VOLVO CONSTRUCTION EQUIPMENT
MATRIS REPORT

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Company name	Dealer	Report Issuer
volvo	arnold machinery	

Contact name	Technician	Primary Application
mike seifert	CE Tech	Mining

Site	Workorder	Ground Condition

MATRIS Reading, Summary / Recommendation

Machine model	SerialNo	Operating Hours	Reading Date
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Main equipment	Type	Equipment
	Track chain	
	X3 piping	
	Attachment Interface	
	Hydraulic Fluid	
	X1 Piping	
	Main Attachment	
	Hose Rupture Valve on Boom	
	Hose Rupture Valve on Arm	
	X1 return filter	

Machine model	SerialNo	Operating Hours	Reading Date
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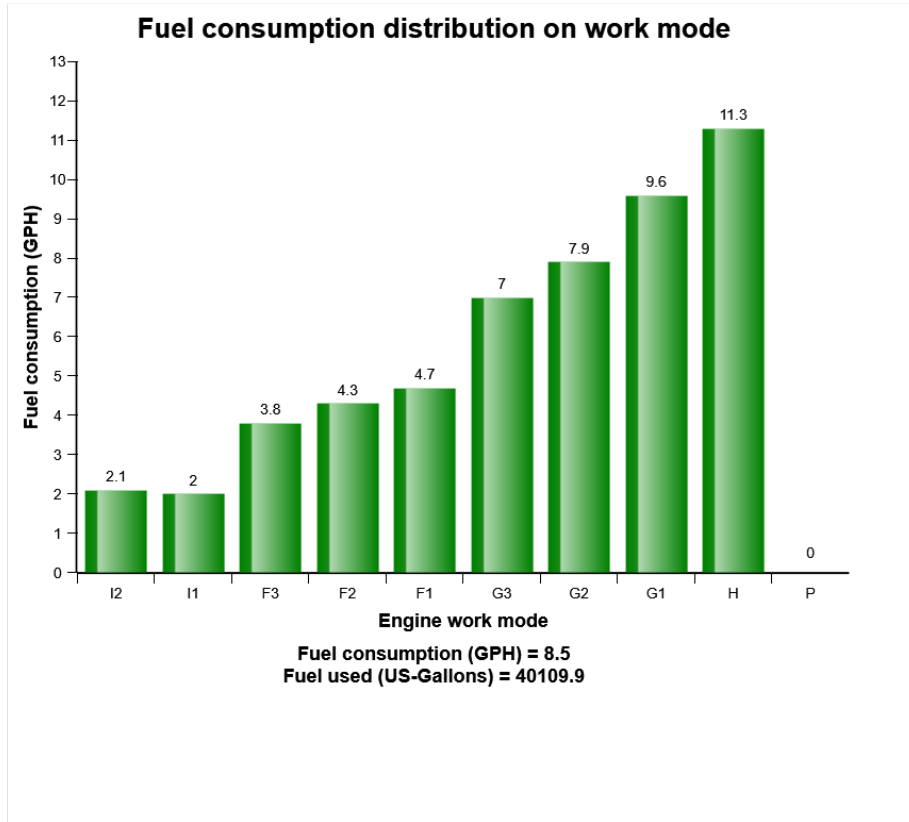
Fuel consumption distribution on work mode

Fuel consumption (GPH) — Engine work mode

I2	I1	F3	F2	F1	G3	G2	G1	H	P
2.1	2	3.8	4.3	4.7	7	7.9	9.6	11.3	0

Fuel consumption (GPH) = 8.5
Fuel used (US-Gallons) = 40109.9

Machine model	SerialNo	Operating Hours	Reading Date
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Machine utilization (%)

■ Working ■ Idle

66.6

33.4

Total logged time (h) = 4724.2
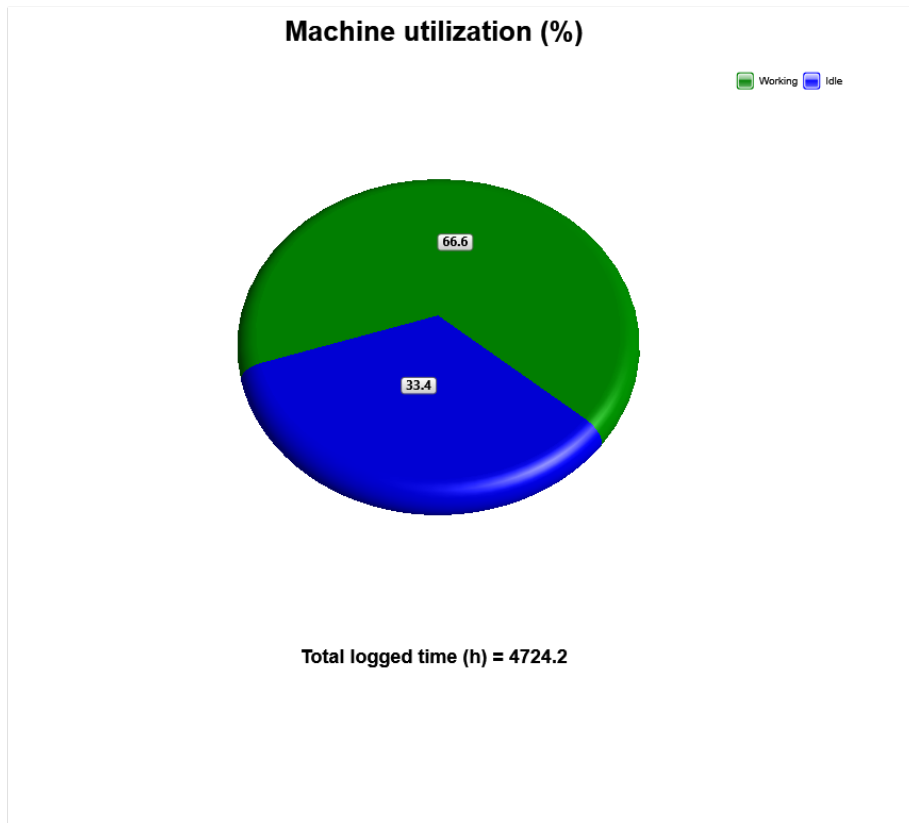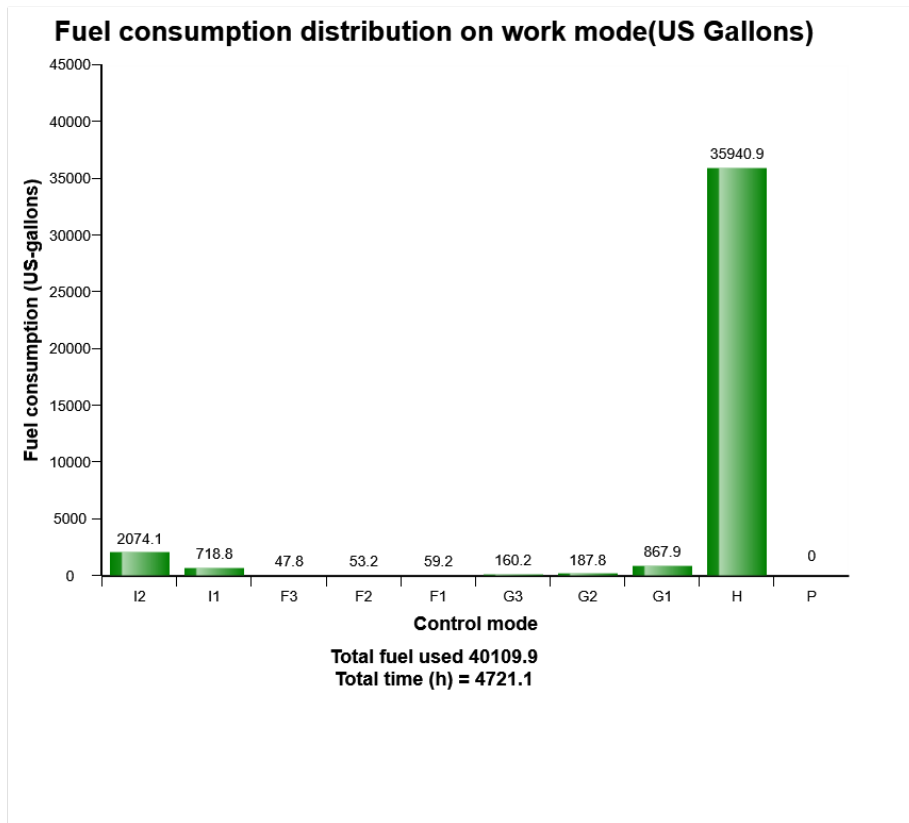
Definition:

The graph shows the distribution of the operating time for the machine. The operating time is defined as the time with engine on

Blue sector   = Engine is running, but attachments and tracks are not moved

or operated .

Green sector   = Machine in work with the move of attachments and tracks

VOLVO

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Fuel consumption distribution on work mode(US Gallons)

Total fuel used 40109.9
Total time (h) = 4721.1

Bar chart values by Control mode:
- I2: 2074.1
- I1: 718.8
- F3: 47.8
- F2: 53.2
- F1: 59.2
- G3: 160.2
- G2: 187.8
- G1: 867.9
- H: 35940.9
- P: 0

Y-axis: Fuel consumption (US-gallons), scale 0 to 45000
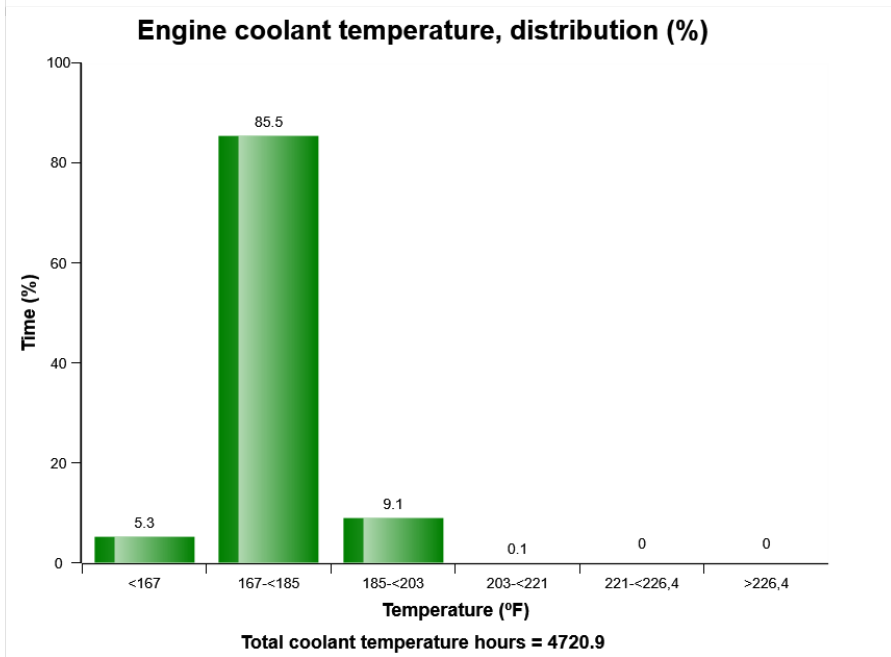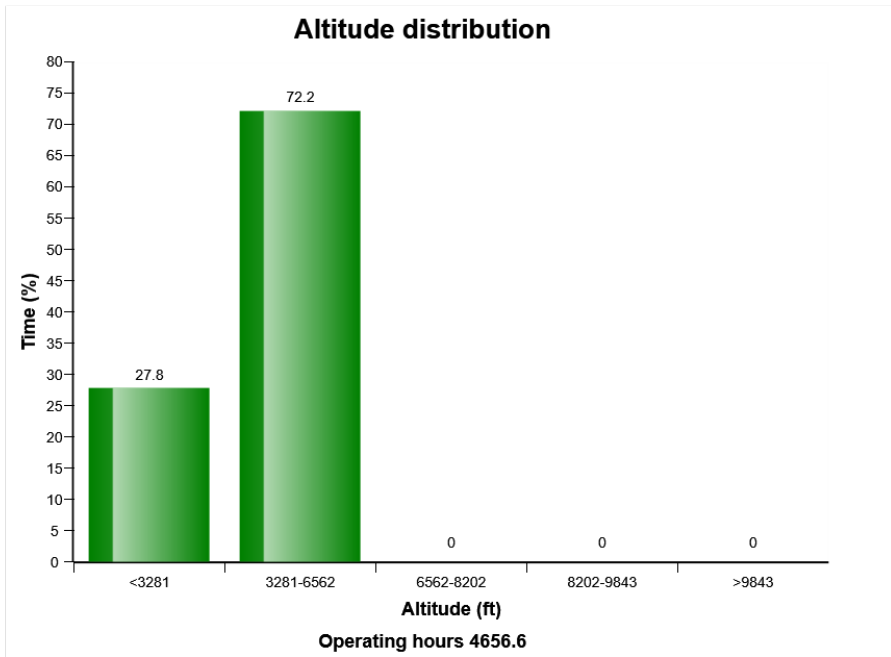
Definition:

The diagram describes the amount of fuel consumed per engine speed mode distribution.
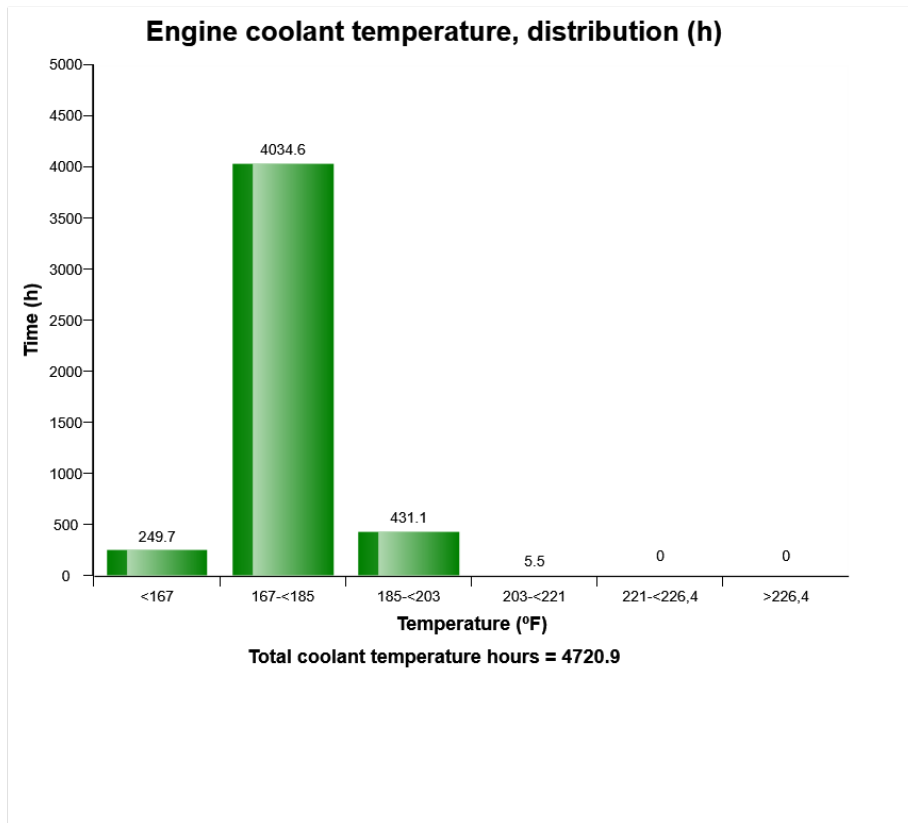
Total amount of fuel consumed (m3) in above means that the sum of the fuel while it consumed for engine ON. The values above distribution were calculated from theoretical calculation with logged data in V-ECU so it can be some different from actual performance in field.

Altitude distribution

Operating hours 4656.6

Engine coolant temperature, distribution (%)

Total coolant temperature hours = 4720.9

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Engine coolant temperature, distribution (h)

Total coolant temperature hours = 4720.9

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.

It is normal to have registrations in this region.

Machine model	SerialNo	Operating Hours	Reading Date
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Green bar = Normal working temperature. The Major part of the registrations shall be in this region.
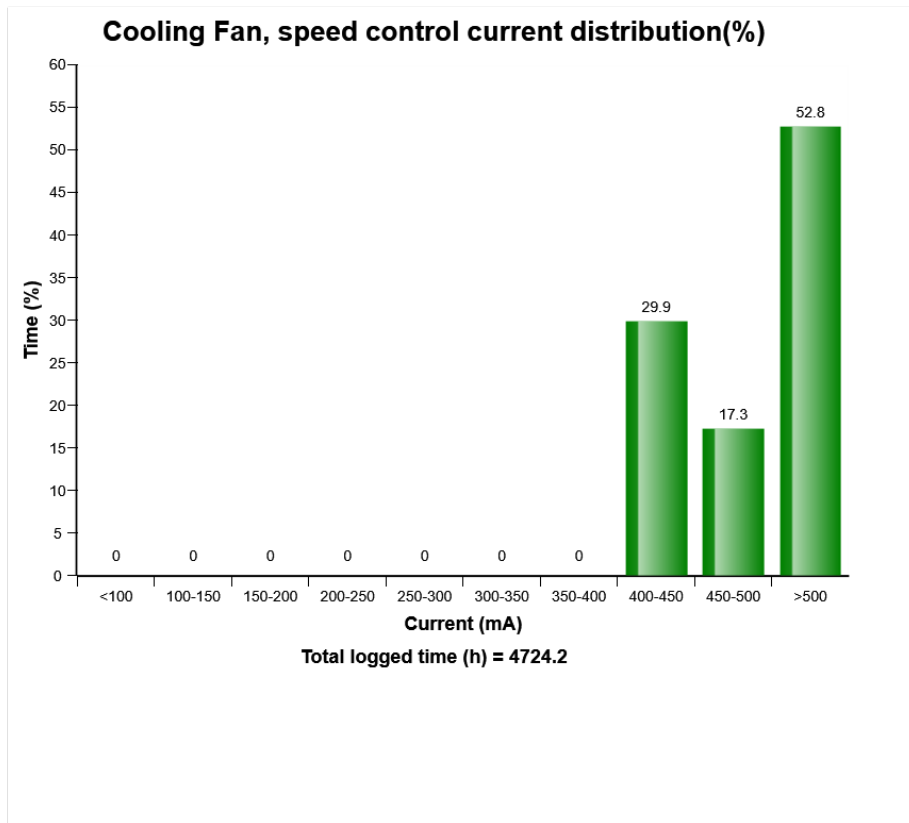
Yellow bar = High working temperature. It is normal to have some registrations in this region.

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
EC480D	210158	4724.2	12/08/2019

Cooling Fan, speed control current distribution(%)

Total logged time (h) = 4724.2

Definition:

The diagram describes Hydraulic Cooling fan speed control, Current (mA) distribution, on fan speed Control..

Total time (hours) in above means the sum of the time for Hydraulic Cooling fan operation.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Cooling Fan, speed control current distribution(h)

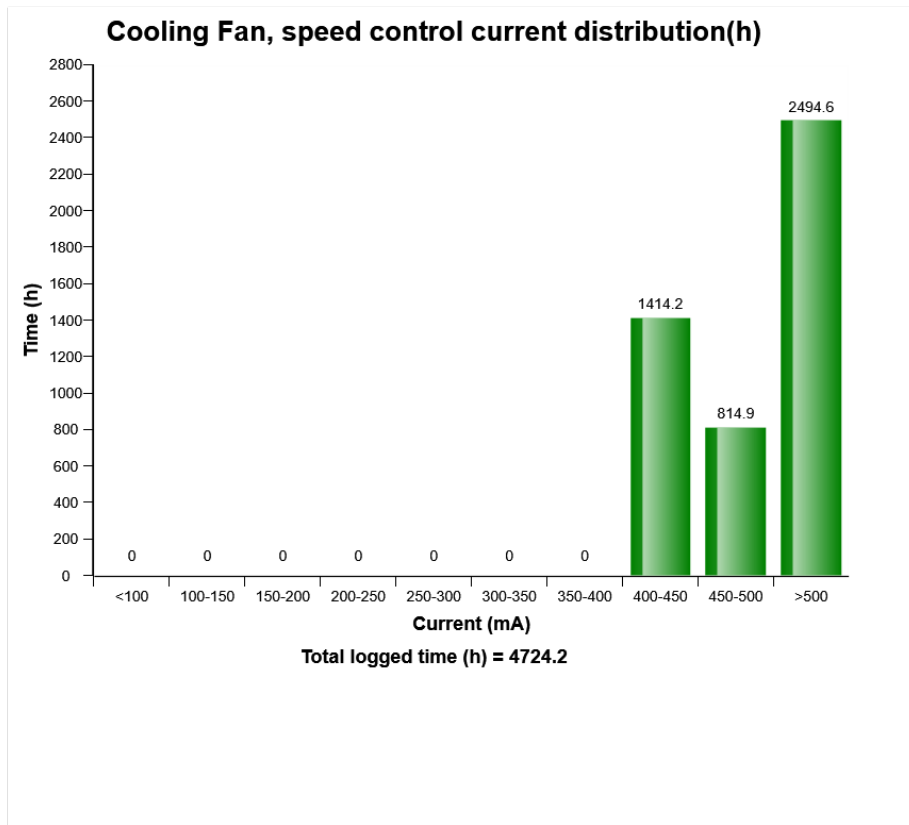

Total logged time (h) = 4724.2

Definition:

The diagram describes Hydraulic Cooling fan speed control, Current (mA) distribution, on fan speed Control..

Total time (hours) in above means the sum of the time for Hydraulic Cooling fan operation.

Machine model	SerialNo	Operating Hours	Reading Date
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Cooling fan, Mode distribution (h)

Time (h)

0	0	0	0
Manual	Auto 1	Auto 2	Off

Mode
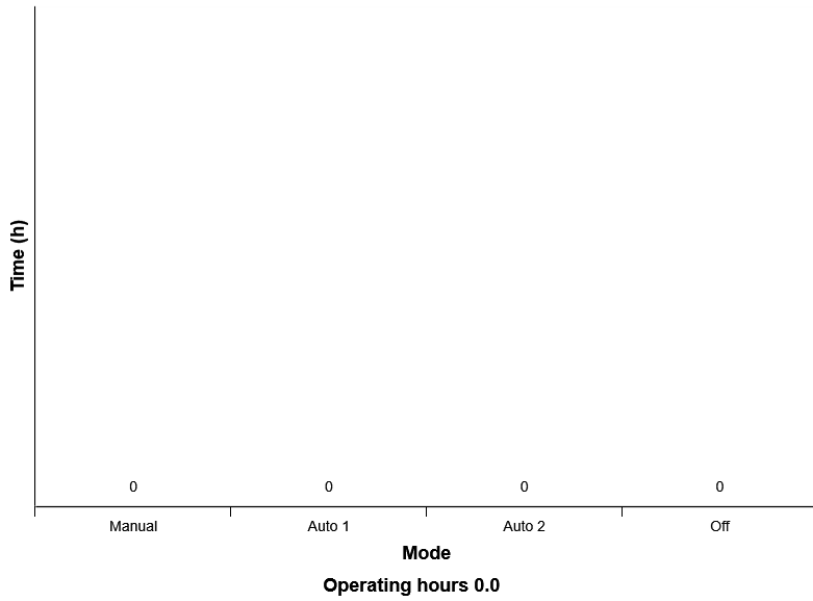
Operating hours 0.0

Cooling fan, Normal-Reverse rotation distribution (%)

Normal rotation   Reverse rotation

100

0
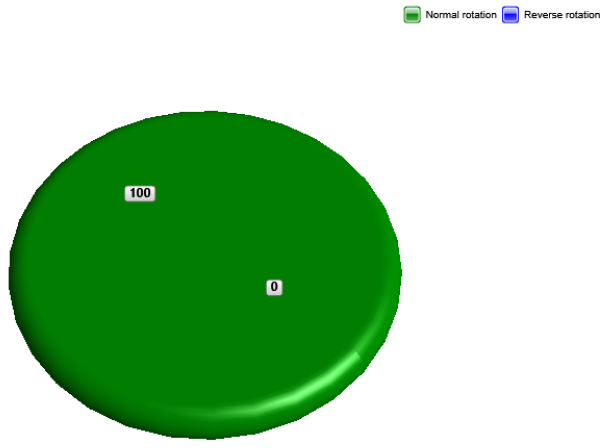
Total operating time (h) = 4724.2

Reverisble fan, Time setting distribution (h) at Auto 1 mode

Time (h)

0	0	0	0	0	0	0	0	0	0
20-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-110	111-120

Setting time (min.)

