

Installation Reference, Volvo Penta IPS Propulsion Unit and Engine *

NOTE! Read the Volvo Penta IPS Installation Manual before the installation work of IPS propulsion unit and engine is started. For installation of the EVC system, please refer to EVC specific literature.

NOTE! The procedure for building drive unit positions and engine bed is described on the poster **Installation Reference, Volvo Penta IPS Hull Insert/ Hull Mold Plug and Engine Foundation.**

WARNING! Make sure all safety precautions are made prior to lifting to avoid personal injuries and damage on equipment.

NOTE! Before installing propulsion unit and engine, make sure that the rest of the installation work in the engine compartment has been completed. In addition, all cables and hoses must be correctly located and clamped.

* **NOTE!** For IPS installations with jackshaft, follow step 1 to 7 (incl 8F) on this page, then follow jackshaft procedures on page 2.

1 Chassis no. identification

IMPORTANT! Check that engine chassis no. and propulsion unit (SUS) chassis no. are identical.

SUS Chassis no. 99999999 IPS-X RATIO X.XX.X
 VVXXXXXXXXXX
 0000000000

Engine chassis no. VVXXXX XXXXXX
 MID250

SUS Chassis no. VVXXXX XXXXXX

2-5 Installing the propulsion unit

Clean (wipe) hull mating surfaces to IPS propulsion unit

3

Arrange the clamp ring with a separate loop as shown.
NOTE! Sealing rings in place.

Apply rubber lubricant

Wipe rubber sealing rings and apply rubber lubricant, Volvo Penta part no. 3817243.

IMPORTANT! Do not use vaseline or grease.

IMPORTANT! Apply grease, P/N 21347121 (400g) or 828250 (25g).

IMPORTANT! Keep sealing rings and mating surfaces inside hull clean and free from grease.

4

Lifting force: Max. 10000 N (2200 lbf)

Alternative lifting device. Special tool 21623510*

Clamp ring with rubber sealing ring

* See Application bulletin 15-18 how to modify previous tool 885835

5

Lifting force: Max. 10000 N (2200 lbf)

12 x M12 screws. Tightening torque: 70-80 Nm (52-60 lbf.ft)

4 x M12 screws, placed as in figure. Tighten cross wise, 5 mm at a time. Final torque: 70-80 Nm (52-60 lbf.ft)

NOTE! Apply corrosion protection, part no. 9510227, in area between clamp ring and gear housing.

6 Installing the water inlet and water bypass valves

NOTE! Water bypass is only used on IPS600 applications. All other models use blocking cover.

IPS600

Blocking cover Green

Cover Water bypass valve O-ring

O-ring

Wipe surfaces

Tightening torque: 24-28 Nm (18-21 lbf.ft)

Water inlet valve Red

7 Installing the engine *

WARNING! Always use both lifting eyes when lifting the engine.

Check: Equal loading on port and starboard mounts by measuring distance H.

NOTE! Unequal loading will cause engine vibrations. See also 8F

8 Connecting the drive shaft

A No lubricant on shaft!

B Check clearance: Max. 3 mm (1/8") Min. 0.5 mm (.0196")

C Tighten the two allen screws. 120-130 Nm (90-96 lbf.ft)

D Check: Drive shaft flange-to-flange distance. Adjust engine if needed. Check: Aligning of arrows. 385±15 mm (15±0.6)

E Leave a space of approx. 5-10 mm (0.2-0.4"). Tightening torque: 25-30 Nm (18-22 lbf.ft)

F Check: Equal loading on mounts. Check on three points using setting tool 21244540.

NOTE! Ensure there is clearance between drive shaft coupling and gear box housing.

NOTE! Ensure that the driveshaft halves can move on the splines coupling when mounted and do not touch bottom.

9 Installing the oil cooler

x4 Tightening torque: 25±3Nm (18.4±2.2 lbf.ft)

Hose clamp tightening torque: 4 Nm (2.9 lbf.ft)

10 Connecting oil hoses

Hose clamps tightening torque: 5-6 Nm (3.7-4.4 lbf.ft)

Tightening torque: 80 Nm (59 lbf.ft)

NOTE! Check oil level before and after starting the engine. Top up if necessary. Use only Volvo Penta branded IPS transmission oil.

11 Installing the exhaust line and the water inlet and bypass hoses. Mounting the protective anode.

A Tightening torque: 48-52 Nm (35-38 lbf.ft)

B **NOTE!** Place O-ring in exhaust bend. Apply grease 828250 on the O-ring outer surface to secure exhaust pipe mounting without O-ring dislocation.

C Hose clamps tightening torque: 5-6 Nm (3.7-4.4 lbf.ft)

D Anode bond cable

Protective anode kits - GRP hull - Steel or Alu hull

NOTE! Place reducing insert in hose. Only IPS600

NOTE! Place reducing insert in hose.

Hose clamp tightening torque: 4 Nm (2.9 lbf.ft)

Two hose clamps!

IMPORTANT! For sensor mounting, see instruction included in the exhaust elbow/riser kit.

IMPORTANT! Apply corrosion protection, part no. 9510227, on bonding connections after mounting to seal. Use marine sealant on the through hull fittings.

E Installing exhaust riser

The need of an exhaust riser is described in the Volvo Penta IPS installation manual.

Tightening torque: 10±2 Nm (7.5±1.5 lbf.ft)

NOTE! IPS600 engines: Place reducing insert in hose. Water bypass hose only on IPS600 engines. Hose clamp tightening torque: 4 Nm (2.9 lbf.ft)

Two hose clamps!

Exhaust hose clamp, standard elbow and riser. Tightening torque: 20-25 Nm (15-18 lbf.ft)

Recommended riser angle: 45°

F

Tighten the four screws. Tightening torque: 48-52 Nm (35-38 lbf.ft)

NOTE! Min. distance exhaust bend to transom or components: 50 mm (2").

G Installing the water inlet hose

Two hose clamps!

Hose clamps, tightening torque: 5-6 Nm (3.7-4.4 lbf.ft)

12 Power supply

Datalink to SUS

Rev.pick-up

Power supply cables

Tie cables

S = Reverse

P = Forward

Oil temp and pressure

NOTE! Tie cables to bracket.

13 Calibration

Calibrate the propulsion unit positions by using the parallel alignment tool, special tool 3808507 alt. the laser calibration tool, special tool 21406897, and the VODIA tool 3838619 or PC VODIA in combination with the switch box, special tool 21287382. Please refer to the Volvo Penta IPS installation manual.

