Design and 3D Modelling at VTS

The initial design stage is the most important to any vacuum truck build, even a simple one to be a successful project, if done correctly and with high attention to detail it can significantly reduce the production time, not only at Vacuum Truck Supplies (VTS) but any manufacturing plant resulting in smooth production and shorter lead times.

Our design process starts with the question, where the truck will be used? Whether it be a mine far north Western Australia in 50 degree heat or sucking up septics in Tasmania where the temperature gets well below freezing. The operator also plays an important role in the design process, who will be using the truck? Are the operators highly trained with years of experience or are they relatively new to operating such trucks. Lastly but just as important is what product will the truck suck up? Whether it be dry iron ore gravel or general liquid waste, our trucks can be capable of anything in-between.

All of the above determines the specification of the project including type of fluids used, size and type of vacuum pump, barrel capacity and diameter, valves, control systems, rear opening door, hoist, and other additional components required such as water pumps or underbody vibrators.

After the specification of the truck is detailed we start to create 3D models of the project, this gives the customer a visual representation of how the truck will look and operate. More and more manufacturers are using 3D modelling including many of our suppliers such as Fruitland Manufacturing who are manufacturers of rotary vane vacuum pumps and Isoflex who are an Australian manufacturer of all types of isolation systems and flexible driveline couplings, these suppliers give us access to 3D models of components allowing us to incorporate these into our own models, giving a better representation of how they tie together, this helps us to foresee issues early in the project that would have previously been found in the final assembly stage of a project, when there is very little time to find a solution.
Another part of the initial design stage is detailing and sketching the brains of the truck, what systems are required? Whether it be hydraulic, pneumatic or electrical or a bit of all three to ensure the truck is simple, runs efficiency, is operator friendly and most important safe to operate. Our engineer works very closely with our automation suppliers such as Mega Pacific and Griffiths Components, to create a full set of brains which is detailed in schematics prior to production beginning.

One of the most important things not mentioned yet is the type of cab chassis the body will go on or trailer be towed behind, we don’t have a preference when it comes to the make and model of the cab chassis, this is entirely the customer’s choice and we have the ability to design a system to almost any cab chassis within reason. However when it comes to choosing the correct wheelbase and getting the weights correct, we work with the customer at this first stage to ensure the truck is fit for purpose, using a weight distribution program called Trailer WIN to work towards getting maximum payload for the customer. The truck make and model must be decided before any design can take place due to different varying truck intelligence and chassis shapes nowadays. Truck manufacturers are giving in to body builders such as VTS and are beginning to provide full 3D models of their trucks on request, which is a huge step forward.
Once all the above is taken care of, production is ready to begin. 3D modelling is not just useful with design of a project for the use in production but it has been recently come very important in training packages especially on mine sites where site access and operations are very restricted to visitors. The 3D models are incorporated into training presentations to give the operators a visual representation of the truck including the locations of controls and components on the truck which need daily inspection and maintenance. We have previously worked alongside Balon who create training documentation, we provide production 3D models which are further enhanced through computer modelling by Balon to develop very detailed representations of our trucks for training purposes.

Image source: Balon