

SOP for Equipment Repair and Return

Version # 2019.05.31-01

Purpose

To provide instruction for sending equipment for repair and returning equipment from repair, using both Tango and Tango Mobile.

Items Needed for Task

An internet-connected mobile device capable of reading QR codes or an internet-connected computer. For mobile devices, tablets or larger phones are recommended.

TANGO Prerequisites

User should already be familiar with:

- Tango and Tango Mobile (www.tf7.com)
- Tango Asset Tree structure
- Equipment rights

Supplemental Information

[Tango Equipment Management Brochure](#)

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1. Sending Equipment for Repair Using Tango

There are multiple ways to locate equipment in Tango. This guide will focus on the simplest way, using the quick search box.

- Search for the item using the search box in the upper right.
- Click the [...] to the right of the search box to bring up the options menu.
- Choose All Equipment search by equipment name/number (Fig. 1).

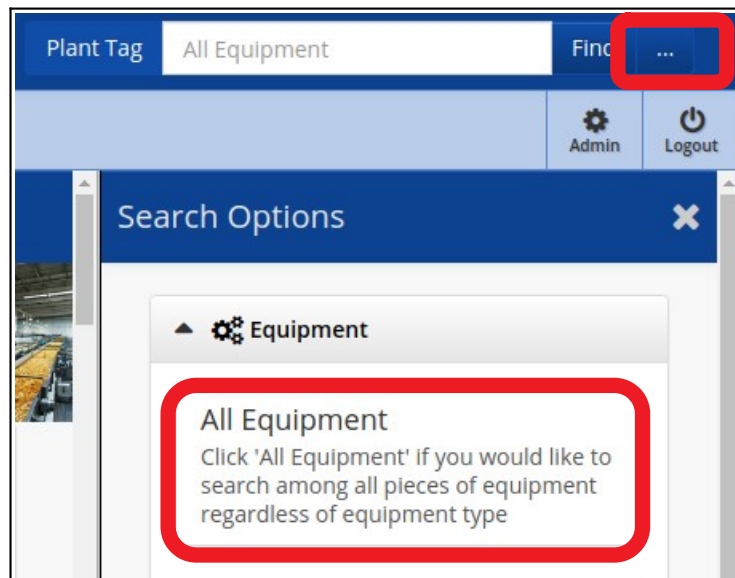


Figure 1

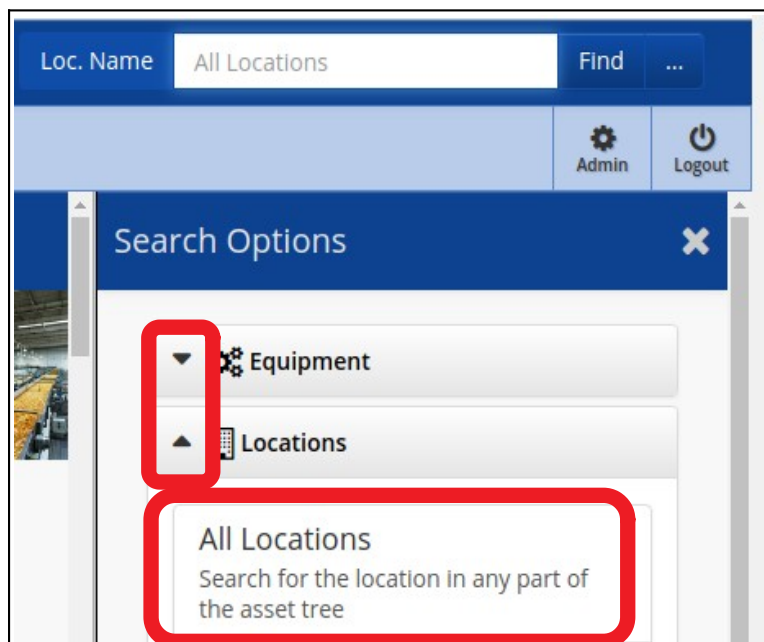
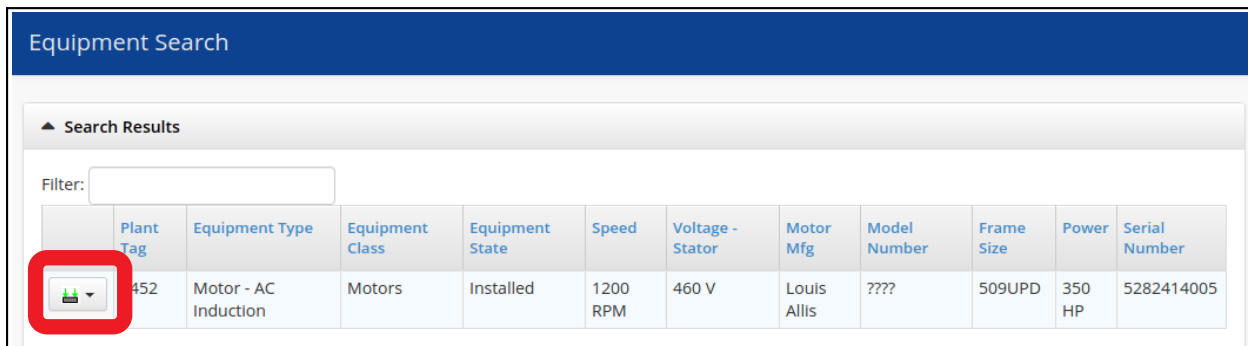


Figure 2

→ Choose All Locations if searching by location name (Fig. 2). You may collapse the Equipment menu by clicking the arrow to the left of "Equipment". Similarly, you may expand the Locations menu by clicking the arrow to the left of "Locations". Enter the Plant Tag or Location in the search box at the top, and click "find".

→ When the search results appear (Fig. 3), choose the action menu in the first column by clicking the down arrow, then choose Location Options, then Locate in Tree.



Plant Tag	Equipment Type	Equipment Class	Equipment State	Speed	Voltage - Stator	Motor Mfg	Model Number	Frame Size	Power	Serial Number
452	Motor - AC Induction	Motors	Installed	1200 RPM	460 V	Louis Allis	????	509UPD	350 HP	5282414005

Figure 3

→ This will highlight the equipment location in the Asset Tree (Fig. 4). Open the menu by clicking the down arrow next to the component name. Under Equipment Actions choose Send Equipment for Repair.

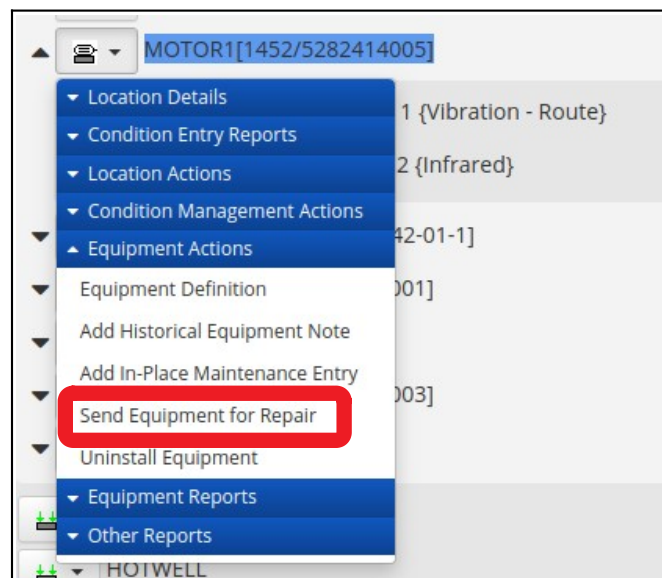


Figure 4

→ This will bring up the Equipment History Entry page (Fig. 5).

▲ Current Location

Location: 101 Cooling Tower » Tower » CLDWELL » MOTOR1

Installation Information

Install Date: Feb 28, 2003

Installation Work Order:

Installation Remarks:

Removal Information

Removal Date:

Removal Work Order:

Removal Remarks:

Figure 5

→ In the Current Location section, Removal Date is required. Other fields are optional.

→ In the Send for Repair >> Shop Info section, Shop and Sent on Date are required (Fig. 6).

▲ Send for Repair

Plant Info

Plant WO#:

Purchase Order #:

Requisition #:

Item Code #:

Account:

Shipping #:

Shop Info

Shop:

Shop Tracking #:

Sent On Date:

Due Back Date:

Figure 6

→ You have the option to add Send for Repair Comments or Linked Documents (Fig. 7). You may also add *Suspected* Faults by clicking the + symbol to the right. This will bring up the Fault List window (Fig. 8).

