



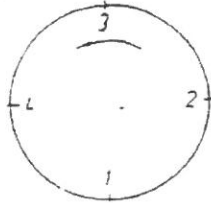
CRANKSHAFT DEFLECTION CONTROL
 INDIKERING AV VEIVAKSEL
 ENGINE NO./MOTOR NR.: 9024

0.1.03.1

Nov.-85

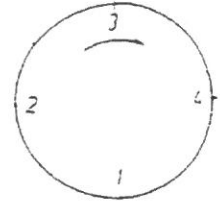
ANTICLOCKWISE ROTATION
 VENSTREGÅENDE MOTOR

CLOCKWISE ROTATION
 HØYREGÅENDE MOTOR



INDICATES DIRECTION OF ROTATION
 VISER MOTORENS DREIERETNING

SEEN FROM THE FLYWHEEL END
 SETT FRA MOTORENS SYINGHJULSENDE



CONTROL MEASUREMENT TO BE MADE IN DIRECTION OF ROTATION
 INDIKERING FORETAS I DREIERETNINGEN

*CRANK *	CRANK POSITION/VEIVSTILLING								*
* NO. *	-----								*
*VEIV *	1	*	2	*	3	*	4	*	
* NR. *	*BOTTOM / BUNN*				* TOP / TOPP *				
* * *	* COLD *	* WARM *	* COLD *	* WARM *	* COLD *	* WARM *	* COLD *	* WARM *	
* * *	* KALD *	* VARM *	* KALD *	* VARM *	* KALD *	* VARM *	* KALD *	* VARM *	
* 1 *	* 0.0 *	* 0.0 *	* -0.5 *	* 0.0 *	* -1.0 *	* -2.5 *	* -0.5 *	* -1.5 *	
* 2 *	* 0.0 *	* 0.0 *	* +0.5 *	* -1.5 *	* 0.0 *	* -4.0 *	* 0.0 *	* -3.0 *	
* 3 *	* 0.0 *	* 0.0 *	* +1.0 *	* -1.5 *	* 0.0 *	* -5.0 *	* -1.0 *	* -5.0 *	
* 4 *	* 0.0 *	* 0.0 *	* +1.5 *	* 0.0 *	* +0.5 *	* -4.0 *	* -0.5 *	* -3.0 *	
* 5 *	* 0.0 *	* 0.0 *	* +0.5 *	* -1.0 *	* -1.0 *	* -5.0 *	* -1.5 *	* -4.0 *	
* 6 *	* 0.0 *	* 0.0 *	* 0.0 *	* -2.0 *	* -2.0 *	* -6.5 *	* -2.0 *	* -5.0 *	
* 7 *	* 0.0 *	* 0.0 *	* +1.0 *	* -1.0 *	* -1.0 *	* -6.0 *	* -1.0 *	* -5.0 *	
* 8 *	* 0.0 *	* 0.0 *	* -0.5 *	* -2.0 *	* -1.5 *	* -5.5 *	* -1.5 *	* -5.0 *	

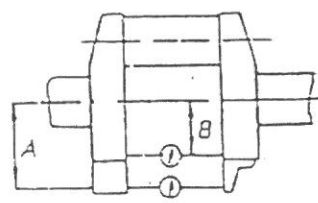
REMARKS : MEASURED ON TEST-BED.
 -BEMERKNINGER:

MEASUREMENT IN : 1/100 mm
 MÅL I : 1/100 mm

Engine-/Motor type	K	B	LD
	A	A	B
	245	260	95

DATE/DATO SIGN.

COLD/KALD: 07.03.90 WJ
 VARM/WARM: 09.03.90 MR



L - K - B



T E S T B E D R E S U L T S E N G I N E N O . : 9024.

Reading no.: 5 Date : 9. 3.90. Time : 13.25.28.

