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## E. Electrical Modules—Servo Module

### 1. Product Overview

A servo module is provided on the Tool Changer to pass electrical power and servo signal connections to a servomotor. When the modules are coupled, the V-ring seal forms a water resistant but not waterproof seal around the pin block.

Compliant spring pins are provided on the Master and fixed contact pins on the Tool. To avoid unintentional human contact, the Master spring pins are recessed below an insulated surface on both the power and signal circuits.

The power and signal circuits are electrically isolated from each other and the Tool Changer. Critical wiring has EMI/RF shielding to protect it from interference.

On the pin blocks, the central pin is first-to-mate and last-to-break during a tool change. For safety, this pin should be used as a designated ground.



**CAUTION:** Never couple or uncouple the servo modules unless electrical power has been disconnected and discharged both upstream and downstream from the modules. Arcing and contact damage occur during coupling or uncoupling if power is not removed and discharged. Always disconnect and discharge power from upstream and downstream of the modules before coupling or uncoupling.

Various types of servo modules can be used on Tool Changers or Utility Couplers. To be installed on a particular Tool Changer or Utility Coupler, servo modules have different styles of mounting patterns. The type and style are included in the ATI part number. The general part numbering convention is covered in the following table. At the bottom of the table, example part numbers are provided for reference. For more information, contact an ATI representative or go to the [ATI website](#).

Table 1.1—General Part Numbering Scheme For Servo Modules: 912X-Y-Z						
912X		-	Y		-	Z
X signifies the product line		-	Y signifies a common prefix for a type of servo module		-	Z signifies the side of the Tool Changer or Utility Coupler
X	Description	-	Y	Style	-	Z Description
0	Standard Tool Changer	-	REP, SE, ES	J16 Mount ( <a href="#">Section 1.3—Standard Tool Changer Modules</a> )	-	M T Master Tool
1	Heavy Duty Tool Changer	-	EA, EB, EC, ED, EF, EG, EJ, EL, EP	Ledge Mount ( <a href="#">Section 1.1—Ledge Mount Modules</a> )	-	M T Master Tool
			EN	Rail Assembly Mount ( <a href="#">Section 1.2—Rail Mount Modules</a> )		M T Master Tool

**Examples:**

9121-EA12-M signifies a Heavy Duty Tool Changer standard ledge mount Master module.

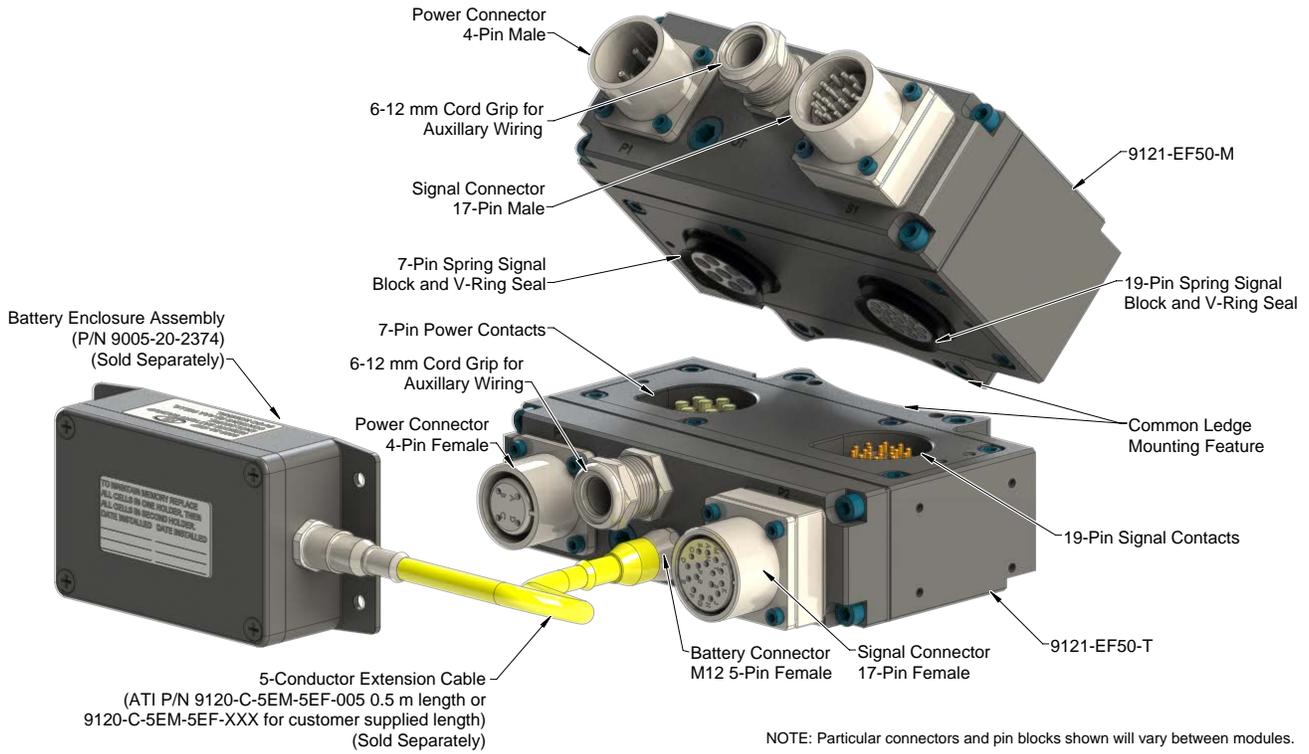
9121-EN56-M signifies a Heavy Duty Tool Changer, rail assembly mount Master module.

9120-REP10-T signifies a Standard Tool Changer J16 mount Tool module.

## 1.1 Ledge Mount Modules

Ledge-mount servo modules are compatible with ATI's Heavy Duty Tool Changer and some of the Utility Coupler series and do not require an adapter. At times, ATI's servo tool modules may have a connection for a battery back-up, for which ATI can supply a battery adapter assembly. For a list of ledge-mount servo modules and their compatible Tool Changers, visit the [ATI website](#).

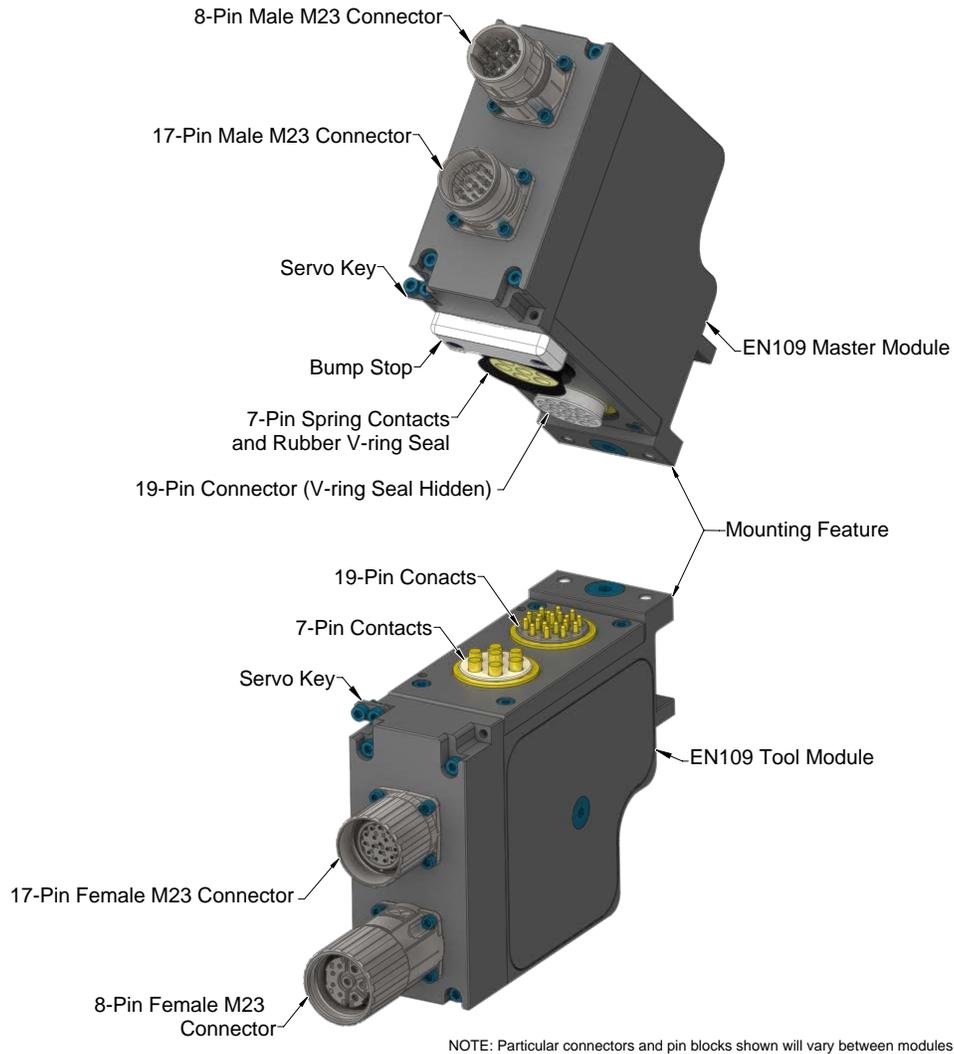
**Figure 1.1—Servo Module With a Ledge Mount (EF50 Module Shown)**



