



**Quick Coupler Lock Kit  
Installation Instructions**

**For  
John Deere 120D  
Hitachi ZX120-3**

**DQ4-JD0034**

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## **GENERAL SAFETY GUIDELINES FOR INSTALLING THE KIT**

- Read the instruction manual thoroughly to familiarize yourself with the kit before installing it. Deviating from the drawings and/or instructions in this manual may result in increased installation time and/or damage to hydraulic kit, machine or attachment.
- Follow proper procedures as specified in the ‘Service Manual’ for your machine. In case of discrepancies in guidelines between the ‘Service Manual’ and our kit instructions, the manufacturer safety instructions take precedence, especially regarding the welding instructions.
- Use safety protection such as hardhat; working gloves, safety shoes and safety glasses as needed to do the job.
- Lower the bucket or any attachment to the ground.
- It is very important to relieve the hydraulic tank pressure before loosening any connections or hoses. Follow proper procedures as specified in the ‘Service Manual’ for your machine.
- Be careful while handling hot parts on machines that have just been shut down. The hydraulic fluid in the lines, tubes and components are very hot and could cause severe skin burns. It is advisable to allow hydraulic oil to cool down before removing any lines, fittings, tubes or plugs on machines.
- Kit installation procedures outlined in this instruction manual have been arranged to keep the hydraulic oil spills to a minimum. However, during kit installation, oil spills are unavoidable and should be contained using rags, absorbent towels or containers/buckets. Dispose off all waste oils, fluids, lubricants and other hazardous waste properly. If there is an oil spill on the floor, use liberal amounts of “oil dry” to avoid slippery conditions.
- Once installation is complete, check and tighten all fittings and hoses before activating the circuit.
- Use a piece of cardboard to check for oil leaks in the circuit, in order to prevent contact with high-pressure oil.

## BEFORE STARTING THE KIT INSTALLATION

- Check to make sure this installation kit is correct for your excavator and/or attachment. Check the excavator information against kit description. If there are any concerns or discrepancies please contact the kit manufacturer immediately.
- Open crates/boxes to take inventory of parts. Compare them with the Bill of Materials to make sure no parts are missing. *Please note that to reduce installation time, some components are pre-assembled before shipping.* In case of any discrepancies, contact kit manufacturer immediately.
- Read instructions manual to familiarize yourself with the installation kit.
- For the purpose of kit installation, it is a safe practice to have the machine on a level surface. Swing the machine housing to get access to the panels under the cab for installing the pilot circuit components. *It will be necessary to remove the panels under the cab for this purpose.*
- Shut off engine. If the machine has just completed work then allow sufficient time for cooling before opening any lines.
- Make sure there are enough rags, absorbent towels and/or containers available.
- Disconnect battery. *Remove the negative (ground) terminal connection.*
- Release pressure from the hydraulic tank.
- Flow meter and pressure gauges will be required to complete the Finish and Test section of this installation.
- Steel brackets/mounts are protected from corrosion using primer or optional powder coating. It may be necessary to paint these to match the excavator color after completing installation and checking all hoses for binding/pinching. Ensure there is enough factory paint available to do so.
- Refer to the following pages for the proper specifications for all connections. These specs must be followed to prevent damage to the threads and flare seat.

## JIC 37° FLARE CONNECTIONS

The 37° JIC (*Joint Industrial Council*) flare is a reliable, straight thread, flare design that is used world-wide. It is popular in many applications and environments because it is compact and easy to assemble. Since it is a metal-to-metal seal it can be reliably connected and reconnected multiple times. The assembly may or may not include a sleeve.

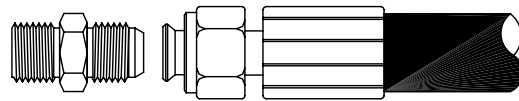


Figure 1. Female Swivel without Sleeve

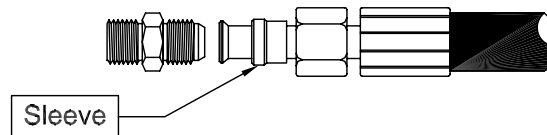


Figure 2. Female Swivel with Sleeve

Nominal Size	Dash <sup>3</sup> Size	Torque Value <sup>2</sup>		F.F.F.T <sup>1</sup>
		lb-in	N-m	
1/4"	-4	130-150	15-17	2
3/8"	-6	235-265	27-30	1-1/4
1/2"	-8	525-575	59-65	1
5/8"	-10	600-700	68-79	1
3/4"	-12	950-1050	107-119	1
1"	-16	1400-1500	158-170	1
1-1/4"	-20	1900-2100	215-237	1
1-1/2"	-24	2250-2550	254-288	1

Note : 1. The **F**lats **F**rom **F**inger **T**ight (F.F.F.T.) method counts the number of hex flats past the finger tightened position.

- a. Visually inspect the threads to make sure they are clean.
  - b. Hand tighten the female swivel nut onto the male thread.
  - c. Make alignment marks on the nut and fitting.
  - d. Proceed to tighten to F.F.F.T. value.
2. These torque values are given for components without lubrication. Do not use oil on the threads before tightening.
  3. Dash number represents the size in sixteenths of an inch.

## O-RING FACE SEAL CONNECTIONS

The O-ring Face Seal connection is one of the most reliable, leak-free connections available on the market today for mobile hydraulic applications. The use of an elastomeric seal (o-ring), as apposed to a metal-to-metal connection, has many advantages. It is very resistant to vibrations or pulsations in the system. The connection can be assembled and dismantled many times without compromising the integrity of the connection.

It is important to note that because the connection is dependent on the o-ring, some simple precautions must be taken. The o-ring and fitting must be visually inspected before the connection is made. If the o-ring or o-ring groove is nicked, bent, warped, cut, or otherwise damaged, it must be replaced immediately. Use a minimal amount of grease to install the o-ring into the groove paying careful attention that it is seated properly. Take care not to get grease on threads. The o-ring will be permanently damaged if it is not seated properly and the connection will leak.

Nominal Size	Dash Size	Assembly Torque		F.F.W.R. <sup>1</sup>
		ft.-lb.	N-m	
1/4"	-4	18	25	1/2 to 3/4
3/8"	-6	30	40	1/2 to 3/4
1/2"	-8	40	55	1/2 to 3/4
5/8"	-10	60	80	1/2 to 3/4
3/4"	-12	85	115	1/3 to 1/2
1"	-16	110	150	1/3 to 1/2
1-1/4"	-20	140	190	1/3 to 1/2
1-1/2"	-24	180	245	1/3 to 1/2

**Table 1. ORFS Torque Specifications**

**Note 1.** If a Torque Wrench is not available, an alternate method of assembly is the **Flats From Wrench Resistance (F.F.W.R.)**. Tighten the nut onto the fitting body until light wrench resistance is reached. Tighten further to the appropriate F.F.W.R. value shown in Table 1. Using a Torque Wrench is the preferred and suggested method and should be used whenever possible.

## STANDARD TIGHTENING TORQUE

The following Table gives the standard tightening torques of bolts. This applies to mounts, tube clamps, split flange clamps, and any other bolts provided with this hydraulic kit. It is important to follow this chart when installing bolts and nuts. Failure to do so could result in premature failure, damage to components, or even serious injury.

