



JORDAN LEE

*Chief Engineer and
Program Manager,
GM Small Block Engines*

SMALL BLOCK
GEN 5



ALL-NEW, SUPERCHARGED 6.2L LT4

OBJECTIVES

- Ultimate horsepower and torque for the most capable Corvette ever
- Create one of the smallest and lightest 650 horsepower engines in the industry
- Be extremely compact to maintain low hood profile and meet PED PRO requirements for export markets



ALL-NEW, SUPERCHARGED 6.2L LT4

OBJECTIVES

- Competition-crushing, low-end torque for maximum responsiveness
- Apply Gen 5 technology suite – DI, AFM, CVVT, variable displacement oil pump and combustion system
- Maintain durability under the most demanding track conditions



ALL-NEW, SUPERCHARGED 6.2L LT4

TECHNOLOGIES

- Build off the technologies of the LT1
- High output/compact supercharger
- Dry sump lubrication





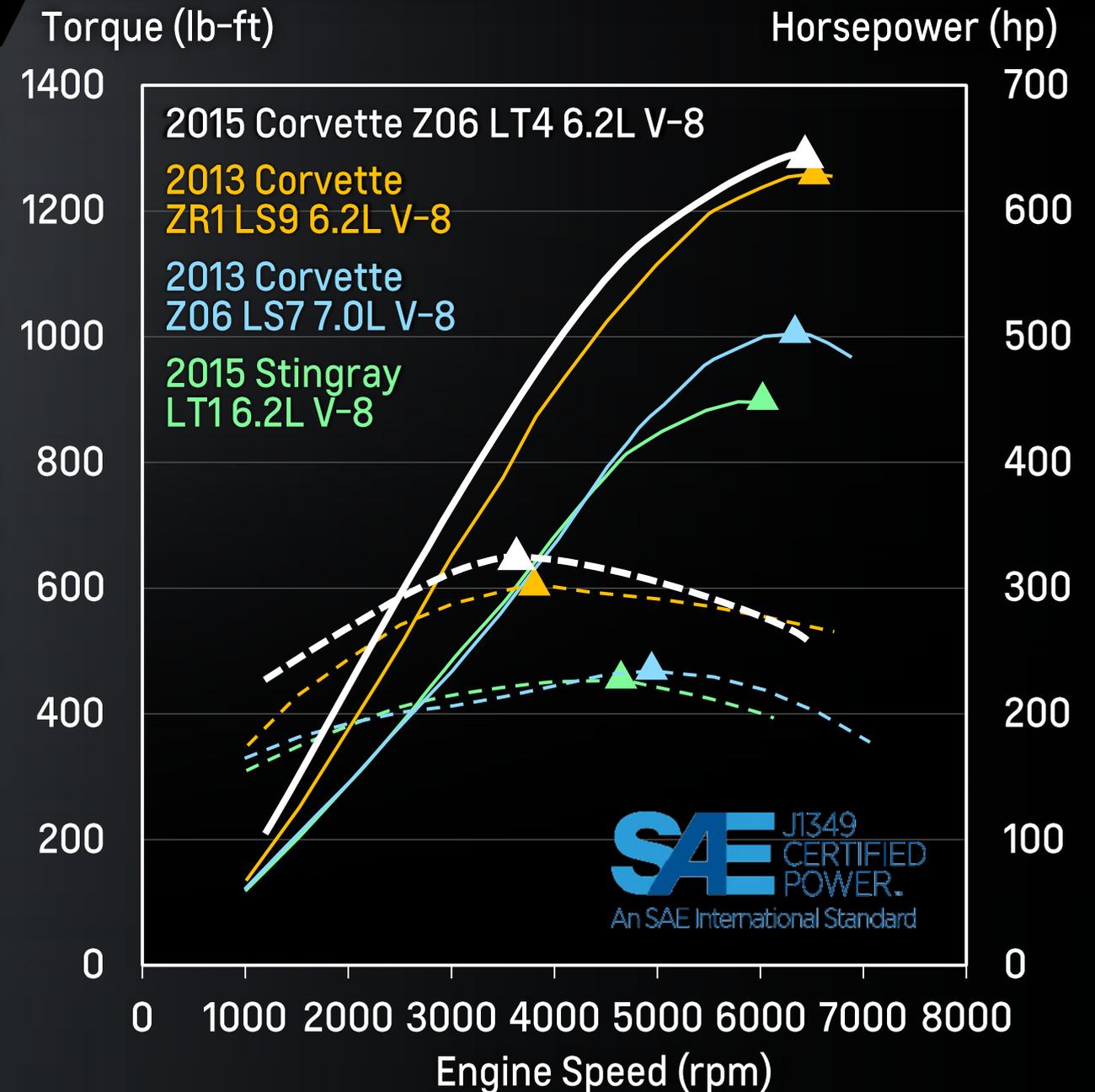
ALL-NEW, SUPERCHARGED 6.2L LT4

TORQUE AND POWER DELIVERY

- Most powerful production engine ever made by GM
- Optimization of low and mid speed torque and power

650 hp (485 kW) @ 6400 rpm
638 hp (476 kW) @ 6500 rpm
505 hp (377 kW) @ 6300 rpm
455 hp (339 kW) @ 6000 rpm

650 lb-ft (881 Nm) @ 3600 rpm
604 lb-ft (819 Nm) @ 3800 rpm
470 lb-ft (637 Nm) @ 4800 rpm
460 lb-ft (624 Nm) @ 4600 rpm





