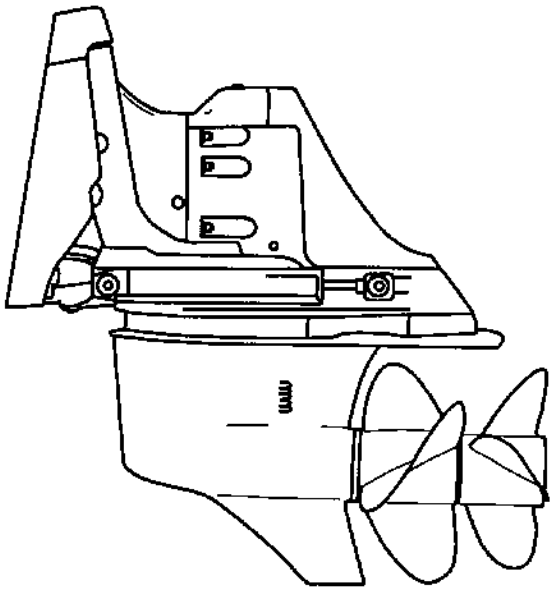
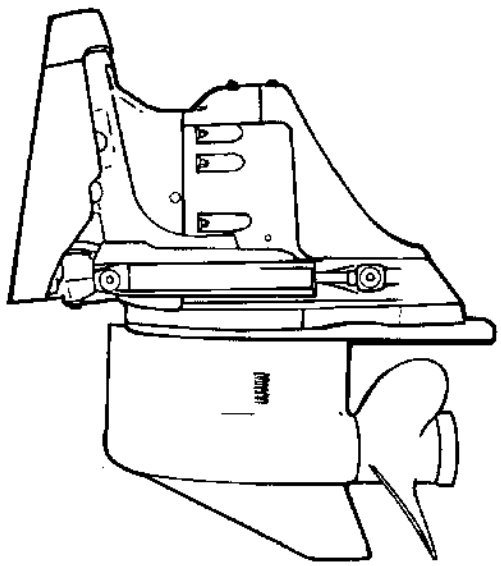
P/N 7788881-6
4-1996

Workshop Manual

"NC" Models

SX, DP-S Drive Unit & Transom Shield





VOLVO PENTA®

⚠ Safety Warning

This Workshop Manual will alert you to certain procedures that must be done very carefully. If you ignore this information, you could...

- **Injure yourself or people around you**
- **Injure the boat operator, boat passengers, or people around the boat**
- **Damage the Volvo Penta product or its systems**

Understand the following symbols before proceeding:

⚠ **Safety Warning**	Alerts you to the possibility of danger and identifies information that will help prevent injuries.
Note	Identifies information that will help prevent damage to machinery.
Important	Appears next to information that controls correct assembly and operation of the product.

This Workshop Manual is written for qualified, factory trained service technicians familiar with the use of Volvo Penta special tools.

This Workshop Manual tells you how to correctly maintain and service Volvo Penta products and systems. When correctly serviced, the Volvo Penta product will be reliable and safe to operate.

When Volvo Penta special tools are called for, use them. Where mentioned, the tools are required to perform the service procedure.

If you use service procedures or service tools that are not recommended in this manual, YOU ALONE must decided if your actions might injure people or damage the Volvo Penta product.

Contents

This Workshop Manual is one of a set of nine that covers *Volvo Penta* sterndrive models. All nine books can be ordered as a set from *Volvo Penta Parts.* Order P/N 7788880-8.

Individual Workshop Manuals covering these models are also available. Order the following part numbers from *Volvo Penta Parts.*

- **P/N 7788881-6 *SX, DP-S Drive Unit and Transom Shield***
  Includes information on Transom Shield, Upper Gear Unit and Lower Gear Unit service; Drive Unit removal and installation; Propellers; and Trim/Tilt hydraulic operation.

- **P/N 7788882-4 *MFI Diagnostic (5.0 Fi, 5.8 Fi/FSi) - Ford***
  Includes step by step troubleshooting procedures for all MFI Ford related components and wiring.

- **P/N 7788883-2 *TBI Diagnostic (4.3 Gi, 5.7 Gi/GSi) - GM***
  Contains troubleshooting procedures for all TBI GM models and related components.

- **P/N 7788884-0 *MFI Diagnostic (7.4 Gi/GSi, 8.2 GSi) - GM***
  Includes step by step troubleshooting procedures for all MFI GM related components and wiring.

- **P/N 7788885-7 *SP-DP Drive Unit and Transom Shield***
  Includes information on Transom Shield, Upper Gear Unit, Lower Gear Unit service; Drive Unit removal and installation; Propellers; and Trim/Tilt hydraulic operation and servicing procedures.

