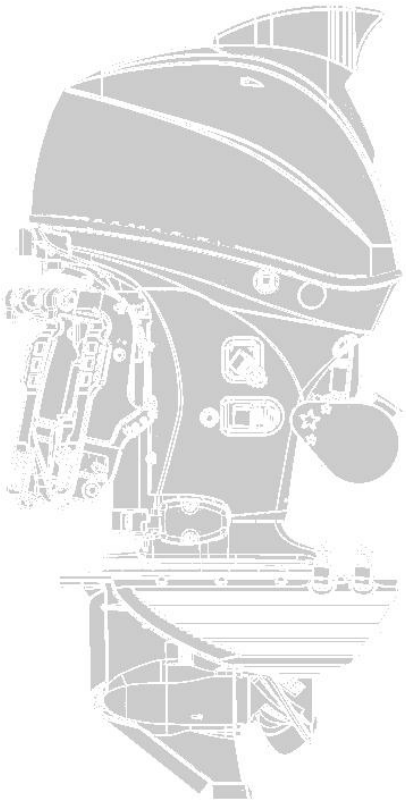
FREEDOM OUTBOARD



SM0060-01-00

SM0050-01-00

SM0040-01-00

Service Manual Supplement

Version 1.0

July 2025

Contents

1. General Information

Service and Maintenance and the Warranty

To our customer, or valued Freedom Outboard Dealer,

Thank you for choosing Freedom Outboard for your boating needs.

Proper care and safe operation of this outboard motor is required for optimal performance and use of the Freedom Outboard motor. A Freedom Outboard Authorized Service shop must be used for service, maintenance, repairs and warranty work on this outboard motor.

Please review the Freedom Outboard Warranty for details at www.Freedom-Outboard.com.

If a problem arises that cannot be solved through the troubleshooting section of this manual, please do not hesitate to contact Freedom Outboard for assistance.

This Freedom Outboard supplement is to be used in conjunction with the 2014 Tohatsu Service Manual for 4 Stroke MFS 40/50A Models. OB No.003-21067-014-09 NB

Freedom Outboard reserves the right to make changes at any time without notice and without incurring any obligation.

Freedom Outboard

7385 Willowbrook Road, Victor, NY 14564

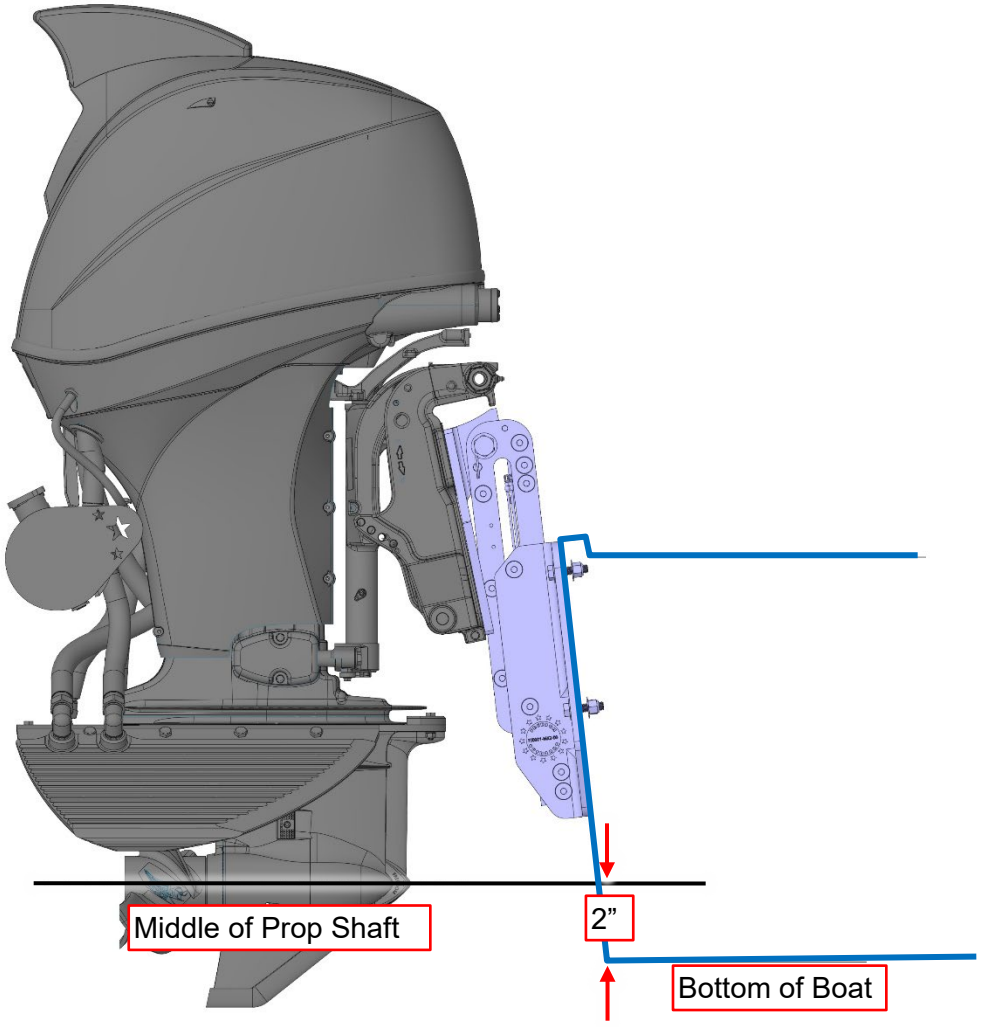
Phone: (888) 239-2628

Website: www.Freedom-Outboard.com

Freedom Outboard Breakaway Jack Plate

To get the optimal performance from your Freedom Outboard motor, a Freedom Outboard Breakaway Jack Plate is highly recommended.

	Installation height: With the jack plate in the fully extended position, the center of the prop shaft must be 2” from the bottom of the boat



Freedom Outboard Modifications

Freedom Outboard motor modifications take you to places no other motor has gone. To keep your adventures running smoothly, review these modifications and apply that knowledge to your service and maintenance work.

Covers and Decals

The Top Cowl has been modified to provide room for the Coolant Pump and hoses. The Mid Section cover and flywheel cover have been similarly modified. Outside modifications are protected by rubber trim or weatherstripping. Freedom Outboard warning and informational decals have been added.

Coolant Pump

The Cooling Water pump has been removed from the Lower Unit. A Coolant Pump system and protective guarding are now installed over the Cam Shaft Sprocket on the Engine.

Coolant Tank

The Freedom Outboard Coolant tank provides the reservoir for and monitoring of the Coolant level. The tank is mounted from the lower cowl, providing a centralized location for maintenance.

Cooling System Hoses

A number of modifications have been made to accommodate the Freedom Outboard closed loop system of hoses. Specified plates, fittings and adapters provide the closed loop connections between the hoses, tank, fins, pump and motor.

Exhaust

An Exhaust shroud in the Mid Section and Exhaust plate in the Lower Unit have been added to the motor. This diverts to the exhaust gasses through the lower unit, avoiding the Mid Section.

Lower Unit

The Lower Unit has the Water Pump removed and the Water Intake Pipe replaced. A pair of Heat Exchanger fins are installed to provide optimal heat dissipation. The fins are mounted on a fin bracket and reinforced with tie plates and the bumper/bumper keeper.

This page intentionally left blank

2. Cross Reference Table

This Freedom Outboard supplement is to be used in conjunction with the 2014 Tohatsu Service Manual for 4 Stroke MFS 40/50A Models. OB No.003-21067-014-09 NB

The following cross reference table is provided to quickly identify information in the Tohatsu Service Manual that is impacted by Freedom Outboard modifications (see *Freedom Outboard Modifications* pg. *1-5*).

Service Category	Section	Chapter	Page #	Remarks	Link in this manual
1. Service Information	1. Identification		1-2		*Decals* pg. *4-1*
	4. Pre-delivery Inspection	4. Gear Oil		Additional Step to access.	*Removing the Starboard Fin for Gear Oil Access* pg. *5-22*
		6. Rigging		Jack Plate recommendation.	*Freedom Outboard Breakaway Jack Plate* pg. *1-4*
		10. Cooling water Check Port		Procedure is no longer valid.	n/a
		14. Fill Coolant		New procedure.	*Initial Fill of Coolant* pg. *5-4*
2. Service Data	1. Outline Dimensions	1) Engine Dimensions	2-2 & 2-3	Contact Freedom Outboard for details.	*General Information* pg. *1-3*
	4. Cooling Water System		2-7	Diagram replaced, flow chart no longer valid.	*Coolant Flow Diagrams* pg. *3-2*
	5. Specifications		2-8 & 2-9	Changes to listed items.	*Engine Specifications* pg. *3-1*
	6. Maintenance Data	Cooling System Parts	2-18	Remove references to Pump Impeller, Pump Case and Guide Plate. Replace with Check Coolant Pump for leaks and functionality.	
	7. Tightening Torque Data		2-20	Additional torque specifications.	*Torque Table* pg. *3-1*
	8. Sealant Application Locations		2-22, 2-23 & 2-24	See specific procedures in this service supplement for lubrication directions.	

Cross Reference Table

Service Category	Section	Chapter	Page #	Remarks	Link in this manual
3. Maintenance	2. Inspection Schedule		3-3	Specifications for Cooling System added.	*Inspection Schedule* pg. *5-1*
	3. Inspection Items	9) Inspection of Water Pump	3-9 & 3-10	Water Pump no longer used. Coolant Pump used instead of Water Pump.	*Replacing the Coolant Pump* pg. *5-11*
		10) Replacement of Gear Oil	3-11	Additional steps to access upper oil plug.	*Removing the Starboard Fin for Gear Oil Access* pg. *5-22*
		11) Inspection of Gear Case (for leakage)	3-12	Additional steps to access upper oil plug.	*Removing the Starboard Fin for Gear Oil Access* pg. *5-22*
		12) Inspection of timing belt	3-13	Additional steps to access timing belt.	*Access Under the Coolant Pump* pg. *5-8*
		13) Replacement of timing belt	3-13 & 3-14	Additional steps to access timing belt.	Access Under the Coolant Pump pg. *5-8*
		16) Inspection and Adjustment of Valve Clearance	3-19	Additional steps to access under flywheel cover.	*Access Under the Coolant Pump* pg. *5-8*
		24) Inspection of Anodes	3-26	Replacement images.	*Anode Inspection* pg. *5-36*
		28) Inspection of Cooling Water Passage	3-28	This procedure is no longer valid.	
		29) Inspection of Cooling Water Pressure	3-28	This procedure is no longer valid.	
		30) Flushing with Water	3-29	This procedure is no longer valid.	
4. Fuel System				Freedom Outboard modifications do not change this section.	
5. Power Unit	2. Parts Layout		5-3 – 5-17	View Freedom Outboard explosion diagrams for additions and modification.	*Explosion Diagrams* pg. *4-1*
	3. Inspection Items	4) Removing Power Unit	5-18	Additional steps to access under flywheel cover.	*Access Under the Coolant Pump* pg. *5-8*
				Step 10, Cooling Water (fuel cooler) hose is now Hose #5.	*External Views* pg. *3-3*
		40) Installation of Power Unit	5-54	Step 5, Cooling Water (fuel cooler) hose is now Hose #5. Additional steps to replace flywheel cover.	*Access Under the Coolant Pump* pg. *5-8*
					External Views pg. *3-3*
6. Lower Unit	2. Parts Layout		6-4 – 6-6	View Freedom Outboard explosion diagrams for additions and modification.	*Explosion Diagrams* pg. *4-1*

Service Category	Section	Chapter	Page #	Remarks	Link in this manual
6. Lower Unit	3. Inspection Items	3) Removing the Lower Unit	6-8	Additional Steps to remove LU.	*Removing the Lower Unit* pg. *5-23*
		7) Removing Water Pump	6-11	This procedure is no longer valid.	
		8) Inspection of Water Pump	6-12	This procedure is no longer valid.	
		9) Inspection of Water Pipe	6-12	This procedure is no longer valid.	
		10) Disassembly of Water Pump Case (Lower)	6-13	This procedure is no longer valid.	
		11) Assembly of Water Pump Case (Lower)	6-13	This procedure is no longer valid.	
		30) Inspection of Gear Case (for leakage)	6-28	Additional steps to access upper oil plug.	*Removing the Starboard Fin for Gear Oil Access* pg. *5-22*
		35) Assembly of Pump Case	6-36	This procedure is no longer valid	
		39) Installation of Lower Unit	6-39 – 6-41	Procedure change	*Reinstalling the Lower Unit* pg. *5-28*
7. Bracket	4. Parts Layout	Drive Shaft Housing	7-8	View Freedom Outboard explosion diagrams for additions and modification	*Explosion Diagrams* pg. *4-1*
	5. Inspection Items	5) Disassembly of Drive Shaft Housing	7-22	Step 3, ⑥, gasket is replaced with Freedom Outboard part	*Explosion Diagrams* pg. *4-1*
		6. Assembly of Drive Shaft Housing	7-23	Step 3, ⑥ gasket is replaced with Freedom Outboard part	*Explosion Diagrams* pg. *4-1*
8. Electrical System	3. Parts Layout	Magneto	8-8	View Freedom Outboard explosion diagrams for additions and modifications.	*Explosion Diagrams* pg. *4-1*
9. Troubleshooting		10-1	9-10 & 9-11	10-1-1, 10-1-2, 10-1-4: Causes are no longer valid. Cooling system is closed, Check coolant levels.	*Coolant - Check & Add* pg. *5-6*
		Compression and Lubrication Systems	9-12	Change “Cooling water is lacking, pump is defective or clogged”. To “Coolant is lacking, pump is defective:	*Coolant - Check & Add* pg. *5-6* *Replacing the Coolant Pump* pg. *5-11*
	State 2	Cooling System	9-23	Flow chart replaced	*Troubleshooting – State 2 – Cooling System* pg. *5-38*
		5) Trouble Indication List (Self Diagnosis Mode 3)	9-50	Description of Problem: Engine temp. high. Replace Fault wording “cooling water” with “coolant”	*Coolant - Check & Add* pg. *5-6*
			9-50	Description of Problem: Engine temp. over heat. Replace Fault wording “cooling water” with “coolant”	*Coolant - Check & Add* pg. *5-6*
10. Rigging	1. Service Information	5) Installation of Outboard Motor	10-5	Jack Plate recommendation	*Freedom Outboard Breakaway Jack Plate* pg. *1-4*
	2. Service Data			Additional procedure	*Initial Fill of Coolant* pg. *5-4*
11. Wiring Diagram			Freedom Outboard modifications do not change this section.		

This page intentionally left blank

3. Specifications

Engine Specifications

Contact Freedom Outboard for more information. See *General Information* pg. *1-3*.

Item	Measurement	MFS 40/50/60A	
		Remote Control	Multi-function tiller handle
Overall Width	mm (in)	546.1 (21.5)	
Overall Height	mm (in)	L: 1511.33 (59.5)	
Weight Wet (with Engine Oil and Coolant), without a propeller	L kg (lb)	60A: 135.62 (299)	
Weight Dry (without Engine Oil or Coolant), without a propeller	L kg (lb)	60A: 125.19 (276)	
Cooling System		Closed Loop	

Replacement Specifications

Item	Measurement	Standard Outboard
Coolant	Gal	2 gallon 50/50 Ethylene Glycol Antifreeze/water mixture

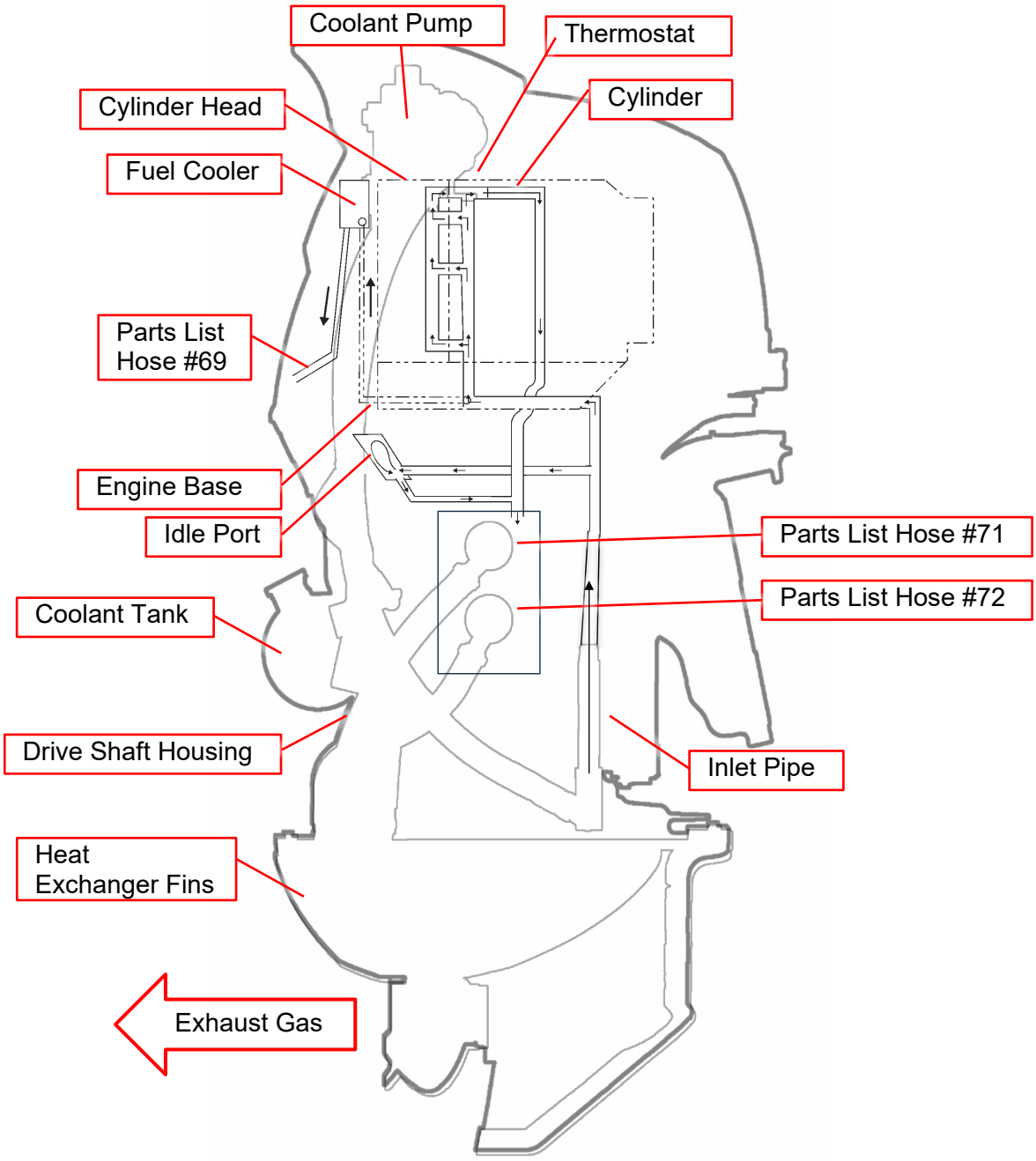
Torque and Adhesive Table

Fastened Components	Tightening Torque	Adhesive	Note
Idle Plate	65 in/lbs	Blue Loctite 242	Follow tightening pattern. See #24, *Mid Section Exterior* pg. *4-6*.
Outlet Plate	54 in/lbs	Blue Loctite 242	Follow tightening pattern. See #25, *Mid Section Exterior* pg. *4-6*.
Water Pump Case	15 ft/lbs	Blue Loctite 242	Used during removal of old water pump for new Lower Units. See *New Lower Units* pg. *5-28*.
Lower Unit	40 ft/lbs	Red Loctite 271	4 new 50mm bolts and washers (#30 on *Parts List* pg. *6-1*). See *Reinstalling the Lower Unit* pg. *5-31*.
Lower Unit	40 ft/lbs	Red Loctite 271	Tohatsu included 40 mm bolt and washer. See *Reinstalling the Lower Unit* pg. *5-31*.
AN Fittings	40 ft/lbs	Assembly Lube	Hose fittings. See *Replacing Coolant Hoses & Fittings* pg. *5-21*.

