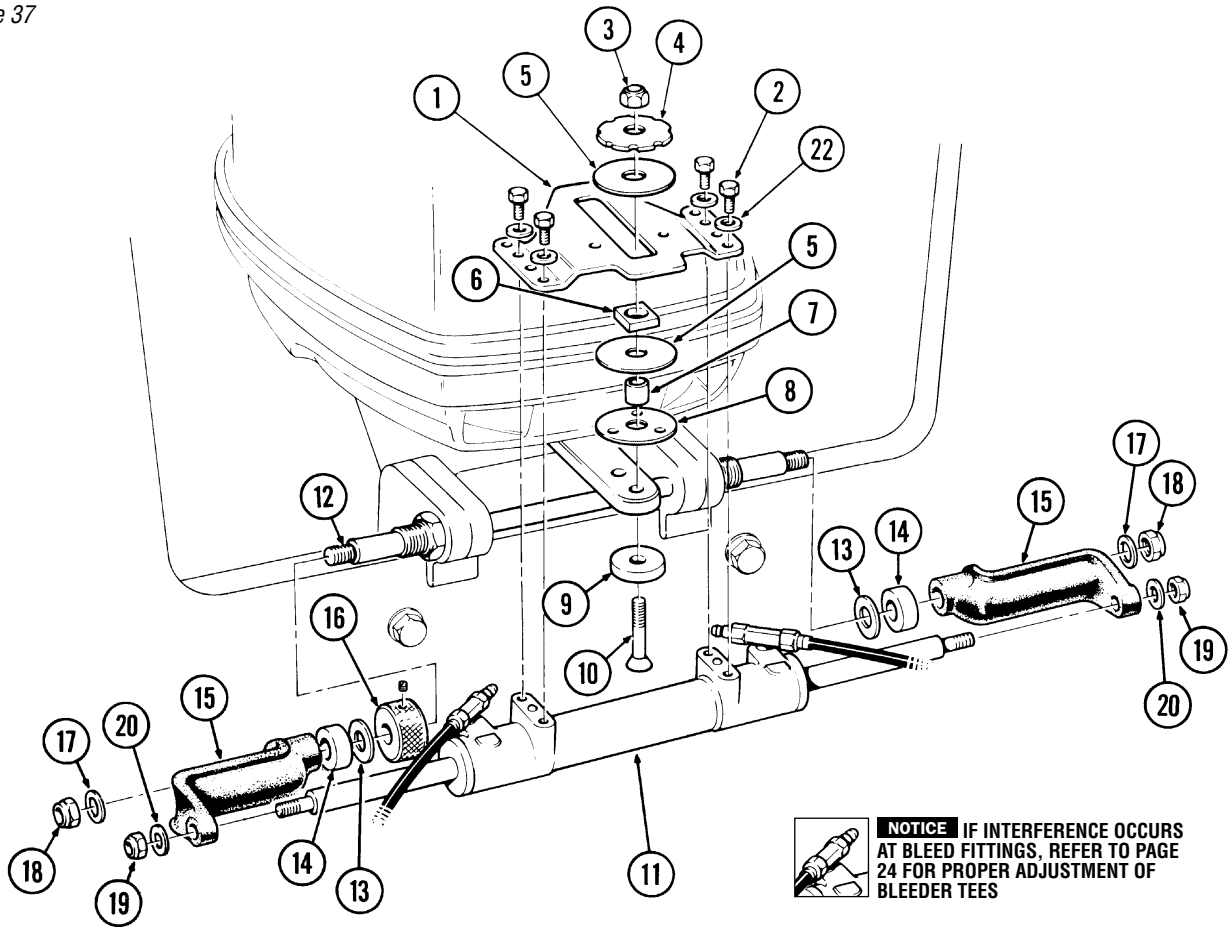
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
SUZUKI	1986-TO DATE	150-220 HP	HC5342	NOT REQ.	HO5001A	N/A
	1990-TO DATE	100 HP	HC5342	NOT REQ.	HO5001A	N/A

Figure 37



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
SUZUKI	1986-TO DATE	150-220 HP	HC5342	NOT REQ.	H05001A	N/A
	1990-TO DATE	100 HP	HC5342	NOT REQ.	H05001A	N/A

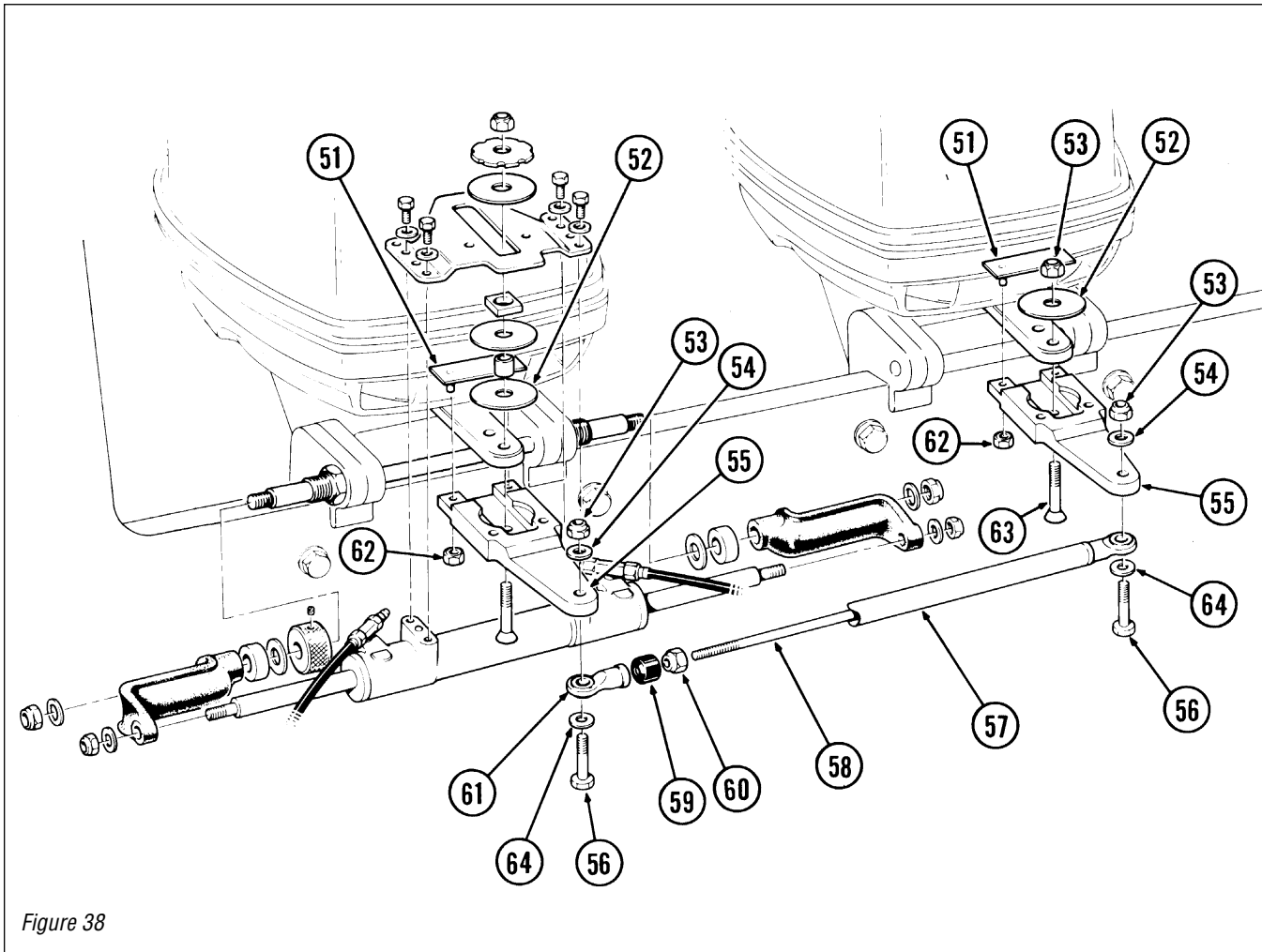


Figure 38

ITEM	PART #	QTY	DESCRIPTION
51	722829	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	2	Washer 3/8" dia.
55	725625	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head
64	113600	2	Washer 3/8", Fender, SS

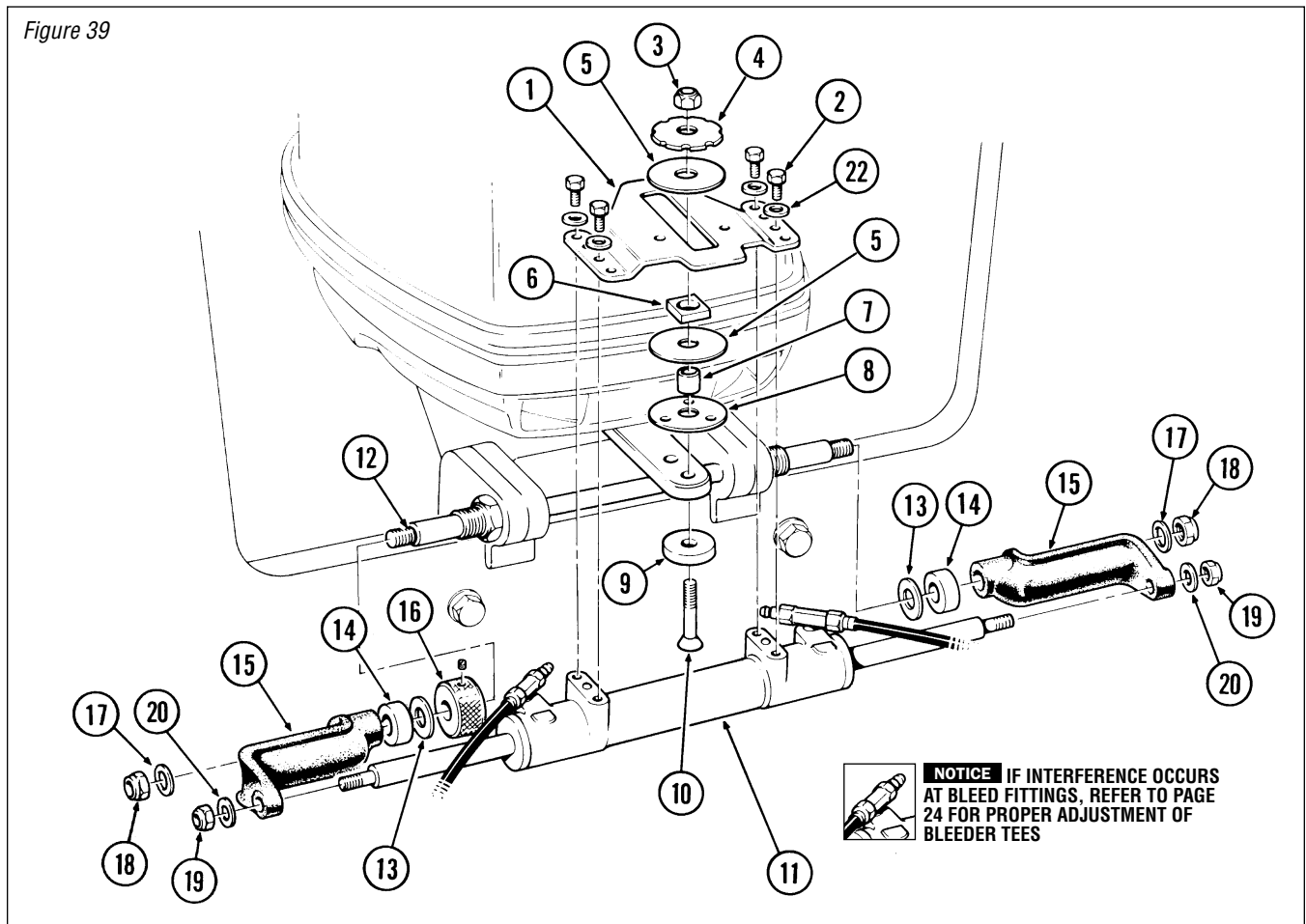
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
TOHATSU	1990-TO DATE	120-140 HP	HC5342	NOT REQ.	HO5048	N/A
NISSAN	1990-TO DATE	120-140 HP	HC5342	NOT REQ.	HO5048	N/A

Figure 39



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	186021	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
TOHATSU	1990-TO DATE	120-140 HP	HC5342	NOT REQ.	H05048	N/A
NISSAN	1990-TO DATE	120-140 HP	HC5342	NOT REQ.	H05048	N/A

