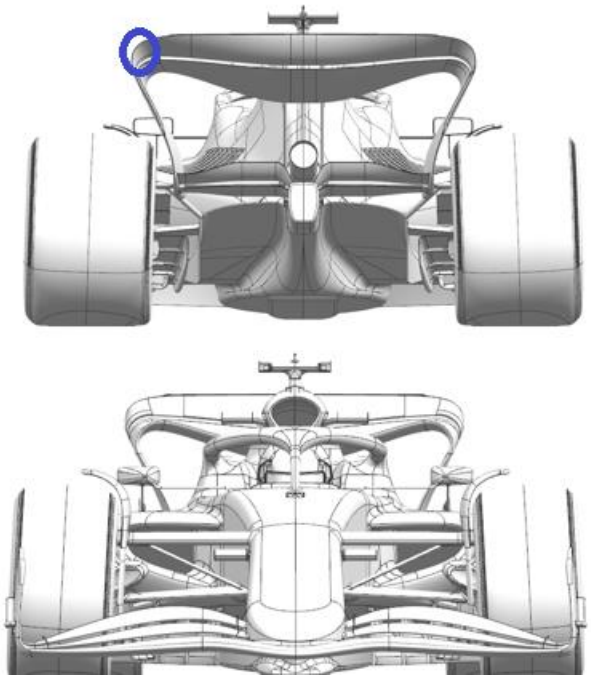
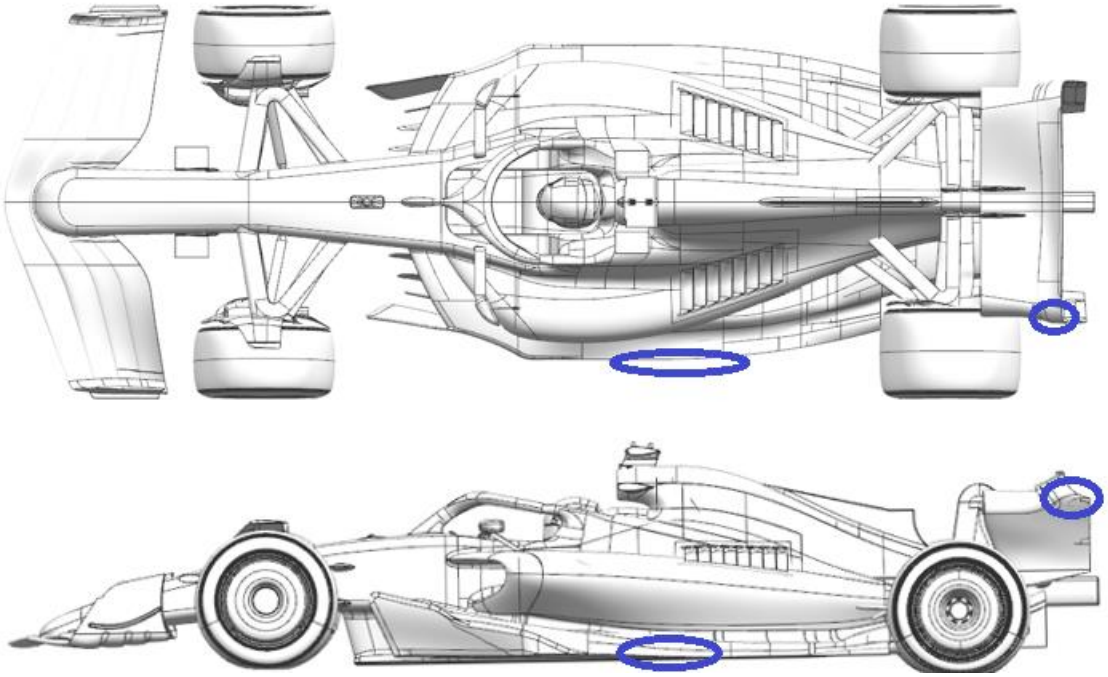
Pre-Event Automobile Display – Singapore Grand Prix

ORACLE RED BULL RACING

	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Floor Edge	Performance - Local Load	More camber in the forward portion of the floor edge wing	To exploit energy in the air stream, more camber has been applied to the forward part of the floor edge wing resulting in more local load from this region of the floor assembly.
2	Rear Wing Endplate	Performance - Local Load	The end of the flap element has a revised curl detail.	Taking inspiration from competitor designs, the end of the flap element has a revised curl to the endplate which offered more local load for this element for this particular upper wing design.

