Introduction

We would like to thank you for purchasing the **Hard Hose Drag Reel Clutch Upgrade Kit**. This upgrade kit will improve the retrieve and pull out cycle of your equipment.

Figure 1 - Upgrading your Hard Hose Drag Reel

img-00272.png

BEFORE attempting to install this **Hard Hose Drag Reel Clutch Upgrade Kit**, inspect for damaged or missing parts. **REPORT ANY DAMAGE TO CADMAN POWER EQUIPMENT LIMITED OR YOUR LOCAL DEALER IMMEDIATELY!**

Kit Contents

The following shows the contents required to complete the **Hard Hose Drag Reel Clutch Upgrade**.

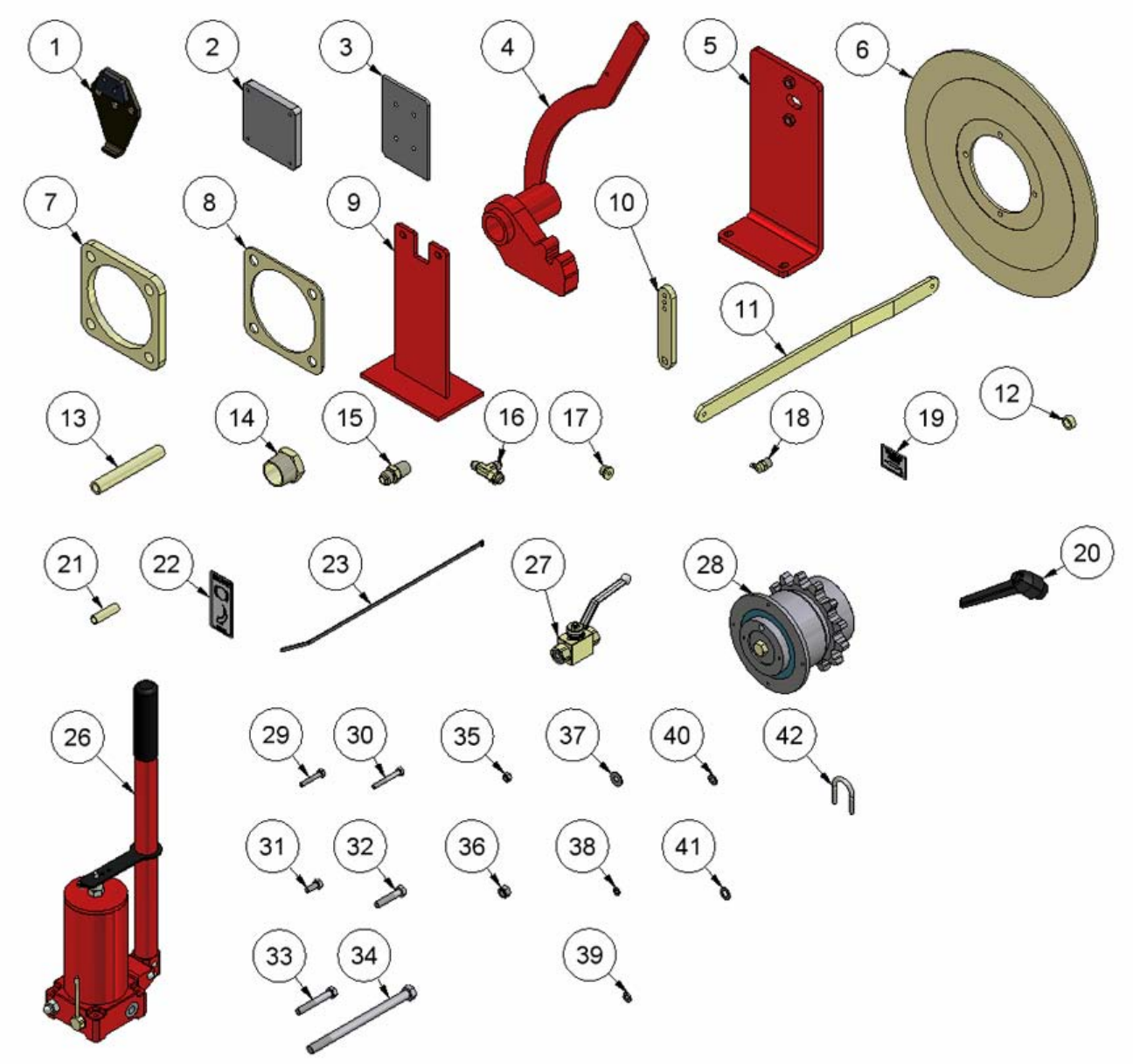

Figure 2 - Kit Contents

img-00328.png

Item	Description	Part Number	QTY	4600 S	4600 L	5500 L
1	BRAKE CALIPER HALF	17-639	2	X	X	X
2	MOUNT PLATE - HAND PUMP 050	22-210	1	X	X	X
3	SHUT OFF VALVE MOUNT PLATE 019	22-451-A	1	X	X	X
4	DRUM LOCK WELDMENT PAINTED	22-610-B	1	X	X	X
5	BRAKE CALIPER BRACKET WELDMENT	22-650	1	X	X	X
6	BRAKE DISC - MACHINED	22-651	1	X	X	X
7	SPACER PLATE – MOTOR 0.50	22-654	2	X	X	X
8	SPACER PLATE – MOTOR 013	22-655	2	X	X	X
9	CLUTCH SUPPORT WELDMENT	22-656	2	X	X	X
10	VALVE HANDLE 038	22-657	1	X	X	X
11	VALVE TIE BAR 025	22-658	1	X	X	X
12	SPACER BRAKE BOLT 3/4 x 120 WALL	22-781	1	X	X	X
13	SLEEVE BRAKE BOLT 3/4 x 120 WALL	22-799-A	1	X	X	X
14	1 1/4" STEEL PIPE HEX HEAD PLUG	25-WHD-3159X20	2	X	X	X
15	1/4 x 1/8 MALE CONNECTOR	25-WHD-48X4	2	X	X	X
16	RUN TEE - #6 JIC x #6 JIC x #6 SAE	25-WHD-5716X6	1	X	X	X
17	PLUG - #6 SAE	25-WHD-7238X6	2	X	X	X
18	1/8 NPT 45 DEG GREASE FITTING	40-001-45	1	X	X	X
19	DECAL - GREASE POINT	40-041-A	1	X	X	X
20	BRAKE HANDLE	40-179	1	X	X	X
21	SPACER, 1/2 x 1 3/4 LG.	40-183	2	X	X	X
22	BRAKE DECAL (W/ VERTICAL ARROW)	40-188-A	1	X	X	X
23	CABLE TIE - 14 IN. BLACK	40-425	8	X	X	X
24◆	1/4 IN. X 41 IN. HYDRAULIC HOSE	40-HHZ-0171	1	X	X	X
25◆	1/4 IN. X 120 IN. HYDRAULIC HOSE	40-HHZ-0172	1	X	X	
—◆	1/4 IN. X 149 IN. HYDRAULIC HOSE	40-HHZ-0176	1			X
26	HYDRAULIC HAND PUMP	40-HYD-HP22SA50	1	X	X	X
27	1/4 IN. HIGH PRESS. BALL VALVE - FXF	40-HYD-VLV025BLLFF	1	X	X	X
28	CLUTCHED DRIVE SPROCKET - SHORT	42-081	2	X		
—	CLUTCHED DRIVE SPROCKET - LONG	42-081-L	2		X	X
29	1/4-20 X 1 1/2 STAINLESS STEEL BOLT	88-BLT-02520X150	2	X	X	X
30	1/4-20 X 2 LG. STAINLESS STEEL BOLT	88-BLT-02520X200	4	X	X	X
31	5/16-18 X 3/4 LG. STAINLESS BOLT	88-BLT-03118X075	8	X	X	X
32	3/8-16 X 1 3/4 STAINLESS STEEL BOLT	88-BLT-03816X175	2	X	X	X
33	3/8-16 X 2 1/2 STAINLESS STEEL BOLT	88-BLT-03816X250	2	X	X	X
34	1/2-13 X 7 1/2 LG. STAINLESS BOLT	88-BLT-05013X750	1	X	X	X
35	1/4-20 STAINLESS STEEL LOCKNUT	88-NUT-LOC025-20	6	X	X	X
36	3/8-16 STAINLESS STEEL LOCKNUT	88-NUT-LOC038-16	2	X	X	X
37	5/16 STAINLESS FLAT WASHER	88-WSR-FLT031	2	X	X	X
38	1/4 STAINLESS STEEL LOCK WASHER	88-WSR-LOC025	4	X	X	X
39	5/16 STAINLESS STEEL LOCK WASHER	88-WSR-LOC031	8	X	X	X
40	1/4 STAINLESS SAE FLAT WASHER	88-WSR-SAE025	8	X	X	X
41	3/8 STAINLESS SAE FLAT WASHER	88-WSR-SAE038	2	X	X	X
42	1/4-20 ROUND U-B0LT	90-UBT-RND02520X200	2	X	X	X
43◆	4600M/5100M/5500M MANUAL	TR-MAN-5155M	1	X	X	X

◆ = Not Shown

Safety Note

Before undertaking this upgrade, be sure to read and **understand** all instructions within this manual. Failure to comply with the safety information can result in serious injury or death.

This upgrade must be done ONLY when the machine is shut down and is in a non-loaded condition. This means that no fluid is being pumped through the reel and all mechanical and hydraulic tension has been released from the hose rewind system and stabilizers.

1. Perform this upgrade and all other maintenance service on firm level ground.
2. Use wheel chocks to prevent the machine from moving during the upgrade.

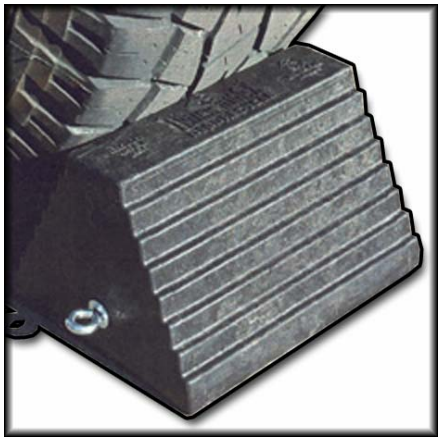

Figure 3 - Wheel Chock

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3. Only a certified welder should perform any welding during this upgrade.

Hydraulic Tank Removal

The first part of the Hard Hose Drag Reel Clutch Upgrade is the removal of the Hydraulic Tank and plumbing.

Step 1

Before any dismantling can begin you must first drain the hydraulic tank located at the front right of the machine. Be prepared with a large reservoir (approximately 10 gallons if tank is full). Remove the drain plug. Wait until the contents have been drained.

