

FREQUENT FAILURE OF CW PUMP, RWP, CTPL MOTORS TOP BEARING

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The problem faced with the vertical motors used for CWP / RWP / CTPL was that, the water at a pressure of 1.2 Kg/Cm² used for cooling of the lubricant oil, was getting mixed with the oil. This used to reduce lubricant effect at the bearings and resulted in to premature failures. Such a phenomena of water getting mixed into lubricant oil and damage of costly bearings went on for years with no solution in sight inspite of trying all possible ways.

Such a piquant situation led me to start an interaction with the motor itself, for a solution was to be found out to end this suffering of the motor. I pondered over the reasons as to why the water does not flow outwards even when housing cover is tightened with 12 bolts with a gasket in between.

The top cover was removed. Please look at the Fig. No. 2 to see how the housing cover is fitted. At a distance 'B' i.e. 25 mm, the M 12 bolts (12 Nos.) are tightened with gasket. The contact surface 'A' is of 85 mm. but tight fit contact surface of cover is of width 50 mm (i.e. 25 + 25) from the end through out circle. The remaining portion $85 - 50 = 35$ mm width through out the circle of gasket is not so pressed and allows the water to seep in. This water which seeps through the in-pressed area of gasket reaches the oil chamber and contaminates the lubricant oil.

This could be the reason for the fact that the water only tended to flow in side and was not coming out. A circular plate was provided in between the housing and cover which can be fitted both from inside and outside without disturbing the existing condition of housing. Sufficient space was found to insert such a plate.

The required plate as in Fig. No. 3 with dimensions as 10 mm thick, 770 mm outer dia., 601 mm inner dia., 12 Nos. holes of 14 mm at a PCD of 720 mm was fabricated in MS material at our workshop. The inner side of the plate is

fitted with 10 mm size counter sunk screw at 636 mm PCD. For this 12 Nos. threaded holes of M 10 were driven in the housing. A neoprene sheet of 2 mm thick was put in between plate and housing to take care of uneven surface. A gasket of 2 mm thick is introduced between plate and cover to ensure that oil does not come out (Please see Fig. No. 4 and 5).

Such a plate was first tried at CTPL No. 4 motor on trial basis on 01-03-2002 to see the effect of such modification. The cooling oil of this motor was periodically checked to ensure that there was no water content inside the cooling oil. It may be mentioned that there is no complaint of failure of this motor till date i.e. after 7 years. There after plates of this design were fabricated in SS material to avoid rusting and introduced in many motors of CW Pump / RWP and CTPL. The results of this modification are very much encouraging given the fact that there has not been a single complaint of top bearing since year 2002 and this is a story of success.

INSTALLED QUANTITY OF MOTORS WITH SPECIFICATIONS :-

(KTPS STAGE II, KORADI 3 X 210 MW)

CW PUMP	950 KW,	118 A,	485RPM	06 Nos.
RWP	780 KW,	95 A,	485 RPM	06 Nos.
CTPL	710 KW,	89.2 A,	485 RPM	04 Nos.

All the above motors are continuously running motors and top bearing were frequently failing. The bearing used in these motors is (Brg. No. 29434 E) which is very costly (@ 1.35 Lack).

From the record the bearing failure rate of these motors is as below.

Sept. 2000 to	Oct. 2000	-	03 Nos.
Feb. 2001 to	Dec. 2001	-	05 Nos.
Feb. 2002 to	Dec. 2002	-	05 Nos.
Jan. 2003 to	Dec. 2003	-	06 Nos.
Jan. 2004 to	Aug. 2004	-	01 No.
Aug. 2004 to	Sept. 2005	-	Nil.

Further rate of failure is Nil till date

Water seal plate modification is done for the motors.

- CTPL No. 3 Nov. 2002
- CTPL No. 4 Mar. 2002
- CW Pump 5B Aug. 2003
- RWP No. 2 Feb. 2003
- RWP No. 3 Oct. 2003
- RWP No. 4 Oct. 2003
- RWP No. 5 Aug. 2004
- CW Pump 6A Jul. 2004
- CW Pump 7B Sept. 2005

Now all the motors are fitted with water seal plate.

BENEFIT :- Since then the above motors are running smooth and no bearing related problems are noted. This has resulted into saving of @ 5 to 7 lacs per year on account of purchase of bearings and 16 man days for replacement of bearing. Beside generation loss on account of non availability of CW Pump motor is avoided which otherwise runs in to crores of rupees.