3838619

21287382

3808507

21406897

web

VODIA 5 PC based diagnostics tool

NOTE! Read the Volvo Penta IPS Installation Manual before the installation work of IPS propulsion unit and engine is started. For installation of the EVC system, please refer to EVC specific literature.

WARNING! Make sure all safety precautions are made prior to lifting to avoid personal injuries and damage on equipment.

NOTE! Before installing propulsion unit and engine, make sure that the rest of the installation work in the engine compartment has been completed. In addition, all cables and hoses must be correctly located and clamped.

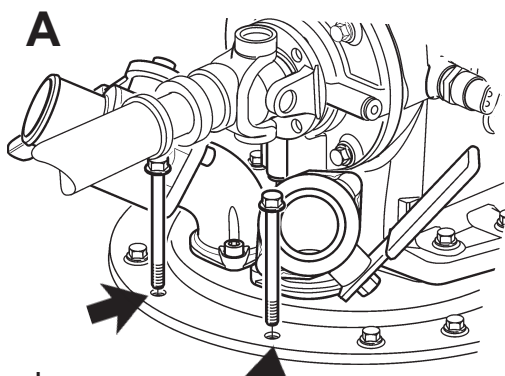
Installation Reference, Volvo Penta IPS Jack shaft mounting

WARNING! Make sure all safety precautions are made prior to lifting to avoid personal injuries and damage on equipment.
NOTE! Before installing propulsion unit and engine, make sure that the rest of the installation work in the engine compartment has been completed. In addition, all cables and hoses must be correctly located and clamped.

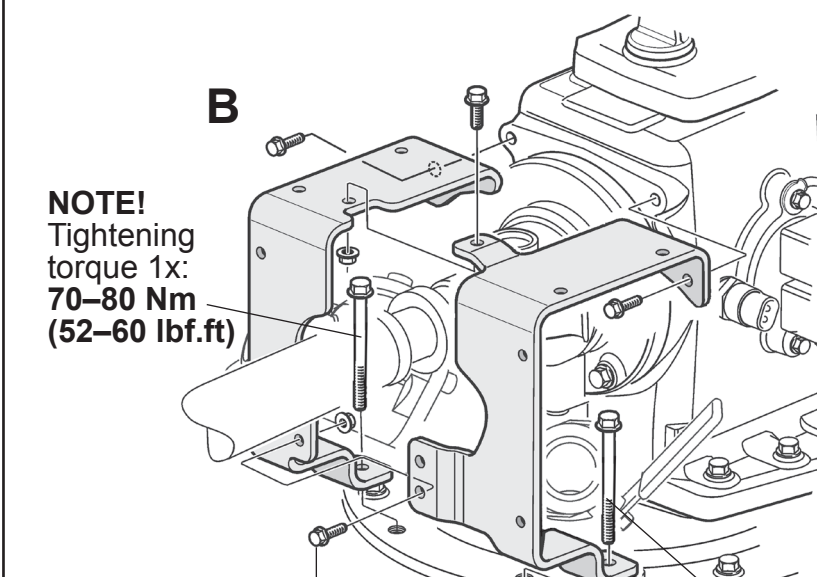
Step 1 to 7

Follow the corresponding steps for IPS standard installation (without jack shaft).

12 Mounting the rear end catch (IPS600 installation is shown)



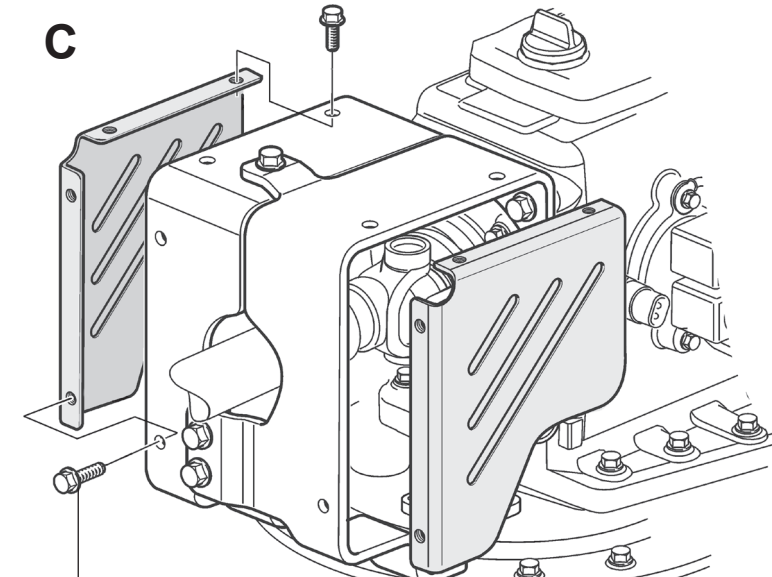
Loosen two screws (M14) from clamp ring.



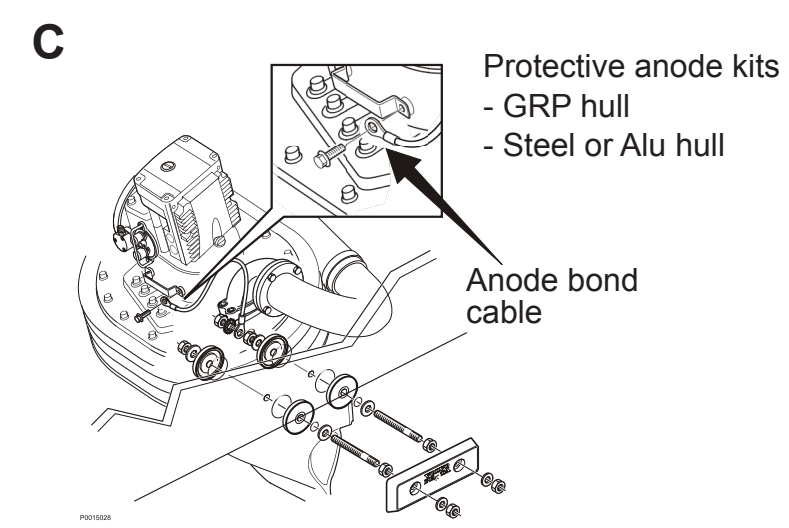
NOTE! Tightening torque 1x: 70-80 Nm (52-60 lbf.ft)

Tightening torque 5x: 35-38 Nm (26-28 lbf.ft)

Tightening torque 1x: 70-80 Nm (52-60 lbf.ft)



Tightening torque 8x: 24-28 Nm (18-21 lbf.ft)



