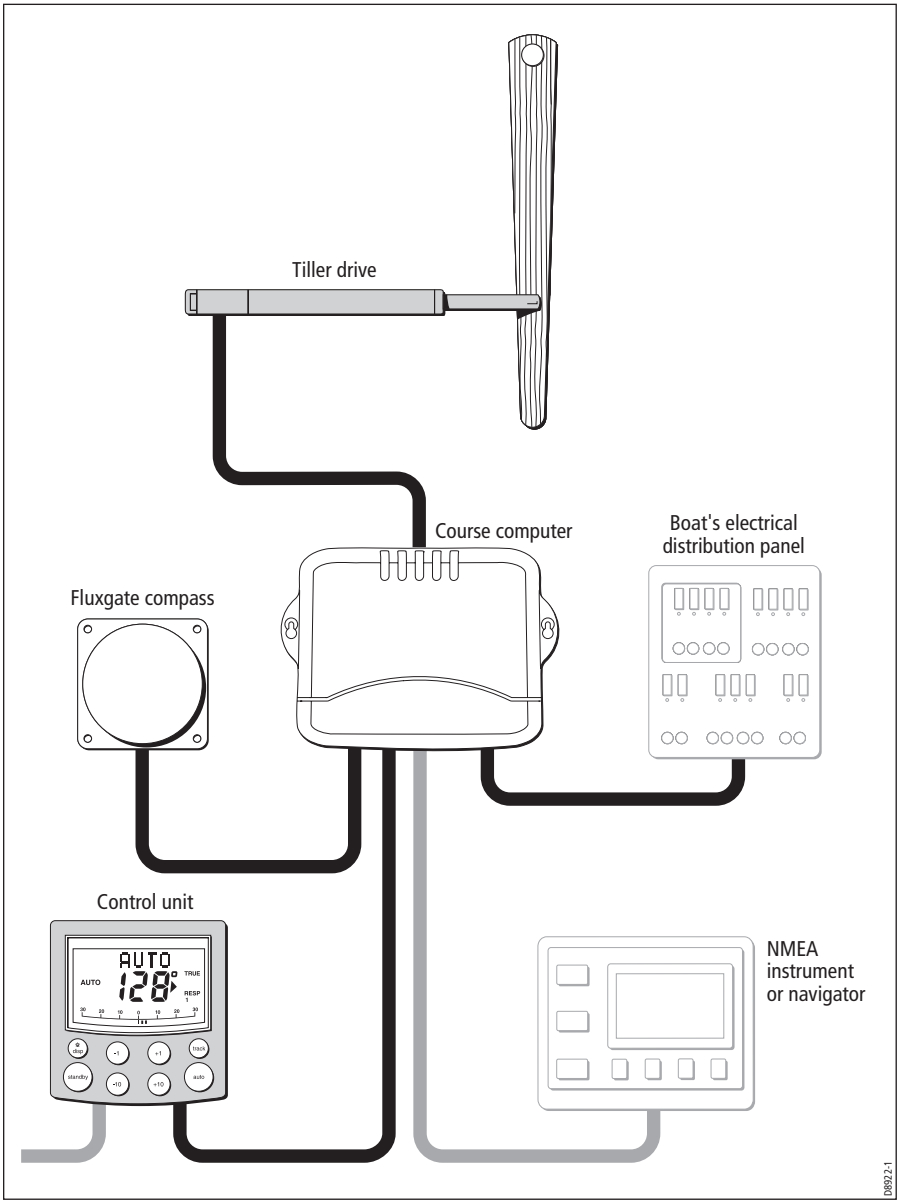
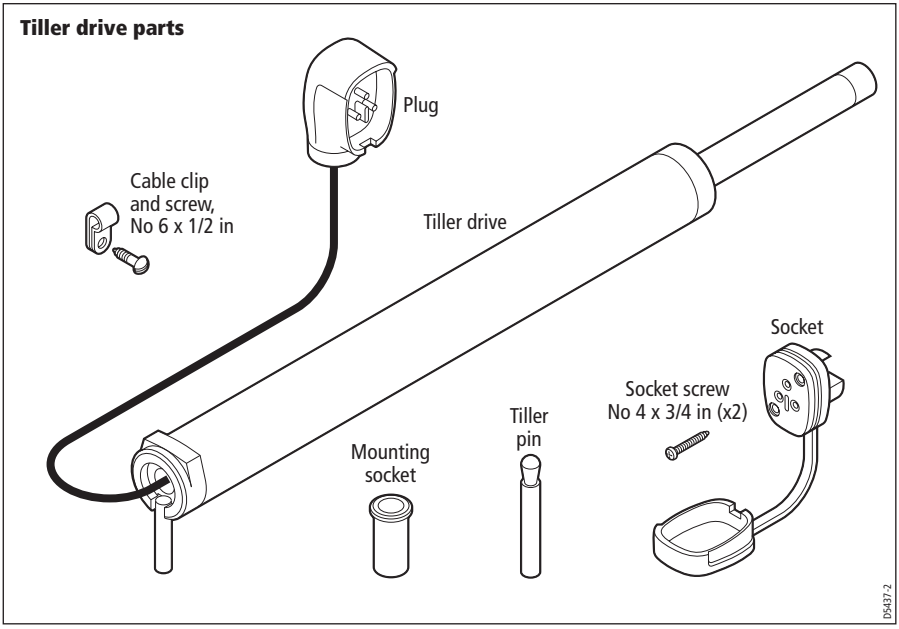
Tiller Drive
Installation Guide

