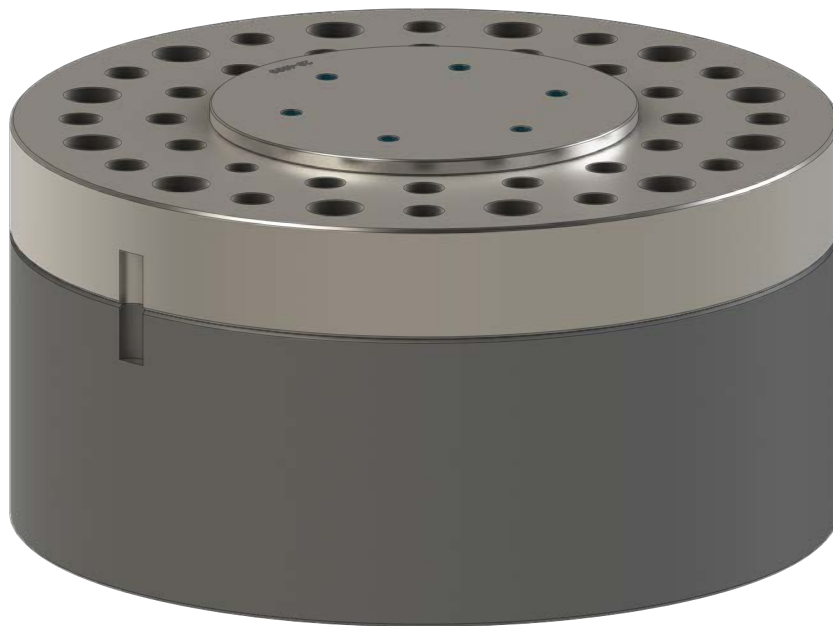




QC Spacer Manual

Two Piece, Bolted Type



Document #: 9610-20-2992

Engineered Products for Robotic Productivity

Pinnacle Park • 1031 Goodworth Drive • Apex, NC 27539 • Tel: +1-919.772.0115 • Fax: +1-919.772.8259 • www.ati-ia.com • Email: info@ati-ia.com

Foreword

Please contact ATI Industrial Automation with any questions concerning your 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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How to Reach Us

Sale, Service and Information about ATI products:

ATI Industrial Automation

1031 Goodworth Drive
Apex, NC 27539 USA
www.ati-ia.com
Tel: 919.772.0115
Fax: 919.772.8259
E-mail: info@ati-ia.com

Technical support and questions:

Application Engineering

Tel: 919.772.0115, Option 2, Option 2
Fax: 919.772.8259
E-mail: mech_support@ati-ia.com

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Glossary of Terms

Term	Definition
End-effector	The customer's tooling that attaches to the Tool Side Spacer and is used to perform a particular function.
Interface Plate	Either an optional plate used to adapt the robot side spacer to the customer's robot flange or to adapt the Tool Side Spacer to the customer tooling or end-effector.
QC Spacer	See Spacer.
Quick-Change (QC)	See Tool Changer.
Robot	Any multi-axis automated articulated arm that can be reprogrammed.
Robot Interface Plate (RIP)	An optional plate used to adapt the Robot Side Spacer to the customer's robot flange.
Robot Side Spacer	The piece of the QC Spacer that is mounted to a robot.
Spacer	A fixture used in customer applications with only one tool and where tool changing is not currently required. The Spacer has the same stack height as its corresponding Tool Changer and is designed to be a physical placeholder for future replacement by the Tool Changer.
Tool Changer	An assembly with two mating parts, a Master side and a Tool side, that have been designed to couple and uncouple together automatically, carry a payload, and have the ability to pass utilities such as electrical signals, pneumatic circuits, fluid lines, etc. The Tool Changer provides the flexibility for any automated process to change tools and pass various utilities. The Master side mounts to a customer device like a robot. The Tool side mounts to the customer end-effector.
Tool Side Spacer	The part of the QC Spacer that attaches to the customer end-effector or customer tooling

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. More specific notifications are imbedded within the sections of the manual where they apply.

1.1 Explanation of Notifications

The following notifications are specific to the product(s) covered by this manual. It is expected that the user 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

Prior to purchase and installation, the customer should verify that the selected QC Spacer is suitable for the maximum loads and moments expected during operation. Refer to [Section 6—Specifications](#) for further product information or contact ATI for assistance. Particular attention should be paid to dynamic loads caused by robot acceleration and deceleration. These forces can be many times the value of static forces in high acceleration or deceleration situations.

1.3 Safety Precautions



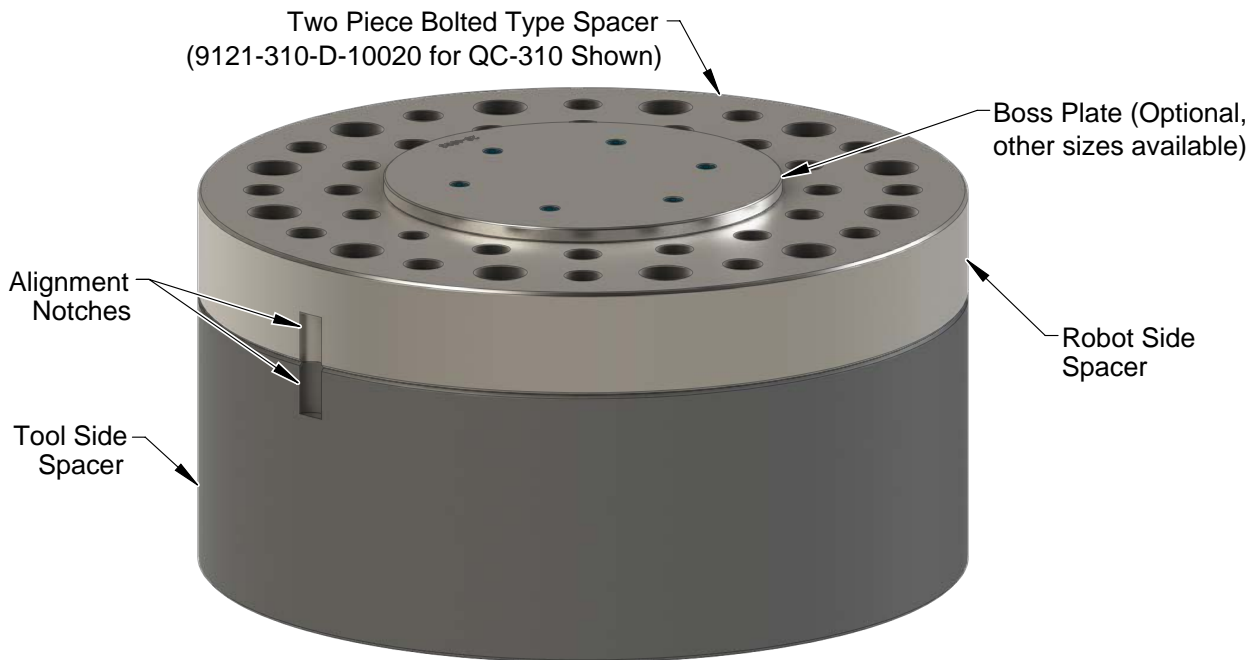
CAUTION: The QC Spacer is only to be used for intended applications and applications approved by the manufacturer. Using the QC Spacer in applications other than intended will result in damage to the Spacer or end-of-arm tooling and could cause injury to personnel.

2. Product Overview


ATI provides a series of Two Piece Bolted Type QC Spacers that serve as a temporary placeholder for applications that will require a Tool Changer in the future. When tool changing is required, the Spacer can be easily exchanged for the corresponding ATI Tool Changer and should not require extraordinary programming changes to the robot. The series of Spacers are designed for QC-110, QC-210, QC-310, and QC-510 heavy automation Tool Changers. Refer to [Section 6—Specifications](#) and [Section 7—Drawings](#) for more information. For the most current product information, click the following link: [QC Spacers](#).


Each Spacer assembly has a Robot Side Spacer that attaches to a robot interface plate or the robot (refer to [Figure 2.1](#)). Some Robot Spacers have a removable boss plate. Using the alignment notches, the Tool Side Spacer is oriented to the Robot Side Spacer and assembled together with socket head cap screws. Customer tooling can then be attached to a tool interface plate or directly to the Spacer. Refer to [Section 3—Installation](#) and [Section 7—Drawings](#) for mounting details.

Figure 2.1—Two Piece Bolted Type Spacer



3. Installation

 **WARNING:** Do not install or remove the QC Spacer unless all energized circuits from the robot to customer tooling attached to the Spacer have been turned off in accordance with the user's safety practices and policies. Injury or equipment damage could occur. Turn off and discharge customer's energized circuits as applicable. Verify the user's safety practices and policies have been implemented before installing or removing the Spacer from the work area.

