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ADJUSTMENT INSTRUCTIONS

FOR

CONSTANT TIMING CONTROL PANELS

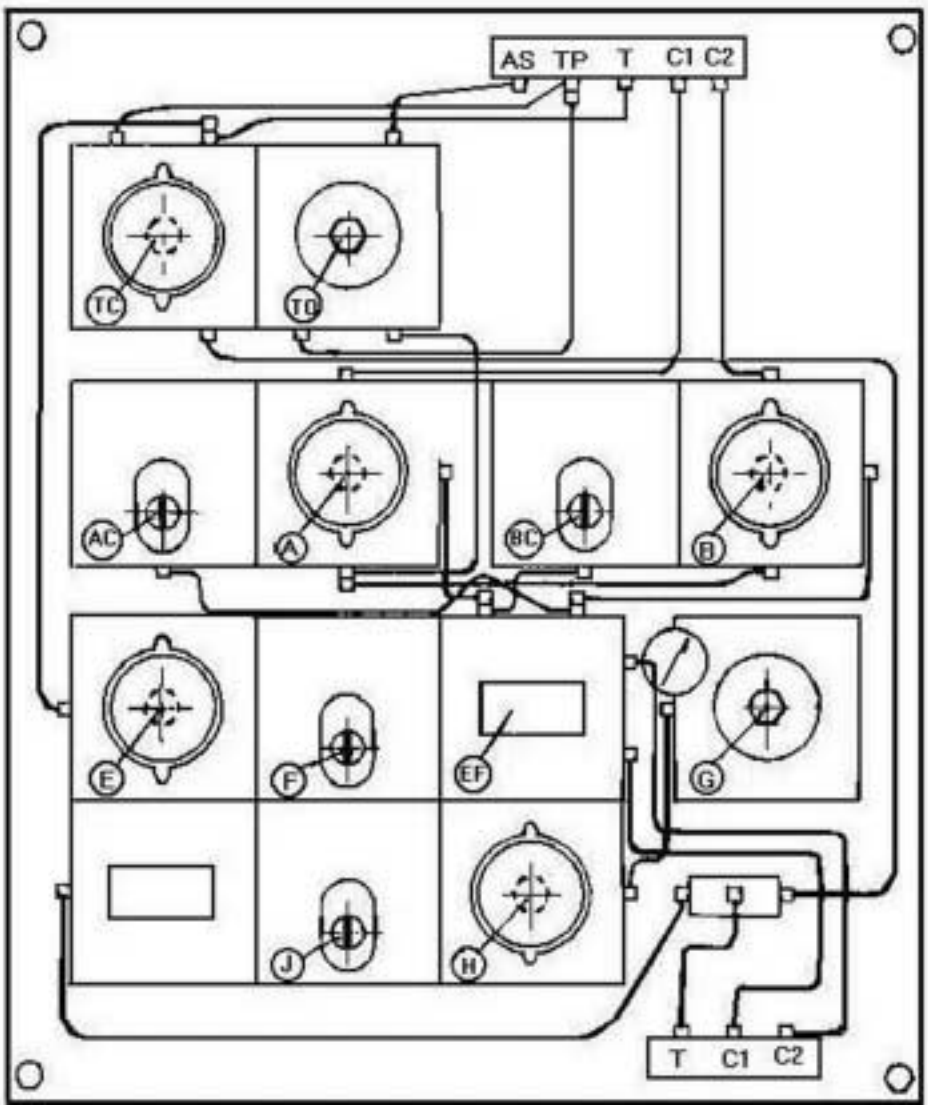
FOR

HYDRAULIC GEARS

ADJUSTMENT INSTRUCTIONS FOR CONSTANT TIMING CONTROL PANELS FOR HYDRAULIC GEARS

The remote control signal entering the clutch circuit via ports C1 and C2 will trip either relay valve A or B into an open position. The engine room air supply (AS) will then energize the interlock valves and clutch actuator. The adjustments on relay valves A and B should be set at approximately 30 psi. If the clutch relay A is energized, the output from this relay is permitted to enter into the accumulator tank BC immediately, therefore, locking out relay valve B. When a reverse manoeuvre is made, the clutch valve B is energized and the accumulated air pressure in the accumulator tank BC must exit via needle valve BC before clutch engagement can take place in the opposite direction. Closing needle valves (clockwise) prolongs the delay in the clutch neutral position. Opening the needle valves (counter-clockwise) will increase the volume of air exiting through the needle valves and therefore reduces the neutral time delay. This allows for separate time delay settings for the forward and reverse clutches.

