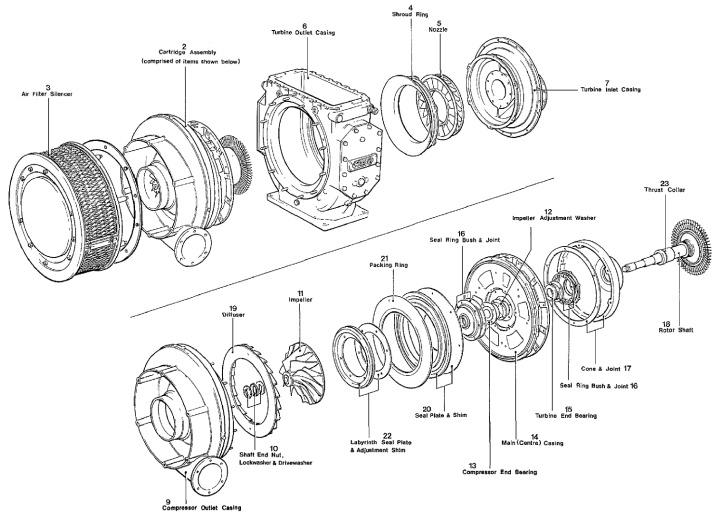
Service report

Turbo charger

Client	Fornaes ApS	Job number	120389
Ships' name	NAPIER	Component No.	C209081
Engineno.	NAPIER	Date Workshop In	2024-09-12
Engine type		Print Date	2025-01-29
Engine rHrs(calc)		Quality control by	Bolier iPad Turbo
Turbo charger serial No.	240	Type	NA357
		Specification	4GS126B180K

1. Drawing and condition at arrival



2. Maintenance overview

A. Standard overhaul has been executed, including:

- Disassembly
- Cleaning
- Inspection & measurement
- Assembly with new gaskets and seals

B. Additional work carried out:

Item	Quantity	Remark
Turbine inlet casing	1	
Turbine outlet casing	1	

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Turbo charger cont.

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3. Measurements & wear limits

Item	Min. value	Min. limit	Max. value	Max. limit	Measured value	Remark
Turbine Blisc/Cone clearance	2,85	2,85	3,35	3,35	**3,25**	
Impeller axial clearance	1,05	1,05	1,15	1,15	**1,10**	
Compressor end bearing trust clearance	0,105	0,105	0,345	0,345	**0,20**	

4. Findings

Item	Serial No./ IMO No.	Condition	Recommendation	Decision	Remark
(6) Gas outlet casing		OK	**Reuse**		
(7) Turbine inlet casing		OK	**Reuse**		
(5) Nozzle ring		OK	**Reuse**		
(4) Shroud ring		OK	**Reuse**		
(17) Cone		OK	**Reuse**		
(9) Volute (compressor outlet casing)		OK	**Reuse**		
(19) Diffuser		OK	**Reuse**		
(21) Labyrinth seal plate		OK	**Reuse**		
(16) C/E Bearing housing		OK	**Reuse**		
(14) Main (centre) Casing		OK	**Reuse**		
(16) T/E Bearing housing		OK	**Reuse**		
(13) Compressor end bearing		Worn	**Replace**		
(15) Turbine end bearing		Worn	**Replace**		
(23) Thrust collar		Worn	**Replace**		
Thrust (axial) bearing		Worn	**Replace**		
Air filter Silencer		Deformed	**Replace**		
Lacing wire		OK	**Reuse**		
Turbine blades		OK	**Reuse**		
Speed probe		N/A	-		
Packing ring		OK	**Reuse**		
(11) Impeller		OK	**Reuse**		
(18) Shaft & Blisc		OK	**Reuse**		

A more comprehensive overview of the components that were not found in "OK" condition, can be seen on the next pages.

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5. Findings elaboration

Item	Serial No./ IMO No.	Condition	Recommendation	Decision	Remark
(13) Compressor end bearing		Worn	**Replace**		

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Engineno.	NAPIER	Component No.	C209081
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5. Findings elaboration

Item	Serial No./ IMO No.	Condition	Recommendation	Decision	Remark
(15) Turbine end bearing		Worn	**Replace**		

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Turbo charger serial No.	240	Type	NA357
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5. Findings elaboration

Item	Serial No./ IMO No.	Condition	Recommendation	Decision	Remark
(23) Thrust collar		Worn	**Replace**		

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Turbo charger cont.

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Engineno.	NAPIER	Component No.	C209081
Turbo charger serial No.	240	Type	NA357
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5. Findings elaboration

Item	Serial No./ IMO No.	Condition	Recommendation	Decision	Remark
Thrust (axial) bearing		Worn	**Replace**		

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Turbo charger serial No.	240	Type	NA357
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5. Findings elaboration

Item	Serial No./ IMO No.	Condition	Recommendation	Decision	Remark
Air filter Silencer		Deformed	**Replace**		