Coolant Flow Diagrams

Internal View

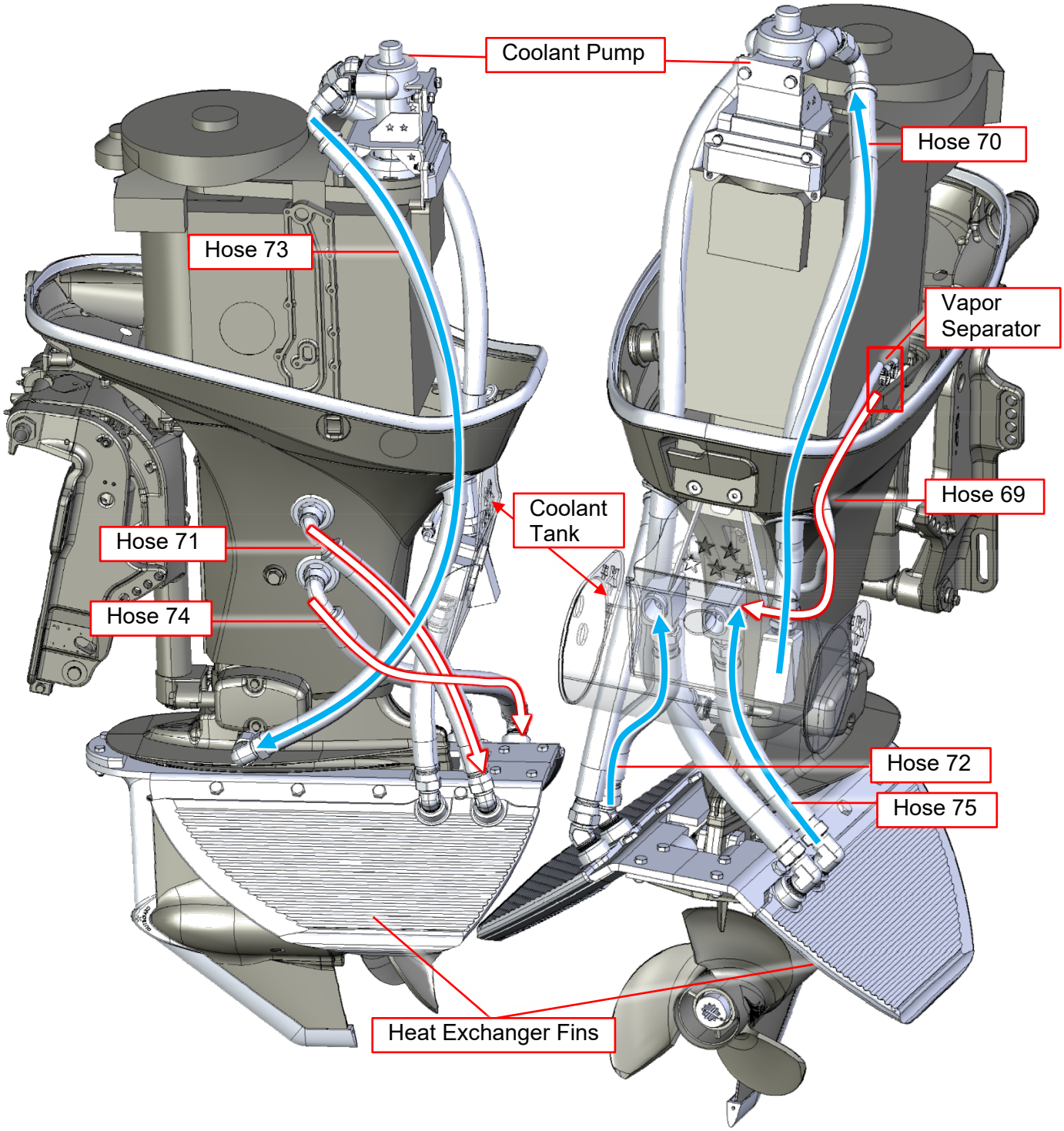
See *Explosion Diagrams* pg. *4-1* for specific breakouts with Freedom Outboard Parts



External Views

	Direction of hot coolant
	Direction of cold coolant

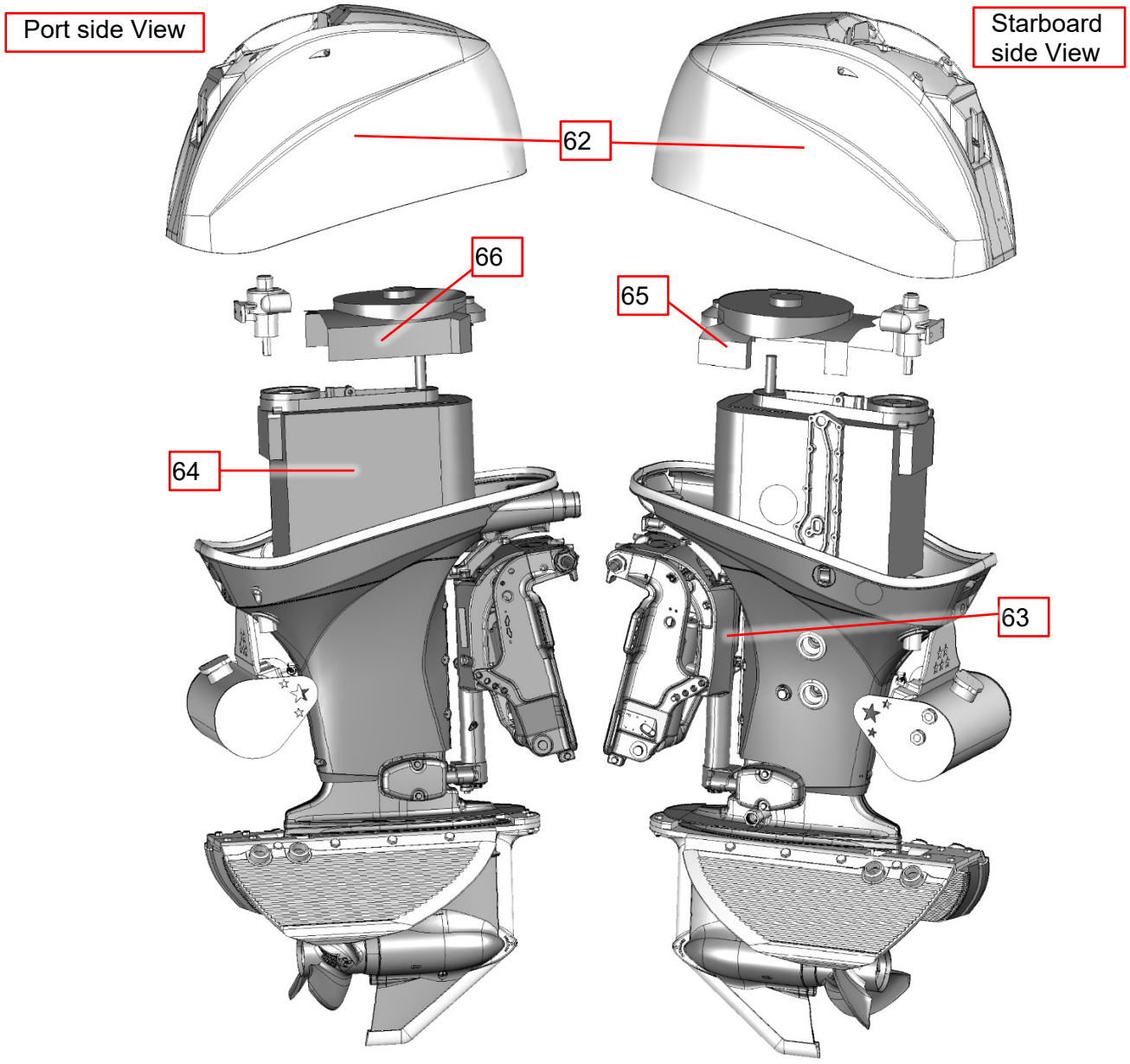
See *Parts List* pg. *6-1* for Hose # descriptions. See *Hoses* pg. *4-3* for additional part information.



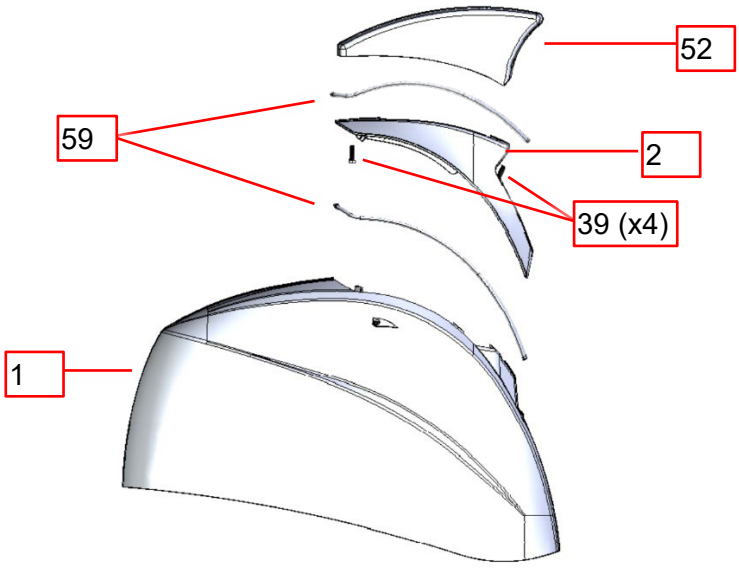
This page intentionally left blank

4. Explosion Diagrams

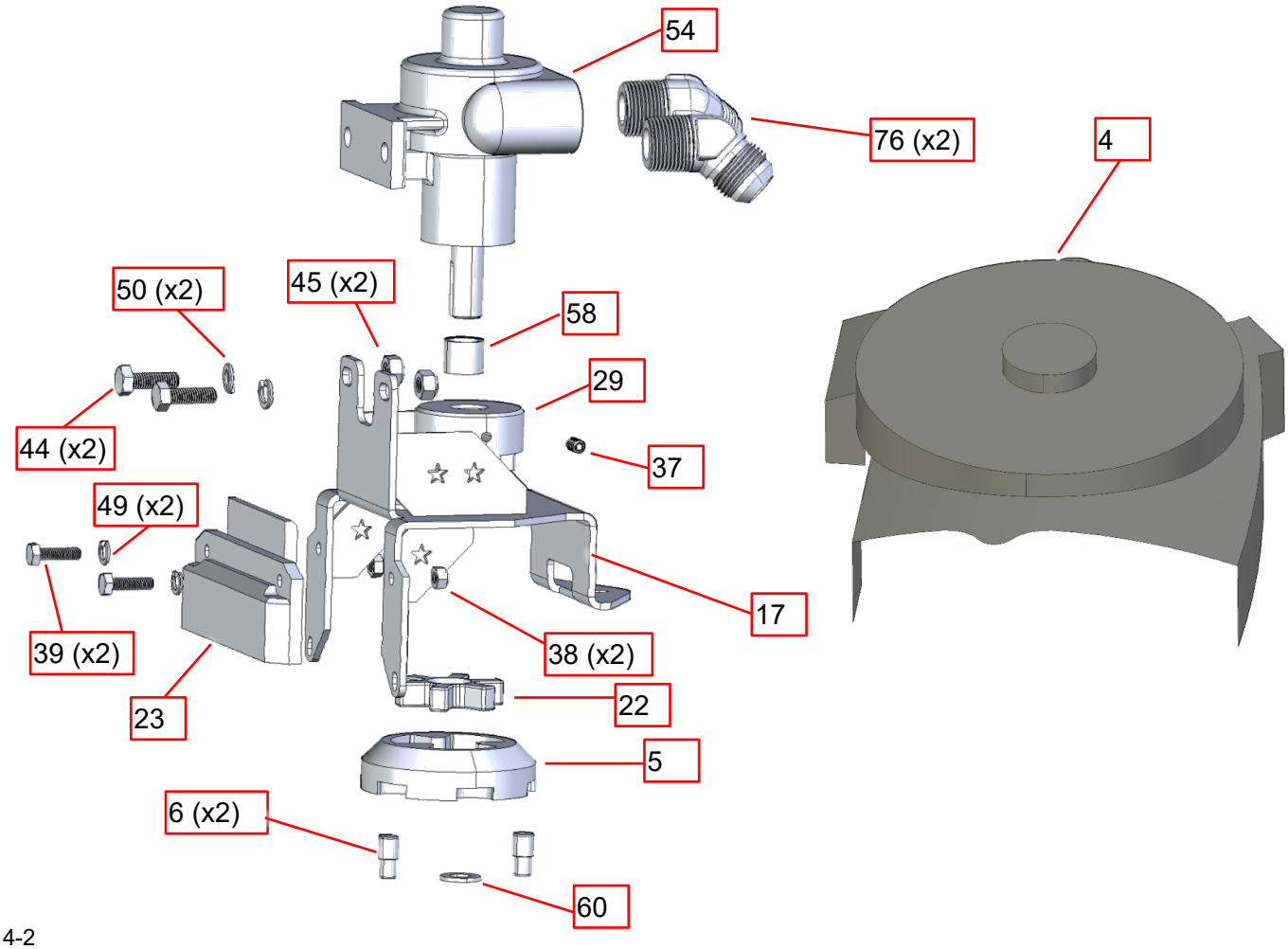
Decals



Top Cowl



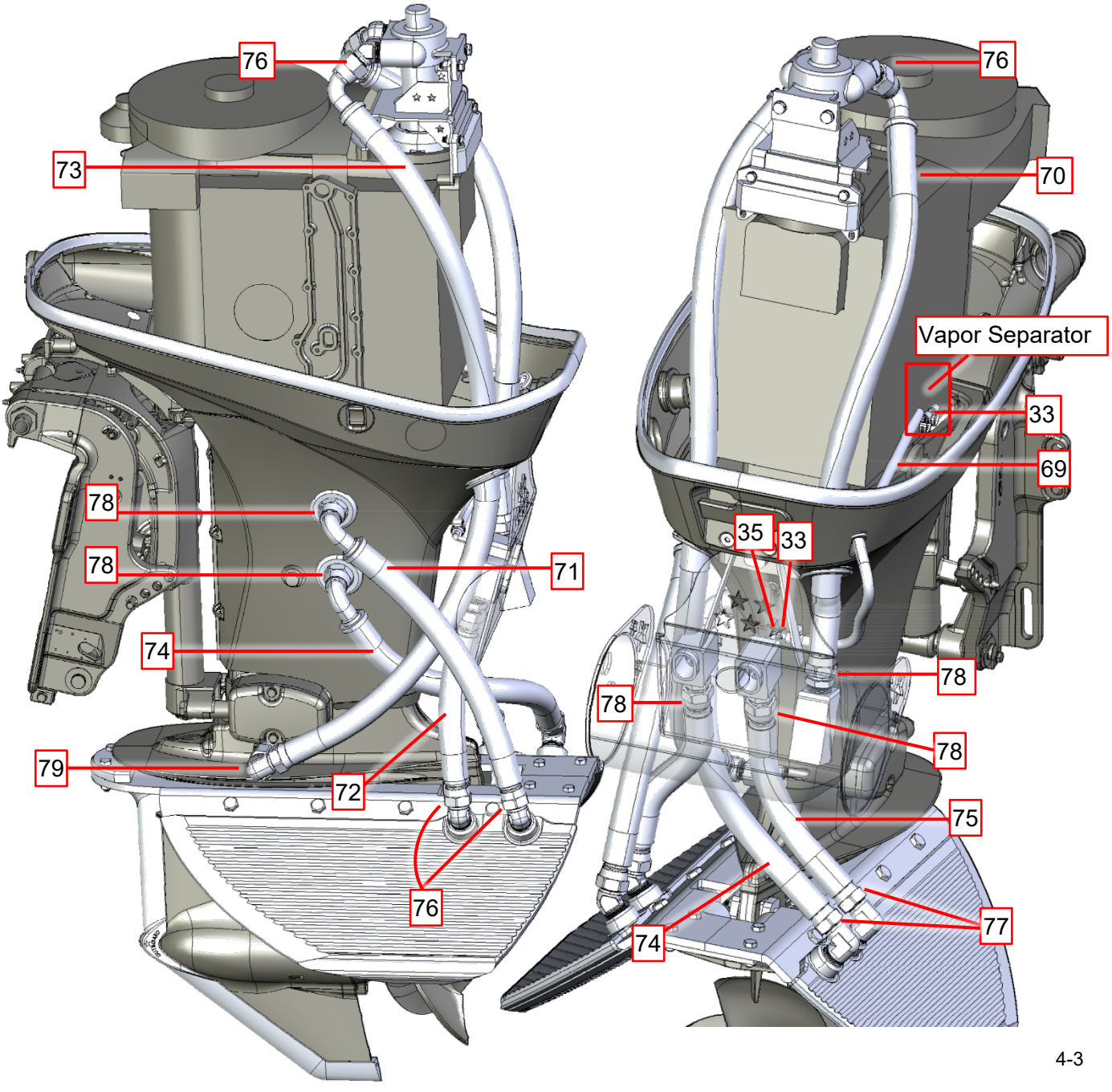
Coolant Pump



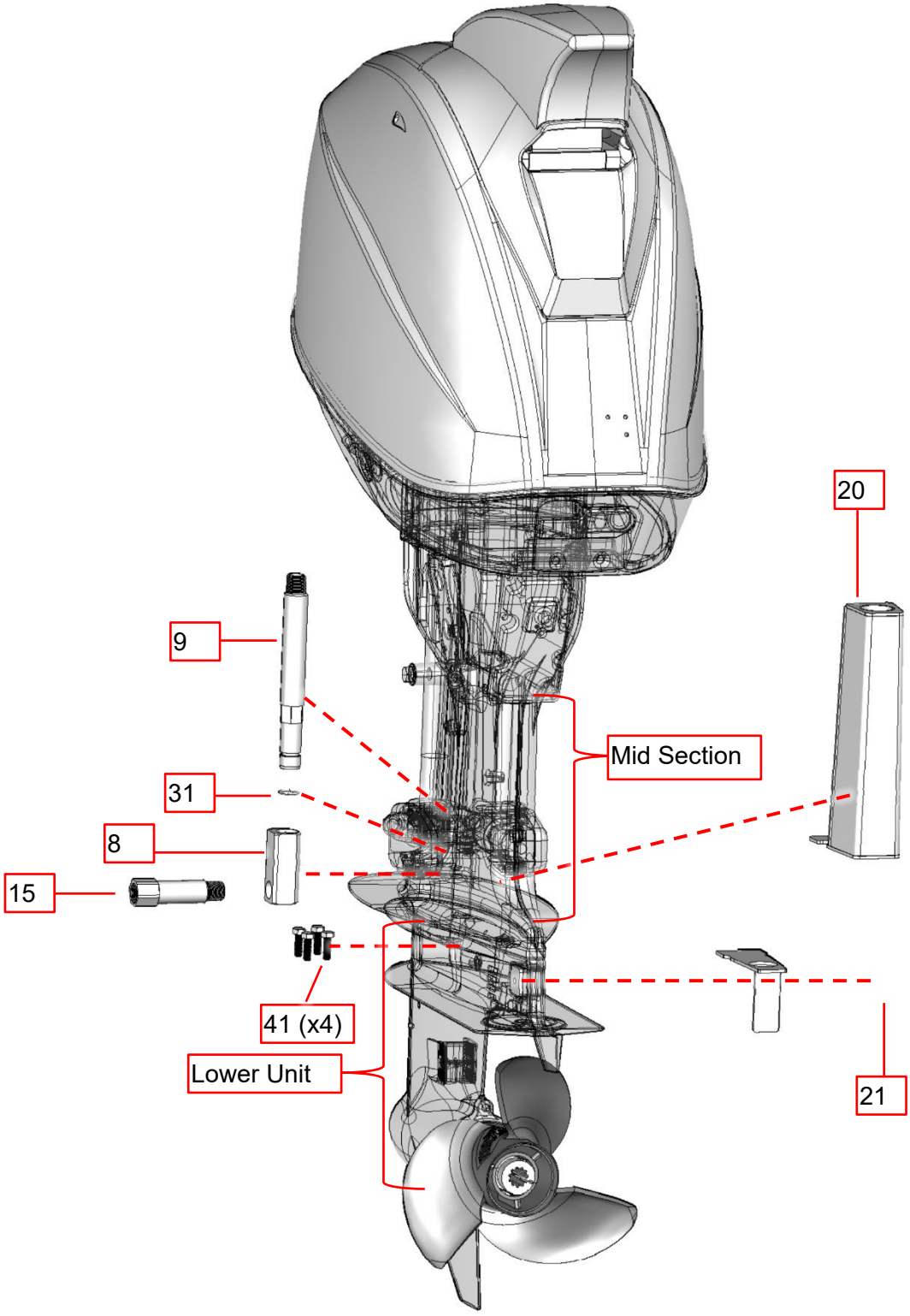
Hoses

The Hoses and adapters are also available as a kit. See *Parts List* pg. *6-1*, item #67.

From	From Fitting	Hose	Temp.	To	To Fitting
Tank	78	70	Cool	Pump	76
Pump	76	73	Cool	Mount Cover	79
Upper Outlet	78	71	Hot	Right Fin	76
Lower Outlet	78	74	Hot	Left Fin	77
Vapor Separator	Vapor Separator + 33	69	Hot	Tank	35 + 33
Left Fin	77	75	Cool	Tank	78
Right Fin	76	72	Cool	Tank	78

