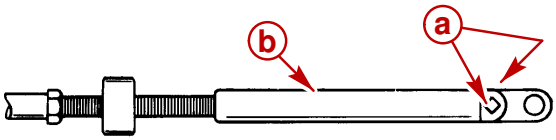
Shift Cable

Removal

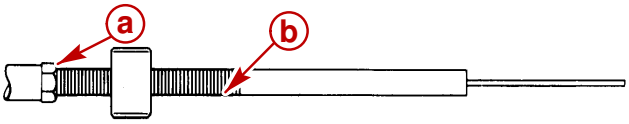
1. Remove sterndrive unit.
2. Disconnect shift cable from shift plate and remove end guide.



22183

a - Anchor Screws (2)
b - End Guide

3. Remove threaded tube.

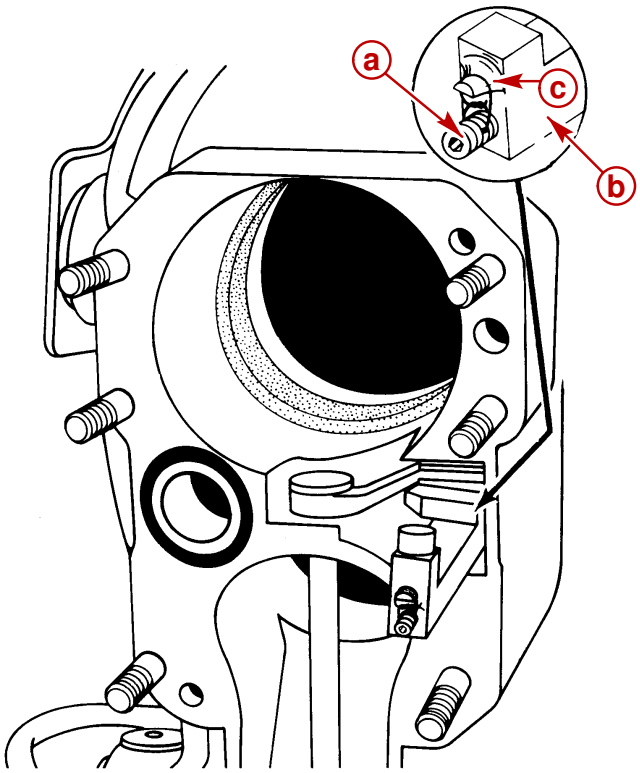


22183

a - Jam Nut
b - Threaded Tube

22183

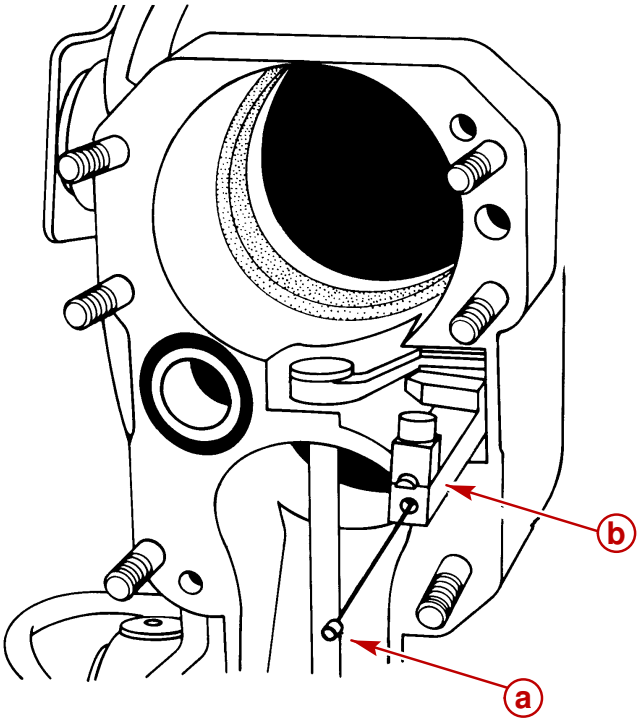
4. Cut safety wire and remove set screw from shift slide.



70138

a - Set Screw
b - Shift Slide
c - Safety Wire

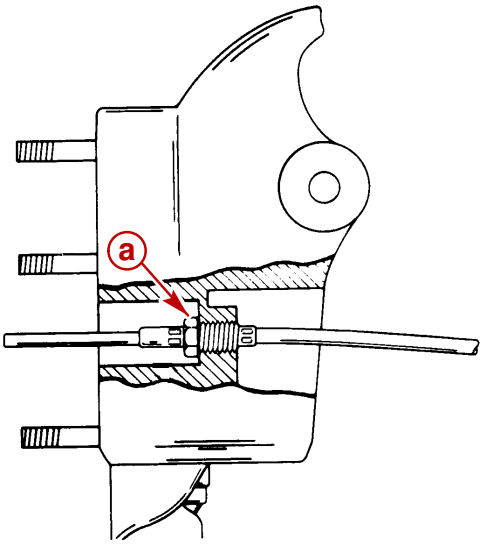
5. Remove inner core wire and shift slide.



