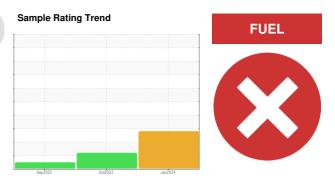


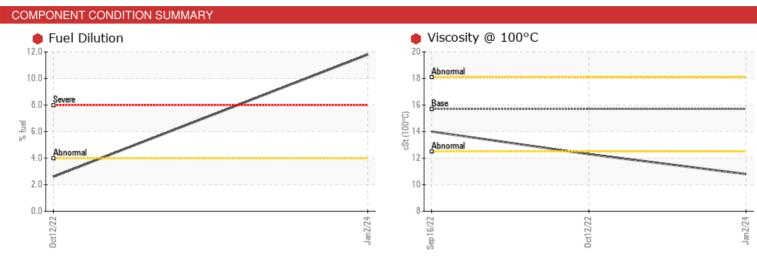
PROBLEM SUMMARY

CARESSA K Machine Id [CARESSA K] CARESSA K CARESSA K

Center Main Engine

SHELL ROTELLA T 15W40 (20 GAL)





RECOMMENDATION

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

PROBLEMATIC TEST RESULTS								
Sample Status				SEVERE	ATTENTION	NORMAL		
Fuel	%	ASTM D3524	>4.0	11.8	△ 2.6	<1.0		
Visc @ 100°C	cSt	ASTM D445	15.7	10.8	12.3	14.0		

Customer Id: INGPAD
Sample No.: MW0060293
Lab Number: 06077810
Test Package: MAR 2

To manage this report scan the QR code

To discuss the diagnosis or test data:
Wes Davis +1 905-569-8600 x223
wesd@wearcheck.ca

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

Action Status Date Done By Description Resample --- ? We recommend an early resample to monitor this condition. Check Fuel/injector System --- ? We advise that you check the fuel injection system.

HISTORICAL DIAGNOSIS

12 Oct 2022 Diag: Don Baldridge

FUEL



Oil and filter change at the time of sampling has been noted. Resample at the next service interval to monitor. All component wear rates are normal. Light fuel dilution occurring. The oil viscosity is lower than normal. The BN result indicates that there is suitable alkalinity remaining in the oil.



16 Sep 2022 Diag: Don Baldridge

NORMAL



Resample at the next service interval to monitor. All component wear rates are normal. There is no indication of any contamination in the oil. The BN result indicates that there is suitable alkalinity remaining in the oil. The condition of the oil is suitable for further service.





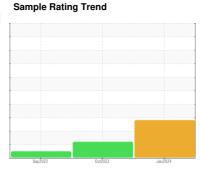
OIL ANALYSIS REPORT

CARESSA K Machine Id [CARESSA K] CARESSA K CARESSA K

Component

Center Main Engine

SHELL ROTELLA T 15W40 (20 GAL)





DIAGNOSIS

Recommendation

We advise that you check the fuel injection system. The oil change at the time of sampling has been noted. We recommend an early resample to monitor this condition.

Wear

All component wear rates are normal.

Contamination

There is a high amount of fuel present in the oil. Tests confirm the presence of fuel in the oil.

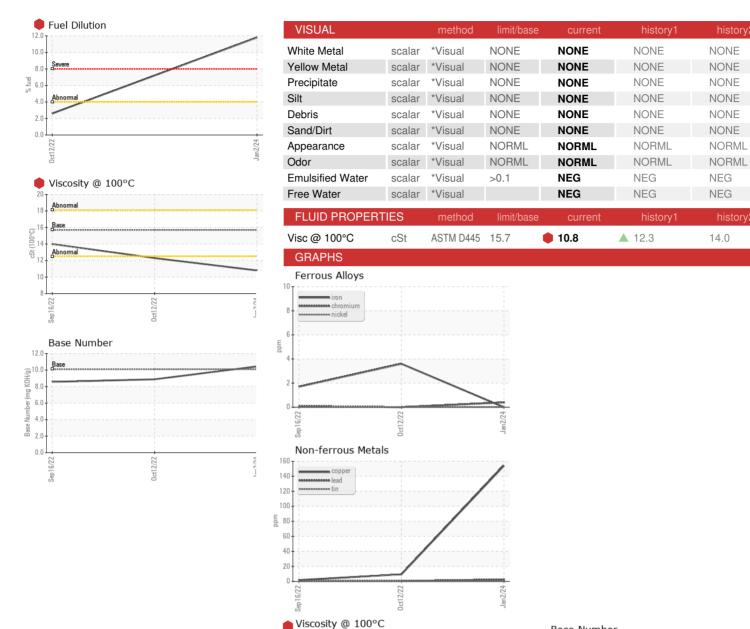
Fluid Condition

The BN result indicates that there is suitable alkalinity remaining in the oil. Fuel is present in the oil and is lowering the viscosity. The oil is no longer serviceable due to the presence of contaminants.

