TOYOTA A90/A91 SUPRA
GT4+ AERODYNAMIC INFORMATION PACKET

BASE GT4+ Package + GT4+ EVO Package
120 MPH V²-SCALED CFD PERFORMANCE DATA

CFD-BASED PERFORMANCE DATA + PACKAGE COMPARISON

Matched-condition CFD comparison using consistent V²-based speed scaling.

GT4+ PACKAGE CONTENT OVERVIEW

Complete Base Package + three additional EVO components.

BASE PACKAGE

INCLUDES

4 CORE AERO COMPONENTS

1. GT4+ FRONT SPLITTER WITHOUT ENDPLATES
2. 1600mm REAR WING WITH FLAT ENDPLATES
3. GT4+ HOOD VENT
4. GT4+ CANARDS

Complete Base aerodynamic system.

PACKAGE LOGIC

BASE + EVO

COMPLETE EVO PACKAGE

+ 3

Three additional airflow-control components.

EVO PACKAGE ADDS

3 UPGRADES

ON TOP OF THE BASE PACKAGE

1. EVO SPLITTER ENDPLATES
2. EVO 3D REAR-WING ENDPLATES
3. ROOF FINs

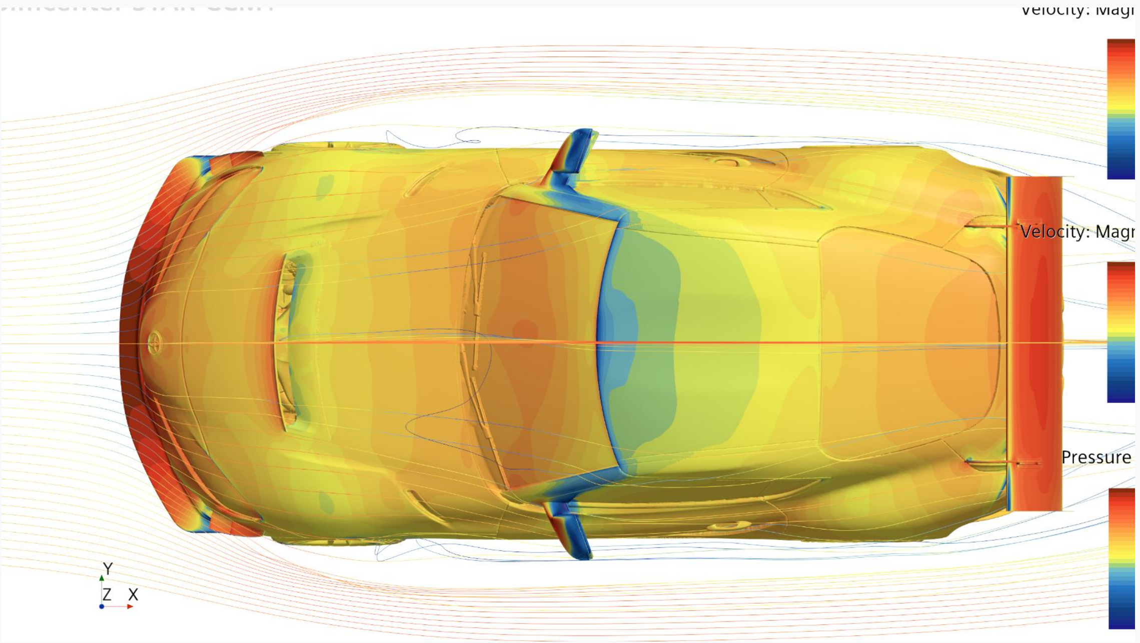
All Base Package components remain included.

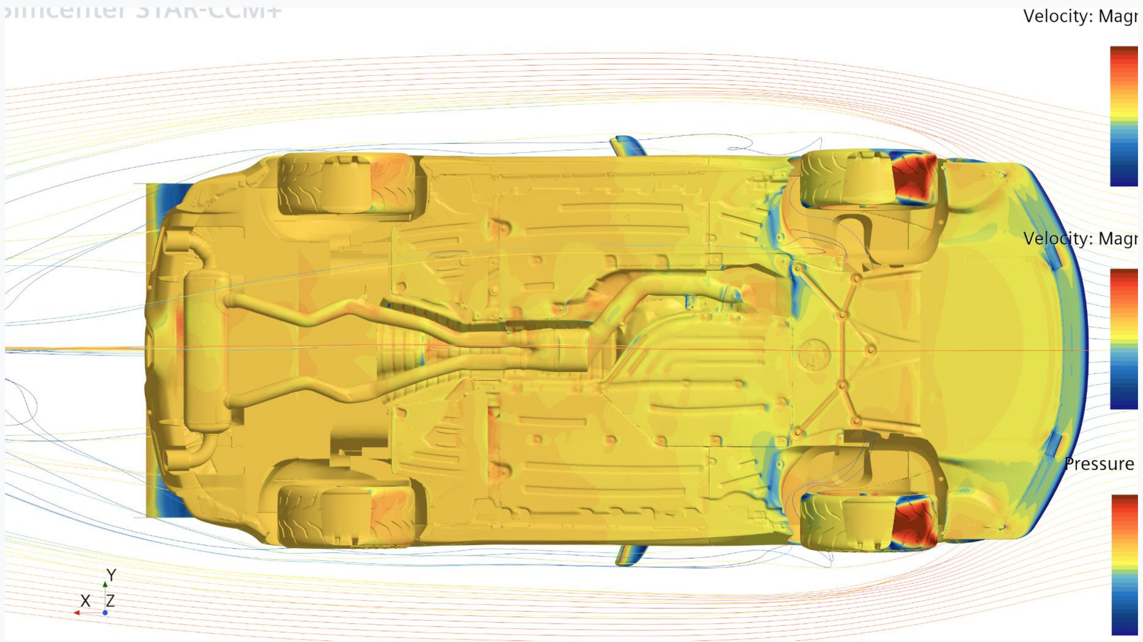
PACKAGE STRUCTURE

The EVO Package includes every Base Package component, plus the EVO Splitter Endplates, 3D Rear-Wing Endplates, and Roof Fin.

CFD METHOD & SCOPE

Full-vehicle engineering assessment performed in Simcenter STAR-CCM+.





MODEL & CONDITION

Scanned body geometry with a simplified engine bay; full-vehicle straight-line CFD solved at desired speed.

SOLVER SETUP

k-ε turbulence model; target y+ ≈ 30; approximately 70 million cells.

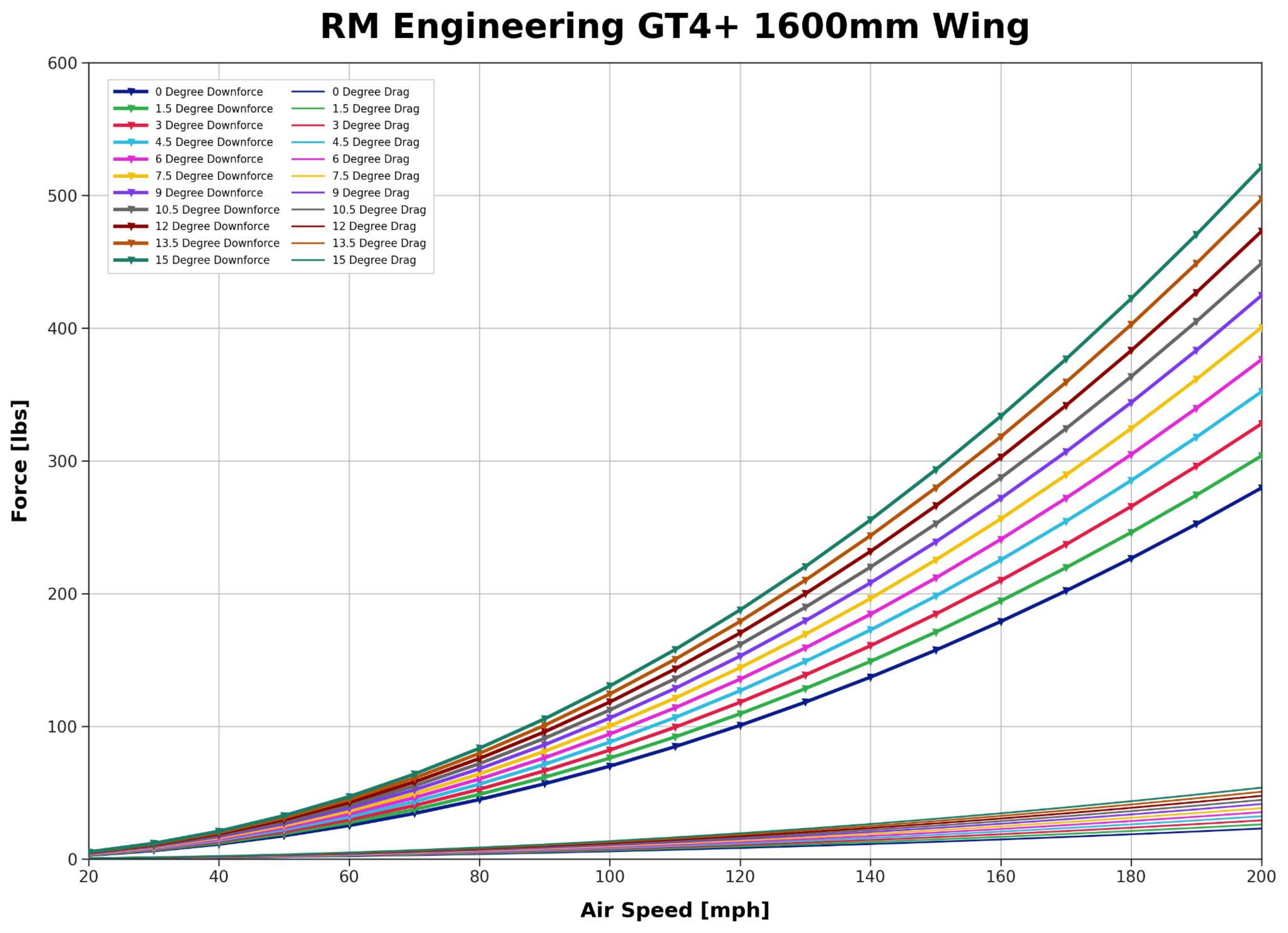
EVALUATED HARDWARE

Whole vehicle, rear wing and front splitter; supported by velocity, Cp, relative-velocity and total-pressure analysis.