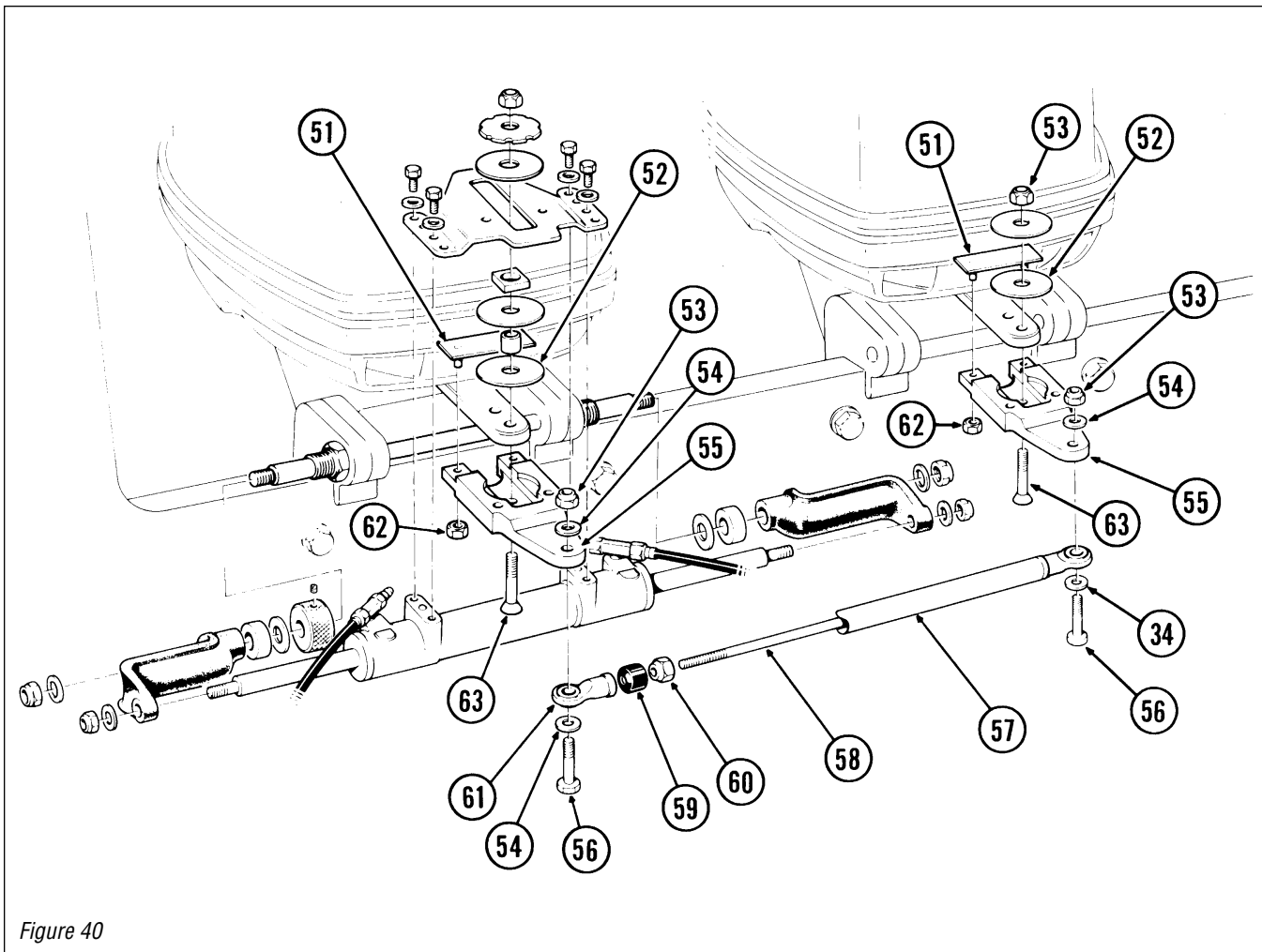


Figure 40

ITEM	PART #	QTY	DESCRIPTION
51	753428	2	Clamp Plate
52	721925	4	Bottom Washer (MC)
53	113529	2	Nut 3/8" NF Nylok®
54	113622	2	Washer 3/8" dia.
55	771727	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	2	Screw 3/8" x 15/8" Flat Head

APPLICATIONS

SINGLE ENGINE

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
US MARINE (FORCE)	1985-TO DATE	90-150 HP	HC5342	HO5059	HO5060	N/A

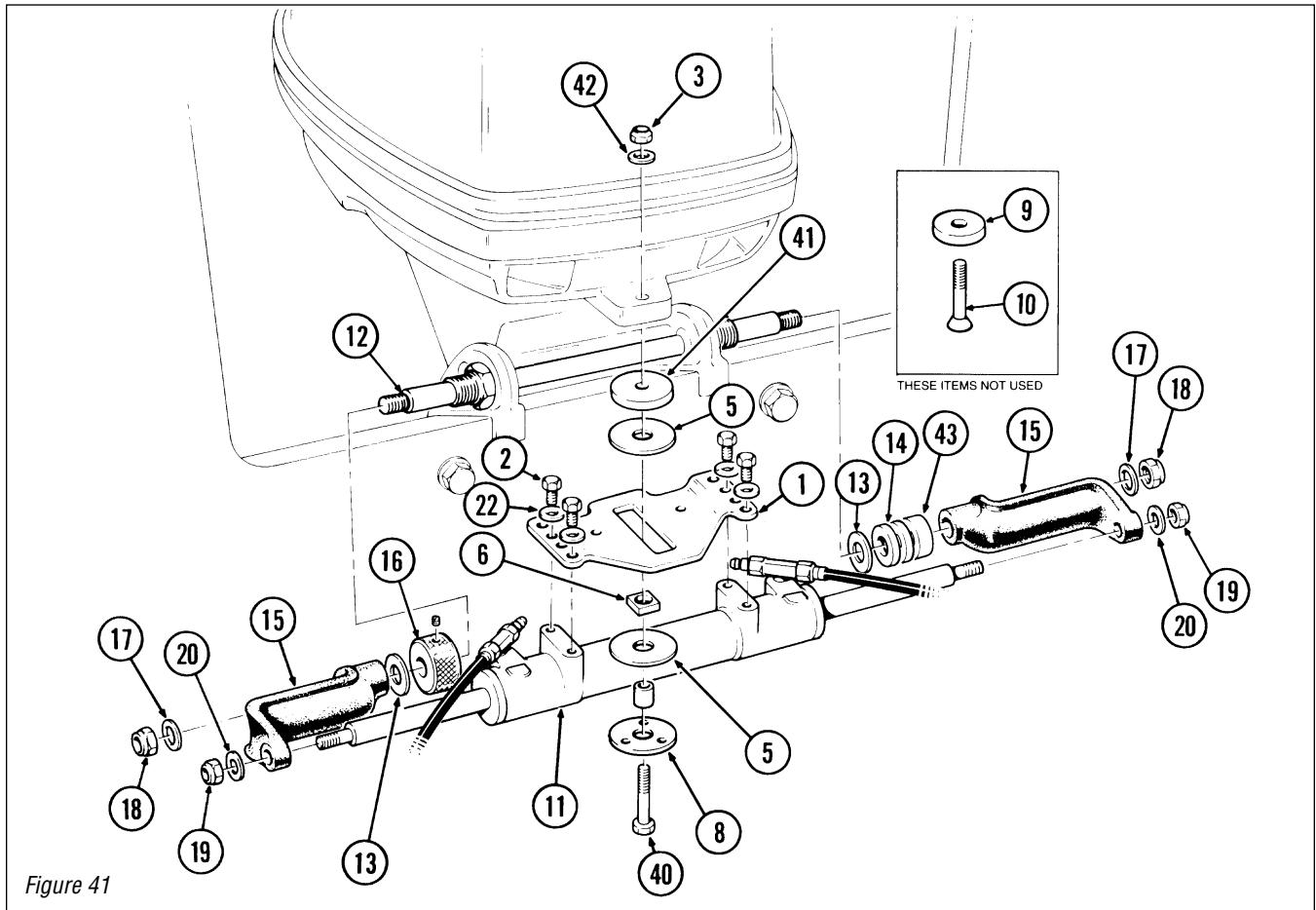


Figure 41

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809900	2	Support Bracket
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# HO5059

40	186426	1	Screw 3/8" x 21/4" Hex Head
41	770921	1	Top Washer
42	113622	1	Washer 3/8" dia.
43	770423	1	Support Rod Spacer

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
US MARINE (FORCE)	1985-TO DATE	90-150 HP	HC5342	HO5059	HO5060	N/A

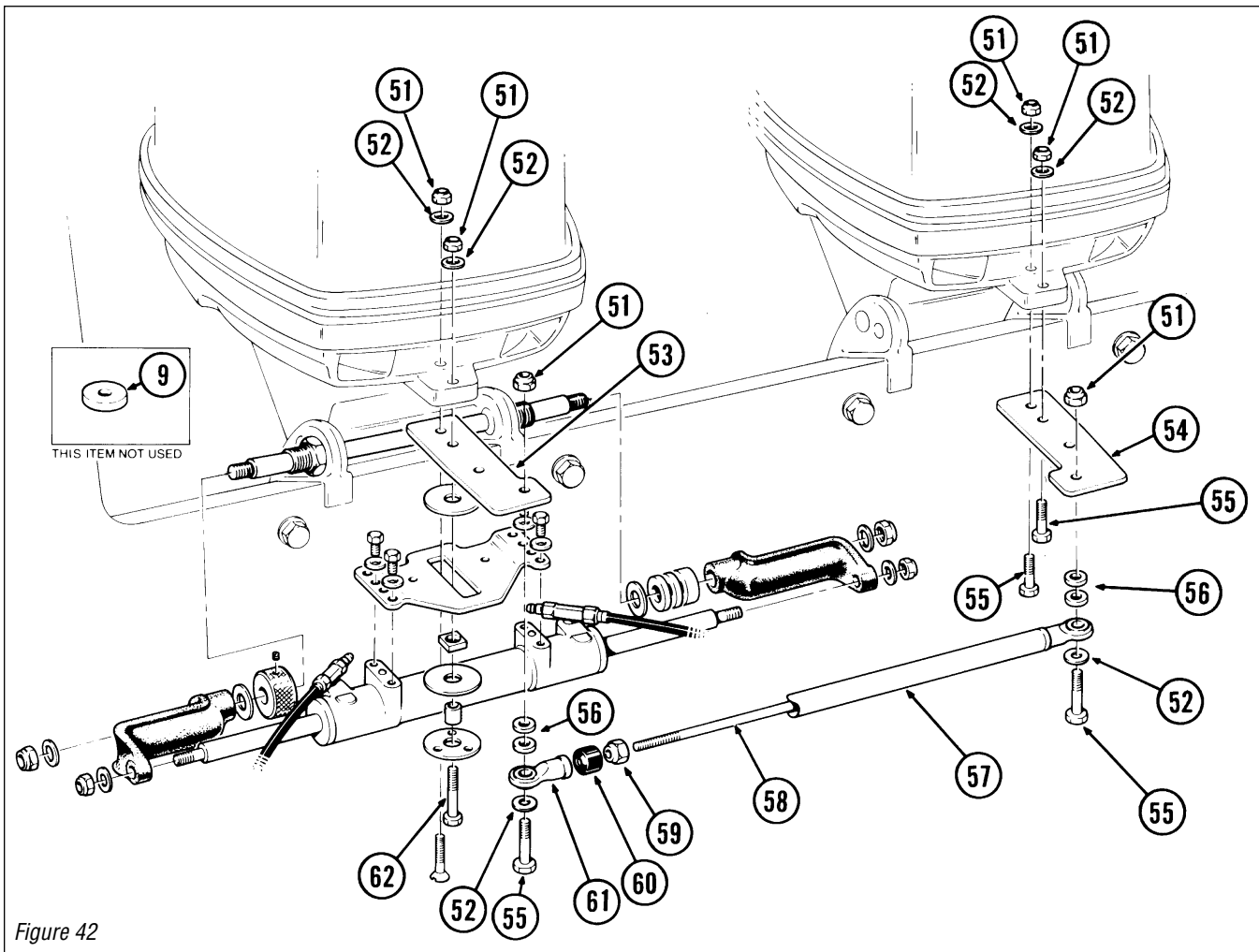


Figure 42

ITEM	PART #	QTY	DESCRIPTION
51	113529	6	Nut 3/8" NF Nylok®
52	113622	6	Washer 3/8" dia.
53	770226	1	Extension Plate Stbd.
54	770122	1	Extension Plate Port
55	726825	4	Screw 3/8" x 1 3/4" Hex Head
56	731128	4	Standoff Washer
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod c/w Ball Joint

ITEM	PART #	QTY	DESCRIPTION
59	192126	1	Nut 1/2" NF Nylok®
60	N/A	1	Obsolete—No longer required
61	116527	1	Ball Joint
62	186426	1	Screw 3/8" x 21/4" Hex Head

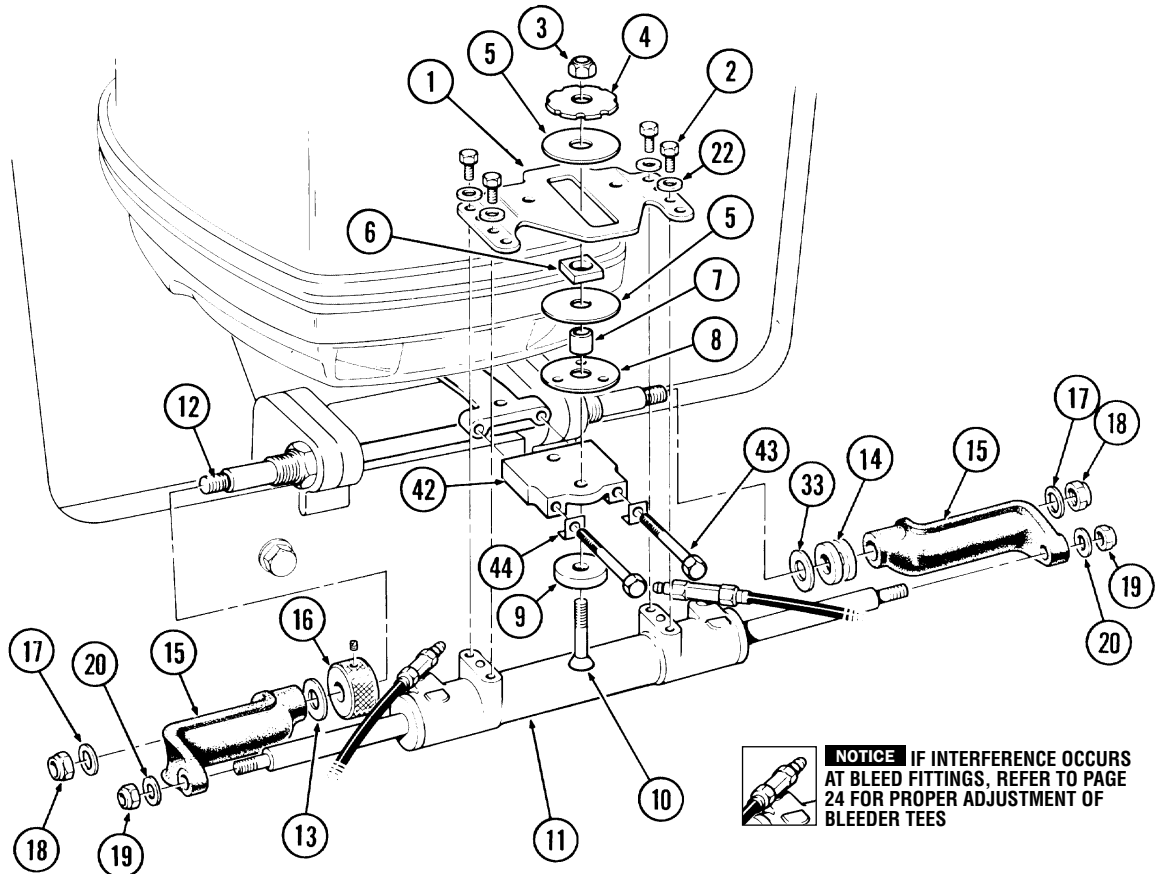
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
US MARINE (FORCE)	1995-TO DATE	120 HP	HC5342	H05035	H05009	H05042

Figure 43



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer
15	809900	2	Support Bracket

ITEM	PART #	QTY	DESCRIPTION
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# H05035.