Document number: 87061-2
Date: Oct 2006

System layout



Parts supplied



Tools required

1. Drill
2. 2.5 mm ($^{3}/_{32}$"), 6 mm(1/4"), 12.5 mm (1/2"), 18 mm ($^{23}/_{32}$") drill bits
3. Two-part epoxy (Araldite) adhesive
4. Cross-head/pozi-drive screwdriver
5. Slotted-head screwdriver

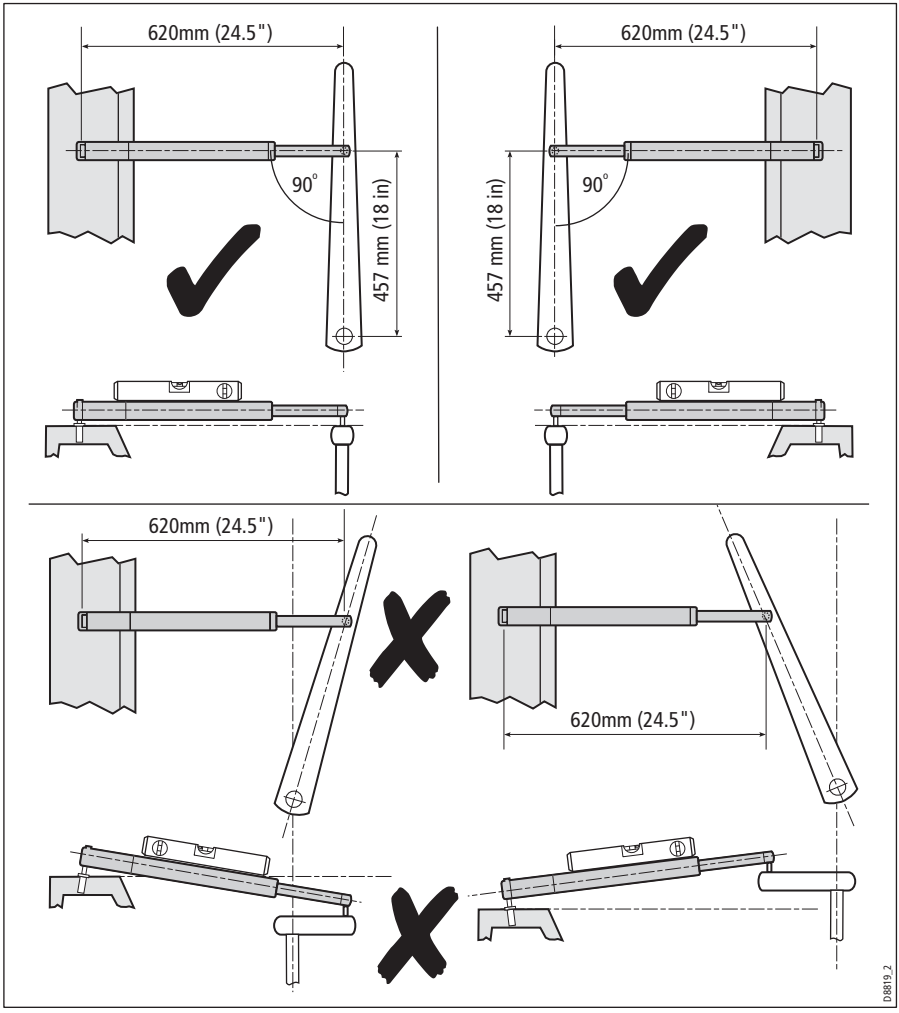
Contents

Standard installation

Mounting requirements

The standard tiller drive mounting arrangement is shown below.

