

# VOLVO CONSTRUCTION EQUIPMENT MATRIS REPORT

Machine model EC350E	SerialNo 310328	Operating Hours 5207.7	Reading Date 27/03/2020
Company name Hoffman	Dealer HOFFMAN	Report Issuer	
Contact name	Technician Edwin Cabrera	Primary Application Civil engineering/Heavy construction	
Site	Workorder	Ground Condition	

MATRIS Reading, Summary / Recommendation

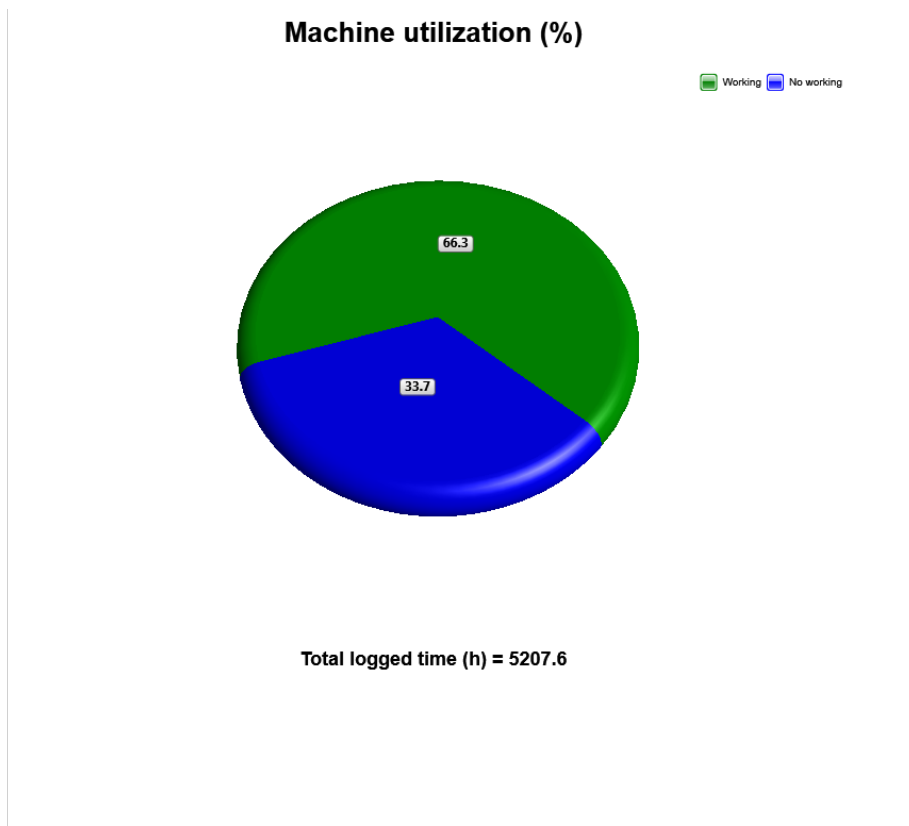


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Main equipment	Type	Equipment
	Track chain	
	X3 piping	
	Main Attachment	
	Attachment Interface	
	Hydraulic Fluid	
	X1 Piping	
	Hose Rupture Valve on Boom	
	Hose Rupture Valve on Arm	
	X1 return filter	



Machine model	SerialNo	Operating Hours	Reading Date
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**Definition:**

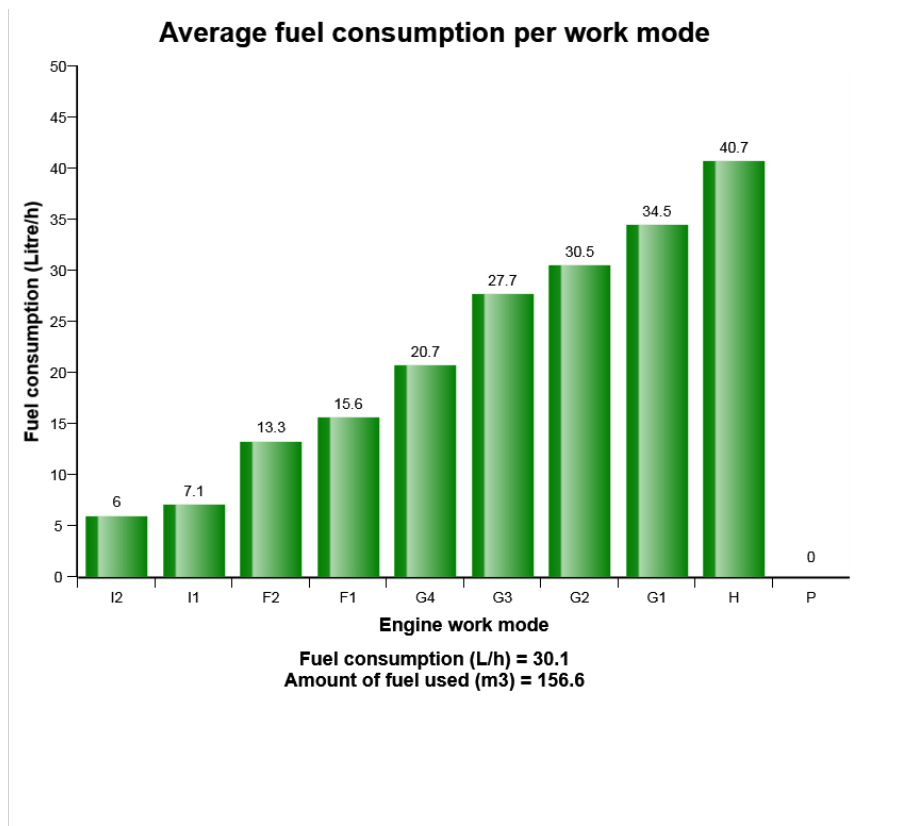
The graph shows the distribution of the operating time for the machine. The operating time is defined as the time with engine on

**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



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### Definition:

This diagram shows the fuel consumption distribution rate on each work mode.

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

### Explanation:

Y-axis: The rate of the fuel consumption on each work mode.

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



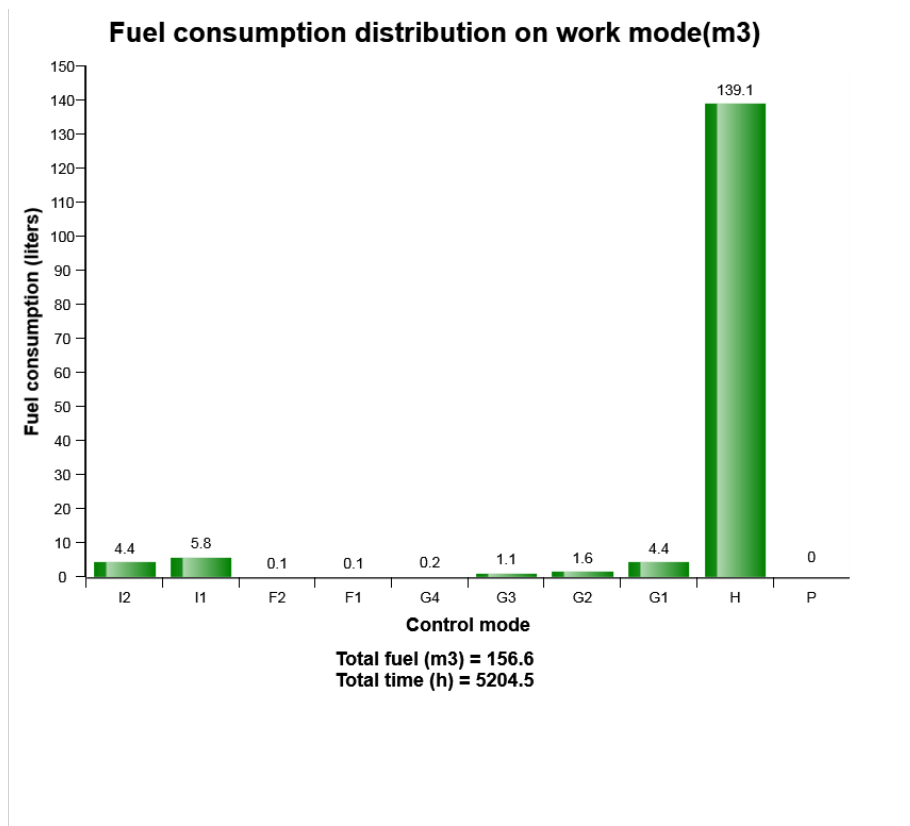
Machine model	SerialNo	Operating Hours	Reading Date
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Distribution of each work mode is shown on top of its column in rate

Average fuel consumption per hour is listed below the diagram



Machine model	SerialNo	Operating Hours	Reading Date
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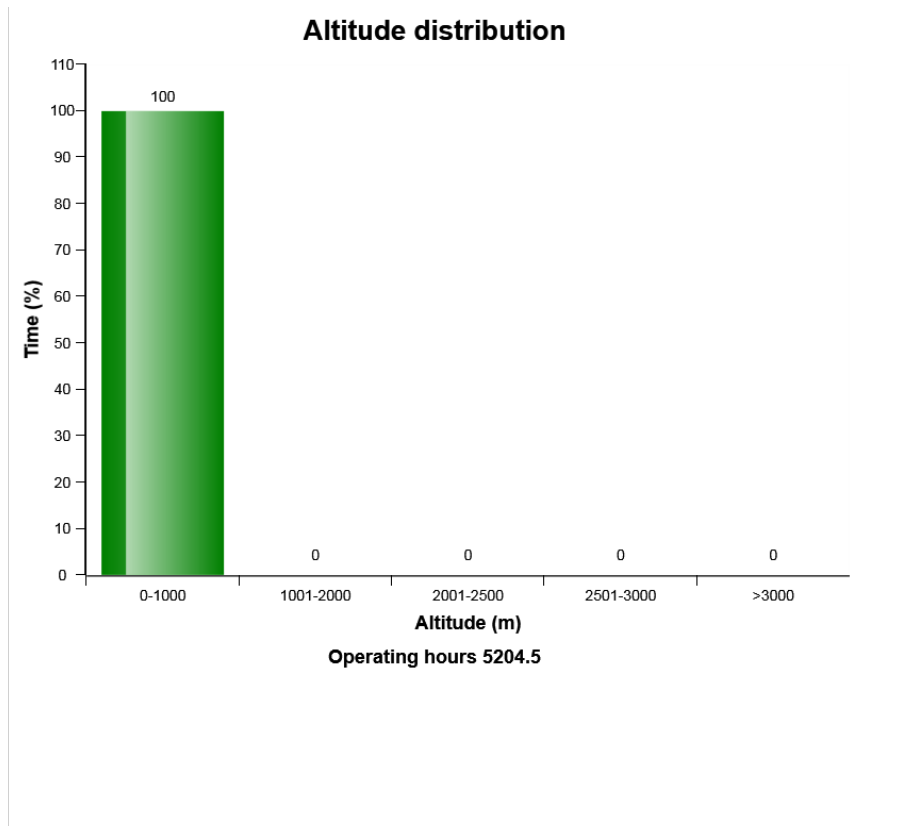
**Definition:**

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.



