



Infor LN Manufacturing User Guide for Tools Requirement Planning

Release 2022.x

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About this guide

This guide provides conceptual information for *Tools Requirements Planning* module in the Manufacturing package of LN.

Use this guide as a reference at your site.

How to read this document

This document was assembled from online help topics. Consequently, references to other sections in the manual are presented as shown in this example:

Refer to the Table of Contents to locate the referred section.

Underlined terms indicate a link to a glossary definition. If you view this document online and you click on underlined text, you jump to the glossary definition at the end of this document. Non-underlined references do not represent a link to glossary definitions or other elements.

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Chapter 1: Introduction

Tools Requirement Planning (TRP)

Use the Tools Requirement Planning module to control the *tools* that are required by *production orders* and *service orders*.

The Tools Requirement Planning module supports the following functions:

- Identification and marking
- Requirements planning
- Procurement (together with the Purchase Control module)
- Dispensing and scheduling
- Refurbishing
- Tracking and disposal
- Performance measurement

Tools are defined as *purchased items* with **tool** item type specification. These items can be purchased and stored in a warehouse like any other item.

Chapter 2: Tools Setup

Listing Tools Requirement Planning Parameters

To view the parameters, select the parameter settings and click Open on the File menu.

To change the parameters, select the first record without an effective date, and click Open on the File menu. The TRP Parameters (**Tool Planning Parameters (titrp0100s000)** details session starts with the current parameter settings. You can use the Tools Requirement Planning (TRP) parameter (titrp0100s000) details session to change and save the new parameters. LN sets the effective date of the new parameters to the current date and time.

You can also use the **Print Tools Requirement Planning Parameters (titrp0400m000)** session to print and compare the parameter settings.

Tool identification

The master data of tools to be used in LN is first defined in this business object. The following data related to tools can be defined:

- *Tool*
- *Tool types*
- *Tool types by tool kit*
- *Tool number*
- *Tool components*

The first step is to define the tools. In the master data, tools are defined as a combination of tool type and tool number. The *tool's* life, *refurbishing* data, and the planning method can be specified for each tool type. Tools are considered as items.

If more than one tool is required to perform an operation, you can group tools to form a tool kit. To use tools interchangeably, alternative tools can be defined. Alternative tools are tools that can perform the same operation.

The tool component list can be maintained in this business object for multipiece tools that can have detachable components.

Defining tools

To define a tool, perform the following steps:

1 Create a tool

Use the Items (tcibd0501m000) session to create a *tool*. You must define an item of the type **Tool** with the supply source **Purchase** or **Job Shop**. From the **Items (tcibd0501m000)** session, you must also define subentities, such as, costing data, warehousing data, purchase data, and ordering data. Calculate the standard cost for the newly defined tool.

2 Define tool type

Use the Tools (titrp0101m000) session to define the *tool* type in the Tools Requirement Planning module. Here, you can specify the general and refurbishing details of the tool type.

3 Set status to **Active**

Set the **Item Warehouse Status** field in the Item Data by Warehouse (whwmd2510m000) session to **Active**.

4 Define tools

Use the Tool Numbers (titrp0102m000) session to define tools for the tool type. Every tool type gets a *tool serial number*. You can specify the general and refurbishing details of each tool.

Note: The serial number of a tool is displayed in the Serialized Items (tcibd4501m000) session.

Maintaining Tools by Tool Type

For each tool you record:

- Usage data
- Refurbishing data
- Status

If you add a tool, LN generates an adjustment order which can be viewed in the **Adjustment Orders (whinh5120m000)** session. The adjustment order is generated and automatically processed for the warehouse that you entered in the **Tool Numbers (titrp0102m000)** session. The reason for adjustment equals the reason defined in the **Reason for Adjustment Order** field in the **Tool Planning Parameters (titrp0100s000)** session. The available inventory for the tool in the **Warehouse - Item Inventory (whwmd2515m000)** session is increased when you add a tool.

When a tool is scrapped, LN also generates an adjustment order which can be viewed in the **Adjustment Orders (whinh5120m000)** session. The adjustment reason equals the reason defined in the **Default Scrap Reason** field in the **Tool Planning Parameters (titrp0100s000)** session.

Due to financial transactions, you must enter a *purchase office* for the particular tool. You can define a purchase office as follows:

- Use the **Item - Purchase** session to enter the item purchase data for this tool.
- Use the **Procurement User Profiles (tdpur0143m000)** session to check the user defaults.

