

INSTALLATION INSTRUCTIONS

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Installation Instructions

1-Inch Drive Extension Kit (P/N 3855667-6)
For Use On DuoProp® (DP) and SX
Cobra™, Model "NC" Drives Only

**VOLVO
PENTA**

IMPORTANT!

This batch with its accompanying instructions is produced for Volvo Penta's service workshops, boat-builders, machine manufacturers and other authorized workshops which have personnel with qualified professional training.

The installation instructions are only produced for professional use and are not intended for non-professional use. Volvo Penta will not assume any liability whatsoever for damage incurred, either damage to materials or personal injury, which may result if the installation instructions are not followed or if the work is carried out by non-professional personnel.

WICHTIG!

Dieser Satz mit vorliegender Einbauanleitung ist für Volvo Penta Kundendienst-werkstätten, Werften, Maschinenbauer und für andere ermächtigte Werkstätten mit beruflich geschultem Personal vorgesehen.

Die Einbauanleitung ist nur für den berufsmäßigen Gebrauch vorgesehen und nicht für unprofessionelle Anwendung gedacht. Volvo Penta übernimmt nicht die geringste Haftung für irgendwelchen Schäden an Personen oder Sachen, die als Folge einer Nichtbefolgung der Einbauanleitung oder wegen Ausführung der darin beschriebenen Arbeiten durch nicht beruflich geschulte Personen entstehen.

IMPORTANT!

Ce kit, avec instructions de montage, est destiné aux ateliers de service Volvo Penta, aux constructeurs de bateaux et autres ateliers de construction agréés avec un personnel qualifié.

Les instructions de montage sont exclusivement conçues pour une utilisation professionnelle. Volvo Penta se dégage de toute responsabilité pour d'éventuels endommagements, corporels ou matériels, résultant du non respect des instructions ou d'un travail effectué par un personnel non compétent.

IMPORTANTE!

El presente juego con las instrucciones de montaje se destina a los talleres de servicio Volvo Penta, constructores de embarcaciones y máquinas y a otros talleres autorizados que cuentan con personal capacitado.

Las instrucciones de montaje están destinadas únicamente para uso profesional, por lo que Volvo Penta no aceptará responsabilidad alguna por cualquier daño, tanto personal como material, resultado de no haber seguido las instrucciones de montaje o de haber sido efectuado el trabajo por personal que no está debidamente capacitado.

IMPORTANTE!

Questo kit e le relative istruzioni di montaggio sono stati realizzati per le officine di servizio Volvo Penta, i cantieri, i fabbricanti di macchine e tutte le altre officine autorizzate il cui personale ha ricevuto un addestramento qualificato e specializzato.

Le istruzioni di montaggio sono state redatte esclusivamente per uso professionale e non sono adatte all'uso non professionale. La Volvo Penta non si assume alcuna responsabilità per eventuali danni alle cose o alle persone, derivanti da trascuratezza nel seguire le istruzioni di montaggio oppure dall'esecuzione dei lavori da parte di personale non qualificato.

VIKTIGT!

Denna sats med föreliggande monteringsanvisning är framtagen för Volvo Pentas serviceverkstäder, båtbyggare, maskintillverkare och övriga auktoriserade verkstäder som har personal med kvalificerad fackutbildning.

Monteringsanvisningen är enbart framtagen för yrkesbruk och är inte avsedd för icke yrkesmässig användning. Volvo Penta påtager sig inget som helst ansvar för eventuella skador, såväl materiella som personskador, som kan bli följden om monteringsanvisningen ej följs, eller om arbetet utförs av icke yrkeskunnig

VIGTIGT!

Dette sæt med tilhørende monteringsvejledning er blevet udviklet for Volvo Pentas serviceværksteder, bådbyggere, maskinproducenter og andre autoriserede værksteder, som har medarbejdere med kvalificeret, faglig uddannelse.

