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C. Valve Adapter

Valve Adapters with Double Solenoid, Valve Signal Pass Through, and Pressure Switch

1. Product Overview

Valve adapters are required to provide an air supply to the compatible Tool Changer or Utility Coupler Master for actuation of the locking mechanism. Valve adapters come outfitted with an integrated double solenoid valve and mount to Flat 'A' of the Tool Changer or Utility coupler Master. Control of the integrated valve is accomplished though the valve signal pass through connector to the control/signal module. The latch/unlatch signal sent to the control/signal module is transmitted to the valve adapter using a small, internal pin block. *Figure 1.1* shows the control/signal module to valve adapter electrical interface.

Many variations of the valve adapter with valve signal pass through are available, depending upon the Tool Changer size and type of porting required by the customer (see *Table 1.1* and *Section 8—Drawings* for a complete listing of available adapters and customer drawings)

Figure 1.1—Valve Pass Through and Pressure Switch Connections

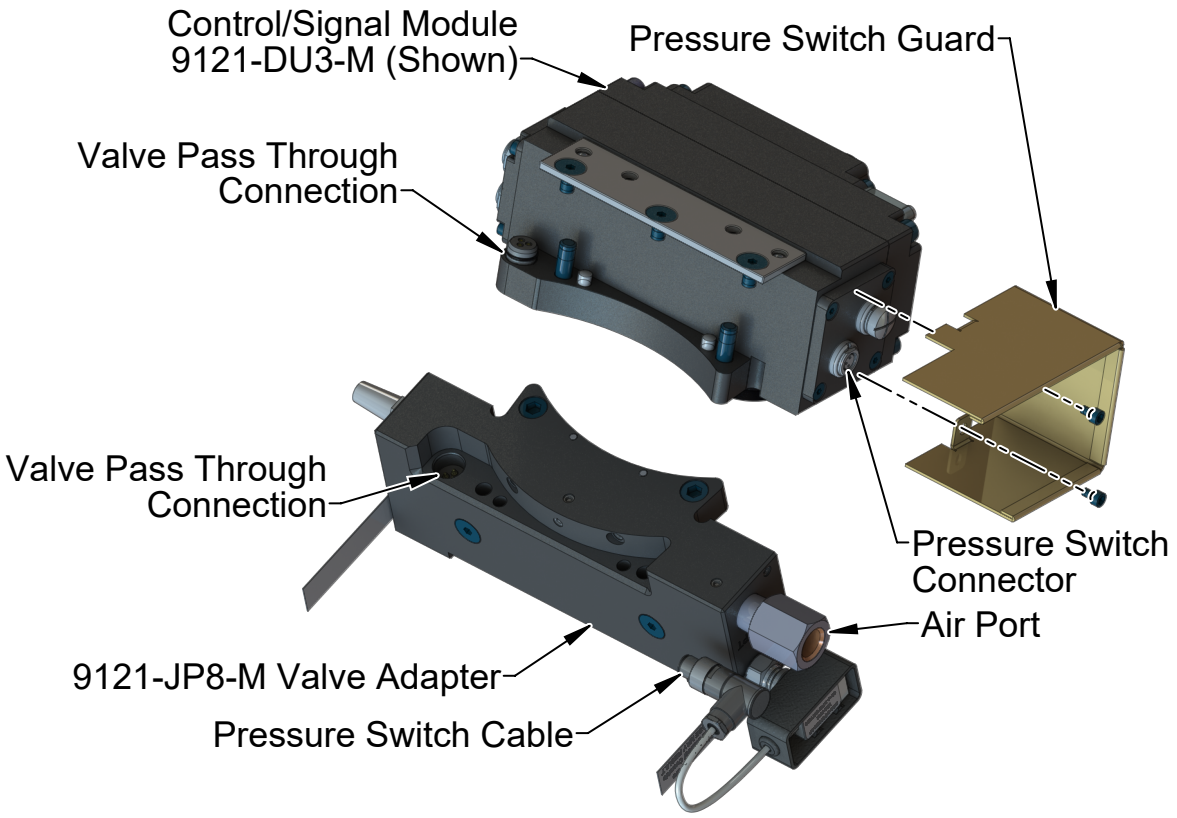


Table 1.1—Valve Adapters with a Double Solenoid, Valve Pass Through, and Pressure Switch Model

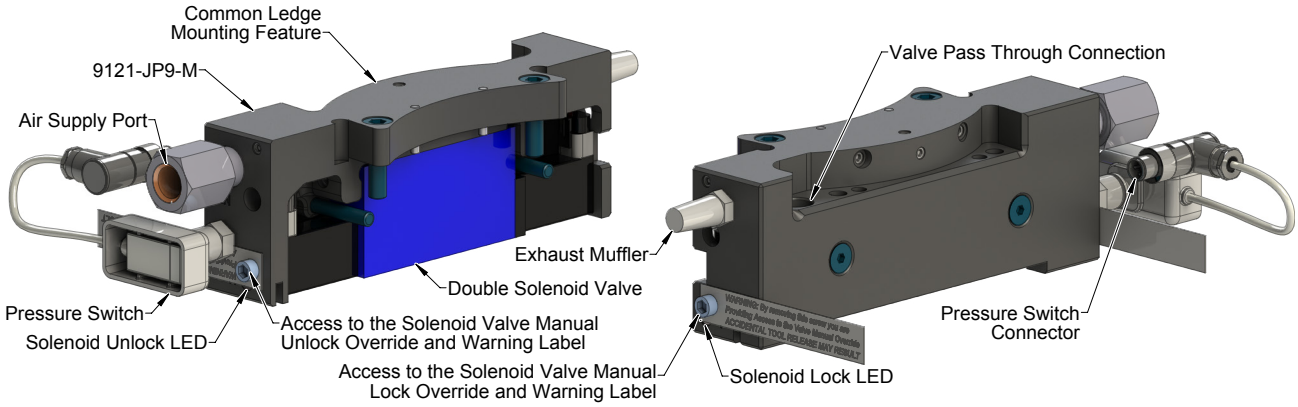
Module	Description	Air Port Size	Compatible Tool Changer or Utility Coupler models
9121-JP9-M	Double Solenoid	Rc 1/4 (BSPT)	QC-113, QC-210, QC-213, GL6L, GL7L
9121-JP10-M	Double Solenoid	Rc 1/4 (BSPT)	QC-310, QC-313, QC-510, QC-1210
9121-JT10-M	Double Solenoid	1/4 (NPT)	QC-113, QC-210, QC-213, GL6L, GL7L
9121-JU6-M	Double Solenoid	G 1/4 (BSPP)	QC-113, QC-210, QC-213, GL6L, GL7L
9121-JU7-M	Double Solenoid	G 1/4 (BSPP)	QC-310, QC-313, QC-510, QC-1210

The valve adapter is equipped with an air pressure switch to monitor pressure of the air supply to the Valve Adapter. The valve adapter module works with a control/signal module that is equipped with a pressure switch connector such as the 9121-DU3-M module. A pressure switch guard is provided with the valve adapter that mounts to the control signal module and protects the switch. The pressure switch is equipped with a LED indicating the supplied air pressure exceeds 63 psi +/- 3 psi. The switch also provides a signal to the control/signal module. The pressure switch in this assembly is potted to achieve an IP65 rating which ensures that the pressure switch is not adjustable.

The valve adapter provides a ledge mount for the control/signal Master module and provides a single air port connection for the customer air supply. Lock and unlock air connections to the Tool Changer or Utility Coupler are provided through ports in the ledge mount, O-rings in the body seal the connection.

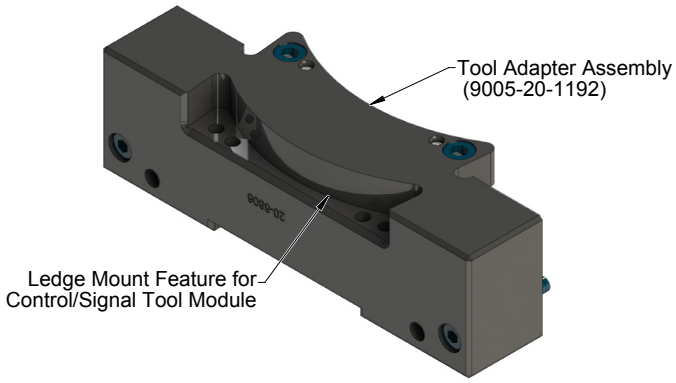
The valve adapter is equipped with an exhaust muffler, double solenoid valve, and LED indicators for the solenoid lock and unlock position, refer to *Figure 1.2.* Access to the solenoid valve manual override is provide through a screw in the aluminum housing, refer to *Section 5.1.1—Solenoid Valve Manual Override Procedure* for more information.

Figure 1.2—Valve Adapters with a Double Solenoid and Valve Pass Through



A tool adapter assembly (9005-20-1192) is required for the tool side which provides the proper spacing and a ledge mount for the control/signal Tool module.

Figure 1.3—Tool Adapters Assembly



2. Installation

Valve adapters and tool adapter assemblies are typically installed by ATI prior to shipment. The steps below outline the field installation or removal as required.

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 (e.g. electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer's 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.