*This CFD report is not intended as an academic or scientific publication and is provided for reference purposes only.

01 RM ENGINEERING GT4+ WING CFD DATA

This conclusion is based on CFD analysis of the rear wing alone, rather than data from a full-vehicle simulation.



Adjustment of the GT4+ Wing

Our GT4+ Wing offers five angle settings, ranging from 0° to 6° in 1.5° increments. For optimal aerodynamic efficiency, we highly recommend using an angle of 3° or less.

02 CFD VELOCITY & REPORTING METHODOLOGY

CFD SIMULATED @ 100 km/h

V²-SCALED @ 120 mph

Toyota A90 / A91 Supra GT4+ Aero Package

NATIVE CFD CASE

100 km/h

62.1 mph baseline velocity

Representative >90% of the user cases.

Output: aerodynamic coefficients + force values at 100 km/h.

DYNAMIC PRESSURE SCALING

$$\text{Force} \propto V^2$$

$$F120 = F62.1\times (120 / 62.1)^2$$

$$\approx 3.73\times$$

Assumes CL / CD remain consistent across the normalized speed range.

REPORTING CONDITION

120 mph

193.1 km/h normalized velocity

Chosen 120 mph reporting condition for comparison with common aftermarket aero figures.

Output: normalized downforce / drag loads at 120 mph.

NOTE

CFD was solved at 100 km/h. Forces are scaled to 120 mph using V^2 only, assuming constant aerodynamic coefficients. No additional performance multiplier is applied; relative package gains and L/D remain unchanged.

03 AERODYNAMIC FORCE SUMMARY: GT4+ BASE PACKAGE

At the 120 mph V²-scaled reporting condition, the Base Package generates 384.5 lbf of net downforce.

NET DOWNFORCE

384.5 lbf

120 mph V²-scaled

*Rear-wing evaluation shown at a 0° geometric angle of attack, representing the most common real-world setup.

~ ESTIMATED NET DOWNFORCE AT A NOMINAL 12° REAR-WING SETTING

584.5 lbf

120 mph V²-scaled

**Comparative estimate based on a nominal 12° rear-wing setting to align with the published competitor test configuration. This configuration was not independently solved in CFD.

TOTAL DRAG

265.8 lbf

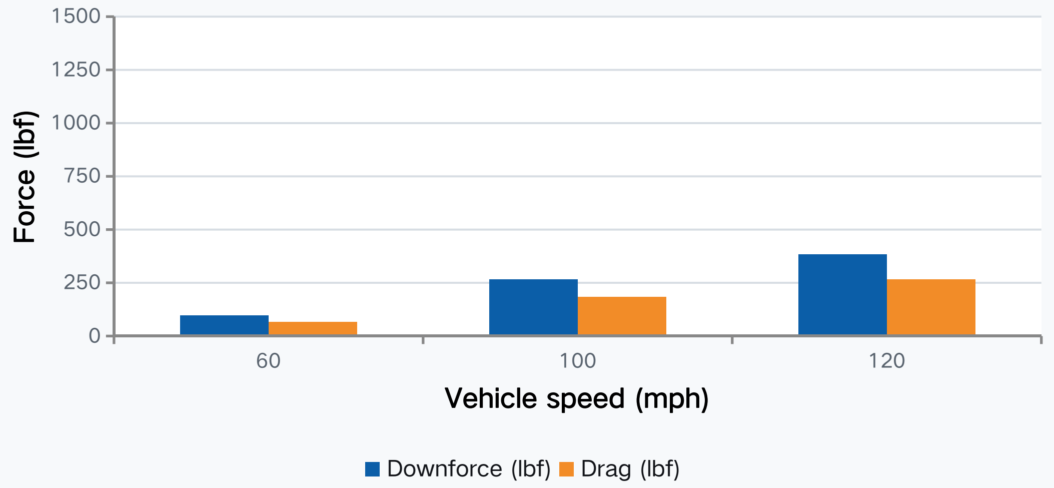
120 mph V²-scaled

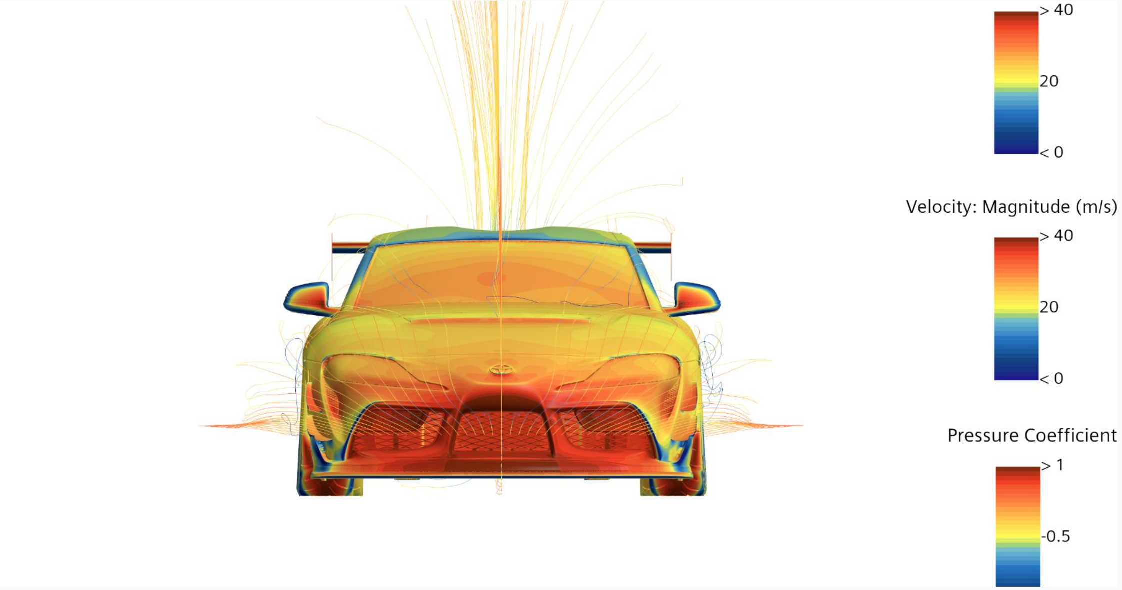
OVERALL L/D

1.45

|L| / D

V²-SCALED FORCE TREND



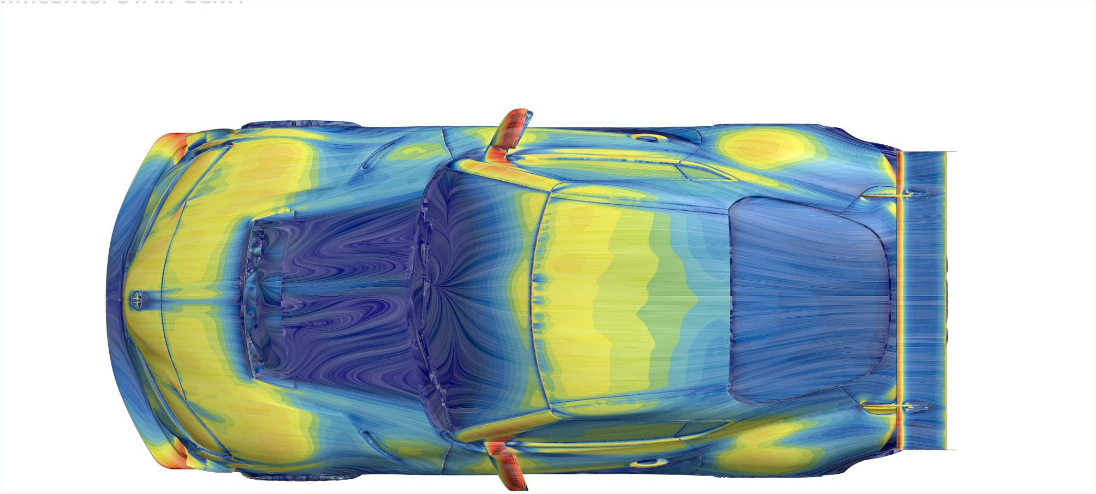


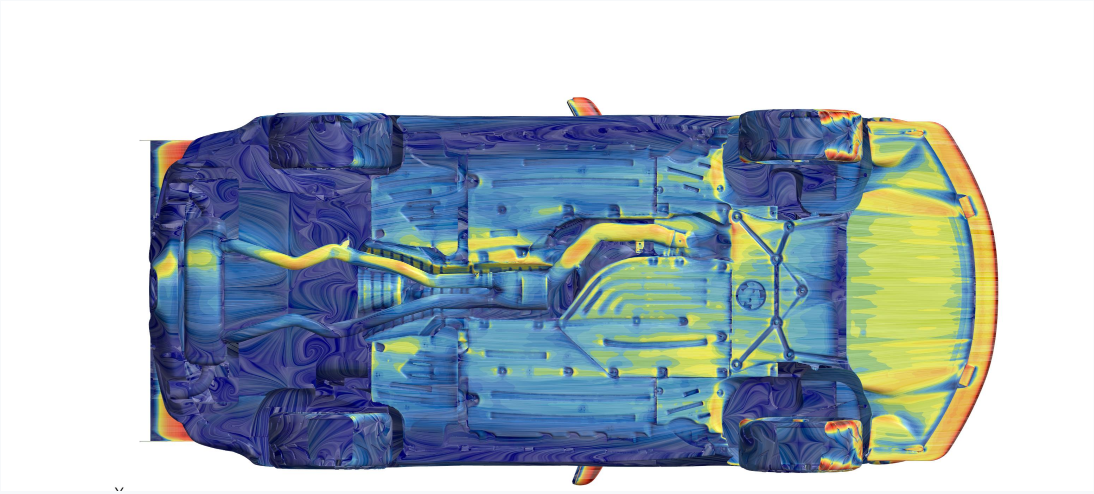
REPORTING BASIS

Values at 60, 100 and 120 mph use V² scaling only, preserving package gains and L/D.