 **CAUTION:** Do not use fasteners with pre-applied adhesive more than once. Fasteners might become loose and cause equipment damage. Always apply new thread locker when reusing fasteners.

All fasteners used to assemble the Spacer assembly and mount to the robot should be tightened to a torque value as well as have a threadlocker as indicated in [Table 3.1](#) and [Table 3.2](#), which contains recommended values based on engineering standards.

If the customer determines to use robot and/or tool interface plates to account for stack height with a Tool Changer, the Spacers have the same robot and tool mounting patterns as their respective Tool Changers. Refer to [Table 3.1](#) and [Table 3.3](#) for recommended torque and threadlocker values. For further information on recommended interface plate mounting features and design, refer to [Section 3.1—Robot Interface](#) and [Section 3.2—Tool Interface](#).

Mounting Condition		Fastener Size and Property Class ²	Allen® Wrench Size	Suggested Torque	Threadlocker
Mounting Configuration	Minimum Thread Engagement				
Robot Side Spacer to Robot Interface Plate (6061-T6 aluminum)	0.59" (15 mm) [1.5X fastener Ø]. ¹	M10-1.5 Class 12.9	8 mm	38 ft-lbs (52 Nm)	Pre-applied Adhesive or Loctite® 242
	0.71" (18 mm) [1.5X fastener Ø]. ¹	M12-1.75 Class 12.9	10 mm	70 ft-lbs (95 Nm)	
	0.94" (24 mm) [1.5X fastener Ø]. ¹	M16-2.0 Class 12.9	14 mm	165 ft-lbs (225 Nm)	
Robot Side Spacer to Robot Interface Plate (steel; USS ≥ 40KSI)	0.71" (18 mm) [1.5X fastener Ø]. ¹	M12-1.75 Class 12.9	10 mm	100 ft-lbs (135 Nm)	
	0.94" (24 mm) [1.5X fastener Ø]. ¹	M16-2.0 Class 12.9	14 mm	240 ft-lbs (325 Nm)	
Robot Side Spacer to Robot (steel; USS ≥ 90KSI)	0.39" (10 mm) [1.0X fastener Ø]. ¹	M10-1.5 Class 12.9	8 mm	55 ft-lbs (75 Nm)	
	0.47" (12 mm) [1.0X fastener Ø]. ¹	M12-1.75 Class 12.9	10 mm	100 ft-lbs (135 Nm)	
	0.63" (16 mm) [1.0X fastener Ø]. ¹	M16-2.0 Class 12.9	14 mm	240 ft-lbs (325 Nm)	

Note:

1. Confirm available thread engagement with Robot Manufacturer.
2. Socket Head Cap Screw.
3. Do not exceed maximum available thread depth as shown in [Section 7—Drawings](#).

Table 3.2—Fastener Size, Class, and Torque Specifications for Spacer Assembly Mounting Condition				
Two Piece Bolted Type Spacer Part Number	Fastener Quantity, Size, and Property Class	Allen Wrench Size	Suggested Torque	Threadlocker
9120-110-A-10038 9120-110-B-10038 9120-110-C-10038 9120-110-D-10038 9120-110-E-10038 9120-110-F-10038 9121-210-A-10014	M10-1.5 Class 12.9 (11) for QC-110 (12) for QC-210 Socket Head Cap Screw	 8 mm	 55 ft-lbs (75 Nm)	Pre-applied Adhesive ¹ or Loctite 242
9121-310-D-10020	(15) M12-1.75 Class 12.9			
	Socket Head Cap Screw	10 mm	100 ft-lbs (135 Nm)	
9121-510-D-10036	(15) M16-2.0 Class 12.9			
	Socket Head Cap Screw	14 mm	240 ft-lbs (325 Nm)	

Note:

- Do not use supplied fasteners with pre-applied adhesive more than one time. After one time, the pre-applied adhesive on these screws is no longer a suitable threadlocker; apply Loctite for re-installation.

Table 3.3—Fastener Size, Class, and Torque Specifications for Tool Mounting Conditions					
Mounting Condition		Fastener Size and Property Class ²	Allen Wrench Size	Suggested Torque	Threadlocker
Mounting Configuration	Minimum Thread Engagement				
Tool Interface Plate (aluminum) to Tool Side Spacer	0.59" (15 mm) [1.5X fastener Ø]. ³	M10-1.5 Class 12.9	8 mm	38 ft-lbs (52 Nm)	Pre-applied Adhesive or Loctite 242
	Tool Interface Plate (aluminum or steel) to Tool Side Spacer	0.71" (18 mm) [1.5X fastener Ø]. ³	M12-1.75 Class 12.9	10 mm	
0.94" (12 mm) [1.5X fastener Ø]. ³		M16-2.0 Class 12.9	14 mm	165 ft-lbs (225 Nm)	

Note:

- Confirm available thread engagement with Robot Manufacturer.
- Socket Head Cap Screw.
- Do not exceed maximum available thread depth as shown in [Section 7—Drawings](#).

3.1 Robot Interface

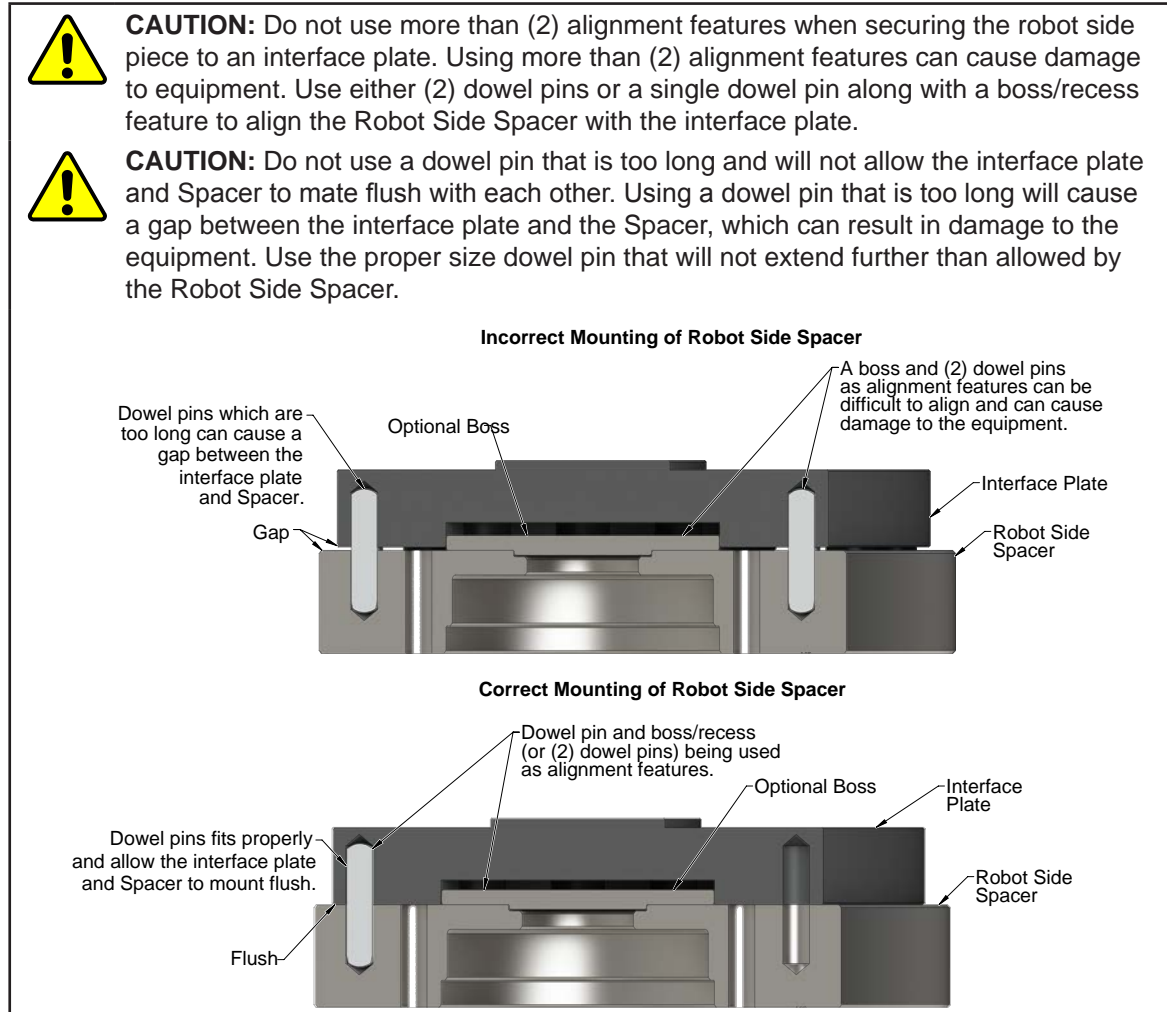
The Robot Side Spacer is typically attached to the robot arm. It may be necessary for a robot interface plate to adapt the Spacer to a specific robot arm. The Robot Side Spacer has alignment features (dowel holes and optional boss) to accurately position to the robot arm or an interface plate. Custom interface plates are available from ATI upon request. (Refer to [Section 7—Drawings](#) of this manual for technical information on mounting features.)



