

# User Manual Saker



[WWW.SAKERSPORTSCARS.COM](http://WWW.SAKERSPORTSCARS.COM)

**RapX - GT - Sniper - Sprint**

## PREFACE.

Congratulations and thank you for choosing a Saker sportscar. Thorough familiarity with your vehicle will provide you with enhanced control and security when you drive it. Please take the time to read this User Manual and familiarize yourself with the information that we have compiled for you before starting off in your new vehicle. It contains important data and instructions intended to assist you in gaining maximum driving fun and satisfaction from your Saker. The manual also contains information on maintenance designed to enhance operating safety and contribute to maintaining the value of your Saker throughout an extended service life.

You, as a proud Saker owner, can help us in improving our cars & services even further. As a matter of fact Saker drivers and teams have helped us since the early days in improving our product, keeping our values, and staying open for any feedback. Let us know your Saker experiences, your voice will be heard and can help us and other Saker drivers!

We wish you an unforgettable driving experience.

Saker Sportscars

### Contact information

Saker Sportcars

Bauerngasse 4

73450 Neresheim

Deutschland

T +4017687730705

info@sakersportscars.com

Important! Saker parts and accessories are especially designed for Saker Sportscars. They are therefore perfectly suited for your Saker. For your own safety, use genuine parts and accessories approved by Saker.

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## INTRODUCTION.

Since the founding in 2002, Dutch manufacturer Saker Sportscars has steadily and ambitiously worked towards her goals. Making pure racing accessible, with sportscars that are built for years of racing fun. With this vision, the following four models have been designed.



SAKER RAPX



SAKER GT



SAKER SNIPER



SAKER SPRINT

## SPECIFICATIONS.

### Engine

Engine type:	Saker-Subaru by VEGE
Working principle:	4-stroke, positive ignition
Direct injection:	No
Cylinders:	4
Cylinder arrangement:	Boxer
Valves per cylinder:	4
Capacity:	1998cc
Maximum power:	275BHP
Maximum torque:	350Nm
Transmission system:	5 speed manual (optional 6 speed sequential)
Turbo type:	TD05
Clutch type:	Dry single plate diaphragm

### Wheels

Tire size front:	8.7/21.5-15
Tire size rear:	10.5/23.0-15
Wheel size front:	15x8.5inch
Wheel size rear:	15x10.5inch

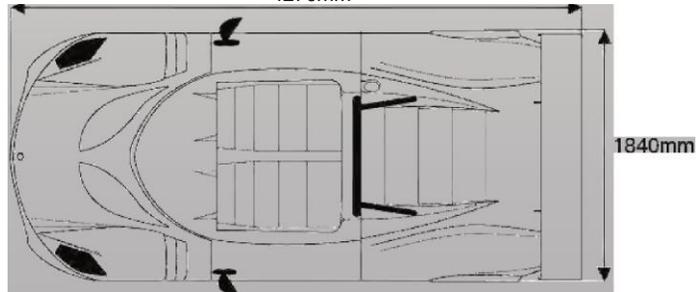
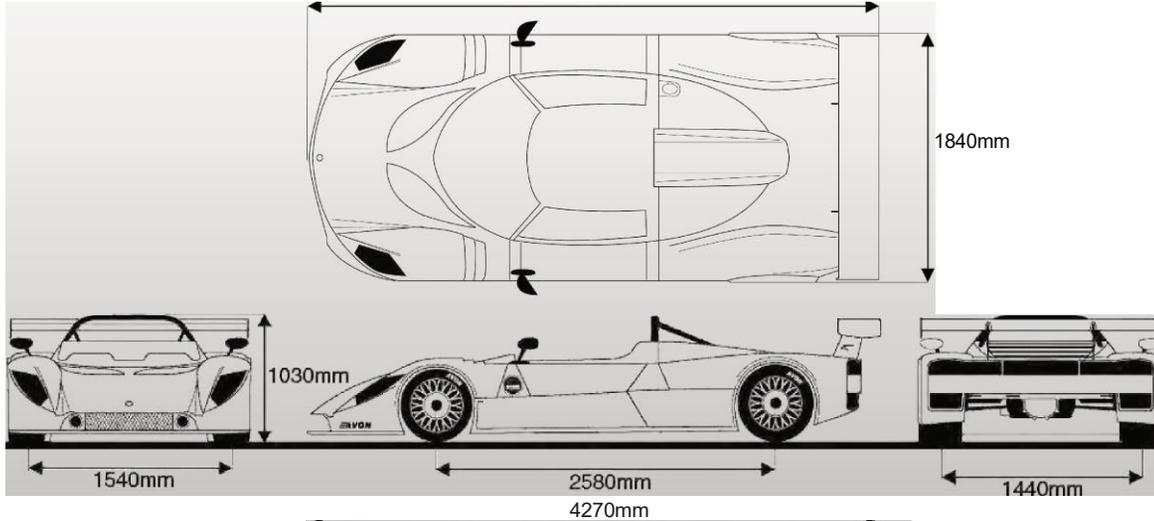
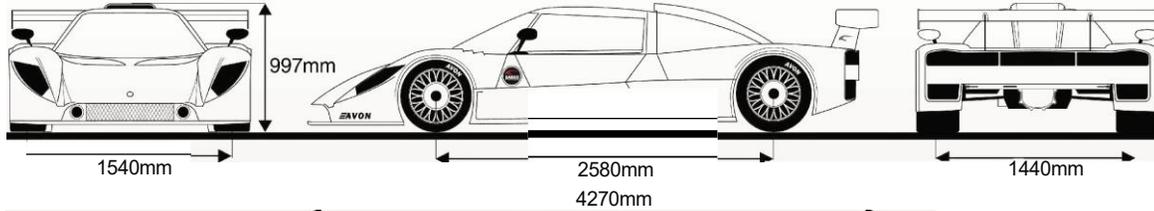
### Chassis

Frame:	Steel space frame
Body:	Fibreglass (GRP)
Brakes:	Tarox 6-pot callipers, slotted discs (optional Brembo 4-pot callipers, slotted discs)
Brake system:	Mechanical-hydraulic, no assistance, no ABS, 2 circuits
Steering:	Mechanical, no assistance
Suspension:	Adjustable double wishbones
Fuel capacity:	70L (optional 90L)
Ride height:	Sem (adjustable)

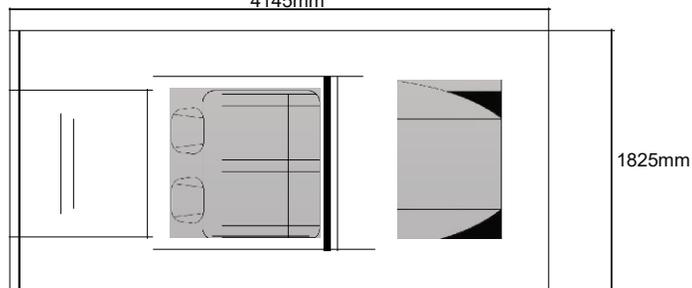
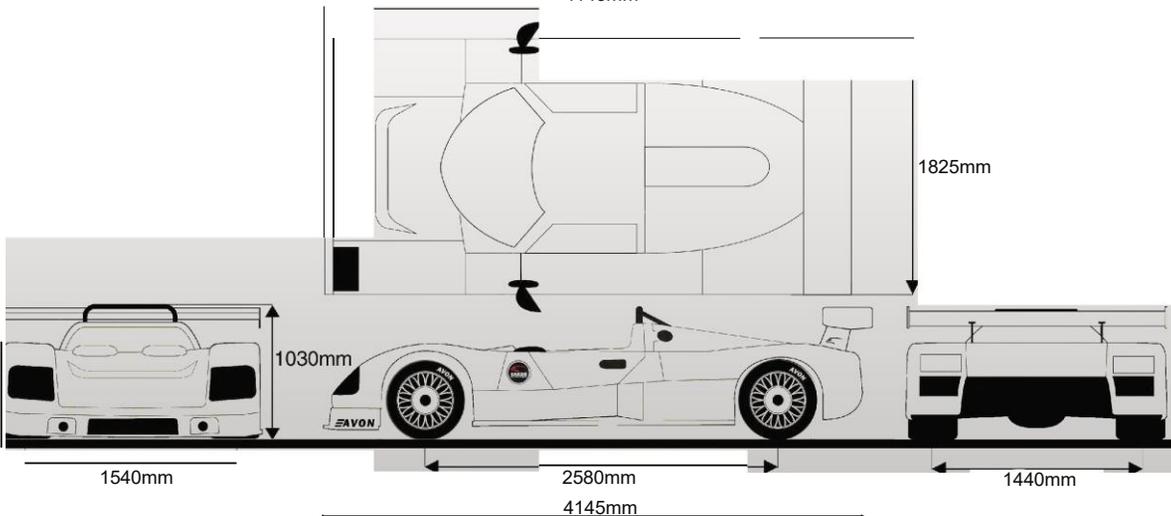
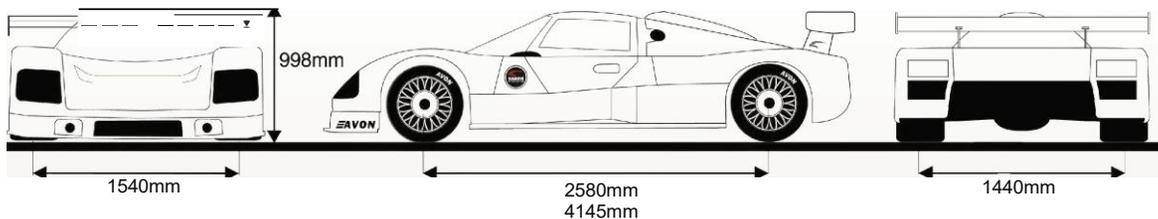
### Performance

