

MAIN ENGINE PERFORMANCE ANALYSIS REPORT



Version 3.0.0 (20131028)

MV AURIGA LEADER (7UEC60LSII)

☒ This item shown with mark is suggested this time.
今回提案したアイテムです

Vessel Name	AURIGA LEADER	Engine Type	MITSUBISHI 7UEC60LS II	Analysis Date	1-Apr-20
Owner	NYK SHIPMANAGEMENT PTE LTD	Engine No.	3959	Reporter	J-ENG
Total Running Hours	73,996.0	Performance Data	30-Mar-20	Ref.No	-

1-1. ENGINE OPERATING POINTS (Refer to attached file Fig.1)

- ☒ Operating point is within Designed propeller characteristic curve, and there is normal condition.
運航点は問題ありません
- ☐ Operating point is a trend to ward torque-rich condition. Please pay attention to this condition.
運航点がトルクリッチ気味です。ご注意ください

1-2. PERFORMANCE CURVE (Refer to attached file Fig.2)

- ☒ The engine parameters are on the performance curves at the Shop test record which are in normal condition .
エンジンパラメーターは陸上運転と比べて問題ありません
- ☐ When comparing the shop test result, the difference is as follows
陸上運転データと違うデータは以下の通りです
- | | |
|---|---|
| <input type="checkbox"/> Load indicator(LI) is High.
ロードインジケーター (LI) が高い | <input type="checkbox"/> Pmax is High.
Pmax. が高い |
| <input type="checkbox"/> Scav.air pressure (PS) is low.
掃気圧力 (PS) が低い | <input type="checkbox"/> Pmax is low.
Pmax. が低い |
| <input type="checkbox"/> Turbo charger revolution (Nt) is low.
過給機回転数 (Nt) が低い | <input type="checkbox"/> Exh.gas temp(Tv, Tn, and Tz) is high.
排気ガス温度 (Tv, Tn, Tz) が高い |
| <input type="checkbox"/> Pc is low.
Pc が低い | |

1-3. OUR RECOMMENDATION

- ☒ Especial no recommendation
特に問題ありません
- ☐ We would like to advise you the following items for performance improvement
性能改善のために下記項目をアドバイスします

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- | | |
|--|---|
| <input type="checkbox"/> Check of Fuel injection timing
燃料噴射タイミング不良(進・遅角) | <ul style="list-style-type: none"> • Inspection of sliding surfaces of fuel cam and roller, and confirmation of their lubricating condition • Overhaul, cleaning, and inspection of FO pump (each valve) and FO valve driving device • FO pump setting adjustment and timing inspection • Inspection of oil leakage from fuel oil pipe joint part • 燃料カム、ローラの摺動面の点検、潤滑状況確認 • 燃料ポンプ(各弁)、燃料弁駆動装置解放、清掃及び点検 • 燃料ポンプセッティング調整、及び、タイミング点検 • 燃料油管継手部からの漏れ点検 |
|--|---|

Judging from the data, we recommend to	Keep	fuel injection timing by :	Present	deg.
--	------	----------------------------	---------	------

