RM ENGINEERING G87 M2 GT4+

AERODYNAMIC INFORMATION PACKET

120 MPH V²-SCALED PERFORMANCE

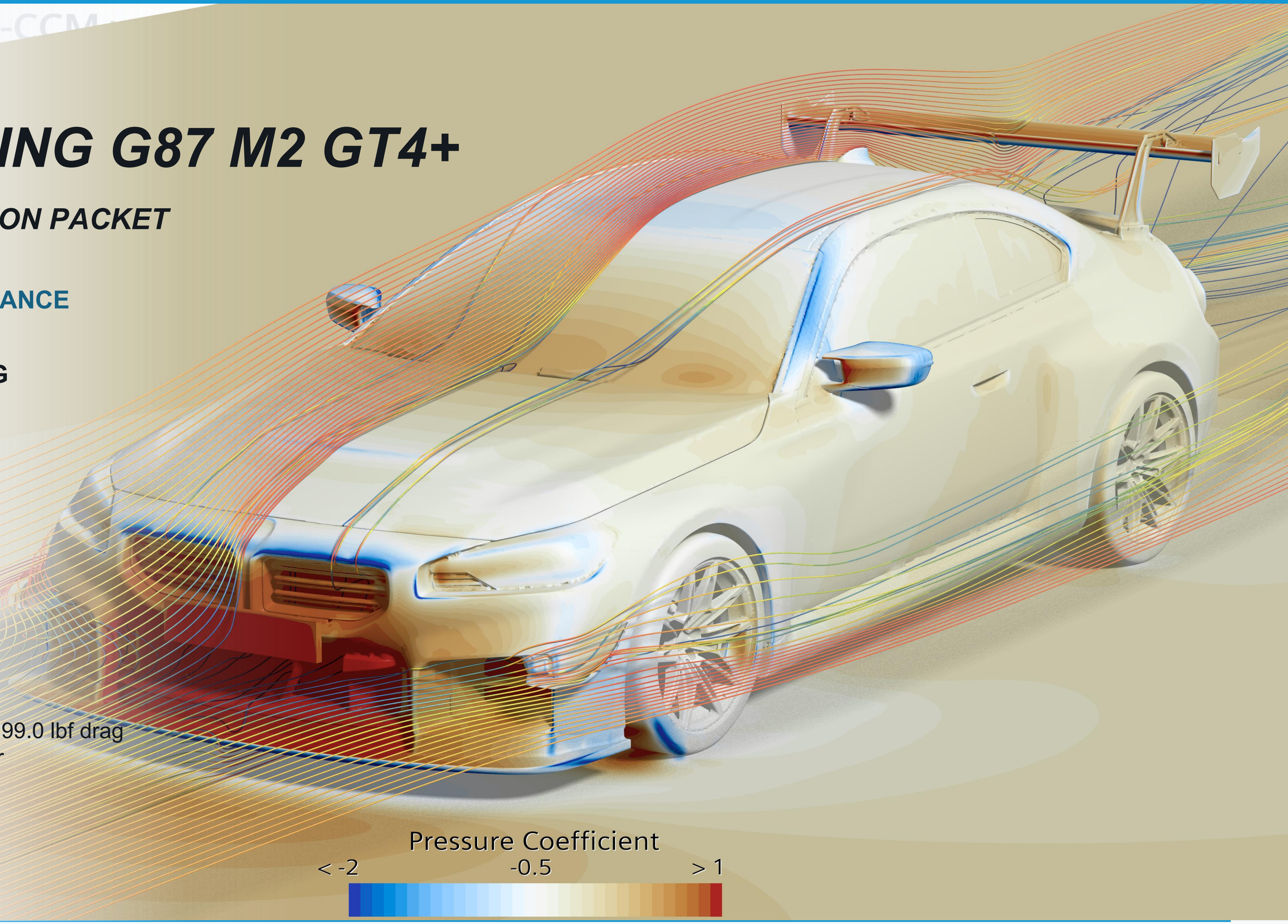
FRONT SPLITTER + REAR WING
Wing position 2

NET DOWNFORCE

489.2

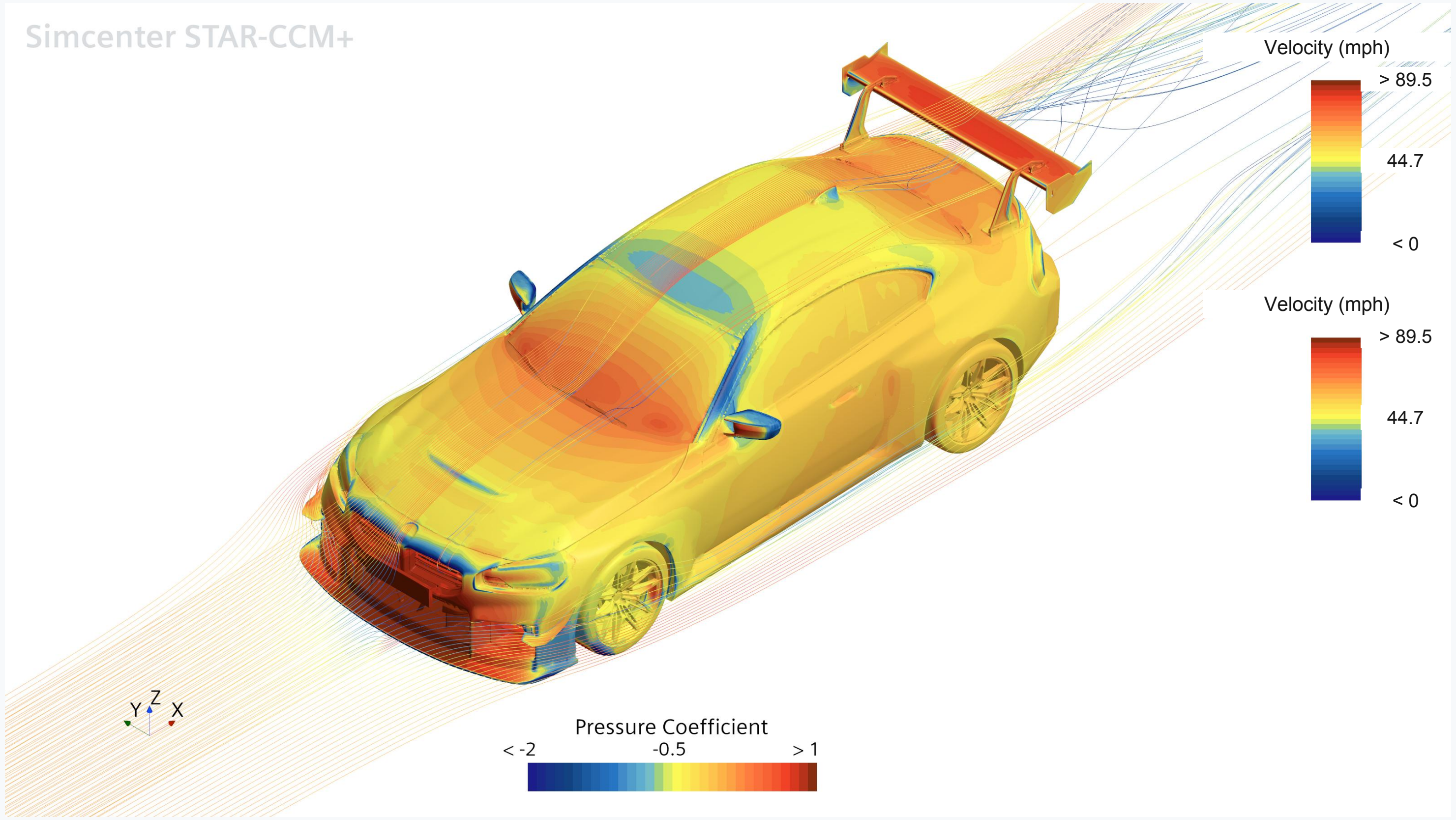
lbf at 120 mph (V²-scaled)

