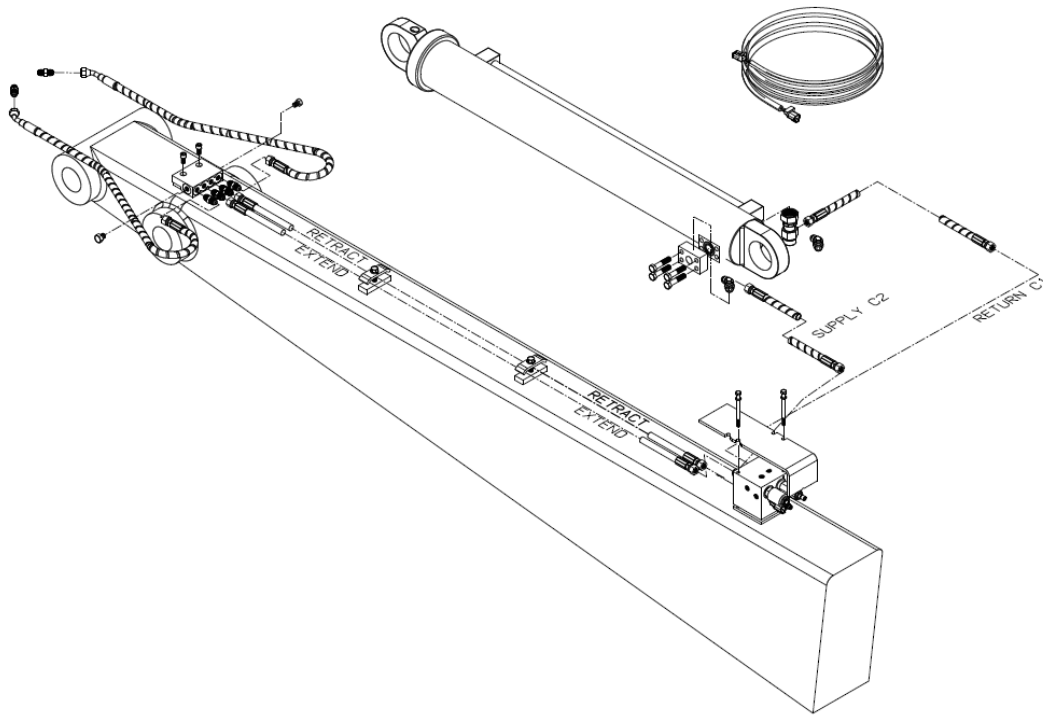


**PRODUCT MANUAL
& INSTALLATION
KIT**



D-LOCK STICK MOUNTED HYDRAULICS INSTALLATION MANUAL

THANK YOU FOR YOUR PURCHASE You have received a high quality, extremely versatile attachment that will increase your machine's capability. This D-Lock hydraulic stick installation kit was designed to be safe and efficient to install.

TELL US WHAT YOU THINK Werk-Brau would like to know what you think about its products. Please visit our website & share your experience with us!



**WERK-BRAU
Co., Inc.**

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***YOUR PARTNER IN
PRODUCTION***

IMPORTANT This instruction manual describes the installation, operation, and maintenance for a Werk-Brau D-Lock hydraulics stick install kit. Please take the time to record the information listed below.

Serial No.: _____

Model No.: _____

Date Manufactured: _____

ABOUT WERK-BRAU Since 1947, Werk-Brau has manufactured the highest quality and most innovative specialty products for the heavy equipment industry. Werk-Brau is respected internationally for providing outstanding customer service and being dedicated to excellence in all aspects of our business. Duke Werkheiser and Dutch Brautigan, for whom the company is named after, first opened their blacksmith shop in Findlay Ohio. Still today Werk-Brau manufactures and produces in Findlay Ohio, in a state of the art facility.

Over the decades Werk-Brau has grown and become so much more than a simple blacksmith operation. Today Werk-Brau proudly employs an industry leading team of professionals who work hard to follow the vision set by the founders of Werk-Brau to "Provide Excellence in Customer Service". As a modern company Werk-Brau is efficient, high-tech, dedicated to its customers, and deeply proud of the quality of products manufactured.

Werk-Brau manufactures a complete line of O.E.M. and replacement attachments for excavators, mini excavators, backhoes, mini and full size loaders and crawler loaders. All over the world Werk-Brau attachments can be found hard at work in the toughest of conditions.

THANK YOU FOR YOUR PURCHASE!

