

## CHAPTER 6: MANUFACTURING

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- Production Bill of Material
- Routing
- Standard Cost Roll Up
- Planning
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### Overview

Manufacturing in Microsoft® Business Solutions–Navision® is a key element that is used by just about all of the organizations that would employ Microsoft Navision software. Manufacturing is how the company plans for and then executes the plan to produce or acquire product, or in some cases, resources that are the core of that company's business. Basically, a company will make or buy the things that they will sell, using Microsoft Navision to organize, plan, guide and track the activities.

This involves the definition of a product found in item numbers, bills of material (the listing of all parts, purchased and produced, that are required to make an item) and routings (manufacturing process steps and instructions). A company will establish inventory or raw materials needed to produce the end items (what they sell). They have to assign costs to their inventory so that they can determine how to price their end products so that they will make a profit by their sale, and be able to monitor the value of their remaining inventories.

Based on the demand for their products, a company will use the system to plan what inventory and how much will be needed to meet that demand. Then they release production orders to the manufacturing facility to produce the products for sale.

In this chapter, we focus on the main elements of the following:

- Creating Items and the Item Card.
- Creating a Production Bill of Material
- Creating a Routing.
- Rolling up standard costs to the parent item number.
- Planning worksheets and material requirements planning.
- Creating a Released Production Order.
- Pulling material and recording finished product with Consumption and Output Journals.
- Reviewing the results of the Production Order activity.

More detailed information can be found in the Microsoft Business Solutions Manufacturing manual.

First we create an Item by completing the Item Card. We then create a Production Bill of Material and a Routing for the new Item. Next we roll up the costs to determine the cost of the parent item.

Then we will walk through a scenario where a sales order triggers a demand for a product. We set up the appropriate planning and create a production order to make the product. Finally, we gather material and charge labor to the production order, and then finish the order so that the product is in inventory, ready for shipment.

## Items and the Item Card

The Item (or part number) Card is the basic building block of the system. We buy, make, stock and sell items. Item cards hold the master data required to buy, store, produce, account for, track, sell and ship items.

On the Manufacturing menu, click PRODUCT DESIGN→ITEMS. The Item Card window appears:

The Item Card has eight tabs used to describe various attributes of the item or part number. The tabs are labeled: General, Invoicing, Replenishment, Planning, Foreign Trade, Tracking, E-Commerce and Warehouse.

In this section we create a new Item. We will not define or use all the fields on the Item Card, only those that are necessary for processing the scenarios and exercises in this chapter.

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**NOTE:** You can always find more information about fields by using the F1 help or clicking on the What's This? button and then clicking in the field in question.

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### The General Tab

1. Press F3 to insert a new Item card.
2. In the **No** field, enter 100-500.
3. In the **Description** field, enter Brand New Item.
4. In the **Base Unit of Measure** field, click the **AssistButton** to access the Item Units of Measure window. In the **Code** field, click the **AssistButton** and select PCS. Click **OK** in both windows to return to the Item Card.

5. In the **Item Category Code** field, click the **AssistButton** and select MISC. You can specify a product group from which assigned default values will be created for the item, including posting groups (see **Posting Group** fields below).

On the **General** tab, the only fields that need to be filled in are the item number, description and unit of measure. Using the Item Category Code will default values on later screens that make this process easier.

Most of the fields on the right-hand side of the tab provide lookups to detailed information about the item's inventory level and its current supply and demand situation.

Click the **Invoicing** tab.

### The Invoicing Tab

1. In the **Costing Method** field, you must select the costing method that will determine how the program calculates the unit cost of the item and the cost of outbound items. Standard is typically used for manufacturing items. Standard was defaulted in by our selection of MISC as the Item Category Code on the previous tab.
2. The **Average Cost (LCY)** field is filled by the program.
3. Since we have chosen the Standard costing method, we must fill in the **Standard Cost** field with an appropriate value for the cost of one unit of the item. Enter 25.50 and press ENTER. A warning message will appear asking if you want to change the Standard Cost. Click on the **Yes** button.
4. The **Unit Cost** field initializes order lines and journal lines as they are created. For items using Standard costing method, this field contains the standard cost.

