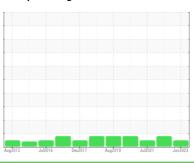


# **OIL ANALYSIS REPORT**

# Area [603521913 SDR] K-ST02 DIS DRIVE (S/N 20069654)

Gearbox

GEAR OIL ISO 150 (--- GAL)



Sample Rating Trend



### Recommendation

Resample at the next service interval to monitor.

All component wear rates are normal.

### Contamination

There is no indication of any contamination in the component.

### **Fluid Condition**

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

SAMPLE INFORMATION         method         limit base         current         history1         history2           Sample Date         Client Info         WC0562488         WC0562236         WC0562236         30 Jul 2021           Machine Age         mls         Client Info         0         0         0         0           Oil Age         mls         Client Info         0         0         0         0           Oil Age         mls         Client Info         0         0         0         0           Oil Changed         MRR         Client Info         0         0         0         0           Oil Changed         ASTM DSISSm         10         ASTM Changed         NoRMAL         NoRMAL         NoRMAL           Iron         ppm         ASTM DSISSm         >200         17         253         26           Chromium         ppm         ASTM DSISSm         >15         0         3         <1           Nickel         ppm         ASTM DSISSm         >15         0         3         <1           Ricked         ppm         ASTM DSISSm         >10         0         0         0           Alleria         ppm         ASTM DSISSm <t< th=""><th></th><th></th><th>Aug2013</th><th>Jul2016 Dec2017</th><th>Aug2019 Jul2021</th><th>Jun2023</th><th></th></t<>			Aug2013	Jul2016 Dec2017	Aug2019 Jul2021	Jun2023		
Sample Date   Client Info   O9 Jun 2023   17 Jul 2022   30 Jul 2021	SAMPLE INFORM	MATION	method	limit/base	current	history1	history2	
Machine Age   mis   Client Info   0   0   0   0   0   0   0   0   0	Sample Number		Client Info		WC0562488	WC0562433	WC0562326	
Oil Age         mls         Client Info         Changed         <	Sample Date		Client Info		09 Jun 2023	17 Jul 2022	30 Jul 2021	
Oil Changed Sample Status         Client Info         Changed NORMAL         Changed ABNORMAL         Changed ABNORMAL         Changed ABNORMAL         Changed NORMAL         Changed ABNORMAL         Changed NORMAL         Changed ABNORMAL         Changed NORMAL         Changed ABNORMAL         Changed NORMAL         Changed NORMAL         Changed ABNORMAL         Changed NORMAL         Changed NORMAL         Changed ABNORMAL         Changed NORMAL         Changed NORMAL         Changed NORMAL         Changed NORMAL         NORE NORMAL           Iron         ppm         ASTM D5185m         >200         17         253         26           Chromium         ppm         ASTM D5185m         >15         0         0         0         0           Silver         ppm         ASTM D5185m         >15         0         0         0         0           Aluminum         ppm         ASTM D5185m         >25         2         <1         0         0           Lead         ppm         ASTM D5185m         >20         <1         2         <1         0         <1           Antimony         ppm         ASTM D5185m         >20         <1         2         <1         0         <1           Antimonum         ppm         ASTM D5185m	Machine Age	mls	Client Info		0	0	0	
NORMAL   ABNORMAL   NORMAL   NORMAL	Oil Age	mls	Client Info		0	0	0	
	Oil Changed		Client Info		Changed	Changed	Changed	
Iron	Sample Status				NORMAL	ABNORMAL	NORMAL	
Chromium         ppm         ASTM D5185m         >15         0         3         <1	WEAR METALS		method	limit/base	current	history1	history2	
Nickel         ppm         ASTM D5185m         >15         0         0         <1	Iron	ppm	ASTM D5185m	>200	17	<u>^</u> 253	26	
Description	Chromium	ppm	ASTM D5185m	>15	0	3	<1	
Silver         ppm         ASTM D5185m         0         0         0           Aluminum         ppm         ASTM D5185m         225         2         <1         0           Lead         ppm         ASTM D5185m         >100         0         0         <1           Copper         ppm         ASTM D5185m         >200         <1         2         <1           Tin         ppm         ASTM D5185m         >25         <1         0         <1           Antimony         ppm         ASTM D5185m         >5           0           Vanadium         ppm         ASTM D5185m         5           0           Cadmium         ppm         ASTM D5185m         5           0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         0         0         1           Barium         ppm         ASTM D5185m         15         0         0         0         0           Barium         ppm         ASTM D5185m         15         0         0	Nickel	ppm	ASTM D5185m	>15	0	0	<1	
Aluminum	Titanium	ppm	ASTM D5185m		0	0	0	
Lead         ppm         ASTM D5185m         >100         0         <1           Copper         ppm         ASTM D5185m         >200         <1	Silver	ppm	ASTM D5185m		0	0	0	
Copper         ppm         ASTM D5185m         >200         <1         2         <1           Tin         ppm         ASTM D5185m         >25         <1	Aluminum	ppm	ASTM D5185m	>25	2	<1	0	
Tin	Lead	ppm	ASTM D5185m	>100	0	0	<1	
Antimony         ppm         ASTM D5185m         >5          0           Vanadium         ppm         ASTM D5185m         0         0         0           Cadmium         ppm         ASTM D5185m         0         0         0           Boron         ppm         ASTM D5185m         50         0         0         0           Barium         ppm         ASTM D5185m         15         0         0         0           Molybdenum         ppm         ASTM D5185m         15         0         0         0           Manganese         ppm         ASTM D5185m         15         0         0         0           Magnesium         ppm         ASTM D5185m         50         0         0         0           Calcium         ppm         ASTM D5185m         50         0         0         0           Phosphorus         ppm         ASTM D5185m         50         0         0         0           Sulfur         ppm         ASTM D5185m         100         3         0         <1	<th>Copper</th> <td>ppm</td> <td>ASTM D5185m</td> <td>&gt;200</td> <th>&lt;1</th> <td>2</td> <td>&lt;1</td>	Copper	ppm	ASTM D5185m	>200	<1	2	<1