- **P/N 7788886-5 *Engine Components***
  Includes information on Engine service and troubleshooting; Engine removal and installation; Steering systems; Throttle and Shift Control systems; and Cooling systems.

- **P/N 7788887-3 *Electrical & Ignition System***
  Includes service and troubleshooting information on Cranking systems; Charging systems; Trim/Tilt electrical systems; Ignition systems; and Engine and Instrument wiring diagrams.

- **P/N 7788888-1 *Fuel System***
  Includes service and troubleshooting information on all carburetor, MFI and TBI fuel systems and related components.

- ***P/N 7788889-9 DPX-Lower Unit and Xact™ Steering System***
  Includes specific information for repair and overhaul of the DPX Lower unit and Xact™ steering systems not covered in the SP and DP Workshop manual.

This *Volvo Penta* Workshop Manual
Covers The Following *Volvo Penta* "NC" Models

Engine

3.0 LITER	
30GSMNCA	3868181
30GSMNCS	3868181
30GSPNCA	3868182
30GSPNCS	3868182
4.3 LITER	
43GLPNCA	3868184
43GLPNCS	3868477
43GLPNCB	3868566
43GSPNCA	3868186
43GSPNCS	3868478
43GSPNCM	3868321
43GSPNCB	3868484
43GSJNCS	3868453
43GSJNCC	3868487
43GiPNCACE	3868185
43GiPNCSCE	3868479
43GiPNCMCE	3868320
43GiPNCBCE	3868485
5.7 LITER	
57GLPNCS	3868570
57GiPNCACE	3868429
57GiPNCSCE	3868553
57GSiPNCS	3868564
57GiPNCMCE	3868533
57GiPNCBCE	3868556
57GiINCSCE	3868507
57GiINCCCE	3868507
5.0 LITER	
50FLPNCA	3868414
50FLPNCS	3868414
50FLPNCM	3868419
50FiPNCACE	3868416
50FiPNCSCE	3868416
50FiPNCMCE	3868421
50FiPNCBCE	3868421
5.8 LITER	
58FLPNCA	3868415
58FLPNCS	3868540
58FLPNCM	3868420
58FLPNCB	3868544
58FLINCS	3868284
58FLINCC	3868546
58FiPNCACE	3868417
58FiPNCSCE	3868541
58FiPNCMCE	3868422
58FiPNCBCE	3868545
58FSiINCS	3868538
58FSiINCC	3868547
58FSiPNCD	3868537
58FSiPNCS	3868543
58FSiPNCACE	3868418
7.4 LITER	
74GLPNCA	3868196
74GLPNCS	3868555
74GLINCS	3868283
74GLINCC	3868559
74GiPNCACE	3868450
74GiPNCSCE	3868527
74GLPNCM	3868328
74GLPNCB	3868557
74GiPNCMCE	3868335
74GiPNCBCE	3868528
74GiINCSCE	3868282
74GiINCCCE	3868529
74GSiXNCM	3868198
74GSiXNCB	3868558
74GSiINCS	3868509
74GSiINCC	3868560
8.2 LITER	
82GSiXNCB	3868457

Transom Shield

SX-C1	3868404
SX-CLT1	3868432
SX-C1AC	3868515
DP-S	3868299
DPX-C	3868289

Sterndrive

SX-CT1	1.97:1	3868397
SX-CT1	1.85:1	3868396
SX-C1	1.85:1	3868465
SX-C1	1.66:1	3868395
DP-S	2.30:1	3868163
DP-S	1.95:1	3868164
SX-C1	1.60:1	3868394
SX-C1	1.51:1	3868393
SX-C1	1.43:1	3868392
DP-S	1.78:1	3868165
DP-S	1.68:1	3868166
SX-RT1	1.66:1	3868398
SX-RT1	2.18:1	3868333
DP-C1	1.95:1	3868002
DP-D1	1.95:1	872862
DP-D1	1.78:1	3868022
DP-D1	1.68:1	3868455
DPX-S	1.59:1	3868020
DPX-S1	1.59:1	3868637
DPX-S	1.68:1	3868021
DPX-S1	1.68:1	3868638
DPX-S	1.78:1	3868023
DPX-S1	1.78:1	3868639

Jet Drive

PJX-S	3868467
PJX-C	3868694

Section 1

General Information

Table of Contents

⚠ Safety Warnings

Before beginning work in this section, read Safety chapter at end of this manual.

