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LAMBORGHINI TEMERARIO GT3, PURE RACING SOUL OF A BITURBO V8 ENGINE

35th Aachen Automotive Colloquium, 06 October 2026

TORQUE CURVE CONCEPT



L411

Lamborghini Temerario engine

Torque filling Hybridization ICE+P1

ICE only

Torque [Nm]

Engine speed [RPM]

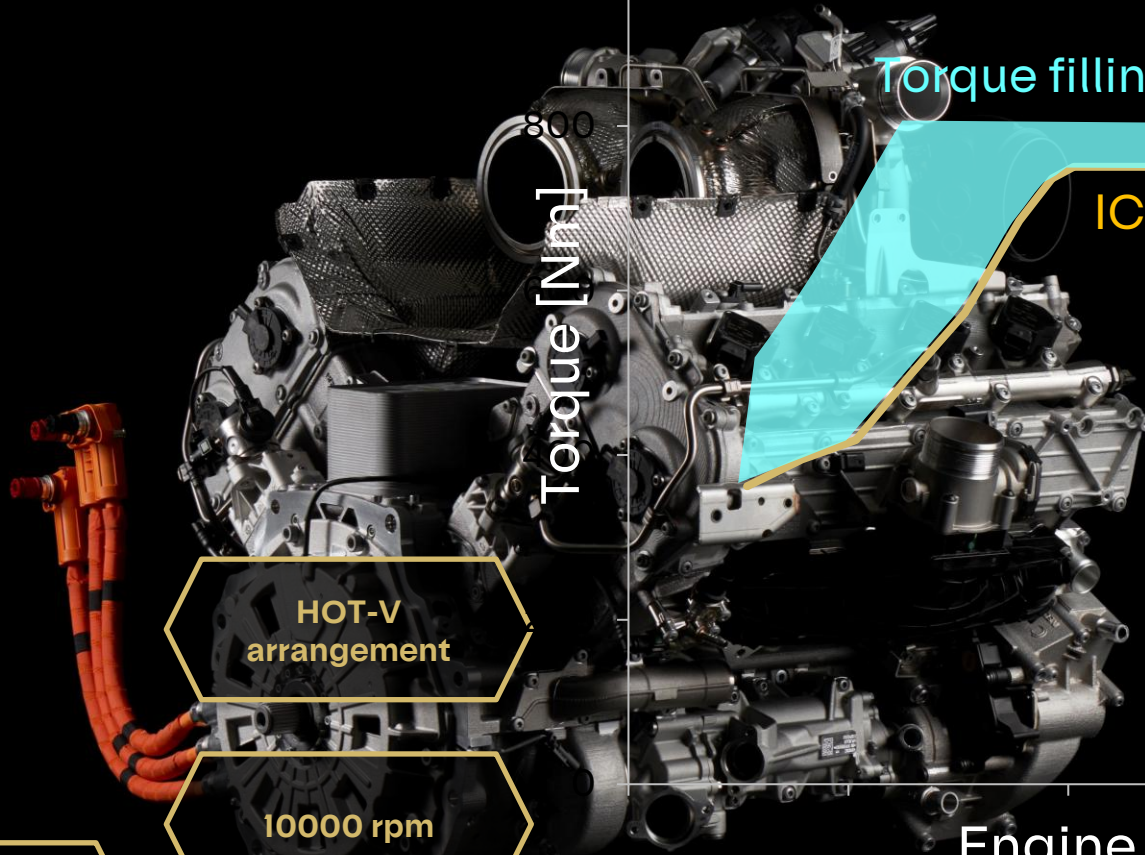
V8 – BiTurbo
4.0 L

PHEV
Architecture

P1 + P4 Hybrid
system

HOT-V