- | | |
|--|--|
| <input type="checkbox"/> Excessive FO injection amount
燃料噴射量過多 | <ul style="list-style-type: none"> • Overhaul and inspection of FO pump driving device • FO pump setting adjustment and timing injection • 燃料ポンプ、駆動装置の解放、点検 • 燃料ポンプセッティング調整、及び、タイミング確認 |
| <input type="checkbox"/> Torque rich operation
トルクリッチ運転 | <ul style="list-style-type: none"> • Confirmation of torque rich judging diagram & avoiding operation in alarm range • Cleaning of hull • トルクリッチ判定図の確認、警告範囲での運転回避 • 船体洗浄 |
| <input type="checkbox"/> Check & Cleaning of Turbo charger
(include turbine blade top clearance)
過給機性能不良 | <ul style="list-style-type: none"> • Blower side overhaul and cleaning • Turbine side cleaning (vegetable solid particles) • Turbine side overhaul and cleaning • Cleaning of air suction filter • Inspection of air suction filter differential pressure • Cleaning of exhaust gas inlet grid • Confirmation of exhaust gas economizer contamination • フロア側開放清掃 • タービン側洗浄(植物性固体性状) • タービン側開放清掃 • 空気吸込フィルタ清掃 • 空気吸込フィルタ差圧点検 • 排気ガス入口グリッド清掃 • 排気ガスエコノマイザー汚れ確認 |
| <input type="checkbox"/> Check & Cleaning of air cooler
エアクーラー冷却機能不良 | <ul style="list-style-type: none"> • Air venting • Inspection of air side differential pressure • Air side washing (fin tube) • Washing of cooling pipe inside • Confirmation of cooling sea water inlet pressure • Confirmation of water separator clogging • 空気抜き実施 • 空気側差圧点検 • 空気側洗浄(フィン管) • 冷却管内部洗浄 • 冷却海水入口圧力値確認 • ウォーターセパレータ閉塞確認 |
| <input type="checkbox"/> Check of air cooler (over cooling)
エアクーラー不良(過冷) | <ul style="list-style-type: none"> • Confirmation of cooling sea water inlet pressure value • Inspection of air side differential pressure • 冷却海水入口圧力値確認 • 空気側差圧点検 |
| <input type="checkbox"/> Check & Maintenance of Fuel injection valve
燃料噴射状況不良 | <ul style="list-style-type: none"> • Injection testing (Do maintenance if atomization is not good.) • Cleaning and correction of fuel injection nozzle • Inspection of contact surfaces of fuel valve body and nozzle • 噴射テスト実施 (噴霧状況が悪けれ整備を実施) • 噴射ノズルの清掃及び修正 • 燃料弁本体とノズルの当り面の点検 |
| <input type="checkbox"/> Check & Maintenance of pressure gauge
圧力計表示不良 | <ul style="list-style-type: none"> • Inspection of pressure gauge line leakage • Replacement of pressure gauge • 圧力計のラインのリーク点検 • 圧力計の交換 |
| <input type="checkbox"/> Slackness of fuel oil regulation linkage
燃料調整リンケージのガタ | <ul style="list-style-type: none"> • Confirmation of each joint part wear and sticking of pin, bush, lever bearing, cam roller • 陸上運転記録と比較し、LI値とFOPumpラック値の關係に誤差が認められる。 • 各接続部ピン、ブッシュ、レバー軸受、カム・ローラ部の磨耗、固着確認 |

1-4.J-ENG Comments./J-ENG コメント

Engine performance curve shows in normal condition.
Cylinder oil feed rate is 0.70g/PSH at MCR condition // Cylinder lub oil feed rate is in recommended range.

The judgement of main engine performance

SHIP NAME	AURIGA LEADER	KW	14315
ENGINE TYPE	7UEC 60LS II #3959	min-1	105

JUDGE	GOOD	NORMAL	CAUTION
MARK	◎	○	×

Judgement for main engine condition

Mark on graph	□	◇	△	×	*	○	+	■	◆	●
Date	17-Aug-19	22-Sep-19	11-Oct-19	11-Nov-19	06-Dec-19	09-Jan-20	30-Mar-20	-	-	-
Load	71.6	71.1	70.8	71.3	68.8	64.9	71.2	-	-	-
Te1	○	○	◎	◎	◎	◎	◎	-	-	-
Te2	○	○	○	×	○	○	○	-	-	-
Tc	○	○	○	○	○	○	○	-	-	-
Ps(Mpa)	×	◎	◎	○	◎	○	○	-	-	-
Pm(Mpa)	○	○	◎	○	◎	◎	◎	-	-	-
Pc(Mpa)	○	○	◎	◎	◎	◎	◎	-	-	-
Rc or Ll	◎	◎	◎	◎	◎	◎	◎	-	-	-
Nb	◎	◎	◎	◎	◎	◎	◎	-	-	-
Ne	◎	◎	◎	◎	◎	◎	◎	-	-	-
Te1-Te2	◎	◎	◎	×	◎	◎	◎	-	-	-
A.C.	◎	◎	◎	◎	◎	◎	◎	-	-	-