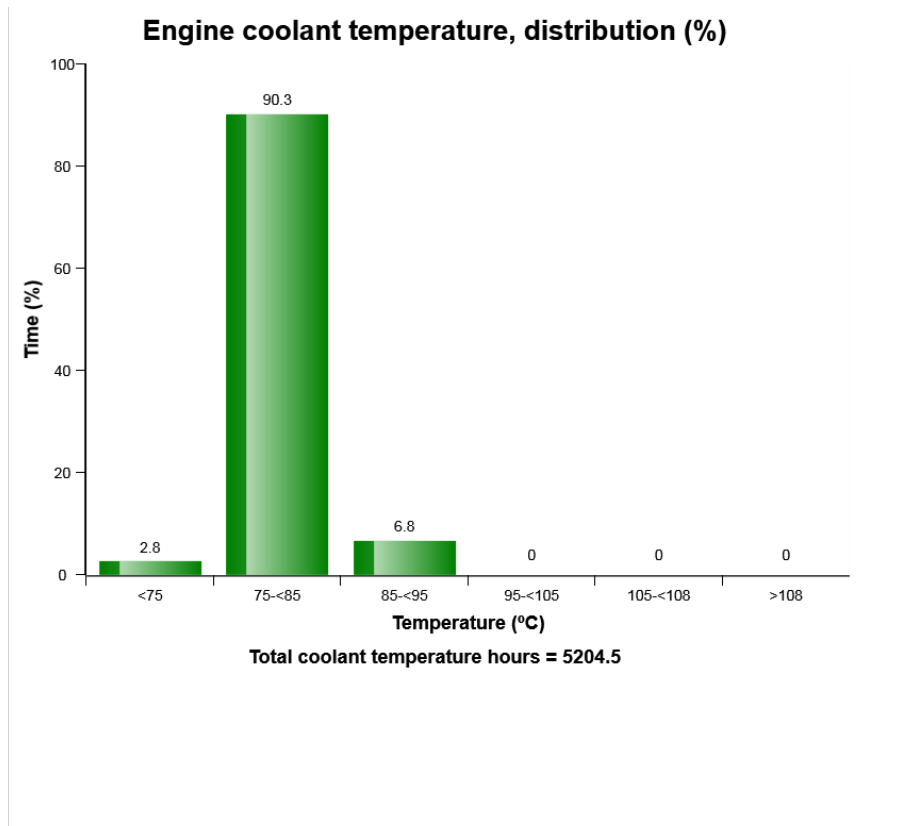
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An error has occurred while processing HtmlTextBox 'htmlTextBox1':  
 'WordSection1' is an unexpected token. The expected token is "" or ". Line 1, position 18.



Machine model	SerialNo	Operating Hours	Reading Date
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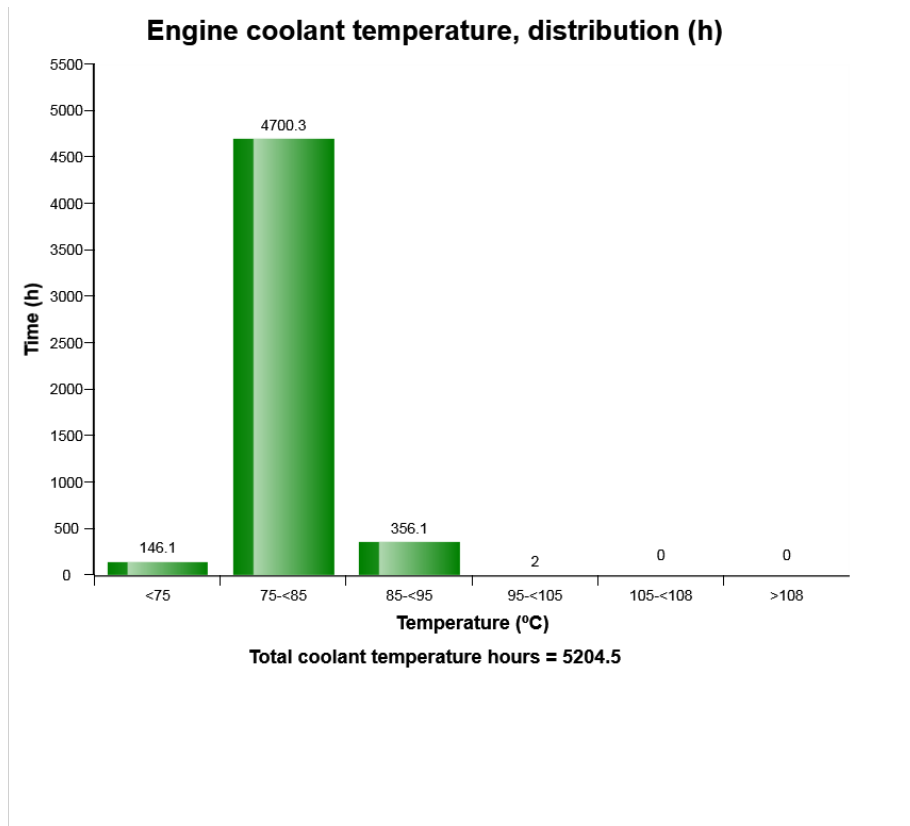


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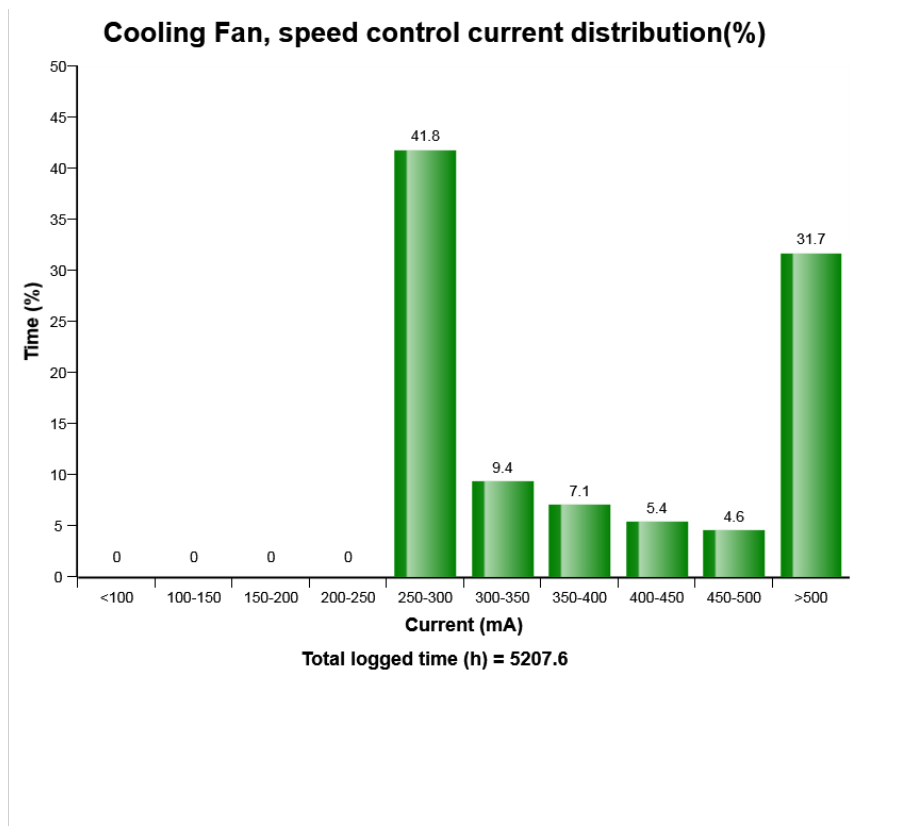
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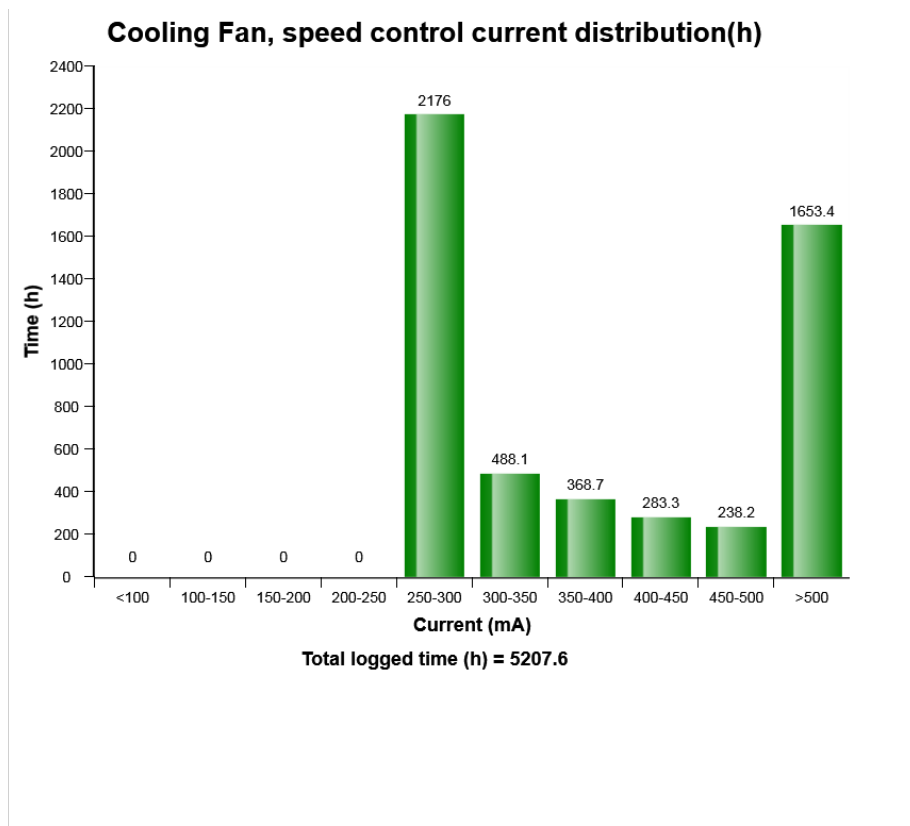
**Definition:**

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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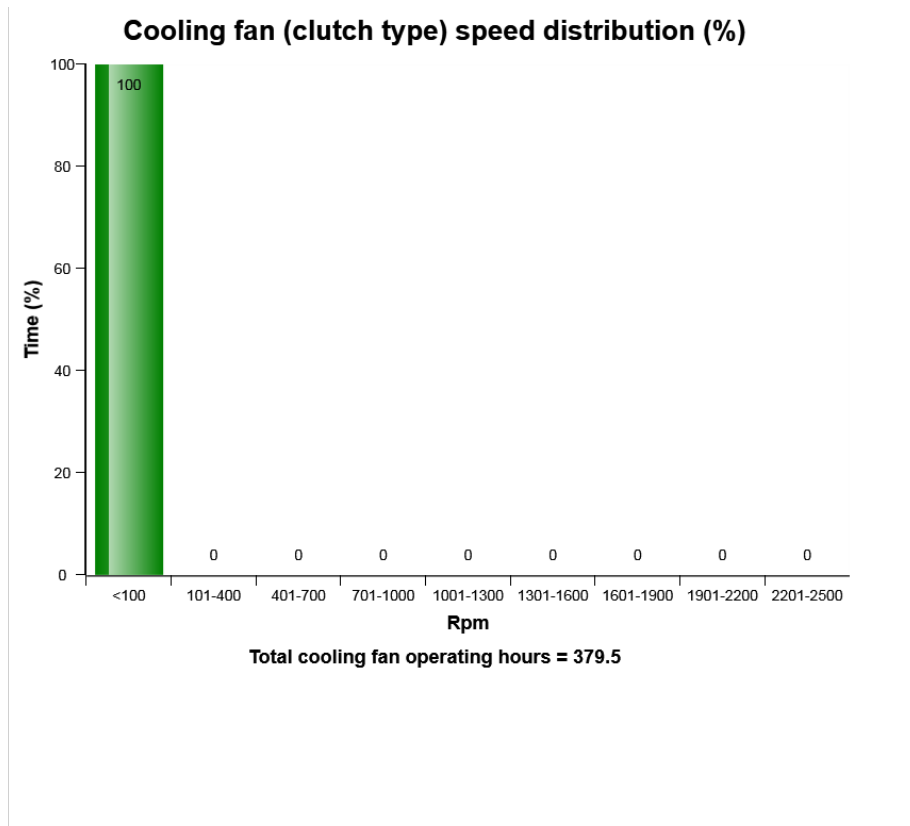
**Definition:**

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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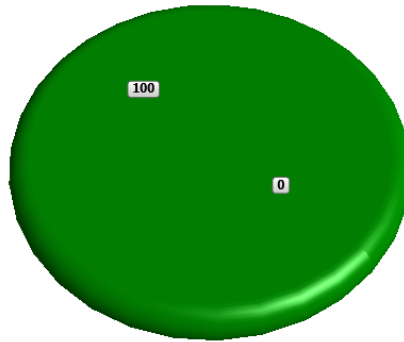
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### Cooling fan, Normal-Reverse rotation distribution (%)