62.14 mph CFD: 131.2 lbf downforce / 99.0 lbf drag
Aero balance: 48.5% front / 51.5% rear



01 CFD METHOD & SCOPE

Full-vehicle straight-line analysis at 62.14 mph, with the rear wing in position 2.



ITEM	M2 CASE
Native velocity	62.14 mph (91.13 ft/s)
Model scope	Full vehicle / straight line
Rear-wing setting	Position 2
Force convention	Downforce shown positive
Reported systems	Vehicle, splitter, rear wing

The M2 case specifies wing position 2. Its geometric angle is not defined.

CFD EVIDENCE

Velocity, pressure coefficient, surface-relative velocity and total-pressure fields support the integrated force results.

The M2 source does not document the turbulence model, mesh count or y+.

02 CFD SPEED & REPORTING BASIS

The CFD solution is at 62.14 mph. Loads are normalized to 120 mph using speed-squared scaling.

NATIVE CFD CASE

Native solution
62.14 mph

Full-vehicle CFD force results.

DYNAMIC PRESSURE SCALING

Force $\propto V^2$
$(120 / 62.13712)^2$

Speed multiplier: 3.7296×

REPORTING CONDITION

120 mph
Scaled condition

Scaled loads reported in lbf.

F at 120 mph [lbf] = F at 62.14 mph [lbf] × 3.729583

SCALING ASSUMPTION

Scaling assumes unchanged aerodynamic coefficients, air density and vehicle attitude. L/D and aerodynamic balance remain constant. The 120 mph condition was not independently simulated.

03 AERODYNAMIC FORCE SUMMARY

At 120 mph V²-scaled, the M2 generates 489.2 lbf of net downforce with 369.2 lbf of drag.

SYSTEM	62.14 mph DOWNFORCE	62.14 mph DRAG	120 mph DOWNFORCE	120 mph DRAG	L/D
Whole vehicle	131.2 lbf	99.0 lbf	489.2 lbf	369.2 lbf	1.33
Front splitter	41.0 lbf	7.1 lbf	152.9 lbf	26.3 lbf	5.81
Rear wing	65.7 lbf	3.3 lbf	245.0 lbf	12.3 lbf	19.87

