IMPORTANT INFORMATION

Section 1D - Mercury Jet Installation

1 D

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General Information

Notice to Installer

Throughout this publication, “Warnings” and “Cautions” (accompanied by the International Hazard Symbol) are used to alert the 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 service, plus “common sense” operation, are major accident prevention measures.

⚠ WARNING

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

⚠ CAUTION

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

IMPORTANT: Indicates information or instructions that are necessary for proper installation and/or operation.

This installation manual has been written and published by the service department of Mercury Marine to aid installers when installing the products described herein.

It is assumed that these personnel are familiar with the installation procedures of these products, or like or similar products manufactured and marketed by Mercury Marine. Also, that they have been trained in the recommended installation procedures of these products which includes the use of mechanics’ common hand tools and the special Mercury Marine or recommended tools from other suppliers.

We could not possibly know of and advise the marine trade of all conceivable procedures by which an installation might be performed and of the possible hazards and/or results of each method. We have not undertaken any such wide evaluation. Therefore, anyone who uses an installation procedure and/or tool, which is not recommended by the manufacturer, first must completely satisfy himself that neither his nor the product’s safety will be endangered by the installation procedure selected.

All information, illustrations, and specifications contained in this manual are based on the latest product information available at time of publication. As required, revisions to this manual will be sent to all OEM boat companies.

Torque Specifications

NOTE: *Tighten all fasteners, not listed, securely.*

10 mm Fasteners (Powerhead to Pump)	35 lb. ft. (47 Nm)
Reverse Stop Screw	120 lb. in. (14 Nm)
Forward Stop Screw	120 lb. in. (14 Nm)
Ride Plate-to-Pump Screws	75 lb. in. (8.5 Nm)
Pump Cover to Pump Housing Nuts	35 lb. ft. (47 Nm)

Installation Requirements

IMPORTANT: The M^2 Jet Drive is considered an INBOARD engine. The boat it is installed in must meet industry standards (ABYC, NMMA, etc.), federal standards and Coast Guard regulations for INBOARD engine installations

Battery/Battery Cables

IMPORTANT: Boating industry standards (ABYC, NMMA, etc.), federal standards and Coast Guard regulations must be adhered to when installing battery. Be sure battery cable installation meets the pull test requirements and that positive battery terminal is properly insulated in accordance with regulations.

IMPORTANT: Engine electrical system is negative (–) ground. It is recommended (required in some states) that battery be installed in an enclosed case. Refer to regulations for your area.

1. Select a battery that meets all of the following specifications:

FOR OPTIMAX ENGINES –

   a. 12-volt marine type.

   b. 1000 Marine Cranking Amps (MCA) or 750 Cold Cranking Amps (CCA) minimum.

   c. Reserve capacity rating of at least 105 minutes.

FOR Carbureted and EFI ENGINES –

   d. 12-volt marine type.

   e. 670 Marine Cranking Amps (MCA) or 520 Cold Cranking Amps (CCA) minimum.

   f. Reserve capacity rating of at least 100 minutes.

2. Select proper size positive (+) and negative (–) battery cables using chart. Battery should be located as close to engine as possible.

IMPORTANT: Terminals must be soldered to cable ends to ensure good electrical contact. Use electrical grade (resin flux) solder only. Do not use acid flux solder, as it may cause corrosion and a subsequent failure.

Cable Length	Cable Gauge
Up to 3-1/2 ft. (1.1 m)	4 (25mm^2)
3-1/2 - 6 ft. (1.1-1.8 m)	2 (35mm^2)
6 - 7-1/2 ft. (1.8-2.3 m)	1 (50mm^2)
7-1/2 - 9-1/2 ft. (2.3-2.9 m)	0 (50mm^2)
9-1/2 - 12 ft. (2.9-3.7 m)	00 (70mm^2)
12 - 15 ft. (3.7-4.6 m)	000 (95mm^2)
15 - 19 ft. (4.6 - 5.8 m)	0000 (120mm^2)

Boat Construction

IMPORTANT: All applicable U.S. Coast Guard regulations for INBOARD engines must be complied with when constructing engine compartment.

Care must be exercised in the design and construction of the engine compartment. Seams must be located so that any rain water or splash, which may leak through the seams, is directed away from the engine and its air intake. Also, the passenger compartment drainage system should not be routed directly to the engine compartment. **Water that runs on or is splashed in the air intake may enter the engine and cause serious damage to internal engine parts.**

IMPORTANT: Mercury Marine will not honor any warranty claim for engine damage as a result of water entry.

Engine Compartment Ventilation

Engine compartment must be designed to provide a sufficient volume of air for engine breathing and also must vent off any fumes in engine compartment in accordance with industry standards (ABYC, NMMA, etc.), federal standards and U.S. Coast Guard regulations for inboard engines. Pressure differential (outside engine compartment versus inside engine compartment) should not exceed 2 in. (51mm) of water (measured with a manometer) at maximum air flow rate.

Engine Compartment Specifications	
Engine Air Requirements at Wide Open Throttle	Physical Engine Volume*
552 ft.^{3}/min. (0.260 m^3/sec.)	1.41 ft.^{3} (40.4 L)

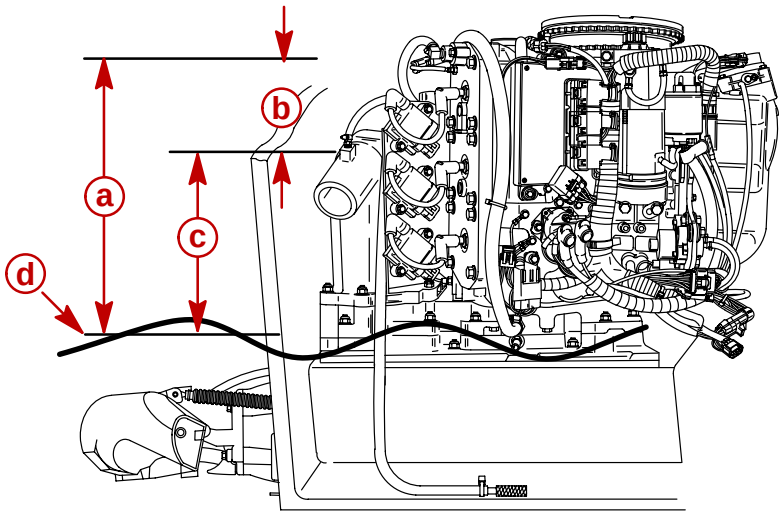
* Physical engine volume is used in flotation calculations and is representative of the amount of flotation the engine provides.

For serviceability, it is recommended that an additional 6 inches minimum (152 mm) (per side) of clearance be allowed between powerhead and engine compartment walls.

Exhaust System

IMPORTANT: It is the responsibility of the boat manufacturer, or installing dealer, to properly locate the engine. Improper installation may allow water to enter the expansion chamber and combustion chambers and severely damage the engine. Damage caused by water in the engine will not be covered by Mercury Marine Limited Warranty, unless this damage is the result of defective part(s).

The engine must be properly located to ensure that water will not enter the engine through the exhaust system. Determine the correct engine height by taking measurements (a) and (b), with boat at rest in the water and maximum load aboard. Subtract (b) from (a) to find (c). If (c) is less than specified in chart, boat construction must be altered to properly lower waterline relative to exhaust chamber.



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a - From Waterline to Top of Transom
b - From Highest Point on Expansion Chamber to Top of Transom
c - (a) minus (b) = (c)
d - Waterline at Rest (at Maximum Load)

Model	c = (a) minus (b)
Jet Drive	(c) must be 8 in. (203 mm) or more.

Fuel Delivery System

⚠ WARNING

Boating standards (NMMA, ABYC, etc.), federal standards and U. S. Coast Guard regulations for INBOARD engines must be adhered to when installing fuel delivery system. Failure to comply could result in severe personal injury or death.

⚠ CAUTION

Remove plastic plug from fuel inlet fitting. Attach fuel line to fuel fitting with U.S. Coast Guard approved hose clamp. Inspect for fuel leaks.

1. Fuel pickup should be at least 1 in. (25 mm) from the bottom of the fuel tank to prevent picking up impurities.
2. Fuel lines used must be U.S. Coast Guard approved (USCG type A1). Fittings and lines must not be smaller than 5/16 in. (8 mm) I.D.

3. On installations requiring long lines or numerous fittings, larger size lines should be used.
4. Fuel line should be installed free of stress and firmly secured to prevent vibration and/or chafing.
5. Sharp bends in fuel line should be avoided.
6. A flexible fuel line must be used to connect fuel line to engine fuel pump to absorb deflection when engine is running.
7. A primer bulb is not necessary with this application. If a primer bulb is used, it must be U.S. Coast Guard approved for inboard engine installations.
8. Vapor separator must be vented to fuel tank. Vent hose must comply with U.S. Coast Guard/ABYC regulations.

Instrumentation

⚠ CAUTION

If a fused accessory panel is to be used, it is recommended that a separate circuit (properly fused) be used from the battery to the fuse panel with sufficient wire size to handle the intended current load.

NOTE: *Check the charging capability of the engine. The electrical load of the boat should not exceed this capacity.*

We recommend the use of Quicksilver Instrumentation and Wiring Harness(es). Refer to “Quicksilver Accessories Guide” for selection.

If other than Quicksilver electrical accessories are to be used, it is good practice to use waterproof ignition components (ignition switch, lanyard stop switch, etc.). A typical jet boat of this nature will see water splashed on these components. Therefore, precautions must be taken to avoid ignition failure due to shorting out of ignition components.

⚠ WARNING

Sudden stopping of engine (shorting ignition components) while boat is underway will cause loss of steering control due to loss of thrust. This loss of steering control may cause property damage, personal injury or death.

A warning horn must be incorporated in the wiring harness (see wiring diagram) to alert the user of an overheat, low oil condition or oil pump failure.

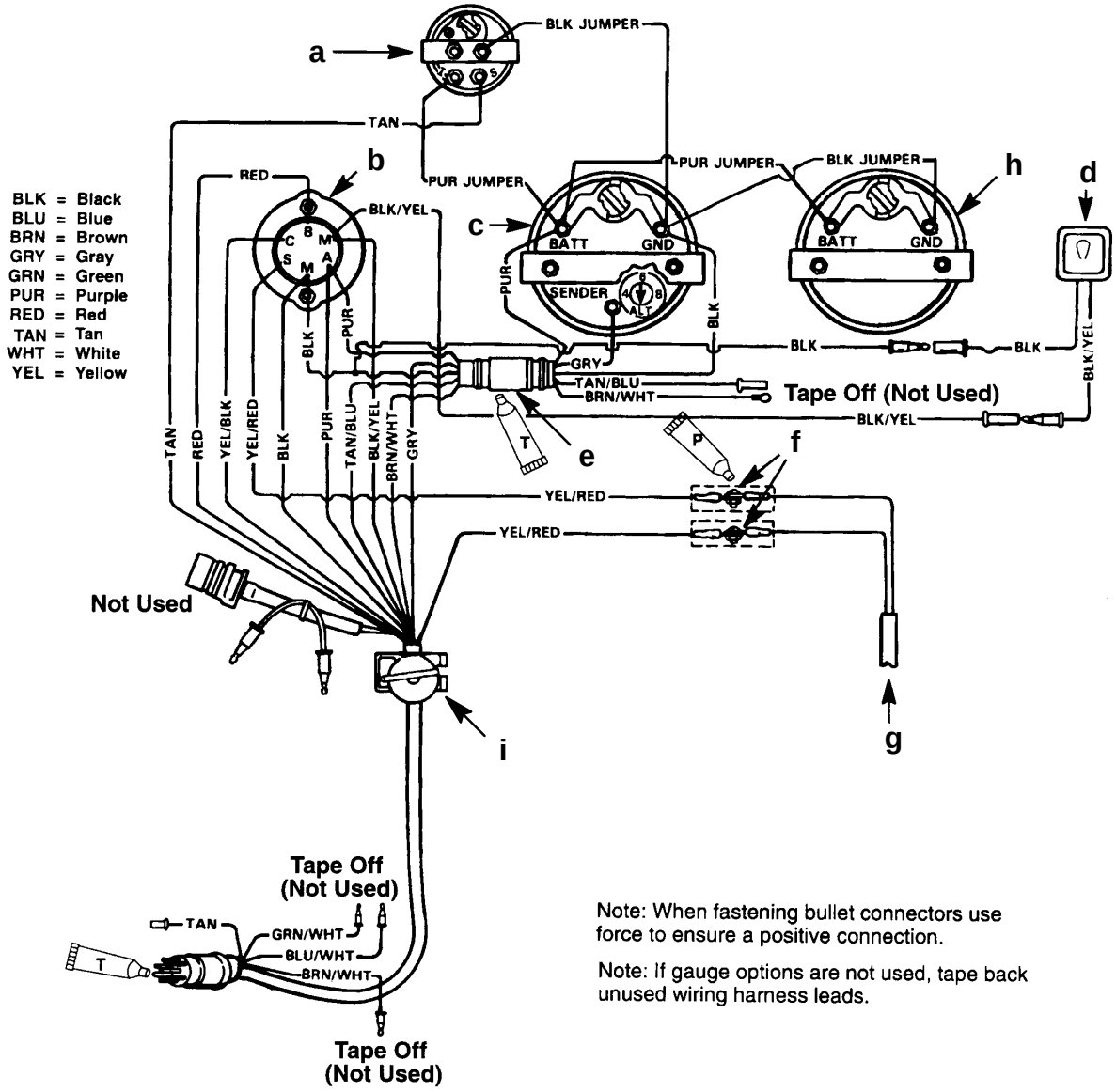
IMPORTANT: If a warning horn system is not installed by the boat manufacturer, Mercury Marine will not honor any warranty claims for engine damage as a result of overheating or lack of engine oil.

