PeopleSoft®

EnterpriseOne B73.3.1 Product Data Management PeopleBook

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J.D. Edwards World Source Company
One Technology Way
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Product Data Management Overview

Product Data Management Overview

The Product Data Management system enables you to organize and maintain information about each item that you manufacture. Use the Product Data Management system to define the relationships between inventory items (and other purchased or nonstock items) and how they can be combined to manufacture a saleable product.

This system provides basic data for other manufacturing systems. You should verify that your product data is accurate to ensure the efficiency of associated systems, such as Shop Floor Management and Master Production Schedule.

System Integration

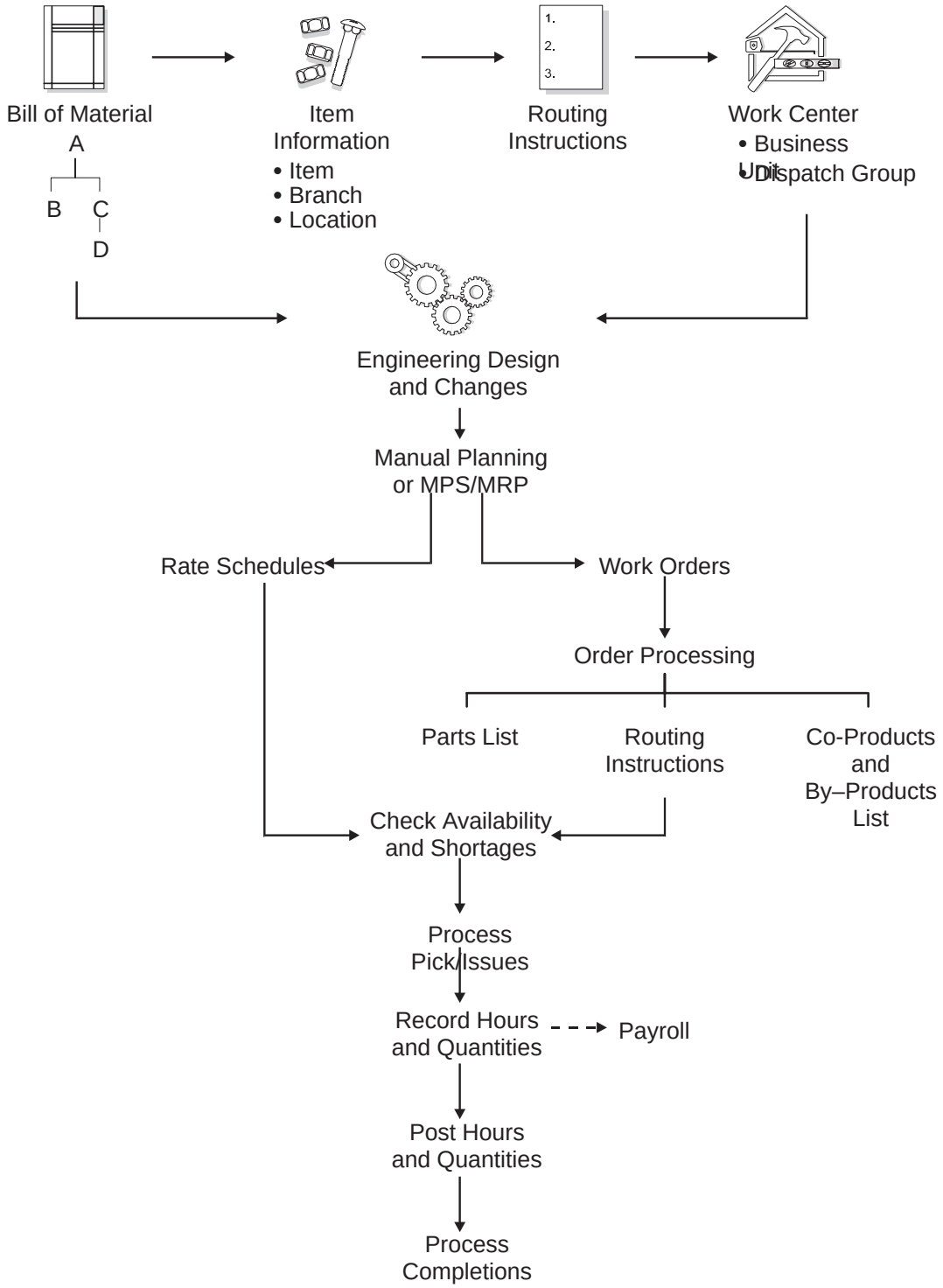
Product Data Management integrates with the following systems:

Inventory Management	Supplies the basic information about each item (or ingredient), such as part number, description, unit of measure, stocking type, and location. Activates flash messaging to warn of a pending engineering change order (ECO).
Shop Floor Management	Uses bills of material and routing instructions to process work orders and schedule work activity within the plant.
Procurement	Activates flash messaging to warn of a pending ECO. Uses bills of material for kit processing.
Manufacturing and Distribution Planning	• Uses the Product Data Management information to plan finished goods and the raw material and purchased parts required to manufacture them • Uses sales orders and forecasts to pass demand for items down through the bills of material to the components • Uses the bills of material to determine component requirements for planned orders and work orders without a parts list

Product Costing and Manufacturing Accounting	• Uses bills of material, routing instructions, and work center information to calculate total material, labor, machine, and overhead costs for each primary unit of the parent item • Uses bills of material during a cost rollup to determine the material cost for the parent
Sales Order Management	Uses bills of material for kit processing.
Resource Requirements Planning	Retrieves a multi-level bill of material for a master-scheduled item and selects the routing instructions for the components. Activates flash messaging to warn of a pending ECO.
Master Production Schedule	Uses the effective dates established by ECOs to plan and introduce products.

Process Flow

The following graphic is an example of a typical manufacturing process:



Types of Manufacturing

Depending on the type of product being produced, almost all manufacturing can be defined in one of the following three ways:

- Discrete
- Process
- Repetitive

Discrete, process, and repetitive manufacturing all use bills of material and routing instructions. The bills of material contain individual parts, components, or ingredients such as a nut, bolt, wire, plastic, or metal part of a fixed or variable quantity. Products can be broken down into subassemblies that go into various larger assemblies. The routing instructions include the operations to be performed, their sequence, the various work centers involved, and the standards for setup and run.

Units of measure

Not all items are planned, scheduled, or produced in their primary unit of measure. To accommodate this, full unit of measure capabilities are allowed throughout the Shop Floor Management system.

Most entry programs have a unit of measure next to the quantity fields, and the unit of measure is stored in the database tables, along with the quantities. The system uses the following three fields in the Item Master table throughout shop floor as default values in entry forms:

- Component Unit of Measure
- Production Unit of Measure
- Primary Unit of Measure

The Primary Unit of Measure value must be the smallest of the three units of measure.

See *Defining Default Units of Measure for Bulk Items* in the *Bulk Stock Management Guide*.

Discrete Manufacturing

Discrete manufacturing is characterized by the following:

- Work orders produce a specific quantity of a single item for a specific completion date.
- Routing instructions are a series of independent operations.
- The total quantity of the work order is completed at each operation before the order moves to the next operation.

- Components are most often manually issued with the release of the work order, backflushed at the completion of the work order, or both.

Discrete manufacturing is most often used in the following manufacturing environments:

- Make-to-stock, using either a highly repetitive or process order-based system
- Any of the "to-order" strategies, such as make-to-order, assemble-to-order, or engineer-to-order
- The one-off or job shop environment

Discrete manufacturing is used to produce items such as the following:

- Cars
- Furniture
- Electronics
- Airplanes

Process Manufacturing

Process manufacturing is characterized by the following:

- Work orders produce multiple items, both co-products and by-products, for a specific completion date.
- Routing instructions are a series of dependent operations that work together continuously.
- Products are often produced in batches or with a continuous process.
- Components or ingredients are often stated in terms of a recipe or formula.
- The quantities of components or ingredients can vary according to its grade or potency.
- Components or ingredients are most often issued by preflushing with the release of the work order or backflushed at the completion of the work order.

Process manufacturing is most often used to produce the following:

- Pharmaceuticals
- Foods and beverages
- Raw materials, such as lumber, metals, and fluids

The different types of processing in process manufacturing consist of the following:

Batch processing

In batch processing, a product is usually made in a standard run or lot size determined by vessel size, line rates, or standard run length. Items made this way are typically scheduled in short production runs due to the life cycle of the product after its completion. Typical items might be pharmaceuticals, foods, inks, glues, oil or chemical products, and paints. A co-products and by-products list might be generated during batch processing.

Continuous processing

In the continuous (or flow) environment, production is typically of an extended period, using dedicated equipment that produces one product or product line with slight variations. This method of manufacturing is characterized by the difficulty of planning and controlling quantity and quality yield variances. Typical items might be petroleum-based products or distilled sea water. Co-products and by-products are generally more prevalent in continuous processing than in batch processing.

In addition, strategies similar to discrete manufacturing, such as repetitive or any of the "to-orders" (for example, make-to-order, assemble-to-order, or engineer-to-order) might be employed to drive the process. Usually, both batch and continuous processing methods require extensive record-keeping and recording of quality and tolerance values during the process, as well as strict adherence to lot tracing and tracking. Lot tracing is the display of items assigned to a lot. Lot tracking is the display of items removed from a lot.

Repetitive Manufacturing

Repetitive manufacturing is characterized by the following:

- Entire production lines are dedicated to a family of products.
- Product families share similar components and routing instructions.
- Products are often manufactured in a continuous process which requires less inventory movement to and from the production line.
- Work center setup and changeover times between related products are kept to a minimum.
- Production is defined in terms of units per hour. The time spent at the operational level might or might not be important. Therefore, the ability to set up line capacity and define routing instructions in units per hour at the line level is necessary. The fundamental basis for backscheduling and capacity planning is hours. To view information in units, the system uses a conversion factor defined at the work center level.

- Material movement may be controlled by visual cues called kanbans. Kanbans are predetermined quantities of components at specified locations on the production line. They are designed to minimize work-in-process inventories.

Multimode Manufacturing

Multimode manufacturing allows you to combine production methods within each production facility. For example, you can use discrete, process, batch, and repetitive manufacturing in combination or separately for each product that you manufacture.

Features

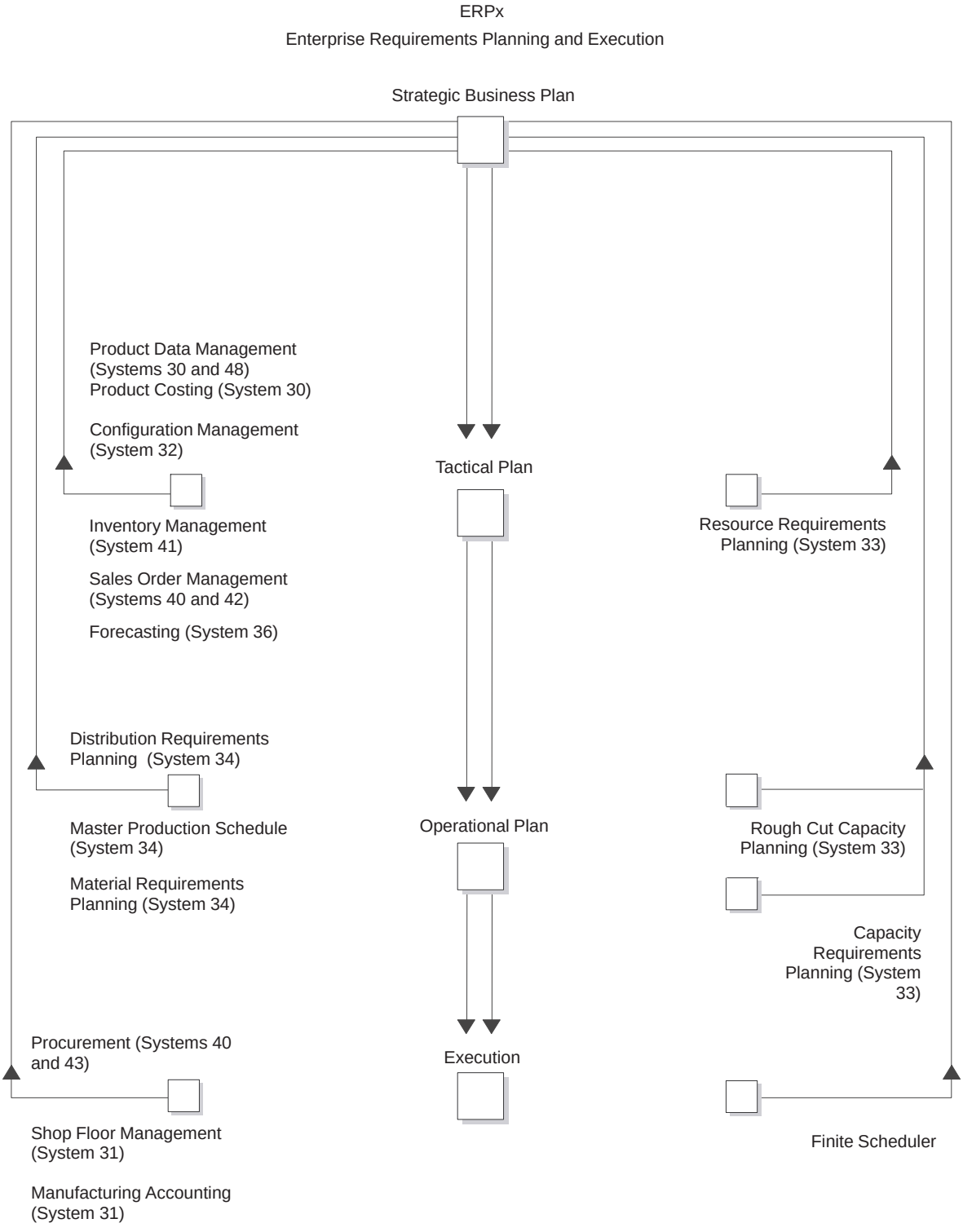
The Product Data Management system includes the following features:

Bills of material	• Enter multiple bills of material to maintain many arrangements for an item without creating additional part numbers • Access items online using the item description as search criteria • Define quantities of intermediate products in any unit of measure as they progress through the manufacturing process • Enter similar items by copying bills of material, routing instructions, and processes, and changing only the information that is unique to each item
Work centers	• Define work center number, description, and link to business unit • Define queue and move times • Define operator, machine, and capacity by hours per day • Define rates for setup, labor, machine, and overhead • Define information for Capacity Planning • Define where an item is produced
Routing instructions	• Define each step of the manufacturing process with allowances for anticipated yield and scrap for each operation • Add alternate operations to routing instructions
Engineering Change Management	• Control item changes from a single source • Incorporate approved changes to bills of material automatically

Enterprise Requirements Planning and Execution Review

Product Data Management is one of several systems within the Enterprise Requirements Planning and Execution (ERPx) system. Use the ERPx system to coordinate your inventory and labor resources to deliver products according to a managed schedule. It is a closed-loop manufacturing system that formalizes company and operations planning, and the implementation of those plans.

The ERPx system includes the following J.D. Edwards systems:



Tables Used by Product Data Management

Product Data Management uses the following tables:

Business Unit Master (F0006)	The Business Unit Master table identifies branch, plant, warehouse, work center and business unit information, such as company, description (name), and category codes assigned to that unit.
Work Day Calendar (F0007)	The Work Day Calendar table contains the work day types for month, year, century, and shift of each branch/plant.
Address Book Master (F0101)	The Address Book Master table is the central repository for all address information relating to customers, vendors, employees, and prospects.
Work Center Master (F30006)	The Work Center Master table contains the labor, machine, and overhead rates for each work center.
Work Center Rates (F30008)	The Work Center Rates table stores work center rate information, such as simulated and frozen costs for labor and machines.
Bill of Material Master (F3002)	The Bill of Material Master table defines warehouse information at the plant level about bills of material, such as quantities of components, features, options, and levels of detail for each bill.
Routing Master (F3003)	The Routing Master table contains information describing how an item is manufactured, such as operation numbers, work centers, labor and machine hours, and outside operations.
Work Center Resource Units (F3007)	The Work Center Resource Units table contains the capacity information for work centers, for example, business unit, month, shift, efficiency.
Job Shop Manufacturing Constants (F3009)	The Job Shop Manufacturing Constants table contains constants for maintaining bills of material, including the maximum number of levels in the bills and whether to write changes to the bills, to the history file, or to perform online validation.
Bill of Materials Change (F3011)	The Bill of Materials Change table stores all changes made to any bill of material, including dates, engineering change order reasons, and effectivity dates.

ECO Parts List Detail (F3013)	The ECO Parts List Detail table contains the list of parts that are affected by the engineering change order.
Component Locator (F3015)	The Component Locator table stores the location of a component that you define within a subassembly.
Kanban Master (F3016)	The Kanban Master table contains the set of kanban cards associated with an item. Each kanban defines the supplying location, consuming location, quantity, and unit of measure. The system uses next numbers to control the kanban identification number. If the system pulls the item from an external source, it includes the supplier's number.
Kanban Card Detail (F30161)	The Kanban Card Detail table contains information related to the kanban, for example, status, transaction quantity, and date updated.
Work Order Routing (F3112)	The Work Order Routing table contains the routing steps for implementing the work order or engineering change order.
Item Master (F4101)	The Item Master table stores basic information about each defined item, such as item numbers, descriptions, category codes, and units of measure.
Line Type Control Constants (F40205)	The Line Type Control Constants table stores constants for maintaining line types, such as general ledger classification, order type, and record variance.
Item Manufacturing Data (F4101M)	The Item Manufacturing Data table stores manufacturing data for each item, such as leadtime, document type, and issue type code.
Item Branch (F4102)	The Item Branch table defines and maintains plant-level information and branch-level category codes.
Item Location (F41021)	The Item Location table defines plant-level information, such as quantities and physical location.
Item Balance Tag (F4102J)	The Item Balance Tag table contains item information such as net change flag and pay on consumption.
Item Cross Reference (F4104)	The Item Cross Reference table stores information about item numbers that are related for a specific purpose. You can establish your own codes that define relationships.

Work Order Master (F4801)	The Work Order Master table stores the ECOs and the manufacturing work orders.
Order Routing Approval Master (F4808)	The Order Routing Approval Master table contains the address book numbers of the people who are responsible for approving ECOs and determines the order in which responsible personnel should be notified.
WO Supplemental DB User Defined (F48092)	The WO Supplemental DB User Defined table stores additional information about ECOs, such as implementation costs.
Order Approval Audit (F4818)	The Order Approval Audit table contains the approval history of an ECO.

Menu Overview

J.D. Edwards systems are menu-driven. System functions are organized according to their function and frequency of use. Access the Product Data Management system menus from the Manufacturing Systems menu (G3).

The Product Data Management system provides two different environments in which you can perform your activities:

- Discrete Manufacturing (G3011, G3021)
- Process Manufacturing (G3012, G3022)

The Discrete environment is designed to accommodate the production of distinct items, each having a unique list of materials and production instructions. The Process environment is designed to accommodate the production of multiple items from a common list of ingredients and production instructions.

Many activities are common among both environments. However, the menus and forms are set up differently to accommodate processes and procedures for each specific environment. The environment that you use depends on your organization. Some organizations might use both environments, while other organizations might use only one environment.

Product Data Management (G30)

Daily Processing (G3010)

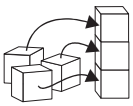
- Daily PDM Discrete (G3011)
- Daily PDM Process (G3012)
- Engineering Change Management (G3013)
- Daily Product Casting (G3014)
- Engineering Change Request (G3015)

Periodic Processing (G3020)

- Periodic PDM Discrete (G3021)
- Periodic PDM Process (G3022)

Advanced Product Data Management (G3031)

- Product Data Interoperability (G30311)



Product Data Management Setup (G3041)

- Inventory Setup (G4141)
- Product Costing Setup (G3042)

Fast Path Commands

The following table lists the fast path commands that you can use to access Product Data Management menus.

Fast Path	Menu	Title
PDM	G30	Product Data Management
DPDD	G3011	Daily PDM Discrete
PDMM	G3011	Daily PDM Discrete
DPDP	G3012	Daily PDM Process
DEC	G3013	Engineering Change Management
COST	G3014	Daily Product Costing
COSTI	G3014	Daily Product Costing
COSTM	G3014	Daily Product Costing
DPC	G3014	Daily Product Costing
PDMR	G3021	Periodic PDM Discrete
PPDD	G3021	Periodic PDM Discrete
PPDP	G3022	Periodic PDM Process
APD	G3031	Advanced Product Data Management
PDMS	G3041	Product Data Management Setup
SPD	G3041	Product Data Management Setup
COSTS	G3042	Product Costing Setup
SPC	G3042	Product Costing Setup

Product Data Management Setup

Product Data Management Setup

Product Data Management requires some setup prior to using the system. Setup for Product Data Management includes user defined codes and generic message/rate types for your bills of material, as well as manufacturing constants and decimal settings that are unique to your branch/plants. You must also define your company's work days by month and year in the calendar for your branch/plants.

Product Data Management setup consists of the following tasks:

- ❑ Setting up bill of material and routing information
- ❑ Setting up manufacturing information

Before You Begin

- ❑ Define your items in the Inventory Management system. See *Entering Item Master Information* in the *Inventory Management Guide.*

Setting Up Bill of Material and Routing Information

You need to define certain user defined codes and generic message/rate types for your bill of materials and routing instructions. These user defined codes and generic message/rate types identify the type of bill of material, the rate used for machine or labor hours, the procedures used by your company, whether an item is purchased or manufactured, and the type of routing instruction to use.

Setting up bills of material consists of the following tasks:

- ❑ Setting up user defined codes
- ❑ Setting up generic message/rate types

Setting Up User Defined Codes

User defined codes are stored in tables by system and code type. For example, system 30, type TB represents Product Data Management and user defined code time basis code. To set up time basis codes for machine or labor hours, identify all the codes you want to use to identify the different time basis codes using the User Defined Codes form. If you enter a time basis code on another form that you did not identify as a time basis code on the User Defined Codes form, the system displays an error message. For example, you can only enter codes in the time basis code field that exist in the user defined code table for system 30 and type TB.

The following user defined codes are primary to the Product Data Management system:

- Bill of materials type (40/TB)
- Time basis code (30/TB)
- Make/buy table (41/I)
- Routing types (40/TR)

Bill of Materials Type (40/TB)

Bill of materials type (40/TB) indicate the type of bill of materials, such as manufacturing bills, rework bills, and spare parts bills. Regardless of the other bill of material types that you define, only the standard manufacturing bill (M) is planned and costed. A planned bill of material facilitates master scheduling of material planning and forecasting. A costed bill of material extends the quantity per amount of every component by the cost of the components.

Time Basis Code (30/TB)

Time basis code (30/TB) indicates the rate used for machine or labor hours as you enter a routing instruction. The following program and systems use the value of the time basis code to determine run time per unit:

- Leadtime Rollup program
- Product Costing system
- Capacity Requirements Planning system
- Shop Floor Management system

Make/Buy Table (41/I)

Make/buy table (41/I) maintains stocking type codes that indicate whether an item is purchased or manufactured. For example, you can define types such as subassemblies and purchased raw material.

M (manufactured) and P (purchased) are hard-coded and appear in the first character in Description 02. You can use any other letter to define additional make and buy values.

Routing Types (40/TR)

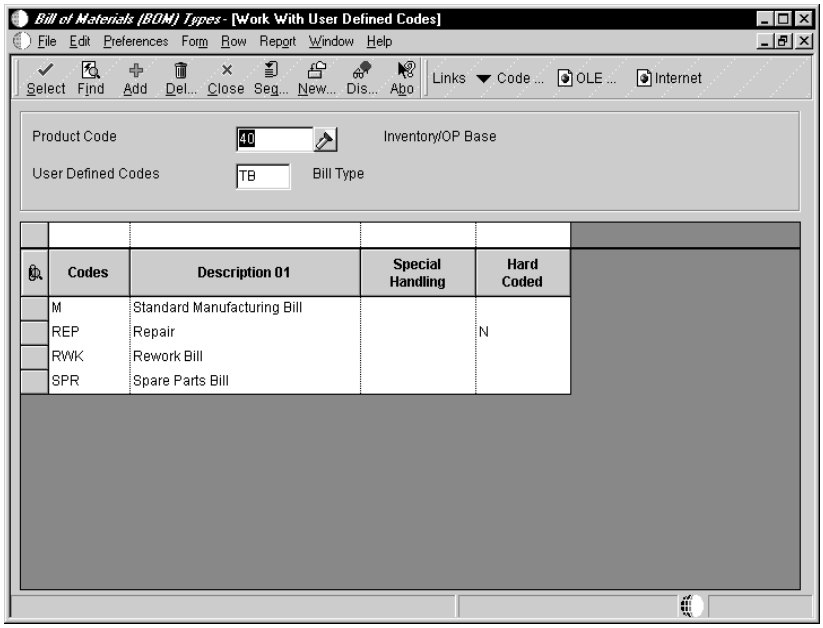
Routing types (40/TR) indicate the type of routing instruction, such as alternate routing instruction, standard manufacturing routing instruction, rush routing instruction, and rework routing instruction. Regardless of the other bill of material types that you define, only the standard manufacturing bill (M) is planned and costed.

You should understand the changes that the General User Defined Codes program will make to your system before you run this program. This program should not be run for data stored in Microsoft Access tables.

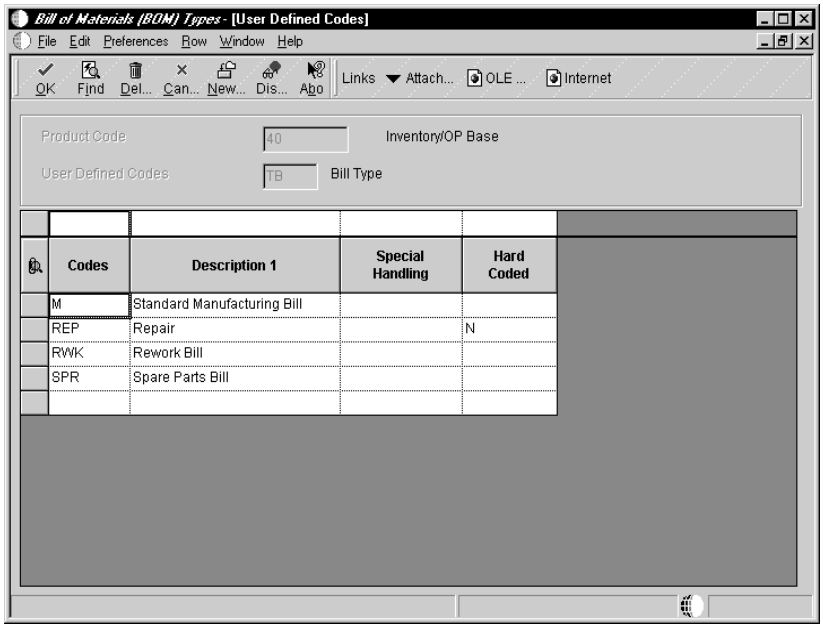
To set up user defined codes

From the Product Data Management Setup menu (G3041), choose Bill of Materials (BOM) Types.

On Work With User Defined Codes



1. Click Add.



2. On User Defined Codes, complete the following fields:
   - Codes
   - Description 1
   - Special Handling
   - Hard Coded

Field	Explanation
Codes	A list of valid codes for a specific user defined code list.
Description 1	A user defined name or remark.
Special Handling	A code that indicates special processing requirements for certain user defined code values. The value that you enter in this field is unique for each user defined code record type. The system uses the special handling code in many ways. For example, special handling codes defined for Language Preference specify whether the language is double-byte or does not have uppercase characters. Programming is required to activate this field.
Hard Coded	A code that indicates whether a user defined code is hard coded. Valid values are: Y The user defined code is hard-coded N The user defined code is not hard-coded For OneWorld, a check indicates that the user defined code is hard-coded.

Processing Options for User Defined Codes

Defaults

Enter the desired System Code: _____

Enter the desired Record Type: _____

Setting Up Generic Message/Rate Types

You can set up generic messages (48/SN) that represent procedural or message text for your company. Use them to describe a standard procedure for each step in the routing instructions.

You set up generic message/rate types to represent standard procedures for your company. For each code, you define message text that is standard to your business.

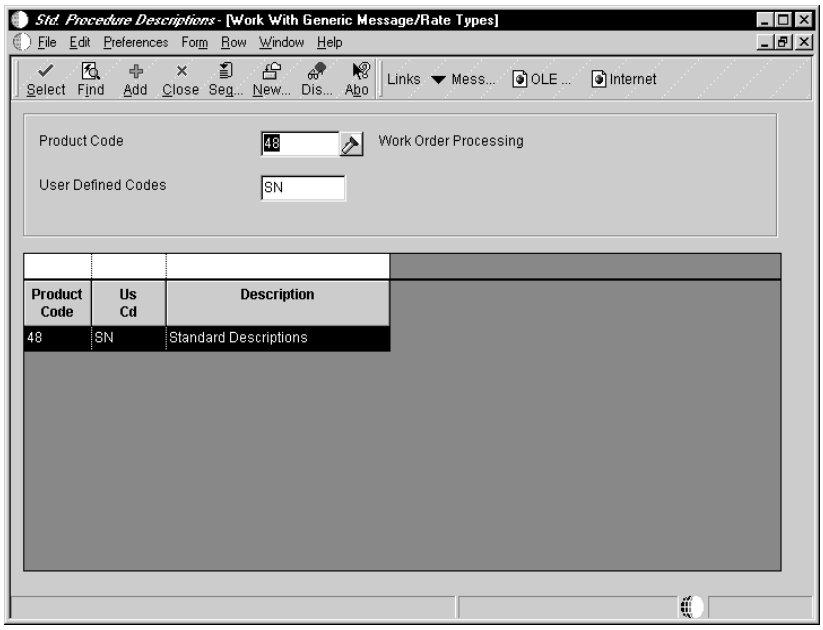
After you define standard procedure codes, you can enter them in the Standard Description field on the Enter/Change Routing program to indicate the procedure to use for each operation on the routing instructions.

The description that you define for the code appears on shop floor documents and in online inquiries that access data from the Enter/Change Routing program.

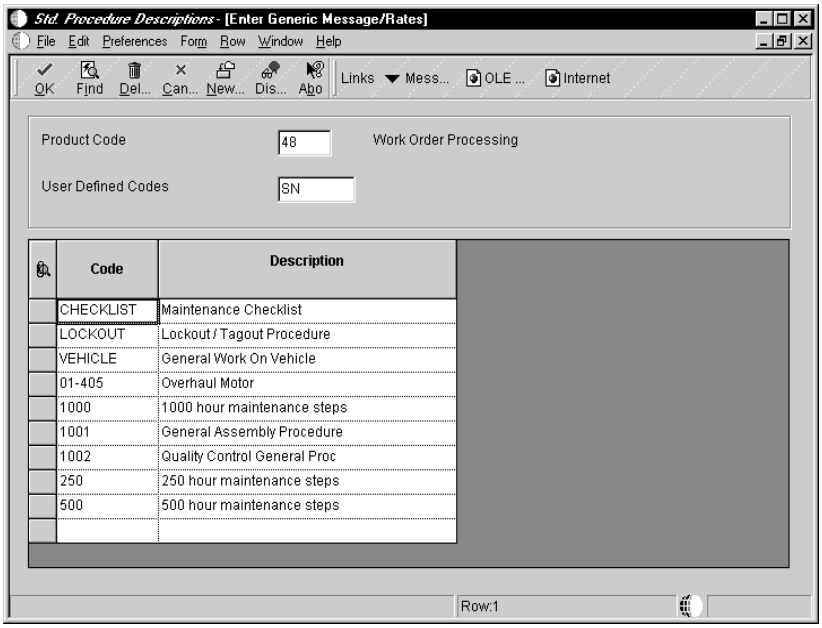
▶ To set up generic messages/rate types

From the Product Data Management Setup menu (G3041), choose Standard Procedure Descriptions.

On Work With Generic Message/Rate Types



1. Click Add.



2. On Enter Generic Message/Rates, complete the following field:
   - Code
3. Type a message in the following field:
   - Description
4. Choose the row you entered and then choose General Message from the Row menu.
5. On General message, type the actual procedure in the following field:
   - Description
6. Click OK, and then click Cancel.
7. On Enter Generic Message/Rates, click OK.

Processing Options for Generic Message Rates

Defaults

1. Enter the desired System Code.

   System Code _____

   Tax Authority 5

   Record Type _____

Display

1. Enter a ’1’ to display Rate Text or a ’2’ to display Message Text.

   Text Type _____

2. Enter a ’1’ for 60 column display or a ’2’ for 80 column display.

   Text Column Display _____

Setting Up Manufacturing Information

You need to set up manufacturing information necessary for the Product Data Management system. This information includes decimal placement for quantities, manufacturing constants, and calendars. If you want the system to display quantities with the decimal set to something other that zero, you must change the decimal setting. You can change the manufacturing constants to record bill of material changes, perform online component and parent validation, and retrieve information from the master routing when attaching the routing instructions. And, you define work days for your branch/plants by month and year using the shop floor calendar.

Setting up manufacturing information consists of the following tasks:

- ❑ Converting quantity decimal places
- ❑ Setting up manufacturing constants
- ❑ Setting up a shop floor calendar

Converting Quantity Decimal Places

From the Advanced Product Data Management menu (G3031), choose QNTY Decimal Conversion.

The following tables in the Manufacturing system maintain the Quantity (QNTY) data item:

- Bill of Material Master (F3002)
- Bill of Materials Change (F3011)
- ECO Parts List Detail (F3013)
- Work Order LSN (F3105)
- Rules Table Detail (F3283)
- Assembly Inclusion Rules (F3293)
- Configurator Level/Sequence File (F3296)

J.D. Edwards ships the QNTY data item in the data dictionary with the display decimals set to zero. You may want to change the decimals on this data item to a value other than zero. If you change the display decimals, the system displays any data that has already been entered into the tables incorrectly on forms and reports. To prevent decimal displays from being incorrect, run the QNTY Decimal Conversion program before anyone enters any new data using the new display decimals.

Use the QNTY Decimal Conversion program to convert the QNTY data items on all affected tables from a specified number of decimal places to a new number of decimal places. You use the processing options to identify these numbers. If you enter 0 as the *display decimals from* value and 2 as the *display decimals to* value, the system adds two decimal places to the existing QNTY value. For example, the system converts 1 to 100, and displays it as 1.00. If you convert from two decimals to zero decimals, the system removes two decimal places. For example, the system converts 100 (displayed as 1.00) to 1.

The system first rounds the value before adding or removing decimal places. If you convert from two decimals to zero decimals, and the display quantity is 1.51, the system rounds the quantity to 2.00 and then converts 200 to 2.

You should run this program only if you have changed the Quantity field to display decimal places. You can run this program in proof mode and in final mode. Proof mode displays the changes you made to the decimal placement, but does not update any tables. Final mode displays the changes and updates tables.

The system performs special processing for the following conditions:

- Prints a warning message when rounding a co-product or by-product quantity on the Bill of Material Master table or the Bill of Materials Change table.
- Prints a warning message when rounding a percent bill quantity on the Bill of Material Master table or the Bill of Materials Change table.
- Prints an error message and does not convert the quantity when you are increasing the number of decimals and the quantity value is too large, such as adding decimal positions that would cause an overflow on the nondecimal portion of the quantity.
- Converts only P and Q type records on the Rules Table Detail table and the Assembly Inclusion Rules table.

You should understand the changes that this program will make to your system and your existing data before you run this program. Because of the way the system stores numeric values in Access databases, you should not run this program against any Microsoft Access tables.

Processing Options for QNTY Decimal Conversion

Process

1. Enter a '1' to run this program in Final mode (update and report). If left blank, the program will run in Proof mode (report only).

   Proof or Final Mode _____

2. Enter the number of display decimals you are converting from.

   Display Decimals From _____

3. Enter the number of display decimals you are converting to.

   Display Decimals To _____

Setting Up Manufacturing Constants

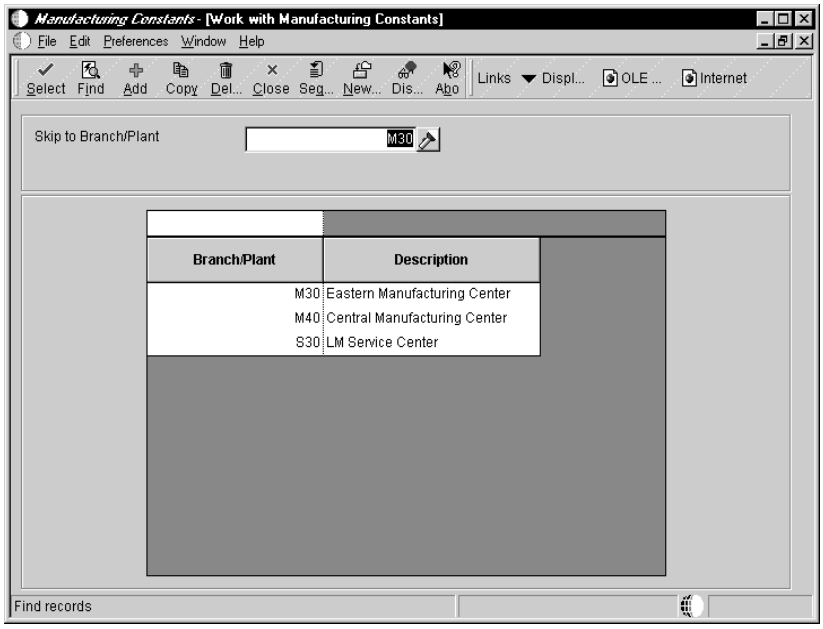
Set up manufacturing constants to establish information that is unique to your branch/plants. ERPx systems use manufacturing constants to determine the following:

- How to allocate, commit, and backflush inventory
- How to calculate overhead costs
- Whether to consider work center efficiency when calculating direct labor and overhead
- Whether an audit trail tracks all changes to bills of material
- Whether to validate bills of material online as you enter them
- Whether a branch/plant has multiple shifts specified

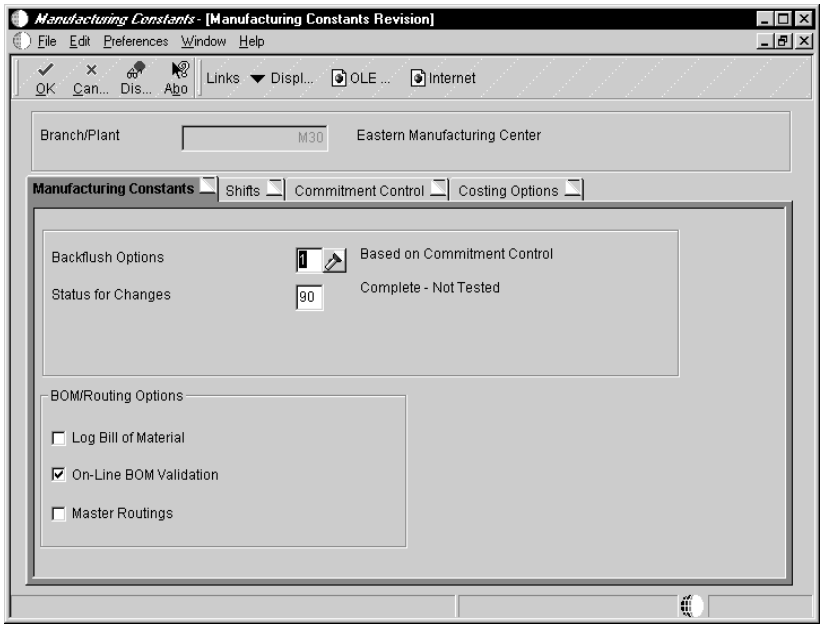
To set up manufacturing constants

From the Product Data Management Setup menu (G3041), choose Manufacturing Constants.

On Work with Manufacturing Constants



1. Complete the following field and click Find:
   - Skip to Branch/Plant
2. Choose a branch/plant and click Select.



3. On Manufacturing Constants Revision, click the Manufacturing Constants tab and click any of the following options:
   - Log Bill of Material
   - On–Line BOM Validation
   - Master Routings

Field	Explanation
Skip to Branch/Plant	A code that represents a high-level business unit. Use this code to refer to a branch or plant that might have departments or jobs, which represent lower-level business units, subordinate to it. For example: • Branch/Plant (MMCU) • Dept A (MCU) • Dept B (MCU) • Job 123 (MCU) Business unit security is based on the higher-level business unit.

Field	Explanation
Log Bill of Material	A code that determines whether changes to the bill of material are recorded in the Bill of Material Change table (F3011). When you log bill of material changes, the system saves the old bill of material and the new changed bill of material. For World: Valid values are: Y Yes, log changes. N No, do not log changes. Blank The system assigns a default value of N. For OneWorld: To record changes to the bill of material, click the Log Bill of Material option under the BOM/Routing Options heading. If you do not click Log Bill of Material, the program does not record changes.
On–Line BOM Validation	An option that determines whether the system performs an online component or parent validation and low-level code assignment when you revise a bill of material. J.D. Edwards recommends that you validate items online unless your bills of material are extremely large. If you choose not to validate items online, you must validate the items in batch. Run the Print Integrity Analysis program (P30601) after updates to the bill of material and before you run the Frozen Cost Update program (P30835) or perform a DRP/MPS/MRP generation (P3482). For World: Valid values are: Y Yes, validate items online. N No, do not validate items online. For OneWorld: To specify that the system validates items online, click the On-Line BOM Validation option under the BOM/Routing Options heading. If you do not click the On-Line BOM Validation option, the system does not validate items online.

Field	Explanation
Master Routings	An option that determines whether the system uses the master routing for an item or a routing defined for the parent item. Both routings are retrieved from the Routing Master table (F3003). If you choose to check for master routings, the Shop Floor Management system checks the Item Cross Reference table (F4104), cross-reference type MR, for the parent item. If it finds a cross-reference, the program uses the master routing from the Routing Master Table (F3003). If it does not find a cross-reference, the system uses the routing defined for the parent item. If you do not choose to check for master routings, the program uses the parent item's routing from the Routing Master table. For World: Valid values are: Y Yes, use the master routing for an item, if one exists. N No, do not check for a master routing for the item. For OneWorld: To specify whether the system checks for cross-references and uses a master routing for the item, click the Master Routings option under the BOM/Routing Options heading.

Setting Up a Shop Floor Calendar

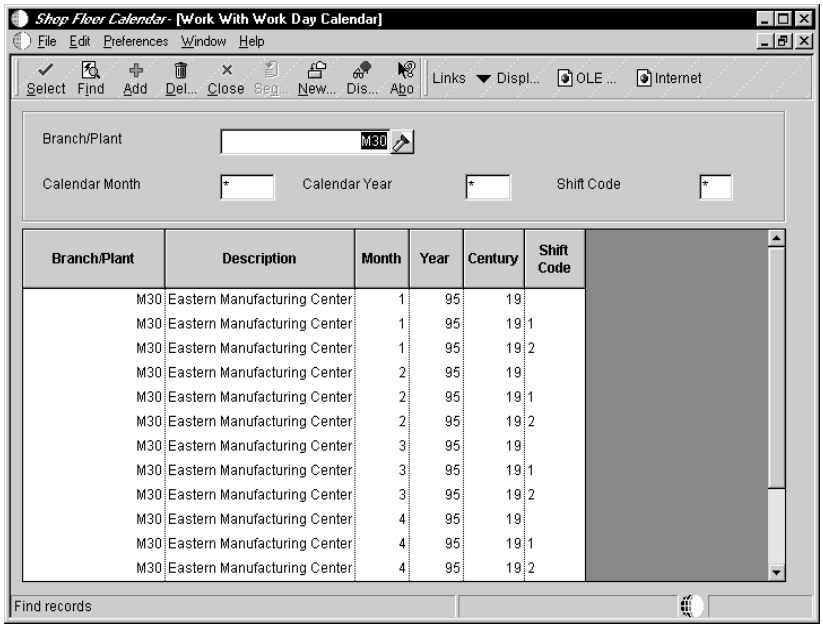
Use the shop floor calendar to define work days by month and year for all branch/plants. The system uses this calendar to determine the following information:

- Manufacturing schedules
- Start dates for work orders
- Start and complete dates for work order routing instructions

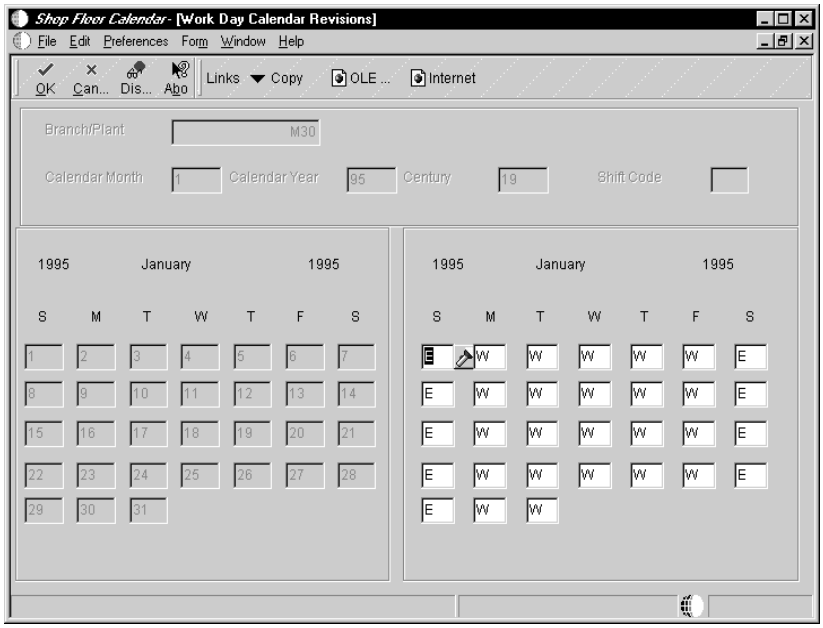
To set up a shop floor calendar

From the Product Data Management Setup menu (G3041), choose Shop Floor Calendar.

On Work With Work Day Calendar



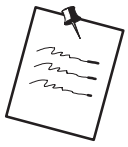
1. Complete the following fields and click Add:
   - Branch/Plant
   - Calendar Year
   - Calendar Month



2. On Work Day Calendar Revisions, complete each day field with a valid day type code.

The calendar on the left displays the calendar days for the month and year. The calendar on the right displays the defined work days.

Day types are stored in user defined code table 00/TD to define work days.



Day type W is hard-coded. To indicate nonwork days, you must set them up in the user defined code table 00/TD.

Processing Options for Work Day Calendar

```
Interop

1. Enter the transaction type for the
    interoperability transaction.  If
    left blank, outbound
    interoperability processing will not
    be performed.

      Type – Transaction                    _____

2. Enter a '1' to write before images
    for outbound change transactions.
    If left blank, only after images
    will be written.

      Before Image Processing               _____
```

Bills of Material

Bills of Material

A bill of material identifies the manufacture of finished products (end items), subassemblies, and components. Before you create a bill of material, you must first understand the types of bills of material and how they are used. Then you can create a bill of material, define its components, and enter reference, grade and potency information, and substitute item information as necessary. After you have entered bills of material, you can review them to plan and research engineering change orders, view the results of a pending product change, determine the effect of an item shortage, or evaluate capacity, manpower, equipment needs, and other resources.

Use a bill of material to accomplish the following:

- Detail the specific items and quantities that are used to assemble the parent item
- Define the items as parents or components in the assembly
- Provide the foundation for Product Costing and Master Production Schedule programs

Bills of material consists of the following tasks:

- ❑ Understanding bills of material
- ❑ Entering bills of material
- ❑ Reviewing bills of material

Understanding Bills of Material

Use a bill of material to detail the specific items and quantities that are used to assemble the parent item, define the items as parents or components in the assembly, and provide the foundation for Product Costing and Master Production Schedule programs. A bill of material is the basis for creating a parts list for a work order in the Shop Floor Management system.

The features and functionality associated with bills of material enable you to do the following:

- Replace all occurrences of one component with another
- Plan for component scrap in the Product Costing and Shop Floor Management systems
- Substitute one component for another
- View the producible quantity of an end item for the amount of the component that you enter
- Print complete bill of material information
- Copy an existing bill of material and make changes for a new item
- Offset the required date of a component in a work order from the order start date
- Locate all bills of material that use a specified part
- Create multiple versions of your bills of material to present information in formats tailored to the needs of different departments
- Track the status of all bill of material changes
- Define where a component is located within a specific assembly
- Check an item's low-level codes
- Inquire on a bill of material using a single-level or multilevel format

You can use bills of material in a multiplant environment. This allows you to define different manufacturing data for an item used in different branches, such as order policy or lot size.

You can specify the effective dates for component parts on a bill of material. In addition, you can define nonstock, bulk, and expense items, as well as notes describing tool requirements.

A properly structured bill of material does the following:

- Supports the Product Costing system
- Allows for efficient storage and maintenance of bill of material information
- Reflects material flow and how the product is built
- Permits easy order entry
- Allows the system to display the master schedule in the fewest end items possible
- Allows for forecasting of optional product features

An inaccurate bill of material might result in the following:

- Poor material planning
- Material shortages
- Inaccurate product costing
- Increased production costs
- Delayed shipments
- Excess and obsolete inventory
- Poor specification control
- Increased product liability

The system uses a bill of material as a master list when generating parts lists for work orders, cost rollups, leadtime rollups, MPS/MRP/DRP generation, and kit processing for sales orders.

Types of Bills of Material

Depending on your business requirements, the Product Data Management system provides several types of bills of material. For example:

- Planning bill of material
- Batch bill of material
- Percent bill of material
- Manufacturing bill of material

Planning Bill of Material

Use a planning bill of material to facilitate master scheduling and material planning by categorizing product features or options. This bill includes the ratio of each item, determined from revision history. The planning bill of material is also known as any of the following:

- Super bill of material
- Modular bill of material
- Transient bill of material
- Aggregate bill of material

Batch Bill of Material

Use a batch bill of material to accommodate physical constraints, such as ovens or vats, in industries where products are produced in fixed quantities.

The Material Requirements Planning (MRP) system plans orders to fill net requirements by using one or multiple batch quantities. If the system does not find a batch quantity for the net requirement, it uses the next largest batch size. If there isn't a larger batch size, MRP uses the closest smaller batch size until the requested amount is supplied.

Example: MRP Orders

The Material Requirements Planning system functions differently when you have defined more than one batch bill of material. When there is only one batch bill, the Material Requirements Planning system uses the batch quantity as a multiple if the net requirements are greater than the batch quantity, or as a minimum if the net requirements are less than the batch quantity.

The following table shows the resulting MRP planned order for one batch bill of material:

Batch Quantity	MRP Requirement	Resulting MRP Planned Order
1000	1500	1000
		1000
1000	967	1000

If multiple batch bills of material exist and the net requirement is greater than all of the batch quantities, then the system uses the largest batch quantity in combination with any of the others to satisfy the requirement.

The following table shows the resulting MRP planned order for multiple batch bills of material:

Batch Quantity	MRP Requirement	Resulting MRP Planned Order
400	1500	1000
600		600
800		
1000		

Batch Quantity	MRP Requirement	Resulting MRP Planned Order
400	3000	1000
600		1000
800		1000
1000		

If multiple batch bills exist and the net requirement does not match, but is less than the largest batch quantity, then the system uses the smallest batch bill that satisfies the requirements.

The following table shows the resulting MRP planned order for multiple batch bills of material with requirements that are less than the largest batch quantity:

Batch Quantity	MRP Requirement	Resulting MRP Planned Order
400	780	800
600		
800		
1000		

Percent Bill of Material

A percent bill of material enables you to express component quantities as a percent of the parent item or process batch quantity. The system converts the batch quantity to the primary unit of measure for the parent item or process.

The system stores quantities for components as follows:

- Calculates a percentage for the component in relation to the batch size
- Converts the batch unit of measure to the component unit of measure and stores the quantity for the component

Example: Percent Bill

The parent item is Soft Drink and its batch quantity is 300 GA.

The following table shows the components of the parent item along with the component quantity, unit of measure, and whether the component is a fixed quantity, variable quantity, or expressed as a percentage:

Components	Quantity	Unit of Measure	Fixed/Variable
Vanilla	50	GA	%
Water	40	QT	%
Concentrate	10	LT	%

The system calculates the following:

% Calculation and Conversion to Batch Unit of Measure			Storage
Vanilla	= .5 X 300	= 150 GA	150 GA
Water	= .4 X 300	= 120 GA	480 QT
Concentrate	= .1 X 300	= 30 GA	114 LT

The system uses the component unit of measure in the percent bill to convert the number of gallons that correspond to the percent for each component. In this example, the system calculates the water and concentrate components to be 120 GA and 30 GA of the batch size. The system converts the unit of measure to the component unit of measure and stores them as 480 QT and 114 LT.

You must set up the unit of measure conversion for percent bills to work properly. Verify that all components can convert to the batch quantity unit of measure.

Manufacturing Bill of Material

Use a manufacturing bill to document and track components. This type of bill is also known as any of the following:

- As-built bill of material
- Customer order configured bill of material
- Frozen bill of material

Bill of Material Terminology

The following topics describe terminology with which you should be familiar before working with bills of material:

- Parent and component relationship
- Phantom item

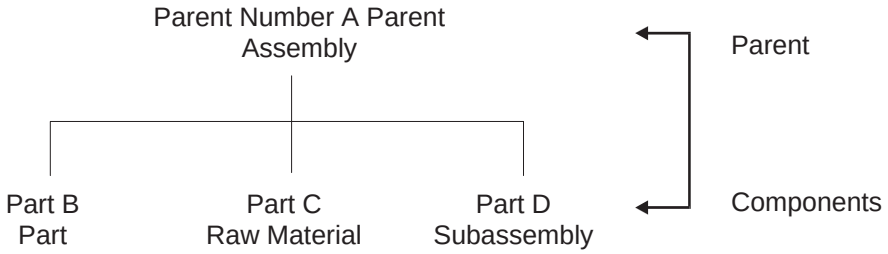
- Substitute item
- Component locator
- Nonstock item
- Tools
- Bulk item
- Part replacement

Parent and Component Relationship

A parent and component relationship defines the association between a parent item and the components that you use to produce it. Parent and component relationships are used in engineering change orders to define the proposed item change.

Example: Relationships in a Single-Level Bill of Material

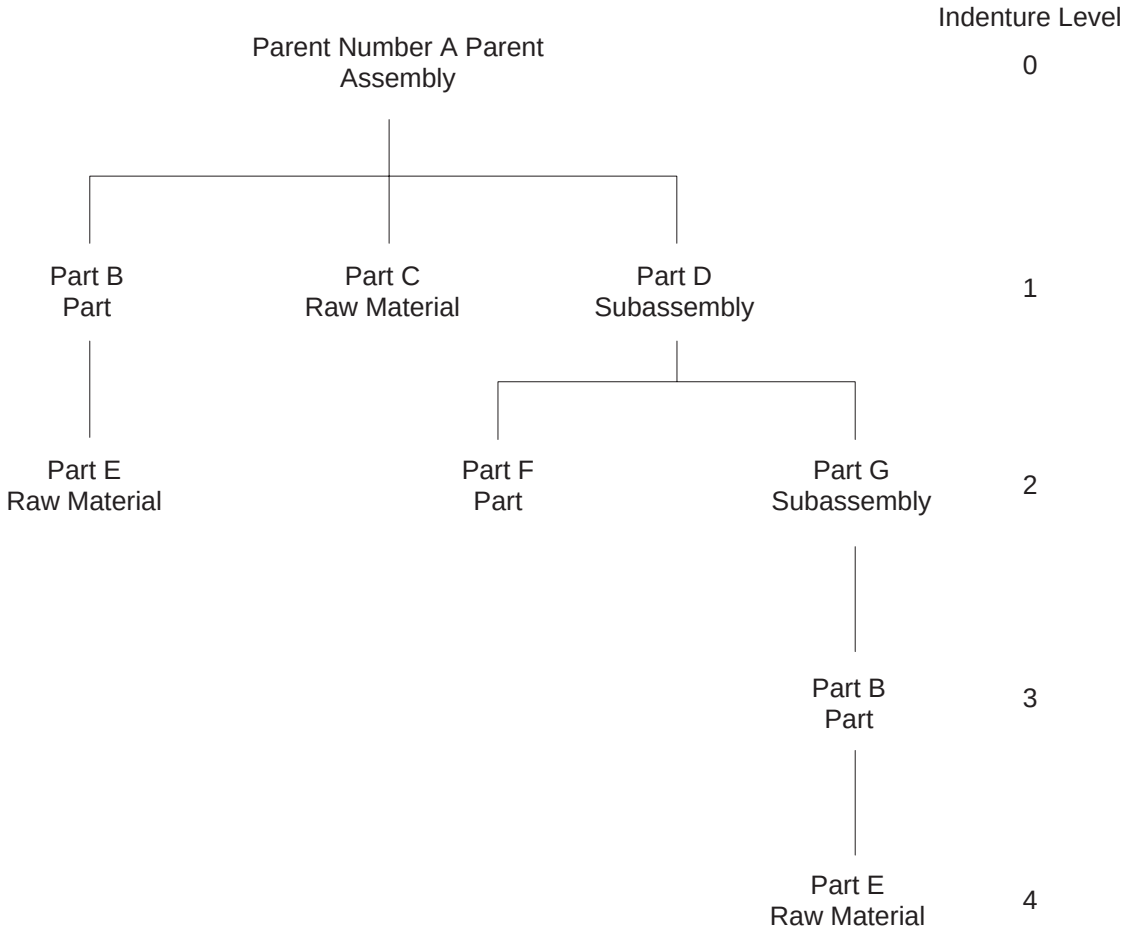
The following example shows the relationship of a parent item to components in a single-level bill of material that includes parts, raw materials, and subassemblies.



