the Season Review 2010

part 2

Summary

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Regulation Changes

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Constructors
Drivers
Grand Prix
Ferrari Drivers

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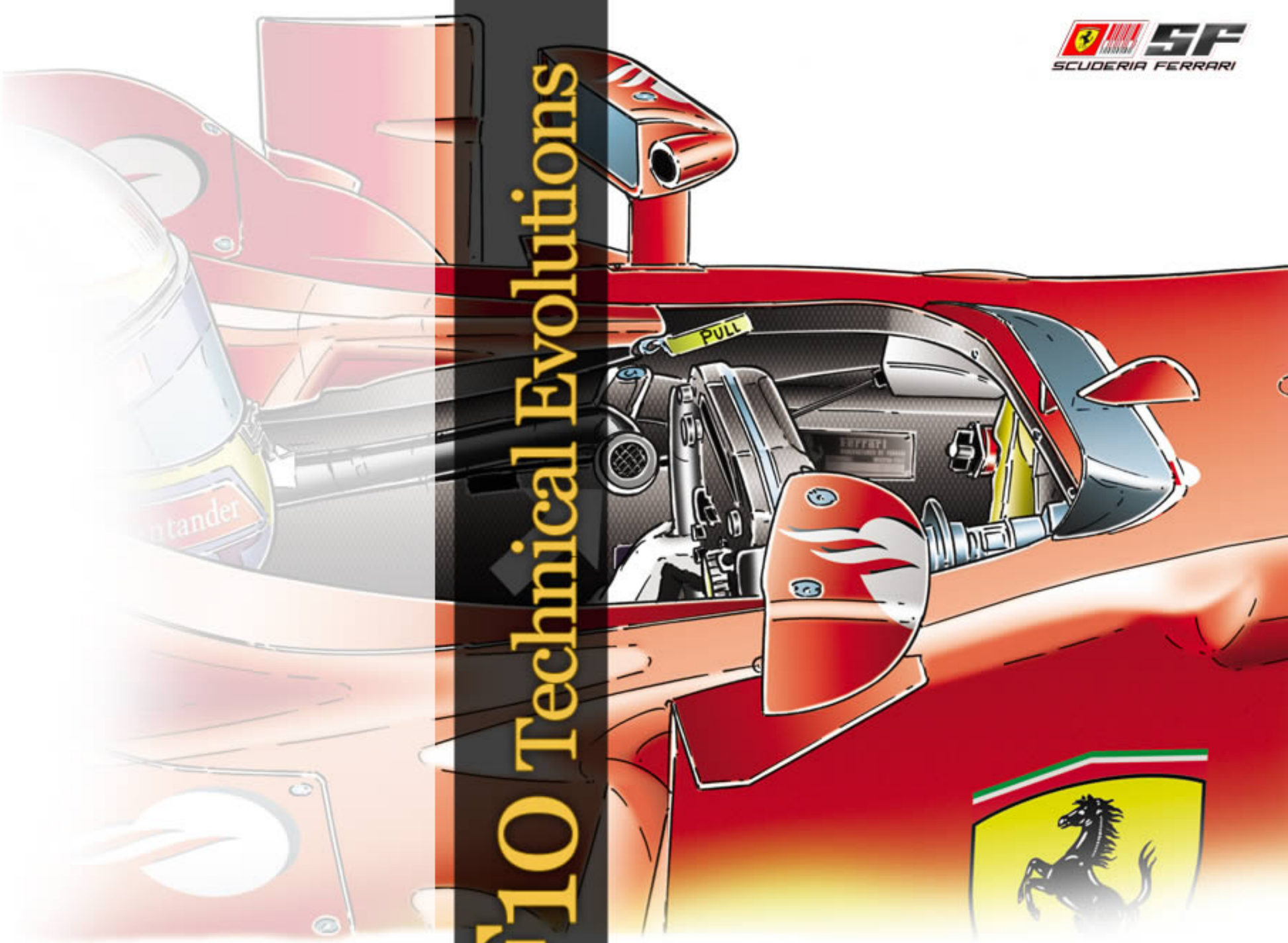
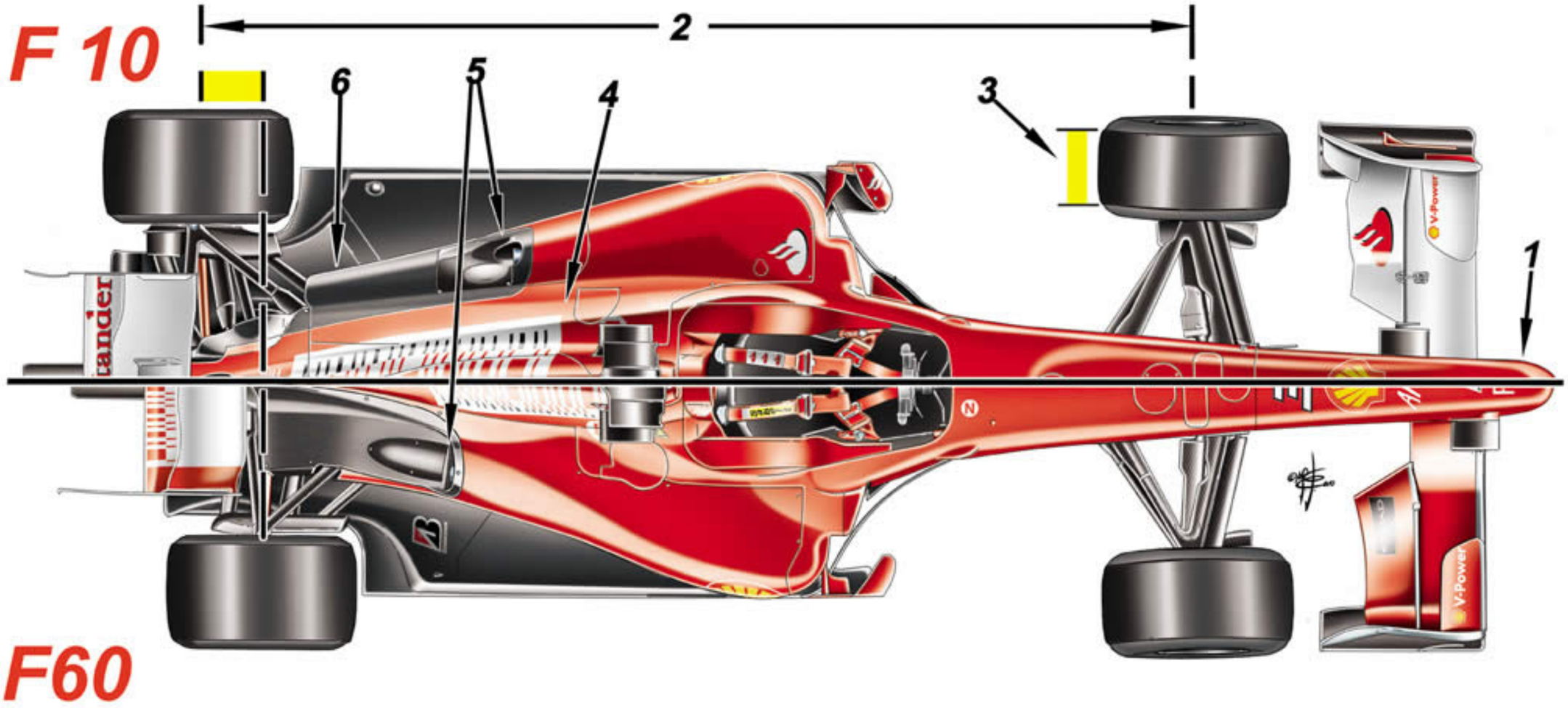
F10 Technical Evolutions



