

UNIVERSAL DIESEL WITH HURTH TRANSMISSION

Model HBW-50 (2:1)

Used on Models 12, M2-12, M-18, M3-20, M4-30, M25 and M-25XP

Model HBW-100 (1.8:1)

Used on Models 30, 35, and 40

Model HBW-150 (1.9:1)

Used on Model 50

Model HBW-150 V-Drive (2.13:1)

Used on All of our V-Drive Models

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CAUTION

DO NOT LEAVE GEAR IN FORWARD WHEN SAILING. GEAR MUST BE IN NEUTRAL FOR FREE WHEELING OR SHIFTED INTO REVERSE TO LOCK PROPELLER WHILE SAILING.

A. DESCRIPTION:

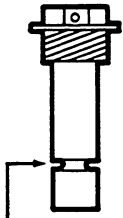
The Hurth transmission housing is made of a high strength aluminum alloy that is resistant to sea water. The transmission is equipped with shaved and case hardened helical gears and with shafts mounted in heavy-duty roller bearings. Forward and reverse is accomplished by a mechanical friction clutch.

Gear shifting is mechanical and requires only a minimum effort on the gear lever. Precision setting or readjustment of the shifting control (Morse or Teleflex) is not required.

The transmission is designed to permit reversing at full engine speed. **TO BE USED ONLY IN THE EVENT OF AN EMERGENCY!**

B. SERVICING:

The transmission is filled with Type AFT or DEXRON II transmission fluid at the factory during the engine load test.



Recheck and fill the gear box with the prescribed oil up to the **FULL INDENTED RING MARK ON THE DIPSTICK** (approximately 1/4" up from bottom of stick). Do not overfill.

When checking the oil level, **DIPSTICK TO BE INSERTED ONLY - DO NOT SCREW IN.**

Tighten the dipstick after adding oil or checking the oil level.

FULL 1. Placing in service after storage.

If the transmission was completely filled with oil for storage and preservation, make sure to drain the excess oil to the proper level. Use new oil if necessary.

2. Oil quantity.

Approximately

3. Oil grade.

Transmission Fluid	Quantity
HBW 50	0.29 Quarts (0.30 Liters)
HBW 100	0.33 Quarts (0.35 Liters)
HBW 150	0.59 Quarts (0.56 Liters)
HBW 150V	1.10 Quarts (1.05 Liters)

Automatic Transmission Fluid, "AFT Type A oil only" according to specification DEXRON II (General Motors) and M2 C33 G (Ford).

ALWAYS USE THE SAME GRADE AND TYPE OF OIL WHEN ADDING OR CHANGING OIL.

WARNING: ADDITIVES SUCH AS MOYBDENUM SULPHITE OR THE LIKE MUST NOT BE CONTAINED IN THE OIL UNDER ANY CIRCUMSTANCES.

C. MAINTENANCE:

1. Oil level in the transmission should be checked weekly.
Oil level: See Servicing.

2. Changing oil.

Change oil after first 25 hours of operation. Then change every 300 hours of operation, or at least at intervals of once a year or season.

3. Placing transmission in storage.

If the transmission is put out of operation for long periods of time under unfavorable environmental conditions, it should be protected against corrosion by filling it completely with oil of the same, grade and type. Otherwise, it should be operated briefly, with a good oxidation inhibiting oil to allow the agent to contact all parts of the gearbox.

D. GENERAL INFORMATION:

1. General

If the transmission is being painted, care should be taken to protect the oil seals at the output shaft in back of the coupling. Make sure the venting hole on the oil filter screw is not covered with paint.

The assembly - (engine/transmission) should be flex mounted in the boat to avoid distortion of the transmission housing.

2. Angle of installation

The angle of installation must not exceed 15° in relation to the water line in operation. See illustration (Figure 13-A)

3. Operating temperature

Proper ventilation of the engine and transmission compartment should be insured. The operating temperature of the transmission oil should not exceed 250° F. (130° C)

4. Flexible couplings (Optional)

The flex coupling between engine coupling and propeller shaft should be designed to absorb bending stresses to compensate for minor angular deviations after installation.

Coupling alignment must be checked with the boat in the water, both rigid and flexible.

