

# WERK-BRAU CO., INC.

## PRODUCT AND INSTALLATION MANUAL

### Loader Coupler Hydraulic Kit (WERBR-LK24 – 12/24V Kit)

REV. DATE  
11/15/15

ISSUE DESCRIPTION  
REVISED BY PRODUCTION

BY  
MJD

DATE  
5/16

### WERBR-LK24 / WERBR-LK12

#	DESCRIPTION	PART #	QTY
1	40' HOSE - 1/2" ID	4010-02-24-02-40-1/2	2
2	90' HOSE	4010-02-24-02-90-1/2	2
3	72" HOSE	4010-02-24-02-72-1/2	2
4	1/4" HOSE	4010-02-24-02-1/4-1/4	4
5	WIRE TIES	115-7550-1000	30
6	OLJIC MALE - 04000 MALE	6000-00-04	6
7	OLJIC MALE - 00000 MALE 90'	6001-00-00	6
8	OLJIC MALE - 00000 MALE	6000-00-00	4
9	04000-04000 MALE 90' SHIM	6000-00-00	1
10	04000-04000 MALE 90' SHIM	6000-00-00	1
11	WIRE TIE	1157100	1
12	1/4" ID x 1/4" ID NUT	1157100	2
13	1/4" WIRE	1157100	2
14	1/4" ID WIRE NUT	1157100	2
15	WIRE TIE	1157100	1
16	1/2" VOLT / 12 VOLT VALVE	5000-00-00-1/2" VOLT	1
17	WIRE TIE	1157100	1
18	WIRE CLAMP	1157100	4
19	OLJIC MALE - OLJIC FEMALE	* 6000-00-00	2
20	OLJIC MALE - OLJIC FEMALE	* 6000-00-00	2
21	OLJIC MALE - OLJIC FEMALE	* 6000-00-00	2
22	OLJIC MALE - OLJIC FEMALE	* 6000-00-00	2
23	OLJIC MALE - OLJIC FEMALE	* 6000-00-00	2
24	1/2" HOSE	* 4010-02-24-02-1/2	2
25	INSTRUCTIONS AND STICKERS	INST-WERBR-LK	1
26	WIRE CLAMP	1157100	1

WERBR-LK

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2800 POSTORIA AVE. P.O. BOX 545 FINDLAY, OHIO 45840-0545  
www.werk-brau.com PHONE: 419-422-2012 FAX: 419-422-7207

WELD SPEC: WELDS TO CONFORM TO F7. PRO-16 ARC WELDING QUALITY STANDARD DATE: 11/15/15 WEIGHT: - Lbs.  
MACHINE: - PART No.: WERBR-LK24 Dwg. No.: WERBR-LK24  
THIS PRINT AND THE INFORMATION CONTAINED HEREIN IS A CONFIDENTIAL DISCLOSURE. THE SUBJECT MATTER IS THE PROPERTY OF WERK-BRAU CO., INC. DRAWN: A

Serial No:

Model No:

Date Manufactured:



PROUDLY MANUFACTURED IN FINDLAY, OH  
Werk-Brau.com



## TABLE OF CONTENTS

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**Werk-Brau.com**

TITLE	PAGE
General Safety Guidelines for Kit Installation	3
Before Starting the Kit Installation	4
JIC 37° Flare Connections	5
O-Ring Face Seal Connections	6
Standard Tightening Torque	7
Precautions Before Welding	7
System Overview	8
Troubleshooting	8
Schematic	9
Loader Hoses	10
Control Valve	10
Finish and Test	11

If at any time in the future, you require additional information on this product or any aspects of its use, please do not hesitate to contact Werk-Brau Co., Inc.

## General Safety Guidelines

- 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 the 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 welding instructions.
- Use safety protection such as a hardhat, working gloves, safety shoes and safety glasses as needed to safely do the job.
- Lower the bucket or any attachment to the ground prior to any work being completed.
- 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 compartments 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 the machine.
- Kit installation procedures outlined in this instruction manual have been arranged to keep 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.
- 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 the kit description. If there are any concerns or discrepancies, please contact the kit manufacturer immediately.
- Open crates/boxes to take inventory of parts prior to installation. 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 the kit manufacturer immediately.
- Read the instructions manual to familiarize yourself with the installation kit.
- For the purpose of this 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 for any spilled fluids.
- Disconnect the 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.

