



Operating Manual

Tool Stand Product Line



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Engineered Products for Robotic Productivity

Pinnacle Park • 1031 Goodworth Drive • Apex, NC 27539 USA • Tel: +1 919-772-0115 • Fax: +1 919-772-8259 • www.ati-ia.com

Foreword

Please contact ATI Industrial Automation with any questions concerning a particular model.



CAUTION: This manual describes the function, application, and safety considerations of this product. This manual must be read and understood before any attempt is made to install or operate the product, otherwise damage to the product or unsafe conditions may occur.

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Contact information:

Sale, Service and Information about ATI products:

ATI Industrial Automation

1041 Goodworth Drive
Apex, NC 27539 USA
<https://ati.novanta.com/>.
Tel: +1 919-772-0115
Fax: +1 919-772-8259

Application Engineering

E-mail: Applications.Engineers@novanta.com

24/7 Support: +1 855 ATI-IA 00 (+1 855-284-4200)

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Glossary

Term	Definition
Alignment Pin	Attaches to the interface plate assembly and mounting module to support and locate the tooling in the Tool Stand.
Debris Shield	Cover that protects against dirt and debris build up on the Tool side assembly and modules.
Debris Shield Actuator	Pneumatically actuated device that moves the debris shield over the Tool Changer for protection and removes the shield for Tool pickup.
End-Effector	A tool or other device attached to the robot arm in order to perform a task.
Hook and Hanger	A Tool Stand that uses mounting modules with hangers to support and accurately locate the Tool side and customer tooling.
Horizontal Extension	Provides more tool clearance for the customer tooling than the standard TSL post.
Jog	The action of running an assembly process or robot at a slower pace than normal operational speed.
Master side	The half of the Tool Changer that is mounted to an interface plate or the robot.
Mounting Module	Provides a mount on the Tool Stand for the tooling interface plate or can mount the Tool side directly for some specific models.
Pin and Bushing	A Tool Stand configuration that uses mounting modules with alignment pins and a bushing to support and accurately locate the Tool side and customer tooling.
Post	A welded steel vertical post to which (1) or more mounting modules are installed.
Post-mounted Tool Support	A fixture that attaches to the post module to support unbalanced customer tooling.
Proximity Sensor	Provides a signal indicating the tool is located in the Tool Stand.
Rack	A mounting module plate specific to the pin and rack solution. The rack is a stationary fixture on the Tool Stand that holds the pin and rack style tool storage plate.
Sensor Holder	Provides a mount on the Tool Stand for the proximity sensor.
Stroage Module	A machined plate that adapts the Tool side to an end-effector and provides mounting features for a Tool Stand.
Tool Hook	Tooling fixture that utilizes steel hooks to support the Tool side and customer tooling on the Tool Stand.
Tool side	The half of the Tool Changer that is mounted to tooling interface plate and/or the customer-supplied tooling.
Tool Stand Interlock (TSI)	A system that detects that the Tool side is safely placed on the Tool Stand. The Tool Stand has a TSI switch assembly that is used congruently with the TSI connector on the Tool control module. For more information about control modules, refer to the applicable control module manual.
Tool Storage Plate	A machined plate with that adapts the customer tooling and provides mounting features for a Tool Stand. Tool storage plates can be vertically mounted or horizontally.
TSL	Tool Stand Large. Includes ATI Tool Changers QC-160 and larger.
TSM	Tool Stand Medium. Includes ATI Tool Changers QC-20 to QC-110.
TSS	Tool Stand Small. Includes ATI Tool Changers QC-46 and smaller.

1. Safety

The safety section describes general safety guidelines to be followed with this product, explanations of the notifications found in this manual, and safety precautions that apply to the product. Product specific notifications are imbedded within the sections of this manual (where they apply).

1.1 Explanation of Notifications

These notifications are used in all of ATI manuals and are not specific to this product. The user should heed all notifications from the robot manufacturer and/or the manufacturers of other components used in the installation.



DANGER: Notification of information or instructions that if not followed will result in death or serious injury. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.



WARNING: Notification of information or instructions that if not followed could result in death or serious injury. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.



CAUTION: Notification of information or instructions that if not followed could result in moderate injury or will cause damage to equipment. The notification provides information about the nature of the hazardous situation, the consequences of not avoiding the hazard, and the method for avoiding the situation.

NOTICE: Notification of specific information or instructions about maintaining, operating, installing, or setting up the product that if not followed could result in damage to equipment. The notification can emphasize, but is not limited to: specific grease types, best operating practices, and maintenance tips.

1.2 General Safety Guidelines

This system is intended for use in the industrial applications for tool changing and storage and therefore requires the use of a Tool Changer.

Prior to purchase and installation, the customer should verify that the Tool Changer selected is rated for the maximum loads and moments expected during operation. Refer to the applicable Tool Changer manual or contact ATI for assistance.



WARNING: The customer is responsible for ensuring that the area between the Tool and the Tool Stand is clear of foreign objects during tool drop-off. Failure to do so may result in serious injury to personnel.



WARNING: The gap between the Master and Tool sides is a pinch point. All personnel should be prevented from placing any part of their body or clothing in the gap, especially during actuation of the tool hanger mechanism.

1.3 Safety Precautions



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.



WARNING: During operation, the area between the Master and Tool must be kept clear. Failure to keep area clear will result in damage to Tool Changer, modules, or end-of-arm tooling and could cause injury to personnel.



CAUTION: This system is only to be used for intended applications and applications approved by the manufacturer.

2. Tool Stand System Overview

NOTICE: ATI's Tool Stand product family is just one essential component to the overall robotic system. Tool Stands work in conjunction with an **ATI Tool Changer** and **ATI Utility Pass-Through Modules**.

ATI Tool Changer Operating Manual: [9610-20-4451](#)

ATI Utility Pass-Through Module Operating Manual: [9610-20-4452](#)

For individual product specification and technical drawings refer to the [ATI Tool Changer Catalog](#).

ATI's Tool Stand line is a critical piece to its Tool Changer product family. A Tool Stand safely supports the Tool side Tool Changer and customer tooling when not in use. ATI breaks down the Tool Stand catalog into three main categories: Tool Stand Small (TSS), Tool Stand Medium (TSM), and Tool Stand Large (TSL).

[Table 2.1](#) outlines the appropriate category for each ATI Tool Changer.

Table 2.1—Tool Stand Offering			
QC Model	Tool Stand Small (TSS)	Tool Stand Medium (TSM)	Tool Stand Large (TSL)
QC-1	✓		
QC-7	✓		
QC-11	✓		
QC-20	✓	✓	
QC-21	✓	✓	
QC-29	✓	✓	
QC-40Q	✓	✓	
QC-41	✓	✓	
QC-46	✓	✓	
QC-60		✓	
QC-71		✓	
QC-76		✓	
QC-110		✓	
QC-160			✓
QC-210			✓
QC-310			✓
QC-313			✓
QC-510			✓
QC-835			✓
QC-850			✓
QC-1210			✓
QC-1310			✓
QC-1510			✓

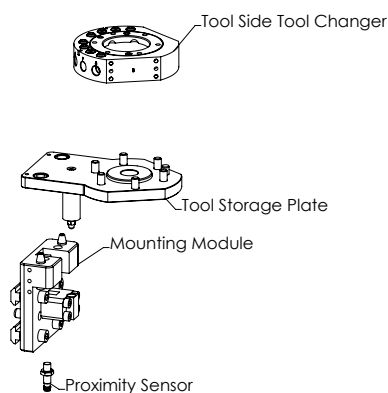
2.1 Tool Stand Part Numbering Scheme

There are many components that make up ATI's Tool Stand line.

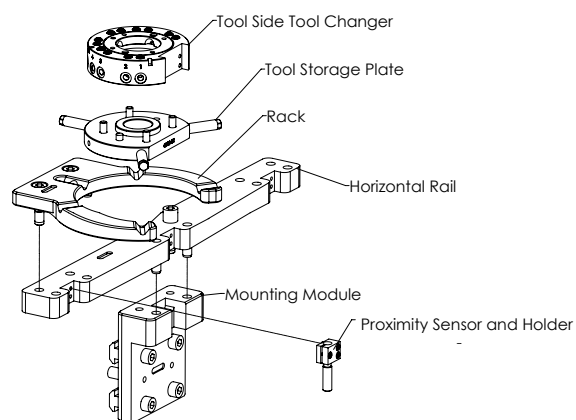
[Figure 2.1](#) outlines the individual components within each tool stand solution style, while [Figure 2.2](#) breaks down the ATI Tool Stand part numbering scheme.

Figure 2.1—Tool Stand Component Overview

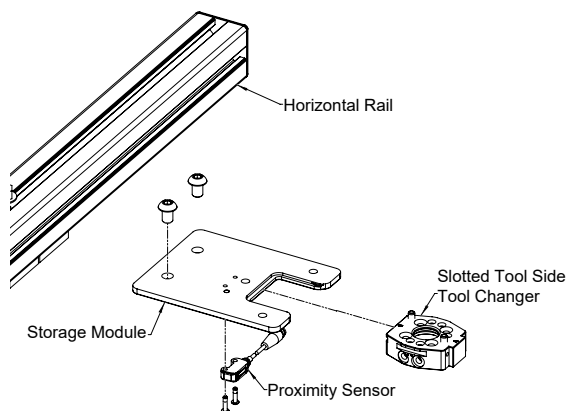
Pin and Bushing Style



Pin and Rack Style



Slotted Tool Style



Hook and Hanger Style

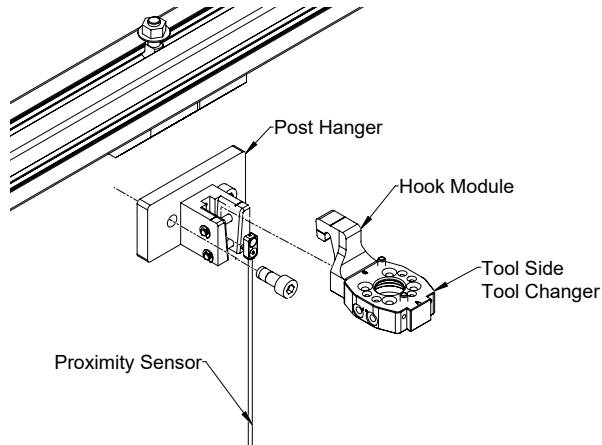
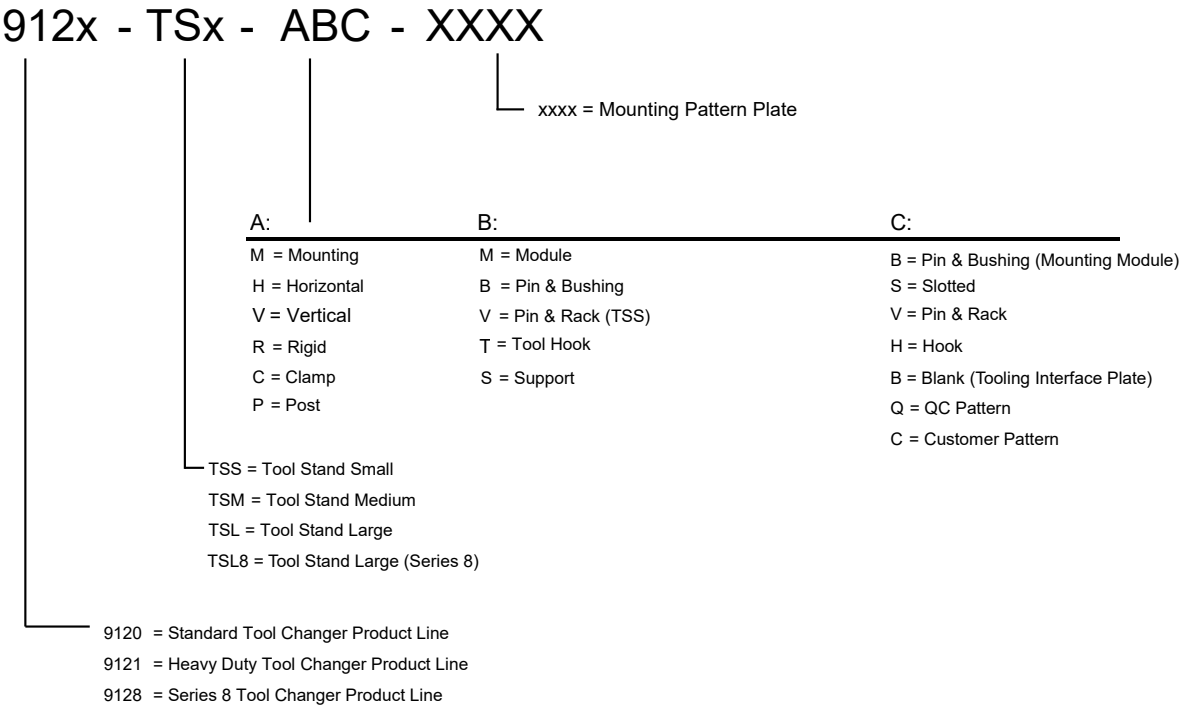


Figure 2.2—Tool Stand Part Numbering Scheme



3. Tool Stand Solutions

The following sections detail Tool Stand solution overviews, installation, operation, and servicable parts for each ATI Tool Changer.

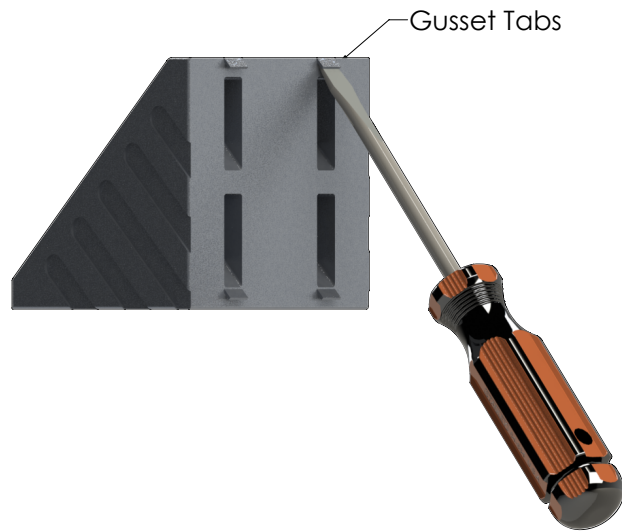
In most cases, multiple Tool Stand solutions are available. For assistance determining an appropriate solution, contact ATI.

3.1 Tab Removal

In most Tool Stand Small (TSS) and Tool Stand Medium (TSM) solutions, the use of gussets is required. Prior to installation, tabs may need to be removed from each gusset in order for the gusset to sit flush on the mounting surface. Tabs can remain attached if the gusset is installed on an extruded aluminum member.

Tools required: Flathead screw driver

Figure 2.3—Removing Gusset Tabs



1. Insert screwdriver into slot under tab.
2. Pry up on the tab to break it off.
3. Remove any burrs that may not allow flush contact with mounting surface.

3.2 QC-1

The QC-1 Tool Changer has only one Tool Stand solution: slotted plate.