- Use the **Buy-from Business Partners (tccom4520m000)** session to maintain the business partner data for this tool.

If you plan production orders, *operations* of the routing are also planned. If you plan service orders, the tools linked to the service activities are also planned. The planning is based on the *tool type* and the **Planning Method** session specified for the tool type.

If you close operations of a **Production Order** and/or service activities of an **Service Order**, and actual costing took place, the tool's usage field is updated.

Tool status

A tool can have the following statuses:

Note: If the tool is **Blocked**, the tool is not considered when new estimated requirements are planned, or while performing the availability check for tools.

New

When you enter a tool, the status is **New** status. You can change the status from **New** to **Available**, or to **Blocked**.

Available

To allocate the status to a **Production Order** or **Service Order**, the status must be **Available**. You can manually change the status to **Blocked** or to **In Refurbishing**.

Blocked

Tools with this status cannot be planned or issued to a **Production Order** or to a **Service Order**. The status of the tool is set to **Blocked** if:

- The *tool's life* becomes less or equal to the total number of hours/times the tool is used.
- The status is manually changed in the **Tool Numbers (titrp0102m000)** session to **Available** or to **In Refurbishing**.

Allocated

The **Allocated** status is assigned to a tool when it is issued to either a **Production Order** or a **Service Order**. You cannot manually assign the **Allocated** status in the **Tool Numbers (titrp0102m000)** session.

In Refurbishing

The **In Refurbishing** status is assigned to a tool when the tool is requested by means of the **Request and Return Tools (titrp0215m000)** session for refurbishment. Tools with this status are not planned for issue to a **Production Order** or to a **Service Order** within the planned period of maintenance.

If the tool is returned with the **Request and Return Tools (titrp0215m000)** session, the status of the tool changes from **In Refurbishing** to **Available**.

Request status

A request can have the following statuses:

Requested

The tool is requested at the work center or the service center.

Available

The tool is available at the work center or the service center.

Request tools

When a tool is requested, LN checks if there is a *tool* request present in the **Tool Requests (titrp0515m000)** session for the tool work-center combination.

If there is no request present at the work center, LN creates a request. Next, LN plans the tool requests available in the **Tool Requests (titrp0515m000)** session, based on the earliest request date and the highest priority.

Note: If there is no request for the tool at any other work center or service center, this request has the **Available** status.

If the tool has already been requested at another work center or service center, the new request has the **Requested** status.

LN updates the **Tool Requirement Status** field in the **Estimated Tool Requirements (titrp0111m000)** session and the **Status** field in the **Tool Numbers (titrp0102m000)** session.

Tool tracking

Tool tracking contains the tooling data related to the requests for tools that are linked to the planned production order and operation, or that are linked to the planned service order, line number, and activity line.

The tool tracking is updated when the tools are returned with the **Request and Return Tools (titrp0215m000)** session. Tools are printed by order in the **Print Tools Used by Order (titrp1412m000)** session.

Linking Operation/Operation Step - Tools

To link tools to an operation

- If the sequence in which the tools are presented on the production order documents is not important, you can link tools directly to an operation.

To link tools to an operation:

- Select a record in the Routing Operations (tirou1102m000) session.
- On the *appropriate* menu, click **Tools**.
- The **Operation (Step) - Tools (tirou1110m000)** session starts, in which you can link one or more tools to an operation.
- These tools are presented directly below the operation number on production order documents.

To link tools to an operation step

Tools information linked to operation steps can indicate, for example, which tools are required to carry out a specific operation.

To add several tools to a specific operation in a specified order, you must link a tool to an operation step. After you defined operation steps for the operation in the Operation Steps (tirou1105m000) session, you can link one or more tools to each operation step.

- Select an operation step in the **Operation Steps (tirou1105m000)** session for the correct item/routing/operation combination.
- On the *appropriate* menu, click **Tools**.
- The **Operation (Step) - Tools (tirou1110m000)** session starts, in which you can link one or more tools to an operation step.

Default value

If the current session is started for an operation that makes use of a task relationship to which tools are linked in the Task Relationship - Tools (tirou0115m000) session, the tools from the **Task Relationship - Tools (tirou0115m000)** session are defaulted to the current session. When operation steps are added, these defaults are removed again.

