Hybrid Assistant Report

Info	
Car model	Prius C
VIN	JTDKDTB39D1------
Odometer	257,438
Generated at	23/10/2023 16:42:01
Version	HA:318 HR:318

Index

Trip summary

Time	
Start	23/10/2023 16:31:18
Finish	23/10/2023 16:40:20

Trip					
	Total	**EV**	**%**	**No Fuel**	**%**
Distance	0.00 mi	0.00 mi	0%	0.00 mi	0%
Time	9:01	6:08	66%	6:08	68%
Moving	0:00	0:00	NaN%	0:00	NaN%

Speed	
Average	0 mph
Moving Average	NaN mph
EV Average	0 mph
Max	0 mph

Environment	
Start SOC	58.82%
End SOC	43.92%
Avg Ambient Temperature	18°C
Altitude Delta	0

Trip summary values are detailed by Time, Moving and EV.
Time is the total trip time.
Moving stats regards only the fraction of time while the car was not standing still.
EV stats are accounted only when the petrol engine is stopped.
No Fuel sums EV driving with the petrol engine running without fuel like coasting at high speed or driving down a slope.

Device info

Phone	
Manufacturer	sprd
Model	uis8581a2h10_Automotive
Product	uis8581a2h10_Automotive
Android SDK	29
Hostname	Bluetooth 2
Screen	1024x600
Scale	1

OBD	
Connection type	Bluetooth
Model	vLinker
MAC Address	DC:0D:30:B9:93:AE
Name	ELM327 v2.2
Manufacturer	OBDII to RS232 Interpreter
Firmware	STN1151 v4.3.2

Requests per second	
Average	17
Start	20
End	21
Delta	1
Min	10
Max	23

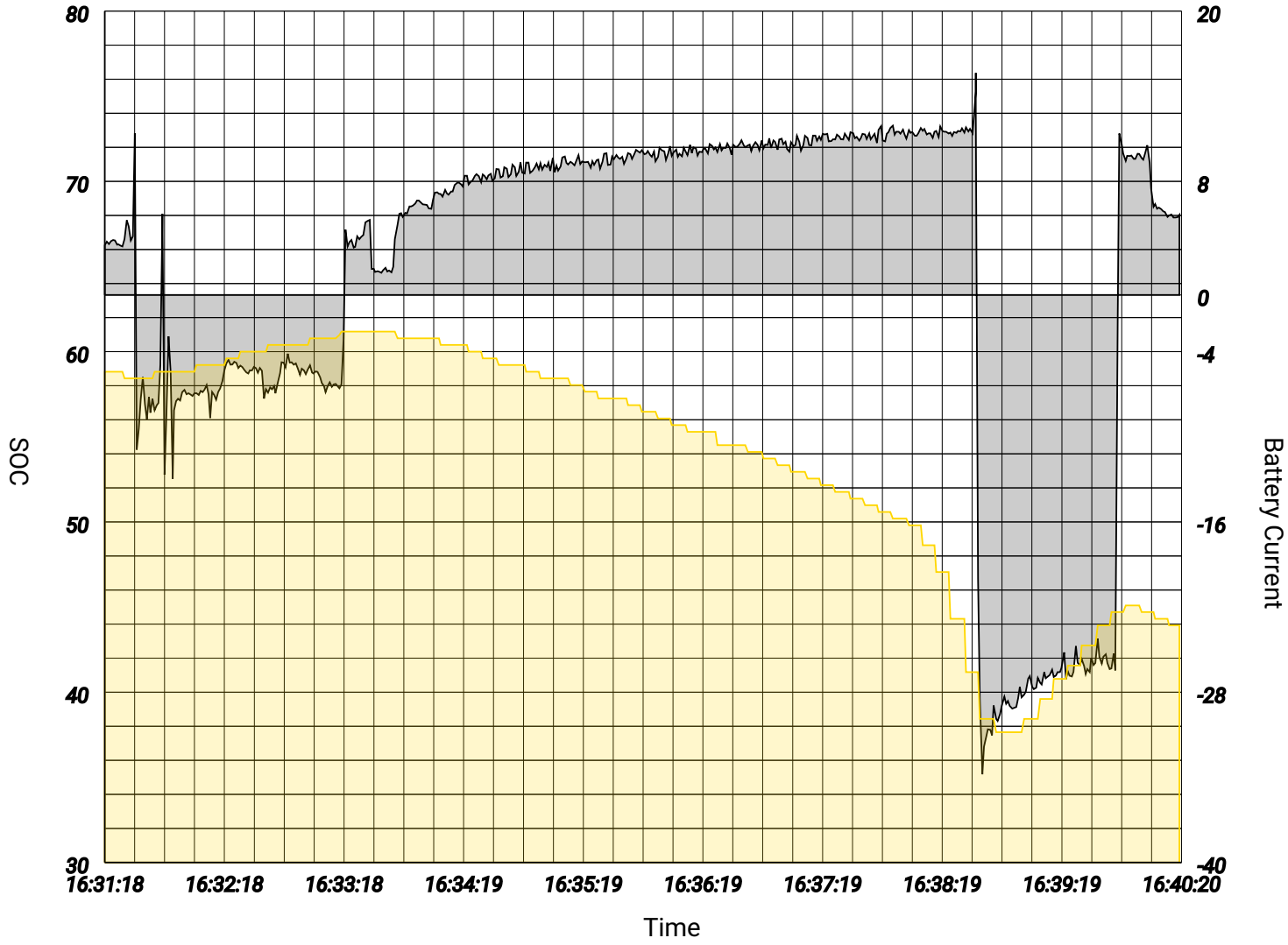
Sampling	
Start time	23/10/2023 16:31:18
End time	23/10/2023 16:40:20
Duration	9:01
Samples	1381
Average	0.39 sec
Standard deviation	0.05 sec
Disconnections	0

Sampling	
Corrupted frames	0/13,984

Information about phone and OBD adapter.
The sampling average is the time taken for reading all sensors, in seconds: the lowest, the fastest Hybrid Assistant will run.
Speed is mainly affected by OBD adapter and by other apps running on the phone.

SOC Statistics

SOC


80
70
60
50
40
30
SOC
20
8
0
-4
-16
-28
-40
Battery Current
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

SOC	
Average	53.76%
Start	58.82%
End	43.92%
Delta	-14.90%
Min	37.65%
Max	61.18%
Standard deviation	7.18%

Variations	
Difference from optimum	-6.24%
SOC gained from brakings	2.75%
SOC gained from coasting	0.00%
Total SOC gained	2.75%
SOC charged by ICE	7.06%

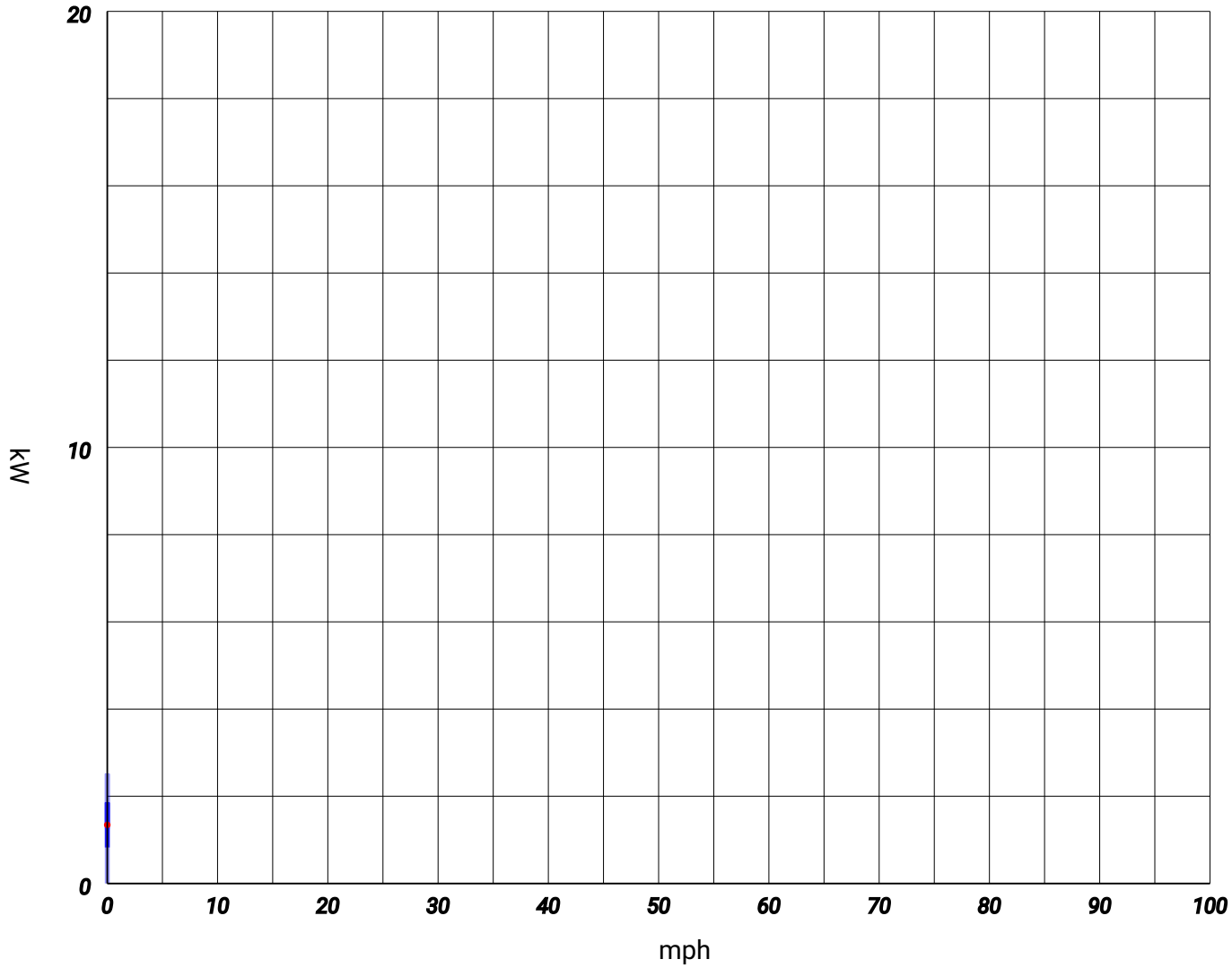
High Voltage Battery Statistics

Levels		
	Current	Voltage
Avg	1.30 A	157.81 V
Min	-33.79 A	141.00 V
Max	15.64 A	171.00 V

Power			
	Power	Charge Limit	Discharge Limit
Avg	0.127 kW	-17.500 kW	14.793 kW
Start	0.560 kW	-17.500 kW	15.000 kW
End	0.822 kW	-17.500 kW	15.000 kW
Min	-5.114 kW	-17.500 kW	12.000 kW
Max	7.026 kW	-17.500 kW	15.000 kW

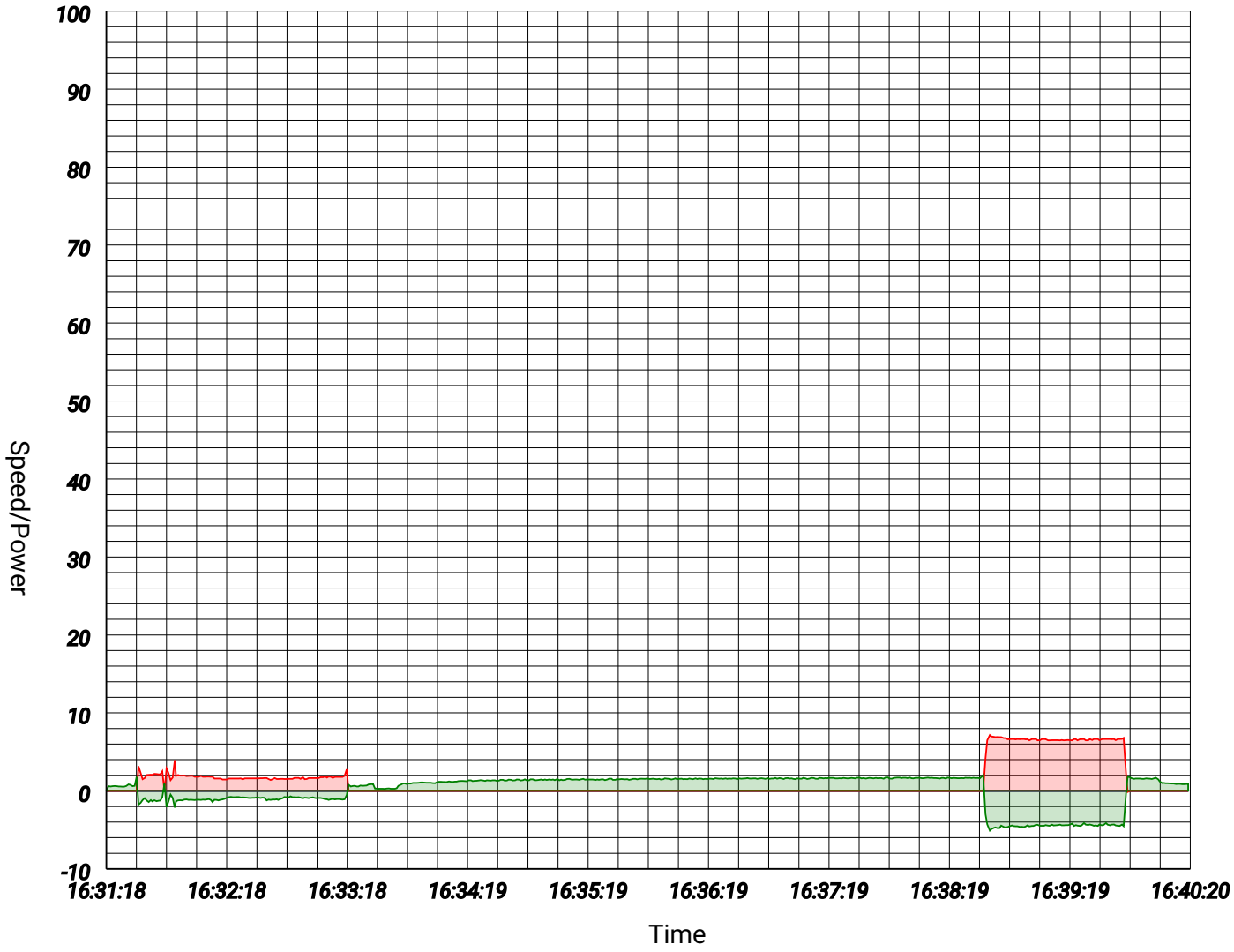
Energy	
Total energy from the battery	0.141 kWh
Total energy to the battery	0.116 kWh
Battery energy balance	-0.025 kWh
Average services consumption	1.366 kW

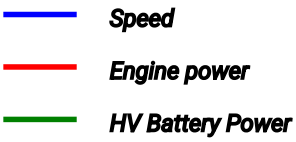
Average Power Usage



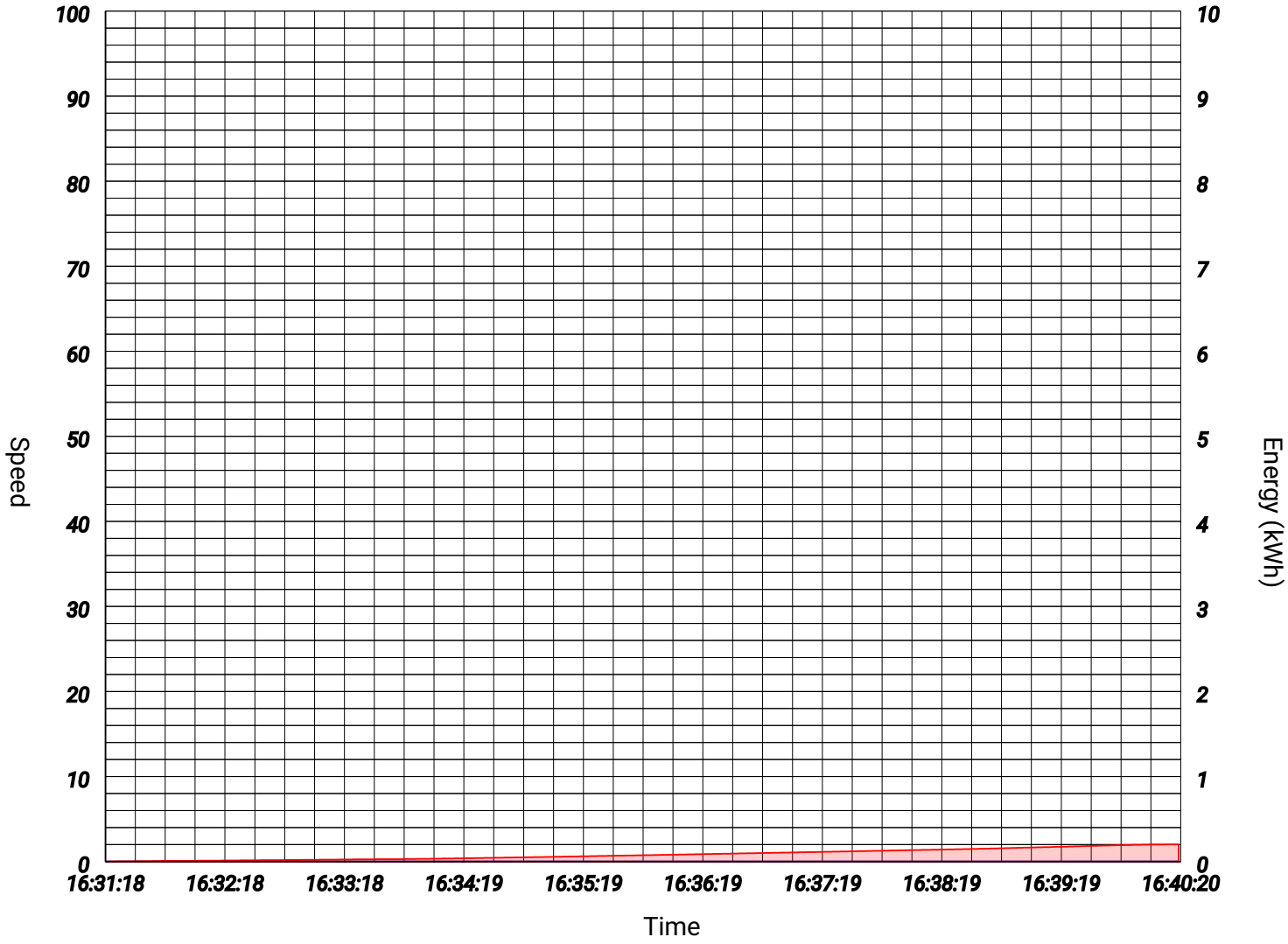
Plot of power required to keep a given speed.
Values are collected only when a constant speed is maintained long enough to have a consistent reading, so a trip with many different speeds may not gather enough data to plot.
Since required energy is heavily influenced by road slope, you should drive on a plain road to have a correct reading.