Nom. output	(%)	50.	Running hours	(h)	.5
Engine speed	(rpm)	751.	B.m.e.p.	(bar)	10.2
Engine output	(kW)	1484.	Fuel consump. time	(sec)	61.0
Generator output	(kW)	0.	Spec. fuel consump.	(g/kWh)	201.3

Barometric press. (mbar) 988.0
 Temp. engineroom (C) 26.0
 Relative humidity (%) 48.0

LUBE-OIL :		COOLING WATER :			
Temp. engine inlet	(C)	43.8	Temp. engine inlet	(C)	75.4
Temp. engine outlet	(C)	61.9	Temp. engine outlet	(C)	78.3
Press. engine inlet	(bar)	4.8	Press. engine inlet	(bar)	2.8

Fuel oil press.	(bar)	1.5	Rocker arm press.	(bar)	.5
Fuel oil temp.	(C)	12.2	Nozzle oil press.	(bar)	1.8

CYL. BANK (A for in-line engine)		*	A	*	B	*
Turbocharger speed	(rpm)	*	17398.	*	0.	*
Charge air press.	(bar)	*	.89	*	0.00	*
Charge air temp. receiver	(C)	*	33.6	*	0.0	*
Cool.water temp. CA.cooler inlet	(C)	*	21.9	*	0.0	*
Fuel rack index - mean	(mm)	*	28.5	*	0.0	*
Exhaust-gas temp. after cyl. 1	(C)	*	301.	*	0.	*
" " " 2	"	*	306.	*	0.	*
" " " 3	"	*	294.	*	0.	*
" " " 4	"	*	290.	*	0.	*
" " " 5	"	*	299.	*	0.	*
" " " 6	"	*	299.	*	0.	*
" " " 7	"	*	299.	*	0.	*
" " " 8	"	*	279.	*	0.	*
" " " mean	"	*	296.	*	0.	*
" " " turbin	"	*	0.	*	0.	*
Max. cylinder press. cyl. 1	(bar)	*	104.	*	0.	*
" " 2	"	*	104.	*	0.	*
" " 3	"	*	105.	*	0.	*
" " 4	"	*	104.	*	0.	*
" " 5	"	*	103.	*	0.	*
" " 6	"	*	103.	*	0.	*
" " 7	"	*	105.	*	0.	*
" " 8	"	*	108.	*	0.	*
" " mean	"	*	105.	*	0.	*



CERTIFICATE FOR DIESEL ENGINE

DET NORSKE VERITAS

Form No. 72.00a
Page 1
Certificate No.
BGN 79/90

Manufacturer Bergen Diesel A/S, Bergen, Norway Works order No. 388140
 Type designation BRM-8 Serial No. 9024
 Ordered by Seatrans I/S, Bergen, Norway Order No.
 Intended for (incl. Ship, Rig, Installation) Hermann Sürken GmbH & Co., West Germany Yard No. or Signal letters 365

THIS IS TO CERTIFY that the diesel engine, described below, has been built and tested in accordance with the requirements of: Det norske Veritas

MAIN ENGINE				AUXILIARY ENGINE				
2-stroke	4-stroke	Number of cylinders	Diameter of cylinders	Length of stroke	MEAN PRESSURE Effective at	at	MAXIMUM CONTINUOUS OUTPUT	
			mm	mm	bar	r.p.m.	kW	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	8	320	360	20.6	750	2995	750
MAXIMUM FIRING PRESSURE at				MAIN COLLUMNS				
151 bar				Cast				
750 r.p.m.				Welded				
22.2 bar				<input checked="" type="checkbox"/>				
SUPERCHARGER				Type				
Type				Number				
Brown Boveri Corp.				VTR 304/11				
TORSIONAL VIBRATION DAMPER				IMPORTANT CONNECTED PUMPS				
Type				Number				
Fluid				1				
Remarks				Lubrication oil pump				

The engine was stamped on Engine Block Maneuver Side
 NV
 BGN
 9-3-90
 WEL

The marking is placed on Engine Block Maneuver Side
 The following components, which must be surveyed after the installation, are not included in the certificate:
 EO-system to be surveyed onboard ship.
 Overspeed protective device also to be checked.

Material certificates and drawings with dates of approval, see reverse side. Place Bergen
 When this certificate is issued based on VERITAS approval and auditing of the manufacturers QA-system mark x in corner below. Date 09.03.90.
 If marked x, see reverse side. *John B. Welby* Supervisor
 John B. Welby

DET NORSKE VERITAS
 BERGEN

It is the responsibility of the manufacturer to ensure that the engine is built in accordance with the requirements of the certificate. The certificate is issued on the basis of the information provided by the manufacturer. The certificate is not a guarantee of performance. The certificate is issued on the basis of the information provided by the manufacturer. The certificate is not a guarantee of performance. The certificate is issued on the basis of the information provided by the manufacturer. The certificate is not a guarantee of performance.