ALL-NEW, SUPERCHARGED 6.2L LT4

TORQUE AND POWER DELIVERY

- Class leading torque and power

650 hp (485 kW) @ 6400 rpm

455 hp (339 kW) @ 6000 rpm

560 hp (418 kW) @ 6500-6750 rpm

400 hp (298 kW) @ 7400 rpm

350 hp (261 kW) @ 7400 rpm

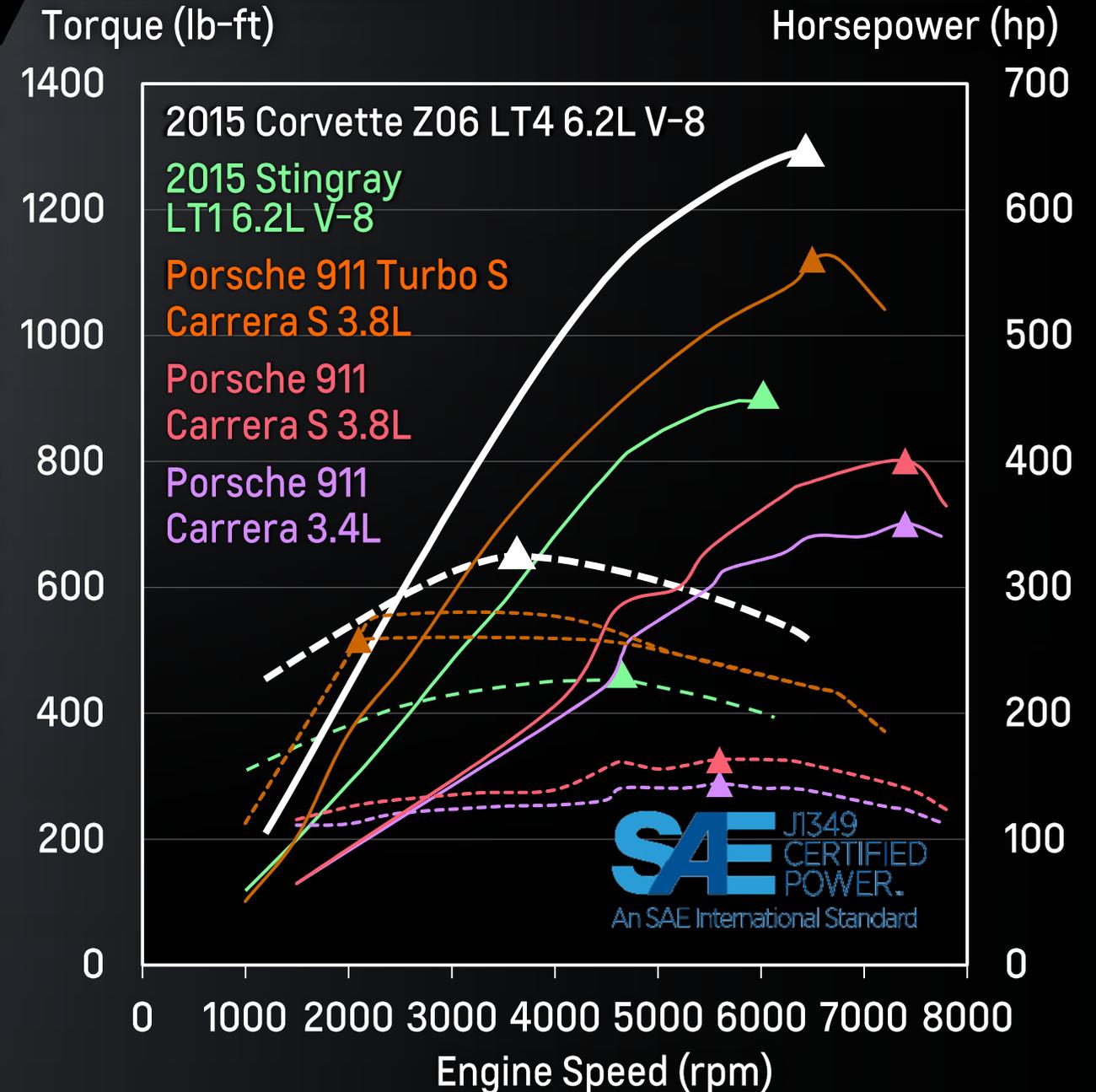
650 lb-ft (881 Nm) @ 3600 rpm

460 lb-ft (624 Nm) @ 4600 rpm

516 lb-ft (700 Nm) @ 2100-4250 rpm

325 lb-ft (441 Nm) @ 5600 rpm

287 lb-ft (389 Nm) @ 5600 rpm





ALL-NEW, SUPERCHARGED 6.2L LT4

PACKAGING

- Compact
- Adds only 1 inch height at the rear of the engine vs. the non-supercharged LT1
- One of the smallest and lightest 650 horsepower engines in the world
- Meets Euro Pedestrian Protection requirements