Top speed:	237km/h
Acceleration 0-100km/h:	3.4sec
Lateral G-forces:	Upto 2G
Weight Rapx & GT:	785kg
Weight Sniper & Sprint:	765kg

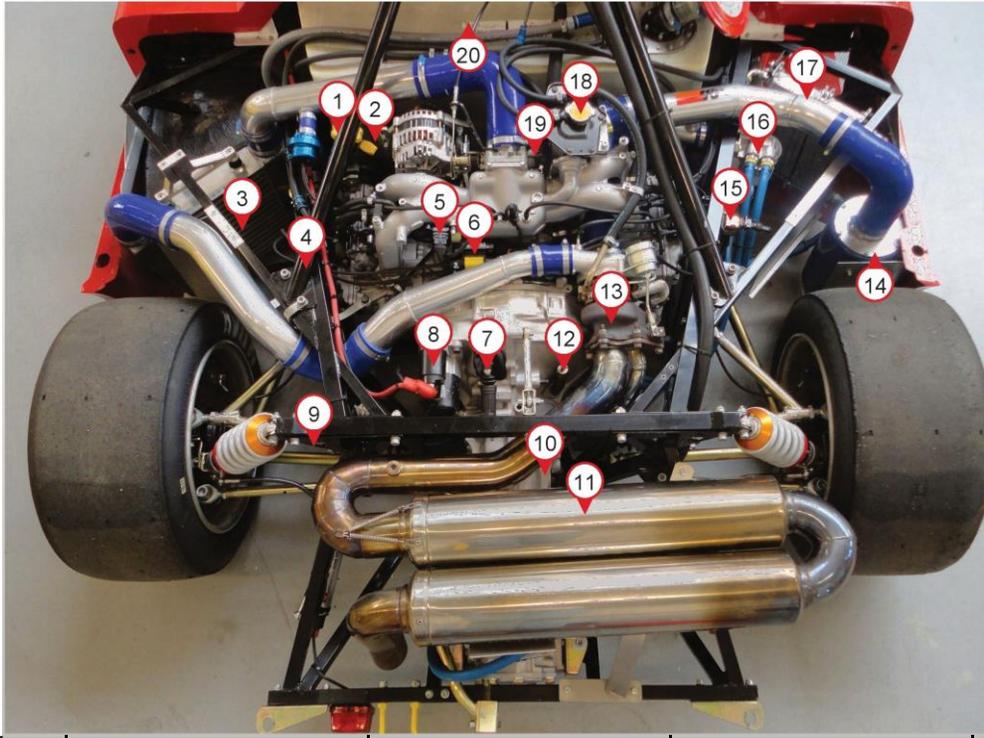
**DIMENSIONS SAKER RAPX AND SNIPER.**



# DIMENSIONS SAKER GT AND SPRINT.

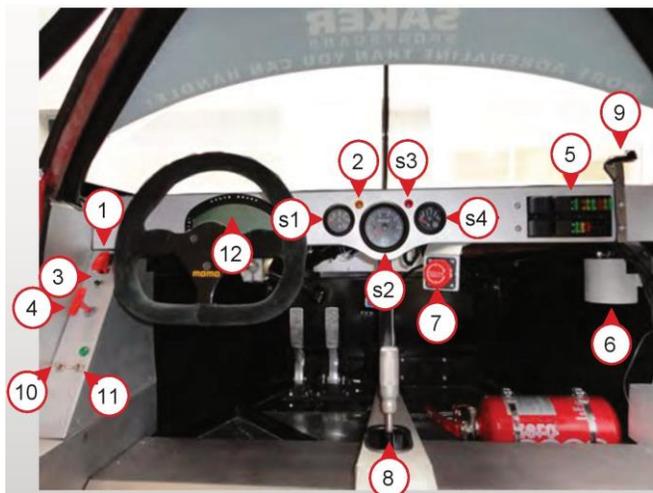


OVERVIEW ENGINE COMPARTMENT.

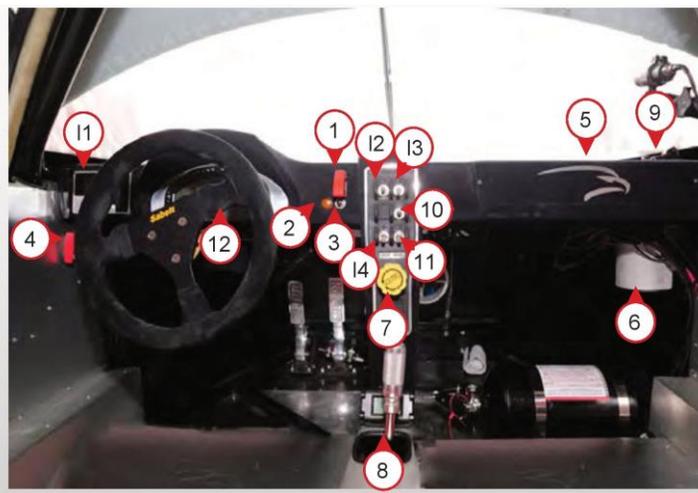


1. Engine oil	2. Engine oil dipstick	3. Intercooler	4. Fuel pump	5. Map sensor
6. Ignition coil	7. Clutch release lever	8. Starter motor	9. Drive shaft	10. Gearbox
11. Exhaust	12. Gearbox oil dipstick	13. Turbo	14. Air filter	15. Boost solenoid
16. Oil filter gearbox	17. Oil cooler	18. Coolant	19. Throttle Position Sens.	20. Fuel tank

OVERVIEW STANDARD DASHBOARD.



OVERVIEW LUXURY DASHBOARD.



Standard dashboard		Luxury dashboard	
s1: Water temperature	s2: Tachometer	11: Rear view cam. display	12: Headlight switch
s3: Oil pressure warning light	s4: Oil pressure gauge	13: High beam switch	14: Interior fan switch
1: Main switch	2: Dynamo indicator	3: Starter button	4: Extinguisher pull cable
5: Fuse box	6: Main relay	7: Brake bias adjuster	8: Gear lever
9: Beacon IR receiver	10: Wiper switch	11: Fog light (rear) switch	12: AIM data logger

## AIM.

Saker Sportscars are optionally equipped with an AIM MXL Pista data log system. The MXL Pista is a digital dash, gauge, and race data acquisition system featuring a tachometer, RPM input, 8 analogue inputs, 1 speed input, CAN/serial ECU connector, gear position indicator (sampled or calculated), internal lateral G-sensor, and lap timer.

### Shift lights RPM

saoo 16000 16250 | 6soo 6750 6750 | 6soo 162so 16000 1 saoo



### AIM Alarm descriptions

AL1: Water T > 100°C	AL4: Oil P < 0,8bar (optional)
AL2: ECU V < 12,2V	ALS: Air T > 65°C
AL3: Fuel level < 4L (optional)	AL6: MAP P > 2,Sbar

## MXL PISTA MAIN FEATURES.

MXL Pista is featured as follows:

- Wide display with standard backlight;
- RPM numerical and graphical view (configurable RPM scaling);
- 1 RPM input;
- Internal lateral G-sensor to map tracks;
- 8 analogue inputs;
- 1 speed input;
- Gear number (optional);
- Optional built-in GPS System (GPS internal board and external GPS antenna) for 30 track mapping;
- 10 shift lights: green, yellow and red;
- 6 freely configurable alarm leds for maximum/minimum alarm;
- Fast USB data download (300 Kb/sec) to your PC and Race Studio 2 analysis software (free);
- 8Mb internal non volatile memory;
- Lap and (configurable number of) split times;
- Built-in clock and calendar for test management;
- Internal data acquisition system;
- Total and partial (resettable) odometer;
- Water resistant.

