Dynamic Block Tools in AutoCAD
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AC4783 This class describes adding visibility and lookup parameters to enhance the usefulness of blocks. It also explains how to apply geometric constraints and constraint parameters to blocks as an alternative or in addition to using parameters and actions. Finally, this class explores the process of using a block properties table.

Learning Objectives
At the end of this class, you will be able to:

- Apply visibility and lookup parameters
- Use parameter sets
- Constrain block geometry
- Use a block properties table

About the Speaker
John is a professor at Kankakee Community College. He has 15 years of CAD teaching experience at universities and colleges. His professional experience covers the span of 30 years, including 13 years of expertise in managing all aspects of the CAD function for large organizations with multiple engineering disciplines, and remote offices such as AECOM and STS Consultants. John’s four main areas of specialization include CAD management and education, information technology, training and performance improvement, and industrial technology. His education includes an MS in training and organizational development from Northern Michigan University. The research project for his master’s degree was “AutoCAD® E-Learning Objects for the Adult Learner.” Additionally, he has a BS in industrial technology and applied sciences with a minor in CAD.

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**Visibility Parameters**

A *visibility parameter* allows you to assign *visibility states* to objects within a block. Selecting a visibility state displays the only objects in the block associated with the visibility state. Visibility states expand the capacity of blocks in a symbol library by allowing you to hide or make visible specific objects and even completely different symbols. A block can include only one visibility parameter. Visibility parameters do not require an action.

**Figure 1** provides an example of using a visibility parameter to create four different valve symbols from a single block. To create the block, draw all of the objects representing the different variations, as shown in **Figure 1A**. Then assign a visibility parameter and add visibility states that identify the objects that are visible in each variation. Insert the block and select a visibility state to display the corresponding objects. See **Figure1B**.

To add a visibility parameter, access the *Visibility Parameter* option and pick a location for the parameter label. The parameter automatically includes a single grip. When you insert the block and select the grip, a shortcut menu appears listing visibility states. There is no prompt to select objects because the visibility parameter is associated with the entire block.

**Figure 1.**
A—All of the objects composing each unique valve symbol shown together. B—Create each different valve from a single block using a visibility parameter with different visibility states.

![Gate Valve](#) ![Regulating Valve](#)

![Check Valve](#) ![Butterfly Valve](#)

**NOTE:**
Name, Label, Description, and Palette options are available before you specify the parameter. Most of the options are also available from the Properties palette if you have already created the parameter.
Creating Visibility States
The tools in the Visibility panel of the Block Editor ribbon tab become enabled when you add a visibility parameter. See Figure 2. To create a visibility state, access the BVSTATE command to display the Visibility States dialog box. See Figure A. Pick the New... button to open the New Visibility State dialog box shown in Figure 3B. Type the name of the new visibility state in the Visibility state name: text box. For the valve block example shown in Figure 1, an appropriate name could be GATE VALVE, REGULATING VALVE, CHECK VALVE, or BUTTERFLY VALVE, depending on which valve the visibility state represents.

Figure 2.
The visibility tools in the Visibility panel of the Block Editor ribbon tab.

Figure 3.
A—Manage visibility states using the Visibility States dialog box. B—Create new visibility states using the New Visibility State dialog box.

Pick the Hide all existing objects in new state radio button to make all of the objects in the block invisible when you create the new visibility state. This allows you to choose only the objects that should be visible for the visibility state. Pick the Show all existing objects in new state radio button to make all of the objects in the block visible when you create the new visibility state. This allows you to hide objects that should be invisible for the visibility state.
Select the **Leave visibility of existing objects unchanged in new state** radio button to display the objects that are currently visible when you create the new visibility state.

Pick the **OK** button to create the new visibility state. The new state is added to the list in the **Visibility States** dialog box and becomes the current state, as indicated by the check mark next to the name. Pick the **OK** button to return to block editing mode.

Next, use the **BVSHOW** and **BVHIDE** commands to display only the objects that should be visible in the current state. Pick the **Make Visible** button to select objects to make visible. Invisible objects are temporarily displayed semi-transparently for selection. Pick the **Make Invisible** button to select objects to make invisible. For example, to make a visibility state to depict the gate valve shown in Figure 4B from the valve block shown in Figure 4A, use the **Make Invisible** command to turn off the filled circle and the arrow. The changes are saved to the visibility state automatically. Use the **BVMODE** command to toggle the visibility mode on and off. Turn on visibility mode to display invisible objects as semi-transparent. Turn off visibility mode to display only visible objects.

