VOLVO CONSTRUCTION EQUIPMENT

MATRIS REPORT

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

Company name	Dealer	Report Issuer
Euro Auctions		
Contact name	**Technician**	**Primary Application**
	434762	Rehandling
Site	**Workorder**	**Ground Condition**

MATRIS Reading, Summary / Recommendation

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Main equipment	Type	Equipment
	Tyre size/class	
	Main Attachment	
	Extra Counterweight	
	Ballast	
	Chains	
	Boom Suspension System	
	Attachment Interface	
	Volume m3 (yd3) / Area m2 (ft2)	
	Attachment make	

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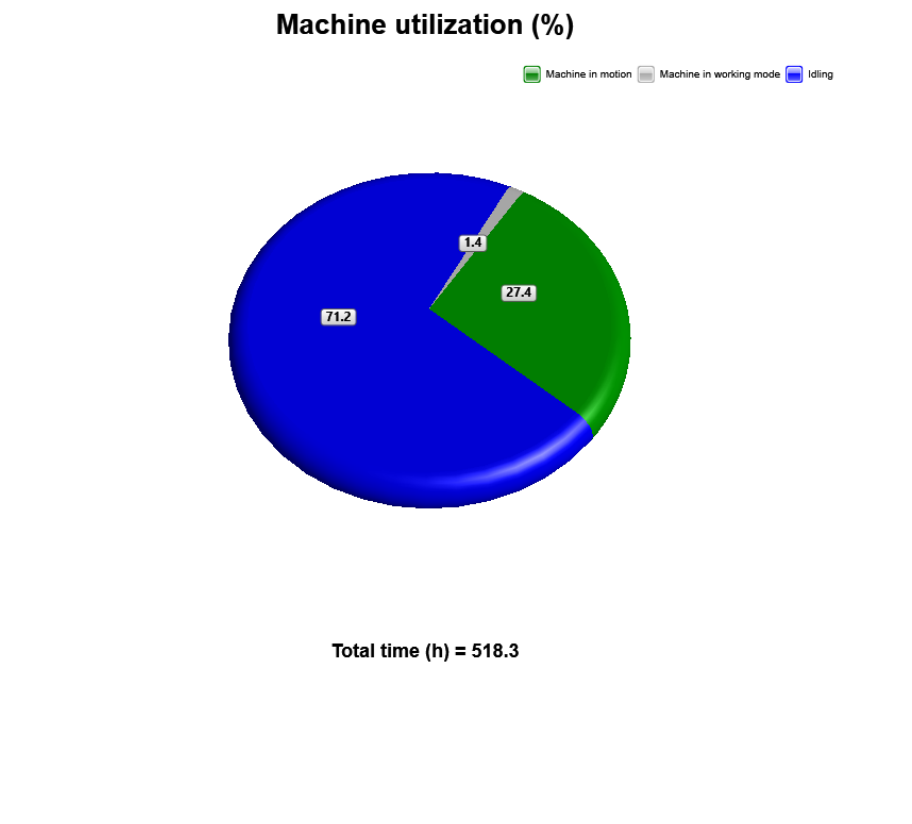

Definition:

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 speed less than idling or equal to idling and machine speed less than 0.5 km/h (0.3 mph)

Gear level position: Neutral, forward or reverse.

Green sector = Machine in motion.

Engine speed larger than idling and machine speed larger than 0.5 km/h (0.3 mph) .

Gear level position: Forward or reverse.

One typical situation is material transportation, in bucket or long distance transportation.

Grey sector = Engine in working mode.

Engine speed larger than idling and machine speed less than 0.5 km/h (0.3 mph) .

Gear level position: Forward or reverse.

Typical application is loading and unloading of the bucket.

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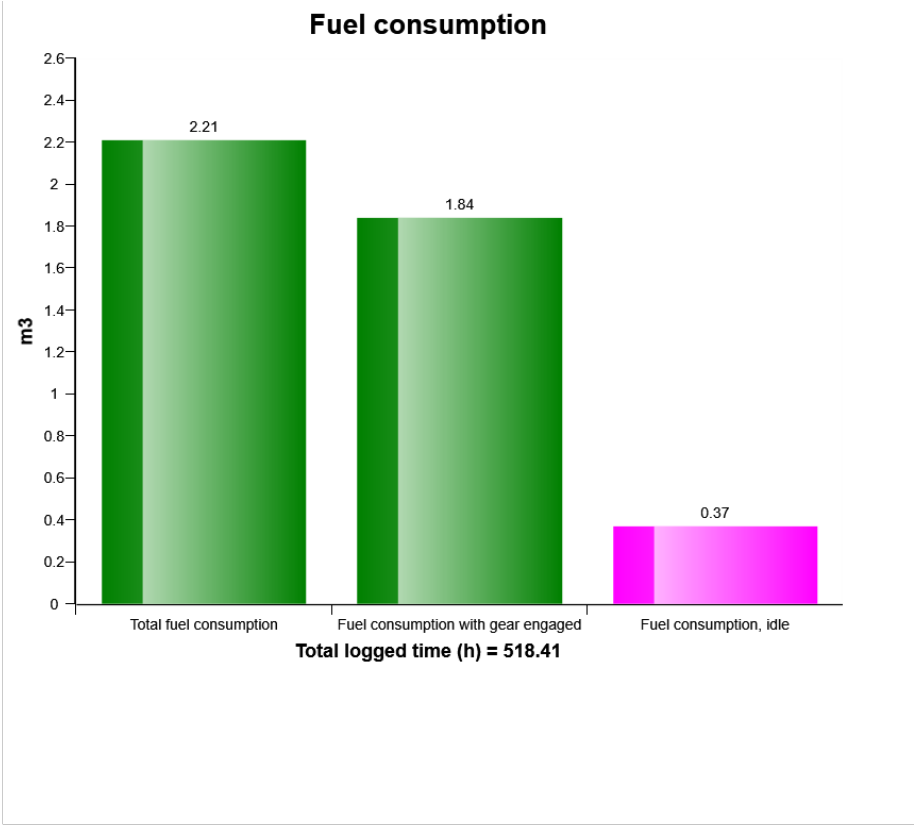

The diagram shows the total fuel consumption, fuel consumption with gear engaged and fuel consumption during idle.

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

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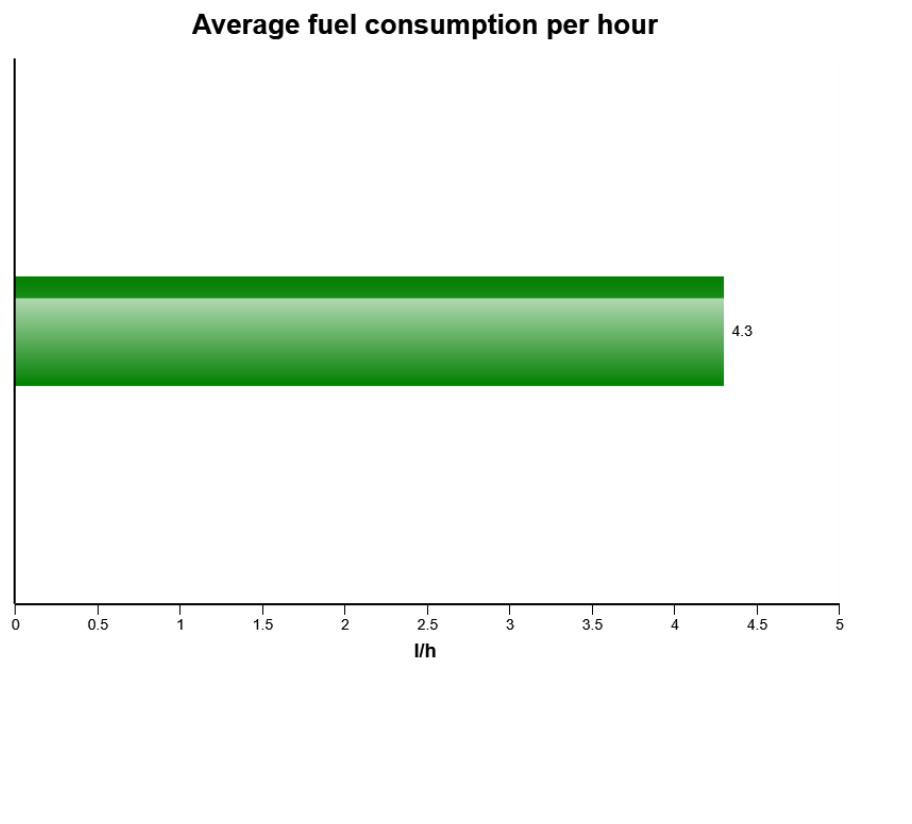

The diagram shows the average fuel consumption based on total operating hours.

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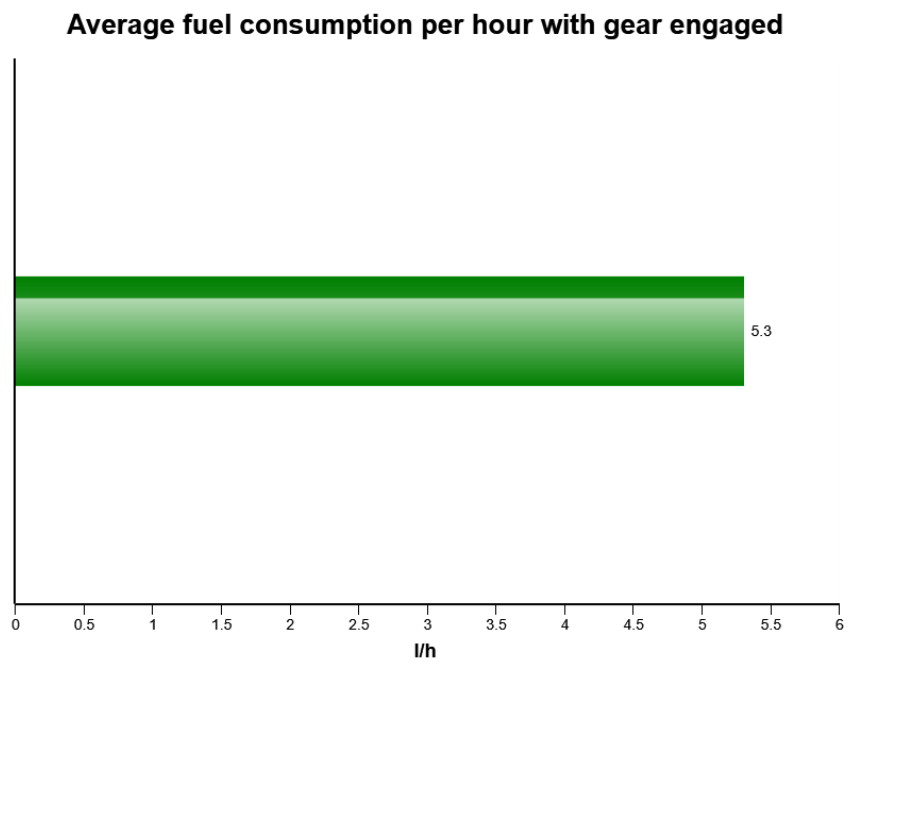

The diagram shows the average fuel consumption based on the operating hours with gear engaged.

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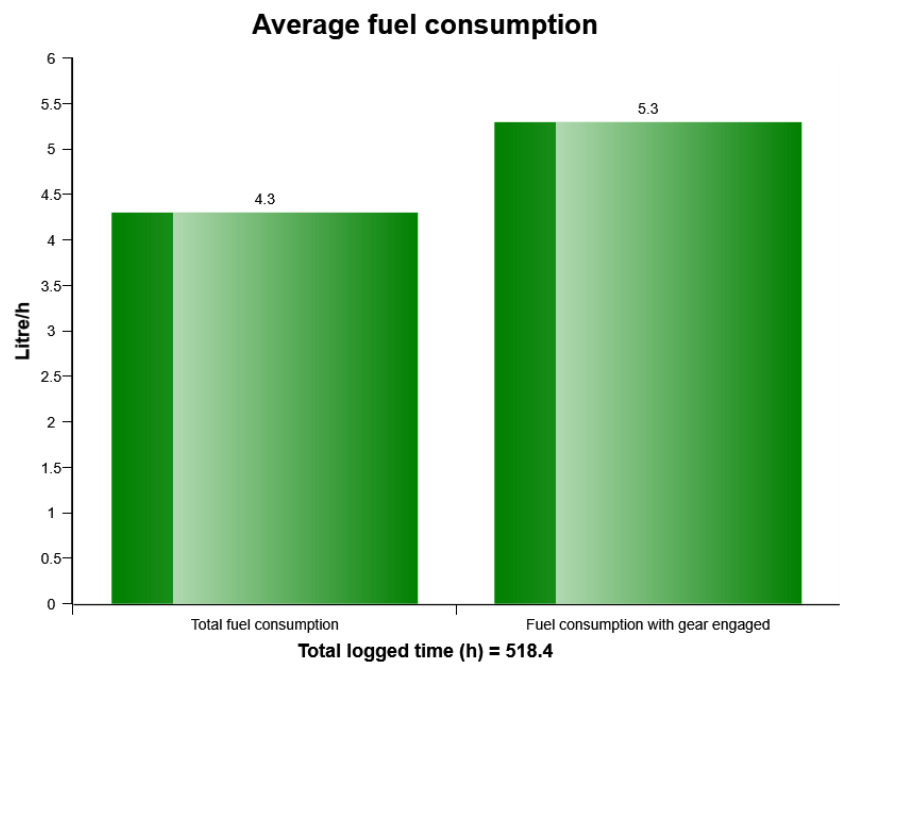

The diagram shows the total average fuel consumption versus average fuel consumption with gear engaged.