CAUTION: Do not use more than (2) alignment features when securing the robot side piece to an interface plate. Using more than (2) alignment features can cause damage to equipment. Use either (2) dowel pins or a single dowel pin along with a boss/recess feature to align the Robot Side Spacer with the interface plate.



CAUTION: Do not use a dowel pin that is too long and will not allow the interface plate and Spacer to mate flush with each other. Using a dowel pin that is too long will cause a gap between the interface plate and the Spacer, which can result in damage to the equipment. Use the proper size dowel pin that will not extend further than allowed by the Robot Side Spacer.



If the customer chooses to design and build a robot interface plate, consider the following points:

- The interface plate should be designed to include bolt holes for mounting either (2) dowel pins or a dowel pin and a boss for accurate positioning of the robot and Spacer. The dowel and boss features are important to prevent rotation. Refer to the robot manual for robot mounting features.
- The thickness of the interface plate must be sufficient to provide the necessary thread engagement for the mounting bolts.
- The dowel pin must not extend out from the surface of the interface plate farther than the depth of the dowel hole in the Robot Side Spacer.
- A recess of proper depth and diameter must be machined into the interface plate to correspond with the boss on the Robot Side Spacer.
- Mounting bolts should not be too long, such that a gap is formed at the interface.
- The interface plate must provide rigid mounting to the Spacer.

3.2 Tool Interface

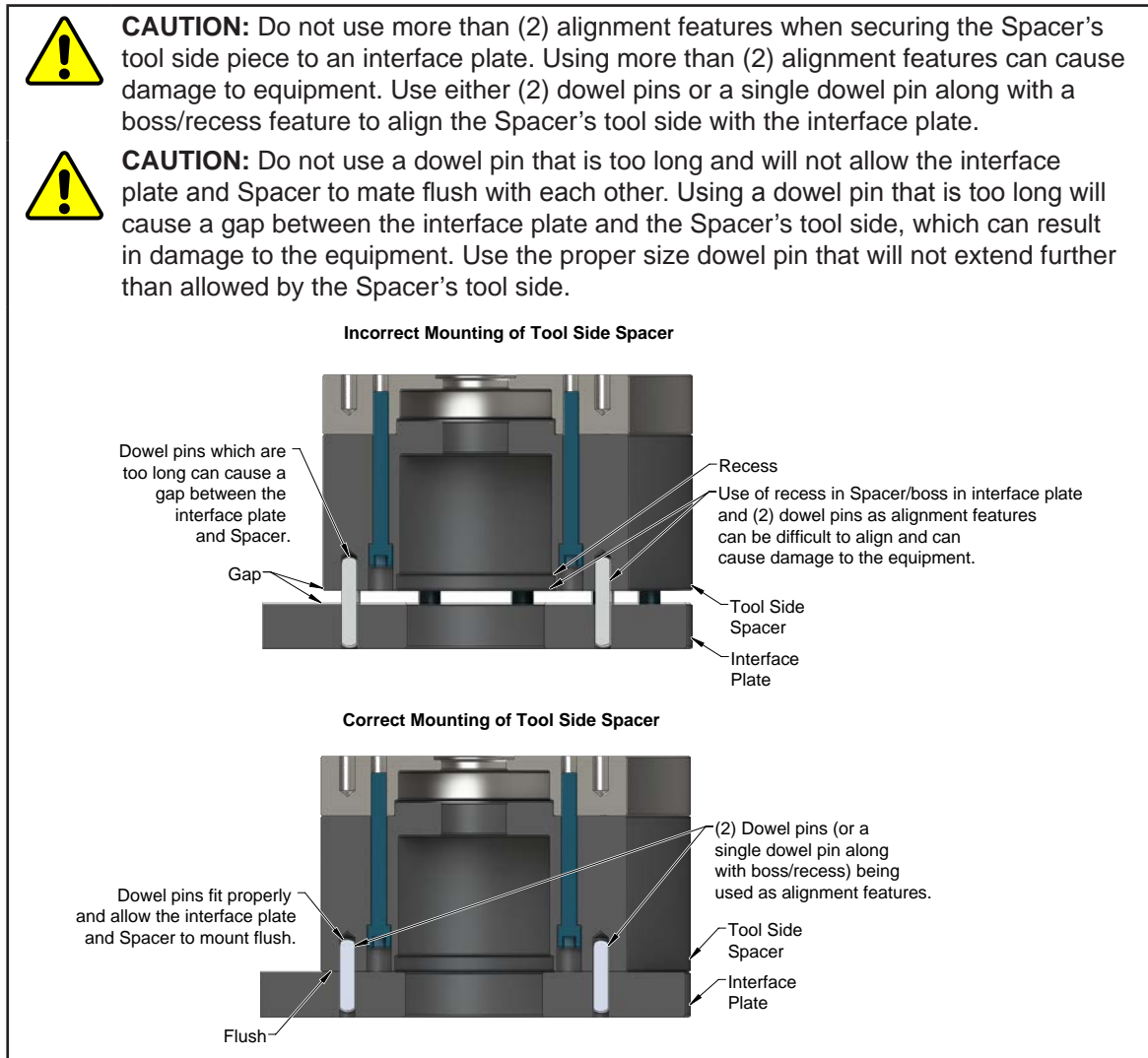
The Tool Side Spacer is attached to the customer's tooling. It may be necessary for a tool interface plate to adapt the Spacer to customer's tooling. The Tool Side Spacer has alignment features (a dowel hole and recess) for accurate positioning and bolt holes securing the Tool Side Spacer to the customer's tooling. Custom tool interface plates can be supplied by ATI to meet customer's requirements (Refer to [Section 7—Drawings](#) of this manual for technical information on mounting features).



CAUTION: Do not use more than (2) alignment features when securing the Spacer's tool side piece to an interface plate. Using more than (2) alignment features can cause damage to equipment. Use either (2) dowel pins or a single dowel pin along with a boss/recess feature to align the Spacer's tool side with the interface plate.



CAUTION: Do not use a dowel pin that is too long and will not allow the interface plate and Spacer to mate flush with each other. Using a dowel pin that is too long will cause a gap between the interface plate and the Spacer's tool side, which can result in damage to the equipment. Use the proper size dowel pin that will not extend further than allowed by the Spacer's tool side.



If the customer chooses to design and build a tool interface plate, consider the following points:

- The interface plate should include bolt holes for mounting, a dowel pin, and a boss for accurate positioning on the customer tooling and Spacer. The dowel and boss features are important to prevent rotation.
- The dowel pins must not extend out from the surface of the interface plate farther than the depth of the dowel holes in the Tool Side Spacer.
- The thickness of the interface plate must be sufficient to provide the necessary thread engagement for the mounting bolts. Fasteners should meet minimum recommended engagement lengths while not exceeding the maximum available thread depth. Use of bolts that are too long can cause equipment damage.
- A boss of proper height and diameter must be machined into the interface plate to correspond with the recess in the Tool Side Spacer.

3.3 Installing the Spacer to the Robot

Tools Required: Allen wrench (refer to [Table 3.1](#), [Table 3.2](#), and [Table 3.3](#)), torque wrench

Supplies Required: Threadlocker for mounting fasteners (refer to [Table 3.1](#), [Table 3.2](#), and [Table 3.3](#)), Clean rag

1. Make sure the mounting surface of the Robot Side Spacer, robot arm, and interface plate are clean and free of debris.
2. If required, attach the interface plate to the robot. Secure with customer supplied fasteners. Refer to [Table 3.1](#) for torque and threadlocker specifications.
3. Using customer supplied fasteners, secure the Robot Side Spacer to the robot or interface plate. Refer to [Table 3.1](#) for torque and threadlocker specifications.

