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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.
- Be careful while handling hot parts on machines that have just been stopped. 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.
- 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.
- Lower the bucket or any attachment to the ground.
- 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.
- 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 of 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.
- Use safety protection such as hardhat; working gloves, safety shoes and safety glasses as needed to do the job.

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 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/valves/parts are pre-assembled before shipping.* In case of any discrepancies, contact the manufacturer immediately.
- Make sure there are enough rags, absorbent towels and/or containers available.
- Steel brackets/mounts are protected from corrosion using powder coat or primer. 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.
- 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.
- Shut off engine. If the machine has just completed work then allow sufficient time for cooling before opening any lines.
- Disconnect battery. *Remove the negative (ground) terminal connection.*
- Release pressure from the hydraulic tank.
- Refer to the sheets on the following pages for the proper torque specifications for all connections. These torque 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.

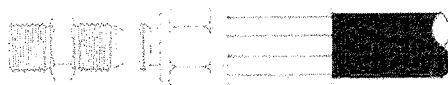


Figure 1. Female Swivel without Sleeve

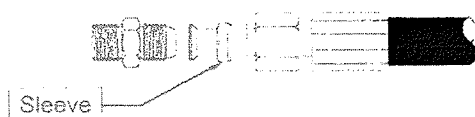


Figure 2. Female Swivel with Sleeve

Nominal Size	Dash ³ Size	Torque Value ²		F.F.F.T. ¹
		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 Flats From Finger Tight (F.F.F.T.) method counts the number of hex flats past the finger tightened position.

- Visually inspect the threads to make sure they are clean.
 - Hand tighten the female swivel nut onto the male thread.
 - Make alignment marks on the nut and fitting.
 - Proceed to tighten to F.F.F.T. value.
- These torque values are given for components without lubrication. Do not use oil on the threads before tightening.
 - 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. ¹
		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 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.

Standard Tightening Torque Of Metric Bolts			
Bolt O.D. x Pitch (mm)	Metric Class 10.9		
	kgm	Nm	lb.ft.
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

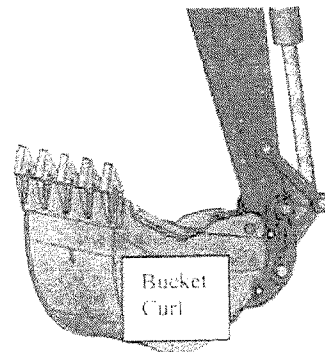
- **NOTE:** These techniques are a general guideline only. If the excavator manufacturer has published welding guidelines, use them instead.
- Turn off the engine and disconnect the battery.
- Release the pressure from the hydraulic tank.
- Protect all areas in, on and around the machine with a flame 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. 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

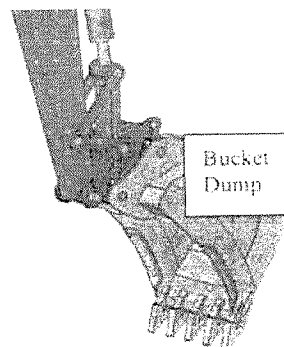
- This instruction manual describes the installation of the hydraulic kit that will operate the Fleco coupler. This hydraulic circuit uses machine pressure to lock and unlock the coupler.
- The coupler attaches onto various tools by “hooking” the front pin (closest to operator) and then extending a locking device under the rear pin of the attachment. While engaged, the lock is securely held in place by the cylinder and safety pin. In the event of hydraulic failure, the coupler’s safety lock pin will enable the coupler to hold the attachment.
- To disengage (unlock) the coupler, position the machine as described in the “Operation and Maintenance” manual, also supplied with this coupler. Remove the safety pin and follow the steps to safely remove the attachment.
- With the control box still in the “unlock” position, position the machine to pick up the next attachment. Follow the steps to safely connect to the new attachment. Turn the switch to the “lock” position and wait several seconds for the lock to fully engage. Now install the safety lock pin with lynch pin in the rear of the coupler to fully lock the attachment in place.
- **THE SAFETY LOCK PIN MUST BE INSTALLED AT ALL TIMES DURING USE OF THE COUPLER.** Failure to install the safety pin could result in severe injury or death. Once installed, it insures the operator that the lock is properly seated under the pin, because the safety pin lock cannot be installed if the lock is only partially engaged. The Safety Lock Pin will also prohibit inadvertent disengagement.
- Before operating a machine with a Fleco coupler, visually check that the lock is properly positioned with the rear pin and the safety lock pin is properly installed.
- To confirm that the coupler and attachment are properly connected, set the attachment on the ground and rotate in a dumping motion until the tracks come off the ground. Do this *EVERY* time an attachment is changed.
- Never lift an attachment off the ground until all steps have been completed to confirm safe and proper connection.
- **NOTE:** Pictures and diagrams throughout this manual may not be your exact Fleco coupler. The pictures represent an action or a setup required for installation and operation.