## 1.2 Rail Mount Modules

Rail-mount modules are compatible with ATI's Heavy Duty Tool Changer and some of the Utility Coupler series. These modules, which typically have the prefix *EN*, require the use of a rail adapter (reference [Figure 1.3](#)). Its narrow housing and use of a rail adapter allow customers to mount multiple servo modules on a single side of the Tool Changer. For a list of rail-mount servo modules and their compatible Tool Changers, visit the [ATI website](#).

**Figure 1.2—Servo Module with a Rail Assembly Mount (EN109 Module Shown)**

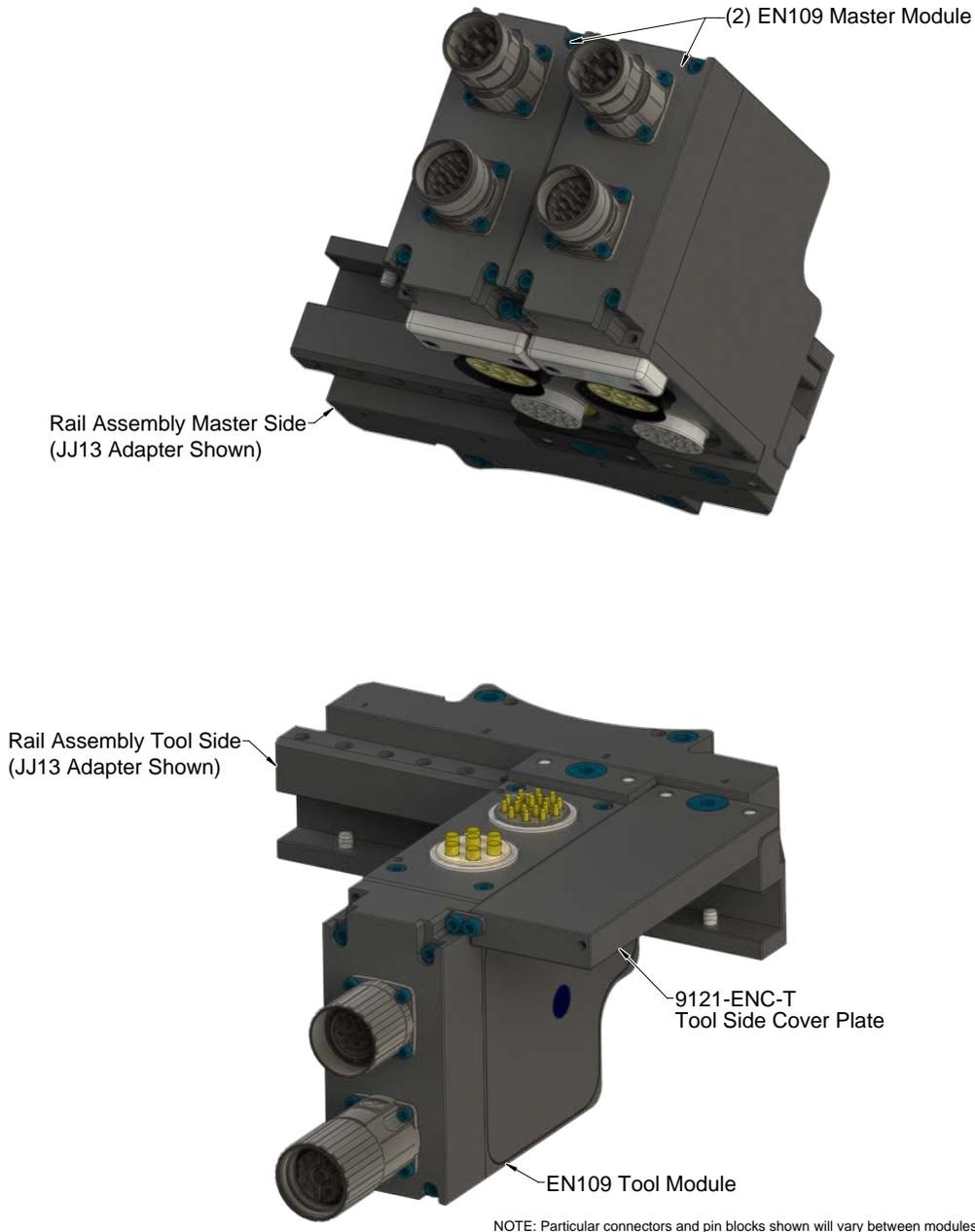


### 1.2.1 Rail Assembly and Tool Side Cover

A mounting rail is used to attach the rail-mount modules to the Tool Changer. A symmetric mounting pattern on the mounting rail allows the customer to position servo modules where they best fit the application. This modular design also allows for ease of maintenance when servo modules must be repaired or replaced.

When an EN module is not used on the Tool side, a tool cover assembly (P/N 9121-ENC-T) may be supplied (sold separately) to protect the Master side servo module from dust, debris, and weld spatter.

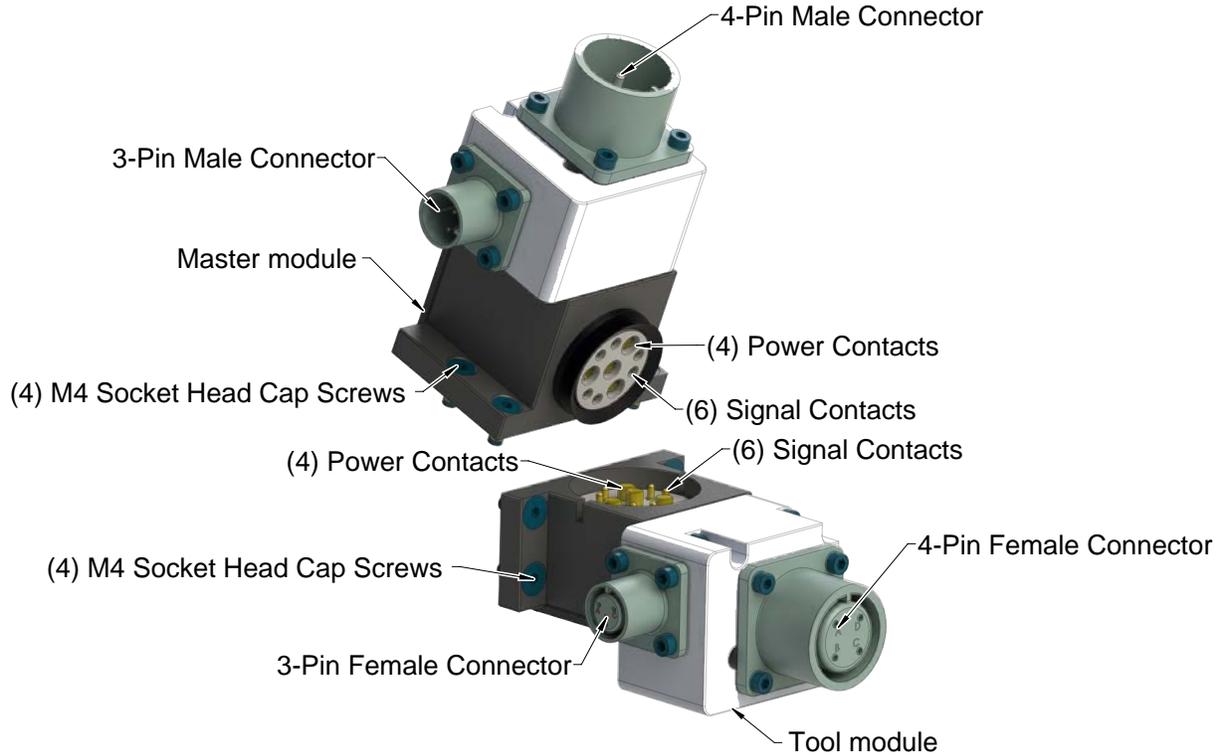
**Figure 1.3—Rail Assemblies (4 position shown) and Tool Side Cover**