For costing methods other than Standard, the **Unit Cost** field should be filled in with an appropriate value. When the Adjust Cost – Item Entries batch job is run, the program updates the field so it contains the most recent adjusted average unit cost.

5. In the **Unit Price** field, enter 80.00. This is the sales price of one unit of the item.
6. The program updates the **Last Direct Cost** field whenever a purchase is invoiced.
7. The **Posting Group** fields must be filled in to be able to post transactions with the item. These three fields were defaulted in from our selection of the Item Category Code.

Please note that Posting Groups are a central element in the accounting process within Microsoft Navision.

Click the **Replenishment** tab.

### The Replenishment Tab

1. In the **Replenishment System** field, click the **AssistButton** and select Prod. Order. Here indicate whether your standard way of supplying the item is by buying it (Purchase) or by producing it (Prod. Order).
2. In the **Manufacturing Policy** field, leave Make-To-Stock.
3. In the **Routing No.** field you can click the **AssistButton** and select a routing to govern the item's manufacturing process.

A specific routing must be set up and certified before it can be used for an item card. For now, leave this field blank.

4. In the **Production BOM No. you can** field click the **AssistButton** and select a production BOM to govern the product structure of the item. A specific production BOM must be set up and certified before it can be used for an item card. For now, leave this field blank.
5. In the **Flushing Method** field, select Manual. Here indicate whether consumption of this item in production should be calculated and posted manually; Manual, or automatically with either of the following two methods: Forward, to have the program automatically calculate and post consumption when the production order is released, or Backward, to have the program automatically calculate and post consumption when the released production order is finished. To see all of the Flushing Methods available and there definitions, click on the **Help** Button, and then in the field, Flushing Method.

Click the **Planning** tab.

### The Planning Tab

1. In the **Reordering Policy** field, select Lot-for-Lot. This is the common approach in a material requirements planning (MRP) environment. The other options are more applicable with other inventory planning and management techniques.
2. In the **Include Inventory** box, click in the check box. This tells the planning process to consider on hand inventory of this item during the planning process.

The remaining four tabs on the Item Card are Foreign Trade, Item Tracking, E-Commerce and Warehouse. Each tab further defines the item for those specific purposes.

The Item Card setup is complete. We now have a new item number that can be used throughout the system.

### Production Bill of Material

The production process could be viewed as a recipe for manufacturing companies: the Production Bill of Material (BOM) is the list of ingredients, the Routing tells us what to do with the ingredients to get a finished product, and the finished product is stored and sold as Inventory.

Elsewhere in the manual, we see that production orders keep a queue of what we plan to make and tell us what to work on next. The planning functions tell us what to make or buy and when we need to make or buy those items.

The production bill of material (BOM) shows the items used to make the parent item. The end result of a production BOM could be a subassembly (used in another item) or a finished good (an item ready for sale). 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.

The structure of the production BOM defines the number of levels, or how many levels deep the item is. A production BOM can consist of multiple levels – the maximum being 50 levels deep.

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.

On the Manufacturing menu, click PRODUCT DESIGN→PRODUCTION BOM. The Production BOM window appears:

T.. No.	Description	Quantity...	Unit of Meas...	Scra...	Routing ...
1100	Front Wheel	1	PCS	0	
1200	Back Wheel	1	PCS	0	
1300	Chain Assy	1	PCS	0	
1400	Mudguard front	1	PCS	0	
1450	Mudguard back	1	PCS	0	
1500	Lamp	1	PCS	0	
1600	Bell	1	PCS	0	

## Production BOM Header

1. In the header, press F3 to insert a new Production BOM.
2. In the **No.** field, enter 100-500. This is the number of the production BOM (for example, the same as the parent item).
3. In the **Description** field, enter Brand New Item. This is the name of the production BOM (for example, the same as the parent item).
4. In the **Unit of Measure Code** field, click the **AssistButton** and select PCS, which is the parent item's unit of measure code
5. The **Status** field must be New or Under Development to edit the BOM, and Certified to enable it. Leave it as New and click in the **No.** field in the lines.

