

VOLVO CONSTRUCTION EQUIPMENT MATRIS REPORT

Machine model EC300D	SerialNo 210058	Operating Hours 2199.6	Reading Date 1/12/2016
Company name Asset Appraisal Services	Dealer	Report Issuer	
Contact name	Technician Appraiser	Primary Application Other industrial handling	
Site	Workorder	Ground Condition	

MATRIS Reading, Summary / Recommendation



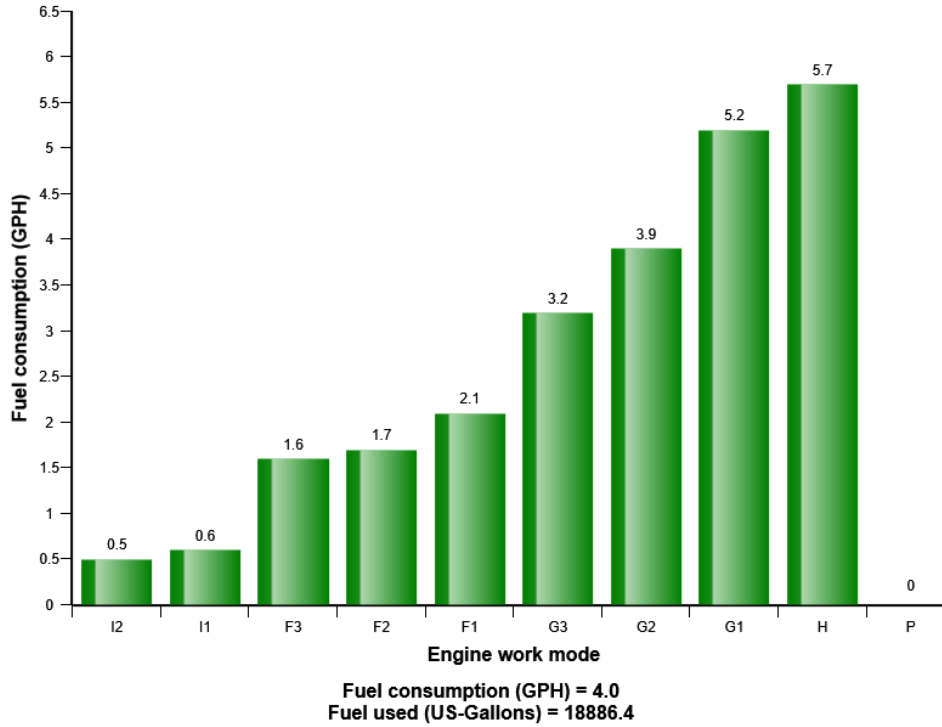
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Main equipment	Type	Equipment
	Track chain	
	X3 piping	
	Main Attachment	
	Attachment Interface	
	Hydraulic Fluid	
	X1 Piping	
	Hose Rupture Valve on Boom	
	Hose Rupture Valve on Arm	
	X1 return filter	



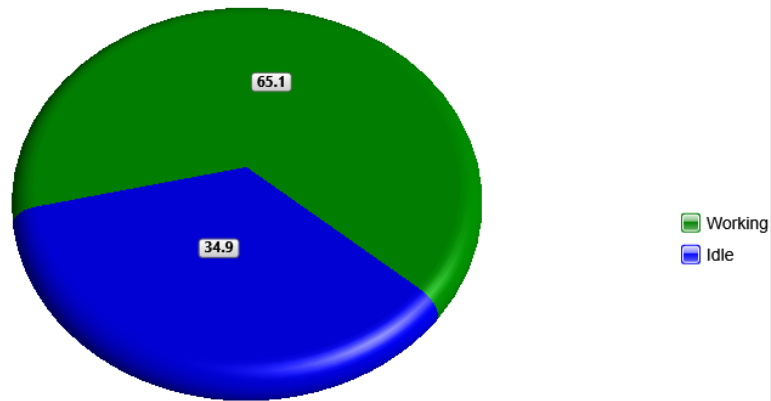
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Fuel consumption distribution on work mode



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



Total logged time (h) = 4695.3

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



Machine model	SerialNo	Operating Hours	Reading Date
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Regeneration ignored
Total number of ignored regenerations 5

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
* 577	2015	1	20	5	41	21
* 578	2015	1	20	6	5	30
* 1397	2015	5	23	8	1	77
* 1872	2015	10	31	7	10	78
* 1873	2015	10	31	8	29	29



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Regeneration aborted
Total number of aborted regenerations 82

	Op hours	Year	Month	Day	Hour	Minute
*	1193	2015	4	22	15	42
*	1226	2015	4	28	7	13
*	1339	2015	5	16	8	21
*	1370	2015	5	20	11	8
*	1378	2015	5	21	9	9
*	1389	2015	5	22	11	30
*	1418	2015	5	26	15	53
*	1425	2015	5	27	14	3
*	1425	2015	5	27	13	55
*	1478	2015	6	2	15	37
*	1506	2015	6	5	8	50
*	1506	2015	6	5	10	19
*	1508	2015	6	5	11	39
*	1724	2015	7	2	8	20
*	1724	2015	7	2	9	2
*	1743	2015	7	6	9	53
*	1868	2015	10	30	15	45
*	1873	2015	10	31	8	29
*	2040	2015	11	19	15	40
*	2146	2015	12	8	11	22



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Regeneration duration
Total number of occurrences = 398

	Op hours	Year	Month	Day	Hour	Minute	Duration (min)
*	2096	2015	12	1	12	21	26
*	2100	2015	12	2	4	59	27
*	2108	2015	12	2	13	15	27
*	2114	2015	12	3	7	35	27
*	2119	2015	12	3	12	40	26
*	2124	2015	12	4	6	34	26
*	2129	2015	12	4	11	49	28
*	2134	2015	12	7	5	26	26
*	2140	2015	12	8	5	31	27
*	2146	2015	12	8	11	9	13
*	2146	2015	12	8	11	46	26
*	2150	2015	12	9	6	18	27
*	2156	2015	12	9	11	49	27
*	2161	2015	12	10	5	42	27
*	2166	2015	12	10	11	8	26
*	2171	2015	12	11	4	46	28
*	2177	2015	12	11	10	29	26
*	2184	2015	12	12	8	23	27
*	2189	2015	12	14	6	1	27
*	2194	2015	12	14	11	10	27



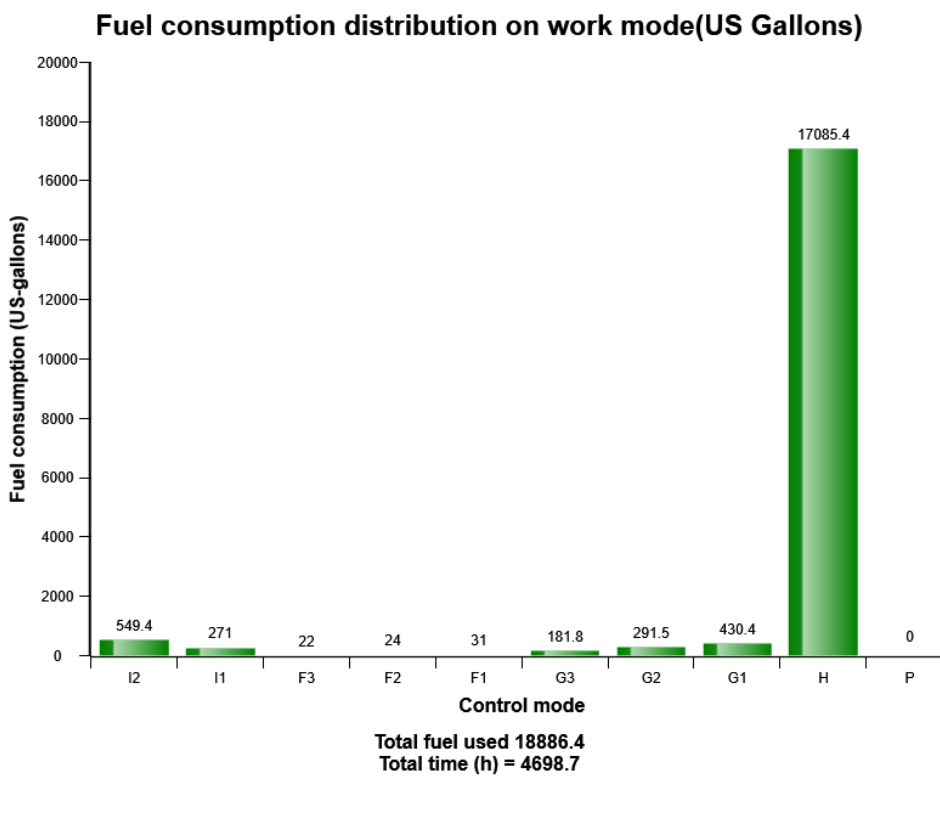
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Regeneration intervals
Total number of occurrences = 1583

	Op hours	Year	Month	Day	Hour	Minute	Duration (min)
*	2187	2015	12	14	4	7	114
*	2189	2015	12	14	6	28	281
*	2194	2015	12	14	11	37	28
*	2195	2015	12	14	12	37	4
*	2195	2015	12	14	14	30	13
*	2195	2015	12	14	14	52	34
*	2196	2015	12	15	8	23	34
*	2196	2015	12	15	9	5	19
*	2197	2015	12	15	10	5	15
*	2197	2015	12	15	10	42	17
*	2197	2015	12	15	11	48	19
*	2197	2015	12	15	12	33	15
*	2198	2015	12	15	13	44	10
*	2198	2015	12	15	13	26	10
*	2198	2015	12	15	13	3	4
*	2198	2015	12	16	6	36	23
*	2198	2015	12	15	14	1	10
*	2199	2016	1	12	9	16	2
*	2199	2015	12	16	13	2	12
*	2199	2015	12	16	10	29	11



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Definition:

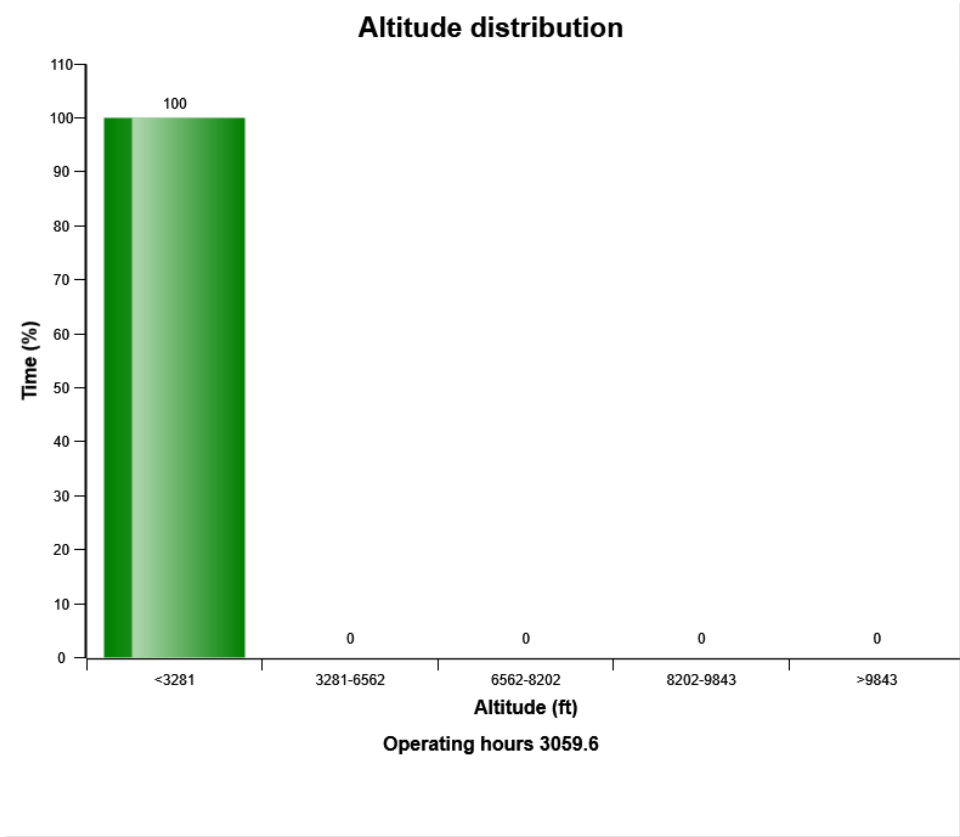
The diagram describes the amount of fuel consumed per engine speed mode distribution.

