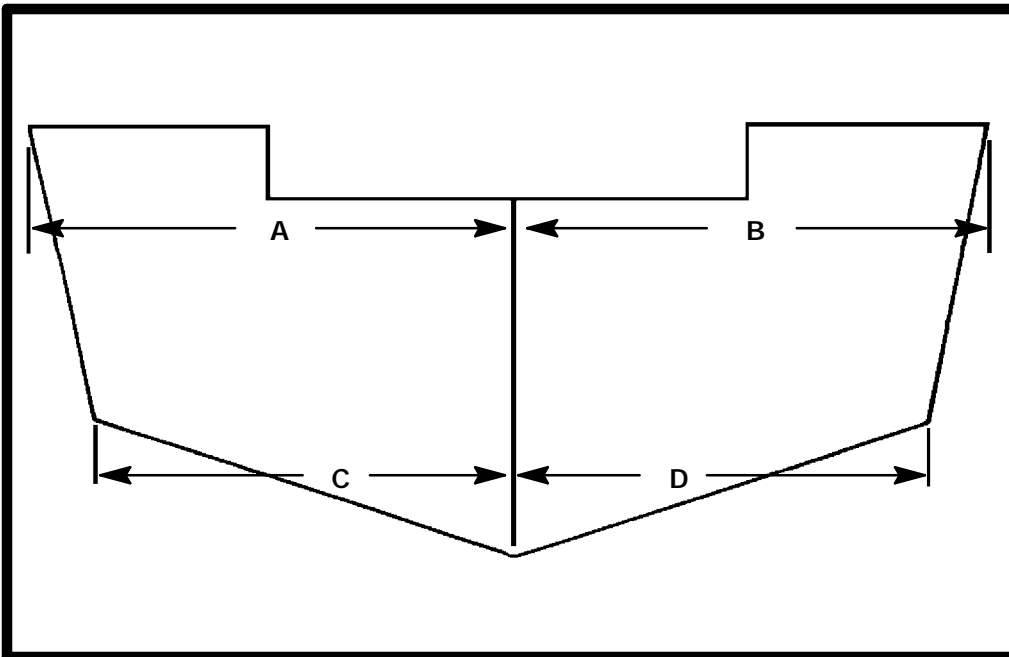




IMPORTANT INFORMATION

1

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OUTBOARD MOTOR INSTALLATION



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Notice to Installer and Owner

This manual as well as safety labels posted on the outboard use the following safety alerts to draw your attention to special safety instructions that should be followed.

WARNING

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

CAUTION

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

Boat Horsepower Capacity

U.S. COAST GUARD CAPACITY	
MAXIMUM HORSEPOWER	XXX
MAXIMUM PERSON CAPACITY (POUNDS)	XXX
MAXIMUM WEIGHT CAPACITY	XXX

Do not overpower. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer following certain federal guidelines. If in doubt, contact the boat manufacturer.

WARNING

Using an outboard that exceeds the maximum horsepower limit of a boat can 1. cause loss of boat control 2. place too much weight at the transom altering the designed flotation characteristics of the boat or 3. cause the boat to break apart particularly around the transom area. Overpowering a boat can result in serious injury, death or boat damage.

Outboard Remote Control

The remote control connected to the outboard must be equipped with a start-in-gear protection device. This prevents the engine from starting when the outboard is in gear.

WARNING

Avoid serious injury or death from a sudden unexpected acceleration when starting the engine. The design of this outboard requires that the remote control used with it must have a built in start-in-gear protection device.

Selecting Accessories For The Outboard

Some accessories not manufactured or sold by Mercury Marine are not designed to be safely used with these outboards or outboard operating system. Acquire and read the installation, operation and maintenance manuals for all selected accessories.

WARNING

The misuse of acceptable accessories or the use of unacceptable accessories can result in serious injury, death or product failure.

Selecting Steering Cables and Remote Control Cables

Refer to "Quicksilver Accessories Guide" to determine correct length of steering cables and remote control cables.

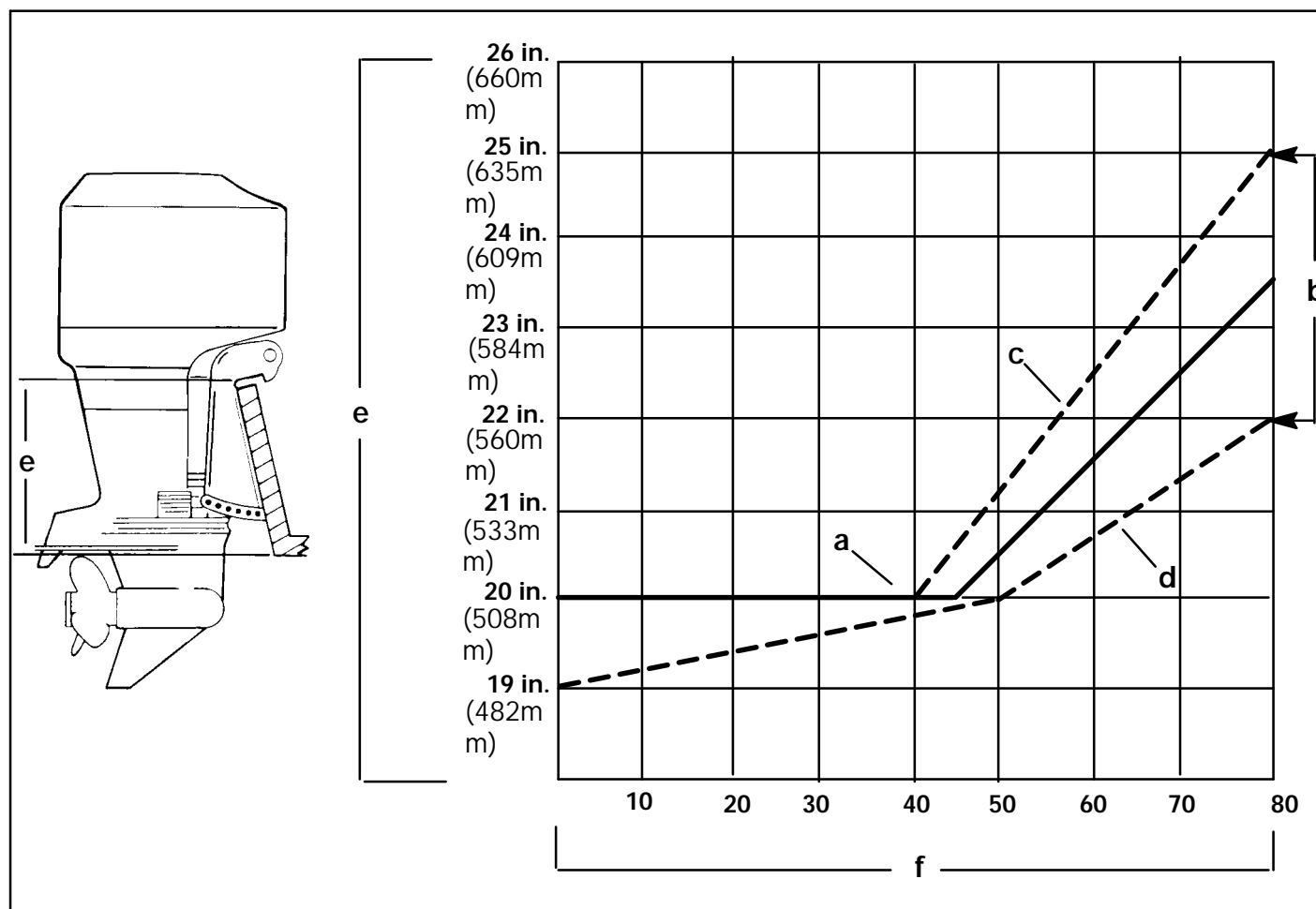
IMPORTANT: Steering cables and remote control cables must be the correct length. Sharp bends on too-short cables result in "kinks"; too-long cables require unnecessary bends and/or loops. Both conditions place extra stress on the cables.