You can list and define the tools that are required for an actual production order's operation in the Estimated Tool Requirements (titrp0111m000) session. Based on the data in the current session, tools information is defaulted to the **Estimated Tool Requirements (titrp0111m000)** session on operation level, or on operation step level.

However, in the **Estimated Tool Requirements (titrp0111m000)** session, you can link additional tools to an operation, or to an operation step of an actual production order in the following ways:

- By inserting a new record
- By starting the **Operation (Step) - Tools (tirou1110m000)** session, in which you can define additional default tools information. To start the **Operation (Step) - Tools (tirou1110m000)** session, select a record in the **Estimated Tool Requirements (titrp0111m000)** session and on the *appropriate* menu, click Operation/Operation Step - Tools.

Note: If you add additional tools to the production order by means of the **Operation (Step) - Tools (tirou1110m000)** session, the inserted tools are defaulted to future production orders that make use of the relevant operation or the relevant operation step.

Return tools to an order

LN checks the requests for the work center or service center of the specific combination of order and operation. If the request is found, the request has the **Available** status.

If the *tool request details* or the request are not present, LN adds the missing request or missing details. The tool is then sent to this request.

Note: If the next operation of the order also requires the tool used by previous operations of the order, the tool is transferred to this operation without considering the earliest request date and highest priority.

Integrations of JSC with Tool Requirements Planning

You can define the tool requirements for the production of an item in the **Operation (Step) - Tools (tirou1110m000)** session in the Routing module.

Tool requirements for a particular production order can be maintained in the **Estimated Tool Requirements (titrp0111m000)** session in the Tools Requirement Planning module.

When a new production order is transferred to the Job Shop Control module or created manually, LN calculates the tool requirements.

Chapter 3: Tools Requirement Planning

Tool requirements planning

The tool requirement planning module is used to check the availability of tools for:

- **Planned Production Order** from the Order Planning module in Enterprise Planning.
- **Production Order Advice** from the Inventory Analysis module in Warehousing.
- **Production Order** from the Job Shop Control module in Manufacturing.
- **Service Order** from the Service Order Control module in Service.

Tools planning is based on the material resource concept. It is critical to plan tools at the right place, at the right time, and in the right quantity. Tools are considered items.

Note: The scope of the Tools Requirement Planning module does not include revision control and renting of tools.

The Service module allows for (field) service orders and (maintenance) work orders. Both are reflected in Tools Requirement Planning if tools are used.

LN updates the tool requirement planning in the Availability Planning (titrp0513m000) session if one of the following is true:

- The production order planning is entered or updated in the Production Orders (tisfc0501m000) session.
- A **Service Order** from the Service Order Control module in the Service is entered or maintained.
- The tool type of an estimated tool requirement in the Estimated Tool Requirements (titrp0111m000) session is changed.
- The tool number of a tool type in the **Estimated Tool Requirements (titrp0111m000)** session is changed.
- The **Tool Usage** field in the **Estimated Tool Requirements (titrp0111m000)** session is changed.
- The **Generate Availability Planning (Planned Production Orders) (titrp1213m000)** session is used.
- The **Generate Tools Availability Planning (whina3205m000)** session is used.
- When a maintenance work order is entered.
- When you run the **Service Order Resource Planning (tssoc2260m000)** session in Service.

Store availability planning of tools in the **Availability Planning (titrp0513m000)** session. When you run the **Availability Check for Tools (titrp0213m000)** session, LN prints a report with the following information:

- Required tool usages, to check how many tools are actually required for the appropriate date of the operation, line number, or activity line.
- Planned tool usages available to complete the operation.
- The shortages of tools for each operation.

- Recommended purchase quantity required. LN calculates this quantity by LN with the following formula:

Shortage of the tool type / Tool life

If there is a shortage of tools, the data in the **Production Orders (tisfc0501m000)** session is not affected.

Tools planning method

The purpose of tools planning is to estimate the tools that are needed for production orders, service orders, and work orders. If a production order is planned, the required tools are determined using the routing that is linked to the item.

After the tools are planned, the **Estimated Tool Requirements (titrp0111m000)** session checks the availability of the planned tools.

The tools planning procedure is used in the following sessions:

- **Plan Tools Globally (titrp0211m000)** session. The method is only used if the tool serial number is not specified.
- **Replan Tools (titrp1202m000)** session.
- **Availability Check for Tools (titrp0213m000)** session. This method is only used if the tool serial number is not specified.

