Using NFS MW 2012 Exporter Blender addon by DGlorio

Advanced tutorial for cars by SwiftZC33S & PolySoupList

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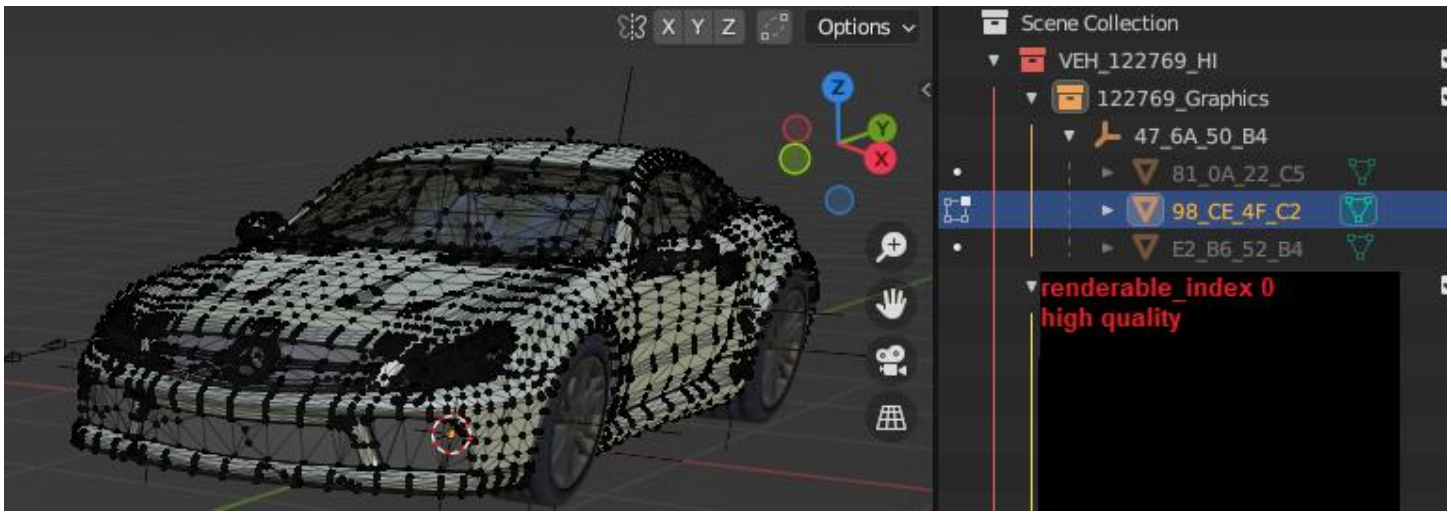
Replace the reflection, shadow or wheel LODs

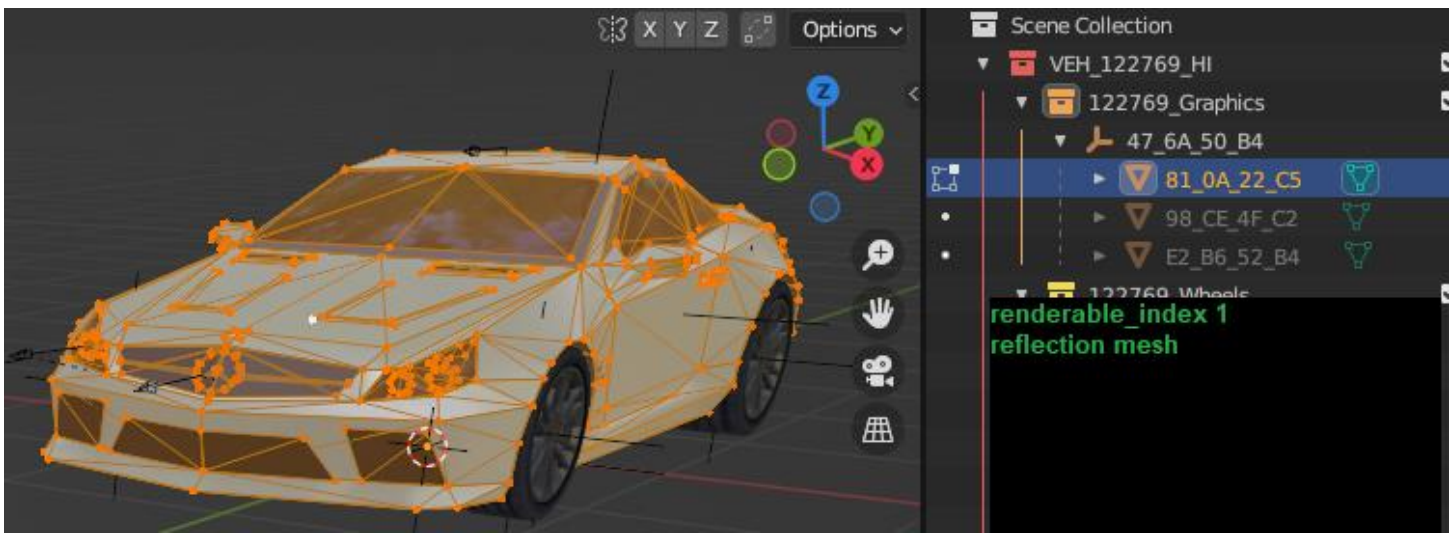
- Put the meshes for the Reflection and/or Shadow under the *same* Empty Object as the associated high quality mesh.
- Put the meshes for the lower quality LODs and spinning/blurred wheel under the *same* Empty Object as the associated high quality mesh.
- Later when you get to the *Set Up The Custom Properties* stage, add a Custom Property on each Mesh as below:

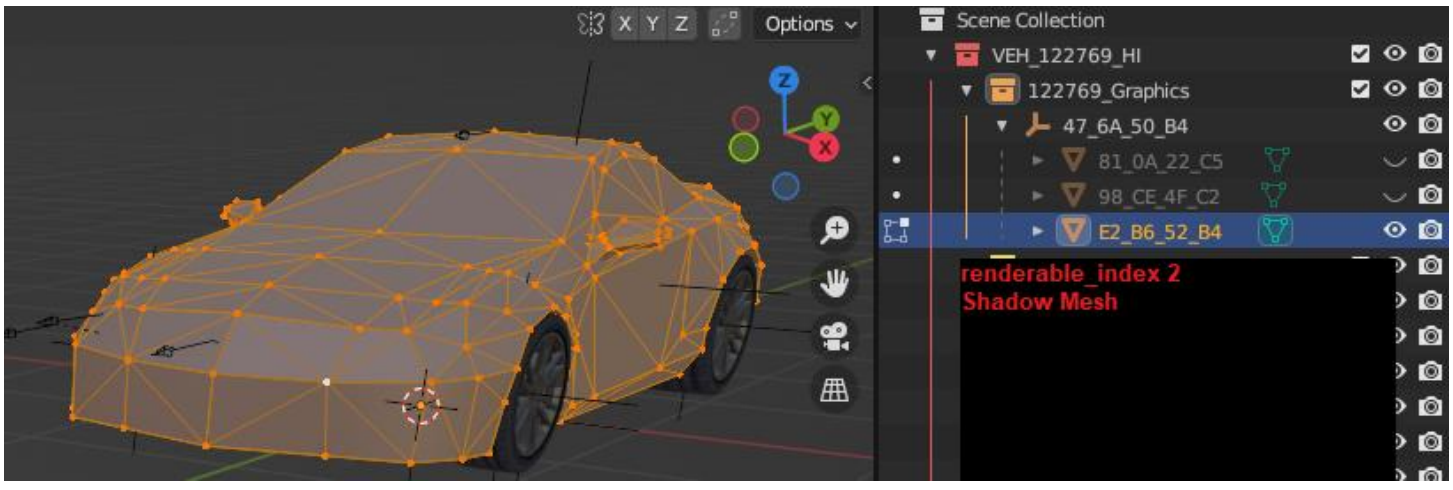
Table 4 - Mesh Custom Property - Name: `renderable_index` Type: `Integer`

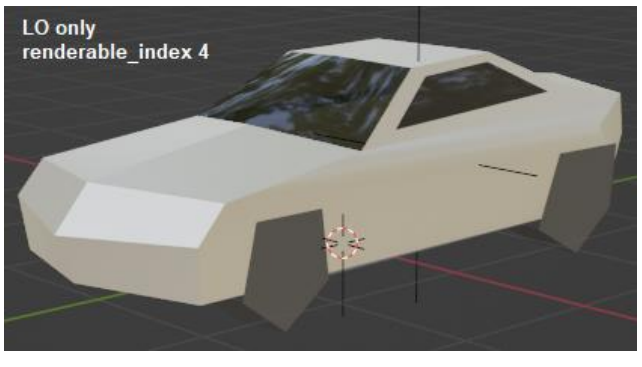
For body

HI file		LO file	
value	**Description**	**value**	**Description**
0	Set 0 on the mesh that will be the highest quality Level Of Detail	0	Set 0 on the mesh that will be the highest quality Level of Detail
1	Set 1 on the mesh that will be for the car's reflection	1	This should be a copy of the above mesh but set as 1. In original LO files there is a copy for an unknown reason, so make it the same
2	Set 2 on the mesh that will be for the car's shadow	2	Set 2 on the mesh to use for lower quality Level of Detail
		3	Set 3 on the mesh that will be for the car's reflection
		4	Set 4 on the mesh to use for cars that are very far away (super low poly)
		5	Set 5 on the mesh that will be for the car's shadow