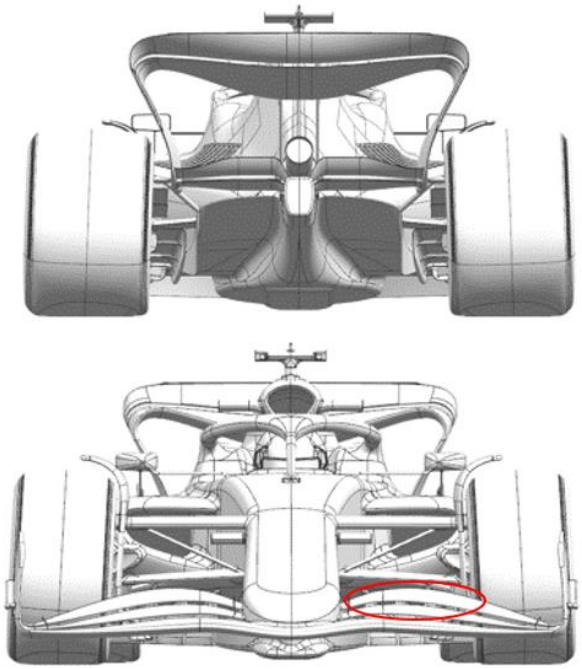


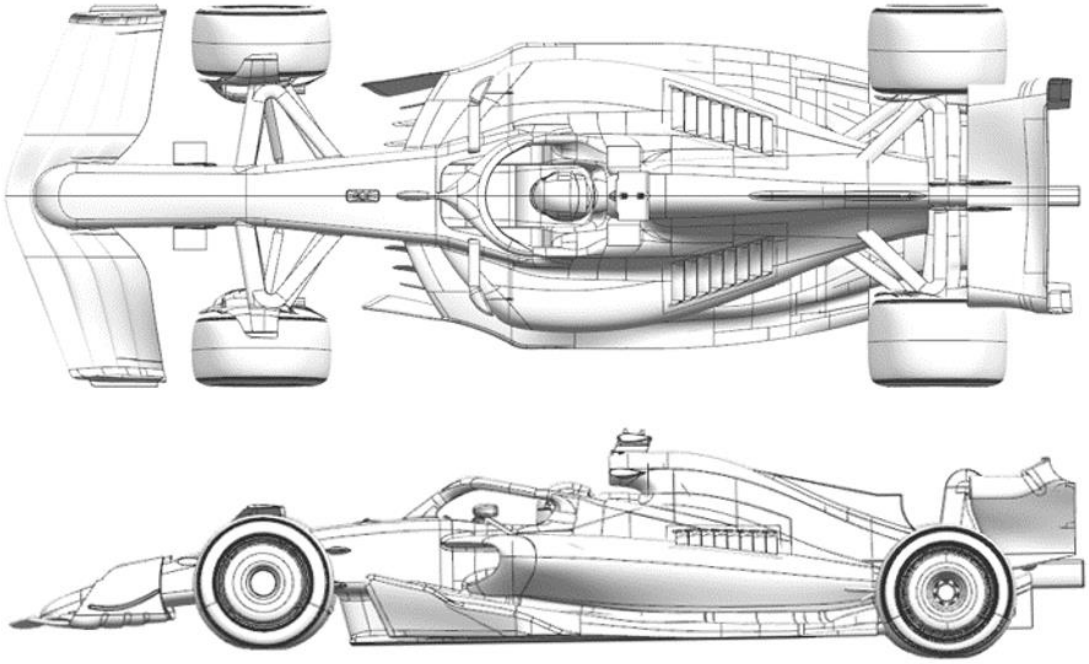


FIA Formula 1 World Championship™

Scuderia Ferrari

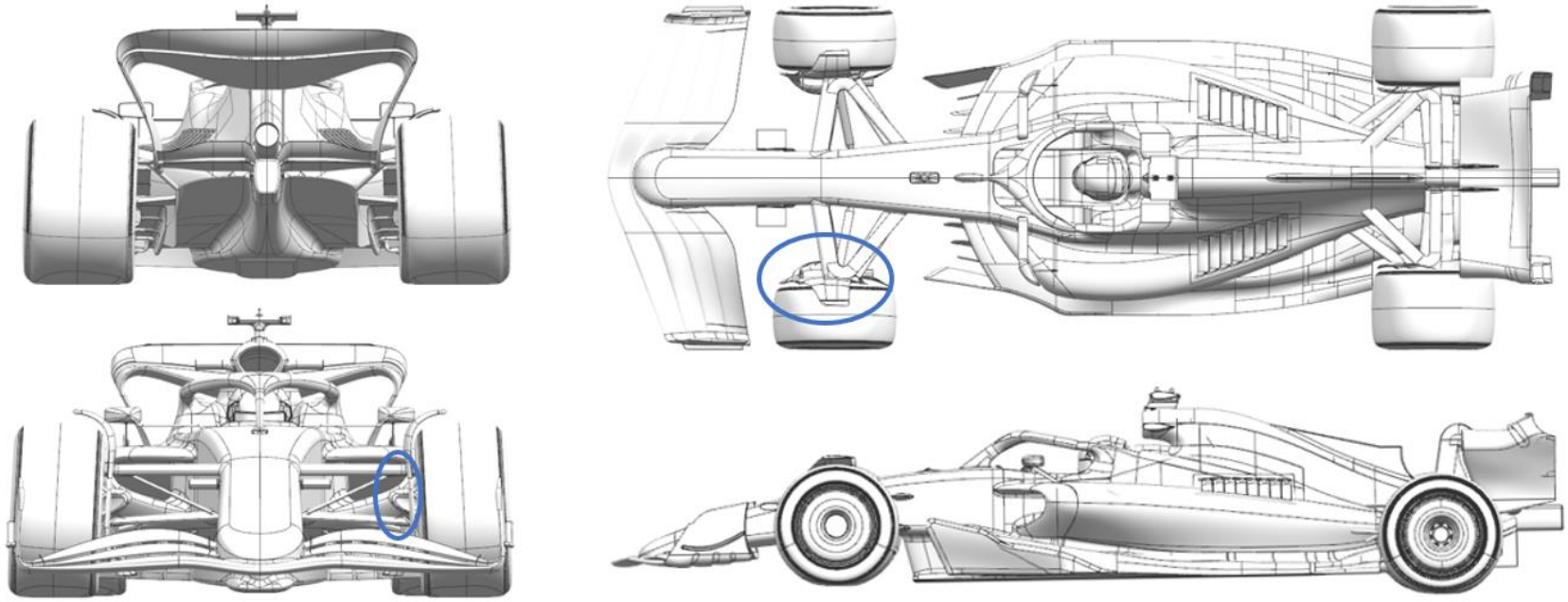
	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Front Wing	Performance - Local Load	Reprofiled front wing flap	Not specific to Singapore and part of the standard development cycle, the aim of this front wing flap update is to improve car efficiency over an extended aero balance range





