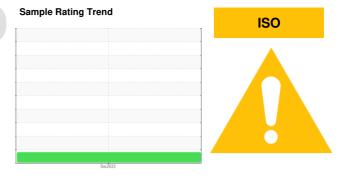


## **PROBLEM SUMMARY**



# PALFINGER 100714393

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            |              |           | ATTENTION       |  |  |  |  |  |  |
| Particles >4µm           | ASTM D7647   | >5000     | <u> </u>        |  |  |  |  |  |  |
| Oil Cleanliness          | ISO 4406 (c) | >19/17/14 | <b>20/16/12</b> |  |  |  |  |  |  |

Customer Id: PALJACNJ Sample No.: WC0695630 Lab Number: 05721948 Test Package: CONST



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

There are no recommended actions for this sample.

HISTORICAL DIAGNOSIS



### **OIL ANALYSIS REPORT**

Sample Rating Trend

ISO

#### Machine Id PALFINGER 100714393

Component Hydraulic System Fluid AW HYDRAULIC OIL ISO 32 (--- GAL)

#### DIAGNOSIS

#### A 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 moderate 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         WC0695630             Machine Age         hrs         Client Info         0             Machine Age         hrs         Client Info         0             Oil Age         hrs         Client Info         0             Oil Changed         Client Info         N/A             Sample Status         Image         Client Info         N/A             WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         >10         0             Aluminum         ppm         ASTM D5185m         >10         0             Adadum         ppm         ASTM D5185m         >10         1             Aluminum         ppm         ASTM D5185m         >10              Adadum         ppm  | SAMPLE INFORM    | ATION    | method       | limit/base | current         | history1 | history2 |
|---|------------------|----------|--------------|------------|-----------------|----------|----------|
| Sample Date         Client Info         07 Dec 2022             Machine Age         hrs         Client Info         0             Oil Age         hrs         Client Info         N/A             Sample Status         Image         Client Info         N/A             WEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         1             WEAR METALS         method         Imit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >10         0   | Sample Number    |          | Client Info  |            | WC0695630       |          |          |
| Oil Age         hrs         Client Info         NA             Sample Status         I         Image         Current         history1         history2           WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         1             Chromium         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         >10         0             Nickel         ppm         ASTM D5185m         >10         0             Aluminum         ppm         ASTM D5185m         >10         1             Copper         ppm         ASTM D5185m         >10         1             Cadmium         ppm         ASTM D5185m         >10              ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0 | •                |          | Client Info  |            | 07 Dec 2022     |          |          |
| Oil Changed     Client Info     N/A         Sample Status     Imathod     Imit/base     current     history1     history2       Iron     ppm     ASTM D5185n     >20     1         Nickel     ppm     ASTM D5185n     >10     <1  | Machine Age      | hrs      | Client Info  |            | 0               |          |          |
| Oil Changed     Client Info     N/A         Sample Status     method     limitbase     current     history1     history2       Iron     ppm     ASTM D5185m     >20     1         Nickel     ppm     ASTM D5185m     >10     Q         Nickel     ppm     ASTM D5185m     >10     Q         Aluminum     ppm     ASTM D5185m     >10     Q         Aluminum     ppm     ASTM D5185m     >10     <1  | U                | hrs      | Client Info  |            | 0               |          |          |
| WEAR METALS         method         limit/base         current         history1         history2           Iron         ppm         ASTM D5185m         >20         1             Chromium         ppm         ASTM D5185m         >10         <1  | -                |          | Client Info  |            | N/A             |          |          |
| Iron         ppm         ASTM D5185m         >20         1             Chromium         ppm         ASTM D5185m         >10         Q             Nickel         ppm         ASTM D5185m         >10         Q             Silver         ppm         ASTM D5185m         >10         Q             Aluminum         ppm         ASTM D5185m         >10         Q             Lead         ppm         ASTM D5185m         >10         <1  | Sample Status    |          |              |            | ATTENTION       |          |          |
| Chromium         ppm         ASTM D5185m         >10         <1   | WEAR METALS      |          | method       | limit/base | current         | history1 | history2 |
| Nickel         ppm         ASTM D5185m         >10         0             Titanium         ppm         ASTM D5185m          0             Silver         ppm         ASTM D5185m         >10         0             Aluminum         ppm         ASTM D5185m         >10         <1   | Iron             | ppm      | ASTM D5185m  | >20        | 1               |          |          |
| Titanium       ppm       ASTM D5185m       <10       0           Silver       ppm       ASTM D5185m       >10       0           Aluminum       ppm       ASTM D5185m       >10       <1   | Chromium         | ppm      | ASTM D5185m  | >10        | <1              |          |          |
| Silver         ppm         ASTM D5185m         <1             Aluminum         ppm         ASTM D5185m         >10         0             Lead         ppm         ASTM D5185m         >10         <1  | Nickel           | ppm      | ASTM D5185m  | >10        | 0               |          |          |
| Aluminum       ppm       ASTM D5185m       >10       0           Lead       ppm       ASTM D5185m       >10       <1  | Titanium         | ppm      | ASTM D5185m  |            | 0               |          |          |
| Lead         ppm         ASTM D5185m         >10         <1             Copper         ppm         ASTM D5185m         >75         <1   | Silver           | ppm      | ASTM D5185m  |            | <1              |          |          |
