

3.3 Create, edit and save library items from existing separate entities

Blocks stored within a drawing - Exercise



- 1 **Close** down all other drawings and create a **New** drawing using the **Start from Scratch, Metric** option, then produce the drawing shown in Figure 01 without adding the dimensions.



Perform a **Zoom Extents** command, select from the **Navigate** panel on the **View** tab of the **Ribbon**, or from the **Navigation Bar**



Ensure the **7689 2D Workspace** is loaded, by selecting from the pop-up menu on the **Workspace Switching** button on the **Status** bar.

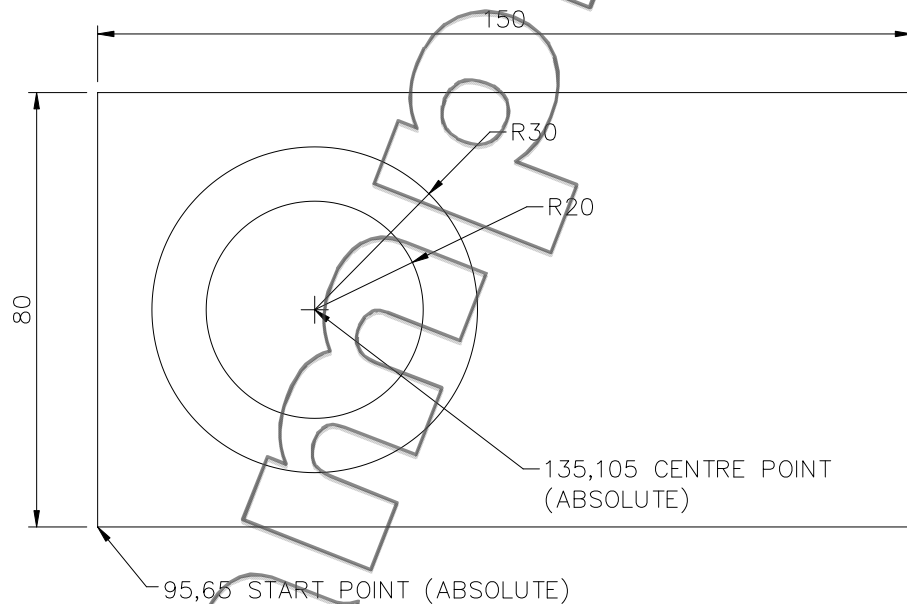


Figure 01



- 2 Draw the **“nut and washer”** (without the centre-lines and text), between the two circles at the 12 o'clock position (**Zoom** in if necessary) as shown in Figure 02.

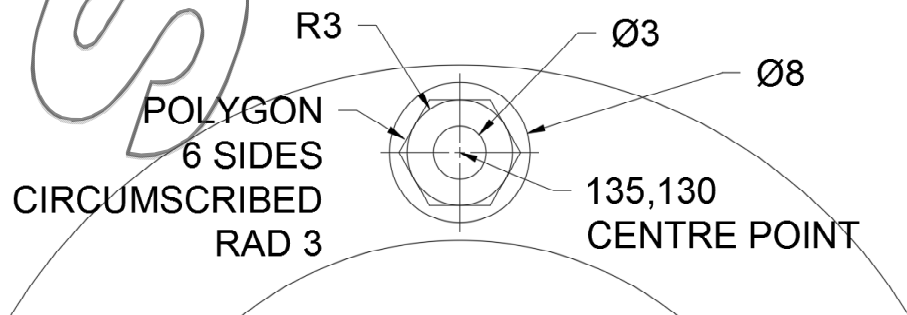


Figure 02

Creating a Block



A standard **Block** is a collection of drawn objects (lines, arcs, circles, etc) within a drawing, grouped together to form a named item, that is recognised by Autodesk AutoCAD as a single object. Some CAD programs call these blocks **Parts** or **Symbols**. In theory, once you use blocks, there should be no further need to ever draw the same object again! You are going to use the **nut** and **washer** item you have just created to make into a **block**.



- 3 Click the **Create** button on the **Block** panel on the **Home** tab of the **Ribbon**, (or from the **Insert** tab), to display the "**Block Definition**" dialog box.