F10 Technical Evolutions

F60 vs F10: comparison between the two single seaters

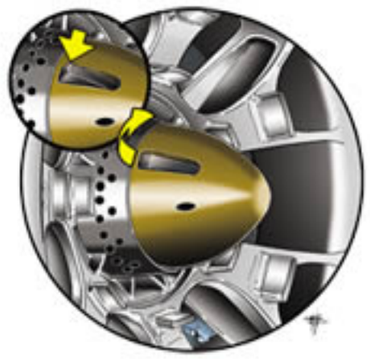


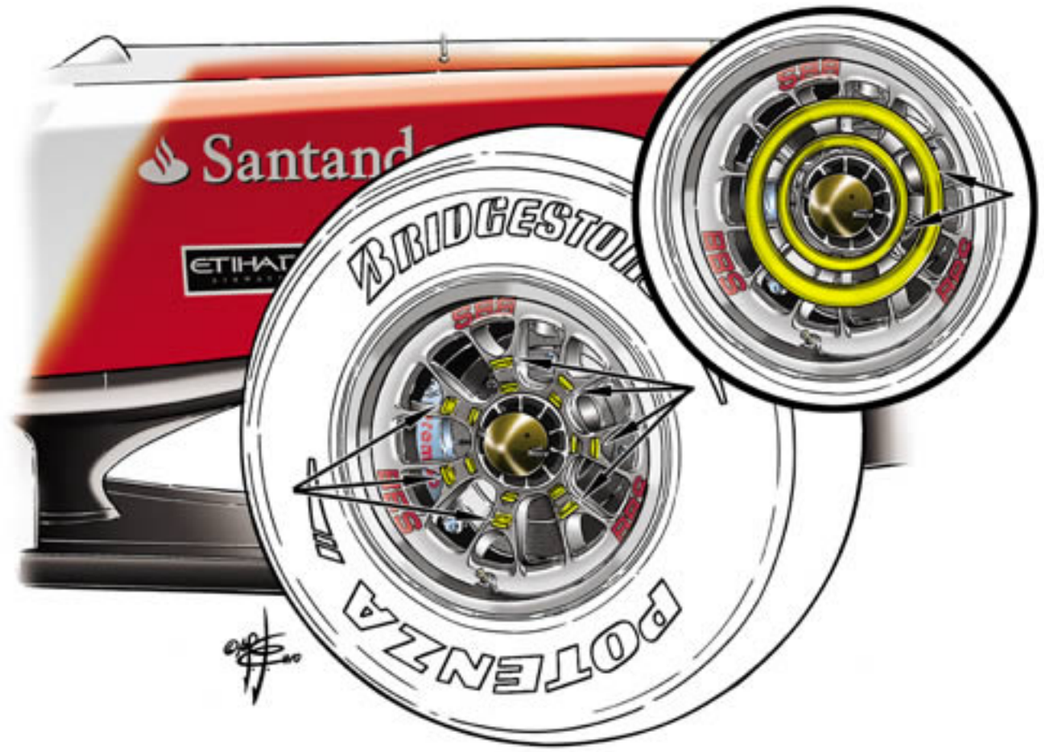
*"The F10 has still some of the looks of the old F60 family like the nose **(1)** and the sides. The wheelbase **(2)** has been extended, because the tank **(4)** now has to be bigger, because due to the 2010 regulations the cars can't be refuelled during the race. The front wheels **(3)** are, also due to the rules, narrower. The engine's inclination is hidden by the bodywork, while the exhausts' extension **(5)** is visible, just like the narrower bodywork **(6)** in front of the wheels. Meanwhile the suspension layout has been more or less maintained."*

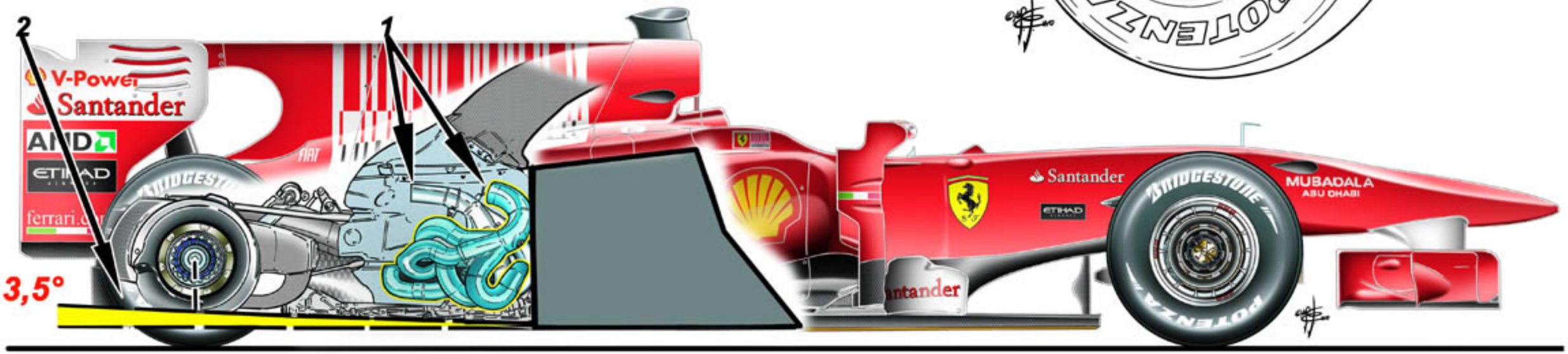
F10 Technical Evolutions

Innovative Solutions

*"Despite some elements from the previous F60 family the F10 introduced a brand-new solution: the engine inclination of 3,5° **(2)** to create a bigger central double diffuser. A unique technical solution in the paddock for the whole 2010 season. The second solution "found" by the technicians from Maranello includes the rims, designed to partly reproduce the positive effects created by the lenticular fairing in carbon fibre banned by the FIA for the 2010 season. The rims are part of those parts of the cars, which can't be copied or modified during the season. This is not a completely new solution, but a novelty regarding the regulations for the 2010 season, the mechanical fixing of the ogival wheel nut."*