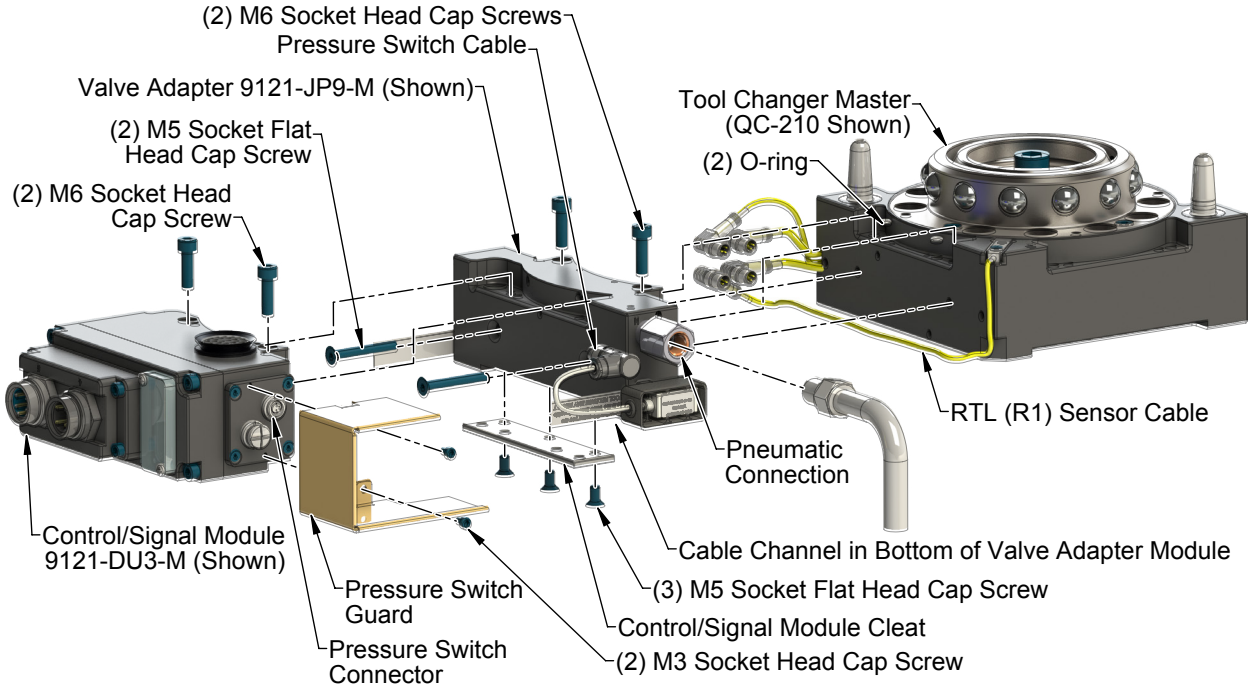
2.1 Valve Adapter Installation for QC-113, QC-210, QC-213, GL6L, GL7L

Tools required: *2.5 mm, 3 mm and 5 mm hex key wrenches, torque wrench*

Supplies required: *clean rag, Loctite® 222 and Loctite® 242 (if fasteners do not have pre-applied adhesive)*

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. (2) O-rings are required on the Master side Flat 'A' interface. Make sure these O-rings are present and lightly lubricated (refer to *Figure 2.1*).
6. Using the ledge feature to place the valve adapter adjacent to the 'Flat A' mounting surface. Align the valve adapter using the dowels in the bottom of the ledge feature.
7. Apply Loctite 242 to the supplied M6 socket head cap screws. Secure the valve adapter with the M6 socket head cap screws using a 5 mm wrench. Tighten to 70 in-lbs (7.9 Nm).
8. Apply Loctite 222 to the (2) supplied M5 socket flat head cap screws. Secure the valve adapter with the M5 socket flat head cap screws using a 3 mm hex key wrench. Tighten to 28 in-lbs (3.2 Nm).

Figure 2.1—Valve Adapter Installation (QC-210 Shown)

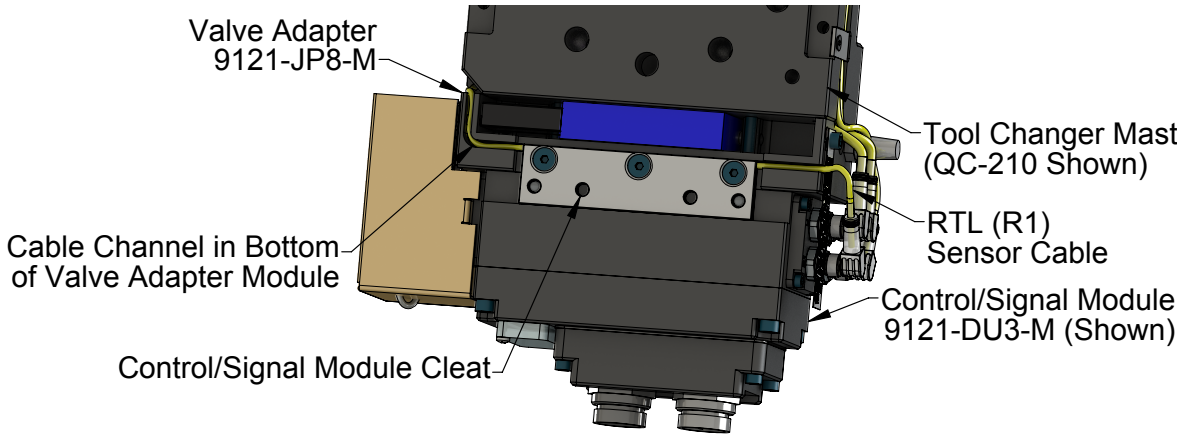


9. Route the RTL (R1) sensor cable through the cable channel in the bottom of the valve adapter. Refer to *Figure 2.2*.
10. Install the cleat from the control/signal module to retain the RTL (R1) sensor cable in the cable channel, Secure the cleat with the (3) M5 socket flat head cap screws using a 3mm hex key wrench. Tighten to 14 in-lbs (1.6 Nm).
11. Make pneumatic connections to the valve adapter housing as required. Ensure that the connectors are cleaned prior to being secured as appropriate. ATI recommends using a thread sealant such as Loctite 569 or similar.
12. When the control/signal module is installed the pressure switch guard can be installed on the control module. Apply Loctite 222 to the (2) supplied M3 socket head cap screws and secure the guard with the (2) M3 socket head cap screws using a 2.5 mm hex key wrench. Tighten to 10 in-lbs (1.1 Nm).

NOTICE: When the control/signal modules is installed the pressure switch, Lock (L), Unlock (U), and RTL (R1 and R2) cables can be connected to the control/signal module. Refer to the control/signal module manual for instructions.

13. After the procedure is complete, resume normal operation.

Figure 2.2—RTL (R1) Sensor Cable Routing



2.2 Valve Adapter Removal for QC-113, QC-210, QC-213, GL6L, GL7L0

Refer to *Figure 2.1*.

Tools required: *3 mm and 5 mm hex key wrenches*

1. IPlace 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. Remove the control/signal module off the valve adapter. Refer to the control /signal module manual for instructions.
5. Remove the (3) M5 socket flat head cap screws securing the control/signal module cleat using a 3 mm hex key wrench. Remove the cleat. Refer to *Figure 2.1*.
6. Remove the RTL (R1) sensor cable from the cable channel in the bottom of the valve adapter. Refer to *Figure 2.2*.
7. Remove the (2) M5 socket flat head cap screws securing the valve adapter off the Tool Changer, using a 3 mm hex key wrench
8. Remove the (2) M6 socket head cap screws using a 5 mm hex key wrench and lift the valve adapter off the Tool Changer.
9. Make sure that the O-rings are retained at the Master side Flat ‘A’ mounting interface.

2.3 Valve Adapter Installation for QC-310, QC-313, QC-510, QC-1210

Tools required: *2.5 mm, 4 mm and 5 mm hex key wrenches, torque wrench*

Supplies required: *clean rag, Loctite® 222 and Loctite® 242 (if fasteners do not have pre-applied adhesive)*

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. (2) O-rings are required on the Master side Flat 'A' interface. Make sure these O-rings are present and lightly lubricated (refer to *Figure 2.3*).

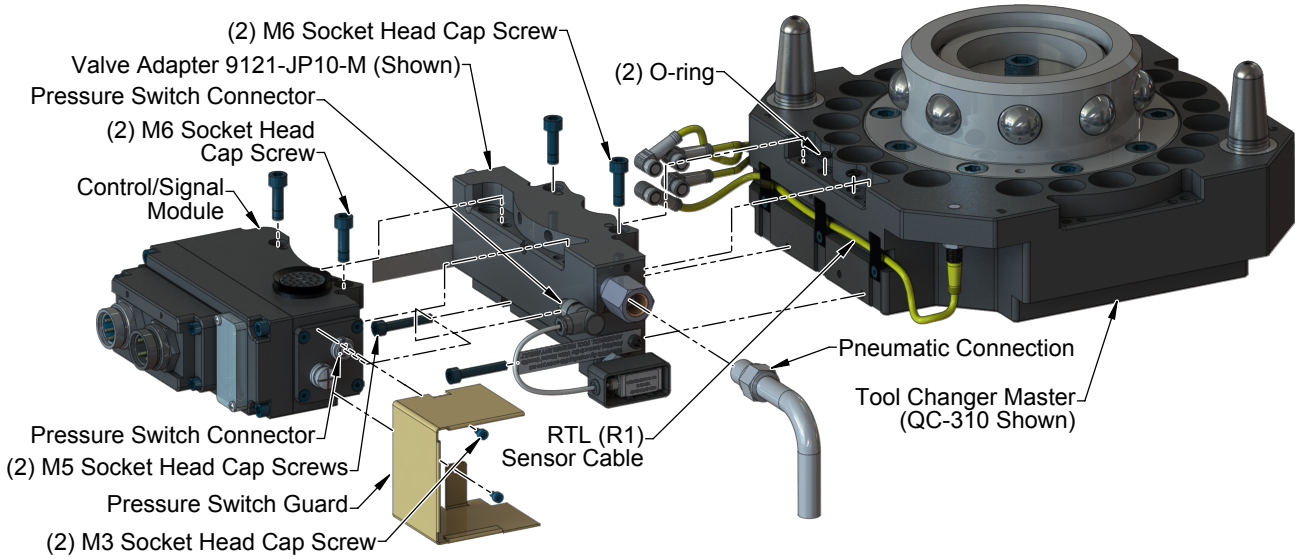
NOTICE: Makes sure the RTL (R1) sensor cable is in the cable channel in the Tool Changer body, so it will not get pinched when installing the valve adapter.