Normal rotation Reverse rotation

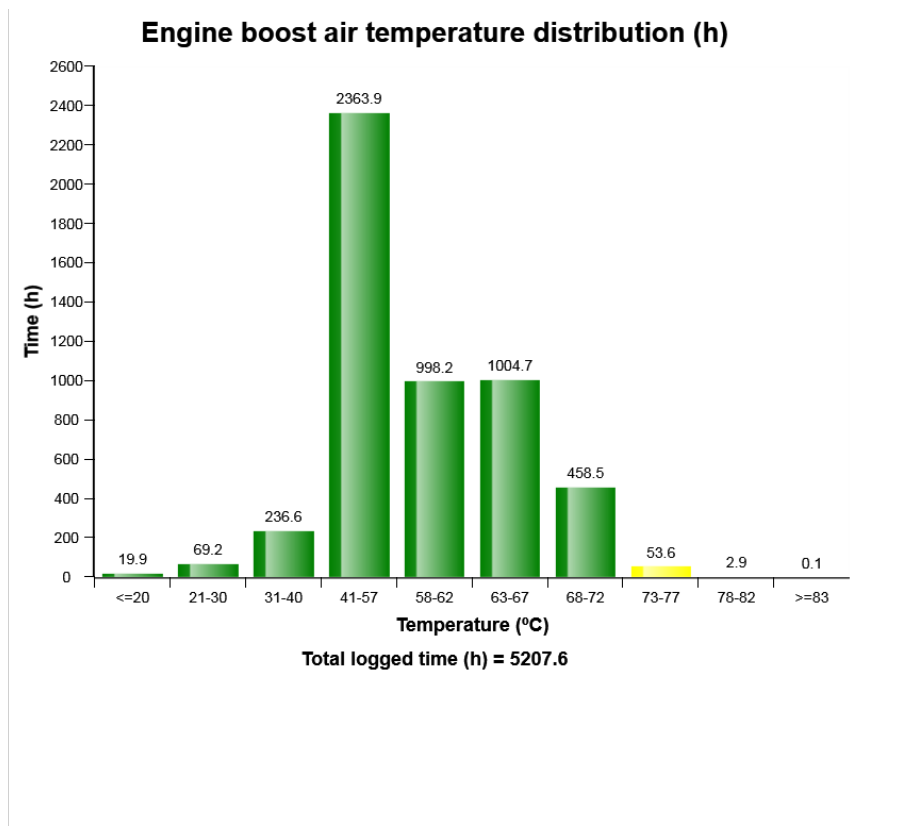


Total operating time (h) = 379.5

An error has occurred while processing HtmlTextBox 'htmlTextBox1':  
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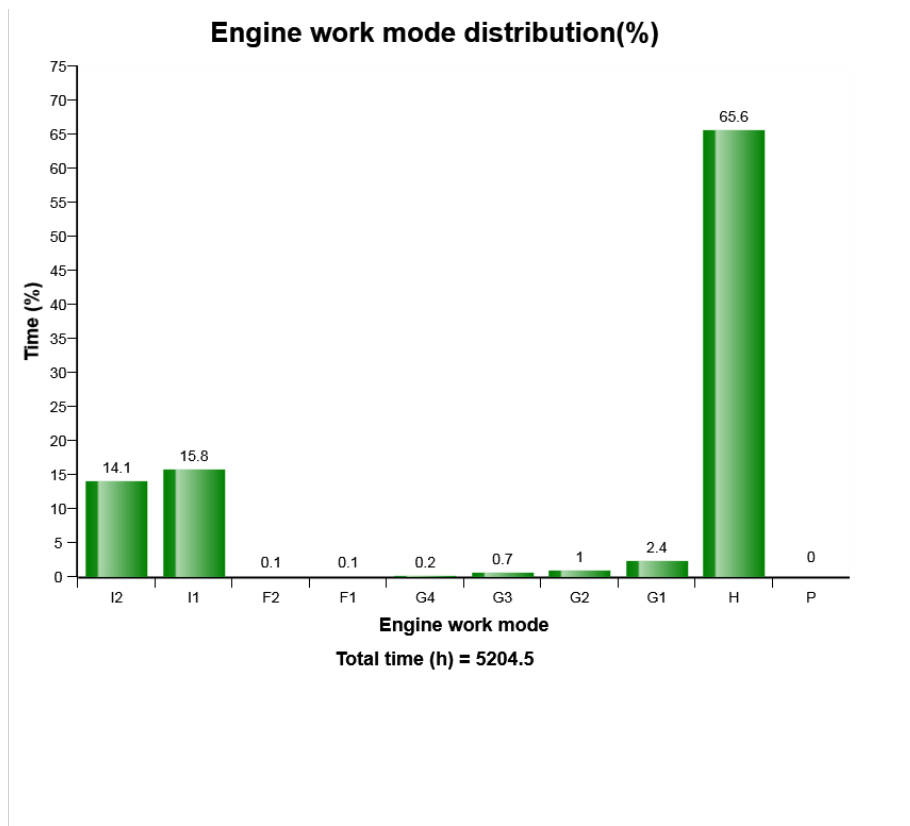


**Definition:**

The diagram describes Engine boost air temperature distribution of the machine when the engine is on.



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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)



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

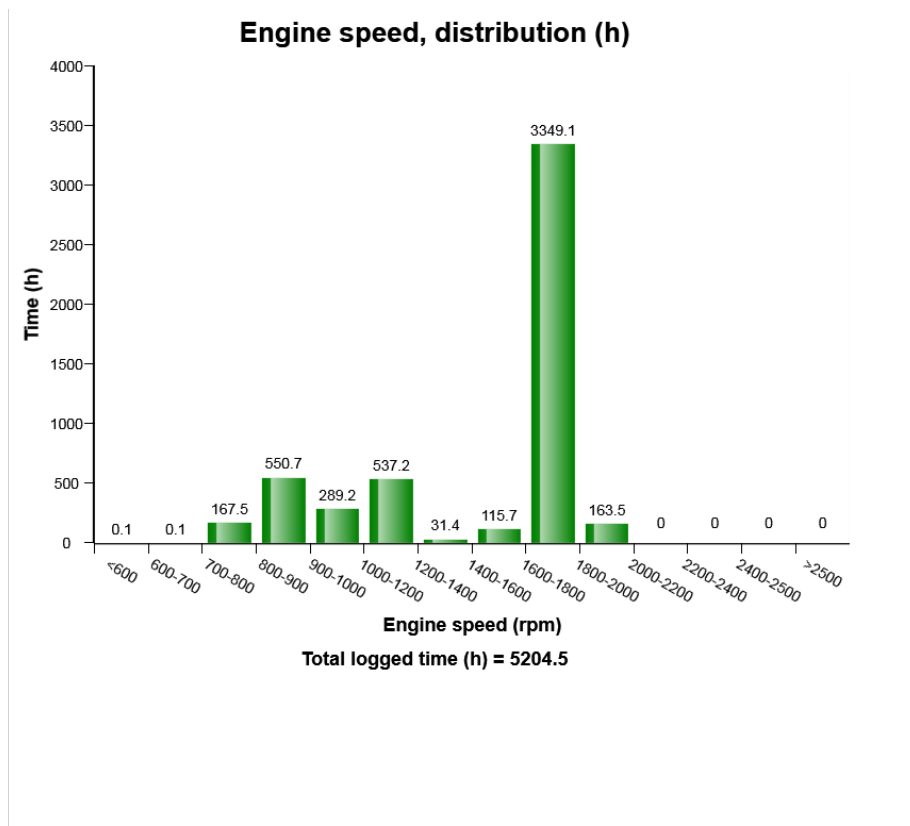
The sum of time distribution in percentage is 100

Total time (h) is listed below the diagram





Machine model	SerialNo	Operating Hours	Reading Date
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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.



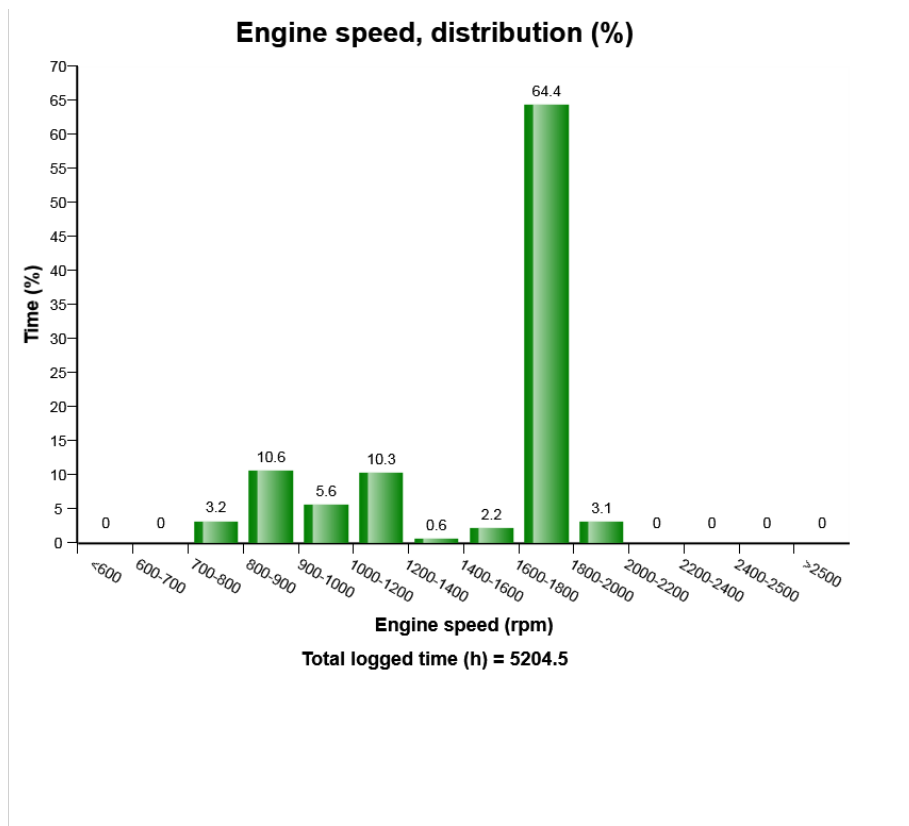
Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

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
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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.



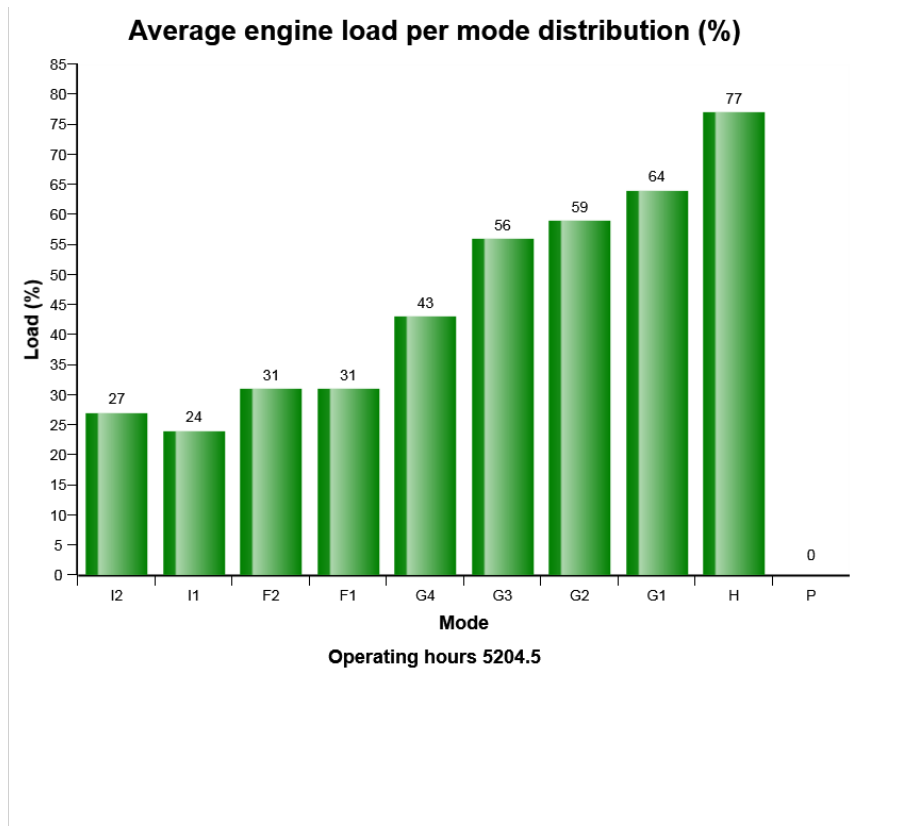
Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