42	741327	1	Adapter Plate #MT
43	752021	2	Screw 5/16" x 31/2" Hex Head
44	203123	2	Locking Tab Washer

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
US MARINE (FORCE)	1995-TO DATE	120 HP	HC5342	H05035	H05042 & H05009	H05042

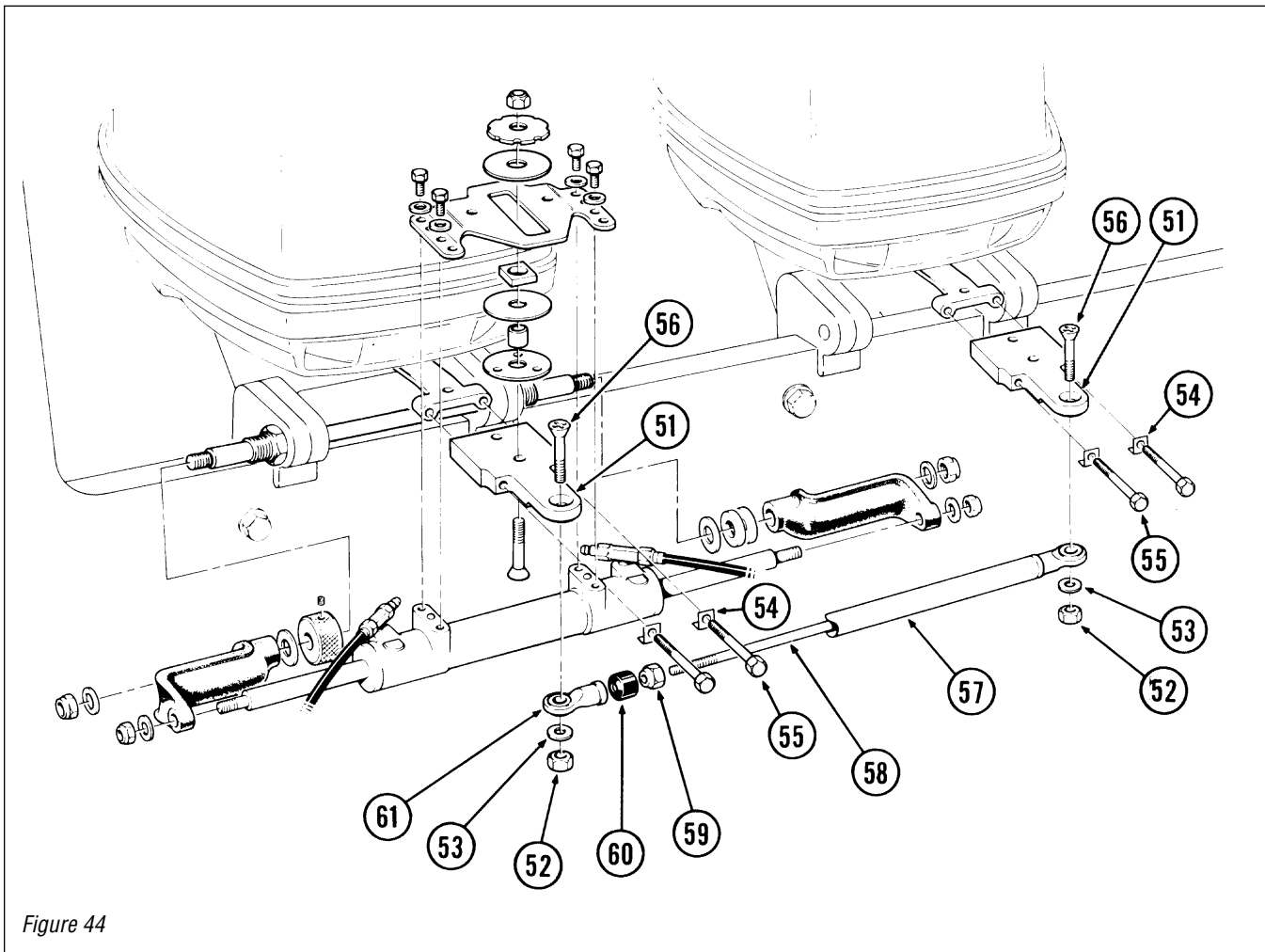


Figure 44

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05009			
52	113529	2	Nut 3/8" NF Nylok®
53	113622	4	Washer 3/8" dia.
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	192126	1	Nut 1/2" NF Nylok®
60	N/A	1	Obsolete—No longer required
61	116527	1	Ball Joint
62	726825	2	Screw 3/8" NF x 1-3/4" Hex Head (Not Used)

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05042			
51	680321	2	Adapter Plate Force
54	203123	4	Locking Tab Washer
55	752021	4	Screw 5/16" x 3-1/2" Hex Head
56	734925	2	Screw 3/8" x 1-3/4" Flat Head

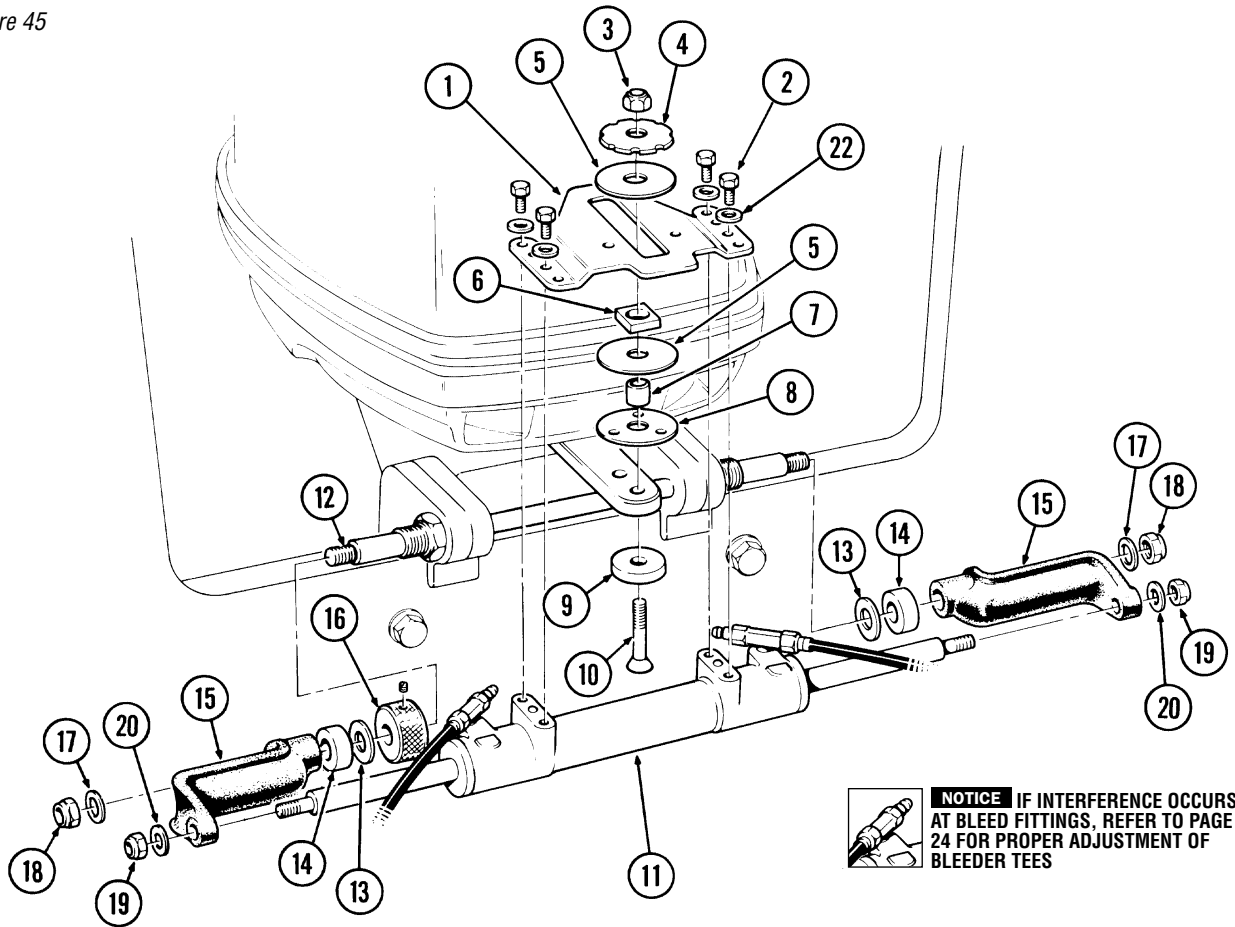
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1984-1985	115-220 HP	HC5342	NOT REQ	HO5005	N/A

Figure 45



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1984-1985	115-220 HP	HC5342	NOT REQ	H05005	N/A

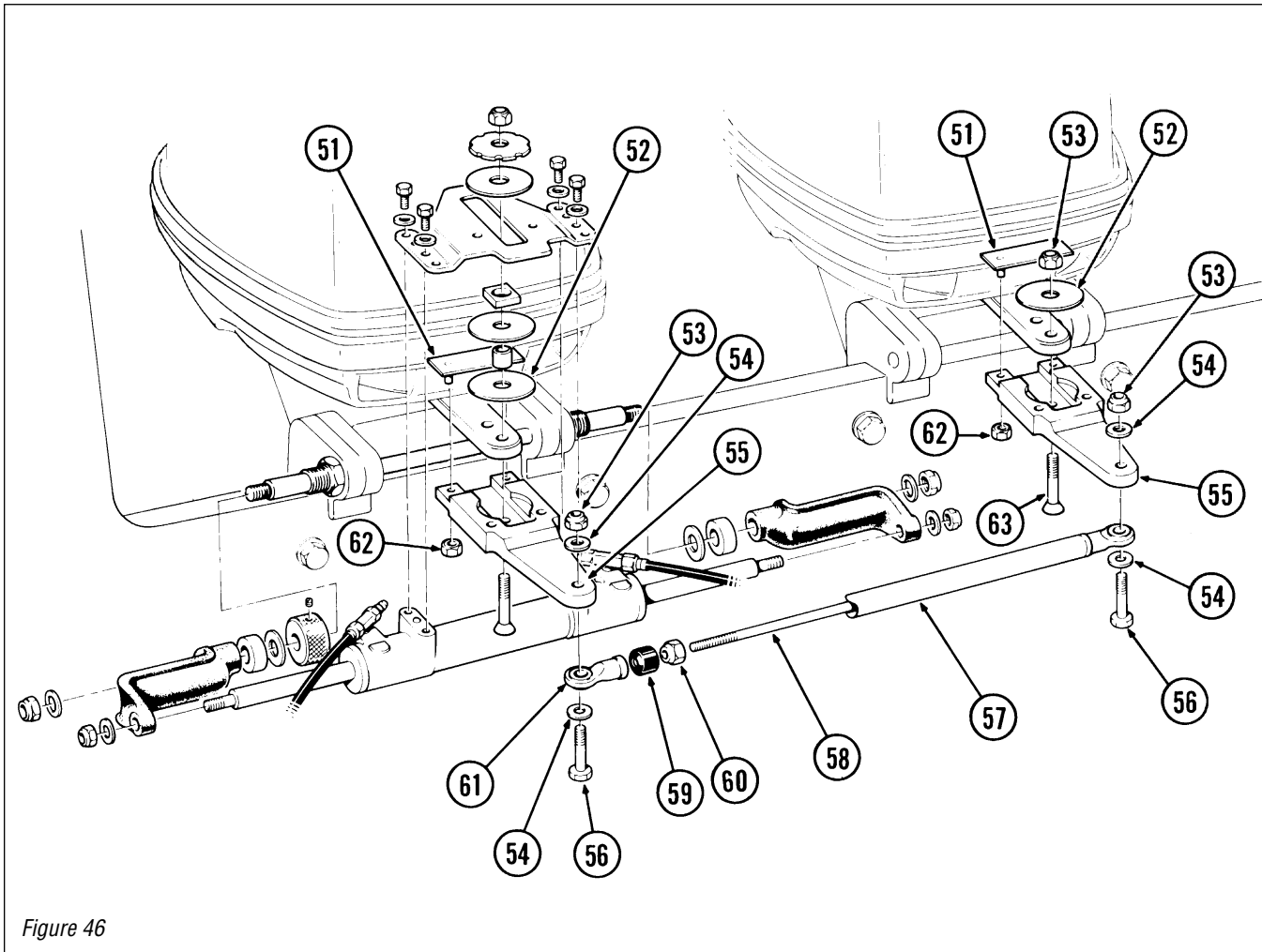


Figure 46

ITEM	PART #	QTY	DESCRIPTION
51	722928	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	4	Washer 3/8" dia.
55	725729	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head

