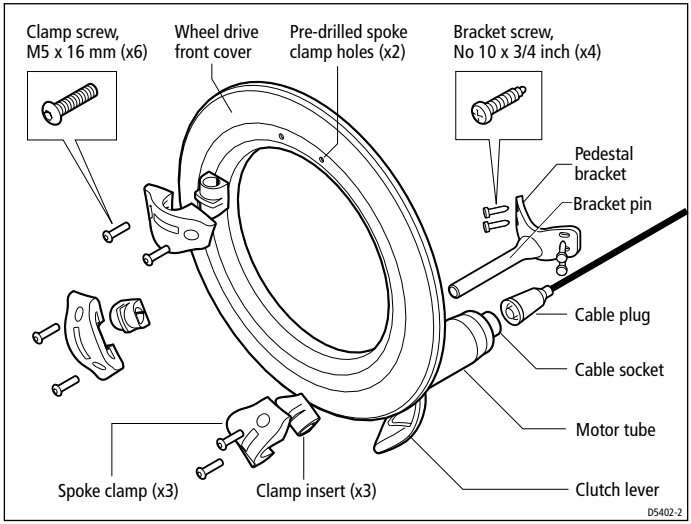
5.5 Wheel drive (wheel pilots only)

The Raymarine wheel drive will fit 3, 4, 5, 6, 7 or 8 spoke wheels. It is designed to operate with steering systems with between 1 to 3.5 turns lock to lock.



Wheel drive – main parts (see *page 104* for dimensions)

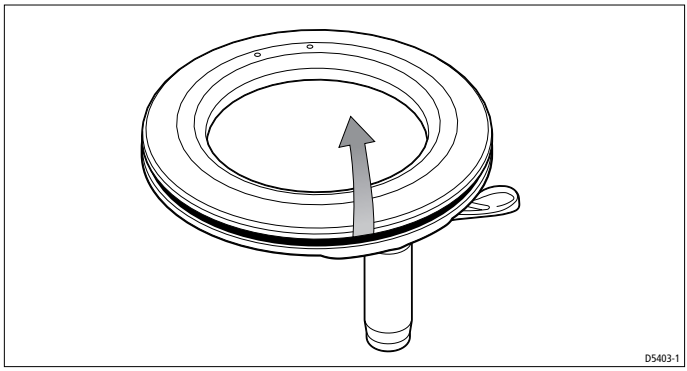
Installation stages

Installing the wheel drive involves four stages:

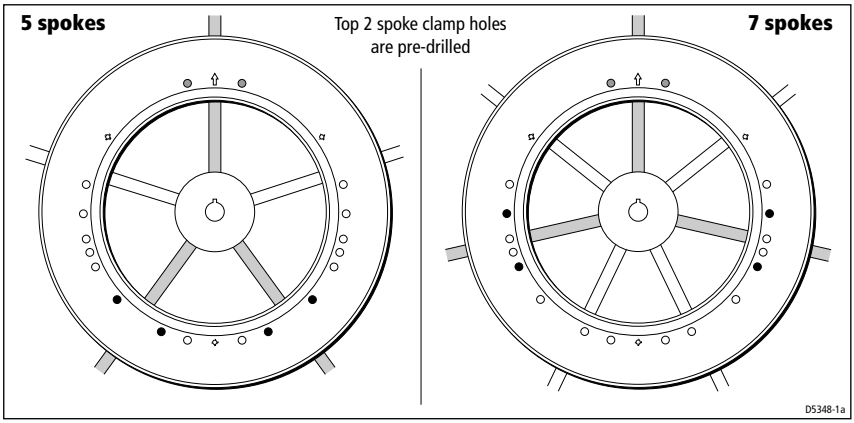
1. Drilling the spoke clamp holes in the front cover.
2. Securing the wheel drive to the wheel.
3. Attaching the pedestal bracket.
4. Connecting the drive to the control unit.

