# Infor LN Service User Guide for Work Order Control (RMA & Depot Repair)

## Important Notices



## Trademark Acknowledgements



## Publication Information



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# About this document

This guide provides information about the various concepts and processes such as work order control, subcontracting and material allocation, available in Work Order Control.

### 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 handle subassembly
- To use reference activities

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

### Document summary

This guide describes the various concepts and processes available in the Work Order Control.

### 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 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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# Chapter 1
# Introduction

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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 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.
- Warehousing 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

2

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

You must define a **Cost** or **Service** item and a **Subcontractor** at the work order activity level to identify that the activity is subcontracted. You can subcontract different activities to various subcontractors.

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**

- It is not required to subcontract the entire work order. For example, if a product is defective, the customer requests a repair and sends the product to the service department. The service department repairs the product, but some part of the repair is subcontracted to another repair center. A work order activity line is created for tracking the repair costs incurred by the subcontracted repair center and this internal invoice is created based on the actual material used, actual hours booked, and actual other costs such as transportation costs.
- 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.

# 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 Inventory**
- **From Kit**
- **To Warehouse**

# Processing Subassembly

When a work order receives an item, that requires maintenance, the item is disassembled into various components and you can decide upon a follow-up action for each disassembled component. These disassembled components are called subassemblies.

### Business Example

A car is received from a customer on a maintenance sales order and a work order is created for the same. The engine, gearbox, wheels and the tyres are disassembled.

## **Action Outgoing Subassembly**:

An outgoing subassembly can be linked to a work order activity or to a work order directly and can be registered manually. For each disassembled component, an outgoing subassembly is created in the

Work Order Outgoing Subassemblies (tswcs4150m000) session. You can specify the action that must be performed on each subassembly.

**Note**

For more information, refer to *Actions Performed on Outgoing Subassemblies (p. 42)*.

With reference to the business example, the following outgoing subassemblies are registered. You can process these subassemblies using the **Confirm** option in the Work Order Outgoing Subassemblies (tswcs4150m000) session:

- The Wheels: Outgoing subassembly is created with the **Action Outgoing Subassembly** field set to **To Location**. The subassembly is transferred to the **Location** selected manually. The subassembly is received from this location by the **Assembly Activity**.
- The Gearbox: Outgoing subassembly is created with the **Action Outgoing Subassembly** field set to **To Warehouse**. The subassembly is transferred to the **Warehouse** selected manually. The subassembly is received from this warehouse by the **Assembly Activity**. When processed, a warehouse order is created to handle the inbound.

**Note**

The subassembly is stored as company owned inventory or customer owned inventory. In case of company owned, the ownership is changed from customer to the service organization.

If the subassembly is stored as company owned inventory and is replaced by a new part from inventory, a material resource line is created in the Work Order Material Resources (tswcs4110m000) session.

- The Tyres: Outgoing subassembly is created with the **Action Outgoing Subassembly** field set to **To Scrap**. The subassembly is scrapped. If the subassembly is replaced by a new part from inventory, a material resource line is created in the Work Order Material Resources (tswcs4110m000) session. The new part can be owned by the customer or by the service organization. When processed, the ownership, actual location, and status data is modified in the Physical Breakdowns (tscfg2110m000) and Serialized Items (tscfg2100m000) sessions.
- The Engine: Outgoing subassembly is created with the **Action Outgoing Subassembly** field set to **To Location for Work**. The subassembly is transferred to the **Location** selected manually and a related work order is generated that is used for further repair work on the subassembly. The relation between the initiating work order and the related work order is saved in the Related Orders (tsmdm4500m000) session. The engine is repaired at the location and the actual costs for material, labor and other costs are booked on the related work order.

## Action Incoming Subassembly:

LN generates the incoming subassembly based on the **Action Incoming Subassembly** specified in the Work Order Outgoing Subassemblies (tswcs4150m000) session. You can view the incoming subassemblies in the Work Order Incoming Subassemblies (tswcs4151m000) satellite session in the Work Order (tswcs2100m100) session.

**Note**

For more information, refer to *Actions Performed on Incoming Subassemblies (p. 44)*.

With reference to the business example, following incoming subassemblies are registered, when the outgoing subassemblies are processed. You can process these subassemblies using the **Confirm** option in the Work Order Incoming Subassemblies (tswcs4151m000) session.

- The Wheels: Incoming subassembly is created with the **Action Incoming Subassembly** field set to **From Location**. The **Assembly Activity** receives the subassembly from the **Location**. The **Received on Shop Floor** check box is selected in the Work Order Incoming Subassemblies (tswcs4151m000) session, if the subassembly is received on job shop.
- The Gearbox: Incoming subassembly is created with the **Action Incoming Subassembly** field set to **From Warehouse**. The **Assembly Activity** receives the subassembly from the **Warehouse**. A warehouse order is created when incoming subassembly is created. You must select the **Received on Shop Floor** check box in the Work Order Incoming Subassemblies (tswcs4151m000) session, if the shipment for the subassembly is received on job shop.
- The Tyres: The subassembly is scrapped and a replacement part is procured from the warehouse. A material resource line is created in the Work Order Material Resources (tswcs4110m000) session.
- The Engine: Incoming subassembly is created with the **Action Incoming Subassembly** field set to **From Location for Work**. The incoming subassembly is processed only after the related work order is **Completed** and **Signed-Off**.

# 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.

# Service Costing Break Hierarchy and Search Path

The project, element and activity are retrieved from the Costing Breaks (tppdm3600m000) session. LN follows hierarchy for the various cost types, based on the following attributes.

Material Resource Lines Costing Breaks - Service Material (tppdm3103m000).

1. Installation Group of the MWO Header
2. Item of the MWO header (main item)
3. Item of the material line
4. Serial Number of the material line item
5. Project of the material line item

The following search order is applied:

1. Material line item and serial number
2. Main item and material line item
3. Material line item
4. Installation group and main item
5. Main item
6. Installation group
7. Service item group

Labor Resource Lines Costing Breaks - Service Labor (tppdm3104m000).

1. Master Routing of the MWO Activity the labor line is linked to
2. Routing Options of the MWO Activity the labor line is linked to

3. Reference Activity of the labor line
4. Task of the labor line
5. Project of the labor line

The following search order is applied:

1. Reference activity and task
2. Task
3. Reference activity
4. Master routing, routing option and reference activity
5. Master routing and routing option
6. Master routing

Other Resource Lines Costing Breaks - Service Other Cost (tppdm3105m000).