Mount the drive horizontally. With the tiller centred, the drive axis must be at 90 degrees to the tiller axis. The standard actuation point on the tiller arm shall be 460 mm (18 ") from the tiller rotation axis; this distance may be reduced within limits detailed on page 11.



The installation can be adapted to suit a wide variety of configurations. See also:

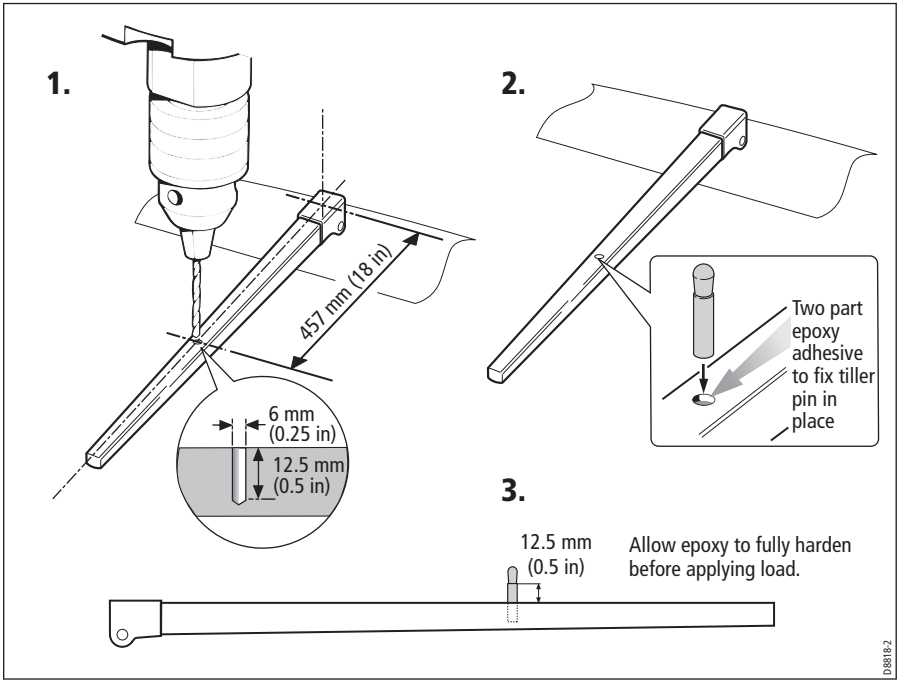
- *Drive unit position page 11*
- *Accessories page 13*

Installation procedure

This procedure can be followed when neither accessories or adaption of the drive unit position are required.