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.



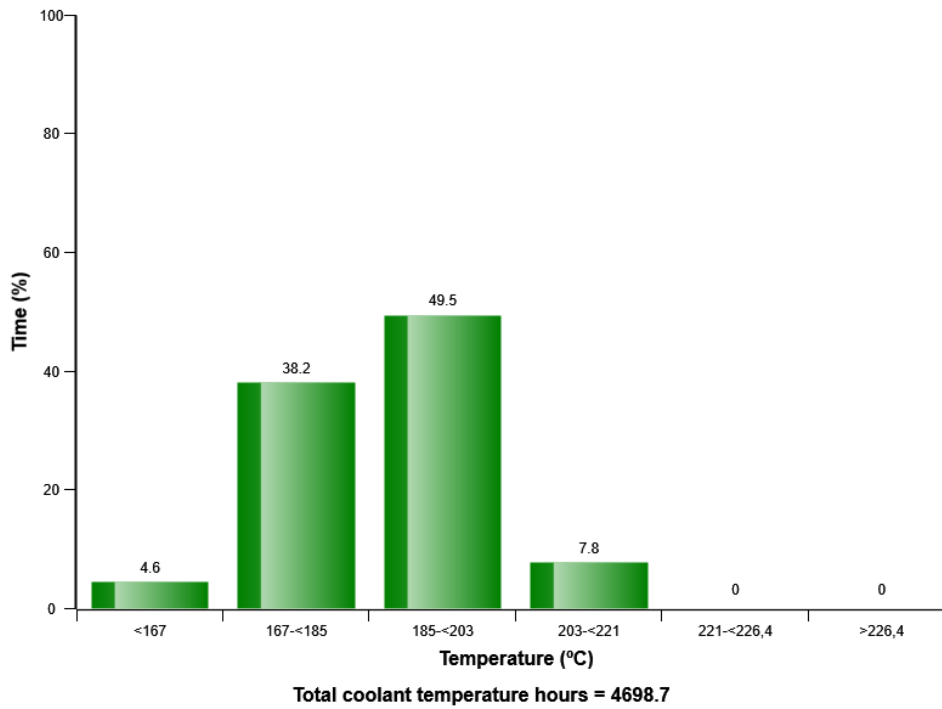
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Altitude distribution

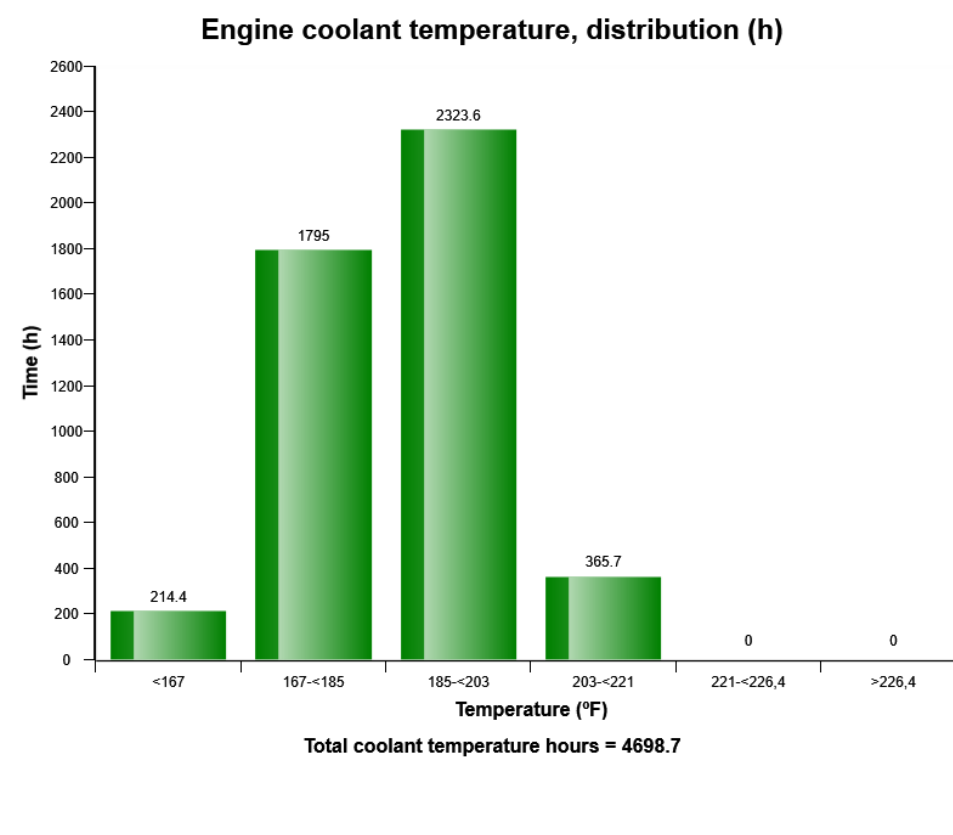


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Engine coolant temperature, distribution (%)



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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



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region.

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

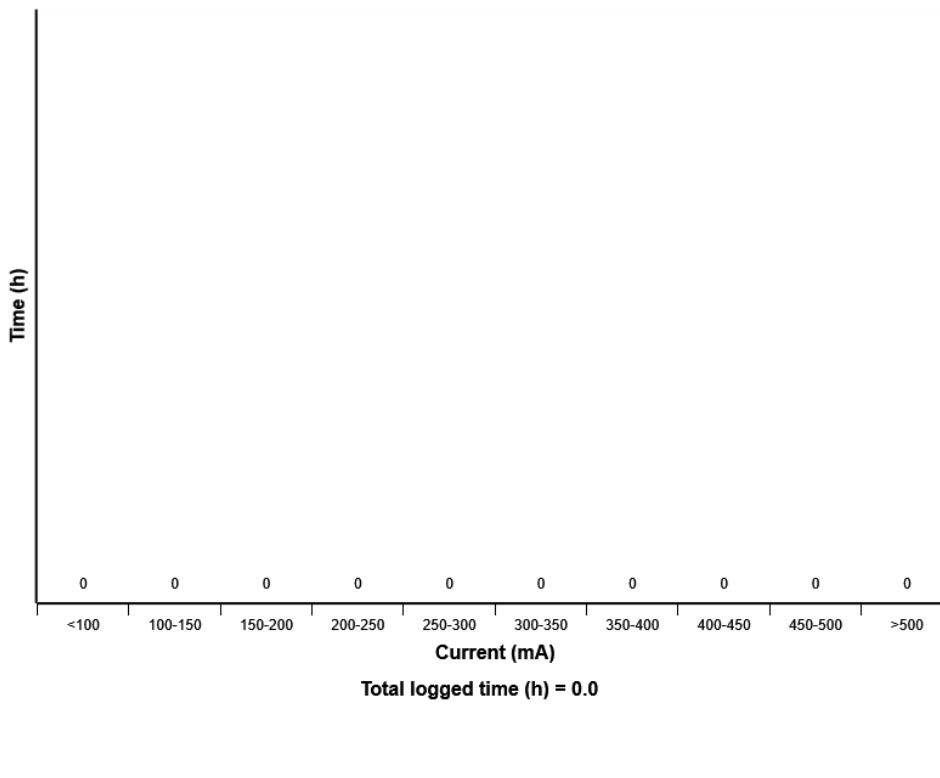
Red bar = Alarm.

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



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Cooling Fan, speed control current distribution(h)



Definition:

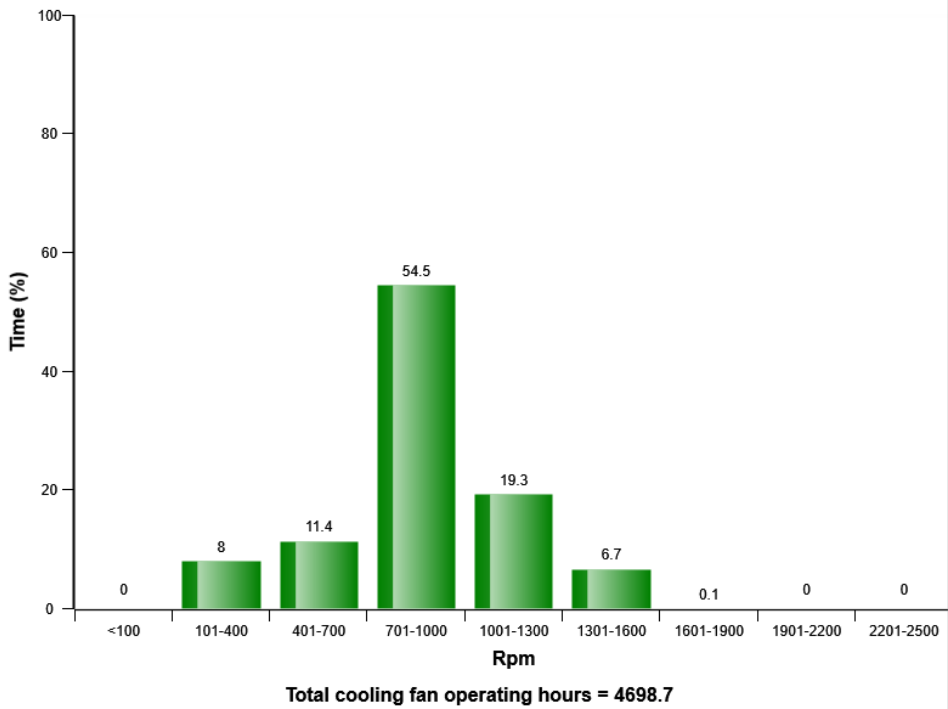
The diagram describes Hydraulic Cooling fan speed control, Current (mA) distribution, on fan speed Control..

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



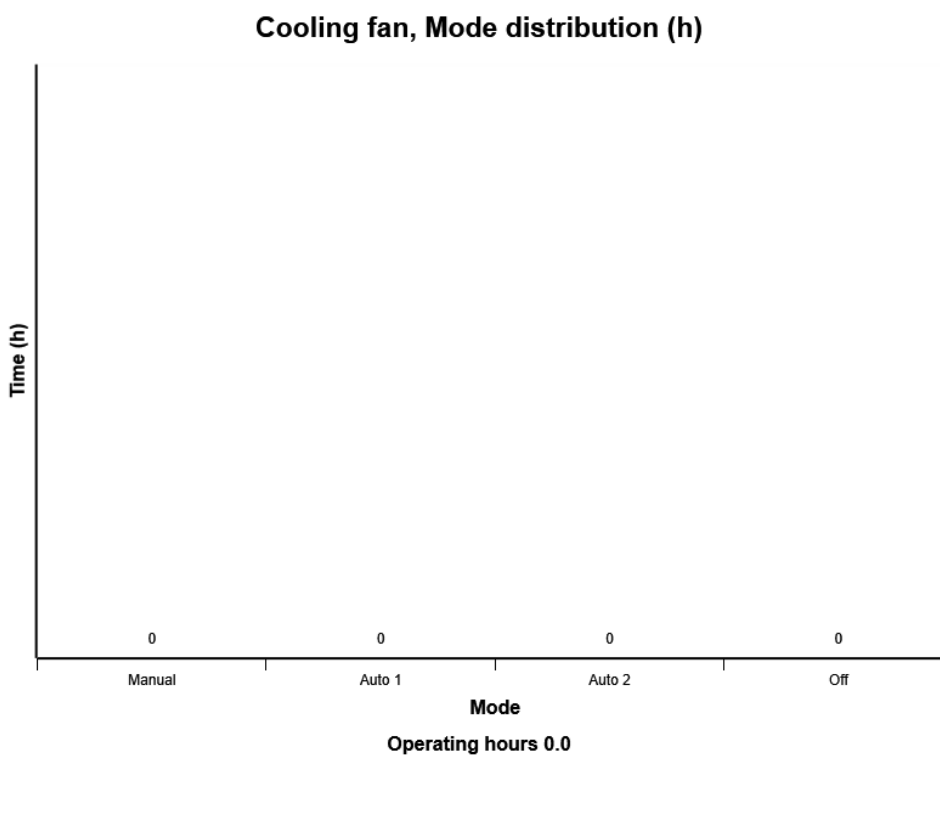
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Cooling fan (clutch type) speed distribution (%)



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Cooling fan, Mode distribution (h)