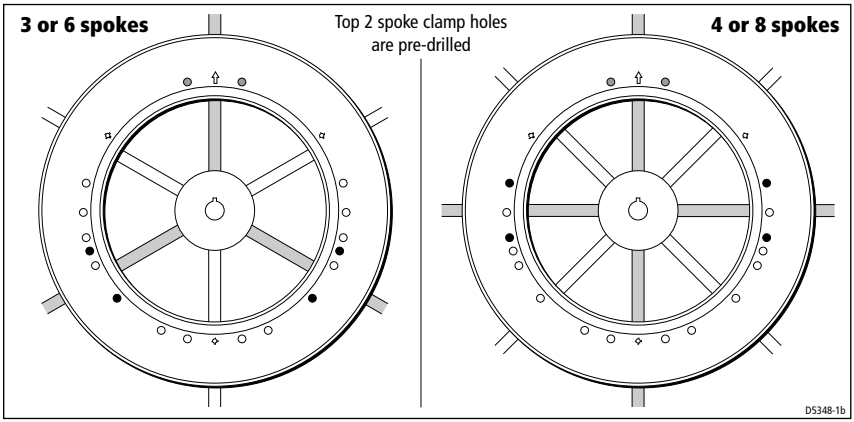
Drilling the spoke clamp holes

1. Remove the wheel drive front cover:
   - the front cover is held onto the wheel drive by three 'push-fit' posts which sit in three sockets on the drive ring
   - to remove the cover, hold the motor in one hand and use your other hand to pull the cover up and away from the drive unit (as shown below)



2. Identify the appropriate spoke clamp holes for your wheel. With the arrow at the top, refer to the following diagrams:
   - the holes are numbered inside the cover (e.g. if you have a 5 spoke wheel, you need to drill the 4 locations marked with '**5**')
   - mark the appropriate spoke clamp holes and check them by holding the cover against your wheel

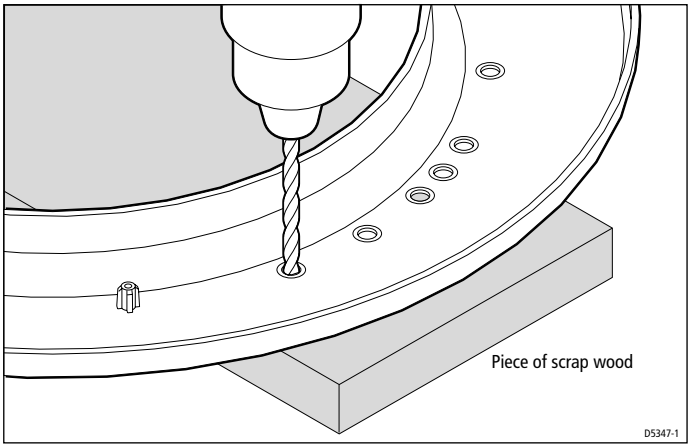




Note: *The wheel drive is designed to work with 3 spoke clamps on 4 or 8 spoke wheels. For cosmetic reasons, however, you may want to fit an extra spoke clamp to the fourth spoke. Raymarine dealers can supply an extra spoke clamp (part number A18089).*