Part #	Description	Make/Buy	Unit of Measure	Quantity
A	Parent Assembly	M	EA	
B	Part	M	EA	1.0
C	Raw Material	B	EA	3.0
D	Subassembly	M	EA	.25

Example: Relationships in an Indented Bill of Material

The following example shows a complex relationship of a parent item to its components. Part B is both an independent part and part of the subassembly that makes up Part G.



Phantom Item

A phantom is an individual item that can exist anywhere in the bill of material. The term phantom has many aliases throughout the manufacturing industry, such as the following:

- Transient
- Module
- Blow-through
- Nonstocked subassembly
- Self-consumed
- Partial list

Example: Phantom Item

An example of a phantom item, in this case, a spray pump nozzle, occurs during automated assembly. The spray pump nozzle consists of a button, tubing, and an insert. The first operation specifies placing the button and inserting items in an automated assembly machine. The machine combines them into a phantom part called a button unit. This unit goes directly to the next operation. After the next operation attaches the tubing, the spray pump nozzle is complete. The button unit, as with all phantom items, is never stocked.

Substitute Item

You can define a substitute item for components within your parent item. You might need to do this for several reasons, such as quality concerns, inventory shortages, or supplier delivery problems.

See Also

- *Entering Bills of Material* to review how to enter substitute items

Component Locator

A component locator indicates the specific location of a component within a subassembly. This is a common feature in the electronics industry. For example, the printed key pads that cover the keys on your computer keyboard must be placed in a specific sequence. Use a component locator to indicate the location of each key pad cover to ensure that each is correctly placed during production.

See Also

- *Entering Component Locators* to review how to enter locators

Nonstock Item

You can add a nonstock item to the bill of material. Nonstock items include drawings, tools, bulk items, or reference materials. The system does not plan for nonstock items, but they appear on the bill of material and parts list for shop floor personnel.

You can enter drawing numbers on your bills of material as nonstock items so that they print on the shop paperwork. If your drawing numbers differ for each branch/plant, enter the drawing number as a component.

Tools

If a tool is needed to create the parent item and is located on the shop floor and reused as needed, you can indicate that it is a necessary component item required for the parent item. Enter reusable tools as text lines or nonstock items in the bill of material.

You enter expendable tools (that is, tools used one time) on the bill of material like any other component item. The manufacturing process commits and consumes expendable tools in the same way as the other components. An example of an expendable tool is paint roller pads.

Bulk Item

You use bulk items on the shop floor. Bulk items are not closely tracked, but are ordered in large quantities as they are needed. Examples include tape, rubber bands, lubricants, cleaning fluid, rivets, and nails. You must enter bulk items in the Item/Branch Plant Information form.

See Also

- *Entering Item Branch/Plant Manufacturing* in the *Inventory Management Guide*

Part Replacement

You might need to replace one part with another in the bill of material. You can either scrap the old part or use up the inventory. Use the following guidelines to specify a replacement part:

- Leadtime must be set to 0 (zero)
- Order policy code in the branch/plant record must be set to lot-for-lot
- Bill of material must be entered so that the new part is a component of the old part
- Stocking type must be set appropriately

As the Material Requirements Planning system uses up the quantity of the old part, the quantity reaches zero. Since there are still requirements, the system generates a planned order release. This planned order becomes the requirement for the new item in the same period (because the leadtime of the old part is zero). MRP then plans the new part. This alerts the material planner to change the bill of material by removing the old part.

Entering Bills of Material

A bill of material defines an item as a parent or component in the assembly. It details the specific components and quantities that are used to assemble the parent item and provides the foundation for costing and planning activities.

Entering bills of material consists of the following tasks:

- ❑ Entering a bill of material
- ❑ Entering planning bill and kit information (optional)
- ❑ Entering production information
- ❑ Entering component locators (optional)

As you define a bill of material, you combine information from the Job Shop Manufacturing Constants, Item Master, and Item Branch tables. The resulting bill of material is stored in the Bill of Material table. Changes are stored in the Bill of Materials Change table.

When you delete a parent item's bill of material, the item's lower level components and subassemblies are not affected.

Before You Begin

- ❑ If you are using batch bills of material, define a bill of material for batch bills, define routing instructions that correspond to the batch sizes, and set the processing options for Enter/Change Bill and Work Order Entry to activate batch functions. See *Setting Up User Defined Codes* and *Entering Routing Instructions.*

Entering a Bill of Material

A parent item is the end result of a bill of material. After you enter a parent item, you can define the specific location, components, and quantities used to assemble the parent item.

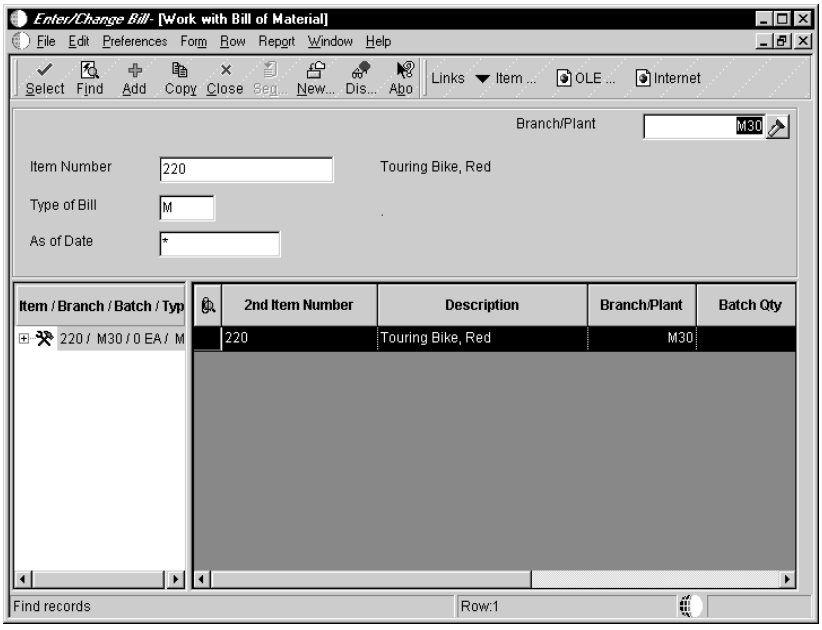
Entering a bill of material consists of the following tasks:

- Entering basic bill of material information
- Entering reference information
- Entering grade and potency information
- Entering a substitute item

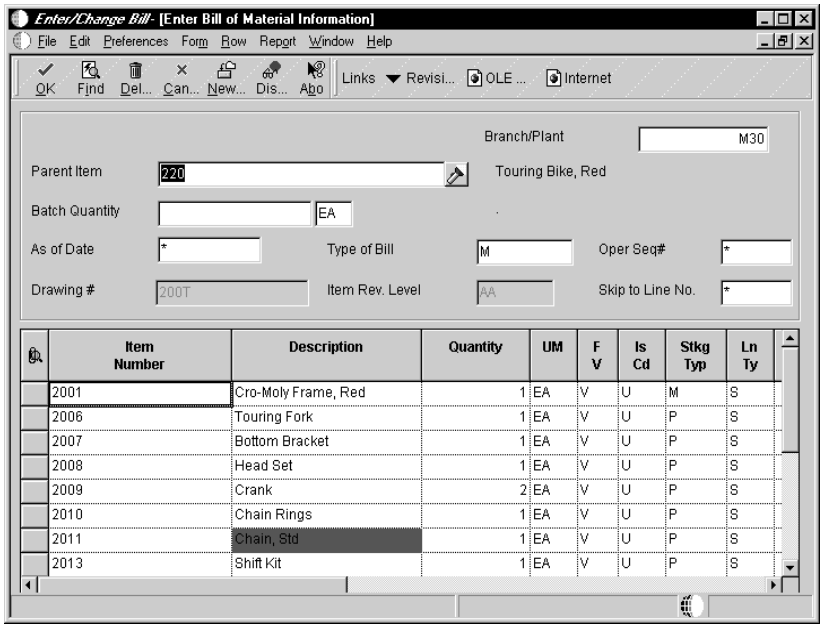
▶ To enter basic bill of material information

From the Daily PDM Discrete menu (G3011), choose Enter/Change Bill.

On Work with Bill of Material



1. Complete the following fields and click Add:
   - Branch
   - Item Number
   - As of Date



2. On Enter Bill of Material Information, complete the following fields:
   - Batch Quantity
   - Type of Bill
   - Item Number
   - Quantity
   - UM
   - F V
   - Is Cd
   - Effective From
   - Effective Thru
   - Percent Scrap

If you want to enter bills of material for the same parent item but to multiple branch/plants, you can copy the original bill of material. Locate the existing bill, select Copy, and enter the new branch/plant.

After you enter a parent item, you can define batch information.

Field	Explanation
Item Number	A number that the system assigns to an item. It can be in short, long, or third item number format.

Field	Explanation
Quantity	The number of units that the system applies to the transaction. . . . . . *Form-specific information* . . . . . . A number that indicates how many components you use to manufacture the parent item. A quantity of zero is valid. The default value is 1.
Item Number	A number that the system assigns to an item. It can be in short, long, or third item number format.
Quantity	The number of units that the system applies to the transaction. . . . . . *Form-specific information* . . . . . . A number that indicates how many components you use to manufacture the parent item. A quantity of zero is valid. The default value is 1.
UM	A user defined code (00/UM) that identifies the unit of measurement for an amount or quantity. For example, it can represent a barrel, box, cubic meter, liter, hour, and so on.
F V	A code that indicates if the quantity per assembly for an item on the bill of material varies according to the quantity of the parent item produced or is fixed regardless of the parent quantity. This value also determines if the component quantity is a percent of the parent quantity. Valid values are: F Fixed Quantity V Variable Quantity (default) % Quantities are expressed as a percentage and must total 100% For fixed-quantity components, the Work Order and Material Requirements Planning systems do not extend the component's quantity per assembly value by the order quantity. For percent bills of material, the system treats zero batch sizes as variable quantity components and treats batch sizes greater than zero as fixed quantity components.
Is Cd	A code that indicates how the system issues each component in the bill of material from stock. In Shop Floor Management, it indicates how the system issues a part to a work order. Valid codes are: I Manual issue (default) F Floor stock (no issue) B Backflush (when part is reported as complete) P Preflush (when parts list is generated) U Super backflush (at pay-point operation) S Sub-contract item (send to supplier) Blank Shippable end item You can issue a component in more than one way within a specific branch/plant by using a different code on the bill of material and work order parts list. The bill of material code overrides the branch/plant value.

Field	Explanation
Effective From	A date that indicates one of the following: • When a component part goes into effect on a bill of material • When a routing step goes into effect as a sequence on the routing for an item • When a rate schedule is in effect The default is the current system date. You can enter future effective dates so that the system plans for upcoming changes. Items that are no longer effective in the future can still be recorded and recognized in Product Costing, Shop Floor Management, and Capacity Requirements Planning. The Material Requirements Planning system determines valid components by effectivity dates, not by the bill of material revision level. Some forms display data based on the effectivity dates you enter.
Effective Thru	A date that indicates one of the following: • When a component part is no longer in effect on a bill of material • When a routing step is no longer in effect as a sequence on the routing for an item • When a rate schedule is no longer active The default is December 31 of the default year defined in the Data Dictionary for Century Change Year. You can enter future effective dates so that the system plans for upcoming changes. Items that are no longer effective in the future can still be recorded and recognized in Product Costing, Shop Floor Management, and Capacity Requirements Planning. The Material Requirements Planning system determines valid components by effectivity dates, not by the bill of material revision level. Some forms display data based on the effectivity dates you enter.

Field	Explanation
Percent Scrap	The percentage of unusable component material created during the manufacture of a particular parent item. During DRP/MPS/MRP generation, the system increases gross requirements for the component item to compensate for the loss. Note: Shrink is the expected loss of parent items (and hence, components) due to the manufacturing process. Shrink and scrap are compounded to figure the total loss in the manufacture of a particular item. Accurate shrink and scrap factors can help to produce more accurate planning calculations. Enter percentages as whole numbers: 5% as 5.0 . . . . . *Form-specific information* . . . . . . The Shop Floor Control and Material Requirements Planning systems inflate component requirements by this percentage. This scrap percentage is unique to the relationship of one parent and one component.

▶ To enter reference information

From the Daily PDM Discrete menu (G3011), choose Enter/Change Bill.

Use the Enter Bill of Material Information form to add reference information to specific items.

On Work with Bill of Material

1. Complete the following fields and click Find:
   - Branch
   - Item Number
2. Choose the item and click Select.
3. On Enter Bill of Material Information, complete the following fields:
   - Bubble Seq No
   - Ln Ty
   - Remarks

   The following fields display stocking information:

   - Stkg Typ
   - Drawing Number

Field	Explanation
Bubble Seq No	A secondary bill of material sequence number that indicates the drawing bubble number.
Ln Ty	A code that controls how the system processes lines on a transaction. It controls the systems with which the transaction interfaces, such as General Ledger, Job Cost, Accounts Payable, Accounts Receivable, and Inventory Management. It also specifies the conditions under which a line prints on reports and is included in calculations. Codes include the following: S Stock item J Job cost N Nonstock item F Freight T Text information M Miscellaneous charges and credits W Work order
Remarks	A brief description of an item, a brief description of a remark, or a brief description of an explanation.
Stkg Typ	A user defined code (41/I) that indicates how you stock an item, for example, as finished goods or as raw materials. The following stocking types are hard-coded and you should not change them: 0 Phantom item B Bulk floor stock C Configured item E Emergency/corrective maintenance F Feature K Kit parent item N Nonstock The first character of Description 2 in the user defined code table indicates if the item is purchased (P) or manufactured (M).
Drawing Number	An engineering drawing number. It might be the same as the part or item number.

▶ To enter grade and potency information

From the Daily PDM Discrete menu (G3011), choose Enter/Change Bill.

Use the Enter Bill of Material Information form to enter grade and potency information for a specific item. You can define either grade or potency information, but not both.

On Work with Bill of Material

1. Complete the following fields and click Find:
   - Branch
   - Item Number
2. Choose the item and click Select.
3. On Enter Bill of Material Information, complete the following fields to define grade information:
   - Frm Grd
   - Thr Grd
4. To define potency information, complete the following fields:
   - From Potency
   - Thru Potency

Field	Explanation
Frm Grd	A user defined code (40/LG) that indicates the minimum grade that is acceptable for an item. The system displays a warning message if you try to purchase or issue items with grades that do not meet the minimum grade acceptable. The system does not allow you to sell items with grades that do not meet the minimum acceptable level.
Thr Grd	A user defined code (40/LG) that indicates the maximum grade that is acceptable for an item. The system displays a warning message if you try to purchase or issue items with grades that exceed the maximum grade acceptable. The system does not allow you to sell items with grades that exceed the maximum grade acceptable.
From Potency	A number that indicates the minimum potency or percentage of active ingredients acceptable for an item. The system displays a warning message if you try to purchase or issue items that do not meet the minimum acceptable potency. The system does not allow you to sell items that do not meet the minimum acceptable potency.

Field	Explanation
Thru Potency	A number that indicates the maximum potency or percentage of active ingredients that is acceptable for an item. The system displays a warning message if you try to purchase or issue items that have a potency that exceeds the maximum potency acceptable. The system does not allow you to sell items that have a potency that exceeds the maximum potency acceptable.

▶ To enter a substitute item

From the Daily PDM Discrete menu (G3011), choose Enter/Change Bill.

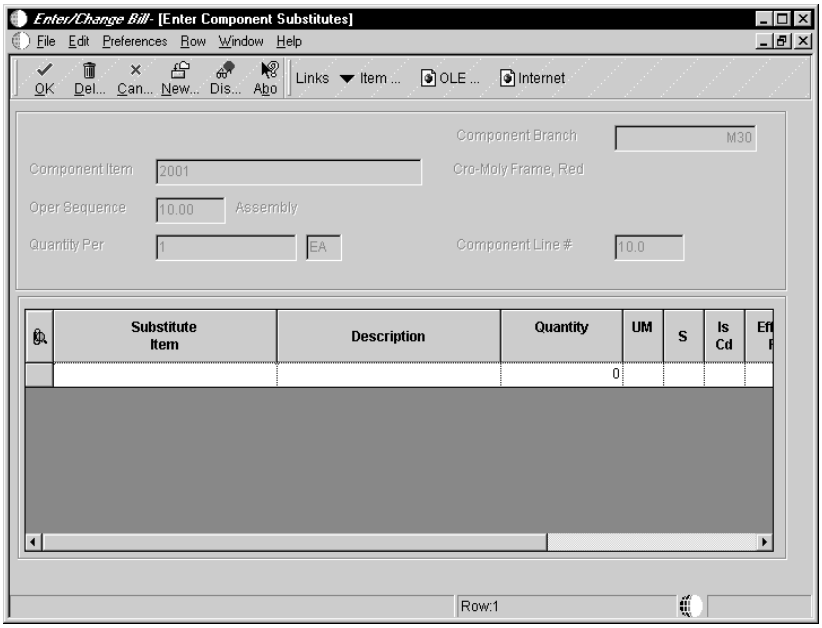
Enter a substitute item for components within your parent item. You can use substitute items if you encounter quality issues, inventory shortages, or supplier delivery problems with the original component.

To enter a substitute item for all your parent items, use item cross references. For more information about item cross references, see *Setting Up Item Cross-Reference* in the *Inventory Management Guide*.

On Work with Bill of Material

1. Complete the following fields and click Find:
   - Branch
   - Item Number
2. Choose the item and click Select.
3. On Enter Bill of Material Information, choose a component and then choose Substitutes from the Row menu.

   The system displays Enter Component Substitutes and highlights a component's item description to indicate a substitution.



4. On Enter Component Substitutes, complete the following fields:
    - Substitute Item
    - Sub Item Sequence
    - Quantity
    - UM
    - Effective From
    - Effective Thru
    - Percent Scrap
    - F V
    - Frm Grd
    - Thr Grd
    - From Potency
    - Thru Potency

Field	Explanation
Substitute Item	A number that the system assigns to an item. It can be in short, long, or third item number format.
Sub Item Sequence	A number that indicates the sequence for the substitute items for a component. The system looks for substitute items by this sequence number. For the component being substituted, set this field to zero.

Field	Explanation
Frm Grd	A user defined code (40/LG) that indicates the minimum grade that is acceptable for an item. The system displays a warning message if you try to purchase or issue items with grades that do not meet the minimum grade acceptable. The system does not allow you to sell items with grades that do not meet the minimum acceptable level.
Thr Grd	A user defined code (40/LG) that indicates the maximum grade that is acceptable for an item. The system displays a warning message if you try to purchase or issue items with grades that exceed the maximum grade acceptable. The system does not allow you to sell items with grades that exceed the maximum grade acceptable.
From Potency	A number that indicates the minimum potency or percentage of active ingredients acceptable for an item. The system displays a warning message if you try to purchase or issue items that do not meet the minimum acceptable potency. The system does not allow you to sell items that do not meet the minimum acceptable potency.
Thru Potency	A number that indicates the maximum potency or percentage of active ingredients that is acceptable for an item. The system displays a warning message if you try to purchase or issue items that have a potency that exceeds the maximum potency acceptable. The system does not allow you to sell items that have a potency that exceeds the maximum potency acceptable.

Entering Planning Bill and Kit Information

Use planning bills and kits to produce items in which components are features and might not be listed as separate inventory items. When you enter these components as parts of kits, the system places them in the planning and manufacturing processes.

▶ To enter planning bill and kit information

From the Daily PDM Discrete menu (G3011), choose Enter/Change Bill.

After you have added components, you can enter planning bill and kit information.

On Work with Bill of Material

1. Complete the following fields and click Find:
    - Branch

- Item Number

2. Choose the item and click Select.
3. On Enter Bill of Material Information, complete the following fields:
   - Feat Plan %
   - Feat Cost %
   - Unit Price
   - Unit Cost
   - Opt (S/O/F)
   - R
   - D C

Field	Explanation
Feat Plan %	The percentage of demand for a specified feature based on projected production. For example, a company might produce 65% of their lubricant with high viscosity, and 35% with low viscosity, based on customer demand. The Material Planning system uses this percentage to accurately plan for a process's co-products and by-products. Enter percentages as whole numbers, for example, enter 5% as 5.0. The default value is 0%.
Feat Cost %	A percentage that the Simulate Cost Rollup program uses to calculate the cost of a feature or option item as a percentage of the total cost of the parent. Enter the percentage as a whole number, for example, enter 5% as 5.0.
Unit Price	A base or default price that is used with multipliers from the pricing rules to develop discounted prices. If no formula applies to an item or no discounts apply to a customer, the system uses this price without adjustments.

Field	Explanation
Unit Cost	The amount per unit, derived by dividing the total cost by the unit quantity. You can change the dollar amount for any cost method at any time. If you change the amount for the cost method that you use to track costs of goods sold, the system applies the new amount to your on-hand quantity of the item. It also creates journal entries to account for the difference between the old and the new amounts. Certain programs update the dollar amount for some cost methods. Examples include the following: • Last-in method - The system interactively updates this unit cost based on the last cost of the item at the time of a purchase order receipt or after an inventory adjustment. • Weighted average method - The system calculates and updates this amount by adding transaction quantities, adding transaction costs, and dividing the total cost by the total quantity. • Purchase method – The system updates similarly to the last-in method, but without landed costs.
Opt (S/O/F)	A code that indicates whether a component is standard or optional within a bill of material or for kit processing. Valid codes are: S Standard. The item is always included in any transaction involving the bill of material. O Optional. In order entry, you can specify whether the item will be included in a particular sale. F Feature. The item has features that you must specify at order entry. The default value is S.
R	A code that specifies whether a component is required. Valid codes are: Y The component is required. N The component is not a required selection during order processing. The default value is N.
D C	An option that specifies a default component. Use this field if you are creating Sales Orders using the Recurring Orders Edited Creation program (P40211Z). To do so, enter Y in this field. When you specify a kit master item, the Recurring Orders Edited Creation program automatically selects all related standard and default components.

See Also

- *Entering Item Master Information* in the *Inventory Management Guide*

Entering Production Information

Use production information to identify how the system issues each component from stock and how many days that the component is needed before or after the start date of the work order. For each component, enter an issue code and the number of days for leadtime. The Shop Floor Management system uses this production information when processing work orders.

▶ To enter production information

From the Daily PDM Discrete menu (G3011), choose Enter/Change Bill.

On Work with Bill of Material

1. Complete the following fields and click Find:
   - Branch
   - Item Number
2. Choose the item and click Select.
3. On Enter Bill of Material Information, complete the following fields:
   - Is Cd
   - Leadtime Offset

Field	Explanation
Is Cd	A code that indicates how the system issues each component in the bill of material from stock. In Shop Floor Management, it indicates how the system issues a part to a work order. Valid codes are: I Manual issue (default) F Floor stock (no issue) B Backflush (when part is reported as complete) P Preflush (when parts list is generated) U Super backflush (at pay-point operation) S Sub-contract item (send to supplier) Blank Shippable end item You can issue a component in more than one way within a specific branch/plant by using a different code on the bill of material and work order parts list. The bill of material code overrides the branch/plant value.

Field	Explanation
Leadtime Offset	The number of days that a part is needed before or after the start date of a manufacturing work order. The system adds the leadtime offset days for the part to the start date of the work order to determine the actual date that the part is required. To indicate that a part is needed prior to the work order start date, enter the days as a negative number. To indicate how many days after the work order start date that the part is required, enter a positive number.

Processing Options for Bill of Material Revisions

```
Defaults

1.  Enter a '1' to default the Component
    Branch to the Parent Branch
    displayed at the top of the form.

      Default Component Branch                    _____

2. Enter the following default values:

      Type Bill of Material                       _____

3. Enter a '1' to default the as of date
    to the current date.  If left blank,
    all dates will be shown.

      Default to Current Date                     _____

Display

1.  Enter a '1' by the following fields
    to activate them:

      Bill Type                                   _____
      Batch Quantity                              _____

Versions

Enter the version for each program. If
    left blank, version ZJDE0001 will be
    used.

      1. Single Level BOM Print                   _____
      (P30410)
      2. Multi Level BOM Print (P30415)           _____
      3. ECO Workbench (P30225)                   _____
      4. Component Maintenance (P3015)            _____
      5. ECO Header [P30BREV]                     _____
      6. Bill of Material Where Used              _____
      (P30201)
      7. Item Master (P4101B)                     _____
      8. Co/By Produced Inquiry                   _____
      (P30211)
      9. Bill of Material Inquiry                 _____
      (P30200)

Edits
```

1. Enter a ’1’ to validate for an existing Branch/Item record.

   Item Branch validation _____

Sort

1. Enter a ’1’ to sequence by Line Number or enter a ’2’ to sequence by Operation. (FUTURE)

   Sequence By _____

Interop

1. Enter the Transaction type for the interoperability transaction. If left blank, outbound interoperability processing will not be performed.

   Transaction Type _____

2. Enter the version of “Process Outbound Bill of Material” (R3002Z1O). If left blank ZJDE0001 will be used.

   Outbound Processing Version _____

3. Enter a ’1’ to write the before image for a change transaction. If left blank, only the after image will be written.

   Before Image Processing _____

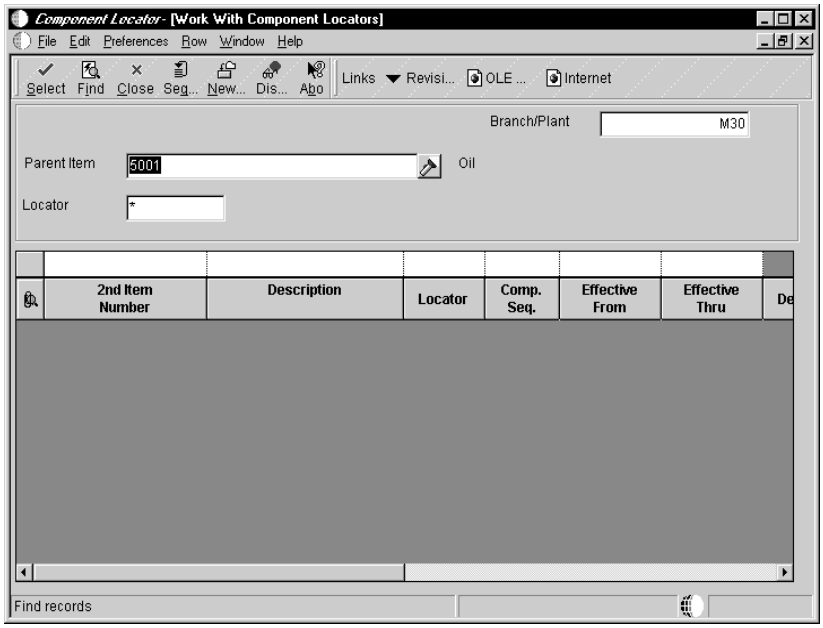
Entering Component Locators

Use component locators to indicate the specific location of a component within a subassembly. You can define locations with any combination of characters, but the number of locations must equal the quantity per assembly.

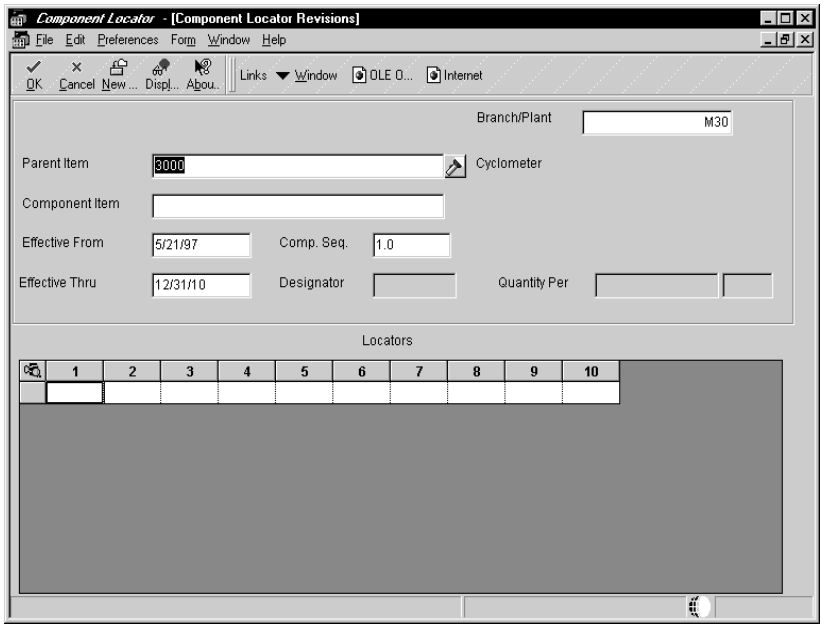
▶ To enter a component locator

From the Daily PDM Discrete menu (G3011), choose Component Locator.

On Work With Component Locators



1. Complete the following fields and click Find:
   - Branch/Plant
   - Parent Item
2. Select the row and click Select.



3. On Component Locator Revisions, complete the following field:

   - Locators 1

Field	Explanation
Locators 1	This field identifies the specific location of a component in the assembly of an item, for example, the location of a part on a circuit board.

Processing Options for Component Locator Revisions

```
Defaults

1.  Enter the date to be used as the
    Effective From date. If left blank,
    the current date will be used.

      Effective From Date                    _____________

2.  Enter the Sales or Purchasing
    Category Code that will be used as
    the Designator (e.g. S1 = Sales
    Category Code 1, P1 = Purchasing
    Category Code 1, etc.)

      Designator                             _____________

Versions

1.  Enter the version to use for each
    application listed.  If left blank,
    version "ZJDE0001" will be used.

      Bill of Materials (P3002)              _____________
```

Reviewing Bills of Material

You can review bills of material to plan and research engineering change orders, view the results of a pending product change, determine the effect of an item shortage, or evaluate capacity, manpower, equipment needs, and other resources.

Reviewing bills of material consists of the following tasks:

- Verifying bills of material
- Locating bills of material
- Comparing bills of material
- Printing bill of material information
- Changing multiple bills of material

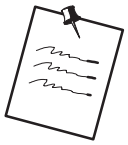
Verifying Bills of Material

From the Advanced Product Data Management menu (G3031), choose Integrity Analysis.

To check your bills of material for low-level codes and product structure errors, such as when a parent item is listed as a component of itself, use the Integrity Analysis program.

This program generates a report that identifies any bills of material that you need to correct. If the report indicates errors, you should correct the bills of material and run the Integrity Analysis program again. When the program does not find errors in the bills of material, it updates the low-level codes in both the Item Master and the Item Branch tables (F4101 and F4102).

J.D. Edwards recommends that you run the Integrity Analysis program immediately after a data conversion, such as system startup, and then on a periodic basis, such as two or four times a year. You should also run the Integrity Analysis program before running the Simulated Cost Rollup or DRP/MPS/MRP Generation programs to prevent the system from updating tables with incorrect product structures.



As an alternative to running Integrity Analysis, you can activate online validation, whereby the system validates the items as you enter them. In this procedure, the system does not allow you to enter recursive components. An error message displays, and you are not able to enter a parent item as a component of itself.

See Also

- *Setting Up Manufacturing Constants*

Locating Bills of Material

There are several forms that display bill of material information. Depending on the information that you want to see, you can review a parent item and its components, the subassemblies of components, a graphical tree structure of a bill of material, and where used information for a component. Locating bills of material consists of the following optional tasks:

- ❑ Locating a single-level bill of material
- ❑ Locating a multilevel bill of material
- ❑ Locating a bill of material graphically
- ❑ Locating where a component is used in a single-level bill of material
- ❑ Locating where a component is used in a multilevel bill of material

See Also

- *Reviewing Leadtimes* for more information about leadtimes

Locating a Single-Level Bill of Material

Use Single Level Bill Inquiry to find and view the components of a bill of material. You can also use Single Level Bill Inquiry to view parts availability and leadtime information.

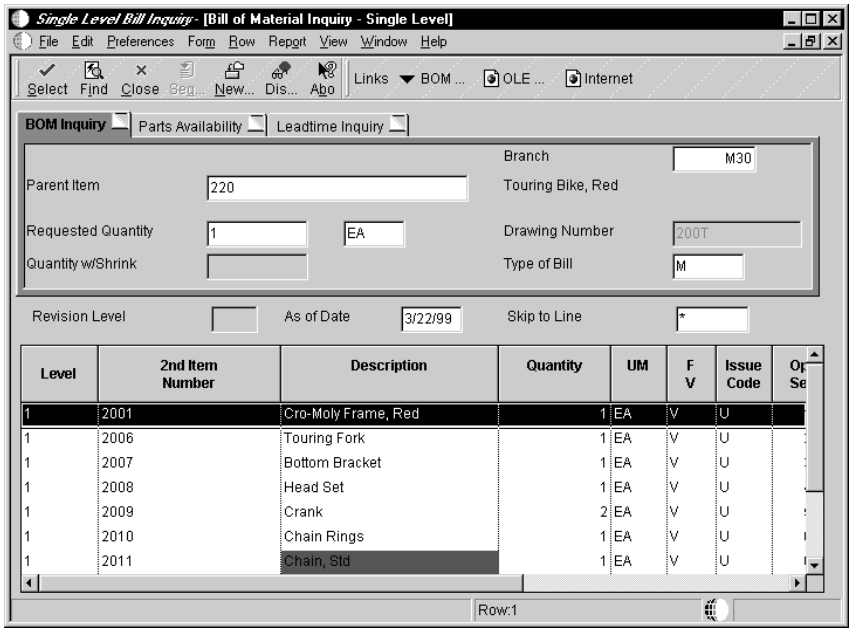
You can use processing options to select which bill of material components appear. For example, you can do the following:

- Choose to view phantom items, or only the components of the phantom items.
- Choose to view subassemblies, or only the components of the subassemblies.
- Consolidate entries that have the same component branch, component item, and fixed and variable information into one component record. You can also consolidate across a single level or multiple levels.
- Choose to view processes, or only discrete bills of material.
- Adjust the quantity of parent or component items based on shrink information from the Item Branch table (F4102), and scrap and yield information from the bill of material.

▶ To locate a single-level bill of material

From the Daily PDM Discrete menu (G3011), choose Single Level Bill Inquiry.

On Bill of Material Inquiry – Single Level



1. Click the BOM Inquiry tab, complete the following fields, and then click Find:
   - Branch
   - Parent Item
   - Requested Quantity
   - Type of Bill
   - As of Date
2. From the View menu, choose an option to view the bill of material.

Locating a Multilevel Bill of Material

Use Multi Level Bill Inquiry to find and view the components of a bill of material. You can also use Multi Level Bill Inquiry to view parts availability and leadtime information.

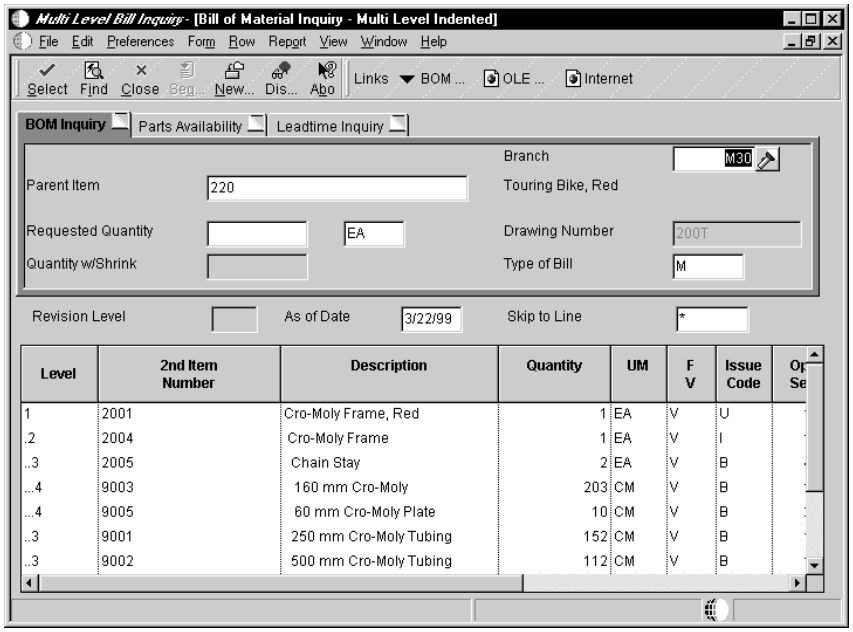
You can use processing options to select which bill of material components appear. For example, you can do the following:

- Choose to view phantom items, or only the components of the phantom items
- Choose to view subassemblies, or only the components of the subassemblies
- Consolidate entries that have the same component branch, component item, and fixed and variable information into one component record
- Adjust the quantity of parent or component items based on shrink information from the Item Branch table (F4102), and scrap and yield information from the bill of material

To locate a multilevel bill of material

From the Daily PDM Discrete menu (G3011), choose Multi Level Bill Inquiry.

On Bill of Material Inquiry – Multi Level Indented



1. Click the BOM Inquiry tab, complete the following fields, and then click Find:
   - Branch
   - Parent Item
   - Requested Quantity
   - Type of Bill
   - As of Date
2. From the View menu, choose an option to view the bill of material.

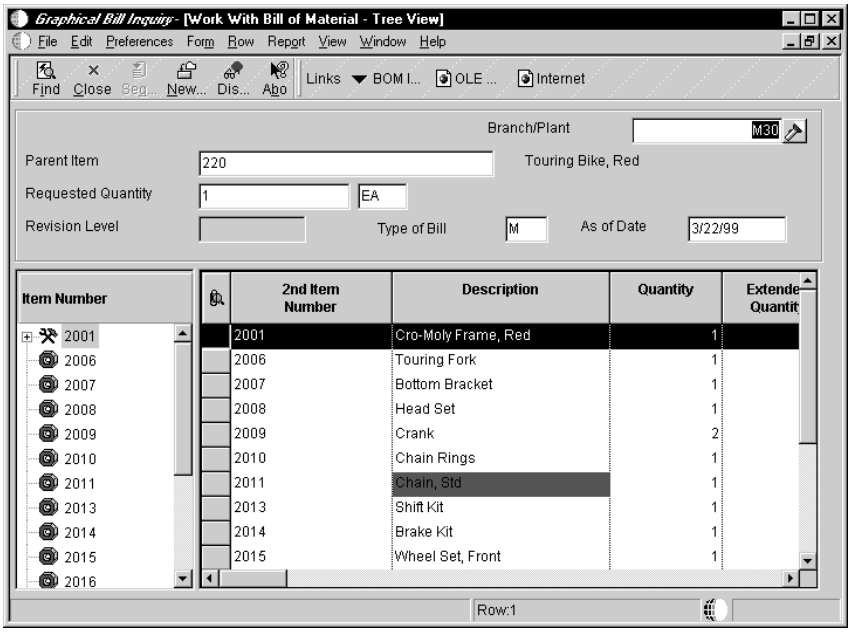
Locating a Bill of Material Graphically

Use the Graphical Bill Inquiry form to review each parent item and its components organized in a tree structure. You can change the inquiry type and display sequence based on the options you choose. For example, you can view a single-level, multilevel, or indented bill of material, and you can view the bill sequenced by line number, operation sequence number, or item number.

▶ To locate a bill of material graphically

From the Daily PDM Discrete menu (G3011), choose Graphical Bill Inquiry.

On Work With Bill of Material - Tree View



1. Complete the following fields:
   - Branch/Plant
   - Parent Item
   - Requested Quantity
   - Type of Bill
   - As of Date
2. From the View menu, choose Options to change the inquiry type and display sequence.

Processing Options for Bill of Material Inquiry

Default

1. Information Displayed (1=Simple Inquiry, 2=Parts Availability 3=Leadtime Inquiry

   Mode – Processing _____

2. Type of Inquiry. (1=Single Level, 2=Multi-level, 3=Multi-level Indented)

   Mode – Inquiry _____

3. Enter the default bill type.

   Type Bill of Material _____

4. Enter a '1' to sequence by line number, or '2' to sequence by operation.

   Display Sequence Options _____

Versions

1. Enter the version of the application being called. If left blank, ZJDE0001 will be used.

   Bill Of Material Print (R30460) _____
   ECO Workbench (P30225) _____
   ECO Header (P48020) _____
   Bill of Material Revisions (P3002) _____
   Item Master (P4101B) _____
   Process Inquiry (P30240) _____
   Work With Routing Master (P3003) _____
   Item Availability (P41202) _____
   Item Cross Reference (P4104) _____
   Item Search (P41200) _____

Availability

1. Enter a '1' if Safety Stock is to be subtracted from the quantity on hand. If left blank, safety stock will not be subtracted.

   Safety Stock _____

2. Enter a '1' to display negative items.

   _____

Leadtime

1. Enter a ’1’ to display calculated leadtime values. Leave blank to display actual values from Item Branch file.

   Leadtime Actual _____

Process 1

1. Enter a ’1’ to include Phantom Items. Leave blank to exclude them.

   Phantom Items _____

2. Enter a ’1’ to include process items. Leave blank to exclude them.

   Show Process Items _____

3. Enter a ’1’ to include text lines. Leave blank to exclude them.

   Show text lines _____

4. Enter a ’1’ to display consolidated component rows.

   Consolidate Component Items _____

Process 2

1. Enter a ’1’ to include subassemblies.

   Include Subassemblies _____

2. Enter a ’1’ to adjust requested quantity for shrinkage.

   Include Shrink in calculation _____

3. Enter a ’1’ to adjust extended quantity for scrap.

   Include Scrap in calculation _____

4. Enter a ’1’ to adjust extended quantity for yield.

   Include Yield in Calculation _____

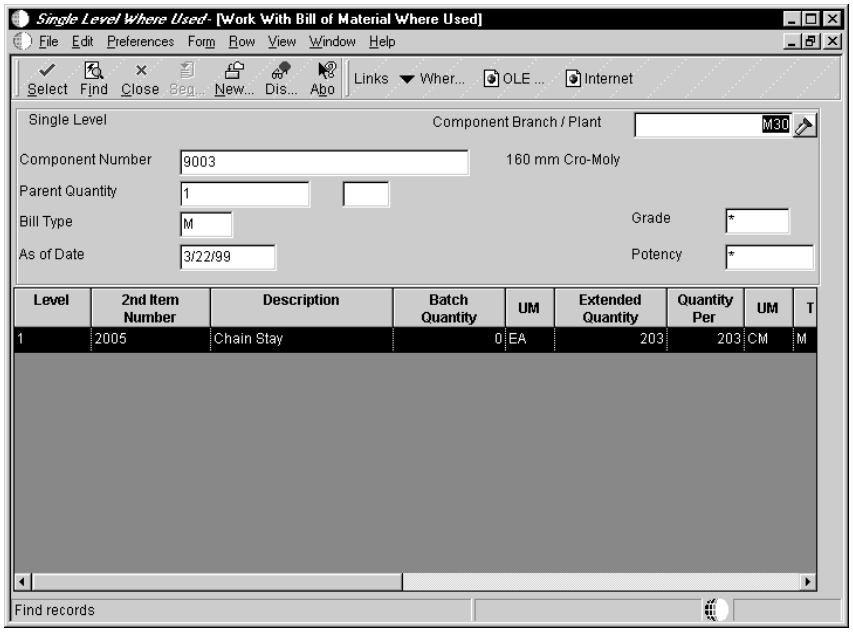
Locating Where a Component is Used in a Single-Level Bill of Material

Use Single Level Item Where Used to review components in single level bills of material. When you enter a component number, the system displays all of its parent items.

▶ To locate where a component is used in a single-level bill of material

From the Daily PDM Discrete menu (G3011), choose Single Level Where Used.

On Work With Bill of Material Where Used



1. Complete the following fields and click Find:
   - Component Branch / Plant
   - Component Number
   - Units – Batch Quantity
   - Effective – Thru Date
2. From the View menu, choose an option to view the bill of material.

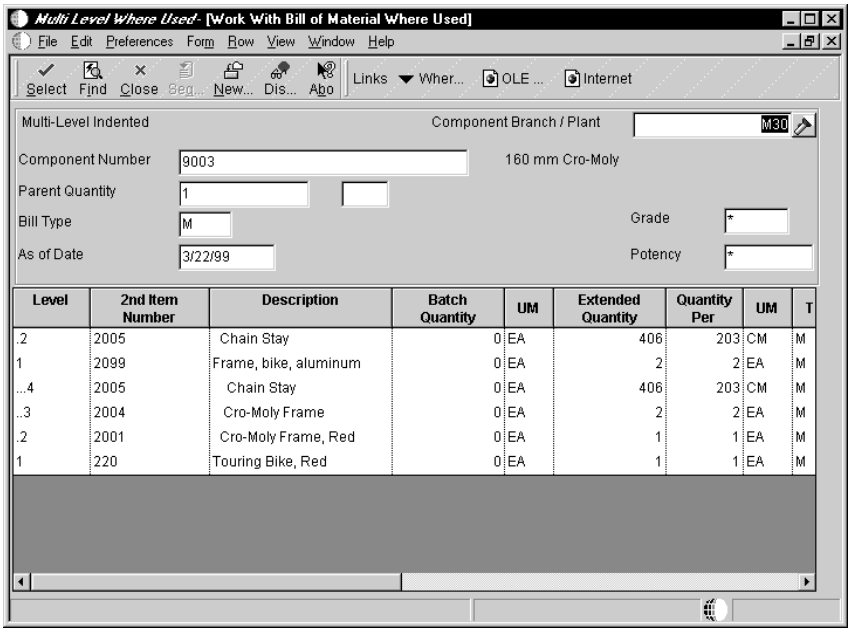
Locating Where a Component is Used in a Multilevel Bill of Material

Use Multi Level Item Where Used to review components in multilevel bills of material. When you enter a component number, the system displays all of its parent items and subassemblies.

▶ To locate where a component is used in a multilevel bill of material

From the Daily PDM Discrete menu (G3011), choose Multi Level Where Used.

On Work With Bill of Material Where Used



1. Complete the following fields and click Find:
   - Component Branch / Plant
   - Component Number
   - Quantity
   - As of Date
2. From the View menu, choose an option to view the bill of material.

Processing Options for Bill of Material Where Used

Defaults

1. Enter the Screen Default type: ’1’ Single Level, ’2’ Multi-Level, ’3’ Multi-Level Indented

   Mode – Processing _____

2. Enter the default Bill Type to be used. If left blank, ’M’ will be used for all Bill Types

   Default Type Bill of Material _____

Versions

1. Enter the version to execute of the following programs. If left blank, the “ZJDE0001” will execute.

   Item Search (P41200) _____
   Material Where Used Print (R30420) _____
   Item Master (P4101B) _____
   Where Used Inquiy (P13226) _____
   Manufacturing Work Order Processing (P48013) _____
   Bill of Material Inquiry (P30200) _____

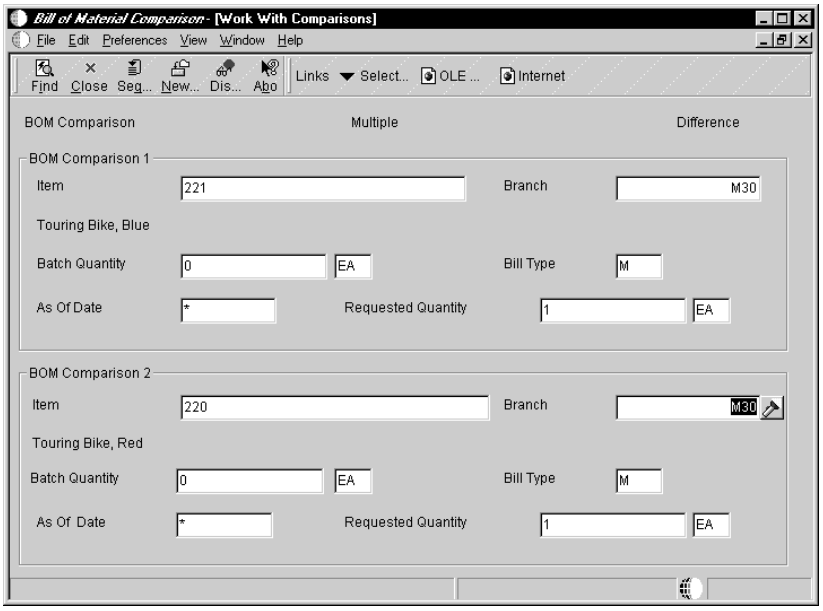
Comparing Bills of Material

Use Bill of Material Comparison to compare bills of material. Based on the view mode that you select, the system displays all the components of both bills or only those components that are different between the two.

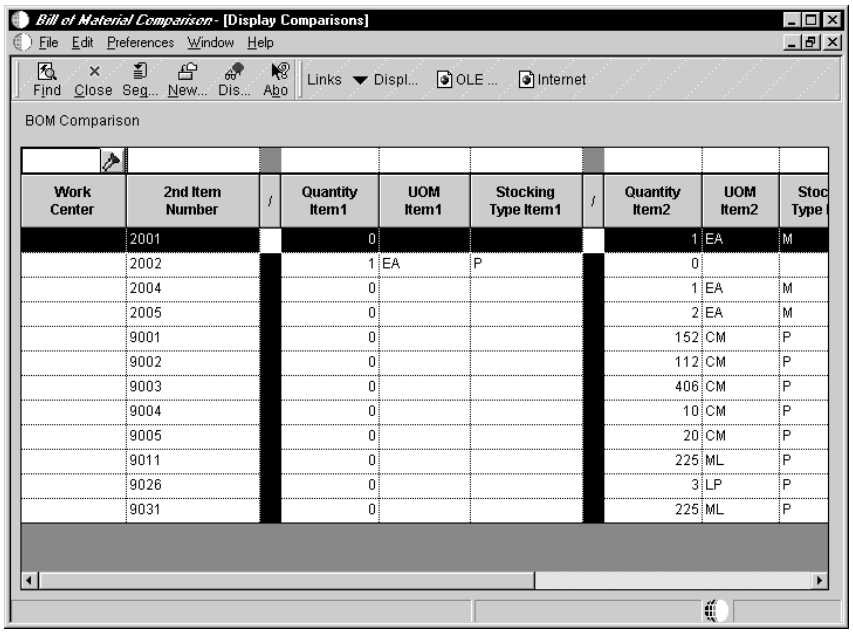
▶ To compare bills of material

From the Daily PDM Discrete menu (G3011), choose Bill of Material Comparison.

On Work With Comparisons



1. From the View menu, choose Mode and then choose All or Difference.
2. Complete the following fields under the BOM Comparison 1 heading:
   - Item
   - Branch
3. Complete the following fields under the BOM Comparison 2 heading and click Find:
   - Item
   - Branch



4. On Display Comparisons, review the following fields:
   - Work Center
   - 2nd Item Number
   - Quantity Item1
   - Quantity Item2

Field	Explanation
Item	A number that identifies the item number. It can be in any of the three formats (short, long or 3rd item number).
Work Center	An alphanumeric field that identifies a separate entity within a business for which you want to track costs. For example, a business unit might be a warehouse location, job, project, work center, branch, or plant. You can assign a business unit to a voucher, invoice, fixed asset, employee, and so on, for purposes of responsibility reporting. For example, the system provides reports of open accounts payable and accounts receivable by business units to track equipment by responsible department. Security for this field can prevent you from locating business units for which you have no authority. NOTE: The system uses the job number for journal entries if you do not enter a value in the AAI table.

Field	Explanation
2nd Item Number	A number that identifies the item. The system provides three separate item numbers plus an extensive cross-reference capability to alternate item numbers. These item numbers are: 1. Item Number (short) – An 8-digit, computer-assigned item number. 2. 2nd Item Number – The 25-digit, free–form, user defined, alphanumeric item number. 3. 3rd Item Number – Another 25-digit, free–form, user defined, alphanumeric item number. In addition to these three basic item numbers, the system provides an extensive cross-reference search capability. Numerous cross-references to alternate part numbers can be user defined (for example, substitute item numbers, replacements, bar codes, customer numbers, or supplier numbers).
Quantity Item1	The quantity of finished units that you expect this bill of material or routing to produce. You can specify varying quantities of components based on the amount of finished goods produced. For example, 1 ounce of solvent is required per unit up to 100 units of finished product. However, if 200 units of finished product is produced, 2 ounces of solvent are required per finished unit. In this example, you would set up batch quantities for 100 and 200 units of finished product, specifying the proper amount of solvent per unit.
Quantity Item2	The number of units that the system applies to the transaction.

Processing Options for Bill of Material Comparison

```
Defaults

      1. Enter bill type. If Left Blank,          _____________
      'M' will be used.
      2. Enter one of the following: '1'          _____________
      -  Single-level Comparison. '2' -
      Multi- level Comparison. If left
      blank, '1' will be used.

Process1

      1. Enter a 'D' to list records              _____________
      with a Difference, or 'A' to list
      All. If blank,  'D' will be used.
      2. Enter the Default View Mode,             _____________
      '1' for BOM Comparison, '2' for
      Parts List Comparison, or '3' for
      Parts List to BOM Comparison. You
      may also change the View Mode
      during run time.
```

```
Process2

      1. Enter one of the following: '1'          _____________
      – Summary by  Work Center   '2' -
      Summary by Item. If left blank,
      '2' will be default.

Process3

      1. Subassemblies Included. '0' –            _____________
      Exclude subassemblies. '1' -
      include subassemblies
      2. Phantoms Included. '0' –                 _____________
      Exclude Phantoms. '1' – Include
      Phantoms
```

Printing Bill of Material Information

You can generate several reports to review bill of material information. These reports consist of the following:

- Single-level bill of material report
- Multilevel bill of material report
- Where used item report

J.D. Edwards recommends that you do not change the first two data sequences from the settings in the DEMO version of these reports.

Single-Level Bill of Material Report

From the Periodic PDM Discrete menu (G3021), choose Single Level Bill of Material Report.

Single Level Bill Report displays an item's first-level components. Use the processing options to print additional information such as the following:

- Phantom items
- Process items
- Subassemblies
- Component locators
- Detail
- Text lines

The system retrieves the data for this report from the Bill of Material Master table (F3002).

See Also

- *R30460, Single Level Bill of Material* in the *Reports Guide* for a report sample

Processing Options for Single Level Bill Report

Default

1. Type of Inquiry. (1=Single Level, 2=Multi-Level, 3=Multi-Level Indented

   Mode – Inquiry _____

2. Enter the “As of Date” for Bill of Material. If left blank, today’s date will be used.

   As of Date _____

3. Enter the default bill type.

   Type Bill of Material _____

4. Enter a ’1’ to sequence by line number, or ’2’ to sequence by operation.

   Display Sequence _____

Print

1. Enter a ’1’ to print a second line of detail, for items appearing on the report. If left blank, only one line of detail will be printed.

   Detail Line _____

2. Enter a ’1’ to print the component locations.

   Component Locators _____

Enter a ’1’ to print Parent Item Detail Line.

   Parent Item Detail Line _____

Process

1. Enter a ’1’ to include Phantom Items. Leave blank to exclude them.

   Phantom Items _____

2. Enter a ’1’ to include process items. Leave blank to exclude them.

   Process Items _____

3. Enter a '1' to include subassemblies.
   Leave blank to exclude them.

   Include Subassemblies _____

4. Enter a '1' to include text lines.
   Leave blank to exclude them.

   Print Text Lines _____

5. Enter a '1' to display consolidated
   component rows.

   Consolidate Component Items _____

Multilevel Bill of Material Report

From the Periodic PDM Discrete menu (G3021), choose Multi Level Bill of Material Report.

The Multi Level Bill Report lists all the levels of an item's components. Run this report if you want to view all the subassemblies of the components for an item. Use the processing options to print additional information such as the following:

- Phantom items
- Process items
- Subassemblies
- Component locators
- Detail
- Text lines

The system retrieves the data for this report from the Bill of Material Master table (F3002).

Processing Options for Multi Level Bill of Material Report

Default

1. Type of Inquiry. (1=Single Level,
   2=Multi-Level, 3=Multi-Level
   Indented

   Mode – Inquiry _____

2. Enter the "As of Date" for Bill of
   Material. If left blank, today's
   date will be used.

   As of Date _____

3. Enter the default bill type.

   Type Bill of Material _____

4. Enter a ’1’ to sequence by line number, or ’2’ to sequence by operation.

Display Sequence _____

Print

1. Enter a ’1’ to print a second line of detail, for items appearing on the report. If left blank, only one line of detail will be printed.

Detail Line _____

2. Enter a ’1’ to print the component locations.

Component Locators _____

Enter a ’1’ to print Parent Item Detail Line.

Parent Item Detail Line _____

Process

1. Enter a ’1’ to include Phantom Items. Leave blank to exclude them.

Phantom Items _____

2. Enter a ’1’ to include process items. Leave blank to exclude them.

Process Items _____

3. Enter a ’1’ to include subassemblies. Leave blank to exclude them.

Include Subassemblies _____

4. Enter a ’1’ to include text lines. Leave blank to exclude them.

Print Text Lines _____

5. Enter a ’1’ to display consolidated component rows.

Consolidate Component Items _____

Where Used Item Report

From the Periodic PDM Discrete menu (G3021), choose Where Used Item Report.

The Where Used Item report lists the parent assemblies that contain a specific component. Run this report if you want to view all the subassemblies of the components for an item, and the indented level of these subassemblies. Use the processing options to display the data by single level, multilevel, or indented, and to specify whether to include the second line of detail.

The system retrieves the data for this report from the Bill of Material Master table (F3002).

Processing Options for Material Where Used List

```
Format Option

1. Select the Mode or Style of report to
    be created: 1 = Single Level;  2 =
    Multi- Level;  3=Multi-Level
    Indented

      Mode of Report                          _____________

2. Enter a '1' to print a second line of
    detail on the report.  If left
    blank, only one line of detail will
    be printed.

      Print Line of Detail                    _____________
```

Changing Multiple Bills of Material

From the Advanced Product Data Management menu (G3031), choose Where Used Update.

