VOLVO CONSTRUCTION EQUIPMENT
MATRIS REPORT

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Company name	Dealer	Report Issuer
ALTA		

Contact name	Technician	Primary Application
	Brandon Krimm	Earth moving construction

Site	Workorder	Ground Condition

MATRIS Reading, Summary / Recommendation

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Main equipment	Type	Equipment
	Tyre size/class	Sold without tyres
	Body extensions	Not mounted
	Tail-gate	Not mounted
	Extra spillguard	Not mounted
	Wear plates	Not mounted
	Pattern	None

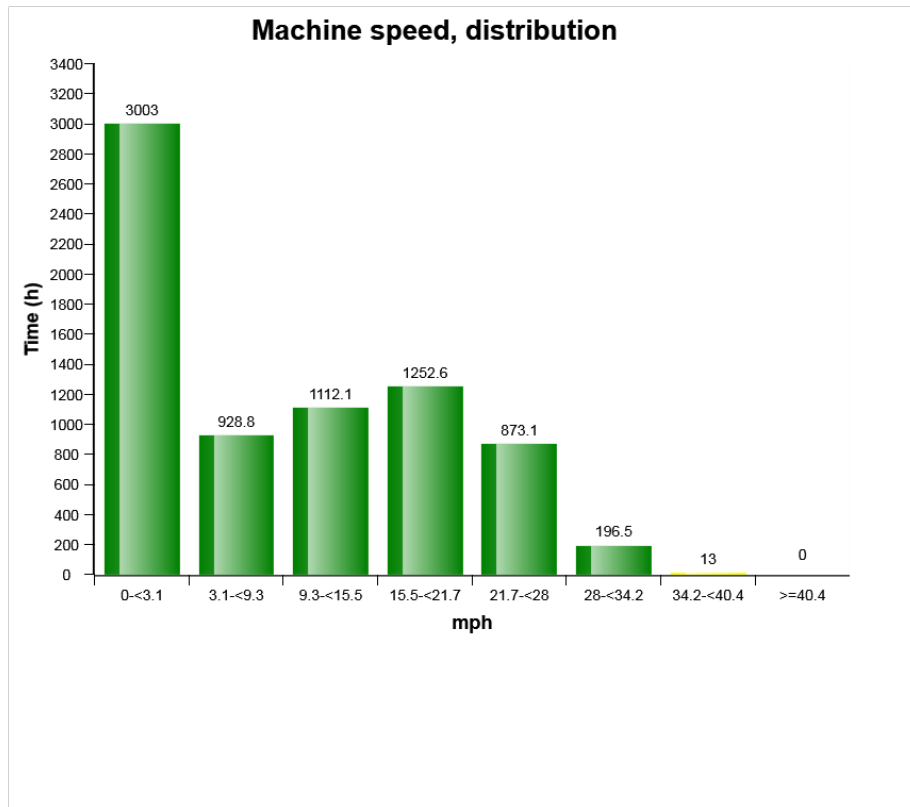| Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Machine utilization (%)
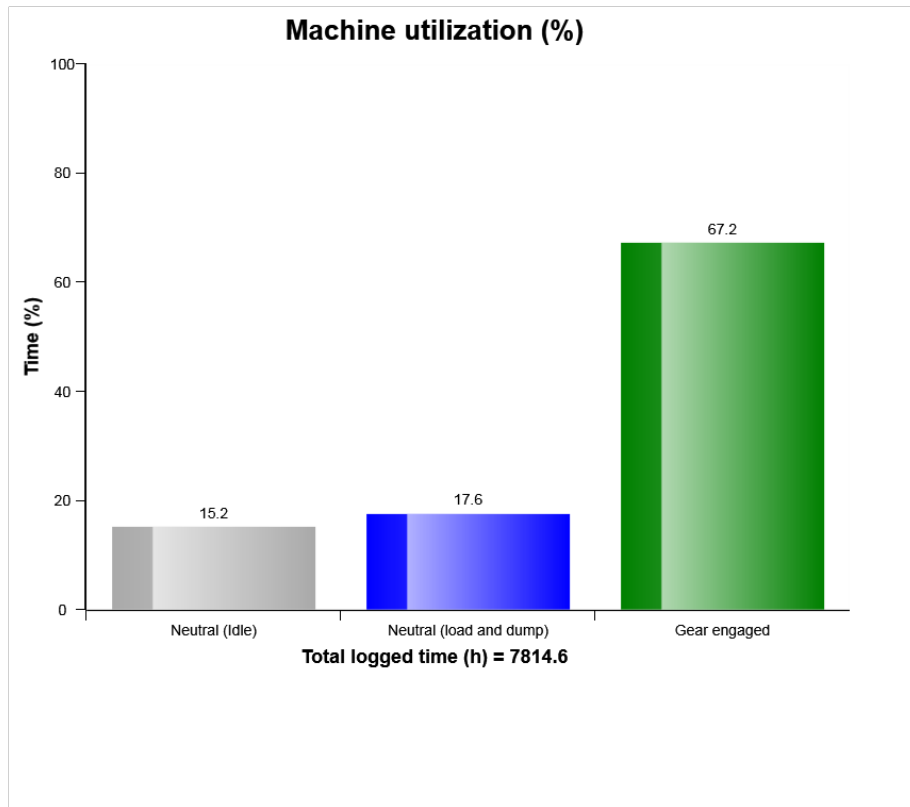
The diagram shows a simplified presentation of the machines utilization based on the relation between time in gear and time in neutral. The "Gear engaged " includes both forward and reverse gears.

This presentation of the machines utilization can only be seen as a guideline value since a full calculation of the machines utilization is more advanced. E.g. "Neutral" includes time for loading and dumping which should be seen as operating time.

High percentage of neutral time may indicate that the machine is underused due to e.g. under dimensioned loading tool or oversized hauler fleet

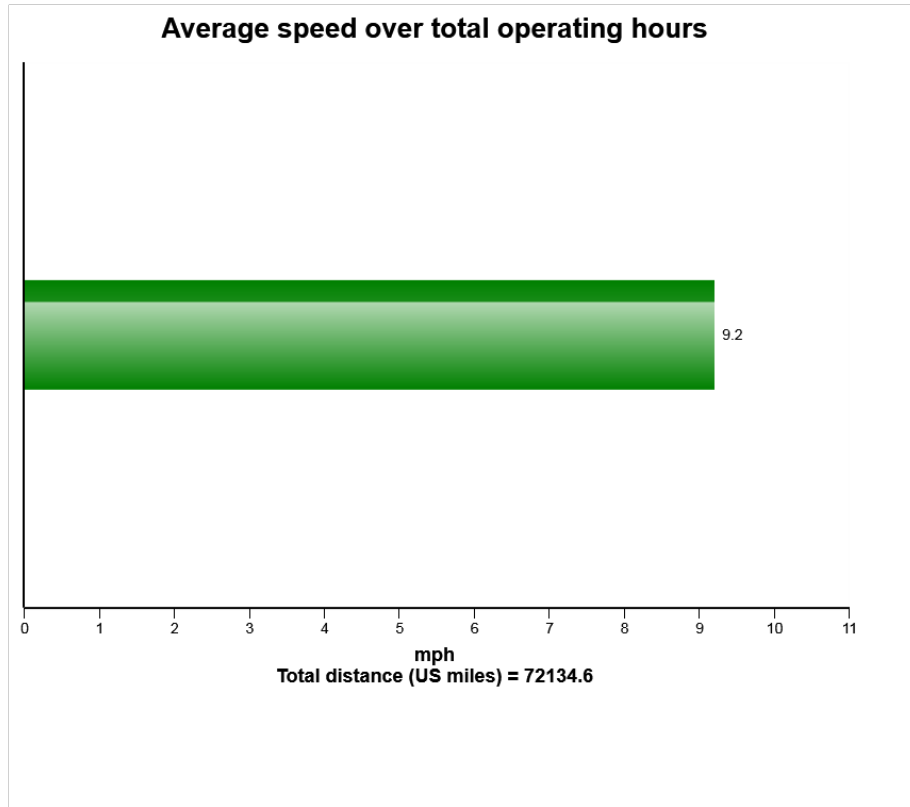| Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Machine speed, distribution

The presentation shows the time in hours in speed-intervals for the machine.

Note that the interval 0-3,1 mile/h includes machine not in motion. If the machine has been operated above 34,2 Mile/h there is a risk of engine over speed, check "Engine speed, over 2100 rpm"

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average speed over total operating hours

9.2

mph
Total distance (US miles) = 72134.6

The diagram shows the machines average speed based on the total operating hours

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average speed with gear engaged

14.4

mph
Total distance (US miles) = 72134.6
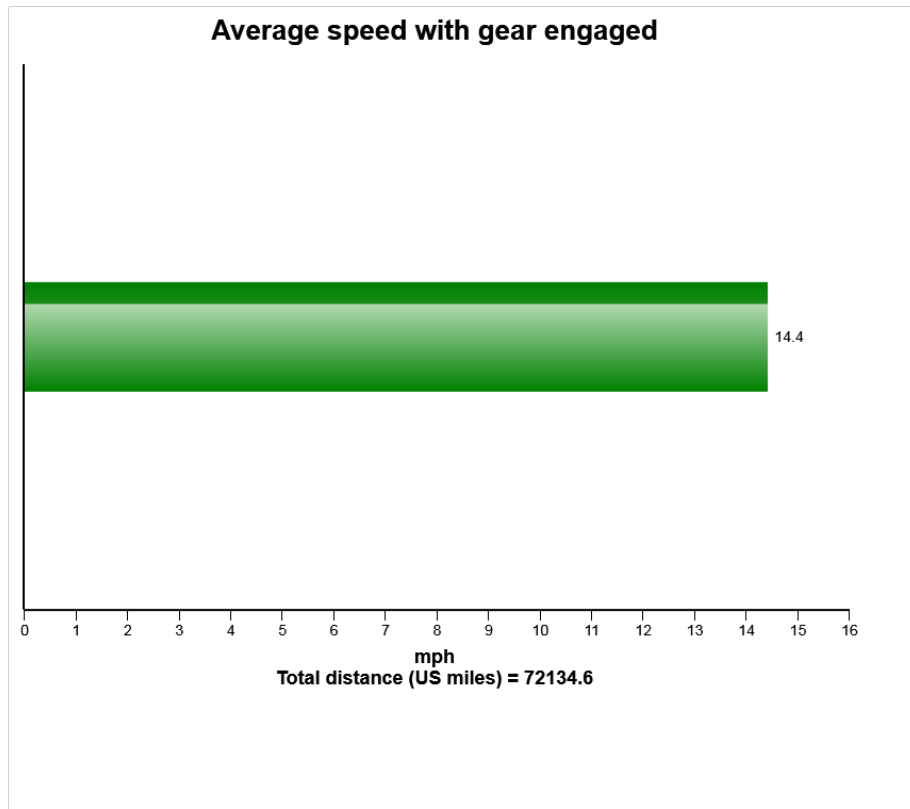
The diagram shows the machines average speed based on the operating hours with gear engaged.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Fuel consumption

US-gallon (y-axis, 0 to 65000)

- Total fuel consumption: 59886
- Fuel consumption with gear engaged: 57034
- Fuel consumption, idle: 2852

Total logged time (h) =
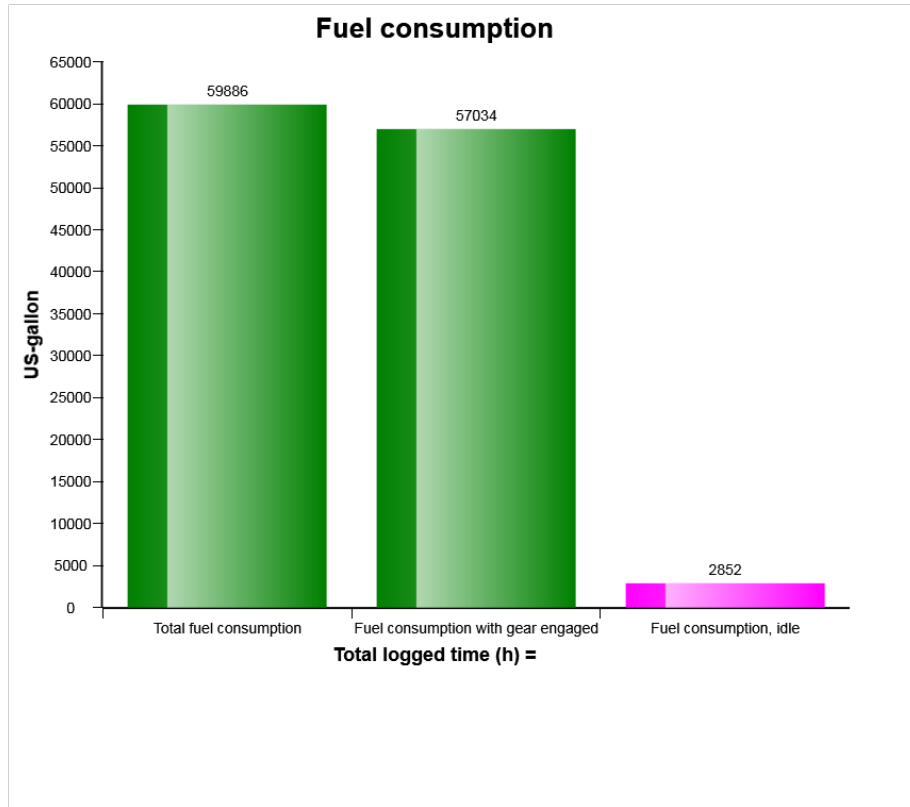
The diagram shows the total fuel consumption, fuel consumption with gear engaged and fuel consumption during idle.

