# Assignment 11

CAD Mechanical – Part 2

Polyons & Scaling

Objectives

In this assignment you will learn to apply the dimscale, ltscale, and polygon commands along with commands previously learned.

Getting Started

1. When AutoCAD's menu appears, scroll down and select the **Otto 2016.dwt** template file.
2. Insert the Block, however, this time you will be changing the Scale. Before clicking okay continue below.
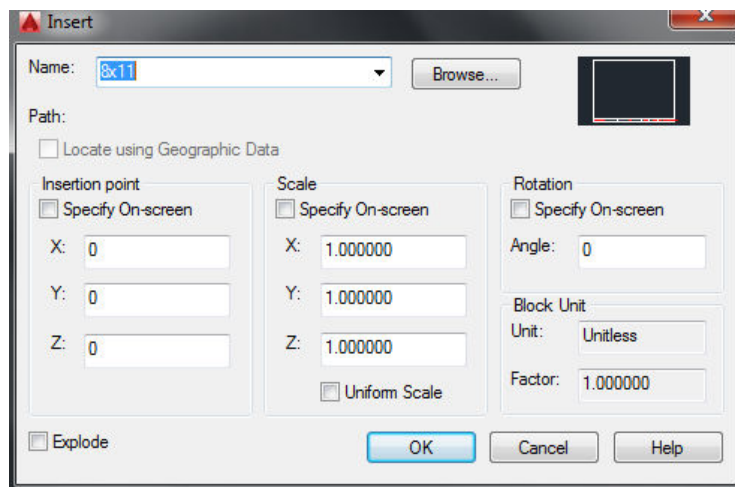
Setting Up the Scale and Title Block

1. AutoCad allows you to always draw in an environment that 1 = 1. The unit can be 1 inch, 1 mile, or 1 foot. It does not matter until you have to plot. Scaling becomes a factor to make the drawing fit to a particularly sized sheet of paper.
   Obviously, you would not try to draw one mile equals one mile and place it onto a sheet of paper. Scaling would be required.

2. We are going to set the scale for our drawing in the beginning when we insert the title block.

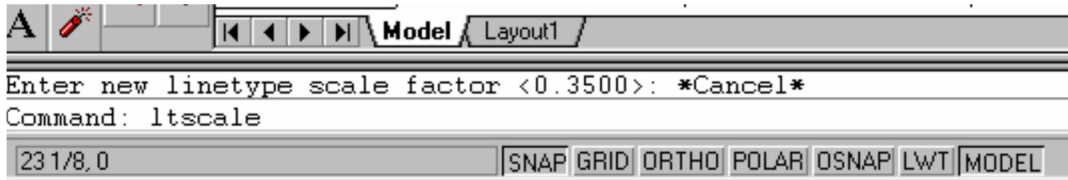3. When you insert the block for the title block on this drawing make the following changes:
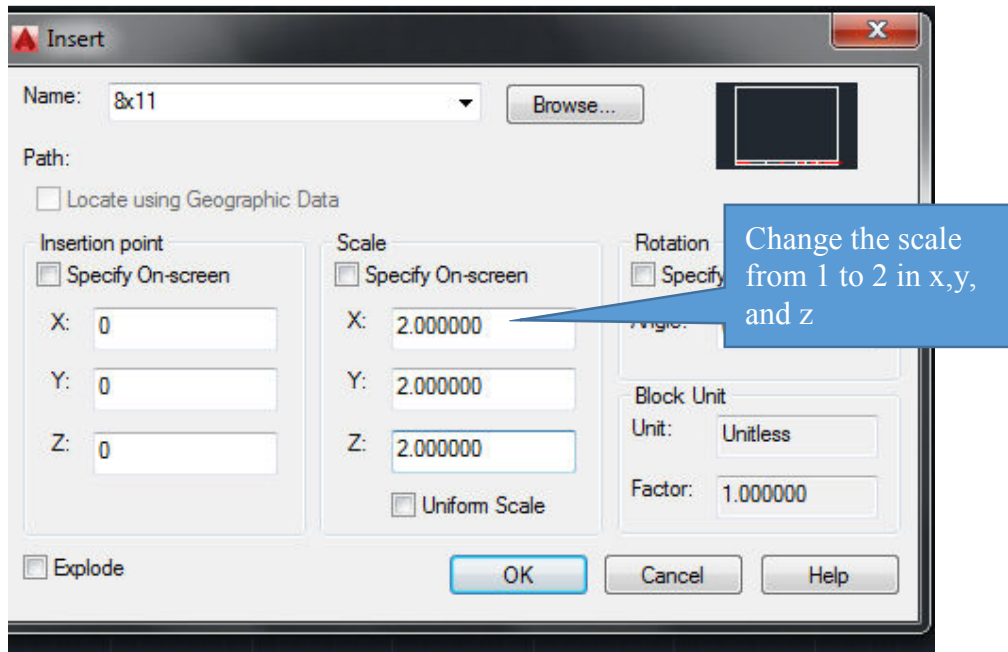
Note: Also remember to remove the check from the Specify On-screen box.

