

INSTALLATION
JETOVATORINSTALLATION 203
SECTION 6 PAGE 5.15
DATE 4-18-73

SUPERSEDES

NEW

PRELIMINARY PROCEDURE - The first step required for installation of the Jetovator is to provide a horizontal pivot axis by rotating the nozzle housing 90°. On the Model 12JB Jet-Drive this is done by simply rotating the removable nozzle housing either clockwise or counter-clockwise. If you have a Model 12JC Jet-Drive, the process becomes slightly more involved in that the bowl of the unit, which incorporates the bowl and nozzle housing into one piece, must be rotated 90° in a counter-clockwise direction. This will require removal of the transom adapter.

To rotate the nozzle housing on the Model 12JB Jet-Drive, disconnect the reverse cable from the reverse bucket, remove the steering tiller from its shaft, and remove both the lower and upper tiller shafts. (After removing the upper shaft's set screw, the shaft must be removed by tapping it downward into the steerable nozzle, as this shaft's Woodruff key prevents any upward travel.) Now remove the 6 hex nuts and 2 capscrews holding the nozzle housing in place, rotate the nozzle housing 90° clockwise or counter-clockwise and remount the part.

On the Model 12JC Jet-Drive after disconnecting the reverse cable from the reverse bucket and removing the tiller and steerable nozzle assembly (by removing upper and lower tiller shafts), remove all 10 transom adapter screws. Use a pocket knife to carefully cut away any sealant applied to the transom adapter gasket. To remove the transom adapter make four wooden wedges, preferably of hardwood, about 2 inches wide and 6 inches long and drive them evenly between the transom and the transom adapter at equally spaced locations. After the transom adapter has been freed, remove the 8 bowl retaining bolts and tap the nozzle housing end of the bowl with a soft mallet to loosen the bowl on its fit. Use care not to damage the gasket. Without moving the bowl more than 1/4" off its fit, rotate the bowl 90° counter-clockwise and remount it to the suction piece. (NOTE: The bowl attaching bolts may be used to gently pull the bowl up snug against the suction piece. However, care must be used so as to not bind the bowl and damage the fit.) Apply Loctite to all bowl bolts and tighten securely. Clean any old sealer from the bowl, O-Ring and transom adapter gasket, reinstall the O-Ring in its groove and lubricate it with grease or silicone sealer. The transom adapter can be installed by seating it squarely against the O-Ring and pulling it over the O-Ring by evenly tightening one long flat head machine screw placed in the middle of each side of the adapter. Observe to make certain that the O-Ring is not rolled out of its groove. Before the transom adapter is completely flush against the transom, apply a bead of silicone sealer between the transom and the adapter gasket; also apply silicone sealer to the threads of each transom adapter screw, before installing it. Tighten transom adapter screws evenly; make a smooth

fillet of excess sealer which has been squeezed out between the transom and the transom adapter. Make certain the bowl O-Ring is in place by probing the gap between the bowl and the transom adapter with feeler gages.

JETOVATOR INSTALLATION - After the above steps have been completed you can begin installing the Jetovator assembly. Numerical symbols used in the following steps correspond to the parts identification drawing H-2846.

- 1 Install one Nylon bearing (1) in each nozzle housing (bowl) bore, flange end inward. Hold the adapter body (2) in place and slide a short horizontal shaft (3) through each nozzle housing bore. Apply Loctite to the threads of two 5/16"-18 x 1" socket head capscrews (4) and secure the adapter body in place (Figure 1).

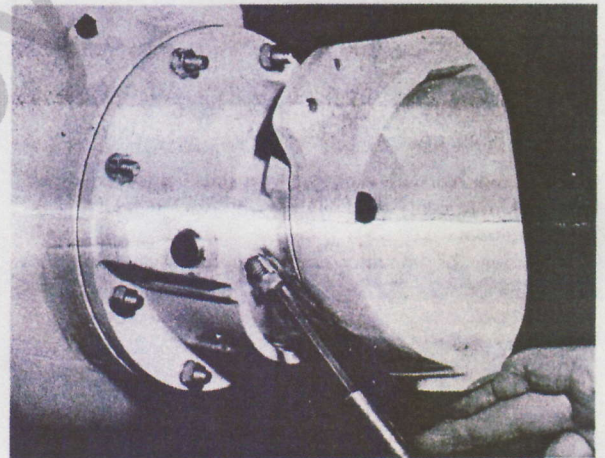


Figure 1

- 2 Attach the control lever (5) to the adapter body, using the 5/16"-18 x 1" hex head capscrews (6) and 5/6" lockwashers (7) (Figure 2).