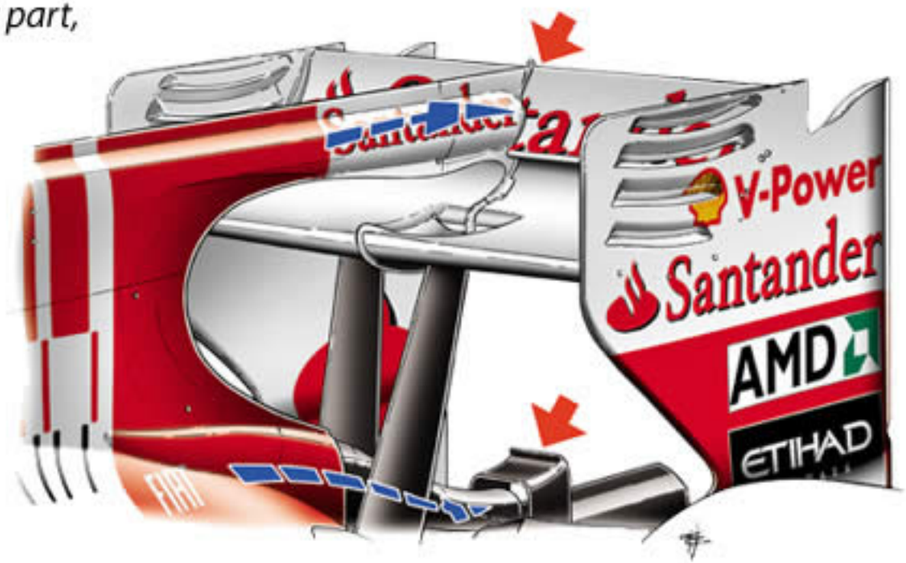


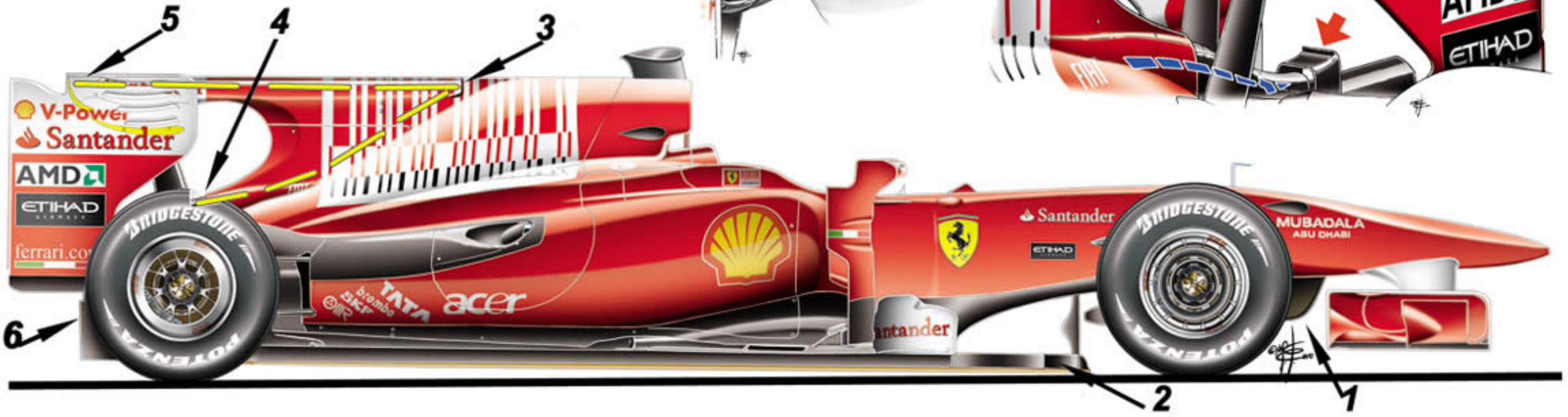
F10 Technical Evolutions

Ferrari F-DUCT

*"The F Duct's debut came in two stages: in China, as an experiment, with Alonso collecting the data, and at the Spanish GP in its definite version. The blown rear wing is almost identical to the one used by McLaren with high "outlet" **(in yellow)** on the flap's rear part. The only difference is the feeding, which is not achieved by dividing the one of the engine in two, but by applying two small "ears" **(3)** in the upper part of the new engine cover. In the profile it is evident how on the F10 the flow can go to blow, but also high up on the extractor **(4)** and on the flap **(5)**, with a split on its bottom. New flow deviators under the nose **(1)**, a double underbody **(2)** at the beginning of the underbody **(2)** and a new extractor profile. Also the driver manages everything in a different way.*

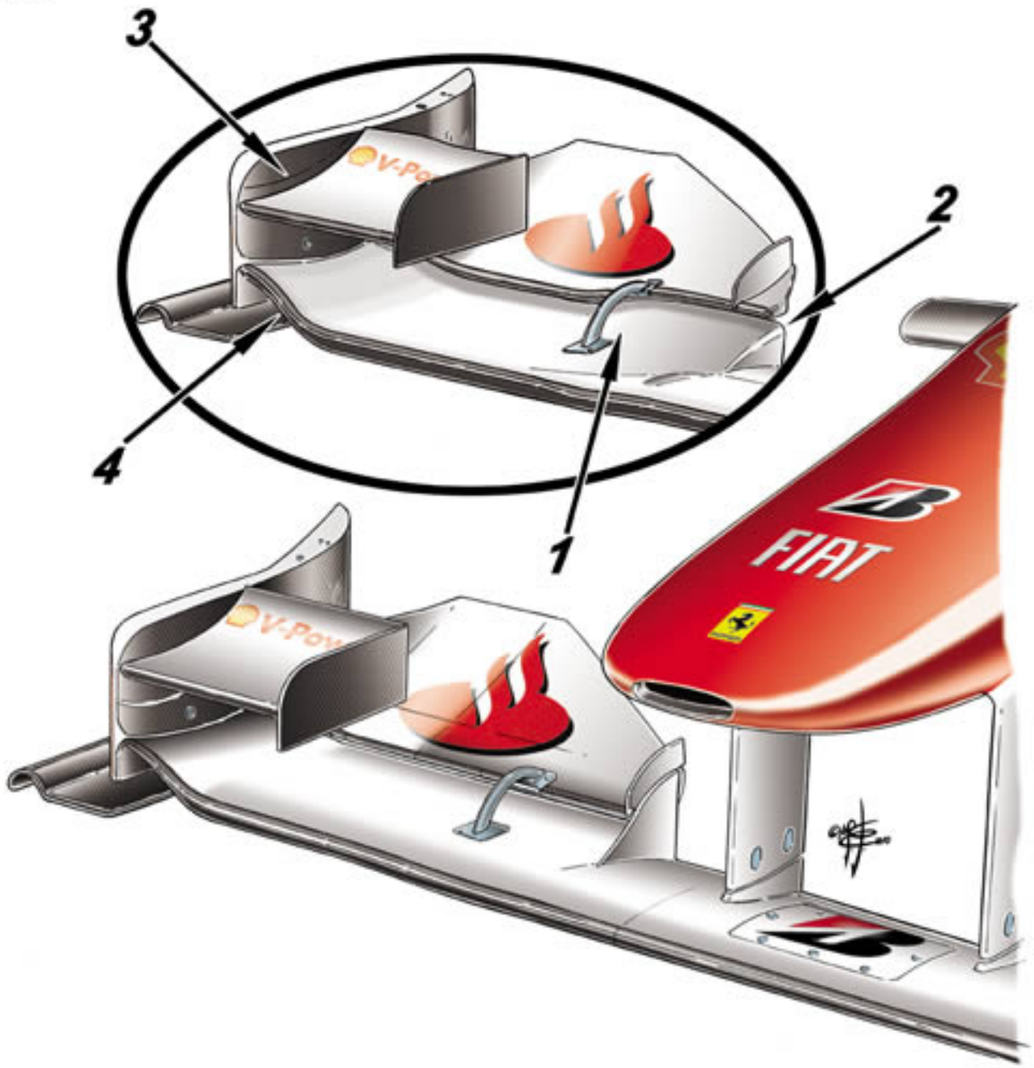
The supplementary air in the Ferrari doesn't arrive through an additional inlet in the bodyworks front part, but through a canalisation inside the airbox, leading the air to the cockpit when the hole is open. When the driver shuts the hole (in China with the left hand and in Spain with the left foot) the air is diverted towards the spoiler. The canalisation diverting the air to the lower part of the car's back can be seen."

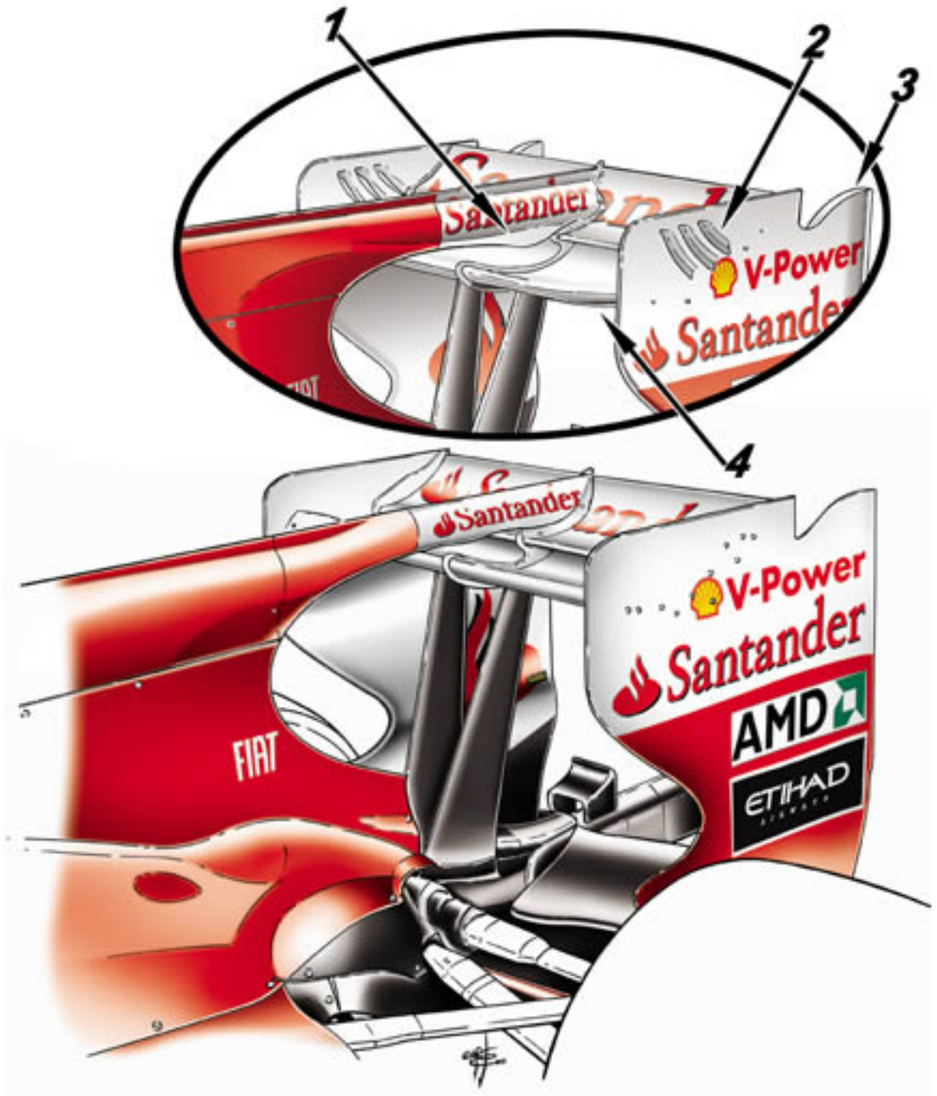




Ferrari F-DUCT Monza release

*"For the extremely fast track in Monza Ferrari was the only team using a specific F duct. On Friday the two Ferrari drivers carried out tests with two different, but still quite similar, aerodynamic packages. The solution for the rear axle was very interesting, because it not only had ad hoc profiles **(4)**, but also a F Duct especially planned for the reduced flap. There was one section **(1)**, which was different and smaller. The bulkheads **(2)** and the small vertical nolder **(3)** didn't have slits."*