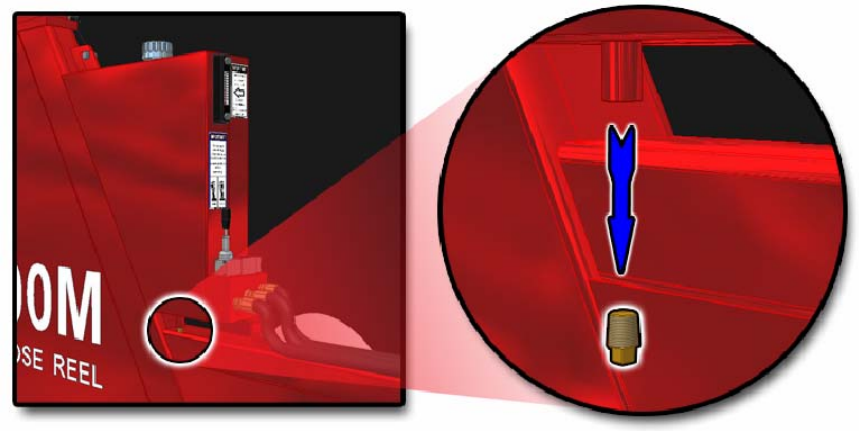

Figure 4 - Remove Drain Plug

img-00273.png

Step 2

Remove the hydraulic tank hoses at the right hand motor and allow the oil to drain. Remove the reducer bushings to prepare for the next step.

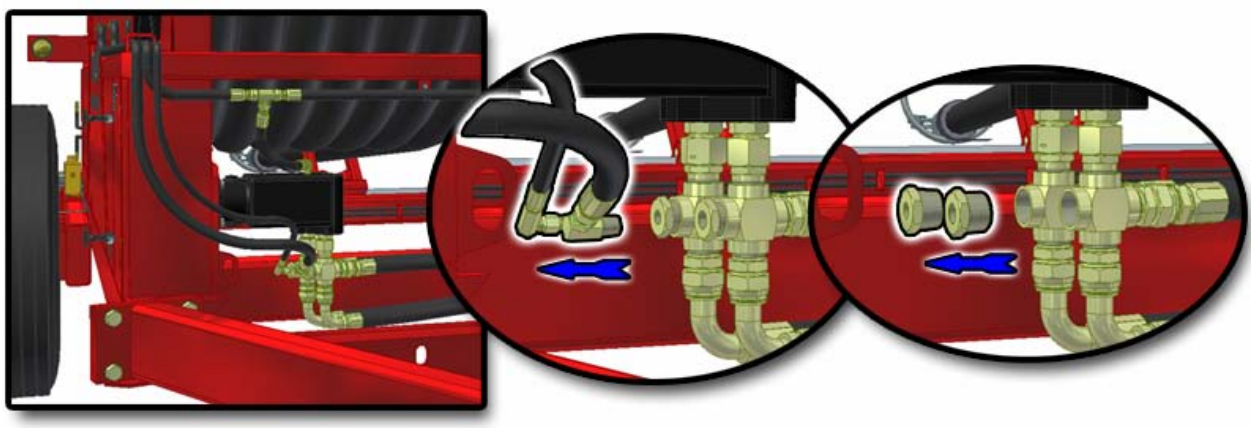

Figure 5 - Remove Tank Hoses from Motor

img-00274.png

Step 3

Install the provided hex head plugs (P/N 25-WHD-3159X20) to prevent more spillage.

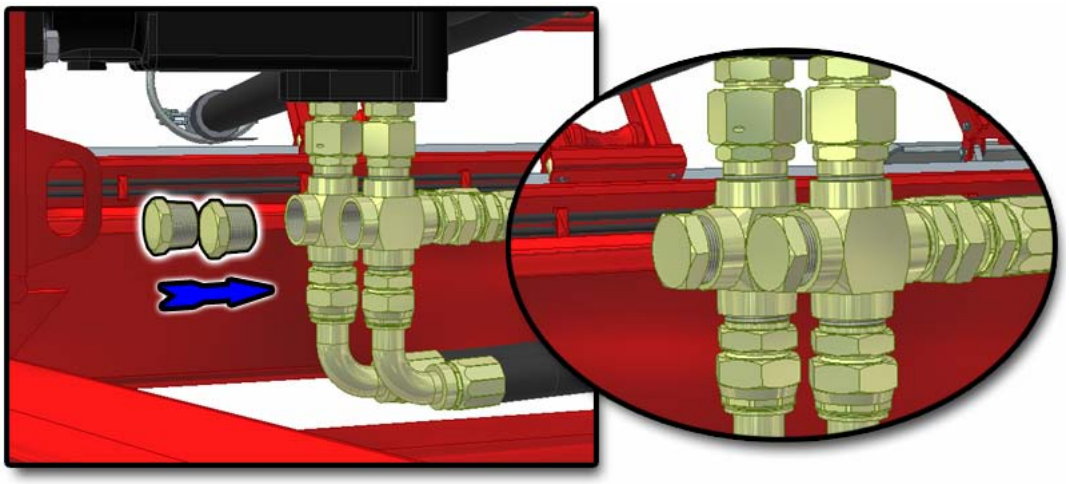

Figure 6 - Install Plugs

img-00275.png

Step 4

Remove the case drain hoses on each hydraulic motor and allow the oil to drain from the hose. Also remove the hose hangers.

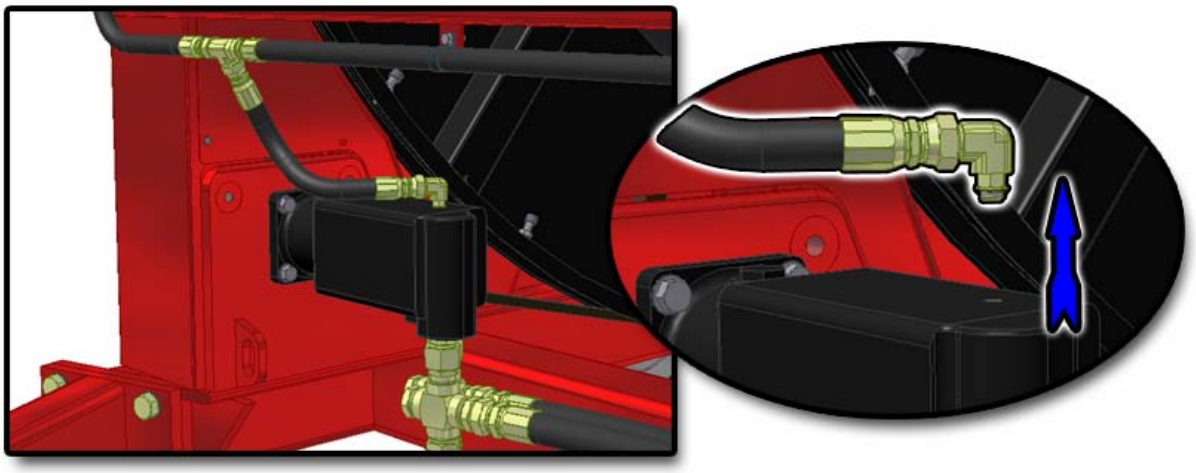

Figure 7 - Remove Case Drain Hoses

img-00276.png

Step 5

Install the plugs provided (P/N 25-WHD-7238X6).

Figure 8 - Install Plugs

img-00277.png

Step 6

Reinstall the drain plug and remove the hydraulic tank assembly from the machine.

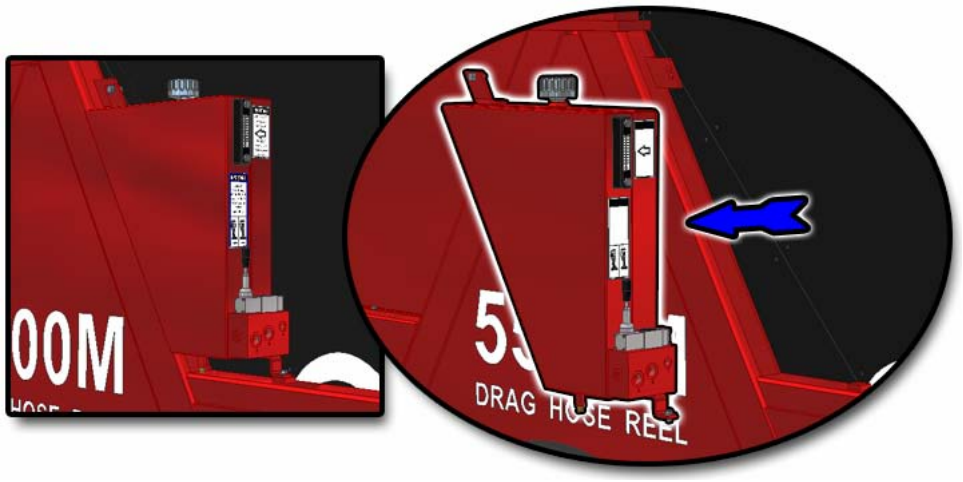

Figure 9 - Remove Hydraulic Tank

img-0278.png

Shut Off System Rework

Complete the following instructions to successfully rework the Shut Off System.

Step 1

Label each hose before removal to ensure proper re-installation. Remove both hydraulic hoses from the left side stabilizer cylinder. Feed the hoses through the hose guide and move them away from the Shut Off Valve Assembly.

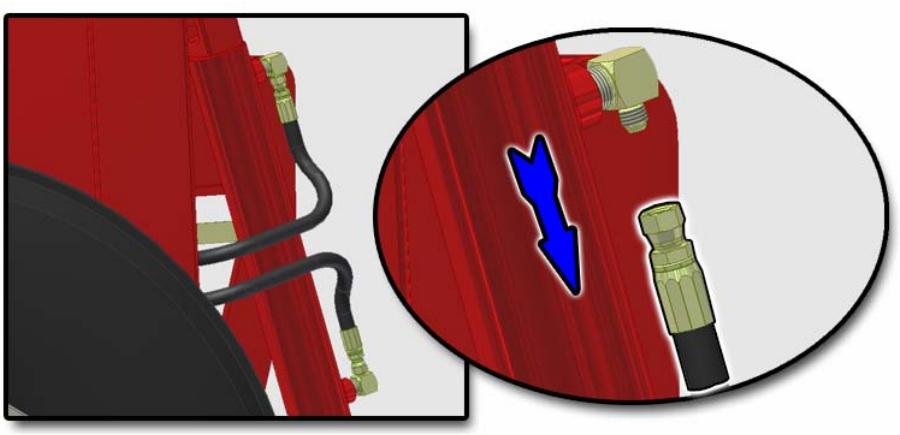

Figure 10 - Remove Left Stabilizer Cylinder Hoses

img-00279.png

Step2

Remove the Shut Off Bar Latch.

Figure 11 - Remove Latch

img-00280.png

Step 3

Remove the valve connecting rod assembly.

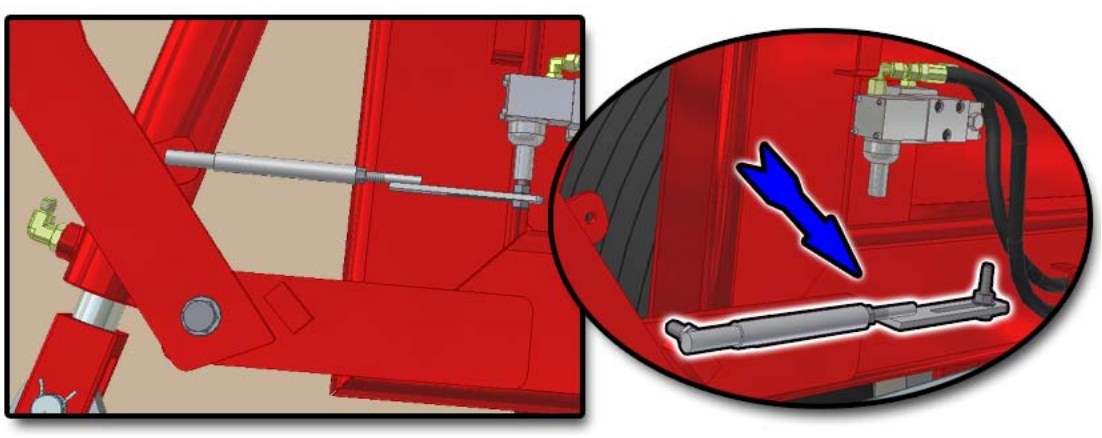

Figure 12 - Remove Connecting Rod Assembly

img-00281.png

Step 4

Remove the hydraulic hoses connected to the Shut Off Control Sub-Plate. Place the hoses out of the way.

