

#1292: HyperGraph – Cross Plot

Product: HyperGraph

Product Version: HyperGraph 12.0 or above

Topic Objective

Cross Plot in HyperGraph

Topic Details

The **Cross Plot** utility can be used to extract the y-axis from two curves and plot them against each other. For example, if data is in the form of Force vs. Time and Displacement vs. Time, using **Cross Plot** you can create a Force vs. Displacement curve.

To access **Cross Plot**, go to the **Math** menu slide your pointer over **Two Curves**, and click **Cross Plot**. If you don't see a **Math** menu, you can add it by appending the vst.mvw file to your session. This file is usually located in the <install_directory>/Altair/hv2017.0/utility/VehicleSafetyTools directory

The **Cross Plot** utility takes four inputs.

CurveX (scaleX*Y-> X)	The curve whose Y-axis you want as the X-axis of the new curve
ScaleX	The scale factor for the X-axis of the new curve
CurveY (scaleY*Y-> Y)	The curve whose Y-axis you want as the Y-axis of the new curve
ScaleY	The scale factor for the Y-axis of the new curve

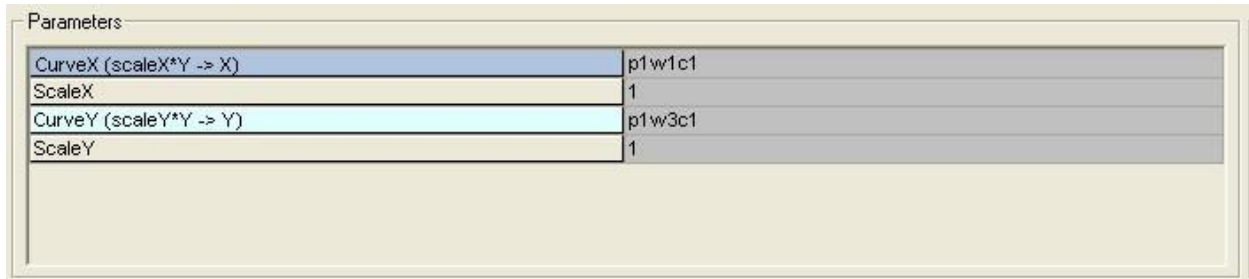


Figure 1: The Cross Plot panel

For example, to create a Force vs Displacement curve based on the data given in Table 1, start by plotting the individual curves (see Figure 2).

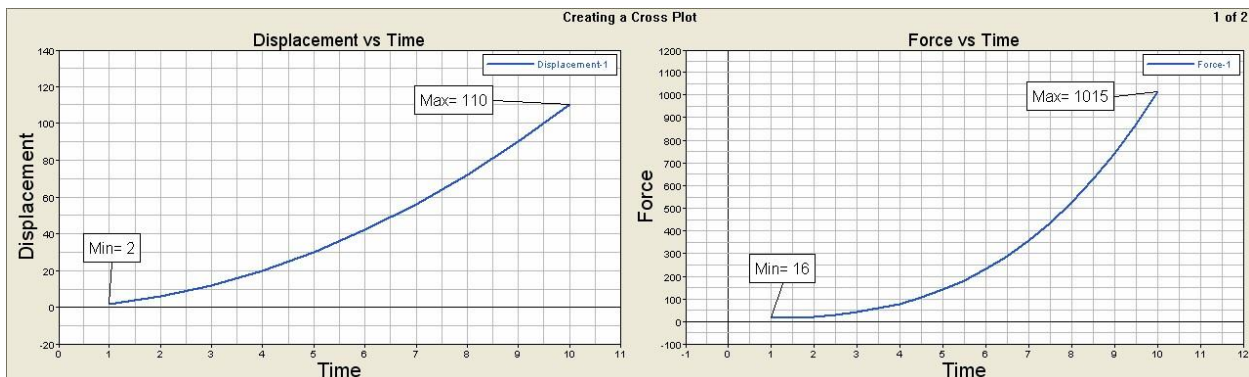


Figure 2: The Force vs. Time and the Force vs. Displacement plots.

Curve 1		Curve 2	
Time	Displacement	Time	Force
1	2	1	16
2	6	1.5	18.375
3	12	2.5	23
4	20	3.5	30.625
5	30	4.5	42
6	42	5	57.875
7	56	5.5	79
8	72	6	106.125
9	90	6.5	140
10	110	7.5	181.375
		8.5	231
		9.5	289.625
		10	358
			436.875
			527
			629.125
			744
			872.375
			1015

Table 1: X-Y data for curves.