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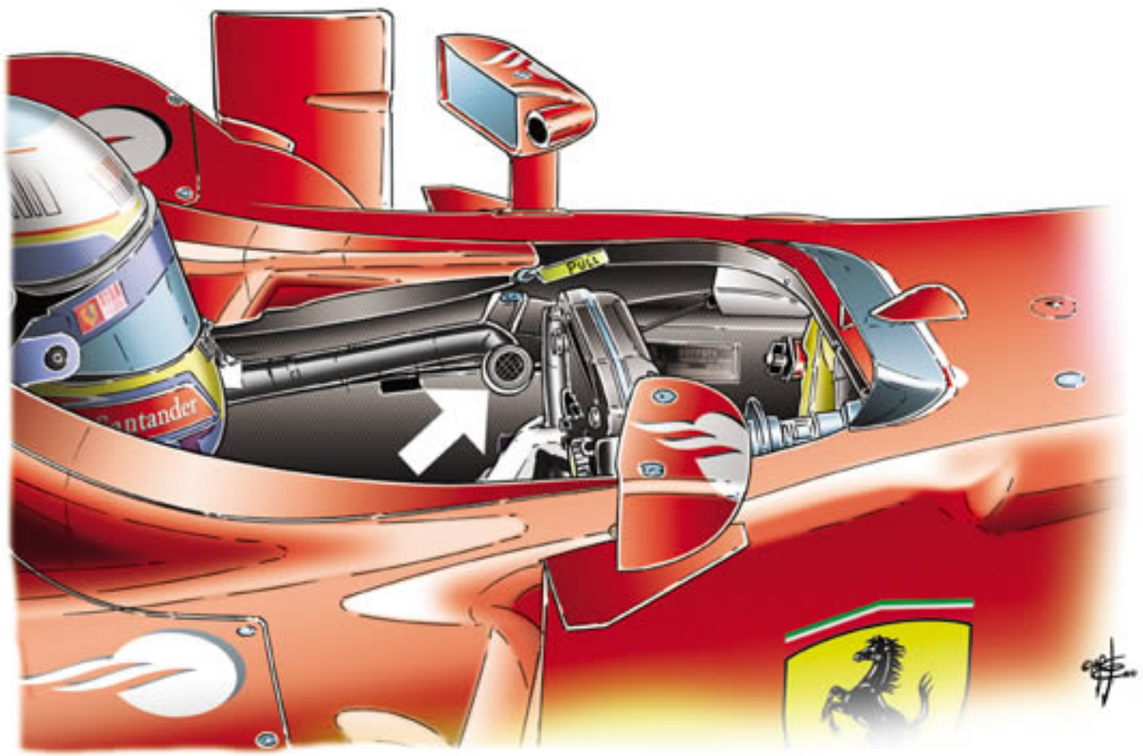
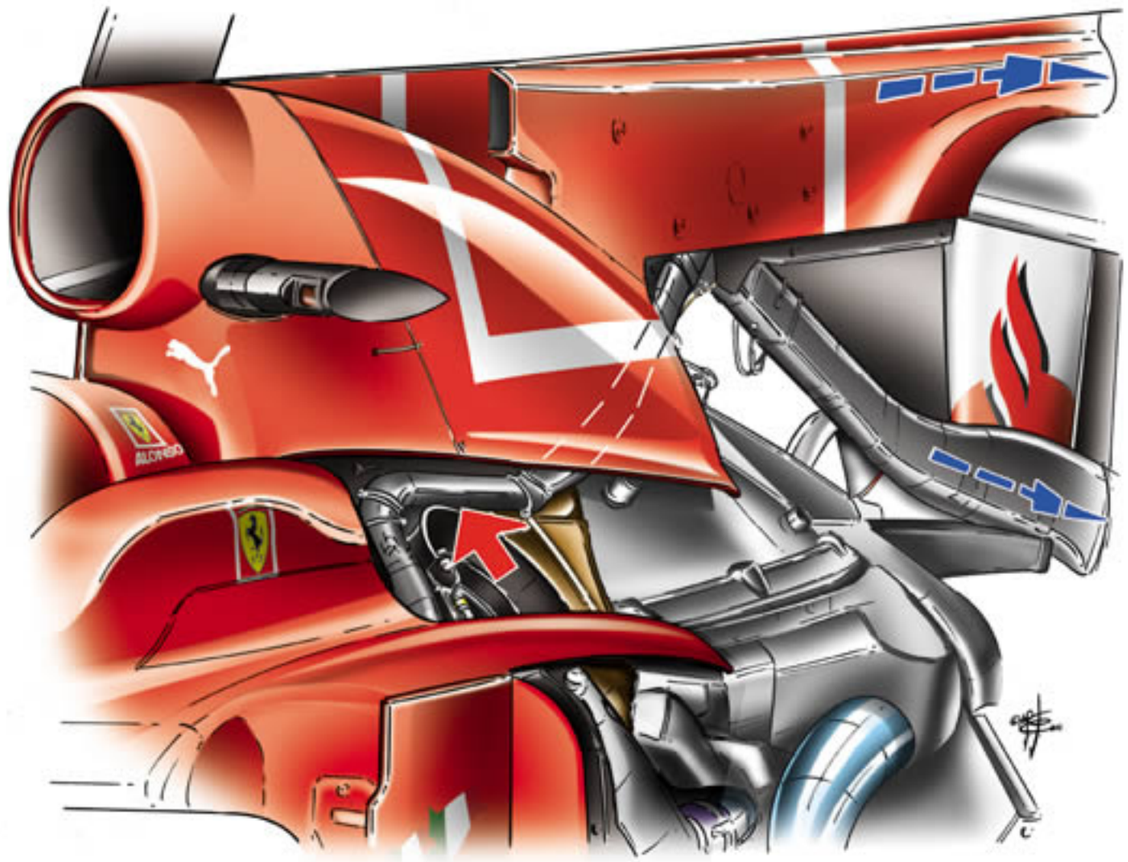
Ferrari F-DUCT Management

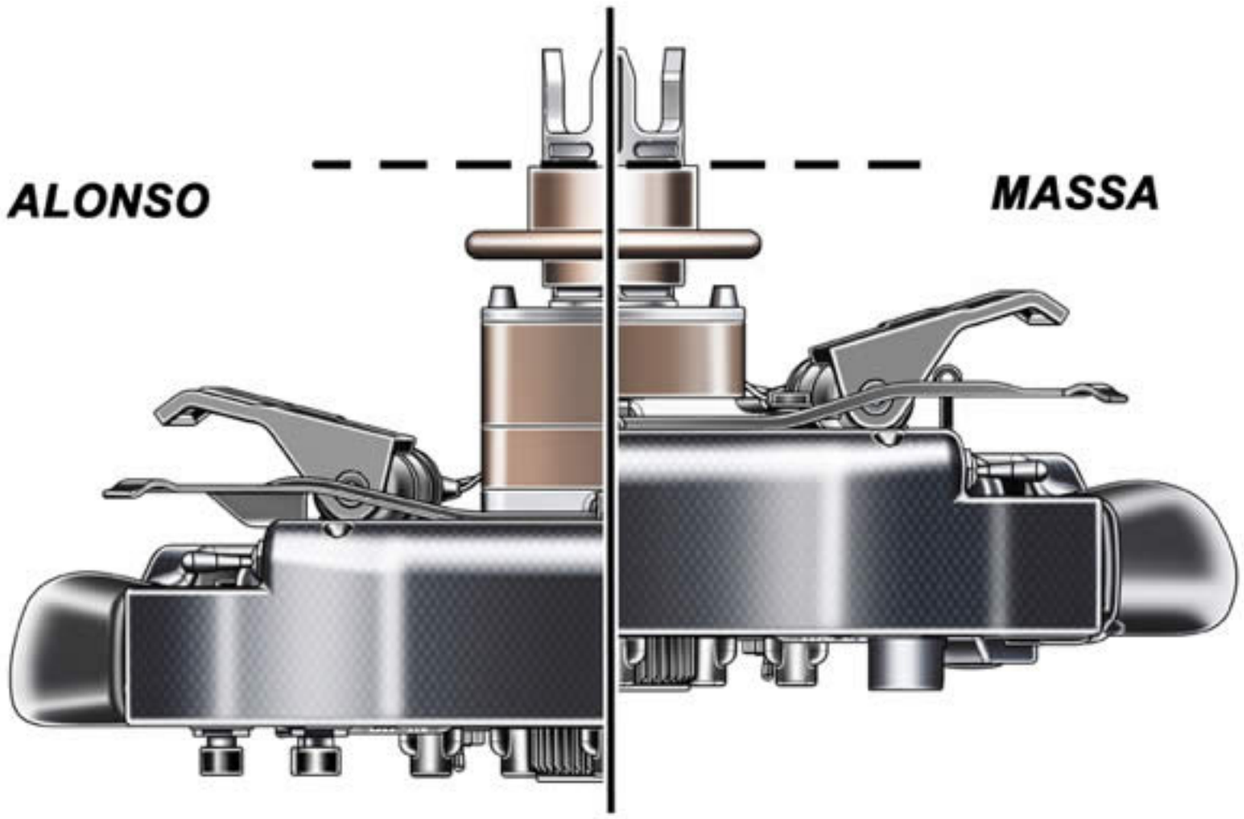
"Managing the blow on the rear wing with the left hand was abandoned after the tests in China; especially Massa had some problems here, because the forward position of his steering wheel made him take his hand off the steering wheel to close the hole. Alonso drives with his arms closer to his body; the Ferrari technicians had to build a longer spacer."