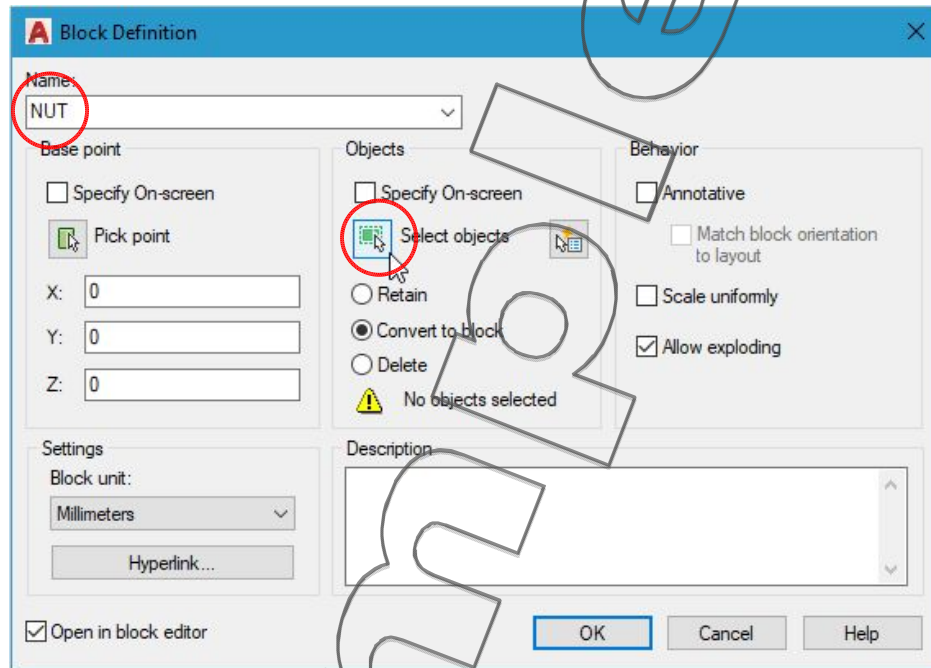


Figure 03 Block Definition

Type **NUT** in the **Name:** text box (Figure 03).

Click the **Select objects** button, and select the **nut** and **washer** only, then press **[RETURN]** to return to the "**Block Definition**" dialog box.

Click the **Pick point** button, and pick the **centre point** on one of the circles using **Osnaps** to provide the **X** and **Y** values for the **Base point** - see Figure 04.

Ensure the rest of the dialog box is completed as shown in Figure 04, then click the **OK** button.