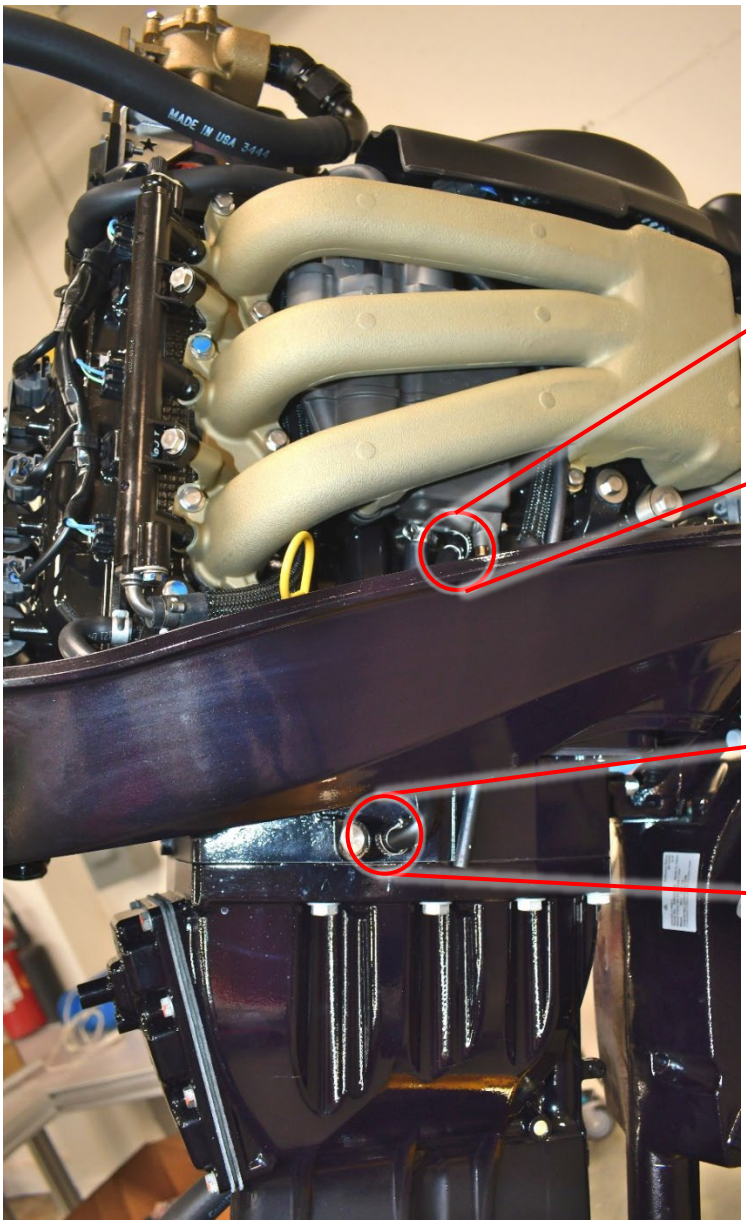


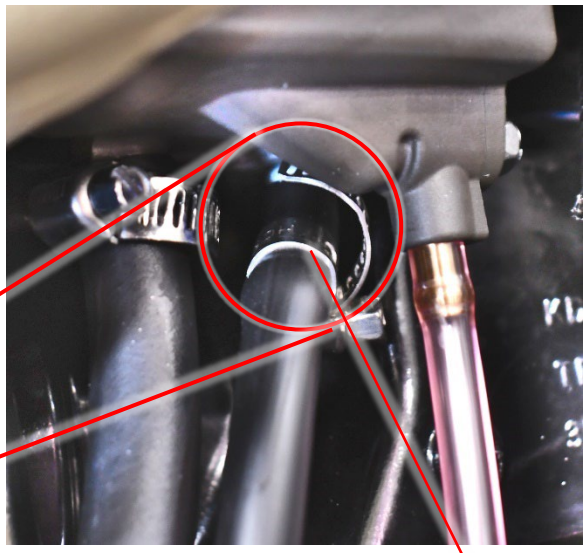
Mid Section & Lower Unit Interior



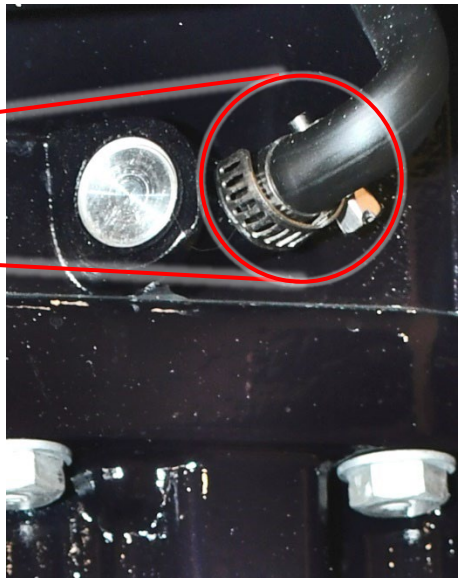
Chiller Hose

Worm Clamps added to existing Chiller Hose

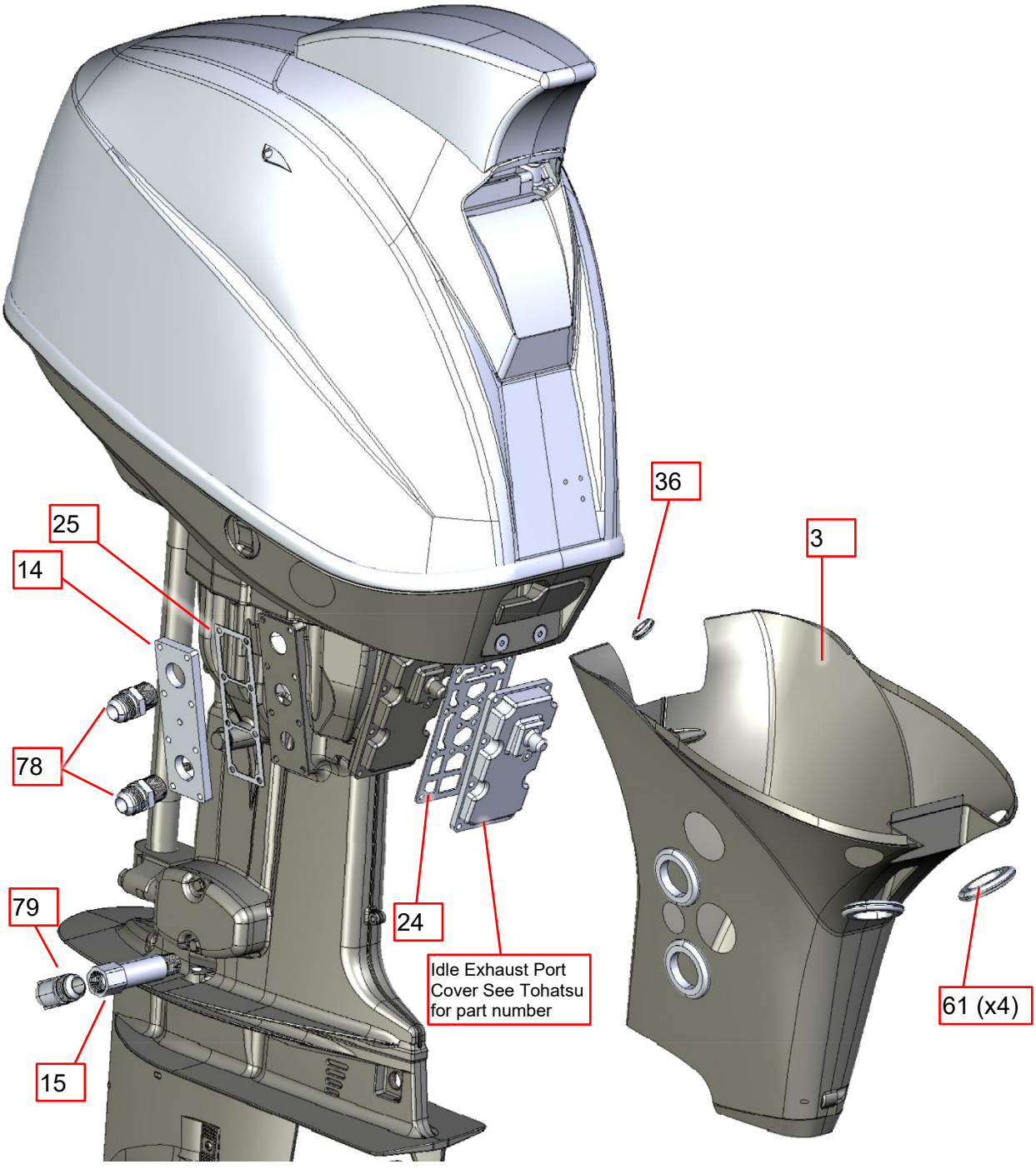




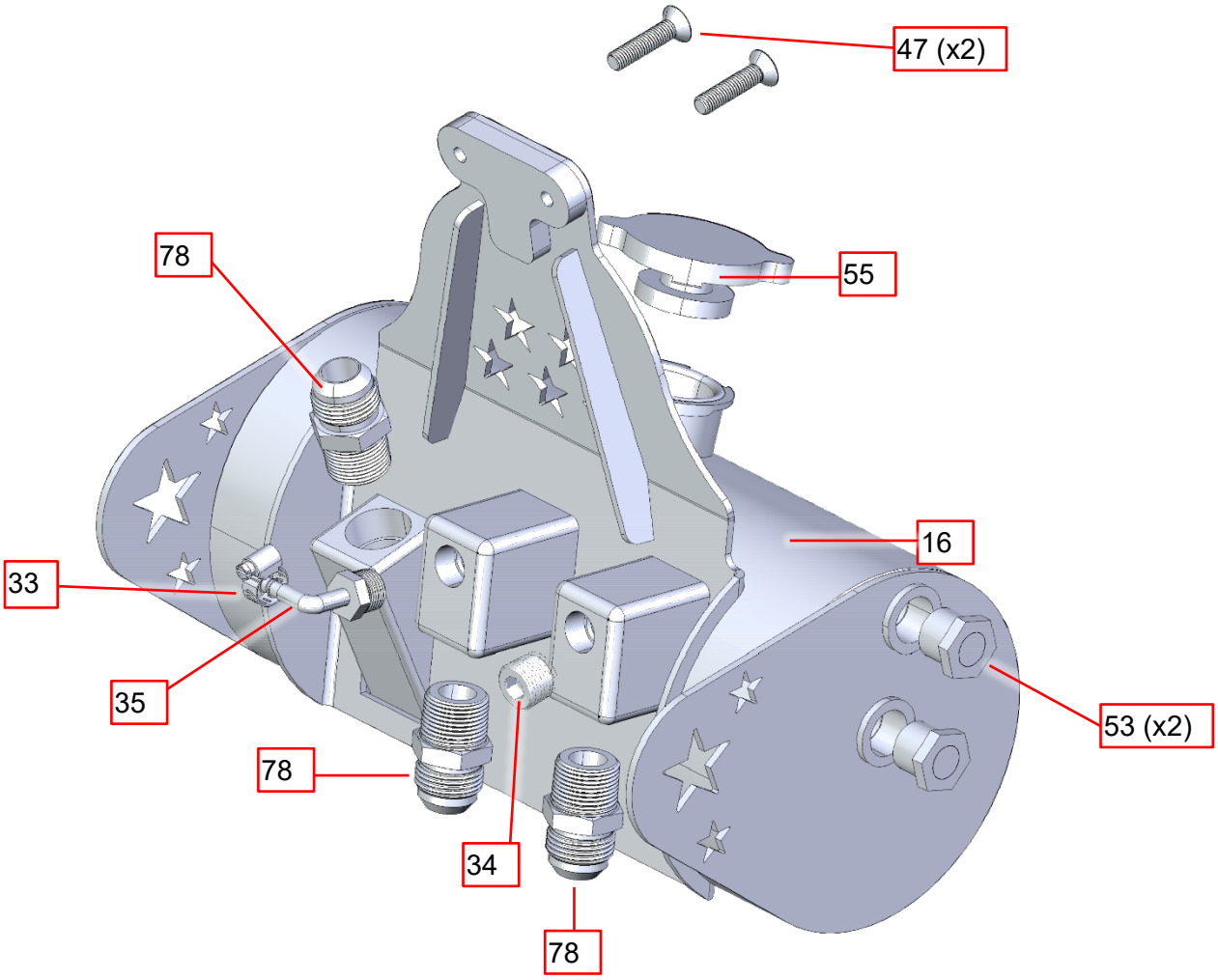
33 (x2)



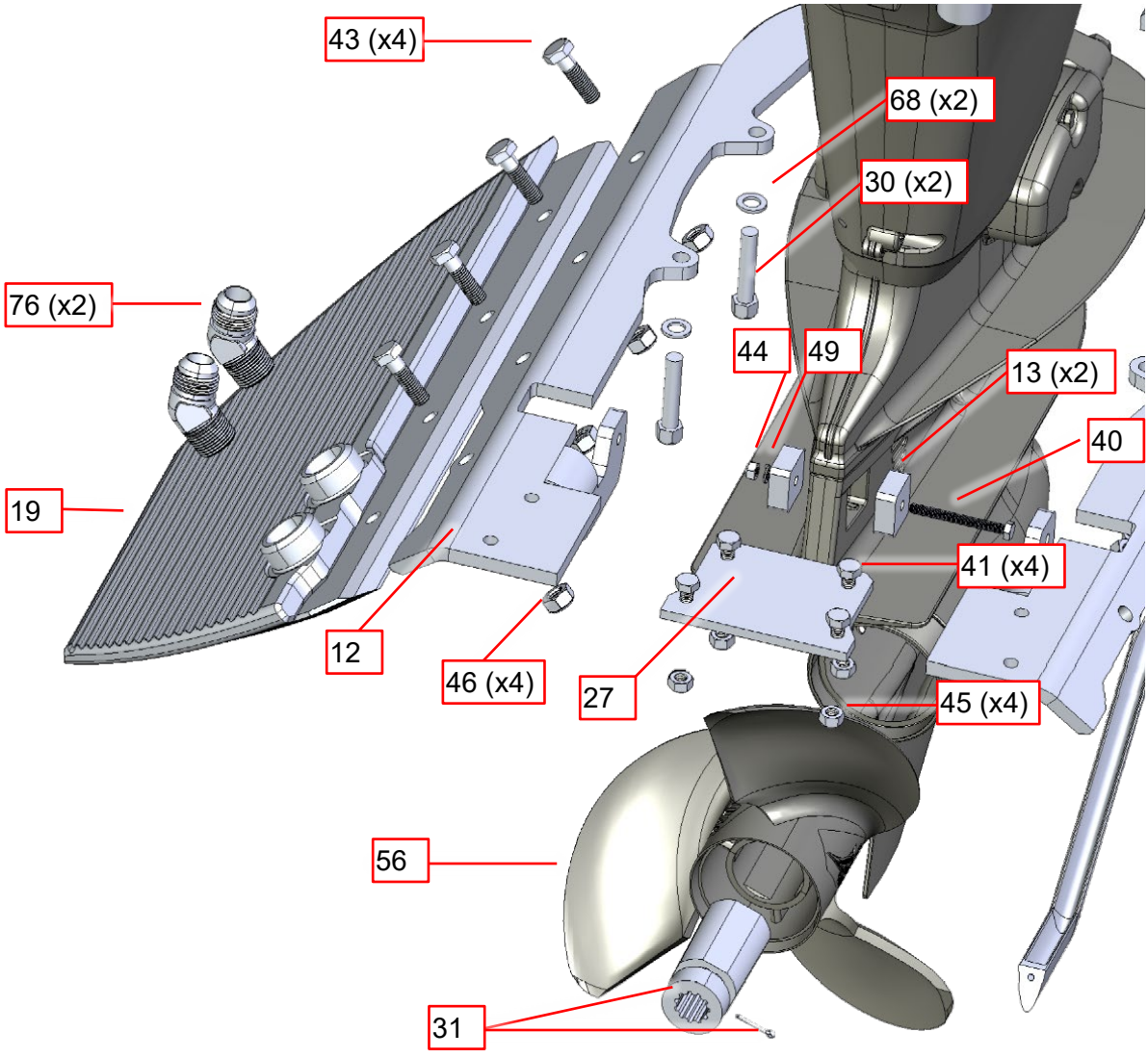
Mid Section Exterior



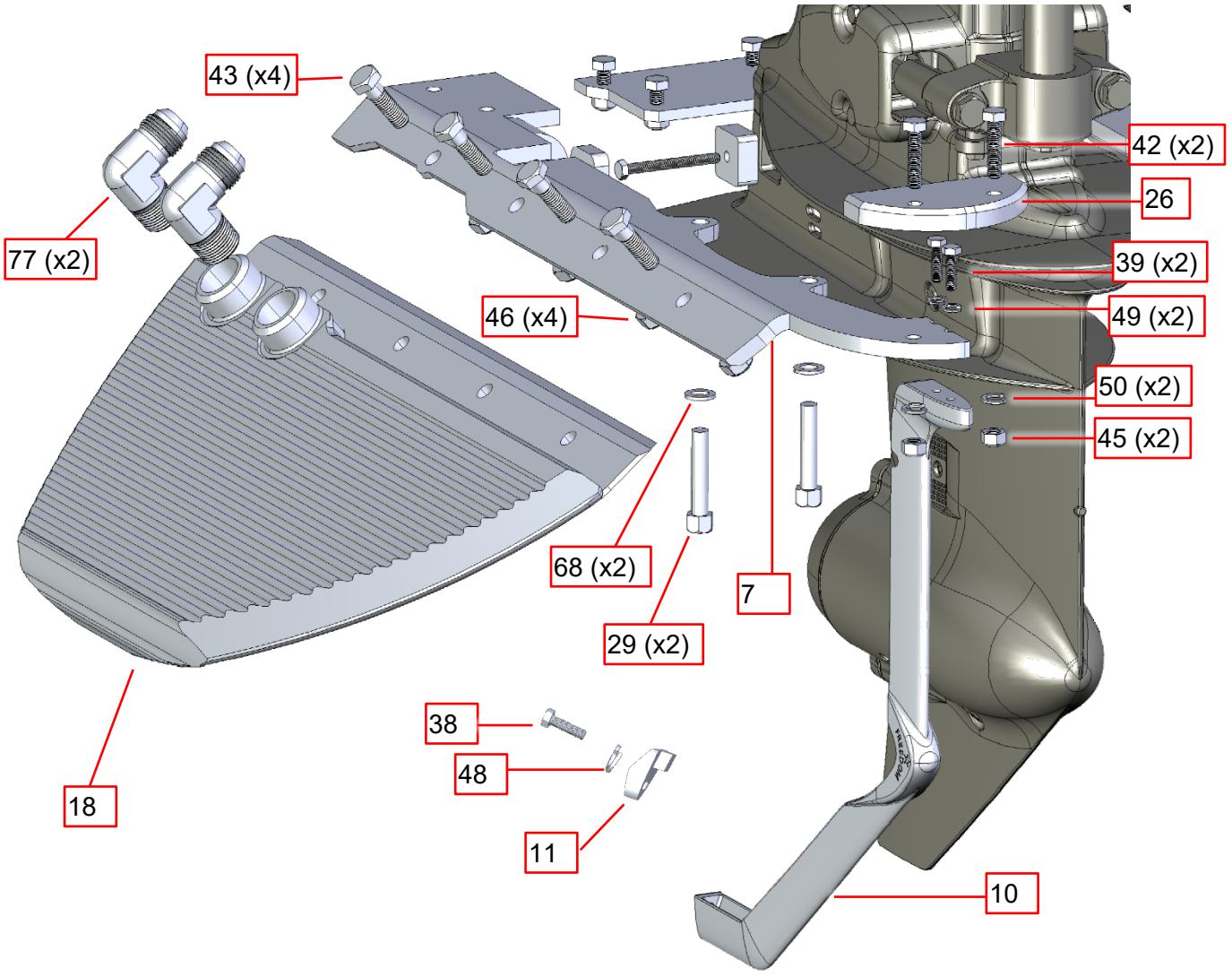
Tank



Fins and Lower Unit (Stern Facing & Port View)



Fins and Lower Unit (Bow Facing and Starboard View)



This page intentionally left blank

5. Service Additions & Changes

Inspection Schedule

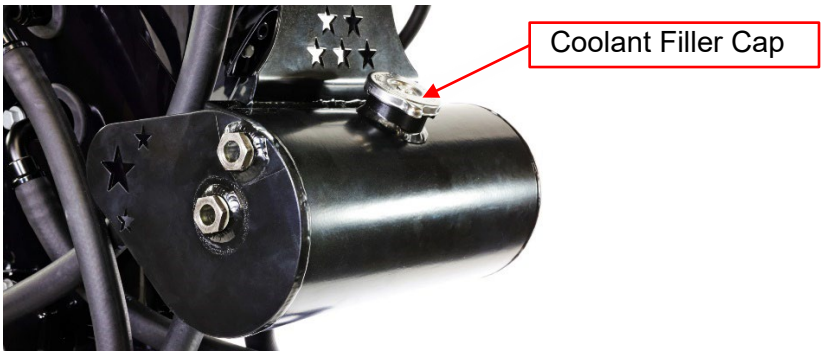
	Description	Inspection Intervals				Inspection Procedure
		First 20 hours or 1 month	Every 50 hours or 3 months	Every 100 hours or 6 months	Every 200 hours or 1 year	
Fuel System	Fuel Filter	○	○			Check & clean or replace if necessary
	Piping/Hoses	○	○			Check & clean or replace if necessary
	Fuel Tank	○	○			Clean
Ignition	Spark Plug	○		○		Remove carbon deposits or replace 0.8 to 0.9 mm (0.032 to 0.035 in)
Starting System	Starter Motor			○		Check for salt deposits and battery cable condition
	Battery	○	○			Check installation, fluid quantity, gravity.
Engine	Engine Oil	Replace		Replace		Oil Filter replaced: 2.4L (2.5 US qt). Oil Filter not replaced: 2.2L (2.3 US qt.)
	Oil Filter	Replace			Replace	Replace Oil Filter cartridge.
	Compression Pressure				○	Check
	Combustion Chamber				○	Clean. Include valve lapping if necessary.
	Valve Clearance	○		○		Check and adjust. IN: 0.15 to .025 mm (0.0059 to 0.0098 in) OUT: 0.25 to .035 mm (0.0098 to 0.0138 in)
	Timing Belt			○		Check and replace if necessary.
	Thermostat			○		Check and replace if necessary.
Coolant System	Coolant		Replace			Drain and re-fill. 2 gallon 50/50 Ethylene Glycol Antifreeze/water mixture
	Hoses		○			Check and clean or replace if necessary.
	Fittings	○	○			Retighten
	Pump				○	Inspect impeller for wear or damage.
Lower Unit	Propeller	○	○			Check for bent blades, damage or wear. Replace if necessary.
	Gear Oil	Replace	○	Replace		Change or replenish oil and check for leaks. Hypoid Gear Po;)GL5, SAE$80-90) 500ml
Power Trim & Tilt		○		○		Check & replenish PTT oil, manually operate.
Warning System			○			Check function
Bolts & Nuts		○	○			Retighten
Sliding and Rotating Parts. Grease Nipples		○	○			Apply and pump in grease.
Anode				○		Check for corrosion & deformation. Replace if necessary.
Control System	Shift Cable / Throttle Cable		○			Check for operation and damage.

Draining Coolant

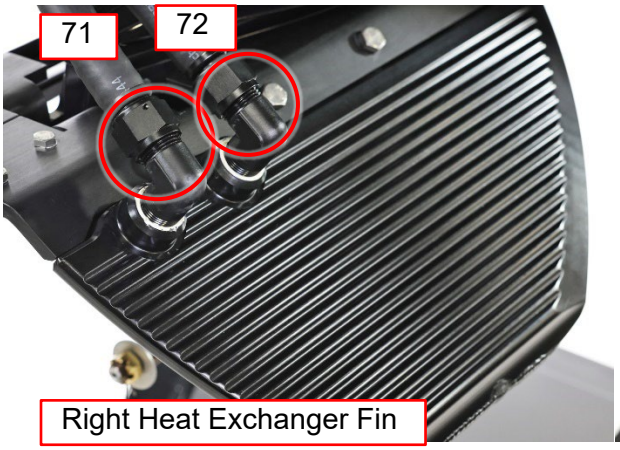
Under normal conditions, the engine contains around 2 gallons of Coolant.

See *Hoses* pg. *4-3* for Hose identification.

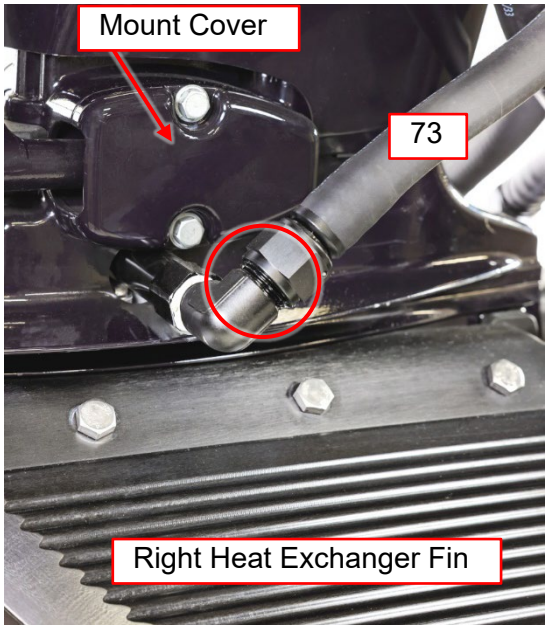
1. Place the engine in an upright and level position.
2. Place a basin under the motor.
3. Remove the coolant filler cap.



