



## Gen-set FAT Report

ORDER	: MAN	
OWNER	: -	
PJT NAME	: A3	
HULL No.	: -	SHIP NAME : -
MODEL	: 18V32/40	ENGINE No. : SB18V32-10213
DATE	: 2011-02-21	(MAN No. 1068379)

No. 41 GENERATING SET

WITNESSED BY  
(OWNER)

APPROVED BY  
(STX Eng)

WITNESSED BY  
(MAN)

CHECKED BY  
(STX Eng)

WITNESSED BY  
(SHIPYARD)

CHECKED BY  
(STX Eng)

WITNESSED BY  
(CLASS)

DRAWN BY  
(STX Eng)

S.Y JUNG

STX ENGINE CO., LTD.

# 1. SPECIFICATION OF TEST ENGINE

ENGINE NO. SB18V32-10213

DATE :

2011-02-21

MAIN DATA FOR DIESEL ENGINE	ENGINE MODEL	18V32/40
	NO. OF CYLINDER	18 ea
	CYCLE	4-STROKE
	DIAMETER OF CYLINDER	320 mm
	STROKE OF PISTON	400 mm
	RATED OUTPUT	9080 kW
	RATED SPEED	720 rpm
	MAX.FIRING PRESSURE (IN COMBUSTION CHAMBER / TEST COCK)	190 / 196 bar
	ROTATION DIRECTION	C.W VIEW FROM FLYWHEEL
MAIN DATA FOR ALTERNATOR	MAKER	HHI
	TYPE	HAR7 189 - 1028
	SERIAL NO	20100184RBH01402
	CAPACITY	11032kVA
	EFFICIENCY, COS $\phi$ = 1.0, 25%/50%/75%/85%/100%	96.6%/97.8%/98.0%/98.0%/98.0%
	VOLTAGE	13800 V
	CURRENT	461.5 A
	FREQUENCY	60 Hz
	POWER FACTOR	0.8
MAIN DATA FOR TURBOCHARGER	MAKER	STX METAL
	TYPE	NR34/S146
	SERIAL NO	A : SMN 0635 B: SMN 0636
MAIN DATA FOR GOVERNOR	MAKER / TYPE	HEINZMANN / STG 180-01
	SERIAL NO	-
	ACTUATOR SERIAL NO	10 07 030417-180
ACCESSORIES	AIR COOLER SERIAL NO.	A: 20000374/120-06 B: -03
	L.O COOLER SERIAL NO.	-
	F.O PUMP SERIAL NO.	-
	L.O PUMP SERIAL NO.	10B020C 1061
	H.T F.W PUMP SERIAL NO.	10B020C 1366
	L.T F.W PUMP SERIAL NO.	10B020C 1369
FUEL OIL	NAME	MARINE DIESEL OIL
	SPECIFIC GRAVITY	0.9030 (15°C, Kg/L )
	VISCOSITY	6.96 (40°C, mm <sup>2</sup> /s )
	L.C.V	10041 kcal/kg
LUB. OIL FOR ENGINE & T/C	NAME	DAPHNE MARINE OIL SX - 40
	FLASH POINT	270 (°C)
	VISCOSITY	128.3 (40°C, mm <sup>2</sup> /s )

## 2. ENGINE LOAD TEST SHEET (1)

ENGINE NO. : SB18V32-10213

BED NO. : 5(A4)