Route instrumentation wiring harness back to engine, making sure that harness does not rub or get pinched. If an extension harness is required, be sure to secure connection properly. Fasten harness(es) to boat at least every 18 in. (460 mm), using appropriate fasteners.

Wiring Diagrams

Quicksilver Instrumentation, Typical Analog Installation Shown

NOTE: *Refer to gauge manufacturer's instructions for specific connections.*



Note: When fastening bullet connectors use force to ensure a positive connection.

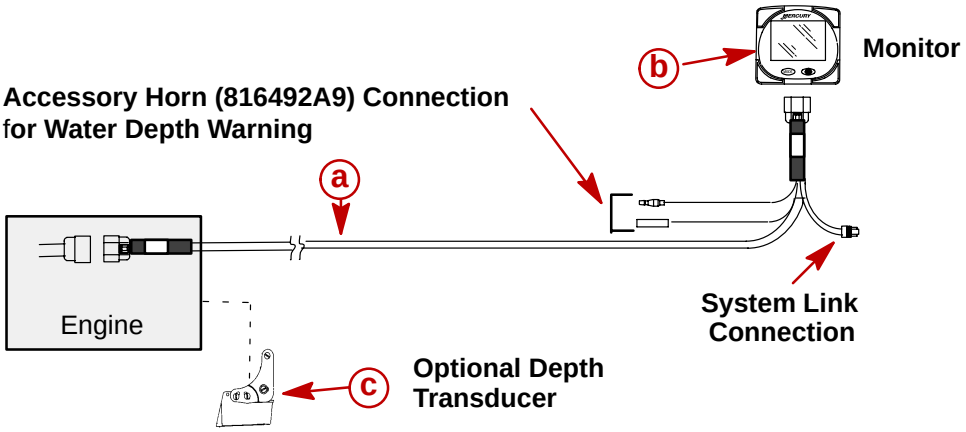
Note: If gauge options are not used, tape back unused wiring harness leads.

a - Temperature Gauge
b - Key Switch
c - Tachometer Gauge
d - Emergency Stop Switch
e - Tachometer Harness (P/N 84-86396A8) (Not Included With Key/Choke Harness Kit)
f - Connect Wires Together With Screw and Hex Nut (2 Places) Apply Quicksilver Liquid Neoprene to Connections and Slide Rubber Sleeve Over Each Connection.
g - To Neutral Start Safety Switch In Remote Control Box
h - Speedometer Gauge
i - Overheat/low oil horn

P Liquid Neoprene

T Dielectric Grease

SmartCraft System Monitor – Model Year 2001 and Newer



Ref.	Part Number	Description	Qty.
a	879982T_	Wiring Harness SC1000-2RSL (20,30 ft)	1
b	879896K2	System Monitor – Front Mount (Outboard Only)	1
b	879896K1	System Monitor – Rear Mount (Outboard Only)	1
b	879896K4	System Monitor 2 – Front Mount (All Models)	1
b	879896K3	System Monitor 2 – Rear Mount (All Models)	1
c	881931A1	Depth Transducer – Transom Mount	1
c	881932A1	Depth Transducer – In Hull	1
c	881933A1	Depth Transducer – Through Hull	1

Remote Control and Cables

The remote control must provide the following required features:

- Start-in-gear protection
- Neutral rpm limit at 2,000 rpm
  Note: This applies to dual lever remote controls as well as single lever remote controls.
- High strength mechanism to accommodate loads transmitted to the remote control
- Shift cable travel of 3 inches ±1/8 inch (76 mm ±3 mm)
- Ability to use 40 series shift cable

The remote control must meet the above criteria as well as the design criteria outlined in the ABYC manual pertaining to Mini-Jet Boats (Standard P-23).

SHIFT CABLE

The shift cable to be used MUST MEET the following criteria:

- 40-Series Cable
- 40 Series bulkhead fitting at output end
- Allow for a minimum of 3 inches (76 mm) of travel.
- A means of attaching and locking the cable to the shift cable bracket (provided).
- Cable end at pump must allow for a 1/4 inch clevis pin and cotter pin (all provided) to connect cable to the reverse gate.
- Protected against water intrusion and/or corrosion as the cable end (at the pump) is submersed in water with the boat at rest.

The shift cable end (at the pump) is submersed in water. It should be sealed against water intrusion, protected against corrosion and be able to withstand the shift loads imparted on it by the reverse gate.

Follow shift cable adjustment procedure for proper adjustment.

THROTTLE CABLE

The throttle cable must have one end compatible with the control box. The other end must have Mercury style connectors.

Follow throttle cable adjustment procedures for proper adjustment.

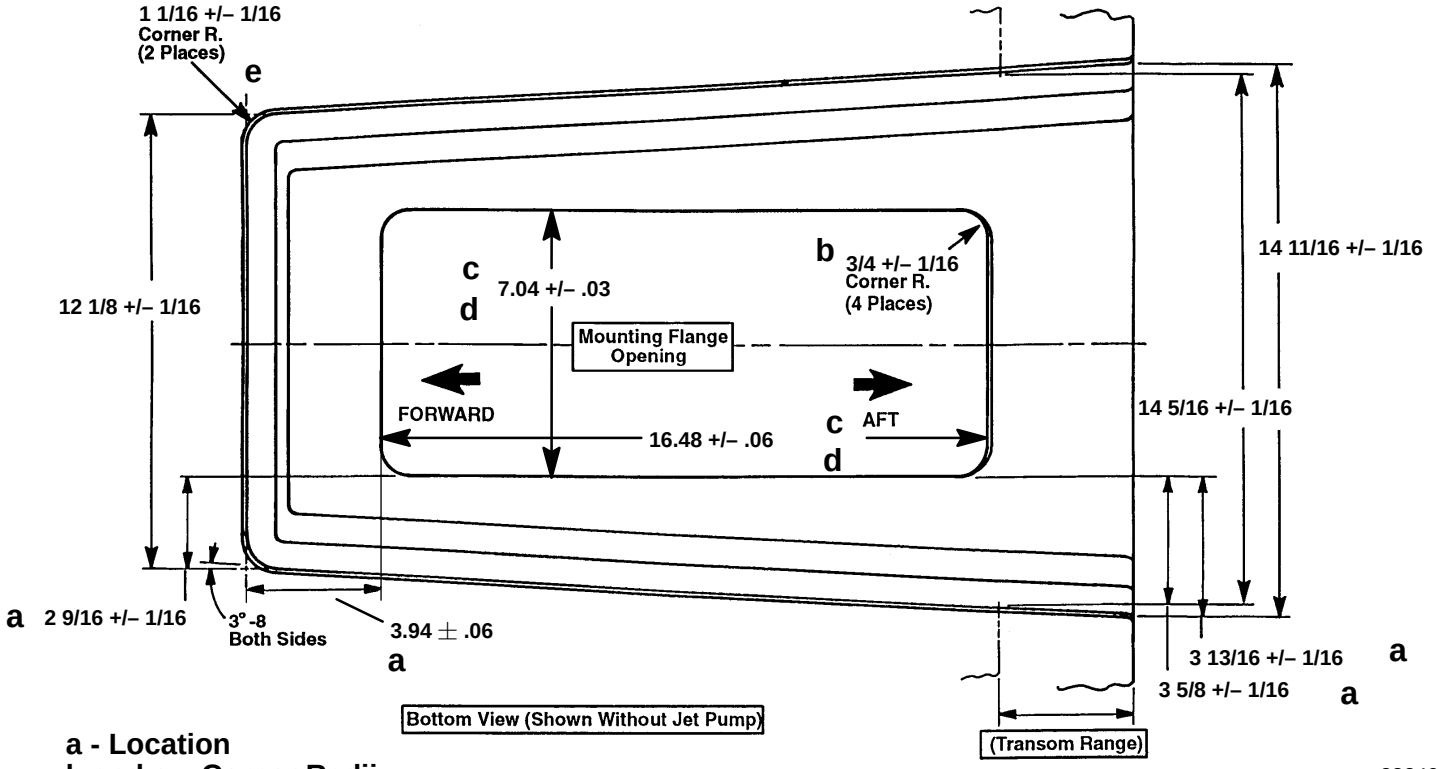
Mercury Jet Drive Hull Dimensions

HULL OPENING

The pump to powerhead opening in the hull is the most important factor to consider in a Jet Drive installation. There are four areas of concern:

1. Location (a) of the pump to powerhead hull opening relative to the boat bottom for proper ride plate seal fit.
2. Dimensional control of the opening - corner radii (b), straightness (c) and size (d) for proper grommet installation, and corner radii (e) for ride plate seal fit.
3. Flatness and thickness of the area around the hull opening for proper grommet sealing (see drawing on next page).
4. The hull opening must have a 0.125 inch radius on both the top and bottom corners all around the opening.

Tunnel Dimensions (in inches)



a - Location
b and e – Corner Radii
c and d - Size and Straightness

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Steering Helm and Cable

STEERING HELM

The steering helm must limit steering cable travel to 3.50 ± .10 inches (88.9 ± 2.5 mm).

⚠ WARNING

Failure to limit steering cable travel at the helm could pre-load the cable resulting in premature failure of a steering component causing loss of steering. This loss of steering could cause property damage, personal injury or death.

STEERING CABLE

The steering cable to be used MUST MEET the following criteria:

- 60 Series Steering Cable
- 60 Series bulkhead fitting at output end
- Allow for a minimum of 3.75 inches (95.3 mm) of travel.
- Cable end at pump must allow for a 5/16 in. threaded adaptor shouldered thru-bolt and lock nut to connect the cable to the steering arm.
- A means of attaching and locking the cable to the steering cable bracket (provided).
- Protected against water intrusion and/or corrosion as the cable end (at the pump) is submersed in water with the boat at rest.
- The steering cable should be able to withstand the steering loads imparted on it by the rudder.

A locking tab is provided by Mercury to be used with the steering cable having threads and locknuts located 11.31 inches (287 mm) from cable end at pump with cable at center of travel.

Follow steering cable adjustment procedure for proper adjustment.

METHOD FOR CONTROLLING LOCATION AND SIZE

Mercury Marine recommends that the tunnel opening be done as a part of the manufacture of the tunnel. This will ensure consistency of location as well as size.

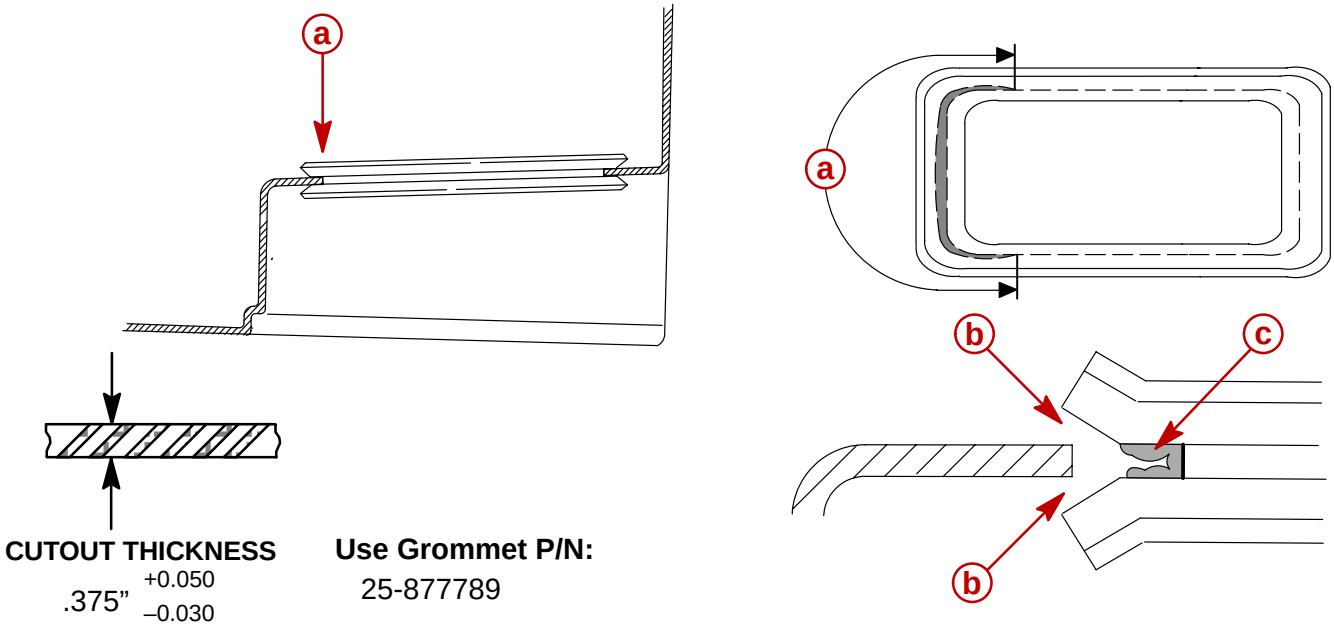
Installing Jet Pump

Hull Cutout

⚠ CAUTION

The hull opening dimensions are critical for proper sealing between Jet Pump and boat. Measure cutout thickness and overall dimensions before attempting a Jet Pump installation.