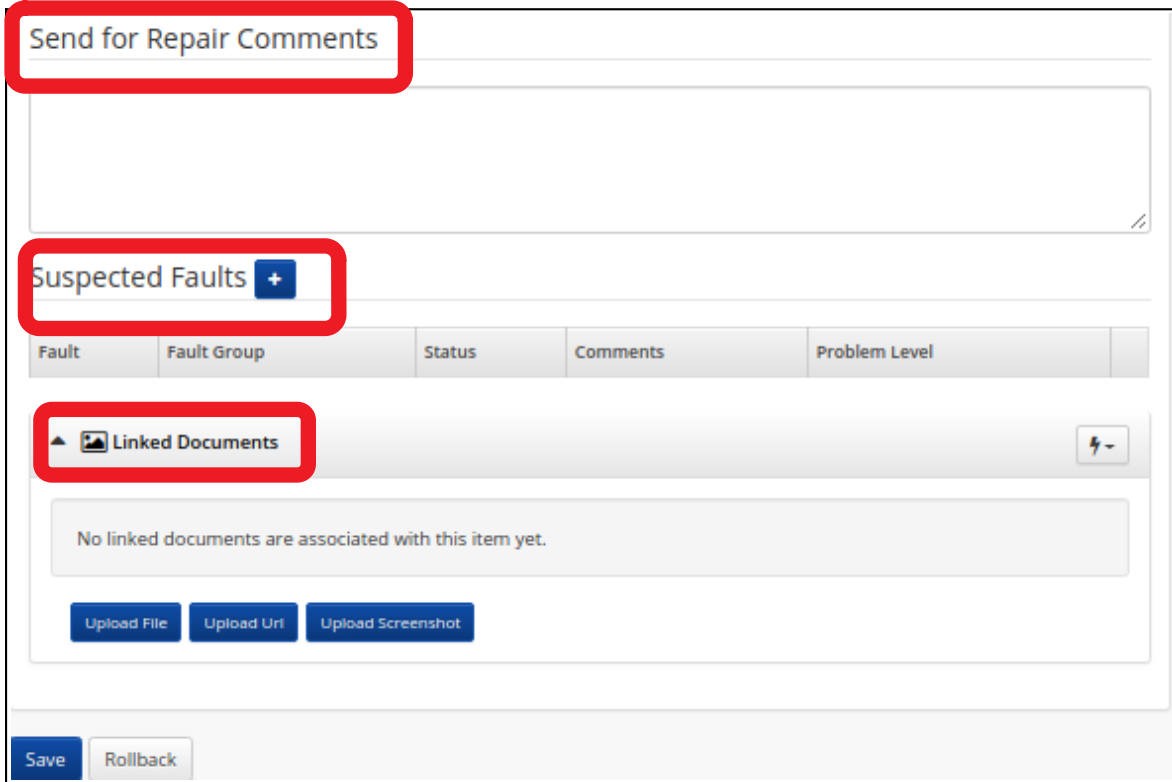


Figure 7

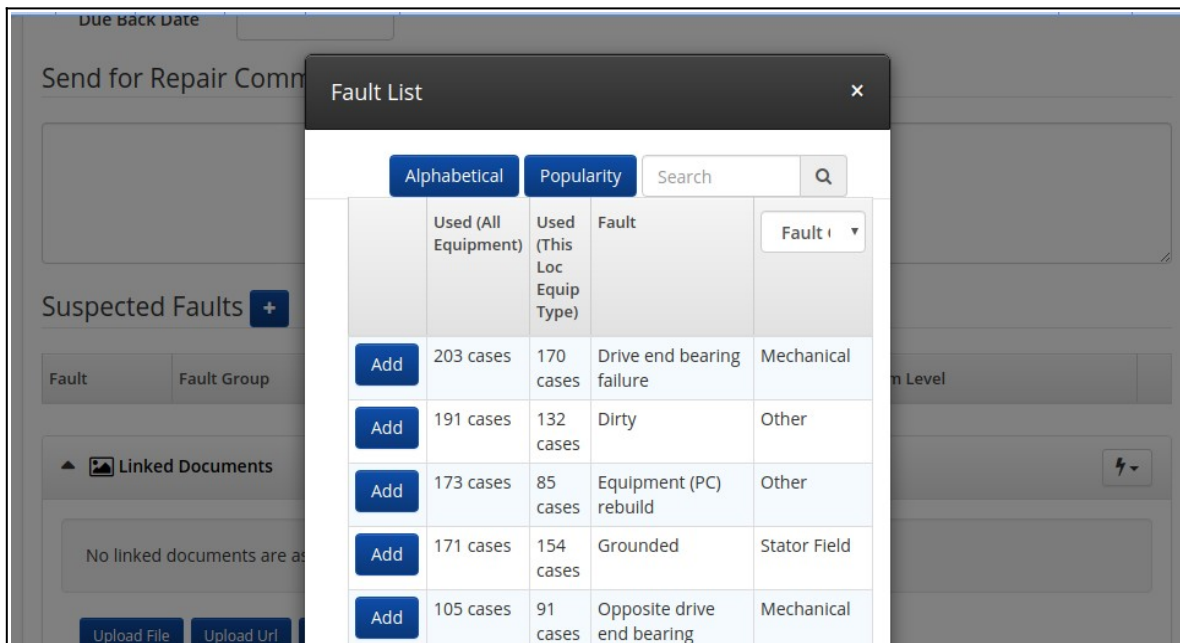
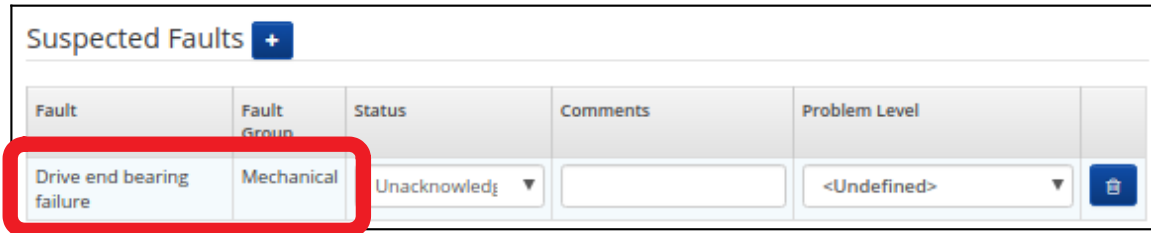


Figure 8

- Choose the appropriate fault(s) from the list and click 'Add'. After you have added all appropriate faults, click the 'X' in the upper right to close this window.
- The Suspected Fault(s) will now be on the list (Fig. 9).




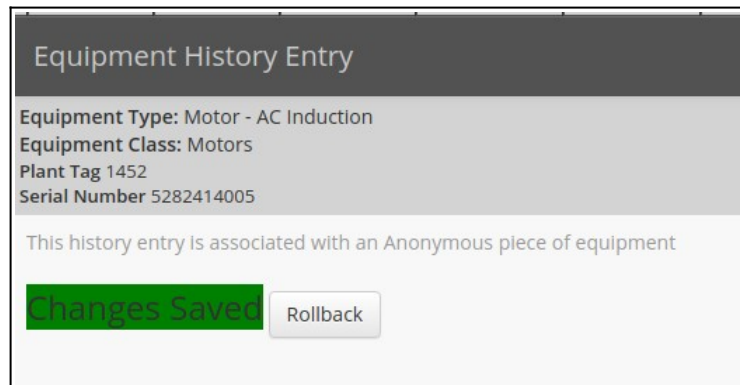
Fault	Fault Group	Status	Comments	Problem Level	
Drive end bearing failure	Mechanical	Unacknowledg		<Undefined>	

Figure 9

- Click Save at the bottom of the page (Fig. 7). This will bring up the Changes Saved page (Fig. 10). The equipment has now been sent for repair.



Equipment History Entry

Equipment Type: Motor - AC Induction
Equipment Class: Motors
Plant Tag 1452
Serial Number 5282414005

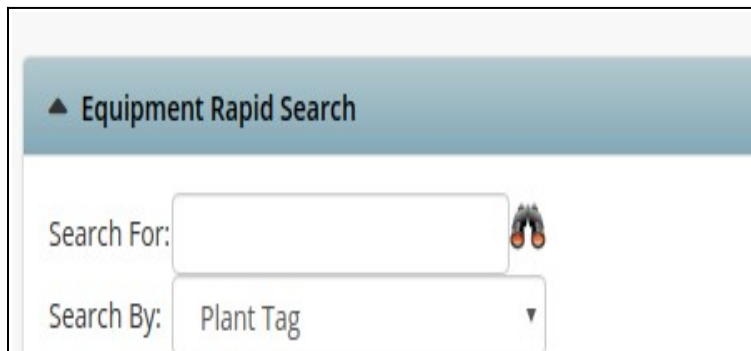
This history entry is associated with an Anonymous piece of equipment

Changes Saved

Figure 10

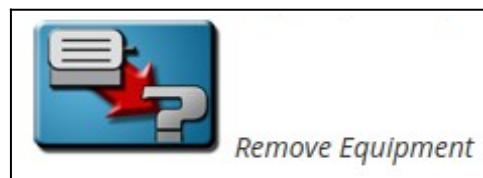
2. Sending Equipment for Repair Using Tango Mobile

- Locate the equipment in Tango Mobile. There are two ways to do this:
 - If the equipment has a QR code assigned to it, you may simply scan it and go directly to the equipment page.
 - If there is no QR code, you may search for the equipment by plant tag or serial number (Fig. 11).



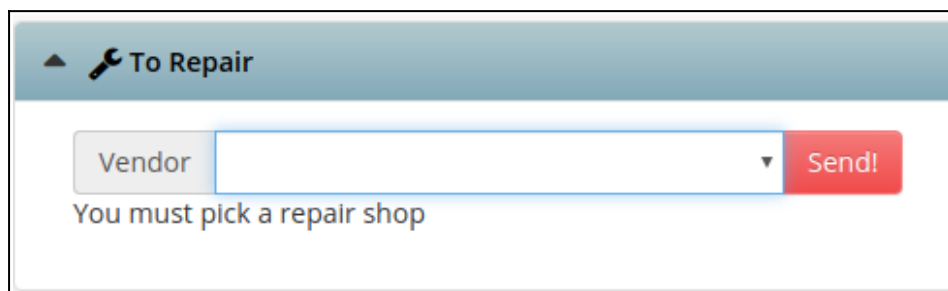
**Figure
11**

- Once on the equipment page, choose Remove Equipment under the Actions section (Fig. 12).



**Figure
12**

- Under the To Repair section, choose a vendor and click Send (Fig 13).



**Figure
13**

- This will bring up the Equipment History Page (Fig. 14). Under Current Location, the Removal Date is required. Under Send for Repair, Sent on Date is required. All other information is optional. You may include Suspected Faults (see figures 8 and 9 above). Click Save when finished.