Protective anode kits
- GRP hull
- Steel or Alu hull

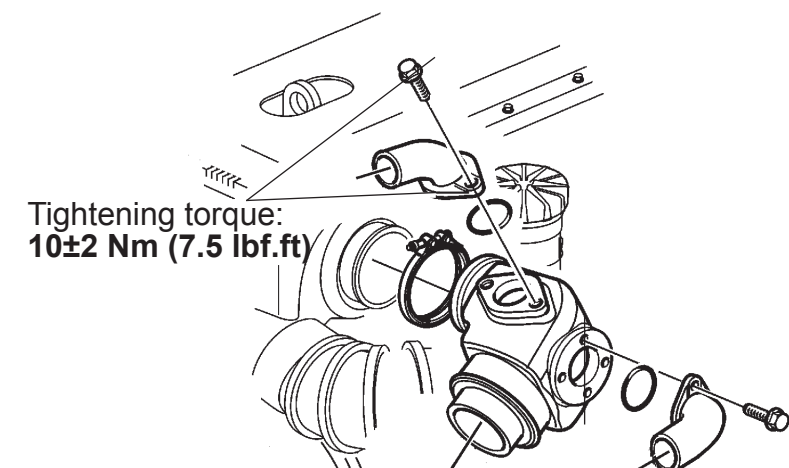
Anode bond cable

IMPORTANT!
- Do not bond the IPS units together.
- Do not bond the IPS to the engine or any other component on board the boat.
- Do not bond any other equipment to the IPS external anode.

NOTE! If ACP (Active Corrosion Protection) will be used, regular anode protection shall not be installed. Installation instructions ACP are included in the ACP kit.

IMPORTANT!
Apply corrosion protection, part no. 9510227, on bonding connections after mounting to seal. Use marine sealant on the through hull fittings.

D Installing an exhaust elbow Only on IPS600 engines.

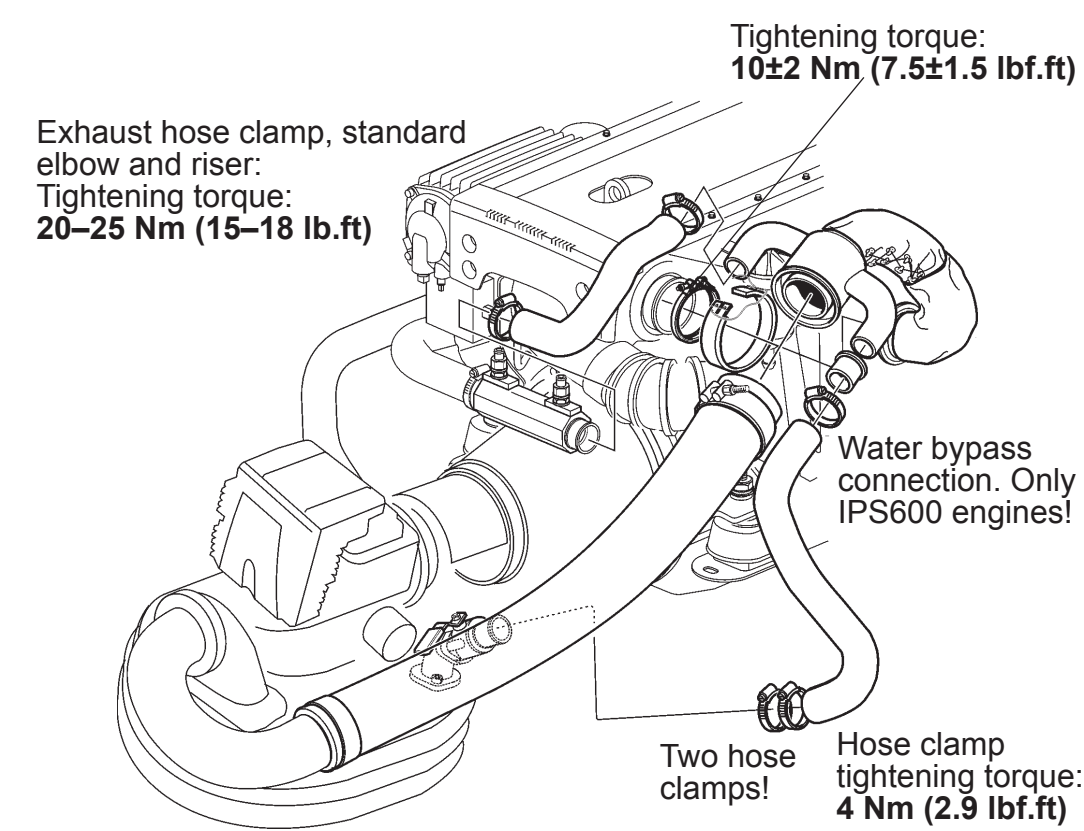


Tightening torque: 10±2 Nm (7.5 lbf.ft)

Water bypass connection. Only IPS600 engines!

E Installing exhaust riser

The need of an exhaust riser is described in the Volvo Penta IPS installation manual.

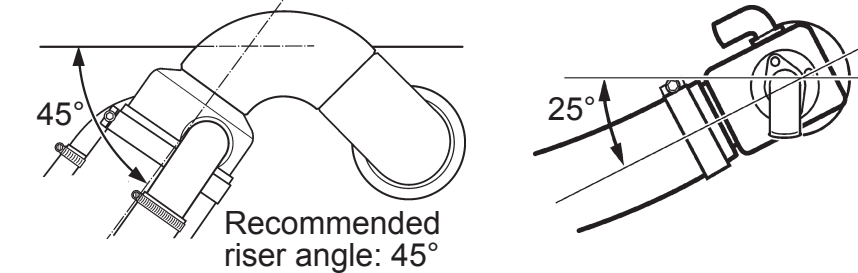


Tightening torque: 10±2 Nm (7.5±1.5 lbf.ft)

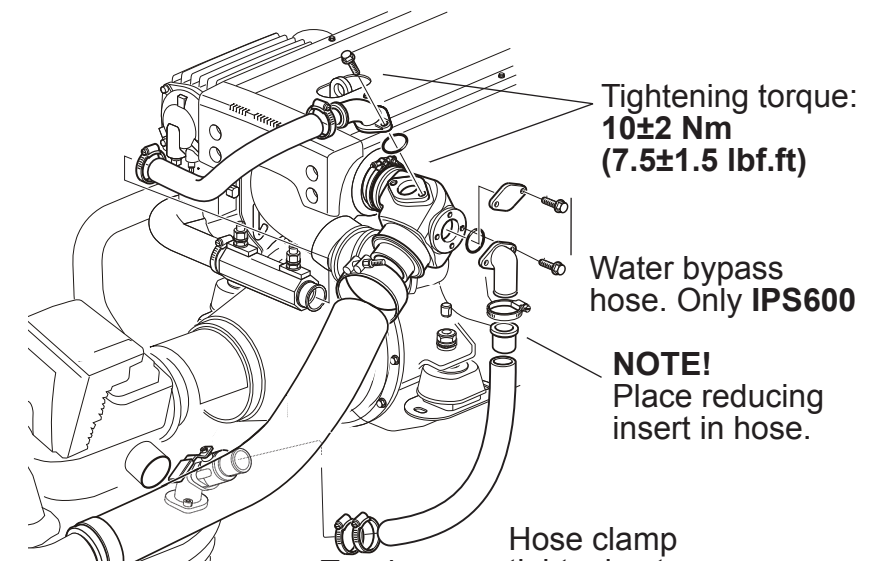
Exhaust hose clamp, standard elbow and riser:
Tightening torque: 20-25 Nm (15-18 lbf.ft)

Water bypass connection. Only IPS600 engines!