| Copper         ppm         ASTM D5185m         >75         <1             Tin         ppm         ASTM D5185m         >10         <1  | Aluminum         | ppm      | ASTM D5185m  | >10        | 0               |          |          |
| Tin       ppm       ASTM D5185m       >10       <1           Vanadium       ppm       ASTM D5185m       0           ADDITIVES       method       limit/base       current       history1       history2         Boron       ppm       ASTM D5185m       5       0           MDIVbdenum       ppm       ASTM D5185m       5       <1           Manganese       ppm       ASTM D5185m       5       <1           Magnesium       ppm       ASTM D5185m       25       3           Calcium       ppm       ASTM D5185m       200       61           Magnesium       ppm       ASTM D5185m       200       61           Calcium       ppm       ASTM D5185m       200       61           Sulfur       ppm       ASTM D5185m       200       1232           Sulfur       ppm       ASTM D5185m       20       1332           Sodium       ppm       ASTM D5185m  | Lead             | ppm      | ASTM D5185m  | >10        | <1              |          |          |
| Vanadium         ppm         ASTM D5185m         0             Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0             Molybdenum         ppm         ASTM D5185m         5         <1  | Copper           | ppm      | ASTM D5185m  | >75        | <1              |          |          |
| Cadmium         ppm         ASTM D5185m         0             ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0             Barium         ppm         ASTM D5185m         5         <1             Molybdenum         ppm         ASTM D5185m         5         <1             Manganese         ppm         ASTM D5185m         5         <1             Magnesium         ppm         ASTM D5185m         25         3             Calcium         ppm         ASTM D5185m         200         61             Magnesium         ppm         ASTM D5185m         200         611             Sulfur         ppm         ASTM D5185m         300         342             Sulfur         ppm         ASTM D5185m         2500         1232             Sulfur         ppm         ASTM D5185m         20         <1                                   | Tin              | ppm      | ASTM D5185m  | >10        | <1              |          |          |
| ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         5         0             Barium         ppm         ASTM D5185m         5         <1   | Vanadium         | ppm      | ASTM D5185m  |            | 0               |          |          |
| Boron       ppm       ASTM D5185m       5       0           Barium       ppm       ASTM D5185m       5       <1   | Cadmium          | ppm      | ASTM D5185m  |            | 0               |          |          |
| Barium       ppm       ASTM D5185m       5       <1           Molybdenum       ppm       ASTM D5185m       5       <1           Manganese       ppm       ASTM D5185m       25       3           Magnesium       ppm       ASTM D5185m       25       3           Calcium       ppm       ASTM D5185m       200       61           Phosphorus       ppm       ASTM D5185m       300       342           Sulfur       ppm       ASTM D5185m       370       447           Sulfur       ppm       ASTM D5185m       2500       1232           CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       0           Sodium       ppm       ASTM D5185m       >20       0           FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647   | ADDITIVES        |          | method       | limit/base | current         | history1 | history2 |
| Molybdenum       ppm       ASTM D5185m       5       <1   | Boron            | ppm      | ASTM D5185m  | 5          | 0               |          |          |
| Magnese       ppm       ASTM D5185m       0           Magnesium       ppm       ASTM D5185m       25       3           Calcium       ppm       ASTM D5185m       200       61           Phosphorus       ppm       ASTM D5185m       300       342           Zinc       ppm       ASTM D5185m       370       447           Sulfur       ppm       ASTM D5185m       2500       1232           CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       <1  | Barium           | ppm      | ASTM D5185m  | 5          | <1              |          |          |
| Magnesium       ppm       ASTM D5185m       25       3           Calcium       ppm       ASTM D5185m       200       61           Phosphorus       ppm       ASTM D5185m       300       342           Zinc       ppm       ASTM D5185m       370       447           Sulfur       ppm       ASTM D5185m       2500       1232           CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       <1  | Molybdenum       | ppm      | ASTM D5185m  | 5          | <1              |          |          |
| Calcium         ppm         ASTM D5185m         200         61             Phosphorus         ppm         ASTM D5185m         300         342             Zinc         ppm         ASTM D5185m         370         447             Sulfur         ppm         ASTM D5185m         2500         1232             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1   | Manganese        | ppm      | ASTM D5185m  |            | 0               |          |          |
| Phosphorus         ppm         ASTM D5185m         300         342             Zinc         ppm         ASTM D5185m         370         4477             Sulfur         ppm         ASTM D5185m         2500         1232             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1   | Magnesium        | ppm      | ASTM D5185m  | 25         | 3               |          |          |
| Zinc       ppm       ASTM D5185m       370       447           Sulfur       ppm       ASTM D5185m       2500       1232           CONTAMINANTS       method       limit/base       current       history1       history2         Silicon       ppm       ASTM D5185m       >20       <1           Sodium       ppm       ASTM D5185m       >20       <1           Sodium       ppm       ASTM D5185m       >20       <1           Potassium       ppm       ASTM D5185m       >20       0           FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647       >5000       6081           Particles >6µm       ASTM D7647       >160       26           Particles >14µm       ASTM D7647       >40       6           Particles >21µm       ASTM D7647       >3       0           Particles >71µm       ASTM D7647       >3       0   | Calcium          | ppm      | ASTM D5185m  | 200        | 61              |          |          |