70138

a - Inner Core Wire
b - Shift Slide

6. Using shift cable removal and installation tool (91-12037), completely loosen shift cable retaining nut.

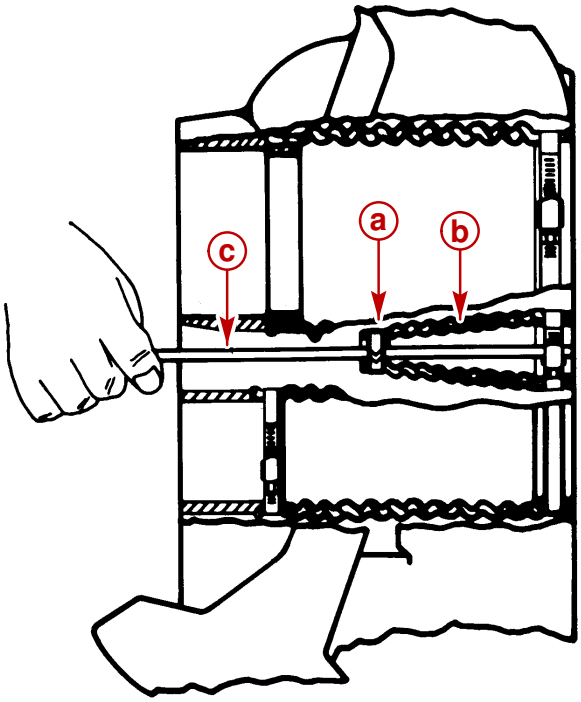


23156

a - Shift Cable Retaining Nut

IMPORTANT: The shift cable should be replaced as an assembly only.

7. Loosen and remove shift cable bellows crimp clamp.

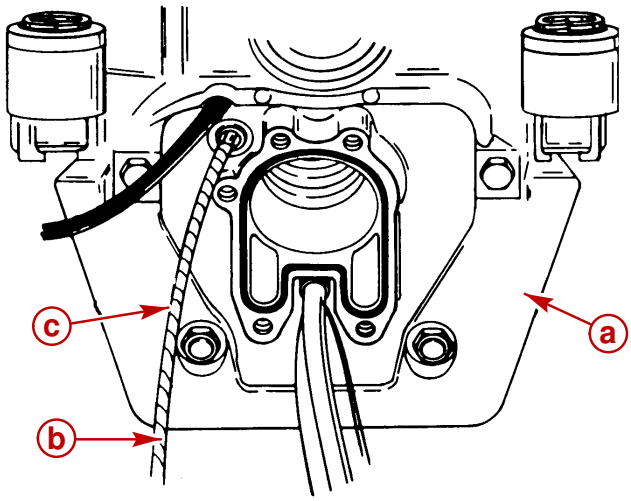


70137

a - Crimp Clamp
b - Shift Cable Bellows
c - Shift Cable

70138

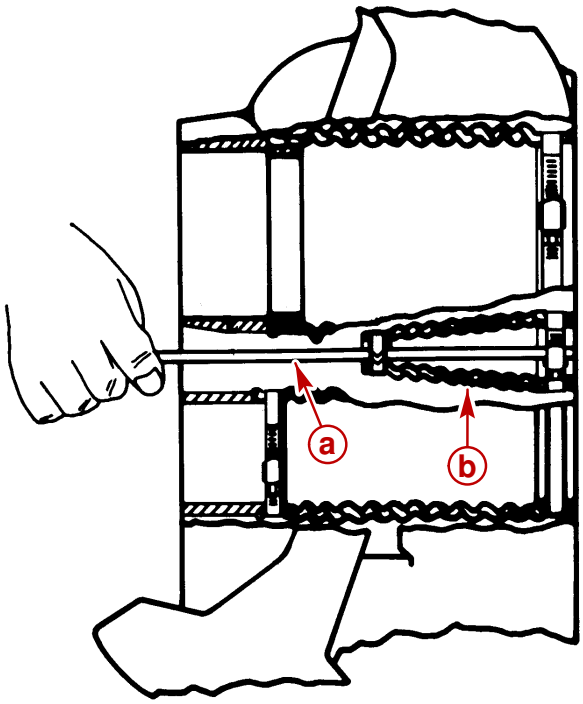
8. Remove shift cable wrapping from shift cable on inner transom.



22030

a - Inner Transom
b - Shift Cable
c - Wrapping

9. Pull shift cable through shift cable bellows.



70137

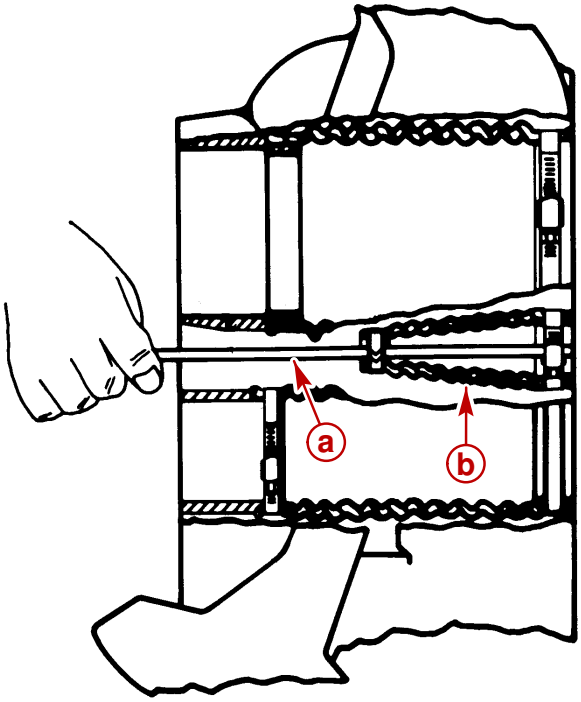
a - Shift Cable
b - Shift Cable Bellows

Inspection

1. Inspect shift cable for cuts, kinks and chafing.
2. Inspect inner core wire for kinks and unraveling.
3. Inspect shift cable retainer nut threads for damage.
4. Inspect for signs of retainer nut separating from outer casing.

Installation

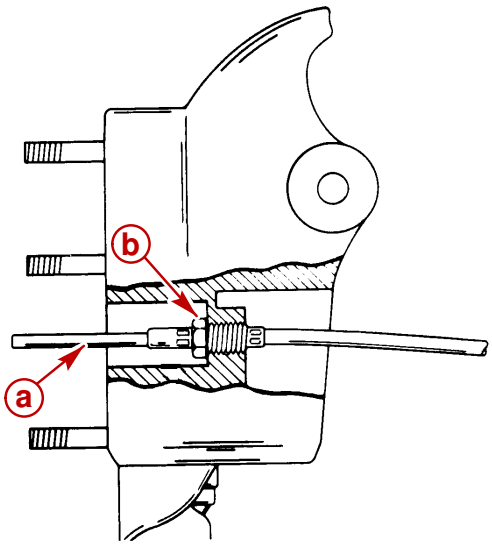
1. Insert shift cable through bell housing and shift cable bellows.



