

User's Guide for Work Order Control (RMA & Depot Repair)

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About this document

Objectives

This document is a User's Guide that is designed to meet the following objectives:

Understand the following concepts

- Work order control
- Subcontracting
- Material allocations, delivery types, and work order (activity) status
- Disassembly/assembly process

To perform the following tasks

- To create a work order
- To process a work order
- To close a work order
- To create follow-up work orders
- To use reference activities

In this document, you are assumed to already have an understanding of Infor ERP LN Service.

Document summary

This User's Guide describes the various concepts and processes available in the Work Order Control module.

How to read this document

This document is assembled from Online Help topics. As a result, references to other sections in the manual are presented as shown in the following example:

For details, refer to the Infor ERP LN Service Online Help.

To locate a section referenced in this document, refer to the table of contents.

Underlined terms indicate a link to a glossary definition. If you view this document online, you click on underlined text to jump to the glossary definition at the end of this document.

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This chapter provides a brief introduction of the Work Order Control functionality available in the RMA & Depot Repair module.

Work Order Control (WCS)

In the Work Control System module, the work order preparation, planning, and execution in a maintenance shop or repair shop is handled.

Work Control System for internal maintenance and for maintenance on customer owned parts. For maintenance on customer owned parts, Work Control System is fully integrated with the Maintenance Sales Control module.

In addition, Work Control System is related to the following ERP LN packages and modules:

- People for labor resources, hours registration, and to transfer all labor hours to maintenance sales order coverage lines.
- Purchase Control Purchasing to create a purchase order for required materials or items.
- Tools Requirement Planning Tooling to allocate tool requirements to a work order or a work order activity.
- Warehouse Management to create a warehousing order, for transactions on economic stock or to increase or decrease the actual stock, to create inventory commitment, and to check economic stock.
- General Ledger to book WIP costs in Financials.
- Maintenance Sales Control to transfer the costs incurred during repair on the work order.
- Activity Management to select and create reference activities. To create work order activities, you can select routing options.

Chapter 2

Work Order Control Concepts

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This chapter provides a brief description of the concepts available in work orders.

Subcontracting - Work Order

A single company may not deliver the entire range of services. In which case, the company may subcontract the entire service of a product to a subcontractor.

In ERP LN, you can enter into a subcontracting agreement with the supplier to carry out the required services as specified in the work order.

You must define a **Cost** or **Service** item and a **subcontractor** on the work order to identify that the work order is subcontracted.

When you release the work order a purchase order is generated for the subcontractor. A subcontracting cost line is created in the **Work Order Other resources (tswcs4130m000)** session with the cost type set to **Subcontracting** to register the cost and sales related to the subcontracted work.

When the purchase order generated is received, it indicates the delivery of the required services.

Note

You must subcontract the entire work order.

Material allocations, delivery types, and work order (activity) status

The work order material resource lines are created when the work order or work order activity can have the following status:

- **Free**
- **Planned**
- **Released**

■ Completed

For the **To Warehouse** delivery type, an available-to-promise check is carried out during the **Planned** status of the work order or the work order activity. If commitment is required during the planning phase, a warehouse order is created after the work order is planned, and the material resources are then allocated. If commitment is required if the work order status is **Released**, the warehousing procedure starts after the work order or the work order activity is released.

For the **Via Purchase** delivery type, a purchase order is created when the work order status or the work order activity status is **Planned**. If you release the work order or the work order activity, the warehousing procedure is started to issue the materials.

For the following delivery types, the materials are allocated manually to the work order or to the work order activity after the work order or work order activity is released:

- From Service Stock
- From Kit
- Location
- Follow-up Work Order
- To Warehouse

Disassembly/Assembly process

If you carry out maintenance on an item, you can decide to disassemble the item. For example, you take the engine off an airplane because you want to clean it separately. The actions that can be carried out on the disassembled components depend on the component's item condition.

No activities are carried out, the component is serviceable.