Total operating time at Auto 1 mode (h) = 0.0
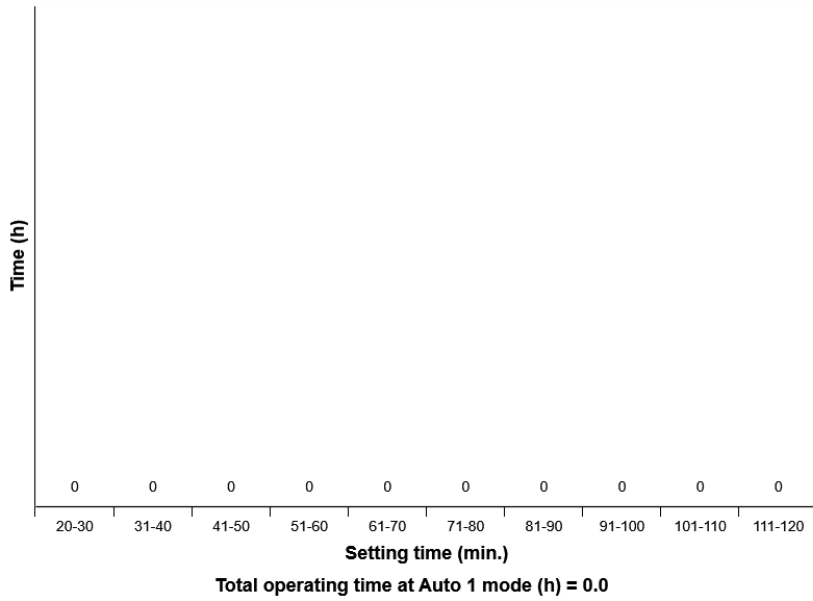
Reversible fan, Time setting distribution (h) at Manual mode
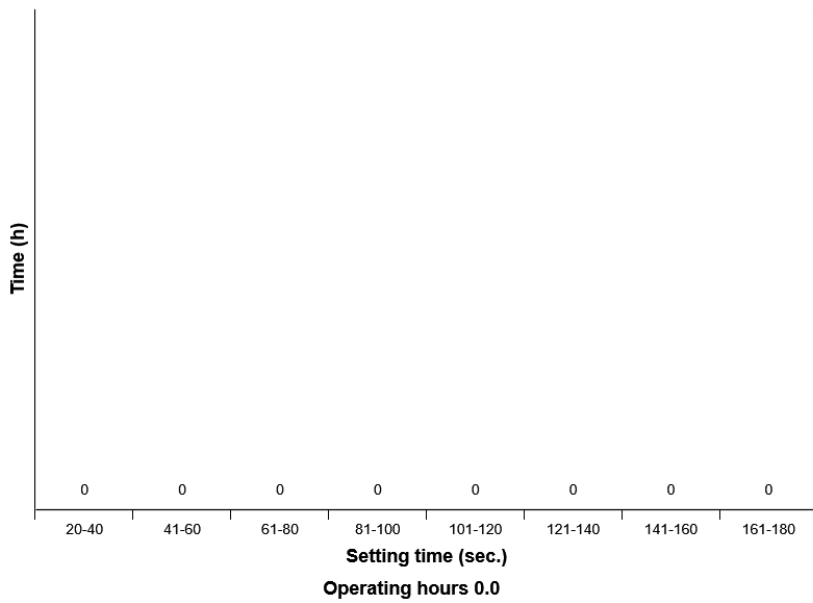
Time (h)

0	0	0	0	0	0	0	0
20-40	41-60	61-80	81-100	101-120	121-140	141-160	161-180

Setting time (sec.)

Operating hours 0.0

Engine boost air temperature distribution (h)

Total logged time (h) = 4671.3

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Engine work mode distribution(%)

Total time (h) = 4721.1
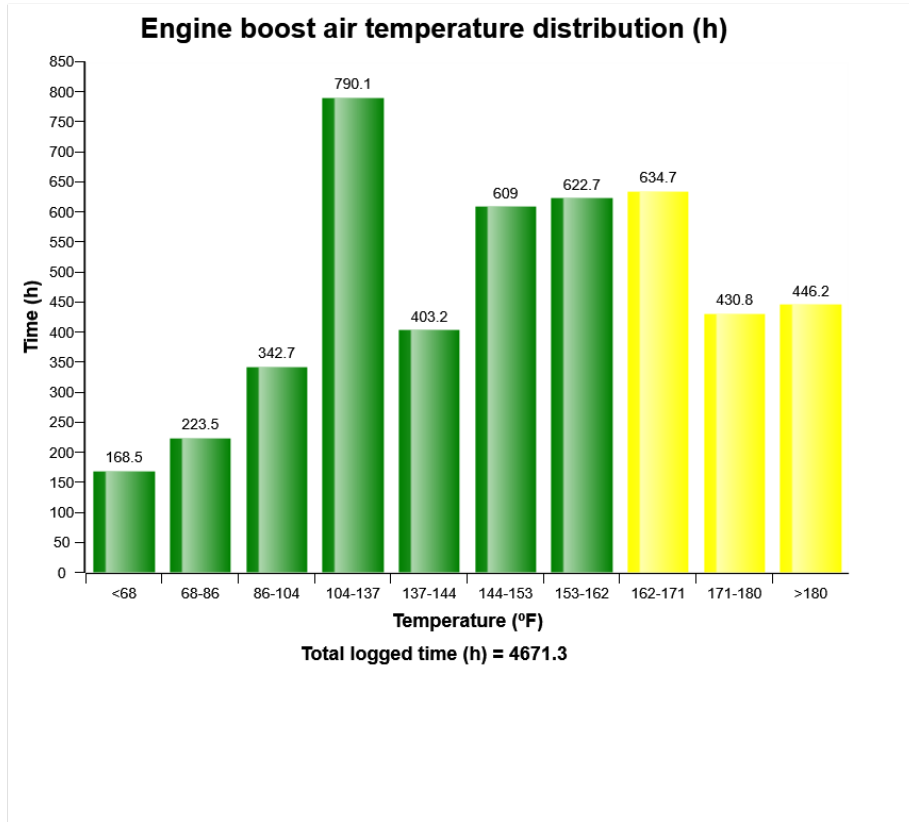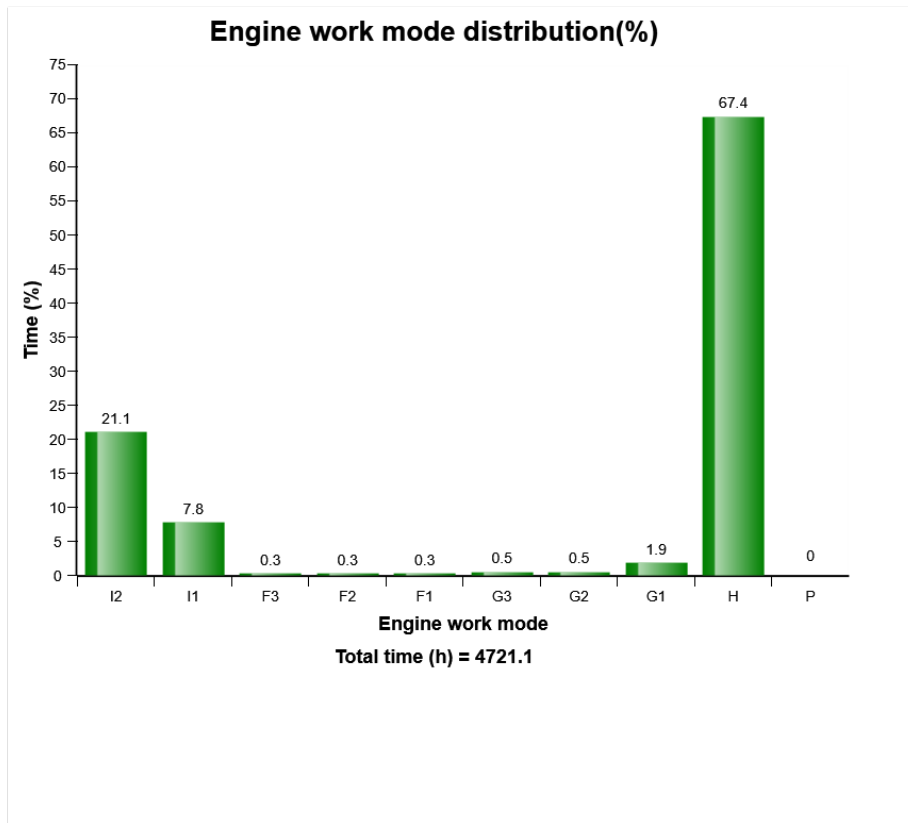
Definition:

This diagram shows the distribution of the engine work mode in time percent.

Distribution of each work mode is shown on top of the column in percentage.

Explanation:

Y-axis: The percentage of the operating hours on each work mode.

X-axis: The engine work mode (10 step in total)

Distribution of each work mode is shown on top of the column in percentage.

Machine model	SerialNo	Operating Hours	Reading Date
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The sum of time distribution in percentage is 100

Total time (h) is listed below the diagram

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Engine speed, distribution (h)

Total logged time (h) = 4724.2
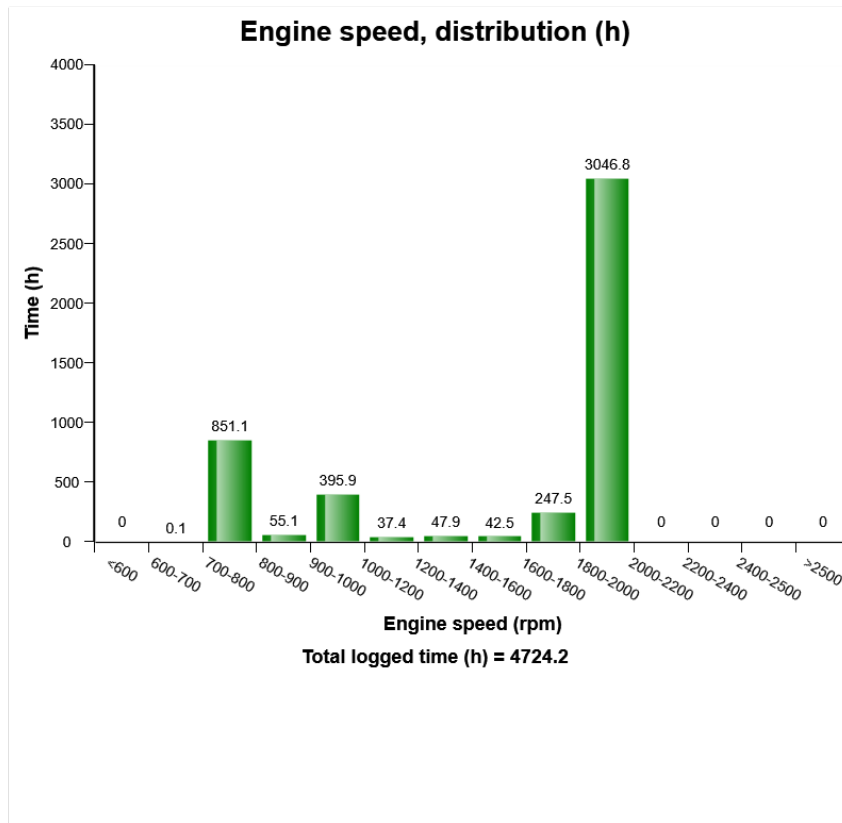
Definition:

The graph describes the engine speed distribution, in hours.

The sum of all bars = total time of engine running.

Explanation:

Y-axis: Engine running time in hours.

X-axis: Engine speed in rpm.

Green bars = Normal engine speed range.

Red bars =The engine speed has exceeded the maximum design speed.

Exceeding the maximum design speed may cause severe damage to the engine.

Engine speed, distribution (%)

Total logged time (h) = 4724.2

Definition:

The graph describes the engine speed distribution in percent of time.

The sum of all bars=100% of engine running time.

Explanation:

Y-axis: Engine running time in percent.

X-axis: Engine speed in rpm.

Green bars = Normal engine speed range

Blue bar = Idling interval.

Red bars =The engine speed has exceeded the maximum design speed.