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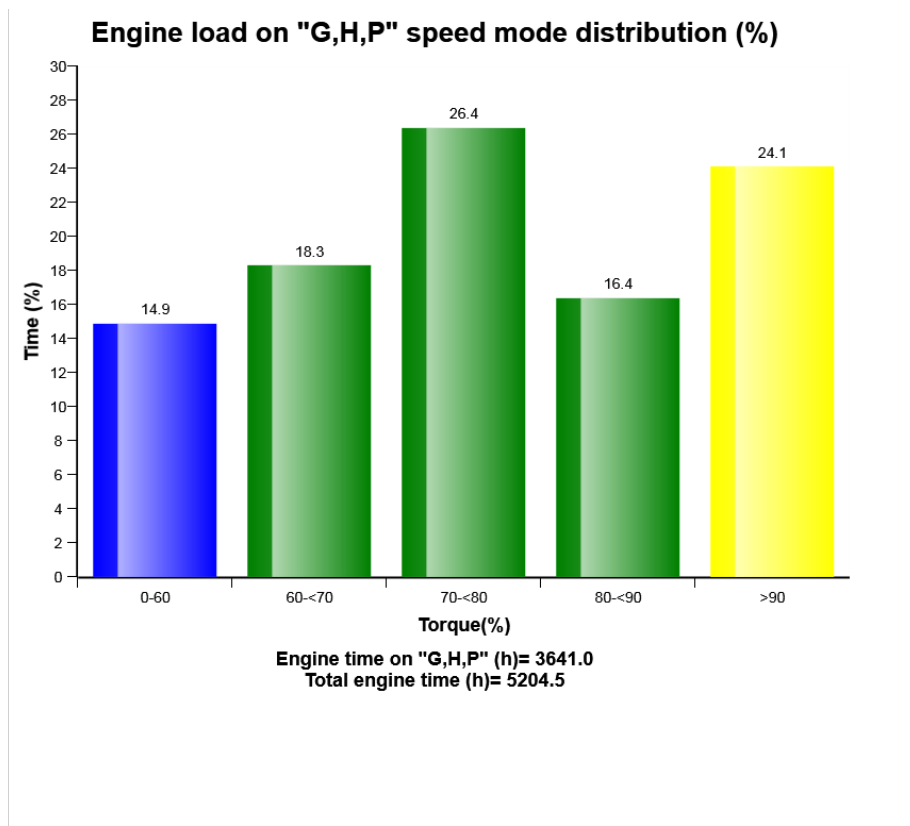
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This graph shows the distribution of the engine load.

Blue bar: Low load

Green bar: Normal load

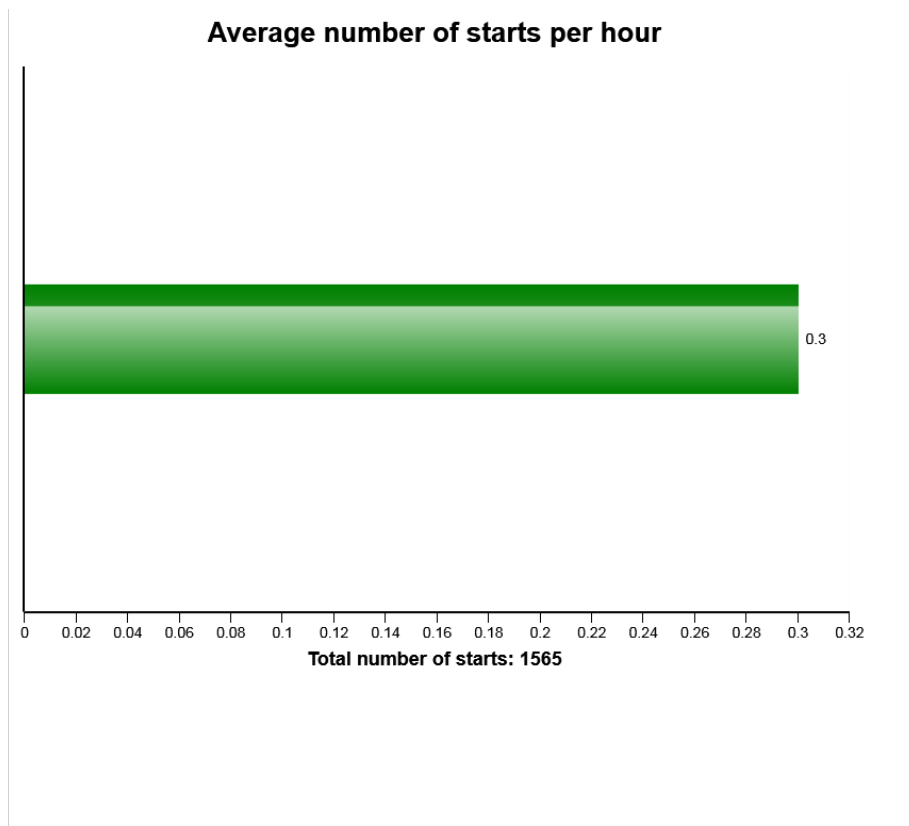
Yellow bar: Excessive load

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.



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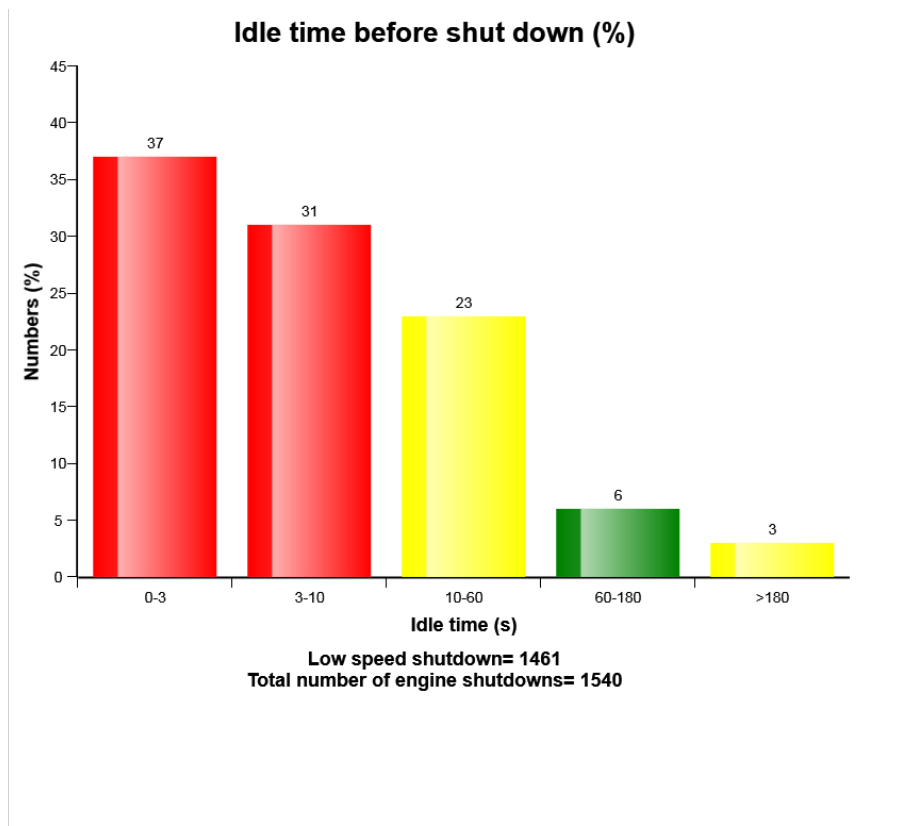
To see at which different temperatures engine is started see" Start at different engine temperatures."

Green bar = Number of average starts per hour





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**Definition:**

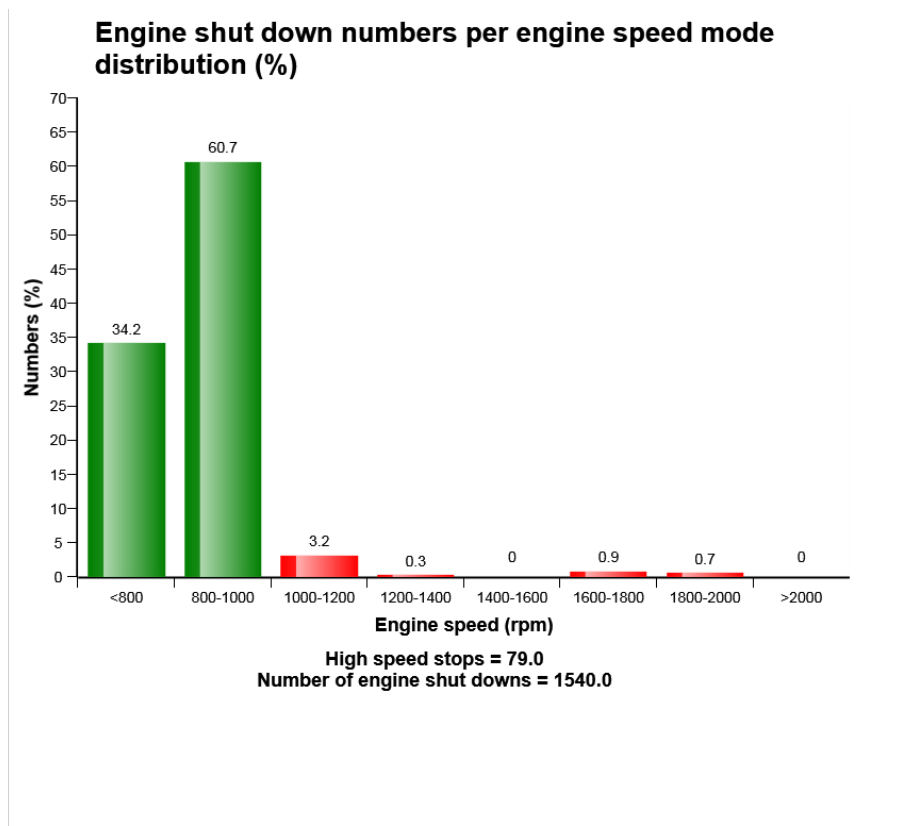
This graph shows the distribution of delayed time at low idle speed until the engine is turned off.

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.



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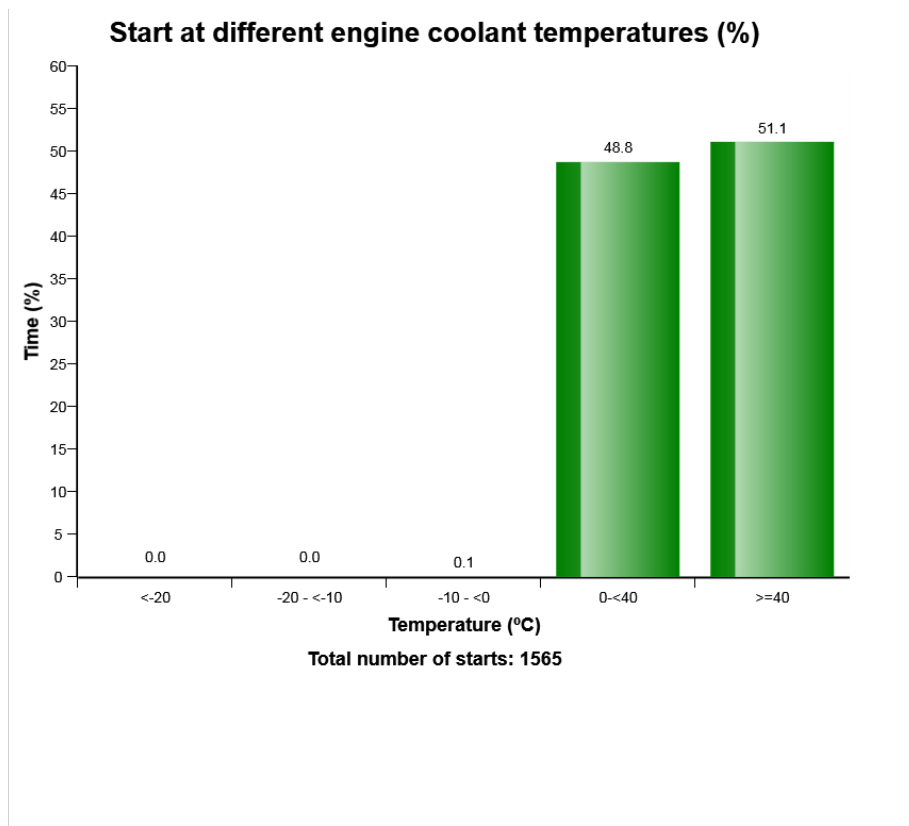
X-axle: Work mode.

