HYUNDAI HEAVY INDUSTRIES CO., LTD.

Doc. No.: K630-IR10A-2353

SHOP TEST RESULT FOR MAIN ENGINE		
	Engine No.	**AA4154**
	Engine type	**6S50MC-C7**
	Hull No.	**HMD2196**
	Owner	**DALESIO**
	Class	**RINA**
	Ship yard	**HYUNDAI MIPO DOCKYARD CO. LTD.**

HYUNDAI - MAN B&W

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QUALITY MANAGEMENT DEPARTMENT
HHI-EMD

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0	M. H. OH 2010-05-28		M.H.KIM 2010-05-28	First issue

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Test Date	May.14, 2010
Specification of Main Engine	Output(MCR)	9480 kW	Engineer	D. J. HONG
	Speed(MCR)	127 rpm	Operator	J. J. LIM

PARTICULARS OF ENGINE

NUMBER OF CYLINDERS	6
DIAMETER OF CYLINDER	500 mm
STROKE	2000 mm
FIRING ORDER	AH→ 1 - 5 - 3 - 4 - 2 - 6 - 1 ←AS
CYLINDER CONSTANT (kW)	0.6545

TURBO CHARGER

TYPE	1 x TPL77B12
SPECIFICATION	CT70CA15 TF20TA23
nMmax. / tMmax.	17040 r/min / 550 ℃
nBmax. / tBmax.	16200 r/min / 520 ℃
SERIAL No.	XH002788
MANUFACTURER	HYUNDAI - ABB

DYNAMOMETER

MAKER / TYPE	FROUDE / FA-18
CONSTANT (kW)	1 / 1.35962
MAXIMUM CAPACITY	29400 kW x 325 rpm

SPECIFICATION OF OIL USED AT SHOP TEST

		F.O	System Oil	Cam Oil	Cyl. Oil	T/C Oil
KIND OF OIL		BUNKER-A	VERITAS 800 M 30	VERITAS 800 M 30	ALEXIA LS	VERITAS 800 M 30
SPEC. GRAVITY	(15 ℃)	0.9031	0.8810	0.8810	0.9170	0.8810
FLASH POINT	℃	68	258	258	260	258
VISCOSITY	cst	(50℃) 3.85	(40℃) 103.8	(40℃) 103.8	(40℃) 209.1	(40℃) 103.8
WATER	vol%	0.05				
SULFUR	wt%	0.163				
CALORIFIC VALUE (LOWER)	kcal / kg	10042				

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Test Date	May.14, 2010
Specifiction of Accessory	Output(MCR)	9480 kW	Engineer	D. J. HONG
	Speed(MCR)	127 rpm	Operator	J. J. LIM

GOVERNOR

TYPE	AC C20 DGS
SERIAL No.	B0097D327820045
MANUFACTURER	KONGSBERG MARITIME KOREA

FUEL VALVE (ATOMIZER)

TYPE		3062332-6 x 115							
OPENING PRESSURE		350 ±30 bar							
SPEC.	HOLE No.	1	2	3	4				
	DIA. OF HOLE(Φ)	1.15	1.15	1.15	1.15				
	VERTI. ANGLE(α°)	27	17	13	12				
	HORIZ. ANGLE(β°)	-2	12	30	48				

AUXILIARY BLOWER

TYPE / CAPACITY		HAA-334/80N / 1.92 / 3.90	m³/sec
SPEED / PRESSURE		3560 rpm / 571 / 327	mmAq
SERIAL No. 1 / 2		SRA14920101 / 02	
MANUFACTURER		HYUNDAI MARINE MACHINERY CO.,LTD.	
ELECT. MOTOR	TYPE / VOLTAGE	HM / 440	V
	FREQUENCY / POWER / Amp	60 Hz / 45 kW / 72.1	A
	SERIAL No. 1 / 2	0F094F26-001 / 0F094F26-002	
	MANUFACTURER	HYUNDAI HEAVY INDUSTRIES CO.,LTD.	

AIR COOLER

PART No. / SURFACE AREA	A19-288255-0 / 638.6	m²
SERIAL No.	DHL30750-A	
MANUFACTURER	DongHwa Entec	

CYLINDER LUBRICATOR

TYPE	Φ 4.5 mm
NO. OF PISTON	18 PER UNIT 2 SET
MANUFACTURER	SHIN HEUNG PRECISION Co.,LTD.

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Summary Data of Load Test

Hull No.	HMD2196	Owner	DALESIO
Engine No.	AA4154	Class	RINA
Engine Type	6S50MC-C7	Test Date	May.14, 2010
Output(MCR)	9480 kW	Engineer	D. J. HONG
Speed(MCR)	127 rpm	Operator	J. J. LIM

DATA SHEET No.		1	2	3	4	5	6	
LOAD (%)		25	50	75	90	100	110	
MEASURING TIME		9:50	10:20	10:50	11:20	11:50	12:50	
SPEED (rpm)		80.0	100.8	115.4	122.6	127.0	131.1	
Brake Power (kW)		2370	4740	7110	8532	9480	10428	
Indicated Power (kW)		2670	5156	7588	9037	10005	10976	
MECH. EFF. (%)		88.77	91.93	93.70	94.41	94.75	95.01	
Pmax. (bar)		79.2	105.3	132.3	143.8	150.2	154.8	
Pcomp. (bar)		48.3	71.7	100.0	117.2	127.7	135.2	
Pi (bar)		8.50	13.03	16.74	18.77	20.06	21.32	
F.O PUMP (PΘ)		33.0	47.0	59.8	66.8	73.8	79.8	
Fuel Oil Con-	Measured	183.54	180.38	177.64	177.92	179.30	184.93	
sum.(g/kWh)	Corrected	181.68	177.41	174.54	174.85	176.24	181.85	BLANK
Exh. Gas	Cyl. Out	281	307	312	327	346	366	
Temp.	Bef. T/C	297	342	362	383	412	440	
(℃)	Aft. T/C	245	264	242	242	252	265	
T/C Speed	No. 1	6170	10630	13420	14620	15330	15980	
(rpm)	No. 2				BLANK			
	No. 3							
	No. 4							
	Average	6170	10630	13420	14620	15330	15980	
Scavenging	℃	25.0	29.0	34.0	36.0	38.0	40.0	
Air	kg/cm²	0.330	1.030	1.860	2.340	2.670	2.900	
Cooling Water Inlet (℃)		17.0	18.0	20.0	24.0	25.0	24.0	
Test Room	℃	20.3	22.0	22.8	24.0	22.0	21.6	
	mbar	1020	1020	1020	1020	1020	1020	
	Humidity(%)	0.43	0.45	0.44	0.43	0.47	0.51	

* Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal/kg, and ISO condition

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Data sheet of 25 % Load test