Data is stored in a 8Mb non-volatile memory and may be downloaded to a PC through an USB cable. For further information concerning transporting the data, please refer to the instructions in chapter 4 - onboard computers.

## LIQLJIDS.

### Fuel

The regular tank capacity is 70L, a tank capacity of 90L is optional. Saker strongly recommends unleaded petrol with a RON (Research Octane Number) of at least 98 (AKI or PON: 93-94). Lower octane numbers will suffer in bad engine performances and eventually damage to the engine.



### Engine oil

Fill with 5,25L Ravenol Racing Eco 10W-60 oil. Advice: cold engine 1cm above maximum on dipstick.



### Gearbox oil

Fill with 5,25L Ravenol RHP Racing oil 75W90. Advice old dipstick: cold engine between F and L on dipstick. Use Ravenol CeramiX-Pro as an Additive



Advice new dipstick: cold engine below L on dipstick.

### Coolant

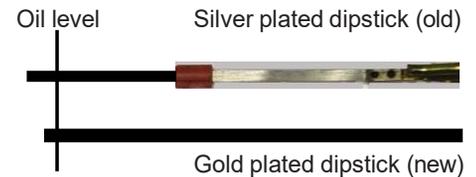
Fill with Ravenol ETC Concentrate Protect C12evo. . Advice: fill with coolant and fill it up further during running the engine. Make sure no air is left in the cooling system.



### Brake fluid

Use Ravenol Racing Brake Fluids R325+

**Important!** Never mix brake fluids with different DOT numbers or from different brands! If not sure about the DOT number or brand of the used brake fluid, refresh the fluid of the whole brake system.



## TIRES & BRAKES.

Before driving, make sure the tires and brake pads are in good condition and show no signs of damages. The rear driving shaft nuts must be tightened at 280Nm (2061lb/ft) and locked.

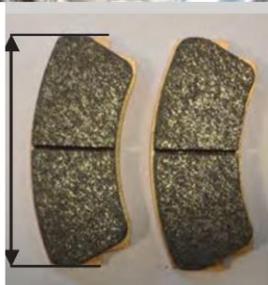
In normal conditions the tire pressure (warm) needs to be between 1.4bar (20.3PSI) and 1.5bar (21.8PSI). Start driving at 1.2bar (17.4PSI) (or 1.4bar (20.3PSI) in pouring rain conditions), and let it off to the required pressure after the temperature and pressure have risen.

**Important!** Check wheelnuts before every session, make sure they are tightened at 110Nm (81lb/ft).



Replace old worn brake pads only with modified Saker brake pads with a maximum length of 112.6mm.

112.6mm



Tape up the (brake coolers and) oil cooler in really cold and rainy conditions ( $T < 2^{\circ}\text{C}$ ). Do not forget to remove the tape when the temperature has risen.

### Adjust brake balancer static

Lift the car up with all four wheels off the ground. One person applies the brake at such a force that another person can *just (so with a certain amount of force)* turn the wheel on the front. The person in the car must keep the same load on the brake pedal, while the second person now turns the wheel on the rear. If the rear wheel is easier to rotate; move brake balancer to R (rear), and try again. If front wheel is easier to rotate; move brake balancer to F (front), and try again, until the resistance front and rear is the same.

Always check the brake balance on the track while driving for fine tuning it.



### Adjust brake balancer dynamic

The brake balancer is adjustable step by step, by turning half rotation each time. Do it while driving, with warm tires, on a straight part of the track. Apply the brake and push until either front or rear wheels lock (release brake immediately). If front tires lock up first, more brake pressure is needed on the rear, so apply the brake balancer towards rear (R), by half a turn each time, and try again, until the brake balance is good. If rear tires lock up first, apply the brake balance to the front (F). In rainy conditions the brake balance must be moved to the rear.

## STARTING & DRIVING.

Engine (water) temperature should be kept between 70°C and 88°C. Warm up until at least 70°C, and don't run over 100°C. Engine temperature is controlled by putting (duct)tape on the front airdam gauze (B84N). At warm days no tape needs to be applied, at cold or rainy conditions use the amount of tape to get to the required temperature range.

**Important!** This table only shows an indication. Always make sure engine temperature keeps between 78°C and 88°C.

Weather condition	Amount of tape	
T < 5°C	1/2	
5°C < T < 14°C	1/4	
T > 15°C	0	
Rain & T < 8°C	1/2	
Rain & T > 15°C	1/4	

Add K&N Drycharger (E72A) to air filter during wet conditions. Always keep the K&N filter maintained through the official K&N procedures. For these procedures, please refer to the K&N Air Filter Cleaning Instructions in chapter 4 \_Air filter cleaning instructions.

### Check shortly before driving:

- Check conditions of tires and brakes and tighten wheelnuts at 110Nm (81lb/ft);
- Check if the body parts are locked with the R-clips (M52); The steering wheel has a quick release system. Always make sure it is completely locked; two clicks!;
- Remove the locking pin of the fire extinguisher;
- Check cooling fans and gearbox cooling for functioning (explained in chapter 4 - maintenance schemes & checks).

### Starting the engine:

- On the outside of a RapX and GT a 'kill-switch' is mounted. To the rear = ON;
- Main switch (with red cover) has two clicks. First click switches the main power supply, second click turns the ECU on. Always apply two clicks for starting;
- With cold engine apply the main switch three or four times without starting, to build up fuel pressure. At the fourth time start the engine during fuel pump is working, no throttle applied.

### Check shortly after the shake down / first test:

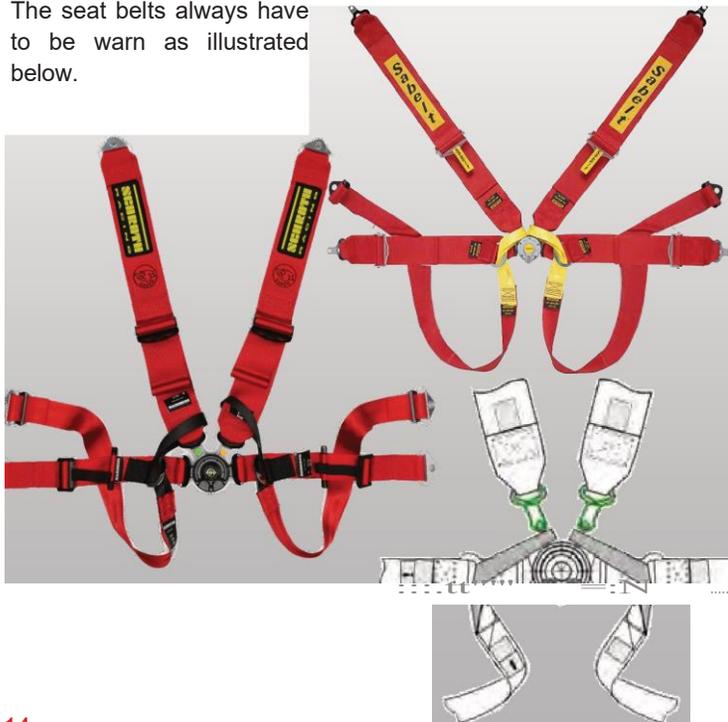
- Change engine oil;
- Check all mounting points and fasteners of the suspension;
- Check all connections, fasteners and bolted parts carefully; Check wheel bearing play.

**Important!** Do not shut down the engine directly after driving, always allow the engine to cool down for at least one minute.

## SEAT BELTS.

The restraint assembly in your Saker consists of several components, each with a specific function. The system is built to control a drivers movement inside the car during a crash, keeping him pinned to the seat and allowing him to ride the crash down to acceptable limits of force. Saker Sportscars are equipped with Schroth Racing Profi II-6F or Sabelt CCS633SRU 6-point racing harnesses.

The seat belts always have to be worn as illustrated below.