Determining Recommended Outboard Mounting Height

⚠ WARNING

Boat instability can occur at high speeds by installing engine at the wrong transom height. Contact the boat manufacturer for their recommendations for a specific engine installation.



Add 5 in. (127mm) for XL models and 10 in. (254mm) for XXL models to listed outboard mounting height.

- a. This solid line is recommended to determine the outboard mounting height.

IMPORTANT: Increasing the height of outboard generally will provide the following: 1) Less steering torque, 2) more top speed, 3) greater boat stability, but, 4) will cause more prop "break loose" which may be particularly noticeable when planing off or with heavy load.

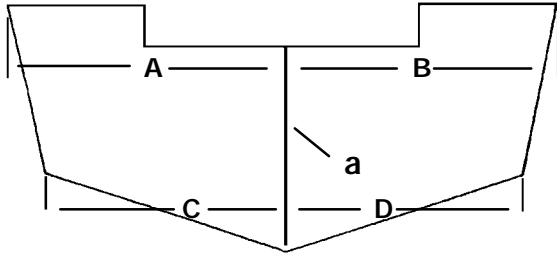
- b. These broken lines represent the extremes of known successful outboard mounting height dimensions.
- c. This line may be preferred to determine outboard mounting height dimension, if maximum speed is the only objective.

- d. This line may be preferred to determine outboard mounting height dimension for dual outboard installation.
- e. Outboard mounting height (height of outboard transom brackets from bottom of boat transom). For heights over 22 in. (560mm), a propeller, that is specifically designed for surfacing operation, such as the "Laser" and "Mirage" series, usually are preferred.
- f. Maximum boat speed anticipated.



Locating Centerline of Boat Transom

Locate (and mark with pencil) vertical centerline (a) of boat transom.



a - Centerline of Transom

Dimensions "A" & "B" and "C" & "D" are equal length.

Drilling Outboard Mounting Holes

IMPORTANT: Before drilling any mounting holes, carefully read "Determining Recommended Outboard Mounting Height," preceding. There is a 3/4 in. (19 mm) difference between outboard mounting holes in transom brackets.

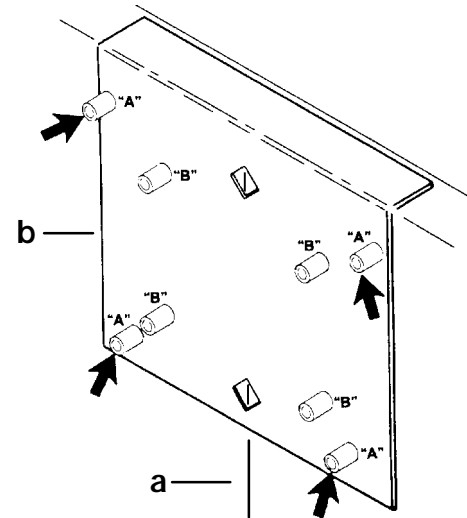
⚠ WARNING

DO NOT, under any circumstances, allow upper outboard mounting bolts to be closer than 1 in. (25.4 mm) from top of boat transom. Upper mounting bolts must never be installed thru shims.

When drilling into a fiberglass boat, place masking tape directly onto boat where mounting holes will be drilled to help prevent fiberglass from chipping.

Use a 17/32 inch (13.5mm) diameter drill bit and drill 4 mounting holes perpendicular to and thru the transom.

IMPORTANT: If using "Transom Drilling Fixture" (part number 91-98234A2), use drill guide holes marked "A" when drilling outboard mounting holes.



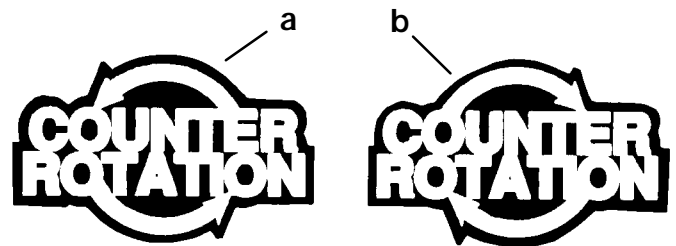
a - Centerline of Transom
b - Transom Drilling Fixture (91-98234A2)

IMPORTANT: During installation of dual or multiple V-6 product, the following is recommended. A minimum of 26 inches (660mm) centerline to centerline width is recommended. This is required to alleviate cowling interference during lock to lock turns if one outboard would be in the full tilt position, while the other outboard(s) are in the vertical running position.

Applying Counter Rotation Decals

IMPORTANT: For dual outboard counter rotation installations, the left-hand rotation outboard is generally placed on the port side of boat transom.

