

## **Building a car body from scratch**

### **Developing the Idea**

1. Acquire photos, sales literature, and any drawings from factory of actual car or similar cars built by the same firm. View an original car of similar build if possible.
2. Make hand sketch for dimensions using sweeps to quantify body surface arcs. Make templates using poster board and sweeps. Locate key points in space if possible.
3. Develop a side, top and front view simple line drawing in small scale. This can be accomplished using the above mentioned. If no actual car is available then use of any photos scaled will work.
4. Develop a full size side view on MDF plywood set up along a way. Wheelbase, front and rear axles should be placed on drawing along with outside of top of engine parameters. These can be "ghosted" in. Seating area set around owners "H-point" of hip and size of body to show steering wheel, pedals and seat position. A side cut out of owner should be made using 1/8-inch thick plywood and pinned together so joints move. This can be used to make sure the three points: pedals, steering and seat all work. (Known as "Oscar" in design circles). Sweeps should be used to ensure body surfaces are accurate and build-able.
5. Drawing a top view of the vehicle can be useful. This can be accomplished directly over the side view in a lighter line or different color due to the size of the height of the plywood necessary to make them separate.
6. A quick and inexpensive "wire frame" can be made to show the major outer body surfaces. Using 3/8 or 5/16 diameter wire for major areas with 1/4 to 3/6 for others. This would show the highest sweeps in the top center of the fenders and hood going from front to back. Hood, door, truck and front grill openings should be indicated with wire.

### **Building a surface development buck**

1. Based on the wire frame a more developed surface template should be made. This can be a separate wooden station buck with plywood ribs anywhere from 6 inches to one foot apart. Areas of unresolved shapes can be made in foam to show the actual surface. This will be the buck to start shaping to. Shaping can start even before the buck is completed although major parameters need to be developed prior to beginning shaping.
2. Thought at this point needs to have a plan as to what the inner structure of the vehicle will be to fasten the sheet metal to. Classic Italian tube frames are common for light construction with some sheet metal bent into angles defining edge openings such as hood, deck lid, doors etc.

### **Developing inner structure**

1. The inner structure can be made at this point although it will not show progress to a customer like the outer body skin will. I would think that a

combination of making some inner structure to indicate actual openings discussed above could occur at this point. Windshield placement and style should be considered. It would be best to have the majority of the inner structure completed prior to starting shaping of outer body skins although it's not necessary. With a good plan laid out above shaping of outer body and inner structure development can proceed together.

### **Developing outer body skin**

2. With a good station buck and some body openings defined shaping can start.
3. L&R front fenders defining openings (Wheel opening, door and hood)
4. L&R inner rear wheel wells that the fender quarters will attach to. Some work can be done to the floors although this can wait till the end.
5. L&R rear quarters defining openings (Wheel opening, door and truck)
6. Grill surround that attaches to front fenders and defines hood opening
7. Windshield post area. This is the area that defines the rear of the hood opening, along with cowl to driver/passenger compartment
8. Area just behind the driver/passenger compartment that defines the front of the truck opening.
9. Rear valance that defines the top trunk opening and connects the two rear fenders.
10. After the outside 4 corners have been defined, then the connecting areas going from side to side are made, the openings can be addressed. I would start with making the L&R door skins. Getting the doors to work.
11. Last hood and deck lid.
12. Inner panels will need to be made and any other connecting pieces inside like transmission tunnel, front inner fender wells.