04 UPPER & UNDERBODY FLOW

Roof flow remains broadly attached, while underbody steps, wheel wakes and exposed hardware create measurable energy loss.





UPPER SURFACE

The hood and rear glass carry a moderate boundary layer. A-pillar and mirror wakes create local shear, but major separation is limited.

UNDERBODY PATH

Floor steps, exhaust and suspension geometry form slow-flow pockets and vortices that weaken pressure recovery.

DEVELOPMENT OPPORTUNITY

A smoother floor and properly developed diffuser should improve whole-vehicle efficiency more effectively than relying on rear-wing load alone. This is the clearest opportunity for future underbody development.

05 FRONT SPLITTER PERFORMANCE

At the 120 mph V²-scaled reporting condition, the splitter produces 179.8 lbf of downforce for 33.6 lbf of drag, giving L/D ≈ 5.35.

DOWNFORCE

179.8 lbf

46.8% of vehicle net downforce

DRAG

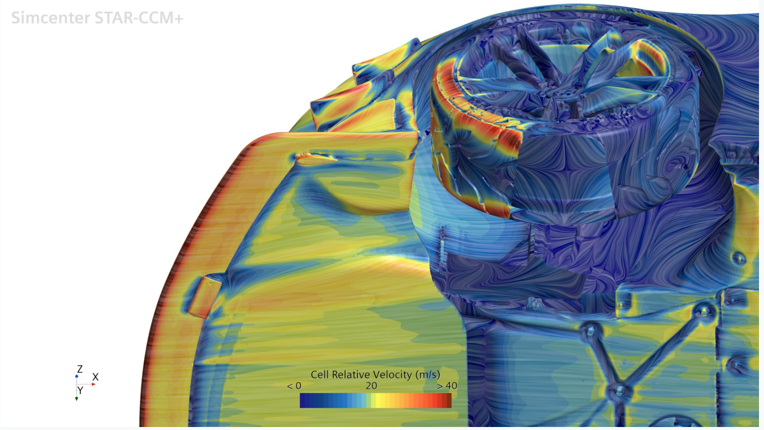
33.6 lbf

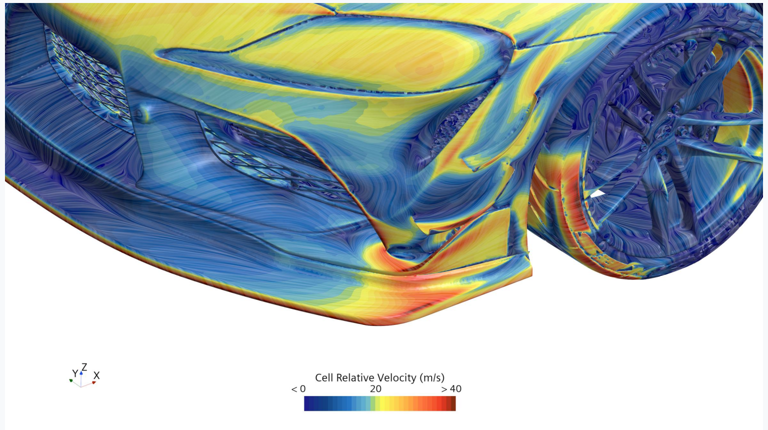
12.7% of vehicle drag

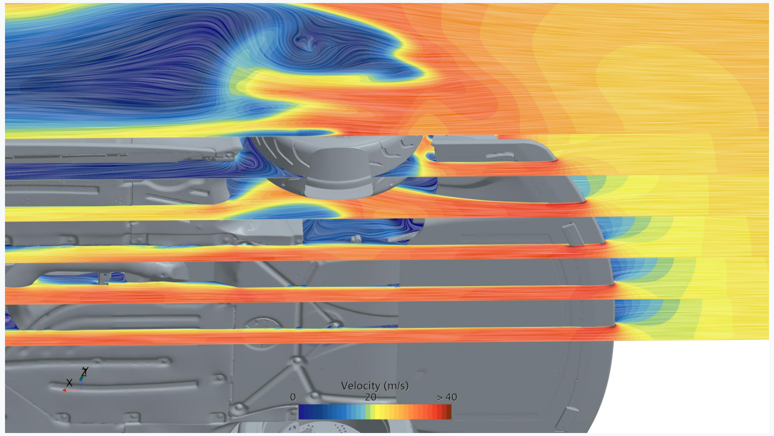
EFFICIENCY

5.35

|L| / D







STRENGTHS

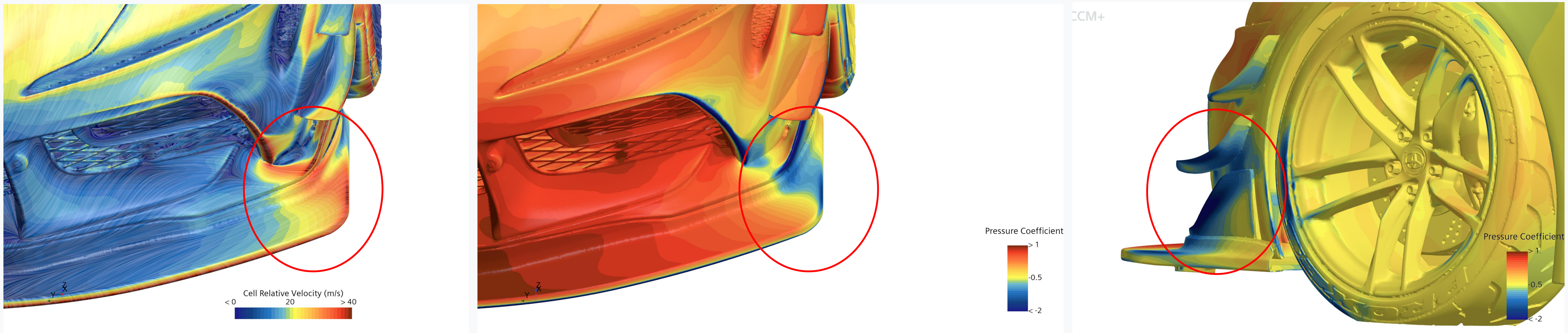
Unlike flat-panel splitter assemblies that rely on universal diffuser elements, the molded RM splitter allows diffuser geometry and local transitions to be developed as one system. The result is a stable low-pressure region beneath the front of the vehicle and broadly uniform surface flow compatible with future underbody development.

LIMITATIONS

The current styling endplates contribute little aerodynamic sealing. Outer-edge spill and local separation reduce load near the splitter shoulders.

06 SPLITTER FLOW DETAILS

High pressure develops across the bumper and leading edge, while the splitter underside and edge-vortex region create local suction.



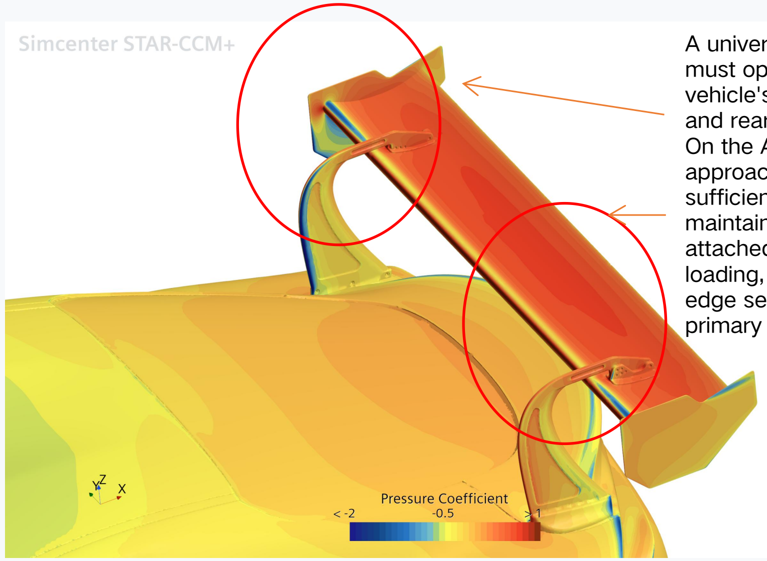
P1/P2 show fast outer-edge spill feeding a detached vortex and a localized low-pressure region; P3 shows stronger suction beneath the lower strake.

The front-tire interaction zone is highly energetic. Endplate-to-tire spacing should be validated under steering input and crosswind.

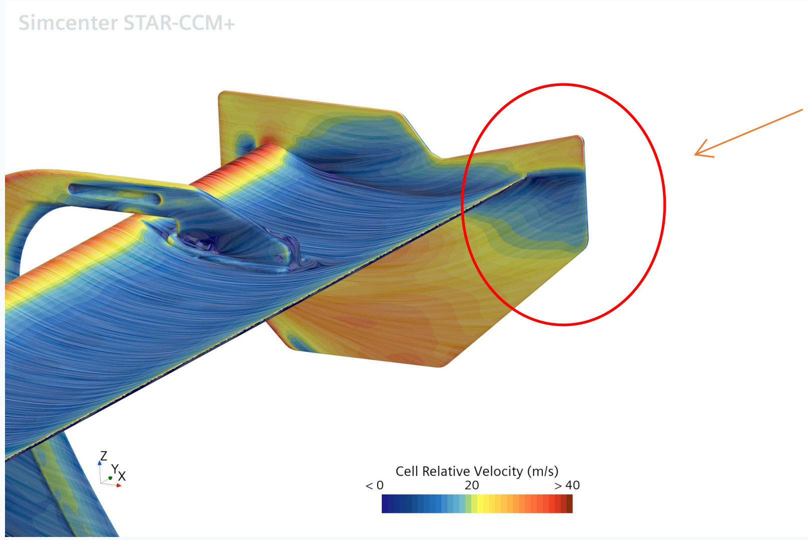
This outer-edge limitation is addressed by the GT4+ EVO splitter endplates; see the EVO splitter section.