1. Cost Type (Tooling / Subcontracting / Other)
2. Item Group of the cost line item
3. Item
4. Serial Number
5. Project of the cost line

The following search order is applied:

If cost type is tooling

1. (Tool) Item and (Tool) serial number
2. (Tool) item

If cost type is subcontracting

1. Item
2. Item group

If cost type is other

1. Item
2. Item group

# Project Pegging Costing Breaks in Depot Repair

The costing break functionality allows you to collect costs at different Physical Breakdown levels for Depot Repair to redirect costs from project peg for service contract to another project peg.

## Setup Costing Breaks for Depot Repair

Costing breaks must be defined in the Costing Breaks (tppdm3600m000) session for material, labor and other resources lines for depot repair.

## Create Work Order from MSO Part Maintenance Line

When MWO is created from a MSO and costing breaks are defined in the Costing Breaks (tppdm3600m000) session, LN identifies the existing costing breaks and implement them to the project peg for the material lines, labor lines and other lines. The project pegs are defaulted in the following sequence:

1. If the project is defined on the MWO header and the **Costing Breaks** check box is selected in the Implemented Software Components (tccom0100s000) session, the Element and Activity are defaulted from the Costing Breaks (tppdm3600m000) session based on the material ( Costing Breaks - Service Material (tppdm3103m000)), labor ( Costing Breaks - Service Labor (tppdm3104m000)) and other resource line data ( Costing Breaks - Service Other Cost (tppdm3105m000) sessions. LN identifies existing costing breaks and follows a hierarchy to implement them to the project pegs for the material lines, labor lines and other lines. When a costing break applies to the material, labor or other cost line the **Project Peg Origin** is set to **Costing Break**. For more information refer to *Service Costing Break Hierarchy and Search Path (p. 16)*.
2. If the **Costing Breaks** check box is not selected in the Implemented Software Components (tccom0100s000) session, the Element and Activity are defaulted from the Work Orders (tswcs2100m000) session. The **Project Peg Origin** field is set to **Top Demand**.

**Note**

- When a Maintenance Work Order (MWO) is created from a Maintenance Sales Order (MSO) - part maintenance line, the pegging (project, element, activity) data on the work order header is defaulted from the part maintenance line.
- When MWO is created from a MSO part maintenance line and a reference activity or master routing is defined on the part maintenance line or resource lines are defined manually, all material, labor, tooling and other requirement lines linked to the reference activity are copied to work order activity resource lines.
- When creating an internal work order, you can add the project pegging data and can modify this data only if the work order status is set to Free. You must specify a change reason when creating, changing or copying an internal work order.
- When a maintenance sales order or a work order is generated from a service order material cost line, the project pegging data is defaulted from the service order material cost line to the maintenance sales order part line or the work order.
- When a new maintenance sales order activity line is created or generated, the project pegging data is defaulted from the related maintenance part line or the related work order activity. You cannot modify this data.

- When work order activities are created, updated or deleted, the related maintenance sales activity lines are also created, updated or deleted. The project pegging data is considered during this synchronization.

### Update Peg Data on MSO Part Maintenance Line

If the project pegging data changes on the MSO Part Maintenance Line and a Maintenance Work Order is already created before receiving the main part for repair on the MSO Part Maintenance Line, changes on the MSO Part Maintenance Line automatically update the project peg on the related MWO header and on MWO resource lines.

**Note**

After the MSO Receipt Line is generated, the peg data cannot be modified.

### Plan Work Order

If the **Project Pegged Inventory** check box is selected in the Work Orders (tswcs2100m000) session, to issue the main item from warehouse, the project peg data is transferred to Warehousing for processing and a warehouse order is created with an outbound line.

If the **Project Pegged Inventory** check box is selected in the Work Orders (tswcs2100m000) session, to create the planned inventory transactions for the receipt of the main item or for each material line (with **Delivery Type** set to **From Warehouse** or **From Kit** or **To Warehouse** or **Via Purchase** in the Work Order Material Resources (tswcs4110m000) session), the project pegs of the MWO header are transferred to Warehousing.

**Project Pegged Inventory** check box is not selected in the Work Orders (tswcs2100m000) session for the items (to be issued from the warehousing) which are not project peg. The project peg is also not applicable for processing planned inventory transaction for such items.

If the **Project Pegged Inventory** check box is selected in the Work Orders (tswcs2100m000) session, for checking the availability of dedicated project inventory when performing the ATP check, the project pegs of the work order material resource line are used.

**Note**

When planning the MWO, LN checks the validity of the project pegs. In case a peg is not valid, an error message is displayed.

### Release Work Order

If the **Project Pegged Inventory** check box is selected in the Work Orders (tswcs2100m000) session, at the time of releasing a work order, the work order planned inventory transaction are updated and warehouse outbound lines are created for the required material. The project pegs of the material lines are transferred to warehousing.

### Register Actual Work Order Costs

Financial transactions are created when actual materials, labors or other cost are registered on the work order resource lines. The project peg data is also defaulted from the work order resource line. When actual costs are registered and the cost line is pegged, the costs are posted to the Project. For a new labor line that is created, MWO is project pegged, and **Costing Breaks** check box is selected in the Implemented Software Components (tccom0100s000) session, the pegging data are defaulted from the Costing Breaks (tppdm3600m000) session. When costing breaks are not defined, the pegging data is defaulted from the Work Orders (tswcs2100m000) session. For a new actual resource lines, the standard project peg defaults mechanism, described above is applicable.

### Subcontract Work Order Activity

When you subcontract a work order activity, a work order other resource line with **Cost Type** set to **Subcontracting** is created in the Work Order Other Resources (tswcs4130m000) session. The project peg is defaulted from the applicable costing break or MWO header to the purchase order created for subcontracting.

### Create Related Work Order

When a MWO is created for department transfer, the project peg data of the existing MWO must be transferred to the new related MWO. When you create a related MWO which is transferred within the same department (disassemble-assemble scenario), the project peg and the project peg origin of the material resource line in the Work Order Material Resources (tswcs4110m000) session, are defaulted on the new related MWO.

### Close Work Order

When closing a work order, a warehouse order is created to receive the repaired item back in the warehouse. Return delivery lines are created for warehouse deliveries that are not fully consumed. The standard project peg defaults mechanism, described above is applicable.

### Post Work Order to History

Canceled and closed work orders are posted to history. The project peg data is also copied.

### Add MSO Coverage Line Additional Costs

When you manually add a coverage line for the additional costs, the project pegs are defaulted from the MSO header or the Lines which the coverage line is linked.

**Note**

If the coverage line is linked to a Part Maintenance Line and the **Costing Breaks** check box is selected in the Implemented Software Components (tccom0100s000) session , the Element and Activity are

defaulted from Costing Breaks - Service Other Cost (tppdm3105m000) session, overwriting the project peg data defaulted from MSO header/line.