Apply "COUNTER ROTATION" decal (supplied with left-hand rotation outboard) onto bottom cowl (rear) of right-hand rotation outboard. Match decal placement with left-hand rotation outboard.



a - Counter Rotation Decal (Left-Hand Rotation Outboard)
b - Counter Rotation Decal (Right-Hand Rotation Outboard)

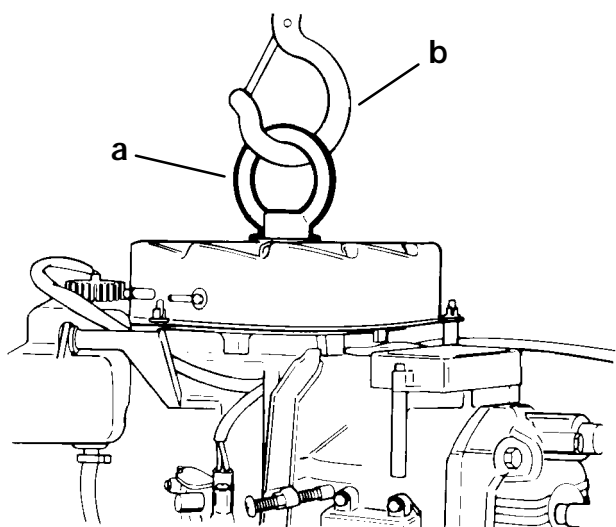


Lifting Outboard

⚠ WARNING

Verify lifting ring is threaded on crankshaft a minimum of 5 turns and that hoist has a maximum lift capacity over 500 lbs. (227 kg) BEFORE lifting outboard.

Remove cowling from outboard. Remove plastic cap from center of flywheel. Thread lifting eye (a) into flywheel hub a minimum of 5 turns. Replace plastic cap after installation. Connect hoist [minimum lift capacity of 500 lbs. (227 kg)] to lifting eye. Lift outboard and place on boat transom.



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a - Lifting Eye (91-75132)
b - Hoist

Installing Outboard To Boat Transom

IMPORTANT: If boat is equipped with thru tilt tube steering, steering cable end must be installed into tilt tube of outboard (port outboard only for dual outboard installations) before securing outboard to transom. Refer to "Steering Cable and Steering Link Rod Installation" following.

Refer to "Determining Recommended Outboard Motor Mounting Height", preceding and position outboard on boat transom, to align mounting holes in transom bracket that will place the outboard nearest to the recommended mounting height.

⚠ CAUTION

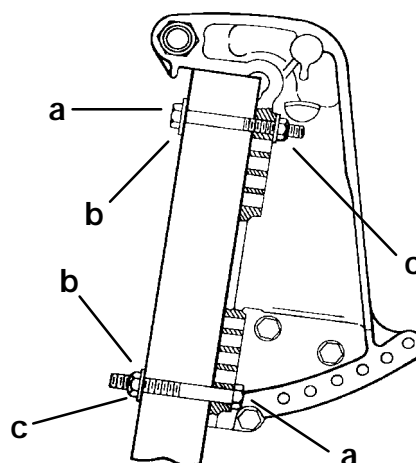
Marine sealer must be used on shanks bolts to make a water-tight installation.

IMPORTANT: DO NOT use an impact driver when tightening transom bolts.

Apply marine sealer to shanks of mounting bolts (not threads) and secure outboard to transom with 4 bolts, flat washers and locknuts, as shown. Be sure that installation is water-tight.

⚠ WARNING

Before operating, outboard(s) **MUST BE SECURED** to boat transom with four 1/2 in. diameter bolts and locknuts, as follows: 2 bolts must be installed thru upper mounting holes and 2 bolts thru lower mounting holes. Installation must be water-tight and outboard should be checked for tightness on the transom during operation. Failure to bolt outboard to transom (using 4 bolts and locknuts, as shown) may result in damage to boat and/or loss of outboard and possible injury to occupants of boat.



a - 1/2 in. Diameter Bolts
b - Flat Washers
c - Locknuts



Single Steering Cable and Steering link Rod Installation

These instructions are for single cable-single outboard installations. Instructions for mounting dual engines are included with the applicable dual engine attaching kit. Refer to "Quicksilver Accessories Guide" to determine correct kit.

Refer to "Quicksilver Accessories Guide" to determine correct length of steering cable.

IMPORTANT: Steering cable must be correct length. Sharp bends on too-short of a cable result in "kinks;" too-long of a cable require unnecessary bends and/or loops. Both conditions place extra stress on the cable.

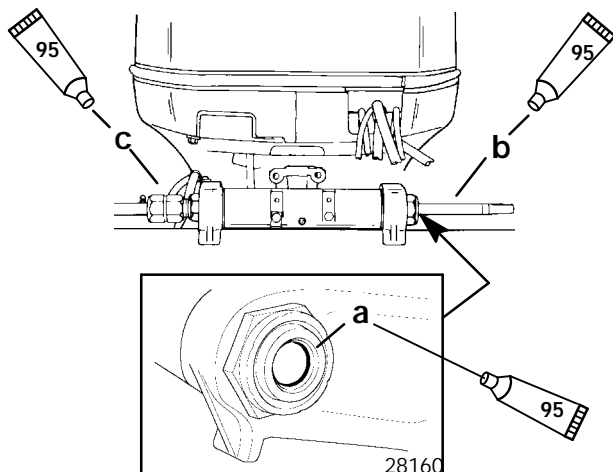
Install steering mount and steering wheel in accordance with installation instructions that accompany each.

Installing Ride Guide Cable to Outboard Tilt Tube

IMPORTANT: Before installing steering cable in tilt tube, lubricate entire cable end with Quicksilver 2-4-C w/Teflon Marine Lubricant.

Ride Guide steering cable is lubricated at the factory and requires no additional lubrication at initial installation.

1. Lubricate seal (a) inside of outboard tilt tube and entire cable end (b) with Quicksilver 2-4-C w/Teflon Marine Lubricant.
2. Insert steering cable end thru outboard tilt tube and secure steering cable to tilt tube with steering cable attaching nut (c), as shown. Torque nut to 35 lb. ft. (41.0 N-m).