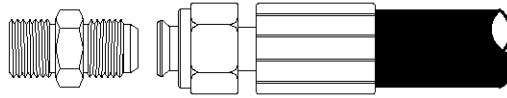


Figure 1. Female Swivel without Sleeve

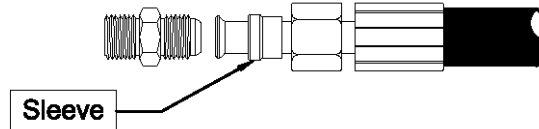


Figure 2. Female Swivel with Sleeve

Nominal Size	Dash Size <sup>3</sup>	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 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 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.

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 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 loader manufacturer has published welding guidelines, use them instead.
- Turn off 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 instruction manual describes the installation of the hydraulic kit that will operate the Werk-Brau Loader coupler on a pilot operated Loader. This hydraulic circuit uses pilot pressure (Min. 300 PSI / Optimal 500 PSI / Max. 1,500 PSI) to lock and unlock the coupler.
- The coupler attaches onto various designated coupler series. Examples: J416, 418, 420, A30, 60, ISO, Etc.
- To disengage (unlock) the coupler, position the machine as described in the “Operation and Maintenance” manual, also supplied with this coupler.
- Before operating a machine with a Werk-Brau coupler, visually check the coupler for any issues such as cracking, missing bolts, leaks, etc.
- 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 a safe and proper connection has been made.
- **NOTE:** Pictures and diagrams throughout this manual may not be your exact Werk-Brau coupler. The pictures represent an action or a setup required for installation and operation.

## Troubleshooting

- Coupler will not function at all from start.
  - Double check hoses are routed correctly, most likely positions 2 & 4 are switched (shown on page 9).
- Coupler will not disengage.
  - Double check valve. The solenoid may have been shorted out or does not have enough power to actuate.
- Coupler will not disengage.
  - Double check the voltages on the machine and valve match.



# Schematic

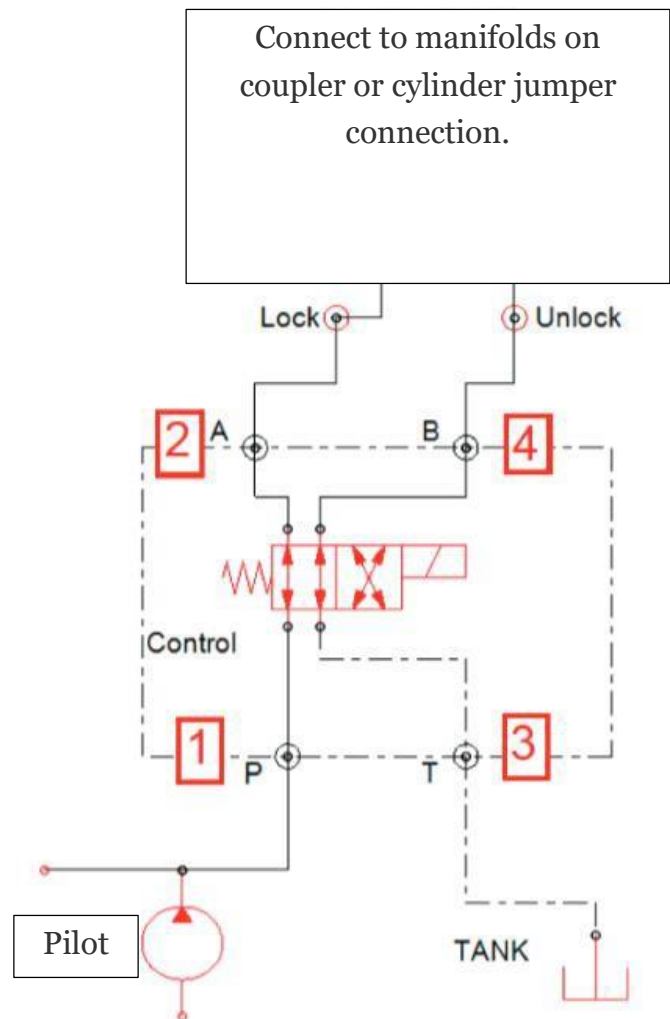
**Note:** Number on valve match up with numbers on diagram.