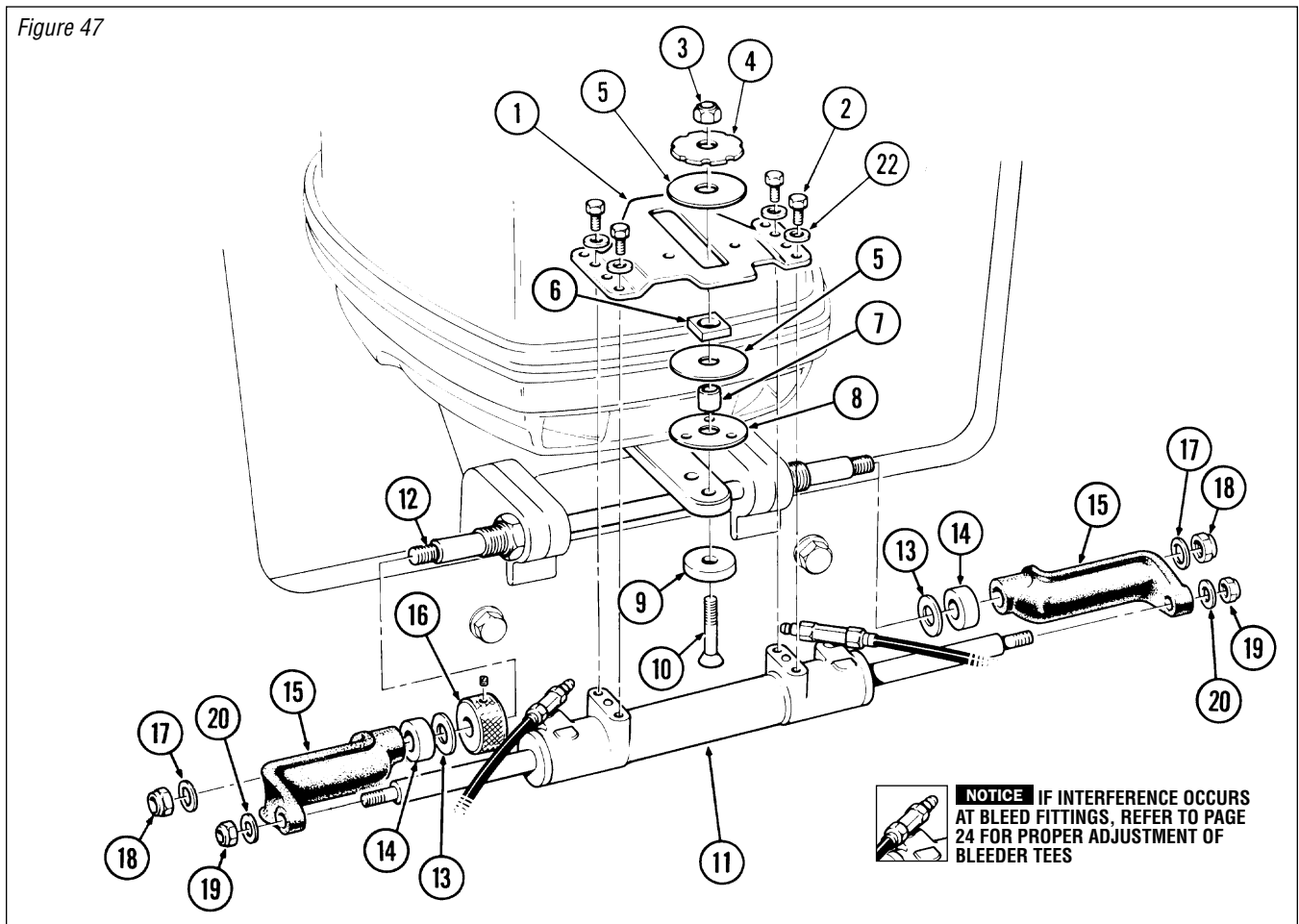
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1986 ONLY	115-220 HP	HC5342	NOT REQ	HO5004	N/A

Figure 47



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1986 ONLY	115-220 HP	HC5342	NOT REQ	H05004	N/A

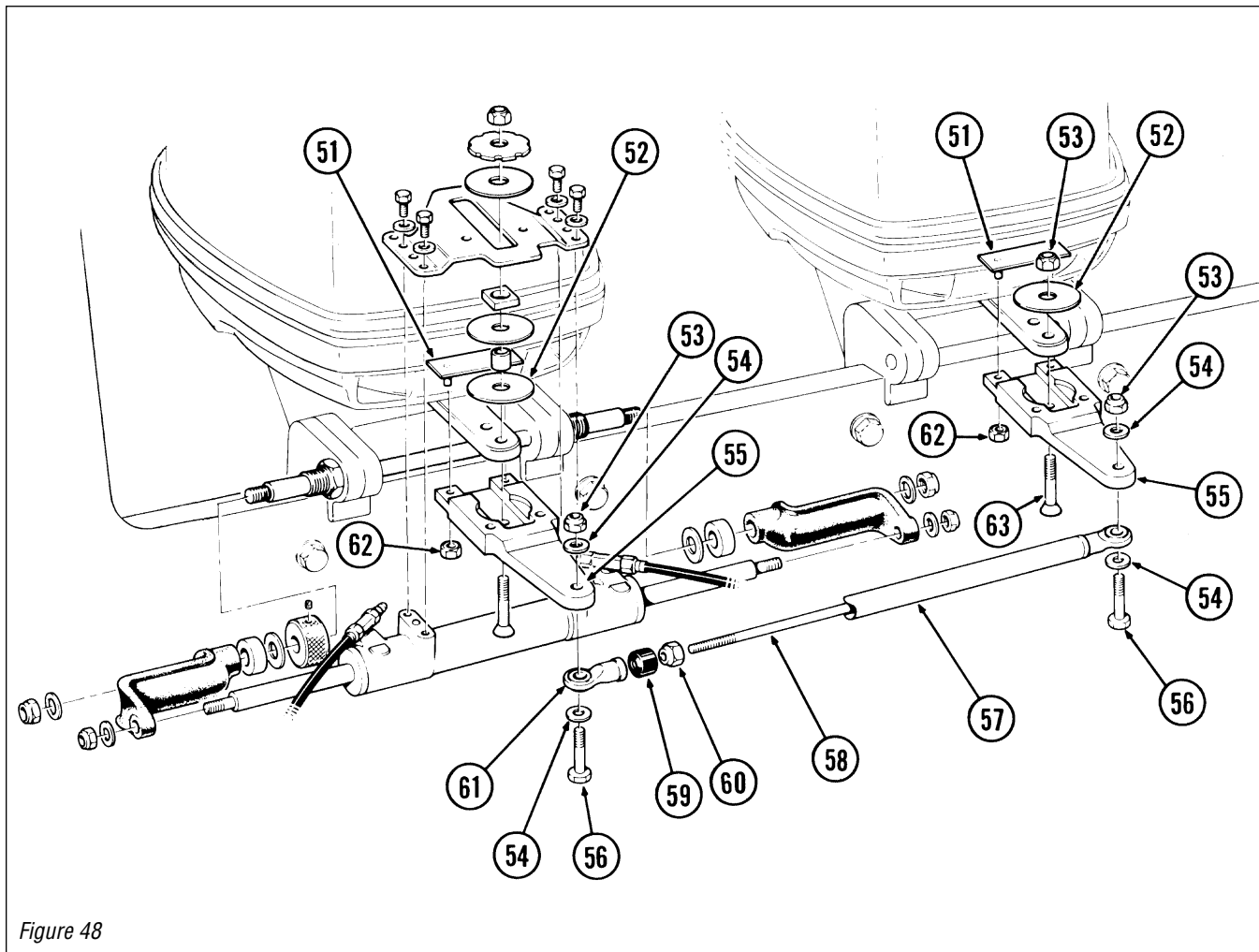


Figure 48

ITEM	PART #	QTY	DESCRIPTION
51	722829	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	4	Washer 3/8" dia.
55	726026	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head

APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1989-TO DATE	50-70 HP	HC5342	H05039	N/A	N/A

Figure 49

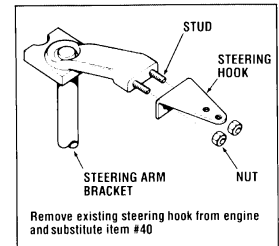
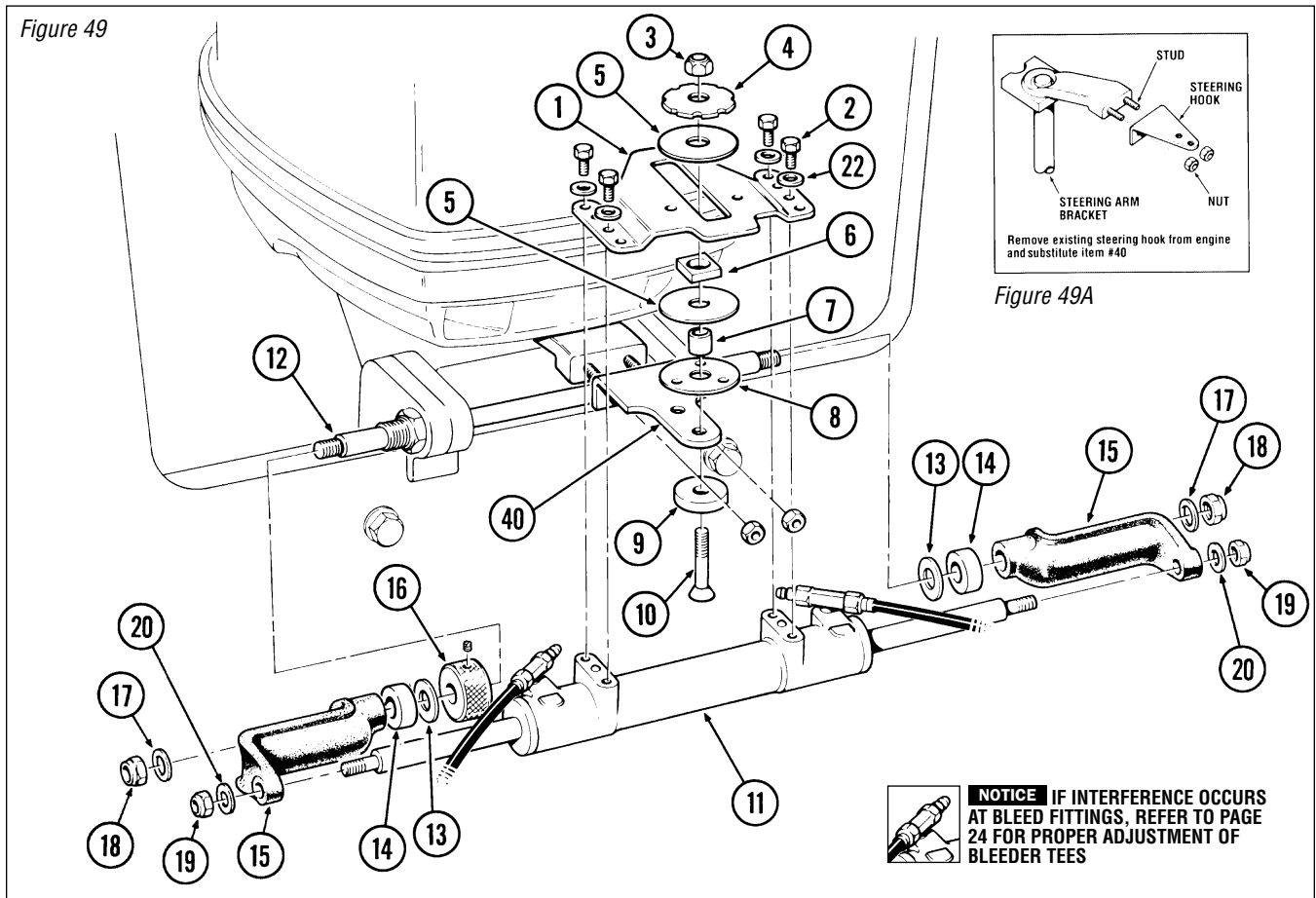


Figure 49A

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736078	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 15/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809900	2	Support Bracket
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# H05039.