70137

a - Shift Cable
b - Shift Cable Bellows

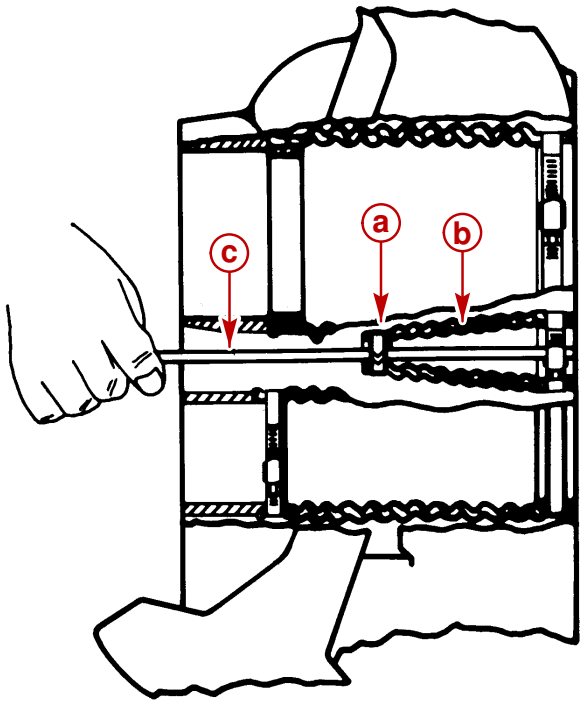
2. Apply Perfect Seal to shift cable retainer nut threads and secure shift cable to bell housing, using shift cable removal and installation tool (91-12037). **No more than 2 threads on retainer nut should be exposed.**



23156

a - Shift Cable
b - Retainer Nut

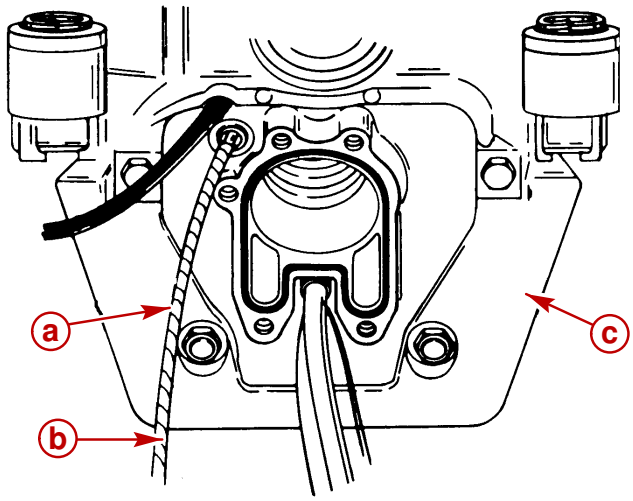
3. Install and compress shift cable bellows crimp clamp. Be sure that clamp is crimped evenly so that a good seal is maintained between bellows and shift cable. (Plans for Crimp Clamp Tool are on p. 4A-26) DO NOT allow bellows to flatten or water leak may occur.



70137

a - Crimp Clamp
b - Shift Cable Bellows
c - Shift Cable

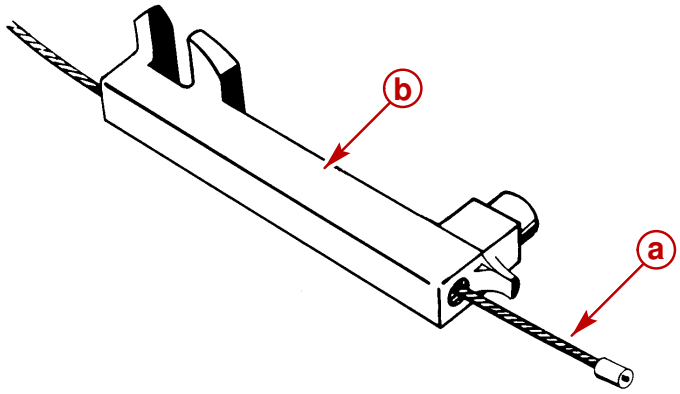
4. Install shift cable wrapping.



22030

a - Shift Cable
b - Shift Cable Wrapping
c - Inner Transom Plate

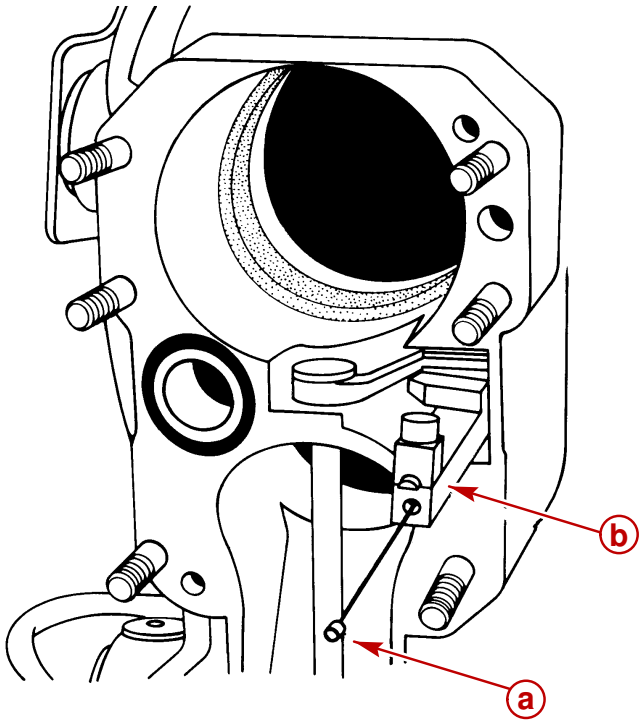
5. Install inner core wire through shift slide.