Hull No.	HMD2196	Weather	FINE
Engine No.	AA4154	Measuring Time	9:50
Eng. Type	6S50MC-C7	Test Date	May.14, 2010
Owner	DALESIO	Engineer	D. J. HONG
Class	RINA	Operator	J. J. LIM

* Room Temperature : 20.3 ℃ * Atmospheric Pressure : 1020 mbar * Humidity 43.2%

Engine Speed	Water Brake	Brake Power	Indicated Power	Mech.Efficiency	NOTCH
80.0 rpm	40.3 tonf	2370 kW	2670 kW	88.77 %	4.80

System		Main L.O	P.C.O	Exh.V/V Act.	Fuel Oil	Cooling F.W
In	Press.(kg/cm²)	2.05			8.50	4.00
	Temp.(℃)	44.0			40.0	70.0

Cyl. No.		Avg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pmax.	bar	79.2	80	79	79	79	79	79								
Pcomp.	bar	48.3	49	48	48	48	49	48								
Pi	bar	8.50	8.52	8.56	8.63	8.42	8.38	8.48								
F.O Pump	PΘ	33.0	33.0	33.0	33.0	33.0	33.0	33.0	BLANK							
	VIT	-	-	-	-	-	-	-								
Exh.Gas Out.	℃	281	288	280	288	275	274	280								
C.F.W Out.	℃	73.0	73.0	73.0	73.0	73.0	73.0	73.0								
Cam L.O Out.	℃	40.0	40.0													
P.C.O Out.	℃	50.0	50.0	50.0	50.0	50.0	50.0	50.0								

Air Cooler

No.		1	2	3	4	Avg.
Bef. Cooler Press	mmHg	200				200.0
Press. Drop	mmAq	44	BLANK			44.0
Air In.	℃	42				42.0
Air Out.	℃	19.0				19.0
Cooling Water In.	℃	17.0				17.0
Cooling Water Out.	℃	19.0				19.0

Scavenging Air

Pressure	Temperature
0.33 kg/cm²	25.0 ℃
Air Receiver Pressure	240 mmHg
Exhaust Manifold Pressure	0.25 kg/cm²

Specific Fuel Oil Consumption

Meas.(kg/h)	Meas.(g/kWh)	Correct(g/kWh)
435.00	183.54	181.68

TurboCharger

Turbo Charger	Speed	Blower Inlet			Before Turbine		After Turbine		L.O.(℃ , kg/cm²)			F.W Temp
	rpm	℃		mmAq	℃	mmHg	℃	mmAq	In	Out	Press.	℃
No. 1	6170	20.0	28.0	7	297	170	245	11	44	45	1.55	-
No. 2						BLANK						
No. 3												
No. 4												
Avg.	6170	24.00		7	297	170	245	11	44	45	1.55	-

* Pressure VIT : - kg/cm² * Governor Position : 37.9 * Thrust Pad : 45.0 ℃

Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal / kg & I.S.O condition

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Data sheet of 50 % Load test

Hull No.	HMD2196	Weather	FINE
Engine No.	AA4154	Measuring Time	10:20
Eng. Type	6S50MC-C7	Test Date	May.14, 2010
Owner	DALESIO	Engineer	D. J. HONG
Class	RINA	Operator	J. J. LIM

* Room Temperature : 22.0 ℃ * Atmospheric Pressure : 1020 mbar * Humidity 44.5%

Engine Speed	Water Brake	Brake Power	Indicated Power	Mech.Efficiency	NOTCH
100.8 rpm	63.9 tonf	4740 kW	5156 kW	91.93 %	6.30

System		Main L.O	P.C.O	Exh.V/V Act.	Fuel Oil	Cooling F.W
In	Press.(kg/cm²)	2.05			8.50	3.95
	Temp.(℃)	44.0			40.0	70.0

Cyl. No.		Avg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pmax.	bar	105.3	105	106	105	105	106	105								
Pcomp.	bar	71.7	72	72	72	72	71	71								
Pi	bar	13.03	12.92	13.01	12.94	13.13	13.03	13.12								
F.O Pump	PΘ	47.0	47.0	47.0	47.0	47.0	47.0	47.0	BLANK							
	VIT	-	-	-	-	-	-	-								
Exh.Gas Out.	℃	307	310	310	310	300	300	310								
C.F.W Out.	℃	75.0	75.0	75.0	75.0	75.0	75.0	75.0								
Cam L.O Out.	℃	44.0	44.0													
P.C.O Out.	℃	52.0	52.0	52.0	52.0	52.0	52.0	52.0								

Air Cooler

No.		1	2	3	4	Avg.
Bef. Cooler Press	mmHg	750				750.0
Press. Drop	mmAq	95	BLANK			95.0
Air In.	℃	97				97.0
Air Out.	℃	28.0				28.0
Cooling Water In.	℃	18.0				18.0
Cooling Water Out.	℃	55.0				55.0

Scavenging Air

Pressure	Temperature
1.03 kg/cm²	29.0 ℃
Air Receiver Pressure	730 mmHg
Exhaust Manifold Pressure	0.83 kg/cm²

Specific Fuel Oil Consumption

Meas.(kg/h)	Meas.(g/kWh)	Correct(g/kWh)
855.00	180.38	177.41

TurboCharger

Turbo Charger	Speed	Blower Inlet			Before Turbine		After Turbine		L.O.(℃ , kg/cm²)			F.W Temp
	rpm	℃		mmAq	℃	mmHg	℃	mmAq	In	Out	Press.	℃
No. 1	10630	20.0	32.0	25	342	610	264	67	44	55	1.40	-
No. 2						BLANK						
No. 3												
No. 4												
Avg.	10630	26.00		25	342	610	264	67	44	55	1.4	-

* Pressure VIT : - kg/cm² * Governor Position : 52.7 * Thrust Pad : 46.0 ℃

Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal / kg & I.S.O condition

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Data sheet of 75 % Load test

Hull No.	HMD2196	Weather	FINE
Engine No.	AA4154	Measuring Time	10:50
Eng. Type	6S50MC-C7	Test Date	May.14, 2010
Owner	DALESIO	Engineer	D. J. HONG
Class	RINA	Operator	J. J. LIM

* Room Temperature : 22.8 ℃ * Atmospheric Pressure : 1020 mbar * Humidity 44.4%

Engine Speed	Water Brake	Brake Power	Indicated Power	Mech.Efficiency	NOTCH
115.4 rpm	83.8 tonf	7110 kW	7588 kW	93.70 %	7.50

System		Main L.O	P.C.O	Exh.V/V Act.	Fuel Oil	Cooling F.W
In	Press.(kg/cm²)	2.05			8.00	3.95
	Temp.(℃)	43.0			40.0	70.0