High fuel consumption during idle can indicate that the machine is not fully utilized.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average fuel consumption per hour

US-gallon/h

7.7
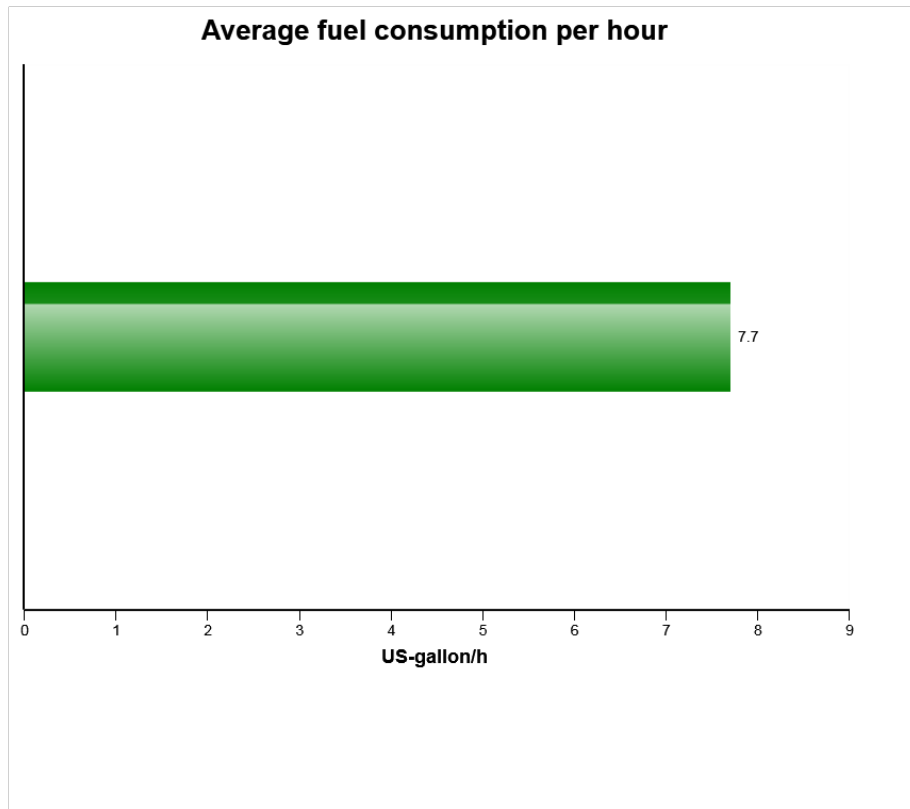
The diagram shows the average fuel consumption based on total operating hours

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average fuel consumption per hour with gear engaged

10.9

US-gallon/h
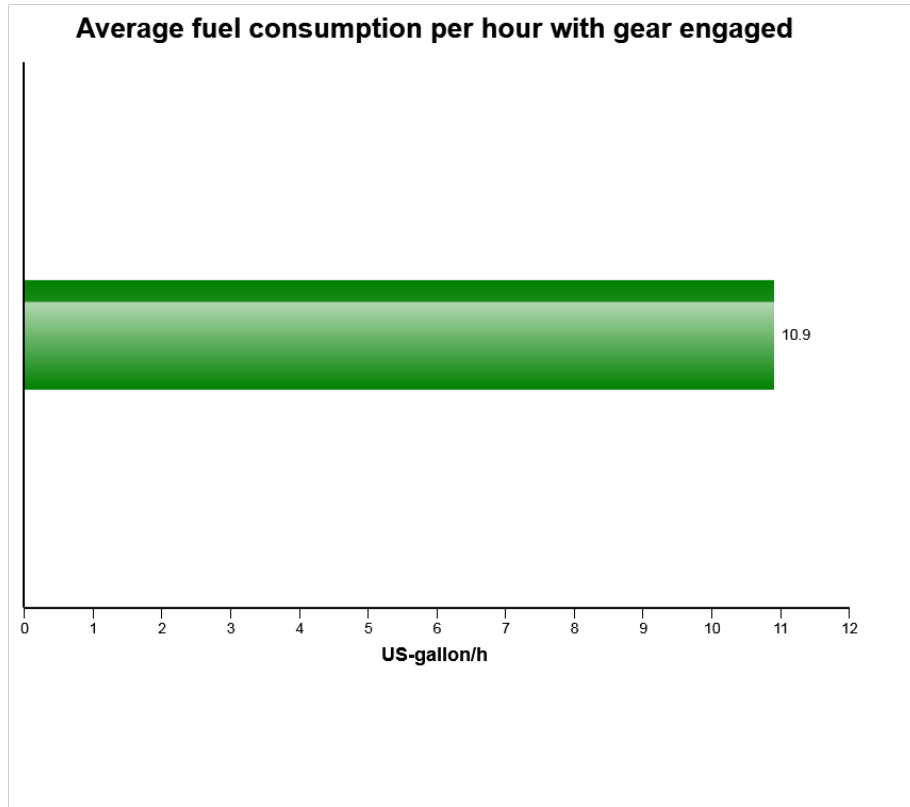
The diagram shows the average fuel consumption based on operating hours with gear engaged

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average fuel consumption

US-gallon/h

- Total fuel consumption: 7.7
- Fuel consumption with gear engaged: 10.9

Total logged time (h) = 7757.8
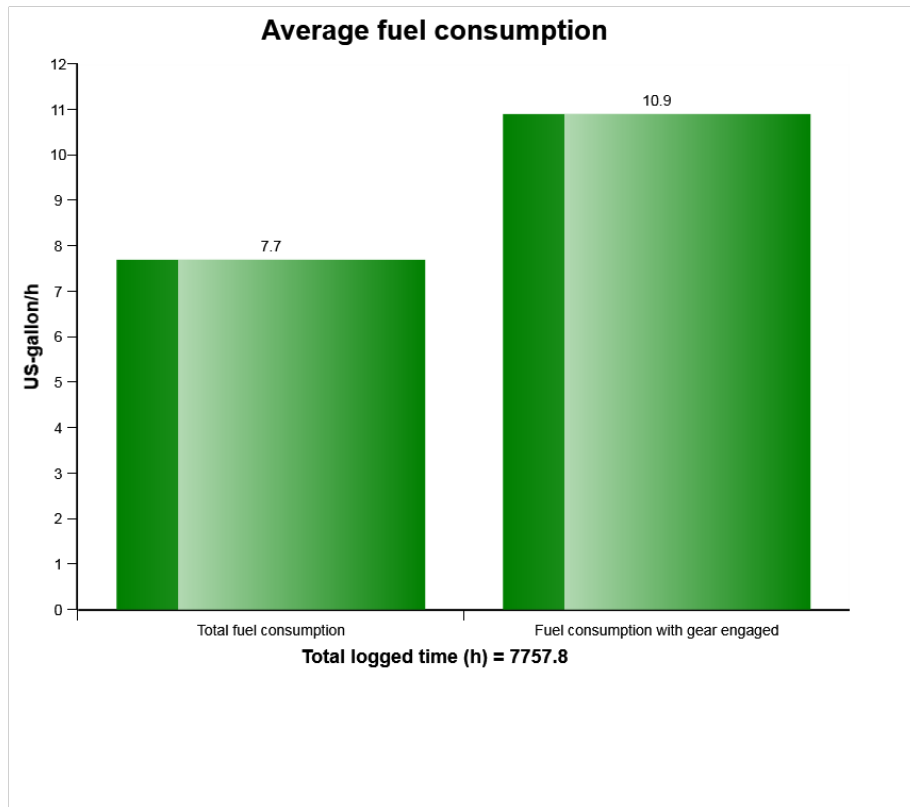
The diagram shows the total average fuel consumption versus average fuel consumption with gear engaged.

Big difference between the bars can indicate that the machine is not fully utilized, high idle lowers the total average fuel consumption.

Machine model	SerialNo	Operating Hours	Reading Date
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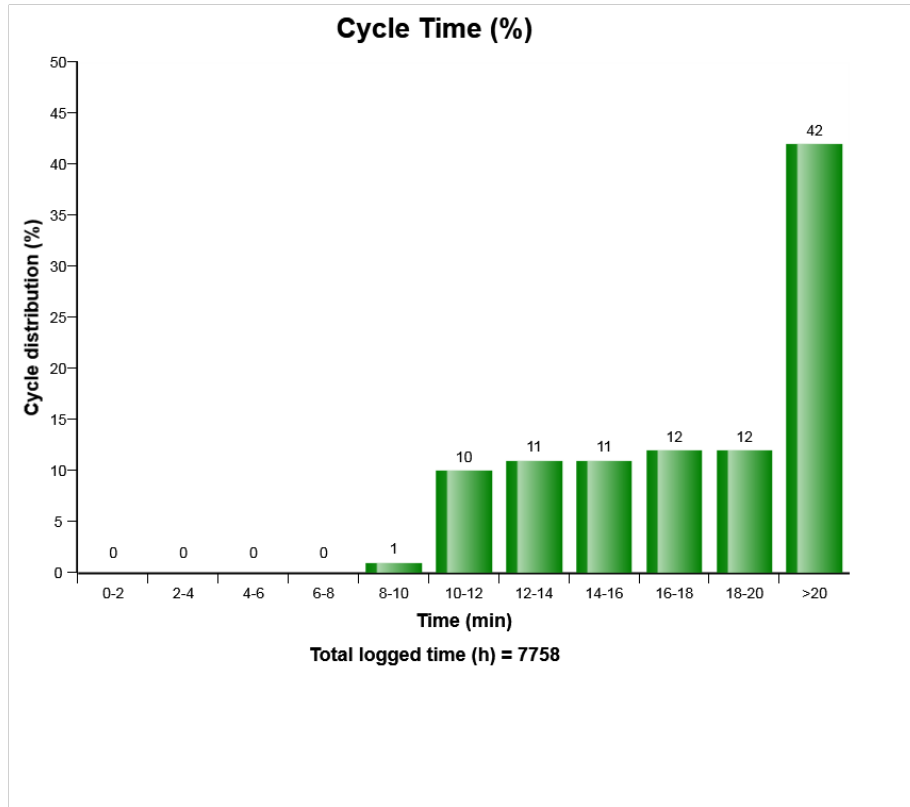
Cycle Time (%)

The diagram shows the distribution of the working cycle time. The time between 2 valid cycle registrations is registered. Time starts from lifting the body.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Cycle Distance (%)

Distribution (%)

5	1	1	1	6	8	24	22	32
0 - 1/4	1/4 - 1/2	1/2 - 3/4	3/4 - 1	1 - 1 1/2	1 1/2 - 2	2 - 2 1/2	2 1/2 - 3	>3

Cycle Distance (miles)