DATE : 2011-02-21

LOAD		%	25%	50%	75%	85%	100%	100%	REMARK
TIME OF RECORDING		min	20	20	20	30	30	30	
ENGINE SPEED		rpm	720	720	720	720	720	720	
GENERATOR SPEED		rpm	720	720	720	720	720	720	
GENERATOR EFFICIENCY		%	96.6	97.8	98.0	98.0	98.0	98.0	
ENGINE LOAD		kw	2270	4540	6810	7718	9080	9080	
GENERATOR LOAD		kw	2193	4440	6674	7564	8898	8898	
T/C SPEED	A-BANK (X1000)	rpm	10.50	16.80	21.20	22.79	24.50	24.60	
	B-BANK (X1000)	rpm	10.50	16.80	21.20	22.76	24.50	24.50	
GOVERNOR FUEL POSITION		pos.	31	50	65	71	80	80	
AMBIENT TEMPERATURE		°C	14	15	15	15	16	16	
ATMOSPHERE PRESSURE		mbar	1026	1025	1025	1024	1024	1023	
FUEL OIL	MEASURING	kg	136.7	242.8	349.5	390.8	464.6	464.7	
	TIME	min/Sec	15'00"	15'00"	15'00"	15'00"	15'00"	15'00"	
CONSUMPTION	CONSUMPTION	kg/h	546.8	971.2	1398.0	1563.2	1858.4	1858.8	
	CONSUMPTION	g/kW-h	239.8	211.9	204.7	202.0	204.5	204.5	
	ISO, CONSUMPTION	g/kW-h	236.8	209.0	201.9	199.3	201.7	201.7	
COOLING WATER	H/T PRESSURE	bar	2.4	2.5	2.5	2.5	2.5	2.5	
	L/T PRESSURE	bar	3.7	3.7	3.7	3.7	3.7	3.7	
	NCW PRESSURE	bar	2.4	2.5	2.5	2.5	2.5	2.5	
CHARGE AIR ENGINE INLET PRESS		bar	0.3	1.2	2.3	2.8	3.4	3.4	
T/C GAS INLET PRESS	A-BANK	bar	0.35	0.90	1.65	2.02	2.50	2.50	
	B-BANK	bar	0.35	0.90	1.65	2.02	2.50	2.50	
FUEL OIL ENGINE INLET PRESS		bar	5.1	5.0	5.0	5.0	5.0	5.0	
LUB OIL PRESSURE	ENGINE INLET	bar	4.3	4.3	4.2	4.1	4.0	4.0	
	T/C IN (A-BANK)	bar	1.5	1.5	1.5	1.5	1.5	1.5	
	T/C IN (B-BANK)	bar	1.5	1.5	1.5	1.5	1.5	1.5	
FUEL INJECTION PUMP RACK POSITION (A-BANK)	1	mm	14.0	21.0	28.0	31.0	35.0	35.0	
	2	mm	14.0	21.0	28.0	31.0	35.0	35.0	
	3	mm	13.0	21.0	27.5	30.5	35.0	35.0	
	4	mm	14.0	21.0	28.0	31.0	35.0	35.0	
	5	mm	14.0	21.0	28.0	30.5	35.0	35.0	
	6	mm	14.0	21.0	28.0	31.0	35.0	35.0	
	7	mm	14.0	21.0	28.0	31.0	35.5	35.5	
	8	mm	14.0	21.5	28.0	31.0	36.0	36.0	
	9	mm	13.0	20.5	27.0	30.0	35.0	35.0	
	Mean	mm	<b>13.8</b>	<b>21.0</b>	<b>27.8</b>	<b>30.8</b>	<b>35.2</b>	<b>35.2</b>	
FUEL INJECTION PUMP RACK POSITION (B-BANK)	1	mm	14.0	21.0	28.0	31.0	35.0	35.0	
	2	mm	14.0	21.0	28.0	30.5	35.0	35.0	
	3	mm	14.5	22.0	28.0	31.0	36.0	36.0	
	4	mm	14.5	22.0	28.0	31.0	35.5	35.5	
	5	mm	14.5	22.0	28.0	31.0	36.0	36.0	
	6	mm	14.5	22.0	28.0	31.0	35.5	35.5	
	7	mm	14.0	21.0	28.0	30.5	35.0	35.0	
	8	mm	14.0	21.0	28.0	30.5	35.0	35.0	
	9	mm	14.5	22.0	28.0	31.0	36.0	36.0	
	Mean	mm	<b>14.3</b>	<b>21.6</b>	<b>28.0</b>	<b>30.8</b>	<b>35.4</b>	<b>35.4</b>	

### 3. ENGINE LOAD TEST SHEET (2)

ENGINE NO. : SB18V32-10213

BED NO. : 5(A4)

DATE : 2011-02-21

LOAD		%	25%	50%	75%	85%	100%	100%	REMARK	
TIME OF RECORDING		min	20	20	20	30	30	30		
MAXIMUM FIRING PRESSURE  (AT INDICATOR COCK)	A-BANK	1	bar	78	116	158	177	197	198	
		2	bar	78	116	159	178	197	197	
		3	bar	77	114	156	176	195	195	
		4	bar	79	116	158	176	196	196	
		5	bar	80	119	161	181	200	200	
		6	bar	79	118	159	177	195	195	
		7	bar	80	117	158	176	195	195	
		8	bar	81	118	158	177	195	195	
		9	bar	79	119	159	178	198	196	
	Mean	bar	<b>79.0</b>	<b>117.0</b>	<b>158.4</b>	<b>177.3</b>	<b>196.4</b>	<b>196.3</b>		
	B-BANK	1	bar	79	115	158	178	200	200	
		2	bar	82	118	160	179	198	198	
		3	bar	79	114	157	176	196	196	
		4	bar	81	116	158	176	195	195	
		5	bar	82	117	159	178	198	198	
		6	bar	81	117	159	178	196	196	
		7	bar	80	118	160	179	199	199	
		8	bar	81	118	160	179	196	196	
		9	bar	82	118	160	181	199	199	
Mean	bar	<b>80.8</b>	<b>116.8</b>	<b>159.0</b>	<b>178.2</b>	<b>197.4</b>	<b>197.4</b>			
EXHAUST GAS TEMPERATURE	CYLINDER OUTLET (A-BANK)	1	°C	355	315	322	324	349	348	
		2	°C	366	318	330	331	354	354	
		3	°C	334	305	312	316	339	339	
		4	°C	372	330	345	345	375	374	
		5	°C	350	318	333	336	361	361	
		6	°C	370	332	343	342	371	369	
		7	°C	374	347	353	355	378	377	
		8	°C	380	348	355	357	384	383	
		9	°C	362	334	353	355	383	384	
	Mean	°C	<b>362.6</b>	<b>327.4</b>	<b>338.4</b>	<b>340.1</b>	<b>366.0</b>	<b>365.4</b>		
	CYLINDER OUTLET (B-BANK)	1	°C	343	305	322	324	345	341	
		2	°C	381	339	344	342	366	366	
		3	°C	341	306	310	314	337	335	
		4	°C	384	349	360	361	385	385	
		5	°C	363	329	334	337	360	356	
		6	°C	376	331	346	343	370	369	
		7	°C	337	307	324	329	356	354	
		8	°C	360	338	347	342	371	370	
		9	°C	389	356	360	359	381	382	
	Mean	°C	<b>363.8</b>	<b>328.9</b>	<b>338.6</b>	<b>339.0</b>	<b>363.4</b>	<b>362.0</b>		
	T/C INLET	A	°C	406	439	455	453	485	485	
B		°C	402	439	457	455	487	488		
T/C OUTLET	A	°C	359	347	314	296	300	301		
	B	°C	359	347	316	295	302	303		
T/C INLET AIR TEMP		A	°C	19	22	29	29	31	32	
		B	°C	19	22	29	29	31	32	
T/C OUTLET BACK PRESSURE		mmAq	8	50	120	160	210	210		
CRANK CASE INSIDE PRESSURE		mmAq	7	9	10	13	20	20		