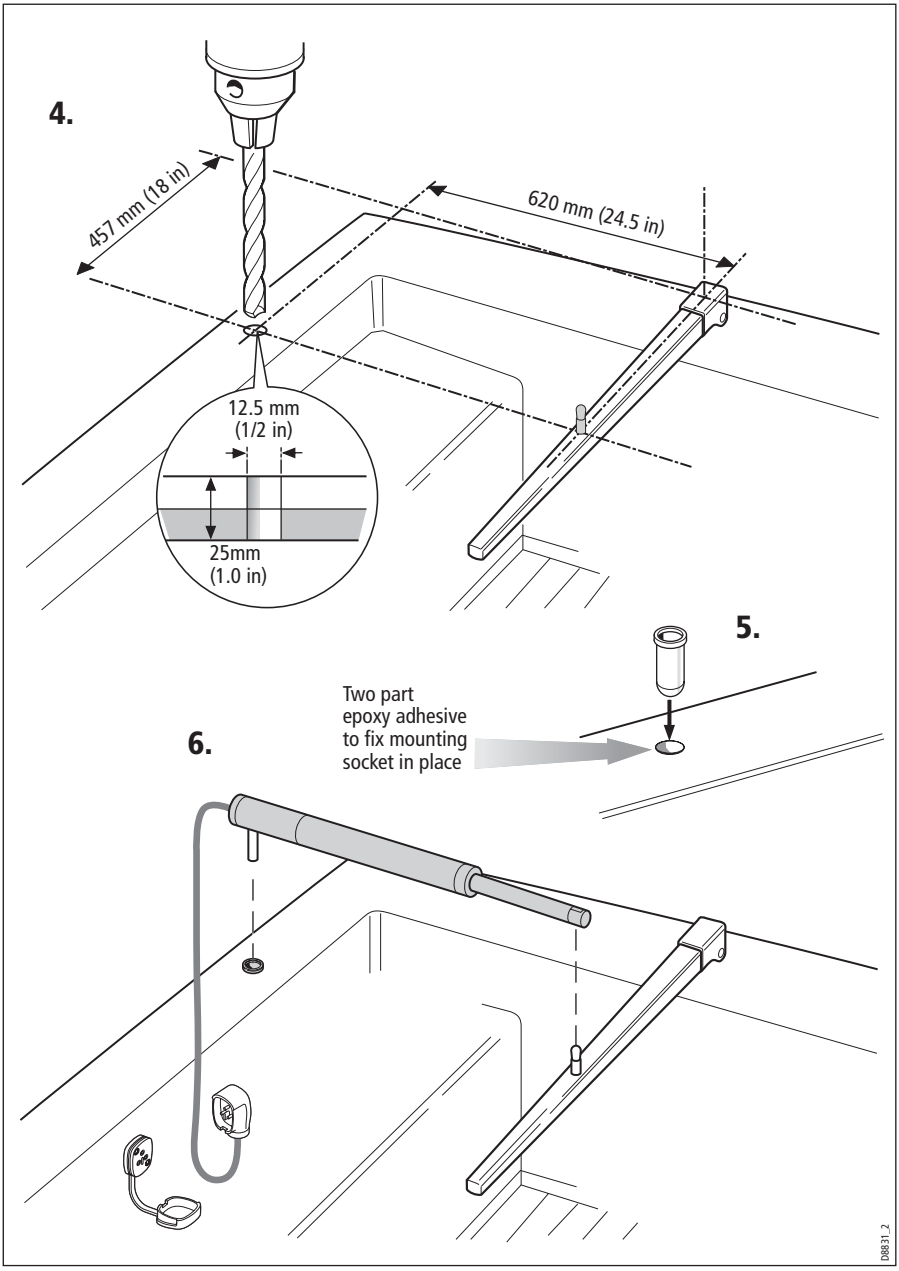
Install the tiller drives as follows:

1. Securely clamp the tiller, mark the pin position and drill the 6 mm (1/4") hole.
2. Fix the pin in position using a two-part epoxy adhesive.
3. Check the shoulder height of the pin.



4. Mark the socket position and drill a 6 mm (1/4") pilot hole to confirm the thickness of the structure. If less than 25 mm, reinforce with plywood and bond into position. Once cured open up the hole diameter to 12.5 mm (1/2").
5. Fix the socket in position using a two-part epoxy adhesive.

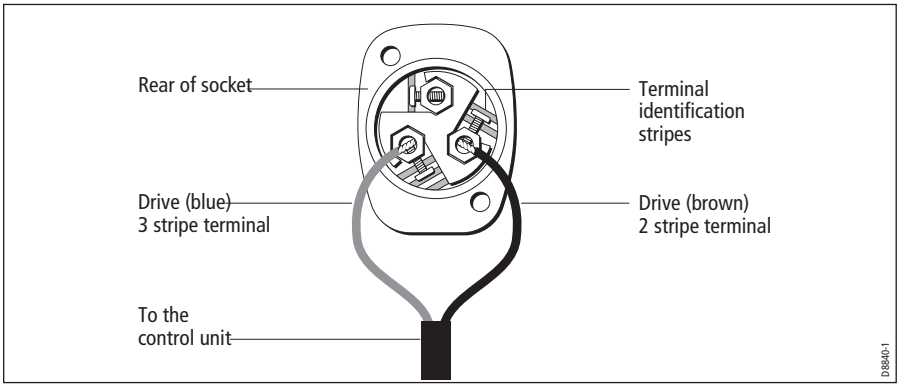
6. Once the epoxy has fully hardened, fit the tiller drive.

