

# **PROBLEM SUMMARY**

Sample Rating Trend

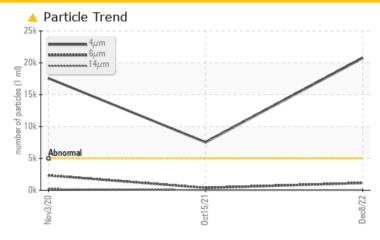


Machine Id 100431847

Component **Hydraulic System** 

AW HYDRAULIC OIL ISO 32 (--- GAL)

# **COMPONENT CONDITION SUMMARY**



## RECOMMENDATION

No corrective action is recommended at this time. Resample at the next service interval to monitor.

PROBLEMATIC TEST RESULTS											
Sample Status			ABNORMAL	ATTENTION	ABNORMAL						
Particles >4µm	ASTM D7647	>5000	<u> </u>	<u>^</u> 7518	<u>▲</u> 17582						
Oil Cleanliness	ISO 4406 (c)	>19/17/14	<b>22/17/12</b>	<b>2</b> 0/16/12	<b>2</b> 1/18/15						

Customer Id: PALJACNJ Sample No.: WC0695625 Lab Number: 05721950 Test Package: CONST



To manage this report scan the QR code

To discuss the diagnosis or test data:

Don Baldridge +1 don.b505@comcast.net

To change component or sample information: Customer Service +1 1-800-237-1369 customerservice@wearcheck.com

## **RECOMMENDED ACTIONS**

There are no recommended actions for this sample.

## HISTORICAL DIAGNOSIS

## 15 Oct 2021 Diag: Don Baldridge

ISO



No corrective action is recommended at this time. Resample at the next service interval to monitor. All component wear rates are normal. There is a moderate amount of silt (particulates < 14 microns in size) present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.



## 03 Nov 2020 Diag: Jonathan Hester

150



No corrective action is recommended at this time. Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. Please specify the brand, type, and viscosity of the oil on your next sample. All component wear rates are normal. There is a high amount of particulates present in the oil. The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.





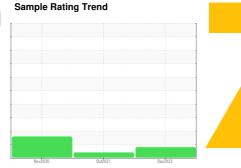
# **OIL ANALYSIS REPORT**

100431847

Component

**Hydraulic System** 

**AW HYDRAULIC OIL ISO 32 (--- GAL)** 





## **DIAGNOSIS**

#### Recommendation

No corrective action is recommended at this time. Resample at the next service interval to monitor.

#### Wear

All component wear rates are normal.

## Contamination

There is a high amount of silt (particulates < 14 microns in size) present in the oil.