## 4. ENGINE LOAD TEST SHEET (3)

ENGINE NO. : SB18V32-10213

BED NO. : 5(A4)

DATE : 2011-02-21

LOAD		%	25%	50%	75%	85%	100%	100%	REMARK		
TIME OF RECORDING		min	20	20	20	30	30	30			
LOW TEMP. COOLING WATER TEMPERATURE	AIR COOLER INLET	°C	33	34	34	32	33	32			
	AIR COOLER OUTLET	°C	-	-	-	-	-	-			
	L.O COOLER INLET	°C	-	-	-	-	-	-			
	L.O COOLER OUTLET	°C	-	-	-	-	-	-			
	H.T COOLER INLET	°C	-	-	-	-	-	-			
	H.T COOLER OUTLET	°C	-	-	-	-	-	-			
HIGH TEMP. COOLING WATER TEMPERATURE	AIR COOLER INLET	°C	76	67	66	60	58	57			
	AIR COOLER OUTLET (H.T ENGINE INLET)	°C	77	72	76	73	74	73			
	H.T ENGINE OUTLET	°C	81	80	83	81	85	85			
	NOZZLE COOL WATER	°C	76	68	66	60	56	56			
CHARGE AIR TEMPERATURE (A-BANK)	COOLER INLET	°C	55	110	167	187	211	212			
	COOLER OUTLET	°C	34	37	43	46	49	49			
	DIFF.PRESSURE	mmAq	206	360	510	560	630	630			
CHARGE AIR TEMPERATURE (B-BANK)	COOLER INLET	°C	54	111	166	186	210	212			
	COOLER OUTLET	°C	34	38	45	48	51	42			
	DIFF.PRESSURE	mmAq	206	360	510	560	630	630			
CHARGE AIR ENGINE INLET TEMP.		°C	-	-	-	-	-	-			
FUEL OIL TEMPERATURE	ENGINE INLET	°C	19	19	18	18	17	16			
LUB. OIL TEMPERATURE	COOLER INLET	°C	-	-	-	-	-	-			
	COOLER OUTLET	°C	-	-	-	-	-	-			
	ENGINE INLET	°C	62	61	62	64	66	66			
	T/C OUTLET(A-BANK)	°C	70	77	85	90	95	95			
	T/C OUTLET(B-BANK)	°C	70	78	87	92	97	97			
GENERATOR	BRG.TEMP'BEFORE		°C	41	44	46	48	48	49		
	BRG.TEMP'AFTER		°C	40	47	50	52	54	54		
	C.W COOLER INLET		°C	-	-	-	-	-	-		
	C.W COOLER OUTLET		°C	-	-	-	-	-	-		
	L.O COOLER INLET		°C	-	-	-	-	-	-		
	L.O COOLER OUTLET		°C	-	-	-	-	-	-		
	L.T L.O COOLER IN		°C	-	-	-	-	-	-		
	L.T L.O COOLER OUT		°C	-	-	-	-	-	-		
	WINDING TEMPERATURE	R	°C	26	30	38	45	52	57		
		S	°C	29	34	43	53	61	66		
T		°C	29	34	43	52	60	65			
BEARING & SPLASH OIL TEMPERATURE (UNDER 100% LOAD)											
NO.	01	1	2	3	4	5	6	7	8	9	10
MAIN BEARING	Refer to 11 page of measuring data.										
SPLASH OIL											

## 5. ADJUSTMENT(MEASURING) DATA SHEET

(BELOW DATA WAS MEASURED AND RECORDED BY STX Eng ITSELF AT PRELIMINARY TEST.)