Cyl. No.		Avg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pmax.	bar	132.3	133	132	132	132	133	132								
Pcomp.	bar	100.0	100	100	100	100	100	100								
Pi	bar	16.74	16.84	16.74	16.77	16.59	16.79	16.73								
F.O Pump	PΘ	59.8	60.0	60.0	60.0	60.0	60.0	59.0								
	VIT	-	-	-	-	-	-	-								
Exh.Gas Out.	℃	312	310	315	315	305	310	315								
C.F.W Out.	℃	76.0	76.0	76.0	76.0	76.0	76.0	76.0								
Cam L.O Out.	℃	47.0	47.0													
P.C.O Out.	℃	54.0	54.0	54.0	54.0	54.0	54.0	54.0								

BLANK

Air Cooler

No.		1	2	3	4	Avg.
Bef. Cooler Press	mmHg	1380				1380.0
Press. Drop	mmAq	130				130.0
Air In.	℃	146				146.0
Air Out.	℃	32.0				32.0
Cooling Water In.	℃	20.0				20.0
Cooling Water Out.	℃	57.0				57.0

BLANK

Scavenging Air

Pressure	Temperature
1.86 kg/cm²	34.0 ℃
Air Receiver Pressure	1370 mmHg
Exhaust Manifold Pressure	1.60 kg/cm²

Specific Fuel Oil Consumption

Meas.(kg/h)	Meas.(g/kWh)	Correct(g/kWh)
1263.00	177.64	174.54

TurboCharger

Turbo Charger	Speed	Blower Inlet			Before Turbine		After Turbine		L.O.(℃ , kg/cm²)			F.W Temp
	rpm	℃		mmAq	℃	mmHg	℃	mmAq	In	Out	Press.	℃
No. 1	13420	22.0	34.0	65	362	1180	242	150	44	68	1.55	-
No. 2												
No. 3												
No. 4												
Avg.	13420	28.00		65	362	1180	242	150	44	68	1.55	-

BLANK

* Pressure VIT : - kg/cm² * Governor Position : 66.3 * Thrust Pad : 47.0 ℃

Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal / kg & I.S.O condition

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Data sheet of 90 % Load test

Hull No.	HMD2196	Weather	FINE
Engine No.	AA4154	Measuring Time	11:20
Eng. Type	6S50MC-C7	Test Date	May.14, 2010
Owner	DALESIO	Engineer	D. J. HONG
Class	RINA	Operator	J. J. LIM

* Room Temperature : 24.0 ℃ * Atmospheric Pressure : 1020 mbar * Humidity 42.5%

Engine Speed	Water Brake	Brake Power	Indicated Power	Mech.Efficiency	NOTCH
122.6 rpm	94.6 tonf	8532 kW	9037 kW	94.41 %	8.10

System		Main L.O	P.C.O	Exh.V/V Act.	Fuel Oil	Cooling F.W
In	Press.(kg/cm²)	2.00			7.80	3.90
	Temp.(℃)	43.0			40.0	70.0

Cyl. No.		Avg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pmax.	bar	143.8	144	144	144	144	143	144								
Pcomp.	bar	117.2	118	117	117	117	117	117								
Pi	bar	18.77	18.78	18.76	18.89	18.64	18.84	18.71								
F.O Pump	PΘ	66.8	67.0	67.0	67.0	67.0	67.0	66.0		BLANK						
	VIT	-	-	-	-	-	-	-								
Exh.Gas Out.	℃	327	325	330	328	323	323	330								
C.F.W Out.	℃	77.0	77.0	77.0	77.0	77.0	77.0	77.0								
Cam L.O Out.	℃	49.0	49.0													
P.C.O Out.	℃	55.0	55.0	55.0	55.0	55.0	55.0	55.0								

Air Cooler

No.		1	2	3	4	Avg.
Bef. Cooler Press	mmHg	1740				1740.0
Press. Drop	mmAq	145	BLANK			145.0
Air In.	℃	166				166.0
Air Out.	℃	35.0				35.0
Cooling Water In.	℃	24.0				24.0
Cooling Water Out.	℃	57.0				57.0

Scavenging Air

Pressure	Temperature
2.34 kg/cm²	36.0 ℃
Air Receiver Pressure	1720 mmHg
Exhaust Manifold Pressure	2.05 kg/cm²

Specific Fuel Oil Consumption

Meas.(kg/h)	Meas.(g/kWh)	Correct(g/kWh)
1518.00	177.92	174.85

TurboCharger

Turbo Charger	Speed	Blower Inlet			Before Turbine		After Turbine		L.O.(℃ , kg/cm²)			F.W Temp
	rpm	℃		mmAq	℃	mmHg	℃	mmAq	In	Out	Press.	℃
No. 1	14620	23.0	37.0	92	383	1510	242	220	44	75	1.55	-
No. 2						BLANK						
No. 3												
No. 4												
Avg.	14620	30.00		92	383	1510	242	220	44	75	1.55	-

* Pressure VIT : - kg/cm² * Governor Position : 74.5 * Thrust Pad : 48.0 ℃

Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal / kg & I.S.O condition

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Data sheet of 100 % Load test

Hull No.	HMD2196	Weather	FINE
Engine No.	AA4154	Measuring Time	11:50
Eng. Type	6S50MC-C7	Test Date	May.14, 2010
Owner	DALESIO	Engineer	D. J. HONG
Class	RINA	Operator	J. J. LIM

* Room Temperature : 22.0 ℃ * Atmospheric Pressure : 1020 mbar * Humidity 46.5%

Engine Speed	Water Brake	Brake Power	Indicated Power	Mech.Efficiency	NOTCH
127.0 rpm	101.5 tonf	9480 kW	10005 kW	94.75 %	8.50

System		Main L.O	P.C.O	Exh.V/V Act.	Fuel Oil	Cooling F.W
In	Press.(kg/cm²)	2.00			7.80	3.90
	Temp.(℃)	43.0			40.0	70.0

Cyl. No.		Avg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pmax.	bar	150.2	150	150	150	150	150	151								
Pcomp.	bar	127.7	128	128	127	128	128	127								
Pi	bar	20.06	19.95	20.11	20.02	20.01	20.19	20.09								
F.O Pump	PΘ	73.8	74.0	74.0	74.0	74.0	74.0	73.0		BLANK						
	VIT	-	-	-	-	-	-	-								
Exh.Gas Out.	℃	346	348	350	350	345	340	345								
C.F.W Out.	℃	78.0	78.0	78.0	78.0	78.0	78.0	78.0								
Cam L.O Out.	℃	50.0	50.0													
P.C.O Out.	℃	56.0	56.0	56.0	56.0	56.0	56.0	56.0								

Air Cooler

No.		1	2	3	4	Avg.
Bef. Cooler Press	mmHg	1980				1980.0
Press. Drop	mmAq	155	BLANK			155.0
Air In.	℃	184				184.0
Air Out.	℃	38.0				38.0
Cooling Water In.	℃	25.0				25.0
Cooling Water Out.	℃	57.0				57.0