Two hose clamps!
Hose clamp tightening torque: 4 Nm (2.9 lbf.ft)



Recommended riser angle: 45°



Tightening torque: 10±2 Nm (7.5±1.5 lbf.ft)

Water bypass hose. Only IPS600

NOTE! Place reducing insert in hose.

Two hose clamps!

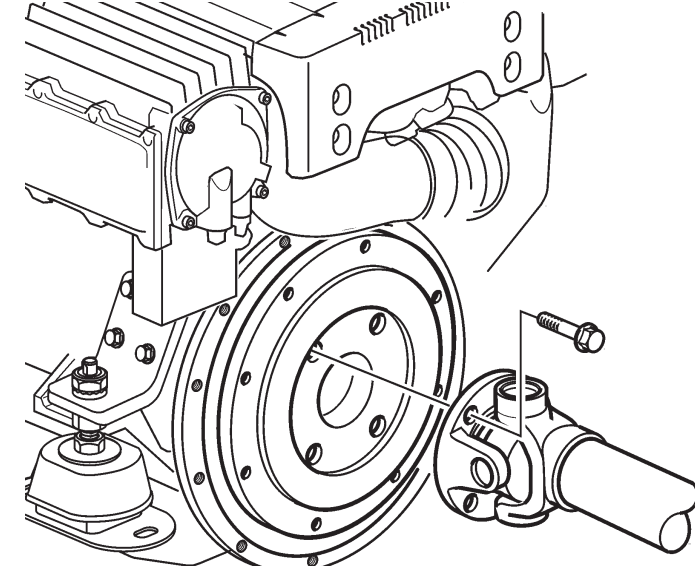
Hose clamp tightening torque: 4 Nm (2.9 lbf.ft)

IMPORTANT! For sensor mounting, see instruction included in the exhaust elbow/riser kit.

8 Connecting the drive shaft, front end (engine side)

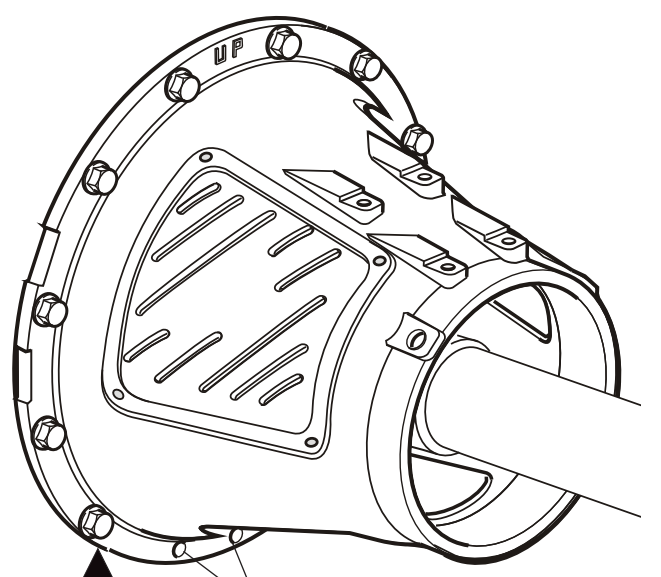
See step 10 E for available drive shaft lengths.

NOTE! Ensure that the protective casing (step 9) can be moved to place from the drive shaft rear end after that the drive shaft front end is mounted.



Tightening torque: 4x: 140±15Nm (103±11 lbf.ft)

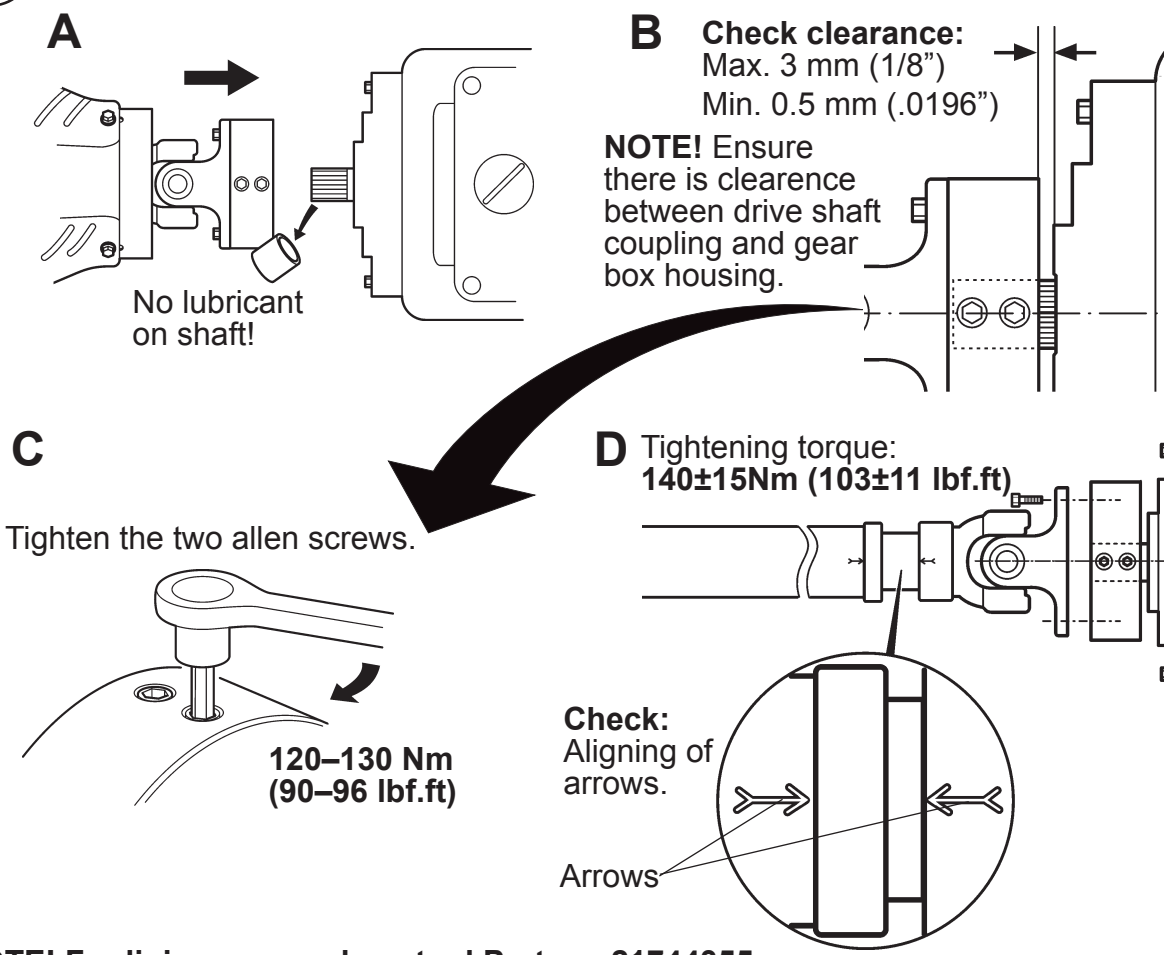
9 Mounting the front end protective casing