NET DOWNFORCE

489.2

lbf / 120 mph V²-scaled

TOTAL DRAG

369.2

lbf / 120 mph V²-scaled

FRONT / REAR

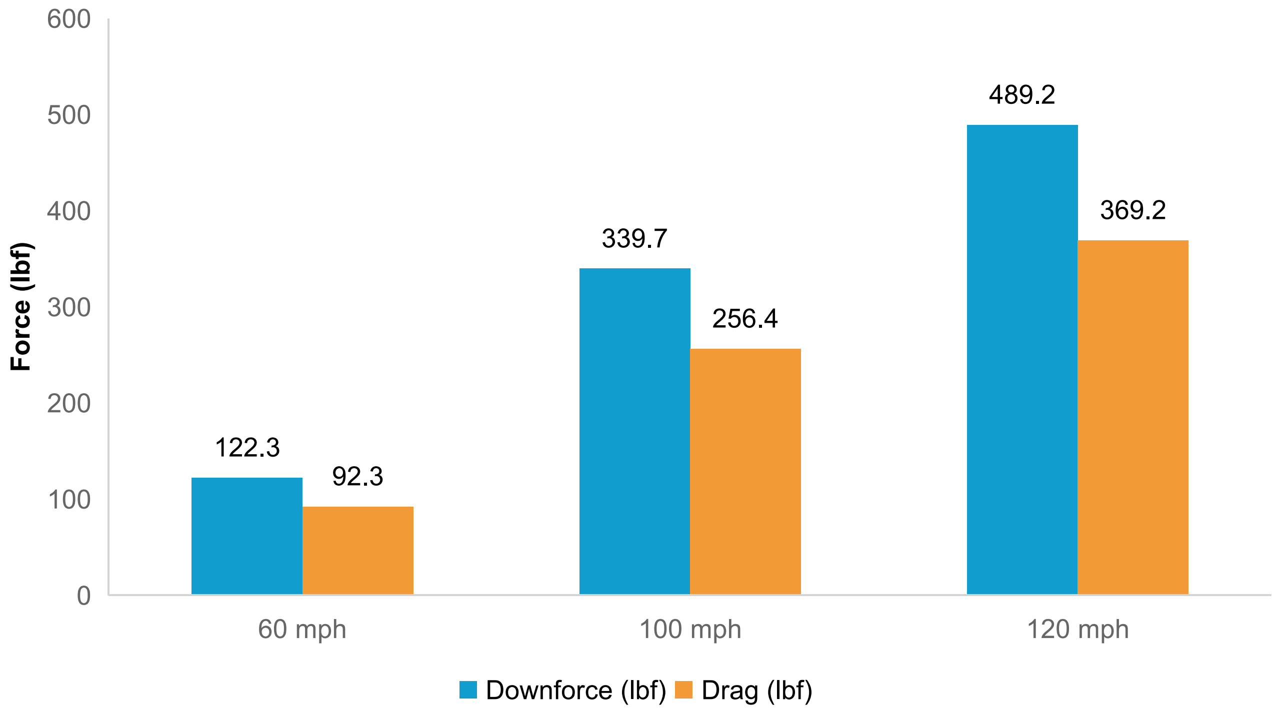
48.5 / 51.5

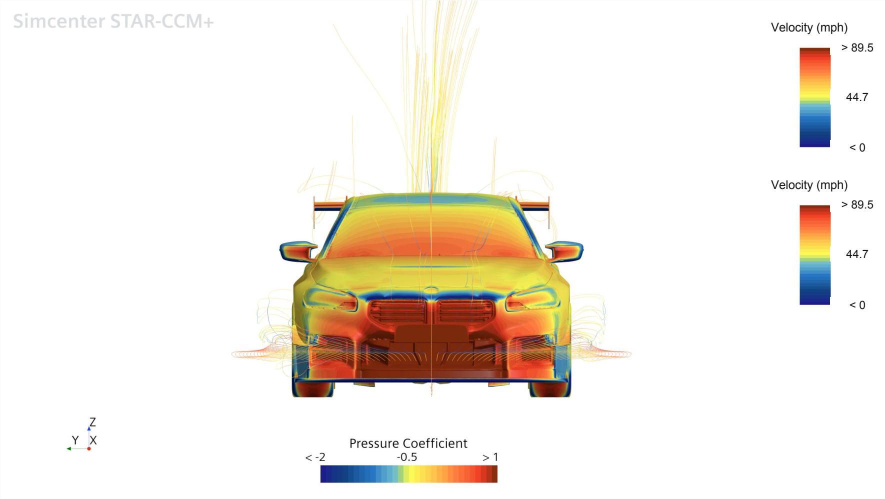
% of total aerodynamic load

L/D uses positive downforce divided by global X-direction drag. The installed rear-wing ratio is specific to the M2 flow field.

04 V²-SCALED FORCE TREND

Downforce and drag follow the same V² scaling, keeping whole-vehicle L/D at 1.33.





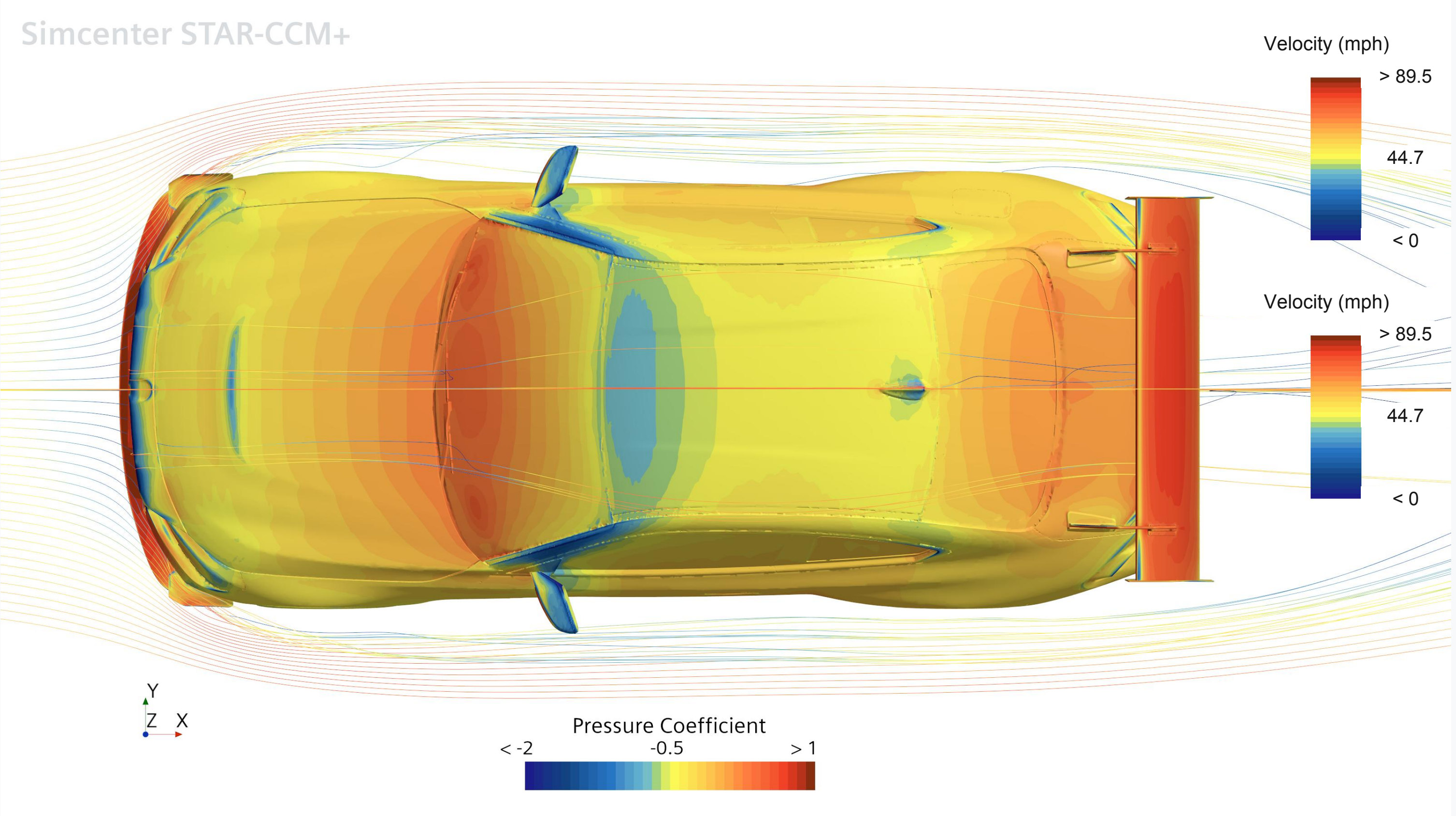
Front-view pressure and velocity
62.14 mph CFD

REPORTING BASIS

All plotted values scale from the 62.14 mph CFD case. Changes in ride height, pitch or flow separation at higher speeds are outside this estimate.