Steering Wheel

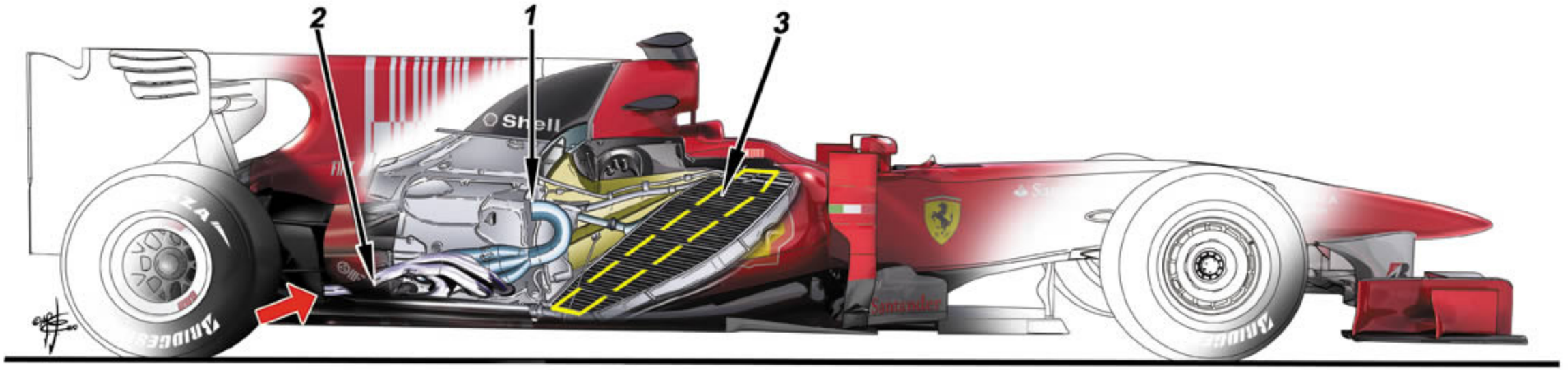
"The F10 steering wheel is simplified regarding the F60, keeping the same form and architecture. Some "manettini" have been removed and the central, multifunction knob has been modified (now similar to the one used by Alonso at Renault in 2009). The levers in the lower part are now four and not six like in the Renault."



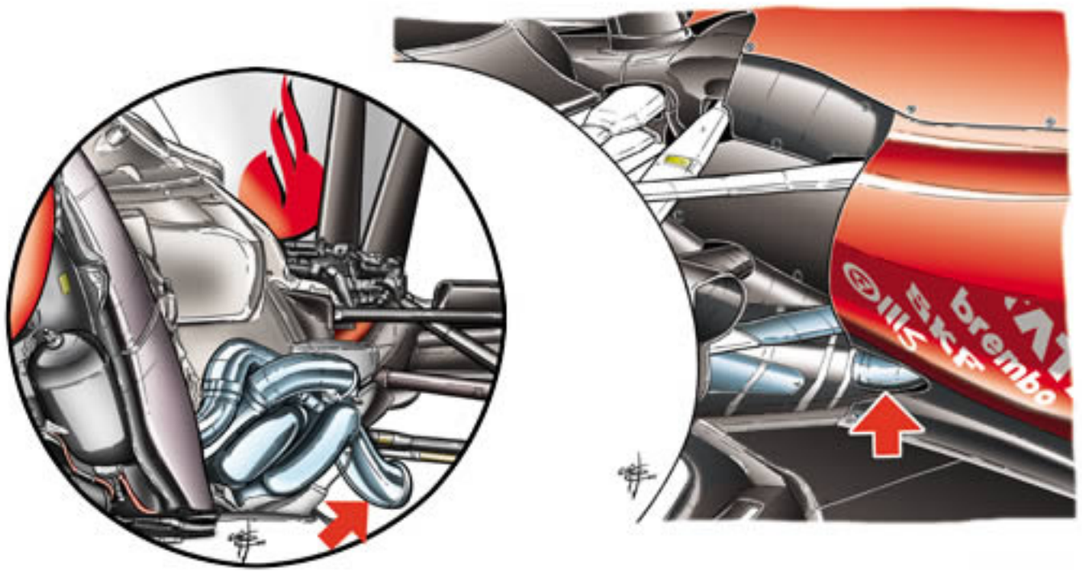
F10 Technical Evolutions

Low Exhausts

*"Ferrari found the key in Valencia with the introduction of low exhausts on the single-seaters with modifications beyond a simple replacement of the exhausts' positions from the top **(1)** to the bottom **(2)**. The radiator design **(3)** changed: slightly bigger and inclined. The bodywork changed in the lower rear part, too. The whole aerodynamics in the lower area changed to improve the advantages due to the blown sides of the diffuser's lateral canal."*



"Massa used a new gearbox, where the connection of the suspension was raised. In the designs you can see the exhausts on the sides. The parts above the exhausts are fitted with anti-heat plates and thermo-adhesives on the diffuser (modified), the suspension and the rear wing bulkheads. The engine exhausts aren't turned inside anymore, while the final part is very low."



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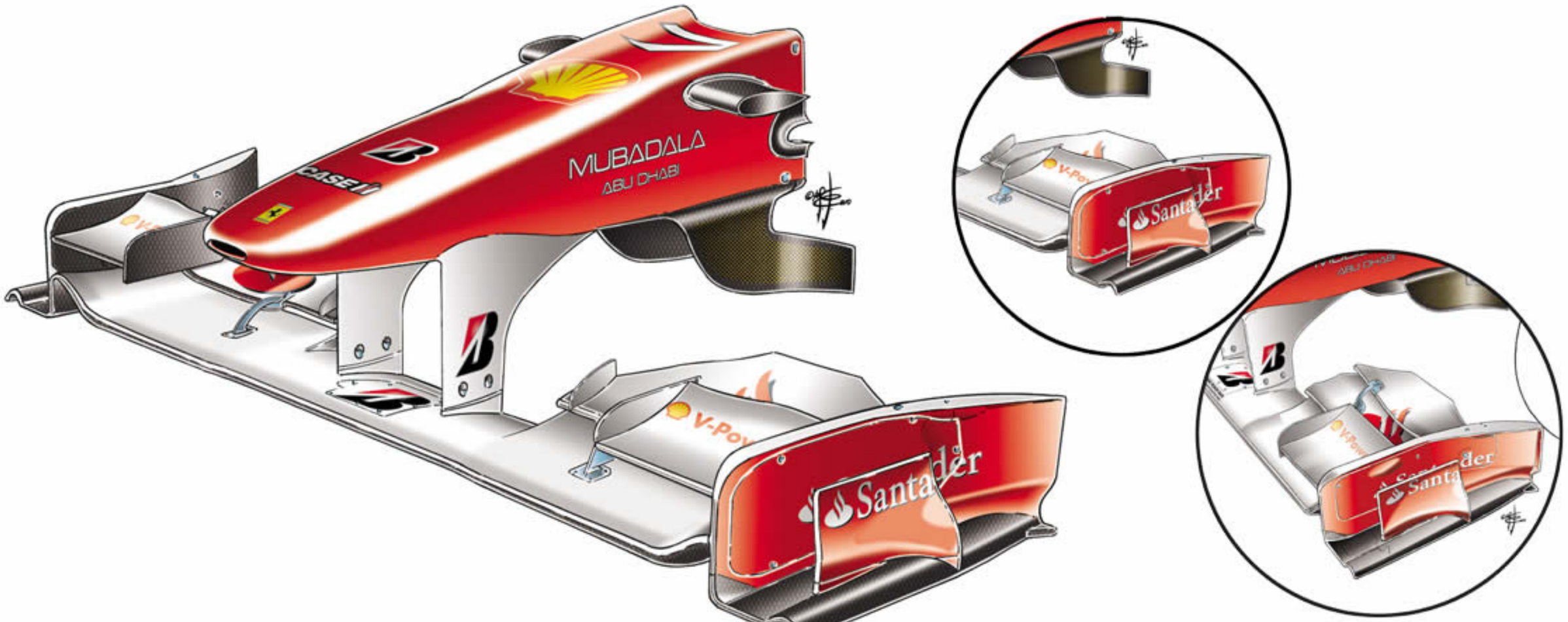
Front Wings