### Cost MSO Coverage Line

When the **Status** of MSO or individual coverage lines is set to **Costed** in the Maintenance Sales Orders (tsmsc1100m000) session, invoice lines are created and the project peg of the coverage lines are transferred to Invoicing.

# Warehouse Transfer Orders

As part of handling logistic for work orders, warehouse orders and planned inventory transactions are generated. The warehouse transfer orders are generated for the following scenarios:

- For the Maintenance Sales Order - Part Maintenance Lines (tsmsc1110m100):
  - **Receipt Warehouse** to **Work Order Warehouse**.
  - **Work Order Warehouse** to **Warehouse**.
- For the Work order generated using the **Generate Work Order** option from the Action menu in the Service Order Actual Material Costs (tssoc2121m000) session: **Actual Warehouse** in the Service Order Actual Material Costs (tssoc2121m000) to **From Warehouse** in the Work Orders (tswcs2100m000) session.
- For the follow-up Work order generated using **Transfer to Department** option from the Action menu on Work Orders (tswcs2100m000) session : **To Warehouse** of the original Work Order to the **From Warehouse** of the follow up Work Order.
- For the Work Order Outgoing Subassemblies (tswcs4150m000): When Action is **To Department** a follow up work order is created for the subassembly item. Transfer order is from **Warehouse** in the Work Order Outgoing Subassemblies (tswcs4150m000) to the **From Warehouse** in the follow up Work Orders (tswcs2100m000).
- For the Work Order Incoming Subassemblies (tswcs4151m000): Incoming subassemblies are used to incorporate the subassembly again after they are disassembled by an outgoing subassembly. When follow up work order was created on the outgoing subassembly the transfer order on the related incoming subassembly is from **To Warehouse** on the follow up Work Orders (tswcs2100m000) to the **Warehouse** on the Work Order Incoming Subassemblies (tswcs4151m000).

**Note**

Only if the delivery and receipt warehouses are different, Infor LN creates a warehouse transfer order in the Transfer Order Attributes (tstdm3100m000) session. The session holds all the warehouse related data. When warehouses are the same, no warehouse transfer order is generated. For example, a follow up work order can be generated and the From Warehouse on the follow work order is the same warehouse as the warehouse on the original work order where the item is received, then no transfer order is required.

## Defining data for transfer orders

The field **To Warehouse** is available in various Service sessions. The transfer order can be generated from these sessions. You can use the Transfer Data option from the action menu to access the Transfer Order Attributes (tstdm3100m000) session.

**Note**

The transfer order option is applicable only if a record is available in the Transfer Order Attributes (tstdm3100m000) session, for the related data.

## Planned Delivery Date and Planned Receipt Date

The Planned Delivery Date for the transfer order is defaulted with the time and date, the item is received (or planned to be received) in the warehouse. The Planned Receipt Date of the transfer order is calculated based on the time required to transport the item from the delivery warehouse to the receipt warehouse.

## Updating Warehouse Orders and PIT

If the warehouse orders are not processed, the data used for creating these Warehouse Orders can be updated.

If the warehouse is changed, the warehouse order for the existing warehouse must be deleted. Infor LN creates a warehouse order for the new warehouse. In case of transfer orders, if the ‘To Warehouse’ of the transfer order is changed to the ‘From Warehouse’, the transfer order is no longer required. When this warehouse is changed and set to a value other than the ‘From Warehouse’, a transfer order must be created again.

# Tool refurbishing using maintenance work order

You can now refurbish a tool using an internal maintenance work order. To use or refurbish the tool item using the Depot Repair functionality, the **Tool Used in Maintenance** check box must be selected in the Tool Numbers (titrp0102m000) session. The tool must be defined as serialized item in the Serialized Items (tscfg2100m000) session. This serialized item can be specified on the work order header.

When you plan a work order, the tool requirement is created in the Estimated Tool Requirements (titrp0111m000) session. Also an order line is created in the Availability Planning (titrp0513m000) session, If the **Critical in Availability Planning** check box is selected in the Tools (titrp0101m000) session.

When the tool to be refurbished is issued from the warehouse and the work order **Status** is set to **Released**, the **Status** is set to **In Refurbishing** in the Tool Numbers (titrp0102m000) session. When the tool item is refurbished and the work order **Status** is set to **Completed**, the tool is sent back to the warehouse and the refurbishing data for the tool is updated in the Tool Numbers (titrp0102m000) session.

When you subcontract the tool refurbishment to a subcontractor, a subcontracting reference activity and an outgoing subassembly line is created for the tool item in the Work Order Outgoing Subassemblies

(tswcs4150m000) session. When this outgoing subassembly is processed, a new work order activity line is created for the subcontracting reference activity. When this work order activity is released, a purchase order is created for the material supply line for the tool item.

When the purchase order is processed, the tool is sent to the subcontractor for refurbishment. After refurbishment, the tool is received in the warehouse. This tool is issued to the repair shop using an incoming subassembly line.

When the work order is completed, the tool is sent back to the warehouse and the refurbishing data is updated in the Tool Numbers (titrp0102m000)

# Estimates in Work Control System

You can maintain the estimates for the work order resource and subassembly lines, in the Maintenance Sales Order - Estimated Coverage Lines (tstdm4100m000) session, before the work order or the activity is released (estimated phase). You can compare these estimated amounts with the actual amounts.

To implement the Estimates functionality for work orders, you must select the **Use Coverage Calculation for Estimates** check box in the Maintenance Sales Control Parameters (tsmsc0100m000) session.

You can use the **Allow to Delete Estimates** field in the Work Order Parameters (tswcs0100m000) session to indicate if the estimated resource and subassembly lines can be deleted.

## The impact of the estimates functionality

### General

If a resource line or the subassembly line is created during the estimated phase (before the order or the activity is released), LN selects the **Estimated Resource Line** check box for the line.

### For work order

If you create a copy of an existing work order, for the new work order:

- The **Status** is set to **Free**.
- The **Estimated Resource Line** check box is selected.
- The **Estimated Quantity** is defaulted on all the resource and subassembly lines linked to the new work order, from the existing work order resource and subassembly lines.
- The outgoing subassembly lines are also copied.

### For Work Order Material Resource Lines

In the estimated phase, for a material resource line you can specify the **Estimated Quantity** of the material. In case the **Estimated Quantity** is modified, the **Required Quantity** is also modified.

After the work order or the activity is released (the actual phase), you can specify or modify the **Required Quantity**. However, LN does not update the **Estimated Quantity** with this value.