## Production BOM Lines

1. You can copy lines from an existing Production BOM by clicking FUNCTIONS→COPY BOM to select existing lines, or you can enter the lines manually, which we will do now.
2. In the **Type** field, leave Item as the selection. Bill of material lines may be purchased items, manufactured items, or sub-assemblies.
3. In the **No.** field, click the **AssistButton** and select any item number except 100-500. This item number should not be a parent of itself in a product structure.
4. In the **Quantity Per** field, enter 1. This indicates how many units of the item go into the parent item (e.g. 4 wheels for 1 car).
5. Press the ARROW DOWN key to go to the next item line.
6. Select another item **No.** and enter a **Quantity Per**, for this line and repeat two or three additional times. You have created a bill of material for our item 100-500, made up of three to five component items even if they are nonsensical in this case. The component lines only require an item number and a quantity per.
7. In the **Status** field of the header, select Certified.
8. Close the **Production BOM** window.

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**NOTE:** Remember to go back to the Item Card for the parent part number and enter this production BOM number on the Replenishment tab, Production BOM No. field. You must do this in order to have the system utilize the correct BOM numbers for all bill explosions (The process of determining component identities, quantities per assembly and other parent/component relationship data for a parent item.). Do this after you have developed the Routing.

You also need to recalculate the item's standard cost (all levels). You learn how to do this after you have developed the Routing.

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### 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.

As an example, from the Manufacturing menu, click **PRODUCT DESIGN**→**ITEMS**. The Item Card window appears.

1. Use the **List** Button, or F5, to locate item 1120.
2. In the List, with item 1120 selected, click **ITEM**→**MANUFACTURING**→**WHERE-USED**. The Prod. BOM Where-Used window appears.
3. Make note of the results in the window.
4. In the **Levels** field, select Multi and now review the results. Again, the Where-Used is showing the production bills of material on which this item is used as a component part.
5. Close the Where-Used, List and Item Card windows.

## Routings

A routing specifies the sequence of operations to manufacture a product. The operations can be performed at a work center or at a machine center. Work centers and machine centers are referred to as capacities or facilities. Manufacturing companies use routings to manage and show the production process. The routings are the basis for process scheduling, capacity scheduling, and manufacturing documents.

The routings are then assigned to the item card in the same manner as production BOMs.

Work Centers and Machine Centers are critical to establishing routings. They are the locations where work is performed, and they have their own set of set up factors that describe capacities, number of resources, shift lengths etc. This information is used in the back scheduling of production orders and in capacity planning.



## Routing Header

On the Manufacturing menu, click PRODUCT DESIGN→ROUTINGS. The Routing window appears:

Operatio...	T...	No.	Description	Setup Time	Run Time	Wait Time	Move Time
10	W.	100	Wheel assembly	110	12	0	0
20	M.	120	Chain assembly	15	15	0	0
30	M.	130	Final assembly	10	20	0	0
40	M.	110	Control	10	8	0	0

To create a routing, you need to define the routing header. This header information applies to the entire routing. In the routing detail lines, the data is entered for the specific machine center and work center that processes the product at that operation. You must define a number (code) and a type.

1. In the header, press F3 to insert a new Routing.
2. In the **No.** field, enter 100-500. This is the number of the routing (for example, according to the process or the parent item).
3. In the **Description** field, enter Brand New Item. This is the name of the routing (for example, after the process or the parent item).
4. In the **Type** field, select Serial.
5. The **Status** field must be New or Under Development to edit the routing, and Certified to enable it. Leave New in this field.

## Routing Lines

The routing lines allow you to list the user-defined required operations. In our recipe example, this is the area where we list the steps of the recipe. If a field is mentioned below that you do not see, remember to use TOOLS→SHOW COLUMN to add the field.

1. In the **Operation No.** field, enter 10. This is the number of the first operation. By entering 10, each new operation number will be incremented by 10.

2. In the **Type** field, select Work Center. This determines which kind of resource is used.
3. In the **No.** field, click the **AssistButton** and select any of the Work Centers listed. This indicates which work center will be used.
4. In the **Run Time** and **Setup Time** fields, enter the process times needed to perform the operation. In our example, these are in minutes. Enter reasonable figures such as 10 minutes to Set Up and 5 minutes per piece Run Time. Note that **Setup time** is calculated per production order, run time is calculated per produced item.
5. Use the Down Arrow to move to the next open operation step and continue to fill in lines for all operations involved in producing the item in question. Enter the following additional lines:

Field	Line 2	Line 3	Line 4
<b>Operation No.</b>	20	30	40
<b>Type</b>	Work Center	Work Center	Work Center
<b>Work Center No.</b>	Choose any	Choose any	Choose any
<b>Setup Time</b>	5 minutes	10 minutes	7 minutes
<b>Run Time</b>	4 minutes	5 minutes	6 minutes

Successive steps may take place in the same Work Center. This is not unusual.