23262

a - Core Wire
b - Shift Slide

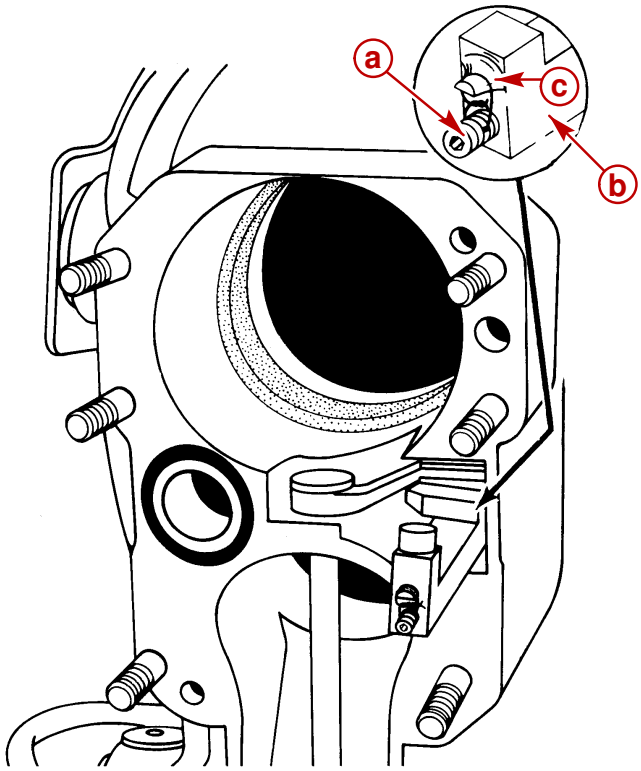
6. Install inner core wire through shift cable.



70138

a - Inner Core Wire
b - Shift Slide

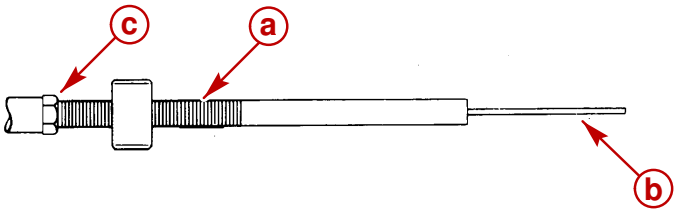
7. Install set screw into shift slide. Tighten until it contacts core wire. Then back off a maximum of 1/8 turn. Safety wire set screw to shift slide using a “figure 8” pattern. Twist until tight and cut off excess length of safety wire.



70138

a - Set Screw
b - Shift Slide
c - Safety Wire

8. Install threaded tube on shift cable and tighten until it bottoms. Secure jam nut against shift cable end.

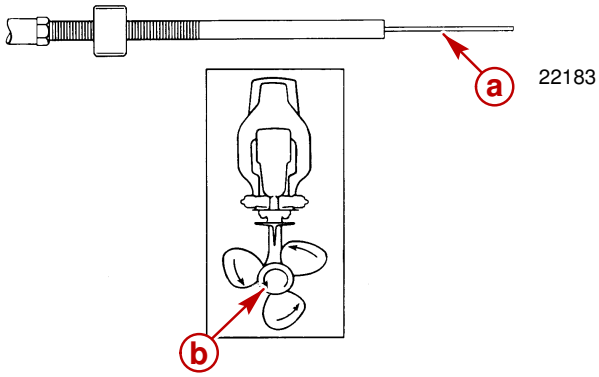


22183

a - Threaded Tube
b - Core Wire
c - Jam Nut

9. Install sterndrive unit.

10. Push in on drive unit shift cable while simultaneously turning propeller shaft counterclockwise until shaft stops. To ensure that clutch is fully engaged, maintain pressure on propeller shaft with a suitable device (elastic strap).



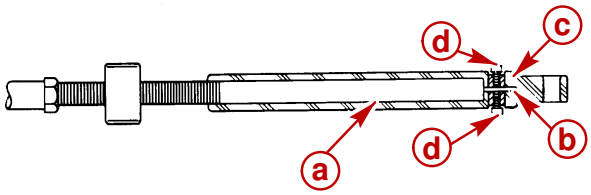
22183

23170

a - Inner Core Wire
b - Propeller Shaft

NOTE: *Clutch engagement will be in forward on right hand rotation units and reverse for left hand rotation.*

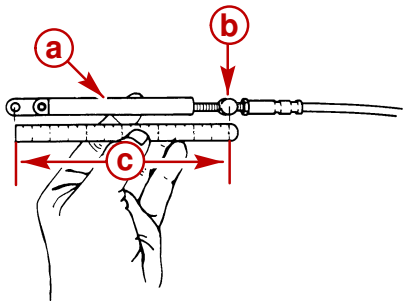
11. Install shift cable end guide over core wire and insert core wire through cable anchor. Tighten screws securely.



22183

a - Shift Cable End Guide
b - Core Wire
c - Cable Anchor
d - Screws (2)

12. While applying light inward pressure, rotate barrel on shift cable threads until distance between center of hole in shift cable end guide and center of brass barrel measure 6 in. (153 mm).