SAMPLE INFORMATION method limit/base current history1 history2 Sample Number Client Info MW00466093 MW0046609 MW0046677 Sample Date Client Info 7091 44942 44380 Machine Ag hrs Client Info Changed Changed Changed Oil Changed Client Info Changed Changed Changed Changed Sample Status Immitted Immitted Value							
Sample Date Client Info 02 Jan 2024 12 Oct 2022 16 Sep 2022 Machine Age hrs Client Info 7091 44942 44380 Oil Age hrs Client Info 471 561 1000 Oil Changed Client Info Changed Changed Changed Changed Sample Status Client Info Changed Changed Changed Changed Sample Status Client Info Changed Changed Changed Changed Wear WC Method >0.1 NEG NEG NEG WEAR METALS method Ilmit/base current history1 history2 Iron ppm ASTM D5185m >10 <1	SAMPLE INFORM	IATION	method	limit/base	current	history1	history2
Machine Age hrs Client Info 7091 44942 44380 Oil Age hrs Client Info 471 561 1000 Oil Changed Client Info Changed	Sample Number		Client Info		MW0060293	MW0046609	MW0046577
Oil Age hrs Client Info 471 561 1000 Oil Changed Sample Status Client Info Changed	Sample Date		Client Info		02 Jan 2024	12 Oct 2022	16 Sep 2022
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Oil Changed Sample Status Client Info Changed SEVERE Changed ATTENTION Changed NORMAL CONTAMINATION method limit/base current history1 history2 Water WC Method >0.1 NEG NEG NEG NEG WEAR METALS method limit/base current history1 history2 Iron ppm ASTM D5185m >120 0 4 2 Chromium ppm ASTM D5185m >10 <1	Oil Age	hrs	Client Info		471	561	1000
SEVERE	-		Client Info		Changed	Changed	Changed
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Water Glycol WC Method (WC Method) >0.1 NEG (NEG (NEG (NEG (NEG (NEG (NEG (NEG (CONTAMINATION	I	method	limit/base	current	history1	history2
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Chromium ppm ASTM D5185m >10 <1	WEAR METALS		method	limit/base	current	history1	history2
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Lead ppm ASTM D5185m >40 2 <1							
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Tin ppm ASTM D5185m >10 <1							
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Calcium ppm ASTM D5185m 2292 2230 1860 1832 Phosphorus ppm ASTM D5185m 1064 965 907 889 Zinc ppm ASTM D5185m 1160 1146 1023 1015 Sulfur ppm ASTM D5185m 4996 2945 3799 3768 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 2 2 3 Fuel % ASTM D5185m >20 2 2 3 Fuel % ASTM D3524 >4.0 11.8 ≥ 2.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415	Boron Barium	ppm	ASTM D5185m ASTM D5185m	316 0.0	6 0	255 0	266
Phosphorus ppm ASTM D5185m 1 064 965 907 889 Zinc ppm ASTM D5185m 1 160 1146 1023 1015 Sulfur ppm ASTM D5185m 4996 2945 3799 3768 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 2 2 3 Fuel % ASTM D5185m >20 2 2 3 Fuel % ASTM D5185m >20 2 2 3 Fuel % ASTM D3524 >4.0 11.8 △ 2.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 <th>Boron Barium Molybdenum</th> <th>ppm</th> <th>ASTM D5185m ASTM D5185m ASTM D5185m</th> <th>316 0.0</th> <th>6 0 51</th> <th>255 0 54</th> <th>266 0 54</th>	Boron Barium Molybdenum	ppm	ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0	6 0 51	255 0 54	266 0 54
Zinc ppm ASTM D5185m 1160 1146 1023 1015 Sulfur ppm ASTM D5185m 4996 2945 3799 3768 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 2 2 3 Potassium ppm ASTM D5185m >20 2 2 3 Fuel % ASTM D3524 >4.0 11.8 △ 2.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method	Boron Barium Molybdenum Manganese	ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2	6 0 51 0	255 0 54 <1	266 0 54 <1
Sulfur ppm ASTM D5185m 4996 2945 3799 3768 CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m >20 1 <1 <1 Potassium ppm ASTM D5185m >20 2 2 3 Fuel % ASTM D5185m >20 11.8 2.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7415 >30 15.5 22.6	Boron Barium Molybdenum Manganese Magnesium	ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2	6 0 51 0 14	255 0 54 <1 286	266 0 54 <1 294
CONTAMINANTS method limit/base current history1 history2 Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 0 1 <1 Potassium ppm ASTM D5185m >20 2 2 3 Fuel % ASTM D3524 >4.0 11.8 2.6 <1.0 INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium	ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2 24 2292	6 0 51 0 14 2230	255 0 54 <1 286 1860	266 0 54 <1 294 1832
Silicon ppm ASTM D5185m >25 4 3 4 Sodium ppm ASTM D5185m 0 1 <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus	ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2 24 2292 1064	6 0 51 0 14 2230 965	255 0 54 <1 286 1860 907	266 0 54 <1 294 1832 889
Sodium ppm ASTM D5185m 0 1 <1	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2 24 2292 1064 1160	6 0 51 0 14 2230 965 1146	255 0 54 <1 286 1860 907 1023	266 0 54 <1 294 1832 889 1015