**NOTE: Nm (Newton meter): 1Nm = 0.102 kgm = 0.737 lb.ft.**

<b>Standard Tightening Torque Of Metric Bolts</b>			
<b>Bolt O.D. x Pitch (mm)</b>	<b>Metric Class 10.9</b>		
	<b>kgm</b>	<b>Nm</b>	<b>lb.ft.</b>
M6x1	1.3 +/- 0.15	13.5 +/- 1.5	10 +/- 1
M8x1.25	3.2 +/- 0.3	32.2 +/- 3.5	24 +/- 2.6
M10x1.5	6.5 +/- 0.6	63 +/- 6.5	47 +/- 4.8
M12x1.75	11 +/- 1	108 +/- 11	80 +/- 8
M14x2	17.5 +/- 2	172 +/- 18	127 +/- 13
M16x2	27 +/- 3	268 +/- 29	198 +/- 22
M18x2.5	37 +/- 4	366 +/- 36	270 +/- 26

## **PRECAUTIONS BEFORE WELDING**

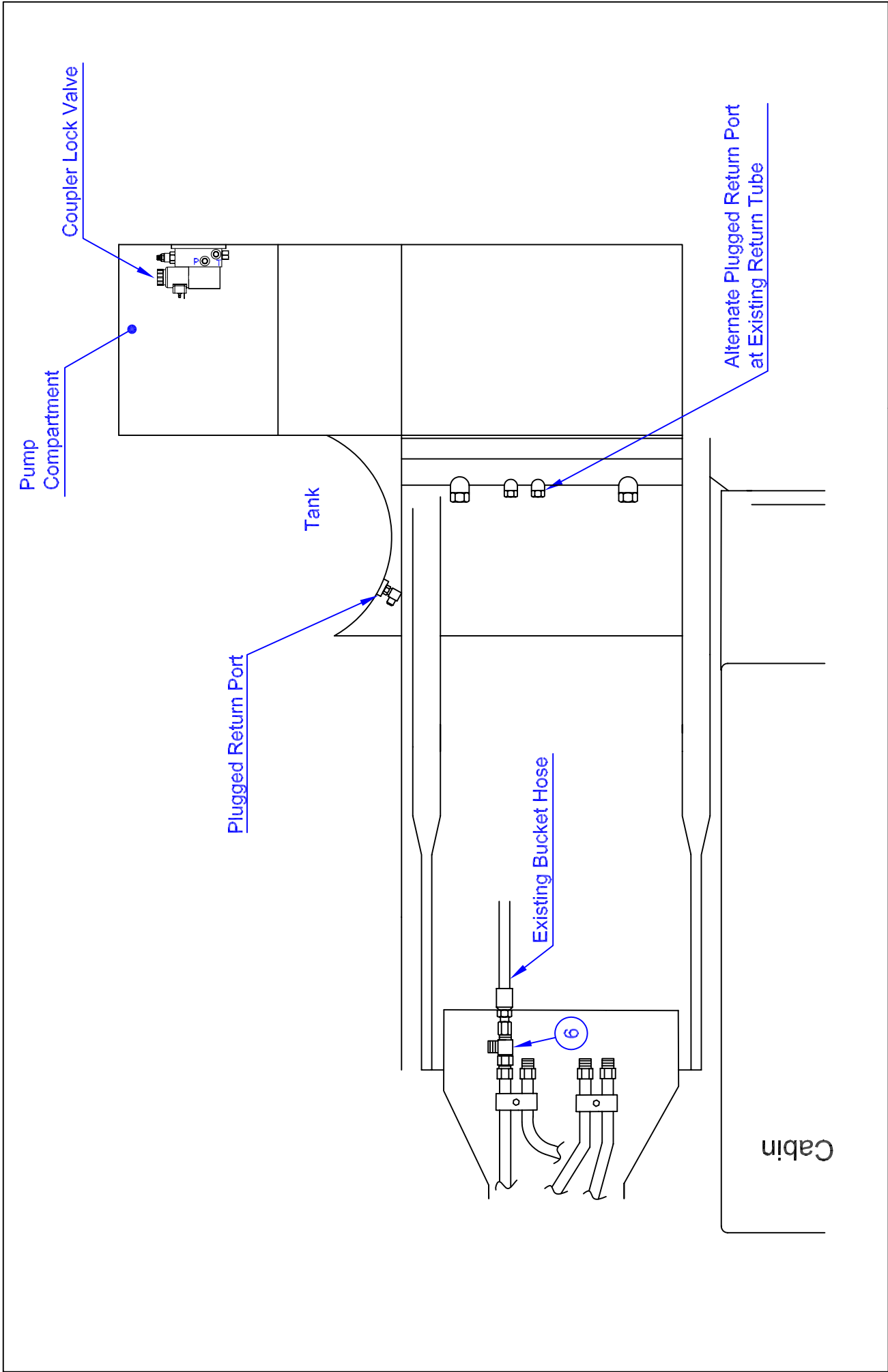
- **NOTE:** These techniques are a general guideline only. If the excavator manufacturer has published welding guidelines, use them instead.
- Turn off the engine and disconnect the battery.
- Protect all areas in, on and around the machine with a flame resistant covering during grinding and welding operations. Use proper solvents to clean parts for welding. Always clean parts in a well-ventilated area. Cover the cylinder rods and glass for protection against welding spatter. Protect any wiring harnesses in the vicinity.
- Clean welding areas of any combustible materials like dried leaves, hydraulic oil etc.
- Clamp the ground cable from the welder, directly to the component that will be welded. If this is not achievable, place the clamp as close as possible to the weld. Make sure the electrical path from the ground cable to the component does not go through a bearing.



## SYSTEM OVERVIEW

This hydraulic coupler lock kit allows switching between different work tools (Buckets etc.) with the flip of a switch. An electrical control box actuates the coupler lock valve that directs pressurized oil to the coupler cylinder for locking or unlocking it. The coupler cylinder is in the LOCK position by default. The coupler (hydraulic pin grabber) unlocks and releases the work tool only when the control box switch is flipped to the unlock position and the pressure in the bucket curl-in line goes over 280 bar (4000 PSI). This safety feature in the hydraulic kit prevents accidental release of the work tool. In addition to the safety features in the hydraulic circuit, there is a load holding check valve installed on the coupler cylinder to prevent it from unlocking.

- ❖ Make sure the system in the LOCK position during machine operation. This will prevent accidental release of the work tool.
  - ❖ After the coupler (hydraulic pin grabber) unlocks/unlatches, release the work tool before moving the machine.
  - ❖ It is necessary to activate the bucket function to build up pressure for LOCKING and UNLOCKING the work tool.
- 
- **Lock:** Grab the work tool (Bucket or any attachment) with the coupler. Follow the DROMONE instruction manual to lock the work tool in place by activating the bucket curl-in function with the control lever in the cab. Allow the circuit to complete its stroke i.e. till oil flows over relief. With the control lever in place, make sure the black switch on the control box is in the “OFF” position. Read the operator’s manual for more details on locking and unlocking the coupler.
  - **Un-Lock:** Position the work tool (bucket or attachment) close to the ground for releasing. Follow the DROMONE instruction manual and actuate the control lever in the cab to activate the bucket curl-in function and allow the bucket cylinder to complete its stroke i.e. till oil flows over relief. With the control lever in place, activate the system by switching the black switch on the electric control box panel to the “ON” position and pressing the RED button within 5 seconds. Release the work tool at this time.
  - **NOTE:** Refer to the control box manual for more details on control box operation.



View from Above

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Dwg No: DQ4-JD0023

OEM

Drawing in not to scale

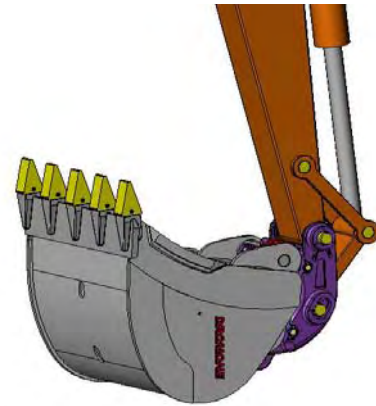
DATE: 06/03/10

Drawing By: AK

Approved By: B.M.B.

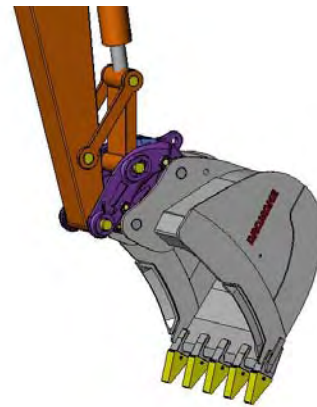
## STICK AND BOOM HOSES

- Install fittings [10] to the coupler lock cylinder. Connect the ¼” JIC end of hoses [100] to the coupler lock cylinder fittings and the 3/8” JIC end of the hoses [100] to the live swivels on the junction block assembly [4]. The junction block assembly [4] is located close to the end of the stick.
- Curl the bucket in as far as possible, and let this suggest the mounting location of the junction block [4].
- Leave approximately 2-1/2” of slack in the hoses [100] to allow for cylinder movement while locking and unlocking.



