# Chiltern Model Steam Engines

**Quad Mill Model Steam Engine Assembly Instructions v1.**

NOTE:

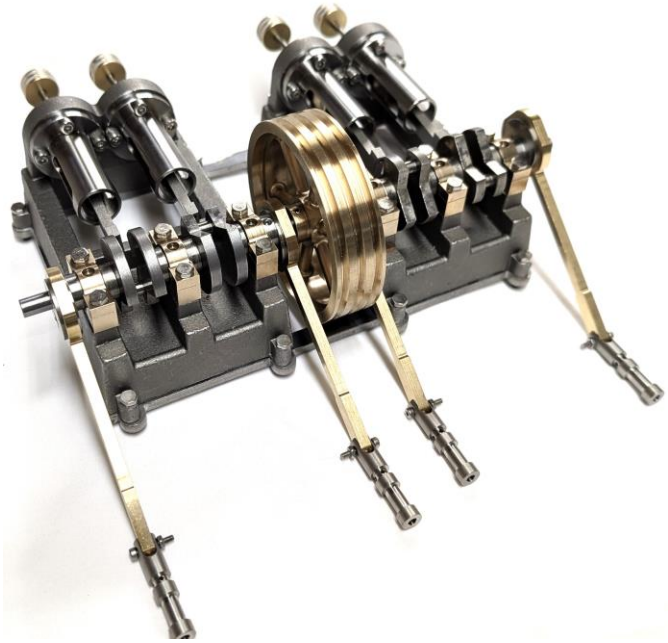
1. These instructions are to be used as an addition to the Mill Twin Cylinder Assembly Instructions.
2. The Manifold shown in the Mill Twin Cylinder Assembly Instructions has been superseded by the Manifold shown in these instructions.

**Step by step instructions:**

1. The Quad Mill is 2 Mill Twins with their crankshafts connected by a large flywheel and manifold. So first assemble each Mill Twin as per the instructions and ensure that they each work properly, independently.

2. Remove the cylinders and connecting rod bearings from each Mill Twin, so that the crankshafts move freely.

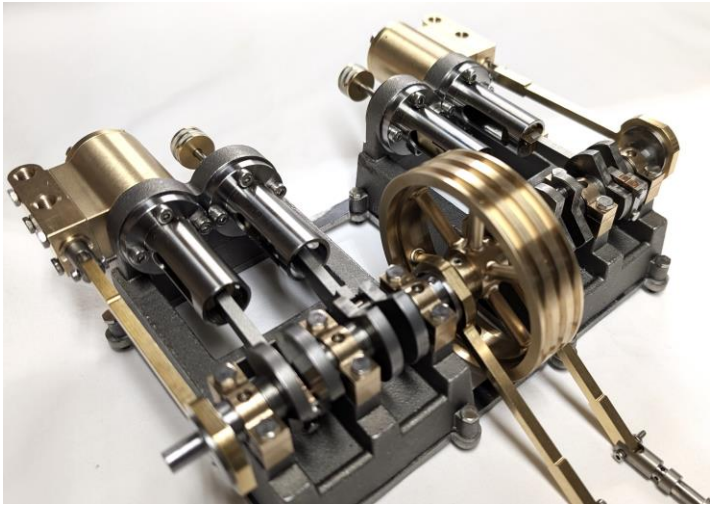
3. Mount each Mill Twin on the base plate, place the flywheel on the crankshafts between them and secure each loosely with 4 M3 screws.
   The engine will work with the crank arms of the 2 Mill Twins in any orientation by best to have each facing in a different direction 90 degrees apart.