6. Using the ledge feature to place the valve adapter adjacent to the 'Flat A' mounting surface. Align the valve adapter using the dowels in the bottom of the ledge feature.
7. Apply Loctite 242 to the supplied M6 socket head cap screws. Secure the valve adapter using the M6 socket head cap screws using a 5 mm hex key wrench. Tighten to 70 in-lbs (7.9 Nm).
8. Apply Loctite 222 to the (2) supplied M5 socket head cap screws. Secure the valve adapter with the M5 socket head cap screws using a 4 mm hex key wrench. Tighten to 55 in-lbs (6.2 Nm).
9. Make pneumatic connections to the valve adapter housing as required. Ensure that the connectors are cleaned prior to being secured as appropriate. ATI recommends using a thread sealant such as Loctite 569 or similar.
10. When the control/signal module is installed the pressure switch guard can be installed on the control module. Apply Loctite 222 to the (2) supplied M3 socket head cap screws and secure the guard with the (2) M3 socket head cap screws using a 2.5 mm hex key wrench. Tighten to 10 in-lbs (1.1 Nm).

NOTICE: When the control/signal modules is installed the pressure switch, Lock (L), Unlock (U), and RTL (R1 and R2) cables can be connected to the control/signal module. Refer to the control/signal module manual for instructions.

11. After the procedure is complete, resume normal operation.

Figure 2.3—Valve Adapter Installation (QC-310 Shown)



2.4 Valve Adapter Removal for QC-310, QC-313, QC-510, QC-1210

Refer to *Figure 2.3*.

Tools required: *4 mm and 5 mm hex key wrenches*

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. Remove the control/signal module off the valve adapter. Refer to the control /signal module manual for instructions.
5. Remove the (2) M5 socket head cap screws securing the valve adapter off the Tool Changer using a 4 mm hex key wrench.
6. Remove the (2) M6 socket head cap screws using a 5 mm hex key wrench and lift the valve adapter off the Tool Changer. Refer to *Figure 2.3.*
7. Make sure that the O-rings are retained at the Master side Flat 'A' mounting interface.

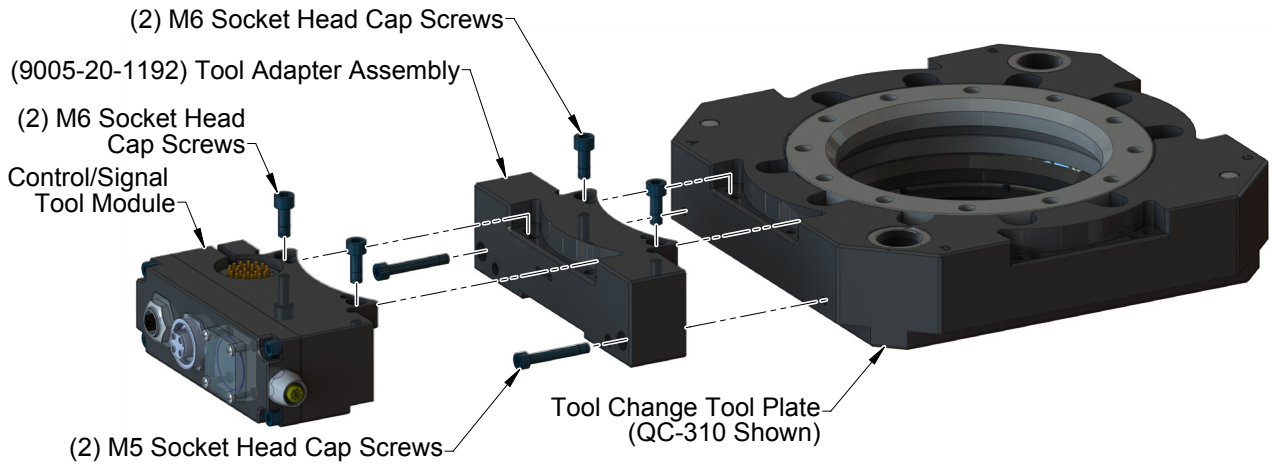
2.5 Tool Adapter Assembly Installation

Tools required: *4 mm and 5 mm hex key wrenches, torque wrench*

Supplies required: *clean rag, Loctite® 222 and Loctite® 242 (if fasteners do not have pre-applied adhesive)*

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. Using the ledge feature to place the tool adapter assembly adjacent to the 'Flat A' mounting surface. Align the tool adapter assembly using the dowels in the bottom of the ledge feature.
6. Apply Loctite 242 to the supplied M6 socket head cap screws. Secure the tool adapter with the M6 socket head cap screws using a 5 mm hex key wrench. Tighten to 89 in-lbs (10.0 Nm).
7. Apply Loctite 222 to the (2) supplied M5 socket head cap screws. Secure the tool adapter with the M5 socket head cap screws using a 4 mm hex key wrench. Tighten to 52 in-lbs (5.9 Nm).
8. After the procedure is complete, resume normal operation.

Figure 2.4—Tool Adapter Assembly Installation



2.6 Tool Adapter Assembly Removal

Refer to *Figure 2.4*.

Tools required: *4 mm and 5 mm hex key wrenches*

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. Disconnect the utilities from the attached modules (if required).
5. Removing the (2) M6 socket head cap screws using a 5 mm hex key wrench and lift the control/signal module off the tool adapter assembly (refer to *Figure 2.4*).
6. Remove the (2) M5 socket head cap screws securing the tool adapter assembly to the Tool Changer or Utility Coupler using a 4 mm hex key wrench.
7. Remove the (2) M6 socket head cap screws using a 5 mm hex key wrench and lift the tool adapter assembly off the Tool Changer or Utility Coupler.

2.7 Pneumatic Connections

The air supply used for coupling and uncoupling the Tool Changer or Utility Coupler should be clean, dry, and non-lubricated. A supply pressure in the range of 60 to 100 psi (4.1–6.9 Bar) is acceptable for operation of the locking mechanism, with a setting of 80 psi suggested. The air should be filtered 40 micron or better. A single air supply is require to the valve adapter for Lock and Unlock air, refer to *Figure 2.3* for connection.

CAUTION: Do not use the Tool Changer or Utility Coupler in a fail-safe condition. Do not transport the Tool Changer in a fail-safe condition. Possible damage to the locking mechanism could occur. Re-establish air pressure before returning to normal operations.

2.8 Electrical Connections

The electrical connection for valve control is made through an internal pin block as described in *Section 1—Product Overview* and detailed in drawings in *Section 8—Drawings*. The control of the double solenoid valve is integrated with an ATI-supplied control/signal module that is piggy-backed onto the valve adapter.

3. Operation

Latch and Unlatch commands sent to the control/signal module are pass through the internal pin block to control the solenoid valve providing lock and unlock air to the Tool Changer. The control/signal module can provide a customer specified safety functionality to prevent the accidental unlock of the Tool Changer unless the Tool is nested in the tool stand. Depending on the functionality of the control/signal module, the ability to unlock the Tool Changer unless the tool is coupled and in the tool stand may be denied. When this is the case the manual override is provided on the valve adapter, refer to *Section 5.1.1—Solenoid Valve Manual Override Procedure* Use of the manual override should be restricted to contingency situations and only when the robot and tool are in the stand or storage location. Actuation of the Unlatch valve manual override will result in Tool Changer release.

WARNING: Tool Changer release will occur with actuation of the Unlatch valve manual override. Use of the manual override is restricted to contingency situations. The Tool Changer and Tool should be in a stand or storage location prior to actuation of the manual override.

It is important that the valve adapter be supplied with clean, dry, non-lubricated air supplied between 60 and 100 psi (4.1–6.9 Bar) and filtered at 40 microns or better. Valve adapters are supplied with the Tool Changer to provide a fully integrated solution. The customer is only required to supply the valve adapter with a single air supply.

4. Maintenance

Valve adapters should require little maintenance. The only wear components are the valve itself and an exhaust muffler. Under normal operating conditions, the valve will last for millions of cycles. The exhaust muffler should be checked every 6 months of operation or more frequently in dirty environments to see if it is clogged.

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 (e.g. electrical, air, water, etc.) are turned off, pressurized connections are purged and power is discharged from circuits in accordance with the customer's 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.

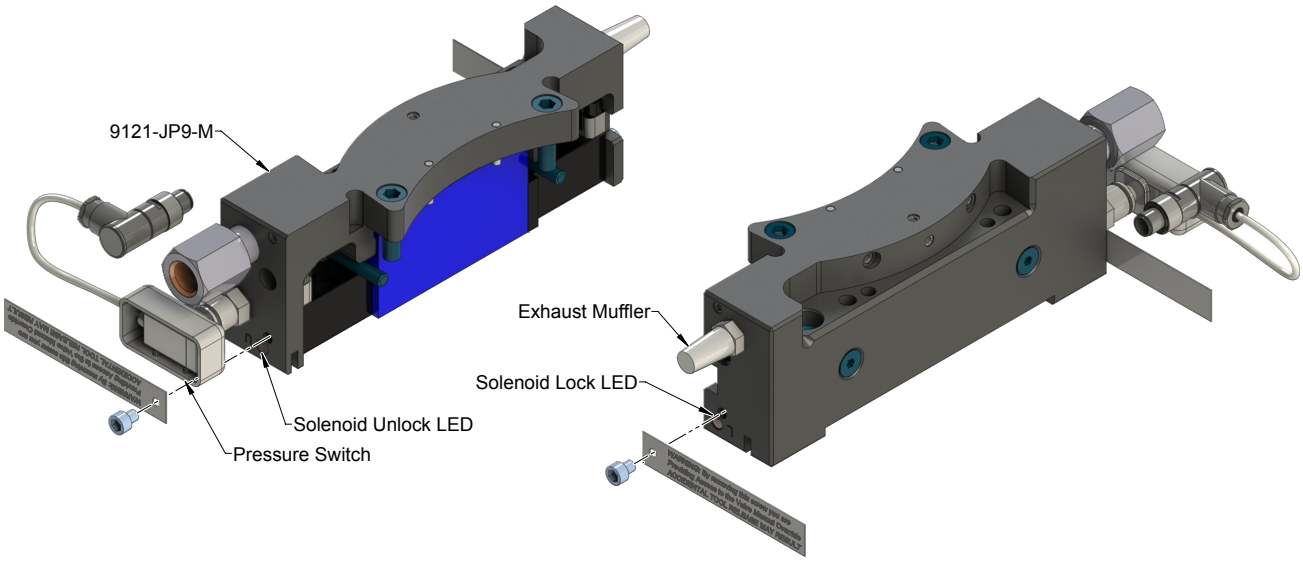
To check if the exhaust muffler is clogged remove the muffler and blow through the muffler. If it is difficult to blow or you can not blow through it at all replace the exhaust muffler. Refer to *Section 5.2.1—Exhaust Muffler Replacement.*

Inspect pressure switch connection for air leaks or damage to switch or cable, if air leaking reinstall switch into valve adapter. If sensor or cable is damaged replace switch. refer to *Section 5.2.2—Pressure Switch Replacement*

5. Troubleshooting and Service Procedures

Valve adapters with valve signal pass through are provided with LEDs to indicate whether or not power is being supplied to the double solenoid valve. This can be a valuable troubleshooting tool. *Figure 5.1* shows the location of the LEDs.

