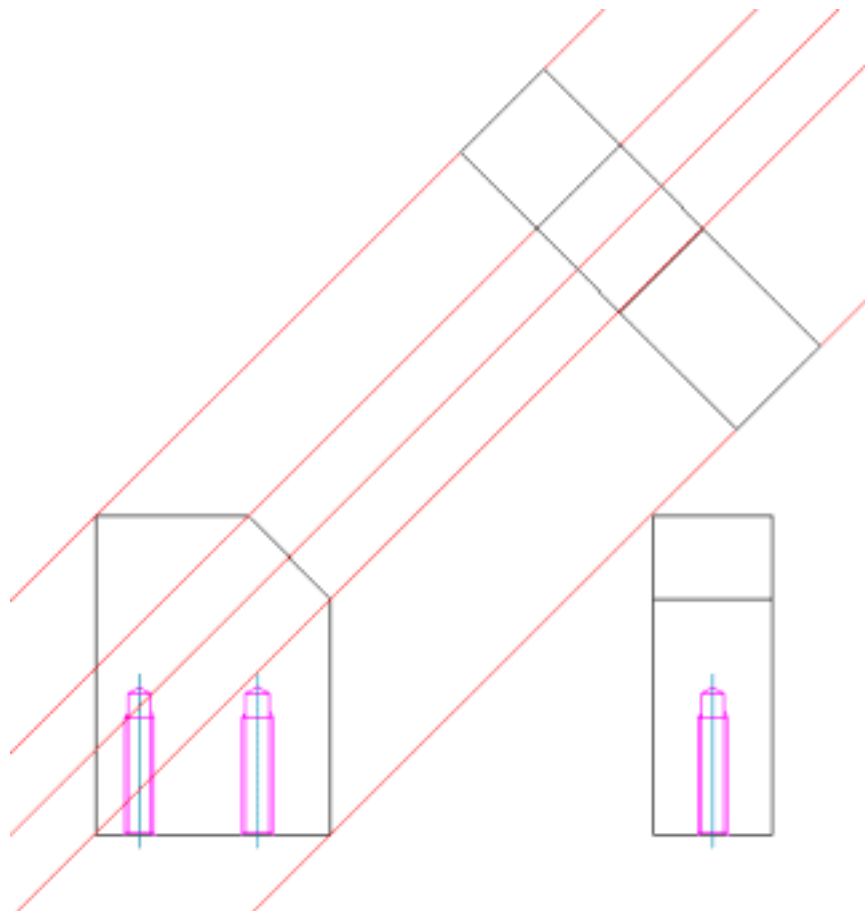




Construction Lines in AutoCAD Mechanical

Jim Swain
Design Applications Engineer
Manufacturing Solutions
Synergis
September 26, 2005

This document takes a look at the construction line tools available in AutoCAD Mechanical. It covers the basic operation of the tools, and a few techniques to help in general design work.





Construction Lines in AutoCAD Mechanical

Topics covered:

1. Construction Line Basics
2. Projections
3. Additional Construction Line Tools

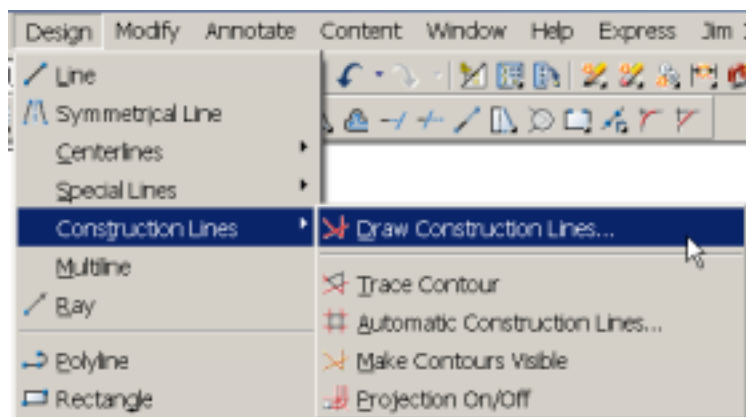
Construction Line Basics

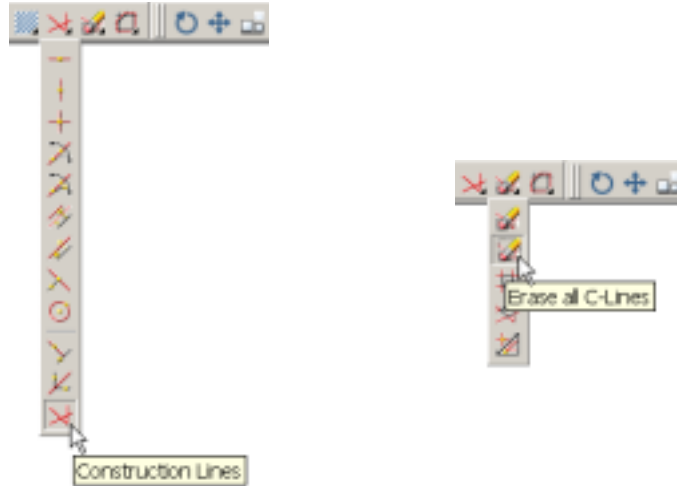
Construction lines in vanilla AutoCAD (XLINES) are straight lines that appear to go forever in both directions. No matter how far the drawing is zoomed out they still extend to the edge of the screen. RAYS are similar to XLINES, except that they extend in only one direction.

The construction line tools In AutoCAD Mechanical go beyond the XLINE command in vanilla AutoCAD in several ways:

- Construction objects are placed on a separate layer by default.
- Layer tools allow the easy toggling of construction geometry visibility.
- Layer tools also allow rapid removal of construction geometry from the drawing.
- XLINES, RAYS and circles are all created from the same tool set.
- A projection tool helps the creation of orthogonal views of 2D parts.

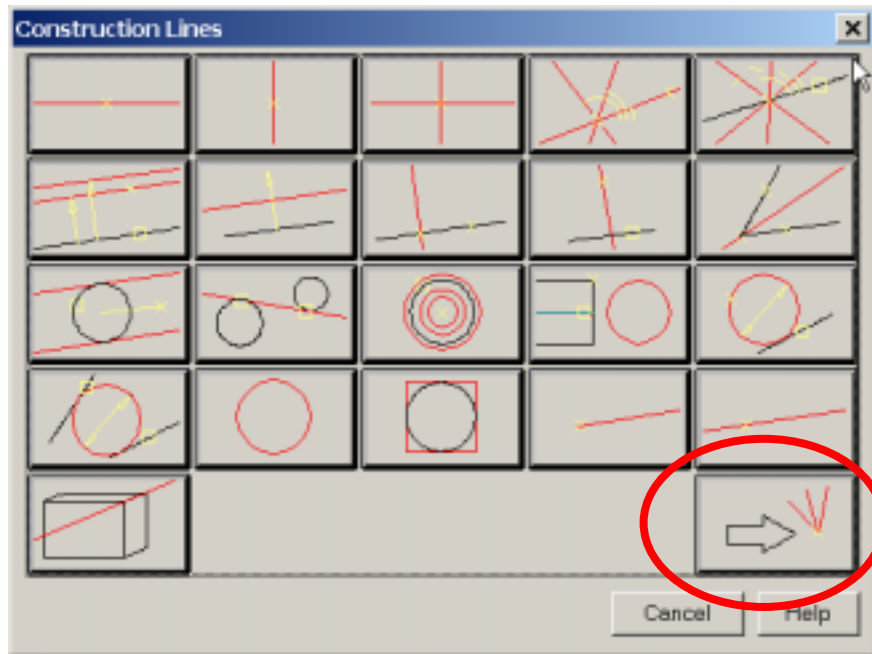
The construction line tools are available from the Design pull down menu or from a pair of flyout toolbars:





Mechanical's Layer Management utility places objects drawn with the construction line tools on the AM_CL layer. There are dedicated tools for toggling the visibility and locking this layer, as well as filtering this layer for erasing construction objects. These tools are covered in a later section of this paper. (The naming and coloring of this layer will be covered in a separate paper.)

A few of the more commonly used tools are included in the main toolbar, but the full construction lines dialog box can be accessed by the last button on the toolbar, or from the pull down menu (or by the AMCONSTLINES command).

