

PRODUCT/SERVICE BULLETIN

BULLETIN #304271 (Alpha)

DATE: 3/1/96

SUBJECT: STERN JACK installation & owner's manual.

IMPORTANT! Read all instructions fully before starting installation. For personal safety of operator and prevention of damage to equipment be sure to observe all "WARNING:" notes! Installers: Be sure that all owners and operators receive and read this information.

PARTS LIST
QUANTITY DESCRIPTION

- 1- *billet set back spacer assembly*
- 2- *side thrust arms*
- 2- *trim cylinder extension rods*
- 1- *female drive yoke*
- 1- *universal joint*
- 6- *long mounting studs*
- 2- *extension gasket and seal sets*
- 1- *assorted nylon spacer pads, shift cable extension, & hardware*
- 1- *tube of Loctite*
- 1- *tube of Anti-seize compound*
- 1- *installation & owner's manual*



WARNING: THIS KIT CONTAINS SPECIAL HEAVY DUTY HEAT TREATED STAINLESS STEEL MOUNTING STUDS! DO NOT ATTEMPT TO SUBSTITUTE COMMON 300 SERIES STAINLESS STUDS, THREADED ROD, ETC.! THE HIGHER LOADS IMPOSED BY A JACKED UP, SETBACK, AND/OR HIGH POWERED ENGINE CAN CAUSE MOUNTING FAILURE IF ONLY STANDARD HARDWARE IS USED!

WARNING: AS THE RIGGER, YOU MUST MAKE SURE THE BOAT'S TRANSOM, DRIVE UNIT, STEERING, ETC. ARE ADEQUATE FOR THE LOADS IMPOSED BY THE ENGINE SIZE, DRIVE HEIGHT, AND SETBACK. IF IN DOUBT, CONTACT BOAT AND/OR DRIVE MANUFACTURER FOR ADVICE. FOR MODIFIED ENGINES, RACING OR OTHER SEVERE DUTY USE ALL HARDWARE, BRACKETS, AS WELL AS THE BOAT'S TRANSOM AND THE DRIVE'S GIMBAL HOUSING HINGE AND SWIVEL PINS MUST BE INSPECTED AND REPLACED PERIODICALLY AS CONDITIONS DICTATE. IF THESE WARNINGS ARE NOT HEEDDED, MOUNTING COULD EVENTUALLY FAIL! IF DRIVE MOUNTING FAILS, DRIVE WILL BREAK AWAY FROM BOAT AND SERIOUS INJURY COULD RESULT!

INSTALLATION PROCEDURE

1. Match all components to the parts list to become familiar with the terminology used.
2. If it is already installed, remove the drive shaft housing from the bell housing assembly per the factory service manual. Check gimball housing components for damage and wear and replace as necessary. Tighten bolts to factory specification.
3. FROM INSIDE THE ENGINE COMPARTMENT, disconnect the shift cable (that comes from the bell housing) from the engine's shift plate per the factory service manual. Loosen the two set screws in the plastic cable end guide and pull the end guide from the cable's internal wire core.
4. From back outside the boat at the bell housing, pull the shift cable slide and wire core completely out of the bell housing. Cut the cable slide's lock wire and remove the allen set screw that locks the cable in the slide. Slip the shift cable slide off the wire core.



Figure 1

5. Insert the shift cable inner core wire into the Land & Sea black 4" long x 1/2" square aluminum shift bar extension half so that the barrel on the end of the wire sets into the threaded recess in the extension. Using a drop of blue Loctite (included) on its threads, screw the Land & Sea black 8" long x 5/16" hex aluminum cable extension half into the threads of the square extension half. Tighten the two extension halves to lock the cable in place. (Fig. 1)
6. Slip the original MerCruiser shift cable slide over the round tube end of the Land & Sea shift cable extension assembly. Secure the slide to the extension with a #4-40 x 1/2" socket head screw (included). Then reinstall the original MerCruiser allen screw (removed previously). (Fig. 2)

TIP: Use blue Loctite on the screw and be sure to reinstall the original safety lock wire that held the screw in the slide.