Proper installation is important for the safe, reliable operation of all mechanical products. The procedures we recommend and describe in these instructions are effective methods to be followed when installing *Volvo Penta* sterndrive products. Some of these methods require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

Introduction

This service manual covers *Volvo Penta* sterndrive models. It's divided into sections concerning various systems and assemblies. Refer to the Contents to locate the section covering the system or assembly requiring service. Each section title page has an additional listing that will describe the section's contents in more detail. Be sure to read the Safety Section at the end of this manual, and pay special attention to all safety warnings as they appear throughout the text. Since models are subject to change at any time, some photos may not depict actual product.

Good Service Practice

Service for *Volvo Penta* sterndrives are generally one of three kinds:

- Normal care and maintenance - which includes putting a new stern drive into operation, storing engines, lubrication, and care under special operating conditions such as salt water and cold weather.
- Operating malfunctions - due to improper engine or drive mounting, propeller condition or size, boat condition, or the malfunction of some part of the engine. This includes engine servicing procedures to keep the engine in prime operating condition.
- Complete disassembly and overhaul - such as major service or rebuilding a unit.

It's important to determine before disassembly just what the trouble is and how to correct it quickly, with minimum expense to the owner.

When repairing an assembly, the most reliable way to ensure a good job is to do a complete overhaul on that assembly, rather than just to replace the bad part. Wear not readily apparent on other parts could cause malfunction soon after the repair job. Repair kits and seal kits contain all the parts needed to ensure a complete repair, to eliminate guess work, and to save time.

Repair time can also be minimized by the use of special tools. *Volvo Penta* Special Tools are designed to perform service procedures unique to the product that cannot be completed using tools from other sources. They also speed repair work to help achieve service flat rate times. In some cases, the use of substitute tools can damage the part.

Note Do not operate engine out of water even momentarily. If operated in test tank, use proper test wheel. Failure to do so can damage water pump, overheat engine, or allow excessive engine RPM.

Preparation for Service

Proper preparation is extremely helpful for efficient service work. A clean work area at the start of each job will minimize tools and parts becoming misplaced. Clean an engine that is excessively dirty before work starts. Cleaning will occasionally uncover trouble sources. Obtain tools, instruments and parts needed for the job before work is started. Interrupting a job to locate special tools or repair kits is a needless delay.

⚠ Use proper lifting and handling equipment. Working on stern drives without proper equipment can cause damage and personal injury.

Always use clean fresh fuel when testing engines. Troubles can often be traced to the use of old or dirty fuel.

Service Policy

Whether within or following the warranty period, *Volvo Penta* has a constant interest in their products.

It is *Volvo Penta's* policy to provide dealers with service knowledge so they can give professional service demanded by today's consumer. *Volvo Penta* Training Centers, Service Bulletins, Letters and Promotions, Special Tools and this Service Manual represent *Volvo Penta's* efforts to assist dealers in giving consumers the best and most prompt service possible. If a service question does not appear to be answered in this manual, you are invited to call, fax, or write to the *Volvo Penta* Service Department for additional help. Always be sure to give complete information, including engine model number and serial number.

Be sure that you are familiar with *Volvo Penta's* Warranty. If you have any questions, call, fax or write the *Volvo Penta* Service Department. If other than genuine *Volvo Penta* replacement components or parts are used, *Volvo Penta* may refuse subsequent warranty claims involving that engine.

When a brand-name product or specific tool is called for, another item may be used. However, the substitute must have equivalent characteristics, including type, strength, and material. You must determine if incorrect substitution could result in product malfunction and personal injury to anyone. To avoid hazards, equivalent products which are used must meet all current U.S. Coast Guard Safety Regulations and ABYC standards.

Replacement Parts

⚠ When replacement parts are required, always use genuine *Volvo Penta* parts, or parts with equivalent characteristics, including type, strength, and material. Failure to do so may result in product malfunction and possible injury to the operator and/or passengers.

Parts Catalogs

Parts catalogs are a good source of information for ordering replacement parts. They are not a good source for disassembly and reassembly of sterndrives and accessories. The exploded views in the Parts Catalogs are for illustration of parts only, not a source of assembly instructions. The Workshop manual has detailed information and is the only source of information for disassembly and reassembly.

Volvo Penta Special Service Tools

Volvo Penta has specially designed tools to simplify some of the disassembly and assembly operations. These tools are illustrated in this Service Manual, in many cases in actual use. All *Volvo Penta* special tools can be ordered from *Volvo Penta Parts and Accessories.* Individual purchasers of Service Manuals must order Special Tools through an authorized *Volvo Penta* dealer.