Figure 3.1—Installing the Robot Side Spacer to the Robot

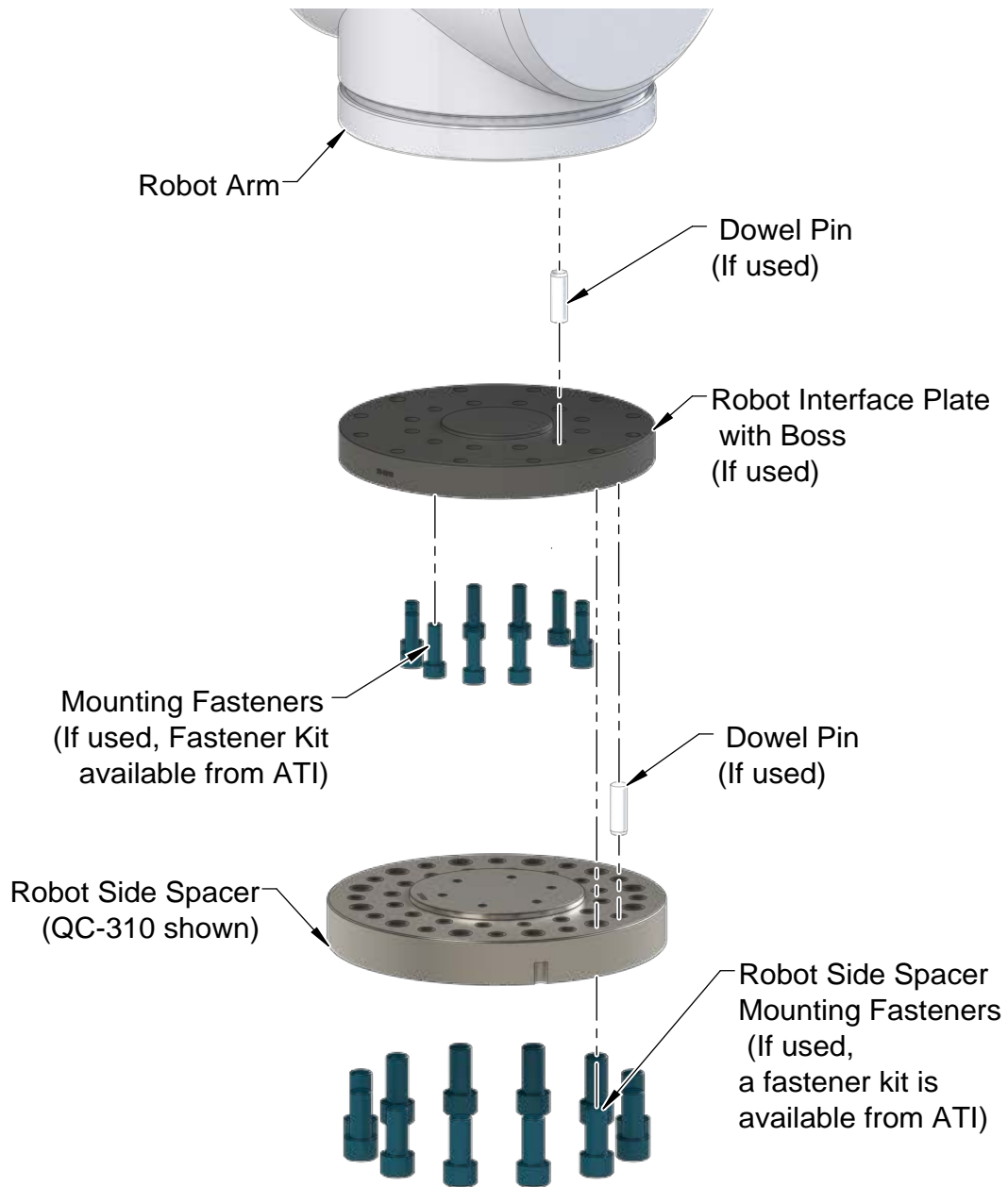
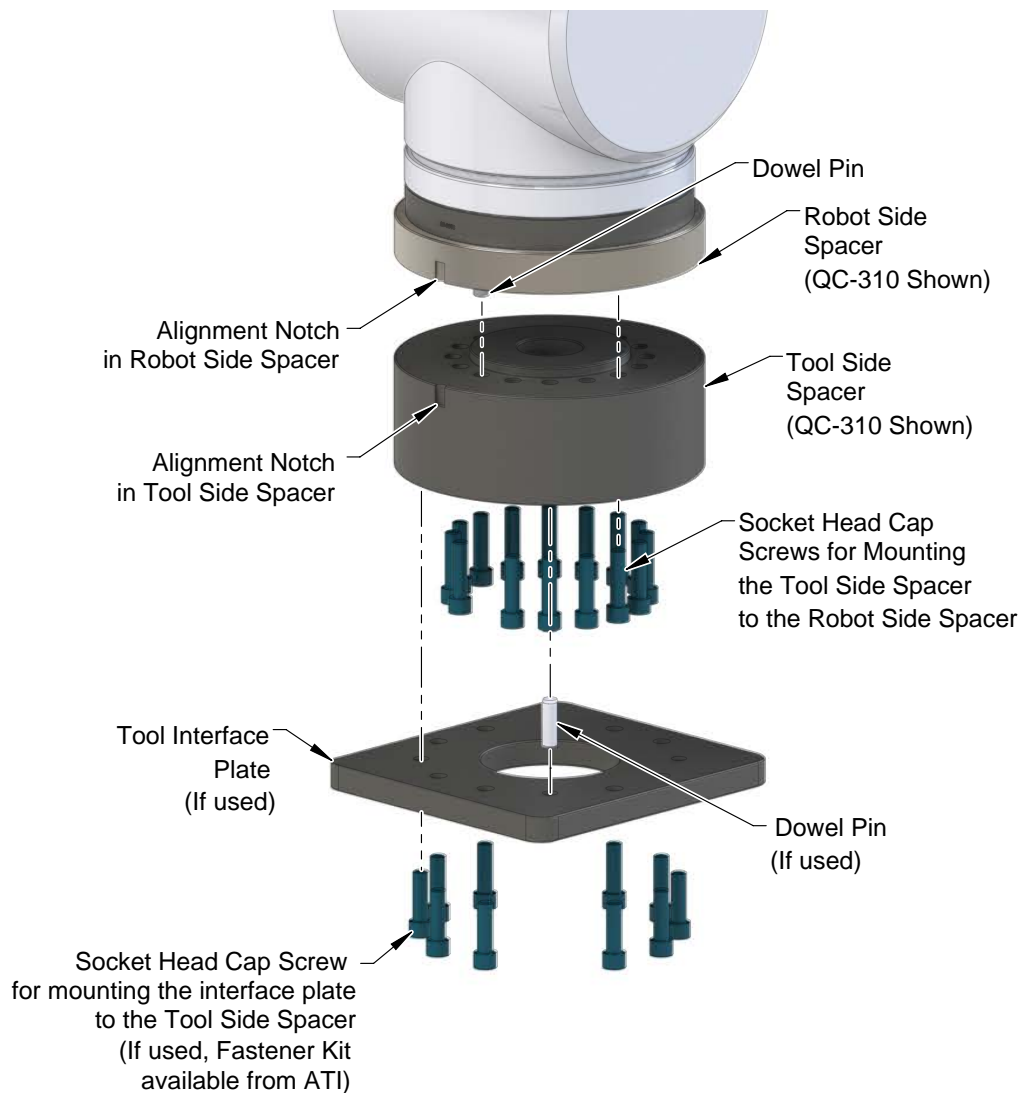


Figure 3.2—Installing the Tool Side Spacer



4. With a clean rag, make sure the mounting surface of the Tool Side Spacer and TIP or customer tooling is clean and free of debris.
5. Using the alignment notches in the Tool Side Spacer and Robot Side Spacer as a guide, orient the Tool Side Spacer's boss and corresponding dowel hole to the recess and dowel pin in the Robot Side Spacer.
6. Using an Allen wrench, secure the Tool Side Spacer to the Robot Side Spacer with the supplied socket head cap screws. Refer to [Table 3.2](#) for Allen wrench tool size as well as torque and thread locker specifications.
7. Attach the customer tooling or interface plate if required to the Tool Side Spacer. Refer to [Table 3.3](#) for torque and threadlocker specifications.
8. Connect utilities (e.g. power, air, and water) to the customer tooling.
9. After installation is complete, the Spacer may be placed into normal operation.

3.4 Removing the Spacer from the Robot

Tools Required: Allen wrench (refer to [Table 3.2](#) and [Table 3.3](#))

1. Turn off all energized circuits (e.g. electrical, air, water, etc.).
2. Depending on the maintenance or repair being performed, the user may need to disconnect utilities from the customer tooling to allow better access to the Spacer.
3. Supporting the customer tooling and/or interface plate remove the customer supplied screws attaching the customer tooling to the Spacer. Refer to [Table 3.3](#) for Allen wrench size.
4. Supporting the Tool Side Spacer, use an Allen wrench to remove the socket head cap screws securing the Tool Side Spacer to the Robot Side Spacer. Refer to [Table 3.2](#) for Allen wrench size.
5. Remove the Tool Side Spacer.
6. Supporting the Robot Side Spacer, use an Allen wrench to remove the customer supplied mounting fasteners attaching the Spacer to an interface plate or robot.
7. Remove the Robot Side Spacer.

