Hydraulic Equipment for Fishing Boats

M. VELU
Central Institute of Fisheries Technology, Cochin - 5.

Hydraulic drives and equipment possess certain important advantages over mechanical, electrical and electro-mechanical systems. Besides being rugged and reliable, which are pre-requisites for equipment in a fiishing boat, hydraulic systems require very little maintanence and present no installation problem as the pipes carrying the fluid can be installed in any convenient position, unlike the mechanical drives requiring shafting, belting etc. which have to follow definite straight lines. A hydraulic trawl winch, for example, possesses higher starting torque, better acceleration and flexibility of operation, qualities which make the hydraulic drive eminently suitable for this purpose.

Hydraulic deck equipment such as trawl winch, line hauler, power block, bridge controls and steering gear are increasingly being used in fishing boats of advanced maritime nations. Non-availability of suitable components and equipment has retarded usage of hydraulic equipment in fishing boats, depriving the fast expanding Indian fishing fleet of the benefits of hydraulic system.

The Trawl Winch

The main features of a trawl winch used for handling the fishing gear on board a trawler is schematically shown in Fig. 1. It consists of a pump driven by diesel engine or electric motor, a

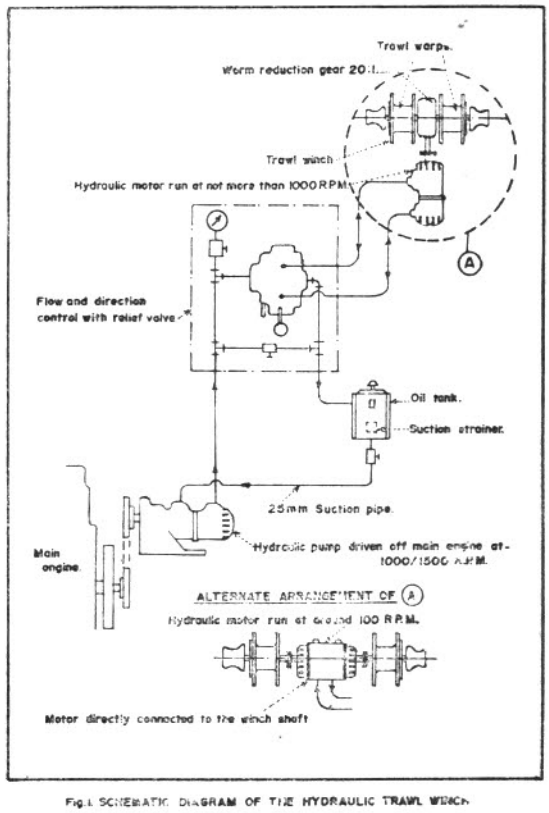

Fig.1 SCHEMATIC DIAGRAM OF THE HYDRAULIC TRAWL WINCH

hydraulic motor fed by the pump, the control valves and the connecting piping. The circuit can either be open

Power block

The power block (fig. 4a) used for handling the 'purse-seine' net is a patented device. The whole 'block' along with the driving motor is suspended on the derrick of a mast. Hence the overall size and the weight of the motor have to be necessarily small. Motors for powerblocks, in order to keep the weight as low as possible, work on higher pressures of 60–70 Kg /cm² and at speeds around 1000 rpm. A built in reduction gearing is used to bring down the speeds of the power block.

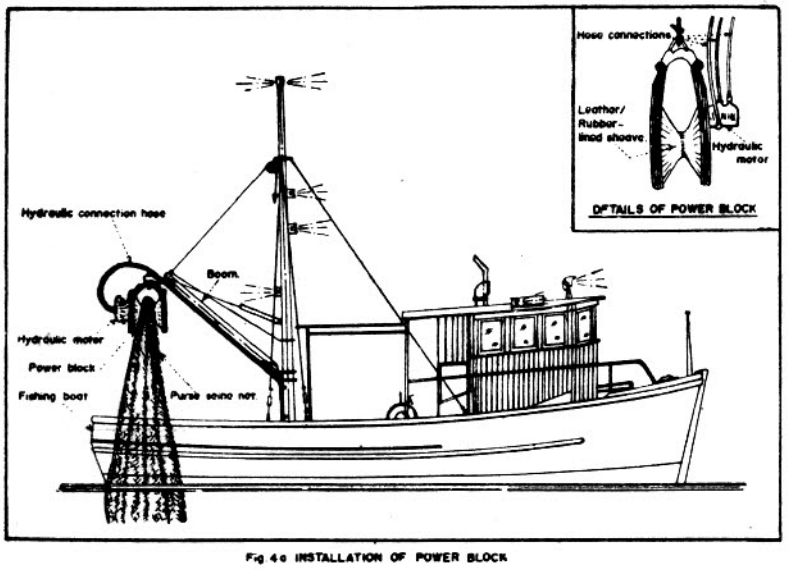

Fig 4a INSTALLATION OF POWER BLOCK

Bridge controls

Bridge controls for the operation of engine and accessories from wheel house used at present in India are only of the mechanical type consisting of levers and links. Besides creating installation problems, it is quite often difficult to operate the mechanical controls as they require too much force at the operating levers, particularly in the case of larger boats and deep sea trawlers.