05 UPPER-BODY FLOW

The upper flow remains continuous overall, with local disturbances around the A-pillars, mirrors and rear body.



UPPER SURFACE

The hood and roof show accelerated flow. A-pillars and mirrors introduce local wakes and three-dimensional disturbances.

DEVELOPMENT FOCUS

Assess body-flow losses and sensitivity to vehicle attitude when developing the next setup.

06 FRONT SPLITTER PERFORMANCE

At 120 mph V²-scaled, the splitter produces 152.9 lbf of downforce and 26.3 lbf of drag, with L/D ≈ 5.81.

DOWNFORCE

152.9

lbf scaled / 41.0 lbf at 62.14 mph

DRAG

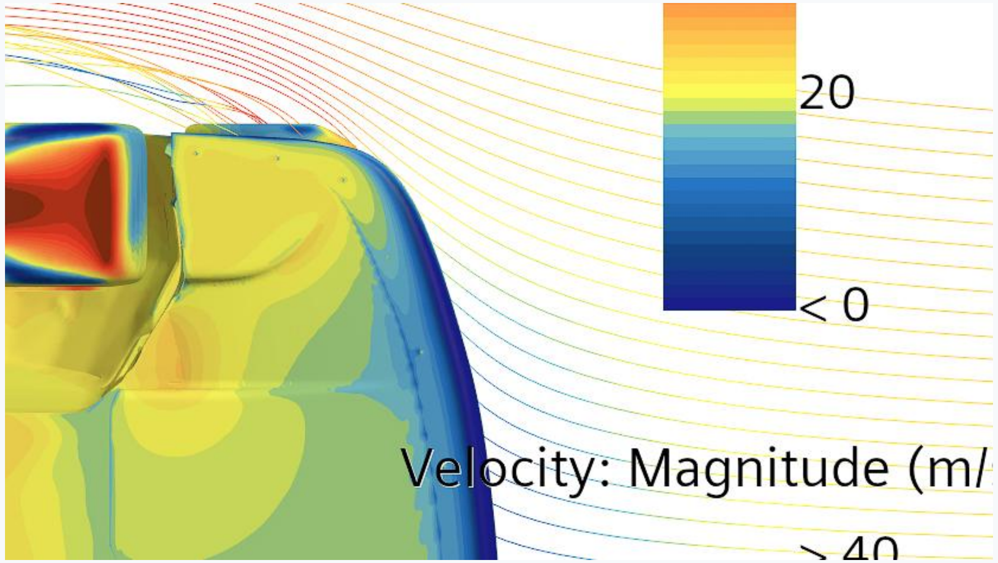
26.3

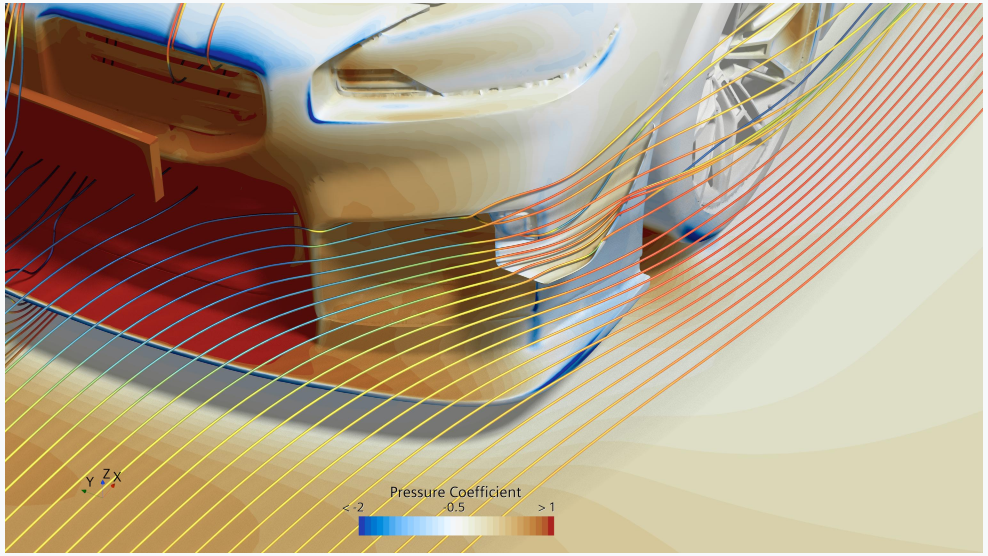
lbf scaled / 7.1 lbf at 62.14 mph

EFFICIENCY

5.81

31.3% of vehicle net downforce





PRESSURE DIFFERENCE

High pressure at the leading region combines with underside suction and accelerated edge flow to generate downforce.

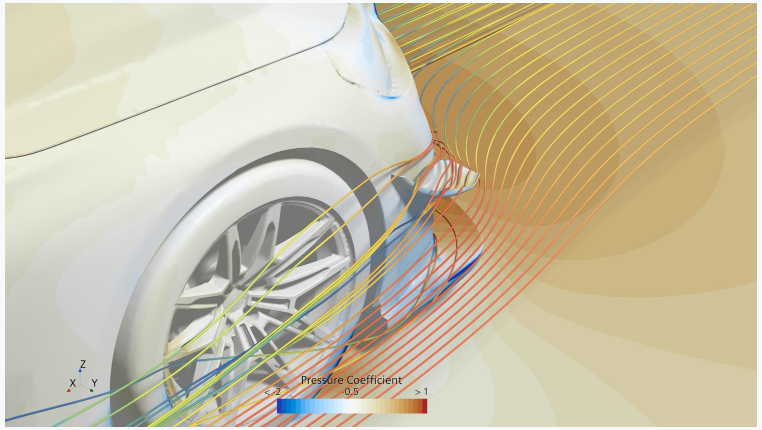
SETUP IMPLICATION

The splitter adds front load. Validate its sensitivity to ground clearance and braking pitch.

