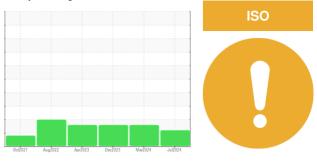


OIL ANALYSIS REPORT

Sample Rating Trend



Machine Id

KAESER 6516378

Component Compressor Fluid KAESER SIGMA (OEM) M-460 (--- GAL)

DIAGNOSIS

Recommendation

No corrective action is recommended at this time. The filter change at the time of sampling has been noted. Resample at the next service interval to monitor.

Wear

All component wear rates are normal.

Contamination

There is a moderate amount of particulates present in the oil.

Fluid Condition

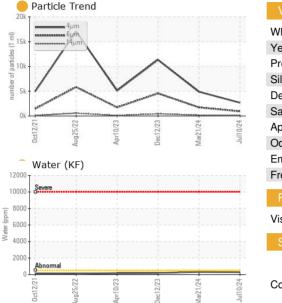
The AN level is acceptable for this fluid. The condition of the oil is suitable for further service.

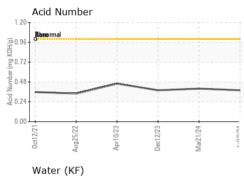
Sample Date Client Info 10 Jul 2024 21 Mar 2024 12 Dec 2023 Machine Age hrs Client Info 25510 24059 22818 Oil Age hrs Client Info 0 0 0 Oil Changed Client Info Not Changd N/A N/A Sample Status method Imit/base current history1 history2 Iron ppm ASTM D5185m >50 0 <1 0 Chromium ppm ASTM D5185m >10 0 <1 0 Nickel ppm ASTM D5185m >3 <1 <1 0 Silver ppm ASTM D5185m >10 <1 10 0 Cadadium ppm ASTM D5185m >10 0 1 <1 0 Cadadium ppm ASTM D5185m >10 0 1 <1 0 Cadadium ppm ASTM D5185m 0 0 1	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Sample Date Client Info 10 Jul 2024 21 Mar 2024 12 Dec 2023 Machine Age hrs Client Info 25510 24059 22818 Oil Age Client Info 0 0 0 0 Sample Status Client Info Not Changd N/A ABNORMAL ABNORMAL WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM 05185m >50 0 <1 0 Nickel ppm ASTM 05185m >3 <1 1 0 Silver ppm ASTM 05185m >10 0 1 0 Copper ppm ASTM 05185m >10 0 1 <1 0 Vanadium ppm ASTM 05185m >10 0 <1 0 1 <1 0 AstM 05185m 0 0 <1 0 <1 0 1 0 Vanadium ppm AST	Sample Number		Client Info		KCPA014194	KCPA007698	KCPA000791
Machine Age Oil Age Oil Age Oil Age Sample Status Client Info 25510 24059 22818 Oil Age Sample Status Client Info Not Changd ATTENTION N/A N/A Sample Status Imalibase current history1 history1 history2 Iron ppm ASTM D5185m >50 0 <1 0 Nickel ppm ASTM D5185m >3 <1 0 0 Nickel ppm ASTM D5185m >3 0 <1 0 Silver ppm ASTM D5185m >10 0 1 0 Cadmium ppm ASTM D5185m >10 0 1 0 Adaminum ppm ASTM D5185m >10 0 1 0 Cadmium ppm ASTM D5185m 0 0 1 0 Adaminum ppm ASTM D5185m 0 0 1 0 Adaminum ppm ASTM D5185m 0 0 1			Client Info		10 Jul 2024	21 Mar 2024	12 Dec 2023
Oil Changed Client Info Not Changd N/A N/A Sample Status Imit base current history1 ABNORMAL WEAR METALS method Imit/base current history1 history2 Iron ppm ASTM D5185n >50 0 <1 0 Chromium ppm ASTM D5185n >3 <1 <1 0 Nickel ppm ASTM D5185n >3 0 <1 0 Silver ppm ASTM D5185n >10 <1 1 <1 Lead ppm ASTM D5185n >10 0 1 <1 Cadmium ppm ASTM D5185n >10 0 <1 0 Cadmium ppm ASTM D5185n 0 0 <1 0 ADDITVES method Imit/base current history1 history2 Boron ppm ASTM D5185n 0 0 <1 0 M	Machine Age	hrs	Client Info		25510	24059	22818
Sample Status ATTENTION ABNORMAL ABNORMAL ABNORMAL ABNORMAL WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185n >50 0 <1 0 Nickel ppm ASTM D5185n >3 <1 <1 0 Titanium ppm ASTM D5185n >2 0 0 0 Aluminum ppm ASTM D5185n >2 0 0 0 Aluminum ppm ASTM D5185n >10 <1 1 <1 0 Copper ppm ASTM D5185n >10 0 1 0 0 0 Copper ppm ASTM D5185n 0 0 <1 0 0 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185n 0 0 1 0 Adignessium	Oil Age	hrs	Client Info		0	0	0
WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >50 0 <1 0 Nickel ppm ASTM D5185m >3 <1 <1 0 Nickel ppm ASTM D5185m >3 0 <1 0 Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >10 <1 1 <1 Lead ppm ASTM D5185m >10 0 1 <1 0 Copper ppm ASTM D5185m >10 0 1 <1 0 Cadmium ppm ASTM D5185m 0 0 <1 0 0 Magaanese ppm ASTM D5185m 0 0 <1 1 1 Maganese ppm ASTM D5185m 0 0 <1 0 3 Calmium ppm	Oil Changed		Client Info		Not Changd	N/A	N/A
Iron ppm ASTM D5185m >50 0 <1	-				ATTENTION	ABNORMAL	ABNORMAL