arrangement

10000 rpm



TORQUE CURVE CONCEPT



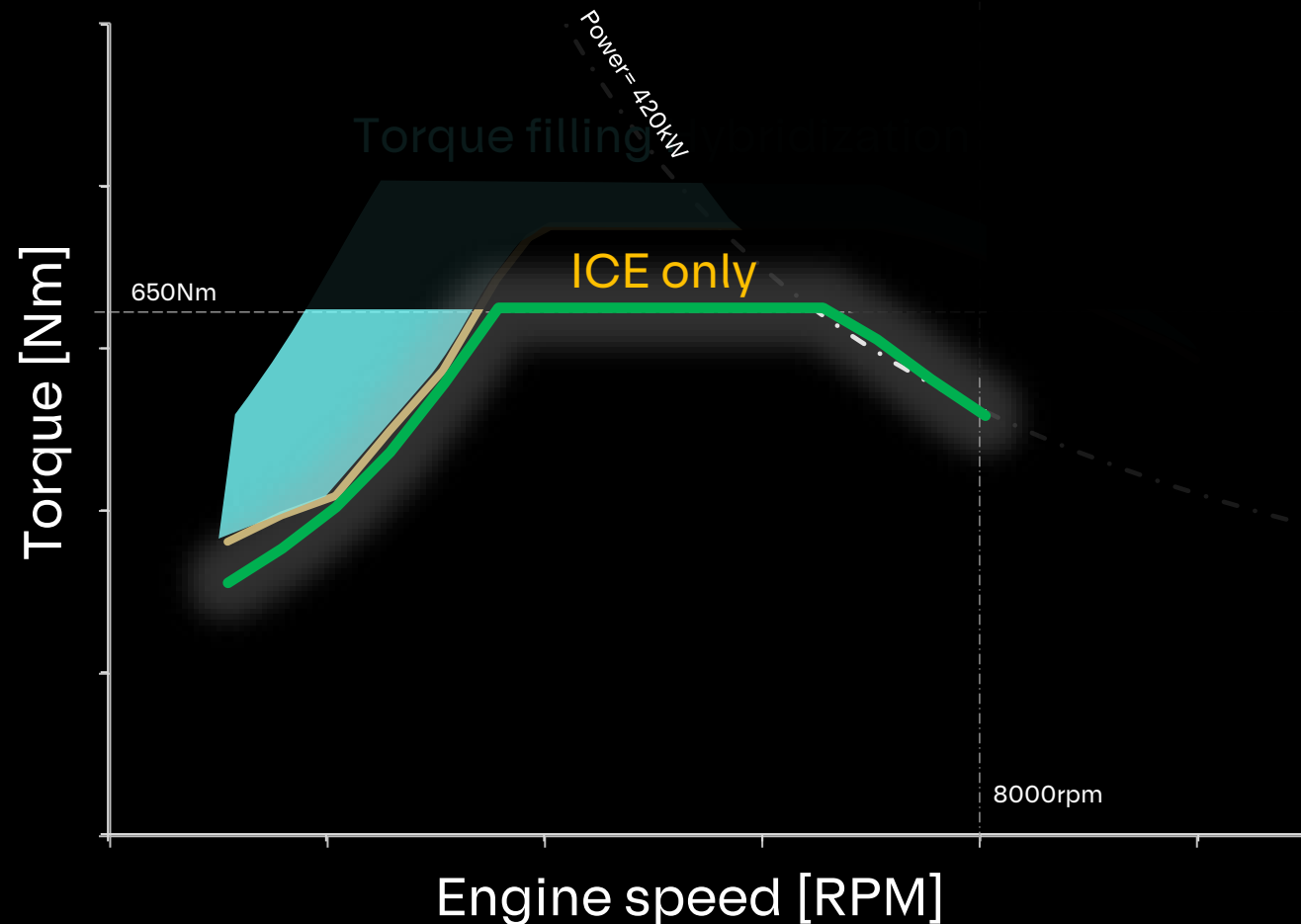
L411

Lamborghini Temerario engine

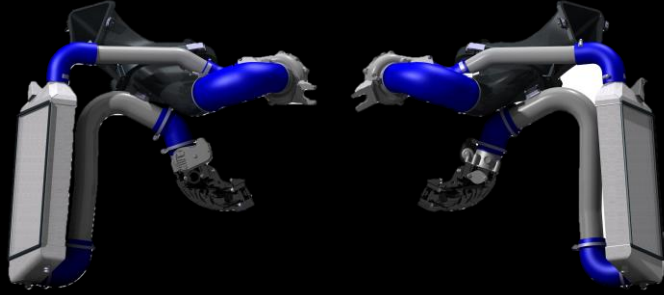
- ❖ Pure internal combustion engine
- ❖ Average power output: 420kW
- ❖ Maximum engine speed: 8000rpm
- ❖ Peak torque: 650Nm

L412

Lamborghini Temerario GT3 engine

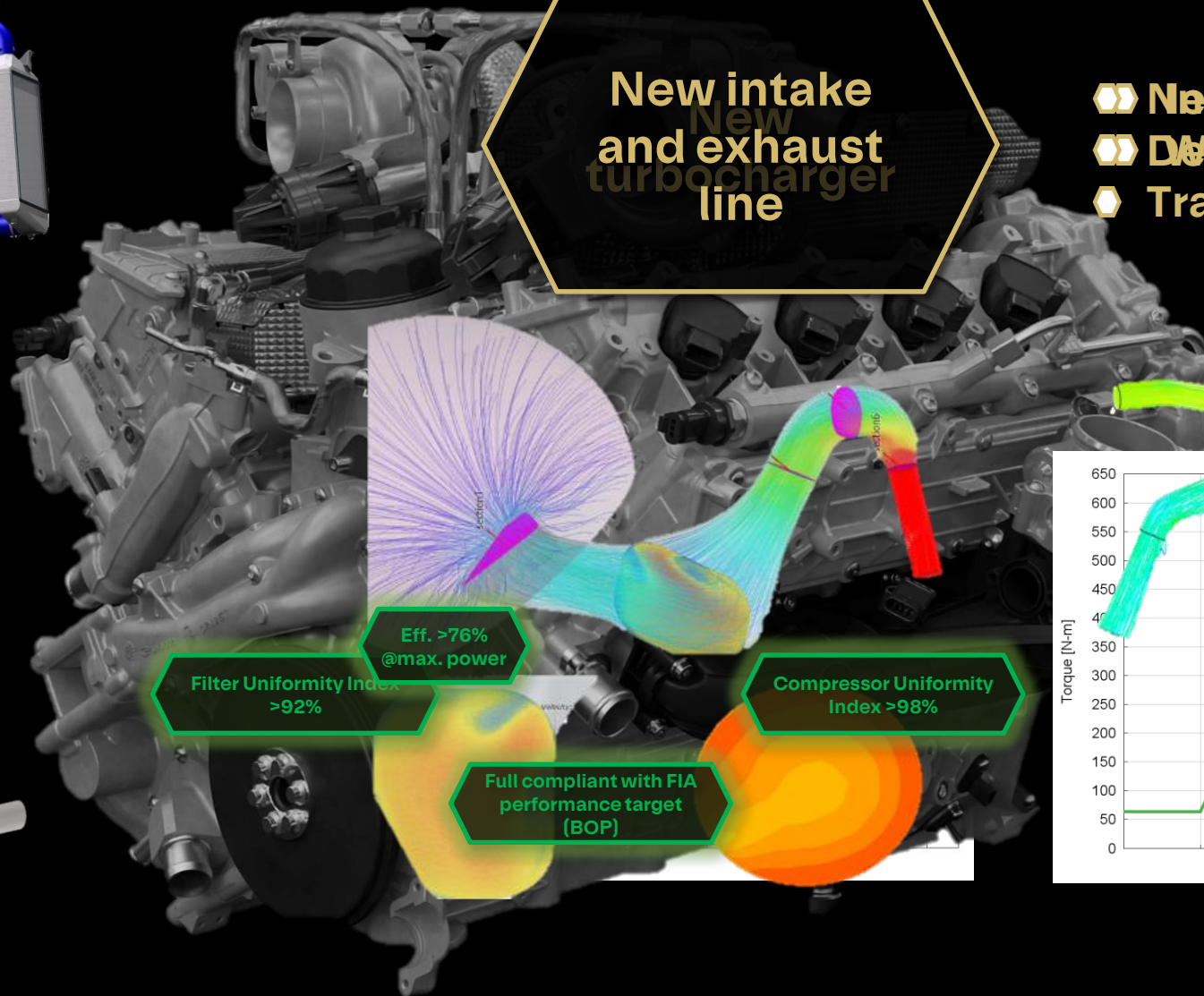
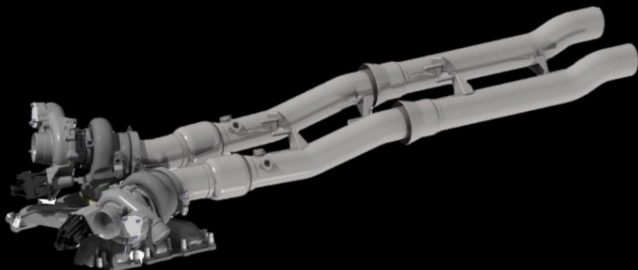