Figure 2.4—QC-1 Slotted Plate Solution

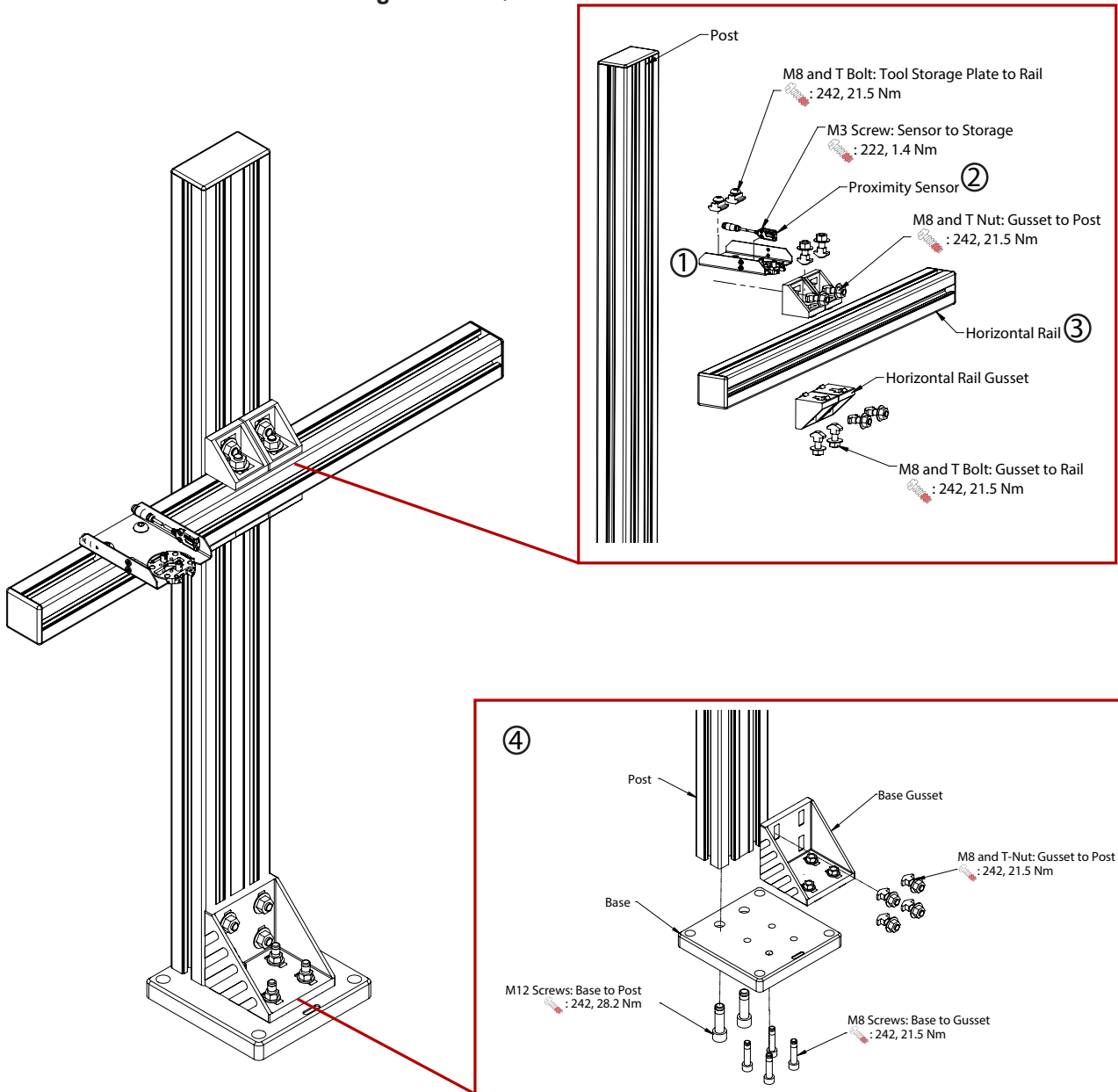


Table 2.2—QC-1 Tool Stand Servicable Parts

No.	Part Number	Description
1	9120-TSS-MM-XXXX	Slotted tool storage plate
2	9120-TSS-SMA-XXXX	Proximity sensor assembly
3	9120-TSM-HM-XXXX	Horizontal rail
4	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.		

3.3 QC-7

ATI's QC-7 Tool Changer has two storage solutions: hook and hanger and slotted plate. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.5—QC-7 Hook and Hanger Tool Stand Storage Solution

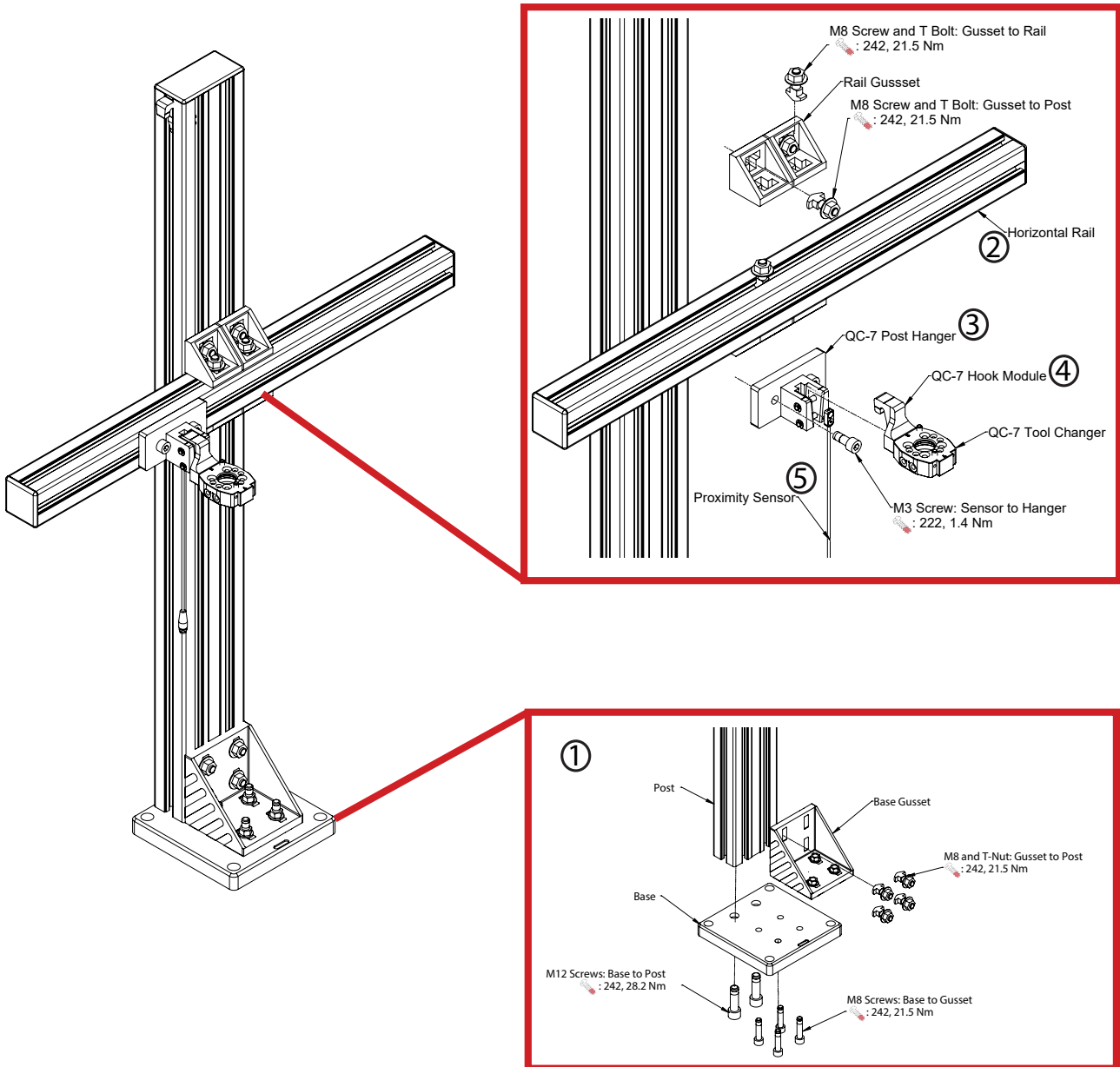


Table 2.3—QC-7 Hook and Hanger Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-MMH-XXXX	Post hanger
4	9120-TSS-TH-XXXX	Hook module (installs to Tool Changer)
5	9120-TSS-SMA-XXXXX	Proximity sensor assembly
Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.		

Figure 2.6—QC-7 Slotted Plate Tool Stand Storage Solution

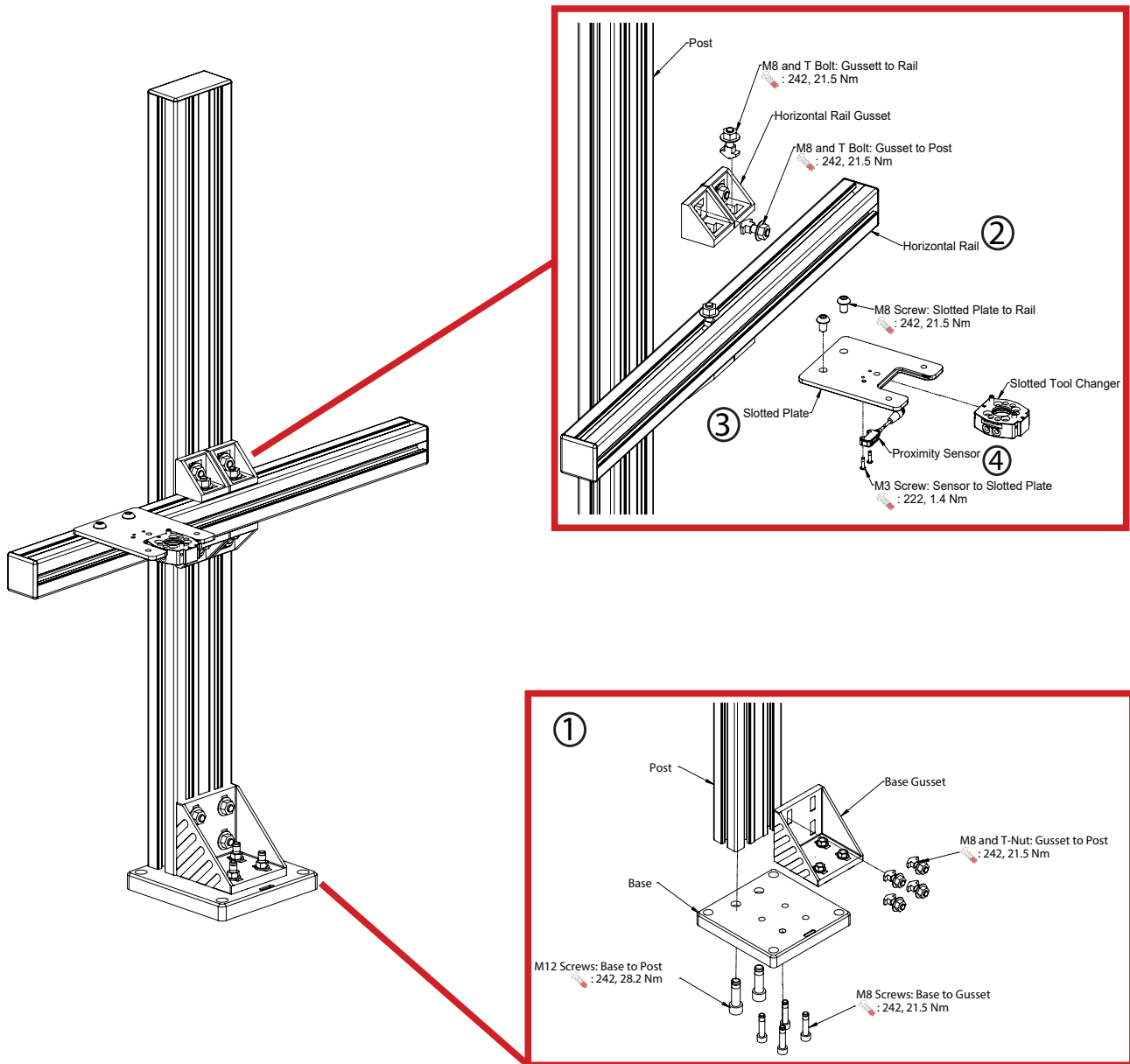


Table 2.4—QC-7 Slotted Plate Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-MMS-XXXXX	Slotted tool plate. For use only with slotted Tool Changer.
4	9120-TSS-SMA-XXXXX	Proximity sensor assembly
Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.		

3.4 QC-11

ATI's QC-11 Tool Changer has two storage solutions: pin and bushing and pin and rack. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.7—QC-11 Pin and Bushing Tool Stand Storage Solution

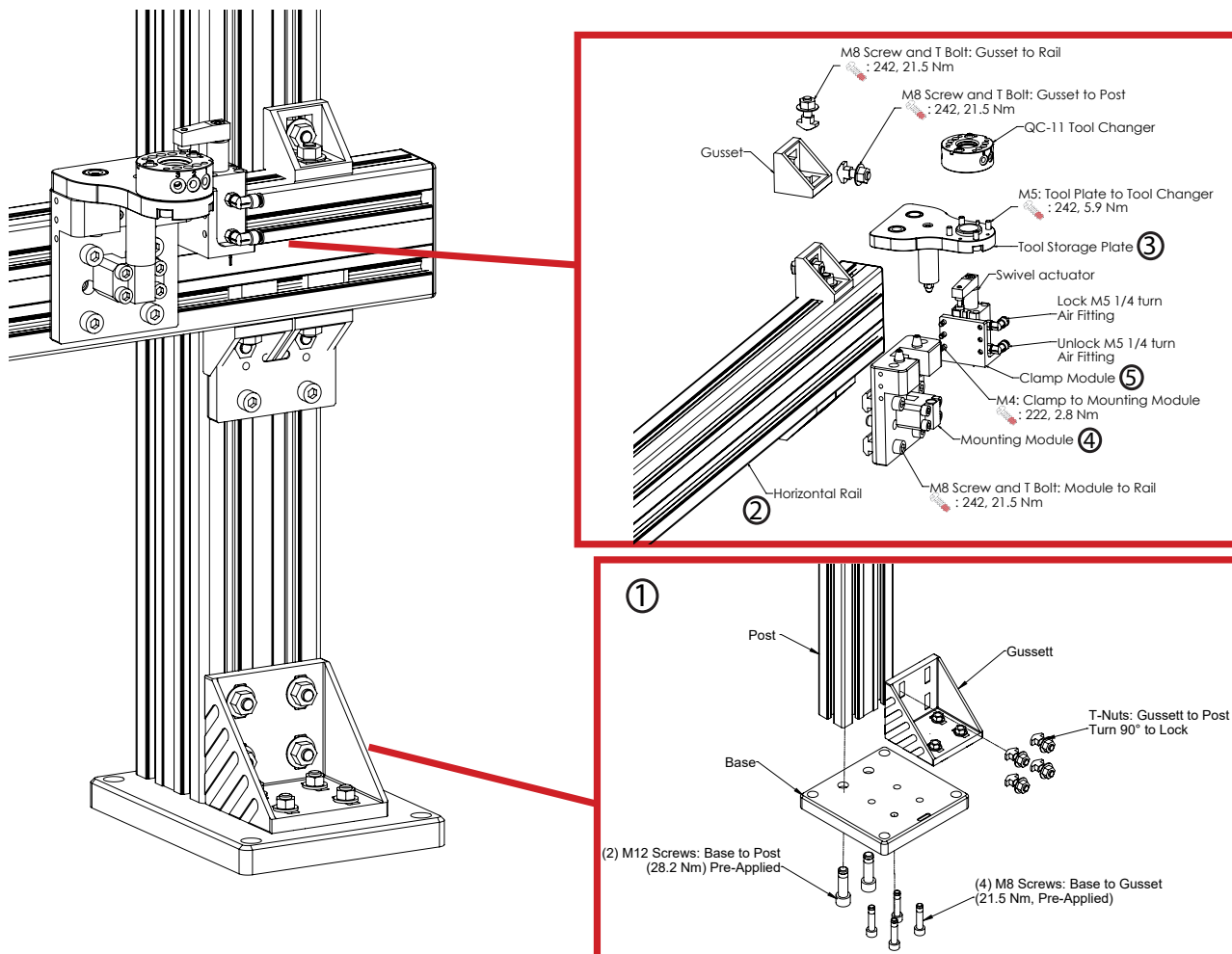


Table 2.5—QC-11 Pin and Bushing Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3-	9120-TSS-HBX-XXXX	Horizontal tool storage plate
-	9120-TSS-VBB-XXXX	Vertical tool storage plate (not shown in image)
4	9120-TSS-MMB-XXXX	Mounting module
5	9120-TSS-CM-XXXX	Clamp. Used to prevent utility lines from pulling tool plate. Requires 6.2-10 bar air pressure.
-	8590-9909999-08	Proximity sensor PNP 3 wire DC (not shown in image)
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.8—QC-11 Pin and Rack Tool Stand Storage Solution

