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EngMod2T

The Multi-Cylinder Two-Stroke
Engine Simulator

EngMod2T

EngMod2T is a Two-Stroke Engine Simulator that simulates the gas-dynamic processes, the thermodynamic processes and the mechanical processes of an engine. It allows the following engine types and variants:

1. Reed valve engines.
2. Inlet piston port engines.
3. Rotary disc valve engines.
4. 1 to 8 cylinder engines.
5. Inline and V engines.

Main Assumptions

EngMod2T uses the GPB-method to simulate the one dimensional gasdynamics in the pipes and ducts. It uses Cd-maps for all the ports, pipe ends and pipe discontinuities like restrictions, steps and throttles.

The combustion model is a typical two-zone model as described in numerous publications. The burn rate is described using a Wiebe function.

The scavenging model is based on the model as developed by Prof. GP Blair with the added capability that no empirical factor has to be added to separate the burnt zone from the fresh mixture zone. The thermodynamics is handled by the software. The user has to choose the type of scavenge model.

Types of Exhaust Pipes

A range of exhaust pipe configurations are available, depending on the type of engine. The following lists some of them:

1. Tuned pipe (expansion chamber, expansion box) for each cylinder.
2. Open pipe for each cylinder (the user specifies the layout).
3. Box pipe where the pipe ends in a box with outlet – individual boxes or a common box.
4. Ninto1 pipes from N=2 to N=8, with the collector pipe an open, tuned or box pipe.
5. Log manifolds as is typical on outboard engines ending in an open, tuned or box pipe.

There are also some special pipes for V-engines with cross connectors etc.

Types of Inlet Pipes

As with the exhaust, a range of inlet pipes are available, depending on the type of engine. The following lists some of them:

1. Plain open inlet pipe.
2. Inlet pipe with a throttle.
3. Inlet pipe with a boost bottle.
4. Inlet pipe with a throttle and boost bottle.
5. Ninto1 collector inlet with cylinder pipe throttles.
6. Ninto1 collector with collector throttle.
7. All the above with airbox/es.

Using EngMod2T

The model is created using a pre-processor called **Dat2T** that is a stand alone program. The simulation is then executed using **EngMod2T**. At the completion of the simulation run the post processing is done using **Post2T**. Or if the user prefers by something like **Excel**.

Obtaining the EngMod2T suite of programs

The software price is \$US400.00. To purchase it email Neels van Niekerk at vannik@mweb.co.za with a request. The software will then be emailed to you after which you install it on your PC. The pre and post processors together with all the help files should then work. **EngMod2T** requires a licence file to run. If after reading the help files you should decide to purchase the software contact Neels van Niekerk to obtain banking details. Once proof of payment has been received the licence file will be sent to you. The licence is for one computer only.

Note

The software was written with the more experienced user in mind that cannot afford the more sophisticated programs but still wants the ability to simulate multi-cylinder engines and/or have some control over the temperatures and combustion processes.