HARDWARE PERFORMANCE UPGRADES



New intake
and exhaust
line

- New turbocharger
- Digitalized CAC
- Track oriented exhaust

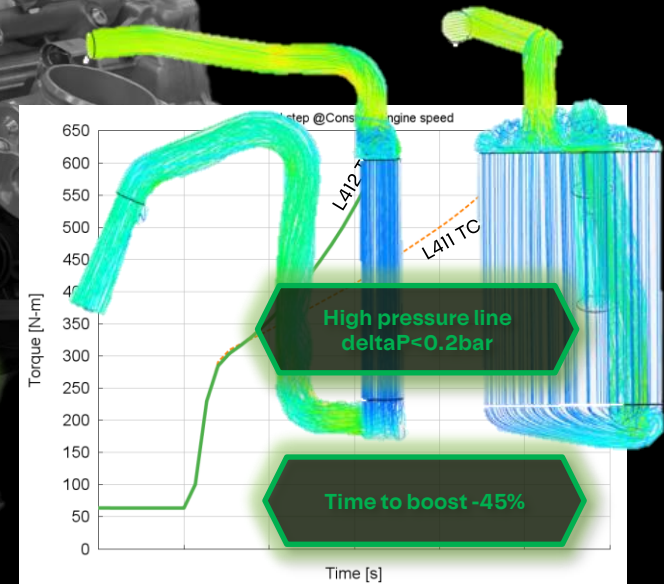


Eff. >76%
@max. power

Filter Uniformity Index
>92%

Full compliant with FIA
performance target
(BOP)