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
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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.



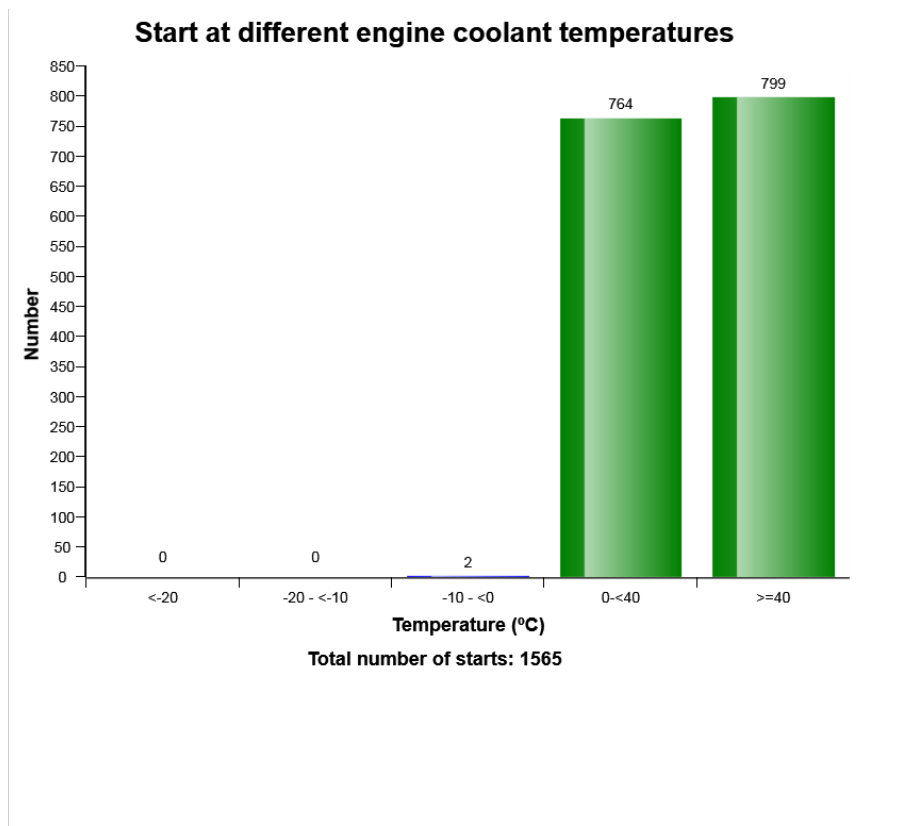
Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

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
EC350E	310328	5207.7	27/03/2020



**Definition:**

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

**Explanation:**

Y-axis: Number of engine starts

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Machine model	SerialNo	Operating Hours	Reading Date
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Under the graph the total number of engine starts is displayed.

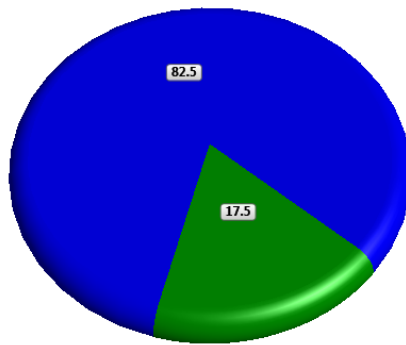
Also see " *Number of starts / hour*" to get a complete picture of engine starting.



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### ECO mode distribution (%)

ECO mode OFF ECO mode ON (h)



Total engine time (h)= 5207.6

An error has occurred while processing HtmlTextBox 'htmlTextBox1':  
The 'font' start tag on line 1 position 114 does not match the end tag of 'BR'. Line 1, position 145.





Machine model	SerialNo	Operating Hours	Reading Date
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**Low coolant level**  
**Total number of occurrences = 261**

Op hours	Year	Month	Day	Hour	Minute	Duration (minutes)
* 4432	2019	1	28	12	35	0
* 4435	2019	1	28	15	3	0
* 4448	2019	1	30	8	14	0
* 4461	2019	1	31	11	10	0
* 4468	2019	2	1	7	18	0
* 4477	2019	2	2	7	1	0
* 4477	2019	2	2	7	17	0
* 5196	2019	10	28	8	24	53
* 5197	2019	10	28	16	18	0
* 5197	2019	10	28	10	26	0
* 5198	2019	10	30	11	22	3
* 5198	2019	10	31	18	25	1
* 5201	2019	12	18	11	44	74
* 5202	2019	12	27	12	16	0
* 5202	2019	12	18	16	53	10
* 5202	2020	1	21	16	38	21
* 5202	2020	1	21	15	56	0
* 5203	2020	2	12	14	16	1
* 5203	2020	2	4	14	47	5
* 5203	2020	2	12	13	46	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



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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

#### 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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**Fuel Filter Clogging**  
**Total number Fuel filter clogging = 593**

Op hours	Year	Month	Day	Hour	Minute	Duration (minutes)
* 4891	2019	5	2	16	8	1
* 4891	2019	5	2	16	11	2
* 4891	2019	5	2	16	16	1
* 4891	2019	5	2	16	21	0
* 4891	2019	5	2	16	24	1
* 4891	2019	5	2	16	29	0
* 4891	2019	5	2	16	32	0
* 4891	2019	5	2	16	36	1
* 4891	2019	5	2	16	41	0
* 4891	2019	5	2	16	50	0
* 4892	2019	5	2	16	55	1
* 5054	2019	5	23	11	22	0
* 5146	2019	6	5	10	54	0
* 4890	2019	5	2	15	18	0
* 4890	2019	5	2	15	25	1
* 4890	2019	5	2	15	32	1
* 4890	2019	5	2	15	41	0
* 4890	2019	5	2	15	49	0
* 4891	2019	5	2	15	53	1
* 4891	2019	5	2	16	0	2

An error has occurred while processing HtmlTextBox 'ExplanationTxb':  
'WordSection1' is an unexpected token. The expected token is "" or "". Line 1, position 18.



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**Regeneration aborted**  
**Total number of occurrences = 8**

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
* 308	2017	4	28	17	45	2
* 373	2017	5	8	18	29	2
* 374	2017	5	9	7	25	2
* 1800	2017	12	11	23	15	2
* 1801	2017	12	11	23	58	1
* 1801	2017	12	11	23	38	2
* 1815	2017	12	13	22	18	2
* 1876	2017	12	20	2	25	2

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**Regeneration ignored**  
**Total number of occurrences = 23**

Op hours	Year	Month	Day	Hour	Minute	Duration (min)
* 373	2017	5	9	6	53	34
* 374	2017	5	9	7	33	43
* 1797	2017	12	11	19	20	243
* 1801	2017	12	11	23	38	20
* 1801	2017	12	12	19	3	640
* 1812	2017	12	13	19	3	192
* 1815	2017	12	13	22	18	444
* 1822	2017	12	14	19	1	641
* 1833	2017	12	15	19	3	586
* 1843	2017	12	16	19	3	463
* 1851	2017	12	17	19	13	438
* 1858	2017	12	18	19	10	629
* 1868	2017	12	19	18	56	443
* 1876	2017	12	20	2	25	1
* 3263	2018	7	7	6	53	12
* 4010	2018	10	23	9	56	409
* 4017	2018	10	24	6	42	106
* 4018	2018	10	24	8	35	483
* 4026	2018	10	25	6	11	7
* 4091	2018	11	6	7	4	23

An error has occurred while processing HtmlTextBox 'ExplanationTxb':  
The 'span' start tag on line 1 position 43 does not match the end tag of 'BR'. Line 1, position 153.



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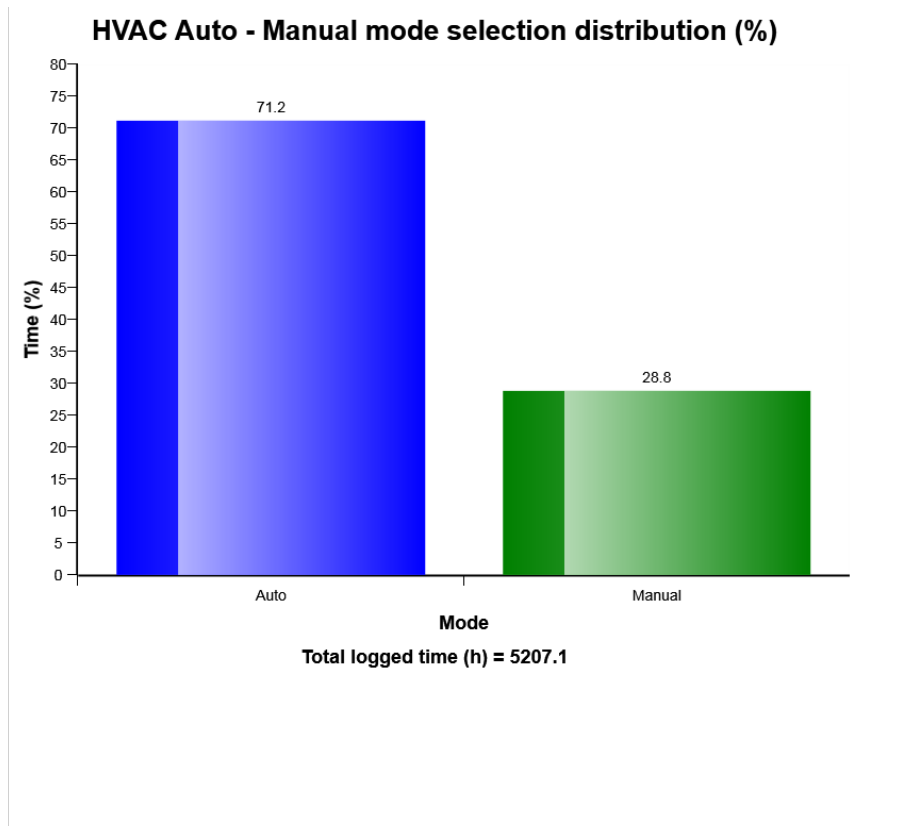
**Regeneration duration**  
**Total number of occurrences = 13**

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
* 308	2017	4	28	17	24	56
* 373	2017	5	9	6	54	32
* 373	2017	5	8	18	28	0
* 374	2017	5	9	7	34	42
* 1800	2017	12	11	23	14	1
* 1801	2017	12	11	23	58	0
* 1801	2017	12	11	23	23	16
* 1815	2017	12	13	22	15	3
* 1876	2017	12	20	2	20	55
* 3263	2018	7	7	7	5	51
* 4018	2018	10	24	8	28	7
* 4027	2018	10	25	6	18	53
* 4092	2018	11	6	7	27	52

An error has occurred while processing HtmlTextBox 'ExplanationTxb':  
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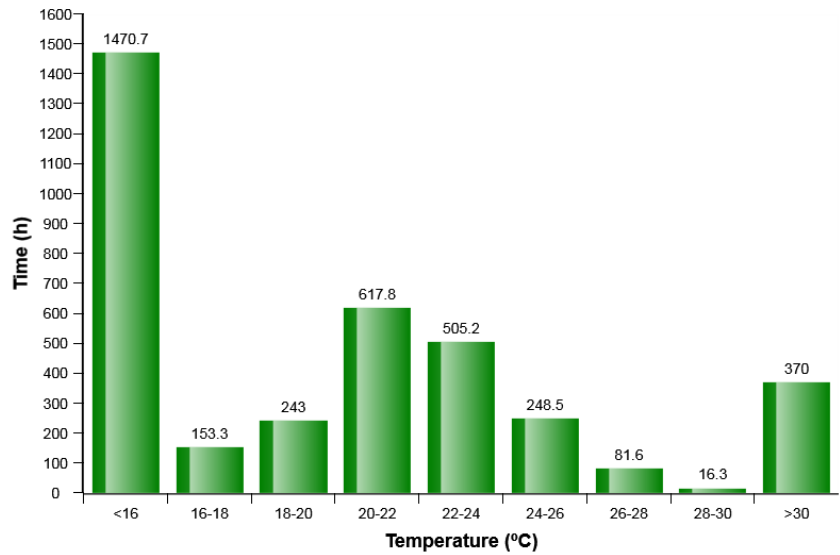
**Definition:**

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.