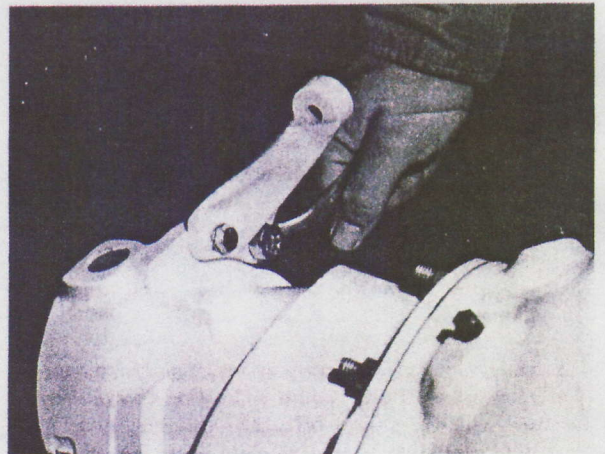


Figure 2



INSTALLATION JETOVATOR

SUPERSEDES
NEW

- Reinstall the steerable nozzle assembly and reverse cable (Figure 3). When installing the Jetovator on Model 12JC Jet-Drives, attach the new tiller (8) at this time.

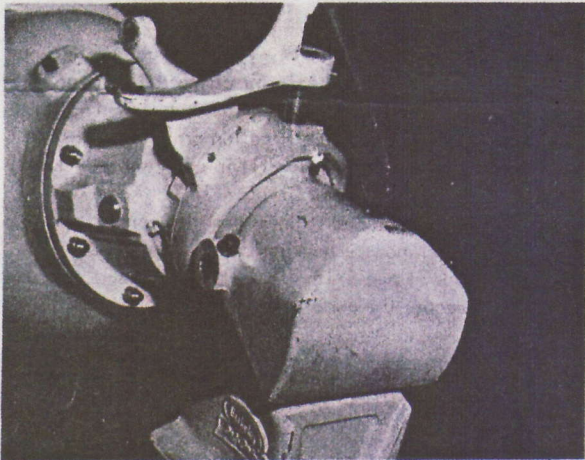


Figure 3

- Remove rear adjusting nut from steering tube and pull steerable cable assembly through transom adapter into boat. Layout and drill a 1/4" hole in transom adapter for Jetovator control cable as shown in Figure 4.

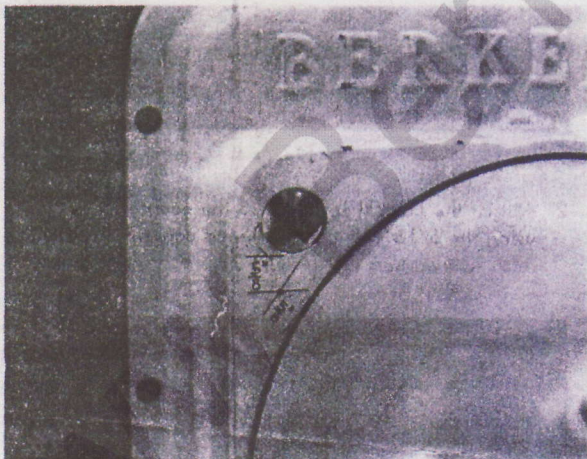


Figure 4

- Insert O-Ring (9) into steering tube bearing (10). From INSIDE of boat start long, chamfered end of bearing through steering tube hole in transom adapter, positioning either milled flat or shoulder of bearing toward bowl (Figure 5).
- Using block of wood and hammer, lightly tap bearing rearward until pivot points on bearing contact transom adapter. Now lubricate new steering tube (11) with Lubriplate or other suitable substance, and insert

tube into bearing bore being careful not to damage O-Ring. Try sliding new steering tube back and forth through bearing (Figure 6). Should tube not slide freely in bearing, remove bearing and lightly sand inside steering tube hole in TRANSOM ADAPTER. Replace bearing and recheck steering tube fit in bearing.

