

AMESim

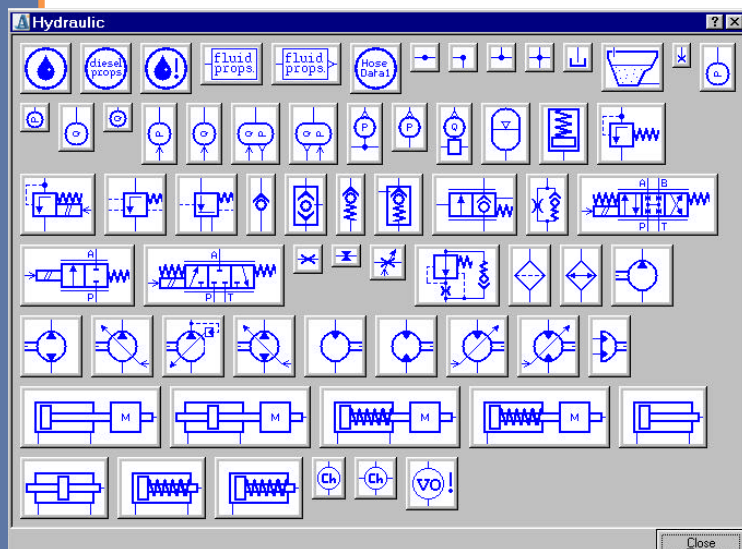
LIBRARIES - HYDRAULIC

KEY POINTS

- Steady-state and transient simulation.
- Graphical interface enables you to create new designs quickly.
- State-of-the-art theory. Easy parameters filling from manufacturers' experiments or data, or from technical drawings.
- Recognizable technological icons facilitating direct model identification with technical drawings.
- Full multi-domain compatibility for total system analysis with energetic couplings study.
- Complex modeling without writing a single line of code.
- Build and save your own models for easy reuse.
- Rigorous handling of fluid properties.
- Sensitivity analysis and size optimization.
- Time domain and frequency analysis for vibration modes characterization (eigenvalues, modal shapes, transfer functions).
- Activity index for energies and efficiencies evaluation, and models reduction.
- Matlab®/Simulink® interface for control design.
- Direct Integration of your own C or Fortran code.
- Fully compatible with other AMESim libraries.

Overview

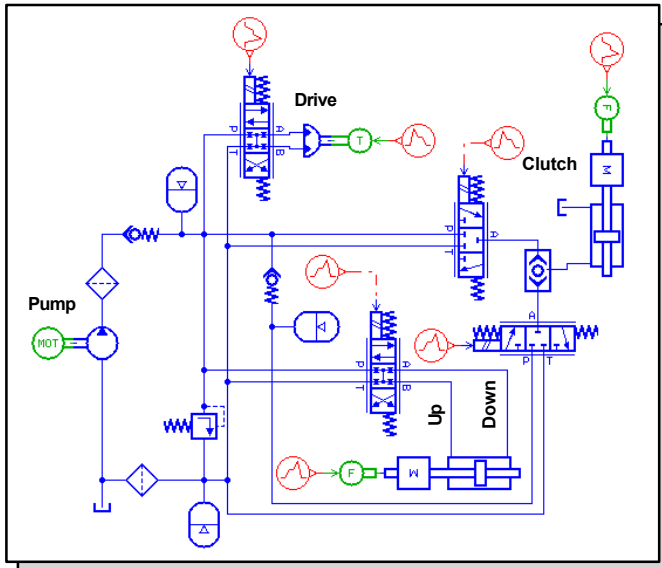
Fully dedicated to the design of complex hydraulic systems for a large range of applications the AMESim® Hydraulic library is made of over 120 models of various complexity levels. This library is the design accelerator for your hydraulic systems in business areas such as automotive and off-highway (power steering, braking, suspension, fuel injection, camless distribution, lubrication, powershift transmission actuators...), aerospace (landing gear, braking, flight control systems, fuel and lubrication systems...) or industrial equipment (test bench, lift, machine tools...).



Benefits

The user-friendly AMESim Hydraulic library helps you to develop new design concepts efficiently. Thanks to a very large collection of hydraulic components, it allows the user to find out the right answers for the optimal development of complex hydraulic systems. As a result, the customer cuts down on the number of prototypes, and reduces both development cost and time to market.

Model of hydraulic systems are numerically stiff, extremely non-linear and are often modeled with discontinuities. The unrivaled AMESim solver automatically and dynamically selects the most adapted integration method based on the particular system dynamics better than any other software on the market.



Part of a Formula 1 Car Hydraulic circuit

Hydraulic model families

- Hydraulic fluid and fuel properties.
- Fluid property sensors.
- Hydraulic pipe and hoses.
- Data for complex hydraulic pipe/hose models.
- Hydraulic nodes.
- Hydraulic tank or reservoir.
- Hydraulic pressurized tank with complex shape.
- Hydraulic flow and pressure sources.
- Signal port to hydraulic port converters.
- Pressure and flow rate transducer.
- Hydraulic (gas filled) and spring accumulator.
- Hydraulic pressure relief valve.
- Signal operated hydraulic pressure relief valve.
- Hydraulic operated valve.
- Hydraulic check valve.
- Shuttle valve.
- Spring loaded hydraulic check valve.
- Piloted spring loaded hydraulic check valve.
- Piloted spring loaded hydraulic check valve with external drain.
- Hydraulic orifice with by-pass check valve.
- Electrically operated 2, 3 and 4 port hydraulic valve.
- Hydraulic restrictor.
- Variable hydraulic restrictor.
- Hydraulic flow regulator.
- Hydraulic filter.
- Hydraulic cooler.
- Fixed displacement unidirectional and bi-directional hydraulic pump.
- Variable displacement unidirectional and bi-directional hydraulic pump.
- Pressure regulated hydraulic pump.
- Fixed displacement unidirectional and bi-directional hydraulic motor.
- Variable displacement unidirectional and bi-directional hydraulic motor.
- Rotary hydraulic actuator.
- Hydraulic actuator with single/double hydraulic chambers and single/double rods.
- Hydraulic actuator with/without spring assistance.
- General hydraulic volume.
- Zero hydraulic volume.

Features

The AMESim environment and Hydraulic library offer a large number of capabilities such as:

- Many standard components included (pumps, valves actuators...).
- Compressible fluid consideration with rigorous treatment of fluid properties and mass conservation.
- One or more fluids in one system model.
- Includes effects of cavitation, air release and viscosity.
- Severe non-linearities and discontinuities are seamlessly handled.
- Calculation of all the required variables (flow rates, pressures...), accessible during or after computation.
- Water hammer transients with advanced pipe and hose models (pressure drop, wall expansion, frequency dependent friction).
- Hydraulic network analysis.
- Detailed system efficiency.

Requirements

The AMESim Hydraulic library runs on Unix[®], Linux[®] platforms and Pentium[®] - based PCs.

IMAGINE
www.amesim.com

Contact IMAGINE directly:

USA: +1 734 207 5557
 UK: +44 18 69 351 994
 France: +33 (0)4 77 23 60 30
 Germany: +49 89 548 495 0
 China: +86 13818750986
 Japan: +81 (0) 3 3351 9691

E-mail: info@amesim.com

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