Figure 5.1— Valve Adapter LOCK and UNLOCK LED Locations



5.1 Troubleshooting

Follow the suggested actions listed in *Table 5.1* when attempting to troubleshoot the valve adapter. If issues persist, contact your closest ATI representative.

Table 5.1—Troubleshooting

Symptom	Cause	Resolution
Tool Changer or Utility Coupler will not Lock / Unlock or operates slowly.	Exhaust muffler is clogged.	Check/Replace exhaust muffler; ensure clean air supply.
	No or not enough air pressure on the pneumatic connection.	Make sure Pneumatic connection has minimum pressure, refer to *Section 2.7—Pneumatic Connections.*
	Loose valve adapter or O-rings leaking or missing.	Verify that the fasteners connecting the control/signal module to the valve adapter are properly tightened. If air still leaking, remove the valve adapter module from the Tool Changer or Utility Coupler and check for air leaks, damaged or missing O-rings., Refer to *Section 2.2—Valve Adapter Removal for QC-113, QC-210, QC-213, GL6L, GL7L0* or *Section 2.4—Valve Adapter Removal for QC-310, QC-313, QC-510, QC-1210*.
	No power is supplied to the Solenoid valve.	Monitor LOCKED and UNLOCKED LEDs to verify power is supplied to valve. If the LEDs do not light, verify valve power supply at control/signal module is present. if so replace valve adapter.
Tool Changer will Lock but not Unlock	Control/signal module safety features not met.	The tool stand Interlock, or other safety feature is preventing the Tool Changer from unlocking, refer to the control/signal module manual for more information. Control/signal module may not have bypass circuit and will have to be unlocked manually, refer to *Section 5.1.1—Solenoid Valve Manual Override Procedure.*
The pressure switch indicates insufficient or no air pressure.	Air line is clogged, no air pressure exists.	Check pressure at the connection, make sure a minimum of 60 psi is provided, if not check air lines for leaks or clogs. Check pressure source.
	Pressure switch malfunctioning.	Apply proper air pressure, check if pressure switch LED indicate pressure is sufficient, check if signal sent through control/signal module indicate sufficient pressure, if not replace Pressure switch, refer to *Section 5.2.2—Pressure Switch Replacement*.

5.1.1 Solenoid Valve Manual Override Procedure

The manual override procedure should be used when the Tool Changer is locked without the Tool plate attached. The control module safety circuit does not allow the Tool Changer to be unlatched without the Tool plate attached and the tool in the tool stand.

WARNING: Do not use the solenoid valve manual override if the tool is locked to the Master. Using the manual override will release the Tool and may cause bodily injury or damage to equipment. If the Tool is attached to the Master, it must be secured in the tool stand or in a location where the tool weight is supported before using the manual override.

CAUTION: The manual override is not intended for normal operations. Manual override is to be used in situations where no alternative is available to unlock the Master. Do not execute the Latch command unless the Master and the Tool are ready to be coupled.

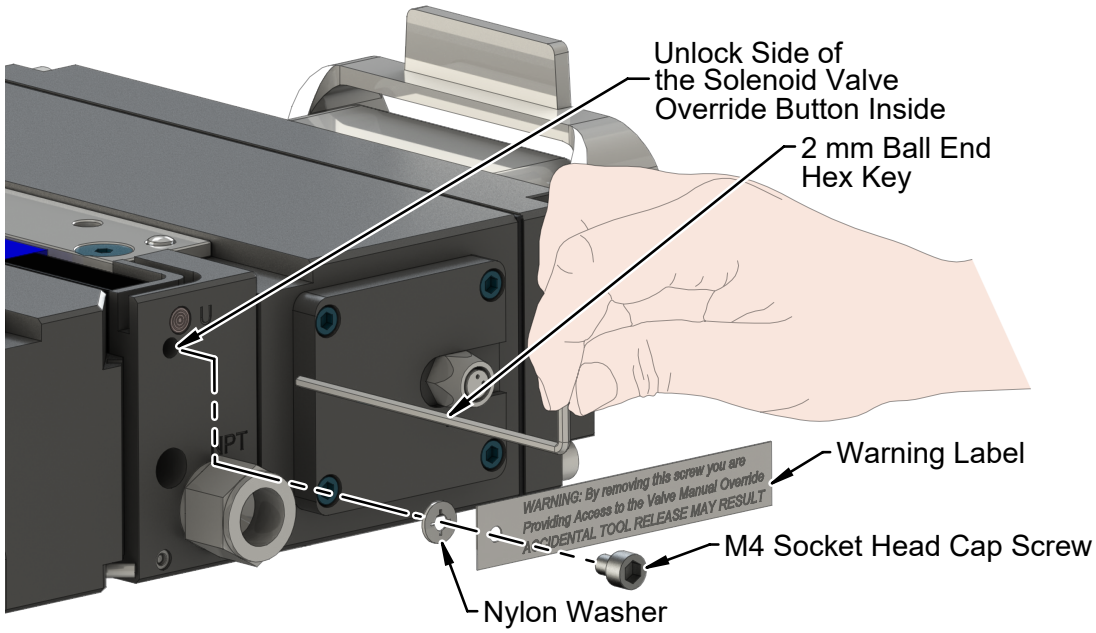
Tools required: *3 mm hex key, 2 mm ball end hex key*

1. Using a 3 mm hex key, remove the M4 socket head cap screws, warning label, and nylon washer from the Unlock side of the solenoid valve. The Unlock side is marked with a “U”.

CAUTION: Applying excess force can damage the solenoid or cause the override button to stick in one position. Actuation of valve override buttons requires about 1 mm of travel and minimal of force. Use a non-sharp object, similar to ball nose 2 mm hex key, to gently depress the override button; an air release should be heard when the solenoid is activated.

2. Insert a 2 mm ball end hex key in the unlock valve screw hole and gently depress the valve override button. An air release should be heard when the solenoid is actuated. Make sure the locking mechanism is fully retracted.
3. Using a 3 mm hex key, replace the M4 socket head cap screws, warning label, and nylon washer and tighten the screw.

Figure 5.2—Manual Override



5.2 Service Procedures

The following service procedures provide instructions for inspection, adjustment, test or replacement of components.

5.2.1 Exhaust Muffler Replacement

The exhaust muffler allows air from the Tool Changer or Utility Coupler locking mechanism to be exhausted to the atmosphere, if the muffler is clogged it may affect the ability to Lock and Unlock the Tool Changer or Utility Coupler. Remove and check to make sure the exhaust muffler is not clogged.

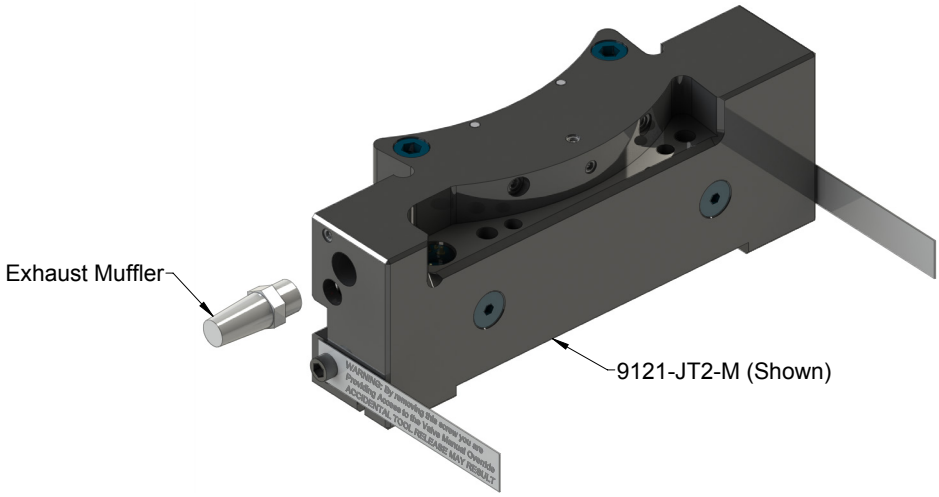
Parts required: *Refer to Section 8—Drawings.*

Tools required: *11 mm Wrench*

Supplies required: *Loctite 569*

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. Remove the exhaust muffler using a 11 mm wrench, blow through the muffler. If it is difficult to blow or you can not blow through it at all replace the exhaust muffler. Discard the exhaust muffler.
5. Thread the new exhaust muffler into the valve adapter housing. Tighten to contact plus one turn using a 11 mm wrench.
6. After the procedure is complete, resume normal operation.