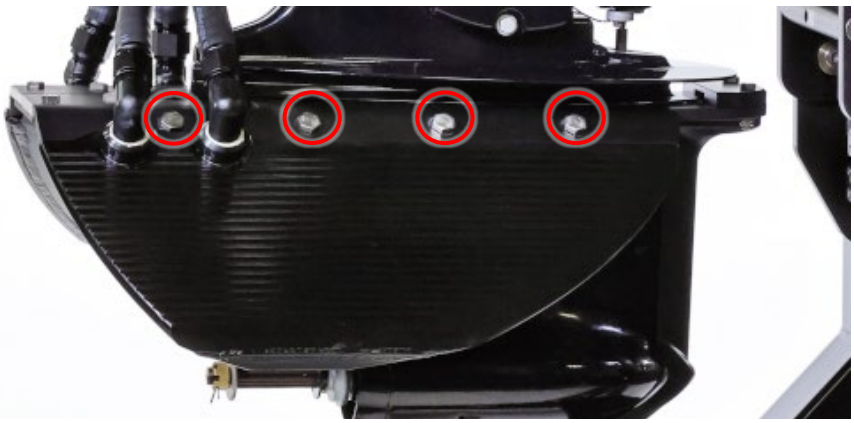
4. Use a commercially available syphon pump to remove coolant from the coolant tank into a receiving container.
5. Loosen Hoses 71, 72, 74 and 75 from the adapters on the right and left heat exchanger fins. Allow Coolant to drip into the basin.



6. Loosen and completely remove Hose 73 from fitting. Allow coolant to drain.



7. Completely remove Hoses 71, 72, 74 and 75 from the adapters on the left and right fins. Allow any remaining coolant to drip into the basin.
8. Unbolt the 4 right fin heat exchanger bolts and remove the fin.



9. Manually tip fin over the basin until all coolant is drained.
10. Repeat Steps 8 & 9 for the left fin.
11. Wipe coolant off engine and parts with a clean, dry rag.
12. Dispose of coolant according to local regulations and guidelines.

    CAUTION: Clean up any Coolant Spills immediately.

13. Re-attach fins.
14. Re-attach hose assemblies to their corresponding fittings. See *Replacing Coolant Hoses & Fittings* pg. *5-21*.
15. Replace coolant before operating motor. See *Initial Fill of Coolant* pg. *5-4*.

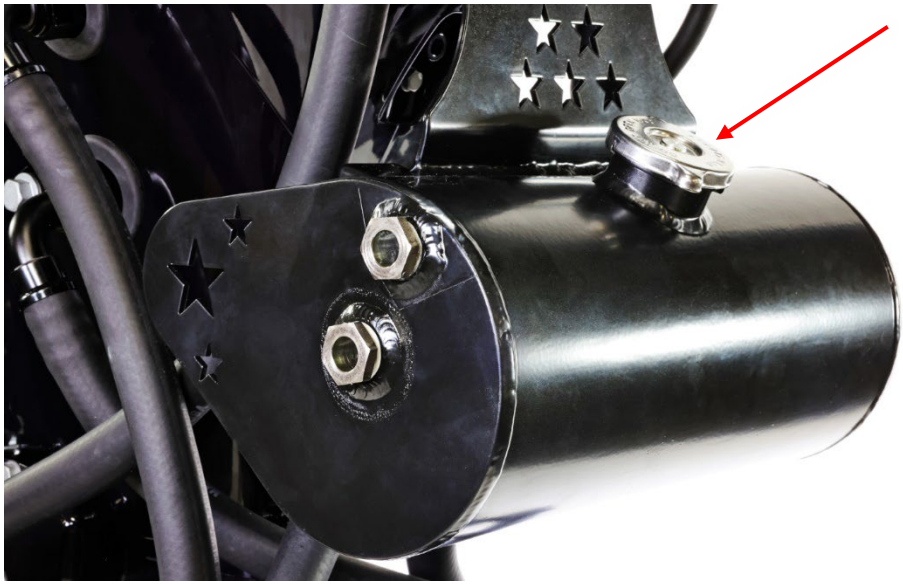
Initial Fill of Coolant

The Coolant is drained for shipping at the factory. Be sure to fill the engine to the proper level before starting the engine.

The Coolant Tank provides two sight glasses for assisting with checking Coolant Levels.

- The lower sight glass is used to assess correct Coolant levels while the engine is running as directed below and Coolant is moving through the system.
- The upper sight glass may show a level of Coolant while the engine is at rest and Coolant has drained back into the tank. Coolant levels are not expected to be visible in the upper sight glass while the engine is running. Visible Coolant levels in the upper sight glass while the engine is running is an indication that the tank is overfilled.

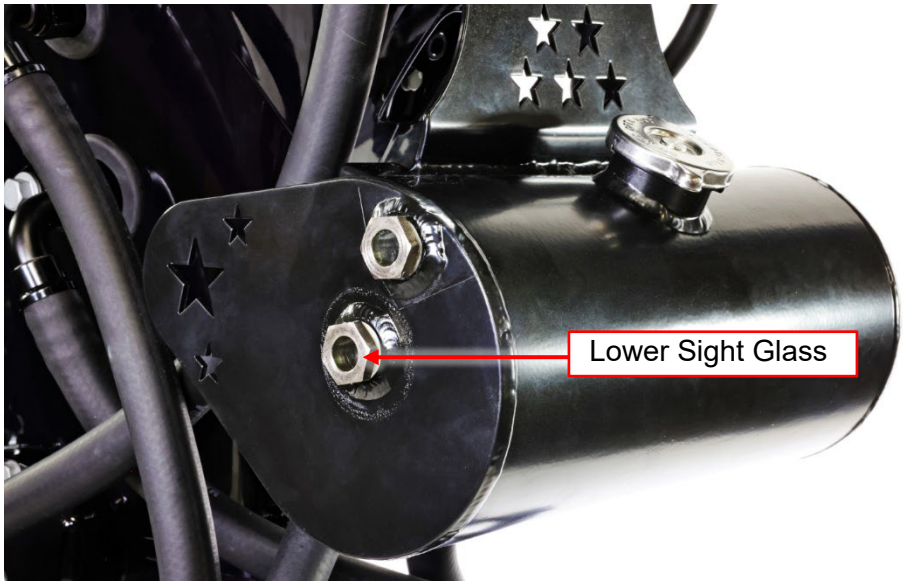
1. Place the engine in an upright and level position.
2. Remove the coolant filler cap.



3. Select the Coolant. See Replacement Specifications pg. 3-1 for Coolant specifications.

4. Fill Coolant.
   a) Add Coolant until tank is filled to middle of the lower sight glass.
   CAUTION: Wipe off coolant immediately if spilled.
   b) Start and run the motor at idle. While the motor is running, add Coolant until the tank fill stabilizes to the middle of the lower sight glass.
   c) Increase motor speed to 2500 min^{-1}(rpm) for roughly 10 seconds. While the motor is running, add Coolant until the tank fill stabilizes to the middle of the lower sight glass.

   IMPORTANT: Overfilling the Coolant Tank may cause coolant to leak from the coolant filler cap during operation. If the tank is overfilled, use a syphon to remove excess coolant.



5. Stop the engine.
6. Replace and tighten the coolant filler cap.
7. Coolant is filled.

Coolant - Check & Add

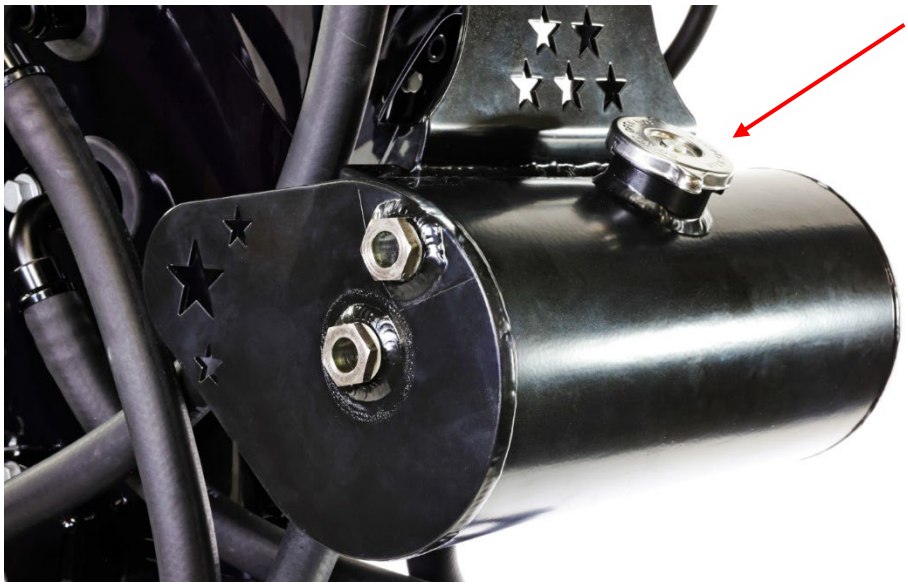
Check the coolant level as recommended before each use or after activation of a temperature warning indicator.

IMPORTANT: Stop engine immediately if the cooling temp high warning lamp is lit or coolant leak is found, or engine could be severely damaged.

The Coolant Tank provides two sight glasses for assisting with checking Coolant Levels.

- The lower sight glass is used to assess correct Coolant levels while the engine is running as directed below and Coolant is moving through the system.
- The upper sight glass may show a level of Coolant while the engine is at rest and Coolant has drained back into the tank. Coolant levels are not expected to be visible in the upper sight glass while the engine is running. Visible Coolant levels in the upper sight glass while the engine is running is an indication that the tank is overfilled.

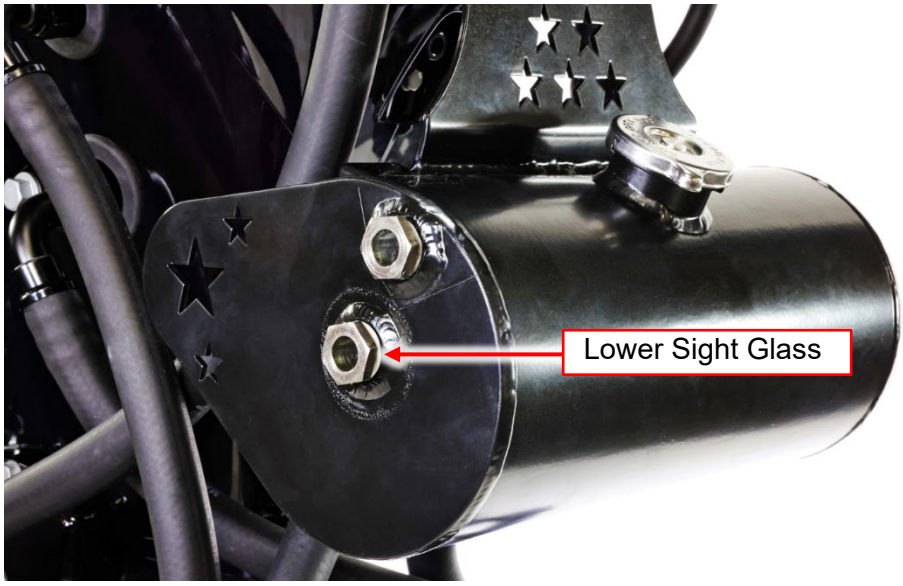
1. Place the engine in an upright and level position.
2. Remove the coolant filler cap.



3. Select the Coolant. See Replacement Specifications pg. 3-1 for Coolant specifications.

4. Fill Coolant.
   a) Add Coolant until tank is filled to middle of the lower sight glass.
   CAUTION: Wipe off coolant immediately if spilled.
   b) Start and run the motor at idle. While the motor is running, add Coolant until the tank fill stabilizes to the middle of the lower sight glass.
   c) Increase motor speed to 2500 min^{-1}(rpm) for roughly 10 seconds. While the motor is running, add Coolant until the tank fill stabilizes to the middle of the lower sight glass.

   IMPORTANT: Overfilling the Coolant Tank may cause coolant to leak from the coolant filler cap during operation. If the tank is overfilled, use a syphon to remove excess coolant.



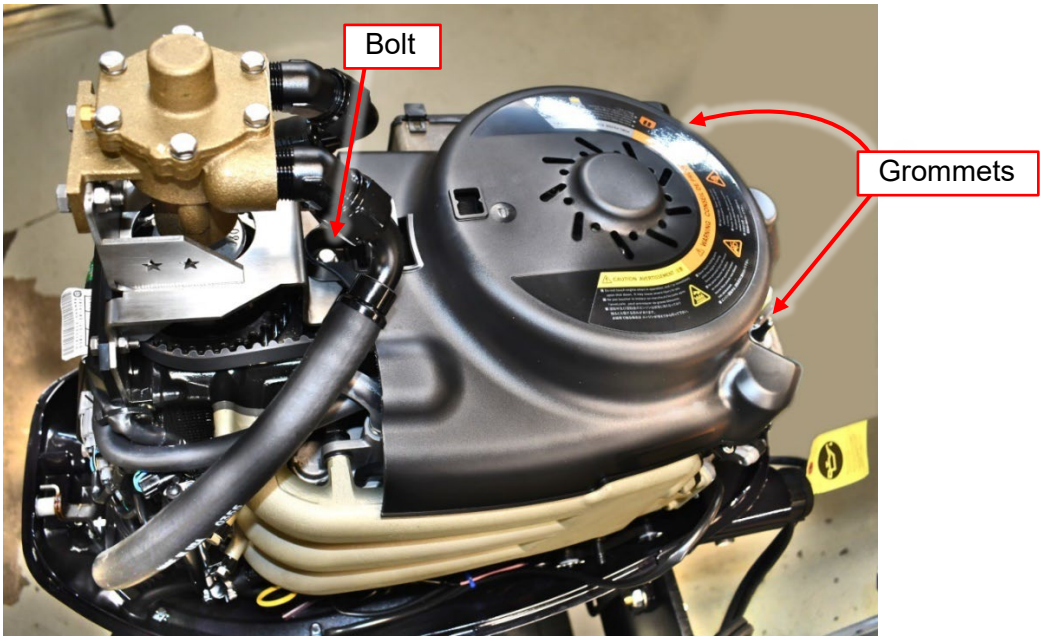
5. Stop the engine.
6. Replace and tighten the coolant filler cap.
7. Coolant is re-filled.
8. Record Coolant refill information on your maintenance log

The Coolant Pump

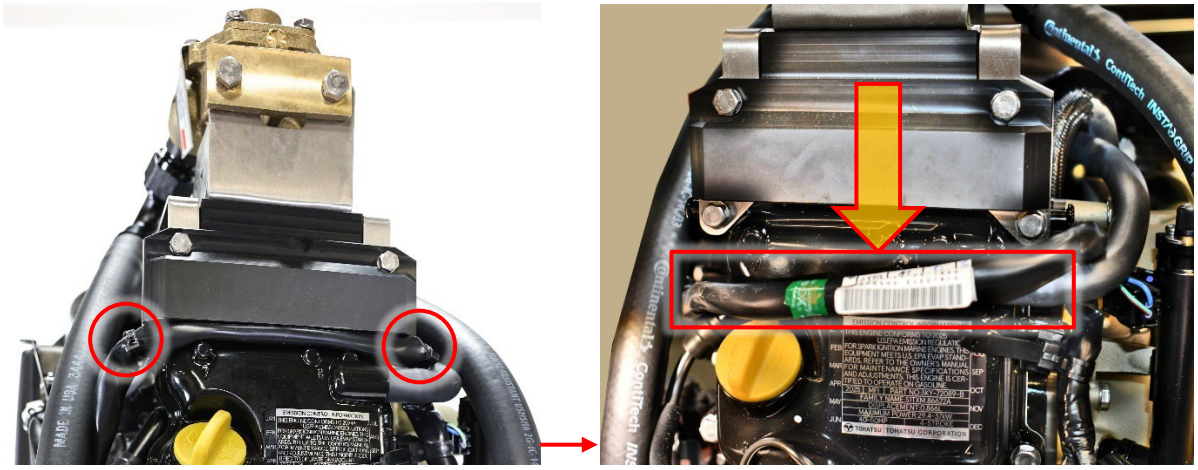
The Cooling Water pump has been removed from the Lower Unit. A Coolant Pump system and protective guarding are now installed over the Cam Shaft Sprocket on the Engine.

Access Under the Coolant Pump

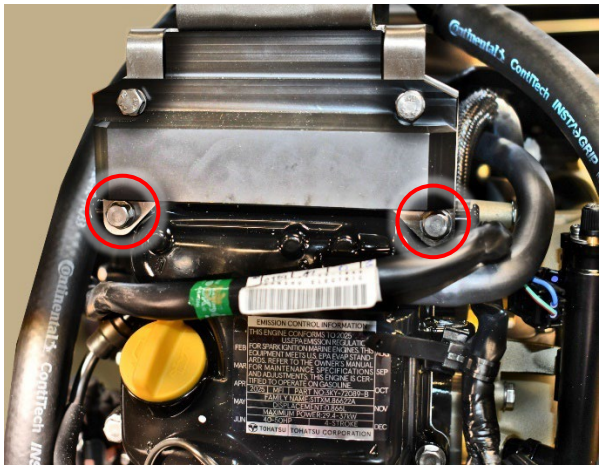
1. Remove the bolt connecting the flywheel to the coolant pump bracket and pop the flywheel cover off of the grommets.



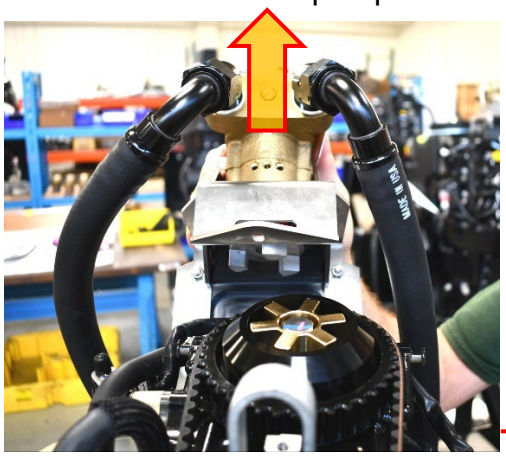
2. Cut the ties holding the wiring harness in place. Lower the wiring harness to expose the coolant pump bracket bolts.



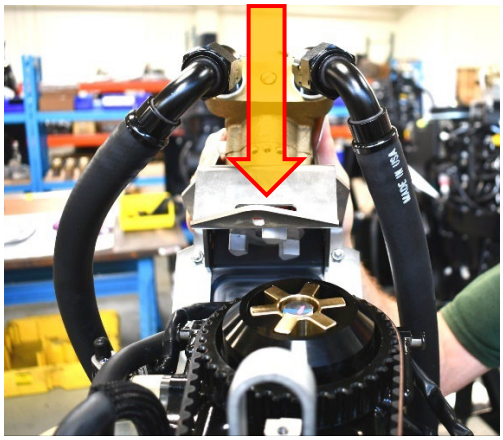
3. Remove the bolts connecting the coolant pump bracket to the engine.



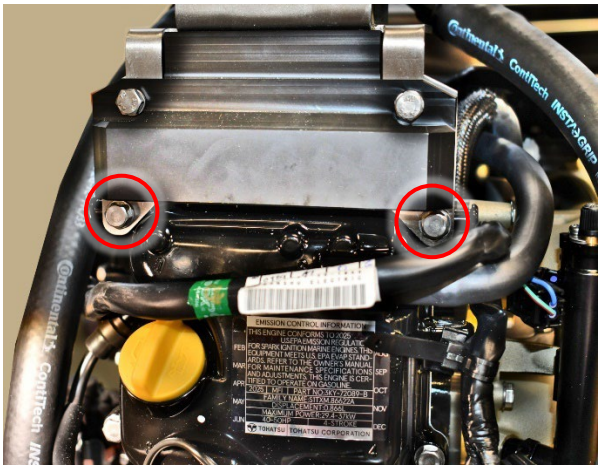
4. Pull the entire coolant pump bracket up and off the adapter hub.



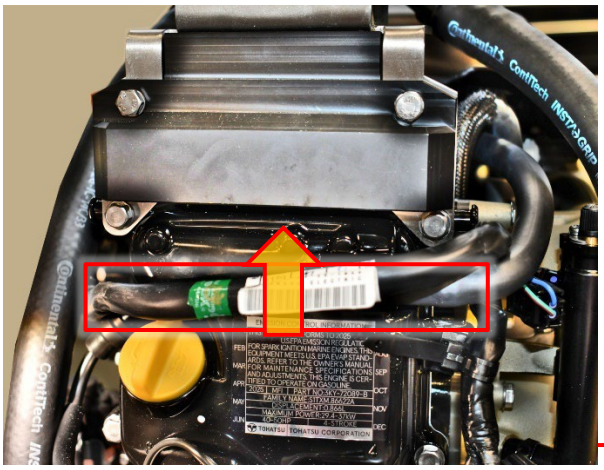
5. To replace, reseat the coolant pump bracket over the hub adapter. Pump is correctly oriented when half coupler is seated in and evenly parallel to the hub adapter.