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



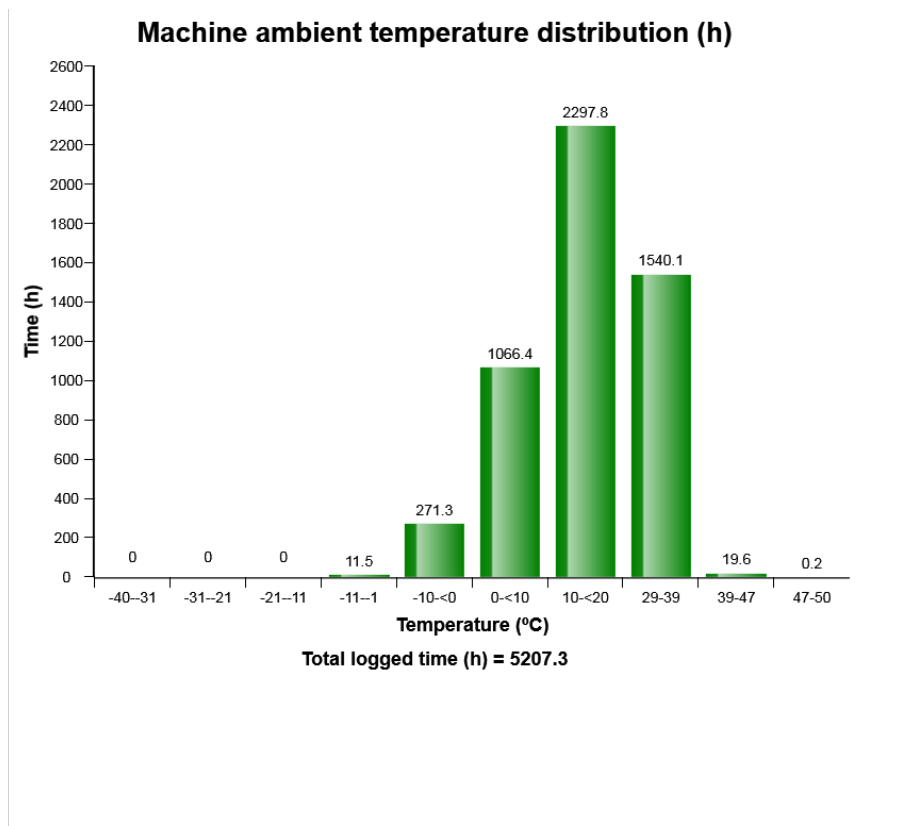
**Definition:**

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





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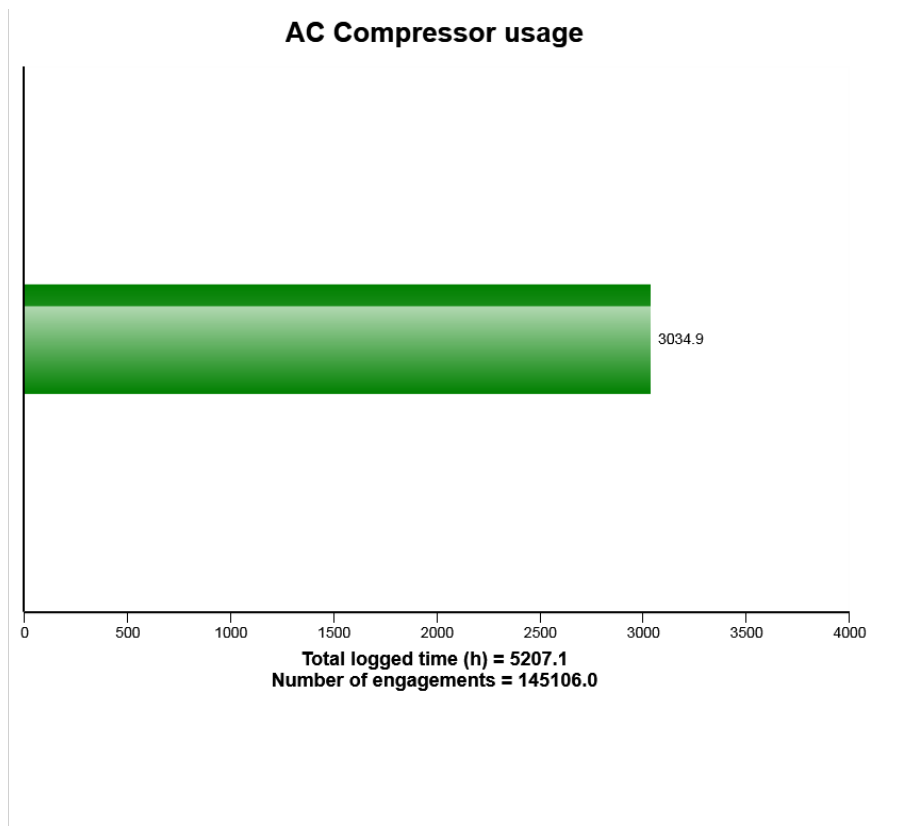


**Definition:**

The diagram describes ambient temperature distribution of the machine while machine operates.



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**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.

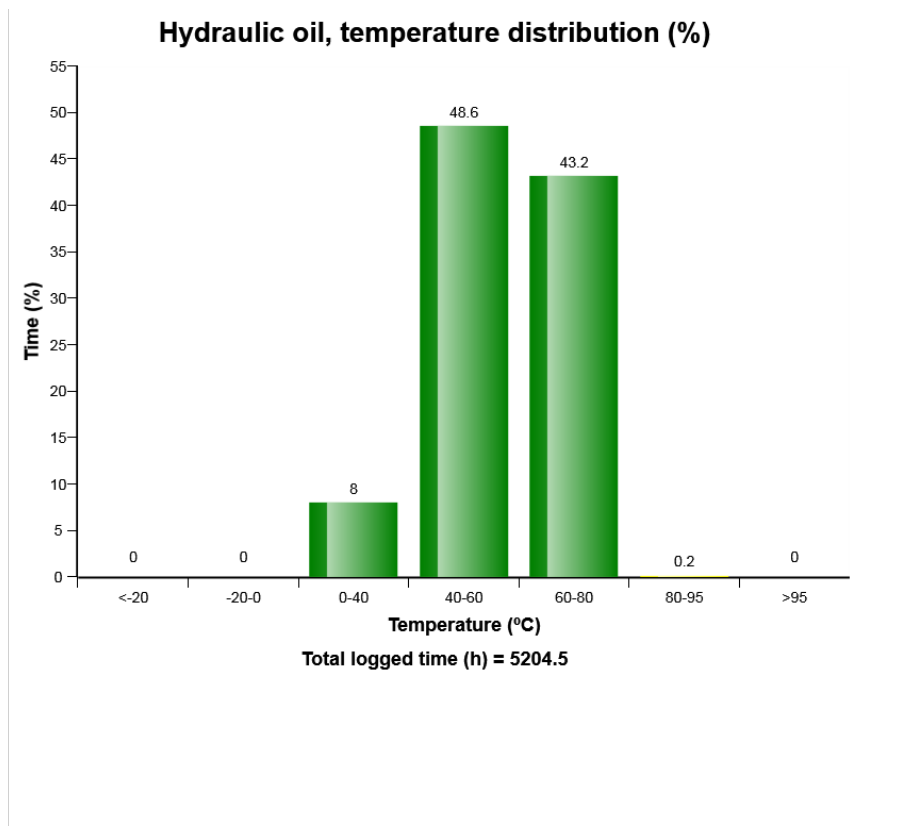


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Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020



**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.



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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.

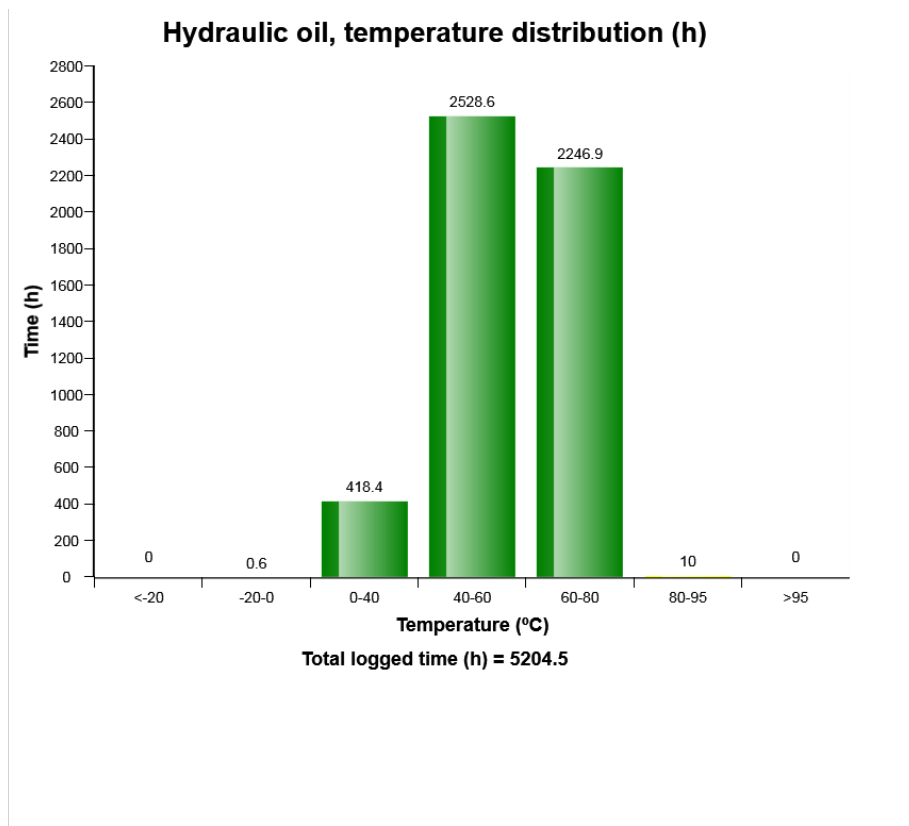
**Yellow bar** = High working temperature. It is normal to have some registrations in this region.

**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
EC350E	310328	5207.7	27/03/2020



**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
EC350E	310328	5207.7	27/03/2020

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.

