CHAPTER 3: PRODUCTION BILL OF MATERIALS

Objectives

The objectives are:

- Production Bill of Materials (BOM)
- Production BOM Advanced Features
- Production BOM Reports

Introduction

This chapter introduces the basic concepts regarding Bill of Materials (BOM) and its significance in the production process.
Manufacturing Product Design

Microsoft Dynamics® NAV 2009 Manufacturing I helps manufacturers control the manufacturing environment by providing the following functionality:

- Production Bill of Materials (BOM)
- Routings
- Inventory

Another way to describe the production process is to say that a person can use recipes to make things: the Production BOM is the list of ingredients, the routing tells the person what to do with the ingredients to obtain a finished product, and the finished product is stored and sold as inventory.

The manual also shows that production orders keep a queue of what users plan to make, as well as what they will work on next. Additionally, the planning functions tell users what to make or buy and when they need to make or buy those items.

In Microsoft Dynamics NAV 2009 Manufacturing I, the Product Design menu helps users understand the creation of a manufactured item in the following ways:

- Defining a finished good and its components.
- Putting the items together into a Production BOM.
- Creating the steps involved in the routing.

Production Bill of Materials

A BOM is a list of all components and subassemblies needed to make a final product or finished good. The list contains the description, the quantity, and unit of measure.
The end-result of a Production BOM can be one of the following:

- Subassembly (used in another item)
- Finished good (an item ready for sale)

**FIGURE 3.1 PRODUCTION BOM**

As shown in the example, a bicycle is made of many components and subassemblies (frame, tires, chain assembly, and so on); these are the bicycle's bill of materials. Thus, to manufacture or assemble one bicycle, you need one frame, two wheels, 72 spokes, and so on.

The different levels within the BOM illustrate the parent-component relationship, otherwise known as a multi-level BOM. This means that every component occupies a certain level within the hierarchy. Levels define the parts that make up the item that is being produced. This is known as a level code. There are a maximum of 50 levels in Microsoft Dynamics NAV 2009.

Note that a level 0 denotes a finished product (insofar as the manufacturer is concerned).

In the illustration, Cronus International assembles bicycles as one of its products. This is shown by the level 0 (finished good) designation of the bicycle. However, if Cronus International orders bicycle tires from another manufacturer, then these will be considered finished goods or level 0 by that manufacturer (but not by Cronus International).

Low level codes will be covered further in this chapter.

It is possible for an item to be both a subassembly and a finished good, for example, if a part is sometimes sold as a spare part of another item. The items listed on the production BOM are components.
The production BOM is used when production orders are created and is used by the Planning Worksheet to show what needs to be made or purchased.

Once the production order is certified, changes to the components are often made by creating a new version of the production BOM rather than changing the original production BOM.

**Production BOM Header**

Start by looking at the fields in a production BOM, and then create one. In the navigation pane, click *Production BOMs > New*. To create a production BOM, complete the following fields in the header:

<table>
<thead>
<tr>
<th>Field</th>
<th>Comments</th>
</tr>
</thead>
</table>
| No.              | This field identifies the BOM. It must be unique and have a maximum of 20 characters. The number field can be set to default, using No. Series in the manufacturing setup, or can be manually created.  
<pre><code>              | In a company where each production BOM is used on only one item (a 1:1 relationship), the production BOM number is often set up to be the same number as the item it is connected to. |
</code></pre>
<p>| Description      | This field contains the BOM description so that its particular use is easily recognized.                                                                                                                   |
| Unit of Measure  | This field is used as a basis for recalculation factors in the BOM line item. The unit of measure used on a production BOM must also be set up in the Item Units of Measure table (from the Item card) before a production order can be created. This topic is examined later in the chapter. |</p>
<table>
<thead>
<tr>
<th>Field</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Status</strong></td>
<td>This field indicates the status of a BOM. The valid statuses are: [ New ] [ Certified ] [ Under Development ] [ Closed ]</td>
</tr>
<tr>
<td><strong>New</strong></td>
<td>The status is automatically set to New when creating a new BOM and it is editable.</td>
</tr>
<tr>
<td><strong>Certified</strong></td>
<td>The program allows a BOM with the status of Certified to be used for production planning and orders. A Certified BOM is not editable and an error message displays if a user attempts to use a non-Certified BOM.</td>
</tr>
<tr>
<td><strong>Under Development</strong></td>
<td>This status indicates that a Certified BOM is undergoing edits or changes. After the edits or changes have been completed, the status must be changed back to Certified. This is not used in Cost Rollup for the item. (Refer to the Manufacturing Costing training course for more information on cost roll up.) Cost is not calculated with this status.</td>
</tr>
<tr>
<td><strong>Closed</strong></td>
<td>This status indicates that the BOM is no longer used. (Similar to the Block option used elsewhere in Microsoft Dynamics NAV 2009.) This is not used in Cost Rollup for the item.</td>
</tr>
<tr>
<td><strong>Search Name</strong></td>
<td>This field can be used to search for a BOM when its number has been misplaced. It defaults from the description and can be up to a maximum of 30 characters. This field can be edited to create a more pneumonic search name.</td>
</tr>
<tr>
<td><strong>Version Nos.</strong></td>
<td>This field shows the version number series applicable to the Production BOM. You can choose a number series from the No. Series table or leave it blank.</td>
</tr>
<tr>
<td><strong>Last Date Modified</strong></td>
<td>This field tracks the last date the BOM was edited or changed.</td>
</tr>
</tbody>
</table>
### Production BOM Lines

The production BOM lines show the components. Components can be items or production BOMs, usually called Phantom BOMs. Fill in the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **Type**      | Use the drop down arrow to select from the following options:  
|               | • Item  
|               | • Production BOM  
|               | • Blank  
| **Item**      | This option lets users select an item from the inventory item file in the production BOM. If the item is a produced item and has a production BOM, the components are automatically considered when the BOM is exploded.  
| **Production BOM** | This option utilizes a phantom BOM in the line.  
| **Blank**     | This option is used to add a comment after a production BOM line. Comments do not carry through to production orders. |
| **No.**       | Choose an Item No. or production BOM No. to use on this line. |
| **Quantity per** | This usually indicates the quantity of the component required for the production of one production BOM item. If using a calculation formula, the amount in the field is multiplied by calculation specifications to compute the quantity. |
| **Calculation Formula** | This field is used to determine how the Quantity per field must be calculated. Select one of the following options:  
|               | • Blank (the quantity is not calculated)  
|               | • Length (Quantity = Length * Quantity per)  
|               | • Length * Width (Quantity = Length * With * Quantity per)  
|               | • Length*With*Depth (Quantity = Length * With * Depth * Quantity per)  
|               | • Weight (Quantity =Wight*Quantity per) |
Create a Production BOM

As previously mentioned, a production BOM is created to determine the materials required to manufacture or assemble a specific item.
Demonstration 1

Follow these steps to create a production BOM:

1. In the navigation pane, click the Production BOMs button.
2. Click New.
3. Use the following information for these fields:

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>1003</td>
</tr>
<tr>
<td>Description</td>
<td>Basic Bike</td>
</tr>
<tr>
<td>Unit of Measure Code</td>
<td>PCS</td>
</tr>
</tbody>
</table>

The unit of measure on the production BOM has to be listed in the item Units of Measure table for any item it is used with.

4. Move to the production BOM lines, and use the following information:

<table>
<thead>
<tr>
<th>Type</th>
<th>No.</th>
<th>Description</th>
<th>Quantity per</th>
<th>Unit of Measure Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>1100</td>
<td>Front Wheel</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1200</td>
<td>Back Wheel</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1300</td>
<td>Chain Assy</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1600</td>
<td>Bell</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1700</td>
<td>Brake</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1800</td>
<td>Handlebars</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1850</td>
<td>Saddle</td>
<td>1</td>
<td>PCS</td>
</tr>
<tr>
<td>Item</td>
<td>1900</td>
<td>Frame</td>
<td>1</td>
<td>PCS</td>
</tr>
</tbody>
</table>

Note that the Description and Unit of Measure Code fields are automatically populated when the item number is entered.