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

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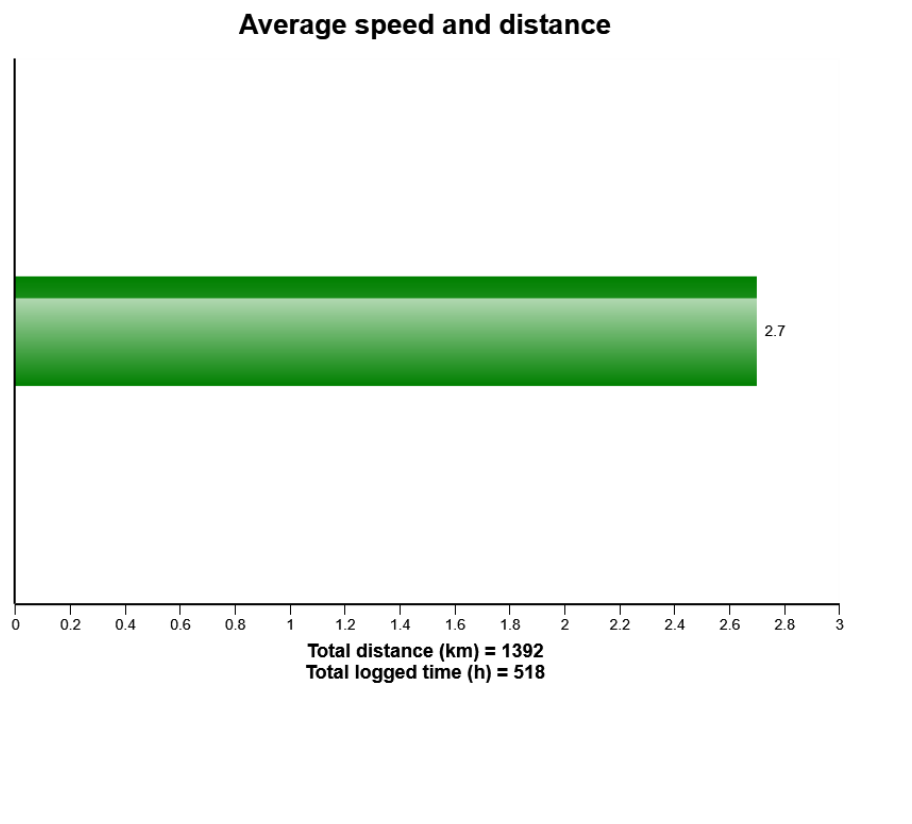

The diagram shows the machines average speed based on the total operating hours.

Machine model	SerialNo	Operating Hours	Reading Date
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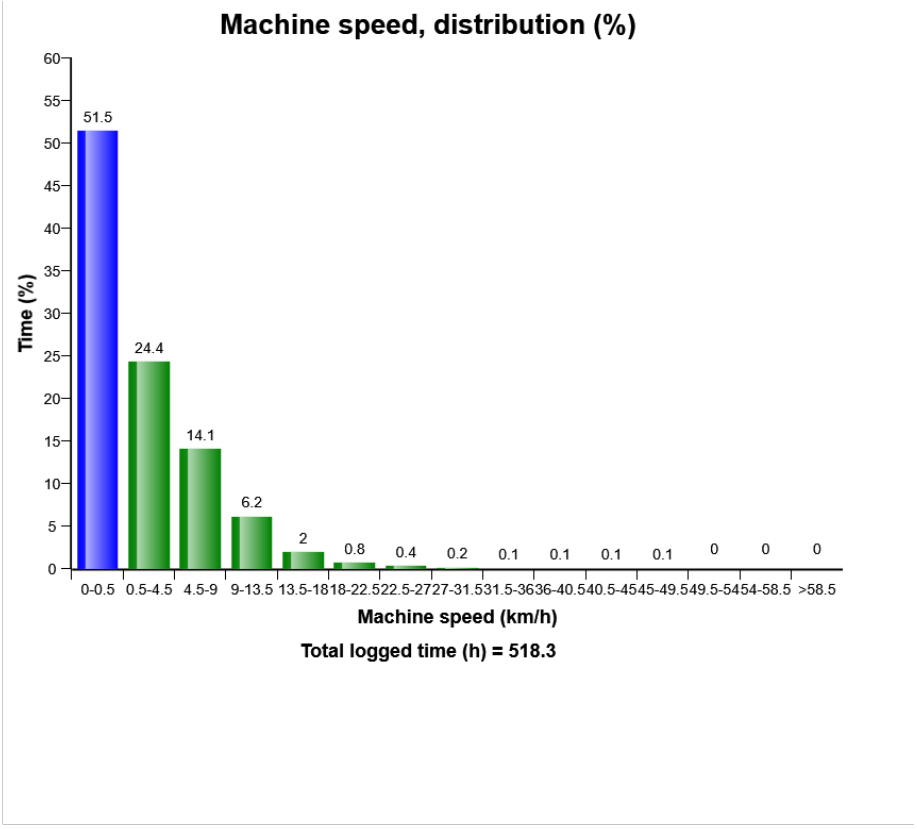

Definition:

This graph describes the machine speed distribution.

The sum of all bars = 100% of machine speed time.

Under the graph total time with engine on, in hours, is displayed.

Explanation:

Y-axis: Time, specified for each speed interval.

X-axis: Machine speed, divided into speed intervals.

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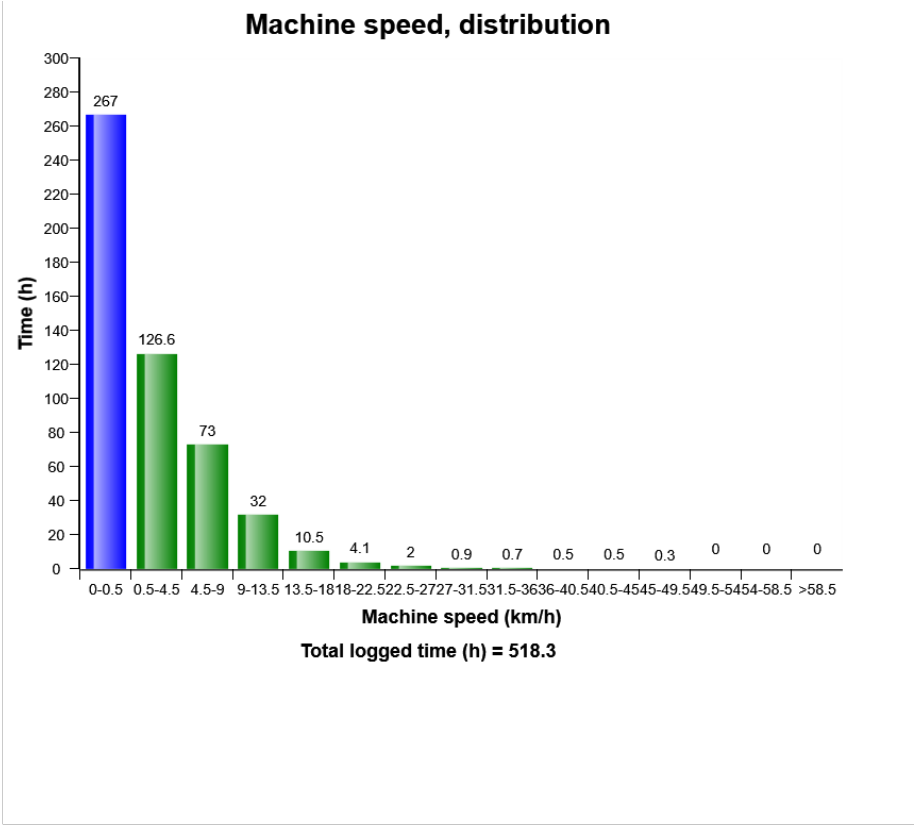

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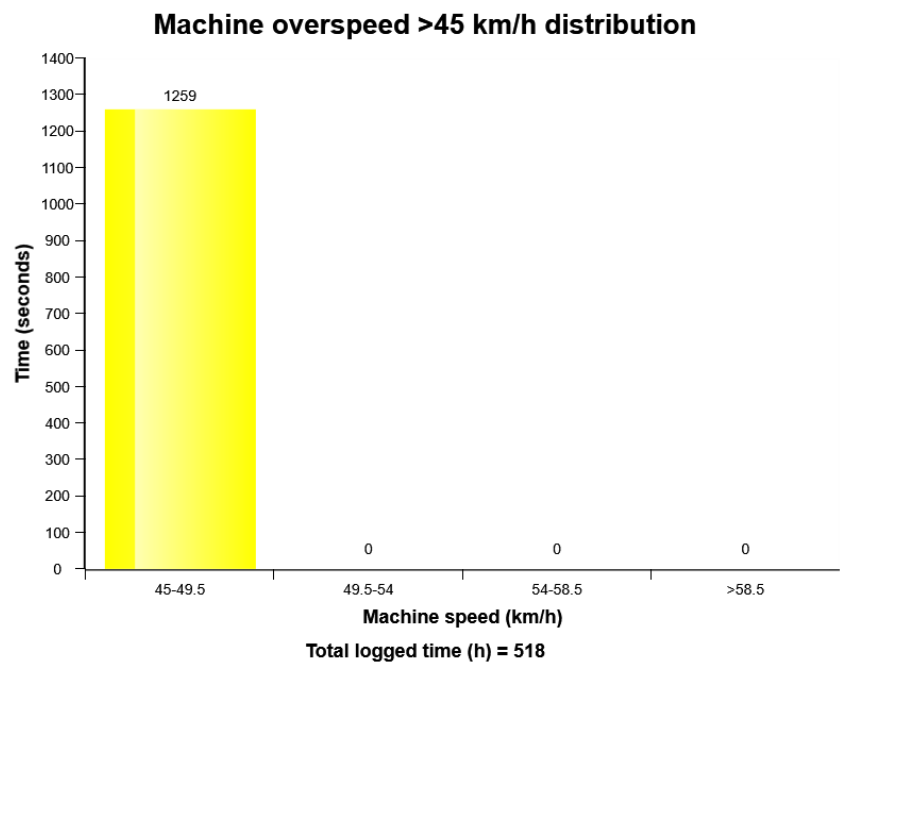

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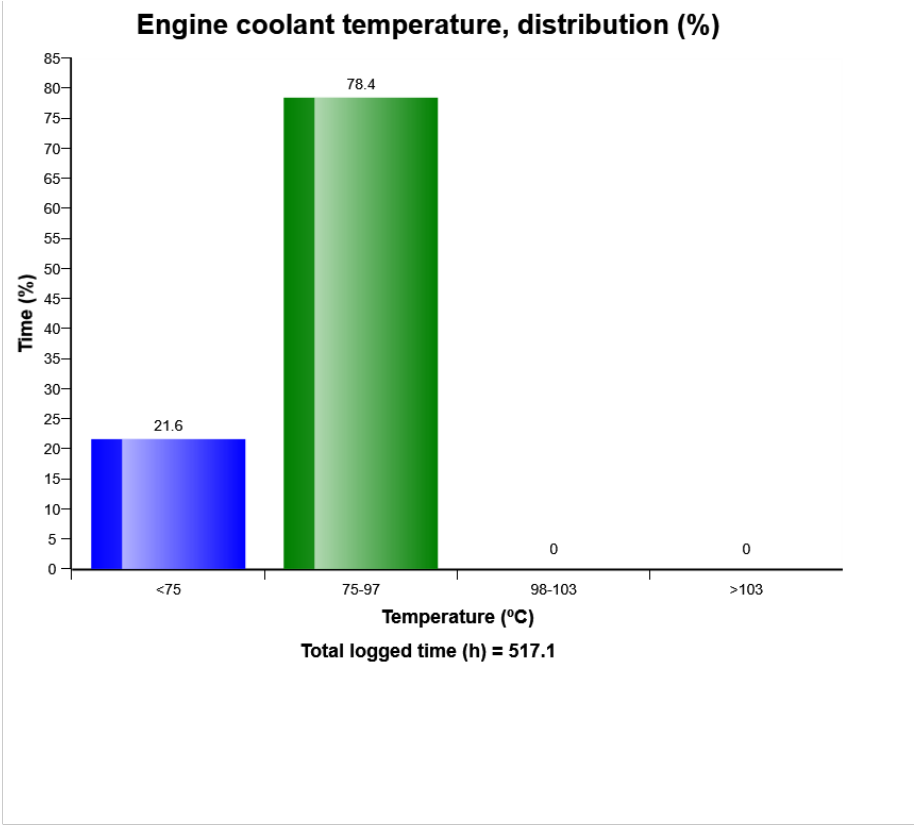

Definition:

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.

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

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.

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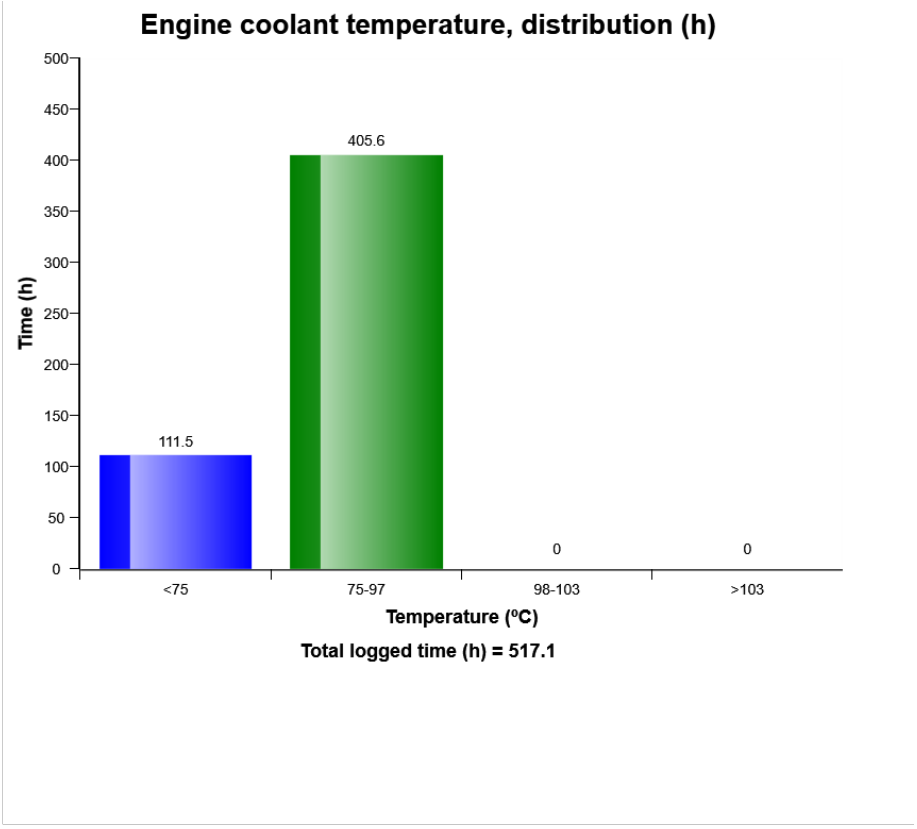

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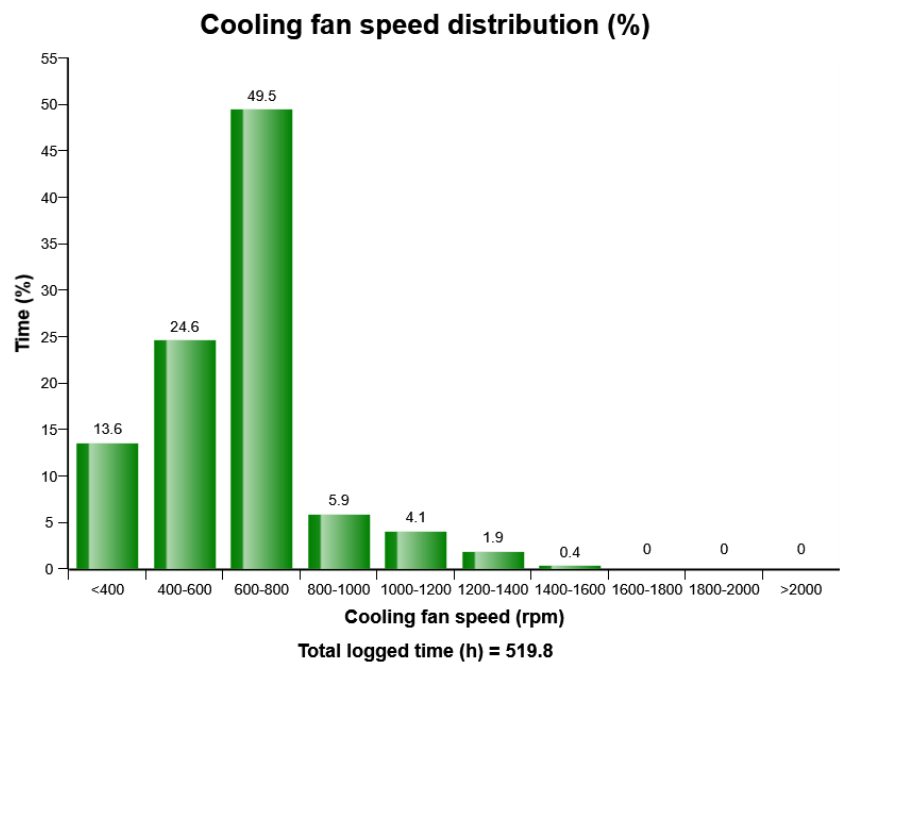

The diagram shows the time distribution for the cooling fan in different rpm ranges.