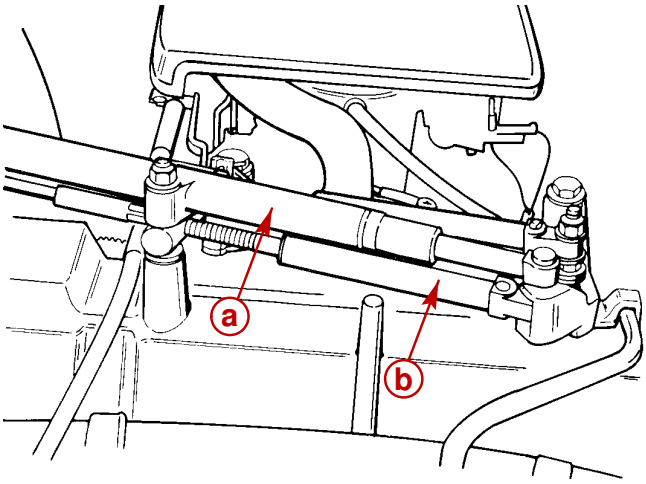
50484

a - End Guide
b - Brass Barrel
c - 6 in. (153 mm)

13. Adjust shift cable.

Remote Control Shift Cable Adjustment (Drive Unit Installed)

NOTE: *The illustrations on the following pages show models that have a shift plate that is mounted on the exhaust elbow. The shift mechanism components on the 3.0L model are located on the top of the valve cover as shown in the following illustration. The procedure for making the adjustments is exactly the same.*



50626

3.0L Model With Components Mounted On Valve Cover

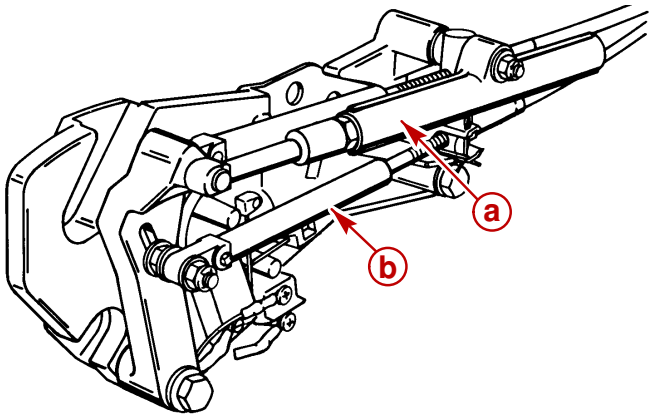
a - Shift Assist Assembly
b - Remote Control Shift Cable

IMPORTANT: Shift cable adjustment for a right hand (RH) rotation drive unit is different than the procedure for adjusting a left hand (LH) rotation drive unit. Be sure to refer to the appropriate procedure when performing the following steps.

IMPORTANT: Drive unit must be installed.

IMPORTANT: DO NOT run engine.

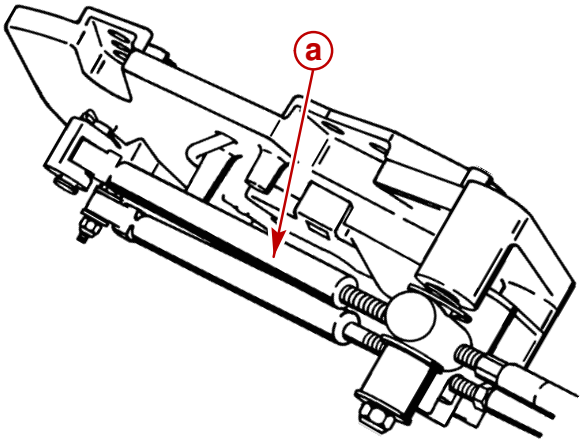
1. Remove remote control shift cable and shift assist assembly (if installed).



50308

With Shift Assist Assembly

a - Shift Assist Assembly
b - Remote Control Shift Cable

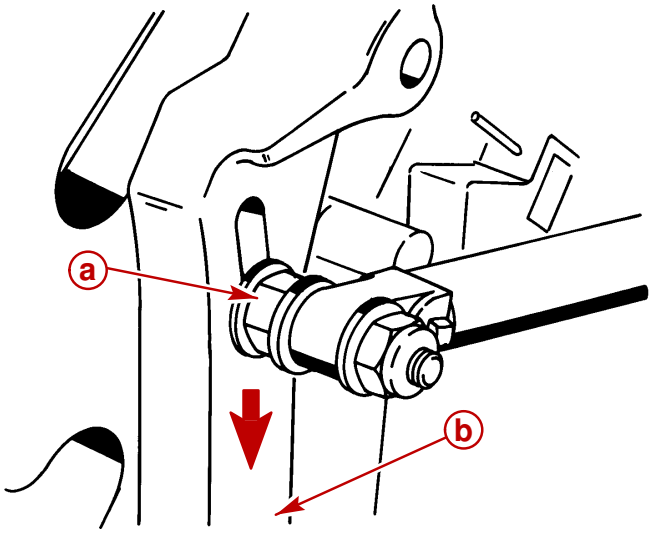


50310

Without Shift Assist Assembly

a - Remote Control Shift Cable

2. Ensure shift lever adjustable stud is at bottom of slot. If necessary, loosen stud and move it to bottom of slot toward the pivot bolt, then retighten stud.

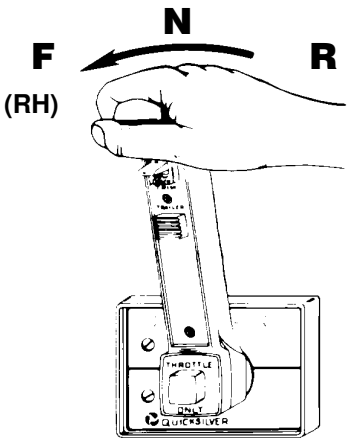


50309

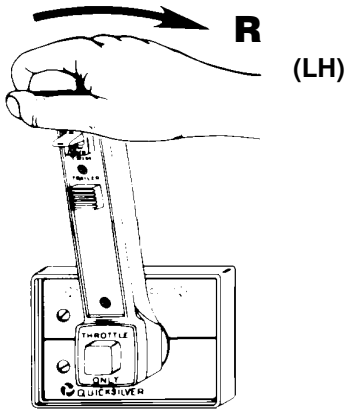
a - Adjustable Stud
b - Toward pivot bolt

3. Shift remote control as stated in “a” or “b” following:

   a. **Right Hand (RH) Rotation Drive Unit -** forward gear, past detent, into wide-open-throttle position.