4. Maintenance



WARNING: Do not complete maintenance activity on a QC Spacer attached to a robot unless all energized circuits from the robot to customer tooling mounted on the QC Spacer have been turned off in accordance with the user's safety practices and policies. Injury or equipment damage could occur. Turn off and discharge customer's energized circuits as applicable. Verify the user's safety practices and policies have been implemented before installing or removing the spacer from the work area.

Under normal conditions, no special maintenance is necessary; however, it is recommended that the user visually inspect and ensure no movement occurs at the robot and tool side interfaces. Movement indicates that the mounting fasteners may not be secure. Refer to [Section 3—Installation](#) for more information.

5. Serviceable Parts

5.1 Two Piece Bolted Type QC Spacer Serviceable Parts

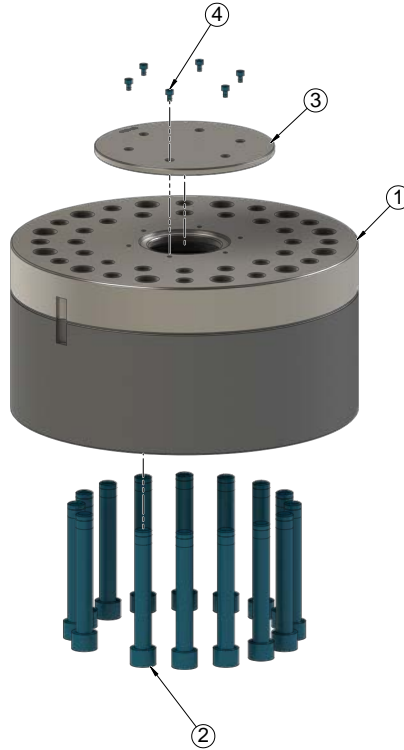


Table 5.1—Two Piece Bolted Type QC Spacer Serviceable Parts

Item No.	Configuration	Qty.	Part Number	Description
1		1	9120-110-A-10038	QC-110 Spacer, Two Piece Bolted Type, No Boss
			9120-110-B-10038	QC-110 Spacer, Two Piece Bolted Type, 50 mm Boss
			9120-110-C-10038	QC-110 Spacer, Two Piece Bolted Type, 56 mm Boss
			9120-110-D-10038	QC-110 Spacer, Two Piece Bolted Type, 60 mm Boss
			9120-110-E-10038	QC-110 Spacer, Two Piece Bolted Type, 63 mm Boss
			9120-110-F-10038	QC-110 Spacer, Two Piece Bolted Type, 80 mm Boss
			9121-210-A-10014	QC-210 Spacer, Two Piece Bolted Type, No Boss
			9121-310-D-10020	QC-310 Spacer, Two Piece Bolted Type, 125 mm Boss
	9121-510-D-10036	QC-510 Spacer, Two Piece Bolted Type, 125 mm Boss		
2	9120-110-A-10038 9120-110-B-10038 9120-110-C-10038 9120-110-D-10038 9120-110-E-10038 9120-110-F-10038	11	3500-1070060-15A	M10-1.5X 60 SHCS, 12.9, ISO4762/DIN912, ES-ATI-007, YLM-spheres/IFI 525
	9121-210-A-10014	12		M10-1.5X 60 SHCS, 12.9, ISO4762/DIN912, ES-ATI-007, YLM-spheres/IFI 525
	9121-310-D-10020	15	3500-1072085-15A	M12-1.75X 85 SHCS, 12.9, ISO4762/DIN912, ES-ATI-007, YLM-spheres/IFI 525
	9121-510-D-10036	15	3500-1075100-15A	M16-2.0X 100 SHCS, 12.9, ISO4762/DIN912, ES-ATI-007, YLM-spheres/IFI 525

Table 5.1—Two Piece Bolted Type QC Spacer Serviceable Parts

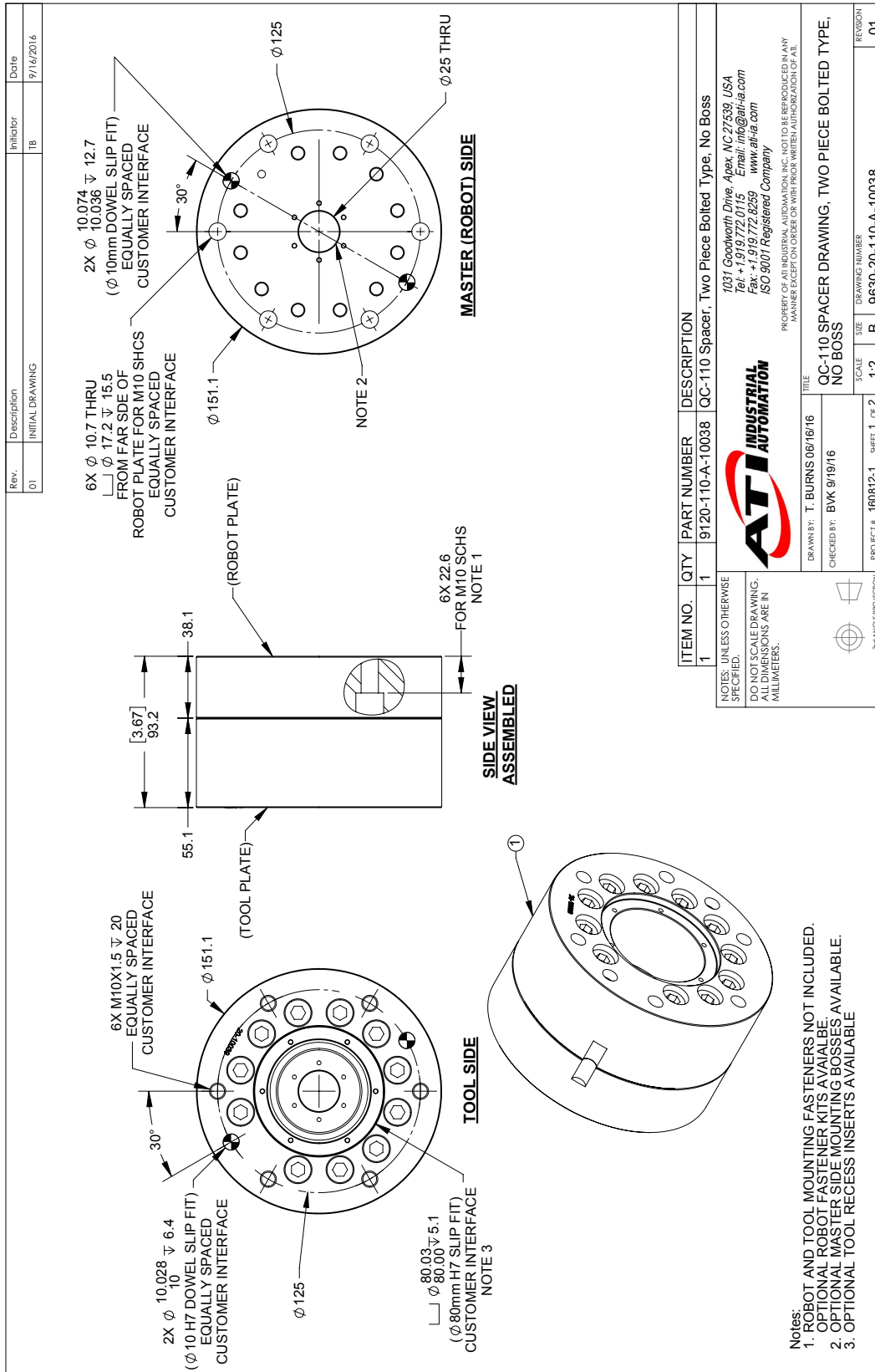
Item No.	Configuration	Qty.	Part Number	Description
3	9120-110-B-10038	1	3700-20-4311	Boss Plate, 50 mm
	9120-110-C-10038		3700-20-4312	Boss Plate, 56 mm
	9120-110-D-10038		3700-20-4313	Boss Plate, 60 mm
	9120-110-E-10038		3700-20-4314	Boss Plate, 63 mm
	9120-110-F-10038		3700-20-7929	Boss Plate, 80 mm
	9121-310-D-10020 9121-510-D-10036		3700-20-4088	Boss Plate, 125 mm
4	9120-110-B-10038 9120-110-C-10038 9120-110-D-10038 9120-110-E-10038	6	3500-1057006-15A	M3 x 6 mm SHCS, 12.9, ISO4762/DIN912, ES-ATI-007, YLM-spheres/IFI 525
	9120-110-F-10038		3500-1258006-15A	M3x6 FHSCS, 10.9, ISO10642/DIN7991, ES-ATI-007, YLM-Spheres/IFI 525
	9121-310-D-10020 9121-510-D-10036		3500-1057005-15A	M3 x 5 mm SHCS, 12.9, ISO4762/DIN912, ES-ATI-007, YLM-spheres/IFI 525

