Macalloy 460/S460/520 Bar System Assembly

Correct installation of the Macalloy tendons is essential so that they meet the designated design criteria of the system. It is also essential that any connection plates designed or supplied by Macalloy meet the recommended design criteria stated in the brochure.

All of the components should be visually inspected for any damage caused due to the transportation of the tendons before installation.

In most applications it is desirable for the forks at either end of the bar to be aligned to help prevent any bending from being induced into the bars. (See diagram 1)

The following assembly instructions are guidelines only, when in doubt, please seek advice from our technical department.

A – Fork Assembly (see diagram 2)

The fork offers an efficient end termination for the bar, allowing easy assembly to a gusset plate via a pinned joint.

1. Establish the thread size of the tendon together with its orientation i.e. left hand or right hand. Note all left hand bars are marked with paint.

2. Screw a lock cover onto the threaded end of the bar with the taper pointing along the bar. Screw the lock cover all the way along the thread length.

3. Screw the fork onto the threaded end of the bar for a distance approximately 1.5 times that of the thread diameter for tendons between M10 and M56, and approximately 25mm plus 1 times the thread diameter for M64 to M100 tendons. Note that in order to achieve a full strength connection, the bar must be engaged by a minimum of 1 times the thread diameter.

4. Screw the lock cover back up the bar and tighten them against the fork end. The thread of the bar should now be covered by the fork and lock cover.

5. The fork is now ready for the pin assembly – see final assembly.

B – Coupler Assembly

The coupler is designed to connect the same size diameter bars, all coupling threads are right handed.

1. Establish the bars to be coupled. On the first bar, and if required so, screw a lock cover over the threaded end of the bar along the full thread length (as note 2 fork assembly).

2. Screw coupler into the bar until it comes up against the centre stop. The amount of bar screwed into the coupler should be half of the overall length of the coupler.

3. On the other bar to be coupled, if required, screw a lock cover on the thread first. Then thread the bar into coupler, until the bars are butting up to each other inside the coupler.

Macalloy
Caxton Way, Dinnington, Sheffield, S25 3QE, United Kingdom
Tel: +44 (0) 1909 519 200 Fax: +44 (0) 1909 519 201
Website: www.macalloy.com Email:sales@macalloy.com

4. Screw the lock covers on both bars back up the thread and tighten them up against the coupler body.

5. Note in areas where the bars and couplers are cast-in concrete they are not supplied with lock covers.

C – Turnbuckle Assembly

The turnbuckle connects two bars with a right hand thread at one end and a left hand thread at the other. It also has a chamber allowing the tendon to be adjusted lengthwise.

1. Screw a lock cover onto the threaded end of the bar with the taper pointing along the bar. Screw the lock cover all the way along the thread length.

2. Screw the appropriate handed thread of bar into the turnbuckle. For sizes between M10 and M24, distance should be 12.5mm plus the 1 times the thread diameter. For sizes between M30 and M100, distance should be 25mm plus 1 times the thread diameter.

3. The same procedure should then be carried out for the other bar to be attached to the turnbuckle.

4. Tighten the lock covers up against the turnbuckle body.

5. If the length of the overall tendon needs adjusting, unscrew the lock covers and turn the turnbuckle (whilst preventing the bars from moving). Ensure that a minimum of 1 times the thread diameter of bar is engaged into the turnbuckle after final length adjustment.

6. Re-tighten the lock covers upon completion of adjustment.

D – Final Assembly

1. The full tendon should be assembled on the ground with all the necessary forks, turnbuckles and couplers in place. The pins should not be in place at this stage, but the length of the overall tendon should be set at the required pin-to-pin dimension.

2. The tendon should then be lifted into place. Note that long tendons will tend to sag under their own weight, negatively affecting the ease of connection to the structure. This particularly happens where the tendons are placed horizontally or at a raking angle. To ease connection, a stiff lifting beam should be used to raise the tendon into position. Bends, dents or damage resulting from bar sagging, must be avoided and permanently deformed tendons must be replaced.

3. Once the fork is located over the structural gusset plate, the pin should be placed through the fork. Detach one round end cap of the pin assembly and push the pin through the fork and gusset plate. Replace the round end cap and secure it by tightening the countersunk screw through the end cap and into the pin body.

4. Once the pins are in-place and secured, the tendon is now in a position to be adjusted and tensioned up. If the tendon includes a turnbuckle, point 6 of the turnbuckle assembly instructions should be followed. If the tendon does not have a turnbuckle, merely a fork at each end, adjustment can still be achieved. To prevent rotation of the fork, screw back the lock covers and rotate the bar. The lock covers should then be tightened back up against the fork, when the correct tendon length is achieved. Ensure that a minimum of 1 times the thread diameter of bar is engaged into the fork, after the final adjustment.

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5. After final installation, it is recommended that the lock covers should be injected with sealant. This prevents corrosion and also stops the lock cover from working loose due to any vibrations. Please see our sealant method statement for details.

E – In Situ Adjustment

1. Tendons with a turnbuckle:
M10 to M24 inclusive: +/-25mm
M30 to M100 inclusive: +/- 50mm

2. Tendons fitted with right or left hand threaded fork:
M10 to M56: +/- 1.0 thread diameter
M64 to M100 +/- 50mm

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DIAGRAM 1

FORKS ALIGNED

FORKS MISALIGNED*

* MISALIGNMENT OF FORKS NOT NORMALLY RECOMMENDED UNLESS NO ROTATION OF PIN REQUIRED

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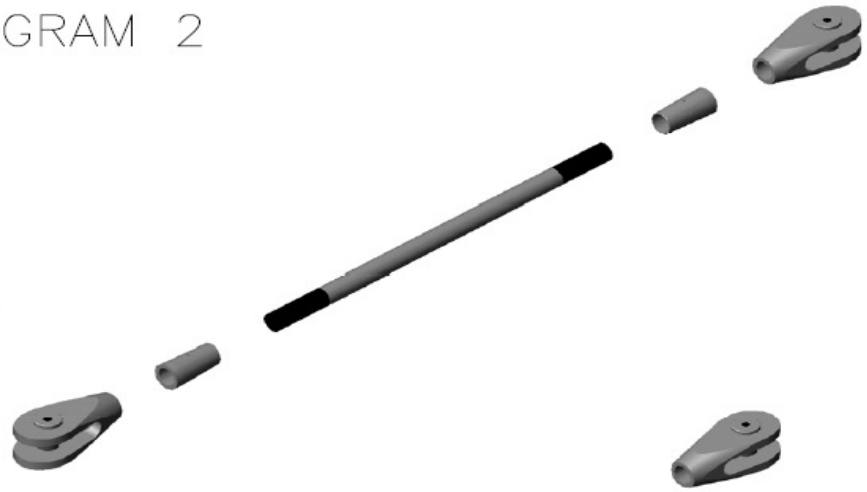
DIAGRAM 2

1.



2.

3.

4.

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