Result of calculation for main engine output

Standard Output of judgement: Output-Rc

Output(PS)-Rc	13937.6	13835.5	13779.3	13877.6	13393.9	12639.4	13863.2	-	-	-
Output(KW)-Rc	10251.1	10176.0	10134.7	10207.0	9851.2	9296.3	10196.4	-	-	-
Output(PS)-Nb	11685.1	12568.1	11626.5	12092.2	11856.7	12552.4	12486.9	-	-	-
Output(KW)-Nb	8594.4	9243.9	8551.3	8893.8	8720.6	9232.3	9184.1	-	-	-
Output(PS)-Be	14006.4	13871.5	13060.6	13831.7	13807.0	15086.6	14114.9	-	-	-
Output(KW)-Be	10301.7	10202.5	9606.1	10173.2	10155.1	11096.2	10381.5	-	-	-

Rev. margin	5.28%	5.11%	4.83%	5.33%	6.69%	7.78%	4.68%	-	-	-
Feed rate(qP1)	0.70	0.72	0.70	0.70	0.71	0.78	0.70	-	-	-
Feed rate(qA)	0.87	0.91	0.89	0.88	0.91	1.04	0.87	-	-	-
Running hour	701135	706366	70989	71447	71954	74280	73996	-	-	-

Rev. margin	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	-	-	-
Cyl. oil consump.	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	-	-	-

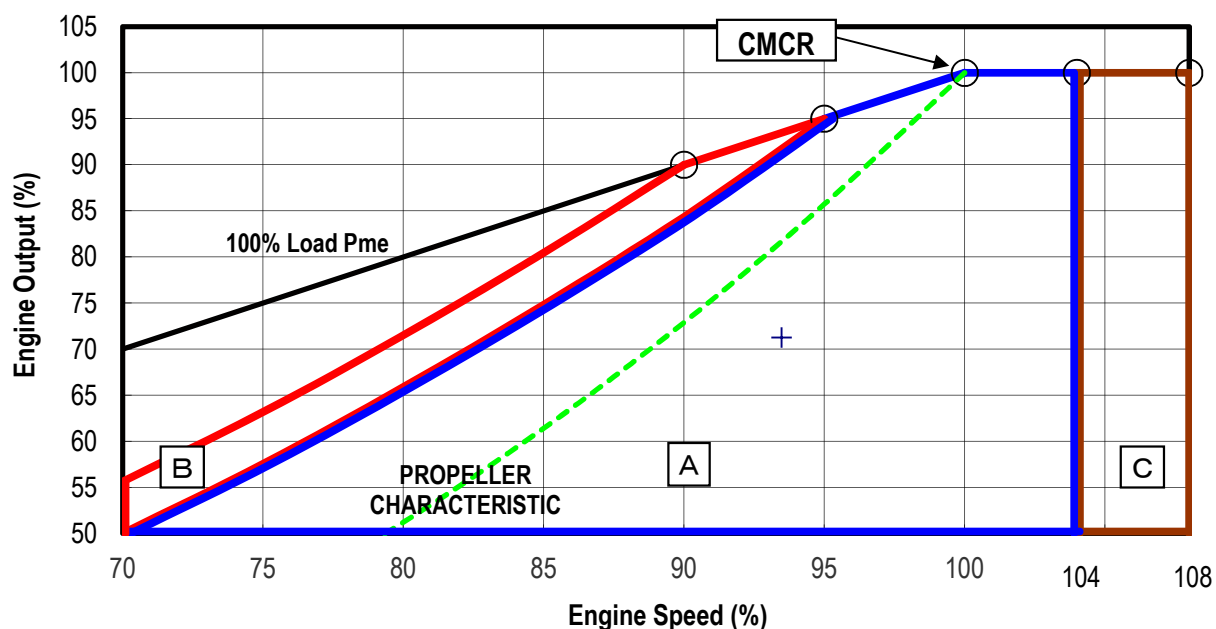
Te1,Te2 & Tc were converted into shop trial situation.