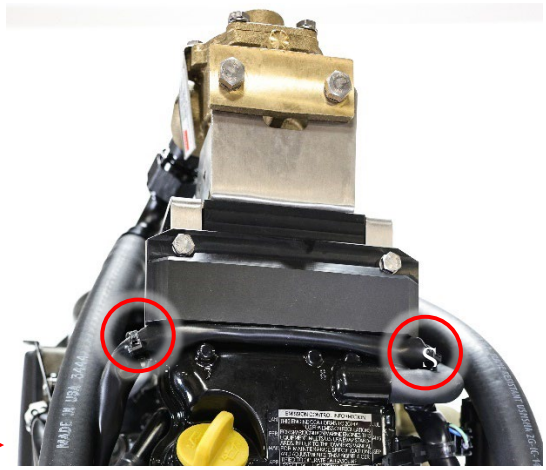


6. Reinstall the bolts connecting the coolant pump bracket to the engine.

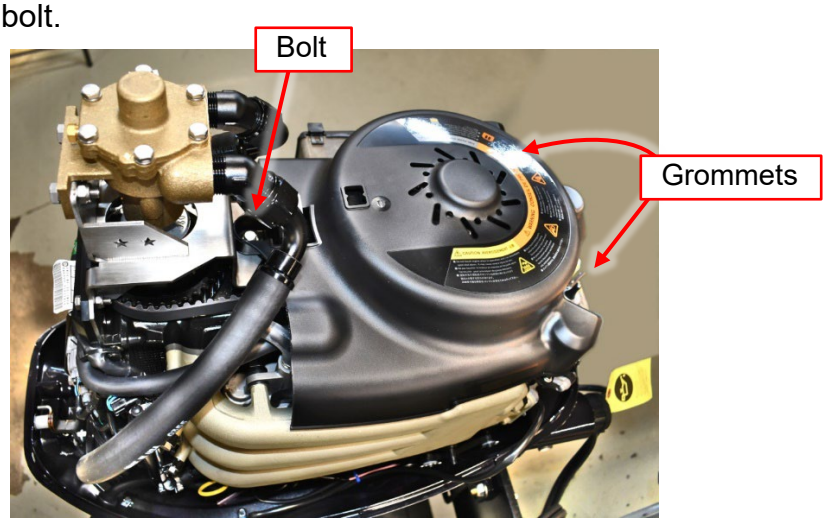


7. Thread each tie through each headed post on each side of the finger guard and around the wiring harness. Secure harness over the coolant pump bracket bolts and under the finger guard.





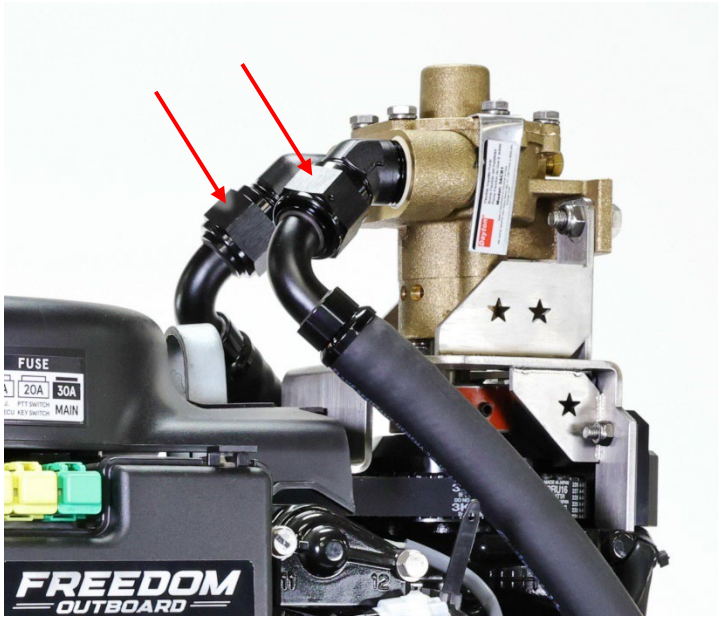
8. Replace the flywheel cover onto the grommets. Re-secure the coolant pump bracket bolt.



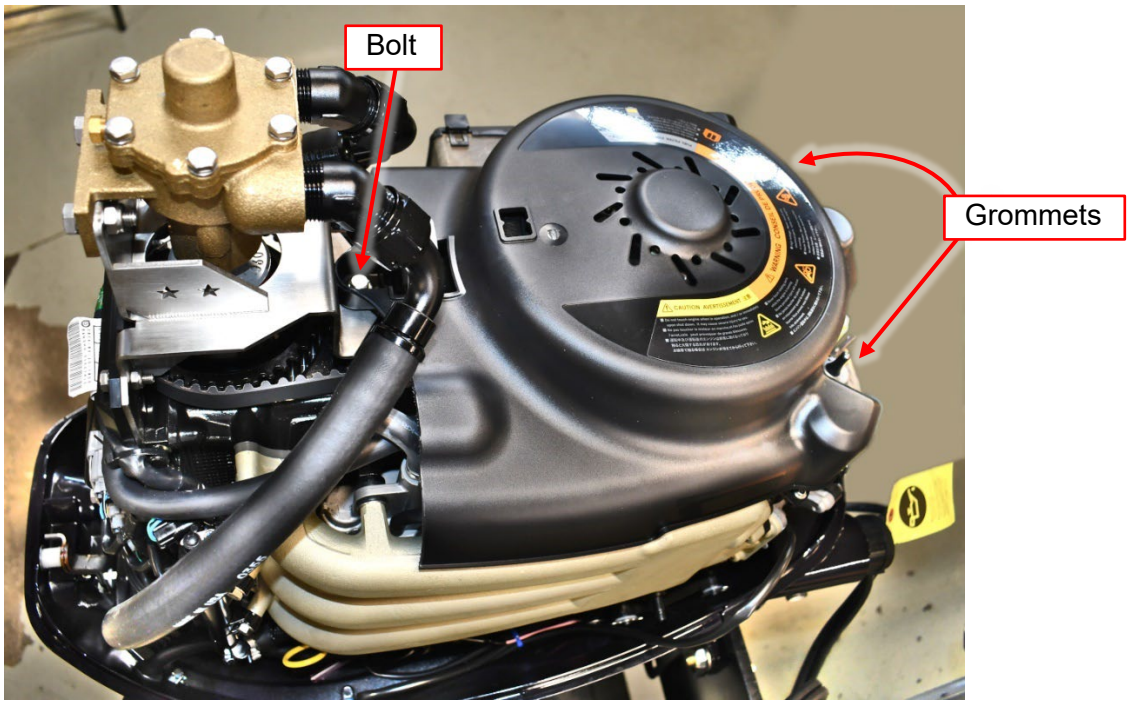
Replacing the Coolant Pump

Remove the existing pump

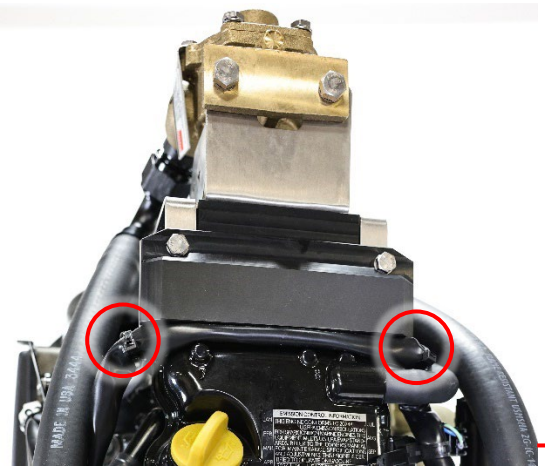
1. Disconnect the coolant pump hoses and drain coolant into a container.

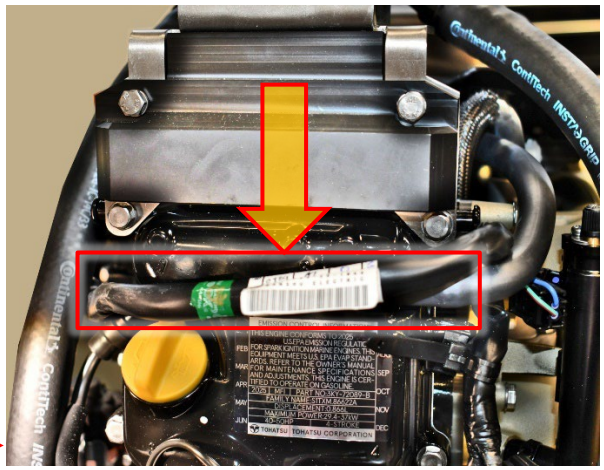


2. Remove the bolt connecting the flywheel to the coolant pump bracket and pop the flywheel cover off of the grommets.

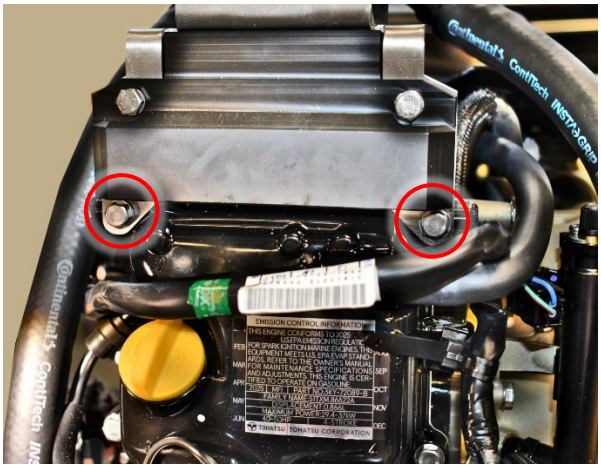


3. Cut the ties holding the wiring harness in place. Lower the wiring harness to expose the coolant pump bracket bolts.

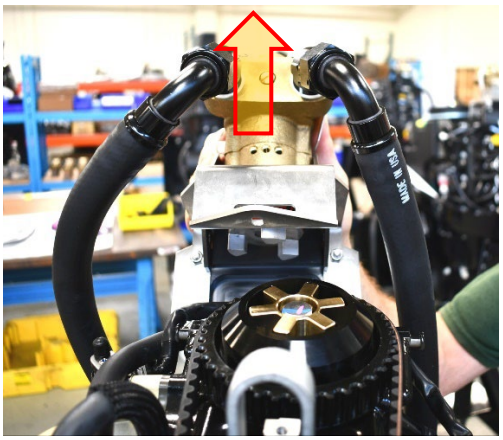




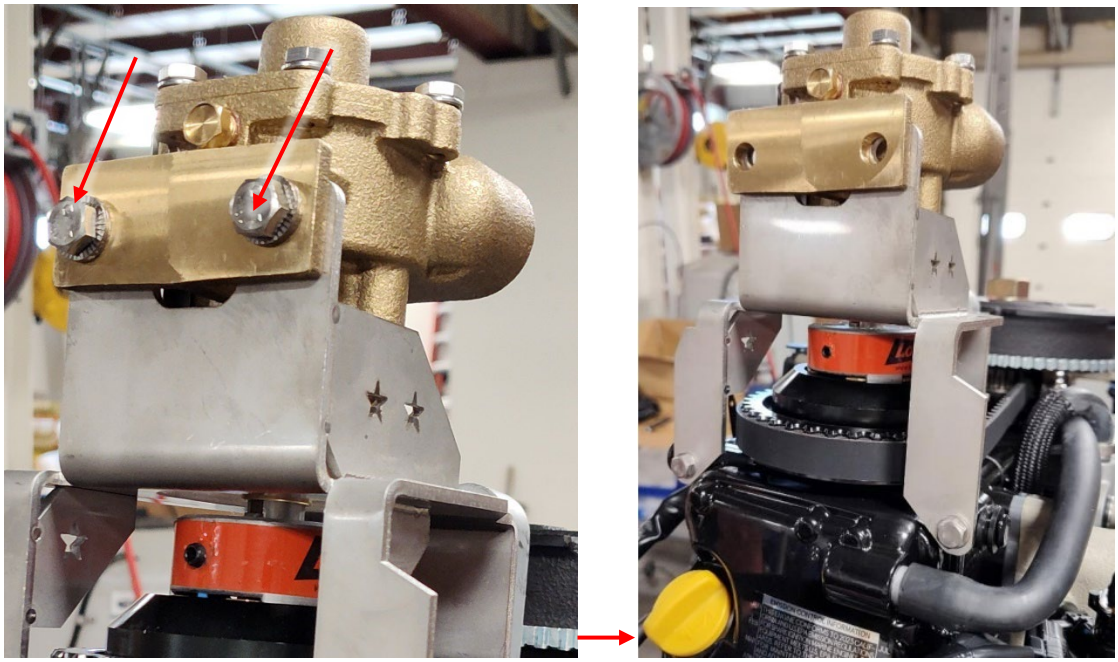
4. Remove the bolts connecting the coolant pump bracket to the engine.



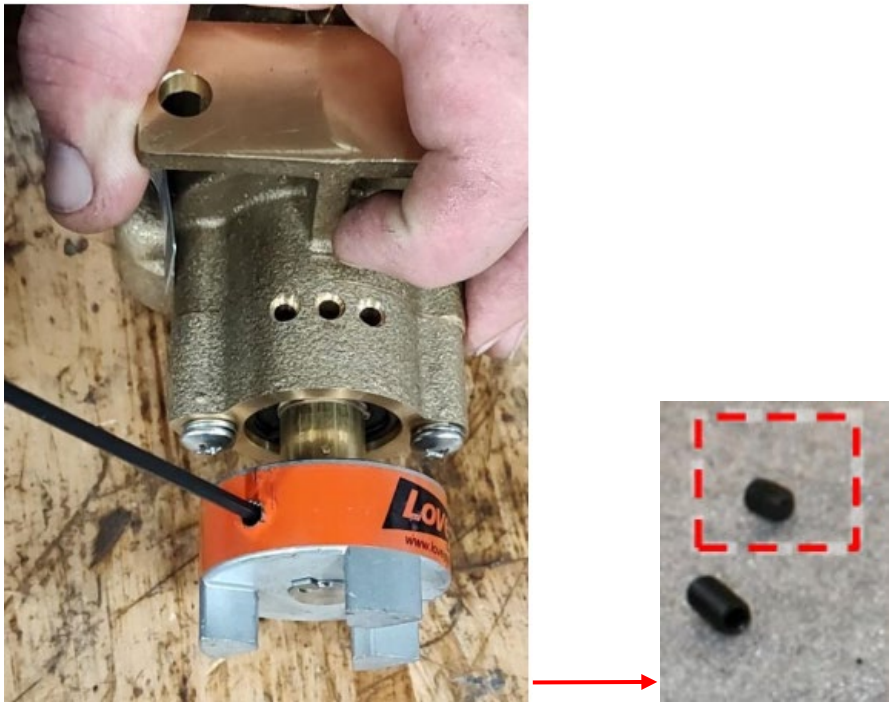
5. Pull the entire coolant pump bracket up and off the adapter hub and set on a workbench.



6. Unbolt and remove the pump from the bracket.



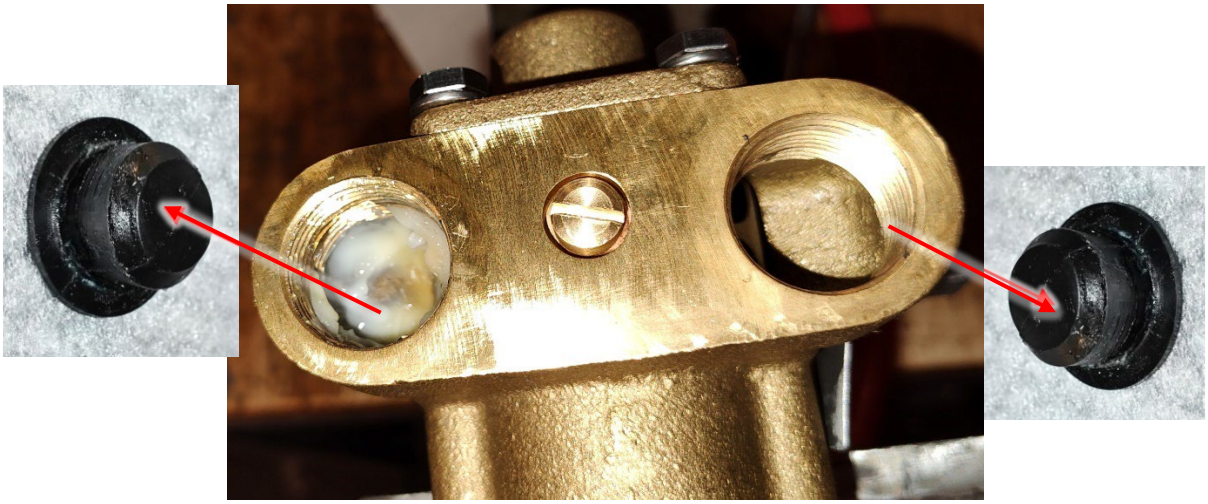
7. Remove the two set screws from the half coupling.



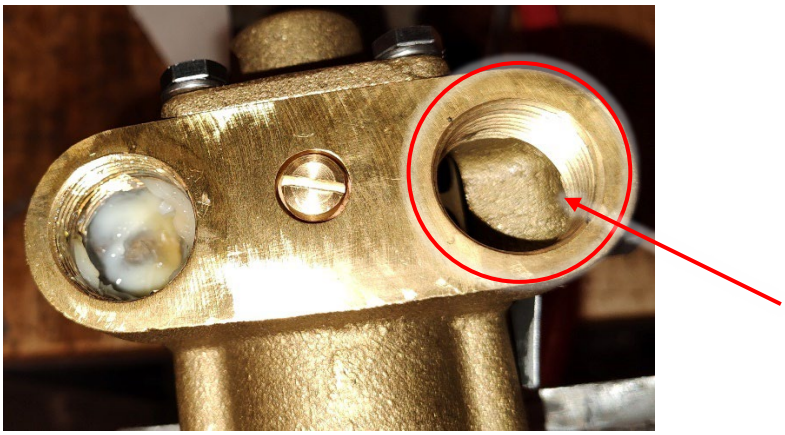
8. Remove the half coupling.
9. See *Assemble the new pump* pg. *5-14* to continue with the new pump assembly.

Assemble the new pump

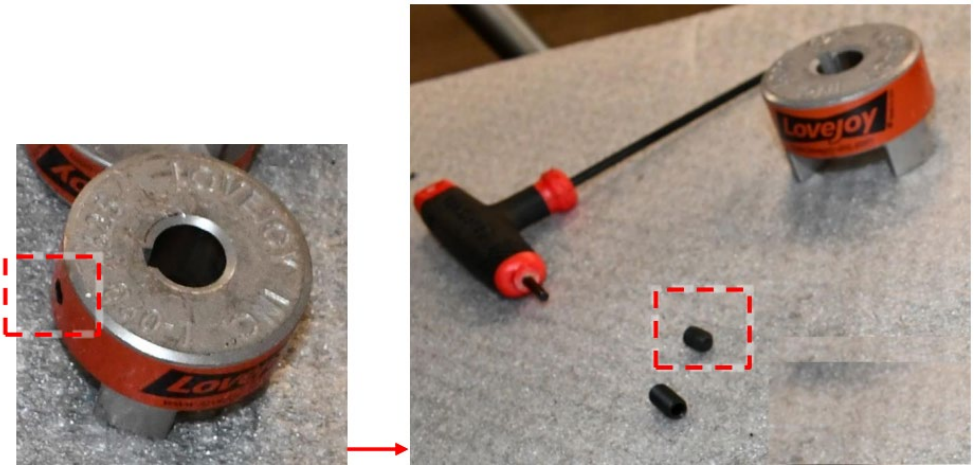
1. Unbox a new coolant pump.
2. Remove the plugs from the threaded holes and discard.



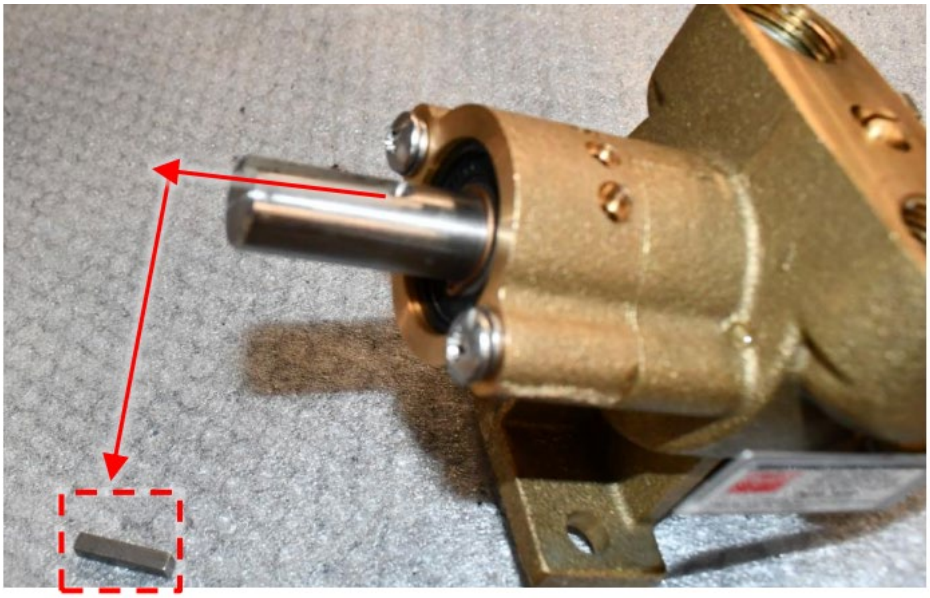
3. Clean the excess grease out of the right side threaded hole.