LT4



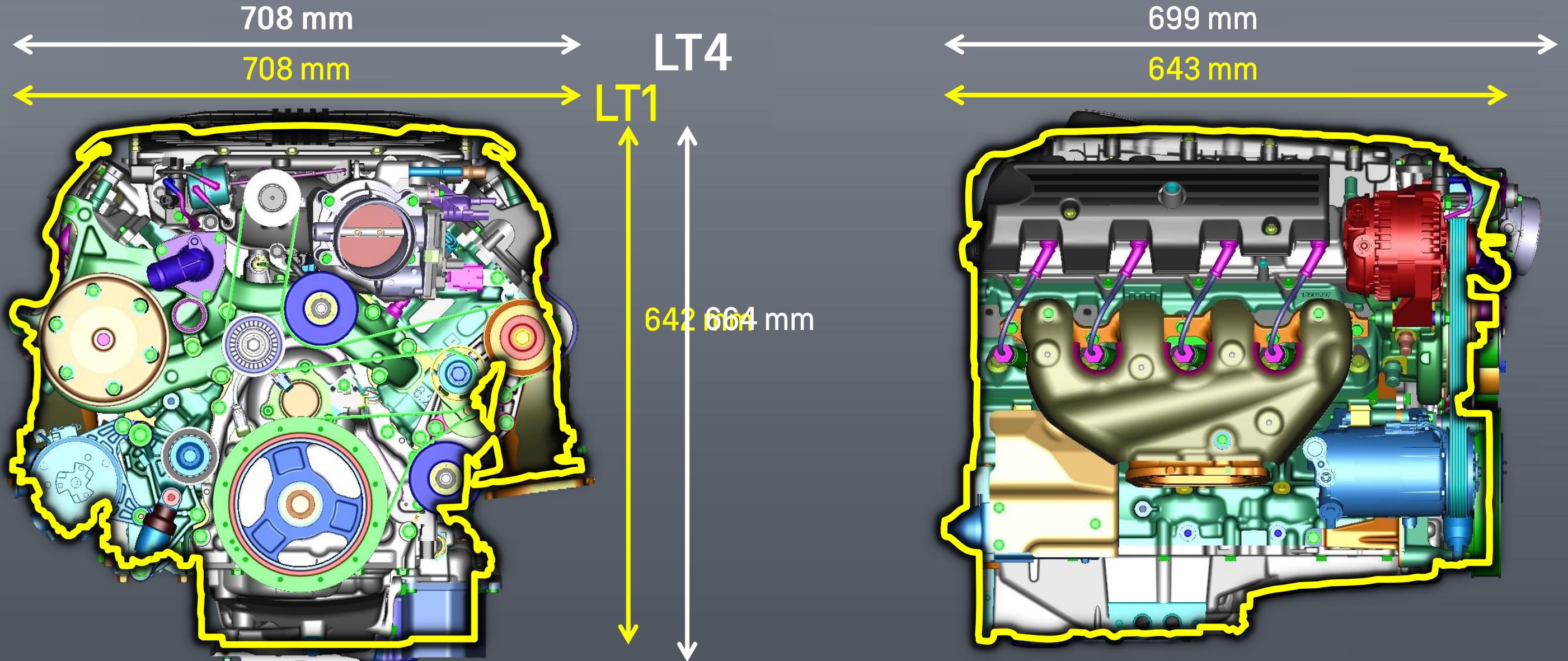
LT1





LT1 AND LT4 DIMENSION COMPARISON

DESIGN





JOHN RYDZEWSKI

*Assistant Chief Engineer,
GM Small Block Engines*

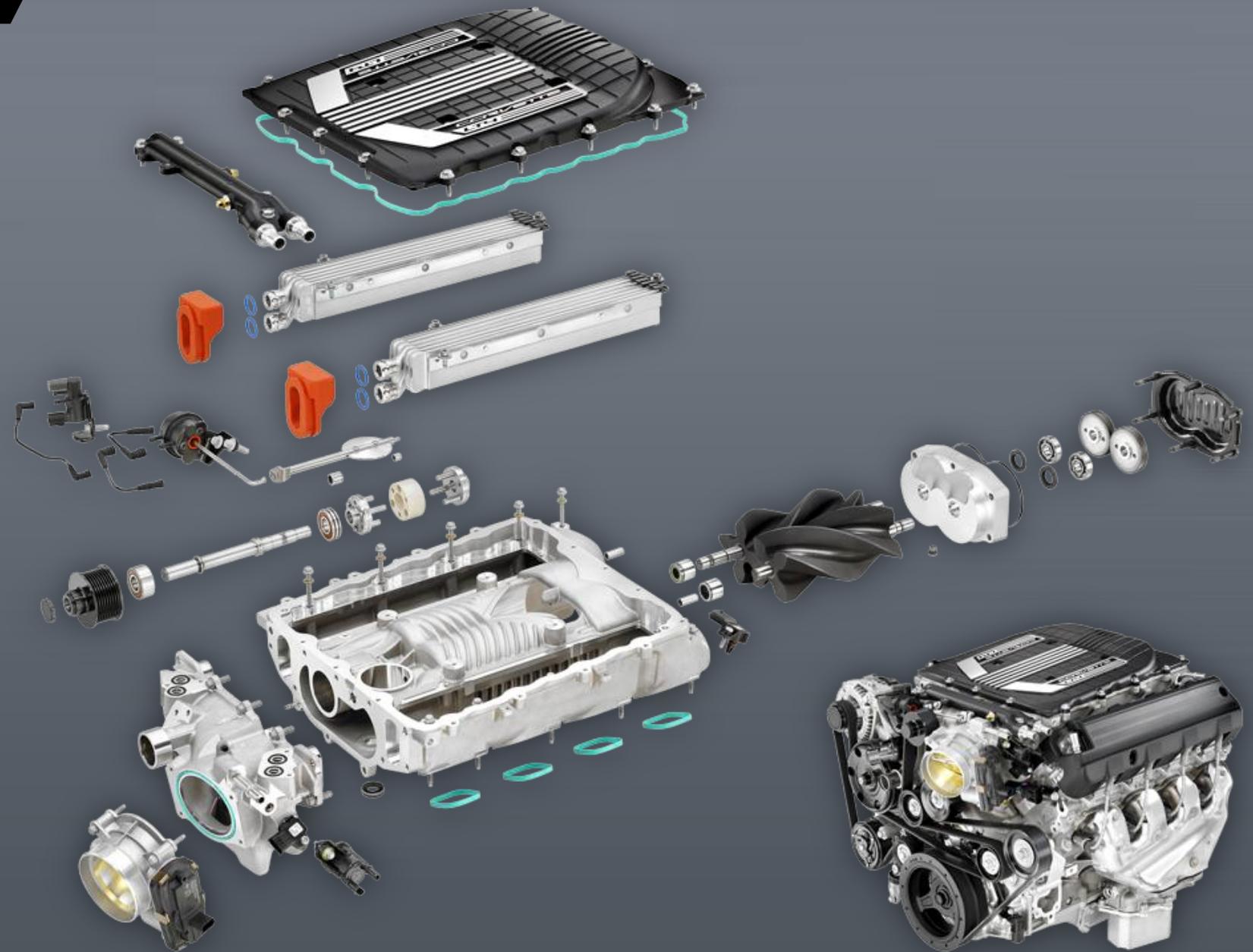
SMALL BLOCK
GEN 5



ALL-NEW, SUPERCHARGED 6.2L LT4

TECHNICAL DETAILS

- Supercharger / intercooler
- Fuel system
- Combustion system
- Cylinder heads
- Exhaust manifolds
- Valvetrain
- Cranktrain
- Pistons / rods
- Lubrication and vent system
- Tonawanda and Bowling Green Performance Build Center





LT4 SUPERCHARGER FEATURES

TECHNICAL DETAILS

More Efficient

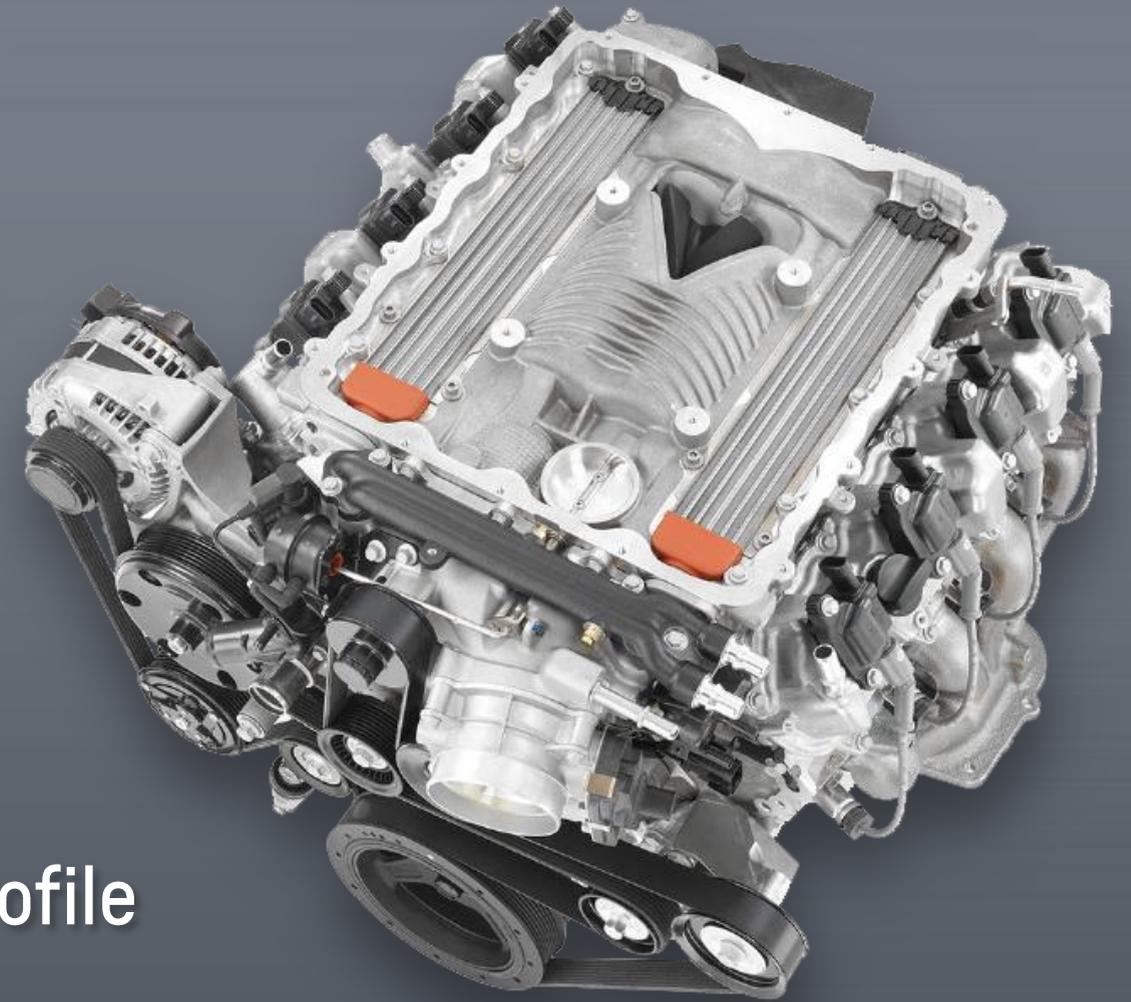
- R1740 TVS-Series Supercharger with 4-lobe, 160-degree helix rotor design

Lighter

- 20 pounds lighter than LS9 Supercharger

Improved Packaging Efficiency

- Smaller rotor diameter
- Package envelope on average 75 mm lower in profile
 - Enables low hood design

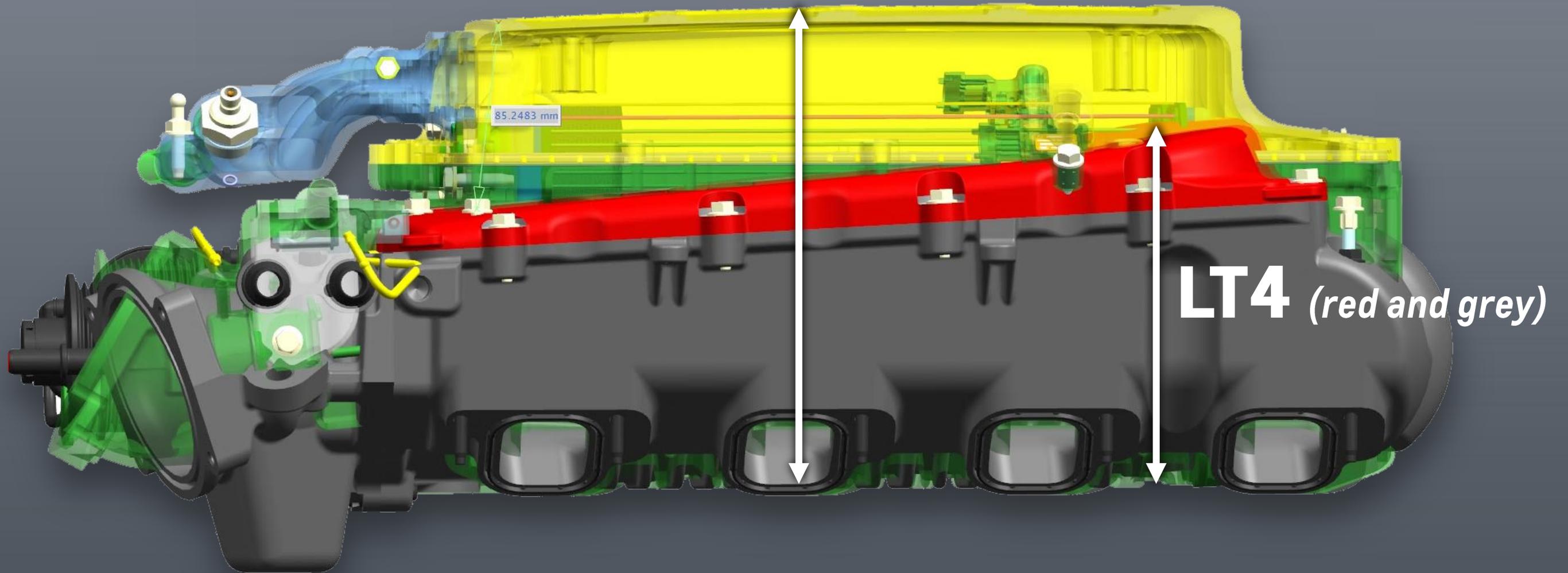




LT4 SUPERCHARGER PACKAGING EFFICIENCY

TECHNICAL DETAILS

LS9 (yellow/green/blue)



LT4 (red and grey)



LT4 SUPERCHARGER SPECS

TECHNICAL DETAILS

	LT4	LS9
Supercharger Name	R1740 4-lobe TVS	R2300 4-lobe TVS
Displacement	1742 cc/rev	2296 cc/rev
Drive Ratio	3.10 : 1	2.32 : 1
Maximum Supercharger Speed	20,150 RPM	15,080 RPM
Maximum Boost	9.4 PSI	9.7 PSI
Helix Angle	160 degrees	160 degrees
Rotor Diameter	100.2 mm	111.7 mm
Rotor Length	200.2 mm	211 mm
Center Distance	67.3 mm	75.0 mm

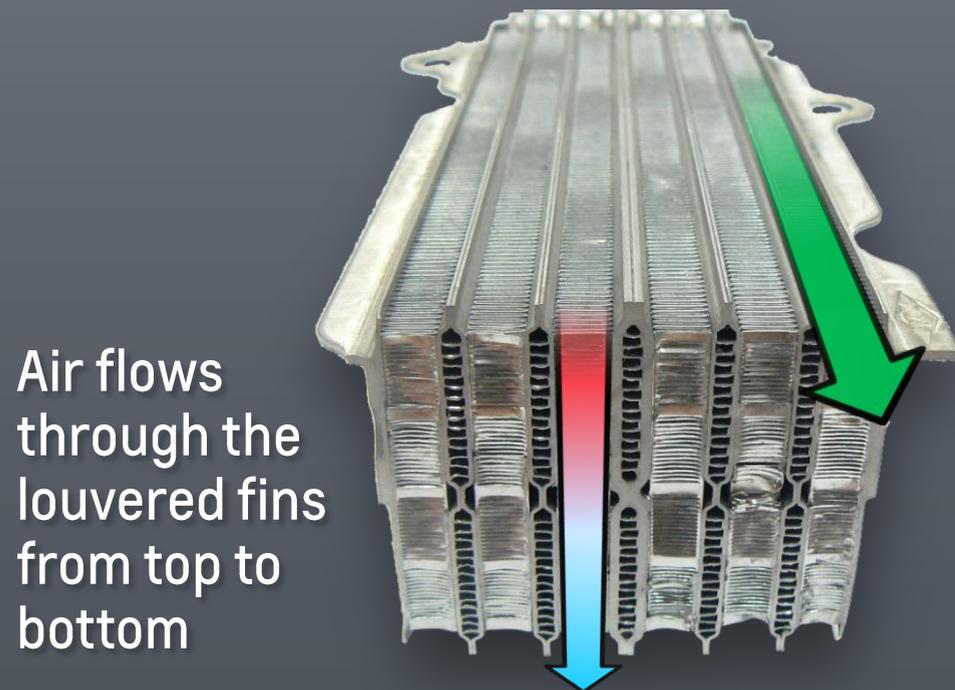


INTERCOOLER LT4 VS. LS9

TECHNICAL DETAILS

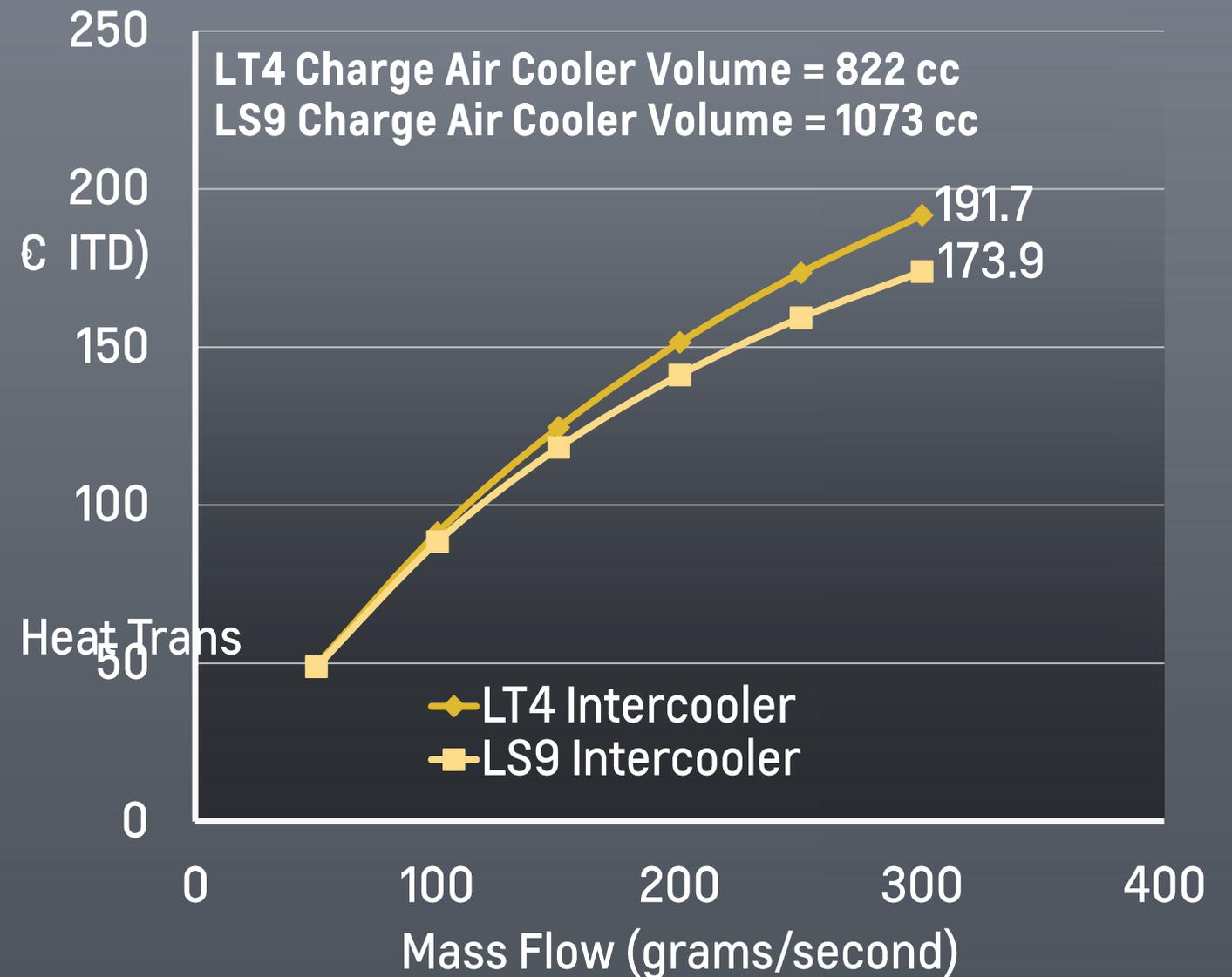
RH and LH Intercooler Bricks

- 10% greater heat rejection
- 23% smaller by volume



Coolant flows through five coolant channels with the turbulizers inside

CAC Heat Transfer vs Mass Flow

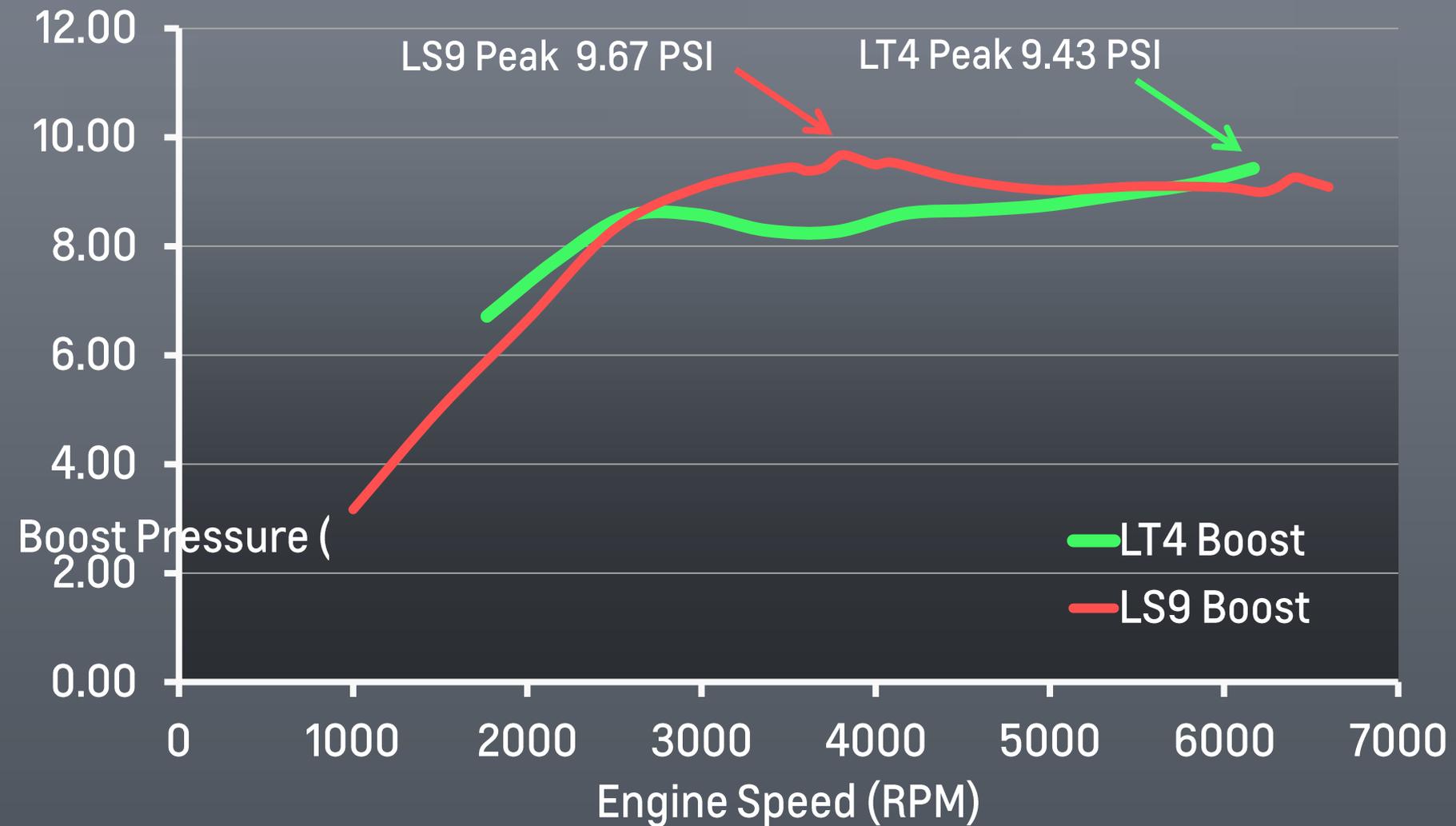




LT4 AND LS9 BOOST COMPARISON

TECHNICAL DETAILS

Supercharger Boost Pressure Comparison LT4 vs. LS9

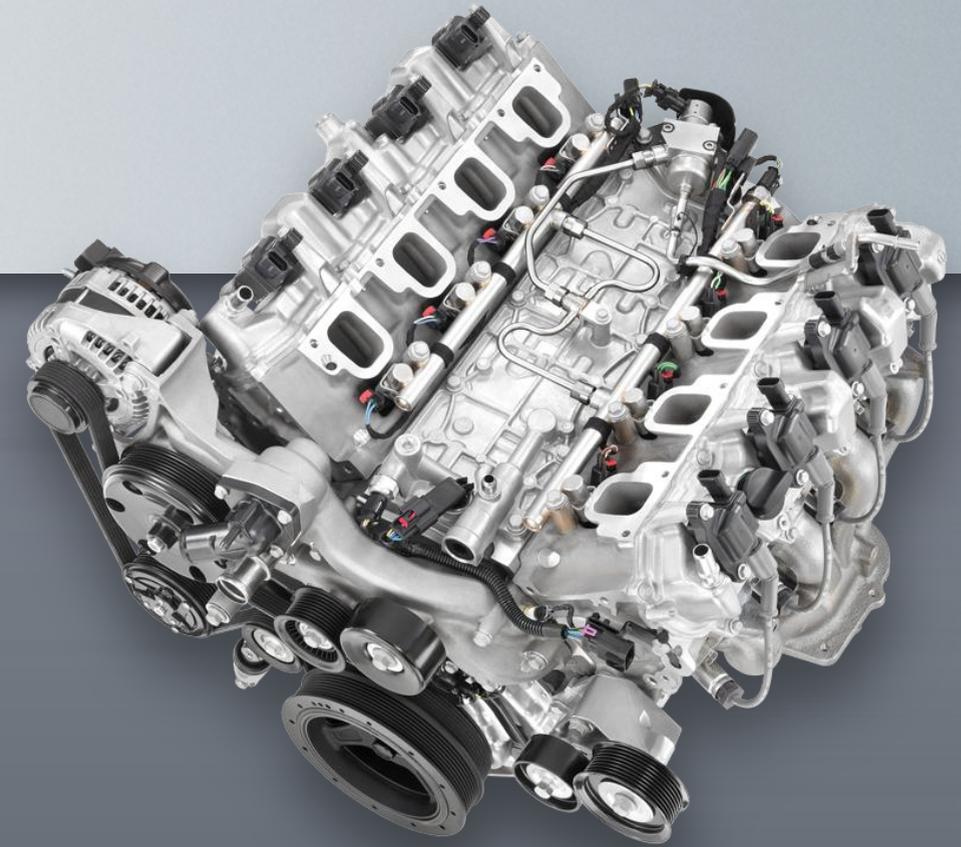


Boost is a function of engine air demand and not a characteristic inherent in the supercharger.



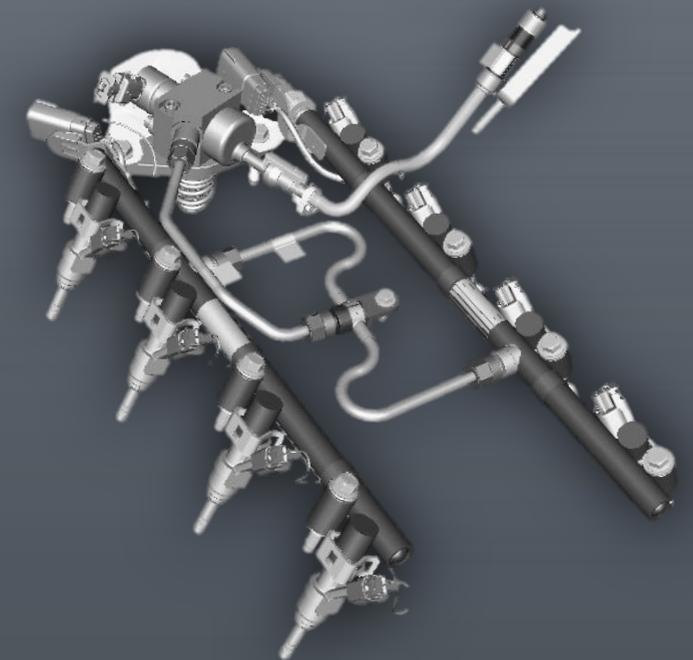
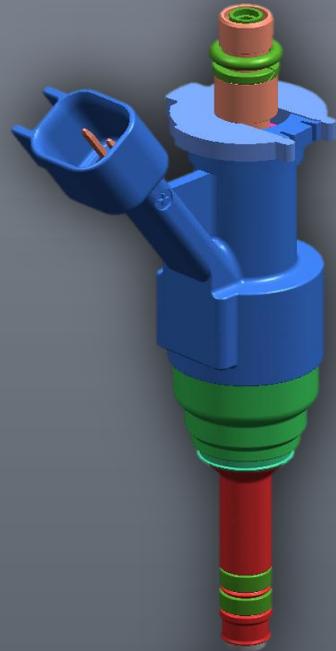
LT4 FUEL SYSTEM

TECHNICAL DETAILS



Fuel System

- Direct injection
- Higher flow fuel pump
 - 2900 psi (20 MPa) operating pressure (LT1 was 15 MPa)
- New fuel rail assembly
- High flow injectors
 - 25 cc/second flow (LT1 was 20 cc/second)
 - Fuel spray cone for optimized combustion



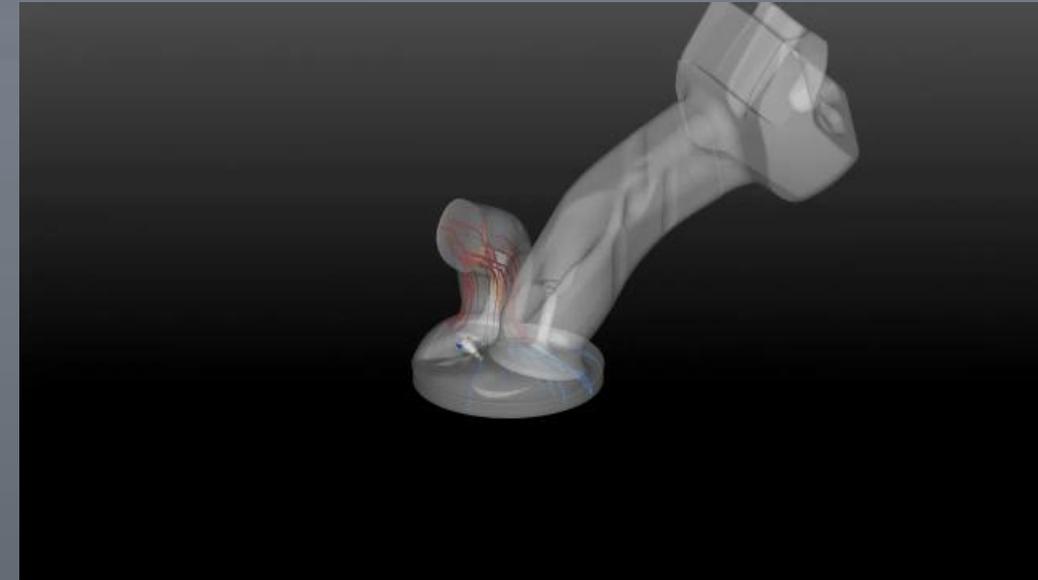


ALL-NEW, SUPERCHARGED 6.2L LT4

TECHNICAL DETAILS



- **Combustion system**
 - Gen 5 combustion system
 - 10.0 : 1 CR (premium fuel)
- **Cylinder heads**
 - Rotocast
 - 356-T6 aluminum alloy
 - Compact combustion chamber
 - Titanium compatible intake seats
- **Exhaust manifolds**
 - Cast Stainless
 - Cast header passages enable consistent exhaust flow to the “wide mouth” collector





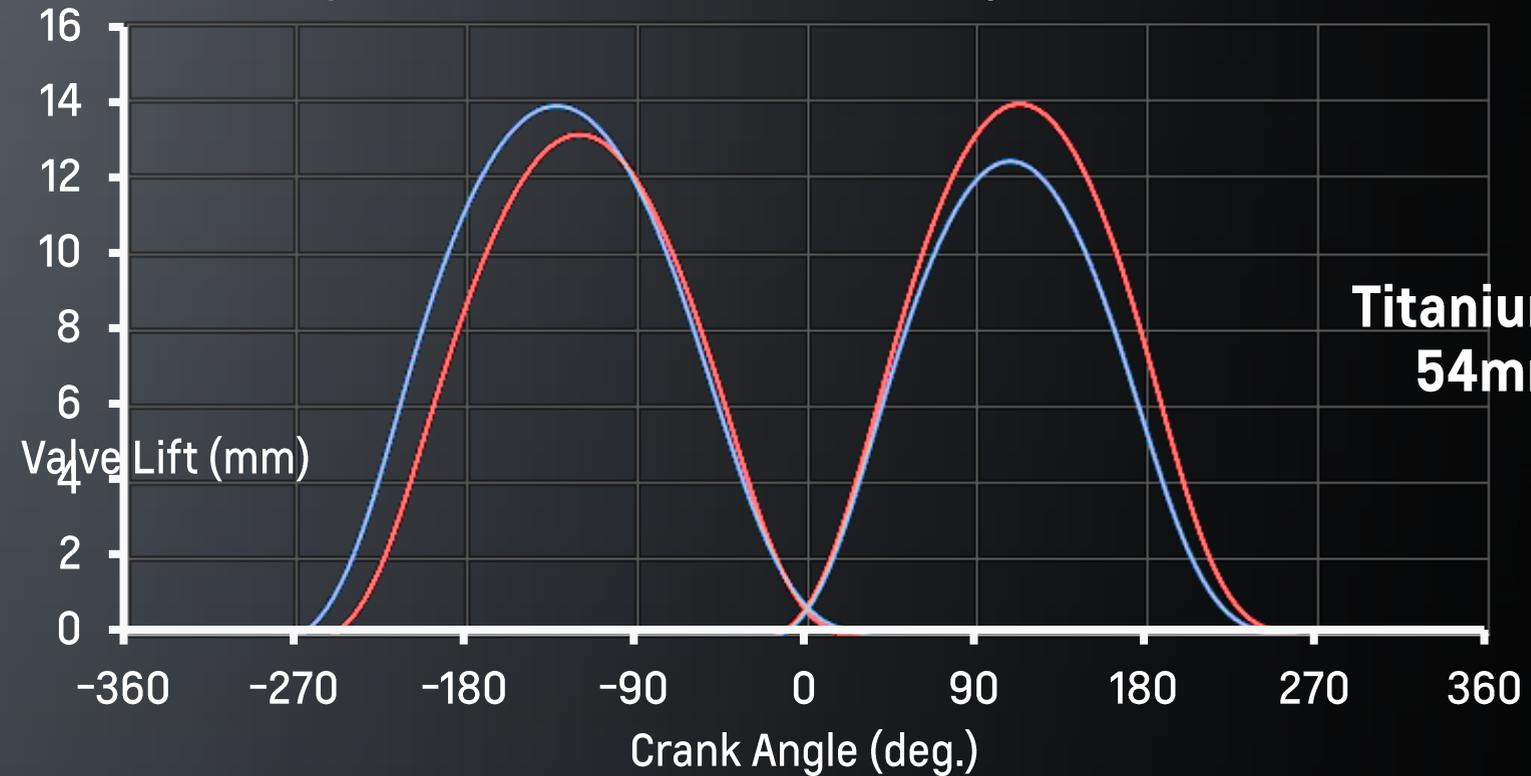
LT4 VALVETRAIN

TECHNICAL DETAILS

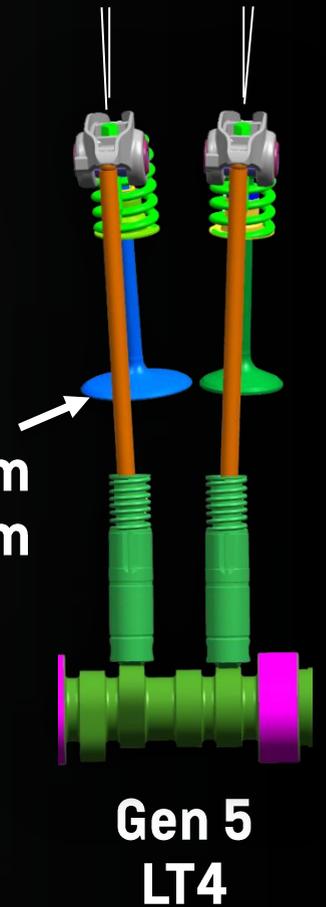
Valvetrain

- Titanium intake valves
- Longer duration cam
- Continuously variable valve timing

Lash Adjusted Valve Lift vs. Crank Angle – LT1 vs LT4



— LT1-Exh-AFM — LT1-Int-AFM — LT4-Exh-AFM — LT4-Int-AFM





LT4 PISTON / ROD

TECHNICAL DETAILS

Pistons/Rods

- Forged pistons
- DLC (diamond-like coating) piston pins
- Lightweight machined forged powder metal steel rods



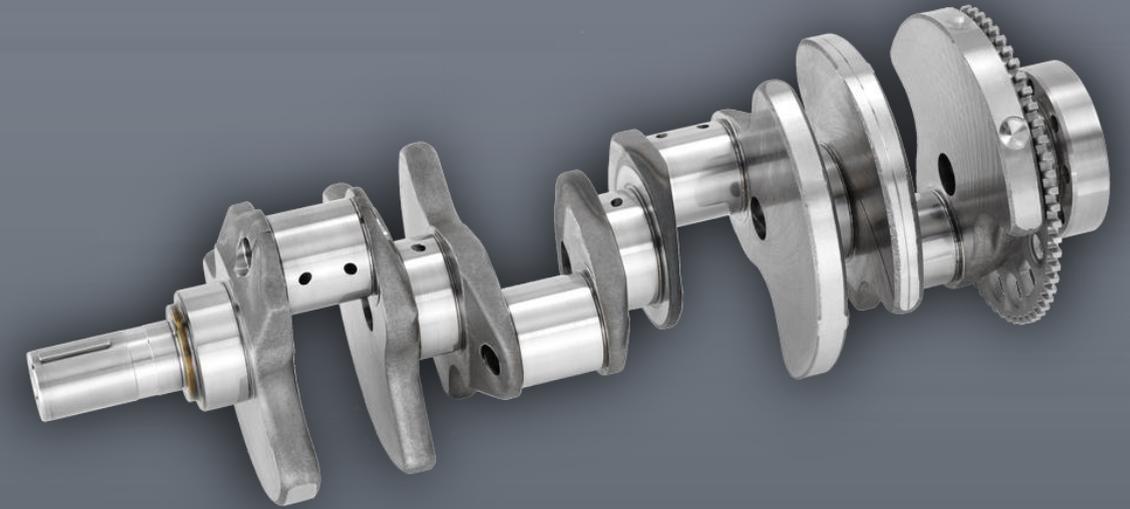


LT4 CRANKSHAFT AND DAMPER

TECHNICAL DETAILS

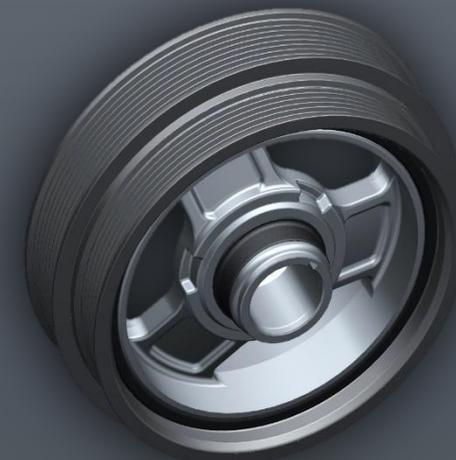
Crankshaft

- 1538MV steel forging (twisted)
- Ground pin collars
- Intermediate pin drills except 7, 8
- Tungsten insert crank balance



Damper

- Forged aluminum 6061
- T6 anodized hub
- Iron inertia ring



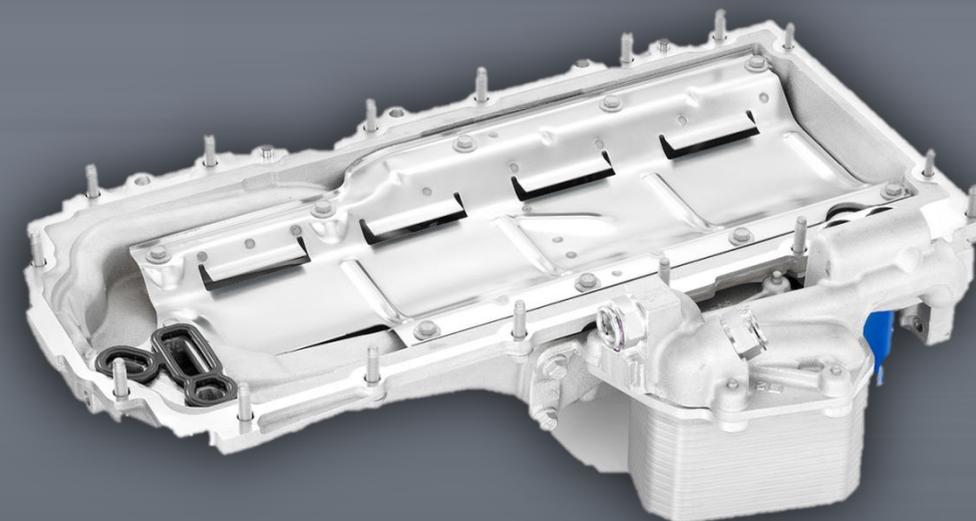


LT4 LUBRICATION AND VENTILATION

TECHNICAL DETAILS

Lubrication and Vent

- All Z06 are dry sump (option on Stingray)
- New and larger oil cooler
- High strength scavenge pump gears for oil pump
- Vent line enhancements





ALL-NEW, SUPERCHARGED 6.2L LT4

MANUFACTURING

- Tonawanda and Bowling Green Performance Build Center
 - Engine Build Experience under development at PBC
 - All-new assembly systems at both locations