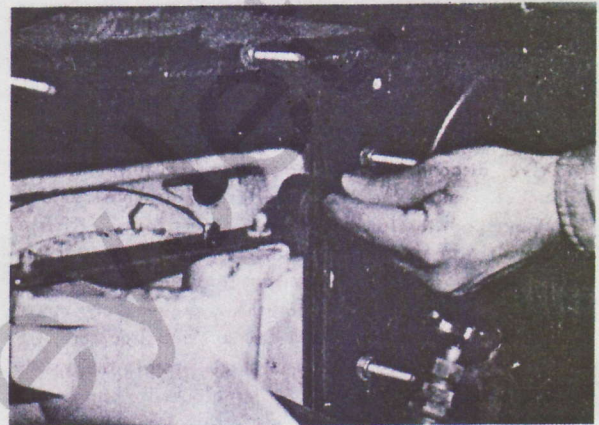


Figure 5

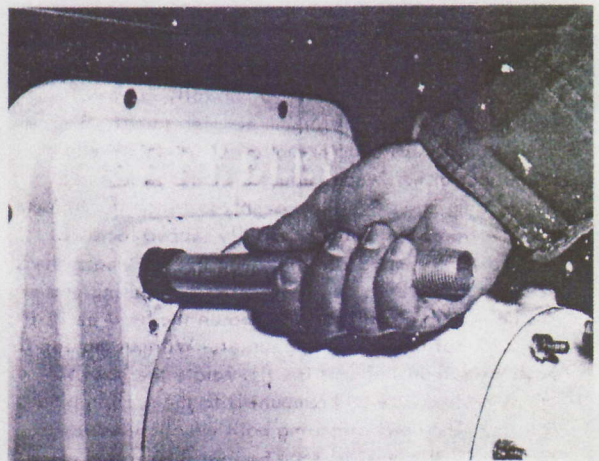


Figure 6

- Remove old steering tube from steering cable, and install new tube provided. Slide adjusting clamp (12) over steering tube with its counter weight spring fit facing the end of the steering cable. Do not tighten in place. Slip counter weight spring (13) over steering tube. When using Morse or Steer-master steering, thread terminal eye (14) on to end of steering cable (Figure 7).
- Lubricate steering tube and slide tube through the bearing in transom adapter being careful not to damage O-Ring. Slide transom seal bellows (15) over steering tube, flanged end first. Thread steering tube nut (16) on to steering tube, recessed face of nut to -



INSTALLATION
JETOVATOR

SUPERSEDES
NEW

wards transom. Thread connecting link (17) on to steering tube until rear face of connecting link is flush with end of steering tube. Connect guide swivel (18) and forward ends of steering extension bars (19) to steering cable terminal eye. Hold in place using clevis pin (20) two 1/4" flat washers (21) and cotter pin (22) (Figure 8).



Figure 7

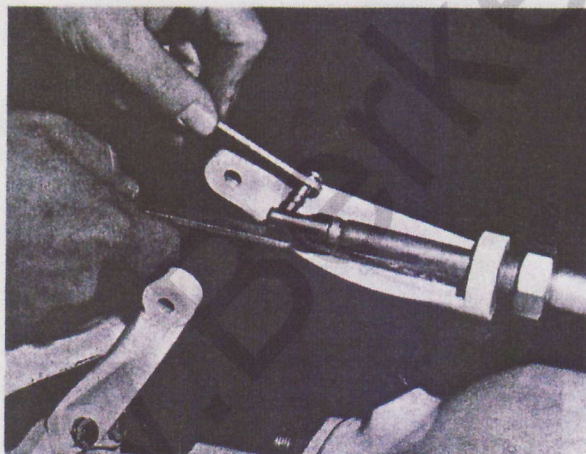


Figure 8

- 9 Attach connecting link (17) to control lever (5). Pass 3/8"-24 hex head capscrew (23) through connecting link and thread through control lever until finger tight. Loosen capscrew 1/2 turn, apply Loctite to exposed threads and fasten assembly with 3/8"-24 hex nut (24) jamming nut against control lever while holding capscrew in place (Figure 9).
- 10 Attach steering swivel (25) to tiller using hex head capscrew (23) spacer nut (24) and lock nut (26) on Model 12JC Jet-Drive as shown on Parts I.D. Drawing H-2846. Note that steering swivel is mounted above 12JC tiller arm. Jam both nuts against tiller allowing steering swivel to rotate freely. On Model 12JB