### 1.3 Standard Tool Changer Modules

ATI offers a selection of servo modules compatible with its Standard Tool Changer series and most mount directly to a Tool Changer with a J16 mounting pattern. However, some of ATI's standard Tool Changer servo modules require the use of a JLx adapter (reference [Section 2.3.2—JLX Adapter Plate \(With ES Modules\) and Standard J16 Mounting Pattern](#)). For a list of standard Tool Changer servo modules and their compatible Tool Changers, visit the [ATI website](#).

**Figure 1.4—Servo Module for Standard Tool Changers**



NOTE: Particular connectors and pin blocks shown will vary between modules.

## 2. Installation

The servo modules are typically installed onto the Tool Changers or Utility Couplers by ATI prior to shipment. Installation and removal procedures are outlined in the following sections.

For wiring information refer to the module drawing.



**WARNING:** Do not perform maintenance or repair(s) on the Tool Changer or modules unless the Tool is safely supported or placed in the tool stand, all energized circuits (for example: electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer specific safety practices and policies. Injury or equipment damage can occur with the Tool not placed and energized circuits on. Place the Tool in the tool stand, turn off and discharge all energized circuits, purge all pressurized connections, and verify all circuits are de-energized before performing maintenance or repair(s) on the Tool Changer or modules.



**CAUTION:** Thread locker applied to fasteners must not be used more than once. Fasteners might become loose and cause equipment damage. Always apply new thread locker when reusing fasteners.

### 2.1 Installation of Ledge Mount Modules

#### 2.1.1 Module Installation

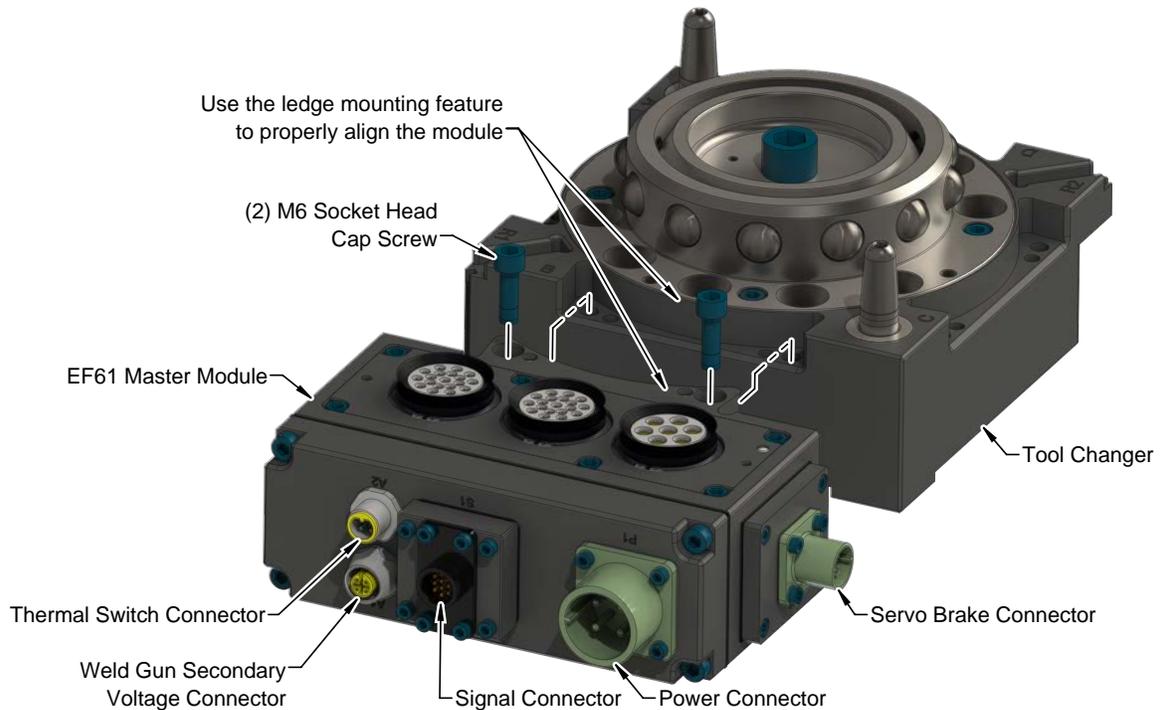
Refer to [Figure 2.1](#).

**Tools required:** 5 mm hex key, torque wrench

**Supplies required:** Clean rag, Loctite® 242

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Wipe down the mounting surfaces with a clean rag.
5. Place the module into the appropriate location on the Tool Changer or Utility Coupler.
6. Apply Loctite 242 to the supplied M6 socket head cap screws.
7. Install the (2) M6 socket head cap screws and secure the module to the Tool Changer or Utility Coupler using a 5 mm hex key. Tighten to 70 in-lbs (7.9 Nm).
8. Ensure the power, signal, auxiliary, and other connectors are clean and properly connected to the module.
9. Safely resume normal operation.

**Figure 2.1—Ledge Mount Module Installation  
(EF61 Module Shown For Reference)**



### 2.1.2 Module Removal

*Tools required:* 5 mm hex key

*Supplies required:* paint marker

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Use a paint marker to indicate where the module is to be re-installed.
5. Disconnect all connections (for example: power, signal, and auxiliary) to the module.
6. Remove the (2) M6 socket head cap screws using a 5 mm hex key.
7. Remove the module.

## 2.2 Installation of Rail Assembly Mount Modules

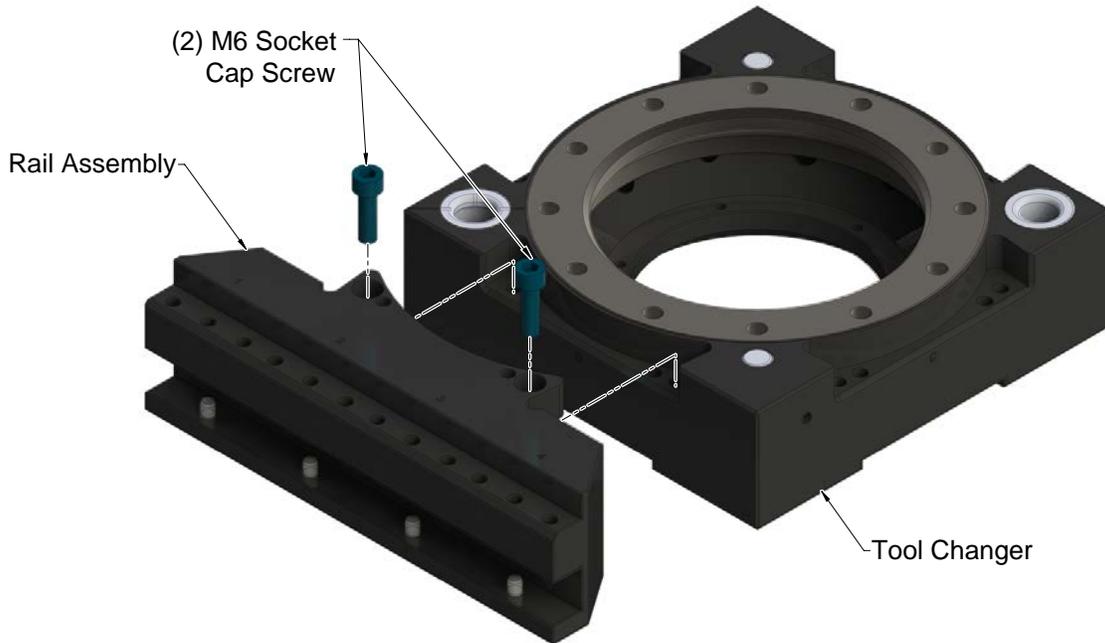
### 2.2.1 Installation of the Rail Assembly To a Ledge Mount

*Tools required:* 5 mm hex key, torque wrench

*Supplies required:* clean rag, Loctite® 242

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Wipe down the mounting surfaces with a clean rag.
5. Place the rail assembly into the appropriate location on the Tool Changer or Utility Coupler.
6. Apply Loctite 242 to the supplied M6 socket head cap screws.
7. Install the (2) M6 socket head cap screws and secure the rail assembly to the Tool Changer or Utility Coupler using a 5 mm hex key. Tighten to 70 in-lbs (7.9 Nm).
8. Safely resume normal operation.