07 REAR-WING PRESSURE & TIP FLOW

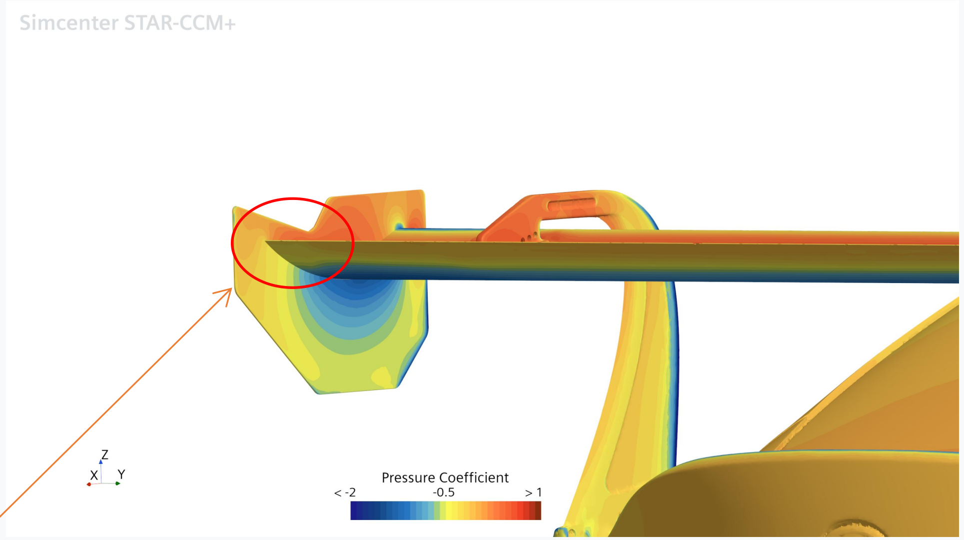
The main plane carries strong suction underneath and positive pressure above; the flat endplate region shows three-dimensional leakage and vortex formation.



A universal mainplane must operate within the vehicle's existing roof and rear-glass flow field. On the A90/A91, the approach flow remains sufficiently clean to maintain broadly attached mainplane loading, with mild trailing-edge separation as the primary local loss.



The flat endplate region exhibits three-dimensional leakage and tip-vortex development. The EVO 3D endplate addresses this area; see the EVO rear-wing section.



REAR-WING CONTRIBUTION

Integrated rear-wing load 230.5 lbf
Rear-wing drag 33.0 lbf
Rear-wing L/D 6.98

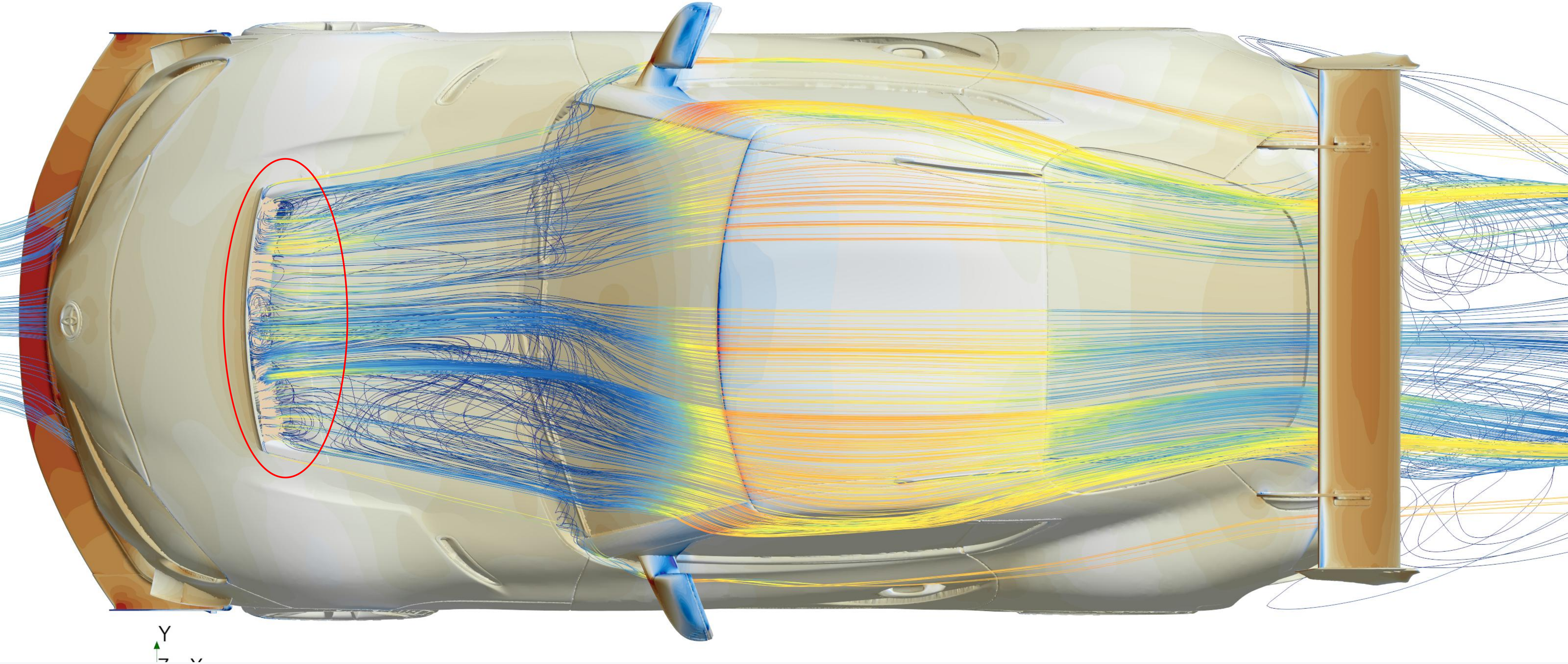
FLOW CHARACTER

Main-plane flow remains broadly attached, with an even underside suction field. The swan-neck mount produces minimal disturbance.

The A90/A91 roof and rear-glass flow deliver a clean approach to the wing. Mild trailing-edge separation remains the principal local loss.

08 HOOD VENT

A recessed outlet and upstream Gurney flap position the RM Hood Vent within a local low-pressure zone, promoting extraction of hot, high-pressure engine-bay air. RM track test has shown practical heat-extraction benefits.



09 BASE PACKAGE CONCLUSIONS

The Base Package delivers a strong street-and-track foundation with 384.5 lbf of V²-scaled net downforce at the 120 mph reporting condition. Identified edge leakage and underbody losses define the EVO development path.

WHOLE VEHICLE

384.5 lbf downforce · 265.8 lbf drag at 120 mph.

FRONT SPLITTER

179.8 lbf downforce · 33.6 lbf drag · L/D ≈ 5.35.

REAR WING

230.5 lbf load · 33.0 lbf drag · L/D 6.98.

RECOMMENDED TEST MATRIX

Ride height ±10 mm · pitch ±1° · yaw 3°/5° · rear-wing angle ±2°.

DEVELOPMENT TARGET

Reduce wake losses and validate high-speed stability on track.