Transfer Equipment

User: John Reliable

Equipment History Entry

Equipment Type: Motor - AC Induction

Equipment Class: Motors

Plant Tag 1452

Serial Number 5282414005

This history entry is associated with an Anonym equipment

▼ Current Location

▼ Send for Repair

Save

Rollback

**Figure
14**

3. Returning and Installing Equipment Using Tango

→ The next step depends on whether the equipment is being repaired in-house or has been repaired by an outside repair shop. If the equipment has been repaired in-house, proceed with this step. If the equipment has been repaired by an outside repair shop, skip down to "Installing Equipment from Stores or Limbo Using Tango" below.

→ As in section 1 above, use the quick search in the top right corner, clicking the [...] icon and choosing All Equipment (Fig. 15).

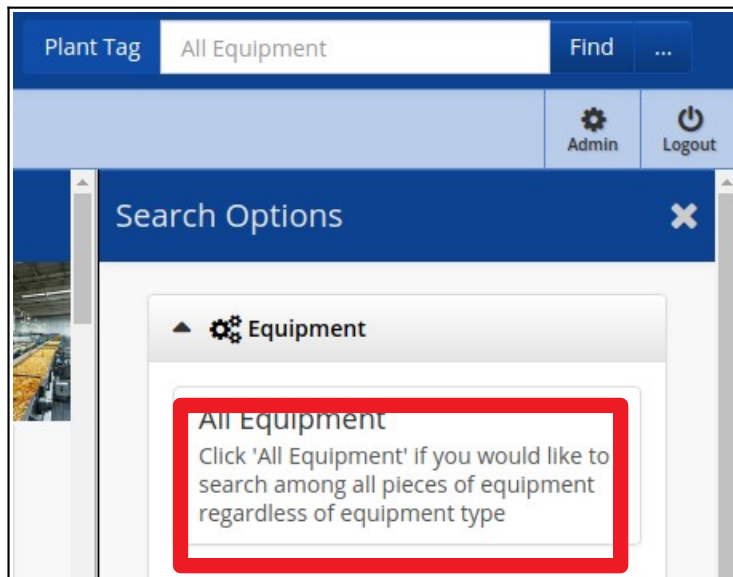
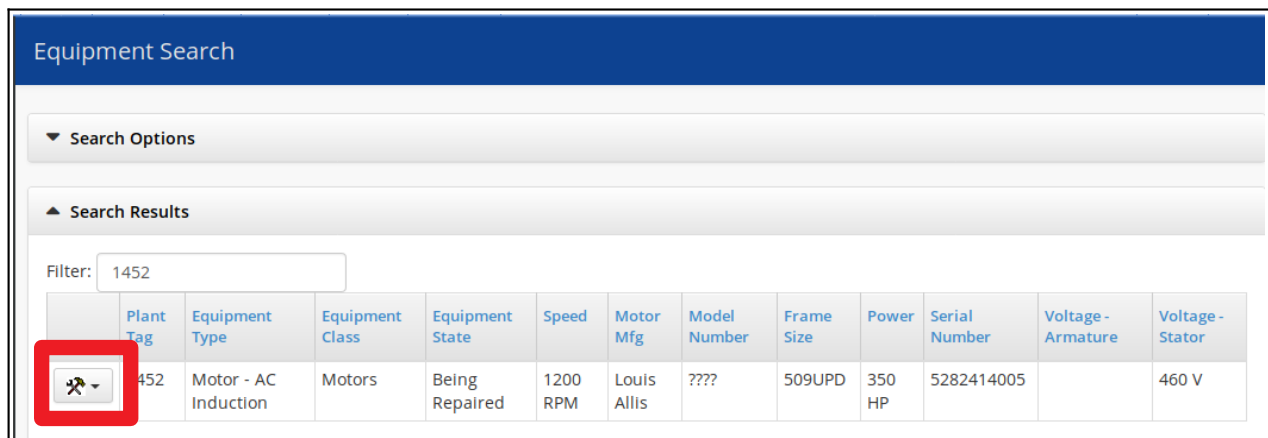


Figure 15

→ When results appear, type any information into the 'filter' box to narrow the results. The Plant Tag is usually available and provides the best results (Fig 16).




	Plant Tag	Equipment Type	Equipment Class	Equipment State	Speed	Motor Mfg	Model Number	Frame Size	Power	Serial Number	Voltage - Armature	Voltage - Stator
	452	Motor - AC Induction	Motors	Being Repaired	1200 RPM	Louis Allis	???	509UPD	350 HP	5282414005		460 V

Figure 16

→ When the search results appear, choose the icon next to the equipment to be repaired (Fig. 17). Under Equipment History Actions, choose Select for Install.

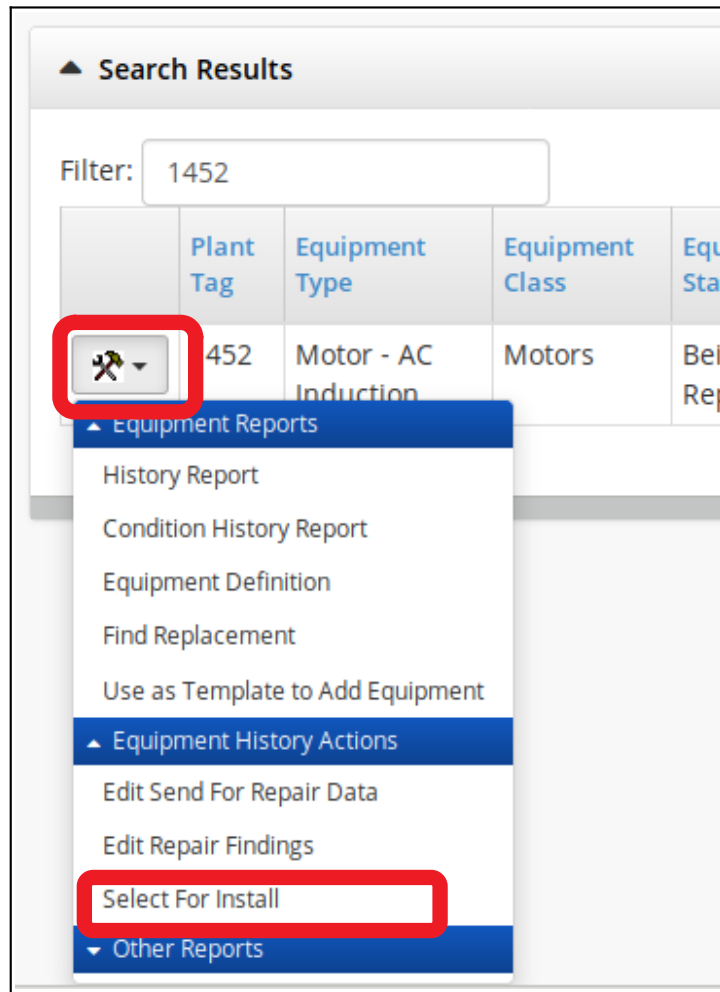


Figure 17

This will highlight the selected equipment, indicating it is ready to be installed (Fig. 18).

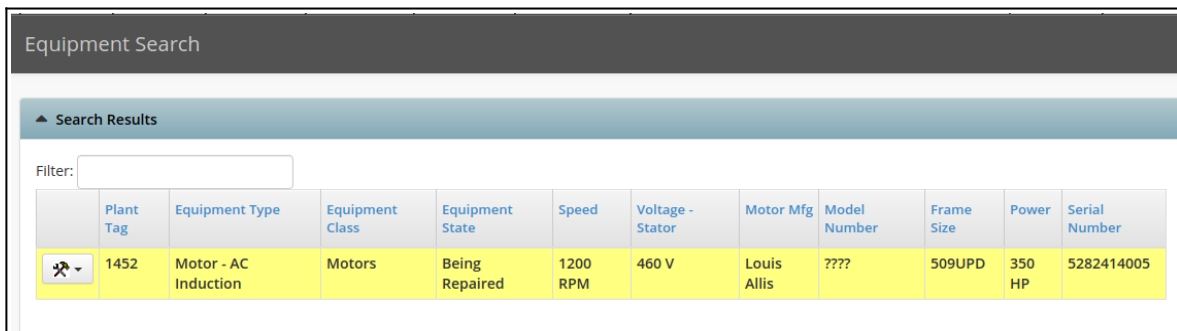


Figure 18

→ Locate the installation location in the asset tree. Note that, compared to the Circuit Breaker above, the icon color for MOTOR1 is faded, indicating that there is currently no equipment installed at this location (Figure 19).

