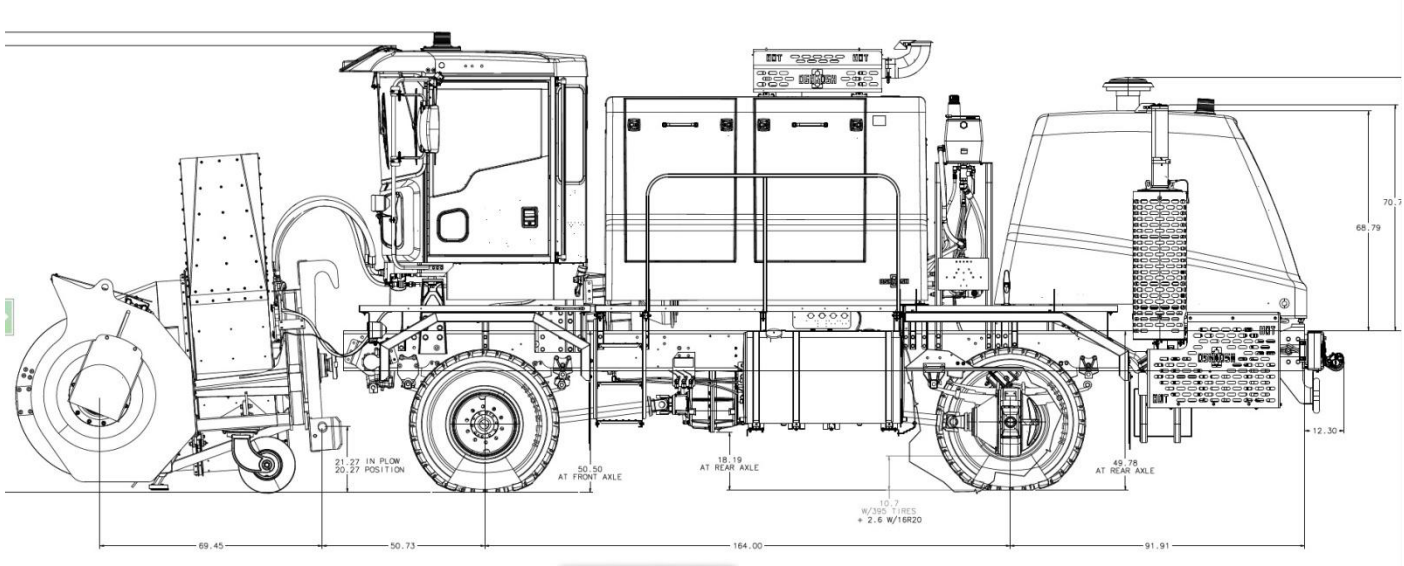
14th scale Oshkosh H-Series Snow Blower

Built by Pete Dickinson

After building the Oshkosh Birmingham Airport fire appliance my contact as Oshkosh asked me what I intended to build next. Despite telling him that I was going to have a rest while I decided, he suggested that his company also made snow removal vehicles for airports and sent me some very interesting photos of them.
The H-Series Snow Blower was the one that attracted me most and I asked my contact if there was a possibility of obtaining photos of it. It seemed that my previous efforts had impressed the 'powers that be' in the company as I was sent a set of detailed drawings, which I am using to create the model.

