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*Capitano*TM

and

SeaStar[®]

ARE MANUFACTURED BY

Teleflex[®]
Teleflex Canada

OPERATING INSTRUCTIONS

AND OWNERS MANUAL

www.seastarsteering.com




SeaStar[®]

AUTOMATIC AND POWER PURGING SYSTEMS
PART# HA5427, HA5437, HA5445 & HA5447

FILLING AND PURGING INSTRUCTIONS FOR
TELEFLEX HYDRAULIC STEERING SYSTEMS




*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.

Introduction

Before proceeding with the installation, read these instructions thoroughly. Teleflex 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.

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Hydraulic Fluid Requirements

SeaStar and Capilano hydraulic steering systems require special high quality hydraulic fluid meeting Mil specification H-5606. This fluid is available in bottles as:

SeaStar Hydraulic Fluid, part no. HA5430 1 Liter (33.8 fluid ounces)
HA5440 4 liters (1 Gallon)

Alternate hydraulic fluids recommended for SeaStar/Capilano Steering Systems:

Shell	Aero Shell Fluid #4	Mobil	Aero HFA
Esso	Univis N15 or J13	Chevron	Aviation Fluid A
Texaco ..	HO15	Petro Canada	Harmony HV115 <i>(available in Canada Only)</i>

CAUTION

Substitution of non-recommended fluids may result in heavier steering loads, and/or irreparable damage to your steering system.

AUTOMATIC PURGING SYSTEM

GENERAL

The following instructions are for use with Automatic Purging Systems; Part # **HA5427**—SeaStar Hydraulic Steering Systems or Part # **HA5437**—Capilano Hydraulic Steering Systems

STEP 1 FILLER TANK CONNECTION TO HELM

Remove fill cap from helm. Unscrew the brass fitting out of the red fill container and screw into the fill hole of the helm.

Attach the hose from the red fill container to the brass fitting making sure it clicks into place.

Place or hang the red fill container above helm filler plug level.

NOTICE

Since a significant amount of air removed from the system rises up this line, the filler tank should be supported so that there is a continuous rise in the connection line.

Allow the helm to fully fill with oil. Assure that all air is out of helm before turning the steering wheel.

NOTICE

If the helm reservoir is not filled with oil before turning the wheel, you will increase the possibility of foaming the oil. A system filled with aerated or foamed oil is not purged properly.

STEP 2 BLEED TANK CONNECTION TO CYLINDER

⚠ CAUTION

Make sure male bleed fittings on the cylinder are clean and free of rough edges that may damage seals and cause leakage.

Use caution when removing filler plug from bleed tank as pressure builds up in the tank during bleeding. Fill bleed tank 1" from the top through the top fill port. The bleed tank should be topped with oil for system bleed and resealed so that it will retain internal pressure. If pressure in bleed tank reaches red line area, loosen filler plug to release. Retighten plug and resume procedure.

Failure to properly fill the tank before starting can cause the oil level to drop, and air instead of oil will be sucked into the system.

Connect the bleed tank hose fittings over the male bleed fitting on the cylinder and loosen the bleed fitting nuts 1-1/2 to 2 turns. Open both bleed nuts or bleed tank will over pressurize!

NOTICE

Bleed tank works better if elevated above the level of the cylinder.

Open bleed tank flow control knob approximately 1/4 turn.

NOTICE

Important: The brass flow control knob on the bleed tank should be adjusted so that there is a sufficient system pressure to drive the cylinder fully to either of its hardover positions during bleeding. This removes air from cylinder.

STEP 3 BLEEDING THE SYSTEM

NOTICE

If the wheel is turned too fast at the beginning of the purging procedure, foaming of the oil will occur. The foamed oil will pass through the bleeder tank and will not be separated. The slow wheel turning speed is very important at the start but not important when the system is full of oil.

Single Cylinder

Turn the steering wheel slowly, **(approximately 10 R.P.M.)** counter clockwise for approximately 2 minutes.

Turn the steering wheel slowly, **(approximately 10 R.P.M.)** clockwise for approximately 2 minutes.

Turn the steering wheel, **(approximately 40-50 R.P.M.s.)** counter clockwise for approximately 2 minutes.

Turn the steering wheel, **(approximately 40-50 R.P.M.s.)** clockwise for approximately 2 minutes.

Close the male bleed fitting nuts on the cylinder fittings. Do not over tighten. The air bleeder tank can now be disconnected and the rubber caps put back on the cylinder fittings.

With the filler tank still connected to the helm, check the system for proper number of wheel turns. If the wheel turns are within a quarter turn of correct turns, the system is adequately bled and purged. Refer to table for Cylinder/Turns chart.

Disconnect filler tank and remove the quick disconnect filler plug. The quick disconnect filler plug automatically sets the correct oil level.

Twin Cylinder

Perform step 3 on each cylinder.

Twin Station

Perform step 3 at each steering station.

STEP 4 CHECK FOR AIR

NOTICE

CAUTION

Turn the wheel starboard and just before hardover is reached, watch the oil level in the pump. If no appreciable drop in oil level occurs, the starboard side of the steering system is free of air. Repeat test by turning to the port for a port side check.

Important: If you turn past hardover and pressurize the system, oil will spill out of the helm.

Replace the fill cap in the helm. Turn the wheel starboard beyond its normal stop with enough pressure to “crack” the pressure relief valve (1,000 psi).

Check fitting connections for leaks.