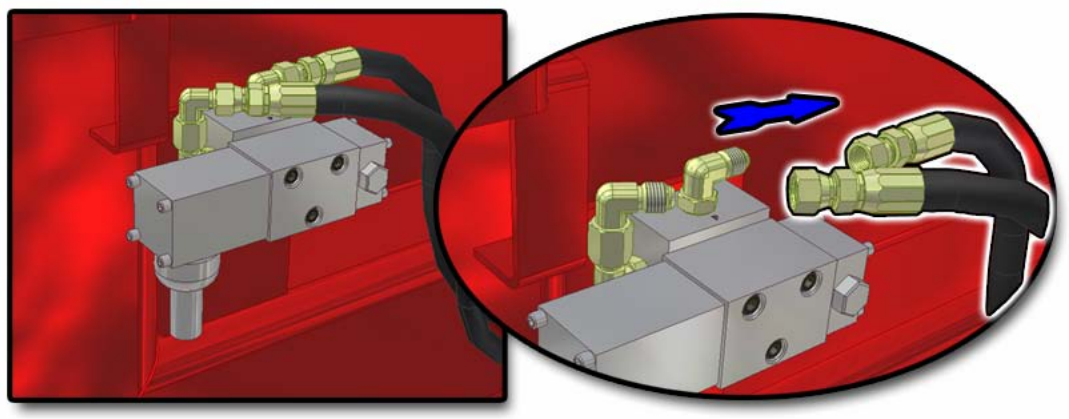

Figure 13 - Remove Shut Off Hoses

img-00282.png

Step 5

Remove the Shut Off Control Valve and Control Sub Plate.

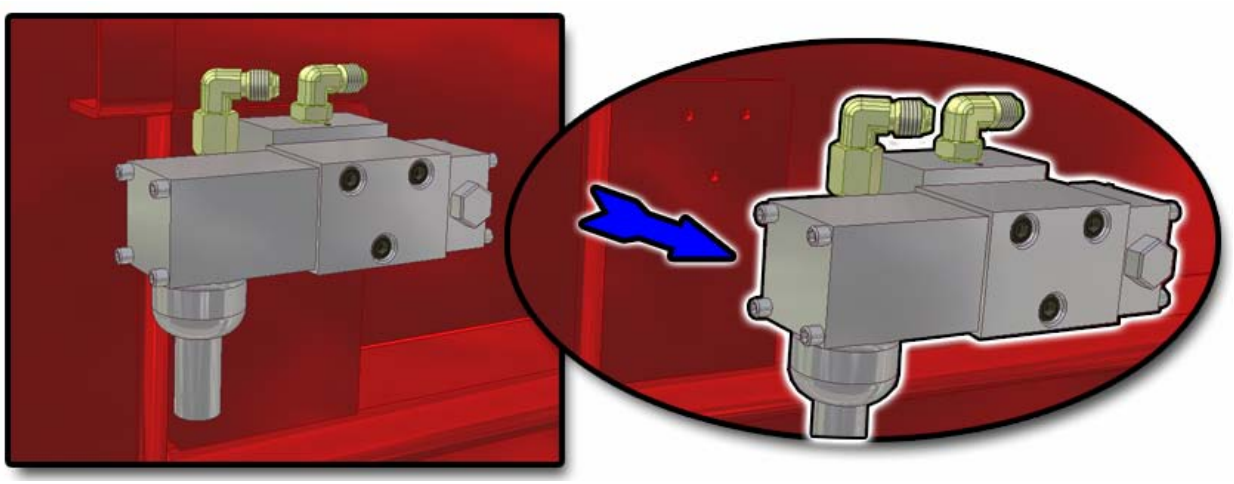

Figure 14 - Remove Shut Off Valve and Sub Plate

img-00283.png

Step 6

Using a cutting tool (i.e. angle grinder with cutting wheel) remove the hose guide and valve mount shown. Be careful not to cut into the frame tubes.

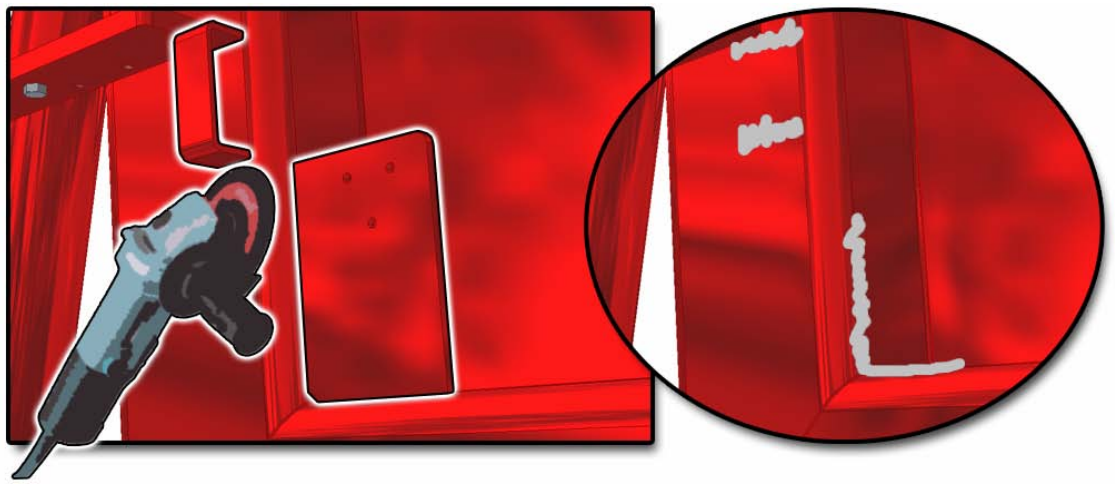

Figure 15 - Remove Hose Guide and Valve Mount

img-00284.png

Step 7

Prepare an area on the frame to weld the hose guide removed in the previous step. See Figure 17 below for location. Use a 1/8" fillet weld on the top and bottom of the hose holder.

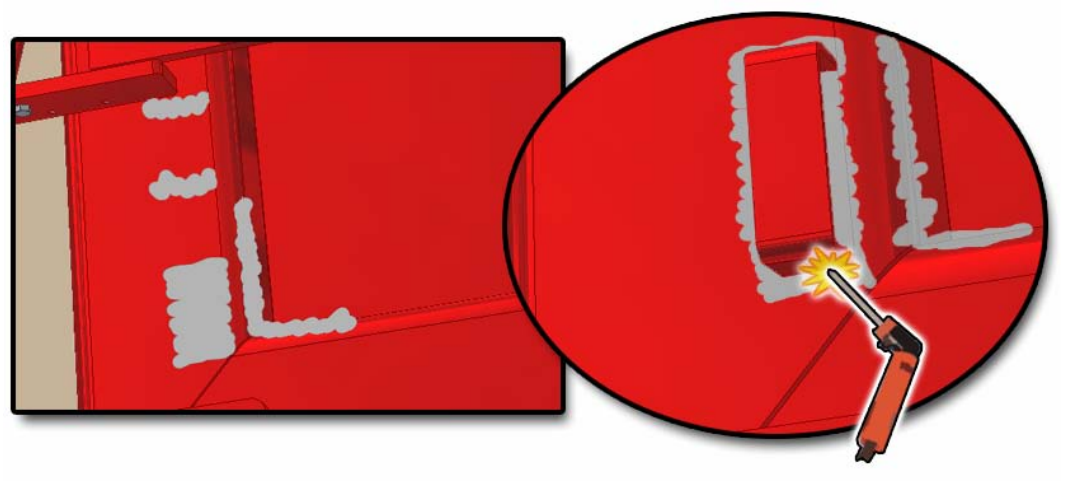

Figure 16 - Weld hose guide in new Location

img-00285.png

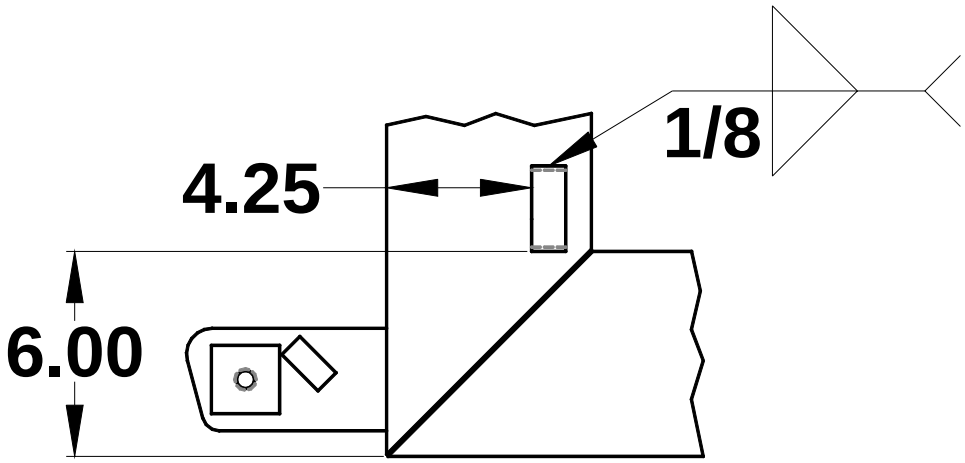

Figure 17 - Dimension - Hose Holder Location

img-00286.wmf

Step 8

Prepare the required area on the frame to weld the new valve mount (P/N 22-451-A). See below. Once the area has been prepared use a 3/16" fillet weld to secure the mount to the frame. It is important that the dimensions are maintained so that the shut off system will work properly.