Exceeding the maximum design speed may cause severe damage to the engine

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019
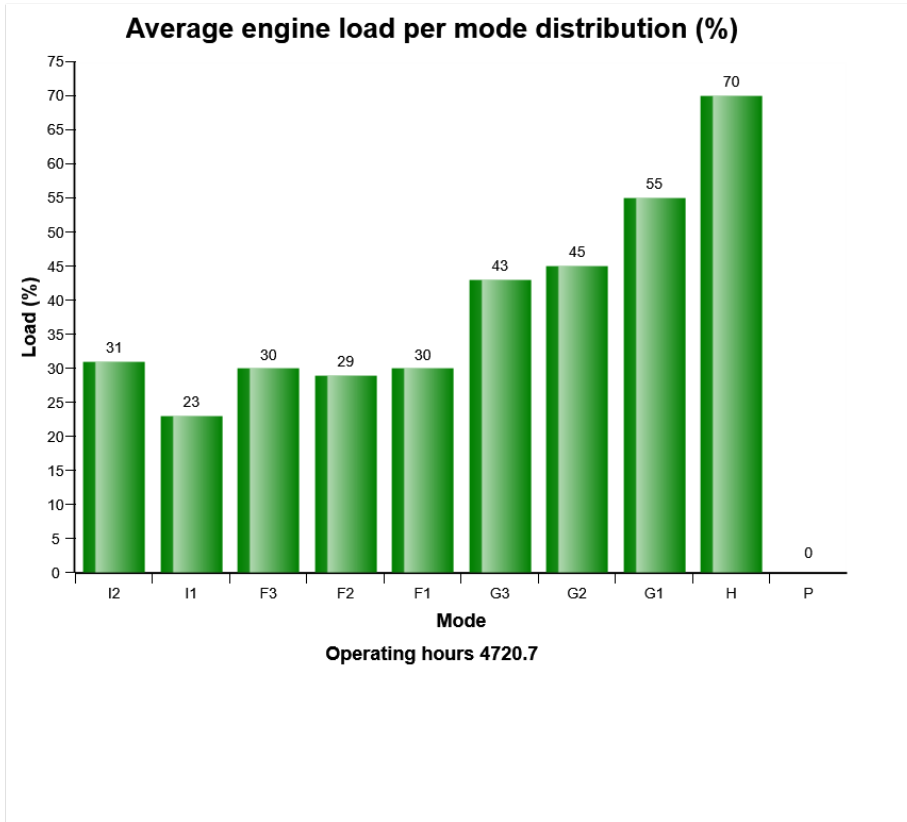
Average engine load per mode distribution (%)

Load (%) vs Mode

- I2: 31
- I1: 23
- F3: 30
- F2: 29
- F1: 30
- G3: 43
- G2: 45
- G1: 55
- H: 70
- P: 0

Operating hours 4720.7

Engine load on "G,H,P" speed mode distribution (%)

Engine time on "G,H,P" (h)= 3319.5
Total engine time (h)= 4721.1
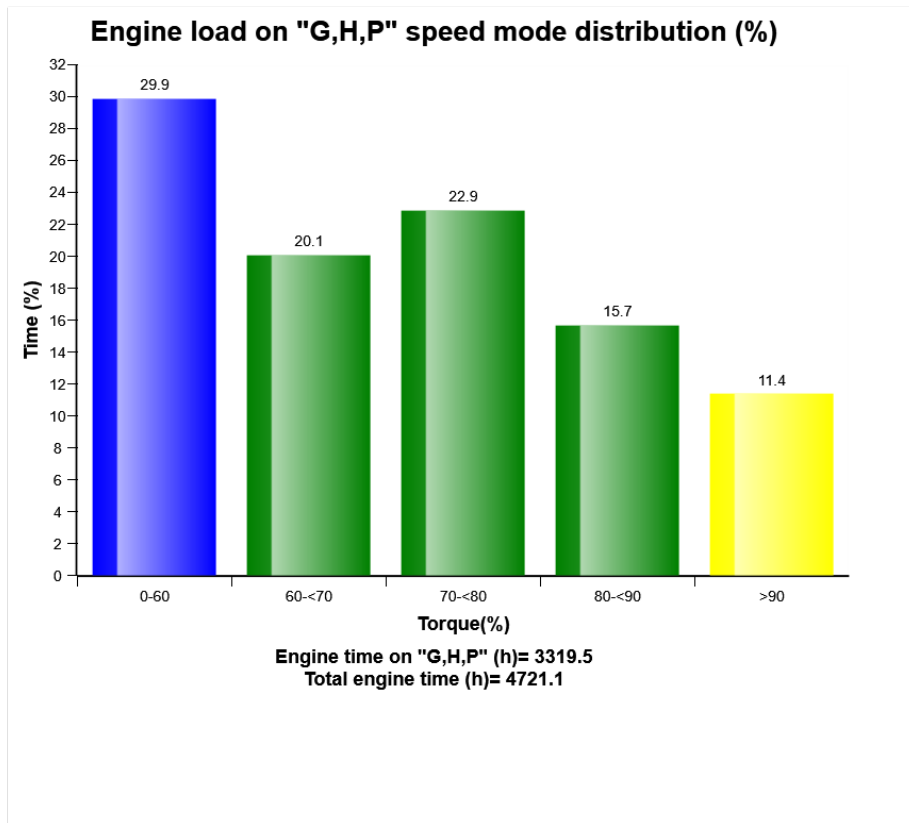
This graph shows the distribution of the engine load.

Blue bar: Low load

Green bar: Normal load

Yellow ba r: Excessive load

Load distribution for each bar is shown on top of its column in percentage.

The sum of bars is 100%.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Average number of starts per hour

Total number of starts: 2559
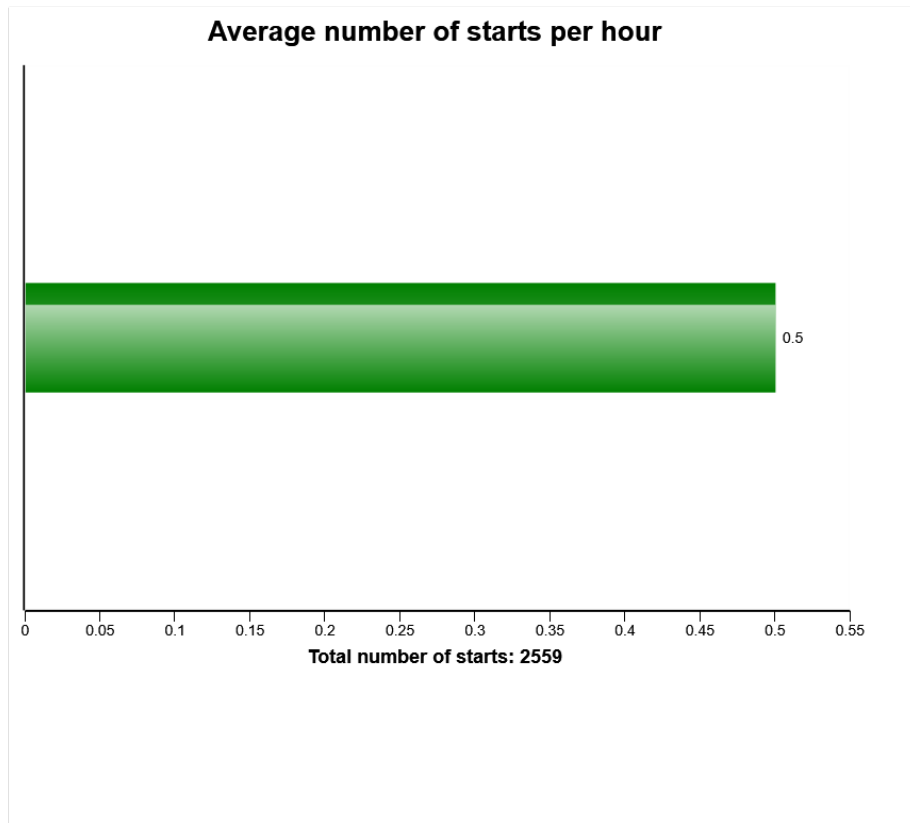
Definition:

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
EC480D	210158	4724.2	12/08/2019

Idle time before shut down (%)

Low speed shutdown= 2530
Total number of engine shutdowns= 2680
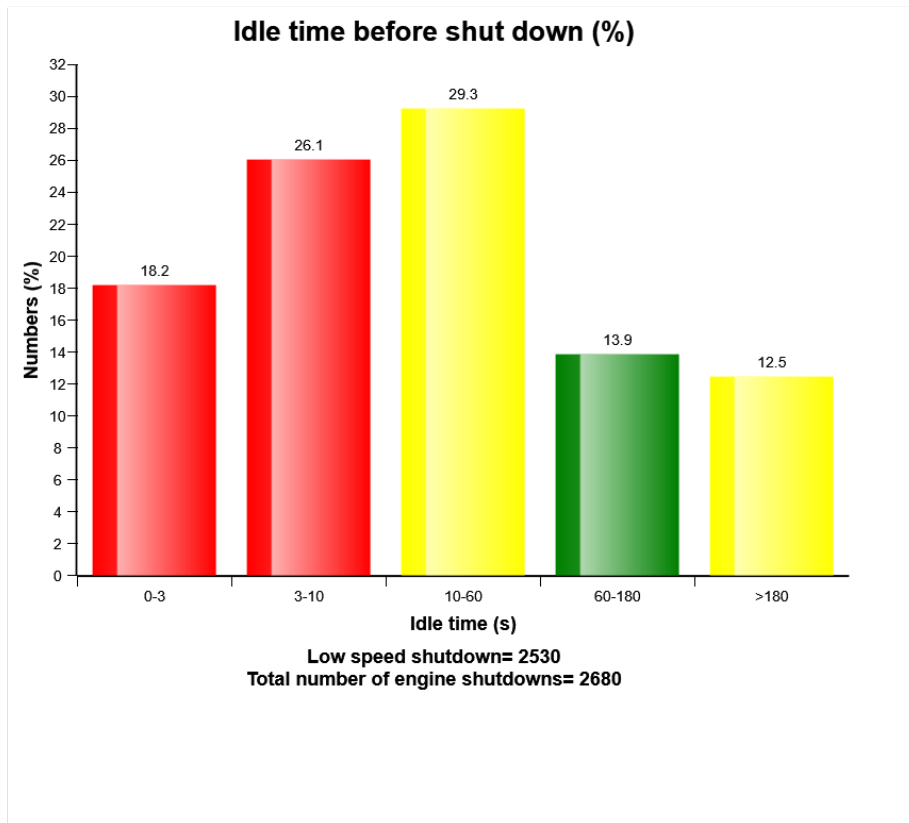
Definition:

This graph shows the distribution of delayed time at low idle speed until the engine is turned off.

The delayed time distribution for each bar is shown on top of its column in percentage.

The sum of bars is 100%.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Engine shut down numbers per engine speed mode distribution (%)

High speed stops = 97.0
Number of engine shut downs = 2680.0
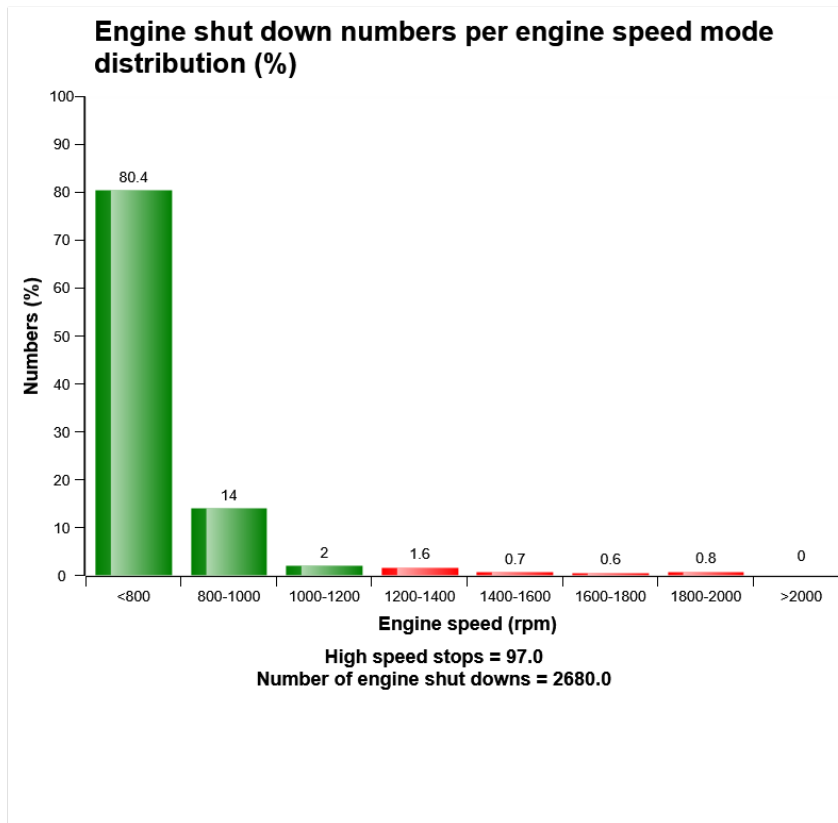
Definition:

The diagram shows the number of stops at high idle (I1 ~ P mode).

Green bars = Normal engine stop

Red bars = Abnormal engine stop

Engine stops at a high idle can cause server damage to the turbo charger due to shortage of the oil lubrication. The engine should be stopped at low idle(I2 mode).

Explanation:

Y-axle: Number of engine stop at each work mode.

X-axle: Work mode.

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Distribution of each work mode is shown on top of its column in number.