95 2-4-C With Teflon (92-825407A12)

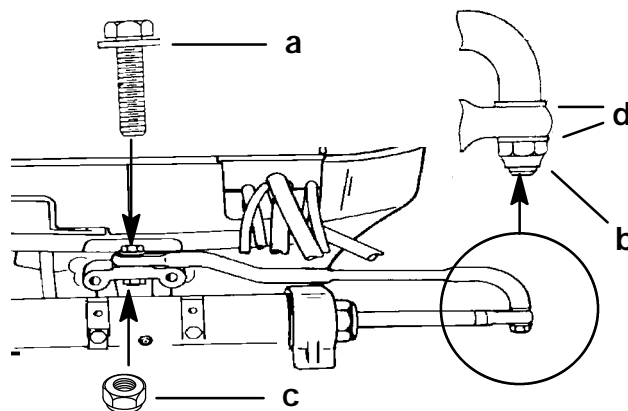
Steering Link Rod Installation

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using special washer head bolt ("a" - Part Number 10-14000) and self locking nuts ("b" & "c" - Part Number 11-34863). These locknuts must never be replaced with common nuts (non locking) as they will work loose and vibrate off freeing the link rod to disengage.

WARNING

Disengagement of a steering link rod can result in the boat taking a full, sudden, sharp turn. This potentially violent action can cause occupants to be thrown overboard exposing them to serious injury or death.

3. Assemble steering link rod to steering cable with two flat washers (d) and nylon insert locknut ("b" - Part Number 11-34863). Tighten locknut (b) until it seats, then back nut off 1/4 turn.
4. Assemble steering link rod to engine with special washer head bolt ("a" - Part Number 10-14000) and nylon insert locknut ("c" - Part Number 11-34863). First torque bolt (a) to 20 lb. ft. (27.0 N-m), then torque locknut (c) to 20 lb. ft. (27.0 N-m).



WARNING

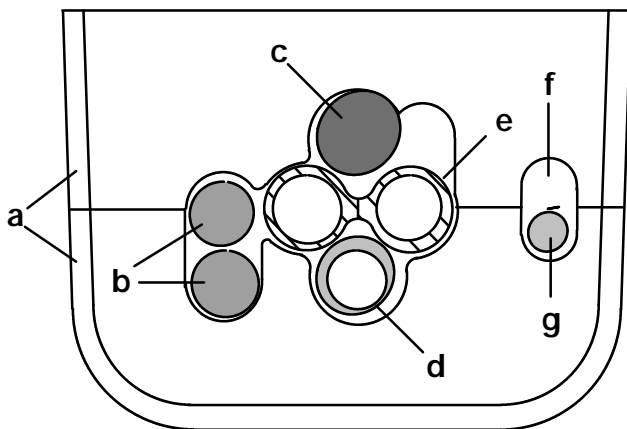
After installation is complete (and before operating outboard), check that boat will turn right when steering wheel is turned right and that boat will turn left when steering wheel is turned left. Check steering thru full range (left and right) and at all tilt angles to assure interference-free movement.



Routing location for Wiring and Hoses thru Clamp in Bottom Cowl

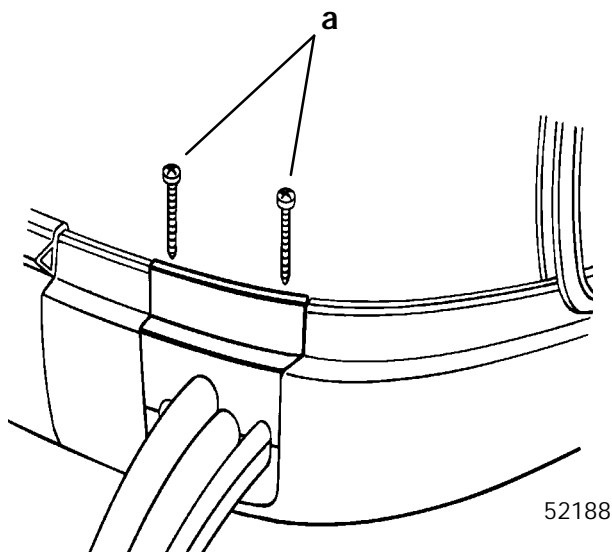
IMPORTANT: Sufficient slack must exist in engine wiring harness, battery cables, fuel hose, and oil hoses routed between clamp and engine attachment point, to relieve stress and prevent hoses from being kinked or pinched.

1. Route engine wiring harness, battery cables, fuel hose, oil hoses and control cables thru clamp in bottom cowl at locations shown.



- a - Clamp (2 Halves)
- b - Battery Cables
- c - Engine Wiring Harness
- d - Fuel Hose
- e - Oil Hoses
- f - Throttle Cable
- g - Shift Cable

2. Secure clamp halves together with 2 screws.



- a - Screws

Remote Control Installation

Refer to "Quicksilver Accessories Guide" to determine correct length of remote control cables.

IMPORTANT: Remote control cables must be correct length. Sharp bends on too-short cables result in "kinks;" too-long cables require unnecessary bends and/or loops. Both conditions place extra stress on the cables.

IMPORTANT: Install control cables to remote control and mount remote control **BEFORE** attaching control cables to engine. Refer to installation instructions included with remote control.

Counter (Left Hand) Rotation Outboards

IMPORTANT: Counter rotating (left hand) gear cases can be identified by a "L" stamped into the end of the propeller shaft.

On counter (left hand) rotation outboards, the shift guide block moves aft for FORWARD and towards the bow for REVERSE. This is opposite motion compared to a standard (right hand) rotation outboard.

The Quicksilver Commander Series Dual Engine Console Mount Control, P/N 88688A22, is required to shift the counter rotation outboard. The installation instructions shipped with the control explain the procedure required to connect this control to a counter rotation outboard.

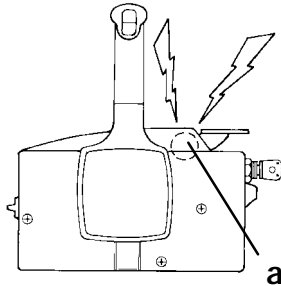
IMPORTANT: If the counter rotation outboard is rigged similar to a standard rotation outboard OR if a standard rotation outboard is rigged similar to a counter rotation outboard, the reverse gear and bearing in the gear case must function as forward gear. **THE REVERSE GEAR/BEARING ARE NOT DESIGNED TO CARRY THE SUSTAINED LOADS THAT ARE GENERATED WHEN RUNNING UNDER CONSTANT HIGH RPM AND THRUST CONDITIONS.**



Required Side Mount Remote Control or Ignition Key Switch Assembly

Boats Equipped with Side Mount Remote Control

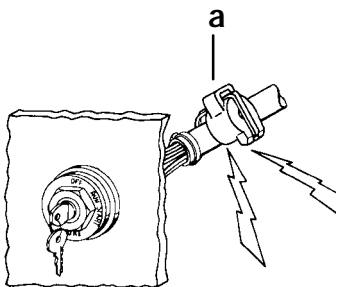
A Quicksilver Commander 2000 series Side Mount Remote Control equipped with a warning horn must be used with this outboard. This warning horn is necessary for the engine warning system.