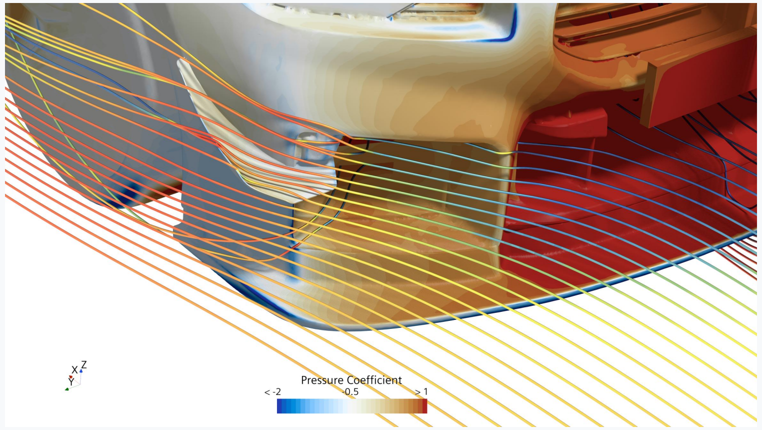
07 SPLITTER FLOW DETAILS

These local views show the splitter edge, front-wheel interaction and underside flow.

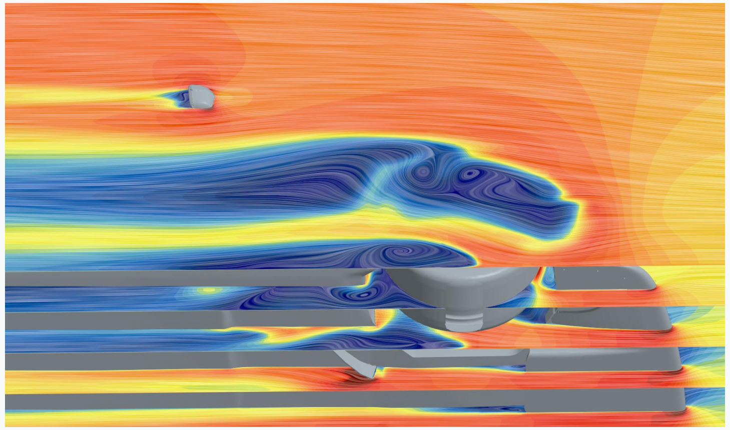
FRONT-WHEEL INTERACTION



LEADING EDGE & SIDE REGION



SPLITTER UNDERSIDE



LOCAL FLOW OBSERVATION

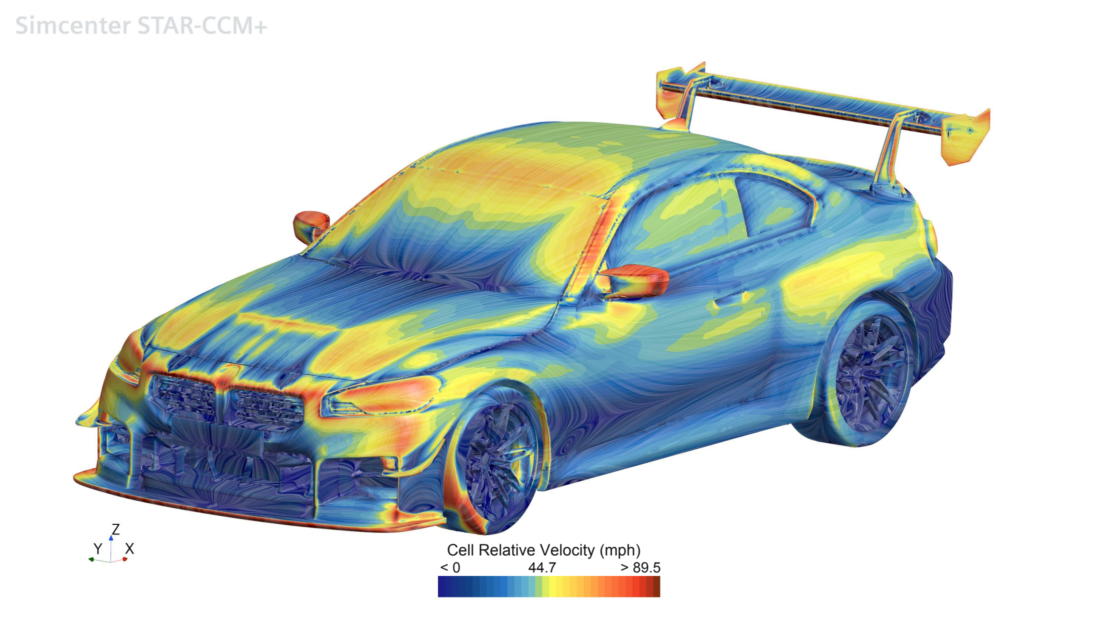
Flow turns around the outer edge and interacts with the front wheel. The underside low-pressure field supports the integrated downforce result.

