

CHAPTER 5 - CONCLUSIONS AND RECCOMENDATIONS

5.1 Conclusions

1. Periodical Service Reguler (PSR) program is the right answer to help agro customers in handling customer heavy equipment maintenance, with the condition that customers do not have sufficient and competent manpower resources to handle heavy equipment maintenance. And can answer from the pain and gain of XYZ customers.
2. The impact of the implementation of this PSR program for UT is that there is a revenue service increase of 240% of the declared target.

5.2 Recommendations

From the results of the implementation of the PSR program for XYZ customers, several things can be done to improve PSR program services, among others.

1. The implementation of periodical service carried out by UT mechanics can involve XYZ customer mechanics as a form of knowledge transfer process and XYZ customer mechanical development.
2. This PSR program can be implemented for other customers who have character, pain and gain such as XYZ customers.

A. PERIODICAL SERVICE FORM (SAMPLE)

Appendix 1. PERIODICAL SERVICE FORM (SAMPLE)

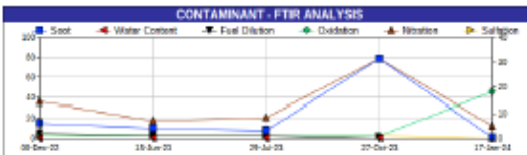
B. OIL ANALYSIS REPORT (SAMPLE)

Customer Name	: PT. MUARATOYU SUBUR LESTARI	Unit Number	: VCD6	Viscosity@100/80C	:
Address	: BATU KAJANG	Component	: ENGINE	Viscosity@40/80C	:
Unit Model	: BW211D-40	Component Matrix	: EG D GEN	T B N	:
Serial Number	: 961582391142	Oil Matrix	: GEN DSO 15W-40		

Test Detail						Overall Analysis Result		
Lab. Number	B22152186	B23097568	B23127046	B23189167	B24008660			
Sampling Date	2022-11-27	2023-06-09	2023-07-22	2023-10-03	2024-01-06			
Received Date	2022-12-07	2023-06-13	2023-07-27	2023-10-25	2024-01-16			
Report Date	2022-12-08	2023-06-15	2023-07-29	2023-10-27	2024-01-17			
Hours on Oil	576	970	439	595	500			
Hours on Unit	576	1546	1985	2593	3035			
Lube Oil Name	KGO 15W/40	KGO 15W/40	KGO 15W/40	KGO 15W/40	KGO 15W/40			
Oil Change	Yes	Yes	Yes	Yes	Yes			
Status	CRITICAL	CAUTION	CAUTION	SEVERE	NORMAL			
Physical Test	Unit	Method				Caution	Critical	
Visc@40C	cSt	ASTM D7279-20						
Visc@100C	cSt	ASTM D7279-20	8.41	10.18	10.18	15.33	13.06	
T A N	mg KOH/g	ASTM D974-22						
T B N	mg KOH/g	ASTM D2896-21	8.08	8.59	8.78	8.94	11.11	
Metal Additive						Warning	Limit	
Magnesium (Mg)	ppm	ASTM D5185-18	11	8	7	882	6	
Calcium (Ca)	ppm	ASTM D5185-18	2742	2896	3088	3186	3430	
Zinc (Zn)	ppm	ASTM D5185-18	899	985	1001	1705	1102	
Molybdenum (Mo)	ppm	ASTM D5185-18						
Boron (B)	ppm	ASTM D5185-18						
Phosphor (P)	ppm	ASTM D5185-18						
Contaminant								
Sodium (Na)	ppm	ASTM D5185-18	7	2	1	2	0	
Silicon (Si)	ppm	ASTM D5185-18	44	11	7	24	1	
Fuel Dilution	%v	ASTM E2412-23	2	1	1	0	0	
Fame Dilution	%v	ASTM E2412-23	6.5	3.5	4	0.3	0	
Water Content	%v	ASTM E2412-23	0	0	0	0	0	
Glycol	%v	ASTM E2412-23	0	0	0	0	0	
Wear Metal								
Iron (Fe)	ppm	ASTM D5185-18	129	42	24	225	5	
Copper (Cu)	ppm	ASTM D5185-18	105	11	2	28	1	
Aluminium (Al)	ppm	ASTM D5185-18	6	6	4	11	1	
Chromium (Cr)	ppm	ASTM D5185-18	5	3	2	11	0	
Nickel (Ni)	ppm	ASTM D5185-18	1	1	0	1	0	
Tin (Sn)	ppm	ASTM D5185-18	1	1	0	9	0	
Lead (Pb)	ppm	ASTM D5185-18	4	1	1	255	1	
Pb 75th Percentile								
PQ Index	-	D8184-18	7	5	6	42	1	
Color		ASTM D1500-12						
FTIR						Warning	Limit	
Soot	Abs/cm	ASTM E2412-23	14	10	7	78	1	
Oxidation	Abs/cm	ASTM E2412-23	1	1	1	1	18	
Nitration	Abs/cm	ASTM E2412-23	14	6	8	31	4	
Sulfation	Abs/cm	ASTM E2412-23	1	1	1	1	0	
Other Analysis								
ISO CODE		ISO 4406 : 2021	-					