1. Install tunnel grommet in cut-out of boat by gluing front portion of grommet to tunnel with Loctite 454 or equivalent. Avoid gluing flexible sealing lips to tunnel.



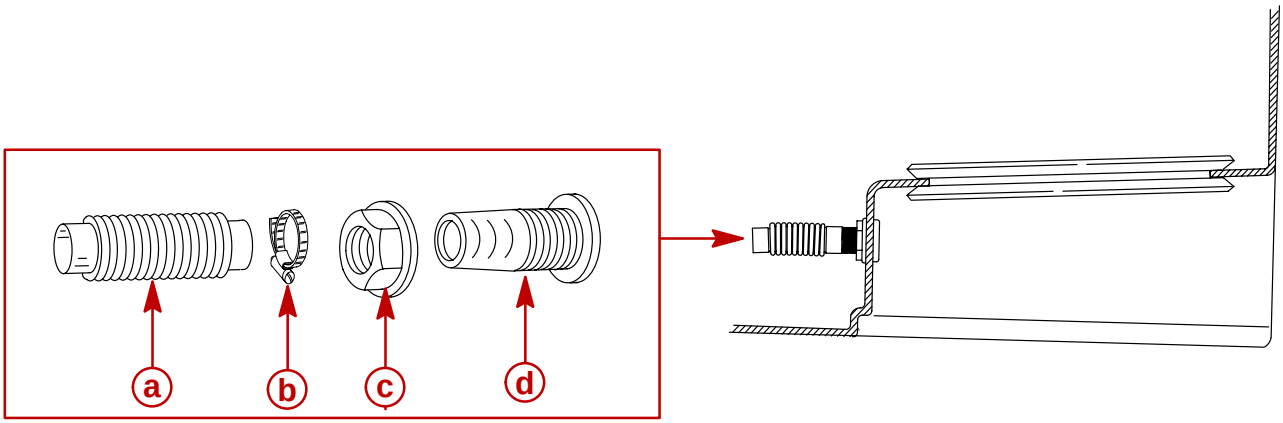
CUTOUT THICKNESS
.375" $^{+0.050}_{-0.030}$

Use Grommet P/N:
25-877789

a - Glue Front Portion of Grommet
b - Avoid Gluing Flexible Sealing Lips to Tunnel
c - Loctite 454

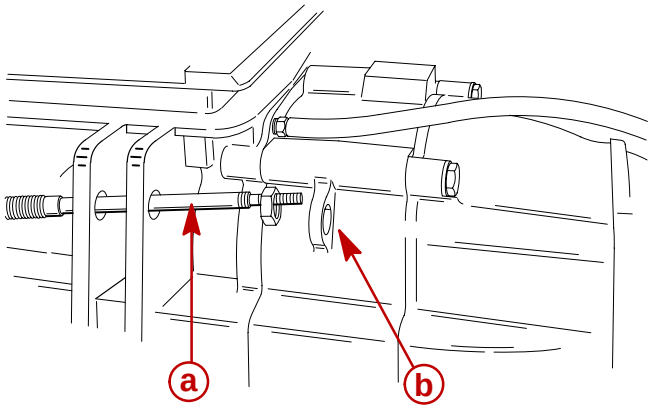
NOTE: *The procedure for gluing the grommet is not required for the following grommets:*
Part Number 820663–250 (1/4 in grommet)
Part Number 820663–375 (3/8 in grommet)
Part Number 882811 (3/8 in grommet)

2. Install steering and shift through hull bellows assemblies. Tighten securely.



a - Bellows
b - Clamp
c - Nut
d - Through Hull Fitting

3. Route steering cable through the through-hull fitting and bellows. Route steering cable through the port side hole in flange of pump housing. Install nut on shift cable before routing cable through wear ring.



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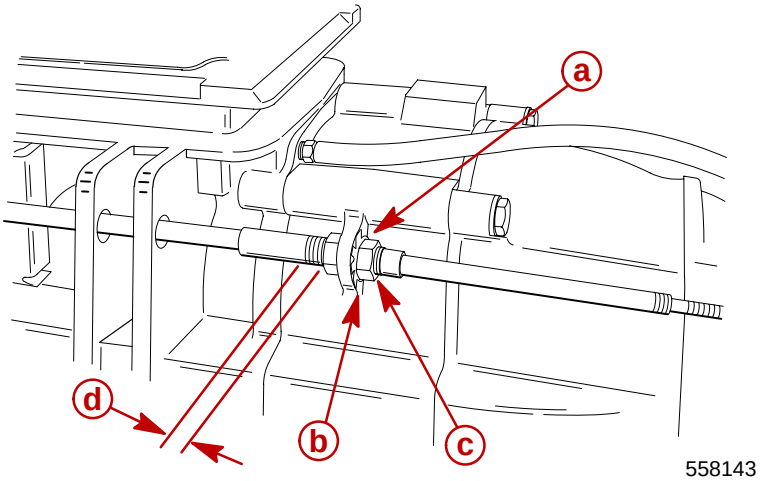
a - Steering Cable
b - Wear Ring

4. Install tab washer and nut on steering cable after guiding through wear ring. Locate tab washer in tab hole. Coarse cable adjustment is made using these nuts. Do not tighten until after final steering adjustment is made.



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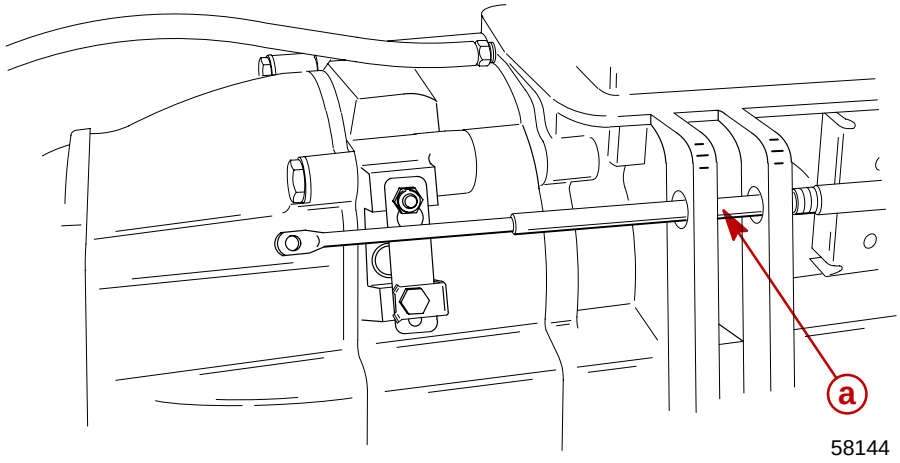
a - Tab Hole
b - Nut
c - Tab Washer
d - 0.25 in. (6.4mm)

5. Route shift cable through the through-hull fitting and bellows. Route shift cable through the starboard side hole in flange of pump housing.

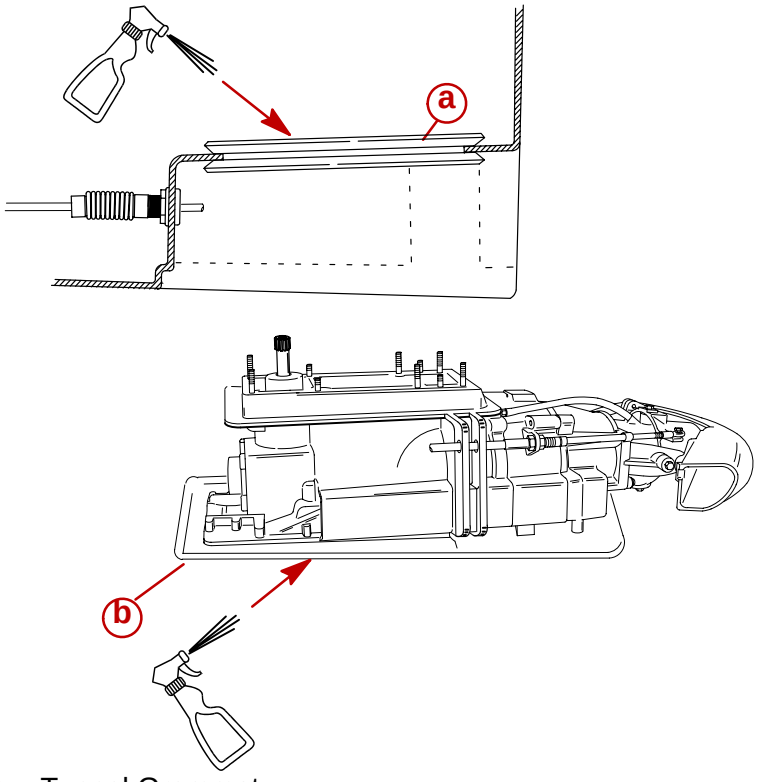


a - Shift Cable

IMPORTANT: Ensure that the shift lever in the control box is set for three (3) inches of travel.

NOTE: *It is easier to adjust the shift and steering cables before installing pump unit in boat.*

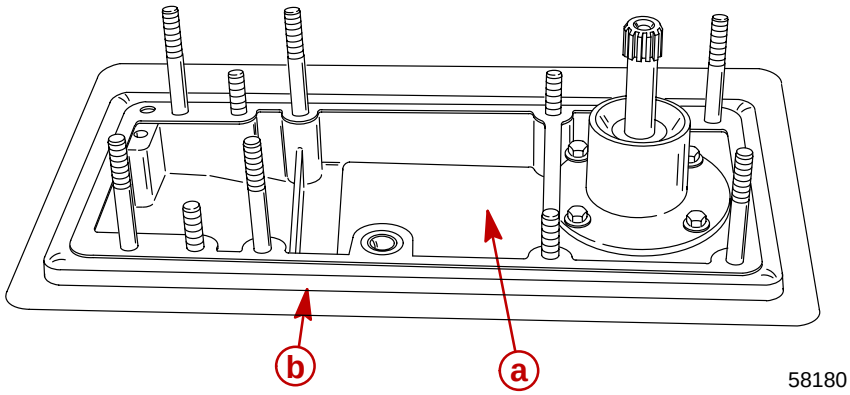
6. Spray soapy water on inside surface of tunnel grommet and ride plate seal.



a - Tunnel Grommet
b - Ride Plate Seal

NOTE: *When installing pump in tunnel, be sure cables are below tunnel grommet flange on pump to prevent pinching of cables between pump and boat.*

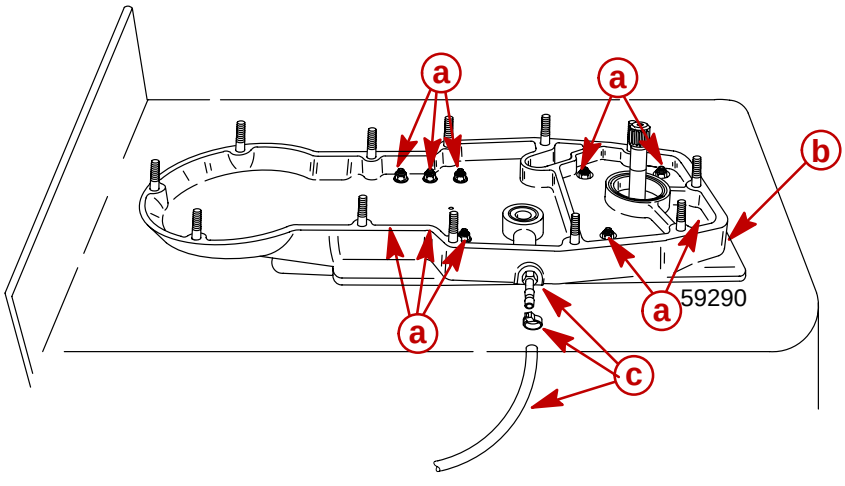
7. Install jet pump by pushing unit through opening in tunnel grommet. Ride plate seal should fit snug in boat tunnel without any gaps along perimeter.



a - Jet Pump
b - Tunnel Grommet

NOTE: *Before torquing fasteners, check ride plate seal for proper fit in tunnel.*

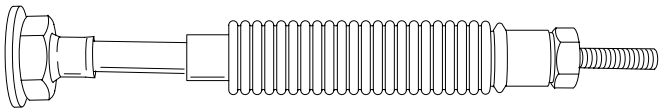
8. Install gasket, o-ring, and cover on jet pump. Align holes in cover with studs in housing and secure with ten (10) M10 x 1.5 nuts. Check ride plate seal for proper fit in tunnel and torque housing cover nuts to 35 lb. ft. (47 N m).
9. Check steering and shift cables for freedom of movement. Correct installation if cables are pinched.
10. Attach flush hose to fitting and secure with hose clamp. Failure to secure hose will allow water to fill boat. Refer to **Installation of Flushing Kit** for completion.