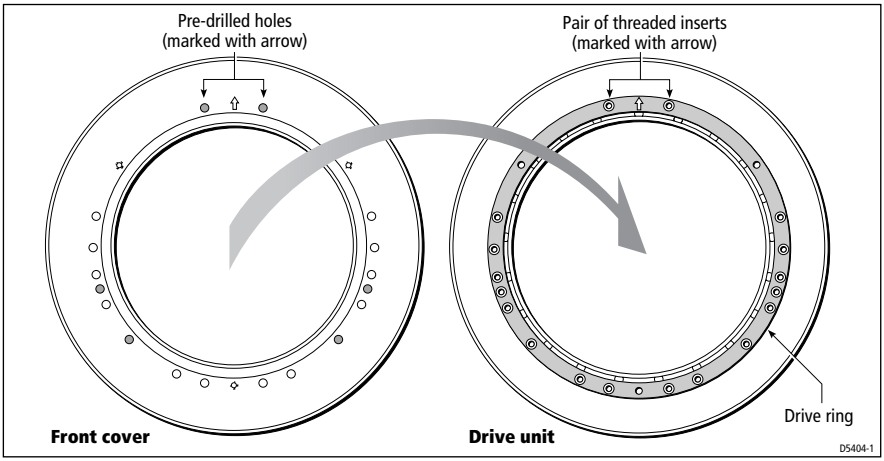
3. Drill the appropriate spoke clamp holes using the larger of the supplied drill bits (6.0 mm or $^1/_4$ in):
   - drill from the inside, placing a piece of scrap wood under the cover to produce a clean exit hole
   - you will need to drill 4 new holes so the cover has 6 holes in total (2 for each spoke clamp)

Note: *The spoke clamps will cover these exit holes, so they will not be visible when the wheel drive is installed.*



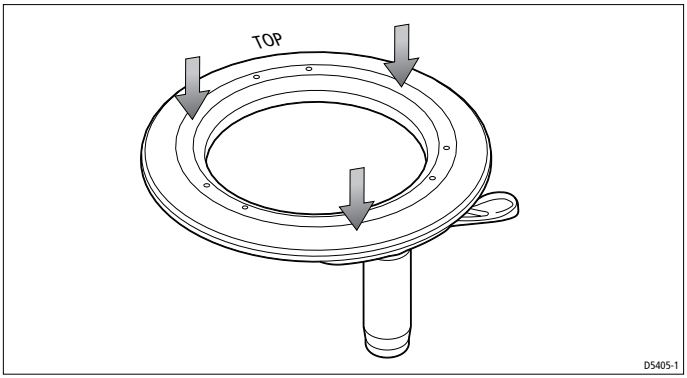
4. Align the cover with the wheel drive:
   - the two pre-drilled holes (marked with an arrow) must line up with their matching pair of threaded inserts on the drive ring (also marked with an arrow)
   - make sure that the other spoke clamp holes align with their threaded inserts

Note: *The cover will only fit back onto the wheel drive when you have aligned the two parts correctly.*



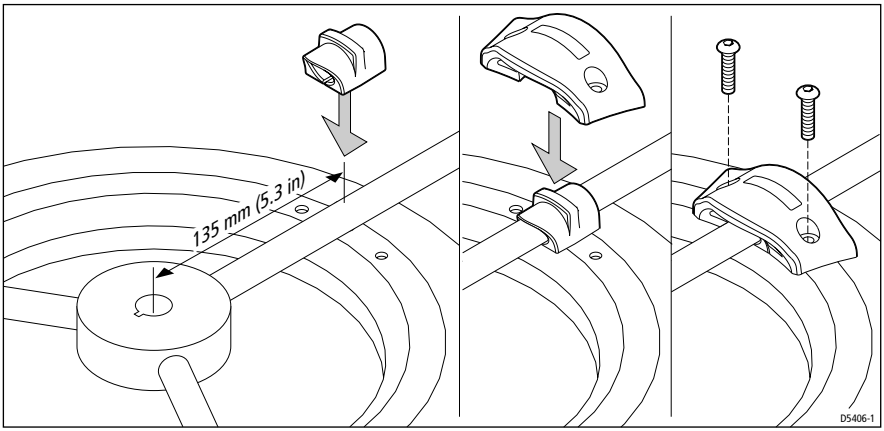
5. Fit the cover back onto the wheel drive:
   - press the cover in the three places shown on the diagram below to push each of the posts back into its locating socket