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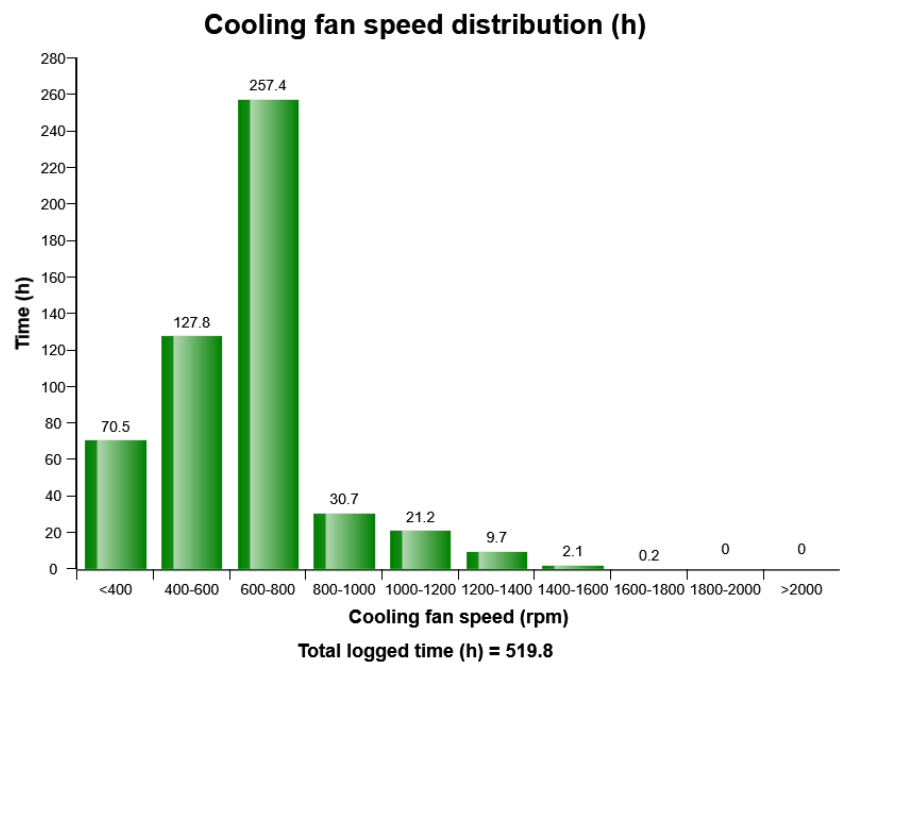

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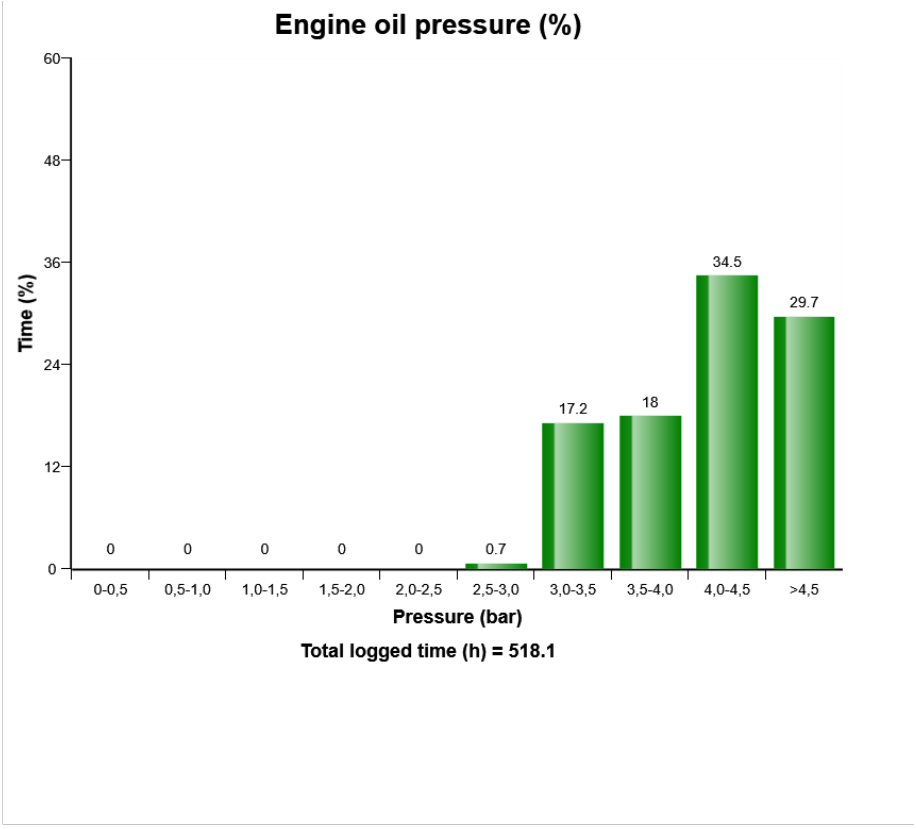

Engine oil pressure should be maintained at the correct level so that the vehicle can function perfectly. Both Low and high oil pressure is not good for the machine to funtion. This graph describes the Engine Oil Pressure. Below the graph is the total logged time in hours X Axis - Pressure Y Axis - Time in percentage

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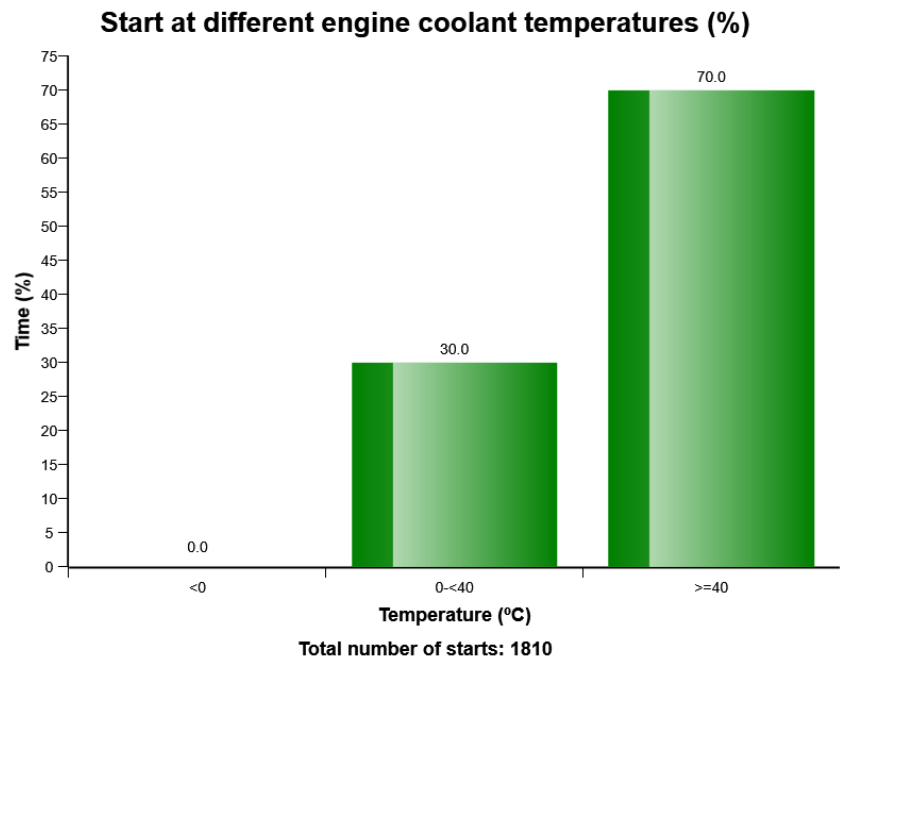

Definition:

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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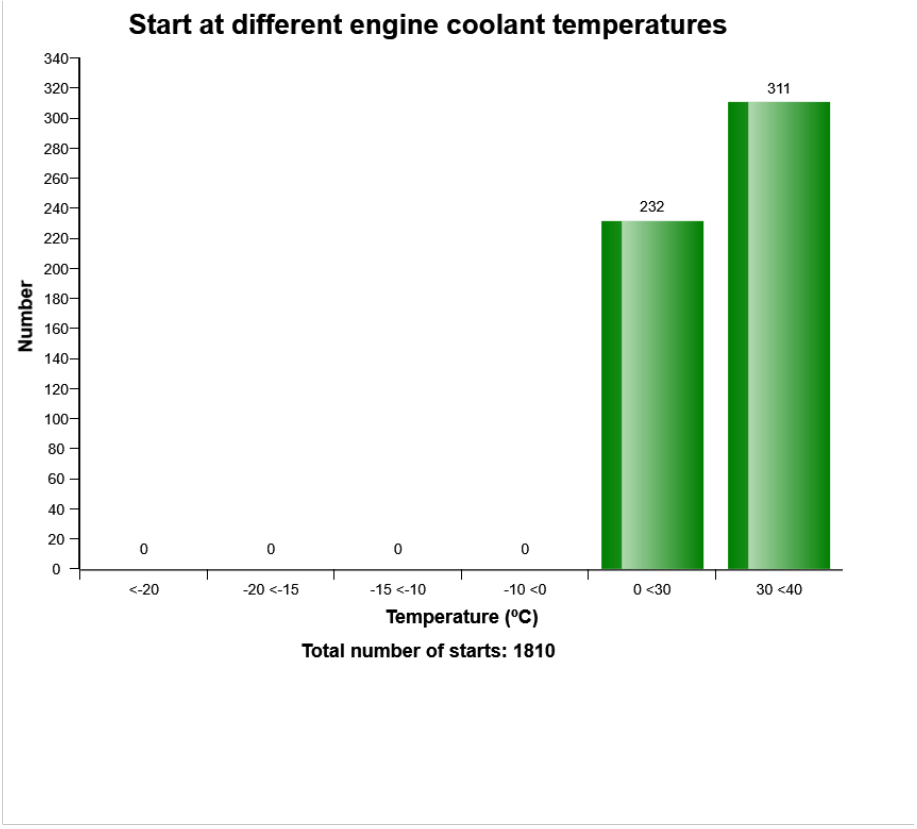

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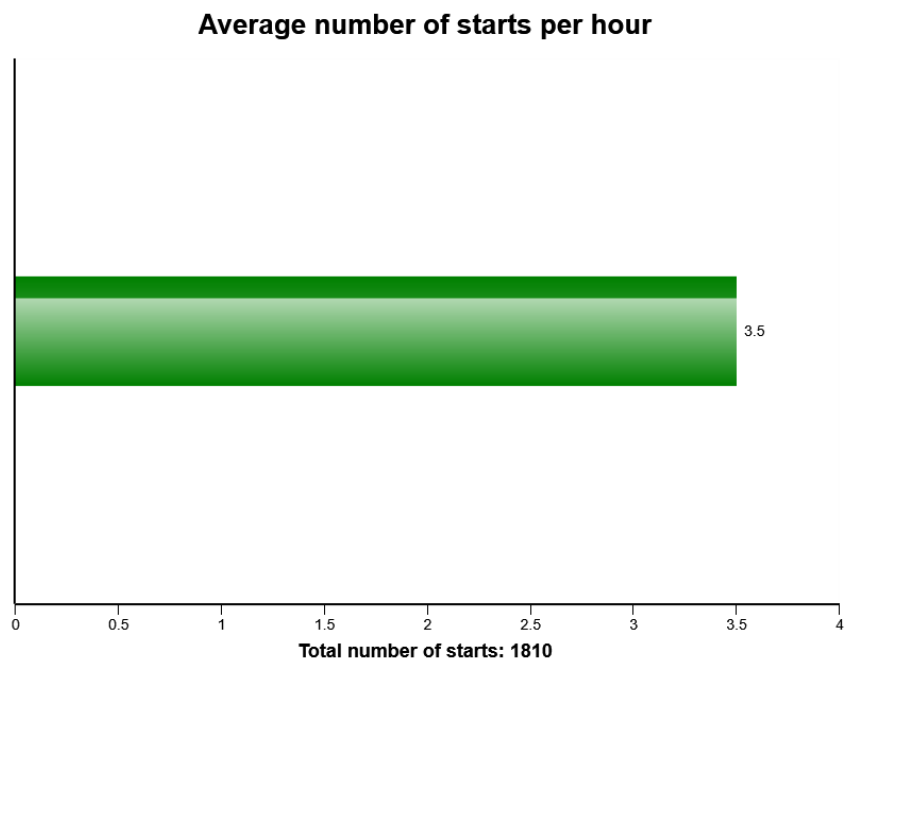

Definition:

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."