a - M10x1.5 Nuts (10)
b - Cover and Gasket
c - Attach Flush Hose to Fitting with Hose Clamp

Steering Cable Adjustment

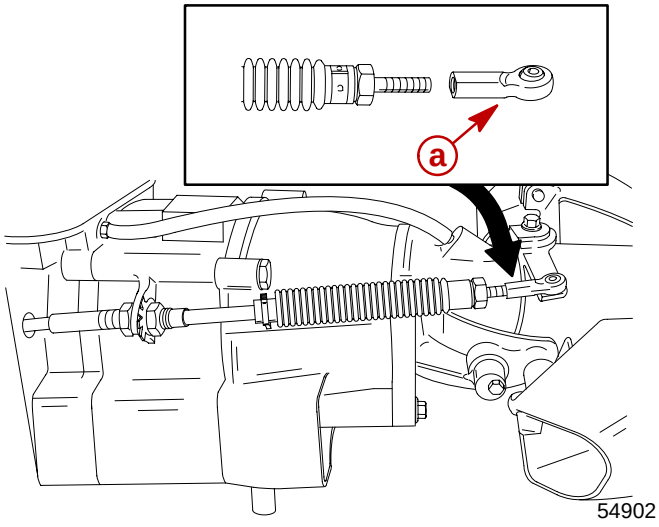
1. Slide bellows assembly over cable and thread on cable completely. Do not tighten.
2. Route cable thru-hull fitting after routing through bellows



3. Thread cable end adaptor on steering cable 14 turns (to allow for adjustment).

⚠ WARNING

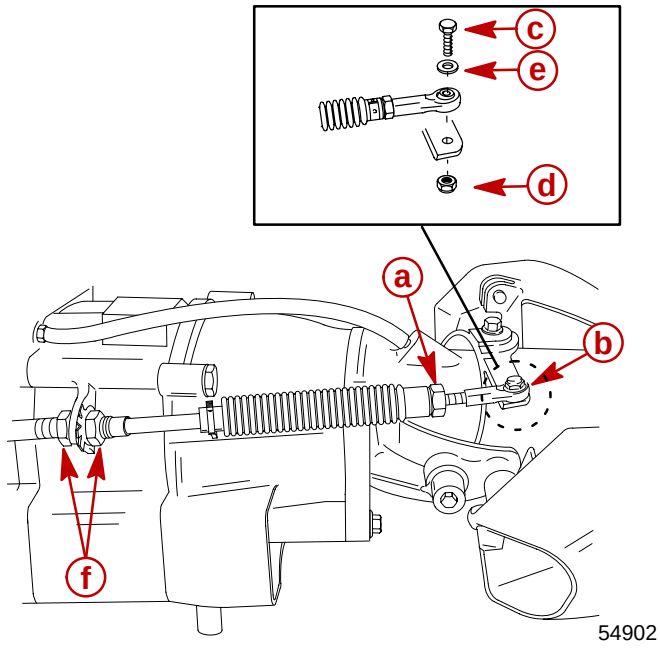
Cable end adaptor must be installed a minimum of nine (9) turns. Failure to install cable end adaptor on steering cable a minimum of nine (9) turns could result in loss of steering control of boat, personal injury, or death.



a - Cable End Adaptor

4. Center rudder assembly on nozzle.
5. Center steering wheel by turning wheel lock to lock and positioning wheel midway between locks.

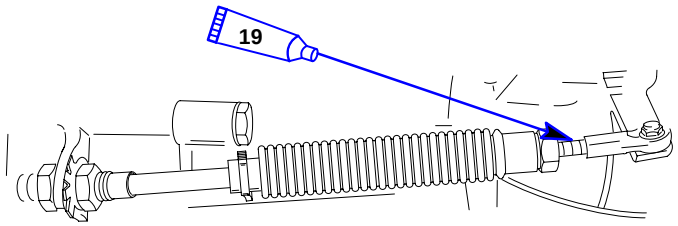
6. Adjust cable end adaptor until thru-hole in adaptor lines up with threaded hole in steering arm. This is the steering cable fine adjustment. Cable end adaptor **MUST** be installed on steering cable a minimum of nine (9) turns.
7. Attach steering cable to steering arm with bolt, washer and locknut. Torque nut to 70 lb. in. (7.9 Nm).



a - Bellows Nut
b - Steering Arm
c - Bolt
d - Lock Nut
e - Flat Washer
f - Cable Nuts

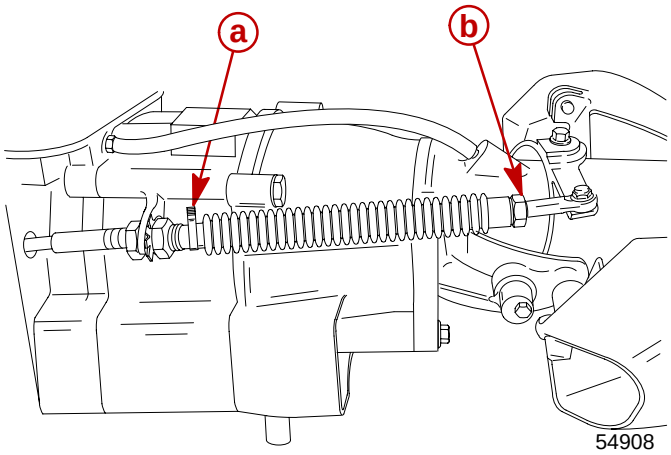
8. Tighten cable nuts.
9. Check steering adjustment to ensure that the helm limits cable travel for maximum left and right turns. Correct if required.
10. Secure cable nut with tab washer by bending a tab over flat of hex nut.

11. Apply perfect seal to end threads and cable conduit end.



19 Perfect Seal

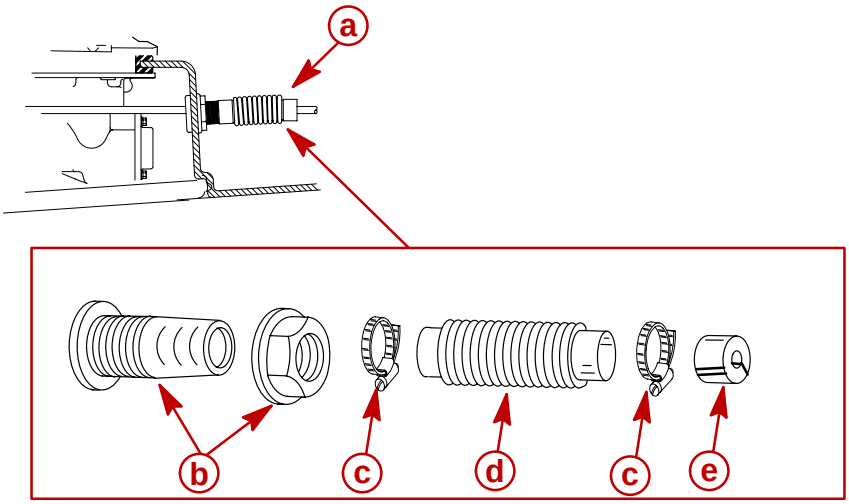
12. Turn bellows nut out and tighten against cable end adaptor.



a - Bellows Clamp
b - Bellows Nut Tight Against Jam Nut

13. Turn rudder to port to compress bellows as much as possible. Pull bellows over cable conduit and secure with bellows clamp.

14. Secure bellows to fitting with clamp. Slide slit adaptor over cable and push into bellows. Secure with clamp.

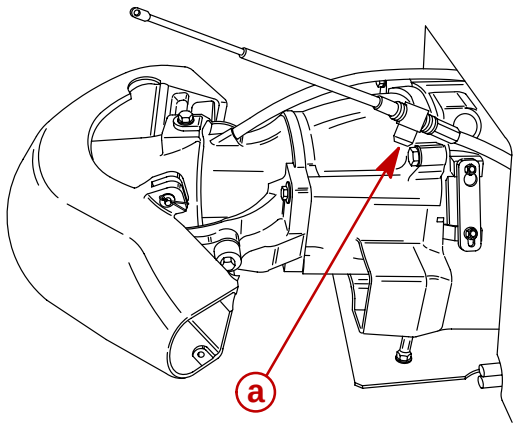


a - Steering Cable, Thru-Hull Fitting, and Bellows Assembly
b - Thru-Hull Fitting and Nut
c - Clamp
d - Bellows
e - Slit Adaptor

Shift Cable Adjustment

IMPORTANT: The shift cable MUST BE properly adjusted. The shift cable is adjusted so that the reverse gate is not pre-loaded against either the forward or reverse stop. Pre-load in either position may cause failure of the stop and/or premature wear of the shift cable or control box components. It may also cause stiffness of the throttle control.

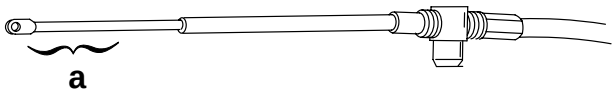
1. Thread the cable barrel onto the shift cable.



a - Cable Barrel

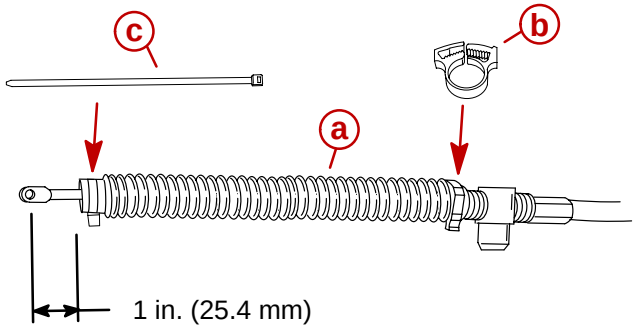
2. Use a de-greaser and clean off all oil film from the area shown on the shift cable.

NOTE: *Removing the oil film from the shift cable is necessary to prevent the bellows from sliding on the cable.*



a - Remove Oil Film From This Area

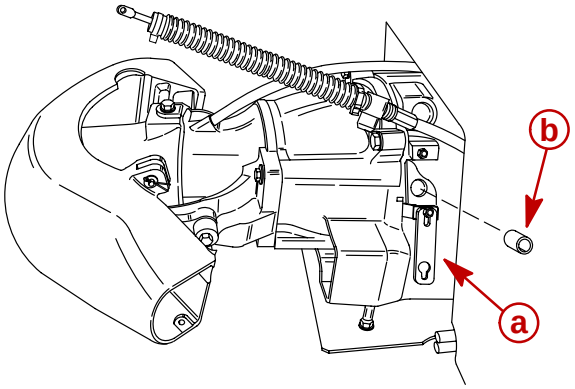
3. Slide the bellows over the shift cable end. Position and install the bellows onto the cable conduit as shown. Fasten ends with clamp and sta-strap.



a - Bellows
b - Clamp
c - Sta-Strap

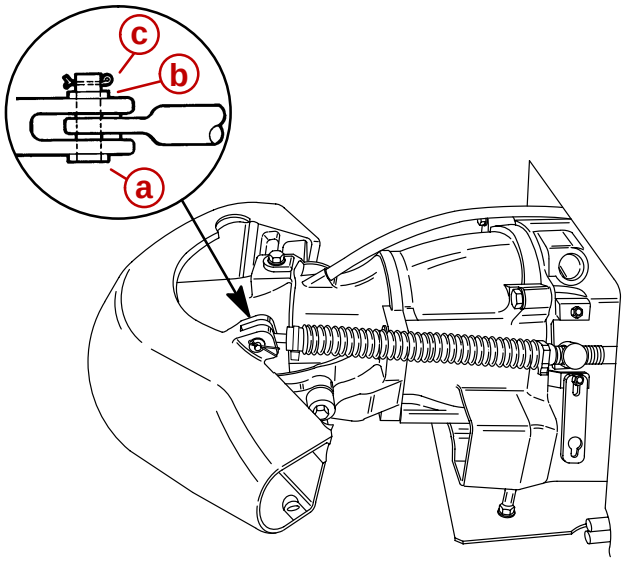
4. Loosen the locknuts and unfasten the top end of the shift cable retainer.