Note: *This step is easier with the clutch engaged.*



Securing the wheel drive to the wheel

1. Remove the wheel from the pedestal and place it on top of the drive unit, with the front of the wheel and drive both facing up.
2. Using the wheel drive template at the end of this book, select the correct set of spoke clamp inserts for your wheel:
   - measure the spoke diameter at a distance of about 135 mm (5.3 in) from the center of the wheel
   - select the appropriate set of inserts: the wheel drive is supplied with 2 sets of 3 inserts suitable for 12 mm ($^1/_2$ in) and 16 mm ($^5/_8$ in) diameter spokes – each insert is marked with its size
3. Fit the first spoke clamp:
   - lubricate the spoke with washing-up liquid – so you can slide the spoke clamp along the spoke to adjust its position
   - place the insert on the spoke about 135 mm (5.3 in) from the wheel center – this distance is not critical as the wheel drive will self-center as you fit all 3 spoke clamps
   - place the spoke clamp onto the insert, making sure that you have correctly located the clamp insert in the clamp
   - locate 2 of the clamp screws (M5 x 16 mm allen-head screws)
   - **lightly** tighten the screws using the 3 mm allen key (supplied)



4. Repeat step 3 to fit the other 2 spoke clamps. As you fit each one, adjust the position of the wheel relative to the wheel drive so the holes in the clamp line up with the holes in the cover. **As you do this, the wheel drive will self-center on the wheel.**
5. After fitting all 3 spoke clamps, **fully tighten** the screws.

Attaching the pedestal bracket

Note: *If your wheel is bulkhead or box pedestal mounted, you will need to obtain a bulkhead fitting kit (part number E15017) from your Raymarine dealer. Fitting instructions are supplied with the kit.*

Motor tube location

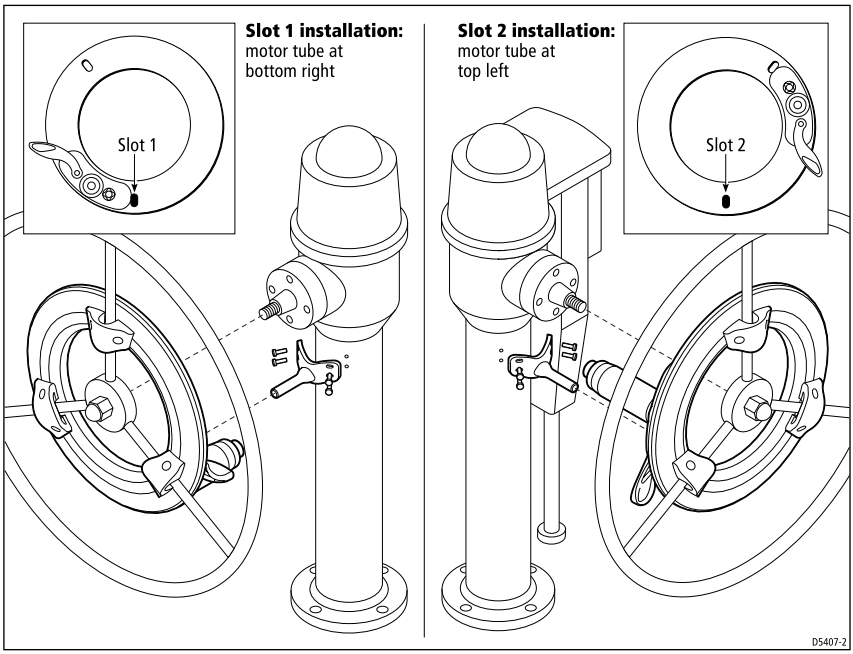
Depending on the design of your pedestal and any surrounding obstructions, you can mount the wheel drive in one of two ways:

- **Slot 1 installation**: the standard position uses slot 1 on the back of the wheel drive (the slot closest to the motor tube) so the motor tube is at the bottom to the right of the pedestal
- **Slot 2 installation**: the alternative installation uses slot 2 to position the motor tube at the top to the left of the pedestal

Select the appropriate slot so the motor tube is clear of obstructions.