5. Gear shifting

Shifting requires little effort, therefore, both the single and dual lever control works well on this transmission. Dual lever is considered the standard in most cases.

Shift lever: Upon loosening the retaining screw, the shifting lever can be rotated as required to meet the control cable connection. The operating cable or rod assembly should be positioned perpendicular to the shifting lever in its neutral position (Figure 13-B).

The shifting travel, measured at the pivot point of the shifting lever, must be at least 1-3/8" (35mm) from neutral to forward and neutral to reverse position. Longer shifting movements have no detrimental effect on the transmission (Figure 13-B), however, insure lever travels beyond the detent in both directions when shifting.

When shifting transmission, engine R.P.M. should be returned to idle, then shift transmission firmly from one direction to another. A slight pause in neutral will allow propeller to slow and add life to transmission.

When running the engine to charge batteries in neutral, engage transmission for 1 or 2 minutes every 2 or 3 hours to lubricate all internal parts.

To lock the propeller vertically in line with the keel, mark the coupling and POSITION GEAR IN REVERSE. This will prevent slippage and damage to the clutch.

CAUTION: THE CABLE MUST BE MOUNTED TO THE SHIFT LEVER AT A 90° ANGLE TO INSURE EQUAL TRAVEL FROM NEUTRAL TO FORWARD AND NEUTRAL TO REVERSE (See Fig. 13-B).

CAUTION: TRANSMISSION MUST BE LEFT IN NEUTRAL WHEN SAILING, DO NOT LEAVE IN FORWARD GEAR WHEN SAILING WITHOUT POWER AS IT WILL DAMAGE GEAR.

