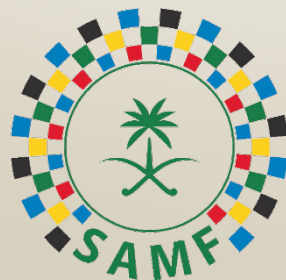


Saudi Toyota Hill Climb Championship

PERFORMANCE FACTOR (Pf) CONCEPT OF CAR CLASSIFICATION

EXPLANATION AND REQUIREMENTS FOR 2024 EVENTS



HILL CLIMB

OPEN
TECHNICAL
REGULATIONS



NEW
PERFORMANCE
FACTOR



LOOKING *TO THE FUTURE*





INTRODUCTION PERFORMANCE FACTOR (Pf)

CALCULATION AND CLASSIFICATION

FIA Pf WEBSITE

COMPETITORS

SCRUTINEERS

- Appendix 1- Input data for the FIA **Pf** website
- Appendix 2 - Weight
- Appendix 3 – Engine
- Appendix 4- Chassis
- Appendix 5- Aerodynamic component dimension definition
- Appendix 6 - Chassis component classification



The Performance Factor (**Pf**) concept is designed to classify a diverse range of 'production based' cars for all hill climb competitions.

Using physical data input by the **competitor** describing their car, calculations are made to derive a **Pf** number that places the car in the appropriate class.

The **Pf** will ensure that:

- The *competitor* is clear which class the car is allowed to compete in.
- The *organiser* can easily put the car in the appropriate class for an event.
- The *scrutineers* have physical elements available at an event to check against the classification.
- The stewards can resolve technical protests at an event without reference to paperwork from other championships/homologations, etc.

SAMF will implement the Pf classification in 2024 for KSA events



PERFORMANCE FACTOR (Pf)

The **Pf** is derived from physical data input by the competitor to describe the car being entered..

Below are the two steps required to calculate the Pf **on the FIA website**

FIA Pf Website Features

Input Car Data

Competitor enters data for his/her car.

Calculation

FIA **Pf** Website uses input data to calculate a Pf number.



CALCULATION AND CLASSIFICATION

PERFORMANCE FACTOR (Pf)

a) Calculation

The **Pf** calculation is as follows and is detailed in *Appendix 1*:

$$\text{Pf} = \frac{\text{Race Weight}}{(\text{Engine Component} * \text{Drive Train Component} * \text{Aero Component} * \text{Chassis Component})}$$

Each component is calculated using physical data supplied by the competitors about their car.

b) Pf Classification of cars

A car's **Pf** will determine the group it is in. SAMF can create classes within a group depending on the participation numbers and variety of cars



CATEGORIES

PERFORMANCE FACTOR (Pf)

Pf classification



SAMF can create 2 classes within a Group

For example, Group 1 covers cars with Pf between 15-39, SAMF can create two classes within Group 1, Class 1 (Pf 15-25) and another Class 2 (Pf 16-39). Therefore, car with Pf 26 for example, would be in Group 1 class 2.

Pf Website Access

The FIA **Pf** website will be accessible to: all parties, including the general public/press. Competitors will be able to use this website to see how different combinations of technical specifications change the car's performance. Competitors will be able to make changes to their cars well in advance of race day in order to decide competing in one group or the other.



Welcome to the FIA platform to register your car in the Performance Factor system. To obtain an FIA-PF-ID, you need to sign in.

The help text in the "Performance Factor" website is for information only and the technical regulations take precedence.

Public mode

Public Mode allows you to test the Performance Factor configurator. No need to sign in, you can do that later.

Start your first draft!



In Public mode, some features will not be available. [Learn more...](#)

[Platform Terms](#)

[Privacy Notice](#)

[Contact](#)

[Website optimized for Chrome and Firefox latest version](#)

vf: 0.2.7 vb: 0.1.8

WWW.FIAPERFORMANCEFACTOR.COM





FIA Pf WEBSITE

- a) The FIA **Pf** website will provide a platform to input, manipulate and provide information to all groups requiring access to the information.