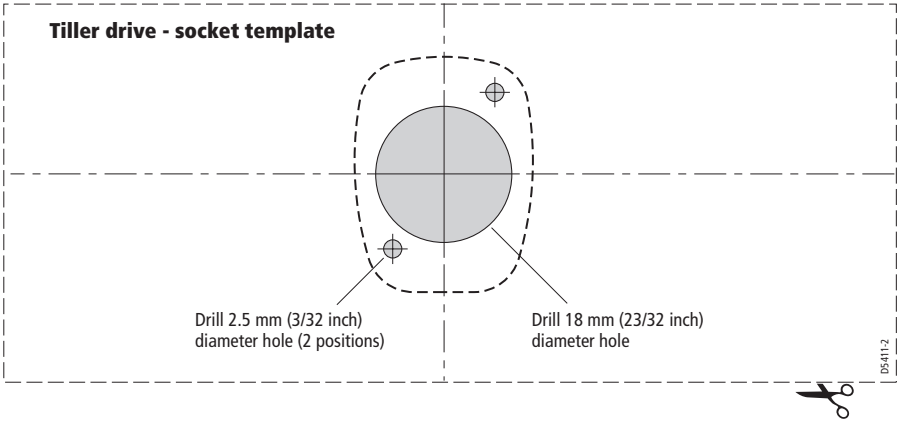


Installing the socket

1. Cut-out and tape the template to the bulkhead in the required position.
2. Drill a 18 mm ($^{23}/_{32}$") clearance hole and two 2.5 mm ($^{3}/_{32}$") pilot holes.
3. Lift off the template remove burrs or sharp edges.
4. Pass the cable through the bulkhead and attach to the socket, making sure you connect each core to the correct pin.

Attach the socket to the bulkhead using the two self-tapping screws. Use cable clamps to secure the drive cable at regular intervals.





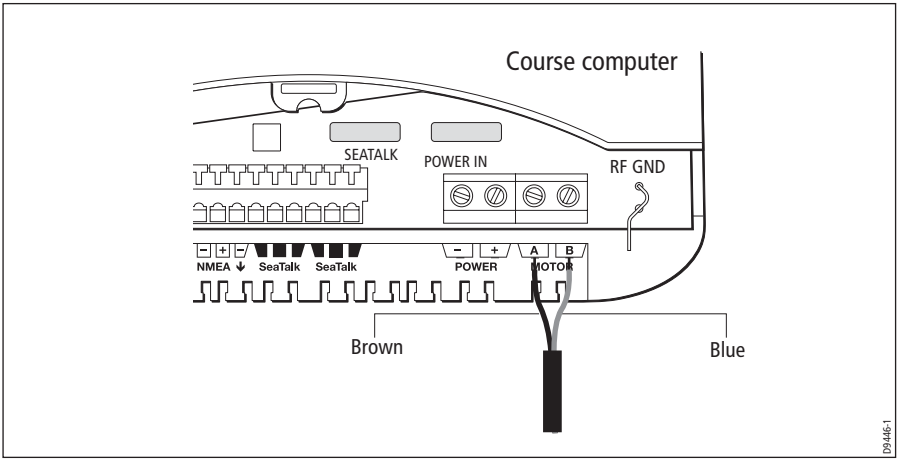
Connecting to the course computer

The tiller drive is supplied with a cord and plug. To connect the drive and course computer, the supplied socket should be installed and a cable routed from the socket to the course computer.

1. Measure the required length of cable and select the correct gauge using the following table:

Cable length	Copper area	AWG
Up to 2.5 m (8 ft)	1.0 mm^2	18
Up to 4.0 m (13 ft)	1.5 mm^2	16
Up to 6.0 m (22 ft)	2.5 mm^2	14

2. Route the cable from the socket to the course computer.



Adapting the installation

Drive unit position

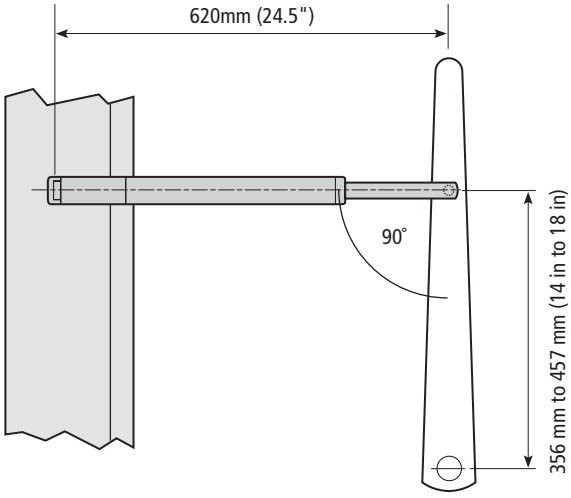
The tiller pin and drive pedestal can be mounted between 356 mm and 457 mm (14" - 18") from the centre of the rudder stock. 457 mm (18") is the standard distance for use on vessels up to:

- 6 tonnes fully laden displacement for the standard tiller drive unit.
- 7.5 tonnes fully laden displacement for the GP tiller drive unit.

