

31 OCT 2014

AMET UNIVERSITY

SHEET 1 OF 6

ORIGINAL

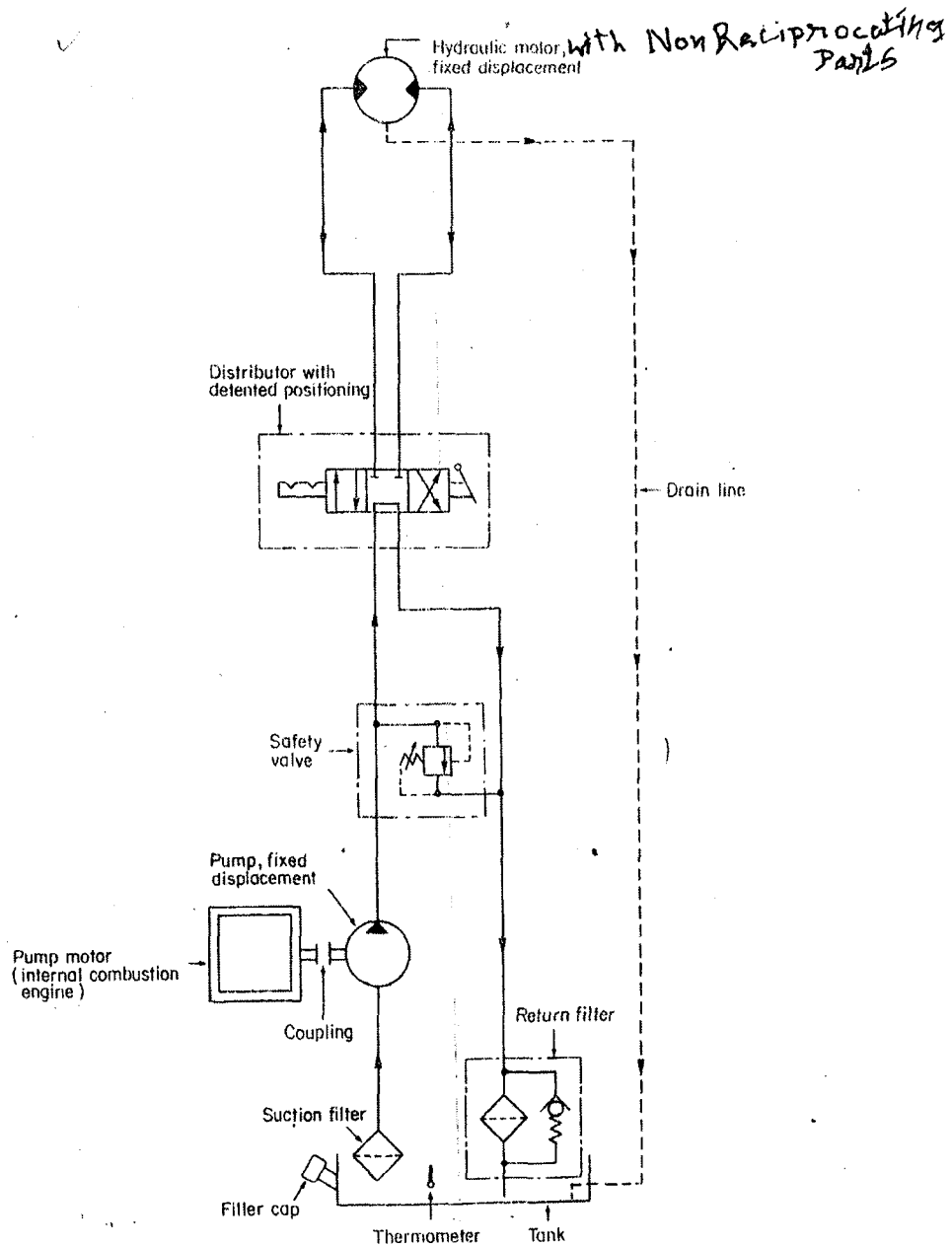


Figure 1 Open circuit

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