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Lloyd's Register of Shipping.

Port NEW YORK

OCTOBER 19, 1942

C-3965

This is to Certify that

C. MACPHERSON

the undersigned Surveyor to this Society did at the request of The United States Maritime Commission proceed to the Works of the Hardie-Tynes Manufacturing Company at Birmingham, Ala. on the 16th October, 1942, for the purpose of examining a two throw section of a crankshaft intended for the S.S. "OLEAN" 7118 gross tons of New York.

Upon arrival at the Works it was found that the crankshaft was set up in a lathe with adjustable centres at both ends and a steady rest about the middle of the shaft.

It was stated that new crankpins and journals had been fitted by the Hardie-Tynes Manufacturing Company in old cast steel webs supplied by the Waterman Steamship Company and used previously in Engine No. 924 built to the order of the U. S. Shipping Board in 1919 by the Hooven-Owens-Rentschler Division of the General Machinery Corporation, Hamilton, Ohio. It was stated by Mr. Stobert, the manager of the Hardie-Tynes Works, that the webs had been re-bored before fitting the new crankpins and journals, but that the holes had been left enlarged at the entry end to facilitate the shrinking operations.

The undersigned found that it was possible to insert feeler gauges of .010" to .015" at all entry sides of the journals for about ¼" depth. However, it was found that a .003" feeler gauge did not enter any more than ½". This proves that the counterbore did not extend as a taper into the body of the web, and it is thought that the Firm's statement can be taken as substantially correct.

It might be well to state here that this counterbore gave the impression that the journals were loose in the webs and the rough appearance of the webs does not tend to create a favourable impression of the standard of workmanship.

Attempts were then made, by the use of feeler gauges, to determine whether there was any movement between the crankwebs and journals, but this was abandoned owing to the difficulty of judging small differences by this means.

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It was then decided to coat the insides and outsides of all webs in way of the journals and pins with a mixture of whiting and gasoline. (Coated surfaces were first carefully cleaned with gasoline.) This formed a hard white coating which would crack easily if any movement took place between the webs and the journals and pins.

The centre steady rest was lowered and no jacks or other means used to prevent deflections between the webs. The shaft was then rotated in the lathe for about five hours, and it was also swung back and forward several times.

Upon examination, all surfaces of the whiting were found to be intact with the exception of the journal of the second web from the end of the shaft without a coupling (H.P. after web). At the journal side of the web there was slight cracking for about one-third of the periphery while on the inside of the web the line of the journal could be discerned for about the same distance. These appeared after about 30 minutes running, and it was decided to run the lathe for a longer time to see whether the markings and cracks would become more extensive or more pronounced.

After five hours the undersigned made a careful examination and found that the crack in the white coating had not extended although a small flake had fallen off. The mark on the inside of the web, while clearly outlining the end of the journal for about a third of its periphery, did not shew any signs of cracking.

In the opinion of the undersigned this evidence was not conclusive because any movement should have shown equally both inside and outside. That such is not the case can not be overlooked, however, and, in the absence of any more definite proof, pro or con, the shrinkage of this journal must remain under suspicion.

The alignment of the shaft was finally tried both with and without the steady rest which showed a maximum deflection of .009" without and .0025" with the steady rest.

In the opinion of the undersigned this shaft could be accepted in the present emergency provided:

1. The two-throw (H.P. & I.P.) section of the crankshaft be put in the lathe and the coupling be machined true.

2. The single throw (L.P.) section be likewise placed in lathe and couplings machined true.

3. The two sections be placed on blocks and properly aligned before coupling up with holes reamered and new Bolts fitted.

4. The H.P. crank be specially examined after being in service for a period of 12 months.

C. Macpherson

Surveyor to Lloyd's Register of Shipping.