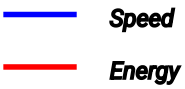
Power Distribution


100
90
80
70
60
50
40
30
20
10
0
-10
Speed/Power
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

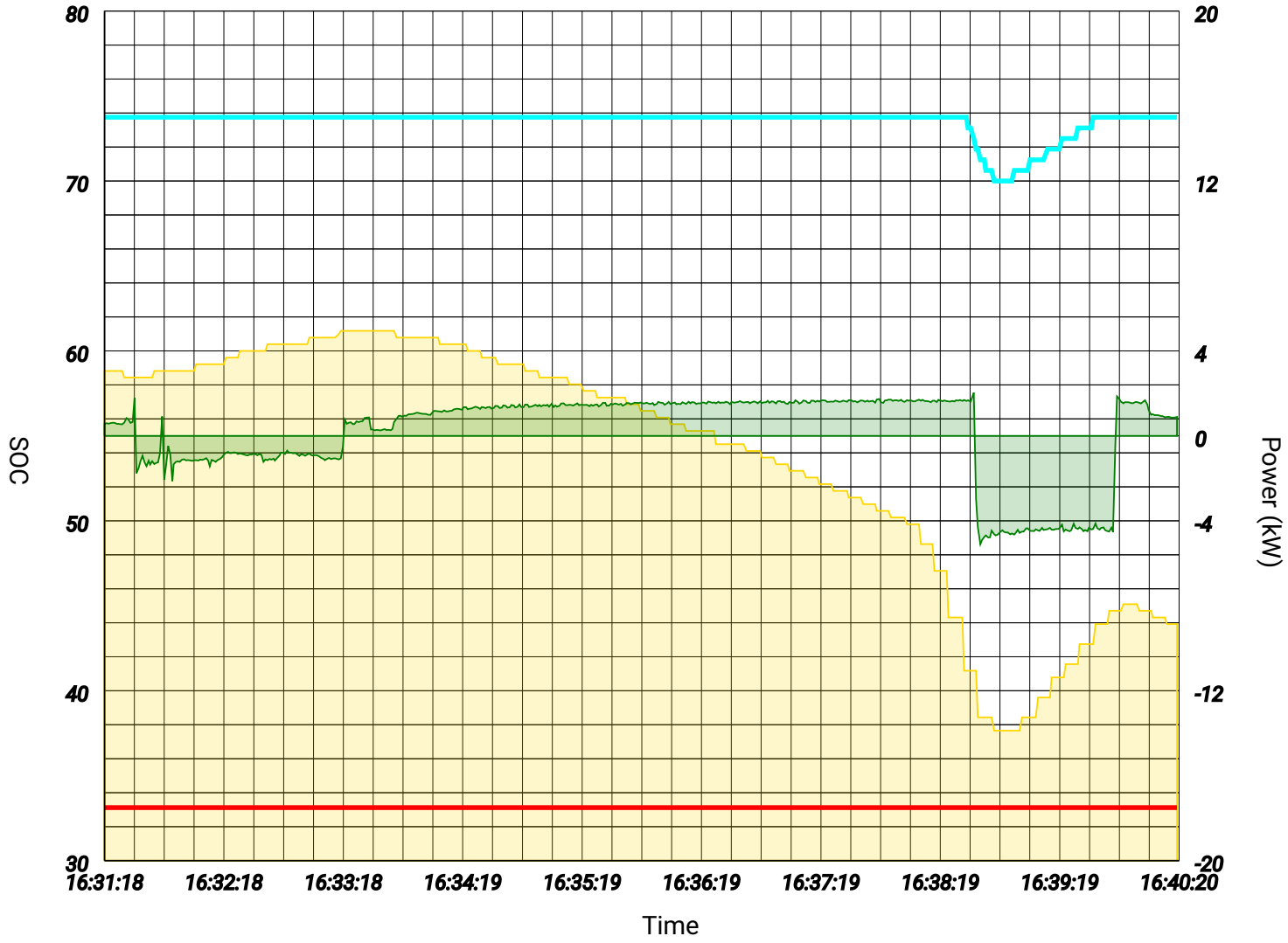


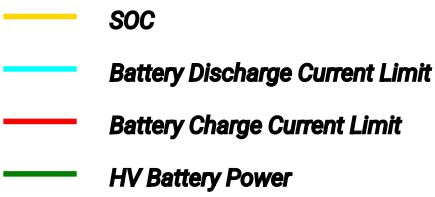
Energy Balance


Speed
Energy (kWh)
100
90
80
70
60
50
40
30
20
10
0
10
9
8
7
6
5
4
3
2
1
0
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time



CCL and DCL


80
70
60
50
40
30
SOC
20
12
4
0
-4
-12
-20
Power (kW)
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time



Charge and discharge kW limits for the battery.
These values may change with battery level and temperature.
When the battery is nearly full, charge limit is reduced.
On low temperatures, charge and discharge limits are reduced to preserve battery life.

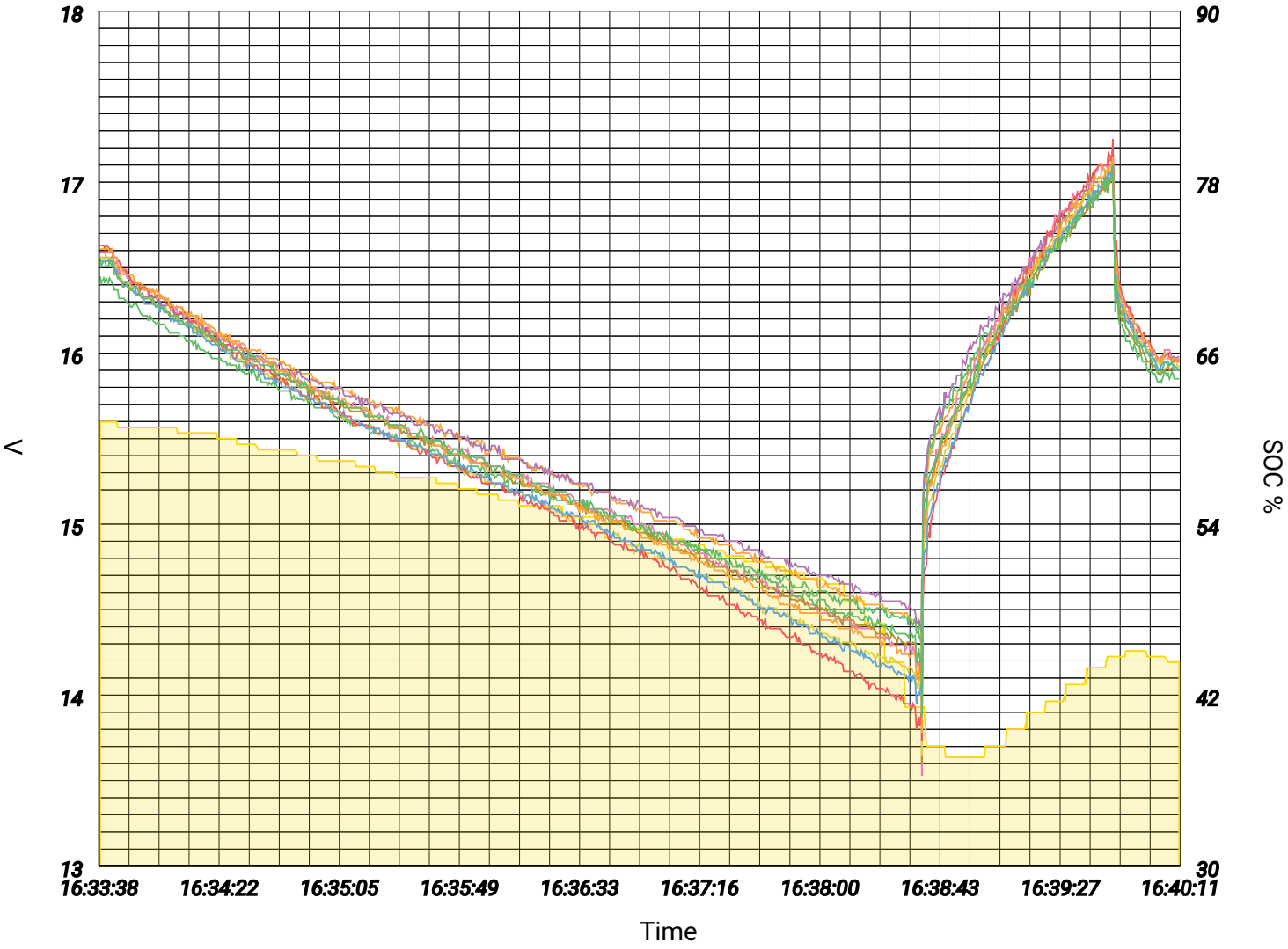
High Voltage Battery Health

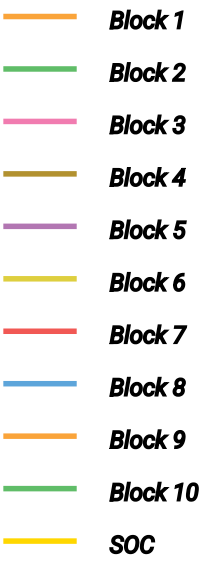
Be sure to follow the guideline for HV Check as specified on the official website.

Note: Statistics from this paragraph are limited to the HV Check time span, not the whole trip

HV Battery	
Number of Blocks	10
Number of samples	948
Average sample time	0.41
Start time	23/10/2023 16:33:38
End time	23/10/2023 16:40:11
Duration	6:32

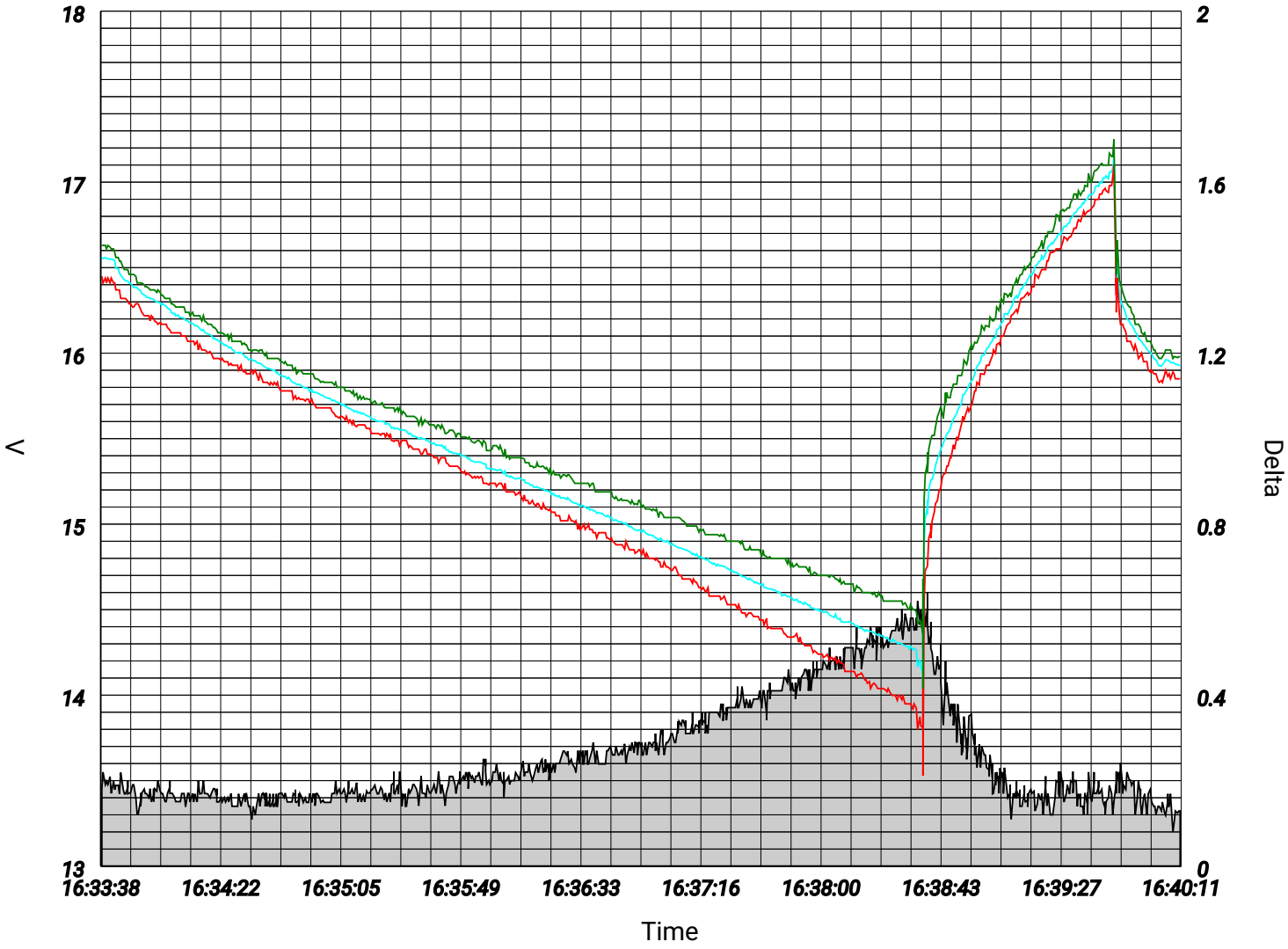
Block values

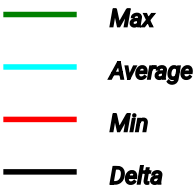

18
17
16
15
14
13
V
90
78
66
54
42
30
SOC %
16:33:38
16:34:22
16:35:05
16:35:49
16:36:33
16:37:16
16:38:00
16:38:43
16:39:27
16:40:11
Time



Voltage value of each battery block.
A block behaving differently from the others may indicate a degraded element.

Voltage Delta


18
17
16
15
14
13
V
2
1.6
1.2
0.8
0.4
0
Delta
16:33:38
16:34:22
16:35:05
16:35:49
16:36:33
16:37:16
16:38:00
16:38:43
16:39:27
16:40:11
Time



Min, max and average voltage values are plotted.
Average value should be halfway between min and max; a bias over one value may indicate an unbalanced battery.
Voltage delta between highest and lowest block is also plotted on the bottom of the chart.