Product References, Illustrations & Specifications

Volvo Penta reserves the right to make changes at anytime, without notice, in specifications and models and also to discontinue models. The right is also reserved to change any specifications or parts at any time without incurring any obligation to equip same on models manufactured prior to date of such change. All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of printing. The right is reserved to make changes at anytime without notice. All photographs and illustrations used in this manual may not depict actual models or equipment, but are intended as representative views for reference only. The continuing accuracy of this manual cannot be guaranteed.

Lubrication - *Volvo Penta SX and DP-S* Models

Adding Lubricant to Sterndrive *Volvo Penta SX Models*

1 Occasionally check oil level in vertical drive. Screw dipstick Ⓐ fully into hole. Remove and read oil level in reference to mark on dipstick. If oil level is low, add oil through dipstick opening. Add only enough lubricant to bring the oil level to the proper level somewhere in the range &) on the dipstick.

Vertical Drive Oil Capacity

Change Lubricant Every 100 Hours or Once Each Season Use *Volvo Penta DuraPlus™ Synthetic GL-5* Gear case Lubricant	
All *Volvo Penta SX* Models	71 oz. (2100 cc)
All *Volvo Penta DP-S* Models	81 oz. (2400 cc)

Draining and Filling Vertical Drive *Volvo Penta SX Models*

When a complete change of lubricant is required in the vertical drive, proceed as follows:

1. Place sterndrive in the full down position. Place a 4 liter drain pan under lower gear case to catch oil.

2 2. Remove oil drain plug Ⓑ (port side of lower gear case) and dipstick Ⓐ (top of vertical drive). Removing dipstick vents sterndrive to improve oil draining. Allow oil to drain completely.

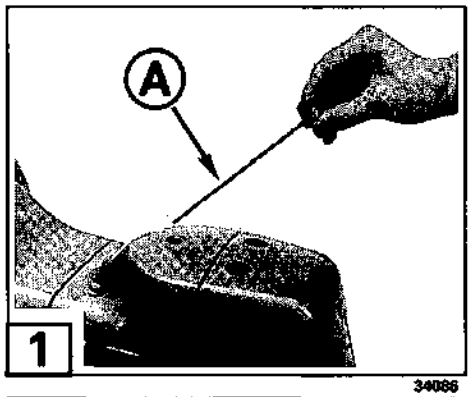
2 3 3. Remove three screws securing the shift link access cover to access the oil level plug Ⓒ. Fill sterndrive with *Volvo Penta Dura Plus™ Synthetic GL-5* Gear case Lubricant through oil drain plug hole Ⓑ. Fill slowly to purge air. Sterndrive is properly filled when the oil level appears at the oil level plug hole. When filled to the proper level, install oil level dipstick Ⓐ and the oil level plug Ⓒ first to prevent excessive oil loss; then the oil drain plug Ⓑ. Tighten oil level gauge, plug, and drain plug finger tight.

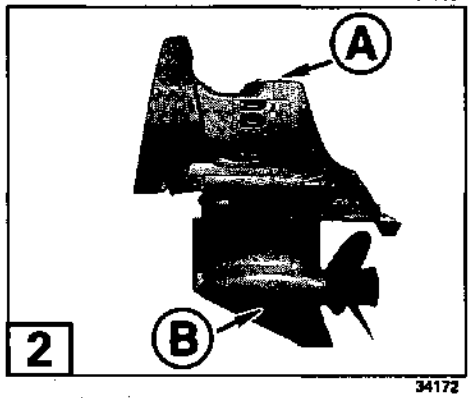
Note Filling sterndrive too quickly may form air pockets that will cause an inaccurate oil level reading. Running the vertical drive with improper oil level will result in immediate internal damage. If lubricant has been completely changed, oil level must be rechecked after unit has been run and trapped air purged. Improper oil level will result in serious internal vertical drive damage. Add makeup oil through dipstick opening to bring oil up to proper level.

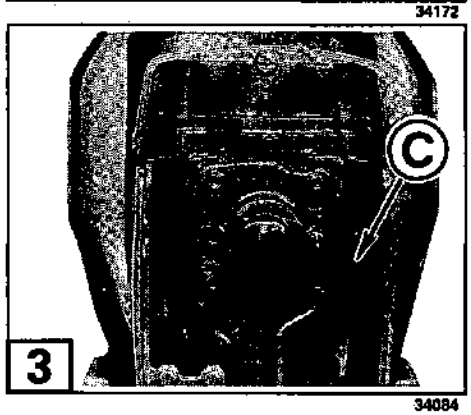
4. Check oil level with dipstick. Oil level must appear on the blade of the dipstick. Add oil if required, through the dipstick hole following procedures under Adding Lubricant to Sterndrive.