Then using **Cross Plot**, create the Force vs. Displacement curve as shown in Figure 3. As a sanity check, see that the values at the end points of the curve match the corresponding values in the individual curves.

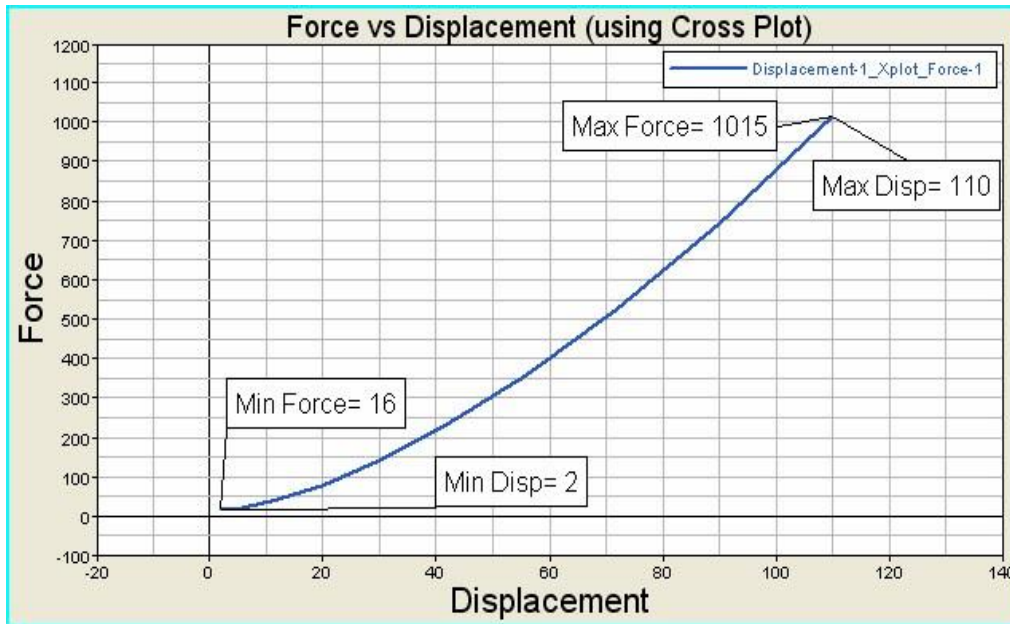


Figure 3: Force vs. Displacement using Cross Plot

Note:

If you use the **Define Curves** panel, to do the above, you will get wrong results (Figure 4). Using the **Define Curves** panel, simply takes the Y values of one curve and pairs it with the Y values of the other curve, irrespective of Time.

The **Define Curves panel** is not intended for cross plotting.

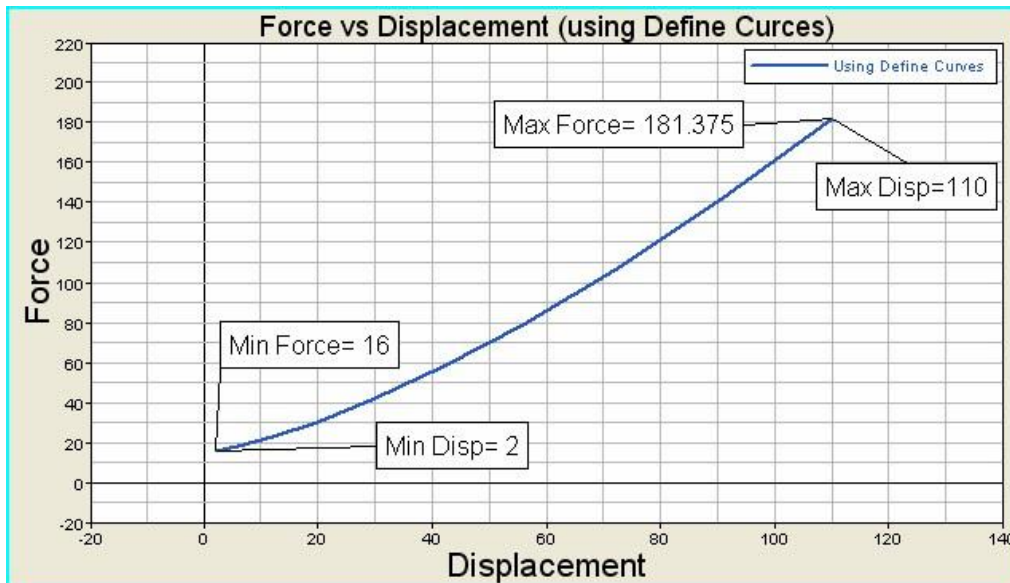


Figure 4: Force vs. Displacement using Define Curves