If the component's item condition is serviceable, the component must be stored in a location until it is reassembled. You can store the component in the default work order location. If you store the component in another location, you must create a work order material resource line for this component. The work order material resource line must have the **Location** delivery type. If you create a work order activity line to assemble the item, a work order material resource line that has the **Location** delivery type, is added to the work order activity line.

A follow-up work order must be created to repair or overhaul the unserviceable component.

A work order material resource line with the **Follow-up Work Order** delivery type is created for the disassembled component. The code that identifies the follow-up work order is stored on the material resource line. If an assembly activity

is created for the component, a work order material resource line with the **Follow-up Work Order** delivery type is added to the work order activity at the same time.

The disassembled component is replaced.

You can also send the unserviceable component to a warehouse to be repaired or overhauled. To send the component to a warehouse, you must create a work order material resource line with the **To Warehouse** delivery type. A non-related work order is created to repair the component.

If the unserviceable component cannot be repaired, it must be scrapped. To scrap the component, you must create a work order material resource line with the Delivery for Scrap delivery type. In both cases a replacement line, which is a work order material resource line for a new component, will be added to a selected assembly activity and immediately released.

Alternative Item

Alternative items serve as a substitute for the standard item when the standard item cannot be delivered or is being replaced. If several items can be substituted for a standard item, you can assign a priority code to each alternative item.

You can specify alternative items for the components in an item breakdown under different parent items. You can select the correct alternative item based on the parent item

When you delete an item breakdown relation then the corresponding alternative items are also deleted. When there is a change in the item breakdown then the corresponding item in the alternative items must be updated.

ATP

An item master plan contains ATP (ATP) information. You can use the ATP information to determine the quantity available and to support order acceptance.

You can use the information to :

- Determine the availability of the stock of the spare part.
 - Identify warehouse in which it is available
 - Determine the date when the spare part can be promised to determine the service execution dates and service delivery dates.
-

Impact of ATP Date

When an ATP check is performed successfully there is an impact of the ATP date on Earliest Start Time(EST), Planned Start Time(PST) , Planned Finish Time(PFT), Latest Finish Time (LFT) and Planned Delivery Date(PDD).

The below table displays the Earliest Start Time(EST), Planned Start Time(PST) , Planned Finish Time(PFT), Latest Finish Time (LFT) and Planned Delivery Date(PDD), when the ATP check is not performed:

EST	PST	PDD	PFT	LFT
5-Apr-07	7-Apr-07	7-Apr-07	10-Apr-07	11-Apr-07

When the ATP check is performed and in case the ATP Date is greater than the Planned Delivery Date then following is the impact of the ATP date:

- The EST date is reset to the ATP date.
- The LFT date increases by the same number of days as the difference between the EST and the new EST as shown in the table below:

ATP Date	EST	New EST	PST	New PST	PDD	New PDD	PFT	New PFT	LFT	New LFT
8-Apr-07	5-Apr-07	8-Apr-07	7-Apr-07	8-Apr-07	7-Apr-07	8-Apr-07	10-Apr-07	9-Apr-07	11-Apr-07	14-Apr-07

When the ATP check is performed and ATP is greater than PDD and the new EST is greater than PST date then following is the impact :

- The EST date is reset to the ATP date.
- The PST date is reset to the ATP date.
- The PDD also reset to the ATP date.
- The PFT date increases by the same number of days as the difference between the PST and the new PST.
- The LFT date increases by the same number of days as the difference between the EST and the new EST as shown in the table below:

ATP Date	EST	New EST	PST	New PST	PDD	New PDD	PFT	New PFT	LFT	New LFT
8-Apr-07	5-Apr-07	8-Apr-07	7-Apr-07	8-Apr-07	7-Apr-07	8-Apr-07	10-Apr-07	11-Apr-07	11-Apr-07	14-Apr-07

Note

The delivery date on the Maintenance Sales Order line is updated with the ATP date when an ATP check is performed successfully.