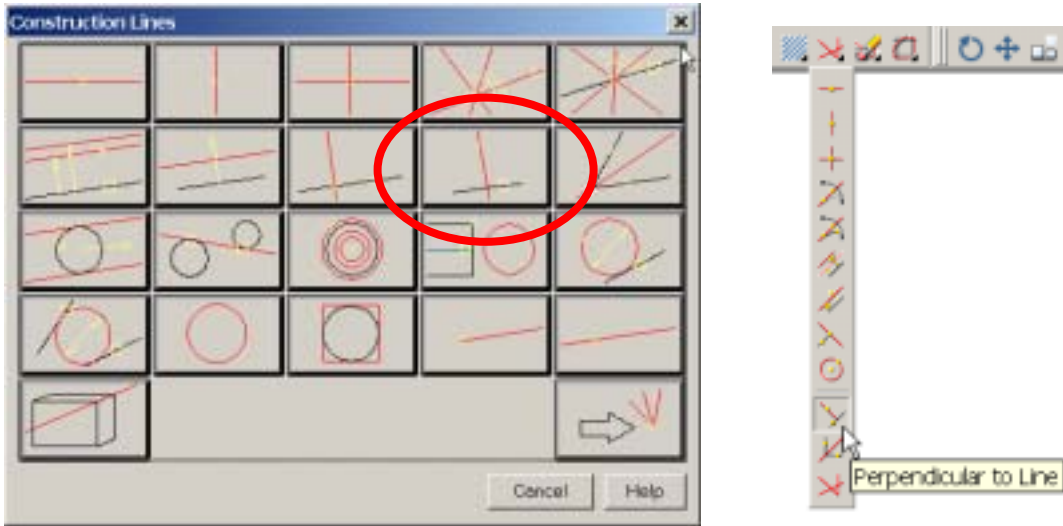


The buttons show both the input required and the results. Point selections, including OSNAPS, are indicated by yellow "x". Object selections are indicated by yellow squares. Distance inputs are indicated by straight yellow arrows. Angle inputs are indicated by curved yellow angles.

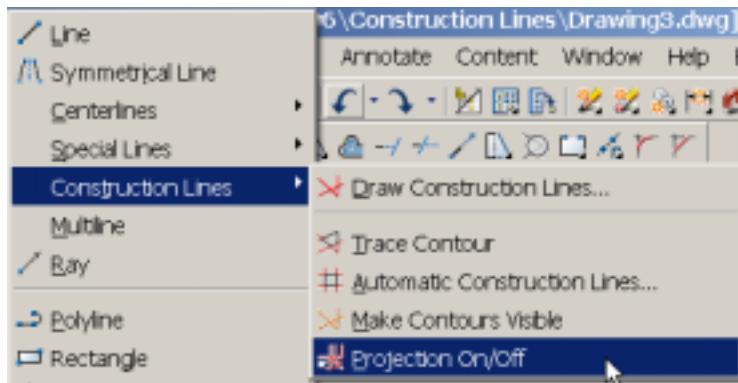
The button in the lower right corner toggles between the XLINE and RAY creation tools.



For layout work the button for “perpendicular to a line, thru a point” can be very useful. It can be used to develop auxiliary views of a plane.



Projections



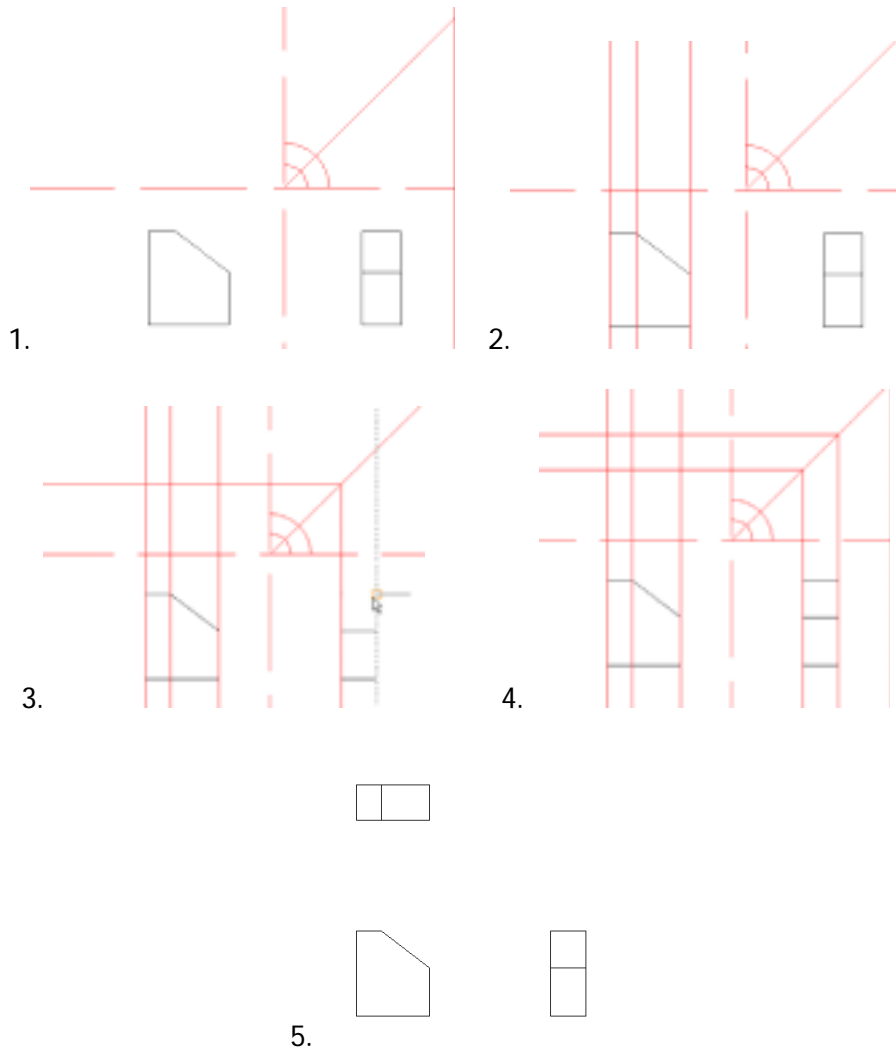
The projection tool (AMPROJO) will reflect vertical or horizontal construction lines about a diagonal line. This line is part of a symbol that is inserted when the command is started.