Machine model	SerialNo	Operating Hours	Reading Date
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Green bar = Number of average starts per hour

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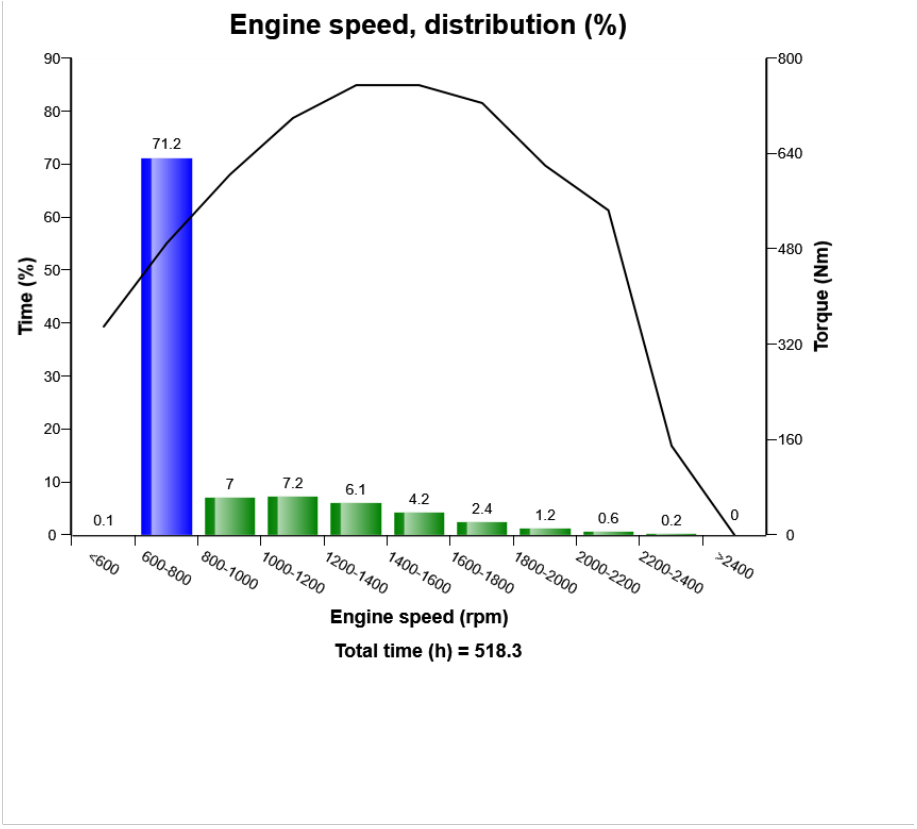

Definition:

The graph describes the engine speed distribution, compared with the engine torque curve.

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

Explanation:

Y-axis_1: Engine running time.

Y-axis_2: Torque (Nm)

X-axis: Engine speed in rpm.

Machine model	SerialNo	Operating Hours	Reading Date
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Black curve = Engine torque curve. The highest part of the torque curve points out at which engine speed that the engine is strongest. To use the machine most efficient, keep the engine speed in the highest part of the torque curve. See below examples:

Blue bar = Idling interval.

Green bars = Normal engine speed range.

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

Never exceed the maximum engine design speed .

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

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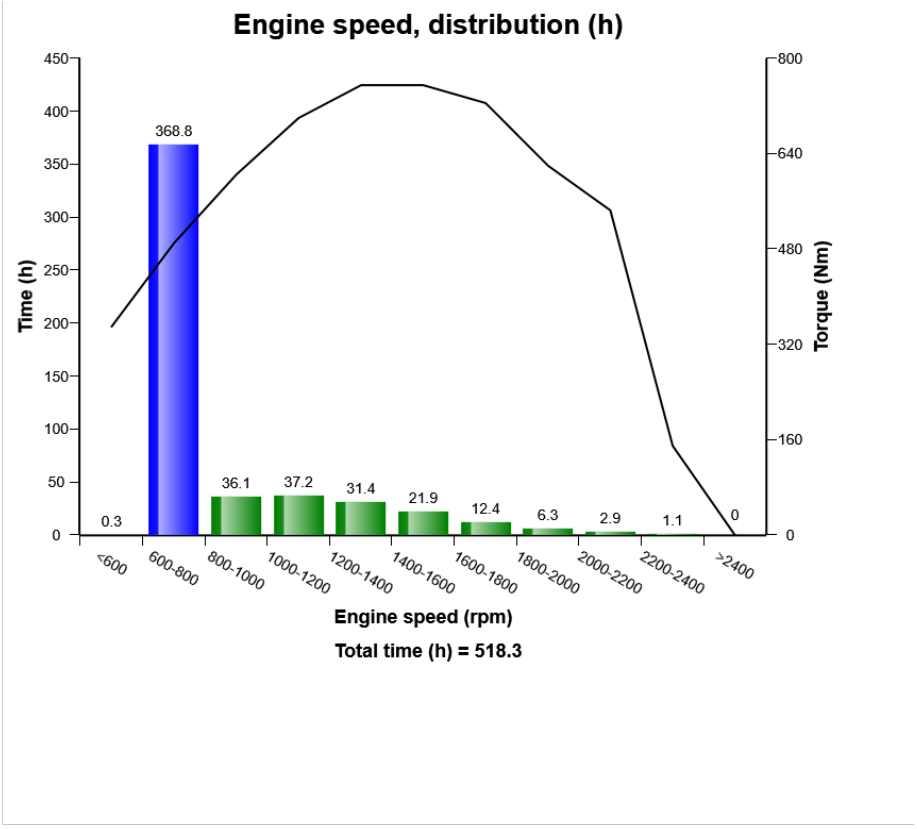

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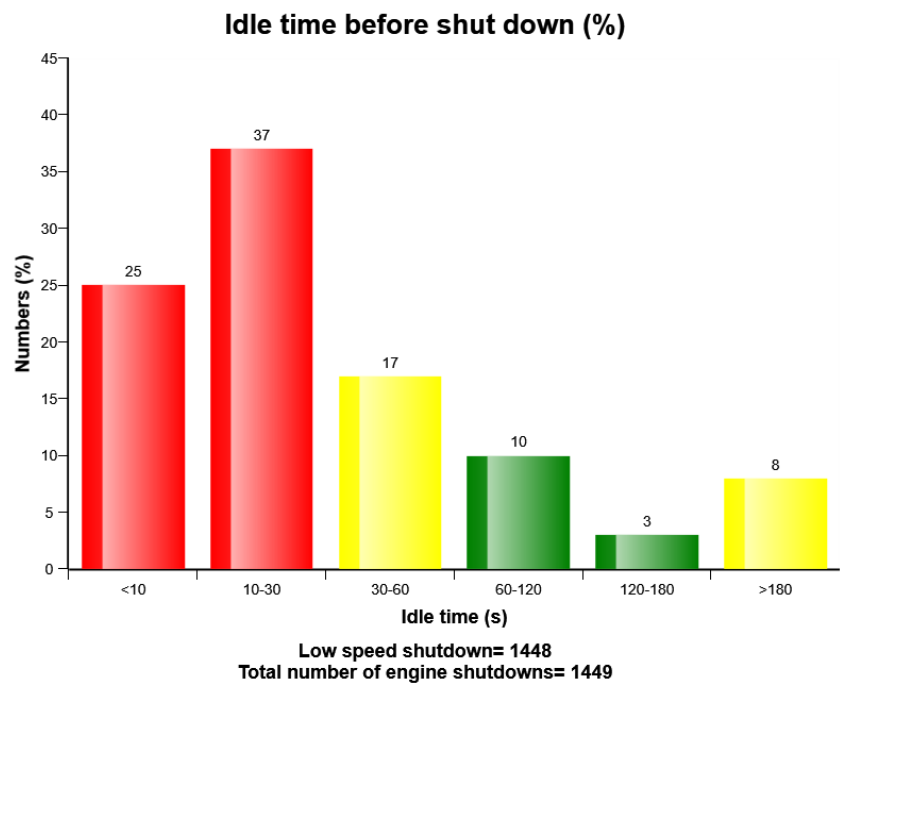

Definition:

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%.

Machine model	SerialNo	Operating Hours	Reading Date
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High voltage
Total number of occurences = 1

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme value
523	2022	11	8	2	20	5	32.1
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
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0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0
0	2000	0	0	0	0	0	0.0

Definition :

This type of table shows the latest occasions when a specific event has occurred. When a specified criteria is fulfilled a registration is made. Each table row corresponds to one occasion. Operating 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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The rows are not ordered chronological (The latest event may be in the middle).

Only one event per minute is registered.

Over the table the total number of events is displayed

Duration :

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

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

Extreme value:

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

Criteria:

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

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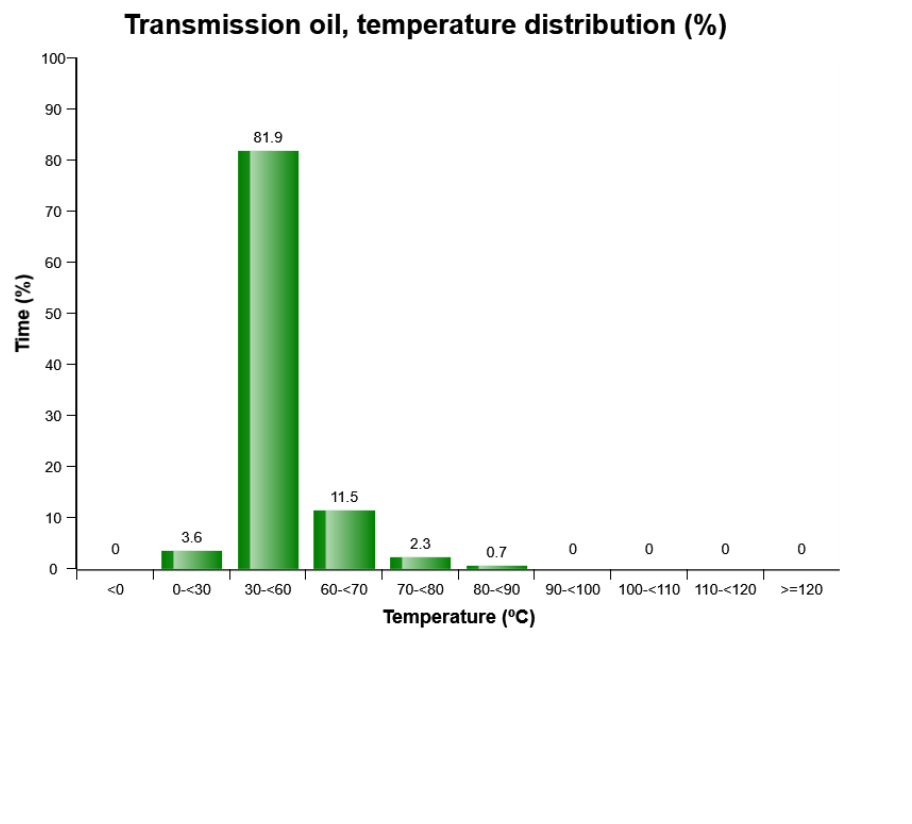

The diagram shows the transmission oil temperature in various temperature ranges. The time is displayed in the following ten temperature ranges:

<0ºC Temperatures below 0ºC

0 - <30°C Temperatures from 0ºC until 30ºC

30-<60°C Temperatures from 30ºC until 60ºC

60-<70°C Temperatures from 60ºC until 70ºC

70-<80°C Temperatures from 70ºC until 80ºC

80-<90°C Temperatures from 80ºC until 90ºC

90-<100°C Temperatures from 90ºC until 100ºC

100-<110°C Temperatures from 100ºC until 110ºC

110-<120°C Temperatures from 110ºC until 120ºC

≥120°C Temperatures over 120ºC

The bar that describes temperatures from 110ºC until 120ºC is yellow and means that the oil has began to be overheated. Driver has been given orange central warning

The bar that describes >120ºC is red and means that the oil has been overheated. Driver has been given red central warning.

Oil temperatures exceeding 110ºC must be avoided since the properties of the oil are degraded

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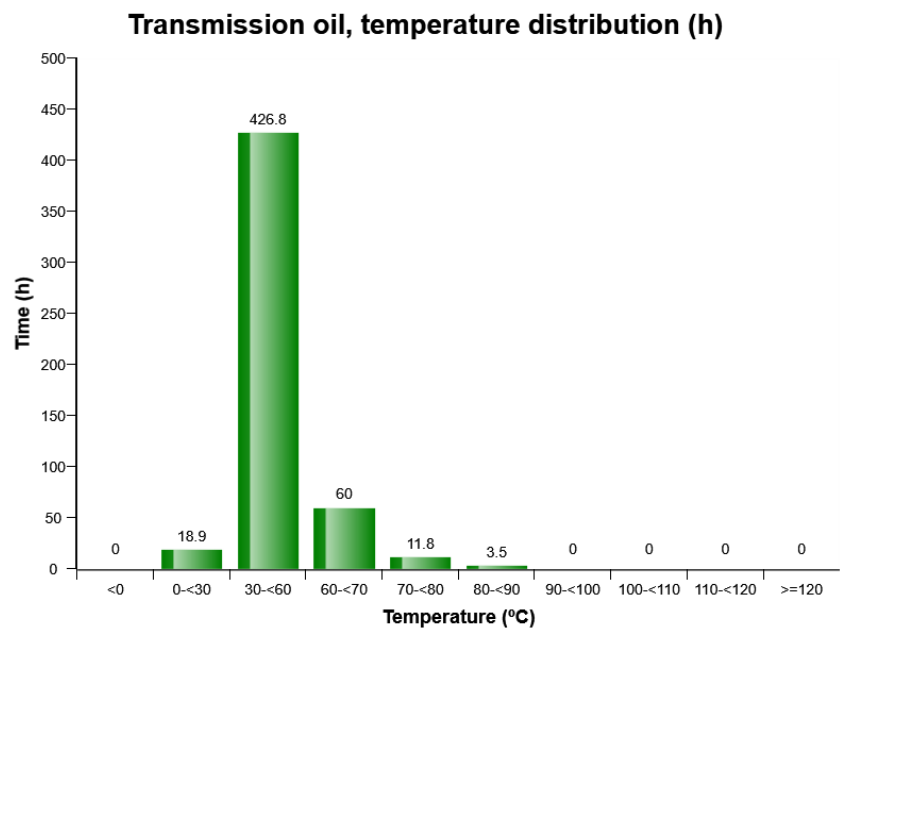

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80-<90°C Temperatures from 80ºC until 90ºC

90-<100°C Temperatures from 90ºC until 100ºC

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110-<120°C Temperatures from 110ºC until 120ºC

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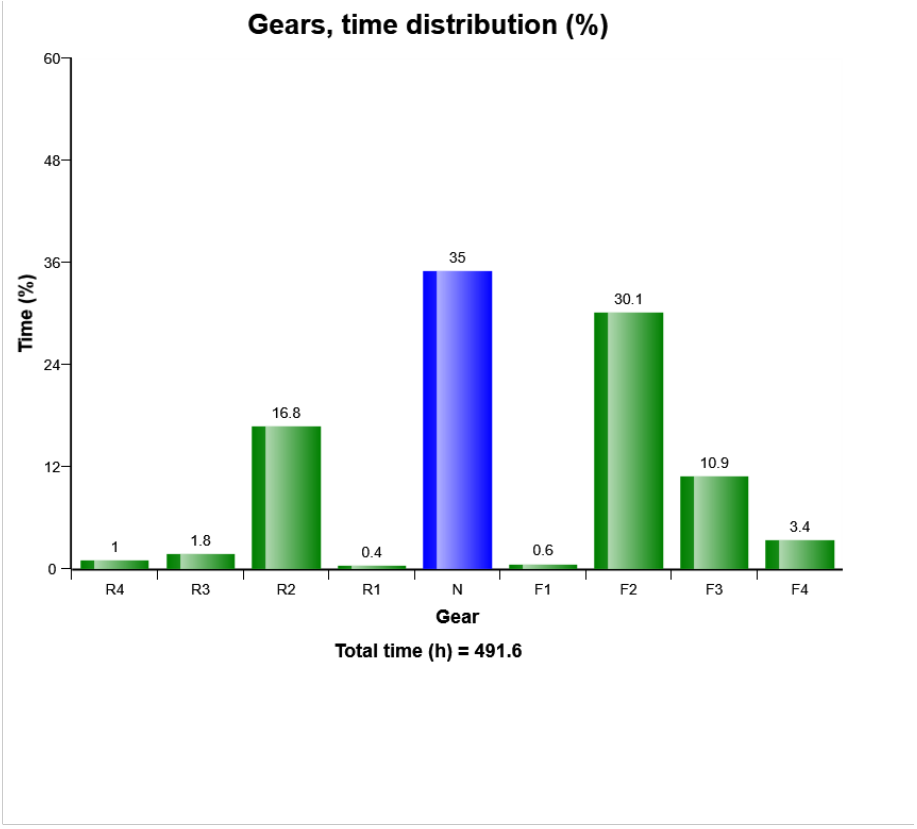

Definition:

The graph describes the distribution of the usage of the different gears, expressed as percentage of total engine running time.