This chapter describes the steps you must follow to set up master data for the Work Order Control module.

Work order control master data

Before you can define or process work orders, you must set up the Work Order Control master data. In addition to company level parameters, you must define details such as work locations and master routing.

The process to create master data for work order control includes the following activities:

- Set up work order control parameters.
- Define work locations.
- Define reference activities for depot repair.
- Define master routing.

To set up master data for work order control

Step 1: Set up work order control parameters

Before you begin to define or use work orders, you must review and set up the related parameters in the **Work Order Parameters (tswcs0100m000)** session. These parameters affect the way in which ERP LN processes work orders .

Step 2: Define work locations

In the **Locations (tswcs0125m000)** session, you can define work locations.

Work locations are generic locations or locations specific to your service department. You can use locations to store incoming parts and repaired parts until they are shipped back to the customer. You can receive an item either in the warehouse or in the service department location. When you use a warehouse,

a receipt warehouse order is created. If you use a location, no warehouse order is created. You can use the item receipt to identify that the item was received in the specific location.

Step 3: Define reference activities for depot repair

In the **Reference Activities (tsacm1101m000)** session, you can define reference activities for work orders. The **Work Control System** module uses reference activity to plan and carry out maintenance on items.

Step 4: Define master routing

In the **Master Routing (tsacm1101m100)** session, you can define master routings.

You can define generic master routings and master routings that are specific for a service department or an item. You can link master routing options to a master routing to determine the type of service to be carried out while implementing work orders. You can also link master routing operations to a master routing to define a set of reference activities for the master routing.

Use the **Master Routing – Operations (tsacm2100m100)** session to define operations for the selected master routing. Use the **Master Routing – Routing Options (tsacm1101m200)** session to define routing options. Next, you can select the defined operations for the routing options in the Routing Matrix (tsacm2800m000) session.

Chapter 4

Work Order Control Procedures

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This chapter describes the Work Order Control procedures.

To create a work order

A work order represents the work carried out on one or more products or component in the repair depots.

Work orders are derived from the following resources:

- Maintenance sales order lines
- Entered directly
- Created as follow-up work order

The process to create a work order entry consists of the following activities:

- Create a work order
- Create work order activities
- Add material resource lines to the work order or work order activities
- Add other resource lines to the work order or work order activities

To create a work order

To create a work order, take the following steps:

Step 1: Create the work order

Use the **Work Orders (tswcs2100m000)** session to create or modify work order details.

Work orders are used for planning, execution, and control of all possible activities to maintain items. A work order consists of multiple activities required to perform the maintenance work. You can release a work order without related activities, which is useful if no work preparation can be carried out with the aid of reference activities.

Step 2: Create work order activities

In the **Work Order Activities (tswcs2110m000)** session, you can maintain work order activities.

An activity is maintenance work that must be performed. For shop maintenance, a work order activity line is an operation to be carried out. You can add activities to a work order during the work order's planning phase, during the work orders preparation phase, and during the execution phase. The work order status must be **Free**, **Planned**, or **Released**. You cannot add activities to subcontracted work orders in **Released** status.

Step 3: Add material resource lines to the work order or work order activities

In the **Work Order Material Resources (tswcs4110m000)** session, you can define the expected and actual consumption of materials, as well as the disassembled components.

The work order material resource lines are created when the work order or work order activity status is **Free**.

You can add work order material resources to:

- Work orders.
- Work order activities. If you link material resources to a work order activity, the resource requirements that you defined in the **Reference Activity - Resource Requirements (tsacm2120m000)** session, are copied to the **Work Control System** module.

Step 4: Add other resource lines to the work order or work order activities

In the **Work Order Other Resources (tswcs4130m000)** session, you can define other resources required for the **Work Order (Activity)**. Other resources are, for example, tools, subcontracting costs, other costs, and so on.

