

Crumple Zones

There are many options available to you in the diagram program to show damaged areas on vehicles. How and what you do to create these types of diagrams depends on what you want and what data you have. You can work with photographs, total station data, sketches with measurements taken by hand (tape measure, ruler, etc...), or you can re-create a rough sketch.

Import a Photograph

Import an image file (bmp, jpg, or wmf) using the “Import Images” feature from the “File” pull-down menu. You can trace over the top of the image if you want to highlight the damaged area. In the diagram program you can Move the bitmap, Scale it, Send to Back or Front, or put it on a different Layer and Lock it.

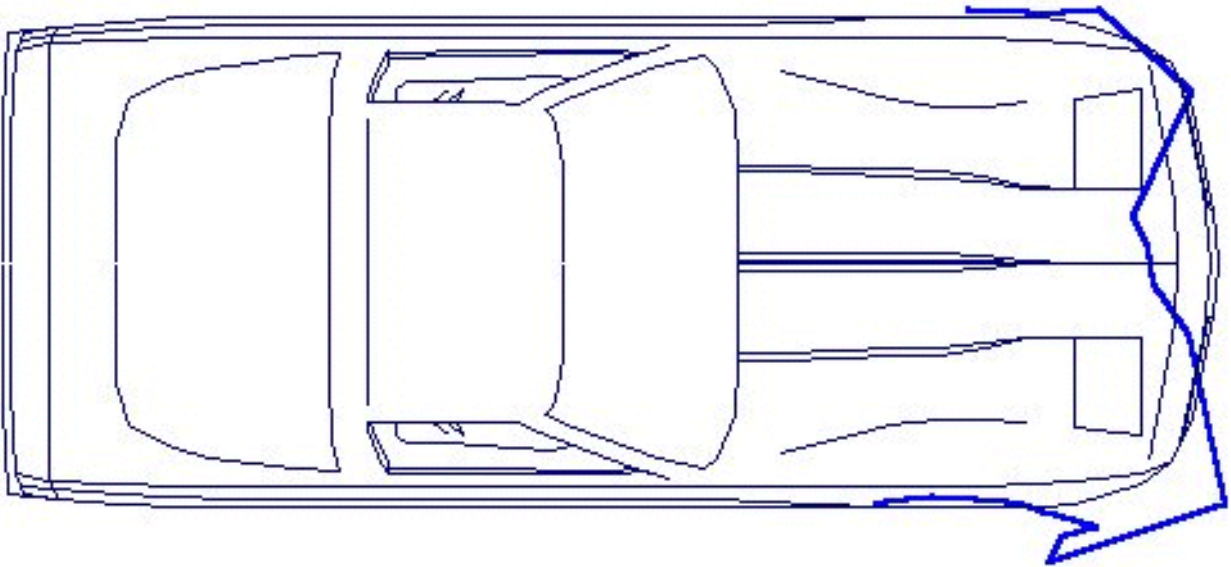
Tip: For more detailed instructions on working with images review the document, “Photos - Bitmaps - Scanned Images”. You’ll find it in the Learning Center in the same location you found this document.



