the overall conceptual information of interconnected parts and subsystems. Importantly, it does not require a full 3-D geometry representation, so engineers can simulate and predict the behavior of intelligent systems long before detailed CAD geometry becomes available.ĊThroughout this process, Messier-Bugatti system engineers took advantage of convenient access to Imagine. Lab Ground Loads software. The systemâĢĻs flexible licensing arrangement enabled them to optimize the use of specific modules and libraries while lowering overall system simulation expenses.ĊSimulating complex behaviorĊGround Loads modeling and analysis capabilities allowed Messier-Bugatti to analyze behavior of hydraulic systems in terms of performance, stability, and robustness. Engineers also used the model to study the thermal characteristics of hydraulic circuits and evaluate the need for heat exchangers. These results were then used to establish the sizing, output, and other component specifications for the entire hydraulic power unit, including its reservoir, pump, and accumulator.ĊUsing Ground Loads, engineers could also explore alternate sets of parameters and scenarios. When developing a steering system, for example, various combinations of components and systems (actuators, motors, valves, ECU, etc.) could be compared from specification to validation, thus significantly improving the steering system quality.Ċ|Signals from electronic control units (ECU) activate multiple small electric