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

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

Explanation:

Y-axis: Engine running time, in percent.

X-axis: Active gear.

Green bars:

R1 = First reverse gear

R2 = Second reverse gear

R3 = Third reverse gear

R4 =Fourth reverse gear

N = Neutral position

F1=First forward gear

F2=Second forward gear

F3=Third forward gear

F4=Fourth forward gear

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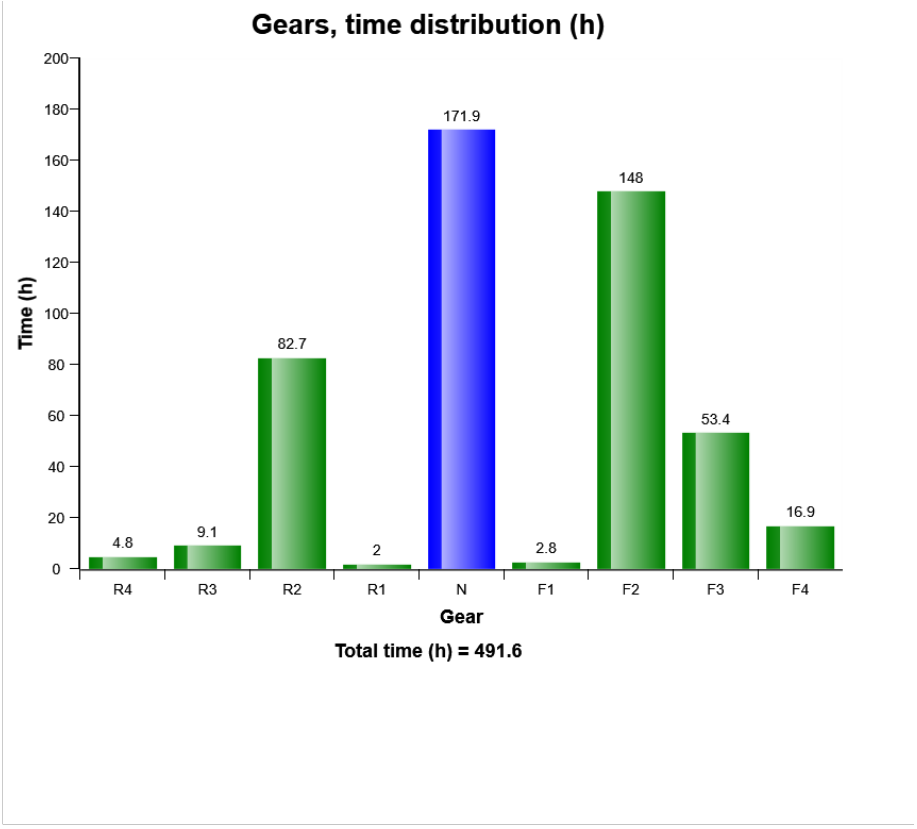

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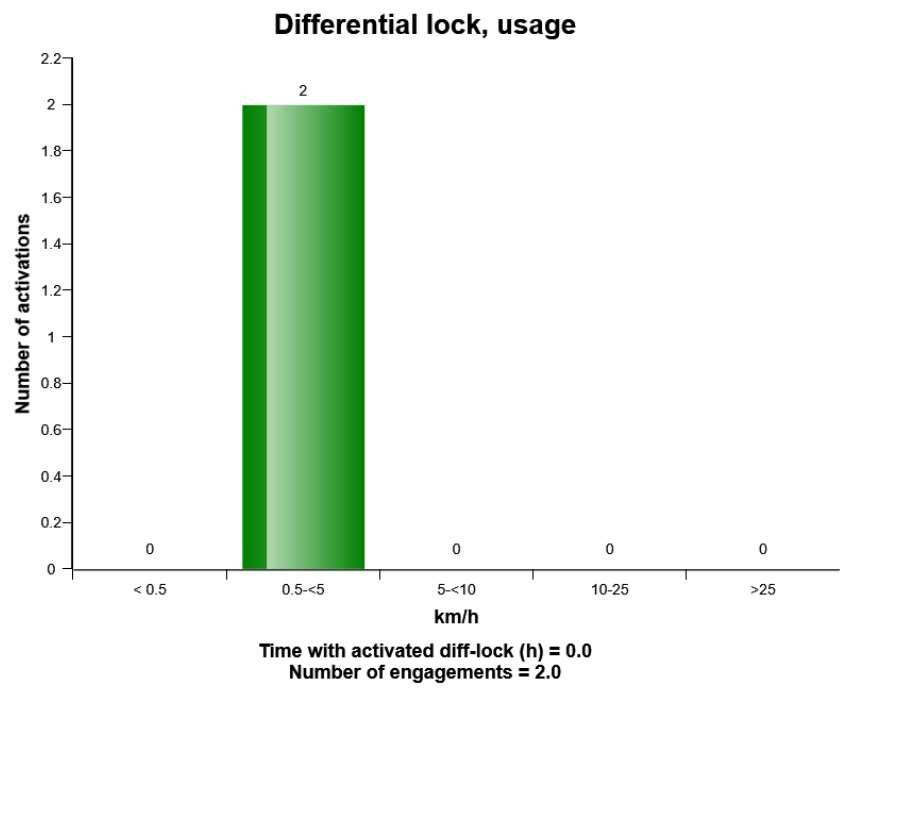

Definition:

The diagram show, number of times the differential lock has been engaged at each speed interval

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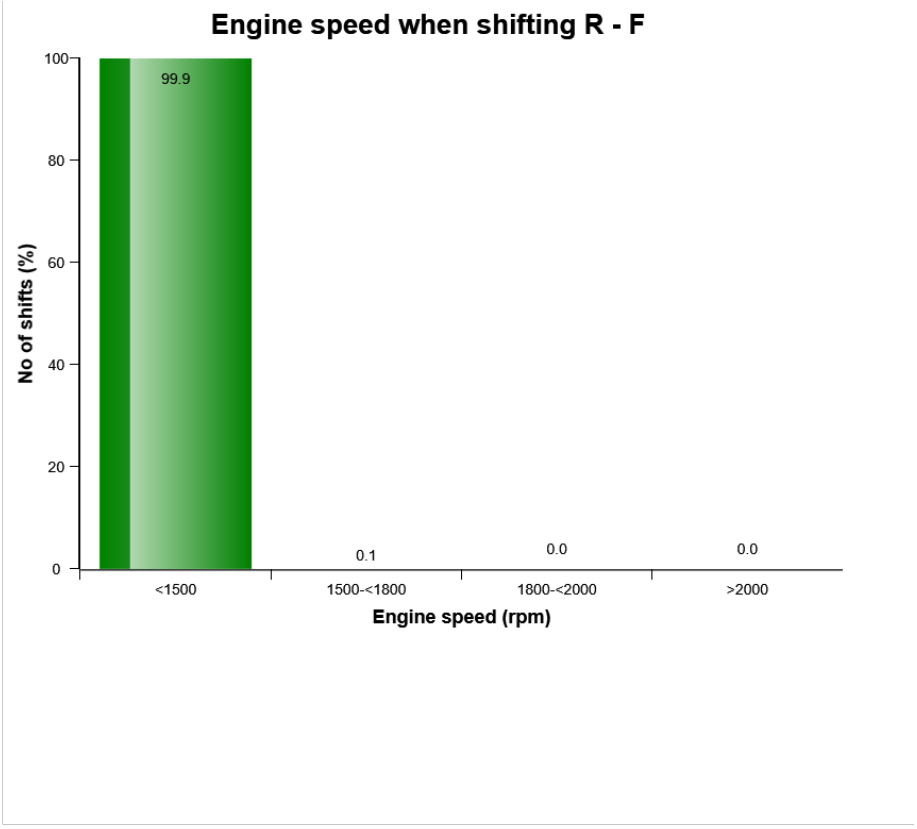

Definition:

The graph shows the machine speed at direction shift, reverse to forward (R-F)

Explanation:

Y-axis: Number of shifts (reverse-forward)

X-axis: Machine speed in km/h.

Under the graph the total number of directional gear shifts R-F below 13,5 km/h is displayed.

Transmission wear depends on current speed when shifting direction. Less machine speed when shifting direction generally cause less wear on the transmission.

Yellow bar = From 13,5km/h to18 km/h

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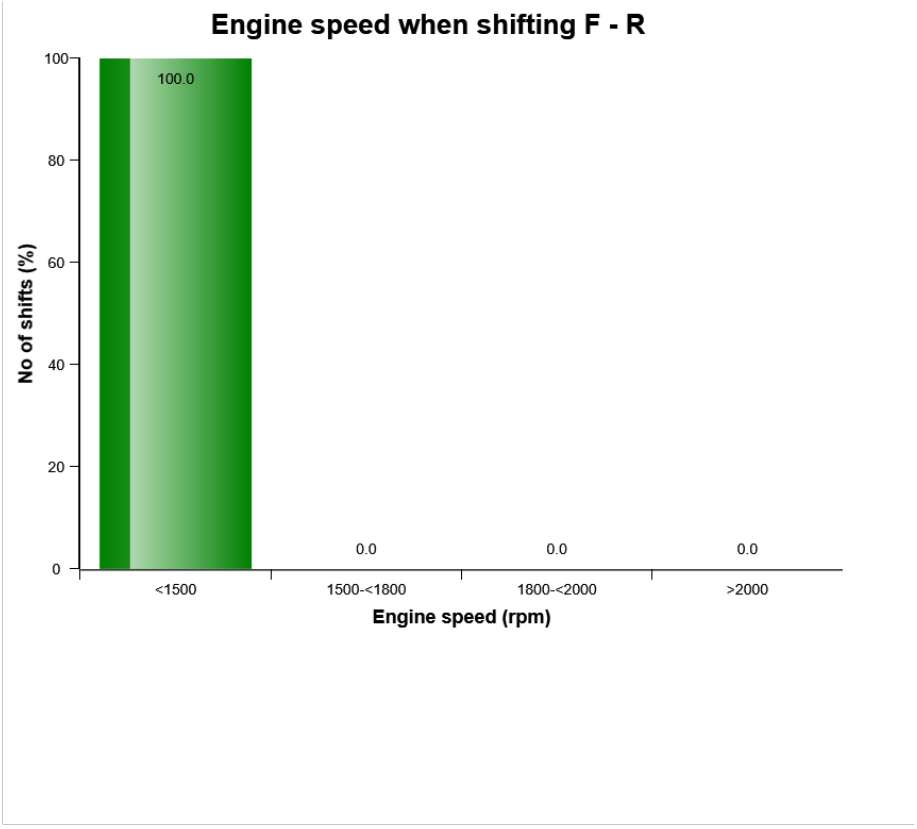
Red bar = From 18km/h to 22,5 km/h

Red bar = From 22,5km/h to 27 km/h

Red bar = Over 27 km/h

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



Definition:

The graph shows the machine speed at direction shift, forward to reverse (F-R).

Explanation:

Y-axis: Number of shifts (forward to reverse)

X-axis: Machine speed in km/h.

Under the graph the total number of directional gear shifts F-R below 13,5 km/h is displayed.

Transmission wear depends on current speed when shifting direction. Less machine speed when shifting direction generally cause less wear on the transmission.