Blocks stats						
Block	Min	Max	% Time @ Min V	Avg Bias	Max Bias	Avg Local Delta
1	14.04	17.10	0.00	0.04	0.20	0.19
2	13.97	17.10	2.32	0.13	0.24	0.19
3	13.53	17.20	0.11	0.10	0.51	0.14
4	13.60	17.10	0.42	0.14	0.44	0.17
5	14.04	17.12	0.00	0.02	0.13	0.29
6	13.65	17.15	5.17	0.19	0.44	0.23
7	13.73	17.25	44.83	0.21	0.64	0.12
8	13.92	17.15	5.06	0.20	0.52	0.14
9	13.78	17.15	0.00	0.12	0.33	0.13
10	13.87	17.10	0.53	0.11	0.27	0.08

Statistics for each battery block.

- Min: minimum observed value.
- Max: maximum observed value.

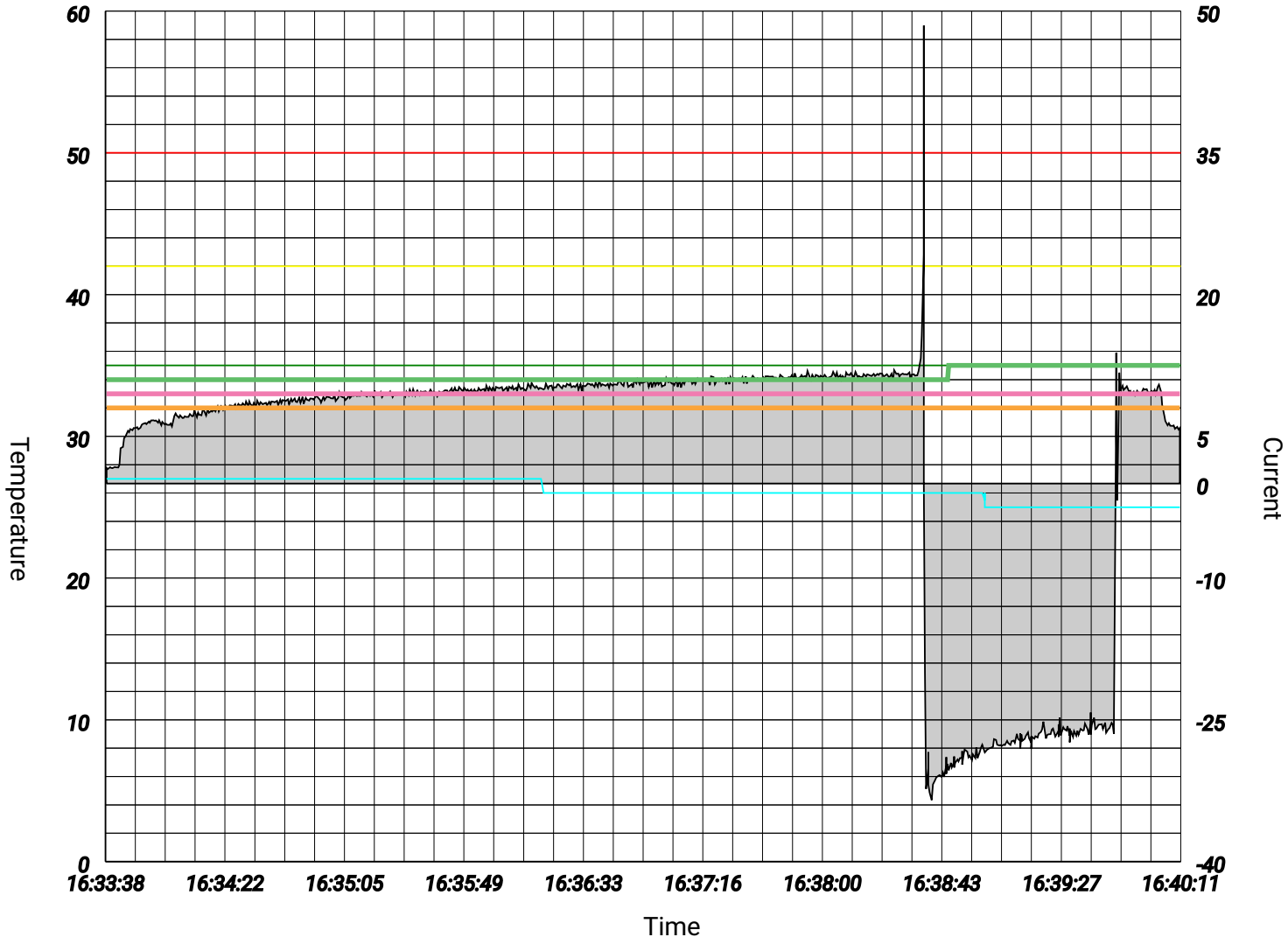
- % Time @ Min V: time percentage the given block was the lowest of the battery; high values may indicate a weak block.
- Bias: difference from the highest block.
- Local Delta: how much a block differs from its immediate neighbours.

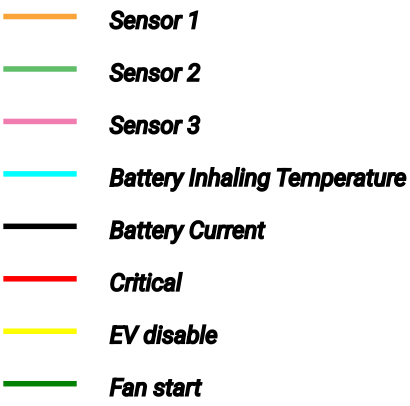
Global stats	
Minimum observed battery voltage	138 V
Maximum observed battery voltage	171 V
Minimum observed block voltage	13.53 V
Maximum observed block voltage	17.25 V
Maximum Delta	0.64 V
Average Delta	0.26 V
Minimum observed current	-33.79 A
Maximum observed current	48.47 A
Minimum observed SOC	37.6%
Maximum observed SOC	61.2%
Delta SOC	23.5%
Energy	805mAh
Estimated Capacity	4.02Ah

Delta Thresholds	
Threshold	**Consecutive Samples**
0.2	386
0.45	100
0.7	0
0.95	0
1.2	0

Maximum delta value between highest and lowest block is the most important parameter for battery health: high delta values suggests a weary battery.
Delta values are significant only when repeated over a long time: the table counts consecutive samples where delta value is over the indicated threshold.
Low counts are not an indication of a fault while high counts may be.

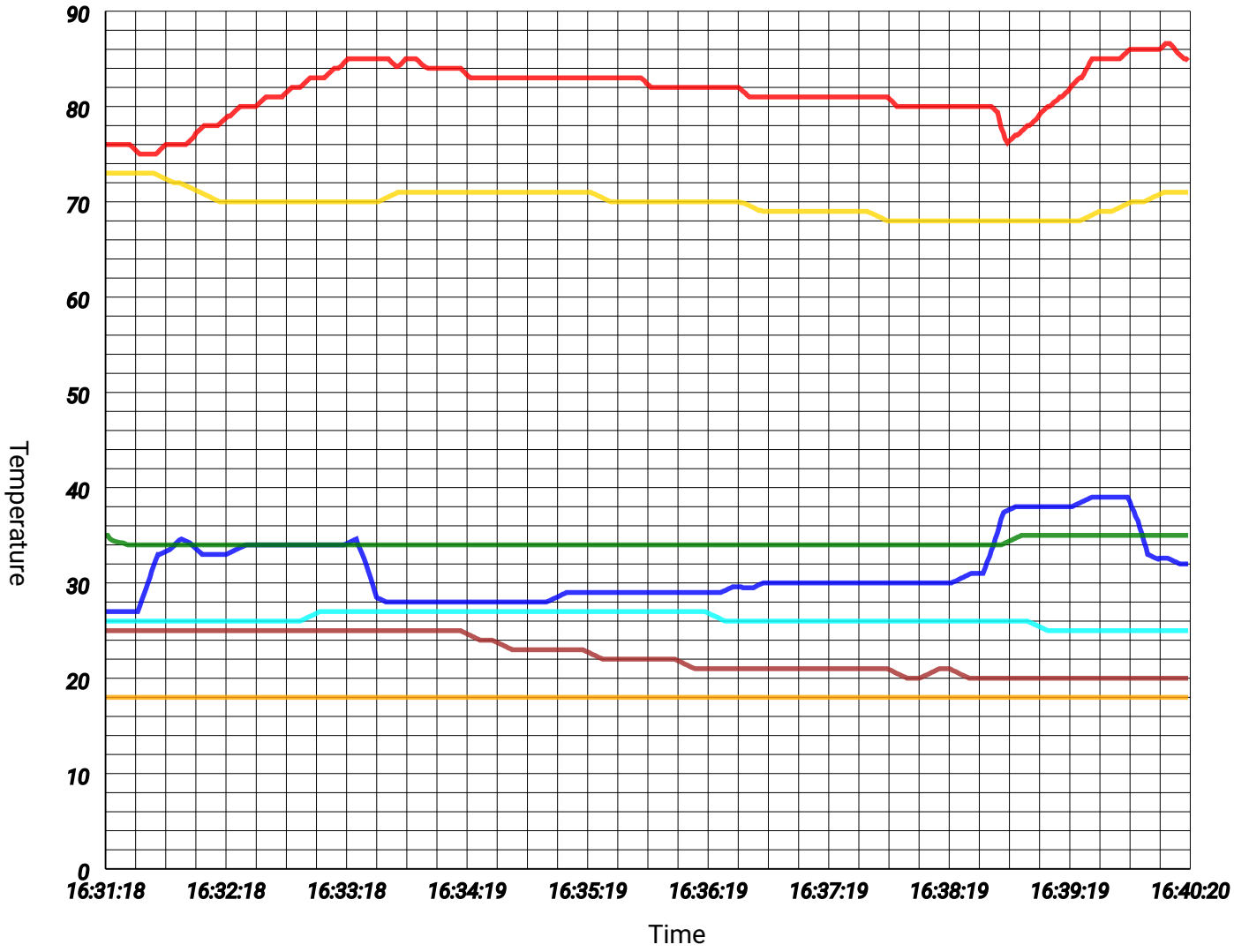
HV Battery Temperature

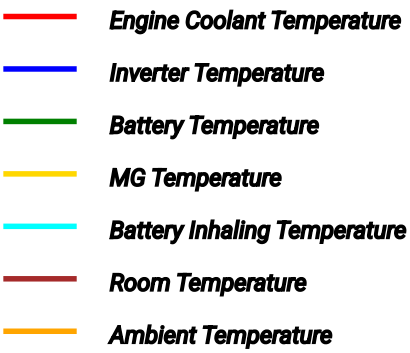

60
50
40
30
20
10
0
50
35
20
5
0
-10
-25
-40
Temperature
Current
16:33:38
16:34:22
16:35:05
16:35:49
16:36:33
16:37:16
16:38:00
16:38:43
16:39:27
16:40:11
Time



Temperature

Powertrain Temperature


90
80
70
60
50
40
30
20
10
0
Temperature
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time



Temperature					
	Ambient	Room	Coolant	Inverter	MG
Avg	18°C	22°C	81°C	31°C	69°C
Min	18°C	20°C	75°C	27°C	68°C
Max	18°C	25°C	87°C	39°C	73°C

Time to reach given temperature	
Coolant Temperature	Time

HV Battery Temperature Sensors				
Sensor	In	1	2	3
% Max	-	0%	100%	0%
Max	27°C	32°C	35°C	33°C
Avg	26°C	32°C	34°C	33°C
Min	25°C	32°C	34°C	33°C

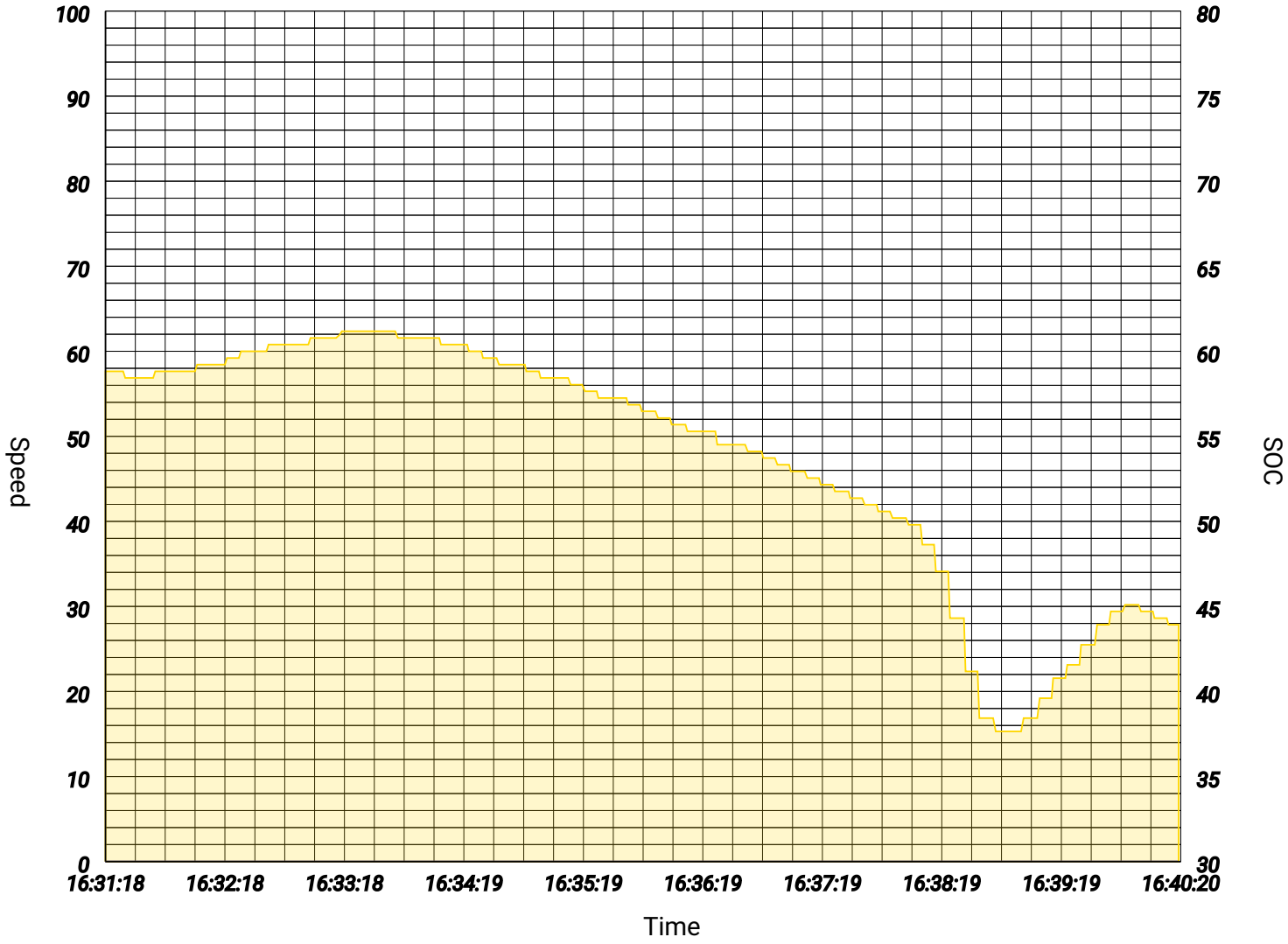
Temperatures for each car component.
Engine coolant temperature is the water temperature, while inverter and MG is the actual component temperature.
For inverters and MGs, only the most significant value among all components is shown.

HV Battery has multiple sensors: usually the inner ones are higher that the outer ones. % Max shows time percentage the specified sensor was the highest of the pack.