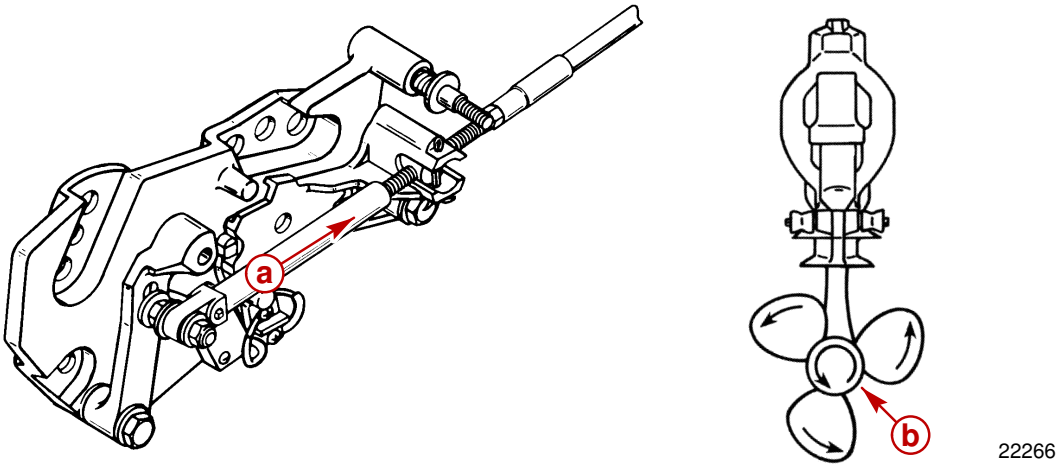


b. **Left Hand (LH) Rotation Drive Unit -** reverse gear, past detent, into wide-open-throttle position.



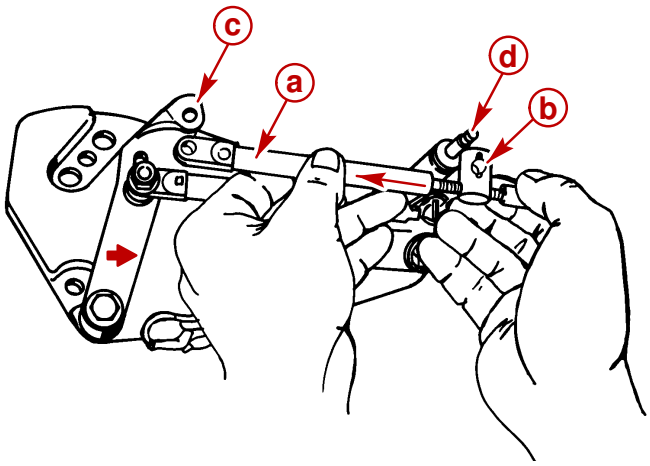
4. Place drive unit into gear by pushing in on drive unit shift cable, while simultaneously rotating propeller shaft counterclockwise until shaft stops, to ensure full clutch engagement. Maintain a light pressure on the drive unit shift cable to hold it at the end of its travel (this removes all slack from the cable).

IMPORTANT: Do not use excessive force when holding pressure on the drive unit shift cable. Excessive force would be indicated by movement of the v-notch on the shift cutout switch.



a - Drive Unit Shift Cable - Push In
b - Propeller Shaft - Rotate Counterclockwise

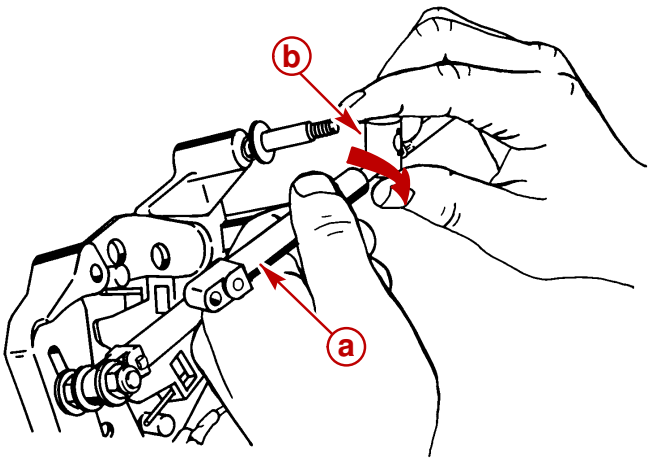
5. Lightly pull on remote control shift cable end guide (to remove slack from remote control and cable) and adjust brass barrel as necessary to align attaching points with shift lever clevis pin hole and stud. Be sure to maintain light pressure on drive unit shift cable.



50309

a - End Guide
b - Brass Barrel
c - Shift Lever Clevis Pin Hole
d - Stud

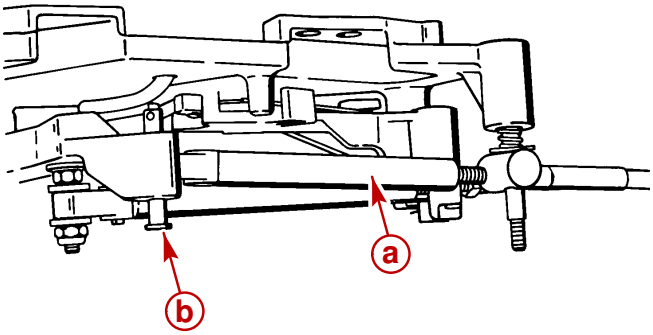
6. After cable has been aligned, turn brass barrel 4 turns **away** from cable end guide.