| Sulfur         ppm         ASTM D5185m         2500         1232             CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >20         <1             Sodium         ppm         ASTM D5185m         >20         <1             Sodium         ppm         ASTM D5185m         >20         0             Potassium         ppm         ASTM D5185m         >20         0             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         6081             Particles >6µm         ASTM D7647         >160         26             Particles >14µm         ASTM D7647         >40         6             Particles >21µm         ASTM D7647         >10         0             Particles >71µm         ASTM D7647         3         0     | Phosphorus       | ppm      | ASTM D5185m  | 300        | 342             |          |          |
| CONTAMINANTSmethodlimit/basecurrenthistory1history2SiliconppmASTM D5185m>20<1   | Zinc             | ppm      | ASTM D5185m  | 370        | 447             |          |          |
| Silicon       ppm       ASTM D5185m       >20       <1           Sodium       ppm       ASTM D5185m       >20       0           Potassium       ppm       ASTM D5185m       >20       0           FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4 $\mu$ m       ASTM D7647       >5000       6081           Particles >6 $\mu$ m       ASTM D7647       >1300       499           Particles >14 $\mu$ m       ASTM D7647       >160       26           Particles >21 $\mu$ m       ASTM D7647       >40       6           Particles >38 $\mu$ m       ASTM D7647       >10       0           Particles >71 $\mu$ m       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       20/16/12   | Sulfur           | ppm      | ASTM D5185m  | 2500       | 1232            |          |          |
| Sodium         ppm         ASTM D5185m         <1   | CONTAMINANTS     |          | method       | limit/base | current         | history1 | history2 |
| Potassium         ppm         ASTM D5185m         >20         0             FLUID CLEANLINESS         method         limit/base         current         history1         history2           Particles >4µm         ASTM D7647         >5000         ▲ 6081             Particles >6µm         ASTM D7647         >1300         499             Particles >6µm         ASTM D7647         >160         26             Particles >14µm         ASTM D7647         >160         26             Particles >21µm         ASTM D7647         >10         0             Particles >38µm         ASTM D7647         >10         0             Particles >71µm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         20/16/12   | Silicon          | ppm      | ASTM D5185m  | >20        | <1              |          |          |
| FLUID CLEANLINESS       method       limit/base       current       history1       history2         Particles >4µm       ASTM D7647       >5000       ▲ 6081           Particles >6µm       ASTM D7647       >1300       499           Particles >6µm       ASTM D7647       >160       26           Particles >14µm       ASTM D7647       >40       6           Particles >21µm       ASTM D7647       >40       6           Particles >38µm       ASTM D7647       >10       0           Particles >71µm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       20/16/12   | Sodium           | ppm      | ASTM D5185m  |            | <1              |          |          |
| Particles >4 $\mu$ m       ASTM D7647       >5000       6081           Particles >6 $\mu$ m       ASTM D7647       >1300       499           Particles >14 $\mu$ m       ASTM D7647       >160       26           Particles >21 $\mu$ m       ASTM D7647       >40       6           Particles >21 $\mu$ m       ASTM D7647       >10       0           Particles >38 $\mu$ m       ASTM D7647       >10       0           Particles >71 $\mu$ m       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       20/16/12  | Potassium        | ppm      | ASTM D5185m  | >20        | 0               |          |          |
| Particles >6µm         ASTM D7647         >1300         499             Particles >14µm         ASTM D7647         >160         26             Particles >14µm         ASTM D7647         >40         6             Particles >21µm         ASTM D7647         >40         6             Particles >38µm         ASTM D7647         >10         0             Particles >71µm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         20/16/12   | FLUID CLEANLIN   | IESS     | method       | limit/base | current         | history1 | history2 |
| Particles >14µm       ASTM D7647       >160       26           Particles >21µm       ASTM D7647       >40       6           Particles >21µm       ASTM D7647       >10       0           Particles >38µm       ASTM D7647       >10       0           Particles >71µm       ASTM D7647       >3       0           Oil Cleanliness       ISO 4406 (c)       >19/17/14       20/16/12   | Particles >4µm   |          | ASTM D7647   | >5000      | <u> </u>        |          |          |
| Particles >21μm         ASTM D7647         >40         6             Particles >38μm         ASTM D7647         >10         0             Particles >37μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14 <b>20/16/12</b>  | Particles >6µm   |          | ASTM D7647   | >1300      | 499             |          |          |
| Particles >38μm         ASTM D7647         >10         0             Particles >71μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14 <b>20/16/12</b>   | Particles >14µm  |          | ASTM D7647   | >160       | 26              |          |          |
| Particles >71μm         ASTM D7647         >3         0             Oil Cleanliness         ISO 4406 (c)         >19/17/14         ▲ 20/16/12   | Particles >21µm  |          | ASTM D7647   | >40        | 6               |          |          |
| Oil Cleanliness ISO 4406 (c) >19/17/14 ▲ 20/16/12   | Particles >38µm  |          | ASTM D7647   | >10        | 0               |          |          |
|   | Particles >71µm  |          | ASTM D7647   | >3         | 0               |          |          |
| FLUID DEGRADATION method limit/base current history1 history2   | Oil Cleanliness  |          | ISO 4406 (c) | >19/17/14  | <b>20/16/12</b> |          |          |
|   | FLUID DEGRADA    | TION     | method       | limit/base | current         | history1 | history2 |
| Acid Number (AN) mg KOH/g ASTM D8045 0.57 0.33  | Acid Number (AN) | mg KOH/g | ASTM D8045   | 0.57       | 0.33            |          |          |