The final judgement is referred to the comment.

SHIP NAME	AURIGA LEADER	KW	14315
ENGINE TYPE	7UEC 60LS II #3959	min-1	105

8.8

Engine Operating Range



A : Service range for normal service

Recommendable operating point of the engine for service should lie in Range A.

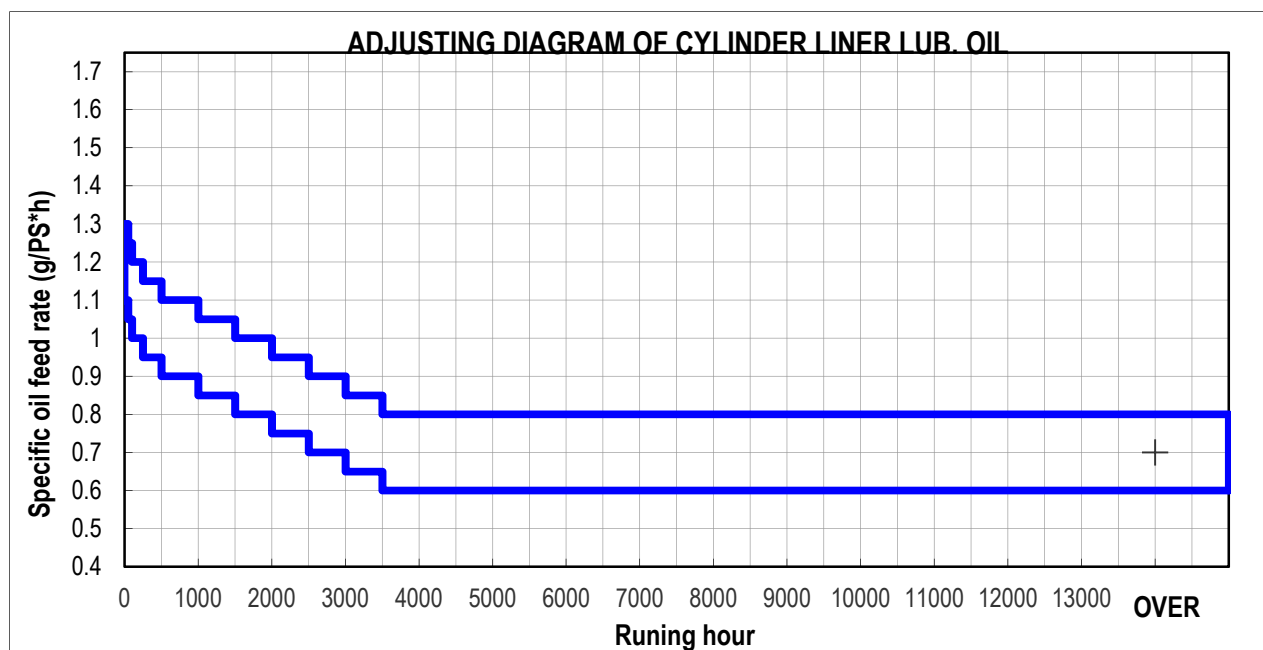
B : Alarm range for service

The engine condition should be always monitored. If it is expected that the operating point enters into Range B, the suitable measures such as cleaning and repainting of ship's hull shall be performed as soon as possible. When the operating point enters this range unwillingly, the operation should be limited to less than 1 hour in every 12 hours.