Note: *Typically laden displacement is up to 20% greater than manufacturers' displacement figures.*

For lighter displacement vessels requiring faster turn rates it is possible to install the tiller pin and drive pedestal closer to the rudder stock, to a minimum of 356 mm (14").

Tiller Drive Unit Position Range



The following table can be used to calculate the required position.

Drive pin distance from rudder stock	Max degrees of helm (with pilot engaged)	Rate of helm change	Force at rudder
457 mm (18") standard distance	31°	8 °per second	84 kgf
432 mm (17")	33°	8 °per second	79 kgf
406 mm (16")	35°	9 °per second	75 kgf
381 mm (15")	37°	9 °per second	70 kgf
356 mm (14")	39°	10 °per second	65 kgf

Accessories

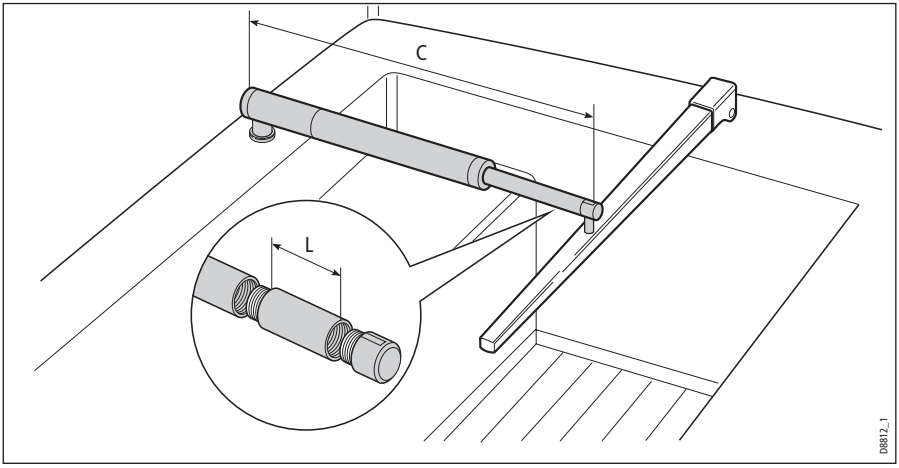
The following accessories may be used to adapt the tiller drive mounting to suit different installation requirements.

Part Number	Description
D003	Pushrod Extension 25 mm (1")
D004	Pushrod Extension 51 mm (2")
D005	Pushrod Extension 76 mm (3")
D006	Pushrod Extension 102 mm (4")
D007	Pushrod Extension 127 mm (5")
D009	Tiller Bracket 25 mm (1")
D010	Tiller Bracket 51 mm (2")
D011	Tiller Bracket 76 mm (3")
D159	Tiller Bracket 102 mm (4")
D160	Tiller Bracket 127 mm (5")
D031	Cantilever Socket
D026	Pedestal Socket 38 mm (1.5")
D027	Pedestal Socket 51 mm (2")
D028	Pedestal Socket 64 mm (2.5")
D029	Pedestal Socket 76 mm (3")
D030	Pedestal Socket 89 mm (3.5")
D002	Mounting Socket (package of 5)
D014	Small Thread Tiller Pin (package of 5)
D001	Tiller Pin (package of 5)
D014	Small threaded tiller pin 25 mm (1")
D020	Extra length tiller pin 71 mm (2.8")
D021	Extra length threaded tiller pin 71 mm (2.8")

Pushrod extension

Use a pushrod extension if dimension C is greater than 620 mm (24.5").