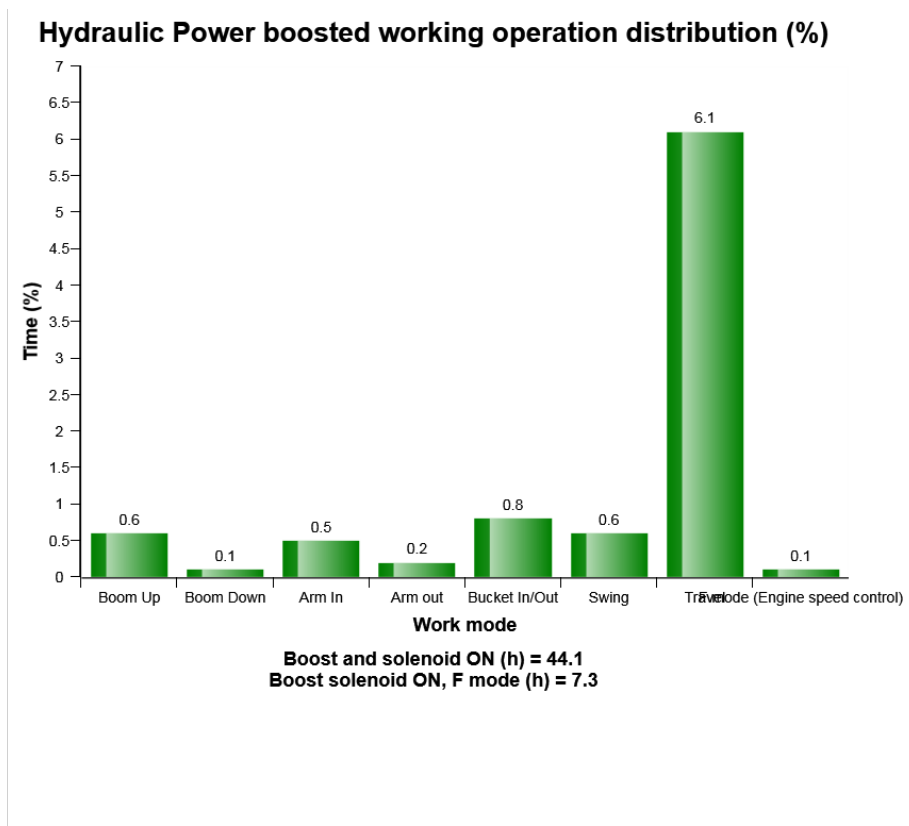
**Yellow bar** = High working temperature. It is normal to have some registrations in this region.

**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
EC350E	310328	5207.7	27/03/2020



### 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.

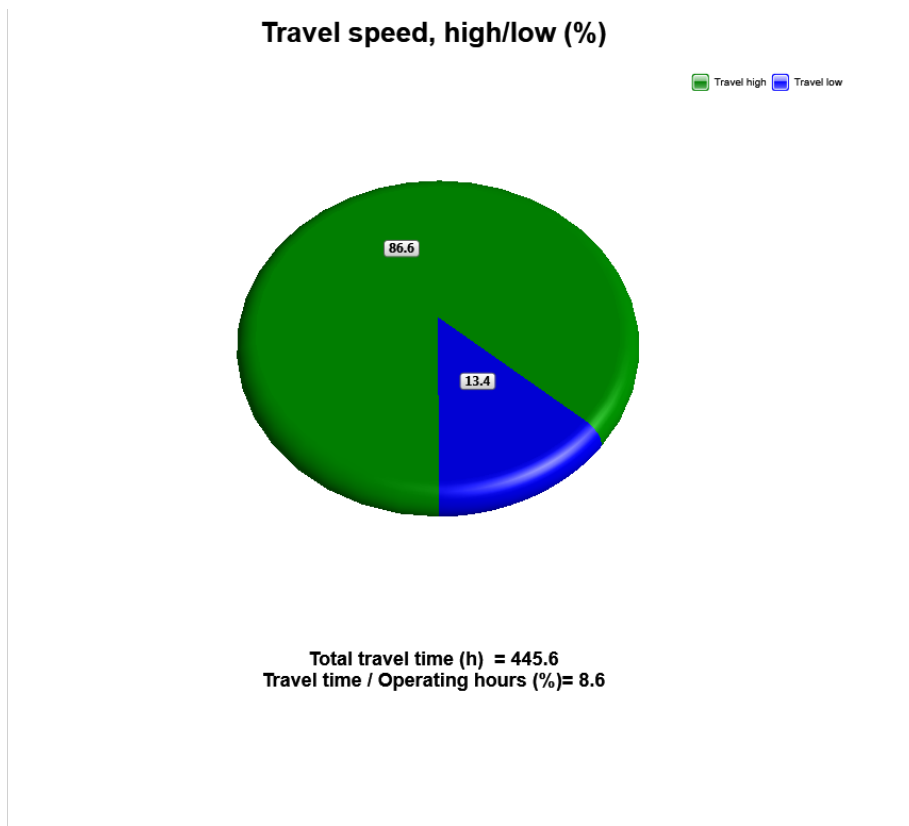




Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020



**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

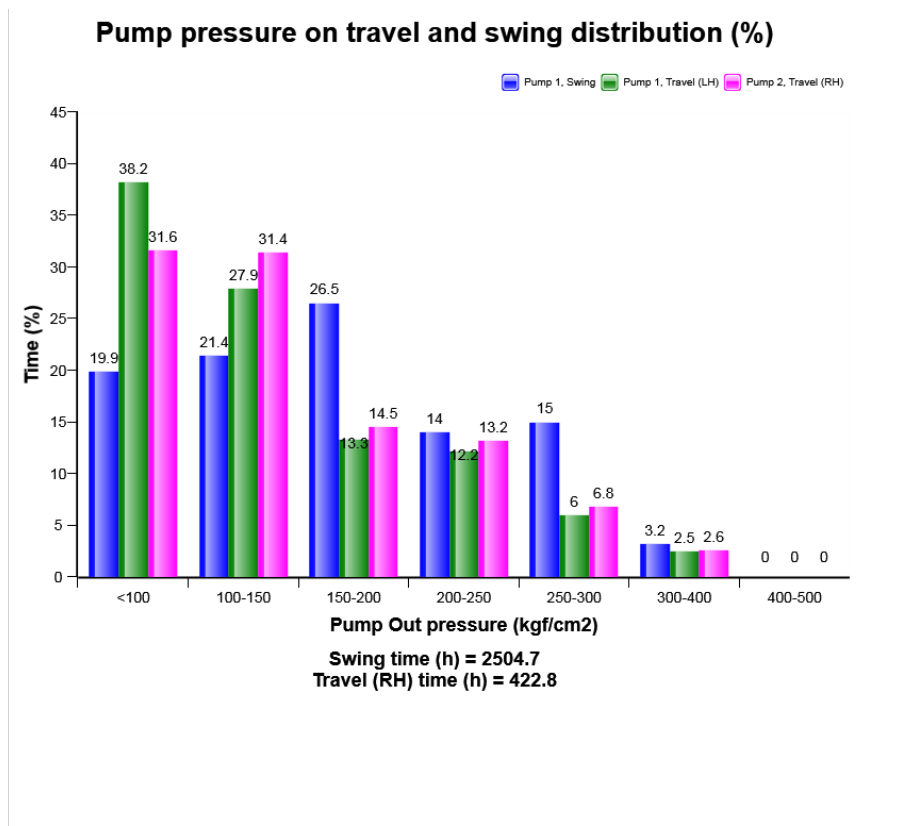


Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

Total travel time is listed below the diagram



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

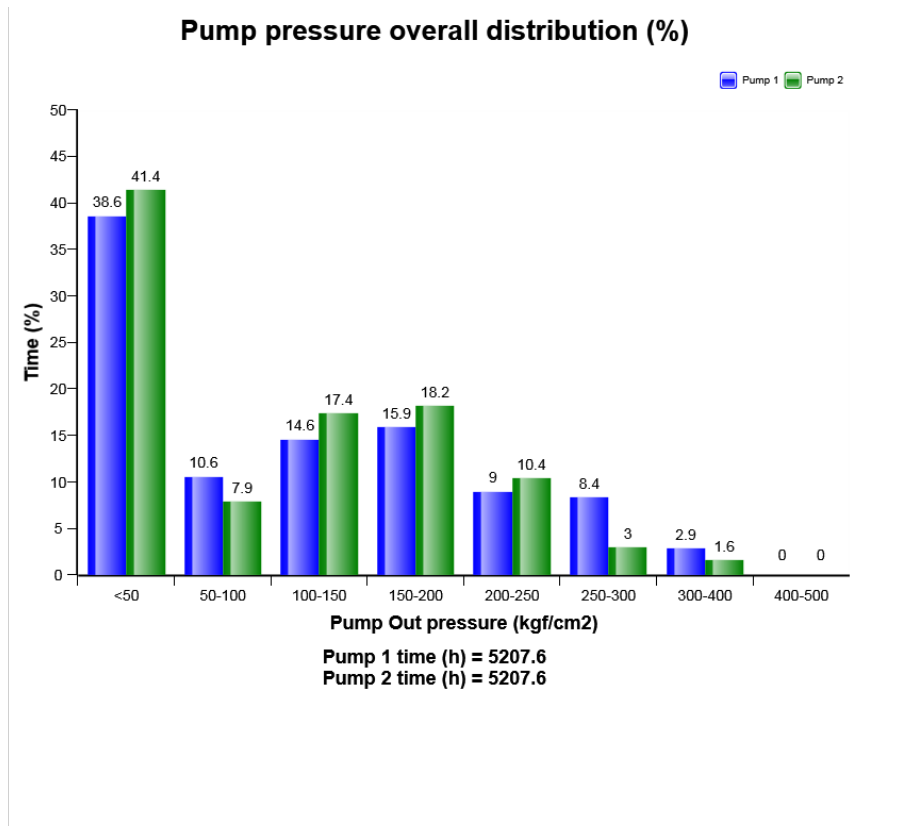


**Definition:**

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
EC350E	310328	5207.7	27/03/2020

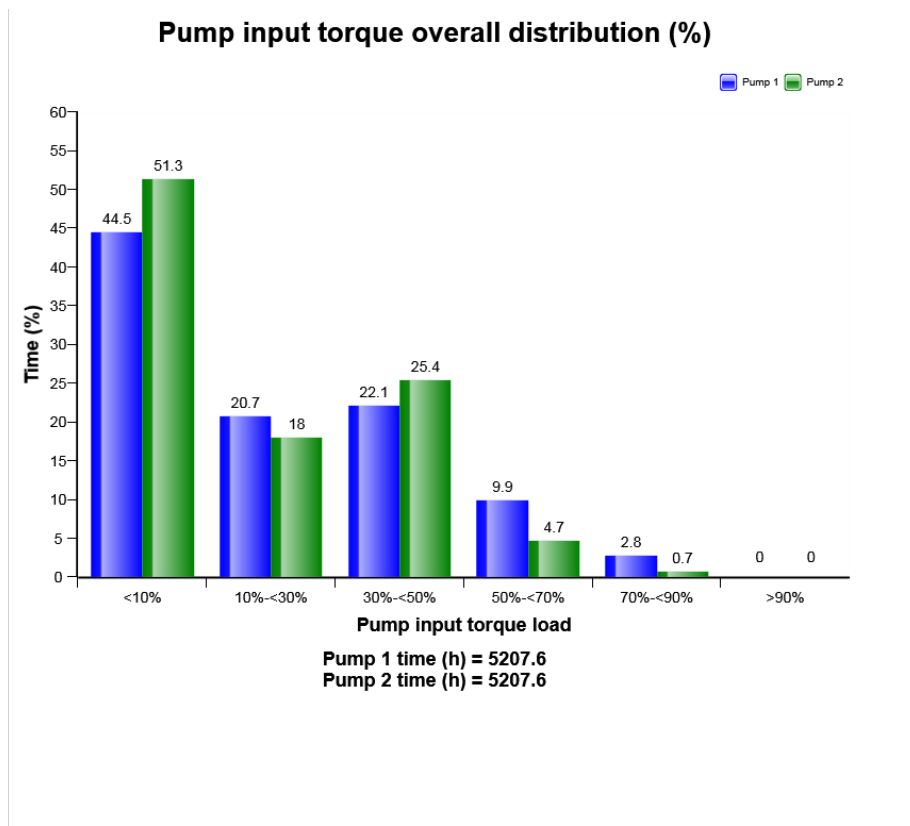


**Definition:**

The diagram describes Pump outlet pressure of 2 Pumps distribution.