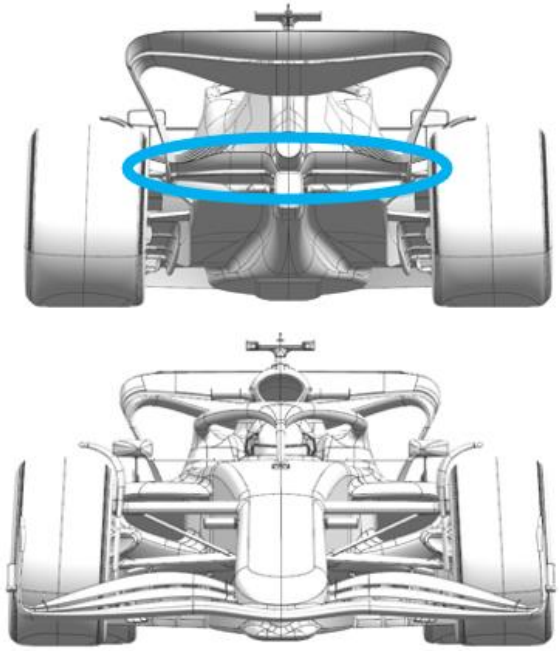
Mercedes-AMG Petronas F1 Team

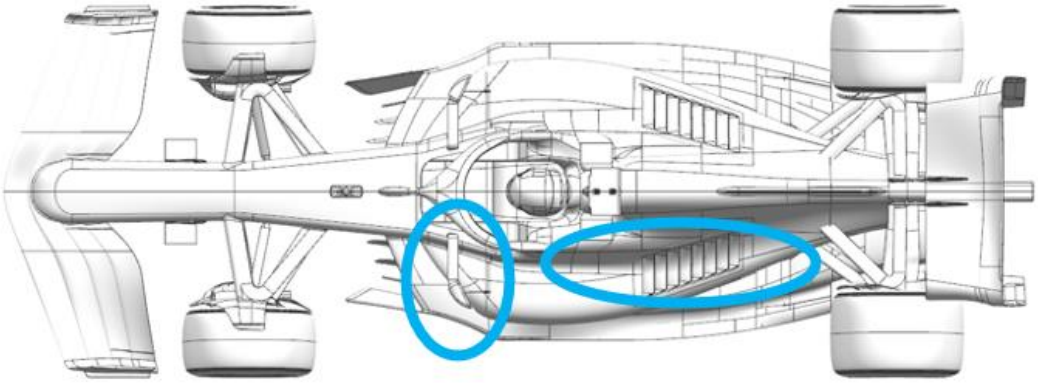
	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Front Corner	Circuit specific - Cooling Range	Large front brake duct inlet and exit.	The change to the front brake duct inlet enables more air mass flow to the brakes to increase cooling capacity at this circuit, which puts especially high duty on the braking system.