Repeat last two items for port side

HA5427 SeaStar Systems ONLY

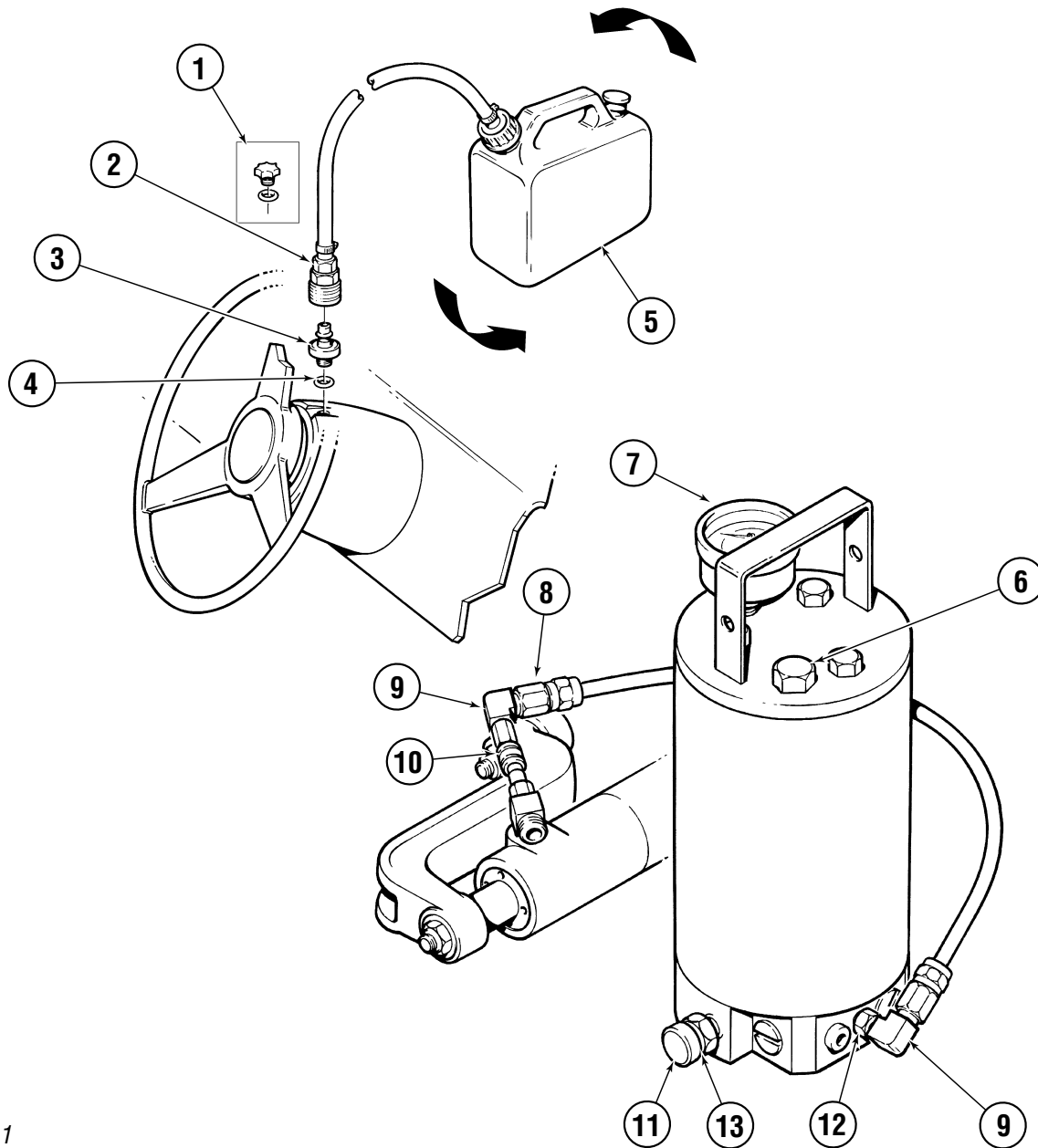


Figure 1

ITEM	PART #	QTY	DESCRIPTION
1	HA5431	1	Vent Cap
2	431821	1	Quick Connect
3	407220	1	Adapter, Filler
4	014925	1	'O' Ring
5	388029	1	Fill Container
6	430320	1	Filler Plug, Valved
7	432325	1	Pressure Gauge 160psi

ITEM	PART #	QTY	DESCRIPTION
8	631428	1	Hose Fitting
9	631521	1	Elbow Fitting
10	431924	1	Quick Connect
11	404720	1	Flow Control
12	432128	1	Bush Fitting
13	015824	1	'O' Ring