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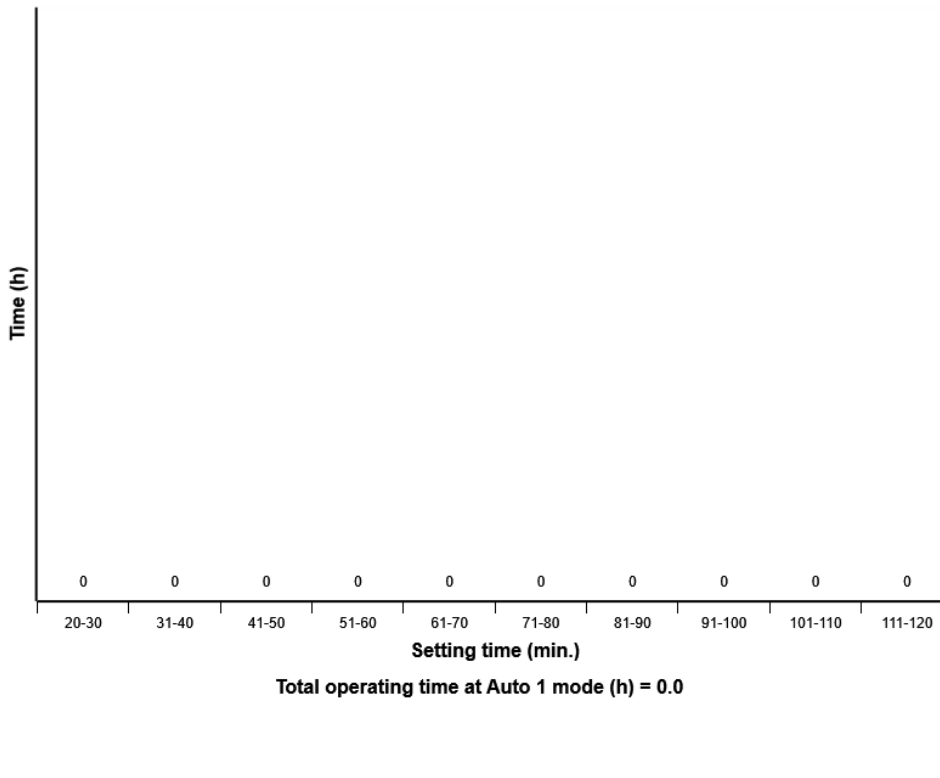
Cooling fan, Normal-Reverse rotation distribution (%)

Total operating time (h) = 4698.7



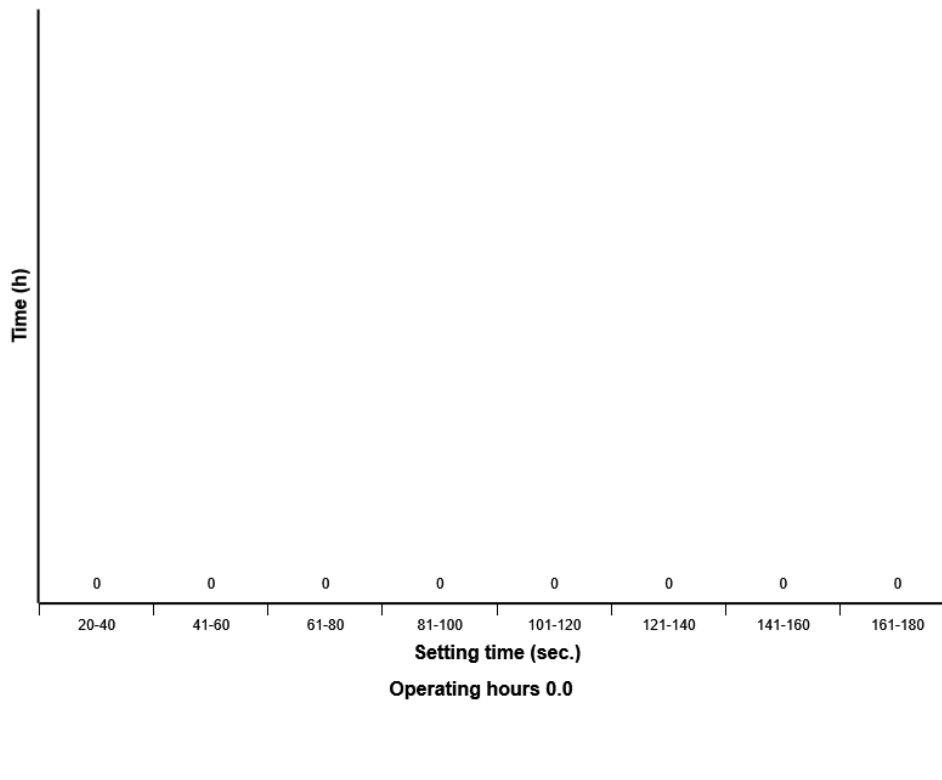
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Reverisble fan, Time setting distribution (h) at Auto 1 mode



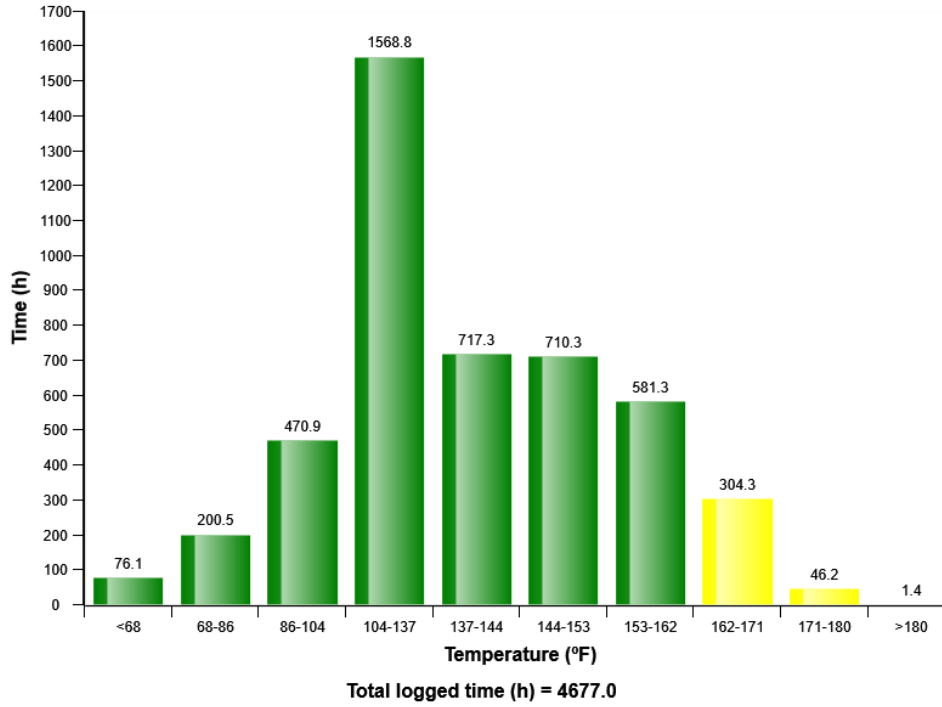
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Reversible fan, Time setting distribution (h) at Manual mode

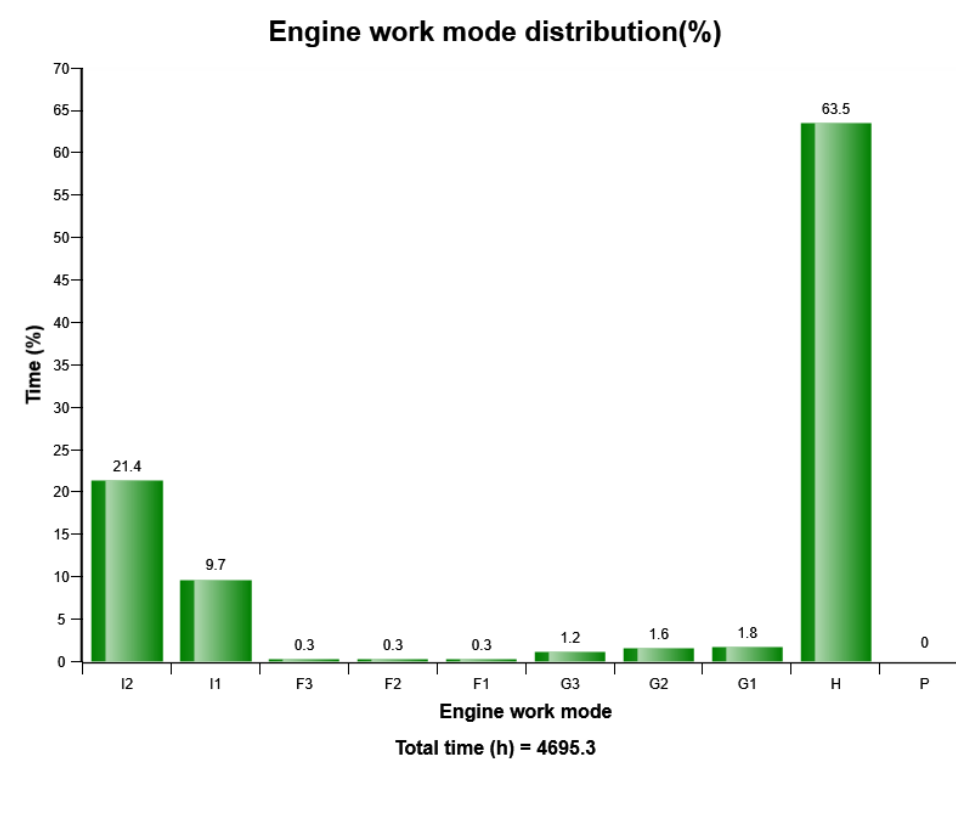


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Engine boost air temperature distribution (h)



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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.

The sum of time distribution in percentage is 100

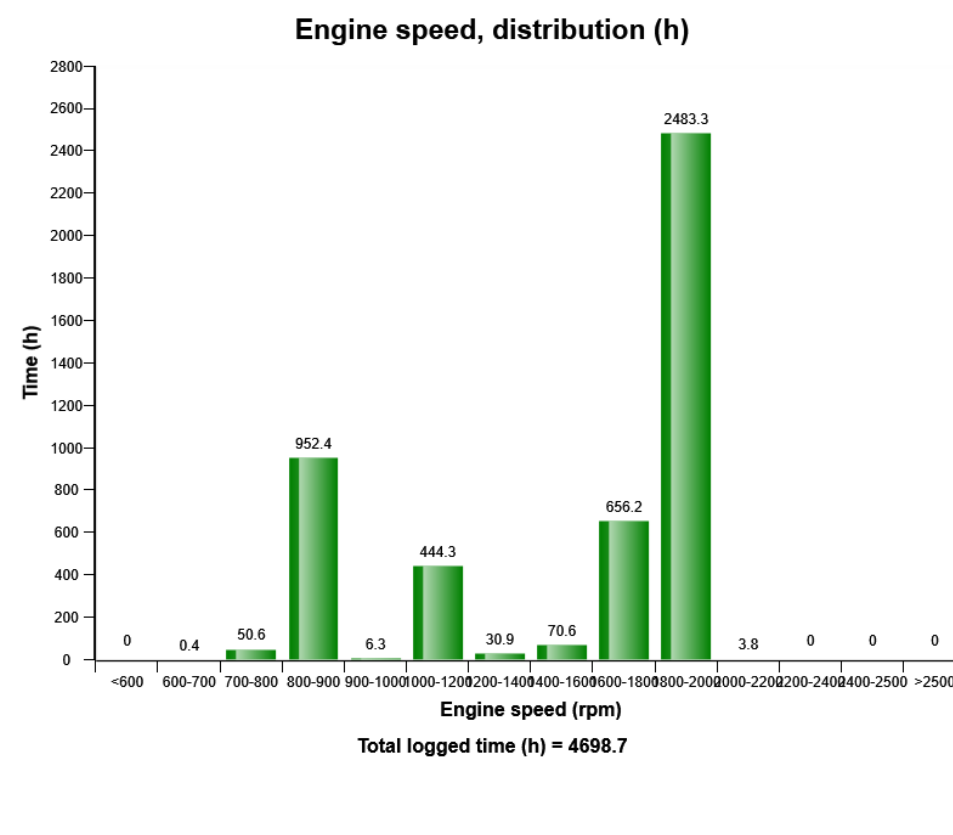


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Total time (h) is listed below the diagram



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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.