a - Warning Horn

Boats Equipped with Panel or Console Mount Remote Control

A Quicksilver Ignition Key/Choke Assembly equipped with a warning horn must be used with this engine. This warning horn is necessary for the engine warning system.



a - Warning Horn

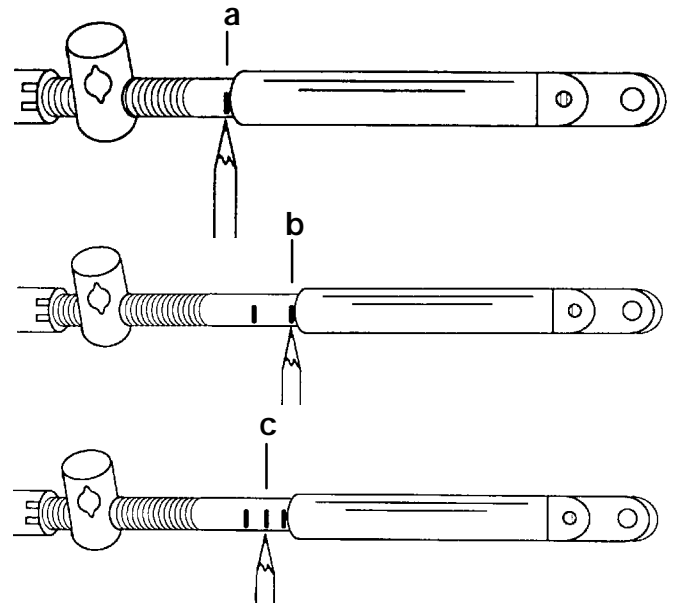
Shift and Throttle Cable Installation to the Outboard

Shift Cable Installation

1. Install the shift cable to the remote control. Refer to installation instructions included with the remote control.
2. Before installing the shift cable to the engine, locate the center point of the slack or lost motion that exists in the remote control and shift cable as follows.

On counter rotation outboards, the location of marks "a" and "b" below on the shift cable will be reversed.

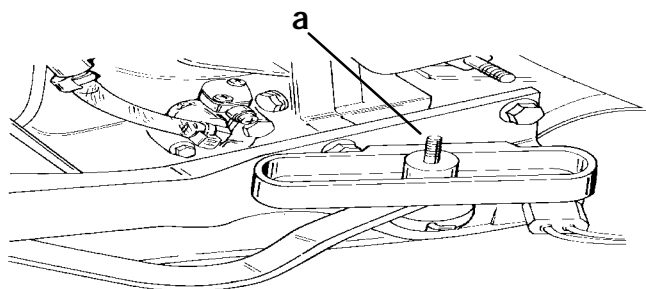
- a. Move the remote control handle into forward and advance the handle to the full speed position. Slowly return the handle back to the neutral detent position. Place a mark on the shift cable against the cable end guide at location (a).
- b. Move the remote control handle into reverse and advance the handle to the full speed position. Slowly return the handle back to the neutral detent position. Place a mark on the shift cable against the cable end guide at location (b).
- c. Make a center mark (c) on the shift cable, midway between marks ("a" and "b"). Align the cable end guide against this center mark (c) when installing cable to the engine.



IMPORTANT: The procedure in Step 3 following, must be used for proper adjustment of the shift cable.

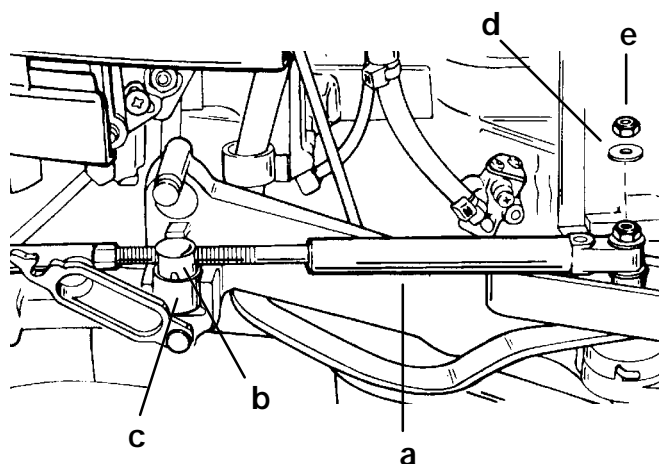


3. Manually shift the engine (move shift actuator "a") into neutral detent position.
4. Slide shift actuator (a) forward until resistance is felt, then slide shift actuator toward rear until resistance is felt. Center the shift actuator between resistance points.

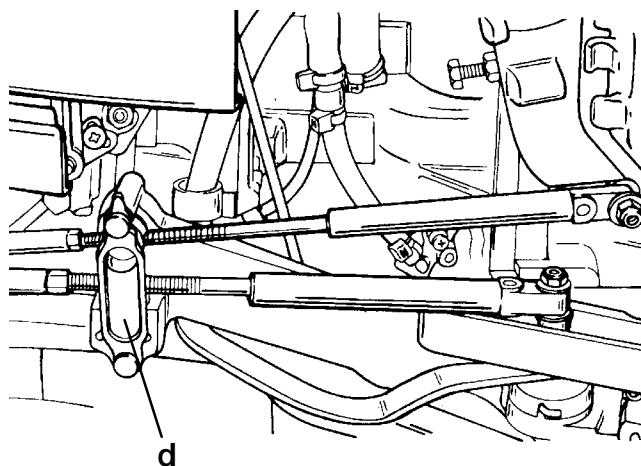


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5. Align cable end guide (a) with the center mark as instructed in Step 4. Place shift cable on shift actuator stud and adjust cable barrel (b) so that barrel slips freely into the plastic barrel retainer (c)
6. Secure shift cable to shift actuator stud with plastic washer (d) and locknut (e). Tighten locknut against shift cable then back-off the locknut 1/4 turn.



7. Lock cable barrels in place with cable retainer.
8. Check preload on throttle cable by placing a thin piece of paper between idle stop screw and idle stop. Preload is correct when paper can be removed without tearing, but has some drag in it. Readjust cable barrel if necessary.