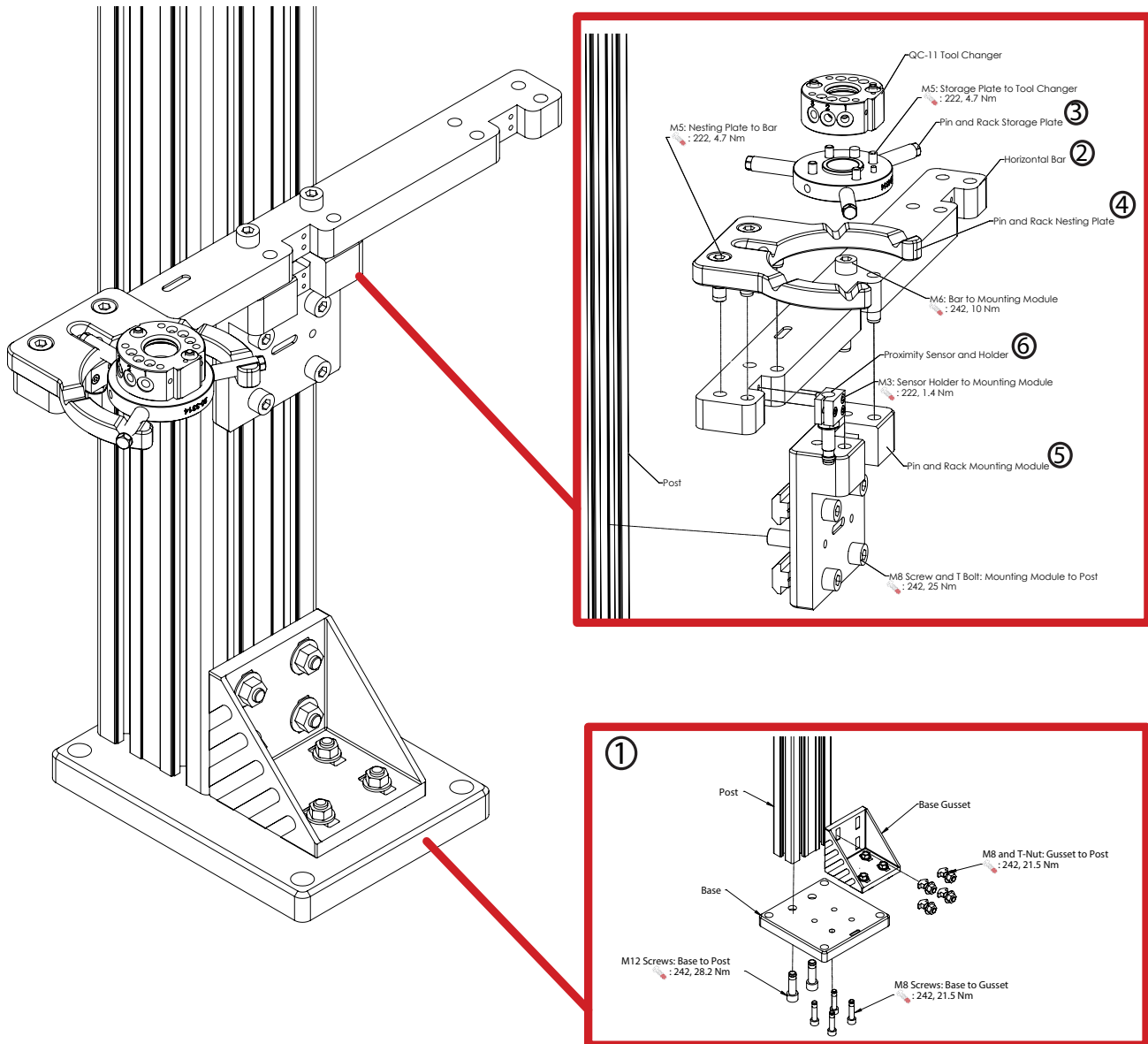


Table 2.6—QC-11 Pin and Rack Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSS-TB-XXXX	Horizontal tool bar
3	9120-TSS-HVX-XXXX	Pin and rack storage plate
4	9120-TSS-MMV-XXXX	Pin and rack nesting plate
5	9120-TSS-MMB-XXXX	Mounting module
6	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.5 QC-20

ATI's QC-20 Tool Changer has two storage solutions: pin and bushing and pin and rack. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.10—QC-20 Pin and Bushing Tool Stand Storage Solution

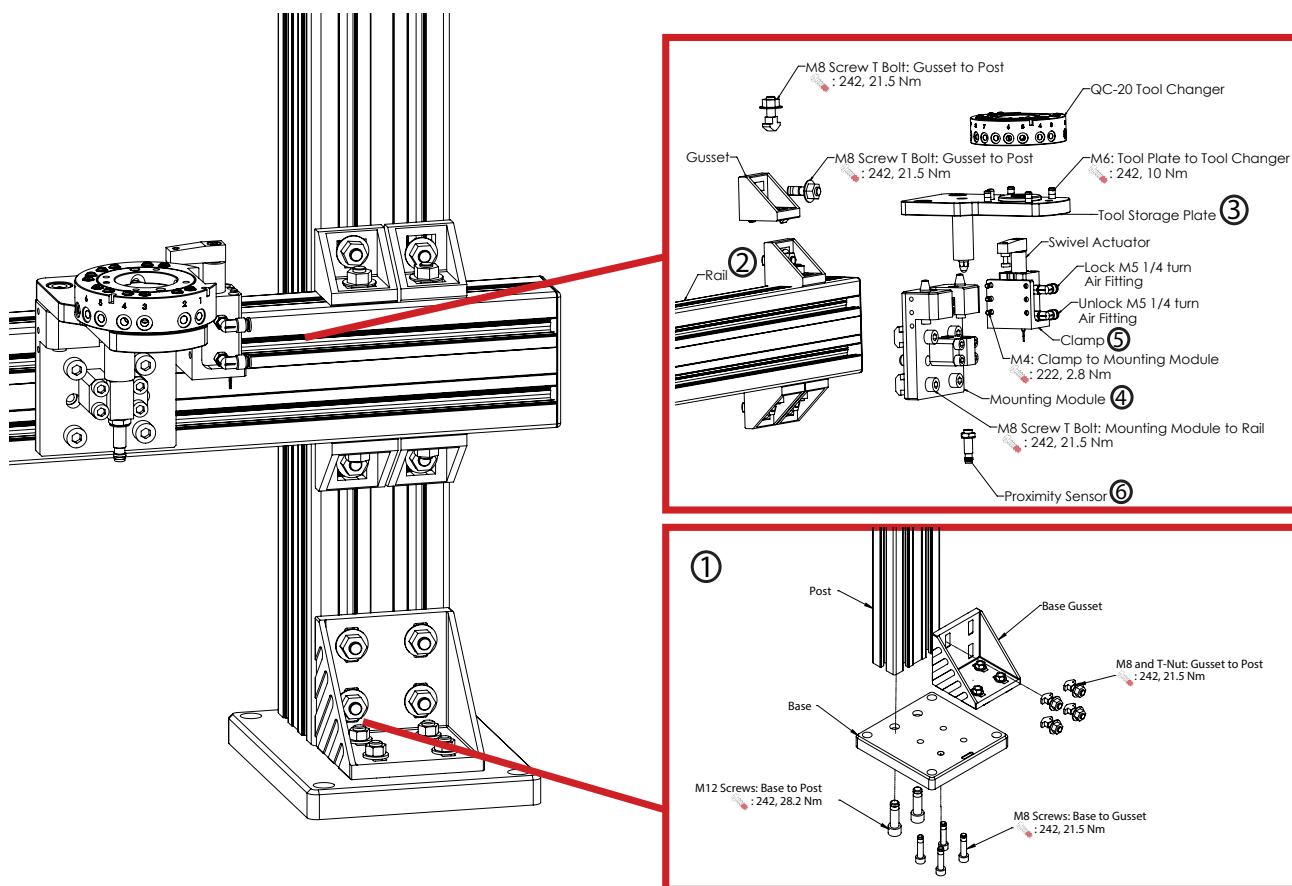


Table 2.7—QC-20 Pin and Bushing Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3-	9120-TSS-HBX-XXXX	Horizontal tool storage plate
-	9120-TSS-VBB-XXXX	Vertical tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	9120-TSS-CM-XXXX	Clamp. Used to prevent utility lines from pulling tool plate. Requires 6.2 to 10 bar air pressure.
6	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.12— QC-20 Pin and Rack Tool Stand Storage Solution

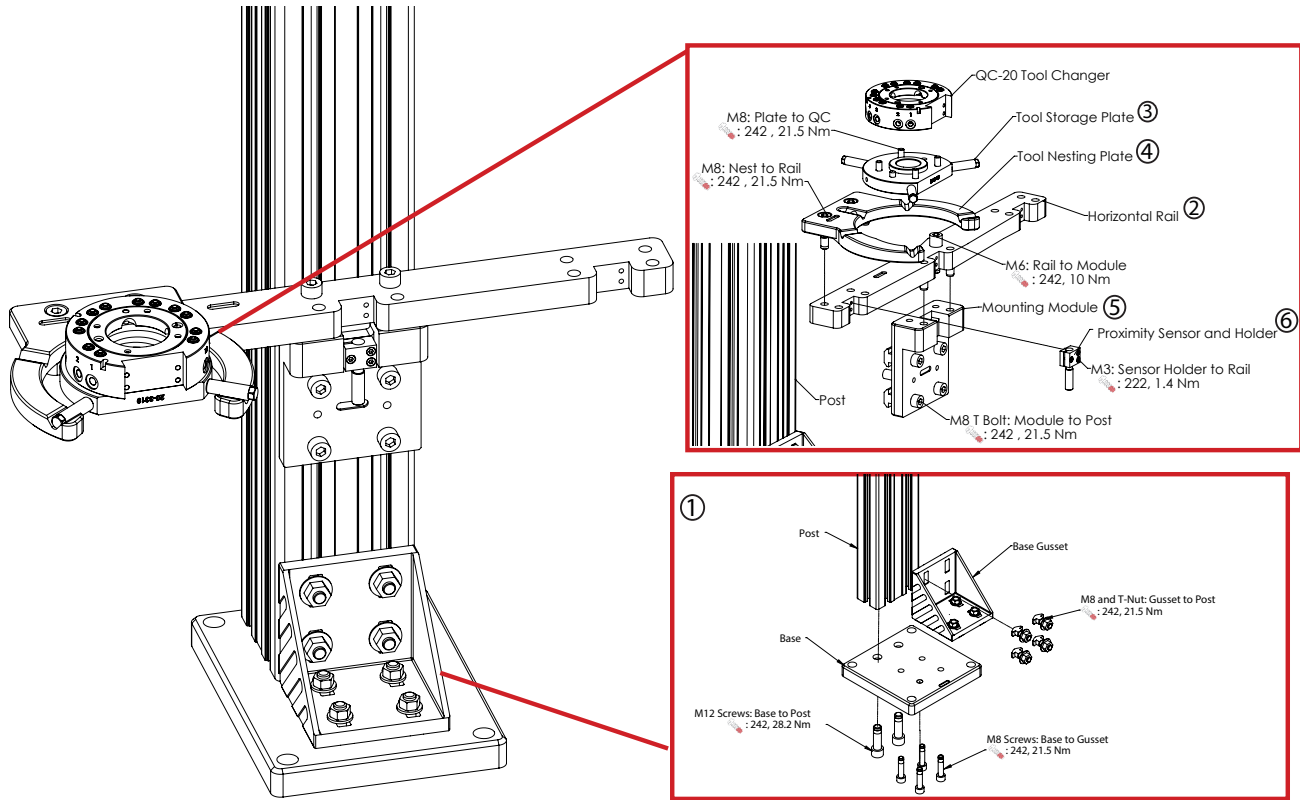


Table 2.8—QC-20 Pin and Rack Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSS-TB-XXXX	Horizontal tool bar
3-	9120-TSS-HVX-XXXX	Pin and rack storage plate
4	9120-TSS-MMV-XXXX	Pin and rack nesting plate
5	9120-TSS-MMB-XXXX	Mounting module
6	8590-9909999-08	Proximity sensor PNP 3 wire DC
	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.6 QC-21

ATI's QC-21 Tool Changer has two storage solutions: pin and bushing and pin and rack. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.13—QC-21 Pin and Bushing Tool Stand Storage Solution

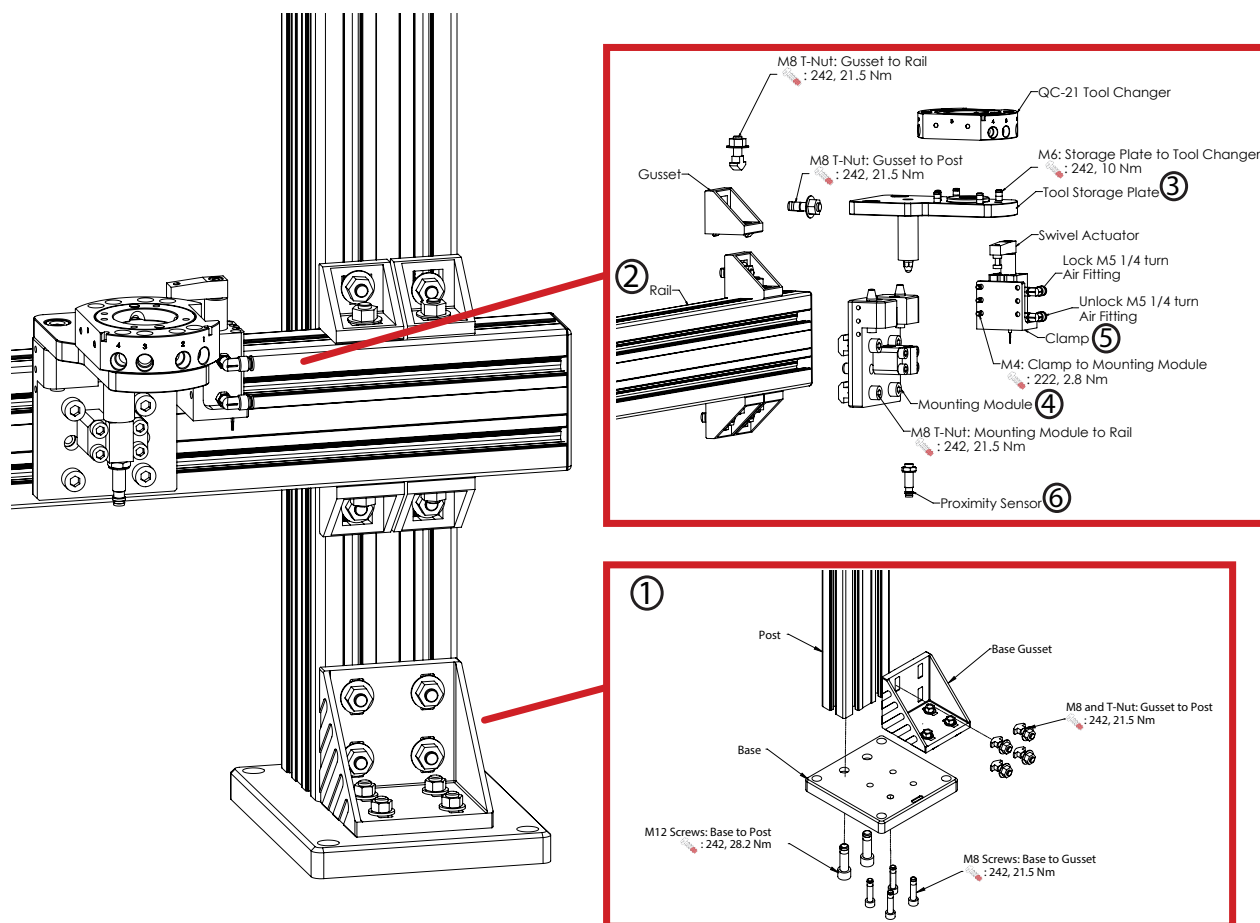


Table 2.9—QC-21 Pin and Bushing Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-HBX-XXXX	Horizontal tool storage plate
-	9120-TSS-VBB-XXXX	Vertical tool storage plate (not shown in image)
4	9120-TSS-MMB-XXXX	Mounting module
5	9120-TSS-CM-XXXX	Clamp. Used to prevent utility lines from pulling tool plate. Requires 6.2-10 bar air pressure.
6	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.14—QC-21 Pin and Rack Tool Stand Storage Solution

