

© Copyright Statement

All rights reserved. All material in this document is, unless otherwise stated, the property of **FPC International, Inc.** Copyright and other intellectual property laws protect these materials. Reproduction or retransmission of the materials, in whole or in part, in any manner, without the prior written consent of the copyright holder, is a violation of copyright law.

*OPERATIONAL TRIAL FTC
FUEL PERFORMANCE CATALYST
K D PERDANA
OPERATIONS*

February 1993

Report prepared by:

R.A. Platt
Fuel Technology Pty Ltd
70 Adelaide Street
FREMANTLE WA 6160

Tel: (09) 335 6446
Fax: (09) 430 5403

ACN 005 945 915

CONTENTS

	Page
Introduction	1
Summary	1
Results	2
Bosch Smoke Measurement	2
Lube Oil Analysis	4
Main Engine Exhaust Temperatures	9
Ships Performance	16
Conclusion	16

APPENDIX

WesTrac Equipment - Laboratory Report

* * * *

Introduction

The purpose of this report is to evaluate and discuss the results of the various parameters measured during a trial of the FTC Combustion Catalyst on the Royal Malaysian Navy patrol boat, K.D. PERDANA.

The parameters investigated were:

- * Bosch Smoke Measurement.
- * Lubricating Oil Analysis.
- * Main Engine Exhaust Temperatures.
- * Ship Performance.

and are set out and detailed in sections 1 to 4.

SUMMARY

The FTC Combustion Catalyst is a fuel treatment which will provide a more complete combustion of the fuel, providing potential maintenance and performance benefits. Our evaluation protocol was implemented to confirm that combustion was more complete following the addition of FTC and our reasoning for the various tests is discussed.

Bosch Smoke Measurement provides an engineering standard test method to evaluate changes in particulate (Soot) emissions from the engine. More complete combustion of the fuel should be evidenced by reduced carbon (Soot) emissions.

Lubricating Oil Analysis for iron wear rates and soot levels. A reduction of soot ingested into the lubricating oil is further evidence of more complete combustion. Reduced soot relates to a reduction in wear inducing material, hence our review of changes in iron wear rates. In both cases the results are factored for hours the oil is in service.

Main Engine Exhaust Temperatures/Ships Performance. More complete combustion will translate to an increase in power at a given throttle setting. If this additional power is not utilized then the engines will maintain the same power at a lower throttle setting, which translates to reduced exhaust temperature.

If the additional power provided by FTC usage is taken up, then ships speed will increase.

Table 2. Bosch Smoke Levels Main Engine No 2.

RPM	Base 1 13.5.92	Treated 1 25.8.92	Treated 2 29.9.92	Treated 3 24.11.92	Base 2 5.12.92
650	1.4	1.4	1.5	1.6	2.1
1050	2.2	1.7	N/A	1.6	N/A
1250	3.2	2.8	N/A	1.5	3.1
Average	2.27	2.0	-	1.57	2.6

Graph II

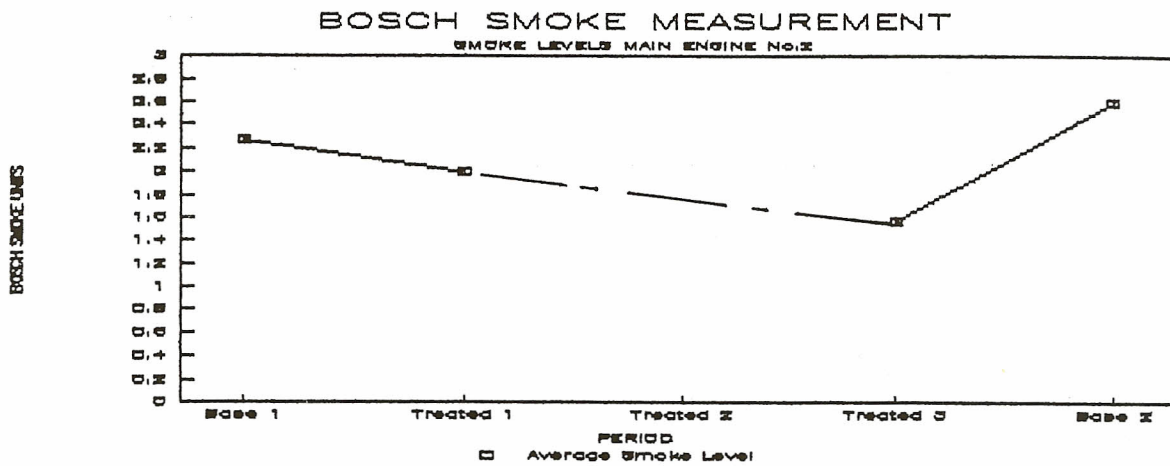


Table 3. Bosch Smoke Levels Main Engine No 3.

