

### TRANSLATION

#### Torsional Vibration Calculations for the Sailing Ships "PAMIR" and "PASSAT", Works No. 605 918.

Plant: F 46a - 6 pu engine for propelling purposes max. speed of engine  
n - 350 revs., capacity N - 900 PS.

The torsional vibration calculations are based on the usual data of the single acting 4 stroke engine F 46a - 6 pu with 350 revs. at a capacity of N - 900 PSe, the shafting arrangement according to plan No. MR 2485, the flywheel according to plan No. Mo 82671 and a 2-bladed propeller of Messrs. Ostermann with a centrifugal moment of  $GD^2 - 250 \text{ kgm}^2$ .

From the particulars the 1-node natural frequency for the calculated installation results in : -

$$\begin{aligned} \text{"PASSAT"} - n_I &= 2275 \text{ (min}^{-1}\text{)} \\ n_{I6} &= 379 - 350 + 8,2 \% \end{aligned}$$

$$\begin{aligned} \text{"PAMIR"} - n_I &= 2310 \text{ (min}^{-1}\text{)} \\ n_{I6} &= 385 - 350 + 10 \% \end{aligned}$$

The 2-node natural frequency results in : -

$$\begin{aligned} n_{II} &= 3500 \text{ (min}^{-1}\text{)} \\ n_{II9} &= 389 - 350 + 11 \% \end{aligned}$$

The attached sheet No. 1 shows the corresponding masses and the swinging form. Sheet No. 2 shows the frequency table values.

The 1-node 6th order vibration occurs at the working speed + 8,2 % and a resonance stress of  $\pm T = 232 \text{ (kg/cm}^2\text{)}$  was obtained.

The additional vibration stresses arising in the working vicinity are not important and the whole installation is in order regarding the torsional vibrations.

T.V. Measurements will be taken at the free end of the crankshaft after installation.

The degree of irregularity is : -

at n- 350 revs. irregularity - 1/59 and at n- 100 revs. irreg. - 1/3,2



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