HA5437 Capilano Systems **ONLY**

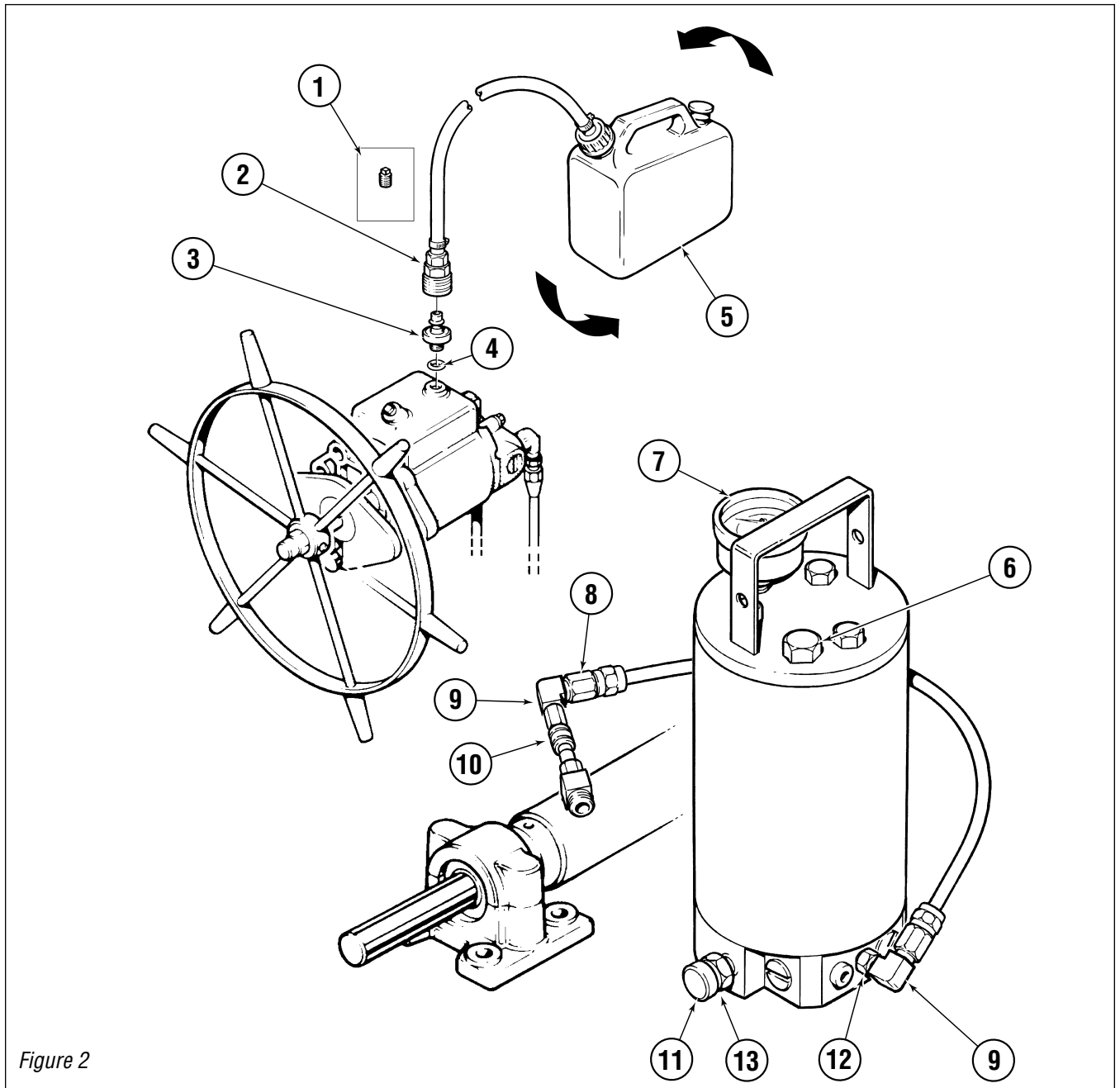


Figure 2

ITEM	PART #	QTY	DESCRIPTION
1	133823	1	Pipe Plug
2	432522	1	Quick Connect
3	403821	1	Adapter, Filler
4	014925	1	'O' Ring
5	388029	1	Fill Container
6	430320	1	Filler Plug, Valved
7	432325	1	Pressure Gauge 160psi

ITEM	PART #	QTY	DESCRIPTION
8	631428	1	Hose Fitting
9	500500	1	Elbow Fitting
10	432522	1	Quick Connect
11	404720	1	Flow Control
12	282821	1	Bush Fitting
13	015824	1	'O' Ring

HA5447 POWER PURGING SYSTEM

⚠ CAUTION

Part# HA5447 Power Purge is for SeaStar Systems ONLY. DO NOT use on BayStar Systems.

NOTICE

Honda 225 4-Stroke Engines MUST have steering cylinder HC5345 disconnected from the tiller arm to be able to stroke the cylinder from hardover to hardover to complete the purging process.

SINGLE CYLINDER—Power Purge Operation

STEP 1. CONNECTION

NOTICE

For dual helm applications, install non-vent plug in upper helm and perform procedure described below on lower helm first. Once complete, install non-vent plug in lower helm and repeat procedure with upper helm.

⚠ CAUTION

Failure to install non-vent plugs during this procedure will result in oil leakage from other helm.

Screw the quick coupling adapter into the helm filler port (refer to Fig. 3c page 7), and **hand-tighten**. See note below for dual helm applications.

Pull the required length of **Helm** hose from the top of the Power Purge Cart and connect both hoses to the quick coupling adapter on the helm. (Refer to Fig. 3c page 7.) Push the quick connects onto their male counterparts and check to ensure they have locked in place.

Pull the required length of **Cylinder** hose from the bottom of the Power Purge Cart and connect one hose to each bleed fitting on the hydraulic cylinder and check to see they have locked in place. (Refer to Fig. 3b page 7.)

Open both cylinder bleeders 1/2 - 1 turn.

STEP 2. PURGING

NOTICE

For Dual Cylinder purging please refer to page 10.

Turn the Power Purge On. Oil should now flow into & out of the helm. Wait 30 seconds for helm to fill with oil.

Quickly turn the steering wheel clockwise until the cylinder rod is fully extended (you may have to manually move the cylinder). Slowly continue to turn the wheel to hold the cylinder in this position for approximately 30 seconds. Ensure there are no air bubbles escaping through the cylinder hoses.

Quickly turn the steering wheel counter-clockwise until the cylinder rod is fully extended on the opposite side of the cylinder. Slowly continue to turn the wheel to hold the cylinder in this position for approx. 30 secs. Ensure there are no air bubbles escaping through the cylinder hoses

Turn off the Power Purge.

Tighten both of the bleeders on the cylinder.

STEP 3. DISCONNECTION AND TESTING

NOTICE

For dual helm applications, install non-vent plug in upper helm and perform procedure described above on lower helm first. Once complete, install non-vent plug in lower helm and repeat procedure with upper helm.