1 = Pilot Side

2 = A or base end of cylinder

3 = Tank

4 = B or rod end of cylinder



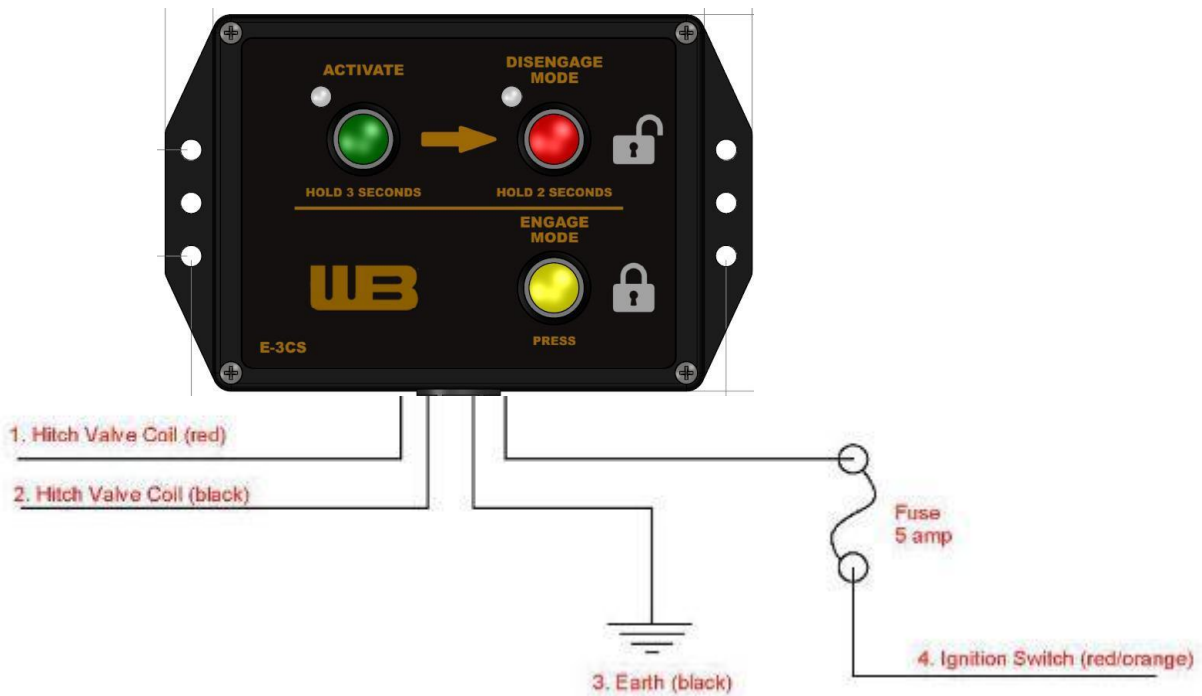
## Loader Hoses

This kit contains varied pre-made lengths of hoses at 48, 72, 96 and 144 inches.

- The figure on the previous page shows a generic installation for illustration purposes only.
- Install the straight adapters to the ports on the coupler lock cylinder. Connect the 48" hoses to the coupler manifold fittings and the other end of the hoses to the fittings on the block assembly on the stick.
- Curl the bucket in as far as possible and let this suggest the mounting location of the blocks. This may require adjustments so clamp or tack weld the block in place. Do not finish weld until all hoses have been checked for pinching or binding.
- Leave a small amount of slack in the hoses to allow for cylinder movement while locking and unlocking.
- Next move the bucket to its fully dump position to ensure that the hoses don't bind or pinch.
- This is a good time to cycle the bucket throughout its full range of motion to ensure that neither the bucket cylinder nor do the linkages come in contact with the junction block.
- **NOTE: It is important to understand that some rubbing on the top and sides of the stick will be unavoidable.**
- Measure the required length of hose to reach the valve mounting location as described in the next section of this manual. Unions have been provided to prevent the need to have one long hose from the stick to the valve. This is an installer preference only and will not affect the function of the circuit.
- Connect the hoses to the blocks and route them up the loader arms. Be sure to allow enough hose in the pivot areas of the machine. Use the hose clamps and wire ties to secure the hoses to the stick, boom and existing hoses.
- If using the clamps, first tack weld the bases in place. Once the location is finalized, remove the hoses and finish weld the bases.
- Install hoses and check for correct alignment and routing. Operate the machine 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. Make adjustments as necessary.