NOTE: *Locknuts do not have to be removed to open retainer.*



a - Shift Cable Retainer
b - Plastic Barrel Holder

5. Install shift cable end in slot of the reverse gate and secure with clevis pin, flat washer, and cotter pin. Bend over ends of cotter pin.



a - Clevis Pin
b - Flat Washer
c - Cotter Pin

⚠ WARNING

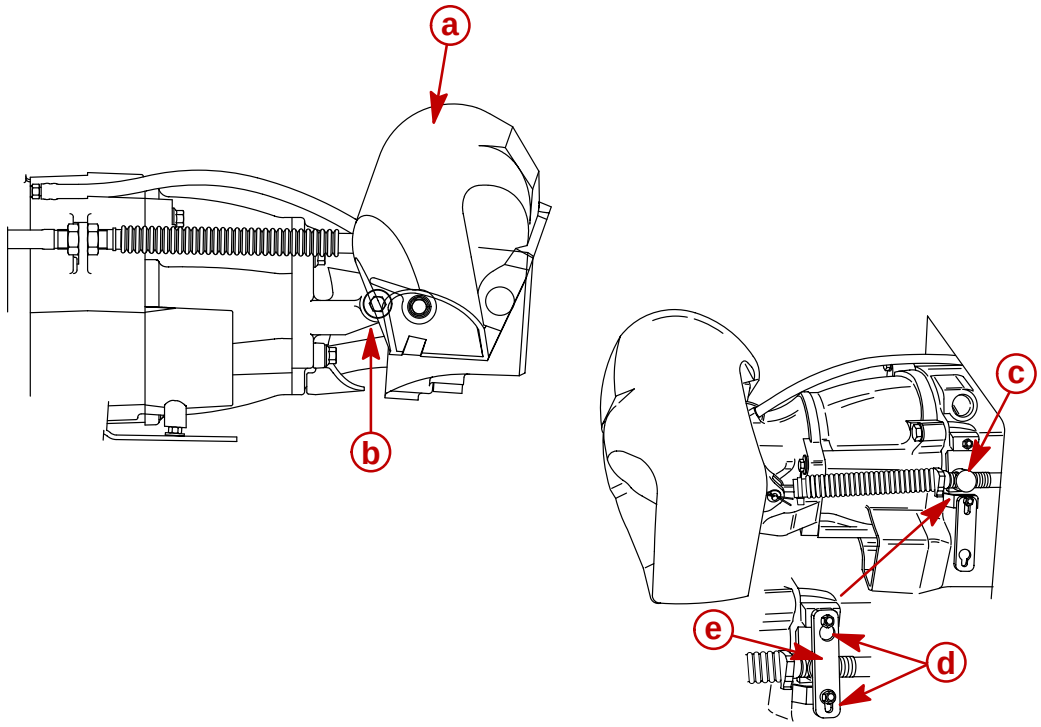
The shift cable must be adjusted correctly so that the reverse gate does not interfere with water flow coming out of the rudder. If the reverse gate hangs down into the water flow, a vibration may be felt in the control box. If this occurs, reduce throttle immediately and readjust the cable. Improper adjustment may result in pump damage including loss of the reverse gate. Failure to properly adjust the shift cable could result in loss of neutral and reverse, property damage, personal injury or death.

6. Adjust shift cable as follows:
   a. Position the control box into forward position.
   b. Position the reverse gate against the forward stop. With the reverse gate at this position, adjust the cable barrel to fit into the barrel holder with slight tension of the reverse gate against the stop.
   c. After adjusting the shift cable, secure the cable barrel in place with the shift cable retainer. Fasten the retainer by tightening both locknuts.

IMPORTANT: The shift cable retainer must be fastened with self locking nylon insert locknuts. These locknuts must never be replaced with common nuts (non locking) as they could vibrate off, freeing the shift cable to disengage.

⚠ WARNING

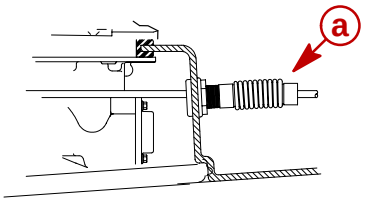
Disengagement of the shift cable can result in the boat suddenly shifting into reverse. This unexpected action could cause occupants to be thrown forward in the boat or to be ejected overboard. Serious injury or death could result.



a - Reverse Gate
b - Forward Stop
c - Cable Barrel
d - Locknuts
e - Shift Cable Retainer

7. Adjust the reverse stop (located on starboard side of the nozzle) so that the stop just touches the reverse gate with the control handle in reverse position. Torque reverse stop screw to 120 lb in. (14 Nm)
8. Check shift cable/reverse gate adjustment as follows:
   a. Shift the control box a few times from the forward position to reverse position.
   b. Return the control handle back to forward. Pull back on the reverse gate gently to take slack out of the cable. Check for the 3/8 to 1/2 in. clearance space between the reverse gate and rudder. If necessary, readjust the cable barrel.

9. Seal the thru-hull fitting to prevent any water leaks.



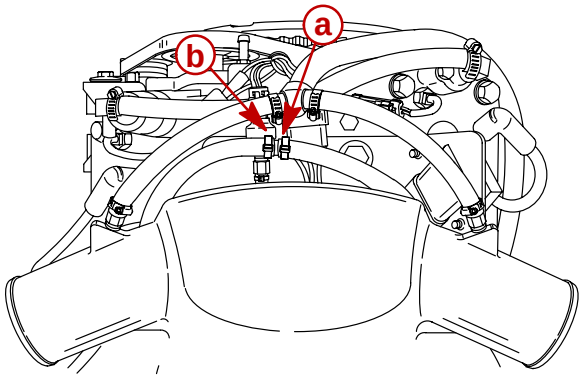
a - Steering Cable Thru-Hull Fitting

Bilge Siphon Feature

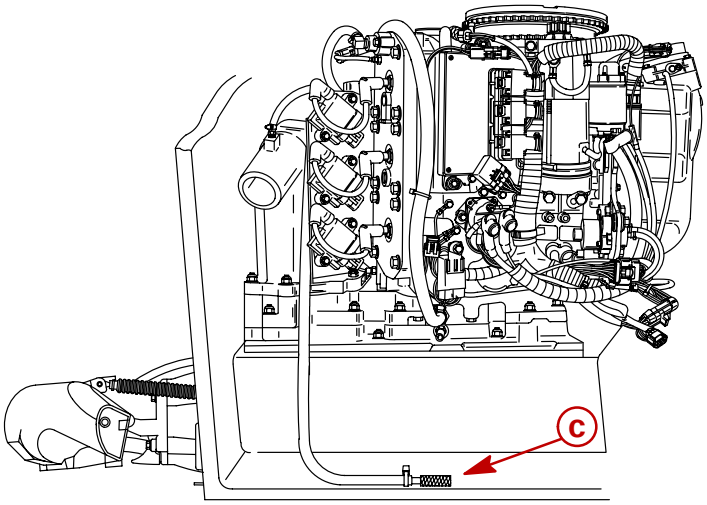
The Sport Jet incorporates an automatic bilge siphoning feature. The bilge siphon is working whenever the engine is running above idle speeds. Maximum performance of the bilge siphon is realized above 3,000 rpm. A hose is attached to the jet pump nozzle. The hose is routed to the engine compartment and placed in the bilge. Water exiting the nozzle creates a suction or vacuum in the hose creating the bilge siphon, drawing water out of the boat.

Installing Bilge Siphon

Uncoil siphon hose from exhaust manifold. Place siphon hose in bilge.



59210



59216

a - Siphon Break
b - Sta-Strap – Add Sta-Strap to secure hose
c - Pick Up Screen

The siphon break must be located above the water line at the highest point (sta-strap). The siphon break has a 0.020 in. hole which must be kept open.

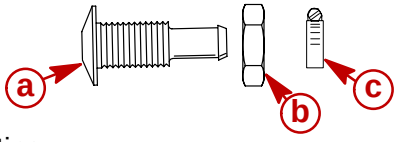
⚠ WARNING

Failure to locate siphon break above the water line and keep hole open could result in water entering the bilge through the siphon system causing property damage, personal injury or death.

Water By-Pass System

The water by-pass system is designed to improve powerhead cooling at idle speed.

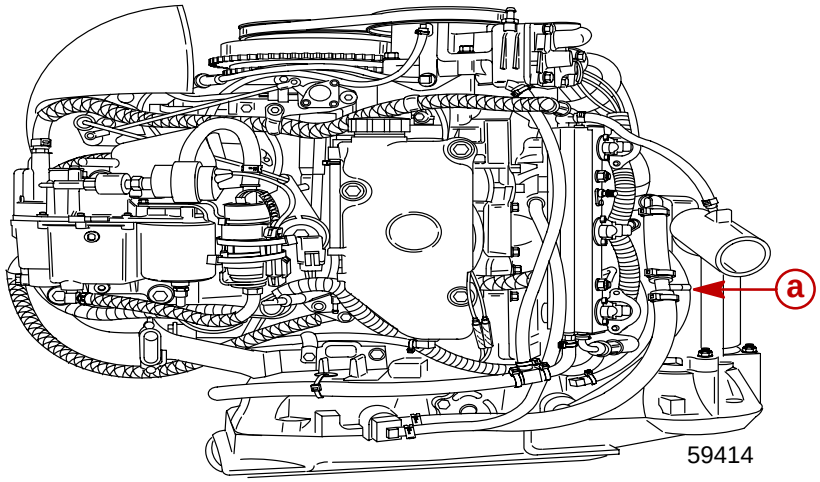
1. Locate the water by-pass components (provided).



a - Thru-Hull Fitting
b - Brass Nut
c - Hose Clamp

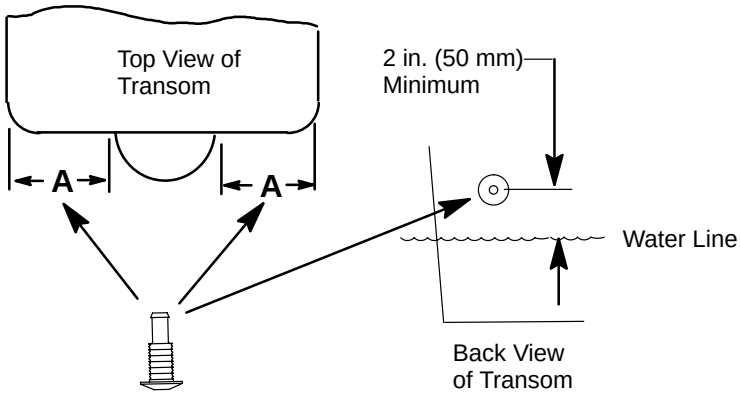
IMPORTANT: The thru-hull fitting must be correctly positioned in the boat transom as instructed in Step 3.

2. Install water hose (not supplied) to connect thru-hull fitting to bypass fitting on engine.



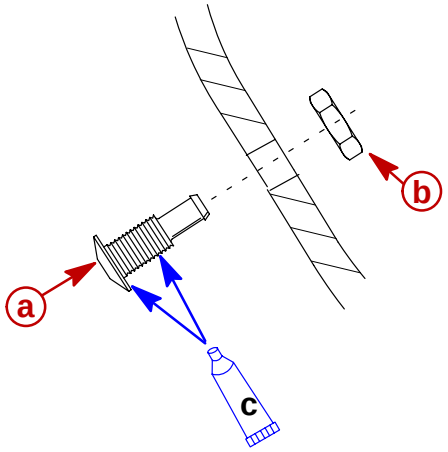
a - Water By-Pass Hose

3. Select the mounting location for the through-hull fitting as follows:



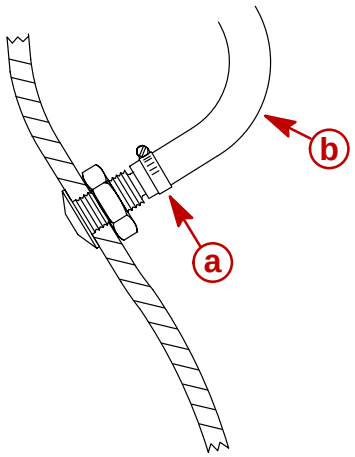
- The thru-hull fitting must be mounted in either side of the transom within the zones marked A.
- The thru-hull fitting must be located a Minimum of 2 in. (50 mm) above the water line when boat is at its maximum load capacity.
- The water by-pass hose must slope down towards the thru-hull fitting at a minimum rate of 1 in. (25 mm) drop per 12 inches (300 mm) of hose.
- The thru-hull fitting should be positioned so the water spray will be pointed downward.