ENGINE NO. : SB18V32-10213

HOT CONDITION BEARING TEMPERATURE.										UNIT: °C		
BEARING NO.	1	2	3	4	5	6	7	8	9	10		
MAIN BEARING	73	74	74	74	74	74	74	74	74	73		
Crank Pin BRG.	FORE	75	74	75	75	75	75	75	75	76	-	
	AFT	75	74	75	75	75	75	75	75	76	-	
LUB OIL TEMP.	62 °C											
CRANK SHAFT DEFLECTION(COLD ENGINE)										ROOM TEMP. : 10 °C		UNIT : 1/100 mm
POSITION \ NO	1	2	3	4	5	6	7	8	9			
LBDC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
LTDC	-1.0	1.5	0.5	-0.5	0.0	-1.5	-0.5	-0.5	-1.5			
TDC	-6.0	0.5	-2.0	-3.0	-1.5	-3.5	0.0	-0.5	-4.0			
RTDC	-6.0	-2.0	-3.0	-3.0	-1.0	-1.5	1.5	1.0	-2.0			
RBDC	-2.5	-2.0	-2.0	-2.5	-0.5	0.0	1.5	1.5	0.0			
CRANK SHAFT DEFLECTION(WARM ENGINE)										L.O TEMP. : 62 °C		* ENGINE CONNECTION
POSITION/NO.	1	2	3	4	5	6	7	8	9	- RIGID COUPLING <input type="checkbox"/> - FLEX. COUPLING <input checked="" type="checkbox"/> - FLEX. DISC <input type="checkbox"/> * ENGINE INSTALLATION - RIGID MOUNTING <input type="checkbox"/> - RESILIENT MOUNT <input checked="" type="checkbox"/>		
LBDC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
LTDC	0.0	2.0	-1.0	-1.5	-1.0	-3.0	-2.5	-2.0	-2.0			
TDC	-5.0	-2.0	-7.0	-8.0	-5.0	-8.5	-6.0	-4.0	-6.0			
RTDC	-7.0	-6.0	-9.5	-9.0	-5.0	-4.0	-3.0	-3.0	-3.0			
RBDC	-6.0	-5.5	-8.0	-7.0	-3.0	-1.5	-1.0	-1.5	-1.0			
STANDARD VALUE FOR NEW ENGINE (UNIT 1/100mm)	COLD ENGINE	* No. 1 CYL' (COUPLING SIDE) - RIGID COUP. : ±5 - FLEX. COUP. : -15 ~ +5 * OTHER CYL' : ±5				* THIS VALUE IS APPLIED FOR NEW ENGINE ONLY. PLEASE REFER TO INSTRUCTION MANUAL DURING MAINTENANCE.						
	WARM ENGINE	* ALL CYL' : -15 ~ +5										
FUEL INJECTION PUMP SETTING.												
CYL. NO.	1	2	3	4	5	6	7	8	9	10		
SHIM THICKNESS (mm)	A-BANK	10.50	11.10	10.90	11.10	10.50	11.10	11.10	11.10	11.10	-	
	B-BANK	10.50	11.10	11.10	11.10	11.10	11.10	11.30	11.30	11.30	-	
FUEL CAM LIFT (mm)	A-BANK	8.60	8.61	8.60	8.61	8.59	8.59	8.61	8.60	8.59	-	
	B-BANK	8.65	8.64	8.66	8.66	8.64	8.64	8.86	8.85	8.86	-	
GOVERNOR SETTING												
GOVERNOR TYPE	STG 180-01				STOP RACK				0.0 mm			
SPEED DROOP	-				MAXIMUM RACK				36.0 mm			
COMPENSATION	-				START LIMIT RACK				- mm			
NEEDLE VALVE SETTING	- °Open				GOV'LINK LENGTH				295 mm			

## 6. PROTECTIVE DEVICE & REMOTE CONTROL TEST SHEET

ENGINE NO. : SB18V32-10213

DATE : 2011-02-21

STARTING TEST				
NO.	TEST ITEM	STANDARD	RESULT	REMARK
1	EM'CY START	CHECK	O.K	
2	TURNING GEAR INTERLOCK	※ Test will be done at power plant.		
TRIP TEST				
NO.	TEST ITEM	STANDARD	RESULT	REMARK
1	OVER SPEED	828 rpm	827 rpm	
2	LUB OIL LOW PRESSURE ENG INLET	2.5 ± 0.1	2.5 bar	
3	SPLASH OIL HIGH TEMP.(DEVIATION 6℃)	Check	O.K	
4	OIL MIST GAS HIGH LEVEL	Check	O.K	
ALARM TEST				
NO.	TEST ITEM	STANDARD	RESULT	REMARK
1	LUB OIL LOW PRESSURE ENG INLET	2.8 ± 0.1	2.7 bar	
2	SPLASH OIL HIGH TEMP.(DEVIATION 4℃)	Check	O.K	

\* PRESSURE MEASUREMENT AT EACH GENSET RPM( For reference )

Engine RPM	T/C L.O regulating (bar)	H.T inlet (bar)	L.T inlet (bar)	L.O Engine inlet (bar)	Voltage (V)
450	1.3	1.9	2.3	3.0	9184
600	1.4	2.2	3.1	4.0	12868
720	1.5	2.5	3.9	4.5	13872

# 7. GENERATOR TEST SHEET

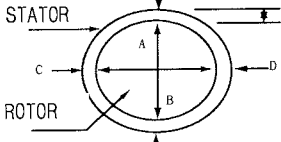
GEN. NO.: 20100184RBH01402 ENGINE NO. : SB18V32-10213 DATE : 2011-02-21