## Control Valve

- Locate a good mounting location for the coupler lock valve, near the pilot pump outlet line. The mount can be bolted or welded in place.
- Locate the hose at the pump outlet port. Disconnect the hose at the pump and install the tee. Reconnect the existing hose to one end of the tee. Measure the appropriate length of hose to connect the "P" port on the valve to the pilot line tee.
- Locate an existing JIC 06 (3/8") tank line. Disconnect the existing hose and install tee. Reconnect the existing hose to one end of the tee. Measure the appropriate length of hose to connect the "T" port on the valve to the tank line tee and cut to length. Install the hose ends and connect the hose.
- Measure the required length of hose to reach from the valve mounting location to the blocks on the stick.



## Finish and Test

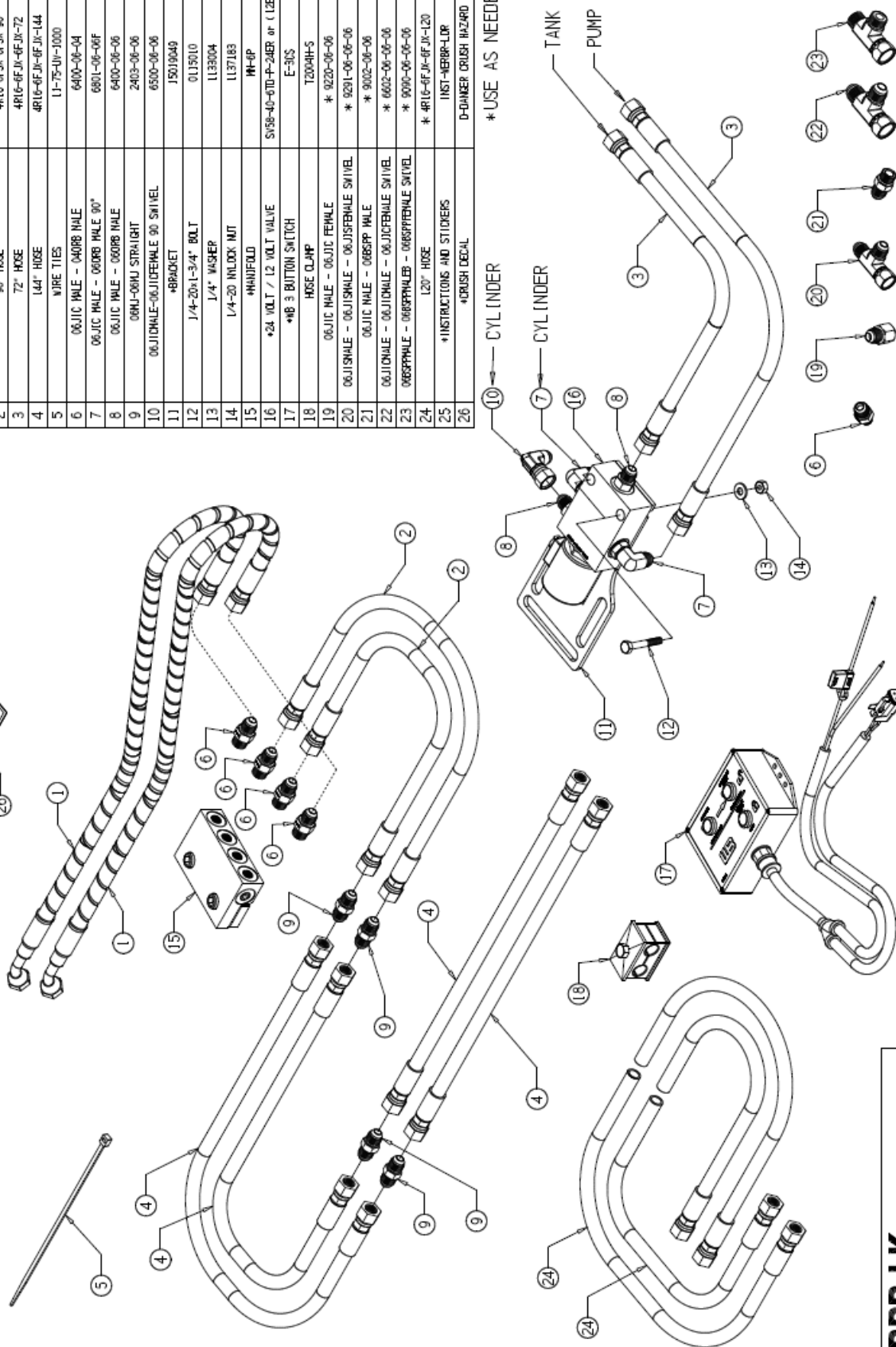
- Before starting this section, position the machine in the oil level check position as suggested by the loader manufacturer. Check the oil level sight gauge on the hydraulic tank to ensure that the machine has enough hydraulic oil. Add hydraulic oil (*use only loader manufacturer recommended grade*) if 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.
- Check again for proper hose movement and routing, then tighten all clamps, hoses and fittings.
- Paint brackets and clamps to match the loader.
- Make sure the hoses 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 the 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.
- 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. Visit [Werk-Brau.com](http://Werk-Brau.com) for more information or locating any missing information.*
- 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 of 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.

REV	DATE	CHANGE DESCRIPTION	BY	CHECKED
1	11/18/15	CHANGE DESCRIPTION RELEASED TO PRODUCTION	REH	GJS

# WERBR-LK24 / WERBR-LK12

#	DESCRIPTION	PART #	QTY
1	48" HOSE w/GUARD	4R16-4F-JK-4F-JK-48 w/PMD	2
2	90° HOSE	4R16-4F-JK-4F-JK-90	2
3	72" HOSE	4R16-4F-JK-4F-JK-72	2
4	144" HOSE	4R16-4F-JK-4F-JK-144	4
5	WIRE TIES	11-75-10-1000	30
6	06JIC MALE - 0608B MALE	6400-06-04	6
7	06JIC MALE - 0608B MALE 90°	6801-06-06F	6
8	06JIC MALE - 0608B MALE	6400-06-06	4
9	06JIC MALE - 0608B MALE	2403-06-06	6
10	06JIC MALE - 0608B MALE 90° SWIVEL	6500-06-06	1
11	BRAKET	15019049	1
12	1/4-20x1-3/4" BOLT	0115010	2
13	1/4" WASHER	1138004	2
14	1/4-20 NUT	1137183	2
15	WASHER	W-4P	1
16	*24 VOLT / 12 VOLT VALVE	SV58-40-010-P-24ER or (12ER)	1
17	*#3 BUTTON SWITCH	E-3IS	1
18	HOSE CLAMP	T2004H-5	4
19	06JIC MALE - 06JIC FEMALE	* 9220-06-06	2
20	06JIC MALE - 06JIC FEMALE SWIVEL	* 9291-06-06-06	2
21	06JIC MALE - 0608B MALE	* 9002-06-06	2
22	06JIC MALE - 06JIC FEMALE SWIVEL	* 6602-06-06-06	2
23	0608B MALE - 0608B FEMALE SWIVEL	* 9000-06-06-06	2
24	120" HOSE	* 4R16-4F-JK-4F-JK-120	2
25	*INSTRUCTIONS AND STICKERS	INST-WERBR-LK12	1
26	*CRUSH DECAL	D-DUMPER CRUSH HAZARD	1

\*USE AS NEEDED



**WERBR-LK**

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WELD SPEC: WELDS TO CONFORM TO P7, P706-MB ARC WELDING QUALITY STANDARD  
 MACHINE: -  
 PART No.: WERBR-LK12, CKD  
 DWG. NO.: WERBR-LK12, CKD

DATE: 11/18/15 WEIGHT: - Lbs.  
 REVISION  
 A  
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**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**

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