WORK SAFE

SYSTEM OVERVIEW

This hydraulic quick coupler kit allows easy switching between different attachments. An electrical control box or rocker switch actuates the coupler lock valve that directs pressurized oil to the quick coupler cylinder for locking or unlocking. The quick coupler cylinder is in the LOCK position by default. The quick coupler unlocks and releases the attachment only when the control panel switch is engaged in the unlock position and the hydraulic pressure in the bucket curl-in line exceeds **240 bar (3500 PSI)**. This safety feature in the hydraulic kit prevents accidental release of the attachment. In addition to the safety features in the hydraulic circuit, there is a load holding check valve installed on the quick coupler cylinder to prevent it from unlocking.

- Make sure the system is in the FULLY ENGAGED AND LOCK position during machine operation. This will prevent accidental release of the attachment.
- After the quick coupler unlocks/unlatches, release the attachment before moving the machine.
- It is necessary to activate the bucket curl-in function to build up pressure for ENGAGING AND RELEASING the attachment.
 - NOTE: See the Quick Coupler Operation & Maintenance Manual for complete instructions on engaging and releasing attachments.
 - NOTE: Read the following instructions before proceeding with kit installation. When applicable, pictures and other illustrations are used, refer to Appendix C for details.
- Follow these basic steps to simplify the installation of this hydraulic coupler kit:

GENERAL SAFETY GUIDELINES FOR INSTALLING THE KIT

- Read the instruction manual thoroughly to familiarize yourself with the kit before installing. 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.

PRECAUTIONS BEFORE WELDING

- NOTE: These techniques are a general guideline only. If the machine 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.
- If a gap exists between a component and the machine after welding is complete, it is necessary to weld or caulk the seam to prevent water from penetrating, which leads to rust and possible premature failure.
- After welding, all bare metal must be cleaned and painted.

BEFORE STARTING THE KIT INSTALLATION

- Check to make sure this installation kit is correct for your machine and/or attachment.
- Check the machine information against kit description. If there are any concerns or discrepancies please contact the kit manufacturer immediately. Do not use this hydraulic kit to operate anything other than the supplied Quick Coupler.
- Open crates/boxes to take inventory of parts. Compare them with the Specific 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 the kit manufacturer immediately.
- 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.
- 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.
- Steel brackets/mounts are protected from corrosion using powder coating. It may be necessary to paint welded mounts to match the machine color after completing installation and checking all hoses for binding/pinching. Ensure there is enough factory paint available to do so.
- Refer to the recommended torque charts located at the end of this manual for the proper specifications for all connections. These specs must be followed to prevent damage to the threads and flare seat. These connections and related torque specs must be checked regularly.