To process work orders

Orders that are used to plan, carry out, and control all maintenance on items in a maintenance shop or in a repair shop. A work order consists of at least one work order header, and can have a number of activities that must be carried out on a repairable service item.

The items are received in either the locations or warehouses and then the items are issued to the service depot for executing the repairs, you can process the work order to complete the repair.

To process work orders

Take the following steps to process the work orders:

Step 1: Plan the work order

Use the **Work Order Planning/Releasing (tswcs3200m000)** session to plan or release the work order.

You can plan the work orders if the following conditions are fulfilled:

- The work order is accepted in the work load of a shop or a depot.
- The work order activities for the work order are defined.

Step 2: Release the work order

After you define a work order, the work order status is **Free** or **Planned**. You can release work orders that have the **Free** or the **Planned** status.

Work orders can be released one by one. On the **Work Orders (tswcs2100m000)** session, select the work order and on the **Specific** menu, click **Release**. ERP LN starts the **Work Order Planning/Releasing (tswcs3200m000)** session.

Step 3: Process the work order hours

Work order tasks are accounted based on the registered and processed hours accounting lines. Employees executing the work order can register the hours spent on the work orders. The work order hours contribute to the labor-related charges to the linked maintenance sales order lines. You can enter or process the hours registered on the work order in the **Work Order Hours (bptmm1140m000)** session. The hours can be registered and processed when the work order has the following status:

- Released
- Completed.

Step 4: Complete the work order

Work orders can be completed with the completion of all the underlying activities. If no activities are defined for a work order, then the work order can be directly set to **Completed**.

On the **Work Orders (tswcs2100m000)** session, select the work order and on the **Specific** menu, click **Complete Order**. ERP LN sets the work order status to **Completed**.

Step 5: Sign Off**Step 6: Close the work order.**

To close a work order

Work-order closure is the signing-off and closing of work orders, and copying the finished work orders to history.

The process to close a work order includes the following activities, each of which are described in detail in the following section:

- Sign-off the work order activities.
- Close the work orders.
- Copy closed or cancelled work orders to history.
- Delete closed work orders.

To close a work order

Step 1: Sign-off the work order activities

Sign-off can be critical for the repair of products, where safety is an important concern, such as with ships or aircraft. The sign-off step can ensure a satisfactory completion of the related activities.

To sign-off work order activities, start the **Work Order Activities (tswcs2110m000)** session, select an activity and, on the **Specific** menu, click **Sign-Off**. ERP LN changes the work order activity status to **Signed-Off**. You can only sign off work order activities that have the **Released** or the **Completed** status.

Step 2: Close work orders

You can close work orders that have the **Signed-Off** or **Completed** status. If work order activities are not created for the work order, the work orders with the **Completed** status can be set to **Closed**. If work order activities are created for the work order, each activity must be signed off before you can close the work order.

Use the **Close Work Orders (tswcs2265m000)** session to change the work order status to **Closed**.

Step 3: Copy closed or cancelled work orders to history

The closed or cancelled work orders can be copied to history, which you can use for analytical purposes later. Copying work orders to history does not delete the work orders from the active sessions.

Run the **Copy Work Orders to History (tswcs2280m000)** session to copy work orders with **Closed** or **Canceled** status to history.

Step 4: Delete closed work orders

After you close work orders, and if required copy the work orders to history, you can then delete the work orders. Because the work orders can exist in a structure with multiple follow-up work orders, you must delete the entire work order structure. You can delete such structures, or individual work orders within the selection range.

In the **Delete Work Order Structures (tswcs2202m000)** session, you can delete work orders with **Closed** or **Canceled** status.

To create follow-up work orders

If components of disassembled parts must be overhauled or repaired, you can create a follow-up work order to make the components serviceable again.