You change multiple bills of material by running the Where Used Update program. You can use this program to perform mass updates to information such as the following:

- Replacing one component item with another
- Deleting an item
- Changing effective dates for an item
- Changing the quantity per assembly for an item
- Changing the issue type code
- Changing the unit of measure

You use Data Selection to specify the items that you want to change. You then use processing options to define the change. The system locates all occurrences of the item

(as a component) and updates the bills of material. You can also update a component with past or future effective dates.

If you want to make changes to a bill of material and remove the old records, run the program twice. First, run the program to create the new records, and then run it again to delete the old ones.

The system stores changes in the Bill of Material Master table (F3002). The existing parts lists, MRP calculations, and costing information are not automatically updated.

In addition, the program updates the following fields in other tables:

- Low Level Code (in the Item Master table, F4101)
- Net Change Flag (in the Item Balance Tag table, F4102J)

You can run this program in either proof or final mode. In proof mode, the system generates a report of the proposed changes for your review but doesn't update the data. In final mode, the system generates a report that identifies the changes and updates the data.

You can potentially change many bills of material in your system when you run this program. J.D. Edwards recommends that you run this program in proof mode first to verify your choices before running it in final mode to change the data. You might want to restrict access to this program.

Before You Begin

❑ Review your bills of material to verify that the item that you are updating is active (within the effective dates) and appears in at least one bill of material. See Locating Bills of Material.

Processing Options for Where Used BOM Update

```
Defaults 1

1.  Enter the Branch/Plant location to
    select for Bill of Material changes.
    This is a required field; if left
    blank, no processing will be
    performed.

      Branch/Plant                          _____________

2.  Enter the new Component Item number.
    If left blank, no change will be
    made to the Component Item number.

      New Component Item Number             _____________

3.  Enter the new Quantity Per amount.
    If left blank, no change will be
    made to the Quantity Per amount.
```

New Quantity Per _____

4. Enter the new Quantity Per Unit of Measure. If left blank, no change will be made to the Quantity Per Unit of Measure.

   New Unit of Measure _____

Defaults 2

1. Enter the new Effective From Date. If left blank, today's date will be used.

   New Effective From _____

2. Enter the new Effective Thru Date. If left blank, no change will be made to the Effective Thru Date.

   New Effective Thru Date _____

3. Enter the new Issue Type Code. If left blank, no change will be made to the Issue Type Code.

   New Issue Type Code _____

Process

1. Enter a "1" if this is to be run in Final Mode. If left blank, the program will be run in Proof Mode.

   Final Mode _____

2. Enter a "1" to DELETE the existing record(s) from the BOM file. No updating will be performed when Delete is selected.

   Delete Mode _____

Edits

1. Enter a "1" to validate the new component against the Item Branch file (F4102). If left blank, the new item will not be validated.

   Item Branch Validation _____

Work Centers and Routings

Work Centers and Routing Instructions

After you have defined an item's components using a bill of material, you must specify where each operation occurs and the sequence of operations necessary to manufacture the item. Work centers consist of people and machines where routing operations occur. Routing instructions define the operations that are required to produce an item, and the leadtime for an item at each routing instruction step.

Work centers and routing instructions consist of the following tasks:

- ❑ Working with work centers
- ❑ Working with routing instructions
- ❑ Working with leadtimes

Work Centers

A work center consists of people and machines. It is a specific production facility on the shop floor where the routing instruction operations occur. For each work center, you can define the following:

- Number, description, and associated business unit
- Queue and move times
- Operator, machine, and hours-per-day capacity
- Rates for setup, labor, machine, and overhead

Work centers consist of the following topics:

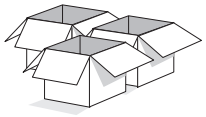
- ❑ Work center system integration
- ❑ Work center arrangement

Examples of work centers include lathe, drill, heat treat, mill, and cut-off.

Work Center
(Where you build the item)

Operation 1

Operation 2



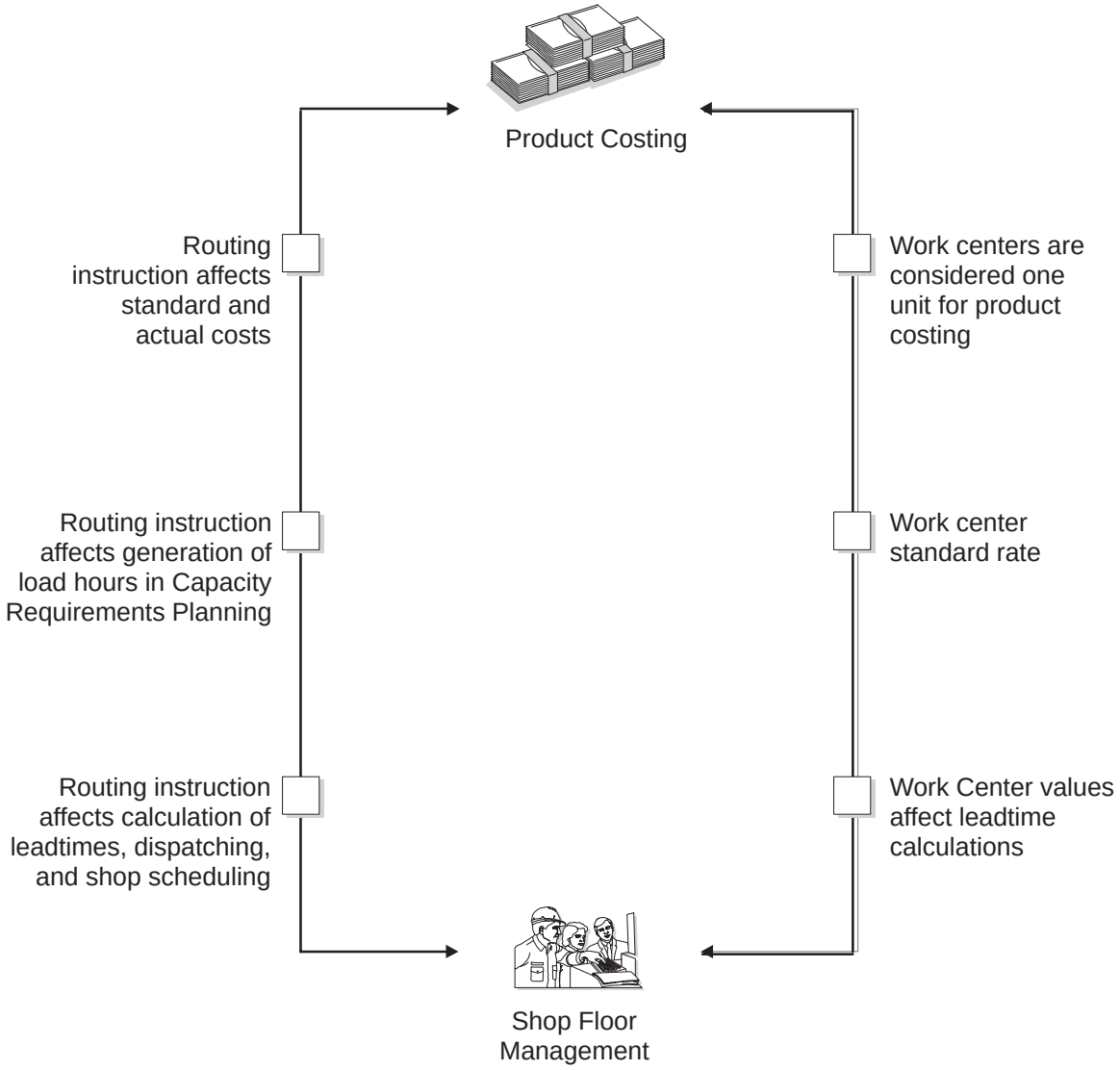
Operation 3

A work center enables you to do the following:

- Set up a dispatch group for departments that perform similar operations
- Specify if an operation is a reporting point for material, or labor, or both
- Define crew size per work center
- Specify the work center efficiency for Product Costing
- Define work center labor, machine, and setup rates

Work Center System Integration

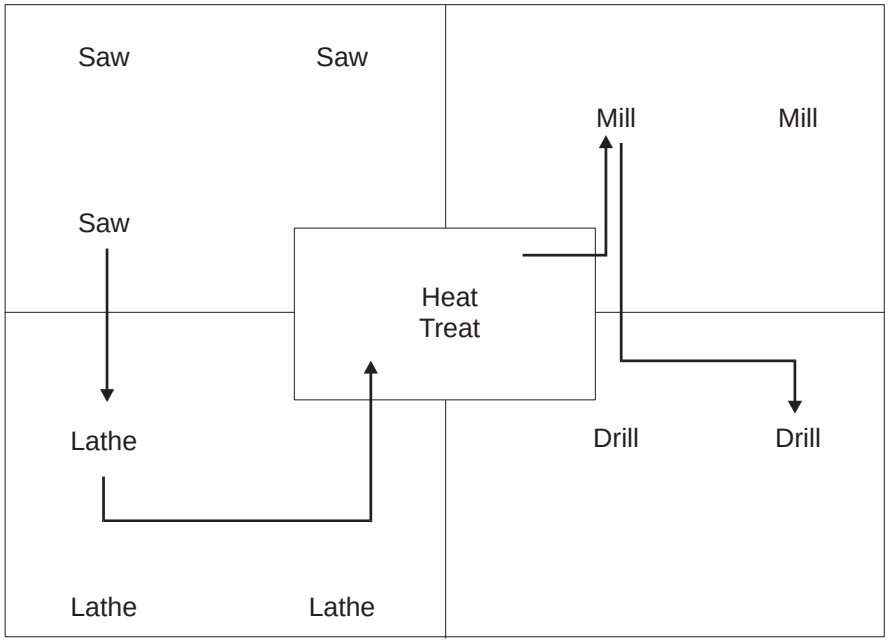
The following graphic illustrates how work centers in the Product Data Management system are integrated with other manufacturing systems.



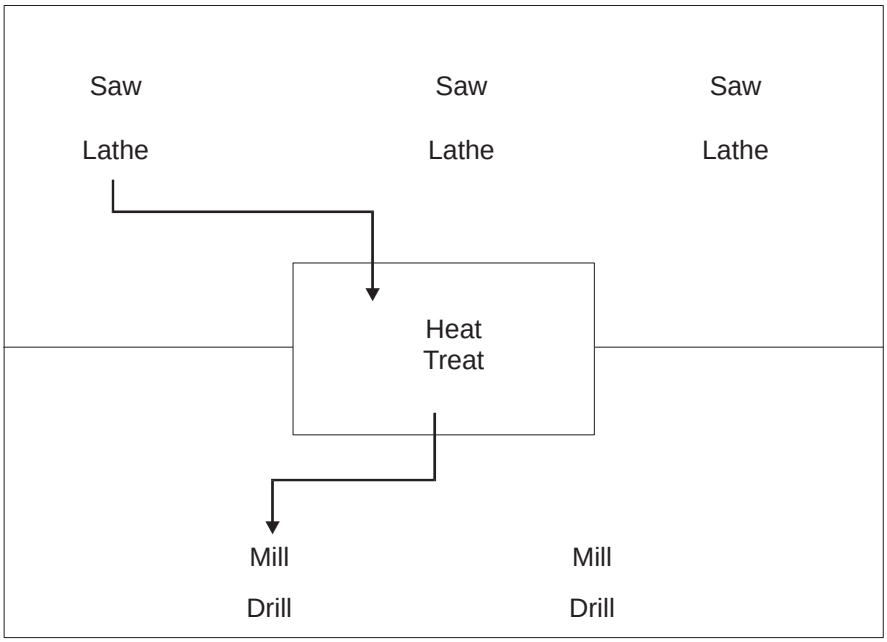
Work Center Arrangement

You should arrange your work centers so that work in process moves efficiently from one area to the next.

In the following example, the same types of equipment are located in the same areas. This functional layout provides an indirect path that might produce bottlenecks in the work flow.



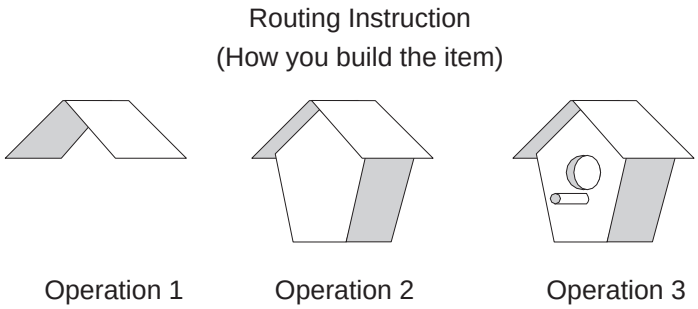
In the following example, equipment is grouped by operation. This structured flow layout provides a direct path and ensures efficient work flow.



Routing Instructions

After you have defined the item's components (bill of material), and where each operation occurs on the factory floor (work center), you must define the sequence of operations necessary to manufacture the item (routing instruction).

Routing instructions define the steps or operations that are required to produce a manufactured item. Routing instructions are critical for the Shop Floor Management, Capacity Requirements Planning, and Product Costing systems, and for measuring production efficiency.



For each item, you define routing instructions that include the following information:

- Production process
- Tool requirements
- Operator skill level
- Inspection criteria
- Operations
- Sequence
- Applicable work centers
- Standards for setup, machine, and labor times

Routing instructions consist of the following topics:

- ❑ Features
- ❑ Master routing instruction
- ❑ Batch routing instruction
- ❑ Alternate operation

Features

Specific routing instruction features enable you to do the following:

- Use the effective from and thru dates to enter and date routing instruction changes as they occur
- For multiplant environments, set up identical or different routing instructions for an item by plant
- Define the sequence of operations
- Add multiline descriptions for each operation
- Record a tool ID number for each operation
- Attach descriptive text to an operation
- Define outside operations
- Use master routing instructions to create one routing instruction for parts that use the same manufacturing steps
- Use batch routing instructions for products that are commonly made in batch quantities

Master Routing Instruction

The master routing instruction allows you to create one routing instruction for many parts that use the same manufacturing steps. This eliminates the need for duplicate routing instructions. For example, during the manufacture of furniture, the frame and fabric might change, but the routing instruction is the same.

Product Data Management uses the master routing instruction for an item in the following situations:

- You have checked the Master Routing check box on Manufacturing Constants for the branch/plant where the item will be manufactured.
- You have set up the master routing instruction as an item.
- You have defined a cross-reference for the item using the master routing instruction.
- You have defined an item routing instruction for the item of the master routing instruction.

Batch Routing Instruction

Batch routing instructions are useful in industries such as pharmaceuticals, foods, or petroleum, where products are manufactured in fixed quantities or batches. You can create different batch routing instructions for the same item by branch, type, batch quantity produced, or a combination of these.

Alternate Operation

You can define an alternate routing instruction operation to be performed only if required, such as using drill B if drill A is unavailable for any reason. An alternate routing instruction operation is information for shop floor personnel. The system ignores it during product costing and backscheduling.

Working with Work Centers

You use work centers to define each production facility on the shop floor where routing instruction operations occur. Once you have set up the work centers, you can enter costing and accounting information so that you can generate reports and journal entries.

Working with work centers consists of the following tasks:

- ❑ Entering work centers
- ❑ Entering costing and accounting information
- ❑ Reviewing operations by work center (optional)

The system stores work center information in the Work Center Master table (F30006).

Before You Begin

- ❑ Define all work centers as business units. See *Creating Business Unit Structures* in the *General Accounting Guide*.

See Also

- *Generating Resource Units Automatically* in the *Manufacturing and Distribution Planning Guide* for information about refreshing resource units for work centers

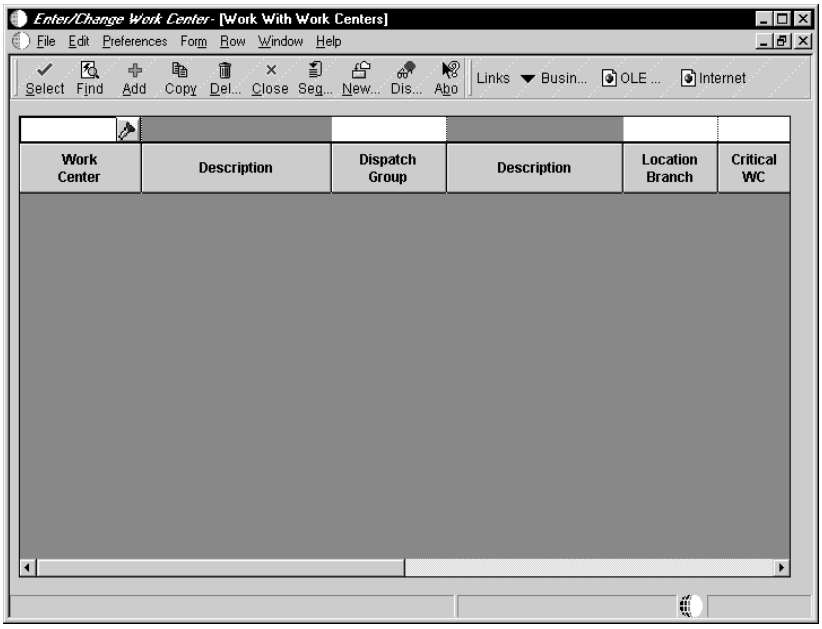
Entering Work Centers

Enter work center information that corresponds to the facilities on your shop floor, such as, dispatch group, pay point, crew size, and queue, move, and replenishment hours.

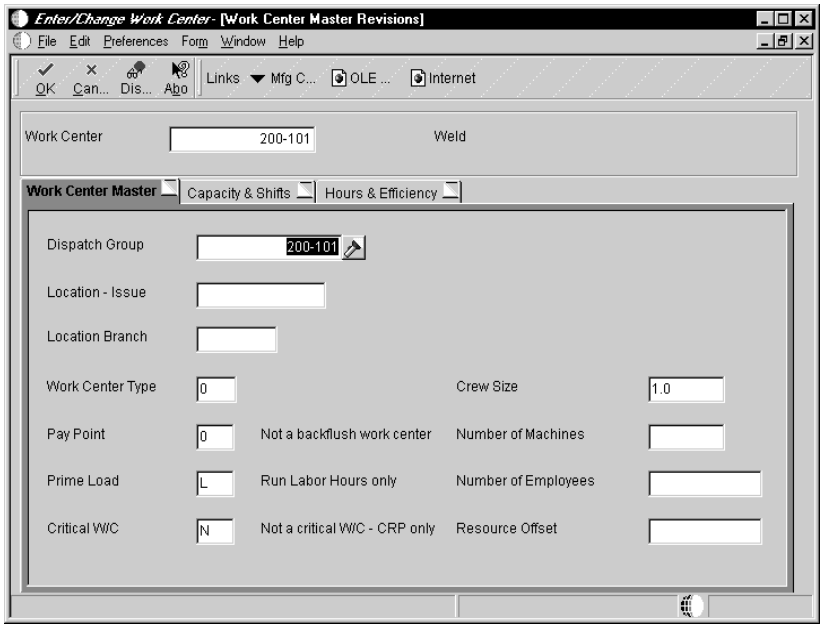
▶ To enter work centers

From the Daily PDM Discrete menu (G3011), choose Enter/Change Work Center.

On Work With Work Centers



1. Click Add.



2. On Work Center Master Revisions, click the Work Center Master tab, and complete the following fields:
    - Dispatch Group
    - Location – Issue
    - Location Branch
    - Work Center Type
    - Pay Point
    - Prime Load
    - Critical W/C
    - Crew Size
    - Number of Machines
    - Number of Employees
    - Resource Offset
3. Click the Hours & Efficiency tab, complete the following fields, and then click OK:
    - Efficiency
    - Utilization
    - Queue Hours
    - Move Hours
    - Replen. Hrs

Field	Explanation
Dispatch Group	A category code used to group work centers within an overall business unit. For example, you can use this code to group similar machines operating out of several work centers that report to one business unit.
Location – Issue	The storage location from which goods will be moved.
Work Center Type	A code that defines the type of work center. Valid values are : 0 Stand alone work center 1 Production line in a repetitive environment
Pay Point	A code that indicates whether a work center has labor, material, or both, backflushed through it when quantities are reported against operations occurring in the work center. If you do not override the routing record, the system uses the work center value as the default. Valid codes are: 0 Not a backflush work center B Backflush material and labor M Backflush material only L Backflush labor only P Preflush material only
Prime Load	A code that determines if a work center is machine or labor intensive. The system also uses prime load codes in Resource Requirements Planning and Capacity Requirements Planning calculations to develop load profiles. Valid codes are: L Run labor hours only M Machine hours only B Run labor plus setup labor hours C Machine plus setup hours O Other (will not generate resource units)
Critical W/C	A code that identifies the work center as critical or not critical when the system calculates capacity. Valid values are: N Not a critical work center 1 A critical work center in calculating resource requirement planning only 2 A critical work center in calculating capacity requirements planning only 3 A critical work center in calculating resource requirements planning and capacity requirements planning 4 Not a capacity work center (will not be generated in capacity planning) NOTE: The system displays Type 3 work centers whenever type 1 or type 2 is selected in this field.

Field	Explanation
Crew Size	The number of people who work in the specified work center or routing operation. The system multiplies the Run Labor value in the Routing Master table (F3003) by crew size during costing to generate total labor amounts. If the Prime Load Code is L or B, the system uses the total labor hours for backscheduling. If the Prime Load Code is C or M, the system uses the total machine hours for backscheduling without modification by crew size. . . . . . *Form-specific information* . . . . . . For Shop Floor Management: If you leave the Hours field on the Routing Revisions form blank, the system uses the value entered in this field for leadtime and scheduling calculations.
Number of Machines	The normal number of machines in this work center. When you run the Work Center Resource Units Refresh program, this number is multiplied by the number of work hours per day from the Manufacturing Constants table (F3009) to generate the total gross machine hours available in the work center each day.
Number of Employees	The normal number of employees in this work center. When you run the Work Center Resource Units Refresh program, the system multiplies this number by the Number of Work Hours Per Day from the Manufacturing Constants table (F3009) to generate the total gross labor hours available in the work center each day.
Resource Offset	A value used in the Resource Profile table (F3303) to determine the number of days that the actual use of a work center resource should be offset from the forecasted need date.

Field	Explanation
Efficiency	A user defined value that indicates how efficiently a work center operates. This value usually refers to staff efficiency. When you enter a value in this field, and the Modify Cost by Work Center Efficiency field in the Job Shop Manufacturing Constants table (F3009) is set to Y, the system creates a new cost component (B4) from the cost calculated from the direct labor cost (B1). For example, if the constant is set to Y, the value of this field is 80%, and the direct labor cost is 10, the system creates a B4 cost component for 2 in the Item Cost Component Add-Ons table (F30026). The Refresh Resource Units program also uses this value as a default when calculating rated capacity. Enter percents as whole numbers. For example, enter 80% as 80.00. Note: The system expects that the routing times entered for each operator are the actual times it takes to complete an operation. Efficiency does not affect total cost. Efficiency does reassign some of the costs into different cost components. Efficiency does not change the duration or backscheduling of a work order.
Utilization	A percentage that indicates how intensively a work center is being used. This value usually refers to machine use. It is the ratio of the direct time charged for production activities to the planned hours. The Refresh Resource Units program also uses this value as a default when calculating rated capacity. Enter percents as whole numbers. For example, enter 80% as 80.00.
Queue Hours	The total hours that an order is expected to be in queue at work centers and moving between work centers. The system stores this value in the Item Branch table (F4102). You can calculate this value using the Leadtime Rollup program or you can enter it manually. When you run the Leadtime Rollup program, the system overrides manual entries and populates the table with calculated values.

Field	Explanation
Move Hours	The planned hours that are required to move the order from this operation to the next operation in the same work center. If the Routing Master values are blank, the system retrieves the default value from the work order routing. However, the system uses these values only for backscheduling variable leadtime items. . . . . . *Form-specific information* . . . . . . If you leave the Hours field on the Routing Revisions form blank, the system uses the value in this field for leadtime and scheduling calculations.
Replen. Hrs	The time required before a consuming location has a replacement kanban available from its supplying location. This value is used only for kanban card processing in Shop Floor Management.

Processing Options for Enter/Change Work Center

```
Interop

1. Enter the transaction type for the
    interoperability transaction.  If
    left blank, outbound
    interoperability processing will not
    be performed.

      Type – Transaction                          _____

2. Enter a '1' to write before images
    for Outbound change transactions.
    If left blank, only after images
    will be written.

      Before Image Processing                     _____

Versions

      Manufacturing Constants (P3009)             _____
      Business Units  (P0006)                     _____
```

Entering Costing and Accounting Information

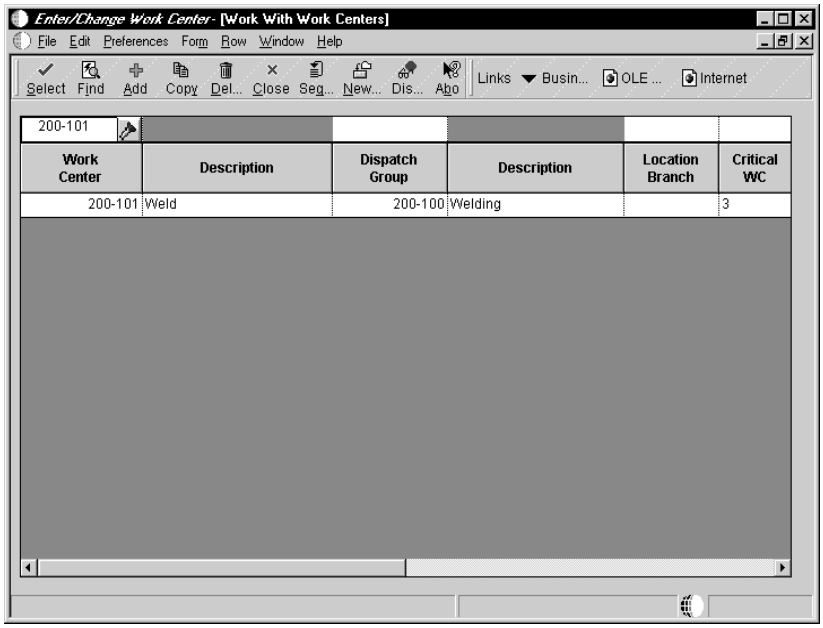
After you enter a work center, you can enter simulated rates for machine and labor hours. The Product Costing and Manufacturing Accounting systems use these values to generate reports, cost rollups, and journal entries. The Cost Rollup program uses all of these values to calculate the simulated cost.

You can update the simulated rates, but not the frozen values. The system updates frozen values when you run Frozen Update.

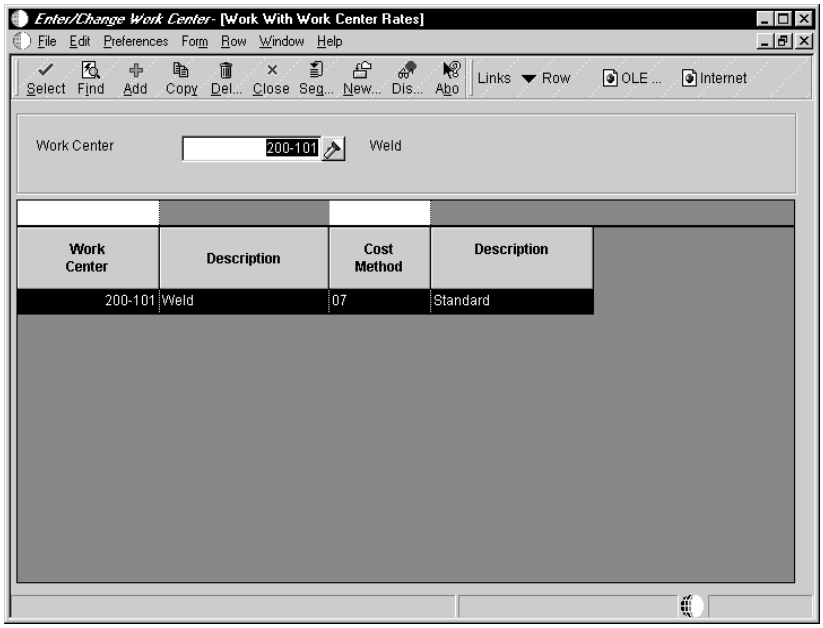
▶ To enter costing and accounting information

From the Daily PDM Discrete menu (G3011), choose Enter/Change Work Center.

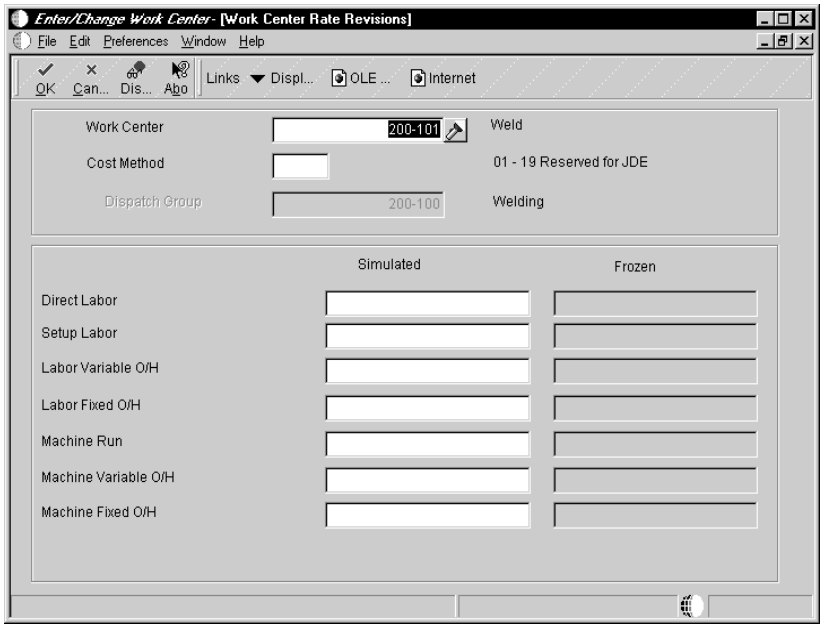
On Work With Work Centers



1. Complete the following field and click Find:
   - Work Center
2. Choose the work center, and then choose Rates from the Row menu.



3. On Work With Work Center Rates, click Add.



4. On Work Center Rate Revisions, complete the following fields and click OK:
   - Cost Method
   - Direct Labor Simulated
   - Setup Labor Simulated
   - Labor Variable O/H Simulated
   - Labor Fixed O/H Simulated

- Machine Run Simulated
- Machine Variable O/H Simulated
- Machine Fixed O/H Simulated

Field	Explanation
Cost Method	A user defined code (40/CM) that identifies a cost method. Use cost methods to indicate the method for the system to use. Cost methods 01 through 19 are reserved for J.D. Edwards use.
Direct Labor Simulated	A rate, in cost per person per hour, that the system uses with the Run Labor hours of the associated routing to calculate the standard run labor cost.
Setup Labor Simulated	A rate that the system uses with the Setup Labor Hours of the associated routing to calculate the standard setup labor cost.
Labor Variable O/H Simulated	A rate or percent, as determined on Manufacturing Constants, used to calculate the standard variable labor overhead cost. If this field is a rate, it is the cost per hour. If this field is a percent, it is the percent of direct labor. Enter percents as whole numbers. For example, enter five percent as 5.00.
Labor Fixed O/H Simulated	A rate or percent, as determined on Manufacturing Constants, used to calculate the standard fixed labor overhead cost. If this field is a rate, it is the cost per hour. If this field is a percent, it is the percent of direct labor. Enter percents as whole numbers. For example, enter five percent as 5.00.
Machine Run Simulated	A rate that the system uses with the Run Machine hours of the associated routing to calculate the standard machine labor cost.
Machine Variable O/H Simulated	A rate or percent, as determined on Manufacturing Constants, used to calculate the future standard machine overhead cost. If this field is a rate, it is the cost per hour. If this field is a percent, it is the percent of machine run. Enter percents as whole numbers. For example, enter five percent as 5.00.
Machine Fixed O/H Simulated	A rate or percent, as determined on Manufacturing Constants, used to calculate the standard fixed machine overhead cost. If this field is a rate, it is the cost per hour. If this field is a percent, it is the percent of machine run. Enter percents as whole numbers. For example, enter five percent as 5.00.

See Also

- *Updating Frozen Costs* in the *Product Costing and Manufacturing Accounting Guide* for more information about updating frozen amounts
- *Entering Work Centers* to review the processing options for Enter/Change Work Center

Reviewing Operations by Work Center

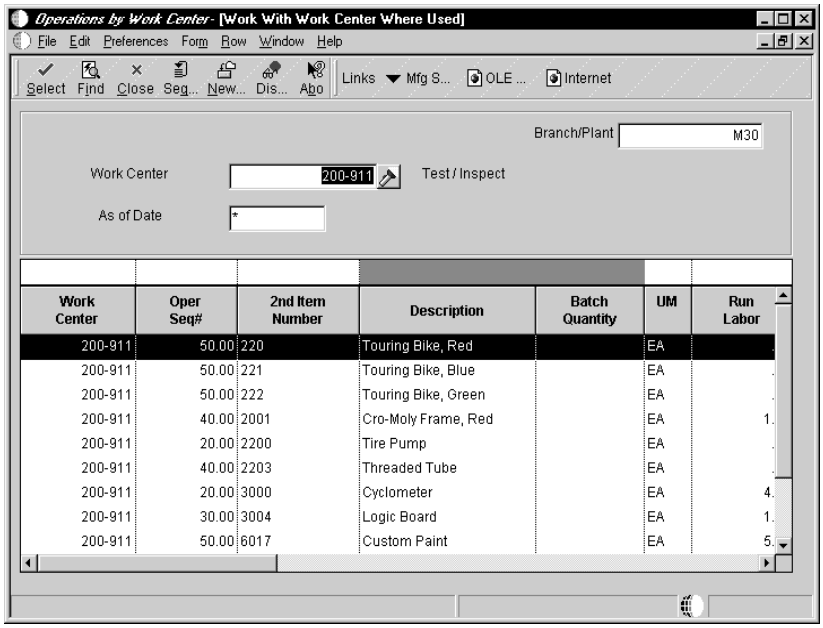
You can review operations by work center to:

- Plan capacity, resource, and manpower
- Evaluate equipment needs
- Display which items include routing instruction operations at the work center

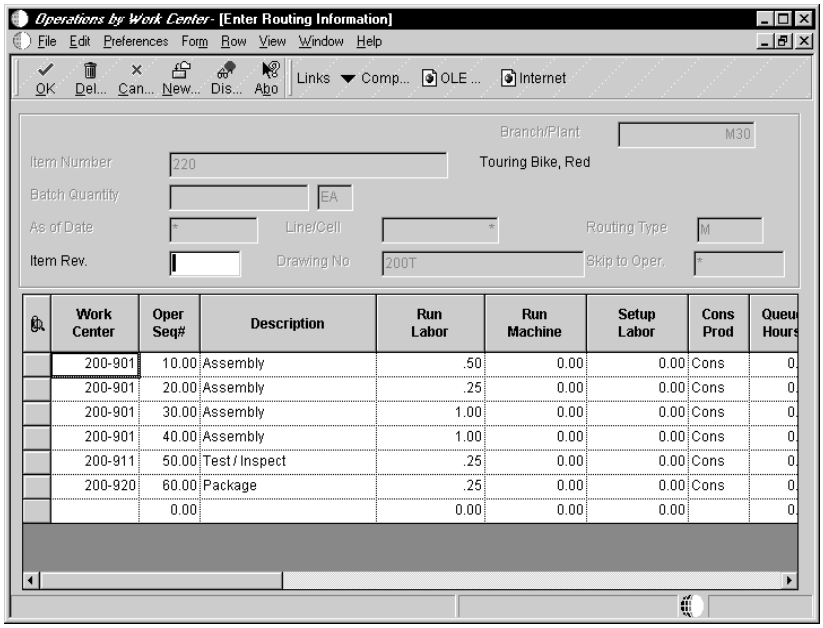
▶ To review operations by work center

From the Daily PDM Discrete menu (G3011), choose Operations by Work Center.

On Work With Work Center Where Used



1. Complete the following fields and click Find:
   - Branch/Plant
   - Work Center
2. Choose a work center and click Select.



3. On Enter Routing Information, review the following fields that display work hour information:

   - Run Labor
   - Run Machine

Working With Routing Instructions

Use routing instructions to define the sequence of operations necessary to manufacture and item.

Working with routing instructions consists of the following tasks:

- ❑ Entering routing instructions
- ❑ Entering outside operations (optional)
- ❑ Updating component scrap (optional)
- ❑ Reviewing routing instruction information (optional)
- ❑ Printing routing instruction information (optional)

Routing instruction information is stored in the Routing Master table (F3003).

Before You Begin

- ❑ If you use batch routing instructions, define your routing types and set the processing options for the Work Order Entry and Enter/Change Routing programs to activate routing batch and type functions.

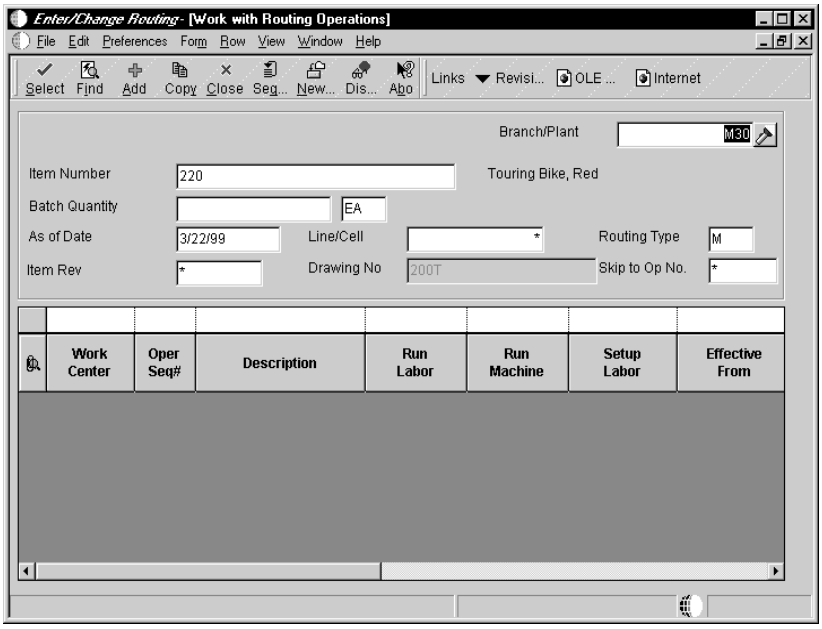
Entering Routing Instructions

After you enter a bill of material, you must define the routing instruction information for each item and for each branch/plant.

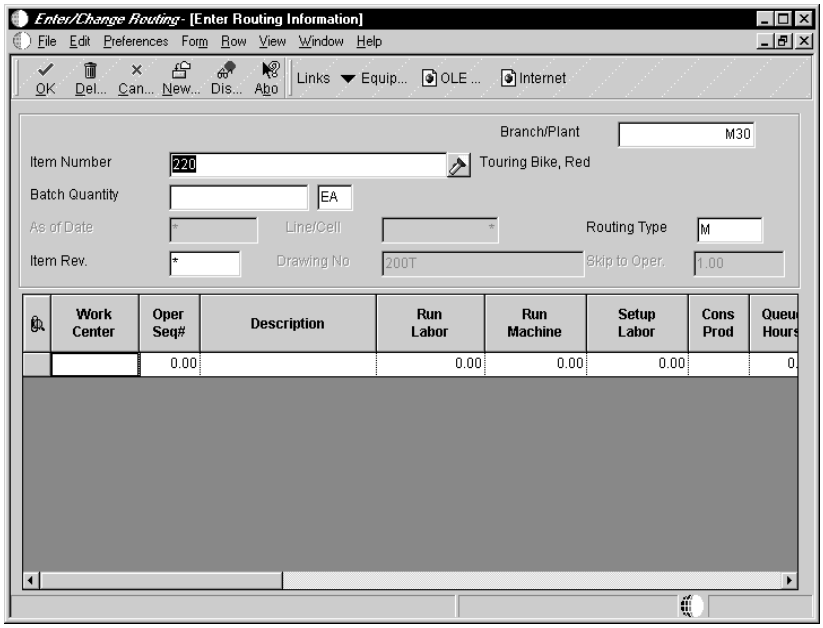
▶ To enter routing instructions

From the Daily PDM Discrete menu (G3011), choose Enter/Change Routing.

On Work with Routing Operations



1. Complete the following fields:
   - Branch/Plant
   - Item Number
   - Line/Cell
   - Routing Type
   - Item Rev
2. To enter batch information, complete the following field:
   - Batch Quantity
3. Click Add.



4. On Enter Routing Information, complete the following field:
    - Work Center
5. Complete the following optional fields:
    - Run Labor
    - Run Machine
    - Setup Labor
    - Queue Hours
    - Move Hours
    - Oper. Seq
    - Description
    - Cons Prod
    - Effective From
    - Effective Thru
    - Crew Size
    - Supplier
    - Cost Type
    - Type Oper
    - Equipment #
    - Standard Desc.
    - P C

- Craft Code
- PO (Y/N)
- Next Oper
- Yield %
- Cum Yield %
- Percent of Overlap
- Time Basis
- Consuming Location
- Resource Units
- Capacity UOM

Field	Explanation
Units – Batch Quantity	The quantity of finished units that you expect this bill of material or routing to produce. You can specify varying quantities of components based on the amount of finished goods produced. For example, 1 ounce of solvent is required per unit up to 100 units of finished product. However, if 200 units of finished product is produced, 2 ounces of solvent are required per finished unit. In this example you would set up batch quantities for 100 and 200 units of finished product, specifying the proper amount of solvent per unit.
Item Rev	A number that indicates the revision level of a routing. It is usually used in conjunction with an engineering change notice or engineering change order. The revision level of the routing should match the revision level of its associated bill of material, although the system does not check this. This value is user defined and not maintained by the system.
Run Labor	The standard hours of labor that you expect to incur in the normal production of this item. The run labor hours in the Routing Master table (F3003) are the total hours that it takes the specified crew size to complete the operation. The hours are multiplied by the crew size during shop floor release and product costing. . . . . . *Form-specific information* . . . . . . For Equipment/Plant: This is the estimated number of hours needed to complete a maintenance activity.

Field	Explanation
Run Machine	The standard machine hours that you expect to incur in the normal production of this item. . . . . . *Form-specific information* . . . . . . For Equipment/Plant Maintenance users: Entering machine hours has several consequences. If you are not using other manufacturing systems, do not enter machine hours. If you are using manufacturing systems, the machine for which the machine hours apply must be set up as a work center. If you enter machine hours in this field, the system indicates a demand for those machine hours, based on the time commitment of the work order. You should plan to take the machine out of service for the entire time necessary to complete the work order. If you enter machine hours, you can optionally complete the Percent of Overlap field to indicate any operations that can overlap previous operations. For planning purposes, the system determines the total duration of the maintenance work order based on values that you enter for machine hours and percent overlap.
Setup Labor	The standard setup hours that you expect to incur in the normal completion of this item. This value is not affected by crew size.
Work Center	An alphanumeric field that identifies a separate entity within a business for which you want to track costs. For example, a business unit might be a warehouse location, job, project, work center, branch, or plant. You can assign a business unit to a voucher, invoice, fixed asset, employee, and so on, for purposes of responsibility reporting. For example, the system provides reports of open accounts payable and accounts receivable by business units to track equipment by responsible department. Security for this field can prevent you from locating business units for which you have no authority. NOTE: The system uses the job number for journal entries if you do not enter a value in the AAI table. . . . . . *Form-specific information* . . . . . . For Product Costing, this is the work center from which costs are retrieved. For Equipment users, this is the craft or resource responsible for completing the maintenance activity. Manufacturing Accounting does not support journal entries by work center.
Description	A brief description of an item, a brief description of a remark, or a brief description of an explanation.

Field	Explanation
Cons Prod	A code that indicates whether consumed resources, produced resources, or both are defined for the operation. Valid values are: Blank No consumed or produced resources are defined for the operation. Cons Consumed resources (components, ingredients) are defined going into the operation. Prod Produced resources (co-products, by-products) are defined coming out of the operation. Both Both consumed resources (components, ingredients) and produced resources (co-products, by-products) are defined for the operation. Note: If this field is highlighted, then an intermediate exists for the operation.
Line/Cell	A number that defines a production line or cell. Detailed work center operations can be defined inside the line or cell.
Crew Size	The number of people who work in the specified work center or routing operation. The system multiplies the Run Labor value in the Routing Master table (F3003) by crew size during costing to generate total labor amounts. If the Prime Load Code is L or B, the system uses the total labor hours for backscheduling. If the Prime Load Code is C or M, the system uses the total machine hours for backscheduling without modification by crew size. . . . . . *Form-specific information* . . . . . . For Shop Floor Management: The Crew Size field on the Work Order Routing form contains the value entered on the Work Center Revision form (P3006). You can override the value by changing this field on the Work Order Routing form. However, the Work Center Revision form will not reflect this change.
Supplier	The address book number of the preferred provider of this item. You can enter the number for the supplier or you can have the system enter it each time that you receive the item from a supplier. You specify whether the system enters the supplier using processing options for Enter Receipts.

Field	Explanation
Cost Type	A code that designates each element of cost for an item. An example of the coding structure is as follows: A1 Purchased raw material B1 Direct labor routing rollup B2 Setup labor routing rollup C1 Variable burden routing rollup C2 Fixed burden routing rollup Dx Usually used for outside operation routing rollup Xx Usually used for extra add-ons, such as electricity and water The optional add-on computations usually operate with the type Xx extra add-ons. This cost structure allows you to use an unlimited number of cost components to calculate alternative cost rollups. The system then associates these cost components with one of six user defined summary cost buckets. . . . . . *Form-specific information* . . . . . . For outside operations, indicates the cost component with which to associate costs.
Type Oper	A user defined code (30/OT) that indicates the type of operation. Examples include the following: A Alternate routing TT Travel time IT Idle time T Text (Enter text at Description) . . . . . *Form-specific information* . . . . . . For Product Costing: Only operations with a “blank” type operation code are costed.
Equipment #	A 12-character alphanumeric code used as an alternate identification number for an asset. This number is not required, nor does the system assign a number if you leave the field blank when you add an asset. If you use this number, it must be unique. For equipment, this is typically the serial number.
Standard Desc.	A generic rates and message code (48/SN) that is assigned to a standard note, message, or general narrative explanation. You can use this code to add instructional information to a work order. You set up codes for this field on Standard Description.
Craft Code	A user defined code (07/G) that defines the jobs within your organization. You can associate pay and benefit information with a job type and apply that information to the employees who are linked to that job type.
PO (Y/N)	Determines if the Work Order Generation program (P31410) creates a purchase order for a subcontracted operation within a routing. Valid values are: Y Yes, create a purchase order. N No, do not create a purchase order.

Field	Explanation
Next Oper	The operation number with which the current operation can be simultaneously processed.
Yield %	The planned output yield percent for a step. The Planned Yield Update program uses this value to update the cumulative percent in the bill of material and the operation scrap percent in the routing. Materials Requirements Planning uses the step scrap percent and the existing component scrap percent to plan component demand.
Cum Yield %	The cumulative planned output yield percent for a step. The system uses this value to adjust the operation step scrap percent for the components at that operation step. This enables the MRP system to use the operation step scrap percent along with the existing component scrap percent to plan component demand.
Percent of Overlap	A number that indicates the percentage that successive operations can overlap. The actual overlap percentage entered for the operation sequence is the percent by which that operation overlaps the prior operation. For example, if you enter 80%, this indicates that work can begin on the overlapped operation when 20% of the prior operation is completed. Notes: 1. Overlapping has no effect on move and queue calculations. 2. The percent entered must be less than or equal to 100%. Enter percents as whole numbers: 5% as 5.00
Time Basis	A user defined code (30/TB) that indicates how machine or labor hours are expressed for a product. Time basis codes identify the time basis or rate to be used for machine or labor hours entered for every routing step. For example, 25 hours per 1,000 pieces or 15 hours per 10,000 pieces. You can maintain the time basis codes in Time Basis Codes. The system uses the values in the Description-2 field on the User Defined Codes form for costing and scheduling calculations. The description is what the code represents, but is not used in calculations.
Consuming Location	The storage location from which goods will be moved.
Resource Units	A number that indicates how many of the line's resource units are needed to produce one item.
Capacity UOM	A unit of measure used to express the capacity of a production line, for example, stamps, injections, and so on.

Processing Options for Work With Routing Master

Display

1. Enter a ’1’ next to the following fields to activate the field on the form.

   Line/Cell _____
   Routing Type _____
   Batch Quantity _____

Defaults

1. Enter the values to preload to the screen at initial inquiry.

   Type of Routing _____

Process

1. Select the screen mode (’0’ = Inquiry, ’1’ = Revise).

   Mode – Processing _____

2. Enter a ’1’ to update the component operation scrap percent in the Bill of Material for the components on the operation and the Cumulative Yield Percent on the Routing, when updating the operation yield percent.

   Update _____

Interop

1. Enter the transaction type for the interoperability transaction. If left blank, outbound interoperability processing will not be performed.

   Transaction Type _____

2. Enter the version of “Process Outbound Routings” (R3003Z1O). If left blank, ZJDE0001 will be used.

   Outbound Processing Version _____

3. Enter a ’1’ to write the before image for a change transaction. If left blank, no before images will be written.

   Before Image Processing _____

Entering Outside Operations

You can define an outside routing operation for an operation that is to be performed on an item by an external supplier.

If you manually link the routing instruction to a work order, the system includes alternate routing instruction steps with the work order routing instructions. If the Process Work Orders program links the routing instruction, then the system does not include the routing instruction steps.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

▶ To enter outside operations

From the Daily PDM Discrete menu (G3011), choose Enter/Change Routing.

On Work with Routing Operations

1. Complete the following fields and click Find:
   - Branch/Plant
   - Item Number
   - Line/Cell
   - Routing Type
2. Choose the item and click Select.
3. On Enter Routing Information, complete the following fields for the outside operation:
   - Supplier
   - PO (Y/N)
   - Cost Type

Field	Explanation
Cost Type	A code that designates each element of cost for an item. An example of the coding structure is as follows: A1 Purchased raw material B1 Direct labor routing rollup B2 Setup labor routing rollup C1 Variable burden routing rollup C2 Fixed burden routing rollup Dx Usually used for outside operation routing rollup Xx Usually used for extra add-ons, such as electricity and water The optional add-on computations usually operate with the type Xx extra add-ons. This cost structure allows you to use an unlimited number of cost components to calculate alternative cost rollups. The system then associates these cost components with one of six user defined summary cost buckets. . . . . . *Form-specific information* . . . . . . For outside operations, indicates the cost component with which to associate costs.

Updating Component Scrap

From Advanced Product Data Management (G3031), choose Planned Yield Update.

During manufacturing, material loss often occurs at operations. Examples of loss include evaporation or items damaged during move time. You can update the amount of materials and labor hours to account for operation loss by running Planned Yield Update.

For the operations that you choose, this program uses the operational planned yield percent to update the cumulative percent for the routing instruction, and the operation scrap percent for the bill of material.

You enter the operational planned yield percent value on the routing instruction. This value represents the planned output yield percent for a step. The system uses this value to adjust the operation scrap percent for the components at that step. This enables Material Requirements Planning to use the step scrap percent along with the existing component scrap percent to plan component demand.

The system updates the cumulative planned yield percent on the routing instruction. This represents the item quantity that an operation is expected to produce. It is the ratio of usable output to input quantity. This value can be less than 100% due to loss at one or more operations. The system uses this value to increase or decrease the amount of labor hours needed to make up for loss within the operation.

The system updates operation scrap percent on the bill of material. The operation scrap percent represents the expected amount of scrap material created at each operation. The system calculates this value by compounding the yield percentages from the last

operation to the first operation. The system uses this value to increase or decrease the amount of materials to account for loss within the operation.

Example: Component Scrap

Step	Operational Planned Yield %	Cumulative Planned Yield %	Operation Scrap %
40	80%	80%	(100%/80%) - 100% = 25%
30	90%	80% x 90% = 72%	(100%/72%) - 100% = 39%
20	100%	72% x 100% = 72%	(100%/72%) - 100% = 39%
10	95%	72% x 95% = 68%	(100%/68%) - 100% = 47%

Processing Options for Planned Yield Update

```
Defaults

Enter the “As of” date for the Planned
    Yield Update.  If left blank the
    current date will be used.

      Date 01                                    _____________
```

Reviewing Routing Instruction Information

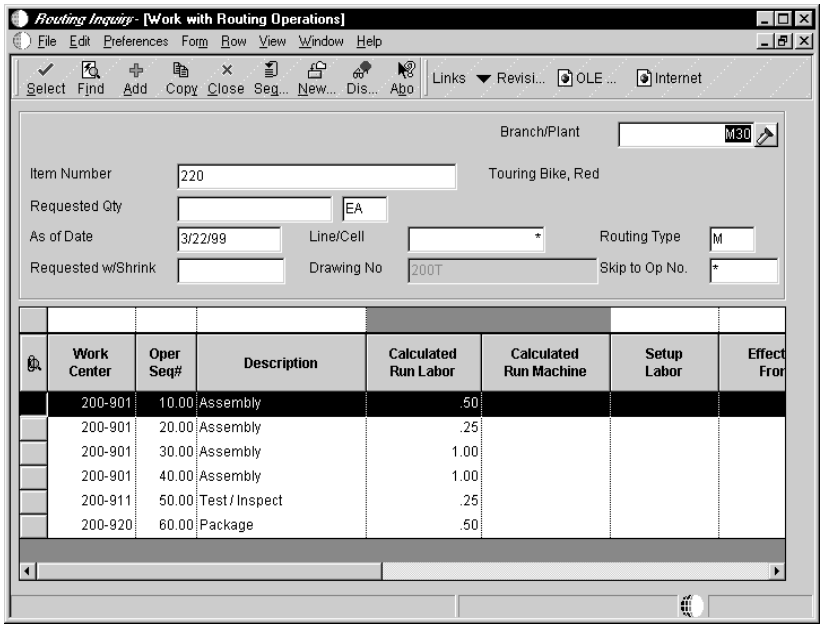
Use Routing Inquiry to verify operations, labor, and setup hours of a routing instruction.

When you have defined more than one routing instruction for an item, the system displays all available routing instructions in a separate window from which you can select a routing to work with.

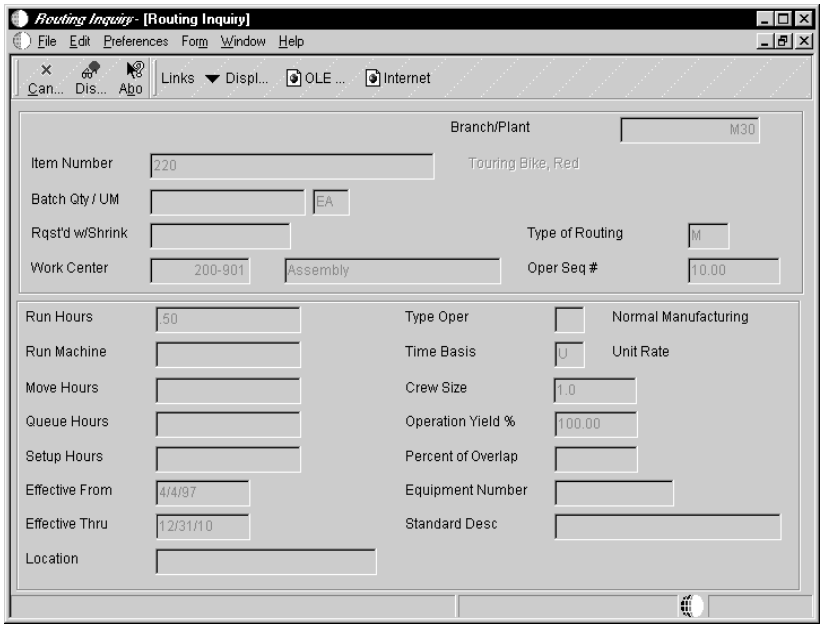
▶ To review routing instruction information

From the Daily PDM Discrete menu (G3011), choose Routing Inquiry.

On Work with Routing Operations



1. Complete the following fields and click Find:
   - Branch/Plant
   - Item Number
2. Choose an operation, and then choose Inquiry from the Row menu.



3. On Routing Inquiry, the following fields display leadtime information:
   - Run Hours
   - Run Machine
   - Setup Hours

See Also

- *Entering Routing Instructions* to review the processing options for Routing Inquiry

Printing Routing Instruction Information

From the Periodic PDM Discrete menu (G3021), choose Routing Instructions Report.

Use the Routing Instructions report to print all routing instruction operations for an item.

The system retrieves the data for this report from the Routing Master table (F3003).

J.D. Edwards recommends that you do not change the order of the first three data selections.

Working with Leadtimes

Determining leadtime is an essential part of any manufacturing or scheduling process. For any product that you purchase or manufacture, you encounter a time lag between when you order or start the item and when you receive or finish it. To account for the lag, you must estimate the extra time and allow for it in your planning.

Actual leadtimes display the leadtimes as updated in the Item Branch table by the Leadtime Rollup program. Calculated leadtimes display how many days you must start to manufacture a part prior to the need date of the parent.

First, define leadtimes for an item at each routing instruction step, then run the Leadtime Rollup program to update leadtime information in the Item Manufacturing Data table.

The system stores leadtime information in the Bill of Material Master table (F3002).