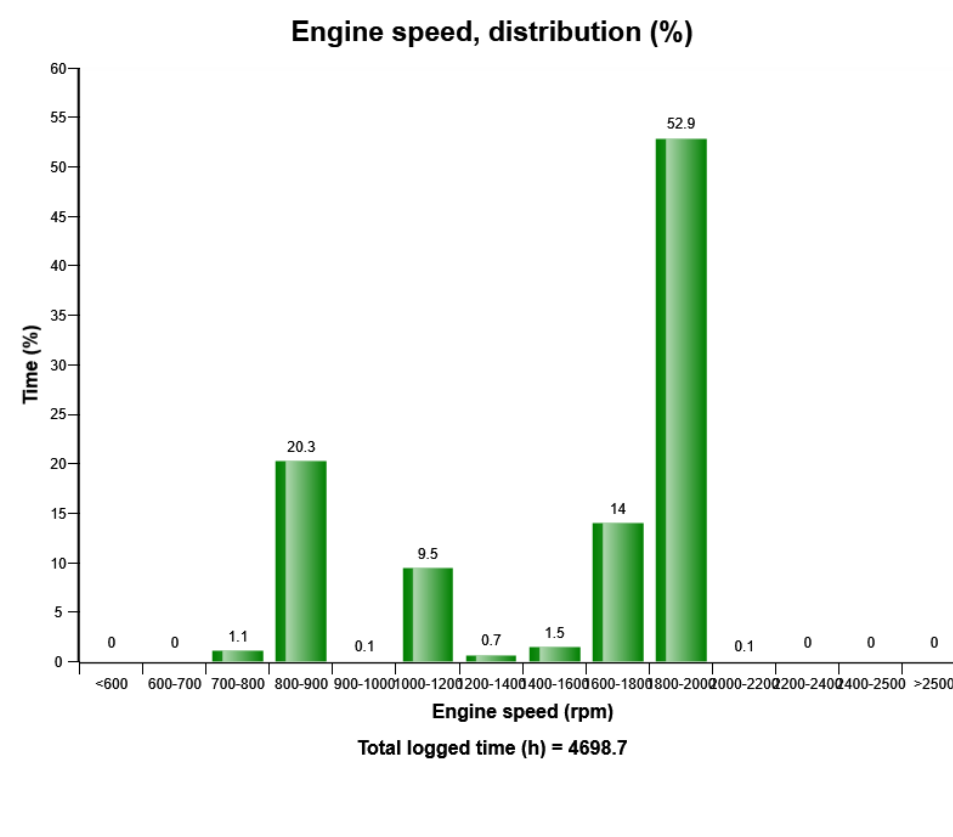
Green bars = Normal engine speed range.

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

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



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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.



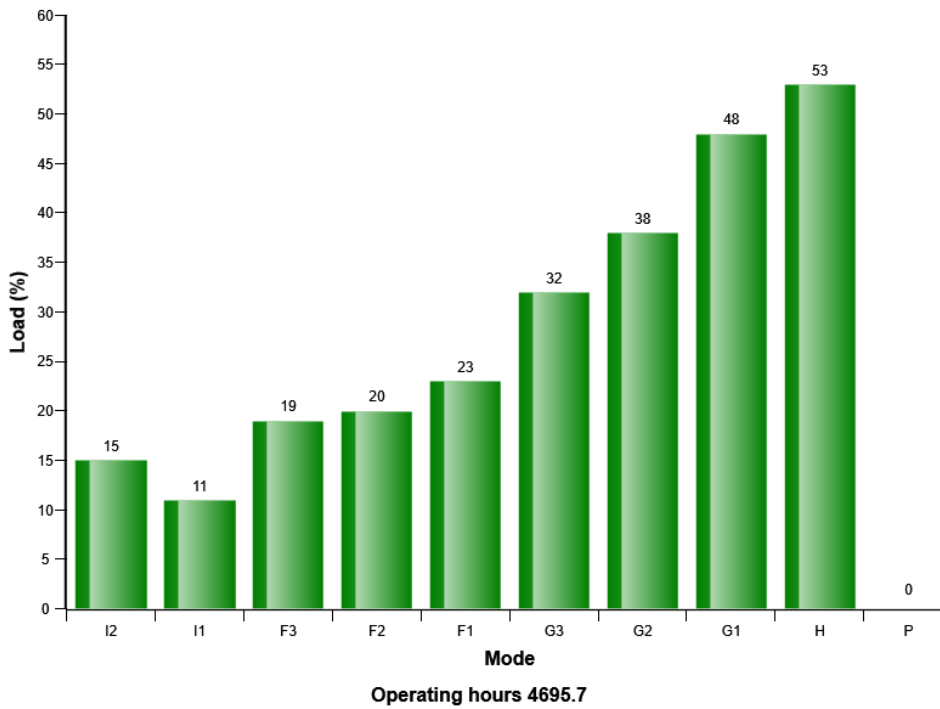
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Exceeding the maximum design speed may cause severe damage to the engine

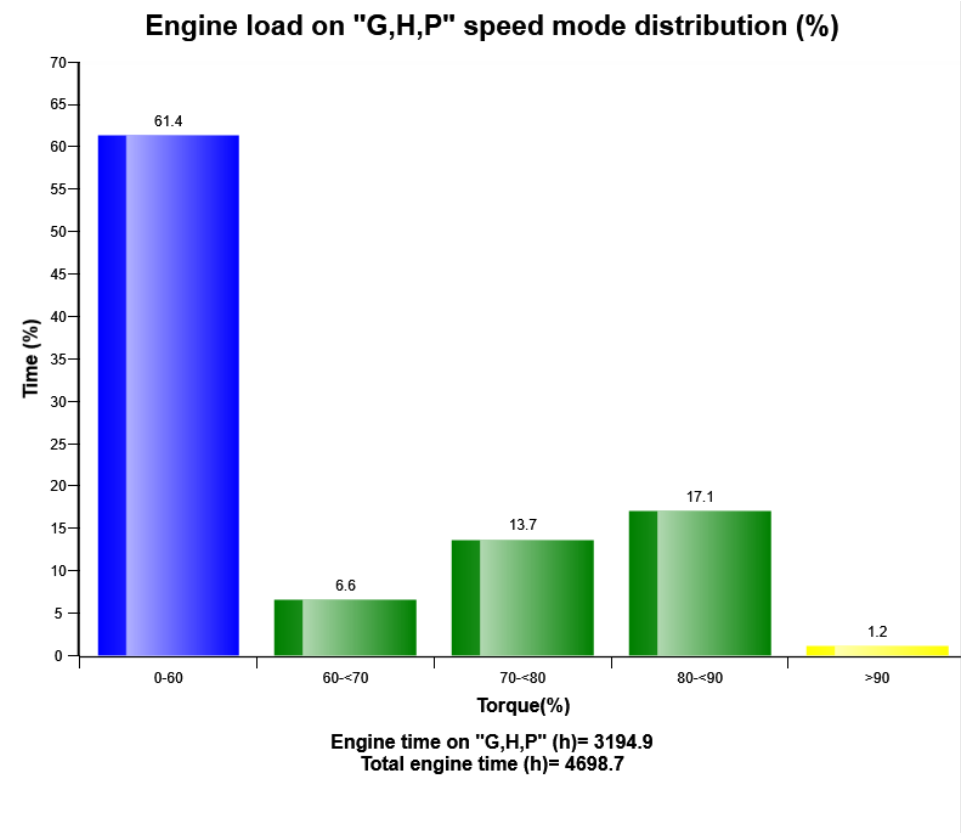


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Average engine load per mode distribution (%)



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This graph shows the distribution of the engine load.

Blue bar: Low load

Green bar: Normal load

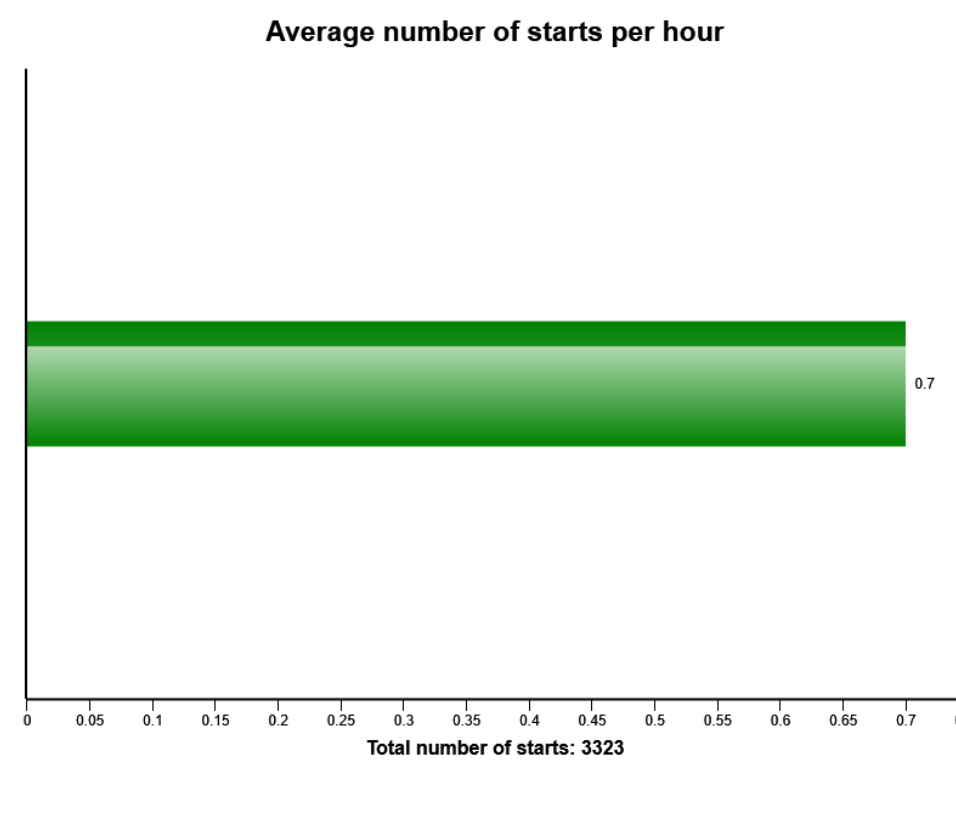
Yellow bar: Excessive load

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

The sum of bars is 100%.



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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."

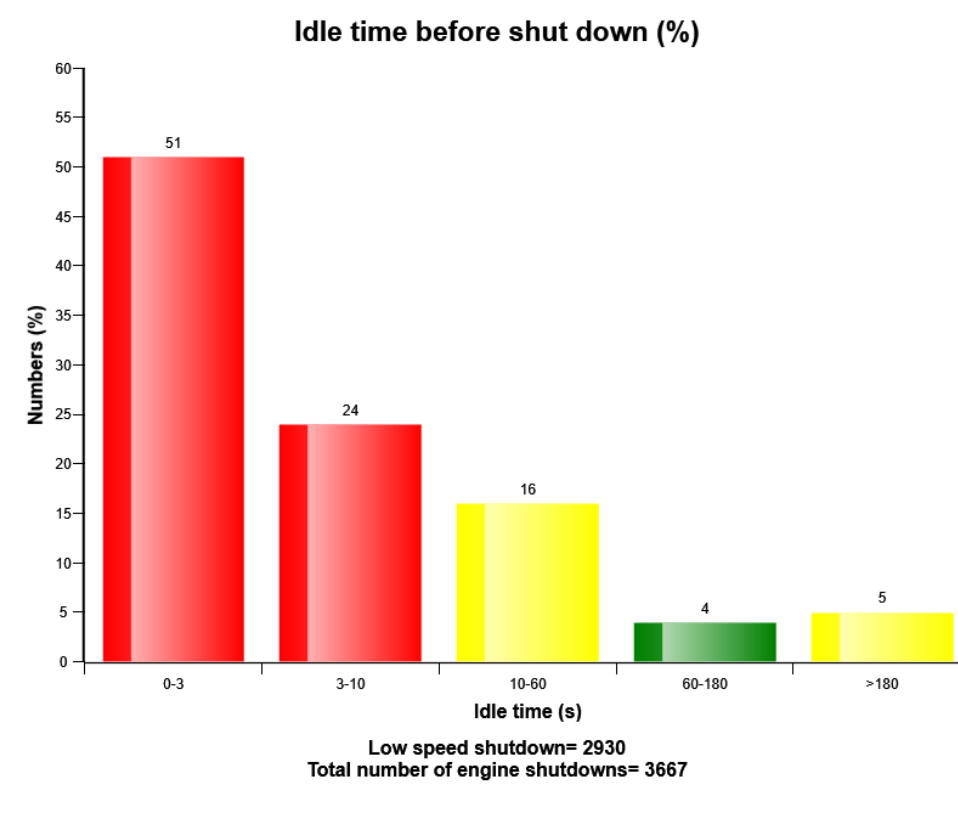


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Green bar = Number of average starts per hour