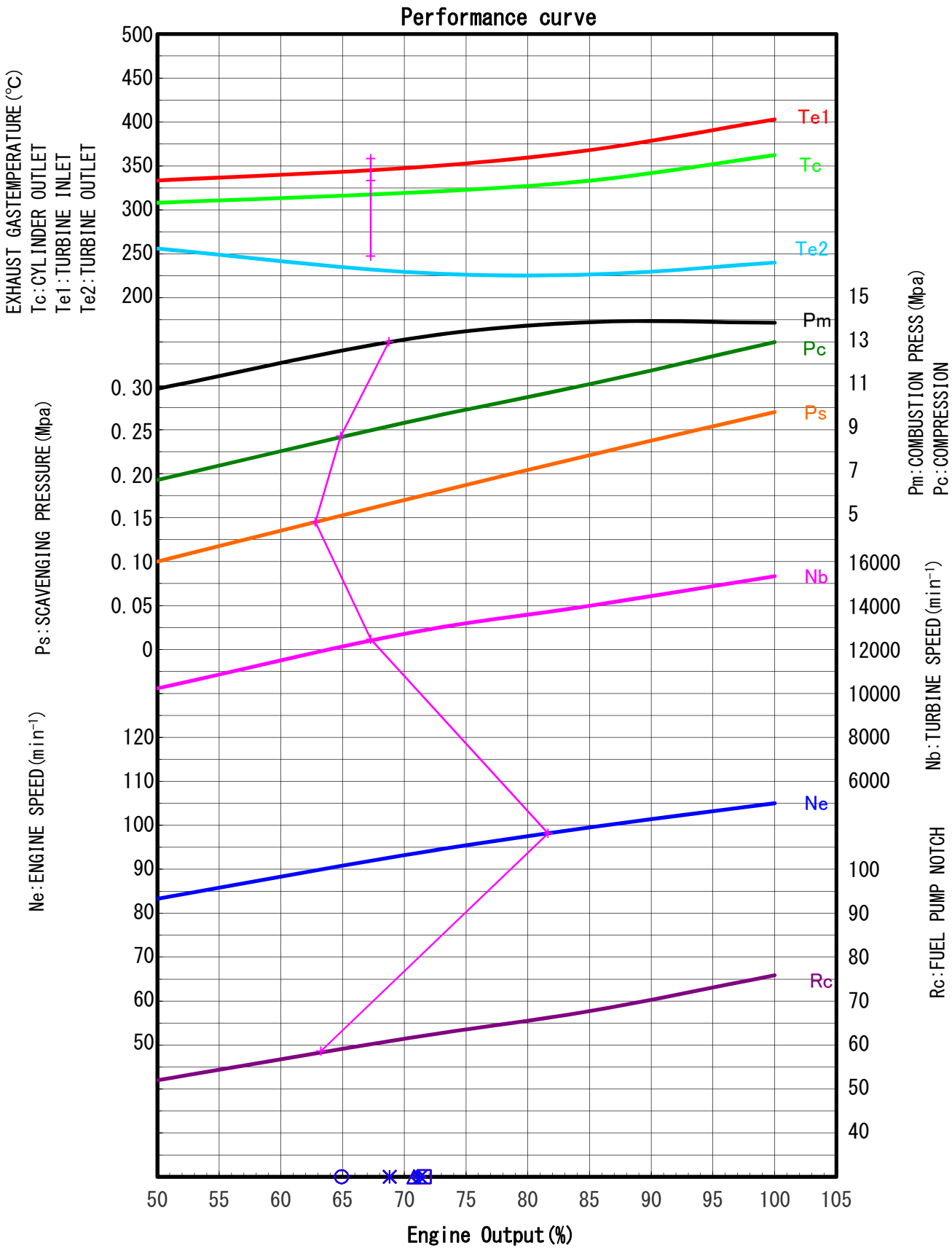
C : Allowable range only at sea trial

Service range with overspeed of 104 to 108% CMCR speed, only permissible during sea trials to demonstrate the CMCR.

CMCR : Contracted Maximum Continuous Rating, i.e. nominal power (100%PS) at nominal engine speed (100%rpm).



SHIP NAME	AURIGA LEADER	KW	14315
ENGINE TYPE	7UEC 60LS II #3959	min ⁻¹	105



MAIN ENGINE LOG

7UEC60LS II

KOBELCO DIESEL CO., LTD.