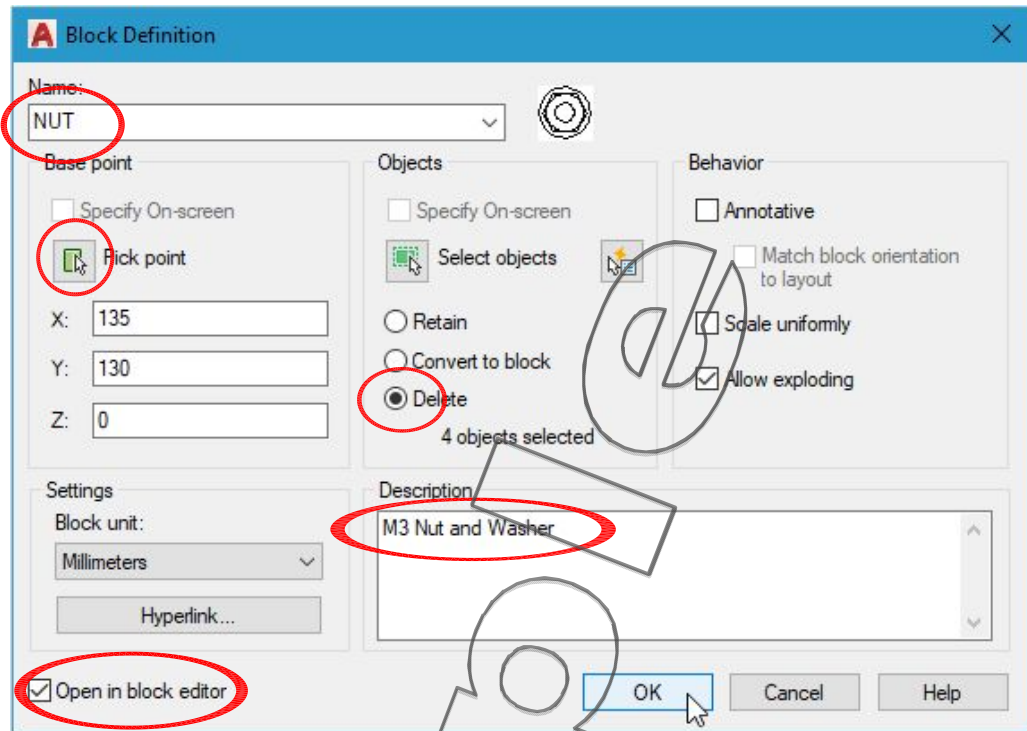


Figure 04 Block Definition

This has placed you in the **Block Editor** (see the **Tab** on the **Ribbon**) anticipating that further work is required on the block. This is not the case, so click on the **Close Block Editor** button on the **Close** tab of the **Ribbon**. If changes are made, the **Block - Changes Not Saved** alert box will display, then click on the **Save the changes to NUT**.

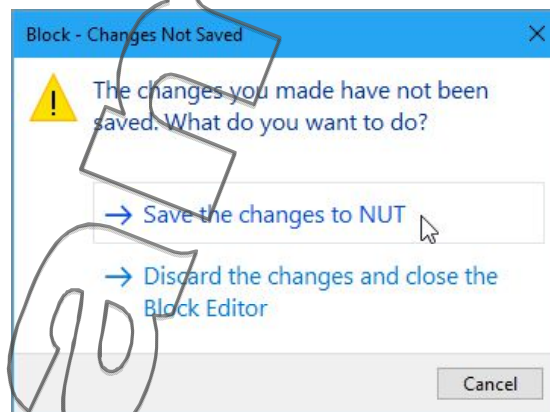


Figure 05 Block - Changes Not Saved



Note that the **nut** and **washer** have now disappeared. With the **Delete** radio button checked when you make a block, the original objects used to make that block are erased. This is to allow you to insert the objects back into the drawing as a block. If required, you can get the original drawn objects back by typing **OOPS** at the keyboard (don't do this).

The standard block **NUT** is now stored in the drawing and can be inserted over and over again. It can also be scaled and rotated as it is being inserted. One of the main advantages is that if you have lots of the same block inserted in the drawing, it saves a substantial amount of disk and memory space.

If you copy an object 50 times in a drawing, you have 50 descriptions of that object stored in the Autodesk AutoCAD database. If however you insert a block 50 times in a drawing, you only have one description of the block with an indicator as to where the others are in the drawing. This is how space saving is made.



At the moment you can only use the block **NUT** within your current drawing. If you want to make it available for insertion into other drawings, you must 'write' it to disk. You use the **WBLOCK** command for this.

Using Wblock to Create a Drawing from a Block



- 4 Click the **Write Block** button on the **Block Definition** panel on the **Insert** tab of the **Ribbon**, (or enter **WBLOCK** at the **keyboard**) to display the "Write Block" dialog box.

As you are producing a drawing on the hard disk using the **Wblock** command direct from an existing **Block** and not from the actual drawing, ensure that the **Block** radio button is selected under **Source**, and from the drop-down list select **NUT**.