## ARM RESTRAINTS.

In a closed car like the Saker RapX and the Saker GT one arm restraint must be worn; on the left arm (on the right arm in a right hand drive). The arm restraint is attached to the left shoulder belt (right shoulder belt in a right hand drive).



In an open car like the Saker Sniper and the Saker Sprint, two arm restraints must be worn. The arm restraints are attached to the right and left shoulder belt.



**Important!** Make sure the arm restraints are completely released with releasing the seat belts.

## SHIFTING.

The following procedures entail successfully shifting with either a sequential gearbox or a h-pattern gearbox resulting in minimum wear.

### **Up-shifting with a sequential gearbox**

The sequential gearbox in a Saker is manufactured by Sadev. This is a manual sequential gearbox with no assistance from the engine management. Dog wear occurs when initiating contact during a shift, therefore the time **between** engaged in the one gear and engaged in the next gear is called the 'danger zone'. The best shifting method is to fully move the dog ring as quick as possible from one gear to the next. The engine's driving load should be removed until the shift is completed.

In practice this will result in the following method: apply load to the gear lever with your hand and then lift your foot from the throttle pedal and re-apply as fast as physically possible. In lifting your foot, the loaded gear lever will almost spontaneously flick to the next gear before your foot re-applies the throttle.

### **Down-shifting with a sequential gearbox**

Whilst braking, the dogs must be unloaded by just touching the throttle pedal a bit or dipping the clutch. When the dogs are unloaded, a lower gear must be engaged. Shift down as late as possible in your braking zone, because the rev drops are lower at lower speeds.

### **Shifting with an H-pattern gearbox**

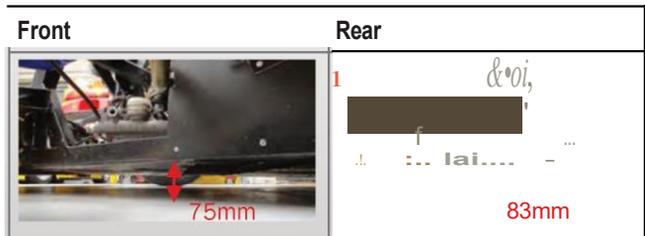
The Saker 5 speed H-pattern gearbox is a synchronized gearbox. This means it needs time to synchronize gears, so too quick/ rough shifting of gears will wear out the synchro rings, and in worst case damage the shift forks and gears inside the gearbox. Handle with care and shift gears without applying too much force, which will eventually result in easy and fast gearshifts. Do not pull or push in one movement between gears, but give some time to 'click' through neutral, this will benefit the ease and speed of the shifts. Always take care there is no excessive play on the joints of the (lang) gear linkage. Play will result in less feeling in shifting gears, and thus higher risk on excessive and unnecessary wear of synchro rings and internals of the H-pattern gearbox.

## FACTORY SETIINGS.

### Car height

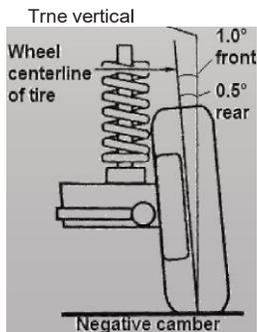
With stabilizer bar loos and tires inflated to 1.Sbar (21.8PSI).

Position	Ride heigt
Front	75mm
Rear	83mm



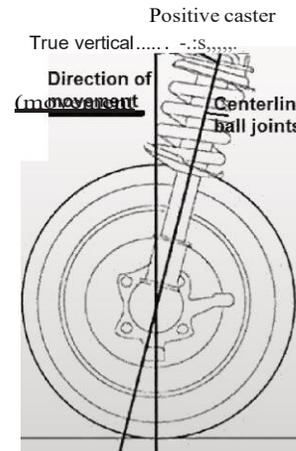
### Camber

Position	Angle
Front	1.0° negative
Rear	0.5° negative



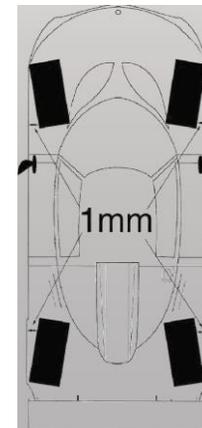
### Caster

Position	Angle
Front	3.5° positive
Rear	0.0°



### Toe

Position	Type
Front	1mm toe-out
Rear	1mm toe-in



## SUSPENSION ADJUSTMENTS.

### Compression adjuster

The compression adjuster is located on top of the canister. It has a range of 7 positions (0-1-2-3-4-5-6). To adjust the shock or strut turn the knob one clock at a time.

(Clockwise '-' softens: counter clockwise '+' stiffens)



(Softest setting is position '0': stiffest setting is position '6')

#### Procedure

The standard position of the compression adjuster is '3'. Turn the knob clockwise until it stops. This is the '0' position. From this position turn the knob counter clockwise 3 clicks. The compression is now set at '3'.

**Important!** The bump and rebound adjuster opens or closes small orifices, this restricts the flow of fluid in small increments. Each click will have an effect on the handling characteristics so do not adjust more than one or two clicks at a time.

### Rebound adjuster

The rebound adjuster is located on top of the piston rod. It has a range of 7 positions (0-1-2-3-4-5-6). To adjust the shock or strut turn the orange alloy rebound knob one click at a time.

(Clockwise '-' softens: counter clockwise '+' stiffens)



(Softest setting is position '0': stiffest setting is position '6')

#### Procedure

The standard position of the rebound adjuster is '3'. Turn the knob clockwise until it stops. This is the '0' position. From this position turn the knob counter clockwise 3 clicks. The rebound is now set at '3'.

### Beginning settings adjusters:

Front compression = 3  
Rear compression = 3

Front rebound = 3  
Rear rebound = 3

## K&N AIRFILTER CLEANING INSTRUCTIONS.

### 1. Apply cleaner

Liberally spray K&N Air Filter Cleaner onto both sides of filter and allow to soak for 10 minutes to loosen the dirt. Do not allow cleaner to dry on air filter.



### 2. Rinse filter

Rinse off air filter with cool low-pressure water applied to the clean side out in order to flush the dirt out of the filter. Continue to rinse the filter until all traces of cleaner are gone. It may be necessary to repeat steps 1 and 2.



### 3. Dry filter

After rinsing, gently shake off excess water and only allow filter to dry naturally. Do not oil until the filter is completely dry.

### 4. Oil filter

Spray K&N Air Filter Aerosol Oil (99-5000) evenly along the crown of each pleat holding nozzle about 8cm away. Allow oil to wick for approximately 20 minutes. Touch up any light areas on either side of the filter until there is a uniform red color at all areas.



The above process is the only approved procedure for maintaining your K&N Air Filter.