STICK AND BOOM HOSES

- Connect the one end of hoses [100] to the coupler lock cylinder fittings and the other end of the hoses [100] to the 6-port block assembly [4].
- Route the hoses [100] up the stick past the block [4] and back down into the block [4] making a 180 degree loop.
- 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.

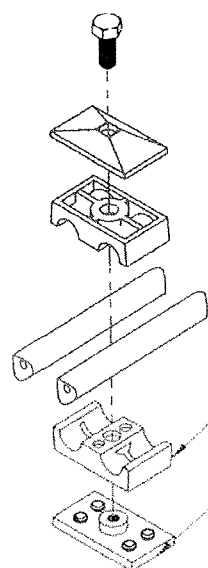


- Next, move the bucket to its fully dump position to ensure that the hoses [100] don't bind or pinch.
- This would be a good time to cycle the bucket throughout its range of motion to ensure that bucket cylinder nor the linkages come in contact with the junction block.



- 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.*
- **NOTE:** In some cases it is necessary to remove the mount [5] and weld the block [4] directly to the top of the stick. This is necessary if the clearance between the bucket linkage and/or cylinder will not allow the additional 1/2" that the mount [5] adds to the assembly.
- 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 guard [11] 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 [10] where there is no space for clamp [3] installation.

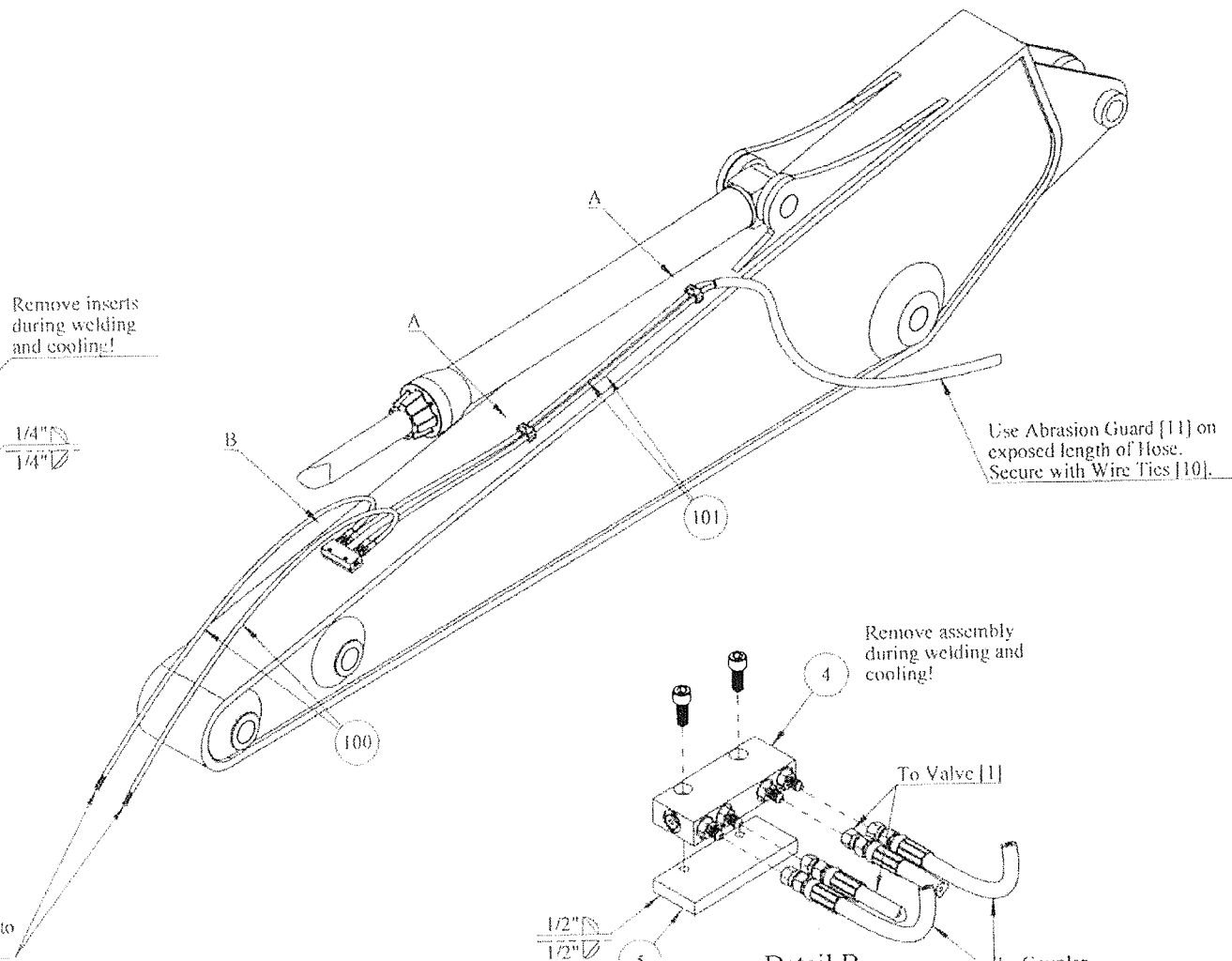


Detail A
Hose Clamp [3]

Remove inserts
during welding
and cooling!

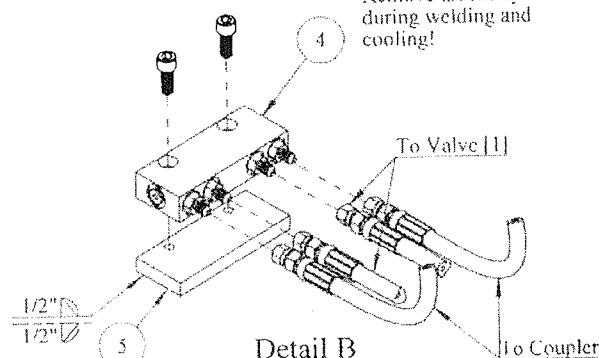
1/4"
1/4"

Note: Connect hoses [100] to
fittings on coupler.



Use Abrasion Guard [11] on
exposed length of Hose.
Secure with Wire Ties [10].

Remove assembly
during welding and
cooling!