RPM	Base 1 13.5.92	Treated 1 25.8.92	Treated 2 29.9.92	Treated 3 24.11.92	Base 2 5.12.92
650	1.1	0.5	0.7	0.7	1.1
1050	0.6	0.6	0.6	0.6	0.7
1250	1.1	0.7	0.8	0.6	0.9
Average	0.93	0.6	0.7	0.6	0.9

Graph III

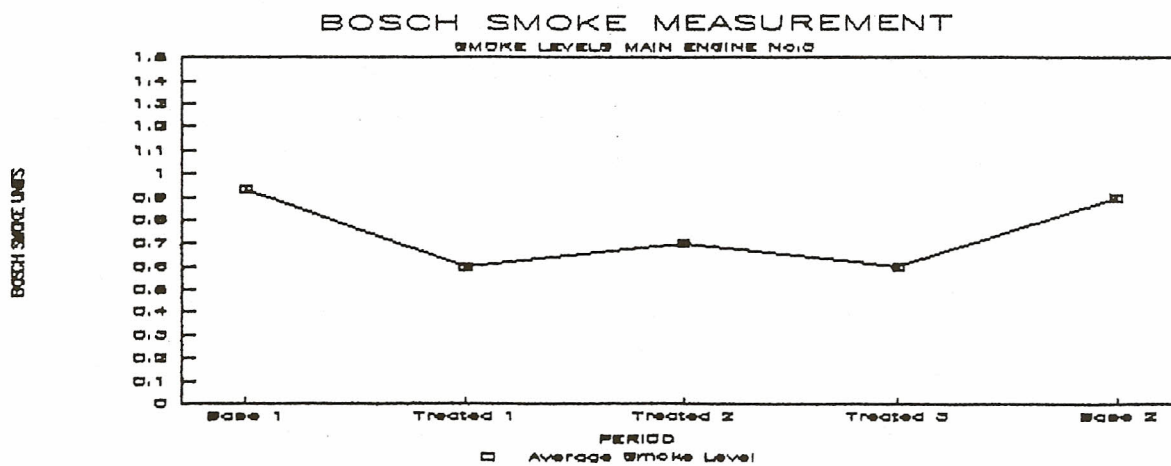


Table 5. Lube Oil Analysis Unit No: GEN-SET #1

Engine: Mercedes

Sump Cap.	Oil Hours	Oil Added	Fe ppm	Fe ppm Hours	Soot ppm	Soot ppm Hours
<i>Untreated</i>						
23	13	0	21	1.615	3	0.231
23	15	0	11	0.733	5	0.333
<i>FTC Treated</i>						
23	283	0	11	0.039	20	0.071
23	250	0	24	0.096	40	0.160
23	122	0	28	0.230	57	0.467
<i>Average levels</i>		Base		1.174		0.282
		Treated		0.122		0.233
		% Change		-89.6		-17.4

Result: Both iron wear and soot levels are significantly reduced.

Table 6. Lube Oil Analysis Unit No: GEN-SET #2

Engine: Mercedes

Sump Cap.	Oil Hours	Oil Added	Fe ppm	Fe ppm Hours	Soot ppm	Soot ppm Hours
<i>Untreated</i>						
23	302	0	28	0.093	13	0.043
23	179	0	37	0.207	19	0.106
<i>FTC Treated</i>						
23	382	0	36	0.094	17	0.045
23	250	0	13	0.052	19	0.076
23	294	0	33	0.112	20	0.068
<i>Average levels</i>		Base		0.15		0.075
		Treated		0.086		0.063
		% Change		-42.7		-16.0

Result: Both iron wear and soot levels are significantly reduced.

Table 9. Lube Oil Analysis Unit No: Main Eng #2

Engine: MTU 16V
538TB90

Sump Cap.	Oil Hours	Oil Added	Fe ppm	Fe ppm Hours	Soot ppm	Soot ppm Hours
<i>Untreated</i>						
273.3	121	0	10	0.083	4	0.033
273.3	267	0	8	0.030	19	0.071
<i>FTC Treated</i>						
273.3	234	0	9	0.038	22	0.094
273.3	284	0	8	0.028	34	0.120
273.3	250	0	18	0.072	3	0.012
<i>Average levels</i>		Base		0.056		0.052
		Treated		0.046		0.075
		% Change		-17.9		+44.2

Result: The iron level shows only a small decline, however the soot has increased as a result of the 284 hour sample which could be an outlier as the companion iron reading is well down. The concern for soot levels is that it acts as an abrasive.

Table 10. Lube Oil Analysis Unit No: Main Eng #3

Engine: MTU 16V
538TB90

Sump Cap.	Oil Hours	Oil Added	Fe ppm	Fe ppm Hours	Soot ppm	Soot ppm Hours
<i>Untreated</i>						
273.3	139	0	12	0.086	7	0.050
273.3	284	0	16	0.056	15	0.053
<i>FTC Treated</i>						
273.3	285	0	16	0.056	11	0.039
273.3	271	0	8	0.030	14	0.052
273.3	216	0	11	0.051	10	0.046
<i>Average levels</i>		Base		0.071		0.052
		Treated		0.046		0.046
		% Change		-35.2		-11.5

Result: Iron level shows significant fall with only slight change in soot.

Table No 12. "Perdana" Oil Soot Sizes

Unit	Baseline			Treated (29.9.92)		
	Hour	Soot Range (Micron)		Hour	Soot Range (Micron)	
		<i>Smallest</i>	<i>largest</i>		<i>Smallest</i>	<i>Largest</i>
Gen 1	13.00	< 0.15	1.0	122	0.2	2.0
Gen 2	302.43	< 0.15	1.0	294	0.2	2.0
Gen 3	180.00	0.2	2.0	67	0.2	2.0
Main 1	122.00	< 0.15	2.0	250	< 0.15	2.0
Main 2	121.00	< 0.15	2.0	250	0.4	2.0
Main 3	139.55	< 0.15	2.0	216	< 0.15	2.0
Main 4	140.35	< 0.15	1.0	205	< 0.15	2.5

As noted in the above table, oil hours are not directly comparable for baseline and treated samples. The results generally show little change in particle size, contrary to our normal experience. However, it must be noted that soot content in the treated oil is lower than baseline.