Scavenging Air

Pressure	Temperature
2.67 kg/cm²	38.0 ℃
Air Receiver Pressure	1960 mmHg
Exhaust Manifold Pressure	2.38 kg/cm²

Specific Fuel Oil Consumption

Meas.(kg/h)	Meas.(g/kWh)	Correct(g/kWh)
1699.80	179.30	176.24

TurboCharger

Turbo Charger	Speed	Blower Inlet			Before Turbine		After Turbine		L.O.(℃ , kg/cm²)			F.W Temp
	rpm	℃		mmAq	℃	mmHg	℃	mmAq	In	Out	Press.	℃
No. 1	15330	24.0	40.0	108	412	1750	252	260	44	79	1.60	-
No. 2												
No. 3						BLANK						
No. 4												
Avg.	15330	32.00		108	412	1750	252	260	44	79	1.6	-

* Pressure VIT : - kg/cm² * Governor Position : 80.4 * Thrust Pad : 48.0 ℃

Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal / kg & I.S.O condition

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Data sheet of 110 % Load test

Hull No.	HMD2196	Weather	FINE
Engine No.	AA4154	Measuring Time	12:50
Eng. Type	6S50MC-C7	Test Date	May.14, 2010
Owner	DALESIO	Engineer	D. J. HONG
Class	RINA	Operator	J. J. LIM

* Room Temperature : 21.6 ℃ * Atmospheric Pressure : 1020 mbar * Humidity 51.0%

Engine Speed	Water Brake	Brake Power	Indicated Power	Mech.Efficiency	NOTCH
131.1 rpm	108.1 tonf	10428 kW	10976 kW	95.01 %	8.90

System		Main L.O	P.C.O	Exh.V/V Act.	Fuel Oil	Cooling F.W
In	Press.(kg/cm²)	2.05			7.70	3.90
	Temp.(℃)	44.0			42.0	70.0

Cyl. No.		Avg.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Pmax.	bar	154.8	155	155	155	155	154	155								
Pcomp.	bar	135.2	135	135	135	135	136	135								
Pi	bar	21.32	21.32	21.33	21.37	21.38	21.37	21.14								
F.O Pump	PΘ	79.8	80.0	80.0	80.0	80.0	80.0	79.0								
	VIT	-	-	-	-	-	-	-								
Exh.Gas Out.	℃	366	367	370	370	362	362	365								
C.F.W Out.	℃	78.0	78.0	78.0	78.0	78.0	78.0	78.0								
Cam L.O Out.	℃	51.0	51.0													
P.C.O Out.	℃	57.0	57.0	57.0	57.0	57.0	57.0	57.0								

BLANK

Air Cooler

No.		1	2	3	4	Avg.
Bef. Cooler Press	mmHg	2150				2150.0
Press. Drop	mmAq	163				163.0
Air In.	℃	195				195.0
Air Out.	℃	39.0				39.0
Cooling Water In.	℃	24.0				24.0
Cooling Water Out.	℃	54.0				54.0

BLANK

Scavenging Air

Pressure	Temperature
2.90 kg/cm²	40.0 ℃
Air Receiver Pressure	2130 mmHg
Exhaust Manifold Pressure	2.60 kg/cm²

Specific Fuel Oil Consumption

Meas.(kg/h)	Meas.(g/kWh)	Correct(g/kWh)
1928.50	184.93	181.85

TurboCharger

Turbo Charger	Speed	Blower Inlet			Before Turbine		After Turbine		L.O.(℃ , kg/cm²)			F.W Temp
	rpm	℃		mmAq	℃	mmHg	℃	mmAq	In	Out	Press.	℃
No. 1	15980	24.0	42.0	120	440	1920	265	280	44	81	1.60	-
No. 2												
No. 3												
No. 4												
Avg.	15980	33.00		120	440	1920	265	280	44	81	1.6	-

BLANK

* Pressure VIT : - kg/cm² * Governor Position : 87.0 * Thrust Pad : 49.0 ℃

Note : The Fuel Oil Consumption is corrected to Lower Calorific Value 10200 kcal / kg & I.S.O condition

HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

Official shop test result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Test Date	May.14, 2010
Starting, Gov', Safety, Min'rev'test	Output(MCR)	9480 kW	Engineer	D. J. HONG
	Speed(MCR)	127 rpm	Operator	J. J. LIM

Starting Test

Time	Ahead	Time	Astern	Time	Ahead	Time	Astern
1	BLANK	2	BLANK	13	BLANK	14	BLANK
3		4		15		16	
5		6		17		18	
7		8		19		20	
9		10		21		22	
11		12		23		24	

m^3

F.W Temp. : ℃ L.O Temp. : ℃

Governor Test

Load	Engine Speed (rpm)	Variation : 1.5 %
M.C.R	**127.0**	
M.C.R ⇒ 50	**128.9**	(Instant)
	127.0	(Permanent)

Safety Device Test

Emergency Stop of Engine	Item	Set Value
	* Over Speed	**136.7** rpm
	* Main L.O Low pressure	**1.20** kg/cm²
	* Cam L.O Low pressure	- kg/cm²
	* T/C L.O Low pressure	**0.80** kg/cm²
	* J.C.W Low pressure	- ℃
	* Thrust Pad High Temperature	**89.3** ℃
	* O.M.D. Function	**OK**

Minimum Revolution Test

Engine Speed rpm	Water Brake tonf	Output kW	Handle Notch Position	Governor Position	Pump Index mm	T/C rpm NO. 1
31.5	**15.0**	**347.5**	**0.9**	**28.5**	**26**	**2030**

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine

Engine performance

Hull No.	HMD2196	Owner	DALESIO
Engine No.	AA4154	Class	RINA
Engine Type	6S50MC-C7	Test Date	May.14, 2010
Output(MCR)	9480 kW	Engineer	D. J. HONG
Speed(MCR)	127 rpm	Operator	J. J. LIM