Yellow bar = From 13,5km/h to 18 km/h

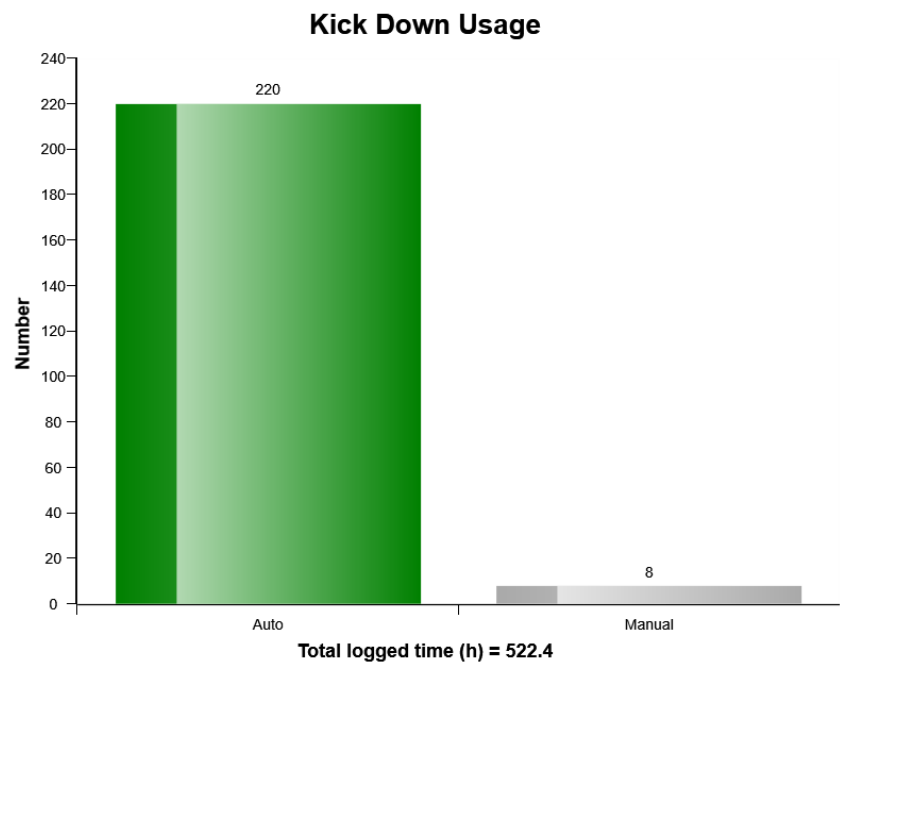
Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

Red bar = From 18km/h to 22,5 km/h

Red bar = From 22,5km/h to 27 km/h

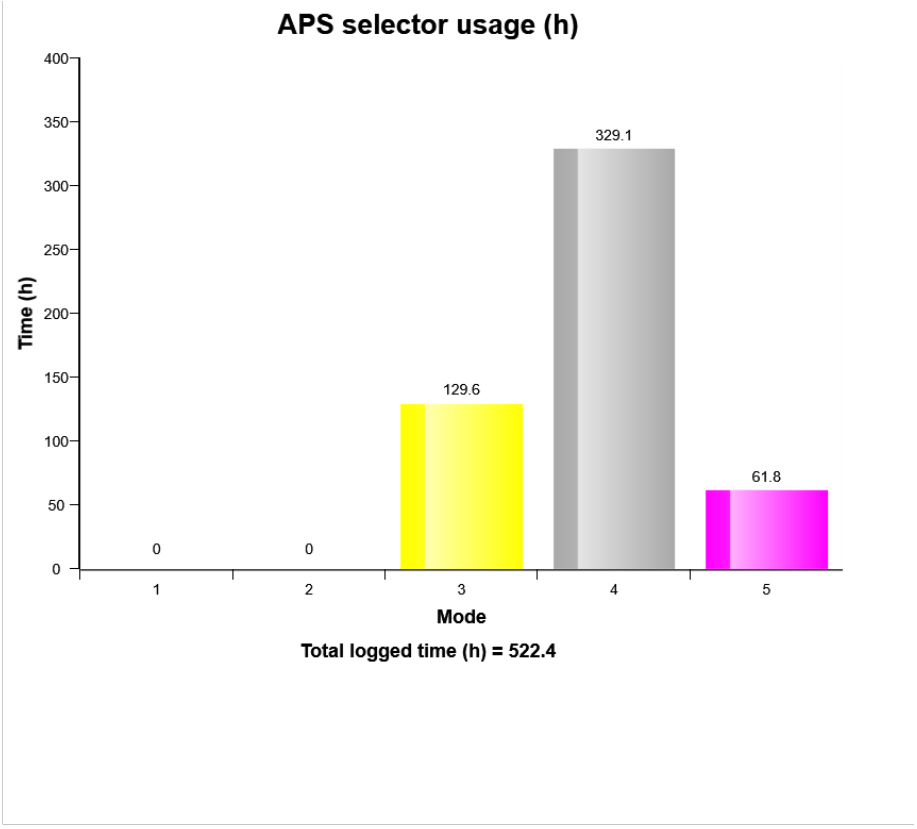
Red bar = Over 27 km/h

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



The diagram shows the distribution between Auto and Manual activations of the Kick down function.

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



The diagram shows the time distribution for the different APS modes.

For WLO :

Mode1 = Light

Mode2 = Normal

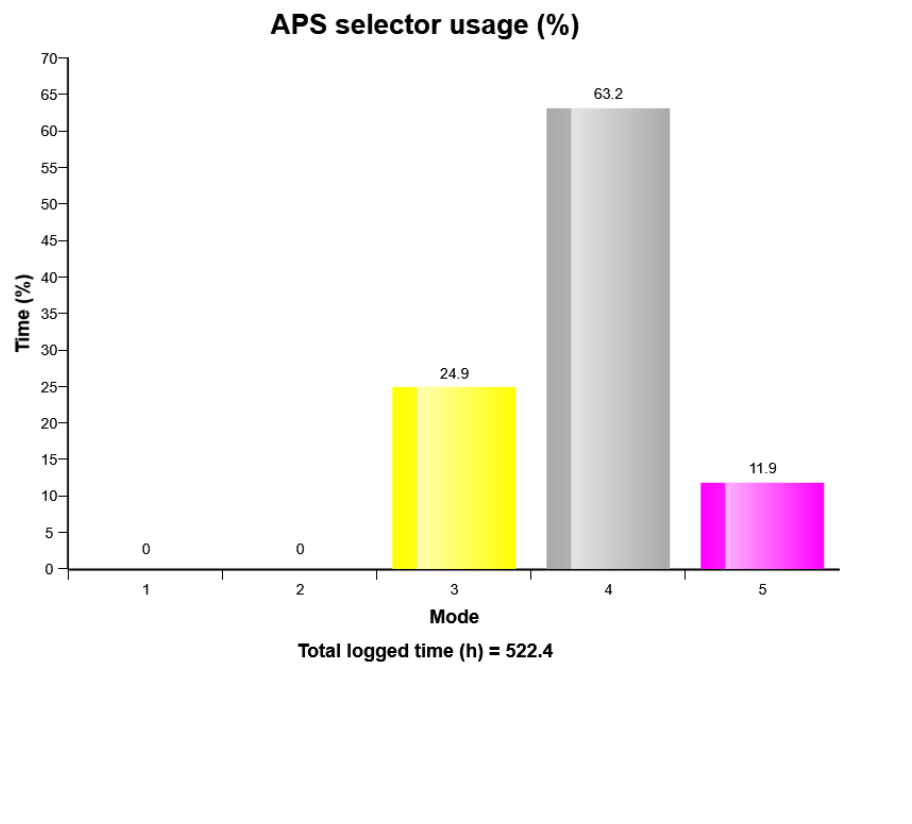
Mode3 = Heavy

Mode4 = Auto

Mode5 = Service.

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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For WLO :

Mode1 = Light

Mode2 = Normal

Mode3 = Heavy

Mode4 = Auto

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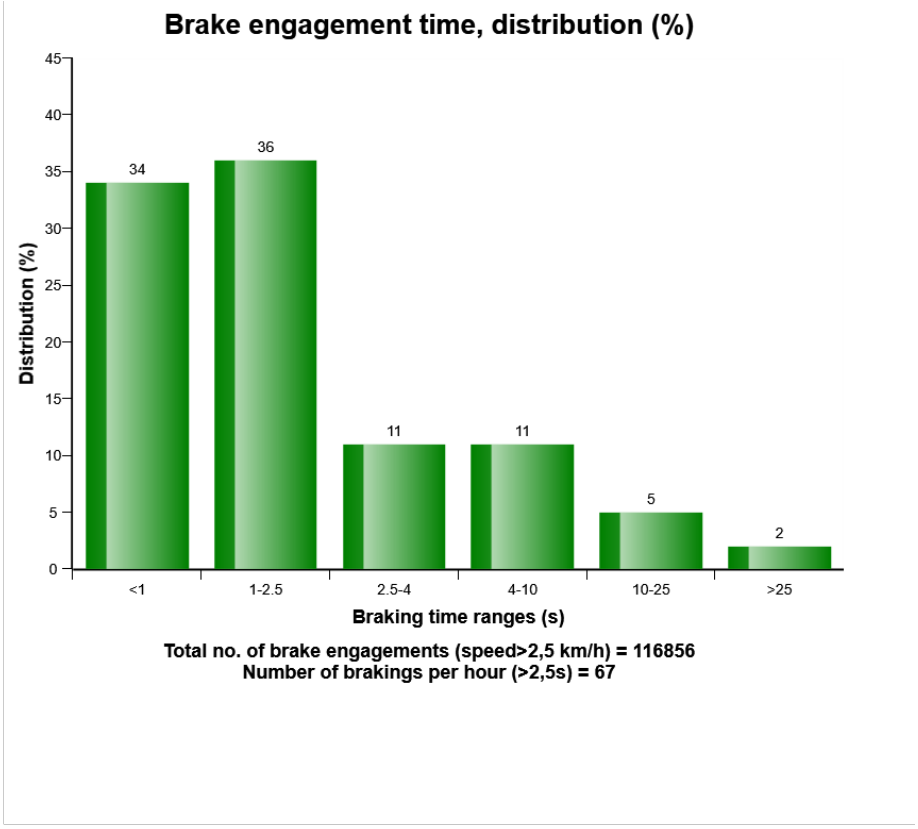
Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



Definition:

The graph describes the duration of brake engagements: Distribution in percent.

This chart illustrates time with higher brake pressure than 5.0 bar (72.5 psi) and machine speed exceeding 2.5 km/h (1.55 mph).

The sum of bars=100% of brake engagements.

Explanation:

Y-axis: Percentage of times that the brake has been engaged in each class.

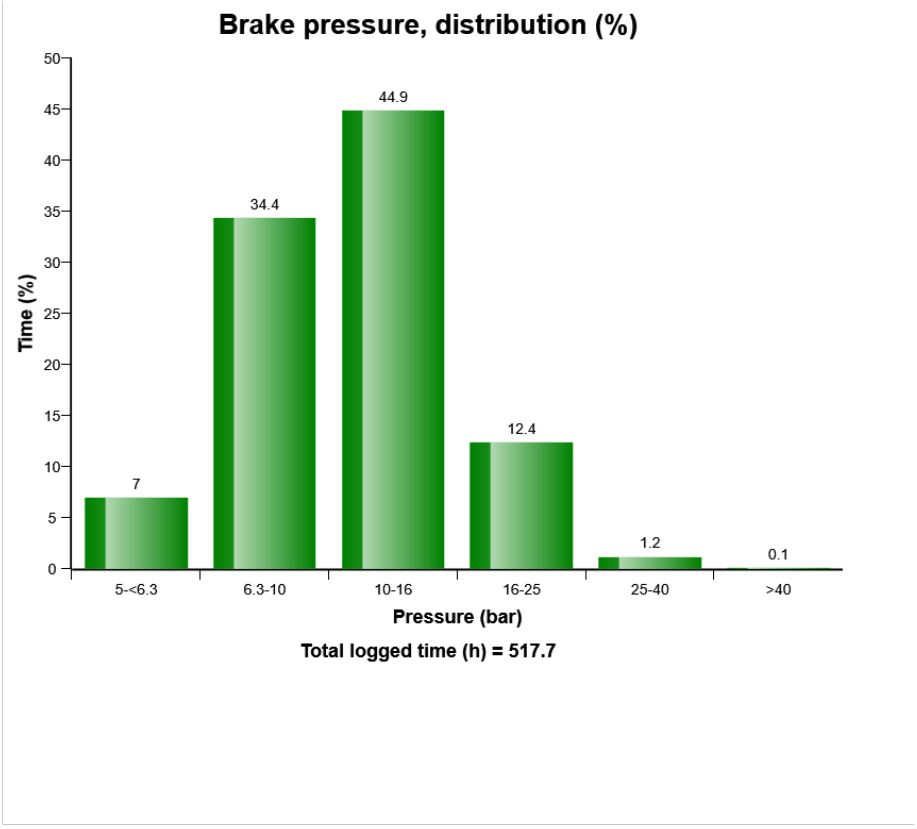
X-axis: Brake engagement time range in seconds.

The distribution of the bars throughout the ranges reflects the operator's way of handling the machine.

To get a greater understanding of how the brake is used also study the presentation " *Brake pressure distribution".*

Green bars = Brake engagement duration in separate ranges

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



Definition:

The graph describes the brake pressure distribution.

The sum of bars=100% of brake engagements.

Explanation:

Y-axis: Percentage of times that the brake has been engaged.

X-axis: Brake pressure distribution in bar.

The distribution of the bars throughout the ranges reflects the operator's way of handling the machine. A concentration in the lower ranges indicates that the machine is being operated correctly.

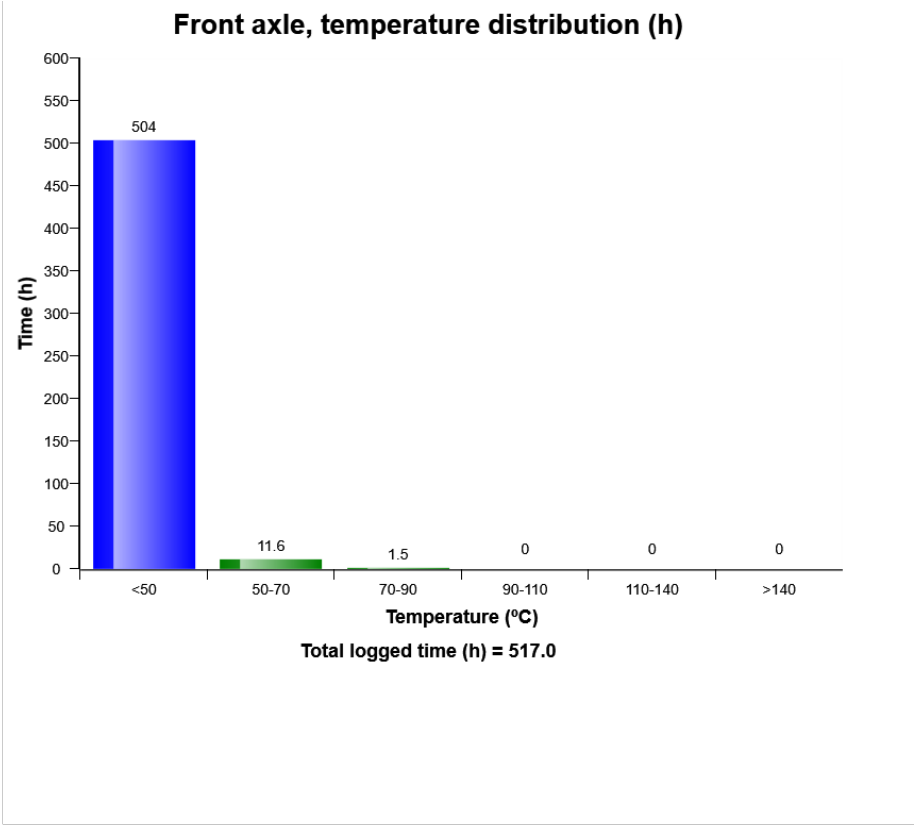
A concentration in the highest range indicates that the machine is operated hard and in an inefficient

manner.

To get a greater understanding of how the brake is used also study the presentation "Brake engagement time".