Total logged time (h) = 7757.8
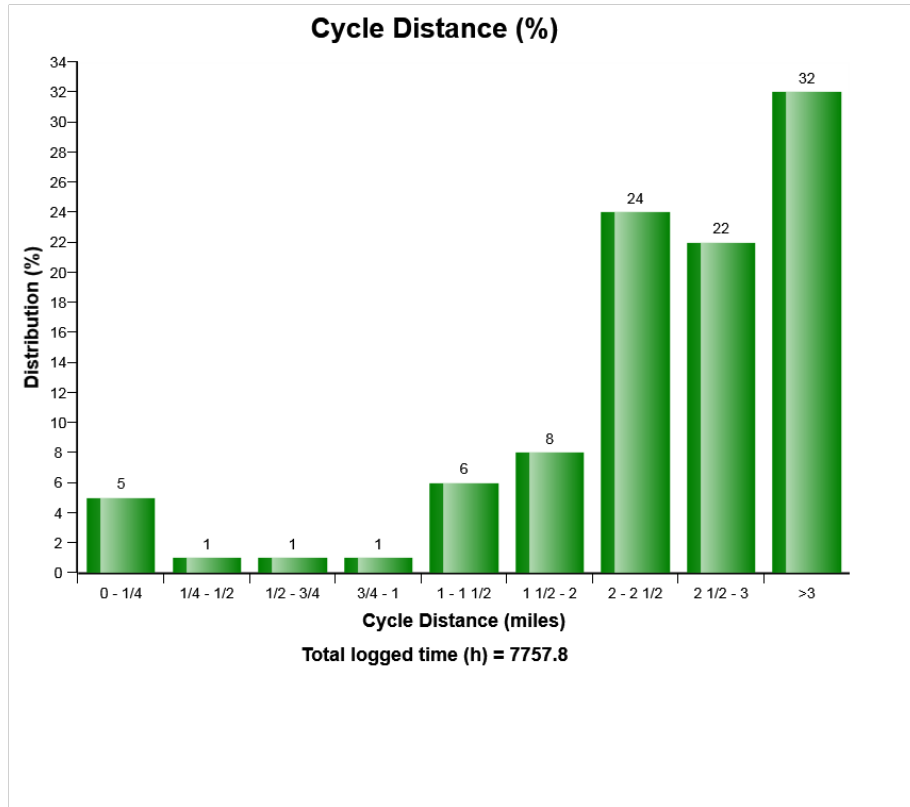
The diagram shows the distribution of the working cycle distance. The distance driven between 2 valid cycle registrations.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Vehicle Tilt (h)

■ Downhill ■ Uphill

Vehicle Tilt (%)

Total logged time (h) = 7814.5
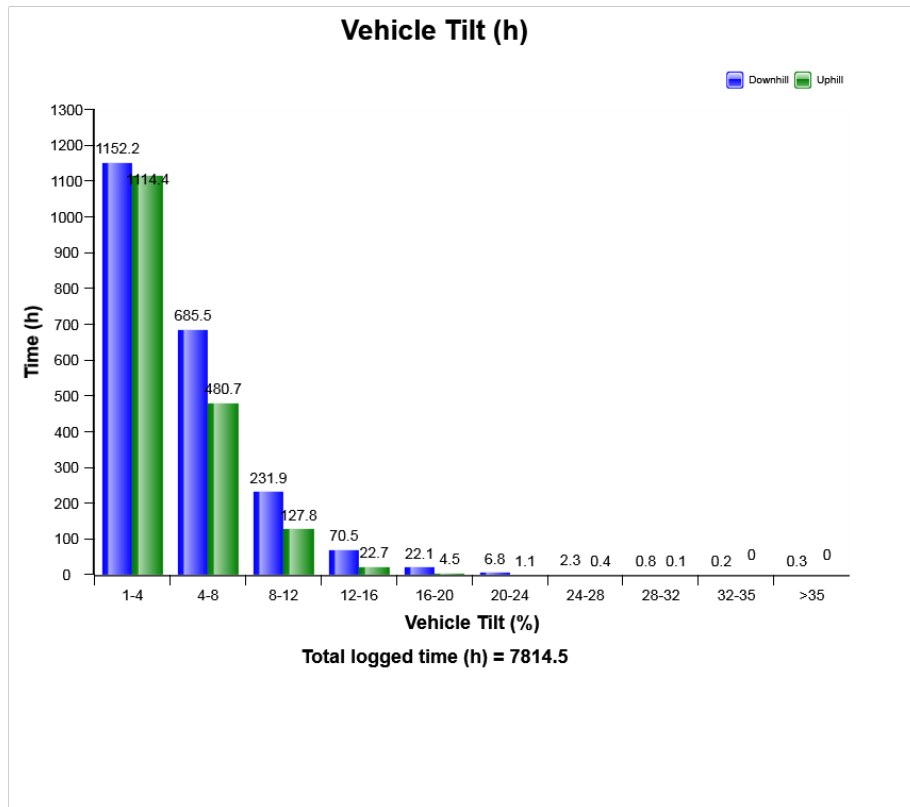
The diagram shows the distribution of the longitudinal tilt in percent (not degrees), the criteria to get registrations is that the vehicle speed exceeds 1km/h (0,62mph) and that the engine is on.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Fuel efficiency (US-ton/gal)

0

Total logged time (h) = 0.0
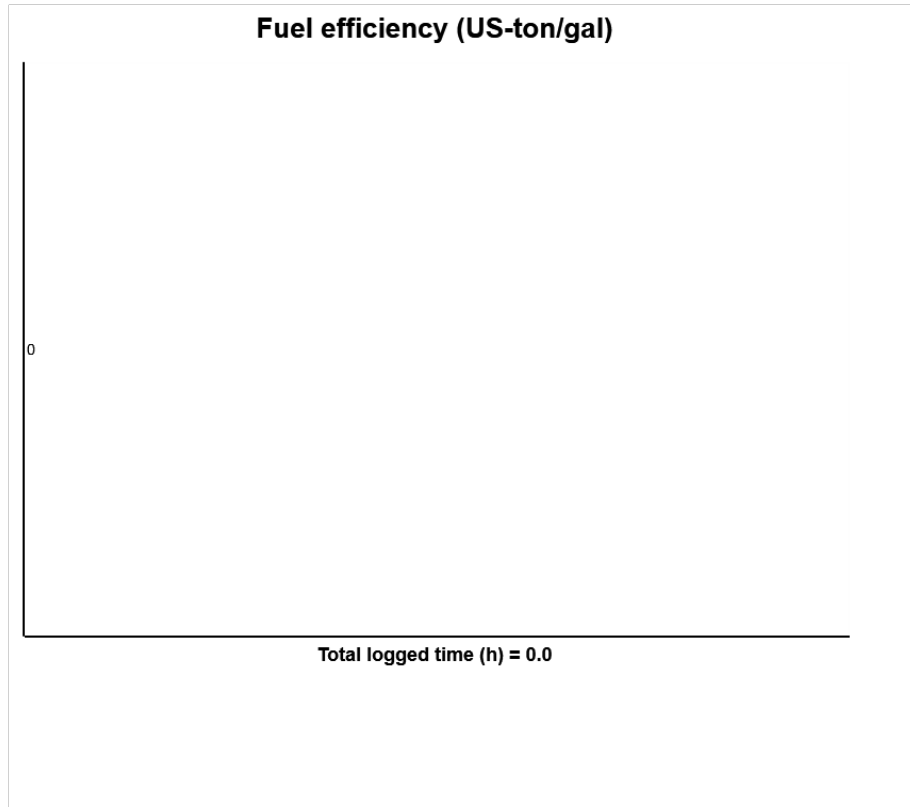
The presentation display the average produced tonne per fuel unit over the machines lifetime

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average number of cycles per hour

0

Total logged time (h) = 0.0
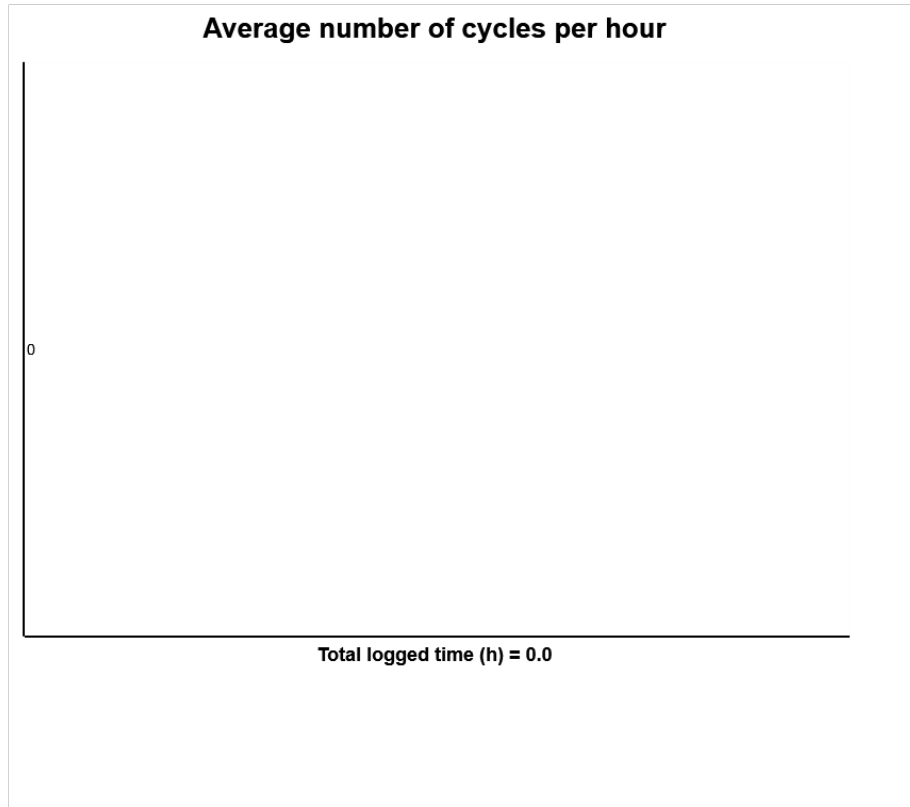
The presentation shows the average number of cycles per hour over the machines lifetime.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Engine coolant temperature, distribution (%)

Total time (h) = 7758

Definition:

The graph shows the time distribution of the temperature, while engine running.

Explanation:

Y-axis: Time

X-axis: Temperature distribution in classes.

Blue bar   = Warm-up phase.

During the engine warm-up phase, this temperature region is passed.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

It is normal to have registrations in this region.

Green bar = Normal working temperature. The Major part of the registrations shall be in this region.

Yellow bar = High working temperature. It is normal to have some registrations in this region.

Red bar = Alarm.

Registrations in this region is not normal, running in this region may cause severe damage.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Engine coolant temperature, distribution (h)

Time (h)

	<167	167-208.4	208.4-217.4	>217.4
	1672.5	6085.5	0	0

Temperature (ºF)

Total time (h) = 7758.1

Definition:

The graph shows the time distribution of the temperature, while engine running.

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Y-axis: Time

X-axis: Temperature distribution in classes.

Blue bar = Warm-up phase.

During the engine warm-up phase, this temperature region is passed.