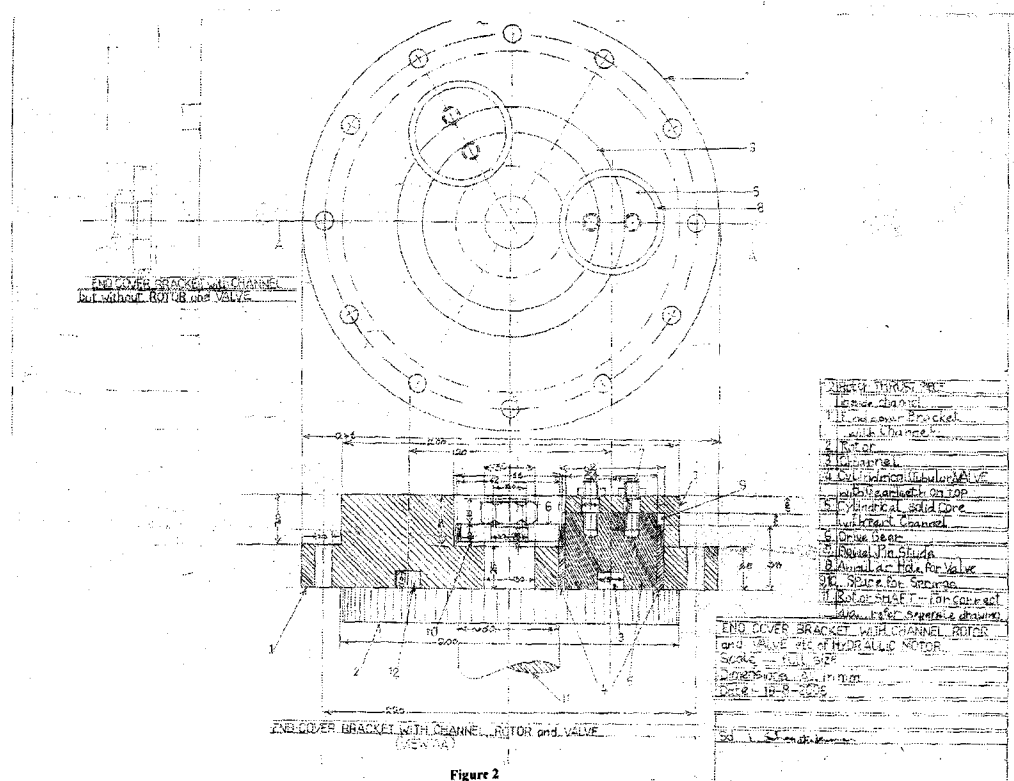


Fig. 2 : End cover bracket with channel, rotor and valve

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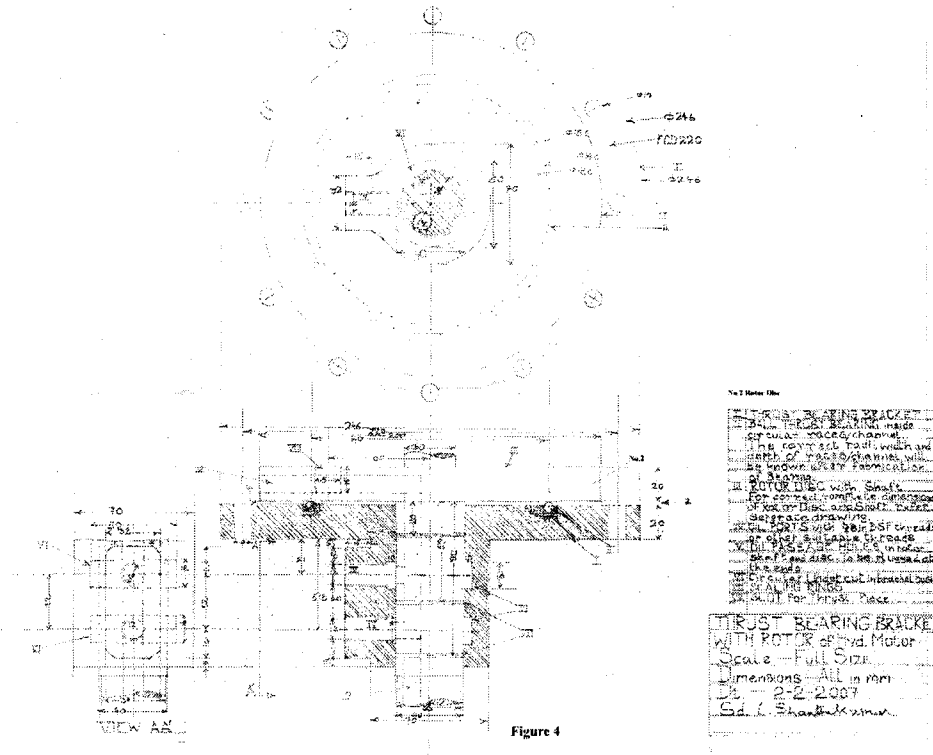