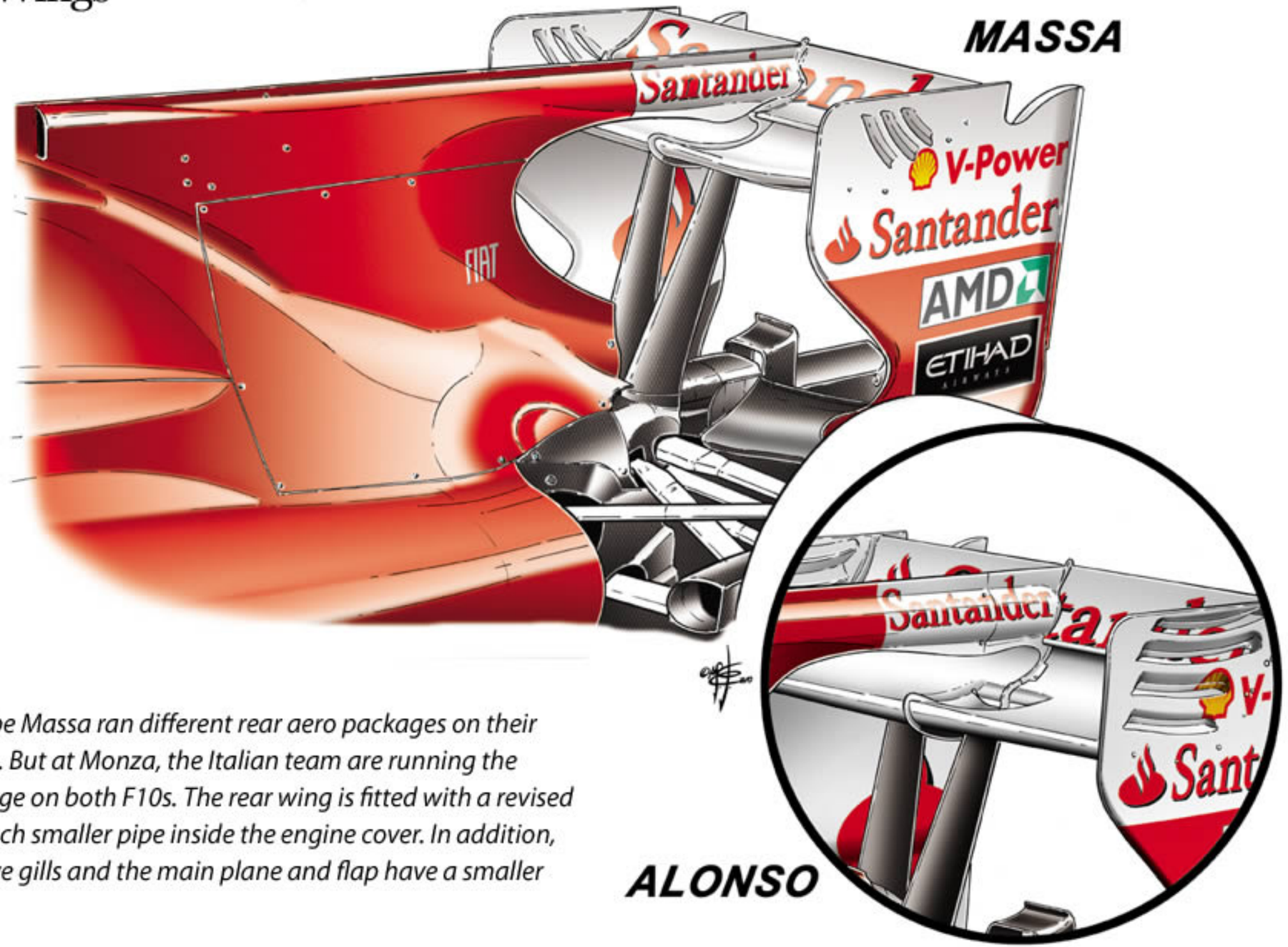
Canadian Grand Prix.

"A new front wing was introduced in Silverstone with a double flap. A solution for higher downforce without losing efficiency. This solution with small modifications was used in the following races, where the cars had to rely on high downforce."