Vanadium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         0         0         1           Barium         ppm         ASTM D5185m         15         0         0         0           Molybdenum         ppm         ASTM D5185m         15         0         0         0           Magnesium         ppm         ASTM D5185m         15         0         0         0           Magnesium         ppm         ASTM D5185m         50         0         0         0           Calcium         ppm         ASTM D5185m         50         0         0         0           Phosphorus         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1	Tin	ppm	ASTM D5185m	>25	<1	0	<1	
Cadmium         ppm         ASTM D5185m         0         0         0           ADDITIVES         method         limit/base         current         history1         history2           Boron         ppm         ASTM D5185m         50         0         0         1           Barium         ppm         ASTM D5185m         15         0         0         0           Molybdenum         ppm         ASTM D5185m         15         0         0         0           Manganese         ppm         ASTM D5185m         50         0         0         0           Magnesium         ppm         ASTM D5185m         50         0         0         0           Calcium         ppm         ASTM D5185m         50         0         0         0           Phosphorus         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1	Antimony	ppm	ASTM D5185m	>5			0	
ADDITIVES	Vanadium	ppm	ASTM D5185m		0	0	0	
Boron	Cadmium	ppm	ASTM D5185m		0	0	0	
Barium	ADDITIVES		method	limit/base	current	history1	history2	
Molybdenum         ppm         ASTM D5185m         15         0         0         0           Manganese         ppm         ASTM D5185m         < 1         1         <1         <1           Magnesium         ppm         ASTM D5185m         50         0         0         0         0           Calcium         ppm         ASTM D5185m         50         0         0         0         0           Phosphorus         ppm         ASTM D5185m         50         0         0         0         0           Zinc         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1           Sulfur         ppm         ASTM D5185m         12500         2043         1233         1473           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         2         2         2         1           Sodium         ppm         ASTM D5185m         >20         <1         0         <1         <1           Full	Boron	ppm	ASTM D5185m	50	0	0	1	
Manganese         ppm         ASTM D5185m         <1         1         <1           Magnesium         ppm         ASTM D5185m         50         0         0         0           Calcium         ppm         ASTM D5185m         50         0         0         0           Phosphorus         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1	Barium	ppm	ASTM D5185m	15	0	0	0	
Magnesium         ppm         ASTM D5185m         50         0         0         0           Calcium         ppm         ASTM D5185m         50         0         0         0           Phosphorus         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1	Molybdenum	ppm	ASTM D5185m	15	0	0	0	
Calcium         ppm         ASTM D5185m         50         0         0         0           Phosphorus         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1	Manganese	ppm	ASTM D5185m		<1	1	<1	
Phosphorus         ppm         ASTM D5185m         350         259         119         317           Zinc         ppm         ASTM D5185m         100         3         0         <1	Magnesium	ppm	ASTM D5185m	50	0	0	0	
Zinc         ppm         ASTM D5185m         100         3         0         <1           Sulfur         ppm         ASTM D5185m         12500         2043         1233         1473           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         2         2         2         1           Sodium         ppm         ASTM D5185m         >50         2         2         2         1           FOURSSIUM         ppm         ASTM D5185m         >20         <1         0         1           FOURSSIUM         ppm         ASTM D5185m         >20         <1         0         <1           FUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg K0H/g         ASTM D5185m         >20         <1         0         <1           FUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg K0H/g         ASTM D8045         0.85         0.78         0.37<	Calcium	ppm	ASTM D5185m	50	0	0	0	
Sulfur         ppm         ASTM D5185m         12500         2043         1233         1473           CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         2         2         1           Sodium         ppm         ASTM D5185m         >50         2         2         1           Potassium         ppm         ASTM D5185m         >20         <1         0         <1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg KOH/g         ASTM D8045         0.85         0.78         0.37         0.668           VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         *Visual         NONE         NONE         NONE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE           Precipitate         scalar         *Visual         NONE         NONE         NONE           Silt         scalar         *Visual         NONE         NONE	Phosphorus	ppm	ASTM D5185m	350	259	119	317	