5. Tighten drain plug to 60-84 in. lbs. (6,8-9,5 Nm). Tighten oil level dipstick to 48-72 in. lbs. (5,4-8,1 Nm)

6. Install access cover and tighten screws to 108-132 in. lbs. (12 - 14 Nm).







Draining Sterndrive *Volvo Penta DP-S* Models

1 1. Move shift control to reverse. Using a 30 mm socket, remove the rear propeller retaining nut Ⓐ and propeller Ⓑ. Move the shift control to forward. Using Prop Tool, P/N 3855876-3, remove the front propeller retaining nut Ⓒ and propeller Ⓓ

⚠ Do not attempt to counterhold propellers by hand while removing or installing propeller nuts, serious injury may result.

2. With the sterndrive in the full down position, place a 4 liter oil drain pan under the gear case.

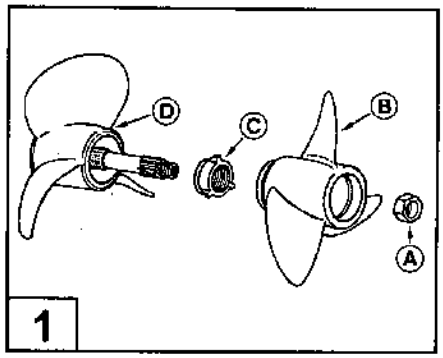
2 3 3. Remove oil fill/drain screw Ⓔ using an 8 mm Allen wrench. Discard the O-ring Ⓕ. Let the sterndrive drain completely.

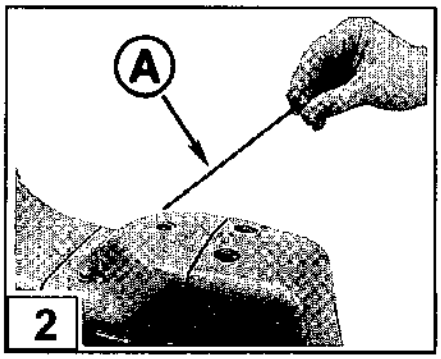
4 4. Remove the oil level dipstick so the oil cavity can vent while draining.

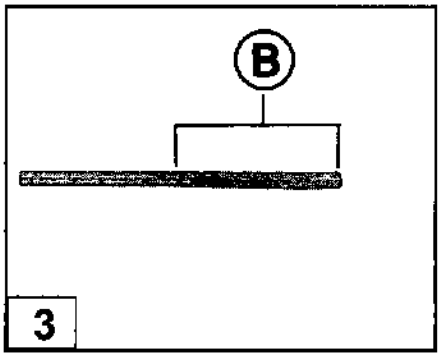
Filling Sterndrive *Volvo Penta DP-S* Models

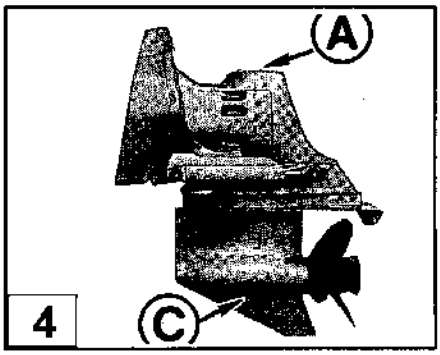
Note Do not fill sterndrive with oil until it passes both pressure and vacuum tests. Drives that fail either test will allow water entry when in use and cause subsequent damage to internal parts.

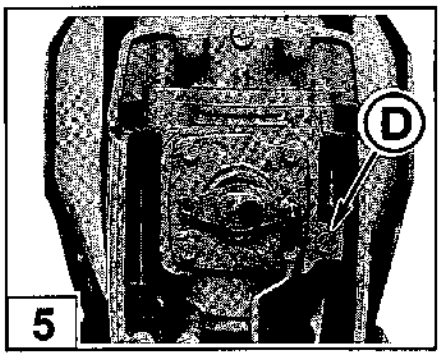
5 1. Remove the rear plastic cover to allow access to the oil level plug. Remove the oil level plug Ⓐ. Discard the plug and dipstick O-ring. Replace them with new ones.