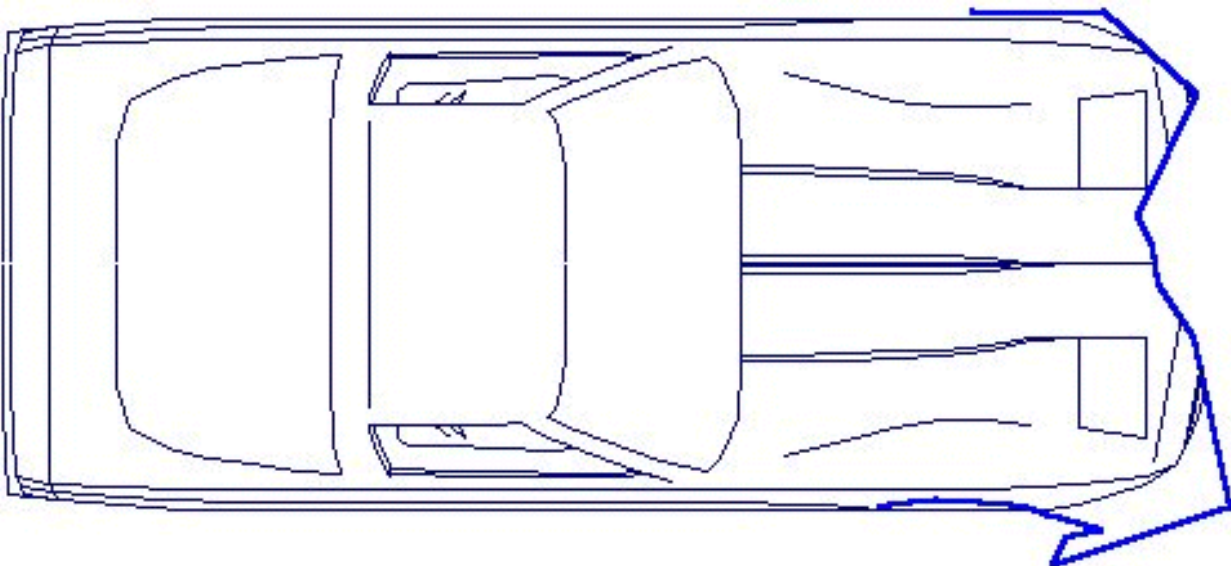
Freehand the Crush Area

Using any of the drawing tools, continuous line, curve, or arc, you can draw the damaged area freehand. Find a vehicle symbol that closely resembles the actual vehicle. You can modify the vehicle symbol by exploding it. Once a symbol is exploded it goes from being a single object to consisting of all the entities (lines, arcs, etc..) used to draw it up initially. These can all be individually modified and erased.

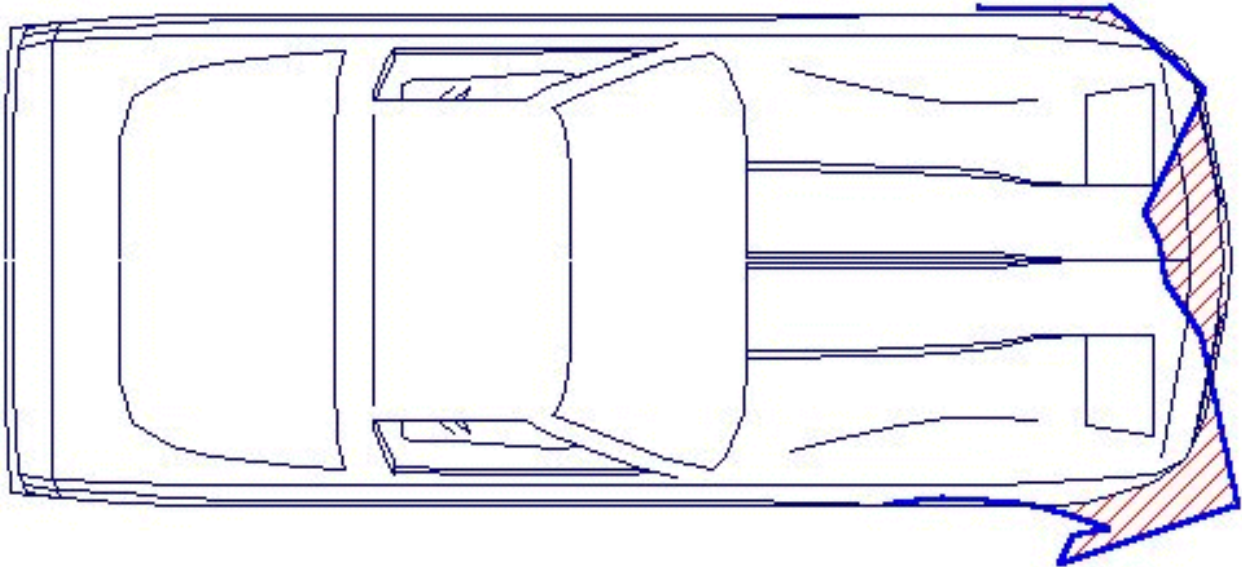
I used a bolder and different colored continuous line for the damaged area.



This example shows the vehicle symbol after it's been exploded and the lines outside the damaged area trimmed and erased.



This example shows the damaged area highlighted with a hatch pattern.