40	772720	1	Extension Plate
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REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1989-TO DATE	50-70 HP	HC5342	NOT REQ	H05009 & H05046	H05046

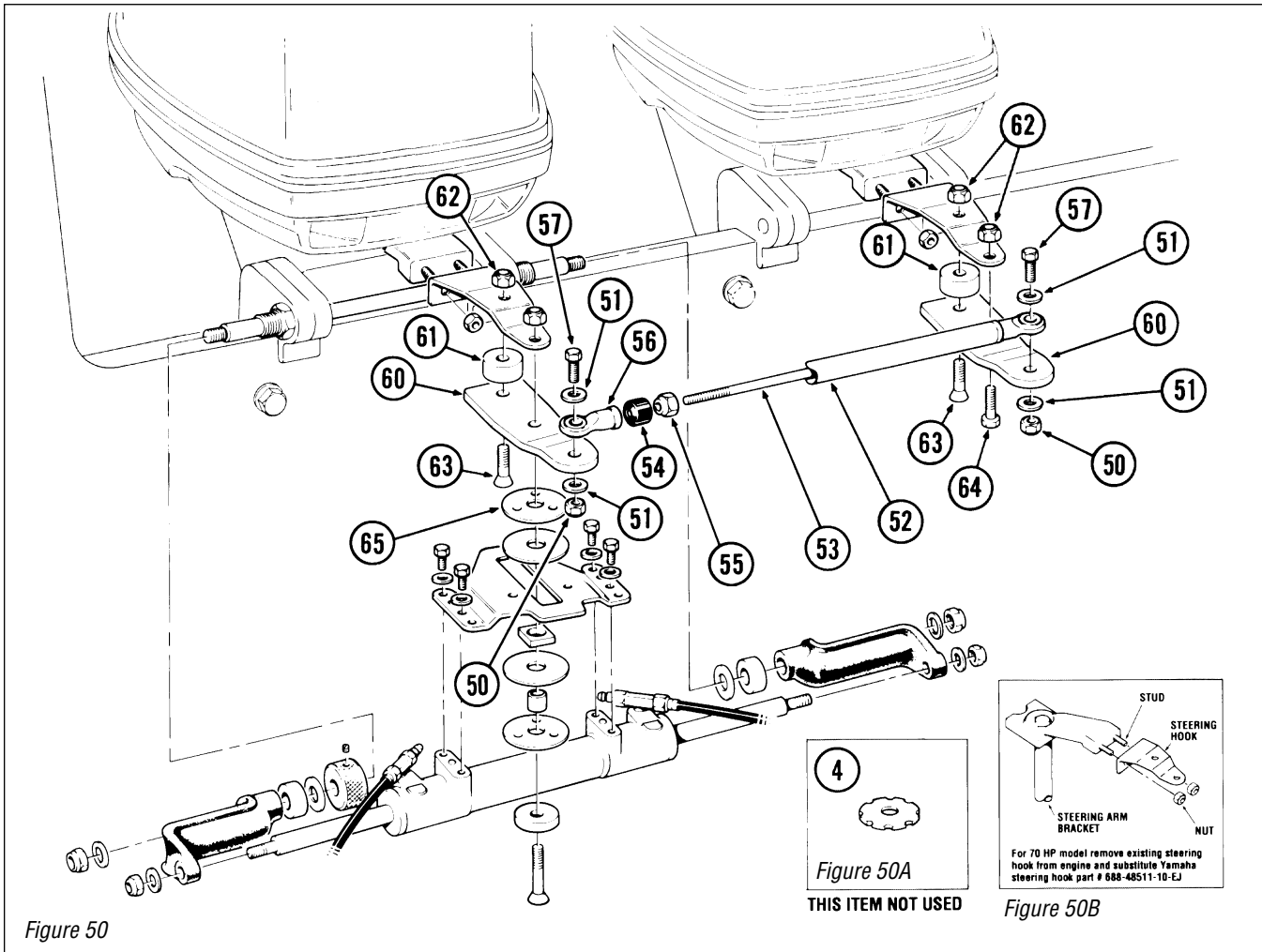


Figure 50

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05009			
50	113529	2	Nut 3/8" NF Nylok®
51	113622	4	Washer 3/8" dia.
52	722721	1	Stringer Tube
53	722523	1	Threaded Rod c/w Ball Joint
54	N/A	1	Obsolete—No longer required
55	192126	1	Nut 1/2" NF Nylok®
56	116527	1	Ball Joint
57	726825	2	Screw 3/8" NF x 1-3/4" Hex Head

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05046			
60	773328	2	Extension plate
61	773421	2	Spacer
62	113529	3	Nut 3/8" NF Nylok®
63	185921	2	Screw 3/8" NF x 1-5/8" Flat Head
64	113321	1	Screw 3/8" NF x 1-1/4" Hex Head
65	736028	1	Bottom Washer (3 Holes)

APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1989-TO DATE	90 HP	HC5342	NOT REQ	HO5009 & HO5046	HO5046

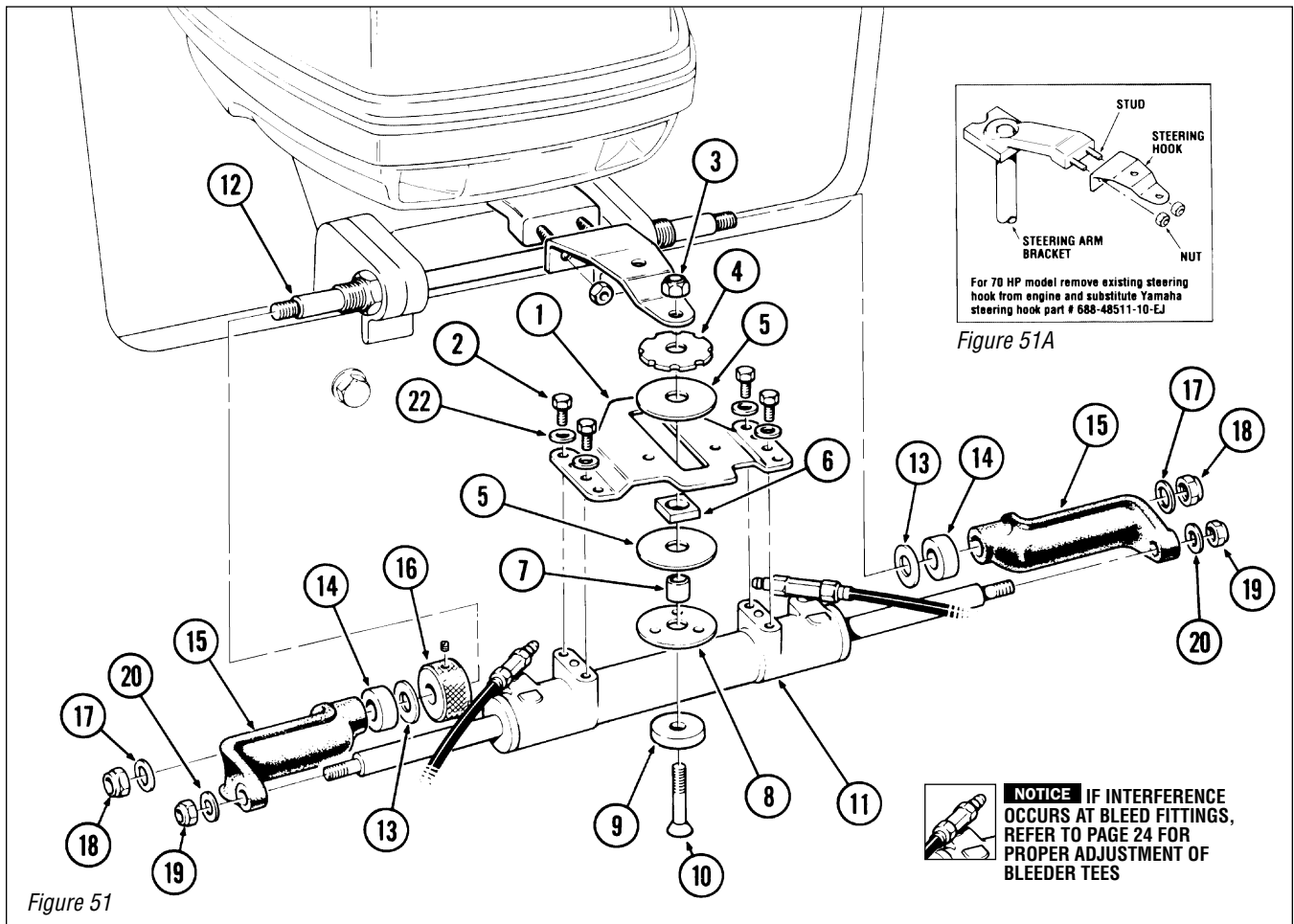


Figure 51

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1989-TO DATE	70-90 HP	HC5342	NOT REQ	H05009 & H05046	H05046

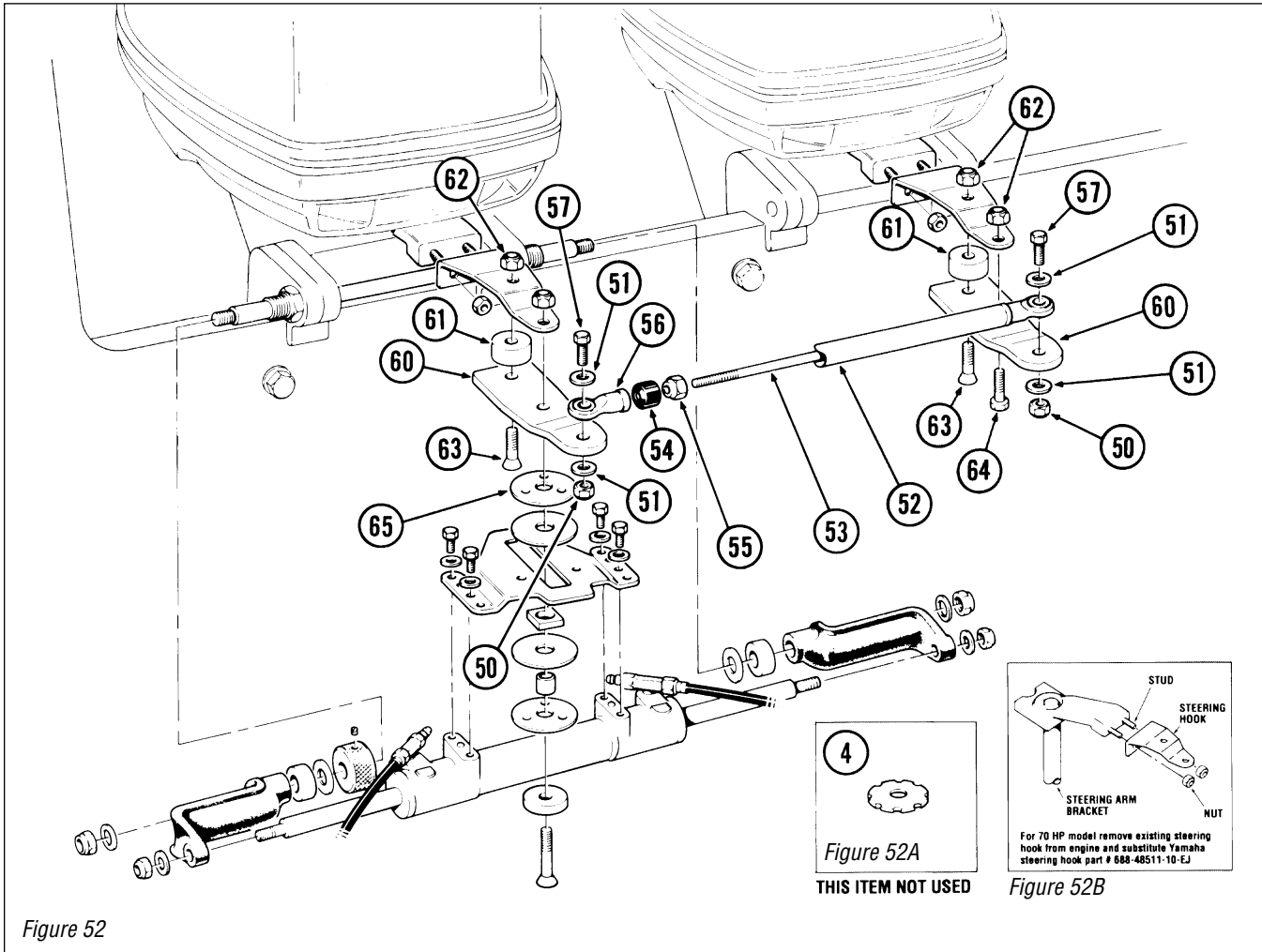


Figure 52

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05009			
50	113529	2	Nut 3/8" NF Nylok®
51	113622	4	Washer 3/8" dia.
52	722721	1	Stringer Tube
53	722523	1	Threaded Rod c/w Ball Joint
54	N/A	1	Obsolete—No longer required
55	192126	1	Nut 1/2" NF Nylok®
56	116527	1	Ball Joint
57	726825	2	Screw 3/8" NF x 1-3/4" Hex Head

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# H05046			
60	773328	2	Extension plate
61	773421	2	Spacer
62	113529	3	Nut 3/8" NF Nylok®
63	185921	2	Screw 3/8" NF x 1-5/8" Flat Head
64	113321	1	Screw 3/8" NF x 1-1/4" Hex Head
65	736028	1	Bottom Washer (3 Holes)

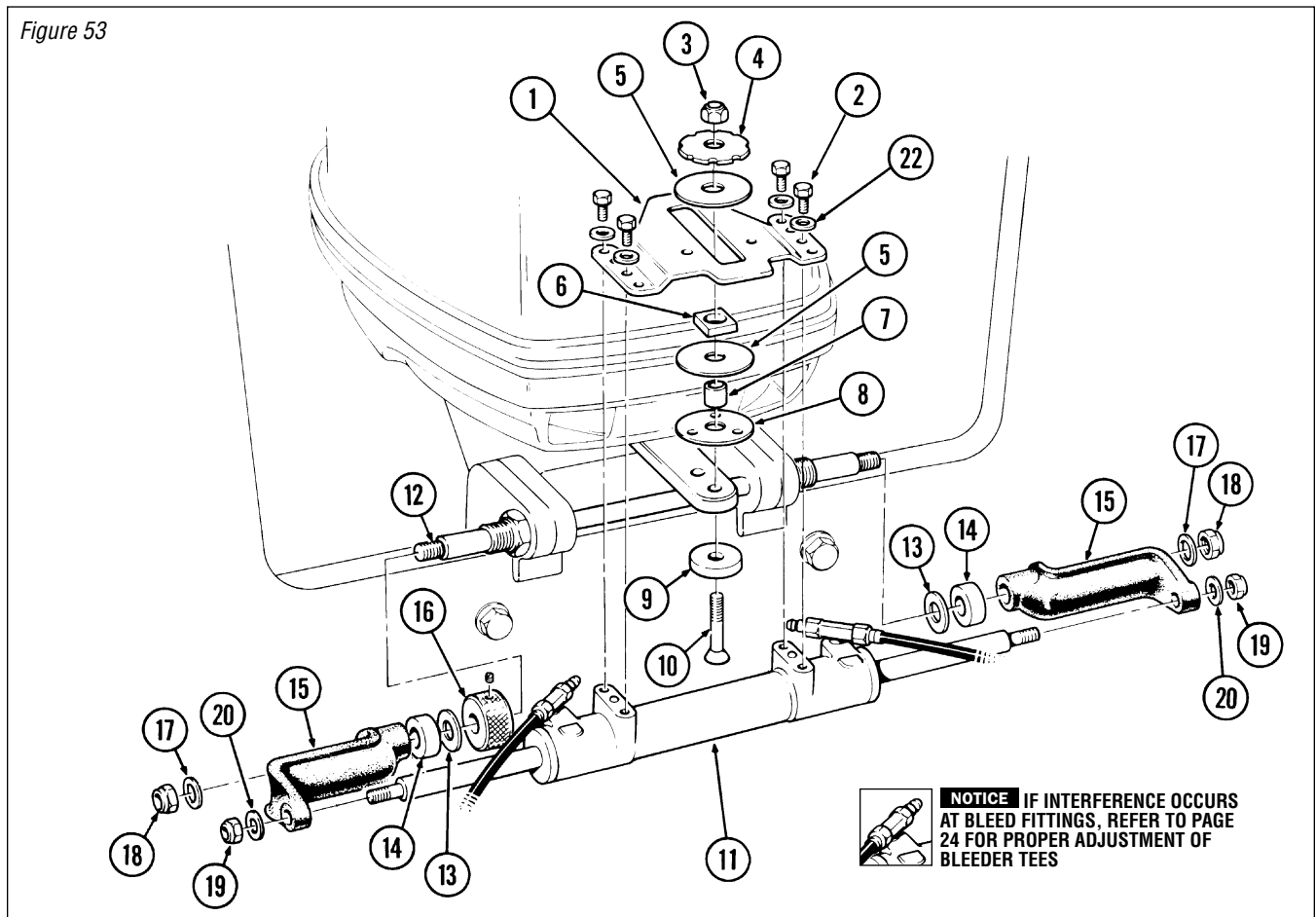
APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1987-TO DATE	115-220 HP	HC5342	NOT REQ	HO5006A	HO5036A
	1990-TO DATE	250 HP	HC5342	NOT REQ	N/A	HO5047
	1990-TO DATE	80-140 HP	HC5342	NOT REQ	HO5006A	HO5036A

Figure 53



ITEM	PART .	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021
Includes all mounting hardware excluding the Support Rod part# 730229.