3) Main Engine Exhaust Temperatures

These temperatures were recorded and logged by ships staff during routine running and whilst conducting Bosch Smoke Tests.

The results of the temperature observations are recorded in Table 13.

Table 13. Record of Exhaust Temperatures

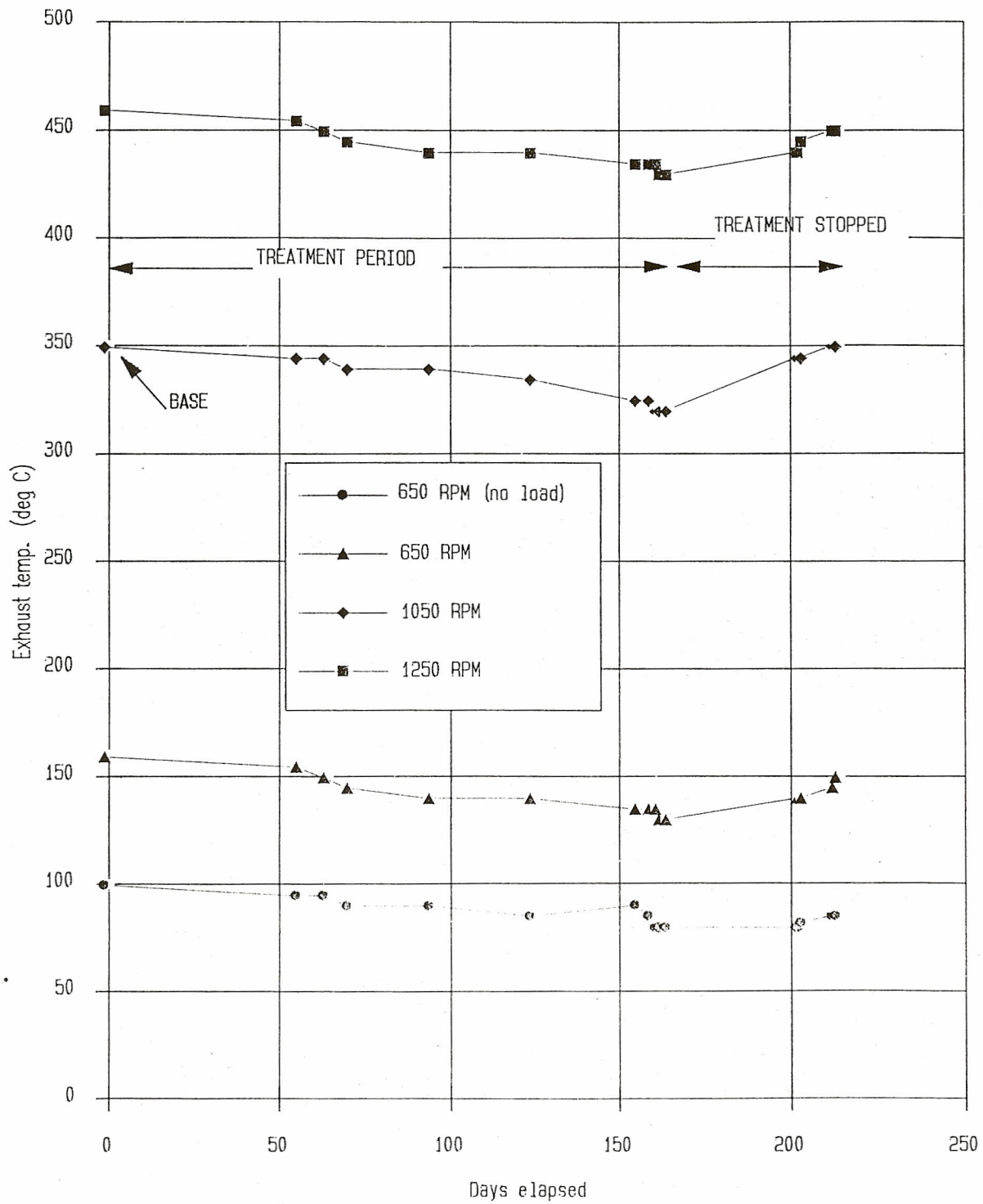
Date	FTC +	RPM	Exhaust Temperatures °C			
			M/E 1	M/E 2	M/E 3	M/E 4
6.5.92	Nil	650 (No load)	95	100	95	95
		650	155	160	155	155
		1050	350	350	355	350
		1250	460	460	465	465
30.6.92	Yes	650 (No load)	90	95	95	90
		650	155	155	155	155
		1050	345	345	350	345
		1250	450	455	455	455
8.7.92	Yes	650 (No load)	90	95	90	90
		650	150	150	150	150
		1050	345	345	350	345
		1250	450	450	450	450
15.7.92	Yes	650 (No load)	85	90	85	90
		650	145	145	145	150
		1050	340	340	345	340
		1250	445	445	450	445

Table 13 indicates that, exhaust temperatures have reduced progressively following the addition of FTC to the fuel, and increased again once FTC treatment ceased.