Chromium ppm ASTM D5185m >10 0 <1	WEAR METALS		method	limit/base	current	history1	history2
Nickel ppm ASTM D5185m >3 <1	Iron	ppm	ASTM D5185m	>50	0	<1	0
Titanium ppm ASTM D5185m >3 0 <1	Chromium	ppm	ASTM D5185m	>10	0	<1	0
Titanium ppm ASTM D5185m >3 0 <1	Nickel		ASTM D5185m	>3	<1	<1	0
Silver ppm ASTM D5185m >2 0 0 0 Aluminum ppm ASTM D5185m >10 <1 1 <1 Lead ppm ASTM D5185m >10 0 1 0 Copper ppm ASTM D5185m >50 <1 2 2 Tin ppm ASTM D5185m 0 0 1 <1 Vanadium ppm ASTM D5185m 0 <1 0 0 Cadmium ppm ASTM D5185m 0 0 <1 0 0 ADDITIVES method imit/base current history1 history2 Boron ppm ASTM D5185m 0 0 1 0 Magnesium ppm ASTM D5185m 0 0 5 <1 Magnesium ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 2500 25316 212	Titanium		ASTM D5185m	>3	0	<1	0
Aluminum ppm ASTM D5185m >10 <1	Silver		ASTM D5185m	>2		0	0
Lead ppm ASTM D5185m >10 0 1 0 Copper ppm ASTM D5185m >50 <1 2 2 Tin ppm ASTM D5185m >10 0 1 <1 Vanadium ppm ASTM D5185m 0 <1 0 Cadmium ppm ASTM D5185m 0 <1 0 ADDITIVES method limit/base current history1 history2 Boron ppm ASTM D5185m 0 0 0 0 Malybdenum ppm ASTM D5185m 90 16 31 12 Maganese ppm ASTM D5185m 0 0 1 0 Maganesium ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 0 0 4 1 Sulfur ppm ASTM D5185m 23500 25316 21274 19816	Aluminum		ASTM D5185m	>10	<1	1	<1
Copper ppm ASTM D5185m >50 <1							
Tin ppm ASTM D5185m >10 0 1 <1							
Vanadium ppm ASTM D5185m 0 <1							
Cadmium ppm ASTM D5185m 0 <1							
Boron ppm ASTM D5185m 0 0 0 0 0 Barium ppm ASTM D5185m 90 16 31 12 Molybdenum ppm ASTM D5185m 0 0 1 0 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 0 0 5 <1 Phosphorus ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 3 2 Water % ASTM D5185m >20 2 3 2 Particles >4µm ASTM D7647 2682 4889							
Barium ppm ASTM D5185m 90 16 31 12 Molybdenum ppm ASTM D5185m 0 0 1 0 Manganese ppm ASTM D5185m 0 0 <1 <1 Magnesium ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 0 0 5 <1 Phosphorus ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 3 2 Vater % ASTM D504 >0.05 0.027 0.031 0.019 pm Water ppm ASTM D7647 2682 48	ADDITIVES		method	limit/base	current	history1	history2
Molybdenum ppm ASTM D5185m 0 0 1 0 Manganese ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 0 0 5 <1 Phosphorus ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 3 2 Vater % ASTM D6304 >0.05 0.027 0.031 0.019 pm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current histor	Boron	ppm	ASTM D5185m	0	0	0	0
Molybdenum ppm ASTM D5185m 0 0 1 0 Manganese ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 0 0 5 <1 Phosphorus ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >20 2 3 2 Vater % ASTM D6304 >0.05 0.027 0.031 0.019 ppm ASTM D6407 >1300 937 1729 4557 Particles >4µm ASTM D7647 2682 4889 11322	Barium		ASTM D5185m	90	16	31	12
Manganese ppm ASTM D5185m 0 <1	Molybdenum		ASTM D5185m	0	0	1	0
Magnesium ppm ASTM D5185m 100 78 80 63 Calcium ppm ASTM D5185m 0 0 5 <1 Phosphorus ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 <1 <1 1 Sodium ppm ASTM D5185m >20 2 3 2 Water % ASTM D5185m >20 2 3 2 Water % ASTM D6304 >0.05 0.027 0.031 0.019 ppm Water pm ASTM D7647 2682 4889 11322 Particles >4µm ASTM D7647 >1300 937	Manganese		ASTM D5185m		0	<1	<1
Phosphorus ppm ASTM D5185m 0 3 4 1 Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 <1	Magnesium	ppm	ASTM D5185m	100	78	80	63
Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 <1	Calcium	ppm	ASTM D5185m	0	0	5	<1
Zinc ppm ASTM D5185m 0 0 4 0 Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 <1 <1 1 Sodium ppm ASTM D5185m >20 2 3 2 Water % ASTM D6304 >0.05 0.027 0.031 0.019 ppm Water ppm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 20 29 30 96 <th>Phosphorus</th> <th>ppm</th> <th>ASTM D5185m</th> <th>0</th> <th>3</th> <th>4</th> <th>1</th>	Phosphorus	ppm	ASTM D5185m	0	3	4	1