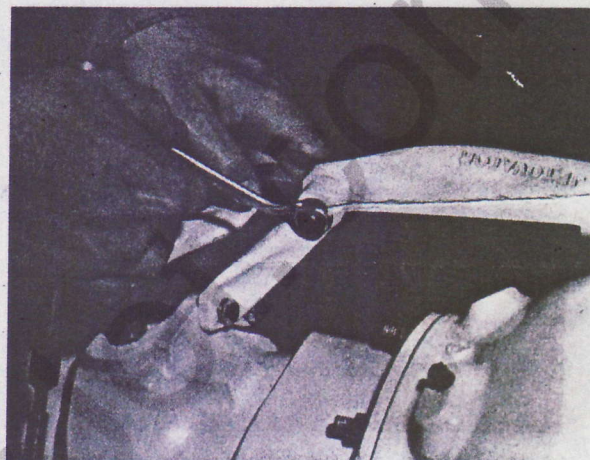


Figure 9

Jet-Drive attach steering swivel to tiller using 3/8"-24 socket head capscrew (27) 1/8" long spacer (28) 1/2" spacer (29) and lock nut (26) as shown in inset on Parts I. D. Drawing H-2846 and in Figure 10. Jam lock nut against tiller, allowing free rotation of steering swivel. Note that steering swivel is mounted below Model 12JB tiller arm.

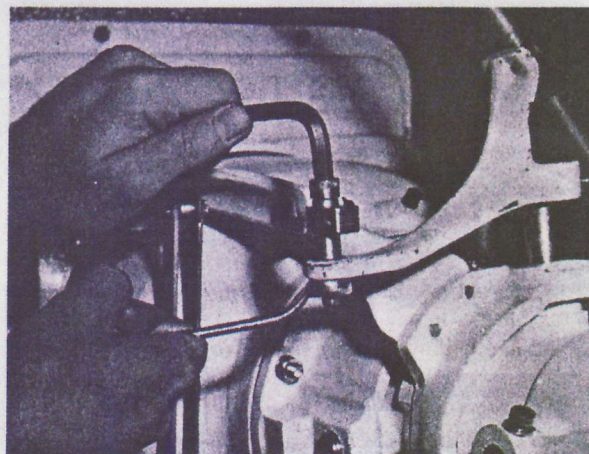


Figure 10

- 11 Connect steering extension bars to steering swivel, using clevis pin (20) two flat washers (21) and cotter pin (22) (Figure 11). Note proper orientation of steering swivel for Model 12JB or Model 12JC Jet-Drive.
- 12 Attach control cable hub to adjusting clamp (12) on steering tube using cable clamp (30) two #10-32 socket head capscrews (31) and two #10 lock washers (32) (Figure 12). Make certain that internal ridge in clamp aligns with groove in cable hub.