Trip

Altitude	
Avg	-23
Start	-23
End	-23
Min	-23
Max	-23
Upward	0
Downward	0
Altitude Delta	0

Speed


Speed
SOC
Time
100
90
80
70
60
50
40
30
20
10
0
80
75
70
65
60
55
50
45
40
35
30
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20

Speed	
Average	0 mph
Moving Average	NaN mph
EV Average	0 mph
Max	0 mph

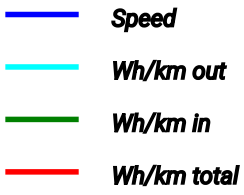
Energy

Energy balance by km

300
260
220
180
140
100
km/h
60
20
0
-20
-60
-100
aN

Wh/km

Km

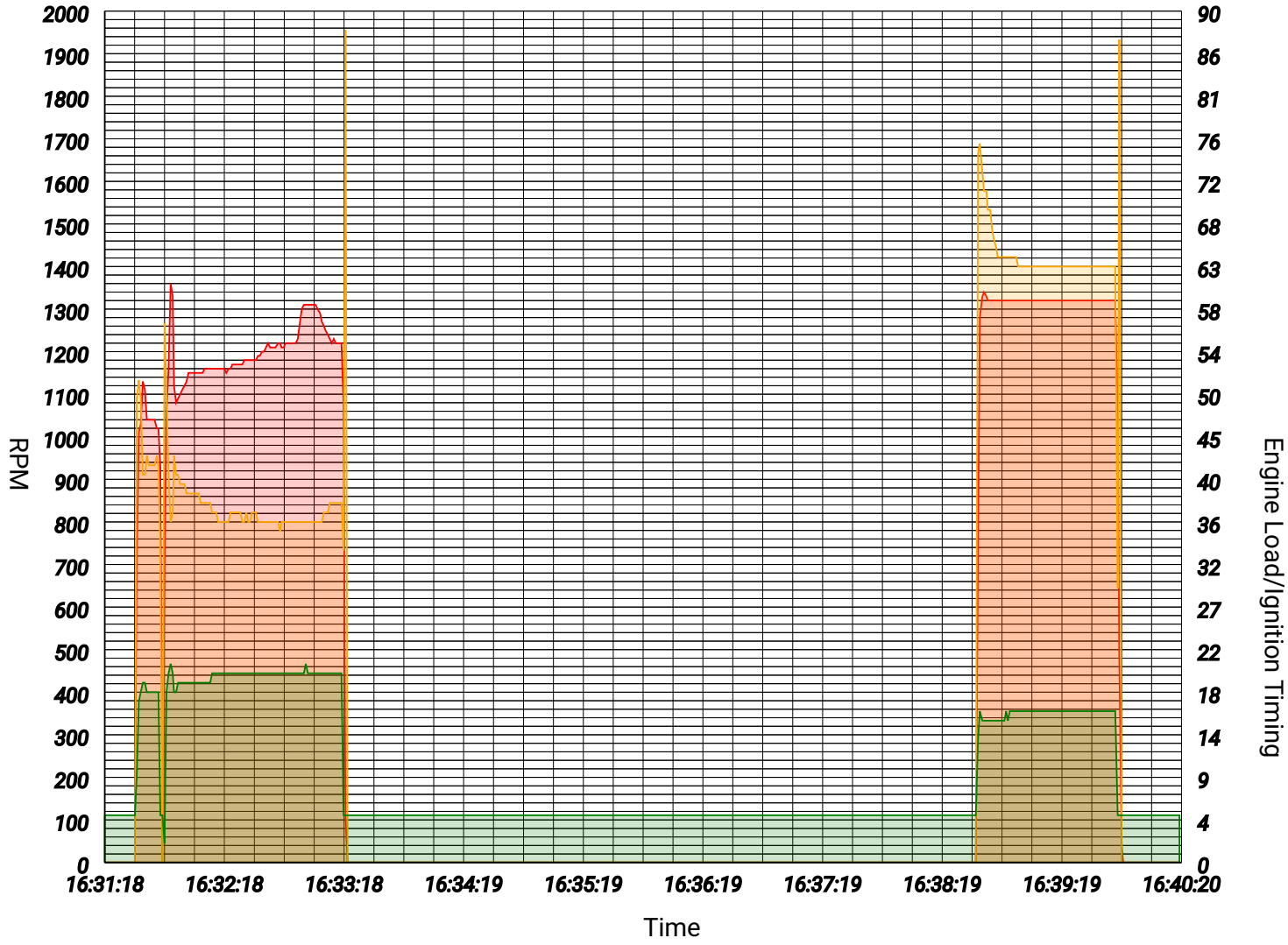


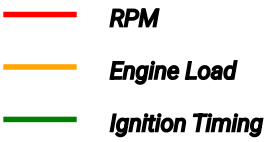
Engine

	RPM	Load	Power	Timing
Avg	1,203	49%	3.688kW	9°
Max	1,360	88%	7.173kW	21°
Min	-	-	-	2°

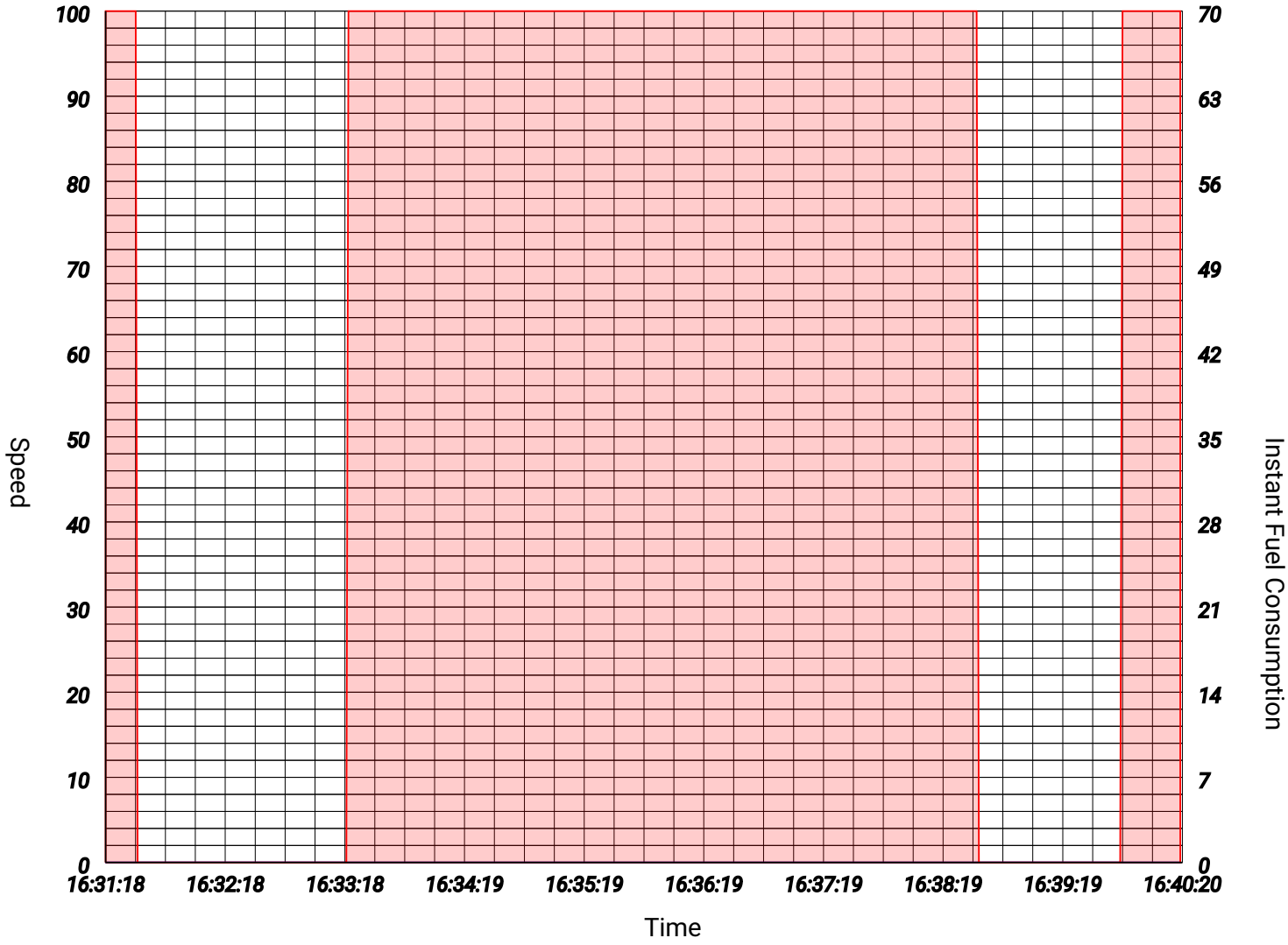
Ignitions	
Total	3
Inefficients	0

RPM

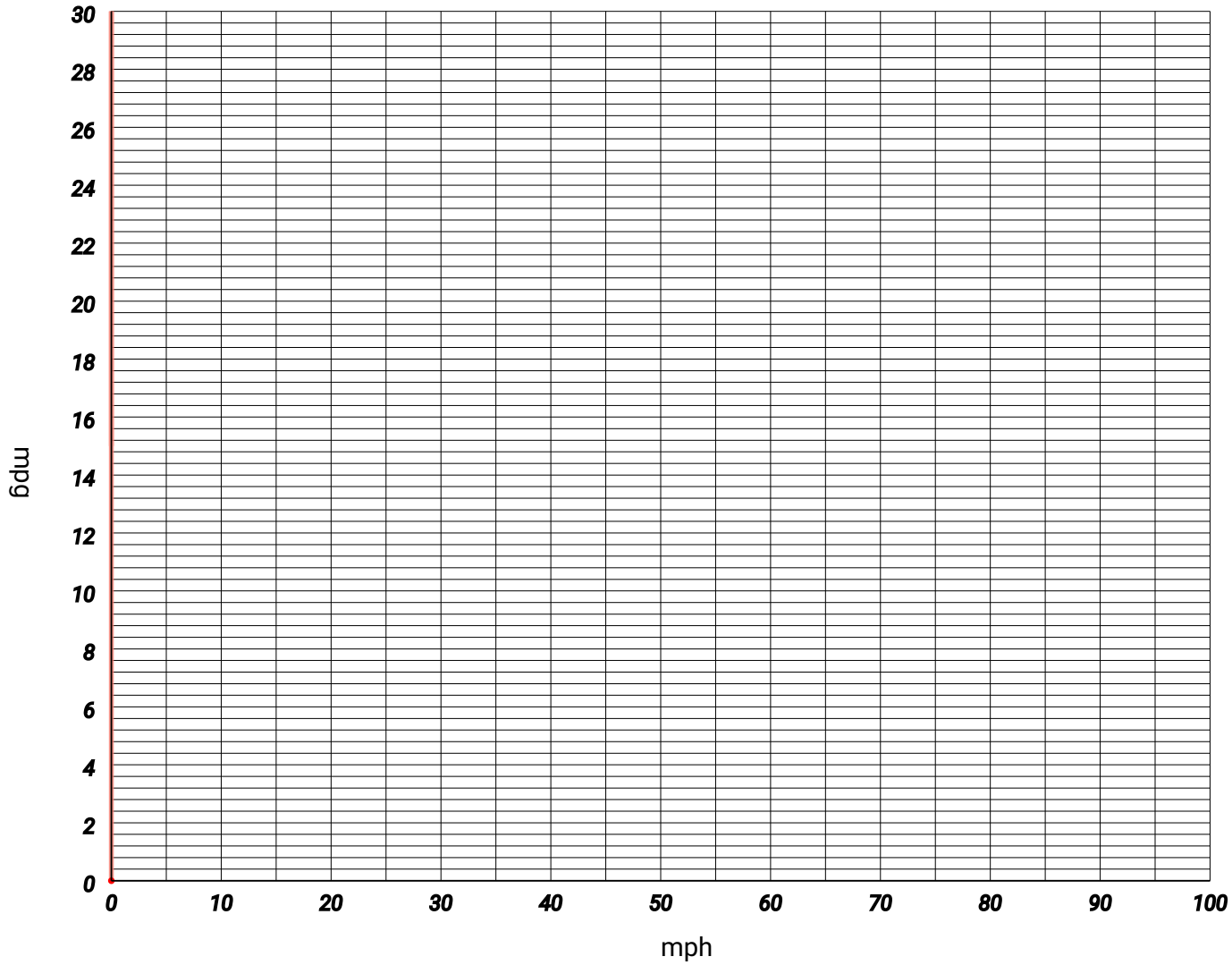

RPM
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
Engine Load/Ignition Timing
90
86
81
76
72
68
63
58
54
50
45
40
36
32
27
22
18
14
9
4
0
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time



Instant Fuel Consumption

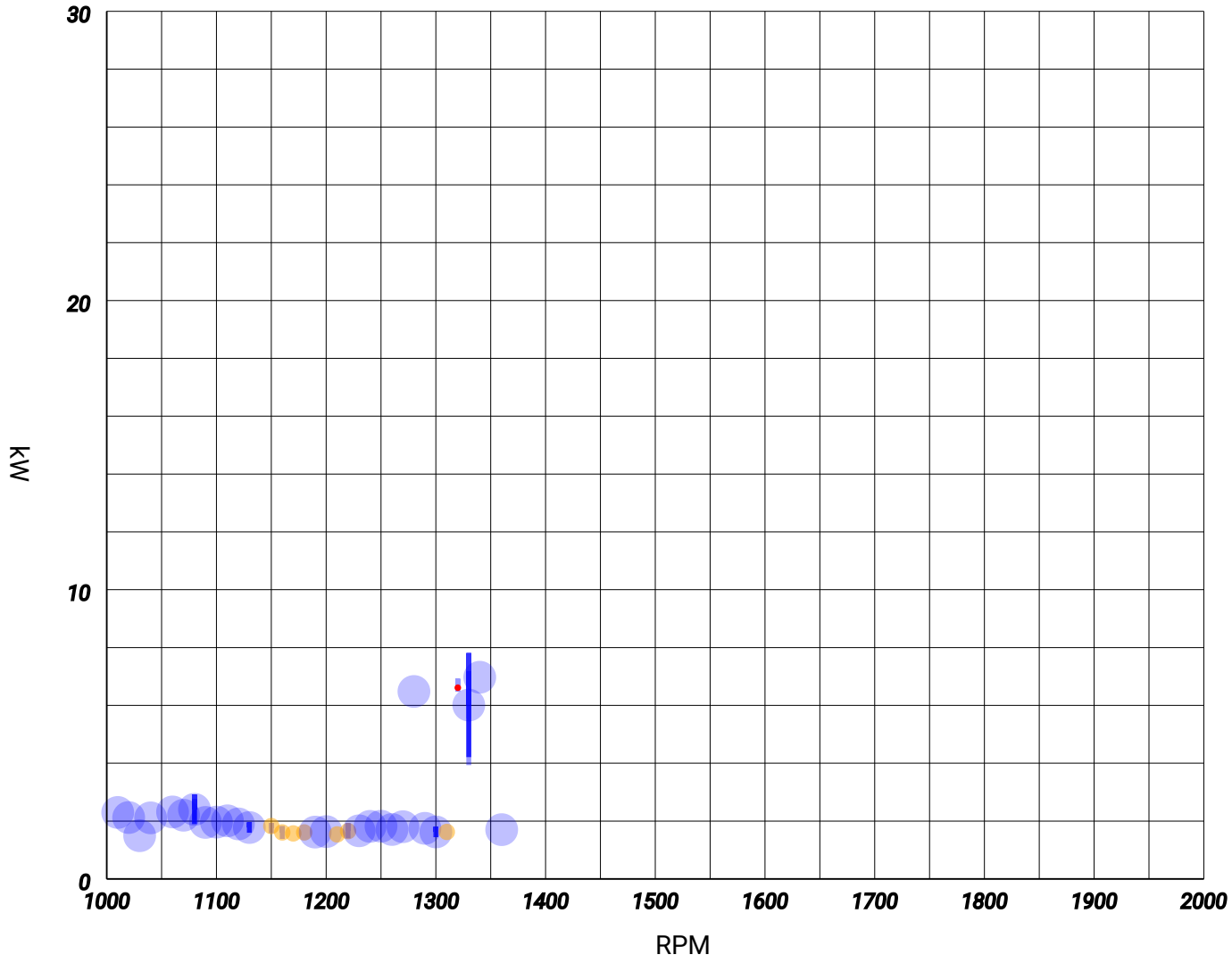

Speed
100
90
80
70
60
50
40
30
20
10
0
Instant Fuel Consumption
70
63
56
49
42
35
28
21
14
7
0
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