Sulfur ppm ASTM D5185m 23500 25316 21274 19816 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 <1 <1 1 Sodium ppm ASTM D5185m >25 <1 <1 1 Sodium ppm ASTM D5185m >20 2 3 2 Water % ASTM D6304 >0.05 0.027 0.031 0.019 ppm Water ppm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 >1300 937 1729 4557 Particles >6µm ASTM D7647 >80 105 164 435 Particles >1µm ASTM D7647 >20 29 30 96 Particles >38µm ASTM D7647 >3 0 0			ASTM D5185m	0	0	4	0
Silicon ppm ASTM D5185m >25 <1	Sulfur				25316	21274	19816
Sodium ppm ASTM D5185m 16 14 8 Potassium ppm ASTM D5185m >20 2 3 2 Water % ASTM D6304 >0.05 0.027 0.031 0.019 ppm Water ppm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 20 29 30 96 Particles >38µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	CONTAMINANTS		method	limit/base	current	history1	history2
Potassium ppm ASTM D5185m >20 2 3 2 Water % ASTM D6304 >0.05 0.027 0.031 0.019 ppm Water ppm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 >20 29 30 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2 <th>Silicon</th> <th>ppm</th> <th>ASTM D5185m</th> <th>>25</th> <th><1</th> <th><1</th> <th>1</th>	Silicon	ppm	ASTM D5185m	>25	<1	<1	1
Water % ASTM D6304 >0.05 0.027 0.031 0.019 ppm Water ppm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 >20 29 30 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oli Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Sodium	ppm	ASTM D5185m		16	14	8
ppm Water ppm ASTM D6304 >500 275 310 191 FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 >20 29 30 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) /17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Potassium	ppm	ASTM D5185m	>20	2	3	2
FLUID CLEANLINESS method limit/base current history1 history2 Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 ▲ 164 ▲ 435 Particles >21µm ASTM D7647 >20 29 30 ▲ 96 Particles >21µm ASTM D7647 >4 2 0 4 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Water	%	ASTM D6304	>0.05	0.027	0.031	0.019
Particles >4µm ASTM D7647 2682 4889 11322 Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 >20 29 30 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16	ppm Water	ppm	ASTM D6304	>500	275	310	191
Particles >6µm ASTM D7647 >1300 937 1729 4557 Particles >14µm ASTM D7647 >80 105 164 435 Particles >21µm ASTM D7647 >20 29 30 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	FLUID CLEANLIN	ESS	method	limit/base	current	history1	history2
Particles >14µm ASTM D7647 >80 105 ▲ 164 ▲ 435 Particles >21µm ASTM D7647 >20 29 30 ▲ 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 ▲ 19/18/15 ▲ 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >4µm		ASTM D7647			4889	11322
Particles >21µm ASTM D7647 >20 29 30 ▲ 96 Particles >38µm ASTM D7647 >4 2 0 4 Particles >71µm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2			ASTM D7647	>1300	937	1729	4557
Particles >38μm ASTM D7647 >4 2 0 4 Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >14µm		ASTM D7647	>80	<mark> </mark> 105	1 64	435
Particles >71μm ASTM D7647 >3 0 0 0 Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >21µm		ASTM D7647	>20	<mark>)</mark> 29	0 30	<u> </u>
Oil Cleanliness ISO 4406 (c) >/17/13 19/17/14 19/18/15 21/19/16 FLUID DEGRADATION method limit/base current history1 history2	Particles >38µm		ASTM D7647	>4	2	0	4
FLUID DEGRADATION method limit/base current history1 history2	Particles >71µm		ASTM D7647	>3	0	0	0
	Oil Cleanliness		ISO 4406 (c)	>/17/13	— 19/17/14	1 9/18/15	1 /19/16
Acid Number (AN) mg KOH/g ASTM D8045 1.0 0.38 0.40 0.38	FLUID DEGRADA	TION	method	limit/base	current	history1	history2
	Acid Number (AN)	mg KOH/g	ASTM D8045	1.0	0.38	0.40	0.38