LOAD TEST				
LOAD (%)	FREQUENCY(Hz)	OUTPUT (kW)	VOLTAGE (V)	CURRENT (A)
25	60.0	2193	13770	89.5
50	60.0	4440	13769	187.5
75	60.0	6674	13773	282.5
100	60.0	8898	13771	377.5
110	60.0	9788	13768	417.0

**LOAD CHARACTERISTIC TEST (CHECKED BY STX AT THE PRELIMINARY TEST)**

LOAD RATE	%	100	75	50	25	0	25	50	75	100	110	100
LOAD	kW	8898	6674	4440	2193	0	2193	4440	6674	8898	9788	8898
VOLTAGE	V	13771	13773	13770	13771	13771	13770	13769	13773	13771	13768	13770
FREQUENCY	Hz	60.0	60.4	60.9	61.3	61.8	61.3	60.9	60.4	60.0	59.8	60.0

**TIME OF 1 Hz CHANGE**

	FREQUENCY	TIME	AIR GAP OF ALTERNATOR	
UP	59 -> 60	TO BE ADJUSTED ON SHIP FOR PARALLEL RUNNING		
	60 -> 61			
DOWN	61 -> 60			A = - mm
	60 -> 59			B = - mm C = - mm D = - mm

**GOVERNOR TEST.**

LOAD	ITEM	BEFORE	INSTANT	STABILITY	VARIATION RATE(%)		TIME
					INSTANT	STABILITY	
100 → 0	FREQUENCY (Hz)	60.0	64.8	61.8	8.0	3.0	2.6SEC
	VOLTAGE (V)	13800	14880	13800	7.8	0.0	
	SPEED (rpm)	720	778	742	8.0	3.0	
0 → 35	FREQUENCY (Hz)	61.8	59.6	61.2	3.7	1.0	2.9SEC
	VOLTAGE (V)	13800	13620	13800	1.3	0.0	
	SPEED (rpm)	742	715	734	3.7	1.0	
35 → 70	FREQUENCY (Hz)	61.2	58.4	60.6	4.7	1.0	2.7SEC
	VOLTAGE (V)	13800	13530	13800	2.0	0.0	
	SPEED (rpm)	734	701	727	4.7	1.0	
70 → 100	FREQUENCY (Hz)	60.6	59.2	60.0	2.3	1.0	1.6SEC
	VOLTAGE (V)	13800	13440	13800	2.6	0.0	
	SPEED (rpm)	727	710	720	2.3	1.0	