To create a follow-up work order, take the following steps:

1. Make sure that the leading status of the work order material resources is **Released** or **Completed**.
2. Set the delivery type to **Follow-up Work Order** in the Work Order Material Resources (tswcs4110m000) session.
3. Fill in the **Deliver to Activity** field, if disassembly is for a work order activity.
4. Enter the appropriate number in the **Actual Quantity** field.
5. On the **Specific** menu, click **Create Follow-up Order**.

ERP LN creates a follow-up work order, which then appears in the **Follow-up Work Order** field.

To use reference activities

In the Activity Management module, you can maintain the definitions of all the work that can be carried out for maintenance reasons. You can create a repository of reference activities that contains various types of static information.

The Work Control System module uses reference activities to plan and carry out maintenance on items.

You can create reference activities for the following:

- All items
- Specific items
- Functional elements. Note that you must select the **Functional Elements Active** check box on the **Control** tab of the General Service Parameters (tsmdm0100m000) session.

Note

Reference activities are the smallest units of work that can be planned and controlled in Service.

Appendix A

Glossary

A

ATP

The item quantity that is available to be promised for a customer either immediately, or at a specific time in the future.

ATP check

A check on the quantity that can be promised to a customer based on the allowed demand. The main purpose of the ATP check is to reserve a certain quantity of the spare part or item.

available-to-promise

The item quantity that is still available to be promised to a customer.

In ERP LN, available-to-promise (ATP) is part of a more extended framework of order promising techniques called capable-to-promise (CTP). If an item's ATP is insufficient, CTP goes beyond ATP in that it also considers the possibility of producing more than was initially planned.

In addition to the standard ATP functionality, ERP LN also uses channel ATP. This term refers to the availability of an item for a certain sales channel, taking into account the sales limits for that channel.

For all other types of order promising functionality used in ERP LN, the term CTP is used.

Acronym: ATP

coverage lines

Lines that store the information on the costs incurred, amounts to be invoiced, and the amounts covered by the applicable contract and/or warranty. Most coverage lines are added through the maintenance sales order process, but can also be manually entered.

delivery type

Indicates how the material that is required to carry out the activities, must be delivered, or what will happen to the defective item.

economic stock

The inventory that is available to be sold.

follow-up work order

The work order that is used to carry out additional work on the material if the delivery type is **Follow-up Work Order**.

functional element

A grouping of exchangeable items with identical functions. Functional elements can be used in item breakdowns, physical breakdowns, and reference activities.

Example

When a maintenance activity is defined for a configuration, a functional element can be specified. This way, the activity applies to all items covered by that functional element, and multiple, identical reference activities for similar items are avoided.

inventory commitment

The reservation of inventory for an order without taking into account the physical storage of the goods within the warehouse. Previously referred to as hard allocation.

maintenance sales order lines

Lines that store all details of the items that must be maintained, loaned, replaced, delivered, or received.

master routing

A set of operations that can be carried out. The reference activities based on which operations are added to a master routing, must have the same characteristics, such as item, functional element, and service department.

Example

All the inspections, tests, cleaning activities, assembly activities, disassembly activities, and repair activities that you can carry out on an engine.

reference activity

The smallest unit of work that is required to carry out maintenance.

routing option

A subset of master routing. A predefined set of operations that can be carried out. Each operation is identified by a unique sequence number.

warehouse order

See: *warehousing order* (p. A-3)

warehousing order

An order for handling goods in the warehouse.

A warehouse order can be of the following inventory-transaction types:

- **Receipt**
- **Issue**
- **Transfer**
- **WIP Transfer**

Each order has an origin and contains all the information required for warehouse handling. Depending on the item (lot or non-lot) and warehouse (with or without locations), lots and/or locations can be assigned. The order follows a predefined warehousing procedure.

Note

In Manufacturing a warehousing order is often called a warehouse order.

Synonym: warehouse order

work order

Orders that are used to plan, carry out, and control all maintenance on items in a maintenance shop or in a repair shop. A work order consists of at least one work order header, and can have a number of activities that must be carried out on a repairable service item.

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