Consumption Map

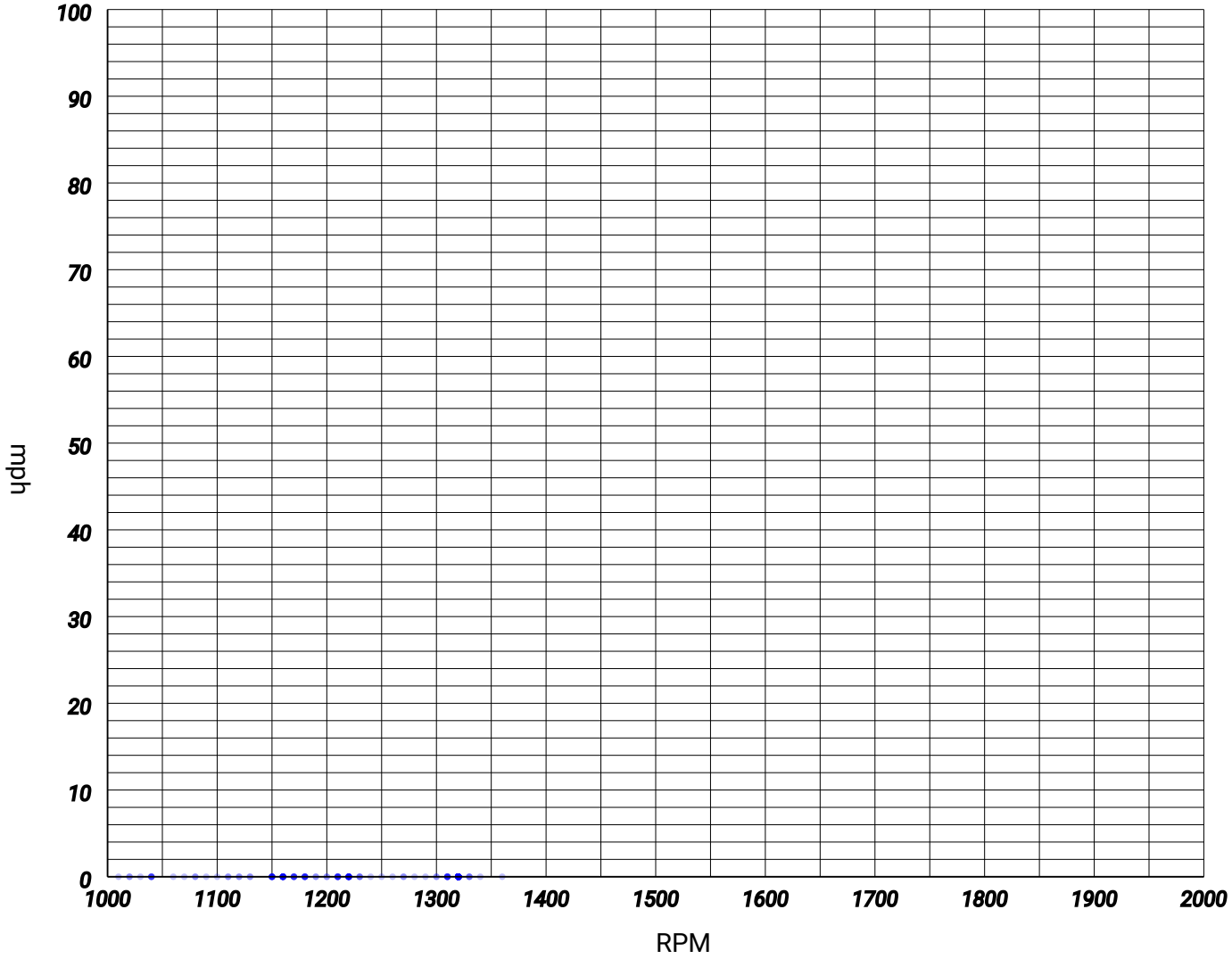


Energy	
Energy from the petrol engine	0.18 kWh

Power Map



RPM Scatter Chart



Engine		
State	%	Longest Time
ICE Running	34%	1:30 sec
ICE Spinning	0%	0:00 sec
ICE Off	66%	5:18 sec

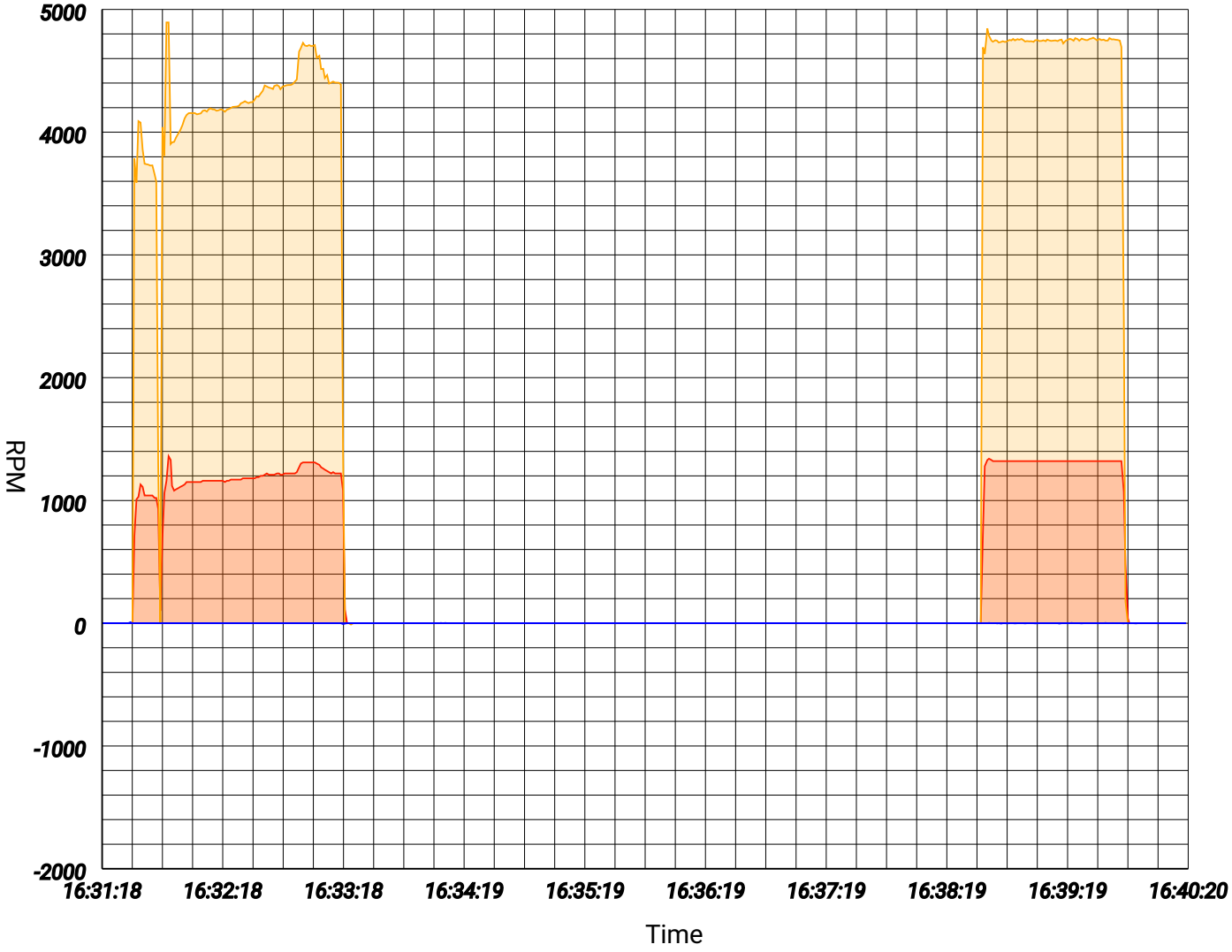
EV Statistics	
Trip Length	0.00 mi
EV Range	0.00 mi
Excessive EV events	0

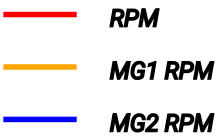
EV States		
State	%	Longest Time
EV	66%	5:18 sec
EV traction	0%	0:00 sec
Excessive EV	0%	0:00 sec

PSD

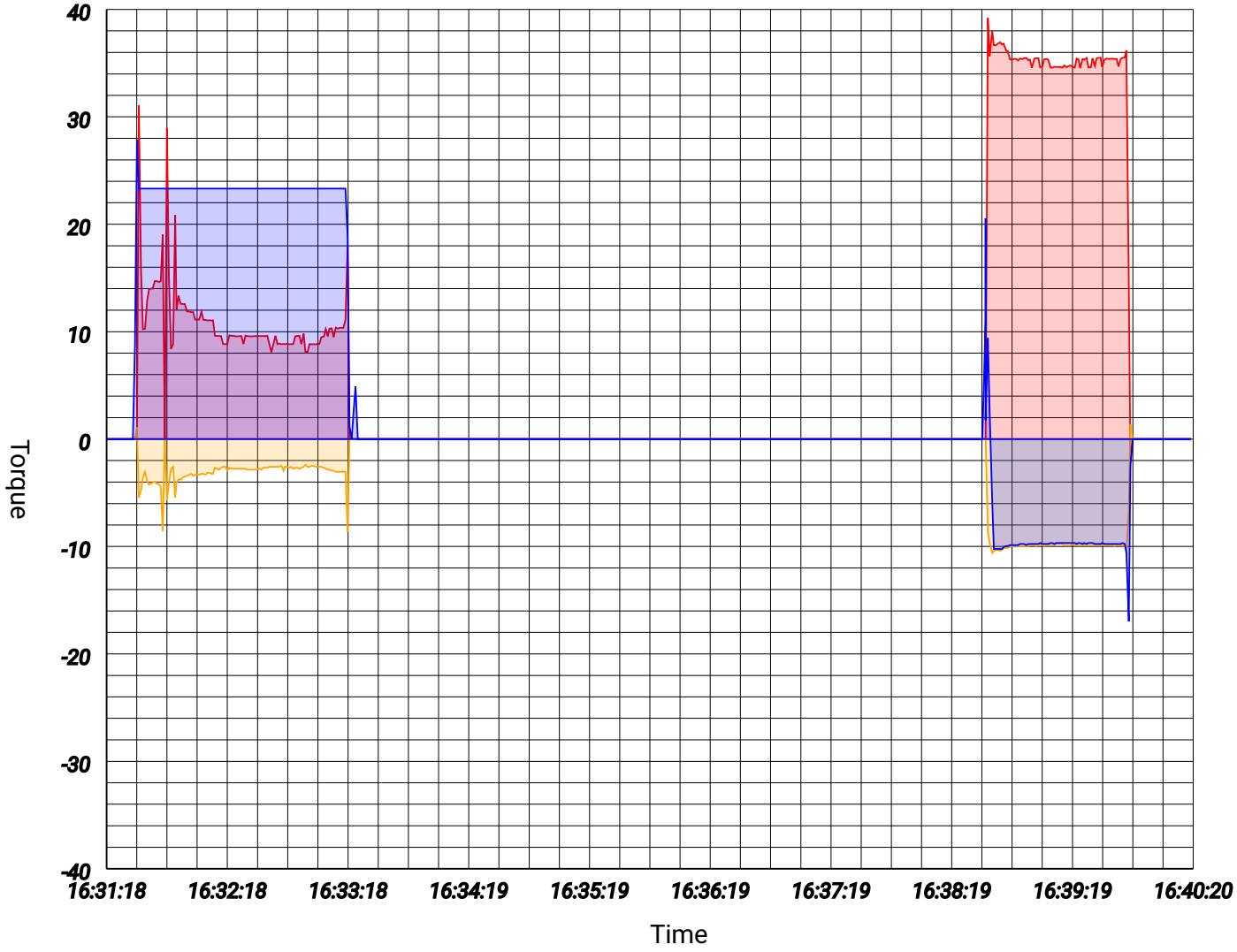
	ICE RPM	Engine Torque	MG1 RPM	MG2 RPM	MG1 Torque	MG2 Torque
Avg	1,203	7	4,309	-0	-8ft-lb	14ft-lb
Max	1,360	39	4,895	8	2ft-lb	38ft-lb
Min	0	-2	-11	-7	-14ft-lb	-23ft-lb

RPM

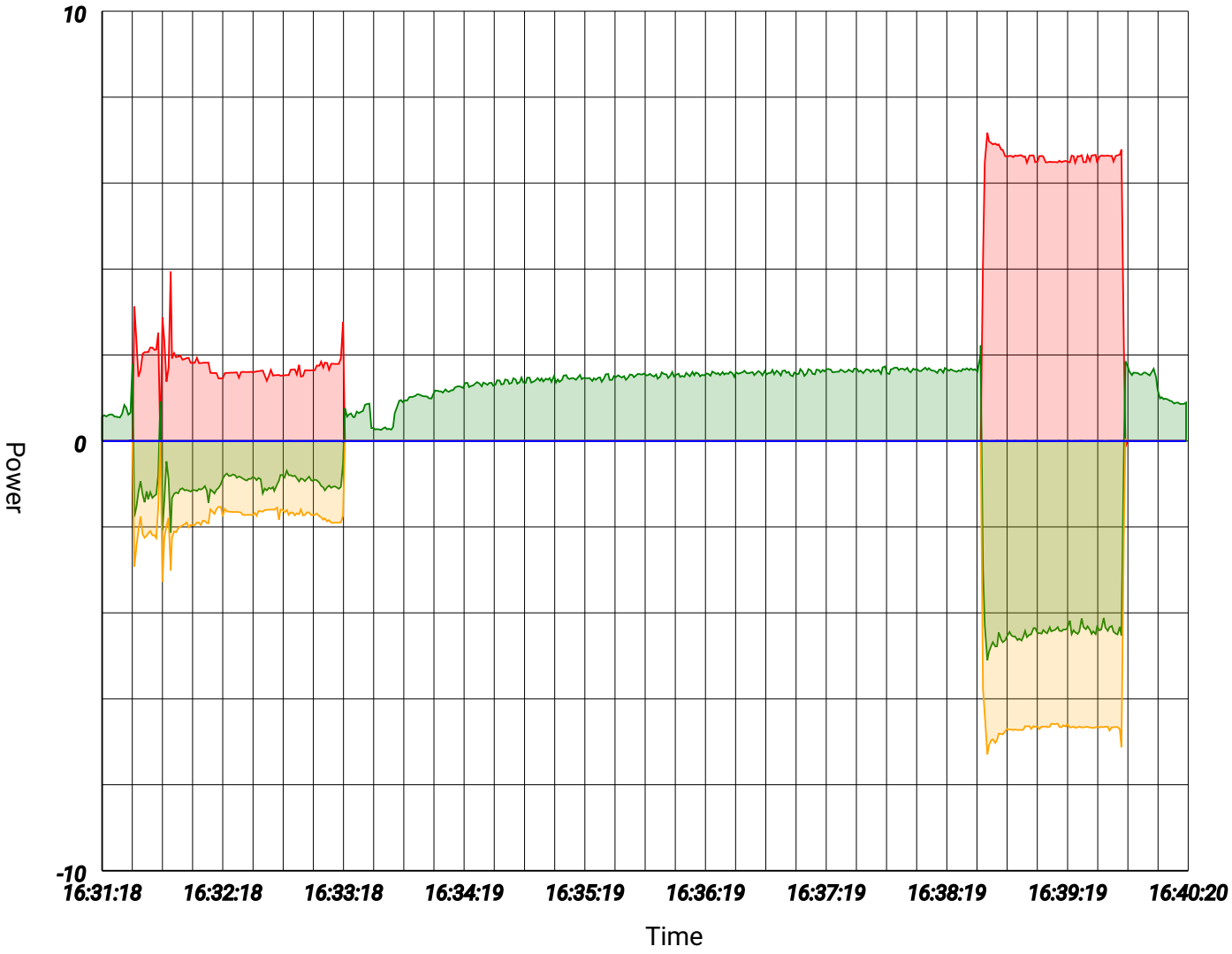

5000
4000
3000
2000
1000
0
-1000
-2000
RPM
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