4. When you click the OK button, type the information into the title block dialog box as illustrated:
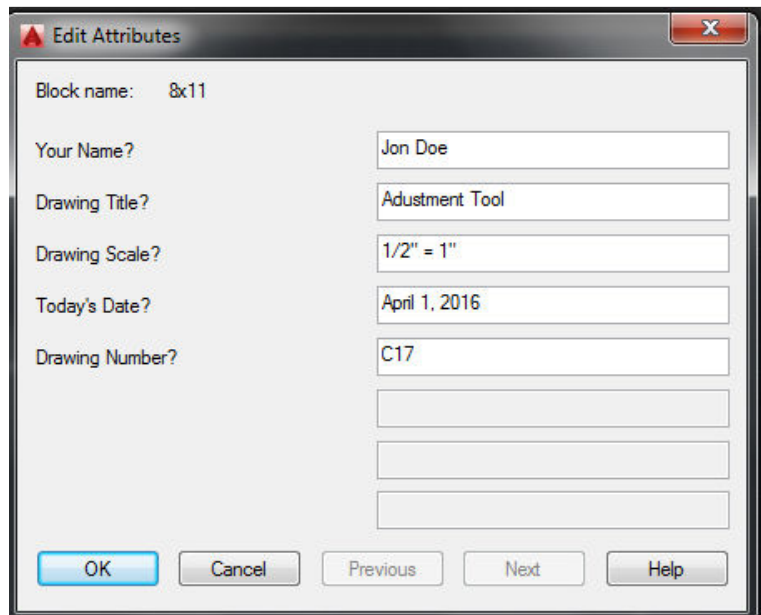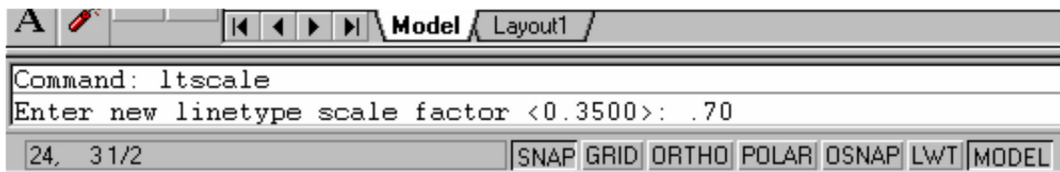
Setting Up Line Type Scale

1. You will have to change the scale for the lines in the drawing. At the command prompt, type ltscale.

```
A  🖉          |◄ ◄ ► ►|\Model / Layout1 /
Enter new linetype scale factor <0.3500>: *Cancel*
Command: ltscale
23 1/8, 0                    SNAP GRID ORTHO POLAR OSNAP LWT MODEL
```
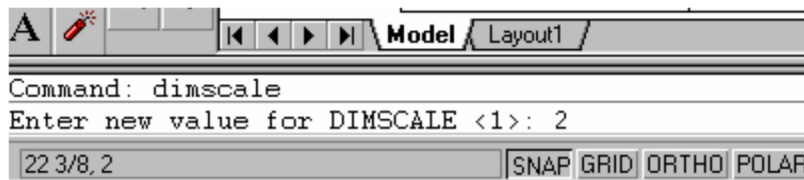
2. Press the Enter key one time and type .70. This will double the size of the scale for the line types. If you did not change the scale, the dashes in center lines would be too small.

```
A  🖉        |◄ ◄ ► ►|\Model / Layout1 /
Command: ltscale
Enter new linetype scale factor <0.3500>:  .70
24,  3 1/2                  SNAP GRID ORTHO POLAR OSNAP LWT MODEL
```