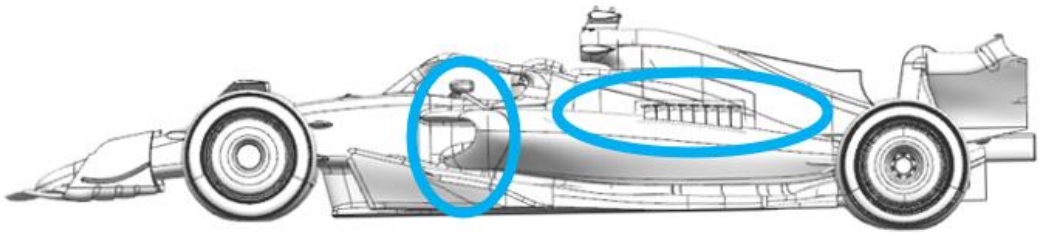


BWT Alpine F1 Team

	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Sidepod Inlet	Performance - Local Load	Raised and staggered sidepod inlet along with increased undercut and revised mirror housing stay and winglets	Increases overall load especially at higher cooling levels through improved flow to the rear of the car
2	Cooling Louvres	Performance - Local Load	Connected to the above - revised cooling louvres to bring appropriate level of cooling with the new bodywork	Different shape to accompany the revised bodywork (see above description)
3	Beam Wing	Circuit specific - Drag Range	Taller lip on the trailing edge of the beam wing	Increases top rear wing load for a gain at high downforce levels - like the Marina Bay Street Circuit in Singapore