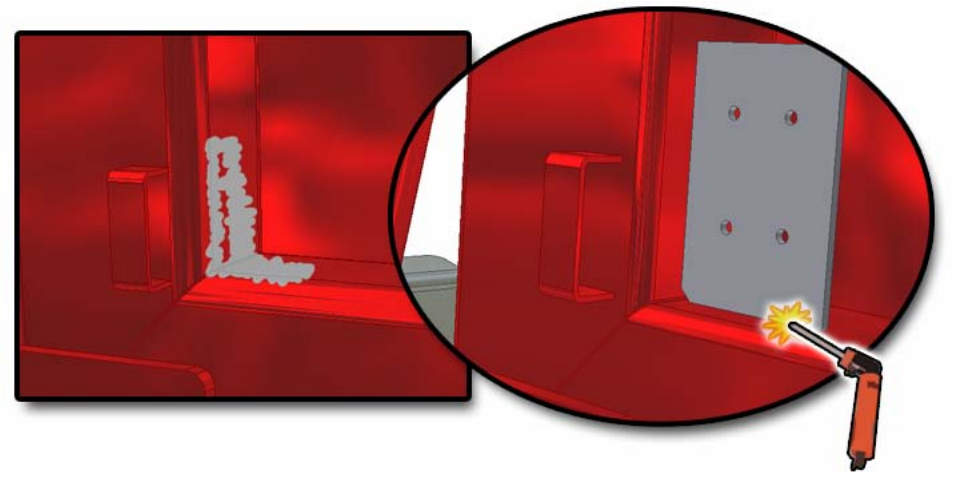

Figure 18 - Weld Valve Mount in new Location

img-00287.png

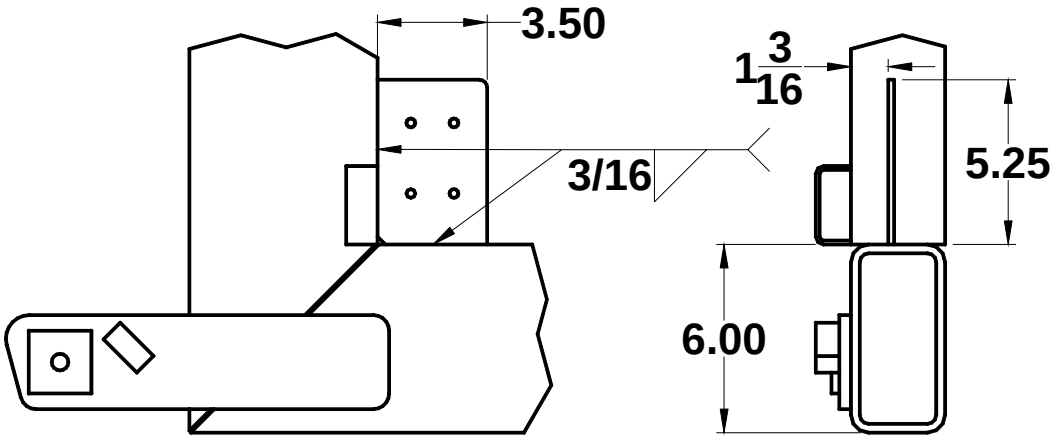

Figure 19 - Dimensions - New Valve Mount Location

img-00288.wmf

Step 9

Drill a 9/32" hole on the shut off bar using the dimensions shown below.

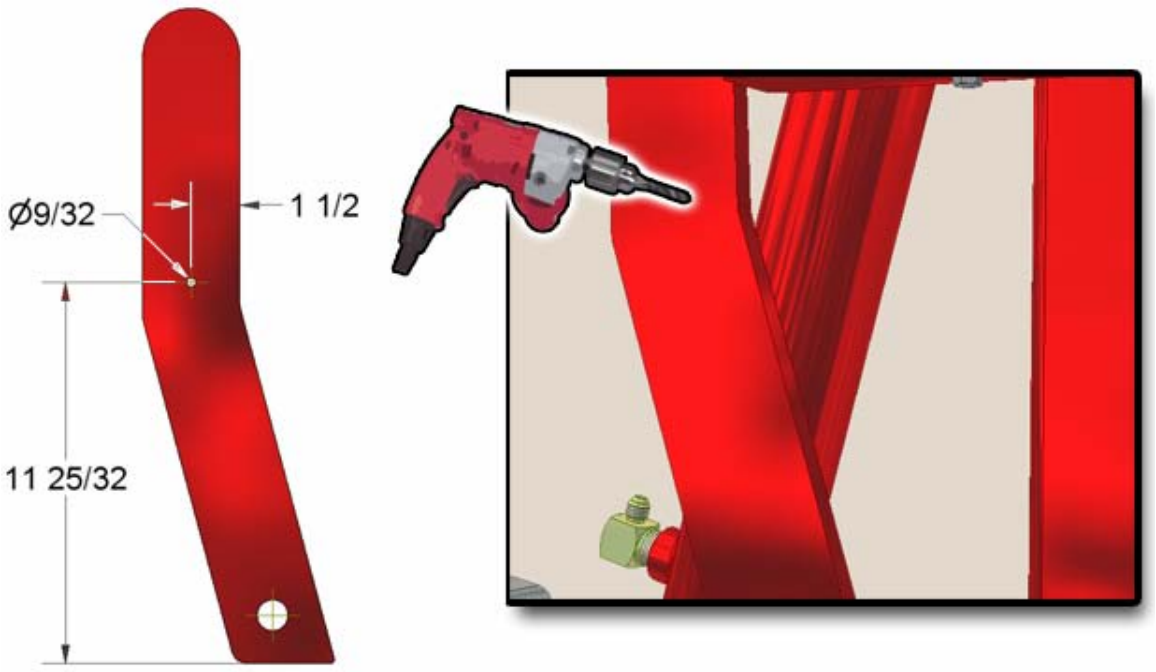

Figure 20 - Drill Valve Tie Bar Mount Hole

img-00289.png

Step 10

Using a good quality primer, coat all exposed metal areas. Once the primer has dried to the manufactures directions paint the area with a good quality paint to prevent rusting.

Step 11

Reinstall the two 90° SAE to JIC Fittings (see Figure 14 on page10) on the 1/4" high pressure ball valve (P/N 40-HYD-VLV025BLLFF qty 1). Install the ball valve using the u-bolts provided (P/N's 90-UBT-RND02520x200 qty 2, 88-WSR-SAE025 qty 4, and 88-NUT-LOC025-20 qty 4). Note the orientation of the ball valve. The stop pin should be located at the bottom.

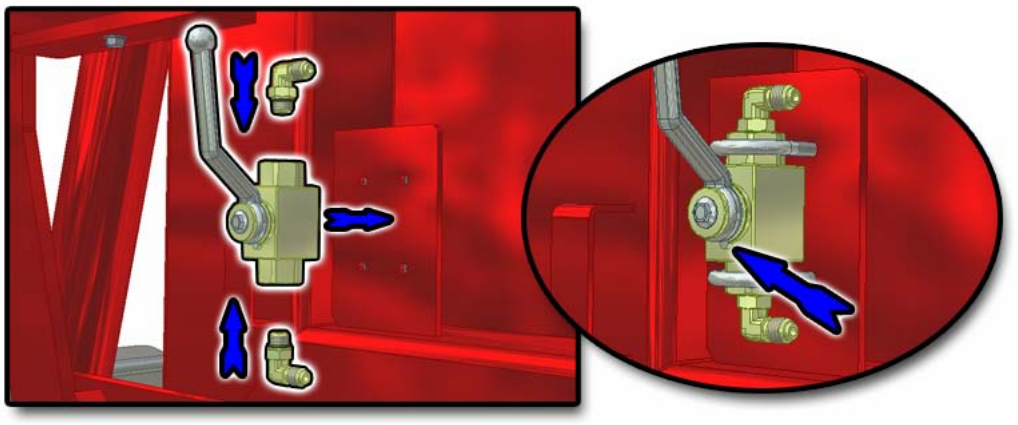

Figure 21 - Install Ball Valve

img-00290.png

Step 12

Remove the handle from the ball valve and replace with the valve handle provided (P/N 22-657). Reuse the fasteners that were included with the ball valve.

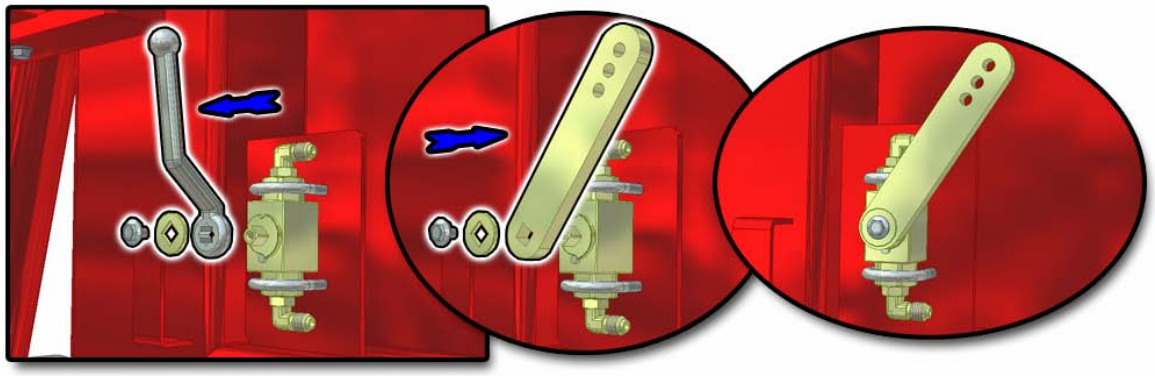

Figure 22 - Install New Valve Handle

img-00291.png

Step 13

Connect the Shut Off System Hoses to the Ball Valve.

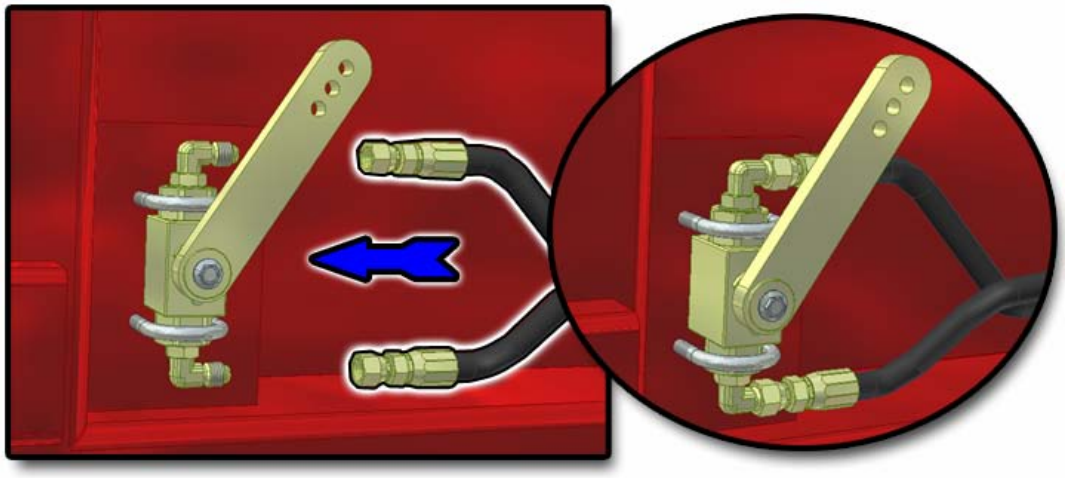

Figure 23 - Reinstall Shut Off System Hoses

img-00292.png

Step 14

Connect the valve tie bar (P/N 22-658) to the Shut Off Valve Handle (top hole) using the supplied fasteners (P/N's 88-BLT-02520x150 qty 1, 88-NUT-LOC025-20 Qty 1, 88-WSR-FLT031 qty 1, and 88-WSR-SAE025 qty 2). Place the 88-WSR-FLT031 flat washer between the Valve Tie Bar and Handle. Tighten the lock nut so that the Tie Bar is free to rotate.