NOTE! No bolts are to be fasten in the lower two holes.

Tightening torque: 48±5Nm (35±4 lbf.ft)

10 Connecting the drive shaft



No lubricant on shaft!

B Check clearance:
Max. 3 mm (1/8")
Min. 0.5 mm (0.0196")

NOTE! Ensure there is clearance between drive shaft coupling and gear box housing.

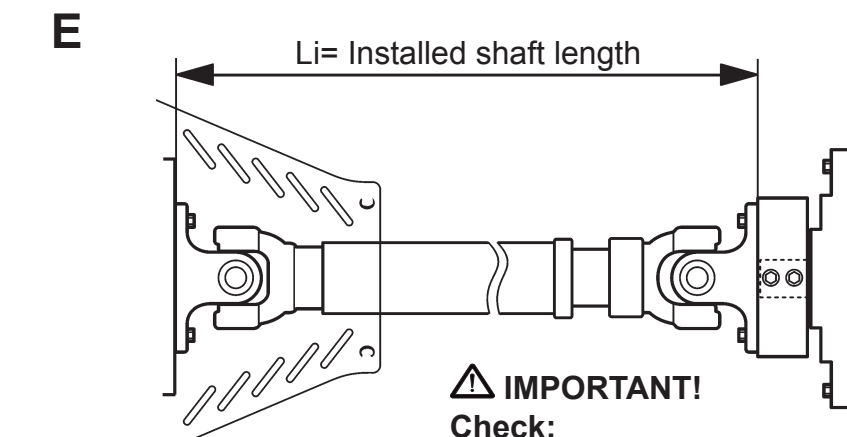
C Tighten the two allen screws.

120-130 Nm (90-96 lbf.ft)

D Tightening torque: 140±15Nm (103±11 lbf.ft)

Check: Aligning of arrows.

NOTE! For lining up, use lasertool Part no. 21744355

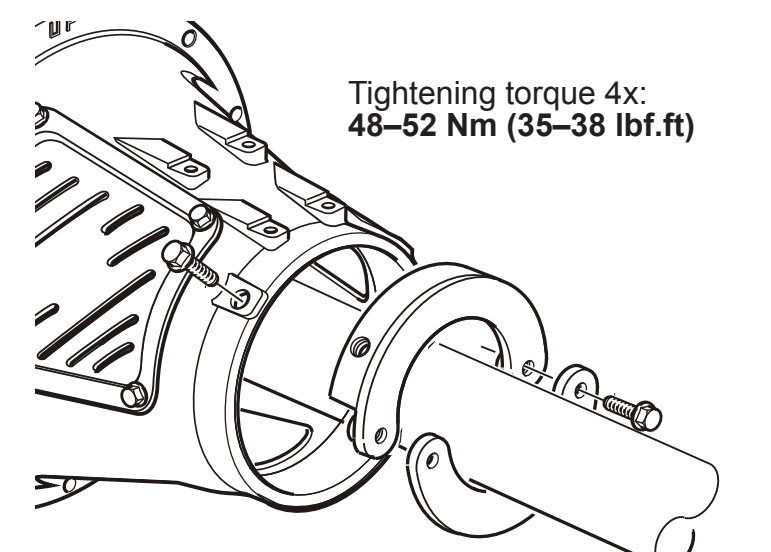


Part no.	Li (mm)
3817450	1670-1750
3817451	1570-1650
3817452	1470-1550
3817453	1370-1450
3817454	1270-1350
3818288	1170-1250
3818289	1070-1150
3818290	970-1050
3818291	870-950
3818292	770-850
3818293	670-750
3818295	570-650

IMPORTANT!
Check:
- Part no. and Li from the table
- Li is within recommended dimension
- Adjust engine if needed

NOTE! Ensure that the driveshaft halves can move on the splines coupling when mounted and do not touch bottom.

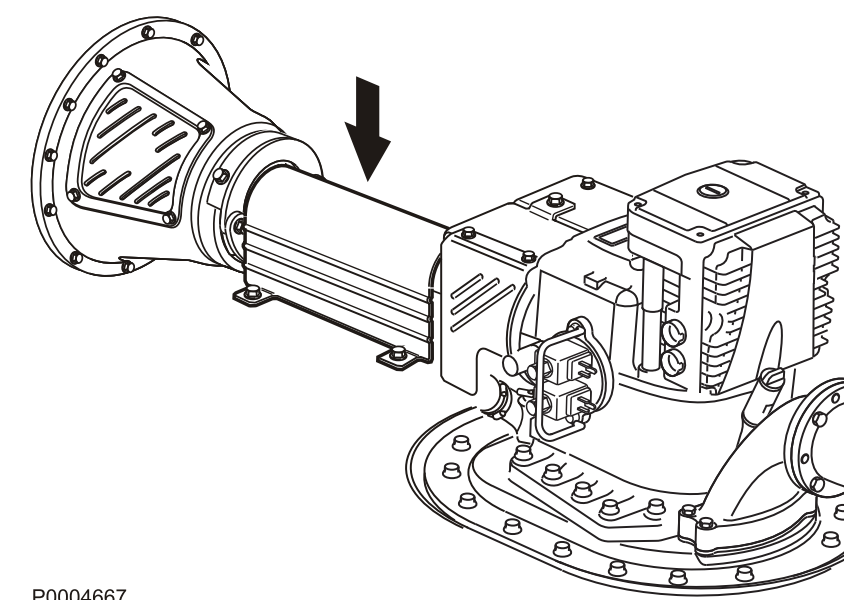
11 Mounting the front end catch



Tightening torque 4x: 48-52 Nm (35-38 lbf.ft)