WEAR TRENDING



CONTAMINANT - FTIR ANALYSIS



TAN - TBN



VISCOSITY

Source of Abnormality

Hasil analisa NORMAL

Action to be Taken

Resampling 250 jam berikutnya.

Appendix 2. OIL ANALYSIS REPORT (SAMPLE)

C. PERIODICAL INSPECTION (SAMPLE)



PT UNITED TRACTORS

BACKLOG REPORT

Customer PT. BBB	Machine Model GD511A-1	Engine Model 56D95L-1
Unit Locat KM 54	Machine SN 12720	Engine SN
Work Order	Code Unit **	Hours Meter 0

Finding	Comment	Suggest
	INSPECTION Serial No Unit.	
	INSPECTION Unit Preview.	
	INSPECTION Engine serial number unit.	
	INSPECTION Control valve leaking Di analisis ada kerusakan pada seal component tsb.	Recommendation : Resealing control valve
	INSPECTION Cylinder table leaking Terjadi kerusakan pada seal cylinder	Recommendation : Resealing cylinder

Appendix 3. PERIODICAL INSPECTION (SAMPLE)

D. PERIODICAL INSPECTION/MACHINE CONDITION REPORT 1 OF 3 (SAMPLE)

UNIT			ENGINE		ATTACHMENT		Machine Condition Report		MCR		
Model	Serial No.	Code No.	Model	Serial No.	Front	Rear					
GD511A-1	12720		S4D95L	17842	SCARIFIER	BLADE					
Customer Name			BRAMA BINABAKTI			SERVICE METER		INSPECTOR		MOTOR GRADER	
Machine Location			KM 54			Air Inspection		Name		Date	
						0		FIKH CA/NDRA		14/07/23	
UNITED TRACTORS Tbk.								United Tractors's Branch		JAMBI	
ITEM		CONDITION	UNIT	STANDARD	ACTUAL	CORRECTION MADE	Result	FINAL ANALYSIS			
ENGINE											
Engine Speed	Eng. Low		Rpm	800 - 850	520	835		Kondisi engine low rpm di bawah standar dan di adjustment FIP			
Engine Speed	Eng. High		Rpm	3050 - 3150	2240	3025		Kondisi engine high rpm di bawah standar dan di adjustment FIP			
Blow-by Press.	Eng. Rated	Oil Temp. 60° C	mm H2O	Max. 100	0.3kpa			Kondisi blowby normal			
Lub Oil Press.	Eng. High	Oil Temp. 80° C	Kg/cm²	3.5 - 6.5	6 Kg/cm²			lubrication oil pressure saat engine high idle normal			
Lub Oil Press.	Eng. Low		Kg/cm²	Min. 1	1 Kg/cm²			lubrication oil pressure saat engine low idle normal			
Compression Press.	Rpm 120 - 360	Oil Temp. 40° C	Kg/cm²	Min. 28	29 Kg/cm²			compression pressure masih masuk range standar			
TRANSMISSION & TORQUE CONVERTER											
Operating Force			Kg	9 - 13	11 kg			inching pedal normal			
Inching Pedal	Travel		mm	45 - 65	52mm			inching pedal normal			
	Play		mm	0	2mm			inching pedal normal			
	Pilot Reducing Press.		Kg/cm²	14	14			pilot press. Normal			
T/M Valve Press.	Lubricating pressure		Kg/cm²	3	2.9			lubricating press. Normal			
	Modulating Press.		Kg/cm²	28	28			modulating press. Normal			
STEERING & BRAKE											
Parking Brake	Road Flat, Dry, Paved Surface	With 11°		No Movement							
	20° Gradient										
	Operating Force Lever		Kg	Max. 30	12kg			adjustment			
	Travel Lever		Notches	Max. 6	4			adjustment			
	Height		mm	185	130			adjustment			
	Play		mm	10	16mm			adjustment			
	Travel		mm	80				adjustment			
	Operating Force		Kg	max. 45	41kg			adjustment			
Brake Performance	Speed 35 Km/h	After Press Pedal	The	Max. 12	5m						
Steering Wheel Play	Eng. Low		mm	10 - 12	18			need fabrication			
HYDRAULIC											
Relief Press.	Raise		Kg/cm²	200 - 205	201						
Blade Lifting Speed	Raise		mm/Sec.	225	230						
	Lower		mm/Sec.	135	133						
Turning Speed	By Circular Rotation	Eng. High	Deg./Sec	10	11						
	Oil Temp. 35 - 45° C										
Scarifier Lift Speed	Raise		mm/Sec.	220	210						
	Lower		mm/Sec.	135.0	128						
	Blade		mm	10	12						
	Support By Blade		mm /10 min.	20	23						
	Scarifier		mm	10	13						
	Support By Scarifier		mm	30	32						
DIFFERENTIAL / FINAL DRIVE & TANDEM											
Diff. Drain Plug	Visual Check			No excessive	Ok						
Tandem Drain Plug		L/H		Metallic Powder	Ok						
		R/H			Ok						
ELECTRICAL											
Electrical Function	Function Check			Normal Function							
OPTIONAL											
Attachment Frame	Crack Detection			No Crack	No Crack						