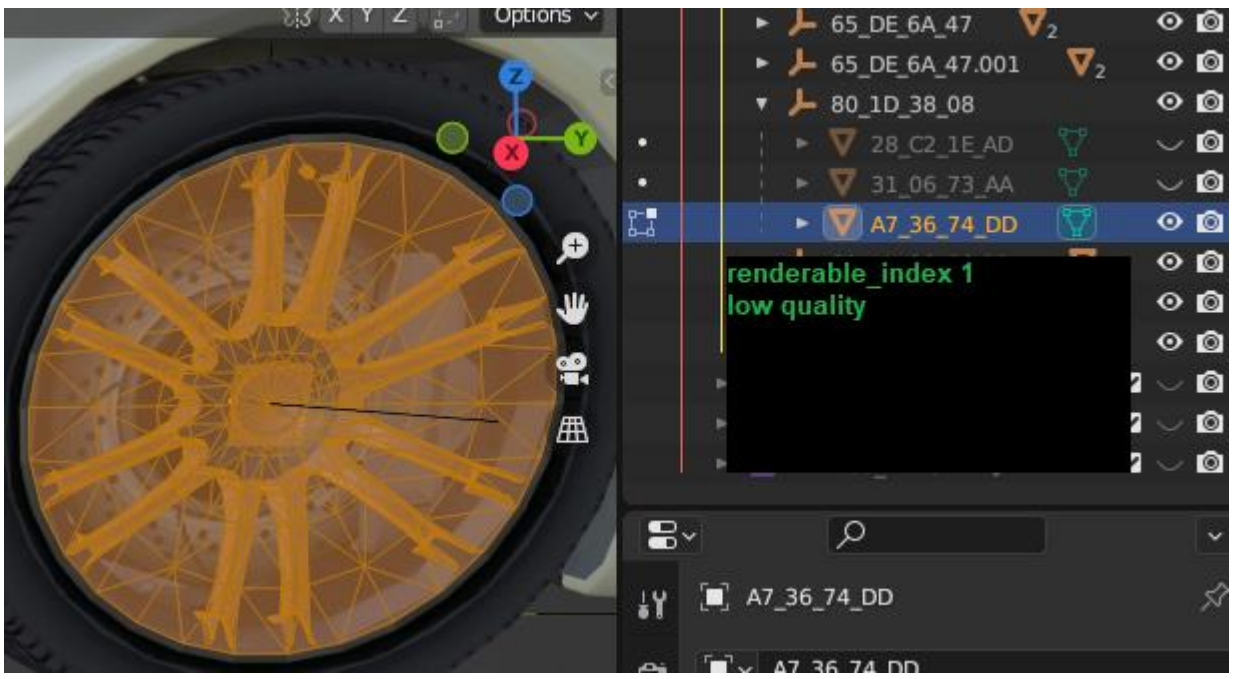


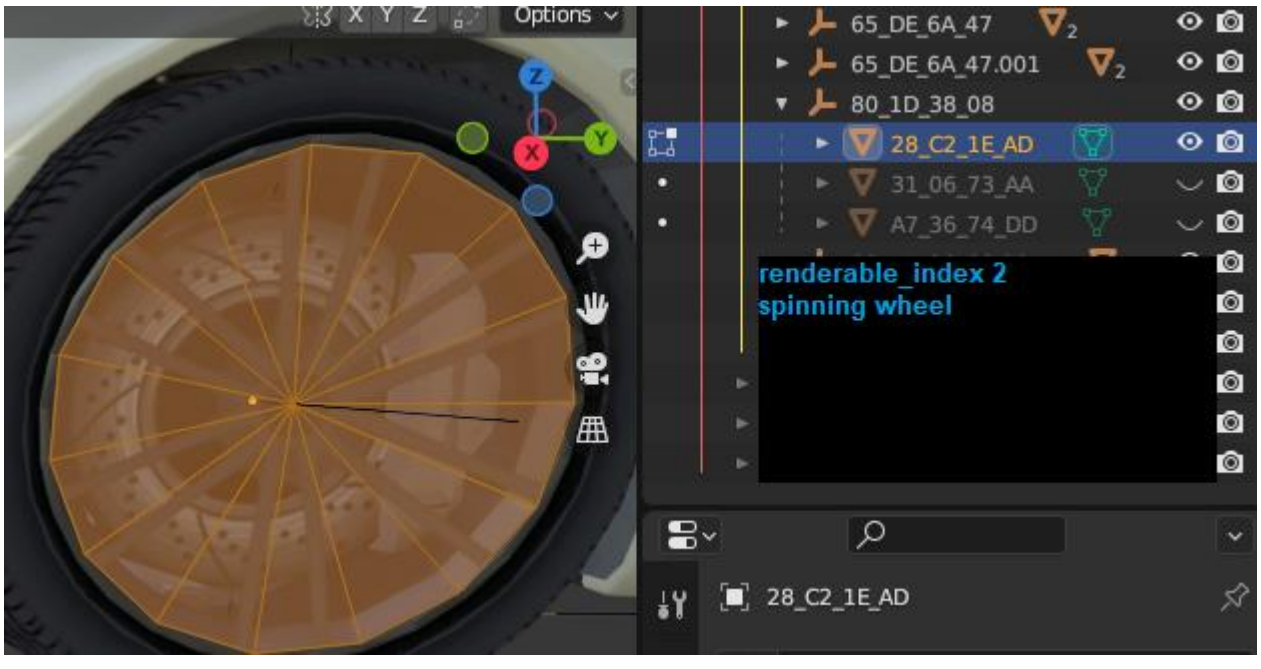




For wheels

HI file		LO file	
value	**Description**	**value**	
0 1 2	Set 0 on the mesh that will be the highest quality Level of Detail (applies to: Tyre, Rim, RimBadge, BrakeDisc, Caliper, CaliperBadge) Set 1 on the mesh for the lower quality wheel (applies to: Tyre, Rim, RimSpin, RimBadge, BrakeDisc, Caliper, CaliperBadge) Set 2 on the mesh for the spinning/blurred wheel (applies to: Rim, RimSpin, RimBadgeFade only)	0 1 2 3	Set 0 on the mesh that will be the highest quality Level of Detail This should be a copy of the above mesh but set as 1. In original LO files there is a copy for an unknown reason, so make it the same Set 2 on the mesh to use for the lower quality Level of Detail Set 3 on the mesh that will be used for the super low poly LOD. (I think. This one needs to be confirmed) (applies to: Tyre, Rim, BrakeDisc, Caliper)





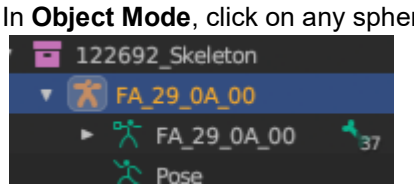
Damage animation

Weight Paint mode will be used to assign vertices to a bone and to set the weight/influence that the bone has on them. If you are new to Weight Painting I recommend you look up a tutorial such as this one.

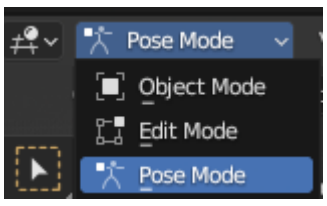
With the Skeleton collection loaded from the original car, there are a number of spheres visible. Each sphere represents a bone used for animations.

Identify the bone name (Sensor_xxx)

In **Object Mode**, click on any sphere, or click the **Armature Object**.