CONTAMINANTS         method         limit/base         current         history1         history2           Silicon         ppm         ASTM D5185m         >50         2         2         1           Sodium         ppm         ASTM D5185m         >20         <1         0         1           Potassium         ppm         ASTM D5185m         >20         <1         0         <1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg KOH/g         ASTM D8045         0.85         0.78         0.37         0.668           VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         *Visual         NONE         NONE         NONE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE         NONE           Precipitate         scalar         *Visual         NONE         NONE         NONE         NONE           Silt         scalar         *Visual         NONE         NONE         NONE         NONE           Debris         scalar         *Visual	Zinc	ppm	ASTM D5185m	100	3	0	<1	
Silicon         ppm         ASTM D5185m         >50         2         2         1           Sodium         ppm         ASTM D5185m         0         0         1           Potassium         ppm         ASTM D5185m         >20         <1	Sulfur	ppm	ASTM D5185m	12500	2043	1233	1473	
Sodium         ppm         ASTM D5185m         0         0         1           Potassium         ppm         ASTM D5185m         >20         <1         0         <1           FLUID DEGRADATION         method         limit/base         current         history1         history2           Acid Number (AN)         mg KOH/g         ASTM D8045         0.85         0.78         0.37         0.668           VISUAL         method         limit/base         current         history1         history2           White Metal         scalar         *Visual         NONE         NONE         NONE           Yellow Metal         scalar         *Visual         NONE         NONE         NONE           Precipitate         scalar         *Visual         NONE         NONE         NONE         NONE           Silt         scalar         *Visual         NONE         NONE         NONE         NONE           Debris         scalar         *Visual         NONE         NONE         NONE         NONE           Sand/Dirt         scalar         *Visual         NORML         NORML         NORML         NORML         NORML	CONTAMINANTS		method	limit/base	current	history1	history2	
Potassium ppm ASTM D5185m >20 <1 0 <1  FLUID DEGRADATION method limit/base current history1 history2  Acid Number (AN) mg KOH/g ASTM D8045 0.85 0.78 0.37 0.668  VISUAL method limit/base current history1 history2  White Metal scalar *Visual NONE NONE MODER NONE  Yellow Metal scalar *Visual NONE NONE NONE NONE  Precipitate scalar *Visual NONE NONE NONE NONE  Silt scalar *Visual NONE NONE NONE NONE  Silt scalar *Visual NONE NONE NONE NONE  Debris scalar *Visual NONE NONE NONE NONE  Appearance scalar *Visual NONE NONE NONE NONE  Appearance scalar *Visual NORML NORML NORML NORML  NORML NORML NORML  NORML NORML	Silicon	ppm	ASTM D5185m	>50	2	2	1	
FLUID DEGRADATION method limit/base current history1 history2  Acid Number (AN) mg KOH/g ASTM D8045 0.85 0.78 0.37 0.668  VISUAL method limit/base current history1 history2  White Metal scalar *Visual NONE NONE MODER NONE  Yellow Metal scalar *Visual NONE NONE NONE NONE  Precipitate scalar *Visual NONE NONE NONE NONE  Silt scalar *Visual NONE NONE MODER NONE  Debris scalar *Visual NONE NONE NONE NONE  Debris scalar *Visual NONE NONE NONE NONE  Appearance scalar *Visual NONE NONE NONE NONE  Appearance scalar *Visual NORML NORML NORML NORML  Odor scalar *Visual NORML NORML NORML NORML	Sodium	ppm	ASTM D5185m		0	0	1	
Acid Number (AN) mg KOH/g ASTM D8045 0.85 0.78 0.37 0.668  VISUAL method limit/base current history1 history2  White Metal scalar *Visual NONE NONE MODER NONE  Yellow Metal scalar *Visual NONE NONE NONE NONE  Precipitate scalar *Visual NONE NONE NONE NONE  Silt scalar *Visual NONE NONE MODER NONE  Debris scalar *Visual NONE NONE NONE LIGHT  Sand/Dirt scalar *Visual NONE NONE NONE NONE  Appearance scalar *Visual NORML NORML NORML NORML  Odor scalar *Visual NORML NORML NORML NORML  NORML NORML	Potassium	ppm	ASTM D5185m	>20	<1	0	<1	
VISUAL method limit/base current history1 history2  White Metal scalar *Visual NONE NONE MODER NONE Yellow Metal scalar *Visual NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE Silt scalar *Visual NONE NONE MODER NONE Debris scalar *Visual NONE NONE NONE LIGHT Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML Odor scalar *Visual NORML NORML NORML NORML	FLUID DEGRADA	TION	method	limit/base	current	history1	history2	
White Metal scalar *Visual NONE NONE MODER NONE Yellow Metal scalar *Visual NONE NONE NONE NONE Precipitate scalar *Visual NONE NONE NONE NONE Silt scalar *Visual NONE NONE MODER NONE Debris scalar *Visual NONE NONE NONE LIGHT Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML Odor scalar *Visual NORML NORML NORML NORML	Acid Number (AN)	mg KOH/g	ASTM D8045	0.85	0.78	0.37	0.668	
Yellow Metalscalar*VisualNONENONENONENONEPrecipitatescalar*VisualNONENONENONENONESiltscalar*VisualNONENONEMODERNONEDebrisscalar*VisualNONENONENONELIGHTSand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORML	VISUAL		method	limit/base	current	history1	history2	
Precipitate scalar *Visual NONE NONE NONE NONE Silt scalar *Visual NONE NONE MODER NONE Debris scalar *Visual NONE NONE NONE LIGHT Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML Odor scalar *Visual NORML NORML NORML NORML		scalar	*Visual			MODER		
Silt scalar *Visual NONE NONE MODER NONE Debris scalar *Visual NONE NONE NONE LIGHT Sand/Dirt scalar *Visual NONE NONE NONE NONE Appearance scalar *Visual NORML NORML NORML NORML Odor scalar *Visual NORML NORML NORML NORML	Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE	
Debrisscalar*VisualNONENONENONELIGHTSand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORML	Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE	
Sand/Dirtscalar*VisualNONENONENONENONEAppearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORMLNORML	Silt	scalar	*Visual		NONE	MODER	NONE	
Appearancescalar*VisualNORMLNORMLNORMLNORMLNORMLOdorscalar*VisualNORMLNORMLNORMLNORML	Debris	scalar	*Visual	NONE	NONE	NONE	LIGHT	
Odor scalar *Visual NORML NORML NORML NORML	Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE	
	Appearance	scalar	*Visual	NORML	NORML	NORML	NORML	
Emulsified Water scalar *Visual >0.2 NEG NEG NEG	Odor	scalar	*Visual	NORML	NORML	NORML	NORML	
	<b>Emulsified Water</b>	scalar	*Visual	>0.2	NEG	NEG	NEG	