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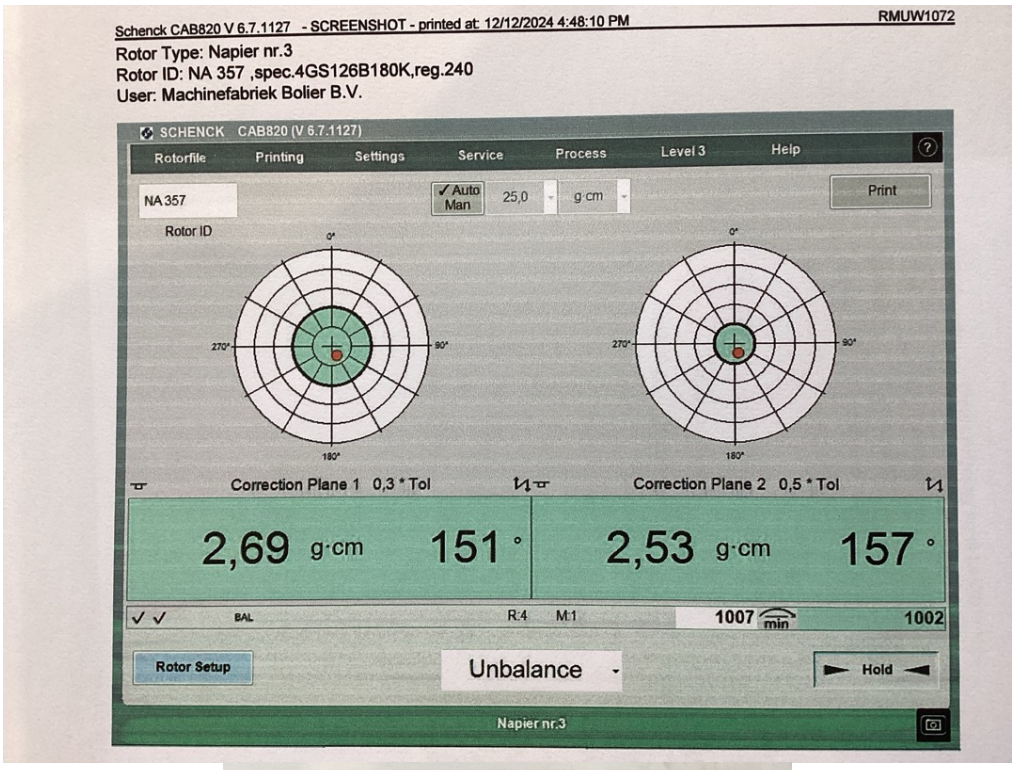
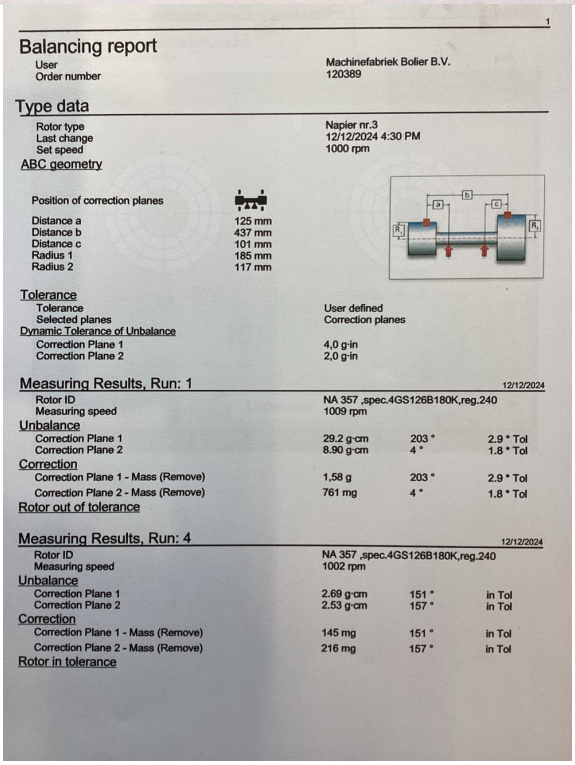
Dynamic balancing results





Balancing report

User	Machinefabriek Bolier B.V.
Order number	120389

Type data

Rotor type	Napier nr.3
Last change	12/12/2024 4:30 PM
Set speed	1000 rpm

ABC geometry

Position of correction planes	
Distance a	125 mm
Distance b	437 mm
Distance c	101 mm
Radius 1	185 mm
Radius 2	117 mm

Tolerance

Tolerance	User defined
Selected planes	Correction planes

Dynamic Tolerance of Unbalance

Correction Plane 1	4,0 g·in
Correction Plane 2	2,0 g·in

Measuring Results, Run: 1 — 12/12/2024

Rotor ID	NA 357 ,spec.4GS126B180K,reg.240		
Measuring speed	1009 rpm		
Unbalance			
Correction Plane 1	29.2 g·cm	203 °	2.9 * Tol
Correction Plane 2	8.90 g·cm	4 °	1.8 * Tol
Correction			
Correction Plane 1 - Mass (Remove)	1,58 g	203 °	2.9 * Tol
Correction Plane 2 - Mass (Remove)	761 mg	4 °	1.8 * Tol

Rotor out of tolerance

Measuring Results, Run: 4 — 12/12/2024

Rotor ID	NA 357 ,spec.4GS126B180K,reg.240		
Measuring speed	1002 rpm		
Unbalance			
Correction Plane 1	2.69 g·cm	151 °	in Tol
Correction Plane 2	2.53 g·cm	157 °	in Tol
Correction			
Correction Plane 1 - Mass (Remove)	145 mg	151 °	in Tol
Correction Plane 2 - Mass (Remove)	216 mg	157 °	in Tol

Rotor in tolerance