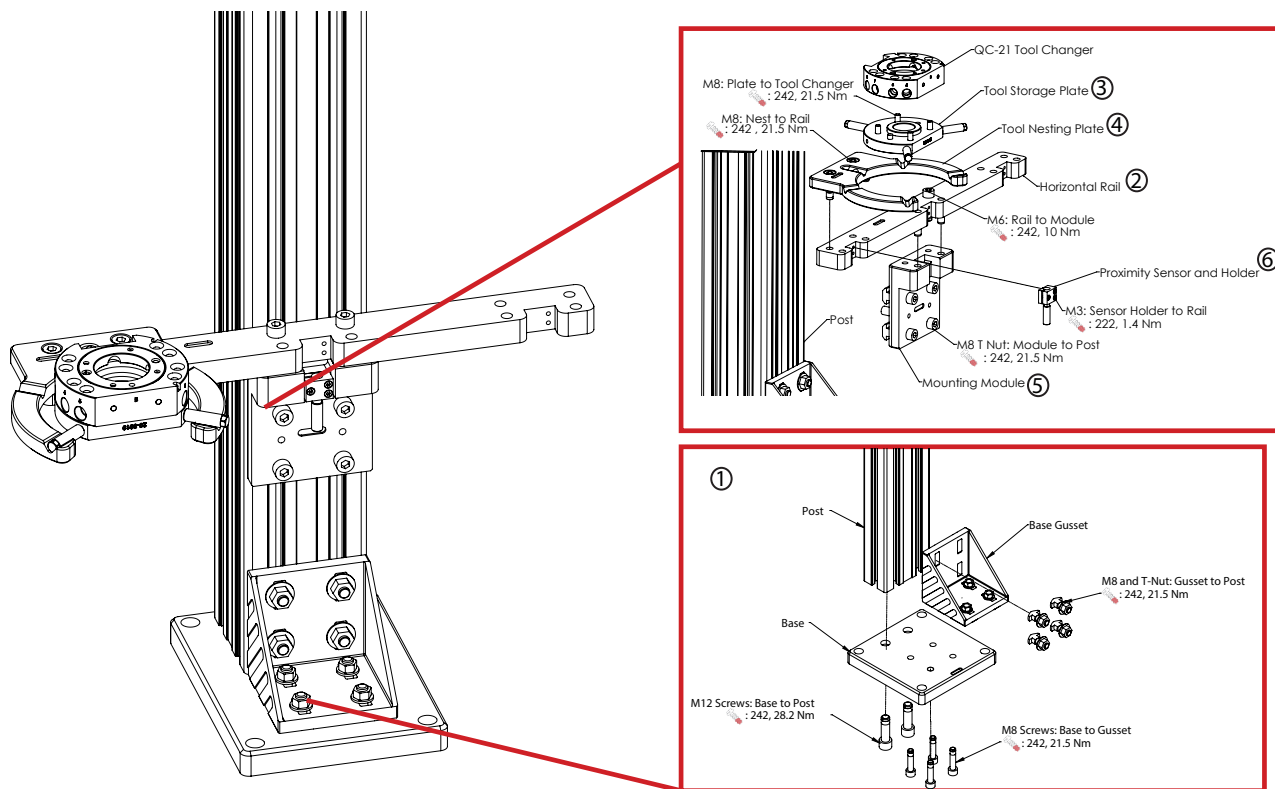


Table 2.10—QC-21 Pin and Rack Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSS-TB-XXXX	Horizontal tool bar
3	9120-TSS-HVX-XXXX	Pin and rack storage plate
4	9120-TSS-MMV-XXXX	Pin and rack nesting plate
5	9120-TSS-MMB-XXXX	Mounting module
6	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.7 QC-29

ATI's QC-29 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.15—QC-29 Pin and Bushing Horizontal Tool Stand Storage Solution

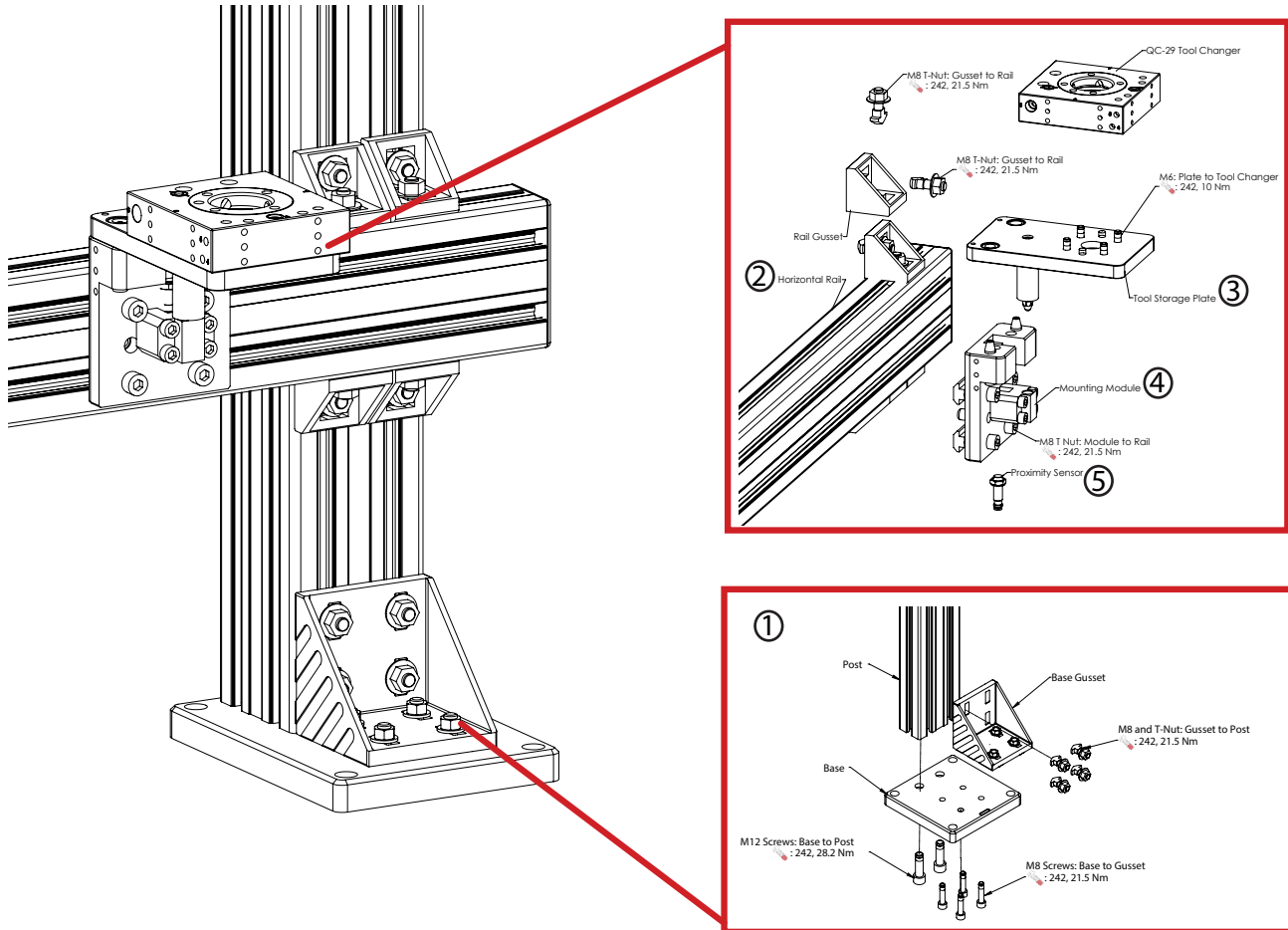


Table 2.11—QC-29 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3-	9120-TSS-HBX-XXXX	Horizontal tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.17—QC-29 Pin and Bushing Vertical Tool Stand Storage Solution

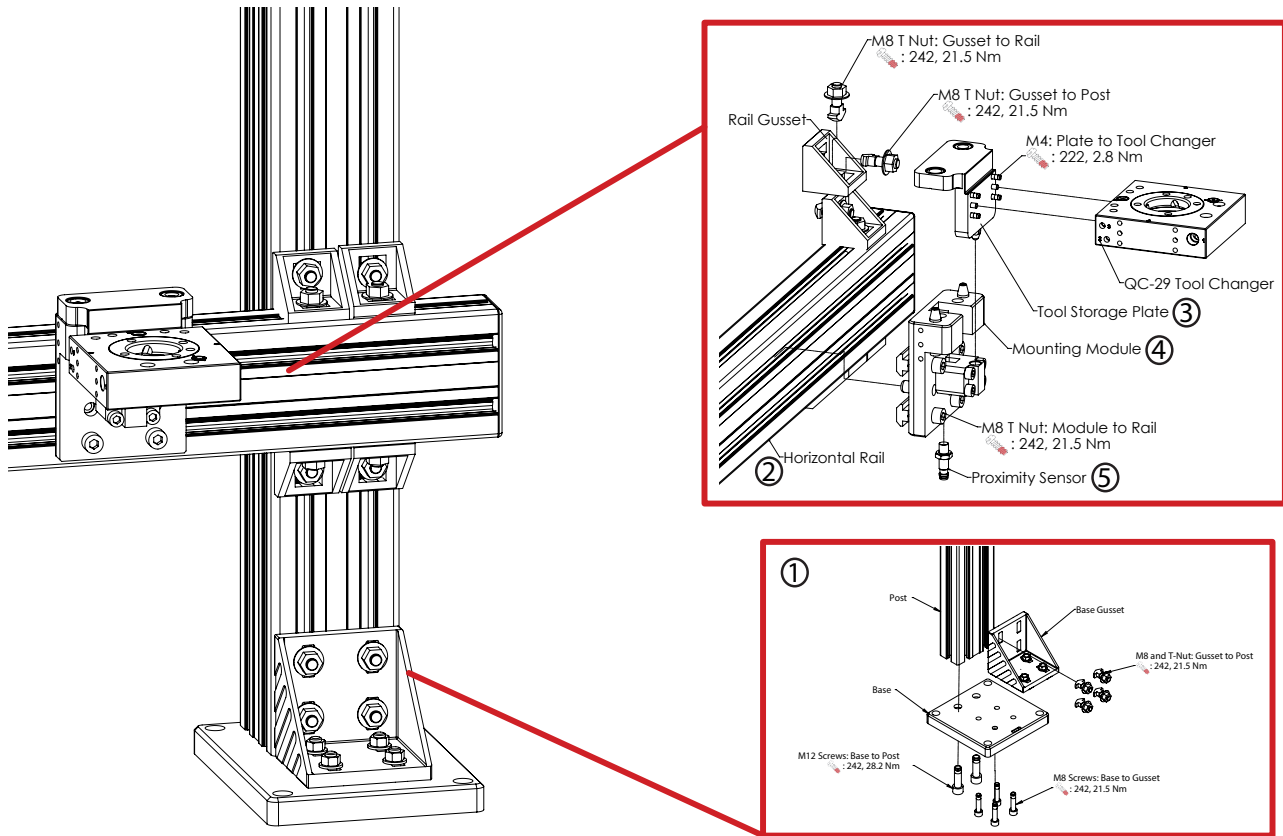


Table 2.12—QC-29 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-VBX-XXXX	Vertical tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.8 QC-40Q

ATI's QC-40Q Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.19—QC-40Q Pin and Bushing Horizontal Tool Stand Storage Solution

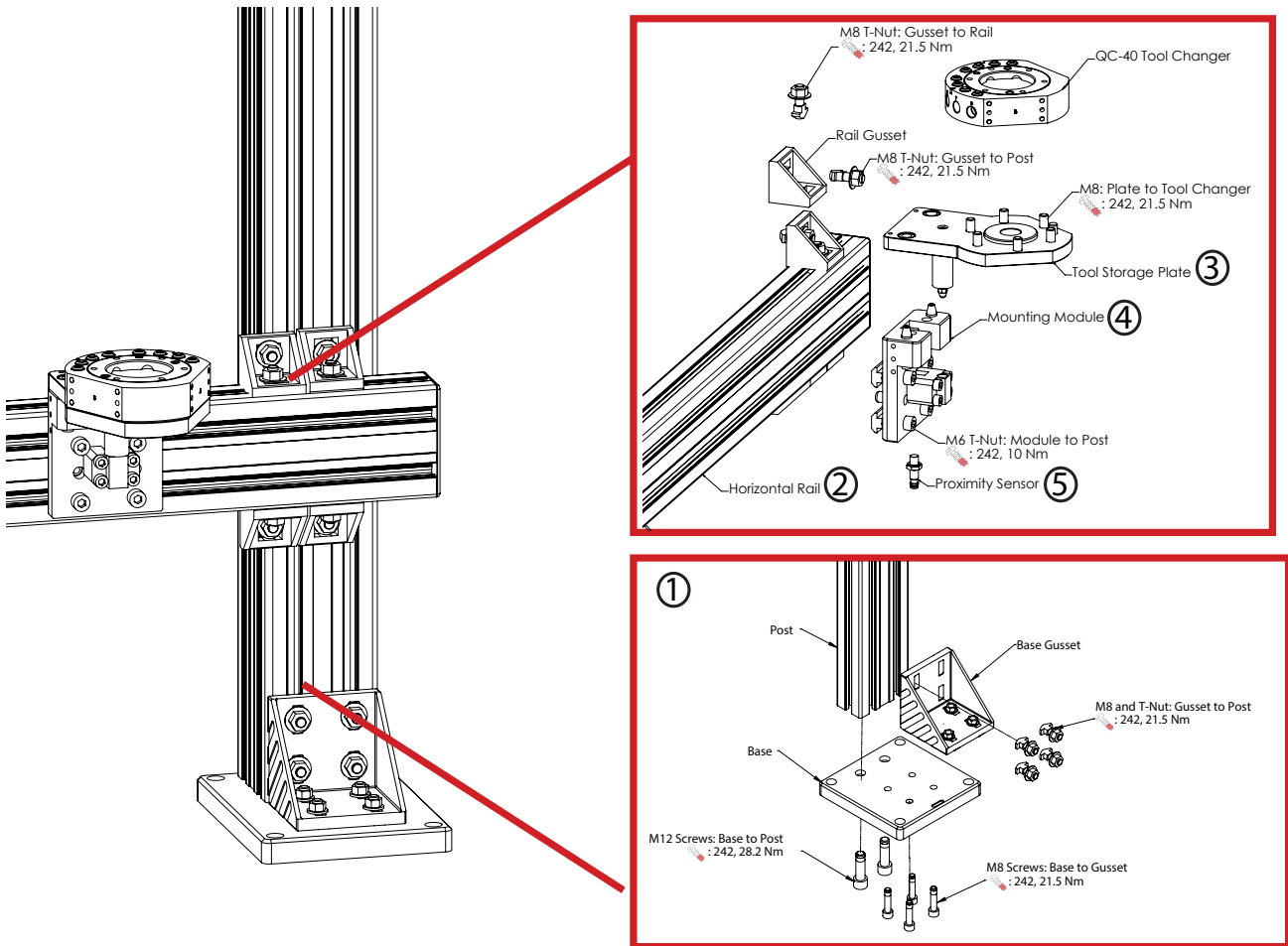


Table 2.13—QC-40Q Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-HBX-XXXX	Horizontal tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.20—QC-40Q Pin and Bushing Vertical Tool Stand Storage Solution