3. Press the Enter key. The linetype scale is now set for the drawing.

Setting Up Dimension Scale

1. The text for dimensioning will also have to be set in order to have the correct size arrowheads and text. If you do not change the dimension scale, the text and arrowheads would be too small.
2. Click the command prompt window and type dimscale and press the Enter key.

```
A  🖉         |◄ ◄ ► ►|\Model / Layout1 /
Command: dimscale
Enter new value for DIMSCALE <1>: 2
22 3/8, 2                  SNAP GRID ORTHO POLAR
```

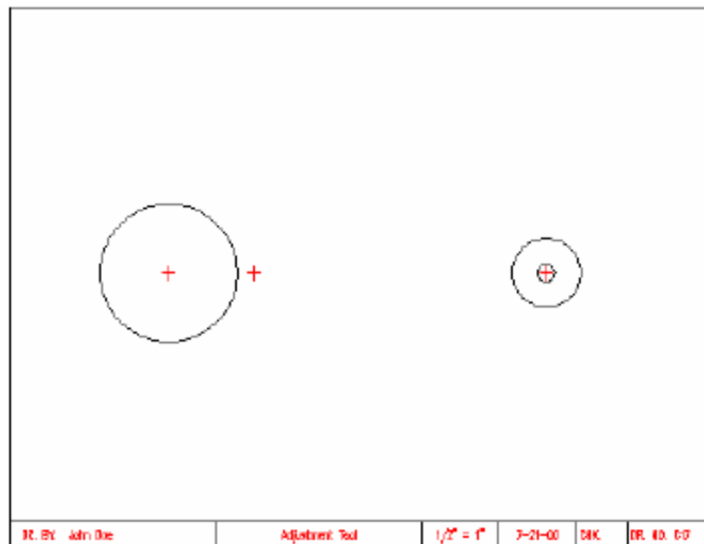3. In the Enter new value for DIMSCALE type 2 and press the Enter key.

Getting Started

1. As you have done in previous drawings draw the circle and copy the two center points to the desired locations. Follow the dimensions on the golden rod sheets.
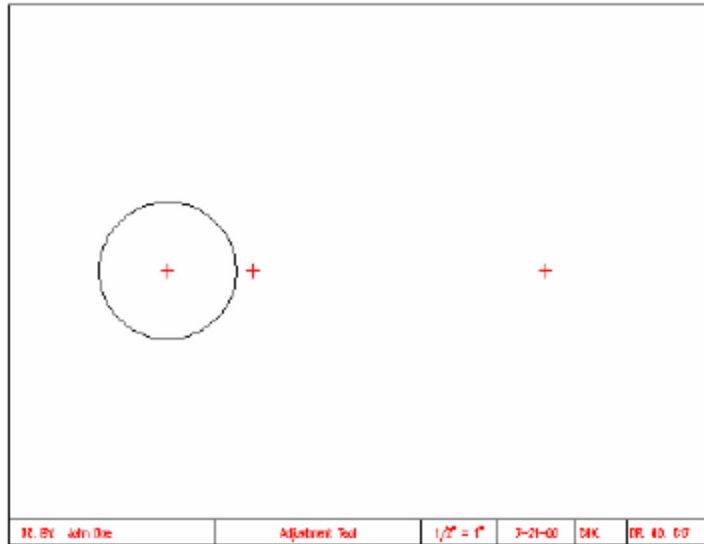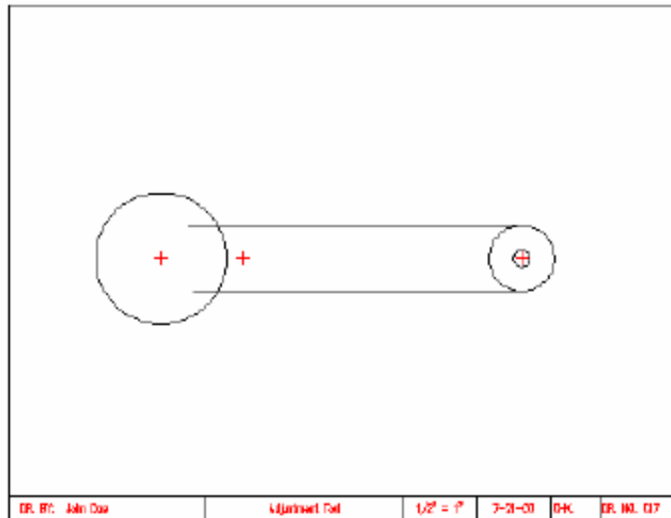