ENGINE TEST REPORT

Engine no. : 9024 Engine type : BRM - 8
Max. cont. rating (kW) : 2995 Engine speed (rpm) : 750

Gen. make : -
Gen. no.: -

Gen. spec.: kW kVA Volt Amp. Hz cos fi
" : - - - - -

Owner : Seatrans I/S, Bergen
Shipyard : Hermann Surken GmbH & Co. Papenburg
Yard no.: S 365
Classification society : DnV EO
Tested date : 09.03.90

Fuel type (-) : MDO Viscosity (cSt) : 3.0
Lower calorific value (MJ/kg): 42.7 Density (g/cm3) : 0.84
Calibrated fuel quantity (g): 5060

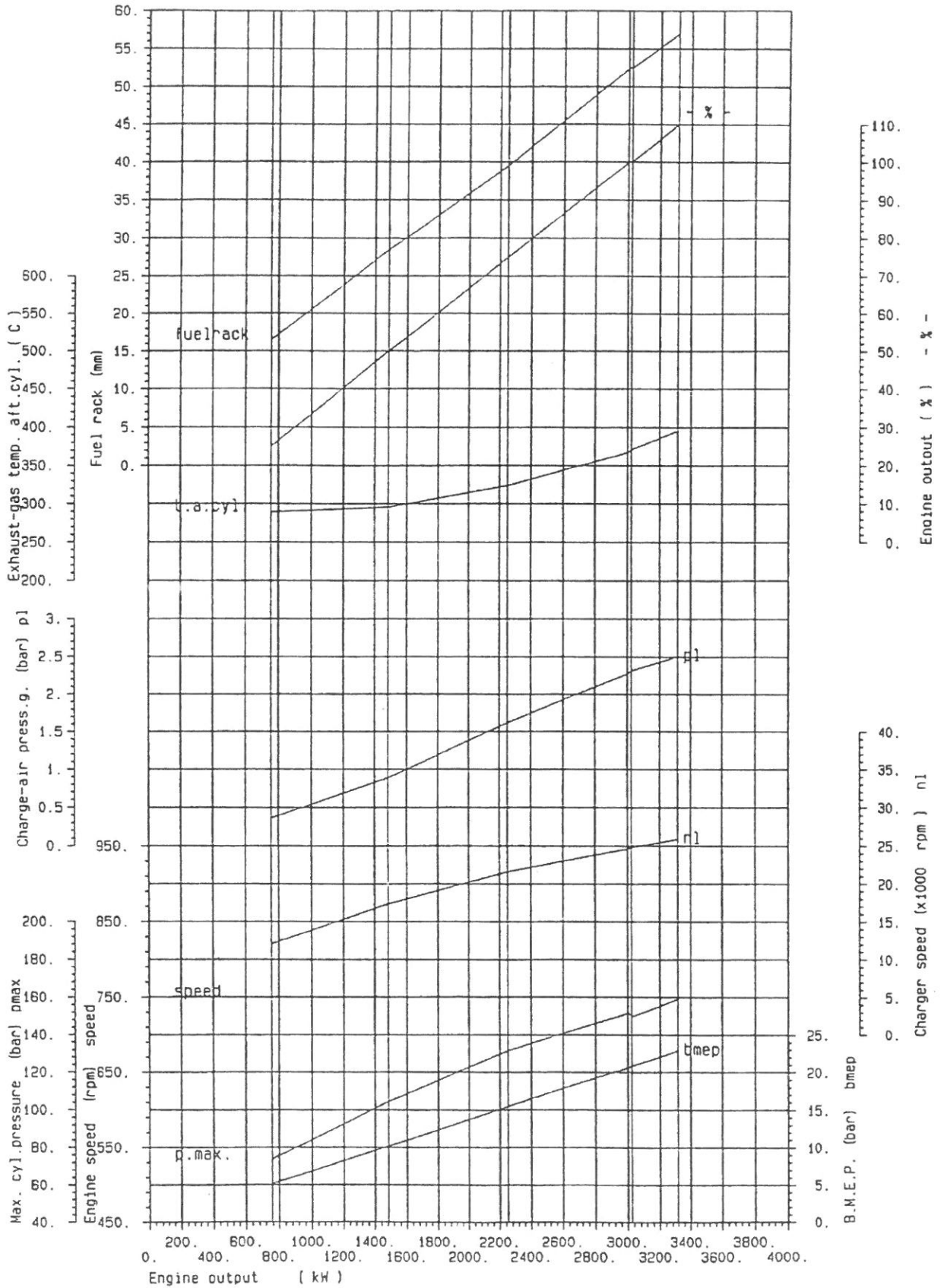
OVERSPEED ADJUSTED TO (rpm): 900

Test approved by:

Bergen Diesel date: 10.03.90 sign.: [Signature]
Buyer date: sign.:
Owner date: sign.:
Classification society date: 9.03.90 sign.: [Signature]
date: sign.:

ENGINE-PERFORMANCE BERGEN DIESEL

ENGINE NO.: ENGINE NO.9024
 ENGINE TYPE: BRM - 8
 TESTED DATE: 09.03.90 tb.