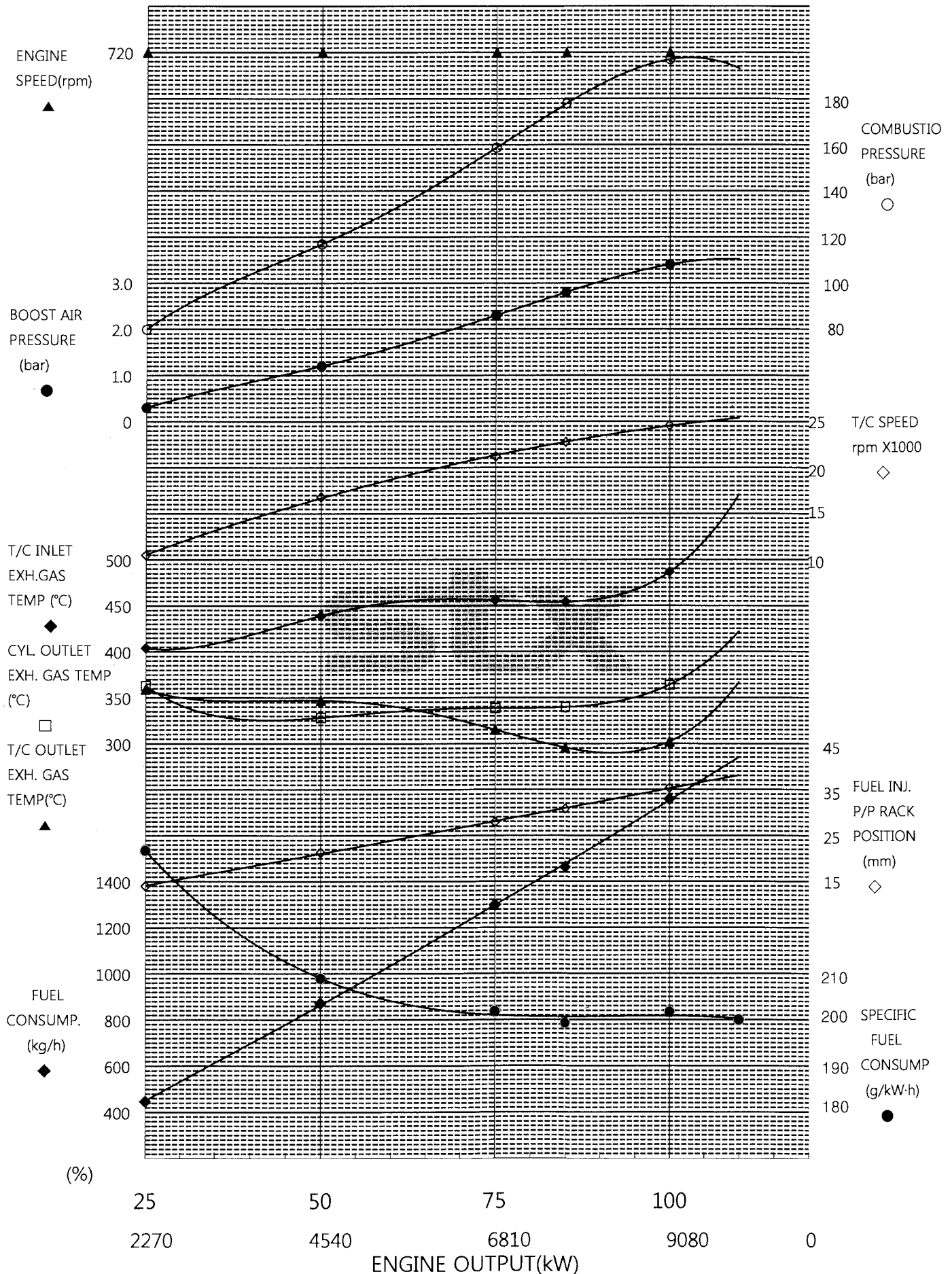
**PARALLEL RUNNING TEST**

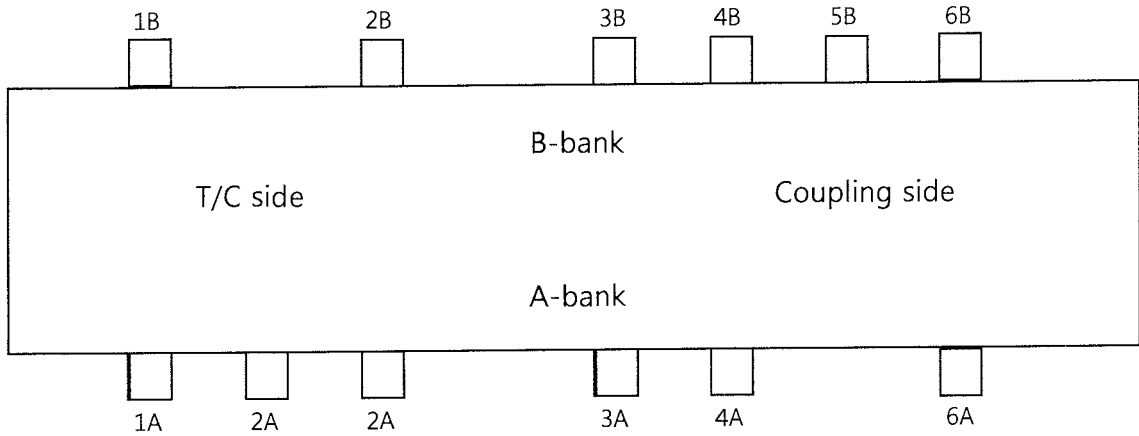
LOAD	%	75	100	75	50	20	50	75	100	75
FREQUENCY	Hz									
OUTPUT	kW									
OUTPUT	kW									



## 8. CALCULATION SHEET OF FUEL OIL CONSUMPTION

Date	2011/02/21					
Owner	-					
Pjt Name	A3					
Ship No.	-					
Engine Model	18V32/40					
Engine No.	SB18V32-10213					
Engine Output	9080 kW					
Engine Speed	720 rpm					
Fuel Oil Specific Gravity at 15 °C	0.903					
Fuel Oil Lower Calorific Value	10041 kcal/kg					
<b>Engine Load (%)</b>						
	25%	50%	75%	85%	100%	100%
<b>Generator Output (kW<sub>G</sub>) – Measured by integrating meter , G</b>						
	2203 kW	4483 kW	6692 kW	7583 kW	8908 kW	8908 kW
<b>Efficiency</b>	96.60%	97.80%	98%	98%	98%	98%
<b>Engine Output (kW<sub>D</sub>) – Design value</b>						
	2270 kW	4540 kW	6810 kW	7718 kW	9080 kW	9080 kW
<b>Engine Output (kW<sub>A</sub>) – Actual apply value , Efficiency/G</b>						
	2281 kW	4584 kW	6828 kW	7738 kW	9089 kW	9089 kW
<b>Measuring Quantity (kg), AL</b>						
	136.70 kg	242.80 kg	349.50 kg	390.80 kg	464.60 kg	464.70 kg
<b>Measuring Time (Sec), B</b>						
	900 Sec	900 Sec	900 Sec	900 Sec	900 Sec	900 Sec
<b>Specific Fuel Oil Consumption (Measured, g/kW-h), B3=(ALX3600X1000)/(BXkW<sub>A</sub>)</b>						
	239.8	211.9	204.7	202.0	204.5	204.5
<b>Ambient Temperature (°C), T1 bar</b>						
	14 °C	15 °C	15 °C	15 °C	16 °C	16 °C
<b>Charge Air Coolant Temperature (°C), T2</b>						
	33 °C	34 °C	34 °C	32 °C	33 °C	32 °C
<b>Ambient Pressure (mbar), P</b>						
	1026 mbar	1025 mbar	1025 mbar	1024 mbar	1024 mbar	1023 mbar
<b>Conversion Factor by Ambient Temperature, T1F=0.006X(25-T1)/10</b>						
	0.00660	0.00618	0.00600	0.00576	0.00570	0.00552
<b>Conversion Factor by Charge Air Coolant Temperature, T2F=0.007X(25-T2)/10</b>						
	-0.00532	-0.00609	-0.00623	-0.00518	-0.00546	-0.00518
<b>Conversion Factor by Ambient Pressure, PF=0.0007X(P-1000)/10</b>						
	0.00182	0.00175	0.00175	0.00168	0.00168	0.00161
<b>Conversion Factor by Lower Calorific Value , HF=(H-10200)/10200</b>						
	-0.01559	-0.01559	-0.01559	-0.01559	-0.01559	-0.01559
<b>Conversion Factor , TCF=T1F+T2F+PF+HF</b>						
	-0.01249	-0.01375	-0.01407	-0.01333	-0.01367	-0.01364
<b>Converted Value of F.O Consumption Based on ISO (g/KW-h) , B1=B3+(B3*TCF)</b>						
	236.8	209.0	201.9	199.3	201.7	201.7
<p>* SPEC. OF F.O CONSUMPTION :</p> <p>: 211.5 g/kW.hr with pumps at MCR Condition</p> <p>( Tolerance : + 0 % )</p>						



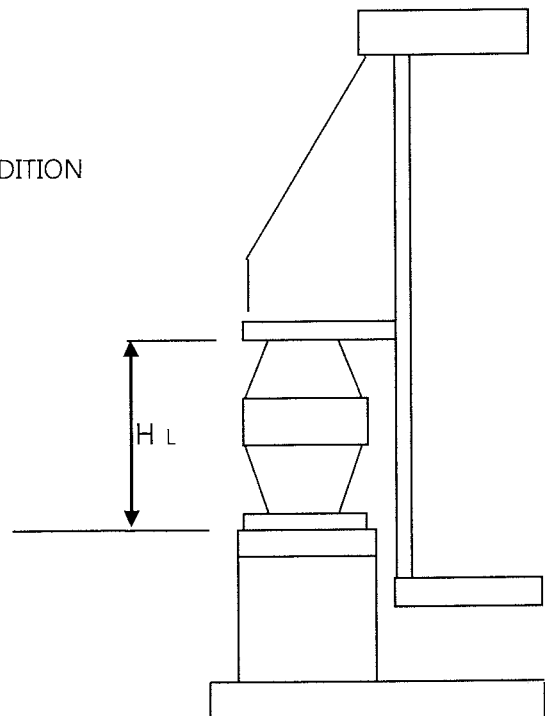


Support No.	1B	2B	3B	4B	5B	6B	-	-	-	-
HL (mm)	171.0	170.5	170.0	170.5	169.5	169.5	-	-	-	-
Support No.	1A	2A	3A	4A	5A	6A	-	-	-	-
HL (mm)	170.0	171.0	170.5	170.0	169.0	169.0	-	-	-	-

Type : 2X 60

HL = HEIGHT OF RESILIENT SUPPORT IN LOADED CONDITION

**Note !** The flexible elements must be loaded for at least 48 hours, before measurements are taken.



## BEARING & SPLASH OIL TEMPERATURE

(110% load running was done only for measuring below data)

<b>Under 25% Load</b>											
POSITION NO.	CS	1	2	3	4	5	6	7	8	9	FES
MAIN BEARING	76	78	83	81	83	83	82	82	80	84	81
SPLASH OIL	-	73	73	72	73	73	72	72	73	73	-
<b>Under 50% Load</b>											
POSITION NO.	CS	1	2	3	4	5	6	7	8	9	FES
MAIN BEARING	77	79	85	84	86	85	84	85	83	86	83
SPLASH OIL	-	75	74	74	74	74	73	73	74	74	-
<b>Under 75% Load</b>											
POSITION NO.	CS	1	2	3	4	5	6	7	8	9	FES
MAIN BEARING	77	81	89	88	90	88	88	88	87	90	84
SPLASH OIL	-	77	76	76	76	77	75	75	77	76	-
<b>Under 85% Load</b>											
POSITION NO.	CS	1	2	3	4	5	6	7	8	9	FES
MAIN BEARING	79	84	93	91	93	91	91	91	90	94	86
SPLASH OIL	-	81	80	79	80	80	79	79	80	80	-
<b>Under 100% Load</b>											
POSITION NO.	CS	1	2	3	4	5	6	7	8	9	FES
MAIN BEARING	79	86	97	94	95	94	93	94	92	97	88
SPLASH OIL	-	83	82	81	82	82	81	81	82	82	-
<b>Under 110% Load</b>											
POSITION NO.	CS	1	2	3	4	5	6	7	8	9	FES
MAIN BEARING	78	84	96	93	95	93	92	93	92	96	87
SPLASH OIL	-	82	80	80	80	81	80	79	81	80	-