Figure 2



Figure 3--Completed Shift Cable Assembly

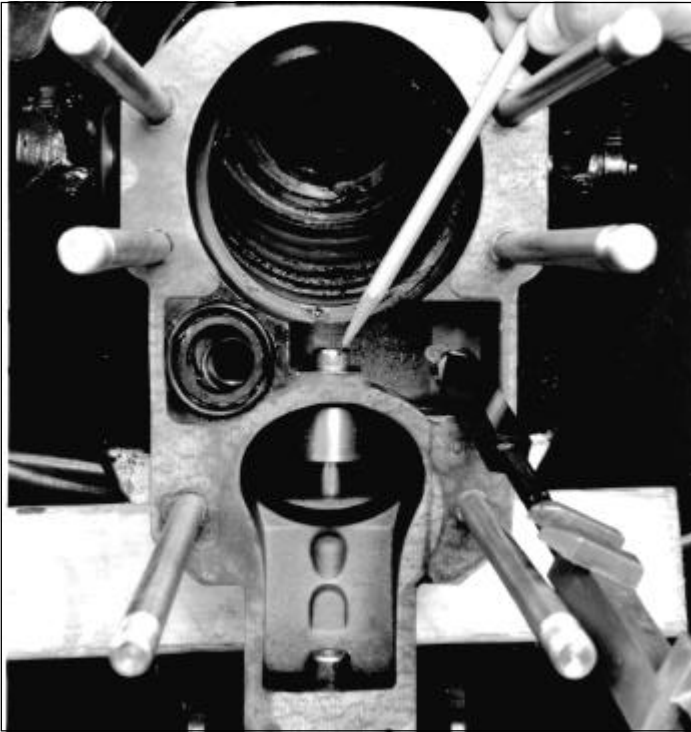


Figure 4



Figure 5

7. Loosen the set screw that holds the shift lever onto its shift shaft in the bell housing. Remove both the shift lever and its shaft from the bell housing. Drop the 3/8" x 1-5/8" socket head PLUG (included) into the upper shift lever bushing to seal the upper bushing hole left by the shift shaft's removal (the plug will be restricted from coming out by the STERN JACK's bearing boss). (Fig. 4) Transfer this shift shaft and lever to the aft end of the Stern Jack. Note: a bronze spacer (included) must be slipped onto the shift shaft of Alpha-I Generation-II drives only to accommodate their longer shift shafts.(Fig. 5)

8. Remove the splined input shaft and universal joint assembly from the drive shaft housing at the drive gear's yoke per the factory service manual.

TIP: Many dealers grind a bit of clearance between the castellations of the bearing retainer to allow changing the universal joint without disassembly of the drive shaft housing.

9. Replace the above removed input shaft and universal joint assembly with the new female spline yoke and NEW universal joint (included) per the factory service manual universal joint installation procedure. The splines should be greased for corrosion protection. (Fig. 6)



Figure 6



Figure 7

10. Install the previously removed input shaft and universal joint assembly onto the yoke in the forward end of the STERN JACK. (Fig. 7)

11. Heat the bell housing around its six studs with a propane torch to break down any Loctite, then, using a suitable stud driver (or double nuts), remove the old studs. Inspect the threaded holes. If they are okay, install the longer studs (included) using blue Loctite on the coarse 7/16"-14 threaded end.

WARNING: DO NOT BOTTOM THE STUDS IN THE HOLES, leave at least 1/2 thread before bottoming. Do NOT run a die over the stud's coarse interference threads.