CAUTION:

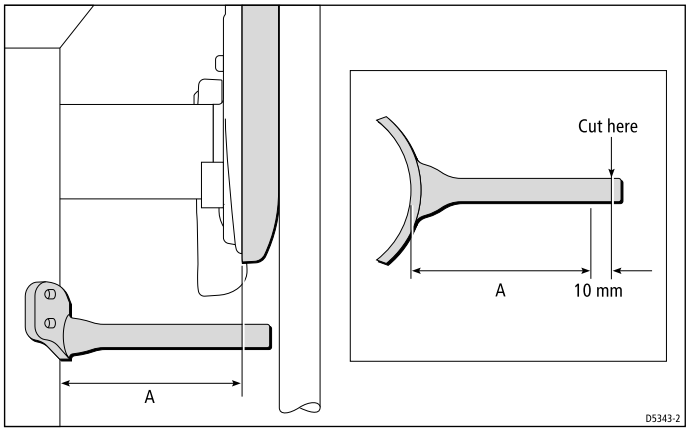
If you use slot 2 and you have a pedestal-mounted compass, the drive motor may affect compass readings.



Pedestal bracket – length and position

Note: *If you are replacing an existing 4000 wheel drive, you need to: remove the old pedestal bracket, cut the new bracket pin to the correct length (see steps 2 and 3 below), then secure it in the standard orientation using the existing pedestal holes.*

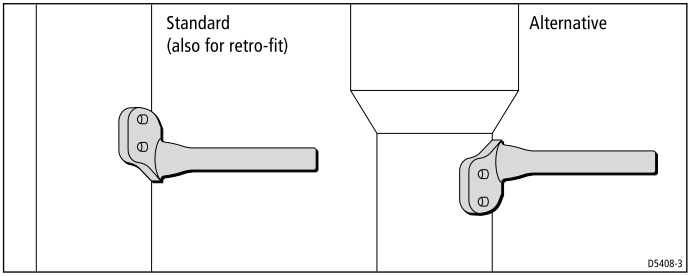
1. Fit the wheel onto the pedestal, tighten the wheel nut to hold the wheel in place, and engage the wheel drive's clutch:
   - if possible, lock the wheel in position with the appropriate slot centered at the bottom of the wheel
   - otherwise, you will find it useful to have an assistant to hold the wheel in position so you can locate the bracket correctly
2. Measure dimension A – the distance between the front of the pedestal and the rear edge of the drive's front cover (see diagram):
   - you may find it easiest to hold the bracket below the wheel drive and mark dimension A directly on the pin



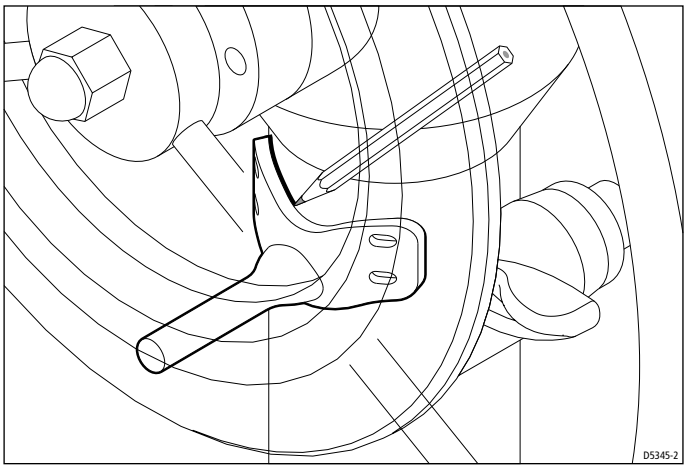
Note: *If the wheel is bent or not running true, dimension A will change with the wheel position. Measure the* ***smallest*** *distance.*

3. Use a hacksaw to cut the pin **10 mm (0.4 in) LONGER** than dimension A. Remove any sharp edges at the cut end with sandpaper or a file.
4. Place the pin end in slot 1 or 2 (as required):
   - to do this you may need to loosen the wheel nut so you can slide the wheel forward slightly, place the pin end in the slot, return the wheel to its normal position and re-tighten the wheel nut