### For Work Order Outgoing and Incoming Subassemblies

In the estimated phase, for an outgoing subassembly line you can specify the **Estimated Quantity** of the **Item**. In case the **Estimated Quantity** is modified, the **Planned Quantity** is also modified.

After the work order or the activity is released (the actual phase), you can specify or modify the **Planned Quantity**. However, LN does not update the **Estimated Quantity** with this value.

In the estimated phase, when an outgoing subassembly line is created, the incoming subassembly line is also created (confirming the outgoing subassembly is not required now). The incoming subassembly is updated or deleted based on the data modified in the outgoing subassembly line.

### For Work Order Activity based on a Reference Activity

If a work order activity is created based on a reference activity:

- The **Estimated Resource Line** check box is selected for all the resource lines linked to this work order activity.
- The **Quantity** specified for the reference activity in the Resource Requirements (tsacm2120m000) session is defaulted in the **Estimated Quantity** field on the work order resource lines and subassembly lines.

Similar process is followed when a work order is created:

- From a planned activity
- From a maintenance sales quotation
- In the process of department transfer
- From a subassembly

### For Work order created from part lines with estimates

If the Estimates functionality is implemented for a maintenance sales order, the work order is generated directly for the part maintenance line linked to the maintenance sales order. You cannot delete this work order when the maintenance sales order is being processed.

### For Synchronization of Estimates from Work Order to Part Line

During the estimated phase, all the manual changes to the estimated work order resource lines are synchronized with the related estimated coverage lines in the Maintenance Sales Order - Estimated Coverage Lines (tstdm4100m000) session. If an estimated work order resource line is created, modified or deleted, the related estimated coverage is also created, modified or deleted.

The values in the Maintenance Sales Order - Estimated Coverage Lines (tstdm4100m000) session are updated from the following sessions:

- Work Order Material Resources (tswcs4110m000)

- Work Order Labor Resources (tswcs4120m000)
- Work Order Other Resources (tswcs4130m000)
- Work Order Outgoing Subassemblies (tswcs4150m000)

### For prices and discounts

When the actual coverage lines are created, the prices and discounts that are modified manually on the estimated coverage lines, are defaulted on the actual coverage lines. If manually modified prices and discounts are not available, LN uses the default price and discount logic for the actual coverage lines. The manually modified **Goodwill Sales Amount** is not defaulted on the actual coverage lines.

## Closing a Work Order

When a work order is closed, actual coverage lines are created in the Maintenance Sales Order - Coverage Lines (tsmsc1120m000) session, for the resource lines linked to the work order if:

- Actual costs are specified for the resource and subassembly lines.
- The **Ownership** of the item is other than **Customer Owned**.

## Deleting work orders, activities and resource lines

For an internal work order, the deletion of the resource line or an activity is based on the **Allow to Delete Estimates** field setting in the Work Order Parameters (tswcs0100m000) session.

For an external work order, the deletion of the resource line or an activity is based on the **Allow to Delete Estimates** field setting in the Maintenance Sales Control Parameters (tsmsc0100m000) session. When a resource line is deleted, LN checks if an estimated coverage line exists. When an activity is deleted, LN checks if:

- Resource lines created in the estimated phase exist for the activity.
- Coverage lines exist for the activity.

# Chapter 3
# Master Data Setup

3

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

## Setting up 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.

### 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 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 Routings (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 Operations (tsacm2100m100) session to define operations for the selected master routing. Use the 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

4

This chapter describes the Work Order Control procedures.

## Creating 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

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

### 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 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.

# Processing 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.

Take the following steps to process the work orders:

### Step 1:

Plan the work order

Use the Plan Work Orders (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...**. LN starts the Plan Work Orders (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**. LN sets the work order status to **Completed**.

### Step 5:

Sign Off

### Step 6: .

Close the work order

# 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.

### 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**. 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 Orders (tswcs2202m000) session, you can delete work orders with **Closed** or **Canceled** status.

# 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** check box in the **Implemented** 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.

# Project pegging in depot repair

## Overview

In Service, you can implement project pegging in the Depot Repair module. You can peg the service cost to a project, element, and/or an activity.

To peg a project, specify the project, element, and/or activity information for the call, the contract, the maintenance sales quotation, maintenance sales orders or work orders. You must select the **Mandatory Project Peg** check box in the Items (tcibd0501m000) session if defining the PCA ID is mandatory to peg the cost of the item to the project.

## Initiation of the pegged transaction

The peg is initiated only when a business process is started for transactions that register actual costs. For Example Calls and Maintenance Sales orders.

Project Cost Account is an account where the cost is pegged. Costs are pegged through Project Cost Account ID. You can populate the PCA ID:

- By entering the PCA ID when you create a new call, contract, maintenance sales quotation, maintenance sales order, or an external work order.
- By specifying the PCA ID on the service contract. You can also enter the PCA ID manually.

## Propagation of the peg in the depot repair process

The PCA ID is propagated to the resulting transaction ( Example, from call to MSO to Work order). You can change the PCA ID until the status of the call / contract / maintenance sales quotation / maintenance sales order / work order changes.

## Propagation of the peg to service contract and configuration lines

In Service, the service contract can determine whether the call / contract / maintenance sales quotation / maintenance sales order / work order, linked to the service contract, retrieves the PCA ID from the contract. By default, the configuration lines retrieve the PCA ID from the service contract header. These PCA IDs on the configuration line are propagated to the maintenance sales quotation lines, maintenance sales order part lines, and work orders.

**Note**

You can define the PCA ID for service contracts that have the status 'Free' or 'Active'.

## Propagation of the peg to a call

The PCA ID of the call is retrieved from the service contract header by default, if the call is related to a service contract. You can specify or modify the PCA ID if the call status is ‘Free’. You must specify the reason for the modification.

If the call is solved without being transferred ( Example to a maintenance sales order or service order), the call can be invoiced. The costs are booked to the corresponding PCAs. The cost component is used to identify the appropriate project cost type using cost mapping in the Cost Mappings (tcmcs0149m000) session.

## Propagation of the peg to the maintenance sales quotations

LN defaults the PCA ID of the quotation header line either from a service call, or a maintenance sales order part line, or a work order. If the PCA ID is not defaulted from these origins, LN defaults the ID from

the service contract configuration line if the serialized item is linked to a service contract. You can specify or change the PCA ID, if the maintenance sales quotation status is ‘Free’.

## Propagation of the peg to the maintenance sales order

LN defaults the PCA ID of the maintenance sales order from the originating call or maintenance sales quotation. The PCA ID of the order part line is defaulted from a service call or maintenance sales order part line. If the PCA ID is not defaulted from these origins, LN defaults the ID from the service contract configuration line in case the serialized item is linked to a service contract. You can enter or change the PCA ID, if the maintenance sales quotation status is ‘Free’.