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Definition:

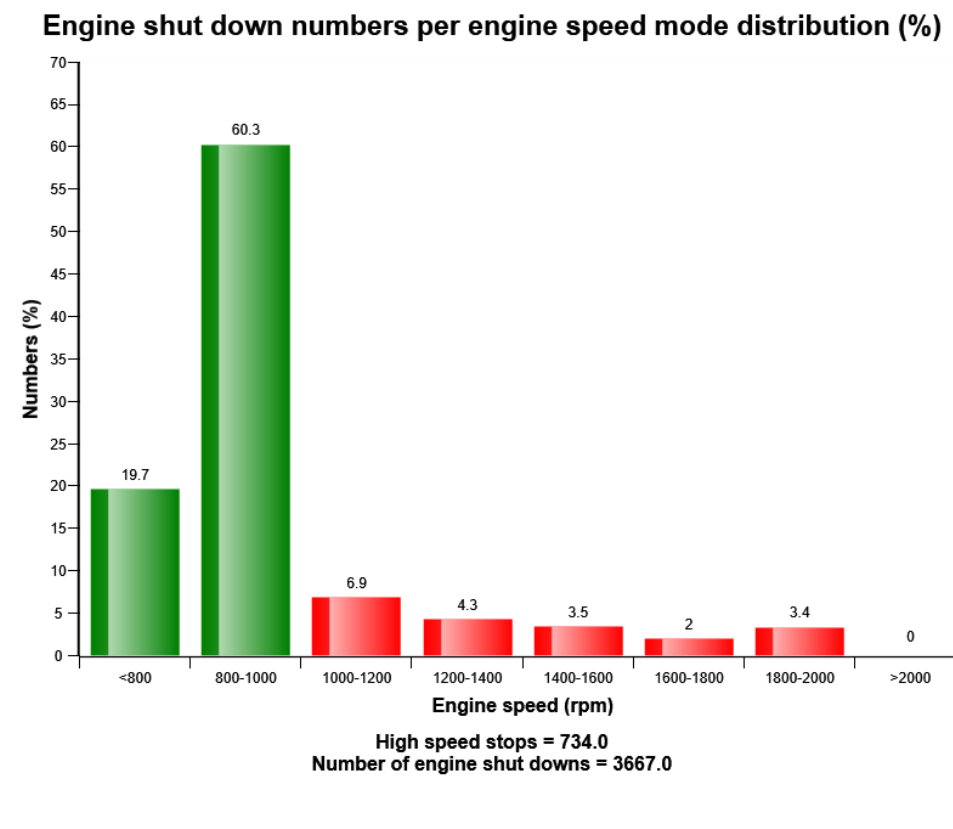
This graph shows the distribution of delayed time at low idle speed until the engine is turned off.

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

The sum of bars is 100%.



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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.



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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 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 occurrences = 95

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)
* 0	2014	11	20	10	46	703
* 135	2094	11	19	7	33	16
* 144	2094	11	20	5	31	6
* 144	2094	11	20	5	21	242
* 146	2094	11	20	7	27	113
* 147	2094	11	20	8	15	383
* 148	2094	11	20	9	17	1770359606
* 148	2014	11	20	9	28	25
* 148	2014	11	20	9	27	20
* 148	2014	11	20	9	26	12
* 148	2014	11	20	9	24	53
* 563	2015	1	17	4	22	322
* 568	2015	1	19	4	11	224
* 583	2015	1	21	4	22	97
* 592	2015	1	22	3	35	336
* 603	2015	1	23	4	12	1365
* 606	2015	1	23	12	20	26
* 609	2015	1	24	4	19	6
* 1830	2015	10	26	4	9	97
* 2110	2015	12	3	3	49	107

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
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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."



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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.

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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



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Fuel Filter Clogging
Total number Fuel filter clogging = 28

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)
* 2189	2014	8	17	13	53	37
* 2189	2014	8	17	14	54	1
* 2190	2014	8	17	15	14	8
* 2190	2014	8	17	15	27	1
* 2190	2014	8	17	15	57	51
* 2191	2014	8	17	18	42	1
* 2191	2014	8	17	18	58	157
* 2194	2014	8	18	17	5	1
* 381	2012	4	17	6	42	4
* 381	2012	4	19	6	4	2
* 382	2012	4	20	7	14	1
* 382	2012	4	20	7	20	1
* 382	2012	4	20	7	25	1
* 576	2012	5	25	13	57	169
* 2185	2014	8	16	15	7	73
* 2186	2014	8	16	16	21	1
* 2186	2014	8	16	16	41	44
* 2187	2014	8	16	20	29	1
* 2188	2014	8	16	21	0	1
* 2188	2014	8	17	13	3	1



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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.

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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.

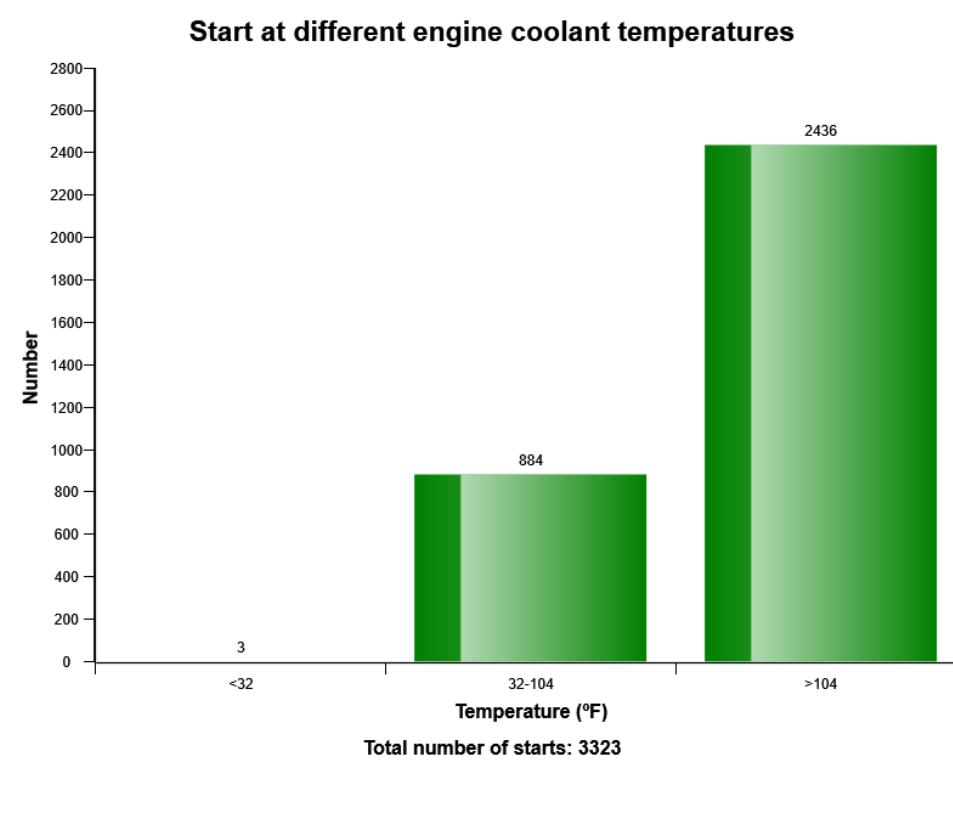
The duration is counted as long as the criteria is fulfilled.

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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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.

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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Duration :

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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."



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Duration :

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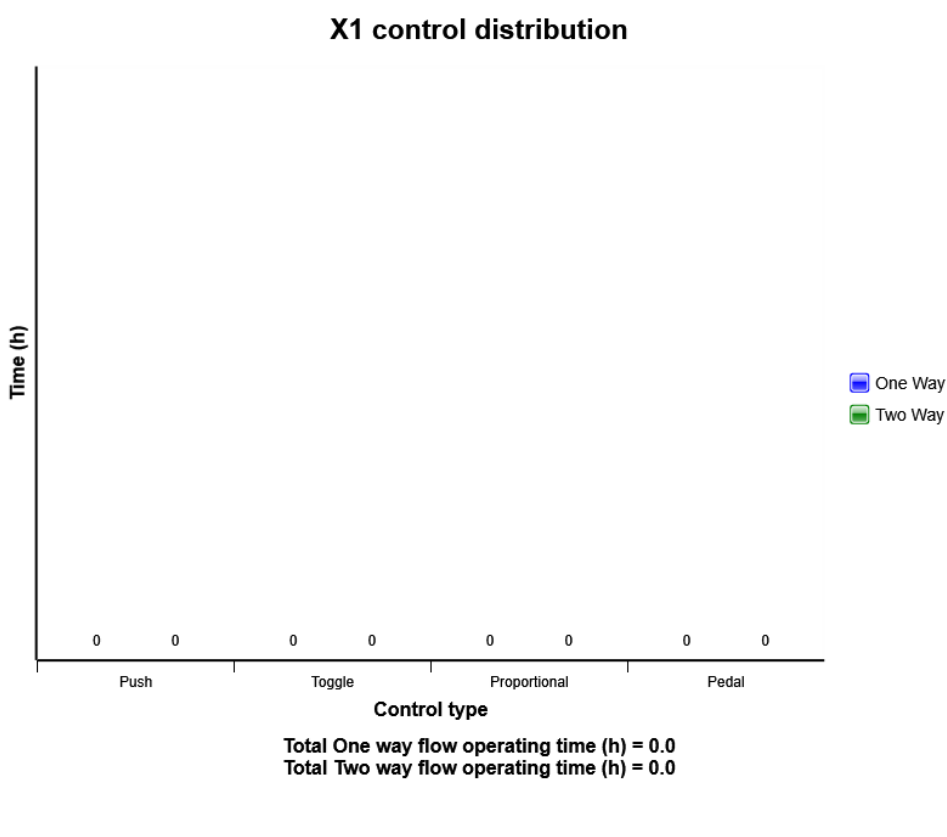
Criteria :

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.



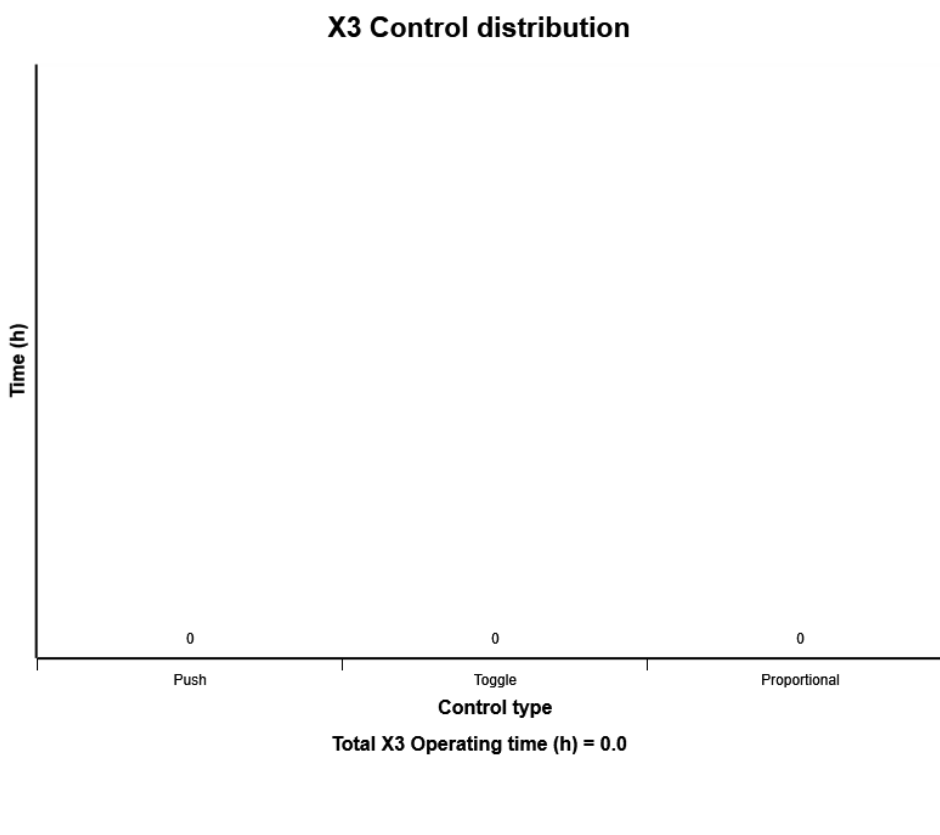
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EC300D	210058	2199.6	1/12/2016