Project No.
HMD2196

Engine No.
AA4154

Engine Type
6S50MC-C7

T/C Type
TPL77B12

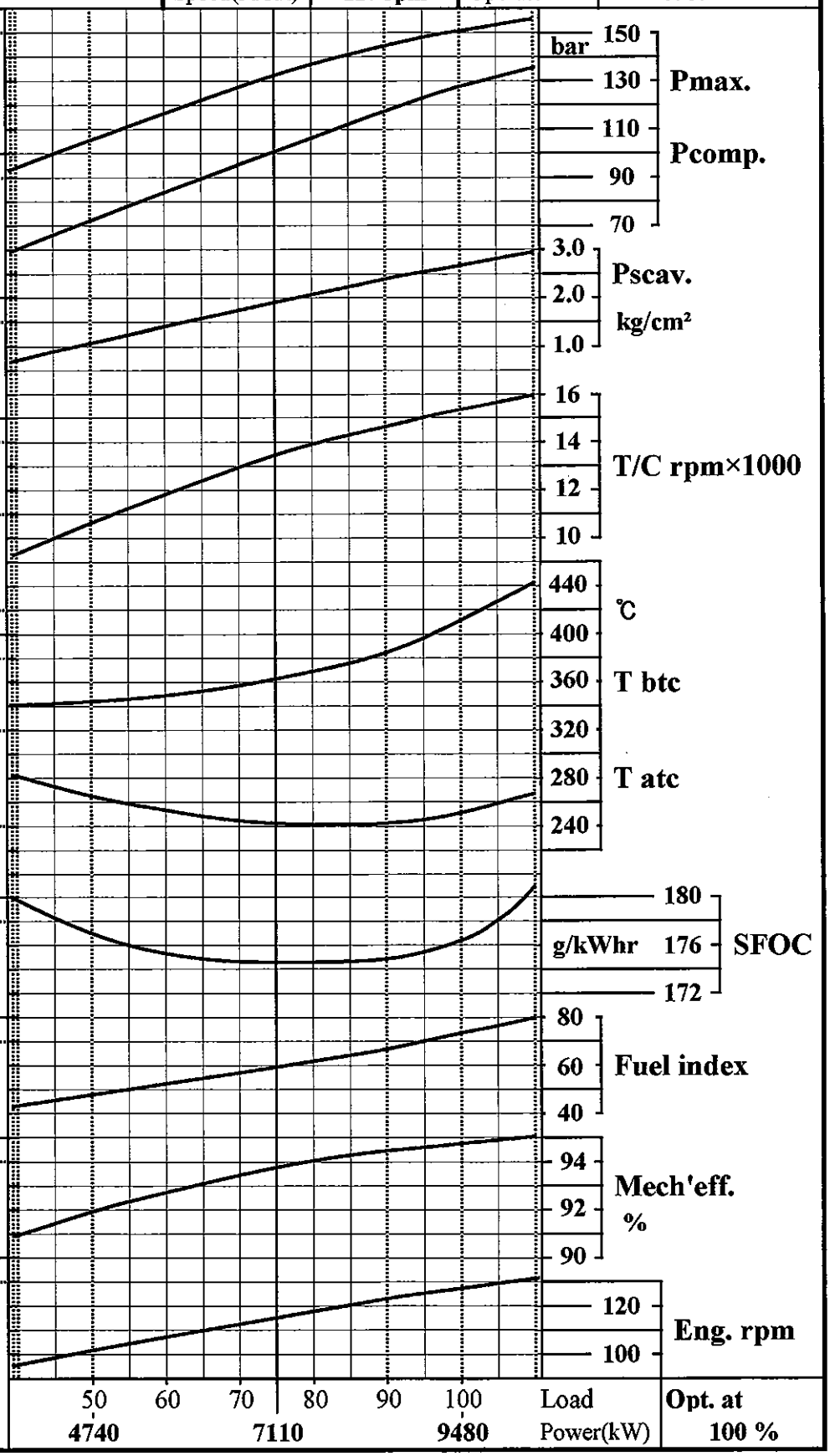
PTU/Bypass

Fuel Cam

Exh. Cam

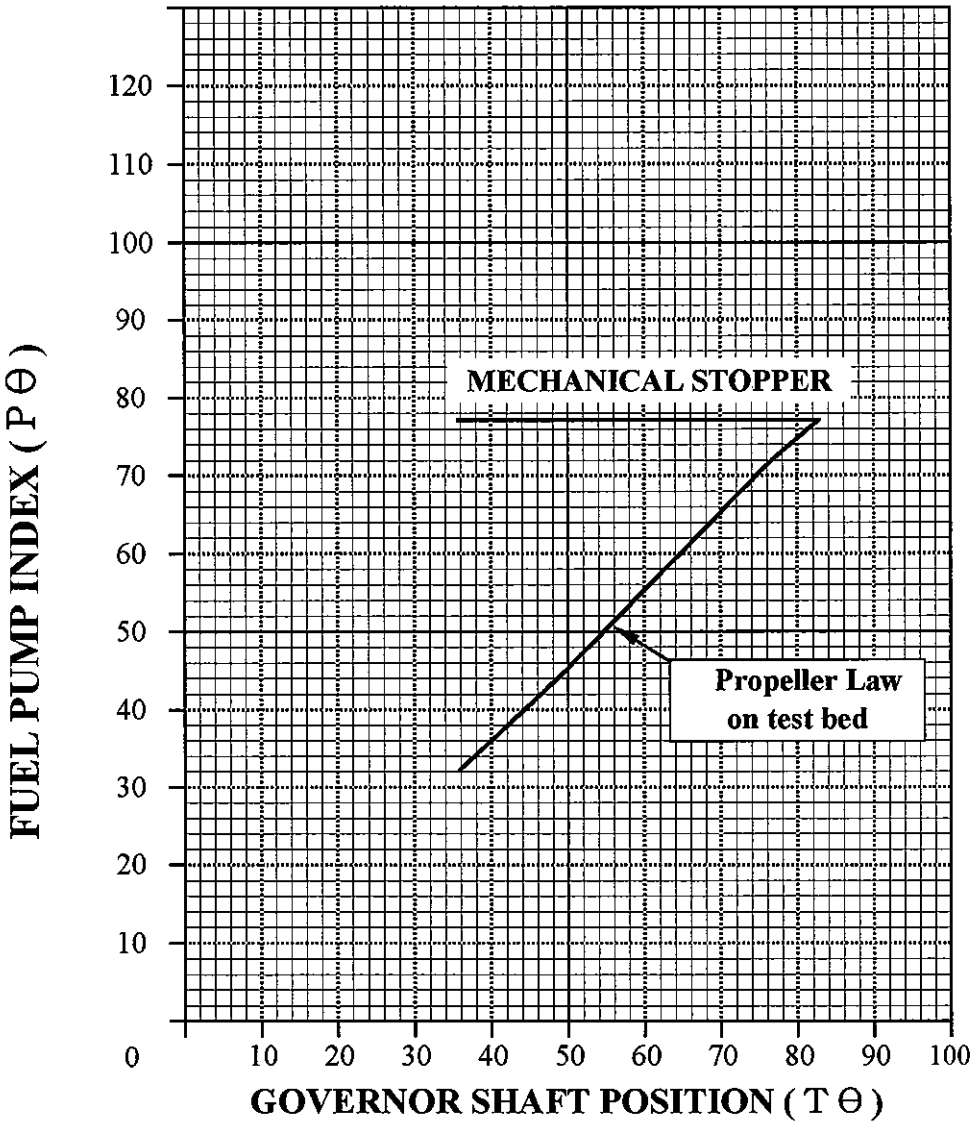
Comp. Shim
6mm

Remark
OFFICIAL SHOP TEST

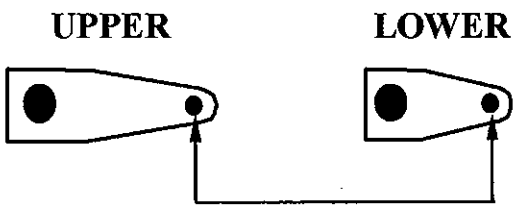


HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Test Date	May.14, 2010
PΘ - TΘ Diagram	Output(MCR)	9480 kW	Engineer	D. J. HONG
	Speed(MCR)	127 rpm	Operator	J. J. LIM