⚠ CAUTION

Failure to install non-vent plugs during this procedure will result in oil leakage from other helm.

Disconnect all the hoses and retract them into the Power Purge Cart. Remove the quick coupling adapter & replace the filler plug in the helm. Push on the cylinder to ensure it does not move more than 1/16" – 1/8" in either direction.

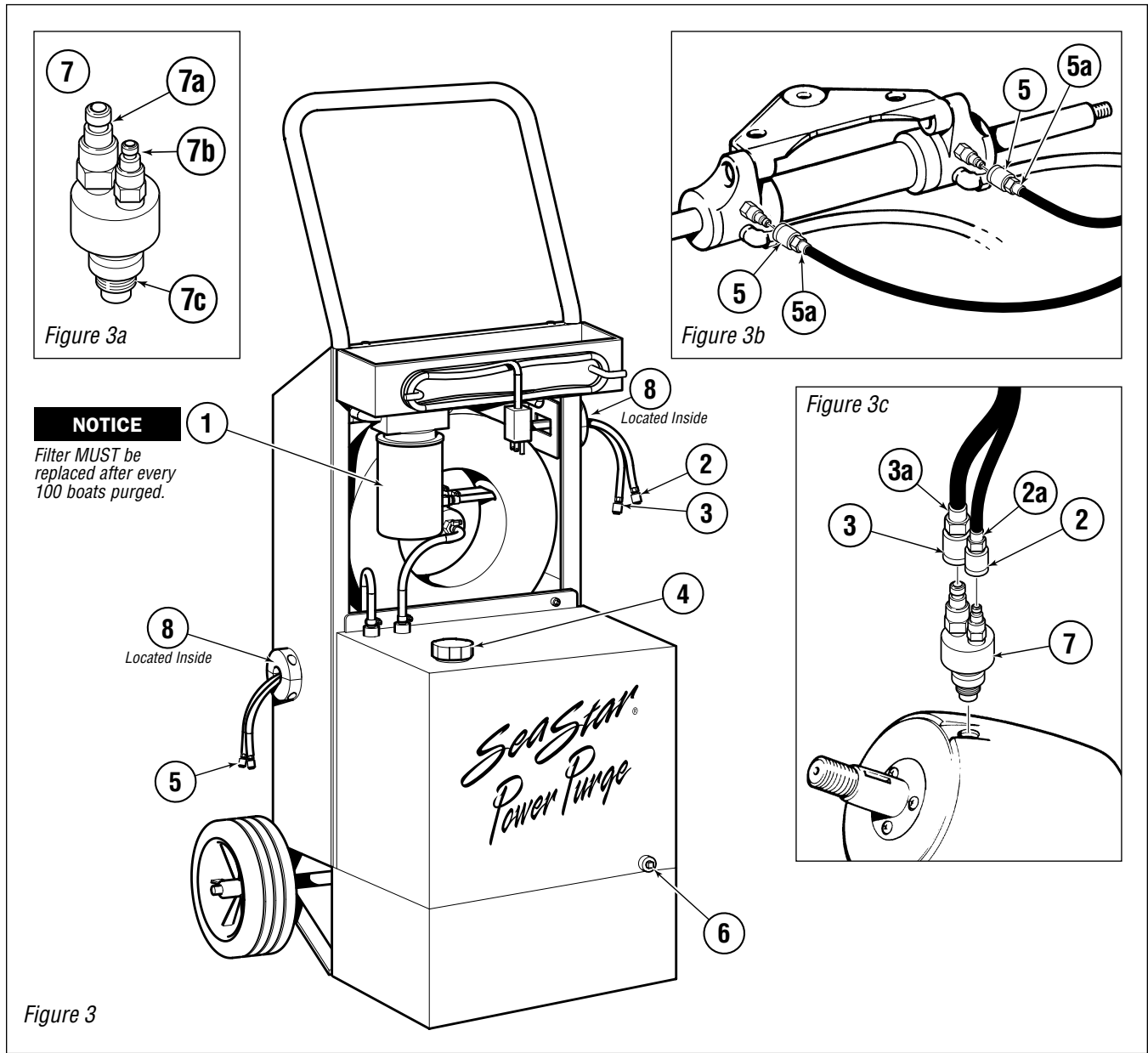
While turning the wheel to starboard and just before reaching the stop look at the oil level in the pump. If no appreciable drop in oil level occurs, the starboard side of the steering system is free of air. Repeat test by turning the wheel to port. If you turn past the stop with the filler cap off the helm, oil will spill out.

Ensure the reservoir isn't over filled, replace the fill cap in the helm. Perform system proof test by turning the wheel to starboard beyond its normal stop with enough pressure to "crack" the pressure relief valve (1000-1500 psi). Repeat with port side.

Fill and purge is now complete.

HA5447 Power Purge (SeaStar Systems **ONLY**)

SEASTAR/SEASTARPRO POWER PURGING SYSTEM



ITEM	PART #	QTY	DESCRIPTION
1	821723	1	10 Micron Filter
2	800112	1	Fitting, QD 5/32" Barb-Series 20
2a	800117	1	Hose 'O' Clamp, 5/16"
3	800111	1	Fitting, QD 5/16" Barb-Series 21
3a	800116	2	Hose Clamp, 3/8"
4	800121	1	Filler Cap, Tethered
5	800113	2	Fitting, QD 1/4" Barb-Series 21
5a	800118	2	Hose 'O' Clamp, 1/2"
6	430122	1	1/4" NPT Drain Plug
7	800136	1	Assembly Fitting, Power Purge Helm
7a	800114	1	Fitting QD 1/8" NPT, series 21

ITEM	PART #	QTY	DESCRIPTION
7b	800115	1	Fitting QD 1/8" NPT, series 20
7c	014925	1	'O' Ring, 0.110 70 DUR N
8	903929	2	Grommet, Base Assembly 1-1/2"
FITTING KIT & SPARE PARTS, Part# 800300			
	800111	1	Fitting, QD 5/16" Barb-Series 21
	800112	1	Fitting, QD 5/32" Barb-Series 20
	800113	2	Fitting, QD 1/4" Barb-Series 21
	800136	1	Assembly Fitting, Power Purge Helm
	821723	2	Filter Element

HA5445 POWER PURGING SYSTEM

NOTICE

Honda 225 4-Stroke Engines MUST have steering cylinder HC5345 disconnected from the tiller arm to be able to stroke the cylinder from hardover to hardover to complete the purging process.