T E S T B E D R E S U L T S E N G I N E N O . : 9024.

Reading no.: 1 Date : 9. 3.90. Time : 10. 4.57.

Nom. output	(%)	100.	Running hours	(h)	2.0
Engine speed	(rpm)	751.	B.m.e.p.	(bar)	20.9
Engine output	(kW)	3026.	Fuel consump. time	(sec)	30.1
Generator output	(kW)	0.	Spec. fuel consump.	(g/kWh)	200.0

Barometric press. (mbar) 989.0
 Temp. engineroom (C) 26.0
 Relative humidity (%) 49.0

LUBE-OIL :		COOLING WATER :	
Temp. engine inlet	(C)	44.9	Temp. engine inlet (C) 73.9
Temp. engine outlet	(C)	66.9	Temp. engine outlet (C) 80.9
Press. engine inlet	(bar)	4.7	Press. engine inlet (bar) 2.7

Fuel oil press.	(bar)	1.4	Rocker arm press.	(bar)	.5
Fuel oil temp.	(C)	15.8	Nozzle oil press.	(bar)	1.8

 CYL. BANK (A for in-line engine) * A * B *

Turbocharger speed	(rpm)	*	24888.	*	0.	*
Charge air press.	(bar)	*	2.32	*	0.00	*
Charge air temp. receiver	(C)	*	52.7	*	0.0	*

Cool.water temp. CA.cooler inlet	(C)	*	19.6	*	0.0	*
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Fuel rack index - mean	(mm)	*	52.5	*	0.0	*
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Exhaust-gas temp. after cyl. 1	(C)	*	388.	*	0.	*
" " " 2	"	*	387.	*	0.	*
" " " 3	"	*	361.	*	0.	*
" " " 4	"	*	358.	*	0.	*
" " " 5	"	*	377.	*	0.	*
" " " 6	"	*	361.	*	0.	*
" " " 7	"	*	390.	*	0.	*
" " " 8	"	*	351.	*	0.	*
" " " mean	"	*	372.	*	0.	*
" " " turbin	"	*	0.	*	0.	*

Max. cylinder press. cyl. 1	(bar)	*	151.	*	0.	*
" " 2	"	*	149.	*	0.	*
" " 3	"	*	150.	*	0.	*
" " 4	"	*	149.	*	0.	*
" " 5	"	*	149.	*	0.	*
" " 6	"	*	148.	*	0.	*
" " 7	"	*	150.	*	0.	*
" " 8	"	*	153.	*	0.	*
" " mean	"	*	150.	*	0.	*



T E S T B E D R E S U L T S E N G I N E N O. : 9024.

Reading no.: 2 Date : 9. 3.90. Time : 10.53.14.

Nom. output	(%)	100.	Running hours	(h)	4.0
Engine speed	(rpm)	751.	B.m.e.p.	(bar)	20.7
Engine output	(kW)	3006.	Fuel consump. time	(sec)	30.3
Generator output	(kW)	0.	Spec. fuel consump.	(g/kWh)	200.0

Barometric press.	(mbar)	989.0
Temp. engineroom	(C)	26.0
Relative humidity	(%)	48.0

LUBE-OIL :		COOLING WATER :		
Temp. engine inlet	(C)	46.4	Temp. engine inlet (C)	73.9
Temp. engine outlet	(C)	68.1	Temp. engine outlet (C)	80.8
Press. engine inlet	(bar)	4.7	Press. engine inlet (bar)	2.7

Fuel oil press.	(bar)	1.5	Rocker arm press.	(bar)	.5
Fuel oil temp.	(C)	14.6	Nozzle oil press.	(bar)	1.8