4. After the location has been selected for the thru-hull fitting, drill a 9/16 in. (14.3 mm) diameter hole.
5. Apply Marine Sealer to entire length of threads and under the head of the thru-hull fitting. Fasten the fitting into the transom with the brass nut (provided).



a - Through-Hull Fitting
b - Brass Nut
c - Marine Sealer

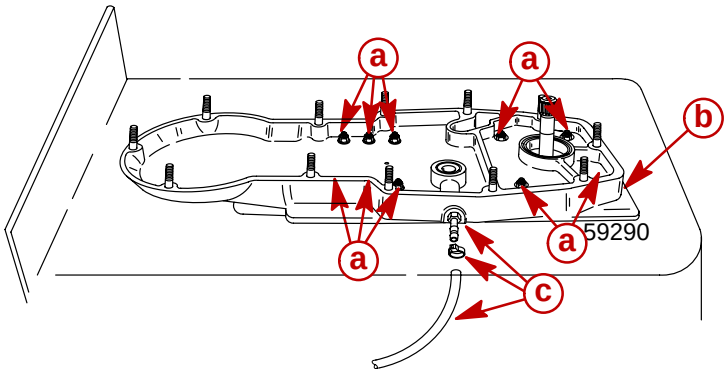
6. Connect the water by-pass hose to the thru-hull fitting with the hose clamp (provided). Make sure the hose slopes at a minimum rate of 1 in. (25 mm) drop per 12 inches (300 mm) of hose.



a - Hose Clamp
b - Water By-Pass Hose

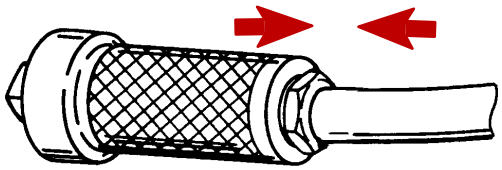
Installation of Flushing Kit

1. Attach flush hose to fitting and secure with hose clamp. Failure to secure hose will allow water to fill boat.



a - M10x1.5 Nuts (10)
b - Cover and Gasket
c - Attach Flush Hose to Fitting with Hose Clamp

2. Attach one end of hose to flush adapter. Secure with clamp as shown.

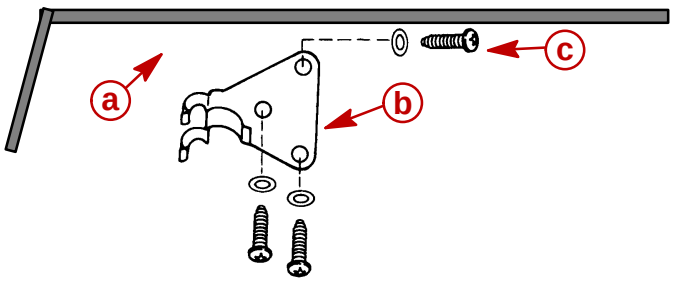


⚠ CAUTION

BEFORE mounting flush adapter bracket, route adapter and hose to selected mounting location. Hose routing MUST NOT INTERFERE with throttle and/or control linkage.

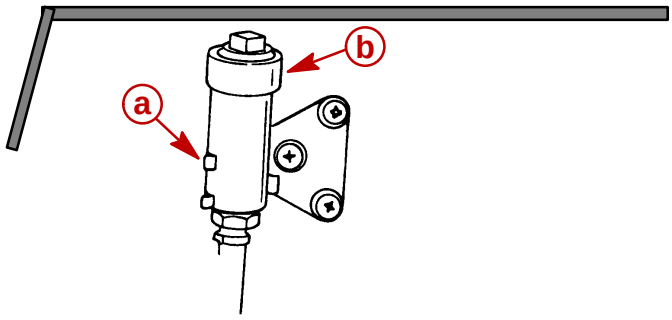
NOTE: *Mount flush adapter bracket in area of motor compartment that has mounting surface thicker than depth of mounting bracket screws.*

3. Locate area (easily accessible) within motor compartment to mount flush adapter bracket. Secure bracket to mounting surface with three screws supplied.



a - Mounting Surface
b - Bracket
c - Screw (3)

4. Snap flush adapter into bracket as shown.



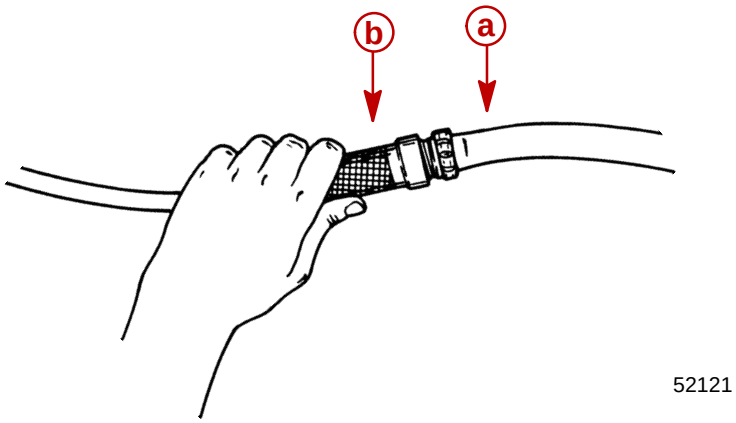
a - Bracket
b - Flush Adapter

Operation Instructions

⚠ WARNING

DO NOT run engine on flushing kit above idle speeds. Damage to engine from overheating, due to lack of water supply may occur.

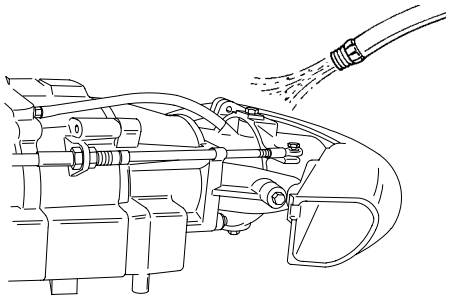
1. With **engine off**, remove flush adapter plug and attach water hose.



a - Flush Adapter
b - Water Hose

2. Turn water hose on and flush engine block for a minimum of ten minutes.
3. Remove water hose from flush adapter and install adapter plug. Tighten plug securely. Place flush adapter into adapter bracket.

4. Flush outer surfaces of water outlet nozzle.



Suggested Flushing Intervals

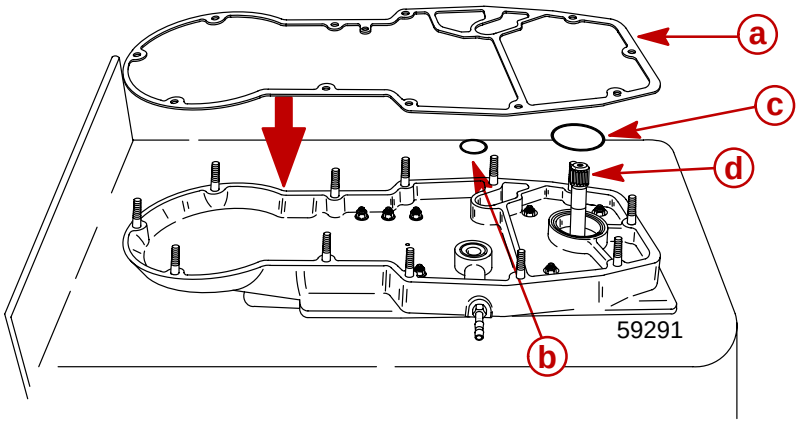
- After running jet in salt water environment
- Where boat was operated in shallow water or run aground.
- Overheat warning horn sounds (May be caused from accumulation of particles/debris in jet powerhead)

⚠ CAUTION

If any of the above conditions are not corrected with normal flushing of engine, it is recommended that the jet be taken to your authorized dealer for service.

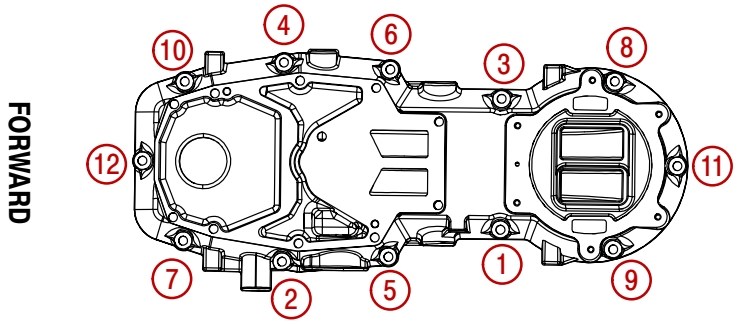
Installing Powerhead

1. Install gasket on drive housing cover. Ensure sealing bead is facing up towards drive housing cover.
2. Install two (2) O-rings.
3. Check that slinger is on drive shaft.
4. Lubricate drive shaft splines with Special Lubricant 101.



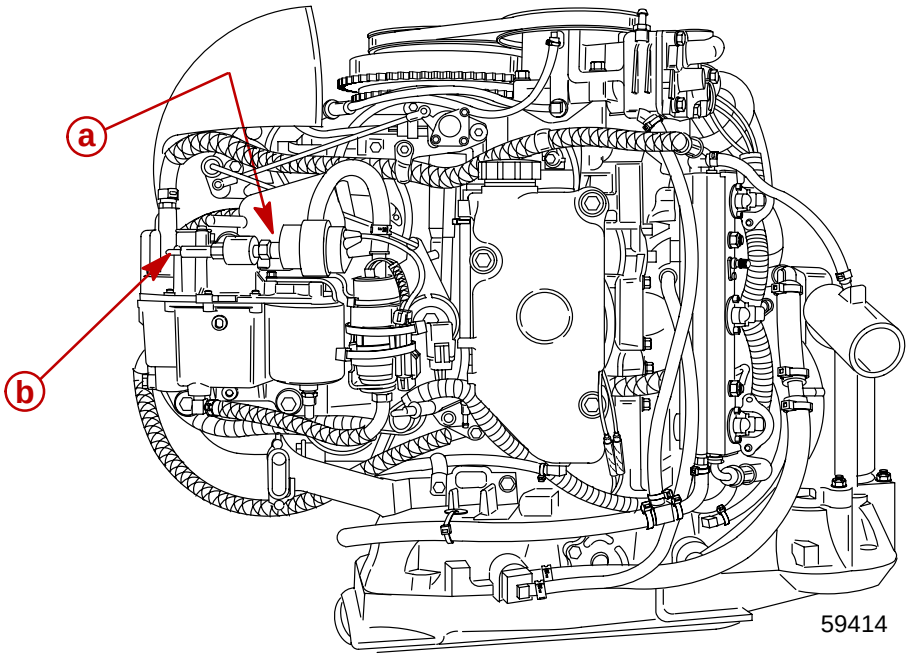
a - Gasket, with Sealing Bead Facing Up
b - Drive Housing Cover O-Ring
c - Drive Shaft O-Ring
d - Lubricate drive shaft splines with Special Lubricant 101

5. Lower powerhead on drive housing cover. Align drive shaft splines with crankshaft splines, and powerhead mounting studs with adapter plate holes.
6. Secure powerhead to drive housing cover with twelve (12) M10 x1.5 nuts. Torque nuts to 20 lb. ft. (27 Nm) following the torque sequence given. Repeat torque sequence, torquing nuts to 35 lb. ft. (47 Nm).



a - M10 x 1.5 Nuts, Torque in two stages

7. Connect fuel line to fuel inlet fitting, secure with U.S. Coast Guard approved hose clamp (183.532).
8. Vapor separator tank (VST) must be vented to fuel tank (250 hp). Vent hose must comply with U.S. Coast Guard/ABYC regulations.



a - VST Vent Hose Fitting
b - Fuel Inlet Fitting

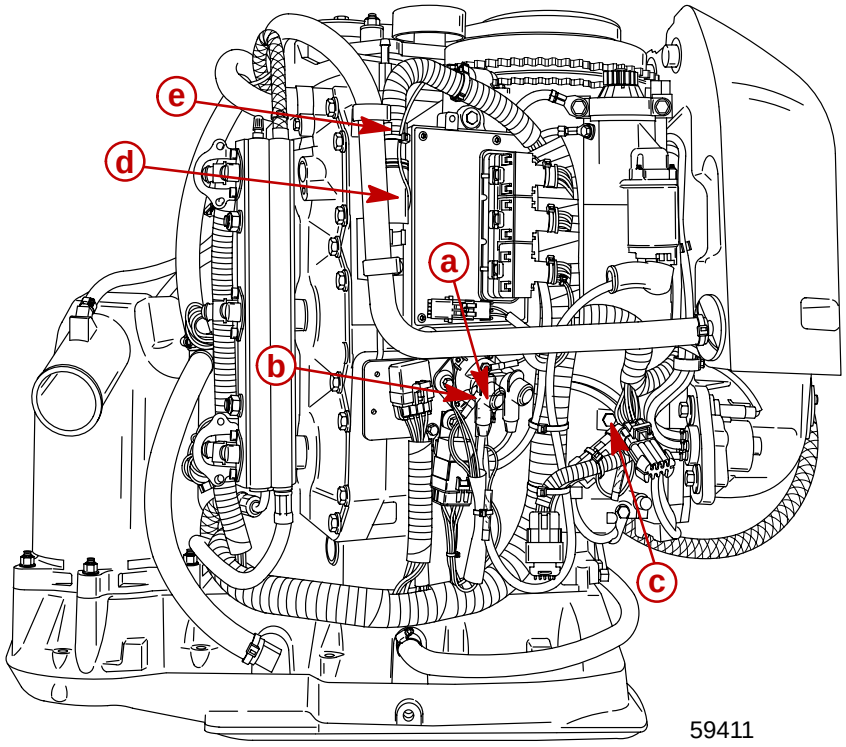
Battery Connection

NOTE: *Engine electrical system is negative (–) ground.*

1. Connect positive (+) battery cable (usually red) to slave solenoid using protective boot (provided).
2. Connect negative (–) battery cable (usually black) to engine ground under starter bracket.
3. Connect battery cables to battery. Make sure that all battery terminal connections are tight, then spray terminals with a battery connection sealant to help retard corrosion.
4. Attach remote control harness plug to engine harness plug. Reinstall harness plug in clip.

⚠ WARNING

U.S. Coast Guard regulation #33 CFR 183.445 requires that the "positive" battery cable connection at the starter solenoid terminal be protected by either a boot ("b" shown following), or protective shield.