6. Certify the routing. Click in the **Status** field in the header and select Certified.

A new routing has been created. Close the Routing window.

Next you **MUST** tell the system that we have created a specific production bill of material and a specific routing number for Item 100-500. On the Manufacturing menu, click PRODUCT DESIGN→ITEMS.

1. Locate item 100-500 and click on the **Replenishment** tab.
2. In the **Routing No.** field, enter 100-500.
3. In the **Production BOM No.** field, enter 100-500.

## Calculate Standard Cost

This is a good opportunity to have the system calculate the standard cost of the item number that we have just created. Remember that we must have the **Production BOM No.** and the **Routing No.** fields identified for this item on the **Replenishment** tab of the Item Card.

On the Manufacturing menu, click **PRODUCT DESIGN**→**ITEMS**. The Item Card window appears.

1. Locate item 100-500 and click on the **Invoicing** tab.
2. Make note of the current values in the **Standard** and **Unit Cost** fields.
3. Click on **ITEM**→**MANUFACTURING**→**CALC. STANDARD COST**.
4. Select **All Levels** and the click **OK**.
5. Notice the change in the **Standard** and **Unit Cost** fields.

The process has taken the cost of the component items or materials found on the production bill of material for our item, plus the labor cost as defined in the operation steps of the routing that you created and established a cost standard for this item. If the item had had a number of bill levels and many routings to make and assemble lower level items, they all would have been calculated and summed to give the standard cost for the top item.

## Test Your Skills – Create New Items for Production

**Scenario:** Your company manufactures wooden tables. Create some new Items using the following information:

Field	Item 1	Item 2	Item 3
Item No.	TYS001	TYS002	TYS003
Description	Table, Complete	Table Top	Table Leg
Base Unit of Measure	PCS	PCS	PCS
Item Category Code	MISC	MISC	MISC
Costing Method	Standard	Standard	Standard
Standard Cost	400.00	200	50
Unit Price	550.00	<blank>	<blank>
Replenishment System	Prod. Order	Purchase	Purchase
Reordering Price	Lot-for-Lot	Lot-for-Lot	Lot-for-Lot
Include Inventory	Yes	Yes	Yes

### All Skill Levels

Your tasks are as follows:

- Create the Items using the Item Card.
- Set up the items appropriately with Purchase or Production replenishments.

## Planning and the Production Order

To produce items in the organization, usually, a production order or work order is issued or released to the manufacturing or assembly facility. The production order specifies what item is to be produced, how many are to be made and a date by which all the pieces should be completed. The production order also specifies what component parts or raw materials are required to make the end item. This is the production bill of material. And finally, the production order includes the steps and instructions required to actually make or assemble the item. This is the routing.

A good deal of planning is required to determine what items to make when, and even more complex is the planning to insure that all of the component parts or raw materials will be available when they are needed to be able to meet the schedule of end item manufacturing to fill sales orders or stock shelves etc.

We will now go through a scenario where a sales order is the source of demand for end items from our plant. We will run the planning process to identify requirements, release a production order to satisfy the sales order demand and process that production order through to completion. This is a very simplified example, but keep in mind how this would work in an organization of thousands of component part numbers, hundreds of saleable end items and hundreds of suppliers and customers.

### Scenario – Initial Setup

The Sales Order Demand and Component Inventory setup must be completed before we begin the next scenarios. We will be using some key forms in the system to accomplish these tasks, but for now, we will not go into any detail about their main purposes and functions. These forms and tasks are defined in more detail in the Manufacturing course.

