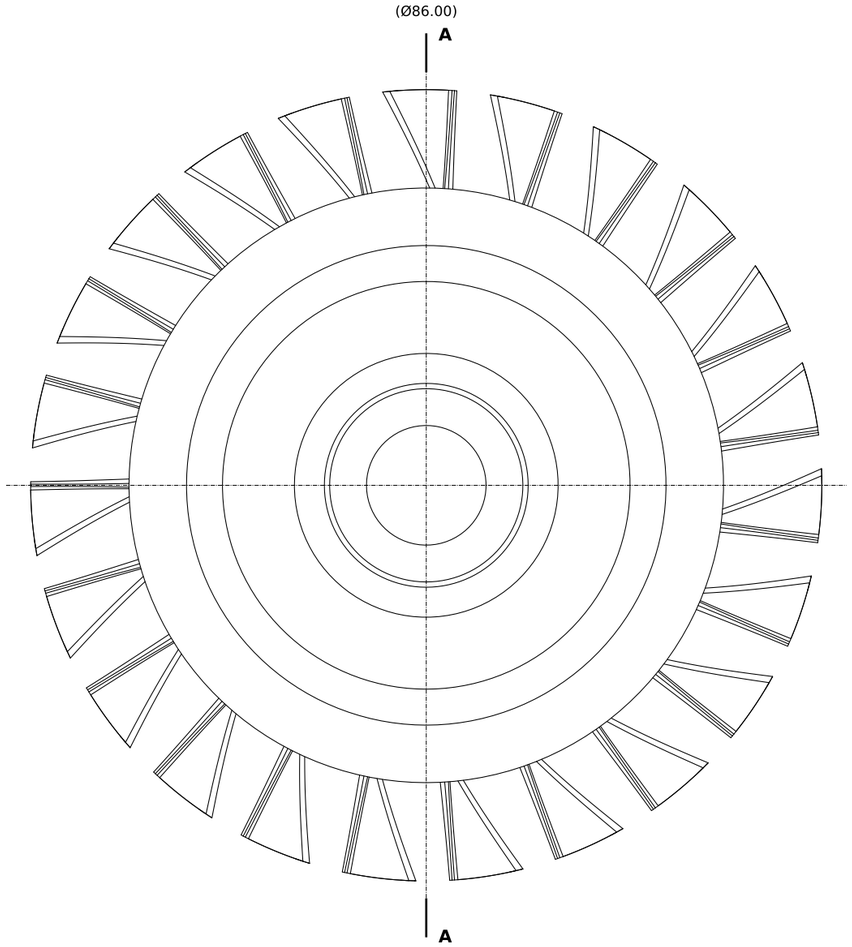
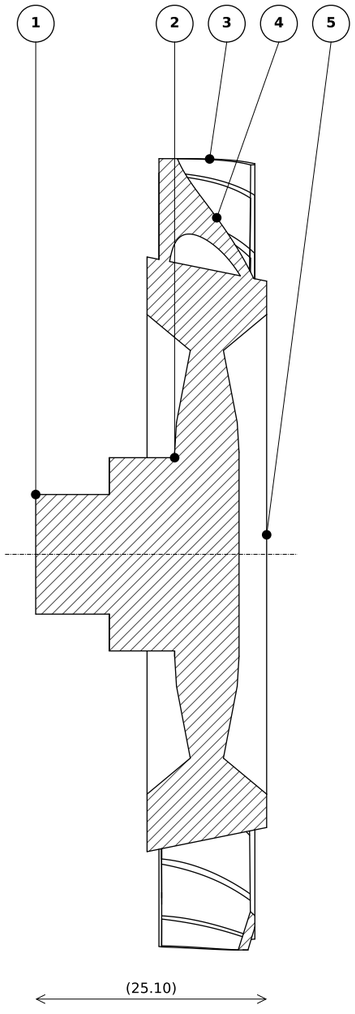


VIEW FROM THE INLET



SECTION A-A

REQUIREMENTS

1. Cast neck Ø13 ±0.05, 8 long (the heat dam's hot end), then the Ø21 boss; its weld face flat 0.02 and square to the wheel's axis (machined before welding); no bore
2. Centre plate 7 thick, the web tapering 6.6 to 3.6 (as cast, ±0.3)
3. Tip Ø86.00 0/−0.03, coaxial Ø0.01 to the shaft's A-B (ground after welding)
4. 23 blades, as cast: profile 0.1 to the axis; edges as modelled
5. Centre hole A2 (ISO 6411) in the back face, for grinding the weldment between centres

NOTES

1. Model is master: sizes not called out come from turbine.step, at the general tolerance.
2. Break sharp edges 0.1–0.3 unless noted. No burrs. No tool marks across sealing or seating faces.
3. Surface finish Ra 1.6 µm unless noted. Threads to ISO 965 (metric fine).
4. Rotor set: balanced as one assembly (the shaft-and-turbine weldment, the compressor wheel, both nuts), two planes, ISO 21940-11 G2.5 at 86,000 rpm. Scribe the angular position after balancing; reassemble to it.
5. Experimental use only. Sold under Highland's experimental-use agreement.
6. Investment cast in Alloy 713C (AMS 5391), used as cast; solid, no bore. Machining stock 0.5 mm on the stub, the tip diameter and the back face's centre, and 3 mm more on the neck's end for the weld's upset (the welder sets it); the blades are as cast. Cast from a pattern printed in castable resin (patterns.py), scaled for the shrink the foundry gives. Mass 255 ±4 g.
7. Disc (disc.py, solid centre, 150 K rim-hot): worst 522 MPa at r 22 mm, 1.42x on yield there; bursts at 1.71x speed; blades 18,477 h to rupture.
8. Fluorescent penetrant and X-ray inspection of the casting before welding (ASTM E1417, E1742); the weld inspected with the shaft (HL-TJ-05).
9. Inspection report, CMM and material certificates are add-ons on the quote.

HIGHLAND Turbojet, 170 N class

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PART Turbine wheel (welded to the shaft)	PART NUMBER HL-TJ-16		REVISION A
MATERIAL Alloy 713C (UNS N07713), investment cast to AMS 5391, as cast			
FINISH None, as machined		HEAT TREAT None (used as cast)	
TOLERANCE UNLESS NOTED ±0.13 mm (±0.005 in) unless noted; angles ±0.5°			
QUANTITY 1 per engine	MASS 255.5 g		SCALE 1.5:1
UNITS mm	PROJECTION Third angle	DATE 2026-11-20	SHEET A3, 1 of 1