**Figure 2.2—Rail Assembly Installation**



### 2.2.2 Removal of the Rail Assembly From a Ledge Mount

*Tools required:* 5 mm hex key

*Supplies required:* paint marker

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Use a paint marker to indicate where the rail assembly is to be re-installed.
5. Remove the (2) M6 socket head cap screws using a 5 mm hex key.
6. Remove the rail assembly.

### 2.2.3 Module Installation

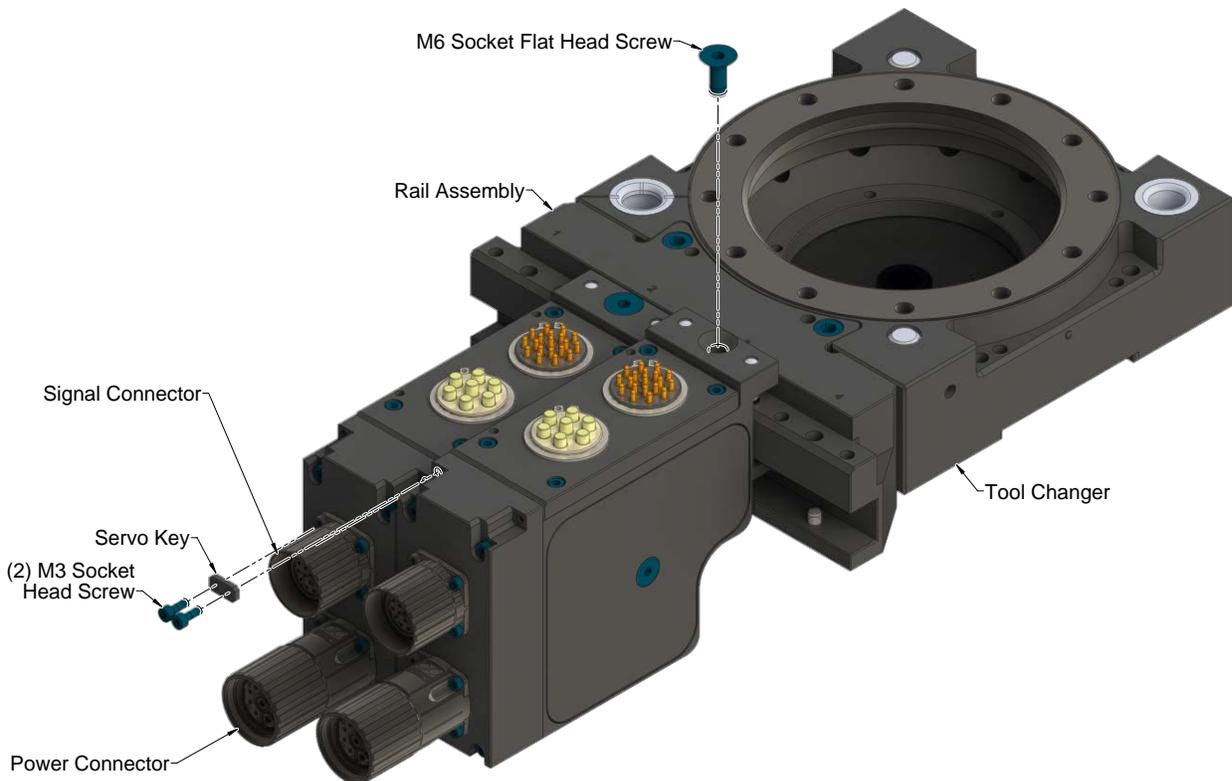
If rail assembly is not already installed on Tool Changer, refer to [Section 2.2—Installation of Rail Assembly Mount Modules](#). Refer to [Figure 2.3](#) for installation and removal of the module(s).

**Tools required:** 2.5 mm and 4 mm hex key, torque wrench

**Supplies required:** Clean rag, Loctite® 242 and 222

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Wipe down the mounting surfaces with a clean rag.
5. Place the module onto the rail assembly.
6. Apply Loctite 242 to the M6 socket flat head cap screw.
7. Using the 4 mm hex key, secure the module to the rail assembly with a M6 socket flat head cap screw. Torque to 44 in-lb (5 Nm).
8. Apply Loctite 222 to the M3 socket head cap screw.
9. Using the 2.5 mm hex key, secure the servo module to adjacent modules using servo key plate(s) and (2) M3 socket head cap screws. Torque screws 12 in-lb (1.3 Nm).
10. Ensure the power, signal, auxiliary, and other connectors are clean and connect to the module.
11. Safely resume normal operation.

**Figure 2.3—Rail Assembly Module Installation (EN109 Module Shown For Reference)**



## 2.2.4 Module Removal

*Tools required:* 2.5 mm and 4 mm hex key, paint marker

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Use a paint marker to indicate where the module is to be re-installed.
5. Using the 2.5 mm hex key, remove the M3 socket head cap screws and servo key plate(s) securing the module to adjacent module(s).
6. Using the 4 mm hex key, remove the M6 socket flat head cap screw securing the module to the rail assembly.
7. Lift the module up until it clears the pin and remove from the rail assembly.

## 2.3 Installation of Standard Tool Changer Modules

### 2.3.1 Standard J16 Mounting Pattern

#### 2.3.1.1 Module Installation

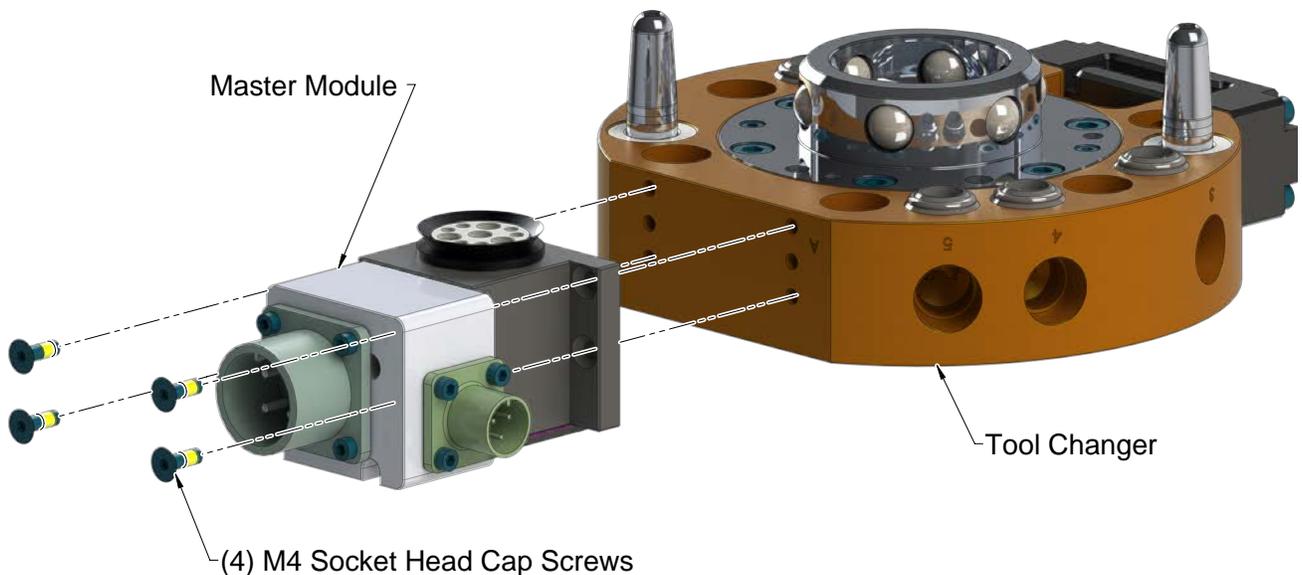
Refer to [Figure 2.4](#) for installation instructions.

