

# Valvetrain System Optimization via 1D Simulation for High Performance SI Engines



➤ Supporting companies: **POWERTECH Engineering (PWT)** and **Lamborghini**

➤ Start date: March 2023

➤ Project duration: 6÷8 months

➤ Site:

- PWT's offices in Turin

➤ Compensations: Meals, travel expenses

➤ Motivations and Project Scope

- In the highly competitive world of today, car manufacturers are continuously trying to shorten the time-to-market, requiring a simultaneous development of all the vehicle systems aimed to converge to the final design with the most efficient usage of the available resources. In this perspective, virtual simulation is a key enabler thanks to its flexibility and its cost/time savings compared to a prototype-based approach.
- The candidate will be in charge of developing and refining a multi-body mechanical model representing the complete valvetrain system (incl. camshaft). Simulations will be performed to evaluate impact on valve motion of sizing/stiffness of the camshaft. The timing drive will be modelled (incl. cam-phaser) as well and integrated into the system-level valvetrain one, to investigate mutual influence. Finally, torsional oscillations in the system will be correlated vs measurements.
- The activity will be based on the 1D multi-physics simulation software GT-SUITE.



Valvetrain System Model