- a) The competitor will have access to the FIA Pf website where they will fill out an electronic 'Declaration Form' by entering data describing their car and declaring it is correct. If there is a modification to the car during the season they can input the change into the FIA Pf website and the new Pf will be logged.

- c) Organisers can access the same FIA **Pf** website to check the cars entered their event. The classification of these cars will be done automatically using the data the competitor entered

- d) Stewards can handle protests or scrutineers' reports quickly with the requirement for only physical checks. The results can therefore be verified and released more easily.



What is next?

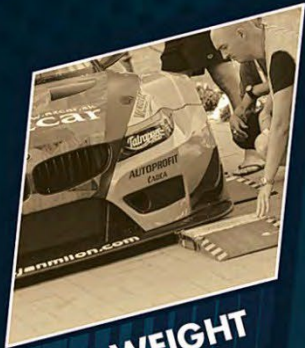
- a) Before the FIA Championship competitions (or during scrutineering), drivers and competitors from Category 1 (Saloon & production cars) and in Category 2 (single seaters & open wheel) will have to fill in the **Pf** form on the FIA **Pf** website.
- **Category 1 Vehicles** eligible for Category 1 must be derived by: Series Production cars (Article 251-2.1.1) or Competition cars (Article 251-2.1.2) with the appearance of a Series Production Car, with a roof, at least two seats* at least two doors*
- (*) as declared in the complete vehicles type-approval Certificate of Conformity for the Reference Car.
- **Category 2 Vehicles** eligible for Category 2 must be two-seater or single-seater competition cars, built as single examples and destined solely for competition.
- b) The PF website is not available in Arabic language, as such, SAMF will be happy to dedicate a member to support a participant.
- c) The FIA Pf website will be accessible during the conference call to demonstrate to the competitors how potential car changes affect the Pf classification.



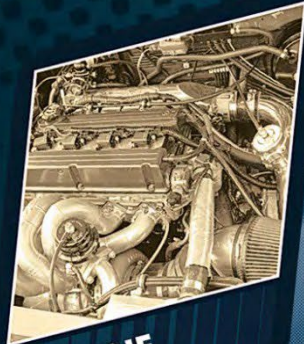
SCRUTINEERS

- a) The SAMF appointed scrutineers will be trained how the **Pf** classification will be used and how the FIA **Pf** website could facilitate and enhance their checking ability. They will be able to check the following:
- Check car data to confirm correct classification;
 - See reports on the car from preceding events.
 - Conduct technical checks at their own discretion to validate certain parameters that were filled by the competitor.
- b) Scrutineers can input notes into a car's data file relating to the specific event.
- c) The Head scrutineer/FIA technical representative can at any point in time change the **Pf** of a competitor based on the findings of the scrutineer. In case of dispute by the competitor, head of scrutineering and the race director will jointly make the decision

PERFORMANCE FACTOR



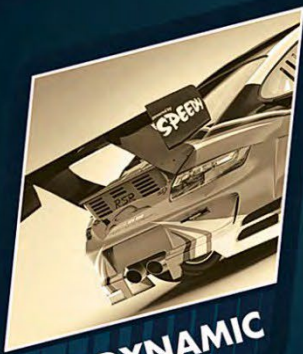
RACE WEIGHT



ENGINE



DRIVE TRAIN



AERODYNAMIC



CHASSIS



The model calculates five components:
HILL CLIMB

Pf 37



PF MODEL ONLINE DATA



TECHNICAL SHEET

Car race weight
683 kg

FIA PF ID: YSC1000XXX
Pf = XXX

FIA-PF-ID: YSC1000XXX
Pf = XXX

1. GENERAL INFORMATION

1	Make	
2	Model	
3	Engine make	
4	Created	
5	FIA equipment level	8

2. Race Weight

6	Race weight	kg
---	-------------	----

3. Engine

7	Engine origin	Car
8	Cylinder layout	In line
9	Engine block and exhaust type	1
10	Number of cylinders	4
11	Number of valves per cylinder	4
12	Bore	mm
13	Stroke	mm
14	Engine displacement	cm ³
15	Oil pump type	Wet
16	Fuel type	Petrol
17	Throttle configuration	Common to several
18	Throttle body diameter	50 Cmm
19	Induction type	Super Turbocharged
20	Turbo charger number	1
21	Compressor housing inducer diameter	38 Cmm
22	Induction surge	No
23	Number of restrictors	3
24	Restrictors diameter	-
25	Exhaust catalyst	No