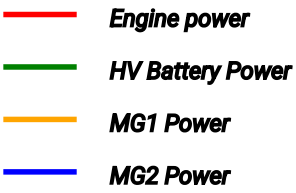


Torque

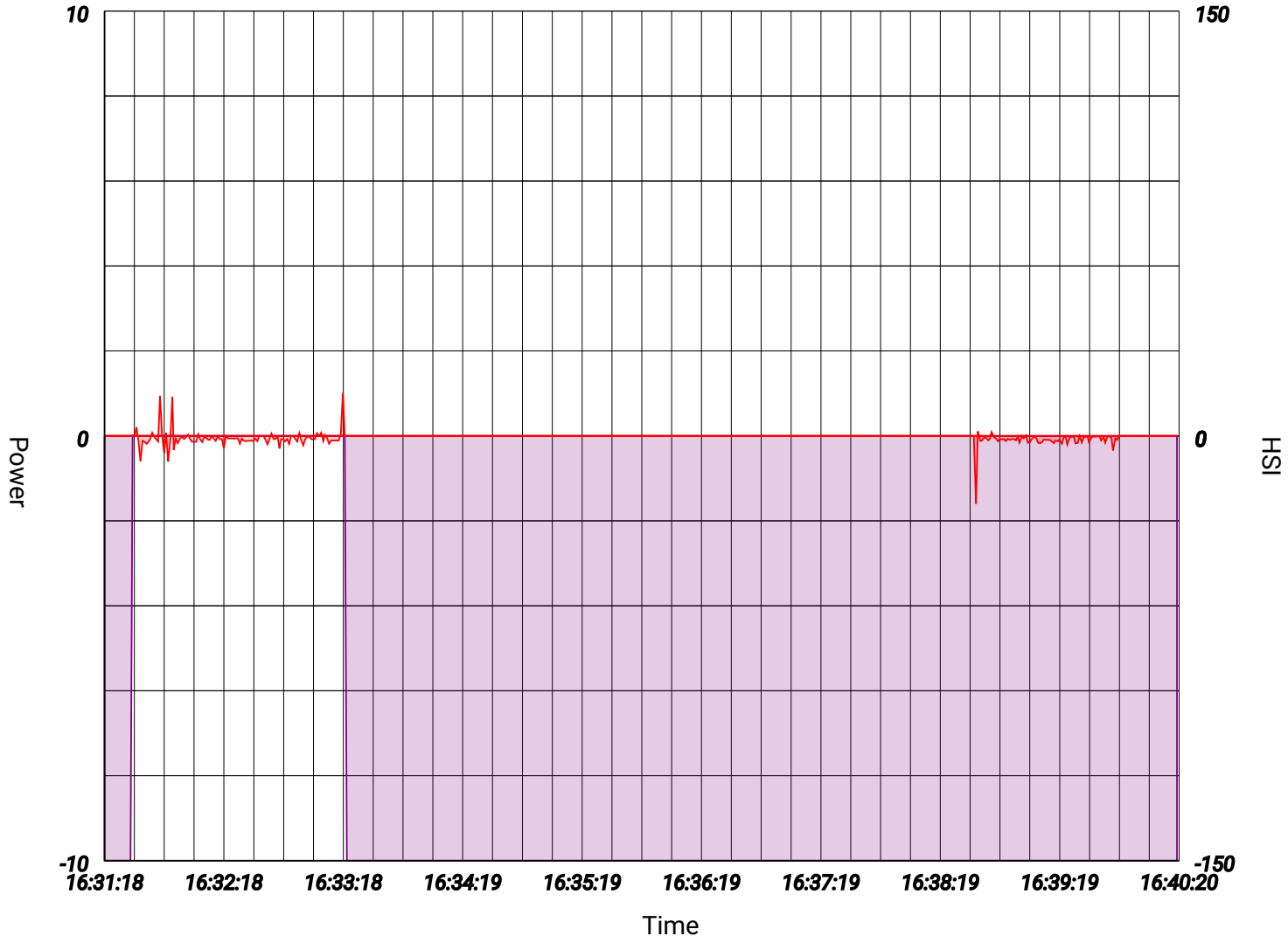

40
30
20
10
0
-10
-20
-30
-40
Torque
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

Power


10
0
-10
Power
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time



Combined power

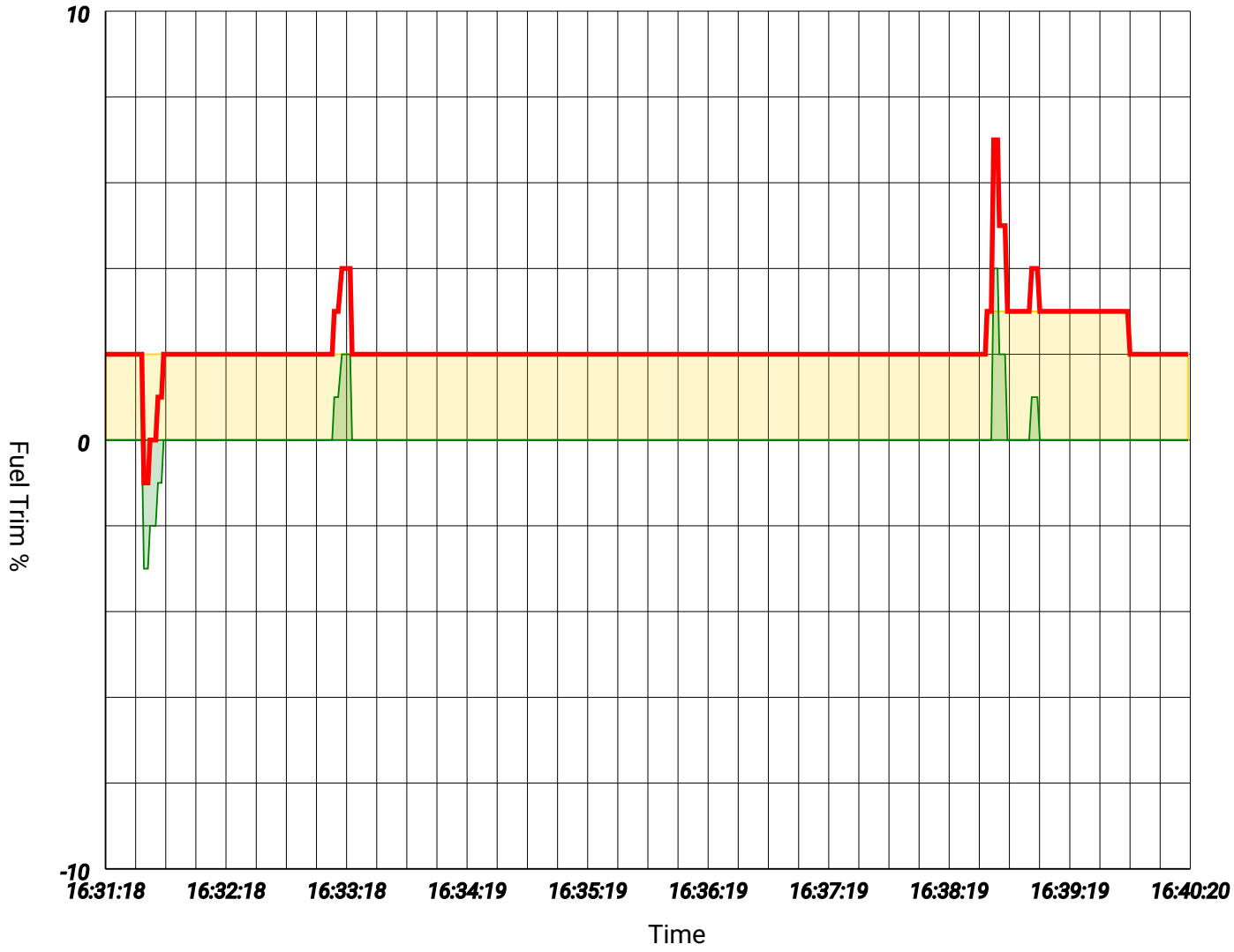

10
0
-10
150
0
-150
Power
HSI
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

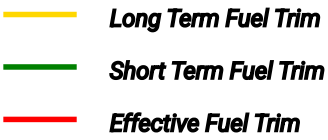
Combined power

Hybrid System Indicator

Fuel Trims

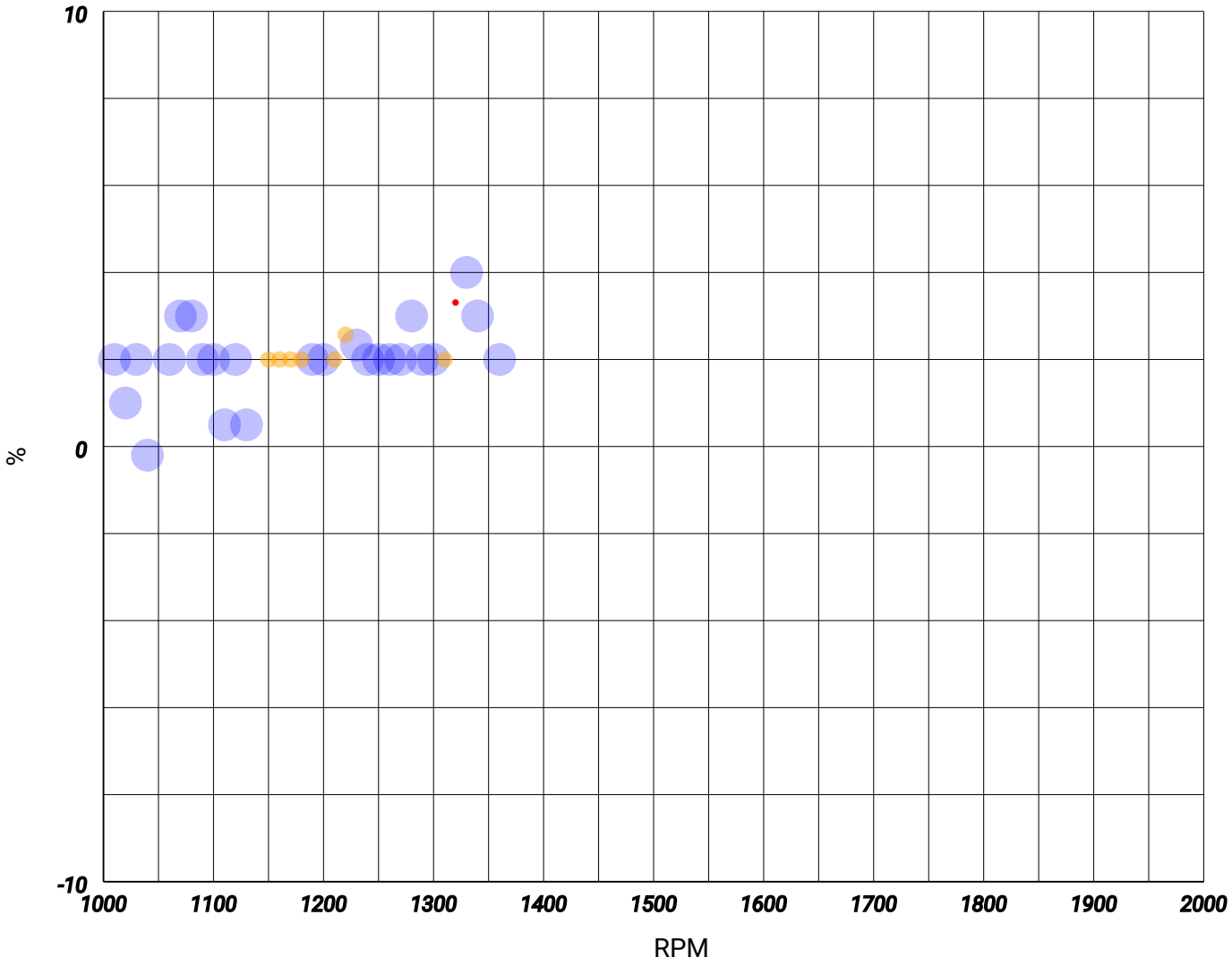
Fuel Trim


10
0
-10
Fuel Trim %
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time



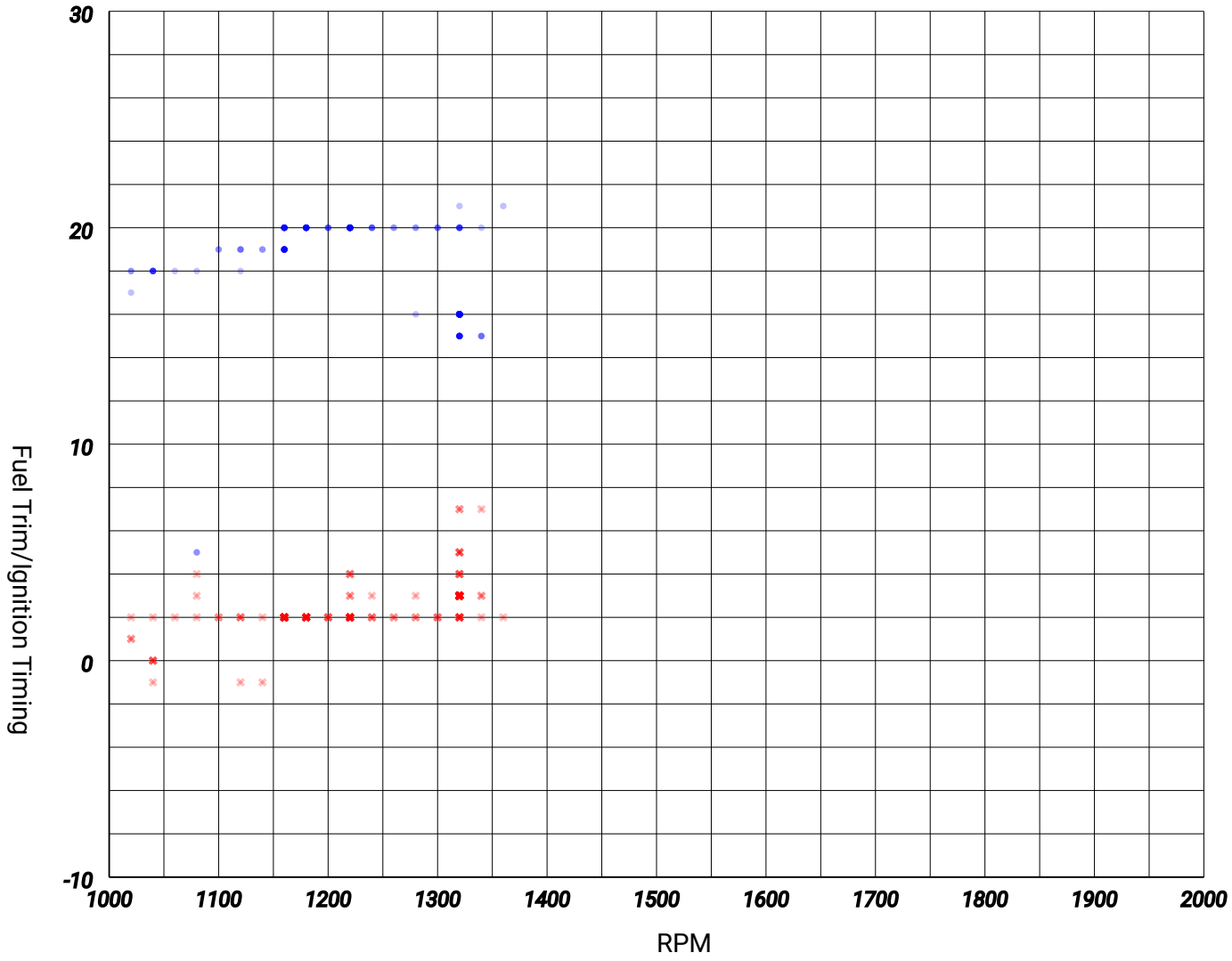
Fuel Trims are the percentage of change in fuel over time.
The engine control unit keeps proper air:fuel ratio by fine-tuning the amount of fuel going into the engine.

Fuel Trim Map



For each RPM value of the petrol engine, the applied Fuel Trim plotted as a dot.
This map can be used to verify LGP-operating engines working condition.