Green bars = Brake pressure ranges

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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
L90F	29451	524.6	16/01/2023

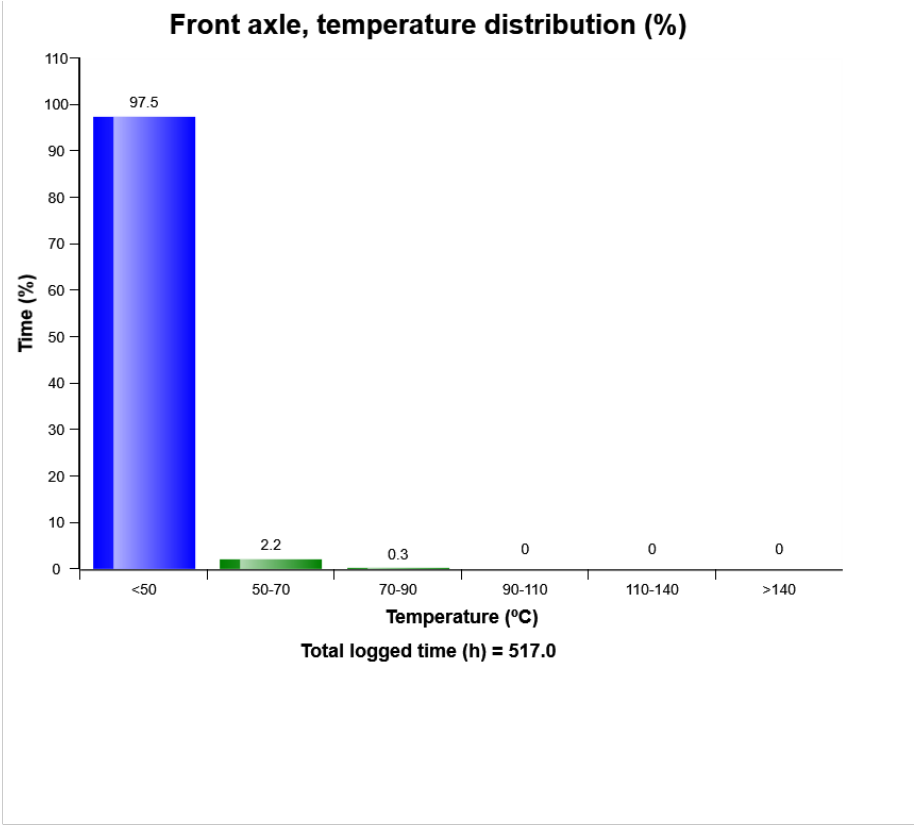
Green bar = Normal working temperature. The Major part of the registrations shall be in this region.

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
L90F	29451	524.6	16/01/2023



Definition:

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

Explanation:

Y-axis: Time

X-axis: Temperature distribution in classes.

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L90F	29451	524.6	16/01/2023

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

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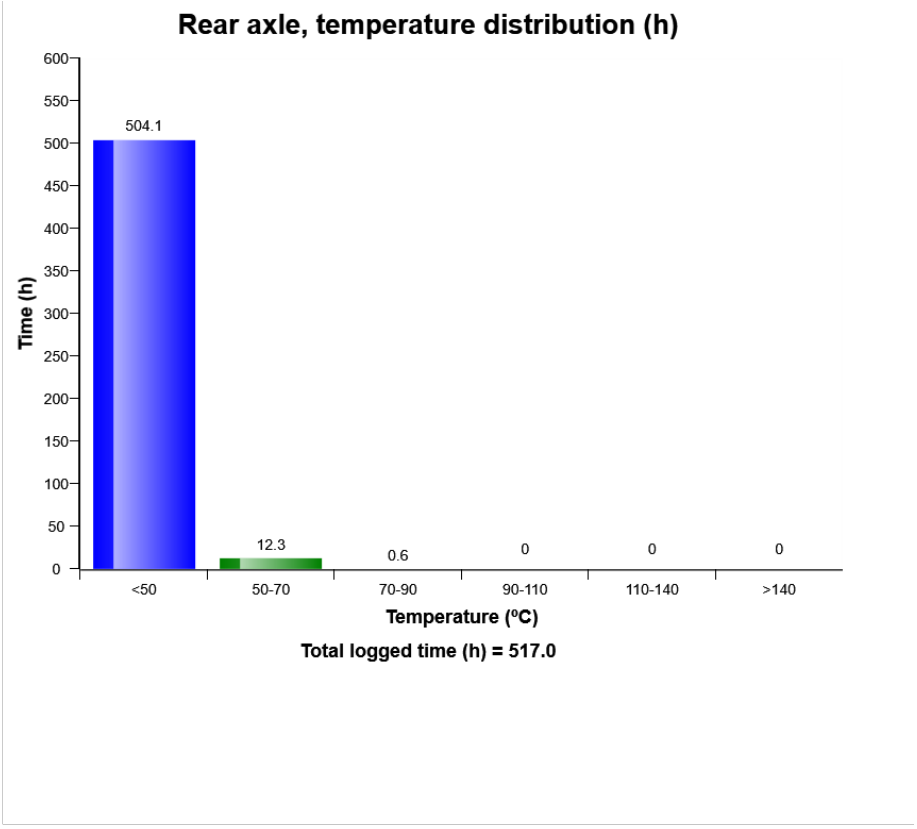
Red bar = Alarm.

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

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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
L90F	29451	524.6	16/01/2023

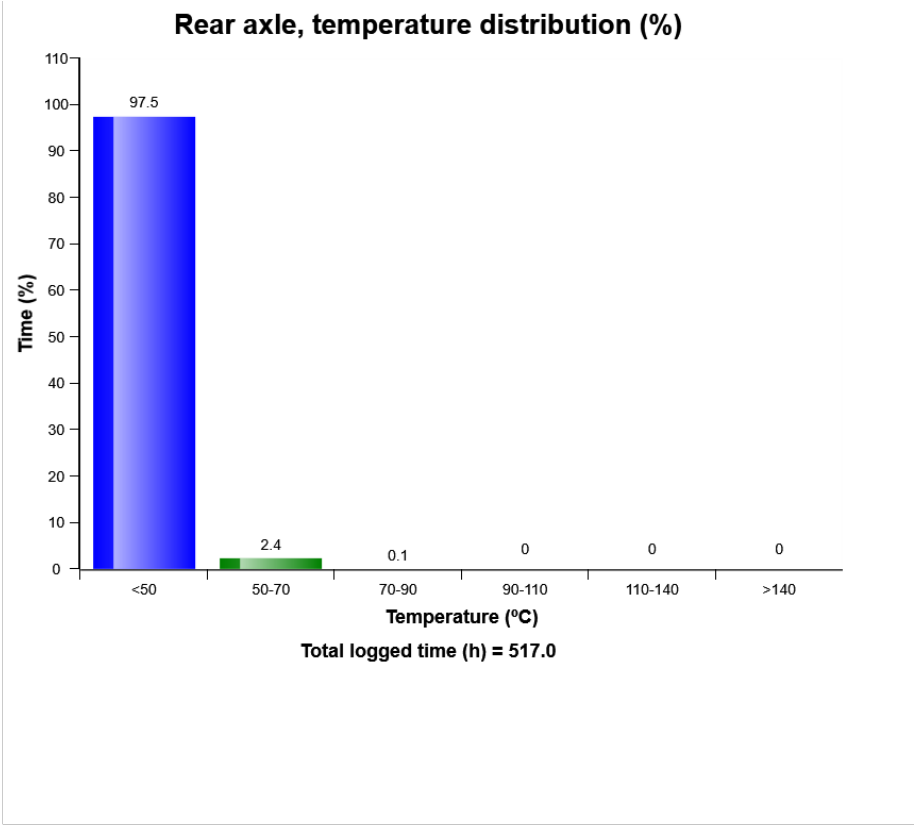
Green bar = Normal working temperature. The Major part of the registrations shall be in this region.

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
L90F	29451	524.6	16/01/2023



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
L90F	29451	524.6	16/01/2023

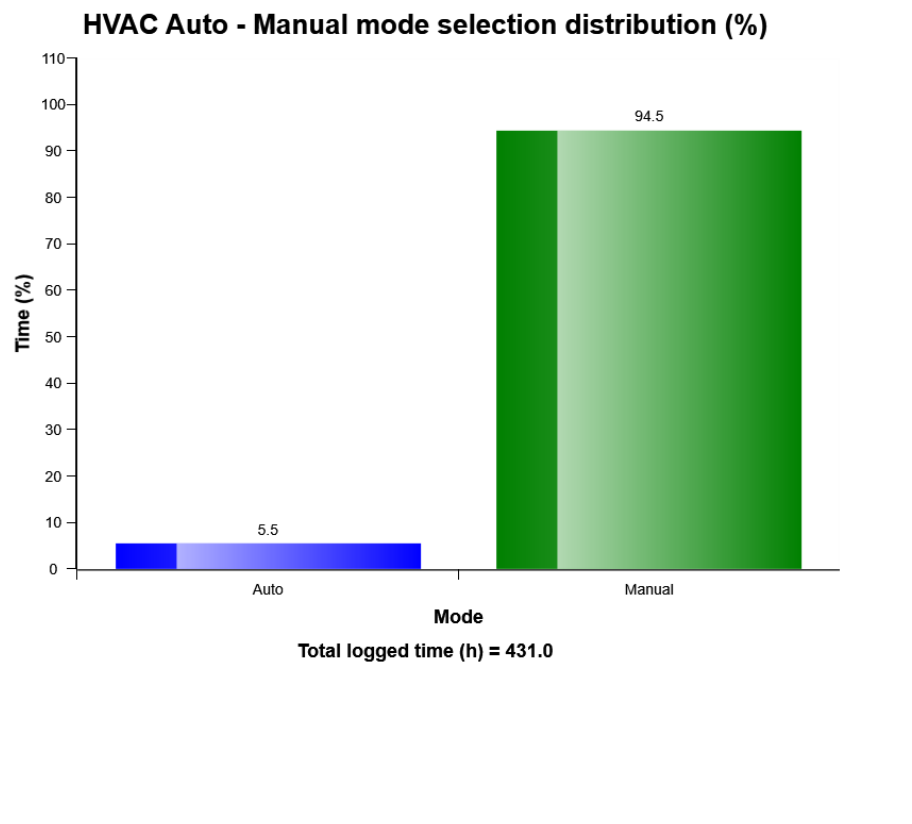
Green bar = Normal working temperature. The Major part of the registrations shall be in this region.

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.

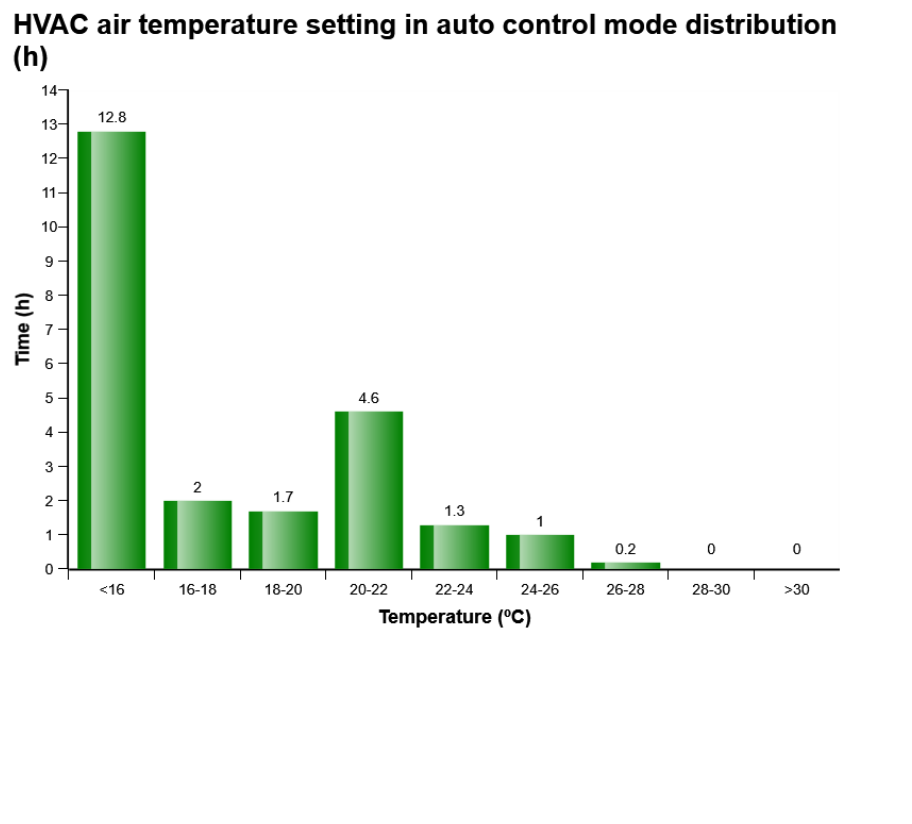
Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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.

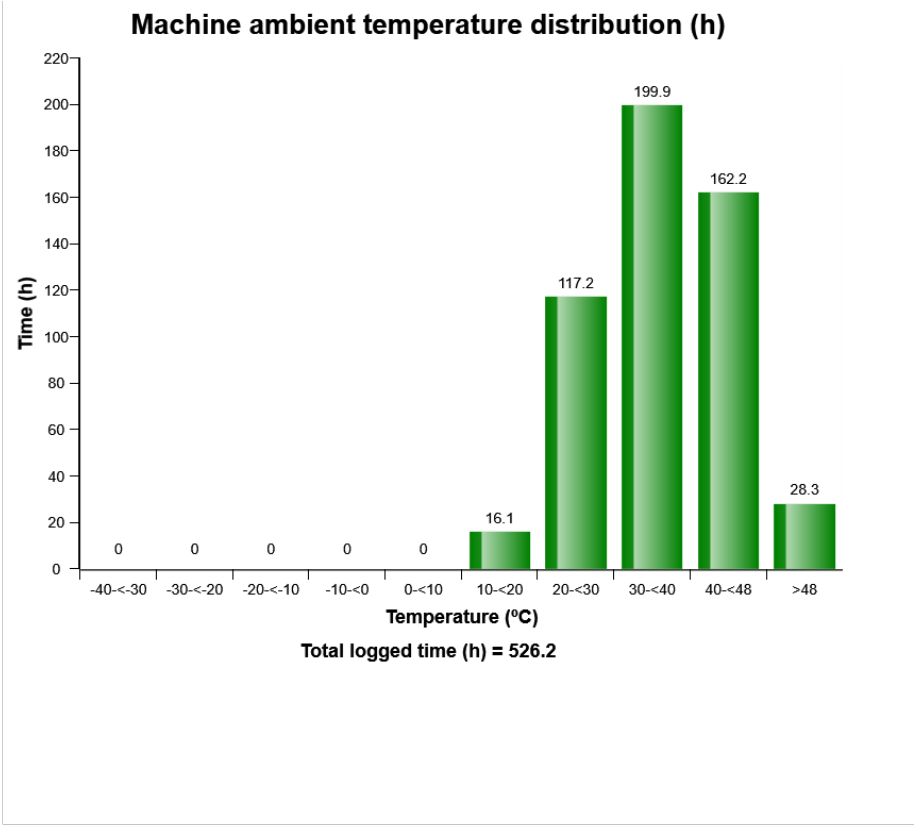
Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



Definition:

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

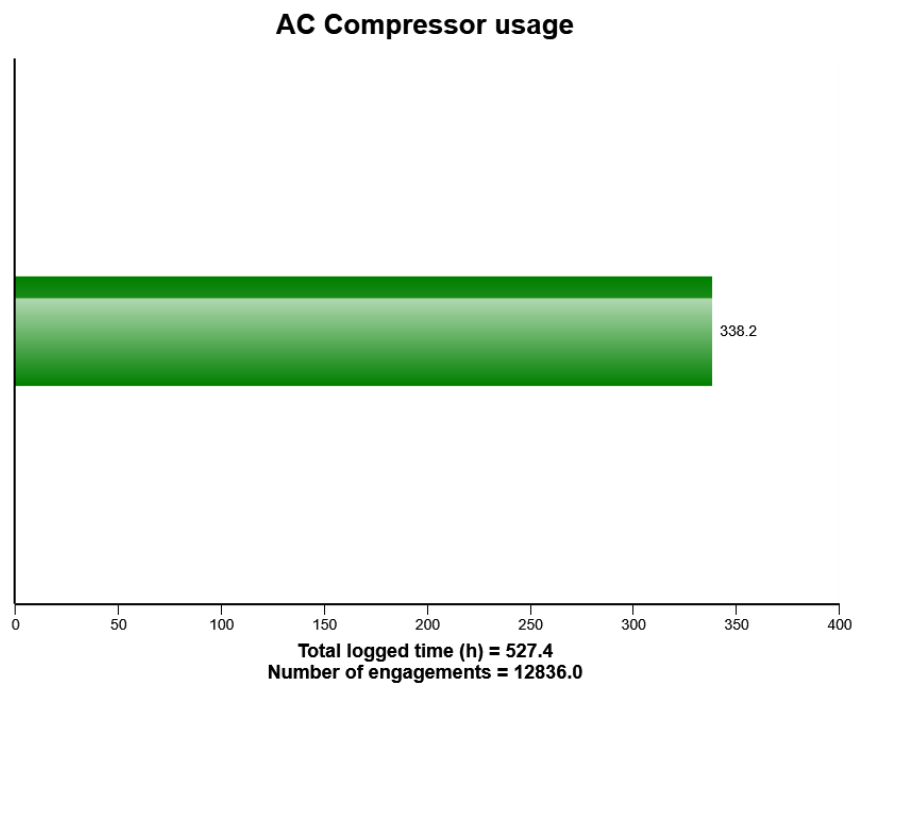
Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



Definition:

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

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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
L90F	29451	524.6	16/01/2023

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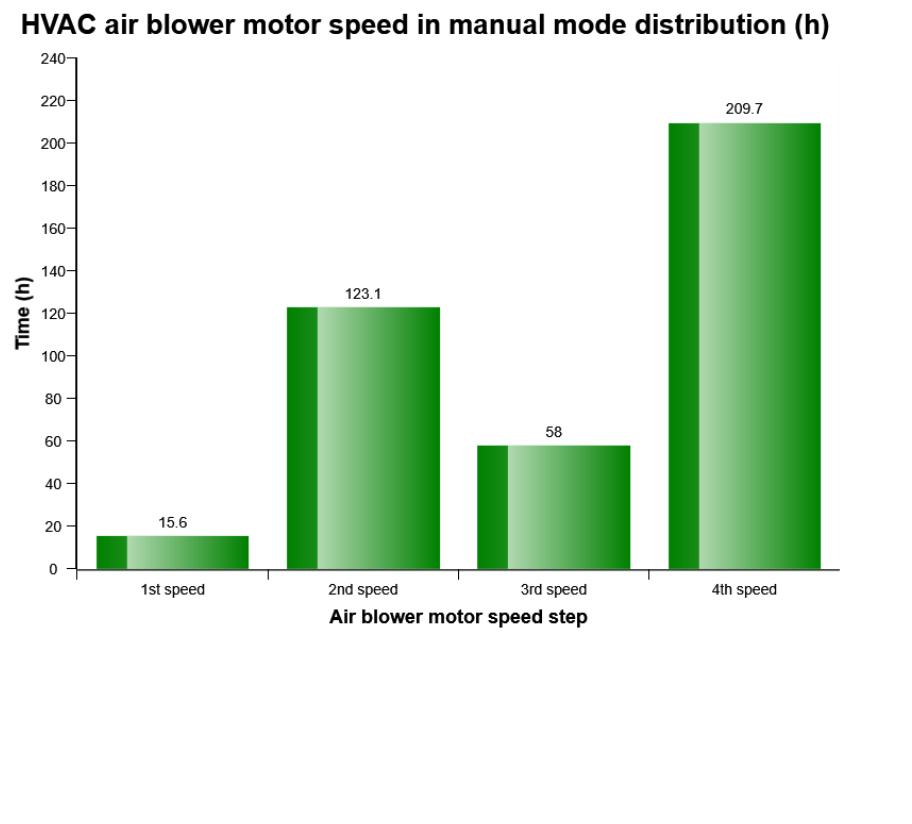
Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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
L90F	29451	524.6	16/01/2023

AC High Pressure
Total number of occurences = 39

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (°C)
249	2020	6	15	11	35	167	45
250	2020	6	15	11	43	1004	46
260	2020	6	30	13	47	2281	52
276	2020	7	12	13	39	377	53
276	2020	7	12	13	52	67	52
277	2020	7	14	12	49	172	50
280	2020	7	19	11	16	2169	46
293	2020	7	27	14	32	43	50
295	2020	7	28	13	49	348	49
296	2020	7	29	13	0	1963	52
327	2020	8	31	9	1	86	39

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

Op hours	Year	Month	Day	Hour	Minute	Duration (sec)	Extreme (°C)
452	2021	8	9	12	25	125	51
455	2021	8	16	14	6	4554	53
467	2021	8	23	13	49	968	49
478	2021	8	29	14	0	4003	51
514	2022	6	8	16	12	36	46
515	2022	8	17	10	48	63	45
518	2022	8	30	11	30	74	45
518	2022	8	30	11	35	139	43
519	2022	8	30	16	42	131	42

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.

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

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.

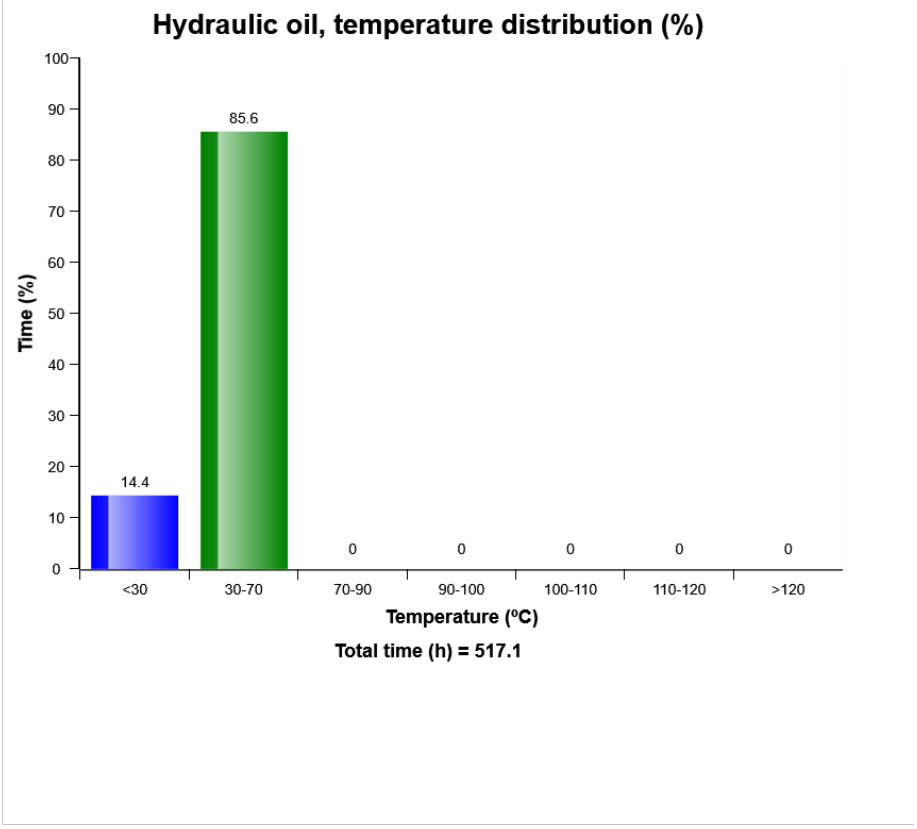
Extreme value:

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
L90F	29451	524.6	16/01/2023



Definition:

The graph describes hydraulic oil temperature distribution.

The sum of bars = Engine total running time.

Under the graph the total engine running time is displayed.

The value of each bar presented above the bars with one decimal.

Explanation:

Y-axis: Engine running time in percent of time.

X-axis: Oil temperature distribution in °C.

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023

Blue bar = Below 30°C, warming-up phase.

Green bar = From 30 ° C to 70°C, normal working temperature

Green bar = From 70 ° C to 90°C, normal working temperature

Green bar = From 90 ° C to 100°C, normal working temperature

Yellow bar = From 100 ° C to 110°C, high working temperature

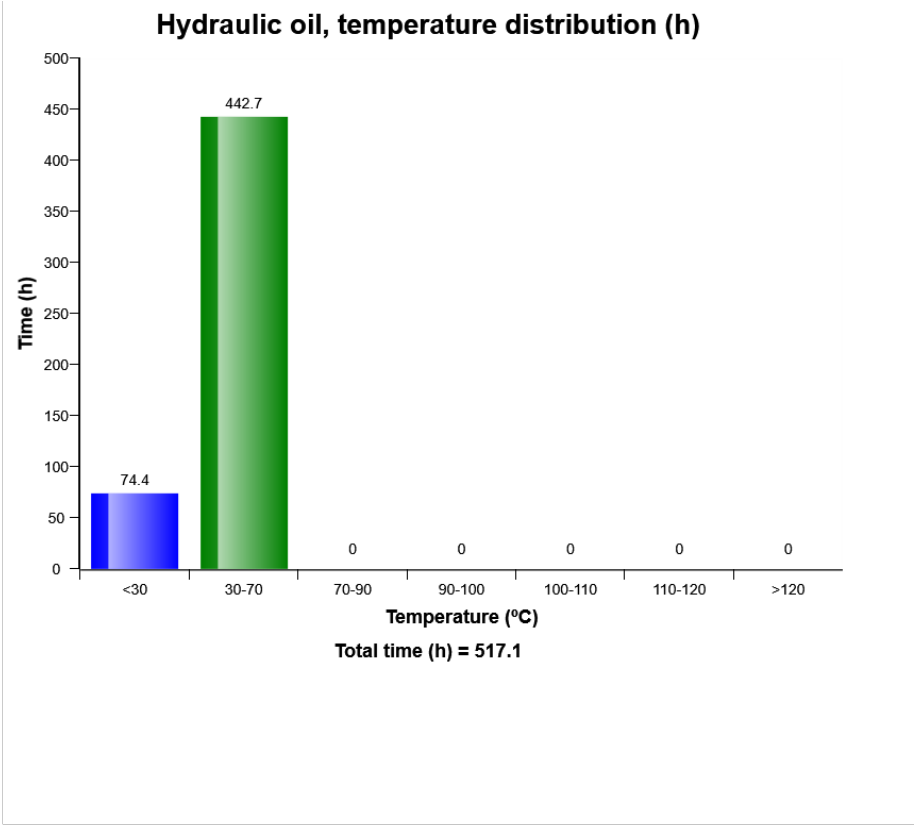
Red bar = From 110°C to 120°, To high temperature

Red bar = Over 120°, Alarm

Temperature in this area is not normal.

Temperature over 120°C may cause severe damages on the hydraulic system.

Machine model	SerialNo	Operating Hours	Reading Date
L90F	29451	524.6	16/01/2023



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
L90F	29451	524.6	16/01/2023

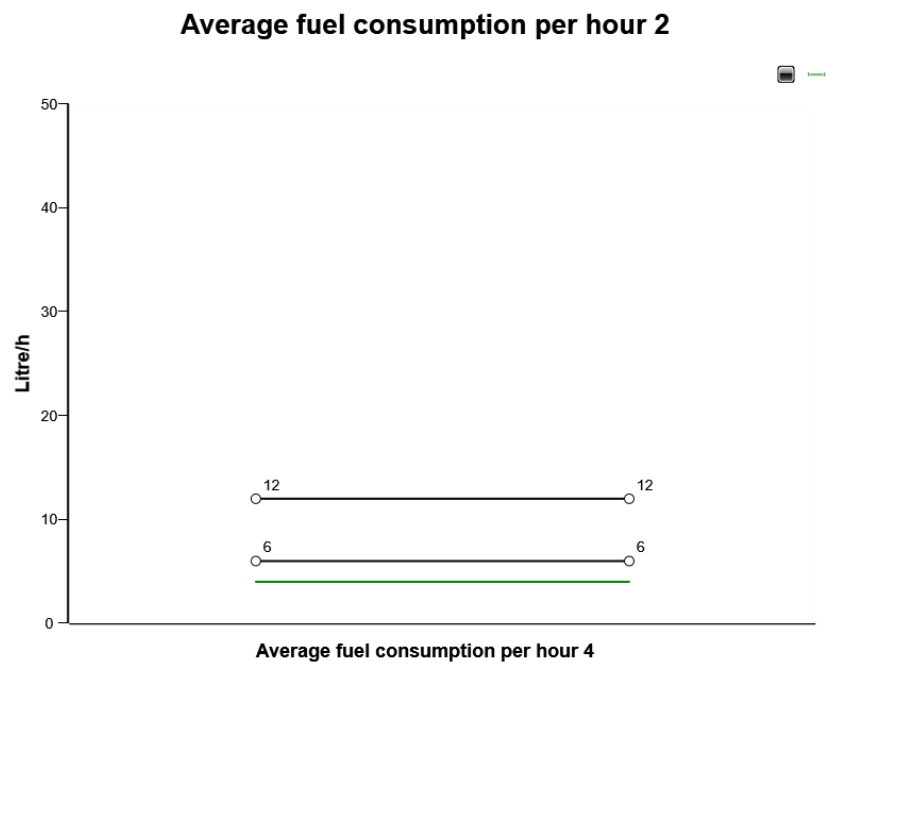
Green bar = Normal working temperature. The Major part of the registrations shall be in this region.

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
L90F	29451	524.6	16/01/2023



The graph displays the comparison between machine population and actual machine regarding average fuel consumption.

80% of the machine population has fuel consumption between the two black lines and the green line show where actual machine is compared to this. It is normal to have values both above and below the black lines (due to different applications and surrounding conditions), this graph is only for comparison. It is normal to have values both above and below the black lines (due to different applications and surrounding conditions), this graph is only for comparison.