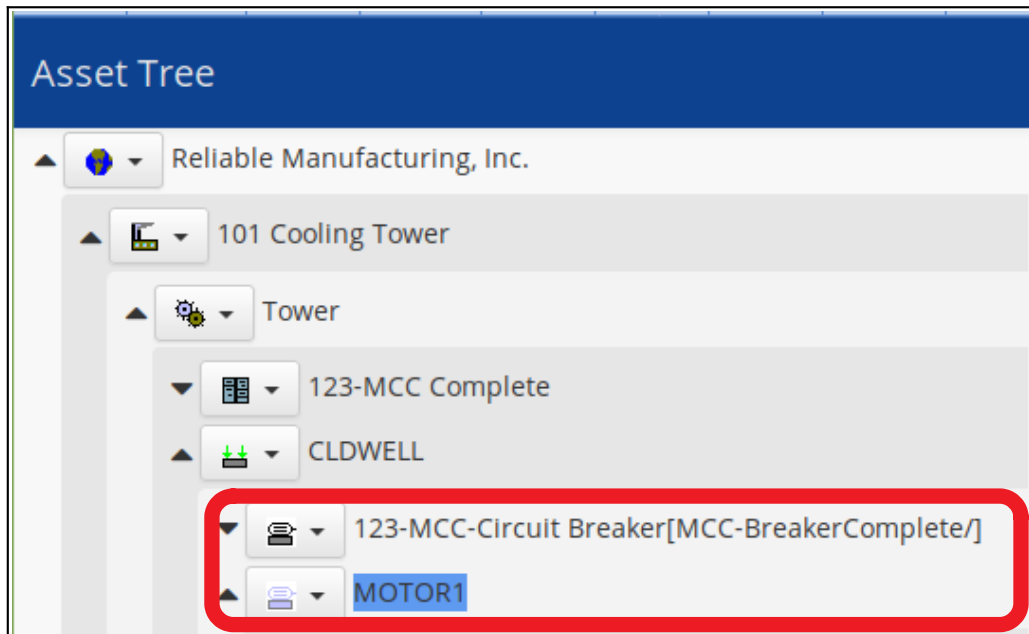


Figure 19

→ Click the arrow on the MOTOR1 icon, revealing the menu in Figure 20. Choose Install Selected Equipment.

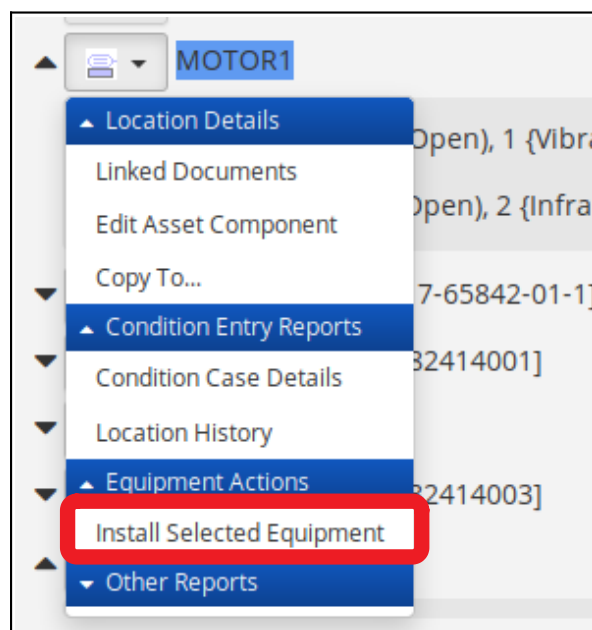


Figure 20

→ This will bring up the Equipment History Entry page (Fig. 21). You have the option to add Fault *Findings* (Fig. 22). This works the same as when adding *Suspected* Faults in Figure 8 above. In this example, the Fault was 'Drive and Bearing Failure'.

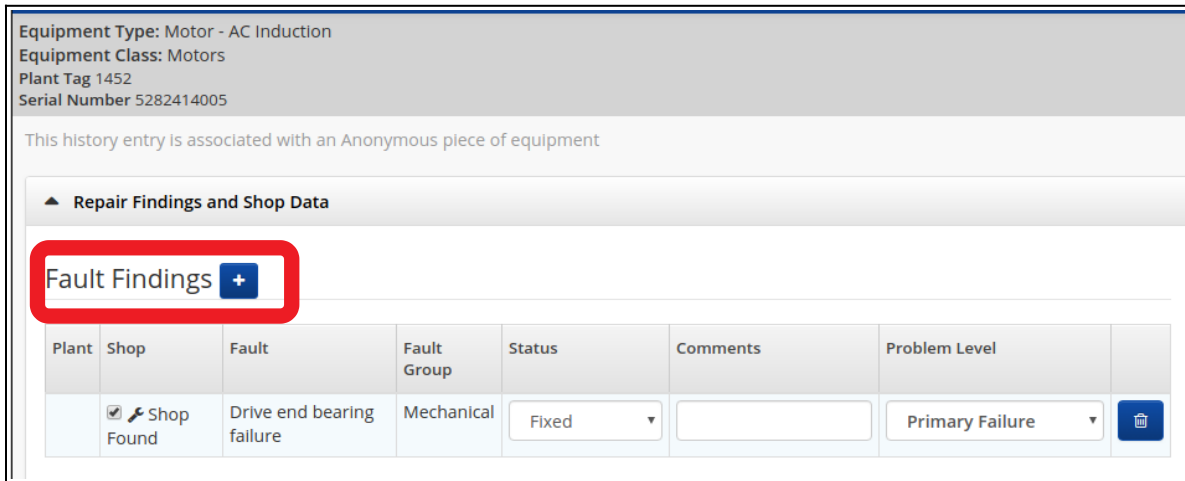


Figure 21

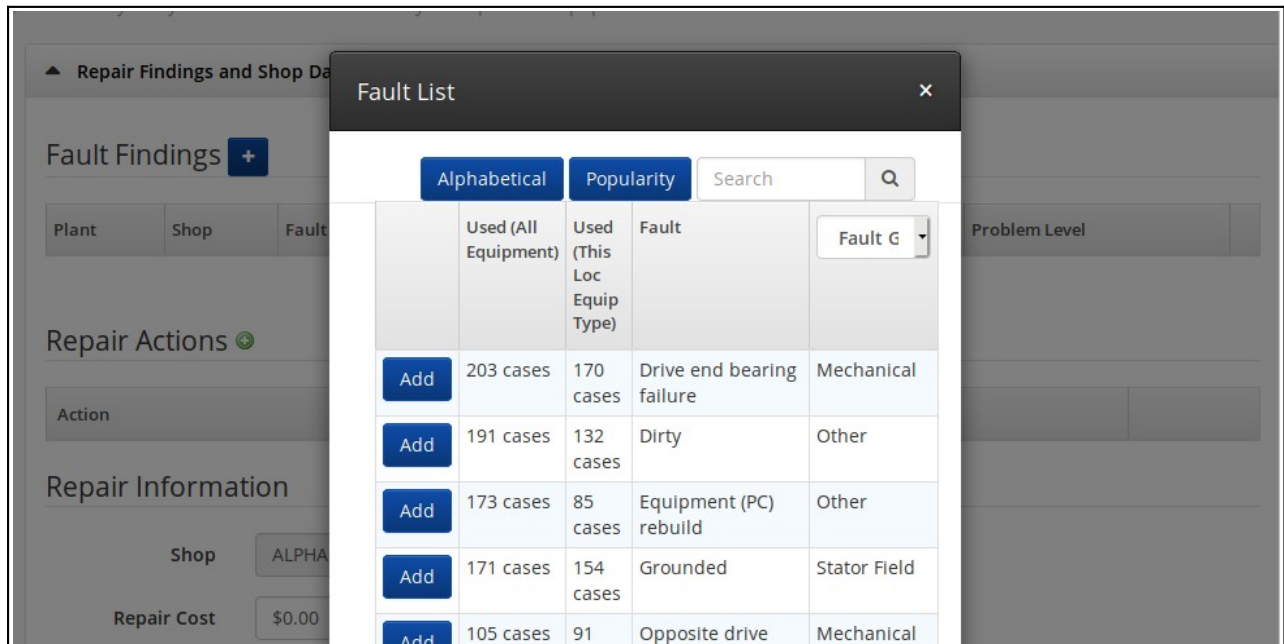


Figure 22

→ Date Returned (Fig. 23) and Install Date (Fig. 24) are required. All other fields are optional.

Repair Actions +

Action	Comments
--------	----------

Repair Information

Shop: Aluminum Specialty Repair

Repair Cost: \$0.00

Date Sent: Apr 10, 2019

Date Returned:

Warranty End Date: Date warranty ends

Installation Warranty: Days Installed *Days*

Plant PO#:

Shop Tracking#:

Send For Repair Comments

Comments on the state of the equipment when it arrived at the shop

Figure 23

Linked Documents ⚡

No linked documents are associated with this item yet.

Upload File Upload Url Upload Screenshot

Destination Location

Location: 101 Cooling Tower » Tower » CLDWELL » MOTOR1

Installation Information

Install Date: Apr 10, 2019

Installation Work Order:

Installation Remarks:

Save Rollback

Figure 24

→ Click Save (Fig. 24). This will bring up the Changes Saved page (Fig. 25). The equipment has now been returned from repair.

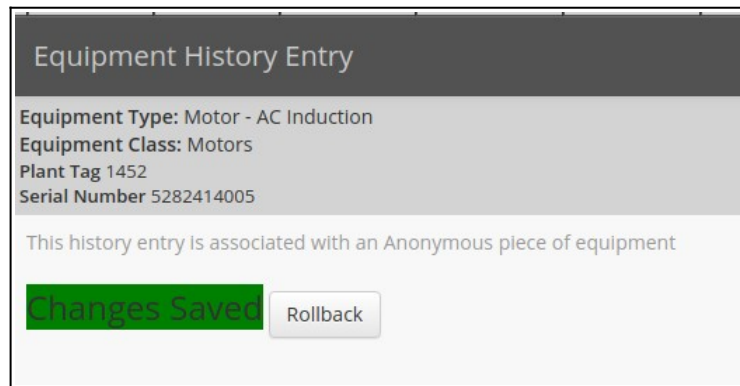


Figure 25

4. Returning and Installing Equipment Using Tango Mobile

→ If the equipment has been repaired in-house, proceed with this section. If the equipment has been repaired by an outside repair shop, skip down to "Installing Equipment from Stores or Limbo Using Tango Mobile" below.

→ Locate the equipment in Tango Mobile. First, click Search Equipment (Fig 26).



**Figure
26**

→ Once on search page, choose the Equipment Type from the list. In this case, Motors – AC Induction was chosen. For Current Equipment State, choose Being Repaired (Fig. 27).