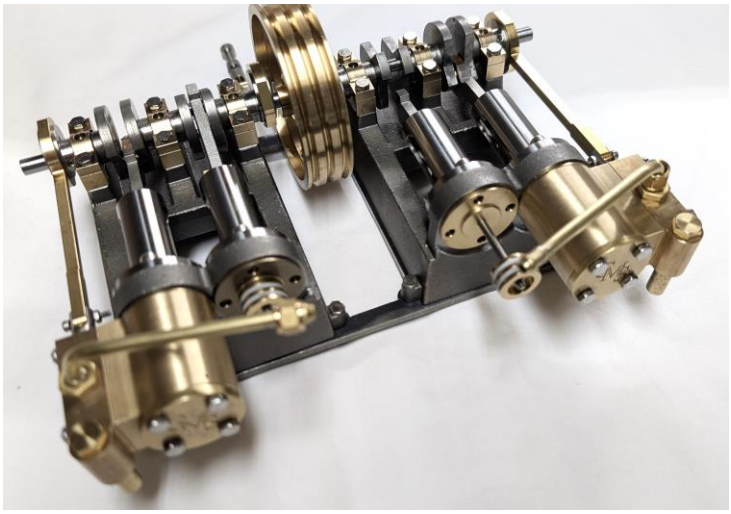
4. Gradually tighten the 4 grub screws in the flywheel's hub while rotating the crankshafts, making sure they can rotate freely when fully tight.
   Then gradually tighten the 8 M3 screws (18mm long) securing the engines to the base plate, again while rotating the crankshafts, making sure they can rotate freely when fully tight. M3 nuts (provided) are used under the base plate to lock the screws.
   Any wobble in the flywheel can be corrected by loosening/tightening of the 4 grub screws.

NOTE: 4 longer M3 screws, replacing 4 18mm ones, can be used to attached the engine to a base board, i.e. the longer screws go through the board with nuts used to secure the engine under the board.

5. Reattach the two outer cylinders, with cylinder end caps and insert the valves into the chests. Reconnect the Con Rod Bearings on the Crankshafts. Ensure the cranks can still be freely rotated whist gradually tighening the cylinder screws.

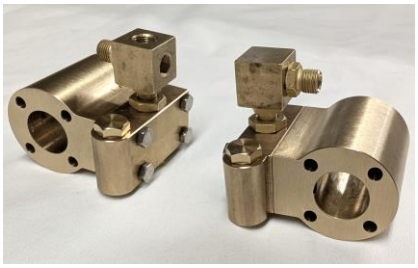


6. Screw in the Manifold long chest link pipes into the outer chest ports. Leave the brass lock nuts slightly loose.



7. Screw the Manifold Cross-T and Elbow blocks into the respective chest ports – again leave the brass lock nuts slightly loose. Screw in the Chest Plugs into the Chest ports on the opposite sides of the Chests.
NOTE: the top port of the Cross-T block is for the steam inlet and can be located on either chest as required.

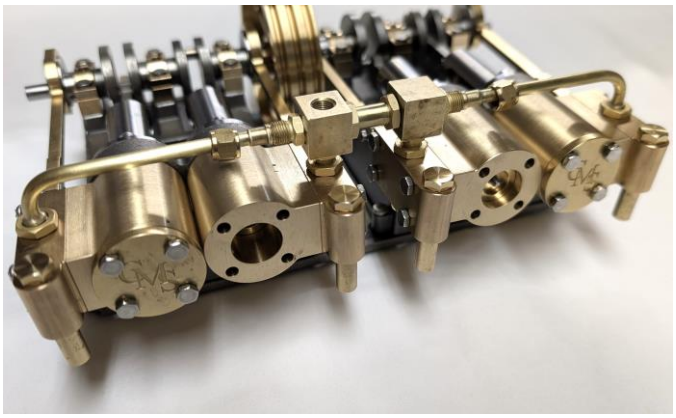
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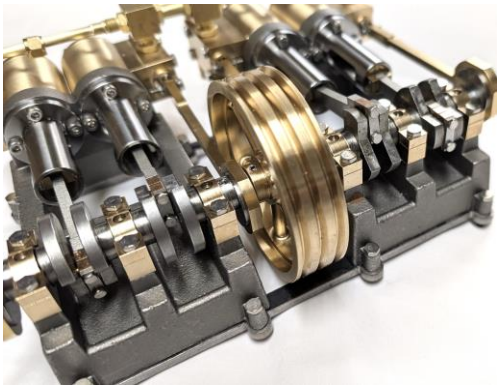
8. Screw the short link pipe into each of the Manifold blocks – again leave the brass lock nuts slightly loose.