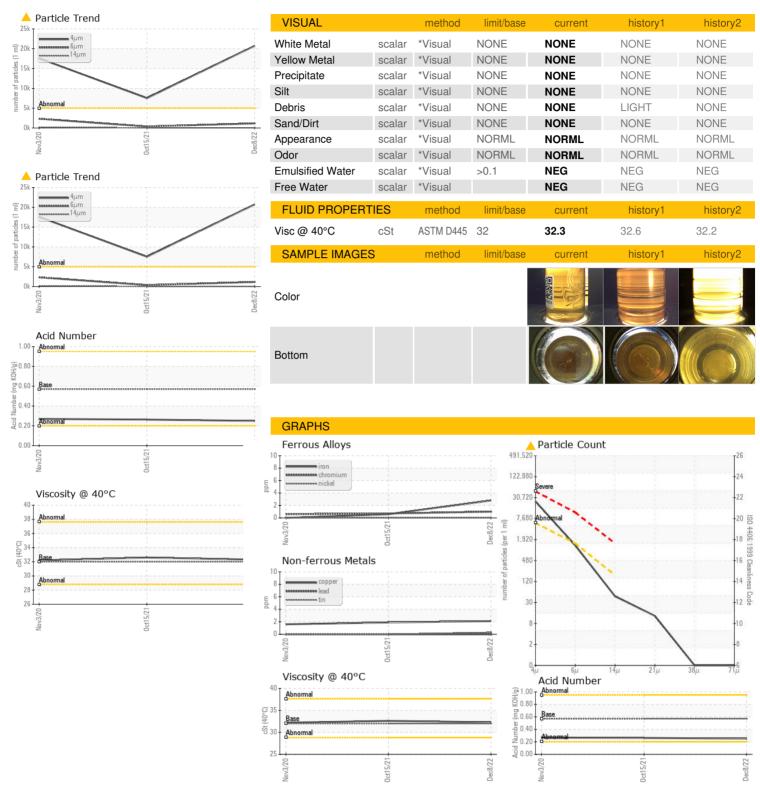
#### **Fluid Condition**

The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

Sample Number   Client Info   WC0695625   WC0573373   WC0470470   Sample Date   Client Info   08 Dec 2022   15 Oct 2021   03 Nov 202   00			No	v2020	Oct2021 Dec20	122	
Sample Date	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info	Sample Number		Client Info		WC0695625	WC0573373	WC0470476
Dil Age	Sample Date		Client Info		08 Dec 2022	15 Oct 2021	03 Nov 2020
Cilic Changed Sample Status	Machine Age	hrs	Client Info		0	0	0
Sample Status         MBNORMAL         ATTENTION         ABNORMAL           WEAR METALS         method         limit/base         current         history1         history2           fron         ppm         ASTM D5185m         >20         3         <1	Oil Age	hrs	Client Info		0	0	0
WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         3         <1	Oil Changed		Client Info		N/A	N/A	Changed
Chromium	Sample Status				ABNORMAL	ATTENTION	ABNORMAL
Chromium         ppm         ASTM D5185m         >10         1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <td>WEAR METALS</td> <td></td> <td>method</td> <td>limit/base</td> <td>current</td> <td>history1</td> <td>history2</td>	WEAR METALS		method	limit/base	current	history1	history2
Nickel	Iron	ppm	ASTM D5185m	>20	3	<1	0
Description	Chromium	ppm	ASTM D5185m	>10	1	<1	<1
Silver	Nickel	ppm	ASTM D5185m	>10	0	0	0
Aluminum         ppm         ASTM D5185m         >10         0         0         0           Lead         ppm         ASTM D5185m         >10         0         0         0           Copper         ppm         ASTM D5185m         >75         2         2         2           Tin         ppm         ASTM D5185m         >10         <1	Titanium	ppm	ASTM D5185m		0	0	0
Lead         ppm         ASTM D5185m         >10         0         0         0           Copper         ppm         ASTM D5185m         >75         2         2         2         2           Tin         ppm         ASTM D5185m         >10         <1         0         0           AATM D5185m         ——         0         0         0         0           Vanadium         ppm         ASTM D5185m         0         0         0         0           Cadmium         ppm         ASTM D5185m         5         0         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         <1           Barium         ppm         ASTM D5185m         5         <1         0         0           Magnesium         ppm         ASTM D5185m         5         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         25         8         8         8         0           Calcium         ppm         ASTM D5185m         20	Silver	ppm	ASTM D5185m		<1	<1	0
Copper         ppm         ASTM D5185m         >75         2         2         2         2           Tin         ppm         ASTM D5185m         >10         <1	Aluminum	ppm	ASTM D5185m	>10	0	0	0
Tin ppm ASTM D5185m >10 <1 0 0  Antimony ppm ASTM D5185m 0 0 0  Cadmium ppm ASTM D5185m 0 0 0  ADDITIVES method limit/base current history1 history2  Boron ppm ASTM D5185m 5 0 0 0 <1 0  Molybdenum ppm ASTM D5185m 5 <1 0 0  Molybdenum ppm ASTM D5185m 5 <1 <1 0 0  Magnesium ppm ASTM D5185m 5 <1 <1 0  Magnesium ppm ASTM D5185m 25 8 8 8 0  Calcium ppm ASTM D5185m 300 282 299 247  Zinc ppm ASTM D5185m 370 359 348 333  Sulfur ppm ASTM D5185m >2500 1830 1476 839  CONTAMINANTS method limit/base current history1 history2  Silicon ppm ASTM D5185m >20 <1 0 0  Sodium ppm ASTM D5185m >20 <1 0 0  FUID CLEANLINESS method limit/base current history1 history2  Particles >4μm ASTM D7647 >5000 20734 7518 17582  Particles >6μm ASTM D7647 >1300 1148 374 2333  Particles >21μm ASTM D7647 >160 40 30 1191  Particles >21μm ASTM D7647 >10 0 0  Particles >21μm ASTM D7647 >10 0 0 1  Particles >21μm ASTM D7647 >10 0 0 1  Particles >21μm ASTM D7647 >10 0 0 0 1  Particles >21μm ASTM D7647 >3 0 0 0 0 0  Oil Cleanliness ISO 4406 (c) >19/17/14 22/17/12 20/16/12 221/18/15  FLUID DEGRADATION method limit/base current history1 history2	Lead	ppm	ASTM D5185m	>10	0	0	0
Tin ppm ASTM D5185m >10 <1 0 0  Antimony ppm ASTM D5185m	Copper		ASTM D5185m	>75	2	2	2
Antimony         ppm         ASTM D5185m          0         0           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         <1           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         5         <1         <1         <1         <1           Magnesium         ppm         ASTM D5185m         25         8         8         0           Calcium         ppm         ASTM D5185m         200         64         65         30           Phosphorus         ppm         ASTM D5185m         200         64         65         30           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2	Tin	ppm	ASTM D5185m	>10	<1	0	0
Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         <1           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         5         <1         <1         <1         <1         <1         <1         0         0           Manganese         ppm         ASTM D5185m         25         8         8         0         0           Magnesium         ppm         ASTM D5185m         200         64         65         30           Phosphorus         ppm         ASTM D5185m         200         64         65         30         247           Zinc         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silico	Antimony		ASTM D5185m			0	0
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0         0         <1           Barium         ppm         ASTM D5185m         5         <1         0         0           Molybdenum         ppm         ASTM D5185m         5         <1         <1         <1         <1           Manganese         ppm         ASTM D5185m         25         8         8         0           Calcium         ppm         ASTM D5185m         200         64         65         30           Phosphorus         ppm         ASTM D5185m         300         282         299         247           Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         20         1         0         0           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1	Vanadium				0	0	0
Boron ppm ASTM D5185m 5 0 0 0 <1 Barium ppm ASTM D5185m 5 <1 0 0  Molybdenum ppm ASTM D5185m 5 <1 <1 <1 <1 0  Manganese ppm ASTM D5185m 25 8 8 8 0  Calcium ppm ASTM D5185m 20 64 65 30  Phosphorus ppm ASTM D5185m 300 282 299 247  Zinc ppm ASTM D5185m 370 359 348 333  Sulfur ppm ASTM D5185m 2500 1830 1476 839  CONTAMINANTS method limit/base current history1 history2  Silicon ppm ASTM D5185m >20 <1 0 0  Sodium ppm ASTM D5185m >20 <1 0 0  FLUID CLEANLINESS method limit/base current history1 history2  Particles >4μm ASTM D7647 >5000 20734 7518 17582  Particles >21μm ASTM D7647 >10 0 0  Particles >38μm ASTM D7647 >10 0 0  Particles >37μm ASTM D7647 >10 0 0  Particles >38μm ASTM D7647 >10 0 0 1  Particles >71μm ASTM D7647 >3 0 0 0  OII Cleanliness ISO 4406 (c) >19/17/14 22/17/12 20/16/12 1/18/15  FLUID DEGRADATION method limit/base current history1 history2  Particles >71μm ASTM D7647 >3 0 0 0 0  DII Cleanliness current history1 history2  ASTM D7647 >3 0 0 0 0  DII Cleanliness ISO 4406 (c) >19/17/14 22/17/12 20/16/12 1/18/15	Cadmium						
Barium ppm ASTM D5185m 5 <1 0 0 0 Molybdenum ppm ASTM D5185m 5 <1 <1 <1 <1 <1	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum         ppm         ASTM D5185m         5         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <0         Manganese         ppm         ASTM D5185m         ≥5         8         8         0         Calcium         ppm         ASTM D5185m         200         64         65         30         Phosphorus         ppm         ASTM D5185m         300         282         299         247         247         247         250         282         299         247	Boron	ppm	ASTM D5185m	5	0	0	<1
Manganese         ppm         ASTM D5185m         <1         <1         0           Magnesium         ppm         ASTM D5185m         25         8         8         0           Calcium         ppm         ASTM D5185m         200         64         65         30           Phosphorus         ppm         ASTM D5185m         300         282         299         247           Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1	Barium	ppm	ASTM D5185m	5	<1	0	0
Magnesium         ppm         ASTM D5185m         25         8         8         0           Calcium         ppm         ASTM D5185m         200         64         65         30           Phosphorus         ppm         ASTM D5185m         300         282         299         247           Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1         0         0           Sodium         ppm         ASTM D5185m         >20         0         0         0           Potassium         ppm         ASTM D5185m         >20         0         0         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         20734         7518         17582           Particles >21µm         ASTM D7647         >1300         1148	Molybdenum	ppm	ASTM D5185m	5	<1	<1	<1
Calcium         ppm         ASTM D5185m         200         64         65         30           Phosphorus         ppm         ASTM D5185m         300         282         299         247           Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1	Manganese	ppm	ASTM D5185m		<1	<1	0