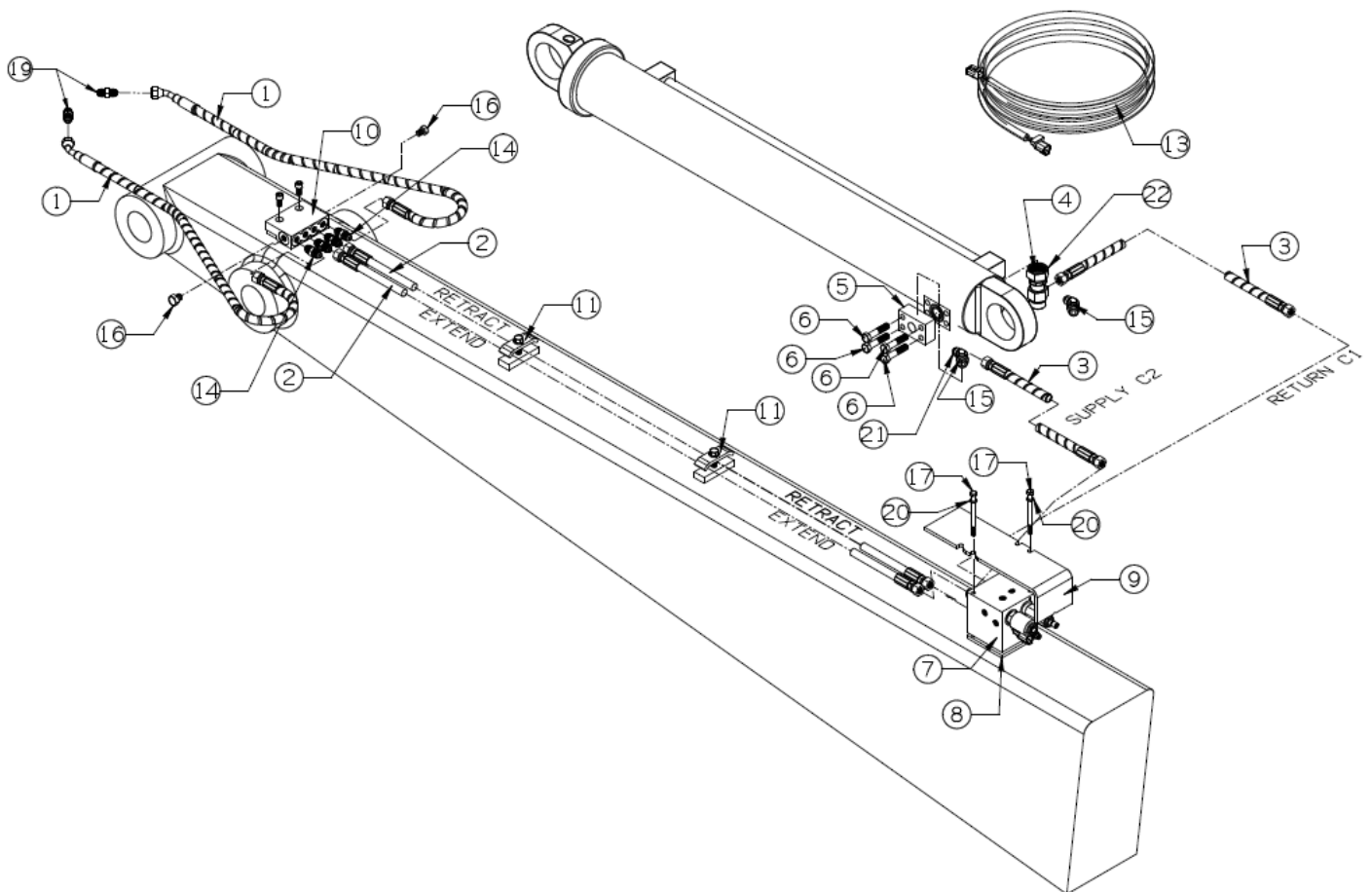
Hydraulic Installation

Main Points of Function

1. Hydraulic pressure comes from the tee fitting or gauge port block on the base end of the bucket cylinder (#6 or #7)
2. The Valve Block (#9) will not switch until the bucket is in full curl position and sees 3500 PSI.
3. There are only 6 hoses, all of which are installed only on the stick
4. First install the coupler to the machine following instructions included in the coupler 'Operator's Manual'.

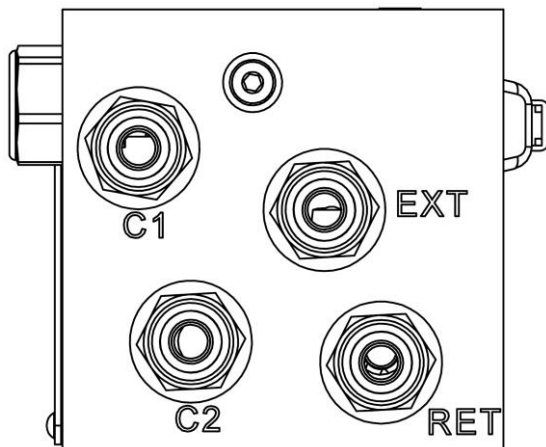
GENERIC PARTS BREAKDOWN

(Please refer to the specific breakdown included in your kit)



INSTALL

1. Extend machine's arm and boom so they are low to the ground, or at desired height to work on the top side of both.
 2. To determine "A" distance (manifold block location) the coupler must be installed, and fittings and hoses must be hand tightened to both the coupler cylinder and to the manifold block. Cycle coupler through full curl and dump range of motion to determine the most appropriate location for the manifold block that prevents any interference with the bucket cylinder while also ensuring the jumper hoses allow the coupler to move freely in the full extension and curl positions, but preventing too much slack that could cause a pinch point with linkage during rotation. Most machine breakdown prints provide a reference dimension for this position.
 3. Once the manifold block location is determined, remove hoses from the block and reinsert plugs into ports to protect from any debris during grinding & welding. Grind down paint on areas and weld into place, ensuring no welding takes place near ports. Prime and repaint.
- Note: Be sure to disconnect battery on machine prior to welding to the stick**
4. Determine appropriate locations for hose clamps, keeping in mind some machines require the clamps to be offset to one side to prevent interference with bucket cylinder. Mark location and grind down areas prior to welding in place. Only weld on sides of clamps. Prime and repaint.
 5. Install fittings into two center ports of manifold block (17). Connect extend (2) & retract (3) hoses to the two center fittings in the manifold block. Run hoses up stick and under bucket cylinder, securing with hose clamps (14). Reference the schematic below but also reference your specific kit breakdown for the hose routing.
 6. Connect the extend hose (2) (EXT port), then the retract hose (3) to the valve (RET port). Hoses should be looped under the stick cylinder.