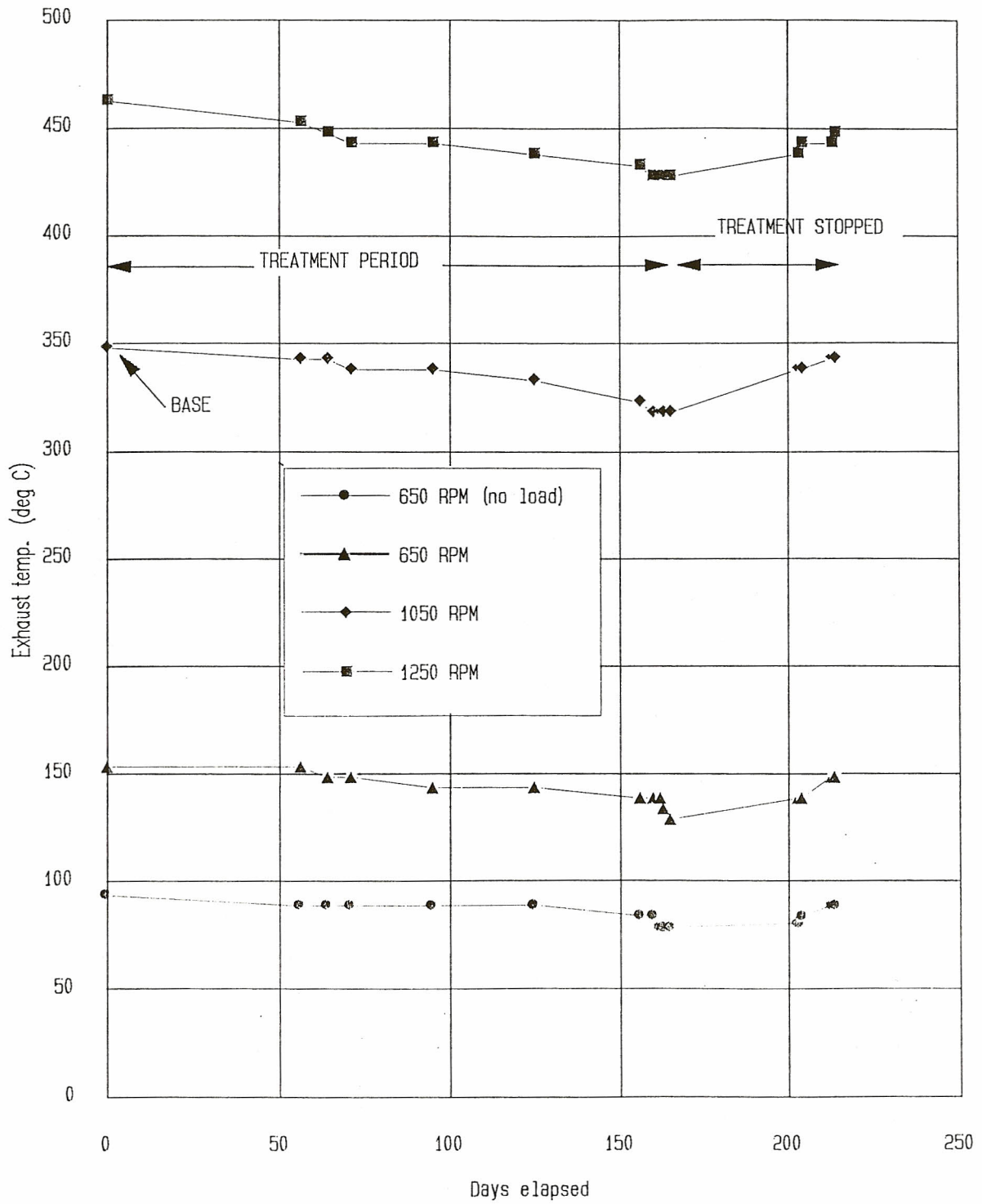
Temperatures have reduced 10°C following FTC treatment at low RPM's and up to 20°C for the higher RPM range. Again this is consistent with our experience in this area.

Graphical representation of this exhaust temperature data is provided in the following pages.

Exhaust temps. for M/E 2.



Exhaust temps. for M/E 4.



Appendix

WESTRAC EQUIPMENT - LABORATORY REPORT

WesTrac Equipment

WesTrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampler

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 1
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 1
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-4
LAB I.D. # 92178404
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	TEST RESULTS
REC'D 271092	N	335	335		COPPER IS HIGH. SODIUM IS HIGH. ALL OTHER ELEMENTS TEST RESULTS APPEAR NORMAL. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
DATE TAKEN 29-09-92				PREVIOUS #1	VERY LITTLE CHANGE CONTINUE SAMPLING AT THE NORMAL INTERVAL.
REC'D 271092	N	250	250		
DATE TAKEN 28-08-92				PREVIOUS #2	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	284	284		
DATE TAKEN				PREVIOUS #3	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CONTINUE SAMPLING AT THE NORMAL INTERVAL. NOTE: NEW OIL CONTAINS HIGH LEVELS OF COPPER AND SODIUM.
REC'D 271092	N	50	50		

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	102	10	0	4	1	4	-	454	-	CUR	N	N	-	7	11	-	43	-	-	-	-	-
271092	108	10	0	5	2	5	-	505	-	#1	N	N	-	24	18	-	54	-	-	-	-	-
271092	105	8	0	4	2	3	-	457	-	#2	N	N	-	18	13	-	45	-	-	-	-	-
271092	110	12	0	5	2	5	-	400	-	#3	N	N	-	10	7	-	34	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sample