Appendix 4 PERIODICAL INSPECTION/MACHINE CONDITION REPORT 1 OF 3 (SAMPLE)

E. PERIODICAL INSPECTION/MACHINE CONDITION REPORT 2 OF 3 (SAMPLE)

UNIT			ENGINE		ATTACHMENT	
Model	Serial No.	Code No.	Model	Serial No.	Front	Rear
GD511A-1	12720		S6D95L	171842	SCARIFIER	BLADE
Customer Name			PERSADA HARAPAN KAHURIPAN		SERVICE METER	
Machine Location			SEI BENGKAL		At Inspection	Daily
					0	

UNITED TRACTORS Tbk.

Machine Condition Report

MCR

INSPECTOR
 Name: FIQI CANDRA
 Date: 07/14/2023
 United Tractors's Branch: JAMBI

MOTOR GRADER
GD511A-1

MAINTENANCE RECOMMENDATION / SERVICE PRESCRIPTION

1. SUMMARY

☐ GOOD

HASIL PEMERIKSAAN DINYATAKAN BAIK.

☒ PARTIAL SUSPECTED, CLOSE EXAM. REQUIRED.
PLEASE NOTE NO. 2 FOR DETAIL

HASIL PEMERIKSAAN DIDUGA SEBAGIAN
MEMERLUKAN PERBAIKAN.
SILAHKAN CATAT RINCIANNYA PADA NO 2

☐ BAD EARLY REPAIR REQUIRED
PLEASE NOTE NO. 2 FOR DETAIL

HASIL PEMERIKSAAN DINYATAKAN JELEK
MEMERLUKAN PERBAIKAN SEGERA
SILAHKAN CATAT RINCIANNYA PADA NO 2

2. CLOSE EXAMINATION OR REPAIR REQUIRED

KESIMPULAN PEMERIKSAAN ATAU KEBUTUHAN PERBAIKAN

ITEM UNSATISFIED	COMMENTS
CONTROL VALVE	1. Control valve mengalami kebocoran. Sehingga perlu dilakukan Reseating terhadap control valve.
CYLINDER LEANING	1. Cylinder leaning sudah tidak layak pakai. Karena rod cylindernya sudah pernah patah dan dlas kembali.
CYLINDER LIFT	1. Cylinder lift mengalami kebocoran. Sehingga perlu dilakukan Reseating cylinder lift.
CYLINDER DRAWBAR	1. Cylinder drawbar mengalami kebocoran. Sehingga perlu dilakukan Reseating cylinder drawbar.

Appendix 5. PERIODICAL INSPECTION/MACHINE CONDITION REPORT 2 OF 3 (SAMPLE)

ANALISA BIAYA REPAIR

Appendix 6. PERIODICAL INSPECTION/MACHINE CONDITION REPORT 3 OF 3 (SAMPLE)

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