5. In the Status field, select Certified.
6. Click OK.

Copy BOM

The creation of a new BOM can be streamlined using the Copy BOM function. Once the components have been copied to the new BOM, users can make changes or augmentations.
**Demonstration 2**

Create a new production BOM that is similar to the first one by following these steps:

Follow these steps to create a production BOM:

1. In the navigation pane, click the **Production BOMs** button.
2. Click **New**.
3. Use the following information for these fields:

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>1004</td>
</tr>
<tr>
<td>Description</td>
<td>Basic 2 Bike</td>
</tr>
<tr>
<td>Unit of Measure Code</td>
<td>PCS</td>
</tr>
</tbody>
</table>

4. Click on a production BOM line (those under Type, No., Description, and so on).
5. Go to **Actions > Functions > Copy BOM**.
6. From the list, choose the production BOM 1000 (Bicycle), and click **OK**.
7. All of the components are copied into the new production BOM. Changes can be made by adding or deleting components or changing the quantities.
8. Check that the **Status** field is New.
9. Click **OK**.

**NOTE:** *While maintaining a production BOM or production BOM version, the Status field must be set to New (the starting default) or Under Development. For a production BOM to be available for use in production orders, MRP, and item cost calculation, the status must be Certified.*

### Changing or Correcting Production BOM lines

If a production BOM is changed, users have two options:

- Change the production BOM itself (if changes are not tracked).
- Create a version (required if the company tracks engineering changes).
EXAMPLE: The company engineer determines that to improve the quality of a product, a change must be made to the components. This is sometimes called an engineering change order (ECO). Rather than creating an entirely new production BOM, the current one is updated by creating a version. This allows the company to maintain the original production BOM in case it is needed for reference, but to use the updated production BOM in production. Using versions also maintains the product structure if the production BOM is used in many items.

For example, a BOM version is created to comply with a legal requirement that a bell should be included in the specifications from November until February. The Production Planner can send an email to the Sales Manager requesting confirmation if the specifications are correct.

Demonstration 3

Follow these steps to change a BOM:

1. From the Production BOMs list, double-click production BOM 1004 (Basic 2 Bike), that was created in the previous exercise.
2. In the Status field, select Under Development.
3. Delete items 1400 (Mudguard front), 1450 (Mudguard back), and 1500 (Lamp).
4. Add the Starting Date and Ending date in the Lines FastTab columns. Refer to the Introduction to Microsoft Dynamics NAV 2009 course for more information.
5. For item 1600 (Bell), enter a starting date of 11/01/2010 and an ending date of 02/28/2011.

This means that the bell will only be included in the production process during the specified period.

6. Change the Status to Certified.
7. Click OK.

Production BOM Versions

Sometimes, a company needs to make an adjustment to a production BOM, but does not necessarily need to create an entirely new production BOM.

Notice that a starting date can be entered in the version header. Production orders created on or after the starting date in the version header use the new BOM or components list. When setting the starting date, new ECOs can be phased in.
Copy BOM Version

To streamline the creation of a new BOM version, use the function Copy BOM Header or Copy BOM Version. Once the components have been copied to the new BOM version, users can make any necessary changes or modifications to the lines before certifying the BOM.

**Demonstration 4**

1. From the Production BOMs list, double-click production BOM 1004 (Basic 2 Bike).
2. Click Versions from the Process actions pane.
3. Click New.
4. In the Versions Code field, enter a version number, such as 1.
5. In the Description field, type Summer Edition.
6. In the Unit of Measure Code field, select PCS.
7. In the Starting Date field, enter a date in the future (for example, February 1, 2010). This field is used in planning and creation of production orders. If a process is run before the Starting Date, then the original BOM (or a previous version) is used.
8. Click on a production BOM line (those under Type, No., Description, and so on).
9. Go to Actions > Functions > Copy BOM Header. Select Yes to copy from the Production BOM.
10. Make the ECO changes to the components list; add, delete or modify production BOM lines. For example, add item 1400 (Mudguard front), and 1450 (Mudguard back). These added items should each have a quantity of 1.
11. In the Status field, select Certified.
12. Click OK.

Active Versions

The active version can be seen from the production BOM card. If the original production BOM is the active version, the field is blank.