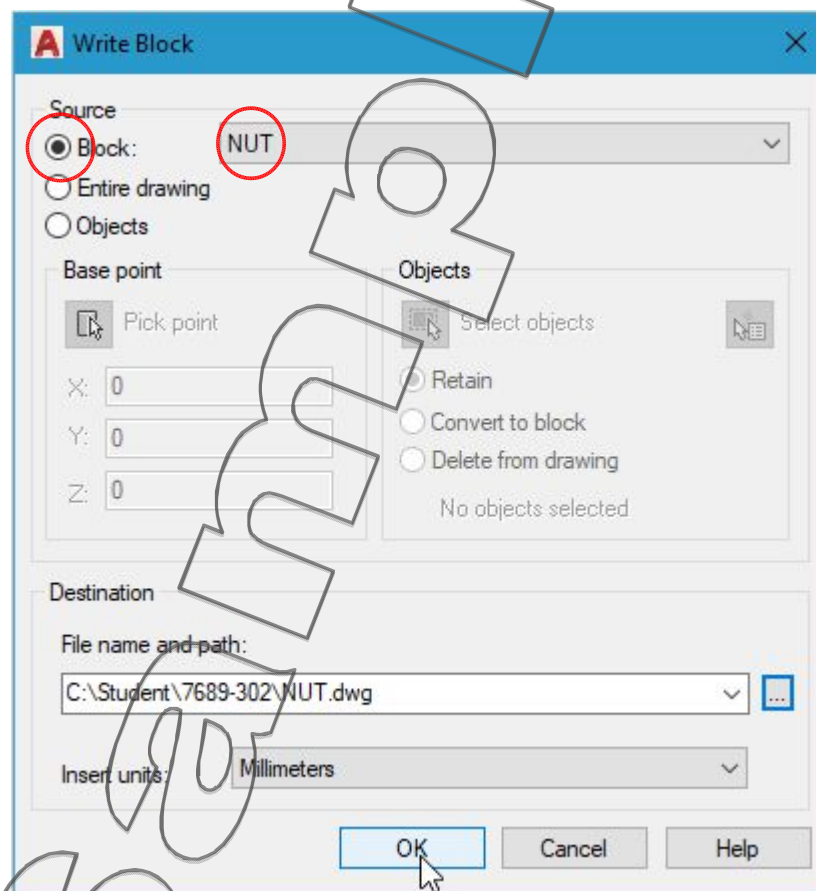


Figure 06 Write Block from Block

The **Wblocked** drawing you are creating is to be given the **same** name as the **Block**, so leave the **File name** as **NUT**, but note that the **path** may be different on your computer. If you are not sure, consult your Tutor.

Click the **OK** button and the block will be written to disk (the Hard Disk in this case) as a file called **NUT.dwg**.

Creating a Wblocked Drawing from Objects



If you only want to create a **Wblocked** drawing, without creating a block in your current drawing, simply type **WBLOCK** at the keyboard to display the "Write Block" dialog box, and follow the same procedure as before, but complete the box as shown below. The **File name and path:** would obviously be of your choosing.