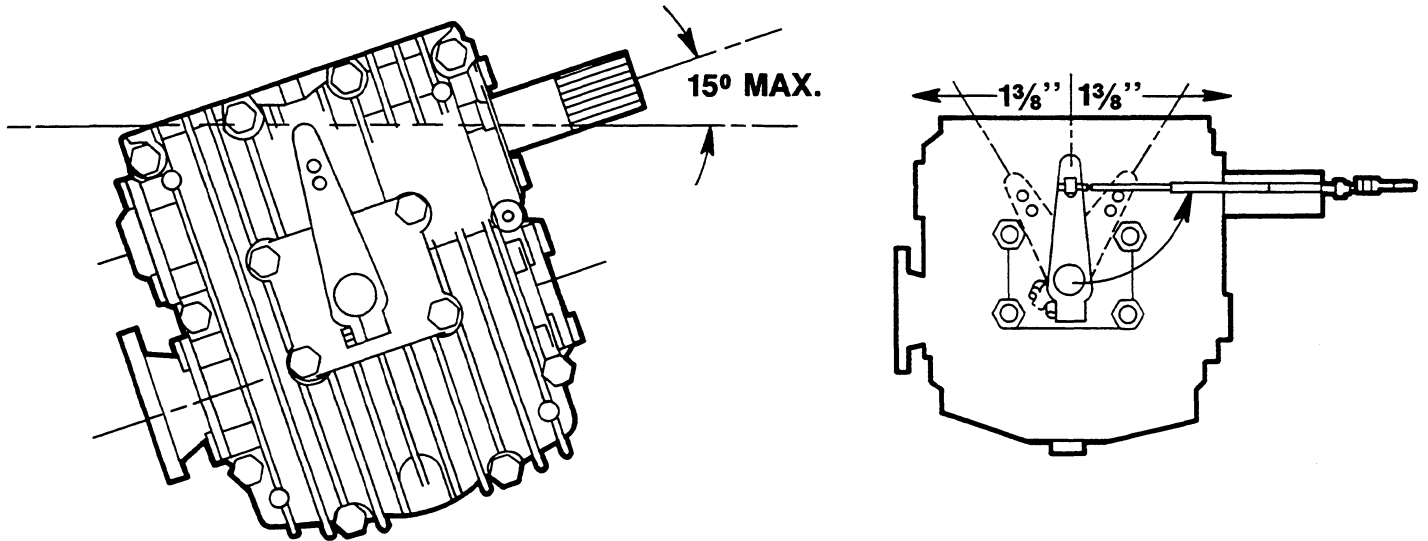


FIGURE 13-A

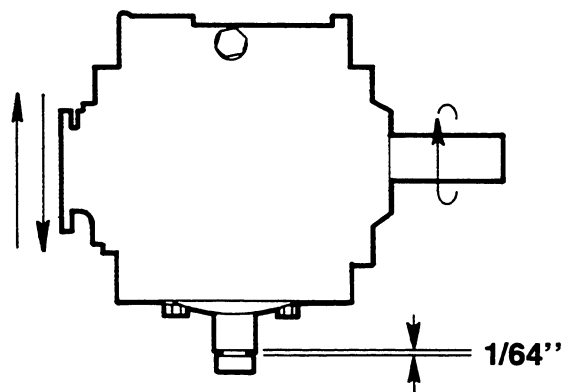
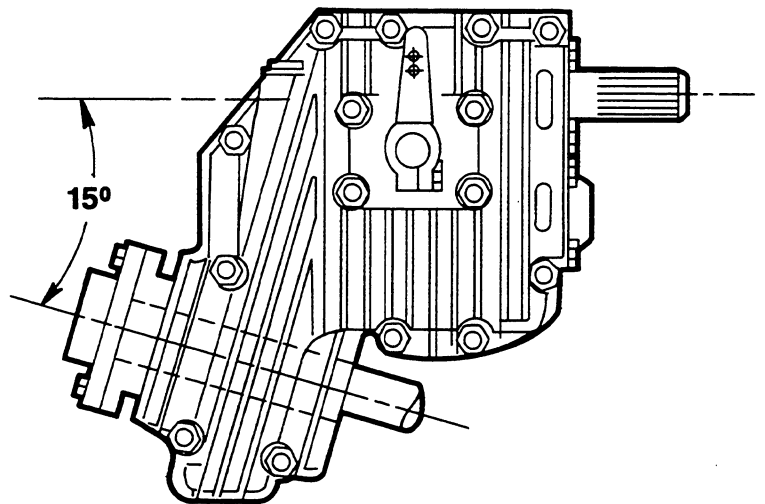
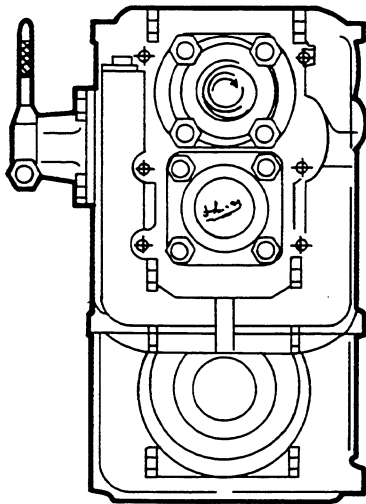
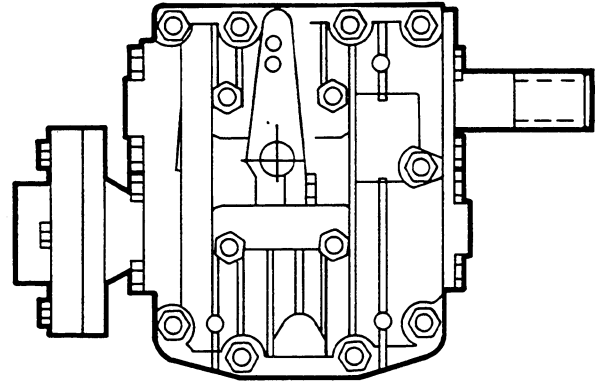
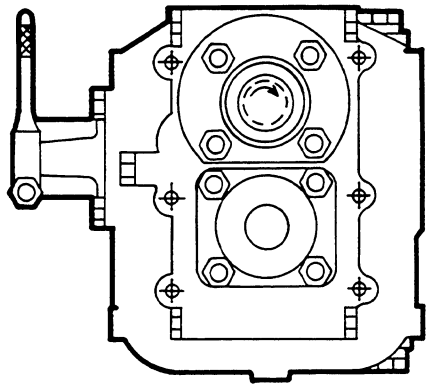


FIGURE 13-B

COUPLINGS

1. Rigid Coupling Specify Bore Size
2. Drivesaver Flex Coupling 1" Thick Require (1) rigid coupling (2A) & (2B) mounting screws and bolts.
3. Flex Coupling (Deluxe) 2" Thick Specify Bore Size (3A) Mounting capscrews, locks, and nuts.
4. Set Screws To Lock Coupling To Shaft.
5. Point at which you check shaft coupling to gear coupling. See coupling alignment for details.