Tightening torque: 10±2 Nm (7.5±1.5 lbf.ft)

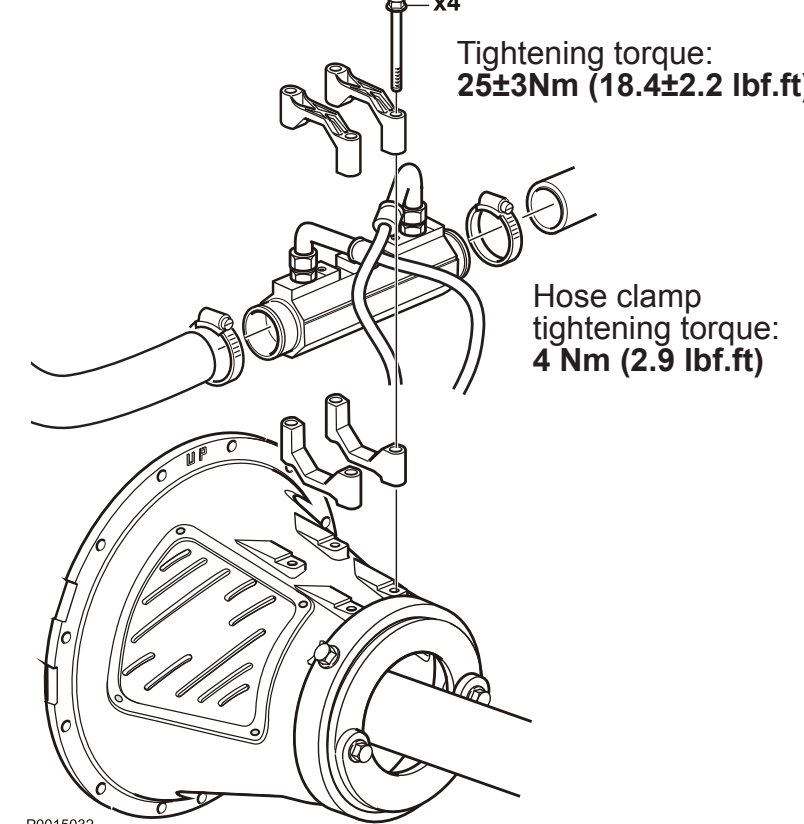
13 Mounting the jackshaft safety cover



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NOTE! Jackshaft safety covers are not supplied by Volvo Penta. These covers must be made to fit the boat model and designed according to local regulation and current safety legislation.

14 Installing the oil cooler



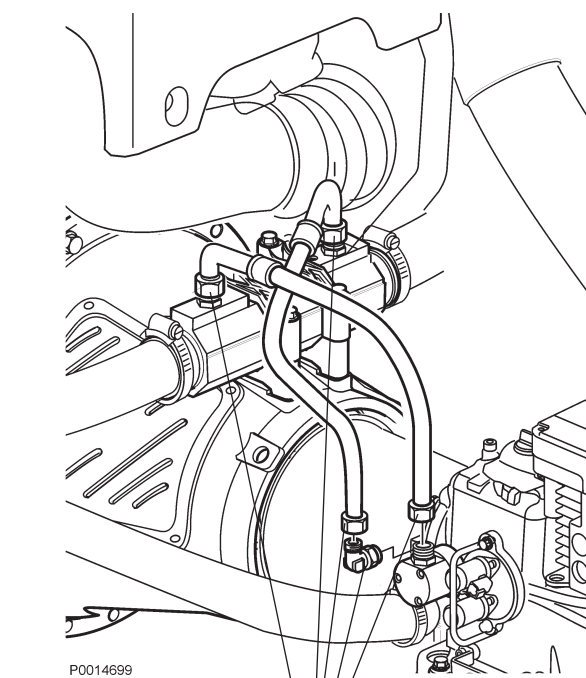
Tightening torque: 25±3Nm (18.4±2.2 lbf.ft)

Hose clamp tightening torque: 4 Nm (2.9 lbf.ft)

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15 Installing new oil hoses to drive unit and oil cooler

Demount the standard oil hoses from oil cooler and replace with new ones extended for jackshaft installations.

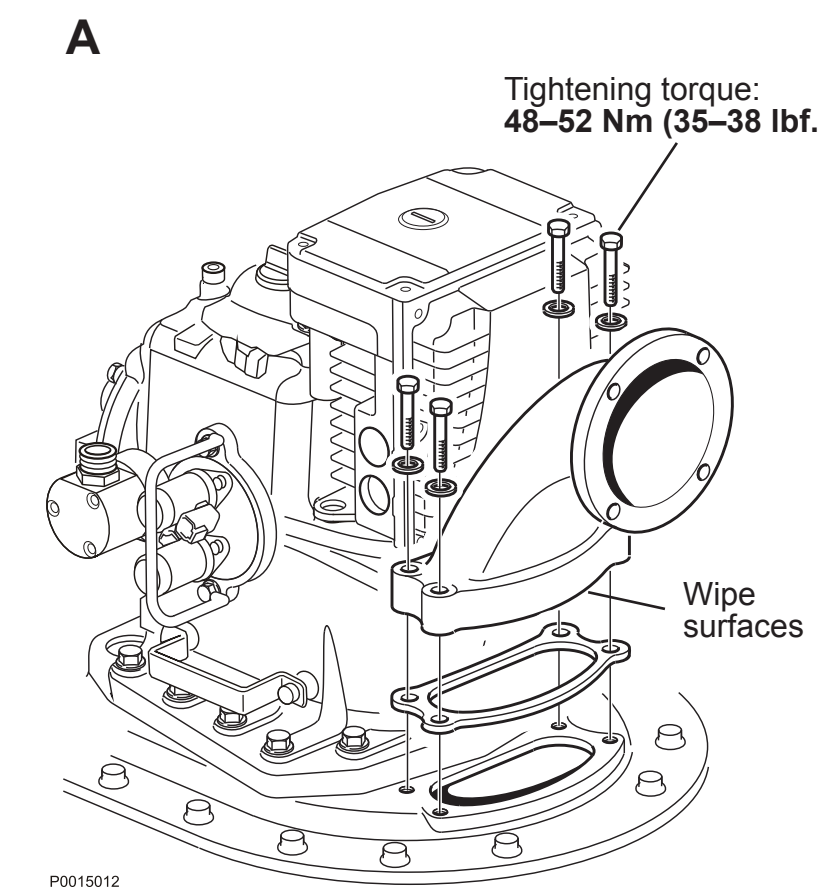


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Tightening torque: 80 Nm (59 lbf.ft)

NOTE! Check oil level before and after starting the engine. Top up if necessary. Use only Volvo Penta branded IPS transmission oil.