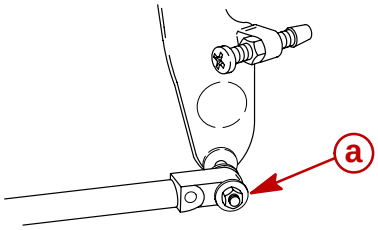


a - Positive Battery Cable Attaching Location
b - Boot Protector for Positive Battery Cable
c - Negative Battery Cable Attaching Location (Engine Ground)
d - Engine Harness Plug
e - Clip

Throttle Cable

Installation

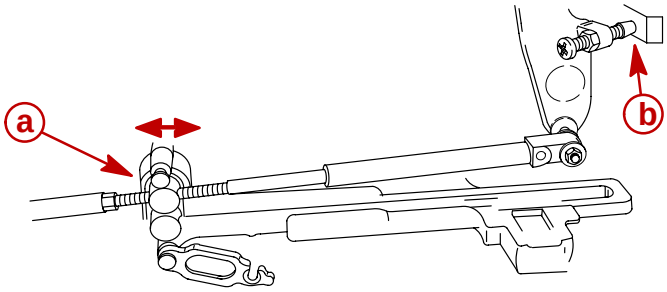
1. Position remote control into neutral.
2. Attach throttle cable to the throttle lever. Secure with washer and locknut.



57837

a - Washer and Locknut – Tighten locknut and back off 1/4 turn

3. Adjust the cable barrel so that the installed throttle cable will hold the idle stop screw against the stop.

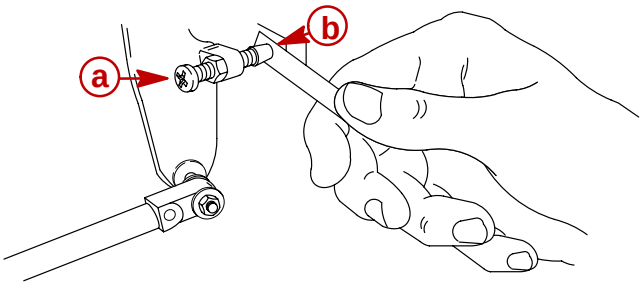


57838

a - Cable Barrel – Adjust To Hold Idle Stop Screw Against Stop
b - Idle Stop Screw

4. Check throttle cable adjustment as follows:
   a. Move throttle from idle to wide open several times to activate throttle linkage.
   b. Return throttle to neutral. Place a thin piece of paper between idle adjustment screw and idle stop. Adjustment is correct when the paper can be removed without tearing, but has some drag on it. Readjust cable barrel if necessary.

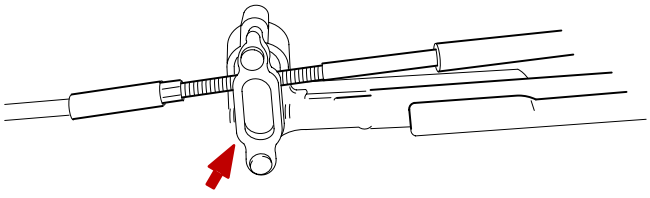
IMPORTANT: The idle stop screw must be touching the stop.



57839

a - Idle Stop Screw **b** - Idle Stop

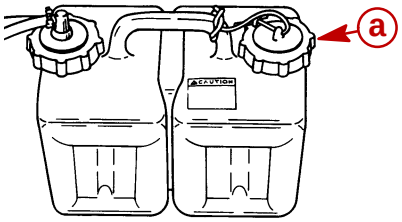
5. Lock the barrel holder in place with the cable latch.



Oil Injection Set-Up

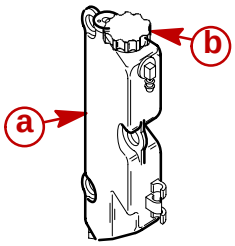
Filling

1. Fill remote oil tank with the recommended oil listed in the Operation and Maintenance Manual. Tighten fill cap.



a - Fill Cap

2. Remove cap and fill engine oil tank with oil. Reinstall the fill cap.



a - Engine Oil Tank

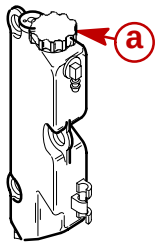
b - Fill Cap

Priming the Oil Injection Pump (If Required)

All Mercury Jet Drive powerheads have the oil systems primed. To determine if repriming is necessary, check the clear oil line between the engine oil reservoir and the oil pump. If there are no air bubbles in the line, it is not necessary to reprime the oil system. If air bubbles are present, it will be necessary to reprime the system using the Digital Diagnostic Terminal (DDT). This method fills the oil pump, oil supply hose feeding pump, and oil hoses going to the vapor separator. Refer to procedure in the Technician Reference Manual provided with the Digital Diagnostic Software Cartridge Part. No. 91-880118.

Purging Air From the Engine Oil Tank

1. Loosen the fill cap on the engine oil tank.
2. Start the engine. Run the engine until the all the air has been vented out of the tank and oil starts to flow out of the tank. Re-tighten fill cap.

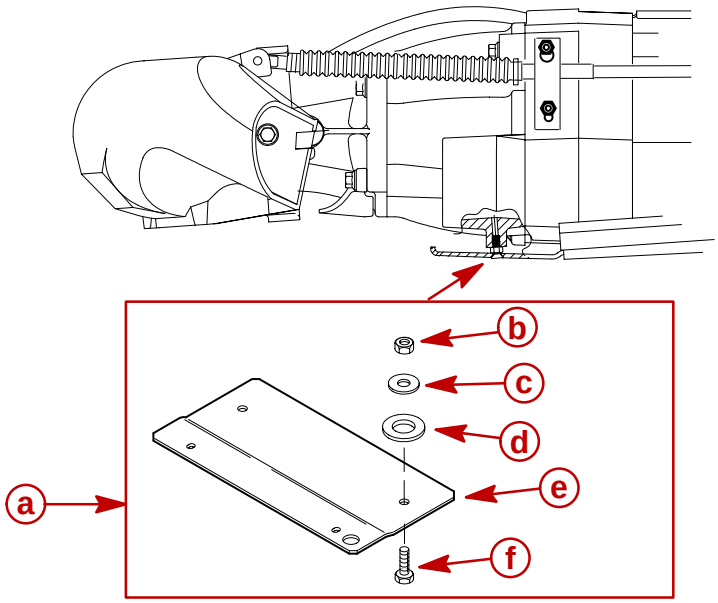


a - Fill Cap

Trim Plate Adjustment

The Jet Drive unit trim plate is factory set for general applications. Should a particular boat experience porpoising problems, the trim plate can be adjusted as follows:

1. Loosen both jam nuts on trim plate (one starboard and one port).



a - Jam Nut with Washer (Two: One On Each Side)
b - Jam Nut
c - Small Diameter Washer
d - Large Diameter Washer
e - Plate
f - Screw

2. Turn both screws the exact same number of turns. Tighten both jam nuts against trim plate. The distance from top of nut to bottom of boss should be equal on both sides.

⚠ WARNING

Adjusting the trim plate may affect boat handling (steering). Overly sensitive steering or reduced turning ability could result from trim plate adjustments. Boat handling characteristics also vary with the load distribution in the boat. Use caution after adjusting: check for acceptable handling characteristics under all loading conditions. Failure to adequately test the boat could result in inadequate steering control resulting in property damage, personal injury or death.

Exhaust System Installation

General Exhaust System Notes

1. Exhaust system application must meet ABYC standard P–1 for marine exhaust installations.
2. The entire exhaust system must meet 190 p.s.i. (1309.99 kPa) burst pressure.
3. All rubberized exhaust system components must meet SAE J–2006 standards for marine exhaust hoses.

⚠ CAUTION

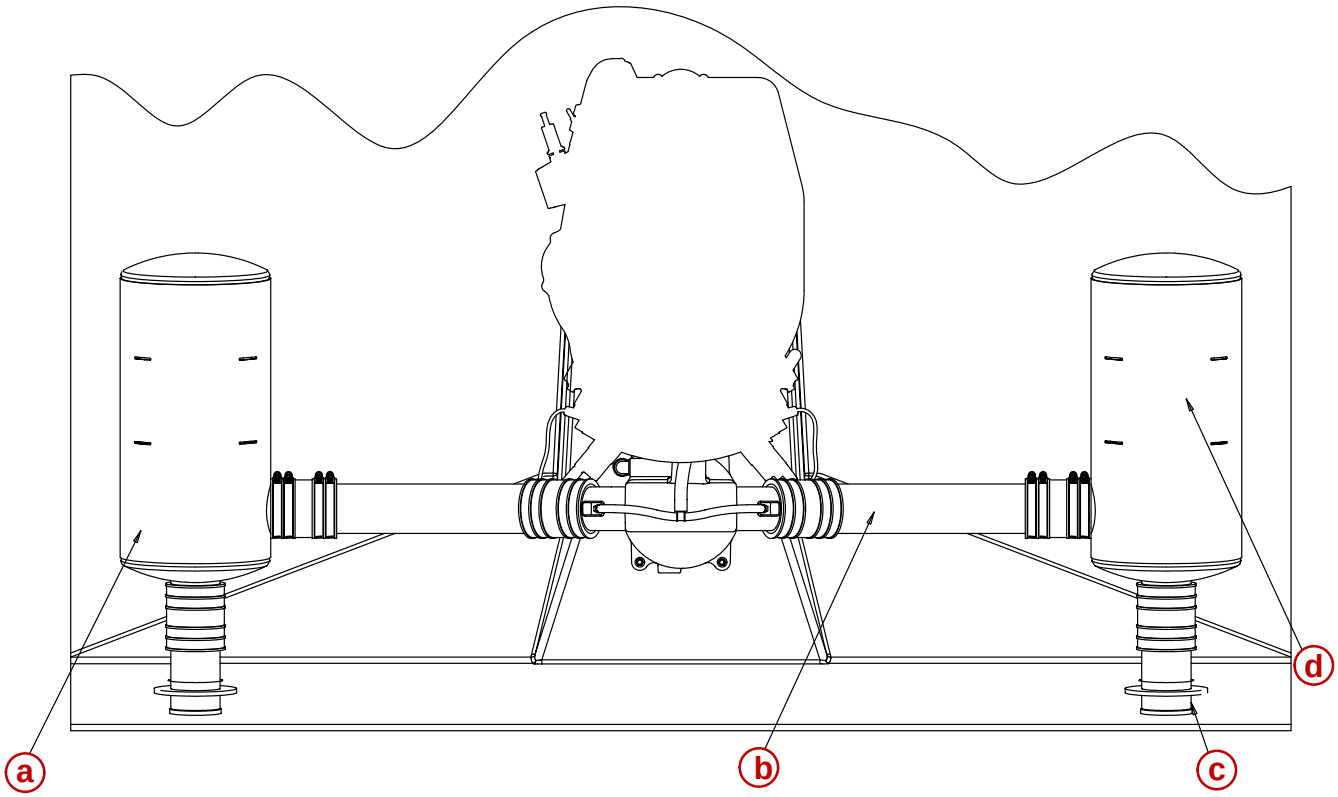
Mufflers must be secured in such a way as to prevent muffler movement during inadvertent engine backfire. Movement of mufflers may result in exhaust hose loosening which could cause boat sinking due to water intrusion.

4. The mufflers and exhaust hoses must be adequately supported for proper orientation and to prevent overstressing the exhaust components. The support requirements will vary with exhaust system design and the amount of G-forces to be encountered.
5. Rubber hose should be connected to pipes with flares or beads or barbs to prevent the hose from sliding off the pipe under pressure.
6. For additional exhaust system recommendations, see MERCURY publication 90–884386 which covers all jet drive exhaust applications not covered under these guidelines.

Exhaust Outlet Measurement Procedure

1. Fill all fuel, oil and water tanks to maximum capacity.
2. Add maximum allowable cargo weight to boat in areas where it will be stored.
3. Add 190 lbs. (86 kg) of weight in all locations where each passenger will sit during normal operation.
4. Using diagrams provided (following), measure to ensure location of muffler outlets.
5. Move load weight and cargo weight to stern of boat to simulate greatest “stern down” attitude the boat will encounter such as when loading.
6. Recheck muffler outlet measurements.
7. Check exhaust system slope to ensure 5° down hill slope.