**Tools required:** 3 mm hex key, torque wrench

**Supplies required:** Clean rag, Loctite® 222

1. If the Tool Changer is installed place the Tool safely in the tool stand. Uncouple the Tool Changer to allow clear access to the Master and Tool plates.
2. Turn off and de-energize all circuits (e.g. electrical, air, water, etc.).
3. It may be necessary to clean the mounting surface on the Tool Changer prior to installing the module in order to remove any debris that may be present.
4. Using the dowel pins as a guide, install the (4) M4 socket head cap screws.
5. Tighten the (4) M4 socket head screws to secure the servo module to the Tool Changer. Use Loctite 222 and a 3 mm hex key to apply 15 in-lb (1.69 Nm) of torque.
6. Cables (e.g. power, signal, auxiliary, etc.) can be connected to the module. Ensure that the connectors are cleaned prior to being secured as appropriate.
7. For Tool module installation set the Tool-ID to a unique number.
8. After installation is complete, module may be put into normal operation

**Figure 2.4—Standard J16 Pattern Module Installation (Module Shown For Reference)**



### 2.3.1.2 Module Removal

**Tools required:** 3 mm hex key

1. If the Tool Changer is installed place the Tool safely in the tool stand. Uncouple the Tool Changer to allow clear access to the Master and Tool plates.
2. Turn off and de-energize all energized circuits (e.g. electrical, air, water, etc.).
3. Prior to removing module use a marker pen to scribe a line or indication between the Tool Changer and module as a reminder where the module is to be re-installed.
4. Disconnect the cables (e.g. power, signal, auxiliary, etc.) to the module.
5. Remove the (4) M4 socket head cap screws using a 3 mm hex key and lift off from the Tool Changer.

## 2.3.2 JLX Adapter Plate (With ES Modules) and Standard J16 Mounting Pattern

### 2.3.2.1 Module Installation

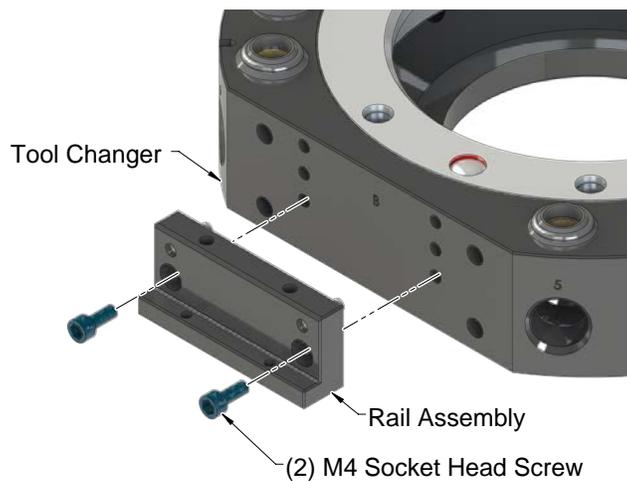
Refer to [Figure 2.5](#) and [Figure 2.6](#).

**Tools required:** 2.5 mm and 3 mm hex keys, torque wrench

**Parts required:** Clean rag, Loctite® 222

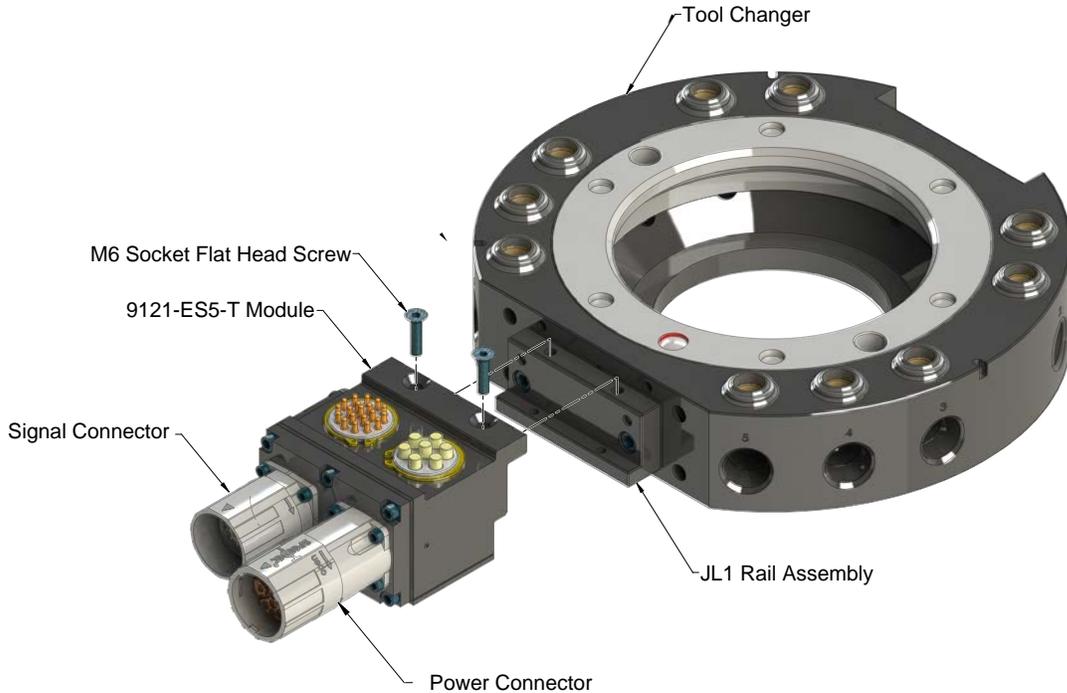
1. Place the Tool in a secure location
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (e.g. electrical, air, water, etc.).
4. Clean the mounting surfaces.
5. Apply primer and Loctite 222 to the (2) M4 socket head cap screws and (2) M6 flat socket head screws.
6. Using the dowels, place the rail assembly into the appropriate location on the Tool Changer body. Align the rail assembly with the Tool Changer using the dowels in the rail assembly and the dowel holes in the Tool Changer.

**Figure 2.5 —Installation and Removal of the Rail Assembly**



7. Secure the rail assembly to the Tool Changer using (2) M4 socket head cap screws and a 3 mm hex key. Torque to 12 in-lbs (1.4 N-m).
8. Secure the module to the rail assembly using (2) M6 flat socket head screws and a 2.5 mm hex key. Torque to 12 in-lbs (1.4 N-m).

**Figure 2.6—Installation and Removal of ESx Module (ES5 Module Shown For Reference)**



9. Ensure the power, signal, auxiliary, and other connectors are clean and connect them to the module.
10. After the procedure is complete, resume normal operation.

### 2.3.2.2 Module Removal

Refer to [Figure 2.5](#) and [Figure 2.6](#).

**Tools required:** 2.5 mm and 3 mm hex keys, torque wrench

**Parts required:** Clean rag

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (e.g. electrical, air, water, etc.).
4. Use a marker pen to indicate where the module is to be re-installed.
5. Using a 2.5 mm hex key, remove the (2) M6 flat socket head screws that secure the module to the rail assembly.
6. Lift the module off the rail assembly to remove it from the Tool Changer.
7. Use a marker pen to indicate where the rail assembly is to be re-installed.
8. Using a 3 mm hex key, remove the M4 socket head cap screws and lift the rail assembly from the Tool Changer.

### 2.3.3 SE Servo Module

Some SE servo modules may be installed as described in [Section 2.3.1—Standard J16 Mounting Pattern](#). If the J16 mounting pattern must be accessed from inside the modular housing, refer to the following procedures.