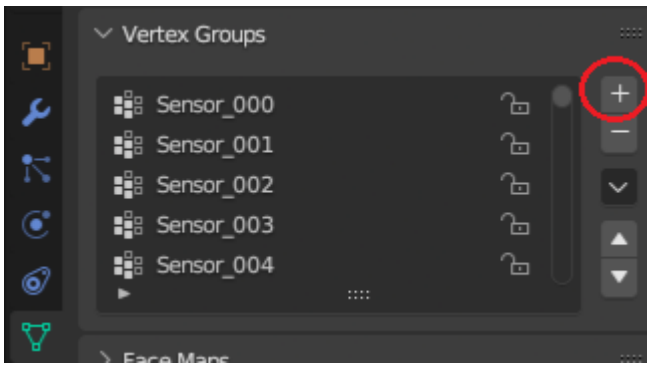


Go to **Pose Mode** and click on a sphere to see the name of it.

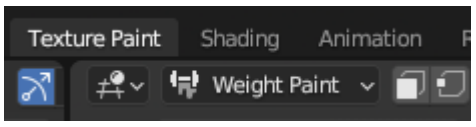


Assign vertices to a bone

In Object Mode, select the mesh to be animated and create a vertex group with the same name as the relevant `Sensor_xxx`.

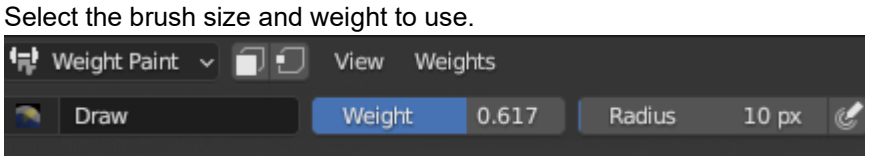


Go to `Weight Paint` mode.



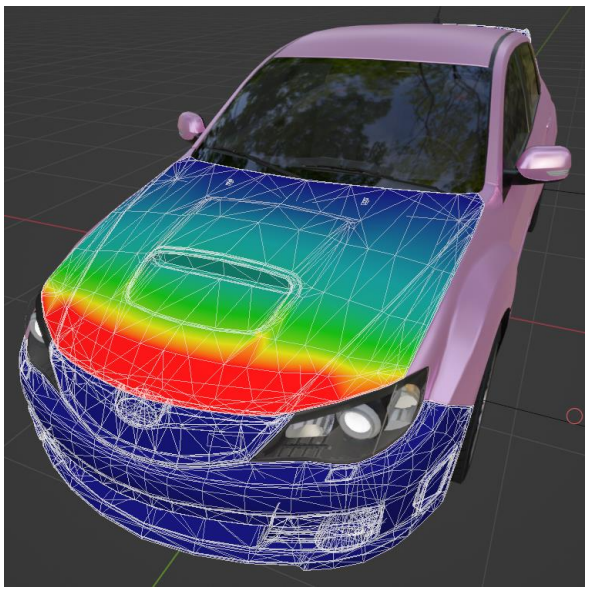
Select the vertex group you created.

Select the brush size and weight to use.



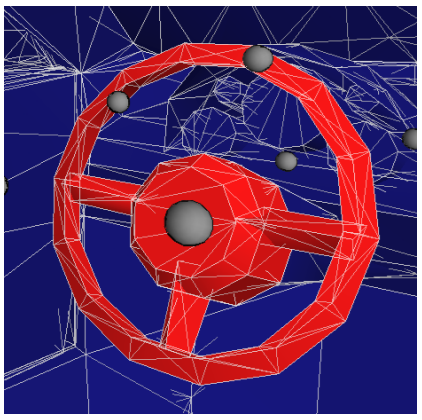
Paint the vertices that should be influenced by that Sensor/Bone. They'll be automatically added to the vertex group. A vertex can belong to more than one vertex group (max 4)
Weight 1.00 (red) means that the vertex will be 100% influenced by the bone and Weight 0 (dark blue) means no influence.

(Look at an existing car in Weight Paint mode to get an idea of how you can paint it - in this example the front of the bonnet is the most affected, through to the back which is barely affected.)

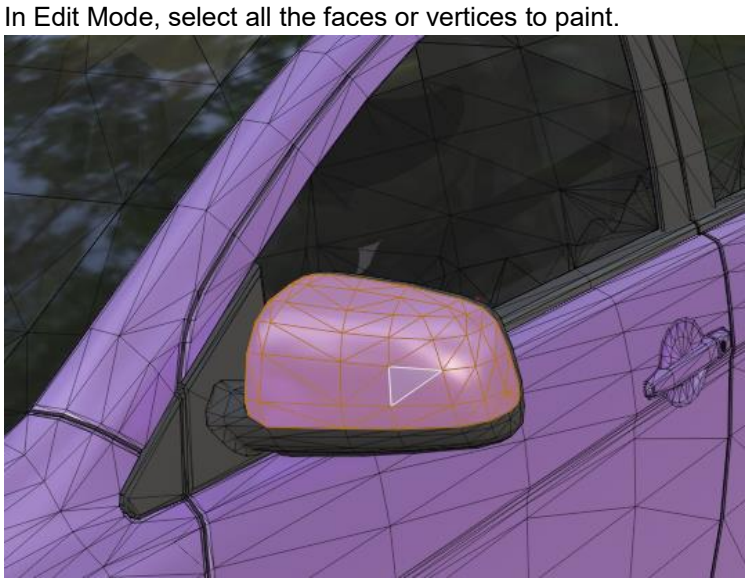


Spoiler and steering wheel animation

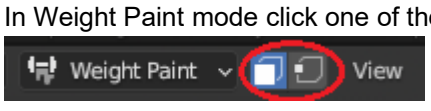
Find the bone for the spoiler, steering wheel…… or mirror, or whatever else really, using the same method as in ***Identify the bone name*** above.
Create a vertex group named appropriately (`Sensor_xxx`) and select it.
Paint the whole steering wheel or spoiler part with Weight 1.00 (all red)