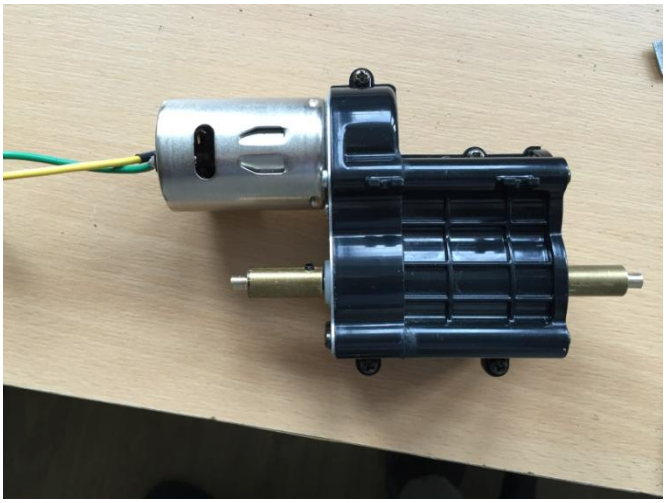


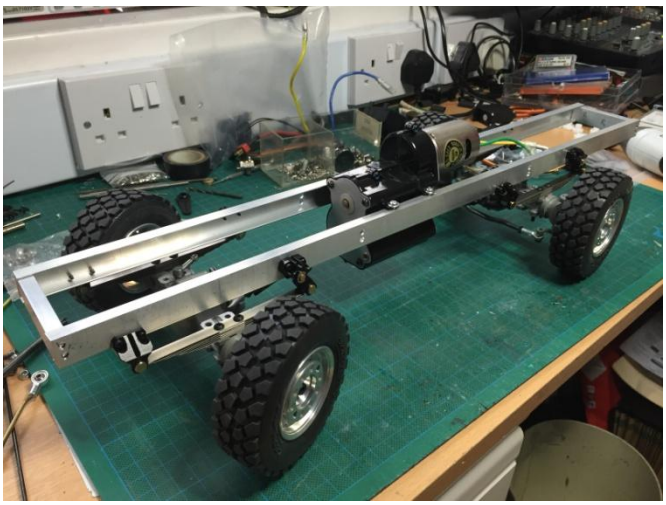
Unlike my previous model vehicles which are all based on modified Tamiya Chassis and drive gear, this model was going to be built from scratch so the wheels, tyres, leaf springs and axles had to be obtained as near to the original vehicle as possible. The next issue was discovering, after looking at some of the photos I had of the original, that both axles are not only driven but independently steer, which entailed a rather expensive purchase of two full differential axles from a German manufacturer.

The main (lower) chassis is formed from two lengths of 15 x 10mm aluminium U section and the upper is formed from 10 x 10mm section.

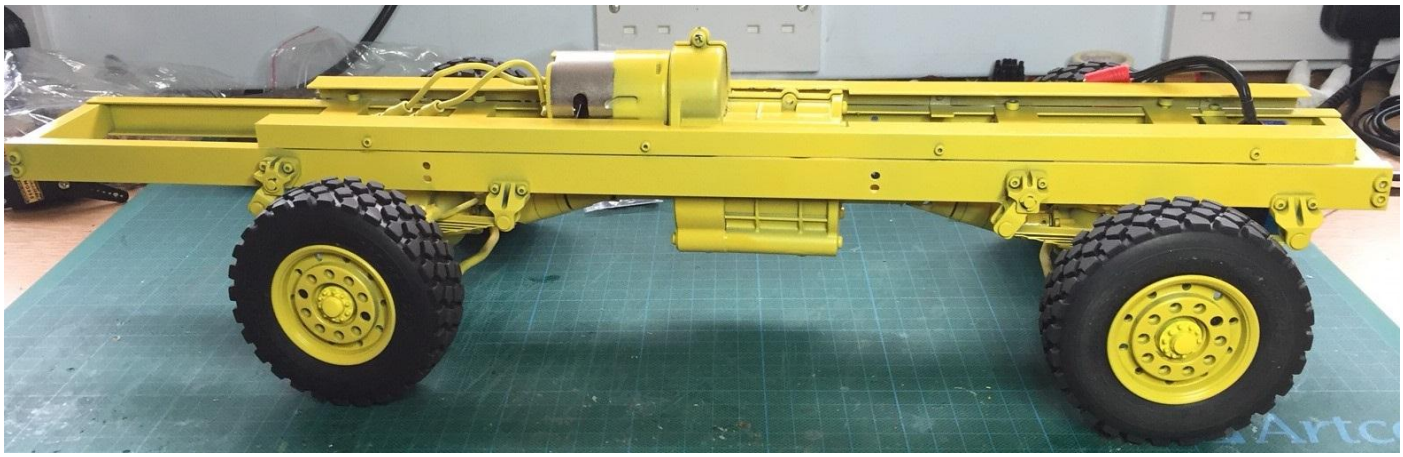
The cross members were made from stock aluminium bar machined at the ends to slot into the chassis sides and fixed using M3 x 6mm stainless cap head screws. Four lengths of the 15 x 10mm section channel were cut to form the fixing supports for the two metal geared servo's mounted over the axles and connected via 3mm brass rod and ball and socket style servo connectors.
The axles were fitted next and the aluminium turned wheels fitted with all terrain tyres before being fixed in position on the leaf springs.