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 1
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 1
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-2
LAB I.D. # 92J78403
EVALUATION CODE B

DATE TAKEN 29-09-92 ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	VERY LITTLE CHANGE CONTINUE SAMPLING AT THE NORMAL INTERVAL.
REC'D 271092	N	250 250		
DATE TAKEN 28-08-92			PREVIOUS #1	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	284 284		
DATE TAKEN			PREVIOUS #2	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CONTINUE SAMPLING AT THE NORMAL INTERVAL. NOTE: NEW OIL CONTAINS HIGH LEVELS OF COPPER AND SODIUM.
REC'D 271092	N	50 50		
DATE TAKEN			PREVIOUS #3	
REC'D				

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	108	10	0	5	2	5	-	505	-	CUR	N	N	-	24	10	-	54	-	-	-	-	-
271092	105	8	0	4	2	3	-	457	-	#1	N	N	-	18	13	-	45	-	-	-	-	-
271092	110	12	0	5	2	5	-	400	-	#2	N	N	-	10	7	-	34	-	-	-	-	-
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM	A - ANTIFREEZE			

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 2
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 2
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-6
LAB I.D. # 92J78407
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	TEST RESULTS
REC'D 271092	N	234	234	CURRENT COPPER IS HIGH, SODIUM IS HIGH. ALL OTHER ELEMENTS TEST RESULTS APPEAR NORMAL. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	122	122	PREVIOUS #1 COPPER IS HIGH, SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	121	121	PREVIOUS #2 COPPER IS HIGH, SODIUM IS HIGH. ALL OTHER ELEMENTS TEST RESULTS APPEAR NORMAL. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D				PREVIOUS #3

DATE	ELEMENT CONCENTRATIONS IN PPM										OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	106	9	0	4	2	4	-	450	-	CUR	N	N	-	22	12	-	51	-	-	-	-	-
271092	103	8	0	6	2	2	-	332	-	#1	N	N	-	10	17	-	28	-	-	-	-	-
271092	104	10	0	4	2	2	-	310	-	#2	N	N	-	4	13	-	26	-	-	-	-	-
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

WesTrac Equipment

WesTrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sample

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 2
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 2
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No. UNTREATED
LABEL # 4-10
LAB I.D. # 92J7B406
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	TEST RESULTS
271092	N	122	122	CURRENT	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
271092	N	121	121	PREVIOUS #1	COPPER IS HIGH. SODIUM IS HIGH. ALL OTHER ELEMENTS TEST RESULTS APPEAR NORMAL. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
				PREVIOUS #2	
				PREVIOUS #3	

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	DXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	103	8	0	6	2	2	-	332	-	CUR	N	N	-	10	17	-	28	-	-	-	-	-
271092	104	10	0	4	2	2	-	310	-	#1	N	N	-	4	13	-	26	-	-	-	-	-
										#2												
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 2
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 2
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-B
LAB I.D. # 92J78409
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	TEST RESULTS
REC'D 271092	N	267	267	CURRENT COPPER IS HIGH. SODIUM IS HIGH. ALL OTHER ELEMENTS TEST RESULTS APPEAR NORMAL. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
DATE TAKEN 29-09-92				PREVIOUS #1 IRON ACCEPTABLE BUT INCREASING OXIDATION AND SULPHUR ARE HIGH CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.
REC'D 271092	N	250	250	
DATE TAKEN				PREVIOUS #2 COPPER IS HIGH. SODIUM IS HIGH. ALL OTHER ELEMENTS TEST RESULTS APPEAR NORMAL. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	234	234	
DATE TAKEN				PREVIOUS #3 COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	122	122	

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	105	8	0	4	2	3	-	420	-	CUR	N	N	-	19	14	-	34	-	-	-	-	-
271092	110	18	0	8	5	7	-	548	-	#1	N	N	-	3	62	-	84	-	-	-	-	-
271092	106	9	0	4	2	4	-	450	-	#2	N	N	-	22	12	-	51	-	-	-	-	-
271092	103	8	0	6	2	2	-	332	-	#3	N	N	-	10	17	-	28	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6168

EQUIP. # 3
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 3
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-14
LAB I.D. # 92J78414
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	PREVIOUS
REC'D 271092	N	284	284	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. IRON ACCEPTABLE BUT INCREASING	
DATE TAKEN 29-09-92					COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	216	216		#1
DATE TAKEN 28-08-92					COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	211	211 ²¹⁰		#2
DATE TAKEN					COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	139	139		#3

DATE	ELEMENT CONCENTRATIONS IN PPM										OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	114	16	0	7	2	2	-	292	-	CUR	N	N	-	15	12	-	75	-	-	-	-	-
271092	112	11	0	5	1	2	-	414	-	#1	N	N	-	10	12	-	96	-	-	-	-	-
271092	104	8	0	4	1	2	-	412	-	#2	N	N	-	14	18	-	49	-	-	-	-	-
271092	109	12	0	6	2	3	-	250	-	#3	N	N	-	7	20	-	40	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

WesTrac Equipment

WesTrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 3
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 3
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-13
LAB I.D. # 92378413
EVALUATION CODE B

DATE TAKEN 29-09-92 ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	216 216		
DATE TAKEN 28-08-92			PREVIOUS #1	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	211 211 ²⁷¹		
DATE TAKEN			PREVIOUS #2	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	139 139		
DATE TAKEN			PREVIOUS #3	
REC'D				