※ CS : Coupling Side end bearing / FES : Free End Side end bearing

Measuring data at 110% load

Exh' Gas Temperature			
T/C INLET	A	°C	519
	B	°C	522
T/C OUTLET	A	°C	323
	B	°C	324
Charge air inlet pressure	bar		3.6

Turbo charger speed			
A	rpm	25.51	x 1000
B	rpm	25.43	
Turbo charger L.O outlet			
A	°C	95.1	
B	°C	97.4	

Engine No. 41( 1068379 ) SB18V32-10213	<b>Vibration Measurement</b>
DATE : 2011-02-21	

100% Load	Longitudinal ( X )								Crosswise ( Y )								Vertical ( Z )							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
No.41	3.9	4.8	4.6	4.0	2.2	-	3.0	-	4.0	6.2	9.2	10.5	2.5	-	2.4	-	6.2	14.8	5.5	10.8	3.2	-	2.5	-

Unit : mm/Sec

**Vibration Level Limits**  
 Based on ISO 8528-9 & MAN Ausburg Design  
 : 45.0 mm/sec

**Vibration measuring device**  
 Device : SV PA101 (3185D)  
 Serial no. : 1G10C1S3210142  
 Calibration date : 2010.02.25  
 ( valid until 2011.02.26 )

< MEASURING POSITION >

1. CYL' BLOCK(TOP, T/C SIDE)
2. CYL' BLOCK(TOP, GOV' SIDE)
3. RUBBER BRACKET(FORE)
4. RUBBER BRACKET(END)
5. GEN' BEARING(END)
6. GEN' COOLER(IF APPLIED)
7. GEN' BEARING(FORE, IF APPLIED)

OVERHAUL INSPECTION	No.41		-		-		-		-		-	
	CYL' No.	MAIN B/G	1	2	3	4	5	6	7	8	1	2
	B1	1	-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-
			-	-	-	-	-	-	-	-	-	-

YS-41

CHARTING B. S. S. S. A. I. YU. S. I. N. E. C. O. R. P.

CHARTING B. S. S. S. A. I. YU. S. I. N. E. C. O. R. P.

0

20

40

60

80

100

120

140

160

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760

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860

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Engine ser. No. SB18V32-10213 ( No. 41 )  
( MAN - 1068379 )

Engine type 18V32/40

Hull No. -

PJT NAME A3

Start of set of coupling alignment

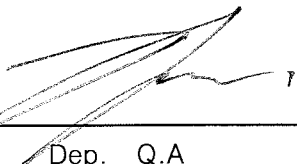
2011.02.13

Confirmation of coupling alignment

2011.02.13

Remark

Proved on correctness and completeness



Name H. J KIM

Dep. Q.A

Date 2011.02.14



<u>Engine No.</u> SB18V32 – 10213 (No.41 Engine)	<u>MAN No.</u> 1068379	<u>STX PJT No.</u> E10B025
<u>Generator maker</u> HYUNDAI HEAVY IND.	<u>Generator ser. no.</u> 20100182RBH01402	<u>Coupling maker</u> CENTA COUPLING

Web deflection

Direction of rotation :



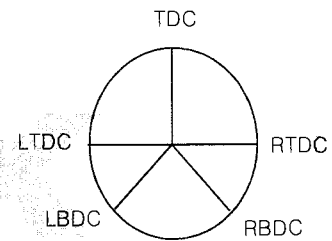
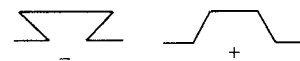
V = Before coupling

N = After coupling

Measuring unit : 1/100 mm

Cyl' No.	1		2	
	V	N	V	N
LBDC	0.0	0.0	0.0	0.0
LTDC	0.0	-1.5	2.5	2.0
TDC	-5.5	-6.0	1.0	1.0
RTDC	-4.5	-4.0	-2.0	-1.0
RBDC	-2.0	-2.0	-2.0	-1.0

Crank web position



View on driving end

All values which are not indicated in particular, are to be stated in mm.

Date : 2011.02.13

Name : K. T SEO

Remark

Engine No.

SB18V32 - 10213  
(No.41 Engine)

MAN No.

1068379

STX PJT No.

E10B025

Flexible coupling

OT / TDC

※ Dial gauge is fixed at Alternator

LOT / LTDC

View on Flywheel

ROT / RTDC

UT / BDC

UNIT : 1/100 mm

Engine - cold, before coupling

Engine - cold, after coupling

	Radial run-out	Axial run-out			Radial run-out	Axial run-out		
		run-out	Crank Axial movement	Total		run-out	Crank Axial movement	Total
OT / TDC	0	0	0	0	0	X	X	X
ROT / RTDC	20	5	0	5	15			
UT / BDC	77	10	0	10	26			
LOT / LTDC	56	5	0	5	10			

Fitting plate thickness

	In front	middle		back		
Driving end	73.30	73.20	-	-	72.90	73.40
	73.00	72.25	-	-	72.00	73.40
						Free end

All values which are not indicated in particular, are to be stated in mm.

Date : 2011.02.13

Name : K. T SEO

Remark