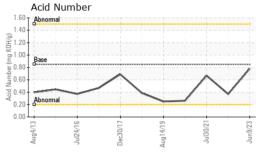
ItionNEONY FIORE NEARSCHI

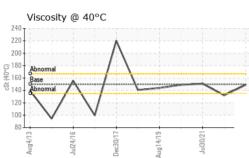
NEG

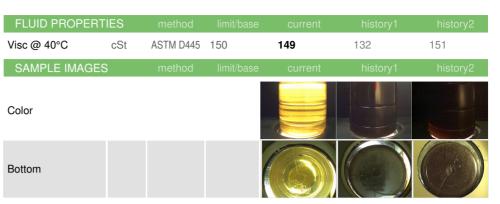
scalar \*Visual



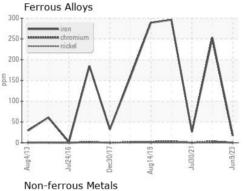
## **OIL ANALYSIS REPORT**

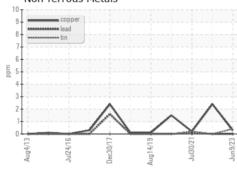


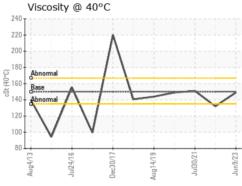


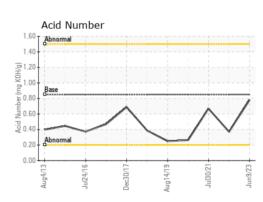


### **GRAPHS**













Certificate L2367

Laboratory Sample No. Lab Number Test Package : IND 2

Unique Number : 10562759

: WC0562488 : 05901403

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Received Diagnosed

: 18 Jul 2023 : 20 Jul 2023 Diagnostician : Don Baldridge

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) MARS CHOCOLATE

2019 NORTH OAK PARK CHICAGO, IL US 60707

Contact: TONY FIORE tony.fiore@effem.com T: (773)745-2279

Contact/Location: TONY FIORE - MARSCHI