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

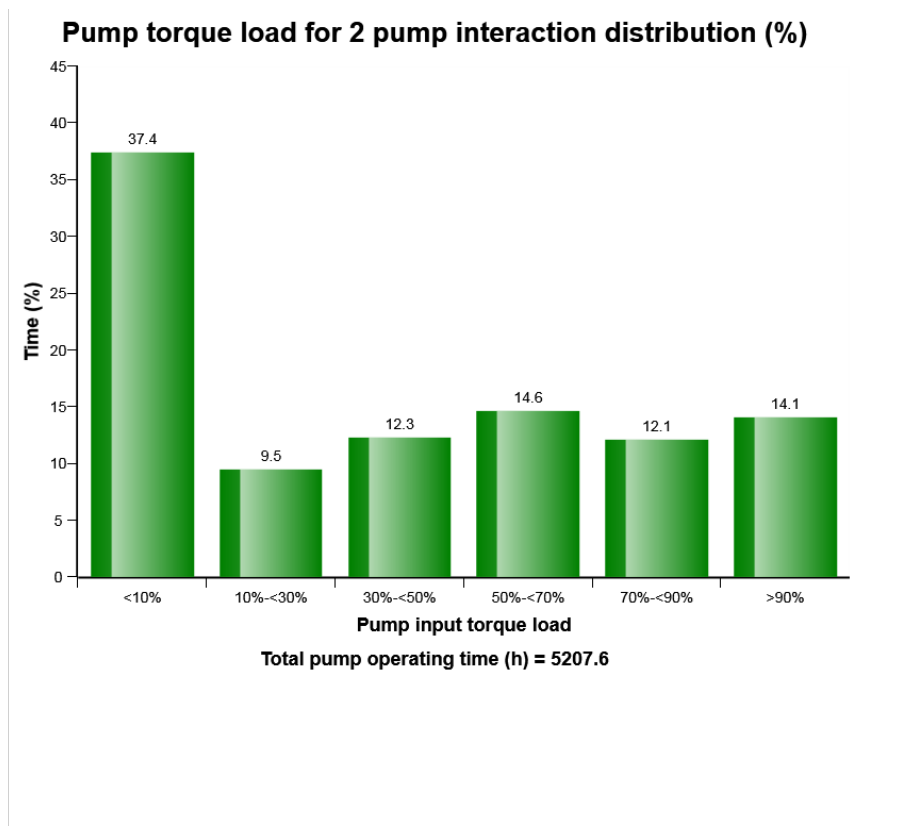


**Definition:**

The diagram describes Pump torque load of 2 Pumps distribution.



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020



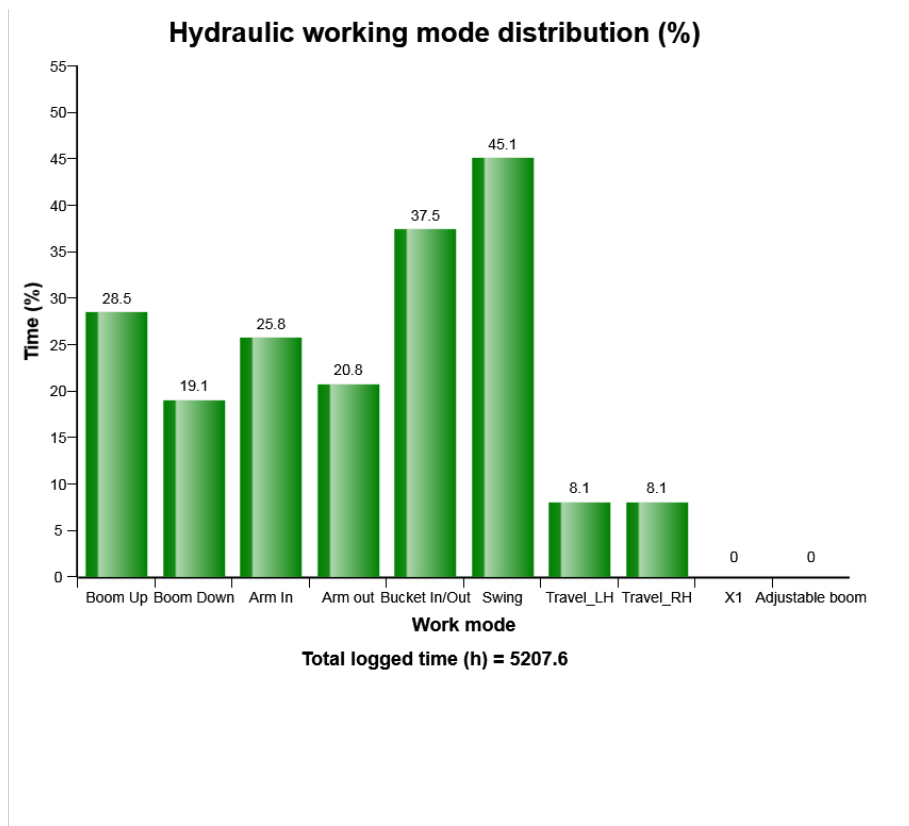
**Definition:**

This is to see total torque load distribution of 2 pumps when it operates 2 pumps at the same time.

The diagram describes total Pump torque load for 2 Pump's interaction distribution



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020



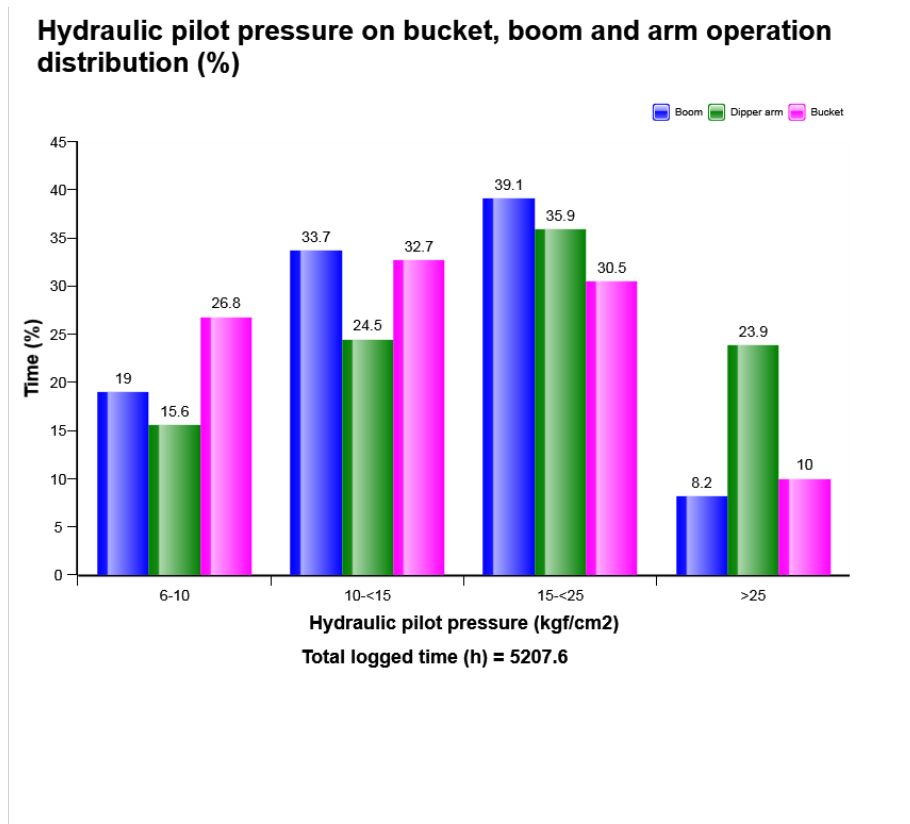
**Definition:**

The diagram describes hydraulic working operation mode distribution.





Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

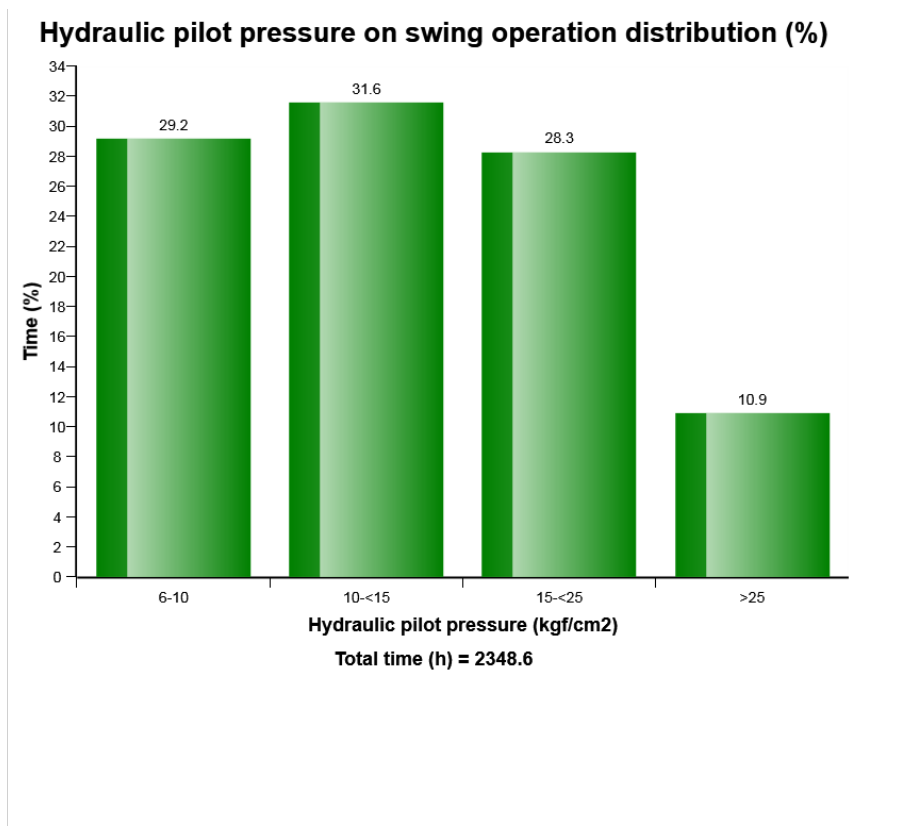


**Definition:**

The diagram describes the distribution of hydraulic pilot pressure in specified operation



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020

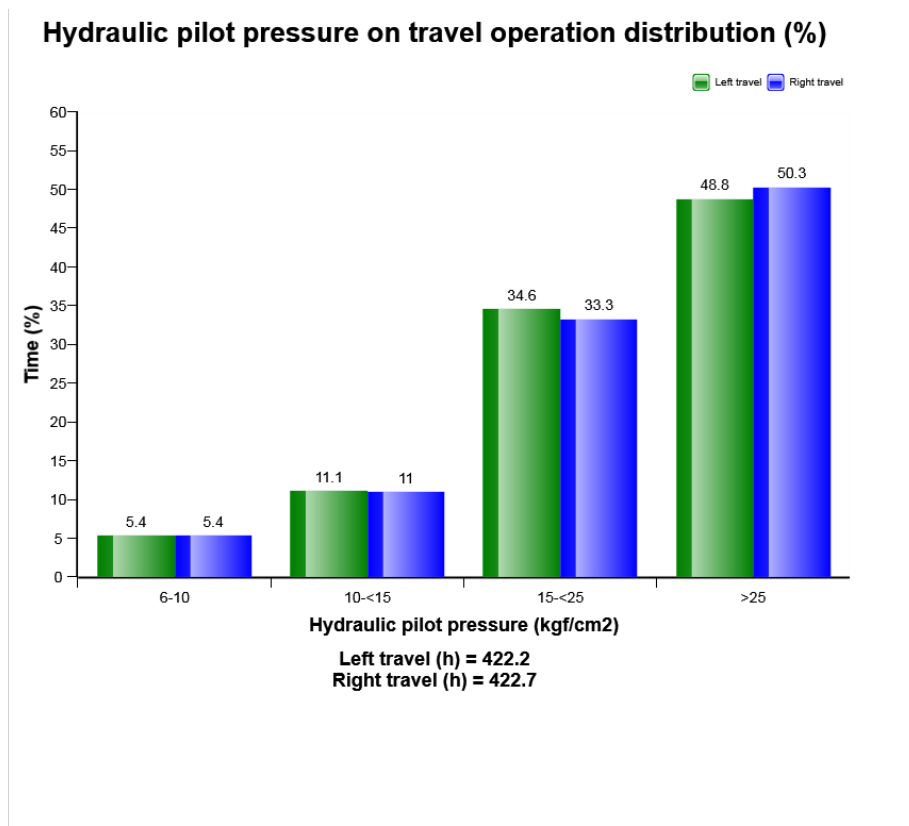


**Definition:**

The diagram describes the distribution of hydraulic pilot pressure in specified operation



Machine model	SerialNo	Operating Hours	Reading Date
EC350E	310328	5207.7	27/03/2020



**Definition:**

The diagram describes the distribution of hydraulic pilot pressure in specified operation