Monteringsvejledningen er udelukkende beregnet til professionel anvendelse og ikke til hobby- eller fritidsbrug. Volvo Penta påtager sig intet som helst ansvar for eventuelle skader på såvel materiel som personer, som kan være en følge af at monteringsvejledningens anvisninger ikke blev overholdt, eller hvis arbejdet blev udført af ikke-professionelt personale.

TÄRKEÄÄ!

Tämä sarja ja asennusohje on tarkoitettu Volvo Pentan huoltokorjaamoille, veneenrakentajille, konevalmistajille ja muille valtuutetuille korjaamoille, joiden henkilökunta on saanut pätevän ammattikoulutuksen.

Asennusohje on tarkoitettu ainoastaan ammattikäyttöön. Volvo Penta ei vastaa mahdollisista materiaali- tai henkilövahingoista, joita asennusohjeen laiminlyöminen tai ammatitaidottoman henkilökunnan suorittama asennustyö voi aiheuttaa.

BELANGRIJK!

Deze set met de bijgevoegde montage-aanwijzing is ontwikkeld voor de werkplaatsen van Volvo Penta, botenbouwers, machinefabrikanten en overige bevoegde werkplaatsen, die personeel hebben met een gekwalificeerde vakopleiding.

De montage-aanwijzing is alleen ontwikkeld voor professioneel gebruik en is niet bedoeld voor niet-professioneel gebruik. Volvo Penta neemt geen enkele verantwoordelijkheid op zich voor eventuele schade, zowel materiële schade als persoonlijk letsel, die het gevolg kan zijn als de montage-aanwijzing niet wordt gevolgd, of als het werk wordt uitgevoerd door niet-vakkundig personeel.

IMPORTANTE!

Este jogo, juntamente com as respectivas instruções de montagem, foi concebido para as oficinas de serviço da Volvo Penta, construtores navais, construtores de máquinas e outras oficinas autorizadas, com pessoal devidamente formado.

As instruções de montagem foram concebidas unicamente para utilização profissional e não se destinam a utilização não profissional. A Volvo Penta não se responsabiliza por quaisquer danos eventuais, tanto materiais como pessoais, que possam resultar no caso de as instruções de montagem não serem seguidas, ou se os trabalhos forem executados por pessoal não profissional.


ΠΡΟΣΟΧΉ!

Το περιεχόμενο αυτού του πακέτου μαζί με τις οδηγίες συναρμολόγησης που το ακολουθούν είναι ειδικά επιλεγμένο για συνεργεία σέρβις της Volvo Penta, ναυπηγεία, κατασκευαστές μηχανών και για λοιπά εξουσιοδοτημένα συνεργεία που διαθέτουν εξειδικευμένο προσωπικό.

Οι οδηγίες συναρμολόγησης προορίζονται μόνο για επαγγελματική χρήση και δεν αποσκοπούν για χρήση από μη επαγγελματίες. Η Volvo Penta δεν αναλαμβάνει απολύτως καμία ευθύνη για πιθανές ζημιές, τόσο υλικές όσο και προσωπικές, που μπορούν να προκληθούν επειδή δεν ακολουθούνται οι οδηγίες συναρμολόγησης ή επειδή η εργασία εκτελείται από μη εξειδικευμένο προσωπικό.

These instructions will alert you to certain things you should do very carefully. If you don't, you could

- hurt yourself or bystanders
- hurt the boat operator or bystanders
- damage the machinery

Safety symbol, , appears next to information important to prevent you and others from being hurt.

Note symbol, **Note**, appears next to information important to keep machinery from being damaged.

IMPORTANT: The safeguards and instructions appearing in these instructions cannot cover all possible conditions or situations that occur. The person following these directions must use common sense, caution, and care.

