

Series 5000 Marine Transmission Owner's Manual

Assembly Numbers:

2001-000-001
2001-000-002
2001-000-003
2001-000-004
2001-000-005
2001-000-006



BorgWarner
Marine & Industrial Transmissions

VolvoPenta

**Marine & Industrial
Transmissions**
Service Center

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OWNER'S RESPONSIBILITIES:

It is the responsibility of the owner or operator to perform necessary safety checks to ensure that all lubrication, testing, maintenance and recommended practices are followed for safe, enjoyable operation.

Proper care and maintenance will help ensure trouble-free operation and long service life from your "Velvet Drive" marine transmission.



SECTION I GENERAL INFORMATION

Every Verbe 3000 Verbe® marine transmission is self-contained with its own pump and hydraulic pump separate from the engine. However, connection to an external oil (transmission fluid) cooler is required.

The Verbe Verbe® Series 3000 transmission is available with gear ratios refer to Table 1) suitable for inboard pleasure and work boats.

The Series 3000 is a down-angle transmission, specifically designed for twin engine applications that require nearly horizontal engine installation. Its full reversing feature eliminates the need for opposite rotating engines.

The identification tag (see Figure 1), located on top of the port-side transmission mounting base (see Figure 2), shows the assembly number, serial number and gear ratio for the unit.

ASSEMBLY NUMBER appears below the words **VELVET DRIVE**.

SERIAL NUMBER appears just below the assembly number, to the right.

RATIO appears just below the assembly number, to the left.

Transfer the information on the identification tag to the Maintenance Record Chart found on page 35 of this manual so that you will have it available without having to look at the transmission.

The assembly number and serial number are required on all correspondence regarding warranty or service.



Figure 1. Identification Tag

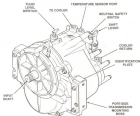


Figure 3. Parker 1000 Series Transmission

Table 3. General Specifications

ASSEMBLY NO.	RATIO	FLUID CAPACITY* GPM/LITERS	DRY WEIGHT LBS/KG
1001-100-001	1.8:1	3.8/13.2	120/55
1002-100-002	1.25:1	3.8/13.2	120/55
1003-100-003	1.5:1	3.8/13.2	120/55
1004-100-004	1.8:1	3.8/13.2	120/55
1005-100-005	2.0:1	3.8/13.2	120/55
1006-100-006	1.8:1	3.8/13.2	120/55

*Approximate, depending on angle of transmission installation. For transmission-only. Capacity given does not include fluid required to fill oil cooler and oil cooler lines.

SHIFT LINKAGE CHECK

CAUTION: Excessive adjustment linkage may result in transmission damage.

The transmission shift lever forward and reverse positions are used to actuate the transmission shift yoke handle left-hand/reverse (Figure 8). The shift linkage must maintain sufficient clearance in the transmission housing to forward, neutral and reverse positions. The shift lever at the floor must operate smoothly in the reverse, adjust the shift linkage if required.



Figure 8. Transmission Shift Lever Position

TRANSMISSION BOLT CHECK

Check that all external transmission bolts and nuts, including those in the coupling flange, are tight. Tighten floor bolts to specifications.

COOLER AND ELECTRICAL CONNECTIONS

Visually check the transmission parts, oil filter/cooler, pressure regulator and fittings for fluid leaks, loose connections, or broken or loose fasteners. As required, replace a cracked/loosened hose/fittings and broken or loose fasteners. Replace worn or damaged hydraulic lines.

Visually inspect electrical connections in the transmission for loose terminals or wires, wires. Replace all loose or broken wires to IEC Type 3000 specifications. Tighten all loose connections.

CHANGING TRANSMISSION FLUID

It is recommended that the transmission fluid be changed after all planned work. Work levels require more frequent change-overly intervals. In addition, the transmission fluid must be changed after the following conditions: contaminated, contaminated, changes color, or becomes overly foaming.

WARNING: Do not put gasoline or any other volatile or highly combustible liquid in a cleaning solvent when changing the transmission fluid.