## FUSE & RELAY BOX.

Dashboard	Schematic dashboard																																																																					
	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 10%;">R1</td> <td style="width: 10%;">R2</td> <td style="width: 10%;">R3</td> <td style="width: 10%;">R4</td> <td style="width: 10%;">2</td> <td style="width: 10%;">3</td> <td style="width: 10%;">4</td> <td style="width: 10%;">5</td> <td style="width: 10%;">6</td> <td style="width: 10%;">7</td> <td style="width: 10%;">15</td> </tr> <tr> <td style="border-right: 2px solid black;"></td> <td style="border-right: 2px solid black;">16</td> </tr> <tr> <td style="border-right: 2px solid black;"></td> <td style="border-right: 2px solid black;">17</td> </tr> <tr> <td style="border-right: 2px solid black;">R5</td> <td style="border-right: 2px solid black;">R6</td> <td style="border-right: 2px solid black;">R7</td> <td style="border-right: 2px solid black;">RB</td> <td style="border-right: 2px solid black;">B</td> <td style="border-right: 2px solid black;">9</td> <td style="border-right: 2px solid black;">10</td> <td style="border-right: 2px solid black;">11</td> <td style="border-right: 2px solid black;">12</td> <td style="border-right: 2px solid black;">13</td> <td style="border-right: 2px solid black;">14</td> <td style="border-right: 2px solid black;">19</td> </tr> <tr> <td style="border-right: 2px solid black;"></td> <td style="border-right: 2px solid black;">20</td> </tr> <tr> <td style="border-right: 2px solid black;"></td> <td style="border-right: 2px solid black;">21</td> </tr> </table>	R1	R2	R3	R4	2	3	4	5	6	7	15											16											17	R5	R6	R7	RB	B	9	10	11	12	13	14	19												20												21
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Standard dashboard Saker	Luxury dashboard full option Saker
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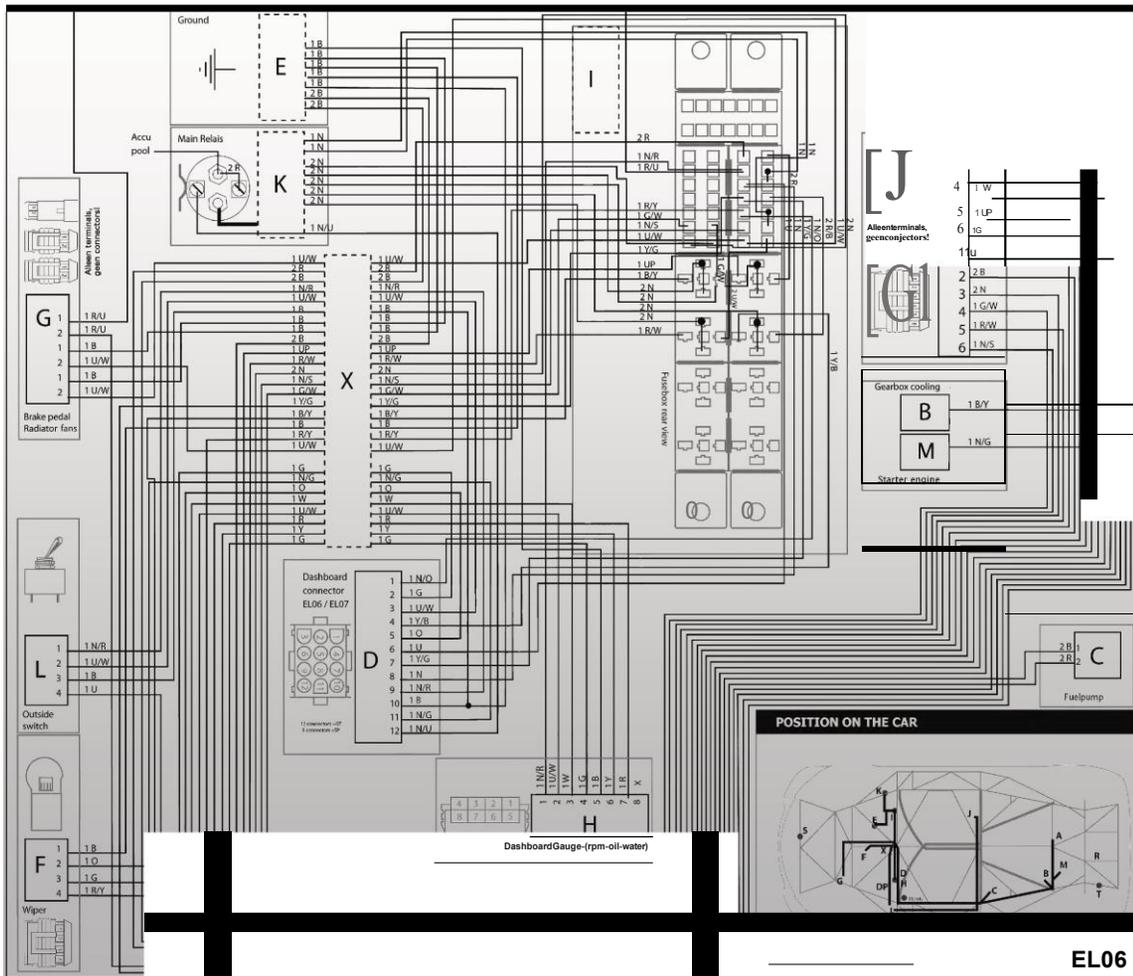
<b>Relays</b>	
R1. Headlights*	R5. Turn lights*
R2. High beam*	R6. Paddle shift*
R3. Fog light rear	R7. Cooling fans
R4. Fuel pump	RB. Gearbox cooling

10A	20A	30A
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<b>Fuses</b>	
1. Cooling fans	12. Rear view cam. and display*
2. Boost valve	13. 12V connector*
3. Wiper	14. Gearbox Control Unit*
4. Fog light front/interior fan*	15. Side lights*
5. ECU / starter relay	16. Fog light rear*
6. Dashboard / brake lights	17. Reverse light*
7. Fuel pump	1B. High beam*
B. Injection / ignition coils	19. Headlights*
9. Gearbox cooling	20. Intercooler spray system*
10. AIM*	21. Compressor*
11. Tire Pressure Monitoring System*	

\*Related to an optional system and thus not necessarily installed in your Saker's fuse box