6. Specifications

Table 6.1—Specifications						
Part Number	Stack Height	Weight	Suggested Payload Limit	Static Moment Capacity		Material
				XY	Z	
9120-110-A-10038 9120-110-B-10038 9120-110-C-10038 9120-110-D-10038 9120-110-E-10038 9120-110-F-10038	3.67 in (93.1 mm)	14 lb (6.43 kg)	330 lb (150 kg)	6940 lbf-in (780 Nm)		Robot Side: 1045 steel with zinc and clear chromate finish. Tool Side: 7075-T651 aluminum with black anodized finish.
9121-210-A-10014	4.06 in (103.1 mm)	18 lb (8 kg)	660 lb (300 kg)	24000 lbf-in (2710 Nm)	20000 lbf-in (2260 Nm)	Robot Side: 1045 steel with zinc and clear chromate finish. Tool Side: 7075-T651 aluminum with black anodized finish.
9121-310-D-10020	4.73 in (120.2 mm)	37 lb (17 kg)	1100 lb (500 kg)	29100 lbf-in (3290 Nm)	28000 lbf-in (3160 Nm)	Robot Side: 1045 steel with zinc and clear chromate finish. Tool Side: 7075-T651 aluminum with black anodized finish.
9121-510-D-10036	5.57 in (141.5 mm)	47 lb (21 kg)	1500 lb (680 kg)	43000 lbf-in (4860 Nm)	31000 lbf-in (3500 Nm)	Robot Side: 1045 steel with zinc and clear chromate finish. Tool Side: 7075-T6 aluminum with black anodized finish.

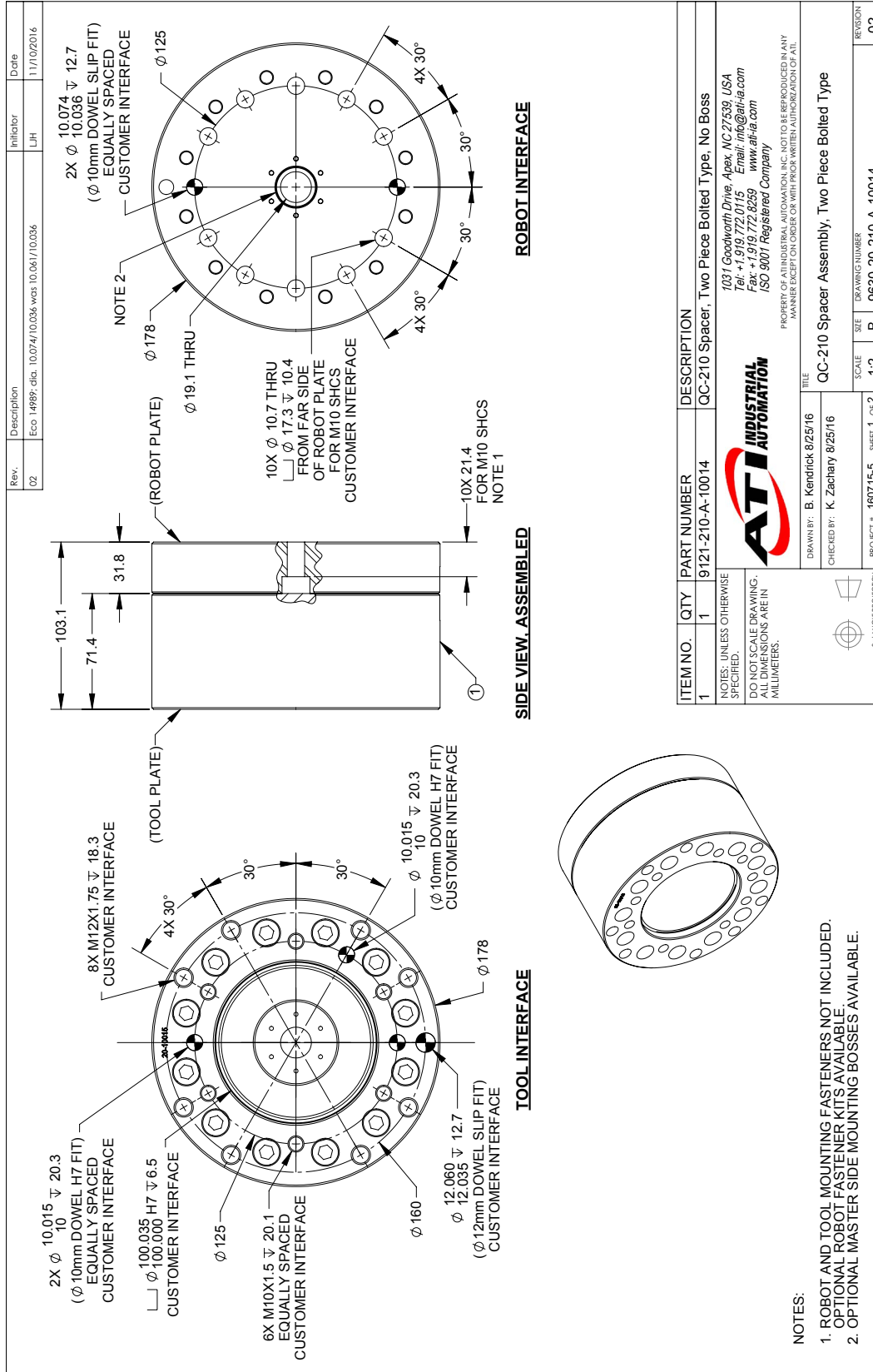
7. Drawings

7.1 9630-20-110-A-10038



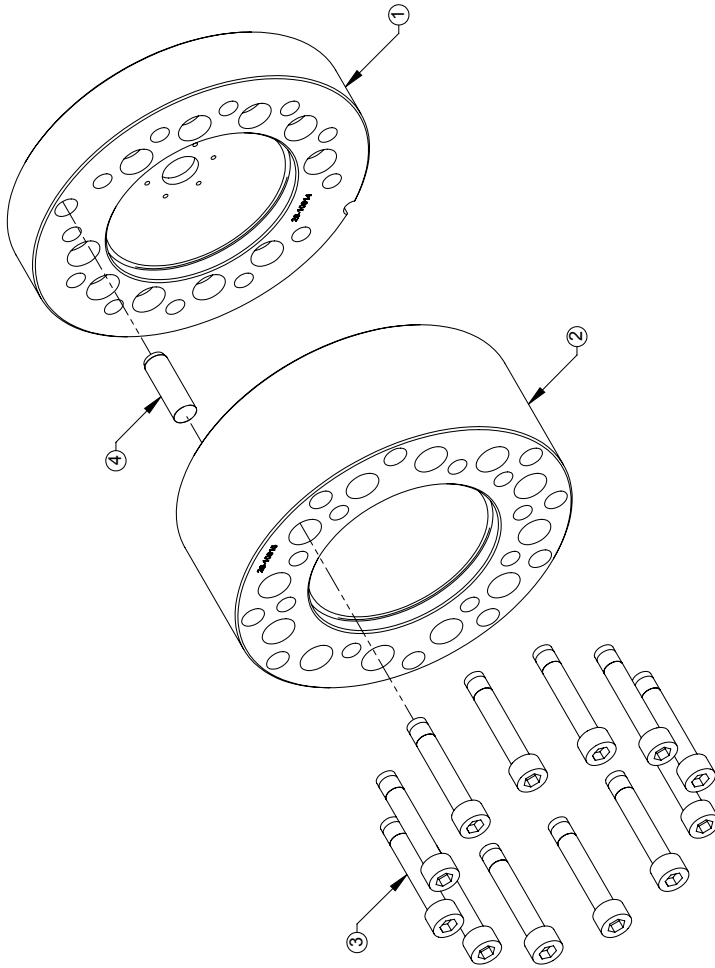
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Rev.	Description	Initiator	Date																							
-	SEE SHEET 1	-	-																							
DRAWN BY: T. BURNS 06/16/16	TITLE																									
CHECKED BY: BVK 9/19/16	QC-110 SPACER DRAWING, TWO PIECE BOLTED TYPE, NO BOSS																									
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	1:2																									
	DRAWING NUMBER																									
	9630-20-110-A-10038																									
	REVISION																									
	01																									