Detail B
6 Port Block Assembly

Hoses on Stick

Dwg No: FQ1-3059T-A

OEM

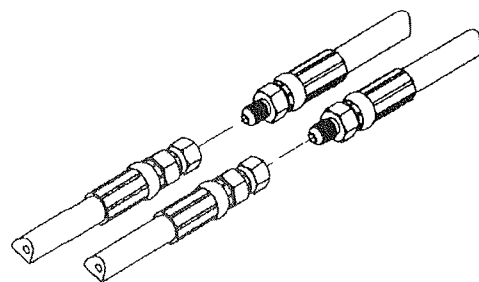
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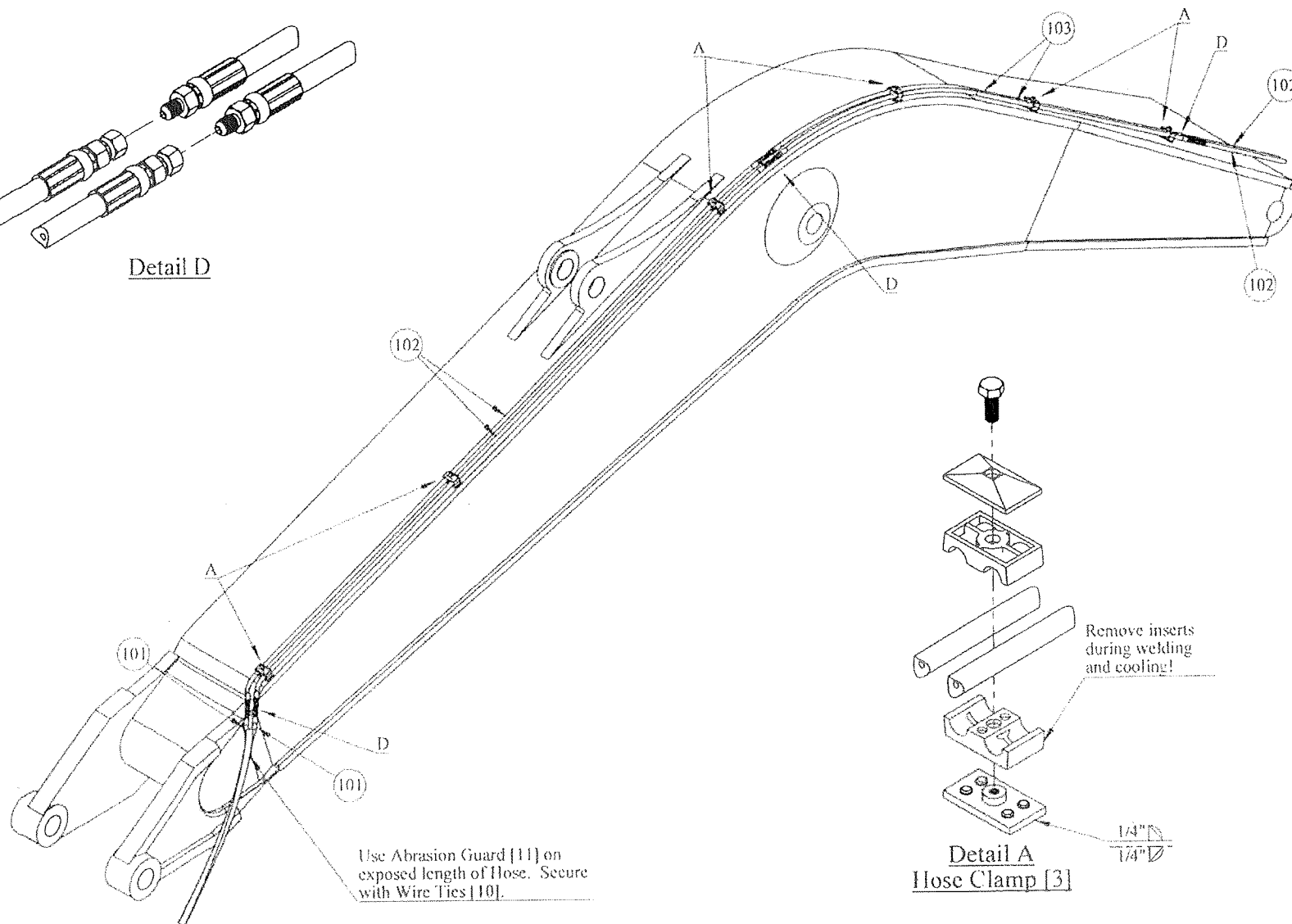
Drawing By: AK

Approved By: BMB

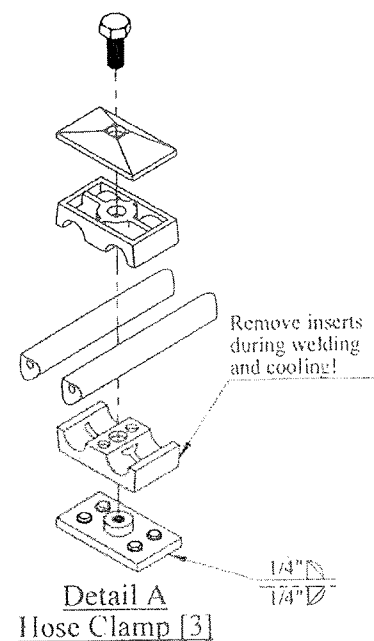
This is the property of Hydraulic kit manufacture
and shall not be altered, copied, used for manufacturing
or duplicated by any other person or company without
our written permission.



Detail D



Use Abrasion Guard [11] on
exposed length of Hose. Secure
with Wire Ties [101].



Detail A
Hose Clamp [3]