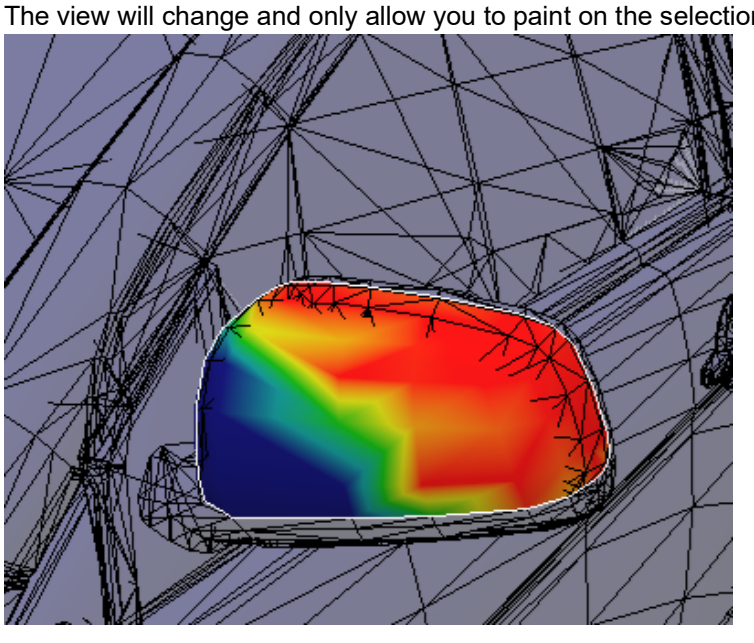
Tip - To focus on an area to be painted, ie. stop colouring outside the lines:
In Edit Mode, select all the faces or vertices to paint.



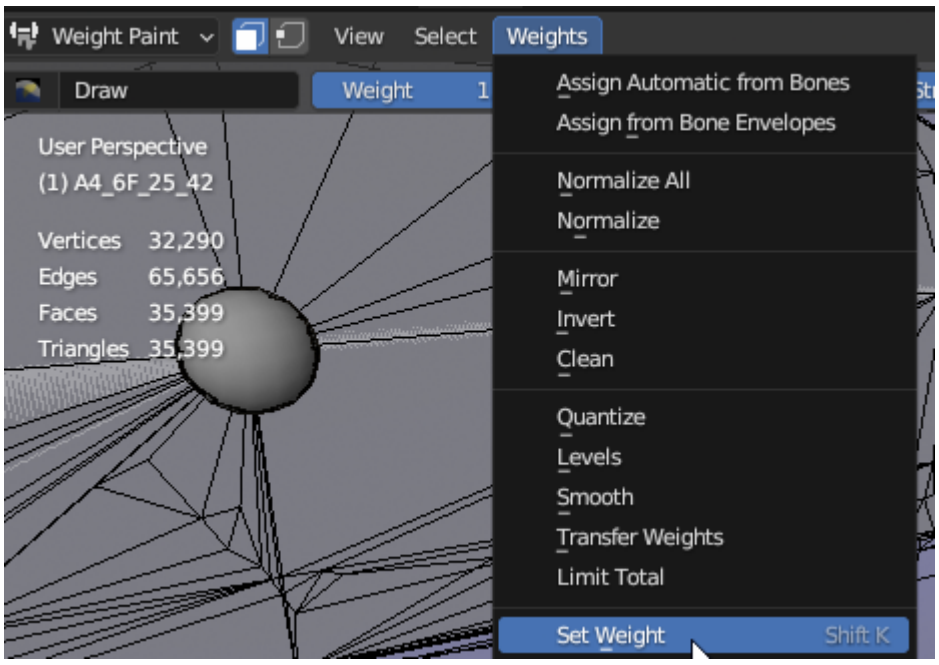
In Weight Paint mode click one of these buttons.



The view will change and only allow you to paint on the selection.



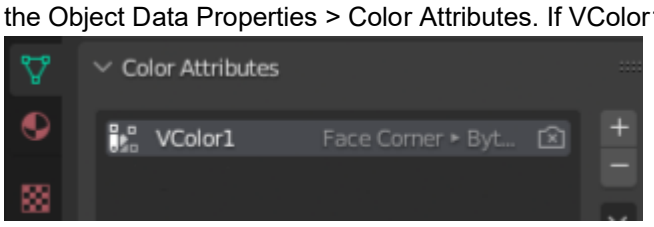
If only one weight value is to be painted, next you can go to the **Weights** menu and click **Set Weight**. This instantly sets the weight on all selected faces.