SINGLE CYLINDER—Power Purge Operation

STEP 1. CONNECTION

Screw the quick coupling adapter into the helm filler port, and **hand-tighten**. See note below for dual helm application.

Remove the blue hose from the Power Purge Box and connect both hoses to the quick coupling adapter on the helm. Push the quick connects onto their male counterparts and check to ensure they have locked in place.

Remove the clear hose from the Power Purge Box and connect one end to each bleed fitting on the hydraulic cylinder. Check to see if they have locked in place.

Open both cylinder bleeders 1/2 – 1 turn.

Attach the electric cable to the boat battery by connecting the black alligator clip to the negative terminal and the red alligator clip to the positive terminal.

STEP 2. PURGING

Turn the Power Purge Jr. ON. Oil should flow into and out of the helm. Wait twenty seconds for the helm to fill with oil.

Quickly turn the steering wheel clockwise until the cylinder rod is fully extended (you may have to manually move the cylinder). Slowly continue to turn the wheel to hold the cylinder in this position for approximately 30 seconds. Ensure there are no air bubbles escaping through the cylinder hoses.

Quickly turn the steering wheel counter-clockwise until the cylinder rod is fully extended on the opposite side of the cylinder. Slowly continue to turn the wheel to hold the cylinder in this position for approximately 30 seconds. Ensure there are no air bubbles escaping through the cylinder hoses.

Turn off the Power Purge Jr.

Tighten both of the bleeders on the cylinder.

STEP 3. DISCONNECTION AND TESTING

Disconnect all the hoses and place them back in the box. Remove the quick coupling adapter.

Disconnect the Power Purge Jr. from the battery.

Push on the cylinder to ensure that it does not move more than 1/4" in either direction.

While turning the wheel to starboard and just before reaching the stop look at the oil level in the pump. If no appreciable drop in the oil level occurs, the starboard side of the steering system is free of air. Repeat the test by turning the wheel to port. **If you turn past the stop with the filler cap off the helm, oil will spill out.**

Ensure the reservoir isn't overfilled and replace the filler cap in the helm. Perform system proof test by turning the wheel to starboard beyond its normal stop with enough pressure to "crack the pressure relief valve (1000–1500 psi). Repeat with port side.

Fill and Purge is now complete.

NOTICE

For dual helm applications, install non-vent plug in upper helm and perform procedure described above on lower helm first. Once complete, install non-vent plug in lower helm and repeat procedure with upper helm.

CAUTION

Failure to install non-vent plugs during this procedure will result in oil leakage from other helm.

HA5445 Power Purge JR (SeaStar and BayStar Systems)