![Figure 4](image)

**Figure 4.**
A—The VALVE block with all objects visible.
B—The VALVE block after making the arrow and filled circle invisible to display the GATE VALVE visibility state.

Repeat the process to create additional visibility states for the block. The valve block example requires four visibility states. The **Current visibility state** drop-down list displays the current visibility state. Select a state from the drop-down list to make the state current. After you create all visibility states, test and save the block and exit the **Block Editor**. The dynamic block is now ready to use.

**Modifying Visibility States**
Visibility state modification requires special consideration. Set the state you want to modify current using the **Current visibility state** drop-down list, and then use the **BVSHOW** and **BVHIDE** commands to change the visibility of objects as needed. When you add objects to the current visibility state, the objects are automatically set as invisible in all visibility states other than the current state.
Use the **Visibility States** dialog box to rename and delete visibility states. You can also use the **Visibility States** dialog box to arrange the order of visibility states in the shortcut menu that appears when you insert the block and pick the visibility parameter grip. The state at the top of the list is the default view for the block. Pick the visibility state to rename, delete, or move up or down from the **Visibility states** list box. Then select the appropriate button to make the desired change.

**PROFESSIONAL BEST PRACTICES TIP**
If you add new objects when modifying a state, be sure to update the parameters and actions applied to the block to include the new objects, if needed.

**Using Visibility States Dynamically**
**Figure 5A** shows the valve block reference selected for editing. Select the visibility grip to display a shortcut menu containing each visibility state. A check mark indicates the current visibility state. To switch to a different view of the block, select the name of the visibility state from the list. See **Figure 5B**. You can also use the **Properties** palette to select a visibility state.

**Look up Parameters**
A **lookup parameter** creates a lookup property to which you can assign a **lookup action**. For example, **Figure 6** shows three valve symbols created from a single block by adjusting the rotation parameter of the middle line. The lookup action allows the middle line rotation to control the length of the start and end lines.
To create the valve block shown in Figure 7, first draw the geometry of the 0° symbol. Then add a linear parameter and label it Start Line. Select the start point as the bottom of the start line, and the endpoint as the top of the start line. Assign a stretch action to the parameter, associated with the top parameter grip. Draw the crossing window around the top of the start line and select the start line as the object to stretch.

Figure 7.
The block of the valve symbol example with linear parameters and stretch actions assigned to the start and end lines and a rotation parameter and rotate action assigned to the middle line.

Add another linear parameter, labeled End Line. Select the bottom of the end line as the start point and the top of the end line as the endpoint. Assign a stretch action to the parameter, associated with the top parameter grip. Draw the crossing window around the top of the end line and select the end line as the object to stretch.

Next, add a rotation parameter labeled Middle Line. Specify the center of the circle as the base point. Select the right endpoint of the middle line to set the radius, and specify the default rotation angle as 0. Assign a rotation action to the parameter. Pick the center of the circle as the rotation base point, and select the middle line as the object to rotate.

To add a lookup parameter, access the Lookup Parameter option and pick a location for the parameter label. Then enter the number of grips to associate with the parameter. The default
option creates a single lookup grip that allows you to use grip editing to carry out the lookup action. When you insert the block and select the grip, a shortcut menu appears listing rotation options. There is no prompt to select objects because a lookup parameter is associated with the entire block.

**NOTE**
Name, Label, Description, and Palette options are available before you specify the parameter. Most of the options are also available from the Properties palette if you have already created the parameter.

**Assigning a Lookup Action**
To assign a lookup action, access the Lookup Action option and select a lookup parameter. The Property Lookup Table dialog box appears, allowing you to create a lookup table. See Figure 8.

**Figure 8.**
The Property Lookup Table dialog box.

Creating a Lookup Table
A lookup table groups parameter properties into custom-named lookup records. The Action name: display box indicates the name of the lookup action associated with the table. The table is initially blank. To add a parameter property, pick the Add Properties… button to open the Add Parameter Properties dialog box. See Figure 9.
All parameters in the block that contain property values appear in the **Parameter properties** list. Lookup, alignment, and base point parameters do not contain property values. Notice that the property name is the parameter label. The **Property type** area determines the type of property parameters shown in the list. By default, the **Add input properties** radio button is active, which displays available input property parameters. To display available lookup property parameters, select the **Add lookup properties** radio button.