## Propagation of the peg to the work order for MSO part line

By default, the PCA ID is retrieved from the maintenance sales order. If the installation group or the item is linked to a service contract, the PCA ID is retrieved from the service contract configuration line. If the PCA ID is not defaulted from these origins, LN defaults the ID from the service contract configuration line in case the serialized item is linked to a service contract. You can specify or change the PCA ID, if the maintenance sales quotation status is ‘Free’.

## Propagation of the peg to the work order linked /originating from a maintenance sales order

LN defaults the PCA ID of the work order (linked/originating from maintenance sales order) from the service contract configuration line, if the serialized item is linked to a service contract. If the PCA ID is not defaulted from these origins, LN defaults the ID from the service contract configuration line in case the serialized item is linked to a service contracts. You can specify or change the PCA ID, if the maintenance sales quotation status is ‘Free’.

## Propagation of the peg to the follow-up work order

By default, the PCA ID is retrieved from the initiating work order. If the installation group or the item is linked to a service contract the PCA ID is retrieved from the service contract configuration line. If the PCA ID is not defaulted from these origins, LN defaults the ID from the service contract configuration line in case the serialized item is linked to a service contract. The user can specify or change the PCA ID, if the work order status is ‘Free’.

## Propagation of a material request to LN Warehousing from depot repair

When warehouse orders are generated from Service, in order to request material from a warehouse, the PCA ID is propagated to Warehousing only if the **Inherit Project Peg** check box in the Items (tcibd0501m000) session is selected. Warehousing uses the PCA ID for financial bookings to LN Project. Warehousing handles the potential peg transfers:

## Example

Service needs materials B and material C to be used in the repair of item A. For item B, LN Service requests inventory with a peg. For item C, Service requests material with a peg, because the cost for B and C have to be reported to the project.

Warehousing checks if there is inventory of item B with the corresponding PCA. In the case of an inventory shortage, Warehousing checks whether transfer rules apply to meet the LN Service request. Warehousing handles the potential peg transfers in the background.

For item C, the process is the same. Service requests the material with a PCA, though there is inventory for item C without a peg.

For Example, a demand transaction for item A has a peg123 that requires material B and C. When the **Inherit Project Peg** check box in the Items (tcibd0501m000) session for Material B is set to Yes and for Material C is set to No:

| | Inherit Peg | Cost Pegged To | Request to Warehouse |
|---|---|---|---|
| Material B | Yes | P1E10A10 | Financially peg costs to: P1E10A10 Inventory from: P1E10A10 |
| Material C | No | P1E10A10 | Financially peg costs to: P1E10A10 Inventory from: <empty peg > |

Since material C is without a peg in inventory, the costs are not yet pegged to the project. However, since material B is already cost pegged to the project, the cost do not have to be booked again to the project when the actual outbound process is executed.

## Propagation of the Peg to generate purchase order

For project pegged items when purchase orders are generated, the PCA ID from Service ( Example Subcontracting), is propagated to LN Order Management to generate the purchase order with the corresponding peg. For material request of type Via Purchase, the PCA ID is propagated only if the **Inherit Project Peg** check box in the Items (tcibd0501m000) session is selected.

## Propagation of the peg to book hours

When hours are booked in Service, the PCA is processed to LN People to book hours on the work order.

## Book other costs or bench stock material costs

When actual other costs or Bench stock material costs are defined in Service, the costs are logged in the PCL. If the item is defined for the maintenance sales coverage line, the item is used to identify the appropriate project cost type. In case the item is not defined, the cost component is used to identify the appropriate project cost type using cost mapping in the Cost Mappings (tcmcs0149m000) session.

## Propagation of the peg to a maintenance sales order coverage line

When the maintenance sales order coverage lines are costed, the invoice is created in LN Invoicing. The revenues and costs are booked to the corresponding PCAs. If the item is defined for the maintenance sales coverage line, the item is used to identify the appropriate project cost type. In case the item is not defined, the cost component is used to identify the appropriate project cost type using cost mapping in the Cost Mappings (tcmcs0149m000) session. LN Invoicing receives the related PCA IDs for the actual costs.

# Internal subcontracting for depot repair

## Overview

When a defect occurs in a product, the customer requests for a repair and sends the product to the service department. The service department repairs the product, but a part of the repair is subcontracted to another repair center that belongs to another legal entity. Therefore an internal invoice is based on the actual material used, the actual hours booked, and the actual other costs such as transportation costs, is required to cover the repair costs incurred by the subcontracting repair center..

## Creation of the Maintenance Sales Order

If a customer sends the product to a service department for repair, the service department creates a maintenance sales order using the Maintenance Sales Orders (tsmsc1100m000) session. Example The service department (in The Netherlands) receives an order from the customer to repair a defective product. The service department creates a maintenance sales order.

## Creation of the Work Order

The service department must generate a work order for the repair center using the Work Orders (tswcs2100m000) session. The repair center must plan the repair activities and acquire the required material and/or tools. Example The service center generates a work order and assigns this work order to a repair center located at its own location.

## Shipment of the Goods

The customer sends the defective product to the repair center. Example The customer sends the product to a repair center in Netherlands.

## Receipt of the Product

The defective product is received at the repair center.

## Repair Activity

The repair center repairs the product.if the product cannot be repaired at the current repair center, the repair work can be subcontracted to another repair center. A new repair order must be created for the product at the new repair center. Example At the repair center in the Netherlands, the first repair activity takes place. If the product cannot be repaired on this location, the repair order is created for another repair location in the United Kingdom and the product is send to this repair location for repair.

## Transfer of the Product

The product is transferred to the next repair center. Example The product is transferred from repair center, in Netherlands, and received at repair centre in United Kingdom.

## Repair at the Repair Center

The product must be repaired and all cost such as materials used, and hours spent must be captured in the work order. If Internal Invoicing is implemented, the cost must be available on the work order. Example The repair center in United Kingdom repairs the product and includes all the cost on the work order.

## Customer Invoicing

The service department invoices the customer, unless the product is repaired under the warranty or contract.