Fig. 4 : Thrust bearing bracket with rotor of Hydraulic Motor

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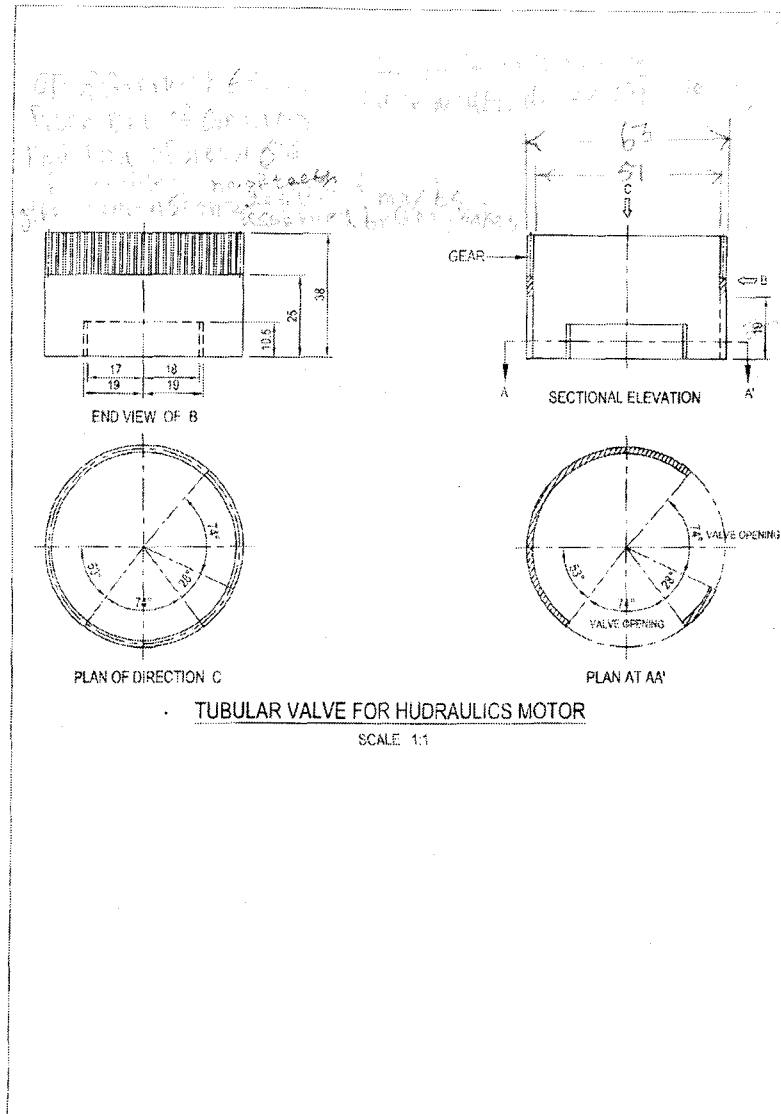