A simple remote control (fig. 5) system consists of a hand operated reversible pump and a double acting ram with a piston area upto 15 cm² working at a pressure of 5–6 Kg./cm². The pump is connected to a hand wheel, by working which, oil is pumped into the hydraulic ram which moves the piston either way depending upon the direction in which the hand wheel is rotated. This movement of the piston actuate the engine controls.

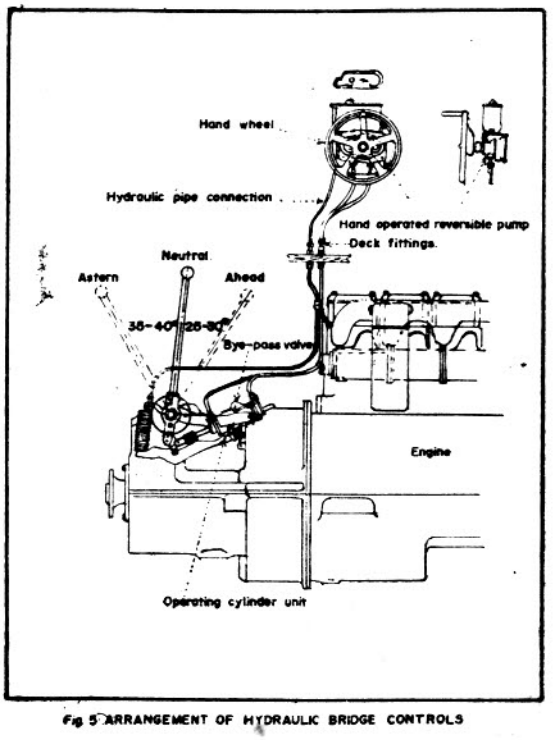

Fig 5 ARRANGEMENT OF HYDRAULIC BRIDGE CONTROLS

Steering gear

Small boats below 50 gross tons normally use mechanical type steering gear consisting of chain, quadrant, and a steering column. The force required to operate the steering wheel in the case of larger boats is considerably high and manually operated steering gear are not quite suitable for boats above this range. A typical hydraulic steering gear suitable for such boats, illustrated in Fig. 6, consists of a hand operated, reversible pump feeding a couple of double acting hydraulic rams through a control valve. The rudder shaft is connected to the pistons of the ram, through an angle of 40–45° on either direction by the action of the rams.

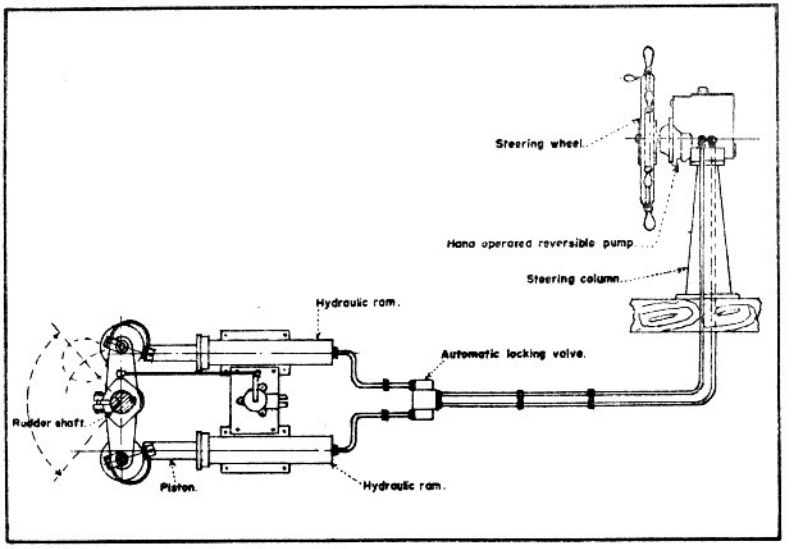

Fig.6 HYDRAULIC STEERING GEAR

It is also possible to use power driven pumps for remote controls and steering gear along with suitable valves.

Discussions

Hydraulic transmission system is playing an over increasing role in the rapidly advancing technology of modern fisheries. Its simplicity combined with realiability makes it eminently suitable for use in fishing boats. No more time can be lost in taking up manufacture of these equipment and to fill the lacuna in this fast expanding field. While some of the components such as rams and certain valves are available indigenously, other vital components like the hydraulic motor have to be developed for indigenous production. These equipment will also find vide industrial applications besides in fishing boats, merchant navy and naval ships. The Central Institute of Fisheries Technology has already taken certain preliminery steps in this direction and a few designs of hydraulic equipment have been produced. Work has also been initiated to develop hydraulic motor and pump, the most important components required for fabrication of deck equipment. It is hoped that the manufacturing industry will also come forward to fill the long felt need without any more loss of time.

Acknowledgement

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