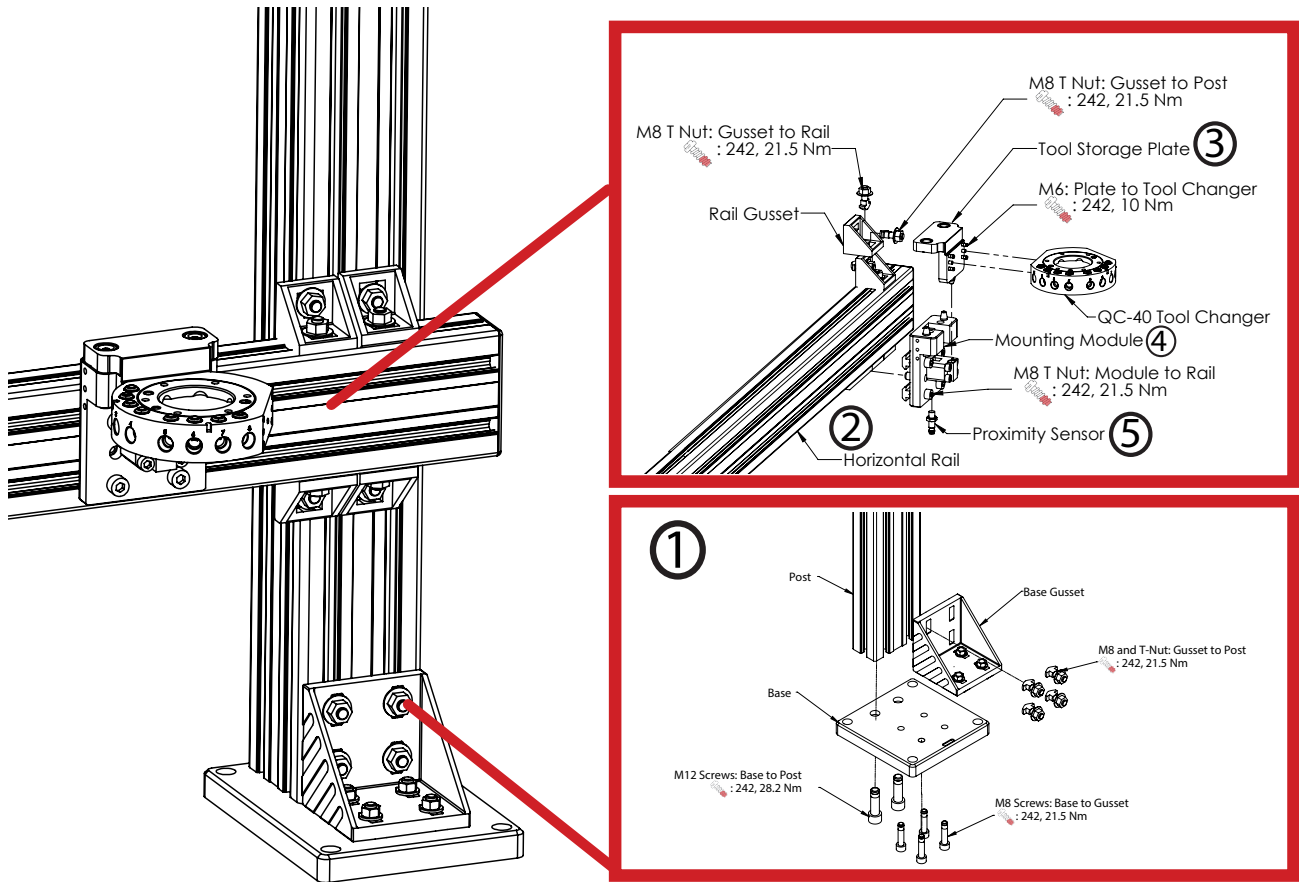


Table 2.14—QC-40Q Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-VBX-XXXX	Vertical tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.9 QC-41

ATI's QC-41 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.21—QC-41 Pin and Bushing Horizontal Tool Stand Storage Solution

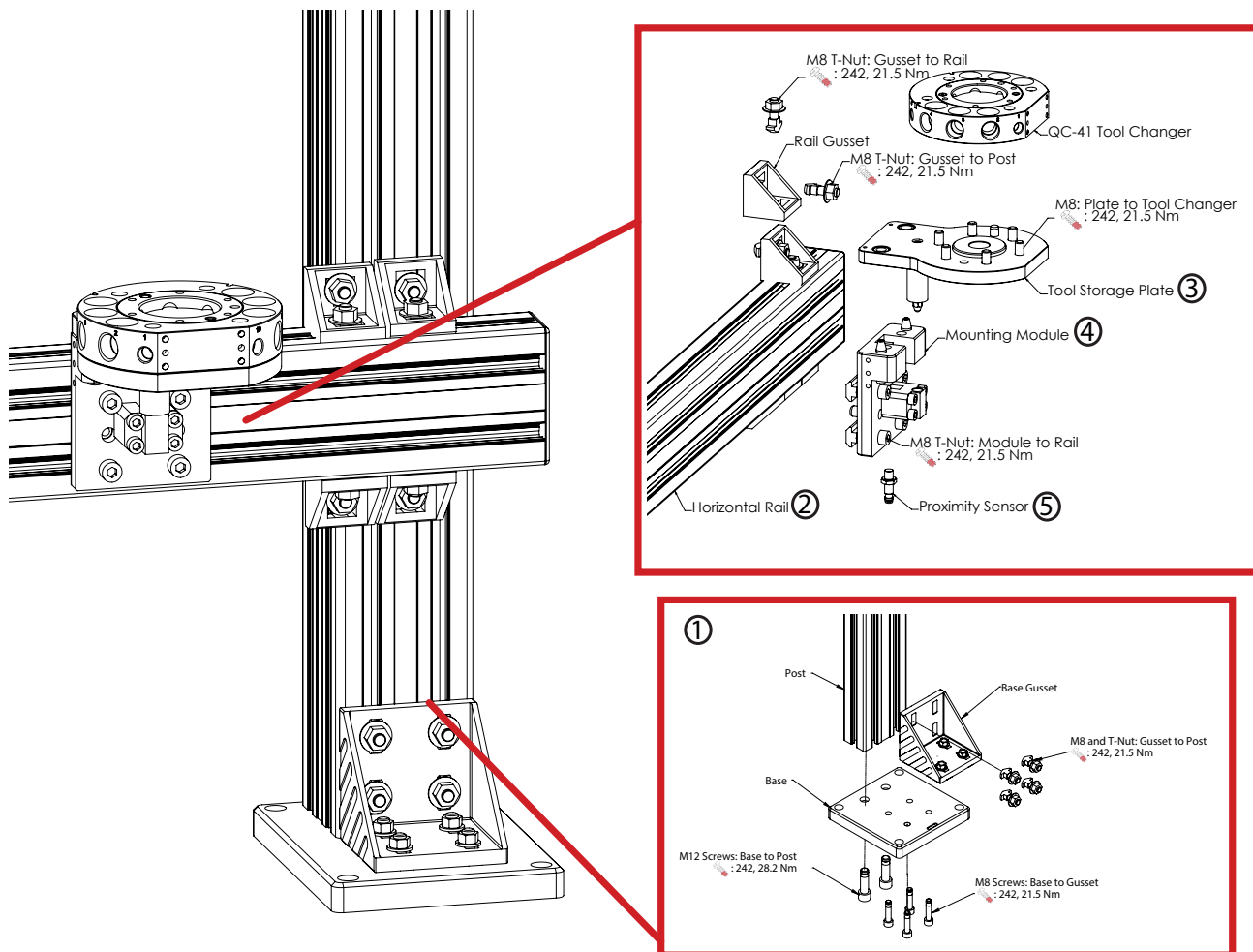


Table 2.15—QC-41 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-HBX-XXXX	Horizontal tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.22—QC-41 Pin and Bushing Vertical Tool Stand Storage Solution

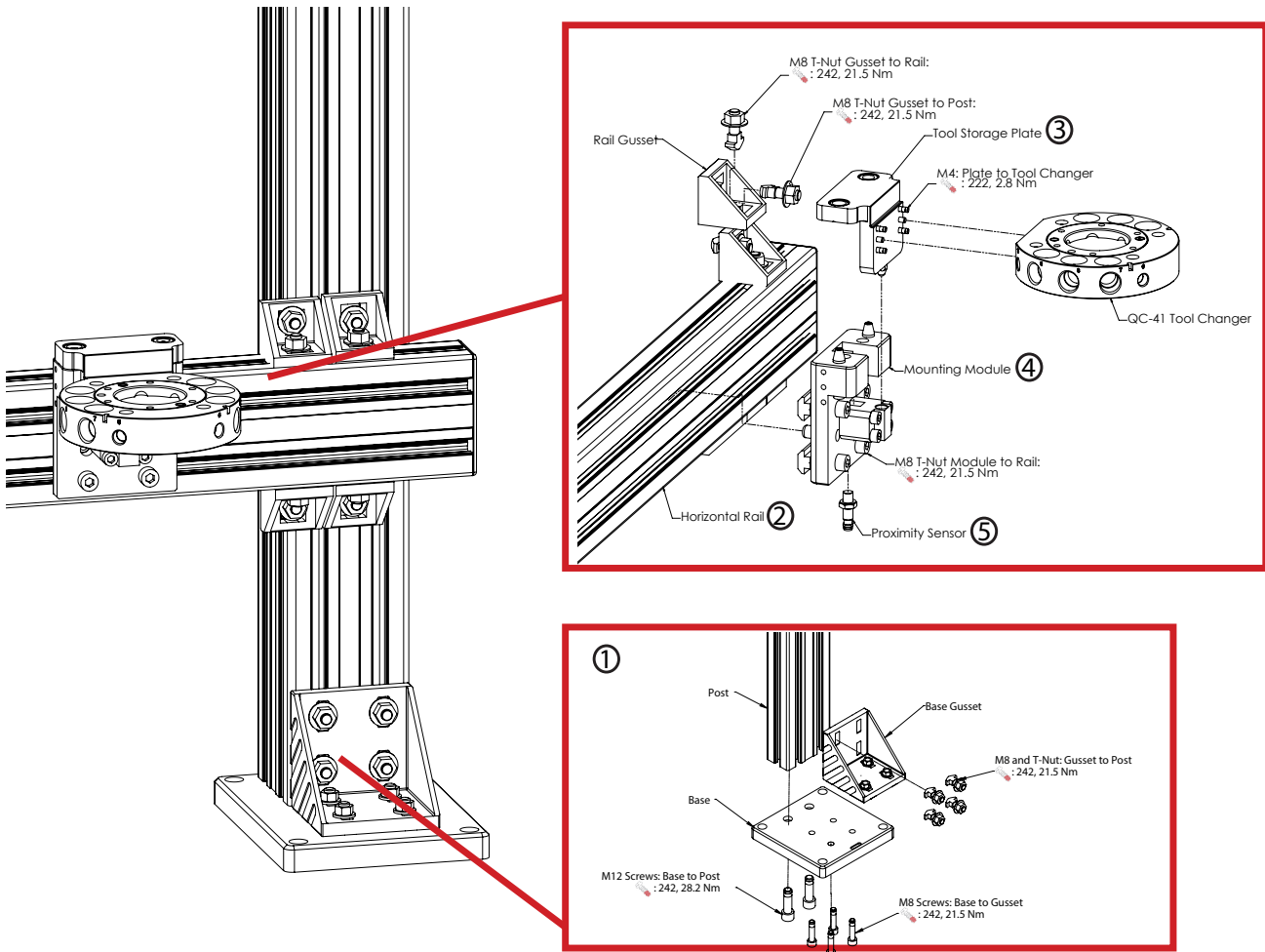


Table 2.16—QC-41 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-VBX-XXXX	Vertical tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.10 QC-46

ATI's QC-46 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.24—QC-46 Pin and Bushing Horizontal Tool Stand Storage Solution