#### **Sales Order Demand**

1. Click on **TOOLS**→**WORK DATE**. Set the **Work Date** to 01/01/01. Click **OK**.
2. On the **Manufacturing** menu, click **PLANNING**→**SALES ORDERS**. Use the **List** button or F5, or use the **Next** button to locate sales order number 109001.
3. In an empty Sales line, click in the **No.** field and enter item number 1150, Front Hub.
4. In the **Quantity** field and enter 200. Tab once again and a warning box will be displayed. Click **Yes** to bypass the warning.
5. On the first line item, Item 1000, change the **Location Code** to Green and click **Yes** to the warning message.

6. Click FUNCTIONS→RELEASE, and close the Sales Order window.
7. A demand has just been created in the system for 200 of our Front Hubs. This is the end item we will be working with for this exercise.

### **Component Inventory**

1. On the Warehouse menu, click INVENTORY→ITEM JOURNALS. The Item Journals window appears.
2. Create two lines using the following information:

Field	Line 1	Line 2
Item No.	1151	1155
Location Code	Green	Green
Quantity	250	250

3. Click the POSTING→POST. A message will appear asking if you want to post the journal lines, click **Yes** and then click **OK**. Close the Item Journal window.

We have just added inventory of the component items that are needed to make the Front Hub to satisfy the sales order. Notice that we have used Location Green. The Location feature is found throughout Microsoft Navision and is the functionality that allows for multiple facilities, plants, offices etc all within the same organization. The formal planning process would have told us to procure the component parts that we just added.

### **Scenario 1 – Planning**

On the Manufacturing menu, click PLANNING→PLANNING WORKSHEETS. The Planning Worksheet window appears.

Now we are going to have the system perform its planning routines to identify what items we need to purchase and what items we need to make in order to fulfill commitments based on either or both open sales orders from customers and sales forecasts that we have developed. Remember our Front Hub, Item number 1150, that we just added to a sales order.

1. Click the FUNCTIONS→CALCULATE REGENERATIVE PLAN. (Regenerative means that we will re-do the entire plan, as opposed to a partial update.)

2. Fill out the request form as follows:

Tab	Field	Value
Item		
	Location	Green
Options		
	MPS	Yes (checked)
	MRP	Yes (checked)
	Order Date	01/01/01
	Ending Date	01/31/04
	Order Tracking	Respect Item Card

3. Click the **OK** button to start the process.

We have just run Material Requirements Planning (MRP), for our location. That is, the form has gathered all sources of demand for product coming from sales orders and forecasts. It has exploded the bills of material for each demand item to determine what component parts are required to build the demand items. It has compared the required quantity of all of these component parts against the on hand inventory of those parts, and against the open purchase orders and work orders to supply those parts. Finally, it will tell us what items are outstanding and give us recommendations to procure (purchase or make) those items. And, it does all this keeping track of the requirement or need dates of each item based on that items lead time and position in the product structure or bill of material. The system is trying to insure that we will have the correct items on hand and in the correct quantity just when they are needed.

The planning worksheet is giving us the results of our planning run. Scroll horizontally and vertically to get a feel for the type of information it is providing. Remember that in addition to our Front Hub, that sales order also had a line for 25 bicycles in our Green plant. You are seeing the requirements for many of the other components of the bicycle. But we will focus on item 1150, the Front Hub.

### Scenario 2 – Production Order

1. In the Planning Worksheet window, click in the **No.** field and locate item no. 1150. You should find two requirement lines for 1150, one from the order for the bicycle of which it is a component, and one for the order for itself. Click in either one.
2. Click the **Field Filter** icon or use F7. Our item number 1150 will appear in the Field Filter window. Click **OK**. This filters out all requirements except those for our item number. The other requirements have not been deleted, just hidden, and in the real world the planner would return to handle those requirements also.
3. Click the **FUNCTIONS→CARRY OUT ACTION MESSAGES**. On the **Options** tab, for Production Order, select Firm Planned. This is the only field we need to be concerned with because right now we are only dealing with production orders to make our item. We are not buying any items with purchase requisitions or purchase orders.
4. Click **OK**, and notice that our two requirement lines have been deleted. This is because we have just converted the requirements from the planning process or MRP, into production orders.
5. We just used the Planning Worksheet to calculate all of our requirements. We could have used the Order Planning form, also in the Planning folder, to determine order requirements just at the top level. This is a valuable tool in certain business environments. Close the Planning Worksheet and close the Planning Folder windows.
6. On the Manufacturing menu, click **EXECUTION→FIRM PLANNED PROD. ORDERS**. The Firm Planned Prod. Order window appears. Locate our two production orders for the Front Hub, item 1150. Notice that one order is for a quantity of 200 and one is for a quantity of 25. This mirrors the demand quantities coming from the sales orders. Either in the previous step, the Planning Worksheet, or here, the planner could elect to combine these into one order if that would make the best production decision. Select the order for 200.
7. Now we have a Firm Planned Production Order for 200 of our 1150 Front Hubs with a due date that will support our sales order demand. Microsoft Navision has a number of production order types used for various purposes. To proceed, we want to Release this production order. Click the **FUNCTIONS→CHANGE STATUS**.