To add parameter properties to the lookup table, select the properties in the **Parameter properties** list and pick the **OK** button. A new column, named as the parameter property, forms for each parameter in the **Input Properties** area of the Property Lookup Table dialog box. See Figure 10. Use the **Input Properties** area to specify a value for parameters added to the table. Type a value in each cell in the column. Add a custom name for each row, or record, in the **Lookup** column in the **Lookup Properties** area. This area displays the name that appears in the shortcut menu when you insert the block and select the lookup parameter grip.
For the valve symbol example, add the *Middle Line*, *Start Line*, and *End Line* parameter properties to the table. Then complete the lookup table as shown in Figure 10. Start with the *Middle Line* values. Press [Enter] after typing the value to add a new blank row and then type the remaining values in each cell. Use the [Enter], [Tab], or arrow keys, or pick in a different cell to navigate through the table.

The row, or record, that contains the *<Unmatched>* value, named *Custom* in the *Lookup* column, applies when the current parameter values of the block do not match a record in the table. This allows you to adjust the block using parameter values other than those specified in the lookup table. You cannot add any values to the row, but you can change the name of *Custom*.

The *Allow reverse lookup* setting at the bottom of the *Lookup* column is available only if all of the names in the lookup table are unique. This option allows the lookup parameter grip to display when you select the block. Pick the grip to choose a specific lookup record. The *Read only* setting appears if you do not name a lookup property, or if two or more properties have the same name. Select *Read only* from the drop-down list to disallow selecting a lookup record.

Right-click on a column heading to access a menu with options for adjusting columns, or right-click on a row to access a menu with options for adjusting rows. Figure 11 briefly describes each option.
After you add all required properties to the table and assign values to each, pick the **Audit** button in the **Property Lookup Table** dialog box to check each record in the table to make sure they are all unique. If AutoCAD does not find errors, pick the **OK** button to return to the **Block Editor**. Test and save the block, and exit the **Block Editor**. The dynamic block is now ready to use.

**NOTE**
To redisplay the **Property Lookup Table** dialog box, right-click on a lookup action and pick **Display lookup table**.

**Using a Lookup Action Dynamically**
**Figure 12** shows a valve block reference selected for editing. The figure shows the **Property Lookup Table** dialog box for reference only. Since **Allow reverse** lookup is set in the lookup table, the lookup parameter grip appears along with the other parameter grips. Pick the lookup parameter grip to display a shortcut menu containing each lookup record. The entries in the menu match the entries in the **Lookup** column of the **Property Lookup Table** dialog box. A

<table>
<thead>
<tr>
<th>Menu Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sort</td>
<td>Sorts the records (rows) in ascending or descending order. Pick again to reverse the sort order.</td>
</tr>
<tr>
<td>Maximize all headings</td>
<td>Adjusts all columns to the width of the column headings.</td>
</tr>
<tr>
<td>Maximize all data cells</td>
<td>Adjusts all columns to the width of the values in the cells.</td>
</tr>
<tr>
<td>Size columns equally</td>
<td>Makes all columns equal in width.</td>
</tr>
<tr>
<td>Delete property column</td>
<td>Deletes the column.</td>
</tr>
<tr>
<td>Clear contents</td>
<td>Deletes the cell values.</td>
</tr>
</tbody>
</table>

A

<table>
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<tr>
<th>Menu Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert row</td>
<td>Inserts a new row above the selected row.</td>
</tr>
<tr>
<td>Delete row</td>
<td>Deletes the record (row).</td>
</tr>
<tr>
<td>Clear contents</td>
<td>Deletes the cell values.</td>
</tr>
<tr>
<td>Move up</td>
<td>Moves the row up by one row.</td>
</tr>
<tr>
<td>Move down</td>
<td>Moves the row down by one row.</td>
</tr>
<tr>
<td>Range syntax examples</td>
<td>Displays the online documentation examples of how to enter values into a lookup table.</td>
</tr>
</tbody>
</table>

B

<table>
<thead>
<tr>
<th>Menu Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

Figure 11.
A—Options available when you right-click on a column. B—Options available when you right-click on a row.
check mark indicates the current record. To switch to a different view of the block, select the name of the record from the list.

**Figure 12.**
The lookup parameter grip appears when you select the block. The list of available lookup records is displayed when you pick the lookup parameter grip. Notice the correlation between the available options and the lookup property names in the Property Lookup Table dialog box.

You can change other parameters assigned to the block, such as the linear and rotation parameters of the example block, independently of the named records. When you change any of the parameters, the lookup parameter becomes *Custom*, because the current parameter values do not match one of the records in the lookup table.