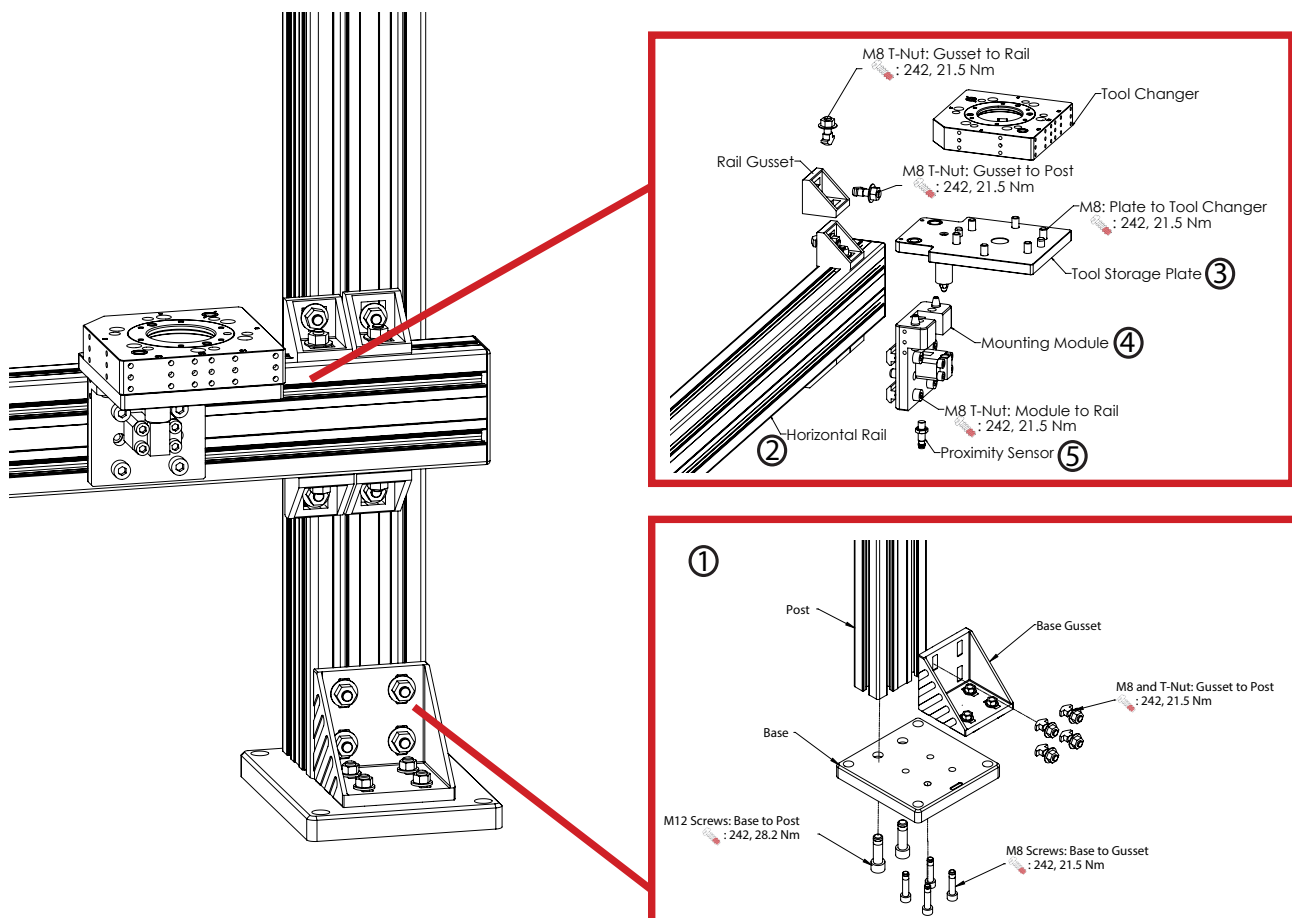


Table 2.17—QC-46 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-HBX-XXXX	Horizontal tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.25—QC-46 Pin and Bushing Vertical Tool Stand Storage Solution

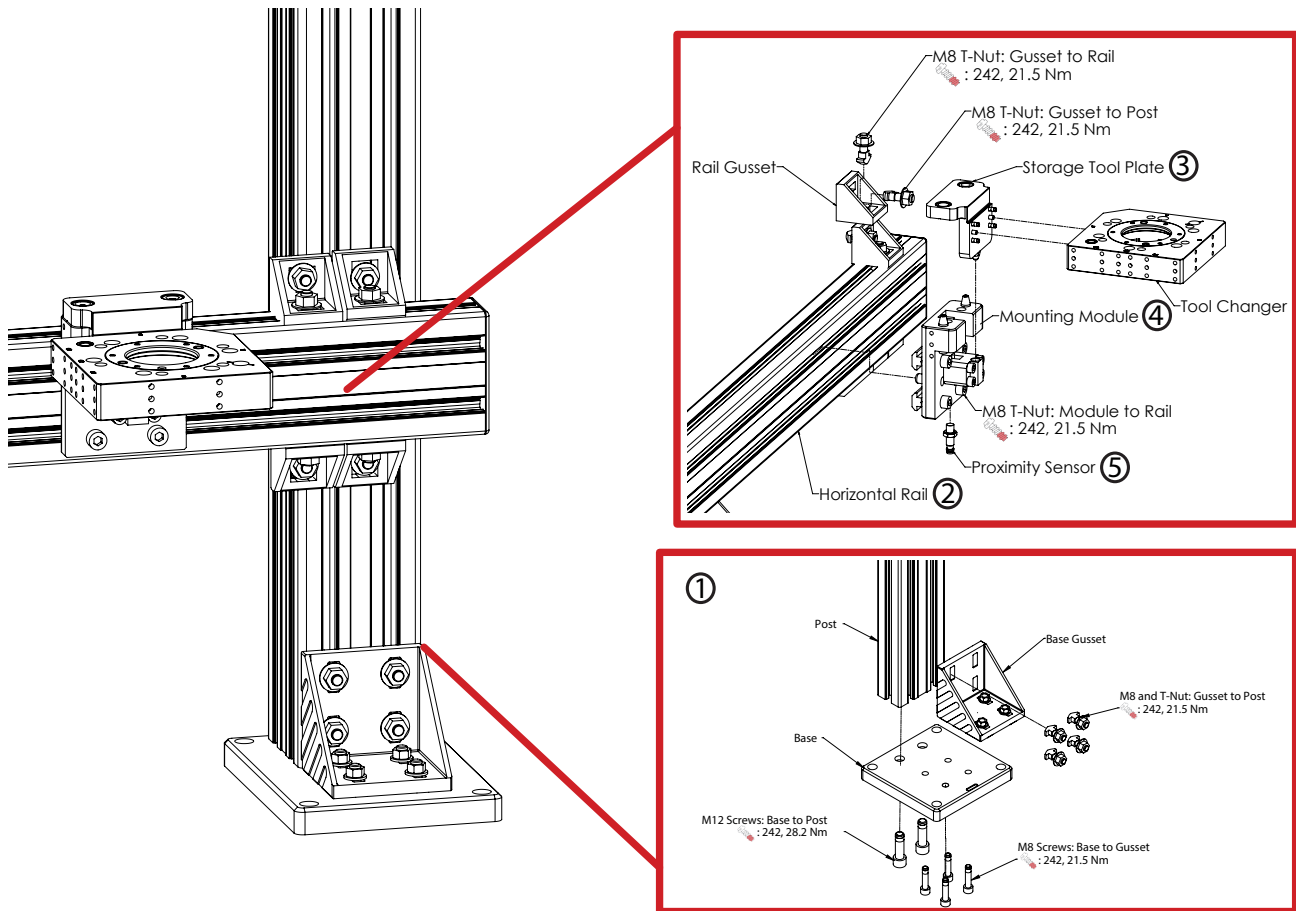


Table 2.18—QC-46 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSS-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSS-VBX-XXXX	Vertical tool storage plate
4	9120-TSS-MMB-XXXX	Mounting module
5	8590-9909999-08	Proximity sensor PNP 3 wire DC
-	8590-9909999-07	Proximity sensor cable, 5 meter female
Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.		

3.11 QC-60

ATI's QC-60 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.26—QC-60 Pin and Bushing Horizontal Tool Stand Storage Solution

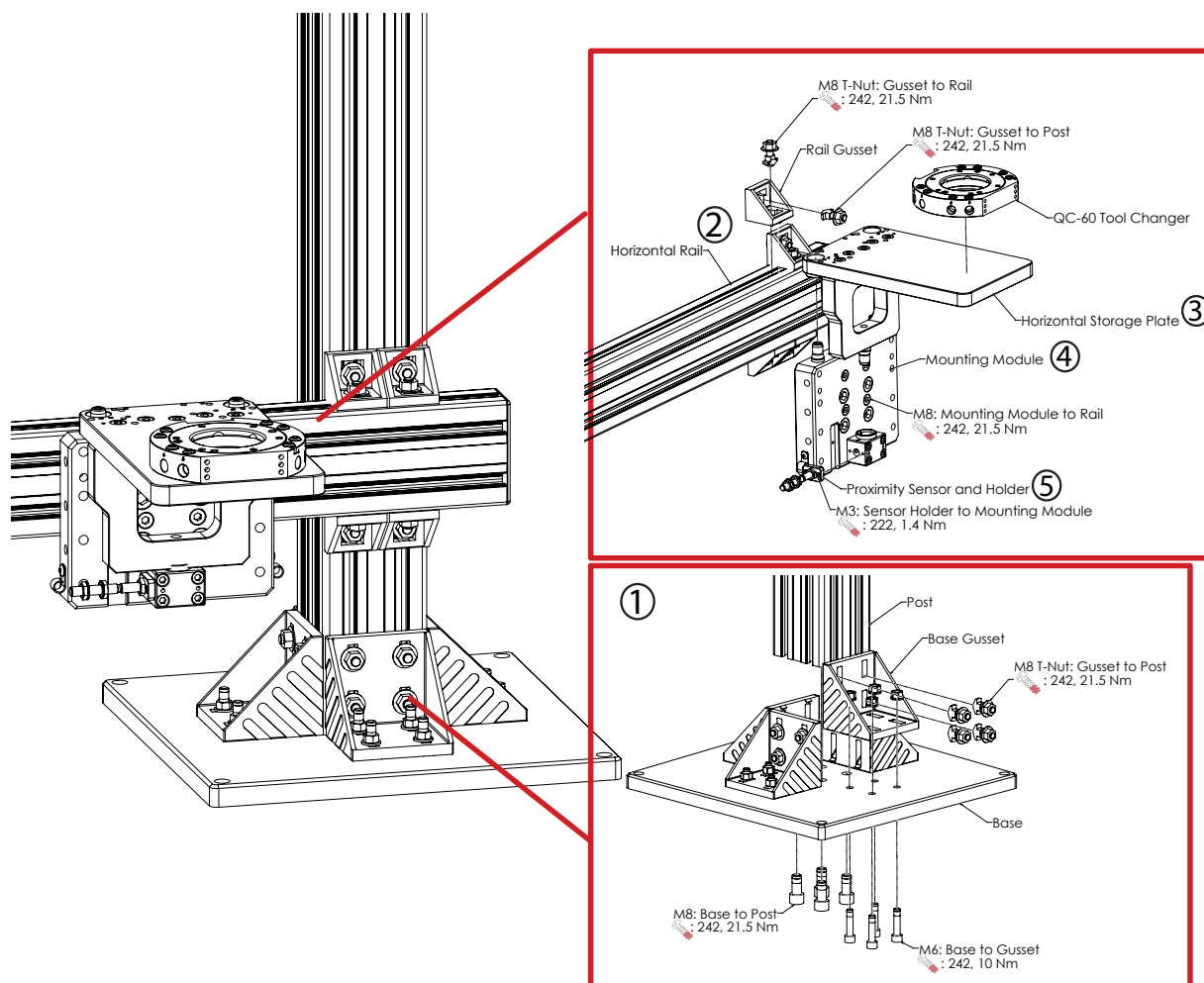


Table 2.19—QC-60 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-HBX-XXXX	Horizontal tool storage plate
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.27—QC-60 Pin and Bushing Vertical Tool Stand Storage Solution

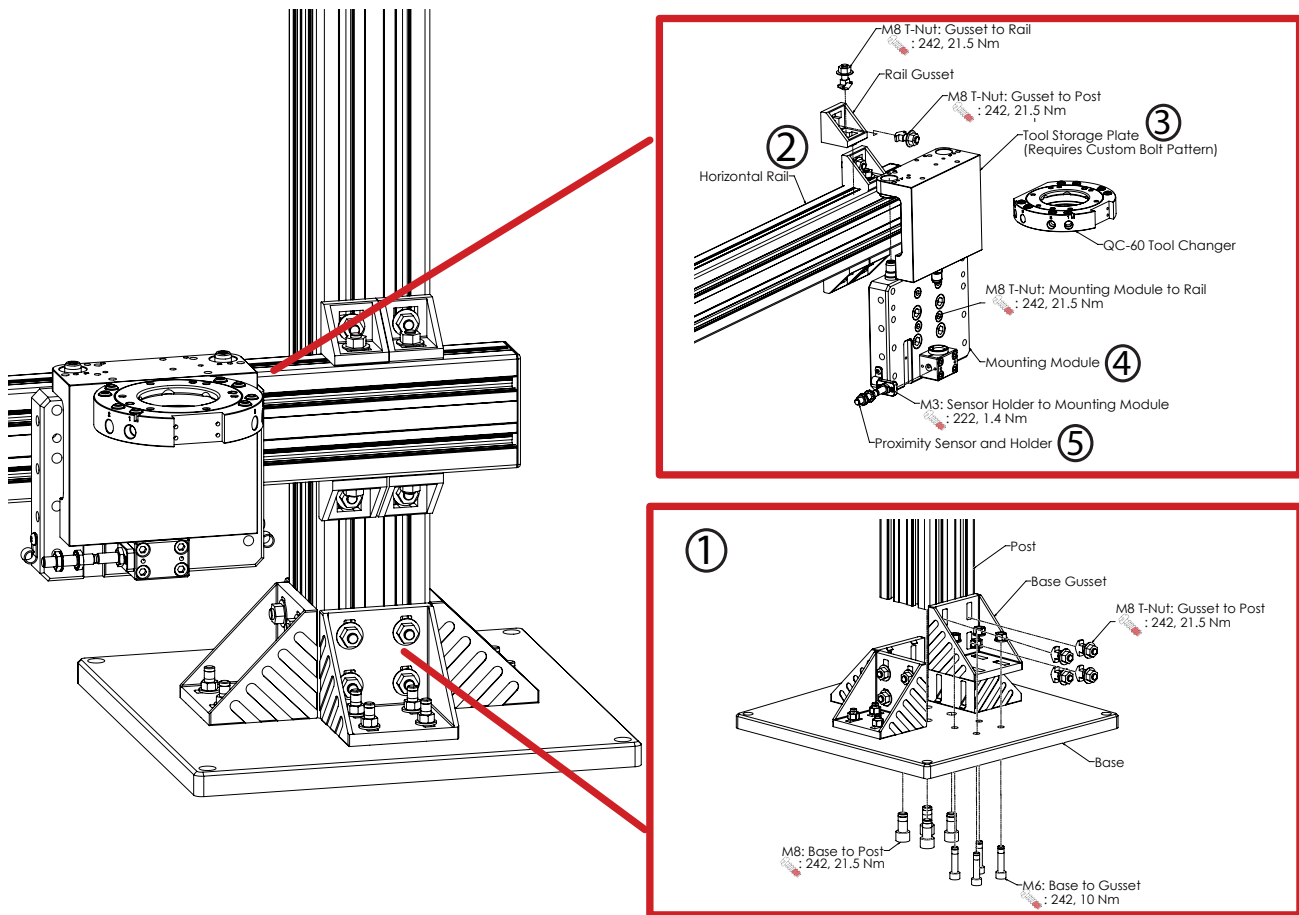


Table 2.20—QC-60 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-VBX-XXXX	Vertical tool storage plate
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.12 QC-71

ATI's QC-71 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.28—QC-71 Pin and Bushing Horizontal Tool Stand Storage Solution