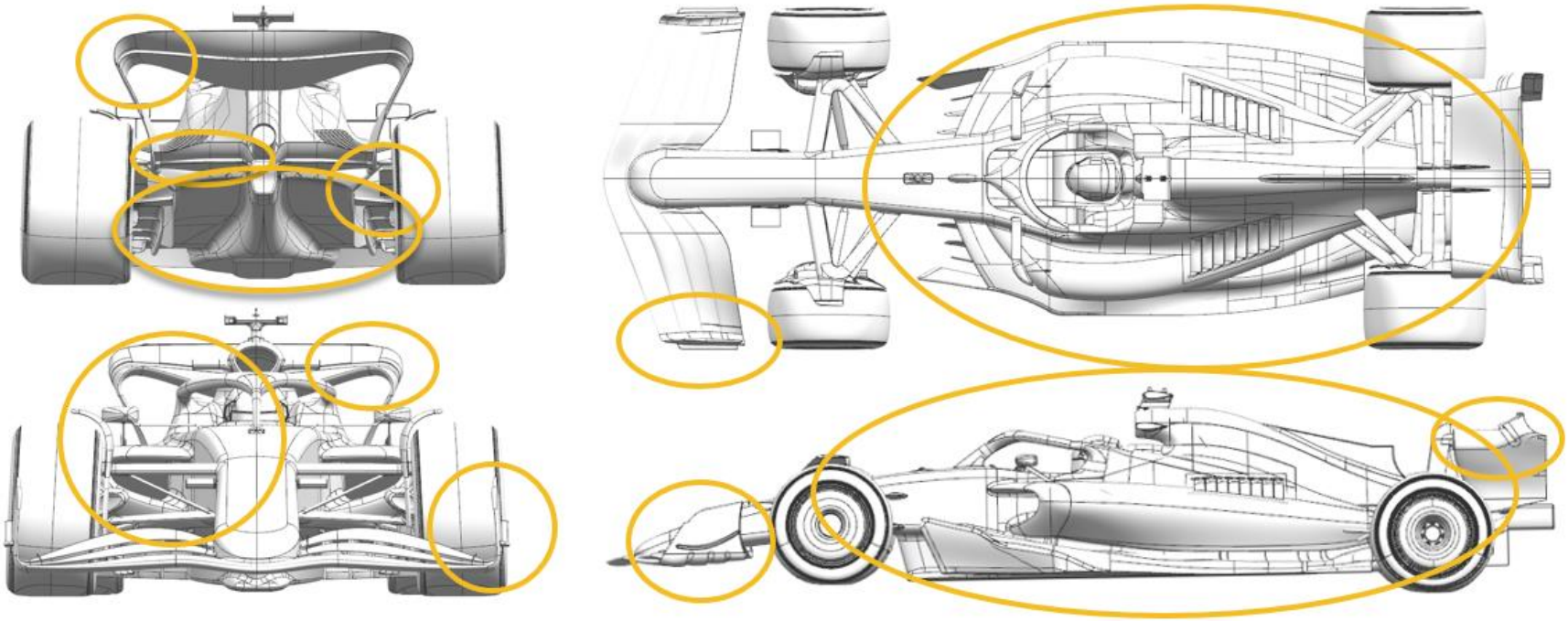




FIA Formula 1 World Championship™

McLaren F1 Team

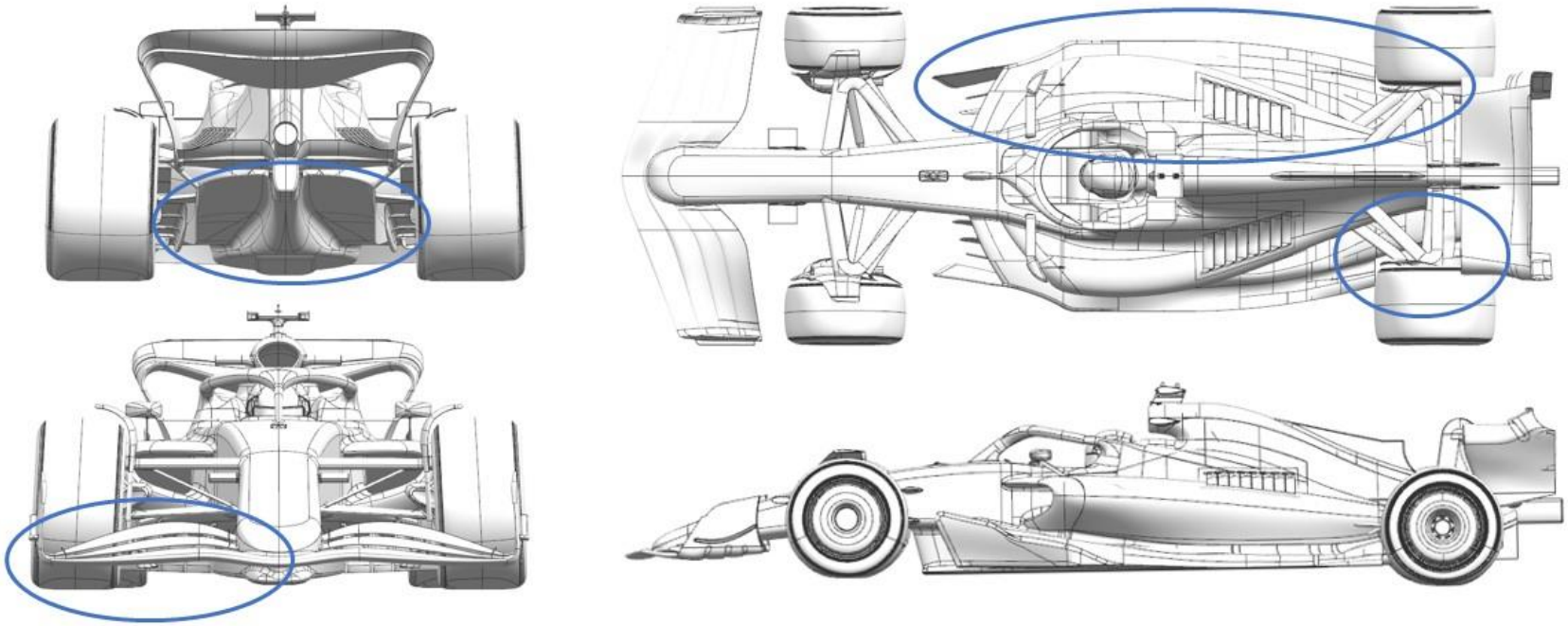
	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Front Wing Endplate	Performance - Flow Conditioning	New Endplate Geometry	A new Front Wing Endplate Geometry will be introduced at this event, resulting in improved flow conditioning which provides a gain of aerodynamic load.
2	Sidepod Inlet	Performance - Flow Conditioning	New Sidepod Inlet Shape	In conjunction with the new Bodywork Shape, the Sidepod Inlet and Mirror mounting has been revised, to aid flow conditioning on Bodywork and Floor.
3	Halo	Performance - Flow Conditioning	New Halo Furniture	In conjunction with the new Bodywork Shape, the Halo Furniture have been updated to aid flow conditioning over the top of the Bodywork.
4	Floor Body	Performance - Local Load	Fully revised Floor	The new floor features updated Fences, Floor Edge as well as Diffuser shape, which in conjunction with the revised Bodywork Shape results in an increase in aerodynamic load.
5	Coke/Engine Cover	Performance - Flow Conditioning	Reshaped Sidepod and Engine Cover	The Engine Cover and Sidepod/Coke has been reshaped to improve flow conditioning to the floor, resulting in the aforementioned increase in load.
6	Rear Corner	Performance - Flow Conditioning	Revised Rear Brake Duct Geometry	The Rear Brake Duct external Winglet array has been revised, resulting in improved flow conditions in the area in conjunction with a modified Rear Toelink.
7	Rear Suspension	Performance - Flow Conditioning	Modified Rear Toelink shroud	The Rear Toelink Shroud has been modified in conjunction with the revision of the rear corner geometry, improving local flow conditions.
8	Rear Wing Endplate	Performance - Local Load	Updated Rear Wing Endplate Geometry	The Rear Wing Endplate has been modified to increase local loading of the Rear Wing which efficiently increases overall aerodynamic load.
9	Beam Wing	Circuit specific - Drag Range	More Loaded Beam Wing Geometry	Suitable for this circuit, a more loaded Beam Wing geometry is available, which in interaction with the Rear Wing allows to efficiently increase aerodynamic load.