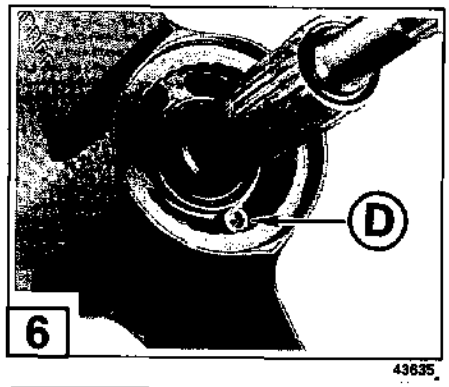


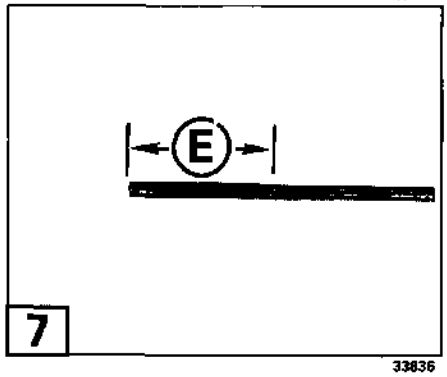
6 2. Install Fill Adaptor, P/N 3855932-4 ©.

7 3. Fill drive with *API GL5 SAE 75*/90 Synthetic from lower gearcase drain hole. Fill slowly to purge trapped air. Stop filling when the oil level reaches the bottom of the oil level hole Ⓐ. Rotate propshaft several times to purge any trapped air.

Note Do not overfill. This will cause the oil cavity to overpressurize during operation and damage oil seals. Filling drive too quickly may form air pockets that will cause an inaccurate oil level reading. Running drive with improper oil level may result in internal damage. Damage caused from running the drive oil too high or too low will not be covered under Volvo Penta's limited warranty.

1 12. Install propellers. Move the shift control to forward. Install the front propeller Ⓓ and propeller nut Ⓒ. Using Prop Tool, P/N 3855876-3 torque to 45 ft. lbs. (60 Nm). Move shift control to reverse. Install the rear propeller Ⓑ and propeller nut Ⓐ. Using a 30 mm socket, torque to 50 ft. lbs. (70 Nm).

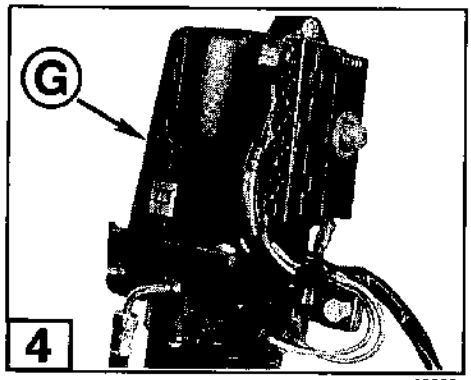




Power Trim/Tilt-Fluid Level

[4] The trim/tilt assembly contains the electric motor, hydraulic pump, and reservoir. At the beginning of each boating season, check the fluid level in the reservoir as follows:

⚠ The trim/tilt hydraulics are pressurized when the vertical drive is in the down position. The sterndrive must be tilted full up to relieve hydraulic pressure before removing level/fill plug Ⓖ. Failure to tilt the vertical drive to the full up position before removing level/fill plug would result in a hazardous spray of hydraulic oil. Caution should always be taken when removing level/fill plug by placing a rag over the level/fill plug to prevent residual pressure from spraying oil.



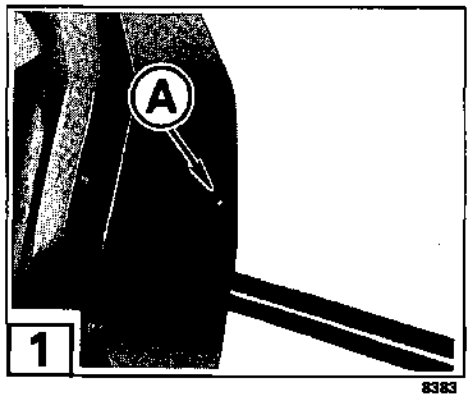
1. With the sterndrive tilted full up, slowly and carefully remove the level/fill plug.

2. Check the fluid level. The fluid should be level with the bottom of the fill hole when the vertical drive is at full tilt.

3. If necessary, add *Volvo Penta Power Trim/Tilt and Power Steering Fluid*. Replace the level/fill plug and tighten securely.

Note When checking fluid level, inspect the trim/tilt unit for leaks and proper operation. Repair or replace defective components.

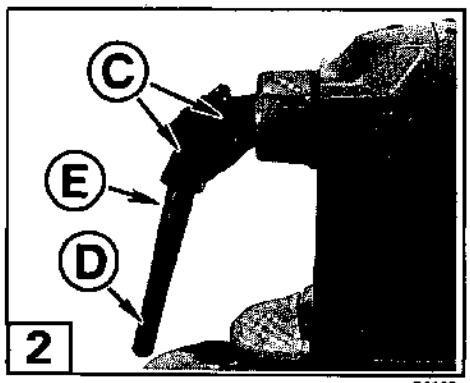
Gimbal Bearing and Universal Joint Lubrication



The gimbal bearing and universal joint must be lubricated each year. Lubricate the gimbal bearing and universal joint when preparing your boat for the off season storage. This requires the removal of the drive unit; therefore, *Volvo Penta* recommends that your *Volvo Penta* dealer perform this operation.