Machine model	SerialNo	Operating Hours	Reading Date
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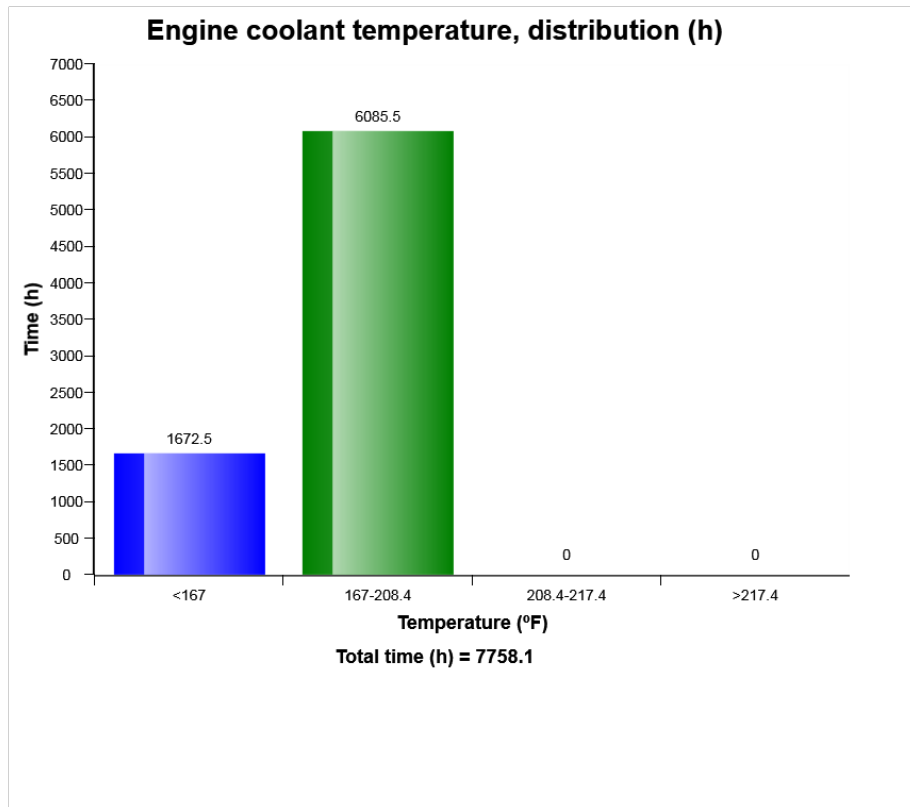
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Red bar = Alarm.

Registrations in this region is not normal, running in this region may cause severe damage.

Machine model	SerialNo	Operating Hours	Reading Date
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Engine speed, distribution (%)

Time (%) vs Engine speed (rpm)

- 1000-1200: 3.4
- 1200-1400: 17.4
- 1400-1600: 24.5
- 1600-1800: 14.5
- 1800-2000: 2
- 2000-2200: 1.3
- >2200: 0

Engine speed (rpm)

Engine run time 7814.6

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Engine speed, distribution (h)

Time (h) / Engine speed (rpm)

- 1000-1200: 266.8
- 1200-1400: 1358.7
- 1400-1600: 1910.7
- 1600-1800: 1133.9
- 1800-2000: 158.5
- 2000-2200: 104.3
- >2200: 0

Engine run time 7814.6

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Start at different engine coolant temperatures (%)

Total number of occurences = 3263

Definition:

The graph shows the distribution of engine coolant temperature, at the starting moment.

Explanation:

Y-axis: Number of engine starts

X-axis: Engine coolant temperature.

A great proportion of engine wear is due to cold starts. Try to avoid extremely cold starts. Try using an electric coolant heater.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Under the graph the total number of engine starts is displayed.

Also see " *Number of starts / hour*" to get a complete picture of engine starting.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Start at different engine coolant temperatures

Total number of starts: 3263

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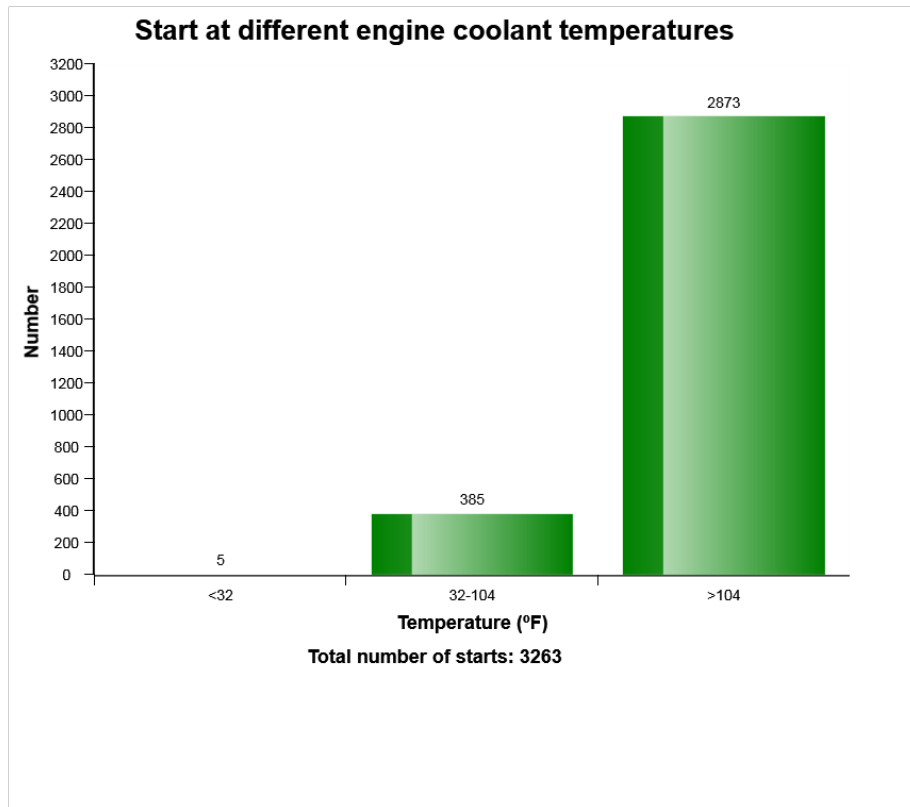| Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Under the graph the total number of engine starts is displayed.

Also see " *Number of starts / hour*" to get a complete picture of engine starting.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Average number of starts per hour

0.4

| 0 | 0.05 | 0.1 | 0.15 | 0.2 | 0.25 | 0.3 | 0.35 | 0.4 | 0.45 |

Total number of starts: 3263

Definition:

The graph describes the average number of engine starts per engine running hour.

Explanation:

X-axis: Number of average starts per hour.

The actual time used for calculation, is time with engine on

If the fuel consumption is high one reason may be that the engine is not turned off often enough, perhaps machine is left idling for long periods. Check " Machine utilization".

The value can vary a lot depending on in which application the machine is used.

To see at which different temperatures engine is started see" Start at different engine temperatures."

Green bar   = Number of average starts per hour

	Machine model	SerialNo	Operating Hours	Reading Date
	A40G	341373	7814	31/01/2019

High engine coolant temperature
Total number of occurences = 0

	Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (° F)
A	0	2000	0	0	0	0	0	32
B	0	2000	0	0	0	0	0	32
C	0	2000	0	0	0	0	0	32
D	0	2000	0	0	0	0	0	32
E	0	2000	0	0	0	0	0	32
F	0	2000	0	0	0	0	0	32
G	0	2000	0	0	0	0	0	32
H	0	2000	0	0	0	0	0	32
I	0	2000	0	0	0	0	0	32
J	0	2000	0	0	0	0	0	32

Definition   :

This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating hours is displayed in the first column, followed by year, month, day, hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed.

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

The criteria to get an registration, is that the alarm signal for high engine coolant temperature is active and that the diesel engine is running.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

High engine oil temperature
Total number of occurences = 0

	Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (° F)
A	0	2000	0	0	0	0	0	32
B	0	2000	0	0	0	0	0	32
C	0	2000	0	0	0	0	0	32
D	0	2000	0	0	0	0	0	32
E	0	2000	0	0	0	0	0	32
F	0	2000	0	0	0	0	0	32
G	0	2000	0	0	0	0	0	32
H	0	2000	0	0	0	0	0	32
I	0	2000	0	0	0	0	0	32
J	0	2000	0	0	0	0	0	32

Definition　:

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Only one event per minute is registered.

Over the table the total number of events is displayed

Duration　:

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Extreme value :

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

The extreme value column displays the most extreme value during the event.

Criteria :

The criteria to get an registration, is that the alarm signal for high engine oil temperature is active and that the diesel engine is running.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Starter overheating
Total number of occurences = 0

Op hours	Year	Month	Day	Hour	Minute
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0
0	2000	0	0	0	0

Definition:

The starter can be damaged if it is overheated.

Machine model	SerialNo	Operating Hours	Reading Date
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Alarm is registered if the starter is used continuously more than 40 seconds and if it is less than five minutes since the latest alarm.

Explanation:

X-axis: Number of times that the starter alarm has been activated.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Low Air filter pressure
Total number of occurences = 0

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0

Definition   :

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Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

hours is displayed in the first column, followed by year, month, day, hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed.

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Criteria :

The criteria to get an registration, is that the alarm signal for air filter clogged is active, and that the diesel engine is running.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Regeneration ignored
Total number of ignored regenerations 0

Op hours	Year	Month	Day	Hour	Minute	Duration (min)
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0
* 0	2000	0	0	0	0	0

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Regeneration aborted
Total number of occurences = 0

Op hours	Year	Month	Day	Hour	Minute	Reason
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0

Machine model	SerialNo	Operating Hours	Reading Date
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Regeneration duration
Total number of occurences = 71

Op hours	Year	Month	Day	Hour	Minute	Duration (min)
7722	2018	7	27	14	5	4
7722	2018	7	27	13	51	0
7722	2018	7	5	14	22	0
7722	2018	7	5	14	20	0
7722	2018	7	3	16	33	2
7723	2018	7	27	14	13	2
7723	2018	7	27	14	12	0
7723	2018	8	2	11	35	12
7726	2018	8	7	10	30	45
7730	2018	8	7	13	48	26
7732	2018	8	7	17	18	45
7735	2018	8	7	20	13	46
7738	2018	8	7	23	38	46
7738	2018	8	7	23	31	2
7741	2018	8	8	2	29	14
7742	2018	8	8	6	17	47
7744	2018	8	8	9	8	46
7749	2018	8	8	17	13	28
7751	2018	8	8	22	43	45
7754	2018	8	9	1	36	48

Water level warning in water separator
Total number of occurences = 0

Op hours	Year	Month	Day	Hour	Minute	Duration (min)
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0
0	2000	0	0	0	0	0

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

High voltage
Total number of occurences = 1

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme value
1779	2017	1	22	16	27	7	31.7
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0

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This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

hours is displayed in the first column, followed by year, month , day , hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

The duration of each event is shown after the timestamp of the event.

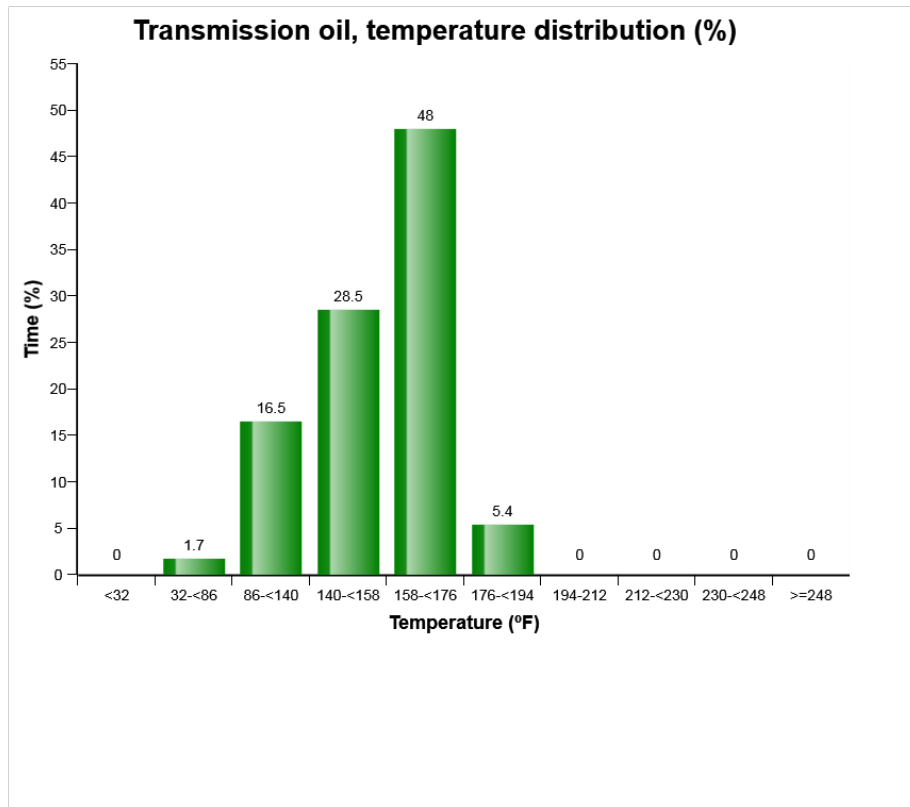The duration is counted as long as the criteria is fulfilled.

Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

Logging is performed when, Alarm high system voltage , is active.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Low voltage
Total number of occurences = 0

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme value
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0

Definition   :

This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

hours is displayed in the first column, followed by year, month , day , hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

Logging is performed when, Alarm low system voltage , is active.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Transmission oil, temperature distribution (%)

The diagram shows the transmission oil temperature in various temperature ranges. The time is displayed in the following ten temperature ranges:

<32ºF Temperatures below 32ºF

32-<86ºF Temperatures from 32ºF until 86ºF

86-<140ºF Temperatures from 86ºF until 140ºF

140-<158ºF Temperatures from 140ºF until 158ºF

158-<176ºF Temperatures from 158ºF until 176ºF

176-<194ºF Temperatures from 176ºF until 194ºF

194-<212ºF Temperatures from 194ºF until 212ºF

212-<230ºF Temperatures from 212ºF until 230ºF

230-<248ºF Temperatures from 230ºF until 248ºF

>248ºF Temperatures over 248ºF

The bar that describes temperatures from 230ºF until 248ºF is yellow and means that the oil has began to be overheated. Driver has been given orange central warning

The bar that describes >248ºF is red and means that the oil has been overheated. Driver has been given red central warning.

Oil temperatures exceeding 230ºF must be avoided since the properties of the oil are degraded

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Transmission oil, temperature distribution (h)

The diagram shows the transmission oil temperature in various temperature ranges. The time is displayed in the following ten temperature ranges:

<32ºF Temperatures below 32ºF

32-<86ºF Temperatures from 32ºF until 86ºF

86-<140ºF Temperatures from 86ºF until 140ºF

140-<158ºF Temperatures from 140ºF until 158ºF

158-<176ºF Temperatures from 158ºF until 176ºF

176-<194ºF Temperatures from 176ºF until 194ºF

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

194-<212ºF Temperatures from 194ºF until 212ºF

212-<230ºF Temperatures from 212ºF until 230ºF

230-<248ºF Temperatures from 230ºF until 248ºF
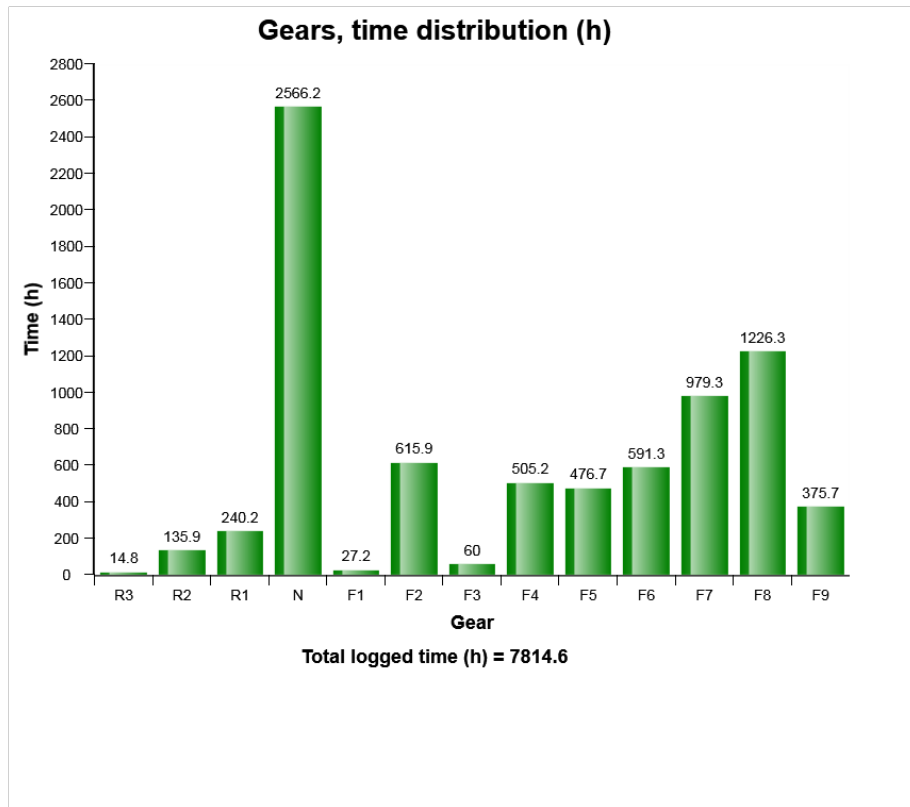
>248ºF Temperatures over 248ºF

The bar that describes temperatures from 230ºF until 248ºF is yellow and means that the oil has began to be overheated. Driver has been given orange central warning

The bar that describes >248ºF is red and means that the oil has been overheated. Driver has been given red central warning.

Oil temperatures exceeding 230ºF must be avoided since the properties of the oil are degraded

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Gears, time distribution (h)
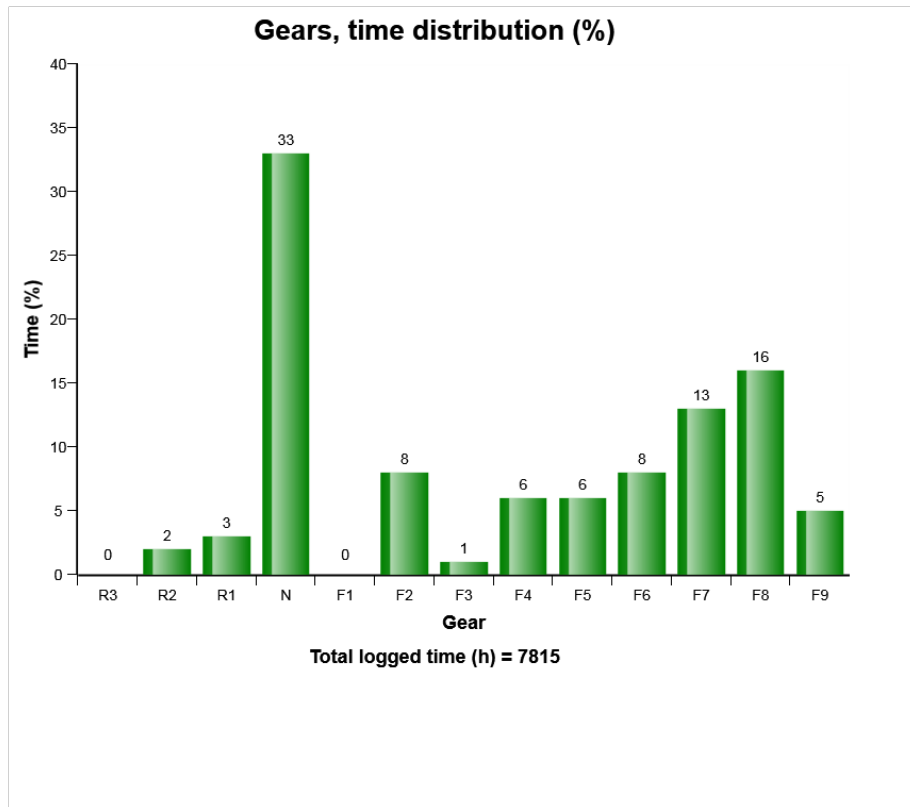
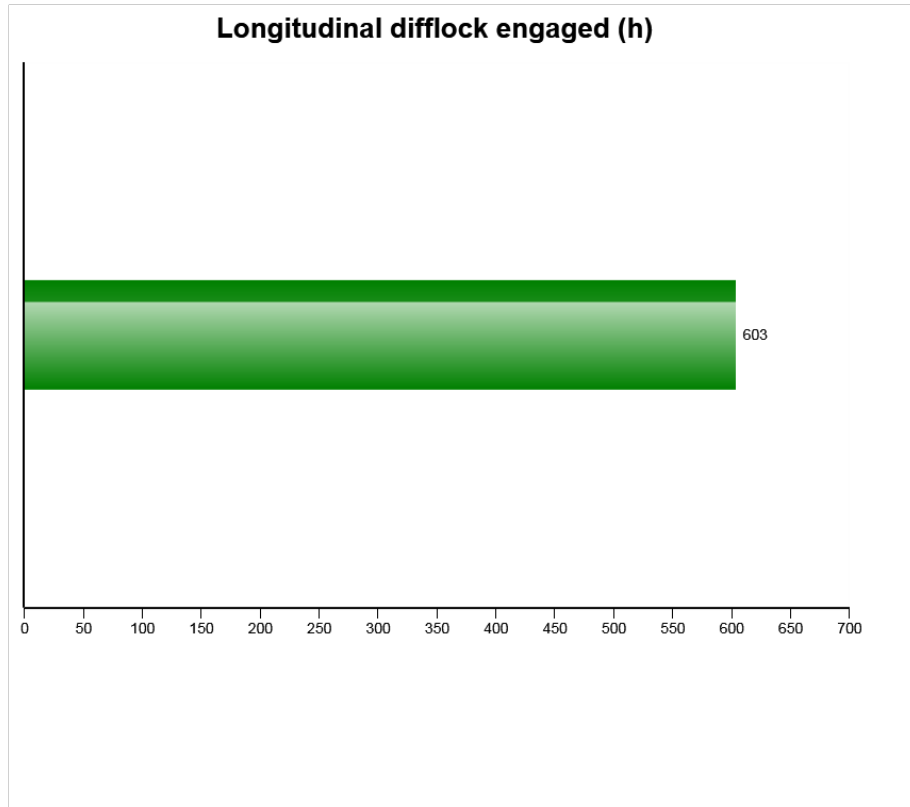

Total logged time (h) = 7814.6

The diagram shows the time for each gear. Each bar represents a gear.

How the time is distributed between the gears depends on the operating conditions.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Gears, time distribution (%)

Time (%)

R3	R2	R1	N	F1	F2	F3	F4	F5	F6	F7	F8	F9
0	2	3	33	0	8	1	6	6	8	13	16	5

Gear

Total logged time (h) = 7815

The diagram shows the time for each gear. Each bar represents a gear.

How the time is distributed between the gears depends on the operating conditions.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Longitudinal difflock engaged (h)

The diagram shows how long time in hours the longitudinal difflock has been engaged. The presentation only shows time when the machine is moving as this is when the wear on the difflock occurs. The difflock should always be disengage when not needed to avoid unnecessary wear.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Longitudinal difflock use related to machine in motion (%)
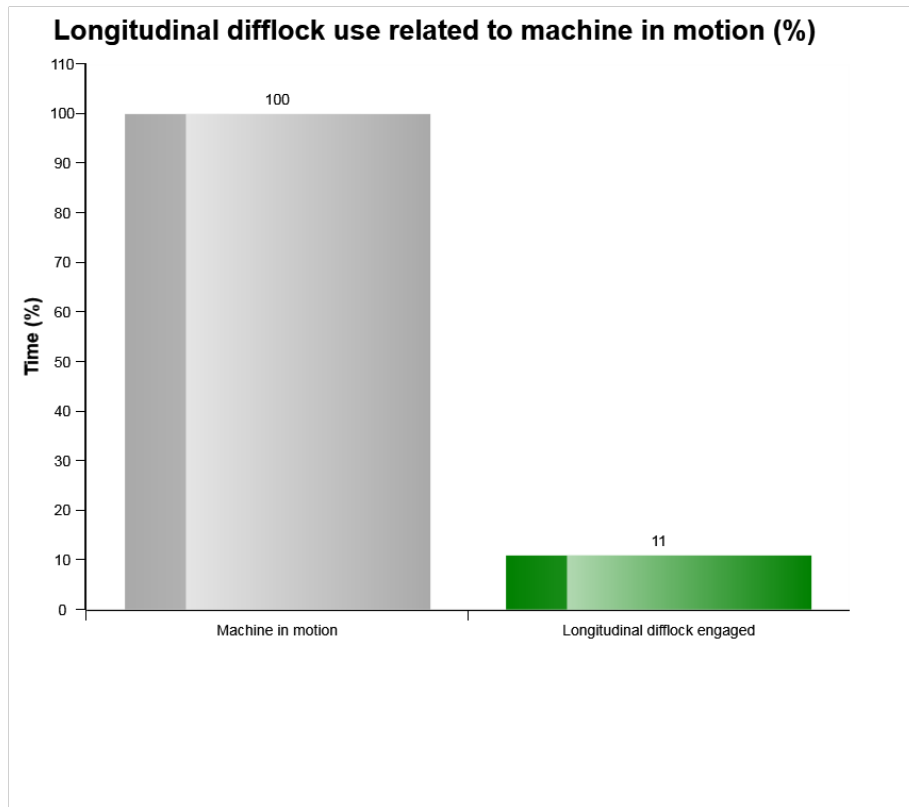
The diagram shows the percentage of engaged longitudinal difflock in relation to machine in motion.