Compressor Uniformity
Index >98%



POWERTRAIN MECHANICS



POWERTRAIN MECHANICS



Temerario Contents

Crankshaft
optimal balance

Titanium
Conrods

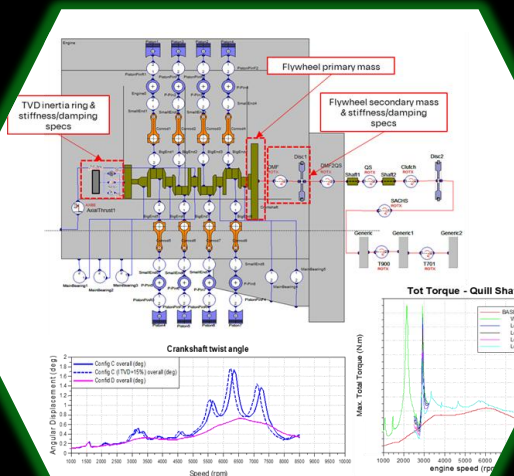
Temerario GT3 Additional Developments

Multibody Simulation
for inertia optimization

New 6 Speed
Gearbox
Dog Engagement
Multi disc green clutch



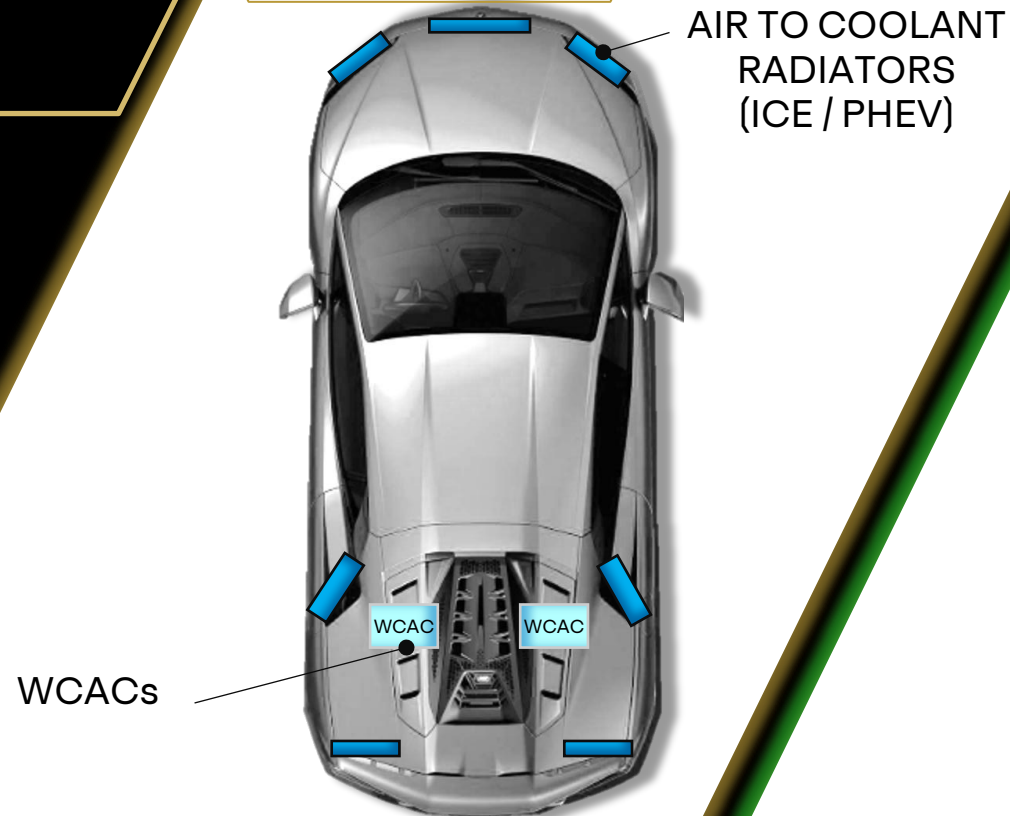
Single Mass Flywheel
Inertia and weight reduction



COOLING

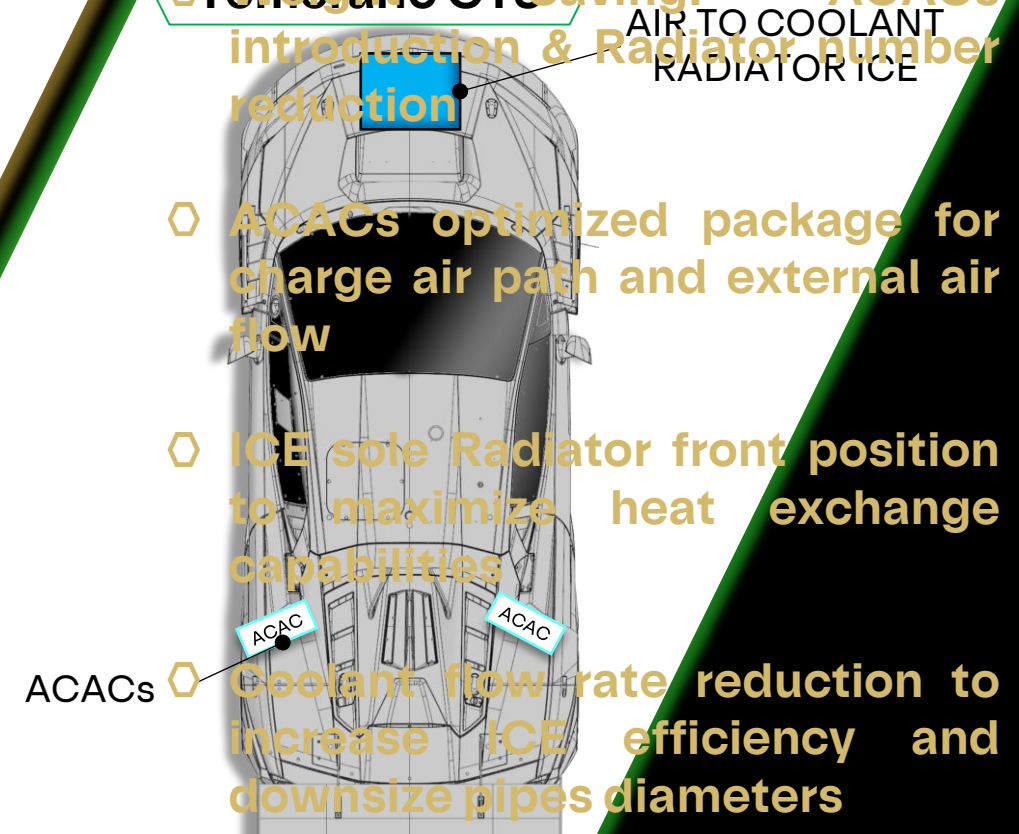
Complete
redesign of the
cooling system

Temerario



Temerario GT3

Weight Saving: ACACs introduction & Radiator number reduction





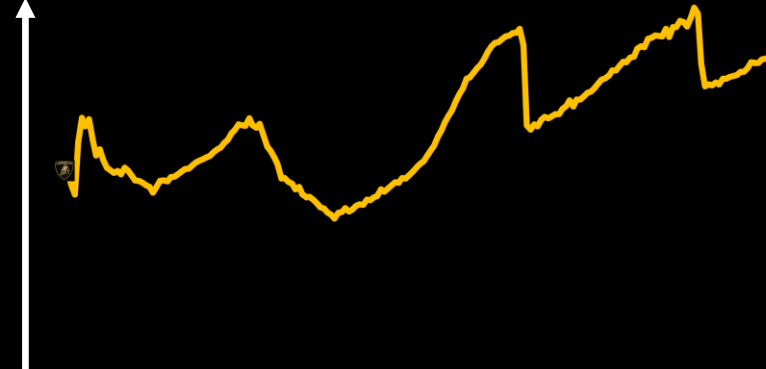
NEW OIL TANK

**Complete
redesign of the
oil tank**

- ❖ **Internal geometry optimized via 3D particle-based CFD**
- ❖ **Integrated one-way flaps to prevent oil backflow**
- ❖ **Stable oil supply during high longitudinal and lateral acceleration**