Hoses on Boom

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our written permission

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OEM

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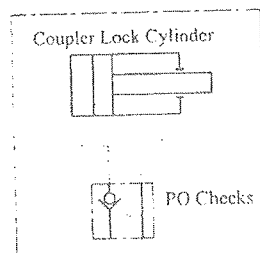
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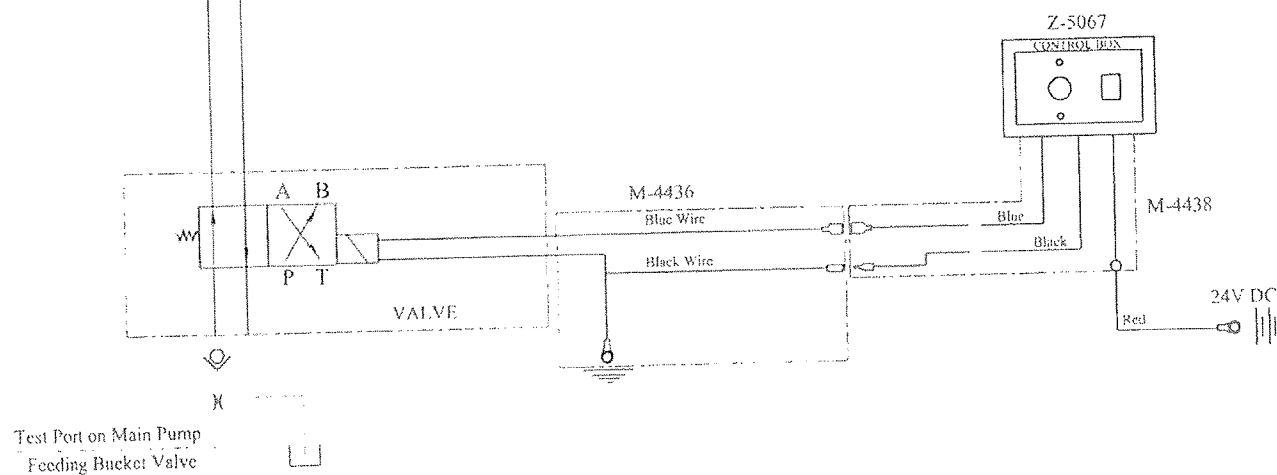
Approved By: BMB

CONTROL VALVE

- Determine a suitable location to mount the coupler lock valve [1] in the pump compartment using the mount [2] and hardware provided. The mount [2] can be bolted to an existing bolt or it can be welded in place. If welding, clamp or tack-weld the valve mounting plate [2] in place. *Do not finish weld the plate at this time.*
- Determine the pump that delivers flow for the bucket function. One way to determine the pump feeding the bucket valve section is by tracing pressure lines from the pumps. Another way would involve installing an appropriately rated pressure gauge at the test ports on both pumps and activating the bucket circuit by moving the control lever in the cab. The gauge that reads pressure indicates the pump we need to tie into.
- Remove the gauge coupling or the plug in the test port of the pump delivering oil to the bucket function and install the adapter [9].
- 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 'P' port on the coupler lock valve [1].
- Locate the 3/8" plugged return port at or near the hydraulic tank or return tube. Remove the plug and install adapter [6] and 90 degree swivel elbow [7] (if necessary). Connect the 3/8" end of hose [107] to the fittings and route the other end of hose [107] to the 'T' port on the coupler lock valve [1].
- If there is no available plugged port available, locate a 3/8" return line at or near the hydraulic tank. Disconnect the existing hose and install tee [8] and 90 degree elbow [7] (if necessary). Reconnect the existing hose to one end of the tee [8] and the 3/8" end of hose [107] to the other end of the fitting. Route the other end of hose [107] to the 'T' port on the coupler lock valve [1].
- Connect hoses [103] 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 [103] using the male/female hose 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.



1. Circuit is designed to withstand up to 5000 PSI pressure.
2. On the DIN connector, terminal 1 is the power source and terminal 2 is the ground.
3. Kit does not have load holding capabilities.



Hydraulic and Electric Schematic

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Dwg No. FQ1-3059T-A

OEM

Drawing in not to scale

DATE: 12/07/11

Drawing By: AK

Approved By: B.M.B.

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 as needed.
- 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.
- Connect the hoses [100] to the existing fittings on 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.*
- When and only when the control box is in the "unlock" position should the buzzer sound and the valve energized. When the switch is in the "lock" position, the buzzer should be off and there should be no electric current to the valve.
- 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.

COUPLER LOCK KIT

BOM NUMBER :FQ1-3059T-A REV:
 DESCRIPTION :Fleco Universal Coupler Kit

Item #	Part No. / Description	Qty.
0001	Z-5251 / 4 Port PL 24V Valve	1
0002	M-3477-A / 9" 2552 BO Mount	1
0003	Z-4883 / Twin Hose Clamp	8
0004	A-0016 / 6 Port Block Assembly (04)	1
0005	M-2705 / Z-4167 Mount	1
0006	Z-1161 / Adapter	1
0007	Z-1730 / 90 degree swivel elbow	1
0008	Z-1746 / Tee	1
0009	Z-1158 / Adapter !! With Retaining Ring	1
0010	Z-1152 / Wire tie	20
0011	Z-2360 / Abrasion Guard #12	8
0012	Z-5067 / Logic Control Box (QCL)	1
0013	M-4438 / WH-HE1-CB	1
0099	Z-3067 / 1.5mm Orifice Connector	1
0100	H-5437 / 206x1700SP Hose	2