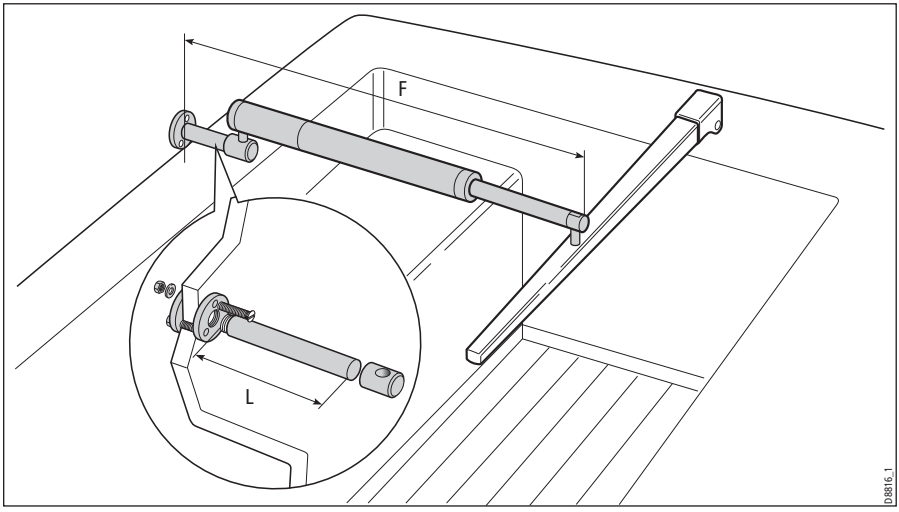
1. Select a pushrod extension with a length L nearest to C - 620 mm (24.5")
2. Unscrew the pushrod end cap
3. Screw on the pushrod extension
4. Screw the pushrod end cap onto the pushrod extension.



Pushrod mounting

Cantilever socket

Use the cantilever socket if you need to attach the tiller drive to a vertical face (such as the cockpit sidewall).

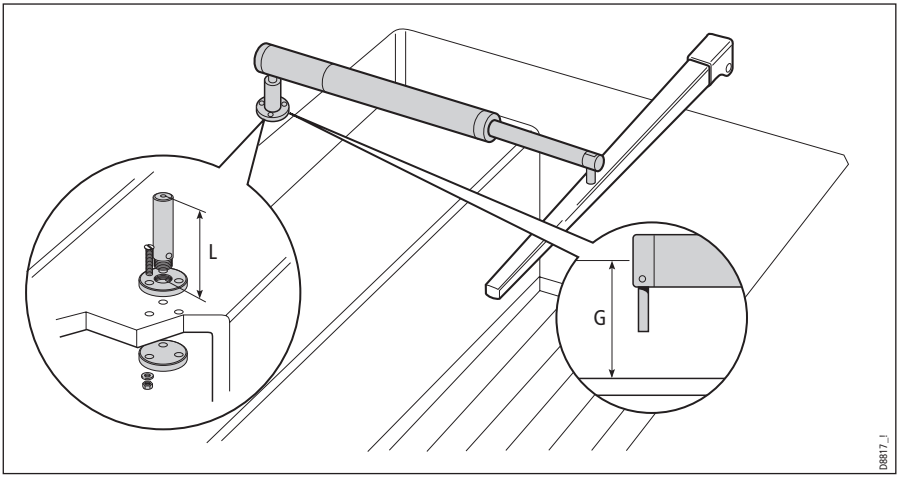


1. Use a hacksaw to cut the rod to length L = F - 635 mm (25").
2. Assemble the mounting ring, rod and socket.
3. With the drive horizontal mark the location of the mounting ring and its holes.
4. Drill three 6 mm (1/4") diameter clearance holes at the marked positions.
5. Apply a thin coat of silicone sealant to the base of the mounting ring.
6. Use three 6 mm (1/4") diameter bolts, nuts and washers to attach the mounting ring and backing plate
7. Roughen the end of the rod and inside of the socket to provide a key. Then apply two-part epoxy adhesive to the rod end and cap.
8. Place the cap over the rod end, making sure the hole faces upwards. Allow the adhesive to harden fully before applying a load.

Note: *Note: When the autopilot is not in use, you can unscrew the complete rod assembly to leave the cockpit unobstructed*

Pedestal socket

Use the pedestal socket if you need to raise the height of the socket to keep the tiller drive horizontal.