Figure 5.3— Exhaust Muffler Replacement



5.2.2 Pressure Switch Replacement

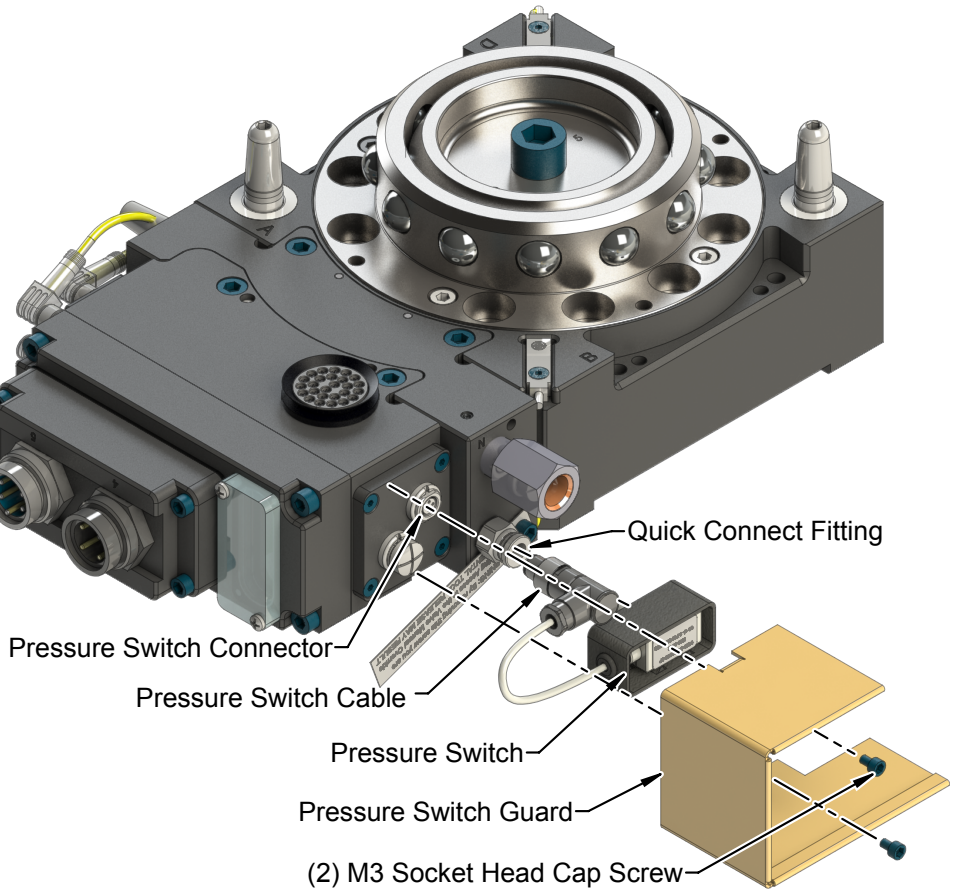
Tools required: *2.5 mm hex key wrench, torque wrench*

Supplies required: *Loctite® 222 (if fasteners do not have pre-applied adhesive)*

Parts required: *Refer to Section 8—Drawings.*

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. Remove the (2) M3 socket head cap screws securing the pressure switch guard to the module and remove the guard.
5. Disconnect the pressure switch cable from the control/signal module.
6. Using your fingers, press the flange on the quick connect fitting in towards the fitting and pull the pressure switch out. Discard the old switch.
7. Push the new pressure switch into the fitting.
8. Connect the pressure switch cable from the control/signal module.
9. Apply Loctite 222 to the (2) supplied M3 socket head cap screws and secure the guard with the (2) M3 socket head cap screws using a 2.5 mm hex key wrench. Tighten to 10 in-lbs (1.1 Nm).
10. After the procedure is complete, resume normal operation.

Figure 5.4— Pressure Switch Replacement



6. Serviceable Parts

Refer to *Section 8—Drawings* for valve adapter serviceable parts.

6.1 Tool Adapter Assembly Serviceable Parts

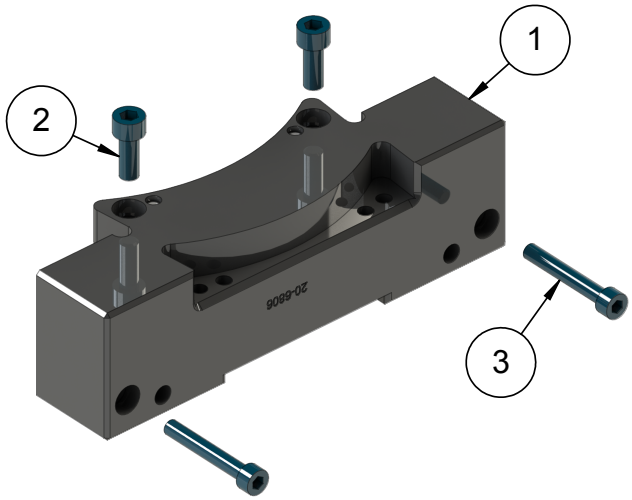


Table 5.2—Tool Adapter Assembly			
ITEM NO.	**QTY**	**PART NUMBER**	**DESCRIPTION**
1	1	9005-20-1192	Tool Adapter Assembly
2	2	3500-1066016-15A	M6 x 16mm SHCS MB ND Microspheres
3	2	3500-1064035-15A	M5 x 35mm SHCS MB, ND Microspheres