FIA Formula 1 World Championship™

Alfa Romeo F1 Team Stake

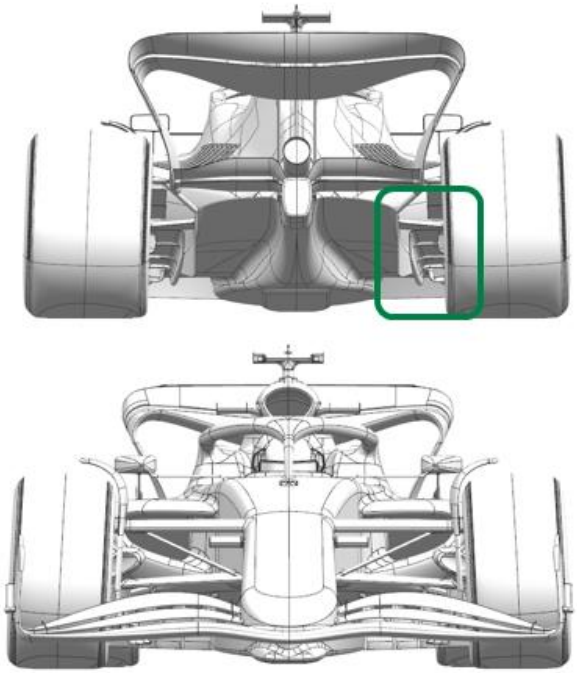
	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Floor Fences	Performance - Flow Conditioning	Redesigned floor fences and floor geometry	This upgrade, consisting of floor, diffuser and rear brake ducts as a whole, improves the aerodynamic efficiency of the whole package.
2	Diffuser	Performance - Flow Conditioning	Updated diffuser expansion	This upgrade, consisting of floor, diffuser and rear brake ducts as a whole, improves the aerodynamic efficiency of the whole package.
3	Rear Corner	Performance - Flow Conditioning	Redesigned rear brake duct geometry, as well as realigned the suspension covers	This upgrade, consisting of floor, diffuser and rear brake ducts as a whole, improves the aerodynamic efficiency of the whole package.
4	Front Wing	Performance - Local Load	Updated front wing flaps	The updated flaps provide more set-up options for the car, improving the efficiency of the whole aerodynamic flow of the car.

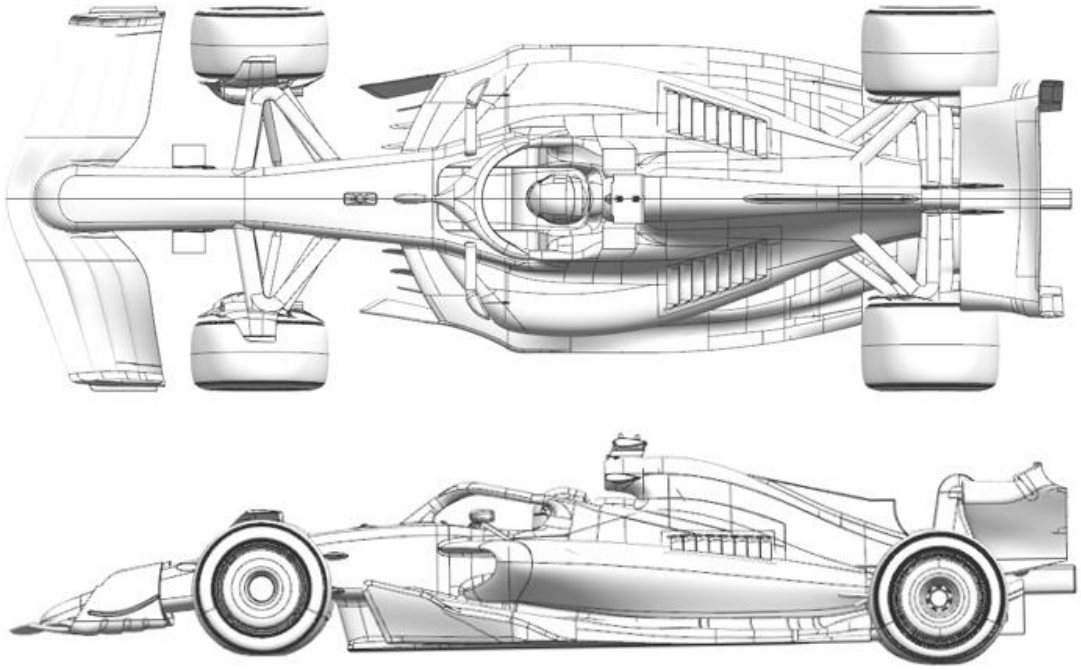


FIA Formula 1 World Championship™

Aston Martin Aramco Cognizant Formula One Team

	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Rear Corner	Performance - Local Load	The lower edge of the lower deflector has a revised profile within the allowable region for modifications.	The modified trim improves the management of associated vorticity increasing the local load on the deflector, this also increases load on surrounding devices.