CYL. BANK (A for in-line engine)	*	A	*	B	*
Turbocharger speed	(rpm)	* 24733.	*	0.	*
Charge air press.	(bar)	* 2.29	*	0.00	*
Charge air temp. receiver	(C)	* 52.9	*	0.0	*
Cool.water temp. CA.cooler inlet	(C)	* 20.4	*	0.0	*
Fuel rack index - mean	(mm)	* 52.5	*	0.0	*
Exhaust-gas temp. after cyl. 1	(C)	* 384.	*	0.	*
" " " 2	"	* 383.	*	0.	*
" " " 3	"	* 359.	*	0.	*
" " " 4	"	* 353.	*	0.	*
" " " 5	"	* 370.	*	0.	*
" " " 6	"	* 360.	*	0.	*
" " " 7	"	* 385.	*	0.	*
" " " 8	"	* 347.	*	0.	*
" " " mean	"	* 368.	*	0.	*
" " " turbin	"	* 0.	*	0.	*

Max. cylinder press.	cyl. 1	(bar)	*	152.	*	0.	*
"	" 2	"	*	152.	*	0.	*
"	" 3	"	*	152.	*	0.	*
"	" 4	"	*	151.	*	0.	*
"	" 5	"	*	150.	*	0.	*
"	" 6	"	*	149.	*	0.	*
"	" 7	"	*	153.	*	0.	*
"	" 8	"	*	156.	*	0.	*
"	mean	"	*	152.	*	0.	*



T E S T B E D R E S U L T S E N G I N E N O. : 9024.

Reading no.: 3 Date : 9. 3.90. Time : 12.27.23.

Nom. output	(%)	110.	Running hours	(h)	1.0
Engine speed	(rpm)	751.	B.m.e.p.	(bar)	22.9
Engine output	(kW)	3317.	Fuel consump. time	(sec)	27.2
Generator output	(kW)	0.	Spec. fuel consump.	(g/kWh)	201.9

Barometric press. (mbar) 988.0
 Temp. engineroom (C) 26.0
 Relative humidity (%) 48.0

LUBE-OIL :			COOLING WATER :		
Temp. engine inlet	(C)	48.7	Temp. engine inlet	(C)	73.7
Temp. engine outlet	(C)	70.8	Temp. engine outlet	(C)	81.6
Press. engine inlet	(bar)	4.7	Press. engine inlet	(bar)	2.7

Fuel oil press.	(bar)	1.4	Rocker arm press.	(bar)	.5
Fuel oil temp.	(C)	12.2	Nozzle oil press.	(bar)	1.8

CYL. BANK (A for in-line engine)		*	A	*	B	*
Turbocharger speed	(rpm)	*	25883.	*	0.	*
Charge air press.	(bar)	*	2.51	*	0.00	*
Charge air temp. receiver	(C)	*	58.0	*	0.0	*
Cool.water temp. CA.cooler inlet	(C)	*	22.0	*	0.0	*
Fuel rack index - mean	(mm)	*	57.0	*	0.0	*
Exhaust-gas temp. after cyl. 1	(C)	*	415.	*	0.	*
" " " 2	"	*	412.	*	0.	*
" " " 3	"	*	388.	*	0.	*
" " " 4	"	*	381.	*	0.	*
" " " 5	"	*	397.	*	0.	*
" " " 6	"	*	386.	*	0.	*
" " " 7	"	*	419.	*	0.	*
" " " 8	"	*	371.	*	0.	*
" " " mean	"	*	396.	*	0.	*
" " " turbin	"	*	0.	*	0.	*
Max. cylinder press. cyl. 1	(bar)	*	159.	*	0.	*
" " 2	"	*	159.	*	0.	*
" " 3	"	*	160.	*	0.	*
" " 4	"	*	159.	*	0.	*
" " 5	"	*	158.	*	0.	*
" " 6	"	*	157.	*	0.	*
" " 7	"	*	160.	*	0.	*
" " 8	"	*	162.	*	0.	*
" " mean	"	*	159.	*	0.	*



T E S T B E D R E S U L T S E N G I N E N O . : 9024.

Reading no.: 4 Date : 9. 3.90. Time : 12.57.29.

