

(1)

UNION IRON WORKS

ROLPH BOATS - HULLS NOS. 119 & 120

2400 HP.- 3550- 707- 90 RPM.

TURBINE SHAFT

80,000 - 50,000 - 20% in 2 inches.

$$\sqrt[3]{\frac{70 \times \text{HP} \times T}{\text{RPM} \times T}} = \sqrt[3]{\frac{70 \times 2400 \times 62720}{3550 \times 80,000}} = 3.340$$

Actual size of shaft used = 6" diameter.

TURBINE SHAFT (FLEXIBLE)

100,000 - 65,000 - 20% in 2 inches.

$$\sqrt[3]{\frac{70 \times 2400 \times 62720}{3550 \times 100,000}} = 3.10$$

Actual size of shaft used = 3-1/2" inches.

HIGH SPEED PINION

110,000 - 90,000 - 19% in 2 inches.

$$\sqrt[3]{\frac{70 \times 2400 \times 62720}{3550 \times 110,000}} = \sqrt[3]{27.0} = 3.00$$

Equivalent diameter of a hollow shaft 4.125" inside diameter-
4.500" outside diameter.

Actual size of shaft used 4.125" inside diameter and 6" outside
diameter.



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Lloyd's Register

(1/2) Foundation

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SECOND SPEED SHAFT (FIRST HALF)

75,000 - 37,500 - 18% in 2 inches.

$$\sqrt[3]{\frac{70 \times 1200 \times 62720}{707 \times 75,000}} = \sqrt[3]{99} = 4.630$$

Actual size of shaft used = 6.000" diameter.

SECOND SPEED SHAFT (SECOND HALF) FLEXIBLE

100,000 - 65,000 - 20% in 2 inches.

$$\sqrt[3]{\frac{70 \times 1200 \times 62720}{707 \times 100,000}} = \sqrt[3]{74.3} = 4.210$$

Actual size of shaft used = 4.750

SECOND SPEED HOLLOW SHAFT & PINION

90,000 - 60,000 - 20% in 2 inches.

$$\sqrt[3]{\frac{70 \times 1200 \times 62720}{707 \times 90,000}} = \sqrt[3]{83} = 4.36$$

Equivalent diameter of hollow shaft- 6.000 inside diameter and 6.545 outside diameter.

Actual size of shaft used- 6.000" inside diameter and 9.000" outside diameter.

LOW SPEED SHAFT

STEEL TO LLOYDS' SHIPPING REGISTER SPECIFICATIONS

$$\sqrt[3]{\frac{70 \times 2400}{90}} = \sqrt[3]{1862} = 12.3$$

Actual size of shaft used - 14" diameter.

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Turbine Engineering Department,
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