

TIPSHEET for iWitness FACET FORM POLYLINE MODELING VEHICLES

Facet form polyline marking requires the images are oriented first in *iWitness*. Therefore, it is recommended that polylines are created after the network of camera positions and 3D points are complete. In this example, we used *iWitnessPRO* for fully automatic determination of the camera positions and 3D points, prior polyline marking.

In this tip sheet we are using the *iWitness* facet form tool for measuring a wheel well of a Toyota Camry.



Figure 1 illustrates the proper selection of images where the blue epipolar line is projecting **close to perpendicular** to the top portion of the wheel well.



The key to facet form polyline measuring curved surfaces such as a vehicle wheel well, is to acquire at least three images (**one elevated above**, i.e., image 10 in our example) and two images to the left and right (in our example case image, image 25 is slightly forward of the wheel and image 27

was captured about straight-on -- relative to the wheel hub.) In this example, to measure the top portion of the wheel well, the proper selection of images would be **image 10** and either **images 25 or 27**, where the epipolar line runs **close to being perpendicular** to the top portion of the wheel well.

The heights of these camera positions were recorded in iWitness (Exterior Orientation Parameters) of image 10, at 6.5 feet off the ground, while image 25 was 2 feet off the ground as noted in Figure 2.

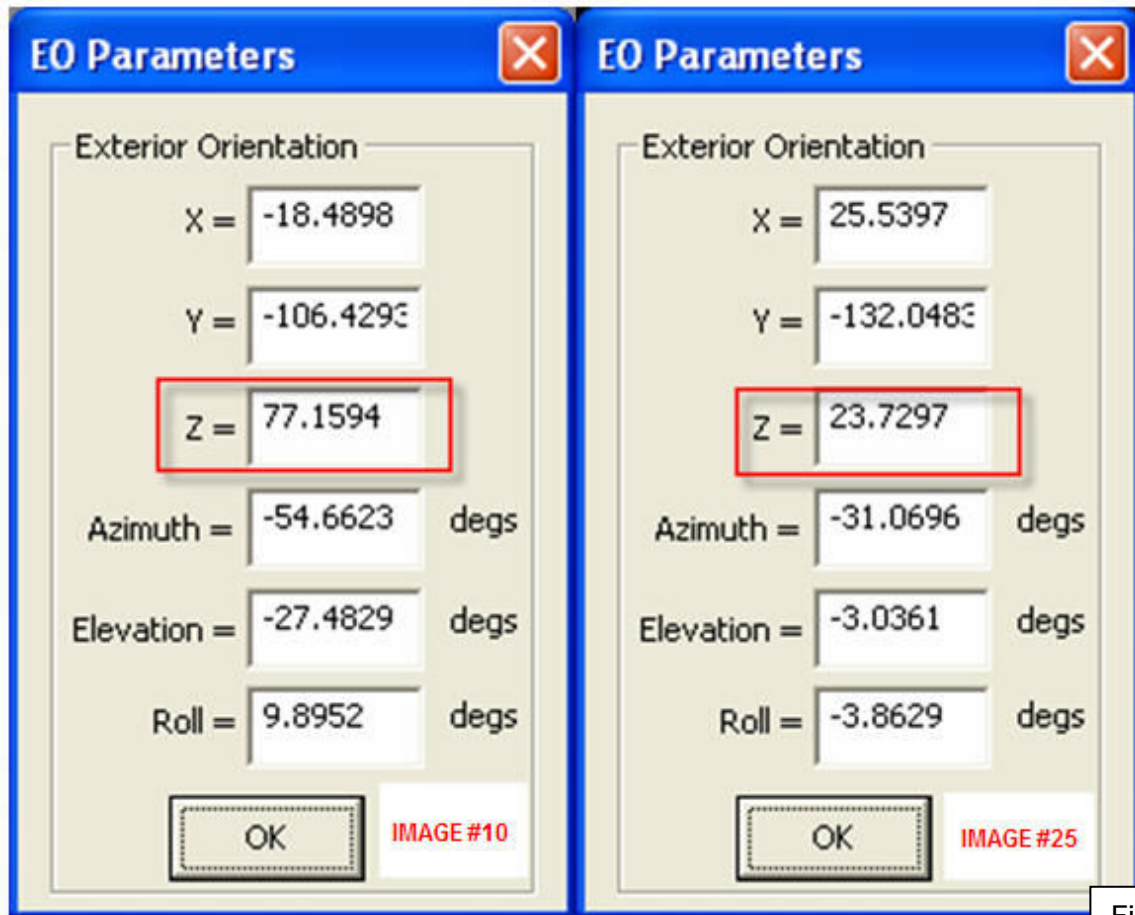


Figure 2

In Figure 3, illustrated is an **"improper image selection"** for facet form polyline referencing where the **blue epipolar line** is running parallel to the surface of measurement interest (i.e., the top most, relatively horizontal area of the left front wheel well.) The images in Reference Mode, noted by the green **"R"** in the upper left corners of the images are essentially at the same camera elevation off the ground. In Figure 3, look closely at **image 25** (lower left) you will see the user traced the edge of the wheel well to be referenced in **image 27** (lower right.) Notice how the epipolar line in image

27 is running parallel to the surface being measured. This is exactly what you **do not want** and the way to avoid the situation is to assure at least one of the images has good vertical height, angular separation.