APPLICATIONS

TWIN ENGINES

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1987-TO DATE	115-225 HP	HC5342	NOT REQ	HO5006A	HO5036A
	1990-TO DATE	250 HP	HC5342	NOT REQ	N/A	HO5047
	1990-TO DATE	80-140 HP	HC5342	NOT REQ	HO5006A	HO5036A

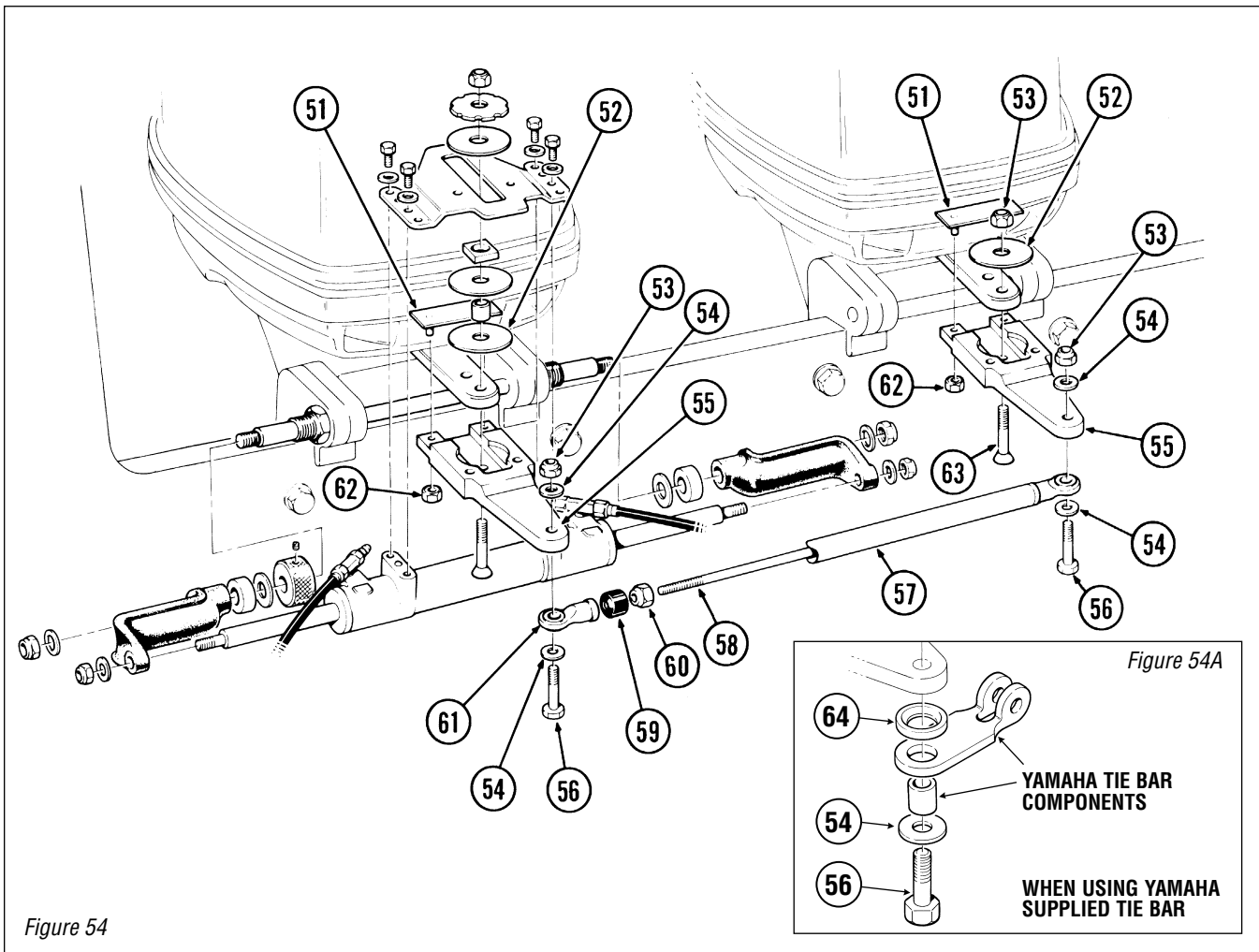


Figure 54

ITEM	PART #	QTY	DESCRIPTION
51	722928	2	Clamp Plate
52	753428	2	Bottom Washer (MC)
53	113529	3	Nut 3/8" NF Nylok®
54	113622	4	Washer 3/8" dia.
55	727122	2	Extension Plate
56	186426	2	Screw 3/8" x 21/4" Hex Head
57	722721	1	Stringer Tube
58	722523	1	Threaded Rod c/w Ball Joint
59	N/A	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok®

ITEM	PART #	QTY	DESCRIPTION
61	116527	1	Ball Joint
62	191424	4	Nut 1/4" NC Nylok®
63	185921	1	Screw 3/8" x 15/8" Flat Head
WHEN USING YAMAHA SUPPLIED TIE BAR			
64	468721	2	Spacer (for use with Yamaha Tie Bar)

APPLICATIONS

SINGLE ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YAMAHA	1997	115-225L HP 225X-250 HP	HC5342 HC5342	NOT REQ NOT REQ	HO5006 N/A	HO5036 HO5047

CAUTION

For 1997 Yamaha 115-225L hp motors. Measure tilt tube length.

Longer tilt tube is normally 12-3/16". Regular tilt tube is normally 12".

On motors with longer tilt tube, replace one of the regular spacers (14) with the thin spacer (14A).

WARNING

The thin spacer must be used with longer tilt tube Yamaha motors, or loss of steering control may result.

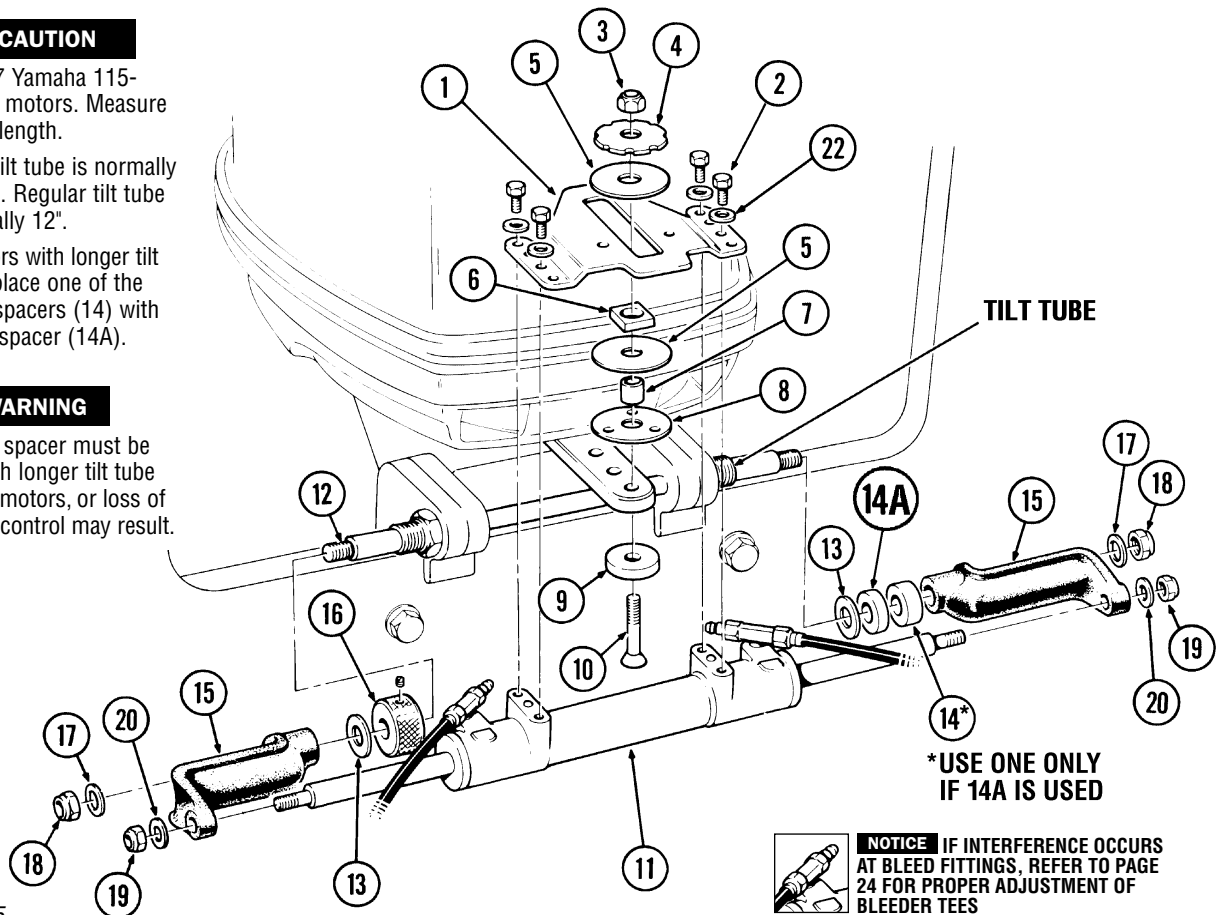


Figure 55

ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.
14	985876	2	Spacer

ITEM	PART #	QTY	DESCRIPTION
14A	728994	1	Spacer Thin
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

REPLACEMENT HARDWARE MOUNTING KIT# 724021

Includes all mounting hardware excluding the Support Rod part# 730229.

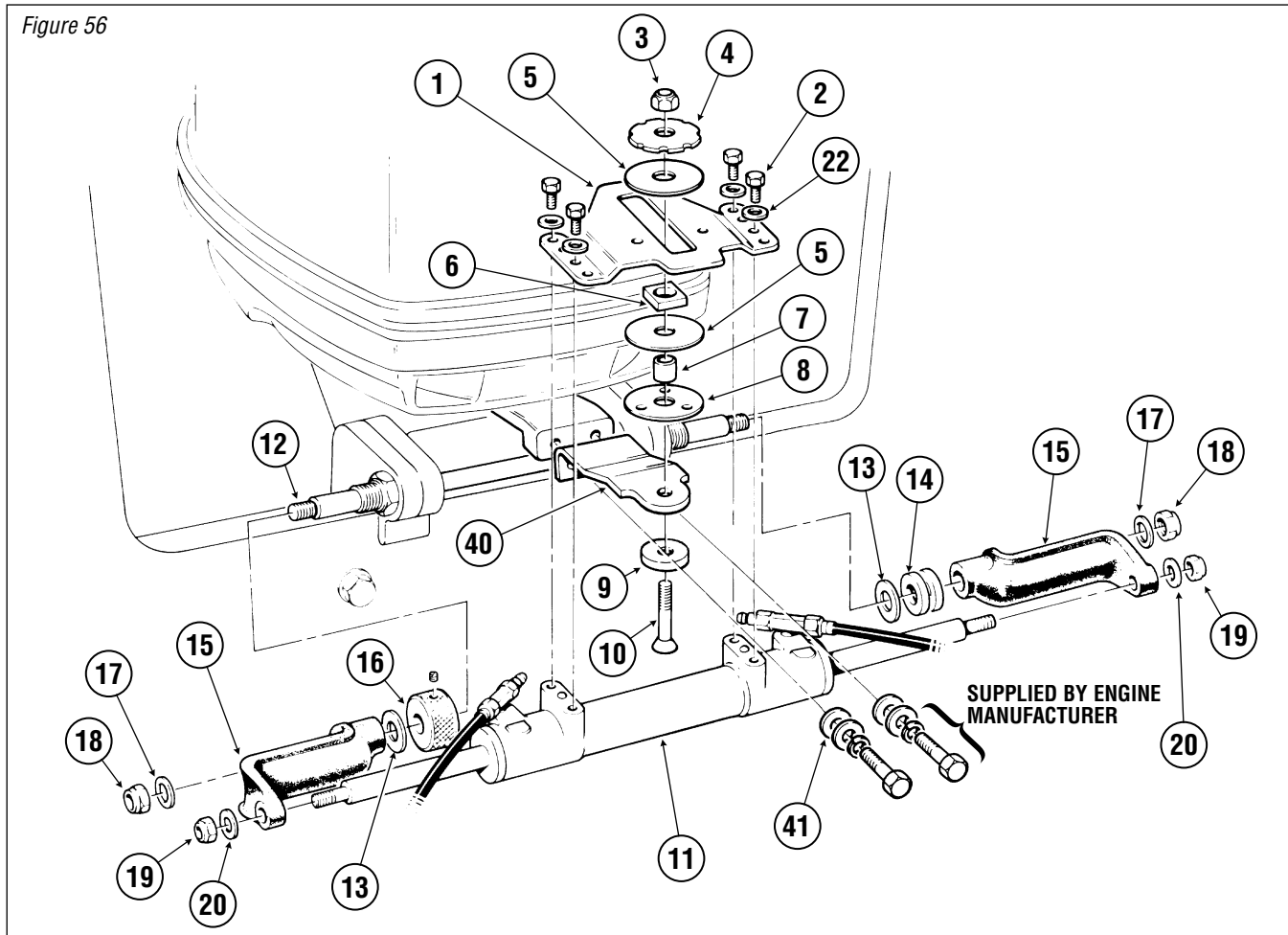
APPLICATIONS

SINGLE ENGINES

⚠ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YANMAR	1993-TO DATE	27-36 HP DIESEL	HC5342	H05045	H05009 & H05055	H05055

Figure 56



ITEM	PART #	QTY	DESCRIPTION
1	722222	1	Slide Plate
2	742724	4	Screw 5/16" x 3/4" Hex Head
3	113529	1	Nut 3/8" NF Nylok®
4	721220	1	Notched Washer
5	727724	2	Slide Washer
6	729221	1	Slide Follower
7	721126	1	Follower Bush
8	736028	1	Bottom Washer (3 Hole)
9	721427	1	Countersunk Washer
10	185921	1	Screw 3/8" x 1 5/8" Flat Head
11	HC5344	1	Cylinder c/w Bleed Tee's
12	730229	1	Support Rod
13	202121	2	Washer 5/8" dia.