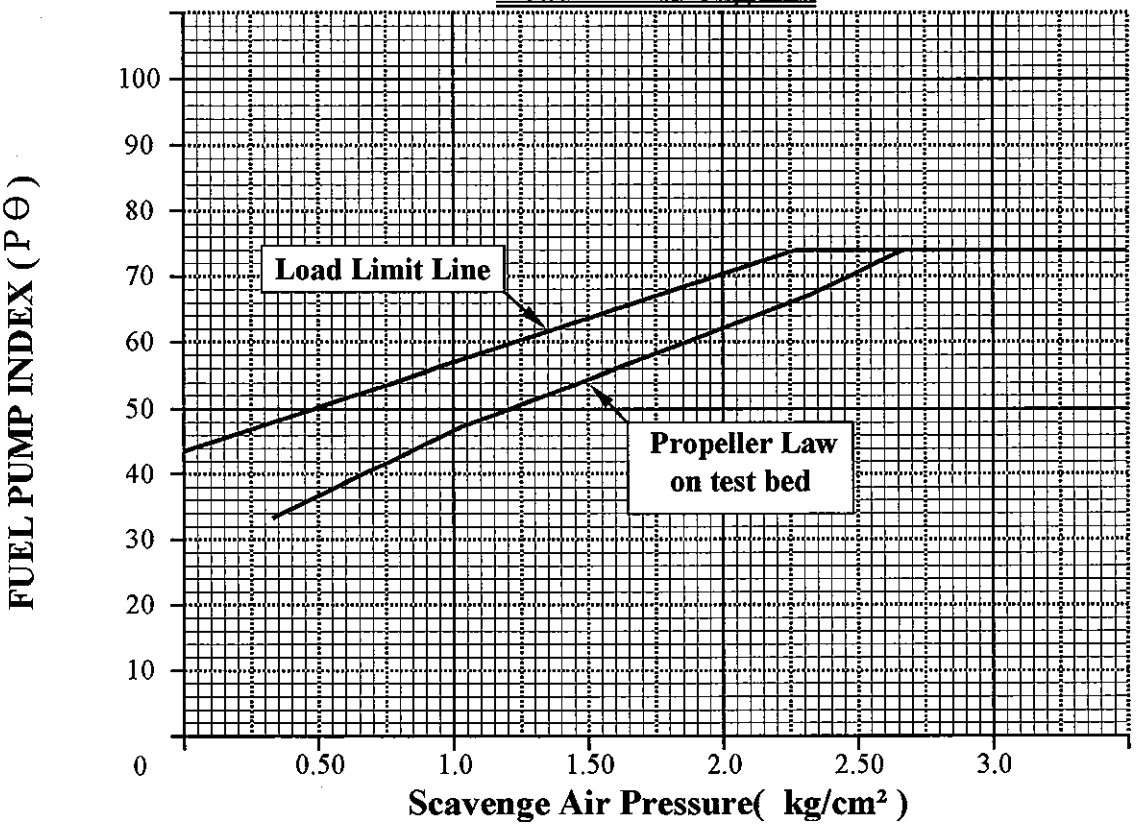
*** REMARK : REGULATING LINKAGE POSITION**



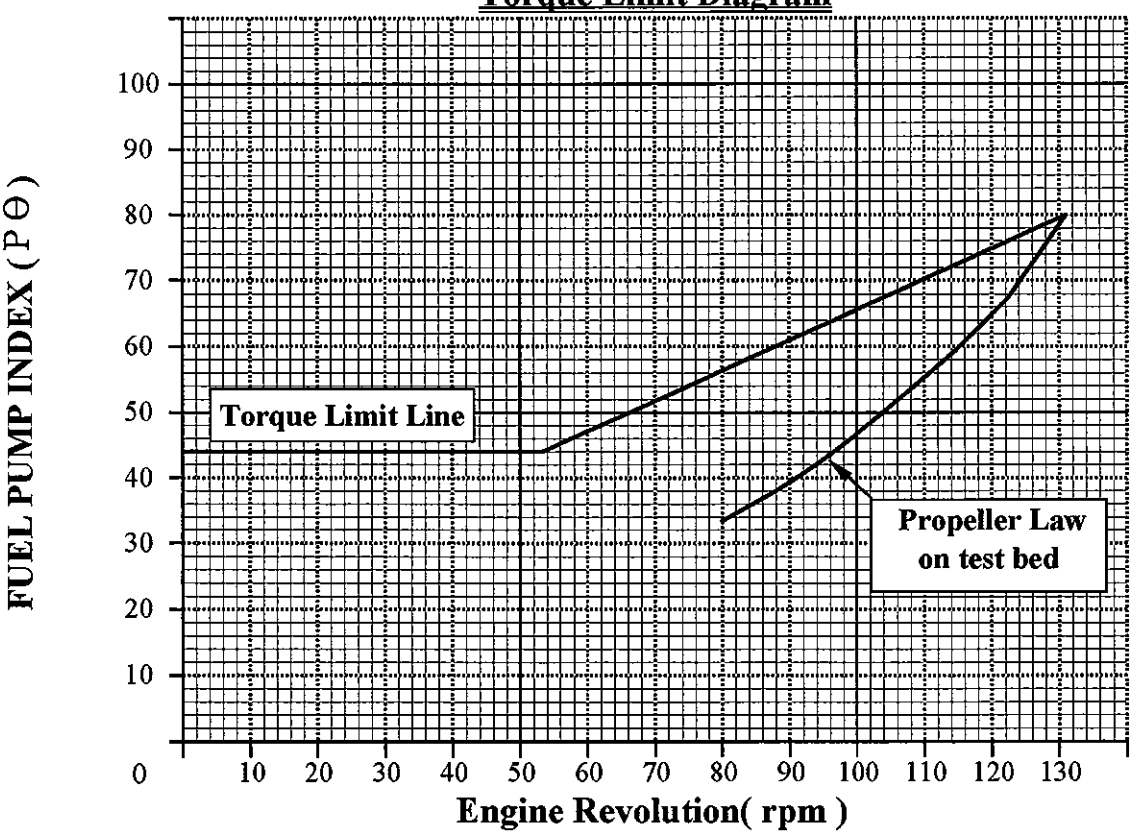
HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine				
	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Test Date	May.14, 2010
Load & Torque Limit Diagram	Output(MCR)	9480 kW	Engineer	D. J. HONG
	Speed(MCR)	127 rpm	Operator	J. J. LIM