4. Remove the small set screw from the coupling half. Set aside. Skip this step if reusing the existing coupling half.



5. Remove the key from the Pump Shaft.

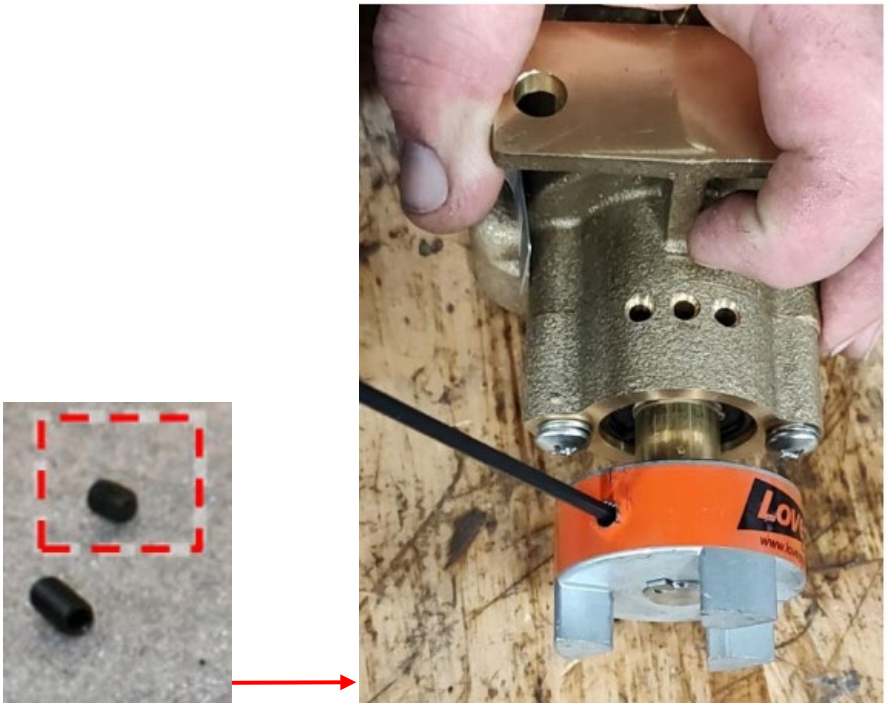


6. Install a bushing on the pump shaft.

7. Replace the key.

8. Slide the Coupling Half over the shaft and up to the bushing.

9. Re-install the small set screw but do not tighten fully.

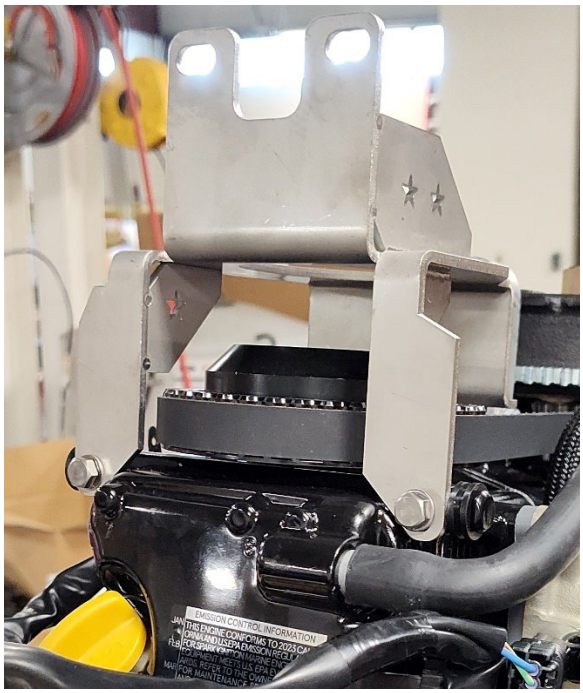


10. Pump Assembly is complete. See *Install the new pump* pg. *5-17* to complete the installation of the New Coolant Pump.

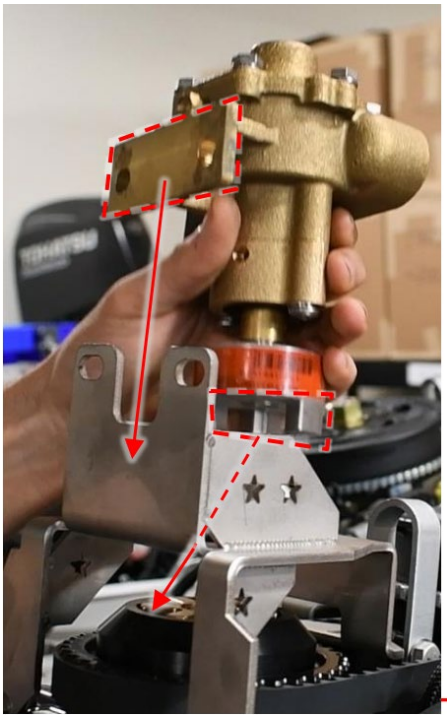
Install the new pump

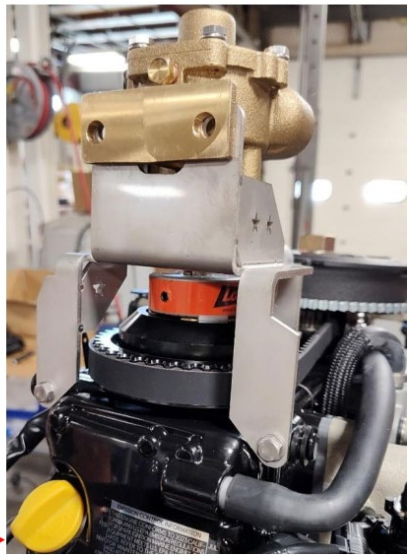
1. Install the pump bracket onto the engine.

   IMPORTANT: Ensure the pump bracket is as level as possible.

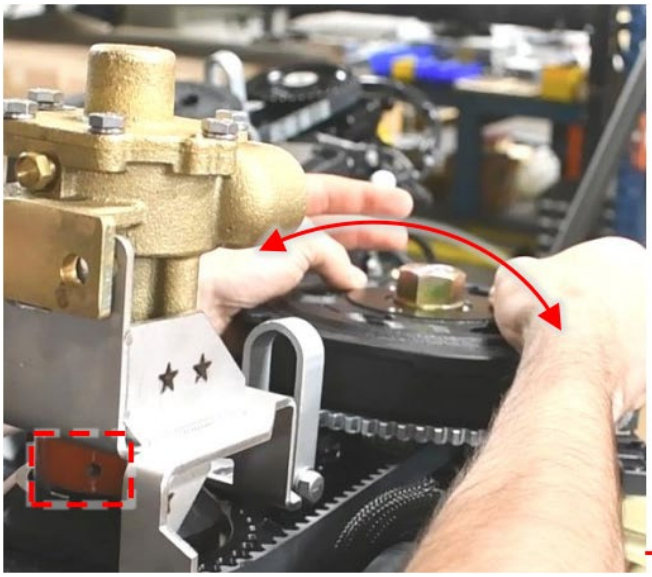


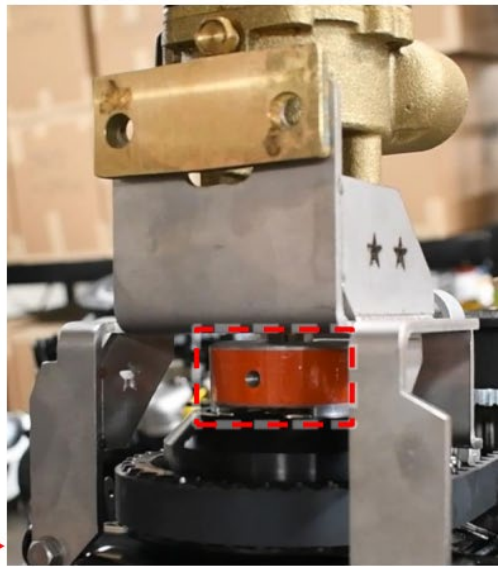
2. Re-install the entire pump bracket assembly onto the adapter hub on the engine.
   - Three extended areas of the coupling half fit level and seated into the matching recessed areas of the hub adapter.
   - Pump bracket fits over the Freedom Outboard bracket.



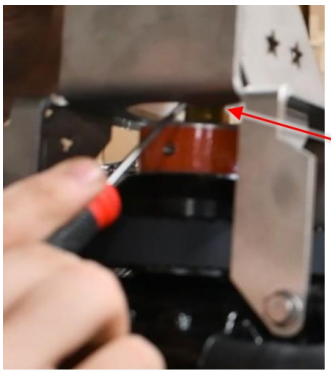


3. Once the pump assembly is level and seated in the hub adapter, turn the timing wheel to move the set screw hold to an accessible position.

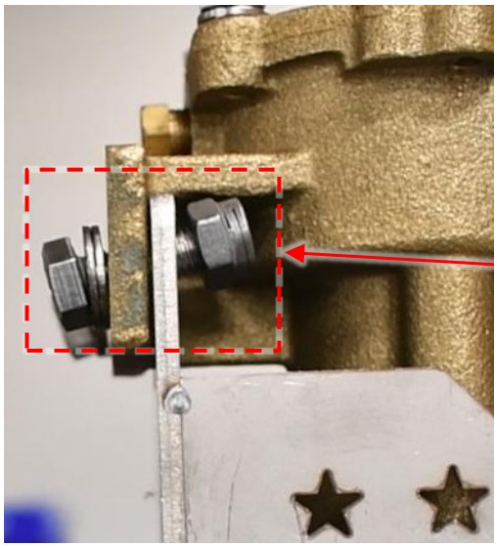




4. Use a hook tool or flat head screwdriver to pull down the installed bushing as far as possible against the half coupling key.



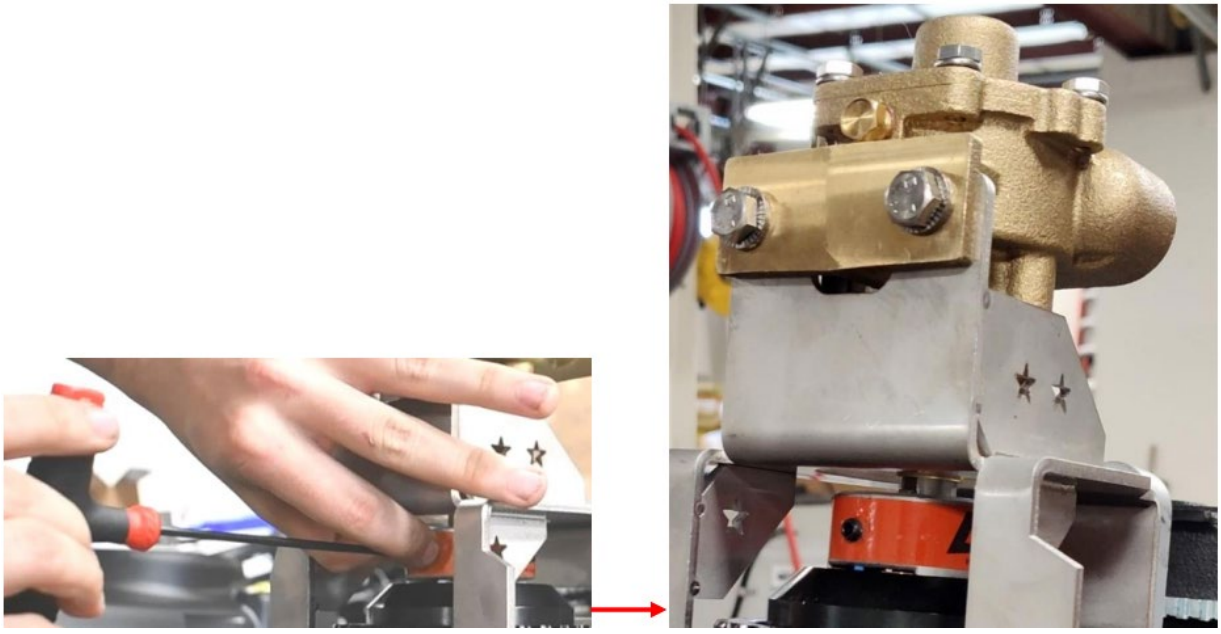
5. Use a 13mm socket and a 13mm wrench with the bolt, washer and nut combination to secure the coolant pump assembly to the pump bracket. Tighten.



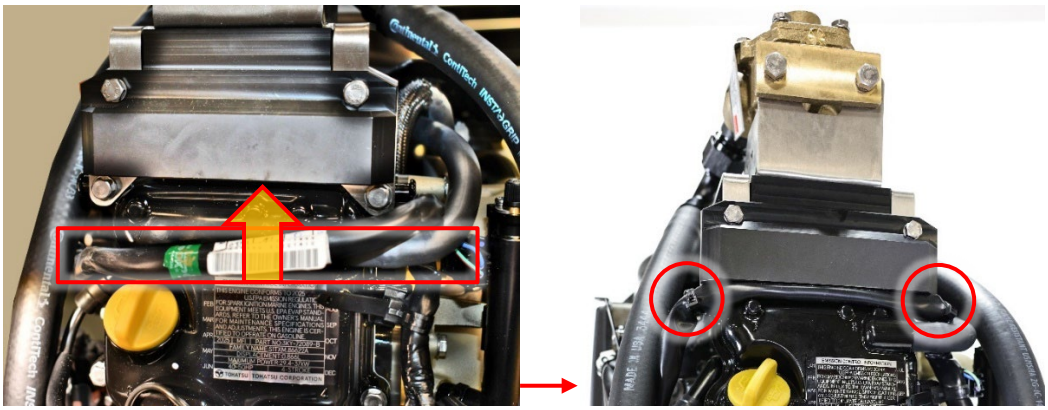
6. Apply Blue Loctite 242 to and install set screws:
   a) Remove the small set screw.
   b) Apply Blue Loctite 242 to the screw threads.

   c) Install the small set screw in the half coupling.
   d) Apply Blue Loctite 242 to the large screw threads.

   e) Install the large set screw against the small screw in the half coupling.

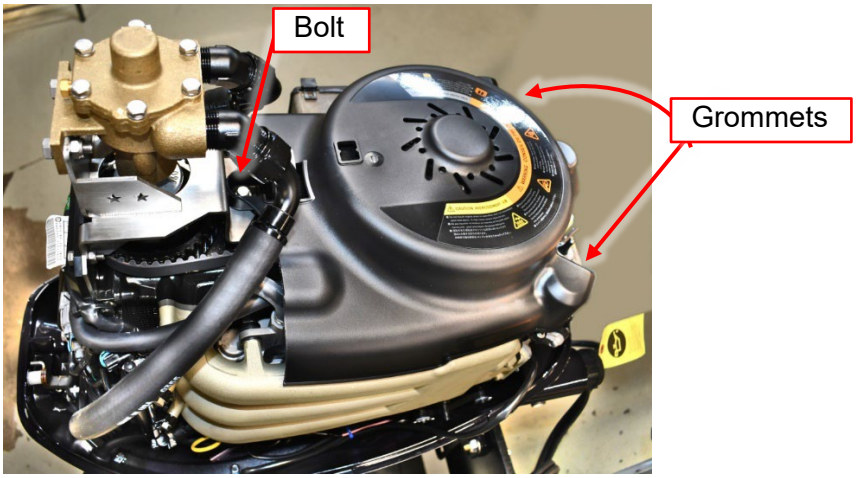


7. Tuck the wiring harness over the bracket bolts and under the finger guard. Thread each tie around the posts on either side of the engine and around the wiring harness.



8. Re-lube the connections with an assembly lube and connect the coolant pump hoses. Tighten.

9. Replace the flywheel cover onto the grommets. Re-secure the coolant pump bracket bolt.



10. Before running the motor, refill coolant to the correct level. See *Coolant - Check & Add* pg. *5-6*.

Replacing Coolant Hoses & Fittings

The images used below as examples. See *Hoses* pg. *4-3* for hose and fitting connections.

Note: If required, use a heat gun to soften and/or apply Dawn dish soap to the inside of hose end of assist in sliding host onto fitting.

1. Fit hose end over the 1st fitting. If clamps are used, insert the clamps loosely over the hose.
2. Fit hose end of the 2nd fitting. If clamps are used, tighten the clamps on each end.
3. Apply lube to threads and sealing surface of the fittings.

4. Connect hose assembly fittings to engine or tank fittings.
5. Tighten to torque.

	Fittings: Torque to 40 ft/lbs

The Lower Unit

Removing the Starboard Fin for Gear Oil Access

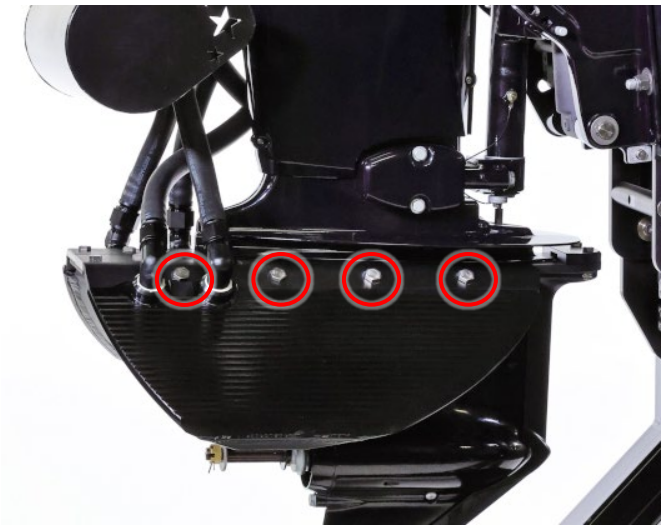
1. Unbolt the 4 right fin heat exchanger bolts. Leave the hoses connected.

2. Swing the fin aside to access the upper oil plug.

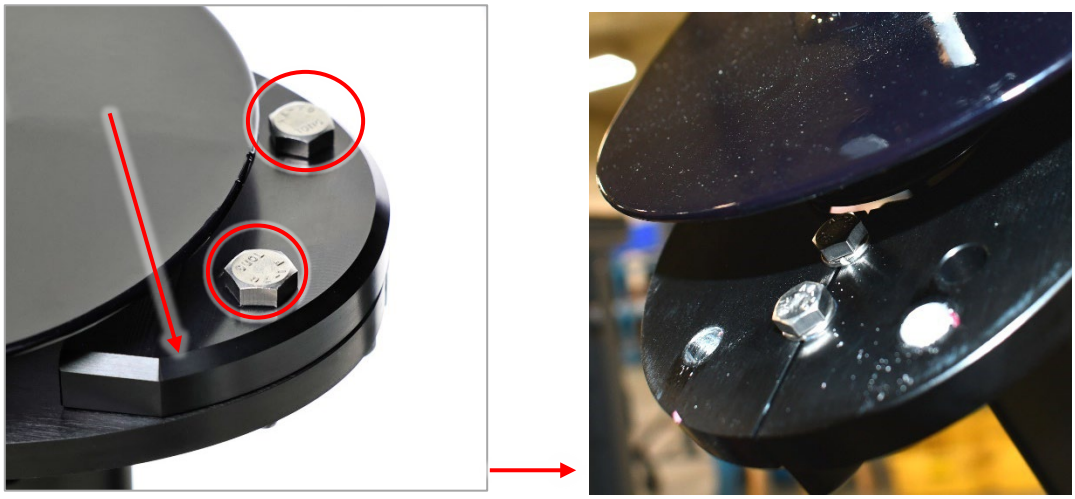
Removing the Lower Unit

1. Unbolt the 4 right fin heat exchanger bolts. Leave the hoses connected. Secure the fin clear of the lower unit. Repeat for the left fin.

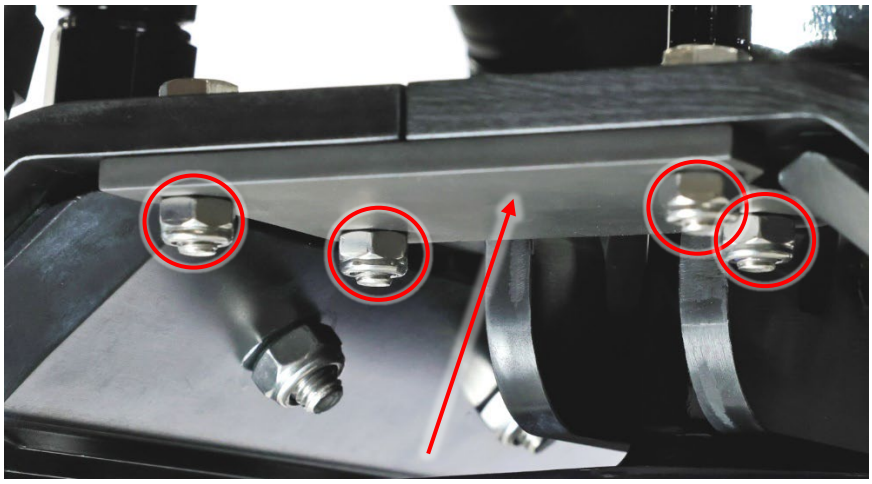
   Note: Hoses may be removed and coolant drained if necessary. See *Initial Fill of Coolant* pg. *5-4* to fill if Coolant is drained.



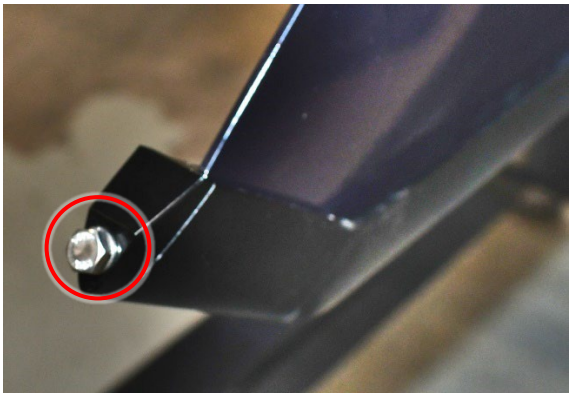
2. Unbolt the bolts, nuts and washers from the front tie plate. Remove the front tie plate.



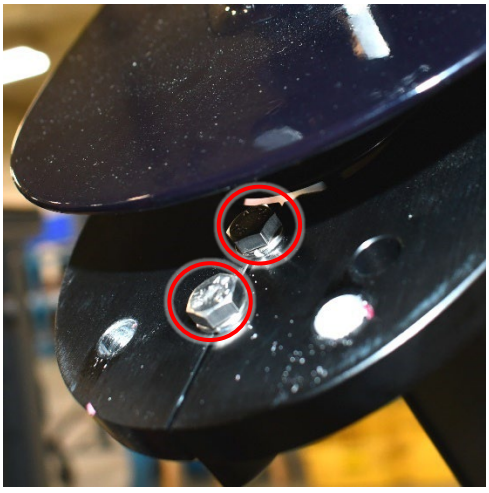
3. Unbolt the bolts and nuts from the fin tie plate. Remove the fin tie plate.



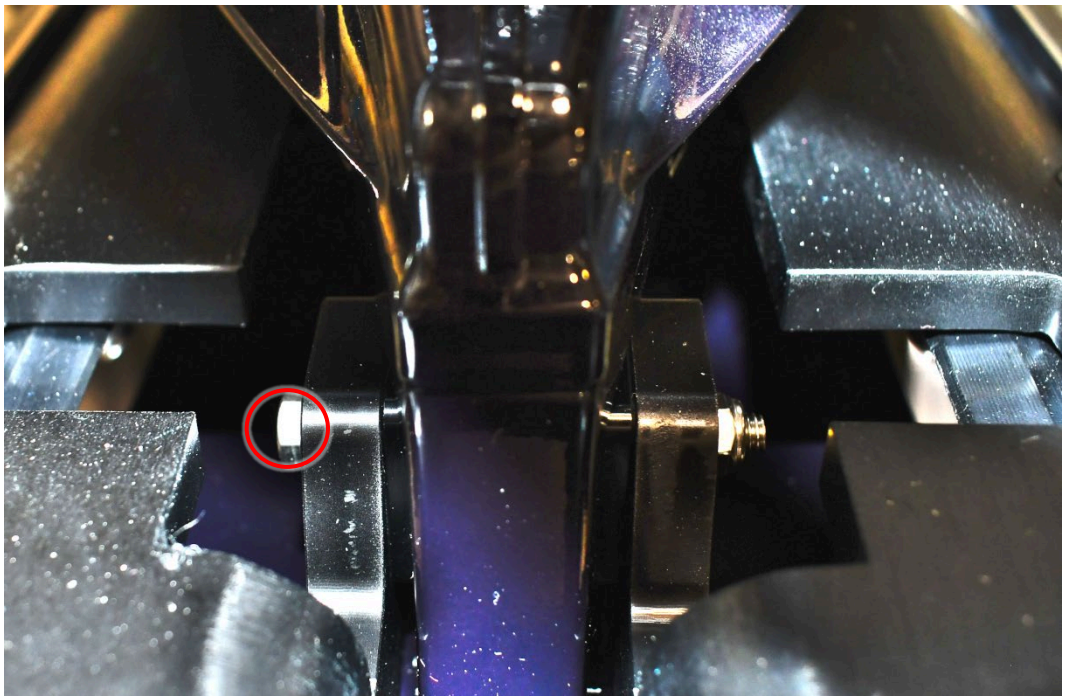
4. Unbolt the bolt and washer from the bumper keeper. Remove the bumper keeper.