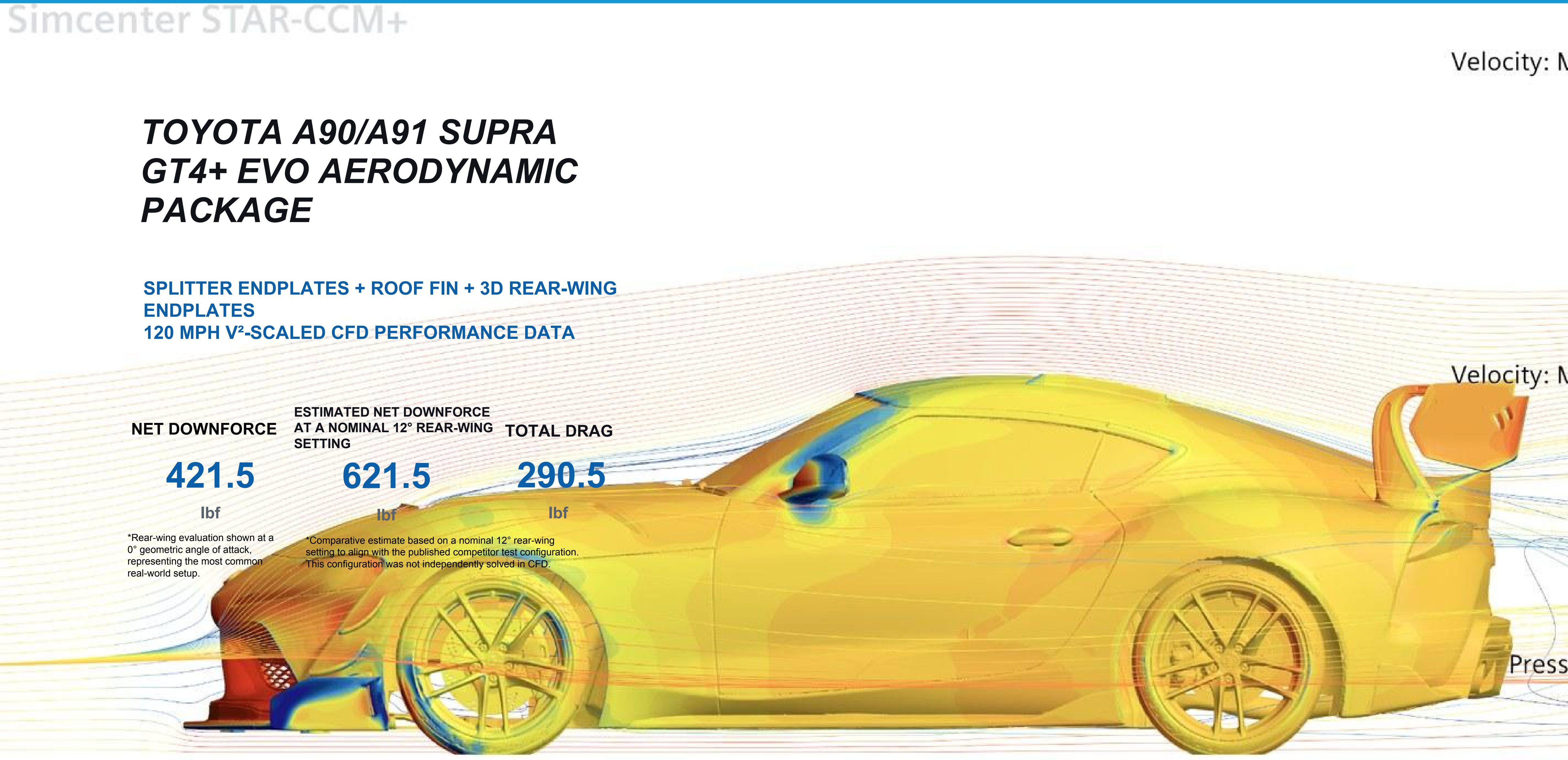
TOYOTA A90/A91 SUPRA GT4+ EVO AERODYNAMIC PACKAGE

SPLITTER ENDPLATES + ROOF FIN + 3D REAR-WING ENDPLATES
120 MPH V²-SCALED CFD PERFORMANCE DATA

NET DOWNFORCE	ESTIMATED NET DOWNFORCE AT A NOMINAL 12° REAR-WING SETTING	TOTAL DRAG
421.5 lbf	**621.5** lbf	**290.5** lbf

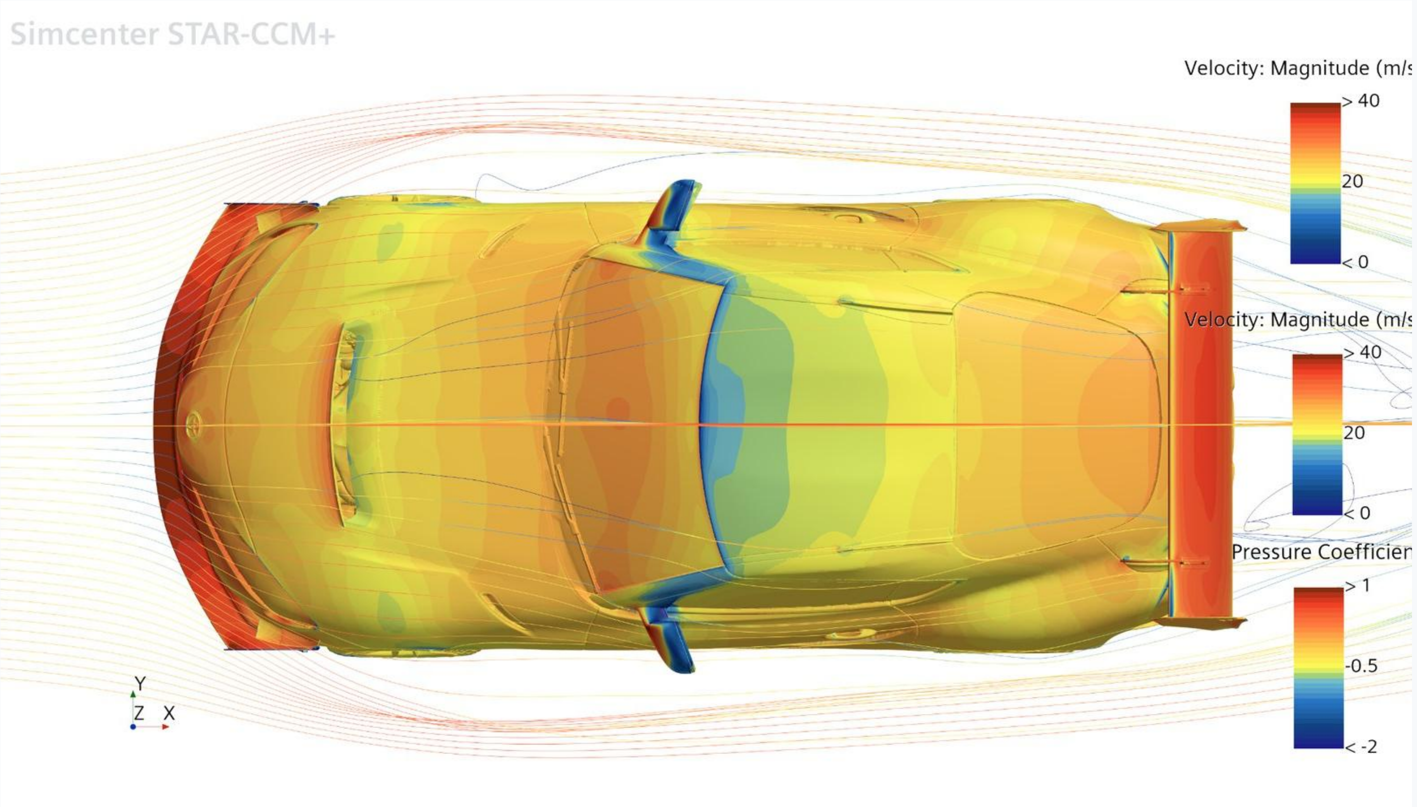
*Rear-wing evaluation shown at a 0° geometric angle of attack, representing the most common real-world setup.

*Comparative estimate based on a nominal 12° rear-wing setting to align with the published competitor test configuration. This configuration was not independently solved in CFD.



01 CFD FOUNDATION & REPORTING BASIS

The 100 km/h CFD solution defines the aerodynamic relationships; 120 mph V²-scaled values provide the common reporting basis.



FULL-VEHICLE STRAIGHT-LINE FLOW & PRESSURE FIELD

ITEM	SETTING
CFD foundation	100 km/h (27.78 m/s)
Primary reporting	120 mph V²-scaled
Speed scaling	$F \propto V^2$
Additional factor	None; V² speed scaling only
Model scope	Full vehicle / straight line
Geometry	Scanned data + simplified engine bay

Forces are V²-scaled directly from the 100 km/h CFD solution to 120 mph, with no additional multiplier. L/D and relative package gains are preserved; track correlation remains a separate validation step.

02 AERODYNAMIC FORCE SUMMARY

At the 120 mph V²-scaled reporting condition, the EVO Package generates 421.5 lbf of net downforce — 37.0 lbf (+9.6%) above Base.

SYSTEM	DOWNFORCE	DRAG	L/D	ASSESSMENT
Whole vehicle	421.5 lbf	290.5 lbf	1.45	Higher load; drag rises proportionally
Rear wing	248.6 lbf	34.9 lbf	7.12	+7.9% load; estimated +2.0%
Front splitter	230.7 lbf	36.1 lbf	6.39	Largest integrated device-load gain

NET DOWNFORCE	TOTAL DRAG	REAR WING	FRONT SPLITTER
421.5	290.5	248.6	230.7
lbf	lbf	lbf downforce	lbf downforce

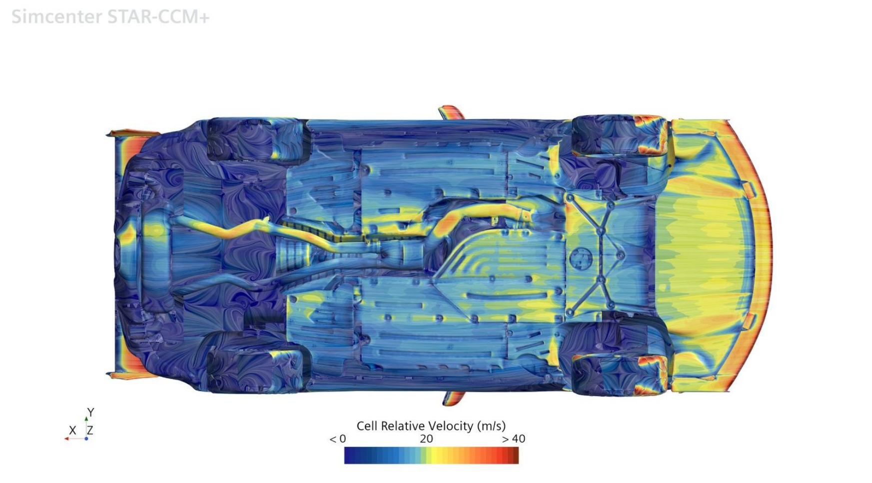
KEY TAKEAWAY: EVO increases net downforce by 9.6% while whole-vehicle L/D remains approximately 1.45. The splitter assembly records the largest integrated load gain. Component rows are selected surface-force groups and are not intended to sum directly to vehicle net downforce.

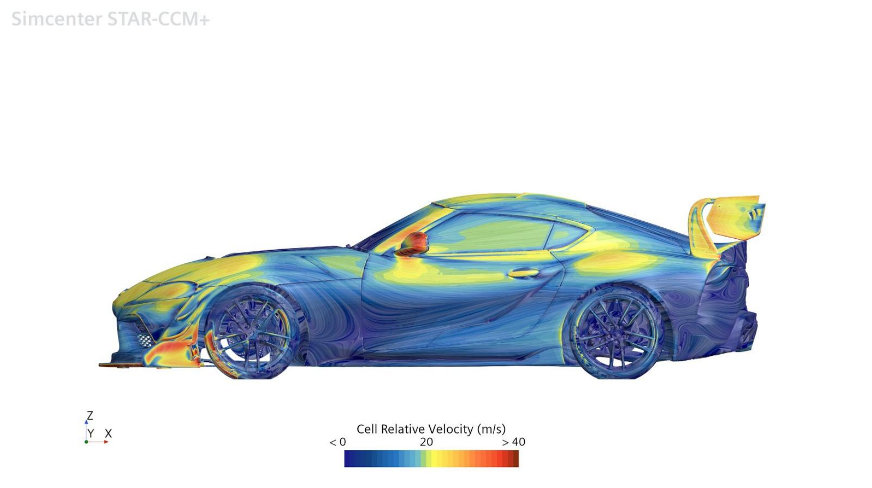
03 BASE vs EVO · 120 MPH V²-SCALED

The matched CFD comparison preserves the original package gains: +9.6% net downforce, +28.3% splitter load and +7.9% rear-wing load.