Total number of shut down is listed below the diagram.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

High Charge air temperature
Total number of occurences = 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 :

In order for an occurrence of high engine charge air temperature to be recorded and the count to increment by 1, the engine charge air temperature must change from "normal" to "high." The event of high engine charge air temperature will end when the status changes from "high" back to "normal."

Machine model	SerialNo	Operating Hours	Reading Date
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Low coolant level
Total number of occurences = 47

	Op hours	Year	Month	Day	Hour	Minute
*	3331	2017	3	17	6	15
*	3343	2017	3	18	6	58
*	3353	2017	3	20	5	52
*	3526	2017	5	31	7	54
*	3526	2017	5	31	7	47
*	3526	2017	5	31	7	32
*	3526	2017	5	31	7	30
*	3526	2017	5	31	7	29
*	3526	2017	5	31	7	27
*	3526	2017	5	31	7	7
*	3526	2017	5	31	7	15
*	3848	2017	9	27	11	36
*	3884	2017	10	5	8	5
*	3884	2017	10	5	8	2
*	3919	2017	10	11	6	48
*	3978	2017	10	20	13	57
*	3981	2017	10	23	7	11
*	3982	2017	10	23	8	18
*	4008	2017	11	1	13	58
*	4010	2017	11	15	10	13

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

Duration (sec)
485
258
17
251
258
722
92
24
43
443
364
16
18
62
31
46
16
16
32
153

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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

Criteria :

In order for an occurrence of low engine coolant level to be recorded in a data point, the count to increment by 1 the engine coolant level state must change from "normal" to "low."

Machine model	SerialNo	Operating Hours	Reading Date
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Low engine oil level at start
Total number of occurences = 0

	Op hours	Year	Month	Day	Hour
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	0	0	0
*	0	2000	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 hours is displayed in the first column, followed by year, month , day , hour and minute to show when

Minute
0
0
0
0
0
0
0
0
0
0
0
0
0
0

| 0 |

| 0 |

| 0 |

| 0 |

| 0 |

| 0 |

Machine model	SerialNo	Operating Hours	Reading Date
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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

Criteria :

In order for an occurrence of low engine oil level to be recorded in a data point and the count to increment by 1, an Alarm shall have been received at start up of machine

Machine model	SerialNo	Operating Hours	Reading Date
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Fuel Filter Clogging
Total number of occurences = 3

Op hours	Year	Month	Day	Hour	Minute	Duration (min)
1972	2015	12	20	9	5	0
1972	2015	12	20	9	7	1
1971	2015	12	19	14	8	21
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
EC480D	210158	4724.2	12/08/2019

Low Air filter pressure
Total number of occurences = 1

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
4578	2018	6	4	11	41	18575

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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 :

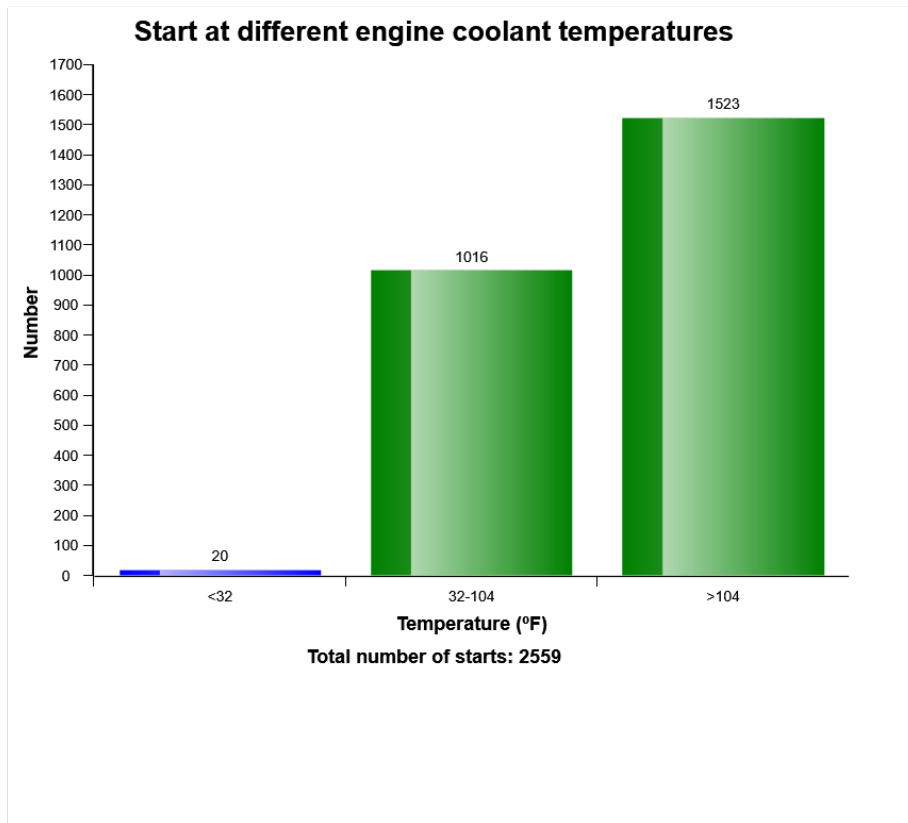**The duration of each event is shown after the timestamp of the event.**

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.

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Start at different engine coolant temperatures

Number (Y-axis) vs Temperature (°F) (X-axis)

- <32: 20
- 32-104: 1016
- >104: 1523

Total number of starts: 2559

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.

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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.

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Regeneration ignored
Total number of ignored regenerations 130

	Op hours	Year	Month	Day	Hour	Minute
*	4429	2018	5	10	7	21
*	4429	2018	5	10	7	11
*	4429	2018	5	10	7	1
*	4430	2018	5	10	8	24
*	4430	2018	5	10	8	12
*	4431	2018	5	10	9	42
*	4431	2018	5	10	8	47
*	4476	2018	5	17	9	12
*	4485	2018	5	18	11	56
*	4485	2018	5	18	11	11
*	4485	2018	5	18	10	2
*	4486	2018	5	18	13	4
*	4487	2018	5	18	13	50
*	4489	2018	5	21	6	54
*	4494	2018	5	21	12	7
*	4494	2018	5	21	12	2
*	4495	2018	5	21	12	28
*	4497	2018	5	21	15	3
*	4499	2018	5	22	6	45
*	4506	2018	5	22	16	54

Duration (min)
49
4
7
17
6
1
42
51
67
2
47
38
124
307
10
4
156
108
408
9

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Regeneration aborted
Total number of occurences = 300

Op hours	Year	Month	Day	Hour	Minute	Reason
4258	2018	4	17	16	48	1
4263	2018	4	18	11	57	1
4280	2018	4	20	10	17	1
4339	2018	4	28	7	58	1
4361	2018	5	1	13	50	1
4429	2018	5	10	7	15	1
4430	2018	5	10	8	11	1
4430	2018	5	10	8	18	1
4437	2018	5	10	16	14	1
4460	2018	5	15	9	56	1
4475	2018	5	17	8	42	1
4476	2018	5	17	10	3	1
4478	2018	5	17	12	59	1
4485	2018	5	18	10	48	1
4486	2018	5	18	13	4	1
4487	2018	5	18	13	42	1
4489	2018	5	18	15	54	1
4554	2018	5	31	14	36	1
4564	2018	6	1	14	31	1
4569	2018	6	2	9	7	1

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Low Engine Oil Pressure
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
4112	2018	3	12	8	41	60	305
4112	2018	3	12	8	37	10	334
4113	2018	3	12	10	20	9	348
4114	2018	3	14	7	4	17	218
4114	2018	3	14	7	3	9	232
4114	2018	3	12	11	47	8	319
4114	2018	3	12	11	40	8	348

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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 engine oil pressure to be recorded in a data point and the count to increment by 1, the engine 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
EC480D	210158	4724.2	12/08/2019

Regeneration duration
Total number of occurences = 1180

Op hours	Year	Month	Day	Hour	Minute	Duration (min)
4621	2018	6	11	7	26	42
4628	2018	6	11	14	22	41
4634	2018	8	28	10	44	68
4644	2019	7	26	15	5	41
4648	2019	7	27	7	41	41
4652	2019	7	27	11	18	43
4656	2019	7	27	15	44	41
4659	2019	7	29	7	38	48
4664	2019	7	29	11	58	43
4669	2019	7	29	16	45	42
4673	2019	7	30	9	36	42
4678	2019	7	30	13	58	41
4683	2019	7	31	7	49	41
4688	2019	8	1	10	43	47
4693	2019	8	1	15	18	41
4698	2019	8	2	10	14	47
4703	2019	8	3	10	48	41
4708	2019	8	3	15	18	41
4714	2019	8	5	10	31	44
4718	2019	8	5	14	48	41

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

High engine coolant temperature
Total number of occurences = 1

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
168	2013	6	27	14	7	362	194

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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.
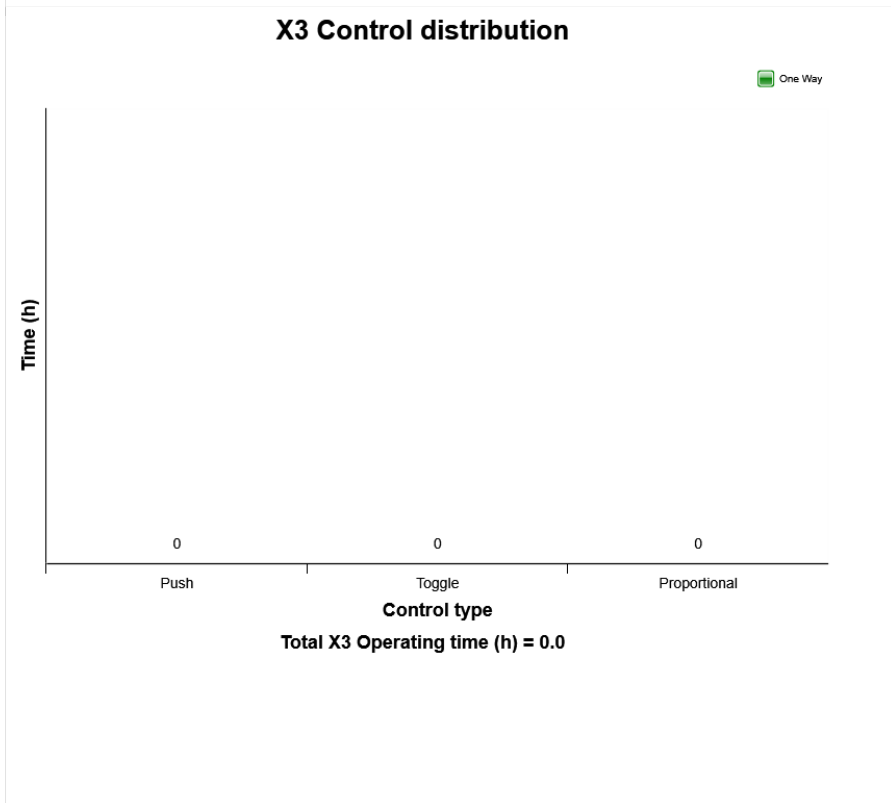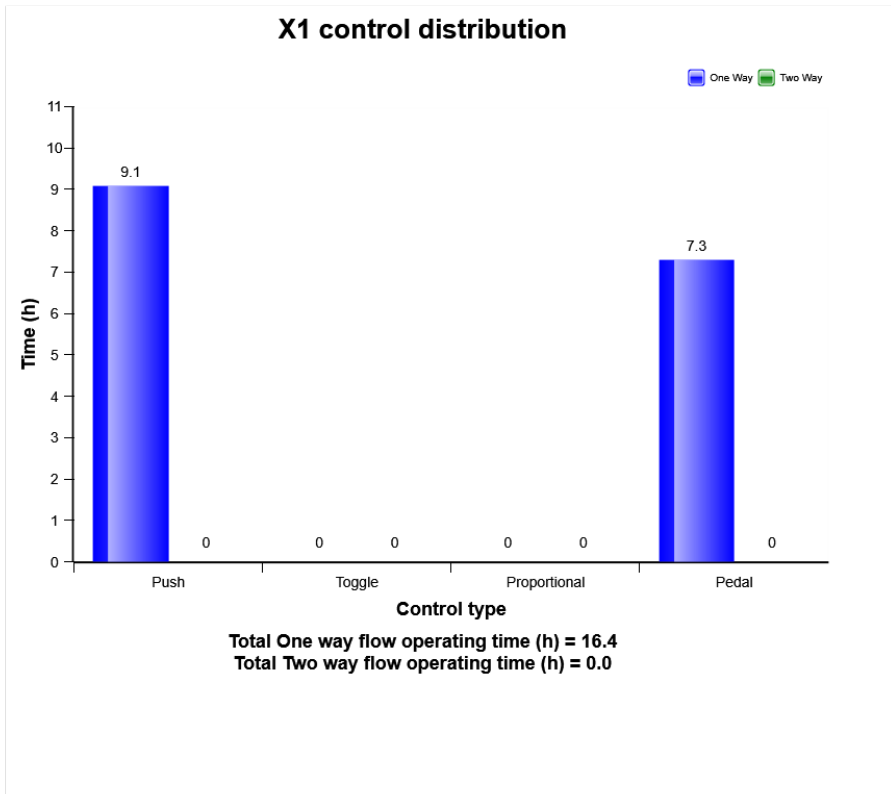
Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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