Nom. output	(%)	75.	Running hours	(h)	.5
Engine speed	(rpm)	751.	B.m.e.p.	(bar)	15.5
Engine output	(kW)	2253.	Fuel consump. time	(sec)	41.0
Generator output	(kW)	0.	Spec. fuel consump. (g/kWh)		197.2

Barometric press.	(mbar)	988.0
Temp. engineroom	(C)	26.0
Relative humidity	(%)	48.0

LUBE-OIL :		COOLING WATER :	
Temp. engine inlet	(C)	46.1	Temp. engine inlet (C) 74.3
Temp. engine outlet	(C)	66.5	Temp. engine outlet (C) 79.0
Press. engine inlet	(bar)	4.7	Press. engine inlet (bar) 2.8
Fuel oil press.	(bar)	1.4	Rocker arm press. (bar) .5
Fuel oil temp.	(C)	12.3	Nozzle oil press. (bar) 1.8

CYL. BANK (A for in-line engine)	*	A	*	B	*
Turbocharger speed (rpm)	*	21682.	*	0.	*
Charge air press. (bar)	*	1.62	*	0.00	*
Charge air temp. receiver (C)	*	43.8	*	0.0	*
Cool. water temp. CA. cooler inlet (C)	*	22.1	*	0.0	*
Fuel rack index - mean (mm)	*	39.5	*	0.0	*
Exhaust-gas temp. after cyl. 1 (C)	*	334.	*	0.	*
" " " 2 " "	*	341.	*	0.	*
" " " 3 " "	*	322.	*	0.	*
" " " 4 " "	*	313.	*	0.	*
" " " 5 " "	*	326.	*	0.	*
" " " 6 " "	*	322.	*	0.	*
" " " 7 " "	*	329.	*	0.	*
" " " 8 " "	*	307.	*	0.	*
" " " mean " "	*	324.	*	0.	*
" " " turbin " "	*	0.	*	0.	*
Max. cylinder press. cyl. 1 (bar)	*	131.	*	0.	*
" " 2 " "	*	132.	*	0.	*
" " 3 " "	*	132.	*	0.	*
" " 4 " "	*	130.	*	0.	*
" " 5 " "	*	131.	*	0.	*
" " 6 " "	*	129.	*	0.	*
" " 7 " "	*	132.	*	0.	*
" " 8 " "	*	135.	*	0.	*
" " mean " "	*	132.	*	0.	*



T E S T B E D R E S U L T S E N G I N E N O. : 9024.

Reading no.: 6 Date : 9. 3.90. Time : 13.50.18.

Nom. output	(%)	25.	Running hours	(h)	.5
Engine speed	(rpm)	751.	B.m.e.p.	(bar)	5.2
Engine output	(kW)	755.	Fuel consump. time	(sec)	106.0
Generator output	(kW)	0.	Spec. fuel consump.	(g/kWh)	227.7

Barometric press. (mbar) 988.0
 Temp. engineroom (C) 26.0
 Relative humidity (%) 48.0

LUBE-OIL :		COOLING WATER :			
Temp. engine inlet	(C)	47.2	Temp. engine inlet	(C)	76.4
Temp. engine outlet	(C)	62.0	Temp. engine outlet	(C)	78.1
Press. engine inlet	(bar)	4.8	Press. engine inlet	(bar)	2.7

Fuel oil press.	(bar)	1.8	Rocker arm press.	(bar)	.5
Fuel oil temp.	(C)	11.7	Nozzle oil press.	(bar)	1.8

CYL. BANK (A for in-line engine)		*	A	*	B	*
Turbocharger speed	(rpm)	*	12120.	*	0.	*
Charge air press.	(bar)	*	.37	*	0.00	*
Charge air temp. receiver	(C)	*	68.7	*	0.0	*
Cool.water temp. CA.cooler inlet	(C)	*	21.5	*	0.0	*
Fuel rack index - mean	(mm)	*	16.5	*	0.0	*
Exhaust-gas temp. after cyl. 1	(C)	*	284.	*	0.	*
" " " 2	"	*	291.	*	0.	*
" " " 3	"	*	288.	*	0.	*
" " " 4	"	*	284.	*	0.	*
" " " 5	"	*	304.	*	0.	*
" " " 6	"	*	305.	*	0.	*
" " " 7	"	*	289.	*	0.	*
" " " 8	"	*	274.	*	0.	*
" " " mean	"	*	290.	*	0.	*
" " " turbin	"	*	0.	*	0.	*

Max. cylinder press.	cyl. 1	(bar)	*	74.	*	0.	*
"	" 2	"	*	73.	*	0.	*
"	" 3	"	*	74.	*	0.	*
"	" 4	"	*	73.	*	0.	*
"	" 5	"	*	73.	*	0.	*
"	" 6	"	*	73.	*	0.	*
"	" 7	"	*	73.	*	0.	*
"	" 8	"	*	77.	*	0.	*
"	mean	"	*	74.	*	0.	*