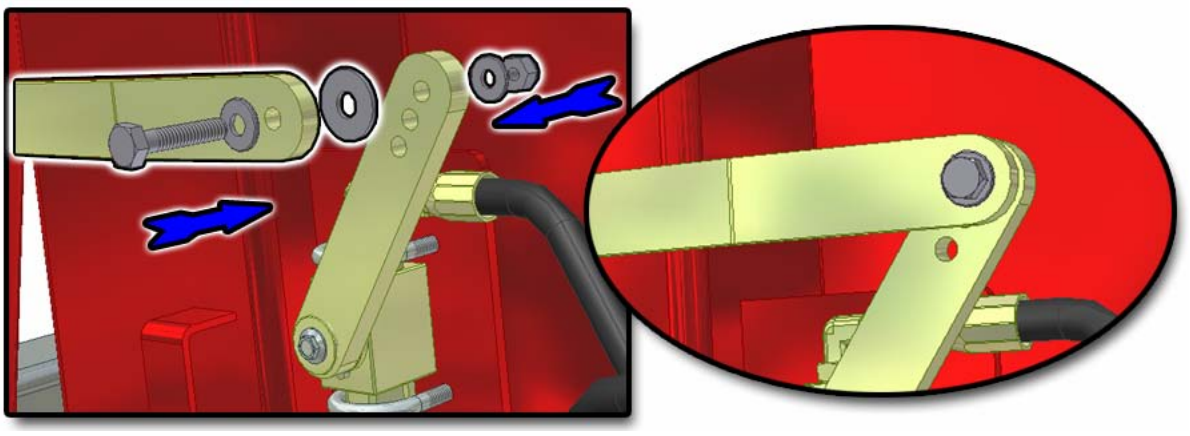

Figure 24 - Connect Valve Tie Rod to Handle

img-00293.png

Step 15

Connect the valve tie bar (P/N 22-658) to the Shut Off Bar using the supplied fasteners (P/N's 88-BLT-02520x150 qty 1, 88-NUT-LOC025-20 qty 1, 88-WSR-FLT031 qty 1, and 88-WSR-SAE025 qty 2). Place the 88-WSR-FLT031 flat washer between the Valve Tie Bar and Shut Off Bar. Tighten the lock nut so that the Tie Bar is able to rotate.

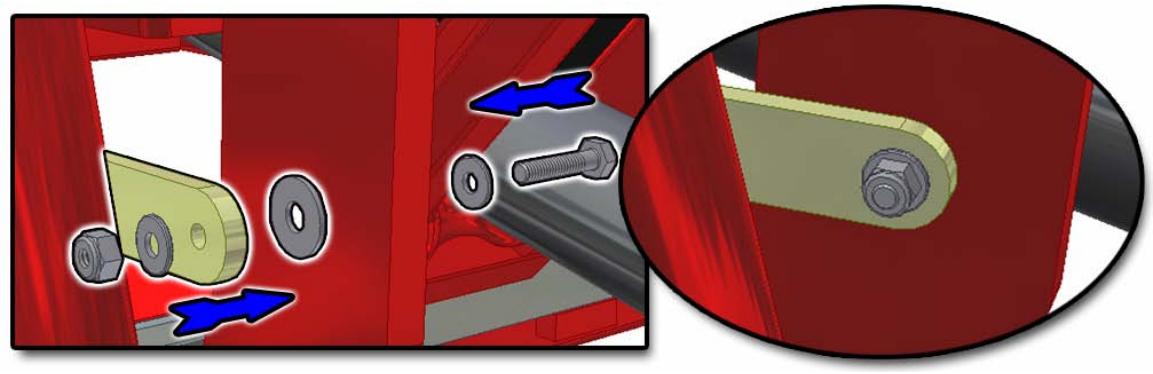

Figure 25 - Connect Valve Tie Rod to Shut Off Bar

img-00294.png

Step 16

Re-install the stabilizer hoses. Make sure to reconnect the hoses as label to the proper fitting.

Figure 26 - Re-install Stabilizer Hoses

img-00295.png

Remove Old Drive System

To prepare for the new clutch system you must first remove portions of the original drive.

Step 1

Remove chain guards at the front right and left of your machine. This will allow you access to the drive chain master links.

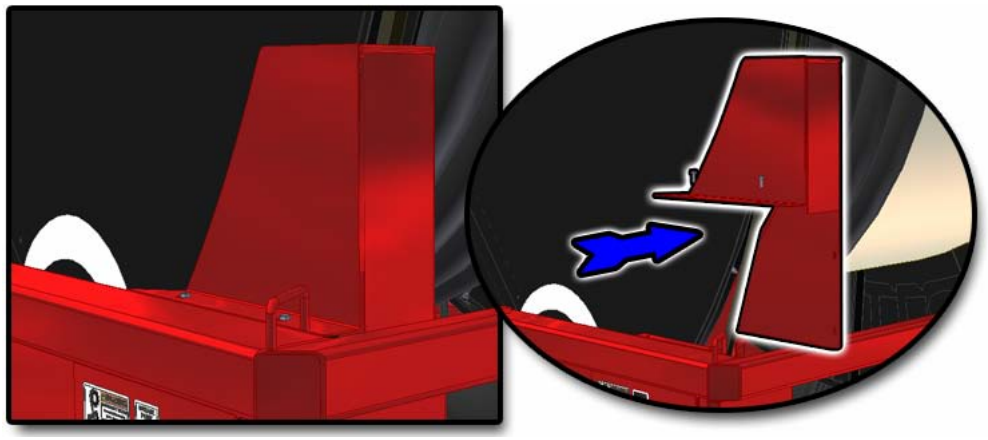

Figure 27 - Remove Front Chain Guards

img-00296.png

Step 2

Pull out the hose just enough to expose the drive chain master link. Both master links will be in the same area or drum rotation.

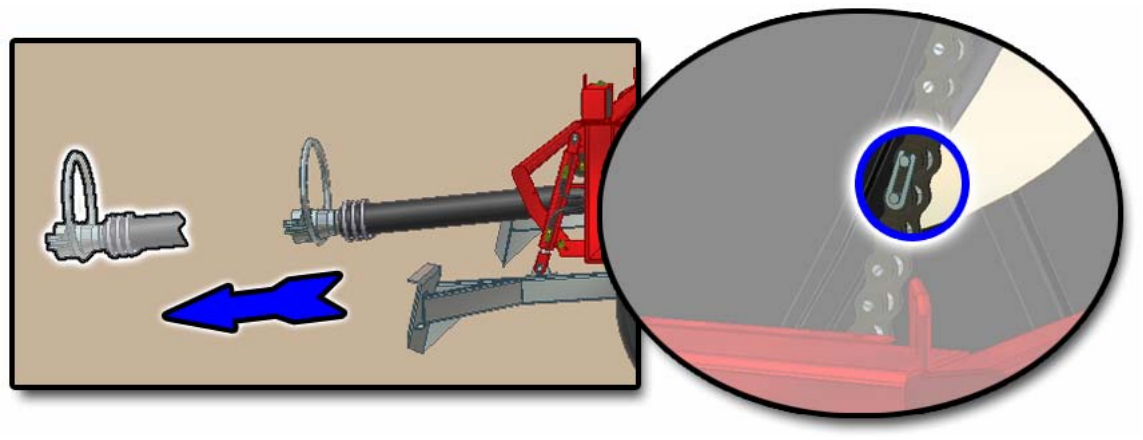

Figure 28 - Pull out Hose to Expose Master Link

img-00297.png

Step 3

Loosen the chain idler to release the tension on the drive chain. Tie the chain idler out of the way.

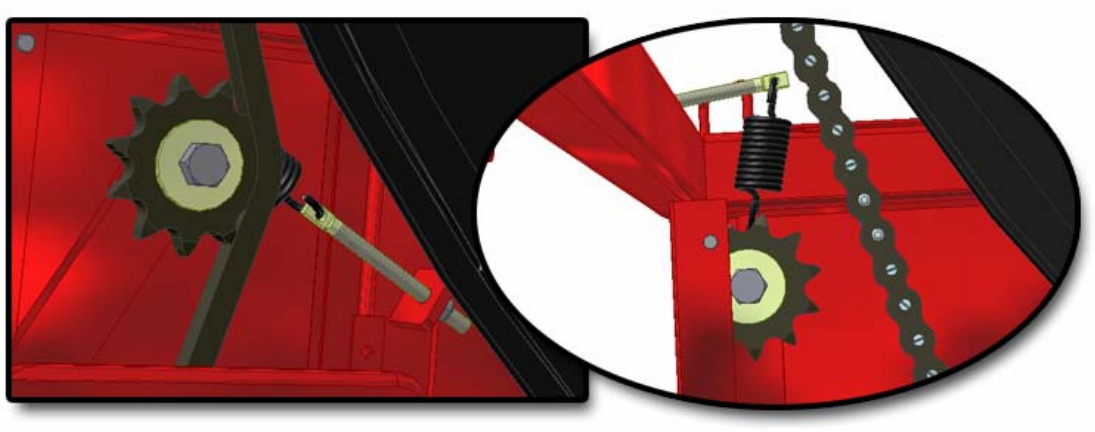

Figure 29 - Tie Idler Arm Out of the Way

img-00298.png

Step 4

Remove the master link from the chain drive. You may have to use a chain stretcher to remove the master links. Tie the drive chain out of the way.

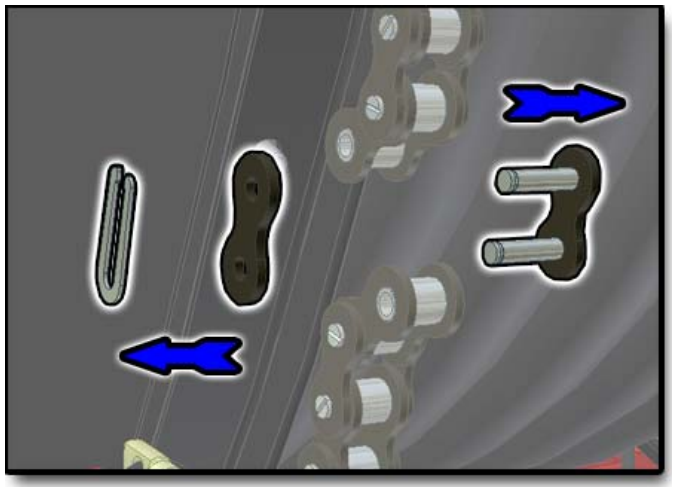

Figure 30 - Remove Master Link

img-00299.png

Step 5

Remove the sprocket retainer.

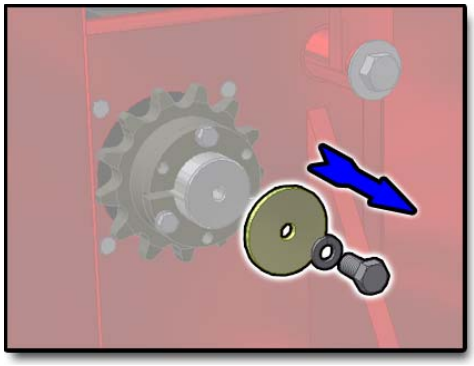

Figure 31 - Remove Sprocket Retainer

img-00300.png

Step 6

Remove the three (3) bolts from the QD bushing. Replace the three (3) bolts in the adjacent holes. Loosen the two (2) set screws. Tighten each bolt a half turn until the bushing breaks free of the sprocket. Using a chisel or screwdriver spread the QD bushing at the break.