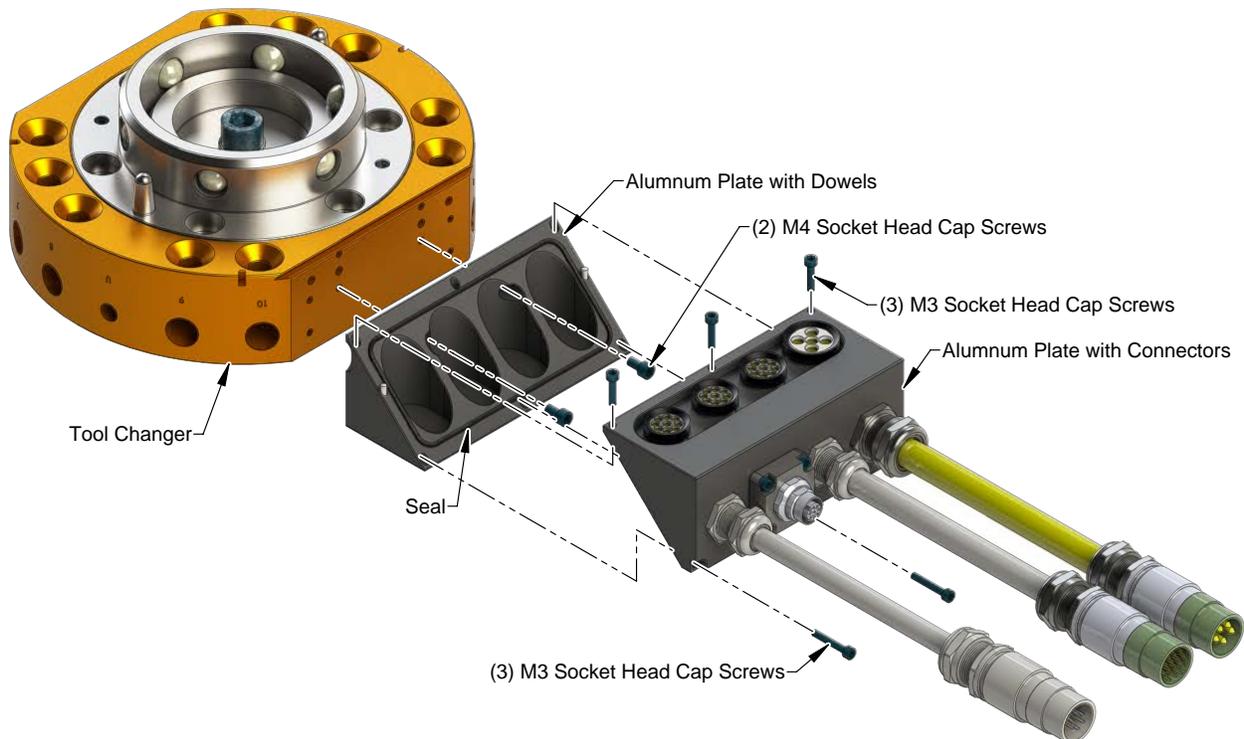
#### 2.3.3.1 Module Installation

**Tools required:** 3 mm hex key, 4 mm hex key, torque wrench

**Supplies required:** Clean rag

1. With the Tool Changer installed, place the Tool safely in the tool stand and uncouple the Tool Changer to allow clear access to the Master and Tool plates.
2. Turn off and de-energize all circuits (e.g. electrical, air, water, etc.).
3. It may be necessary to clean the mounting surface on the Tool Changer prior to installing the module in order to remove any debris that may be present.
4. Using a 3 mm hex key, remove the (6) M3 socket head cap screws securing the aluminum plate with connectors to the aluminum plate with the dowel pins.
5. Lift off the plate with connectors to access the two mounting screws.
6. Using a 4 mm hex key, tighten the (2) M4 socket head screws to secure the servo module housing to the Tool Changer. If the M4 socket head cap screws do not have pre-applied adhesive, apply Loctite 222 and torque to 25 in-lb (2.8 Nm).
7. Fit the connector plate to the aluminum housing. Ensure the seal is in place.
8. Using a 3 mm hex key, tighten the (6) M4 socket head screws securing the connector plate to the aluminum housing. If the M3 socket head cap screws do not have pre-applied adhesive, apply Loctite 222 and torque to 12 in-lb (1.4 Nm)
9. After installation is complete, module(s) may be put into normal operation.

Figure 2.7—SE Module Installation (SE32 Module Shown)



### 2.3.3.2 Module Removal

**Tools required:** 3 mm hex key, 4 mm hex key

**Supplies required:** paint marker

1. If the Tool Changer is already installed, place the Tool side of the Tool Changer safely in the tool stand and uncouple the Tool Changer to allow clear access to the Master and Tool plates of the Tool Changer.
2. Turn off and de-energize all energized circuits (e.g. electrical, air, water, etc.).
3. Prior to removing the module use a marker pen to scribe a line or indication between the Tool Changer and module body as a reminder where the module is to be re-installed.
4. Remove the socket head cap screws securing the aluminum plate with connectors to the aluminum plate with the dowel pins.
5. Lift off the plate with connectors to access the two mounting screws.
6. Remove the socket head screws to secure the servo module housing to the Tool Changer.
7. Remove the module from the Tool Changer.

### 3. Operation

Servo modules work with industrial servo motors and drives, to provide a separable joint in the signal wiring. To maximize the service life of these components, the following points should be observed:



**CAUTION:** Never couple or uncouple the servo modules unless electrical power has been disconnected and discharged both upstream and downstream from the modules. Arcing and contact damage occur during coupling or uncoupling if power is not removed and discharged. Always disconnect and discharge power from upstream and downstream of the modules before coupling or uncoupling.



**CAUTION:** Improper cable routing can result in wires and cables being pinched in the joint between the Tool Changer plates and premature failure of the electrical connectors. Properly route and secure all cables, particularly on the Master side.

### 4. Maintenance

Under normal conditions, no special maintenance is necessary; however, it is recommended that periodic inspections be performed to assure long-lasting performance and that unexpected damage has not occurred. The modules are not designed to be field serviced as all point-to-point wiring connections are soldered.



**DANGER:** This module has a voltage of 50V or greater; always remove power before contacting the module. Arcing and damage occur if power is not removed from the module during maintenance or service. Always remove power before attaching or disconnecting cables, separating or inserting the mating couplers, or making any contact with the Tool Changer or Utility Coupler.



**WARNING:** Do not perform maintenance or repair(s) on the Tool Changer or modules unless the Tool is safely supported or placed in the tool stand, all energized circuits (for example: electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer specific safety practices and policies. Injury or equipment damage can occur with the Tool not placed and energized circuits on. Place the Tool in the tool stand, turn off and discharge all energized circuits, purge all pressurized connections, and verify all circuits are de-energized before performing maintenance or repair(s) on the Tool Changer or modules.

If the Tool Changer is used in dirty environments (for example: welding or deburring applications), limit the exposure of the Tool Changer. Idle Tool assemblies should be covered to prevent debris from settling on the mating surface. Also, the Master assembly should be exposed for only a short period of time during Tool change and down time. Perform the following visual inspections monthly:

- Inspect mounting fasteners to verify they are tight and if loose, then tighten to the proper torque. Refer to [Section 2—Installation](#).
- Inspect cable connections to verify that they are secure. Loose connections should be cleaned and re-tightened as appropriate. Inspect cable sheathing for damage; repair or replace damaged cabling. Loose connections or damaged cabling are not expected and may indicate improper routing and/or strain relieving.
- Inspect the Master and Tool pin blocks for any pin damage, debris, or darkened pins. Refer to [Section 4.1—Pin Block Inspection and Cleaning](#).
- Inspect V-ring seals for wear, abrasion, and cuts. If worn or damaged, replace. Refer to [Section 5.2.1—V-ring Seal Replacement](#).

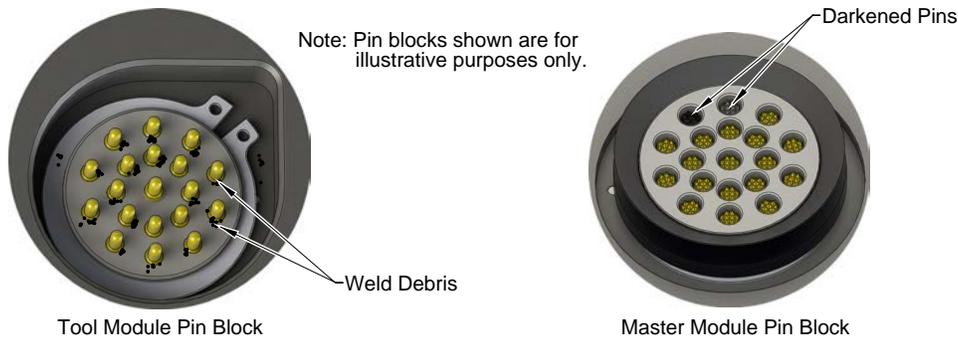
**NOTICE:** Maintaining the servo module's cable structure is important. Cable structure includes shielded and twisted pair (STP) wiring and a minimum number of connection points. Degradation of the cabling, power and signal integrity can lead to issues. Power and signal circuits should remain separate for long term success.