Working with leadtimes consists of the following tasks:

- ❑ Reviewing leadtimes
- ❑ Generating leadtimes

See Also

- *Appendix A: Leadtimes*

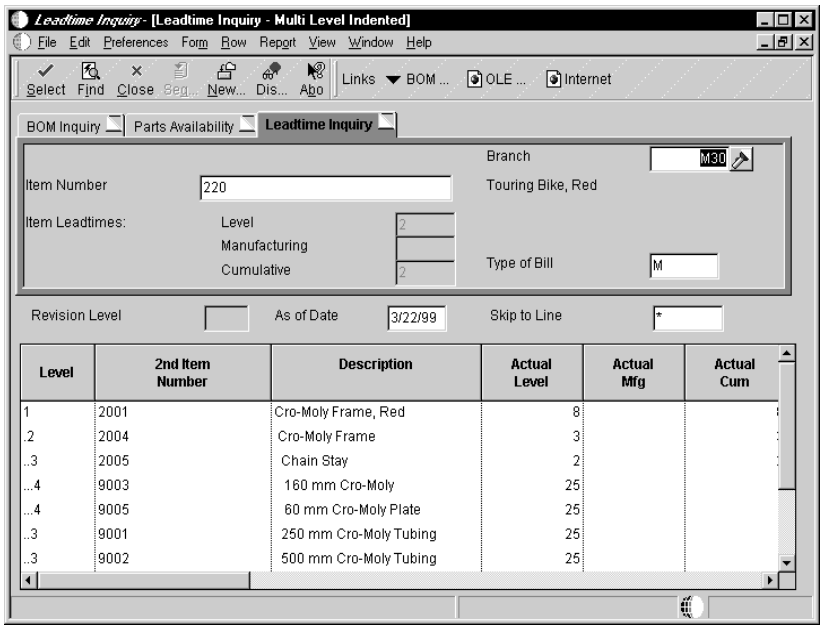
Reviewing Leadtimes

You can review leadtimes to compare both actual and calculated leadtimes for an item.

▶ To review leadtimes

From the Daily PDM Discrete menu (G3011), choose Leadtime Inquiry.

On Leadtime Inquiry – Multi Level Indented



1. Click the Leadtime Inquiry tab, complete the following fields, and then click Find:
   - Branch
   - Item Number
2. Review the following fields that display leadtime information:
   - Level
   - Manufacturing
   - Cumulative
   - Type of Bill
3. From the View menu, choose one of the following options to change the leadtime information display:
   - Single Level
   - Multi Level

- Multi Level Indented

Field	Explanation
Level	A value that represents the leadtime for an item at its assigned level in the production process, as defined on Plant Manufacturing Data. The system uses this value to calculate the start dates for work orders using fixed leadtimes. Level leadtime is different for purchased and manufactured items: Purchased – The number of calendar days required for the item to arrive at your branch/plant after the supplier receives your purchase order. Manufactured – The number of workdays required to complete the fabrication or assembly of an item after all the components are available. You can enter level leadtime manually on Manufacturing Values Entry, or you can use the Leadtime Rollup program calculate it. To calculate level leadtime using the Leadtime Rollup program, you must first enter a quantity in the Manufacturing Leadtime Quantity field in the Item Branch table (F4102).
Manufacturing	The total number of days required to build an item from its lowest level components to the final assembly. This value is the total of the level leadtimes for all manufactured items, plus the highest manufacturing leadtime for all its components. If all components are purchased, the manufacturing leadtime equals the item's level leadtime. Purchased item leadtimes are not included in the calculation of manufacturing leadtimes. You can enter the manufacturing leadtime manually or you can have the system calculate it when you run the Leadtime Rollup program.
Cumulative	The total number of days required to build an item from its lowest level components to the final assembly. The system calculates the value differently for manufactured and purchased items. Manufactured – The total of all level leadtimes for all manufactured items, plus the highest cumulative leadtime of all its components. Purchased – The item's level leadtime. Purchased item leadtimes are included in the calculation of cumulative leadtimes. You can enter this value manually or you can have the system calculate it when you run the Leadtime Rollup program.

Field	Explanation
Type of Bill	A user defined code (40/TB) that designates the type of bill of material. You can define different types of bills of material for different uses. For example: M Standard manufacturing bill RWK Rework bill SPR Spare parts bill The system enters bill type M in the work order header when you create a work order, unless you specify another bill type. The system reads the bill type code on the work order header to know which bill of material to use to create the work order parts list. MRP uses the bill type code to identify the bill of material to use when it attaches MRP messages. Batch bills of material must be type M for shop floor management, product costing, and MRP processing.

See Also

- *Locating Bills of Material* to review the processing options for Leadtime Inquiry

Generating Leadtimes

From the Advanced PDM menu (G3031), choose Leadtime Rollup.

You must generate leadtimes for the Material Requirements Planning and Capacity Requirements Planning systems. The Leadtime Rollup program calculates planned level leadtimes for manufactured items and updates them on Item Manufacturing Data in the Item Branch table (F4102). This program calculates the following:

- Queue and setup hours
- Leadtime per unit
- Level, manufactured, and cumulative leadtimes for selected items

You cannot run this program in proof mode. It updates the records according to the processing options you choose. Changes to leadtimes will affect the Materials Requirements Planning and Capacity Requirements Planning systems. Run this program without any data selection and with no changes to data sequencing.

Processing Options for Leadtime Rollup

Defaults

1. Enter the Branch/Plant to be processed or an '*' for all Branches.

   Branch _____

2. Enter date for routing effectivity. Blanks will default to today's date.

   As of Date _____

Repetitive Manufacturing

Repetitive Manufacturing Setup

Repetitive manufacturing dedicates entire production lines to a family of products. These product families share similar components and routing instructions. Generally, these products are manufactured in a continuous process, which requires less inventory movement to and from the production line. Work center setup and changeover times between related products are kept to a minimum.

Repetitive environments define production in terms of units per hour. The capacity for the line is determined by one constraining operation. Scheduling this line requires the tools to schedule, sequence, and balance the production. It is very important to balance the line so that the workload is distributed evenly along the production line and you can produce a mix of products with different constraining operations. This product mix, when properly sequenced, allows the production line to operate in a consistent and efficient manner.

All items that are produced in a repetitive manufacturing environment must have an Order Policy Code value of 5 on the Manufacturing Data program. This value defines the item as a rate scheduled item.

Repetitive manufacturing setup in the Product Data Management system consists of the following tasks:

- ❑ Setting up shift information
- ❑ Setting up kanbans

Example: Manufacturing Bicycle Frames

The following table illustrates a production line operating in a repetitive manufacturing environment. This production line is manufacturing three aluminum bicycle frames for three different bicycles.

Consuming Location	Material	Operation Number	Work Center	Description
LA.10	50mm aluminum tubing	10	R–112	Cut to length
		20	R–121	Mill ends
		30	R–122	Drill mounting holes and pin
LA.10	Rear assembly, touring	40	R–112	Cut to length
		50	R–121	Mill ends
		60	R–134	Form rear assembly
LA.70	Head tube light Bottom tube	70	R–101	Weld frame
LA.80	Front fork, touring	80	R–103	Inspect welds

Repetitive Terminology

The following topics describe terminology with which you should be familiar with before working with repetitive manufacturing:

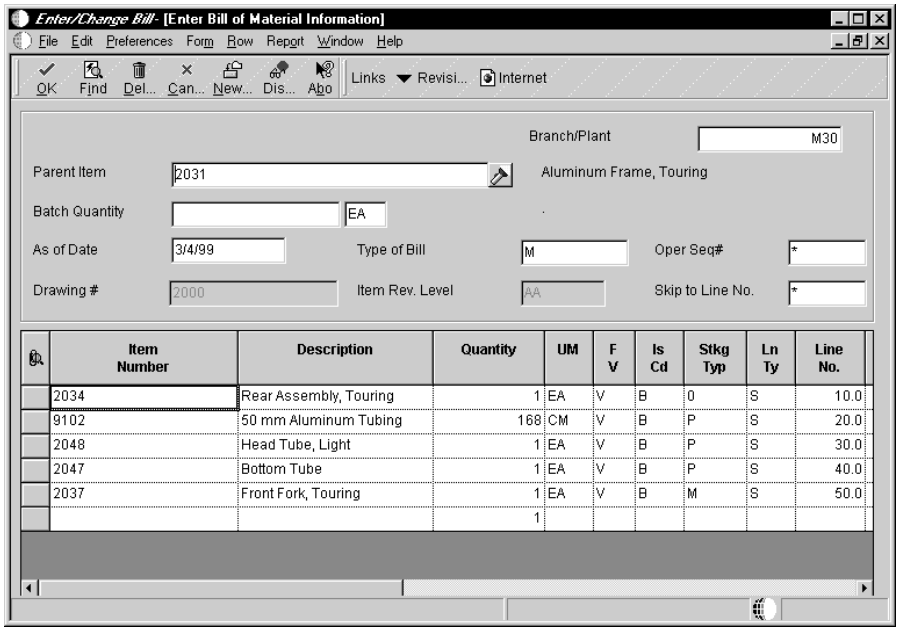
- Production line
- Bill of material
- Routing instruction
- Kanban
- Item to line relationship

Production Line

A production line is a sequence of operations arranged to produce a family of products. The production line is defined as a work center, the operations that make up the production line may or may not be work centers, this is defined in the routing instruction. The capacity of the production line is determined by the constraining operation within the production line.

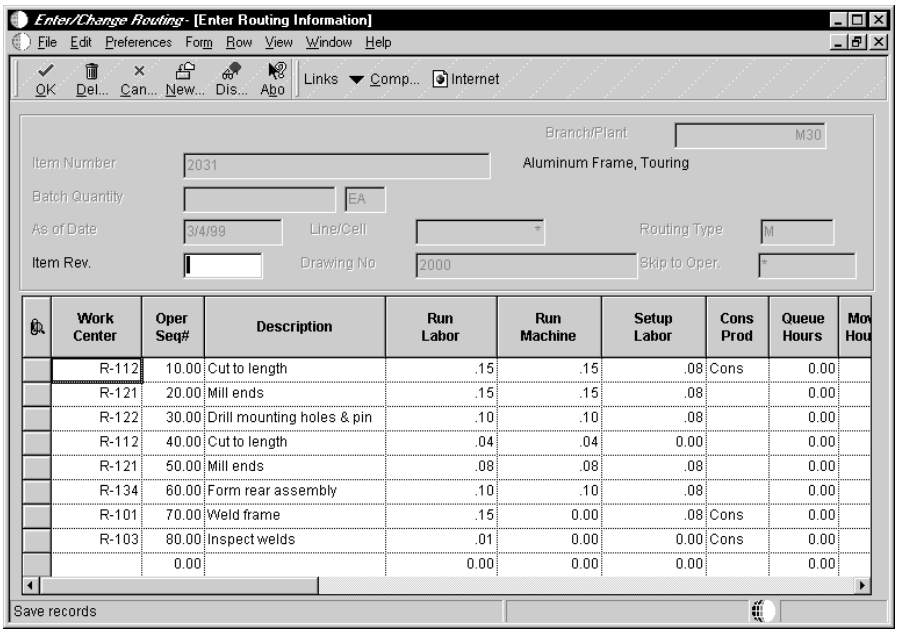
Bill of Material

For items produced in a repetitive manufacturing environment, the operation sequence number on the bill of material is crucial to ensure that the components are delivered to the production line at the operations for which they are needed. Components are typically setup to be consumed through backflushing, at a specific paypoint, or upon completion, because the line is setup to run in a continuous fashion.



Routing Instruction

The relationship between the production line and the operations or work centers that the line contains, are defined in the routing instructions for the parent item. Each operation is tied to its production line by the line or cell number in the Line/Cell field on the routing instruction. The consuming location is the inventory location from which the production line pulls components necessary to produce the parent at a particular operation. The consuming location must be identified in the routing instruction to ensure inventory is always available to the line. When the system backflushes and relieves inventory from the consuming location, it triggers the kanban, a visual cue, to replenish inventory as materials are consumed.



Kanban

Kanban is a method of just-in-time production that uses standard containers or lot sizes. It is a pull system in which work centers or locations signal that they wish to withdraw parts from feeding work centers, inventory locations, or suppliers. This signal alerts manufacturing to build, or suppliers to furnish the required part in the standard lot size defined by the Kanban Master table (F3016).

Item to Line Relationship

This defines the relationship between an item produced in a repetitive manufacturing environment and the production line or lines the item is produced on. Each relationship defines the number of resource units required by the line to produce one end product.

See Also

- *Understanding MRP* in the *Manufacturing and Distribution Planning Guide* for information about Material Requirements Planning
- *EDI Document Processing* in the *Data Interface for Electronic Data Interchange Guide* for information about Electronic Data Interchange transactions
- *Understanding Purchase Order Entry* in the *Procurement Guide* for information about purchase orders

Setting Up Shift Information

There are three places where you need to identify specific shift information for repetitive manufacturing. These include manufacturing constants, work centers, and shop floor calendars.

You set up shift information in manufacturing constants to identify the number of work hours that the plant typically operates in a day by shift for your branch/plants.

You also set up resource unit information that indicates the capacity of a work center on a given day for a specified shift.

You must define shop floor calendars by shift so that the system can use the calendars to schedule and sequence lines by shift. To increase plant capacity, you can run production lines for more than one shift, as well as run different lines of production on different days of the week. You specify these shifts and lines on the shop floor calendar.

Setting up shift information consists of the following tasks:

- ❑ Setting up shifts in manufacturing constants
- ❑ Setting up shift calendars
- ❑ Setting up shifts for work centers
- ❑ Setting up resource units for shifts

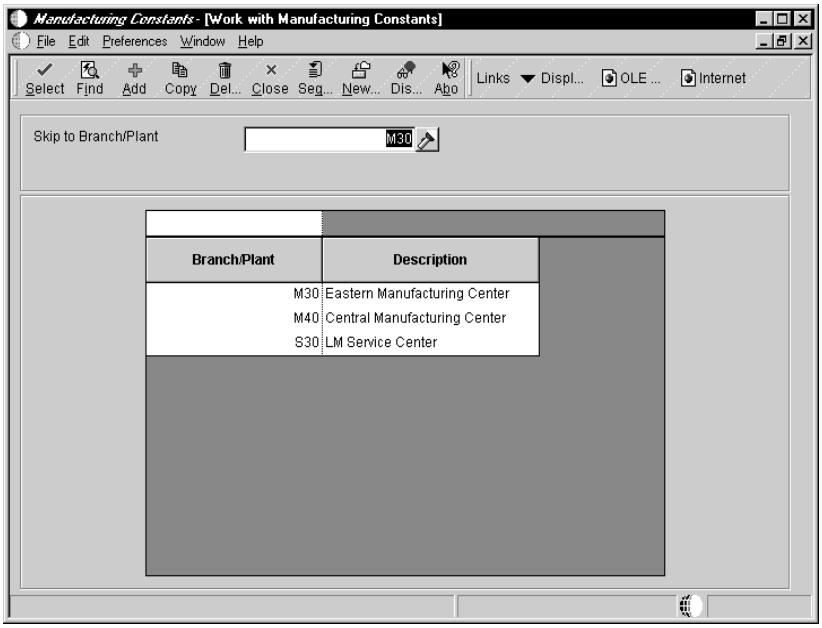
Setting Up Shifts in Manufacturing Constants

Use Manufacturing Constants to establish shifts that are unique to your branch/plants. You can identify up to six shifts for a 24-hour period. However, the work hours per day is calculated from the first three shifts listed only.

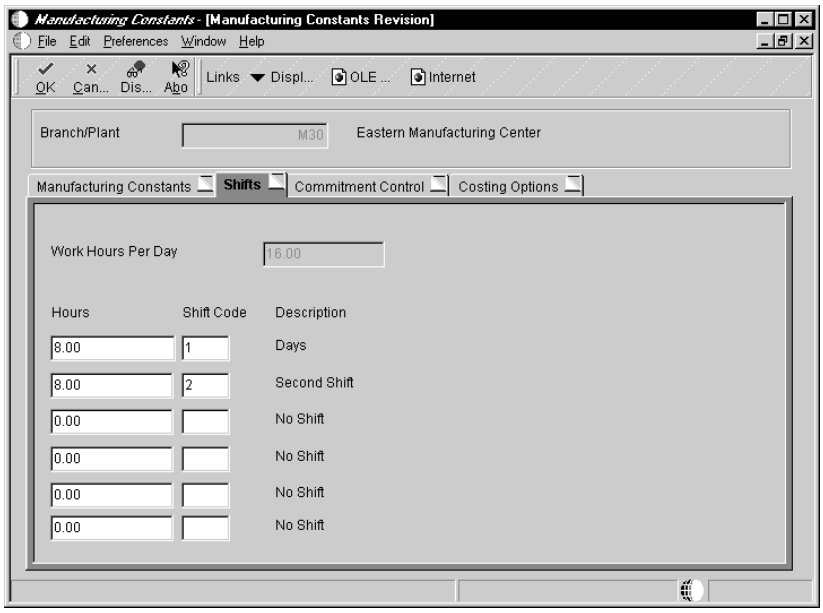
▶ To set up shifts in manufacturing constants

From the Product Data Management Setup menu (G3041), choose Manufacturing Constants.

On Work with Manufacturing Constants



1. Complete the following field and click Find:
   - Skip to Branch/Plant
2. Choose a branch/plant and click Select.



3. Click the Shifts tab and complete the following fields for all the shifts you want set up:

   - Hours
   - Shift Code

   You can enter hours for up to six different shifts. However, the Work Hours Per Day field is the total of the first three shift hours entries only.

Field	Explanation
Hours	The number of work hours that the manufacturing plant operates per day. . . . . . *Form-specific information* . . . . . . The number of work hours for shift 1 that the manufacturing plant operates in a day.

Field	Explanation
Shift Code	A user defined code (00/SH) that identifies daily work shifts. In payroll systems, you can use a shift code to add a percentage or amount to the hourly rate on a timecard. For payroll and time entry: If an employee always works a shift for which a shift rate differential is applicable, enter that shift code on the employee's master record. When you enter the shift on the employee's master record, you do not need to enter the code on the timecard when you enter time. If an employee occasionally works a different shift, you enter the shift code on each applicable timecard to override the default value.

Setting Up Shift Calendars

You can define the work days by month and year for each branch or all branches in your system in the Shop Floor Calendar. The system uses this calendar to determine manufacturing schedules.

You can also define calendars by shift. The system uses these calendars for line sequencing by shift in repetitive manufacturing. Shift calendars are not used for Distribution Requirements Planning, Master Production Schedule, and Material Requirements Planning.

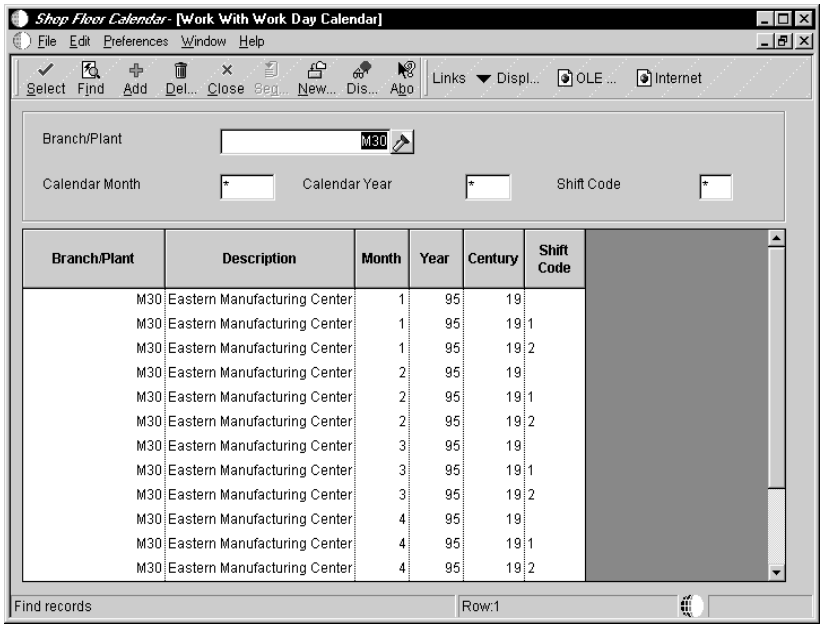
To increase plant capacity, manufacturers run production lines for more than one shift, as well as run different lines of production on different days of the week. You specify these shifts and lines on the Shop Floor Calendar.

If you locate a month and year that does not exist, it will appear with default values for workdays (Monday through Friday) and weekends (Saturday and Sunday). Holidays are always user defined. You can then add the record.

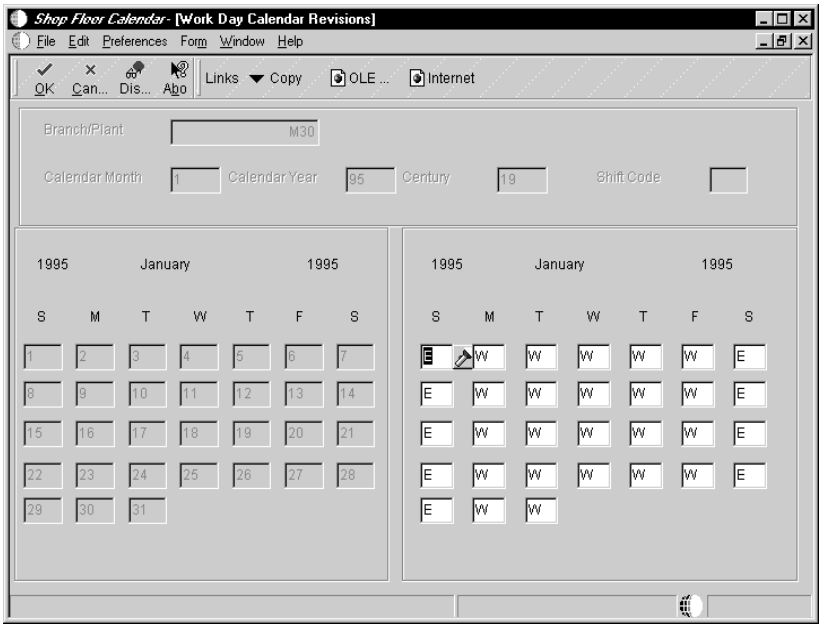
To set up shift calendars

From the Product Data Management Setup menu (G3041), choose Shop Floor Calendar.

On Work With Work Day Calendar



1. Complete the following fields and click Add:
   - Branch/Plant
   - Calendar Year
   - Calendar Month
   - Shift Code



2. On Work Day Calendar Revisions, enter W for each work day.

   The calendar on the left shows the actual calendar days for the month and year that you requested. The calendar on the right shows the work days and non-work days that you define.

Field	Explanation
Branch	A code that represents a high-level business unit. Use this code to refer to a branch or plant that might have departments or jobs, which represent lower-level business units, subordinate to it. For example: • Branch/Plant (MMCU) • Dept A (MCU) • Dept B (MCU) • Job 123 (MCU) Business unit security is based on the higher-level business unit. . . . . . *Form-specific information* . . . . . . This code identifies the branch or plant to which the calendar applies. It must be a valid business unit.

Field	Explanation
Shift Code	A user defined code (00/SH) that identifies daily work shifts. In payroll systems, you can use a shift code to add a percentage or amount to the hourly rate on a timecard. For payroll and time entry: If an employee always works a shift for which a shift rate differential is applicable, enter that shift code on the employee's master record. When you enter the shift on the employee's master record, you do not need to enter the code on the timecard when you enter time. If an employee occasionally works a different shift, you enter the shift code on each applicable timecard to override the default value.

See Also

- *Setting Up a Shop Floor Calendar* to review the processing options for Work Day Calendar

Setting Up Shifts for Work Centers

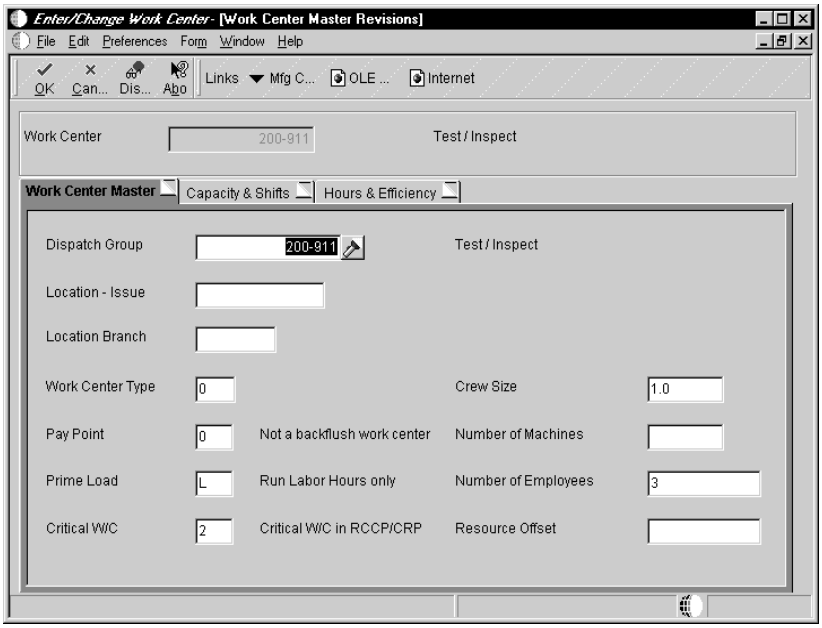
Enter production line information that corresponds to the facilities on your shop floor. Any work hours per shift that you enter here will override all the hours per shift information located in the Job Shop Manufacturing Constants table (F3009).

▶ To set up shifts for work centers

From the Daily PDM Discrete menu (G3011), choose Enter/Change Work Center.

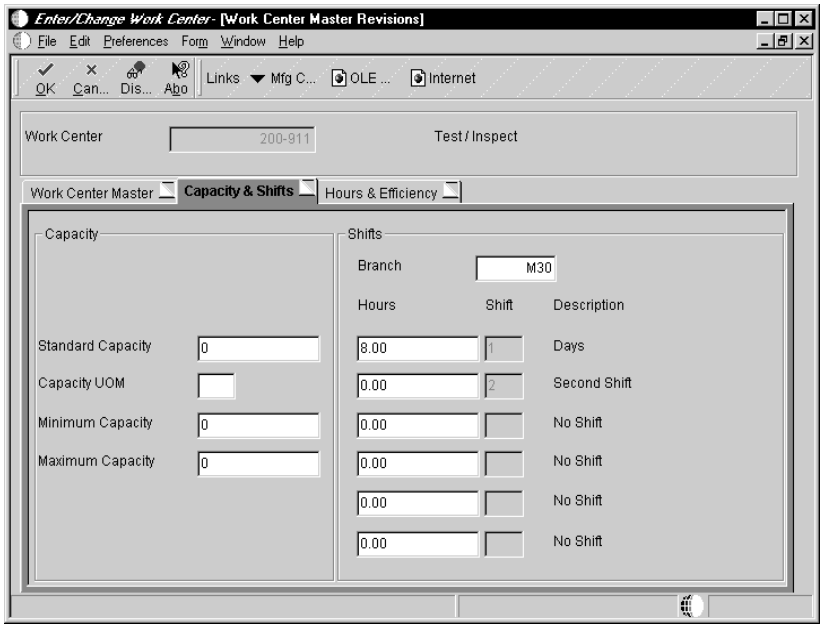
On Work With Work Centers

1. Complete the following field and click Add:
   - Work Center

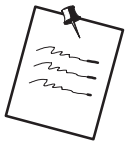


2. On Work Center Master Revisions, click the Work Center Master tab and complete the following fields:

   - Dispatch Group
   - Location – Issue
   - Location Branch
   - Work Center Type
   - Pay Point
   - Prime Load
   - Critical W/C
   - Crew Size
   - Number of Machines
   - Number of Employees
   - Resource Offset



3. Click the Capacity & Shifts tab and complete the following fields:
   - Standard Capacity
   - Capacity UOM
   - Minimum Capacity
   - Maximum Capacity
   - Shift Branch
4. Complete the following optional field:
   - Hours



If you specify any of the hours on the Capacity & Shifts tab to be an amount other than zero, the system updates that amount in the Job Shop Manufacturing Constants table (F3009). If all hours are identified as zero, the system retrieves the hours from the Job Shop Manufacturing Constants table.

Field	Explanation
Dispatch Group	A category code used to group work centers within an overall business unit. For example, you can use this code to group similar machines operating out of several work centers that report to one business unit.
Work Center Type	A code that defines the type of work center. Valid values are : 0 Stand alone work center 1 Production line in a repetitive environment

Field	Explanation
Crew Size	The number of people who work in the specified work center or routing operation. The system multiplies the Run Labor value in the Routing Master table (F3003) by crew size during costing to generate total labor amounts. If the Prime Load Code is L or B, the system uses the total labor hours for backscheduling. If the Prime Load Code is C or M, the system uses the total machine hours for backscheduling without modification by crew size. . . . . . *Form-specific information* . . . . . . For Shop Floor Management: If you leave the Hours field on the Routing Revisions form blank, the system uses the value entered in this field for leadtime and scheduling calculations.
Standard Capacity	The standard capacity level at which a production line usually operates. Capacity is stated in units per hour.
Capacity UOM	A unit of measure used to express the capacity of a production line, for example, stamps, injections, and so on.
Minimum Capacity	The lower limit capacity beyond which the production line should not operate. This value is decided by management, based on factors such as efficiencies, costs, and so on. Capacity is stated in units per hour.
Maximum Capacity	The upper limit capacity beyond which a production line cannot produce. Capacity is stated in units per hour.
Shift Branch	A code that represents a business unit. This item is used to specify from which branch/plant to validate when overriding shift hours for a work center.
Hours – Daily Work Hours	The number of work hours that the manufacturing plant typically operates in a day. The system calculates this value based on hours defined in the shift hours 1, 2, and 3 fields on the Manufacturing Constants Revision form. This value is used in backscheduling and forward scheduling.
Replen. Hrs	The time required before a consuming location has a replacement kanban available from its supplying location. This value is used only for kanban card processing in Shop Floor Management.

See Also

- *Entering Work Centers* to review the processing options for Enter/Change Work Center

Setting Up Resource Units for Shifts

Use the Work with Resource Units program to identify additional shifts for your work centers.

Before You Begin

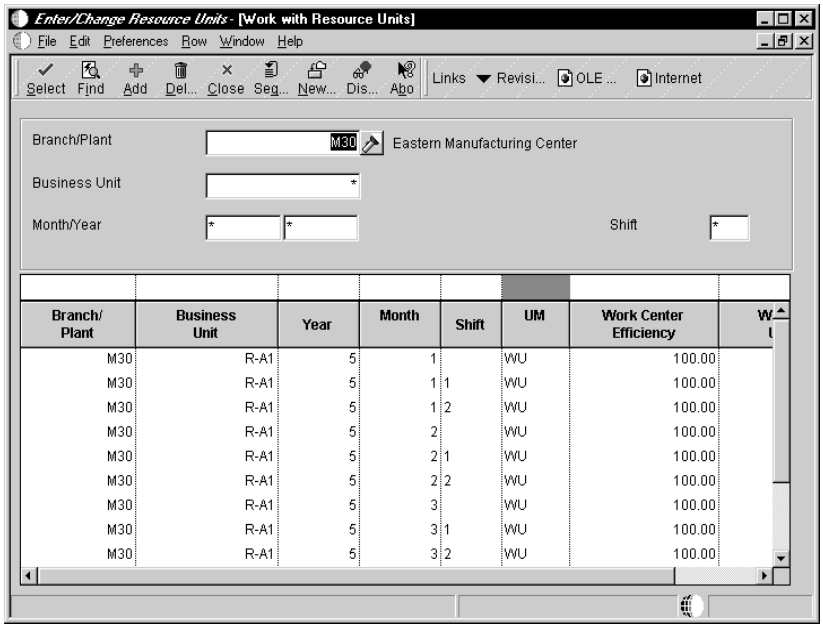
- ❑ Set up your shifts in manufacturing constants for your branch/plants. See *Setting Up Shifts in Manufacturing Constants*.
- ❑ Set up your calendars for each shift needed. See *Setting Up Shift Calendars*.
- ❑ Verify that all of your work centers identify the branch/plant for the shift on the Capacity & Shifts tab of the Work Center Master Revisions form.

When you add resource units for a shift, the system also adds a blank shift that represents the total of all shifts.

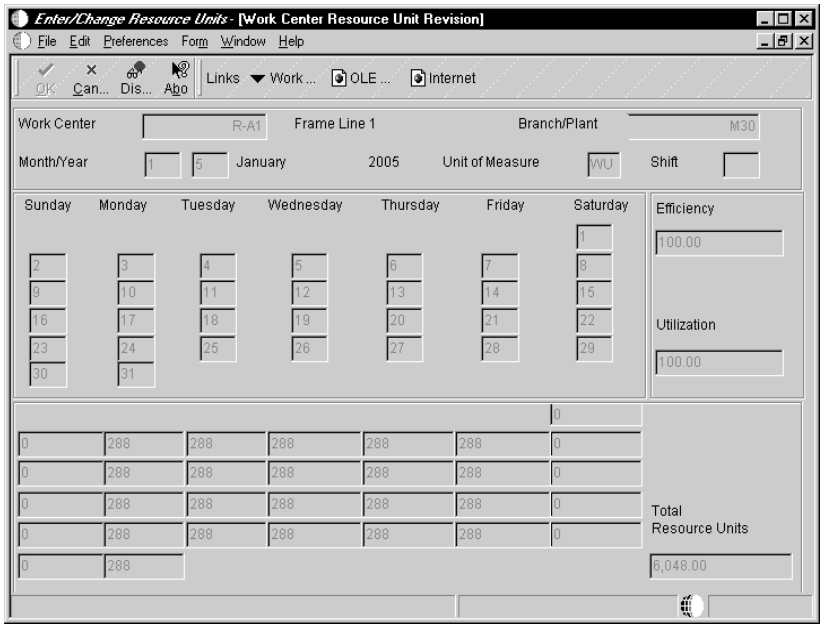
To set up resource units for shifts

From the Shop Floor Management Setup menu (G3141), choose Enter/Change Resource Units.

On Work with Resource Units



1. Complete the following field and click Find:
   - Branch/Plant
2. Choose a branch/plant of the shift to which you want to add resources and click Select.



3. On Work Center Resource Unit Revision, complete the following field for each day:
   - Resource Units Work 01
4. Complete the following optional fields:
   - Efficiency
   - Utilization
   - Unit of Measure

Field	Explanation
Resource Units Work 01	A value expressed in units, dollars, hours, floor space, etc., that is used to calculate capacity.

Field	Explanation
Efficiency	A user defined value that indicates how efficiently a work center operates. This value usually refers to staff efficiency. When you enter a value in this field, and the Modify Cost by Work Center Efficiency field in the Job Shop Manufacturing Constants table (F3009) is set to Y, the system creates a new cost component (B4) from the cost calculated from the direct labor cost (B1). For example, if the constant is set to Y, the value of this field is 80%, and the direct labor cost is 10, the system creates a B4 cost component for 2 in the Item Cost Component Add-Ons table (F30026). The Refresh Resource Units program also uses this value as a default when calculating rated capacity. Enter percents as whole numbers. For example, enter 80% as 80.00. Note: The system expects that the routing times entered for each operator are the actual times it takes to complete an operation. Efficiency does not affect total cost. Efficiency does reassign some of the costs into different cost components. Efficiency does not change the duration or backscheduling of a work order.
Utilization	A percentage that indicates how intensively a work center is being used. This value usually refers to machine use. It is the ratio of the direct time charged for production activities to the planned hours. The Refresh Resource Units program also uses this value as a default when calculating rated capacity. Enter percents as whole numbers. For example, enter 80% as 80.00.

See Also

- *Generating Resource Units Automatically* in the *Manufacturing and Distribution Planning Guide* for information about refreshing resource units for work centers

Processing Options for Enter/Change Resource Units

```
Defaults

1. Enter the Default Unit of Measure for
    Work Center Resource Units. If left
    blank, HR will be used as the
    default Unit of Measure.

      Unit of Measure as Input                _____________
      Work Day Calender (P00071)              _____________
```

Setting Up Kanbans

If you want to control the movement of material using visual cues called kanbans, you must first identify the items, then you must generate and print the kanban cards. These tasks are designed to minimize work-in-process inventories.

Setting up kanbans consists of the following tasks:

- ❑ Setting up kanban-controlled items
- ❑ Generating kanbans

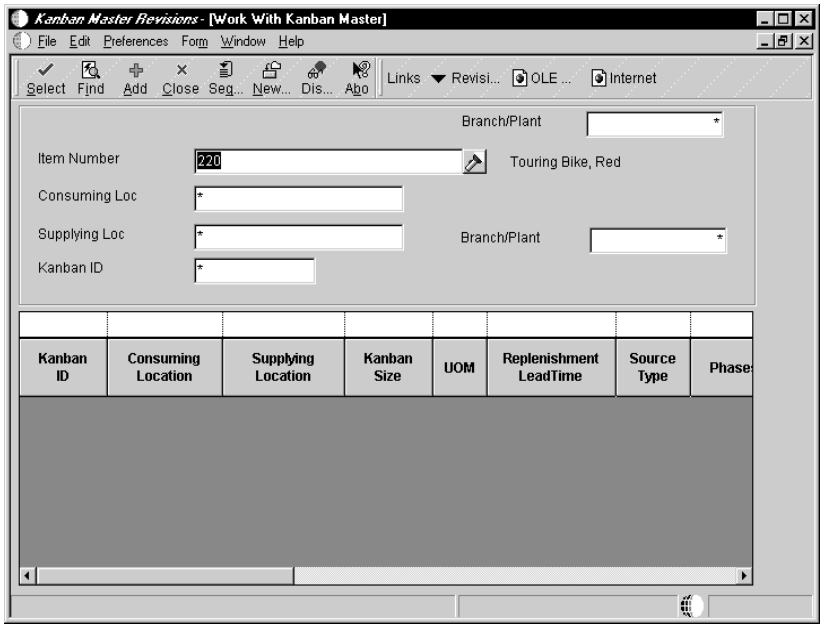
Setting Up Kanban-Controlled Items

Kanbans are predetermined quantities of components at specified locations on the production line. You define kanbans at the item, branch/plant, consuming location, and supplying location level. You must set up an item on the Kanban Master Revisions program before it is kanban-controlled. After you define kanban-controlled items, use Kanban Calculation to size the kanban, depending on the demand for the item.

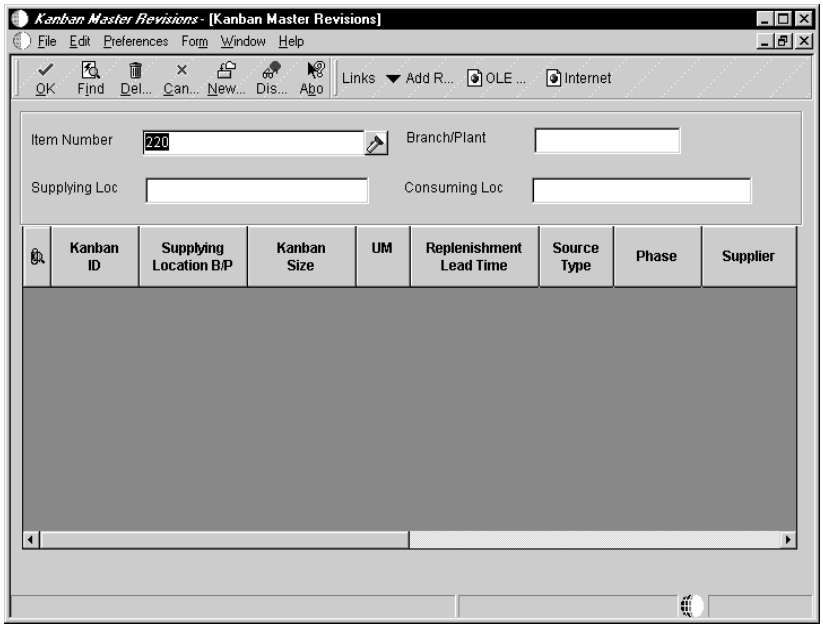
To set up kanban-controlled items

From the Product Data Management Setup menu (G3041), choose Kanban Master Revisions.

On Work With Kanban Master



1. Complete the following fields and click Add:
   - Branch/Plant
   - Item Number
   - Consuming Location
   - Supplying Location



2. On Kanban Master Revisions, choose Add Row from the Form menu.
3. Complete the following fields:
   - Supplying Loc
   - Source Type
   - Container Size
4. Complete the following optional fields and click OK:
   - Kanban Size
   - UM
   - Replenishment Lead Time
   - Phase
   - Supplier
   - Line/Cell Identifier
   - Override
   - Receipts
   - Number Of Cards

   If you activate the override flag, the system does not update the record when you run the calculation program.

Field	Explanation
Supplying Loc	The storage location from which goods will be moved.

Field	Explanation
Kanban Size	The total size of the kanban.
UM	A user defined code (00/UM) that indicates the quantity in which to express an inventory item, for example, CS (case) or BX (box).
Replenishment Lead Time	The time required before a consuming location has a replacement kanban available from its supplying location. This value is used only for kanban card processing in Shop Floor Management.
Source Type	A code that indicates the type of supplying location for a kanban. Valid values are: 1 Work center 2 Inventory 3 Supplier
Phase	A code that indicates the method that the system uses to transfer completed units from the supplying location to the consuming location. Valid values are: 1 One-phase transfer. The completion of the kanban and transfer of inventory are performed simultaneously. 2 Two-phase transfer. The kanban is completed and then the inventory is transferred.
Supplier	A number that identifies an entry in the Address Book system. Use this number to identify employees, applicants, participants, customers, suppliers, tenants, and any other address book members.
Line/Cell Identifier	A number that defines a production line or cell. Detailed work center operations can be defined inside the line or cell.
Container Size	The capacity of a container in a kanban-controlled environment.
Override	A code that is used to lock the kanban size and quantity to prevent changes by the kanban calculation program. Valid values are: 0 The system recalculates the size of the kanban. 1 The system does not recalculate the size of the kanban.
Receipts	A code that is used to indicate whether the system runs the receipts process at kanban check-in time. Valid values are: 0 The system does not run the receipt process. 1 The system runs the receipt process.
Number Of Cards	Results in a calculation. . . . . . *Form-specific information* . . . . . A number that identifies how many cards are needed for the kanban.

Generating Kanbans

From the Product Data Management Setup menu (G3041), choose Kanban Size Calculation.

After you set up the item on Kanban Master Revisions, you can use the Kanban Size Calculation program to calculate the size of a kanban. You can activate the override flag for Kanban Master Revisions to prevent the system from updating the Kanban Master table.

When you generate kanbans, you do the following:

- Specify whether the program runs in proof or final mode
- Print kanban cards
- Print the calculation report
- Update the Kanban Master table if running in final mode
- Specify a safety stock other than what is defined in the Item Branch table (F4102)
- Control the percentage that the system can change the size of the kanban
- Specify the source for the demand, such as MRP/MPS demands or time fence rules
- Specify a user defined program to calculate kanban size

See Also

- *R30450, Kanban Size Calculation* in the *Reports Guide* for a report sample

Processing Options for Kanban Size Calculation

```
Process 1

Processing Control:

      1. Enter a '1' to calculate Kanban          _____________
      Sizes.
      2. Enter a '1' to update Kanban             _____________
      Master file.
      3. Enter a '1' to print Kanban              _____________
      cards.
      4. Enter a '1' to print Kanban              _____________
      Exception Report.
```

Process 2

5. Enter the desired safety stock expressed as a percentage of daily production. (’15’ = 15%)

   Safety Stock _____

6. Enter the range, expressed as a percentage, above or below which the Kanban should not be changed. (’15’ = plus or minus 15%)

   Filter Control _____

Process 3

7. Kanban Average Daily Demand: Enter a ’1’ to select summation of the MPS/MRP demands desired, or enter a ’2’ to select greater of MPS/MRP demands desired. If no demands are selected, the Planning Time Fence Rule for the item will be used.

   Forecasts _____
   Sales Orders _____
   Firm Work Orders _____
   Planned Orders _____
   Rate Schedule _____

Process 4

8. Enter number of hours equivalent to one day. (Default is 8)

   Hours – Work Hours Per Day _____

9. Enter the date range to use for the average daily demand calculation.

   Beginning Date (Required) _____
   Ending Date (Required) _____

10. Enter the program name of the Kanban size calculation program.

    User Defined Program _____

Process Manufacturing

Process Manufacturing

Process manufacturing produces products, such as liquids, fibers, powders, or gasses. Pharmaceuticals, foodstuffs, and beverages are typical examples of process products and represent a significant share of the manufacturing market. Products such as these are usually manufactured by a two-step process as follows:

- Mixing or blending
- Filling or packaging

Intermediate steps, such as curing, baking, or additional preparation, can also occur. Intermediates allow you to track the quantity of output of any operation in a work center at a specific time. You can define intermediates in different units of measure, by item, or by quantity. You can set up one intermediate per operation, but you cannot define an intermediate for the last operation in a routing instruction.

Process manufacturing uses recipes or formulas, and resources or ingredients. Resources can either be consumed or produced during the manufacturing process. The products that the process produces are called co-products and by-products. In a process recipe or formula, the quantity of a component can vary according to its grade or potency.

The different types of processing in process manufacturing are as follows:

Batch processing	In batch processing, a product is usually made in a standard run or lot size determined by vessel size, line rates, or standard run length. Items made this way are typically scheduled in short production runs due to the life cycle of the product after its completion. Typical items might be pharmaceuticals, foods, inks, glues, oil or chemical products, and paints. Co-products and by-products might be generated during batch processing.
Continuous processing	In continuous processing, production is typically an extended period, using dedicated equipment that produces one product or product line with only slight variations. This method of manufacturing is characterized by the difficulty of planning and controlling quantity and quality yield variances. Typical items might be petroleum-based products or distilled sea water. Co-products and by-products are generally more prevalent in continuous processing than in batch processing.

In addition, strategies similar to discrete manufacturing, such as repetitive or any of the "to-orders" (for example, make-to-order, assemble-to-order, or engineer-to-order) might drive the process. Usually, both batch and continuous processing methods require extensive record-keeping regarding quality and tolerance values during the process, as well as strict adherence to lot tracing and tracking.

Not all process are planned, scheduled, or produced in their primary unit of measure. To accommodate this, full unit of measure capabilities are allowed throughout the Shop Floor Management system.

Most entry programs have a unit of measure next to the quantity fields, and the unit of measure is stored in the database tables, along with the quantities. The system uses the following three fields in the Item Master table throughout shop floor as default values in entry forms:

- Component Unit of Measure
- Production Unit of measure
- Primary Unit of Measure

The Primary Unit of Measure value must be the smallest of the three units of measure. In addition, if intermediates exist for an operation, the intermediate can be any valid unit of measure as long as the conversion is set up.

Process manufacturing consists of the following tasks:

- ❑ Understanding process manufacturing
- ❑ Working with processes
- ❑ Reviewing processes

See Also

- *Defining Default Units of Measure for Bulk Items* in the *Bulk Stock Management Guide*

Understanding Process Manufacturing

Process manufacturing companies must cost, plan, and schedule the products that they produce. Processes use formulas or recipes to add value to ingredients in either batch or continuous processing. The following list contains the activities that can occur in a process:

- Mixing ingredients
- Separating ingredients
- Forming ingredients
- Performing chemical reactions on ingredients

Processes provide the basis for creating a parts list for a work order in the Shop Floor Management system. Processes include an ingredient relationship and routing instruction. The ingredient relationship defines information about the ingredients, including effectivity dates, fixed and variable quantities, and queue and move times.

You define a process item with ingredient relationships on the Enter/Change Process form. Relationships also determine information about co-products, by-products, intermediates, and substitutions.

You define the steps that are required to produce a manufactured item with process routing instructions. Routing instructions define work centers and labor standards. Process routing instructions are critical for the Capacity Planning and Product Costing systems, and for measuring production efficiency.

Process Terminology

You should be familiar with the following process manufacturing terms before using process manufacturing.

Co-Products

Many process steps create more than one output. A co-product is produced by process steps that are defined for specific ingredients. Co-products are usually the main products that companies sell to customers. For example, a graphite lubricant process creates two co-products — household and graphite lubricants. Material Requirements Planning plans for co-product demand.

By-Products

A by-product is produced as a residual or incidental item that results from the process steps. Companies can recycle, sell, or use by-products for other purposes. For example, a graphite lubricant process creates one by-product — sludge. Material Requirements Planning does not plan for by-product demand.

Ingredients

An ingredient is the raw material or item that is combined during process manufacturing to produce the end item. Typically, raw materials are purchased.

Intermediates

Intermediates allow you to track the quantity of output of any operation in a work center at a specific time. You can define intermediates in different units of measure, by item, or by quantity. You can set up one intermediate per operation, but you cannot define an intermediate for the last operation in a routing. You can manually attach intermediates. Intermediates are not stocked in inventory, sold to customers, or planned by MRP.

Fermented liquid is an example of an intermediate. The liquid ferments for an extended period of time before being distilled. The resulting liquid is not a finished product, but it proceeds to the next operation.

Process Routing Instructions

A process routing instruction details the method of manufacture for a specific process item. It includes operations and operation sequence, work centers, and standards for setup and run. You can also define operator skill levels, inspection operations, and testing requirements.

Substitutes

A substitute item is an alternate item that the system uses in production when the primary item is not available. You can define substitutes for a single ingredient within your process. You might need to do so for several reasons, such as quality concerns, inventory shortages, or supplier delivery problems.

Alternate Operations

An alternate operation is a replacement for a normal operation for an item in the manufacturing process. You can define an alternate operation to be performed only as required, such as using oven B if oven A is unavailable. This information assists shop floor personnel, but it is not used by the Product Costing or ERPx systems.

Batch Processes

Batch process refers to a process whereby the system selects jobs from the job queue, processes them, and sends output to the outqueue. Food, petroleum, and pharmaceutical industries use batch processes where items are produced in fixed quantities, or batches. The batch process feature allows you to define different processes for items based on quantity or batch size, since processes vary by quantity.

Percent Bills of Material

Percent bills enable you to define processes with ingredient quantities expressed as a percent of the process batch quantity.

The system processes percent information as follows:

- Multiplies the ingredient percentage times the batch quantity to obtain ingredient quantities expressed in the batch quantity unit of measure
- Converts the ingredient quantities from the batch unit of measure to the ingredient unit of measure

The system stores quantities for ingredients as follows:

- Calculates a percentage for the ingredient in relation to the batch size
- Converts the batch unit of measure to the ingredient unit of measure and stores the quantity for the ingredient

Example: Percent Process

In the following example, the parent item is Soft Drink and its batch quantity is 300 GA.

Components	Quantity	Unit of Measure	Fixed or Variable
Vanilla	50	GA	%
Water	40	QT	%
Concentrate	10	LT	%

The system calculates the following:

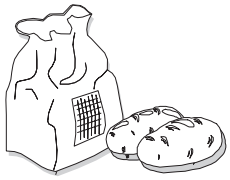
% Calculation and Conversion to Batch Unit of Measure			Storage
Vanilla	= .5 X 300	= 150 GA	150 GA
Water	= .4 X 300	= 120 GA	480 QT
Concentrate	= .1 X 300	= 30 GA	114 LT

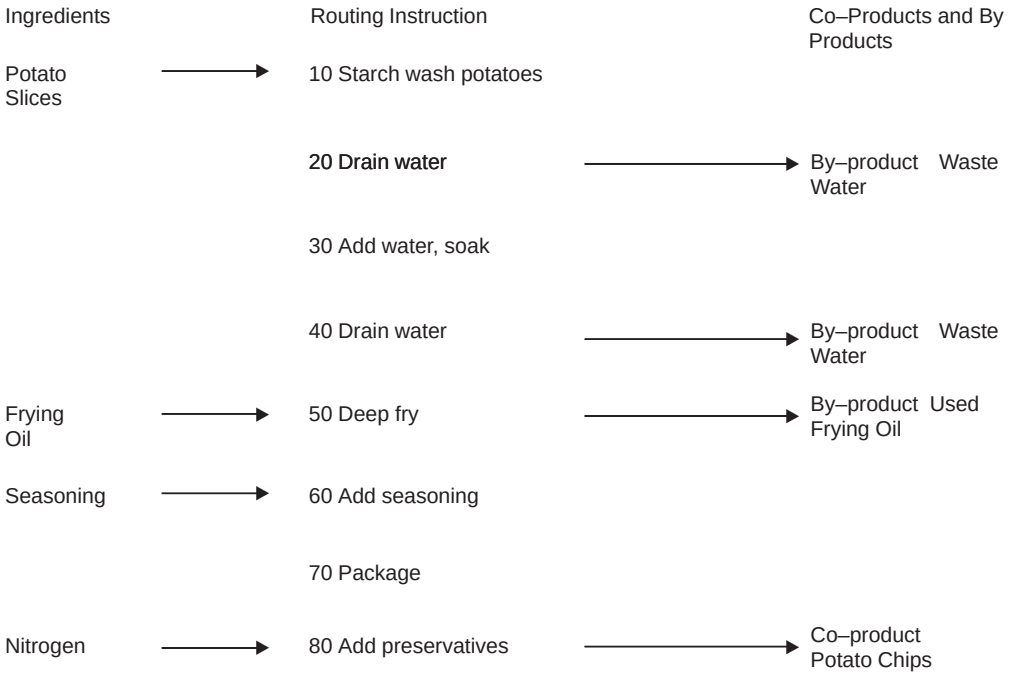
The system uses the ingredient unit of measure in the percent process to convert the number of gallons that correspond to the percent for each ingredient. In this example, the system calculates the ingredients water and concentrate to be 120 GA and 30 GA of the batch size. The system converts the unit to ingredient unit of measure and stores them as 480 QT and 114 LT.

You must set up unit of measure conversions for percent bills to work properly. You must also verify that all components can convert to the batch quantity unit of measure.

Example: Potato Chip Continuous Process

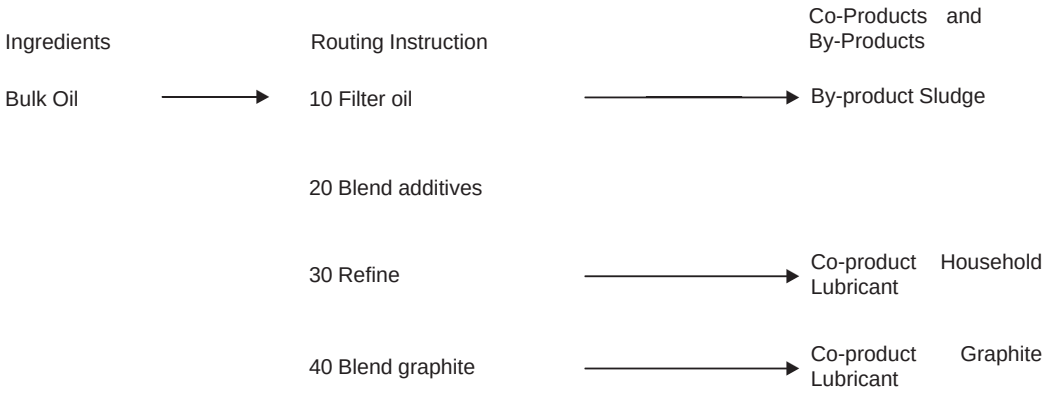
The following illustration shows the ingredients, routing instructions in operation number sequence, and the co-products and by-products that the potato chip continuous process produces:





Example: Graphite Lubricant Batch Process

The following illustration shows the ingredients, routing instructions in operation number sequence, and the co-products and by-products that the graphite lubricant batch process produces:



Working With Processes

Processes allow process manufacturing companies to cost, plan, and schedule the products that they produce. Processes use a formula or recipe that includes an ingredient relationship and a routing instruction.

Working with processes consists of the following tasks:

- ❑ Entering processes
- ❑ Entering process operations
- ❑ Entering process ingredients
- ❑ Entering production information
- ❑ Entering a co-products and by-products list
- ❑ Entering intermediates
- ❑ Updating component scrap
- ❑ Changing multiple processes

When you define a process, you combine information from the following tables:

- Job Shop Manufacturing Constants table (F3009)
- Item Master table (F4101)
- Work Order Routing table (F3112)
- Item Branch table (F4102)

The resulting process is stored in the Bill of Material Master table (F3002) and changes are stored in the Bill of Materials Change table (F3011).

Before You Begin

- ❑ To use batch processing, set the processing options for Enter/Change Process and Enter/Change Order to activate batch and type functions. See *Entering Routing Instructions* to review the processing options for Enter/Change Routing.
- ❑ Define routing instructions that correspond to your process types and batch sizes. See *Entering Routing Instructions* to review the processing options for Enter/Change Routing.

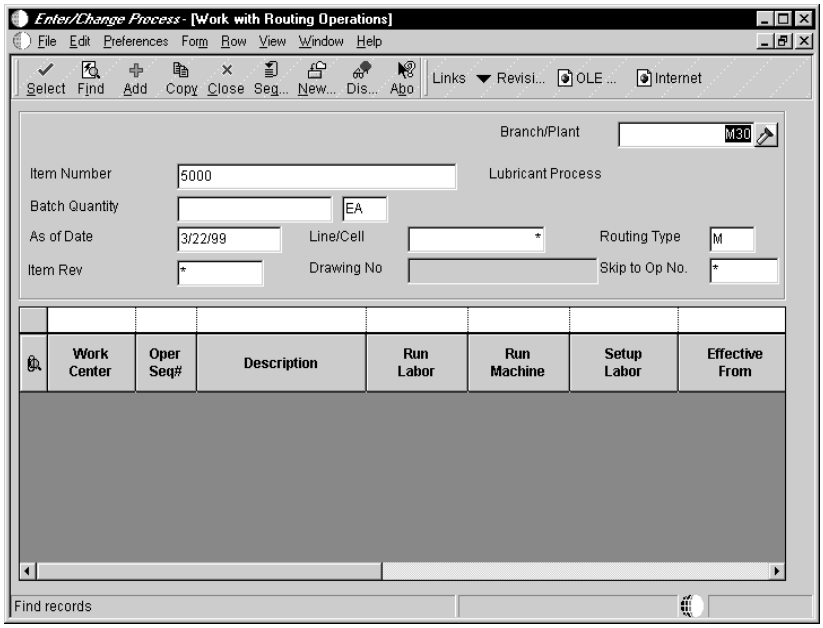
Entering Processes

You use the Enter/Change Process program to enter a process. You define a process item with ingredient relationships. Relationships also determine information about co-products, by-products, intermediates, and substitutions. You can also enter batch information, batch quantity and unit of measure, for the process.