ITEM	PART #	QTY	DESCRIPTION
14	985876	2	Spacer
15	809900	2	Support Brackets
16	436627	1	Adjusting Nut c/w Set Screw
17	202027	2	Washer 1/2" dia.
18	192126	2	Nut 1/2" NF Nylok®
19	731720	2	Nut 7/16" dia.
20	731625	2	Washer 7/16" dia.
22	010924	4	Washer 5/16" dia.

ADAPTER KIT# H05045

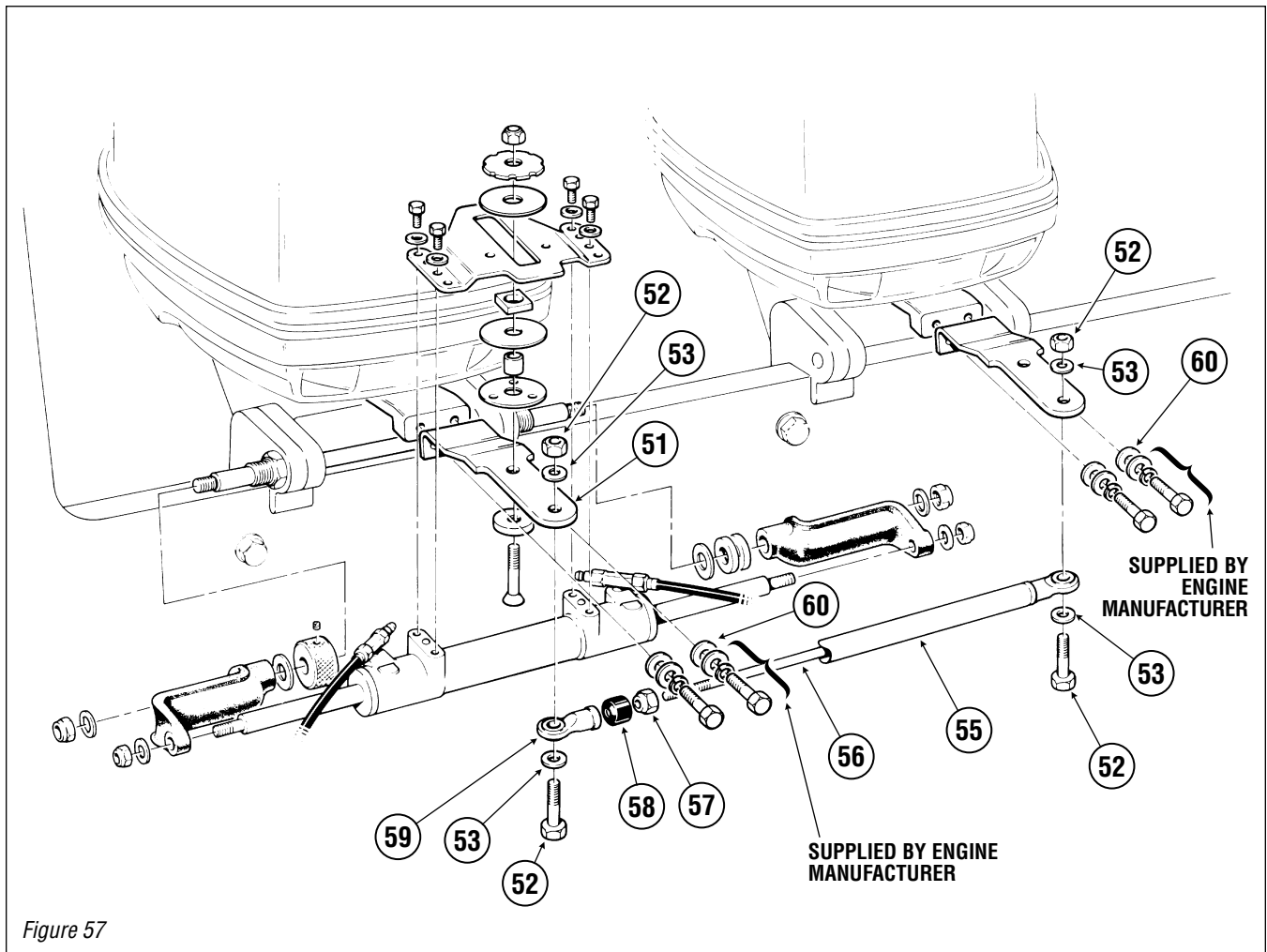
40	815427	1	Adapter Plate Single Engine
41	731625	2	Washer 7/16" dia.

APPLICATIONS

TWIN ENGINE

WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	ENGINE ADAPTER PLATES		
				SINGLE	TWIN c/w tie-rod	TWIN w/o tie-rod
YANMAR	1993-TO DATE	27-36 HP DIESEL	HC5342	HO5045	HO5009 & HO5055	HO5055



ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# HO5009			
52	113529	2	Nut 3/8" NF Nylok®
53	113622	4	Washer 3/8" dia.
54	726825	2	Screw 3/8" x 13/4" Hex Head
55	722721	1	Stringer Tube
56	722523	1	Threaded Rod c/w Ball Joint
57	192126	1	Nut 1/2" NF Nylok®
58	N/A	1	Obsolete—No longer required
59	116527	1	Ball Joint

ITEM	PART #	QTY	DESCRIPTION
ADAPTER KIT# HO5055			
51	815323	2	Adapter Plate Twin Engine
60	731625	4	Washer 7/16" dia.

APPLICATIONS

SINGLE ENGINES

⚠ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER
ALL	ALL	ALL	HC5370

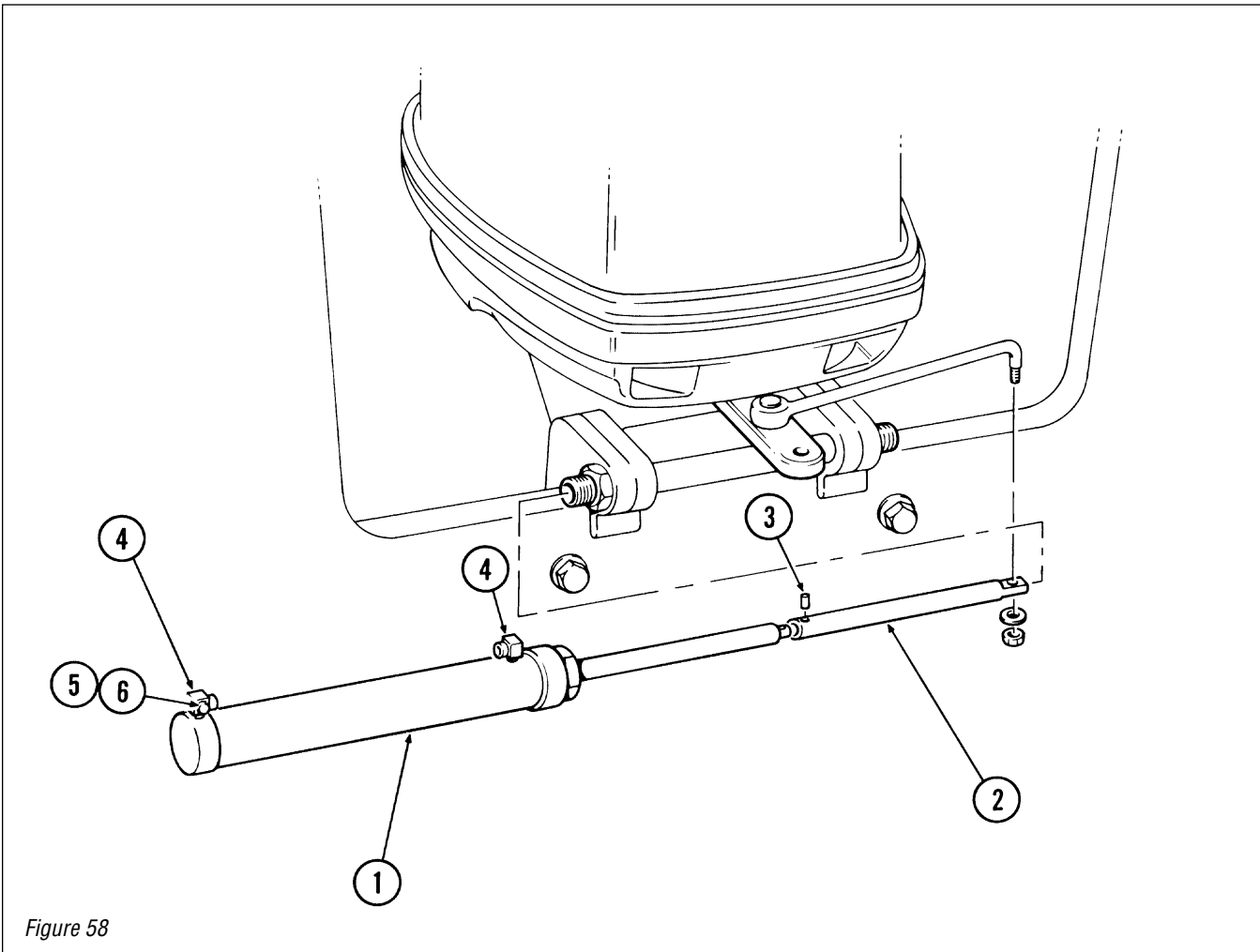


Figure 58

ITEM	PART #	QTY	DESCRIPTION
1	537029	1	O/B Cylinder S.M. Assembly
2	449824	1	Extension Rod SS
3	449721	1	Pin SS
4	448521	2	Hose-Bleed Fitting (Elbow)
5	449025	2	Bleed Screw
6	448925	2	Washer for Bleed Screw

ITEM	PART #	QTY	DESCRIPTION
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APPLICATIONS

TWIN ENGINE

▲ WARNING Refer to page 24 for correct torque specifications of all installation hardware.