1. Place a suitable container under the oil/drain plug.
2. Remove the dipstick (see Figure 9).
3. Remove the oil draining drain all fluid from the transmission into the container.
4. Remove drain plug until torque is 20-25 to 30 (20-30 Nm).
5. Fill the transmission with the proper type fluid to FILLUP TRANSMISSION FLUID following and quantity of transmission fluid. Note: 1. Use fluid capacity, depending on range of transmission for the transmission only. Additional fluid may be required to allow the oil meter to indicate low capacity.
6. Replace dipstick and check fluid level (refer to OPERATING FLUID LEVEL, later).

TYPE OF TRANSMISSION FLUID

Examine Figure 9, Type F, or any transmission fluid which meets Bureau of Road (Bureau) (Type) (Type) for "W" specifications is recommended.

For various different brands or types of transmission fluid.

If transmission fluid temperature exceeds 180°F, the fluid must be changed.

Any addition to the fluid that will change the installed weight of the transmission oil that may require an oil level adjustment.

CHANGING FLUID LEVEL

The transmission should be at operating temperature (180°F) and in gear on a level fluid level reading. The fluid will expand a few hours and slightly settle after the fluid in the transmission.



WARNING: Hot transmission fluid can cause burns.



WARNING: Do not enter the engine compartment with the engine running.

How Fluid Level Check



CAUTION: Transmission fluid will leak back into the transmission from the cooler with the engine idle. Run after engine shutdown. Fluid level must be checked immediately after engine shutdown. Otherwise, the dipstick reading will not be accurate and transmission could be operated with insufficient fluid.

With the engine at operating temperature, place the shift lever in neutral and shut down the engine. Remove the dipstick and wipe it clean. Insert the clean dipstick fully into the transmission, withdraw, and observe fluid level. Notice where fluid level is relative to the "Full" level in the full mark on the dipstick.

Cold Fluid Level Check

For ease of checking the fluid level prior to start-up, a cold fluid level check can be made on the dipstick. First, make the warm fluid level check as described above and compare fluid level to the dipstick's full mark. Then, shut the engine and allow the transmission to cool overnight. Before operating the engine, with the transmission cold, check the fluid level as described above and put a cold fluid mark on the dipstick.

ADDITIONAL MAINTENANCE AND SERVICE INFORMATION

A service manual for the Series 3000 Kubota Tractor contains data for obtaining the following parts list for this tractor:

SECTION III OPERATION

SYSTEM-RELATED TYPICAL WARNINGS

System-related warning vibrations can occur at low engine speeds. They can cause gear noise and/or oil leakage to the fuel system or within the transmission. Keep ROPS Operator and Industrial Transmissions Inc. responsible for total system-related maintenance of this type.

SHUT UP

Make sure the transmission is in neutral before shifting the engine. At the same time, notice the shift lever lock and that fluid level at the above in the transmission of shift lever lock. With the shift lever in this position, response to movement through the transmission can put shift in the proper shift. The safety control system will not allow the engine to be started unless the transmission is in neutral.

Start the engine and let the tractor sit idle until it is warm up the transmission and the engine for a few minutes. Be aware of any transmission or vibration and knowledge to determine the cause.

SHIFTING THE TRANSMISSION

Shifts from first gear position to be made at any time with the engine operating below 1800 RPM.



CAUTION: Shifting the transmission at engine speeds above 1800 RPM can severely damage the fuel, transmission, and engine.

SHIFTER

From neutral move the shift lever to the forward position. When the transmission is engaged in forward gear, shift the lever down. The poppet disengages the fuel in a forward direction.

REVERSE

From neutral move the shift lever to the reverse position. When the transmission is engaged in reverse gear, shift the lever down. The poppet disengages the fuel in a reverse direction.

FREEWHEELING

It has been determined by tests and practical experience that Series 3000 tractor transmissions can be freewheeling during idling with the engine without doing damage. Be careful to maintain the proper fluid level in the transmission for freewheeling as well as power operation.

SECTION IV WINTER STORAGE

The following steps are necessary to properly prepare the transmission for winter storage:

1. Drain the filter.
2. Separate the transmission and propeller shaft flange to allow transmission oil to drain more freely. Oil change and service inspection should be performed with the flange plate clean.

3. Flush the water from the transmission oil (flush using grease). It is recommended to flush the transmission fluid unless the transmission is due for a fluid change.

4. Stop the transmission flow of dirt, grease and sludge.

5. Check the transmission for evidence of external damage or leaks. The transmission will be protected for transmission fluid to work.



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BY BORG-WARNER

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