Mobility and electrical power generation are key to mission success. Future combat engines must efficiently deliver more power to enhance vehicle mobility and satisfy increased electrical system demands. This increased power must be delivered with minimal effect on installed space claim, weight, cooling system load and support logistics. Fuel delivery to the battlefield is costly and dangerous so engine fuel efficiency in all operating conditions is paramount. Engine performance in all operating conditions is vital to the mission.

The AVL Advanced Combat Engine delivers state-of-the-art technology for electrified or conventional vehicle platforms with a high power density, low weight, unparalleled fuel efficiency and consistent power delivery under all in-theater conditions and fuels.

AVL has designed a unique Opposed Piston Engine family to address crucial combat vehicle demands. Compared to more conventional combustion engines, the AVL solution delivers:

- Up to 50% greater power density, which improves vehicle performance while also delivering power for increased vehicle electrical demands
- Up to 30% better fuel efficiency
- Up to 40% reduction in engine heat rejection, which reduces space claim and vehicle mass while maximizing the power to move the vehicle
- Consistent performance in extreme conditions with any type of diesel or JP8 fuel using AVL CYPRESS™ technology
- Modularity and scalability to fit multiple future vehicle applications
- High durability, to ensure that the power is available when required
CYPRESS TECHNOLOGY
Cylinder Pressure Monitoring (CYPRESS™) is a technology which provides closed-loop feedback to enable real-time control of combustion in a compression ignition engine. This makes it possible to adapt to the fuel ignition quality and energy density by adjusting the main injection quantity and the placement of the injection events. The engine control system can thus detect fuel quality and adapt the ignition sequence quickly and robustly – and without any prior knowledge of fuel properties. The technology is a key enabler for the successful implementation of the Single Fuel Concept.

ENGINE FAMILY
The flexible design of the AVL Advanced Combat Engine allows for the realization of an Engine Family ranging from 450 – 1200 kW, ready for horizontal and vertical installation and dedicated to serve as primary power for both conventional and electrified, and both wheeled and tracked vehicles. Due to its high installed power density, low heat rejection, decreased cooling demand and ultra-compact and lightweight design, the AVL Advanced Combat Engine is the preferred solution for the upgrade of current vehicle fleets.

The engine architecture is designed to also satisfy the requirements of our commercial customers. OEMs will be able to use the higher package power density in harmony with hybrid and electrified technologies in commercial vehicle applications. Focusing on compatibility for future powertrain needs, AVL’s engine design has the flexibility to adapt as defense, regulatory and commercial demands change over time.

ABOUT AVL
AVL is the world’s largest independent company for development, simulation and testing technology of powertrains (hybrid, combustion engines, transmission, electric drive, batteries and software) for passenger cars, trucks, military vehicles and large engines.

DEVELOPMENT OF POWERTRAIN SYSTEMS
AVL develops and improves all kinds of powertrain systems and is a competent partner to the engine and automotive industry. With AVL Special Purpose Powertrain, AVL has established a dedicated group to address the specific requirements in the design, engineering and realization of powertrain systems for defense applications.