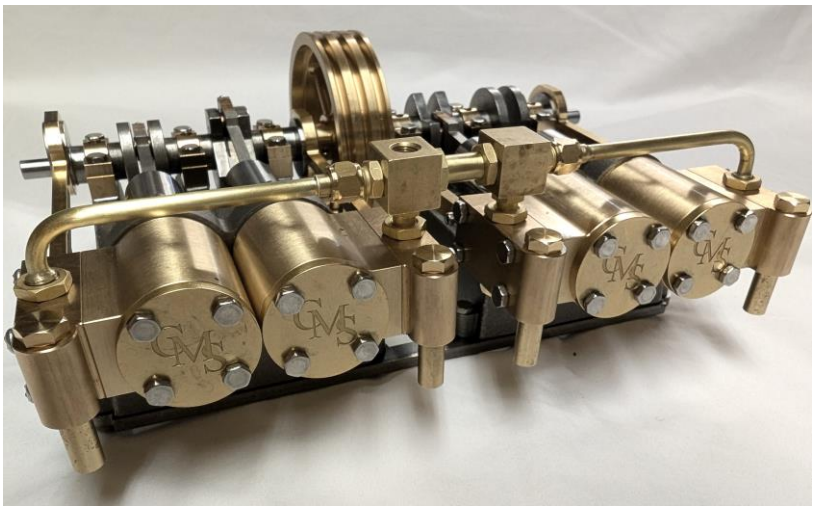
9. Push the cylinders/chests onto the engines over the pistons and valves. As needed, screw the short link pipe in/out of the blocks to ensure the cylinders can be located accurately on the two sides of the engine, i.e. are not too close together or far apart.
Also locate the long link pipes in the Manifold blocks.
The stub pipes shown on the bottom of the chests are for the steam exhausts.



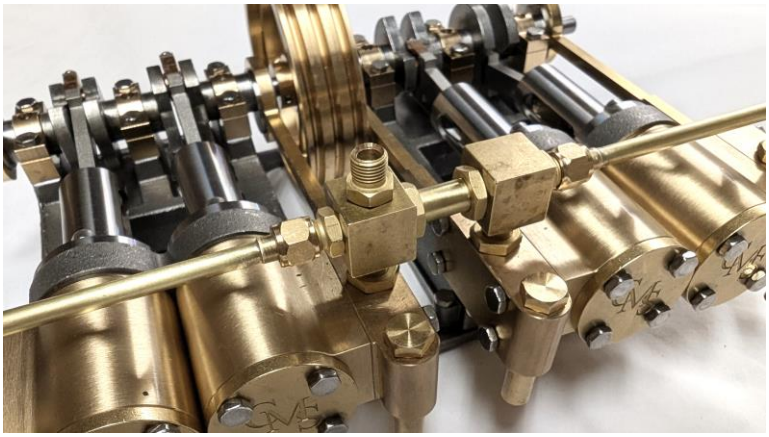
10. Reattach the Con Rod Bearings for the inner cylinders.



11. Secure the 2 inner cylinders and end caps by gradually tightening the long M3 screws whilst rotating the crankshaft to ensure the engines can rotate freely.



12. Screw in the nuts on the long link pipes to the blocks and gradually tighten all the lock nuts. Screw the union connector into the top port of the Cross-T block for the pipe connection to the boiler.
NOTE: Ensure all the link pipes and blocks are aligned longitudinally and are at the same heights and are tightened evenly – no not overtighten.



13. If purchased a second manifold can be installed on the exhaust ports of the chests in a similar fashion and at the same time as the inlet manifold.

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