Engine Speed, rpm

Time: 0.0000s

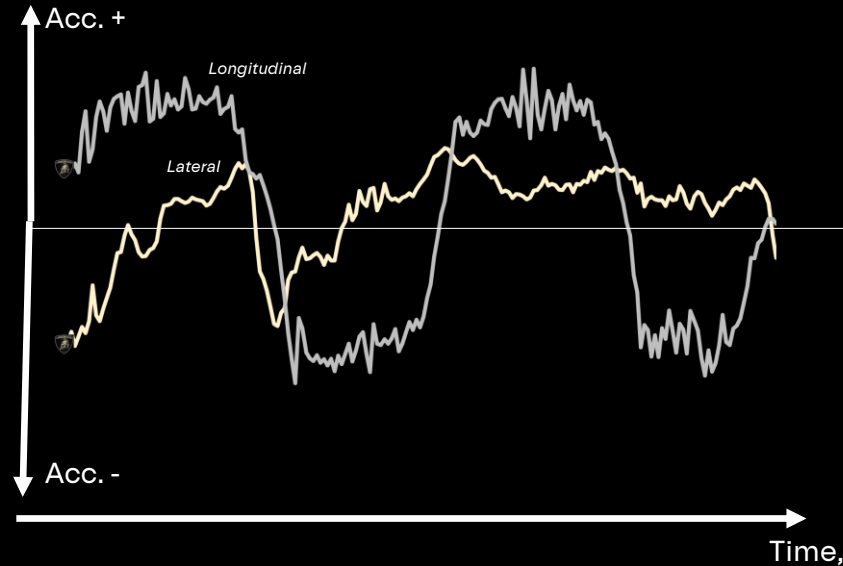


Acc. +

Longitudinal

Lateral

Acc. -



**CFD-DRIVEN
DESIGN**



GT-SPECIFIC REQUIREMENTS



**Endurance
Reliability**

Motorsport Control Unit **Key Points**

- Model based development workflow
- Tailored control strategies
- Engine performance, drivability and vehicle dynamics
- BoP torque curve reproduction and monitoring
- Transients' performance during Tip-In and Gear Shifts
- Repeatability across drivers, torque delivery & stability
- Consistency across environmental conditions