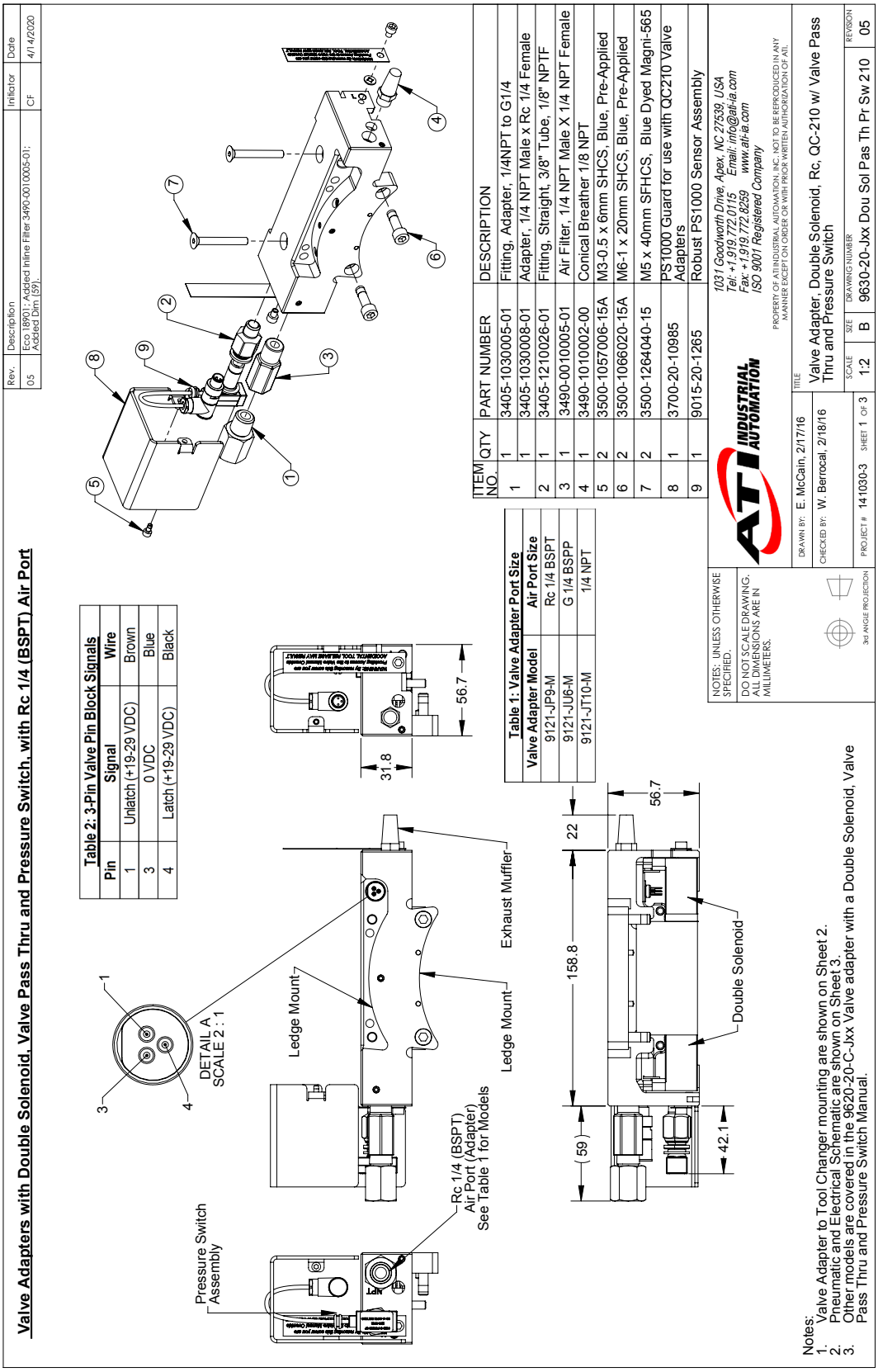
7. Specifications

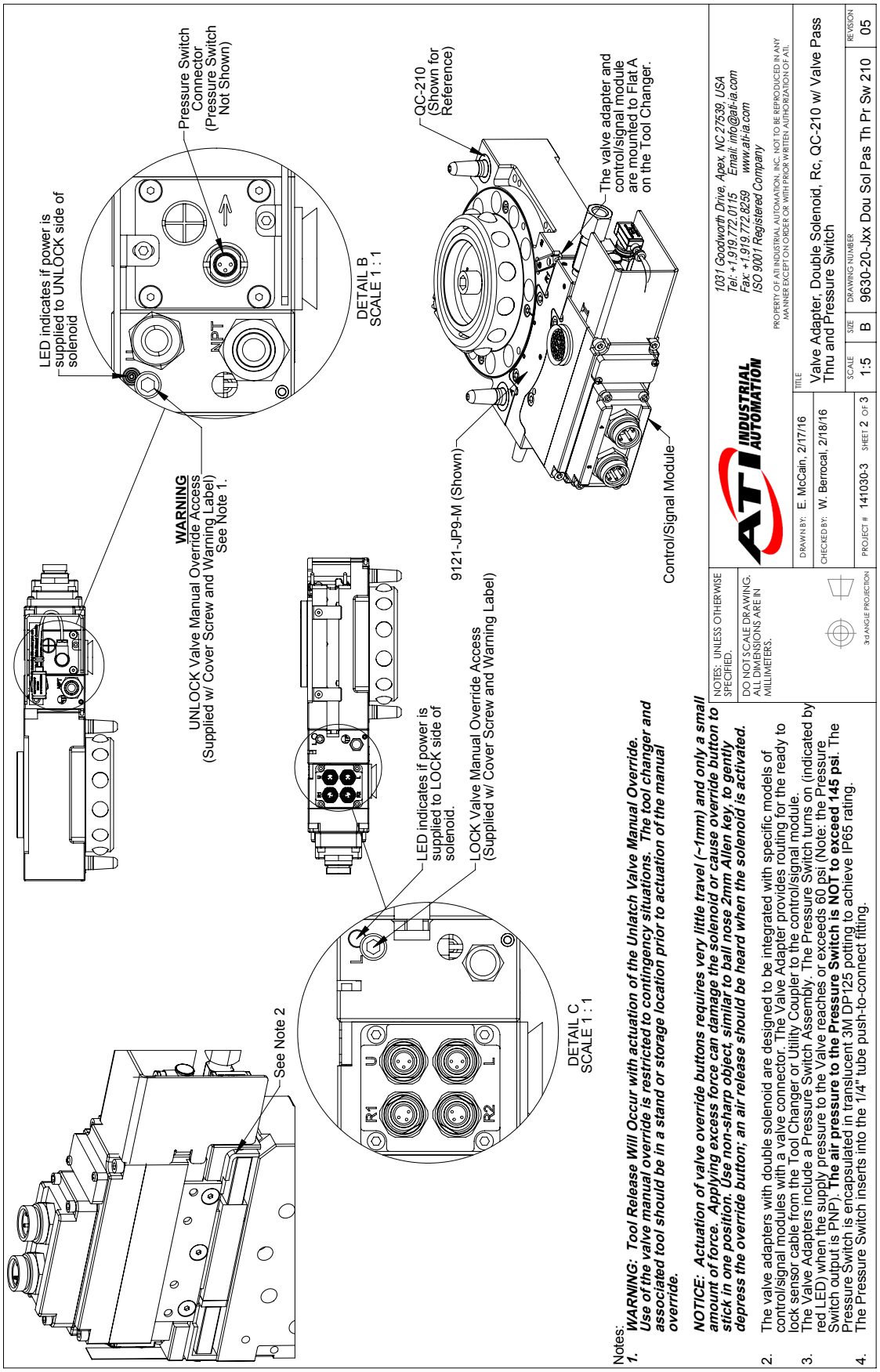
Table 5.3—Valve Adapter Specifications	
All Valve Adapter Models	**Specification**
Interface Connections	Integrated Solenoid Valve Connector: (4-Pin) pin block supporting Latch and Unlatch signals
Electrical Rating	19-29 VDC operational voltage (Solenoid Valve)
Current Draw	Switched Power: 250 mA @ 24 VDC (Solenoid Valve) (only when locking or unlocking Tool Changer).
Air Pressure	60 - 100 psi (4.1 – 6.9 Bar) clean, dry, non-lubricated air
Air Filtration	40 microns
Environmental Resistance	Dust and water resistant, but not water proof or IP67 compliant
Solenoid Valves	**Specification**
Double Solenoid Valve	MAC Series 48, DC Voltage, 6W Coil, Washdown, 250mA @ 19-29VDC
Operational Temperature Range	0 °F - 120 °F (-17.8 °C - 49 °C)
Cv	1.1
9121-JP9-M	**Valve Adapter with Double Solenoid W/ Pressure Switch Rc and Valve Pass Through, QC-113, QC-210, QC-213, GL6L, or GL7L**
Pneumatic Connection	Rc 1/4 (BSPT)
Weight	1.74 lbs (0.79 kg)
9121-JP10-M	**Valve Adapter with Double Solenoid W/ Pressure Switch Rc and Valve Pass Through, QC-310, QC-313, QC-510, or QC-1210**
Pneumatic Connection	Rc 1/4 (BSPT)
Weight	1.98 lbs (0.90 kg)
9121-JT10-M	**Valve Adapter with Double Solenoid W/ Pressure Switch Rc and Valve Pass Through, QC-113, QC-210, QC-213, GL6L, or GL7L**
Pneumatic Connection	1/4 (NPT)
Weight	1.635 lbs (0.74 kg)
9121-JU6-M	**Valve Adapter with Double Solenoid W/ Pressure Switch G and Valve Pass Through, QC-113, QC-210, QC-213, GL6L, or GL7L**
Pneumatic Connection	G 1/4 (BSPP)
Weight	1.46 lbs (0.66 kg)
9121-JU7-M	**Valve Adapter with Double Solenoid W/ Pressure Switch G and Valve Pass Through, QC-310, QC-313, QC-510, or QC-1210**
Pneumatic Connection	G 1/4 (BSPP)
Weight	1.7 lbs (0.77 kg)

Table 5.4—Tool Adapter Assembly Specifications	
9005-20-1192	**Tool Adapter Assembly, QC-210, QC-213, QC-310, QC-313, QC-510, QC-1210, GL6l, GL7L**
Weight	1.33 lbs (0.603 kg)

8. Drawings

8.1 Valve Adapters for QC-210 Tool Changers




LED indicates if power is supplied to UNLOCK side of solenoid
Pressure Switch Connector (Pressure Switch Not Shown)
NPT
DETAIL B
SCALE 1 : 1
QC-210 (Shown for Reference)
The valve adapter and control/signal module are mounted to Flat A on the Tool Changer.
WARNING
UNLOCK Valve Manual Override Access
(Supplied w/ Cover Screw and Warning Label)
See Note 1.
9121-JP9-M (Shown)
Control/Signal Module
LED indicates if power is supplied to LOCK side of solenoid.
LOCK Valve Manual Override Access
(Supplied w/ Cover Screw and Warning Label)
See Note 2
DETAIL C
SCALE 1 : 1
R1
U
R2
L
Notes:
1. WARNING: Tool Release Will Occur with actuation of the Unlatch Valve Manual Override. Use of the valve manual override is restricted to contingency situations. The tool changer and associated tool should be in a stand or storage location prior to actuation of the manual override.
NOTICE: Actuation of valve override buttons requires very little travel (~1mm) and only a small amount of force. Applying excess force can damage the solenoid or cause override button to stick in one position. Use non-sharp object, similar to ball nose 2mm Allen key, to gently depress the override button; an air release should be heard when the solenoid is activated.
2. The valve adapters with double solenoid are designed to be integrated with specific models of control/signal modules with a valve connector. The Valve Adapter provides routing for the ready to lock sensor cable from the Tool Changer or Utility Coupler to the control/signal module.
3. The Valve Adapters include a Pressure Switch Assembly. The Pressure Switch turns on (indicated by red LED) when the supply pressure to the Valve reaches or exceeds 60 psi (Note: the Pressure Switch output is PNP). The air pressure to the Pressure Switch is NOT to exceed 145 psi. The Pressure Switch is encapsulated in translucent 3M DP125 potting to achieve IP65 rating.
4. The Pressure Switch inserts into the 1/4" tube push-to-connect fitting.
NOTES: UNLESS OTHERWISE SPECIFIED.
DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.
3rd ANGLE PROJECTION
DRAWN BY: E. McCain, 2/17/16
CHECKED BY: W. Berrocal, 2/18/16
PROJECT # 141030-3 SHEET 2 OF 3
INDUSTRIAL AUTOMATION
1031 Goodworth Drive, Apex, NC 27539, USA
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Fax: +1.919.772.8259 www.ati-ia.com
ISO 9001 Registered Company
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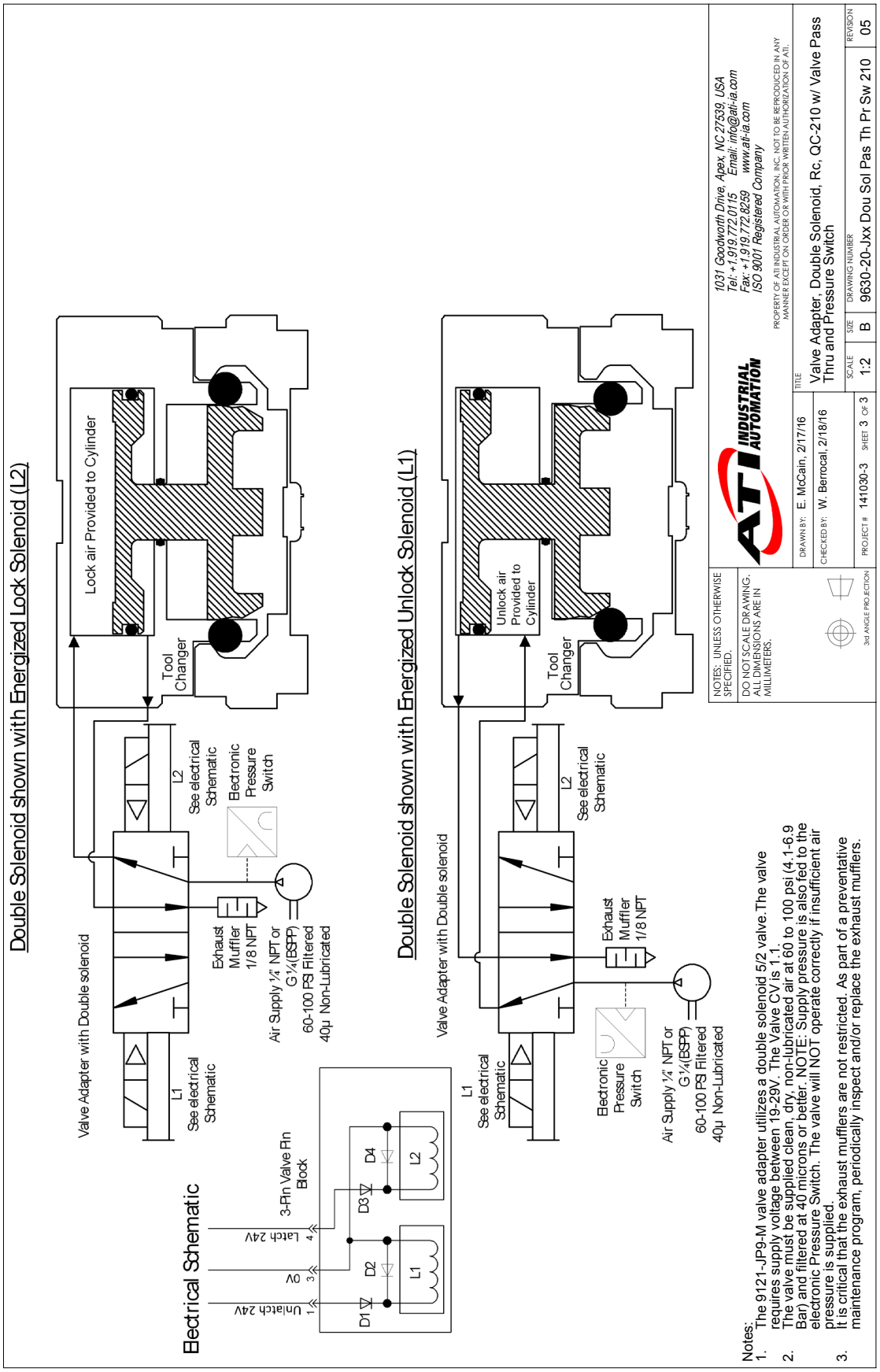
TITLE
Valve Adapter, Double Solenoid, Rc, QC-210 w/ Valve Pass Thru and Pressure Switch
SCALE 1:5
SIZE B
DRAWING NUMBER 9630-20-Jxx Dou Sol Pas Th Pr Sw 210
REVISION 05