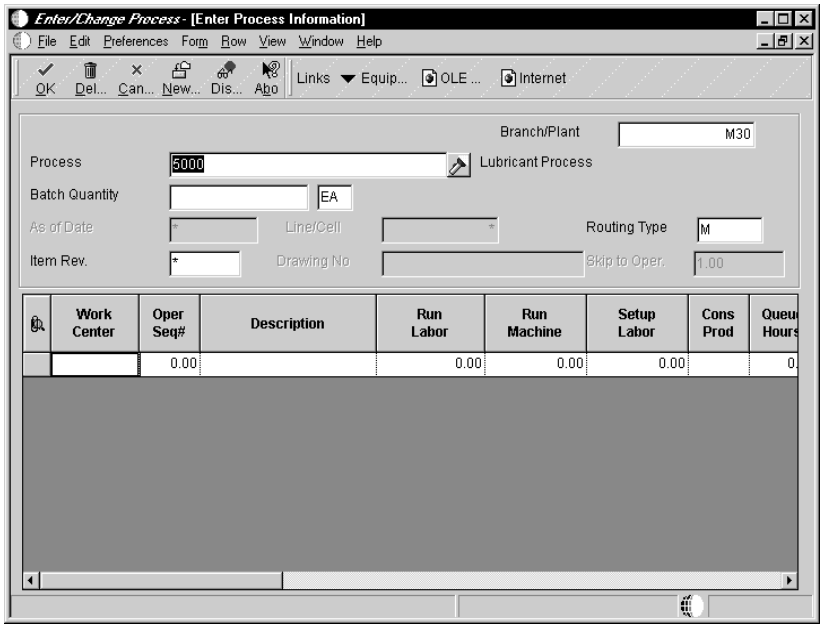
▶ To enter processes

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work with Routing Operations



1. Complete the following fields and click Add:
    - Branch/Plant
    - Item Number



2. On Enter Process Information, complete the following optional fields:
    - Routing Type
    - Line/Cell
3. To enter batch information, complete the following fields and click OK:
    - Batch Quantity
    - Unit of Measure as Input

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Entering Process Operations

After you enter a process, you must enter the process operations. Operations define the work centers and labor standards required to manufacture the process item. To enter the process operations, you must identify the following:

- Work center and operation sequence for the process
- Suppliers of any outside operations in the process
- Hours for any machine, labor, setup, move, and queue time that you may incur

Entering process operations consists of the following tasks:

- Entering operations
- Entering outside operations (optional)
- Entering work center hours

▶ To enter operations

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter an operation and then click Add:
   - Branch/Plant
   - Item Number
2. On Enter Routing Information, complete the following fields:
   - Work Center
   - Oper. Seq
3. Complete the following optional fields and click OK:
   - Description
   - Effective From
   - Effective Thru
   - Next Oper
   - Yield %
   - Type Oper
   - P C
   - Craft Code

- Percent of Overlap
- Equipment #
- Standard Desc.
- Crew Size
- Time Basis
- Line/Cell

Field	Explanation
Next Oper	The operation number with which the current operation can be simultaneously processed.
Type Oper	A user defined code (30/OT) that indicates the type of operation. Examples include the following: A Alternate routing TT Travel time IT Idle time T Text (Enter text at Description) . . . . . *Form-specific information* . . . . . For Product Costing: Only operations with a “blank” type operation code are costed.
Craft Code	A user defined code (07/G) that defines the jobs within your organization. You can associate pay and benefit information with a job type and apply that information to the employees who are linked to that job type.
Crew Size	The number of people who work in the specified work center or routing operation. The system multiplies the Run Labor value in the Routing Master table (F3003) by crew size during costing to generate total labor amounts. If the Prime Load Code is L or B, the system uses the total labor hours for backscheduling. If the Prime Load Code is C or M, the system uses the total machine hours for backscheduling without modification by crew size. . . . . . *Form-specific information* . . . . . For Shop Floor Management: The Crew Size field on the Work Order Routing form contains the value entered on the Work Center Revision form (P3006). You can override the value by changing this field on the Work Order Routing form. However, the Work Center Revision form will not reflect this change.

Field	Explanation
Time Basis	A user defined code (30/TB) that indicates how machine or labor hours are expressed for a product. Time basis codes identify the time basis or rate to be used for machine or labor hours entered for every routing step. For example, 25 hours per 1,000 pieces or 15 hours per 10,000 pieces. You can maintain the time basis codes in Time Basis Codes. The system uses the values in the Description-2 field on the User Defined Codes form for costing and scheduling calculations. The description is what the code represents, but is not used in calculations.

▶ To enter outside operations

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter outside operations and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Routing Information, complete the following fields and click OK:
   - Supplier
   - PO (Y/N)
   - Cost Type

Field	Explanation
Supplier	The address book number of the preferred provider of this item. You can enter the number for the supplier or you can have the system enter it each time that you receive the item from a supplier. You specify whether the system enters the supplier using processing options for Enter Receipts.
PO (Y/N)	Determines if the Work Order Generation program (P31410) creates a purchase order for a subcontracted operation within a routing. Valid values are: Y Yes, create a purchase order. N No, do not create a purchase order.

Field	Explanation
Cost Type	A code that designates each element of cost for an item. An example of the coding structure is as follows: A1 Purchased raw material B1 Direct labor routing rollup B2 Setup labor routing rollup C1 Variable burden routing rollup C2 Fixed burden routing rollup Dx Usually used for outside operation routing rollup Xx Usually used for extra add-ons, such as electricity and water The optional add-on computations usually operate with the type Xx extra add-ons. This cost structure allows you to use an unlimited number of cost components to calculate alternative cost rollups. The system then associates these cost components with one of six user defined summary cost buckets. . . . . . *Form-specific information* . . . . . . For outside operations, indicates the cost component with which to associate costs.

▶ To enter work center hours

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter work center hours and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Routing Information, complete the following fields and click OK:
   - Run Machine
   - Run Labor
   - Setup Labor
   - Queue Hours
   - Move Hours

Field	Explanation
Run Machine	The standard machine hours that you expect to incur in the normal production of this item. . . . . . *Form-specific information* . . . . . . For Equipment/Plant Maintenance users: Entering machine hours has several consequences. If you are not using other manufacturing systems, do not enter machine hours. If you are using manufacturing systems, the machine for which the machine hours apply must be set up as a work center. If you enter machine hours in this field, the system indicates a demand for those machine hours, based on the time commitment of the work order. You should plan to take the machine out of service for the entire time necessary to complete the work order. If you enter machine hours, you can optionally complete the Percent of Overlap field to indicate any operations that can overlap previous operations. For planning purposes, the system determines the total duration of the maintenance work order based on values that you enter for machine hours and percent overlap.
Run Labor	The standard hours of labor that you expect to incur in the normal production of this item. The run labor hours in the Routing Master table (F3003) are the total hours that it takes the specified crew size to complete the operation. The hours are multiplied by the crew size during shop floor release and product costing. . . . . . *Form-specific information* . . . . . . For Equipment/Plant: This is the estimated number of hours needed to complete a maintenance activity.
Setup Labor	The standard setup hours that you expect to incur in the normal completion of this item. This value is not affected by crew size.
Queue Hours	The total hours that an order is expected to be in queue at work centers and moving between work centers. The system stores this value in the Item Branch table (F4102). You can calculate this value using the Leadtime Rollup program or you can enter it manually. When you run the Leadtime Rollup program, the system overrides manual entries and populates the table with calculated values.
Move Hours	The planned hours that are required to move the order from this operation to the next operation in the same work center. If the Routing Master values are blank, the system retrieves the default value from the work order routing. However, the system uses these values only for backscheduling variable leadtime items.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Entering Process Ingredients

After you define operations for each process, you must enter the ingredients. These are the raw materials or items that are combined during operations to produce the process item. To enter process ingredients, you must identify the following:

- Ingredients for each operation
- Minimum and maximum grade or potency ranges that apply to the ingredients
- Substitute ingredients that the system uses when the primary ingredient is not available
- Percentages of applicable ingredients that the system uses

Entering process ingredients consists of the following tasks:

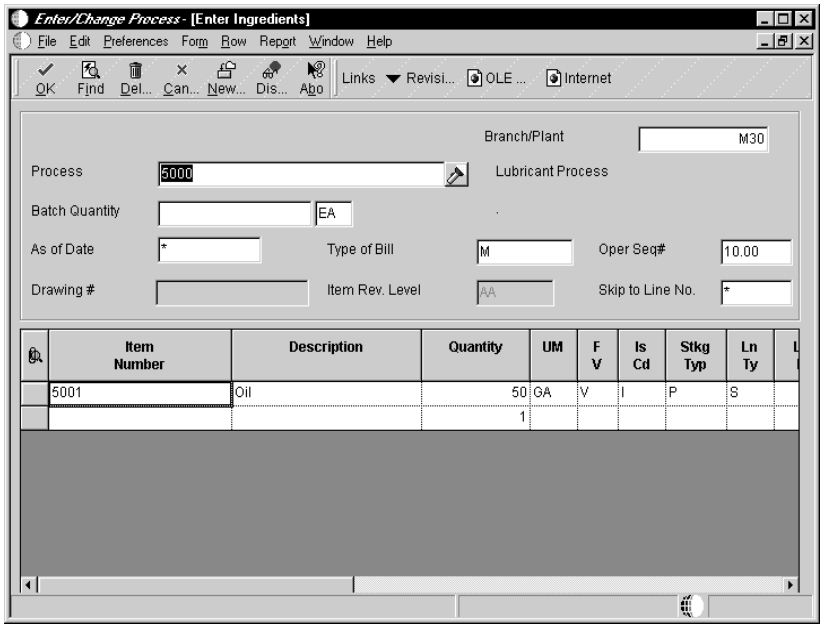
- Entering an ingredient
- Entering grade or potency information
- Entering a substitute ingredient
- Entering ingredients as percentages

▶ To enter an ingredient

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter an ingredient and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose an operation, and then choose Ingredients from the Row menu.



4. On Enter Ingredients, complete the following fields and click OK:
    - Item Number
    - Quantity
    - UM
    - Effective From
    - Effective Thru
    - Branch/Plant
    - Line No.
    - Oper Seq#
    - Percent Scrap
    - P
    - Ln Ty
    - Remarks

Field	Explanation
Effective From	A date that indicates one of the following: • When a component part goes into effect on a bill of material • When a routing step goes into effect as a sequence on the routing for an item • When a rate schedule is in effect The default is the current system date. You can enter future effective dates so that the system plans for upcoming changes. Items that are no longer effective in the future can still be recorded and recognized in Product Costing, Shop Floor Management, and Capacity Requirements Planning. The Material Requirements Planning system determines valid components by effectivity dates, not by the bill of material revision level. Some forms display data based on the effectivity dates you enter.
Effective Thru	A date that indicates one of the following: • When a component part is no longer in effect on a bill of material • When a routing step is no longer in effect as a sequence on the routing for an item • When a rate schedule is no longer active The default is December 31 of the default year defined in the Data Dictionary for Century Change Year. You can enter future effective dates so that the system plans for upcoming changes. Items that are no longer effective in the future can still be recorded and recognized in Product Costing, Shop Floor Management, and Capacity Requirements Planning. The Material Requirements Planning system determines valid components by effectivity dates, not by the bill of material revision level. Some forms display data based on the effectivity dates you enter.
Line No.	A number that indicates the sequence of the components on a bill of material. It initially indicates the relative sequence in which a component was added to a kit or single level bill of material. You can modify this number to change the sequence in which the components appear on the bill of material. Skip To fields allow you to enter a component line number that you want to begin the display of information.

Field	Explanation
Percent Scrap	The percentage of unusable component material created during the manufacture of a particular parent item. During DRP/MPS/MRP generation, the system increases gross requirements for the component item to compensate for the loss. Note: Shrink is the expected loss of parent items (and hence, components) due to the manufacturing process. Shrink and scrap are compounded to figure the total loss in the manufacture of a particular item. Accurate shrink and scrap factors can help to produce more accurate planning calculations. Enter percentages as whole numbers: 5% as 5.0 . . . . . *Form-specific information* . . . . . . The Shop Floor Control and Material Requirements Planning systems inflate component requirements by this percentage. This scrap percentage is unique to the relationship of one parent and one component.
P	When you specify component and substitute items on the bill of material, this field indicates whether the total quantity is required to be available or if a partial quantity available is acceptable to commit. Example: 100 lb of item A is available: 150 lb of item A is needed. If substitutes are not used and Partials Allowed is set to Y for item A, then the 100 lb will be committed. If substitute processing is used, substitutes will be checked next, and Partials Allowed on the substitute record will be considered.
Ln Ty	A code that controls how the system processes lines on a transaction. It controls the systems with which the transaction interfaces, such as General Ledger, Job Cost, Accounts Payable, Accounts Receivable, and Inventory Management. It also specifies the conditions under which a line prints on reports and is included in calculations. Codes include the following: S Stock item J Job cost N Nonstock item F Freight T Text information M Miscellaneous charges and credits W Work order
Remarks	A brief description of an item, a brief description of a remark, or a brief description of an explanation.

To enter grade or potency information

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

You can enter either grade or potency information, but not both.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter grade or potency information and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose an operation, and then choose Ingredients from the Row menu.
4. On Enter Ingredients, complete the following fields to enter grade information:
   - Frm Grd
   - Thr Grd
5. To enter potency information, complete the following fields and click OK:
   - From Potency
   - Thru Potency

Field	Explanation
Frm Grd	A user defined code (40/LG) that indicates the minimum grade that is acceptable for an item. The system displays a warning message if you try to purchase or issue items with grades that do not meet the minimum grade acceptable. The system does not allow you to sell items with grades that do not meet the minimum acceptable level.
Thr Grd	A user defined code (40/LG) that indicates the maximum grade that is acceptable for an item. The system displays a warning message if you try to purchase or issue items with grades that exceed the maximum grade acceptable. The system does not allow you to sell items with grades that exceed the maximum grade acceptable.
From Potency	A number that indicates the minimum potency or percentage of active ingredients acceptable for an item. The system displays a warning message if you try to purchase or issue items that do not meet the minimum acceptable potency. The system does not allow you to sell items that do not meet the minimum acceptable potency.

Field	Explanation
Thru Potency	A number that indicates the maximum potency or percentage of active ingredients that is acceptable for an item. The system displays a warning message if you try to purchase or issue items that have a potency that exceeds the maximum potency acceptable. The system does not allow you to sell items that have a potency that exceeds the maximum potency acceptable.

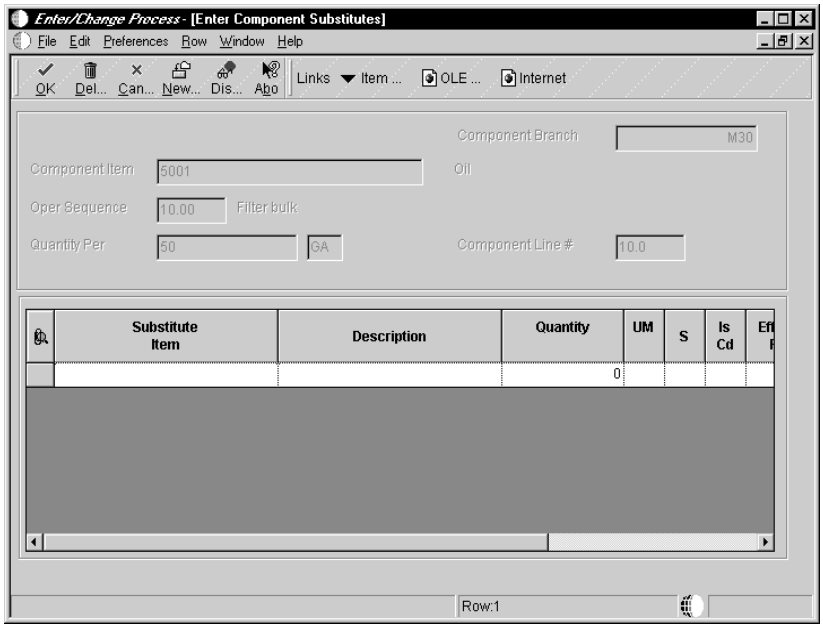
▶ To enter a substitute ingredient

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

You can enter substitute ingredients for components within your parent item. You can use substitute items if you encounter quality issues, inventory shortages, or supplier problems with the original component. The system highlights an ingredient's item description to indicate a substitution. Specify ingredient substitution for a specific process. Use item cross references for global substitutions. For more information about item cross references, see *Setting Up Item Cross References* in the *Inventory Management Guide*.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter a substitute ingredient and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose an operation and then choose Ingredients from the Row menu.
4. On Enter Ingredients, choose an ingredient and then choose Substitutes from the Row menu.



5. On Enter Component Substitutes, complete the following fields and click OK:
   - Substitute Item
   - Sub Item Sequence

Field	Explanation
Substitute Item	A number that the system assigns to an item. It can be in short, long, or third item number format.
Sub Item Sequence	A number that indicates the sequence for the substitute items for a component. The system looks for substitute items by this sequence number. For the component being substituted, set this field to zero.

▶ To enter ingredients as percentages

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

You can enter as many ingredients in the form of percentages as necessary, but the sum of the percentages must equal 100%. The system uses the batch size to calculate percentages of the process for each ingredient. You should verify that each ingredient can convert to the process unit of measure either by using the item unit of measure conversion or the standard unit of measure conversion. See *Setting Up Standard Units of Measure* in the *Inventory Management Guide* for information about these conversions.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter ingredients as percentages and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose an operation and then choose Ingredients from the Row menu.
4. On Enter Ingredients, complete the following field for each ingredient and click OK:
   - F V

Field	Explanation
F V	A code that indicates if the quantity per assembly for an item on the bill of material varies according to the quantity of the parent item produced or is fixed regardless of the parent quantity. This value also determines if the component quantity is a percent of the parent quantity. Valid values are: F Fixed Quantity V Variable Quantity (default) % Quantities are expressed as a percentage and must total 100% For fixed-quantity components, the Work Order and Material Requirements Planning systems do not extend the component's quantity per assembly value by the order quantity. For percent bills of material, the system treats zero batch sizes as variable quantity components and treats batch sizes greater than zero as fixed quantity components.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Entering Production Information

You can enter production and cost information based on demand for a specified feature. You specify an issue type code which identifies how the system issues each component from stock. You identify how many days before or after the start of the process a component is needed. And, you identify the percentage of demand for a specified feature and the percentage used to calculate the cost of the feature.

▶ To enter production information

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter production information and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose an operation and then choose Ingredients from the Row menu.
4. On Enter Ingredients, complete the following fields for each ingredient and click OK:
   - Is Cd
   - Leadtime Offset
   - Feat Plan %
   - Feat Cost %

Field	Explanation
Is Cd	A code that indicates how the system issues each component in the bill of material from stock. In Shop Floor Management, it indicates how the system issues a part to a work order. Valid codes are: I Manual issue (default) F Floor stock (no issue) B Backflush (when part is reported as complete) P Preflush (when parts list is generated) U Super backflush (at pay-point operation) S Sub-contract item (send to supplier) Blank Shippable end item You can issue a component in more than one way within a specific branch/plant by using a different code on the bill of material and work order parts list. The bill of material code overrides the branch/plant value.
Leadtime Offset	The number of days that a part is needed before or after the start date of a manufacturing work order. The system adds the leadtime offset days for the part to the start date of the work order to determine the actual date that the part is required. To indicate that a part is needed prior to the work order start date, enter the days as a negative number. To indicate how many days after the work order start date that the part is required, enter a positive number.
Feat Plan %	The percentage of demand for a specified feature based on projected production. For example, a company might produce 65% of their lubricant with high viscosity, and 35% with low viscosity, based on customer demand. The Material Planning system uses this percentage to accurately plan for a process's co-products and by-products. Enter percentages as whole numbers, for example, enter 5% as 5.0. The default value is 0%.
Feat Cost %	A percentage that the Simulate Cost Rollup program uses to calculate the cost of a feature or option item as a percentage of the total cost of the parent. Enter the percentage as a whole number, for example, enter 5% as 5.0.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Entering a Co-Products and By-Products List

Many process steps create more than one output. You can enter co-products, which are usually the main products that companies sell to customers, or by-products, which are produced as a residual item to the process steps.

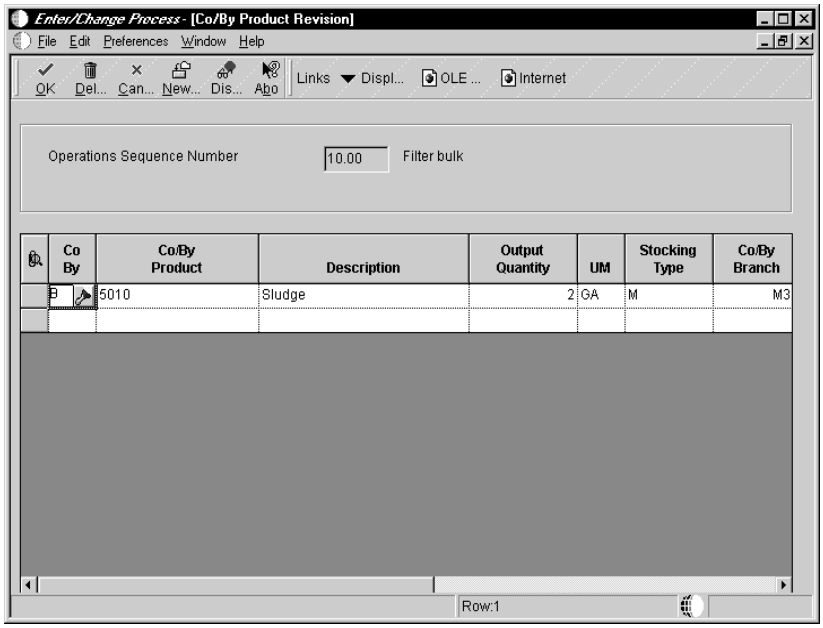
If you are entering a co-products and by-products list for a batch process, verify that the ratio of the co-products and by-products is the same for each batch quantity. For example, if a batch process with a batch quantity of 10 produces 10 each of a co-product and by-product, then a batch quantity of 20 must produce 20 each of the co-product and by-product.

▶ To enter a co-products and by-products list

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter co-products and by-products and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose a process operation and then choose Co/By Revision from the Row menu.



4. On Co/By Product Revision, complete the following fields and click OK:
    - Co By
    - Co/By Product
    - Output Quantity
    - UM
    - Co/By Branch
    - Feat Cost%
    - Resource %
    - Oper Seq#
    - Remark

Field	Explanation
Co By	A code that distinguishes standard components or ingredients from co-products, by-products, and intermediates. Co-products are (concurrent) end items as the result of a process. By-products are items that can be produced at any step of a process, but were not planned. Intermediate products are items that are defined as a result of a step but are automatically consumed in the following step. Generally, intermediates are non-stock items and are only defined steps with a pay-point for reporting purposes. Standard components (Discrete Manufacturing) or ingredients (Process Manufacturing) are consumed during the production process. Valid values are: C Co-products B By-products I Intermediate products blank Standard components or ingredients
Co/By Product	A number that the system assigns to an item. It can be in short, long, or third item number format.
Output Quantity	The quantity of finished units that you expect this bill of material or routing to produce. This field allows you to specify varying quantities of components based on the amount of finished goods produced. For example, 1 ounce of solvent is required per unit up to 100 units of finished product. However, if 200 units of finished product is produced, 2 ounces of solvent are required per finished unit. In this example, you would set up batch quantities for 100 and 200 units of finished product specifying the proper amount of solvent per unit.

Field	Explanation
Co/By Branch	A code that represents a high-level business unit. Use this code to refer to a branch or plant that might have departments or jobs, which represent lower-level business units, subordinate to it. For example: • Branch/Plant (MMCU) • Dept A (MCU) • Dept B (MCU) • Job 123 (MCU) Business unit security is based on the higher-level business unit.
Feat Cost%	A percentage that the Simulate Cost Rollup program uses to calculate the cost of a feature or option item as a percentage of the total cost of the parent. Enter the percentage as a whole number, for example, enter 5% as 5.0. . . . . . *Form-specific information* . . . . . . This value is used in Cost Rollup to calculate what percentage of the cost, up to and including the operation, that the co-product and by-product comes out of, is apportioned to the co-products and by-products at that step. The total of all percentages at an operation cannot exceed 100%. All percentages at the last operation must total 100%.
Resource %	A number that indicates what percent of the ingredients should be issued separately to co-products and by-products. . . . . . *Form-specific information* . . . . . . This is used to issue ingredients separately to co-products and by-products at work order completion, rather than a total issue for each ingredient. For co-products and by-products at the final operation, their resource percent must total 100% to issue all ingredients.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Entering Intermediates

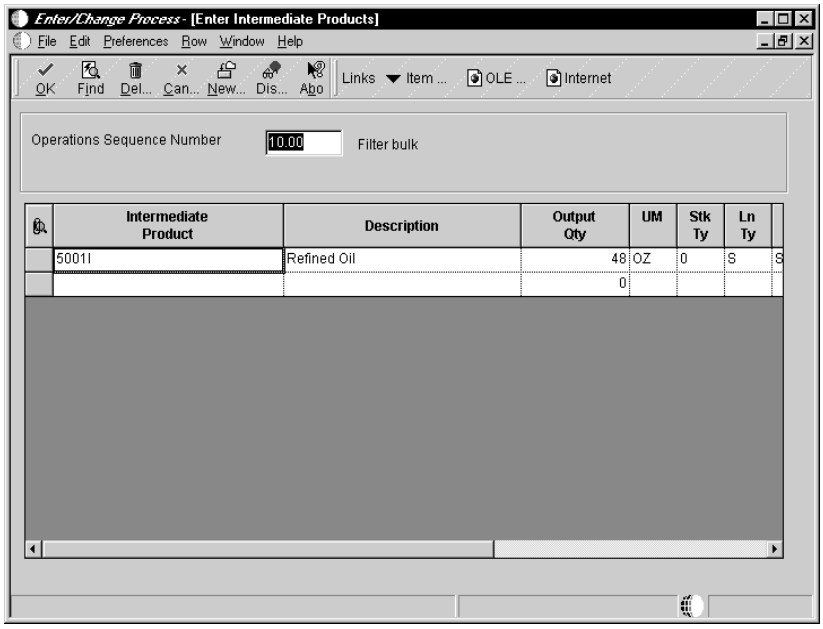
Intermediates are products that are produced from ingredients in the process. Intermediates are not a finished product but they do proceed to the next operation in the process. Intermediates allow you to track the quantity of output of any operation in a work center at a specific time. You can define intermediates in different units of measure, by item, or by quantity. You can set up one intermediate per operation, but you cannot define an intermediate for the last operation in the routing instruction.

▶ To enter intermediates

From the Daily PDM Process menu (G3012), choose Enter/Change Process.

On Work With Routing Operations

1. Complete the following fields for the process for which you want to enter intermediates and then click Find:
   - Branch/Plant
   - Item Number
2. Choose the work center and click Select.
3. On Enter Process Information, choose a process operation and then choose Intermediates from the Row menu.



4. On Enter Intermediate Products, complete the following fields and click OK:
   - Intermediate Product
   - Output Qty
   - UM
   - Effective From
   - Effective Thru
   - Oper Seq#
   - Ln Ty
   - Remark
   - F V

Field	Explanation
Output Qty	The number of units that the system applies to the transaction. . . . . . *Form-specific information* . . . . . The quantity of an intermediate that the system produces at the current step in the process.
Oper Seq#	A number used to indicate an order of succession. In routing instructions, a number that sequences the fabrication or assembly steps in the manufacture of an item. You can track costs and charge time by operation. In bills of material, a number that designates the routing step in the fabrication or assembly process that requires a specified component part. You define the operation sequence after you create the routing instructions for the item. The Shop Floor Management system uses this number in the backflush/preflush by operation process. In engineering change orders, a number that sequences the assembly steps for the engineering change. For repetitive manufacturing, a number that identifies the sequence in which an item is scheduled to be produced. Skip To fields allow you to enter an operation sequence that you want to begin the display of information. You can use decimals to add steps between existing steps. For example, use 12.5 to add a step between steps 12 and 13. . . . . . *Form-specific information* . . . . . For process manufacturing, the sequence number that produces the intermediate product.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Updating Component Scrap

From the Advanced Product Data Management menu (G3031), choose Planned Yield Update.

During manufacturing, material loss often occurs during operations. Examples of loss include evaporation or items that are damaged during move time. You can update the amount of materials and labor hours to account for operation loss by using Planned Yield Update.

For the operations you choose, this program uses the value of the operational planned yield percent to update the cumulative percent for the bill of material, and the percent of operation scrap on the routing instruction. The following table shows the percent of operation scrap for each step:

Step	Operational Planned Yield Percent	Cumulative Planned Yield Percent	Operation Scrap Percent
40	80%	80%	(100%/80%) – 100% = 25%
30	90%	80% x 90% = 72%	(100%/72%) – 100% = 39%
20	100%	72% x 100% = 72%	(100%/72%) – 100% = 39%
10	95%	72% x 95% = 68%	(100%/68%) – 100% = 47%

Operational Planned Yield Percent This value represents the percent of planned output yield for a step. You enter this value on Enter/Change Routing. The system uses this value to adjust the operation scrap percent for the components at that step. This enables the Material Requirements Planning system to use the step scrap percent along with the existing component scrap percent to plan component demand.

Cumulative Planned Yield Percent This value represents the item quantity that an operation is expected to produce. The system updates this value on Enter/Change Bill of Material. It is the ratio of usable output to input quantity. This value can be less than 100% due to loss at one or more operations. The system uses this value to increase or decrease the amount of labor hours needed to make up for loss within the operation.

Operation Scrap Percent This value represents the expected scrap at each operation. The system updates this value on Enter/Change Routing. The system calculates this value by compounding the yield percentages from the last operation to the first operation. The system uses this value to increase or decrease the amount of materials to account for loss within the operation.

Processing Options for Planned Yield Update

```
Defaults

Enter the "As of" date for the Planned
    Yield Update.  If left blank the
    current date will be used.

      Date 01                                    _____________
```

Changing Multiple Processes

From the Advanced Product Data Management menu (G3031), choose Where Used Update.

Use the Where Used Update program to change multiple processes, for example, to replace an old ingredient with a new one. When you run this program, you can review the report to verify changes. You can use this program to perform mass updates such as the following:

- Replacing one ingredient with another
- Deleting a process item
- Changing effectivity dates for a process item
- Changing the quantity per assembly value for a process item
- Changing the issue type code
- Changing the unit of measure

Use data selection to specify the process items that you want to change. Use processing options to define the change. This program finds all occurrences of the item (as an ingredient) in the Bill of Material table and updates the process. You can also update an ingredient that has past or future effectivity dates.

You can run this program in either proof or final mode. In proof mode, the system generates a report of the proposed changes for your review, but it doesn't update the data. In final mode, the system generates a report that lists the changes and updates the data according to your choices.

This program can potentially change many processes in your system at the same time. J.D. Edwards recommends that you first run it in proof mode to verify your choices,

and then run it in final mode to change the data. You might want to restrict access to this program.

If you want to make changes to a process and remove the old records, run the program twice. First, create the new records and then delete the old ones.

The system stores yours changes in the Bill of Material table only. Existing parts lists, Material Requirements Planning calculations, and costing information are not automatically updated. The program updates the following information:

- Low Level Code field in the Item Master table (F4101)
- Net Change Flag in the Item Balance Tag table (F4102J)

The system retrieves the data for this report from the Item Master table (F4101).

Before You Begin

❑ Review your process to verify that the item that you are updating is active (within the effective dates) and appears in at least one process. See *Reviewing Processes.*

See Also

- *R30520, Where Used Update* in the *Reports Guide* for a report sample

Processing Options for Where Used Update

```
Defaults 1

1.  Enter the Branch/Plant location to
    select for Bill of Material changes.
    This is a required field; if left
    blank, no processing will be
    performed.

      Branch/Plant                          _____________

2.  Enter the new Component Item number.
    If left blank, no change will be
    made to the Component Item number.

      New Component Item Number             _____________

3.  Enter the new Quantity Per amount.
    If left blank, no change will be
    made to the Quantity Per amount.

      New Quantity Per                      _____________

4.  Enter the new Quantity Per Unit of
    Measure.  If left blank, no change
    will be made to the Quantity Per
    Unit of Measure.

      New Unit of Measure                   _____________
```

Defaults 2

1. Enter the new Effective From Date. If left blank, today's date will be used.

   New Effective From _____

2. Enter the new Effective Thru Date. If left blank, no change will be made to the Effective Thru Date.

   New Effective Thru Date _____

3. Enter the new Issue Type Code. If left blank, no change will be made to the Issue Type Code.

   New Issue Type Code _____

Process

1. Enter a "1" if this is to be run in Final Mode. If left blank, the program will be run in Proof Mode.

   Final Mode _____

2. Enter a "1" to DELETE the existing record(s) from the BOM file. No updating will be performed when Delete is selected.

   Delete Mode _____

Edits

1. Enter a "1" to validate the new component against the Item Branch file (F4102). If left blank, the new item will not be validated.

   Item Branch Validation _____

Reviewing Processes

You can check your processes for low-level codes and product structure errors (where a process item is listed as an ingredient of itself), by using the Integrity Analysis program.

You can also review the processes for which to plan and research engineering change orders (ECOs), view the results of a pending product change, determine the effect of an item shortage, or evaluate capacity, manpower, equipment needs, and resources.

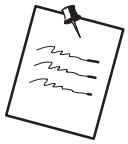
Reviewing processes consists of the following tasks:

- Verifying processes
- Reviewing process information
- Printing process information

Verifying Processes

From the Advanced Product Data Management menu (G3031), choose Integrity Analysis.

The integrity program generates a report that identifies any processes that you need to correct. If the report indicates errors, you should correct the processes and run the Integrity Analysis program again. When the program does not find errors in the processes, it updates the low-level codes in both the Item Master and the Item Branch tables.



J.D. Edwards recommends that you run the Integrity Analysis program immediately after a data conversion, such as a system startup, and then on a periodic basis, such as two or four times a year. You should also run the Integrity Analysis program before running the Simulated Cost Rollup or DRP/MPS/MRP Generation programs.

Instead of running the Integrity Analysis report, you can use online validation so that the system validates process items as you enter them. When you use online validation, the system does not allow you to enter recursive ingredients. For example, an error message displays if you attempt to enter a parent process item as an ingredient of itself.

The system retrieves the data for this report from the Bill of Material Structure Analysis Work table (F30UI002).

See Also

- *Setting Up Manufacturing Constants* to verify that you have set up manufacturing constants appropriately

Reviewing Process Information

You can review process information from several programs depending on the information you want to review. For example, you can review:

- Ingredients
- Co-products and by-products
- Resources
- Routing instructions

Reviewing process information consists of the following tasks:

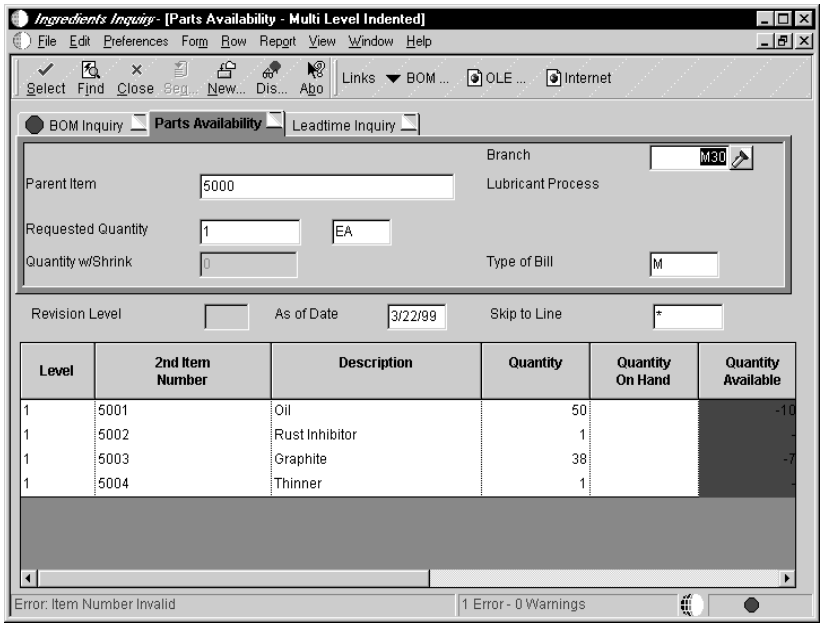
- Reviewing ingredients
- Reviewing where an ingredient is used
- Reviewing co-products and by-products
- Reviewing where co-products and by-products are produced
- Reviewing resources
- Reviewing process instructions

To review ingredients

From the Daily PDM Process menu (G3012), choose Ingredients Inquiry.

Use the Ingredients Inquiry program to review the ingredients of a process.

On Parts Availability – Multi Level Indented



1. Complete the following fields and click Find:
   - Branch
   - Parent Item
   - Requested Quantity
   - As of Date
   - Rev Lev
   - Skip to Line
2. From the View menu, choose one of the following options to change the display:
   - Single Level
   - Multi Level
   - Multi Level Indented

   Single level displays only those components that are directly used in the parent item. Multilevel displays all the components used in the parent item. Multilevel indented displays all the components and shows the level of the component indented.

Field	Explanation
Rev Lev	A value that indicates the revision level of a bill of material. It is usually used in conjunction with an engineering change notice or engineering change order. The revision level of the bill of material should match the revision level of its associated routing, although the system does not check this. This value is defined and maintained by the user.
Skip to Line	A number that indicates the sequence of the components on a bill of material. It initially indicates the relative sequence in which a component was added to a kit or single level bill of material. You can modify this number to change the sequence in which the components appear on the bill of material. Skip To fields allow you to enter a component line number that you want to begin the display of information.

See Also

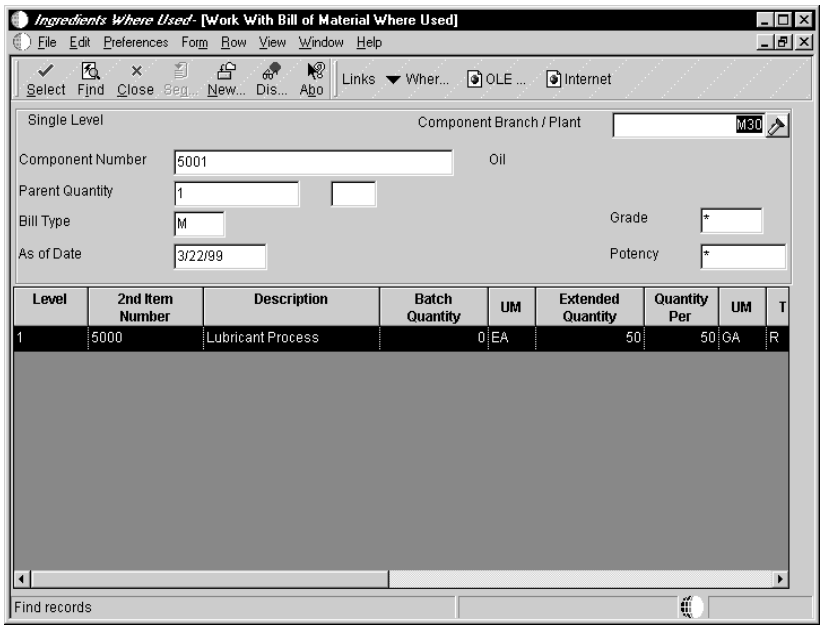
- *Locating Bills of Material* to review the processing options for Ingredients Inquiry

To review where an ingredient is used

From the Daily PDM Process menu (G3012), choose Ingredients Where Used.

Use the Ingredients Where Used program to review the processes that include a specific component.

On Work With Bill of Material Where Used



1. Complete the following fields:
   - Component Branch / Plant
   - Parent Item No
2. Complete the following optional fields and click Find:
   - As of Date
   - Bill Type
   - Units – Batch Quantity
   - Grade
   - Potency
3. From the View menu, choose one of the following options to change the display:
   - Single Level
   - Multi Level
   - Multi Level Indented

Single level displays only those components that are directly used in the parent item. Multilevel displays all the components used in the parent item. Multilevel indented displays all the components and shows the level of the component indented.

See Also

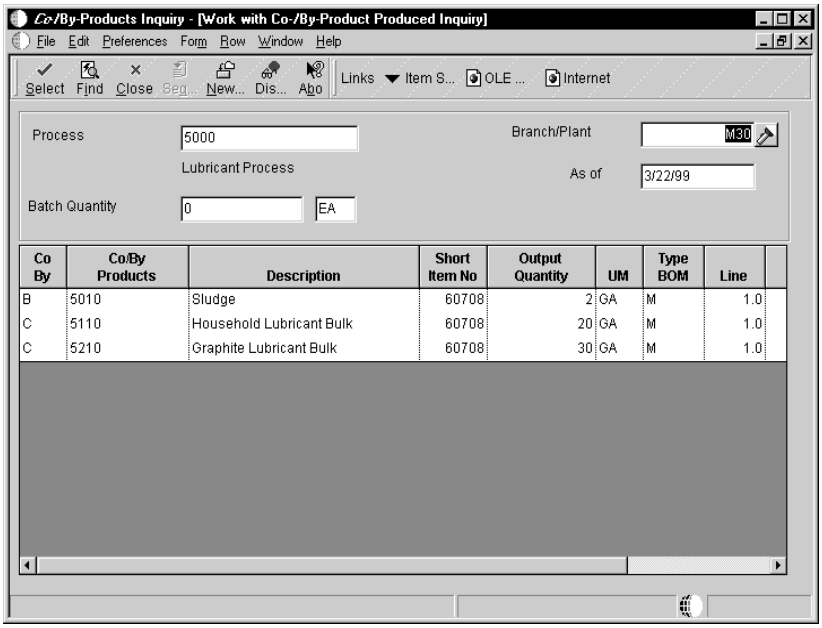
- *Locating Bills of Material* to review the processing options for Ingredients Where Used

▶ To review co-products and by-products

From the Daily PDM Process menu (G3012), choose Co-/By-Products Inquiry.

Use the Co-/By-Products Inquiry program to review all the co-products and by-products of a specific process.

On Work With Co-/By-Product Produced Inquiry



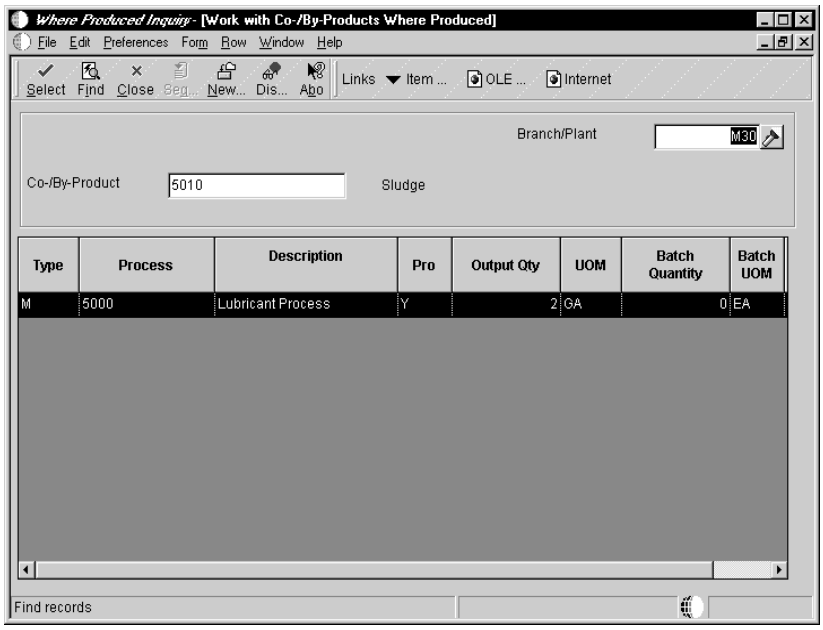
1. Complete the following fields and click Find:
   - Process
   - Branch/Plant
2. Review the co-product and by-product information.

To review where co-products and by-products are produced

From the Daily PDM Process menu (G3012), choose Where Produced Inquiry.

Use the Where Produced Inquiry program to review the processes that include a specific co-product or by-product.

On Work With Co-/By-Products Where Produced



1. Complete the following fields and click Find:
   - Branch/Plant
   - Co–/By–Product
2. Review the co-product and by-product information.

Processing Options for Co By Product Where Produced

```
Entry
1.  Enter a '1' to automatically display
    the following forms on an add:
      Additional Information
      Related Addresses
      Category Codes
      Supplier Master,  if the Payables
      field on the Additional
      Information form = 'Y'
      Customer Master,  if the
      Receivables field on the
      Additional Information form = 'Y'
```

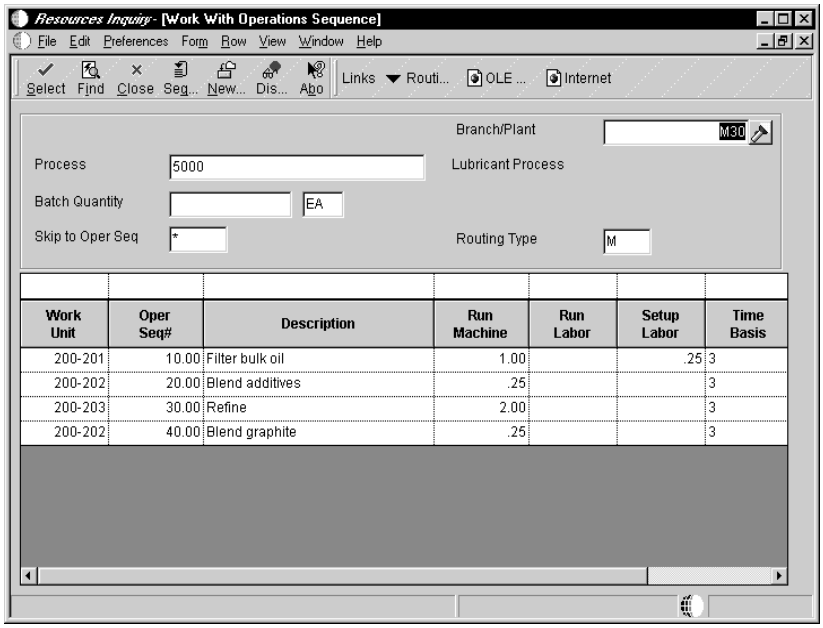
```
Defaults
2.  Enter the default Search Type that
    should appear upon entry into Work
    With Addresses.
      Search Type
3.  Enter the type code to the Who's Who
    attention name which will appear in
    the Mailing Address Window. If left
    blank (default), the attention name
    line will not be included in the
    mailing address. Currently not
    available.
      Type Code
Audit
4.  Enter a '1' to utilize the Audit Log
    file (F0101A). Currently not
    available.
      Audit Log
```

▶ To review resources

From the Daily PDM Process menu (G3012), choose Resources Inquiry.

Use the Resources Inquiry program to review the resources of the process, for example, the operations of the process and at which work center they are processed.

On Work With Operations Sequence



Complete the following fields and click Find:

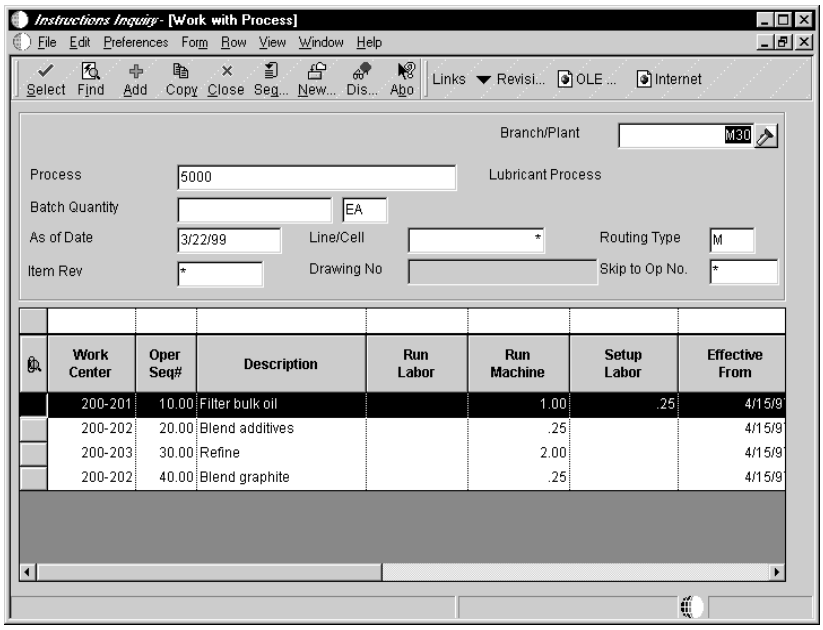
- Branch/Plant
- Process

To review process instructions

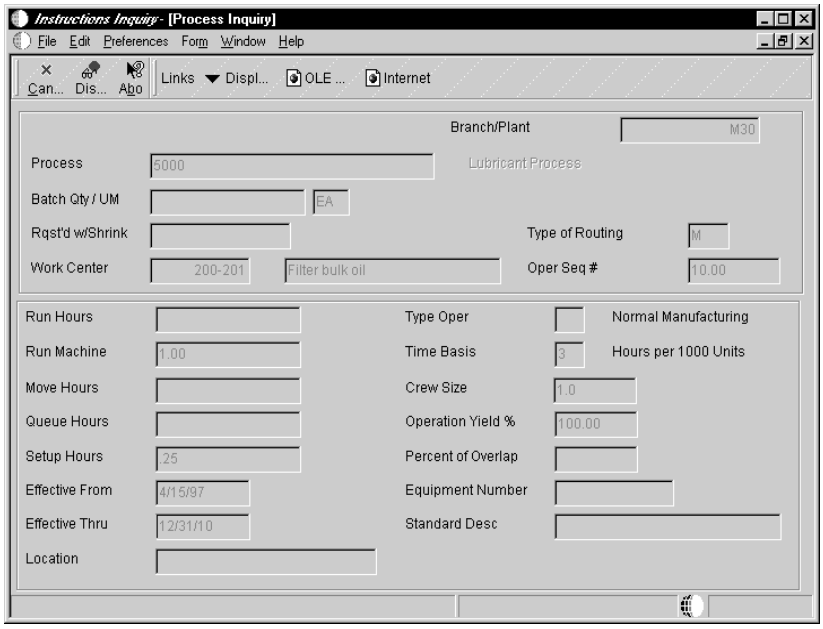
From the Daily PDM Process menu (G3012), choose Instructions Inquiry.

Use the Instruction Inquiry program to review the hours for machine, labor, and setup in the instructions for a specific process.

On Work With Routing Operations



1. Complete the following fields and click Find:
   - Branch/Plant
   - Item Number
2. Choose a process operation, and then choose Inquiry from the Row menu.



3. On Process Inquiry, review the following fields that display leadtime information:
   - Run Machine
   - Run Hours
   - Setup Hours

Field	Explanation
Run Machine	The standard machine hours that you expect to incur in the normal production of this item. . . . . . *Form-specific information* . . . . . . For Equipment/Plant Maintenance users: Entering machine hours has several consequences. If you are not using other manufacturing systems, do not enter machine hours. If you are using manufacturing systems, the machine for which the machine hours apply must be set up as a work center. If you enter machine hours in this field, the system indicates a demand for those machine hours, based on the time commitment of the work order. You should plan to take the machine out of service for the entire time necessary to complete the work order. If you enter machine hours, you can optionally complete the Percent of Overlap field to indicate any operations that can overlap previous operations. For planning purposes, the system determines the total duration of the maintenance work order based on values that you enter for machine hours and percent overlap.

Field	Explanation
Run Labor	The standard hours of labor that you expect to incur in the normal production of this item. The run labor hours in the Routing Master table (F3003) are the total hours that it takes the specified crew size to complete the operation. The hours are multiplied by the crew size during shop floor release and product costing. . . . . . *Form-specific information* . . . . . . For Equipment/Plant: This is the estimated number of hours needed to complete a maintenance activity.

See Also

- *Entering Routing Instructions* to review the processing options for Enter/Change Routing

Printing Process Information

You can print process information in single level, multilevel, and multilevel indented formats. Single level prints parent item and its components. Multilevel prints parent item and its components and subassemblies. Indented indicates the level of the components and subassemblies. You can specify a process and print the ingredients for that process. If there is more than one process, for example, in the case of different batch sizes, the program prints each process separately.

Printing process information consists of the following reports:

- ❑ Single level ingredient report
- ❑ Multilevel ingredient report
- ❑ Ingredient where used report
- ❑ Process report
- ❑ Instructions report

Single Level Ingredient Report

From the Periodic PDM Process menu (G3022), choose Single Level Ingredient.

Use the Single Level Ingredient report to print information about a parent item and its components. Use the processing options to specify a time frame and print detail information.

Processing Options for Single Level Ingredient Report

Defaults

1. Enter the “As of” date for the Bill of Material. If left blank, the current date will be used.

   As of Date _____

Print

1. Enter a ’1’ to print a second line of detail for items appearing on the report. If left blank, only one line of detail will be printed.

   Print Detail Flag _____

Multilevel Ingredient Report

From the Periodic PDM Process menu (G3022), choose Multi Level Ingredient.

Use the Multi Level Ingredient report to print information about a parent item, its components and subassemblies. Use the processing options to specify a time frame and to print detail information, component locators, and an indented bill of material.

Processing Options for Multi Level Ingredient Report

Defaults

1. Enter the “As of” date for the Bill of Material. If left blank, the current date will be used.

   As of Date _____

Print

1. Enter a ’1’ to print an indented Bill of Material.

   Indented Bill _____

2. Enter ’1’ to print a second line of detail, for items appearing on the report. If left blank, only one line of detail will be printed.

   Detail Line _____

3. Enter a ’1’ to print the component locations.

   Component Locators _____

Ingredient Where Used Report

From the Periodic PDM Process menu (G3022), choose Where Used Ingredient.

The Where Used Ingredient report shows all processes that use a specific ingredient. Use the processing options to print detail information and to specify whether you want a single level, multilevel, or indented bill of material style of report.

Processing Options for Ingredient Where Used

```
Format Option

1. Select the Mode or Style of report to
    be created: 1 = Single Level;  2 =
    Multi- Level;  3=Multi-Level
    Indented

      Mode of Report                                    _____________

2. Enter a '1' to print a second line of
    detail on the report.  If left
    blank, only one line of detail will
    be printed.

      Print Line of Detail                              _____________
```

Process Report

From the Periodic PDM Process menu (G3022), choose Process Report.

Use the Process report to print the process operations of all processes.

The system retrieves the data for this report from the Routing Master table (F3003).

Instructions Report

From the Periodic PDM Process menu (G3022), choose Instructions Report.

Use the Instructions report to print the instructions for all processes.

The system retrieves the data for this report from the Routing Master table (F3003).

Engineering Change Management

Engineering Change Management

Manufacturers must respond quickly with engineering changes in order to maintain and increase market share. Engineering changes might be necessary to respond to market demand, governmental requirements, safety issues, service requirements, or for other functional and competitive reasons.

Use the Engineering Change Management system to create, plan, review, approve, and implement engineering change orders (ECOs) and engineering change requests (ECRs).

Engineering change management consists of the following tasks:

- ❑ Setting up engineering change orders
- ❑ Working with engineering change orders
- ❑ Reviewing engineering change orders
- ❑ Approving engineering change orders
- ❑ Creating an engineering change order from a request

What is an Engineering Change Order?

Engineering change orders (ECOs) are numbered documents that you use to track product changes within the Engineering Change Management system. After you have tested and approved an ECO, you can implement it and modify your standard product or process.

Product or process changes can affect many areas within your company, including the following:

- Customer service
- Tooling
- Standards
- Suppliers
- Master production schedule
- Product cost
- Service parts
- Inventory
- Plant layout

The procedures for ECOs are the same as the procedures for engineering change requests (ECRs). However, you must use order type EN when setting up, reviewing, or approving ECOs.

What is an Engineering Change Request?

Engineering change requests (ECRs) are numbered documents that you use to track requested product changes within the Engineering Change Management system. After you have tested and approved an ECR, you can convert it to an engineering change order (ECO) and implement it using your ECO processes.

The procedures for ECRs are the same as the procedures for ECOs. However, you must use order type EG when setting up, reviewing, or approving ECRs.

Features

Engineering change orders (ECOs) enable you to do the following:

Define who approves the ECO

Defining ECO approvers also enables you to do the following:

- Establish levels of approval, so that each member of the first review group must approve the ECO before the next group receives notification
- Locate the status of an ECO and review who has approved it and who has yet to approve it
- Use electronic mail to notify and approve ECOs
- Create and maintain bill of material data that is associated with the change
- Notify reviewers during the approval process
- Limit access to the approval records

Define which items to change

Defining which items to change also enables you to do the following:

- Describe the change
- Define the parts and processes that are necessary to implement the ECO
- Include multiple parent item or component relationships on the same change order

Define the change to the routing instructions

Defining the change to the routing instructions also enables you to itemize the steps required to make the change.

Define additional detail

Defining additional detail also enables you to do the following:

- Enter supporting data, such as costs, dates, reasons, status, affected work and purchase orders, approval history, and implementation steps, into a centralized database
- Identify the originator of and reason for the change
- Set up user defined codes to define the reason, status, and disposition of the change order
- Attach supplemental information

System Integration

Engineering change orders (ECOs) integrate with the following systems:

Shop Floor Management	Uses the revision level maintained by ECOs to retrieve the appropriate bill of material for a work order. You can create a work order from a prior ECO revision level.
Inventory Management	Updates the Item Master revision level.

