

# A1.5 Fitting Primary Surfaces to a Mesh

## OVERVIEW

A scanned mesh of a roof and windscreen is provided, and the tutorial covers how to create primary NURBS surfaces to match the mesh, using Direct Modelling techniques.

## KEY CONCEPTS

### Single Surface Across the Centre-Line

Barry builds the primary surfaces to cover both sides of the design, and keeps it exactly symmetrical using the Object Edit > Symmetric Modelling tool. The benefit is that centre-line continuity is perfectly smooth without any extra effort.

### Direct Modelling 'v' Curves & Surfaces

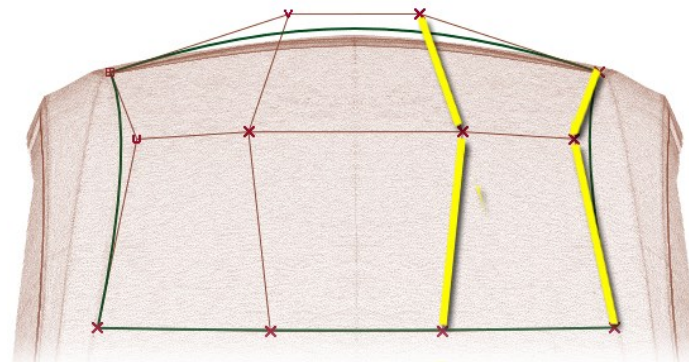
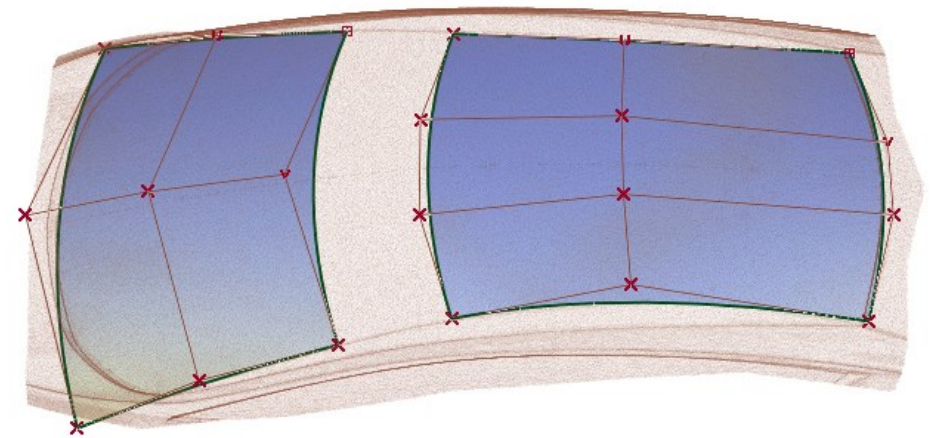
Many users are fixed in workflow that always starts with curves and uses surface tools to create the shape from the curve boundaries. Barry starts by creating a simple surface and so doesn't use curves. However, he treats each of the four boundaries and the centre-line as if they were CVs on boundary curves. This is one approach to the discipline of working on hulls rather than individual CVs, to maintain control over the surface.

### Balancing Hull Polygon Shapes

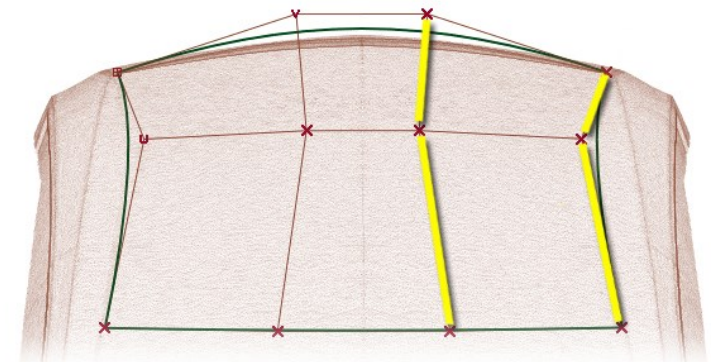
Always watch for the shape of the Hull lines and keep them flowing in sympathy with each other.

### Note:

You may want to increase the patch precision on the surfaces so that you can see the centre-line clearly in the side view.



Unsympathetic Hull Flow



Sympathetic Hull Flow

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0.25	Merging separate meshes into one	Mesh > Mesh Partitioning	<b>Mesh Merge</b>	
0.56	Using Surface Curvature shading to identify feature lines on the mesh	Diagnostic Shading	<b>Curvature Evaluation</b>	<i>Principal Maximum</i>
1.13	Using two views to build the surface			
1.34	Using a Square surface set to deg2 x deg2 to start building the roof	Surfaces > Boundary Surfaces	<b>Square</b>	
2.23	Using Symmetric Modelling to ensure symmetry across the centre-line	Object Edit	<b>Symmetric Modelling</b>	
3.04	Modelling the surface as if it were a set of curves – using hulls			
3.19	Modelling the Plan View shape			
3.37	Refining the boundaries with Xform CV > Slide	Control Panel > Xform CV > Move	<b>Slide</b>	
3.57	Developing the shape in the Front View			
4.09	Applying Cross-Sections to the mesh and the surface	Windows > Editors	<b>Cross-Section Editor</b>	<i>New Axis Increment</i>
5.37	Using layer colors for cross-sections			
6.45	Working with Hulls not single CVs			
8.09	Using Proportional Modification to control movement of multiple CVs	Control Panel > Xform CV	<b>Proportional Modification</b>	
8.58	Refining the crown shape of the roof surface			
9.17	Using Non-Proportional viewing	View Cube Menu	<b>Non-Proportional View Scale Set</b>	
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12.58	Increasing the surface degree to 3x3 to fine tune acceleration			
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15.56	Using Zebra stripe shader to compare surface to mesh	Diagnostic Shading	<b>Horizontal/Vertical</b>	
16.45	Using the same techniques to build the windscreen surface			