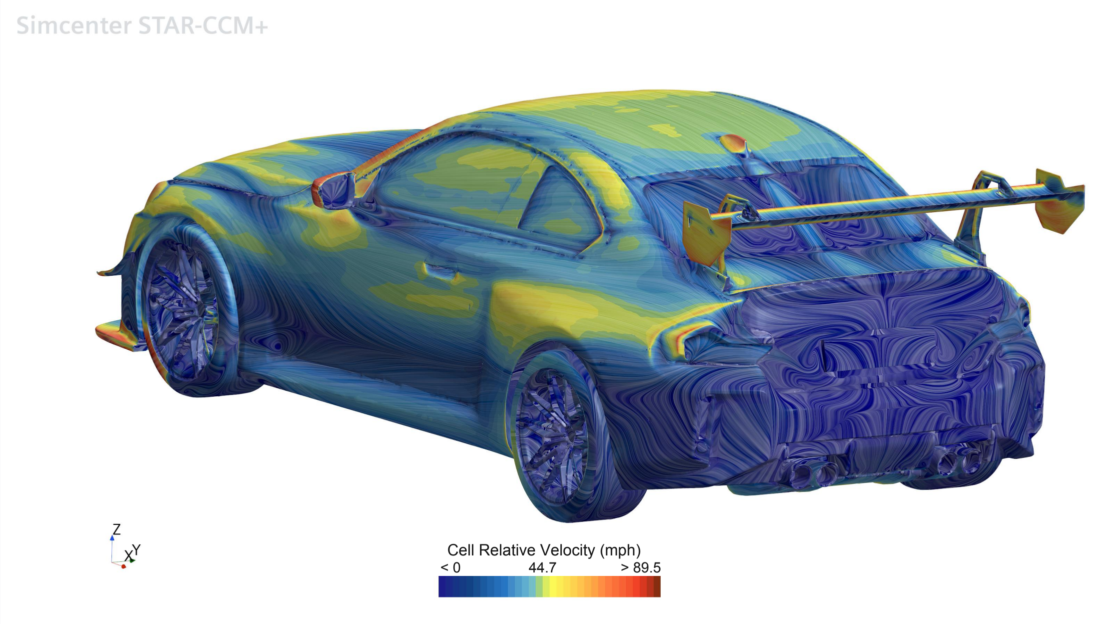
VALIDATION PRIORITY

Validate this interaction under steering, yaw and reduced ground clearance. The current CFD case covers straight-line flow.

08 SURFACE FLOW & REAR GLASS

Surface-relative velocity highlights accelerated regions and slower flow over the rear glass and rear body.





FRONT BODY & ROOF

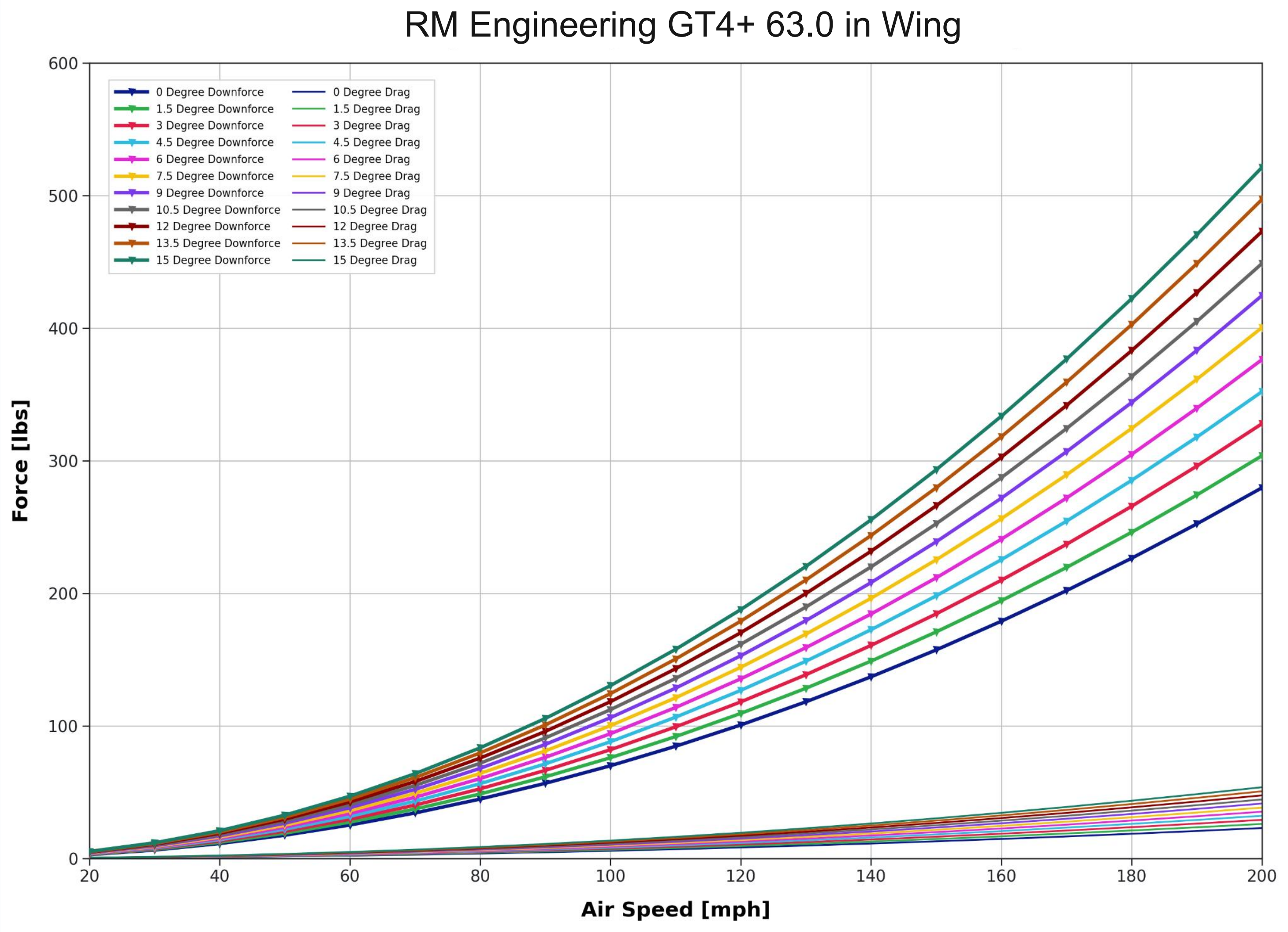
The hood leading edge and roof show acceleration, while the front corners exhibit local separation and flow loss.

REAR GLASS & WING APPROACH

Rear-glass separation reduces downwash relative to the glass slope. The resulting local inflow influences rear-wing performance.

09 GT4+ WING: ISOLATED CFD REFERENCE

The 63.0 in wing curves show isolated-wing behavior across speed and angle of attack.



STANDARD WING ADJUSTMENT

Five settings span 0° to 6° in 1.5° increments. The supplied wing guidance recommends 3° or less for aerodynamic efficiency.