INSTALLATION

JETOVATOR

SUPERSEDES
NEW

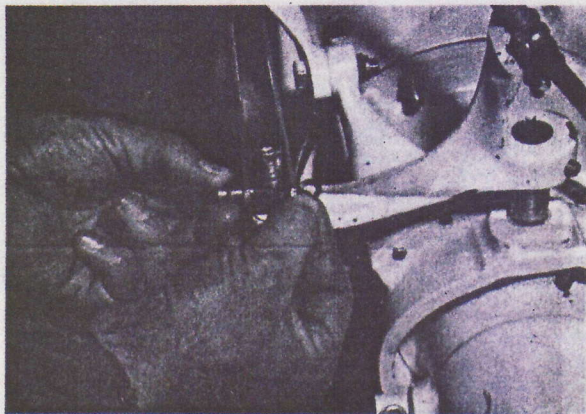


Figure 11

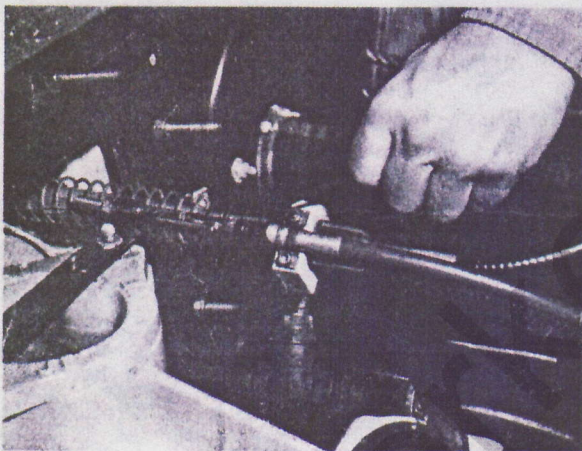


Figure 12

- 13 Fasten control cable end to transom adapter at hole drilled in step 4 using one 1/4"-28 hex nut (33) and one 1/4" flat washer (21) on each side of the transom adapter, applying silicone sealer between flat washers and transom (Figure 13).

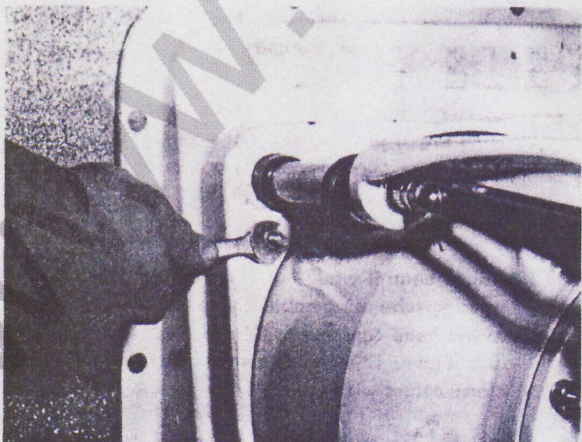


Figure 13

- 14 Wipe area of transom adapter around steering tube bearing clean and apply thick fillet of silicone sealer between bearing and transom adapter. Slip transom seal bellows (15) over bearing and press it firmly against transom adapter. Some excess sealer should squeeze out from between bellows and transom adapter. Secure bellows seal to bearing with self-locking nylon tie (34) (Figure 14). (Note: This tie is the replaceable type. To remove the tie simply pull outward on the tab end of the tie with a pair of needle nose pliers.) Allow sealant sufficient set-up time.



Figure 14

- 15 Connect forward end of control cable to control unit. Set control lever in rearmost position. Push down on steerable nozzle until adapter body rests against stop. Tighten adjusting clamp in place using the 1/4"-20 x 1-1/2" hex head capscrew (35) with Loctite applied to the threads (Figure 15). Minor travel adjustments can be made by moving the adjusting clamp forward or rearward a slight amount. Berkeley Pump Company offers two separate control systems designed for use with the Jetovator, both of which are supplied complete with mounting brackets and necessary hardware.

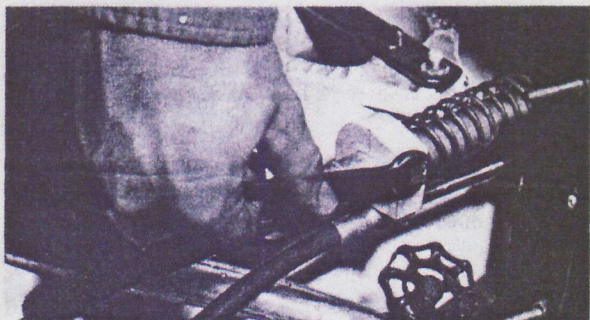


Figure 15

OPERATION - Control arm travel is initiated at the control cable hub rather than at the end of the inner cable in order that heavy cable loads will be pull-type loads. Since it is necessary for the cable jacket to move, the cable should be allowed sufficient room for movement and should not be secured directly to the boat for at least three feet from the hub.