SEASTAR/SEASTARPRO
POWER PURGING SYSTEM

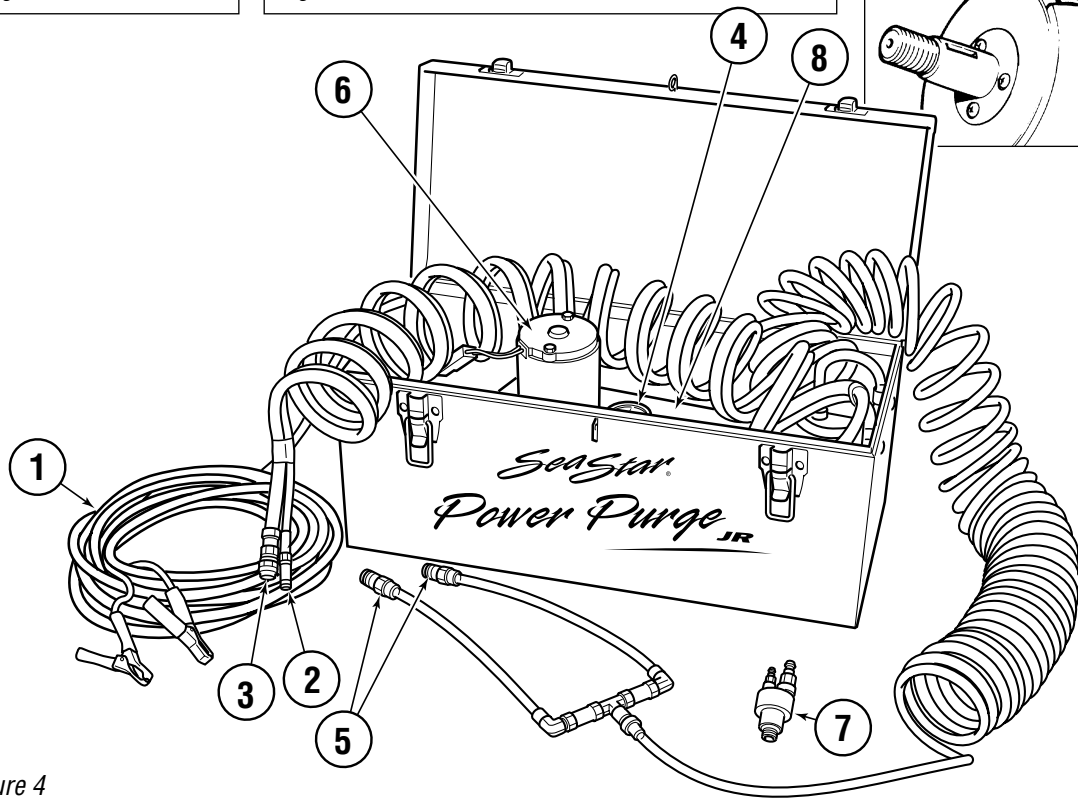
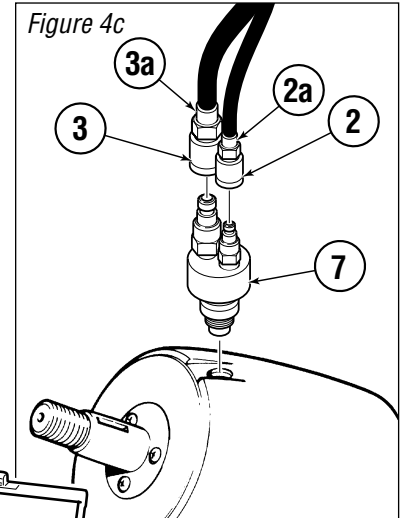
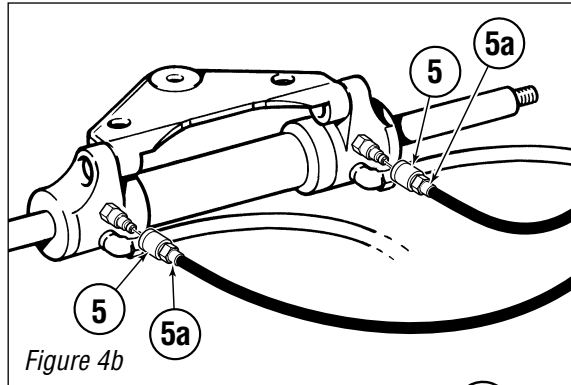
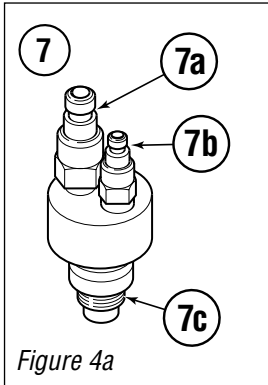


Figure 4

ITEM	PART #	QTY	DESCRIPTION
1	Harness	1	Harness, electrical inc switch & clamps
2	800112	1	Fitting, QD 5/32 Barb-series 20
2a	800117	1	Hose O clamp, 5/16"
3	800111	1	Fitting, QD
3a	800116	1	Hose Clamp, 3/8"
4	470220	1	Tank Cap with gauge
5	800113	1	Fitting, QD 1/4" Barb-series 21
5a	800118	1	hose O clamp, 1/2"
6	470500	1	Pump set
7	800136	1	Assembly fitting, helm/hose connector
7a	800114	1	Fitting QD 1/8" NPT, series 21

ITEM	PART #	QTY	DESCRIPTION
7b	800115	1	Fitting QD 1/8" NPT, series 20
7c	014925	1	'O' Ring 0.110 70 DUR N
8	470200	1	Tank
FITTING KIT & SPARE PARTS, Part# 800300			
	800111	1	Fitting, QD 5/16" Barb-Series 21
	800112	1	Fitting, QD 5/32" Barb-Series 20
	800113	2	Fitting, QD 1/4" Barb-Series 21
	800136	1	Assembly Fitting, Power Purge Helm

HA5461 DUAL CYLINDER PURGE KIT

NOTICE

Honda 225 4-Stroke Engines MUST have steering cylinder HC5345 disconnected from the tiller arm to be able to stroke the cylinder from hardover to hardover to complete the purging process.

DUAL CYLINDER—Power Purge Operation

STEP 1. CONNECTION

NOTICE

For dual helm applications, install non-vent plug in upper helm and perform procedure described below on lower helm first. Once complete, install non-vent plug in lower helm and repeat procedure with upper helm.

⚠ CAUTION

Failure to install non-vent plugs during this procedure will result in oil leakage from other helm.

Screw the quick coupling adapter into the helm filler port, and **hand-tighten**. See notice for dual helm applications.

Remove the Helm hose from the Power Purge Kit and connect both hoses to the quick coupling adapter on the helm. Push the quick connects onto their male counterparts and check to ensure they have locked in place.

Remove the Cylinder hose from the Power Purge and connect one hose to the Dual Cylinder Adapter Kit (HA5461), connect each of the adapter hose ends to the port side bleeders of both cylinders. Connect the other Power Purge hose to the other Adapter Kit Hose, and connect each of those hoses to the starboard side bleeders of each cylinder. Ensure that all connections are locked in place.

Open all four bleeders 1/2 – 1 turn.

Attach the black alligator clip to the negative terminal of the battery. Ensure that the switch is in the off position.

Attach the red alligator clip to the positive terminal.

STEP 2. PURGING

Turn the Power Purge Unit ON. Oil should flow into and out of the helm. Wait 20–30 seconds for the helm to fill with oil.

Quickly turn the steering wheel clockwise until both cylinder rods are fully extended (you may need to manually move the cylinders). Slowly continue to turn the wheel to hold the cylinders in this position for approximately 30 seconds. Ensure there are no air bubbles escaping through the cylinder hoses.

Quickly turn the steering wheel counter-clockwise until both cylinder rods are fully extended on the opposite of the cylinder. Slowly continue to turn the wheel to hold the cylinders in this position for approximately 30 seconds. Ensure there are no air bubbles escaping through the cylinder hoses.