Note: Remember to change layers and place objects into the correct layer.

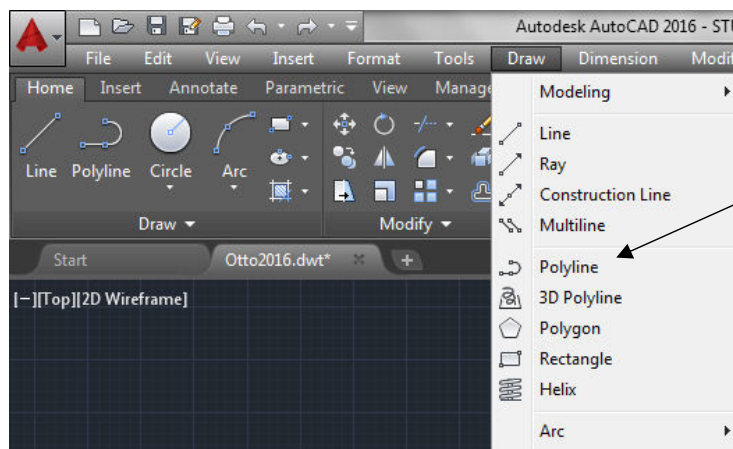2. Draw the two circles on the right.

3. Draw the two horizontal lines to connect the circles as illustrated:

4. Clean up the drawing with the fillet and the trim commands.
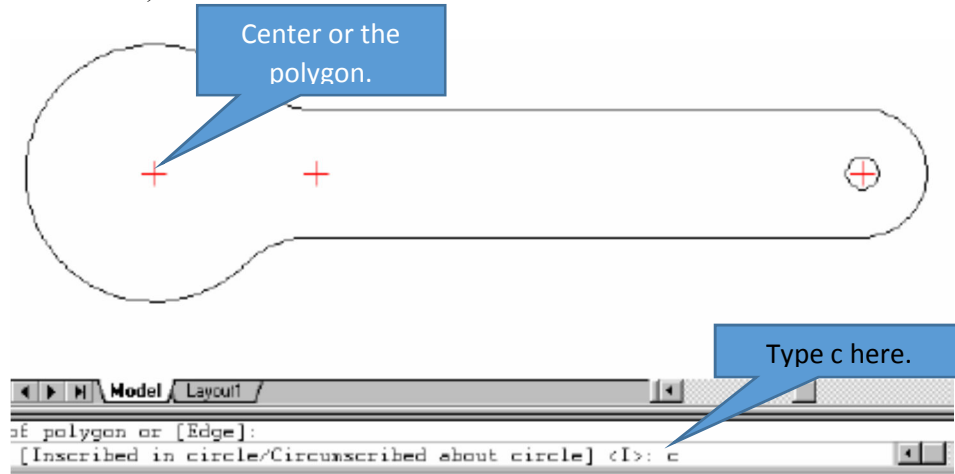
Command: Polygon

1. Select Polygon from the Draw menu.

2. Click the command prompt window and type 6 for the number of sides (hexagon).

3. Position the cross hair onto the center mark of the large circle on the left of the drawing. Pick the center point of the polygon, then click the command window and type c (circumscribed).