The first prompt is for the symbol's origin. A second point is then used to indicate in which quadrant the reflection line will be displayed.

Once the symbol is placed any new vertical or horizontal construction lines that cross over the reflection line will be reflected by 90 degrees.



Here are a series of images showing how a top view can be created from a front view and right side view:





Additional Construction Line Tools

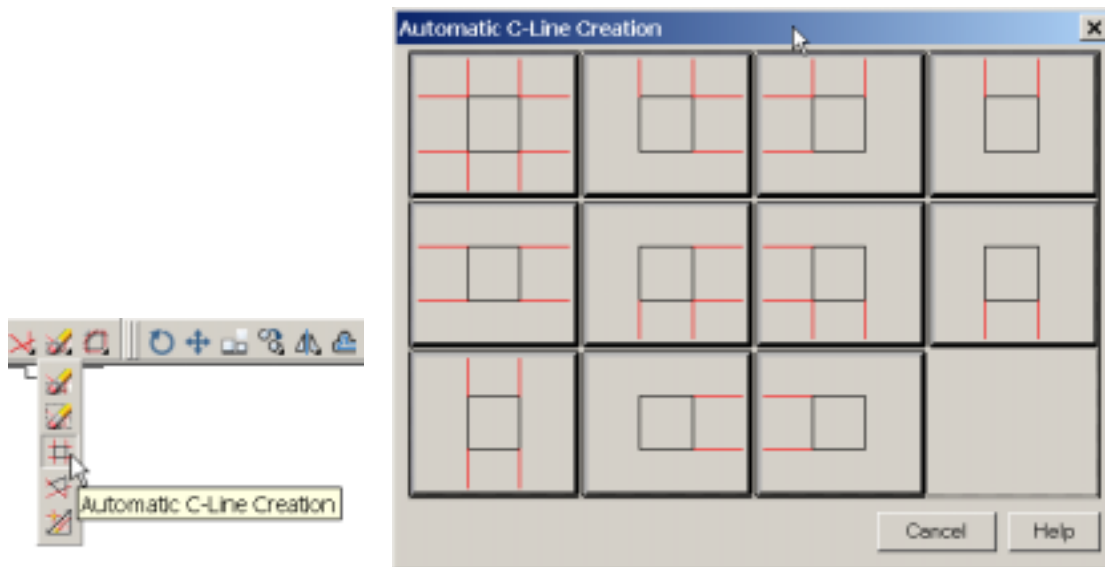


Several additional tools designed to help with construction lines are included on the Construction Edit flyout toolbar.

The first two buttons help in deleting construction line objects. The top button is an erase command that only selects objects on the AM_CL layer. Objects on any other layer are filtered out. The second button erases all objects on the construction line layer.



The Automatic C-Line Creation tool brings up a dialog box to determine which rays are created.



The rays are created at various object snap locations, depending on the objects selected. For line type objects the rays are placed at the endpoints. For circles they are placed at the quadrant and center points.

The next button starts a utility that creates a polyline by picking intersection points.



The final button toggles the construction line tools between creating XLINES and RAYS.

There are also some layer tools on Mechanical's layer toolbar and in the Layer/Layergroup pull down menu. They can be used to toggle the visibility and locked states of the AM_CL layer.