A screenshot of a web form titled "Search Parameters" with a small upward-pointing triangle icon to the left. Below the title is a section labeled "General". There are two input fields: "Equipment Type" with a dropdown menu showing "Motor - AC Induction (Motors)", and "Current Equipment State" with a dropdown menu showing "Being Repaired".

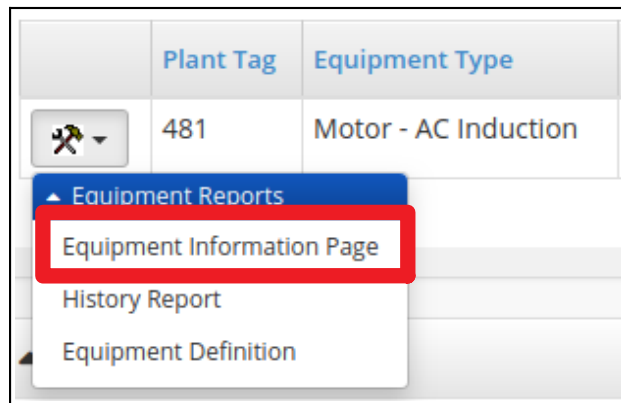
**Figure
27**

→ This will bring up a list of equipment currently being repaired. You may use the filter by typing in the plant tag or other information (Fig 28).

A screenshot of a web page showing search results. At the top, it says "Search Results (11 matches)". Below this is a filter input field with the text "Filter: 481". Below the filter is a table with 12 columns: Plant Tag, Equipment Type, Equipment Class, Equipment State, Speed, Voltage - Stator, Motor Mfg, Model Number, Frame Size, Power, and Serial Number. The first row of data has the following values: 481, Motor - AC Induction, Motors, Being Repaired, 1200 RPM, 460 V, Reliance, 38J7293, 365TD, 30 HP, and 1MAF50512-G1-SR.

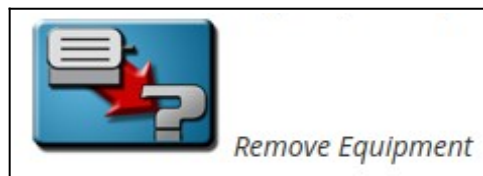
**Figure
28**

→ After locating the equipment, click the action menu to the left, and choose Equipment Information Page (Fig. 29).



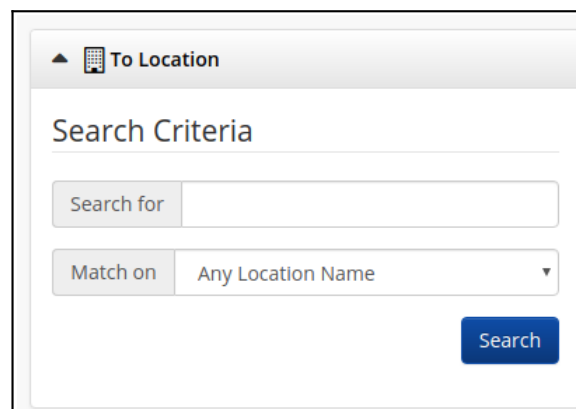
**Figure
29**

→ On the Equipment Information Page, choose Remove Equipment (Fig. 30).



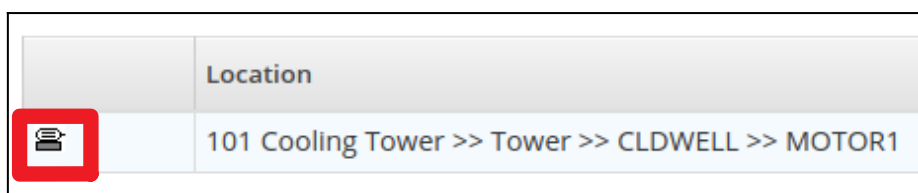
**Figure
30**

→ Next, search for the location where you want to install the equipment (Fig. 31).



**Figure
31**

→ Locate the location where the equipment is to be installed, and click the icon to the left (Fig. 32).



**Figure
32**

→ This will bring up the Equipment History Entry page. If you need to add fault findings, click the + icon (Fig. 33).

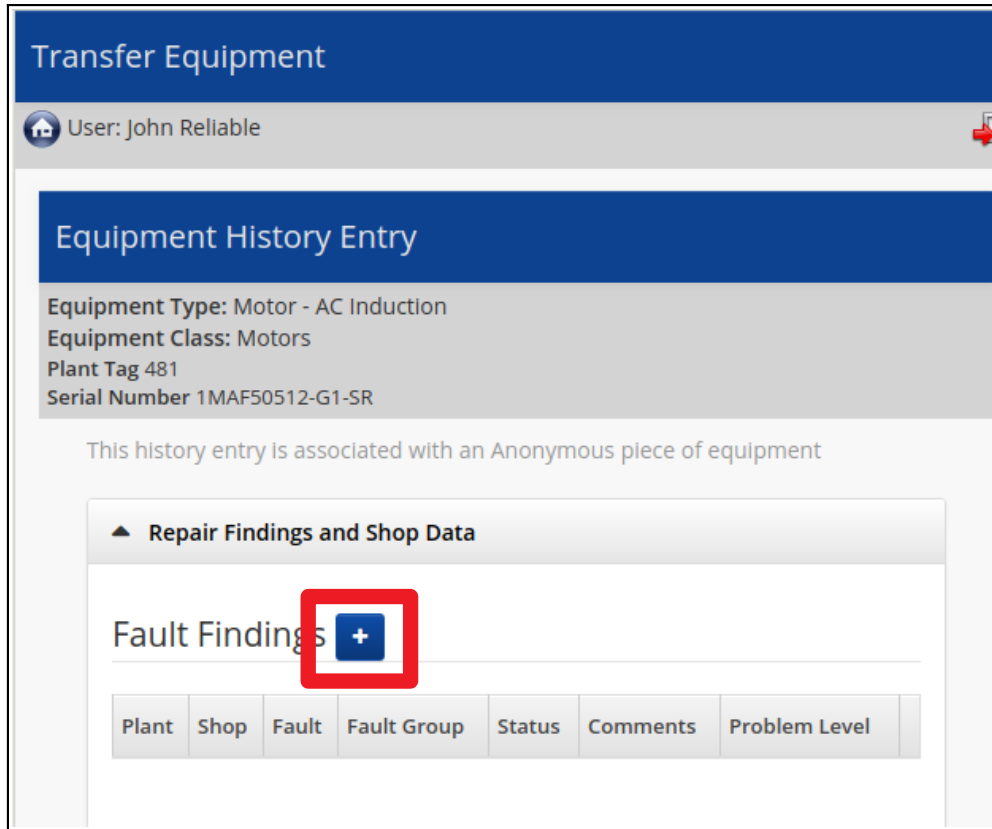


Figure 33

→ On the Faults List page, search for the appropriate fault and click Add (Fig. 34).

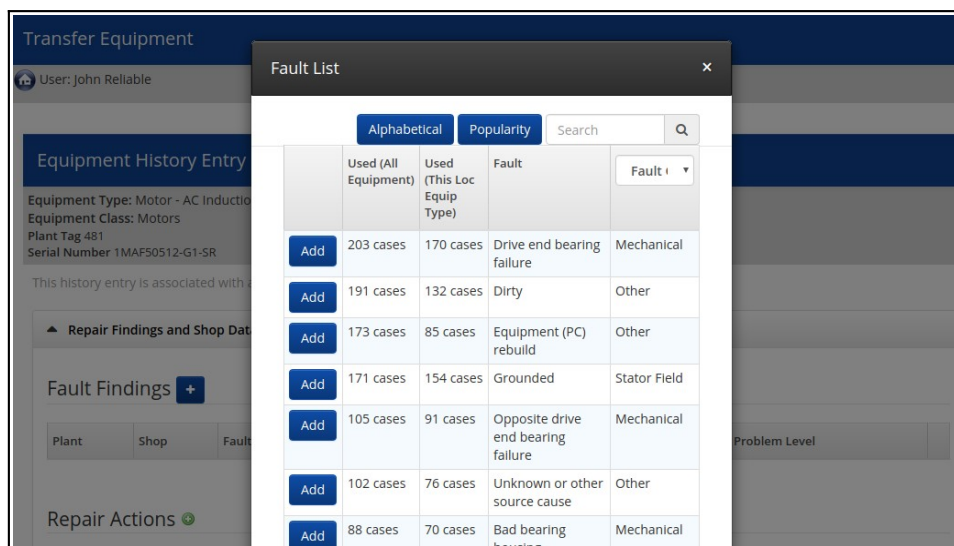
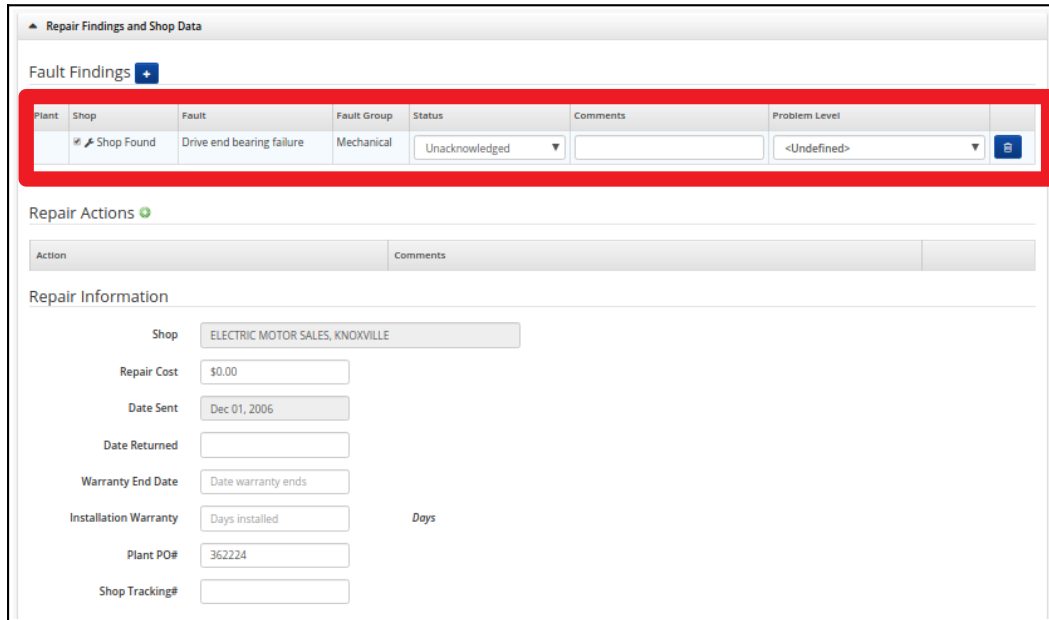


Figure 34

→ The added fault is now visible in the Fault Findings section (Fig. 35). Below you may add Repair Actions or Repair Information. Date Returned is required. All other information is optional.