The longitudinal difflock should always be disengaged when not needed to reduce wear.

The normal use of the longitudinal difflock in relation to the time that the machine has been operated depends on the operating conditions. Generally, the more offroad applications the machine operates in, the higher the longitudinal difflock use shall be in relation to the time that the machine has been operated. Also operating in uphill conditions on slippery surface can require longitudinal difflock.

Also check " Longitudinal difflock engaged (h)"

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Transmission oil pressure low
Total number of occurences = 7

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (psi)
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
0	2000	0	0	0	0	0	0
1667	2016	11	15	14	8	40	988
1673	2016	12	6	14	18	10	962
2410	2017	4	10	14	31	0	1127
6628	2018	4	17	15	6	0	818
6845	2018	5	2	8	59	0	1572
7034	2018	5	15	6	38	0	1153
7232	2018	5	31	10	14	0	1461

Definition   :

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hours is displayed in the first column, followed by year, month, day, hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed.

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.
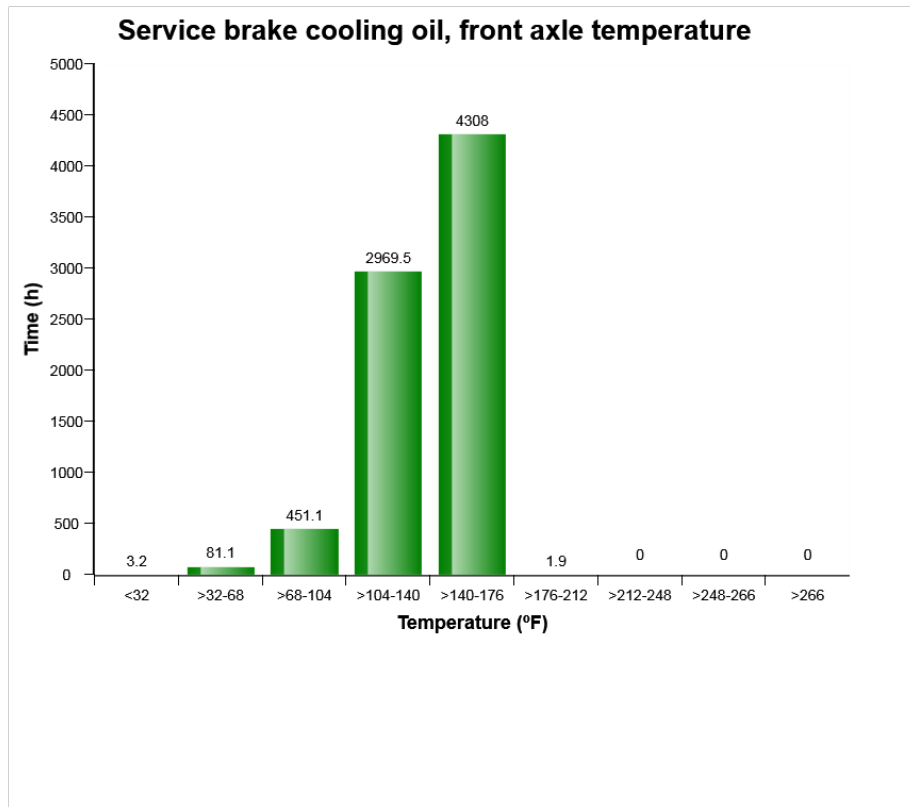
Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

In order for an occurrence of low transmission oil pressure to be recorded in a data point and the count to increment by 1, the transmission oil pressure state must change from "normal" or "error" to "low." The event of low transmission oil pressure will end when the status changes from "low" back to "normal" or "error."

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Service brake cooling oil, front axle temperature

Time (h) vs Temperature (°F)

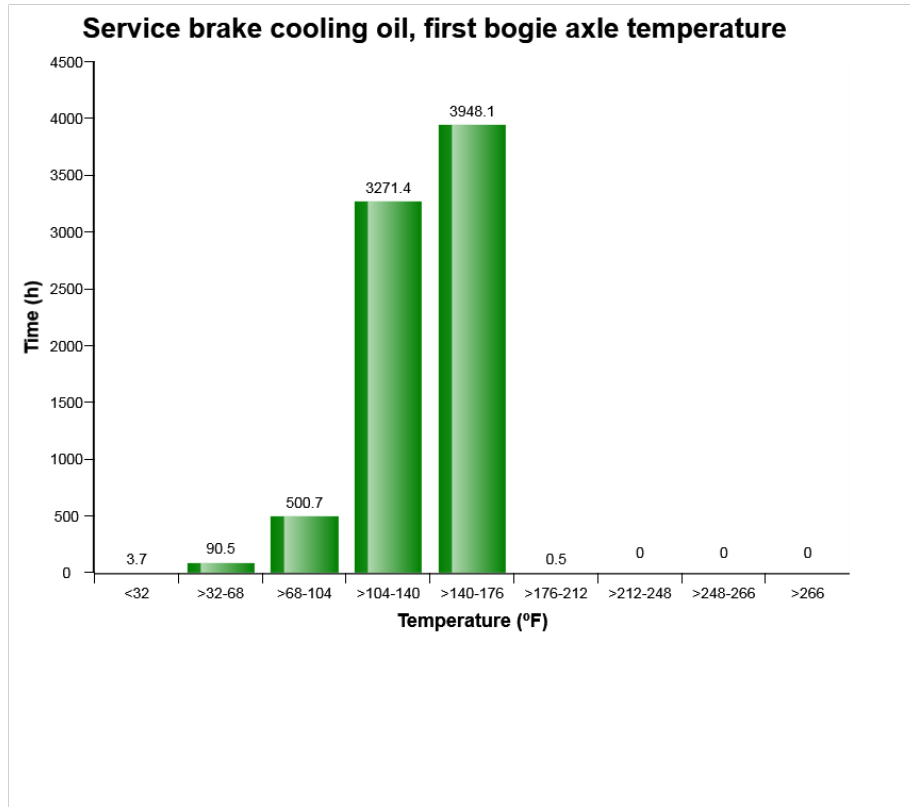| Temperature (°F)	Time (h)
<32	3.2
>32-68	81.1
>68-104	451.1
>104-140	2969.5
>140-176	4308
>176-212	1.9
>212-248	0
>248-266	0
>266	0

The diagram shows the front axle brake cooling oil temperature. The temperatures are divided into ranges, yellow bar (>248-266°F) and red bar (>266°F) shows abnormal temperatures. The temperature is registered in the line from the front axle to the oil cooler, that is, the warmest oil in the circuit.

The temperature shown by yellow and red bars degrade the properties of the cooling oil, and may be the result of incorrect and hard operation of the machine. Check the brake pressure distribution in the diagram "Service brake pressure, distribution (%)". If the brake cooling oil temperature is high despite normal distribution of service brake pressure, there is probably a malfunction in the brake cooling circuit

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

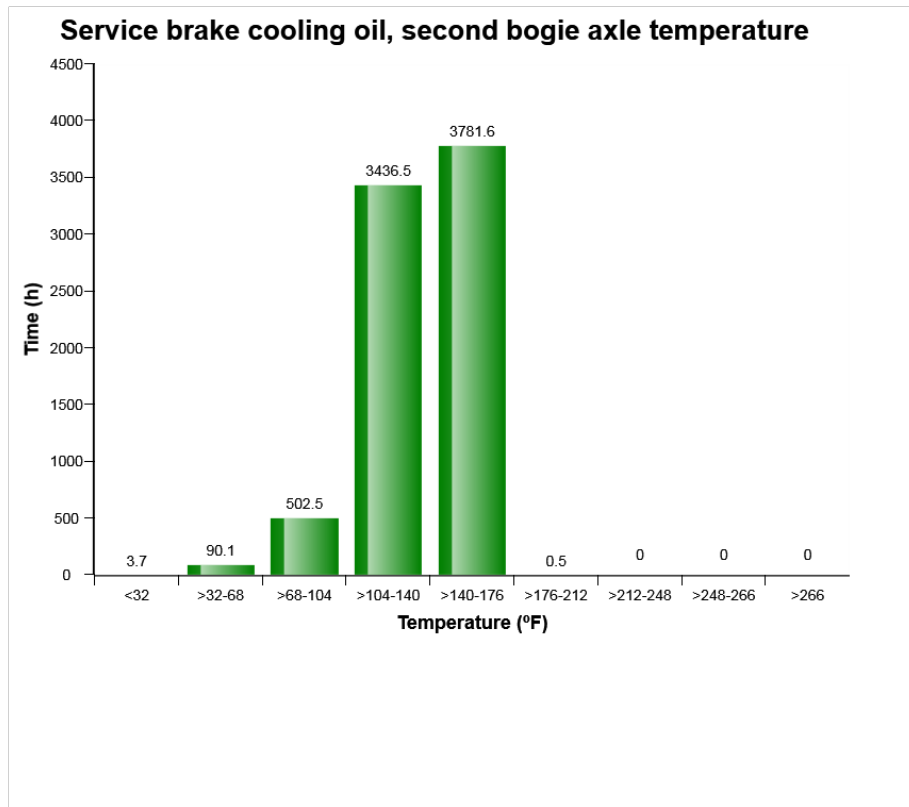**Service brake cooling oil, first bogie axle temperature**

The diagram shows the first bogie axle brake cooling oil temperature. The temperatures are divided into ranges, yellow bar (>248-266ºF) and red bar (>266ºF) shows abnormal temperatures. The temperature is registered in the line from the first bogie axle to the oil cooler, that is, the warmest oil in the circuit.

The temperature shown by yellow and red bars degrade the properties of the cooling oil, and may be the result of incorrect and hard operation of the machine. Check the brake pressure distribution in the diagram "Service brake pressure, distribution (%)". If the brake cooling oil temperature is high despite normal distribution of service brake pressure, there is probably a malfunction in the brake cooling circuit.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