**Multi-Driver
Usability**



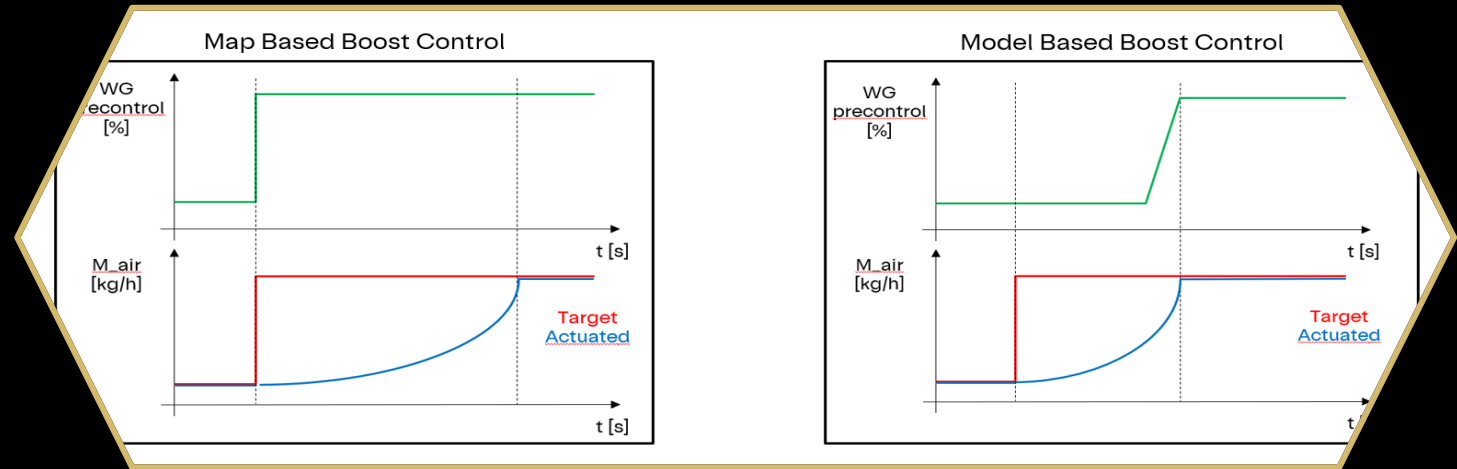
**Balance of
Performance
Compliance**

**High Fidelity
Telemetry**

CUSTOM CONTROL STRATEGIES



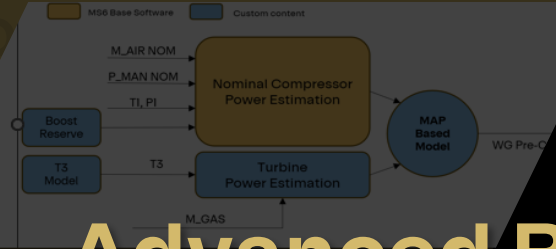
TIME TO BOOST
OPTIMIZATION





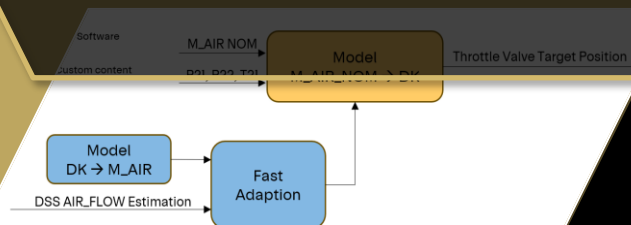
CUSTOM CONTROL STRATEGIES

Advanced Boost Control

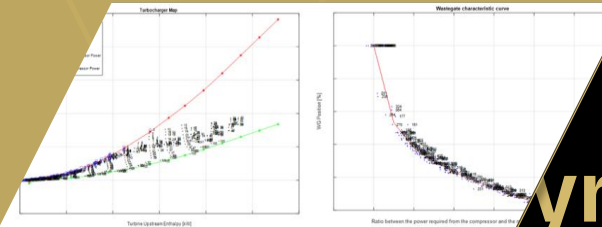


Advanced Boost Control

Dynamic Throttle Control

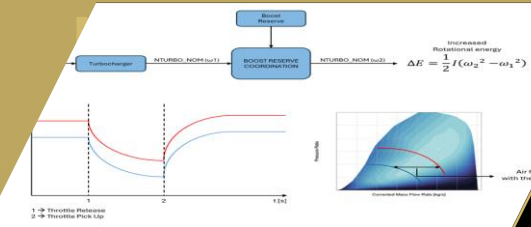


Turbine Power Estimation

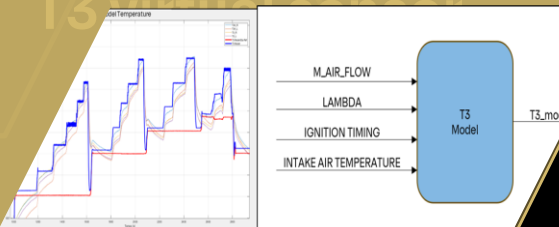


Boost Reserve

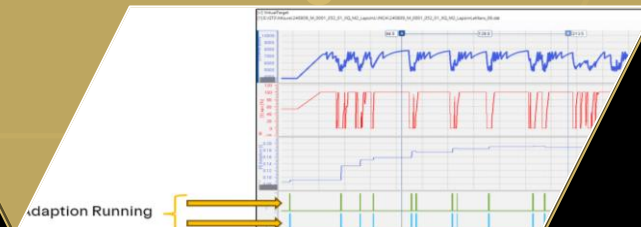
Boost Reserve



T3 virtual sensor



Continuous Wastegate adaption

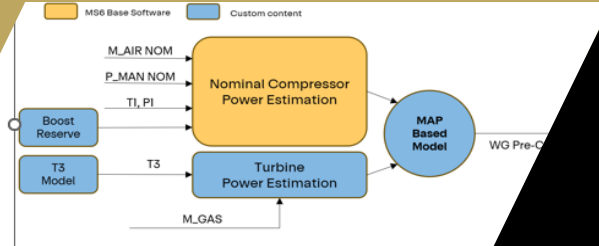




