

5. Cobra Geometry

5.1 Before commencing to fit the tiller arm it is important to understand about the offset angles used with the Cobra system. The Cobra system uses a principal known as 'wide angle geometry' which gives very direct steering near midships and an increasing mechanical advantage as the rudder approaches full travel. This results in the most direct, positive system available to a helmsman — a tiller cannot provide this variable ratio!

To accomplish this effect the pedestal output lever is shorter than the tiller lever in a ratio of 1.52:1. At midships therefore the tiller arm and output lever are **not** pointing athwartships but instead are angled slightly forward. See Figure 4.1. This offset angle is known as B° and **varies** dependent on the length of the draglink. The shorter the draglink the greater the offset angle B . In Figure 4.2 we give a table showing the pedestal to rudder stock distance $L3$ and the corresponding offset angle B° . If you have instructed us to finish bore and key the tiller arm we will have checked the distance $L3$ and cut the keyway in the tiller arm to the correct offset angle. If you are finishing the tiller arm yourself please refer to the table in Figure 4.2. Should this be unclear please contact your local Whitlock agent, who will be pleased to 'guide' you through this procedure.

$L3$ mm	B°
(distance between pedestal centre and rudder stock)	(lever offset angle forward)
less than 200mm	refer to factory-custom
200-225	25°
226-250	23°
251-300	20°
301-350	17°
351-400	14°
401-500	12°
501-750	10°
751-1000	8°
1000	5°

Fig. 4.2

5.3 Please note the above assumes the pedestal is mounted forward of the rudder stock. If the pedestal is mounted behind the rudder stock the same offset angles apply but the levers are **offset aft**.

Fig. 4.1

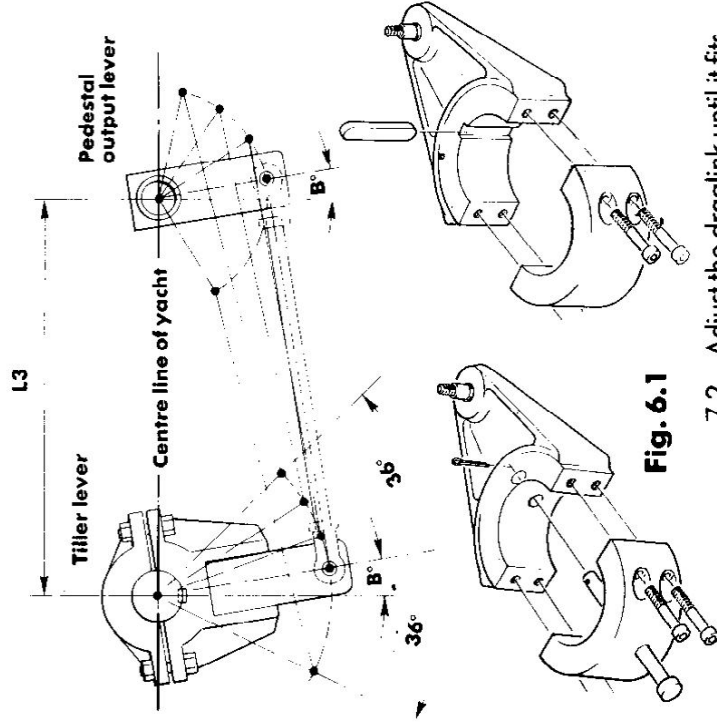


Fig. 6.1

6. Fitting Tiller Arm

6.1 The tiller arm can be fitted to the rudder stock via a keyway or through bolt, see Figure 6.1. Conventionally a key is used on a solid rudder stock and a through bolt on a tubular or pipe stock. The tiller arm should be mounted to keep the draglink as close as possible to horizontal — please refer to section 1.2. Please also ensure that the offset angle is correct as described in section 5.

6.2 When fitting the tiller arm ensure an even gap is maintained on either side of the cap and that the bolts are tightened gradually and sequentially.

Do not overtighten the clamp bolts — torque to tighten assembly is 40Nm.

6.3 For rudder stocks raked at an angle of greater than 15° a special tiller arm may be necessary. This information should have been requested when you placed your order and the arm modified for you. If in doubt consult your Whitlock agent before commencing installation.

7. Fitting Draglink

7.1 To complete the installation of the basic system it is only necessary to fit the draglink assembly. The tiller lever should already be set at the correct offset angle and the rudder fixed at midships. Check that the friction brake is released and rotate the output lever until it is parallel to the tiller arm.

7.2 Adjust the draglink until it fits over both lever pins and offer into position. There must be at least 1.6mm of draglink thread inserted in each rosejoint.

Refit and tighten aeronuts on lever pins and tighten locknuts on draglink.

Check that the 1/8"/3mm alloy spacer is fitted on lever pin between the rosejoint and face of the output lever.

8. Checking Steering Operation

8.1 Ask a colleague to slowly turn the wheel from lock to lock and check that

(a) the tiller reaches its rudder stops before the travel limiter in the head of the pedestal is met.

(b) that the draglink does not foul on the boat structure.

(c) that the rosejoints do not exceed their designed working angle and bind.

8.2 If the above points check out O.K. then ask your colleague to apply moderate load on the wheel with the tiller up against each rudder stop and check that the stops and the cockpit floor do not flex significantly.

The basic installation is now complete. The fitting of a pedestal has now opened up a range of possible accessories to add to your boating pleasure. These include binnacle compasses, guard rails, engine controls, cockpit tables, instrument pods and autopilots. Please refer to the Whitlock catalogue for details of these products and others. We hope you enjoy your Whitlock Cobra steering — the finest system afloat!