Plant	Shop	Fault	Fault Group	Status	Comments	Problem Level
	Shop Found	Drive end bearing failure	Mechanical	Unacknowledged		<Undefined>

Repair Information

Shop: ELECTRIC MOTOR SALES, KNOXVILLE

Repair Cost: \$0.00

Date Sent: Dec 01, 2006

Date Returned:

Warranty End Date: Date warranty ends

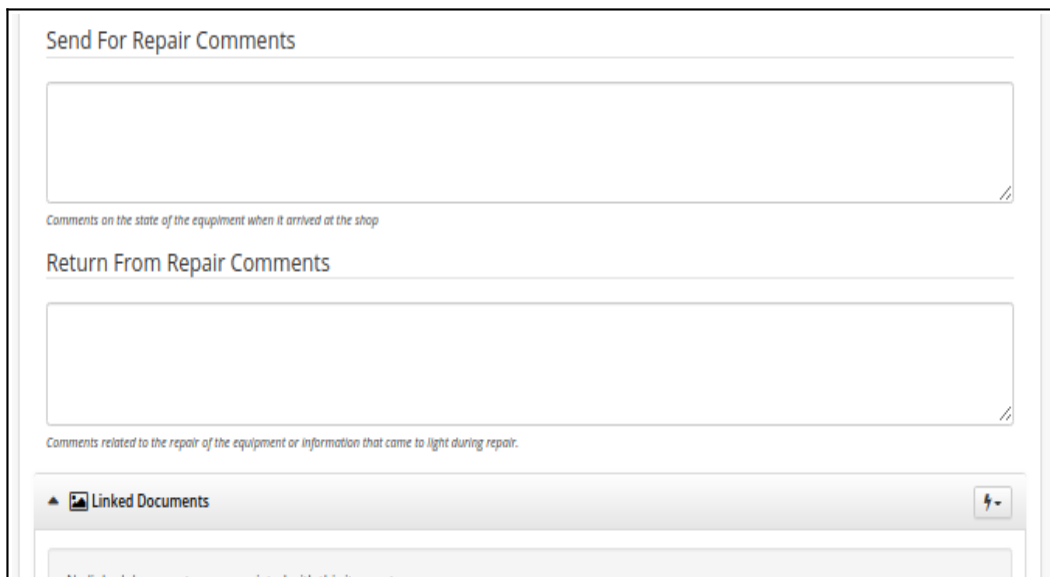
Installation Warranty: Days installed Days

Plant PO#: 362224

Shop Tracking#:

Figure 35

→ You may also add comments or linked documents (Fig. 46).



Send For Repair Comments

Comments on the state of the equipment when it arrived at the shop

Return From Repair Comments

Comments related to the repair of the equipment or information that came to light during repair.

Linked Documents

Figure 36

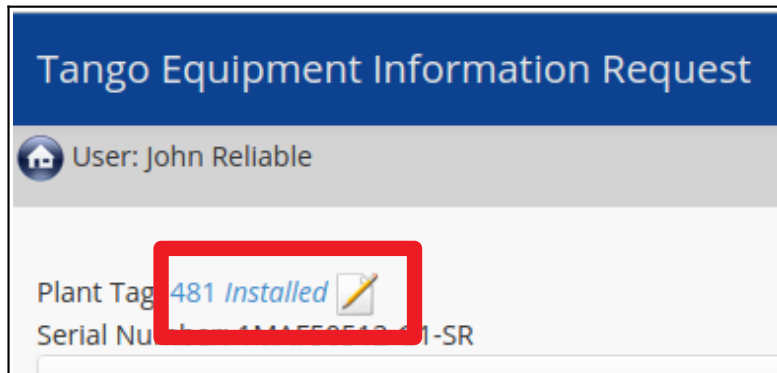
→ Lastly, you may add work order information and Installation Remarks (Fig. 37). Click Save.



The screenshot shows a web form with three main input fields: 'Install Date' with a date picker set to 'May 31, 2019', 'Installation Work Order' with an empty text box, and 'Installation Remarks' with a large empty text area. At the bottom left, there are two buttons: 'Save' and 'Back'. The 'Save' button is highlighted with a red rectangular box.

**Figure
37**

→ The equipment is now installed (Fig. 38).



The screenshot displays the 'Tango Equipment Information Request' page. At the top is a blue header with the title. Below it is a grey bar showing the user 'John Reliable'. The main content area shows 'Plant Tag 481 Installed' with a pencil icon next to it, and 'Serial Number 1M1550512-01-SR'. A red rectangular box highlights the '481 Installed' text and the pencil icon.

**Figure
38**

5. Installing Equipment from Stores or Limbo Using Tango

- Search for the item using the search box in the upper right.
- Click the [...] to the right of the search box to bring up the options menu.
- Choose All Equipment search by equipment name/number (Fig. 39).

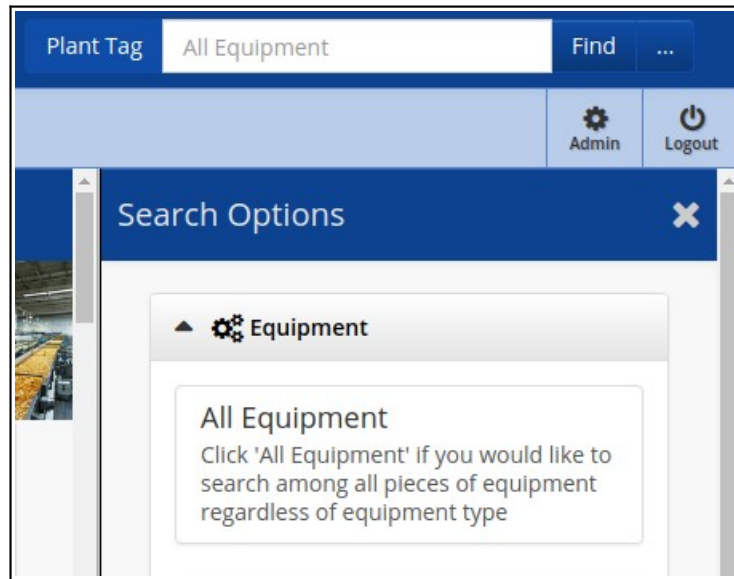
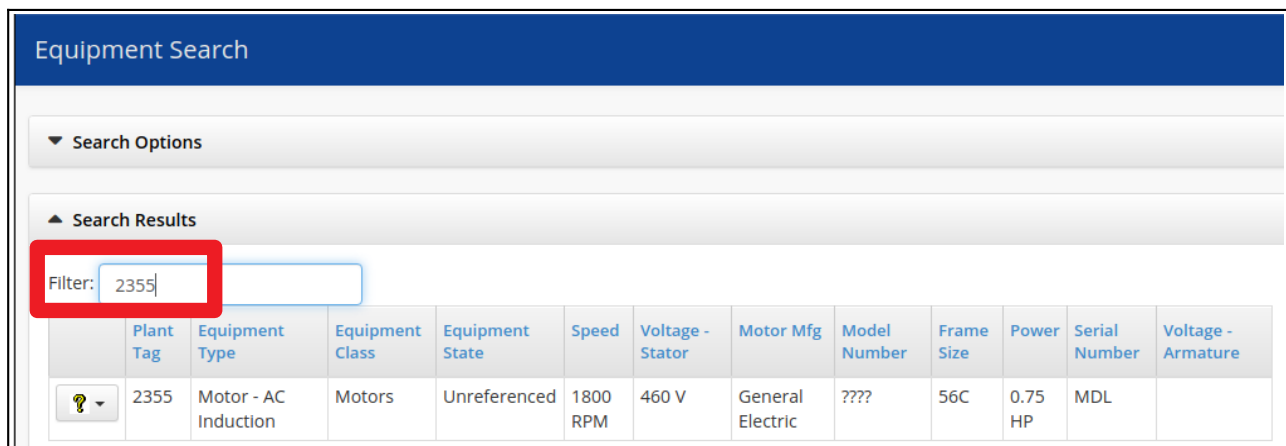



Figure 39

- When the results appear, type any information into the 'filter' box to narrow the results. The Plant Tag is usually available and will provide the best results (Fig 40).