26	Maximum engine speed	7000
27	Compression ratio	8.5
28	Variable Valve Timing (VVT)	No

4. Drivetrain

29	Drive wheels	Fwd
30	Number of gears	6
31	Shifting mechanism	Manual
32	Wheel diameter	18 inches
33	Wheel attachment	Multiple studs

5. Aerodynamics

34	Wheelbase	2020 mm
35	Wheelbase is greater than +170mm	No
36	Front overhang	800 mm
37	Spolier ahead of bumper	-
38	Rear body overhang	800 mm
39	Rear overhang	-
40	Rear wing overhang	-
41	Rear wing height	-
42	Front axle width	1020 mm
43	Rear axle width	1125 mm
44	Overall length	4340 mm

6. Chassis

45	Chassis type	1
46	Chassis reinforcement structure	2
47	Number of operable doors	3
48	Bodywork material	Mixed Material including
49	Welding	Class

Each of the five components will result in its own Pf index

Pf =

Race Weight

(Engine Component * Drive Train Component * Aero Component * Chassis Component)



APPENDIX 1 - PERFORMANCE FACTOR / INPUT DATA FOR THE FIA Pf WEBSITE

1. GENERAL INFORMATION – Appendix 1

Input # 1

1	Entrant name	
2	Driver name	
3	Contact email	
4	Car - make	
5	Car - model	
6	Engine – make	

2. RACE WEIGHT- Appendix 2

Input # 2

7	Race weight	kg
<i>(weight of the car, driver and fluids incl.)</i>		

3. ENGINE- Appendix 3

Input # 3

8	Origin	<input type="checkbox"/> Car <input type="checkbox"/> Moto
9	Cylinder layout	<input type="checkbox"/> L <input type="checkbox"/> V <input type="checkbox"/> W <input type="checkbox"/> H
10	No. of cylinders	
11	No. of valves <i>(total in the engine)</i>	
12	Bore	mm
13	Stroke	
14	Displacement	cm ³
15	Oil Sump type	<input type="checkbox"/> Dry <input type="checkbox"/> Wet
16	Fuel type	<input type="checkbox"/> Petrol <input type="checkbox"/> Diesel
17	Induction type	<input type="checkbox"/> Turbo / Supercharger <input type="checkbox"/> Normally aspirated
18	No. of restrictors	
19	Restrictor inside diameter	mm

4. DRIVETRAIN- Appendix 4

Input # 4

20	Driven wheels position	<input type="checkbox"/> FWD <input type="checkbox"/> RWD <input type="checkbox"/> AWD
21	No. of gears	
22	Shifting mechanism	<input type="checkbox"/> Manual <input type="checkbox"/> Sequential
23	Wheel diameter	Inches

5. AERODYNAMIC- Appendix 5

Input # 5

24	Wheelbase	mm
25	Front overhang (max)	mm
26	Splitter ahead of bumper	mm
27	Rear overhang (max)	mm
28	Diffuser rearward of rear bumper	mm
29	Rear wing position rearward of rear wheel centreline	mm
30	Rear wing height above ground level	mm
31	Front width of car on front axle centreline	mm
32	Rear width of car on rear axle centreline	mm

6. CHASSIS – Appendix 6

Input # 6

33	Roll cage type <i>(see Appendix 4)</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
34	Chassis structure type <i>(see Appendix 4)</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
35	No. of operable doors and rear hatch (if applicable)	<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
36	Fuel tank type	<input type="checkbox"/> Production <input type="checkbox"/> FIA
37	Windscreen	<input type="checkbox"/> Glass <input type="checkbox"/> Plastic



Pf



APPENDIX 2. Weight

Race weight	kg
(weight of the car, driver and fluids incl.)	

Total Weight of the car in race ready condition.