## 4.1 Pin Block Inspection and Cleaning

**Tools required:** Nylon Brush (ATI part number 3690-0000064-60)

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. Inspect the Master and Tool pin blocks for debris or darkened pins.

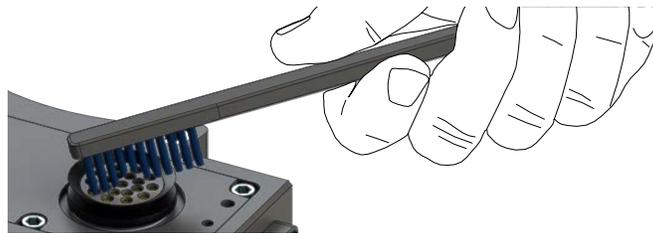
**Figure 4.1—Inspect Master and Tool Pin Blocks**



5. If debris or darkened pins are present, use a vacuum to remove the debris, and clean using a nylon brush (ATI part number 3690-0000064-60).

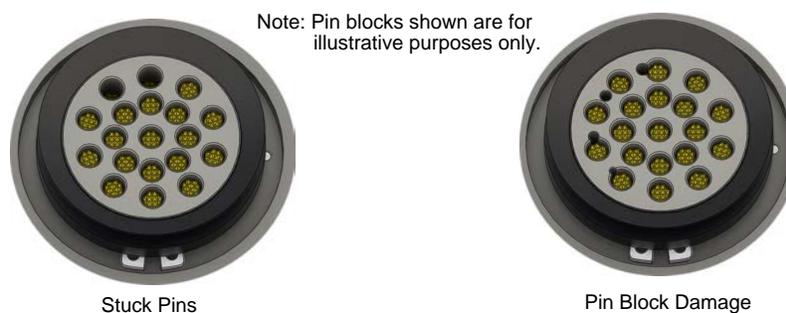
**NOTICE:** Do not use an abrasive media and/or cleaners or solvents to clean the contact pins. Using abrasive media and/or cleaners or solvents will cause damage to the contact surface or cause pins to stick. Clean contact surfaces with a vacuum or non-abrasive media such as a nylon brush (ATI part number 3690-0000064-60).

**Figure 4.2—Clean Pin Blocks with a Nylon Brush**



6. Inspect the Master and Tool pin blocks for stuck pins or pin block damage.

**Figure 4.3—Stuck Pin and Pin Block Damage**



7. If pins become stuck or if there is damage to the pin block, contact ATI for either a possible pin replacement procedure or module replacement.
8. Safely resume normal operation.

## 5. Troubleshooting and Service Procedures

The following section provides troubleshooting information to help diagnose conditions with the servo module and service procedures to help resolve these conditions.



**DANGER:** This module has a voltage of 50V or greater; always remove power before contacting the module. Arcing and damage occur if power is not removed from the module during maintenance or service. Always remove power before attaching or disconnecting cables, separating or inserting the mating couplers, or making any contact with the Tool Changer or Utility Coupler.



**WARNING:** Do not perform maintenance or repair(s) on the Tool Changer or modules unless the Tool is safely supported or placed in the tool stand, all energized circuits (for example: electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer specific safety practices and policies. Injury or equipment damage can occur with the Tool not placed and energized circuits on. Place the Tool in the tool stand, turn off and discharge all energized circuits, purge all pressurized connections, and verify all circuits are de-energized before performing maintenance or repair(s) on the Tool Changer or modules.

### 5.1 Troubleshooting Guidance

General troubleshooting guidance is provided in the following table.

Symptom	Possible Cause	Correction
Signal(s) malfunctioning	Object trapped between modules	Remove object, then attempt coupling.
	Servo module contact pin contamination	Ensure that the spring pins on the Master side can move freely and are not bound by debris. Clean the spring pins to restore free operation. Clean Tool side module contacts, refer to <a href="#">Section 4.1—Pin Block Inspection and Cleaning</a> . Inspect seal, replace if damaged refer to <a href="#">Section 5.2.1—V-ring Seal Replacement</a>
	Contact pin separation due to air supply to Tool Changer	Ensure that the Tool Changer has proper pneumatic connections and air is supplied to proper specification. Refer to Tool Changer section of this manual for air supply requirements.
	Coupling/uncoupling Tool Changer under load	Revise operating procedures to only couple/uncouple with power disconnected and discharged.
	Cable damage: Pinched, torn, or fatigued cables	Examine cables for damage, perform a continuity test on cables and replace any bad cables.
	Servo module damaged	Replace module.
	Drive or motor damaged	Replace module.
(If Applicable) Battery back up is malfunctioning.	Poor connection.	Ensure the cable connector is properly connected to the battery back up connector and the battery enclosure assembly.
	Cable damage: pinched, torn, or fatigued cable.	Examine cables for damage, perform a continuity test on cables, and replace damaged cables.
	Batteries have lost voltage.	Replace batteries. Refer to <a href="#">Section 5.2.2—Battery Replacement For an Enclosure Assembly</a> .

## 5.2 Service Procedures

Component replacement and adjustment procedures are provided in the following section.

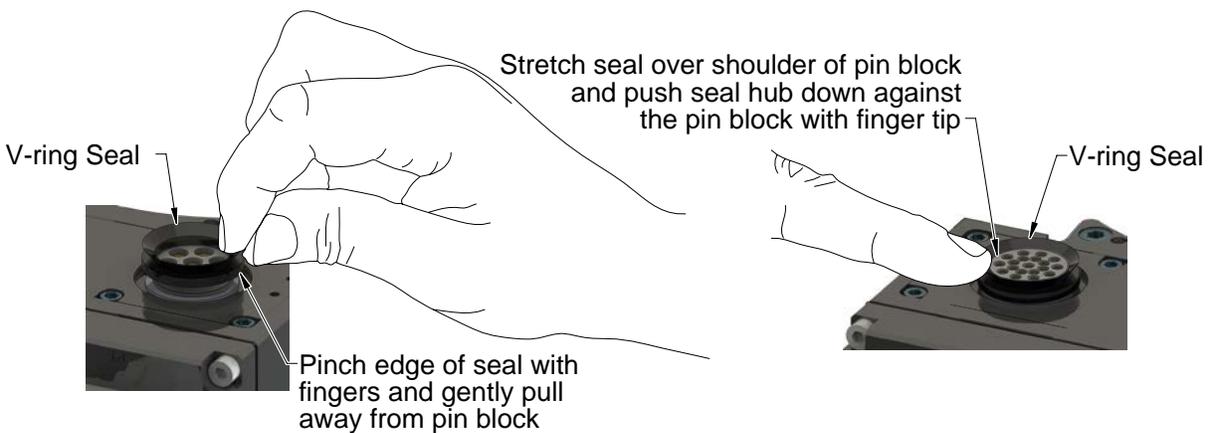
### 5.2.1 V-ring Seal Replacement

**Parts required:** Refer to [Section 6—Serviceable Parts](#).

The seal protects the electrical connection between the Master and Tool module. Replace the seal if it becomes worn or damaged.

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
4. To remove the existing seal, pinch the edge of the seal and pull the seal away from the pin block on the Master module.
5. To install a new seal, stretch the new seal over the shoulder of the pin block.
6. Push the seal hub down against the pin block.
7. Safely resume normal operation.

**Figure 5.1—V-ring Seal Replacement**



## 5.2.2 Battery Replacement For an Enclosure Assembly

For servo modules that have a battery enclosure assembly, refer to the following instructions to replace the batteries.