X1 control distribution



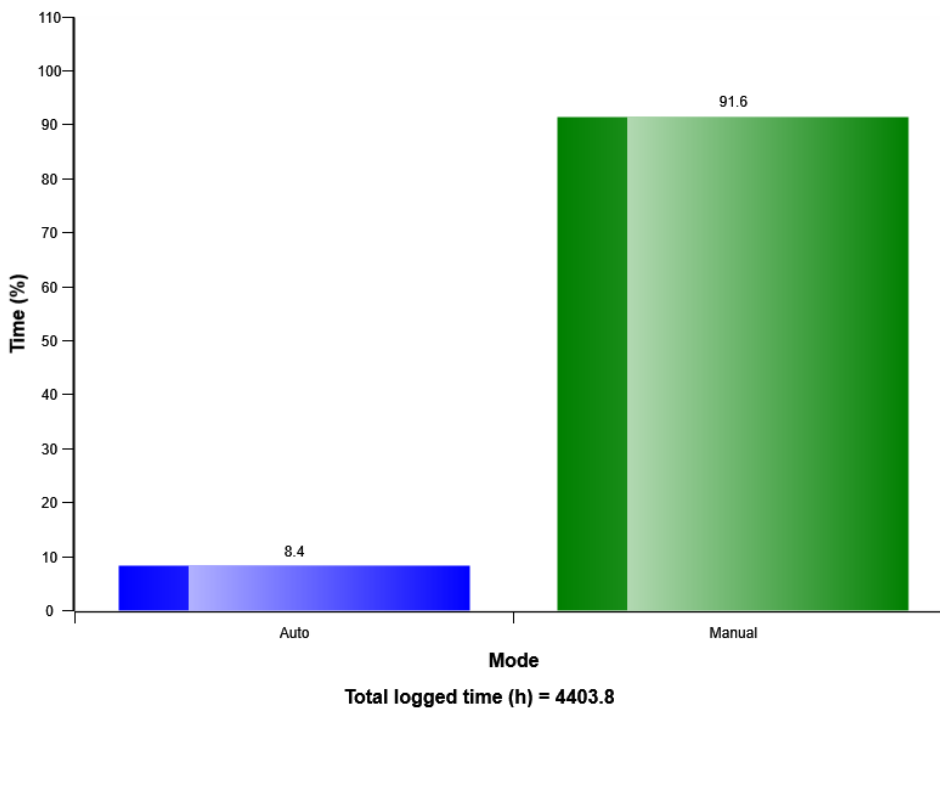
Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

X3 Control distribution



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

HVAC Auto - Manual mode selection distribution (%)



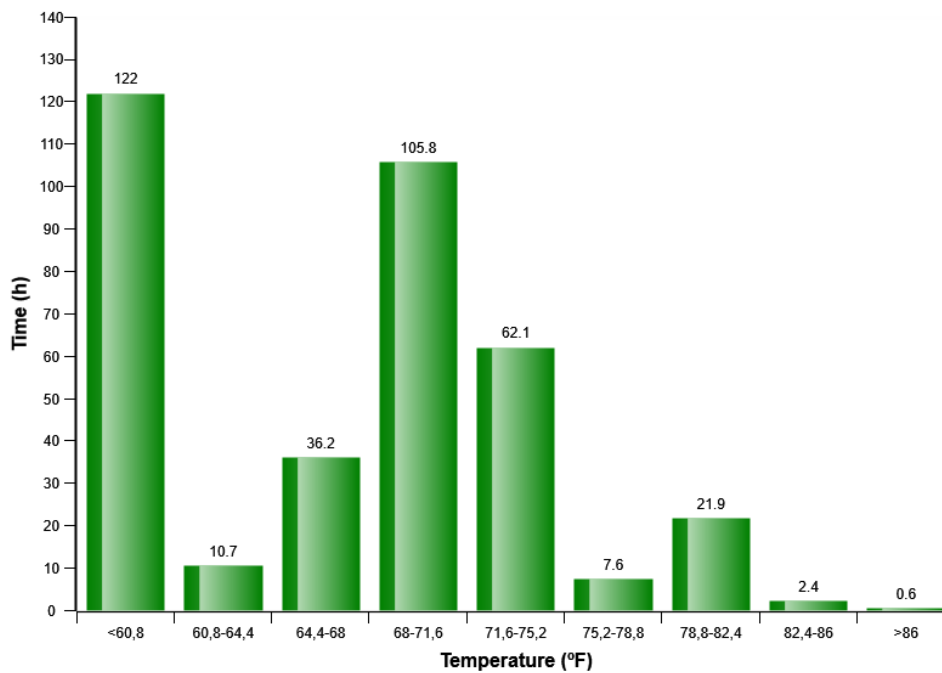
Definition:

The diagram describes auto-manual mode selection 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
EC300D	210058	2199.6	1/12/2016

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



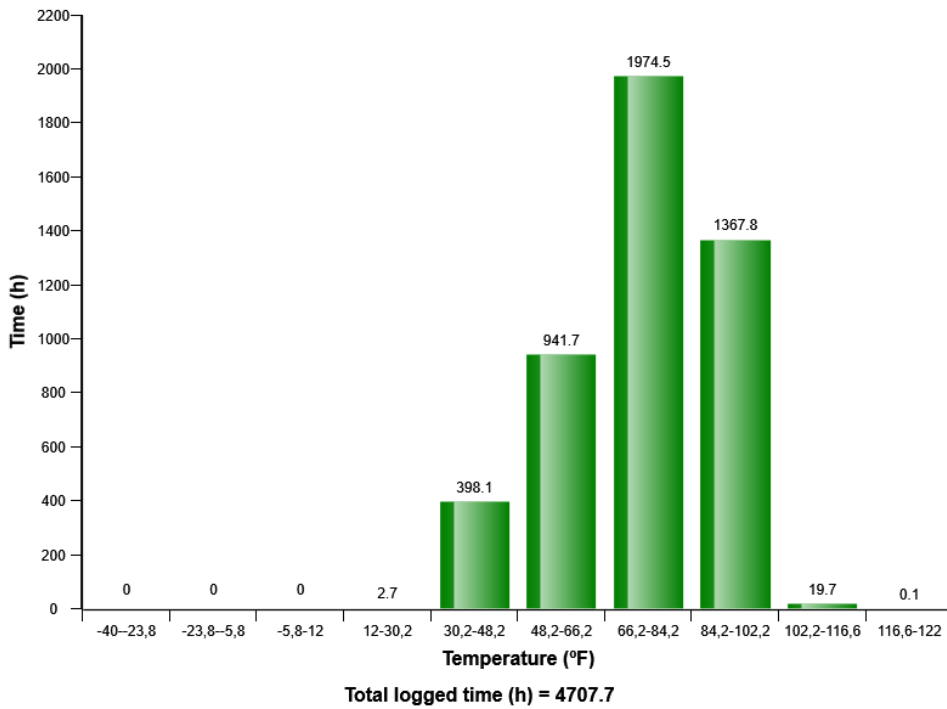
Definition:

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

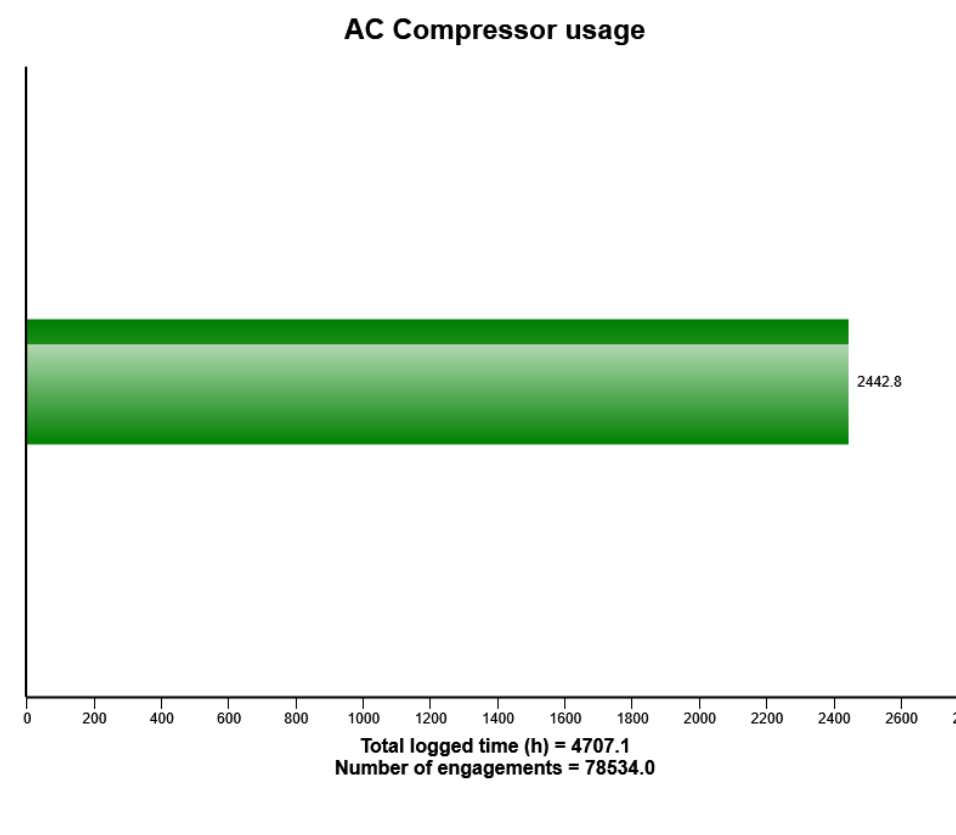


Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

Machine ambient temperature distribution (h)



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016



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.

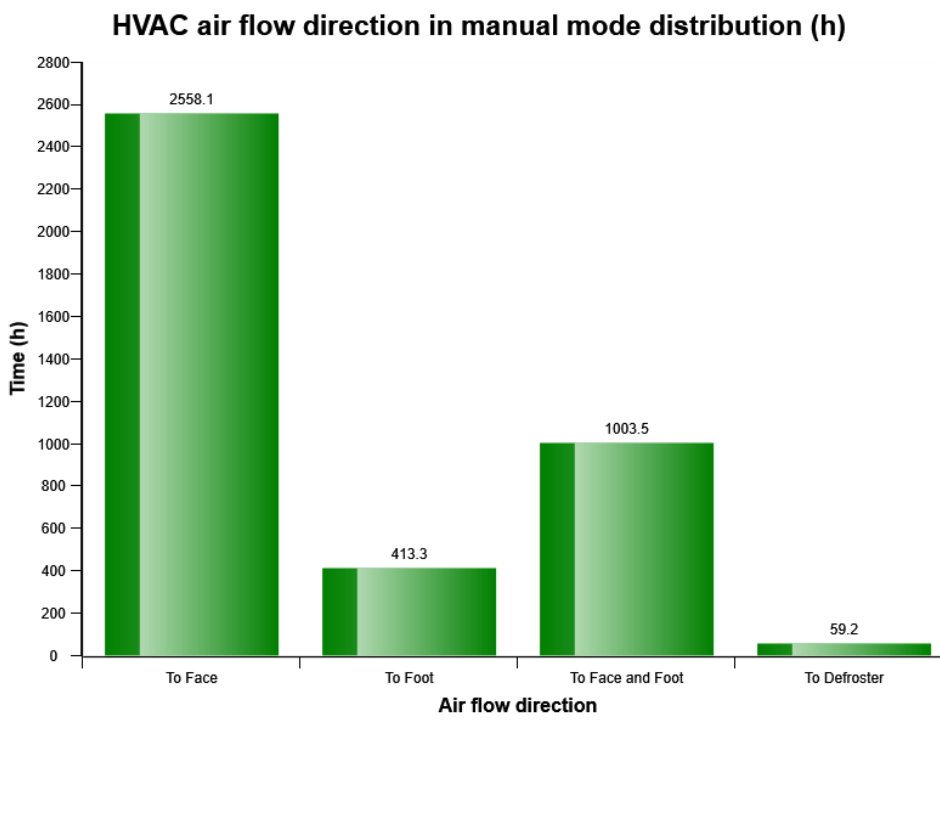
Total number of AC compressor activations is also displayed.