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN		W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	112	11	0	5	1	2	-	414	-	CUR		N	N	-	10	12	-	96	-	-	-	-	-
271092	104	8	0	4	1	2	-	412	-	#1		N	N	-	14	18	-	49	-	-	-	-	-
271092	109	12	0	6	2	3	-	250	-	#2		N	N	-	7	20	-	40	-	-	-	-	-
										#3													

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055
 Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
 ATT MR BOB PLATT
 PO BOX 1271
 FREMANTLE
 WA 6160

EQUIP. # 3
 JOBSITE PERDANA
 MAKE
 MODEL
 SERIAL No. MAIN ENGINE NO 3
 COMPARTMENT ENGINE-PRIMARY
 OIL BRAND & TYPE /
 OIL CHGD?
 ORDER No. UNTREATED
 LABEL # 4-11
 LAB I.D. # 92J78411
 EVALUATION CODE B

DATE TAKEN				COPPER IS HIGH. SODIUM IS HIGH.
	OIL ADDED	TOTAL HOURS	HOURS ON OIL	
REC'D	CURRENT			THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
271092	N	139	139	

DATE TAKEN				
REC'D	PREVIOUS			#1

DATE TAKEN				
REC'D	PREVIOUS			#2

DATE TAKEN				
REC'D	PREVIOUS			#3

DATE	ELEMENT CONCENTRATIONS IN PPM										OIL CONDITION/CONTAMINANTS % OF ALLOWABLE												
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS	
271092	109	12	0	6	2	3	-	250	-	CUP	N	N	-	7	20	-	40	-	-	-	-	-	-
										#1													
										#2													
										#3													

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

WesTrac Equipment

WesTrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampler

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 4
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 4
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-20
LAB I.D. # 92178420
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	PREVIOUS
271092	N	319	319	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
271092	N	284	284	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
29-09-92	N	205	205	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
28-08-92	N	271	271	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.

DATE	ELEMENT CONCENTRATIONS IN PPM												OIL CONDITION/CONTAMINANTS % OF ALLOWABLE									
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	101	7	0	4	1	4	-	472	-	UR	N	N	-	23	14	-	40	-	-	-	-	-
271092	98	7	0	5	2	6	-	403	-	#1	N	N	-	20	11	-	29	-	-	-	-	-
271092	99	5	0	3	1	2	-	477	-	#2	N	N	-	18	8	-	30	-	-	-	-	-
271092	101	5	0	4	1	6	-	452	-	#3	N	N	-	25	12	-	31	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sample

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # 4
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. MAIN ENGINE NO 4
COMPARTMENT ENGINE-PRIMARY
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-17
LAB I.D. # 92J78418
EVALUATION CODE B

DATE TAKEN 29-09-92 ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	205 205		
DATE TAKEN 28-08-92			PREVIOUS #1	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	271 271		
DATE TAKEN			PREVIOUS #2	COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D 271092	N	140 140		
DATE TAKEN			PREVIOUS #3	
REC'D				

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	99	5	0	3	1	2	-	477	-	CUR	N	N	-	18	8	-	30	-	-	-	-	-
271092	101	5	0	4	1	6	-	452	-	#1	N	N	-	25	12	-	31	-	-	-	-	-
271092	98	8	0	5	2	1	-	279	-	#2	N	N	-	15	13	-	23	-	-	-	-	-
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. #	GEN1
JOBSITE	PERDANA
MAKE	
MODEL	
SERIAL No.	GEN NO1
COMPARTMENT	ENGINE-GEN SET
OIL BRAND & TYPE	/
OIL CHGD?	
ORDER No.	
LABEL #	4-25
LAB I.D. #	92J78421
EVALUATION CODE	B

DATE TAKEN 28-08-92 ADDED	TOTAL HOURS	HOURS ON OIL	UNKNOWN HOURS ON OIL SAMPLE. COPPER IS HIGH. SODIUM IS HIGH.
REC'D 271092	N		CURRENT THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
DATE TAKEN			PREVIOUS #1
DATE TAKEN			PREVIOUS #2
DATE TAKEN			PREVIOUS #3

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	99	24	0	7	4	14	-	538	-	CUR	N	N	-	40	24	-	56	-	-	-	-	-
										#1												
										#2												
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM	A - ANTIFREEZE			

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sample

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # GEN1
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. GEN ND1
COMPARTMENT ENGINE-GEN SET
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-23
LAB I.D. # 92378424
EVALUATION CODE B

DATE TAKEN	TOTAL HOURS	HOURS ON OIL	REC'D	STATUS	COMMENTS
29-09-92 ADDED			271092	N 122 122	CURRENT ELEMENTS SLIGHTLY ELEVATED SLIGHT OXIDATION INDICATED, CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP. CHECK FOR CORRECT SHUT DOWN PROCEDURE.
			271092	N 15 15	PREVIOUS #1 COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
			271092	N 13 13	PREVIOUS #2 ELEMENTS ELEVATED SHOWS FUEL DILUTION SUGGEST CHECK FOR SOURCE SCHEDULE UNIT FOR INSPECTION AS SOON AS POSSIBLE. RESAMPLE AFTER 100 HOURS.
28-08-92			271092	N	PREVIOUS #3 UNKNOWN HOURS ON OIL SAMPLE, COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.