7.2 9630-20-210-A-10014



Rev.	Description	Initiator	Date
-	See Sheet1	-	-

QC-210 SPACER, EXPLODED VIEW



NOTES: UNLESS OTHERWISE SPECIFIED:
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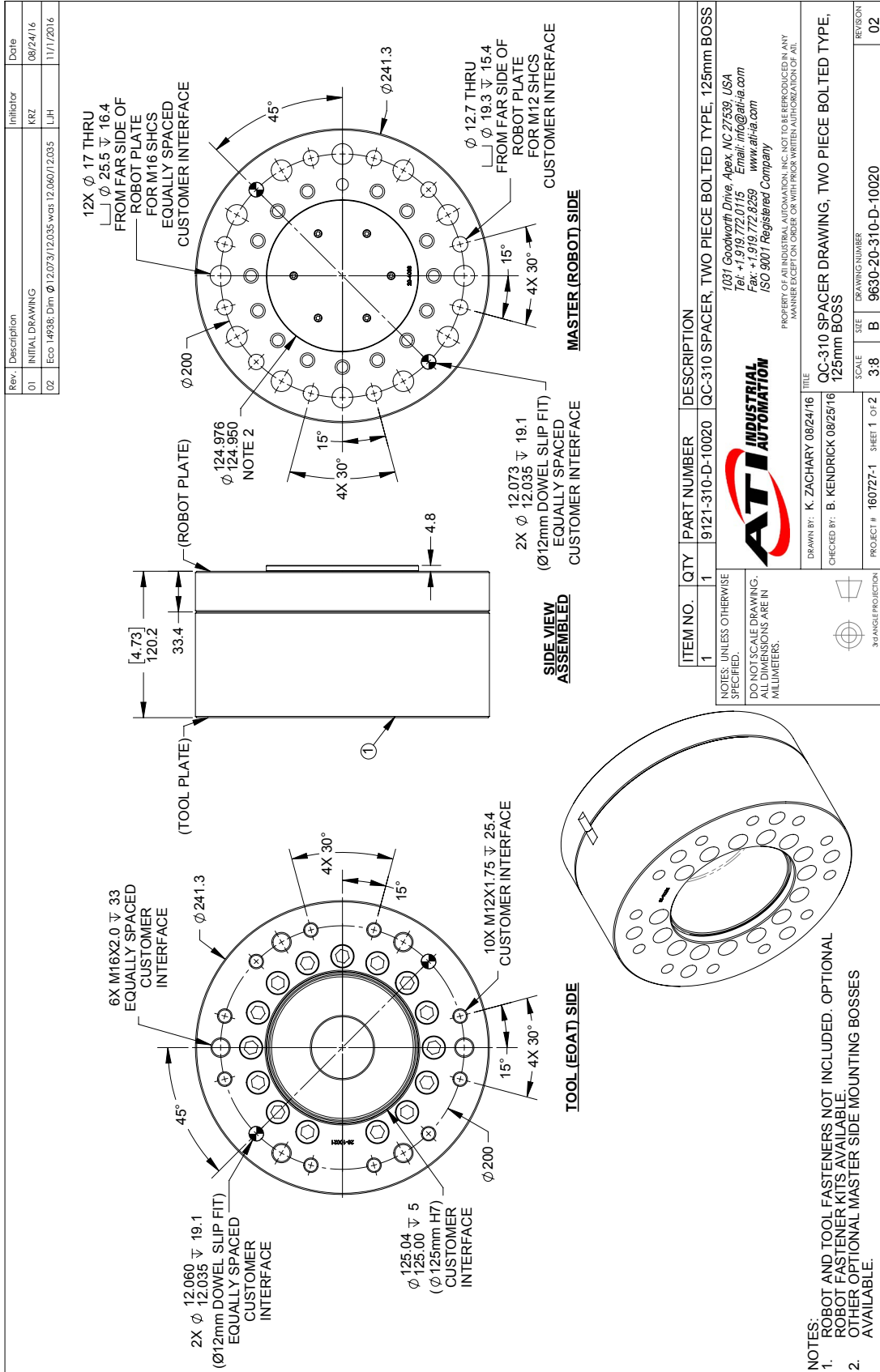


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DRAWN BY: B. Kendrick 8/25/16	TITLE	QC-210 Spacer Assembly, Two Piece Bolted Type
CHECKED BY: K. Zachary 8/25/16	SCALE	1:2
PROJECT # 160715-5	SHEET 2 OF 2	DRAWING NUMBER 9630-20-210-A-10014
3/4 ANGLE PROJECTION	REVISION	02

7.3 9630-20-310-D-10020



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	9121-310-D-10020	QC-310 SPACER, TWO PIECE BOLTED TYPE, 125mm BOSS

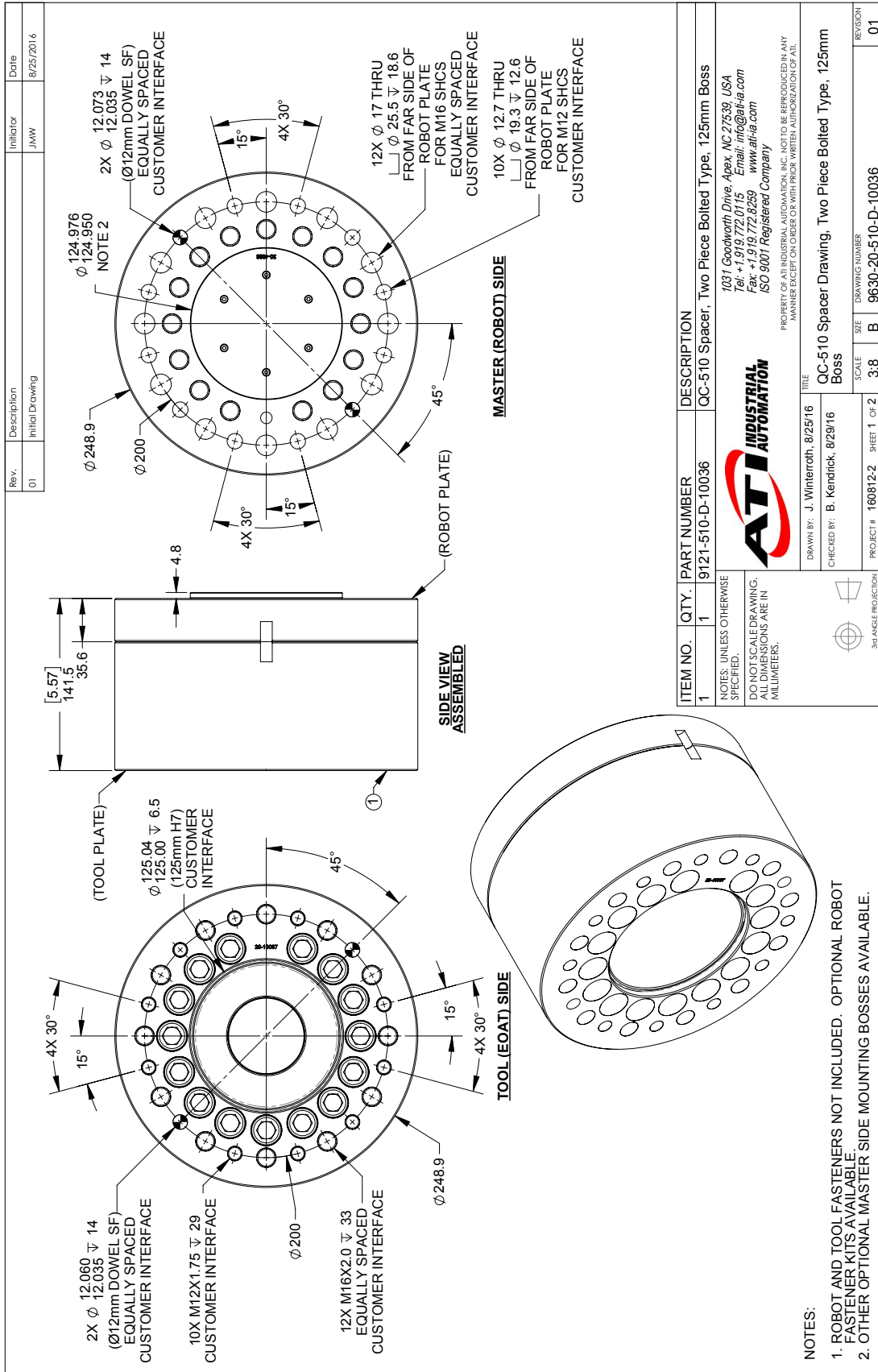
ATI INDUSTRIAL AUTOMATION
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 Tel: +1 919 772 0115, Email: info@ati-ia.com
 Fax: +1 919 772 8259, www.ati-ia.com
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DRAWN BY: K. ZACHARY 08/24/16
 CHECKED BY: B. KENDRICK 08/25/16
 TITLE: QC-310 SPACER DRAWING, TWO PIECE BOLTED TYPE, 125mm BOSS