## Internal Invoicing

The internal invoicing can be based on the actual repair costs or a fixed repair price. For internal invoicing, the repair center must invoice the service department where the product is initially received. The internal invoice must be based on the Follow-up work order. The internal invoice must be created before the work order is closed using the Close Work Orders (tswcs2265m000) session. When the invoice is created, additional costs cannot be booked to the work order. The internal invoice is required for legal reporting and to support internal pricing. Example: The repair center in the United Kingdom invoices the service department (of the maintenance sales order) on time and material, based on the actual costs

or based on a fixed repair rate. This internal invoice is created when all the costs (material, time and other costs) are booked on the work order and no changes are allowed resulting in all costs invoiced internally. For Internal Invoicing, thesePrice Methods can be used:

- Fixed Price : A fixed internal price is specified. This price does not depend on the type of repair or the actual costs but depends on the item to be repaired and on Enterprise Units, therefore, LN uses Price Books (tdpcg0111m000) logic. All cost lines must be passed to Invoicing with an invoice amount of zero, and the cost amount specified. When fixed repair price for the repair of this product is specified, the rate is independent for the actual cost. This price can be used when items are repaired on a regular basis. In this case, the internal price is known and the fixed repair price is set to reflect the average repair costs.
- Time and Material : The internal price is based on the actual costs, therefore, on the material used, the hours spent, and on other costs. All the actuals are priced and invoiced separately. The types of cost are:

  **Material Pricing with Price Origins supported**

  - Actual cost: The total cost amount specified in the Work Order Material Resources (tswcs4110m000) session is used. Surcharges are applicable.
  - Commercial Price: When the price origin is Commercial Price, for the materials issued on the work order, the commercial rate is used to determine the price on the internal invoice. The Price Books (tdpcg0111m000) functionality can be used along with the **Internal Price Search Method** defined in the General Service Parameters (tsmdm0100m000) session. **Note**: The internal business partners linked to the enterprise units are used to search the price. For more Information please refer to *Internal commercial rates (p. 40)*.
  - Zero pricing : For Price Origin Zero Pricing, LN creates invoicing lines with zero costs.

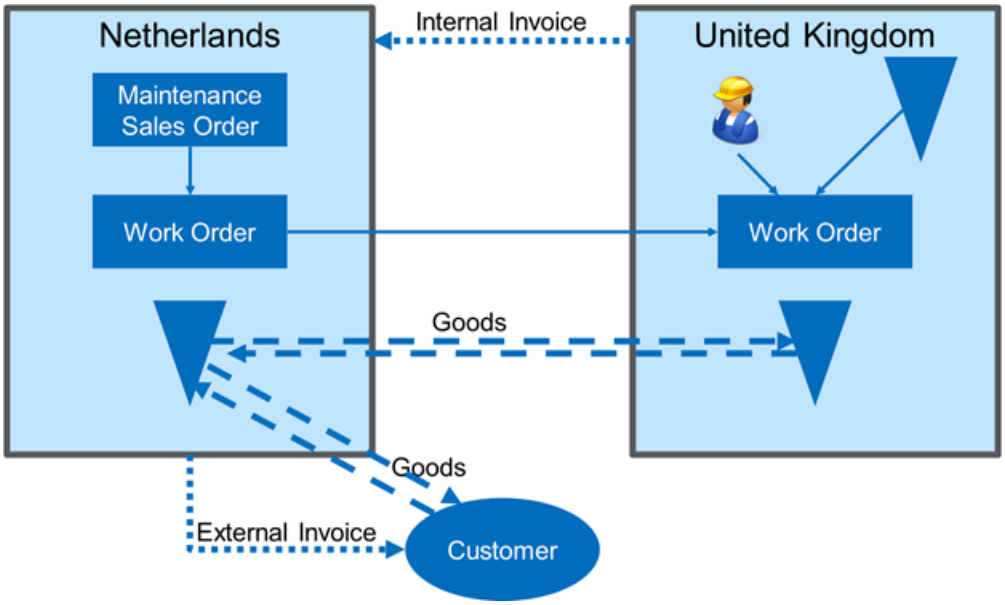
  **Labor Pricing with Price Origins supported**

  - Actual cost: The actual cost amount specified in the Work Order Labor Resources (tswcs4120m000) session is used. Additionally, Surcharges are applicable.
  - Commercial Price: To determine a commercial price for labor, the **Internal Sales Labor Rate** defined in the Service Offices (tsmdm1100m000) session is used. This labor rate specifies the sales labor rate when this service department performs a task for another service department using the specific **Labor Rates** defined in Service Offices (tsmdm1100m000) session. Labor rates for internal business partner can be specified. **Note**: The internal business partners linked to the enterprise units are used to search the price. For more Information please refer to *Internal commercial rates (p. 40)*.
  - Zero pricing: LN creates invoicing lines with zero costs for Price Origin Zero Pricing.

  **Pricing Other Cost**

  For the other costs such as tooling, travelling, and freight, a price based on the actual costs (with or without surcharge) is applicable. For Other Cost Pricing, these Price Origins are supported:

  - Actual cost: The actual cost amount specified in the Work Order Other Resources (tswcs4130m000) session is used. Surcharges are applicable.
  - Zero pricing: LN creates invoicing lines with zero costs for Price Origin Zero Pricing.




# Internal commercial rates

## Overview

For internal pricing, commercial prices can be used for material and labor. Additionally, a single fixed price can be specified. This is a fixed repair rate that must be paid, on the actual material used and hours spent.

## Commercial Material Costs

When the price origin on the relationship detail for material is Commercial Price, for the materials issued for the work order, the commercial rate is used to determine the price on the internal invoice. You can use the **Internal Price Search Method** field in the General Service Parameters (tsmdm0100m000) session to retrieve the price. These are the possible options:

- Price Book Service/Sales : The **Default Service Price Book** is used. This price cannot be specific to one Business Partner. If this price book is not defined, the **Default Sales Price Book** is used.
- Price Book Transfer : Using the Sales price book with **Matrix Type** field set to **Transfer Price** on the Matrix Definitions (tdpcg0110m000) session, an internal sales price between two internal business partners can be specified. **Note**: LN considers the internal business partners linked to the enterprise units to search for the sales price.

- Item Service Price : The sales price defined on the Items - Service (tsmdm2100m000) session is used. This price can also be used for the internal invoice. Item Service Price is used if Service Price Book and Price Book Transfer is not defined.

## Commercial Labor Rates

To define a commercial labor rate when the **Price Origin** for labor pricing is set to **Commercial Price** in the Intercompany Trade Agreements (tcitr1100m000) session, the **Internal Sales Labor Rate** field in the Service Offices (tsmdm1100m000) session is used. This labor rate specifies the sales labor rate when a service department performs the work for another service department. **Labor Rates** for internal business partners can be specified using commercial labor rates.

**Note**: Only the sales rates of the labor rate codes are used. The cost rates are not applicable, because actual costs of the work order are used.

**Note**: LN considers the internal business partners linked to the enterprise units to search for the price.

# Using the Work Order Activity Workbench

You can use the Work Order Activity Workbench (tswcs2600m100) session to view, filter and process the work order activities. In this session, the Work Order Activities (tswcs2110m200) session is displayed as a satellite session.