METRIC	BASE	EVO	DELTA	CHANGE
Total downforce	384.5 lbf	421.5 lbf	+37.0 lbf	+9.6%
Total drag	265.8 lbf	290.5 lbf	+24.7 lbf	+9.3%
Rear-wing load	230.5 lbf	248.6 lbf	+18.1 lbf	+7.9%
Splitter load	179.8 lbf	230.7 lbf	+50.9 lbf	+28.3%
Rear-wing drag	33.0 lbf	34.9 lbf	+1.9 lbf	+5.7%
Splitter drag	33.6 lbf	36.1 lbf	+2.5 lbf	+7.3%

Whole-vehicle drag rises 9.3%, closely tracking the 9.6% gain in net downforce; overall L/D remains approximately 1.45. Selected component rows are surface-force groups and do not sum directly to vehicle net load. Remaining body, underbody and wheel surfaces contribute the balance, including interaction-driven changes between configurations.

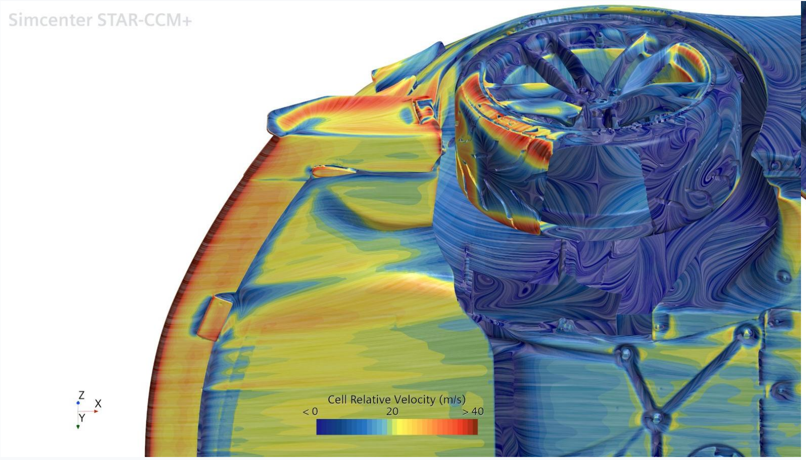


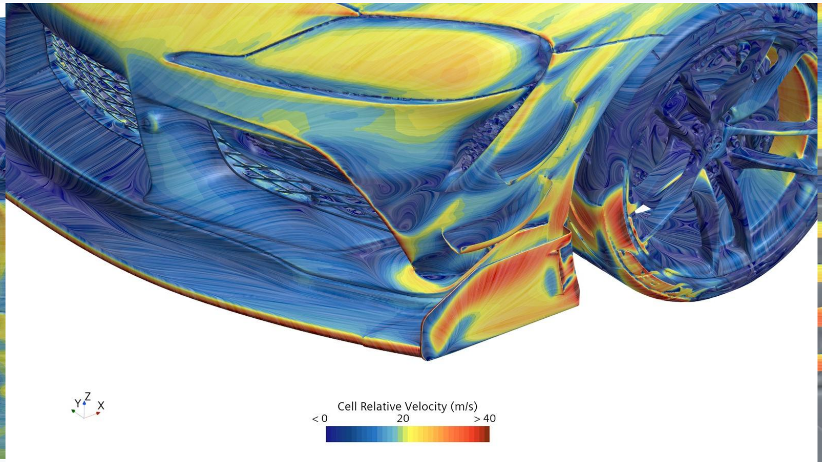


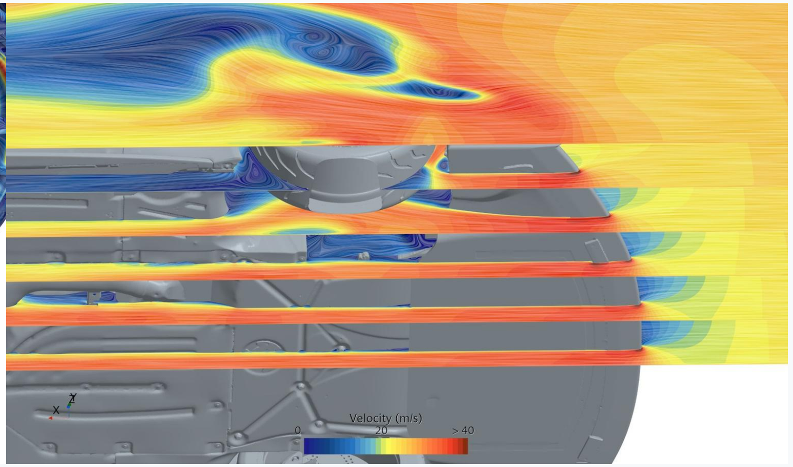
Upper-surface and underbody relative-velocity fields

04 SPLITTER ENDPLATE PERFORMANCE

Within the matched Base/EVO comparison, integrated splitter-assembly load rises from 179.8 to 230.7 lbf (+28.3%), while L/D improves from 5.35 to 6.39.







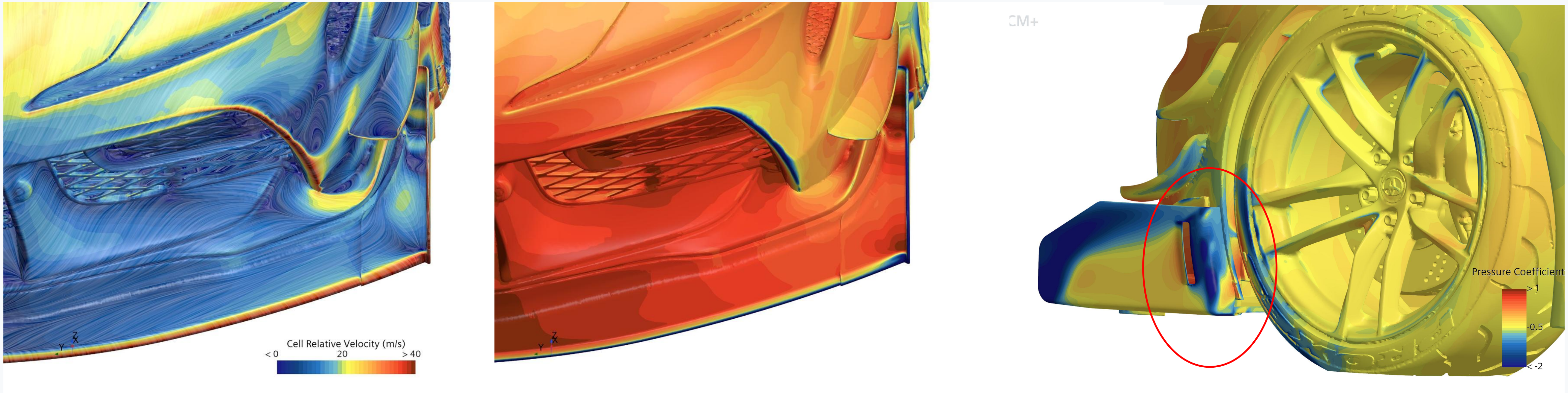
SPLITTER METRIC	BASE	EVO	CHANGE
Downforce	179.8 lbf	230.7 lbf	+50.9 lbf
Drag	33.6 lbf	36.1 lbf	+2.5 lbf
L/D	5.35	6.39	+19.4%

The largest integrated device-level gain occurs at the front splitter assembly. The contoured endplates help retain the outer-edge low-pressure region and work with the molded diffuser geometry.

Because the EVO package includes concurrent hardware changes, the result is reported for the integrated splitter force group. Track setup should account for the added front load through rear-wing angle, ride height and chassis tuning.

05 SPLITTER PRESSURE & LOCAL FLOW

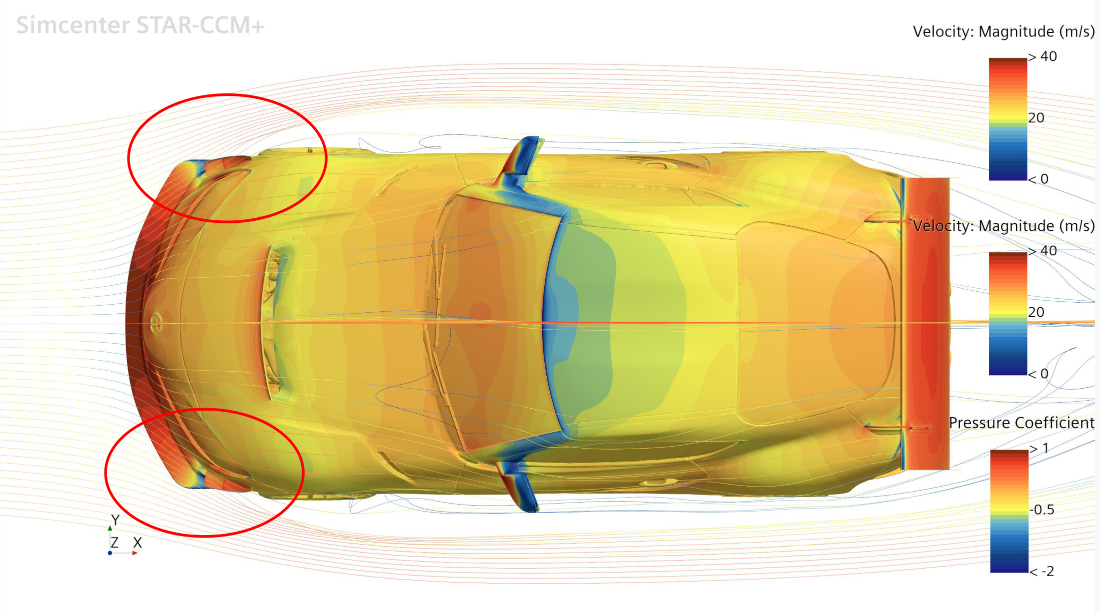
The CFD pressure and velocity fields are consistent with stronger outer-edge sealing in the EVO splitter configuration.