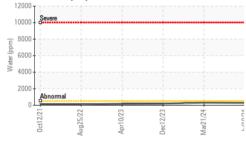


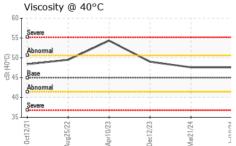
Built for a lifetime

OIL ANALYSIS REPORT



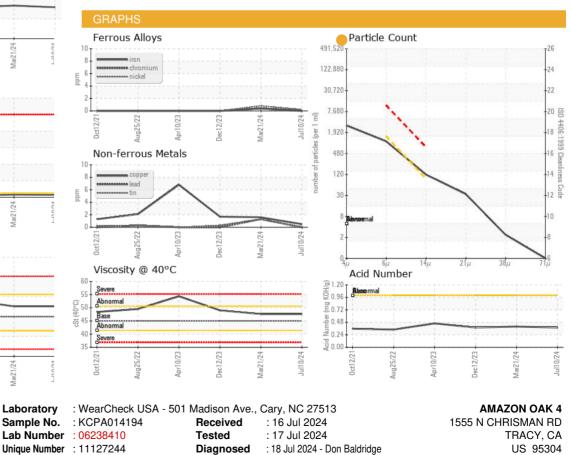






VISUAL		method	limit/base	current	history1	history2
White Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Yellow Metal	scalar	*Visual	NONE	NONE	NONE	NONE
Precipitate	scalar	*Visual	NONE	NONE	NONE	NONE
Silt	scalar	*Visual	NONE	NONE	NONE	NONE
Debris	scalar	*Visual	NONE	NONE	NONE	NONE
Sand/Dirt	scalar	*Visual	NONE	NONE	NONE	NONE
Appearance	scalar	*Visual	NORML	NORML	NORML	NORML
Odor	scalar	*Visual	NORML	NORML	NORML	NORML
Emulsified Water	scalar	*Visual	>0.05	NEG	NEG	NEG
Free Water	scalar	*Visual		NEG	NEG	NEG
FLUID PROPERT	IES	method	limit/base	current	history1	history2
Visc @ 40°C	cSt	ASTM D445	45	47.6	47.6	49.0
SAMPLE IMAGES	6	method	limit/base	current	history1	history2
Color						

Bottom



Test Package : IND 2 (Additional Tests: KF, PrtCount) Certificate 12367 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)

Report Id: AMATRAOAK4 [WUSCAR] 06238410 (Generated: 07/18/2024 12:55:28) Rev: 1

Contact/Location: Service Manager - AMATRAOAK4

T:

F:

Contact: Service Manager

sparcase@amazon.com