RPM/Fuel Trim/Ignition Timing


30
20
10
0
-10
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Fuel Trim/Ignition Timing
RPM

Ignition Timing

Effective Fuel Trim

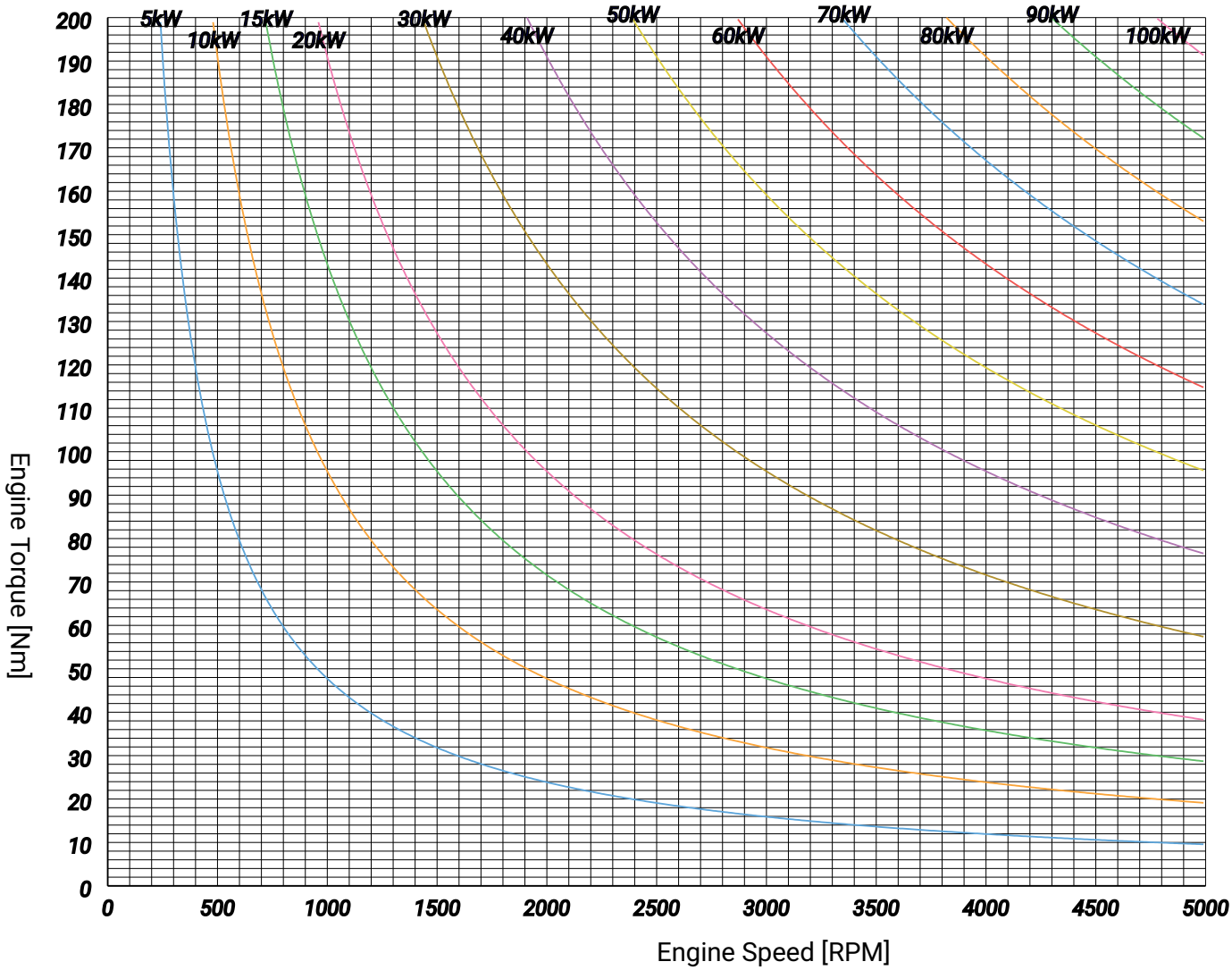
Fuel Trim and Ignition Timings are plotted at various RPM values.
This map can be used to verify LGP-operating engines working condition.

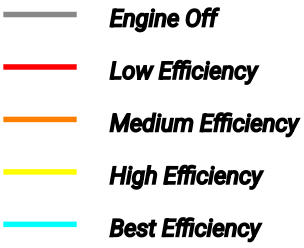
Fuel Trim			
	Short Term	Long Term	Effective
Avg	0%	2%	2%
Min	-3%	2%	-1%
Max	4%	3%	7%

BSFC Statistics

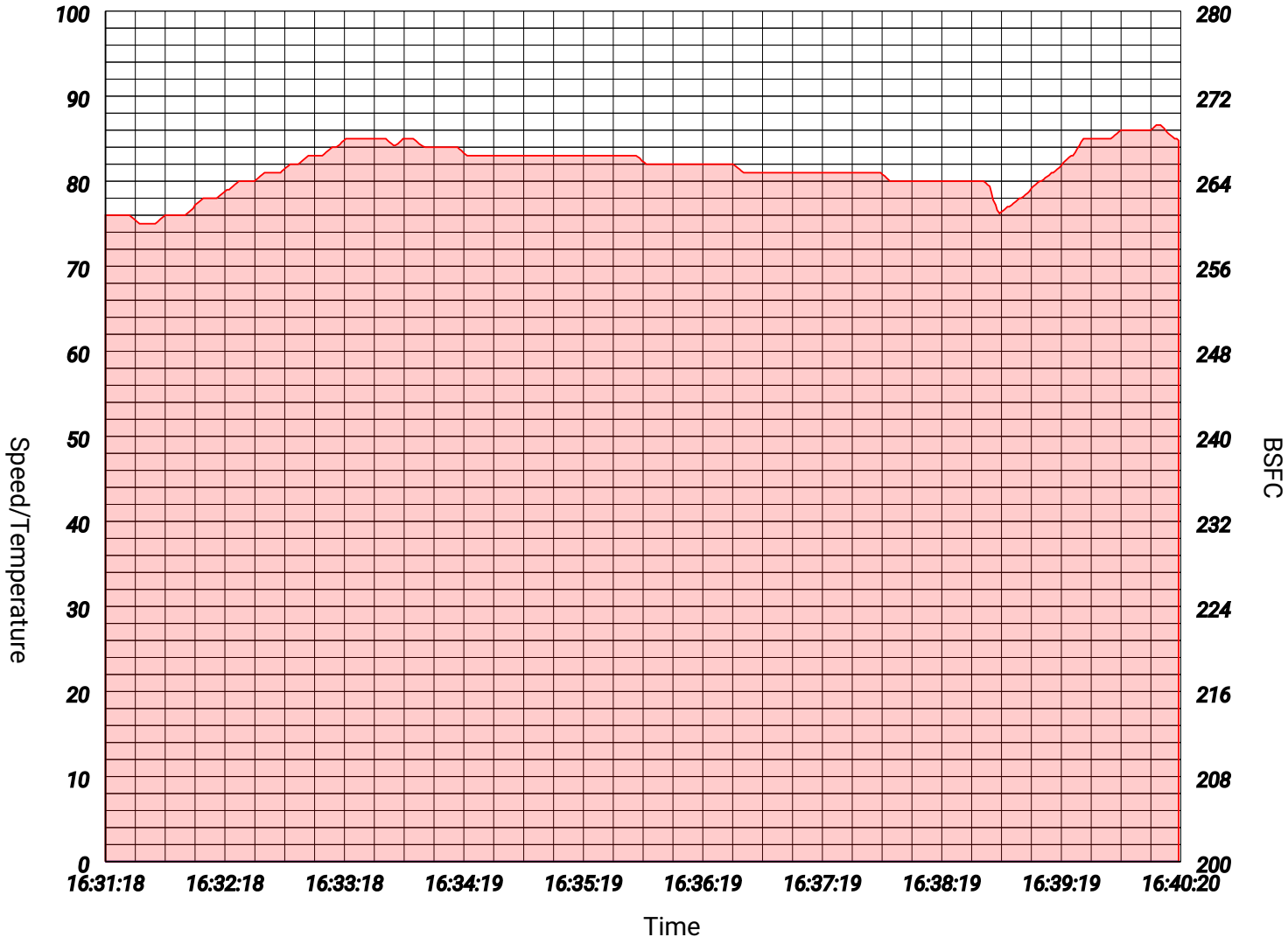
Brake specific fuel consumption (BSFC) is a measure of the fuel efficiency of an engine that burns fuel And produces rotational Power.

BSFC


5kW
10kW
15kW
20kW
30kW
40kW
50kW
60kW
70kW
80kW
90kW
100kW
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Engine Torque [Nm]
Engine Speed [RPM]

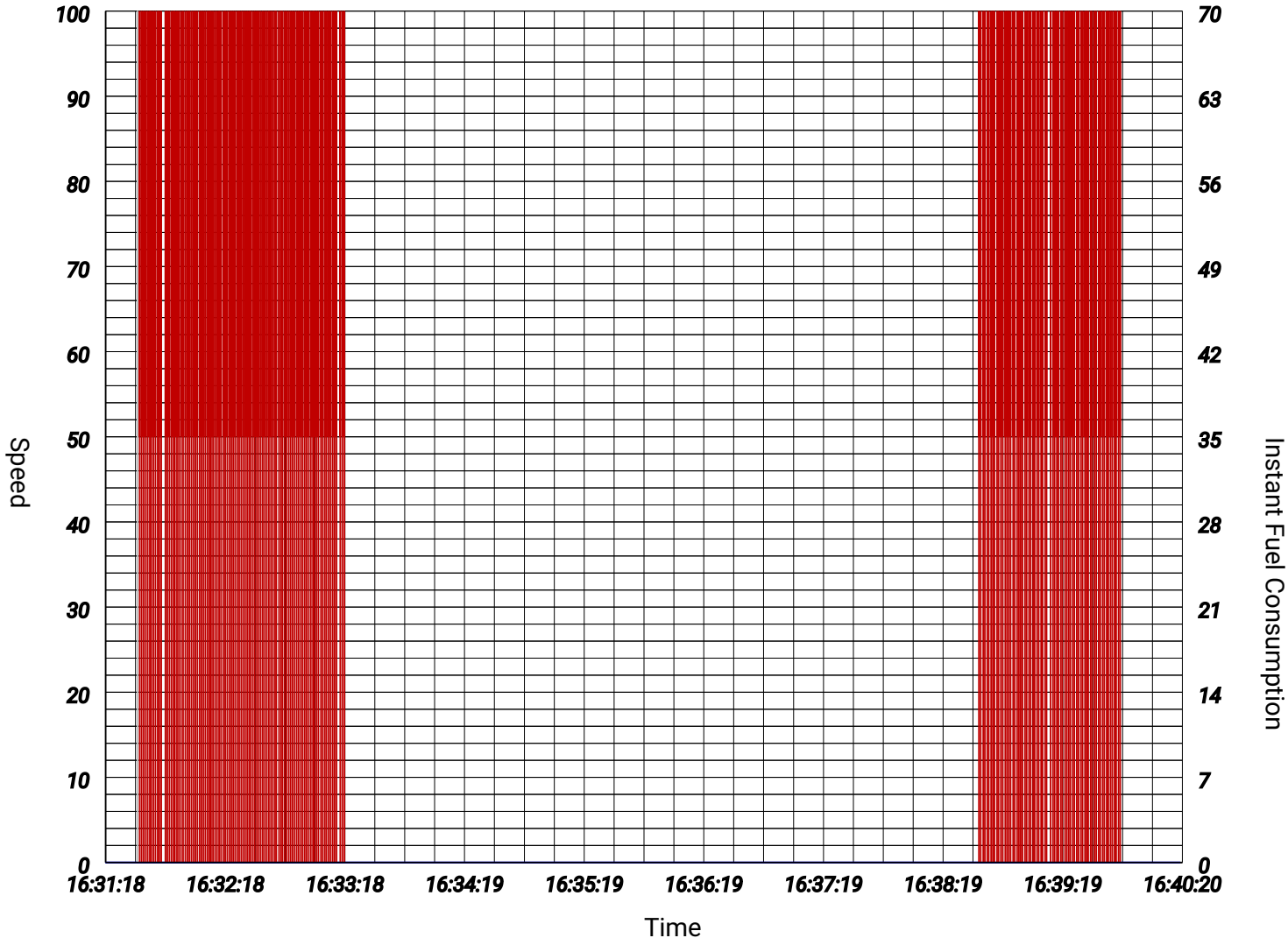


BSFC Absolute Value

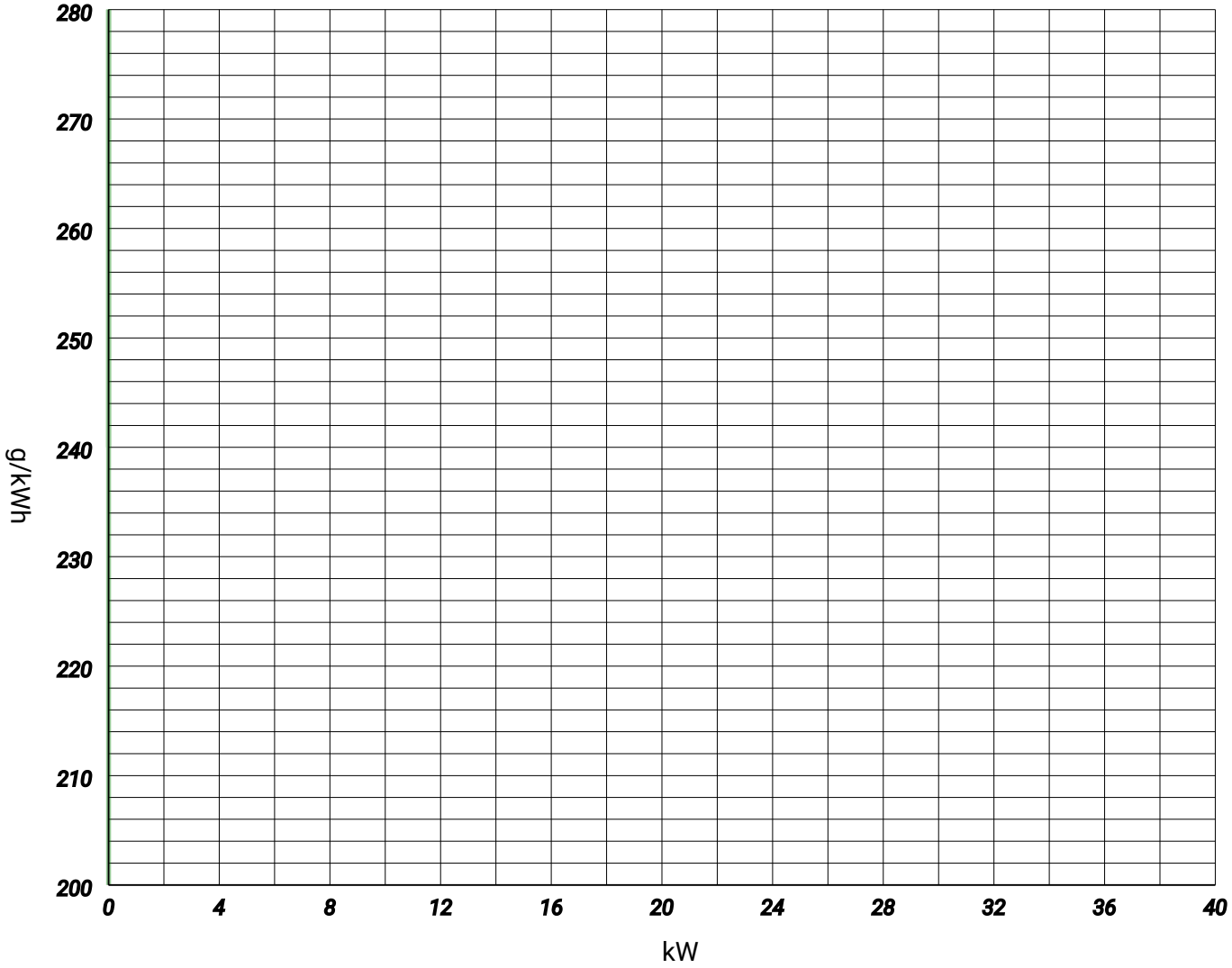

Speed/Temperature
BSFC
Time
100
90
80
70
60
50
40
30
20
10
0
280
272
264
256
248
240
232
224
216
208
200
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20

The average BSFC value is plotted with a colored dot.
Range of BSFC excursion is plotted with a green line, so the shorter the line is, the more precise the BSFC value.