X1 control distribution

One Way   Two Way

Time (h)

9.1

7.3

0   0   0   0   0   0

Push   Toggle   Proportional   Pedal

Control type

Total One way flow operating time (h) = 16.4
Total Two way flow operating time (h) = 0.0

X3 Control distribution

One Way

Time (h)

0   0   0

Push   Toggle   Proportional

Control type

Total X3 Operating time (h) = 0.0

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

HVAC Auto - Manual mode selection distribution (%)


Total logged time (h) = 3861.4

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
EC480D	210158	4724.2	12/08/2019

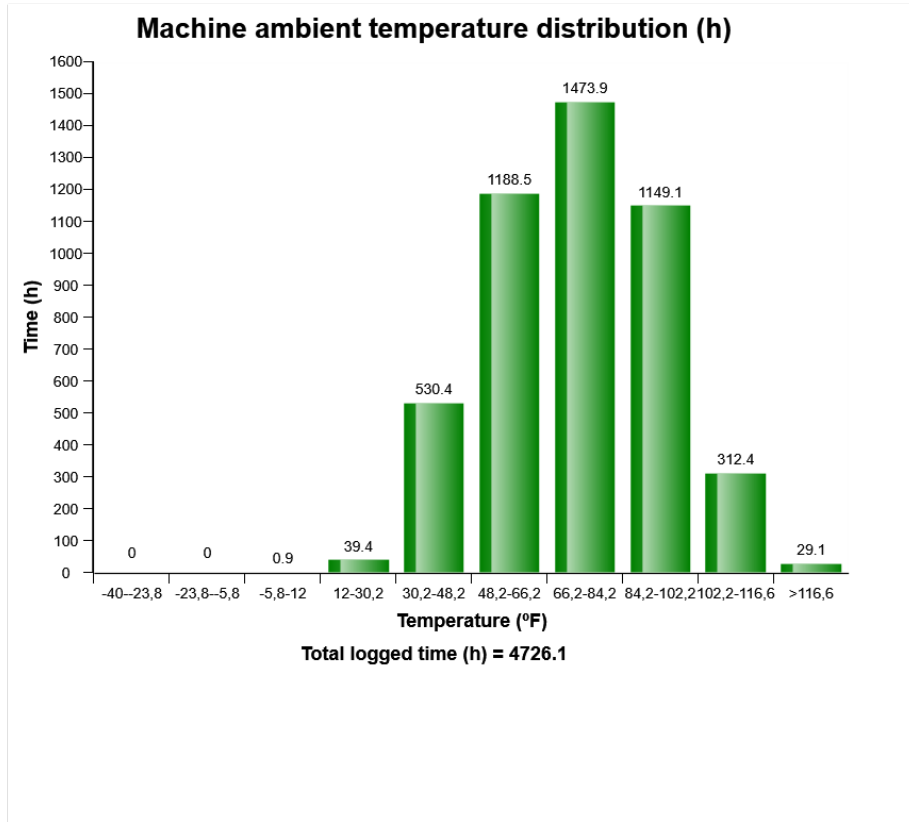**HVAC air temperature setting in auto control mode distribution (h)**
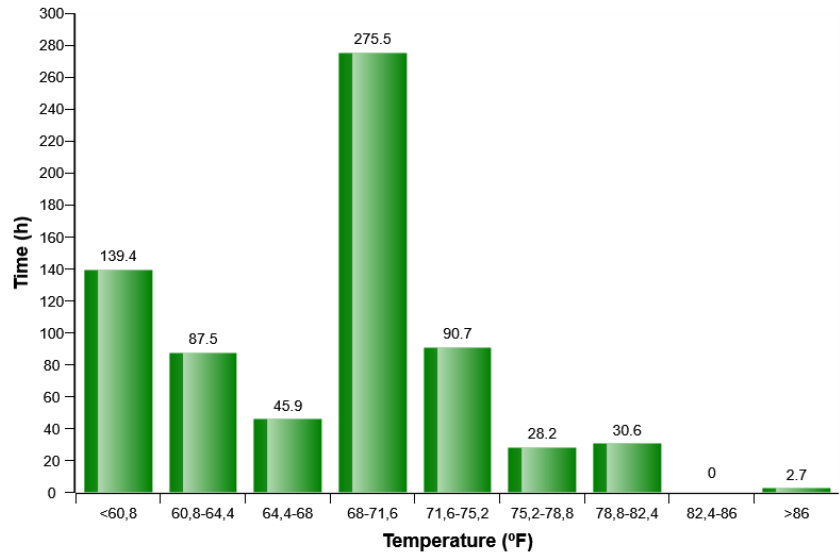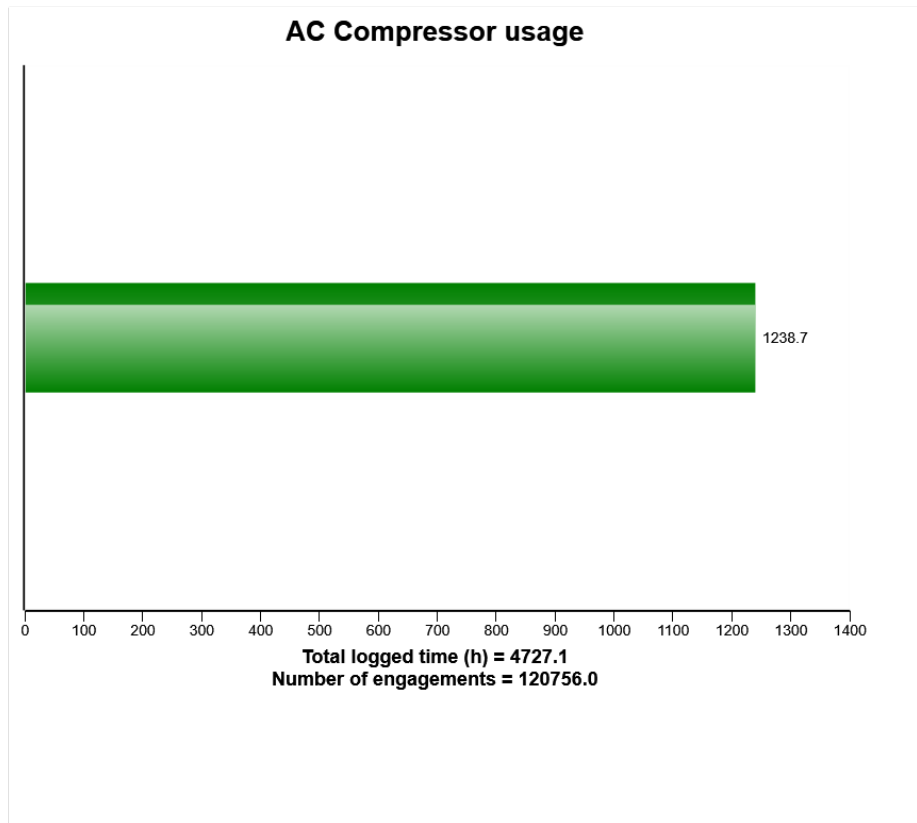

Definition:

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	**210158**	**4724.2**	**12/08/2019**

Machine ambient temperature distribution (h)

Chart: Time (h) vs Temperature (°F)

Temperature (°F)	Time (h)
-40--23,8	0
-23,8--5,8	0
-5,8-12	0.9
12-30,2	39.4
30,2-48,2	530.4
48,2-66,2	1188.5
66,2-84,2	1473.9
84,2-102,2	1149.1
102,2-116,6	312.4
>116,6	29.1

Total logged time (h) = 4726.1

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

AC Compressor usage

1238.7

0   100   200   300   400   500   600   700   800   900   1000   1100   1200   1300   1400

Total logged time (h) = 4727.1
Number of engagements = 120756.0

Definition:

 The graph shows the total time of AC compressor engagement.

   Explanation:

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

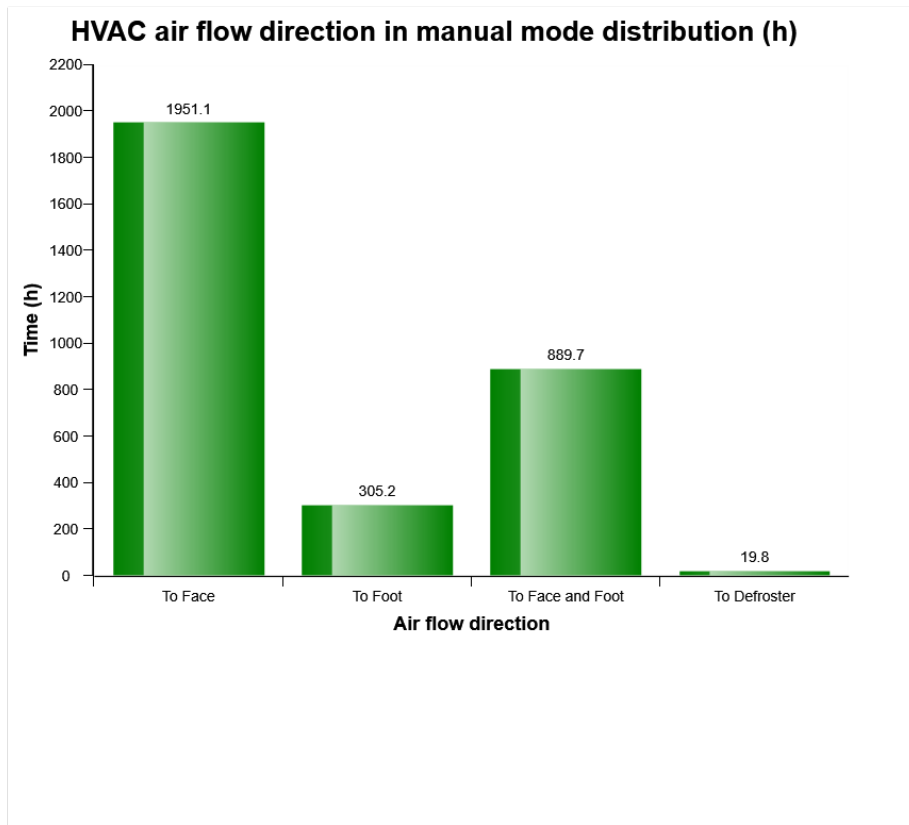Under the graph the total engine running time (in hours) is displayed.

Total number of AC compressor activations is also displayed.