!! Refer to Appendix A

COUPLER LOCK KIT

BOM NUMBER :FQ1-3059T-A REV:
DESCRIPTION :Fleco Universal Coupler Kit

Item #	Part No. / Description	Qty.
0101	H-0212 / 206x4300 Hose	2
0103	H-3552 / 206x4000x00Jx00E Hose	6
0104	H-0338 / 206x1100x00J06x90J Hose	1
0107	H-0389 / 206x1800x00Jx00J6 Hose	1
0200	Z-5026 / Shipping Crate/No Runners	1
0201	INSTALLATION INSTRUCTIONS	1

!! Refer to Appendix A

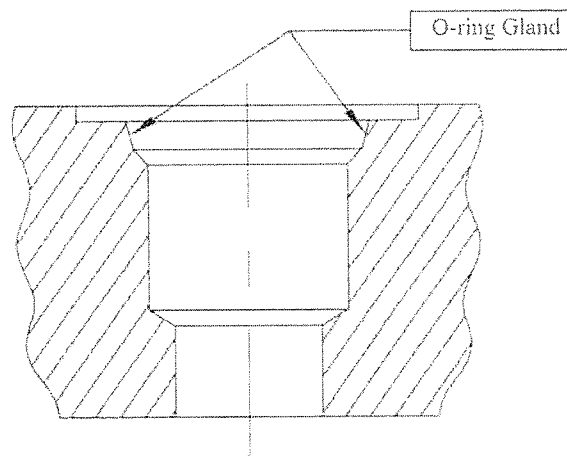
APPENDIX A

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.

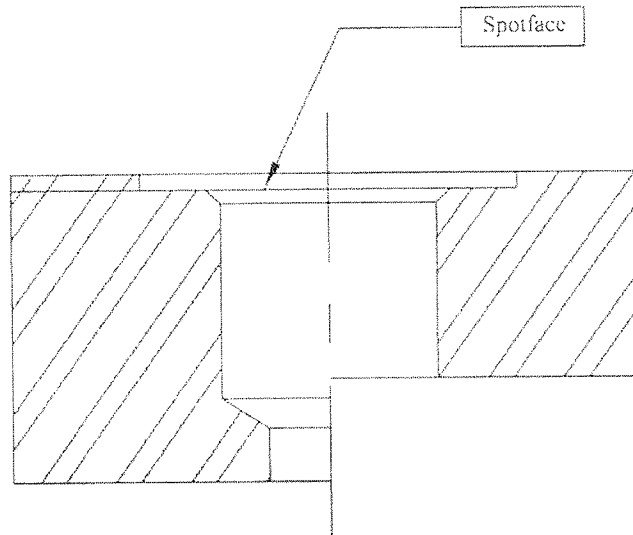


BSPP PORT TYPE 1 DO NOT USE RETAINING RING

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

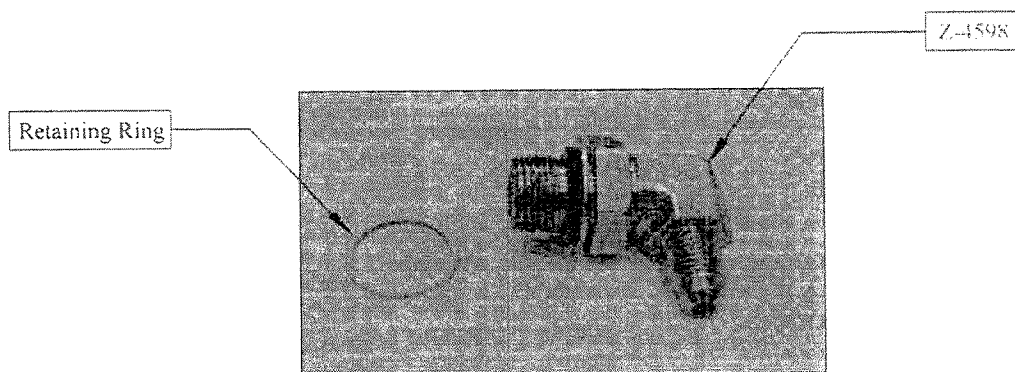


Figure 3: Z-4598 - 90 Degree Adapter