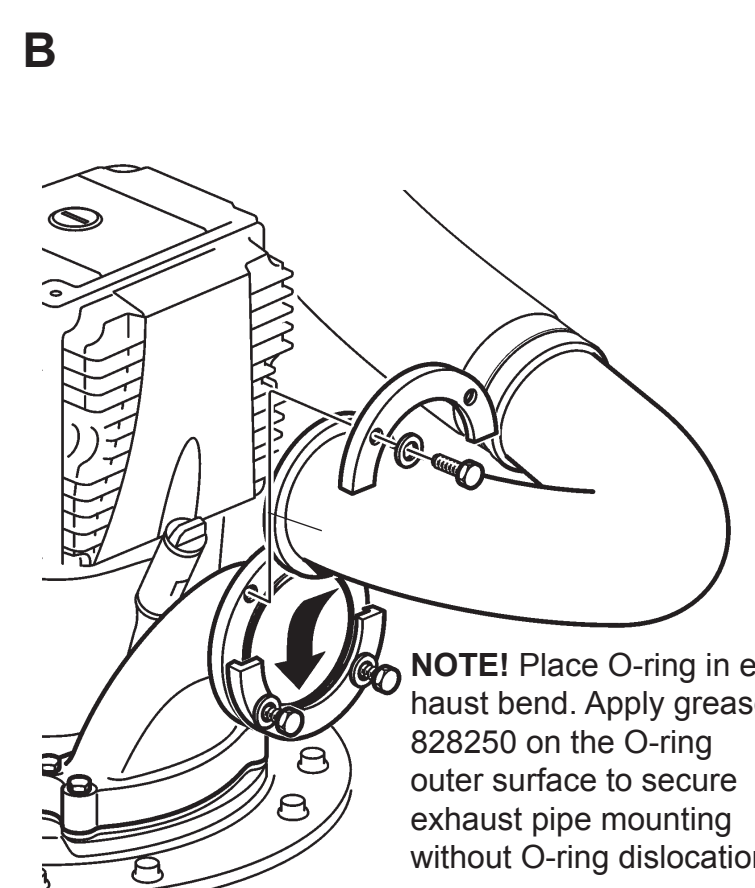
16 Installing the exhaust line and the water inlet and bypass hoses. Mounting the protective anode.



Tightening torque: 48-52 Nm (35-38 lbf.ft)

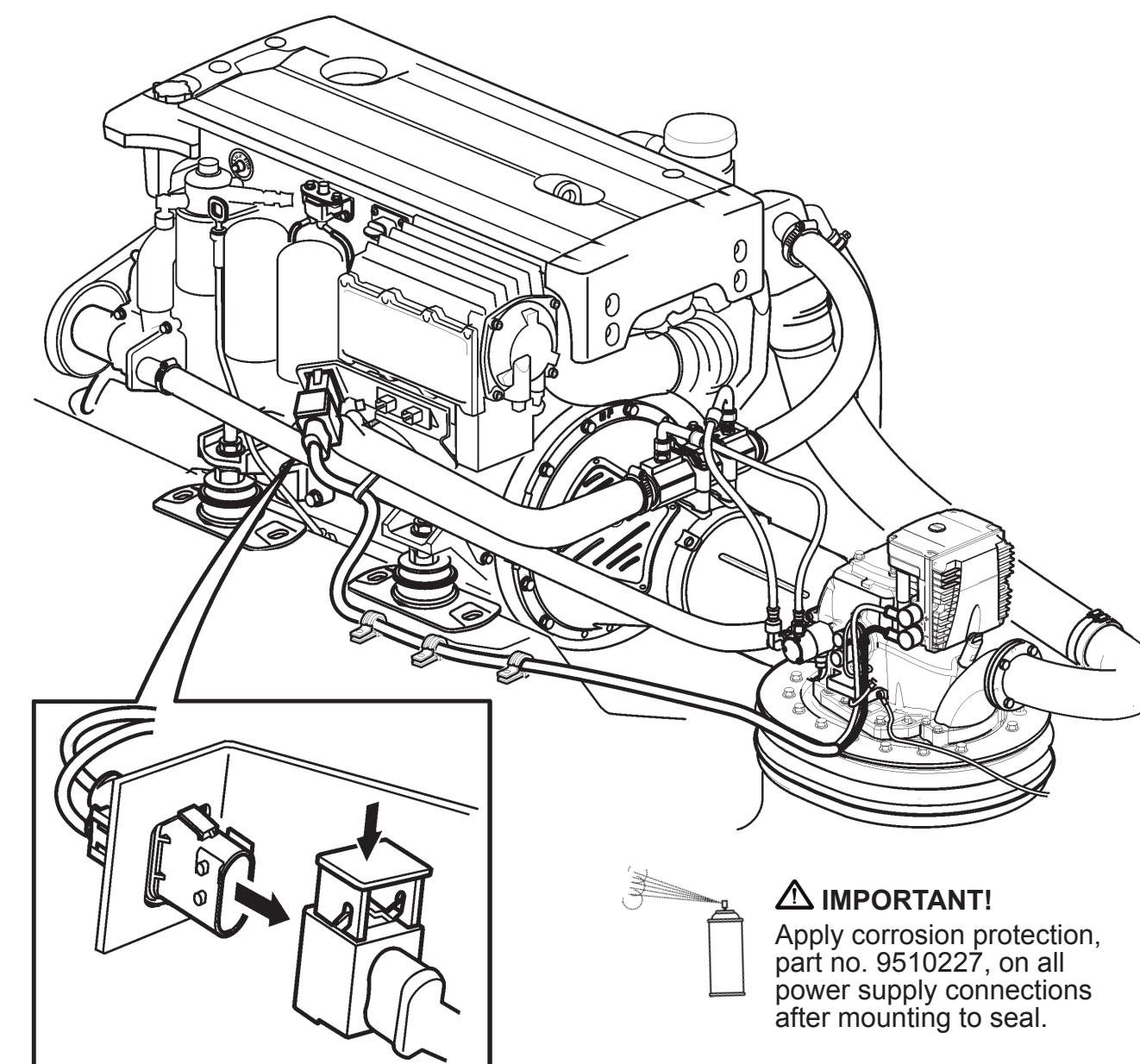
Wipe surfaces

P0015012



NOTE! Place O-ring in exhaust bend. Apply grease 828250 on the O-ring outer surface to secure exhaust pipe mounting without O-ring dislocation.