**Demonstration 5**

Follow these steps to view the active version:

1. Go to the production BOM you have been working with (Production BOM 1004).
2. Click Versions.
3. Change the Starting Date field to a date that is before your work date. For example, choose November 10, 2008.
4. Check that the Status field is set to Certified. Remember that if the version is not certified, it is not available for use.
5. Click OK.
6. Click Close.
7. Go back to the General FastTab and note that the Active Version field is filled in.

**Matrix per Version Window**

The Matrix per Version window is used to compare all of the existing versions of a production BOM. This window offers a view of the components on either a single level or multi level basis.

In the production BOM you just created, click the Matrix per Version button. If the cursor is on a component that is a manufactured item, click Item>Matrix per Version to view the versions for the component.

The default view of the versions is on a single level. Select Multi to view the entire product structure in an exploded form.

**Where-Used Feature**

The where-used feature shows where a production BOM or item is used throughout the product structure. (A similar feature is available for routings.) The single and multilevel features are helpful tools when performing maintenance or troubleshooting. When viewing multilevel, the indentation of the description field indicates the level within the BOM structure, similar to an indented BOM. The quantity needed includes scrap percentage from the production BOM line.

You can access the where-used information in three ways:

- To see which items use a production BOM, click the Where-used button in the actions pane.
- To see which items have a component, place the cursor on a production BOM line, and then click the Where-used button in the actions pane.
- Follow these steps to see where an item is used:
  1. In the navigation pane, click the Production BOMs button.
  2. Click an item (for example, 1150 Hub).
  3. Click the Where-used (Top Level) button in the actions pane.
  4. From the Calculation date field, enter 11/14/2010.
  5. Click Preview.
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Production BOM Advanced Features

Phantom Bill of Material

A phantom BOM is a BOM used for non-stocked subassemblies. In Microsoft Dynamics NAV 2009, a phantom BOM is a production BOM that is chosen on a production BOM line.

A phantom BOM represents a group of items that are put together immediately before being used in production. Instead of listing each of the items needed in the production BOM lines, users can choose the phantom BOM.

Phantom BOMs allow the MRP process to account for the components without having to create an Item card or a separate production order for the subassembly.

The time required for assembling a phantom BOM is considered to be zero or is accounted for in the master item's routing.

Using phantom BOMs can also simplify the creation or review of production BOMs by listing the phantom BOM instead of each component.

Deciding whether a subassembly will be set up as a phantom BOM or an item is a matter of opinion, and the decision is usually made by the engineers or production managers.

The following demonstration shows the use of a phantom BOM.

Demonstration 6

Follow these steps:

1. In the navigation pane, click the Production BOMs button.
2. Click New.
3. In the No. field, type 1005.
4. In the Description field, type Mountain Bike.
5. In the Unit Code of Measure field, select PCS.
6. On the lines, enter the following items with a quantity of 1:
   - 1400 (Mudguard Front)
   - 1450 (Mudguard Back)
7. Add a phantom BOM to the lines.
8. Under Type, select Production BOM.
9. Click the drop down arrow in the No. field and select 1003, with a quantity of 1.
10. From the starting date header, type 11/20/2010, so that this version becomes the current version.

    If the Starting Date field is not visible, click the Actions button (thunderbolt icon) from the Lines FastTab. Click Choose columns, add Starting date to the list on the right, and click OK.

11. Change the Status to Certified
12. Click OK.

**Calculation Formula for Bill of Material**

It is sometimes necessary to specify a calculation formula, such as length multiplied by width, for the component quantity needed in a production BOM. To illustrate this, create an item card for steel. It is inventoried in sheets and purchased in pounds. A 10 foot by 15 foot sheet weighs 100 pounds. Another item, such as the bicycle in the previous demonstration, requires a 3 foot by 5 foot sheet of steel.

**Demonstration 7**

1. In the navigation pane, click the Items button.
2. Click New.
3. In the Description field, type Steel.
4. In the Base Unit of Measure Code field, click the drop down arrow.
5. Click New and add the following units of measure:

<table>
<thead>
<tr>
<th>Code</th>
<th>Qty. per Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHEET</td>
<td>1</td>
</tr>
<tr>
<td>KILO</td>
<td>0.01 (1/100)</td>
</tr>
<tr>
<td>SQFT</td>
<td>0.00667 (1/150)</td>
</tr>
</tbody>
</table>

**NOTE:** To create a new unit of measure, refer to the next exercise.

6. Select Sheet as the Base Unit of Measure.
7. On the Replenishment FastTab, enter a Purchase Unit of Measure of KILO.
8. Click OK.