Product Reference and Illustration

When reference is being made to a brand name, product, or specific tool, an equivalent product may be used in place of the referred to product. Substitute products used must have equivalent characteristics, including type, strength, and material. Incorrect substitution may result in product malfunction and possible injury to the operator and/or passengers. All photographs and illustrations used may not necessarily depict actual models or equipment, but are intended only for reference. Specifications used are based on the latest product information available at the time of publication.

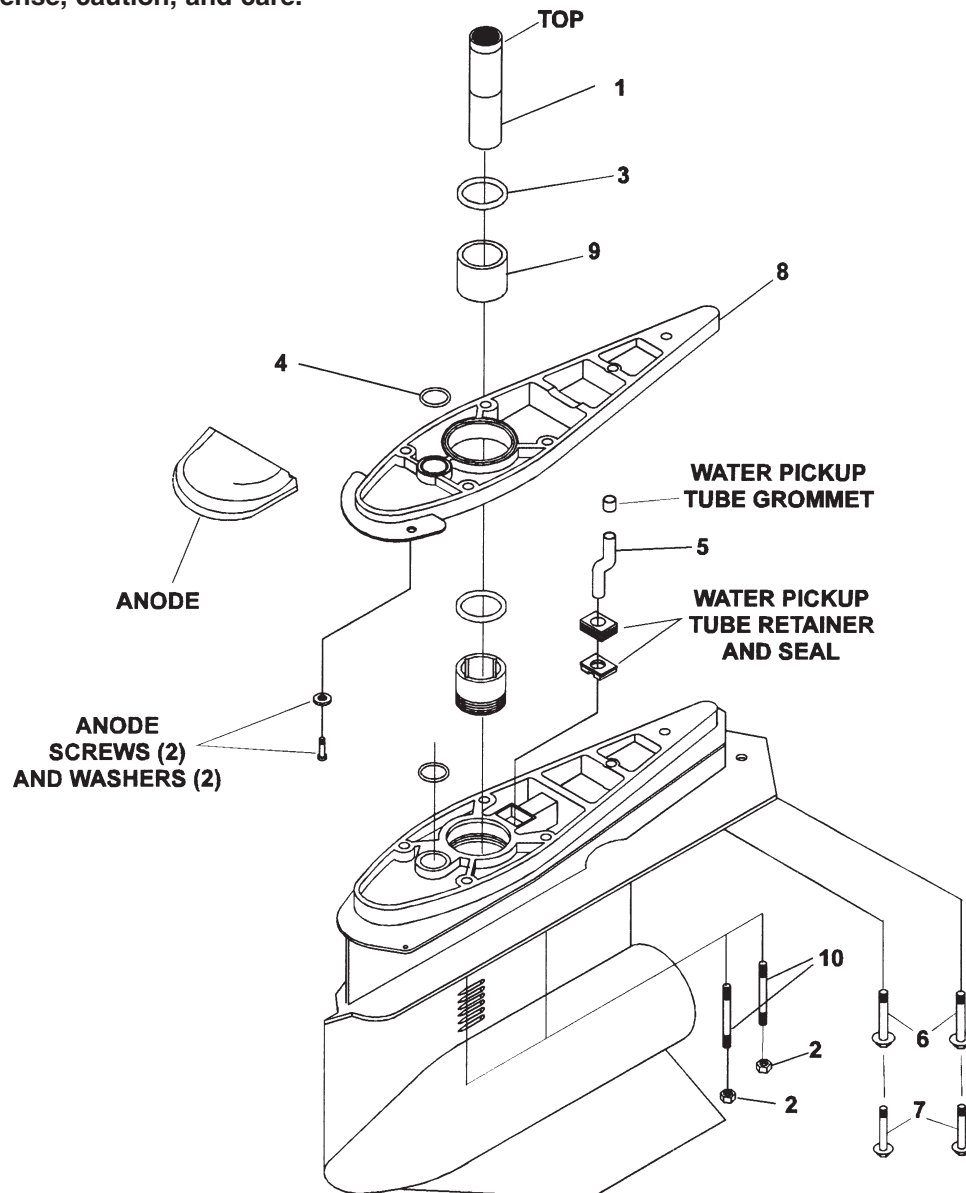


Figure 1. 1" Drive Extension Kit Installation


DuoProp® and SX Cobra™ 1" Extension Kit

Callout No.	Kit Contents Description	Qty
1	Intermediate Driveshaft	1
2	Locknut, Studs	4
3	O-ring, Large	1
4	O-ring, Small	1
5	Tube, Water Inlet	1
6	Screws, Short (SX)	2
7	Screws, Long (DP)	2
8	Extension Housing	1
9	Retainer, Extension Spacer	1
10	Studs	4


KIT APPLICABILITY

This tool kit is applicable to the DP DuoProp®, and SX Cobra™, Model "NC" drives only. This kit will not work on other Volvo Penta® DuoProp® drive installations or other model SX drives.

Removal of Lower Drive Unit

 **DANGER!** Ensure that the engine(s) is shutdown and the ignition switch key(s) is removed from each starting location.

1. The boat must be removed from the water and safely secured from moving.
2. Drain the oil from the drive unit.
 - a. On SX drives, place a 4 quart oil drain pan under the gear unit, remove the drain plug on the lower part of the housing and raise the unit to the full tilt up position.
 - b. On DP drives, place a 4 quart oil drain pan under the gear unit, trim the drive unit as far forward (negative range) as possible. Remove the propellers and remove the Allen head drain plug located on the lowest point of the bearing housing retainer inside the propeller exhaust outlet port.
3. Remove the oil level dipstick so the oil reservoir can vent while draining.

 **DANGER!** Ensure the drive is supported in an appropriate drive dolly before the last screws are removed, the drive is heavy.

4. Remove the six screws on SX or four stud nuts and two screws on DP, two on either side and two aft. Pull off lower gear unit assembly and mount it into a suitable holding fixture to prevent damage to the drive.