**EL06 Wiring loom main\***

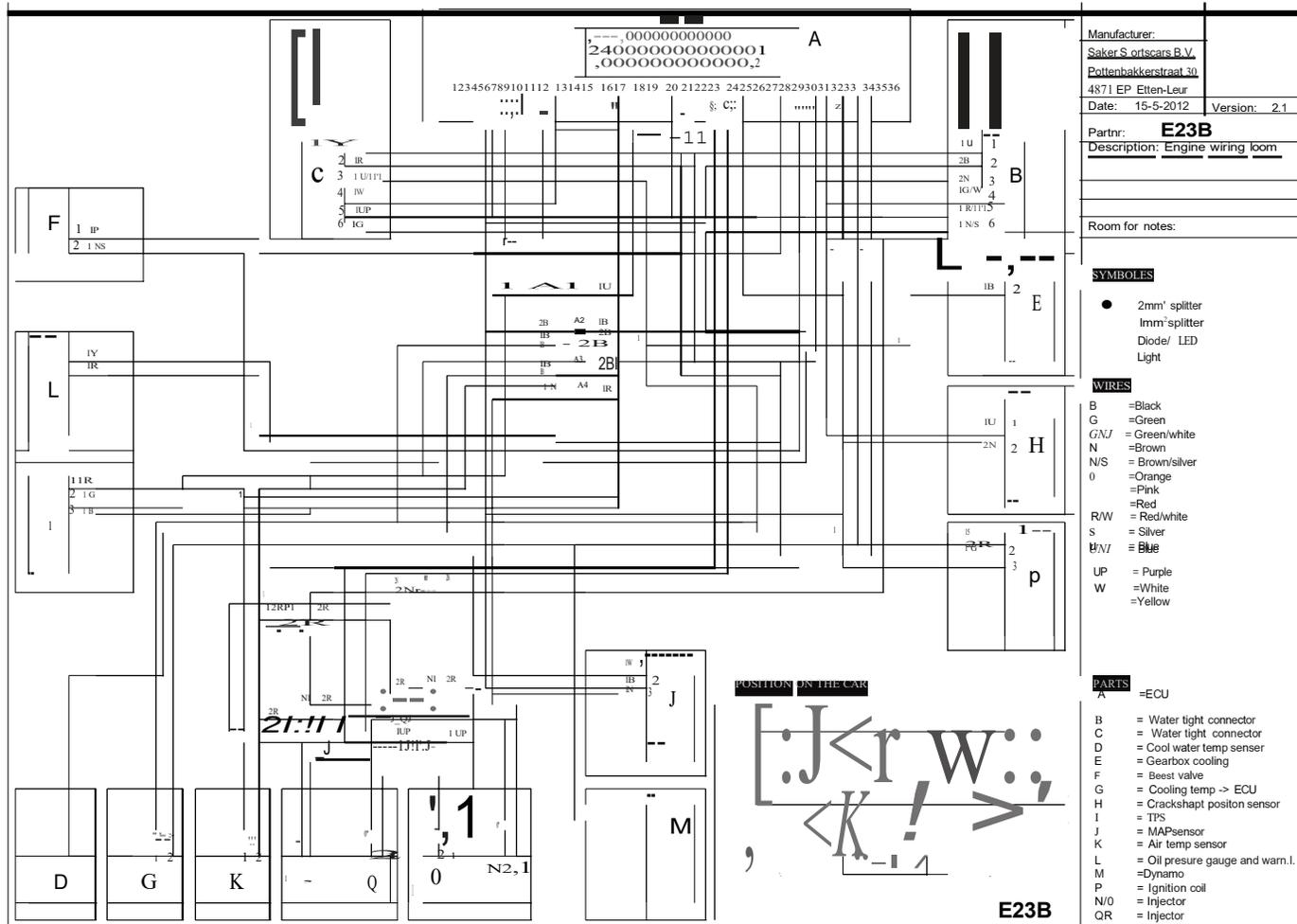


<b>Manufacturer:</b>	
Saker Sports cars B.V. Pottenbakkerstraat 30 4871 EP Elten-Leur	
<b>Date:</b> 11-12-2012	<b>Version:</b> 4.0
<b>Part nr:</b> EL06	
<b>Description:</b> Wiring loom main	
<b>Room for notes:</b>	
<ul style="list-style-type: none"> <li>● 2mm<sup>2</sup> splitter</li> <li>○ 1mm<sup>2</sup>splitter</li> <li>□ Diode/ LED</li> <li>○ Light</li> </ul>	
<b>WIRES</b>	
<ul style="list-style-type: none"> <li>=Black</li> <li>B/Y = Black/yellow</li> <li>=Green</li> <li>G/W = Green/white</li> <li>=Brown</li> <li>NG = Brown/green</li> <li>N0 = Brown/orange</li> <li>N/R =Brown/red</li> <li>N/S = Brown/silver</li> <li>NU = Brown/blue</li> <li>0 =Orange</li> <li>=Red</li> <li>R/B = Red/black</li> <li>R/N =Red/brown</li> <li>R/U = Red/blue</li> <li>R/W = Red/white</li> <li>R/Y = Red/yellow</li> <li>=Blue</li> <li>U/W = Blue/white</li> <li>UP = Purple</li> <li>W =White</li> <li>=Yellow</li> </ul>	
<b>POSITION ON THE CAR</b>	
I	Fuse x
X	Wire split point
D	Side console connector
K	Mainrelais
E	Ground
G	Pedal box/ Vans
L	Outside switch
F	Wiper
A	Rear Light
M	Starter engine
C	Fuelpump
DP	Gear display

**EL06**

\*Large size scheme avail/able upon request

**E23B Engine wiring loom\***



Manufacturer:  
Saker Sportscars B.V.  
Pottenbakkerstraat 30  
4871 EP Etten-Leur  
Date: 15-5-2012 Version: 2.1  
Partnr: **E23B**  
Description: Engine wiring loom  
Room for notes:

- SYMBOLS**
- 2mm' splitter
  - ◌ 1mm' splitter
  - ◌ Diode/ LED
  - ◌ Light

- WIRES**
- B =Black
  - G =Green
  - G/W =Green/white
  - N =Brown
  - N/S =Brown/silver
  - 0 =Orange
  - =Pink
  - =Red
  - R/W = Red/white
  - S = Silver
  - W = White
  - Y = Yellow

- PARTS**
- A =ECU
  - B = Water tight connector
  - C = Water tight connector
  - D = Cool water temp sensor
  - E = Gearbox cooling
  - F = Beest valve
  - G = Cooling temp -> ECU
  - H = Cracksnapt positon sensor
  - I = TPS
  - J = MAPsensor
  - K = Air temp sensor
  - L = Oil presure gauge and warn.l.
  - M =Dynamo
  - P = Ignition coil
  - N/O = Injector
  - QR = Injector

\*Large size scheme available upon request

EL10 Wiring loom light\*

DRAWING INFORMATION

Manufacturer:	
Saker SportsCars BV	
Pottenbakkerstraat 30	
4871 EP Eften-Leur	
Date: 11-12-2012	Version: 3.0
Partnr: <b>EL10</b>	
Description: Wiring loom light	

Room for notes:

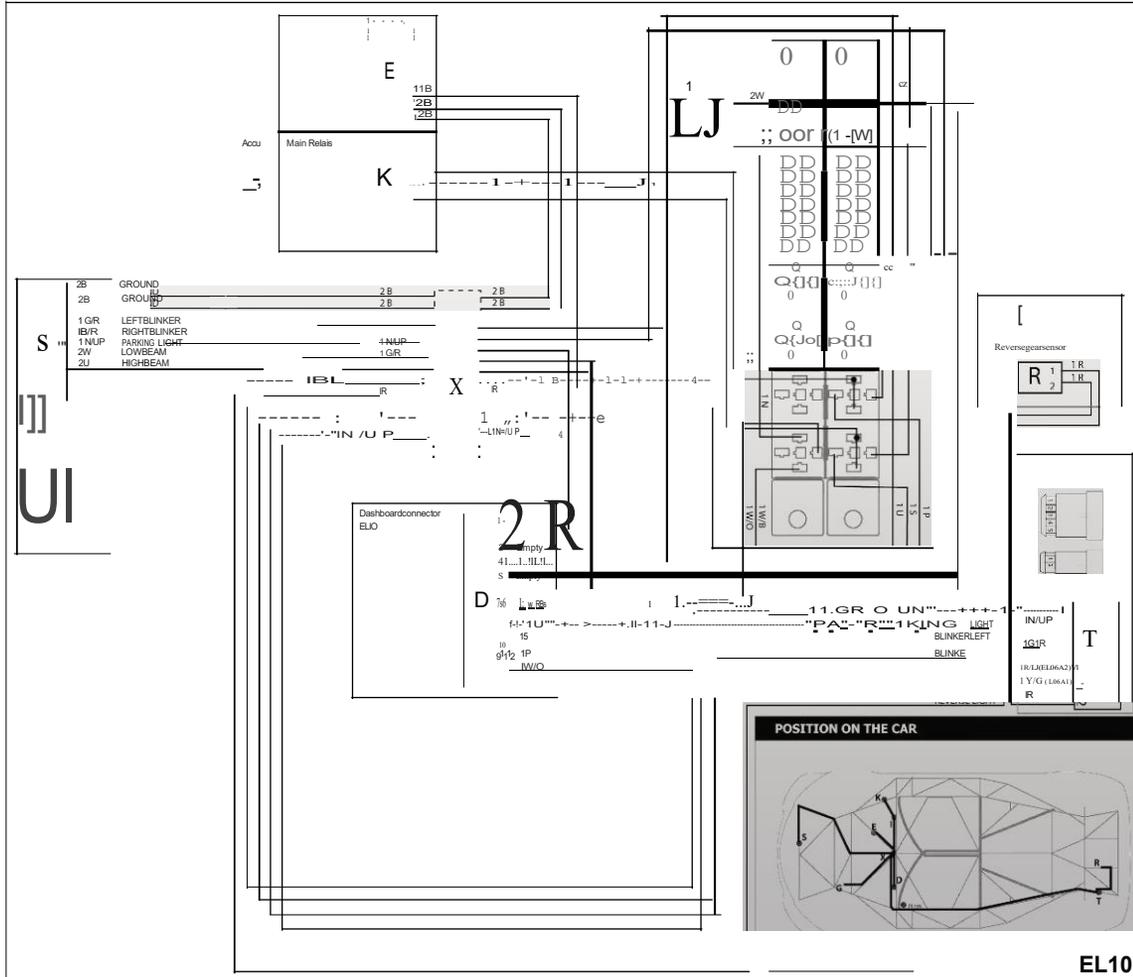
- SYMBOLS**
- 2mm splitter
  - 1mm' splitter
  - Diode/ LED
  - Light

**WIRES**

- 2 B = Black 2mm'
- 2 U = Blue 2mm'
- 2 W = White 2mm'
- 2 R/D = Red / Black 2mm'
- 2 N = Brown 2mm'
- 1 B = Black 1mm'
- 1 U = Blue 1mm'
- 1 W = White 1mm'
- 1 N/U/P = Brown / Purple 1mm'
- 1 R/B = Red / Black 2mm'
- 1 B/R = Black/ Red 1mm'
- 1 G/R = Green / Red 1mm'
- 1 B = Black 1mm'
- 1 R = Red 1mm'
- 1 R/U = Red / Blue 1mm'
- 1 UP = Purple 1mm'
- 1 S = Gray 1mm'
- 1 P = Pink 1mm'
- 1 W/O = White/Orange 1mm'
- 1 W/B = White/Black 1mm'
- 1 Y = Yellow 1mm'
- 1 Y/B = Yellow/Black 1mm'
- 1 UP/S = Purple/Gray 1mm'
- 1 UP/W = Purple/White 1mm'

**PARTS**

- 1 = Fusebox
- X = Wire split point
- D = Side console connector
- K = Main relais
- E = Ground
- S = Connector front body
- T = Connector rear body



EL10

\*Large size scheme avai/able upon request

## DRIVERS FEEDBACK FORM.

After every session the driver should fill in the 'Drivers feedback form\*', in this form the handling, performance, general settings and service experienced by the driver must be judged with a mark from 1 (very bad) till 5 (very good). Hereafter, the mechanic can make improvements on the car by using the completed feedback form.

The content of the Drivers feedback form is shown on this page.