HOW TO READ THE CURVES

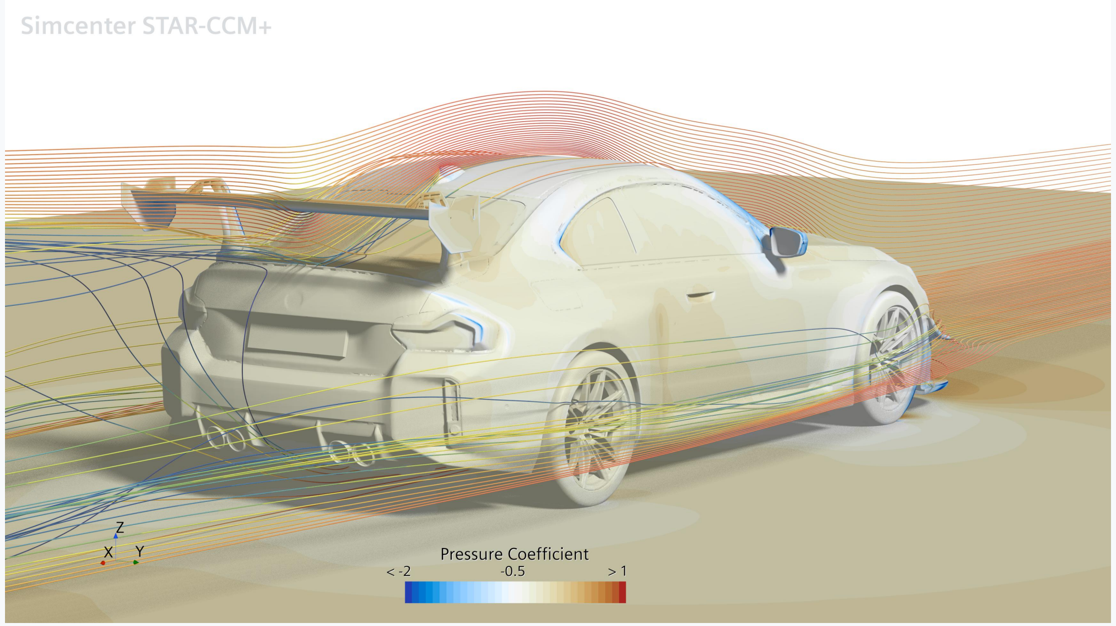
The plotted study extends to 15°. These additional curves are not extra standard adjustment positions.

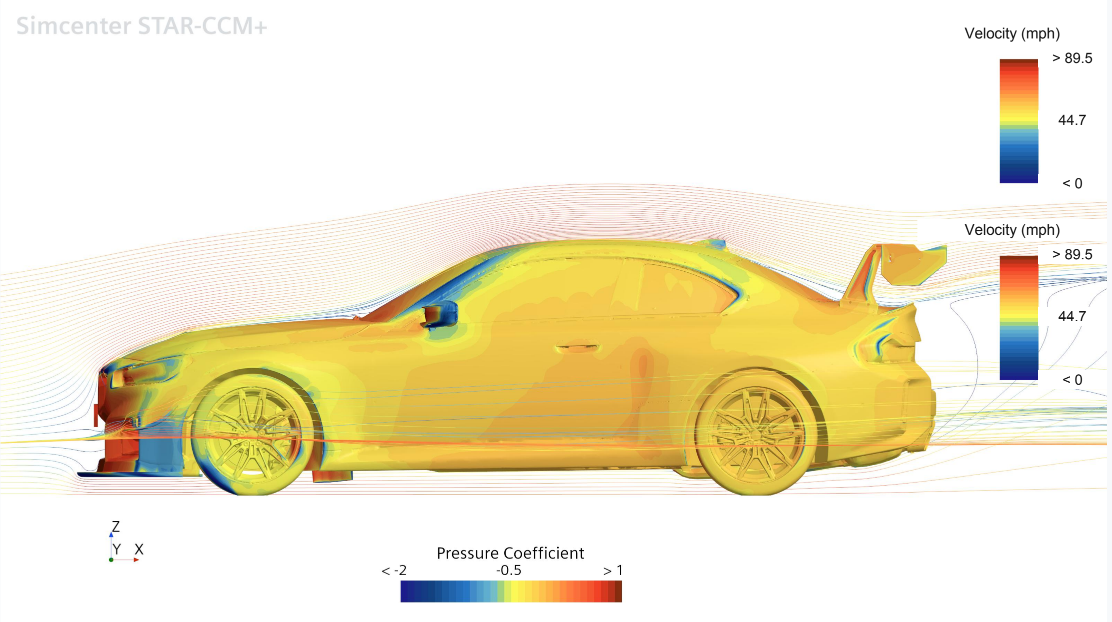
M2 INSTALLATION

Use the full-vehicle results on the next page for M2 loads. The M2 case uses position 2; its geometric angle is not specified.

10 REAR-WING PERFORMANCE ON THE M2

At position 2, the installed wing produces 245.0 lbf of downforce and 12.3 lbf of global X drag at 120 mph V²-scaled.