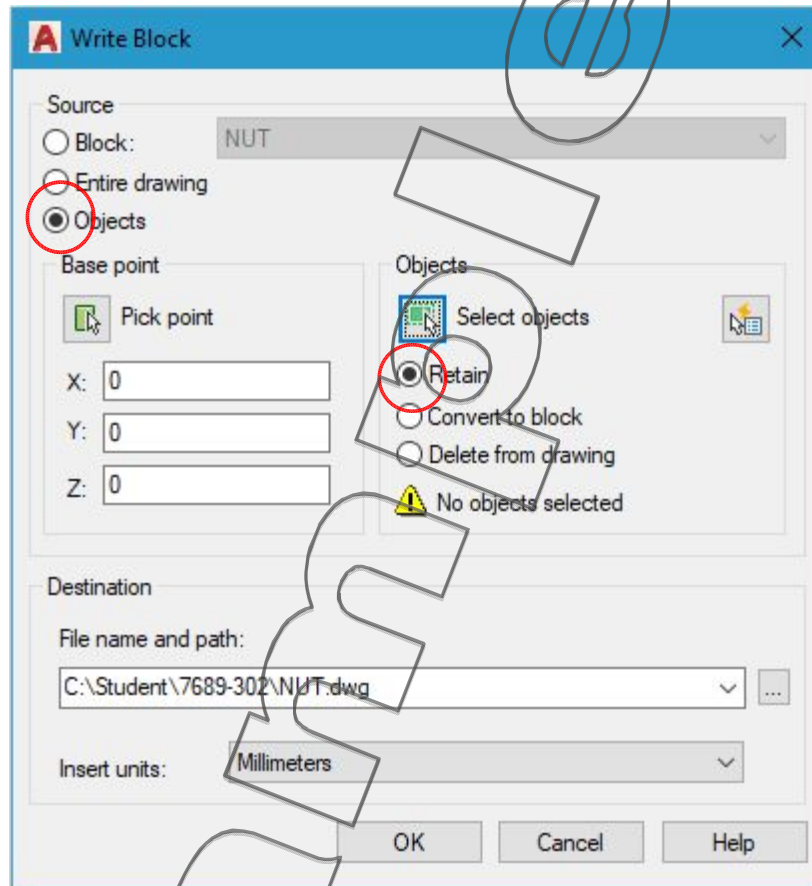


Figure 07 Write Block from Objects

Inserting a Block



- 5 Click the **Insert** button from the **Block** panel on the **Home** tab of the **Ribbon** and select **Recent Blocks...** to display the **Blocks** dialog box.

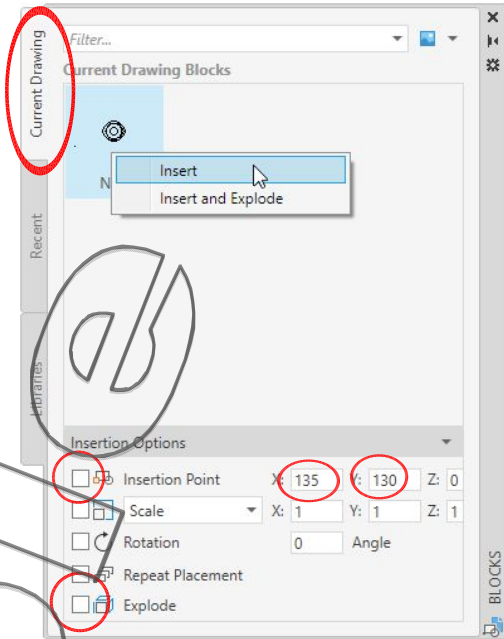
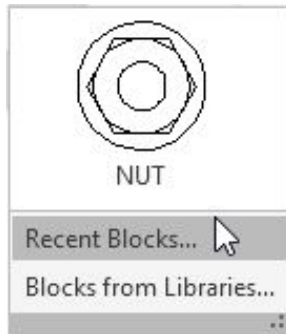


Figure 08 Insert



Select the **Current Drawing** tab and complete the dialog box as shown above, then **Right Click** on the **NUT** Icon and select **Insert**. Now perform a **Zoom Extents**.

The block **NUT** has now been inserted at the same location in which it was drawn.

Note: **Blocks** can be inserted and **Scaled** in the **X** and **Y** direction (ignore **Z** for 2D), and also **rotated**. This can be done in the dialog box or on screen at the time of insertion.

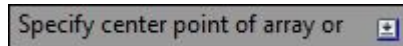
Arraying and Inserting Blocks



- 6 Now **Polar Array** the block **NUT** nine (9) times about the centre of the two large circles.

Click the **Polar Array** button from the **Modify** panel on the **Ribbon** and when prompted to **Select objects**, select the **NUT**, then short **right click** to accept the selection.

When prompted **Specify center point of array**, select the **center of the two large circles**.



The **Array Creation** tab will now be active

For number of **Items** in array enter: **9**

For angle to **Fill** in array enter: **360**.

Ensure **Associative** is **off**.

If the **NUT** has arrayed correctly, select the **Close Array** button on the **Ribbon** to accept.

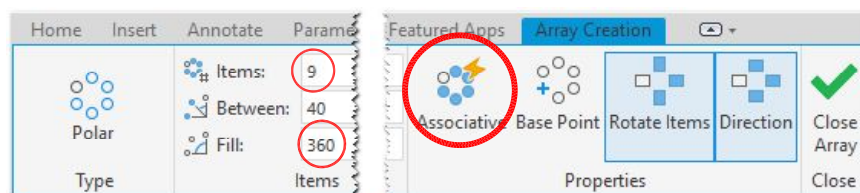
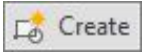


Figure 09 Polar Array - Array Creation tab options



- 7 **Insert** the block **NUT** in the **four** (4) corner positions as shown in Figure 09, scaled in both the **X** and **Y** directions by **1.5**.