5. Remove the anode from the front of the lower drive unit.

6. Retain the grommet, the tube retainer and seal located in the lower gear housing but discard the old short copper water pickup tube.

Installation of Extension to Lower Drive Unit.

1. DP only, remove the studs from the upper housing using two nuts jammed together as a means of removal. Ensure the heli-coil does not come out with the studs.
2. For all drives, temporarily install two nuts (2) on the end of each new stud.
3. Insert and tighten each stud (10) into the upper drive housing until 27-34 N·m (20-25 ft. lbs.) of torque is reached, remove the two nuts.
4. Ensure both large and small diameter o-rings are serviceable and in place in the lower housing around the oil passage and around the lower vertical shaft bearing retainer.
5. With the o-ring grooves facing up, lay the extension plate over the lower drive housing, ensure the extension plate (8) fits tightly to the upper surface of the lower drive unit.
6. Place a light coating of water resistant grease around the lower vertical shaft bearing retainer extension spacer (9). Insert the extension spacer (9) into the extension housing.
7. Clean the oil strainer screen located in the upper gear housing oil passage. Install o-rings (3 & 4) around the oil passage and the extension spacer (9) in the extension housing.
8. Reuse the water pickup tube grommet located in the upper gear housing and the tube retainer and seal located in the lower gear housing. Install the new, longer copper water pickup tube (5) into the upper gear housing.
9. Install the new, longer intermediate shaft (drivesaver) (1), with the outside groove facing upward, onto the lower vertical shaft.
10. Install the anode on the spacer (8) using the two screws and washers as shown in figure 1.

Installing the Lower Gear Housing

1. With the lower gear unit on a drive dolly, raise the unit while ensuring the water pickup tube and the vertical shafts engage and align. It may be necessary to rotate the propeller back and forth to ensure the splines align and become engaged.
2. Install the four locking nuts (2) on the studs. If the studs come into contact with the lower drive housing, the studs have not been seated properly. Remove the drive and reinstall the studs into the upper gear housing. The upper and lower drive units should come together **without being forced or 'drawn up'** using the locknuts.