Fig.5 : Tubular Valve for Hydraulic motor

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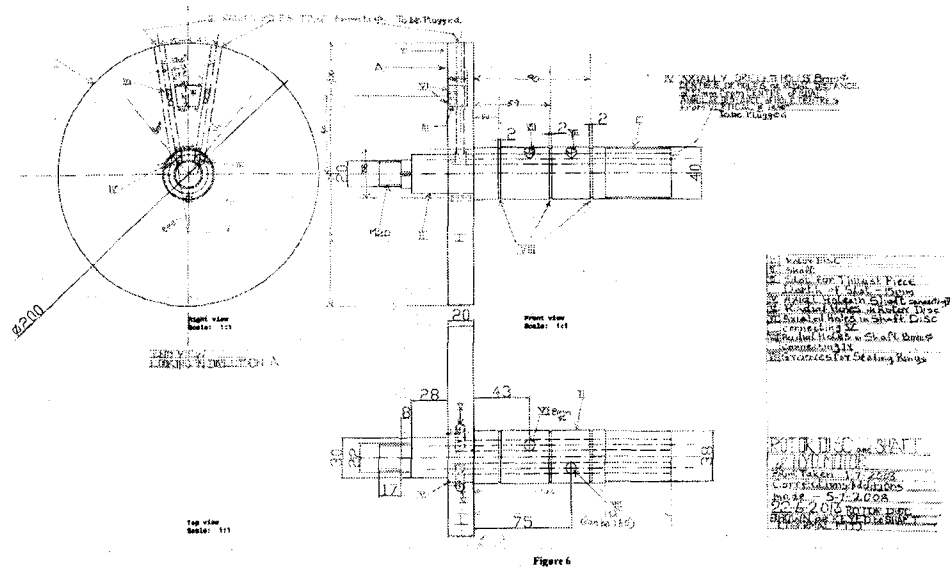


Fig. 6 : Rotor Disc and Shaft of Hydraulic motor

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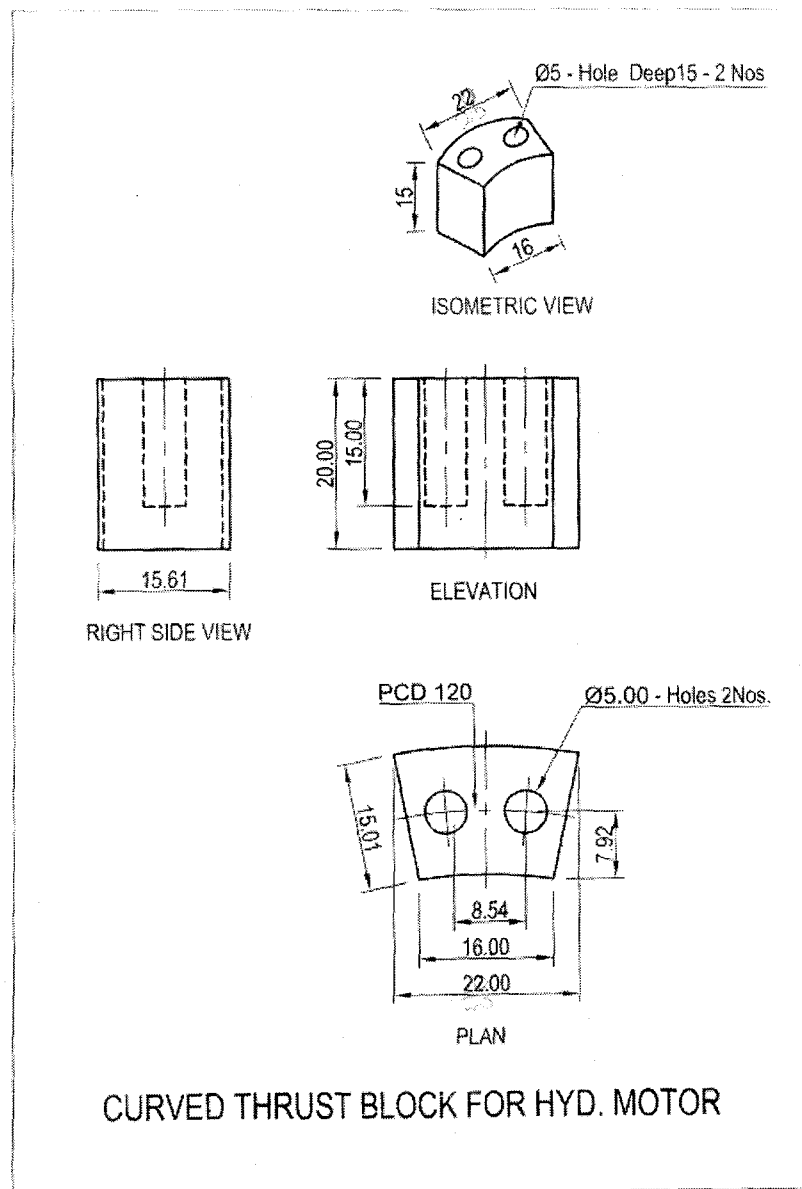