The tools planning method takes into account the Tools Usage field in the **Tool Numbers (titrp0102m000)** session. The number of tools to be planned is determined by the Maximum Number of Tools to be planned. When LN plans tools with the **Plan Tools Globally (titrp0211m000)** session and with the **Replan Tools (titrp1202m000)** session, LN considers the alternative tool types. LN also takes into account the **Planning Method** field in the **Tools (titrp0101m000)** session. Depending on the value of this field, LN uses the following methods when planning:

- Least Remaining Tool Life. LN first considers tools with the least remaining life.
- Maximum Remaining Tool Life. LN selects tools with the maximum remaining tool life.
- Based on Order Quantity. For the planning, LN selects tools with a remaining tool life equal to or greater than the requirement considered for the planning.
- Not Applicable. The planning method is not applicable, which means the tool life is not applicable.

The tools planning method procedure considers all the previously-mentioned input and plans the tools. If the requirement cannot be satisfied in one check-availability procedure, a purchase quantity is recommended. If LN fails to plan the tools for the requirement, the requirement is not changed.

Tools planning and tracking

Use tools planning and tracking to determine the planned and current locations of tools and the tooling historical data.

The tools defined in LN can be:

- Present in a warehouse.
- Planned or issued for a **Production Order**.
- Planned or issued for a **Service Order**.
- In maintenance.

The tools planning and tracking information is generated for the production order when the operations to which the tool is assigned are planned in the Job Shop Control module. The data is generated for service orders when the service activities are planned in Service.

In tool planning and tracking you can:

- Maintain the estimated requirements of tools for production orders/operations and service orders/activities.
- Check the availability of tools before the planned production is transferred from:
 - The Order Planning module.
 - The Inventory Analysis module to the Job Shop Control module.

You can also print the time-phased availability for planning of tools, for planned and actual production orders, and for service orders.

Listing Availability Planning

For the following orders the critical tool data is displayed:

- Production orders from Manufacturing.
- Service orders and work orders from Service.
- Planned Order Planning orders from Enterprise Planning. To include the critical tool data of planned RRP orders in the **Availability Planning (titrp0513m000)** session, you must run the **Generate Availability Planning (Planned Production Orders) (titrp1213m000)** session. Only the actual *scenario* is considered.
- *Production-order advices* in Warehousing. To include critical tool data of advices in the **Availability Planning (titrp0513m000)** session, you must run the **Generate Tools Availability Planning (whina3205m000)** session.

You can indicate that a tool is critical by selecting the **Critical in Availability Planning** check box in the **Tools (titrp0101m000)** session.

Modifying Estimated Tool Requirements

Tool requirements include data about the tool, and about the number of hours or times that the tool is required to perform an operation or activity. You can maintain tools that are estimated to be issued, or tools that are planned for the job shop or the service center.

The availability planning for actual orders is generated by means of the Availability Planning (titrp0513m000) session, after the orders have been entered in Estimated Tool Requirements (titrp0111m000) session.

Specific menu

The estimated tool requirements can be returned to the next requirement, to a warehouse, work center, or another order by using the **Request and Return Tools (titrp0215m000)** session. This session is started by clicking **Request and Return Tools** from the *appropriate* menu.

Click **Tool Requests** from the specific menu to start the **Tool Requests (titrp0515m000)** session. In this session you can view whether a tool is available at the work center or the service center.

Planning Tools Globally

If the *tool serial number* is planned in the **Estimated Tool Requirements (titrp0111m000)** session, you do not need to run this session.

Specify the order type, order, operation, activity line, or line number ranges. If you click **Plan Tools**, LN scans all tool types linked to the order, and plans the tool types for which the tool-serial number is not present.

Note: If no tools of the required tool type are available, the alternative tool type is planned based on the required tool usages, planning method, and maximum tools to be planned. If the required usages for a tool type are not fulfilled by the maximum number of tools specified, no tools are planned for that requirement.

Scrapping Tools Globally

After you clicked **Scrap Tools**, two types of reports can appear:

- A success report, which prints the tools that are successfully removed from LN.
- An error report, which prints the tools that cannot be removed from LN, due to the tool's existing reference in Service or in Manufacturing.