Top View



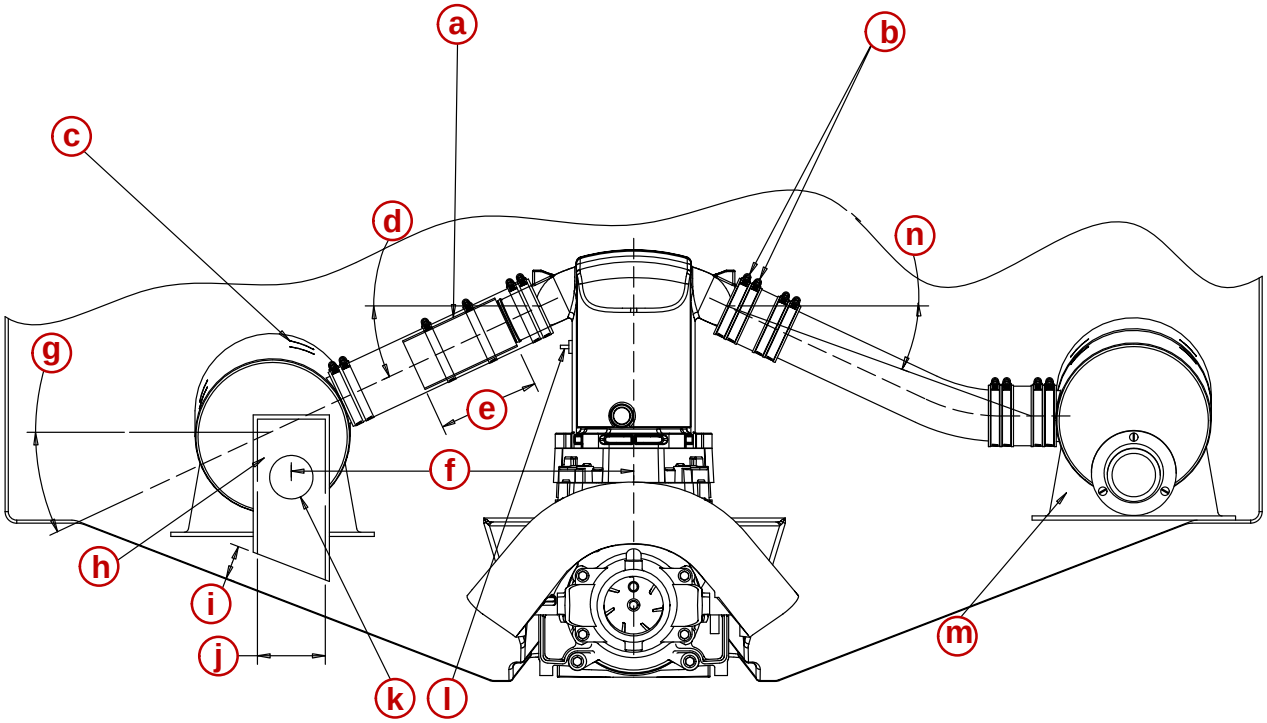
a - **200/240/250 hp** – 878147–A1 Muffler Assy, Port [9.0 in (22.8 cm)] with 3.0 in (7.6 cm) Outlet
210 hp – 859388A1 Muffler Assy, Port [9.0 in (22.8 cm)] with 2.5 in (6.4 cm) Outlet

b - Connection Piping between Expansion Chamber and Muffler must be made of 3.0 in (7.6 cm) O.D. Tubing. Tubing must be either 5052 or 6061 (14 ga) aluminum or type 304 (14 ga) stainless steel to protect against corrosion.

c - 57885–A1 Flange Assembly (2 required) or equivalent through transom fittings may extend 5 in (12.7 cm) below water line for quiet idle operation. Exhausting under a swim platform or other horizontal surface may cause transmission of noise and vibration to the boat during operation.

d - **200/240/250 hp** –878148–A1 Muffler Assy, Starboard [9.0 in (22.8 cm)] with 3.0 in (7.6 cm) Outlet.
210 hp – 859389A1 Muffler Assy, Starboard [9.0 in (22.8 cm)] with 2.5 in (6.4 cm) Outlet

Aft View



a - Alternate Installation – If rubber hosing is to be used for connection between the expansion chamber and the muffler, a inner sleeve made of 6061–T6, 14 gauge aluminum tubing must be used as liner and secured with 2 stainless steel hose clamps p/n 54–815504 or equivalent.

b - Typical Recommended Installation – 54–815504, 256 stainless steel clamp or equivalent. All exhaust hoses and/or tubes must be secured with 2 clamps at each connection.

c - Mufflers may be mounted using straight piping.

d - 25° outlet angle of expansion chamber.

e - 6.0 in (15.2 cm) minimum.

f - Reference maximum practical.

g - 25° maximum from horizontal.

h - Optional exhaust outlet cover.

i - 2.0 in (5.1 cm) minimum.

j - 4.0 in (10.2 cm).

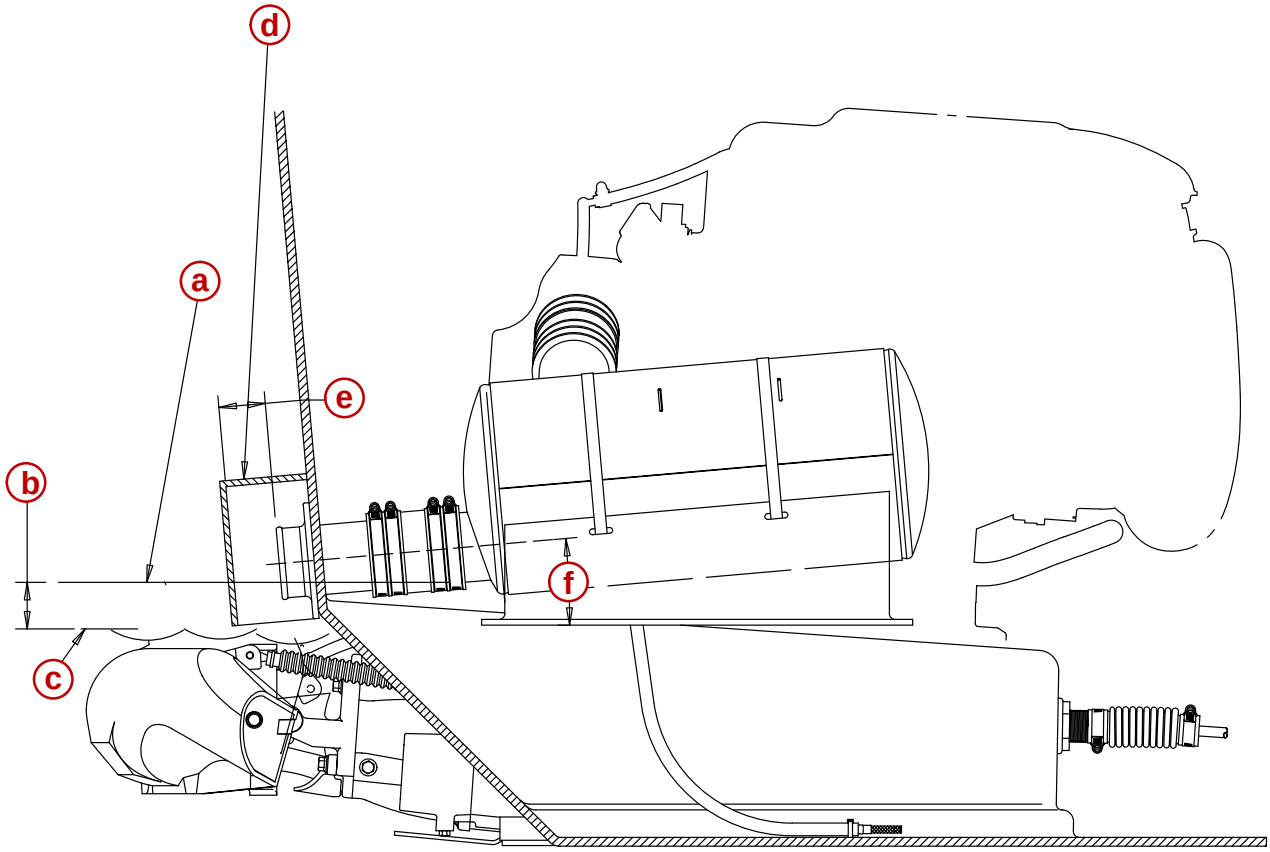
k - To minimize the backflow of exhaust gases into the cockpit or interior of boat, the exhaust termination should be located as far outboard of the centerline as practical.

l - Final system installation shall be reviewed by a MERCURY Field Representative using a modified expansion chamber to ensure back pressure does not exceed 1.8 psi (10.3 kg) at 1000 ft (304.8 m) above sea level or less. This test needs to be performed with the boat in the water and under way. No special loading of the boat is required. However, the engine must be capable of reaching the specified W.O.T. engine speed. Maximum R.P.M. must be verified using an accurate service tachometer.

m - Exhaust system components should be rubber mounted, independently supported and restrained to minimize noise transmission to the boat and stress on exhaust system components.

n - 10° minimum angle from expansion chamber outlet to muffler inlet.

Side View



a - This line represents the bottom edge of the muffler outlet tube. Measure to ensure that the lowest possible location of the bottom edge of the muffler tubes never gets within 2.0 in (5.1 cm) of the maximum depth waterline.

b - 2.0 in (5.1 cm). When installing muffler assemblies, a 2.0 in (5.1 cm) minimum distance between bottom of muffler and water line must be kept. This minimum distance must be calculated with boat under its maximum load. Tilt muffler assemblies back towards outlet to ensure self draining.

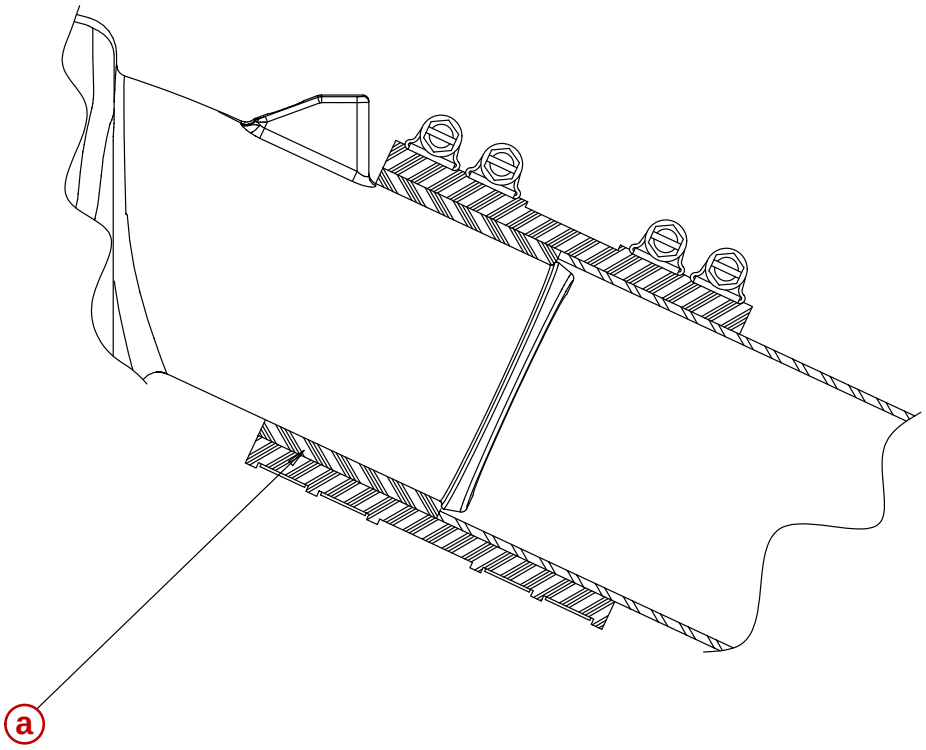
c - Water Line

d - Covers may be placed over exhaust outlets to reduce exhaust noise and may extend 5 in (10 cm) or less below waterline when boat is at rest.

e - 2.0 in (5.1 cm).

f - 5° outlet angle.

Side View of Expansion Chamber Outlet Pipe and Exhaust Pipe Connection



a - A spacer must be used with all 3.0 in (7.6 cm) tube applications. A spacer having a 2.65 in (6.73 cm) I.D. and a 3.0 in (7.6 cm) O.D. needs to be installed over the expansion chamber outlets.

Pre-delivery Inspection

Not Applicable	Check/ Adjust	CHECK BEFORE RUNNING
❑	❑	Water hose connection/torqued
❑	❑	Cover plate & adaptor plate fasteners torqued
❑	❑	Battery meets engine specification
❑	❑	Battery charged & secure
❑	❑	All electrical connections tight
❑	❑	All fuel connections tight
❑	❑	Throttle, shift, & steering adjusted correctly and fasteners torqued
❑	❑	Shift cable adjusted to keep reverse gate above rudder in forward w/ slack pulled out of cable and against the stop.
❑	❑	Pump housing oil level full (See Owner's Manual)
❑	❑	Oil injection reservoir full and bled
❑	❑	Warning system(s) operational

ON THE WATER CHECK

❑	❑	Starter neutral safety switch operational
❑	❑	Lanyard stop switch operational
❑	❑	All gauges read properly
❑	❑	No fuel or oil leaks
❑	❑	No water leaks
❑	❑	No exhaust leaks
❑	❑	Ignition timing set to specs
❑	❑	Idle:_____RPM
❑	❑	Idle mixture adjusted
❑	❑	Forward-Neutral-Reverse operational
❑	❑	Steering operational throughout entire range
❑	❑	Acceleration test
❑	❑	WOT:_____RPM
❑	❑	Boat handling

POST WATER CHECK

❑	❑	Re-torque adapter plate fasteners
❑	❑	No fuel, oil, water or exhaust leaks
❑	❑	Re-check shift cable adjustment. Readjust as necessary