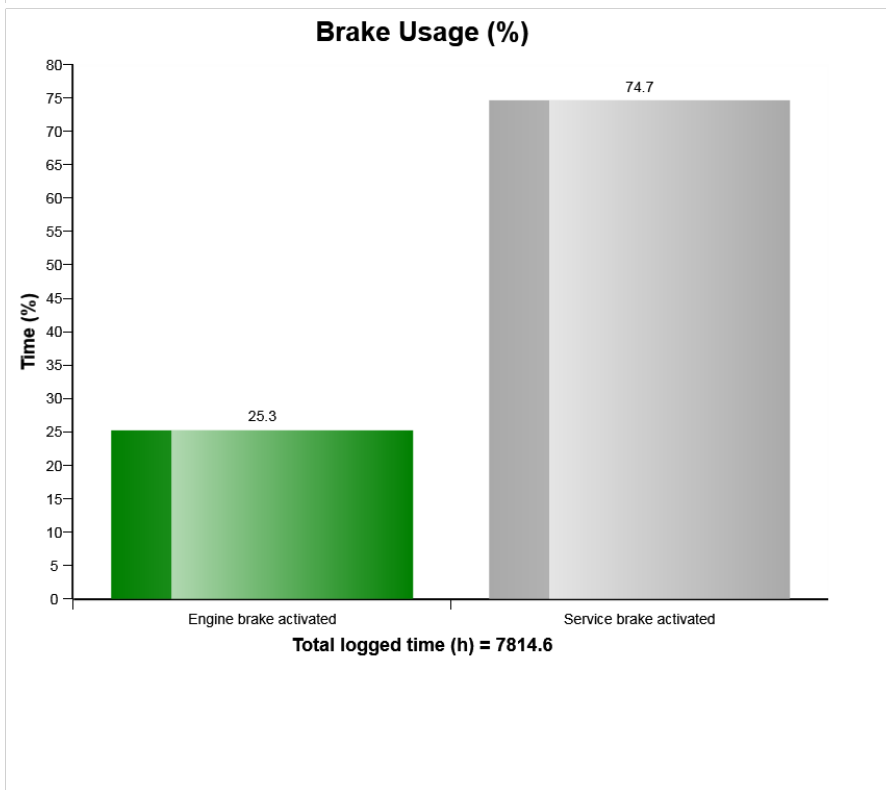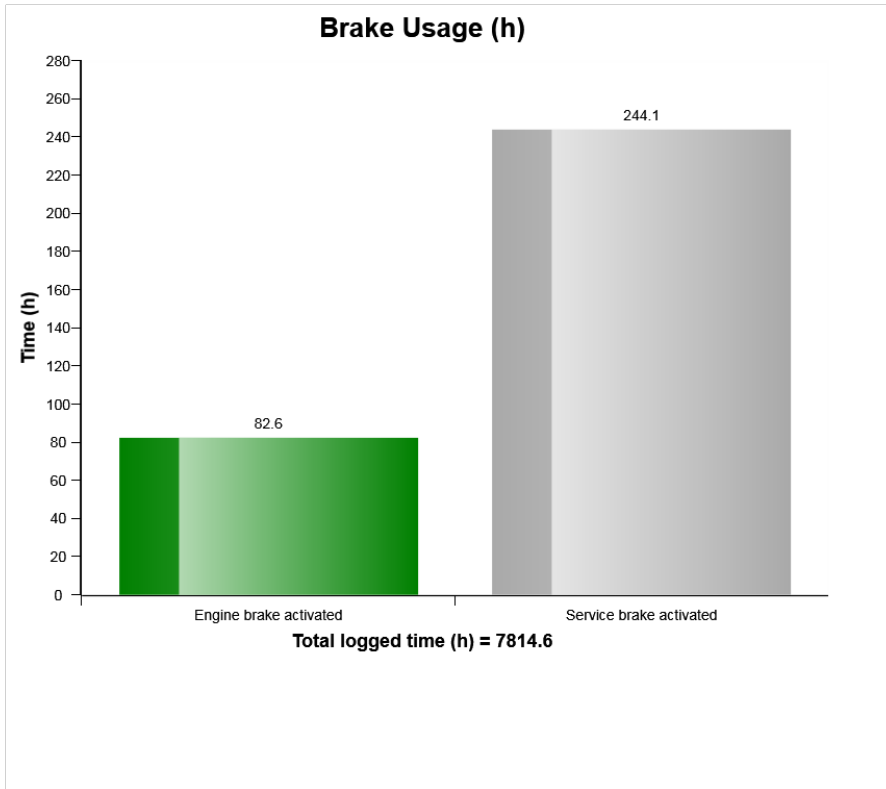**Service brake cooling oil, second bogie axle temperature**

The diagram shows the front axle brake cooling oil temperature. The temperatures are divided into ranges, yellow bar (>248-266ºF) and red bar (>266ºF) shows abnormal temperatures. The temperature is registered in the line from the second bogie axle to the oil cooler, that is, the warmest oil in the circuit.

The temperature shown by yellow and red bars degrade the properties of the cooling oil, and may be the result of incorrect and hard operation of the machine. Check the brake pressure distribution in the diagram "Service brake pressure, distribution (%)". If the brake cooling oil temperature is high despite normal distribution of service brake pressure, there is probably a malfunction in the brake cooling circuit.

Brake Usage (h)

Bar chart — Time (h) vs brake type:
- Engine brake activated: 82.6
- Service brake activated: 244.1

Total logged time (h) = 7814.6

Brake Usage (%)

Bar chart — Time (%) vs brake type:
- Engine brake activated: 25.3
- Service brake activated: 74.7

Total logged time (h) = 7814.6

	Machine model	SerialNo	Operating Hours	Reading Date
	A40G	341373	7814	31/01/2019

Low Brake Servo Pressure
Total number of occurences = 6

	Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (psi)
A	0	2016	4	18	12	10	0	2219
B	0	2016	4	21	8	53	0	2182
C	0	2016	5	12	16	10	0	2225
G	0	2000	0	0	0	0	0	0
H	0	2000	0	0	0	0	0	0
I	0	2000	0	0	0	0	0	0
J	0	2000	0	0	0	0	0	0
D	3442	2017	7	1	7	19	0	2176
E	6893	2018	5	7	6	9	0	1959
F	7777	2018	8	4	8	21	0	2225

Definition :

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The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Extreme value :

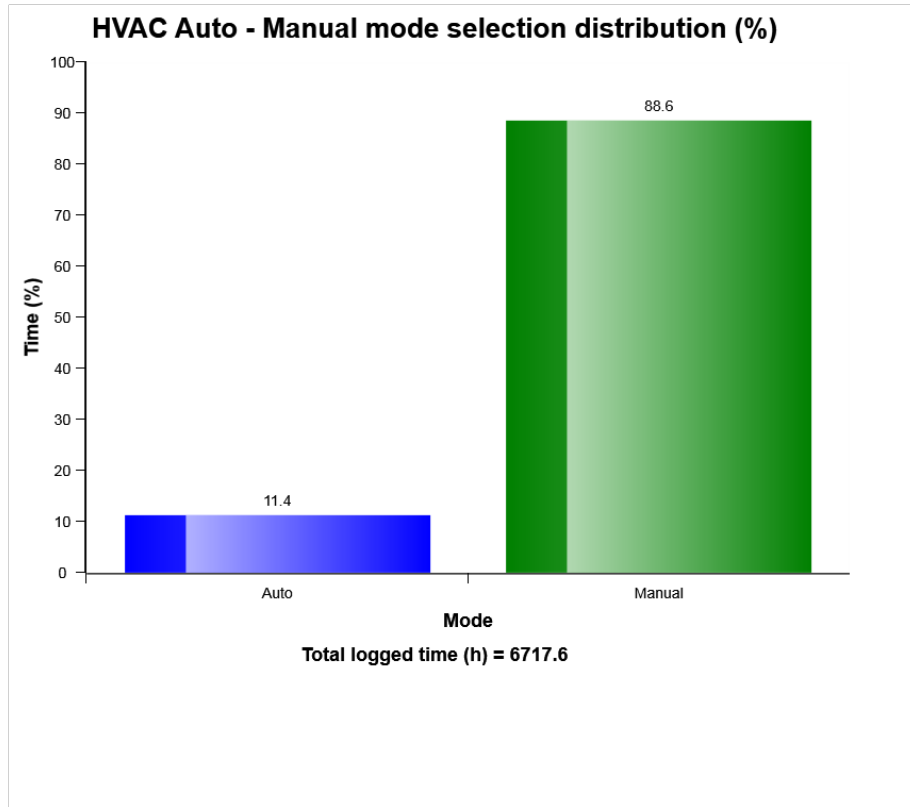| Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

The extreme value column displays the most extreme value during the event.

Criteria :

In order for an occurrence of low brake servo pressure to be recorded in a data point and the count to increment by 1, the low brake servo pressure state must be alarm. Gear not in Neutral and engine must be on.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

HVAC Auto - Manual mode selection distribution (%)

Total logged time (h) = 6717.6

Definition:

The diagram describes auto-manual mode sele ction distribution of HVAC system in machine while it Works. The share of each mode compared to Total time of HVAC operation is displayed.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

HVAC air temperature setting in auto control mode distribution (h)

The chart shows Time (h) on the y-axis (0 to 400) versus Temperature (°F) on the x-axis.

Temperature (°F)	Time (h)
<60,8	60.9
60,8-64,4	5.5
64,4-68	33.6
68-71,6	330
71,6-75,2	204.5
75,2-78,8	116.4
78,8-82,4	14.1
82,4-86	0
>86	0
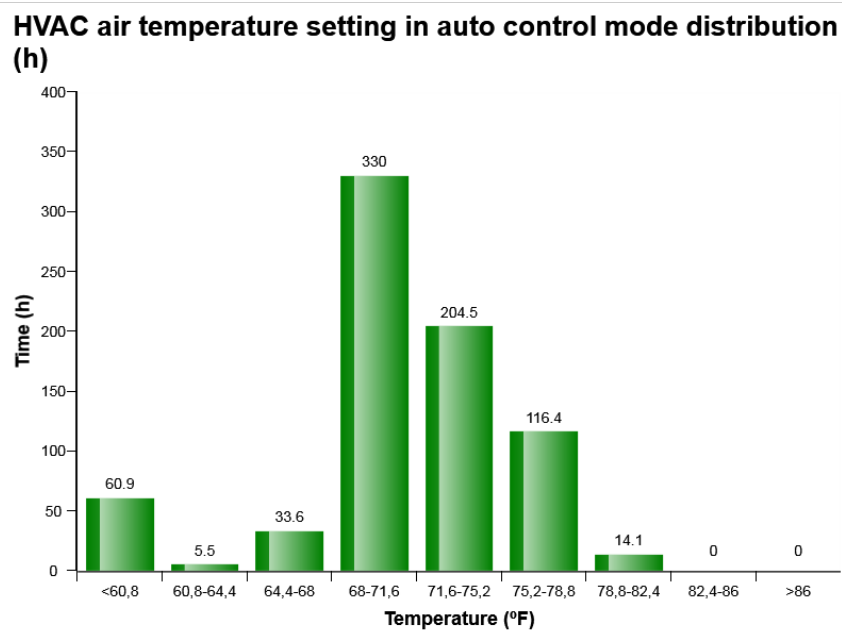
Definition:

The diagram describes air temperature setting distribution for HVAC auto control mode established by operator in Cabin

Machine ambient temperature distribution (h)

Time (h)

Temperature (°F) range	Value
-40--23,8	0
-23,8--5,8	0
-5,8-12	1.3
12-30,2	64.9
30,2-48,2	798.4
48,2-66,2	1671
66,2-84,2	3883.9
84,2-102,2	1323.8
102,2-116,6	0.8
>116,6	0

Temperature (°F)

Total logged time (h) = 7746.7

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

AC Compressor usage

Total logged time (h) = 7747.6
Number of engagements = 320545.0

Definition:

The graph shows the total time of AC compressor engagement.

Explanation:

Green bar: Total time in hours, AC compressor has been engaged.

Under the graph the total engine running time (in hours) is displayed.

Total number of AC compressor activations is also displayed.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

-

HVAC air flow direction in manual mode distribution (h)

Chart showing Time (h) on the Y-axis (0 to 4000) versus Air flow direction on the X-axis:
- To Face: 3437.5
- To Foot: 429.6
- To Face and Foot: 1788.1
- To Defroster: 66.5
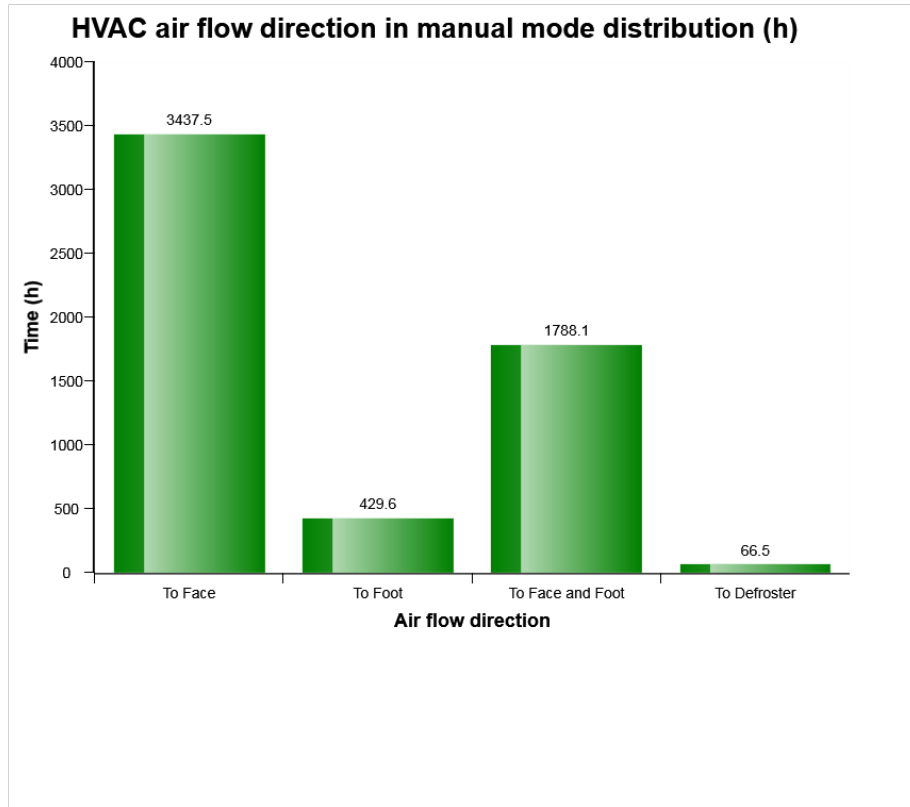
Definition:

The diagram describes air flow direction distribution for HVAC manual control mode established by operator in Cabin.