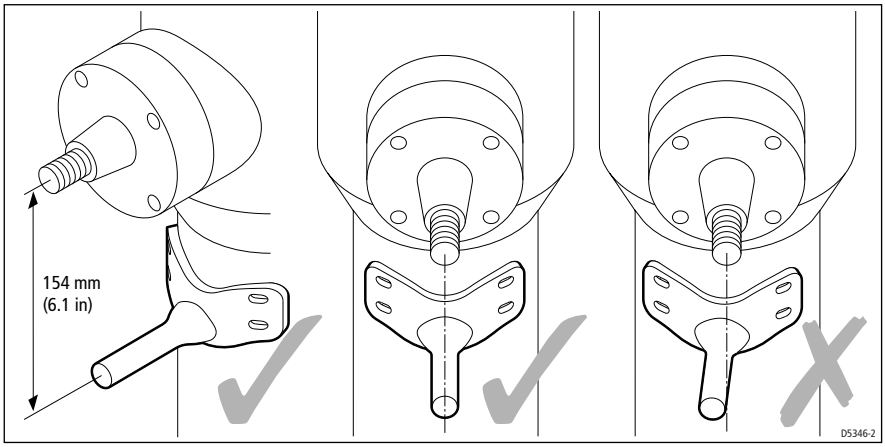
Note: *You can install the pedestal bracket either way up. In the standard orientation the pin is at the bottom (below the mounting holes – see diagram). If obstructions on the pedestal prevent you from using the standard orientation, you can install the bracket so the pin is at the top (above the mounting holes).*



5. Making sure the slot is central at the bottom of the drive unit (6 o'clock position) and the pin is in the **middle** of the slot, carefully draw around the bracket.

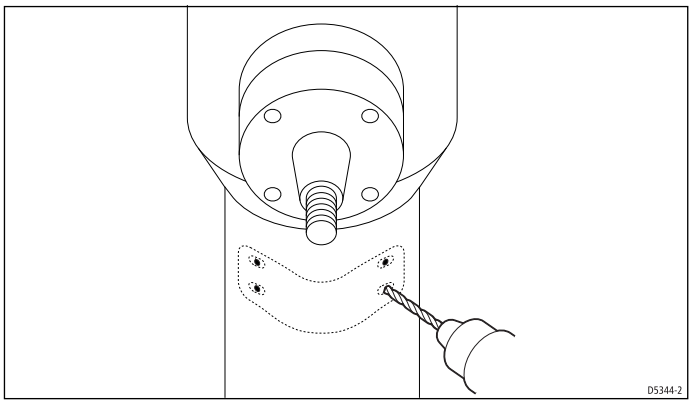


6. Remove the wheel, then hold the bracket on the pedestal in the location you have marked.
7. Check the position and alignment of the pedestal bracket:
   - the bracket pin should be 154 mm (6.1 in) below the pedestal spindle (see the following diagram)
   - the bracket pin should be aligned so it is directly below the pedestal spindle (see the following diagram)



8. When the pedestal bracket is correctly positioned and aligned, mark around the inside of the slots, then remove the bracket.
9. Use a center-punch to mark the center of each slot, then use the smaller supplied drill bit to drill a 4.0 mm ($^5/_{32}$ in) diameter hole.

Note: *Drill at right angles to the pedestal surface.*



10. Hold the bracket in place then **lightly** tighten the four cross-head screws (No 10 x $^3/_4$ in). As you do this, make sure the bracket is correctly aligned.
11. Replace the wheel, making sure that you locate the pin in the correct slot (slot 1 or slot 2).
12. Turn the wheel with the clutch off to check that the bracket is correctly positioned and aligned.