**Parameter Sets**
The **Parameter Sets** tab of the **Block Authoring Palettes** window contains common parameters and actions grouped to enhance productivity. Follow the prompts to create a parameter and automatically associate an action with the parameter. The action forms without any selected objects, as is indicated by the yellow alert icon. If the parameter set contains an
action that must include associated objects, as most do, double-click on the action icon and select objects. The prompts may differ depending on the type of action.

**Constraining Block Geometry**

Geometric constraints and *constraint parameters* can directly replace action parameters and actions. For example, the block of the cut framing member shown in Figure 13A uses geometric constraints to maintain geometric relationships and two linear constraint parameters to specify the member size. When you insert and select the block to edit, use the constraint parameter grips or options in the Properties palette to adjust the block. See Figure 13B. An alternative is to create the block using two linear parameters.

**Figure 13.**
A—A cut framing member block made dynamic using geometric constraints and constraint parameters. B—Using the default 2x4 block to create a 4x4 symbol.

You may find that geometric constraints and constraint parameters are easier to use than action parameters and actions for certain tasks. However, for some blocks, you will discover that action parameters and actions require less effort than adding geometric constraints and constraint parameters. Decide which dynamic block commands and options are appropriate for the blocks you create.
A combination of dynamic properties is also effective. For example, parameters and actions such as alignment, array, and flip offer dynamic controls that are often not possible using geometric constraints and constraint parameters. Figure 14 shows how adding an alignment parameter to the cut framing member block allows you to size and align instances of the block.

**Figure 14.** Using geometric constraints and constraint parameters to adjust the size of a cut framing member symbol. An alignment parameter aligns each member for specific applications.

**Using Geometric Constraints**

The geometric constraint commands and options available in the Block Editor are identical to those you use to constrain a parametric drawing geometrically. The tools in the Geometric panel of the Parametric ribbon tab are duplicates of the tools in the Geometric panel of the Block Editor ribbon tab. Use the geometric constraints in the Block Editor as you would in the drawing environment, including the options for relaxing and deleting constraints. The same shortcut menu, Constraint Settings dialog box, and Properties palette functions apply. Please attend **AC4772 Introduction to Parametric Drafting in AutoCAD 2012** for information on adding geometric constraints.

Assign constraints to block objects before you define the block or during block editing to create a dynamic block. See **Figure 15A**. Once you define and insert the block, only constraint parameters, action parameters, or actions influence geometric constraints. This allows you to use blocks as objects in parametric drawings. For example, you can insert and rotate the block, as shown in **Figure 15B**, even though the block definition includes a horizontal constraint. Use constraints in the drawing to locate blocks and establish geometric relationships between blocks and other objects. See **Figure 15C**.
NOTE
Use geometric constraints in the block environment to form geometric constructions in specific situations when standard AutoCAD commands are inefficient or ineffective.

Using Constraint Parameters
Constraint parameters replace dimensional constraints in the Block Editor. To help avoid confusion, remember that dimensional constraints constrain a parametric drawing, including block references, as shown in Figure 15C. Constraint parameters constrain the size and
location of block components. By default, dimensional constraints are gray and constraint parameters are blue. You also have the option of converting dimensional constraints to constraint parameters.

You can often use constraint parameters instead of action parameters and actions. If you do not use action parameters, you must include constraint parameters to create a dynamic block. The constraint parameter commands and options available in the Block Editor function much like those you use to constrain a parametric drawing dimensionally. Please attend AC4772 Introduction to Parametric Drafting in AutoCAD 2012 for information on adding dimensional constraints.

The BCPARAMETER command replaces the DIMCONSTRAINT command in the Block Editor and provides Linear, Horizontal, Vertical, Aligned, Diameter, and Radius options. The Linear option is the default in the Block Editor ribbon tab. You can also use the BCPARAMETER command to convert dimensional constraints to constraint parameters. Each constraint parameter is a separate DIMCONSTRAINT command option. The quickest way to add or convert constraint parameters using the DIMCONSTRAINT command is to pick the appropriate button from the Dimensional panel of the Block Editor ribbon tab.