DATE	ELEMENT CONCENTRATIONS IN PPM										OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	103	28	0	9	4	13	-	536	-	CU#	N	N	-	57	39	-	73	-	-	-	-	-
271092	96	11	0	5	2	12	-	525	-	#1	N	N	-	5	14	-	4	-	-	-	-	-
271092	91	21	0	11	4	15	-	464	-	#2	N	3%	-	3	12	-	4	-	-	-	-	-
271092	99	24	0	7	4	14	-	538	-	#3	N	N	-	40	24	-	56	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

WesTrac Equipment

WesTrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # GEN1
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. GEN NO1
COMPARTMENT ENGINE-GEN SET
OIL BRAND & TYPE /
OIL CHGD?
ORDER No. UNTREATED
LABEL # 4-21
LAB I.D. # 92J78422
EVALUATION CODE X

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL		
REC'D				CURRENT	ELEMENTS ELEVATED SHOWS FUEL DILUTION SUGGEST CHECK FOR SOURCE SCHEDULE UNIT FOR INSPECTION AS SOON AS POSSIBLE. RESAMPLE AFTER 100 HOURS.
271092	N	13	13		
DATE TAKEN				PREVIOUS	UNKNOWN HOURS ON OIL SAMPLE. COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE.
REC'D				#1	
271092	N				
DATE TAKEN				PREVIOUS	
REC'D				#2	
DATE TAKEN				PREVIOUS	
REC'D				#3	

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	91	21	0	11	4	15	-	464	-	OUR	N	3%	-	3	12	-	4	-	-	-	-	-
271092	99	24	0	7	4	14	-	538	-	#1	N	N	-	40	24	-	56	-	-	-	-	-
										#2												
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # GEN2
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. GEN NO2
COMPARTMENT ENGINE-GEN SET
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-29
LAB I.D. # 92J78427
EVALUATION CODE B

DATE TAKEN		IRON IS SLIGHTLY HIGH. OXIDATION AND SULPHUR ARE HIGH
OIL ADDED		
TOTAL HOURS		
HOURS ON OIL		
REC'D	CURRENT	CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP. POSSIBLE GEAR TRAIN WEAR.
271092	N 382 382	
DATE TAKEN		UNKNOWN HOURS ON OIL SAMPLE. COPPER IS HIGH. SODIUM IS HIGH.
REC'D	PREVIOUS #1	THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. MORE SAMPLES ARE NEEDED TO ESTABLISH A TREND.
271092	N	
DATE TAKEN		
REC'D	PREVIOUS #2	
DATE TAKEN		
REC'D	PREVIOUS #3	

DATE	ELEMENT CONCENTRATIONS IN PPM										OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	104	36	2	9	6	9	-	540	-	CU	N	N	-	17	79	-	150	-	-	-	-	-
271092	97	13	0	5	3	8	-	533	-	#1	N	N	-	5	35	-	59	-	-	-	-	-
										#2												
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # GEN2
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. GEN N02
COMPARTMENT ENGINE-GEN SET
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-27
LAB I.D. # 92178429
EVALUATION CODE B

DATE TAKEN 29-09-02 ADDED	TOTAL HOURS	HOURS ON OIL	CURRENT	IRON IS SLIGHTLY HIGH. OXIDATION AND SULPHUR ARE HIGH CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP. CHECK FOR CORRECT SHUT DOWN PROCEDURE.
REC'D 271092	N	294 294		
DATE TAKEN			PREVIOUS #1	COPPER IS HIGH. SODIUM IS HIGH. OXIDATION AND SULPHUR ARE HIGH CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP. CHECK FOR RESIDUAL OIL FOLLOWING OIL DRAIN
REC'D 271092	N	302 302		
DATE TAKEN			PREVIOUS #2	IRON IS SLIGHTLY HIGH. OXIDATION AND SULPHUR ARE HIGH CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP. POSSIBLE GEAR TRAIN WEAR.
REC'D 271092	N	382 382		
DATE TAKEN			PREVIOUS #3	UNKNOWN HOURS ON OIL SAMPLE. COPPER IS HIGH, SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. MORE SAMPLES ARE NEEDED TO ESTABLISH A TREND.
REC'D 271092	N			

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	100	33	1	6	6	10	-	537	-	CUR	N	N	-	20	83	-	153	-	-	-	-	-
271092	96	28	1	11	6	10	-	535	-	#1	N	N	-	13	65	-	129	-	-	-	-	-
271092	104	36	2	9	6	9	-	540	-	#2	N	N	-	17	79	-	150	-	-	-	-	-
271092	97	13	0	5	3	8	-	533	-	#3	N	N	-	5	35	-	59	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # GEN3
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. GEN NQ3
COMPARTMENT ENGINE-GEN SET
OIL BRAND & TYPE
OIL CHGD?
ORDER No.
LABEL # 4-35
LAB I.D. # 92J7B431
EVALUATION CODE B

DATE TAKEN 28-08-90 ADDED	TOTAL HOURS	HOURS ON OIL	UNKNOWN HOURS ON OIL SAMPLE. COPPER IS HIGH. SODIUM IS HIGH.
REC'D 271092	N		THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. SLIGHT OXIDATION INDICATED, CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.