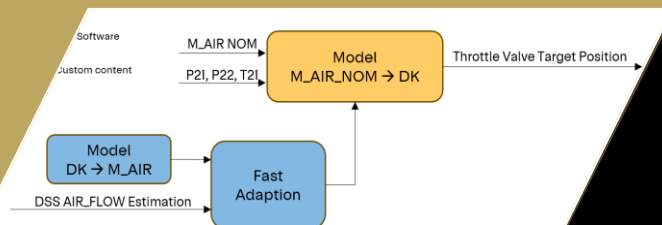
CUSTOM CONTROL STRATEGIES

TIME TO BOOST
OPTIMIZATION

Advanced Boost Control



Dynamic Throttle Control



CONTROL STRATEGY OPTIMIZATION

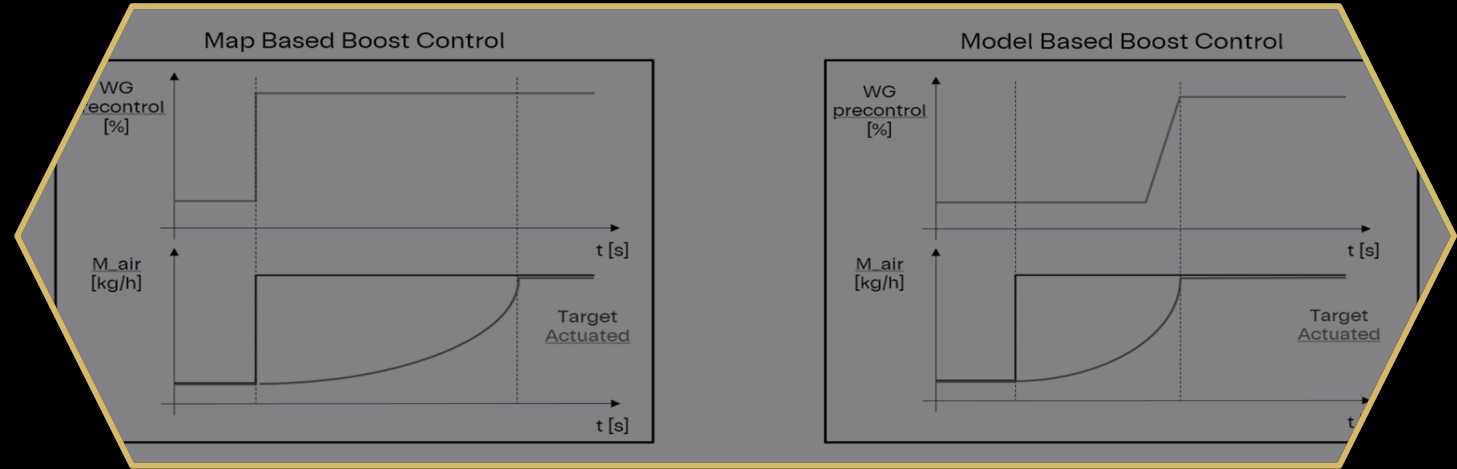


0.25s turbolag
reduction time after
every corner

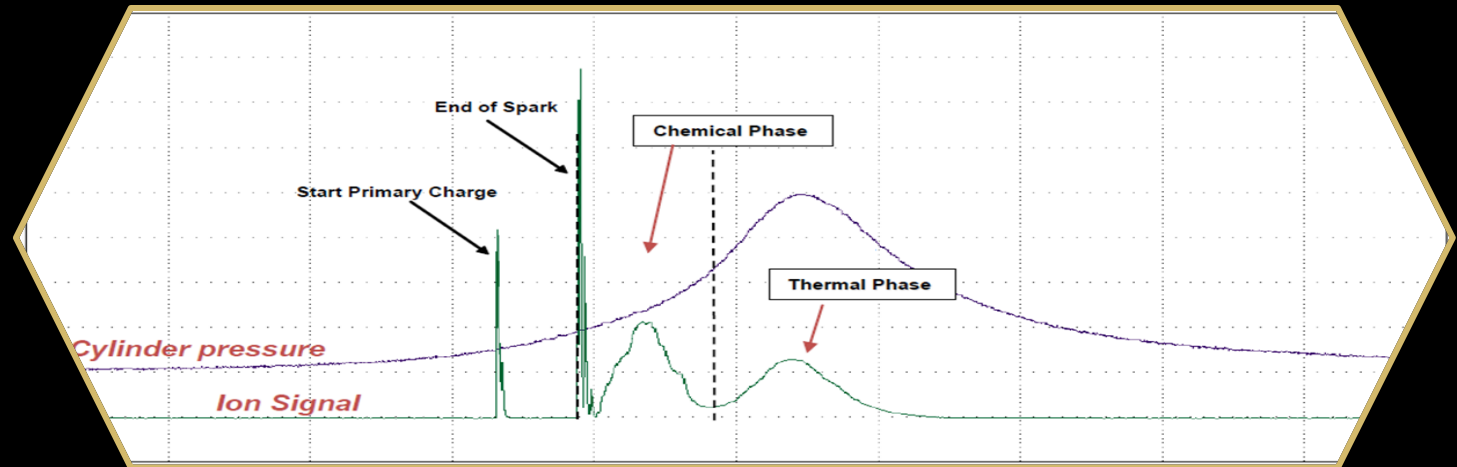
CUSTOM CONTROL STRATEGIES



**TIME TO BOOST
OPTIMIZATION**



**REAL TIME
COMBUSTION
MONITORING VIA
SPARK PLUG ION
CURRENT**



CUSTOM CONTROL STRATEGIES



Knock Control

Knock Control

Misfuel & Misfire

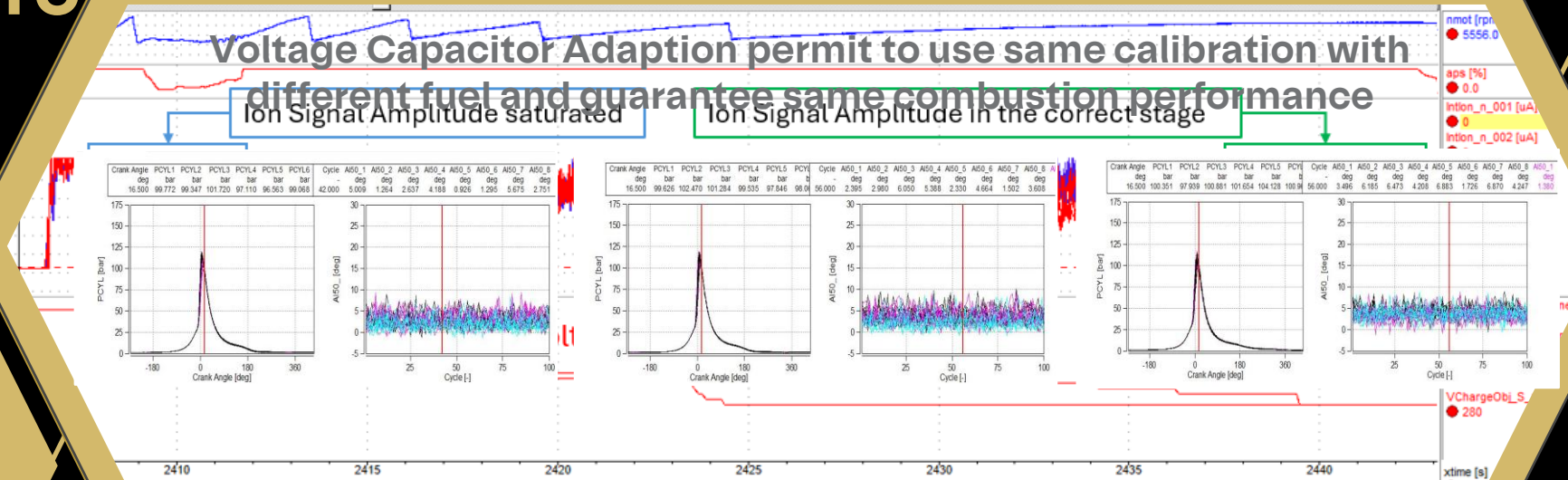
REAL TIME
COMBUSTION
MONITORING VIA
SPARK PLUG ION
CURRENT

GT Racing Fuels are transitioning to *bio-based, sustainable and renewable* formulas