Diagram 1: Timing Panel



CONTROL ADJUSTMENTS FOR VARIABLE TIMING FOR HYDRAULIC GEARS

The remote control clutch signals enter the variable timing panels via ports C1 and C2 into relay valves AA and BB. The remote control signals trip either one of these valves into an open position. Engine room air supply (AS) is permitted to charge the interlock valves and clutch actuator. The adjustments on relay valve AA and BB should be set at approximately 50 psi. The out-signal from the primary relyas is allowed to enter into the primary variable timing manifold which consists of two relay valves (Item A and Item B), two accumulator tanks (Item AC and Item BC) and a flow control valve (mounted on Item AC). With the control in a neutral position, selecting a clutch direction, the air is allowed to pass through either relay valves and energize the clutch immediately. If the gear was previously in an engaged position and at half throttle, the throttle pressure will accumulate in both accumulator tanks via the flow control valve D and AC. Since the throttle pressure is in relation to the engine rpm and the speed of the ship, the throttle pressure venting is controlled by the discharge through needle valve AC.

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Clutch reversal is not made possible until the accumulated air has drained through needle valve AC. This demonstrates that the forward and reverse timing will vary according to engine speed. Needle valve D regulates the charge rate of the tanks. If a boat accelerates very quickly, the tanks should be fully charged in approximately 10 seconds. If a boat accelerates slowly, the accumulator tanks should be charged in 20 - 25 seconds. Gear reversal, without engine speed, will take place almost instantly. At full engine rpm, gear reversal will consequently take longer since a major amount of accumulated throttle air must exit through flow control valve AC. Adjusting flow control valve AC, turning clockwise, will prolong the neutral time delay. Turning flow control valve AC counterclockwise will shorten the neutral time delay. Adjustments A and B, secondary regulating valves, shall be set at 30 psi.

THROTTLE BOOST

The throttle boost consists of three adjustments:

(1) Starting point of boost

(2) Stopping point of boost

(3) Amount of boost

Adjusting the pressure regulator (G), will control the output pressure. It is recommended that this regulator be set at approximately 25 psi. Adjustment H governs the starting point of the boost. It is recommended that the pressure setting is maintained at 25 psi. The flow control valve J regulates the cut-off point of the boost. If the boost comes in too late, adjustment H must be set lower. If the boost comes off too soon, needle valve J must be turned in, clockwise. If the boost stays on too long, adjustment H must be turned out, counterclockwise. If the boost is too low, adjustment G must be turned in, clockwise.

THROTTLE DELAY

The shuttle valve EF will give a pilot signal in either a forward or reverse running position, into the accumulator tank F. The air enters this tank via needle valve F. Turning the needle valve out, counterclockwise, will allow the air to accumulate at a more rapid rate and therefore opening the relay valve, Item E, faster. Closing the needle valve, Item F, clockwise, will prolong the accumulation of air into the tank and delay the opening of relay valve E. This, in turn, will delay the opening of the throttle which avoids engine acceleration during gear engagement. Relay valve E should be set at approximately 70 psi. These instructions apply to all timing panels. Any additional timing functions, such as throttle boost and shaft brake, do not affect the primary settings as given.

MINIMUM TIMING FOR HYDRAULIC GEARS

Minimum time in conjunction with variable timing will give a control minimum neutral time delay. The throttle pressure passing through flow control valve D is fed into shuttle valve LM and passes via its regulator outing into the variable timing accumulator tanks, AC and BC. The pressure regulator, with adjustment N, is fed off the clutch pilot line. Whenever gear engagement occurs, this regulator is charged with clutch pressure. Turning adjustment N in, clockwise, will prolong minimum timing. Turning adjustment N out, counterclockwise, will decrease the pressure setting and shorten the neutral time delay.

PROPELLER SHAFT BRAKE

The relay valve K provides the amount of air pressure required to stop the propeller via Kobelt disc brakes. Item L is a normally open relay valve in a neutral gear position. When clutch pressure enters the accumulator tank via shuttle valve FF, the relay valve will trip into a closed and exhaust position, releasing the brakes. A quick release valve should be installed near the brakes to allow for a fast dump of the air in the brake actuators. Adjustment K should be set between 70 and 100 psi. This adjustment regulates the amount of output pressure to the brake. If the brake torque is not sufficient, the air pressure should be raised. If the brake comes on too severe, the pressure must be lowered. Turning adjustment K out (counter-clockwise) will lower the pressure. Adjustment L on the brake relay governs the releasing point of the brake. If the brake releases too late, adjustment L must be turned out (countercloskwise). If the brake applies too soon, needle valve M must be turned in (clockwise). If the brake comes on too late, the needle valve M must be turned out (counterclockwise).

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When setting the propeller shaft timing during sea trial, it is extremely important to set the brake so that no overlapping in clutch timing or brake timing takes place. It is also important to set the brake to prevent propeller shaft rollback between clutch engagement and brake release. After all adjustments are made, it is important to secure all needle valves with the locking screws and also to lock setting screws on all relay valves and regulators with the locknuts.