Ship name				AURIGA LEADER				kW×min ⁻¹				14315 KW X 105 min(-1)				Date				30-Mar-20									
Owner				NYK LINE				Engine No.UE-3595				Reporter				C/E													
Total Running Hours				73,996				NationalityPANAMA				Port				At sea													
Remarks				O 50 cst in use. WF-4 ;WD-NW; Sea-SLIGHT D=7.4/7.6 (F/A) , Voyage 83, Displacement = 23400 MT , Shaft Power - 11460 KW @ 98.16 Rpm																									
※ Date				09-Jan-20		30-Mar-20								※		1		8.7		12.3		8.5		12.7					
※ T.R.H				72480		73996								P.Comp		2		8.7		12.5		8.7		12.8					
Speed				19		19.4								P.Max		3		8.5		12.4		8.7		12.8					
※ M/E Revolution (rpm)				98		98.16										4		8.7		12.6		8.8		13.1					
Room Temp. (°C)				35		32										5		8.7		12.7		8.7		13.0					
Sea Water Temp. (°C)				24		16										6		8.7		12.8		8.6		13.1					
※ Handle Notch / Load Ind.				9.8/6.3		98/6.4										7		8.8		12.9		8.7		13.2					
※ Governor Index				6.3		6.4								(Mpa)		8													
※ Pressure (Mpa)				T/C LO		0.168		0.17								9													
				LO		0.204		0.207								Mean		8.7		12.6		8.7		13.0					
				FW		0.168		0.173						※		1		361		82		49		352					
				Fuel Oil		0.61		0.51						Exhaust Gas		2		351		81		49		347					
				SW		180		0.149						Temp. /		3		363		82		49		348					
				SCAV.AIR		0.146		0.145						Cylinder Outlet		4		374		82		49		369					
				Exh. V.Oil / Air		0.37/061		0.38/0.59						Temp. /		5		375		82		49		373					
F.O				Inlet Temp.° C		105		69						Piston Outlet		6		369		82		49		370					
				Viscosity (Actual)		13		13.3						Tempt.		7		365		82		49		368					
F.O Pump Rack				1		55.0		59.0								8													
				2		56.0		60.0								9													
				3		56.0		58.0								Mean		364.5		82.0		49.0		361.0					
				4		56.0		58.0						T/C		Inlet		1		397						385			
				5		56.0		58.0						Exh.				2		394						387			
				6		55.0		58.0						Temp.(Outlet		1		287						274	
				7		55.0		59.0						°C)				2		284								276	
				8												Scaven		Inlet		1		139						134	
				9												ging				2		145						141	
Turbo Charger Rev.(min-1)				1		12450		12380						A/Cooler		Outlet		1		39						40			
				2		12460		12550						Temp.		Outlet		2		41						42			
				Mean		12455		12465						(°C)		Trunk		1		46						50			
				In		68		71						T/C Blower		2		45						50					
				Out		82		84						Inlet Temp. (°C)		1		35						32					
				In		43		34								2		35						32					
				Out		49		48						Air Cooler Manometer (kpa)		120								120/120					
				In		43		34						T/C Blower Manometer (kpa)		40								1					
				Out		58		56						IHP															
※ C.W. TEMP (°C) /Air cooler				In		33		33						Fuel		Gravity		0.9765						0.9382					
				Out		42		42						Oil		Sulfur		0.49						0.431					
																Viscosity(50 C)		129						31					
F.O V. C.W. Temp (°C)														Stuff.G Leak Oil (l / Day)		19.44													
Thrust Temp (°C)				45		43								Anti Rust Chemical															
Exh.V.D.O Temp (°C)														Last Bunker				ZEEBRUGGE				KAWASAKI							
Cons.				F.O		Mt / Day		49.6		46.4				OIL		System Oil :		CDX 30				CDX 30							
				L.O		l / Day		50		50				BRAND		Cyl.Oil :		CYLTECH 70				TOTAL TALUSIA LS 40							
				Cyl. Oil		l / Day		336		312				Cylinder Oil		adjustment		Handle											
				Exh. V.Oil		l / Day		NA		NA								Stroke						All Units 1, 2, 3, 4, 5,, 6 & 7 : 1.125					