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

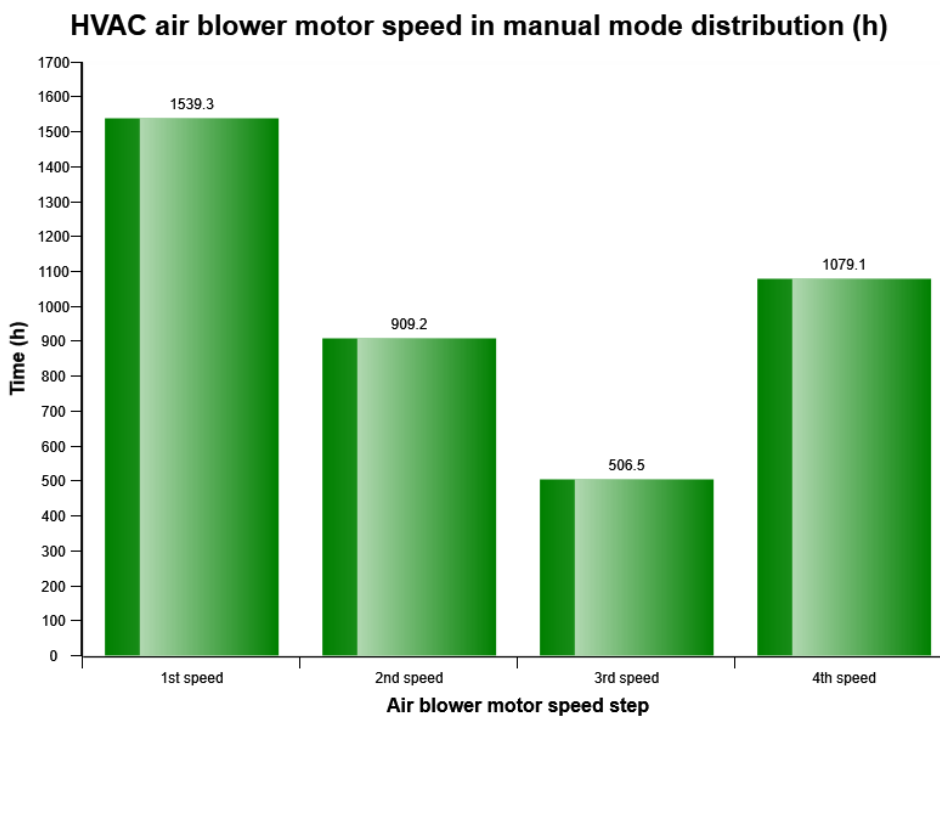


Definition:

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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016



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
EC300D	210058	2199.6	1/12/2016

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.



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

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
EC300D	210058	2199.6	1/12/2016

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 :

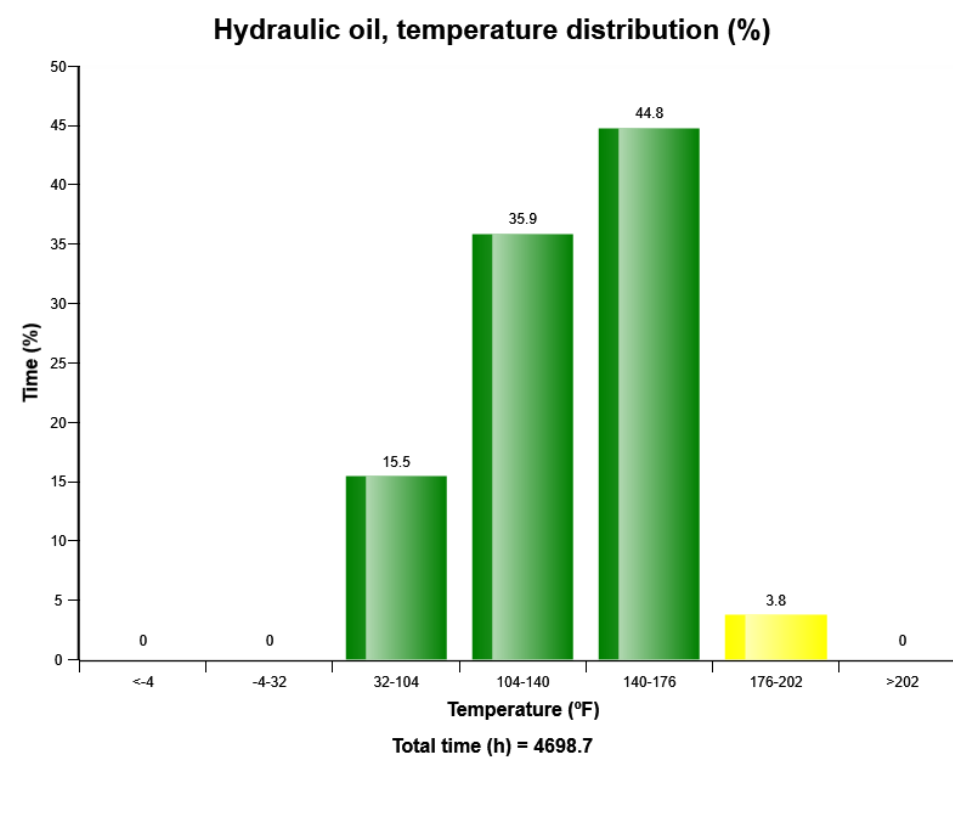
The extreme value column displays the most extreme value during the event.

Criteria :

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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016



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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

region.

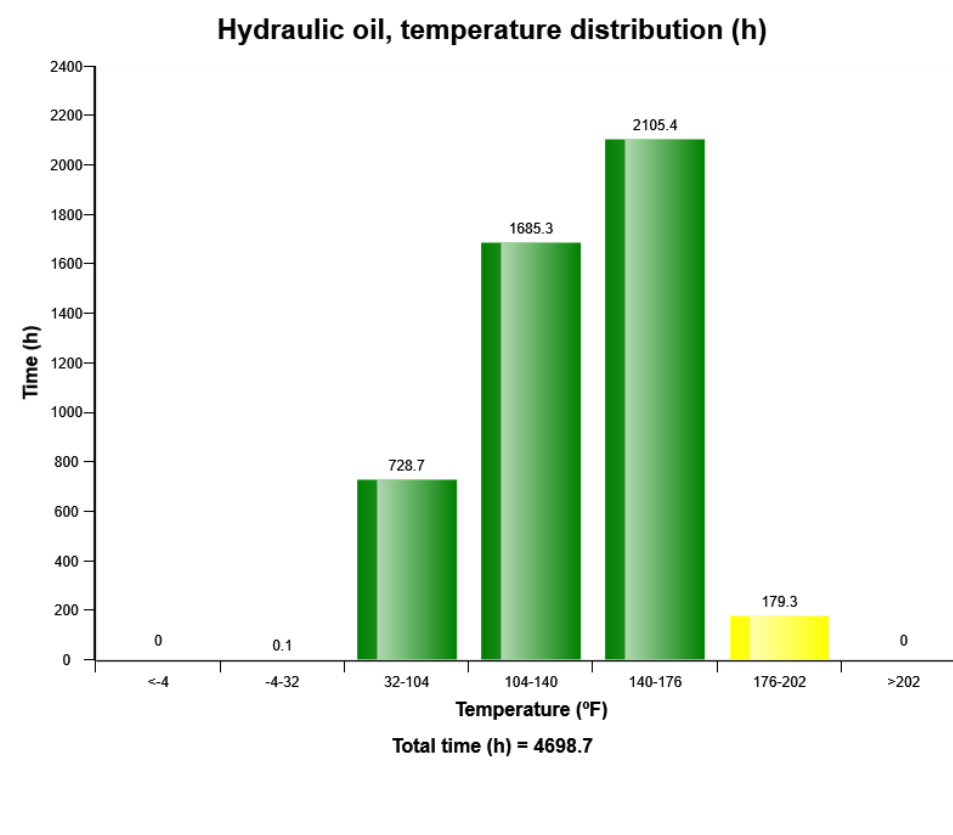
Yellow bar = High working temperature. It is normal to have some registrations in this region.

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
EC300D	210058	2199.6	1/12/2016



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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

region.

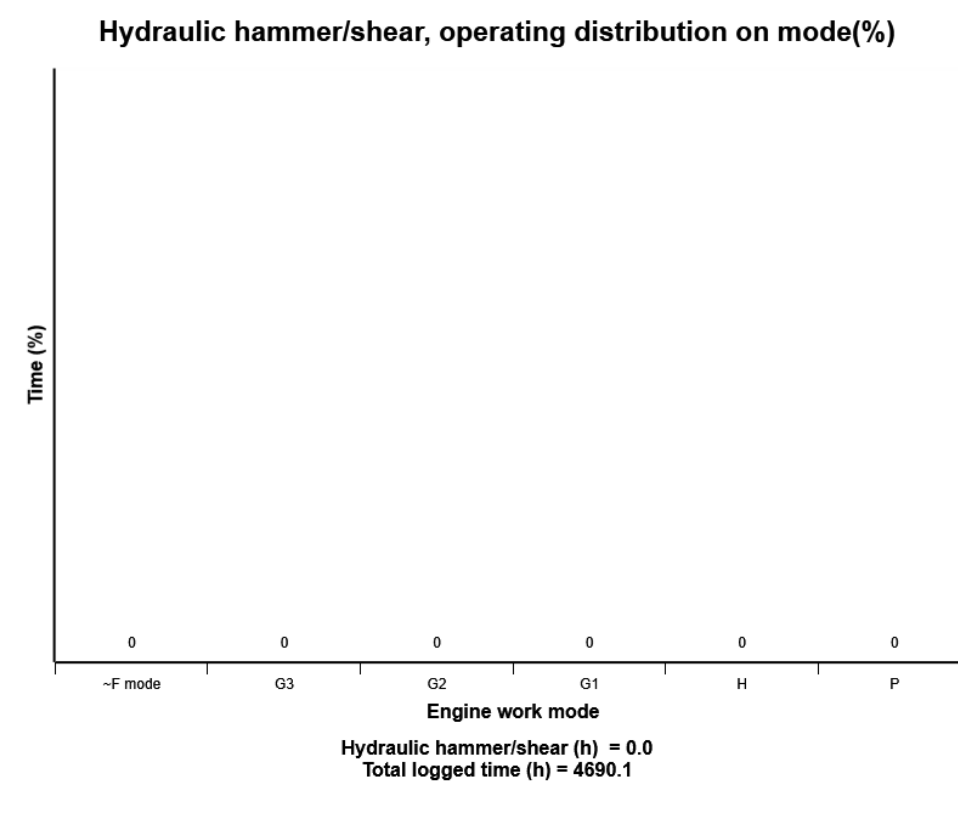
Yellow bar = High working temperature. It is normal to have some registrations in this region.