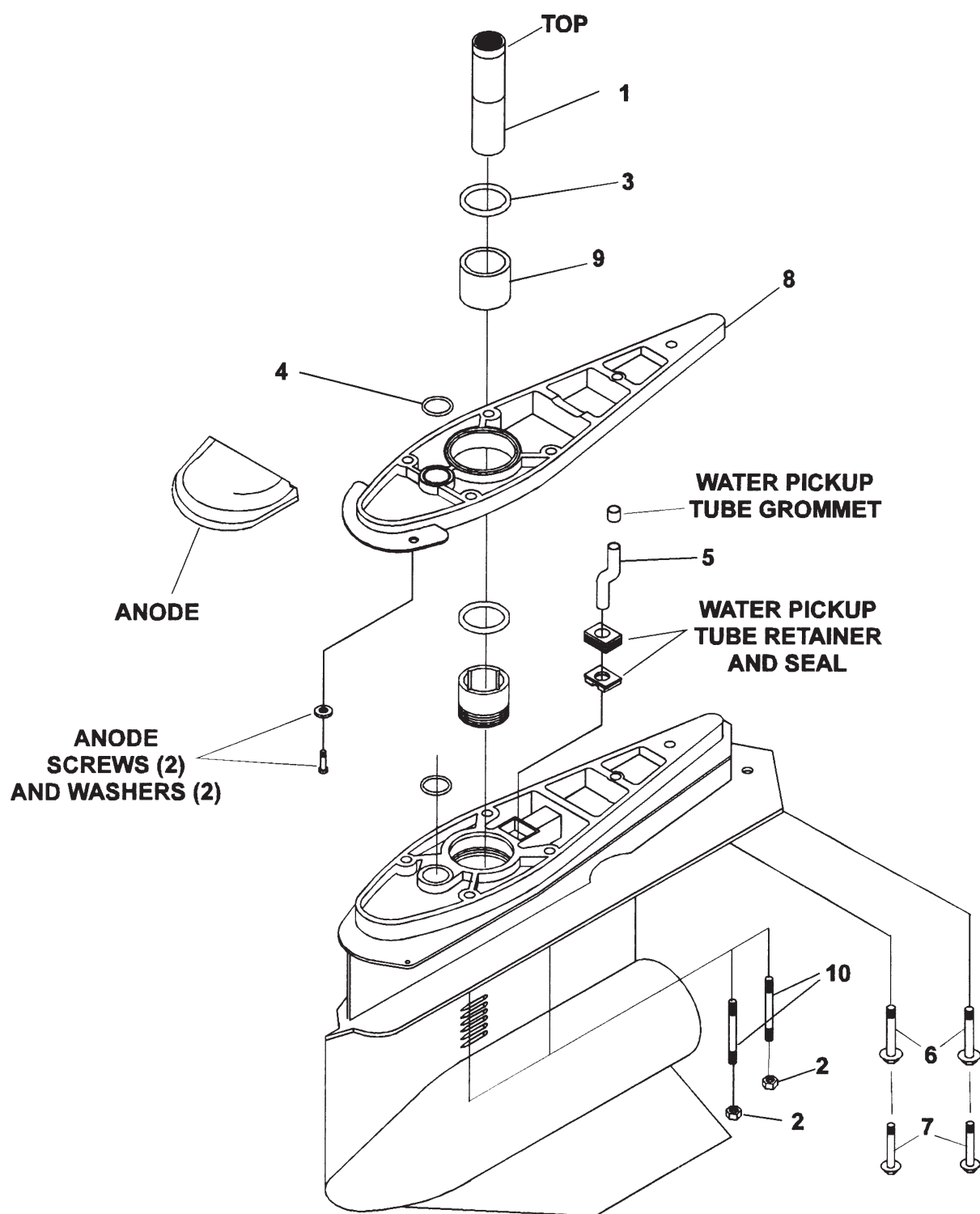


Figure 1. 1" Drive Extension Kit Installation

3. Using a crows foot, torque the stud locking nuts to 27-34 N·m (20-25 ft. lbs.) of torque.

NOTE: *Two of the screws that came in the kit will not be used during assembly. The SX uses the shorter length screws and the DP uses the two longer length screws.*