Potassium ppm ASTM D5185m >20 2 2 3 Fuel % ASTM D3524 >4.0 11.8 ▲ 2.6 <1.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur	ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996	6 0 51 0 14 2230 965 1146 2945	255 0 54 <1 286 1860 907 1023 3799	266 0 54 <1 294 1832 889 1015 3768
Fuel % ASTM D3524 >4.0 11.8 ▲ 2.6 <1.0	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS	ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996	6 0 51 0 14 2230 965 1146 2945	255 0 54 <1 286 1860 907 1023 3799 history1	266 0 54 <1 294 1832 889 1015 3768 history2
INFRA-RED method limit/base current history1 history2 Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996	6 0 51 0 14 2230 965 1146 2945 current	255 0 54 <1 286 1860 907 1023 3799 history1	266 0 54 <1 294 1832 889 1015 3768 history2
Soot % % *ASTM D7844 0.1 0.1 0.1 Nitration Abs/cm *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium	ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996 limit/base	6 0 51 0 14 2230 965 1146 2945 current 4	255 0 54 <1 286 1860 907 1023 3799 history1 3	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1
Nitration Abs/cm *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25	6 0 51 0 14 2230 965 1146 2945 current 4 0	255 0 54 <1 286 1860 907 1023 3799 history1 3 1	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3
Nitration Abs/cm *ASTM D7624 >20 6.5 7.1 5.5 Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel	ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0	6 0 51 0 14 2230 965 1146 2945 current 4 0 2	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 ▲ 2.6	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0
Sulfation Abs/.1mm *ASTM D7415 >30 15.5 22.6 22.4 FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0	6 0 51 0 14 2230 965 1146 2945 current 4 0 2 11.8 current	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 △ 2.6 history1	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0 history2
FLUID DEGRADATION method limit/base current history1 history2 Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot %	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0	6 0 51 0 14 2230 965 1146 2945 current 4 0 2 11.8 current	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 ▲ 2.6 history1 0.1	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0 history2 0.1
Oxidation Abs/.1mm *ASTM D7414 >25 8.1 17 16.3	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7844	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0	6 0 51 0 14 2230 965 1146 2945 current 4 0 2 11.8 current 0.1 6.5	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 △ 2.6 history1 0.1 7.1	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0 history2 0.1 5.5
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D76145	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0 limit/base	6 0 51 0 14 2230 965 1146 2945 current 4 0 2 11.8 current 0.1 6.5 15.5	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 △ 2.6 history1 0.1 7.1 22.6	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0 history2 0.1 5.5 22.4
Base Number (BN) mg KOH/g ASTM D2896 10.1 10.44 8.88 8.57	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation	ppm ppm ppm ppm ppm ppm ppm ppm ppm ppm	ASTM D5185m ASTM D7844 *ASTM D7624 *ASTM D76145	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0 limit/base	6 0 51 0 14 2230 965 1146 2945 current 4 0 2 11.8 current 0.1 6.5 15.5 current	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 △ 2.6 history1 0.1 7.1 22.6 history1	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0 history2 0.1 5.5 22.4 history2
	Boron Barium Molybdenum Manganese Magnesium Calcium Phosphorus Zinc Sulfur CONTAMINANTS Silicon Sodium Potassium Fuel INFRA-RED Soot % Nitration Sulfation FLUID DEGRADA Oxidation	ppm	ASTM D5185m ASTM D7624 *ASTM D7624 *ASTM D7614 *ASTM D7414	316 0.0 1.2 24 2292 1064 1160 4996 limit/base >25 >20 >4.0 limit/base >20 >30 limit/base	6 0 51 0 14 2230 965 1146 2945 current 4 0 2 11.8 current 0.1 6.5 15.5 current 8.1	255 0 54 <1 286 1860 907 1023 3799 history1 3 1 2 △ 2.6 history1 17.1	266 0 54 <1 294 1832 889 1015 3768 history2 4 <1 3 <1.0 history2 0.1 5.5 22.4 history2 16.3



OIL ANALYSIS REPORT







Report Id: INGPAD [WUSCAR] 06077810 (Generated: 02/07/2024 08:43:16) Rev: 1

Laboratory Sample No. Lab Number **Unique Number**

(100°C ŝ

: 06077810 : 10859901

: WearCheck USA - 501 Madison Ave., Cary, NC 27513 Recieved : 01 Feb 2024 : MW0060293 Diagnosed : 05 Feb 2024

Diagnostician : Wes Davis Test Package : MAR 2 (Additional Tests: FuelDilution, PercentFuel)

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) **INGRAM BARGE** 900 S 3RD ST PADUCAH, KY

US 42003 Contact: ANTHONY VAN CURA anthony.vancura@ingrambarge.com

T: (270)415-4467 F: (615)695-3697

Contact/Location: ANTHONY VAN CURA - INGPAD

Base Number

12.

0.0

(mg K0H/g