Vertex ambient occlusion

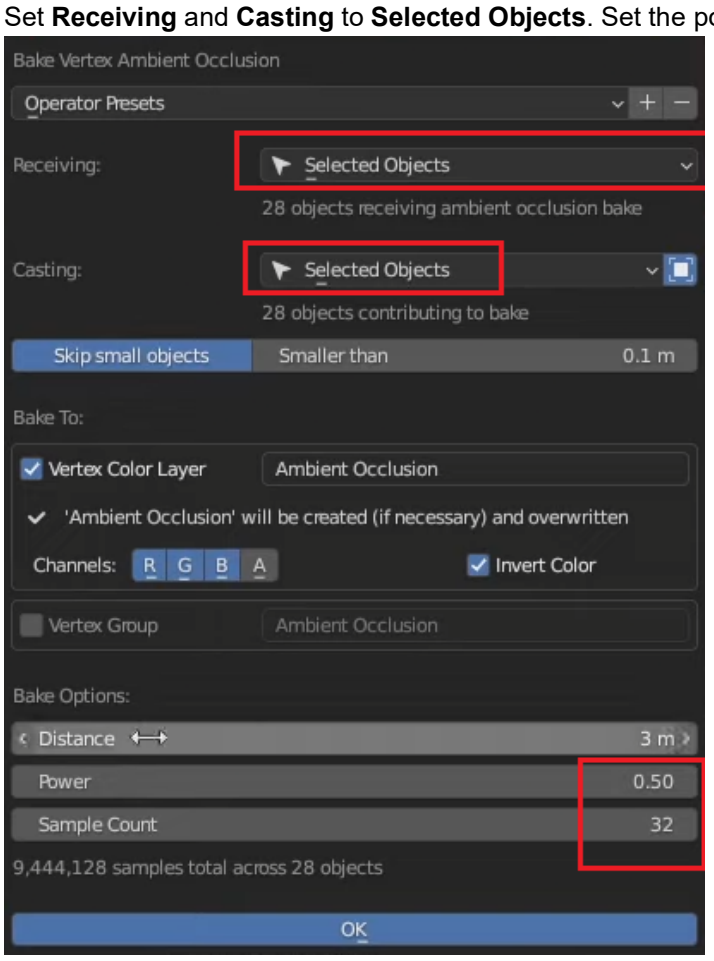
Check if AO exists already

Most of the vehicle shaders require ambient occlusion in vertices colour data instead of a texture. Similar to Frostbite NFS or Project Cars I guess…
It's not necessary to do this step if the model already has vertex colour data (such as cars taken from Frostbite NFS) You can check this by selecting the object, and look at the Object Data Properties > Color Attributes. If VColor1 is present, there's no need to bake AO.



Generate vertex AO for the car body (but not glass)

You can use the VertexOven addon, linked on the Github page, to generate vertex AO.
Select which objects should have AO (don't use it on glass)
In Object Mode go to the Object menu and find Vertex Oven in the list.
Set **Receiving** and **Casting** to **Selected Objects**. Set the power to **two** and sample count to **64**.



When its finished you can see the result here:

For glass parts

Use Blender's Vertex Paint mode for this one. The alpha channel is used on glass transparency.

The following Vertex Colour values were found on existing cars, so use these:

For Shader type: **VehicleNFS13_Glass_Colourise** (aka GlassColourise/GlassColour/GlassColor)

Brakelight (identical between cars):
R: 1.000 G: 0.005 B: 0.000 A: 1.000;
Hex: #ff0f00

Indicator (some cars have Brakelight VColor1 on indicators):
R: 1.000 G: 0.100 B: 0.000 A: 1.000;
Hex: #ff5901

Indicator2 (some cars use this for Indicator):
R: 1.000 G: 0.418 B: 0.000 A: 1.000;
Hex: #ffad00
(found on ford raptor):
R: 0.242 G: 0.242 B: 0.242 A: 1.000;
Hex: #878787

Blue Cop Light:
R: 0.012 R: 0.034 B: 1.000 A: 1.000;
Hex: #1c34ff

For Shader type: **VehicleNFS13_Glass (other glass materials too probably)**:

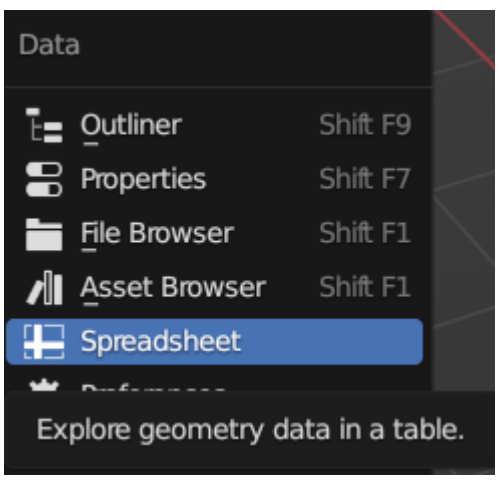
Main windows (sometimes RGB are 0.001, alpha 0.702 seems most common):
R: 0.000 G: 0.000 B: 0.000 A: 0.702;
Hex: #010101

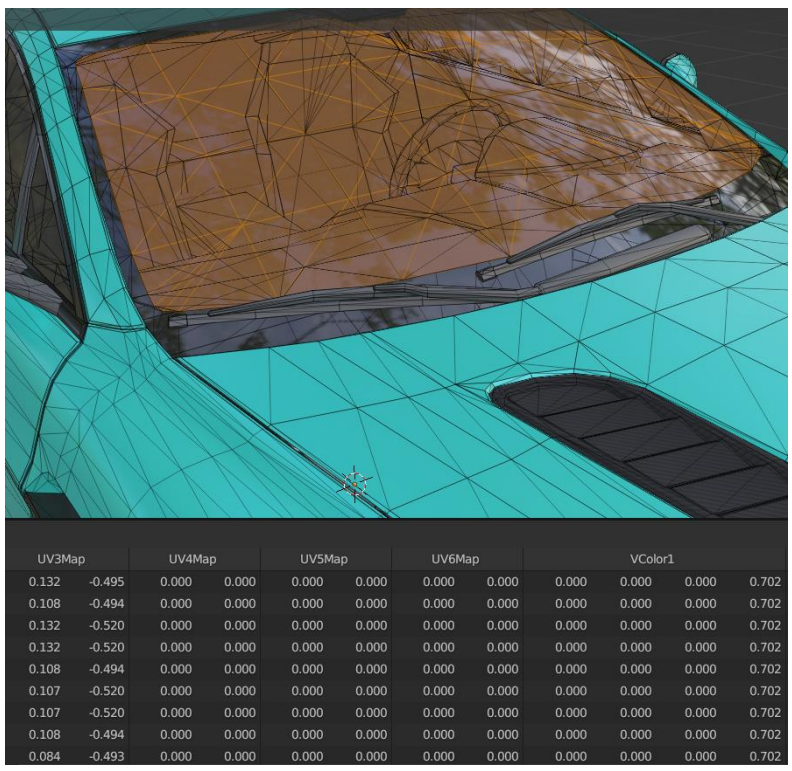
Glass Surrounding the windscreen (sometimes RGB are 0.001):
R: 0.000 G: 0.000 B: 0.000 A: 1.000;
Hex: #000000