The screenshot shows the 'Equipment Search' results page. At the top, there is a 'Search Options' dropdown menu. Below it is a 'Search Results' section with a 'Filter:' input box containing the value '2355'. Below the filter is a table with the following data:

	Plant Tag	Equipment Type	Equipment Class	Equipment State	Speed	Voltage - Stator	Motor Mfg	Model Number	Frame Size	Power	Serial Number	Voltage - Armature
	2355	Motor - AC Induction	Motors	Unreferenced	1800 RPM	460 V	General Electric	????	56C	0.75 HP	MDL	

- When the search results appear, choose the icon next to the equipment to be repaired (Fig. 41). Under Equipment History Actions, choose Select for Install.

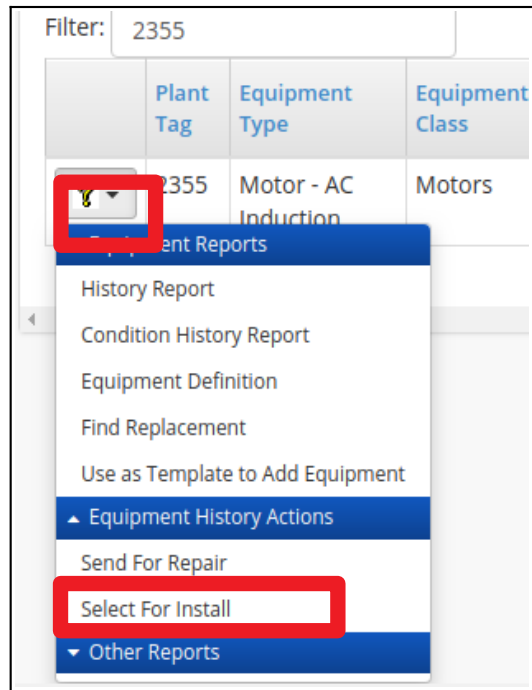


Figure 41

→ This will highlight the item, indicating it is ready to be installed (Fig. 42).

▲ Search Results

Filter: 2355

	Plant Tag	Equipment Type	Equipment Class	Equipment State	Speed	Voltage - Stator	Motor Mfg	Model Number	Frame Size	Power	Serial Number	Voltage - Armature
?	2355	Motor - AC Induction	Motors	Unreferenced	1800 RPM	460 V	General Electric	???	56C	0.75 HP	MDL	

Figure 42

→ Locate the equipment in the asset tree. Note that, compared to MOTOR3 above, the icon color for MOTOR4 is faded, indicating that there is currently no equipment installed at this location (Figure 43).

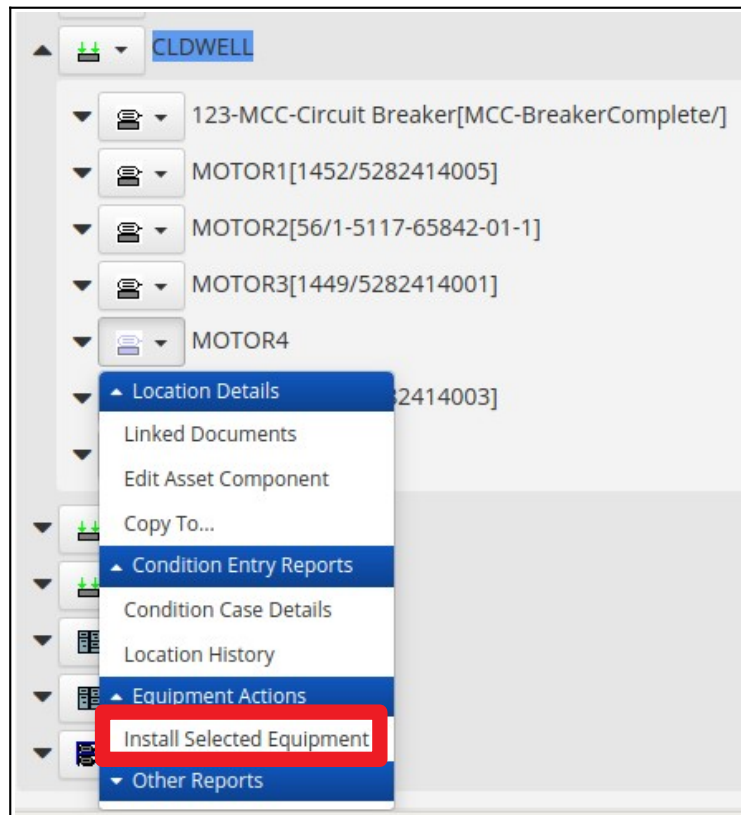


Figure 43

→ This will bring up the Equipment History Entry page (Fig. 44). Install Date is required. Other fields are optional. Click Save when you are done.

Equipment History Entry

Equipment Type: Motor - AC Induction
Equipment Class: Motors
Plant Tag 2355
Serial Number MDL

This history entry is associated with an Anonymous piece of equipment

▲ Equipment in Limbo

This piece of equipment is currently in 'Limbo'. This means that it is not installed, not being repaired, not being purchased, and has not been scrapped. In other words we don't know where it is or what it is doing.

▲ Destination Location

Location: 101 Cooling Tower » Tower » CLDWELL » MOTOR4

Installation Information

Install Date

May 30, 2019

Installation Work Order

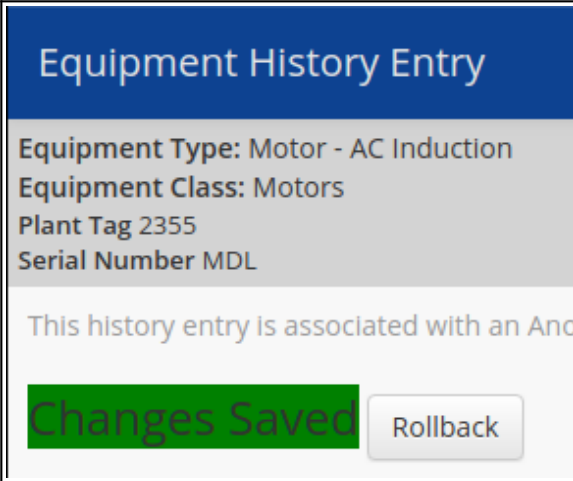
Installation Remarks

Save

Rollback

Figure 44

→ This will bring up the Changes Saved page. The equipment has now been installed (Fig. 45).



The image shows a software dialog box titled "Equipment History Entry". It has a blue header bar with the title in white. Below the header, there is a grey section containing the following text: "Equipment Type: Motor - AC Induction", "Equipment Class: Motors", "Plant Tag 2355", and "Serial Number MDL". Below this grey section, there is a white section with the text "This history entry is associated with an Ano". At the bottom of the dialog, there is a green button labeled "Changes Saved" and a grey button labeled "Rollback".

Figure 45

6. Installing Equipment from Stores or Limbo Using Tango Mobile

→ Locate the equipment in Tango Mobile. First, click Search Equipment (Fig 46).



Figure 46

→ When the search box appears, choose the Equipment Type (Motor – AC Induction in this example). Then choose In Spares or Repaired(Still in Limbo) for the Current Equipment State (Fig. 47).

A dialog box titled "Search Parameters" with a "General" section. It contains two dropdown menus: "Equipment Type" set to "Motor - AC Induction (Motors)" and "Current Equipment State" set to "Repaired (Still in Limbo)".

Search Parameters	
General	
Equipment Type	Motor - AC Induction (Motors)
Current Equipment State	Repaired (Still in Limbo)

Figure 47

→ Use the plant tag or other information to filter the results list, then click the icon in the left column (Fig. 48).

A table showing search results for "2355". The first row is highlighted, and a red box is drawn around the question mark icon in the left column.

Search Results (205 matches)												
												Filter:
												2355
	Plant Tag	Equipment Type	Equipment Class	Equipment State	Speed	Voltage - Stator	Motor Mfg	Model Number	Frame Size	Power	Serial Number	Voltage - Armature
	355	Motor - AC Induction	Motors	Unreferenced	1800 RPM	460 V	General Electric	????	56C	0.75 HP	MDL	

Figure 48

→ This will reveal the menu. Choose Equipment Information Page from the menu (Fig. 49).

	Plant Tag	Equipment Type	Equipment Class
?	2355	Motor - AC Induction	Motors

Equipment Reports

Equipment Information Page

History Report

Equipment Definition

Figure 49

→ Choose Remove Equipment (Fig. 50)



Figure 50

→ Choose To Location. Enter search criteria and click Search (Fig. 51).

▲ To Location

Search Criteria

Search for

Match on

Figure 51

→ Find the location in the search results and click the icon at the left (Fig. 52).

Location	
	101 Cooling Tower >> Tower >> CLDWELL >> MOTOR6

Figure 52

→ On the Installation Information page, you may enter an Installation Work Order number or Installation Remarks. Click Save (Fig. 53).

Installation Information

Install Date
May 31, 2019

Installation Work Order

Installation Remarks

Save Rollback

**Figure
53**

→ The equipment has now been installed (Fig. 54).

Plant Tag: 2355 *Installed*

Serial Number: MDL

▼ Equipment Properties

▲ Location Info

101 Cooling Tower >> Tower >> CLDWELL >> MOTOR6
Installed On: May 31, 2019

**Figure
54**

Appendix A: Overview of Equipment Locations

→ Equipment may exist in any of the equipment states shown in Figure A-1. The states used most often, and referenced in this guide, include:

- **Installed** – The equipment is currently installed in a functional location.
- **Being Repaired** – The equipment is out for repair, either at an outside repair facility or in-house.
- **In Spares** – The equipment is currently in spares and ready to be installed.
- **Repaired (Still in Limbo)** – The equipment has been repaired, but has not yet been assigned to a location or spares.