4. Apply gasket sealing compound to the threads and install the aft two retaining screws into the anti-ventilation plate, the DP will use the two longer screws (3) and the SX will use the two shorter screws (4). Tighten the 3/8"-16 screws to 30-33 N·m (22-24 ft. lbs.) the 7/16"-14 screws to 43-54 N·m (32-40 ft. lbs.).

5. Install trim tab (if equipped). Tighten mounting screw to 19-22 N·m (14-16 ft. lbs.).

6. Before filling the drive with gear lubricating oil, it must be pressure and vacuum tested to verify proper sealing during assembly. For the SX, remove drain plug on side of gear unit skeg and reinstall the oil level gauge into the upper housing. For the DP, remove the Allen head drain plug in the lower bearing housing and install the oil level gauge.

a. Attach a pressure tester (such as a Stevens S-34) to skeg drain hole on the SX or the lower bearing housing oil drain opening on the DP, and pressurize the drive to 20,7-34,5 kPa (3-5 psi). Rotate propeller shaft(s) and U-joint shaft to check sealing. If pressure loss is indicated, use a soapy water solution or submerge drive in water to find source. Make necessary repairs then repeat test.

b. If pressure loss is not indicated, increase pressure to 110-124 kPa (16-18 psi). Again, use a soapy water solution or submerge in water to find source if drive loses pressure. Make repairs as necessary and repeat test. Drive must hold pressure before making vacuum test, and must not lose more than 6,9 kPa (1 psi) in 3 minutes.

c. Attach a vacuum tester (such as a Stevens V-34) to oil drain hole, and pull vacuum to 10-16,8 kPa (3-5 inches of mercury). Rotate propeller(s) and U-joint shaft to check sealing. If drive does not hold vacuum, apply a heavy oil to seal and gasket surfaces to find source. Make necessary repairs then repeat test. No loss of vacuum should occur on low test.

d. If vacuum loss is not indicated, increase vacuum to 47-54 kPa (14-16 inches of mercury). Again, apply heavy oil to find source of leak if drive will not hold a vacuum. Make necessary repairs and repeat test. Drive must not lose more than 3,4 kPa (1 inch of mercury) in 3 minutes.

NOTE: *Do not fill the drive with lubricant unless it passes both pressure and vacuum test.*

7. Place the drive in a full tilted position. Remove the rear plastic shift cover to allow access to the oil level plug. Remove the oil level plug. Also remove the level indicator gauge at top of drive to help vent the oil reservoir. Discard the plug and gauge seal. Replace the seals and o-rings with new ones. Reinstall the oil drain plug.

NOTE: *Filling the drive too quickly may form air pockets that will cause an inaccurate oil level reading. Running drive with improper oil level can result in immediate internal damage.*

8. Fill the drive with approximately 2130 cc (72 ounces) of synthetic GL5 gear oil as specified in the appropriate Owner's Manual through the oil level hole. Slowly fill to purge trapped air. Stop filling when the oil level reaches the bottom of the oil level hole. **Do not overfill.**

9. When oil reaches proper level, stop filling and screw in the level plug and level gauge. Apply gasket sealing compound to the oil level plug and tighten to 5,8-8,1 N·m (48-72 in. lbs.).

10. After the drive has been run, recheck the oil level. Add makeup oil through the oil level plug opening using a small funnel until the proper oil level is reached.