Note Failure to lubricate the gimbal bearing and universal joint each year will result in damage to the transom shield and drive unit.

1 The gimbal bearing is lubricated by a grease fitting located on the starboard side Ⓐ, *Volvo Penta SX and DP-S* models, of the gimbal housing. *Volvo Penta* recommends that lubrication of the gimbal bearing be done with drive unit removed. This will allow observation of old grease as it is being replaced by new grease. If there is evidence of water, the bearing should be inspected for damage and/or replaced. Lubricate gimbal bearing with *EP wheel bearing* grease. Apply grease until all the old grease is removed and new grease appears.



2 The drive unit must be removed ti lubricate the universal joint. Lubricate U-joint with *EP Wheel Bearing* grease. Apply grease to the U-joint grease fittings © until old grease is forced out. When the drive sterndrive is removed, wipe old grease and dirt off driveshaft splines, then thoroughly clean splines before applying new grease. The driveshaft splines Ⓓ must be lubricated with Molybdenum Grease, and light oil applied to the shaft O-rings Ⓔ. The bellows should be checked for damage and deterioration. Replace if necessary. Engine alignment must also be checked. Refer to **Sterndrive Installation** in **Sterndrive Removal and Installation** section of this manual.

Off-Season Storage - SX and DP-S Models

1. **Change Sterndrive Lubricant:**

Drain and refill with fresh *Volvo Penta DuraPlus™ Synthetic GL-5* gear oil. Refer to **Sterndrive Lubrication.**

2. **Lubricate Gimbal Bearing and Universal Joints:** Refer to information elsewhere in this manual.

3. **Inspect Sterndrive Water Pickup Screens for Obstructions.**

Note See ***Engine Components Workshop Manual*** for additional engine off-season storage procedures.

Painting

1. Remove all marine growth.

2. Remove all loose paint and corrosion by sanding of sandblasting.

3. Remove all trace of grease and wash with hot water and detergent. Roughen all painted surfaces with medium *3M Scotchbrite™* pad. Rinse thoroughly with water.

4. Treat any bare aluminum with chromate conversion coating. Clean the entire bare area with an acid cleaner that does not contain fluoride, such as *Du Pont® 5717*. Scrub surface with *3M Scotchbrite™* pad until it is completely "wetted" with no beads of water.

⚠ Fluoride in a cleaner causes a "smut" (dark discoloration on silicon-alloy aluminum castings, and paint will not stick to "smut." If this happens, sand the surface and start over using a different acid cleaner.

⚠ Do not use steel wool. Small pieces of steel will become imbedded in the aluminum and will cause severe corrosion.

5. Rinse thoroughly with water. The area must appear "wetted," or the surface is not clean and the paint will not adhere.

6. While the surface is still wet from rinsing, treat all bare aluminum with *Du Pont® 226S* chromate conversion solution. Brush the chromate solution on the surface. Adding additional solution as required for 2 to 5 minutes to prevent it from drying on the surface. Rinse the surface thoroughly with water and allow to air dry. Follow label instructions exactly.

- If the chromate is allowed to dry anywhere on the bare aluminum surface, chromic acid salts will form which will prevent paint adhesion and promote corrosion. Sand the surface to bare metal

- It is best to let the part air dry, but if you must wipe the surface to speed up drying, use lint free wipes not treated with anything that may contaminate the surface. Do not scrub the surface-wipe very lightly.
- Do not blow dry the part with shop air unless it is completely free of dirt, oil, and water.
- Do not heat the part above 150°F, before painting.
- Do not touch the treated surface with bare hands before painting.
- The part should be primed soon after it dries, or at least within 24 hours.

6. Where the prime coat is thin or where the surface is unpainted, prime with *PPG®* epoxy primer. Do not apply primer over hard finish coat. Primer solvents must be allowed time to evaporate and the primer must harden before applying the finish coat. Allow 8 to 12 hours drying time.

7. Apply finish coat. The parts catalogs and the *Volvo Penta Parts & Accessories* catalogs list part numbers for finishing products.

Recommendations for antifouling paints on boats equipped with sterndrives.

All antifouling paints that prevent marine growth are poisonous and may harm our marine environment. The legislation concerning antifouling paints has changed in many countries and others have announced coming changes in their legislation.