4. Press the Enter key. You will notice the polygon is positioned onto the center of the location. As you move the mouse, notice the polygon increases in size. Read the status line at the bottom of the command window. When 1 1/8<0 is displayed click the mouse. It is best to do this with ortho on.
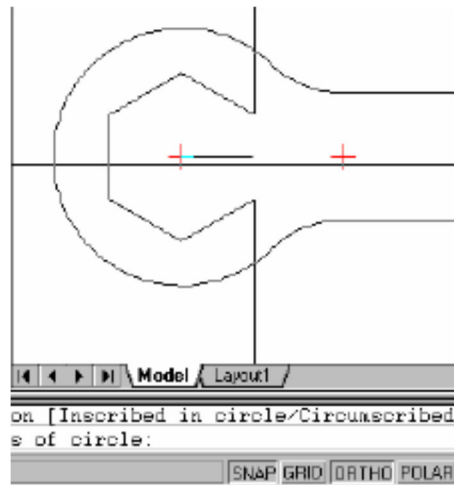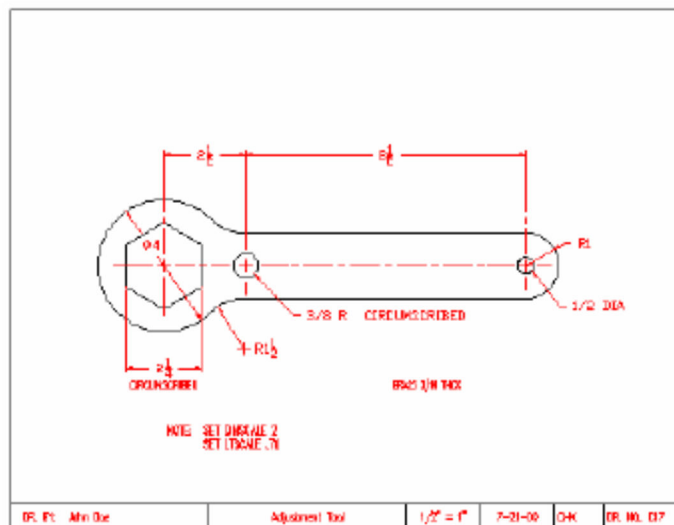

5. Repeat the polygon command to construct the small octagon. Remember an octagon has eight sides.

6. Complete the dimension. The following items need to be completed while dimensioning.

    linear dimensions   radial dimensions   diameter dimensions
    dtext   center lines

7. The completed drawing should appear as illustrated:

8. Save the drawing into the correct folder with the correct name format.

Apply Your Knowledge

1. Open **AutoCAD** and select the Otto 2000 template file. Drawing C18 is a test of your knowledge of commands learned from C1-C17.
2. Select the **Otto 2016** template file and **insert** the **8x11 border**.

3. From the **popup dialog box** type the information for the title block. You will name the eighteenth drawing assignment the same as previously drawn assignments.

   1991 Studebaker Gasket   C18

4. Set the **scale** to **1" = 1".**
5. Create **drawing C18** testing the learned knowledge from previous drawings. When you encounter problems, review the command instructions from the previous drawings.
6. **Dimension** the **drawing** and **save** the **file** into the **correct location** and **file name**.

