Conversion to a Single Engine Control System

These instructions describe the conversion of a dual engine control system (external and internal control stations) to a single engine control system (external control station).

Required Tools

- 8 mm open-end wrench
- 10 mm open-end wrench
- PH2 Phillips screwdriver
- Hot-air gun for loosening the threadlocker
- Needle-nose pliers for the cotter pins
- Combination pliers for holding the push-pull cable while loosening the nuts
- Methylated spirits, isopropanol or brake cleaner for degreasing
- Medium-strength threadlocker (e.g. Loctite 243)

Required Components

- 2x brackets (Volvo Penta 872074)
- 4x metal washers (Volvo Penta 872076)
- 4x M5 screws (Volvo Penta 969439)
- 4x M5 flange nuts (Volvo Penta 949874)

Safety Before Starting

1. Switch off the engine and secure it against unintended starting.
2. Both control stations must be in the neutral position.
3. Ensure that neither the gearbox cable nor the throttle cable is under tension or preloaded by an engaged gear.
4. Before disconnecting the push-pull cables, photograph the existing installation arrangement.

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Preparatory Measures

Disconnect and label the push-pull cables at the engine / gearbox (inside / outside, throttle / gearbox). Then remove the brass end fittings and locknuts. Disconnect the push-pull cables leading to the inside control station from the control lever and remove them completely.

Clean the threads of the remaining push-pull cables and degrease them with a suitable cleaner (e.g. methylated spirits). Then refit the locknuts and screw them on as far as they will go.

Installing the Brackets for the Single Push-Pull Cables

First remove the differential control units.

Install the components specified by Volvo Penta in the following order, from the bottom (gearbox) / from the outside (throttle):

1. Washer
2. Push-pull cable
3. Bracket
4. Washer

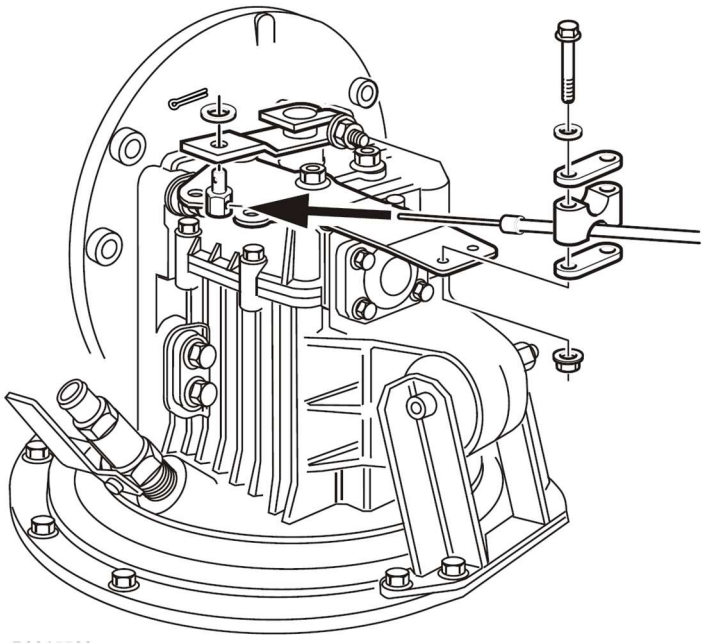

Figure 1 Installation of push-pull cables on the transmission (© Volvo Penta)

Insert the screws from above / from the outside and fit the nuts loosely on the opposite side. Use medium-strength threadlocker unless self-locking nuts are used.

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Installing the Push-Pull Cable End Fittings

Apply medium-strength threadlocker to the push-pull cable thread, route the cable through the bracket, tighten the bracket screws, and then fit the appropriate end fitting.

Adjusting the Gearbox Cable

1. The control lever must remain in the neutral position.
2. The push-pull cable must not be installed preloaded in either compression or tension.
3. The adjustment must be made so that the push-pull cable has the same operating travel in both directions.
4. At least one thread must protrude from the end fitting at every end of the push-pull cables. Check this at the control station as well.
5. Adjust the push-pull cable so that the gear lever on the gearbox is correctly positioned in neutral.
6. Refit the end fitting to the gearbox gear lever, insert the cotter pin, and bend both ends apart so that it cannot work loose.
7. Tighten all locknuts with the open-end wrench and check the clamps and locking devices.

Adjusting the Throttle Cable

1. The control lever must remain in the neutral position.
2. The push-pull cable must not be installed preloaded in either compression or tension.
3. At least one thread must protrude from the end fitting at the end of the push-pull cable at the control station.
4. Adjust the push-pull cable at the engine so that, at idle, there is a 3 mm clearance between the push-pull cable adjustment screw and the engine throttle lever. Ensure that sufficient travel is available to pull the engine throttle lever fully to the full throttle stop.
5. Tighten all locknuts with the open-end wrench and check the clamps and locking devices.

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Functional Test

First carry out the checks with the engine switched off. If the results are satisfactory, repeat the checks with the engine running.

Gearbox Operation

- Move from neutral to forward and then to reverse.
- Neutral must be clearly and reliably selectable.

Throttle Operation

- Move in both directions from idle to full throttle.
    - In neutral (red button or removable lever pressed in)
    - With the gears engaged
- There must be no stiffness or premature contact with an end stop.

Final Inspection

The work is only complete when:

- The control station shifts from neutral into forward and reverse.
- No push-pull cable is under tension.
- All fastenings are secured and tightened.
- The neutral position functions reliably.

Note:

If there are any deviations or stiffness, the yacht must not be put into operation without further inspection.

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