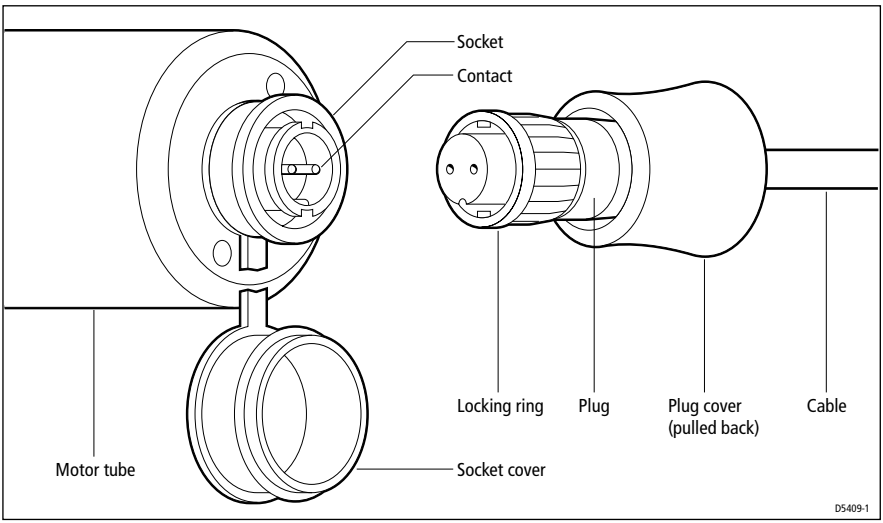
Note: *If the wheel is bent or the wheel drive is off center, the pin will move up and down in the back plate slot. As long as the pin does not hit the top or bottom of the slot, this pin movement will not affect the drive unit's performance.*

13. When you have checked alignment, **fully** tighten all four screws.

Connecting to the control unit

When you have attached the pedestal bracket, you need to connect the wheel drive to the control unit. The drive unit is supplied with 4.5 m (15 ft) of 2-core cable with a waterproof socket at one end.

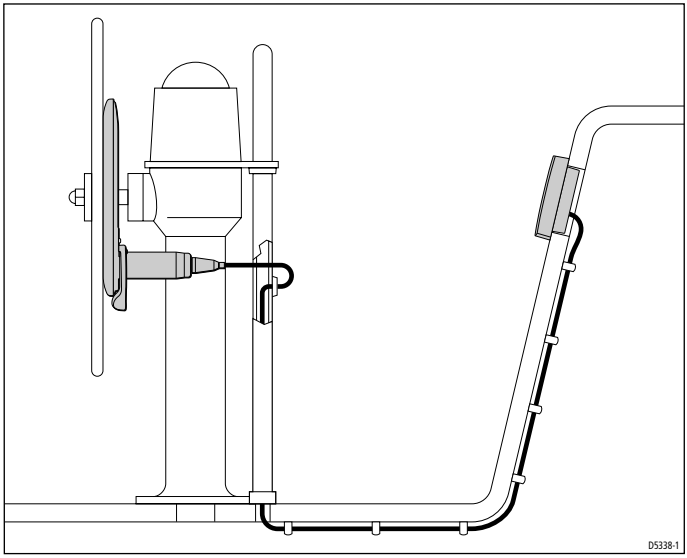
1. Connect the socket to the plug on the wheel drive's motor tube:
   - remove the socket cover
   - pull back the plug cover
   - align the locking ring, plug and socket as shown below



   - push the plug firmly into the socket
   - turn the locking ring 90° clockwise
   - make the connection waterproof by pulling the plug cover across so it protects the plug and socket

Note: *To remove the plug, pull back the cover and turn the locking ring 90° anti-clockwise. If you disconnect the socket for any reason, always use the attached rubber cover to protect the socket.*

2. Route the cable through the pedestal (or guard rail) and back to the control unit:
   - if the pedestal has a cable duct, use this for the drive cable to make sure that it cannot foul the steering mechanism



3. Run the drive cable back to the control unit and connect the two cores to the **Drive** terminals as shown.