Use this new item in a production BOM.

1. In the navigation pane, click Production BOMs. Select a production BOM to which the steel can be added, or create a new production BOM. For example, choose item no. 1003 (Basic Bike).
2. Change the Status to Under Development.
3. On a new line, enter the item **Steel**. Enter the following:

<table>
<thead>
<tr>
<th>Calculation Formula</th>
<th>Length * Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>3</td>
</tr>
<tr>
<td>Width</td>
<td>5</td>
</tr>
<tr>
<td>Quantity per</td>
<td>1</td>
</tr>
<tr>
<td>Unit of Measure Code</td>
<td>SQFT</td>
</tr>
</tbody>
</table>

*NOTE: If the Length and Width columns are not shown in the Lines FastTab, click the Actions button (thunderbolt symbol), select Choose Columns, add these two to the list, and click OK.*

4. Change status to "Certified".

Notice that the steel requires 15 square feet to make one finished item. (1 * 3 * 5 = 15).

5. Click **OK**.

**Exchange Production BOM Item**

The Exchange Production BOM Item report enables users to replace items that are obsolete with replacement parts.

Follow these steps to view the Exchange Production BOM Item:

1. In the navigation pane, click the **Product BOMs** button.
2. Click the **Exchange Production BOM Item** button in the actions pane.
3. It contains the following setup:

<table>
<thead>
<tr>
<th>Field</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange Type</td>
<td>&lt;blank&gt;</td>
</tr>
<tr>
<td>Item</td>
<td>Item Production BOM</td>
</tr>
<tr>
<td>Production BOM</td>
<td>Do not choose &lt;blank&gt;</td>
</tr>
<tr>
<td>Exchange No.</td>
<td>Item No. or Production BOM No. to be replaced.</td>
</tr>
<tr>
<td>With Type</td>
<td>&lt;blank&gt;</td>
</tr>
<tr>
<td>Item Production BOM</td>
<td>Choose &lt;blank&gt; to expire or delete a component but not replace it.</td>
</tr>
<tr>
<td>With No.</td>
<td>New Item No. or Production BOM No.</td>
</tr>
</tbody>
</table>
Field | Comments
--- | ---
Create New Version | Select this check box to have the replacement in a new version. The version is first copied and then the replacements are made. The old version remains unchanged. The Starting Date from the report is copied to the version.

Multiply Qty. with | Quantity ratio = New quantity / Replaced quantity

Starting Date | Enter the date when you want the substitution to be in effect.

Recertify | Select this check box to certify the changed BOM after the exchange process is complete. The exchange batch job automatically changes the status of the current BOM to Under Development, makes the change, and then re-certifies the modified BOM.

Copy Routing Link | Select this box for the routing link to be copied to the new component.

Delete Exchanged Component | You can choose to delete the exchanged component if you have not chosen to create a new version. The Starting Date from the report is copied to the production BOM line.

**NOTE:** If you do not want to create a new version or delete the exchanged component, then view both Starting Date and Ending Date used on the production BOM lines. To delete the old items, run the Delete Expired Components report, described in the following section.

### Delete Expired Components

The Delete Expired Components report is a maintenance function for BOM lines whose ending date has expired.

Follow these steps to view Delete Expired Components:

1. In the navigation pane, click the **Production BOMs** button.
2. Click the **Delete Expired Components** button in the actions pane.

The Delete Expired Components window contains two FastTab:

- Options
- Production BOM Header
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The **Options** FastTab is where users define the date up to which all components are to be deleted. This data is entered in the **Delete Before** field. Enter a T if today's date must be used, or a W if the working date is to be used. Otherwise, enter the date to be used for the routine.

The **Production BOM Header** FastTab is where users enter filters to determine which production BOM lines are to be deleted. Filters can be set on all fields on the production BOM header, as well. The order of the columns does not affect the filter.