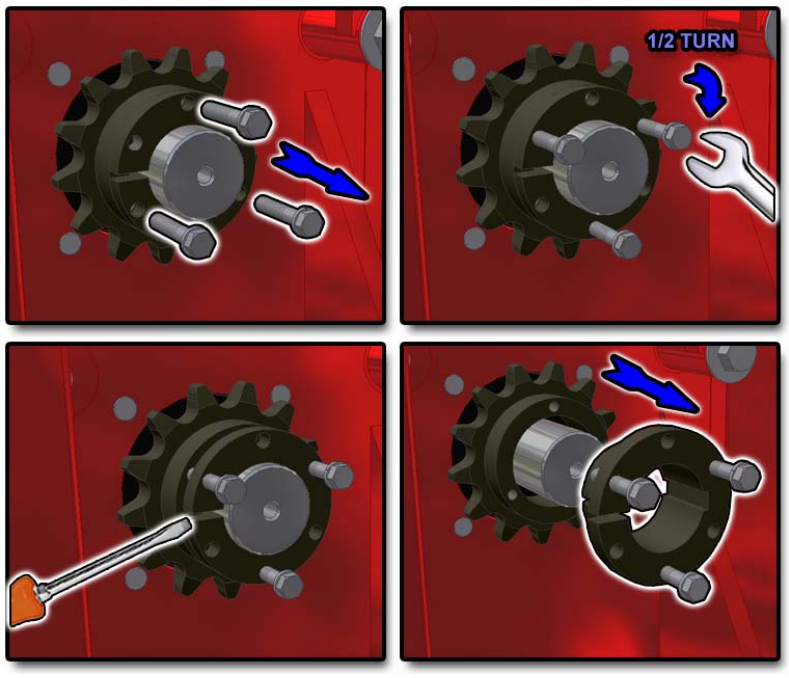

Figure 32 - Remove Sprocket and QD Bushing

img-00301.png

Step 7

Remove the key from the hydraulic motor.

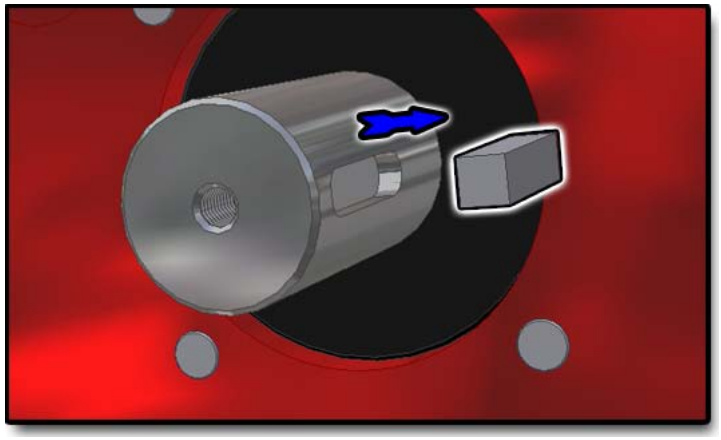

Figure 33 - Remove Key

img-00302.png

Step 8

Repeat steps 3 through 7 for the other side.

Step 9

On the left side of the machine remove the drum lock. Place all removed components aside.

Figure 34 - Remove Drum Lock

img-00303.png

Prepare for Clutch Installation

In order to install the clutch system you are required to rework the frame and tongue of your machine. Complete the following steps prior to installing the clutch.

Step1

Drill a 1/4" diameter hole in the right side frame (hydraulic tank side) inside the door. Then drill a 1/4" diameter hole in the right side frame as shown in figure below. You will be required to drill through approximately 4" of frame tubing.

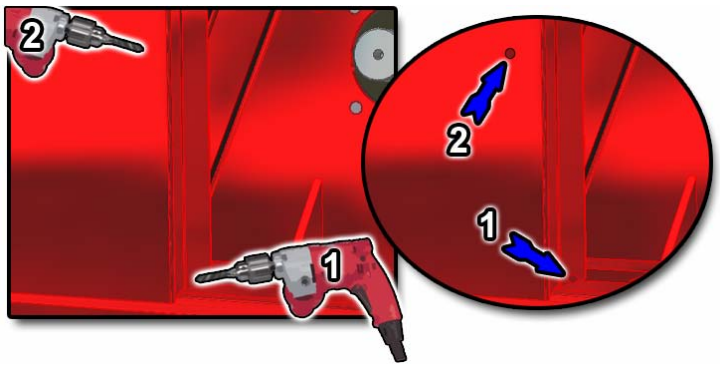

Figure 35 - Drill Brake and Drain Holes

img-00304.png

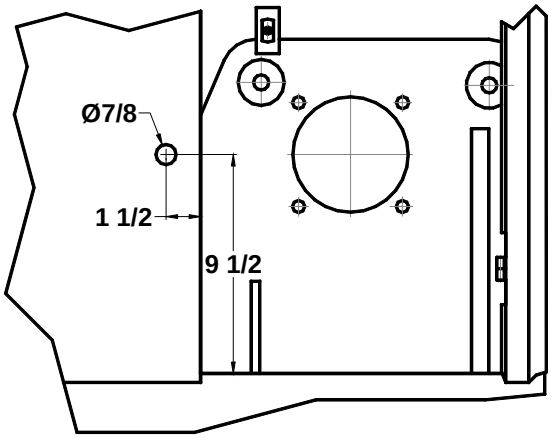

Figure 36 - Hole Location

img-00305.wmf

Step 2

Re drill the last hole with larger drill sizes until you reach a 7/8" diameter hole through the frame. Using a large drill bit at the first try will result in an inaccurate hole alignment which will prevent accurate part alignment. We recommend use a 1/4" drill bit then 1/2", 3/4" and 7/8".

Step 3

Cut a notch in the support gusset using a cutting tool as shown in figure below.

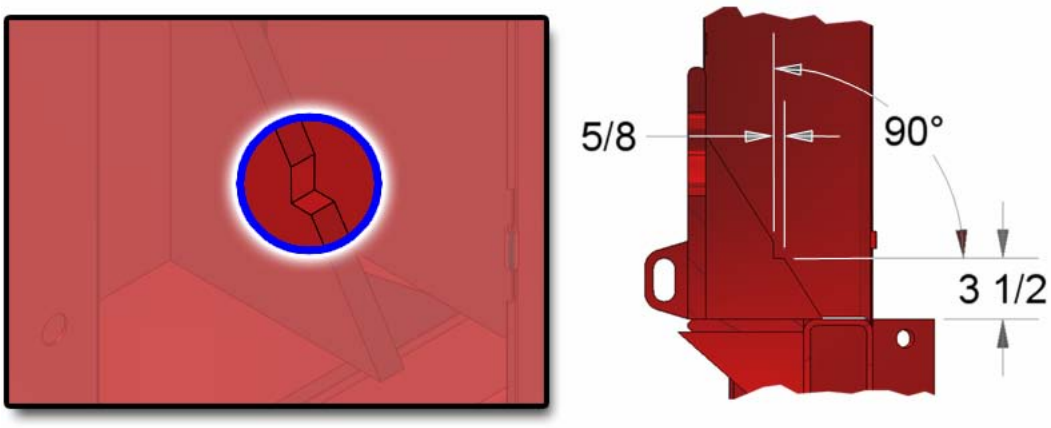

Figure 37 - Cut Notch

img-00306.png

Step 4

Using a 1” diameter hole saw cut a hole as shown below to provide access to the grease point.

Figure 38 - Cut Greasing Access Hole

img-00307.png

Step 5

Prepare a welding surface on the left side of the tongue as shown in figure below.

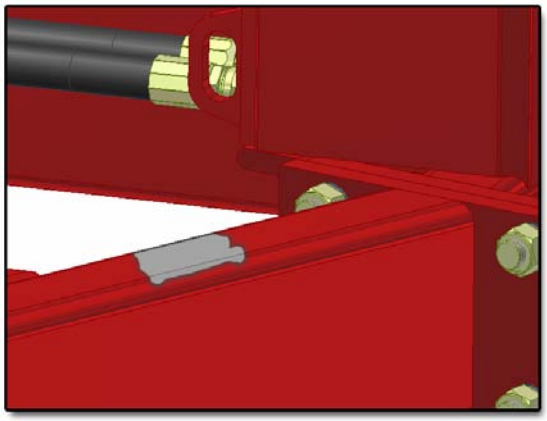

Figure 39 - Prepare Welding Surface

img-00308.png

Step 6

Weld on the pump mount plate (P/N 22-210) using a 1/4" fillet weld.

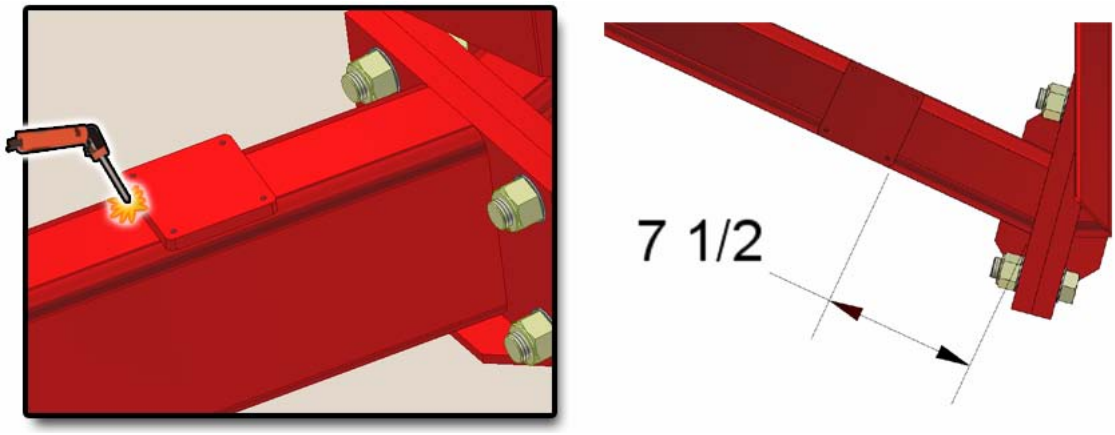

Figure 40 - Weld Pump Plate

img-00309.png

Step 7

Using a good quality primer, coat all exposed metal areas. Once the primer has dried to the manufactures directions, paint the area with a good quality paint to prevent rusting.

Install New Clutch System

Now that the preparation work is complete you can install the new clutch system.

Step 1

Clean the hydraulic motor shaft using a piece of emery cloth or similar material. This will ease the installation of the new clutch system.

Step 2

Install the clutch backer plate. (Part of 42-081)

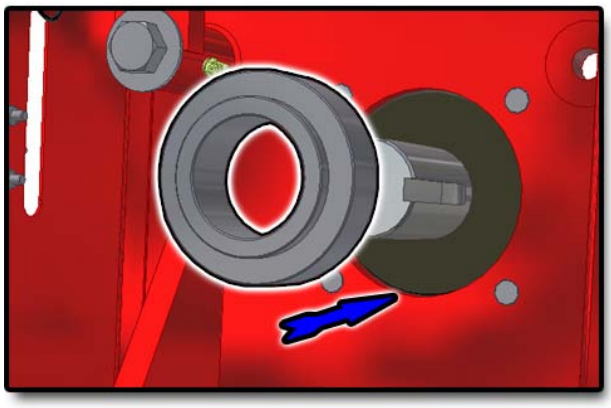

Figure 41 - Install Backer Plate

img-00310.png

Step 3

Install spring washers. (Part of 42-081 qty 3)

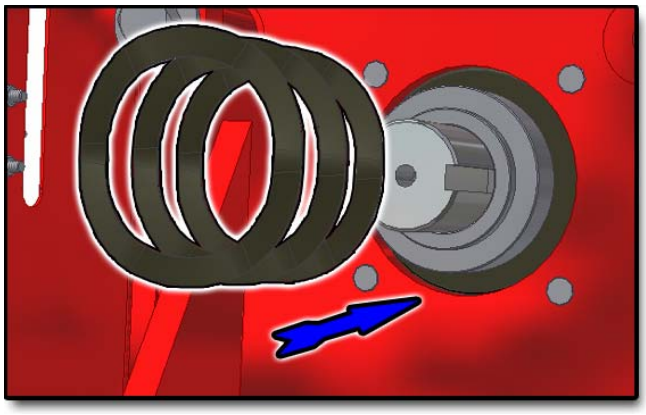

Figure 42 - Install Spring Washers

imp-00311.png

Step 4

Insert key.