Double Solenoid shown with Energized Lock Solenoid (L2)
Lock air Provided to Cylinder
Tool Changer
Valve Adapter with Double solenoid
L1
See electrical Schematic
L2
See electrical Schematic
Electronic Pressure Switch
Exhaust Muffler 1/8 NPT
Air Supply ¼" NPT or G¼(BSPP)
60-100 PSI Filtered
40µ Non-Lubricated
Electrical Schematic
3-Prn Valve Prn Block
Unlatch 24V
0V
Latch 24V
D1
D2
D3
D4
L1
L2
Double Solenoid shown with Energized Unlock Solenoid (L1)
Unlock air Provided to Cylinder
Tool Changer
Valve Adapter with Double solenoid
L1
See electrical Schematic
L2
See electrical Schematic
Electronic Pressure Switch
Exhaust Muffler 1/8 NPT
Air Supply ¼" NPT or G¼(BSPP)
60-100 PSI Filtered
40µ Non-Lubricated
Notes:
1. The 9121-JP9-M valve adapter utilizes a double solenoid 5/2 valve. The valve requires supply voltage between 19-29V. The Valve CV is 1.1.
2. The valve must be supplied clean, dry, non-lubricated air at 60 to 100 psi (4.1-6.9 Bar) and filtered at 40 microns or better. NOTE: Supply pressure is also fed to the electronic Pressure Switch. The valve will NOT operate correctly if insufficient air pressure is supplied.
3. It is critical that the exhaust mufflers are not restricted. As part of a preventative maintenance program, periodically inspect and/or replace the exhaust mufflers.
NOTES: UNLESS OTHERWISE SPECIFIED.
DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.
3rd ANGLE PROJECTION
DRAWN BY: E. McCain, 2/17/16
CHECKED BY: W. Berrocal, 2/18/16
PROJECT # 141030-3 SHEET 3 OF 3
TITLE
Valve Adapter, Double Solenoid, Rc, QC-210 w/ Valve Pass Thru and Pressure Switch
SCALE 1:2
SIZE B
DRAWING NUMBER 9630-20-Jxx Dou Sol Pas Th Pr Sw 210
REVISION 05
ATI INDUSTRIAL AUTOMATION
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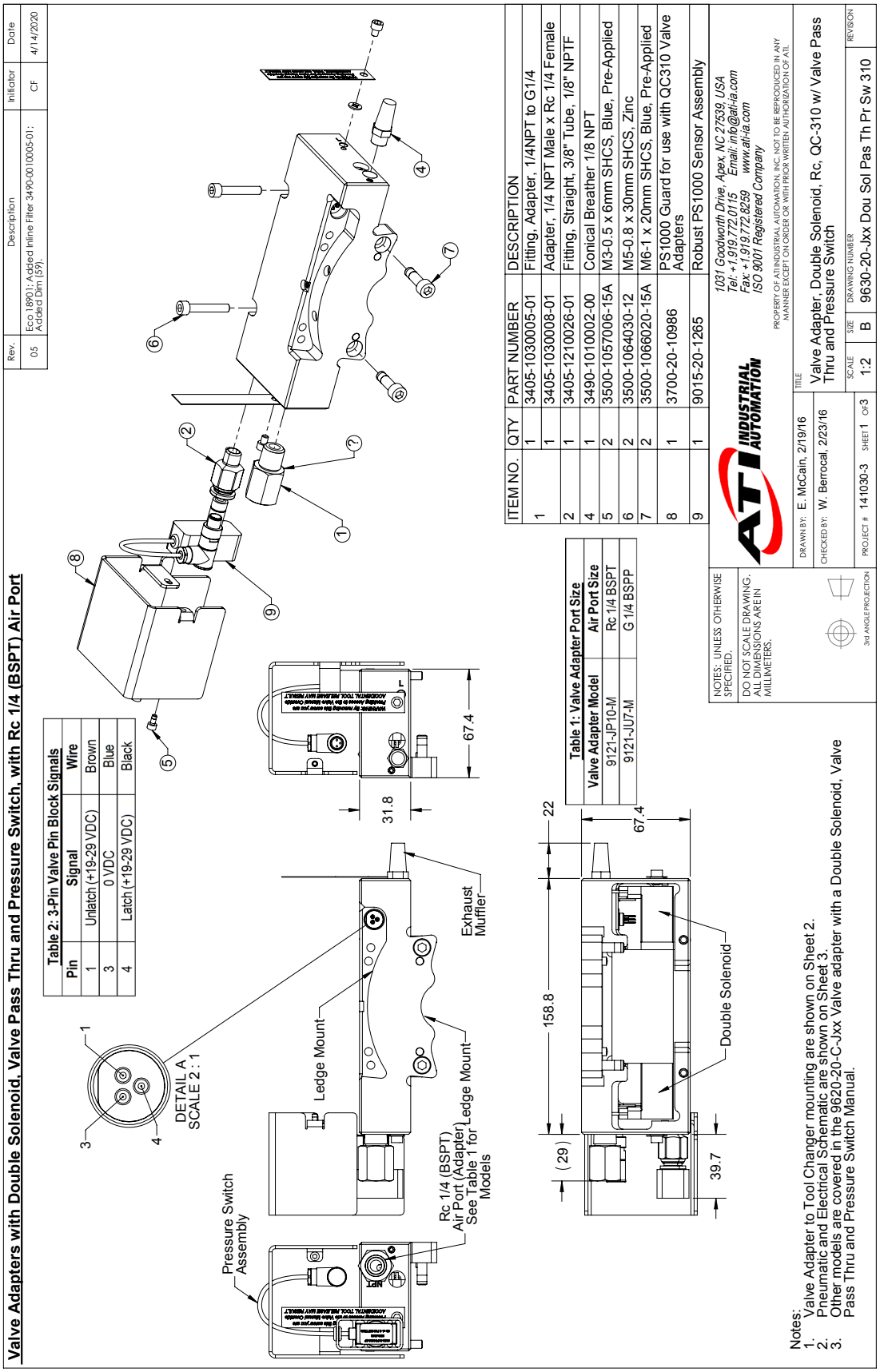
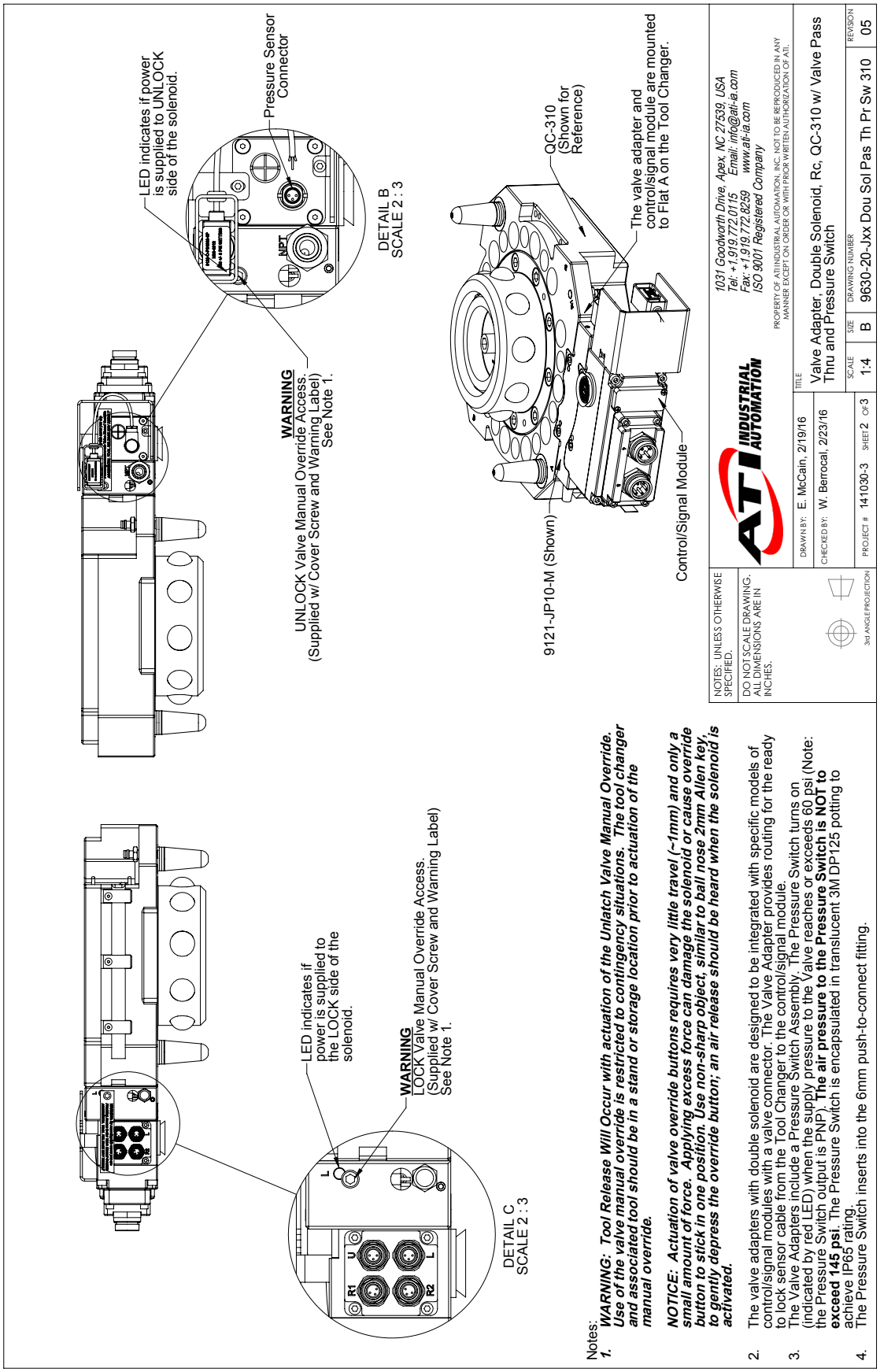
8.2 Valve Adapters for QC-310 Tool Changers