This report is used when having to manually enter an end date on production BOM lines, or used with the Exchange Production BOM item report.

**Inventory and Manufacturing Units of Measure**

The production BOM also has a **Unit of Measure** field in the header. This manufacturing batch unit of measure defines the quantity in which a produced item is manufactured.

For example, an item's stocking unit of measure is pounds (lbs.) and a user might want to produce a ton of this item at a time. In this case, it is beneficial to record the component requirements needed for the production BOM based on producing a ton, rather than a pound, of the parent item.

Often, a production unit of measure is the same as the item's base unit of measure. This means that the user must count an item (base unit of measure) as a piece and you produce it as a piece, as well. When the production BOM unit of measure is not the same as the item's unit of measure, you need to set up the production BOM unit of measure in the item's Item Unit of Measure table. The Item Unit of Measure table is the table accessed by clicking in the **Base Unit of Measure** field on the **General** FastTab of the Item Card.

In addition to being able to create a manufacturing batch unit of measure, users can also create a usage unit of measure for a component that differs from the component base unit of measure.

**Calculate Low Level Code**

As previously mentioned, every component, item, and subassembly in a product is assigned a level code. The level code signifies the relative level in which that item or subassembly is used within the product structure. Often, the end items are assigned a level of zero, with its components assigned levels of one and so on. Low level codes are necessary for the planning process, MPS and MRP, to work properly. Incorrect low level codes mean that the quantity suggested by the planning process might be incorrect.

The periodic activity Calculate Low Level code must be run if you have set Dynamic Low-Level code to No.
To view the Dynamic Low level Code, perform the following steps:

1. To view your manufacturing setup, go to: Departments > Administration > Application Setup > Manufacturing > Tasks > Manufacturing Setup.
2. Look at the General FastTab.

Calculate Low level Code determines the low level code in this way:

- Item A is assembled. Its main components are items B and C.
- Items B and Item C are purchased.
- Item B is both a subassembly and a finished good. Its components are items D until J.

**Low Level Codes**

<table>
<thead>
<tr>
<th>Level</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>&quot;A&quot; BICYCLE (1 pc.)</td>
</tr>
<tr>
<td>1</td>
<td>&quot;B&quot; WHEEL (2 pcs.)</td>
</tr>
<tr>
<td></td>
<td>&quot;C&quot; FRAME (1 pc.)</td>
</tr>
<tr>
<td>2</td>
<td>&quot;D&quot; RIM (2 pcs.)</td>
</tr>
<tr>
<td></td>
<td>&quot;E&quot; TIRE (2 pcs.)</td>
</tr>
<tr>
<td></td>
<td>&quot;F&quot; SPOKES (72 pcs.)</td>
</tr>
<tr>
<td></td>
<td>&quot;G&quot; COLOR</td>
</tr>
<tr>
<td>3</td>
<td>&quot;H&quot; TIRE VALVE (1 pc.)</td>
</tr>
<tr>
<td>4</td>
<td>&quot;I&quot; BOLT (1 pc.)</td>
</tr>
<tr>
<td></td>
<td>&quot;J&quot; NUT (1 pc.)</td>
</tr>
<tr>
<td></td>
<td>&quot;K&quot; CAP (1 pc.)</td>
</tr>
</tbody>
</table>

**FIGURE 3.2 LOW-LEVEL CODE FOR BICYCLE**

In this example:

Item A (bicycle) is the top level, or level 0.

Items B (wheel) and C (frame), are level 1.

Items D (rim), E (tire), F (spokes), and K (color) are level 2.

Item G (tire valve) is level 3.

Items H (bolt), I (nut), and J (cap) are level 4.