CURRENT

DATE TAKEN		PREVIOUS
REC'D		#1

PREVIOUS

DATE TAKEN		PREVIOUS
REC'D		#2

PREVIOUS

DATE TAKEN		PREVIOUS
REC'D		#3

PREVIOUS

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN		W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	99	10	0	6	3	10	-	536	-	CUR		N	N	-	9	44	-	46	-	-	-	-	-
										#1													
										#2													
										#3													

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampling

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. #	GEN3
JOBSITE	PERDANA
MAKE	
MODEL	
SERIAL No.	GEN N03
COMPARTMENT	ENGINE-GEN SET
OIL BRAND & TYPE	/
OIL CHGD?	
ORDER No.	UNTREATED
LABEL #	4-33
LAB I.D. #	92J78433
EVALUATION CODE	B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL		
REC'D 271092	N	180	180	CURRENT	COPPER IS HIGH. SODIUM IS HIGH. SLIGHT OXIDATION INDICATED, THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.
DATE TAKEN				PREVIOUS	
REC'D 271092	N	250	250	#1	COPPER IS HIGH. SODIUM IS HIGH. OXIDATION IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.
DATE TAKEN 28-08-92				PREVIOUS	
REC'D 271092	N			#2	UNKNOWN HOURS ON OIL SAMPLE. COPPER IS HIGH. SODIUM IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. SLIGHT OXIDATION INDICATED, CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.
DATE TAKEN				PREVIOUS	
REC'D				#3	

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE										
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS
271092	98	22	1	9	4	14	-	534	-	CUR	N	N	-	12	47	-	55	-	-	-	-	-
271092	99	17	0	7	3	12	-	538	-	#1	N	N	-	10	54	-	61	-	-	-	-	-
271092	99	10	0	6	3	10	-	536	-	#2	N	N	-	9	44	-	46	-	-	-	-	-
										#3												

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM	CU - COPPER	SI - SILICON	W - WATER	ST - SOOT	OX - OXIDATION
CR - CHROMIUM	PB - LEAD	NA - SODIUM	F - FUEL	SU - SULPHUR	NI - NITRATION
FE - IRON	MO - MOLYBDENUM		A - ANTIFREEZE		

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.

Westrac Equipment

Westrac Equipment Pty Ltd A.C.N. 009 342 572

128-134 Great Eastern Highway, South Guildford, Western Australia, 6055

Telephone: (09) 377 9549, 377 9571 Facsimile: (09) 377 2405



Scheduled Oil Sampli

FUEL TECHNOLOGY
ATT MR BOB PLATT
PO BOX 1271
FREMANTLE
WA 6160

EQUIP. # GEN3
JOBSITE PERDANA
MAKE
MODEL
SERIAL No. GEN N03
COMPARTMENT ENGINE-GEN SET
OIL BRAND & TYPE /
OIL CHGD?
ORDER No.
LABEL # 4-31
LAB I.D. # 92J78435
EVALUATION CODE B

DATE TAKEN	OIL ADDED	TOTAL HOURS	HOURS ON OIL	STATUS	ANALYSIS
REC'D 271092	N	20	20	CURRENT	COPPER IS HIGH. SODIUM IS HIGH. SLIGHT OXIDATION INDICATED, THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.
DATE TAKEN 29-09-92				PREVIOUS #1	COPPER IS HIGH. SODIUM IS HIGH. OXIDATION AND SULPHUR ARE HIGH CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP. CHECK FOR RESIDUAL OIL FOLLOWING OIL DRAIN
DATE TAKEN REC'D 271092	N	180	180	PREVIOUS #2	COPPER IS HIGH. SODIUM IS HIGH. SLIGHT OXIDATION INDICATED, THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.
DATE TAKEN REC'D 271092	N	250	250	PREVIOUS #3	COPPER IS HIGH. SODIUM IS HIGH. OXIDATION IS HIGH. THIS COULD BE CAUSED BY THE OIL ADDITIVE PACKAGE. CHECK FOR THE CORRECT COOLANT PRESSURE/TEMP.

DATE	ELEMENT CONCENTRATIONS IN PPM											OIL CONDITION/CONTAMINANTS % OF ALLOWABLE											
	CU	FE	CR	PB	AL	SI	MO	NA	MG	SN	W	F	A	ST	OXI	NIT	SUL	***	***	TAN	TBN	VIS	
271092	98	22	1	9	4	14	-	532	-	CUR	N	N	-	8	45	-	55	-	-	-	-	-	-
271092	106	20	0	9	5	13	-	548	-	#1	N	N	-	10	75	-	94	-	-	-	-	-	-
271092	98	22	1	9	4	14	-	534	-	#2	N	N	-	12	47	-	55	-	-	-	-	-	-
271092	99	17	0	7	3	12	-	538	-	#3	N	N	-	10	54	-	61	-	-	-	-	-	-

WEAR METAL ABBREVIATIONS

AL - ALUMINIUM CU - COPPER SI - SILICON W - WATER ST - SOOT OX - OXIDATION
CR - CHROMIUM PB - LEAD NA - SODIUM F - FUEL SU - SULPHUR NI - NITRATION
FE - IRON MO - MOLYBDENUM A - ANTIFREEZE

EVALUATION CODES: A - ACCEPTABLE B - REPORTABLE C - UNACCEPTABLE X - URGENT

THIS ANALYSIS IS INTENDED AS AN AID IN PREDICTING MECHANICAL WEAR. NO GUARANTEE, EXPRESS OR IMPLIED, IS MADE AGAINST FAILURE OF THIS PIECE OF EQUIPMENT OR A COMPONENT PART THEREOF.