- 8 Make another **Block** called **FLANGE**, which should consist of the two large circles and the 9 nuts and washers. The base point should be at the centre of the two large circles (**135,105**), and ensure the **Delete from drawing** radio button **is** selected. Click **OK**.



Enter **OOPS** at the **Command:** line to bring back the original **Flange** objects.

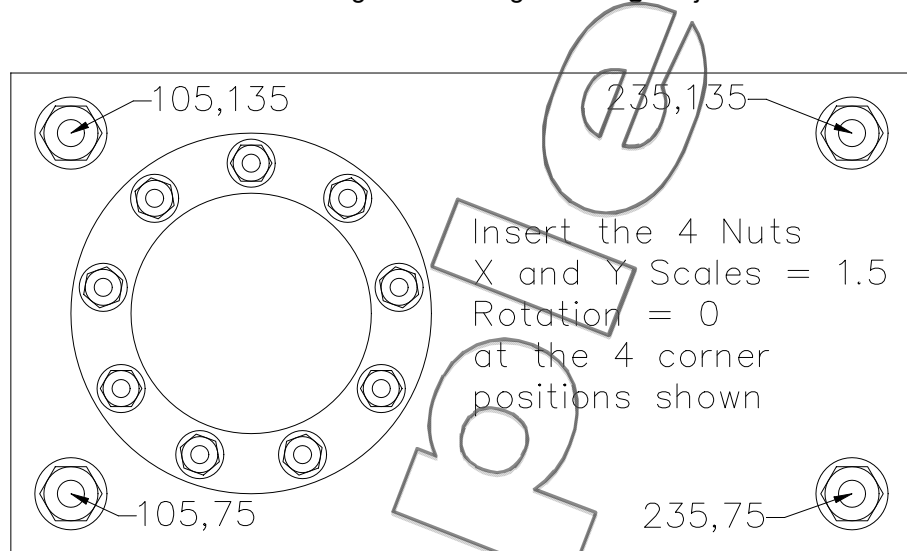


Figure 10

Unequally Scaled Blocks



- 9 **Insert** the new **Block** called **FLANGE** as shown in Figure 11, the exact insertion point is not important. Set the **X Scale** to **1**, and the **Y Scale** to **0.5**, with the **Rotation Angle:** at **45°**.

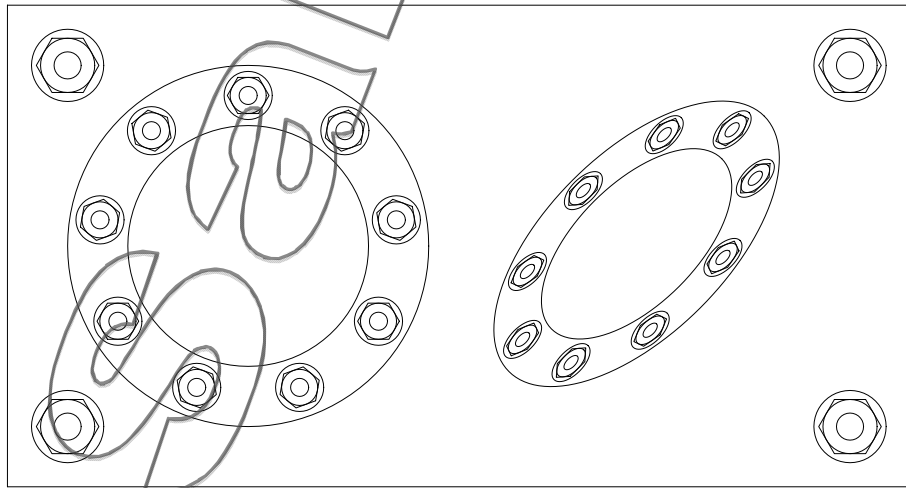


Figure 11