-

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

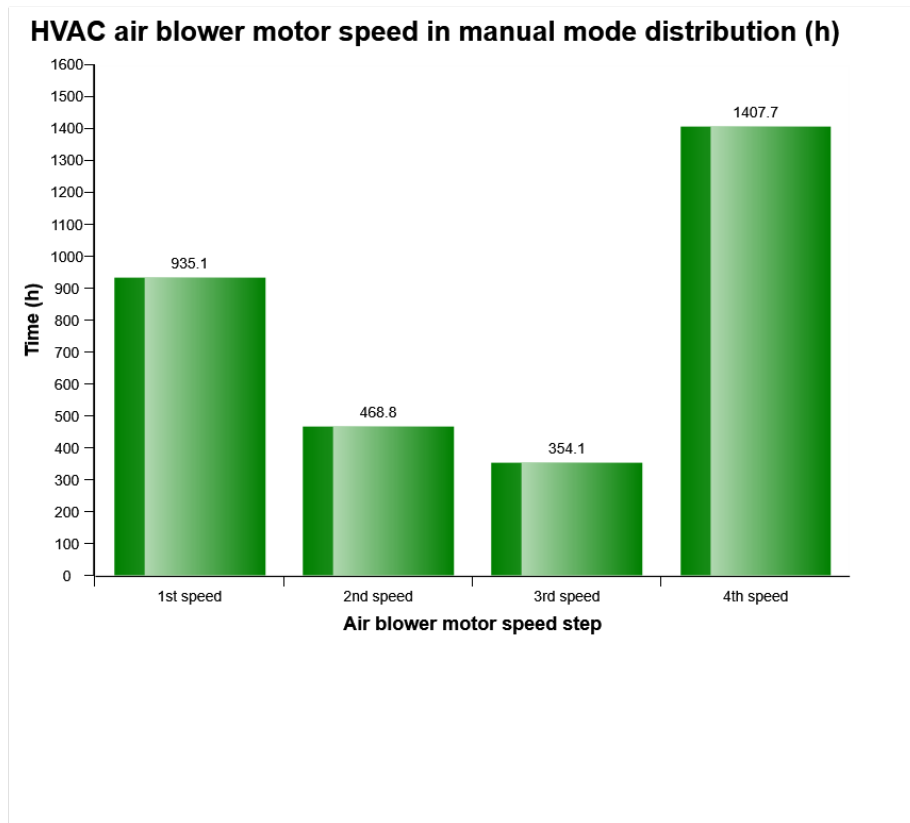**HVAC air flow direction in manual mode distribution (h)**

Definition:

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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

Time (h) vs Air blower motor speed step

- 1st speed: 935.1
- 2nd speed: 468.8
- 3rd speed: 354.1
- 4th speed: 1407.7

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
EC480D	210158	4724.2	12/08/2019

AC High Pressure
Total number of occurences = 0

Op hours	Year	Month	Day	Hours	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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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
EC480D	210158	4724.2	12/08/2019

AC System Cut Out Pressure
Total number of occurences = 7

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
1324	2014	11	17	8	4	653	12
2186	2016	3	25	12	3	0	32
2232	2016	4	4	11	0	0	32
2234	2016	4	4	12	44	0	32
2234	2016	4	4	12	42	0	32
2239	2016	4	4	17	15	0	32
2581	2016	6	27	13	1	1	122

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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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.

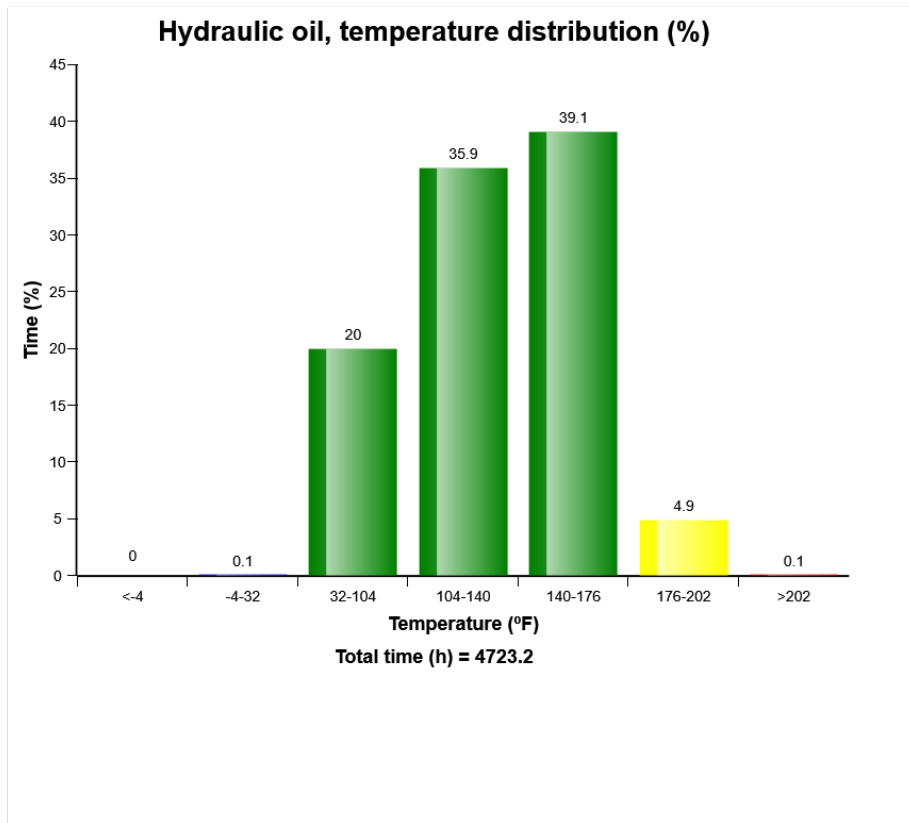The duration is counted as long as the criteria is fulfilled.

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.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Hydraulic oil, temperature distribution (%)

Total time (h) = 4723.2

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.

It is normal to have registrations in this region.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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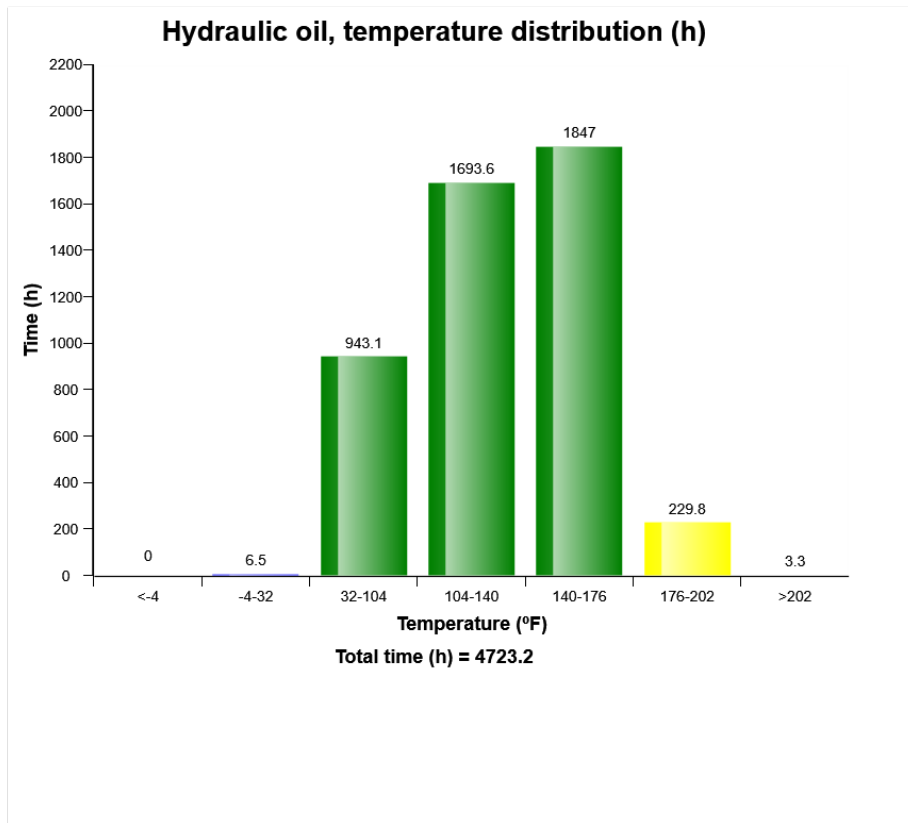
Yellow bar = High working temperature. It is normal to have some registrations in this region.

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
EC480D	210158	4724.2	12/08/2019

Hydraulic oil, temperature distribution (h)

Time (h) vs Temperature (°F)

<-4	-4-32	32-104	104-140	140-176	176-202	>202
0	6.5	943.1	1693.6	1847	229.8	3.3

Total time (h) = 4723.2

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.

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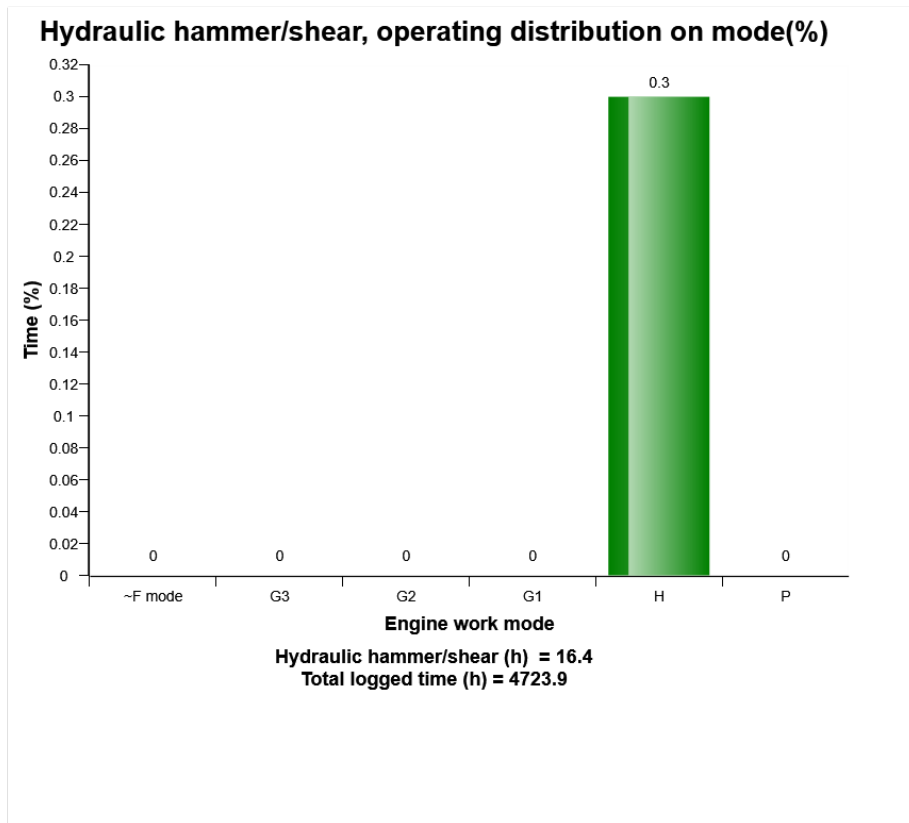
Yellow bar = High working temperature. It is normal to have some registrations in this region.

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
EC480D	210158	4724.2	12/08/2019

Hydraulic hammer/shear, operating distribution on mode(%)

Hydraulic hammer/shear (h) = 16.4
Total logged time (h) = 4723.9

Definition:

The graph describes the operating hours (%) for hydraulic hammer/shears on each engine control mode .

Recommended to use green column mode of the hammer operation.

I2 = Idle 2

I1 = Idle 1

F3= Fine control 3

F2= Fine control 2

F1= Fine control 1

G3 = General 3

G2 = General 2

G1 = General 1

H = Heavy Duty

P = Power max

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Hydraulic Power boosted working operation distribution (%)

Boost and solenoid ON (h) = 86.2
Boost solenoid ON, F mode (h) = 37.5
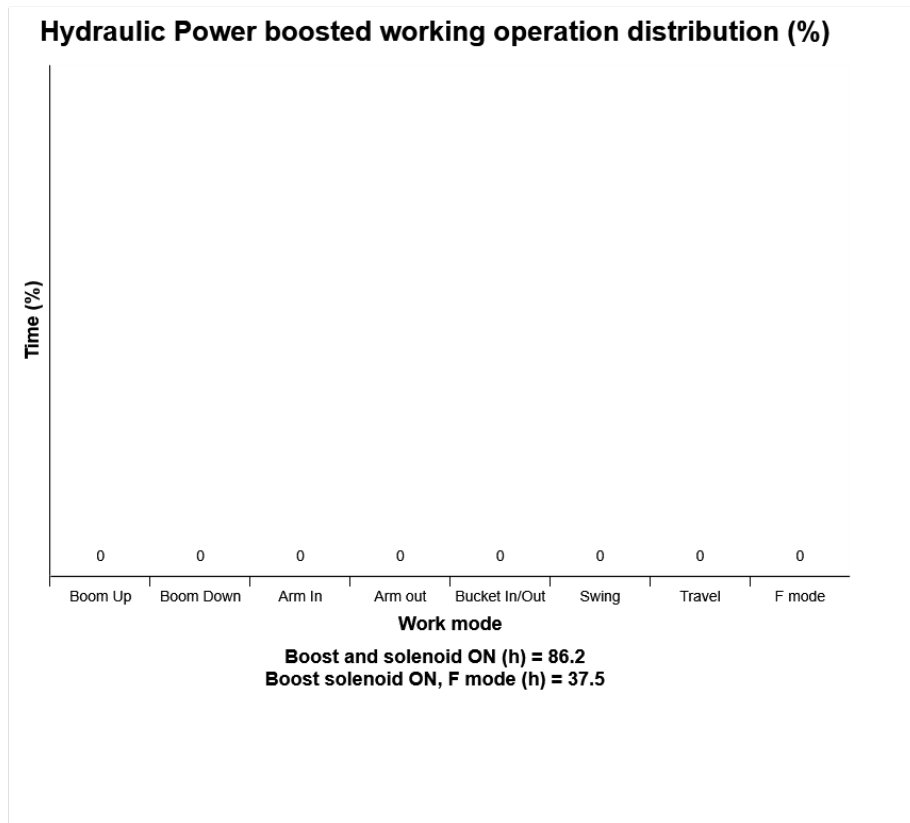
Definition:

T he diagram describes Power boosted operating time distribution, when main relief pressure increases on working operation modes. In this diagram, the sum of time (%) of each working operation mode can exceed 100%. It means that customer has been operated several working operations at the same time.