Includes weight of the car + Driver weight including safety equipment + All fluids including fuel

Competitors should weight their cars in this condition and fill the form.

All cars will be weighed during scrutineering with no exception. Drivers are responsible to have all their safety gear with them, fuel levels in the fuel tank according to their race day.

Cars will be in Parc Ferme after weighing them.





APPENDIX 3 – ENGINE

3. ENGINE

Origin Type	<input type="checkbox"/> Type 1 <input type="checkbox"/> Type 2
Cylinder layout	<input type="checkbox"/> L <input type="checkbox"/> V <input type="checkbox"/> W <input type="checkbox"/> H
No. of cylinders	
No. of valves (Per Cylinder)	
Bore	mm
Stroke	
Displacement	cm ³
Oil Sump type	<input type="checkbox"/> Dry <input type="checkbox"/> Wet
Fuel type	<input type="checkbox"/> Petrol <input type="checkbox"/> Diesel
Induction type	<input type="checkbox"/> Turbo / Supercharger <input type="checkbox"/> Normally aspirated
Throttle Body	<input type="checkbox"/> Single <input type="checkbox"/> One per cylinder
No. of restrictors	
Catalyst	Yes <input type="checkbox"/> No
Maximum Engine Speed	

Internal engine measurements and variances have low impact on overall PF in general:

Scrutineers will have the tools required to measure any engine component. In case some of the data cannot be measured onsite, scrutineers and technical experts will determine the reasonability of the information based on their own research (for example displacement).

Data such as throttle body diameter, turbocharger compressor inducer size, catalytic converter etc.. Can, and will be measured on site at the discretion of scrutineers.

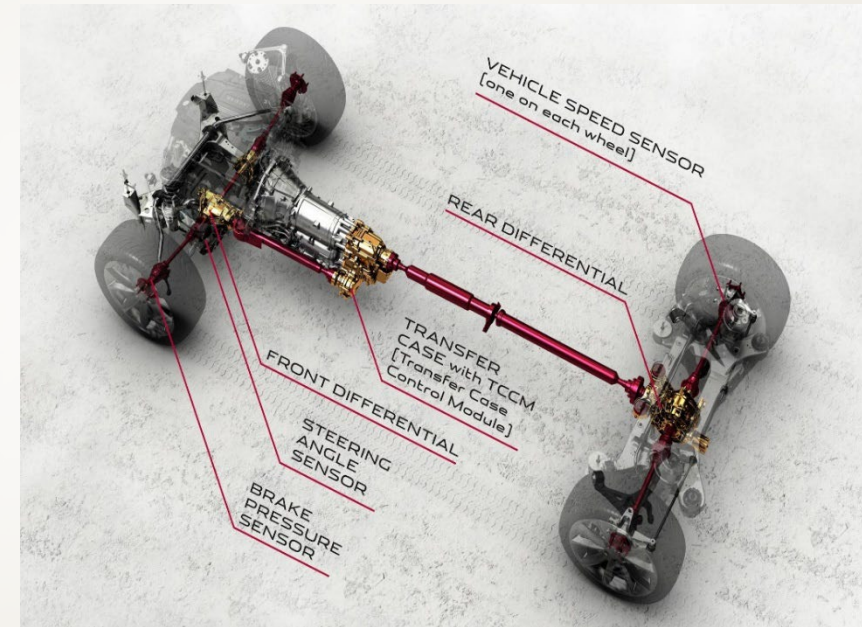


APPENDIX 3 – DRIVETRAIN

4. DRIVETRAIN

Input

Driven wheels position	<input type="checkbox"/> FWD <input type="checkbox"/> RWD <input type="checkbox"/> AWD
No. of gears	
Shifting mechanism	<input type="checkbox"/> Manual <input type="checkbox"/> Sequential
Wheel diameter	Inches
Wheel Attachment	



Straightforward data calculated by the Pf model automatically

A Sequential gearbox for example has a multiplier of 1.1 (10%) vs. Manual gearbox