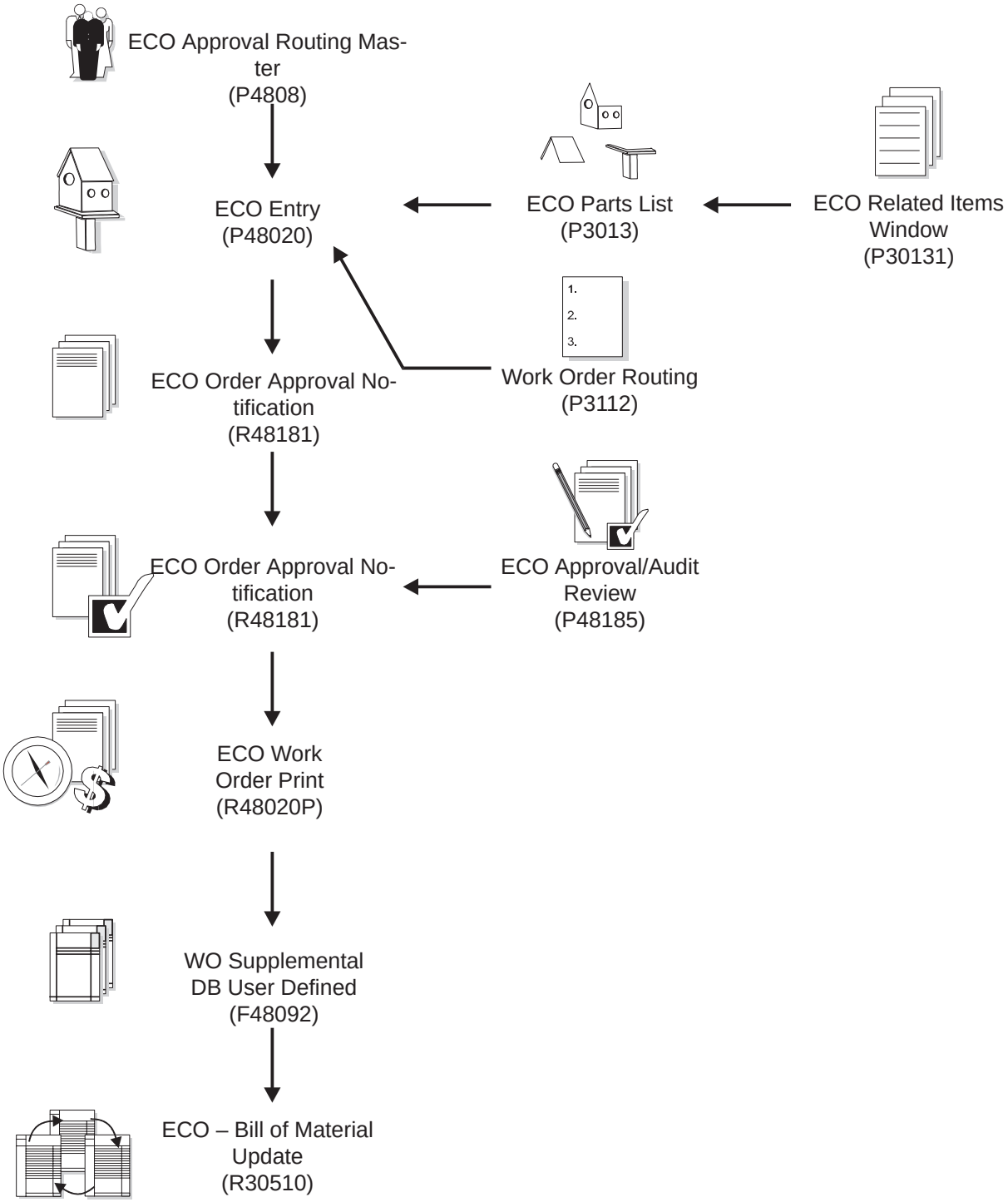
Who is Involved in the Engineering Change Order Process?

The engineering change order (ECO) process includes the following personnel:

- The administrator, who sets up the ECO by doing the following:
  - Setting up the approval routing master
  - Reviewing and modifying the ECO codes
  - Setting up next numbers
- The coordinator, who creates the ECO by doing the following:
  - Verifying that no prior ECO or ECR exists for this change
  - Entering the ECO
  - Defining the change with a list of affected parent and component items
  - Establishing the new routing instruction operations to implement the ECO
  - Maintaining supplemental details
  - Running the notification program
- The reviewer, who approves or rejects the ECO by doing the following:
  - Reviewing the ECO after system notification
  - Running reports to obtain information for an individual ECO or a list of open ECOs
  - Periodically checking for outstanding ECOs
- The coordinator, who implements the ECO by running the Engineering Change Population program (P30510)

Engineering Change Order Process

The following graphic illustrates the engineering change order process:



What Kinds of Changes Can You Define?

You can define the engineering change order by determining the type of change to make and identifying parent and component items. For example, you can determine whether to do the following:

- Add a new part
- Change an existing part
- Replace an old part with a new part
- Remove an existing item

Engineering Change Order Revision Levels

A revision level is an alphanumeric character that represents the number of times that an item has been changed. This usually indicates a permanent change to an item's form, fit, or function. For efficient tracking of changes with revision levels, the revision levels for an item's bill of material and its routing instruction should match. You can use an engineering change order (ECO) to update an item's revision level and a drawing's revision level.

Use ECOs to manage revision-level information. For example, you can do the following:

- Assign the next revision levels (30/NR) for ECOs
- Load parent revision levels for a component that is being added or modified
- Locate the revision levels of an ECO
- Assign ECO revision levels automatically
- Maintain drawing revision levels for each item changed by an ECO, and update the drawing revision in either the Bill of Material or Item Master tables

Setting Up Engineering Change Orders

Before you use the Engineering Change Management system, you need to set up codes, next numbers, and the approval routing master for engineering change orders (ECOs). The codes you must set up are user defined and specify the type, priority, and status of the ECO. The user defined codes also include what the system should do with existing items affected by and the reasons for the ECO. You must also set up next numbers to automatically number ECOs according to your specifications. You can also activate the system to route the ECO information to specified reviewers for their approval, before it is processed. To do so, you must identify an ECO approval routing.

Setting up engineering change orders consists of the following tasks:

- ❑ Setting up user defined codes
- ❑ Setting up next numbers
- ❑ Setting up approval routings

Before You Begin

- ❑ Define your work centers. See *Entering Work Centers.*
- ❑ Define your items in the Inventory Management system. See *Entering Item Master Information* in the *Inventory Management Guide.*

Setting Up User Defined Codes

User defined codes are stored in tables by system and code type. For example, system 30, type TB represents Product Data Management and user defined code time basis code. To set up time basis codes for machine or labor hours, identify all the codes you want to use to identify the different time basis codes using the User Defined Codes form. If you enter a time basis code on another form that you did not identify as a time basis code on the User Defined Codes form, the system displays an error message. For example, you can only enter codes in the time basis code field that exist in the user defined code table for system 30 and type TB.

The following user defined codes are primary to engineering change orders:

- Type Code (00/TY)
- Priority Code (00/PR)
- Status Code (00/SS)
- Phase In Code (40/PH)
- Existing Disposition Code (40/ED)
- Reason Code (40/CR)
- Next Revision Level (30/NR)

Type Code (00/TY)

Type code (00/TY) indicates the type of engineering change order, such as G for government change and R for rework.

Priority Code (00/PR)

Priority code (00/PR) indicates the priority of the engineering change order, such as H for high priority and 3 for normal priority.

Status Code (00/SS)

Status code (00/SS) indicates the status of the engineering change order, such as EM for emergency and A for approved.

Phase In Code (40/PH)

Phase in code (40/PH) indicates how to phase in engineering change orders, such as IMD for immediate and AVL for as available.

Existing Disposition Code (40/ED)

Existing disposition code (40/ED) indicates what to do with existing items that are affected by the engineering change order, such as CNL for cancel, RWK for rework, UAI for use as is, and SCP for scrap.

Reason Code (40/CR)

Reason code (40/CR) indicates the reasons for defined engineering change orders, such as CC for customer change and RF for federal requirements.

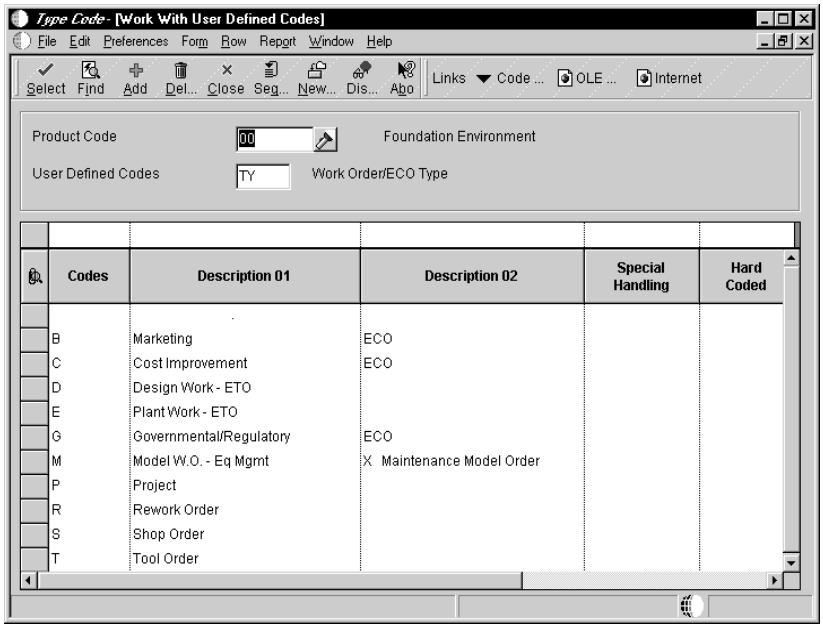
Next Revision Level (30/NR)

Next revision level (30/NR) indicates the sequence of revision levels that are assigned to engineering change order transactions.

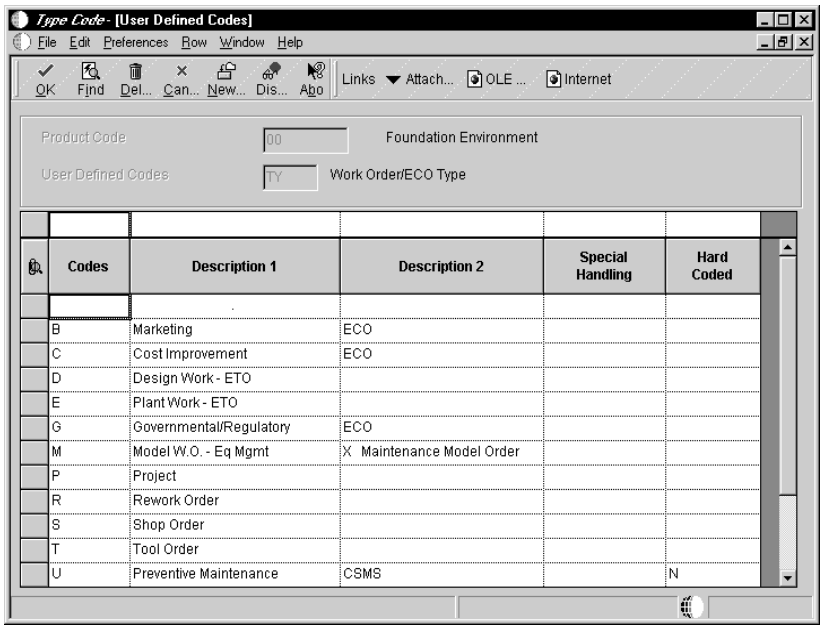
To set up user defined codes

From the Product Data Management Setup menu (G3041), choose Type Code.

On Work With User Defined Codes



1. Click Add.



2. On User Defined Codes, complete the following fields and click OK:
    - Codes
    - Description 1
    - Description 2

See Also

- *Setting Up User Defined Codes* in the *Product Data Management Setup* section to review the processing options for user defined codes

Setting Up Next Numbers

Next numbers is an automatic document numbering feature. It allows you to enter a starting document number for each document type, such as ECOs. If you do not assign an ECO number manually, the system automatically assigns the next number to the ECO.

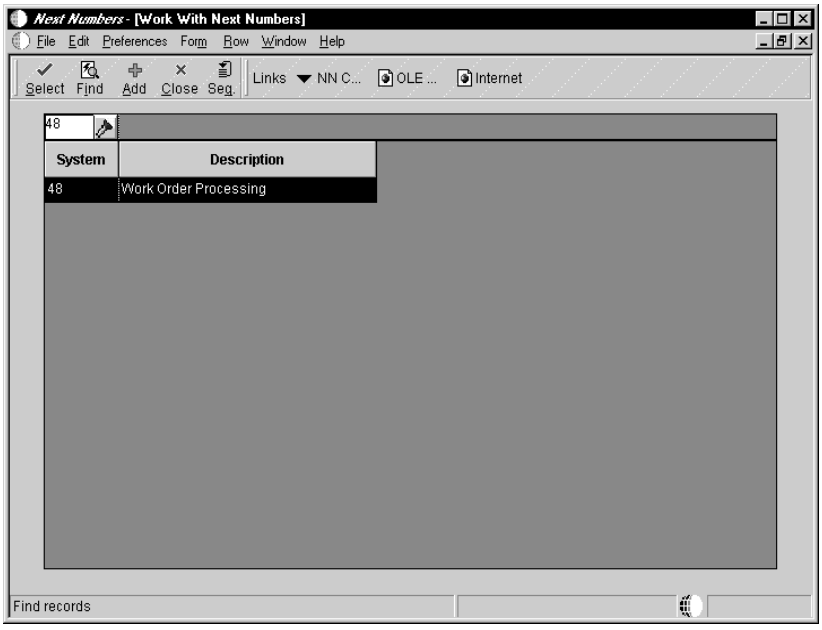
You can also use a check digit. This is an additional number that the system attaches to the end of the next number. Check digits prevent transpositions and data entry errors. Check digits are not sequential.

If you change the numbering scheme, you should change the next number to a value that is greater than the previously assigned numbers.

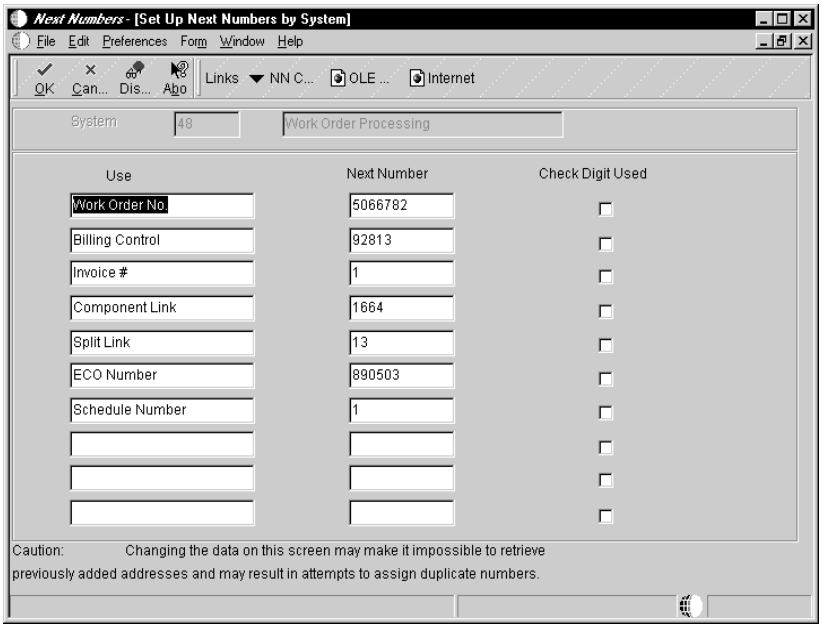
To set up next numbers

From the Product Data Management Setup menu (G3041), choose Next Numbers.

On Work With Next Numbers



1. Enter 48 in the following field and click Find:
   - System
2. Click Add.



3. On Set Up Next Numbers by System, complete the following fields:
   - Use
   - Next Number
4. Click the following check box next to the applicable next numbers and click OK:
   - Check Digit Used

Field	Explanation
System	A user defined code (98/SY) that identifies a J.D. Edwards system.
Next Number	The number that the system uses for the next number that it assigns. The system can use next numbers for voucher numbers, invoice numbers, journal entry numbers, employee numbers, address numbers, contract numbers, and sequential W-2s. You must use the next number types already established, unless you provide custom programming.

Setting Up Approval Routings

Use an approval routing to maintain a list of reviewers that should receive an electronic mail notification of pending ECOs.

You can set up two types of approval routing. The approval routing master applies to a specific branch/plant and order type combination. Order-specific approval routing applies to a specific ECO. After you have set up an approval routing master for your branch/plant, you can customize the routing for a specific ECO.

The system notifies all reviewers in a group at the same time. The system notifies the groups in the order that they are defined within the user defined code. The codes do not have to be numeric. The system waits to send notification to a group until all members in the prior group have approved the ECO.

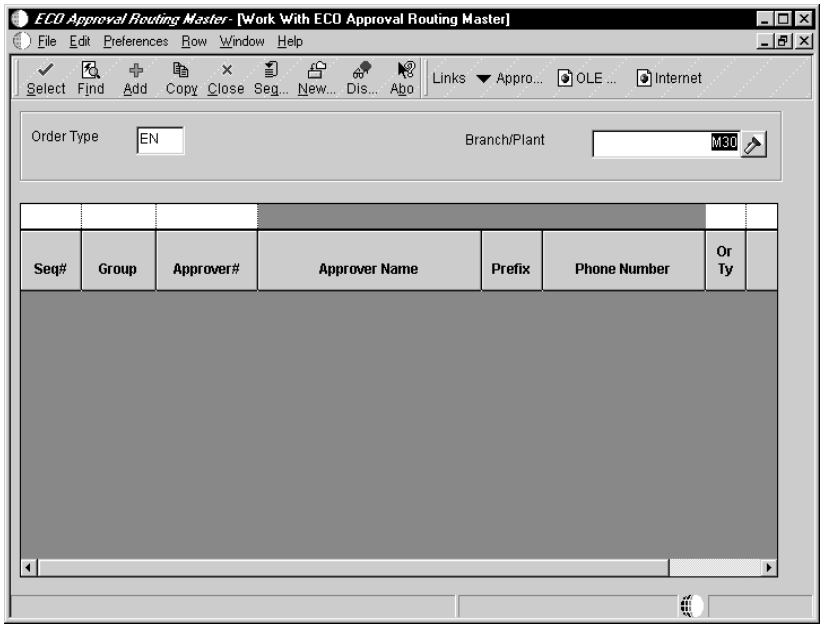
Setting up approval routings consists of the following tasks:

- Setting up an approval routing master
- Setting up an order-specific routing (optional)

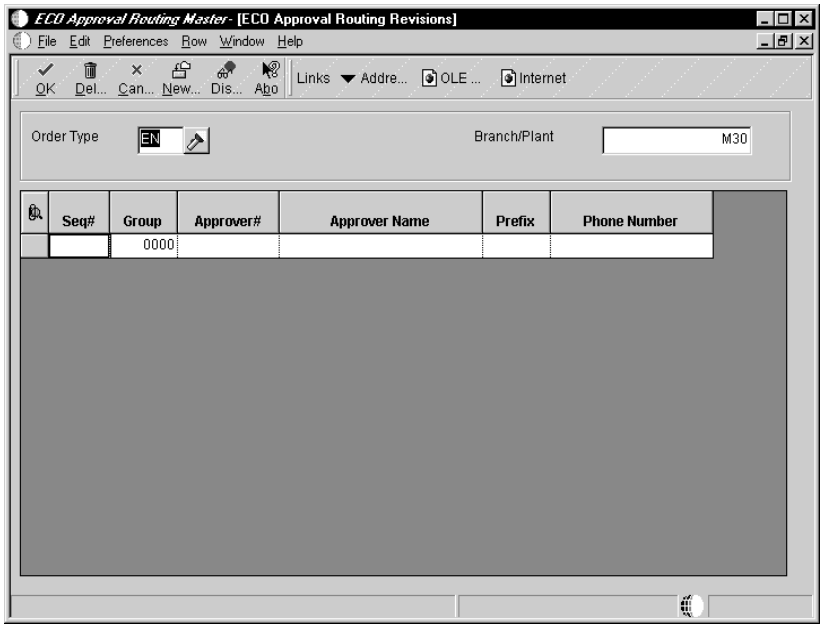
▶ To set up an approval routing master

From the Engineering Change Management menu (G3013), choose ECO Approval Routing Master.

On Work With ECO Approval Routing Master



1. Type EN in the following field:
   - Order Type
2. Complete the following field and click Add:
   - Branch/ Plant



3. On ECO Approval Routing Revisions, complete the following fields and click OK:
   - Branch/Plant

- Seq#
- Group
- Approver#

Field	Explanation
Seq#	For OneWorld, the sequence by which users can set up the order in which their valid environments are displayed. For World, a sequence or sort number that the system uses to process records in a user defined order.
Group	A number used to combine similar records.
Approver#	A number that identifies an entry in the Address Book system. Use this number to identify employees, applicants, participants, customers, suppliers, tenants, and any other address book members.

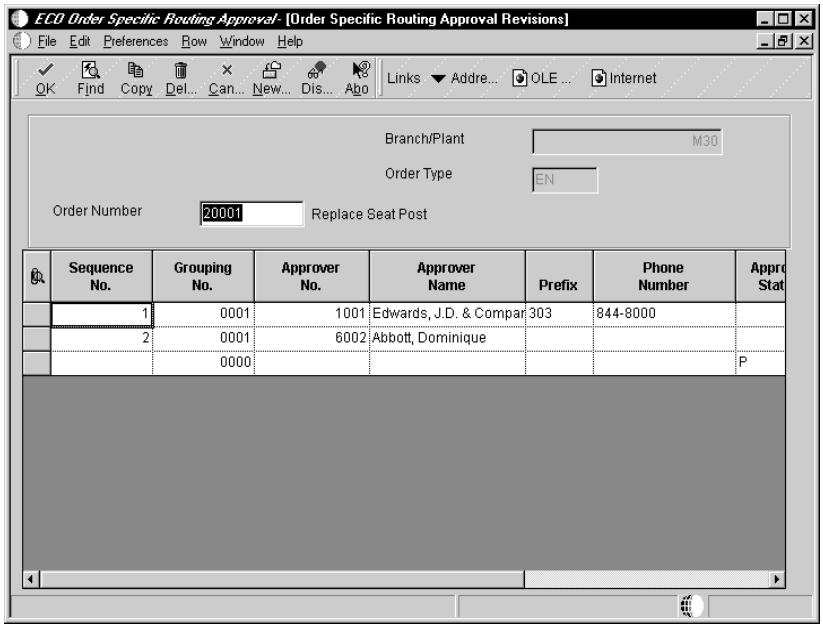
Processing Options for ECO Approval Routing Master

```
Defaults

Enter the default search order type. If
    left blank, 'EN' will be used.

      Order Type                                    _____

Versions

      Address Book (P0101)                          _____
```

▶ To set up an order-specific approval routing

From the Engineering Change Management menu (G3013), choose ECO Order Specific Routing Approval.

On Order Specific Routing Approval Revisions



1. Complete the following field and click Find:
   - Order Number
2. For each approver, complete the following fields and click OK:
   - Sequence No.
   - Grouping No.
   - Approver No.

Field	Explanation
Sequence No.	For OneWorld, the sequence by which users can set up the order in which their valid environments are displayed. For World, a sequence or sort number that the system uses to process records in a user defined order.
Grouping No.	A number used to combine similar records.
Approver No.	A number that identifies an entry in the Address Book system. Use this number to identify employees, applicants, participants, customers, suppliers, tenants, and any other address book members.

Working With Engineering Change Orders

Use engineering change orders (ECOs) to plan, approve, and implement product changes. The creator of the ECO typically performs several tasks, such as setting up the approval routing master, reviewing and modifying the user defined codes, and setting up next numbers.

Working with engineering change orders consists of the following tasks:

- ❑ Locating existing engineering change orders (optional)
- ❑ Entering engineering change orders
- ❑ Defining routing instructions for engineering change orders
- ❑ Defining changes
- ❑ Reviewing pending orders
- ❑ Notifying reviewers of engineering change orders

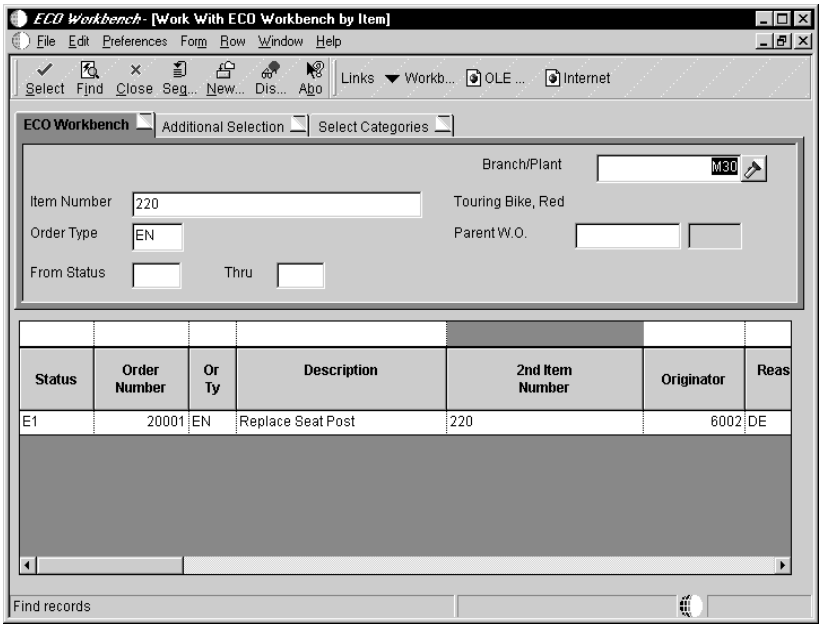
Locating Existing Engineering Change Orders

Before you create an ECO, you might want to verify that one does not exist for the change. Use the ECO Workbench to view and manage ECO information and check the progress of an ECO.

▶ To locate existing engineering change orders

From the Engineering Change Management menu (G3013), choose ECO Workbench.

On Work With ECO Workbench by Item



1. Complete the following fields and click Find:
   - Branch/Plant
   - Item Number
2. To limit your search, use the selection criteria on this form, or click the Additional Selection tab and complete any of the fields.
3. Review the following fields that display ECO information:
   - Status
   - Order Number
   - Or Ty
   - Description
   - Originator

- Reason
- Phase In
- Priority
- Target Incorp
- Actual

Field	Explanation
Status	A user defined code (00/SS) that describes the status of a work order or engineering change order. Any status change from 90 thru 99 automatically updates the date completed.
Order Number	A number that identifies an original document. This can be a voucher, an order number, an invoice, unapplied cash, a journal entry number, and so on.
Type	A user defined code (00/TY) that indicates the type classification of a work order or engineering change order. You can use work order type as a selection criteria for work order approvals.
Description	A user defined name or remark.
Originator	The address book number of the person who originated the change request.
Reason	A user defined code (40/CR) that indicates the reason for an engineering change order.
Phase In	A user defined code (40/PH) that indicates how the system phases in an engineering change order.
Priority	A user defined code (00/PR) that indicates the relative priority of a work order or engineering change order in relation to other orders. A processing option for some forms lets you enter a default value for this field. The value then displays automatically in the appropriate fields on any work order you create on those forms and on the Project Setup form. You can either accept or override the default value.
Target Incorp	The date that the work order or engineering change order is planned to be completed.
Actual	The date that the work order or engineering change order is completed or canceled.

Processing Options for ECO Workbench

Versions

Enter the version for each program. If left blank, version ZJDE0001 will be used.
otherwise specified.

1. Enter/Change Order (P48020) _____
2. WO Details *ZJDE0001 (P480200) _____
3. Pending PO's *ZJDE0002 (P480200) _____
4. Parts List (P3013) _____
5. Approval Audit/Review (P48185) _____
6. Address Book Master Search (P0101S) _____
7. Work Order Routing (P3112) _____

Defaults 1

1. Enter the values to preload to the screen at initial inquiry. If left blank, no value will be preloaded.

Reason Code _____
Phase Code _____
Work Order Type _____
Priority _____
Originator _____

Defaults 2

1. Enter the values to preload to the screen at initial inquiry. If left blank, no value will be preloaded.

From Status _____
Thru Status _____
Item Number _____
Document Type _____
Phase _____

Entering Engineering Change Orders

You must first define the engineering change order (ECO) number and codes that determine its priority, status, effective dates, and so on. Later, you must define the routing instruction, parts list, and detail information. If you specify a parent work order number on the ECO, you can retrieve related work orders and review the history of a product.

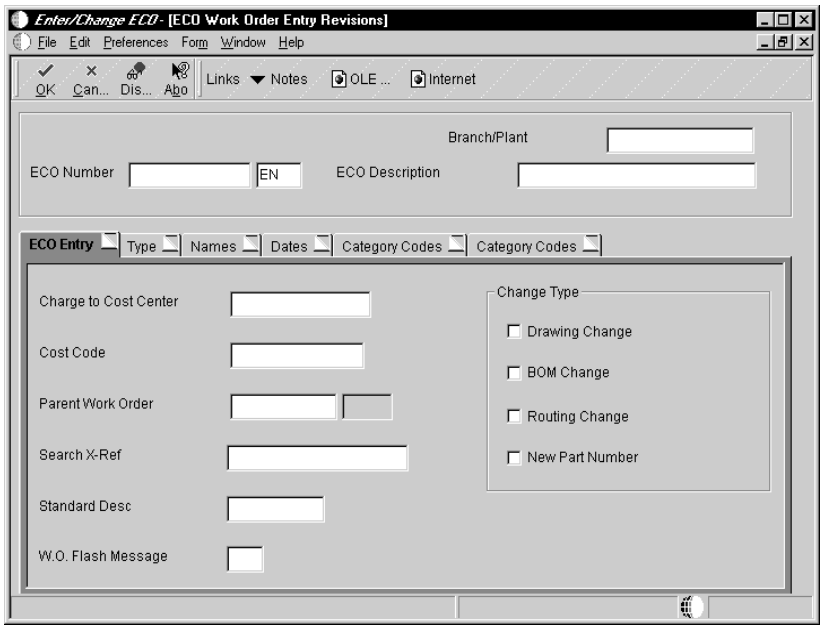
To delete an ECO, you must first delete the ECO parts list, and then delete the ECO.

▶ To enter engineering change orders

From the Engineering Change Management menu (G3013), choose Enter/Change ECO.

On Work With ECO Work Order Entry

1. Click Add.



2. On ECO Work Order Entry Revisions, complete the following fields:
   - Branch/Plant
   - ECO Number
   - ECO Description

3. Click the ECO Entry tab, and complete the following optional fields:
    - Charge to Cost Center
    - Cost Code
    - Parent Work Order
    - Search X–Ref
    - Standard Desc
    - W.O. Flash Message
    - Drawing Change
    - BOM Change
    - Routing Change
    - New Part Number
4. Click the Type tab and complete the following optional fields:
    - Type
    - Priority
    - Status
    - Phase In
    - Existing Disp
    - Reason
5. Click the Names tab and complete the following optional fields:
    - Originator
    - Coordinator
    - Customer
    - Supervisor
    - Manager
6. Click the Dates tab and complete the following optional fields:
    - Target Dates Design
    - Target Dates Incorporated
    - Actual Dates Design
    - Actual Dates Engineering
    - Actual Dates Incorporated
7. Click the first Category Codes tab and complete the following optional fields:
    - Phase
    - Category 02

- Category 03
- Category 04
- Category 05

8. Click the second Category Codes tab, complete the following optional fields, and click OK:
   - Experience Level
   - Service Type
   - Skill Type
   - Status
   - Category 10

Field	Explanation
Cost Code	A subdivision of an object account. Subsidiary accounts include more detailed records of the accounting activity for an object account.
Parent Work Order	A number that identifies the parent work order. You can use this number to do the following: • Enter default values for new work orders, such as Type, Priority, Status, and Manager • Group work orders for project setup and reporting
Search X–Ref	An alphanumeric value used as a cross-reference or secondary reference number. Typically, this is the customer number, supplier number, or job number.
W.O. Flash Message	A user defined code (00/WM) that indicates a change in the status of a work order. The system indicates a changed work order with an asterisk in the appropriate report or inquiry form field. The system highlights the flash message in the Description field of the work order.
Drawing Change	A code that indicates whether the engineering change order requires a drawing change. Valid values are: For World, Y Yes, a drawing change is required. N No, a drawing change is not required. Blank The system uses N. For OneWorld, click Drawing Change to indicate that the engineering change order requires a drawing change.

Field	Explanation
BOM Change	A code that indicates whether the engineering change order requires a change to the bill of material. Valid values are: For World, Y Yes, a change to the bill of material is required. N No, a change to the bill of material is not required. Blank The system uses N. For OneWorld, click BOM Change to indicate that the engineering change order requires a change to the bill of material.
Routing Change	A code that indicates whether the engineering change order requires a change to the routing. Valid values are: For World, Y Yes, a change to the routing is required. N No, a change to the routing is not required. Blank The system uses N. For OneWorld, click Routing Change to indicate that the engineering change order requires a change to the routing.
New Part Number	A code that indicates whether a new part number is required for an engineering change order. Valid values are: For World, Y Yes, a new part number is required. N No, a new part number is not required. Blank The system uses N. For OneWorld, click New Part Number to indicate that a new part number is required for an engineering change order.
Status	A user defined code (00/W6) that indicates the status of the work order.
Phase In	A user defined code (40/PH) that indicates how the system phases in an engineering change order.
Existing Disp	A user defined code (40/ED) that identifies the disposition of the existing item affected by the engineering change order.
Coordinator	The address book number of the person assigned to do the work.
Supervisor	The address book number of the supervisor. Note: A processing option for some forms allows you to enter a default value for this field based on values for Category Codes 1 (Phase), 2, and 3. Set up the default values on the Default Managers & Supervisor form. After you set up the default values and the processing option, the information displays automatically on any work orders that you create if the category code criterion is met. You can either accept or override the default value.

Field	Explanation
Manager	The address book number of a manager or planner. Note: A processing option for some forms lets you enter a default value for this field based on values for Category Codes 1 (Phase), 2, and 3. Set up the default values on the Default Managers and Supervisors form. After you set up the default values and the processing option, the information displays automatically on any work orders that you create if the category code criterion is met. (You can either accept or override the default value.)
Target Dates Design	The start date for the order. You can enter this date manually, or have the system calculate it using a backsheduling routine. The routine starts with the required date and offsets the total leadtime to calculate the appropriate start date. The system uses the system date as the default date.
Target Dates Incorporated	The date that the work order or engineering change order is planned to be completed.
Actual Dates Design	The start date for the order. You can enter this date manually, or have the system calculate it using a backsheduling routine. The routine starts with the required date and offsets the total leadtime to calculate the appropriate start date. The system uses the system date as the default date.
Actual Dates Engineering	The date that the system sends the engineering change order notice to the inspector in the review process.
Actual Dates Incorporated	The date that the work order or engineering change order is planned to be completed.
Phase	A user defined code (00/W1) that indicates the current stage or phase of development for a work order. You can assign a work order to only one phase code at a time. Note: Certain forms contain a processing option that allows you to enter a default value for this field. If you enter a default value on a form for which you have set this processing option, the system displays the value in the appropriate fields on any work orders that you create. The system also displays the value on the Project Setup form. You can either accept or override the default value.
Category 02	A user defined code (00/W2) that indicates the type or category of a work order. Note: A processing option for some forms lets you enter a default value for this field. The value then displays automatically in the appropriate fields on any work orders that you create on those forms and on the Project Setup form. You can either accept or override the default value.

Field	Explanation
Category 03	A user defined code (00/W3) that indicates the type or category of the work order. Note: A processing option for some forms lets you enter a default value for this field. The value then displays automatically in the appropriate fields on any work orders that you create on those forms and on the Project Setup form. You can either accept or override the default value.
Category 04	A user defined code (00/W4) that indicates the type or category of the work order.
Category 05	A user defined code (00/W5) that indicates the type or category of the work order.
Experience Level	A user defined code (00/W9) that indicates the type or category of the work order.
Service Type	A user defined code (00/W7) that indicates the service type for the work order.
Skill Type	A user defined code (00/W8) that indicates the type or category of the work order.
Category 10	A user defined code (00/W0) that indicates the type or category of the work order.

Processing Options for ECO Entry

```
Defaults

1.  Enter the default value for Document
    Type.  If left blank, “EN” will be
    used.

      Document Type                                _____________

2.  Enter the default value for Order
    Status.  If no value is entered,
    then blank will be used as the
    default status.

      Status                                       _____________

Process

1.  Enter the document type created when
    creating an engineering change order
    from and engineering change request.
    If left blank, type ’EN’ will
    default.

      ECO Order Type                               _____________
```

```
Versions

1.  Enter the version to use for each
    program listed.  If left blank,
    version ZJDE0001 will be used.

      WO Details *ZJDE0001 (P480200)                _____________
      Parts List (P3013)                            _____________
       Workbench (P30225)                           _____________
       Pending PO's *ZJDE0002 (P480200)             _____________
       Approval Notification (R48181)               _____________
       Approval Audit/Review (P48185)               _____________
      Instruction/Disposition (P4802)               _____________
      Work Order Routing (P3112)                    _____________
      Work Order Record (P48217)                    _____________
```

Defining Routing Instructions for Engineering Change Orders

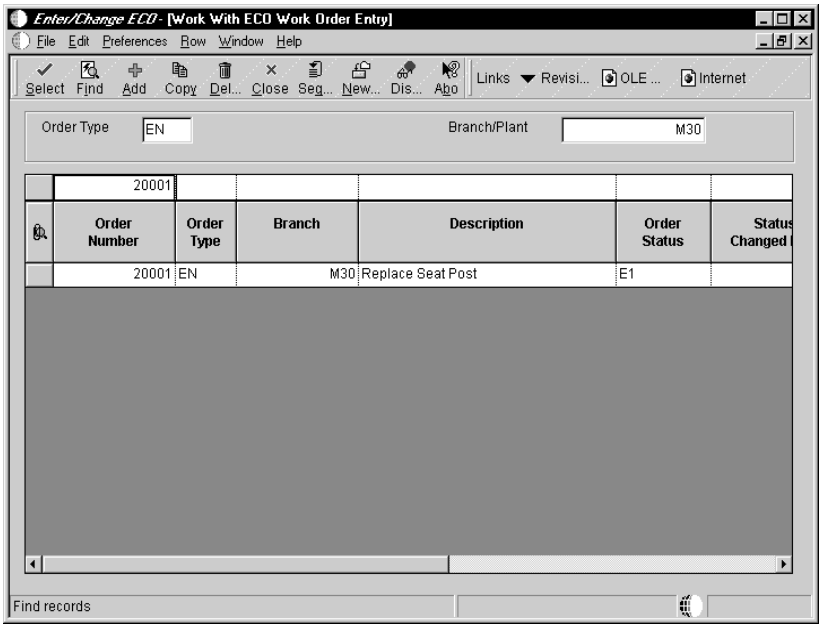
After you enter the engineering change order (ECO), you can define a routing instruction that indicates the steps necessary to implement the ECO. For example, the engineering department might request that you test a new manufacturing process before its implementation.

You cannot use this program to change production routing instructions.

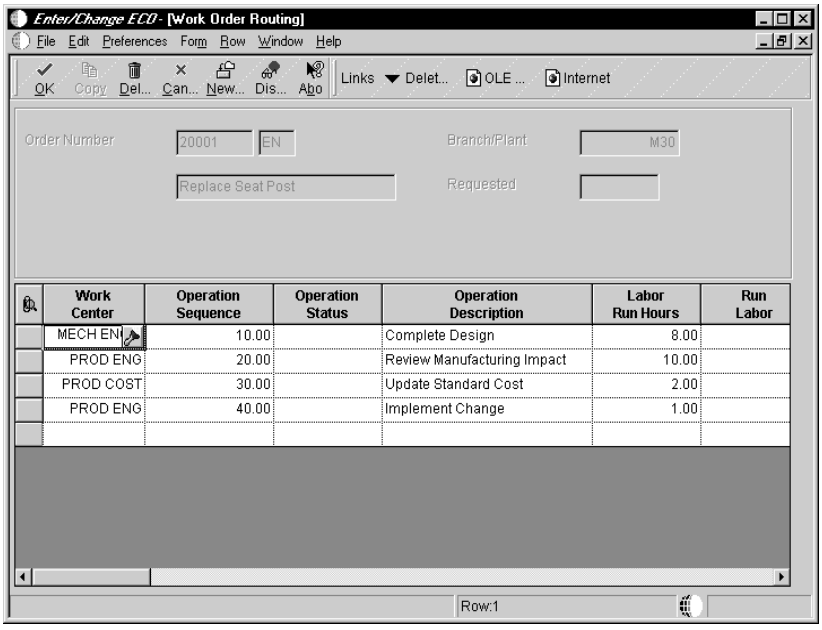
▶ To define routing instructions for engineering change orders

From the Engineering Change Management menu (G3013), choose Enter/Change ECO.

On Work With ECO Work Order Entry



1. Complete the following field and click Find.
    - Branch/Plant
2. Choose the record and then choose Routing from the Row menu.



3. On Work Order Routing, complete the following fields and click OK:
    - Work Center
    - Operation Sequence
    - Description

- Start Date
- Request Date

See Also

- *Entering Engineering Change Orders* to review the processing options for ECO Entry

Defining Changes

After you have created the engineering change order (ECO) and defined the routing instruction, you must define the change and identify the affected items. For all engineering change types except swap parent, you must enter information about the change for other items on the ECO Related Items List form.

You can use the user defined code Next Revision Levels (30/NR) to automatically update revision levels based on the sequence that you define. Revision levels usually require an ECO and are for permanent, long-term changes. Revision levels include changes to form, fit, or function and should match on a bill of material and routing instruction for the item. You can track changes in a bill of material with revision levels. Use the Revision Level field to display a revision history of the bill. These revision levels are user defined and for reference only.

The values that you enter in the Change Type and Parent/Component Relationship fields on the ECO Parts List Entry form define the changes and determine how the Engineering Change Population program updates the bill of material for the item.

Defining changes consists of the following tasks:

- Defining affected items
- Defining engineering changes

You can use the following values in the Change Type and Parent/Component Relationship fields:

Change Type field	N – add new part
	C – change existing part
	S – swap old part with new part
	R – remove existing part
Parent/Component Relationship field	P – parent item
	C – component item

The Change Type and Parent/Child Relationship fields allow eight possible combinations. These combinations are as follows:

Change	ECO Parts List form				Related Items form	
	Change Type	P/C Rel	Enter the following:	Revision Level	Enter the following:	Revision Level
Add a new bill	N	P	New parent item for the new bill	New parent revision	Components for the new parent	Revision level of added components
Change the bill	C	P	Current parent item	Current parent revision	Updated parent information	New revision
Swap a parent item	S	P	Swap to parent information	Swap to parent revision in fold	Not allowed	Not allowed
			Swap from parent	Revision of swap from parent		
Remove a bill	R	P	Current parent information	Current revision	Not allowed	Not allowed
Add a new component	N	C	New component	New component revision	Parent bills using component (where used)	Revision of new components' parent
Change a component	C	C	The component to change	New revision of component	Parent bills that will have component changes	Parent of new component revision
Swap a component	S	C	Swap to component	Revision of swap to component	Parent bill having components swapped	Revision of parent having component swapped
			Swap from component	Revision of swap from component		
Remove a component	R	C	Component to remove	Revision of component to remove	Parent bills have component removed (where used)	Revision of parent having component removed

▶ To define affected items

From the Engineering Change Management menu (G3013), choose ECO Parts List.

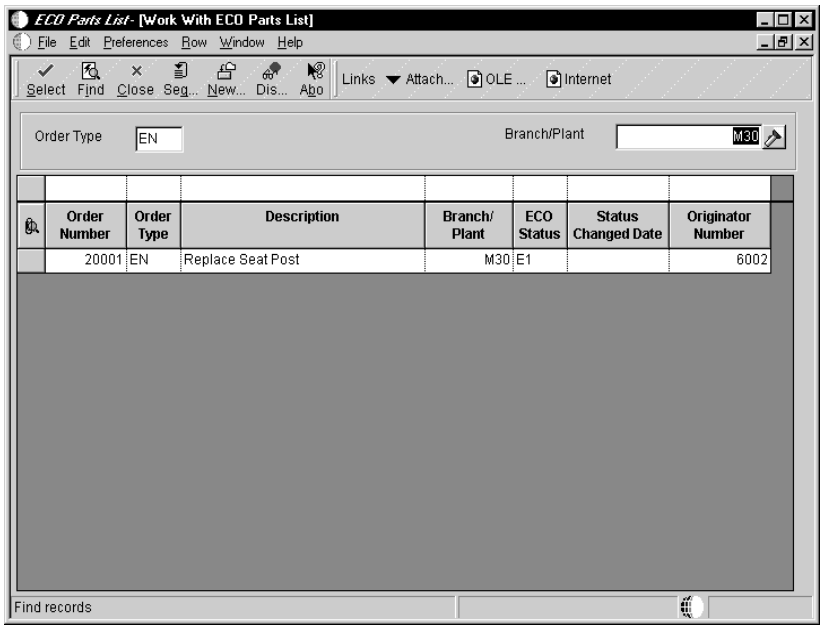
You can only update an engineering change order (ECO) with the next revision level if there are no pending ECOs for the item. If there are pending ECOs, the system displays an error message and does not update the revision level.

The Engineering Change Order system automatically selects related items based on the change type and parent and child relationship values. You can delete the related items for which you do not want to implement the change.

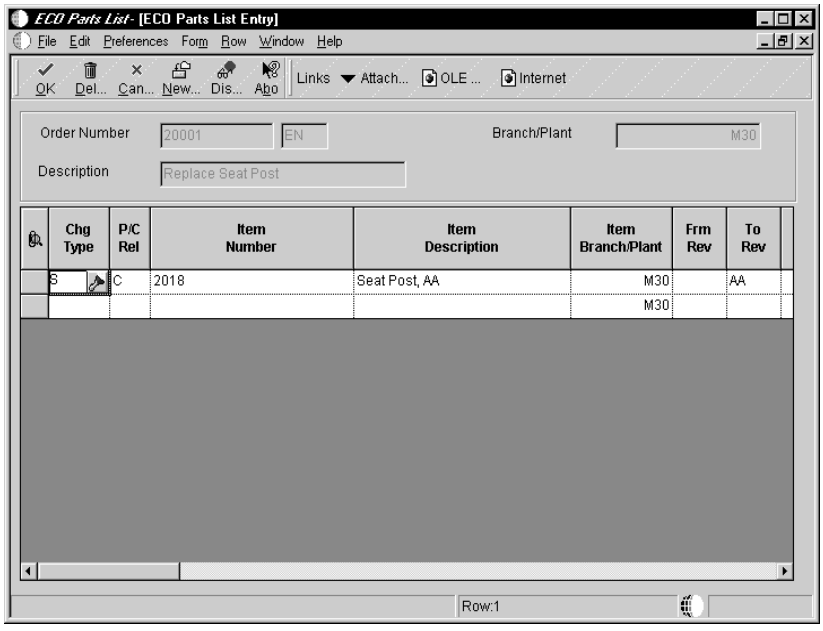
Use effective dates to phase in and out any product or process changes. Effective dates might not require an ECO process and are for smaller, short-term or low-impact changes.

You can maintain the drawing revision level for each item. The Engineering Change Population program can update the drawing revision level in both the Bill of Material Master table (F3002) and the Item Master table (F4101).

On Work With ECO Parts List



1. Complete the following field and click Find:
   - Branch/Plant
2. Choose the row that contains the ECO for which you want to define affected items and click Select.



3. On ECO Parts List Entry, complete the following fields and click OK:
    - Chg Type
    - P/C Rel
    - Item Number
    - To Rev
    - Effective From
    - Effective Thru
    - Batch Qty
    - UM
    - Frm Rev
    - Bill Type
    - Swap to Item
    - Swp Rev

Field	Explanation
Chg Type	A code that describes the type of item change. This value is used by the Related Items window to determine the number and nature of related items allowed. The value is also used during Engineering Change Population to determine the changes. Valid values are: N Add a new component or bill S Swap or replace one item with another C Change an existing component or bill R Remove an existing component or bill
P/C Rel	A code that indicates whether the item is a parent or component. Using this value, the system selects items for you on the Related Items window when you perform a where-used inquiry for components or a single-level or multilevel inquiry for parent items. The Engineering Change Population program uses this value to determine the requested change. Valid values are: P The item is a parent. C The item is a component.
To Rev	A subset to the drawing number. It provides an additional description of the drawing and is useful if the system uses an engineering drawing as a reference for this item.
Frm Rev	The revision level for the part that was previously reported. This might be the previous sequential revision.

Field	Explanation
Bill Type	A user defined code (40/TB) that designates the type of bill of material. You can define different types of bills of material for different uses. For example: M Standard manufacturing bill RWK Rework bill SPR Spare parts bill The system enters bill type M in the work order header when you create a work order, unless you specify another bill type. The system reads the bill type code on the work order header to know which bill of material to use to create the work order parts list. MRP uses the bill type code to identify the bill of material to use when it attaches MRP messages. Batch bills of material must be type M for shop floor management, product costing, and MRP processing.
Swp Rev	The revision level of the "Swap-to item" whenever an engineering change order is swapping out one item for another. The swap-to revision becomes the next revision level for the item only when the ECO is created in "Swap To" mode.

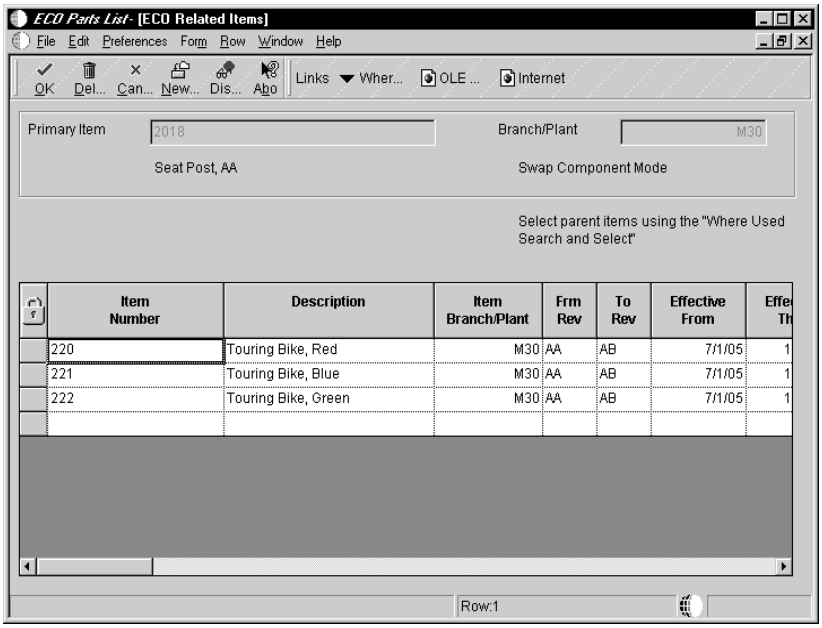
▶ To define engineering changes

From the Engineering Change Management menu (G3013), choose ECO Parts List.

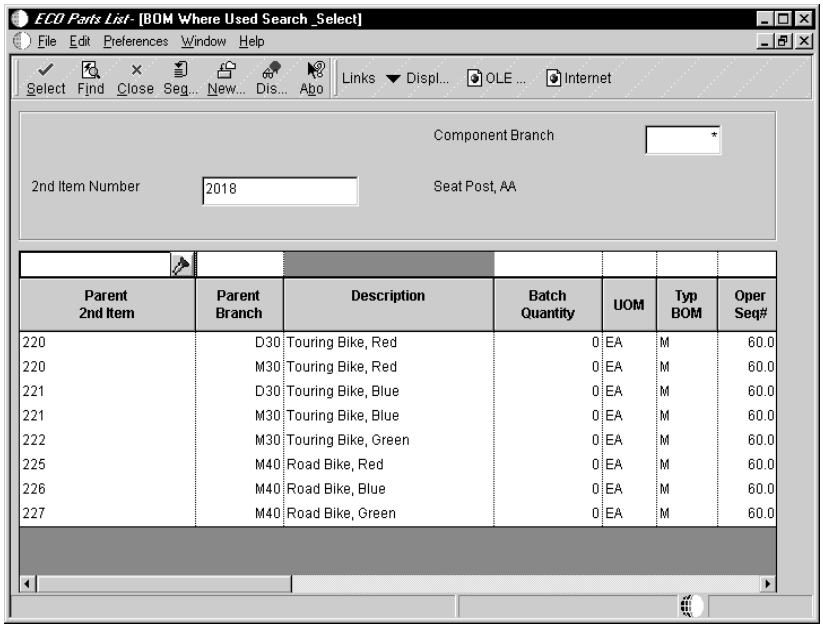
Defining changes does not update the work order parts list for the item. You can update your bills of material with engineering change information manually or by using either the Where Used Update program or the Engineering Change Population program. However, you cannot delete or change the parts on the ECO parts list after you have run the Engineering Change Population program.

On Work With ECO Parts List

1. Complete the following field and click Find:
   - Branch/Plant
2. Choose the row that contains the ECO that you want to work with and click Select.
3. On ECO Parts List Entry, choose a row and then choose Related Items from the Row menu.



4. On ECO Related Items, complete the following fields for each related item and click OK:
    - Frm Rev
    - To Rev
    - Effective From
    - Effective Thru
    - Batch Quantity
    - UOM
    - Typ BOM
    - Item Number
    - Curr Rev
    - Line No.
    - Quantity
    - Oper Seq#
    - F V
5. On ECO Related Items, choose the row, click Delete, and then click OK to remove one of the items.
6. On ECO Releated Items, choose Where Used SS from the Form menu to choose other parent items.



7. On the BOM Where Used Search_Select, choose the parent items and click Select.

   The system populates the grid on the ECO Related Items List program with the additional parent items.

Field	Explanation
To Rev	The revision level for the part that is reported next. This might not be the next sequential revision.
Curr Rev	The revision level for an item. If you enter a revision level, verify that the revision level of the routing for an item matches the revision level on the bill of material for the item.
Line No.	A number that indicates the sequence of the components on a bill of material. It initially indicates the relative sequence in which a component was added to a kit or single level bill of material. You can modify this number to change the sequence in which the components appear on the bill of material. Skip To fields allow you to enter a component line number that you want to begin the display of information.

Field	Explanation
F V	A code that indicates if the quantity per assembly for an item on the bill of material varies according to the quantity of the parent item produced or is fixed regardless of the parent quantity. This value also determines if the component quantity is a percent of the parent quantity. Valid values are: F Fixed Quantity V Variable Quantity (default) % Quantities are expressed as a percentage and must total 100% For fixed-quantity components, the Work Order and Material Requirements Planning systems do not extend the component's quantity per assembly value by the order quantity. For percent bills of material, the system treats zero batch sizes as variable quantity components and treats batch sizes greater than zero as fixed quantity components.

Processing Options for ECO Parts List

```
Defaults

1.  Enter the default search order
    type.

      Order Type                                    _____________

Versions 1

1. Enter the Dream Writer version to use
    for each screen listed. If left
    blank, version ZJDE0001 will be
    used.

      Item Master Revisions  (P4101B)               _____________
      Item Inquiry w/ Word Search                   _____________
      (P41200)
      Supply and Demand Inquiry (P4021)             _____________
      Bill of Material Inquiry (P30200)             _____________
      Where Used Inquiry (P30201)                   _____________
      Item Branch (P41026B)                         _____________

Versions 2

2. Enter the Dream Writer Version to use
    for each screen listed. If left
    blank, version ZJDE0001 will be
    used.

      WO Scheduling Workbench (P31225)              _____________
      Enter/Change Order (P48020)                   _____________
      WO Details *ZJDE0001 (P480200)                _____________
      Pending PO's *ZJDE0002 (P480200)              _____________
      Work Order Routing (P3112)                    _____________
      ECO Related Item (P30131)                     _____________
      Purchase Order (P4310)                        _____________
```

Process

1. Enter the version of Supply/Demand Inclusion Rules to use when adding orders to the ECO Pending Orders Detail. If left blank, no orders will be added.

   Version of Supply/Demand Inclusion Rules _____

2. Enter a '1' to default the 'To Rev' field to the next revision when no Pending ECO's exist.

   Default 'To Rev' _____

3. Enter the User Defined Code table to retrieve the next revision level. If left blank, UDC table 30/NR will be used.

   UDC System Code _____
   UDC Code Type _____

What You Should Know About Processing Options

When you set the processing option for updating the item revision to the next revision level under the Process tab, the system updates the revision level as follows for the change types:

New parent (N/P)

- For new parent information on Parts List, the revision level is updated.
- For component information on Related Items, the revision level is not updated.

Change parent (C/P)

- For existing parent information on Parts List, the revision level is not updated.
- For revised parent information on Related Items, the revision level is updated.

Swap parent (S/P)

- For swap-out parent information on Parts List, the revision level is not updated.
- For new parent information on the Parts List, the revision level is updated.

NOTE: Updating the revision level on Related Items is not allowed.

Remove parent (R/P)

- For parent to remove information on Parts List, the revision level is not updated.

NOTE: Updating the revision level on Related Items is not allowed.

New component (N/C)	• For new component information on Parts List, the revision level is not updated. • For parent information on Related Items, the revision level is updated.
Change component (C/C)	• For information on the component on Parts List, the revision level is updated. • For information on Related Items, the revision level is updated.
Swap component (S/C)	• For component to swap information on Parts List, the revision level is not updated. • For new component information in the Parts List, the revision level is not updated. • For parent information on Related Items, the revision level is updated.
Remove component (R/C)	• For component to remove information on Parts List, the revision level is not updated. • For parent information on Related Items, the revision level is updated.