Note:

To scrap a tool, you must:

- Process the estimated tool requirements of the tool in the **Estimated Tool Requirements (titrp0111m000)** session.
- Delete the tool serial number in the **Operation (Step) - Tools (tirou1110m000)** session and the **Machines (Machine Types) (tirou0102m000)** session.

If you scrap a tool, LN generates an adjustment order which can be viewed in the **Adjustment Orders (whinh5120m000)** session. The adjustment order is generated and automatically processed for the warehouse that you entered in the **Tool Numbers (titrp0102m000)** session. The reason for adjustment equals the reason defined in the **Default Scrap Reason** field in the **Tool Planning Parameters (titrp0100s000)** session.

Due to financial transactions you must enter a *purchase office* for the particular tool. You can define a purchase office as follows:

- Use the **Item - Purchase** session to enter the item purchase data for this tool.
- Use the **Procurement User Profiles (tdpur0143m000)** session to check the user defaults.
- Use the **Buy-from Business Partners (tccom4520m000)** session to maintain the business partner data for this tool.

Chapter 4: Tool Transfer

Requesting and Returning Tools

You can request or return one or more tools for a specific range of:

- Orders
- Operations
- Operation steps
- Line numbers
- Activity lines

If you select **Return** in the **Action** field, you can indicate on the second tab of the session to where you want to return the tool:

- Transfer tools to the warehouse
- Transfer tools to the work center/service center
- Return tools to an order

If you do not indicate to where a tool is transferred, the tool is transferred by default to the next requirement. For more information, refer to Transfer tools to the next requirement.

Request status

If a tool is requested or returned, the status of the request changes. If a tool is requested, the status changes from **Available** to **Requested**. If a tool is returned, the status changes from **Requested** to **Available**.

Transfer tools to the warehouse

When a tool is returned to the warehouse, LN checks if *tool request details* are present for the same *tool request* at the warehouse where the tool was currently in use.

If there are no additional request details:

- The request is deleted.
- The **Tool Present** check box in the **Tool Request - Lines (titrp0516m000)** session is selected.
- The **Tool Tracking (titrp0512m000)** session is updated.

If there are additional request details for the same request:

- The **Request Status** field in the **Tool Requests (titrp0515m000)** session is **Requested**.
- The status of the tool is **Available**.

Transfer tools to the work center/service center

Before a tool is transferred to a warehouse, LN checks if there are additional *tool request details* present for the *tool request*.

If there are no additional request details for the same request:

- The request from the **Tool Requests (titrp0515m000)** session is deleted.
- The tracking data in the **Tool Tracking (titrp0512m000)** session is updated.

If there are additional request details for the same request:

- The **Request Status** field in the **Tool Requests (titrp0515m000)** session is set to **Requested**.
- LN checks if there is a request present for the tool at the specified work center.

If there is a request at the work center:

- The **Request Status** field in the **Tool Requests (titrp0515m000)** session is set to **Available**.
- Request details with the earliest request date and the highest order priority are planned first.
- The **Tool Present** check box in the **Tool Request - Lines (titrp0516m000)** session is selected.

If there is no request at the work center:

- The **Tool Present** check box in the **Tool Request - Lines (titrp0516m000)** session is cleared.
- The **Request Status** field in the **Tool Requests (titrp0515m000)** session is **Allocated**.

Transfer tools to the next requirement

LN checks if there are more tool request details present at the work center where the tool is currently in use.

If there are more *tool request details* present in the **Tool Request - Lines (titrp0516m000)** session, tools are transferred to these requirements. If there are no more request details present, tools are assigned to a new request.

The new request to which the tool is assigned is priority-dependent:

- First, tools are assigned to orders for work centers of type *line station*. The tool is transferred to the order with the earliest **Request Date/Time** and the highest order priority.
- Next, tools are assigned to orders for work centers of type *line segment*. The tool is transferred to the order with the earliest **Request Date/Time** and the highest order priority.
- If there are no requests from work centers of type *line station* or *line segment* the tool is allocated to the order with the earliest **Request Date/Time** and the highest order priority.

Note: If there is no request for the tool, the status of the tool is set to **Available**.

When a tool is transferred to the next requirement for a tool request detail or for a new tool request, the status of the request is set to **Available**. The request status **Available** means that the tool is present at the work center or the service center that is linked to the request. LN selects the **Tool Present** check box.