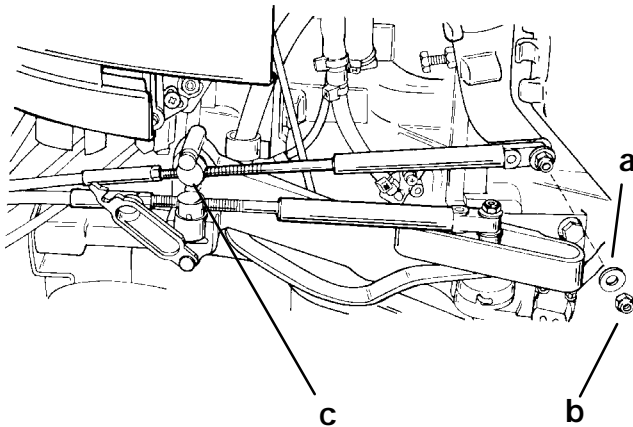
d - Cable Retainer



Throttle Cable Adjustment and Installation to the Outboard

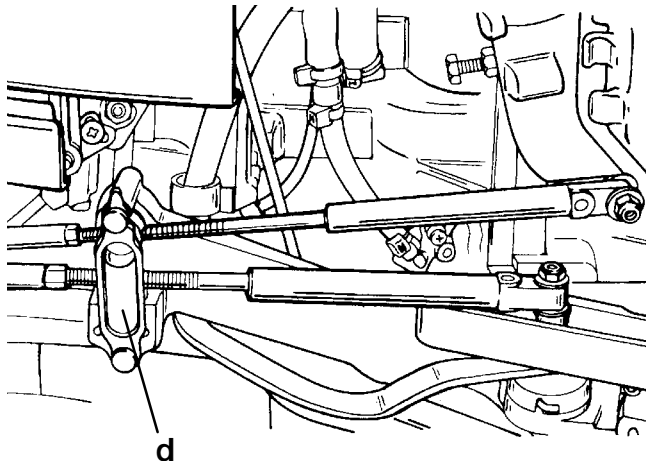
Attach Shift cable to engine prior to attaching throttle cable.

1. Position remote control handle in neutral detent.
2. Position engine throttle lever against idle stop.
3. Install throttle cable to throttle lever with plastic washer (a) and locknut (b). Tighten locknut against throttle cable than back-off the locknut 1/4 turn.
4. Hold throttle lever against idle stop. Adjust cable barrel (c) to slip into its plastic retainer with a very light preload of the throttle lever against the idle stop.



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5. Lock cable barrels in place with cable retainer.
6. Check preload on throttle cable by placing a thin piece of paper between idle stop screw and idle stop. Preload is correct when paper can be removed without tearing, but has some drag in it. Readjust cable barrel if necessary.



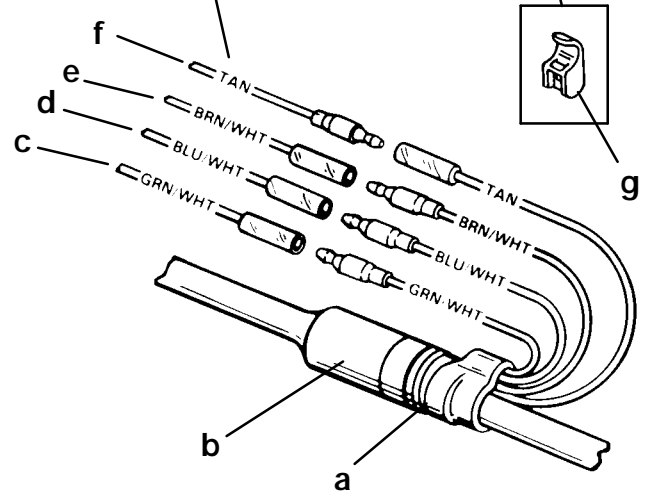
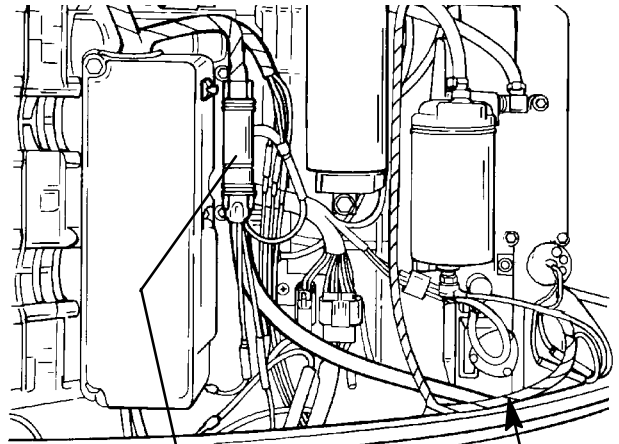
d - Cable Retainer

Remote Wiring Connections

1. Connect the remote wiring harness from the remote control or key switch assembly into the engine wiring harness connector.
2. Push the harness connection into the holder.
3. Place the remote wiring harness and battery cables into the harness holder.

Make wiring (bullet) connections between remote wiring harness and engine wiring.

IMPORTANT: Tape back and isolate any unused wiring harness leads.



- a - Remote Wiring Harness
- b - Engine Wiring Harness Connector
- c - Lead From Trim Solenoid (Down Solenoid)
- d - Lead From Trim Solenoid (Up Solenoid)
- e - Lead From Trim Sender
- f - Lead From Temperature Sender
- g - Harness Holder (Located in Cowl) - Place Wiring Harness and Battery Cables into Holder



Battery Connections

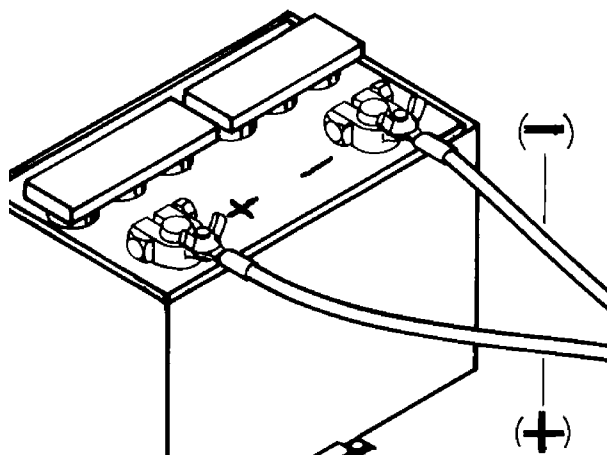
⚠ CAUTION

For dual outboard installations, the negative (-) battery cable of each engines starter motor ground circuit, **MUST BE** connected together by a common circuit (cable) capable of carrying the starting current of each engines' starter motor. [i.e. A locally obtained battery cable connected between the negative (-) terminal of each outboards cranking battery.]