Driver:
Car:
Date:
Session:
Track:
Quietest:
Air temperature (°C):
Track temperature (°C):
Air pressure (bar):
Mechanic:

Tire pressure				
Cold	Pit 1	Pit 2	Pit 3	End

Handling	Review	Description
Stability driving straight		
Braking before cornering		
Entry cornering		
Midsection corner		
Exit cornering		
Performance	Review	Description
Engine		
Gearbox		
Brakes		
Electronics		
General	Review	Description
Tire pressure		
Wing position		
Suspension setting		
Car height		
Seat position		
Service	Review	Description
Service car before race		
Pitstop(s)		
Communication mechanic		
Details		
New brake pads?		
New tires?		
Fuel list?		

## CHECKLIST CIRCUIT MAINTENANCE.

Saker has created a list with checks and short maintenance jobs that should be performed between races or test sessions on the track. Every check or job should be judged by 'Ok' or 'Not ok', and if 'Not ok' be fixed till it is ok where after the box 'Fixed' should be filled out. The content of the 'Checklist interim circuit maintenance\*' is shown on this page.

Drivers fill in feedback	Check the functioning of all control lights and meters
Place fire extinguisher pen back	Check the functioning of external lighting and timing beacon
Check & reset data logger	Clean driver compartment
Remove front and rear body (check for damage + attachment + check rear spoiler)	Remove grit and pickup from the car
Check the functioning of the cooling fans (hot)	Clean windscreen (in- and outside), clean mirrors
Check the functioning of the gearbox cooling (hot)	Fix any problem recovered from the drivers feedback
Check wishbones & hubs for damages	Fix any problem recovered from the data analysis
Check for wheel clearance & bearing play (hot)	Refuel car with the agreed amount of fuel
Check braking system for leaks and damages	Check/adjust setup, align if needed
Check thickness of brake pads and the state of the discs, clean and remove pickup	Mount correct tire set
Clean all uni balls, check bolts/nuts of the suspension drivetrain	Check wheels and tighten wheelnuts at 110Nm (81lb/ft)
Clean and check shock absorbers, springs and stabilizer rod	Polish the car
Check rims and tires on flat spots, damages and pickup	Start engine to test and warm up, remove the fire extinguisher pen
Check cooling system for damage and leaks, check coolant level (Important! Do not open while hot!)	Write down the used components on the list
Check lubrication system for damage and leaks, check oil level	
Check fuel system for damage and leaks, replace coarse filter if needed	
Check gearbox lubrication system for leaks and damage, check oil level	
Check throttle cable (damage and moisture)	

## CHECKLIST REGULAR MAINTENANCE.

After every race or test session the Saker requires regular maintenance. Saker has made a list with all required maintenance inspection sorted by category. Every check is followed by a mark whether it is checked or not, date of checking and by who the check was done. The content of the 'Checklist regular maintenance\*' is listed on the following pages.

<b>Body</b>	V-belts, pulleys checked, timing belt check every 6 hours engine time, replace yearly
Damage	Fuel and oil pipes checked
Air inlets not blocked	Check coolant hoses and clamps
Car numbers/sticker intact	Intercooler/radiator/oil coolers clean
Main power switch/fire extinguisher installation stickers attached	Check exhaust attachment
Main power switch OK	Valve covers checked for leaks
<b>Engine</b>	Engine starts good, no leaks, oil pressure and fuel pressure correct
Warm up the engine and test for leakage	<b>Steering</b>
In the meantime:	Steering wheel centred and fixed
Check frame	Steering box attachment sound & steering box clearance
Test everything for any leaks	Checked full result of pinion
Fuel leak	Track rod ends fixed & playless
Coolant leak	Smooth steering position through nylon bracket in cockpit
Oil leaks	<b>Front suspension</b>
Exhaust and inlet leaks	Hub bearings checked on play and all seals checked
Check spark plug cables	Lower steering knuckle balls checked
Run the leakdown test	Clean all uniballs +check for backlash
Spark plugs fixed at 28Nm (21lb/ft) after leaktest run	Check speed sensor for correct operation and if cable is not too tight
Oil change (every second event / 6 hours engine running time)	Clean upper and lower check absorber attachments
Clean the airfilter (Use the K&N Air filter cleaning instructions)	Stabiliser rod attachment checked
Check the oil level (1cm above maximum; fix cap and dipstick)	Shock absorbers adjusted equal; bump.... rebound....
Coolant level correct; fix cap	Wheels fixed at 110Nm (81lb/ft)
Spark plug cables fixed and secured from hot components	Tires on pressure and puncture free

<b>Rear suspension</b>	<b>Cockpit</b>
Wishbone attachment checked	Fire extinguisher full; attached with tie raps, secured and with the date made visible
Upper M16 bolt tightened at 180Nm (1331b/ft)	Belt confirmation sound
Shock absorber attachment checked	Throttle control checked, full throttle
Shock absorbers adjusted equal; bump ..... rebound .....	Clutch control checked
Lock central wheel nut + retracing with 280Nm (2061b/ft)	Brake control checked; pedal stroke
Checked bearings for clearance	Pedals fixed
Hub nuts tightened	Brake balancer common, possibility of cable lubrication
Seals checked	Wiring fixed and neatly behind the dash board
Correct tires mounted; check for tire pressure and puncture	Clutch control lubricated, gear shift knob is not making contact with edges while shifting
Wheel nuts tightened with 110Nm (81lb/ft)	Mirrors complete and undamaged and not too loose on the ball
<b>Brakes</b>	Cockpit and pedal box clean
Possible indication for "new pads" on steering wheel	Seats are present
New brake pads installed	Bottom seat present
Checked disks on cracks and clearance (cracks in face allowed, not on edges)	Check gear shift knob for clearance
Disks and conduction block clean, check for wear of impact	<b>Electric installation</b>
Vented brakes; venting is fixed and dry	Battery fully charged
Checked seals and connections under pressure	Battery attachment checked
Seals and master cylinder reservoirs fixed & reservoir attachments fixed	Timing beacon operational and fixed decently
Brake fluid reservoir on level; Cap tightened (check after breathing)	Electric fuelpump operates
Checked flexible pipes on bursts, damage and mounting	Check solenoid (main switch position 1, full throttle; solenoid should click constantly)
Brake pads installed	Check lighting
Calliper attachment checked, centred and verified	

<b>Gearbox and clutch</b>	<b>Worked on car</b>	
Check gearbox oil level with running pump (not in case of a sequential gearbox)	Date	number of hours
Fill and drain plugs fixed	Date	number of hours
Piping fixed, not along sharp parts	Date	number of hours
Cooler(s) checked for leakage and fixation	Date	number of hours
CV joints checked	Date	number of hours
Checked drive shaft covers for leaks and cracks		
Drive shafts checked for clearance	<b>Notes from the mechanic</b>	
Drive shaft locking pins mounted		
All gears can be enabled		
Check gear linkage on clearance and fixation		
<b>Details/further considerations</b>		
<i>Also mention what you have done to the maintenance and alterations</i>		
<b>Used components and parts</b>		

## CHECK COOLING FANS & GEARBOX COOLING.

Before driving, always make sure the cooling fans and gearbox cooling are working properly to prevent your engine and gearbox from overheating.

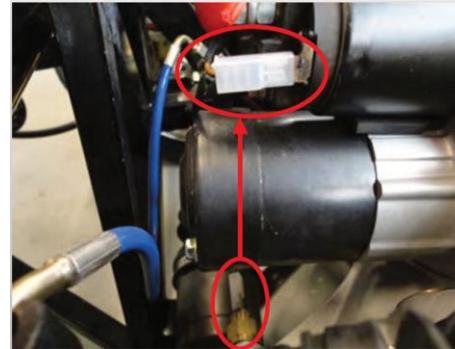
### Check cooling fans

Remove connector from water temperature sensor on the engine underneath the manifold and activate main switch (two clicks), now the cooling fans should run automatically. Make sure the fans have the right rotational direction, they have to suck the air through the radiator.



### Check gearbox cooling

Remove the connector from the temperature switch on the gearbox and remove the connector from the starter engine. Now connect the connector of the temperature switch from the gearbox to the starter engine and activate main switch (two clicks). Now, the gearbox cooling pump should be activated. You can check this by touching the pump underneath the oil cooler, it should vibrate.