17 Power supply



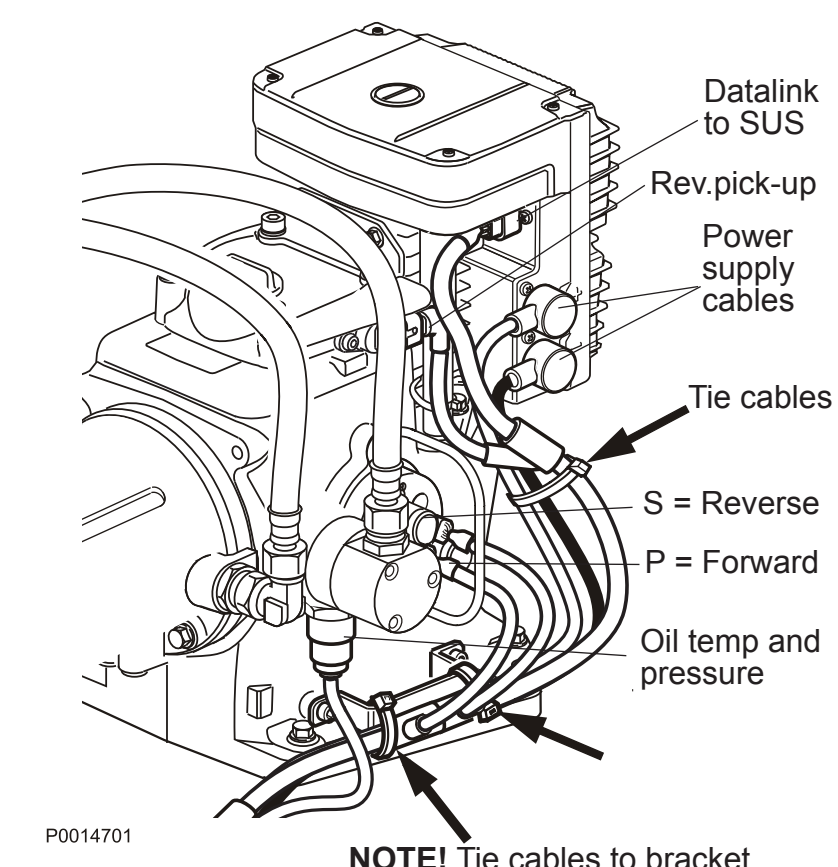
P0016380

IMPORTANT!
Apply corrosion protection, part no. 9510227, on all power supply connections after mounting to seal.

Connect power supply cables (+), (-)
Tightening torque: 10-14 Nm (7.4-10.3 lbf.ft)

Rubber hoods

IMPORTANT!
Apply corrosion protection, part no. 9510227, on all power supply connections after mounting to seal.

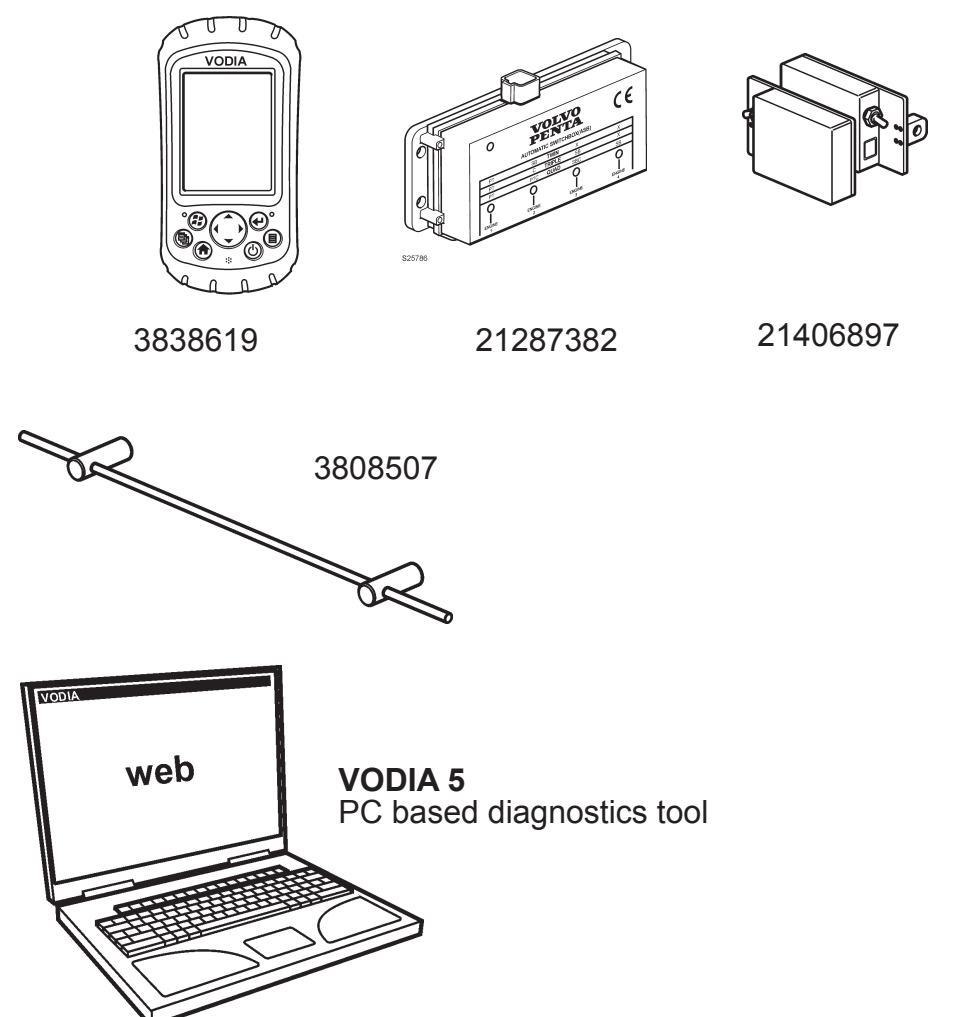


P0014701

NOTE! Tie cables to bracket.

18 Calibration

Calibrate the propulsion unit positions by using the parallel alignment tool, special tool 3808507 alt. the laser calibration tool, special tool 21406897, and the VODIA tool 3838619 or PC VODIA in combination with the switch box, special tool 21287382. Please refer to the Volvo Penta IPS installation manual.



3838619

21287382

21406897

3808507

VODIA 5
PC based diagnostics tool