Each championship defines a specific fuel formula in its technical regulation



Voltage Capacitor Adaption permit to use same calibration with different fuel and guarantee same combustion performance



7500rpm WOT	Fuel 1	Fuel 2	Fuel Ref
V Capacitor	40V (minimum value for bearing)	80V (minimum value for bearing)	250V (avg value for heavy test=250V)
ION Signal	OK (V=250mV)	OK (V=100mV)	Ref. (V=100mV)
AISO [°CA]	9°CA	8.5°CA	8°CA

CALIBRATION METHODOLOGIES



**L411 Temerario
main actuation**

**Tailored Boost
and Combustion**

**GT specific
requirements**

**Charge & Torque
data collection**

**HiL and MiL
approach**

**Virtual
Calibration**





CALIBRATION METHODOLOGIES

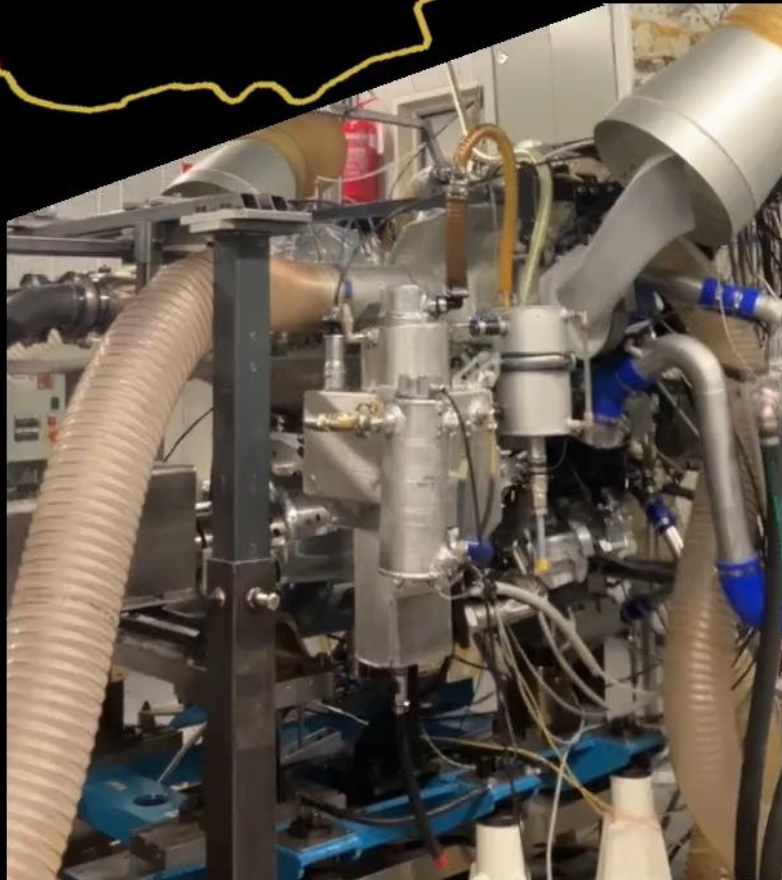
TRACK ORIENTED ENGINE DYNO SIMULATION

MOVE THE COMPLEXITY FROM TRACK TO TEST BENCH

Test bench as a real track simulator for strategy development and base calibration
Tailored Boost and Combustion

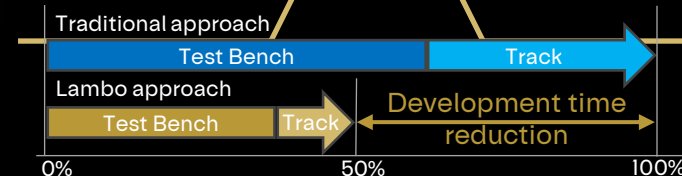
- ◆ Reduced test bench development time
- ◆ Full validation of custom engine control strategies
- ◆ Track functions pre-validated
- ◆ Significant reduction of engine issues during first shakedown session
- ◆ Prototype ready from Day 1

Charge & Torque data collection



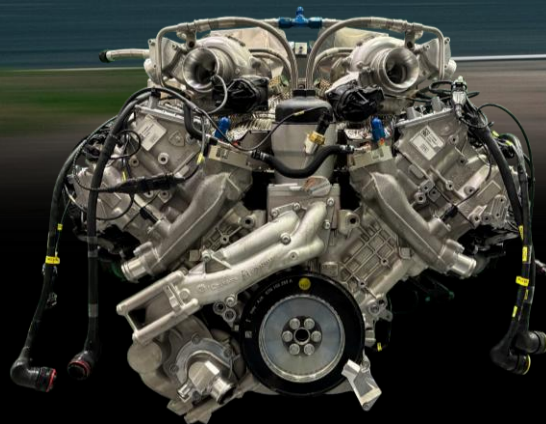
1d MiL approach

Virtual Calibration





PEOPLE ALWAYS MAKE THE DIFFERENCE





THANK YOU FOR YOUR ATTENTION