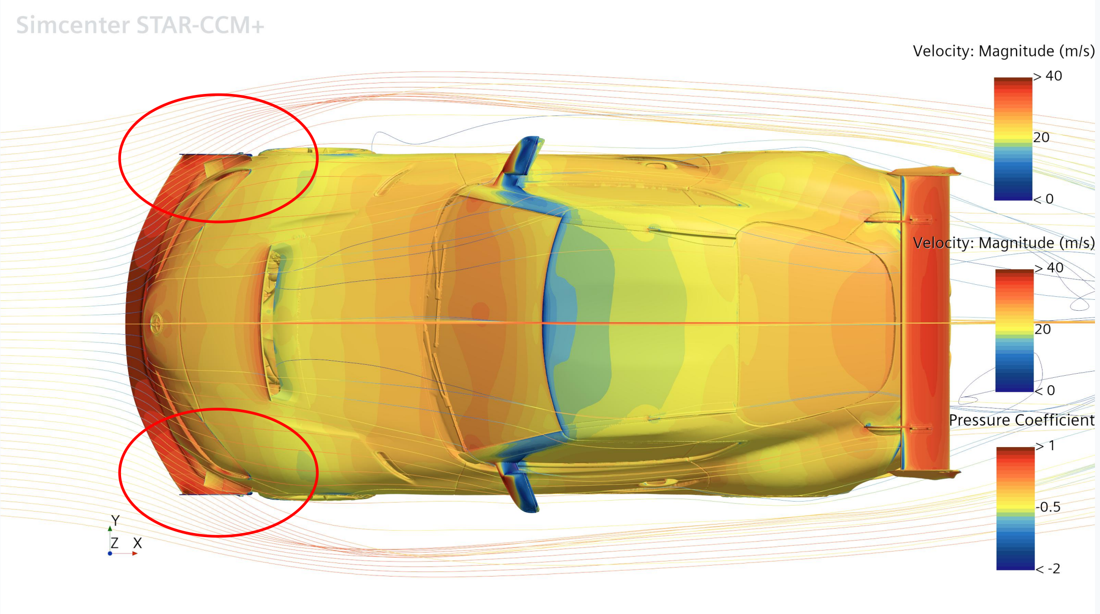


The local pressure field shows a concentrated low-pressure region along the outer splitter edge, consistent with reduced lateral pressure equalization and stronger aerodynamic loading. The resulting pressure gradient also supports the local diffuser geometry near the front-wheel region.

05 SPLITTER PRESSURE BASE VS EVO

The CFD pressure and velocity fields are consistent with stronger outer-edge sealing in the EVO splitter configuration.

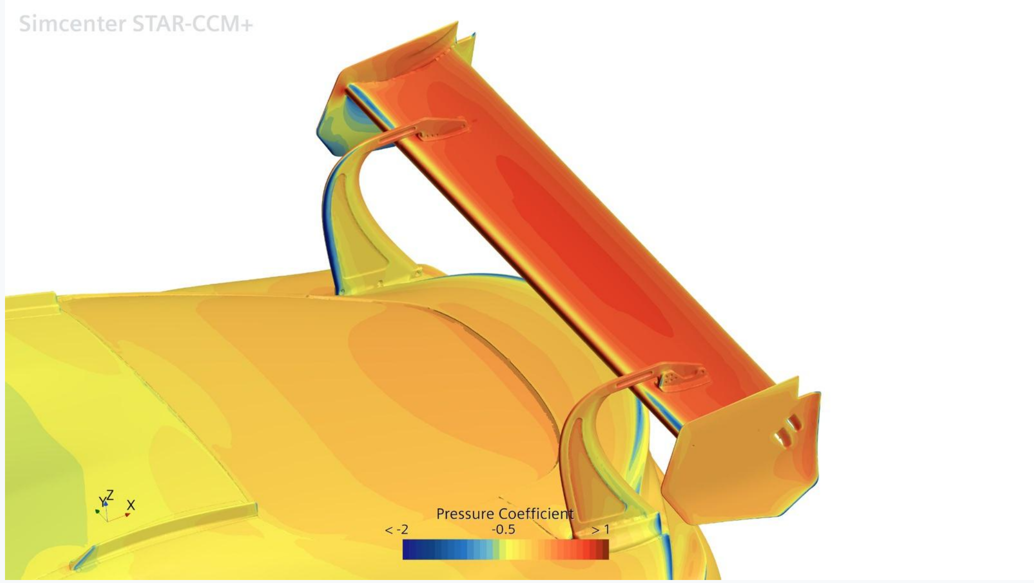




The local pressure field shows a concentrated low-pressure region along the outer splitter edge, consistent with reduced lateral pressure equalization and stronger aerodynamic loading. The resulting pressure gradient also supports the local diffuser geometry near the front-wheel region.

06 EVO REAR-WING SYSTEM PERFORMANCE

In the complete EVO configuration, rear-wing load rises 7.9% while rear-wing drag rises 5.7%, improving rear-wing L/D from 6.98 to 7.12.

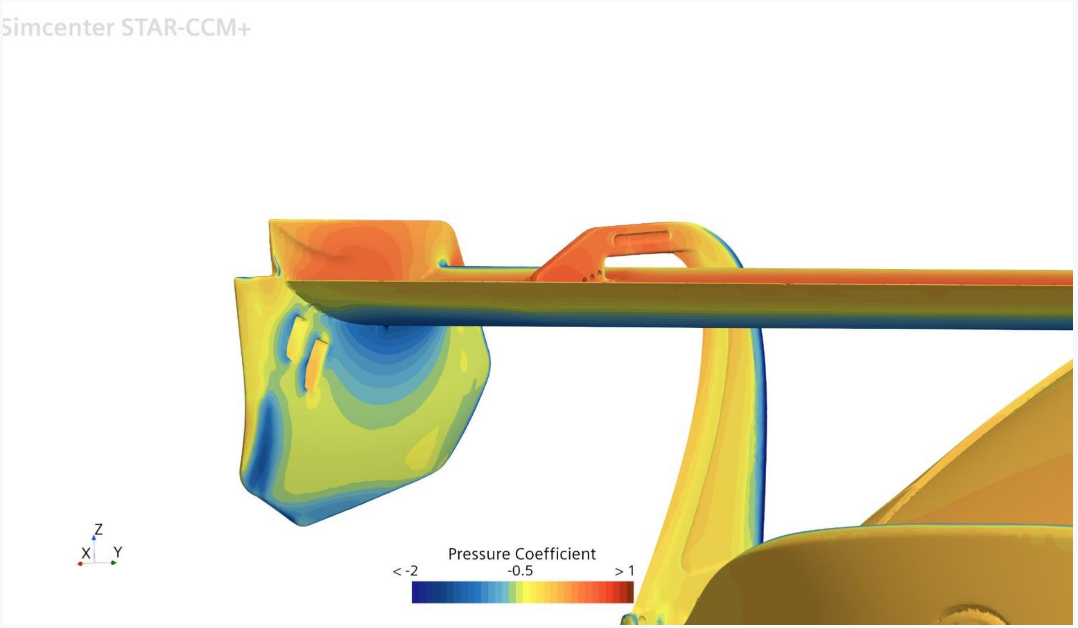


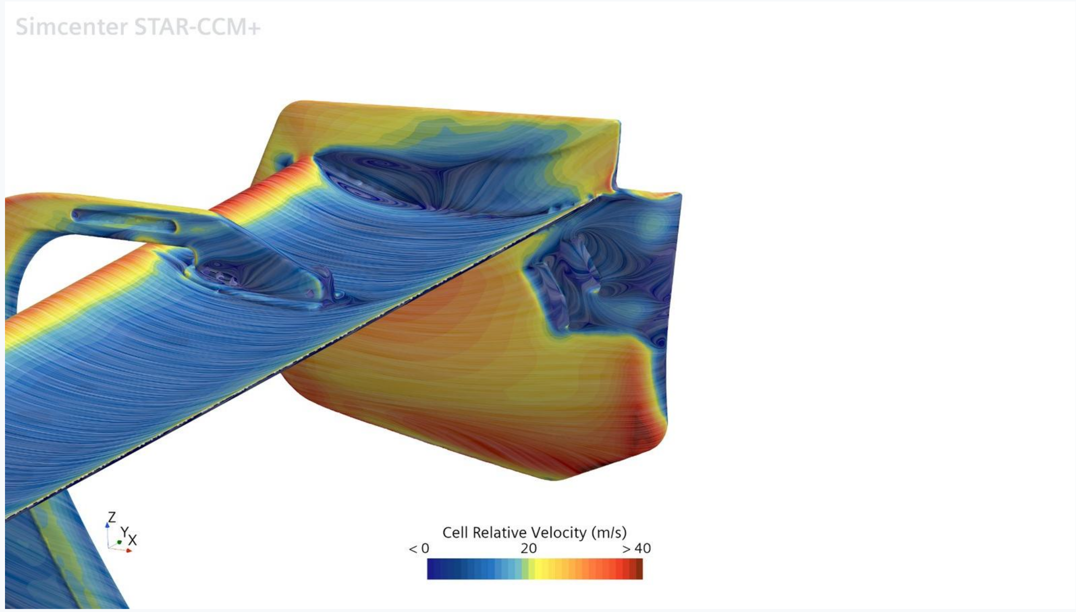
WING METRIC	BASE CONFIG.	EVO CONFIG.	CHANGE
Integrated rear-wing load	230.5 lbf	248.6 lbf	+18.1 lbf (+7.9%)
Rear-wing drag	33.0 lbf	34.9 lbf	+1.9 lbf (+5.7%)
Rear-wing L/D	6.98	7.12	+2.0%

COMPLETE-PACKAGE RESULT: +7.9% rear-wing load for +5.7% drag, yielding a 2.0% improvement in rear-wing L/D. Balance the added rear load through wing angle and chassis setup.