I decided to buy a second hand Tamiya gearbox and cut it down, modifying it so that it had drive shafts at both ends of the gearbox and then obtained some adjustable length universal shafts to connect the drive outputs to the front and rear axles after turning two adaptors from stock brass rod on the lathe.





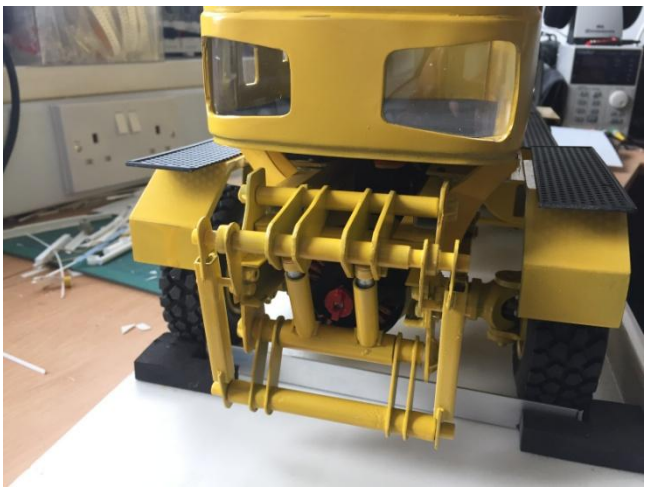
I now added the upper chassis members to achieve the correct height for the temporary build deck.
The entire assembly was then broken down to give it a coat of grey etching primer and a top coat of yellow before being reassembled.



Some 10mm square styrene tube was placed on the top chassis members and fixed with internal cap head screws before adding the build plate and the mudguards made from sheet styrene.

Then began the long process of building the various parts of the superstructure, which is basically in three parts. The cab at the front, the blower engine compartment in the middle and the drive engine compartment at the rear.
As the centre compartment is the largest I decided that this would be the place for all the electronics and battery, which meant that the rear compartment could be populated with a dummy engine and radiator, the unit hinged to give access to view the insides.

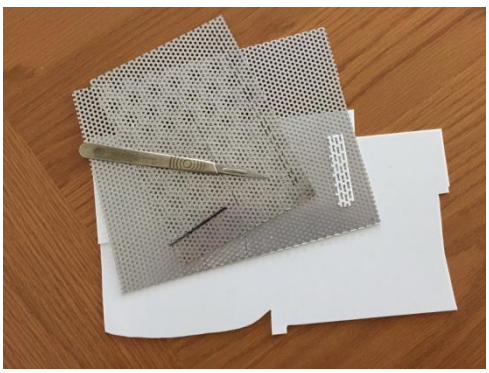
After several attempts to get it to look correct the various parts were scratch built and added to the build plate, modifying it as the build progressed until I was more or less happy with the overall appearance.
The photos on the next page show the process.



The next big issue was to fabricate the hydraulic assembly at the front which is used to attach the vehicle to the blower section. As this isn't shown on the Oshkosh drawing, I had to use some of the many photos I have of it to make the various working parts. I had to guess at some of it but in the end managed to produce quite a realistic version, made from styrene sheet and various tube sizes, that is operated by a servo mounted under the cab.

Sadly because of the need to have the blower operating the position of the blower drive brushless motor meant that the hydraulic assembly had to be mounted 1 cm forward of its correct position.

One of the difficulties I found was sourcing the staggered slotted sheet that surrounds the exhaust systems as shown in the image here. After many hours of fruitless searching on the internet I finally bit the bullet and decided to make my own. The sheets of 2 mm hole staggered aluminium I acquired for the vehicle walkways now came in useful and after sandwiching a sheet of 0.5 mm styrene sheet between them I drilled through all the holes eventually producing a copy of the aluminium in styrene. From there it was just a case of using the scalpel to cut the plastic out between each pair of holes. A scrap piece of the finished item is shown on the image on the left.