8. Be sure that the Released button is selected and click **Yes**. The form returns a message telling us that the order has been released and giving us its new order number. This order is now ready to proceed through the factory or manufacturing process. Click **OK** and close the Firm Planned Order window.
9. On the Manufacturing menu, click EXECUTION→RELEASED PROD. ORDERS.
10. Locate our production order for the Front Hub, item 1150.

Item No.	Due Date	Description	Starting Date-Time	Ending Date-Time	Quantity
1150	09/11/01	Front Hub	08/26/01 9:40:00 PM	09/07/01 11:00:00 PM	

11. Click on LINE→COMPONENTS. In this window we see the components, from the Production Bill of Material that are allocated for this production order. You may ask why the Expected quantities are 210 and not the 200 for the parent item. This is the result of some of the setup factors for these component items, such as safety stock, order quantities and orders multiples. Close the window.
12. Click on LINE→ROUTING. In this window we see the routing operation steps that have been brought over from the routing, for this production order. Take note of the run times that have been calculated for the various steps. Close this window.
13. Now, click on FUNCTIONS→RESERVE. From this window we can link this production order to the sales order that was the source of its original demand. In some environments this is a handy feature to track the progress of work that is being performed to fulfill specific sales orders. This can be very valuable to customer service representatives.
14. Click on FUNCTIONS→AUTO RESERVE. Now click on LINE→RESERVATION ENTRIES. Notice that our production order is now reserved for the original sales order. This can also be seen when the sales order is reviewed. Close all the windows including the Released Production Order.

### Scenario 3 – Pull Component Parts or Raw Materials

1. On the Manufacturing menu, CLICK EXECUTION→CONSUMPTION JOURNALS. The Consumption Journal window appears.

The Consumption Journal is where you report to the system that you have pulled the required component parts from inventory in order to make the 200 Front Hubs called for on this Released Production Order. It is also the activity that moves the costs of the component items from inventory into the production order. You pull material from inventory. Identify the items and quantities that are being pulled for this order. Microsoft Navision has a number of options that allow you to have the components automatically relived from inventory upon notice that the production activity has begun, or when you report to the system that pieces have been completed.

2. Click on FUNCTIONS→CALCULATE CONSUMPTION. On the **Production Order** tab, enter the order number for our 200 of the Front Hub. Click **OK**.

Posting...	Prod. Or...	Docume...	Item No.	Description	Quantity	Unit of M...	Unit
01/01/01	101004	101004	1151	Axle Front Wheel	210	PCS	
01/01/01	101004	101004	1155	Socket Front	210	PCS	

Prod. Order Name  
Front Hub

Line | Prod. Order | Functions | Posting | Print... | Help

3. The form has been populated with the two component items required to make the Front Hubs (from the Production Bill of Material), and the correct quantities have been filled in based on the 200 of the parent item that have been ordered. You are ready to pull these items from stock and start work.
4. Click on POSTING→POST. Click **Yes** to the posting question and **OK** to the message. The items have been pulled and their costs are now part of the production order. Now it is time to apply some labor and complete the pieces. Close the form.

### Scenario 4 – Post Labor and Completed Items

Our production order is out on the floor with the required parts to put it together. Our people are following the operation steps from the routing and finished items are being completed. As this is happening, we want to report back to the system about our progress and at the same time, have the system collect the labor costs of our work, so that when the job is completed we can determine how much it actually cost to produce the product.