Total operating time with power boosted (hours) in above means sum of the time for Hydraulic Power boosted operation. The base for the percentage calculation is Total operating time with power boost. Time(%) on each working operation mode except travel and F mode above is the time, after the operator press power boost button on the joystick and until main relief pressure is recovered to default pressure.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Travel speed, high/low (%)

Travel high Travel low

50.3

49.7

Total travel time (h) = 351.8
Travel time / Operating hours (%)= 7.4
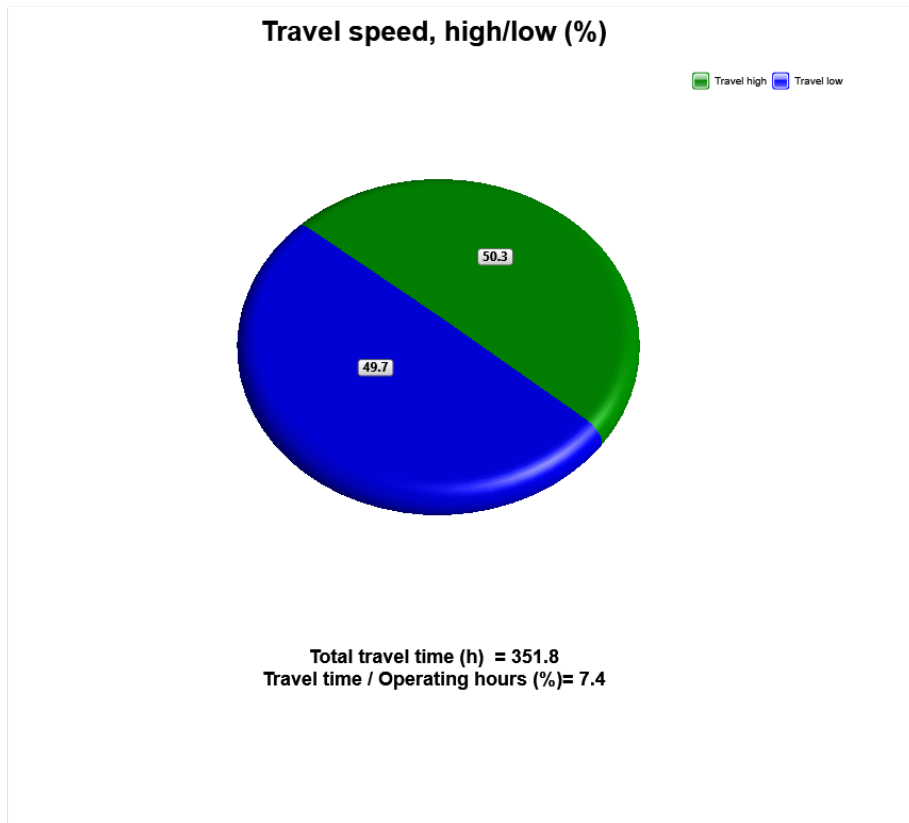
Definition:

This graph shows operating hour distributions on each travel speed for total travel time.

Blue sector: Travel switch in low position

Green sector: Travel switch in high position

Explanation:

Distribution of each travel time is shown on right of its sector in percentage

The sum of travel time in percentage is 100

Total travel time is listed below the diagram

VOLVO

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

High hydraulic oil temperature
Total number of occurences = 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

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

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.

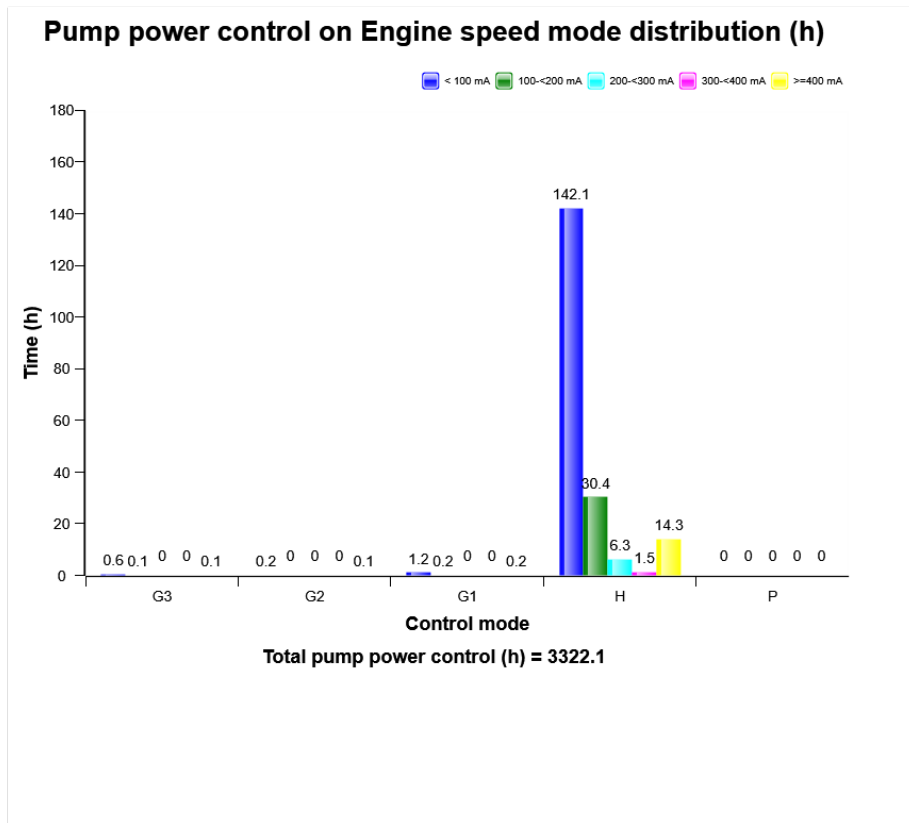The duration is counted as long as the criteria is fulfilled.

Extreme value :

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

Criteria :

Logging is performed when, Alarm high hydraulic oil temperature , is active.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

Pump power control on Engine speed mode distribution (h)

Legend: < 100 mA, 100-<200 mA, 200-<300 mA, 300-<400 mA, >=400 mA

Time (h) vs Control mode

G3: 0.6, 0.1, 0, 0, 0.1
G2: 0.2, 0, 0, 0, 0.1
G1: 1.2, 0.2, 0, 0, 0.2
H: 142.1, 30.4, 6.3, 1.5, 14.3
P: 0, 0, 0, 0, 0

Total pump power control (h) = 3322.1

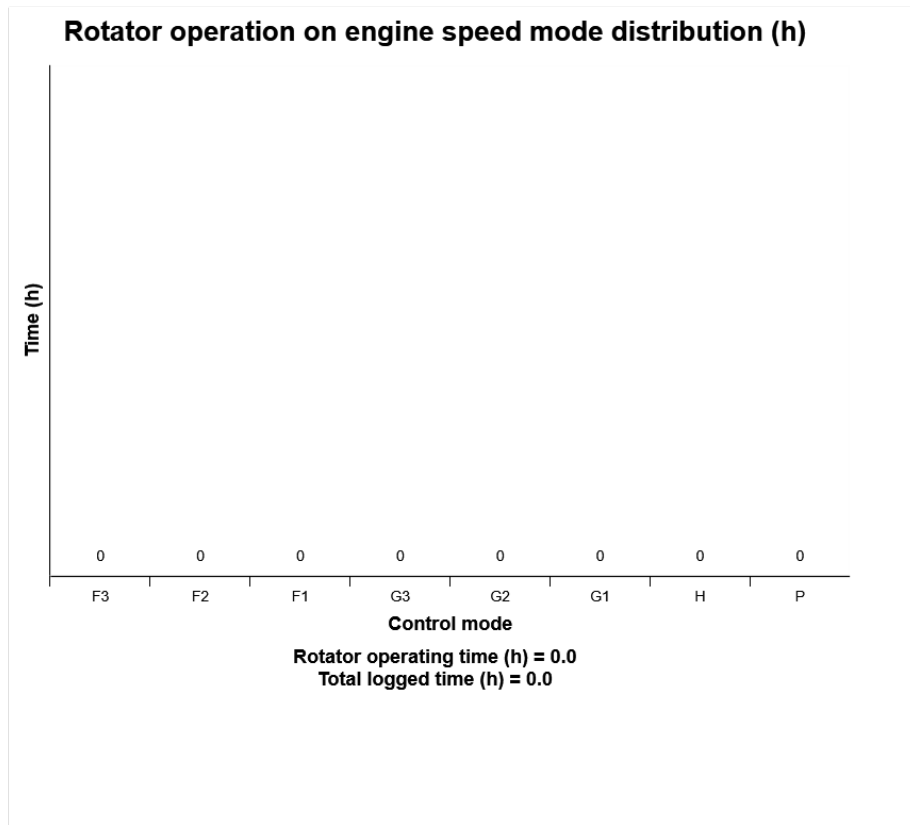Definition:

The diagram describes the distribution of pump power control current operation on each engine mode
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Rotator operation on engine speed mode distribution (h)

Rotator operating time (h) = 0.0
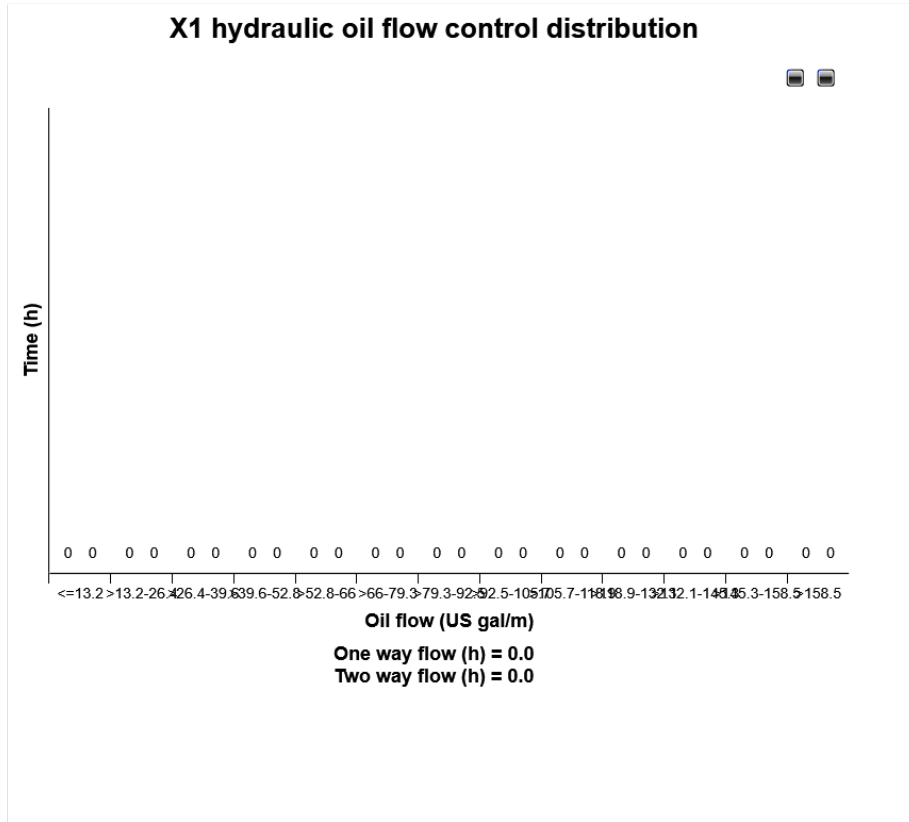Total logged time (h) = 0.0

Definition:

The diagram describes the distribution of Rotator operating hours on mode.

Machine model	SerialNo	Operating Hours	Reading Date
EC480D	210158	4724.2	12/08/2019

X1 hydraulic oil flow control distribution

Time (h)

0 0   0 0   0 0   0 0   0 0   0 0   0 0   0 0   0 0   0 0   0 0   0 0

<=13.2 >13.2-26.4 26.4-39.6 39.6-52.8 52.8-66 >66-79.3 79.3-92.5 92.5-105.7 105.7-118.9 118.9-132.1 132.1-145.3 145.3-158.5 >158.5

Oil flow (US gal/m)

One way flow (h) = 0.0
Two way flow (h) = 0.0

Definition:

The diagram describes X1 hydraulic oil flow control distribution of the machine while machine operates.