The contoured 3D endplates improve wingtip pressure retention and usable outboard loading. Reported force changes reflect the complete EVO configuration; the isolated contribution of the endplates has not been separated from roof-fin and package-interaction effects.

07 3D ENDPLATE LOCAL FLOW





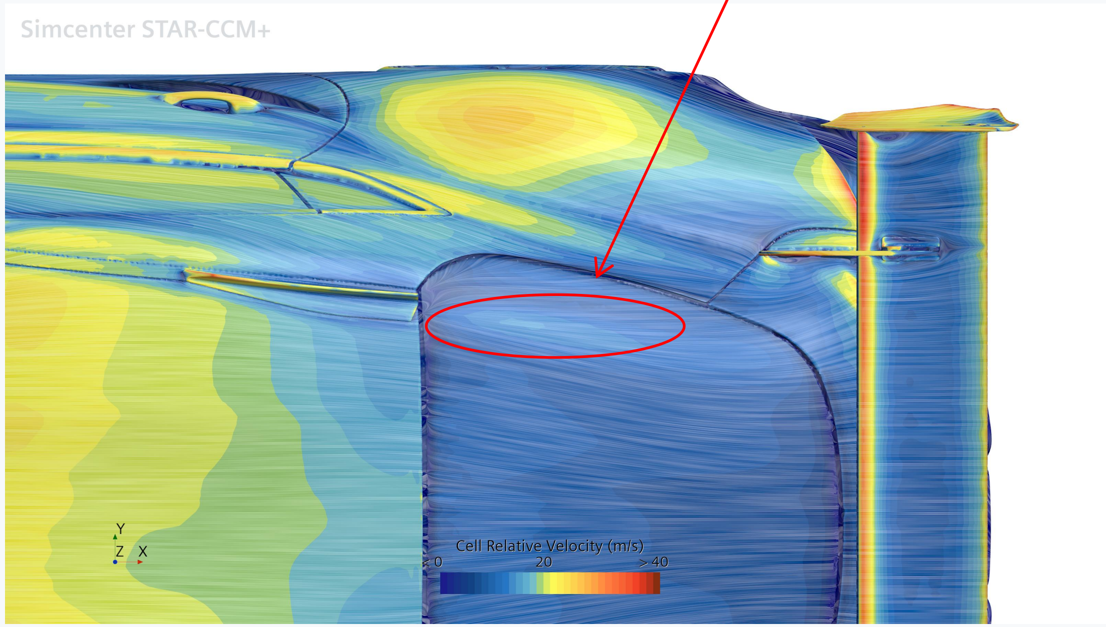
SALES TAKEAWAY — The 3D endplate keeps the outboard mainplane aerodynamically loaded and contains tip flow within the endplate's influence.

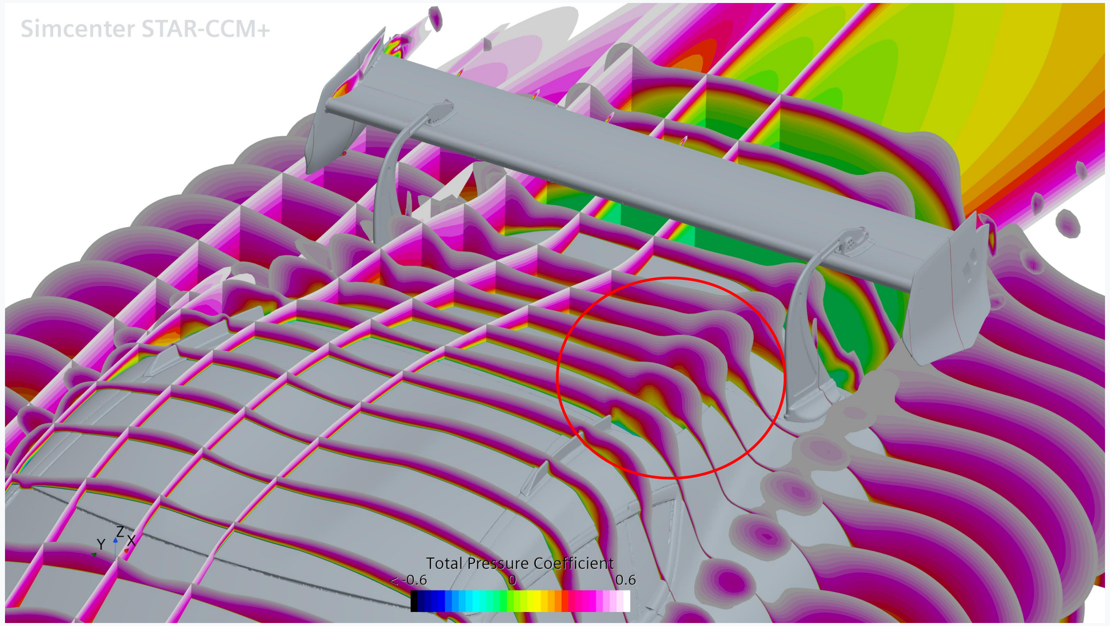
CFD EVIDENCE — Concentrated suction beneath the wingtip and coherent near-wall streamlines support improved pressure retention, reduced pressure equalization and better effective-span utilization. These fields support, but do not independently isolate, the complete-package rear-wing load gain.

08 ROOF FIN

The roof fin is designed to organize centerline roof flow and improve flow consistency approaching the rear wing. Yaw robustness remains a track-correlation target.

The surface-relative-velocity field identifies a lower-velocity boundary-layer region over the rear glass ahead of the rear wing. Positioned along the vehicle centerline, the GT4+ Roof Fin is designed to organize roof flow and limit lateral crossflow as air approaches the rear-wing system, particularly under yaw.

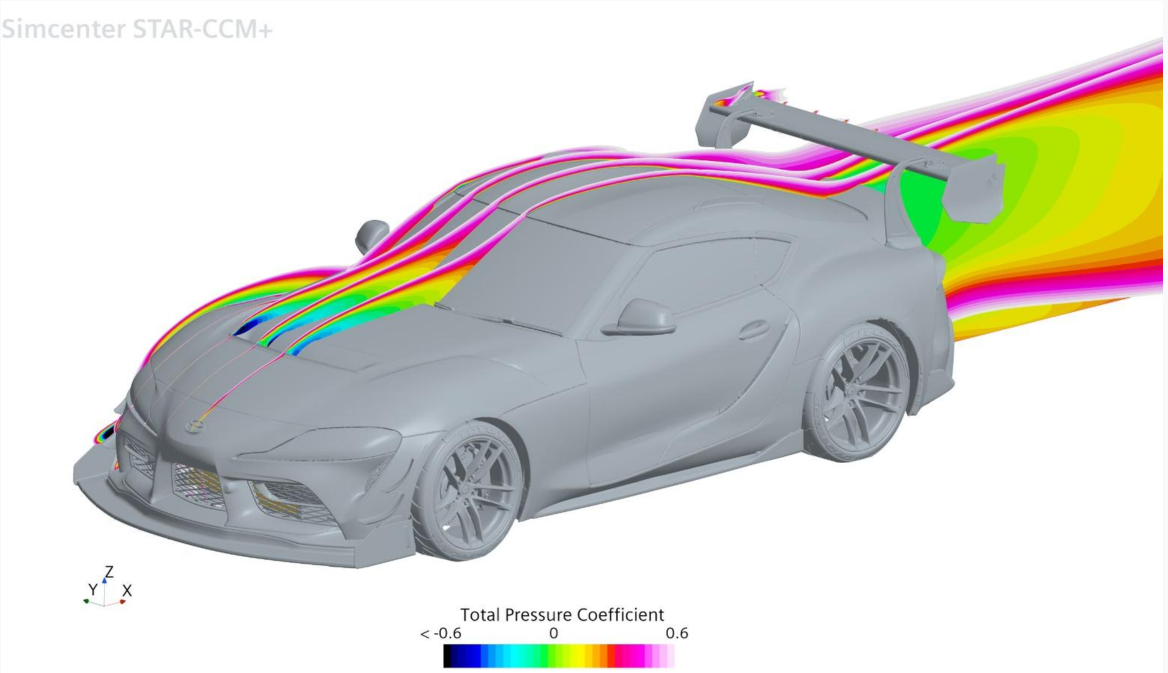




DESIGN INTENT — The roof fin organizes centerline roof flow and supports a more consistent approach to the rear wing. Its primary benefit is expected under yaw; track correlation remains the validation target.

09 EVO PACKAGE CONCLUSIONS

The EVO configuration adds measurable load while preserving whole-vehicle aerodynamic efficiency.



421.5 lbf net downforce at the 120 mph V²-scaled reporting condition — 37.0 lbf (+9.6%) above Base.

Splitter assembly: +50.9 lbf (+28.3%), with L/D improving from 5.35 to 6.39.

Rear-wing system: +7.9% load, +5.7% drag and L/D improving from 6.98 to 7.12.

Whole-vehicle drag: +9.3%, with overall L/D remaining approximately 1.45.

OVERALL ASSESSMENT: The EVO package delivers its largest integrated device-level gain at the front splitter while adding usable rear-wing load and retaining whole-vehicle efficiency.