Mirror (identical between cars):
R: 1.000 G: 1.000 B: 1.000 A: 1.000;
Hex: #ffffff

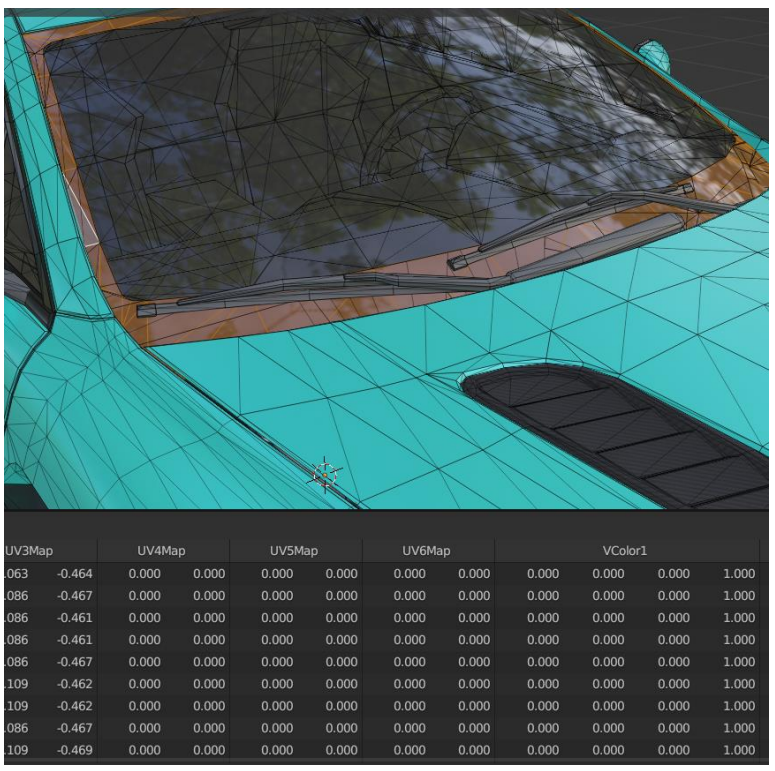
Brakelight/Headlight (identical between cars):
R: 0.000 G: 0.000 B: 0.000 A: 0.000;
Hex: #010101

The Blender Spreadsheet can be used to inspect the data on existing cars (VColor1 column) if you want to see more:





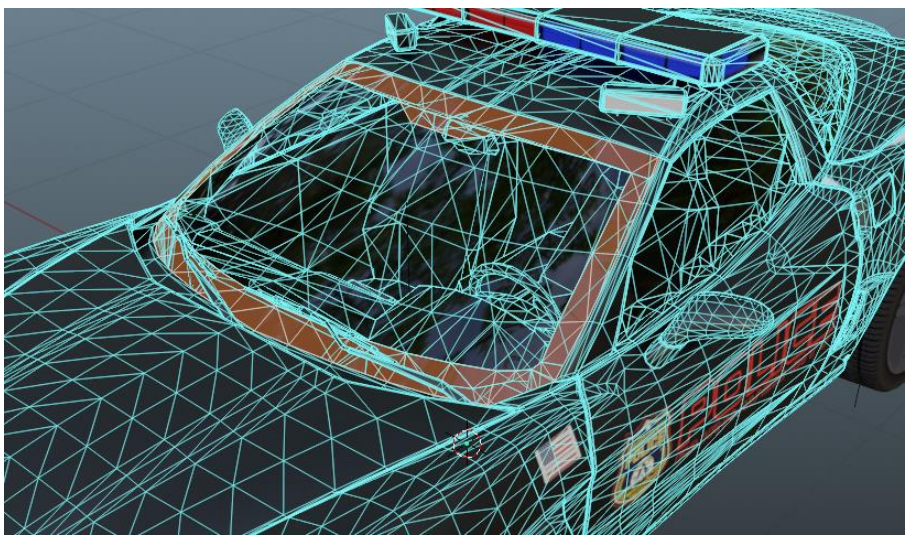
UV3Map		UV4Map		UV5Map		UV6Map		VColor1			
0.132	-0.495	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.108	-0.494	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.132	-0.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.132	-0.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.108	-0.494	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.107	-0.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.107	-0.520	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.108	-0.494	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
0.084	-0.493	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702