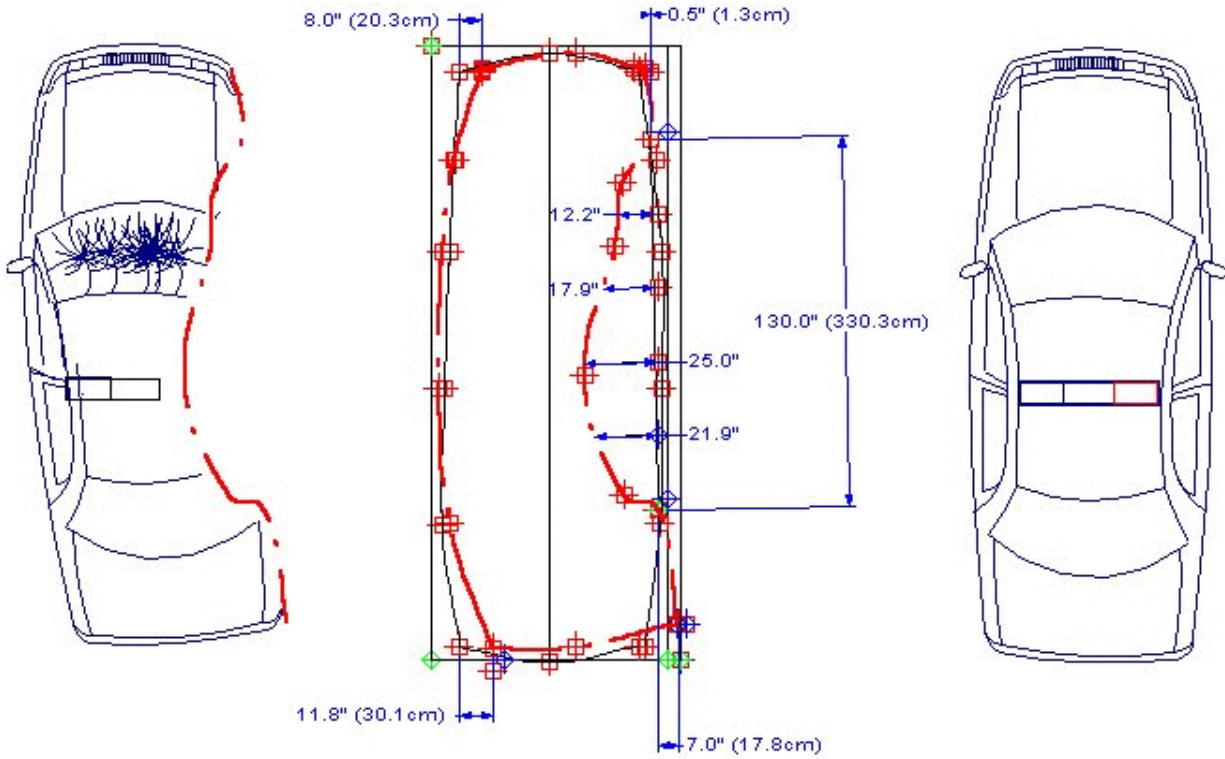


Re-create from Measurements Taken at the Scene

The next example shows a police car that was hit from the side. At the scene measurements were taken from a baseline around each side of the vehicle. At the scene you could draw a rectangle around the vehicle, each side of the rectangle is a baseline.

1. In the diagram program you would draw your rectangle to real world scale.
2. Using Easy Lines (Baseline mode) place your measured points (markers) off of each baseline. In this case you would reset the baseline four times (one for each side). The points would represent damage points and basic points on the vehicle such as corner points to help re-draw the vehicle accurately as well as place the vehicle symbol accurately.
3. Find a vehicle symbol that closely matches the actual vehicle and fit it inside the rectangle. Use your reference markers to size and position the vehicle symbol correctly.
4. Connect the points showing the damaged area. Depending on the number of points measured at the scene, you could possibly connect all the points to outline the entire vehicle.
5. Dimension and label points relevant to your drawing.

The drawing at the left in this example shows a modified vehicle symbol detailing the damaged side, broken windshield, and distortion to the frame at the rear. The center drawing shows all the baseline points and dimensions. The right side drawing shows the vehicle in an undamaged state.



Import Total Station Data

In this example, a total station system was used to show damage to a 95 Caprice. First, the damaged vehicle was mapped out with the total station system. Next, an undamaged 95 Caprice was mapped out. Both images were imported into the diagram program. The damaged outline was then moved over the top of the undamaged outline.

Since all this work is done to real world scale actual measurements could be taken to show the actual extents of the damage.

To make the two images easier to differentiate and work with the following was done:

1. The undamaged diagram was set to a dotted line type.
2. The damaged diagram was set to a solid, bold line type.
3. Each image, before overlayed, was selected and Grouped. Grouping allows you to “glue” all selected entities together. Grouped items behave like symbols. One click on the group and the whole group is selected. It can easily be moved and positioned correctly in the drawing without accidentally moving or changing part of the other image.