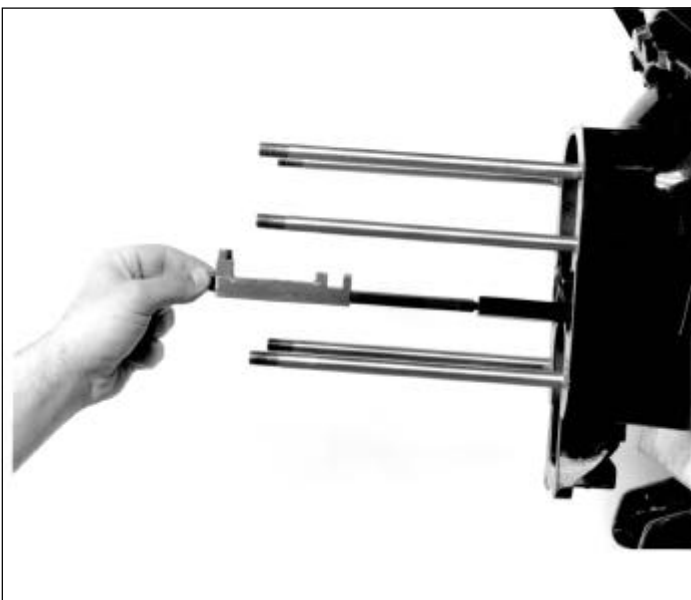


Figure 8



Figure 9

12. Slip the shift cable and extended cable slide assembly back into the cable's sheathing. Re-attach the cable guide to the cable and shift plate as per the factory service manual. (Fig. 8)

13. If your stern drive is equipped with the MerCruiser remote oil reservoir, you must install the supplied MerCruiser check valve parts (MerCruiser 1-#24-17997A1, 1-#18920A1, 2-#25-48171, 1-#25-62705) into the Stern-Jack's fore and aft oil passage ports before continuing.

WARNING: WHEN INSTALLING STERN-JACK FOR THE FIRST TIME, MAKE SURE YOU USE THE SUPPLIED QUAD RING ON THE FRONT AND BACK OF STERN-JACK. WHEN SERVICING DRIVE IN FUTURE, USE ONLY QUAD RINGS. IF STANDARD O-RINGS ARE USED, WATER CAN LEAK INTO HOUSING.

14. Using the supplied seal rings and gaskets as appropriate, slip the STERN JACK over the six long studs in the bell housing while guiding the splined input shaft into the drive coupler. (Fig. 9)

TIP: Clean all grease from the housings and coat all rubber seal rings with silicone to hold them in place.



Figure 10



Figure 11

WARNING: TAKE CARE NOT TO BEND THE STUDS DURING INSTALLATION AS THIS COULD PERMANENTLY WEAKEN THEM.

15. Make sure both the boat's shift lever and the lower unit are in forward. Align the universal joint on the front of the drive shaft housing so that it is straight out.

16. Using the supplied seal rings and gaskets as appropriate, slip the drive shaft housing over the six studs in the STERN JACK. Turn the prop shaft as required so that the male and female splines of the STERN JACK's drive shafts engage.

TIP: Make sure that the shift rod in the STERN JACK correctly engages the shift linkage in the drive shaft housing.

WARNING: DO NOT INSTALL ANY ADDITIONAL SPACERS OR "STAND-OFF BOXES" ON THE BOAT!

17a. Using the six 5/16"-18 x 5/8" socket head cap screws and lock washers, mount the left and right black aluminum side thrust arms to the sides of the STERN JACK's housing.(Fig. 10)



Figure 13



Figure 12

17b. On later model drives you will also have to mount a round nylon spacer pad on each arm using the 1/4"-20 x 5/8" socket head screws provided.

18. Using your drive's stock mounting hardware, torque all six mounting nuts as per the factory service manual.(Fig.11)

TIP: Be sure to coat each stud with anti-seize compound (included) or you can almost bet that one or more of the stainless nuts will gall on the stainless studs!

19. Remove the stock length trim cylinders from the gimbal housing.

TIP: If you avoid compressing or extending the cylinders once they are removed, minimal fluid will be lost and refilling will be unnecessary.