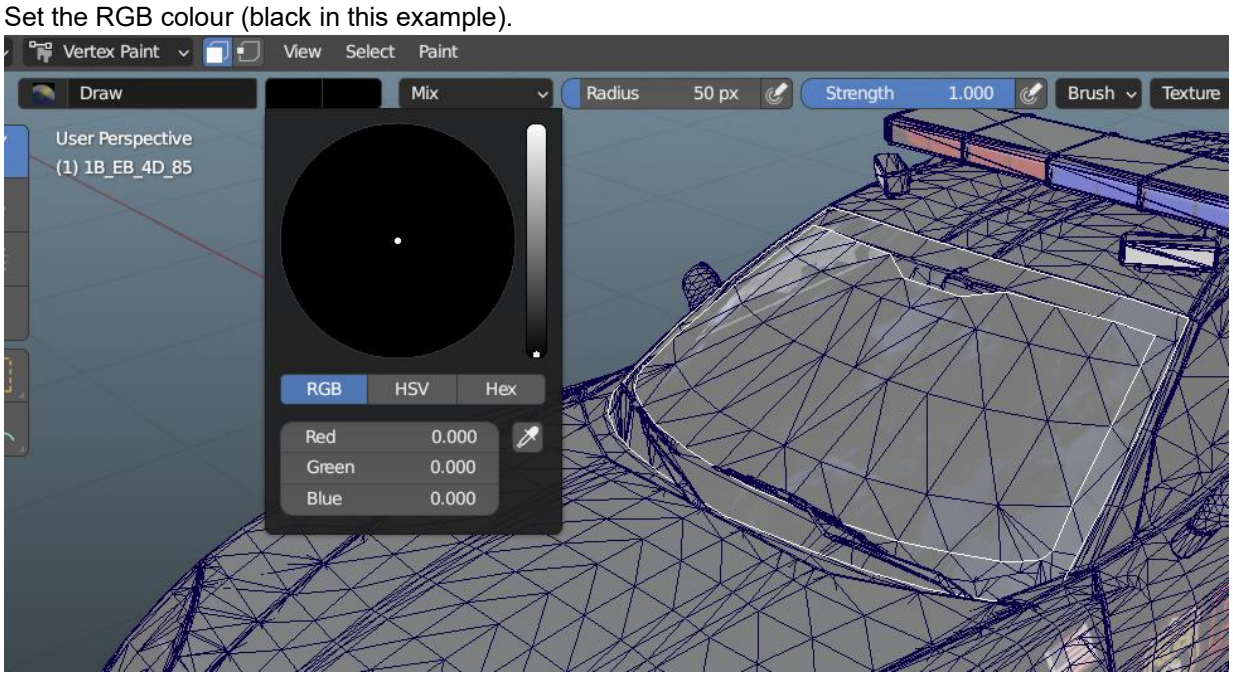
UV3Map		UV4Map		UV5Map		UV6Map		VColor1			
063	-0.464	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
086	-0.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
086	-0.461	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
086	-0.461	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
086	-0.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
109	-0.462	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
109	-0.462	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
086	-0.467	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000
109	-0.469	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000

Example of using Vertex Paint on glass surrounding the windscreen

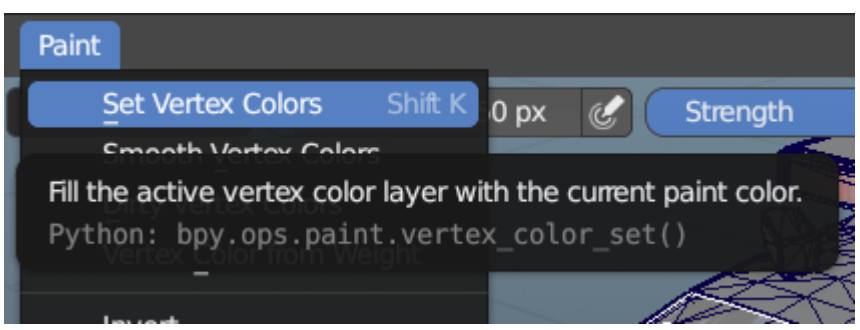
Go to Vertex Paint mode. Select the glass to be painted.



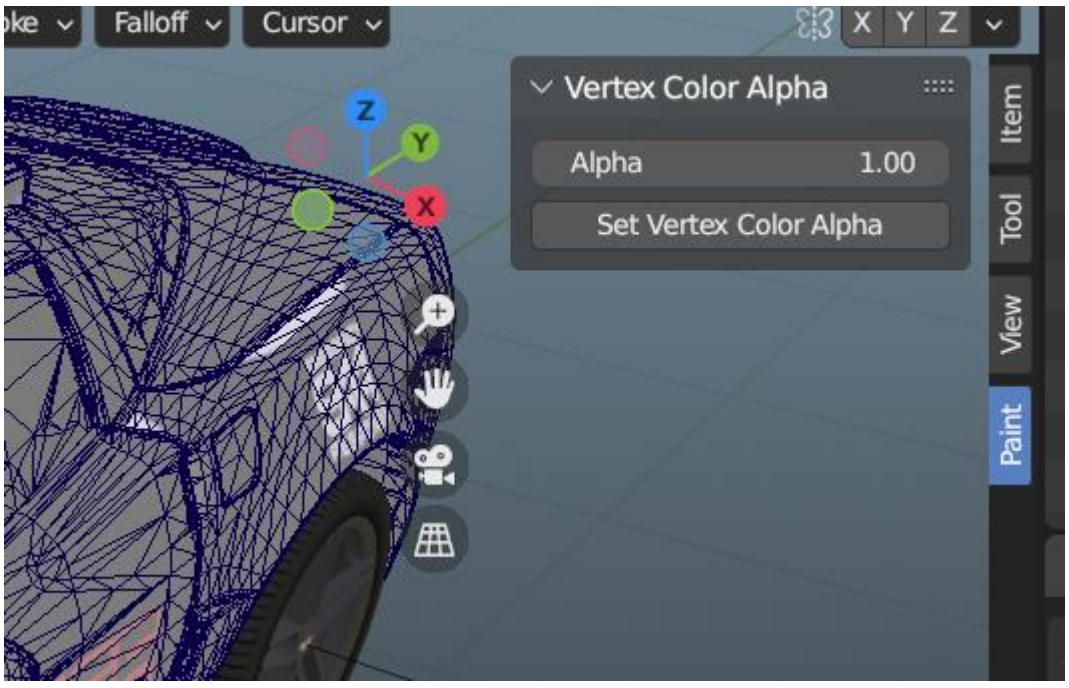
Set the RGB colour (black in this example).



Go to the Paint menu > Set Vertex Colors.



To change the Alpha, install the Vertex Colour Alpha Addon and set it to the required value. This addon can only be seen in Vertex Paint mode. Access it from the tab on the right.



Baking AO from textures

If you have an AO texture it can be baked in.