C1 = Hose from return side of cylinder
 C2 = Hose from supply side of cylinder
 RET = Coupler cylinder Retraction line
 EXT = Coupler cylinder Extend line

7. Bolt the mounting plate (10) to the control valve (9) using the provided bolts (22). Stretch the control valve out by pulling the hoses tight and marking the location of the mounting plate on the stick. Remove the plate from valve and slide the mounting plate down several inches from

that location and mark the new location to give the stick hoses extra slack if/when they shrink. “Snake” hoses up stick if necessary. Remove paint and weld the plate in position. Prime and paint.

8. Mount valve (9) and cover plate (10) to mounting plate using mounting hardware (22).
 - a. NOTE: Only weld sides of clamps, valve plate, and manifold
 - b. NOTE: DO NOT center the hose clamps on the stick. Clamps may need to be welded towards the edge of the stick to avoid potential interference with the cylinder.

NOTE: HOSE ROUTING FROM BUCKET CURL CYLINDER SUPPLY & RETURN LINES TO THE CONTROL VALVE VARIES FROM MACHINE TO MACHINE. PLEASE REFER TO SPECIFIC BREAKDOWN INCLUDED FOR DETAILS ON THE SPECIFIC GAUGE BLOCK AND/OR TEE FITTING SET-UP.

SUPPLY LINE HOSE ROUTING: (Refer to specific schematic included with coupler that shows whether Gauge Block or Tee-Fitting style).

- a. Disconnect OEM bucket cylinder pressure hose (if the machine uses the gauge port block, first remove and disregard bolts). Install Tee-Fitting (6) or gauge port block (7) and re-connect OEM pressure hose.
- b. Connect pressure hose (5) to Tee-Fitting (6) or gauge port block (7) using the supplied fittings and route the hose under the bucket curl cylinder to port “C2” of the solenoid valve. Inspect the hose routings to ensure clearance under the bucket cylinder mounting area.

NOTE: Keep hoses clear of sharp edges and pinch points and leave one to two inches of slack in these hoses prior to mounting valve.

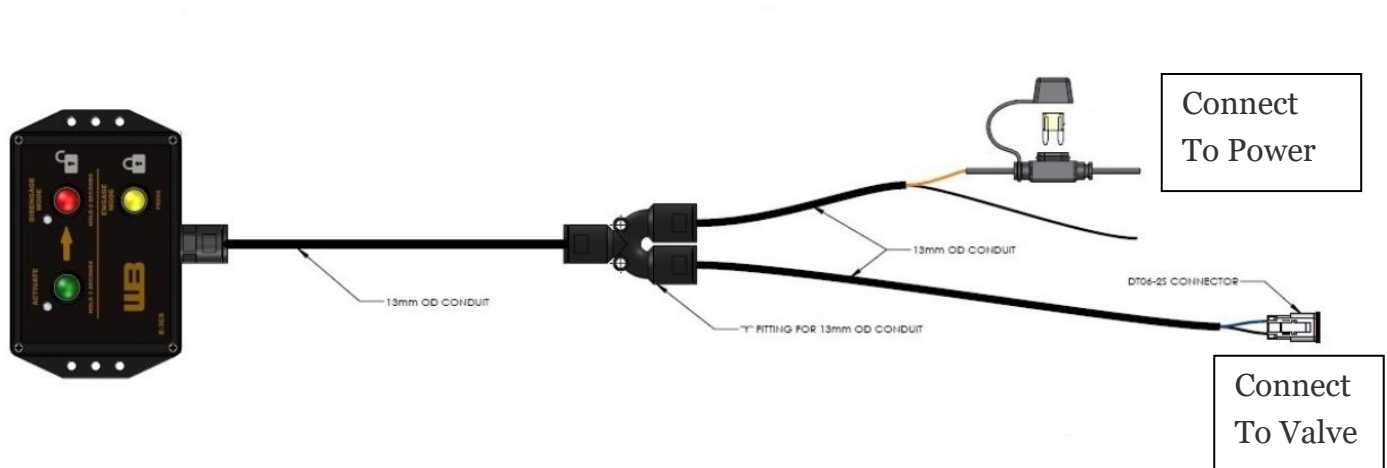
RETURN LINE HOSE ROUTING: (Refer to specific schematic included with coupler that shows whether Gauge Block or Tee-Fitting style).