In general the new legislation is or will be considerably more restrictive as far as the allowed leakage of the active ingredients in the paints to the water is concerned. Several countries have put into practice (or will put into practice) a more restrictive legislation for pleasure boats than for commercial boats and vessels. The reason is that leisure boat harbors often are situated in shallow waters, which are spawning grounds for fish. Contrary to commercial boats, leisure boats spend most of their time tied up in the harbor, which adds to the impact on the environment in these waters.

Since the protection of the environment is in the best interest of all concerned, it is important to minimize the use of antifouling paints. As far as smaller boats are concerned trailer boats, which can be taken out of the water, we recommend teflon type paint only, combined with cleaning a few times during the season. This procedure can prove somewhat impractical as far as larger boats are concerned and therefore antifouling paints might have to be used. However, always take care to find out the valid legislation in the area where you intend to use the boat prior to starting the treatment of the boat! The legislation can also provide rules as to the boat weight or overall length. Always follow these directions.

Note It may be completely forbidden to use antifouling paints on leisure boats in some instances (e.g. in fresh water).

Painting the sterndrive with antifouling paint

Clean the sterndrive carefully. De-grease and flush thoroughly with water. Sand the surface with a water-abrasive paper (grit size 200-240). Make sure not to sand through the original paint of the sterndrive. Damage to drive paint must be carefully repaired with primer and original *Volvo Penta* paint. Pure metal must be cleaned prior to the application of primer. Make sure to let the primer and the paint harden in accordance with the manufacturer's instructions. Mask the hull around the transom shield and spots on the sterndrive which are not to be painted.

Note Do not paint the zinc anodes!

⚠ IMPORTANT Make sure that you have a good contact between the zinc anodes and the sterndrive. Prior to launching the boat the zinc anodes must be cleaned (activated) with emery cloth in order to remove the oxide layer. Never use a steel brush when cleaning. The steel brush reduces the galvanic protection. The engine and sterndrive must never be in metallic contact with the keel, rudder or other metallic components below the water line. Electrical equipment (such as charging equipment, navigational aids, VHF radio, etc.) must never be grounded to the engine or to the sterndrive .

PAINT FOR STERNDRIVES

PART NUMBER	COLOR	DESCRIPTION
832578-9	Blue-gray (270-290A) -1987	2-Part Paint 0.5 qts
832594-6	Blue-gray (270-290A) -1987	2-Part Paint 1.0 qts
1141578-3	Gray (290A-SPC1, DPD2)	2-Part Paint 0.5 qts
1141577-5	Gray (290A-SPC1, DPD2)	2-Part Paint 1.0 qts
1141575-9	Gray (290A-SPC1, DPD2)	Aerosol Spray can
3851219-0	Silver Metallic	Aerosol Spray can
3851220-8	Dark Silver (DPX)	Aerosol Spray can

Painting the hull with antifouling paint

Always follow the manufacturer's instructions. When making the purchase, make sure that you receive the correct product meeting the legislation prevailing in the area where you are going to use the boat. The product must contain the correct properties for the boat hull type. Aluminum hulls often require an initial treatment with an etching primer. Use a pure copper based antifouling paint, containing copper tiocyanate, not copper oxide. Tin-based (TBT-paints) are no longer allowed. Make sure to prepare the hull in accordance with the directions of the paint manufacturer.

⚠ IMPORTANT Leave a 1" strip unpainted around the transom shield/sterndrive.

Preparing Boat After Storage

See **Engine Components Workshop Manual** for specific information concerning the engine preparation.

Volvo Penta Dealer Service - 20 Hour Check

20 - Hour check includes:

- Change engine oil and filter.
- Drain and refill sterndrive. Check the tilt/trim reservoir for proper fluid level.
- Lubricate steering cable ram with grease and check power steering pump reservoir for correct fluid level.
- Change fuel filter/water separator.
- Check tension on all drive belts.
- Check engine timing.
- Carbureted Models: Check and adjust carburetor for correct idle mixture and idle RPM.
- Check engine mounts.
- Lubricate gimbal bearing and U-joint.
- Check engine alignment.
- Check for any deficiencies, malfunctions, signs of neglect or abuse, etc. Correcting any problems discovered at this time will prevent worsening of a minor problem and help ensure a trouble-free boating season.
- Inspect exhaust system, check all hose clamps for security.
- Make sure engine can achieve maximum rated RPM.

For the U.S., Canada, and Mexico, the 20-Hour Check is paid for by the boat owner and performed by your *Volvo Penta dealer* at local shop rates. In other markets the Warranty Inspection is paid for according to the Warranty Policy for Importers.