**Figure 1. Bucket Curl**

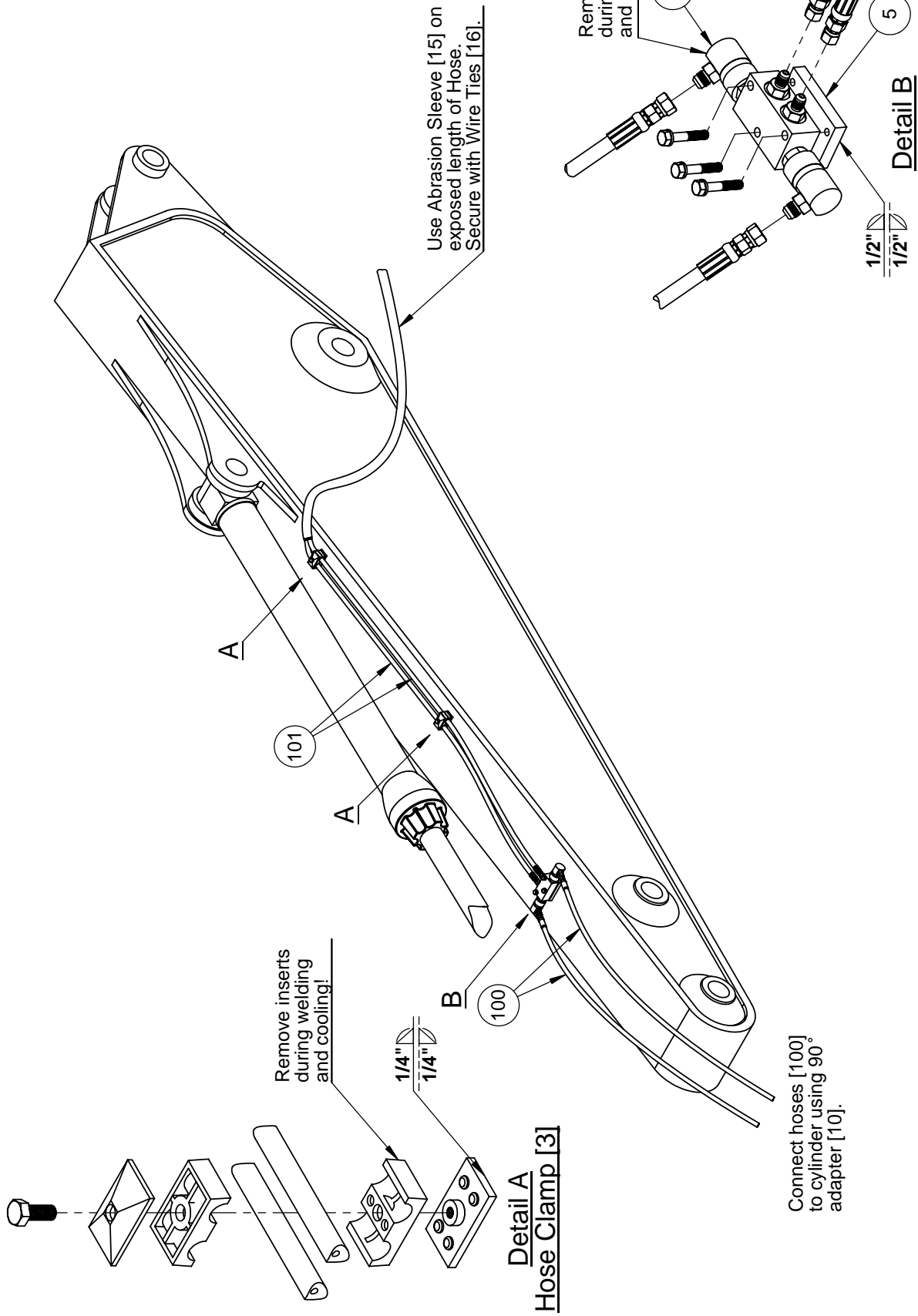
- Next, move the bucket to its fully dump position to ensure that the hoses [100] don't bind or pinch.
- This would be a good time to cycle the bucket throughout its range of motion to ensure that bucket cylinder nor the linkages come in contact with the junction block.



**Figure 2. Bucket Dump**

- Tack-weld the block mount [5] in place. Bolt the junction block assembly [4] to the mount [5] using the hardware supplied in the kit. *This block will be finish welded after completing kit installation and testing the circuit.*
- Loosely affix the clamp assemblies [3] to the hoses using the drawing as a guideline. The hoses are routed together and can be routed on either side of the stick / boom. *The drawing is for illustration purpose only.*

- Route the hoses over the stick and the boom as shown in the drawings. The hoses should preferably follow existing tubes and hoses. Hold the hoses in place and mark the location of the clamp [3] bases on the stick and boom. The hoses are joined together with male-female hose ends. Use nylon abrasion sleeve [15] around the hoses running between the stick and the boom. (*Hoses are identified on the Bill of Materials, and are marked with tags.*)
- Tack-weld the clamp bases in place. You will finish weld the clamps later. *A note of caution: Do not finish weld the clamps with the hoses installed in them. Welding heat will damage the hoses.*
- Install hoses and check for correct alignment and routing. Operate the excavator and observe hose movement throughout the whole range of motion of the stick and the boom. There must be no binding or strain in any of the hoses.
- When you are sure that the routing is correct, remove the hoses and finish weld the clamp bases. Reinstall the hoses.
- Secure the hoses to existing tubes, brackets or hoses using nylon ties [16] where there is no space for clamp [3] installation.



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**Hoses on Stick**

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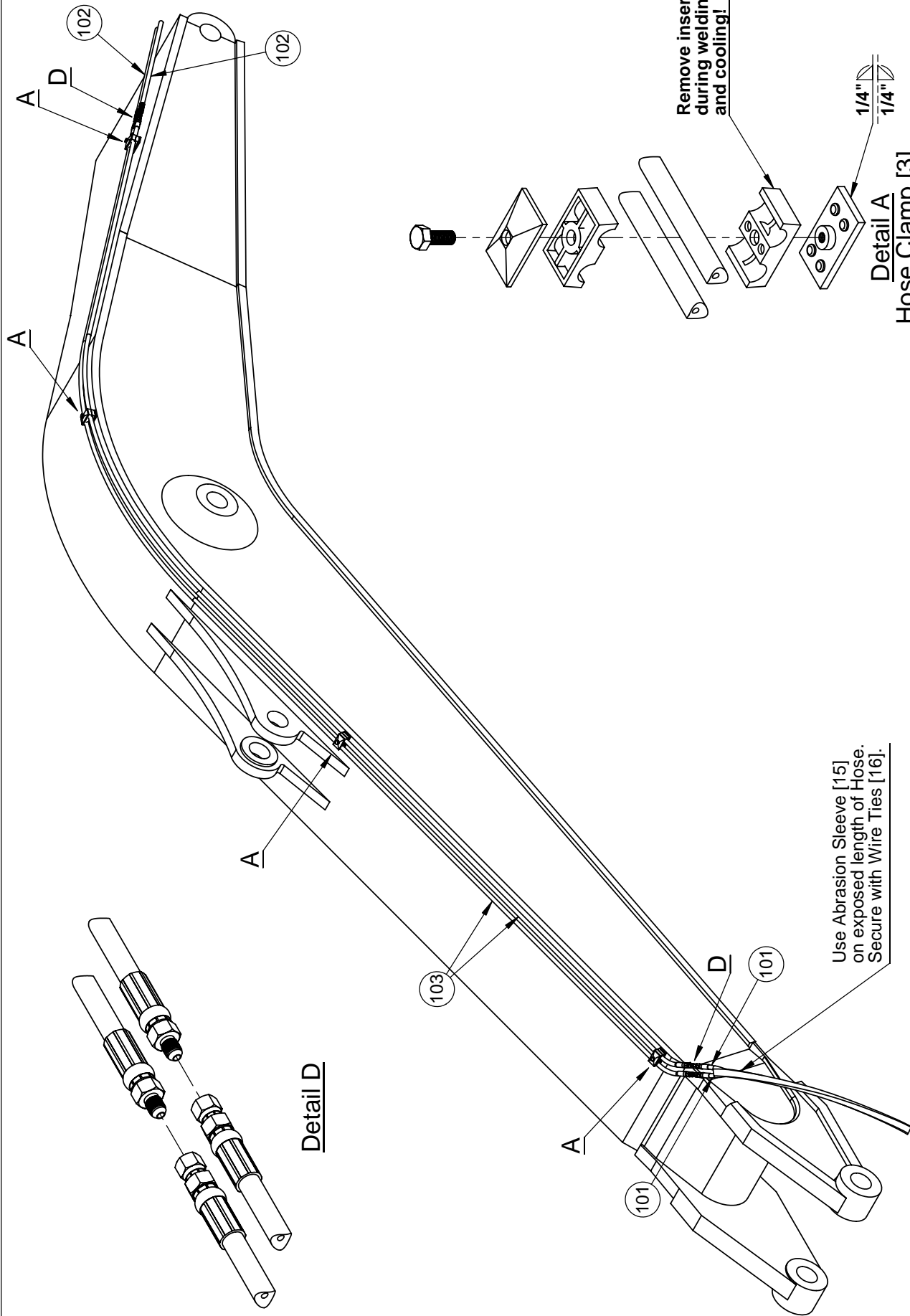
OEM

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Drawing By: AK

Approved By: BMB



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**Hoses on Boom**

Dwg No: DQ4-JD0023

OEM

Not Drawn to Scale

Date: 06/03/10

Drawing By: AK

Approved By: BMB

Use Abrasion Sleeve [15] on exposed length of Hose. Secure with Wire Ties [16].

Remove inserts during welding and cooling!

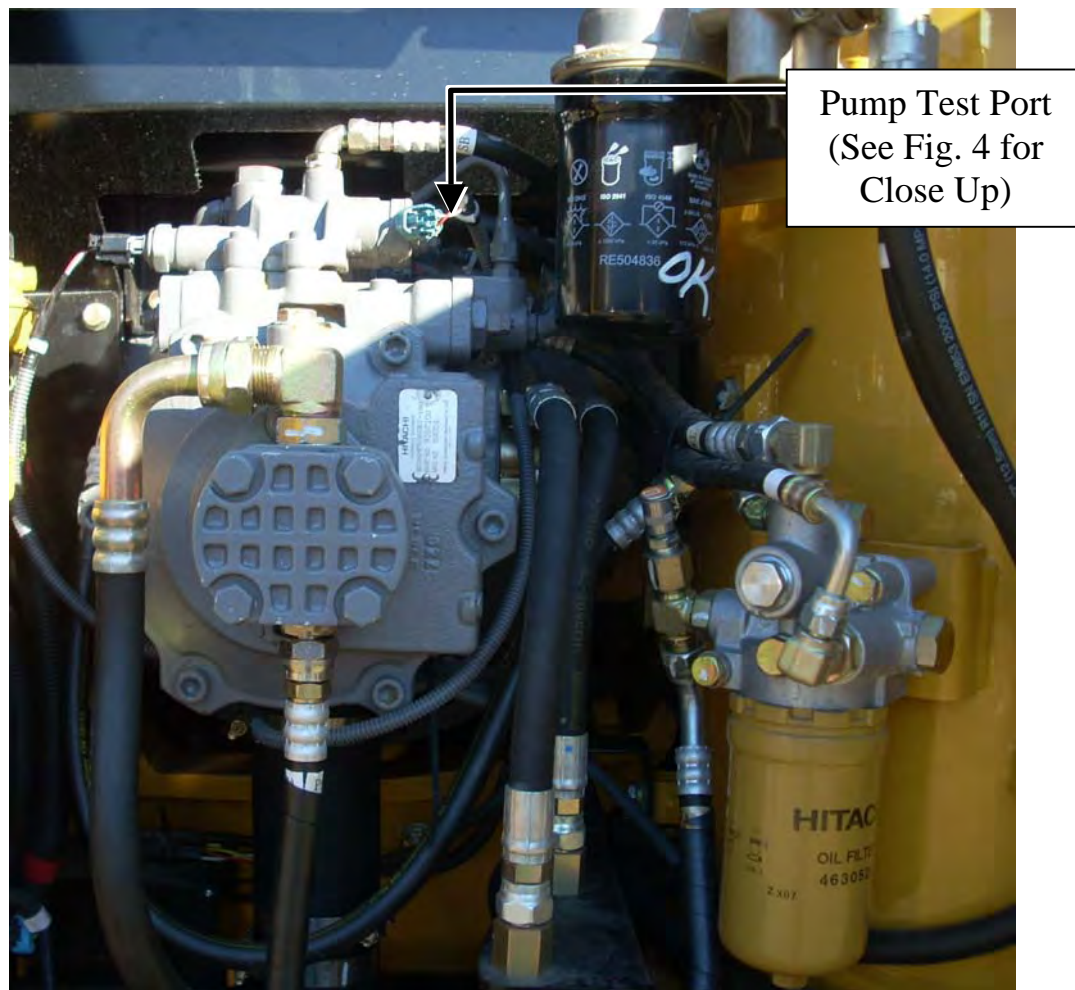
**Detail A**  
**Hose Clamp [3]**

1/4"  
1/4"

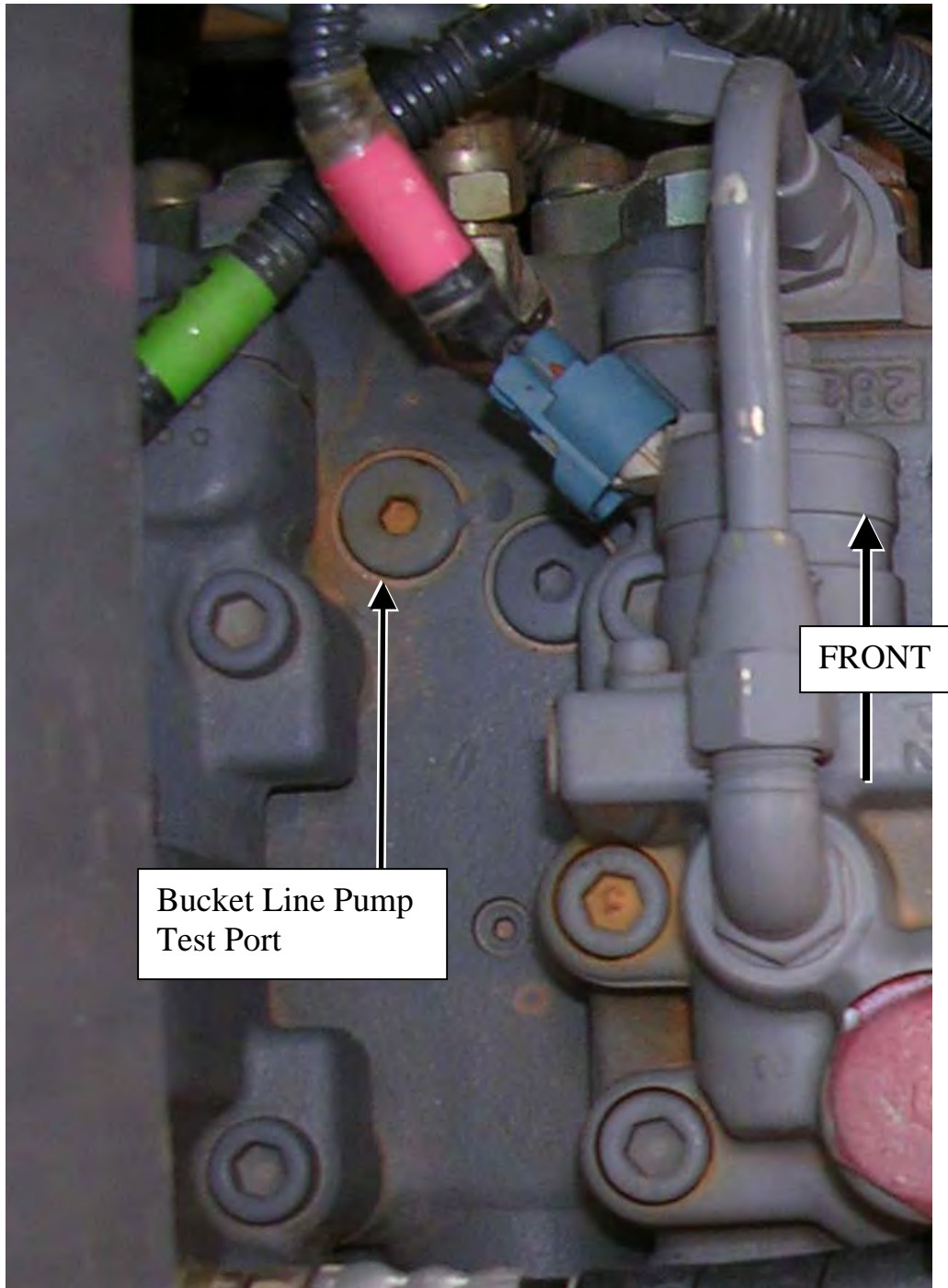
**Detail D**

## CONTROL VALVE

- The valve is mounted to the rear frame in the pump compartment. If an existing bolt-hole is suitable then bolt the mount [2] in place. If one is not available it is necessary to weld the mount [2] to the existing frame. Clamp or tack-weld the valve mounting plate [2] in place. *Do not finish weld the plate at this time.*
- Refer to Figure 3 & 4 to determine which pump must be tied into in order to operate the system properly.
- Remove the gauge coupling or the plug in the test port of the pump delivering oil to the bucket function and install the fitting [9].



**Figure 3. Pump**

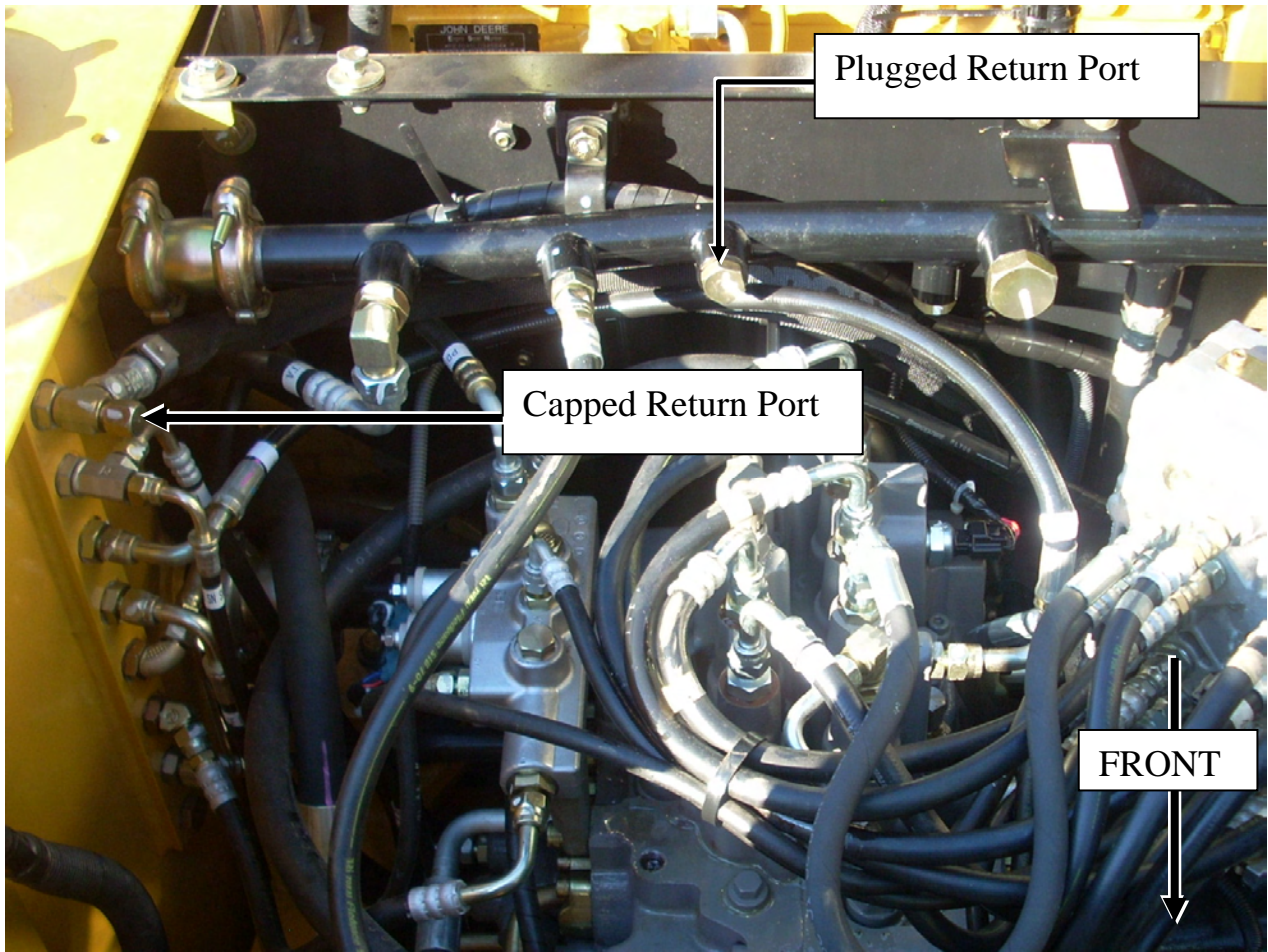


**Figure 4. Pump Test Port – View From Above**

- Install orifice adapter [99] to the fitting [9] at the pump test port. *This adapter [99] will help reduce pressure spikes in the coupler lock system.*
- Connect 90° end of hose [104] to the adapters at the test port and route the other end to the check valve fitting at the 'P' port on the coupler lock valve [1].

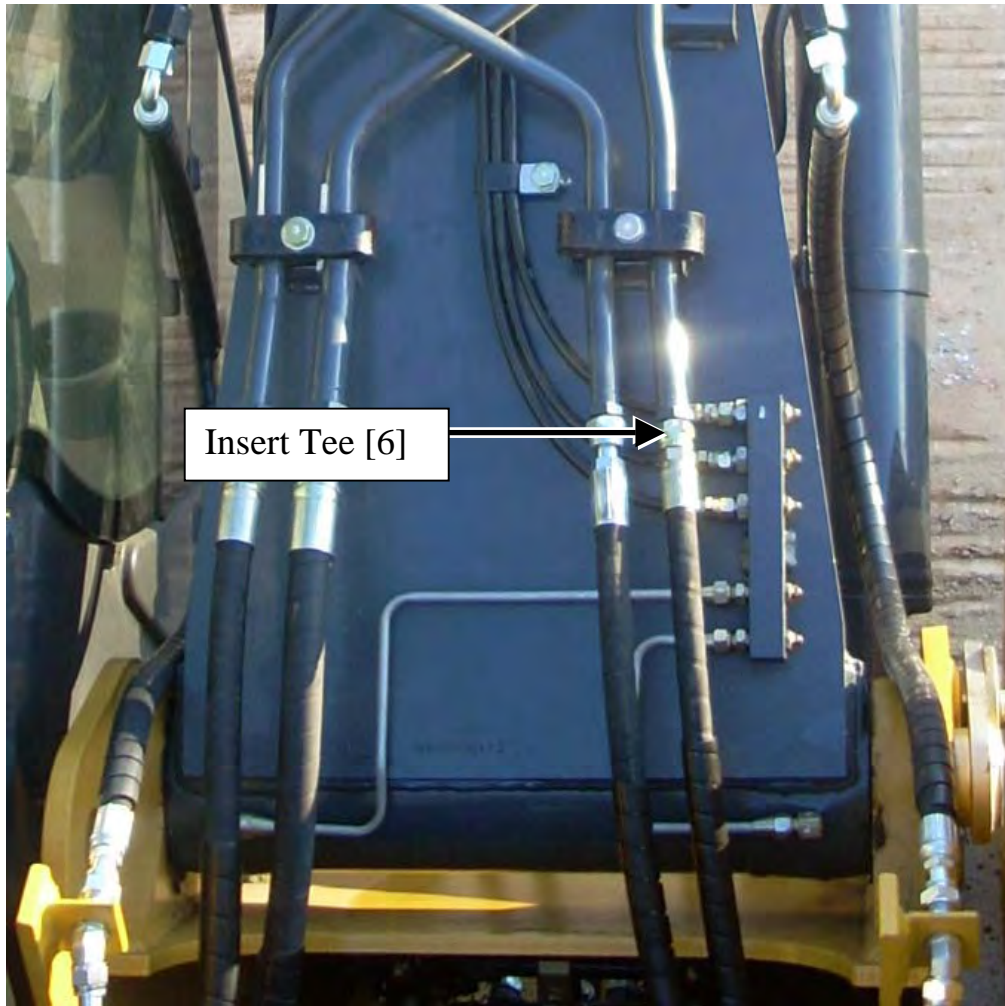


- Locate an existing capped return line on the side of the hydraulic tank. Remove the cap and connect one end of hose [107]. Use 90 degree swivel elbow [8] if necessary to route hose [107] to the 'T' port on the coupler lock valve [1]. If the capped port shown in Figure 5 is not available, locate the 3/8" plugged return port on the main return tube. Remove the plug and install adapter [7]. Use 90° swivel elbow [8] if required and route hose [107] to the 'T' port on the coupler lock valve [1].



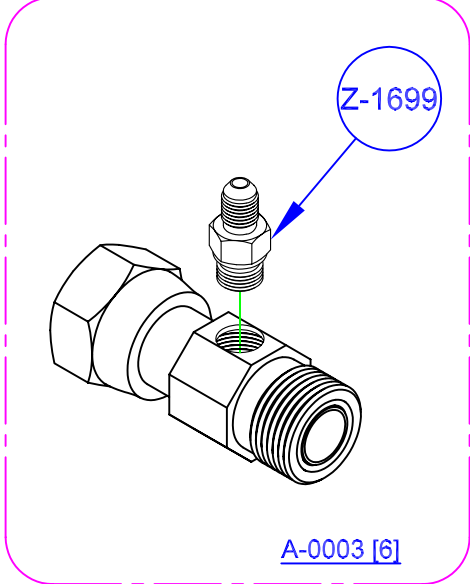
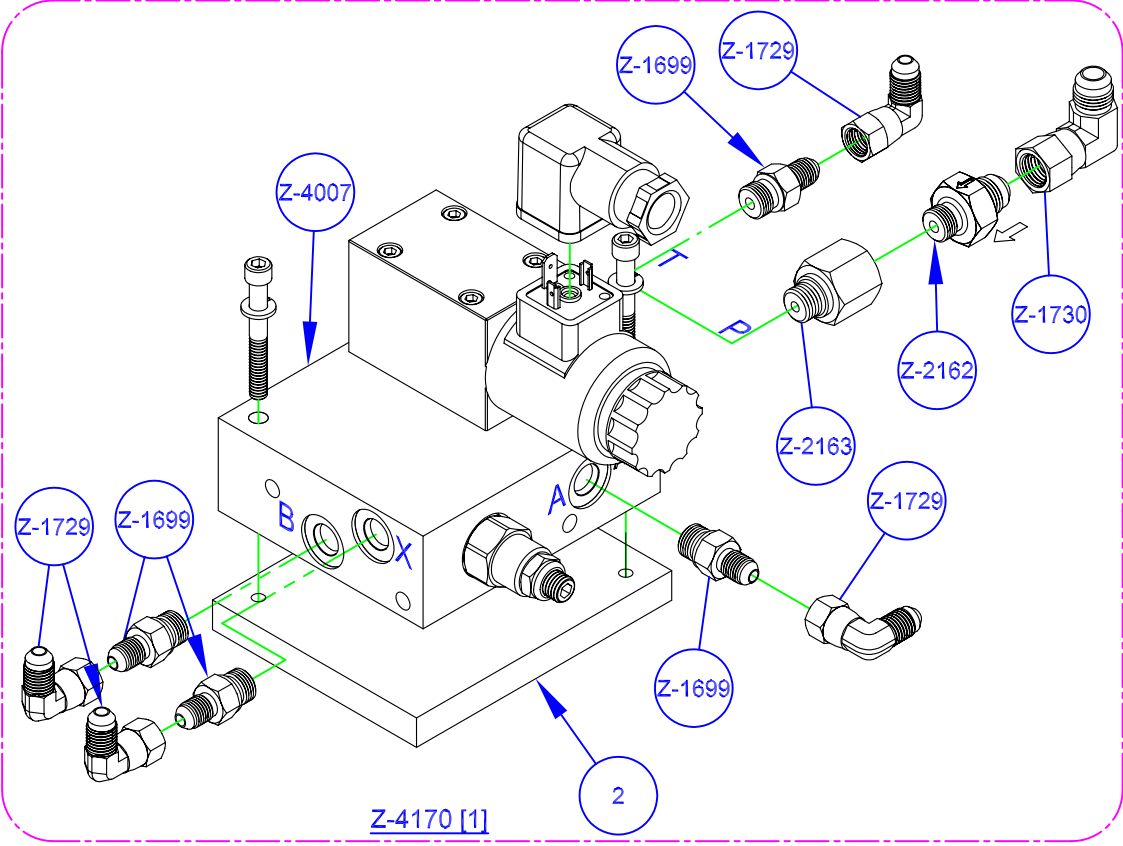
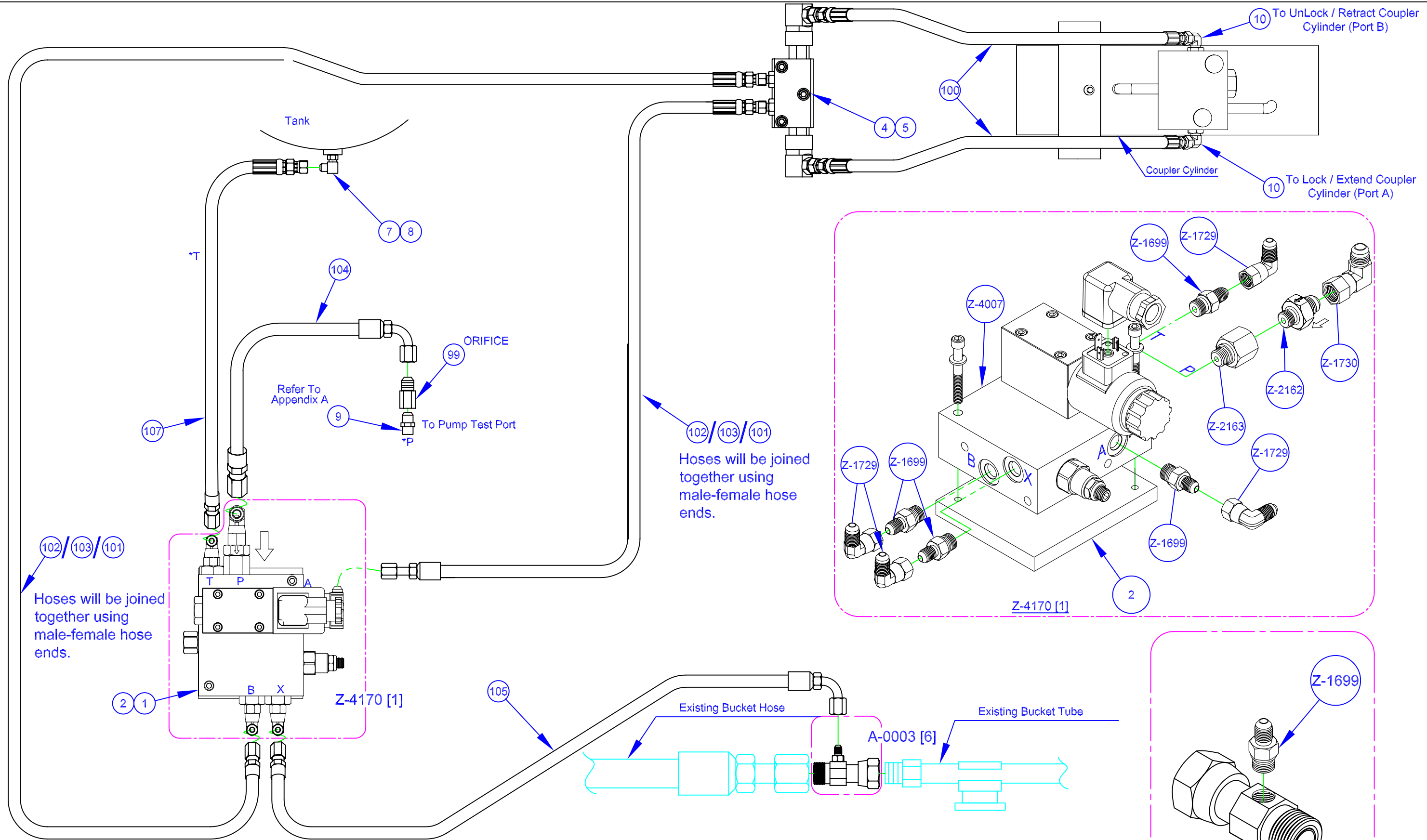
**Figure 5.View From Front**

- The main supply line hoses from the service valves connect to tubes at the base of the boom. Locate the tube feeding the base end of the bucket cylinder (that which curls the bucket in). Remove the bucket circuit hose at the tube and insert tee assembly [6]. Reinstall the existing hose to one end of the tee. Connect the 90° end of hose [105] to the ¼” adapter and route the other end to the ‘X’ port on the coupler lock valve [1].



**Figure 6. Boom Tubes**

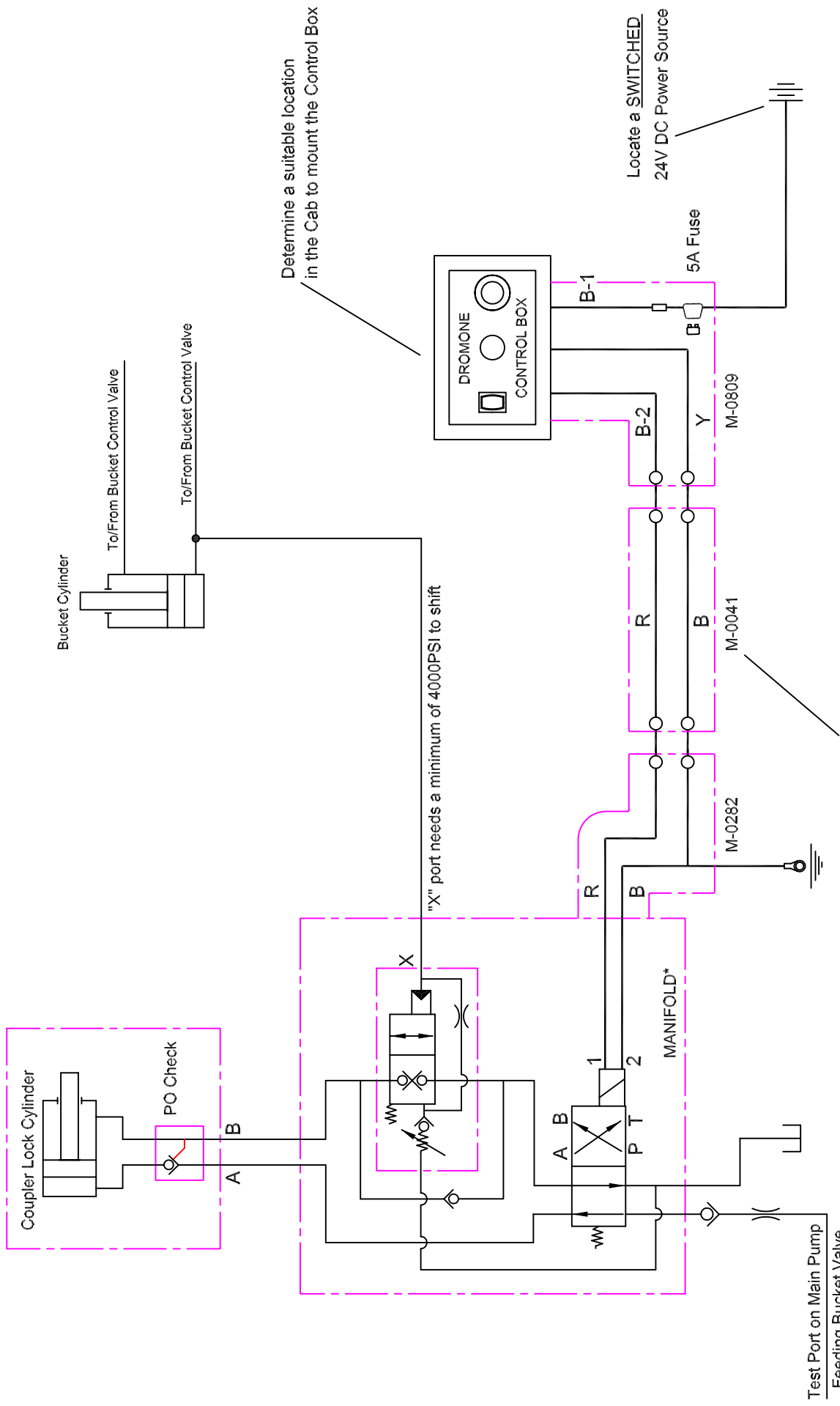
- Connect hoses [102] to the ‘A’ and ‘B’ ports of the coupler lock valve [1] and route them towards the base of the boom. Join them to the hoses on the boom using the male female hoses ends.
- After all the hoses are connected it will be easy to determine the best/final mounting location for the coupler lock valve [1]. Relocate the coupler valve, if necessary, to route the hoses properly. There shouldn't be any binding or strain in any of the hoses. Mark the location of the mounting plate and tack weld the plate in place. Finish weld only after removing the valve otherwise welding heat will damage the valve seals. Reconnect all hoses and tighten.



**General Overview**

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Dwg No: DQ4-JD0023	OEM	Drawing in not to scale	DATE: 06/03/10	Drawing By: AK	Approved By: B.M.B.
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Determine a suitable location in the Cab to mount the Control Box

Locate a SWITCHED 24V DC Power Source

"X" port needs a minimum of 4000PSI to shift

Connect the Control Box Wiring Harness (M-0809) to the Coupler Lock Valve Wiring Harness (M-0282) using the Wiring Harness M-0041

\* Note: On the DIN connector, terminal 1 is the power source and terminal 2 is the ground.

### Hydraulic and Electrical Schematic

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Dwg No: Hydraulic and Electric Circuit	Dromone	DATE: 09/28/06	Approved By: BMB
		Drawing in not to scale	Drawing By: AK



## FINISH AND TEST

- Before starting this section, position the machine in the oil level check position as suggested by the excavator manufacturer. Check the oil level sight gauge on the hydraulic tank to ensure that the machine has enough hydraulic oil. Add hydraulic oil (*use only excavator manufacturer recommended grade*) if necessary.
- Check again for proper hose movement and routing, then tighten all clamps, hoses and fittings.
- Paint brackets and clamps to match the excavator.
- Make sure the hoses [100] are connected to the coupler lock cylinder.
- Run the machine at idle or at a low engine rpm setting, to supply a low volume of oil through the circuit and also, to keep the noise levels low. Activate the circuit and check for any leaks. Be ready to shut down machine immediately in case of leaks. *When shutting down the machine, it is important to turn the engine rpm dial/setting to idle and shift the pilot safety lock lever to the “lock” position.* Tighten fittings and hoses as necessary.
- Clear all personnel from the area and all obstacles in the path of the machine. Operate the machine only when seated in the host machine. Keep the coupler close to the ground.
- Activate the lock and unlock circuits several times to ensure that the system locks and unlocks with ease. *Follow the instruction booklet/manual supplied with the coupler attachment for using different work tools.*
- It is advisable to join the two sides of the circuit together at the end of the stick and activate the ‘LOCK’ and ‘UNLOCK’ circuits for a couple of minutes to flush the system off any contaminants introduced during kit installation.
- In order to reduce the risk of serious injury, it is advised to follow any and all safety procedures as specified in the coupler operation and safety manual.

BOM NUMBER :DQ4-JD0034  
 DESCRIPTION :Dromone Coupler Lock Kit

Item #	Part No. / Description	Remarks	Qty.
0001	Z-4170 / 5 Port PL Valve Assembly		1
0002	M-3518 / 4170 - 9" M10 BO Mount		1
0003	Z-4883 / Twin Hose Clamp		5
0004	Z-3699 / Junction Block Assembly		1
0005	M-0010-M / B01-Mount		1
0006	A-0003 / Z-2058-DT-SAE BKT Tee		1
0007	Z-1159 / Adapter	!! With Retaining Ring	1
0008	Z-1729 / 90 degree swivel elbow		1
0009	Z-1158 / Adapter	!! Retaining Ring	1
0010	Z-4598 / 90 degree adapter	!! With Retaining Ring	2
0015	Z-2360 / Abrasion Guard #12		8
0016	Z-1152 / Wire tie		30
0017	Z-3878 / Control Box (D)		1
0018	M-0041 / WH-CL1 Wiring Harness		1
0019	M-0809 / ELC-RQ1-1 Wiring Harness		1

BOM NUMBER :DQ4-JD0034

DESCRIPTION :Dromone Coupler Lock Kit

Item #	Part No. / Description	Remarks	Qty.
0099	Z-3067 / 1.5mm Orifice Connector		1
0100	H-0344 / 206x800SPx00Jx00J06 Hose		2
0101	H-0346 / 206x3200 Hose		2
0102	H-3556 / 206x2300x00Jx00E Hose		2
0103	H-3558 / 206x5300x00Jx00E Hose		2
0104	H-3091 / 206x800x00J06x90J Hose		1
0105	H-0943 / 206x2500x00Jx90J Hose		1
0107	H-1453 / 206x1400 Hose		1
0200	Z-5026 / Shipping Crate/No Runners		1
0201	INSTALLATION INSTRUCTIONS		1

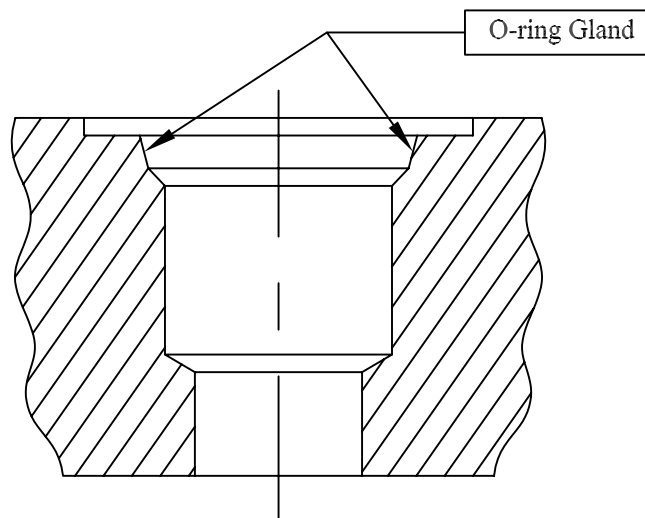
## APPENDIX A

Use Appendix A to help determine whether a metal retaining ring should be used around the o-ring when installing BSPP (British Standard Parallel Pipe) adapters.

BSPP o-ring ports are made to either British 'BS' or Japanese 'JIS' standards. Both feature a 55° flank angle and British Whitworth thread profile but use different sealing methods.

### BSPP Ports to 'JIS' Standards

These ports have an o-ring gland as shown in the picture below. The o-ring on the adapter seals in the o-ring gland. In this case, it will be necessary to remove the metal retaining ring around the o-ring on the adapter, before installing it to the port, in order to ensure proper seal.



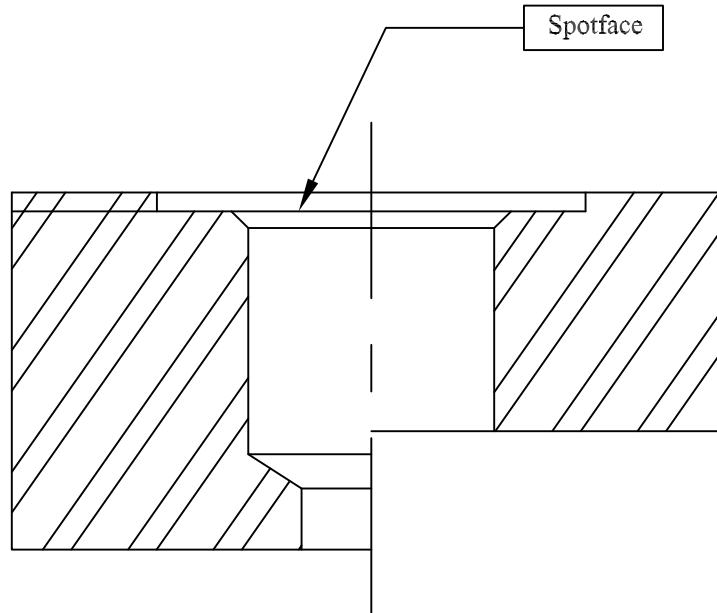
**BSPP PORT TYPE 1  
DO NOT USE RETAINING RING**

Figure 1: Cut Section of BSPP Port Type 1



## BSPP Ports to 'BS' Standards

These ports do not have an o-ring gland. The o-ring on the adapter seals on the port surface or spotface as shown in the picture below. In this case, it will be necessary to use the metal retaining ring around the o-ring on the adapter, before installing it to the port, in order to ensure proper seal.



## **BSPP PORT TYPE 2 REQUIRES RETAINING RING**

Figure 2: Cut Section of BSPP Port Type 2



Figure 3: Z-4598 - 90 Degree Adapter

## Customer Feed Back Form

At DROMONE we continually strive to provide the highest quality product. We feel there is no better opinion than that of the customer. This is why we ask that you take a few minutes to complete the form below and fax it back to us at 770-692-6978. Thank you for your time and effort in helping us provide the highest quality product possible.

**Purchaser/User**

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Phone \_\_\_\_\_  
 Fax \_\_\_\_\_

**Kit Number:**

DQ4- \_\_\_\_\_

**Base Machine**

Make \_\_\_\_\_

Model \_\_\_\_\_

Serial Number \_\_\_\_\_

**Installation Time (hours)** \_\_\_\_\_**Customer Feedback**

Did all components and/or parts fit well? YES Comments: \_\_\_\_\_  
 NO \_\_\_\_\_

Did the kit fit well overall? YES Comments: \_\_\_\_\_  
 NO \_\_\_\_\_

Was the installation easy/simple? YES Comments: \_\_\_\_\_  
 NO \_\_\_\_\_

Were any modifications necessary? YES Comments: \_\_\_\_\_  
 NO \_\_\_\_\_

Were the instructions clear and concise? YES Comments: \_\_\_\_\_  
 NO \_\_\_\_\_

Were the drawings clear and concise? YES Comments: \_\_\_\_\_  
 NO \_\_\_\_\_

Do you have any suggestions to improve the installation of this kit? Comments: \_\_\_\_\_  
 \_\_\_\_\_