Acid Number

1.00

©0.80

Ø.

## **OIL ANALYSIS REPORT**

method

limit/base

current

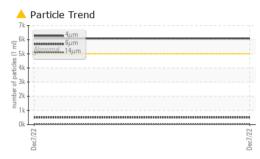
history1

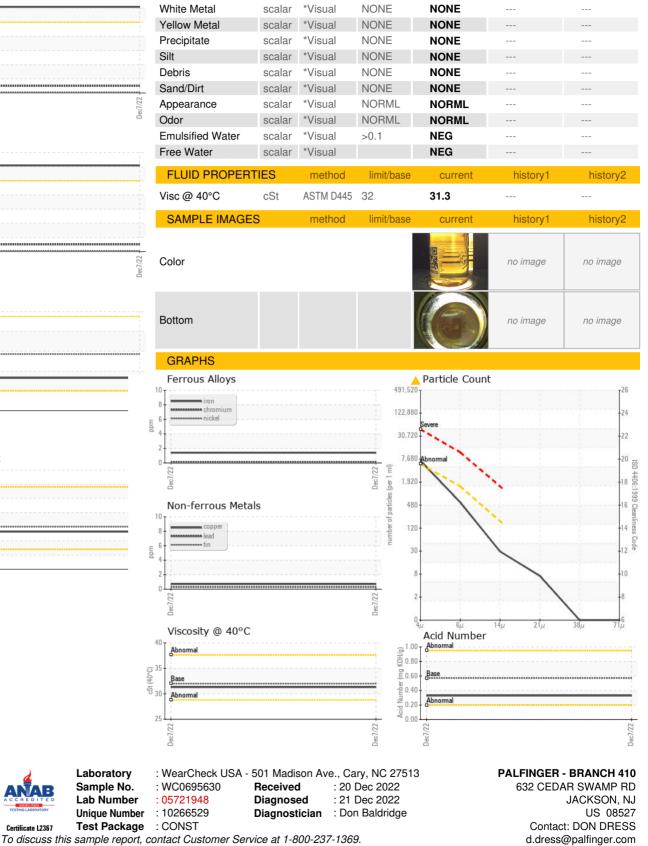
history2

VISUAL









Ê0.60 Ê 0.40 Abnormal Pio 0.20 0.00 Viscosity @ 40°C 40 38 36 Ba tz 32 30 Abno 28 26 Dec7/22

Certificate L2367

Report Id: PALJACNJ [WUSCAR] 05721948 (Generated: 11/14/2023 16:48:25) Rev: 1

\* - 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)

Laboratory

Sample No.

Lab Number

Unique Number

Submitted By: TECHNICIAN ACCOUNT

T:

F: