Propulsion

In the Aerofly FS 2 there are a handful of different engines to propel an aircraft. There are engines that drive propellers through a driveshaft and there are jet-engines that directly create a thrust.

Propeller Propulsion

A propeller in the Aerofly FS 2 is usually connected to a rigidbody object. That Body is then rotated around a jointmulti by a drive shaft torque connection. So in short: the engine acts a torque upon the driveshaft which turns the propeller that then creates thrust based on its rotation speed, pitch and airfoil.

In the Aerofly FS 2 there are a couple of engines to choose from:

- combustion engine
- electric engine
- turboshaft engines

Jet-Stream-Engines

Jet stream engines compress air, mix it with fuel, burn it in a combustion chamber and accelerate the hot gases through turbine blades. There are numerous ways to create such an engine and each has their own characteristics. In the Aerofly FS 2 the following jet stream engines are implemented:

- turbofan (high by-pass-ratio engine used for airliners like the A320, B747)
- turbojet (low by-pass-ratio engine for jet trainers like the MB339)
- jet_engine (afterburning turbojet engine used in flighter jets like the F15E or F18)

The implementation of these engines in the Aerofly simulator follows the international standard nomenclature for jet stream engines. It assigns numbers to the different locations within an engine.

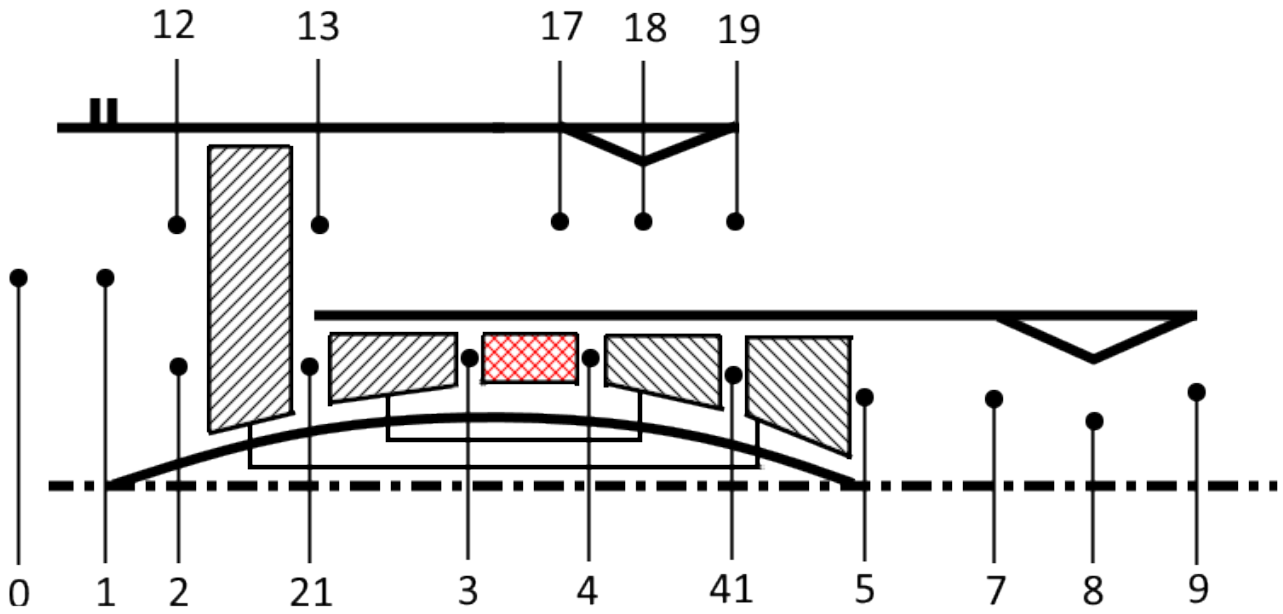
All air from the outside, far in front of an engine (0) enters through the intake (1) and is split into the core (1) and bypass air flow (12). The bypass air masses are accelerated by the fan or “booster” (13) and exit the engine directly (19).

The core air masses are further compressed (21 to 3). They enter the combustion chamber at a relatively slow airspeed (3), where they hit the hot flames. The exhaust is accelerated from the end of the combustion chamber (4) towards the lower pressure rear end of the engine (5). The turbine blades (4 to 5) that spin in the airflow that is rushing towards the low pressure end hereby extract the heat energy in the air flow and converted it into mechanical power to drive all other components (compressor and fan) via shafts in the center of the engine.

The afterburning turbojet engines take the still hot exhaust gases and mix it with fuel for a second time (at 5, between 5 and 7). The resulting fuel burn is not as efficient but it increases the maximum thrust further for short term applications.

All exhaust gases then finally leave the engine through the nozzle (7 to 9) which is can be

mechanically controlled in afterburning fighter jet engines.



Rocket Engine

Rocket Engines are currently only partly implemented. The `rocketengine` class is still recognized but currently broken (as of today, 23rd of Jan. 2017). It might be re-added later, please contact us if you need this type of propulsion for your project. Here is a pretty image of a Laval nozzle in the mean time :D