RWD has a multiplier of 1.1x (10%) vs. Front wheel drive

AWD has a multiplier of 1.3x (30%) vs. Front wheel drive

APPENDIX 4

AERODYNAMIC COMPONENT DIMENSION DEFINITION





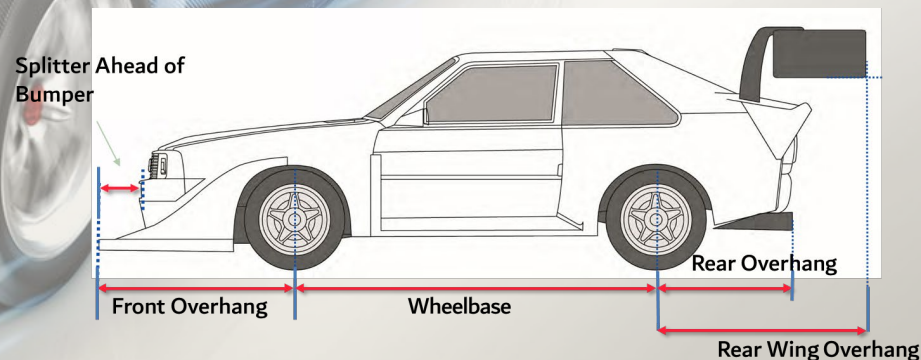
APPENDIX 4 – AERO COMPONENTS

4. AERODYNAMIC

Input # 5

Wheelbase	mm
Front overhang (max)	mm
Splitter ahead of bumper	mm
Rear overhang (max)	mm
Diffuser rearward of rear bumper	mm
Rear wing position rearward of rear wheel centreline	mm
Rear wing height above ground level	mm
Front width of car on front axle	mm
Rear width of car on rear axle	mm
Overall length	mm

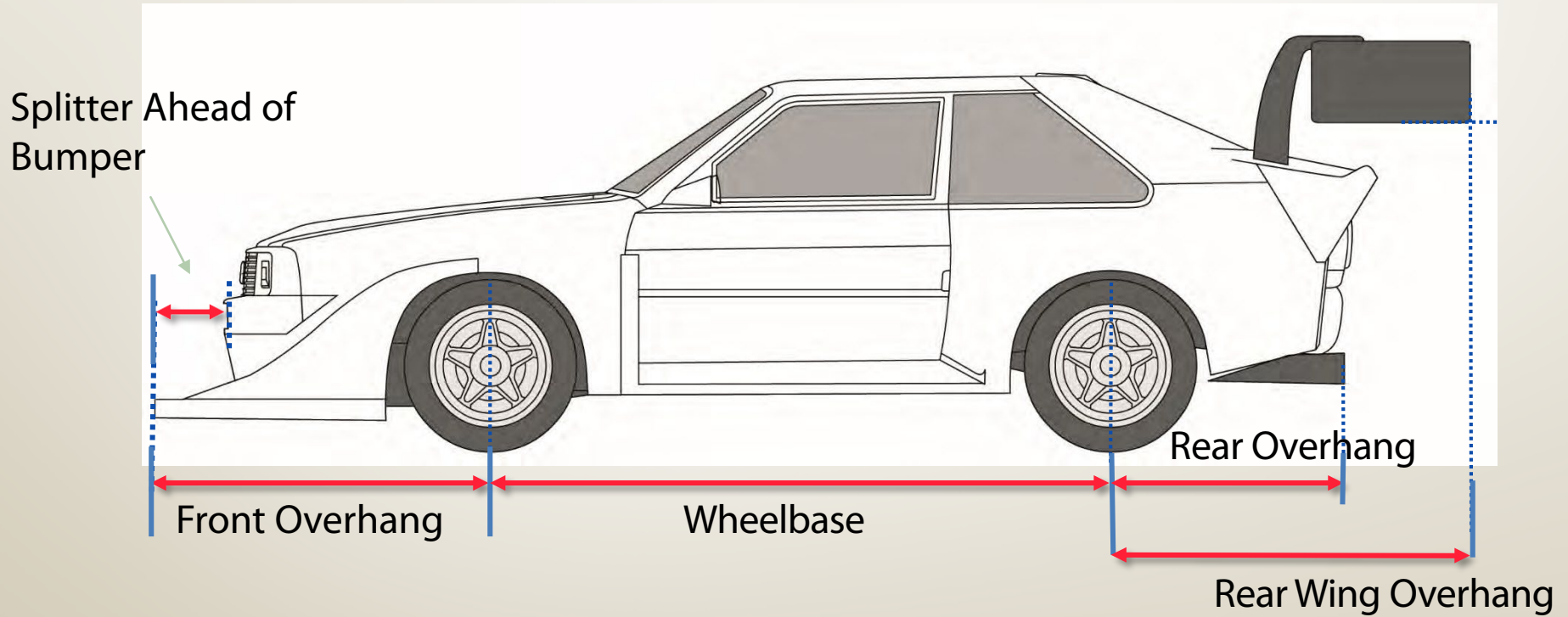
- All calculations are straightforward, the diagrams in next slides help with measurement technique.
- Scrutineers will perform random checks on any component they want and modify the PF accordingly
- The diagrams in the next pages help with explanations about the different measurements