⚠ CAUTION

Failure to observe correct polarity when connecting battery cables to battery will result in damage to the charging system.

Connect battery cables (from engine) to battery. Connect positive (+) battery cable to positive terminal and negative (-) battery cable to negative (-) battery terminal.

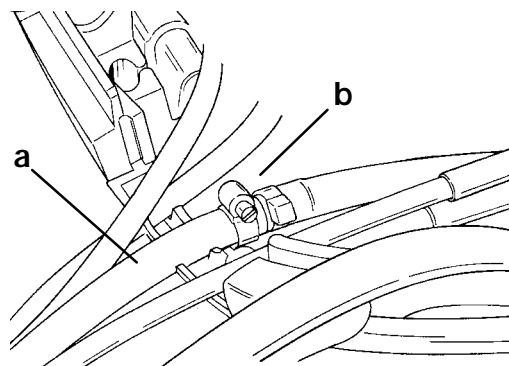


Fuel Connections

Connecting Fuel Hose to Engine

EFI MODELS

1. Connect fuel hose (a) to fitting inside of bottom cowl as shown. Secure with hose clamp (b).
2. Refer to page 6 for proper routing of fuel hose thru clamp in bottom cowl.



Portable Fuel Tank

Select a suitable location in boat within engine fuel line length limitations and secure tank in place.

Permanent Fuel Tank

These should be installed in accordance with industry and federal safety standards which include recommendations applicable to grounding, anti-siphon protection, ventilation, etc.

Fuel Line

Minimum fuel line inside diameter (I.D.) is 5/16 in. (8mm), with separate fuel line/fuel tank pickup for each engine.



Set Up Instructions for Oil Injection System

⚠ CAUTION

Be careful not to get dirt or other contamination in tanks, hoses or other components of the oil injection system during installation.

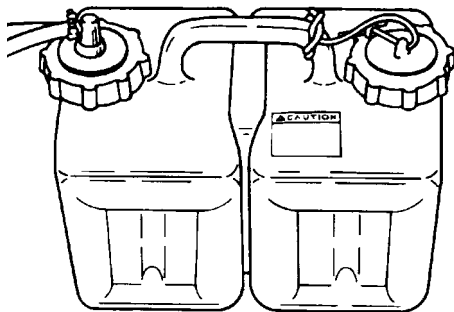
⚠ CAUTION

Oil injected engines additionally, must be run on a 50:1 gasoline/oil mixture during the engine break-in period. Refer to engine break-in procedure in the Operation & Maintenance Manual.

⚠ CAUTION

If an electric fuel pump is to be used on engines with oil injection, the fuel pressure at the engine must not exceed 6 psi. If necessary, install a pressure regulator between electrical fuel pump and engine and set at 6 psi maximum.

Installing Remote Oil Tank



1. The remote oil tank should be installed in an area in the boat where there is access for refilling.
2. The tank should be restrained to keep it from moving around, causing possible damage. Use the oil tank hold down kit provided. Another acceptable means of restraining the tank would be the use of eye bolts and an elastic retaining strap about the midsection of the tank. Verify that any metal hooks do not puncture the tank.

Keep in mind, when installing in tight areas, that this tank will be under pressure when the engine is operating and will expand slightly.

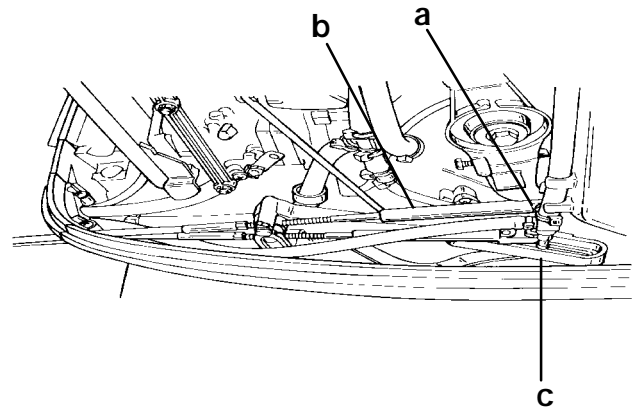
3. Oil hoses when routed thru engine well, must be able to extend to the hose fittings on engine.
4. Oil hoses must be arranged so they cannot become pinched, kinked, sharply bent or stretched during operation of the outboard.

A Quicksilver Accessory oil hose extension kit (41729A3) is available for the remote oil tank.

Installing Oil Hoses To Engine

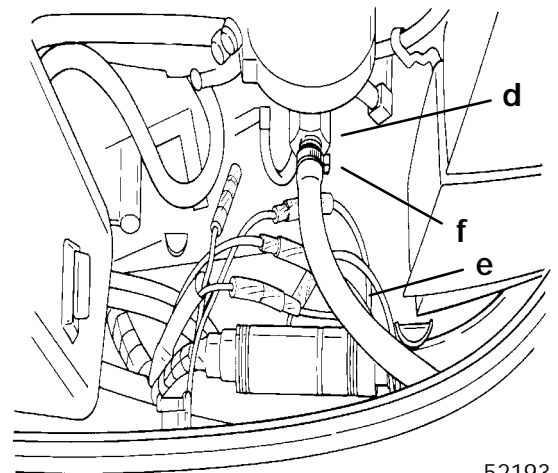
1. Remove (and discard) the shipping cap from hose fitting (a).
2. Connect oil hose ("b" with blue stripe) to fitting as shown. Secure with sta-strap.

The third fitting (c) is a vent and does not get connected.



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3. Remove (and discard) the shipping cap from pulse fitting (d).
4. Route the second oil hose (e) behind retainer (f) and connect to pulse fitting as shown. Secure with sta-strap.