An item is always assigned the lowest level code possible.
Production Design Reports

This report prints an indented BOM listing for items specified in the filters. The report contains the following columns:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>A number and an indentation indicate the level within the BOM structure.</td>
</tr>
<tr>
<td>No.</td>
<td>This is the item or production BOM (phantom BOM) number.</td>
</tr>
<tr>
<td>Description</td>
<td>This is text taken from the item master data or the description of the used production BOM.</td>
</tr>
<tr>
<td>BOM Quantity</td>
<td>This is the quantity of the item or production BOM required to make one of the master item.</td>
</tr>
<tr>
<td>Unit of Measure Code</td>
<td>Code for the unit of measure.</td>
</tr>
<tr>
<td>Total Qty.</td>
<td>Shows the total quantity of the component needed.</td>
</tr>
</tbody>
</table>

**Demonstration 8**

Preview the report as follows:

1. In the navigation pane, click the Production BOMs button. Click Quantity Explosion of BOM from the actions pane.
2. On the Item FastTab, enter one or more items that are produced (that is, have a production BOM on the item card). For example, select Item no. 1000 (Bicycle).
3. On the Options FastTab, enter a date to use for the calculation. For example, select 11/14/2010.
4. Click the Preview button to display the report.

**Where-Used (Top Level) Report**

The Where-Used (top level) report shows where items specified in the filters are used in the product structures. Unlike the Quantity Explosion of BOM report described previously, in this report enter components or subassemblies. The report shows where those items are used in the production BOM. The levels are the opposite of those for the Quantity Explosion of BOM report. This means that they are "bottom up," rather than "top down."

This report is helpful, particularly in the following two cases:

**Quality Control:** After a production run, it is standard for the Quality Department to take a sample to ensure that the finished goods comply with the manufacturing specifications (materials used, quantity, type) as well as legal requirements, when applicable.
Recall: If an error during the manufacturing run is discovered (for example, wrong or defective component used). The report allows the production manager to trace and recall items that have been erroneously manufactured, saving time and money for the company.

Compare List Report

The Compare List report compares the components for two selected items. The report shows the following:

- Components
- Unit costs
- Exploded quantities
- Cost shares (unit cost multiplied by exploded quantity)
- Total cost difference

The report uses the Unit Cost field from the Item cards.

If using a Costing Method other than Standard Cost, users must run the Adjust Cost-Item Entries before running this report to update the unit cost field. The Adjust Cost-Item Entries is found in Departments >Financial Management>Inventory> Tasks >Costing>Adjust Cost-Item Entries.

Demonstration 9

Preview the report as follows:

1. In the navigation pane, click the Production BOMs button.
2. Go to Reports>Compare List.
3. Enter two items in the specified fields. Each item must be produced, that is, it must have a production BOM number entered on it. For example, select items 1100 (Front Wheel) and 1200 (Back Wheel).
4. Enter a Calculation Date so that the correct version is used.
5. Click Preview button display the report.

Summary

This chapter explains the concept and application of bill of materials (BOM), which allows a production planner to determine the type and quantity of components that is needed to manufacture a specific item. The ability to copy BOM versions and use phantom BOMS, provide greater flexibility in the production process.
Test Your Skills – Production Bill of Materials

NOTE: The item and BOM numbers mentioned here are for your guidance only. You may need to create these items and the production BOM, if these do not exist in your database (demo data).

Scenario

Lab 3.1 - Create Production BOM

Scenario: You are a production planner at Cronus International. As a part of a new product launch, you add a water bottle to the standard production BOM for one of the bicycles.

Create a production BOM for the water bottle assembly (item 2000) and structure the water bottle mounting bracket (item 2010) and the water bottle (item 2020) in it.

Lab 3.1 - Step by Step

1. In the navigation pane, click the Production BOMs button.
2. Click New.
3. In the No. field, enter 2000.
4. In the Description field, type Water bottle assembly.
5. In the Unit of Measure Code, select PCS.
6. In the Lines FastTab, under Type, select Item.
7. In the No. header, click the drop down arrow and click New to create the new items.
8. Enter the following information in the General FastTab for the first item:

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>2010</td>
</tr>
<tr>
<td>Description</td>
<td>water bottle mounting bracket</td>
</tr>
<tr>
<td>Base Unit of Measure</td>
<td>PCS</td>
</tr>
</tbody>
</table>

NOTE: If the list is empty, click New and select PCS.
9. Click OK.
10. Create another item using the following information:

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>2020</td>
</tr>
<tr>
<td>Description</td>
<td>water bottle</td>
</tr>
<tr>
<td>Base Unit of Measure</td>
<td>PCS</td>
</tr>
</tbody>
</table>

11. Go back to the Water bottle assembly Production BOM and select these two new items in the Lines FastTab.
12. Under Quantity per, enter 1 for both items.
13. In the Status field, change New to Certified.
14. Click OK.