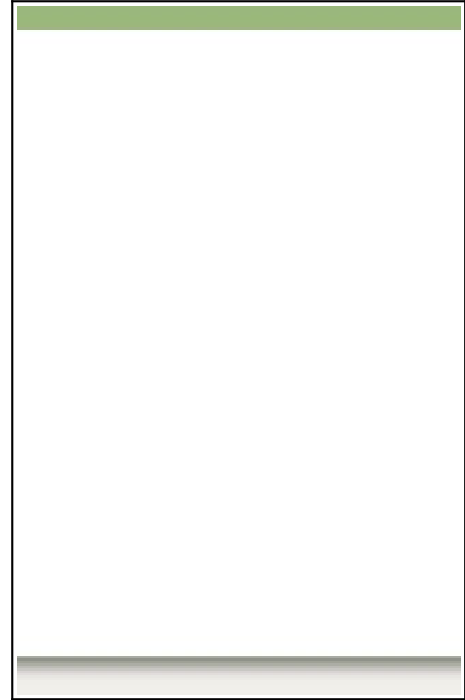


Figure A-1

Appendix B: Anonymous Equipment

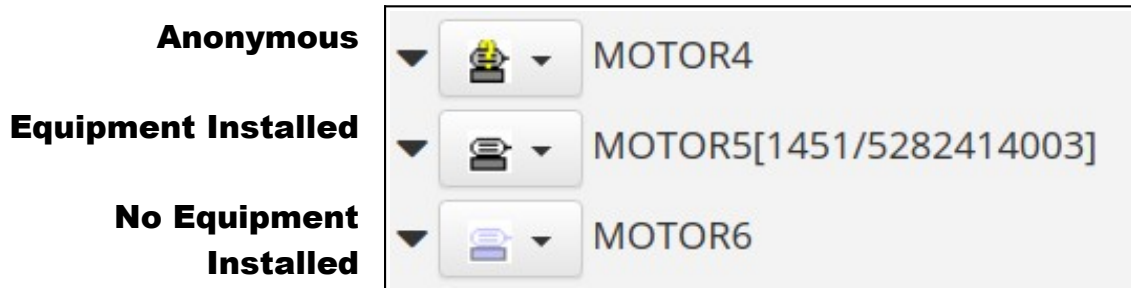


Figure B-1

→ Equipment may be in one of three different states shown in Figure B-1. In this example, MOTOR5 has a piece of equipment installed, as indicated by the filled-in icon and the equipment information in brackets after the name. The MOTOR6 location has no equipment installed, as indicated by the faded (“ghost”) icon. The MOTOR4 location, however, has a question mark (“?”) over the icon. This indicates anonymous equipment is installed at this location.

→ Anonymous equipment may be installed as a placeholder, so that location can still be part of process parameter routes or Condition Assessment Tasks.

→ You may install equipment to a location that has anonymous equipment installed. The process is much the same as installing to an empty location, but you will be presented with two options before proceeding (Fig. B-2).

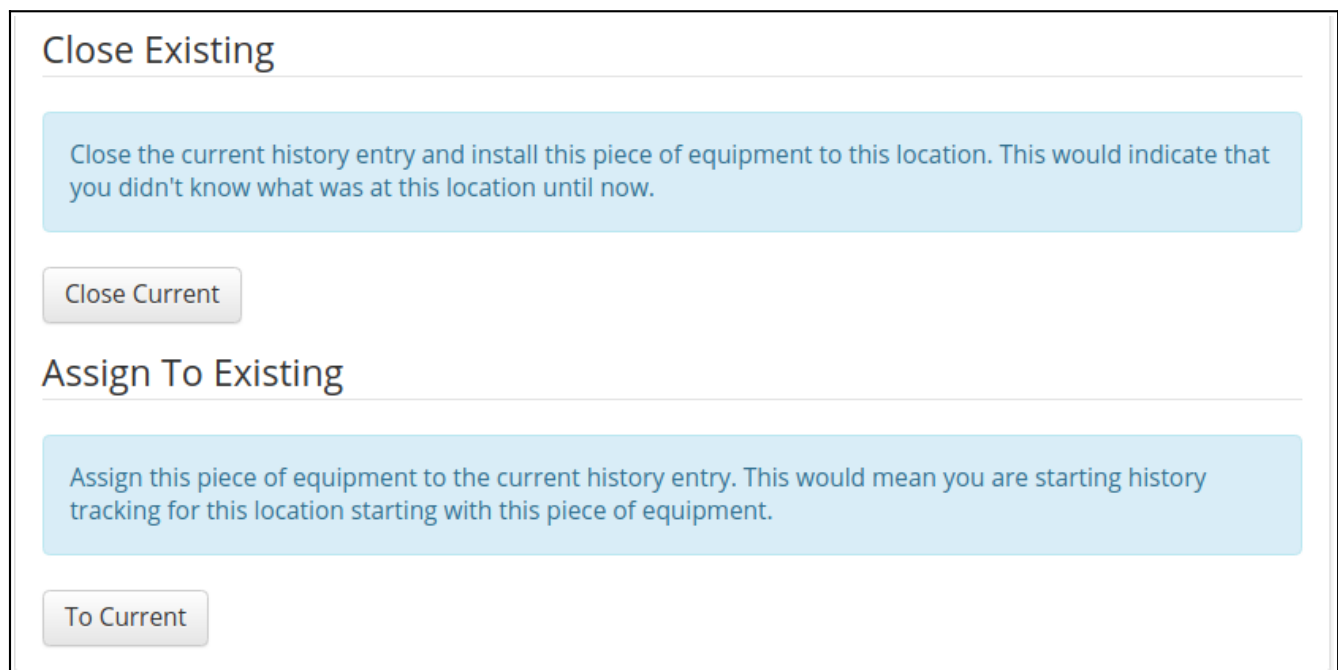


Figure B-2

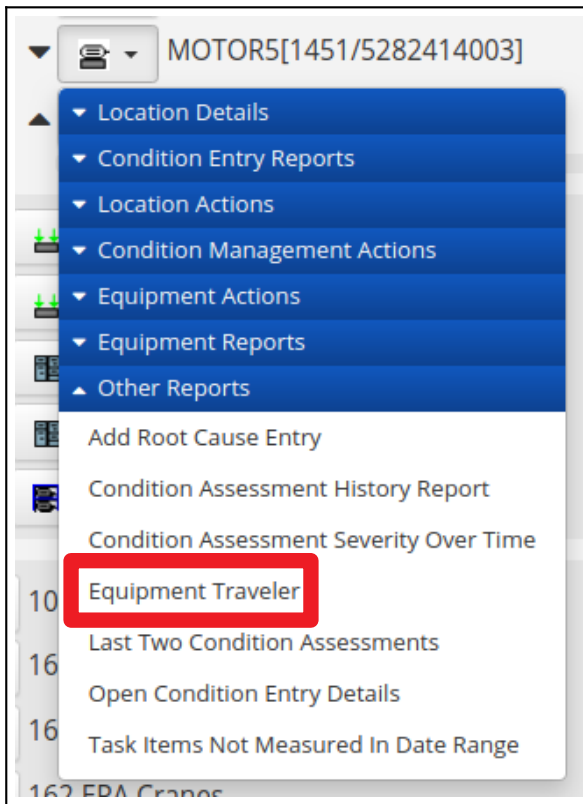
→ Choose "Close Existing" if you wish to close the equipment history associated with the anonymous equipment and install the new equipment.

→ You will be required to enter an equipment removal date for the anonymous equipment. Click Save and then proceed with the installation as described in Sections 3-6 above.

→ Choose "Assign to Existing" if you wish to add the equipment to the existing history entry.

→ Proceed as shown in Sections 3-6 above.

Appendix C: Equipment Traveler



→ By clicking the drop-down menu next to any piece of equipment and choosing "Equipment Traveler" (Fig. C-1), you will be presented with a QR code specific to that piece of equipment (Fig. C-2).

→ This QR code can be printed and attached to the equipment or placed with the paperwork. Any mobile device can be used to scan the QR code, presenting the user with the Equipment Properties page for that piece of equipment.

Figure C-1

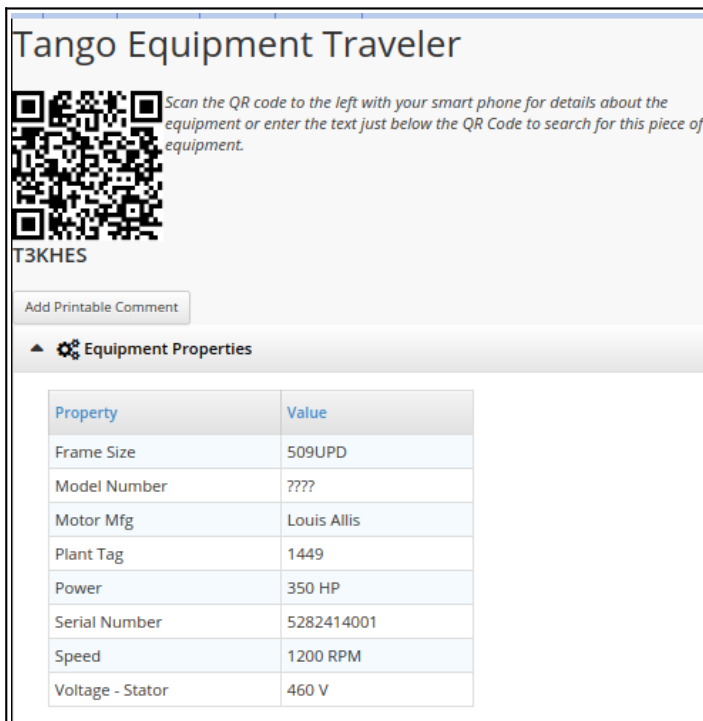


Figure C-2