The modified sheet could now be used to fabricate the two exhaust system covers using the drawings from Oshkosh and the result is on the left.

I then built the cab interior before adding all the electronics to make the lights work, then cabled the various umbilical's to the front and rear of the model before connecting it to all the lights I could see on any of the photos I have of the real vehicle.

Radio control: To enable me to do what I need with this model I decided to buy a rather up-market computer controlled transmitter and, because all my other models use Hitec radio, I went for their Aurora 9X but as it is primarily intended for aircraft use had a struggle to work out how to get it to do what I wanted. In the end, with the help of one of my AWL colleagues I managed to program it so that the steering reacted in the same way as the full size vehicle.

There are three different settings to use on the snow blower and these features are programmed onto one of the transmitters 3 position switches.

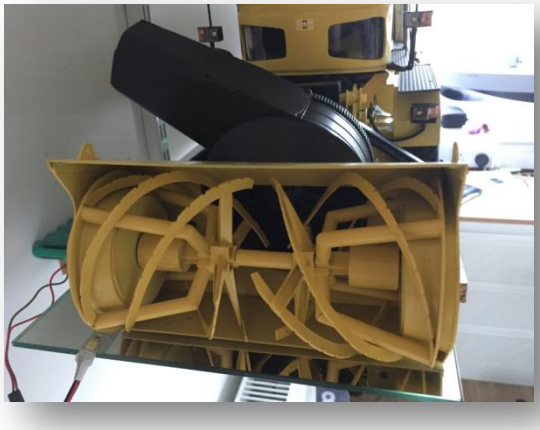
1) is when being used to remove snow in a straight line. So that the rear wheels are always on cleared ground, both wheels steer in the same direction causing the vehicle to 'crab' sideways.
2) is when the vehicle is not on the airport only the front wheels steer, the back wheels remain fixed straight ahead.
3) At the end of a clearing run they need to turn the vehicle in its own length ready to return so the wheels turn in opposite directions creating a very tight turn.

Another of the 3 position switches controls the hydraulic assembly, which needs to go up and down at slightly different speeds and the transmitter programming gives access to this very feature, resulting in a very realistic operation along with a recorded sound of a hydraulic pump running and slowing to a stop as the mechanism comes to rest. The three positions are: Lowest (When the blower section is disconnected from the vehicle. Middle (When the blower section is connected to the vehicle) and Upper (When the blower section can be lifted clear of the ground to enable the vehicle to perform the tight turns)

A spare channel on the transmitter was software plotted to the single spring loaded switch on it and that channel has a R/C electronic switch in the model. The output of this module drives the sequential switching of all the lights and the beacons via the scratch built electronic board that also contains the electronics to generate the hydraulic sound effect, which is situated in the limited space under the cab.

The next part of the build was making the very complicated blower head. Sadly the only drawings I had of this part were insufficient to ensure the finished article was accurate. I tried to get more detailed drawings from Oshkosh but was denied access to them and at first I decided to abandon the build as I was not going to be happy with something that was constructed by pure guesswork. Eventually I was persuaded to continue and began the long and tedious task.

As I wanted everything to work as in the real vehicle I spent some months deciding on the best approach and found some very small 6volt motors with gearboxes fitted and managed to locate them within the structure. Sadly the finished blower section is now far too heavy for the small servo that controls the hydraulic assembly to work properly so that can only be demonstrated with the blower part disconnected. The large impeller inside the moveable exhaust was 3D printed and despite being driven by a fairly powerful brushless out runner, mounted under the cab, has remained intact and produces a very promising blast of air from the nozzle. The biggest problem was trying to work out how to cut the snow scoop blades as each one goes halfway around the circumference of the structure. Fortunately a friend of mine came up with a formula to calculate the blade, allowing it to curve and traverse almost halfway across the driven assembly. After cutting out eight of these and mounting them on the assembly I have to say the end result is quite convincing.



So the Oshkosh snow blower is now near to completion with only a few months of cleaning up and correcting/finishing ahead.