To ground shaft to engine install jumper lead from shaft coupling to engine or gear coupling capscrews.
6. Transmission or Gear Coupling mounted on engine. V-Drive is threaded and requires capscrew MM diameter.
7. Double check clearance between coupling nut or bolt and bearing cover capscrew on transmission. Must not hit or it will cause serious transmission failure. Rotate coupling and shaft to check.

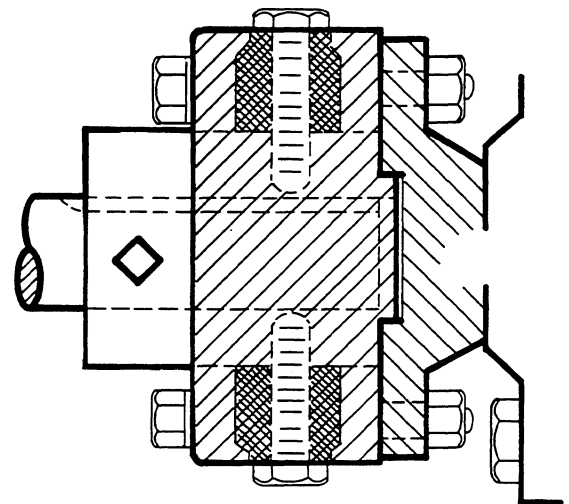
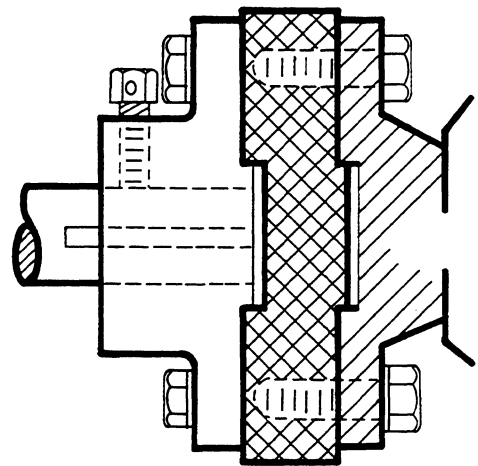
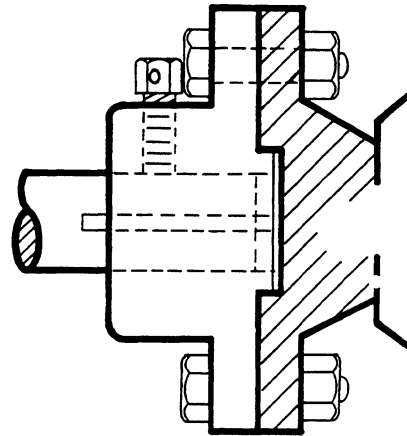


FIGURE 13-C

PERIODIC SERVICE CHART

Always be sure engine is stopped and cool and that your personal safety is considered before making checks or doing any repair work.

<u>PERIOD OF OPERATION</u>	<u>THINGS TO DO</u>	<u>REMARKS</u>
Break-in period (Approx. 25 hours at 75% cruise speed).	Change engine oil, filter and transmission oil after first 25 hours. Always allow engine to warm up before applying load. Check V-belt tension. 1/2" deflection.	
Every 75 hours.	At least once each season, or whichever comes first change engine oil and oil filter.	
Every 100 hours.	Or monthly, check V-belt tension. 1/2" deflection. Check electrolyte levels in battery. At least once each year, or whichever comes first change fuel oil filter and transmission oil. Check engine mounts bolts and lock nuts for looseness, and rubber for wear. Check engine and shaft alignment annually or if vibration is noticed during engine powering. Check all cables for tightness and location to proper positioning. Check for clean tight engine ground connection to block. Check all fuel and water lines for tightness or replacement.	