50308

e - End Guide
f - Brass Barrel

7. Temporarily install remote control shift cable on stud and install clevis pin.

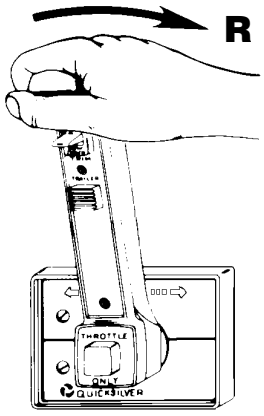


50308

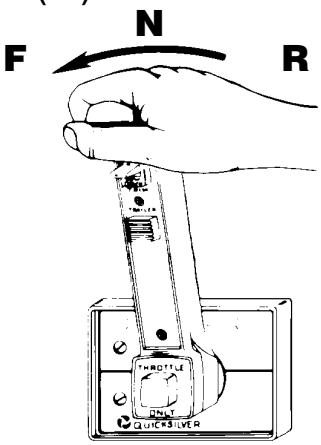
a - Remote Control Shift Cable
b - Clevis Pin

8. Shift remote control as stated in a or b following:
   a. **Right Hand (RH) Rotation Drive Unit -** reverse gear, past detent, into wide-open-throttle position.
   b. **Left Hand (LH) Rotation Drive Unit -** forward gear, past detent, into wide-open-throttle position.

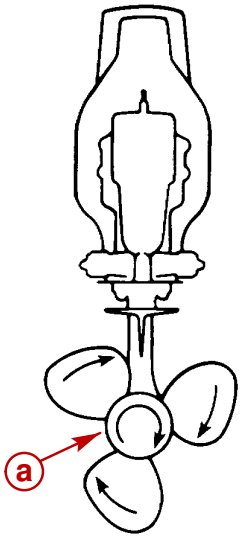
(RH)



(LH)



9. Simultaneously rotate propeller shaft clockwise until shaft stops to ensure full clutch engagement.

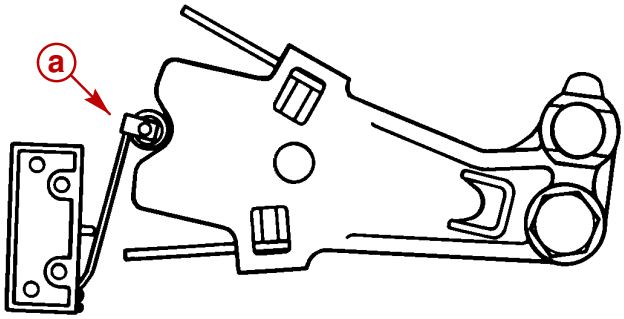


22267

a - Propeller Shaft - Rotate Clockwise

10. Perform a or b as appropriate:

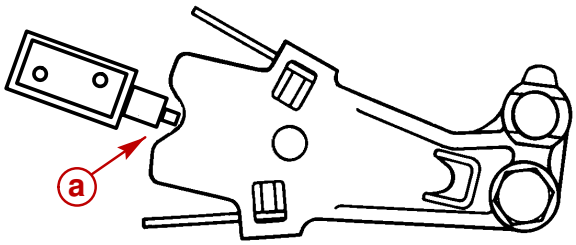
a. **On Models with Earlier Type Switch:** check shift cutout switch lever position. Roller must be centered.



22058

a - Shift Cutout Switch Roller

b. **On Models with Later Type Switch:** check shift cutout switch plunger position. Pin must be centered.



75128

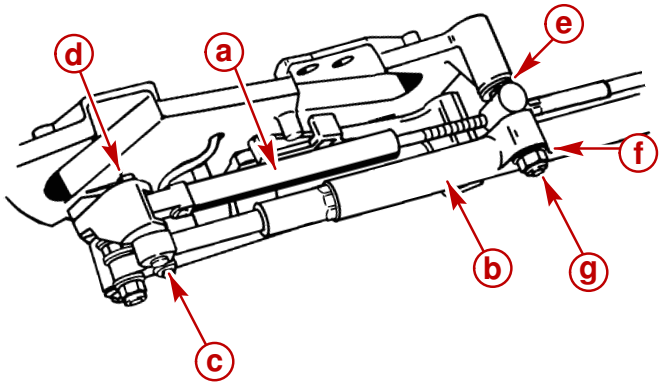
a - Shift Cutout Switch Roller

11. If roller or plunger pin is not centered:
    a. Ensure adjustable stud is at bottom of slot in shift lever.
    b. Check remote control for proper shift cable output [3 in. (76 mm) ± 1/8 in. (3 mm)]. Refer to “Installation Requirements.”
    c. If a and b are correct, ensure drive unit shift cable is not crushed or kinked. (If drive unit shift cable is binding, the shift cutout switch roller or plunger pin will move off center when shifting “into” and “out of” forward **and** reverse).

NOTE: *If shift cable was damaged during installation, install new shift cable assembly in accordance with instructions contained in sterndrive service manual, then repeat shift cable adjustment procedure.*

NOTE: *Some controllers, such as the Commander 3000, have different adjustment procedures. Refer to the appropriate installation instructions for the model being repaired..*

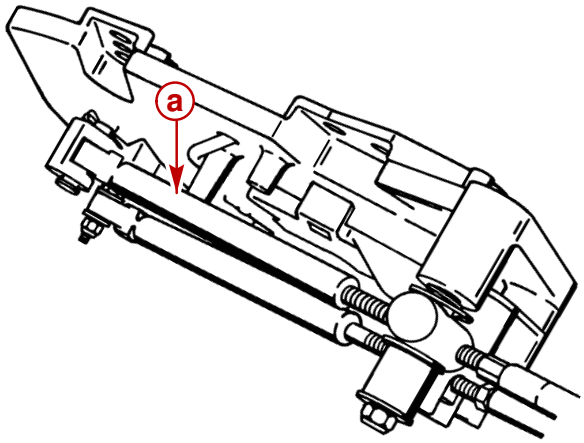
12. After remote control shift cable has been properly adjusted, reinstall cable and shift assist assembly (if applicable) and secure with hardware as shown. If shift assist assembly attaching points will not align, push in or pull out on end of shift assist assembly to install. Do not attempt to readjust shift cable.