F10 Technical Evolutions

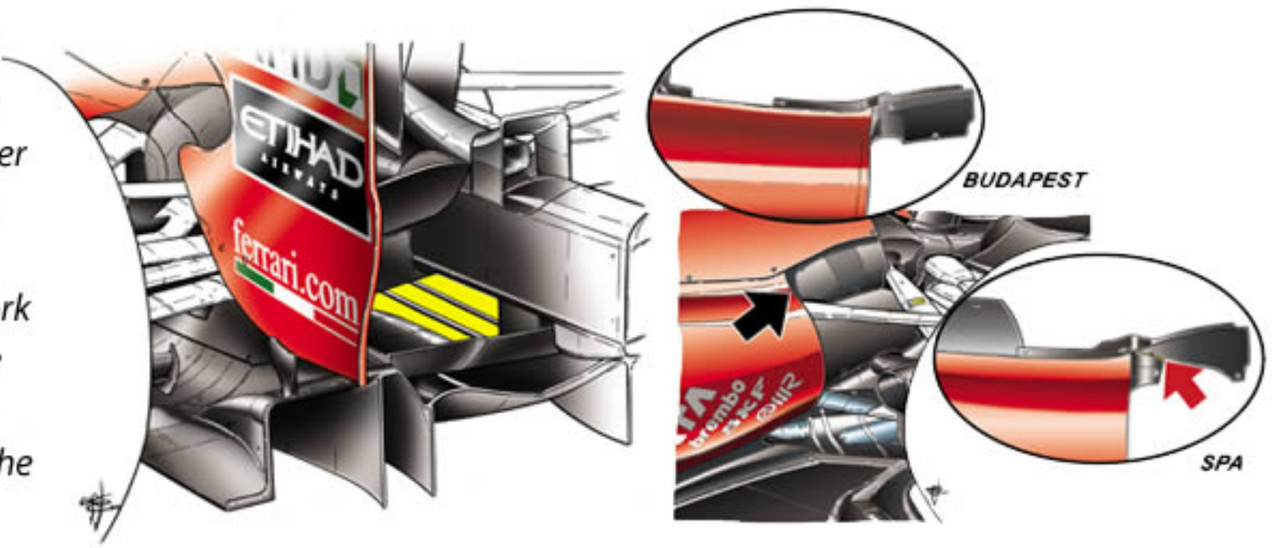
Revised Rear Wings

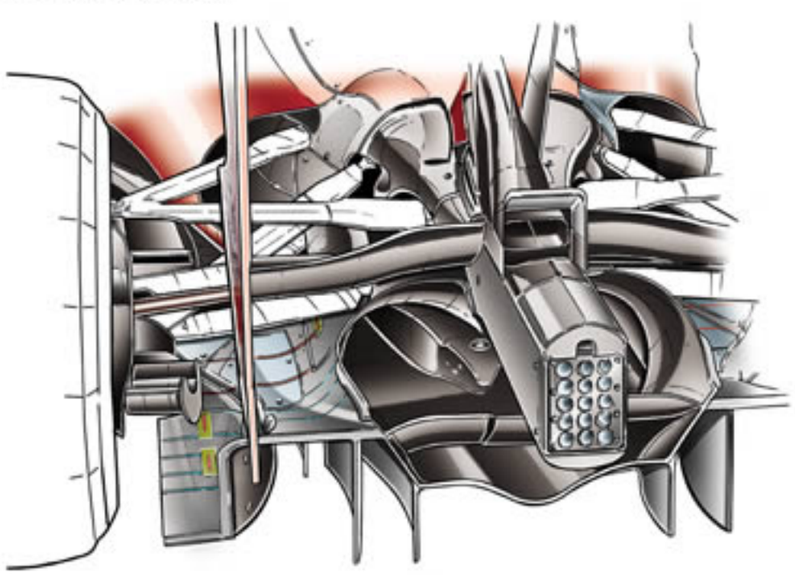


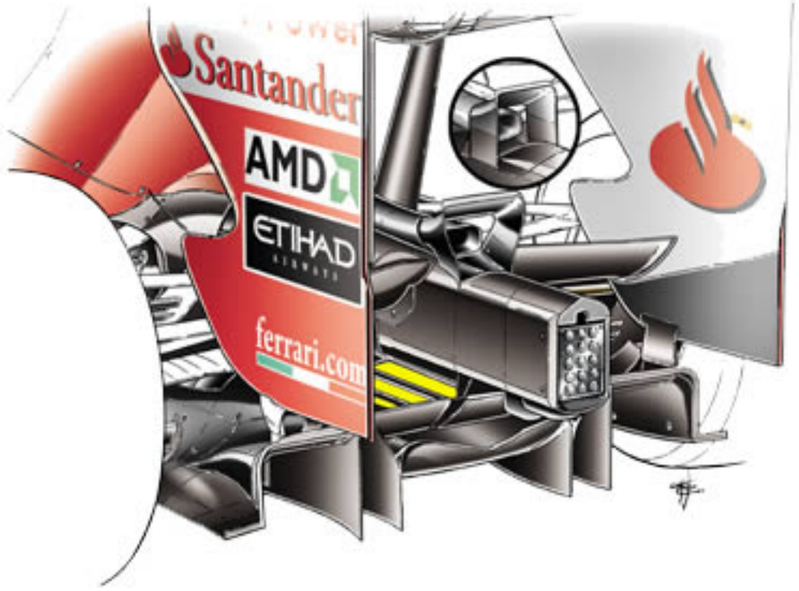
"Fernando Alonso and Felipe Massa ran different rear aero packages on their cars at the last round in Spa. But at Monza, the Italian team are running the same low-downforce package on both F10s. The rear wing is fitted with a revised F-duct, which features a much smaller pipe inside the engine cover. In addition, the endplates no longer have gills and the main plane and flap have a smaller chord."

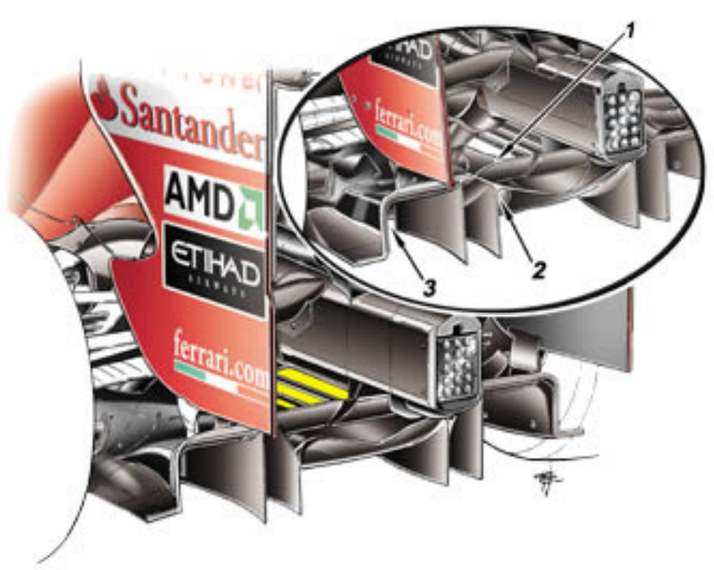
Ferrari Diffusers

"Despite the engine's inclination the F10's diffuser was helpful in terms of volumes which could be used in the central part also in the version introduced in Valencia with the low exhausts. At the Belgian GP, another important step in the F10's development with a completely new rear axle, the F10 created a proper vortex in the central part: to introduce this solution both drivers had to use the new gear fusion. According to the regulations there are two longitudinal extensions and the fusion of the new gearbox with the rear part of the bodywork with small slots. The bodywork has two small cuts. Those cuts have been made to get around the regulations, which state that the sky has to be seen through the openings on the lower part ***(diffuser)****. The diffuser was later modified for the Japanese GP with a Omega profile on the upper apart and for the Korean GP, where the central part was completely redone. The upper* ***(1)*** *and lower* ***(2)*** *profile have been changed, while a small trail fin on the lateral canals* ***(3)*** *has been removed."*