**Tools required:** *Phillips head screwdriver*

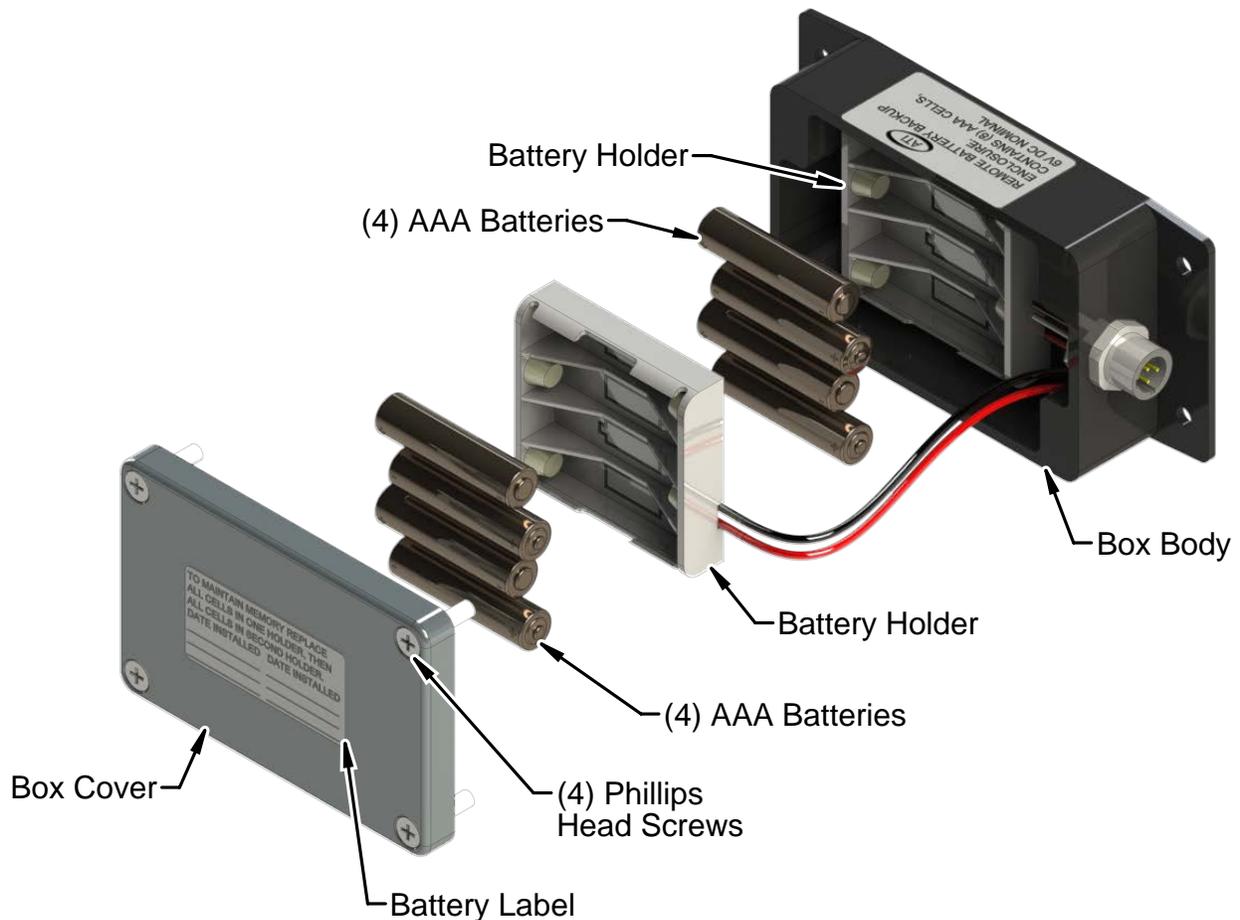
**Supplies required:** *(8) AAA alkaline batteries*

1. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, and hydraulic circuits).
2. Unscrew the (4) phillips head screws from the box cover. Remove the cover.

**NOTICE:** To maintain memory, replace all the cells in one battery holder, and then replace all the cells in the second battery holder.

3. Replace (4) AAA alkaline batteries from one of the battery holders.
4. Replace (4) AAA alkaline batteries in the other battery holder.
5. Place the box cover on the box body.
6. Screw the (4) phillips head screws back into the box cover and box body. Tighten the screws to contact. Do not use Loctite.
7. Record the battery installation date on the battery label.
8. Safely resume normal operation.

Figure 5.2—Battery Replacement



## 6. Serviceable Parts

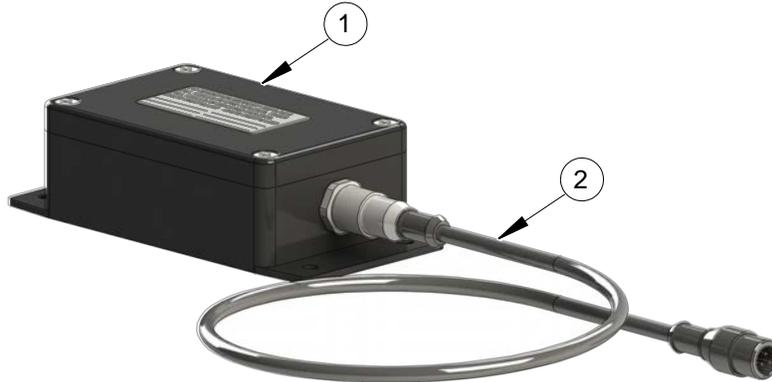
For mounting fasteners and accessories, refer to the following tables. For additional serviceable parts, refer to the module drawings.

### 6.1 Mounting Fasteners

Table 6.1—Mounting Fasteners for Servo Modules and Adapter Plates					
Servo Module Type		Master/Tool/Adapter	Part Number	Description	Qty
Ledge Mount		Master	3500-1066020-15A	M6 x 20 Socket Head Cap Screw, Class 12.9, Blue dyed Magni-565, ND Microspheres Epoxy, Yellow	2
		Tool	3500-1066016-15A	M6 x16 Socket Head Cap Screw, 12.9, ISO4762/DIN912, ES-ATI-007, YL M-spheres/IFI 525	2
Rail Assembly		Adapter (Master and Tool)	3500-1066020-15A	M6 x 20 socket head cap screws Blue Dyed Magni ND Microspheres	4
		Master and Tool	3500-1265016-15A	M6 X 16 Flat Head Socket Cap Screw, 10.9 Blue Dyed Magni-565, ND Ind. Microspheres Epoxy, Yellow	2
			3700-20-6758	Servo Key	2
			3500-1058008-15A	M3 X 8 Socket Head Cap Screw for servo key, Class 12.9, Blue dyed Magni-565, ND Microspheres Epoxy, Yellow	4
Standard QC	J16	Master and Tool	3500-1262012-15	M4 x 12 Flat Head Socket Head Cap Screw, 10.9, ISO10642/DIN7991, ES-ATI-007	8
	J16 (SE models)	Master and Tool	3500-1062060-15	M4 x 60 Socket Head Cap Screw, Class 12.9, Blue dyed Magni-565	8
	J16 with JL1 Adapter	JL1 Adapter (Master and Tool)	3500-1062010-21	M4 x 10 Socket Head Cap Screw, Stainless Steel	4
		Master and Tool	3500-1262016-15A	M4 X 16 Flat Head Socket Cap Screw, 10.9, ISO10642/DIN7991, ES-ATI-007, YL M-spheres/IFI 525	4
	SE Models with internal J16 mounting pattern	Master and Tool	3500-1062008-12	M4-0.7 x 8 Socket Head Cap Screw, Zinc	4

## 6.2 Accessories

In addition to the following items, a number of module adapters are available for both Standard and Heavy Duty series Tool Changers. For options, refer to the [ATI website](#) or contact an ATI representative.



**Table 6.2—Accessories**

Item No.	Qty.	Part Number	Description
1	1	9005-20-1257	Servo Battery Backup Module 3-Pin
2	1	9120-C-3UM-3UF-010	3-pin MicroFast Cable, 1 m
		9120-C-3UM-3UF-XXX	3-pin MicroFast Cable, Customer Specified Length
N/A	N/A	3690-0000064-60	Brush, Blue Nylon All Purpose (Contact Pin Cleaning)
N/A	N/A	9121-ENC-T	Tool Cover Assembly For Rail Assembly Servo Modules
N/A	N/A	9121-ESC-T	Tool Cover for ES Module

## 7. Specifications

Refer to the applicable module drawing or [ATI website](#).