Load Limit Diagram



Torque Limit Diagram



HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official shop test result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Test Date	May.14, 2010
Inspection Report	Output(MCR)	9480 kW	Engineer	D. J. HONG
	Speed(MCR)	127 rpm	Operator	J. J. LIM

Kind of Inspection.	Place of Inspection	Work Condition	Judgement
Timing Data	**Ass'y Shop**	**After Shop Test**	**Ref.**

1. Exhaust Cam Lead (Advance Angle)

Cylinder NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Measured Timing(Ahead)	-3.40	-3.35	-3.35	-3.35	-3.35	-3.30	BLANK							

* Angle A : **112.9°** * Lift : **10.0** mm

* Angle B : **254.1°** * Lift : **10.0** mm

2. Fuel Pump

Cylinder NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Top Lift (mm)	12.30	12.83	12.45	12.80	13.21	12.84								
Lead Angle(Before T.D.C)	14.01	13.67	14.19	13.49	13.40	13.27	BLANK							
Number of Shim(EA) / Thickness of Shim(mm)	8/0.5	8/0.5	8/0.5	8/0.5	8/0.5	8/0.5								

3. Compression Shim

Cylinder NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Thickness (mm)	6	6	6	6	6	6	BLANK							

4. Starting Air Distributor Lead (Advance Angle)

Cylinder NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Open Aft T.D.C (Ahead)	Equal of Cyl. No.1 TDC Scratch Mark						BLANK							
Open Aft T.D.C (Astern)														

HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official Shop Test Result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine type	6S50MC-C7	Nomenclature	Bearing
Inspection Report	Output(MCR)	9480 kW	Kind of insp.	Clearance
	Speed(MCR)	127 rpm	Work condition	Before shop test

Unit: 1/100 mm

1. Main Bearing Clearance(position A) Spec.: 35 ~ 60

BRG.No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Clearance	F	41	40	38	37	37	37	38	42	BLANK						
	A	40	40	38	37	37	36	37	42							

2. Crank pin Bearing Clearance(position B) Spec.: 25 ~ 50

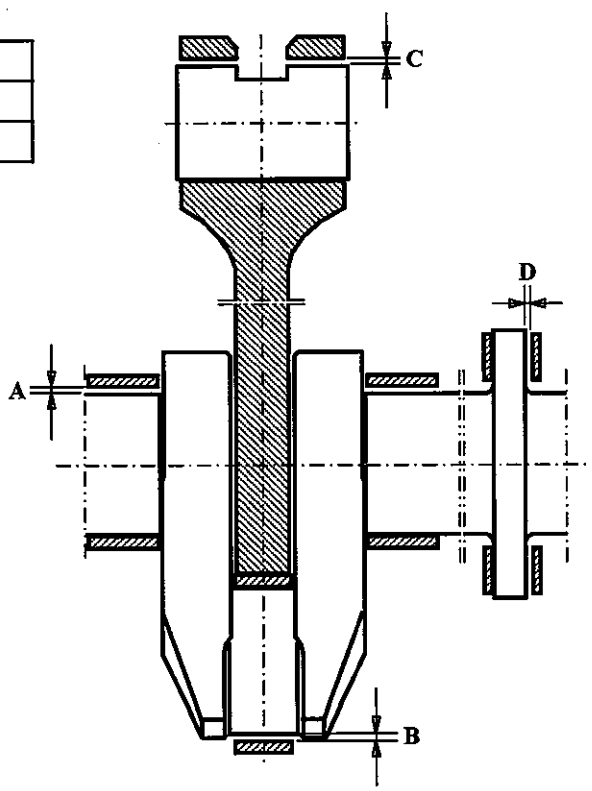
BRG.No.		1	2	3	4	5	6	7	8	9	10	11	12
Clearance	F	32	32	32	32	32	32	BLANK					
	A	32	32	32	32	32	32						

3. Crosshead pin Bearing Clearance(position C) Spec.: 15 ~ 50

BRG.No.		1	2	3	4	5	6	7	8	9	10	11	12
Clearance	F	31	30	30	31	29	31	BLANK					
	A	31	30	30	31	30	32						

4. Thrust pad Clearance

Position	D
Spec.	50 ~ 100
Clearance	73



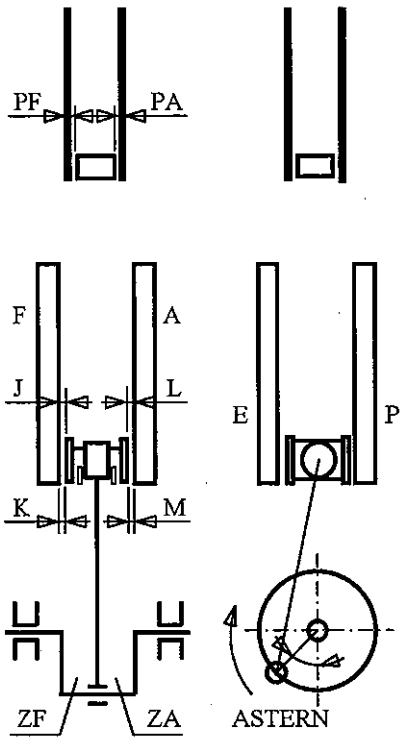
HYUNDAI HEAVY INDUSTRIES CO., LTD.

Official Shop Test Result for Main Engine

Inspection Report

Hull No.	HMD2196	Owner	DALESIO
Engine No.	AA4154	Class	RINA
Engine Type	6S50MC-C7	Nomenclature	Reciprocating parts
Output(MCR)	9480 kW	Kind of Insp.	Alignment
Speed(MCR)	127 rpm	Work Condition	Before shop test

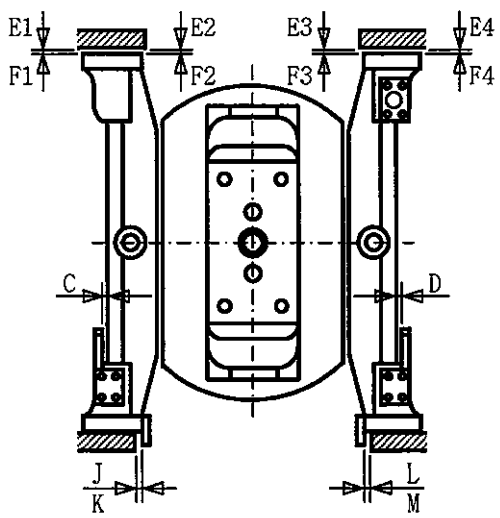
Unit: 1/100 mm



Position	Cyl.No.	1	2	3	4	5	6	7	8	9	10	11	12
Piston & Liner Clearance (Spec.: max.50)	PF	15	16	15	15	16	16	BLANK					
	PA	15	16	15	15	16	16						
	PF+PA	30	32	30	30	32	32						
Guide shoe Clearance (Spec.: 20~50)	E1	30	30	33	32	33	32						
	E2	33	30	33	32	33	30						
	E3	30	30	30	30	30	33						
	E4	30	30	30	30	33	33						
	F1	33	30	38	34	37	33						
	F2	33	33	38	34	37	33						
	F3	32	32	33	32	33	33						
	F4	32	32	32	30	33	33						
Guide rail Clearance (Spec.: 50~90)	J+C	72	69	72	64	70	75						
	L+D	78	77	72	73	67	72						
	K+C	77	69	76	64	66	78						
	M+D	78	74	67	78	72	72						
Crank throw & Conn. rod (Spec.: min.6)	ZF	10	8	10	10	9	9						
	ZA	11	11	11	11	12	12						

(Position: 45 ° after BDC.)