Reviewing Pending Orders

After you process existing work orders and purchase orders, you can review pending orders for items affected by the engineering change order (ECO). Use pending orders to perform the following:

- Enter a quantity and cost estimate of incorporating the ECO into the work order or part on the purchase order
- Work with existing work orders or purchase orders
- Work with open work orders or purchase orders

The system displays the orders based on the supply and demand inclusion rules that you specify in the processing options.

Reviewing pending orders consists of the following tasks:

- Reviewing purchase orders
- Reviewing work orders
- Loading purchase orders into supplemental data
- Loading work orders into supplemental data

See Also

- *Defining Changes* to review the processing options for this program

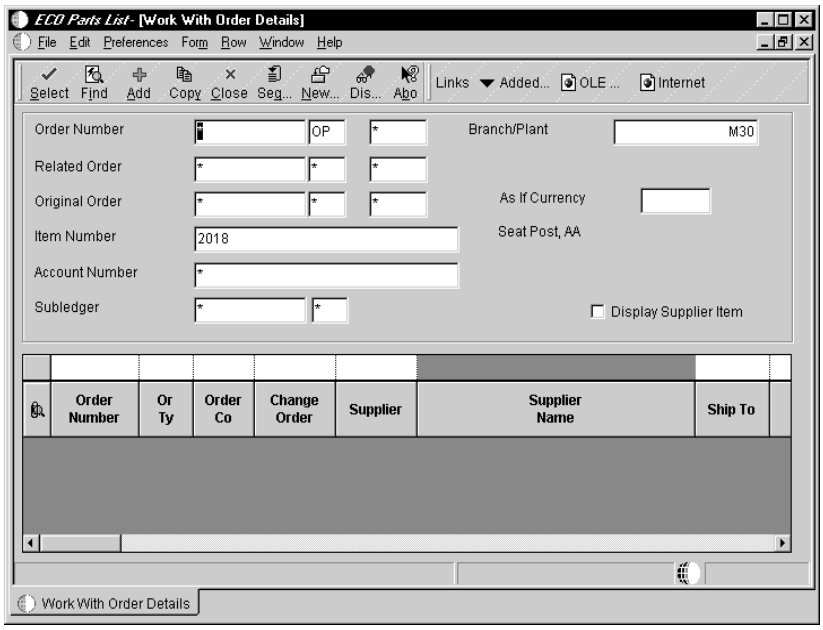
▶ To review purchase orders

From the Engineering Change Management menu (G3013), choose ECO Parts List.

Use Work With ECO Parts List to review the items on pending purchase orders that are affected by an engineering change order.

On Work With ECO Parts List

1. Complete the following field and click Find:
   - Branch/Plant
2. Choose the row and click Select.
3. On ECO Parts List Entry, choose a record and then choose Open POs from the Row menu.



4. On Work With Order Details, review the following fields that display ECO information:
   - Order Number
   - Or Ty

Field	Explanation
Order Number	A number that identifies an original document. This can be a voucher, an order number, an invoice, unapplied cash, a journal entry number, and so on.
Or Ty	A user defined code (00/DT) that identifies the type of document. This code also indicates the origin of the transaction. J.D. Edwards has reserved document type codes for vouchers, invoices, receipts, and time sheets, which create automatic offset entries during the post program. (These entries are not self-balancing when you originally enter them.) The following document types are defined by J.D. Edwards and should not be changed: P Accounts Payable documents R Accounts Receivable documents T Payroll documents I Inventory documents O Purchase Order Processing documents J General Accounting/Joint Interest Billing documents S Sales Order Processing documents

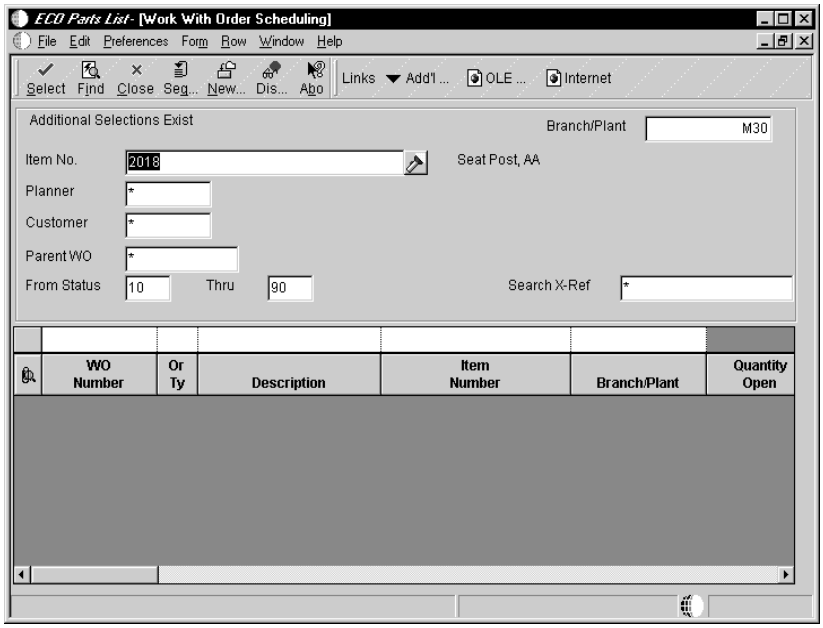
▶ To review work orders

From the Engineering Change Management menu (G3013), choose ECO Parts List.

Use Work With ECO Parts List to review the items on pending work orders that are affected by an engineering change order.

On Work With ECO Parts List

1. Complete the following field and click Find:
   - Branch/Plant
2. Choose the row and click Select.
3. On ECO Parts List Entry, choose the row and then choose Open WOs from the Row menu.



4. On Work With Order Scheduling, review the following fields that display ECO information:
    - WO Number
    - Or Ty
    - Requested Date
    - Quantity Open

Field	Explanation
Requested Date	The date that an item is to arrive or that an action is to be complete.
Quantity Open	The original quantity for the order detail line, plus or minus any changes to that quantity, minus all quantities shipped, received, and vouchered to date.

▶ To load purchase orders into supplemental data

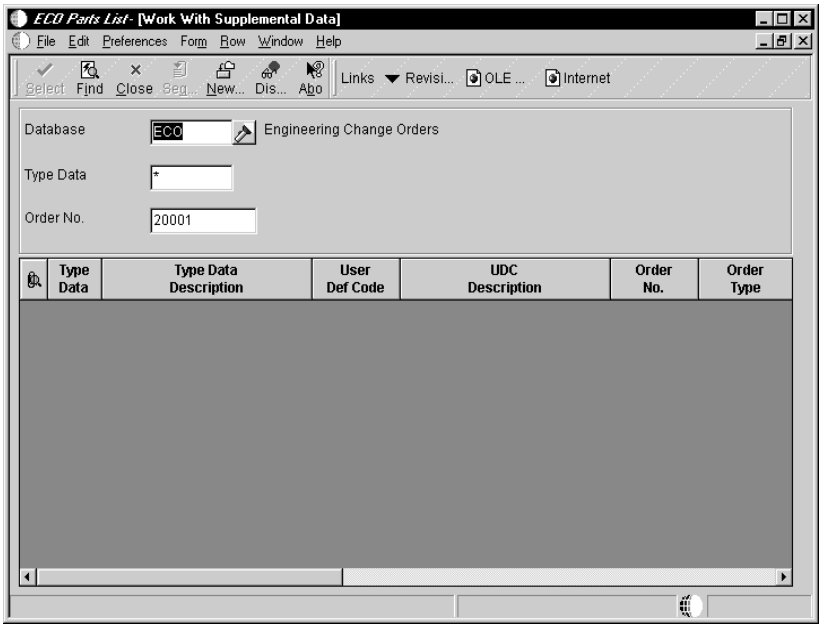
From the Engineering Change Management menu (G3013), choose ECO Parts List.

Use Work With ECO Parts List to load purchase orders into supplemental data.

On Work With ECO Parts List

1. Complete the following field and click Find:
    - Branch/Plant

2. Choose the row and click Select.
3. On ECO Parts List Entry, choose the row and then choose Load Supp POs from the Row menu to load the pending purchase orders into supplemental data.



4. On Work With Supplemental Data, review the fields and click Select.

▶ To load work orders into supplemental data

From the Engineering Change Management menu (G3013), choose ECO Parts List.

Use Work With ECO Parts List to load work orders into supplemental data.

On Work With ECO Parts List

1. Complete the following field and click Find:
   - Branch/Plant
2. Choose the row and click Select.
3. On ECO Parts List Entry, choose the row and then choose Load Supp WOs from the Row menu to load the pending work orders into supplemental data.
4. On Work With Supplemental Data, review the fields and click Select.

See Also

- *Defining Changes* to review the processing options for ECO Parts List

Notifying Reviewers of Engineering Change Orders

From the Engineering Change Management menu (G3013), choose ECO Notification.

After you define an engineering change order (ECO) and its routing instructions and parts list, use the ECO Notification program to send notices to the reviewers that you have defined in the approval routing master. To generate notifications, you must have an address book record established. You can run ECO Notification in two ways as follows:

- To process several ECOs, use the data selection in ECO Notification
- To process a single ECO, run ECO Notification from the Enter/Change ECO program

You run this program once. After all of the reviewers in the first review group have reviewed the ECO, the system sends notification to the next review group.

You can set a processing option to activate flash messages for the item affected by the ECO. You can then view the flash message from inquiry programs. The system deactivates the flash message when you run the Engineering Change Population program to update the bill of material for the item.

Processing Options for ECO Order Approval Notification

```
Process

1. Enter the Flash Message to activate.
    If left blank, the Flash Message
    will not be updated.

      Item Flash Message                                  _____________
```

Reviewing Engineering Change Orders

Both reviewers and coordinators review engineering change order information. An engineering change order (ECO) reviewer reviews ECOs and checks outstanding ECOs that await approval. An ECO coordinator reviews ECO information to do the following:

- Check work orders and purchase orders for affected items
- Determine if anyone has rejected an ECO
- Check the progress of an ECO
- Plan and schedule work
- Review who is in the process of reviewing an ECO
- Review who is pending notification

Reviewing engineering change orders consists of the following tasks:

- ❑ Locating engineering change order information
- ❑ Printing engineering change order information

Locating Engineering Change Order Information

For an ECO, you can locate all the revision-level changes made to the item. To view the most current revision information, you should run the Engineering Change Population program daily.

You can review the approval status of an ECO to display which reviewers have approved it, are in the process of reviewing it, and who is pending notification.

You can locate an ECO by requested dates, start dates, and labor hours by operation to help you plan and schedule work.

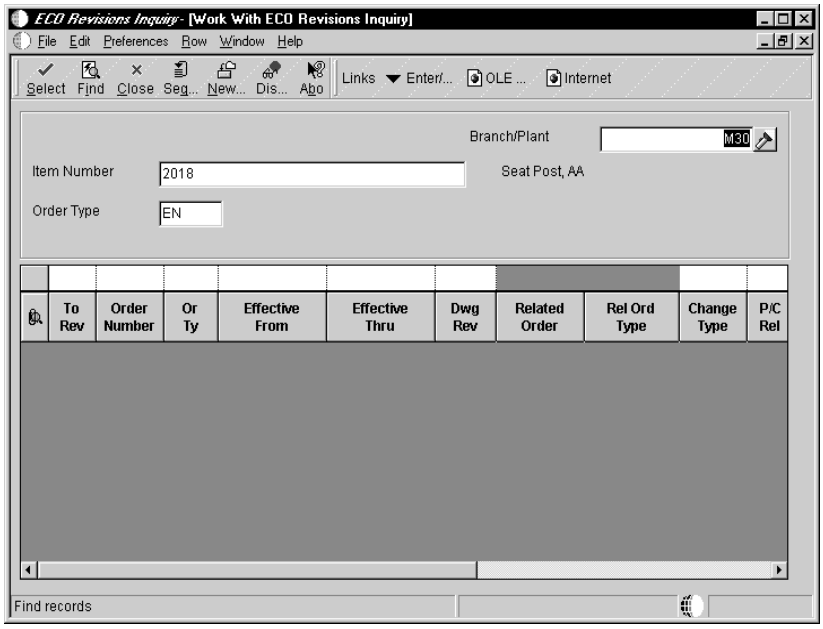
Locating engineering change order information consists of the following optional tasks:

- Locating revision information
- Locating approval audit information
- Locating open tasks

To locate revision information

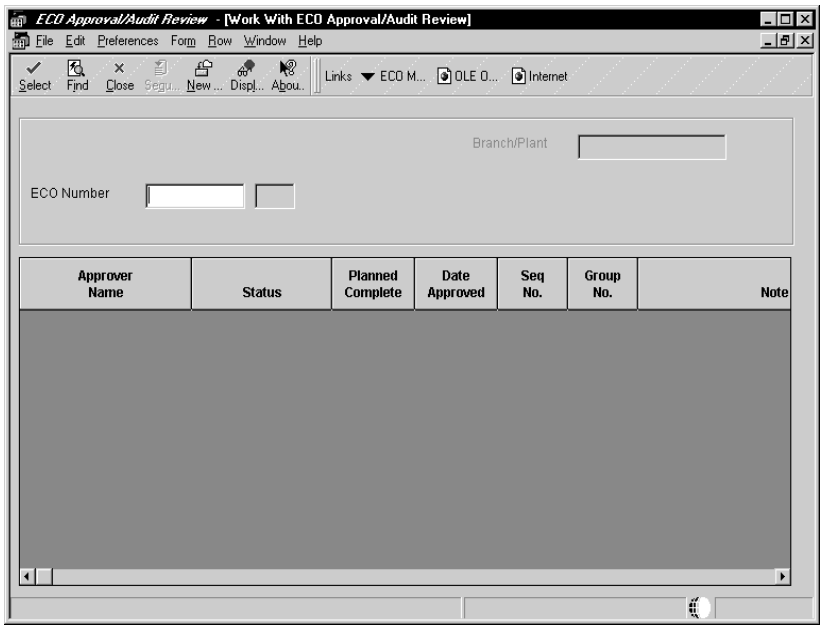
From the Engineering Change Management menu (G3013), choose ECO Revisions Inquiry.

On Work With ECO Revisions Inquiry



1. Complete the following fields and click Find:
   - Branch/Plant
   - Item Number

2. Choose an ECO and click Select.



3. On Work With ECO Approval/Audit Review, review the following fields that display ECO information:
   - Approver Name
   - Status
   - Planned Complete
   - Date Approved
   - Seq No.
   - Group No.
   - Note

Field	Explanation
Approver Name	The text that names or describes an address. This 40-character alphabetic field appears on a number of forms and reports. You can enter dashes, commas, and other special characters, but the system cannot search on them when you use this field to search for a name.
Status	A description, remark, name or address.
Planned Complete	The date that the work order or engineering change order is planned to be completed.
Date Approved	The date on which an approver has approved or rejected an ECO. The default value is the current system date.

Field	Explanation
Seq No.	For OneWorld, the sequence by which users can set up the order in which their valid environments are displayed. For World, a sequence or sort number that the system uses to process records in a user defined order.
Group No.	A number used to combine similar records.
Note	A 40-character description.

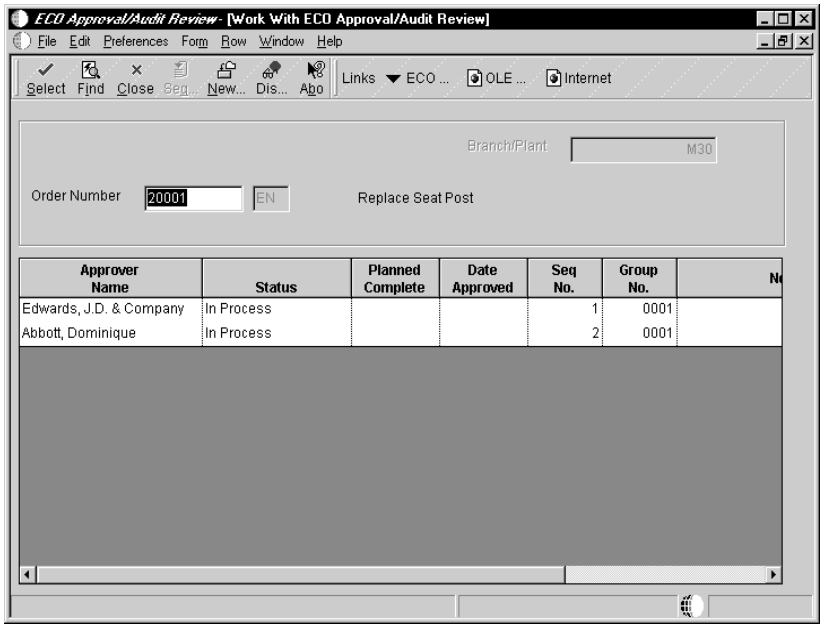
Processing Options for ECO Revisions Inquiry

```
Versions

Enter the version to use for each
    program listed.  If left blank,
    ZJDE0001 will be used.

      1. Enter/Change Order  (P48020)          _____________
      2. BOM Revisions (P3002)                 _____________

Defaults

1.  Enter the default Order Type.  If
    blank, order type 'EN' will
    default.

      Order Type                               _____________
```

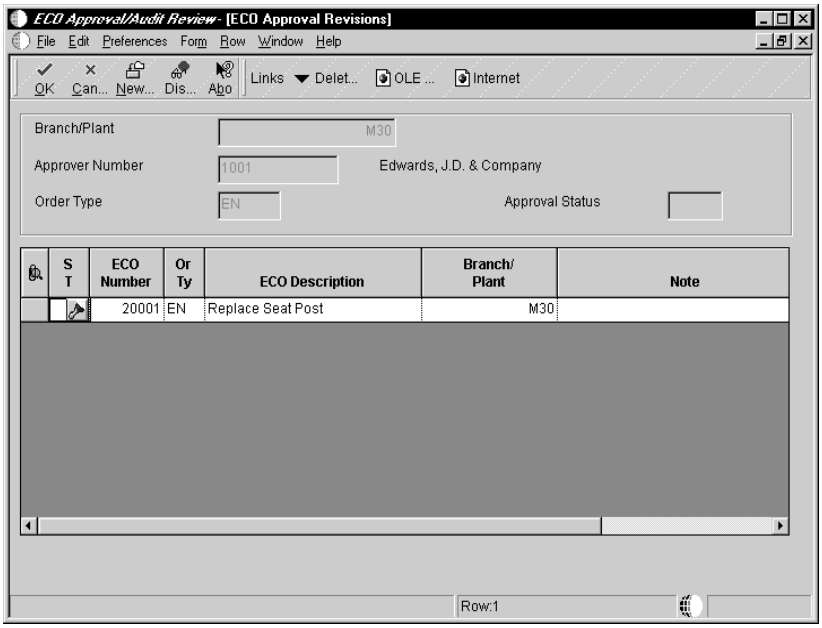
To locate approval audit information

From the Engineering Change Management menu (G3013), choose ECO Approval/Audit Review.

On Work With ECO Approval/Audit Review



1. Complete the following field and click Find:
   - Order Number
2. Choose an approver name and click Select.



3. On ECO Approval Revisions, review the following fields that contain ECO information:

   - S T
   - ECO Number
   - Or Ty
   - ECO Description
   - Branch/Plant
   - Note
   - Target Date
   - Date Approved

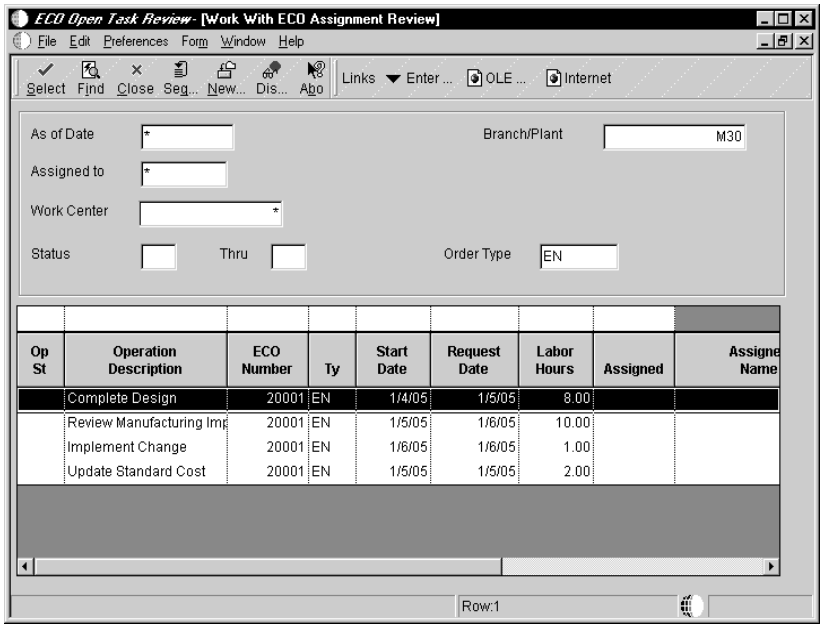
Processing Options for ECO Approval/Audit Review

```
Versions

Enter the version to use for each
    program listed.  If left blank,
    version 'ZJDE0001' will be used.

      1.   Approval        (P4818)          _____________
      2.  Enter/Change Order   (P48020)     _____________
```

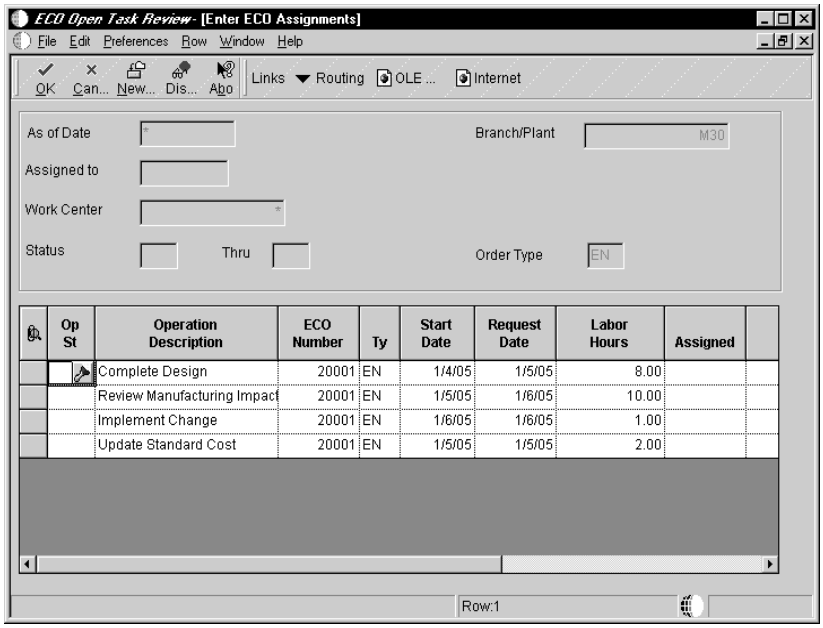
To locate open tasks

From the Engineering Change Management menu (G3013), choose ECO Open Task Review.

On Work With ECO Assignment Review



1. Complete the following fields and click Find:
   - Branch/Plant
   - Work Center
   - Status
   - Thru
2. Choose an operation and click Select.



3. On Enter ECO Assignments, review the following fields that display ECO information:
   - Op St
   - Operation Description
   - ECO Number
   - Work Center
   - Oper Seq#

Field	Explanation
Status	A user defined code (31/OS) that indicates the status of an operation. The from operation status is used as a beginning point to select work order information to display.

Processing Options for ECO – Assignment Review Inquiry

```
Defaults

1.  Enter the default document type to
    be used.  If left blank, '*' will
    load all document types.

      Order Type                                    _____________

2.  Enter the default value for From
    Status.

      Operation Status – From                       _____________

3.  Enter the default value for Thru
    Status.

      Operation Status – Thru                       _____________

Versions

Enter the version to use for each
    program listed.  If no version is
    entered, ZJDE0001 will be used.

      1.  Enter/Change Order (P48020)               _____________
      2.  Parts List  (P3013)                       _____________
      3. Work Order Routing (P3112)                 _____________
```

Printing Engineering Change Order Information

You can print a variety of engineering change order (ECO) information to help you manage the ECOs you create.

Printing engineering change order information consists of the following tasks:

- ❑ Printing the ECO details report
- ❑ Printing the open ECOs report

Printing the ECO Details Report

From the Engineering Change Management menu (G3013), choose ECO Details.

You can generate the ECO Details report to list all details for a specific ECO. You can set the processing options to specify the amount and type of information in the report.

The system retrieves the data for this report from the Bill of Material Master table (F3002).

Processing Options for ECO Details Report

```
Print

Enter a '1' to print any of the
    following details:

      1.  Notes:                                    _____________
      2.  Parts List:                               _____________
      3.  Routing:                                  _____________

Defaults

Enter the default note type that will be
    printed.  If left blank, note type
    'A' will be used.

      Record Type                                   _____________
```

Printing the Open ECOs Report

From the Engineering Change Management menu (G3013), choose Open ECOs.

Use the Open ECOs report to list the ECOs that are currently in the approval process or as a basis for running the Engineering Change Population program.

You can set up the report by the following types of information:

- Document type and status code
- Category code and product family
- Status code for pending approval
- Status code for ECOs that have been approved

The system retrieves the data for this report from the Work Order Master table (F4801).

Approving Engineering Change Orders

After you have located an engineering change order (ECO) for review, you must indicate your approval or rejection. The reviewer typically performs this task. After the last person in the approval routing has approved the ECO, the system updates the status code with the value that you specify in a processing option.

Approving engineering change orders consists of the following tasks:

- ❑ Reviewing engineering change orders for approval
- ❑ Updating bills of material (optional)

Before You Begin

- ❑ Locate the ECOs that have been assigned for your review. You can either have the system notify you automatically or you can locate open ECOs with ECO Approval. See *Reviewing Engineering Change Orders.*

Reviewing Engineering Change Orders for Approval

You locate the engineering change order (ECO) that awaits your approval and then indicate your approval or rejection. You can also enter text to provide more information regarding your approval.

To reject an ECO, use status code R. This stops the notification process. After a reviewer rejects an ECO, the creator of the ECO must redefine the ECO and restart the notification process. The ECO Approval Program sends a message to the ECO originator when anyone in the approval list rejects the ECO.

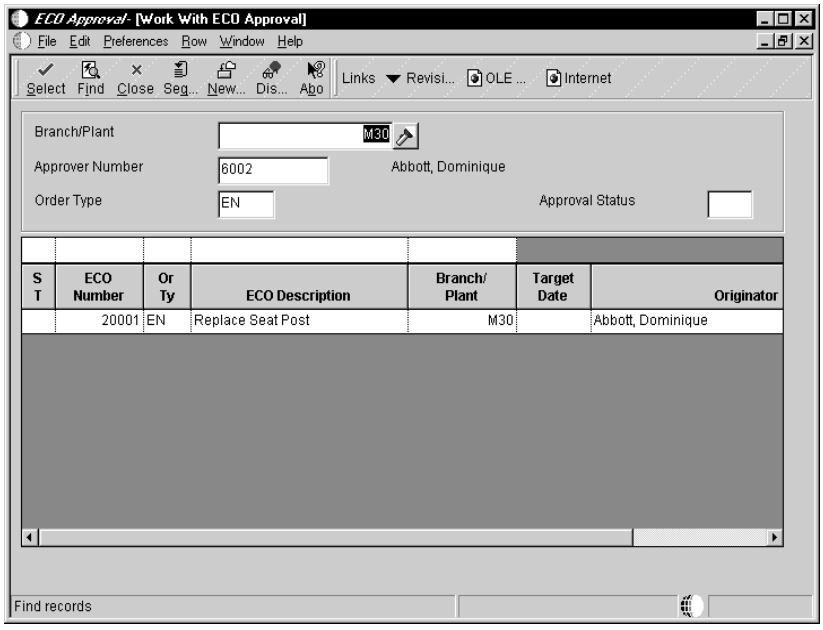
You can set a processing option to protect the approval field so that only the current user can change approval status.

Approval status codes are stored in user defined code table 30/ST. Approval status code A is hard-coded and is the only value that initiates the notification of other review groups. You can define additional approval status code.

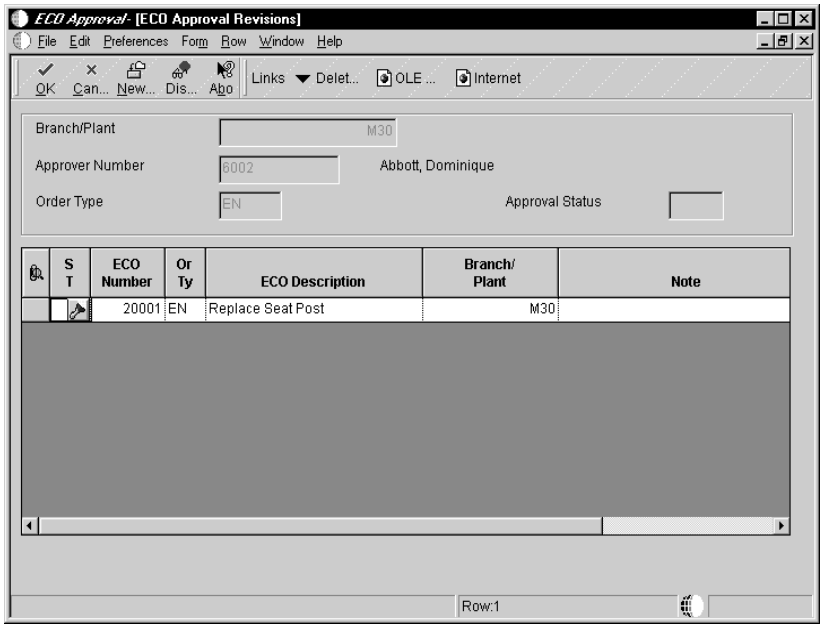
To review engineering change orders for approval

From Engineering Change Management (G3013), choose ECO Approval.

On Work With ECO Approval



1. Complete the following fields and click Find:
   - Branch/ Plant
   - Approver Number
2. Choose an ECO record and click Select.



3. On ECO Approval Revisions, complete the following field to indicate your approval or rejection and then click OK:

   - S T

Field	Explanation
Approver Number	A number that identifies an entry in the Address Book system. Use this number to identify employees, applicants, participants, customers, suppliers, tenants, and any other address book members.
S T	A user defined code (30/ST) that indicates the approval status of an engineering change order. For example: A Accept (initiates notification of next review group) R Reject (stops the notification process)

Processing Options for ECO Approval

Defaults

Enter the default search order type. If left blank, all order types will be used.

1. Order Type _____

Enter the default search approval status. If left blank, then blank will be used.

2. Approval Status _____

Enter the ECO status code to update the ECO order master (F4801) when approval routing is complete. If left blank, no ECO status update will occur.

3. Status Code W.O. _____

Versions

Enter the version to execute for the programs listed below. If left blank ZJDE0001 will be used.

1. Enter/Change Order (P48020) _____
2. Approval Notification (R48181) _____

Updating Bills of Material

From the Engineering Change Management menu (G3013), choose Engineering Change Population.

For engineering change orders (ECOs) with attached parts lists, you can process the ECO parts list and related items list to update the Bill of Material Master table (F3002) with the requested changes.

The Engineering Change Population program performs the following:

- Processes the ECOs
- Updates the bills of material for the items on the ECO
- Creates a report in proof or final mode that describes the requested changes
- Updates ECO-related information in the Item Branch table
- Updates the Item Master table for item flash messages based on other outstanding ECOs
- Validates the ECO for full approval before accepting the requested changes
- Updates the effectivity dates
- Updates the drawing revision level
- Copies substitute items from the old component to the new component
- Updates the parent or component revision level

J.D. Edwards recommends that you first run this program in proof mode. In proof mode, the report lists all requested changes without actually changing any records. Review the report and then run the program in final mode to update records. After you run this program and update the Bills of Material table, you cannot change the parts list and run the program again.

The Engineering Change Population program only updates the bill of material. You must update the routing instruction to include the same item revision level as the bill of material if you want to synchronize them.

Before You Begin

- ❑ Verify that the ECO has been approved by all reviewers.
- ❑ Verify that the ECO parts list contains the correct change type and relationship values.
- ❑ Verify that the ECO-related items list contains the items that you want to include in the change.

Processing Options: Engineering Change Population

Mode Tab

For information about a processing option, right-click the processing option field and choose What's This from the menu. Or, click the processing option field and press F1.

Use this processing option to specify whether the system runs the Engineering Change Population program (P30510) in proof or final mode.

1. Proof or Final Mode

Use this processing option to specify whether the system runs the Engineering Change Population program (P30510) in proof or final mode. J.D. Edwards recommends that you first run this program in proof mode. The proof report lists all requested changes without actually changing any data. Review the report and then run the program in final mode to update the data in the Bills of Material Change table (F3011). After you run this program in final mode, updating the data, you cannot change the parts list and run the program again. Valid values are:

Blank The system runs in proof mode.
1 The system runs in final mode.

Edits Tab

For information about a processing option, right-click the processing option field and choose What's This from the menu. Or, click the processing option field and press F1.

Use this processing option to specify whether the system uses engineering change order validation for the Engineering Change Population program (P30510).

1. ECO Approval Validation

Use this processing option to specify whether the system uses engineering change order (ECO) validation for the Engineering Change Population program (P30510). ECO approval validation lets you update the ECO in final mode only if everyone on the ECO approval list has approved the ECO. If you leave this field blank, it is possible that an ECO can be fully incorporated without any approval. Valid values are:

Blank The system does not validate that the ECO is fully approved before allowing the final mode update.
1 The system validates that the ECO is fully approved before allowing the final mode update.

Process Tab

For information about a processing option, right-click the processing option field and choose What's This from the menu. Or, click the processing option field and press F1.

Use these processing options to specify the following:

- If the system updates the actual incorporation date, order status, revision level, revision information, and drawing revision level
- Which item flash message the system uses
- Whether to copy a component's substitute items to the new bill of material

1. Actual Incorporation Date

Use this processing option to specify whether the system updates the actual incorporation date of the engineering change order (ECO) to the system date. Valid values are:

Blank The system does not update the date.
1 The system updates the date of the ECO.

2. Status Code

Use this processing option to specify the default status code for the engineering change order (ECO). Status code is a user defined code (00/SS) that identifies the status of the engineering change order. Enter the status code to use as the default value or choose it from the Select User Define Codes form. If you leave this field blank, the system does not change the status.

3. Revision Level

Use this processing option to specify whether the system updates the revision level in the Item Branch table (F4102) when the bill of material revision level is updated for a corresponding parent item. The item revision level appears on the Manufacturing Data form in the Inventory Management system. Valid values are:

Blank The system does not update the revision level.
1 The system automatically updates the revision level in the Item Branch table.

4. Revision Level Information

Use this processing option to specify whether the system updates the engineering change order (ECO) item balance revision level information in the Item Branch table (F4102). Item balance revision level information appears on the Manufacturing Data form in the Inventory Management system. Valid values are:

Blank The system does not update the item balance revision level information.
1 The system automatically updates the item balance revision level information in the Item Branch table.

5. Item Flash Message

Use this processing option to specify the message that the system uses when resetting the flash message due to other outstanding engineering change orders (ECOs). Item flash message is a user defined code (40/FL) that identifies the item message. Enter the status code to use as the default value or choose it from the Select User Define Codes form. If you leave this field blank, the system does not display the item flash message.

6. Item Drawing Revision Level

Use this processing option to specify whether the system updates the drawing revision level in the Item Master table (F4101) when a change is made to the drawing revision level for items defined in the engineering change order (ECO) parts list and related item list. The drawing revision level appears on the Manufacturing Data form in the Inventory Management system. Valid values are:

Blank The system does not update the drawing revision level.
1 The system automatically updates the drawing revision level in the Item Master table.

7. Copy Substitute Items

Use this processing option to specify whether the system copies a component's substitute items to the new component or bill of material during a swap or change. Valid values are:

Blank The system does not copy a component's substitute items.
1 The system automatically copies a component's substitute items to the new component or bill of material.

Defaults Tab

For information about a processing option, right-click the processing option field and choose What's This from the menu. Or, click the processing option field and press F1.

Use this processing option to specify the default engineering change order type that the system uses.

1. Order Type

Use this processing option to specify which order type that the system uses when running the Order Change Population program (P30510). Order type is a user defined code (00/DT) that identifies the type of the engineering change order (ECO). Enter the order type to use as the default value or choose it from the Select User Define Codes form. If you leave this field blank, the system includes all order types.

Creating an Engineering Change Order from a Request

Engineering Change Requests (ECRs) are numbered documents that you use to track requested product changes within the Engineering Change Management system. When used with engineering change orders (ECOs), ECRs allow you to create two change request processes with separate reviewers and approvers. For example, your shop floor employees can use ECRs to request that your design engineering staff make a change to a product. Once the ECR is reviewed and approved, you can use your ECO processes to implement the change.

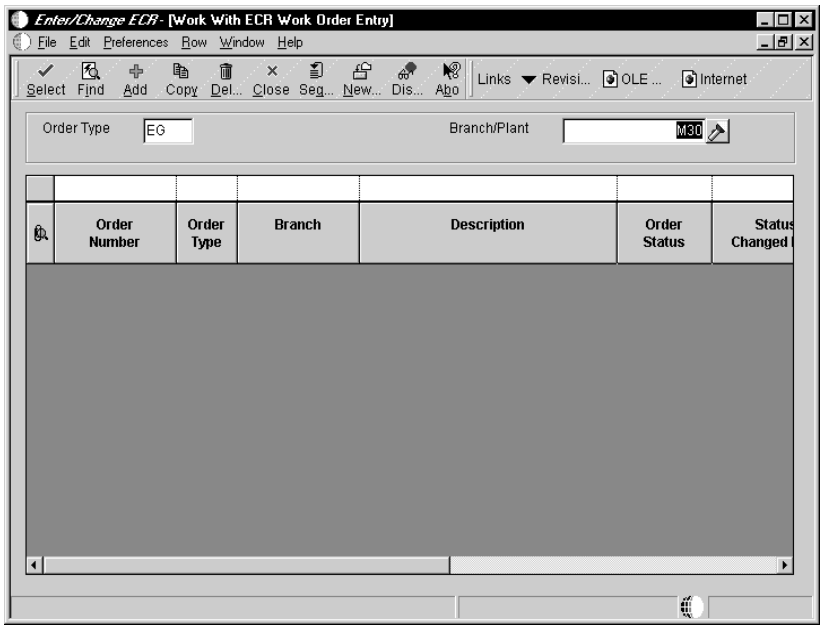
The procedures for ECRs are the same as the procedures for ECOs. Use order type EG when setting up, reviewing, or approving ECRs.

▶ To create an engineering change order from a request

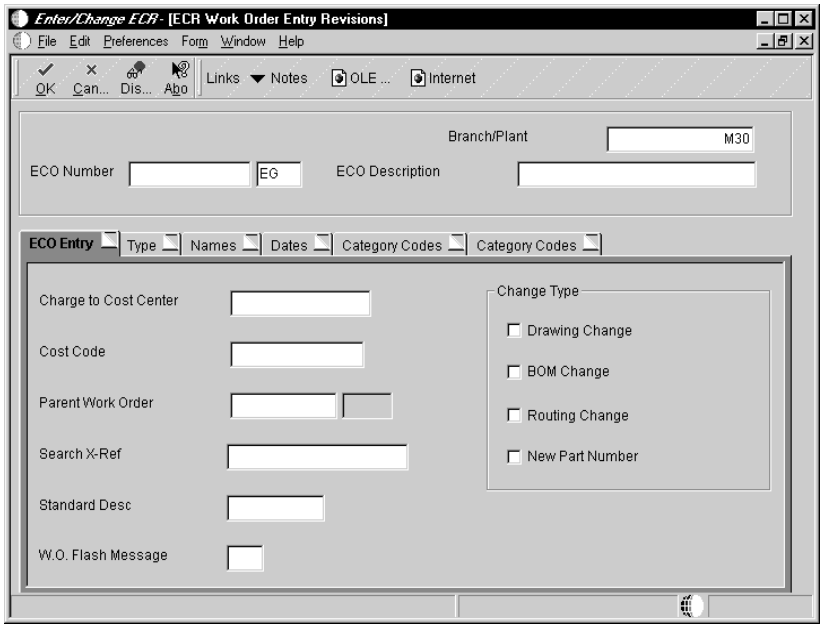
From the Engineering Change Request menu (G3015), choose Enter/Change ECR.

If you create additional document types for ECRs, you must specify handling type R.

On Work With ECR Work Order Entry



1. To locate the ECR, complete the following fields and click Find:
   - Order Type
   - Branch/Plant
2. Choose the row that contains the ECR and choose Create ECO from the Row menu.



3. On ECO Work Order Entry Revisions, click the ECO Entry tab, and complete the following optional fields:
   - Charge to Cost Center
   - Cost Code
   - Parent Work Order
   - Search X–Ref
   - Standard Desc
   - W.O. Flash Message
4. Click the following options:
   - Drawing Change
   - BOM Change
   - Routing Change
   - New Part Number

5. Choose the Type tab and complete the following optional fields:
    - Type
    - Priority
    - Status
    - Phase In
    - Existing Disp
    - Reason
6. Choose the Names tab and complete the following optional fields:
    - Originator
    - Coordinator
    - Customer
    - Supervisor
    - Manager
7. Choose the Dates tab and complete the following optional fields:
    - Target Dates Design
    - Target Dates Incorporated
    - Actual Dates Design
    - Actual Dates Engineering
    - Actual Dates Incorporated
8. Choose the first Category Codes tab and complete the following optional fields:
    - Phase
    - Category 02
    - Category 03
    - Category 04
    - Category 05
9. Choose the second Category Codes tab, complete the following optional fields, and then click OK:
    - Experience Level
    - Service Type
    - Skill Type
    - Status
    - Category 10

Field	Explanation
Drawing Change	A code that indicates whether the engineering change order requires a drawing change. Valid values are: For World, Y Yes, a drawing change is required. N No, a drawing change is not required. Blank The system uses N. For OneWorld, click Drawing Change to indicate that the engineering change order requires a drawing change.
BOM Change	A code that indicates whether the engineering change order requires a change to the bill of material. Valid values are: For World, Y Yes, a change to the bill of material is required. N No, a change to the bill of material is not required. Blank The system uses N. For OneWorld, click BOM Change to indicate that the engineering change order requires a change to the bill of material.
Routing Change	A code that indicates whether the engineering change order requires a change to the routing. Valid values are: For World, Y Yes, a change to the routing is required. N No, a change to the routing is not required. Blank The system uses N. For OneWorld, click Routing Change to indicate that the engineering change order requires a change to the routing.
New Part Number	A code that indicates whether a new part number is required for an engineering change order. Valid values are: For World, Y Yes, a new part number is required. N No, a new part number is not required. Blank The system uses N. For OneWorld, click New Part Number to indicate that a new part number is required for an engineering change order.
Type	A user defined code (00/TY) that indicates the type classification of a work order or engineering change order. You can use work order type as a selection criteria for work order approvals.

See Also

- *Entering Engineering Change Orders* to review the processing options for ECO Entry

Product Data Management Interoperability

Working with Interoperability

To fully cover the information requirements of an enterprise, companies sometimes use products from different software and hardware providers. Interoperability between different products is key to successfully implementing the enterprise solution. Full interoperability between different systems results in a flow of data between the different products that is seamless to the user. The OneWorld Interoperability function provides an interface that facilitates exchanging transactions with external systems. These transactions include both inbound and outbound.

External systems send information to the interface tables, either using an external program or using flat files and the Inbound Flat File Conversion program. The sending party is responsible for conforming to format and other requirements for the interface tables.

You run a transaction process (a batch program) that validates the data, updates valid data to the J.D. Edwards application tables, and sends action messages to the Employee Work Center about any invalid data.

You use an inquiry function to interactively review the data for correctness, and then run the transaction process again. You repeat this process if necessary.

You set a processing option to specify the transaction type for the outbound transaction. The system uses the master business function for the type of transaction, creates a copy of the transaction, and places it in the interface table where external systems can access it.

You use the purge function to remove obsolete and unnecessary data from interface tables. Your system is more efficient when you keep these tables as small as possible.

Working with interoperability consists of the following tasks:

- Converting flat files to the interface tables
- Receiving transactions from external systems
- Reviewing and revising inbound transactions
- Sending transactions to external systems

Interoperability Programs

The interoperability programs for the Product Data Management system are as follows:

Inbound Flat File Conversion Programs (R47002C)

The Inbound Flat File Conversion consists of programs for the following:

- Work Center
- Work Day Calendar
- Bill of Material
- Routing

Inbound Transaction Programs

The Inbound Transaction program consists of the following:

- Process Inbound Work Center Transactions (R30006Z1I)
- Process Inbound Work Day Calendar Transactions (R0007Z1I)
- Process Inbound Bill of Material Transactions (R3002Z1I)
- Process Inbound Routing Transactions (R3003Z1I)

Inbound Inquiry Programs

The Inbound Inquiry program consists of the following:

- Work Center Transaction Revisions (P30006Z1)
- Work Day Calendar Transaction Revisions (P0007Z1)
- Bill of Material Transaction Revisions (P3002Z1)
- Routing Transaction Revisions (P3003Z1)

Purge Programs

The Purge program consists of the following:

- Purge Work Center Transactions (R30006Z1P)
- Purge Work Day Calendar Transactions (R0007Z1P)
- Purge Bill of Material Transactions (R3002Z1P)
- Purge Routing Transactions (R3003Z1P)

Converting Flat Files to the Interface Tables

External systems can use a variety of methods to send data to the interoperability interface tables. One method is to enter the data in a flat file. If you use this method, the system converts the flat file to the interface table.

You can set a processing option to start the transaction process when the conversion completes successfully.

Converting flat files to the interface tables consists of the following tasks:

- ❑ Setting up the flat file cross-reference
- ❑ Running the conversion program

Before You Begin

- ❑ Ensure that the flat file is a comma-delimited ASCII text file stored on the hard drive of your personal computer.
- ❑ Ensure that the data conforms to the specified format. See *Converting Data from Flat Files into EDI Interface Tables* in the *Data Interface for Electronic Data Interchange Guide* for requirements.

Setting Up the Flat File Cross-Reference

From the Product Data Interoperability menu (G30311), choose Flat File Cross-Reference.

Before you can convert a flat file, you must provide a cross-reference from the flat file fields to the interface table fields.

See Also

- *Converting Data from Flat Files into EDI Interface Tables* in the *Data Interface for Electronic Data Interchange Guide* for information about this process, which works the same in interoperability

Running the Conversion Program

From the Product Data Interoperability menu (G30311), choose the applicable Inbound Flat File Conversion.

The Inbound Flat File Conversion program converts the flat file to the interface table. If you set the related processing option, the system starts the transaction process following a successful conversion.

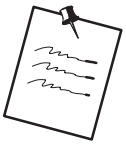
See Also

- *Receiving Transactions from External Systems* for information about the transaction process programs

Receiving Transactions from External Systems

From the Product Data Interoperability menu (G30311), choose Process Inbound Work Center Transactions, Process Inbound Work Day Calendar Transactions, Process Inbound Bill of Material, or Process Inbound Routing.

When an external system sends inbound transactions, the system stores the data in interface tables. These tables contain unedited transactions. The next step is to run the appropriate transaction process to edit the transactions and update the application tables. For example, if you receive transactions in the F3002Z1 interface table, you run the Process Inbound Bill of Material (P3002Z1I) to update the Bill of Material Master table (F3002).



When you run the Inbound Flat File Conversion program and it completes successfully, the system automatically starts the transaction process if specified in the processing option for the conversion.

To be received in the interface tables, data from an external system must conform to the minimum field requirements specified for the interface table.

The transaction process performs the following:

- Validates the data in the interface table (for example, F3002Z1) to ensure that the data is correct and conforms to the format defined for the Product Data Management system
- Updates the associated application table (for example, F3002) with validated data
- Produces a report that lists invalid transactions and sends an action message for each invalid transaction to the employee work center
- Marks in the interface tables those transactions that are successfully updated to the application tables

If the report indicates errors, access the Employee Work Center program from the Workflow Management menu (G02) and review the messages in the message center. Then use the associated inquiry function to review and revise the transactions and rerun the transaction process.

Before you run any of the inbound transaction programs, specify the appropriate values for processing in the processing options.

See Also

- *Reviewing and Revising Inbound Transactions* for more information about using the Inquiry function

Processing Options for Process Inbound Routing

```
Versions

1. Enter the version of “Enter/ Change
    Routing” to retrieve processing
    option values for updates.  If left
    blank,  ZJDE0001 will be used.

      Version                                    _____________
```

Reviewing and Revising Inbound Transactions

Running one of the transaction processes, such as the Work Center Transaction Revisions, often identifies one or more inbound transactions that contain invalid transactions. For example, a work center might have an invalid branch. In that case, the program cannot add that work center to the Work Center Master table (F30006). Instead, the program sends an error message the the Employee Work Center, indicating the transaction number for the transaction in error.

Use the inquiry menu selections to review and revise inbound transactions. Use the inquiry menu selections to add, change, or delete transactions containing errors. Then run the transaction process again. Continue to make corrections and rerun the transaction process until the program runs without errors.

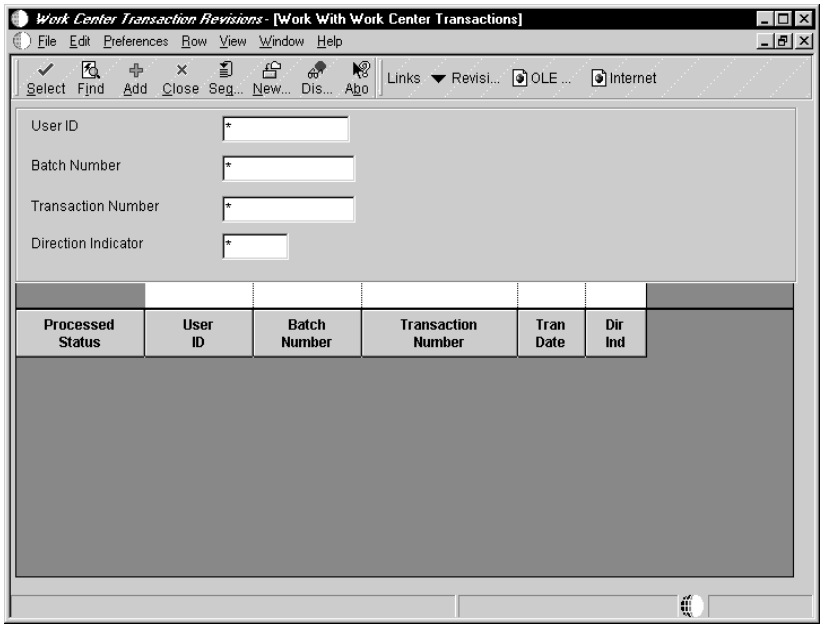
The Product Data Management inquiry menu selections are as follows:

- Work Center Transaction Revisions
- Work Day Calendar Transaction Revisions
- Bill of Material Transaction Revisions
- Routing Transaction Revisions

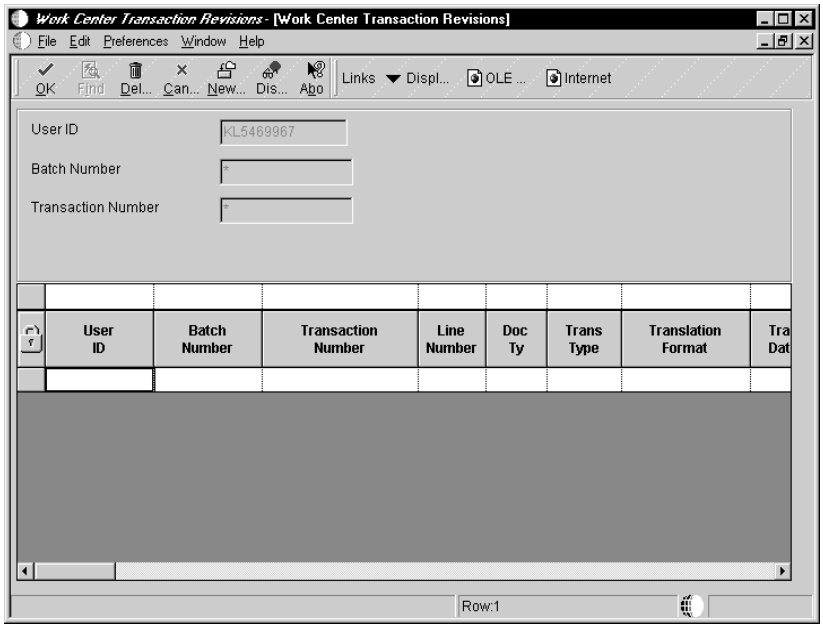
To review and revise inbound transactions

From the Product Data Interoperability menu (G30311), choose Work Center Transaction Revisions.

On Work With Inbound Transaction Records for F31122Z1



1. To limit the search to specific transactions, complete the following fields and click Find:
   - User ID
   - Batch Number
   - Transaction Number
2. Choose the transaction to review and revise and click Select.



3. On Transaction Record Revisions for F31122Z1, review and revise as needed, and then click OK.

After you correct the errors identified by the Inbound Work Order Processor, run the transaction process again. If other errors are identified, correct them and run the transaction process again.

Field	Explanation
User ID	For World, the IBM-defined user profile. For OneWorld, the identification code for a user profile.
Batch Number	The number that the transmitter assigns to the batch. During batch processing, the system assigns a new batch number to the J.D. Edwards transactions for each control (user) batch number it finds.
Transaction Number	This is the number that an Electronic Data Interchange (EDI) transmitter assigns to a transaction. In a non-EDI environment, you can assign any number that is meaningful to you to identify a transaction within a batch. It can be the same as a J.D. Edwards document number.

See Also

- *Understanding EDI Document Inquiry and Revision* in the *Data Interface for Electronic Data Interchange Guide* for information about reviewing and revising inbound product activity data transactions
- *Working with Messages* in the *OneWorld Foundation Guide* for more information about the Employee Work Center

Processing Options for Work Center Transaction Revisions

```
Display

1. Enter a '1' to inquire at the batch
    level, blank to inquire at the
    transaction level.

      Level of Inquiry                          _____

2. Default View: Enter a '1' for
    Processed, a '2' for Unprocessed, or
    blank for both.

      Processed Status.                         _____

3. Default View: Enter a '1' for
    Inbound, a '2' for Outbound, or
    blank for both.

      Direction                                 _____
```

Processing Options for Work Day Calendar Transaction Revisions

```
Display

1. Enter a '1' to inquire at the Batch
    level, blank to inquire at the
    Transaction level.

      Level of Inquiry                          _____

2. Default View: Enter a '1' for
    Processed, a '2' for Unprocessed, or
    blank for both.

      Processed Status                          _____

3. Default View: Enter a '1' for
    Inbound, a '2' for Outbound, or
    blank for both.

      Direction                                 _____
```

Processing Options for Bill of Material Transactions Revisions

Display

Level of Inquiry: Enter a “1” to inquire at the Batch Level, Or Blank to inquire at the transaction level. _____

Processed View: Enter a “1” for Processed, a “2” for Unprocessed, Or Blank for both. _____

Direction: Enter a “1” for Inbound, a “2” for outbound, Or Blank for both. _____

Versions

Default Version: Enter the version for “Processed Inbound Bill of Material” to submit. If left blank, ZJDE0001 will be used. _____

Processing Options for Routing Transactions Revisions

Display

1. Enter a ’1’ to inquire at the Batch level, blank to inquire at the Transaction level.

   Level of Inquiry _____

2. Default View: Enter a ’1’ for Processed, a ’2’ for Unprocessed, or blank for both.

   Processed Status _____

3. Default View: Enter a ’1’ for Inbound, a ’2’ for Outbound, or blank for both.

   Direction _____

Sending Transactions to External Systems

You might send transactions you create or change in the Product Data Management system to another system. For example, if your organization uses hand-held scanning devices, you can use interoperability transactions to update the database used by the scanning devices.

The default outbound transaction is a copy of a data transaction after you created or changed it (an *after image*). With interoperability, you can also send a copy of each transaction as it was before you changed it (a *before image*). Creating and sending before images requires additional processing time. To control the type of image, you set a processing option in the application programs that create transactions.

You can send transactions to an external system from the following programs in the Product Data Management system:

- Enter/Change Work Center (P3006)
- Work Day Calendar (P00071)
- Enter/Change Bill (P3002)
- Enter/Change Routing (P3003)

To create outbound transactions, specify the appropriate transaction type in the related processing option. The system places a copy of the transaction in the interface table for that type of transaction. For example, when you run Enter/Change Work Center with the interoperability processing option turned on, the system places a copy of updated work center data in the F30006Z1 interface table. The data is then available for an external system to use.

The system creates the outbound transaction in EDI format. External systems can process the transactions using standard EDI processing, including extraction.

Before You Begin

❑ Define the data export controls for the type of outbound transaction. The system uses data export controls to determine the batch programs or business processes that third parties supply for use in processing transactions.

See Also

- *Entering Work Centers* for information about entering information for work centers
- *Setting Up a Shop Floor Calendar* for information about setting up the calendar
- *Entering Bills of Material* for information about entering a bill of material
- *Entering Routing Instructions* for information about entering a routing

Appendices

Appendix A: Leadtimes

Determining leadtime is an essential part of any manufacturing or scheduling process. For any product that you purchase or manufacture, you encounter a time lag between when you order or start it and when you receive or finish it. To account for the lag, you must estimate the extra time (leadtime) and allow for it in your planning.

Leadtime information consists of the following topics:

- ❑ Leadtime concepts
- ❑ Work order start dates
- ❑ Operation start and due dates
- ❑ Overlapping operations
- ❑ Overlapping and concurrent operations
- ❑ Calculating leadtimes

Cumulative leadtime is the total amount of time that is required to produce a product. The Shop Floor Management system uses the requested date of the order and, based on the methods used to define the level leadtime (leadtime per unit) for the product, calculates the appropriate order start date.