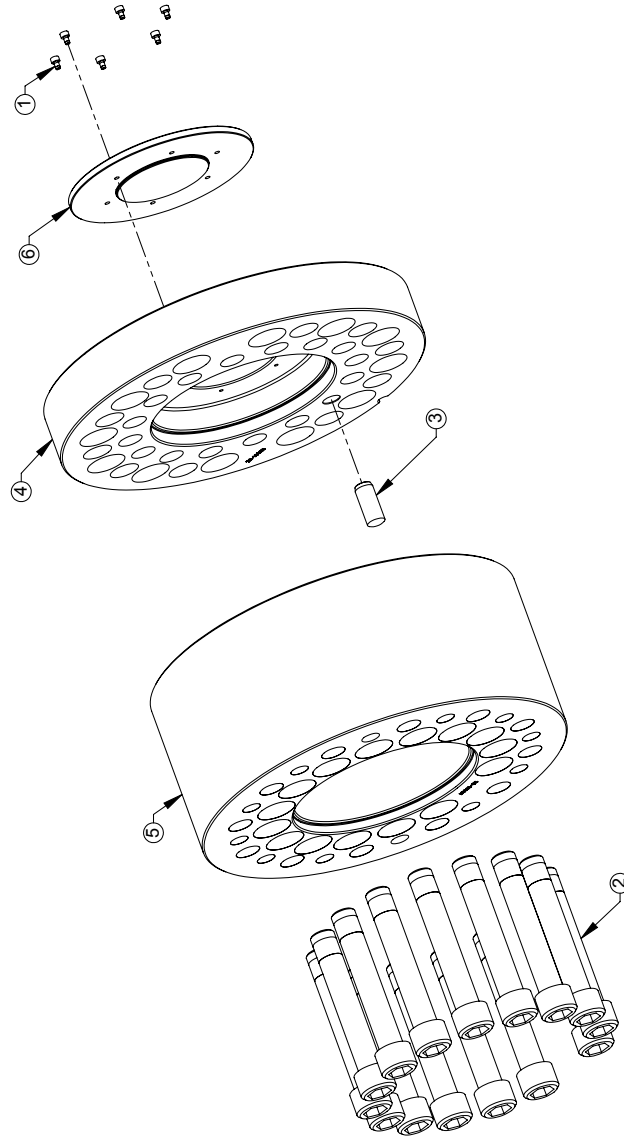
PROJECT # 160727-1 SHEET 1 OF 2
 SCALE 3:8
 DRAWING NUMBER 9630-20-310-D-10020
 REVISION 02

<p>QC-310 SPACER EXPLODED VIEW</p>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Rev.</td> <td style="width: 33%;">Description</td> <td style="width: 33%;">Initiator</td> <td style="width: 33%;">Date</td> </tr> <tr> <td>-</td> <td>See Sheet</td> <td>-</td> <td>-</td> </tr> </table>	Rev.	Description	Initiator	Date	-	See Sheet	-	-	<p>1031 Goodworth Drive, Apex, NC 27539, USA Tel: +1 919.772.0115 Email: info@ati-ia.com Fax: +1 919.772.8259 www.ati-ia.com ISO 9001 Registered Company</p> <p>ATI INDUSTRIAL AUTOMATION</p> <p>PROPERTY OF ATI INDUSTRIAL AUTOMATION, INC. NOT TO BE REPRODUCED IN ANY MANNER EXCEPT ON ORDER OR WITH PRIOR WRITTEN AUTHORIZATION OF ATI.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">DRAWN BY: K. ZACHARY</td> <td style="width: 33%;">DATE: 08/24/16</td> <td style="width: 33%;">TITLE: QC-310 SPACER DRAWING, TWO PIECE BOLTED TYPE, 125mm BOSS</td> </tr> <tr> <td>CHECKED BY: B. KENDRICK</td> <td>DATE: 08/25/16</td> <td></td> </tr> <tr> <td>PROJECT #: 160727-1</td> <td>SHEET 2 OF 2</td> <td>SCALE: 3:8</td> </tr> <tr> <td></td> <td>DRAWING NUMBER: 9630-20-310-D-10020</td> <td>REVISION: 02</td> </tr> </table>	DRAWN BY: K. ZACHARY	DATE: 08/24/16	TITLE: QC-310 SPACER DRAWING, TWO PIECE BOLTED TYPE, 125mm BOSS	CHECKED BY: B. KENDRICK	DATE: 08/25/16		PROJECT #: 160727-1	SHEET 2 OF 2	SCALE: 3:8		DRAWING NUMBER: 9630-20-310-D-10020	REVISION: 02
Rev.	Description	Initiator	Date																				
-	See Sheet	-	-																				
DRAWN BY: K. ZACHARY	DATE: 08/24/16	TITLE: QC-310 SPACER DRAWING, TWO PIECE BOLTED TYPE, 125mm BOSS																					
CHECKED BY: B. KENDRICK	DATE: 08/25/16																						
PROJECT #: 160727-1	SHEET 2 OF 2	SCALE: 3:8																					
	DRAWING NUMBER: 9630-20-310-D-10020	REVISION: 02																					
<p>NOTES: UNLESS OTHERWISE SPECIFIED, DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.</p> <p style="text-align: center;"> 3RD ANGLE PROJECTION </p>																							

7.4 9630-20-510-D-10036



QC-510 SPACER EXPLODED VIEW



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FIRST ANGLE PROJECTION



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DRAWN BY: J. Wintteroth, 8/25/16	TITLE	QC-510 Spacer Drawing, Two Piece Bolted Type, 125mm Boss
CHECKED BY: B. Kendrick, 8/29/16	SCALE	3:8
PROJECT # 1608122	SIZE	B
SHEET 2 OF 2	DRAWING NUMBER	9630-20-510-D-10036
	REVISION	01

8. Terms and Conditions of Sale

The following Terms and Conditions are a supplement to and include a portion of ATI's Standard Terms and Conditions, which are on file at ATI and available upon request.

ATI warrants to Purchaser that robotic Tool Changer products purchased hereunder will be free from defects in material and workmanship under normal use for a period of three (3) years from the date of shipment. The warranty period for repairs made under a RMA shall be for the duration of the original warranty, or ninety (90) days from the date of repaired product shipment, whichever is longer. ATI will have no liability under this warranty unless: (a) ATI is given written notice of the claimed defect and a description thereof within thirty (30) days after Purchaser discovers the defect and in any event not later than the last day of the warranty period; and (b) the defective item is received by ATI not later ten (10) days after the last day of the warranty period. ATI's entire liability and Purchaser's sole remedy under this warranty is limited to repair or replacement, at ATI's election, of the defective part or item or, at ATI's election, refund of the price paid for the item. The foregoing warranty does not apply to any defect or failure resulting from improper installation, operation, maintenance or repair by anyone other than ATI.

ATI will in no event be liable for incidental, consequential or special damages of any kind, even if ATI has been advised of the possibility of such damages. ATI's aggregate liability will in no event exceed the amount paid by purchaser for the item which is the subject of claim or dispute. ATI will have no liability of any kind for failure of any equipment or other items not supplied by ATI.

No action against ATI, regardless of form, arising out of or in any way connected with products or services supplied hereunder may be brought more than one (1) year after the cause of action accrued.

No representation or agreement varying or extending the warranty and limitation of remedy provisions contained herein is authorized by ATI, and may not be relied upon as having been authorized by ATI, unless in writing and signed by an executive officer of ATI.

Unless otherwise agreed in writing by ATI, all designs, drawings, data, inventions, software and other technology made or developed by ATI in the course of providing products and services hereunder, and all rights therein under any patent, copyright or other law protecting intellectual property, shall be and remain ATI's property. The sale of products or services hereunder does not convey any express or implied license under any patent, copyright or other intellectual property right owned or controlled by ATI, whether relating to the products sold or any other matter, except for the license expressly granted below.

In the course of supplying products and services hereunder, ATI may provide or disclose to Purchaser confidential and proprietary information of ATI relating to the design, operation or other aspects of ATI's products. As between ATI and Purchaser, ownership of such information, including without limitation any computer software provided to Purchaser by ATI, shall remain in ATI and such information is licensed to Purchaser only for Purchaser's use in operating the products supplied by ATI hereunder in Purchaser's internal business operations.

Without ATI's prior written permission, Purchaser will not use such information for any other purpose or provide or otherwise make such information available to any third party. Purchaser agrees to take all reasonable precautions to prevent any unauthorized use or disclosure of such information.

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