Turn off Power Purge. Tighten all of the bleeders on both cylinders.

STEP 3. DISCONNECTION AND TESTING

⚠ WARNING

DO NOT store Dual Cylinder Adapter Kit (HA5461) in Power Purge Jr. Carrying Case. This may cause irreparable damage to the reservoir tank resulting in the failure of the pumpset.

Disconnect the black alligator clip from the battery terminal, then disconnect the red alligator clip from the battery terminal.

Disconnect all hoses and return them to the Power Purge. See Warning! Remove the quick coupling adapter from the helm.

Push on cylinders, ensure movement is less than 1/4" in either direction.

While turning the wheel to starboard and just before reaching stop, look at the oil level in the pump. If no appreciable drop in fluid level occurs, the starboard side of the steering system is free of air.

Repeat test by turning wheel to port. If you turn past the stop with the filler cap off the helm, oil will spill out.

Ensure the reservoir isn't overfilled, (oil level should be 1/4" below the fill hole) replace the fill cap in the helm. Perform system proof test by turning the wheel to starboard beyond its normal stop with enough pressure to crack the pressure relief valve (1000–1500 psi). Repeat with port side.

Fill and purge is now complete.

HA5461 Dual Cylinder Purge Kit (SeaStar Systems **ONLY**)

SEASTAR/SEASTARPRO
POWER PURGING SYSTEM

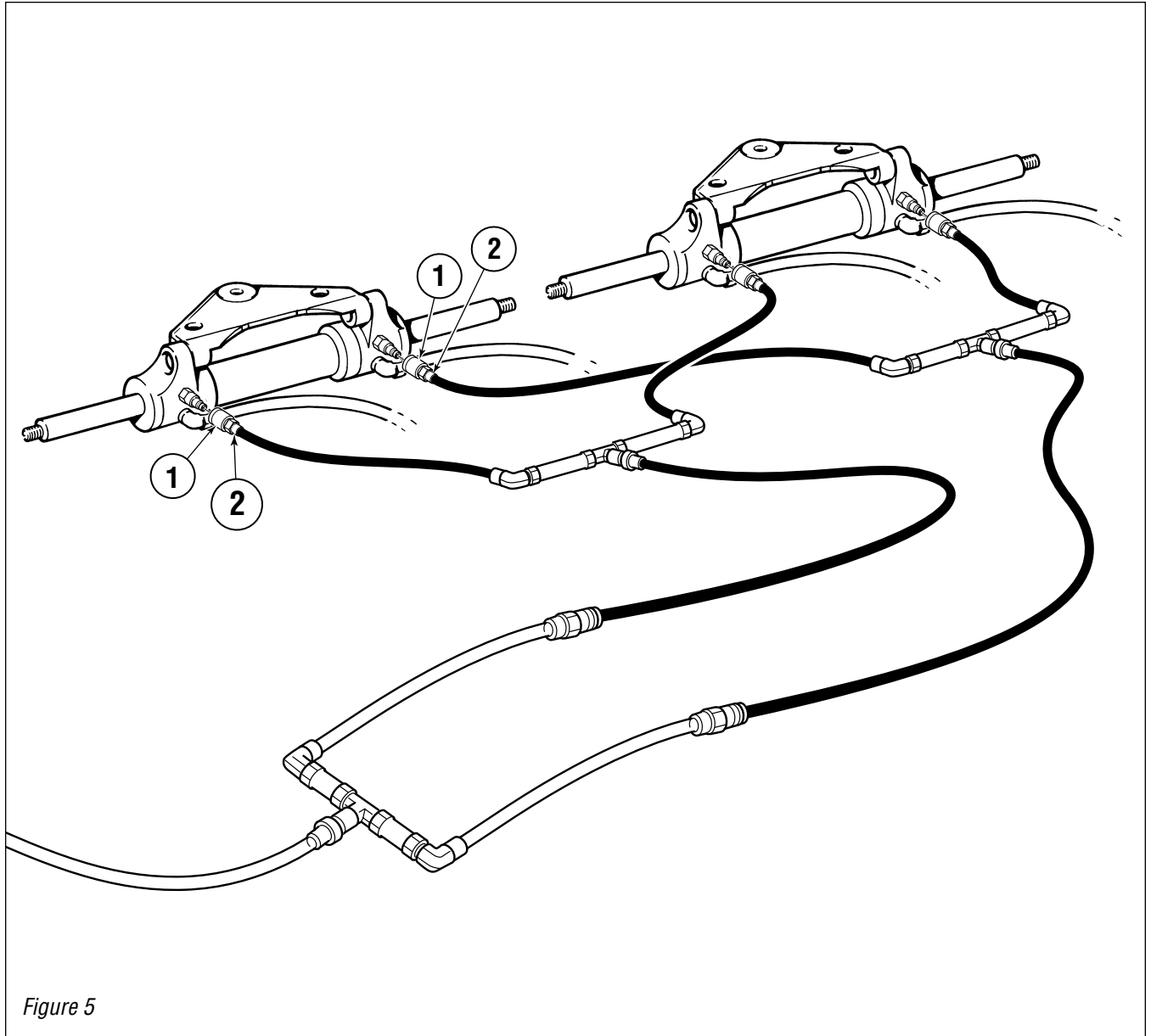


Figure 5

ITEM	PART#	QTY	DESCRIPTION
1	800113	4	Fitting, QD 1/4" Barb-series 21
2	800118	4	Hose O clamp, 1/2"
3	470714	1	Decal (Not Shown)

ITEM	PART#	QTY	DESCRIPTION

MAINTENANCE

⚠ WARNING

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

Inspection (should be performed every 3-6 months)

- Inspect tank and fittings for oil leakage or damage. Replace damaged or leaking fittings or tank.
- Inspect hose and grommets for signs of wear or damage. Replace damaged grommets and hose.
- Inspect all electrical connections to ensure wires are secure and do not show signs of abrasion or chaffing. Replace or repair if outer jacket is damaged.
- Special Note "Model HA5447 Power purge Unit" Replace Oil filter with Gresen K-22001, 10 micron or equivalent every 3 months if pump is used more than 5 times per day. If the Power Purge is used less frequently (3 times or less) change the filter every 6 months.