Step 5

Coat the motor shaft and key with anti-seize material. Once you have coated the shaft install the sprocket clutch assembly.

Step 6

Visually check the sprocket/chain alignment. If the alignment is out you will be required to shim the hydraulic motor. If this is the case, complete the following steps.

A. Determine the shim thickness using a straight edge; place a straight edge on the face of the clutch sprocket. Now measure the distance from the face of the clutch sprocket to the idler sprocket and drum.

B. Remove the sprocket clutch, key, spring washers and backer plate.

C. Remove the hydraulic motor and install the required thickness of shims.

D. Re-install the hydraulic motor, backer plate, spring washers, key, bushing and sprocket clutch.

E. Verify the chain alignment. If the alignment is still out return to step A, if not continue to Step 7.

Step 7

Coat the retainer bolt with Loctite® 243 (Blue) and tighten.

Step 8 *** IMPORTANT ***

The clutch end cap should be able to rotate freely. If the clutch is unable to freely rotate you must contact **Cadman Power Equipment** for further instructions.

Step 9

Repeat steps 1 through 8 for the other side.

Step10

On the left side of the machine install the new drum lock (P/N 22-610-B). Reuse the fasteners, grease nipple, and bushing from the old drum lock. Reconnect the tension spring.

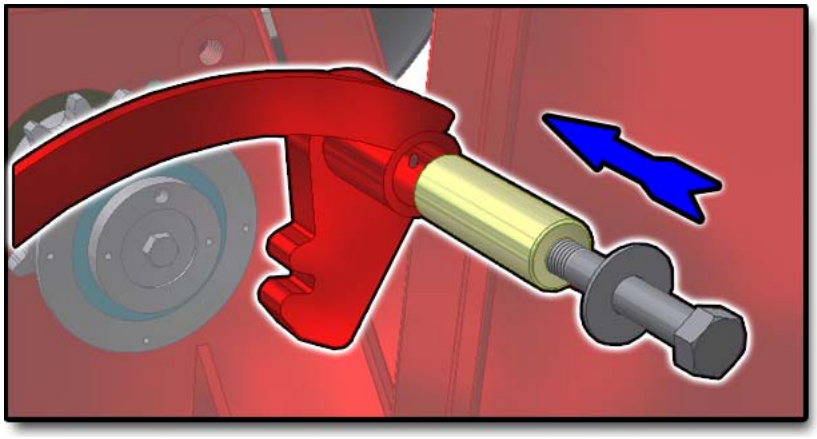

Figure 43 - Install New Drum Lock

img-00312.png

Step 11

Reinstall the chain to wrap around the new sprocket clutch and idler sprocket. Reconnect the drive chain with the master link.

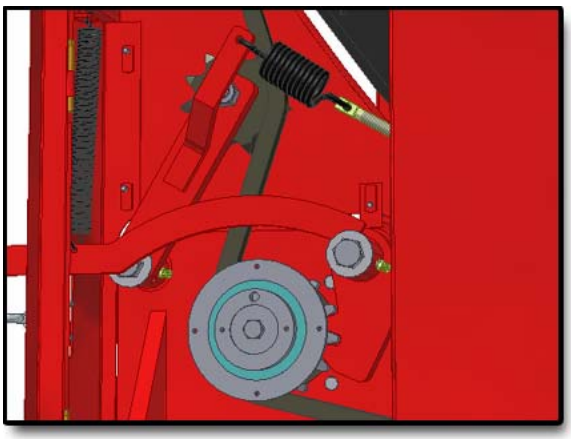

Figure 44 - Re-install Chain

img-00313.png

Step 12

Tighten the idler arm tension rod until the drive chain is tight.

Step 13

Install the clutch support weldment (P/N 22-656) using the provided fasteners (P/Ns 88-WSR-LOC031 qty 2 and 88-BLT-03118X075 qty 2).

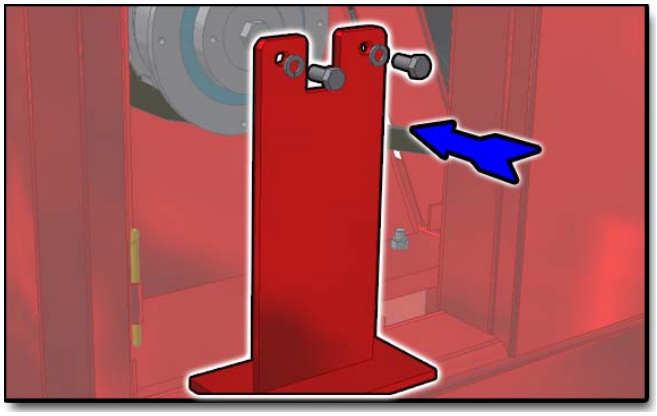

Figure 45 - Install Clutch Support

img-00314.png

Step 14

On the right side of the machine (hydraulic tank side) remove the grease fitting on the idler arm and replace with the supplied grease fitting (P/N 40-001-45).

Step 15

Reinstall the chain to wrap around the new sprocket clutch and idler sprocket. Reconnect the drive chain with the master link.

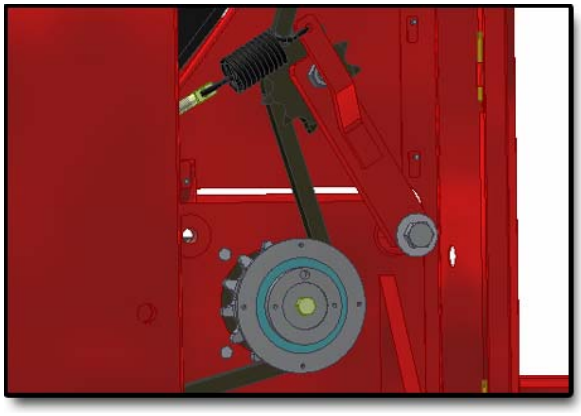

Figure 46 Re-install Drive Chain

img-00315.png

Step 16

Tighten the idler arm tension rod until the drive chain is tight.

Step 17

Install the clutch brake disc (P/N 22-651) using the provided fasteners (P/Ns 88-WSR-LOC031 qty 4, and 88-BLT-03118X075 qty 4).

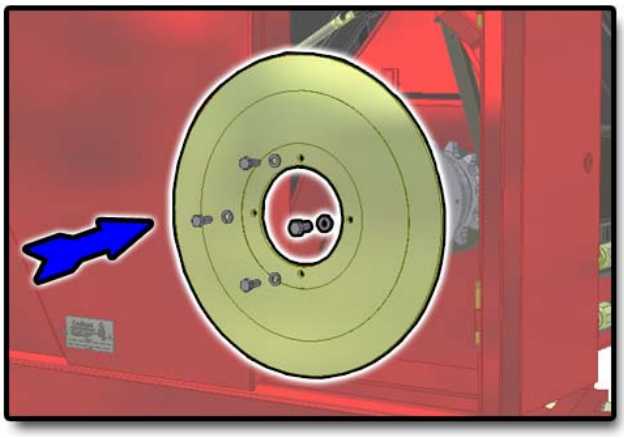

Figure 47 - Install Brake Disc

img-00316.png

Step 18

Install the clutch support weldment (P/N 22-656) using the provided fasteners (P/Ns 88-WSR-LOC031 qty 2 and 88-BLT-03118X075 qty 2).

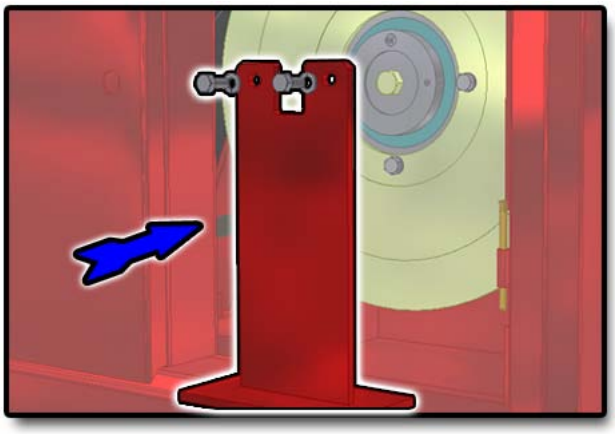

Figure 48 - Install Clutch Support

img-00317.png

Step 19

Install the brake caliper bracket (P/N 22-650) using the provided fasteners (P/Ns 88-WSR-LOC038 qty 2, 88-BLT-03816X175 qty 2, and 88-NUT-LOC038-16 qty 2). Tighten the fasteners to the point where the bracket will not tip but is still able to slide.

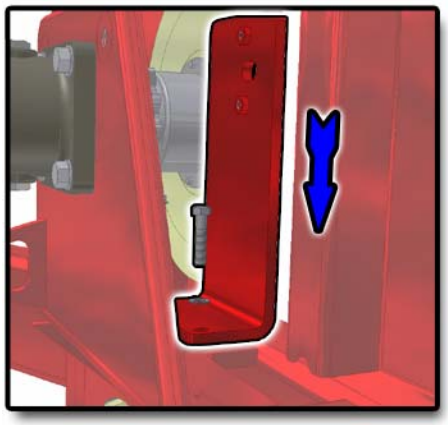

Figure 49 - Install Brake Caliper Bracket (Parts removed for clarity)

img-00318.png

Step 20

Place the bolt spacer (P/N 22-781) on the long bolt (P/N 88-BLT-05013X750) and insert through the center hole on the brake calipers (P/N 17-639 qty 2). Ensure the brake pads are facing each other. Insert the bolt through the hole in the frame. Move the calipers so that there is one on each side of the brake disc.

Figure 50 - Install Brake Calipers (Parts removed for clarity)

img-00319.png

Step 21

Slide the brake bolt sleeve (P/N 22-799) through the frame. Attach the brake handle (P/N 40-179) to the long bolt. Install the brake label (P/N 40-188-A) above the installed handle.

Figure 51 - Install Brake Handle

img-00320.png

Step 22

Install the brake caliper spacers (P/N 40-183 qty 2) and fasten to the brake caliper bracket with supplied fasteners (P/Ns 88-WSR-LOC038 qty 2, and 88-BLT-03816X250 qty 2).