Instant BSFC/Fuel Consumption

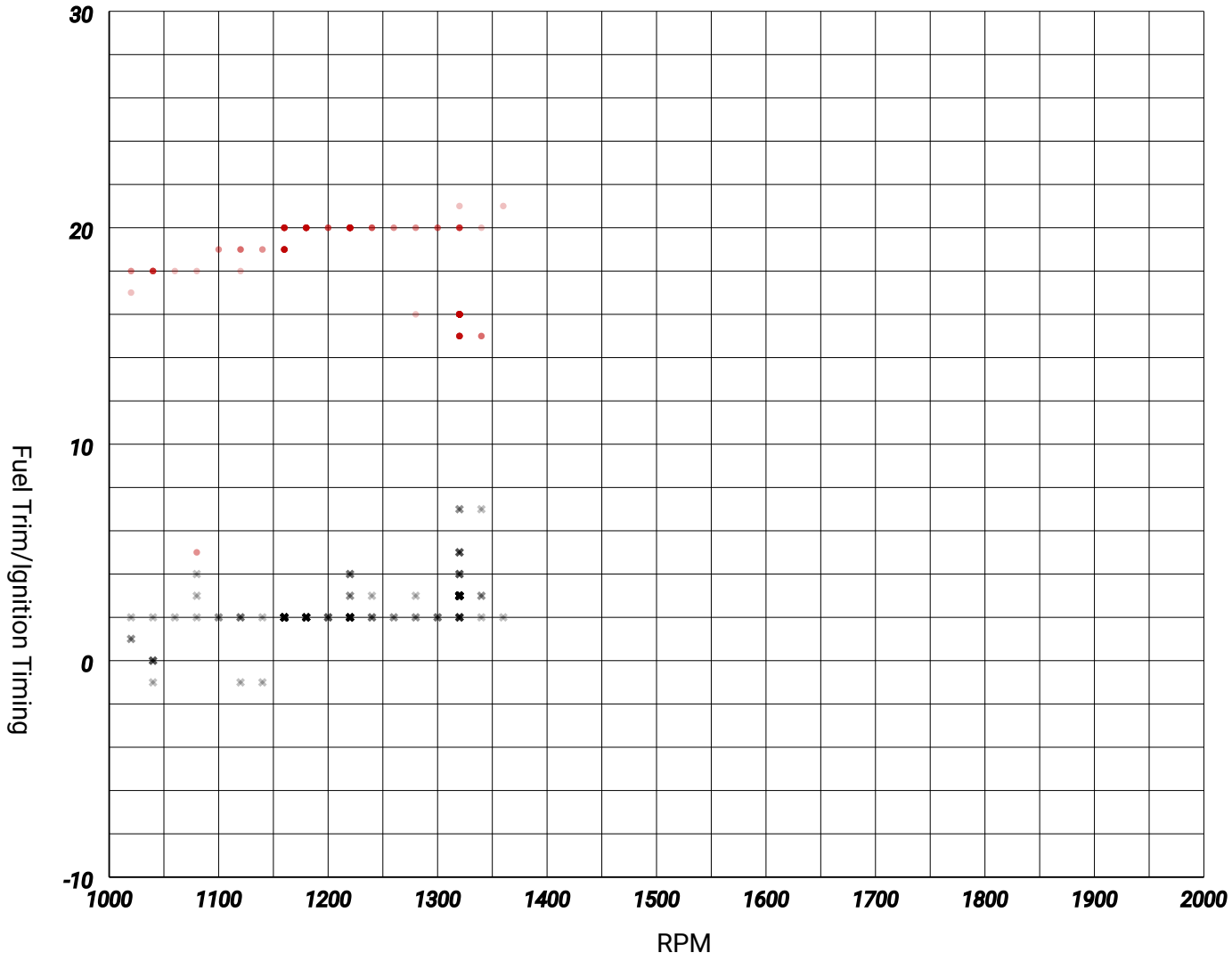

Speed
100
90
80
70
60
50
40
30
20
10
0
Instant Fuel Consumption
70
63
56
49
42
35
28
21
14
7
0
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

BSFC for kW



For each kW range of the petrol engine, the produced BSFC value is plotted as a dot. Light colored range depicts full value excurtion, while darker color plots standard deviation from average.
Values are collected only when engine is at working temperature.

RPM/Fuel Trim/Ignition Timing/BSFC


30
20
10
0
-10
1000
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
Fuel Trim/Ignition Timing
RPM

BSFC

Effective Fuel Trim

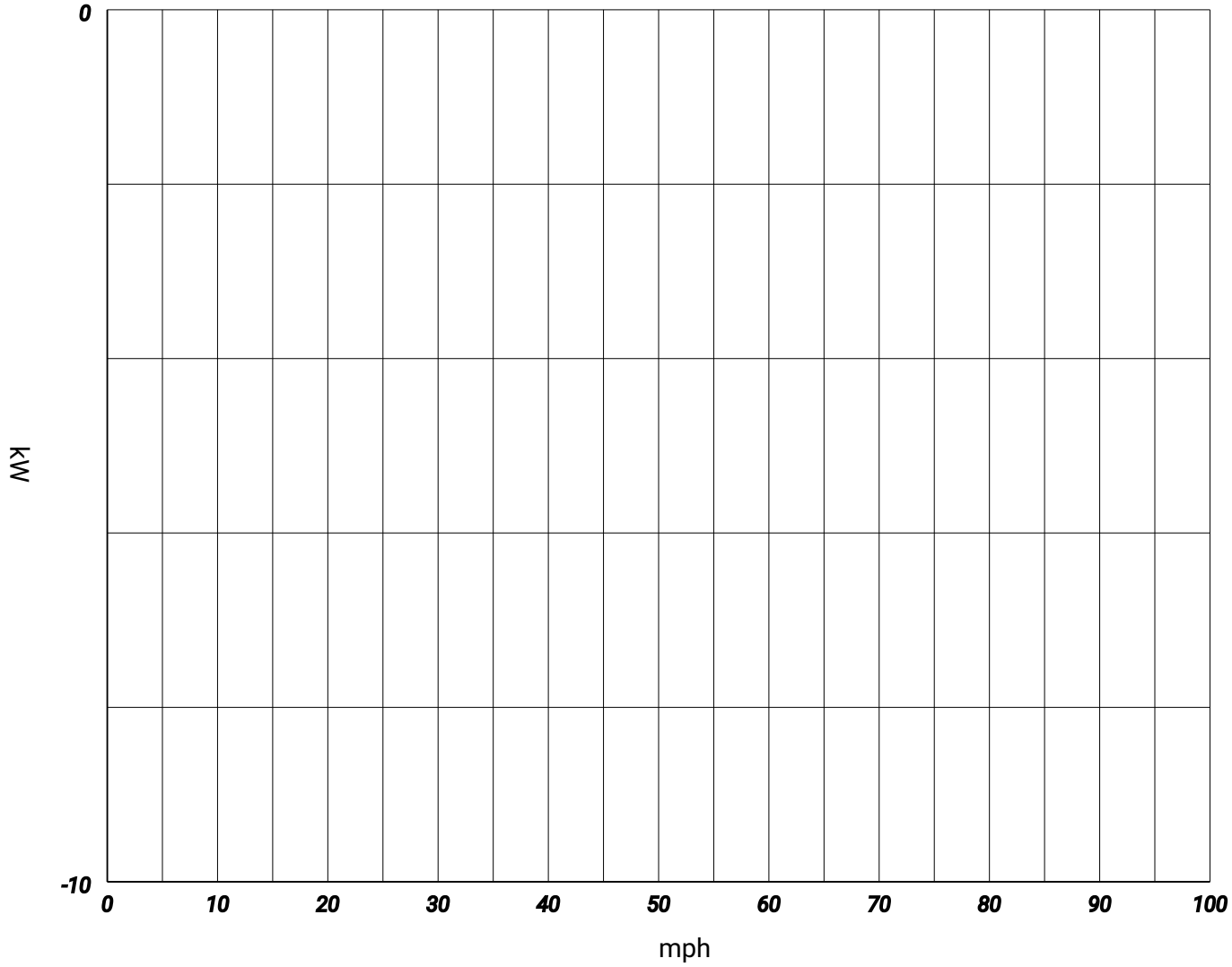
Fuel Trim and Ignition Timings are plotted at various RPM values.
Ignition Timings values are painted with the BSFC value obtained at that specific point.
This map can be used to verify LGP-operating engines working condition.

BSFC	
Average	433
Standard deviation	363

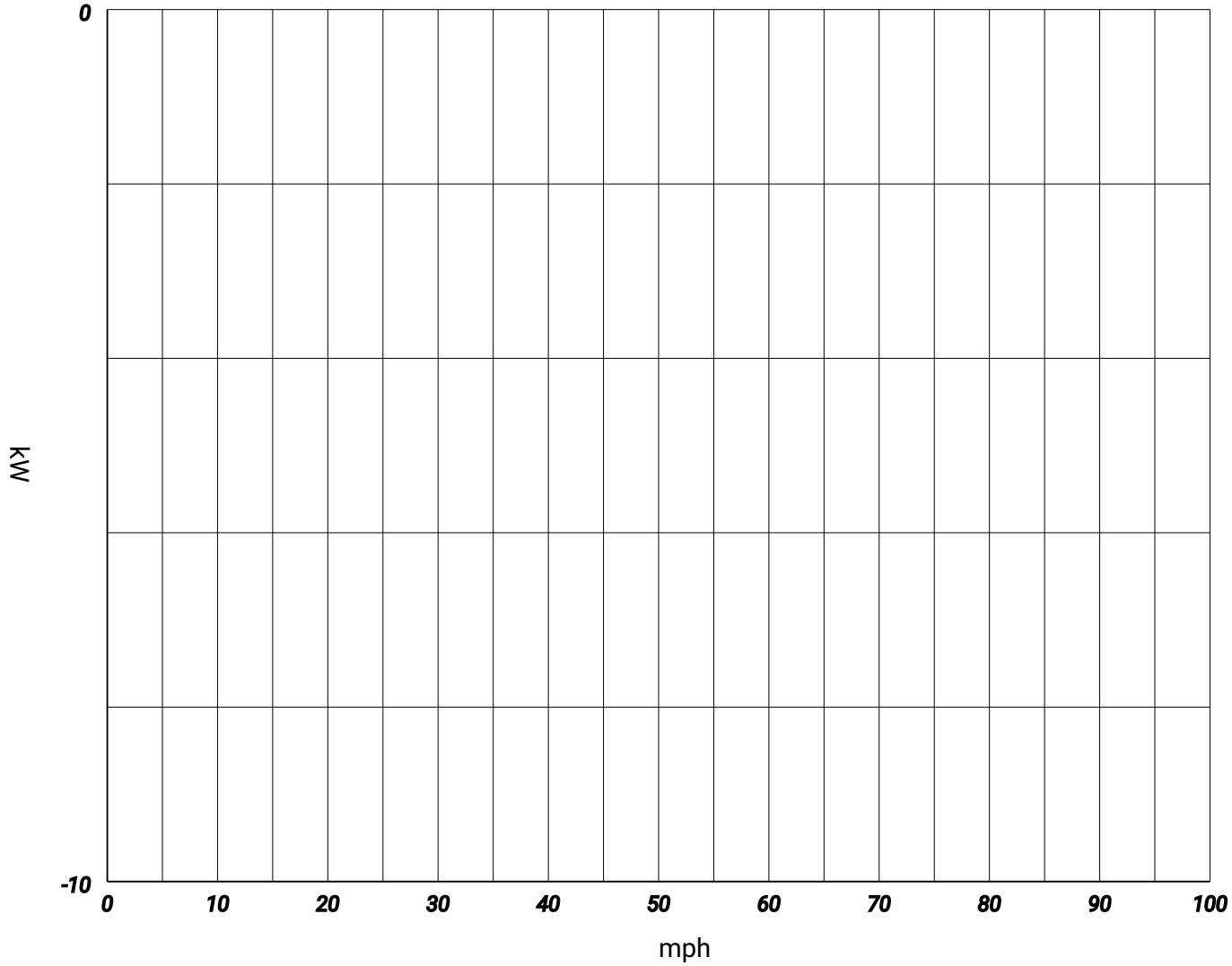
Braking

Brakings	0
Good Brakings	0
Bad Brakings	0
Mixed Brakings	0
Braking Efficiency	0.00 %
Braking while moving	0%
Longest brake event	0:00 sec
Total energy recovered by braking	0.030 kWh

Recovery by braking



Recovery by coasting



Car Driving

State	%	Longest Time
Pulse	0%	0:00 sec
Glide	1%	0:02 sec
Approximate Glide	0%	0:00 sec
Coasting	0%	0:00 sec
Heretical	0%	0:00 sec
Accelerator pressed	22%	1:46 sec
Accelerating	0%	0:00 sec
Moving	0%	0:00 sec

Car operational state statistics during the trip.
States are expressed as percentage over the entire trip time and longest time span the state persisted.

- Pulse: accelerating with nearly all ICE power given to traction.
- Glide: cruising with no electrical or mechanical traction (exact evaluation using Hybrid System Indicator).
- Approximate Glide: cruising with no electrical or mechanical traction (approximate evaluation).
- Coasting: cruising with no accelerator or brake applied.
- Heretical: cruising with MG1 electric motor providing traction.
- Accelerator pressed: accerator pedal is pressed, even if not actually accelerating.

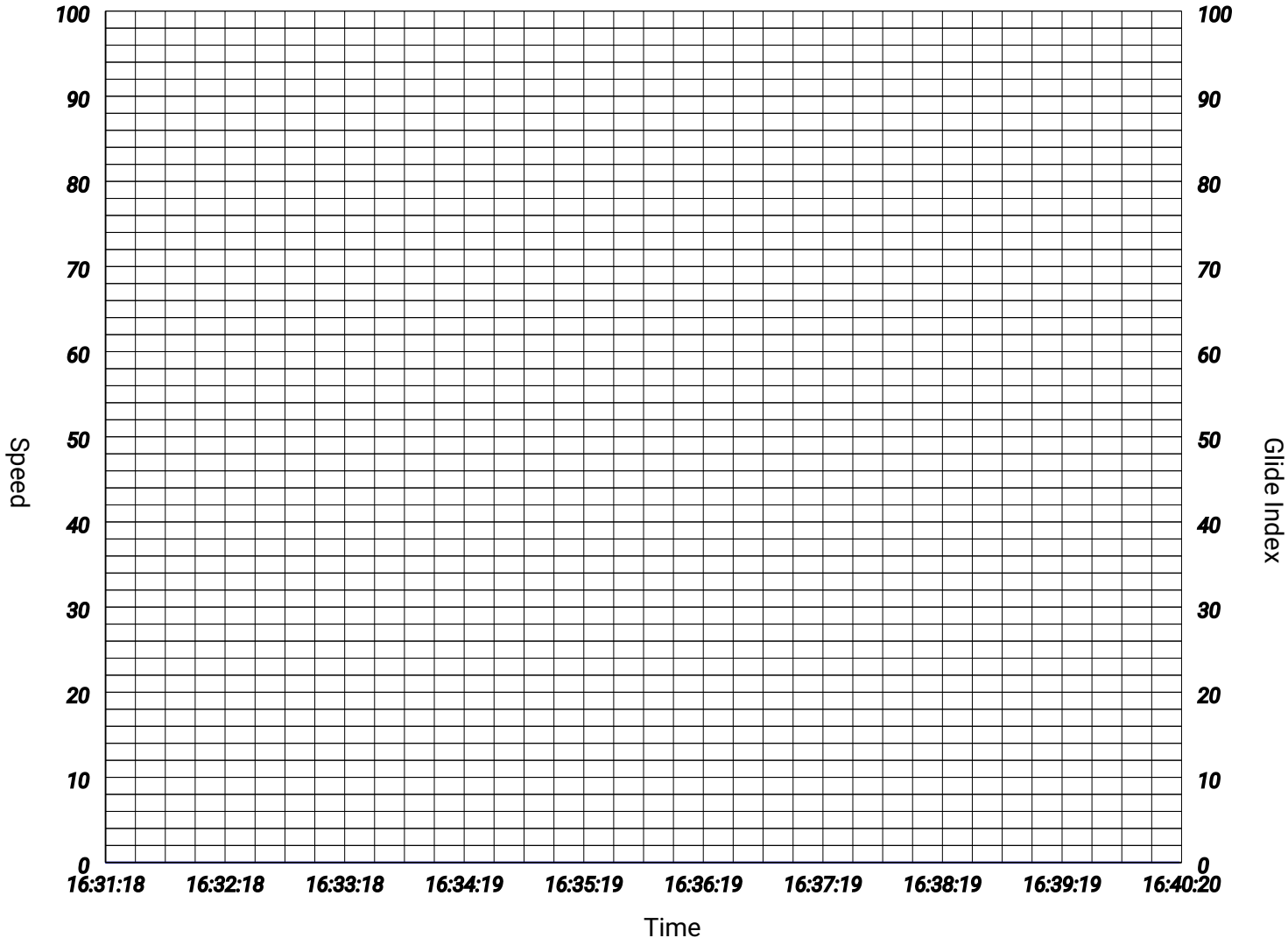
- Accelerating: car speed is increasing.
- Moving: car is not stopped.

Power Meter		
Zone	**%**	**Longest Time**
PWR	0%	0:00 sec
Upper ECO	0%	0:00 sec
Lower ECO	100%	9:01 sec
CHG	0%	0:00 sec

Glide Evaluation

Glide type	HV Neutral
Glide score	0

Glide Index


100
90
80
70
60
50
40
30
20
10
0
Speed
Glide Index
16:31:18
16:32:18
16:33:18
16:34:19
16:35:19
16:36:19
16:37:19
16:38:19
16:39:19
16:40:20
Time

Driver Evaluation

Accelerator Nervousness	2.37
Inefficient Ignitions	0/3

- Accelerator Nervousness: Variability of the accelerator pedal usage. Higher values indicate a nervous driving style
- Braking Efficiency: Ability to use regenerative braking
- Inefficient Ignitions: Number of engine ignitions that lasted less than 5 seconds

Notes

Point size on scatter charts is proportional to number of samples: a small, well defined dot represent a higher confidence value than a bigger, faint dot.