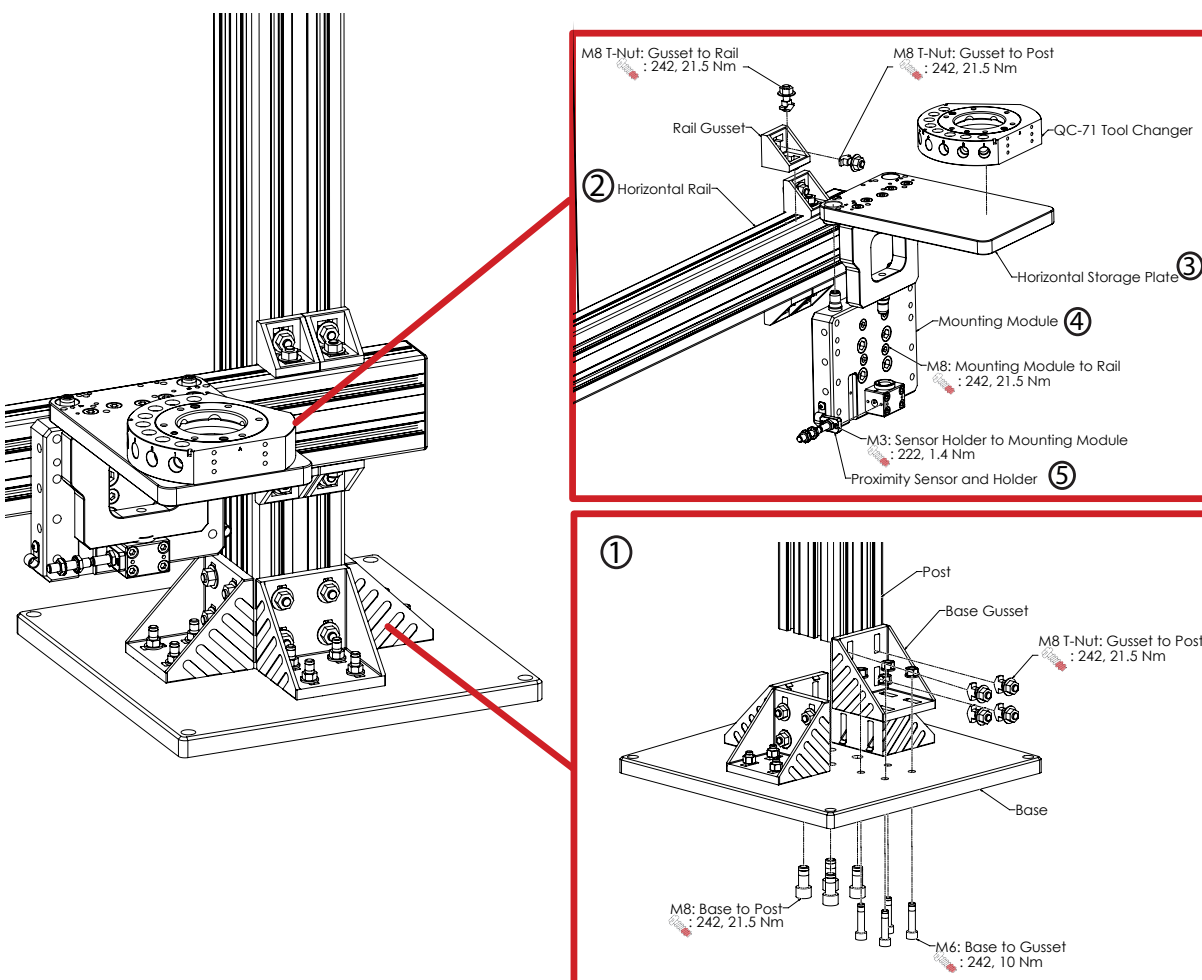


Table 2.21—QC-71 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-HBX-XXXX	Horizontal tool storage plate
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)
Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.		

Figure 2.29—QC-71 Pin and Bushing Vertical Tool Stand Storage Solution

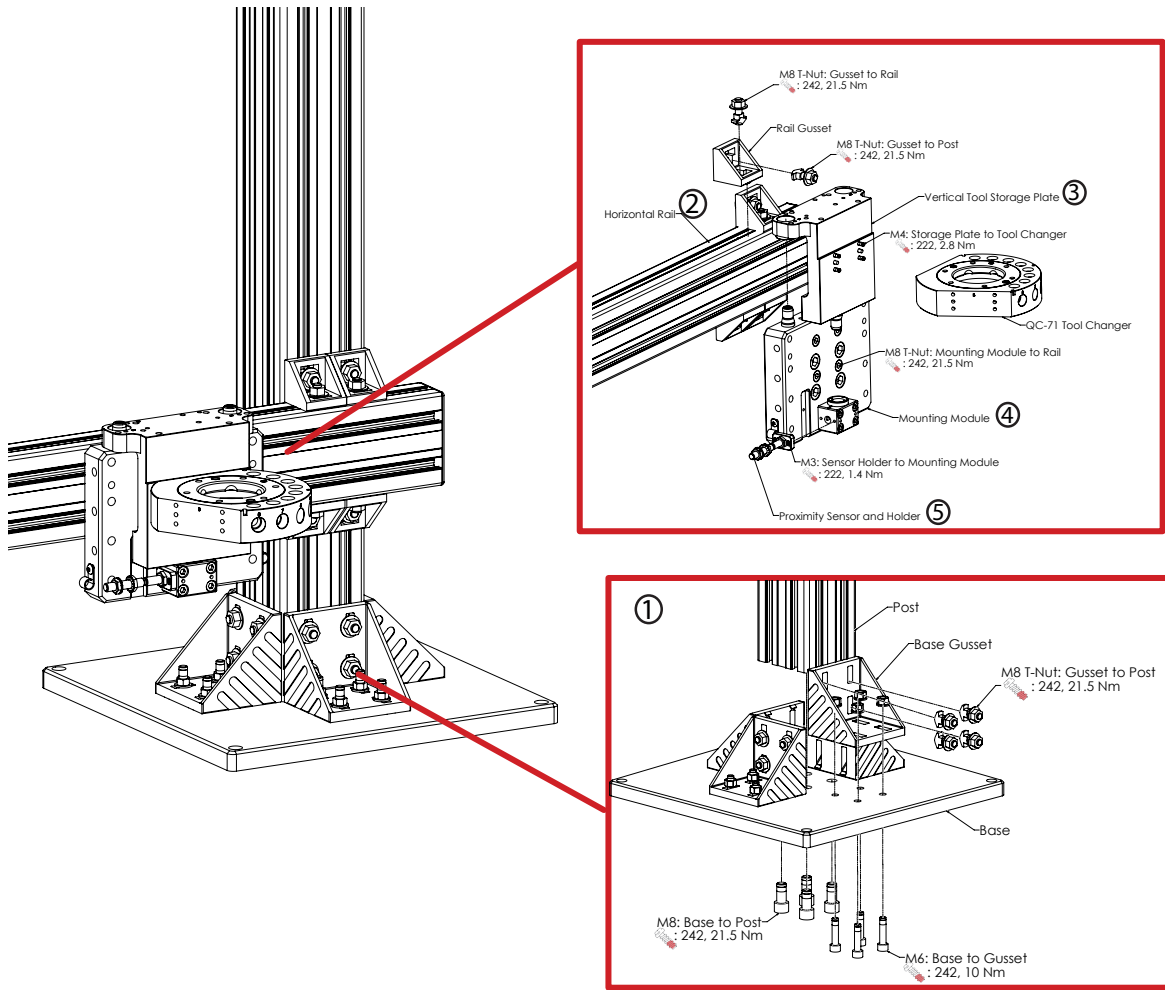


Table 2.22—QC-71 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-VBX-XXXX	Vertical tool storage plate. Limited to less than 10 kg.
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.13 QC-76

ATI's QC-76 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.30—QC-76 Pin and Bushing Horizontal Tool Stand Storage Solution

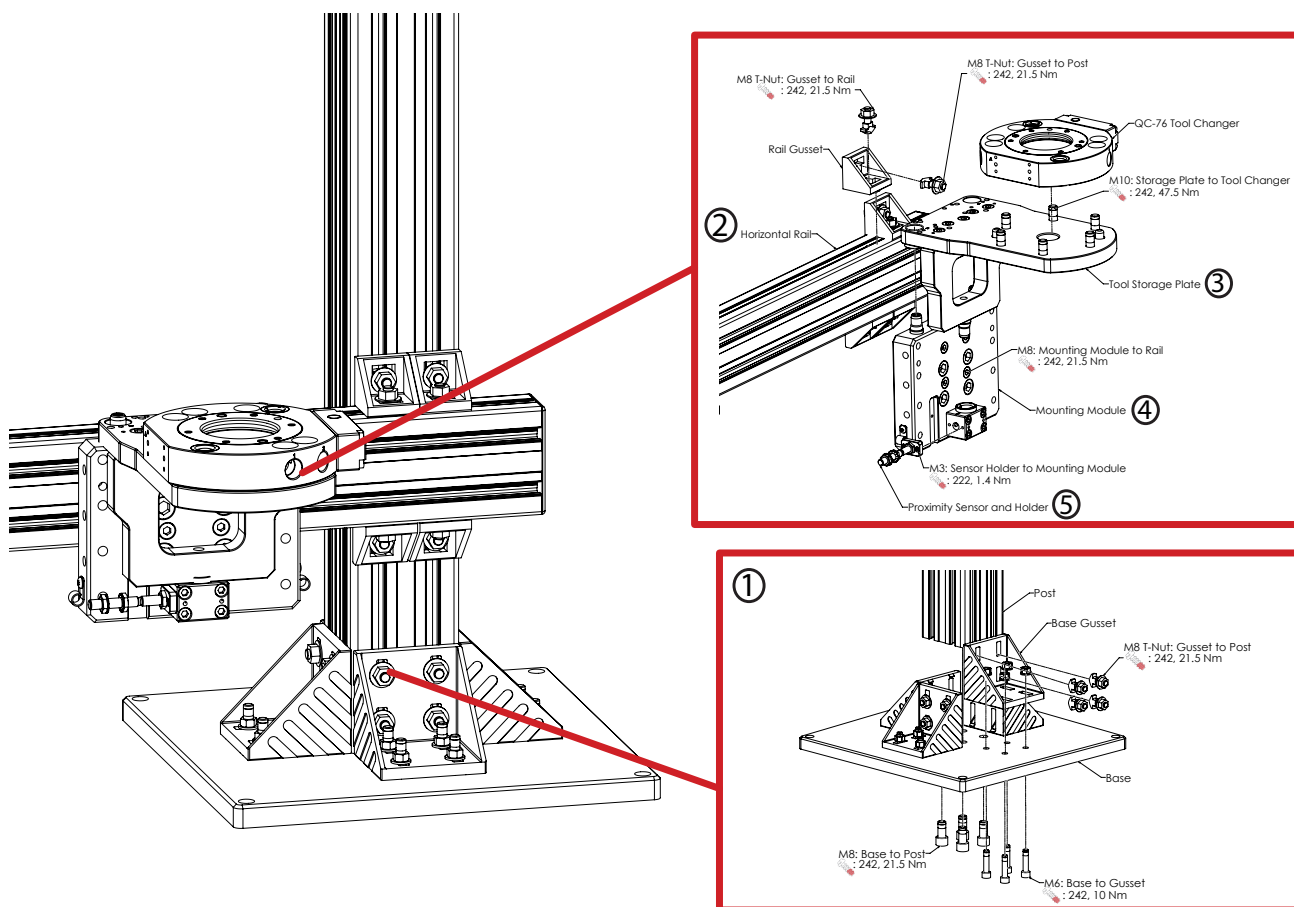


Table 2.23—QC-76 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-HBX-XXXX	Horizontal tool storage plate
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)
Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.		

Figure 2.31—QC-76 Pin and Bushing Vertical Tool Stand Storage Solution

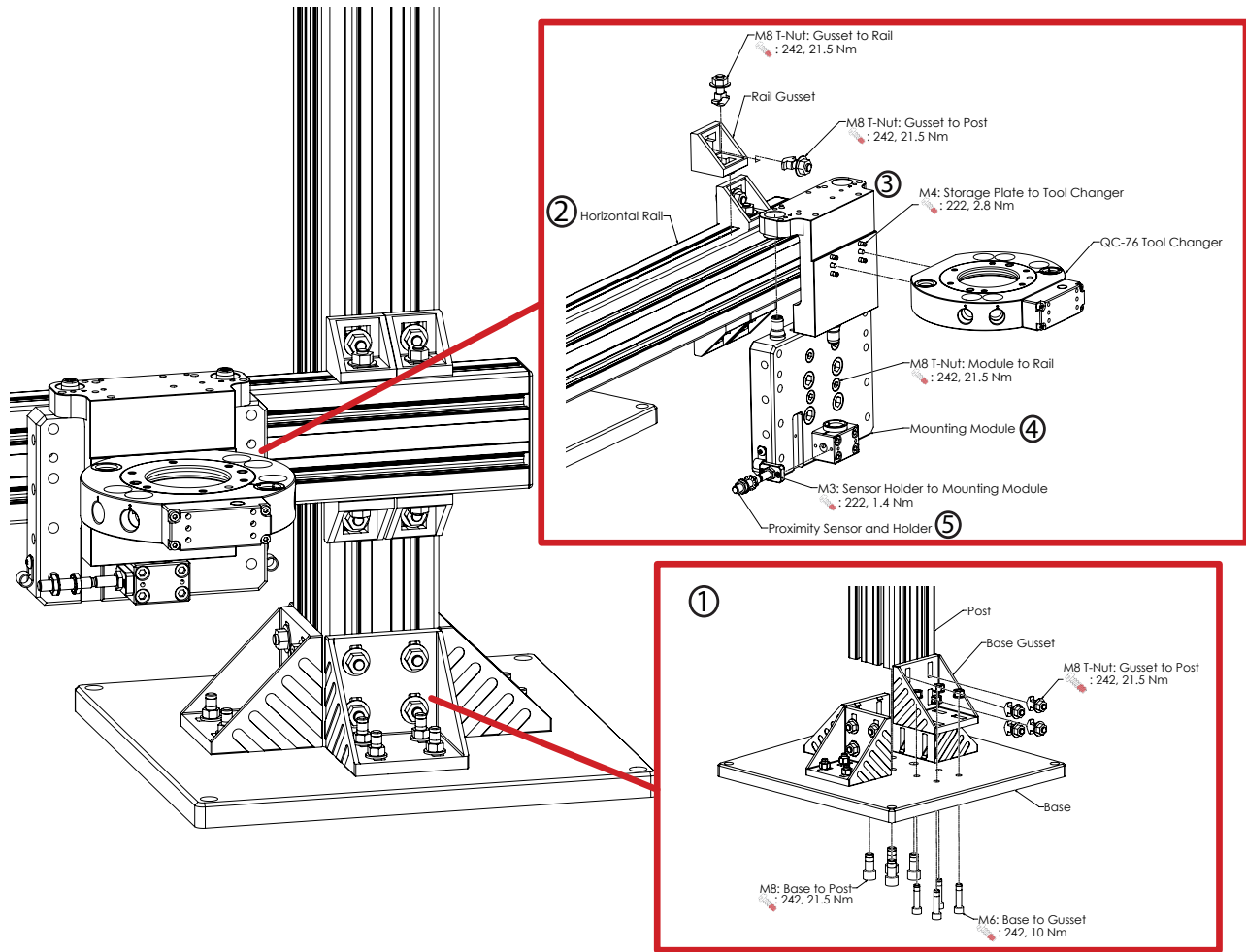


Table 2.24—QC-76 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-VBX-XXXX	Vertical tool storage plate. Limited to less than 10 kg.
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.14 QC-110

ATI's QC-110 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts for each style.