- a. Disconnect OEM bucket cylinder return hose from tube line. Install Tee-Fitting (6) or gauge port block and re-connect OEM supply hose.
- b. Connect return hose (4) to Tee-Fitting (6) or gauge block using the supplied fittings and route the hose under bucket cylinder to “C1” port of solenoid valve. Inspect the hose routings to ensure clearance under the bucket cylinder mounting area.
 - i. NOTE: Keep hoses clear of sharp edges and pinch points and leave 1-2 inches of slack in these hoses prior to mounting solenoid valve. Tighten down all fittings and double check once again that hoses are free of any pinch points or edges.

CONTROL BOX AND OPERATION DECAL INSTALLATION

1. Mount the Control Box (4) in the cab so it is visible when seated in the operator's seat. It is possible to use double sided tape or screws using the mounting flange that is part of the Control Box (4). Some kits come with a bracket to hold the switch.
2. Locate a switched power source to supply power to the Control Box (4). More details on the Control Box (4) connections can be found in the view below.
3. The Operation Decals should be installed inside the cab so they are visible when seated in the operator's seat. It is also suggested that Operation Decals are installed near the Control Box (4) for quick reference.
4. Once a suitable location is chosen, clean the area thoroughly to remove all dirt, grease, oil etc. using alcohol or equivalent cleaning/degreasing agent.
5. Remove the protective sheet from the back of the Operation Decals. Place the decal and smooth to remove all air bubbles.
6. It is very important that no air bubbles are trapped. Air bubbles will severely reduce the life of the Operation Decal. If necessary, smooth the Operation Decal with a smooth piece of plastic or squeegee.
7. Run the valve harness (approx. 50' or 60' based on your specific kit) from under the cab and up the stick to the coupler valve. Connect to the valve and switch.

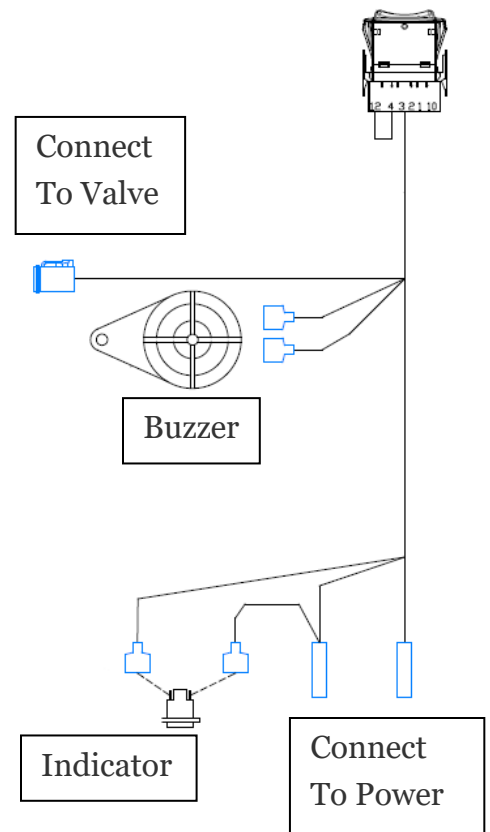
Control Box:



ROCKER SWITCH INSTALLATION

1. To install the rocker switch, first find an empty toggle slot inside the cab and remove the blank cover. You may need to increase the size of the slot for the new switch to fit.
2. If the machine has a coupler or quick hitch connector in the cab, locate it and use the provided Power/Ground harness and/or accessories included in the kit to supply power to the Rocker Switch. The result will be to provide power to the black and red butt splices of the rocker switch harness.
3. An indicator and buzzer are also included as part of the rocker switch harness. It is not necessary to have the indicator and buzzer visible for the operator, but it may be helpful to position the buzzer and cable tie it in place so that it is audible for the operator during operation.