The process of adding constraint parameters is identical to that for adding dimensional constraints, except that constraint parameters can include grips. Constraint parameters are essentially a combination of dimensional constraints and action parameters. The constraint parameters given custom names in Figure 16 are those that can be adjusted for specific block references. As when creating a parametric drawing, the other constraint parameters are required to define the block and define specific geometric relationships. Notice the expressions applied to these values.
To create a constraint parameter, follow the prompts to make the required selections, pick a location for the dimension line, and enter a value to form the constraint. When prompted, specify the number of grips. The radius constraint parameter allows you to add 0 or 1 grip. All other constraint parameters can include 0, 1, or 2 grips. If you plan to assign a single grip to a constraint parameter, select the point associated with the grip second. If you choose the 0 option, you can only use the Properties palette to adjust the block.

**NOTE:**
If you attempt to over-constrain a block, a message appears indicating that adding the geometric constraint or constraint parameter is not allowed. You cannot create reference constraint parameters.

**PROFESSIONAL BEST PRACTICES TIP:**
As when adding dimensional constraints or action parameters, change the constraint parameter name to a custom, more descriptive name. Naming labels helps organize parameters and identify each parameter when you control the block dynamically. Custom parameters also appear in the Custom category of the Properties palette.

Use the Convert option of the BCPARAMETER command to convert a dimensional constraint to a constraint parameter. This allows you to prepare a dynamic block using existing dimensional constraints. Access the Convert option and pick the dimensional constraint to convert. The dimensional constraint becomes the corresponding constraint parameter and includes the default number of grips.
Controlling Constraint Parameters
Control and adjust constraint parameters using a combination of the same techniques you use to manage dimensional constraints and action parameters. Many of the options from shortcut menus, the Constraint Settings dialog box, and the Properties palette apply. Right-click with no objects selected to access options for displaying and hiding parametric constraints and for accessing the Constraint Settings dialog box. Select a constraint parameter and then right-click to display a shortcut menu with options for editing the constraint, changing the name format, and redefining the grips.

As with dimensional constraints and the action parameters, the Properties palette provides an effective way to control and enhance constraint parameters. You can also use the Parameters Manager. Figure 17 shows a foundation detail block with linear constraint parameters. Notice the multiple options available in the Properties palette for adjusting the selected constraint parameter.

Adjust constraint parameters as you would dimensional constraints and action parameters. Use the Properties palette to add value sets.
Use the options in the **Value set** category of the **Properties** palette to assign value sets to a constraint parameter. Each constraint parameter in the **Figure 17** example uses an incremental value to help ensure that you select an appropriate value when adjusting a block reference. You can also create a list of possible sizes. The processes of creating a value set in the **Properties** palette and using value sets are identical for constraint parameters and action parameters.

**Additional Parametric Tools**

The **Block Editor** offers additional options for adding constraints to blocks. Many of the tools, such as the **DELCONSTRAINT** command, function the same in block editing mode as in drawing mode. However, the **Block Editor** does offer some unique parametric construction commands.

The **BCONSTRUCTION** command allows you to create construction geometry to aid geometric construction and constraining. Construction geometry appears only in the block definition. See **Figure 18**. Access the **BCONSTRUCTION** command and select the objects to convert to or revert from construction geometry. Press [Enter] or the space bar, or right-click and pick **Enter**. Next, choose the **Convert** option to convert non-construction objects to the construction format, or choose **Revert** to return construction geometry to the standard format. You can also use the **Hide all** option to hide all existing construction geometry before selecting objects, or use the **Show all** option to display all construction geometry.

**Figure 18.**
A weld nut block in which construction geometry aids geometric construction and constraining.

Use the **BCONSTATUSMODE** command to toggle constraint status identification on and off. When you turn constraint status mode on, objects with no constraints appear white (black) by default, objects assigned some form of constraints are blue, and fully constrained geometry is magenta. If the block contains a constraint error, objects associated with the error are red.
Using constraint status is helpful, especially if you want to constrain objects in a certain order or confirm that geometry has been fully constrained.

**NOTE:**
Use the `BESETTINGS` command to access the **Block Editor Settings** dialog box. There you can adjust parameter and parameter grip color and appearance, constraint status colors, and other **Block Editor** settings.

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**Block Properties Table**

A **block properties table** allows you to assign specific values to multiple block properties, and then select a specific group, or row, of properties to create block references. The concept is similar to using a lookup action parameter. A block properties table can include action parameters, constraint parameters, or both. You can also add attributes to the table, which is often appropriate for naming each record, or row.

**Figure 19** shows the block of the front view of a heavy hex nut in the **Block Editor**. The block includes an appropriate level of constraints and includes constraint parameters to direct dynamic changes. The block also includes an invisible and preset attribute for defining the designation of each different nut and, as shown in the **Parameters Manager**, a user-defined parameter for the nut thickness.