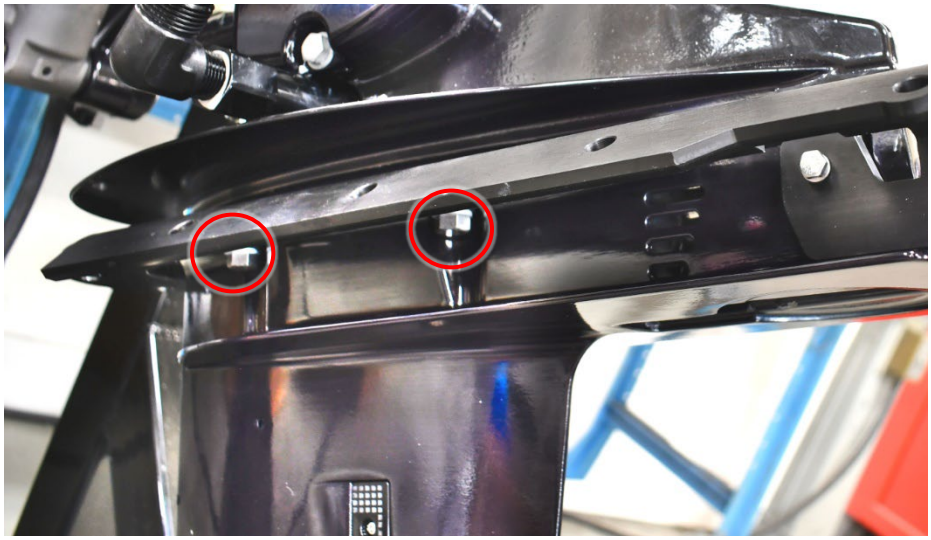
5. Unbolt the two bolts and washers attaching the fin brackets with the bumper. Remove the bumper.



6. Unbolt the bolt, washer and nut attaching the fin brackets to the fin bracket spacers on the mid section. Remove the fin bracket spacers.

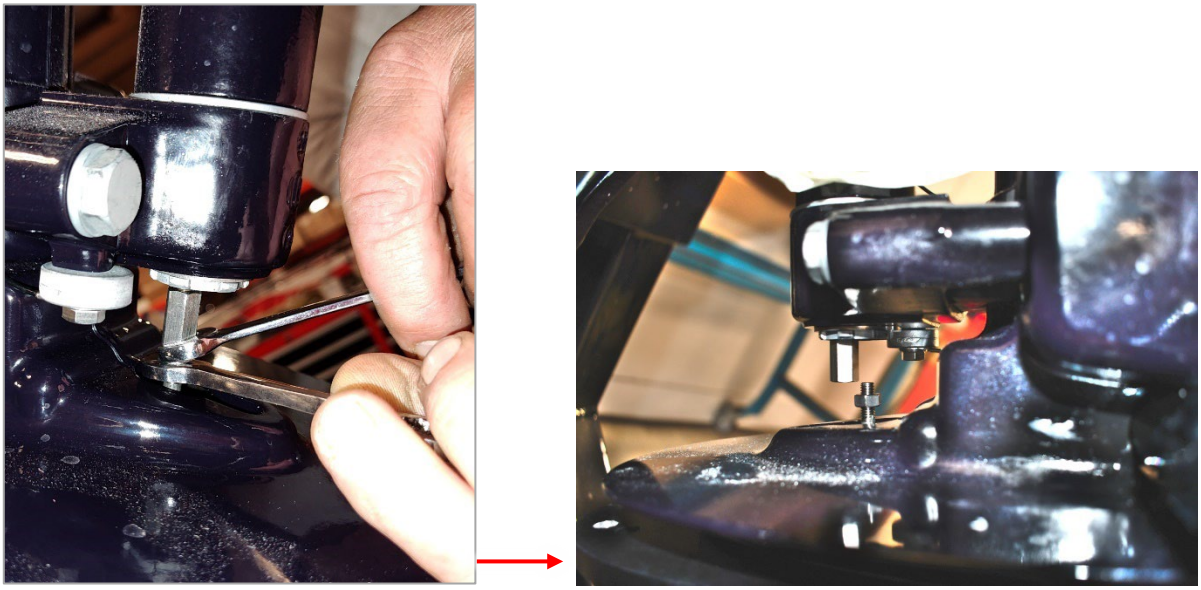


7. Unbolt the screw and washer from under the right fin bracket. Remove the fin bracket. Repeat for the left fin bracket.

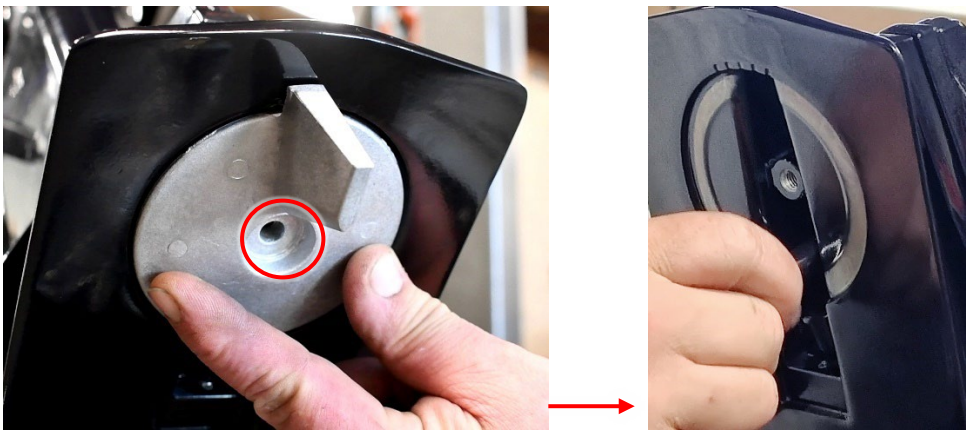


8. Disconnect the Shift Shaft. Hold the bottom nut in place and loosen the top nut under the Shift Shaft to disconnect the top nut from the bottom nut. The top of the Shift Shaft swings free once released.

   Important: Do not disturb the adjustment on the bottom nut.



9. Unbolt the bolt holding the trim tab in place. Remove the trim tab.



10. Hold the lower unit in place and unbolt the bolt inside the trim tab opening to disconnect the lower unit from the mid section.

11. Remove the lower unit and secure in an upright position with a table clamp.

Important: Utilize rags or similar nonabrasive material when clamping the lower unit to avoid any damage to the paint.

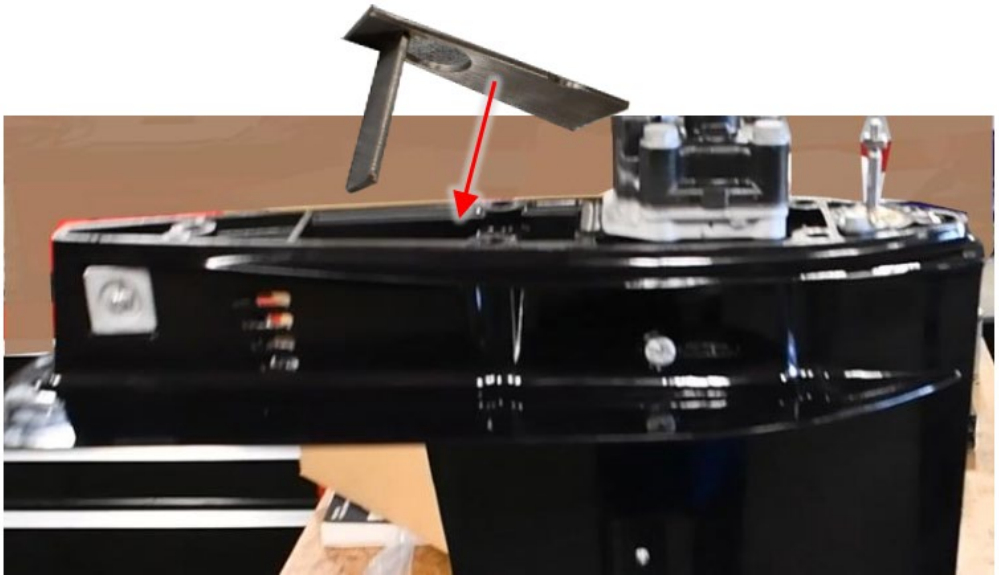
New Lower Units

This procedure details required modifications intended for new Lower Units direct from Tohatsu. New Lower Units from Freedom Outboard are already equipped with the required modifications.

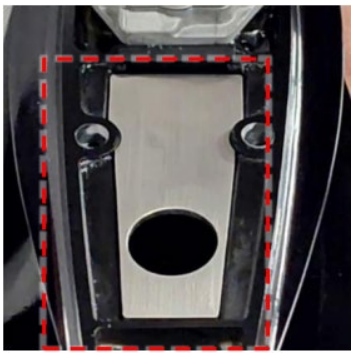
1. Secure the Lower Unit in an upright position with a table clamp.

   Important: Utilize rags or similar nonabrasive material when clamping the lower unit to avoid any damage to the paint.

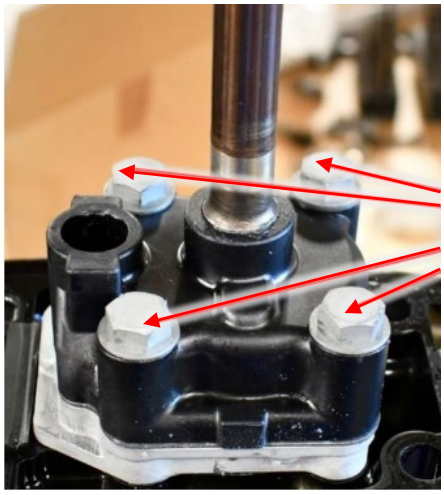
2. Use the Exhaust Foot Plate from the old Freedom Outboard Lower Unit or order a new one from Freedom Outboard. See #21, *Mid Section &* Lower Unit Interior pg. *4-4*..
3. Orient the Exhaust Foot Plate and slide into the Exhaust Chamber as displayed in the image below.



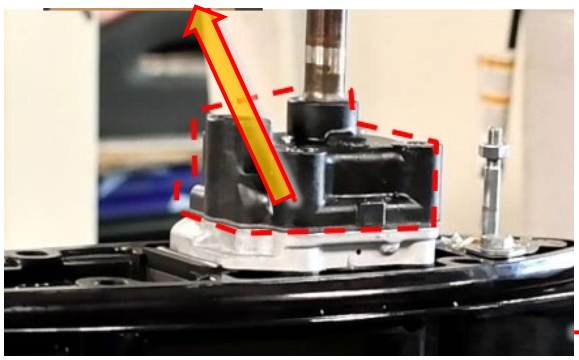
4. Exhaust plate traps into place.

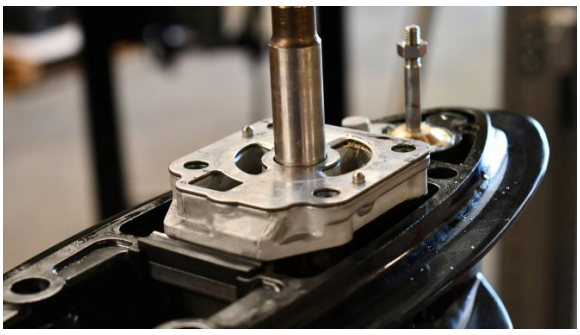


5. Loosen and remove the 4 bolts securing the Upper Pump Case. Discard.

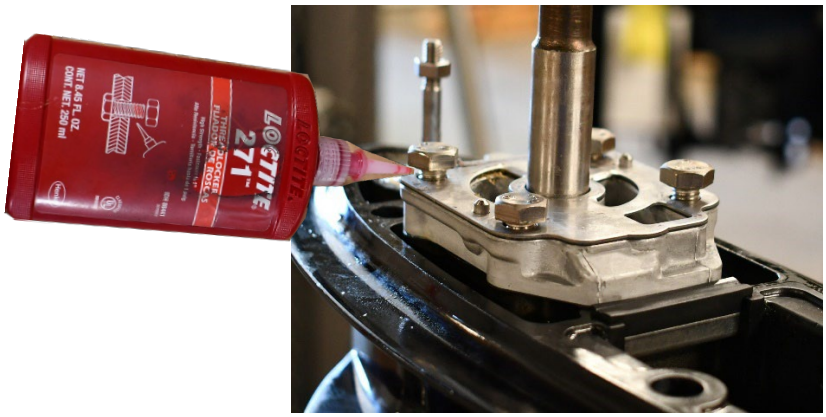


6. Slide the Upper Pump Case off the shaft. Discard.





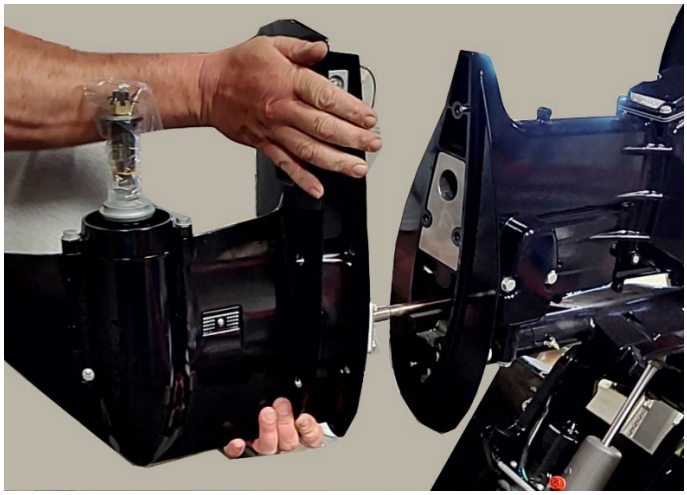
7. Apply Red Loctite 271 to the threads of four M8 x 1.25 x 25 Hex Head bolts. See #41, *Mid Section &* Lower Unit Interior pg. *4-4*.
8. Secure the four bolts through the remaining water pump components.



9. LU Modifications are complete.

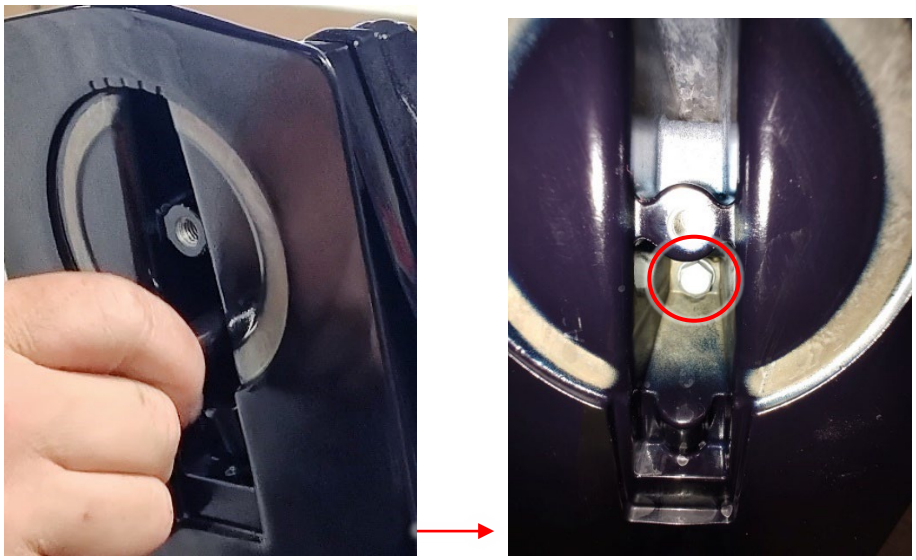
Reinstalling the Lower Unit

1. Orient and insert the LU into the MS as displayed in the image below. LU Exhaust Plate and MS Exhaust Shroud sandwich together.



2. Apply Red Loctite 271 to the Lower Unit to Mid Section bolt.
3. Hold the lower unit in place, install and tighten the bolt inside the trim tab opening to connect the lower unit to the mid section.

	Tohatsu included 40 mm bolt and washer: Torque to 40 ft/lbs



4. Install the trim tab, install and tighten the bolt to hold the trim tab in place.

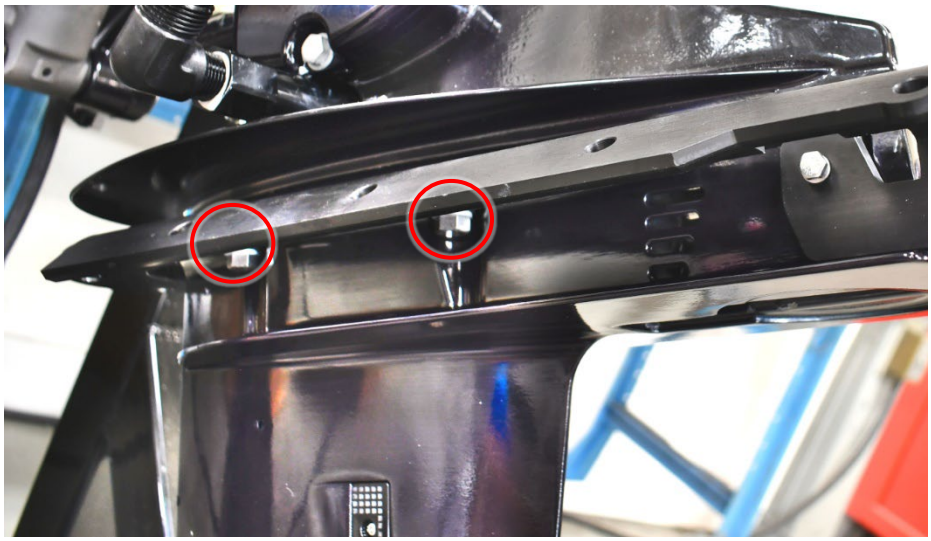
5. Reconnect the Shift Shaft. Align the top and bottom parts of the shift shaft. Hold the bottom nut in place and tighten the top nut under the Shift Shaft to connect the top nut to the bottom nut.

   Important: Do not disturb the adjustment on the bottom nut.

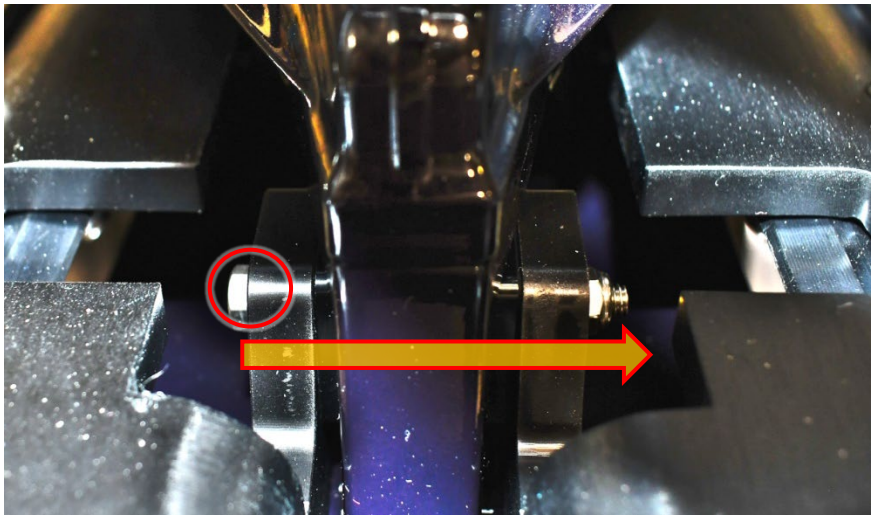
6. Apply Red Loctite 271 to the four bolts.
7. Align the left fin bracket and install the washer and bolt from underneath and tighten. Repeat for the right fin bracket.

   IMPORTANT: If replacing one of the bolts, replace all four.

	#68 & #30 *Fins and Lower Unit (Stern Facing & Port View)* pg. *4-8*. (2) Left Bracket 40mm bolts and washers: Torque to 40 ft/lbs
	#68 & #30 *Fins and Lower Unit (Bow Facing and Starboard View)* pg. *4-9*. (2) Right Bracket 40mm bolts and washers: Torque to 40 ft/lbs

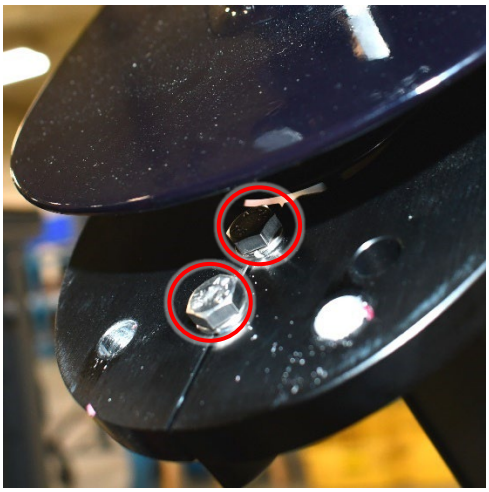


8. Insert each of the fin bracket spacer blocks on either side of the mid-section.
9. Align the right and left fin brackets connection points with the bracket spacer blocks.
10. Insert the bolt through the left fin and left spacer, then the mid section and lastly through the right spacer and right fin. Secure with the washer and nut.