Phosphorus         ppm         ASTM D5185m         300         282         299         247           Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1	Magnesium	ppm	ASTM D5185m	25	8	8	0
Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1	Calcium	ppm	ASTM D5185m	200	64	65	30
Zinc         ppm         ASTM D5185m         370         359         348         333           Sulfur         ppm         ASTM D5185m         2500         1830         1476         839           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1         0         0           Sodium         ppm         ASTM D5185m         >20         0         0         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         20734         7518         17582           Particles >6μm         ASTM D7647         >1300         1148         374         2333           Particles >14μm         ASTM D7647         >160         40         30         191           Particles >21μm         ASTM D7647         >40         11         12         50           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         22/17/12         20/16/12	Phosphorus	ppm	ASTM D5185m	300	282	299	247
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1	Zinc	ppm	ASTM D5185m	370	359	348	333
Silicon       ppm       ASTM D5185m       >20       <1       0       0         Sodium       ppm       ASTM D5185m       <1       0       0         Potassium       ppm       ASTM D5185m       >20       0       0       0         FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4μm       ASTM D7647       >5000       Δ       20734       Δ       7518       Δ       17582         Particles >6μm       ASTM D7647       >1300       1148       374       Δ       2333         Particles >14μm       ASTM D7647       >160       40       30       Δ       191         Particles >21μm       ASTM D7647       >40       11       12       Δ       50         Particles >38μm       ASTM D7647       >10       0       0       1         Particles >71μm       ASTM D7647       >3       0       0       0         Oil Cleanliness       ISO 4406 (c)       >19/17/14       Δ       22/17/12       Δ       20/16/12       Δ       21/18/15	Sulfur	ppm	ASTM D5185m	2500	1830	1476	839
Sodium         ppm         ASTM D5185m         <1         0         0           Potassium         ppm         ASTM D5185m         >20         0         0         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         Δ         20734         Δ         7518         Δ         17582           Particles >6μm         ASTM D7647         >1300         1148         374         Δ         2333           Particles >14μm         ASTM D7647         >160         40         30         Δ         191           Particles >21μm         ASTM D7647         >40         11         12         Δ         50           Particles >38μm         ASTM D7647         >10         0         0         1           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         22/17/12         Δ         20/16/12         Δ         21/18/15           FLUID DEGRADATION         method         limit/base         current         history1         history2	CONTAMINANTS	3	method	limit/base	current	history1	history2
Potassium         ppm         ASTM D5185m         >20         0         0         0           FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         20734         7518         17582           Particles >6μm         ASTM D7647         >1300         1148         374         2333           Particles >14μm         ASTM D7647         >160         40         30         191           Particles >21μm         ASTM D7647         >40         11         12         50           Particles >38μm         ASTM D7647         >10         0         0         1           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         22/17/12         20/16/12         21/18/15           FLUID DEGRADATION         method         limit/base         current         history1         history2	Silicon	ppm	ASTM D5185m	>20	<1	0	0
FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4μm         ASTM D7647         >5000         20734         7518         17582           Particles >6μm         ASTM D7647         >1300         1148         374         2333           Particles >14μm         ASTM D7647         >160         40         30         191           Particles >21μm         ASTM D7647         >40         11         12         50           Particles >38μm         ASTM D7647         >10         0         0         1           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         22/17/12         20/16/12         21/18/15           FLUID DEGRADATION         method         limit/base         current         history1         history2	Sodium	ppm	ASTM D5185m		<1	0	0