20a. Unless you have purchased the optional extended trim cylinders you will have to cut and weld your stock cylinders using the extender rods provided. Cut the eyelets off the stock trim cylinder rods 3/8" from the eyelet.(Fig. 12)

20b. Clean any paint and/or residue from the ends of the trim cylinder rods and eyelet stubs in preparation for welding. Fit the rods and stubs fully into the cylinders and have a competent welder weld the four joints, using 300 series stainless steel welding rod. (Fig. 13)



Figure 14

WARNING: Some boat's drives may hit optional swim platforms, etc. when the drive is fully tilted up with the STERN JACK! In all cases, check for adequate clearance. To prevent interference you can readjust the tilt limit switch or install an appropriate stack of flat washers between the pistons and head seals inside the trim cylinders. Make sure all operators of the boat are instructed as to any special tilt restrictions.

20c. Paint the welded areas to prevent corrosion and provide a finished appearance.(Fig. 14)

21. Install the extended trim cylinders onto the drive as per the factory service manual. On some early drives an upper spray plate may just rub against the trim cylinders in the full down position. If so, lightly file a bit of the offending plate off.

TIP: If you were careful not to lose much trim fluid you probably do not have to add any to the reservoir. If additional fluid is needed, fill and purge the system according to the factory service manual procedure.

22. After the first hour of operation (and as required thereafter) retorque the six long mounting stud nuts.

WARNING: *It is often necessary to readjust the trim limit switch (in or out as required) to match the new handling characteristics of the hull/prop/Stern Jack combination. Have an experienced driver experiment with the trim (and trailer button if necessary) to determine the optimum limit switch setting.*

STERN JACK OPERATION

Using the boat's standard trim/tilt switch the drive can be trimmed up and raised or trimmed down and lowered while underway. The use of an optional trim gauge kit will allow you to easily return to your optimum settings.

WARNING: *Raising the drive and/or trimming way up could allow some of the water pick-up holes in the side of the gearcase to pull air, reducing water pressure and consequently overheating the engine. Watch the engines water pressure and/or temperature gauge during test runs to verify adequate cooling.*

TIP: *An accessory nose cone kit (like Land & Sea's Hydro-Flow II with integral speedometer pitot tube and low water pick-ups will normally provide extra cooling at high trim settings while further improving top speed.*

Performance: Maximum propeller bite, for getting on plane or pulling out skiers, will typically be found in the full down position. As the drive is trimmed out/raised, the full throttle performance will increase, due to less hull, lower unit and propeller drag, or until increasing propeller slippage begins to offset the gains from the drag reduction. This point will vary with the boat load, water conditions, boat speed, and prop. Experience will quickly teach you the best trim/height combination for various operating conditions.

It is likely that you will be able to use a higher pitch propeller and more cup to realize even better performance at the higher transom positions. Additionally, if you can tolerate some loss in low speed pulling power, many surfacing type propellers are available that may offer additional top speed increases over conventional props with the increased available drive height. For the best of both worlds, Land & Sea's Torque Shift variable pitch prop will give incredible low end acceleration combined with high pitch top end cruising.

If you have any questions about installation or operation, contact Land & Sea for assistance.

MAINTENANCE

WARNING: *Frequently check the torque of all Stern Jack mounting hardware. Check gimbal housing components for wear, damage and correct torque as frequently as required for your operating conditions and the extra loads imparted by the Stern Jack and other performance accessories.*

Bearing replacement: As required (by time and or noise indications), both the stock and extra gimbal bearings may be field replaced.

ADDITIONAL ACCESSORIES

FLOOR MOUNT TRIM BUTTONS for foot control of power trim.

STEERING WHEEL TRIM BUTTONS for steering wheel control of power trim.

TORQUE TAB reduces or eliminates RIGHT hand steering torque at high trim/height settings.

HYDRO-FLOW NOSE CONE KIT streamlines the gearcase and provides reliable cooling water pick-up at extreme trim/heights.

TORQUE-SHIFT PROP which automatically adjusts its pitch underway depending on load and rpm.