ENGINE MANUFACTURER	YEAR	MODEL	CYLINDER	TIEBAR KIT	
ALL	ALL	ALL	HC5370	HO5009	

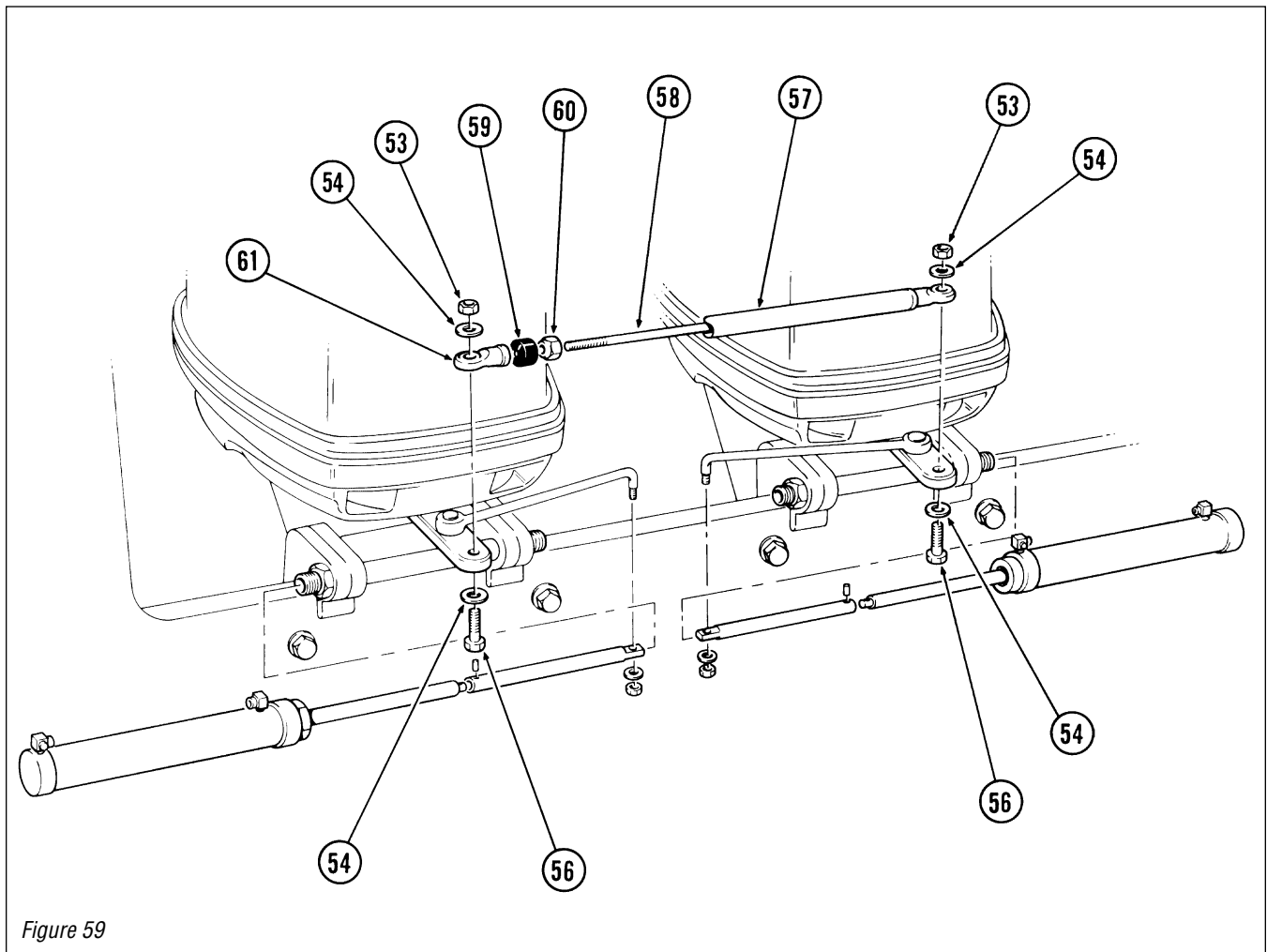


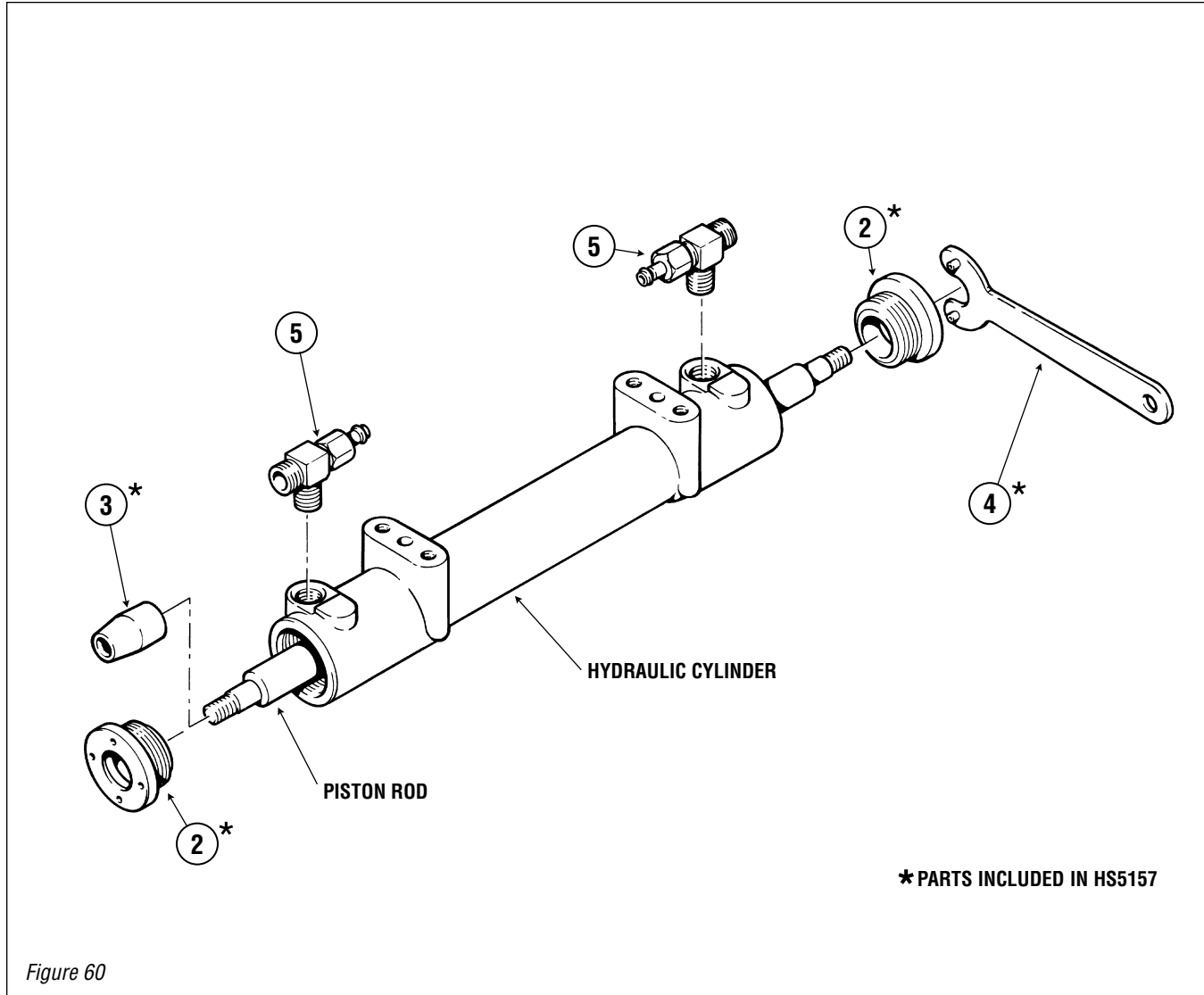
Figure 59

ITEM	PART #	QTY	DESCRIPTION
53	113529	2	Nut 3/8" NF SS Thin Nylok®
54	113622	4	Washer 3/8" dia. Flat SS
56	726825	2	Screw 3/8" NF x 13/4" HHCS SS
57	722721	1	Stringer Tube
58	722627	1	Threaded Rod 1/2" NF x 36" SS
59	746123	1	Obsolete—No longer required
60	192126	1	Nut 1/2" NF Nylok® BR. N.P.
61	116527	1	Rod End Ball Joint 1/2" SS

ITEM	PART #	QTY	DESCRIPTION
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SEAL REPLACEMENT KITS (& NON-ILLUSTRATED PARTS)

FRONT MOUNT CYLINDER (PART # HC5340-42)

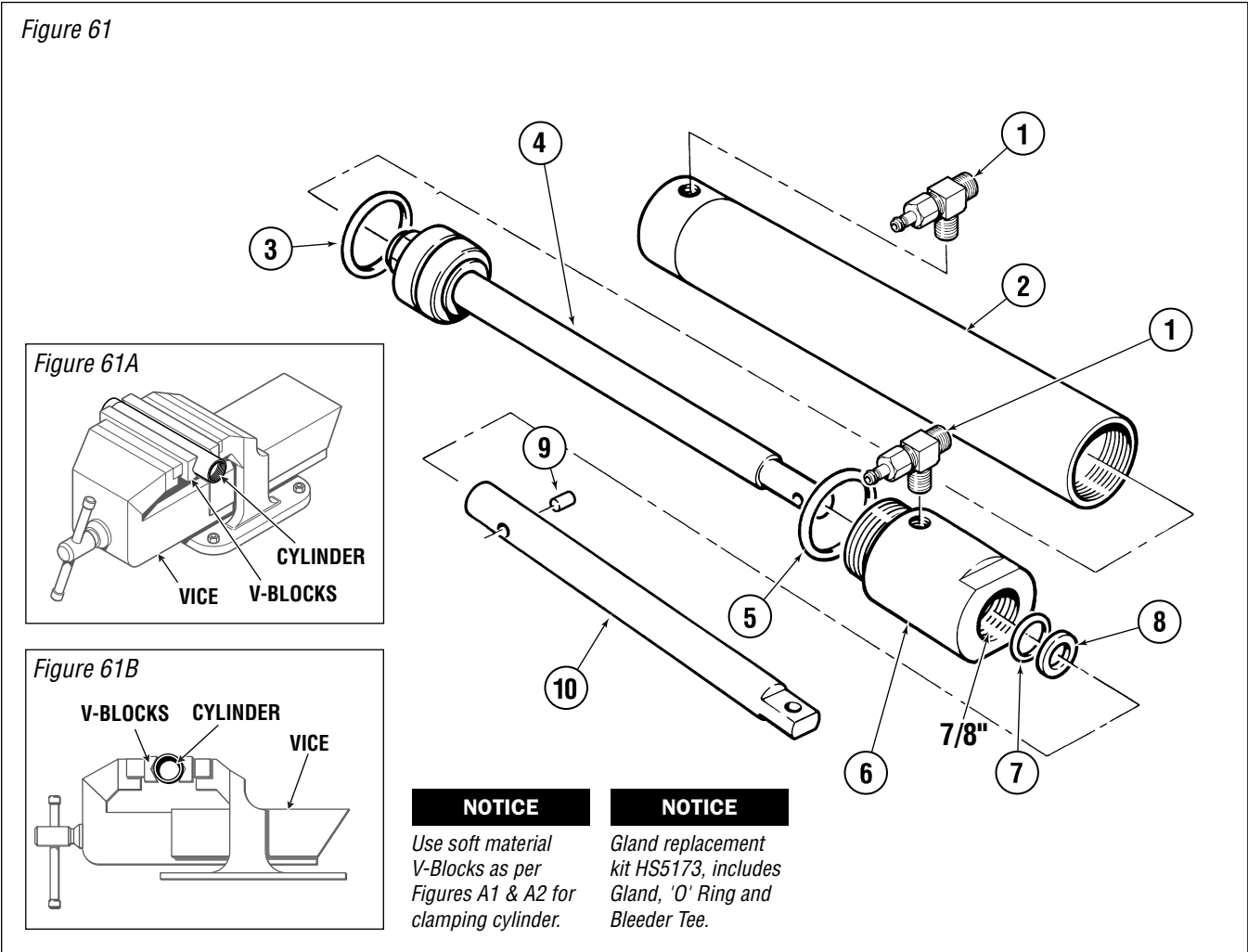


ITEM	PART#	QTY	DESCRIPTION
1	HS5157	1	Seal Kit, c/w Two Seal Glands & Pin Wrench
2	797021	1	Seal Gland Only
3	745920	1	Seal Gland Assembly Guide Tool
4	745525	2	Pin Wrench Only
5	409620	2	Bleeder Tee Fitting (not included)
6	002222	2	O-Ring for Bleeder Fittings
7	222228	2	O-Ring for Bleeder Fittings

ITEM	PART#	QTY	DESCRIPTION
SIDE MOUNT CYLINDER PART# HC5370 NOT ILLUSTRATED			
	HS5153	1	Seal Kit, Seals Only
	HS5173	1	Rod End Gland, Swivel Nut c/w Seals
	448728	2	Elbow Ftg. c/w Bleed Screw
	773722	1	Cylinder Tube, Gland Assembly
	773826	1	Cylinder Rod, Piston Assembly

SIDE MOUNT CYLINDER
(PART # HC5370)

Figure 61



NOTICE
Use soft material V-Blocks as per Figures A1 & A2 for clamping cylinder.

NOTICE
Gland replacement kit HS5173, includes Gland, 'O' Ring and Bleeder Tee.

ITEM	PART#	QTY	DESCRIPTION
1	409620	2	Bleeder Tee Assembly
2	450022	1	Cylinder Barrel / Gland Assembly
3	029620	1	O-Ring (Piston Seal)
4	449928	1	Piston Rod (Shaft Only)
5	469828	1	O-Ring (Rod-End Gland Seal)
6	447321	1	Gland End
7	449627	1	O-Ring (Shaft Seal)
8	215121	1	Wiper Ring
9	449721	1	Pin
10	449824	1	Extension Rod

ITEM	PART#	QTY	DESCRIPTION
SEAL KIT # HS5153			
3	029620	1	O-Ring (Piston Seal)
5	469828	1	O-Ring (Rod-End Gland Seal)
7	008727	1	O-Ring (Shaft Seal)
8	215121	1	Wiper Ring
11	002222	1	O-Ring (Piston Rod Seal) (Not Shown)

Statement of Limited Warranty

We warrant to the original retail purchaser that **Marine Canada Acquisition Inc. DBA SEASTAR SOLUTIONS** (herein forward referred to as **SeaStar Solutions**) products have been manufactured free from defects in materials and workmanship. This warranty is effective for two years from date of purchase, excepting that where **SeaStar Solutions** products are used commercially or in any rental or income producing activity, then this warranty is limited to one year from the date of purchase.

We will provide replacement product without charge, for any **SeaStar Solutions** product meeting this warranty, which is returned (freight prepaid) within the warranty period to the dealer from whom such product were purchased, or to us at the appropriate address. In such a case **SeaStar Solutions** products found to be defective and covered by this warranty, will be replaced at **SeaStar Solutions** option, and returned to the customer.

The above quoted statement is an extract from the complete **SeaStar Solutions** products warranty statement. A complete warranty policy is available in our **SeaStar Solutions** products catalogue.

Return Goods Procedure

Prior to returning product to **SeaStar Solutions** under warranty, please obtain a *Return Goods Authorization number* (claim number).

Be sure to label the goods with:

- a) the name and address of the sender, and
- b) the return goods authorization number (claim number)

Please address the returned goods as follows:

From U.S.A.

RGA # ?
SeaStar Solutions
c/o UPS–Supply Chain Solutions Inc.
Door A37
1201 C Street NW, Auburn, WA,
98001

From Canada

RGA # ?
SeaStar Solutions
3831 No. 6 Road
Richmond, B.C.
Canada V6V 1P6

Technical Support

Phone: 604-248-3858

email: seastar@seastarsolutions.com

Hours: Monday - Friday 05:00 – 15:30 PST

Web: www.seastarsolutions.com



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SOLUTIONS®**

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