Particles >4μm       ASTM D7647       >5000       20734       ↑ 7518       ↑ 17582         Particles >6μm       ASTM D7647       >1300       1148       374       ♠ 2333         Particles >14μm       ASTM D7647       >160       40       30       ♠ 191         Particles >21μm       ASTM D7647       >40       11       12       ♠ 50         Particles >38μm       ASTM D7647       >10       0       0       1         Particles >71μm       ASTM D7647       >3       0       0       0         Oil Cleanliness       ISO 4406 (c)       >19/17/14       22/17/12       ♠ 20/16/12       ♠ 21/18/15         FLUID DEGRADATION       method       limit/base       current       history1       history2	Potassium	ppm	ASTM D5185m	>20	0	0	0
Particles >6μm       ASTM D7647       >1300       1148       374       Δ 2333         Particles >14μm       ASTM D7647       >160       40       30       Δ 191         Particles >21μm       ASTM D7647       >40       11       12       Δ 50         Particles >38μm       ASTM D7647       >10       0       0       1         Particles >71μm       ASTM D7647       >3       0       0       0         Oil Cleanliness       ISO 4406 (c)       >19/17/14       Δ 22/17/12       Δ 20/16/12       Δ 21/18/15         FLUID DEGRADATION       method       limit/base       current       history1       history2	FLUID CLEANLIN	NESS	method	limit/base	current	history1	history2
Particles >14μm       ASTM D7647       >160       40       30       ▲ 191         Particles >21μm       ASTM D7647       >40       11       12       ▲ 50         Particles >38μm       ASTM D7647       >10       0       0       1         Particles >71μm       ASTM D7647       >3       0       0       0         Oil Cleanliness       ISO 4406 (c)       >19/17/14       ▲ 22/17/12       ▲ 20/16/12       ▲ 21/18/15         FLUID DEGRADATION       method       limit/base       current       history1       history2	Particles >4µm		ASTM D7647	>5000	<b>20734</b>	<u></u> 7518	<b>△</b> 17582
Particles >21μm         ASTM D7647         >40         11         12         ▲ 50           Particles >38μm         ASTM D7647         >10         0         0         1           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         Δ 22/17/12         Δ 20/16/12         Δ 21/18/15           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >6µm		ASTM D7647	>1300	1148	374	<u>^</u> 2333
Particles >38μm         ASTM D7647         >10         0         0         1           Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         Δ 22/17/12         Δ 20/16/12         Δ 21/18/15           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >14μm		ASTM D7647	>160	40	30	<u> </u>
Particles >71μm         ASTM D7647         >3         0         0         0           Oil Cleanliness         ISO 4406 (c)         >19/17/14         ▲ 22/17/12         ▲ 20/16/12         ▲ 21/18/15           FLUID DEGRADATION         method         limit/base         current         history1         history2	Particles >21μm		ASTM D7647	>40	11	12	<b>△</b> 50
Oil Cleanliness ISO 4406 (c) >19/17/14  22/17/12  20/16/12  21/18/15  FLUID DEGRADATION method limit/base current history1 history2	Particles >38µm		ASTM D7647	>10	0	0	1
Oil Cleanliness ISO 4406 (c) >19/17/14  22/17/12  20/16/12  21/18/15  FLUID DEGRADATION method limit/base current history1 history2	Particles >71µm		ASTM D7647	>3	0	0	0
	Oil Cleanliness		ISO 4406 (c)	>19/17/14	<u>22/17/12</u>	<b>△</b> 20/16/12	<b>2</b> 1/18/15
Acid Number (AN)         mg KOH/g         ASTM D8045         0.57         0.25         0.263         0.270	FLUID DEGRADA	ATION	method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D8045	0.57	0.25	0.263	0.270



# **OIL ANALYSIS REPORT**







Certificate L2367

Laboratory Sample No. Lab Number

**Unique Number** 

: 05721950 : 10266531 Test Package : CONST

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 : 20 Dec 2022 : WC0695625 Received Diagnosed : 21 Dec 2022 : Don Baldridge Diagnostician

To discuss this sample report, contact Customer Service at 1-800-237-1369.

\* - Denotes test methods that are outside of the ISO 17025 scope of accreditation. Statements of conformity to specifications are based on the simple acceptance decision rule (JCGM 106:2012)

**PALFINGER - BRANCH 410** 

632 CEDAR SWAMP RD JACKSON, NJ US 08527

Contact: DON DRESS d.dress@palfinger.com

T:

F: