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C. Control and Signal Modules

Valve Adapters with Dual Double Solenoid, Valve Signal Pass Through, Proximity and Pressure Sensors

1. Product Overview

Valve adapters are required to provide an air supply to the compatible Tool Changer Master for actuation of the locking mechanism. Valve adapters come outfitted with integrated dual double-solenoid valves to provide redundant protection against unintended tool release, refer to [Section 2.1—Dual Double-Solenoid Valve Function](#) for a detailed Description. The valve adapter is equipped with sensors to monitor the solenoid valves for detection of failure of either valve. Solenoid valve 1 is monitored using a pressure sensor and solenoid valve 2 is monitored using a proximity sensor. Refer to [Section 2.2—Monitoring Solenoid Valves](#) for additional information. The valve adapter when used in combination with a control/signal module such as a DL5, satisfies the PL d safety reliability level in accordance with ISO standard 13849-1.

The valve adapter mounts to the Master body of the Tool Changer. A JR4-T spacer module is required to align the control/signal Master and Tool modules. Control of the integrated valve is accomplished through the valve signal pass through connector to the control/signal module. The latch/unlatch signals sent to the control/signal module are transmitted to the valve adapter using a small, internal pin block. [Figure 1.1](#) shows the control/signal module to valve adapter electrical interface. 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 9—Drawings](#) for a complete listing of available adapters and customer drawings).

Figure 1.1—Valve Pass Through Connection

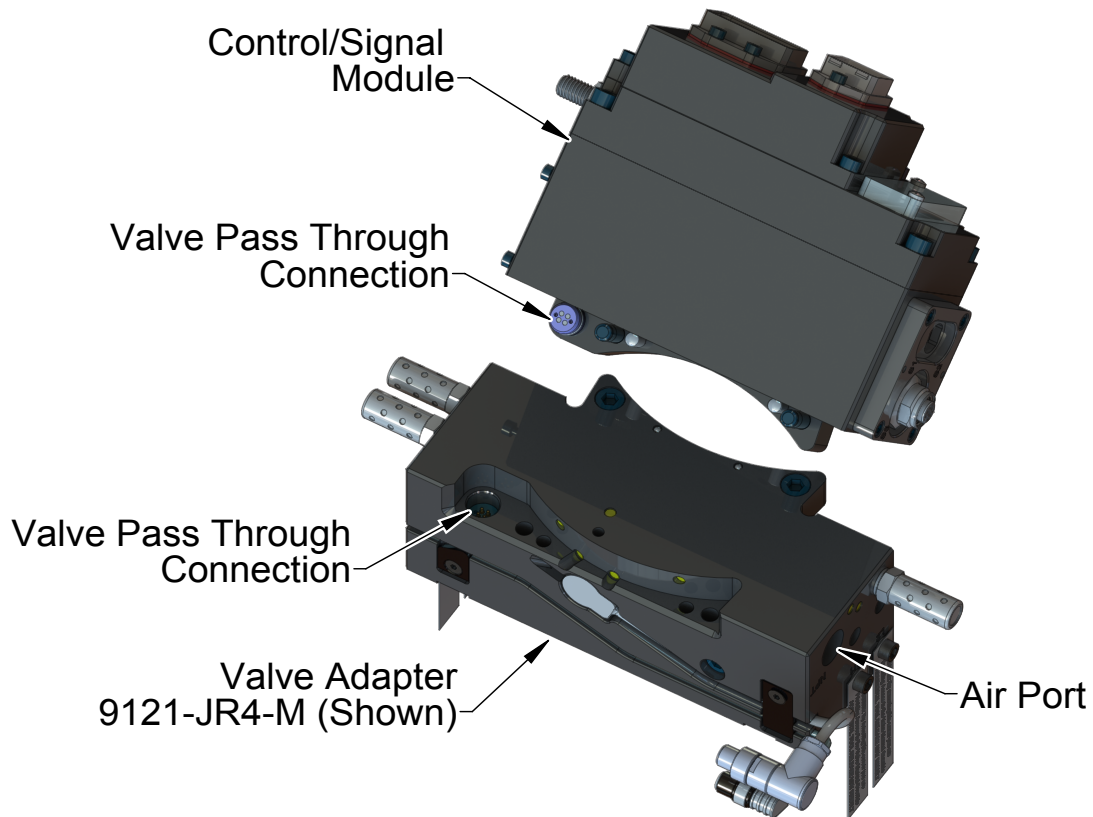
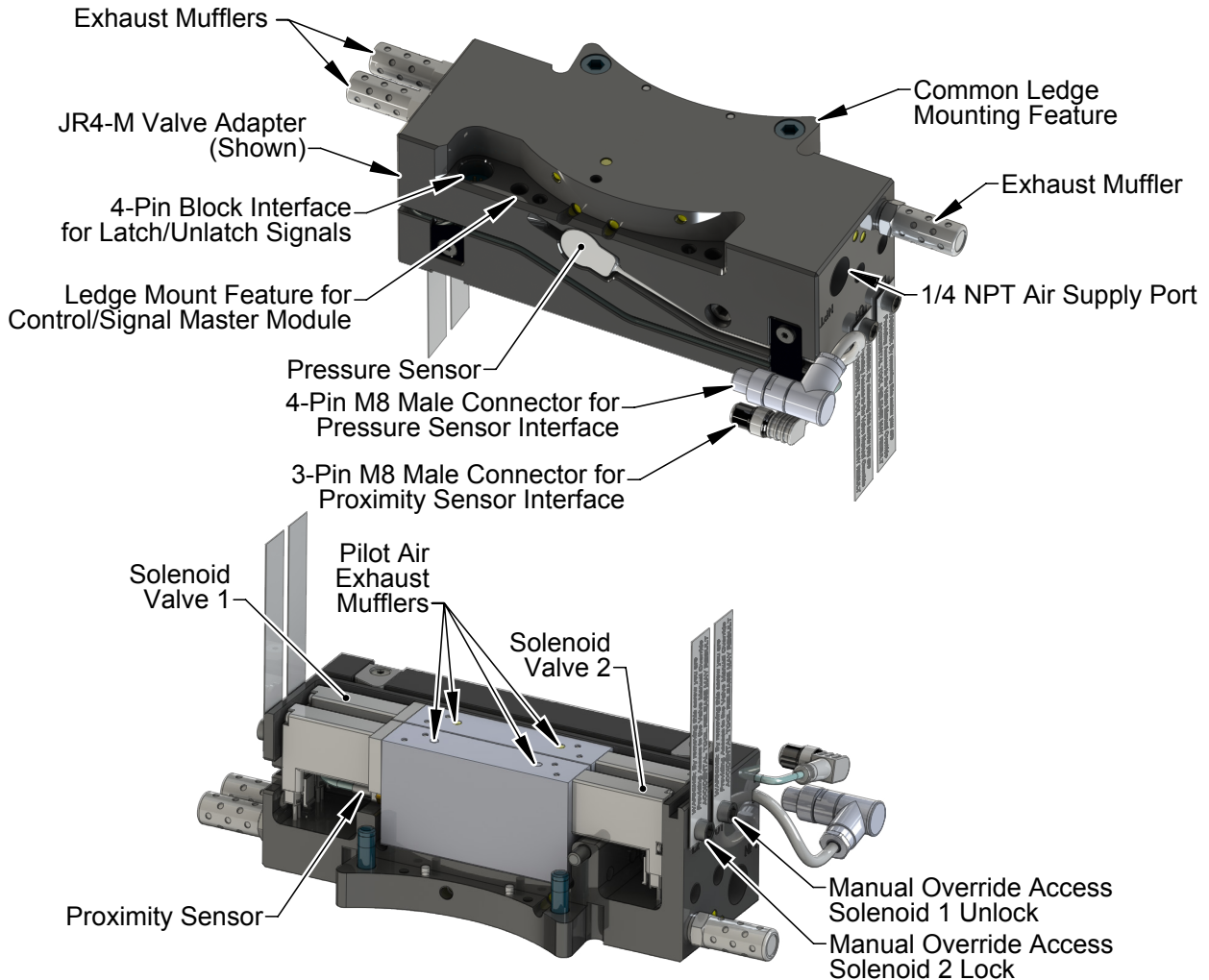


Table 1.1—Valve Adapters with a Dual Double Solenoid, Proximity and Pressure Sensors, and Valve Pass Through Models

| Module | Description | Air Port Size | Compatible Tool Changer |
|-------------|--|---------------|---------------------------------|
| 9121-JR4-M | Dual Double Solenoid w/ Proximity and Pressure Sensors | 1/4 NPT | QC-113, QC-210, QC-213 |
| 9121-JU4-M | Dual Double Solenoid w/ Proximity and Pressure Sensors | G 1/4 (BSPP) | QC-113, QC-210, QC-213 |
| 9121-JP12-M | Dual Double Solenoid w/ Proximity and Pressure Sensors | Rc 1/4 (BSPT) | QC-113, QC-210, QC-213 |
| 9121-JU5-M | Dual Double Solenoid w/ Proximity and Pressure Sensors | G 1/4 (BSPP) | QC-310, QC-313, QC-510, QC-1210 |
| 9121-JT7-M | Dual Double Solenoid w/ Proximity and Pressure Sensors | 1/4 NPT | QC-310, QC-313, QC-510, QC-1210 |
| 9121-JP13-M | Dual Double Solenoid w/ Proximity and Pressure Sensors | Rc 1/4 (BSPT) | QC-310, QC-313, QC-510, QC-1210 |

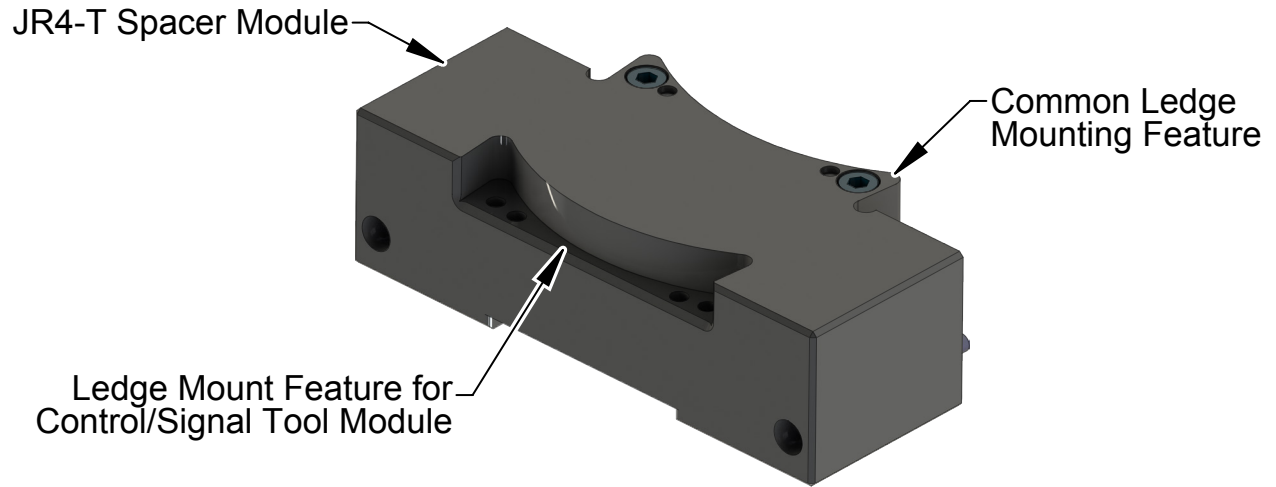
The valve adapter mounts to Flat ‘A’ and provides a ledge mount for the control/signal Master module. A single air port connection for the customer air supply supplies the lock and unlock air to the valve adapter. Lock and unlock air connections to the Tool Changer are provided through ports in the ledge mount, O-rings in the body seal the connection. The valve adapter is equipped with exhaust mufflers, a pressure sensor, a proximity sensor, and dual double solenoid valves, refer to [Figure 1.2](#). Access to the solenoid valve manual overrides are provide through screws in the aluminum housing, refer to [Section 6.2—Manually Phase Solenoids](#) for more information.

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



A 9121-JR4-T Spacer Module is required for the tool side which provides the proper spacing and a ledge mount for the control/signal Tool module.

Figure 1.3—Spacer Module



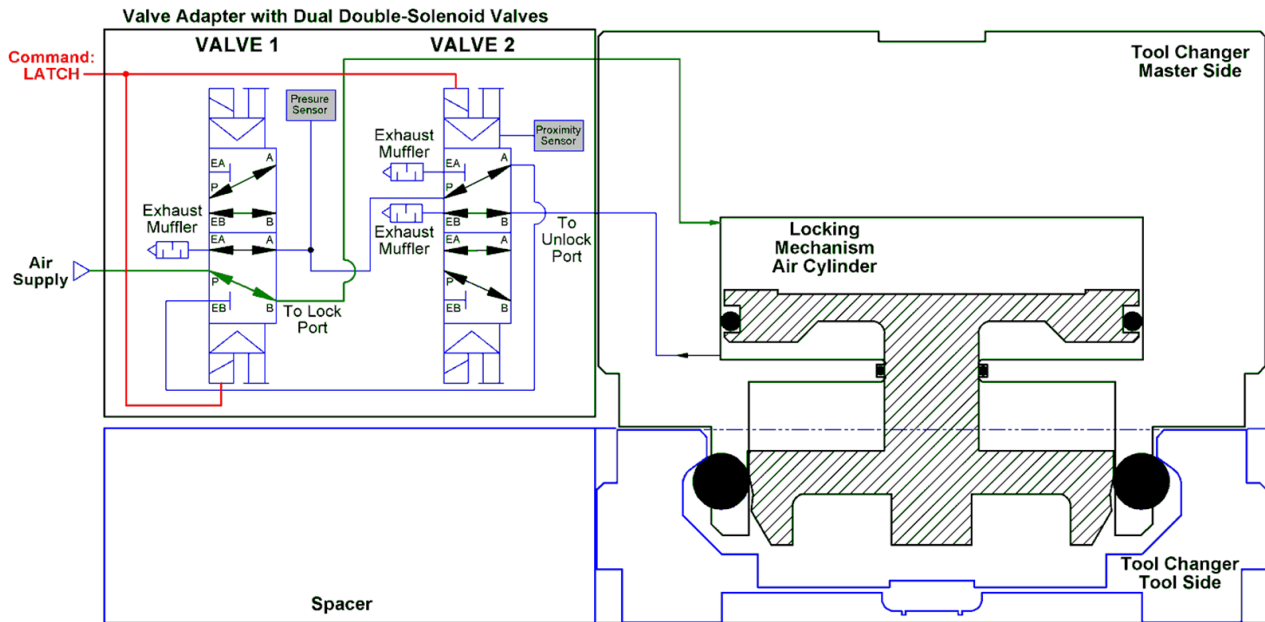
2. Product Information

2.1 Dual Double-Solenoid Valve Function

The Dual Double-Solenoid Valve Adapter employs two double-solenoid valves. The valves are incorporated in a pneumatic circuit that is designed to reduce the probability of an unintended unlatch of the Tool Changer. If any one of the valves was to fail the Tool Changer would remain latched. The pneumatic circuit is designed in such a way that both valves must be in the Unlatch position before the Tool Changer will unlock. The valves remain in their current position when the solenoids are de-energized. The dual double-solenoid valves have pilot exhaust ports, which are exhausted separately from the primary exhaust (not shown in the circuit diagrams).

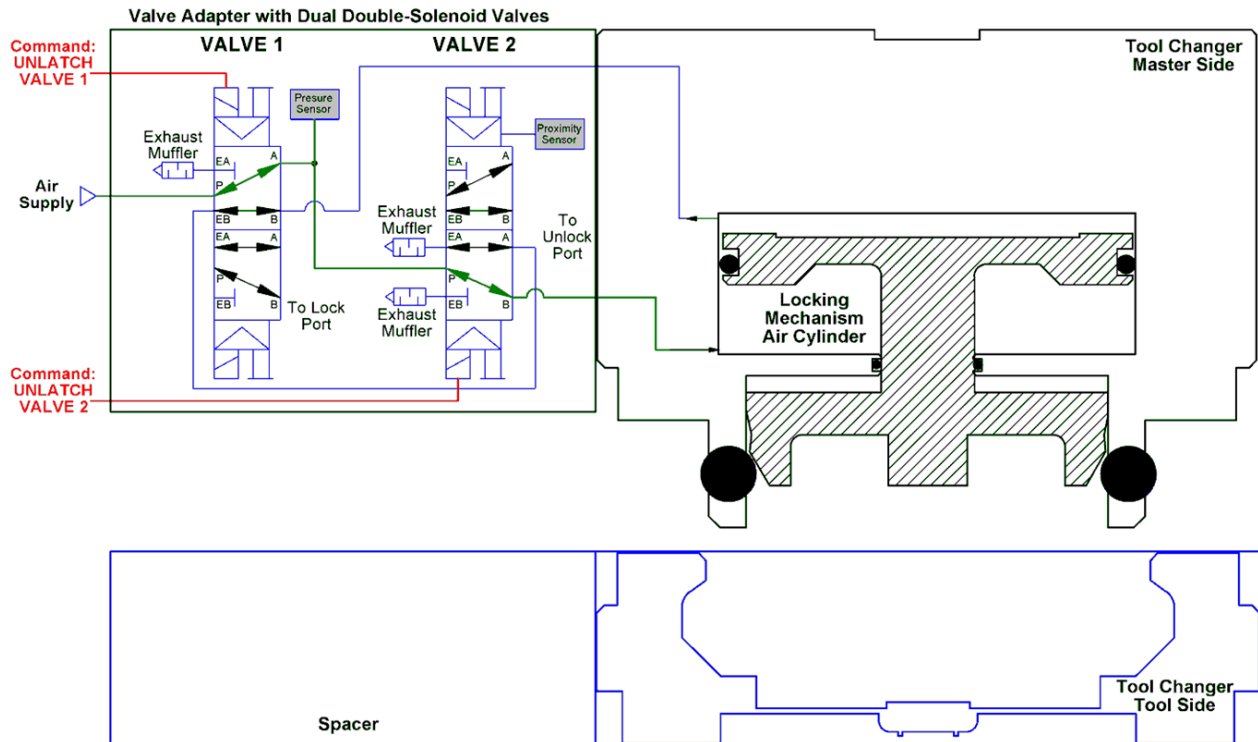
Figure 2.1 shows the Tool Changer in the locked position when the latch command has been provided by the robot. The air is supplied to the locking mechanism through valve 1 and air is exhausted through valve 2. At this point the pressure sensor should be nearly zero indicating that valve 1 is functioning properly and the proximity sensor output should be high indicating that valve 2 is functioning properly. The output from these sensors is provided to the control/signal module to be evaluated to determine if it is safe to latch or unlatch the Tool Changer or if a valve failure has occurred. Once the data has been verified and the Tool Changer has locked, the latch signal to the valves is turned off.

Figure 2.1—Dual Double-Solenoid Valve Adapter Pneumatic Circuit in Latched Position



A separate unlatch command is provided to each solenoid valves in accordance with the requirements of a dual-channel safety system. At this point the pressure sensor should measure a pressure equivalent to the supply air pressure indicating that valve 1 is functioning properly and the proximity sensor output should be low indicating that valve 2 is functioning properly. Once the data has been verified and the Tool Changer has unlocked, the unlatch signal to the valves is turned off. The Master can now move away from the Tool. Refer to *Figure 2.2*.

Figure 2.2—Dual Double-Solenoid Valve Adapter Pneumatic Circuit in Unlatched Position



2.2 Monitoring Solenoid Valves

A pressure sensor is used to monitor solenoid valve 1 to detect if the valve is functioning properly. The pressure sensor can detect if the solenoid valve has failed. Solenoid valve 2 uses a proximity sensor to detect if the valve has failed. The control/signal module monitors the sensor outputs, refer to the Control/Signal Module Manual for more information.

2.2.1 Pressure Sensor Solenoid Valve 1

When the Tool Changer is in the locked position the pressure sensor should be nearly zero indicating that valve 1 is functioning properly. In the unlocked position the pressure sensor should measure a pressure equivalent to the supply air pressure indicating that valve 1 is functioning properly.

2.2.2 Proximity Sensor Solenoid Valve 2

When the Tool Changer is in the locked position the proximity sensor output should be high indicating that valve 2 is functioning properly. In the unlocked position the proximity sensor output should be low indicating that valve 2 is functioning properly.

3. Installation

Valve adapters and spacer modules are typically installed by ATI prior to shipment. Installation and removal are outlined in the following section.



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 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.

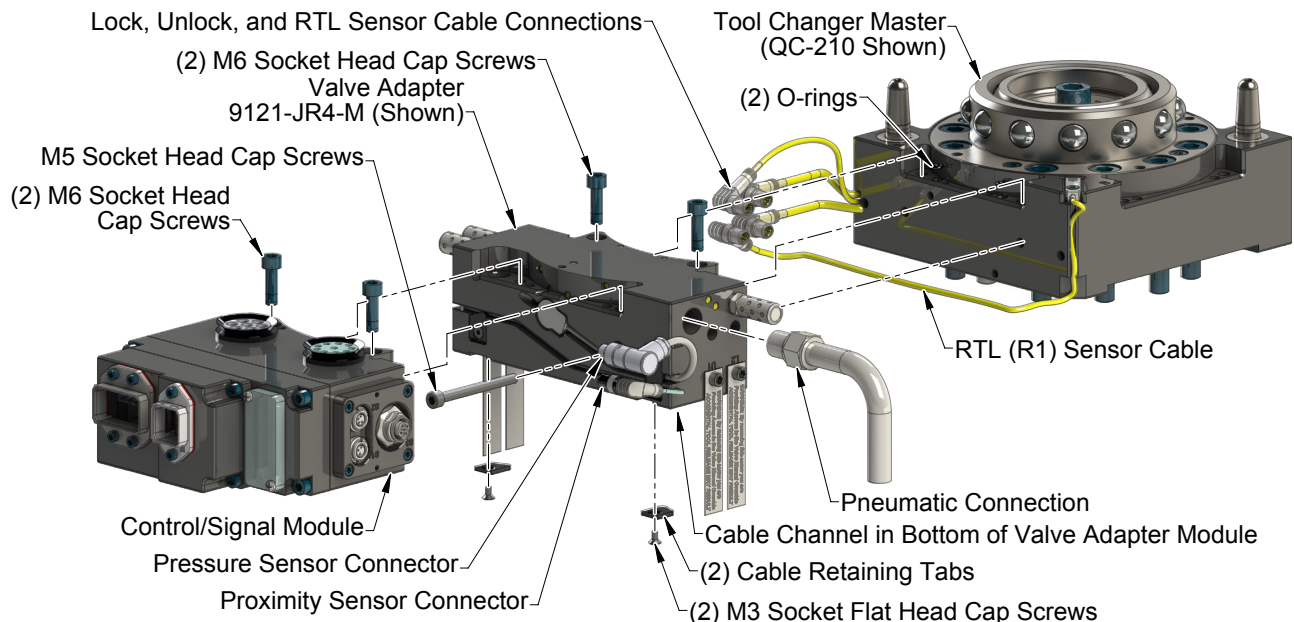
3.1 Valve Adapter Installation for QC-113, QC-210, QC-213

Tools required: 3 mm and 5 mm hex keys, torque wrench

Supplies required: clean rag, Loctite 222, 242, and 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 (for example: electrical, pneumatic, hydraulic).
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 3.1](#)).
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 (2) M6 socket head cap screws. Secure the valve adapter using the M6 socket head cap screws and tighten to 70 in-lbs (7.9 Nm).
8. Apply Loctite 222 to the supplied M5 socket head cap screw. Install the M5 socket head cap screw securing the valve adapter to the Tool Changer and tighten to 55 in-lbs (6.2 Nm).

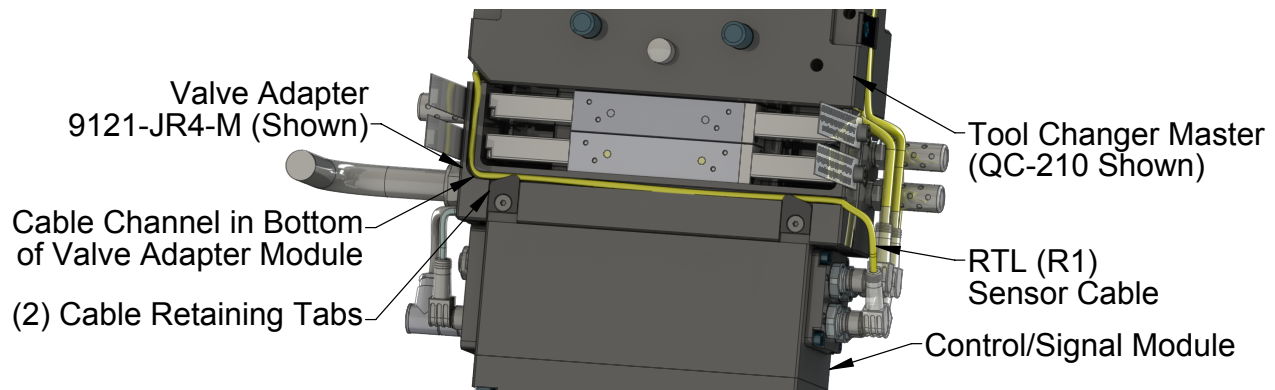
Figure 3.1—Valve Adapter Installation (QC-210 Shown)



9. Remove the (2) M3 socket flat head screws and the (2) cable retaining tabs from the bottom of the valve adapter.
10. Route the RTL (R1) sensor cable through the cable channel in the bottom of the valve adapter. Refer to [Figure 3.2](#).
11. Install the (2) M3 socket flat head screws and the (2) cable retaining tabs from the bottom of the valve adapter. Tighten to 24 in-oz (0.17 Nm).
12. Make pneumatic connection 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.

NOTICE: The Lock, Unlock, RTL, Pressure and Proximity sensor cables will be connected when installing the control/signal module.

Figure 3.2—RTL (R1) Sensor Cable Routing



3.2 Valve Adapter Removal for QC-113, QC-210, QC-213

NOTICE: Depending on maintenance or repair being performed, utilities to modules and Master plate may need to be disconnected.

Tools required: 3 mm and 5 mm hex keys

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. If there is a control/signal module piggy-backed on the valve adapter, it will need to be removed prior to removal of the valve adapter. Disconnect all electrical and pneumatic connections to the control/signal module and valve adapter as required.
5. Disconnect the lock, unlock, RTL, proximity, and pressure sensor connections from the control/signal module. Refer to [Figure 3.1](#).
6. Remove the (2) M6 socket head cap screws and lift the control/signal module off the valve adapter.
7. Remove the (2) M3 socket flat head cap screws and the (2) cable retaining tabs from the bottom of the valve adapter.
8. Remove the RTL (R1) sensor cable from the cable channel in the bottom of the valve adapter. Refer to [Figure 3.2](#).
9. Remove the M5 socket head cap screws and the (2) M6 socket head cap screws and lift the valve adapter off the Tool Changer.
10. Make sure that the O-rings are retained at the Master side Flat 'A' mounting interface.

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

Tools required: 3 mm and 5 mm hex keys, torque wrench

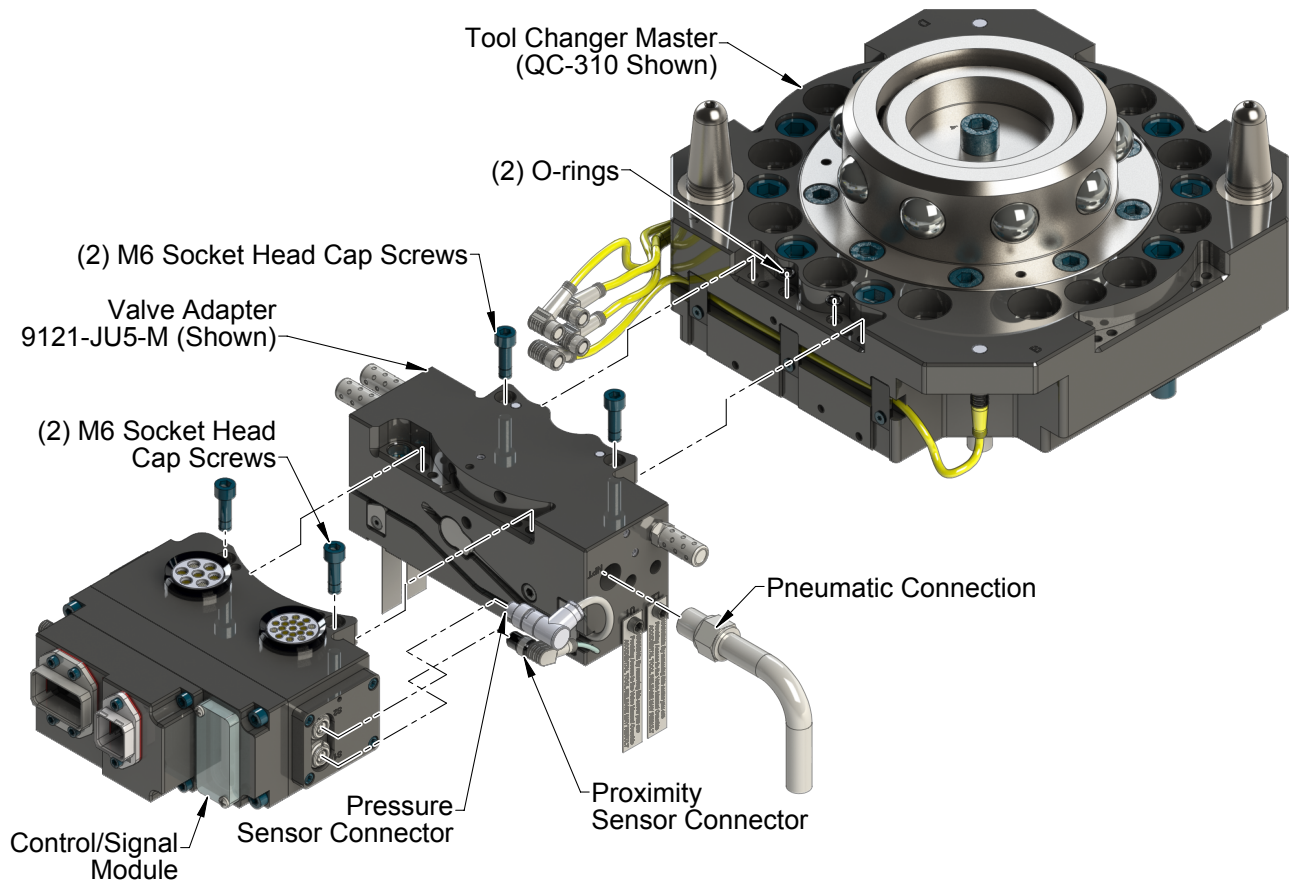
Supplies required: clean rag, Loctite 242 and 569

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
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 3.3](#)).

NOTICE: Make 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. Apply Loctite 242 to the supplied M6 socket head cap screws. Secure the valve adapter using the M6 socket head cap screws and tighten to 70 in-lbs (7.9 Nm).
7. 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.

Figure 3.3—Valve Adapter Installation (QC-310 Shown)



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

Tools required: 3 mm and 5 mm hex keys

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. If there is a control/signal module piggy-backed on the valve adapter, it will need to be removed prior to removal of the valve adapter. Disconnect all electrical and pneumatic connections to the control/signal module and valve adapter as required.
5. Disconnect the lock, unlock, RTL, proximity, and pressure sensor connections from the control/signal module.
6. Remove the (2) M6 socket head cap screws and lift the control/signal module off the valve adapter.
7. Remove the (2) M6 socket head cap screws and lift the valve adapter off the Tool Changer.
8. Make sure that the O-rings are retained at the Master side Flat 'A' mounting interface.

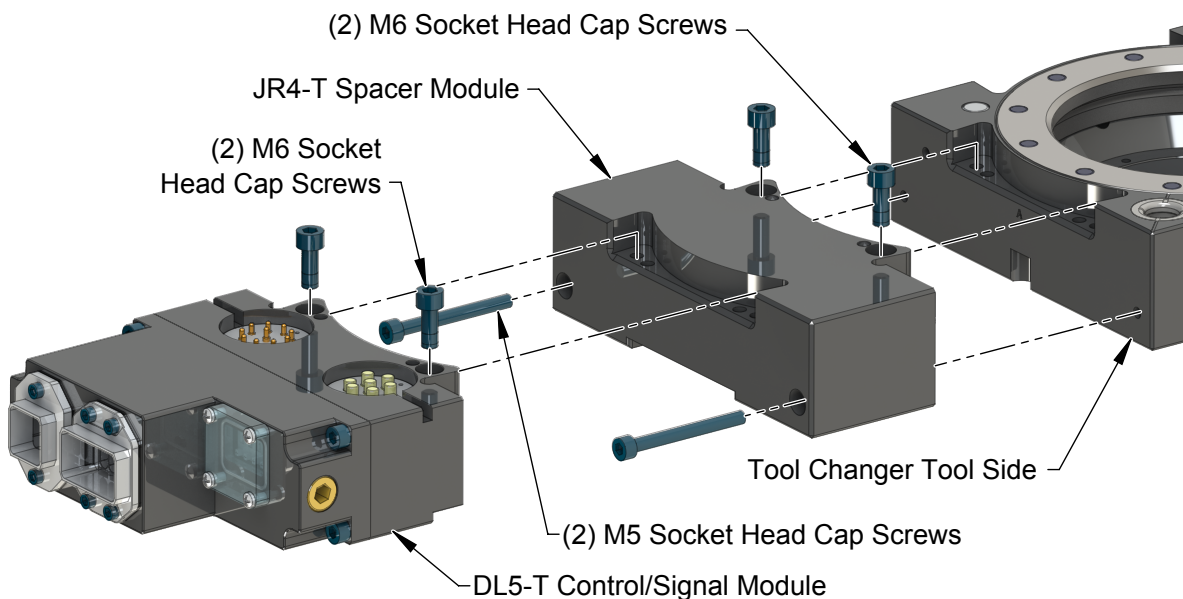
3.5 Spacer Module Installation

Tools required: 3 mm and 5 mm hex keys, torque wrench

Supplies required: clean rag, Loctite 222 and 242

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. Clean the mounting surfaces.
5. Using the ledge feature to place the spacer module adjacent to the 'Flat A' mounting surface. Align the spacer module using the dowels in the bottom of the ledge feature.
6. Apply Loctite 242 to the supplied M6 socket head cap screws. Secure the spacer module using the M6 socket head cap screws and tighten to 89 in-lbs (10.0 Nm).
7. Apply Loctite 222 to the (2) supplied M5 socket head cap screws. Secure the spacer module using the M5 socket head cap screws and tighten to 52 in-lbs (5.9 Nm).

Figure 3.4—Space Module Installation



3.6 Spacer Module Removal

Tools required: 3 mm and 5 mm hex keys

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. If there is a control/signal module piggy-backed on the spacer module, it will need to be removed prior to removal of the spacer. Disconnect all electrical and pneumatic connections to the control/signal module as required.
5. Removing the (2) M6 socket head cap screws and lift the control/signal module off the spacer module (refer to [Figure 3.4](#)).
6. Remove the (2) M5 socket head cap screws and the (2) M6 socket head cap screws and lift the spacer module off the Tool Changer.

3.7 Pneumatic Connections

The customer is only required to supply the valve adapter with a single air supply. A clean, dry, non-lubricated air supplied between 60 and 100 psi (4.1 – 6.9 Bar) and filtered at 40 microns or better is required. A supply air port is provide on the valve adapter. An adapter fitting is required to accommodate G, BSPP, R, or other types of connections. The control/signal module will not allow an unlatch if the pressure is less than 60 or greater than 100 psi.



CAUTION: Do not exceed the pressure overload value (150 psi) of the pressure sensor. Exceeding the pressure overload value will damage the pressure sensor. Maintain the supply pressure between 60 and 100 psi.



CAUTION: All pneumatic fittings and tubing must be capable of withstanding the repetitive motions of the application without failing. The routing of electrical and pneumatic lines must minimize the possibility of stress pullout, kinking, etc. Failure of some critical electrical and/or pneumatic lines to function properly may result in injury to personnel and equipment.



CAUTION: Do not use the Tool Changer 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.

3.8 Electrical Connections

3.8.1 Solenoid Valves Pin Block

The electrical connection for valve control is made through internal pin block as described in [Section 1—Product Overview](#) and detailed in drawings in [Section 9—Drawings](#). The control of the dual double-solenoid valves is integrated with an ATI-supplied control/signal module that is piggy-backed onto the valve adapter.

3.8.2 Pressure and Proximity Sensor Connections

The pressure and proximity sensor interface connectors provided signals to the control/signal module to determine if it is safe to unlatch the Tool Changer. Both connectors are field wireable and IP67 rated. The pin-out for the connectors is shown in [Section 9—Drawings](#).

4. Operation

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. Again, it is important that clean, dry, non-lubricated air supplied between 60 and 100 psi (4.1 – 6.9 Bar) and filtered at 40 microns or better is provided.

An electrical connection is provided for valve control as detailed in [Section 9—Drawings](#) of this manual. The control of this valve is integrated with an ATI-supplied control/signal module that is piggy-backed onto the valve adapter.

5. Maintenance

Valve adapters should require little maintenance. The only wear components are the solenoid valves and an exhaust mufflers. Under normal operating conditions, the valves 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 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.

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 6.3.1—Exhaust Muffler Replacement](#).

6. Troubleshooting and Service Procedures

The following section provides troubleshooting information to help diagnose conditions with the Tool Changer or valve adapter and service procedures to help resolve these conditions.



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 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.

6.1 Troubleshooting

Follow the suggested actions listed in [Table 6.1](#) when attempting to troubleshoot the valve adapter. If issues persist, contact your closest ATI representative.

Table 6.1—Troubleshooting

| Symptom | Cause | Resolution |
|---|---|---|
| Tool Changer will not Lock / Unlock or operates slowly. | Debris caught between the Master and Tool plates. | Clean debris from between Master and Tool plates. Verify mounting fasteners is secure and does not protrude above the mating surfaces. |
| | Exhaust muffler is clogged. | Check/Replace exhaust muffler; ensure clean air supply. Refer to Section 6.3.1—Exhaust Muffler Replacement |
| | No or not enough air pressure on the pneumatic connection. | Make sure Pneumatic connection has minimum pressure, refer to Section 3.7—Pneumatic Connections . |
| | Air leaks | Verify that the fasteners connecting the valve adapter to the Tool Changer are properly tightened. If air still leaking, remove the valve adapter module from the Tool Changer and check for damaged or missing O-rings. Refer to Section 3.1—Valve Adapter Installation for QC-113, QC-210, QC-213 or Section 3.3—Valve Adapter Installation for QC-310, QC-313, QC-510, QC-1210 . Check air hoses and connections for leak replace as necessary. |
| Tool Changer will Lock but not Unlock or error condition exists | No power is supplied to the Solenoid valve or Solenoid valve malfunctioning | 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, refer to Control/signal module manual. Check valve function refer to Section 2.2—Monitoring Solenoid Valves and have valve adapter serviced or replaced as required. |
| | Control/signal module safety features not meet. | 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 does not have bypass circuit and will have to be unlocked manually, refer to Section 6.2.1—Manually Override Solenoid Valves to Unlock Position . The valve adapter solenoids are out of phase. One solenoid valve is in the lock position and the other valve is in the unlock position. This will generate VALVE ERROR and SYSTEM IS UNSAFE error conditions and the Tool Changer will not be able to Unlatch. Manually set both solenoids in the locked position and power cycle the module, refer to Section 6.2—Manually Phase Solenoids . |

6.2 Manually Phase Solenoids

During normal operation the solenoids should never be out of phase. If during set up or maintenance the solenoid valves are left out of phase VALVE ERROR and SYSTEM IS UNSAFE error conditions will be generated indicating the valves are out of phase and need to be manually put back into phase with each other. The dual double-solenoid valve adapters have two lock and two unlock manual overrides.

The state of the Tool Changer is in when the error condition is generated will determine whether to phase the solenoids to the unlocked or locked position.

If the Tool Changer is in the locked position without a Tool Plate attached refer to [Section 6.2.1—Manually Override Solenoid Valves to Unlock Position](#).

If the Tool Changer is locked with the Tool Plate refer to [Section 6.2.2—Manually Override Solenoid Valves to Locked Position](#).

6.2.1 Manually Override Solenoid Valves to Unlock Position

The manual override procedure is to be used if the latch command has been executed without the Tool plate attached. If the Tool Changer is in a locked state without a Tool plate attached it can only be unlatched manually. This procedure can also be used to correct solenoid valves which are out of phase to the unlocked position. Access to valve manual overrides are provided on both sides of the valve adapter. The dual double-solenoid valve adapters have two manual overrides. Both valve overrides must be actuated to unlatch the Master locking mechanism.



WARNING: Do not use the manual override procedure 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. Only use the solenoid valve manual override when the Tool Changer Master and Tool plates are not attached.



CAUTION: The manual override is not intended for normal operations. Manual override is to be used in situations where no other 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, torque wrench

Supplies required: Loctite 222

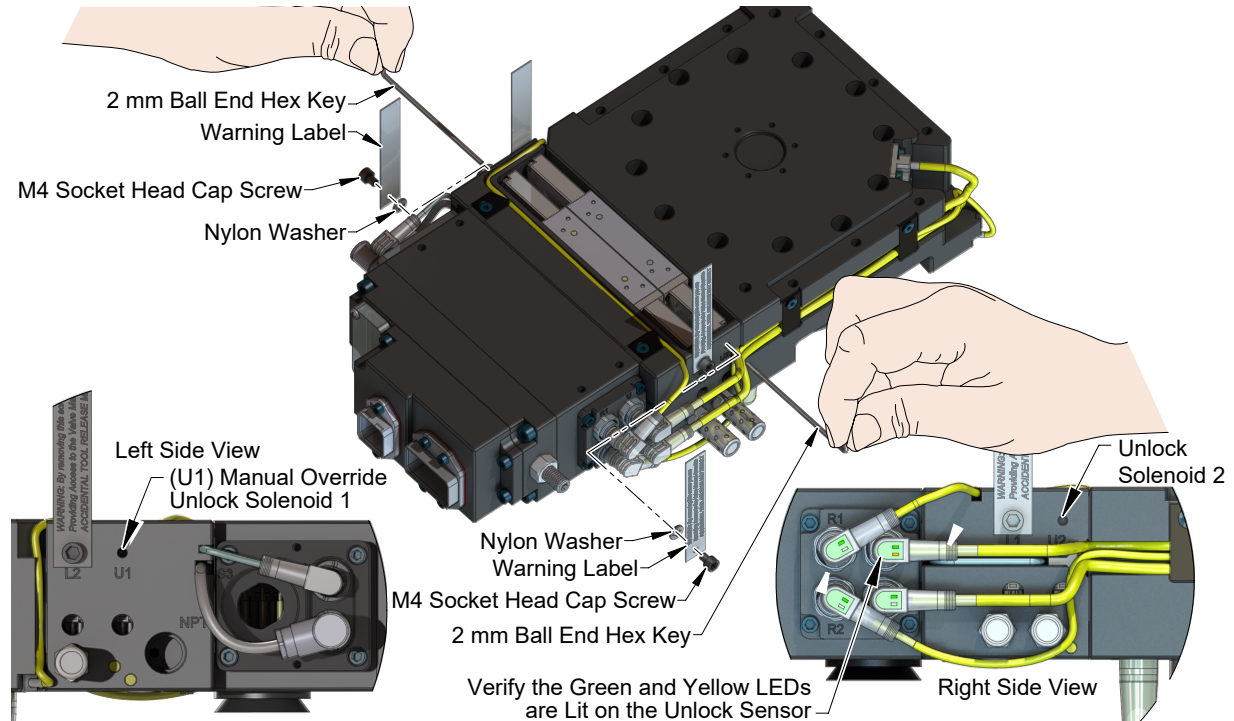
1. To Unlock the Tool Changer, using a 3 mm hex key remove the (2) M4 socket head cap screws, warning labels, and nylon washers from the (U1 and U2) manual unlock override holes on both sides of the valve adapter.



CAUTION: Applying excess force can damage the solenoid or cause override button to stick in one position. Actuation of valve override buttons requires very little travel (~1 mm) and only a small amount of force. Use 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 two 2 mm ball end hex keys or similar blunt objects in the (U1 and U2) solenoid valve screw hole and gently depress both valve override buttons. An air release should be heard when the solenoid is activated. Refer to [Figure 6.1](#).

Figure 6.1—Dual Solenoid Valve Manual Overrides



3. Verify the sensor cable connector LEDs on the control/signal module indicate the Tool Changer is unlocked.
4. Apply Loctite 222 to the M4 x 5 mm socket head cap screw securing the warning label to the valve adapter.

NOTICE: Do not use longer fasteners to secure the warning labels to the valve adapter. If a longer fastener is used it could damage or actuate the solenoid. Make sure to use the same length fastener removed to secure the warning label (M4 x 5 mm socket head cap screw).

5. Secure the warning labels, and nylon washers with the (2) M4 x 5 mm socket head cap screws using a 3 mm hex key. Tighten to 48 in-oz.
6. IF VALVE ERROR and SYSTEM IS UNSAFE errors exist, clear by turning the clear errors bit on. Note: The DL5 control/signal module requires a power cycle to clear these errors.

6.2.2 Manually Override Solenoid Valves to Locked Position

Tools required: 3 mm hex key, 2 mm ball end hex key, torque wrench

Supplies required: Loctite 222

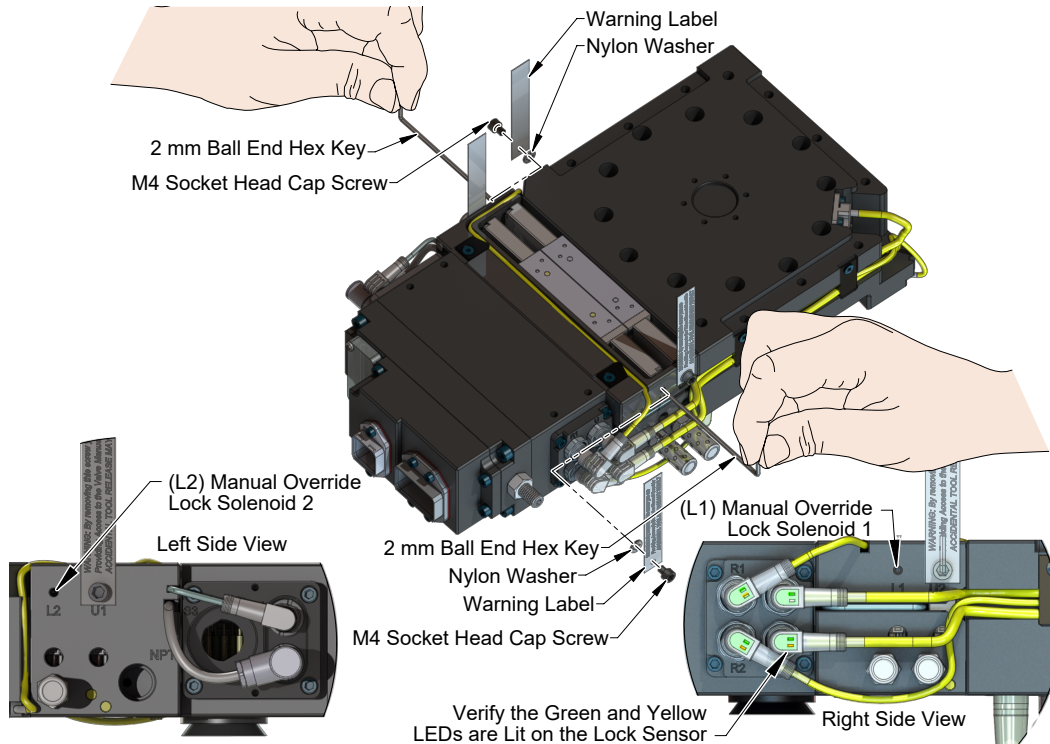
1. Place the Tool side of the Tool Changer safely in the tool stand.
2. To Lock the Tool Changer, remove the (2) M4 socket head cap screws, warning labels, and nylon washers from the (L1 and L2) manual lock override holes as shown in [Figure 6.2](#).



CAUTION: Applying excess force can damage the solenoid or cause override button to stick in one position. Actuation of valve override buttons requires very little travel (~1 mm) and only a small amount of force. Use 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.

3. Insert two 2 mm ball end hex keys or similar blunt objects in the (L1 and L2) solenoid valve screw hole and gently depress both valve override buttons. An air release should be heard when one of the solenoid is activated.

Figure 6.2—Manually Phase the Dual Double Solenoid Valves to the Locked Position



4. Verify the sensor cable connector LEDs on the control/signal module indicate the Tool Changer is Locked. Refer to [Figure 6.2](#).
5. Apply Loctite 222 to the M4 x 5 mm socket head cap screw securing the warning label to the valve adapter.

NOTICE: Do not use longer fasteners to secure the warning labels to the valve adapter. If a longer fastener is used it could damage or actuate the solenoid. Make sure to use the same length fastener removed to secure the warning label (M4 x 5 mm socket head cap screw).

6. Secure the warning labels, and nylon washers with the (2) M4 x 5 mm socket head cap screws using a 3 mm hex key. Tighten to 48 in-oz.
7. Clear the VALVE ERROR and SYSTEM IS UNSAFE errors by turning the clear errors bit on.

NOTICE: The DL5 control/signal module requires a power cycle to clear these errors.

6.3 Service Procedures

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

6.3.1 Exhaust Muffler Replacement

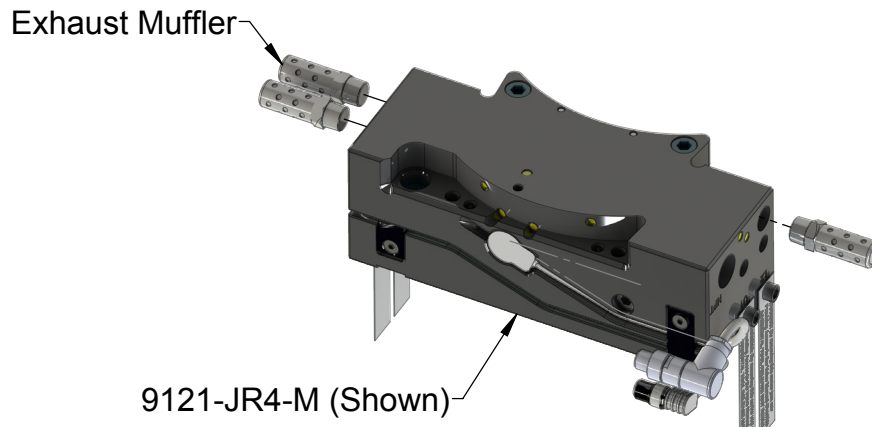
The exhaust muffler allows air from the Tool Changer locking mechanism to be exhausted to the atmosphere, if the muffler is clogged it may affect the ability to lock and unlock the Tool Changer. Remove and check to make sure the exhaust muffler is not clogged.

Tools required: 11 mm wrench

Parts required: Refer to [Section 7—Serviceable Parts](#).

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. Remove the exhaust muffler using a 11 mm wrench and 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. Safely resume normal operation.

Figure 6.3— Exhaust Muffler Replacement



6.3.2 Pressure Sensor Replacement

The pressure sensor can be replaced if it is damaged or no longer functions properly.

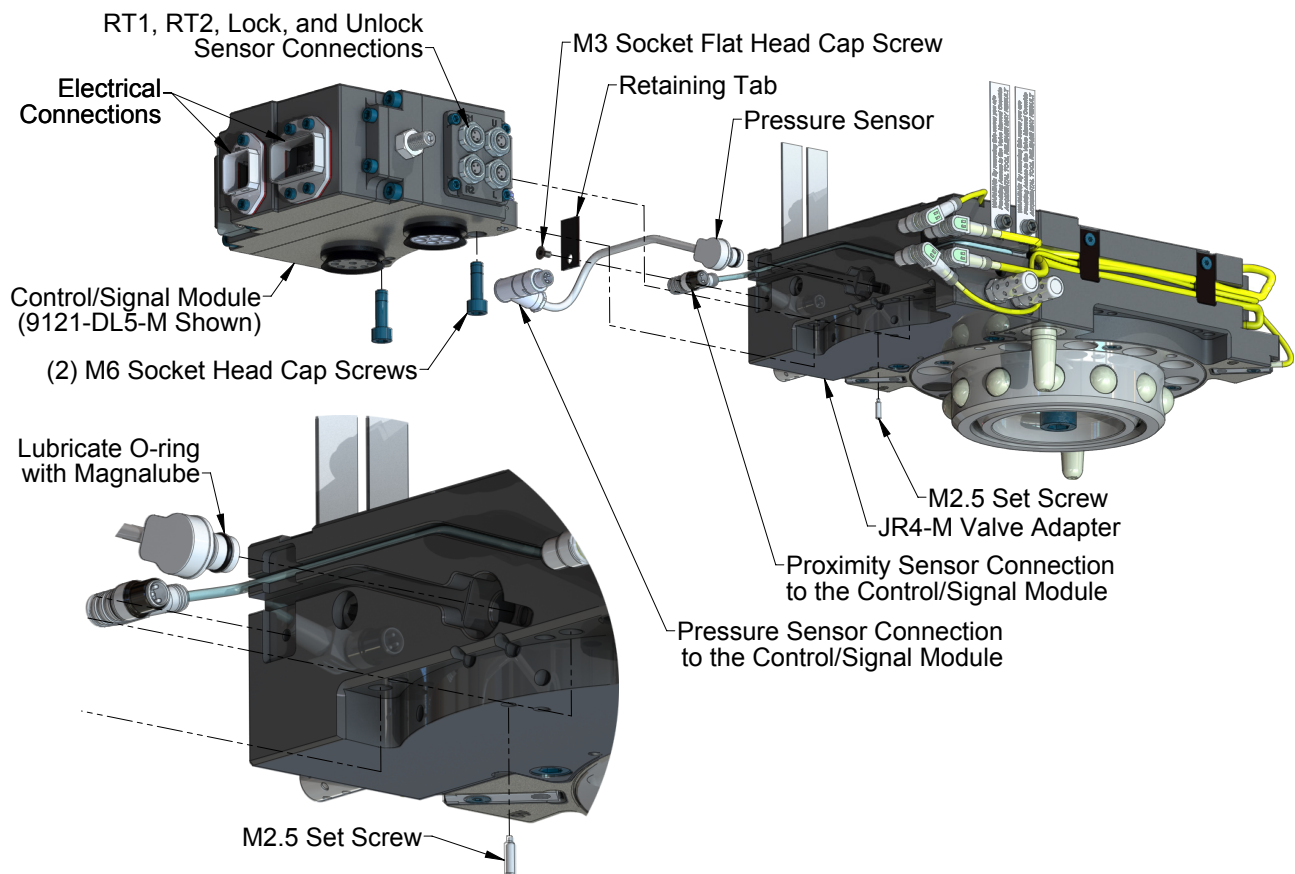
Tools required: 1.3 mm (0.05"), 2 mm, and 5 mm hex key, torque wrench

Supplies required: Magnalube[®] Loctite 222, Loctite 242

Parts required: Pressure Sensor service kit refer to [Section 7.1—JP12, JR4, and JU4 Master Valve Adapters Serviceable Parts](#) or [Section 7.2—JP13, JT7, and JU5 Master Valve Adapters Serviceable Parts](#).

1. Place the Tool in a secure location.
2. Uncouple the Master and Tool plates.
3. Turn off and de-energize all energized circuits (for example: electrical, pneumatic, hydraulic).
4. Disconnect the pressure and proximity sensor cables from the control/signal module connected to the valve adapter.
5. Disconnect all cables (electrical, power, safety switch, RT1, RT2, lock, and unlock sensor cables) from the control/signal module.
6. Support the control/signal module and remove the (2) M6 socket head cap screws using 2.5 mm hex key and lower the module until it clears the guide pin, set module aside.
7. Remove the M3 socket flat head cap screw from the retaining tab using a 2 mm hex key. Set the screw and retaining tab aside.
8. Loosen the 2.5 mm set screw holding the pressure sensor in place using a 1.3 mm hex key. Pull out the pressure sensor and discard.

Figure 6.4—Replace Pressure Sensor



9. Apply Magnalube to the O-ring on the new pressure sensor and insert into the body of the valve adapter making sure it is seated completely.

NOTICE: Do not over tighten the 2.5 mm set screw. Overtightening the set screw can damage the pressure sensor. Tighten the set screw until it contacts the sensor.

10. Apply Loctite 222 to the 2.5 mm set screw, using a 1.3 mm hex key, tighten to contact to secure the pressure sensor.
11. Route the pressure sensor cable through the channel and secure with the retaining tab and the M3 socket flat head cap screw using a 2 mm hex key. Tighten to contact.
12. Apply Loctite 242 to the supplied M6 socket head cap screws.
13. Using the ledge feature to place the control/signal module to the valve adapter and secure with the (2) M6 socket head cap screws using a 5 mm hex key. Tighten to 70 in-lbs (7.9 Nm).
14. Connect all cables (electrical, power, safety switch, RT1, RT2, Lock, and Unlock sensor cables) to the control/signal module.
15. Connect the pressure and proximity sensor cables from the control/signal module connected to the valve adapter.
16. Safely resume normal operation.

7. Serviceable Parts

7.1 JP12, JR4, and JU4 Master Valve Adapters Serviceable Parts

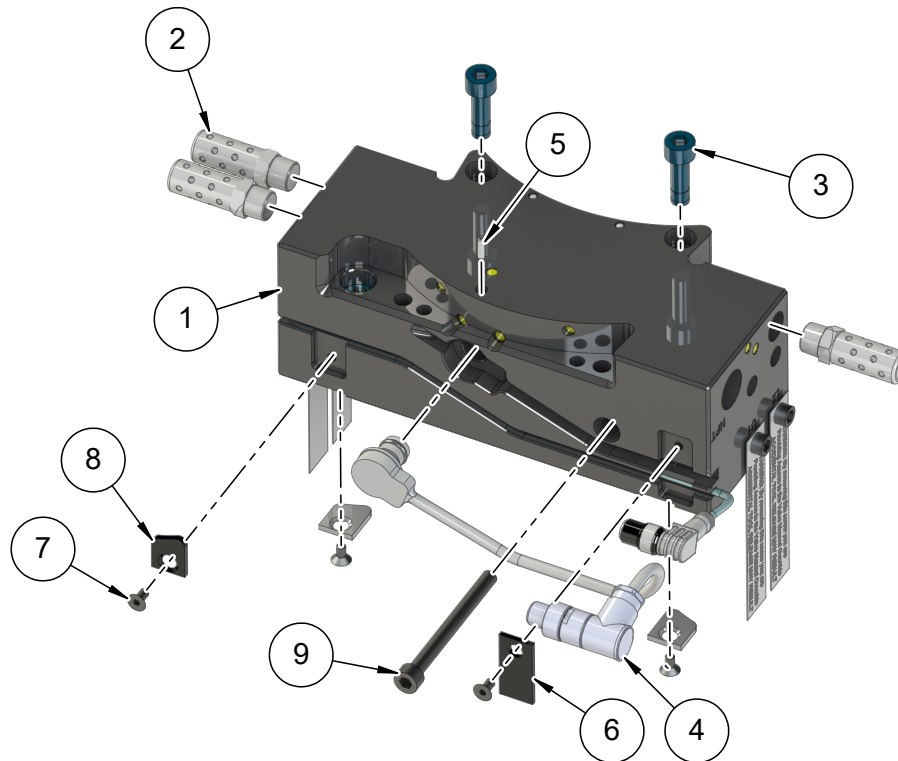


Table 6.2—JP12, JR4, and JU4 Master Valve Adapters

| Item No. | Qty | Part Number | Description |
|--------------------|-----|--------------------------------|--|
| 1 | 1 | 9121-JR4-M | Valve Adapter with Dual Double Solenoid 1/4 NPT, and Valve Pass Through, Pressure and Proximity Sensors, QC-210 |
| | | 9121-JU4-M | Valve Adapter with Dual Double Solenoid G 1/4, and Valve Pass Through, Pressure and Proximity Sensors, QC-210 |
| | | 9121-JP12-M | Valve Adapter with Dual Double Solenoid Rc 1/4, and Valve Pass Through, Pressure and Proximity Sensors, QC-210 |
| 2 | 3 | 3490-1010007-00 | 1/8 NPT Exhaust Muffler |
| 3 | 2 | 3500-1066020-15A | M6 x 20 mm Socket Head Cap Screw Blue Dyed Magni ND Microspheres |
| 9 | 2 | 3500-1064055-11 | M5 x 55 mm Socket Head Cap Screw Black Oxide |
| 4 | 1 | 9120-C-MSP100-4PM90-0018 | 4-Pin Right Angle Male to MSP100 Pressure Sensor, 0.18 m |
| 5 | 1 | 3500-1955008-21 | M2.5 x 8 mm Dog Point Set Screw, Black Oxide Finish |
| 6 | 1 | 3700-20-4092 | Large Cable Retaining Tab |
| 7 | 4 | 3500-1258006-11 | M3 x 6 mm Flat Head Socket Cap Screw Black Oxide |
| 8 | 3 | 3700-20-3292 | Cable Retaining Tab |
| 9 | 2 | 3500-1064055-11 | M5 x 55 mm Socket Head Cap Screw Black Oxide |
| Service Kit | | | |
| * | 1 | 9120-MSP100-PRESSURESENSOR-KIT | 4-Pin Right Angle Male to MSP100 Pressure Sensor, 0.18 m (Includes Qty 1 of Items 4, 5 and a 1.3 mm Hex L-Key wrench). |

7.2 JP13, JT7, and JU5 Master Valve Adapters Serviceable Parts

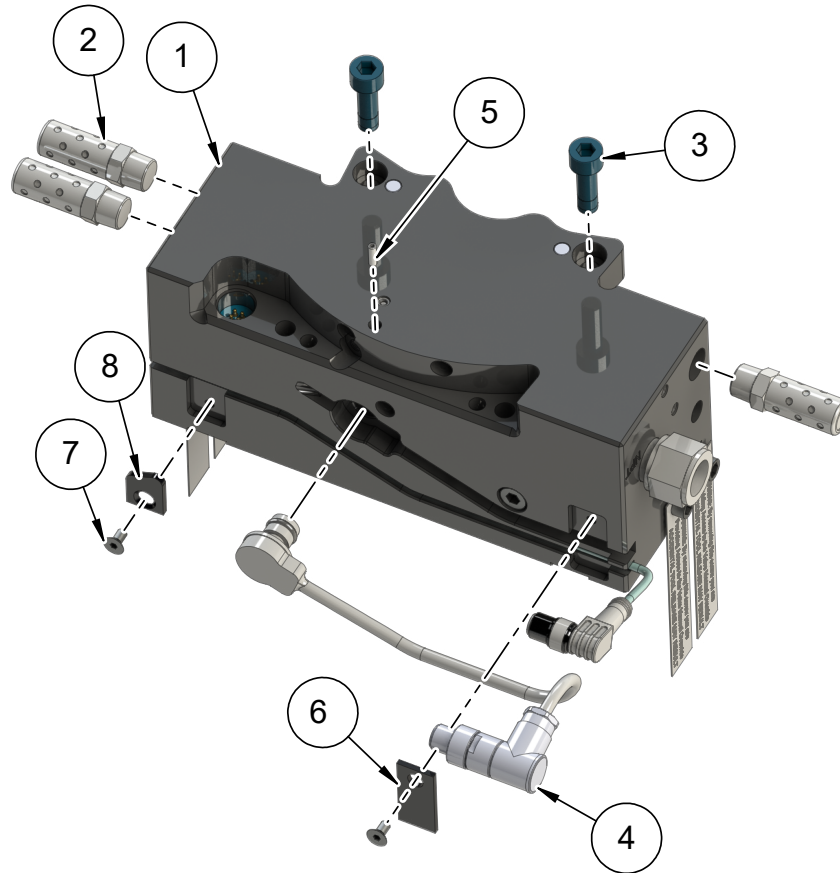


Table 6.3—JP13, JT7, and JU5 Master Valve Adapters

| Item No. | Qty | Part Number | Description |
|--------------------|-----|--------------------------------|--|
| 1 | 1 | 9121-JU5-M | Valve Adapter with Dual Double Solenoid G 1/4, and Valve Pass Through, Pressure and Proximity Sensors, QC-310 |
| | | 9121-JT7-M | Valve Adapter with Dual Double Solenoid 1/4 NPT, and Valve Pass Through, Pressure and Proximity Sensors, QC-310 |
| | | 9121-JP13-M | Valve Adapter with Dual Double Solenoid Rc 1/4, and Valve Pass Through, Pressure and Proximity Sensors, QC-310 |
| 2 | 3 | 3490-1010007-00 | 1/8 NPT Exhaust Muffler |
| 3 | 2 | 3500-1066020-15A | M6 x 20 mm Socket Head Cap Screw Blue Dyed Magni ND Microspheres |
| 9 | 2 | 3500-1064055-11 | M5 x 55 mm Socket Head Cap Screw Black Oxide |
| 4 | 1 | 9120-C-MSP100-4PM90-0018 | 4-Pin Right Angle Male to MSP100 Pressure Sensor, 0.18 m |
| 5 | 1 | 3500-1955008-21 | M2.5 x 8 mm Dog Point Set Screw, Black Oxide Finish |
| 6 | 1 | 3700-20-4092 | Large Cable Retaining Tab |
| 7 | 2 | 3500-1258006-11 | M3 x 6 mm Flat Head Socket Cap Screw Black Oxide |
| 8 | 1 | 3700-20-3292 | Cable Retaining Tab |
| Service Kit | | | |
| * | 1 | 9120-MSP100-PRESSURESENSOR-KIT | 4-Pin Right Angle Male to MSP100 Pressure Sensor, 0.18 m (Includes Qty 1 of Items 4, 5 and a 1.3 mm Hex L-Key wrench). |

7.3 Tool Spacer Block Serviceable Parts

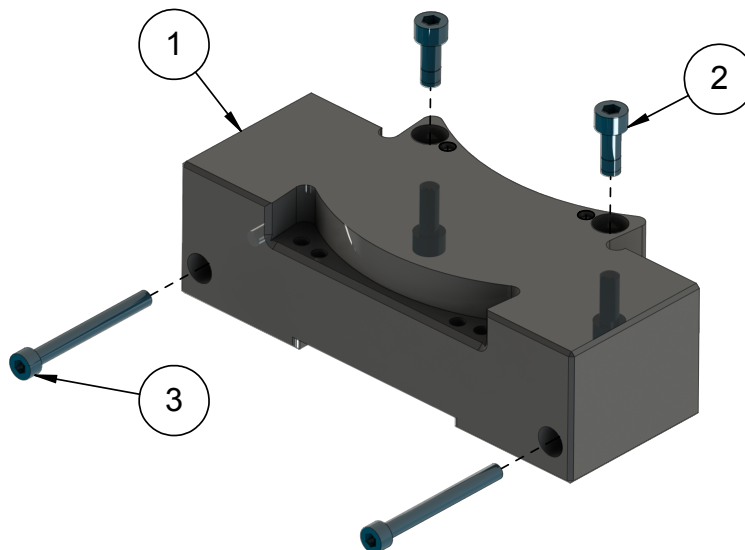


Table 6.4—Tool Spacer Block

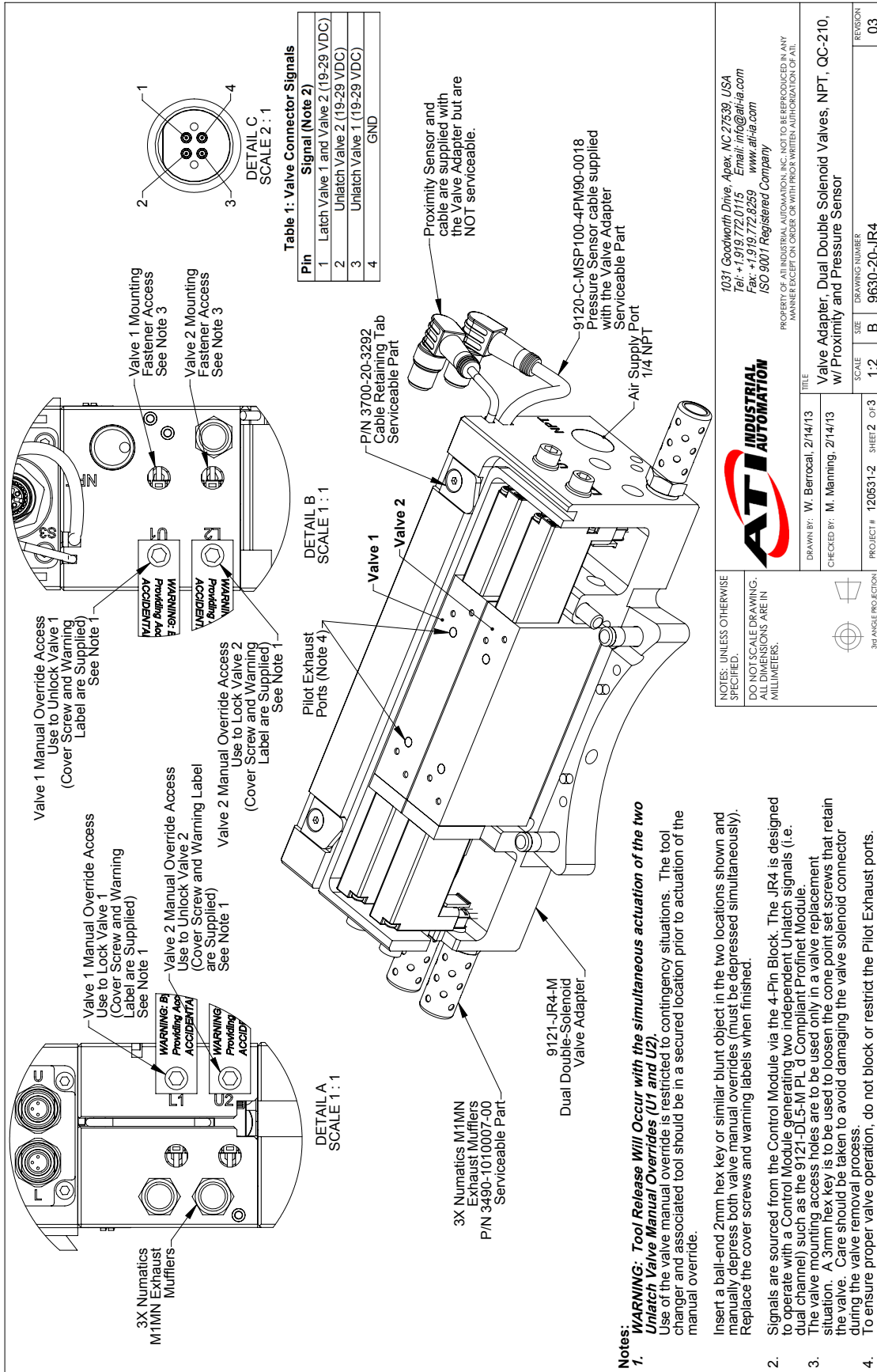
| Item No. | Qty | Part Number | Description |
|----------|-----|------------------|--|
| 1 | 1 | 9121-JR4-T | JR4 Valve Adapter Spacer Block |
| 2 | 2 | 3500-1066016-15A | M6 x 16 mm Socket Head Cap Screw Blue Dyed Magni ND Microspheres |
| 3 | 2 | 3500-1064050-15 | M5 x 50 mm Socket Head Cap Screw Blue Dyed Magni |

8. Specifications

| Table 6.5—Valve Adapter Specifications | |
|--|--|
| All Valve Adapter Models | Specification |
| Interface Connections | <p><u>Integrated Solenoid Valve Connector</u>: (4-Pin) Pin Block supporting Latch and Unlatch signals</p> <p><u>Integrated Proximity Sensor</u>: M8, 3-Pin Male Connector</p> <p><u>Integrated Pressure Sensor</u>: M8, 4-Pin Male Connector</p> |
| Electrical Rating | 19-29VDC operational voltage (Solenoid Valve) |
| Current Draw | Switched Power: 250mA @ 24VDC (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 |
| Operational Temperature Range | 32 °F - 120 °F (0 °C) - 49 °C) ¹ |
| Solenoid Valves | Specification |
| Double-Solenoid Valve | MAC Series 48, DC Voltage, 6W Coil, Washdown, separate pilot exhaust, 5 port, 2 position with air pilot assist, 250mA @ 19-29VDC |
| Sensors | Specification |
| Pressure Sensor | Pressure Transducer, 0 to 100 psig, 5VDC, 2mA, Pressure Overload-1.5X |
| Proximity Sensor | Inductive Proximity Switch, 10 to 30VDC. 12 mA. PNP type. |
| 9121-JR4-M | Valve Adapter, Double Solenoid, NPT, Valve Pass Through, QC-113, QC-210, QC-213 |
| Pneumatic Connection | 1/4" NPT |
| Weight | 2.5 lbs (1.13 kg) |
| 9121-JU4-M | Valve Adapter, Double Solenoid, G, Valve Pass Through, QC-113, QC-210, QC-213 |
| Pneumatic Connection | G 1/4 (BSPP) |
| Weight | 2.5 lbs (1.13 kg) |
| 9121-JP12-M | Valve Adapter, Double Solenoid, Rc, Valve Pass Through, QC-113, QC-210, QC-213 |
| Pneumatic Connection | Rc 1/4 (BSPT) |
| Weight | 2.5 lbs (1.13 kg) |
| 9121-JU5-M | Valve Adapter, Double Solenoid, G, Valve Pass Through, QC-310, QC-313, QC-510, or QC-1210 |
| Pneumatic Connection | G 1/4 (BSPP) |
| Weight | 2.98 lbs (1.35 kg) |
| 9121-JT7-M | Valve Adapter, Double Solenoid, NPT, Valve Pass Through, QC-310, QC-313, QC-510, or QC-1210 |
| Pneumatic Connection | 1/4" NPT |
| Weight | 2.94 lbs (1.33 kg) |
| 9121-JP13-M | Valve Adapter, Double Solenoid, Rc, Valve Pass Through, QC-310, QC-313, QC-510, or QC-1210 |
| Pneumatic Connection | Rc 1/4 (BSPT) |
| Weight | 2.98 lbs (1.35 kg) |
| Note: | |
| 1. Lower temperature limit based on MSP100 Pressure Sensor lower operating temperature limit of 32° F (0° C). Upper temperature limit based on MAC solenoid valve upper operating temperature limit of 120° F (49° C). | |

Table 6.6—Tool Adapter Assembly Specifications

| | |
|------------|--|
| 9121-JR4-T | JR4 Valve Adapter Spacer Block, QC-210, QC-213 |
| Weight | 2.37 lbs (1.07 kg) |



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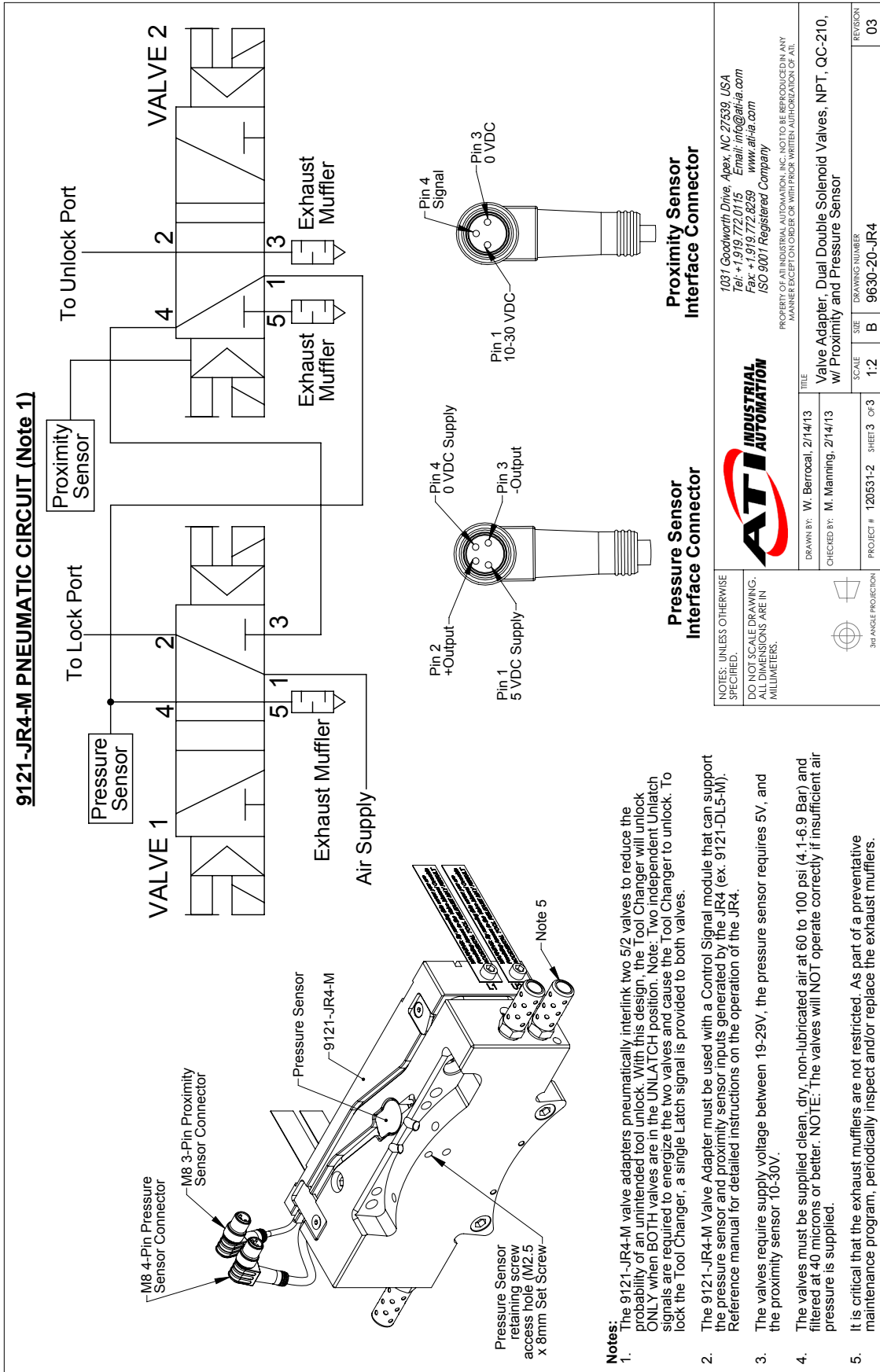
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 DRAWING NUMBER: 9630-20-JR4
 PROJECT #: 120531-2 SHEET 2 of 3

DRIVEN BY: W. Berrocal, 2/14/13
 CHECKED BY: M. Manning, 2/14/13

TITLE: Valve Adapter, Dual Double Solenoid Valves, NPT, QC-210, w/ Proximity and Pressure Sensor

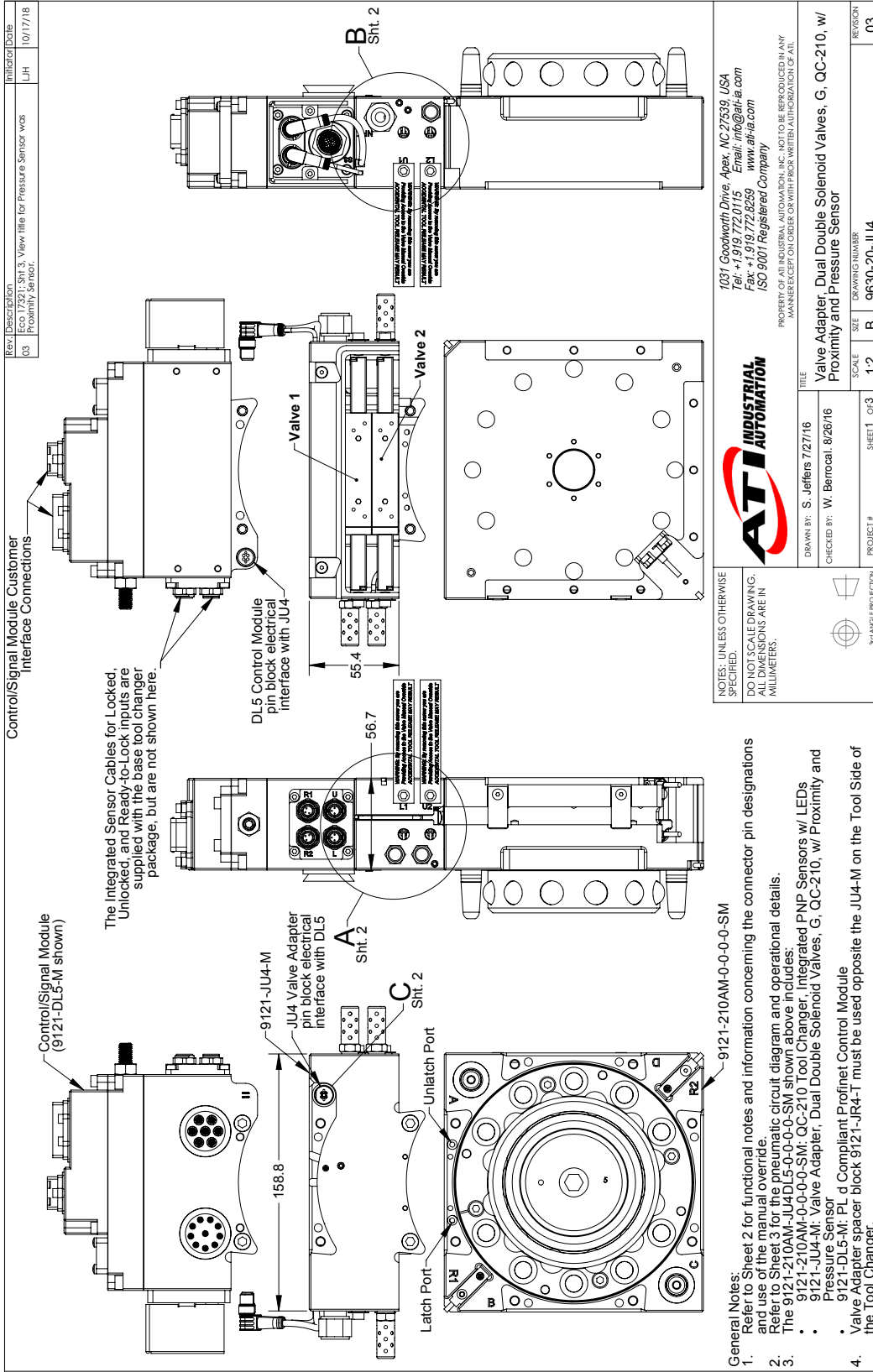
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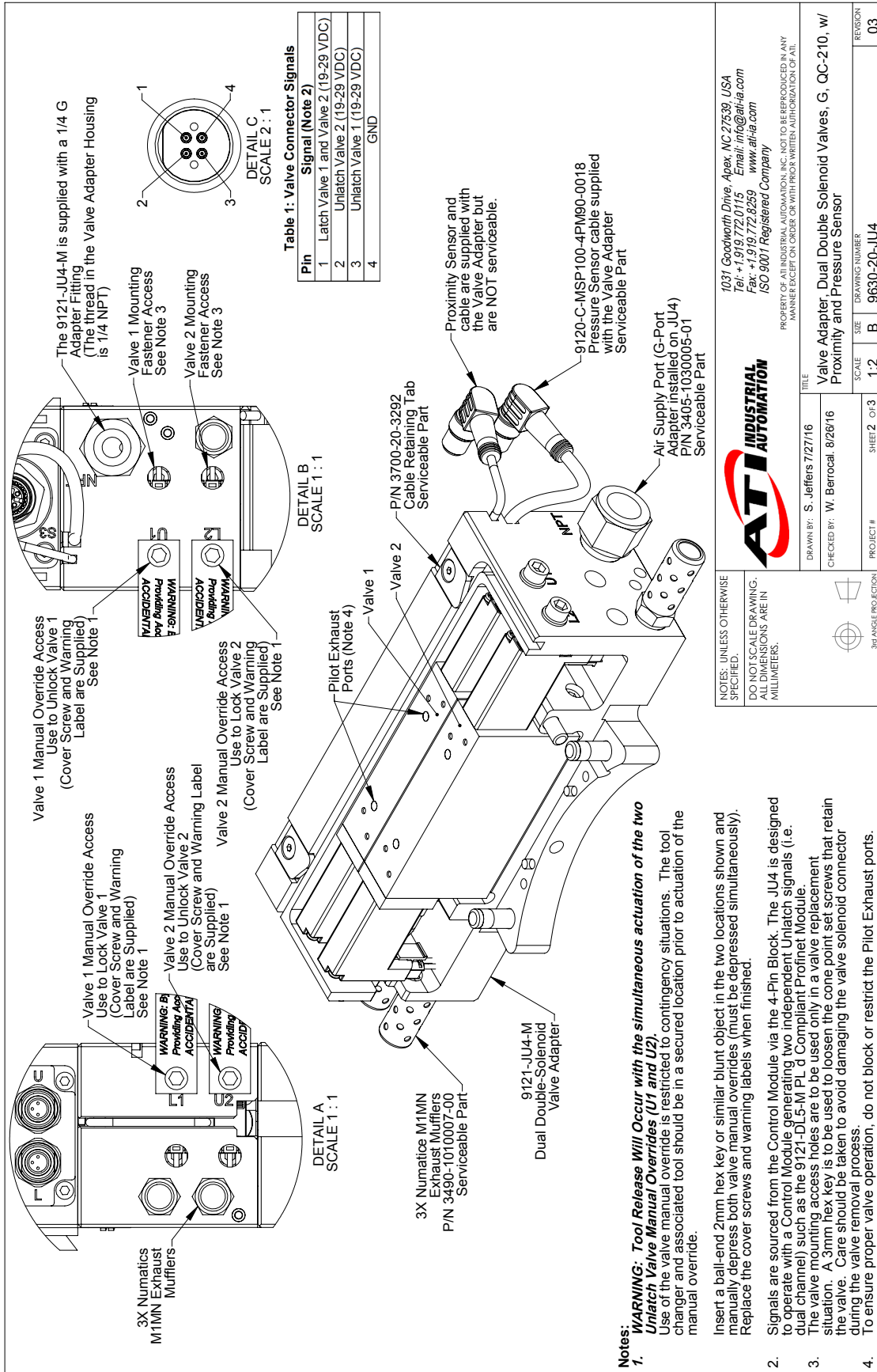
3RD ANGLE PROJECTION



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| DRAWN BY: W. Berrucci, 2/14/13 | CHECKED BY: M. Manning, 2/14/13 | PROJECT # 120531-2 | SHEET 3 OF 3 |
| TITLE Valve Adapter, Dual Double Solenoid Valves, NPT, QC-210, w/ Proximity and Pressure Sensor | | SCALE 1:2 | DRAWING NUMBER 9630-20-JR4 |
| | | REVISION | 03 |

9.2 Integrated QC-210 Tool Changer Valve Arrangement (JU4)





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DRAWN BY: S. Jeffers 7/27/16
 CHECKED BY: W. Berrocal 8/28/16

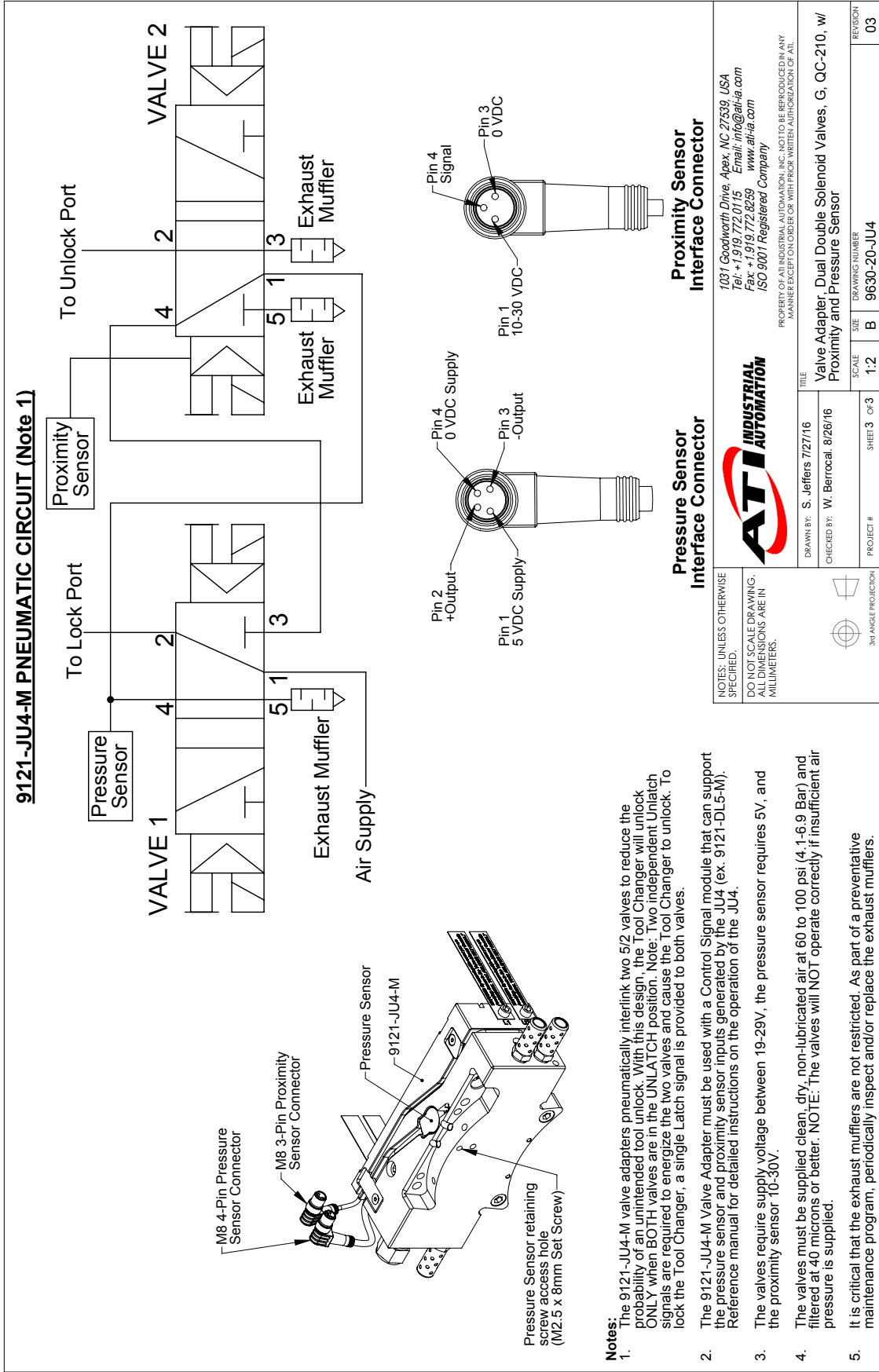
TITLE: Valve Adapter: Dual Double Solenoid Valves, G, QC-210, w/ Proximity and Pressure Sensor

SCALE: 1:2 SIZE: B PROJECT #: 9630-20-JU4

SHEET 2 of 3 DRAWING NUMBER: 03

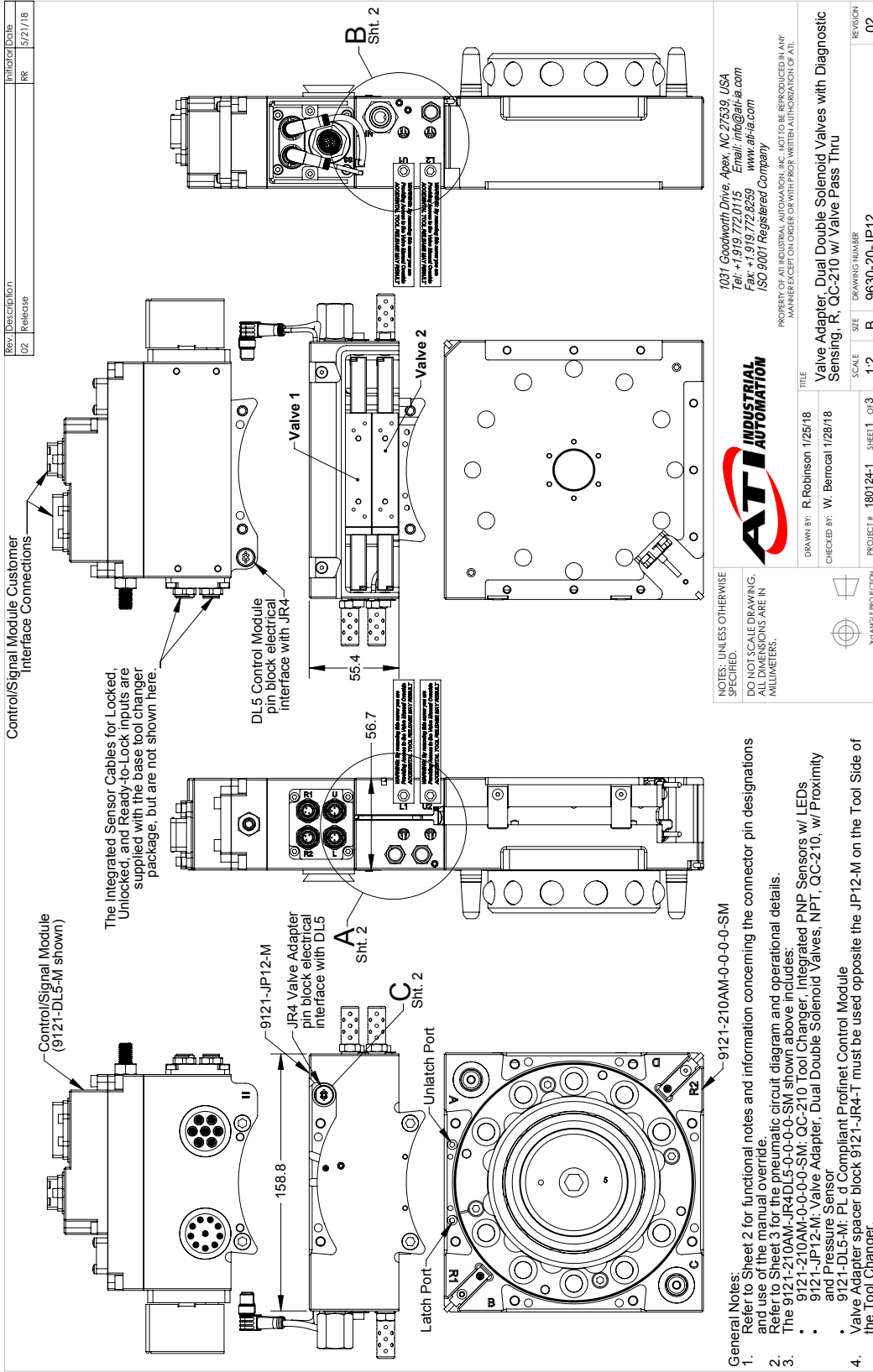
3RD ANGLE PROJECTION

NOTES: UNLESS OTHERWISE SPECIFIED, DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.



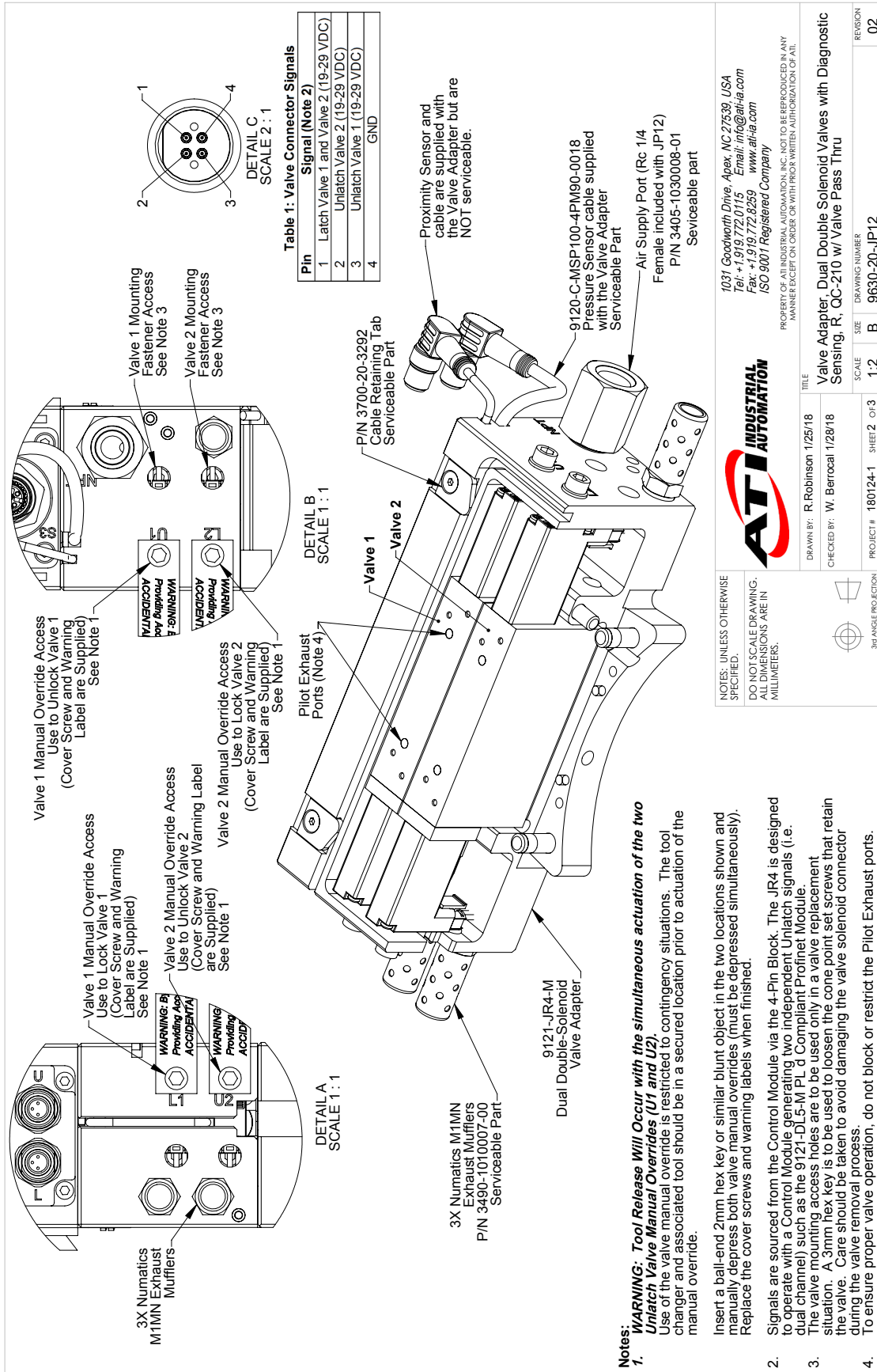
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| NOTES: UNLESS OTHERWISE SPECIFIED, DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS. | | DRAWN BY: S. Jeffers 7/27/16 CHECKED BY: W. Berrocal, 8/26/16 | TITLE: Valve Adapter, Dual Double Solenoid Valves, G, QC-210, w/ Proximity and Pressure Sensor |
| SCALE: 1:2 | SIZE: B | SHEET 3 OF 3 | DRAWING NUMBER: 9630-20-JU4 |
| PROJECT # | REVISION: | 03 | 03 |

9.3 Integrated QC-210 Tool Changer Valve Arrangement (JP12)



General Notes:

1. Refer to Sheet 2 for functional notes and information concerning the connector pin designations and use of the manual override.
2. Refer to Sheet 3 for the pneumatic circuit diagram and operational details.
3. The 9121-210AM-0-0-0-SM shown above includes:
 - 9121-210AM-0-0-0-SM: QC-210 Tool Changer, Integrated PNP Sensors w/ LEDs
 - 9121-JP12-M: Valve Adapter, Dual Double Solenoid Valves, NPT, QC-210, w/ Proximity and Pressure Sensor
 - 9121-DL5-M: PL d Compliant Profinet Control Module
4. Valve Adapter spacer block 9121-JR4-T must be used opposite the JP12-M on the Tool Side of the Tool Changer.

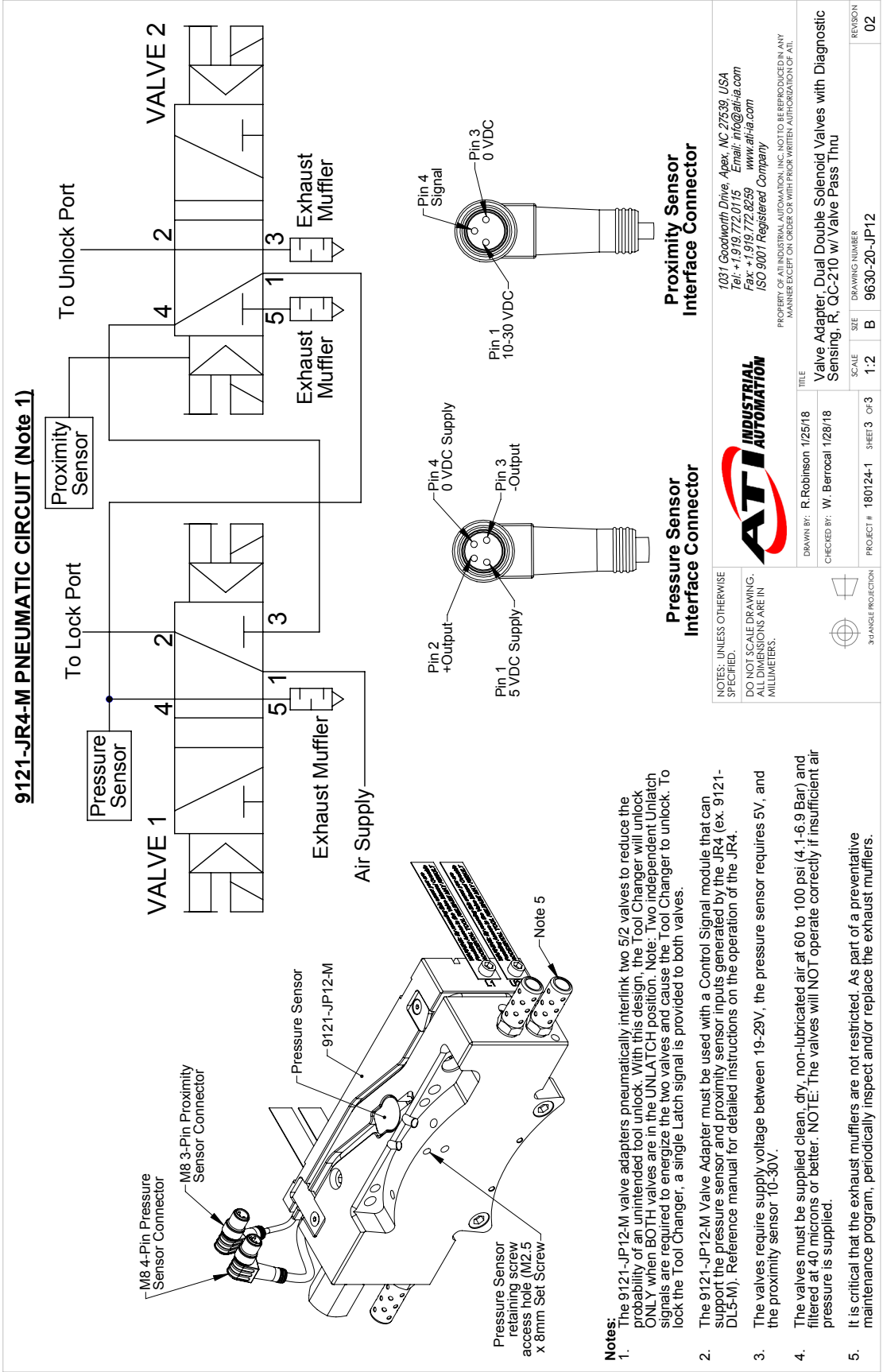


NOTES: UNLESS OTHERWISE SPECIFIED, DO NOT SCALE DRAWING. ALL DIMENSIONS ARE IN MILLIMETERS.

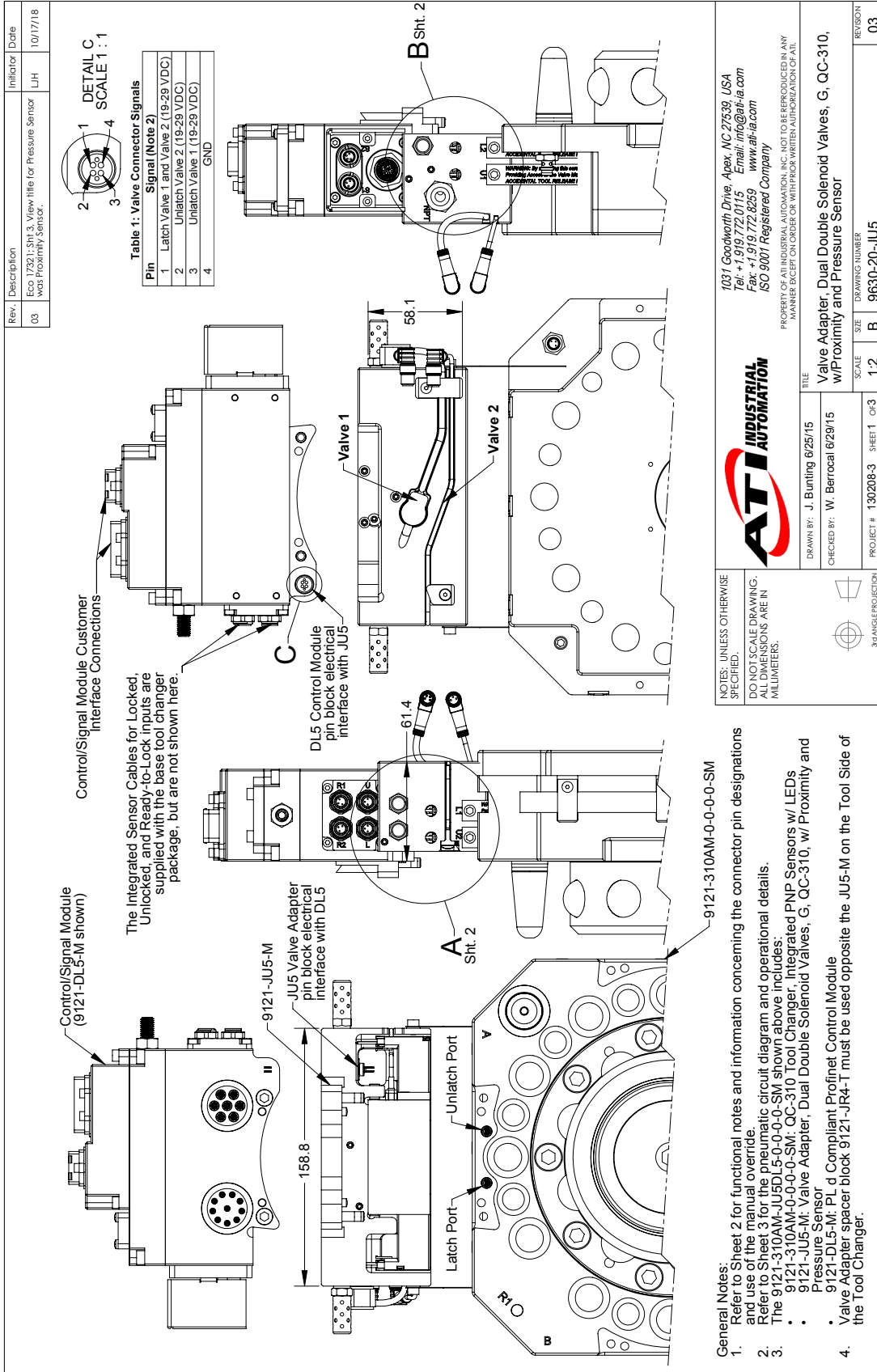
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TITLE: Valve Adapter, Dual Double Solenoid Valves with Diagnostic Sensing, R, QC-210 w/ Valve Pass Thru
 DRAWN BY: R. Robinson 1/25/18
 CHECKED BY: W. Berrocal 1/28/18
 PROJECT #: 180124-1 SHEET 2 of 3
 SCALE: 1:2
 DRAWING NUMBER: 9630-20-JP12
 REVISION: 02



9.4 Integrated QC-310 Tool Changer Valve Arrangement (JU5)



| Rev. | Description | Initiator | Date |
|------|---|-----------|----------|
| 03 | Eco 17321 Sht 3, View title for Pressure Sensor was Proximity Sensor. | LJH | 10/17/18 |

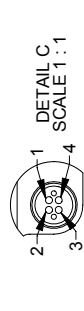
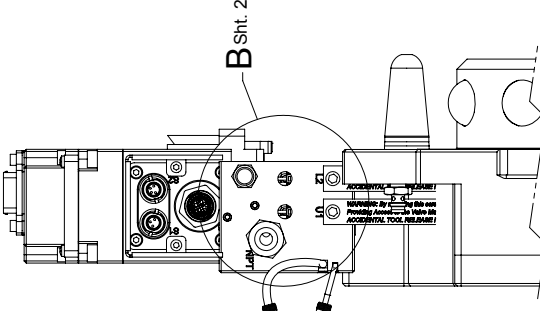


Table 1: Valve Connector Signals

| Pin | Signal (Note 2) |
|-----|---------------------------------------|
| 1 | Latch Valve 1 and Valve 2 (19-29 VDC) |
| 2 | Unlatch Valve 2 (19-29 VDC) |
| 3 | Unlatch Valve 1 (19-29 VDC) |
| 4 | GND |



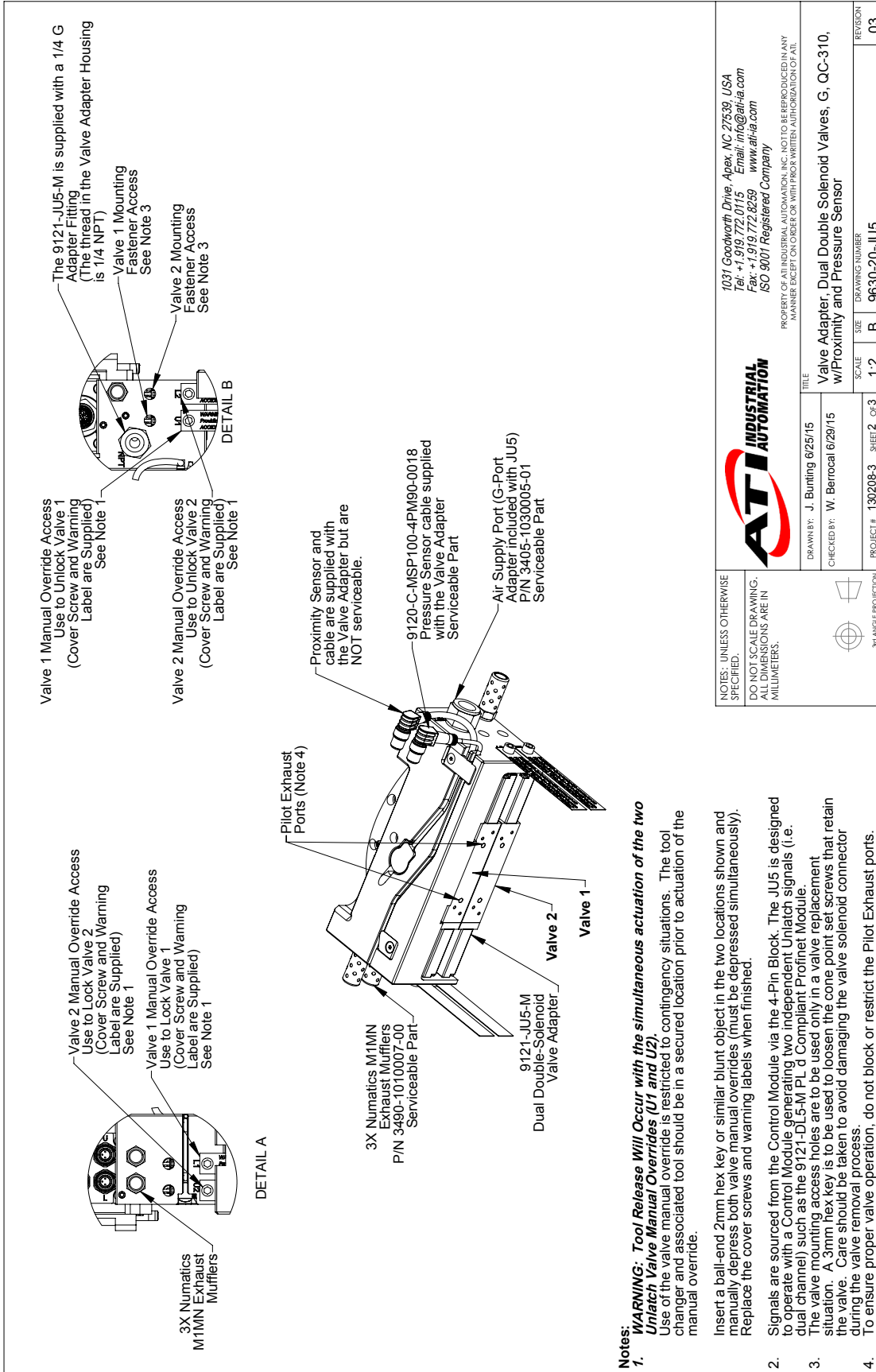
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| DRAWN BY: J. Bunting 6/25/15 CHECKED BY: W. Berrocal 6/29/15 | TITLE Valve Adapter, Dual Double Solenoid Valves, G, QC-310, w/ Proximity and Pressure Sensor |
| PROJECT # 130208-3 SHEET 1 of 3 | DRAWING NUMBER 9630-20-JU5 |
| SCALE 1:2 | REVISION 03 |

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30° ANGLE PROJECTION

General Notes:

- Refer to Sheet 2 for functional notes and information concerning the connector pin designations and use or the manual override.
- Refer to Sheet 3 for the pneumatic circuit diagram and operational details.
- The 9121-310AM-JU5DL5-0-0-0-SM shown above includes:
 - 9121-310AM-0-0-0-SM: QC-310 Tool Changer, Integrated PNP Sensors w/ LEDs
 - 9121-JU5-M: Valve Adapter, Dual Double Solenoid Valves, G, QC-310, w/ Proximity and Pressure Sensor
 - 9121-DL5-M: PL d Compliant Profinet Control Module
- Valve Adapter spacer block 9121-JR4-T must be used opposite the JU5-M on the Tool Side of the Tool Changer.



| | | | |
|---|---|--|-----------------------------|
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| DRAWN BY: J. Bunting 6/25/15 | TITLE: Valve Adapter, Dual Double Solenoid Valves, G, QC-310, w/Proximity and Pressure Sensor | SCALE: 1:2 | DRAWING NUMBER: 9630-20-JU5 |
| CHECKED BY: W. Berrocal 6/29/15 | PROJECT #: 130208-3 | SHEET 2 OF 3 | REVISION: 03 |

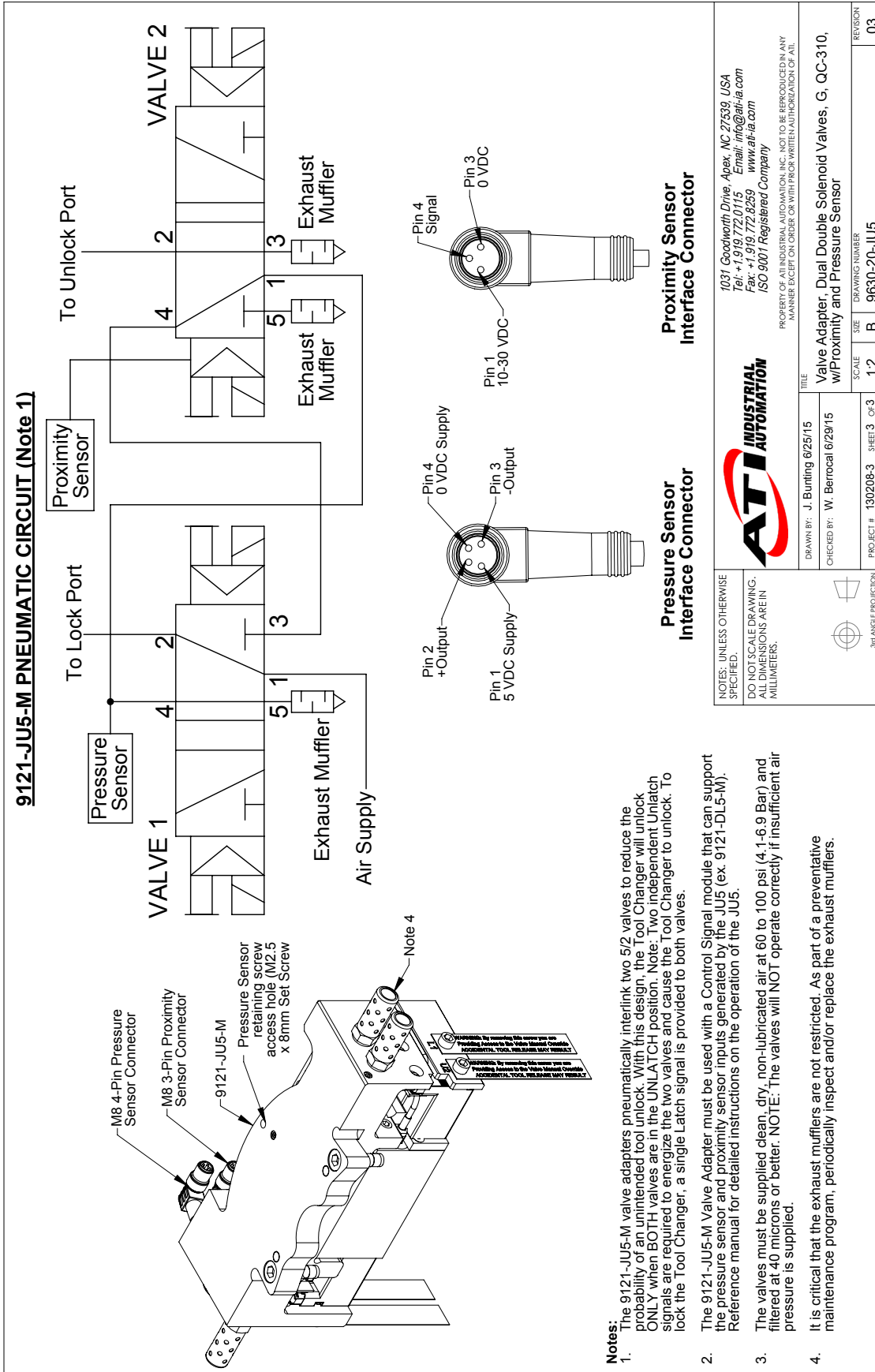
- Notes:**
- WARNING: Tool Release Will Occur with the simultaneous actuation of the two Unlatch Valve Manual Overrides (U1 and U2).**
 Use of the valve manual override is restricted to contingency situations. The tool changer and associated tool should be in a secured location prior to actuation of the manual override.

Insert a ball-end 2mm hex key or similar blunt object in the two locations shown and manually depress both valve manual overrides (must be depressed simultaneously). Replace the cover screws and warning labels when finished.

Signals are sourced from the Control Module via the 4-Pin Block. The JU5 is designed to operate with a Control Module generating two independent Unlatch signals (i.e. dual channel) such as the 9121-DLS-M PL d Compliant Profinet Module.

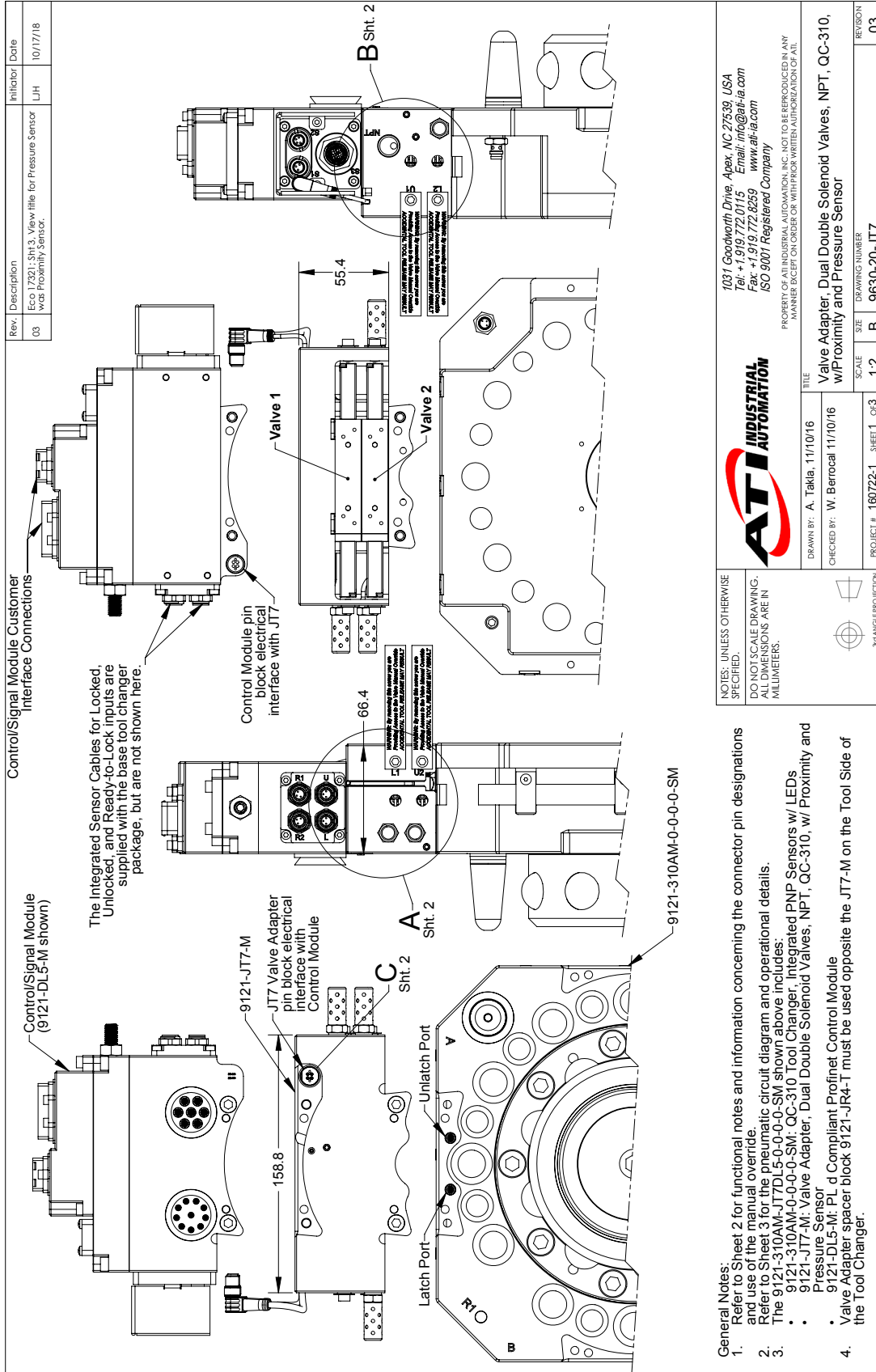
The valve mounting access holes are to be used only in a valve replacement situation. A 3mm hex key is to be used to loosen the cone point set screws that retain the valve. Care should be taken to avoid damaging the valve solenoid connector during the valve removal process.

To ensure proper valve operation, do not block or restrict the Pilot Exhaust ports.



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| DRAWN BY: J. Bunting 6/25/15 CHECKED BY: W. Berrocal 6/29/15 | | TITLE Valve Adapter, Dual Double Solenoid Valves, G, QC-310, w/Proximity and Pressure Sensor | |
| PROJECT # 130208-3 SHEET 3 OF 3 | | DRAWING NUMBER 9630-20-JU5 | |
| SCALE 1:2 | | REVISION 03 | |

9.5 Integrated QC-310 Tool Changer Valve Arrangement (JT7)



| Rev. | Description | Initiator | Date |
|------|--|-----------|----------|
| 03 | Eco 17321; Sht 3, View title for Pressure Sensor was Proximity Sensor. | LJH | 10/17/18 |

NOTES: UNLESS OTHERWISE SPECIFIED.
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30 ANGLE PROJECTION

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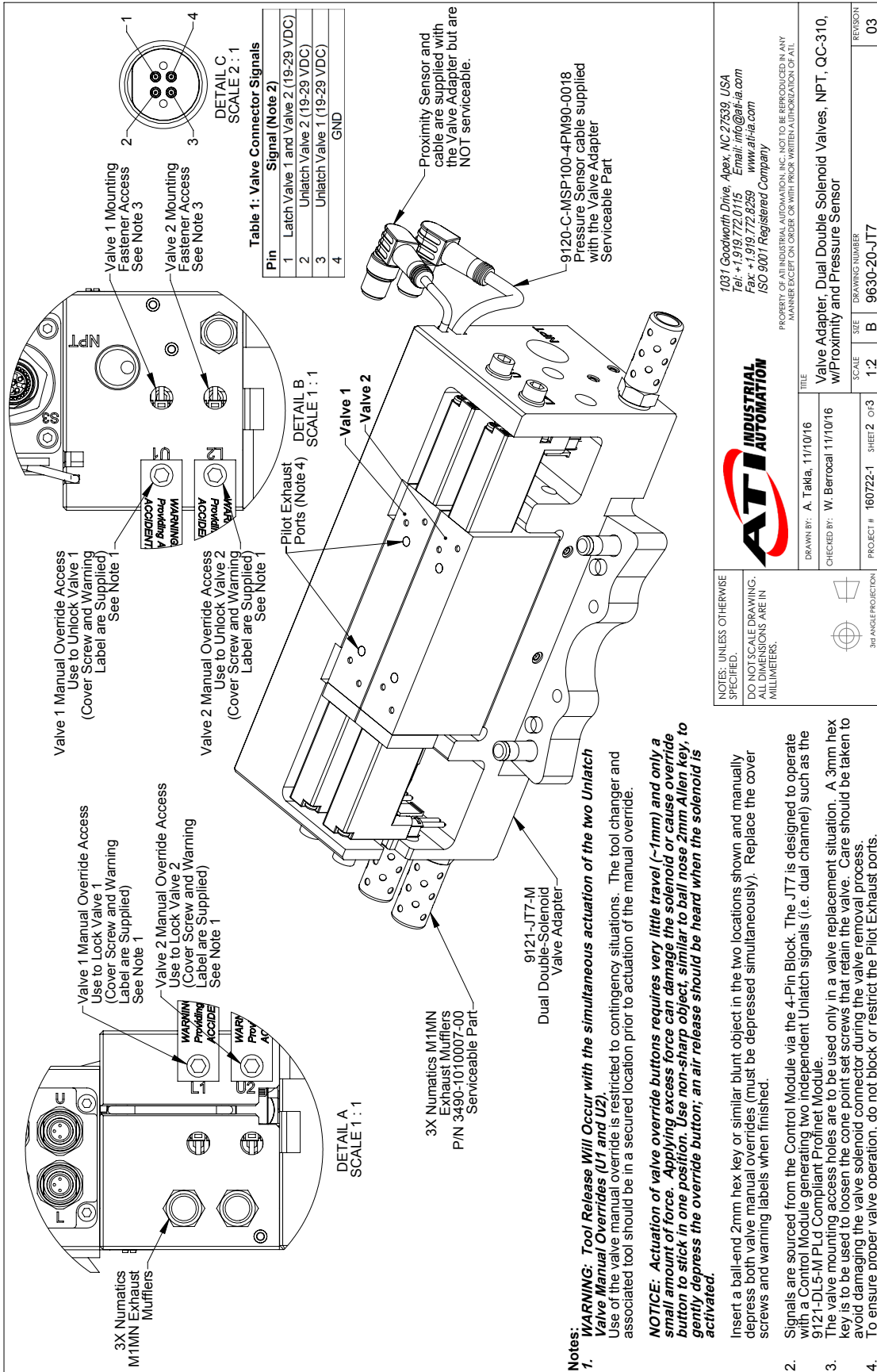
ATI INDUSTRIAL AUTOMATION

TITLE: Valve Adapter, Dual Double Solenoid Valves, NPT, QC-310, w/Proximity and Pressure Sensor

DRAWN BY: A. Takla, 11/10/16
 CHECKED BY: W. Berrocal 11/10/16

SCALE: 1:2
 DRAWING NUMBER: 9630-20-JT7
 PROJECT #: 160722-1 SHEET 1 of 3
 REVISION: 03

- General Notes:
1. Refer to Sheet 2 for functional notes and information concerning the connector pin designations and use of the manual override.
 2. Refer to Sheet 3 for the pneumatic circuit diagram and operational details.
 3. The 9121-310AM-JT7DL5-0-0-0-SM shown above includes:
 - 9121-310AM-0-0-0-SM: QC-310 Tool Changer, Integrated PNP Sensors w/ LEDs
 - 9121-JT7-M: Valve Adapter, Dual Double Solenoid Valves, NPT, QC-310, w/ Proximity and Pressure Sensor
 - 9121-DL5-M: PL d Compliant Profinet Control Module
 4. Valve Adapter spacer block 9121-JR4-T must be used opposite the JT7-M on the Tool Side of the Tool Changer.



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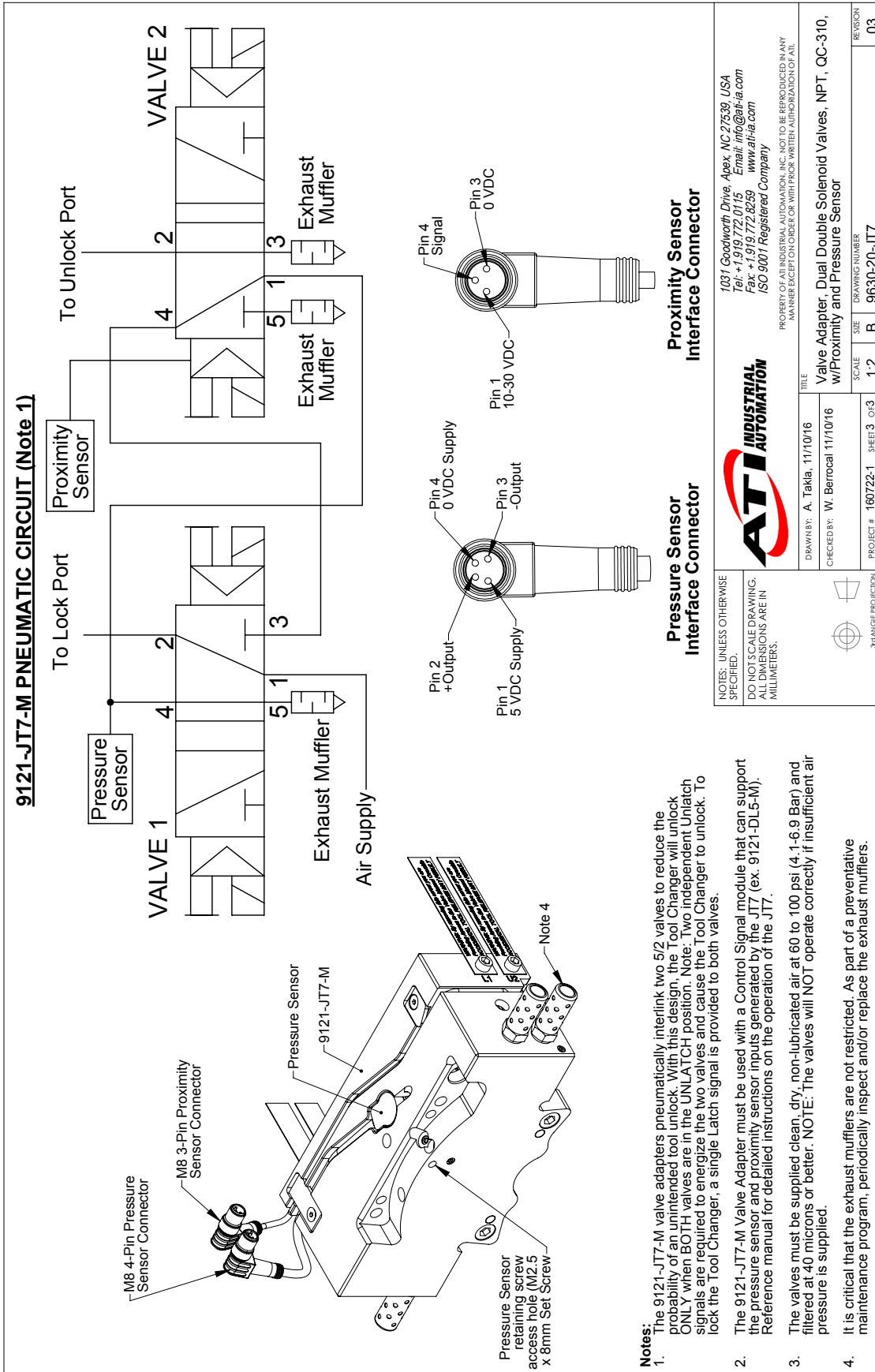
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Drawn by: A. Takla, 11/10/16
 Checked by: W. Berrocal, 11/10/16

Valve Adapter, Dual Double Solenoid Valves, NPT, QC-310, w/Proximity and Pressure Sensor

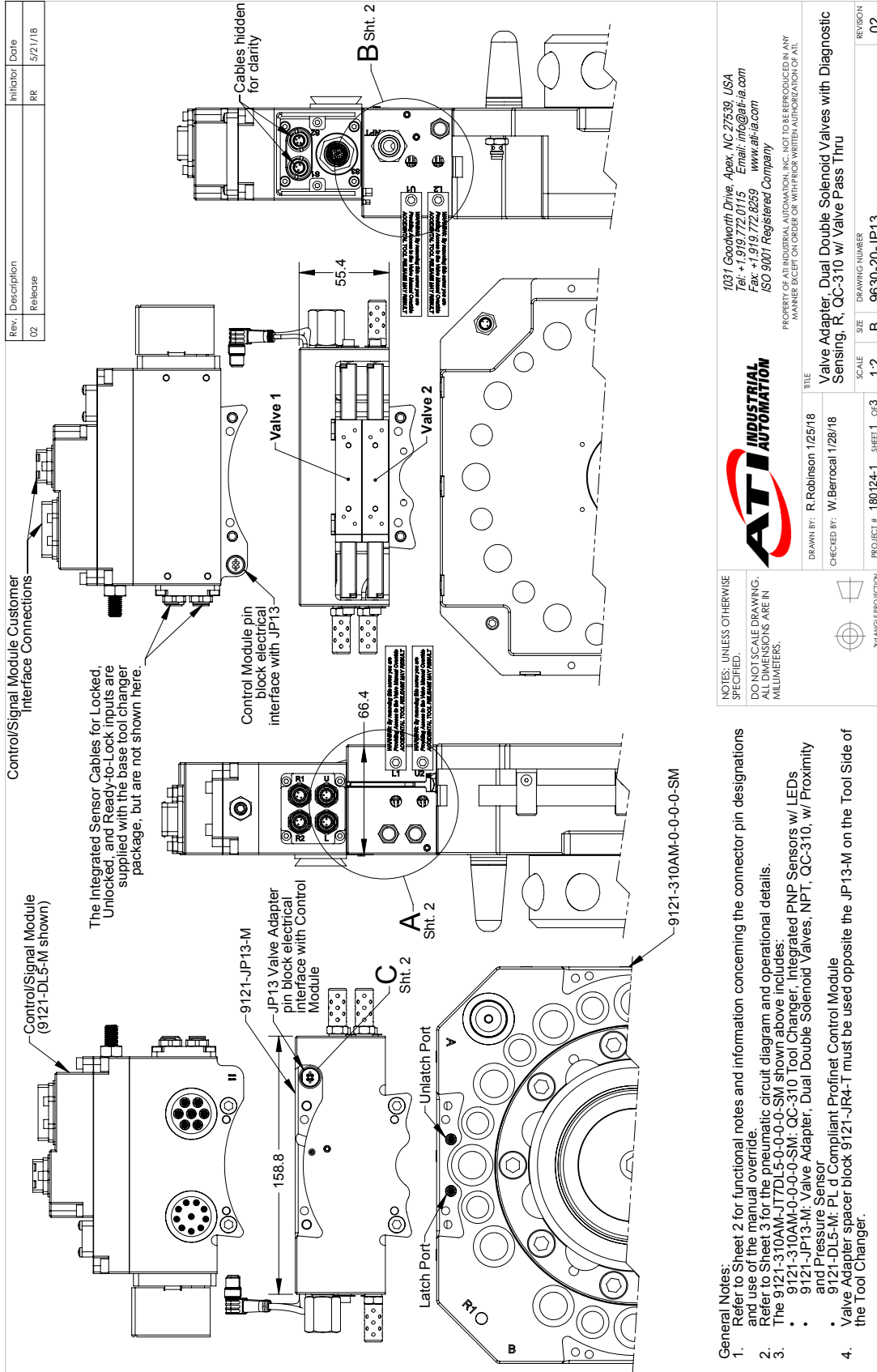
Scale: 1:2
 Sheet: 2 of 3
 Project #: 160722-1
 Drawing Number: 9630-20-JT7
 Revision: 03



- Notes:**
- The 9121-JT7-M valve adapters pneumatically interlink two 5/2 valves to reduce the probability of an unintended tool unlock. With this design, the Tool Changer will unlock ONLY when BOTH valves are in the UNLATCH position. Note: Two independent Unlatch signals are required to energize the two valves and cause the Tool Changer to unlock. To lock the Tool Changer, a single Latch signal is provided to both valves.
 - The 9121-JT7-M Valve Adapter must be used with a Control Signal module that can support the pressure sensor and proximity sensor inputs generated by the JT7 (ex. 9121-DL5-M). Reference manual for detailed instructions on the operation of the JT7.
 - The valves 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: The valves will NOT operate correctly if insufficient air pressure is supplied.
 - 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.

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| DRAWN BY: A. Takla, 11/10/16 | CHECKED BY: W. Berrocal, 11/10/16 | TITLE: Valve Adapter, Dual Double Solenoid Valves, NPT, QC-310, w/Proximity and Pressure Sensor | |
| | | SCALE: 1:2 SIZE: B DRAWING NUMBER: 9630-20-JT7 | REVISION: 03 |

9.6 Integrated QC-310 Tool Changer Valve Arrangement (JP13)



| Rev. | Description | Initiator | Date |
|------|-------------|-----------|---------|
| 02 | Release | RR | 5/21/18 |

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30 ANGLE PROJECTION

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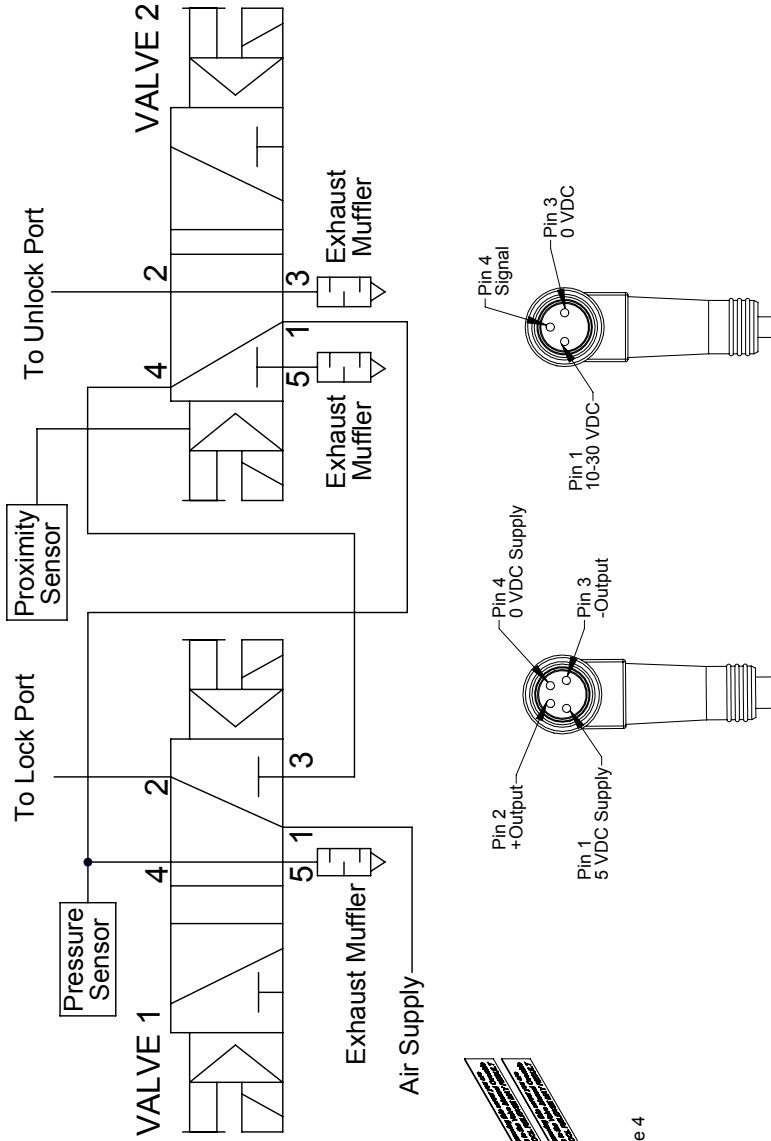
DRAWN BY: R. Robinson 1/25/18
 CHECKED BY: W. Berrocal 1/28/18

TITLE: Valve Adapter, Dual Double Solenoid Valves with Diagnostic Sensing, R, QC-310 w/ Valve Pass Thru

SCALE: 1:2
 SIZE: B
 DRAWING NUMBER: 9630-20-JP13
 PROJECT #: 180124-1 SHEET 1 of 3
 REVISION: 02

- General Notes:
1. Refer to Sheet 2 for functional notes and information concerning the connector pin designations and use of the manual override.
 2. Refer to Sheet 3 for the pneumatic circuit diagram and operational details.
 3. The 9121-310AM-J7DL5-0-0-0-SM shown above includes:
 - 9121-310AM-0-0-0-SM: QC-310 Tool Changer, Integrated PNP Sensors w/ LEDs and Pressure Sensor
 - 9121-JP13-M: Valve Adapter, Dual Double Solenoid Valves, NPT, QC-310 w/ Proximity and Pressure Sensor
 - 9121-DL5-M: PL d Compliant Profinet Control Module
 4. Valve Adapter spacer block 9121-JR4-T must be used opposite the JP13-M on the Tool Side of the Tool Changer.

9121-JP13-M PNEUMATIC CIRCUIT (Note 1)



Pressure Sensor Interface Connector

Proximity Sensor Interface Connector

NOTES: UNLESS OTHERWISE SPECIFIED:
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DRAWN BY: R. Robinson 1/25/18
 CHECKED BY: W. Berrocal 1/28/18
 PROJECT # 180124-1 SHEET 3 OF 3

TITLE
 Valve Adapter, Dual Double Solenoid Valves with Diagnostic Sensing, R, QC-310 w/ Valve Pass Thru
 SCALE 1:2
 DRAWING NUMBER 9630-20-JP13
 REVISION 02

- Notes:**
- The 9121-JP13-M valve adapters pneumatically interlink two 5/2 valves to reduce the probability of an unintended tool unlock. With this design, the Tool Changer will unlock ONLY when BOTH valves are in the UNLATCH position. Note: Two independent Unlatch signals are required to energize the two valves and cause the Tool Changer to unlock. To lock the Tool Changer, a single Latch signal is provided to both valves.
 - The 9121-JP13-M Valve Adapter must be used with a Control Signal module that can support the pressure sensor and proximity sensor inputs generated by the JT7 (ex. 9121-DL5-M). Reference manual for detailed instructions on the operation of the JT7.
 - The valves 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: The valves will NOT operate correctly if insufficient air pressure is supplied.
 - 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.