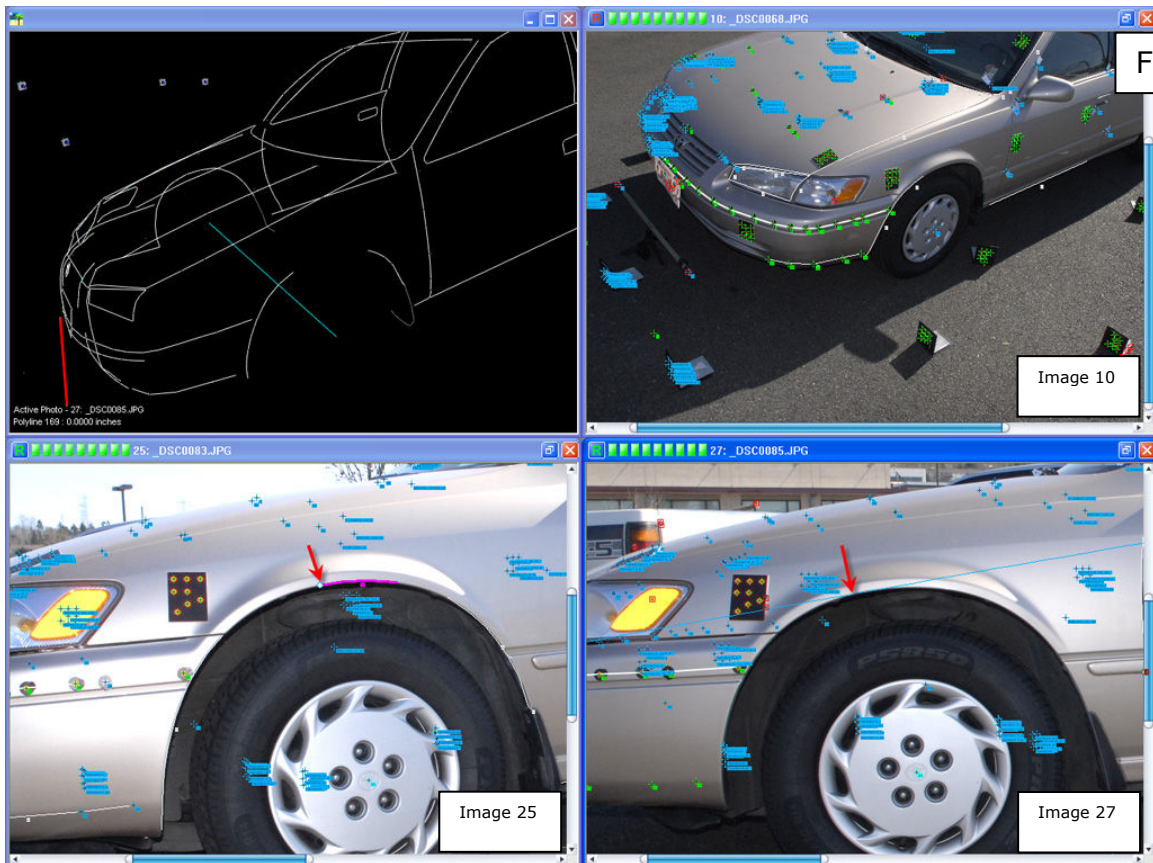


Figure 3

It should be noted that polylines are not as dimensionally accurate as 3D object points. The user should try to reference the polylines in 3 or more images for increased accuracy and modeling reliability; but 2 images will work.

Figure 4 is the end result of Facet Form Polyline marking of the exemplar configuration of the 1998 Toyota Camry - (mostly using 2 image referencing.)

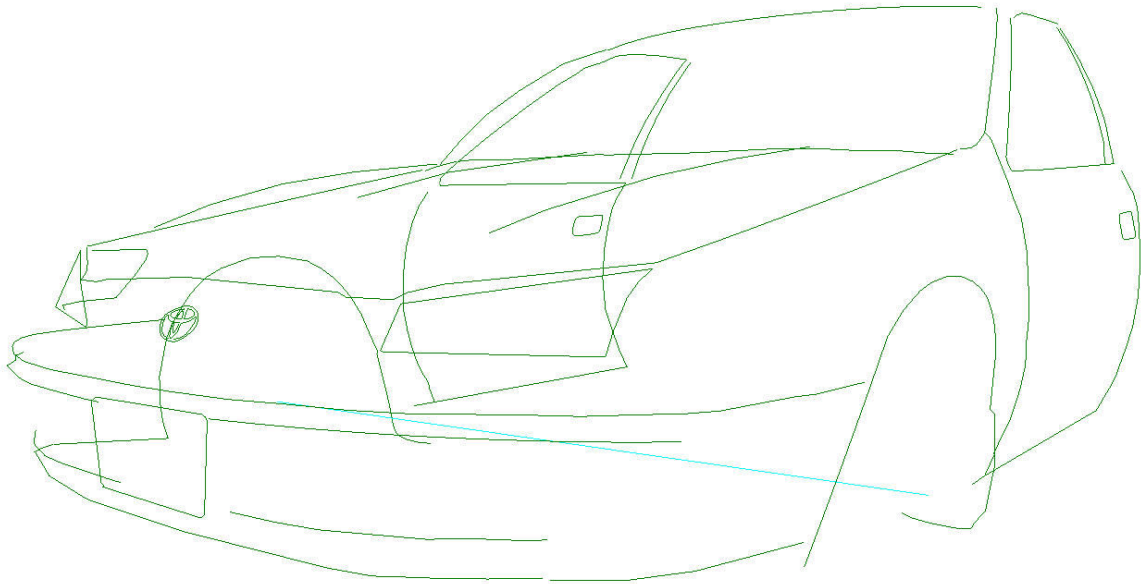


Figure 4