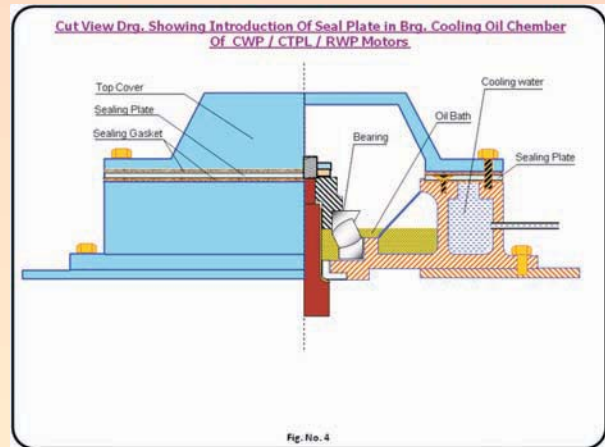


Fig. No. 4

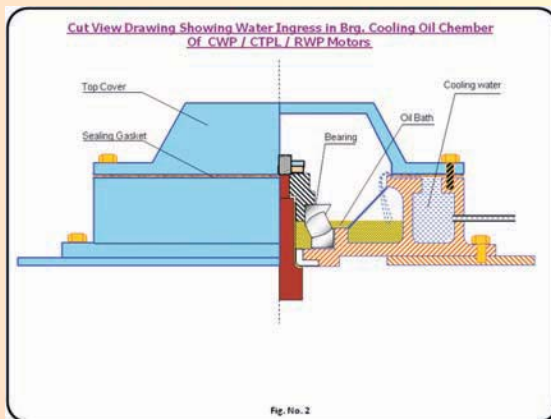


Fig. No. 2

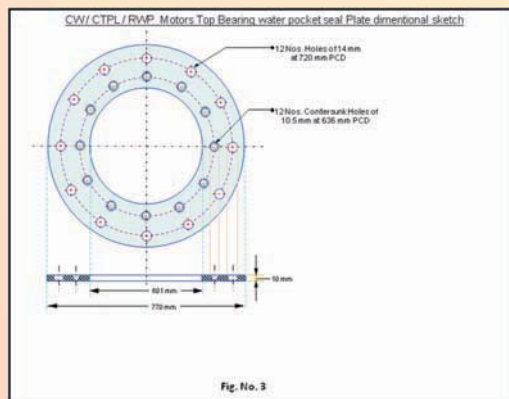


Fig. No. 3

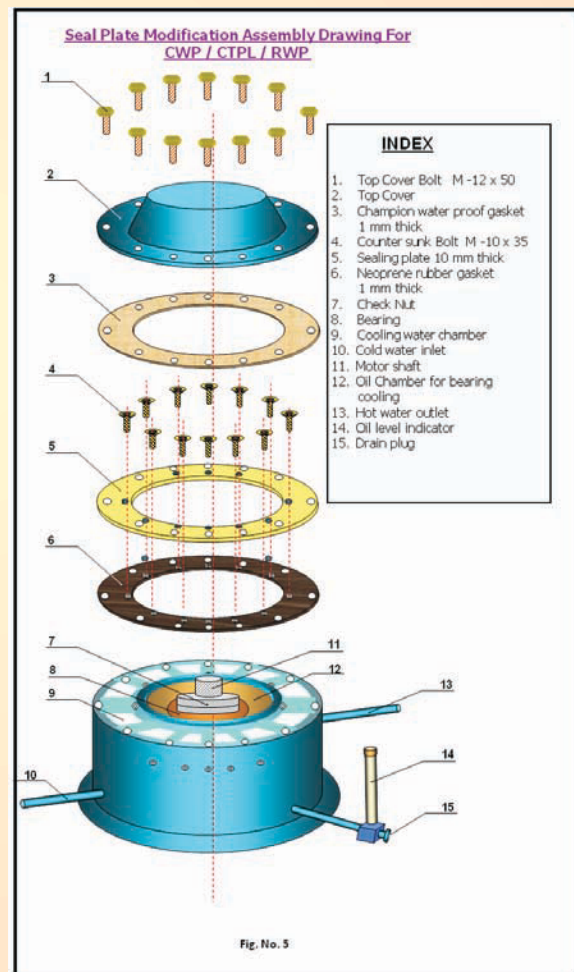


Fig. No. 5