EXPLANATIONS ON HOW TO MEASURE ARE AVAILABLE BY CLICKING ON THE SMALL BLUE SQUARES ON THE LEFT OF EACH DATA POINT ON THE WEBSITE



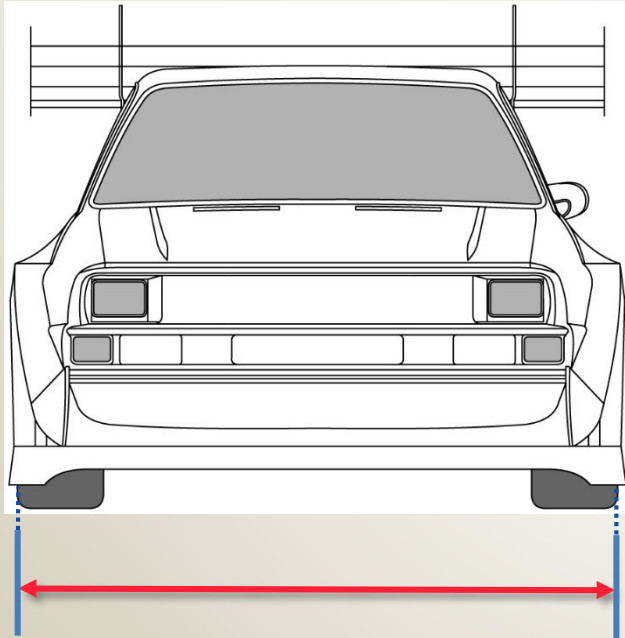
APPENDIX 4- AERODYNAMIC COMPONENT DIMENSION DEFINITION



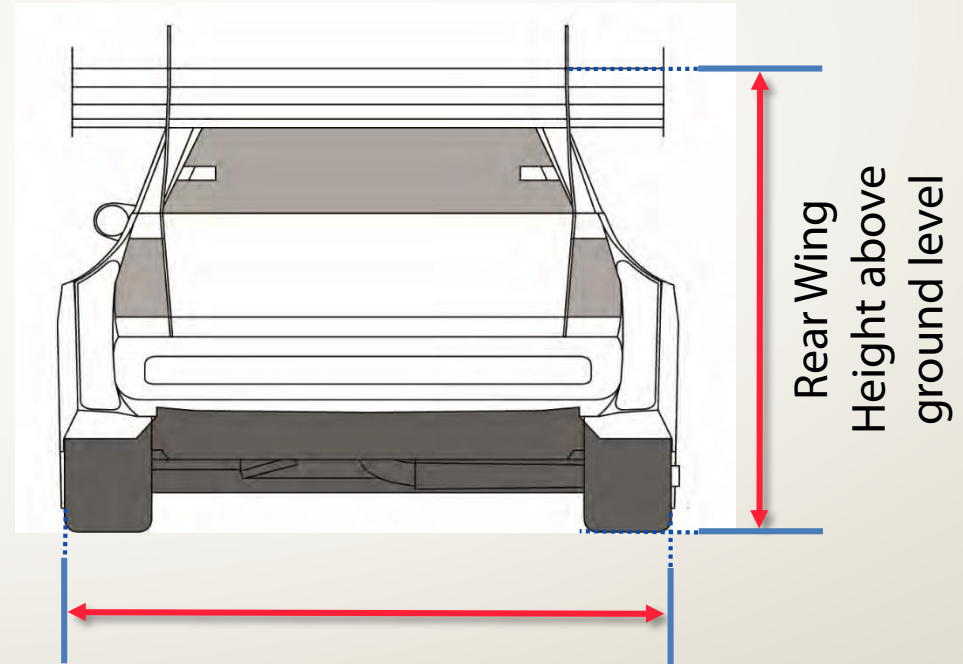


APPENDIX 4 - AERODYNAMIC COMPONENT DIMENSION DEFINITION

Aerodynamic Component Dimension Description



Front width of car at Axle
(From outside tire to outside
tire touching the ground)



Rear width of car at Axle (From
outside tire to outside tire
touching the ground)

Rear Wing
Height above
ground level

APPENDIX 5

CHASSIS COMPONENT CLASSIFICATION





APPENDIX 5 – CHASSIS

6. CHASSIS

Input #

Chassis type <i>(see next slides)</i>	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
Chassis reinforcement structure (see next slides)	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
No. of operable doors and rear hatch (if applicable)	<input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5
Bodywork material	<input type="checkbox"/> Metallic only <input type="checkbox"/> Mixed including composite
Windscreen	<input type="checkbox"/> Glass <input type="checkbox"/> Plastic

2 Points roll bars are not permitted!!

Chassis Type (more info on next slide)

All saloon cars, GT cars, production cars are type 1

Single seaters with chassis made from composite or tubular frame classify as type 2

Chassis Reinforcement structure

Type 1: All 4 points roll cages and most 6 points roll cages Next slide drawings 253.1 -253.16

Type 2: 6 points roll cages with additional reinforcement braces in the rear, top or front mounting points directly between one or both axle strut towers

Type 3: Additional reinforcements welded to the main body (central volume)

Type 4: All single seater cars + Saloon cars with reinforcements under main body



Chassis structure classification

CS1

Chassis structure Class 1

4/6 points cages with no extra structural members

CS2

Chassis structure Class 2

Structural member(s) between one or both axle strut towers without intermediate connections.



CS3

Chassis structure Class 3

Additional structural member(s) to those described in CS2 within the central structural volume.