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
EC300D	210058	2199.6	1/12/2016



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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

G3 = General 3

G2 = General 2

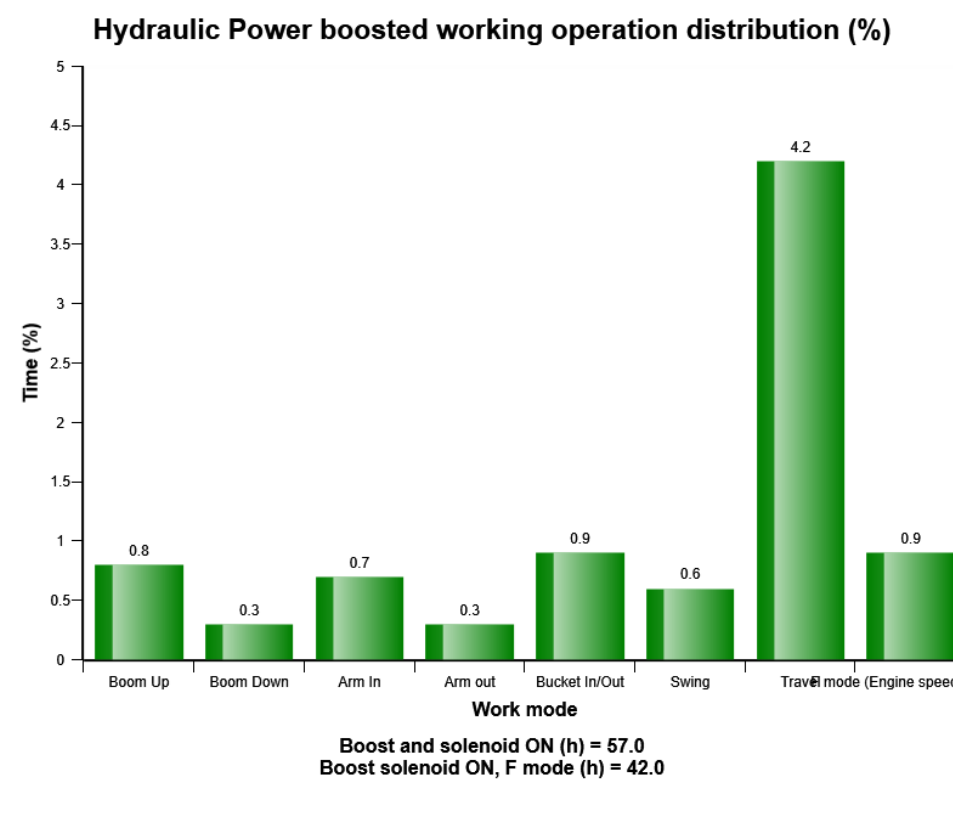
G1 = General 1

H = Heavy Duty

P = Power max



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016



Definition:

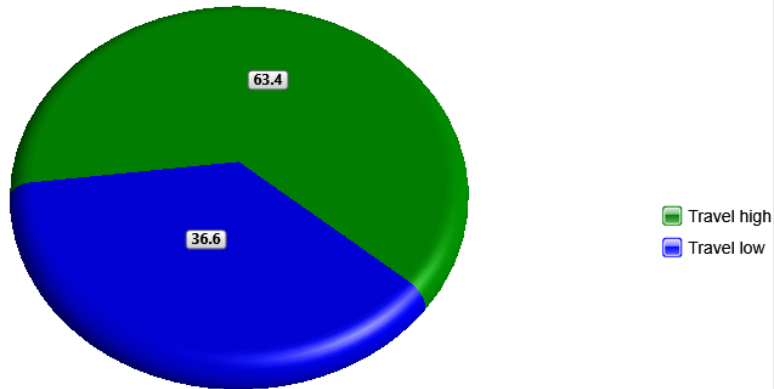
The diagram describes Power boosted operating time distribution, when main relief pressure increases on working operation modes. In this diagram, the sum of time (%) of each working operation mode can exceed 100%. It means that customer has been operated several working operations at the same time.

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
EC300D	210058	2199.6	1/12/2016

Travel speed, high/low (%)



Total travel time (h) = 275.7
Travel time / Operating hours (%)= 5.9

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

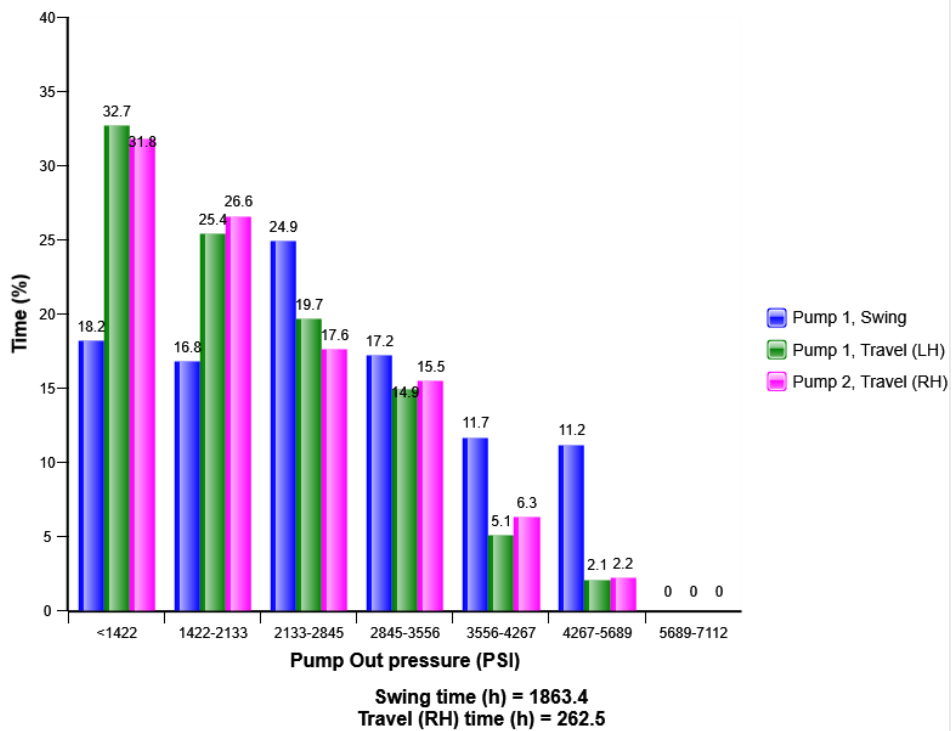
The sum of travel time in percentage is 100

Total travel time is listed below the diagram



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

Pump pressure on travel and swing distribution (%)



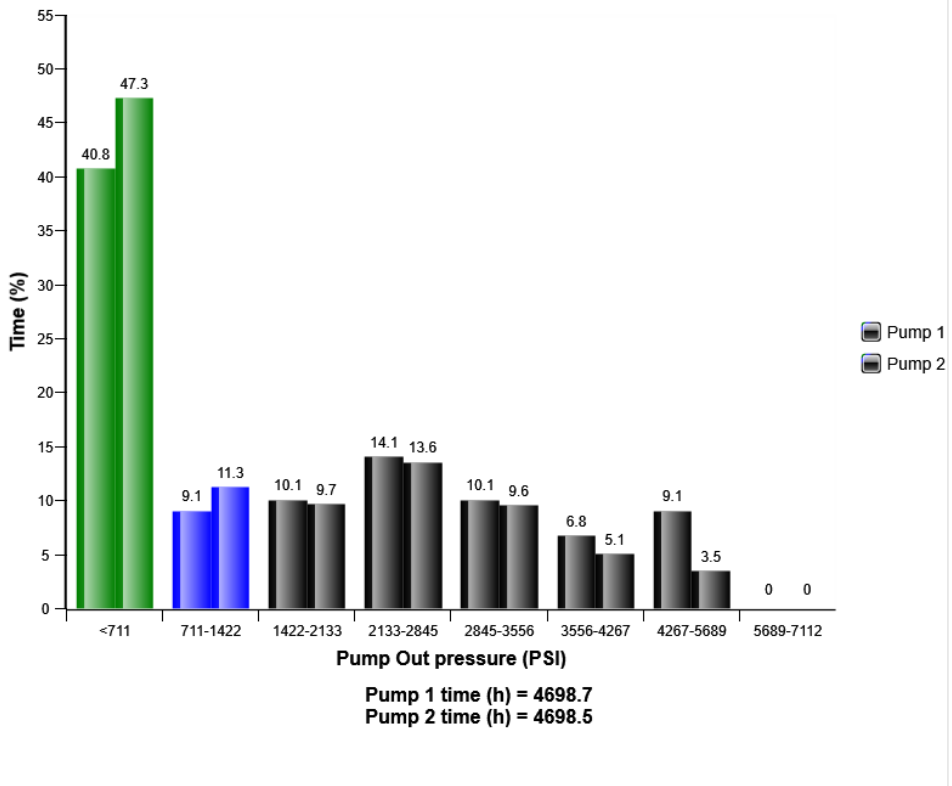
Definition:

The diagram describes Pump outlet pressure of 2 Pumps for travel and swing operation distribution. In case operator use several operations at the same time, this pressure distribution for travel and swing operation can be different from actual operating pressure distribution for travel and swing operation in field.



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

Pump pressure overall distribution (%)



Definition:

The diagram describes Pump outlet pressure of 2 Pumps distribution.



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

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.

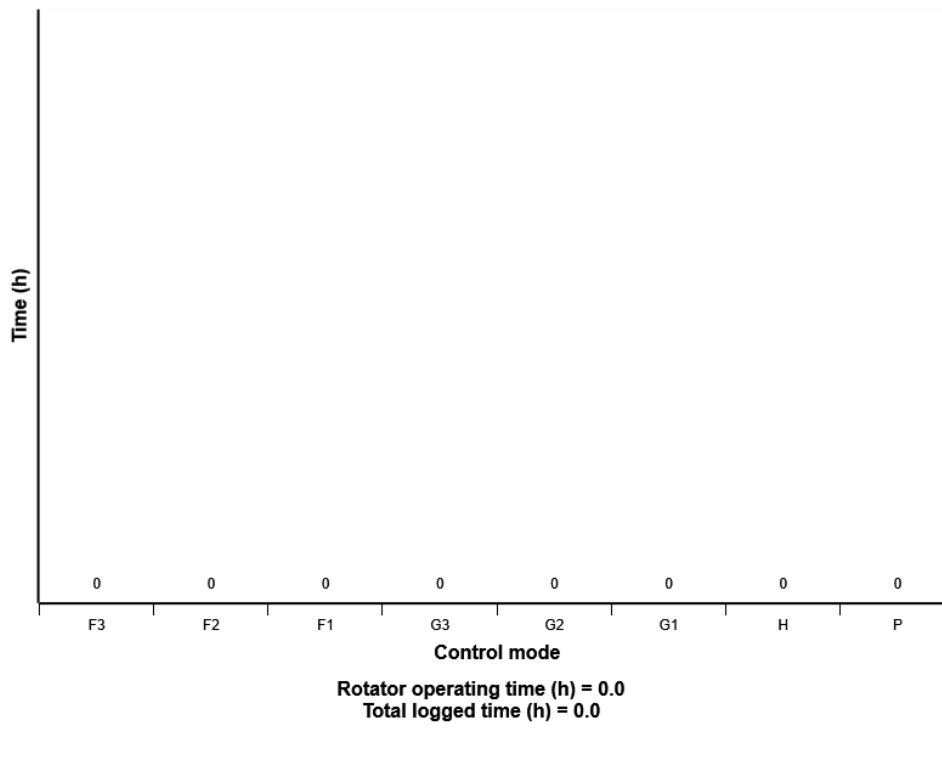
Criteria :

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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

Rotator operation on engine speed mode distribution (h)



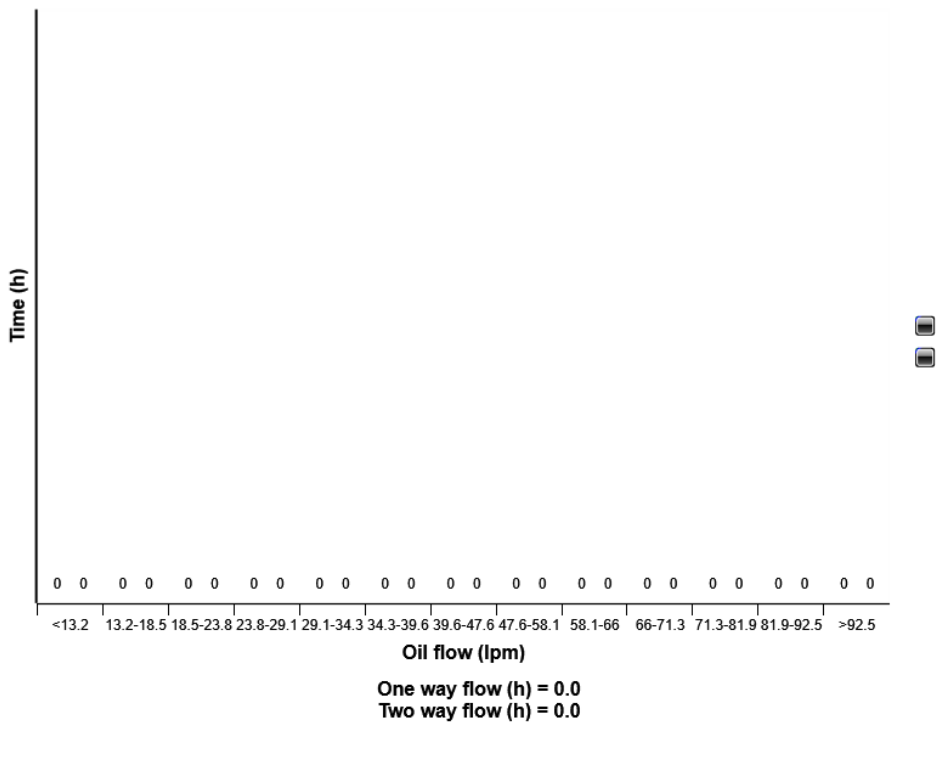
Definition:

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



Machine model	SerialNo	Operating Hours	Reading Date
EC300D	210058	2199.6	1/12/2016

X1 hydraulic oil flow control distribution



Definition:

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