**Figure 19.**
A heavy hex nut block definition ready to use to create a block properties table.
PROFESSIONAL BEST PRACTICES TIP:
It is critical that you assign the **Preset** mode to attributes that you include in a block properties table. This allows the attribute value to adjust to the selected block record. The **Preset** mode requires no default value, and you will not receive a prompt to adjust the value.

After you create parameters and attributes, access the **BTABLE** command and select the parameter location. Then enter the number of grips to associate with the parameter. The default **1** option creates a single grip that allows you to select a table record from the grip shortcut menu. If you choose the **0** option, you can only use the **Properties** palette to select a record. The **Palette** option, available before you specify the parameter location or from the **Properties** palette, determines whether the label appears in the **Properties** palette when you select the block reference. The **Block Properties Table** dialog box appears, allowing you to create a block properties table. See **Figure 20**.

**Figure 20.**
The **Block Properties Table** dialog box.

Creating a Block Properties Table

A block properties table groups the properties of parameters into custom records, or rows. To add parameter properties, pick the **Add Properties**… button to open the **Add Parameter Properties** dialog box. See **Figure 21**. All parameters in the block that contain property values
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appear in the Parameter properties: list. Lookup, alignment, and base point parameters do not contain property values. Notice that the property name is the parameter label.

**Figure 21.** Parameter properties are listed in the Add Parameter Properties dialog box.

To add parameter properties to the table, select the properties in the Parameter properties: list and pick the OK button. A column appears in the table for each parameter property. Type a value in each cell in the column. A new row forms automatically when you enter a value in a cell. See Figure 22. Press [Enter], [Tab], [Shift]+[Enter], or the arrow keys, or pick in a different cell to navigate through the table.
For the nut block example, complete the table as shown in Figure 22. The **DESIGNATION** column references the attribute property. The value you enter in the **DESIGNATION** text box in each row specifies the record name. This value appears in the shortcut menu when you insert the block and select the block properties table parameter grip.

**NOTE:**
Right-click on a column heading to access a menu with options for adjusting columns. Right-click on a row to access a menu with options for adjusting rows. The options are the same as those for adjusting lookup table columns and rows.

You can adjust a block reference using parameter values other than those specified in the table. You may be able to enter a value, such as the value of an attribute property, in a text box found in the **Default** property when values do not match table area of the **Block Properties Table** dialog box. Use the **"Last"** option to use the value assigned to the previous block reference when you specify a value not found in the table. Often it is appropriate to choose the **Block properties must match a row in the table** check box to force the selection of a specific record, matching all values in a row.

**NOTE:**
It is critical that all block definition values match the values specified in the default block row in the block properties table, especially if you force the selection of a specific record.
After you add all required properties to the table and assign values to each, pick the **Audit** button in the **Block Properties Table** dialog box to check each record in the table. Make sure the records are unique and that there are no discrepancies between the block definition and the table values. If AutoCAD does not find errors, pick the OK button to return to the **Block Editor**. Test and save the block, and exit the **Block Editor**. The dynamic block is now ready to use.

**NOTE:**
To redisplay the **Block Properties Table** dialog box, double-click on the parameter, or access the **BTABLE** command.

**Using a Block Properties Table Dynamically**

**Figure 23** shows the inserted nut block example selected for editing. Since the block table parameter includes a grip, a grip appears that you can select to choose a specific block style. The entries in the grip menu match the rows in the **Block Properties Table** dialog box. A check mark indicates the current record. To switch to a different view of the block, select the name of the record from the list. You can also pick the **Properties Table...** option to display the **Block Properties Table** in drawing mode. Double-click a row to activate it. In this example, no other grips were assigned to blocks. This makes the table and the **Properties** palette the only two methods to select a block reference format.
PROFESSIONAL BEST PRACTICES TIP:
The options for developing dynamic blocks and creating parametric drawings can become confusing. Keep the following concepts in mind as you proceed:

- Use constraints as an alternative or in addition to action parameters and actions.
- Constraints allow you to create a parametric drawing or a dynamic block.
- Assign constraints to create a dynamic block during block definition or while editing the block.
- Treat inserted blocks like any other object when preparing a parametric drawing.

Reference
Portions of this document are copyrighted by Goodheart-Willcox Company, Inc. and reproduced with permission from the textbook AutoCAD and Its Applications – Basics 2012.