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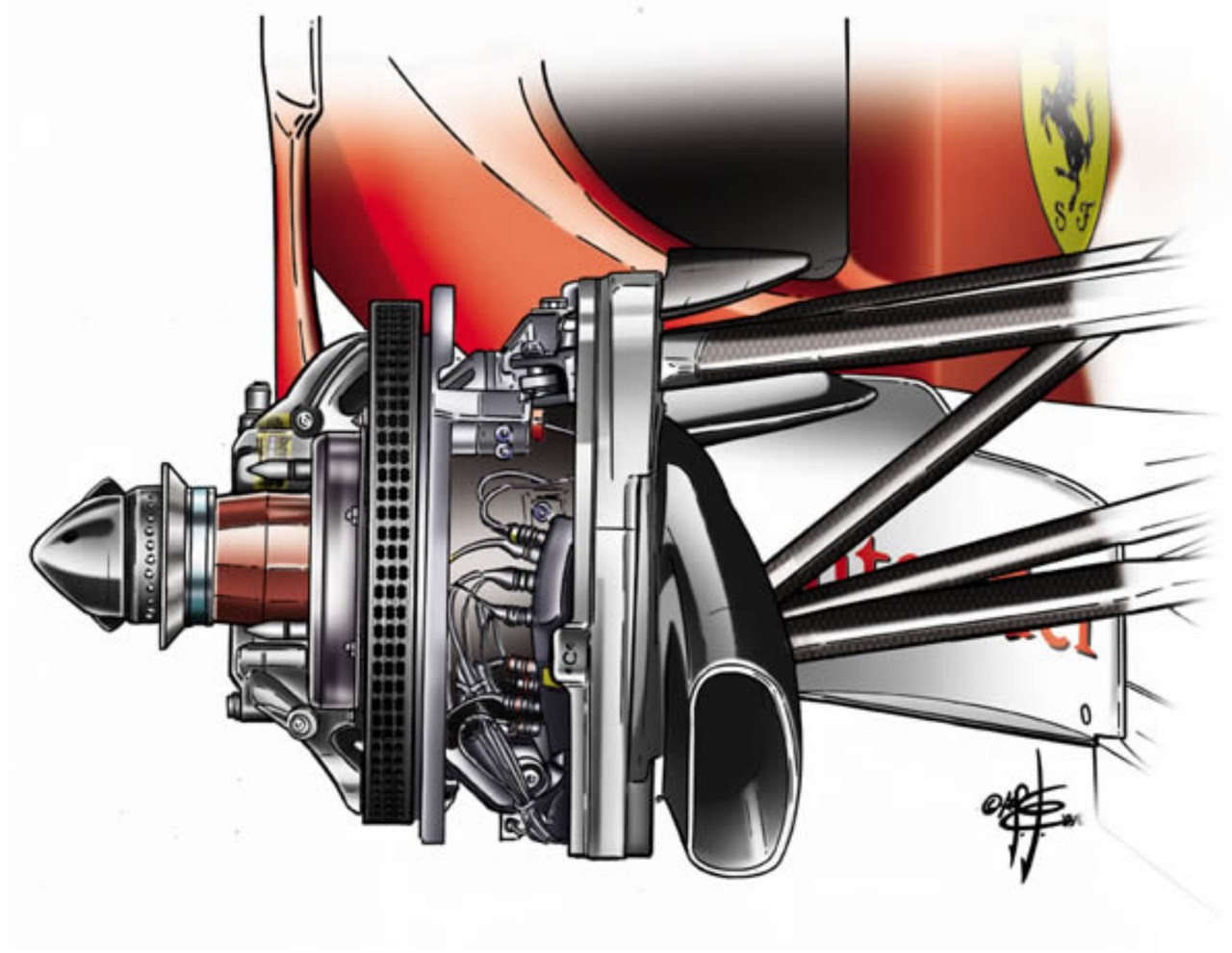
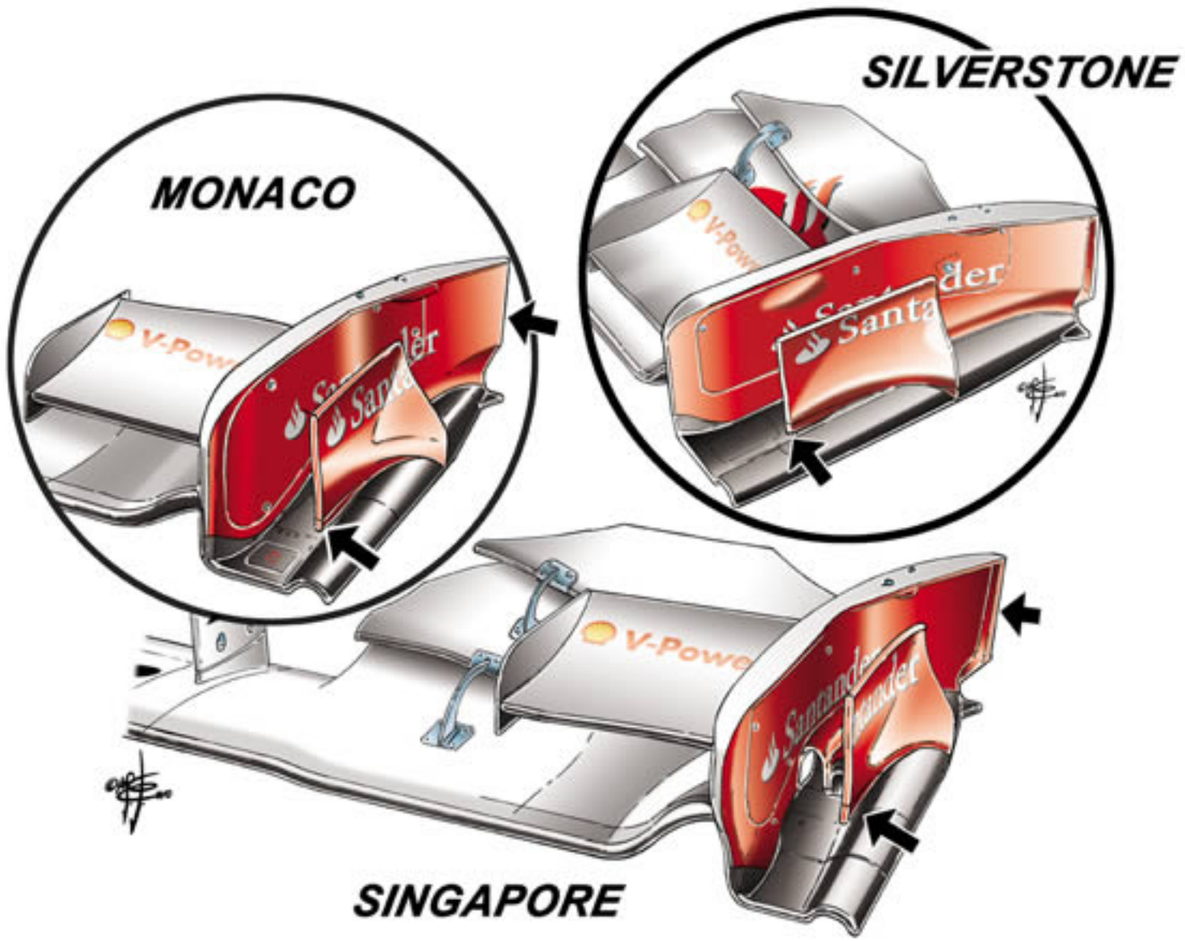
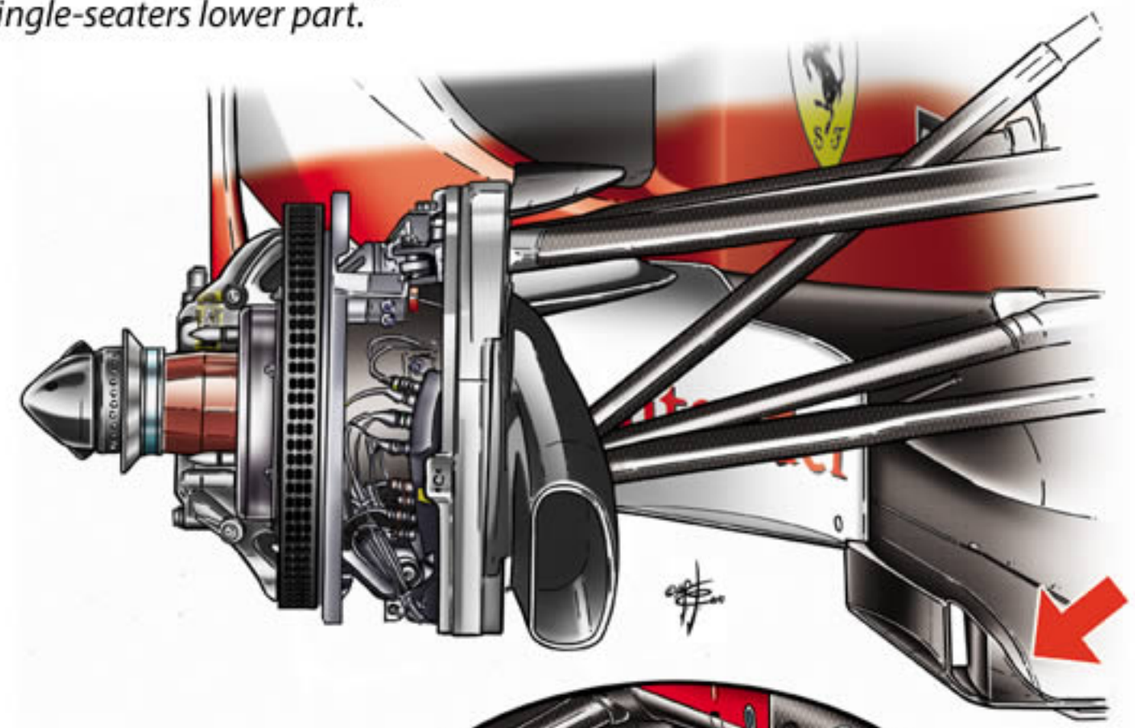


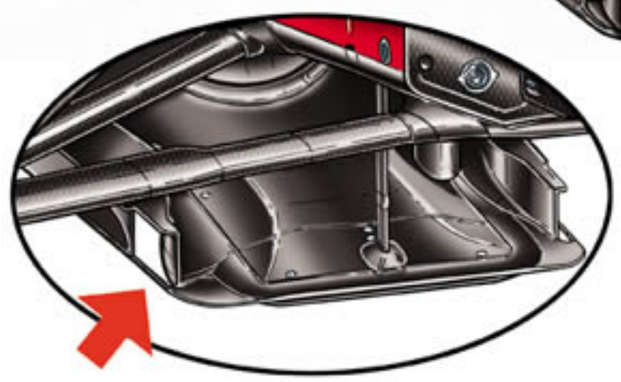
"The success in Monza was also based on a new and superior braking system. Alonso used the Brembo discs for the first time. Those discs are fitted with three lined holes instead of two, leading to an improved thermic discharge. At the following Singapore GP both Ferraris were fitted with these components."

Singapore Modifications

"In Singapore Alonso and Massa had three different front wings available, which they tested on Friday. The Spanish drivers concentrated on the two versions with the double flaps, while Massa also tried the solution from Monaco with only one flap. In the end the new version was used. The difference to the solution introduced in Silverstone was the small external bulkhead, moved back by 8-10cm.
In Singapore the new "knife" area was introduced underneath the chassis. This is a modification due to the stricter verifications by the technical inspectors, limiting the excessive bending of this important area, to create downforce in the single-seaters lower part."







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