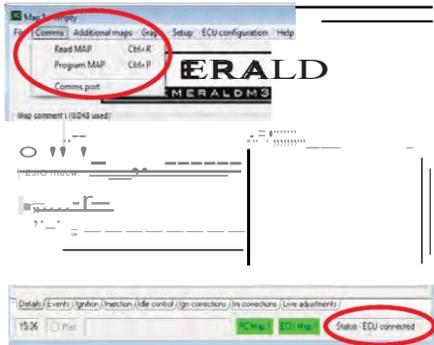


## READ ECU.

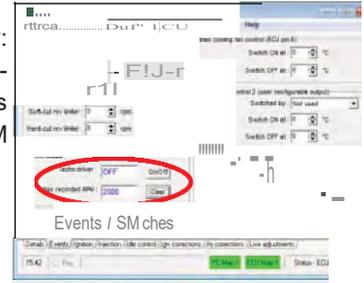
Saker Sportscars are equipped with an Emerald K3 Engine Control Unit (or Engine Management System). A manual about the ECU and the required Emerald K3/K6 ECU software (free) is available under the following link and the manual is available upon request:

<http://www.emeraldm3d.com/software-manuals>

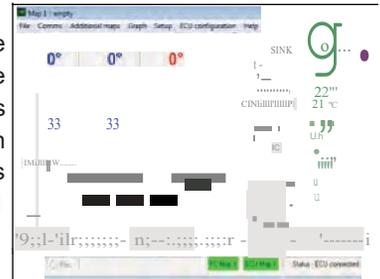
Make sure main power supply is on (two clicks), then connect the data cable from the ECU with a 9-pin serial to USB data cable and plug-in the USB connector in your laptop or PC. Now open the program 'Emerald K3', click on 'Comms'-'Comms port' at the top of the screen and select the preferred com-port. At the bottom of the screen the status changes to 'ECU connected'.



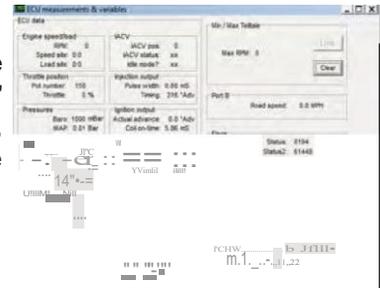
The 'Events' page (shortcut key: F2) contains a number of commonly accessed settings. On this page the maximum recorded RPM can be read and cleared.



The 'Live adjustments' page (shortcut key: F8) displays the current live information the ECU is working with. This information shows you the engine data inputs that the ECU has measured and also the mapping information that results from these inputs.



Click 'Help'-'Diag data' for the 'ECU measurements & variables' page. On this page the Max RPM, ECU running time and Engine running time are shown.



## CALIBRATE TPS.

This instruction describes how the throttle position sensor should be calibrated.

1. First switch the main power supply and ECU on with the main switch (two clicks) and open Emerald software. Choose the COM port and press 'Ok'.



2. At the right bottom 'ECU connected' will appear.



3. Go to 'Setup' > 'Throttle Position Sensor'. The below screen will appear. Press 'Ok'.

4. Apply 100% throttle and release. Press 'Ok'. The received values will appear. Press 'Ok'.

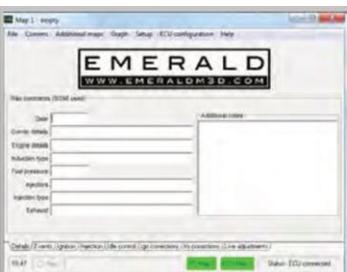


5. Load values to ECU. Press 'Ok'.

6. Click on the tab 'Live adjustments' (shortcut key: F8). Make sure throttle is set on 0% now.



7. Let someone apply full throttle while watching 'Live adjustments'. Make sure throttle is set on 100% now.



## READ AIM AND EXPORT DATA.

Saker Sportscars are equipped with an AIM MXL Pista data log system. More information about the AIM and the required software, Race Studio 2 (free), is available under the following link and the manual is available upon request:

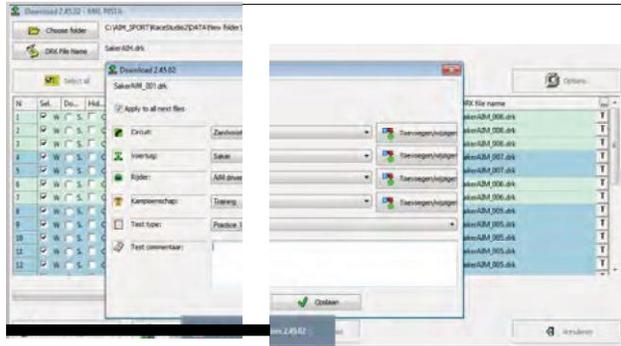
<http://www.aim-sportline.com/eng/download/index.htm>

Make sure main power supply is on (one click) and connect AIM 4-pin-to-USB-cable to the cable marked with 'USB' from the AIM wiring loom and plug-in the USB connector in your laptop or PC (or connect the 3,5mm-jack-to-USB-cable into the side of the AIM display). Open Race Studio 2 and click on 'Device Configuration' (or 'Configuratie').

On the 'Device configuration' page the shift lights, alarm lights and all boxes on the display can be read and configured.



To download the AIM data click on 'Download data' in the main menu and select the preferred sessions, then click on 'Download selected' and change the details to your preferences. Now click on 'Save' and the selected data is downloaded to your database.



Click on 'Analysis' in the main menu to go to your database and view the downloaded data. These files can be sent to Saker Sportscars for further research.

## ADVISORY LIST SPARE PARTS.

The following list gives an indication of the recommended spare parts:

BR46A	Brake pads Carbone Lorraine
E23C	Map sensor
E27	Boost solenoid
E30	Drive shaft
E33	Drive shaft secure nut
E71	Oil filter engine
E72	K&N air filter
E76	Spark plugs (4x)
E91C	Oil filter gearbox cooling
EL31	Fuse 10A
EL32	Fuse 20A
EL33	Fuse 30A
EL38	Fuse 175A

The Saker Parts Catalog contains all parts and is available upon request.

Parts can be ordered through the official dealers in your region, or by sending an e-mail to [info@sakersportscars.com](mailto:info@sakersportscars.com)

## CAR SPECIFIC TECHNICAL DETAILS.

Model:
Year of manufacture:
Engine number:
Turbo number:
Gearbox number:
Fuel cell number:
ECU number:
Expiration date fuel cell:
Expiration date seat belts:
Expiration date fire extinguisher:

**MAINTENANCE LOG.**

Description repair/replacement
Engine running time:              Date:
Invoice number:
Used genuine parts: YesD      NoD

Description repair/replacement
Engine running time:              Date:
Invoice number:
Used genuine parts: YesD      NoD

Description repair/replacement
Engine running time:              Date:
Invoice number:
Used genuine parts: YesD      NoD

Description repair/replacement
Engine running time:              Date:
Invoice number:
Used genuine parts: YesD      NoD

Description repair/replacement
Engine running time:              Date:
Invoice number:
Used genuine parts: YesD      NoD

Description repair/replacement
Engine running time:              Date:
Invoice number:
Used genuine parts: YesD      NoD

## OIICHANGES.

Gearbox oil <input type="checkbox"/>	Replenished <input type="checkbox"/>	Gearbox oil <input type="checkbox"/>	Replenished <input type="checkbox"/>	Gearbox oil <input type="checkbox"/>	Replenished <input type="checkbox"/>	Gearbox oil <input type="checkbox"/>	Replenished <input type="checkbox"/>	Gearbox oil <input type="checkbox"/>	Replenished <input type="checkbox"/>
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Brake fluid <input type="checkbox"/>		Brake fluid <input type="checkbox"/>		Brake fluid <input type="checkbox"/>		Brake fluid <input type="checkbox"/>		Brake fluid <input type="checkbox"/>	
Oil type:		Oil type:		Oil type:		Oil type:			
Oil brand:		Oil brand:		Oil brand:		Oil brand:			
Amount of oil:      Date:		Amount of oil:      Date:		Amount of oil:      Date:		Amount of oil:      Date:			
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Oil brand:		Oil brand:		Oil brand:		Oil brand:			
Amount of oil:      Date:		Amount of oil:      Date:		Amount of oil:      Date:		Amount of oil:      Date:			
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Oil brand:		Oil brand:		Oil brand:		Oil brand:			
Amount of oil:      Date:		Amount of oil:      Date:		Amount of oil:      Date:		Amount of oil:      Date:			



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[INFO@SAKERSPORTSCARS.COM](mailto:INFO@SAKERSPORTSCARS.COM)

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