STUART MODELS

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Slide Valve Timing

Non-Reversing Engines

Check the valve location by temporarily removing the valve chest cover. With the crank at top dead centre check that the high point of the eccentric is 90° plus the angle of advance (usually between 30° and 40°) in advance of the crank, in the direction of rotation.

Rotate the engine and check that at the extreme travel of the valve in both directions that both the top and bottom ports open the same amount. Should the port openings be unequal, uncouple the valve rod and screw the slide valve nut up or down the rod to correct the situation. This is the only way you can correct unequeal valve openings.

Valve timing is checked as follows:- with the crank and piston at the top dead centre the upper port should just be opening. If the engine is then rotated through 180° the lower port should be opening a similar amount. The port opening may be adjusted by loosening the eccentric grubscrew and rotating the eccentric on the shaft.

Slide Valve Timing

Reversing Engines

Valve location and timing procedure is generally similar to that required for non-reversing engines but the reversing engine has two eccentrics usually made in one piece and therefore precluding individual adjustments.

Valve location - with the steam chest cover temporarily removed and the crank turned to top dead centre carefully check that the high points of the eccentrics are 90° plus the angle of advance in advance of crank in the direction of rotation. Operate the reversing gear to bring one eccentric rod in line with the valve rod. Rotate the engine and observe bottom port openings are equal. If the port openings are unequal, uncouple the valve rod and screw in or out of the slide valve nut to required extent. Again operate the reversing gear to bring the other eccentric rod in line with the valve rod and check port openings.

Valve timing is checked as follows:- with the crank and piston at the top dead centre and one eccentric rod aligned with the valve rod, the upper port should just be opening to steam. If the engine is rotated through 180° the lower port should show a similar amount of opening.

Repeat for the other eccentric rod and ensure that similar openings are obtained. Adjust if necessary by loosening the eccentric grubscrew and rotating the eccentric on the shaft to a point where equal advance is obtained for either rotation.

Again check that the valve location is correct before replacing the steam chest cover.

Slide Valve Timing

Details for timing Compound Engines

The H.P. slide valve opens at some 20° before dead centre, which in terms of valve travel equates to 180°.

At this time the exhaust port is fully open to the steam port at the other end of the cylinder.

Steam cut off commences at 130° of crank movement from dead centre.

As the low pressure. piston is 90° behind the H.P. at any given position of the crank it follows that the low pressure piston is not the ideal position for the admission, until the L.P. valve is in the correct place. i.e. with the low pressure. piston at dead centre - 20°.

Until this time the exhaust steam from the H.P. cylinder is held in the H.P./L.P. cylinder. transfer pipe and in the L.P. valve chest.

This equates to full size practice except that in some cases the H.P. exhaust was led to a receiver, sometime with super heater before travelling on to the L.P. cylinder.

Slide Valve Timing

Details for timing the Stuart Triple Expansion Engine

Starting at the low pressure cylinder, temporarily remove the valve chest cover so that the valve travel can be checked. With the crank at the top dead centre carefully check that the high points of the eccentrics are 90° + 15° for I.P. and 90° + 30° for H.P. Cylinders in advance of the crank in direction of rotation. Operate the reversing gear lever to bring one eccentric rod in line with the valve rod and rotate the engine. Observe that at the extreme travel of the valve in either direction, top and bottom port openings are equal.

If the port openings are unequal, uncouple the valve rod and screw in or out of the slide valve nut to the required extent. Again operate gear lever to bring the other eccentric rod in line with the valve rod and check port openings at the extremes of travel.

The intermediate Cylinder is timed in the same way, but because the steam chest and high pressure cylinder are both the same component a dummy steam chest is used so that the port openings can be set equal. When this has been achieved assemble the steam chest and high pressure cylinder. Assemble high pressure Cylinder Components and then time high pressure cylinder in the same manner. Before replacing steam chest covers the valve timing in checked as follows:

With the crank and piston at the top dead centre and one eccentric rod aligned with the valve rod the upper port should just be opening to steam. If the engine is rotated through 180° the lower port should show a similar amount of opening.