REPLACEMENT PARTS

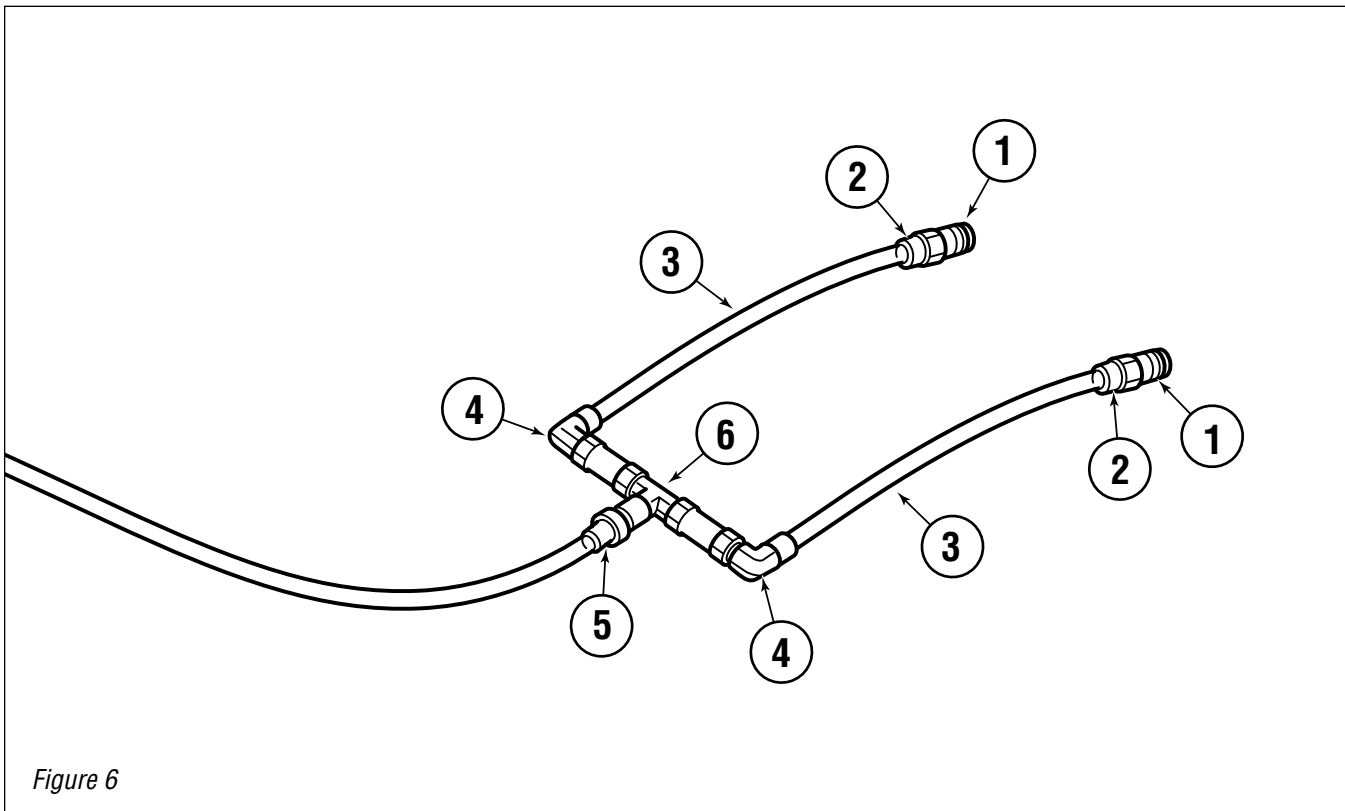


Figure 6

ITEM	PART#	QTY	DESCRIPTION
1	800113	1	Fitting, QD 1/4" Barb-series 21
2	800118	1	Hose O clamp, 1/2"
3	800126	1	Hose, Twin 1/4" ID, 8ft. Length

ITEM	PART#	QTY	DESCRIPTION
4	800150	1	Fitting, 116A Elbow 1/8" NPT M-F
5	930621	1	Fitting, 1/4" Barb x 1/8" NPT
6	980427	1	Fitting, Tee 1/8" NPT

Statement of Limited Warranty

We warrant to the original retail purchaser that **Teleflex Canada Limited Partnership** 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 **Teleflex Canada Limited Partnership** 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 **Teleflex Canada Limited Partnership** product not 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 **Teleflex Canada Limited Partnership** products found to be defective and covered by this warranty, will be replaced at **Teleflex's** option, and returned to the customer.

The above quoted statement is an extract from the complete **Teleflex Canada Limited Partnership** products warranty statement. A complete warranty policy is available in our **Teleflex Canada Limited Partnership** products catalogue.

Return Goods Procedure

Prior to returning product to **Teleflex Canada Limited Partnership** 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 # ?
Teleflex Canada
c/o Panalpina
#8 – 14th Street
Blaine, WA 98230

From Canada

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



TELEFLEX CANADA
3831 NO.6 ROAD
RICHMOND, B.C.
CANADA V6V 1P6

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