

Case Study: Component Wear due to Contamination

Model: Off Highway Truck
Compartment: Wheel Bearing



Sample					Wear Metals																							
Login Date	Sampled Date	Text Id	Meter	Meter on Fluid	Ag	Cu	Fe	Cr	Pb	Sn	Mn	Ni	Ti	Al	Si	Na	K	P	Zn	Ca	Mg	Mo	B	Ba	Cd	V	S	
29-JAN-20	20-JAN-20	J250-50029-0046	26975.0	512.8	0	0	x304	0	1	0	2	0	1	x12	x43	7	1	293	22	266	10	0	153	2	0	0		
20-DEC-19	16-DEC-19	J250-49354-0032	26462.2	534.2	0	1	x413	1	0	0	3	0	1	x17	x56	7	2	315	30	280	24	1	68	3	0	0		
25-NOV-19	17-NOV-19	J250-49329-0084	25928.0	554.5	0	0	x96	0	1	0	1	0	0	~5	23	6	0	283	11	261	1	0	87	1	0	0		
01-OCT-19	27-SEP-19	J250-49274-0039	25373.5	511.1	0	0	x180	0	0	1	1	0	0	x6	23	12	4	291	18	281	4	0	187	1	0	0		
17-AUG-19	11-AUG-19	J250-49229-0092	24862.4	487.9	0	1	16	0	0	0	0	0	0	0	2	10	2	308	25	297	1	0	129	0	0	0		
19-JUL-19	01-JUL-19	J250-49200-0045	24374.5	478.5	0	0	x96	0	0	0	1	0	0	~5	13	5	2	260	11	245	1	0	118	1	0	0		

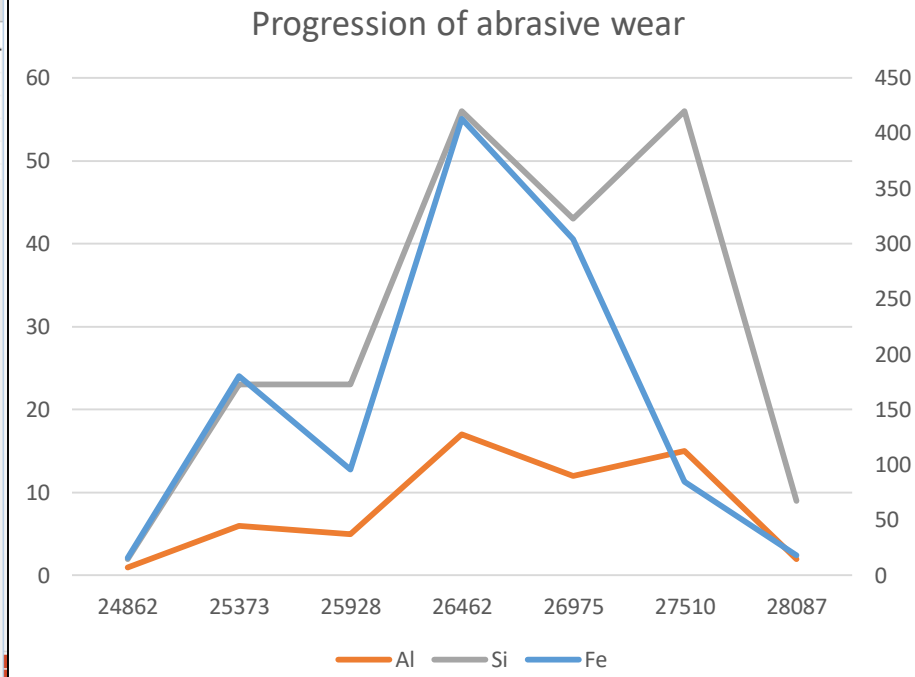
Fluids			Physicals				Infra-Red				Particles																	
FluidChar	Fluid	Fluid	A	F	V40	V100	TAN	TBN	W	ST	OX	NIT	SUL	F	W	ANT	10µ	100µ	15µ	20µ	25µ	5µ	50µ	75µ	PC	ISO	FDM	
Y	CAT	60				25.7			N	0	9	4	15		N	11												387
Y	CAT	60				24.5			N	0	9	4	16		N	12												485
Y	CAT	60				25.1			N	0	9	4	15		N	11												270

Combined
 Evaluation
 Recommendation
Search Criteria:
 Search Codes
 Full Search

100_J250 METAL CONTENTS ARE NORMAL ON FIRST SAMPLE BASIS.
101_J250 NORMAL WEAR METAL READINGS.
102_J250 OTHER ANALYSIS READINGS APPEAR TO BE ACCEPTABLE.

IRON IS STILL HIGH. THIS COULD BE FROM GEARS WEAR. SUSPECTED DIRT CONTAMINATION PROBLEM STILL PERSISTS. CHECK SOURCES OF DIRT ENTRY. CHECK MAGPLUG FOR ABRASIVE WEAR PARTICLE. CHECK SEALS FOR OIL LEAK, INSPECT, REPAIR IF NECESSARY.

Result during dirt ingestion period



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Login Date	Sampled Date	Text Id	Meter	Meter on Fluid	Ag	Cu	Fe	Cr	Pb	Sn	Mn	Ni	Ti	Al	Si	Na	K	P	Zn	Ca	Mg	Mo	B	Ba	Cd	V	S	
13-JUN-20	31-MAY-20	J250-50165-0066	28714.2	626.7	0	0	12	0	1	0	0	0	0	1	4	12	0	290	16	260	2	0	115	0	0	0		
05-MAY-20	10-APR-20	J250-50126-0021	28087.5	577.0	4	0	18	0	1	0	0	0	0	2	9	8	0	285	25	296	2	0	163	0	0	0		
11-MAR-20	27-FEB-20	J250-50071-0071	27510.5	535.5	0	0	x85	0	1	2	1	0	1	x15	x56	9	3	268	30	284	7	1	127	2	0	0		
29-JAN-20	20-JAN-20	J250-50029-0046	26975.0	512.8	0	0	x304	0	1	0	2	0	1	x12	x43	7	1	293	22	266	10	0	153	2	0	0		
20-DEC-19	16-DEC-19	J250-49354-0032	26462.2	534.2	0	1	x413	1	0	0	3	0	1	x17	x56	7	2	315	30	280	24	1	68	3	0	0		
25-NOV-19	17-NOV-19	J250-49329-0084	25928.0	554.5	0	0	x96	0	1	0	1	0	0	~5	23	6	0	283	11	261	1	0	87	1	0	0		

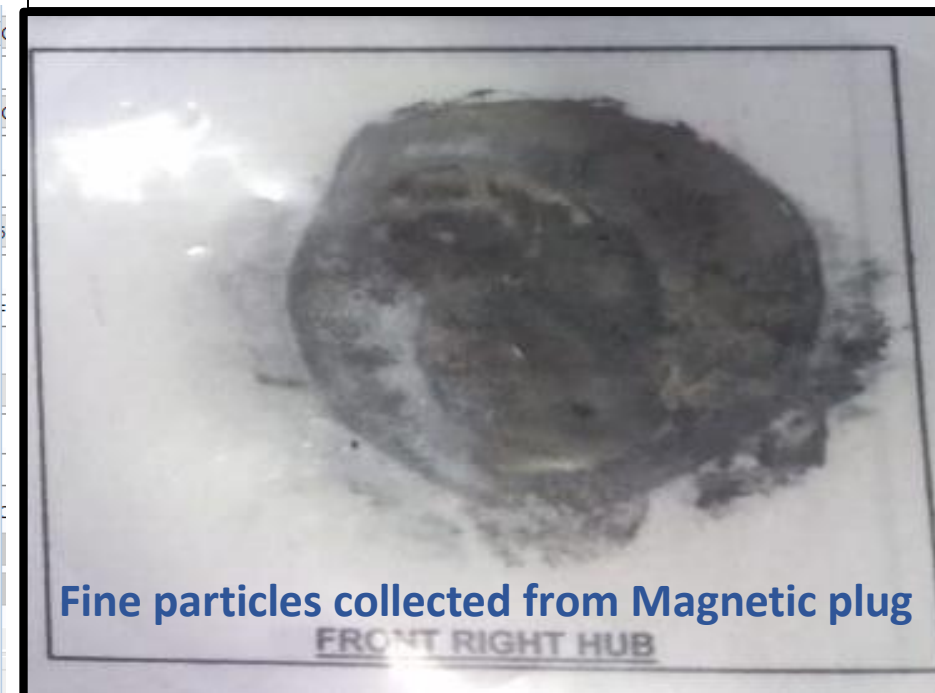
Fluids			Physicals				Infra-Red				Particles																	
FluidChar	Fluid	Fluid	A	F	V40	V100	TAN	TBN	W	ST	OX	NIT	SUL	F	W	ANT	10µ	100µ	15µ	20µ	25µ	5µ	50µ	75µ	PC	ISO	FDM	
Y	CAT	60				25.6			N	0	9	4	15		N	11												10
Y	CAT	60				25.8			N	0	9	4	14		N	11												16
Y	CAT	60				25.7			N	0	9	4	15		N	11												107