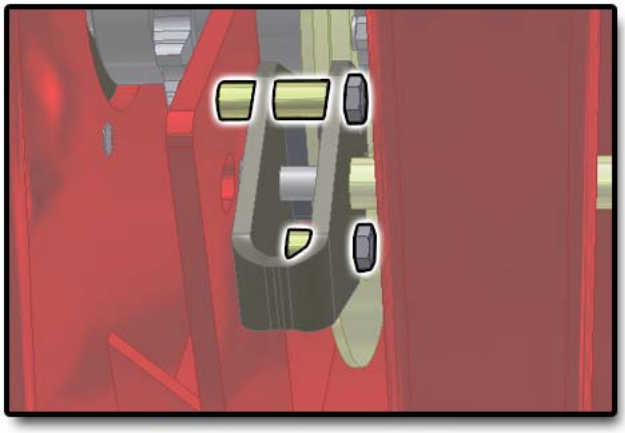

Figure 52 - Install Brake Caliper Bolts and Spacers

img-00321.png

Step 23

Once everything is aligned, tighten the brake caliper bracket fasteners.

Step 24

Re-install the chain guards on the left and right of the machine.

Figure 53 - Reinstall Chain Guards

img-00322.png

Step 25

Install the grease label (P/N 40-041-A) on front right of your machine above the grease access hole.

Figure 54 - Install Grease Point Label

img-00323.png

Install Clutch System Hydraulics

Complete the following steps to install the clutch system hydraulics.

Step 1

On the left side of the machine install the hydraulic hand pump (P/N 40-HYD-HP22SA50) using the fasteners provided (P/Ns 88-WSR-LOC025 qty 2, and 88-BLT-02520X200).

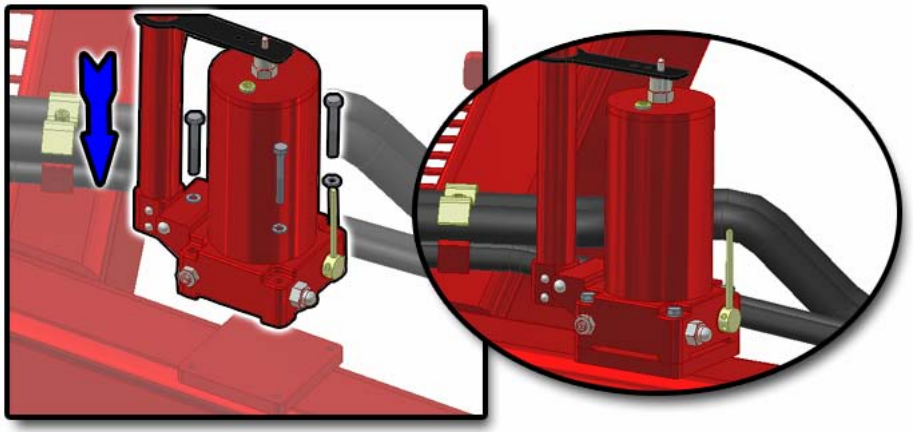

Figure 55 - Install Hydraulic Hand Pump

img-00324.png

Step 2

Install the hydraulic run-tee fitting (P/N 25-WHD-5716X6) as shown.

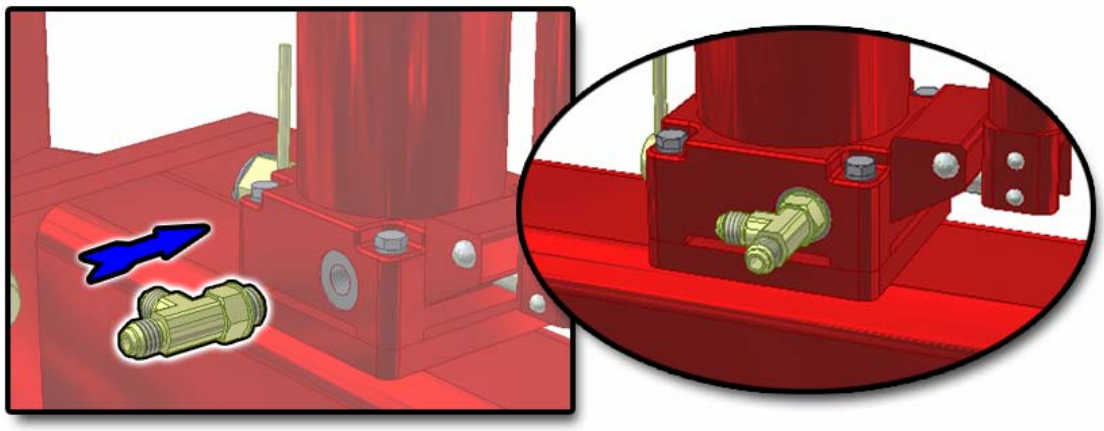

Figure 56 - Install Run Tee Fitting

img-00325.png

Step 3

Install the hydraulic adapter fittings at the clutches (P/N 25-WHD-48X4 qty 2).

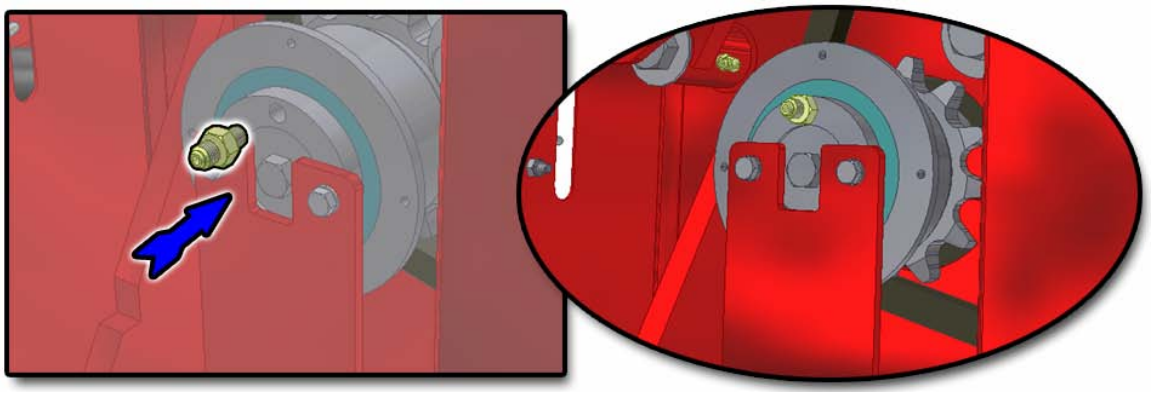

Figure 57 - Install Adapter Fitting

img-00326.png

Step 4

Install the hydraulic hoses. The short hose (P/N 40-HHZ-0171) is connected to the left side clutch. The long hose (P/N 40-HHZ-0172) is connected to the right side clutch. **Do NOT** tighten the hoses at the clutch fitting. Use the provided cable ties to fasten the hoses to the large hydraulic motor hoses.

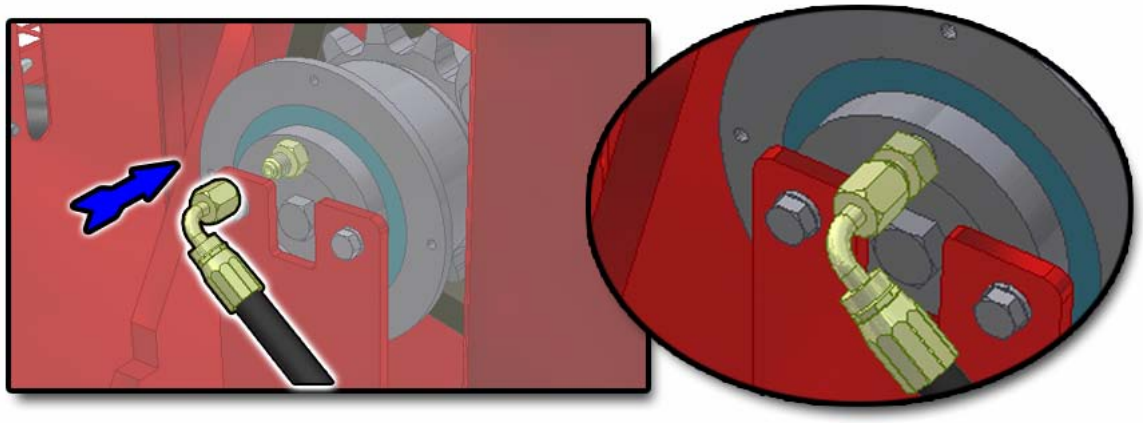

Figure 58 - Install Hydraulic Hoses

img-00327.png

Step 5

Fill the hydraulic reservoir on the hand pump with hydraulic fluid.

Step 6

Turn the handle on the pump as shown below. Pump the hydraulic hand pump handle until the air is purged from the left side clutch. Once the air has purged tighten the hose. Repeat the air purge for the right side of the machine. The clutches will not work properly if there is air trapped in the hydraulic lines.

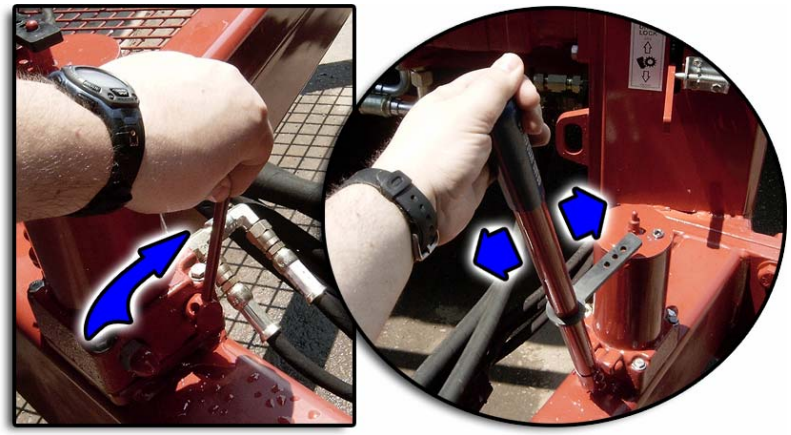

Figure 59 - Turn Lever and Pump Slowly

img-00268.png

Step 7

Refill the hand pump reservoir.

Congratulations! You have successfully upgraded your CADMAN Hard Hose Drag Reel with the New Clutch System.

Discard the original Operator's, Parts and Maintenance Manual.

Before operating your newly upgraded machine you must read and understand the supplied manual (P/N TR-MAN-5155M).

Useful Information

LENGTH

1 FOOT	= 12	Inches	**1 METER**	= 39.37	Inches
1 ROD	= 0.3048	Meter	**1 MILE**	= 3.2808	Feet

AREA

1 SQUARE FOOT	= 144	Square Inches
	= 0.0929	Square Meters
1 SQUARE YARD	= 1296	Square Inches
	= 0.8361	Square Meters
1 SQUARE METER	= 1549.4	Square Inches
	= 10.764	Square Feet
1 ACRE	= 43560	Square Feet
	= 4047	Square Meters
	= 0.4047	Hectare
1 HECTARE	= 107642.62	Square Feet
	= 10000	Square Meters
	= 2.47105	Acres
1 SQUARE MILE	= 640	Acres
	= 259	Hectares

VOLUME

1 GALLON (US)	= 0.8327	Imperial Gallons
	= 231	Cubic Inches
	= 0.1337	Cubic Feet
	= 8.345	Pounds
1 CUBIC FOOT	= 1728	Cubic Inches
	= 7.48	Gallons (US)
	= 62.4	Pounds
	= 28.32	Liters
1 ACRE INCH	= 27154	Gallons (US)
	= 254	Cubic Meters / Hectare

AREA OF A CIRCLE = Diameter x Diameter x 0.7854

CYLINDER VOLUME (US GAL.) = Diameter (ft.) x Diameter (ft.) x Length (ft.) x 5.8748