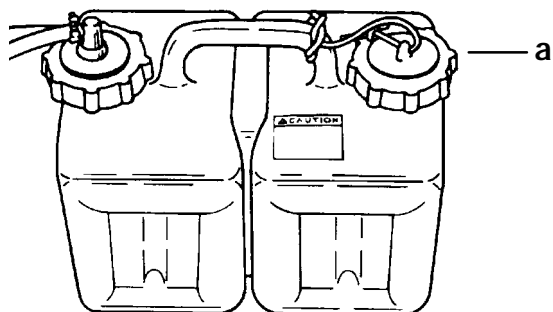
52193

5. Refer to page 1D-6 for proper routing of oil hose routing thru clamp in the bottom cowl.



Filling the Oil Injection System

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



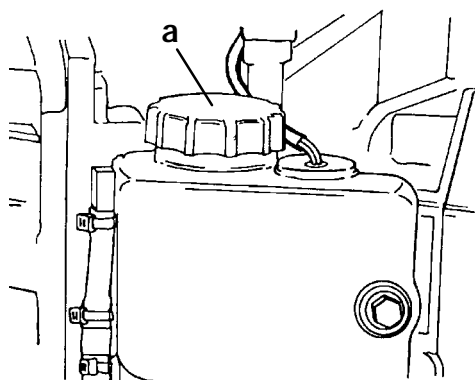
 14 2 Cycle Outboard Oil (92-826666A24)

a - Fill Cap

2. Remove fill cap from the engine oil tank and fill the tank with oil. Reinstall the fill cap.
3. Loosen the fill cap on the engine oil tank. Run the engine until the all the air has been vented out of the tank and oil starts to flow out of the tank. Retighten fill cap.

CAUTION

Be certain that the fill caps on the oil reservoir tank and the remote oil tank are installed tightly. An air leak, at the remote oil tank fill cap will prevent oil flow to the engine. An oil leak at the reservoir fill cap will cause oil spillage.

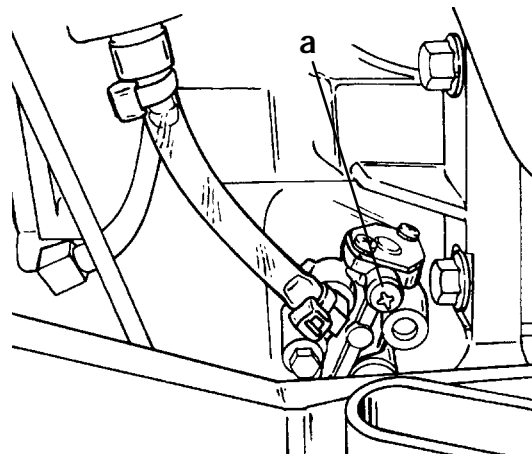


a - Reservoir Tank

Bleeding Air from Oil Injection Pump and Oil Injection Outlet Hose

BLEEDING AIR FROM OIL INJECTION PUMP

With engine not running, place a shop towel below the oil injection pump. Loosen bleed screw three to four turns and allow oil to flow from bleed hole. Retighten bleed screw. This procedure allows the pump to fill with oil.

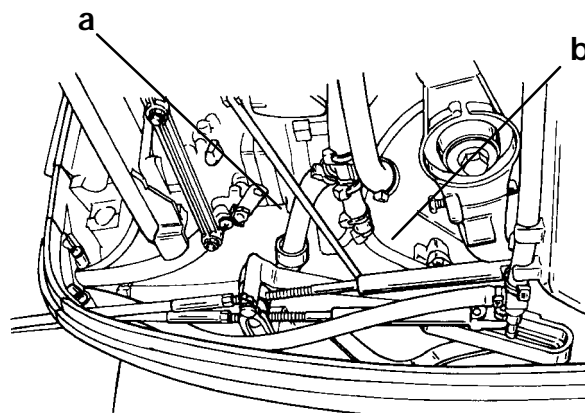


a - Bleed Screw

BLEEDING AIR FROM OIL INJECTION PUMP OUTLET HOSE

Any air bubbles in outlet hose in most cases will be purged out of the system during operation of the engine.

If air bubbles persist, they can be purged out of the hose by removing link rod and rotating the pump arm full clockwise while operating engine at 1000 to 1500 RPM: If necessary, gently pinch the fuel line between the remote fuel line connector and the oil injection pump "Tee" fitting. This will cause the fuel pump to provide a partial vacuum which will aid in removal of the air. Reinstall link rod.



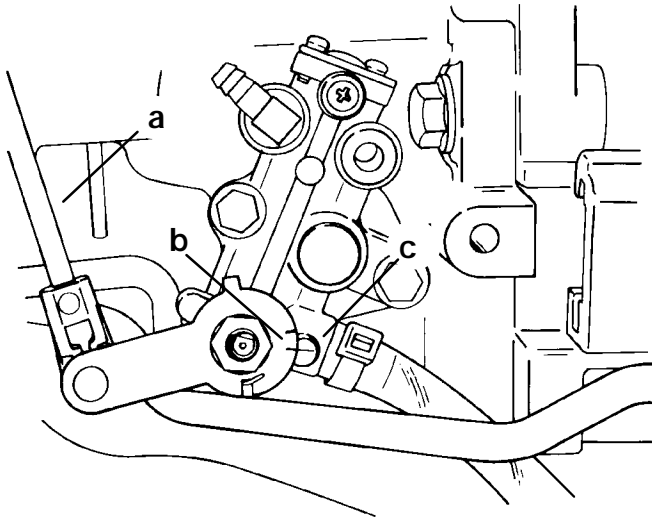
a - Fuel Line
b - Oil Line

52189



Adjusting Oil Injection Pump

When throttle linkage is at idle position, alignment mark on oil injection arm should be in-line with mark on casting as shown. If necessary, adjust link rod.



51702

- a - Link Rod
- b - Alignment Mark
- c - Casting Mark

Trim Tab Adjustment

Propeller steering torque may cause your boat to pull in one direction. This steering torque results from your outboard not being trimmed so the propeller shaft is parallel to the water surface. The trim tab can help compensate for this steering torque and can be adjusted within limits to reduce any unequal steering effort.

MODELS WITHOUT POWER STEERING

Operate your boat at normal cruising speed, trimmed to desired position. Turn your boat left and right and note the direction the boat turns more easily.

If adjustment is necessary, loosen trim tab bolt until trim tab moves freely (does not rub against locking ridges). DO NOT strike tab to make adjustments. Make small adjustments at a time. If the boat turns more easily to the left, move the trailing edge of trim tab to the left. If the boat turns more easily to the right move the trailing edge of trim tab to the right. Position trim tab in one of the locating grooves BEFORE tightening bolt to prevent damage to holding mechanism. Torque bolt to 40 lb. ft. (54.0 N·m) and retest.

MODELS WITH POWER STEERING

Trim tab adjustment is not required. The trailing edge of the trim tab should be set straight back.