1. On the Manufacturing menu, click EXECUTION→OUTPUT JOURNALS. The Output Journal window appears.

In this one form, you report time spent at each operation, and pieces completed. Ideally, you would report pieces completed at each operation, but in some cases, this may not be of value. However, it is the reporting of pieces at the last operation, that tells the system that these pieces have been completed, and could now be used to satisfy sales order demand, or demand from higher level assemblies.

2. Click into the **Prod. Order No.** field. Enter the production order number. You can use the **AssistButton** in that field if you have forgotten the order number.
3. Click on FUNCTIONS→EXPLODE ROUTING. The form fills in with all the operation steps that came from the routing. Post labor time and pieces completed against these steps.

Posting	Prod. Or...	Docume...	Item No.	Operatio...	T.	No.	Description
01/01/01	101004	101004	1150	5 M..			420 CNC/Axle
01/01/01	101004	101004	1150	10 M..			420 CNC/Axle
01/01/01	101004	101004	1150	20 M..			420 CNC/Socket
01/01/01	101004	101004	1150	30 M..			430 Deburr Axle
01/01/01	101004	101004	1150	40 M..			410 Drilling Socket
01/01/01	101004	101004	1150	50 W.			100 Hub assembly
01/01/01	101004	101004	1150	60 M..			420 Inspection of Hub

Prod. Order Name: Front Hub  
Operation: CNC/Axle

Buttons: Line, Prod. Order, Functions, Posting, Print..., Help

4. To simplify the exercise we will only make one entry with this form. In reality you would come back to this form multiple times to post and keep a specific order up to date. On the operation line for operation 50, Hub Assembly, tab over to the **Run Time** field and enter 100 minutes. Now tab to the **Finished** field and check that box for each operation step. Notice that the **Quantity Output** field for each operation has already been filled in with our 200 pieces.


- Click on POSTING→POST. Click **Yes** to the question and **OK** to the message. We have just reported 100 minutes of labor and 200 pieces completed for this work order. Close the Output Journal.

### Scenario 4 - The Results

- On the Manufacturing menu, click EXECUTION→RELEASED PROD. ORDERS. The Released Prod. Orders window appears.
- Be certain that you are looking at your production order for 200 of 1150 Front Hub. Click in the **Source No.** field where you see 1150 and click the **Assist** button. In the Item List, click ON ITEM→ITEMS BY LOCATION towards the top of the displayed options list.

Notice that we now have 200 hubs in our Green location. They are ready to ship.

- Escape back to the Released Production Order. Click on ORDER→ENTRIES→ITEM LEDGER ENTRIES. Notice the three material transactions that we have completed. We pulled or reduced inventory of the two component items and put to stock or increased inventory of our parent item the hub. Close this window.
- Click on ORDER→STATISTICS. The Production Order Statistics window appears:



	Standard Cost	Expected Cost	Actual Cost	Dev. %	Variance
Material Cost . . . . .	256.20	256.20	256.20	0	0.00
Capacity Cost . . . . .	2,232.00	1,548.00	120.00	-92	-2,112.00
Subcontracted Cost . . .	0.00	0.00	0.00	0	0.00
Capacity Overhead . . .	0.00	0.00	0.00	0	0.00
Manufacturing Overhead	0.00	0.00	0.00	0	0.00
Total Cost . . . . .	2,488.20	1,804.20	376.20	-79	-2,112.00
Capacity Need . . . . .		8,373	100	-99	

Here you can review all the cost information concerning this production order. After you have had a chance to look at this information, you can close this window, and the Production Order window.

## Test Your Skills – Production BOM

**Scenario:** It is now time to create a Production Bill of Material for the wooden table that your company manufactures. Remember that your "Table, Complete" is the end item or parent part number. Except for service or repair parts, sales orders will normally be for the Table, Complete.

### All Skill Levels

Your tasks are as follows:

- Create a Production Bill of Material for the Table, Complete item. It will be made up of two component items, the Table Top and the Table Leg.
- Be certain that the bill of material correctly reflects the items required to make the table and be sure that everything is in place so that the system will see your new bill.

## Quick Interaction: Lessons Learned

Take a moment to write down three Key Points you have learned from this chapter:

1.

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2.

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3.

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