Lab 3.2: – Use Copy Production BOM

Create a production BOM for the touring bicycle (item 1001). Use the standard bicycle (item 1000) as a base from which to copy the components. Add the water bottle assembly (item 2000) to the touring bicycle production BOM.

Now go to reports and select Compare List. Enter the produced items created in the two exercises and preview the report to see the differences.

Lab 3.2: - Step by Step

1. In the navigation pane, click the Production BOMs button.
2. Click New.
3. In the No. field, enter 1001.
4. In the Description field, type Touring Bicycle.
5. In the Unit of Measure Code, select PCS.
6. In the Lines FastTab, under Type, click the first line.
7. Go to Actions > Functions > Copy BOM.
8. From the list, select item 1000 (Bicycle), and click OK.
9. Go to a new line.
10. Under Type, select Production BOM.
12. Under Quantity per, enter 1.
13. In the Status field, change New to Certified.
14. Click OK.
Follow these steps to compare lists:

1. In the navigation pane, click the Production BOMs button.
2. Go to Reports>Compare List.
3. Enter an item in the specified fields. For example, select items 1000 (Bicycle) and 1001 (Touring Bicycle).
4. Enter a Calculation Date so that the correct version is used. For this exercise, accept the default date.
5. Click Preview to display the report.

Lab 3.3: – Create and Compare Versions

For the purpose of this exercise, the touring bicycle (item 1001) is modified, so users practice with two versions: with and without the Water bottle assembly (item 2000).

1. Copy the line items from the touring bicycle (item 1008) created in Lab 2.2 and establish version A with a date of 01/01/10.
2. Create version B with a date of 01/01/10. Paste in the same lines and then delete the Water bottle assembly (item 2000).
3. Click the Prod. BOM button and then click Matrix per Version. Observe the differences. When finished, delete versions A and B.

Lab 3.3 :- Step by Step

1. From the Production BOMs list, double-click production BOM 1001 (Touring Bicycle).
2. Click Versions from the Process actions pane.
3. Click New.
4. In the Versions Code field, enter version number A.
5. In the Description field, type Touring Bicycle - A.
6. In the Unit of Measure Code field, select PCS.
7. In the Starting Date field, enter a date in the future (for example, January 1, 2010).
8. Click on a production BOM line (those under Type, No., Description, and so on).
9. Go to Actions > Functions > Copy BOM Header. Select Yes to copy from the Production BOM.
10. In the Status field, select Certified.
11. Click OK.
12. From the Production BOMs list, double-click production BOM 1001 (Touring Bicycle).
13. Click Versions from the Process actions pane.
14. Click New.
15. In the Versions Code field, enter version number B.
16. In the **Description** field, type Touring Bicycle - B.
17. In the **Unit of Measure Code** field, select PCS.
18. In the **Starting Date** field, enter a date in the future (for example, January 1, 2010).
19. Click on a production BOM line (those under Type, No., Description, and so on).
20. Go to **Actions > Functions > Copy BOM Version**.
21. Select Version code A.
22. Click **OK**.
23. Delete the Water bottle assembly. To delete a line, select it, right-click, select Delete Line and click Yes.
24. In the **Status** field, select **Certified**.
25. Click **OK**.
26. From the Production BOM, click **Matrix per Version** from the Process actions pane.
27. In the **Options** FastTab, select Single.
28. Click **Show Matrix** from the Process actions pane.
29. Click **Close**, when you are finished viewing the data.

Follow these steps to delete a BOM Version:

1. From the touring bicycle Production BOM, click **Versions** from the Process actions pane.
2. Double-click version A.
3. Change the Status from Certified to Under Development.
4. Click **OK**.
5. Select version A, right-click, and select Delete.
6. Click **Yes**.
7. Repeat the steps to delete version B.
Quick Interaction: Lessons Learned

Take a moment and write down three key points you have learned from this chapter.

1. ____________________________

2. ____________________________

3. ____________________________