Many factors can influence your company's leadtime policy, including the following:

- Manufacturing environment (assemble-to-order, make-to-order)
- Fixed or variable quantities
- Serial or overlap operations
- Fixed or variable time
- Number of shifts and operators
- Factoring by efficiency
- Protection

Whether your company uses fixed or variable leadtime depends on whether you have consistent work order quantities for a manufactured item. If your work order quantities vary significantly, you should use variable leadtime. A significant variation would be any amount that requires more or less leadtime. Items with short leadtimes could have larger fluctuations than items with long leadtimes. You specify fixed or variable leadtime on the Plant Manufacturing Data form for Item Branch.

For any manufactured product, the system calculates four types of leadtime as follows:

Level leadtime

Level leadtime is the number of workdays required to complete the product after all items are available.

See *Level Leadtime* for more information and the associated calculation.

Manufacturing leadtime

Manufacturing leadtime is the total number of workdays required to complete a product, from its lowest-level components to the final item, assuming that all purchased items are in house.

See *Manufacturing Leadtime* for more information and the associated calculation.

Cumulative leadtime

Cumulative leadtime is the number of workdays required to acquire items and complete a product, from its lowest-level components to the final item. In other words, it is the level leadtime for a product, plus the longest cumulative leadtime of any of its components.

See *Cumulative Leadtime* for more information and the associated calculation.

Per unit leadtime

Per unit leadtime is the sum of the run times, as defined by the prime load codes for the work centers, factored by the routing time basis and converted to the leadtime per unit.

See *Per Unit Leadtime* for more information and the associated calculation.

The Shop Floor Management system uses the following information in its calculation of leadtimes:

- Serial or overlap operations
- Fixed or variable leadtime indicator
- Routing labor, setup, queue, move, and machine run hours
- Work center prime load code
- Number of employees or machines per work center
- Hours per work day

To calculate leadtimes the system does the following:

- Uses the information that you set up for each item on Plant Manufacturing Data in the Inventory Management system
- Coordinates the information with routing instructions and work center information that you enter in the Product Data Management system
- Determines leadtimes for all parent and component items

At any point in your planning and scheduling process, you can change leadtime values manually through Manufacturing Data.

You can use fixed or variable leadtimes for ingredients. The system subtracts fixed leadtimes directly from the requested date on the work request to calculate the start date of production. Fixed leadtime remains the same regardless of the quantity produced. However, variable leadtime adjusts according to the quantity produced.

Leadtime Concepts

The following table explains important leadtime terms and concepts that you need to understand:

Machine hours	The number of machine hours required to produce the amount from the time basis code.
Labor hours	The number of labor hours required to produce the amount from the time basis code.
Setup hours	The number of hours required to prepare machinery to produce a specific item, regardless of quantity.

Move hours

The number of hours that a manufacturing work order is in transit from the completion of one operation to the beginning of the next.

Queue hours

The number of hours that a job waits at a work center before setup or work is performed on the job.

Total queue and move hours

The total queue and move hours is the sum of the move hours and the queue hours.

Time basis code

A user defined code (30/TB) that indicates how machine or labor hours are expressed for a product. Time basis codes identify the time basis or rate to be used for machine or labor hours entered for every step in the routing instructions, for example, 25 hours per 1,000 pieces. You maintain the time basis codes in Time Basis Codes.

Resource units

Shows the available amount of capacity in a work center for the months in the calendar. For leadtime purposes, as the system calculates the operation start and due dates, it uses the available hours to calculate the operation start dates. You maintain the resource units in Work Center Resource Units.

Prime load code

Determines whether a work center is labor-intensive or machine-intensive. The prime load code also determines whether the system uses the number of employees or the number of machines to determine the daily resource units in the Resource Units table. You maintain the prime load codes in Work Center Revisions. For calculating leadtimes, the following prime load code values are valid:

- L = run labor hours
- M = machine labor hours
- B = run and setup hours
- C = machine and setup hours

Purchased parts

A part bought from a supplier. For any part that is purchased you specify the level leadtime, which is equal to the cumulative leadtime. By default, the manufacturing leadtime, leadtime per unit, total queue and move hours, and setup times for purchased parts are zero.

Work Order Start Dates

The system uses the level leadtime or leadtime per unit for an item defined on the Manufacturing Data form to calculate the start date of a work order based on the order's due date.

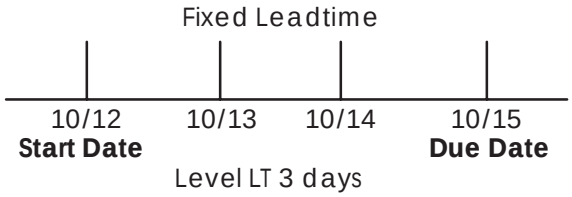
Start dates for work orders are calculated using one of the following:

- Fixed leadtime
- Variable leadtime

Fixed Leadtime

When an item has a fixed leadtime, the system uses the item's level leadtime value in backscheduling to calculate the work order start date.

For example, the system generates a planned order for product 101 with a requested due date of 10/15/99. The level leadtime is 3 days for this product, so the system calculates the start date by counting back 3 working days on the shop floor calendar from (but not including) the requested date. The system assigns the order a start date of 10/12/98.



Variable Leadtime

When an item has a variable leadtime, the system uses the following calculation to determine the leadtime days:

$$\frac{(\text{Leadtime per unit} \times \text{order quantity} / \text{TBC*}) + \text{setup} + \text{total queue/move}}{\text{Work hours per day}}$$

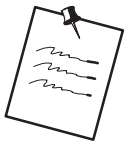
* The system reads the Time Basis Code (TBC) from the Item Branch table (F4102).

For example, to determine the start date, the system counts back the leadtime days from the due date of planned orders. The system backschedules the due date, 10/15, 2 days to determine the start date of 10/13.

(32 x 1000/ 10,000) + 1 + 9) / 8
(3.2 + 10) / 8 = 2 days

The following table shows the values used in this example.

Due date	10/15
Leadtime per unit	32 hours
Order quantity	1000
Setup	1 hour
Total queue/move	9 hours
Work hours per day	8 hours



Leadtime per unit does not use crew size in the calculation of leadtime for an item with a labor-based work center. However, leadtime per unit does use the number of employees in the work center when calculating leadtime.

Operation Start and Due Dates

The system calculates the operation start and due dates with the average number of hours per operation.

Operation start and due dates are calculated using one of the following:

- Fixed leadtime
- Variable leadtime

Fixed Leadtime

The system calculates the operation hours for a fixed leadtime using the following information:

- Level leadtime
- Hours per work day
- Number of employees per machine
- Number of operations

You must schedule the hours per operation according to the resource units within the entire level leadtime. This ensures that the start date of the first operation is the same as the start date of the work order. When the job moves to a different work center in the same day, the system decreases the resource units available by the percentage of the work day remaining. The system does not use resource units on the due date of the work order. Instead, it assumes that the order was completed at the end of the previous day.

For each operation, the system then schedules this average time into the appropriate work center, based on the available hours from the Work Center Resource Units table (F3007). The system schedules the last operation due date on the day before the work order due date.

Calculation

The system uses the following formula to calculate average time per operation:

$$\frac{\text{leadtime level days x work hours per day* x employees or machine}}{\text{number of operation sequences (blank operation sequence codes only)}} = \text{average time per operation}$$

* Work hours per day are retrieved from the Job Shop Manufacturing Constants table (F3009).

The following table shows the values used in this calculation.

Work order due date	05/01/98
Average time per operation	25 hours
Operations in the routing instructions	OP40 WC 200-204 due 4/30 start 4/27
	OP30 WC 200-101 due 4/27 start 4/24
	OP20 WC 200-204 due 4/24 start 4/21
	OP10 WC 200-101 due 4/21 start 4/17
WC Resource Units 200-204	8
WC Resource Units 200-101	8

Variable Leadtime

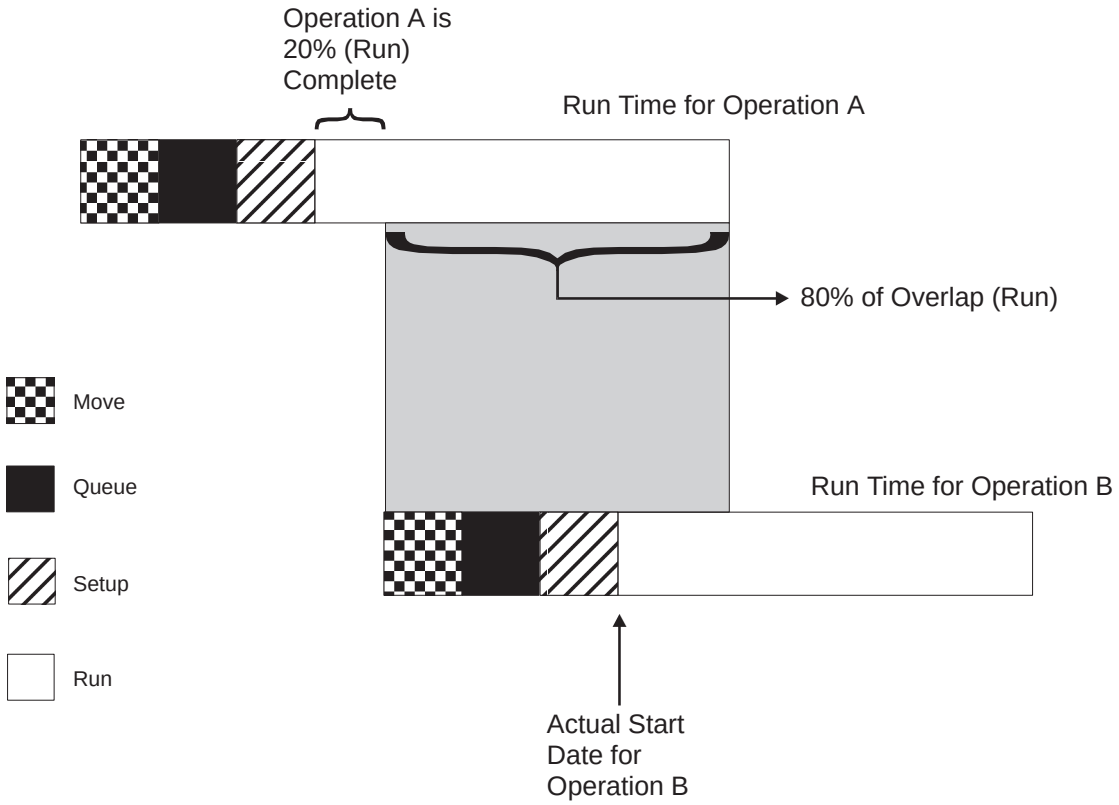
To determine variable leadtimes, the system schedules the actual hours from the work order routing instructions according to the same resource units rules for variable leadtime.

The system uses the prime load code to determine the hours to use. The hours are then applied to the resource units table, similar to fixed leadtime. The system applies queue time from the work order routing instructions at the beginning of an operation, and applies move time at the end of an operation.

Overlapping Operations

One method used to compress leadtimes is to overlap operations. Overlapping operations are two or more operations in a routing instruction that run at the same time. The percent of overlap is the amount of time that these operations can run concurrently. You can define at what point the second operation can begin before the first operation is complete. Because of setup, move, and queue times, the actual overlap in run time might be less than the percent of overlap that you have defined.

In the following example, Operation B has a percent of overlap of 80%. This means that Operation B can begin when 80% of Operation A remains to be finished, or when Operation A is 20% complete. Operations A and B are both active as they overlap.



If the percent of overlap causes an operation to end later than the last operation in the routing instructions, the system issues an error message and enters the work order start and requested dates into each operation.

Overlapping and Concurrent Operations

If a percentage of overlap is specified in the routing instructions, the work order routing instruction includes specified operations that overlap. For example, an overlap percentage of 80% for an operation means that the next operation can start when 20% of the previous operation is complete.

Work order complete date	05/01/98
Last operation 20	24 hours
First operation 10	24 hours
Resource hours per day, per work center	8 hours
Operation overlap on 20	75%

	Without Overlap	**With Overlap**
Operation 10		
start	04/27/98	04/27/98
complete	04/29/98	04/29/98
Operation 20		
start	04/30/98	04/27/98
complete	05/02/98	04/30/98

Using the data from the above tables, the system advances the complete date of the previous operation by 75% of 24 hours or 18 hours. The system then recalculates the start date using the normal backscheduling rules. As a result, operations 10 and 20 overlap and will take 24 hours to complete. The following diagram illustrates this concept.

Date	**4/27**	**4/28**	**4/29**	**4/30**	**5/1**	**5/2**
Resource hours	8	8	8	8	8	8
OP 10 (24 hrs) (w/o overlap)	<----	-----	---->			
OP 20 (24 hrs) (w/o overlap)				<----	-----	---->
OP 10 (w/ overlap)	<----	-----	---->			
OP 20 (w/ overlap)	<-	-----	-----	-->		

Calculating Leadtimes

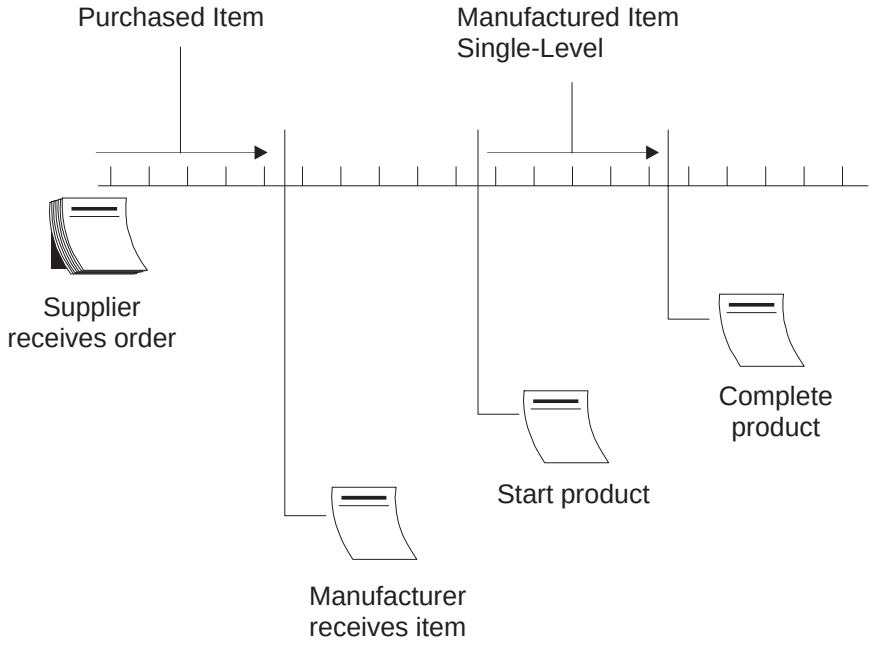
The calculation from the Leadtime Rollup program updates the following values within the Plant Manufacturing Data program:

- Level leadtime (if using manufacturing leadtime quantity)
- Manufacturing leadtime
- Cumulative leadtime
- Per unit leadtime
- Total queue and move hours
- Setup hours

Each of these values is described in detail in the topics that follow.

Level Leadtime

For a manufactured product, level leadtime is the number of workdays required to complete the product once all items are available. Level leadtime for a purchased item is the number of calendar days required for you to receive the item after the supplier receives your purchase order. The following example shows you where in the process are the level leadtimes for a manufactured item and a purchased item:



Calculation

The system uses the following formula to calculate level leadtime:

$$\frac{\sum \left(\frac{\{(M \text{ or } L) / (E \text{ or } M)\} \times MLQ}{TBC^{*}} \right) + \text{setup} + \text{total queue/move hours}}{\text{Work hours per day from Constants table}}$$

* The system reads the Time Basis Code from the Routing Master file (F3003).

The following table defines the values used in the formula.

M or L	Machine or labor hours based on the prime load code
L or B	Labor hours
M or C	Machine hours
SUM	Sum of all operations
TBC	Time basis code
MLQ	Manufacturing leadtime quantity
E	Number of employees in the work center
M	Number of machines in the work center

For example:

$$\frac{\frac{\{(8)/(1)\} \times 2{,}000}{10{,}000} + \frac{\{(12)/(1)\} \times 2{,}000}{10{,}000} + \frac{\{(12)/(1)\} \times 2{,}000}{10{,}000} 1 + 9}{8} =$$

$$(1.6 + 2.4 + 2.4 + 1 + 9) / 8 = 16.4 / 8 =$$

3 days level leadtime

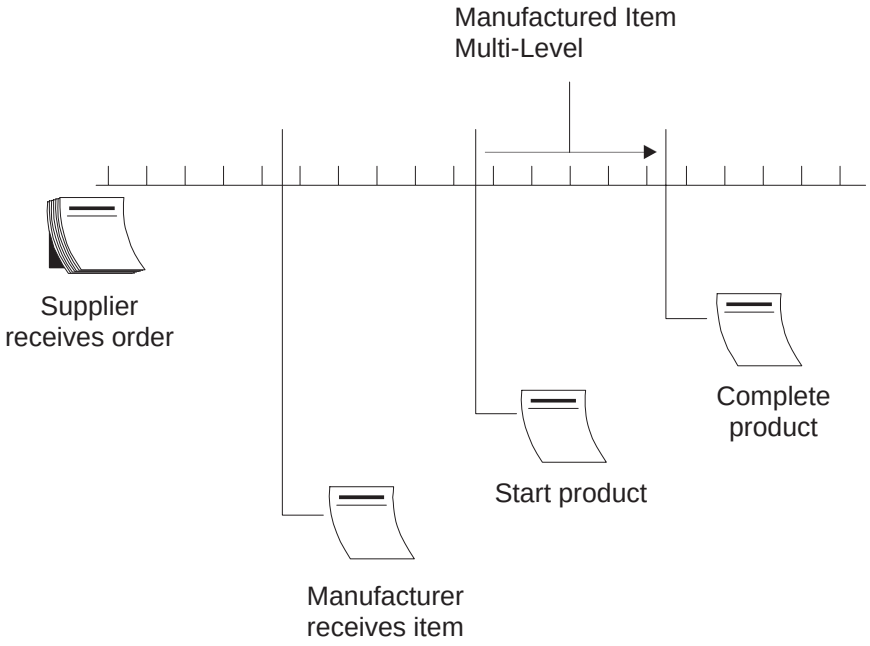
Manufacturing Leadtime

Manufacturing leadtime is the total number of workdays required to complete a product, from its lowest-level items to the final item, assuming that all purchased items are in house. Manufacturing leadtime includes the following:

- Order preparation time
- Queue time
- Setup time
- Run time
- Move time
- Inspection time
- Putaway time

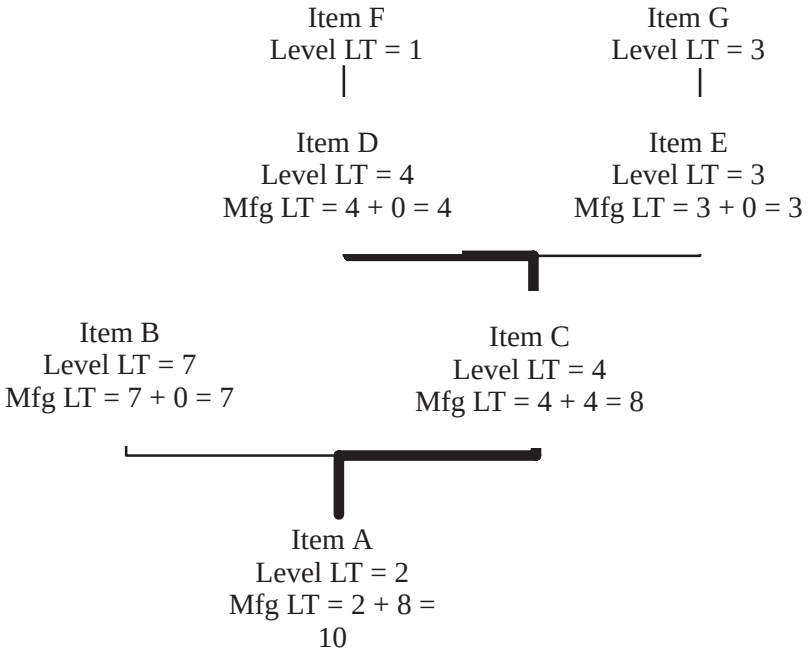
In addition, manufacturing leadtime is the total of the level leadtime for an item plus the longest manufacturing leadtime of any of its components.

Leadtimes for purchased items are not included in manufacturing leadtime calculations. The following example shows you where in the process is the manufacturing leadtime for a manufactured item:



Calculation

The following flow depicts a calculation of manufacturing leadtime.



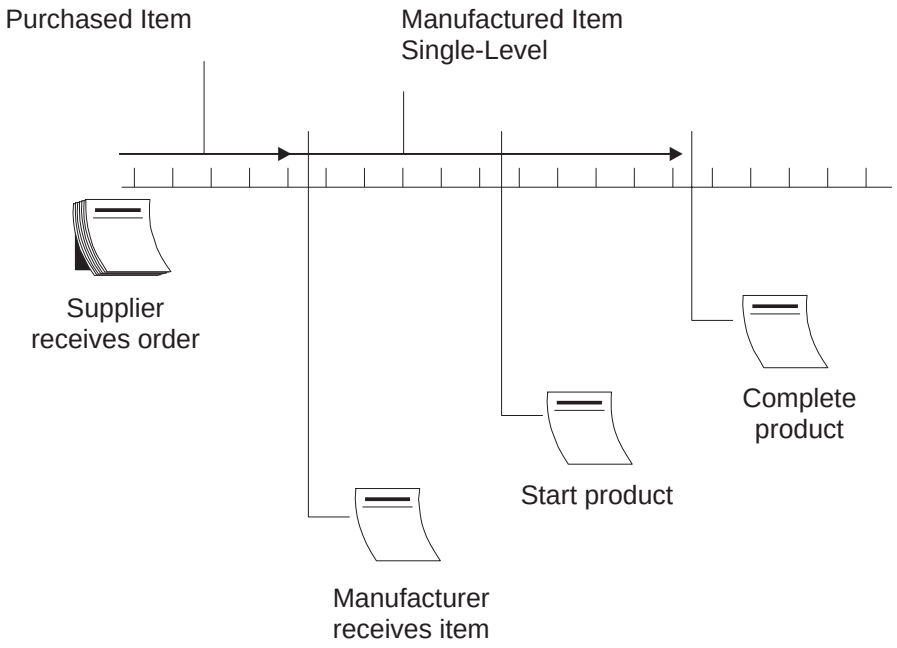
Bold line = Longest manufacturing leadtime of any of the product's items.
Items A, B, C, D, and E are manufactured items.
Items F and G are purchased items.

Cumulative Leadtime

Unlike manufacturing leadtime, cumulative leadtime includes the leadtimes for purchased items. It covers both the time to acquire purchased items and the time to complete the product.

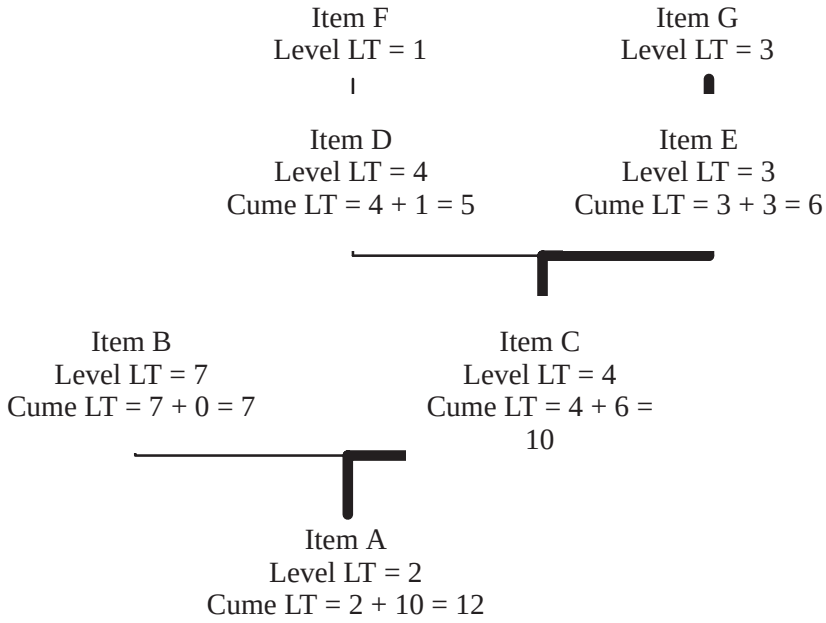
Cumulative leadtime is the number of workdays that are required to acquire items and complete a product, from its lowest-level components to the final item, which is the level leadtime for a product plus the longest cumulative leadtime of any of its components.

The cumulative leadtime for a purchased item is its level leadtime. The following example shows you where in the process are the cumulative leadtimes for a manufactured item and a purchased item:



Calculation

The following flow depicts a calculation of cumulative leadtime.



Bold line = Longest manufacturing leadtime of any of the product's items.
Items A, B, C, D, and E are manufactured items.
Items F and G are purchased items.

Per Unit Leadtime

Per unit leadtime is the sum of the run times, as defined by the prime load codes for the work centers, factored by the routing time basis and converted to the leadtime per unit. The per unit leadtime sets valid start dates for orders planned in other than normal planned order quantity. When you run the leadtime rollup program, the system measures the per unit leadtime in hours.

Calculation

The system uses the following formula to calculate per unit leadtime.

$$\sum \left(\frac{\{(M \text{ or } L) / (E \text{ or } M)\} \times TBC\ ^{1}}{TBC\ ^{2}} \right)$$

For example:

$$\frac{(8 / 1) \times 10{,}000}{10{,}000} + \frac{(12 / 1) \times 10{,}000}{10{,}000} + \frac{(12 / 1) \times 10{,}000}{10{,}000} =$$

$$8 + 12 + 12 =$$

32 hours per unit leadtime

[1] The system reads the Time Basis Code from the Item Branch table (F4102).
[2] The system reads the Time Basis Code from the Routing Master table (F3003).

The following table defines the values used in the formula.

M or L	Machine or labor hours based on the prime load code
L or B	Labor hours
M or C	Machine hours
SUM	Sum of all operations
TBC	Time basis code
E	Number of employees in the work center
M	Number of machines in work center

Total Queue and Move Hours

Queue hours indicate the time that a manufacturing work order is idle at a work center before setup or work begins. Move hours indicate the time that a manufacturing work order is moving from the completion of one operation to the start of the next operation. To calculate the total queue and move hours, add the move hours per routing and the queue hours per routing.

In the following example, 9 is the total queue and move hours.

OP 30	OP 60	OP 80	
(1 + 2)	(2 + 4)	(0 + 0)	= 9

Setup Hours

Setup hours indicate the time that are required to prepare the machinery to run a specific item. To calculate the setup hours, divide the setup by the number of employees or machines for each routing, and then add the values together. This ensures consistency during the backscheduling routing because the resource units for the work center are created based on those numbers.

In the following example, the setup hours equal 1.

Setup / Employees or machines	$\frac{1}{1}$	$\frac{2}{1}$	$\frac{6}{2}$	= 6 setup hours
	OP 30	OP 60	OP 80	

Glossary

Glossary

actual demand. Actual customer orders and allocations of items/ingredients/raw materials to production or distribution.

aggregate leadtime. See cumulative leadtime.

aggregate planning. The sum of all forecasted demand (customer, distribution, manufacturing) for all items in a family for purposes of planning gross requirements.

alternate operation. Replacement for a normal operation or routing for an item in the manufacturing process.

alternate routing. A routing, less preferred than the primary routing, that results in an item identical to that produced by the primary routing.

application. A computer program or set of programs used to accomplish a task. In OneWorld, there are interactive applications and batch applications. Interactive applications are made up of a set of forms through which the user interacts with OneWorld. Interactive application identifiers begin with "P." For example, Address Book Revisions (P01012) is an interactive application. Batch applications run without user interaction. Reports and table conversions are examples of batch applications. Batch application identifiers begin with "R." For example, the Print Mailing Labels report (R01401) is a batch application.

assemble-to-order product. A product for which key components (bulk, semi-finished, intermediate, subassembly, fabricated, purchased, packaging, and so on) are planned and stocked in anticipation of a customer order. Contrast with make-to-order product.

assembly. A group of items or subassemblies that, when put together, constitute an end item.

assembly inclusion rule. A logic statement that specifies the conditions for using a part, adjusting the price or cost, performing a calculation, or using a routing operation for configured items.

associated service type. See linked service type.

audit trail. The detailed, verifiable history of a processed transaction. The history consists of the original documents, transaction entries, and posting of records and usually concludes with a report.

automatic accounting instruction (AAI). A code that refers to an account in the chart of accounts. AAIs define rules for programs that automatically generate journal entries, including interfaces between the Accounts Payable, Accounts Receivable, Financial Reporting, and General Accounting systems. Each system that interfaces with the General Accounting system has AAIs. For example, AAIs can direct the General Ledger Post program to post a debit to a specific expense account and a credit to a specific accounts payable account.

availability. For packaged product, the system checks availability. For bulk product, you can assume it is in stock and available for sale.

backflush. To deduct from inventory records the components or ingredients as a result of the production process. See also super backflush.

batch bill of material. A recipe or formula in which the quantity of each component is based on the standard batch quantity of the parent.

batch control. A feature that verifies the number of transactions and the total amount in each batch that you enter into the system.

batch input. A group of transactions loaded from an external source.

batch job. A task or group of tasks you submit for processing that the system treats as a single unit during processing, for example, printing reports and purging files. The system performs a batch job with little or no user interaction.

batch processing. A method by which the system selects jobs from the job queue, processes them, and sends output to the outqueue. Contrast with interactive processing.

batch quantity. See standard batch quantity.

batch type. A code assigned to a batch job that designates to which system the associated transactions pertain, thus controlling which records are selected for processing. For example, the Post

General Journal program selects for posting only unposted transaction batches with a batch type of O.

bill of material (BOM). A listing of all the subassemblies and raw materials that make up a parent assembly. The BOM is used with the master production schedule to determine the items for which purchase requisitions and production orders must be released. Display formats for bills of material include single level, multi-level, indented, planning, and costed.

broadcast message. 1) An e-mail message that you send to multiple recipients. 2) A message that appears on a form instead of in your mailbox.

bucketed system. A material requirements planning, distribution requirements planning, or other time-phased system in which all time-phased data is accumulated into time periods, or buckets. If the period of accumulation is one week, then the system is said to have weekly buckets.

bucketless system. A material requirements planning, distribution requirements planning, or other time-phased system in which all time-phased data is processed, stored, and displayed using dated records rather than defined time periods, or buckets.

bulk issue. Items issued from stores to work-in-process inventory, based on quantities estimated to cover requirements of individual work centers and production lines instead of individual job orders. A bulk issue can be used to cover a period of time or to fill a fixed-size container.

business unit. See facility.

by-product. A material of positive or negative value produced as a residual of or incidental to the production process. The ratio of by-product to primary product is usually predictable. By-products might be discarded, sold as is, or used for other purposes. See also co-product and restricted by-product.

capacity requirements planning (CRP). The function of establishing, measuring, and adjusting limits or levels of capacity by determining in detail how much labor and machine resources are required to accomplish the tasks of production. Open shop orders and planned orders in the Material Requirements Planning system are inputs to CRP, which "translates" these orders into hours of work by work center and by time period.

category code. A type of user defined code for which you can provide the title. For example, if you were adding a code that designated different sales regions, you could change category code 4 to Sales Region, and define E (East), W (West), N (North), and S (South) as the valid codes. Sometimes referred to as reporting codes. See also user defined code.

certificate of analysis (COA). A document that includes all of the tests performed and resulting test data for an item lot.

chart of accounts. The structure for general ledger accounts. The chart of accounts lists types of accounts, describes each account, and includes account numbers and posting edit codes.

committed material. Material on hand or on order that is assigned to specific future production or customer orders. Sometimes referred to as reserved material.

component. A raw material, ingredient, or subassembly that is used as an element of another assembly, process, or item. A component might be packaging material for a finished item.

component changeout. See component swap.

component swap. In Equipment/Plant Management, the substitution of an operable component for one that requires maintenance. Typically, you swap components to minimize equipment downtime while servicing one of the components.

composite leadtime. See cumulative leadtime.

configuration management. A rules-based method of ordering assemble-to-order or make-to-order products, in which characteristics of the product are defined as part of the Sales Order Entry process. Characteristics are edited using Boolean logic and then translated into the components and routing steps required to produce the product. The resulting configuration is also priced and costed, based on the characteristics defined.

configured item segment. A characteristic of a configured item defined during sales order entry. For example, a customer may specify a type of computer hard drive by stating the number of megabytes of the hard drive, rather than a part number.

constants. Parameters or codes that you set and that the system uses to standardize the processing of information by associated programs.

consuming location. The point on the production line where a component or subassembly is used in the production process. Consuming location is used in kanban processing.

corrective maintenance. Any maintenance work that falls outside the scope of preventive or predictive maintenance. Corrective maintenance can be planned, unplanned, or emergency, for example, to respond to equipment failure. Contrast with preventive maintenance and predictive maintenance.

corrective work order. A work order that is used to formally request corrective maintenance, and to communicate all details pertaining to the corrective maintenance task.

cost component. An element of an item's cost, for example, material, labor, or overhead.

cost rollup. A simulated scenario in which work center rates, material costs, and labor costs are used to determine the total cost of an item.

costed bill of material. A bill of material that extends the quantity per of every component by the cost of the components. See also bill of material.

co-product. An end item produced as the result of a process. There are usually two or more co-products. See also end item and by-product.

crew size. The number of people required to perform an operation.

critical path leadtime. See cumulative leadtime.

cross segment edit. A logic statement that establishes the relationship between configured item segments. Cross segment edits are used to prevent ordering of configurations that cannot be produced.

cumulative leadtime. The longest planned length of time needed to accomplish the activity in question. For any item planned through material requirements planning, cumulative leadtime is determined by reviewing the leadtime for each bill of material path below the item. The path with the longest leadtime defines the cumulative leadtime. Sometimes referred to as critical path leadtime, aggregate leadtime, or composite leadtime.

current cost. The cost associated with an item at the time a parts list and routing are attached to a work order or rate schedule. Current cost is based on the latest bill of material and routing for the item.

data dictionary. A database table that OneWorld uses to manage the definitions, structures, and guidelines for the usage of fields, messages, and help text. J.D. Edwards has an active data dictionary, which means that it is accessed at runtime.

database. A continuously updated collection of all information that a system uses and stores. Databases make it possible to create, store, index, and cross-reference information online.

date pattern. A period of time set for each period in standard and 52-period accounting.

default. A code, number, or parameter that the system supplies when the user does not specify one.

detail. The specific information that makes up a record or transaction. Contrast with summary.

detail area. An area of a form that displays detailed information associated with the records or data items displayed on the form. See also grid.

direct labor. Labor that is applied to the product being manufactured.

direct material. Measurable quantities of material that becomes a part of the final product.

dispatch list. A list of sequenced work orders or rate schedules that contain detailed information on location, quantity, and capacity requirements. Dispatch lists are usually generated daily and are oriented by work center or line.

effectivity date. The date on which a component or an operation is to be added or removed from a bill of material or an assembly process. Effectivity dates are used in the planning process to create demands for the correct items. Normally, bills of material and routings provide for an effectivity start date (from) and stop date (through), signifying the beginning and end of a particular relationship. Sometimes referred to as effective date.

electronic commerce. See Electronic Data Interchange.

Electronic Data Interchange (EDI). The paperless, computer-to-computer exchange of business transactions, such as purchase orders and invoices, in a standard format with standard content.

engineering change order (ECO). A work order used to implement and track a change in a manufactured product. This includes changes in design, quantity of items required, and assembly or production process.

enterprise resource planning (ERP). A closed-loop, integrated system that enables manufacturers and distributors to coordinate all of the activities necessary to fulfill customer demand. This includes activities associated with suppliers, customers, inventory, shop floor, product costing and accounting, forecasting, and planning and scheduling.

Enterprise Workflow Management. A OneWorld system that provides a way of automating tasks, such as notifying a manager that a requisition is waiting for approval, using an e-mail-based process flow across a network.

expedite. To process production or purchase orders in less than the normal leadtime.

explosion. The process of calculating the demand for the components of a parent item by multiplying the parent item requirements by the quantity per specified in the bill of material. Sometimes referred to as requirements explosion. Contrast with implosion.

exponential smoothing. A forecasting technique in which past observations are geometrically discounted according to their age. The heaviest weight is assigned to the most recent data. The smoothing is termed exponential because data points are weighted in accordance with an exponential function of their age.

facility. An entity within a business for which you want to track costs. For example, a facility might be a warehouse location, job, project, work center, or branch/plant. Sometimes referred to as a business unit.

family. See master planning family.

feature. A characteristic of a product or service, such as an option, accessory, or attachment.

field. 1) An area on a form that represents a particular type of information, such as name, document type, or amount. 2) A defined area within a record that contains a specific piece of information. For example, a supplier record consists of the fields Supplier Name, Address, and Telephone Number.

file. A set of information stored under one name. See also table.

finished good. See end item.

firm planned order (FPO). A work order that has reached a user defined status. When this status is entered in the processing options for the various manufacturing programs, messages for those orders are not exploded to the components.

first in, first out (FIFO). A method of inventory valuation for accounting purposes, based on the assumption that oldest inventory (first in) is the first to be used (first out). There is no relationship with the actual physical movement of specific items.

fixed cost. An expense that does not vary with the production volume, for example, setup cost.

fixed order quantity. A lot-sizing technique in MRP or inventory management whereby the system generates planned or actual orders for a predetermined quantity. If the net requirements for a period exceed the fixed order quantity, the system generates orders for multiples of the fixed order quantity.

fixed overhead. Manufacturing costs that continue even if products are not produced. Although fixed overhead is necessary to produce the product, it cannot be directly traced to the final product.

fixed quantity. A value that indicates that the amount of a component or ingredient used in the manufacturing process of an end item remains the same, regardless of the quantity of the end item produced. Contrast with variable quantity.

forecast. An estimate of future demand, determined by mathematical means using historical data, subjective estimates from informal sources, or a combination of both.

forecast consumption. The reduction of forecast demand, based on actual sales orders received or shipped, up to the forecast quantity.

form. The element of the OneWorld graphical user interface by which the user exchanges data with interactive applications. Forms are made up of controls, such as fields, options, and the grid. These controls allow the user to retrieve information, add and revise information, and navigate through an application to accomplish a task.

frozen cost. The cost of an item, operation, or process, after the frozen update program is run, that is used by the Manufacturing Accounting system.

frozen update program. A program that freezes the current simulated costs, thereby finalizing them for use by the Manufacturing Accounting system.

Gantt chart. A control chart that shows graphically the relationship between planned performance and actual performance.

grade. A rating assigned to an item, based on how well the item meets required specifications.

grid. A control that displays detail information on a form. The grid is arranged into rows, which generally represent records of data, and columns, which generally represent fields of the record. See also detail area.

header. Information at the beginning of a table or form. Header information is used to identify or provide control information for the group of records that follows.

indented bill of material. A multi-level bill of material that lists the highest level parent items at the left margin and all the components going into the patents indented to the right of the margin. All subsequent levels of components are indented farther to the right. If a component is used in more than one parent within a given product structure, it will appear under every subassembly in which it is used.

indented where-used. A bill of material listing for one component, every parent item and subassembly, and the respective quantities required. Each of these parent items calls for the given component item in a bill of material table. The component item is shown closest to the left margin of the listing in the bill, with each parent indented to the right, and each of their respective parents indented even further to the right.

ingredient. In process manufacturing industries, the raw material or component of a recipe or formula.

integrity test. A process used to supplement a company's internal balancing procedures by locating and reporting balancing problems and data inconsistencies.

interactive processing. Processing actions that occur in response to commands that you enter directly into the system. During interactive processing, you are in direct communication with the system, and it might prompt you for additional information while processing your request. Contrast with batch processing.

intermediate. Material processed beyond raw material and used in higher level items. Intermediates are not stocked in inventory, sold to customers, or planned by material requirements planning.

in-process inventory. See work-in-process (WIP).

item master. A record for an item. The item master contains descriptive data and control values (leadtimes, lot sizes, and so on), and might contain data on inventory status, requirements, planned orders, and costs. Item master records are linked together by product structure records that define the bill of material for an item.

job queue. A group of jobs waiting to be batch processed. See also batch processing.

Just-in-Time (JIT). A method of manufacturing based on planned elimination of all waste and continuous improvement of productivity. The primary elements of Just-in-Time manufacturing are to have only the required inventory when needed; to improve quality to zero defects; to reduce leadtimes by reducing setup times, queue lengths, and lot sizes; to revise incrementally the operations themselves; and to keep costs to a minimum.

kanban. Information cards attached to a group or bin of items that travel in and out of a work center. Kanbans indicate to producing work centers what has been consumed and what needs to produced next. Some companies use various shapes, sizes, and colors of cards for ease of recognition and to indicate an item's priority. OneWorld uses electronic kanbans.

labor cost. The monetary amount of labor performed during manufacturing.

ledger type. A code that designates a ledger used by the system for a particular purpose. For example, all transactions are recorded in the AA (actual amounts) ledger type in their domestic currency. The same transactions may also be stored in the CA (foreign currency) ledger type.

level. The code used for every item or assembly in a product structure to signify the relative level in which that item or assembly is used within the product structure. Normally, the end items are assigned to level 0 with the components and subassemblies of the item assigned to level 1 and so forth. The material requirements planning explosion process starts from level 0 and proceeds downward, one level at a time.

linked service type. A service type that is associated with a primary service type. Linked service types are cancelled and the maintenance tasks are performed when the primary service type to which they are linked comes due. You can specify whether the system generates work orders for linked service types, as well as the status the system assigns to work orders that have already been generated. Sometimes referred to as associated service types. See also primary service type and service type.

lot. A quantity produced together that shares the same production components. Lots are uniquely identified to allow for traceability.

lot number control. Assignment of unique numbers to each instance of receipt. This number carries forth into subsequent manufacturing processes. Thus, in review of an end item lot, each lot consumed can be identified as having been used for the manufacture of the specific end item lot.

maintenance loop. See maintenance route.

maintenance route. A method of performing PMs for multiple pieces of equipment from a single preventive maintenance work order. A maintenance route includes pieces of equipment that share one or more identical maintenance tasks that can be performed at the same time for each piece of equipment. Sometimes referred to as maintenance loop.

maintenance work order. In J.D. Edwards systems, a term used to distinguish work orders created for the performance of equipment and plant maintenance from other work orders, such as manufacturing work orders, utility work orders, and engineering change orders.

make-to-order product. A product that is produced after receipt of a customer's order. The final product is usually a combination of standard purchased items and items specially designed to meet the needs of the customer. Frequently, long leadtime components are planned prior to the order arriving to reduce the delivery time to the customer. Contrast with assemble-to-order product. See also make-to-stock product.

manufacturing and distribution planning. Planning that includes Resource and Capacity Planning and Material Planning Operations. Resource and Capacity Planning allows you to prepare a feasible production schedule that reflects your demand forecasts and production capability. Material Planning Operations provides a short-range plan to cover material requirements that are needed to make a product.

manufacturing calendar. See work day calendar.

master planning family. Products that are grouped together for material planning purposes, based on shared characteristics.

Master Production Scheduling (MPS). The act of creating a master schedule. See also master schedule.

master schedule. A detailed statement of how many items are planned to be produced and when. The master schedule focuses on products to be made and, through the detailed planning system, identifies the resources (materials, work force, plant equipment, and capital) needed and the timing of the need. See also material requirements planning.

master table. A database table used to store data and information that is permanent and necessary to the system's operation. Master tables might contain data, such as paid tax amounts, supplier names, addresses, employee information, and job information.

material requirements planning (MRP). A set of techniques that uses bill of material, inventory data, and the master schedule to calculate the time-phased net material requirements for every component item and subassembly. MRP suggests a replenishment plan to support the production of the quantities that are specified in the master schedule. See also master schedule.

menu masking. A security feature that lets you prevent individual users from accessing specified menus or menu selections.

model work order. In Equipment/Plant Management, a work order that functions as a template for the creation of other work orders. You can assign model work orders to service types. When the service type comes due, the system automatically generates a work order based on information from the model work order.

net added cost. The cost to manufacture an item at the current level in the bill of material. Thus, for manufactured parts, the net added cost includes labor, outside operations, and cost extras applicable to this level in the bill of material, but not materials (lower-level items). For purchased parts, the net added cost also includes the cost of materials.

next numbers. A feature used to control the automatic numbering of items such as new G/L accounts, vouchers, and addresses. Next numbers provides a method of incrementing numbers.

nonconforming product. Items that do not meet the requirements of a relevant specification, contract, regulation, or quality test.

nonsignificant item numbers. Item numbers that are assigned to each item but do not convey any information about the item. They are identifiers, not descriptors. Contrast with significant item numbers.

operation sequence. The sequential steps that an item follows in its flow through the plant. For instance, operation 10: cut bar stock; operation 20:

grind bar stock; operation 30: shape; operation 40: polish; operation 50: inspect and send to stock. This information is maintained in the routing table.

operation yield. The planned percent of output at an operation. For example, if the operation yield is 90% and 100 units are started at that operation, planned output is 90 units that will be available to the next operation.

output queue. See print queue.

overlap. The percentage by which an operation overlaps the previous operation in the sequence. For example, a 20% overlap means that a step can begin when the previous step is 80% complete.

parameter. A number, code, or character string you specify in association with a command or program. The computer uses parameters as additional input or to control the actions of the command or program.

parent item. See end item.

parent/child relationship. See parent/component relationship.

parent/component relationship. 1) In Equipment/Plant Management, the hierarchical relationship of a parent piece of equipment to its components. For example, a manufacturing line could be a parent and the machinery on the line could be components of the line. In addition, each piece of machinery could be a parent of still more components. 2) In Product Data Management, a hierarchical relationship of the components and subassemblies of a parent item to that parent item. For example, an automobile is a parent item and its components and subassemblies include: engine, frame, seats, and windows. Sometimes referred to as parent/child relationship.

pay on consumption. The method of incurring a liability for items received from a supplier only when the material is used in the production process.

phantom bill of material. A bill of material used primarily for non-stocked items that represents an item that is physically built, but rarely stocked. The item is instead used in the next step or level of manufacturing. Material requirements planning uses the phantom bill of material to explode the requirements through the phantom item to its components. See also explosion.

planning bill of material. An artificial grouping of items or events in bill of material format, used to facilitate master scheduling of material planning, and forecasting. Sometimes referred to as pseudo bill of material.

planning calendar. See work day calendar.

planning family. A means of grouping end items whose similarity of design and manufacture facilitates being planned in aggregate.

PM. Maintenance tasks and procedures that are routine and repetitive, such as periodic lubrications and filter replacements. Preventive maintenance procedures are designed to eliminate breakdowns and the need for corrective maintenance. Contrast with corrective maintenance and predictive maintenance.

potency. Identifies the percent of a process item in solution. For example, 80% solution could be used in a process that called for 100%, but would require 25% more in terms of quantity to meet the requirement (100 / 80 = 1.25).

predictive maintenance. A maintenance strategy that uses computerized data collection and analysis of equipment operating parameters to predict the point at which equipment is expected to fail and then schedules the appropriate procedures just before the expected equipment failure. Predictive maintenance can significantly reduce costs and equipment downtime by eliminating unnecessary preventive maintenance procedures. In addition, by predicting and averting catastrophic equipment failure, predictive maintenance reduces overall maintenance costs and allows for equipment to be operated for its full service life. Contrast with corrective maintenance and preventive maintenance.

preference profile. The ability to define default values for specified fields for a user defined hierarchy of items, item groups, customers, and customer groups.

preflush. To deduct materials from inventory when the parts list and routing are attached.

preventive maintenance (PM). One or more service types that are due to be performed for a piece of equipment, based on the service intervals for each service type. When you complete a preventive maintenance, a new preventive maintenance cycle begins for the service types included in the preventive maintenance.

preventive maintenance cycle. The sequence of events that make up a preventive maintenance task, from its definition to its completion. Because most preventive maintenance tasks are commonly

performed at scheduled intervals, parts of the preventive maintenance cycle repeat, based on those intervals.

preventive maintenance schedule. The combination of service types that apply to a specific piece of equipment, as well as the intervals at which each service type is scheduled to be performed.

primary location. The designation of a certain storage location as the standard, preferred location for an item.

primary service type. A service type to which you can link related service types. For example, for a particular piece of equipment, you might set up a primary service type for a 1000-hour inspection and a linked service type for a 500-hour inspection. The 1000-hour inspection includes all tasks performed at 500 hours. When a primary service type is scheduled to be performed, the system schedules the linked service type. See also linked service type.

print queue. A list of tables, such as reports, that you have submitted to be written to an output device, such as a printer. The computer spools the tables until it writes them. After the computer writes the table, the system removes the table identifier from the print queue.

priority. 1) The relative importance of jobs in a queue. 2) The sequence in which jobs should be completed.

processing option. A feature that allows you to direct the functions of a program. For example, processing options allow you to specify defaults for certain forms, control the format in which information prints on reports, and change how information appears on a form or in a report.

Product Data Management (PDM). In J.D. Edwards software, the system that enables a business to organize and maintain information about each item it manufactures. Features of this system, such as bills of material, work centers, and routings, define the relationships among components and how they can be combined to manufacture an item. PDM also provides data for other manufacturing systems including Manufacturing Accounting, Shop Floor Management, and Manufacturing and Distribution Planning.

product family. See master planning family.

product line. A group of products whose similarity in manufacturing procedures, marketing characteristics, or specifications allow them to be aggregated for planning, marketing, and occasionally, costing. See also master planning family.

production line. A series of work centers or machines allocated to the production of a limited number of items with similar routings.

projected cost. The target expenditure in added value for material, labor, and so forth during manufacture. See also standard cost.

pseudo bill of material. See planning bill of material.

purchased part. An item bought from a supplier.

purge. The process of removing records or data from a system table.

queue. The jobs waiting to be processed at a given work center. As queues increase, so do average queue time and work-in-process inventory.

recipe. See bill of material.

record. A collection of related, consecutive fields of data that the system treats as a single unit of information.

repetitive manufacturing. Producing items in high-volume concentration, often with entire production lines dedicated to a family of products.

replacement parts. Parts that can be used as substitutes. They differ from completely interchangeable service parts in that they require some physical modification, such as cutting, drilling, and so forth, before they can replace the original part.

replenishment point. The location on or near the production line where additional components or subassemblies are to be delivered.

requirements explosion. See explosion.

reserved material. See committed material.

resource requirements planning (RRP). The process of converting the production plan into capacity needs for key resources, such as workforce, machinery, warehouse space, suppliers' capabilities, and in some cases, money. Comparison of capacity required of items in the master schedule to available capacity is usually done for each key resource.

restricted by-product. A restricted secondary or incidental product produced while making another product. Such by-products cannot be sold because they are restricted from sale by government policies.

The company might have to forego making a product if a restricted by-product is produced.

revision level. A number or letter representing the number of times a document or item has been changed.

rollup. See cost rollup.

rough cut capacity planning (RCCP). The process of converting the master schedule into capacity needs for key resources, such as workforce, machinery, warehouse space, suppliers' capabilities, and in some cases, money. Comparison of capacity required of items in the master schedule to available capacity is usually done for each key resource.

run size. See standard batch quantity.

safety stock. 1) A quantity of stock planned to be on hand to protect against fluctuations in demand or supply. 2) In Master Production Scheduling, the additional inventory or capacity planned as protection against forecast errors or short-term changes in the backlog. Overplanning can be used to create safety stock.

scheduling workbench. A multiple-function program that allows the sequencing of work orders, rate schedules, or both on a production line. Sequencing can be manual or automatic, based on user defined category code definition. Sequencing includes forward, finite scheduling, including the option to cross shifts or days.

scrap. Unusable material that results from the production process. Scrap is material outside of specifications and of such characteristics that rework is impractical.

scrap rate. See scrap factor.

sequencing. Determining the order in which a facility processes different jobs.

serial number. A unique number assigned to identify a specific item with a lot size of one.

service interval. The frequency at which a service type is to be performed. Service intervals can be based on dates, periods, or statistical units that are user defined. Examples of statistical units are hours, miles, and fuel consumption.

service type. An individual preventive maintenance task or procedure, such as an inspection, lubrication, or overhaul. Service types can apply to a specific piece of equipment or to a class of equipment. You can specify that service types come due based on a predetermined service interval, or whenever the task represented by the service type becomes necessary.

setup cost. The labor costs associated with setting up an operation for the next product.

shop calendar. See work day calendar.

Shop Floor Management. A system that uses data from Product Data Management, Master Production Scheduling, and Material Requirements Planning to create, maintain, and communicate status on shop orders (work orders).

shrink factor. A percentage factor in the item master record that compensates for expected loss during the manufacturing cycle either by increasing the gross requirements or by reducing the expected completion quantity of planned and open orders. The shrink factor differs from the scrap factor in that the former affects all uses of the part and its components and the scrap factor relates to a single component. Sometimes referred to as shrinkage rate.

shrinkage rate. See shrink factor.

significant item numbers. Item numbers that are intended to convey certain information, such as the source of the part, the material in the part, the shape of the part, and so forth. Contrast with nonsignificant item numbers.

simulated cost. After a cost rollup, the cost of an item, operation, or process according to the current cost scenario. This cost can be finalized by running the frozen update program. You can create simulated costs for a number of cost methods, for example, standard, future, and simulated current costs. See also cost rollup.

single level where-used list. A type of bill of material that lists each parent in which a specific component is directly used and in what quantity it is used.

specification. A statement of the technical requirements of an application or item and the process involved to ensure the requirements are met.

spool. The function by which the system stores generated output to await processing.

standard cost. The expected, or target cost of an item, operation, or process. Standard costs represent only one cost method in the Product Costing system. You can also calculate, for example, future costs or current costs. However, the Manufacturing Accounting system uses only standard frozen costs.

standard costing. A costing method that uses cost units determined before production. For management control purposes, the system compares standard costs to actual costs and computes variances.

standard hours. The length of time that should be required to 1) set up a given machine or operation and 2) run one part, assembly, batch, or end product through that operation. This time is used in determining machine and labor requirements. It is also frequently used as a basis for incentive pay systems and as a basis for allocating overhead in cost accounting systems.

subassembly. An assembly that is used at a higher level to make up another assembly.

substitution. To use alternate components in production when primary items are not available.

summary. The presentation of data or information in a cumulative or totaled manner in which most of the details have been removed. Many systems offer forms and reports that summarize information stored in certain tables. Contrast with detail.

super backflush. To create backflush transactions against a work order at pay points defined in the routing. By doing so, you can relieve inventory at strategic points throughout the manufacturing process. See also backflush.

supplier scheduling. A process of providing suppliers with consistent shipping information and advanced demand profiles to support just-in-time production and delivery. The supplier scheduling system includes a business agreement and delivery schedule for each supplier. Supplier scheduling includes a formal priority planning system and EDI functionality to provide the supplier with valid due dates.

supply chain. The link from the initial raw materials to the consumption of the finished product.

supplying location. The location from which inventory is transferred once quantities of the item on the production line have been depleted. Used in kanban processing.

system. A group of related applications identified by a name and a system code. For example, the Address Book system code is 01. All applications, tables, and menus within a system can be identified by the system code.

system code. A code that identifies a system, for example, 01 for the Address Book system and 31 for the Shop Floor Management system.

table. In database environments, a two-dimensional entity made up of rows and columns. All physical data in a database are stored in tables. See also file.

threshold percentage. In Equipment/Plant Management, the percentage of a service interval that you define as the trigger for maintenance to be scheduled. For example, you might set up a service type to be scheduled every 100 hours with a threshold percentage of 90 percent. When the equipment accumulates 90 hours, the system schedules the maintenance.

traceability. The ability to trace the production history of a product for quality or warranty purposes. This is usually done through the use of lot or serial numbers to link raw materials from the supplier to the end product. Lot/serial number traceability can be a government requirement in certain regulated industries, such as the pharmaceutical or automotive industries. See also lot.

unit cost.The total cost of labor, material, and overhead for one unit of production.

unit of measure. The standard quantity by which an item is managed, such as by weight, box, package, case, each, and so forth.

user defined code (UDC). A code that users can define, assign code descriptions, and assign valid values. Examples of such codes are unit-of-measure codes, state names, and employee type codes.

user defined code type. The identifier for a table of codes with a meaning that you define for the system, such as ST for the Search Type codes table in Address Book. OneWorld provides a number of these tables and allows you to create and define tables of your own.

value added. Amount of increased worth of inventory through manufacturing, processing, or packaging.

variable quantity. A value that indicates the amount of a component or ingredient that varies based on the quantity of the end product produced. Contrast with fixed quantity.

variance. 1) In Product Costing and Manufacturing Accounting, the difference between two methods of costing the same item. For example, the difference between the frozen standard cost and the current

cost is an engineering variance. Frozen standard costs come from the Cost Components table, and the current costs are calculated using the current bill of material, routing, and overhead rates. 2) In Equipment/Plant Management, the difference between revenue generated by a piece of equipment and costs incurred by the equipment.

vocabulary overrides. A feature that you can use to override field, row, or column title text on forms and reports.

work day calendar. A calendar, used in planning functions, that consecutively lists only working days so that component and work order scheduling can be done based on the actual number of work days available. Sometimes referred to as planning calendar, manufacturing calendar, or shop floor calendar.

work order life cycle. In Equipment/Plant Management, the sequence of events through which a work order must pass to accurately communicate the progress of the maintenance tasks it represents.

work-in-process (WIP). One or more products in various stages of completion throughout the plant, including all material from raw material that has been released for initial processing up to completely processed material awaiting final inspection and acceptance as finished product. Sometimes referred to as in-process inventory.

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