LED indicates if power is supplied to UNLOCK side of the solenoid.
Pressure Sensor Connector
DETAIL B
SCALE 2 : 3
WARNING
UNLOCK Valve Manual Override Access.
(Supplied w/ Cover Screw and Warning Label)
See Note 1.
QC-310
(Shown for Reference)
The valve adapter and control/signal module are mounted to Flat A on the Tool Changer.
9121-JP10-M (Shown)
Control/Signal Module
LED indicates if power is supplied to the LOCK side of the solenoid.
WARNING
LOCK Valve Manual Override Access.
(Supplied w/ Cover Screw and Warning Label)
See Note 1.
DETAIL C
SCALE 2 : 3
R1
U
R2
L
Notes:
1. WARNING: Tool Release Will Occur with actuation of the Unlatch Valve Manual Override. Use of the valve manual override is restricted to contingency situations. The tool changer and associated tool should be in a stand or storage location prior to actuation of the manual override.
NOTICE: Actuation of valve override buttons requires very little travel (~1mm) and only a small amount of force. Applying excess force can damage the solenoid or cause override button to stick in one position. Use non-sharp object, similar to ball nose 2mm Allen key, to gently depress the override button; an air release should be heard when the solenoid is activated.
2. The valve adapters with double solenoid are designed to be integrated with specific models of control/signal modules with a valve connector. The Valve Adapter provides routing for the ready to lock sensor cable from the Tool Changer to the control/signal module.
3. The Valve Adapters include a Pressure Switch Assembly. The Pressure Switch turns on (indicated by red LED) when the supply pressure to the Valve reaches or exceeds 60 psi (Note: the Pressure Switch output is PNP). The air pressure to the Pressure Switch is NOT to exceed 145 psi. The Pressure Switch is encapsulated in translucent 3M DP125 potting to achieve IP65 rating.
4. The Pressure Switch inserts into the 6mm push-to-connect fitting.
NOTES: UNLESS OTHERWISE SPECIFIED.
DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN INCHES.
3rd ANGLE PROJECTION
INDUSTRIAL AUTOMATION
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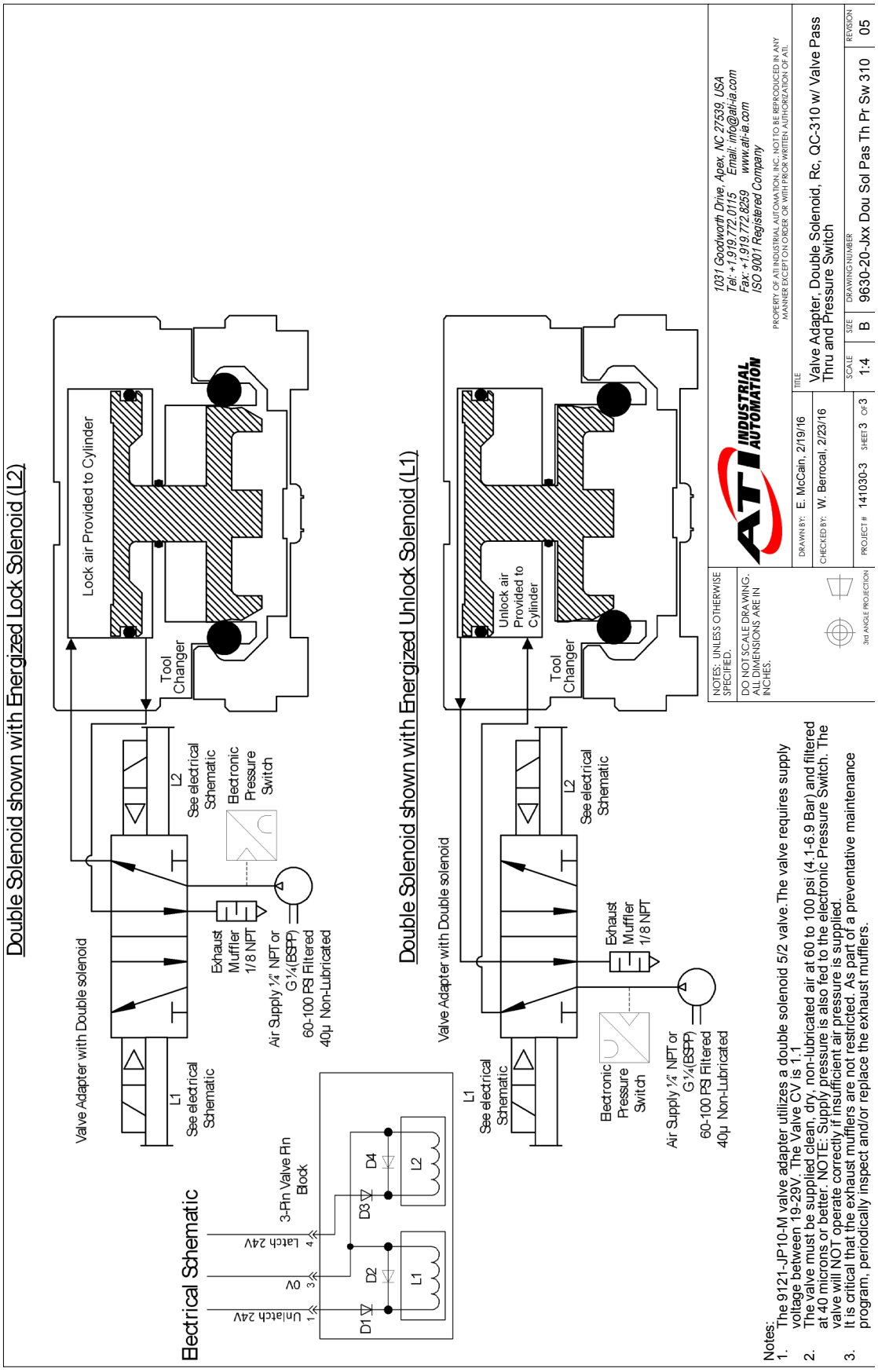
DRAWN BY: E. McCain, 2/19/16
CHECKED BY: W. Berrocal, 2/23/16
PROJECT # 141030-3 SHEET 2 OF 3
TITLE
Valve Adapter, Double Solenoid, Rc, QC-310 w/ Valve Pass Thru and Pressure Switch
SCALE 1:4
SIZE B
DRAWING NUMBER 9630-20-Jxx Dou Sol Pas Th Pr Sw 310
REVISION 05


Double Solenoid shown with Energized Lock Solenoid (L2)
Lock air Provided to Cylinder
Tool Changer
Valve Adapter with Double solenoid
L1
See electrical Schematic
L2
See electrical Schematic
Electronic Pressure Switch
Exhaust Muffler 1/8 NPT
Air Supply 1/4" NPT or G 1/4(BSPP)
60-100 PSI Filtered
40µ Non-Lubricated
Double Solenoid shown with Energized Unlock Solenoid (L1)
Unlock air Provided to Cylinder
Tool Changer
Valve Adapter with Double solenoid
L1
See electrical Schematic
L2
See electrical Schematic
Exhaust Muffler 1/8 NPT
Electronic Pressure Switch
Air Supply 1/4" NPT or G 1/4(BSPP)
60-100 PSI Filtered
40µ Non-Lubricated
Electrical Schematic
3-Pin Valve Pin Block
Unlatch 24V
0V
Latch 24V
D1
D2
D3
D4
L1
L2
Notes:
1. The 9121-JP10-M valve adapter utilizes a double solenoid 5/2 valve. The valve requires supply voltage between 19-29V. The Valve CV is 1.1
2. The valve must be supplied clean, dry, non-lubricated air at 60 to 100 psi (4.1-6.9 Bar) and filtered at 40 microns or better. NOTE: Supply pressure is also fed to the electronic Pressure Switch. The valve will NOT operate correctly if insufficient air pressure is supplied.
3. It is critical that the exhaust mufflers are not restricted. As part of a preventative maintenance program, periodically inspect and/or replace the exhaust mufflers.
NOTES: UNLESS OTHERWISE SPECIFIED.
DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN INCHES.
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ATI INDUSTRIAL AUTOMATION
DRAWN BY: E. McCain, 2/19/16
CHECKED BY: W. Berrocal, 2/23/16
PROJECT # 141030-3 SHEET 3 OF 3
3rd ANGLE PROJECTION
TITLE
Valve Adapter, Double Solenoid, Rc, QC-310 w/ Valve Pass Thru and Pressure Switch
SCALE 1:4
SIZE B
DRAWING NUMBER
9630-20-Jxx Dou Sol Pas Th Pr Sw 310
REVISION 05