50308

With Shift Assist Assembly

a - Remote Control Shift Cable
b - Shift Assist Assembly
c - Clevis Pin
d - Cotter Pin (Spread Both Prongs)
e - Large I.D. Washer
f - Small I.D. Washer
g - Locknut (Tighten Until Bottomed, Then Back Off 1/2 Turn)



50310

Without Shift Assist Assembly

a - Remote Control Shift Cable
b - Clevis Pin
c - Cotter Pin (Existing)
d - Spring (Existing)
e - Washer (Existing)
f - Washer
g - Spacer
h - Washer (Existing)
i - Locknut (Existing) - (Tighten Until Bottomed, Then Back Off 1/2 Turn)

IMPORTANT: If an extra long remote control shift cable is used, or if there are a large number of bends in remote control shift cable, or remote control has inadequate output travel, an additional adjustment may be necessary. Refer to step 12 or 13 as applicable.

13. **Remote Control with Single Lever Shift/Throttle Control:**

    a. **RIGHT HAND (RH) propeller rotation drive unit -** Shift remote control into reverse gear, wide-open-throttle position while simultaneously rotating propeller shaft clockwise. Clutch should engage and cause propeller shaft to lock. If clutch does not engage, loosen adjustable stud on shift lever and move it upward in slot until clutch engages with reverse gear. Retighten stud. Shift remote control several times and stop in reverse to recheck shift cutout switch position. Roller must be centered.

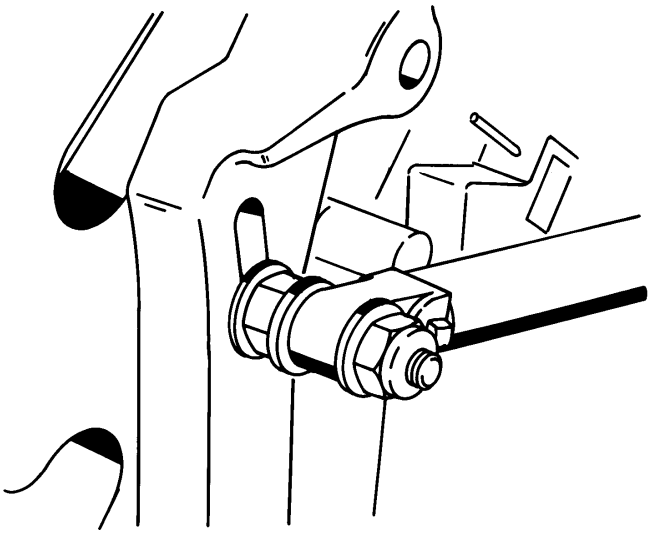
    b. **LEFT HAND (LH) propeller rotation drive unit -** Shift remote control into forward gear, wide-open-throttle position while simultaneously rotating propeller shaft clockwise. Clutch should engage and cause propeller shaft to lock. If clutch does not engage, loosen adjustable stud on shift lever and move it upward in slot until clutch engages with forward gear. Retighten stud. Shift remote control several times and stop in forward to recheck shift cutout switch position. Roller must be centered.

14. **Two Lever Remote Control with Separate Shift and Throttle Levers:**

    a. **RIGHT HAND (RH) propeller rotation drive unit -** While turning propeller shaft clockwise, move remote control shift handle into full reverse position. Clutch should engage before shift lever comes to a stop. If clutch does not engage, loosen

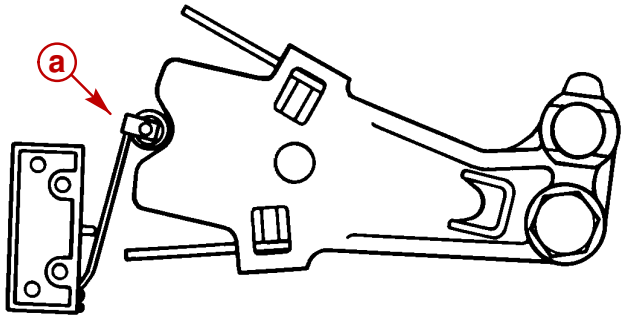
adjustable stud on shift lever and move it upward in slot until clutch engages with reverse gear. Retighten stud. Shift remote control several times and stop in reverse to recheck shift cutout switch position. Roller must be centered.

b. **LEFT HAND (LH) propeller rotation drive unit -** While turning propeller shaft clockwise, move remote control shift handle into full forward position. Clutch should engage before shift lever comes to a stop. If clutch does not engage, loosen adjustable stud on shift lever and move it upward in slot until clutch engages with forward gear. Retighten stud. Shift remote control several times and stop in forward to recheck shift cutout switch position. Roller or pin must be centered.



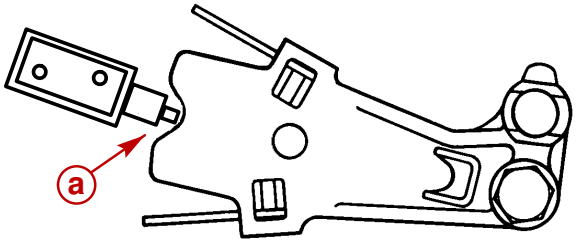
50309

a - Adjustable Stud



22058

a - Shift Cutout Switch Roller



75128

a - Shift Cutout Switch Roller