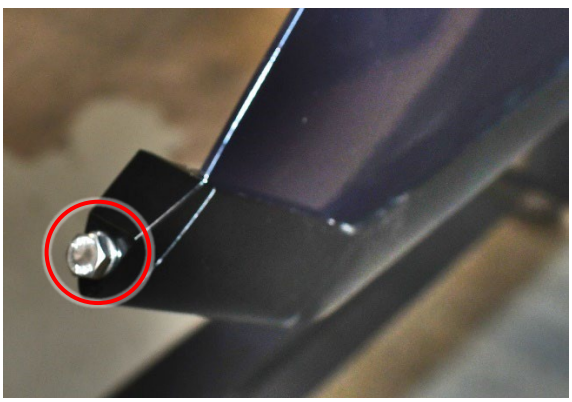


11. Install the Bumper under the LU as displayed in the image below.

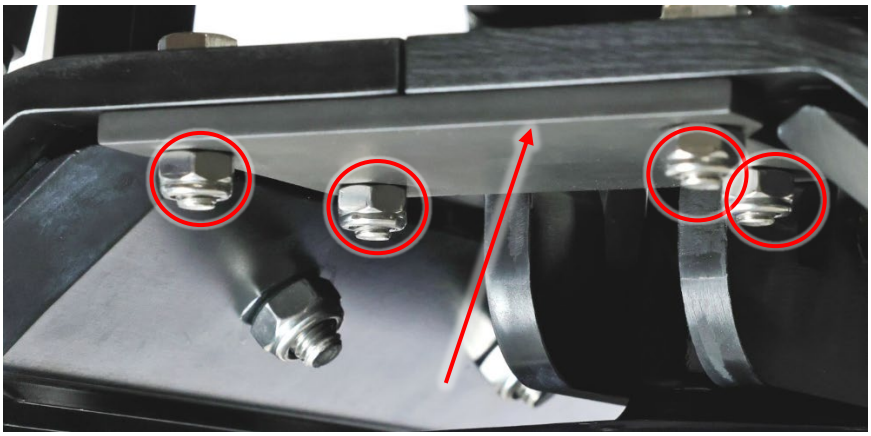
12. Insert the two bolts and washers attaching the fin brackets into the bumper. Tighten.



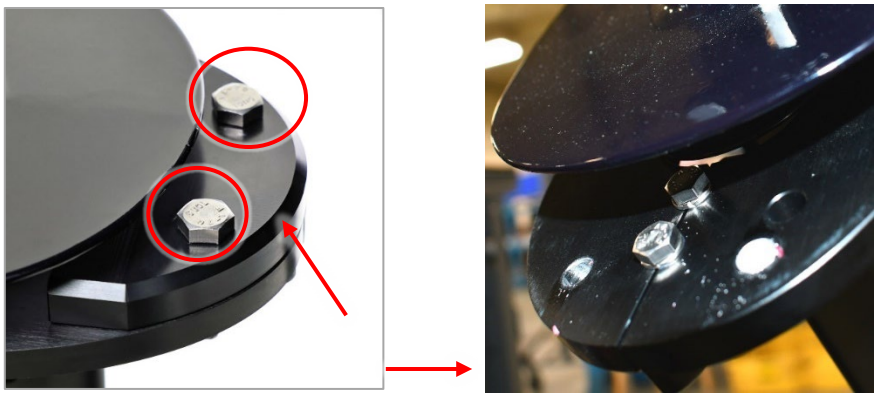
13. Install the bumper keeper. Secure the bumper keeper with the bolt, washer and nut.



14. Install the fin tie plate. Insert the 4 bolds and secure with nuts.



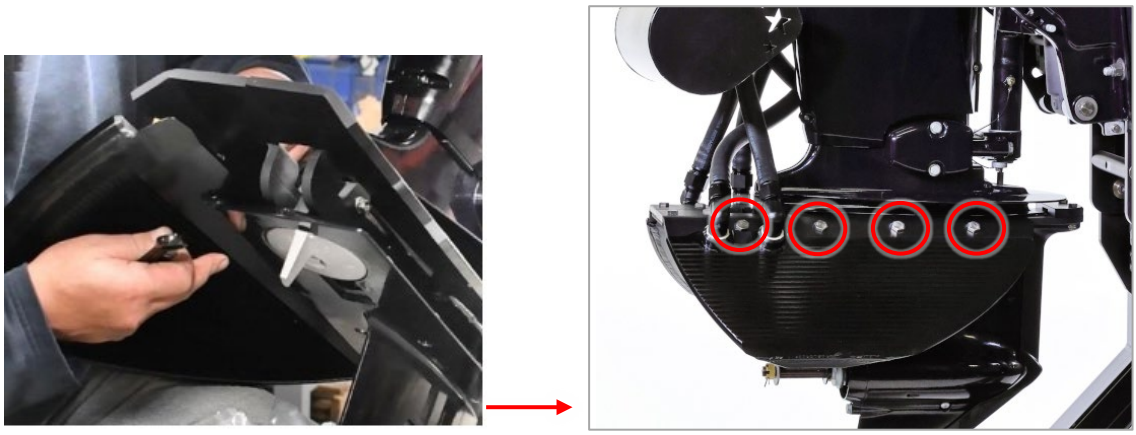
15. Install the front tie plate. Insert the 2 bolts and washers. Tighten with nuts.



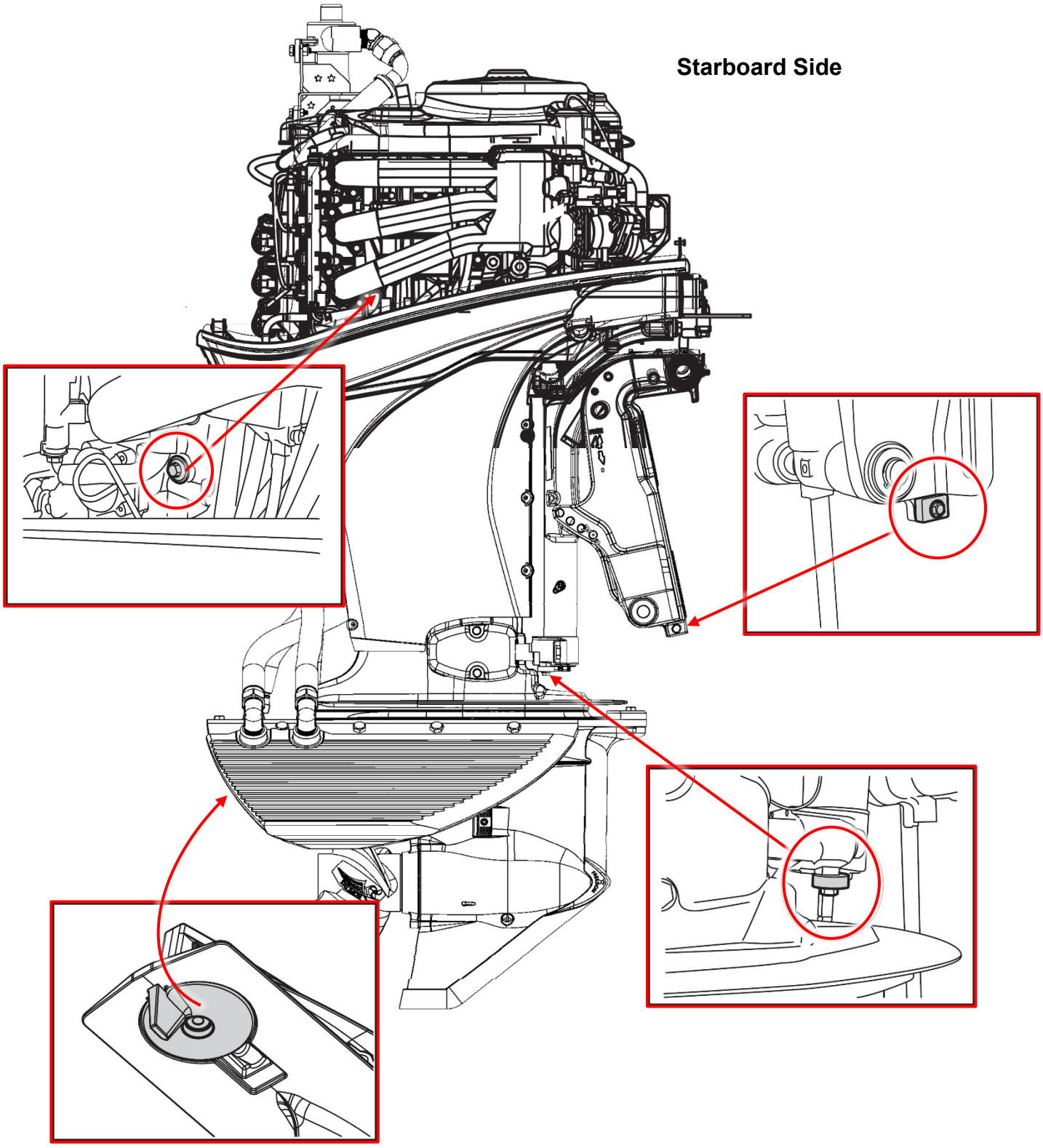
16. If Hoses are still connected, lower each fin exchanger and secure with bolts and nuts.

    If hoses were disconnected, see *Replacing Coolant Hoses and Fittings* pg. *5-21* for reconnect.

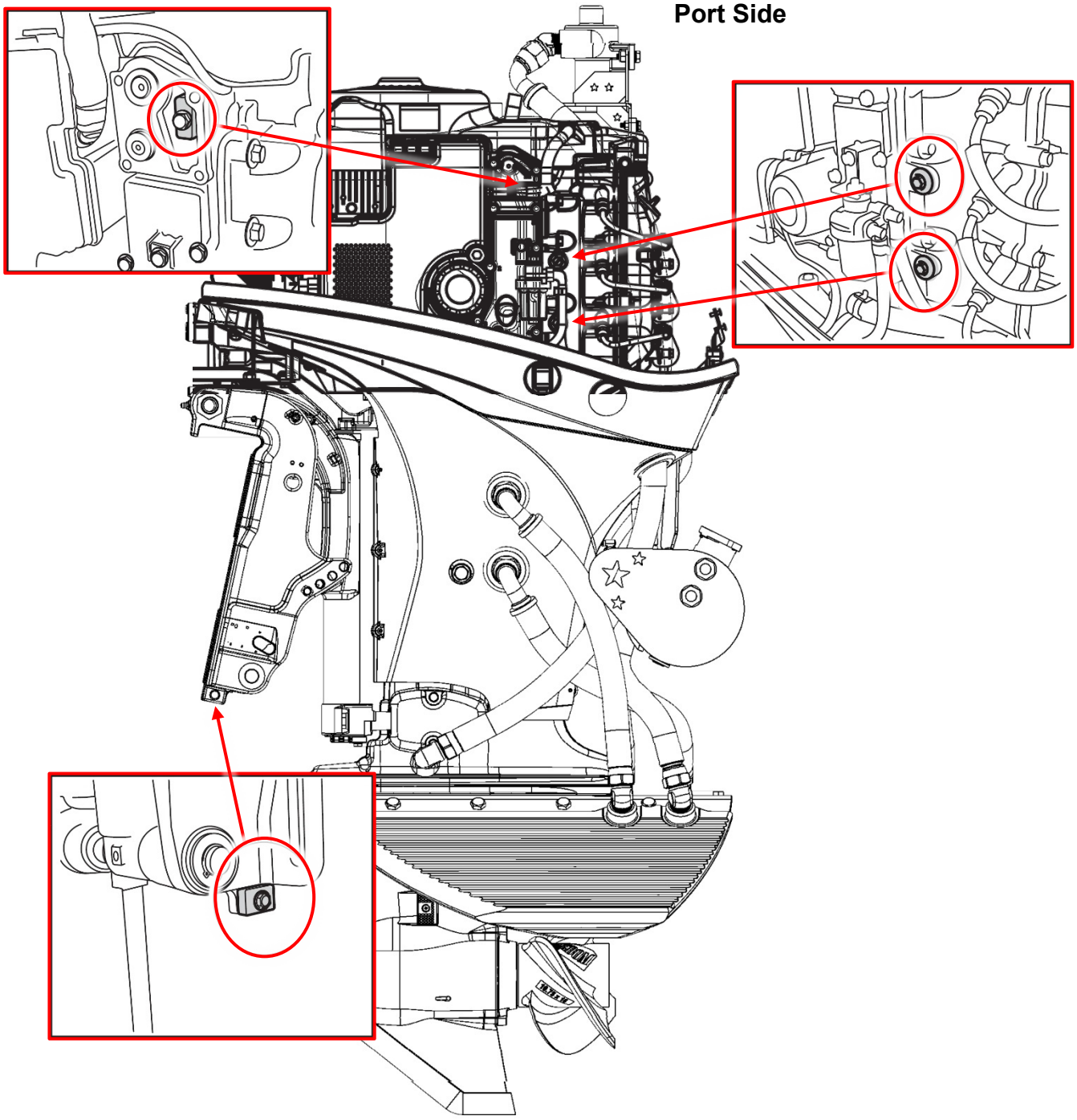
    Note: If hoses were removed and coolant drained, coolant must be refilled. See *Initial Fill of Coolant* pg. *5-4*.



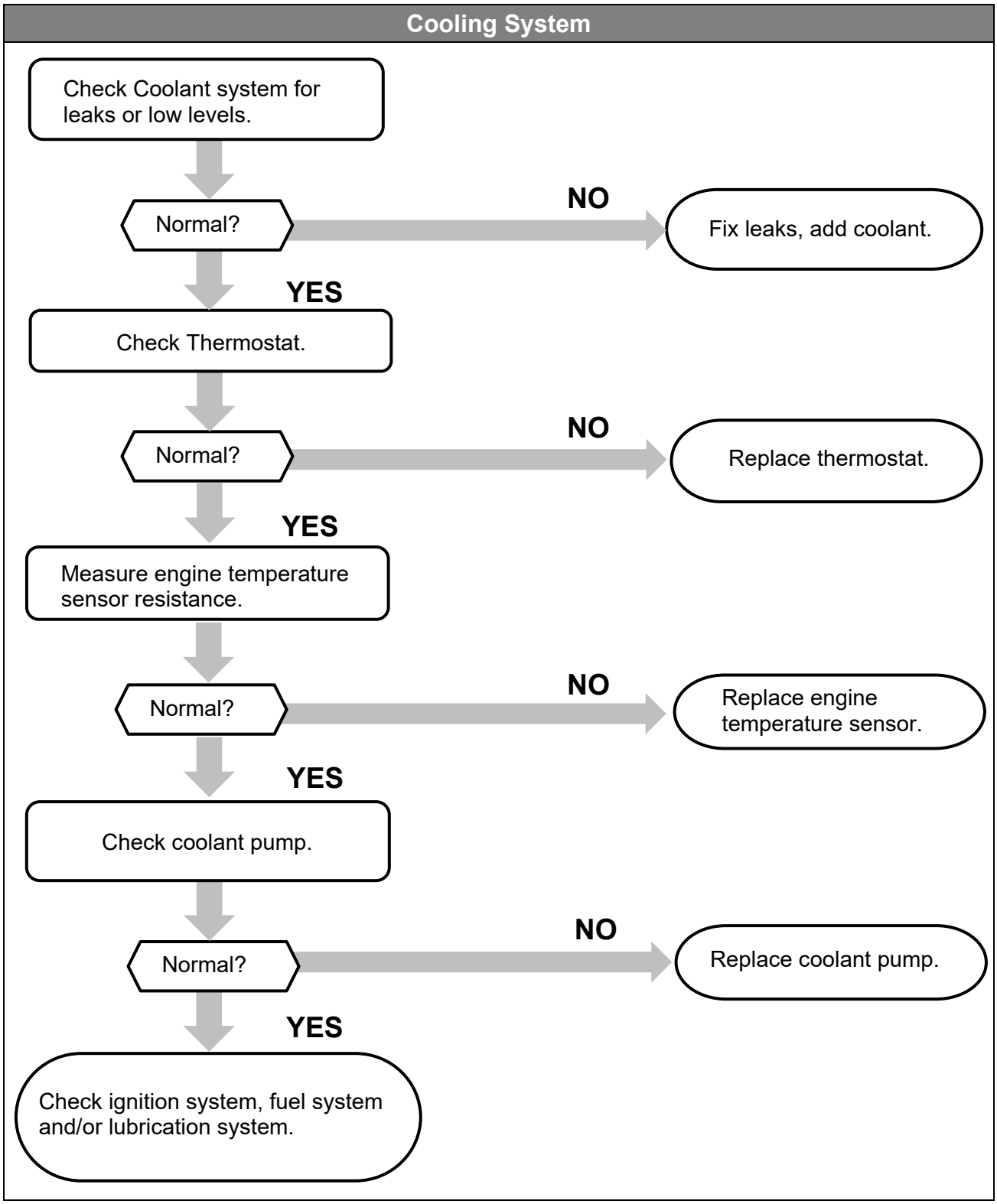
Anode Inspection



Port Side



Troubleshooting – State 2 – Cooling System



6. Parts List

Item No.	Part Number	Description	Total Qty.	Note
1	FA0001-00-00	Altered Cowling Cover	1	
2	FA0002-00-00	Altered Cowling Cover Trim	1	
3	FA0005-00-00	Altered Mid-Section Cover	1	
4	FA0006-00-00	Altered Belt Cover	1	
5	FM0015-00-00	Pump Adapter Hub	1	
6	FM0056-00-00	Adapter Hub Dowel	2	
7	FM0153-00-00	Fin Bracket – Right	1	
8	FM0155-00-00	Inlet Adapter	1	
9	FM0156-00-00	Inlet Pipe	1	
10	FM0167-01-00	Bumper	1	
11	FM0168-00-00	Bumper Keeper	1	
12	FM0173-00-00	Fin Bracket – Left	1	
13	FM0178-00-00	Fin Bracket Spacer	2	
14	FM0186-00-00	Outlet Plate	1	
15	FM0232-00-00	Through Wall Adapter	1	
16	FM0418-02-00	Tank	1	
17	FM0419-00-00	Pump Mount	1	
18	FM0420-00-00	Right Fin	1	
19	FM0421-00-00	Left Fin	1	
20	FM0422-00-00	Exhaust Shroud	1	
21	FM0423-00-00	Exhaust Foot Plate	1	
22	FM0622-00-00	Coupling Spider	1	
23	FM0743-00-00	Finger Guard	1	
24	FM0817-00-00	Exhaust Gasket	1	DO NOT reuse
25	FM0818-00-00	Gasket	1	DO NOT reuse
26	FM2017-00-00	Front Tie Plate	1	
27	FM2018-00-00	Fin Tie Plate	1	
29	FB0311-00-00	L/J – L090 Hub 5/8” Bore	1	
30	FB0421-00-00	M10-1.25 x 50mm JIS Bolt	4	Replace all 4
31	FB0373-00-00	Prop Hub Kit	1	
32	FB0153-00-00	High-Temp EPDM O-Ring 3/32”	1	DO NOT reuse
33	FB0210-00-00	Worm Clamp SS 7/35” to 5/8”	4	
34	FB0140-00-00	Low Pressure Aluminum Plug Hex Drive 3/8” NPT	1	
35	FB0141-00-00	90º Elbow ¼” Hose ID 3/8 NPT Male	1	

Item No.	Part Number	Description	Total Qty.	Note
36	FB0292-00-00	Grommet ¾" Hole Diameter 3/32" Thickness ½" ID	1	
37	FB0291-00-00	1/4-20 x ½" Alloy Steel Cup-Point Set Screw	1	
38	FB0155-00-00	M5-0.08 x 18mm SS Hex Head Bolt	1	
39	FB0154-00-00	M6-1.00 x 22mm SS Hex Head Bolt	8	
40	FB0147-00-00	M6-1.00 x 60mm SS Hex Head Bolt	1	
41	FB0203-00-00	M8-1.25 x 25mm SS Hex Head Bolt	10	
42	FB0345-00-00	M8-1.25 x 35mm SS Hex Head Bolt	2	
43	FB0378-00-00	M10-1.5 x 35mm SS Hex Head Bolt	8	
44	FB0157-00-00	M6-1.00 SS Nylon-Insert Locknut	3	
45	FB0204-00-00	M8-1.25 SS Nylon-Insert Locknut	8	
46	FB0182-00-00	M10-1.50 SS Nylon Insert Locknut	8	
47	FB0151-00-00	M8-1.25 x 35mm SS Hex Drive Flat Head Screw	2	
48	FB0381-00-00	M5 SS Split Lock Washer	1	
49	FB0356-00-00	M6 SS Split Lock Washer	5	
50	FB0344-00-00	M8 SS Split Lock Washer	4	
52	FT0005-01-00	Shark Fin	1	
53	FB0416-00-00	Sight Glass	2	
54	FB0139-00-00	Dayton ¾" Pump	1	
55	FB0212-00-00	Radiator Cap	1	
56	FP0001-00-00	Prop #11.25 x 16	1	
58	FB0375-00-00	Pump Hub Spacer	1	
59	FB0723-00-00	Foam Rubber Seal	7 ft.	
60	FB0422-00-00	M10 SS Flat Washer	1	
61	FB0414-00-00	2" Rubber Grommet	4	
62	FD0004-00-40-WT FD0004-00-50-WT FD0004-00-60-WT	40-50-60HP Cowling Decals	1	Specific standard or camo
63	FD0007-00-60-BK	Serial Number Decal	1	
64	FD00011-00-60-BD	Warranty Decal	1	
65	FD0012-00-60-BD	Break-In Tag Decal	1	
66	FD0013-00-60-BD	Fuse Decal	1	
67	FB3002-01-00	40-60HP Hose Kit	11	All hoses and adapters included

Item No.	Part Number	Description	Total Qty.	Note
68	FB0420-00-00	M10 Washer	2	
69	FB0350-00-00	24” x ¼” Hose	1	
70	FB0450-00-00	26.625” x ¾” Hose	1	
71	FB0451-00-00	14.75” x ¾” Hose	1	
72	FB0452-00-00	8.25” x ¾” Hose	1	
73	FB0453-00-00	40” x ¾” Hose	1	
74	FB0454-00-00	16” x ¾” Hose	1	
75	FB0455-00-00	9.75” x ¾” Hose	1	
76	FB0382-00-00	12 AN x ¾ NPT 45° Fitting	4	
77	FB0411-00-00	12 AN x ¾ MPT 90° Fitting	2	
78	FB0413-00-00	12 AN x ¾ MPT Straight Fitting	5	
79	FB0415-00-00	12 AN x ½ MPT 90° Fitting	1	