Rocker Switch:



D-LOCK OPERATION:

1. Please refer to Werk-Brau D-LOCK Operators manual for proper safety and operation of the coupler

TROUBLESHOOTING:

1. If control box buzzer sound is not working (both slow initial then constant beep) verify wire connections and ensure proper voltage, then try again. If connections are verified and proper voltage is getting to switch and buzzers are still not working, contact Werk-Brau technical support @ 1-800-537-9561.
2. If signal is not getting out to the valve, verify all wire connections on machine side and plug into valve. Verify proper voltage at valve
3. If valve is making “squealing” sound when in extension/locking motion, you most likely have air in the lines. Bleed out air in lines and try again. This may take time depending on how much air and how far air needs to travel to get flushed out. Air can also get flushed out by cycling through the lock/unlock function on the coupler. Again this can take multiple cycles to get all air flushed out. If noise does not go away after each of the above is performed, contact Werk-Brau as there could be a relief setting issue in the valve.
4. If cylinder is retracting in the “lock” function, verify all hoses from coupler cylinder to the valve are tying into the correct ports as they are most likely routed backwards.

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.

JIC 37° Flare Tube Fitting (J/JFS)			
Tube Size	Thread UNF-2A	Torque ft-lbs	Torque N-m
-2	5/16 - 24	6-7	8-9
-3	3/8 - 24	8-9	11-12
-4	7/16 - 20	11-12	15-16
-5	1/2 - 20	14-15	19-21
-6	9/16 - 18	18-20	24-28
-8	3/4 - 16	36-39	49-53
-10	7/8 - 14	57-63	77-85
-12	1 1/16 - 12	79-88	107-119
-14	1 3/16 - 12	94-103	127-140
-16	1 5/16 - 12	108-113	147-154
-20	1 5/8 - 12	127-133	172-181
-24	1 7/8 - 12	158-167	215-226
-32	2 1/2 - 12	245-258	332-350

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 opposed 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.

- Note: The O-ring will be permanently damaged if it is not seated properly and the connection will leak.
O-Ring Installation:
- 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, cleaned, etc. 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.
- Pay close attention to make sure there is no pinching, bunching, twisting, or misalignment of the O-ring.
- Take care not to get grease on threads. Tighten the fitting to the correct torque spec on the table below. Do not allow the mating surfaces to twist or rotate across each other as this can cause damage to the O-ring.

Torque Specifications for ORFS Connections

O-Ring Face Seal Fitting (ORFS) (F/FF)			
Tube Size	Thread Size UNF-2A	Torque ft-lbs	Torque N-m
-4	9/16 - 18	10-12	14-16
-6	11/16 - 16	18-20	24-27
-8	13/16 - 16	32-35	43-47
-10	1 1/4 - 14	46-50	60-68
-12	1 3/16 - 12	65-70	90-95
-16	1 7/16 - 12	92-100	125-135
-16	1 11/16 - 12	125-140	170-190
-20	2 - 12	150-165	200-225

Note:

1. If a Torque Wrench is not available, an alternate method of assembly is the Flats
2. From Wrench Resistance (F.F.W.R.).
 - a. Tighten the nut onto the fitting body until light wrench resistance is reached.
 - b. Tighten further to the appropriate F.F.W.R. value shown.
 - c. 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.

Size	Recommended Torque											
	Grade 2		Grade 5		Grade 8		18-8 S/S		Bronze		Brass	
	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine
#4*	-	-	-	-	-	-	5.2	-	4.8	-	4.3	-
#6*	-	-	-	-	-	-	9.6	-	8.9	-	7.9	-
#8*	-	-	-	-	-	-	19.8	-	18.4	-	16.2	-
#10*	-	-	-	-	-	-	22.8	31.7	21.2	29.3	18.6	25.9
1/4"	4	4.7	6.3	7.3	9	10	6.3	7.8	5.7	7.3	5.1	6.4
5/16"	8	9	13	14	18	20	11	11.8	10.3	10.9	8.9	9.7
3/8"	15	17	23	26	33	37	20	22	18	20	16	18
7/16"	24	27	37	41	52	58	31	33	29	31	26	27
1/2"	37	41	57	64	80	90	43	45	40	42	35	37
9/16"	53	59	82	91	115	129	57	63	53	58	47	51
5/8"	73	83	112	128	159	180	93	104	86	96	76	85
3/4"	125	138	200	223	282	315	128	124	104	102	118	115
7/8"	129	144	322	355	454	501	194	193	178	178	159	158
1"†	188	210	483	541	682	764	287	289	265	240	235	212

* Sizes from #4 to #10 are in lb-in.

Sizes from 1/4" up are in lb-ft.

† Fine thread figures are for 1"-14.

Grade 2, 5, and 8 values are for slightly lubricated bolts.