*ZF & ZA unit: mm



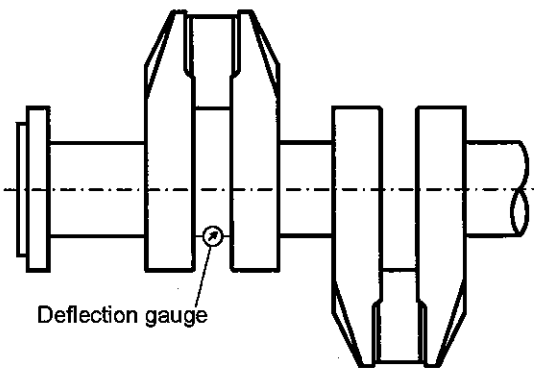
* Remark *

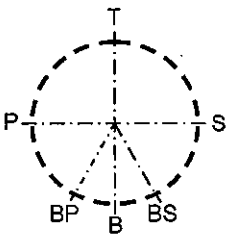
For further particulars, please refer to chapter No.904-5 of instruction book for operation.

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Official Shop Test Result for Main Engine	Hull No.	HMD2196	Owner	DALESIO
	Engine No.	AA4154	Class	RINA
	Engine Type	6S50MC-C7	Nomenclature	Crankshaft
Inspection Report	Output(MCR)	9480 kW	Kind of Insp.	Deflection
	Speed(MCR)	127 rpm	Work Condition	Before & after

Unit: 1/100 mm





Looking from after

Spec.: Max. 18 (normal) / 47 (foremost & aftermost)

Position \ Cyl.No.		1	2	3	4	5	6	7	8	9	10	11	12
After stay bolt tightening	BP	0	0	0	0	0	0	BLANK					
before shop trial	P	+1	-4	-2	-6	-6	+1						
(without water brake)	T	+5	-4	0	-3	-7	+4						
Date: 2010.05.05	S	+1	-3	-1	-1	-1	+11						
Temp.: 25 ℃	BS	+1	+1	-1	+3	+2	+2						
After stay bolt tightening	BP	0	0	0	0	0	0	BLANK					
after shop trial	P	+4	-3	-4	-5	-6	-7						
(with water brake)	T	+8	+5	-8	-3	-4	+1						
Date:2010.05.14	S	+1	+3	-5	+2	-2	+6						
Temp.: 48 ℃	BS	-1	+1	-2	0	-1	+2						

* Remark *

Mark(+): Elongation of distance between Crank web(⎍)

Mark(-): Diminution of distance between Crank web(⎎)

For further particulars, please refer to chapter No.70804 of instruction book for operation.

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

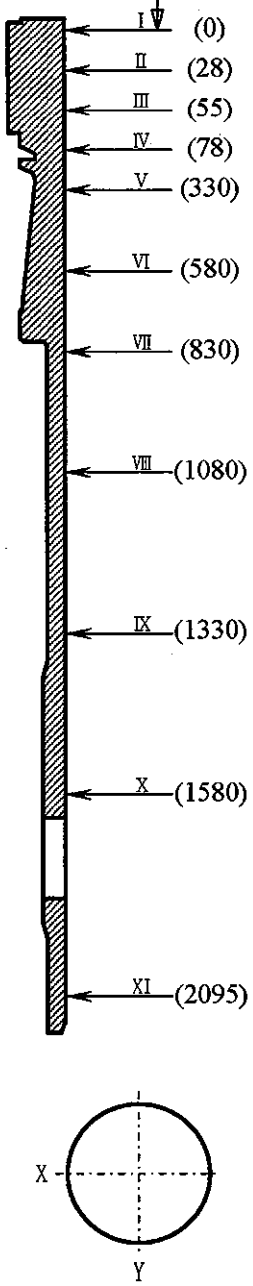
Official Shop Test Result for Main Engine

Inspection Report

Hull No.	HMD2196	Owner	DALESIO
Engine No.	AA4154	Class	RINA
Engine Type	6S50MC-C7	Nomenclature	Cyl. liner
Output(MCR)	9480 kW	Kind of Insp.	Dimension
Speed(MCR)	127 rpm	Work Condition	Before shop test

Unit: 1/100 mm

Note:
Before measuring, the measuring point "I" should be adjusted to 5㎜ below upper edge of uppermost ring at TDC



Cyl.No	Position / Item no.		I	II	III	IV	V	VI	VII	VIII	IX	X	XI
	Spec.		ø500 +0.097 0										
1	S50MC -C-5761	X	+4	+4	+4	+4	+4	+5	+5	+5	+5	+5	+5
		Y	+3	+3	+3	+3	+4	+4	+4	+4	+4	+4	+4
2	-C-5762	X	+7	+7	+7	+7	+7	+7	+7	+7	+7	+7	+7
		Y	+6	+6	+6	+7	+7	+7	+7	+7	+7	+7	+7
3	-C-5768	X	+5	+5	+5	+5	+5	+5	+5	+4	+4	+4	+4
		Y	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4	+4
4	-C-5772	X	+2	+2	+2	+2	+1	+2	+1	+1	+1	+1	+1
		Y	+1	+1	+1	+1	+1	+1	+1	+1	+1	+1	0
5	-C-5774	X	+3	+3	+3	+3	+3	+2	+2	+2	+2	+2	+2
		Y	+2	+2	+2	+2	+2	+2	+1	+1	+1	+1	+1
6	-C5775	X	+4	+4	+4	+4	+4	+4	+4	+4	+4	+3	+3
		Y	+3	+3	+3	+3	+3	+3	+3	+3	+3	+3	+2
S	-C-5777	X	+7	+7	+7	+8	+7	+8	+8	+8	+8	+8	+8
		Y	+6	+6	+6	+7	+7	+7	+7	+7	+7	+7	+7
		X	BLANK										
		Y											
		X											
		Y											
		X											
		Y											
		X											
		Y											
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