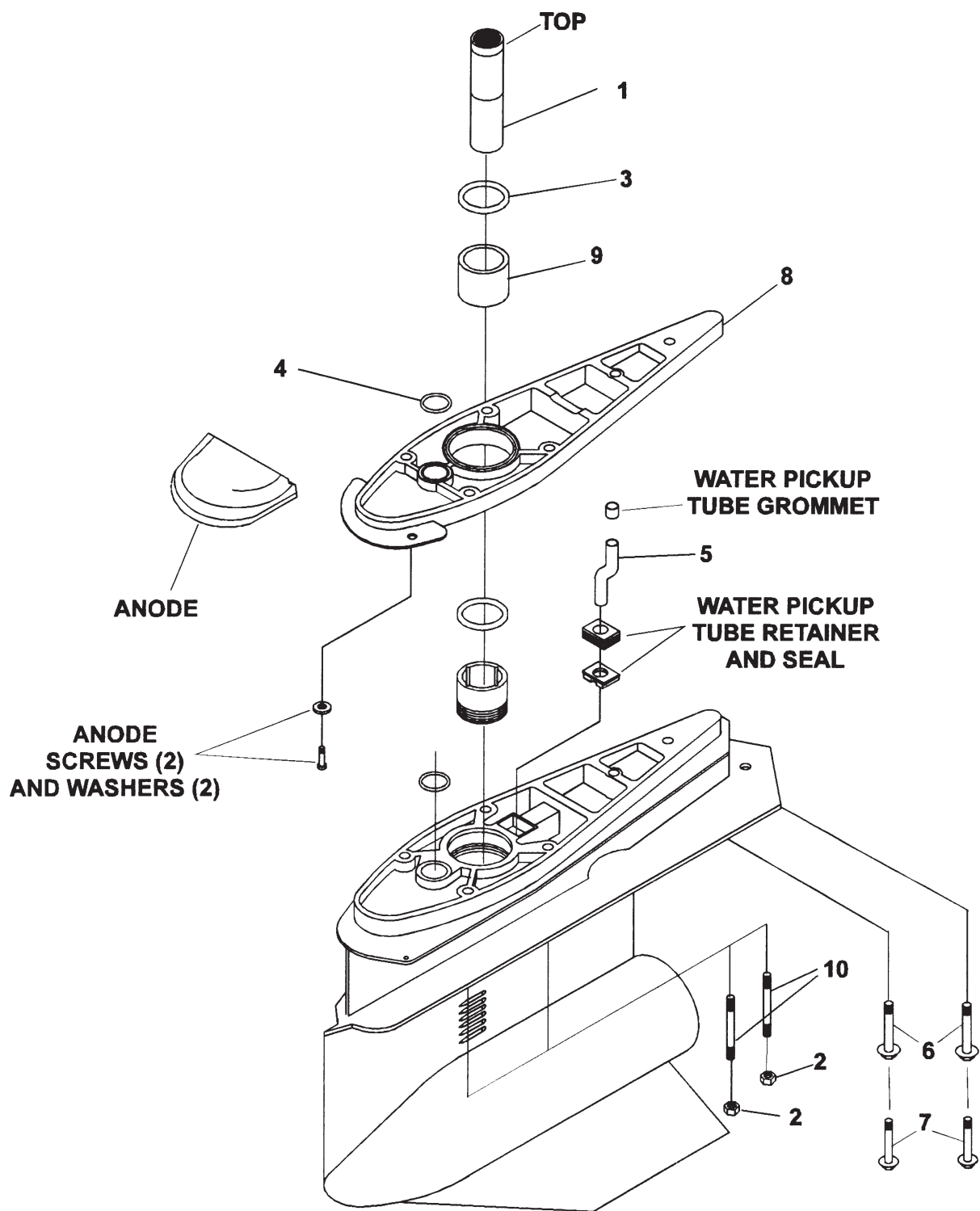


Figure 1. 1" Drive Extension Kit Installation

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