INSTALLED REAR-WING RESULT

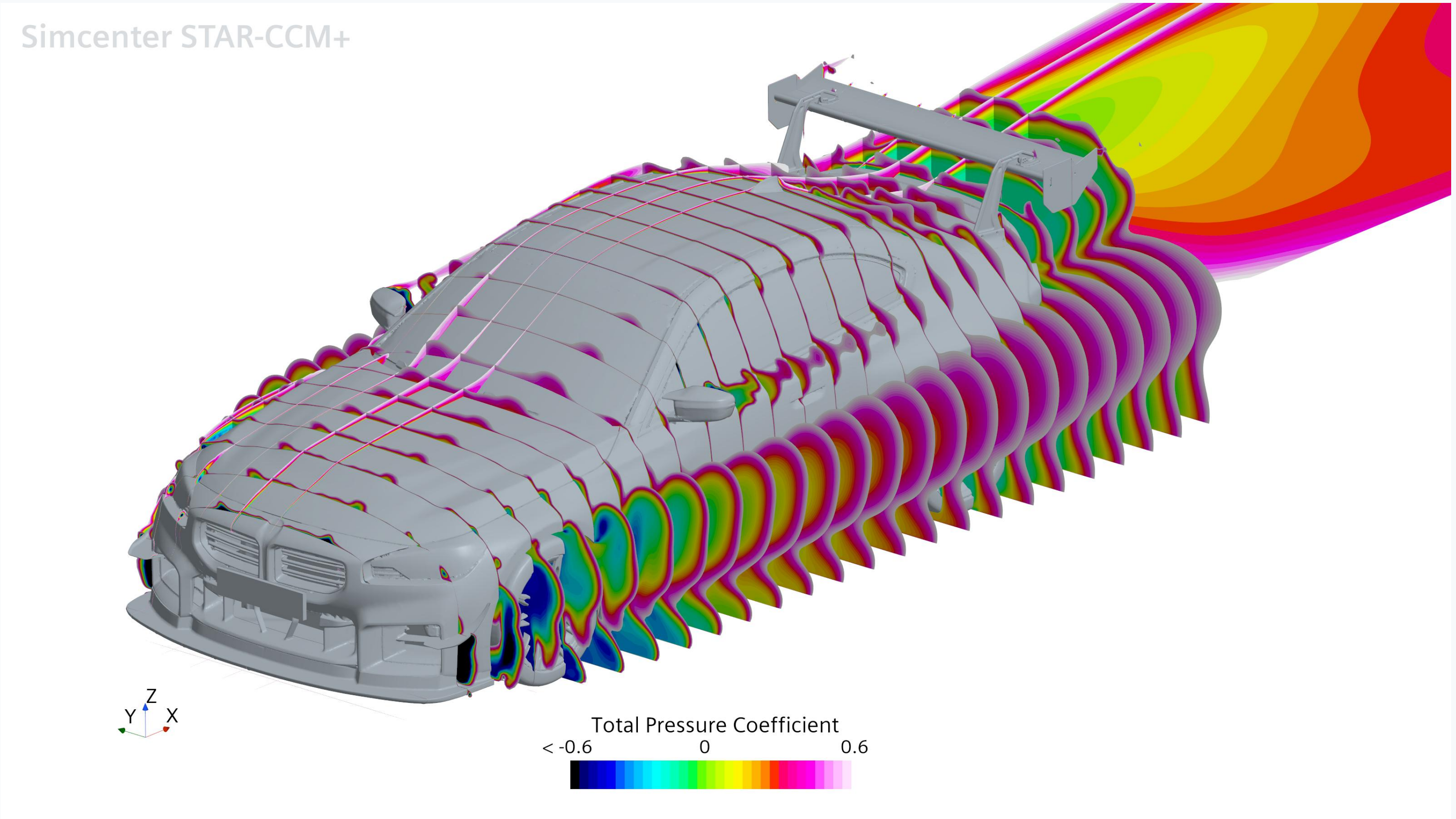
Downforce: 65.7 lbf / 245.0 lbf scaled
Global X drag: 3.3 lbf / 12.3 lbf scaled
Force ratio: 19.87
Wing position: 2

VEHICLE INSTALLATION EFFECT

Rear-glass separation changes the wing inflow. The preceding isolated-wing curves provide a reference. They do not directly predict the installed M2 loads.

11 TOTAL-PRESSURE LOSS & WAKE

The total-pressure field highlights losses around the wheel regions, underbody and rear wake.



LOSS LOCATIONS

Wheel cavities, low-energy underbody flow and the rear base are the main loss regions identified in the M2 analysis. Rear-glass separation also contributes.

DRAG INTERPRETATION

The splitter and wing account for 10.4 lbf of the 99.0 lbf total drag. Their surface forces do not capture all changes induced elsewhere on the vehicle.

12 AERODYNAMIC LOAD DISTRIBUTION

The baseline has nearly even front/rear aerodynamic loading, with a slight rear bias.

FRONT AXLE

48.5%

63.63 lbf / 237.3 lbf scaled

REAR AXLE

51.5%

67.55 lbf / 252.0 lbf scaled

REAR MINUS FRONT

3.9

lbf at 62.14 mph (derived)

LOAD ACCOUNTING	62.14 mph	120 mph V²-scaled	SHARE
Front splitter	41.0 lbf	152.9 lbf	31.3%
Rear wing	65.7 lbf	245.0 lbf	50.1%
Remaining surfaces, net	24.5 lbf	91.3 lbf	18.7%
Whole vehicle	131.2 lbf	489.2 lbf	100%

Component forces and axle loads describe different quantities. Axle loading also depends on force location and pitching moment.

Axle loads use the reported 48.5/51.5 split. Rounded values may not sum exactly. Handling also depends on mass distribution, tires, suspension and vehicle attitude.

13 DRAG & BASELINE COMPARISON

At 62.14 mph, drag rises from the reported 78.0 lbf baseline without the aero package to 99.0 lbf, an increase of 26.8%.

DRAG ACCOUNTING	62.14 mph	120 mph V^2-scaled
Front splitter	7.1 lbf	26.3 lbf
Rear wing	3.3 lbf	12.3 lbf
Remaining surfaces	88.6 lbf	330.5 lbf
Whole vehicle	99.0 lbf	369.2 lbf
Baseline without aero package	78.0 lbf	291.1 lbf
Whole-vehicle increase	20.9 lbf (+26.8%)	78.1 lbf

COMPONENTS & INTERACTIONS

Direct splitter and wing drag totals 10.4 lbf. The 20.9 lbf whole-vehicle increase also includes changes on other surfaces and package interactions.

FRONT-BUMPER PRESSURE

The M2 analysis attributes much of the increase to higher bumper pressure induced by the splitter. A cooling benefit is suggested but not quantified.

14 M2 G87 GT4+ CONCLUSIONS

The baseline combines useful downforce with a nearly even front/rear aerodynamic load distribution.

489.2 lbf net downforce at 120 mph V^2-scaled

62.14 mph CFD: 131.2 lbf downforce / 99.0 lbf drag
Wing position 2. Aero balance: 48.5% front / 51.5% rear.

WHOLE VEHICLE

489.2 lbf downforce
369.2 lbf drag
Overall L/D ≈ 1.33

FRONT SPLITTER

152.9 lbf downforce
26.3 lbf drag
L/D ≈ 5.81

REAR WING

245.0 lbf downforce
12.3 lbf global X drag
Reported force ratio ≈ 19.87

DEVELOPMENT PRIORITIES

Reduce body and wake losses. Validate ground-clearance and braking-pitch sensitivity, then correlate aerodynamic balance with track behavior.

Headline lbf values use 120 mph V^2 scaling.

The CFD solution is at 62.14 mph.