7. When the file is completed it should appear as illustrated.
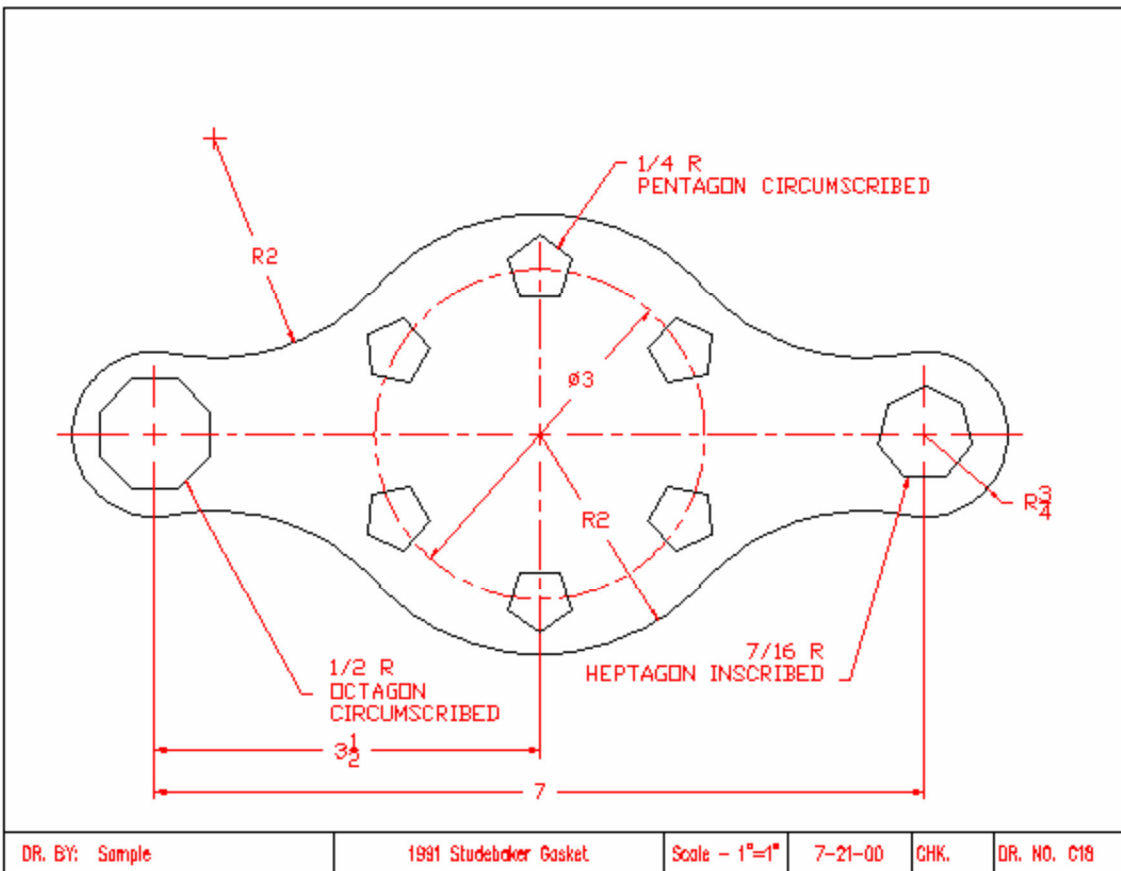
Terms to Know

Circumscribed - (Circumscribed about Circle) specifies the distance from the center of the polygon to the midpoints (tangencies) of the edges of the polygon.
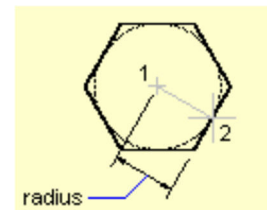
Dimension scale - Affects the size of the dimension geometry relative to the objects in the drawing. Dimension scale affects sizes, such as text height and arrowhead size, and offsets, such as the extension line origin offset. You should set these sizes and offsets to values that represent their actual plotted size. Dimension scale does not apply the overall scale factor to tolerances or measured lengths, coordinates, or angles. Setting dimension scale depends on how you lay out your drawing. There are three methods used to create dimensions in a drawing layout: Dimension in model space for plotting in model space, Dimension in model space for plotting in paper space, and Dimension in layouts.

Half scale - (see scale factor) Multiplies the dimensions of the selected objects by the specified scale. A scale factor greater than 1 enlarges the objects. A scale factor between 0 and 1 shrinks the objects. Half scale is .5"=1.0" or ½"=1"

Inscribed - (Inscribed in Circle) specifies the radius of a circle on which all vertices (endpoints of each side) of the polygon lie.

Line type scale - Use LTSCALE to change the scale factor of linetypes for all objects in a drawing. Changing the linetype scale factor causes the drawing to regenerate.

Polygon - A polygon is a polyline object. AutoCAD draws polylines with zero width and no tangent information. You can use the PEDIT command to change these values. You can create polygons with 3 to 1024 sides.