HVAC air blower motor speed in manual mode distribution (h)

Chart: Time (h) vs Air blower motor speed step
- 1st speed: 2039.4
- 2nd speed: 2327.2
- 3rd speed: 600
- 4th speed: 755.1

Definition:

The diagram describes air blower motor speed distribution for HVAC manual control mode established by operator in Cabin.
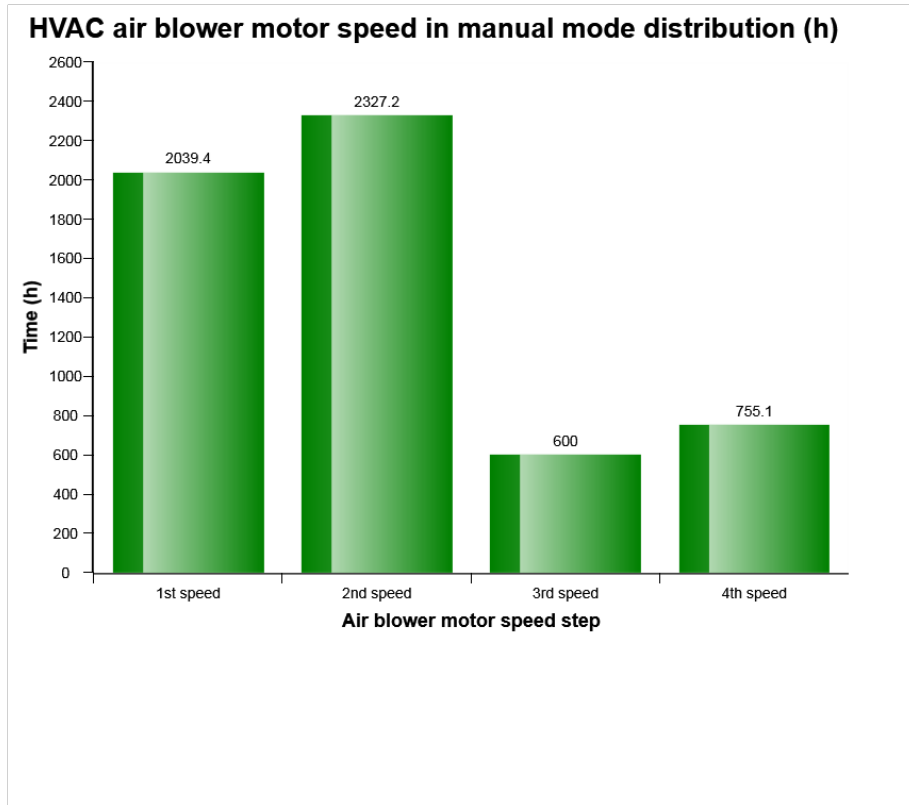
Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

AC High Pressure
Total number of occurences = 42

Op hours	Year	Month	Day	Hours	Minute	Duration (sec)	Extreme (° F)
7571	2018	6	20	14	0	13	93
7573	2018	6	20	17	1	37	95
7586	2018	6	21	15	46	277	97
7587	2018	6	21	16	52	85	97
7589	2018	6	21	18	22	42	90
7619	2018	6	23	14	19	80	97
7636	2018	6	24	10	59	25	90
7638	2018	6	24	13	38	135	97
7638	2018	6	24	13	26	105	97
7639	2018	6	24	13	45	129	97
7639	2018	6	24	13	53	54	97
7639	2018	6	24	14	15	55	97
7639	2018	6	24	14	27	56	99
7640	2018	6	24	15	31	56	97
7640	2018	6	24	15	3	81	97
7640	2018	6	24	14	52	84	97
7640	2018	6	24	14	57	162	97
7721	2018	6	28	18	7	8	91
7751	2018	7	2	14	28	61	97
7789	2018	8	7	19	51	31	86

Definition   :

This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating

hours is displayed in the first column, followed by year, month , day , hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

Logging is performed when, High AC Pressure signal is active. Ambient temp is viewed.

AC Boiling Protection
Number of engagements = 0

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (° F)
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32

Definition :

This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating

hours is displayed in the first column, followed by year, month , day , hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.

Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

Logging is performed when, Boiling protection signal is active. Ambient temp is viewed.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

AC System Cut Out Pressure
Total number of occurences = 12

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (° F)
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
0	2000	0	0	0	0	0	32
1093	2016	9	18	15	0	12	88
1093	2016	9	18	15	48	8	88
5380	2001	10	23	20	43	19	16
5380	2001	10	23	20	10	31	61
5386	2001	10	24	18	34	1011	32
5398	2001	10	25	18	34	511427835	23
7813	2018	12	13	8	29	0	32
7813	2018	12	13	10	35	20	3
7813	2018	12	13	13	16	1405	-2
7813	2018	12	13	6	42	0	32
7813	2018	12	13	8	44	2	-4
7813	2018	12	13	9	58	-64274	3

Definition   :

This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

hours is displayed in the first column, followed by year, month , day , hour and minute to show when an event has occurred.

The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

The duration of each event is shown after the timestamp of the event.

The duration is counted as long as the criteria is fulfilled.
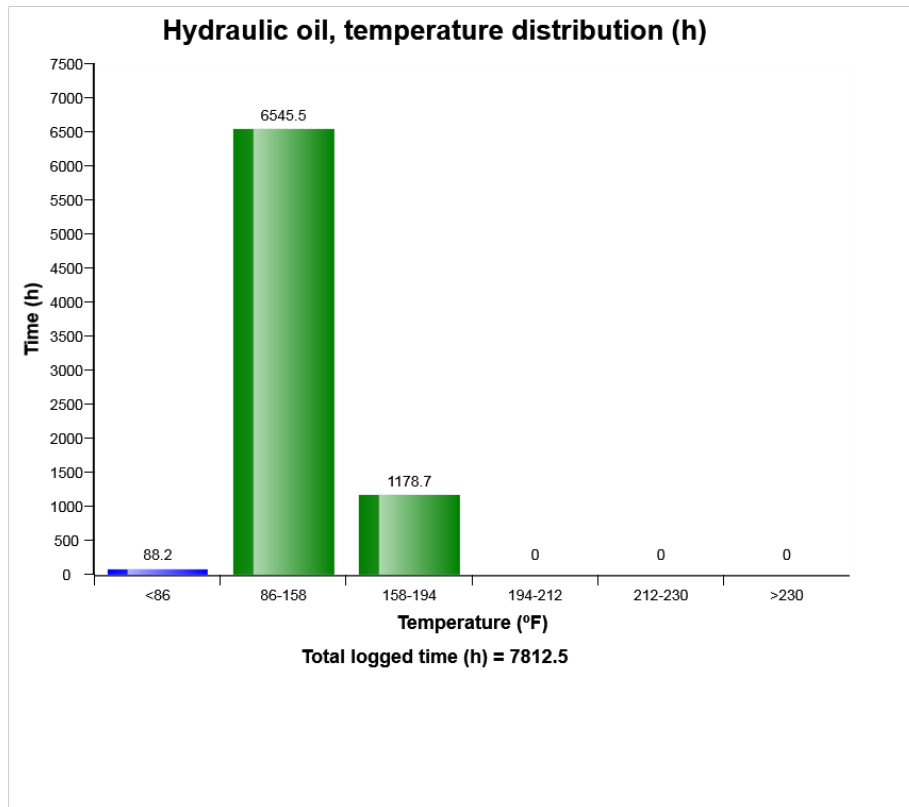
Extreme value :

The extreme value column displays the most extreme value during the event.

Criteria :

Logging is performed when, AC cut out pressure signal is active. Ambient temp is viewed.

Hydraulic oil, temperature distribution (h)

Time (h) — Y-axis values: 0, 500, 1000, 1500, 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500, 7000, 7500

Bar values:
- <86: 88.2
- 86-158: 6545.5
- 158-194: 1178.7
- 194-212: 0
- 212-230: 0
- >230: 0

Temperature (°F)

Total logged time (h) = 7812.5

Definition:

The graph shows the time distribution of the temperature, while engine running.

Explanation:

Y-axis: Time

X-axis: Temperature distribution in classes.

Blue bar = Warm-up phase.

During the engine warm-up phase, this temperature region is passed.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

It is normal to have registrations in this region.

Green bar = Normal working temperature. The Major part of the registrations shall be in this region.
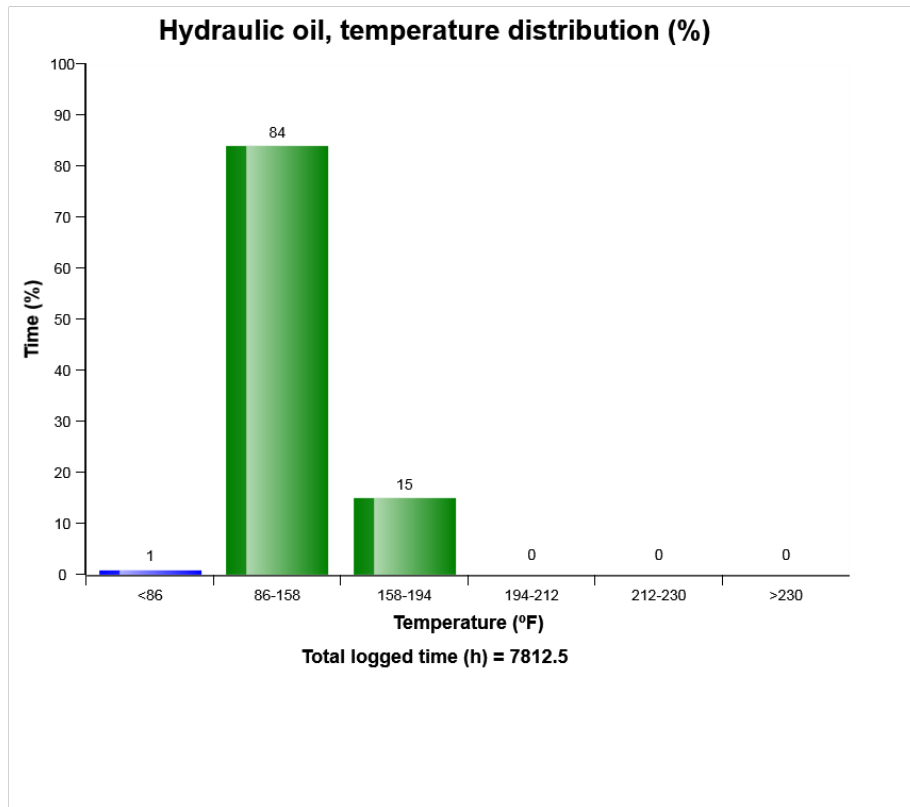
Yellow bar = High working temperature. It is normal to have some registrations in this region.

Red bar = Alarm.

Registrations in this region is not normal, running in this region may cause severe damage.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

Hydraulic oil, temperature distribution (%)

Title (%)

Temperature (⁰F)

Total logged time (h) = 7812.5

Definition:

The graph shows the time distribution of the temperature, while engine running.

Explanation:

Y-axis: Time

X-axis: Temperature distribution in classes.

Blue bar   = Warm-up phase.

During the engine warm-up phase, this temperature region is passed.

Machine model	SerialNo	Operating Hours	Reading Date
A40G	341373	7814	31/01/2019

It is normal to have registrations in this region.

Green bar   = Normal working temperature. The Major part of the registrations shall be in this region.

Yellow bar   =   High working temperature. It is normal to have some registrations in this region.

Red bar   = Alarm.

Registrations in this region is not normal, running in this region may cause severe damage.