CS3 additional structure interna

Chassis structure classification

CS4

Additional structural member(s) to members described in CS2 and CS3 outside the central structural volume



Additional underbody reinforcements



NEXT STEPS *Registration and competitor PF process*

Before Registration

Participant to Login to www.fiaperformancefactor.com
Register as new user and fill all personal data
Add new car and name it per your registration to the event

Fill in all required information in the five required categories
When in doubt, call SAMF representative or email us
Finalize the PF calculation
Save your draft, if you are satisfied, create an FIA ID after payment of €25.

Registration

Register for Race on SAMF website and include the FIA Pf Sheet
It is mandatory that every participant submits the form to SAMF by 18th of July 2024 to be eligible to participate

Post- Registration

SAMF will acknowledge by email receipt of your submission.
SAMF will review all applications and might contact the participant in case they notice data that might be clearly incorrect. It is the responsibility of the competitor to make sure all data is accurate.

7 Days after closing the submission deadline, SAMF will publish on Sportity the list of names with PF for every participant, group and class. This will be called “Draft Competitors PF”
No complaints from any participant will be entertained about their own classification or another competitor

Race Day

Scrutineers will have competitors’ lists printed. Random checks will take place at their own discretion.
Head scrutineer will have the authority of making any changes to the PF of any competitor
No participant can dispute the decision of the Head scrutineer.
Participant can request the presence of the race director to address a complaint paying SR50
The final decision is made unilaterally by the Race Director.
Participants cannot under any circumstance dispute the decision, except through the official channel according to FIA regulation and paying the official fee



General Support: members@samf.gov.sa

PF Technical Support: scrutineer@samf.gov.sa

Telephone number: [+966 59 123 1968](tel:+966591231968)

THANK YOU