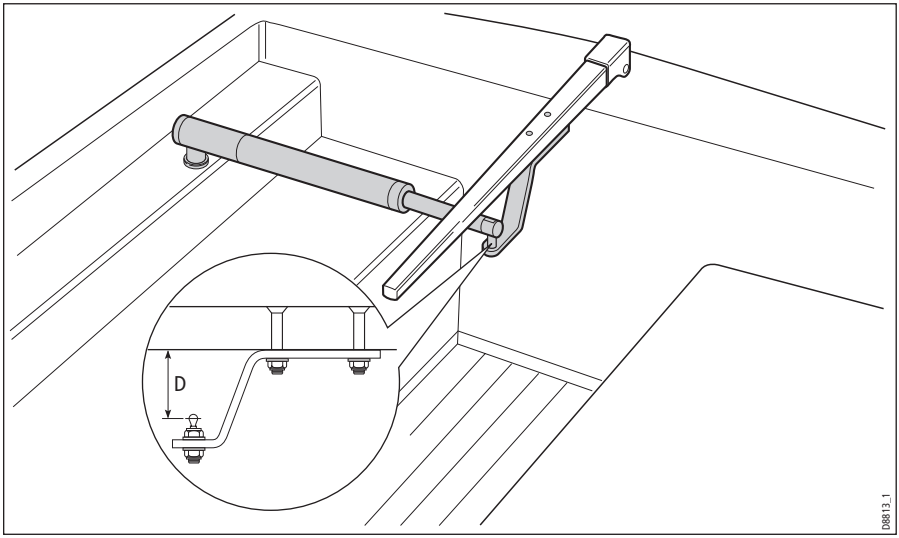


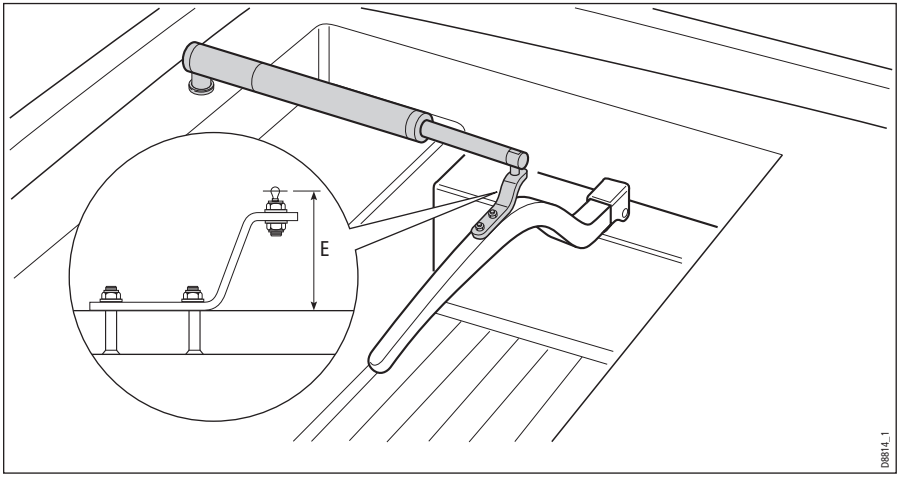
1. Select a socket assembly with a length L, nearest to G -38 mm (1.5").
2. With the drive assembled, and the socket positioned 460 mm (24.5") from the tiller axis mark the location of the mounting ring and holes.
3. Drill three 6 mm (1/4") diameter clearance holes at the marked positions.
4. Apply a thin coat of silicone sealant to the base of the mounting ring.
5. Use three 6 mm (1/4") diameter bolts, nuts and washers to attach the mounting ring and backing plate

Note: *Note: When the autopilot is not in use, you can unscrew the complete rod assembly to leave the cockpit unobstructed*

Tiller brackets

If the tiller is higher or lower than the mounting socket, you can use a tiller bracket to vary the tiller pin height so the drive is horizontal.





1. If the drive is below the tiller; bracket size equals dimension D. If the drive is above the tiller; bracket size equals dimension E - 25 mm (1 ").

2. Place the tiller bracket on the center line of the tiller (above or below) and establish the correct position.
3. Mark the centers of the bracket mounting holes.
4. Drill two 6 mm (1/4") diameter clearance holes through the center line of the tiller at the positions marked.
5. Attach the tiller bracket using two 6 mm (1/4") diameter bolts, nuts and washers.
6. Fix the bolts in position using two-part epoxy adhesive.
7. When the epoxy is completely hardened, fully tighten the nuts.