MoneyGram Haas F1 Team

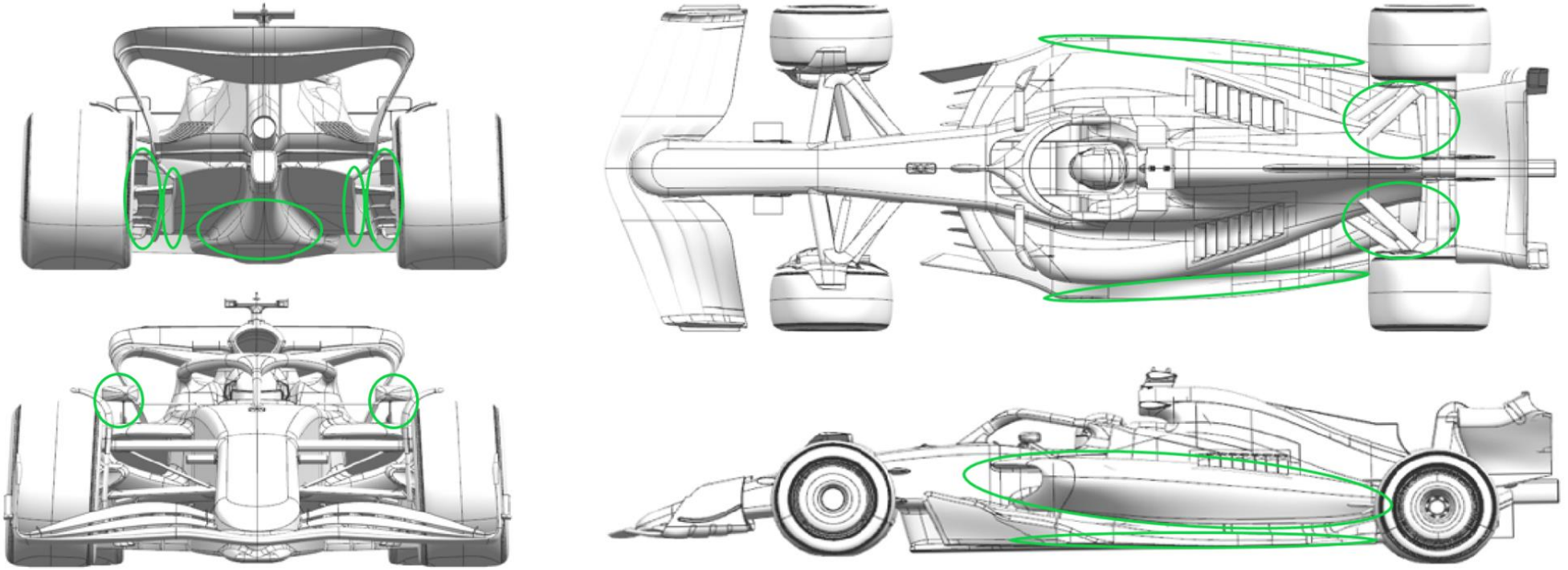
No updates submitted for this event.

FIA Formula 1 World Championship™

SCUDERIA ALPHATAURI

	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Floor Body	Performance - Local Load	Relative to the baseline geometry, the rear central floor has been modified.	The modification is an evolution of the existing design to better optimise the flow entering the diffuser
2	Floor Edge	Performance - Local Load	Relative to the baseline geometry, the floor edge local to the trailing edge of the forward floor fences has been modified. The rear floor edge and floor edge wing have also been revised.	The forward floor edge changes lower static pressure local to the floor edge and helps draw increased massflow under the forward floor between the fences. The rear floor edge removes the rear notch and 'hockey stick' floor edge wing in favour of a solid floor edge with modified floor edge wing remaining parallel to the floor edge. This change increases local floor edge loading.
3	Diffuser	Performance - Local Load	Relative to the baseline geometry, the diffuser sidewall cut-out has been reoptimised to suit the new rear floor edge design.	The diffuser modifications enhance the strength of the rear floor edge vorticity, giving a local load gain within the diffuser.
4	Sidepod Inlet	Circuit specific - Cooling Range	Relative to the baseline geometry, the sidepod inlet area has been reshaped.	This change increases the cooling range for radiators located in the sidepods to protect against very high ambient temperatures at this or any other high cooling demand circuits this season.
5	Coke/Engine Cover	Performance - Local Load	Relative to the baseline geometry, the outboard bodywork has been modified. An additional cooling exit has also been added to the inboard engine cover local to the rear lower wishbone forward leg.	The bodywork has been taken further outboard at its widest point to improve the interaction with the floor edge and strengthen floor edge vorticity for local load gain. The upper outboard bodywork has also been reprofiled to keep front wheel wake losses further away from the rear floor, increasing local load.
6	Rear Suspension	Performance - Local Load	Relative to the baseline geometry, the rear suspension shrouds have been reprofiled.	The leg geometry changes improve local load generated by them. There is also a better interaction with the new rear brake drum geometry, increasing local load generated by the wing elements of the drum assembly.