Figure 2.32—QC-110 Pin and Rack Vertical Tool Stand Storage Solution

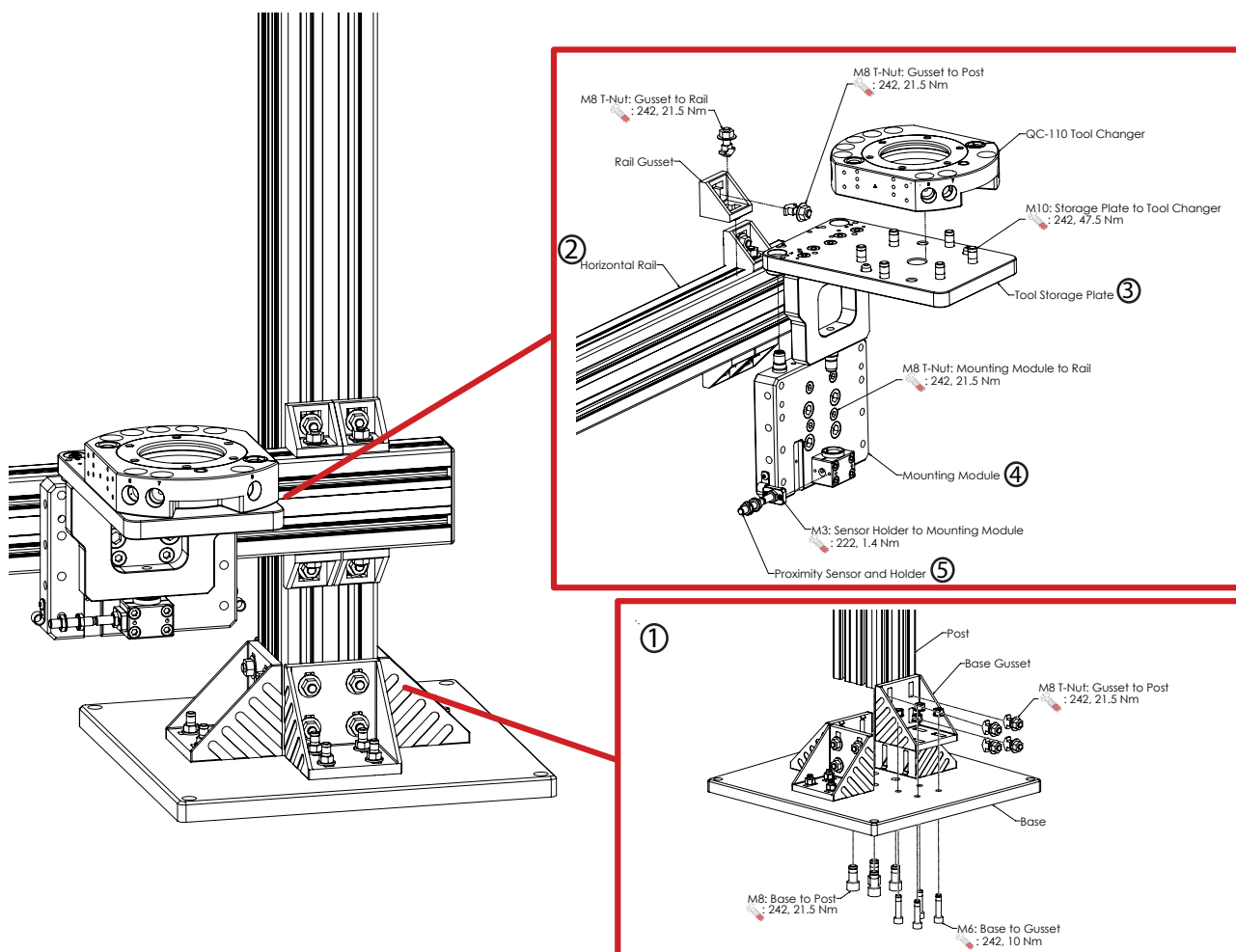


Table 2.25—QC-110 Pin and Bushing Horizontal Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-HBX-XXXX	Horizontal tool storage plate
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

Figure 2.33—QC-110 Pin and Bushing Vertical Tool Stand Storage Solution

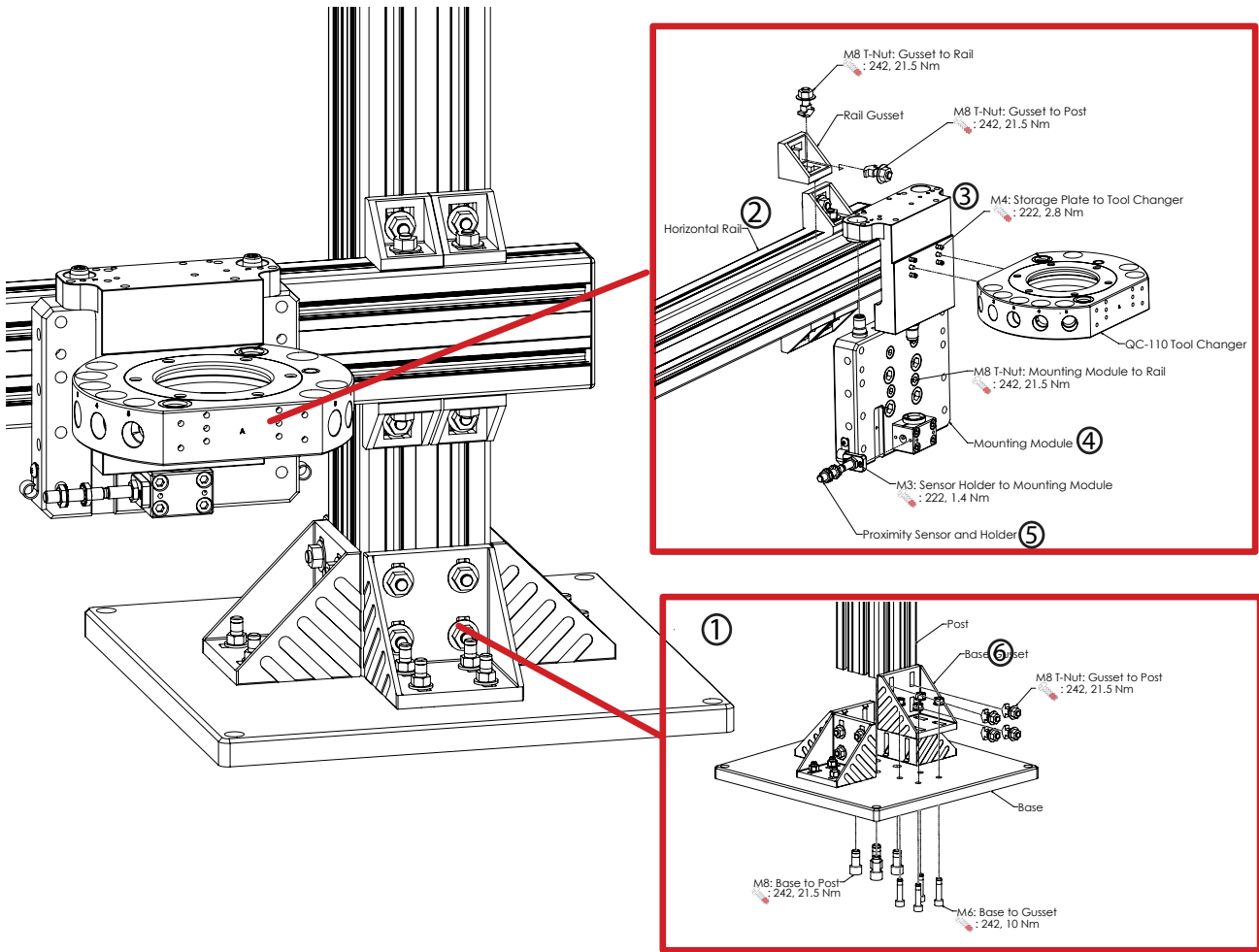


Table 2.26—QC-110 Pin and Bushing Vertical Solution Servicable Parts

No.	Part Number	Description
1	9120-TSM-PM-XXXX	Small Tool Stand post and base assembly
2	9120-TSM-HM-XXXX	Horizontal rail
3	9120-TSM-VBX-XXXX	Vertical tool storage plate. Limited to less than 10 kg.
4	9120-TSM-MMB-XXXX	Mounting module
5	9120-TSM-SMA-XXXX	Proximity sensor assembly
-	8590-9909999-07	Proximity sensor cable, 5 meter female (not shown in image)

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

3.15 QC-160

ATI's QC-160 Tool Changer has one main tool storage solution: pin and bushing. However, both horizontal and vertical mounting plates are available. The following sections detail installation, operation, and any serviceable parts.

Figure 2.34—QC-160 Pin and Bushing Tool Stand Storage Solution

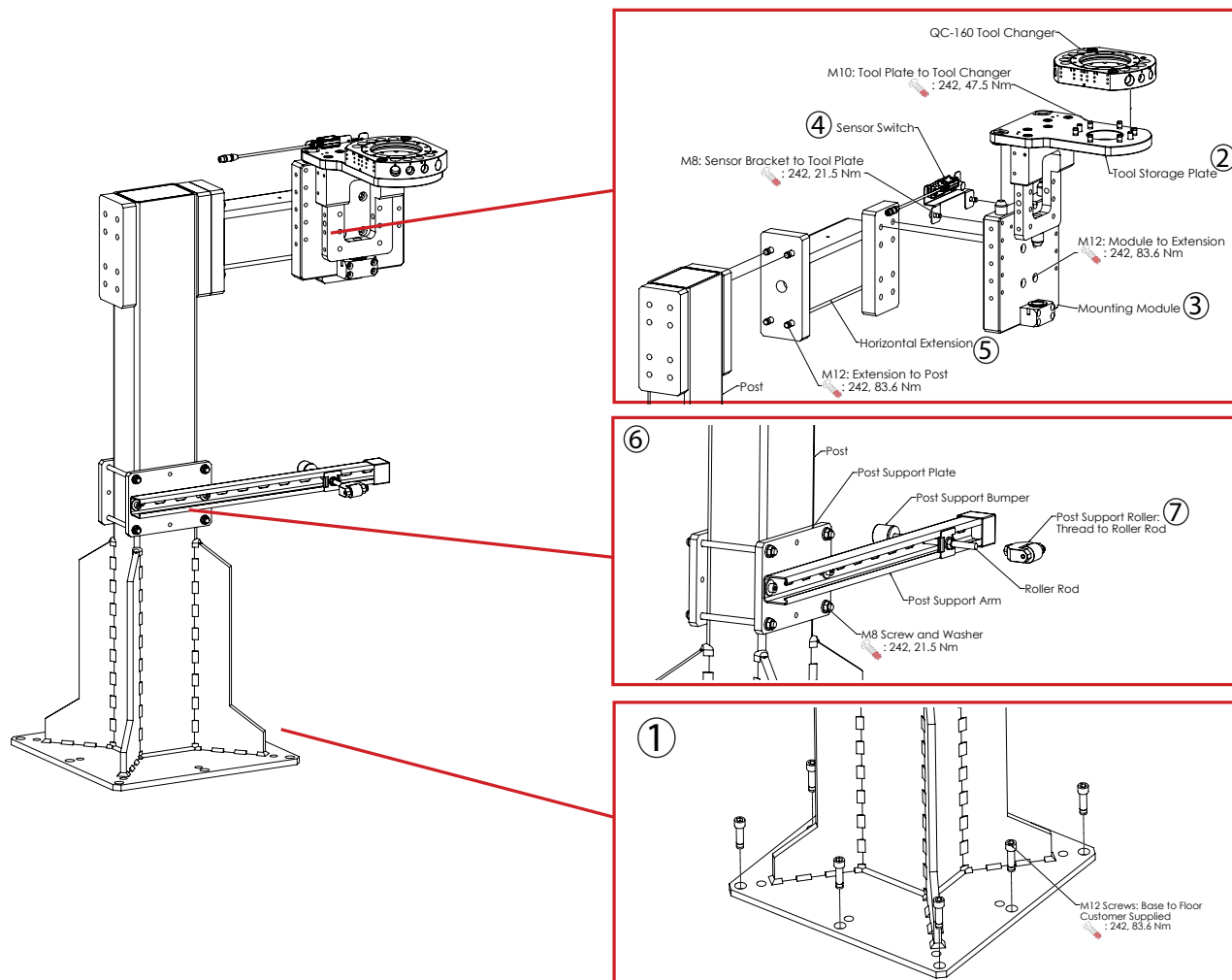


Table 2.27—QC-160 Pin and Bushing Solution Servicable Parts

No.	Part Number	Description
1	9120-TSL-PM-XXXX	Large Tool Stand post
2	9120-TSL-HBX-XXXX	Horizontal tool storage plate
-	9120-TSL-VBX-XXXX	Vertical tool storage plate (not shown in image)
3	9120-TSL-RMB-XXXX	Pin and Bushing Mounting Module
4	9120-TSL-SMA-XXXX	Proximity sensor assembly
4	9120-TSL-SS-XXXX	Switch assembly, used to verify presence of Tool Changer in stand (optional)
5	9120-TSL-HEXX-XXXX	Horizontal rail extension (optional)
6	9120-TSL-PS-XXXX	Post support, used to provide additional stability for heavier tooling (optional)
8	9120-TSL-PS-8229	Post support roller (optional).

Note: For specific part numbering or to select individual components, refer to the ATI Tool Changer catalog or contact ATI.

4. Maintenance



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.

Check the following areas at least once every 5,000 cycles. Earlier intervention is necessary if a problem is identified prior to the scheduled maintenance checks.

Verify regularly that the following components are tight and tighten if necessary:

- Tool Stand base
- Post and gussets
- Horizontal rails and extensions
- Mounting blocks
- Alignment pins and bushings
- Hooks and hanger rods
- Debris shield, shield arm, and debris shield actuator
- Proximity sensors and applicable sensor components

Other maintenance actions:

- Inspect all hoses and utility lines for wear. If worn, repair or replace.
- Inspect all extensions and tooling plates for signs of sagging or deflection; if so, contact ATI.
- Inspect all steel components for rust. If needed, clean and lubricate with a brush and M1 oil.
- Replace sensor, if necessary.
- Clean and lubricate applicable individual Tool Stand components:
 - Pin and Bushing Mounting Module
 - Alignment Pins and Bushings
 - Proximity sensor faces
 - Hooks and hanger rods
 - Storage tool plate

5. Troubleshooting

For assistance to resolve issues that arise during operation, refer to the following table:

Symptom	Possible Cause	Correction
Tool drop-off position not repeatable.	Alignment pin loose, worn, damaged, or missing.	Tighten or replace alignment pins.
	Tool Changer misaligned with storage plate	Inspect Tool Changer and storage plate for signs of damage or wear. Replace components or recalibrate as necessary.
Tool position while in the storage is not straight and parallel.	Alignment pin loose, worn, damaged, or missing.	Tighten or replace alignment pins.
	Alignment bushing worn.	Inspect alignment bushings for wear. Replace If necessary.
	Shoulder bolt loose, worn or missing.	Inspect shoulder bolt, tighten or replace If necessary.
	Hook attachment loose or worn.	Inspect hook attachment, tighten or replace if necessary.
Proximity sensor fails	Debris build up on proximity sensor.	Check for debris build up and clean if necessary.
	Proximity sensor loose or not positioned properly.	Verify correct distance between sensing face and target. Adjust If necessary.
	Sensor cable broken or damaged.	Inspect sensor cable for damage. Test continuity. Replace if damaged.
	Proximity sensor damaged or not functioning.	Inspect proximity sensor for damage; test sensor.
Debris shield malfunctioning	Debris shield mounting loose or out of adjustment.	Inspect mounting for looseness, tighten fasteners. Inspect for proper adjustment.
	Debris shield actuator sensor malfunctioning or cables damaged.	Inspect sensor cable for damage; test continuity. Replace if damaged. Inspect sensor for damage; test sensor. Replace if necessary.
Tool stand interlock switch malfunctioning.	TSI switch or switch actuator out of adjustment or loose mounting fasteners.	Inspect TSI switch and switch actuator for loose fasteners. Adjust or tighten fasteners or adjust switch/trip dog.
	TSI switch or cable damaged.	Inspect switch cable for damage; test for continuity. Replace if damaged. Test switch for functionality; replace if not functioning.
Tool/ end-effector is malfunctioning.	Utility lines and cables damaged.	Inspect utility lines, cables, and connections for damage or wear. Replace any damaged utility lines and cables.
	Tool Changer or utility modules not functioning.	Verify Tool Changer and utility modules function properly. Refer to the Tool Changer and utility module manuals.