## Filtering the work order activities

To filter the work order activities, you can specify the header data such as the **Sold-to B.P.**, the **Operations Department**, the **Item**, the **Work Order** and the **Maintenance Sales Order**. To filter the activities, you can also use the options that are based on the status of the work order activities. When you select an option, the count of the activities with that status is also displayed.

**Note**

If the work order specified on the header is the top work order, the activities linked to the child work orders of this top work order, are also displayed.

## Using the workbench session

You can use the workbench session to process the work order activities. The modified data is defaulted in the Work Order Activities (tswcs2110m000) session. For the work order activities, you can perform actions such as:

- **Plan**
- **Link Non-Conformance Report**
- **Execute Next Step**
- **Release**

- **Cancel...**

**Note**

You cannot add or copy a work order activity in the workbench session.

As part of the usability enhancement, the statuses of the work orders and the work order activities are displayed in specific colors.

# Cancel Work Order Activity

You can cancel activities linked to a work order. Infor LN allows you to cancel the activities only if no actual costs are associated with the work order activities and the **Order Status** is set to **Planned** or **Released** or **Completed** or **Signed-Off** in the Work Order Activities (tswcs2110m000) session. After cancelling a work order activity, you can post the work order activity to history.

If actual cost are associated with the work order activity and you cancel the activity, Infor LN selects the **Initiate Cancelation** check box in the Work Order Activities (tswcs2110m000) session. This check box indicates that the cancellation process is initiated for the activity. Infor LN allows you to cancel the activity only after the activity is closed.

## Cancel Related Work Order

A work order can have one or more child work orders. These child work orders are referred to as related work orders. When a number of sub-processes are linked to a work order and each sub-process has number of associated sub-processes, a hierarchy is established. When you cancel a parent work order, all the underlying sub-processes must be cancelled.

**Note**

- To cancel the related work order, you must cancel the parent work order. The work order can be canceled only if no actual cost are available on work order and/or related work order.
- If you cancel an activity of a work order, for which a related work order exists, you must specify the related work order in the Work Order Material Resources (tswcs4110m000) session.

# Actions Performed on Outgoing Subassemblies

An outgoing subassembly can be generated from the work order using:

- the **Outgoing Subassemblies** option from the Reference menu in the Work Orders (tswcs2100m000) session.
- the **Outgoing Subassemblies** option from the Reference menu in the Work Order Activities (tswcs2110m000) session.

- the Work Order Outgoing Subassemblies (tswcs4150m000) satellite session in the Work Order (tswcs2100m100) session.

The processing of the subassembly depends on the value, the **Action Outgoing Subassembly** field in the Work Order Outgoing Subassemblies (tswcs4150m000) session is set to. The outgoing subassembly can be processed when the **Order Status** is set to **Released** in the Work Order Activities (tswcs2110m000) session.

You can execute the following actions on an outgoing subassembly in the Work Order Outgoing Subassemblies (tswcs4150m000) session:

- **To Location**: Select this option to transfer the subassembly to the specified **Location**. When the subassembly is processed, an Incoming Subassembly is created for the same **Location**.
- **To Location for Work**: Select this option to transfer the subassembly to the specified **Location**. A work order is generated to perform additional work on the subassembly. The **From Location** field in the follow up Work Orders (tswcs2100m000) and the **Location** field in the Work Order Outgoing Subassemblies (tswcs4150m000) session must have the same value. In the Work Orders (tswcs2100m000) session, LN defaults the value of this **From Location** field to the **To Location** field. In case you change the value of the **To Location** field, the value of the **Location** field in the **Receive From** group box of the Work Order Incoming Subassemblies (tswcs4151m000) session must also be updated.

**Note**

The relation between the initiating work order and related work order is displayed in the Related Orders (tsmdm4500m000) session.

- **To Warehouse**: Select this option to transfer the subassembly to the specified **Warehouse**. A warehouse order is created to handle the inbound.The warehouse is defaulted from the Service Offices (tsmdm1100m000) session. The incoming subassembly can be procured from this warehouse by the assembly activity. The subassembly can remain in the warehouse as company owned inventory.
- **To Department**: Select this option to transfer the subassembly to the specified **Department**. To transfer the subassembly to another department, the subassembly must be first returned to the warehouse of the service department, and then transferred to the warehouse of the other department. A warehouse inbound and transfer order must be created.
- **To Subcontractor**: Select this option to transfer the subassembly to the specified subcontractor. You must specify the **Reference Activity** for the subassembly. When the outgoing subassembly is processed, a subcontracting activity is created for the work order, and is displayed in the Work Order Outgoing Subassemblies (tswcs4150m000) session. When this activity is released, a subcontracting purchase order with the cost item is generated for the work order.
- **To Scrap**: Select this option to scrap the subassembly. When you process the subassembly, LN selects the **Confirmed** check box, and the serial status is modified. The scrapped subassembly can be replaced by a new item. You can select the **Add Material** option and generate a Work Order Material Resources (tswcs4110m000) line to replace the scrapped subassembly.
- **To be Decided**: Select this option to put the subassembly on hold.

# Actions Performed on Incoming Subassemblies

When you process an outgoing subassembly, an incoming subassembly is created. The processing of the incoming subassembly depends on the value the **Action Outgoing Subassembly** field is set to, in the Work Order Outgoing Subassemblies (tswcs4150m000) session.

The following actions are executed on an incoming subassembly in the Work Order Incoming Subassemblies (tswcs4151m000) session:

- **From Location**: When you process an outgoing subassembly with **Action Outgoing Subassembly** set to **To Location**, an incoming subassembly is created in the Work Order Incoming Subassemblies (tswcs4151m000) session. The value in the **Location** field in the Work Order Incoming Subassemblies (tswcs4151m000) session is defaulted from the Work Order Outgoing Subassemblies (tswcs4150m000) session. You must confirm the receipt of the subassembly, using the **Confirm Receipt** option in the Work Order Incoming Subassemblies (tswcs4151m000) session, to indicate that the subassembly is returned from the location to the job shop. When you cancel the incoming subassembly, no further action is required and the subassembly remains at the location.
- **From Location for Work**: When you process an outgoing subassembly with **Action Outgoing Subassembly** set to **To Location for Work**, a related work order is created for the subassembly. . The assemble activity is executed only after the **Status** of the related work order is set to **Completed**. You can confirm the receipt of the subassembly using **Confirm Receipt** option in the Work Order Incoming Subassemblies (tswcs4151m000) session, to indicate that the subassembly is returned from the location to the job shop. The incoming subassemblies can be cancelled only if the work order is cancelled manually.
- **From Warehouse**: When you process an outgoing subassembly with **Action Outgoing Subassembly** set to **To Warehouse**, an incoming subassembly is created in the Work Order Incoming Subassemblies (tswcs4151m000) session. The value in the **Warehouse** field in the Work Order Incoming Subassemblies (tswcs4151m000) session is defaulted from the Work Order Outgoing Subassemblies (tswcs4150m000) session. If the incoming assembly requires a replacement in the warehouse, the warehouse outbound order must be canceled and a new item can be procured by generating a Work Order Material Resources (tswcs4110m000) line. If you cancel the incoming subassembly, related warehouse orders and planned inventory transactions must also be canceled. In case LN does not allow you to do so, the incoming subassembly cannot be canceled.
- **From Department**: When the related work order is completed, you can confirm the receipt of the subassembly using the **Confirm Receipt** option in the Work Order Incoming Subassemblies (tswcs4151m000) session, to indicate that the subassembly is returned from the department/warehouse to the job shop. If the task is internally subcontracted to another department by the disassembly activity, the assemble activity is executed only after the **Status** of the related work order is set to **Completed**. The incoming subassemblies can be cancelled, if the work order is cancelled manually.
- **From Subcontractor**: You can confirm the receipt of the subassembly using the **Confirm Receipt** option in the Work Order Incoming Subassemblies (tswcs4151m000) session, to indicate that the subassembly is returned from the subcontractor to the job shop. If the task is subcontracted to a supplier and the **Receive From** is set to **Disassembly Activity** in the

Work Order Incoming Subassemblies (tswcs4151m000) session, the **Assembly Activity** is executed only after the subcontracting purchase order is processed. When you cancel the **Assembly Activity**, the **Activity Status** is set to **Canceled**. The subcontracting purchase order and the subcontracting work order activity must be canceled, manually.

- **To be Decided**: Select this option to put the subassembly on hold.
- **No Action**: The Incoming Subassembly is not created.

# Handling return of maintenance item(s) and non-consumed items in WCS

The maintenance item and the non-consumed material is returned to the warehouse after the work is completed. When the **Status** of the work order is set to completed in the Work Orders (tswcs2100m000) session, the warehouse orders are created to facilitate the return. These warehouse orders must be logistically and financially processed before the work order can be closed.

## Completing the work order

The following logistic transactions are processed during the completion of the work order:

- A warehouse order is created to receive the maintained item(s) in the warehouse.
- The non-consumed material is returned to the warehouse.
- The open reversible warehouse order for material delivery is deleted.
- In case of an external work order, the related part maintenance line is updated for the **Lot**, **Planned Delivery Time** and **Maintained Quantity**, if item is sent to a location.
- The revision of serialized item is updated in Configuration Control and Warehousing.
- The serial, lot information and lot tracking of materials is updated in Warehousing.

**Note**

For the work order, that has the **Initiate Cancelation** check box selected in the Work Orders (tswcs2100m000) session and the status is set to complete, the maintained quantity must be zero.

## Signing off the work order (activities)

You can set the work order **Status** to **Signed-Off** when the administration work is completed. For the repair of products such as ships or aircraft, where safety is an important concern, the **Signed-Off** **Status**, is critical . The **Signed-Off** step ensures satisfactory completion of the related activities.

## Closing the work order

You can set the work order **Status** to **Closed** when the work order is administratively closed. The following logistic and financial transactions are processed during the closing of the work order:

- The used tools are returned.
- The sales value of the serialized item is updated in Configuration Control.
- The repair costs are registered.
- The work in progress value for the work order is cleared and moved to the maintenance sales order, if applicable, or booked as internal service costs in Financials.
- The problem and solution on the part maintenance line of the related maintenance sales order, are updated
- The initiating work order is updated, if **Status** of the work order is **Canceled**.
- The work order related data in the Locations (tswcs0125m000) session, in Work Control System, is updated.

**Note**

If the **Automatically Close Work Order** check box is selected in the Work Order Parameters (tswcs0100m000) session, the work order can be closed after the related warehouse order for the maintained item and non-consumed material is processed.

## Transferring the work order

When the items are transferred to other department, LN creates a warehouse order for the receipt of the maintainable item in the warehouse and the **Status** of the work order is set to **Transferred**.

## Cancelling the work order

You can cancel a work order with **Status** set to **Planned** or **Released**. LN selects the **Initiate Cancellation** check box in the Work Orders (tswcs2100m000) session, when the process of cancelling the work order is initiated. The receipt warehouse order must be processed before the work order is closed. When closing the work order, the **Status** is set to **Canceled**. You can not cancel a work order with status **Completed** (initiated for cancellation, when actual costs are present) because the processing of the receipt warehouse orders is not yet completed.

# Appendix A
# Glossary

A

## ATP

See: *available-to-promise (p. 47)*

## ATP

See: *available-to-promise (p. 47)*

## 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 LN, available-to-promise (ATP) is part of a larger 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, 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 LN, the term CTP is used.

Acronym: ATP

Abbreviation: 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.

## 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.

## inbound

A procedure in which received goods are stored in a warehouse.

## initiating work order

The work order from which the current work order is derived.

## 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.

## labor rate

The labor rate code, defined in the Labor Rate Codes (tcppl0190m000) session in People. A sales rate and cost rate can be specified in this labor rate code.

You can assign labor rates on a wider scale to, for example,

- A service department, for all work done by the service department.
- An installation group, for all work carried out on the installation group.

In the Service Order Parameters (tssoc0100m000) session, default labor rate search paths can be set for the following:

- Estimated sales rate
- Estimated cost rate
- Actual sales rate
- Actual cost rate

## location

A physical, recognizable area in a maintenance shop, a service department, or a work center where parts are temporarily stored. Inbound and outbound handling is not registered in LN.

## maintenance sales order

Orders that are used to plan, carry out, and control the maintenance on customer-owned components, products and the logistic handling of spare parts.

## 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.

### price book

An entity in which you can store price information that is valid for a given period of time.

A price book includes the following elements:

- A price book header, which contains the code, type, and use of the price book.
- One or more price book lines, which contain the items.

A quantity or value break discount schedule can be linked to a price book.

### problem

A source or symptom of malfunction or disturbance.

### 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.

### serialized item

An item that is uniquely identified by the item code (manufacturer part number) in combination with the serial number.

### service department

The department that is responsible for the execution of a work order.

### solution

Codes on calls and service orders that enable you to analyze the orders.

### warehouse

A place for storing goods. For each warehouse, you can enter address data and data relating to its type.

### warehouse order

See: *warehousing order (p. 51)*

## 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.

# Index