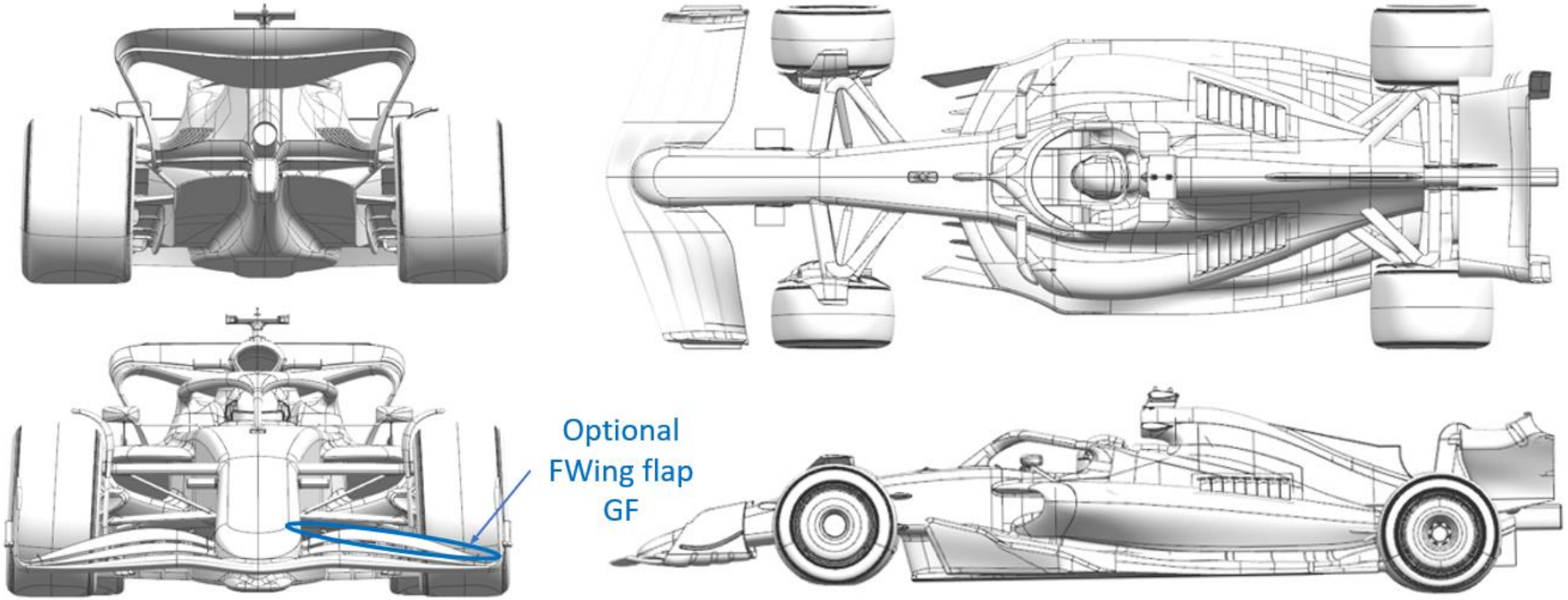
7	Rear Corner	Performance - Local Load	Relative to the baseline geometry, the rear brake drum scoop inlet has been redesigned and the scoop exit geometry revised local to the upper wing cascade.	The modified inlet reduces losses incident onto the upper rearward wing cascade, thereby increasing their local load. The revised scoop exit also allows these wings to generate more load by causing less aerodynamic blockage.
8	Other - rear view mirrors	Performance - Flow Conditioning	Relative to the baseline geometry, the mirror body has been revised. The mirror vanes have also been revised to suit the new sidepod inlet upper surface.	The mirror body changes reduce the extent of its wake losses, increasing flow energy to the back of the floor for increased local load in that area.



FIA Formula 1 World Championship™

Williams

	Updated component	Primary reason for update	Geometric differences compared to previous version	Brief description on how the update works
1	Front Wing	Circuit specific - Balance Range	New, larger gurney flap available for the rearward most element of the front wing	This increases the loading of the front wing to provide additional forward aero balance. This compliments the high downforce rear wing configuration and the balance requirements for Singapore. We will only fit this new GF if the balancing power is required.


Optional
FWing flap
GF