Figure 3

Fig. 3 : Curved Thrust Block for hydraulic motor

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DESCRIPTION

This Hydraulic Motor (Without Reciprocating Parts) can be used for all Marine Hydraulic Applications and Shore based Hydraulic Applications. As shown in Fig.1 the hydraulic pump is driven by an electric motor, which takes suction from an oil tank (reservoir) and delivers the oil to the Hydraulic motor through a distributed valve and a safety valve. The return oil from the hydraulic motor returns to the Oil tank through the distributor valve and a return filter. The description of the working of the hydraulic motor (without reciprocating parts) is as follows

This Motor consists has an End Cover Bracket No1 (Refer fig 2 drawing of End Cover Bracket with Channel) in which a circular Channel (No 3) of rectangular cross section is cut. A Thrust Piece No12 (thrust block) fits in this channel such that it can slide in the channel but it will not allow oil to leak between it and the sides of the channel .The thrust piece(No12) is machined such that it is curved like the sides of the channel for its length and its width is same as the channel. Ref. Fig No3 for the Drawing of thrust Piece (Thrust Block). This thrust piece (No12) is is fitted in a rotor Discs(No2) at the same Pitch Circle Diameter(PCD) as the Channel. The rotor Disc is keyed to a shaft (No11).

The shaft fits in the central portion of the end Cover Bracket (No1) as shown in fig No2, such that the Rotor Disc (No2) will seated on to the End cover Bracket and the thrust piece will be inside the channel. As shown in Fig4, on the other

side of the Rotor disc(No2) another End cover Bracket with thrust bearing (No 1) is fitted which will keep the rotor disc pressed on to the End cover Bracket (No1) with channel(Ref fig No2). As in Fig No2, the Two Tubular Valves (No4) are fitted in annular (circular) grooves(No8) machined in the End cover

5 Bracket(No1), on the same side as the channel such that the two tubular valves will be 120 degrees apart .These tubular valves will be made to rotate by the rotor shaft(No11) through a timing gear(No6) . Also the end of the tubular valves which touch on the rotor Disc will have openings for the thrust Piece to enter in and leave out(Ref fig No5).

10 The channel (No 3) does not have any in / out oil ports and oil only enters and leaves the channel through oil holes drilled axially in the rotor disc no.2. The in and out ports are situated adjacent to the thrust piece no.12 which also moves along with the thrust piece as the rotor disc is rototating.

The Oil from the hydraulic pump, under pressure will be made to enter into the
15 hydraulic motor shaft axial oil holes (No V) from oil ports (No IV) in the End Cover Bracket with thrust bearing, and it will flow through oil hole drilled in the Rotor Disc.(Ref, Fig 5 Of rotor Disc and shaft).When oil is allowed through one the ports it will flow to one side the Thrust piece. As the tubular adjacent to that side will be closed, the oil will force the Thrust piece to move in the Channel thereby
20 making the Rotor Disc and the shaft to Rotate. The Central timing gear fitted to the shaft will make the two tubular valves to rotate such that they will open and

close at the correct time, to allow the thrust Piece to enter in and leave out.

When oil will be allowed through the other port the reverse action will take place and the rotor will rotate in the opposite direction.

5 Description of Drawings

Fig. 1: Open Circuit

Fig 2 : End cover bracket with Channel rotor and valve

Fig 3 : Curved thrust block for hydraulic motor

Fig 4 : Thrust bearing bracket with rotor of hydraulic motor

10 Fig 5 : Tubular valve for hydraulic motor

Fig 6 : Rotor disc and shaft of hydraulic motor

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ABSTRACT

HYDRAULIC MOTOR WITHOUT RECIPROCATING PARTS

This invention discloses a Hydraulic Motor (Without Reciprocating Parts) that can
5 be used for all Marine Hydraulic Applications and Shore based Hydraulic
Applications.



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