Combined
 Evaluation
 Recommendation
Search Criteria:
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100_J250 METAL CONTENTS ARE NORMAL ON FIRST SAMPLE BASIS.
101_J250 NORMAL WEAR METAL READINGS.
102_J250 OTHER ANALYSIS READINGS APPEAR TO BE ACCEPTABLE.

NORMAL WEAR METAL READINGS. NO PROBLEMS PRESENTLY ASSOCIATED WITH THIS SAMPLE. CONTINUE SAMPLING AT THE NORMAL INTERVAL.

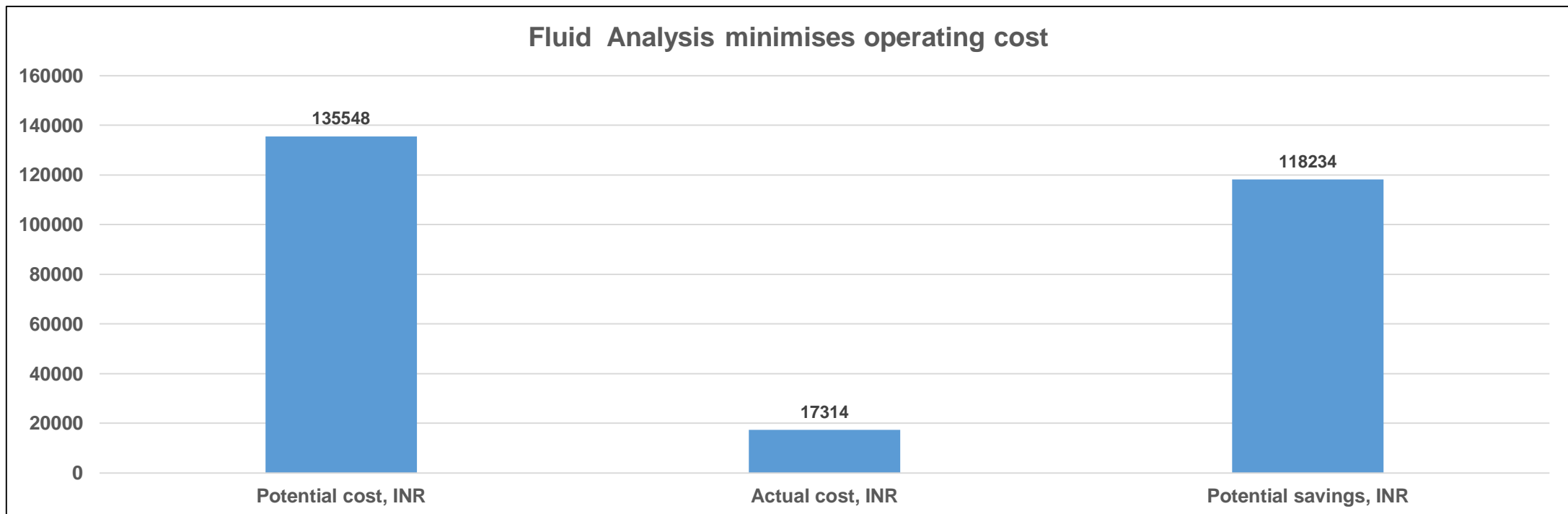
Normal result after repair



Fine particles collected from Magnetic plug

Increase in Aluminium and Silicon are indicating dirt contamination in the system. Fine particles caused by abrasive wear found in magnetic plug. Abrasive wear is the predominant wear mode causing wear in roller race , gears and housing. Machine was inspected and found dirt contamination due to leakage in seals. Components found okay and fit for reuse. Seals and O rings are replaced to resolve this issue. Recheck result found okay.

- **Parts replacement costs(Seals & O-rings): Rs. 17314**
- **Condition failure prevented(Cup & Cone bearings) : Rs.135548**



Gainwell SOS Lab has documented many such case studies to show the efficacy of Condition based maintenance of in-service Lubricants.