



PLASTIC PRODUCTS

A DIVISION OF BOURGALT INDUSTRIES LTD.

MT2000 HYDRAULIC SWATH ROLLER

MODEL - JOHN DEERE W235 SERIES

Kit Part No. 2684-01

HYDRAULIC ASSEMBLY INSTRUCTIONS

EFFECTIVE S/N: FFO01SR-01 - DATE

It is recommended to carefully follow the detailed steps of the assembly manual for the simplest and quickest assembly of the kit. Please check crate packing list against contents to be sure all parts have been received.

On all Free Form equipment, left and right are determined by standing behind the machine and looking forward.

All information, illustrations and specifications in this manual are based on the latest product information. Free Form updates products continually to improve quality. We reserve the right to make changes at any time.

FREE FORM WARRANTY POLICY

Effective April 16, 2001

Free Form Plastic Products (referred to as Free Form), a Division of Bourgault Industries Ltd., warrants its **new**, unused, Agricultural Equipment to be free of defects in material and workmanship at time of the delivery to the first retail purchaser according to the Free Form Warranty Policy.

1) BASIC WARRANTY REPAIR PERIOD AND REMEDIES

- a) Free Form will repair or replace, at its option, without charge for parts or labour, **any defective part** of the equipment for a period of twelve (12) months from delivery to the first retail purchaser.
- b) Free Form will repair or replace, at its option, without charge for parts, **any Free Form manufactured part** that is found to be defective for the period of thirteen (13) months to twenty-four (24) months from delivery to the first retail purchaser.
- c) Free Form will repair or replace, at its option, for a charge of 50% of the parts, **any Free Form manufactured part** that is found to be defective for the period of twenty-five (25) months to thirty-six (36) months from delivery to the first retail purchaser.

Note: A Free Form Manufactured Part is any part which has been manufactured by Free Form. Parts purchased from an outside supplier are not considered to be manufactured by Free Form. Purchased parts would include bearings, bolts, etc...

- d) Any parts that are covered by an Extended Warranty published by Free Form, are an exception to the Basic Policy, and are to be warranted as per the details of the Extended Warranty document. The extended warranty policy may change from time to time without warning from Free Form.

2) EXTENDED WARRANTY

- a) **CULTIVATOR SHANKS** are warranted 100% for five years from date of manufacture against breakage. Breakage after the fifth year will

be covered at 50% warranty. Shanks are not warranted against bending, however, a bent shank policy is in place to provide Free Form customers with replacement shanks for 50% of list price.

3) EXCEPTIONS TO THIS WARRANTY

- a) In no event shall the owner be entitled to recover for incidental, special or consequential damages such as, but not limited to; loss of crop, loss of profit or revenue, other commercial losses, inconvenience or cost of rental of replacement equipment.
- b) **Repair, Maintenance, and Service items not related to defects:**
 - 1. Loss or damage during shipment (see: Free Form Wholegoods Shipping Policy)
 - 2. Failure resulting from lack of or improper maintenance.
 - 3. Damage caused by operator abuse, negligence, or improper operation.
 - 4. Non-defective items replaced due to customer demand unless authorized by Free Form.
 - 5. Nonreimbursable maintenance items including but not limited to oil, etc.
 - 6. Any and all costs for repairs or replacement of parts not shown to be defective.
 - 7. Damage due to accidents.
- c) **Cultivator Sweeps, Reversible Chisels, and Ground Engaging Tools** are **not** covered under this warranty policy, but by the warranty policy of their manufacturer.
- d) **Rubber Tires** are warranted directly by the tire manufacturer's agents only, and **not** by Free Form.
- e) **Replacement Parts** will be warranted for twelve months from the repair date, providing the bill of sale is attached to the warranty claim.
- f) The terms of this warranty are subject to Provincial and State Legislation. Free Form reserves the right to make changes in accordance with these Acts at any time without notification

FREE FORM WARRANTY POLICY

or obligation. The stated warranty contained in the Free Form Warranty Policy applies in all situations, unless the law provides a greater warranty in the jurisdiction of the retail customer.

- g) Free Form reserves the right to continually improve its equipment, and reserves the right to change products or specifications at any time without notice or obligation.

4) OWNER'S OBLIGATION

It is the **responsibility of the owner, at the owner's expense, to transport the equipment to the service shop of an authorized Free Form Dealer (place of purchase) or alternately to reimburse the dealer for any travel or transportation expense** involved in fulfilling this warranty.

It is the **responsibility of the owner to read, understand and practice the maintenance, safety, and operational guidelines set out in the operator's manual** furnished with the equipment.

It is the owner's responsibility to ensure that the Warranty Registration, which must be signed by the owner, is completed and returned to Free Form by the dealer. The completed and signed Warranty Registration is required to register a new unit for warranty.

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1 SAFETY

SAFETY ALERT SYMBOL

This Safety Alert symbol means

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS

INVOLVED!



The Safety Alert symbol identifies important safety messages. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

Accidents Disable and Kill

3 Big Reasons

Accidents Cost

Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words **DANGER**, **WARNING**, and **CAUTION** with the safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER -

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING -

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION -

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

1 SAFETY (CONT'D)

YOU are responsible for the **SAFE** operation and maintenance of your Free Form equipment. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the equipment be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual. This manual will take you step-by-step through your working day and alerts you to all good safety practices that should be adhered to while operating the unit.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- The most important safety device on this equipment is a **SAFE** operator. It is the operator's responsibility to read and understand **ALL** Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- **Think SAFETY! Work SAFELY!**

1.1 GENERAL SAFETY

1. Read and understand the Operator's Manual
2. Have a first-aid kit available for use should the need arise and know how to use it.
3. Wear appropriate protective gear. This list may include but is not limited to:
 - A hard hat
 - Protective shoes with slip resistant soles
 - Protective goggles
 - Heavy gloves
 - Hearing protection

1.2 OPERATING SAFETY

1. Read and understand the Operator's Manual and all safety signs before using.
2. Attach securely to towing unit using a pin with a retainer.
3. Do not exceed a safe travel speed.
4. Use hazard flasher on towing unit when transporting.
5. Review safety instructions annually.

1.3 MAINTENANCE SAFETY

1. Follow good shop practices:
 - Keep service area clean and dry.
 - Be sure electrical outlets and tools are properly grounded.
 - Use adequate light for the job at hand.
2. Use only tools, jacks and hoists of sufficient capacity for the job.

1.4 TRANSPORT SAFETY

1. Read and understand **ALL** the information in the Operator's Manual regarding procedures and **SAFETY** when operating the swath roller in the field and/or on the road.
2. Always travel at a safe speed. Use caution when making corners or meeting traffic.
3. Make sure the reflectors required by the local highway and transport authorities are in place, are clean and can be seen clearly by all overtaking and oncoming traffic.

Note: The slow moving vehicle sign and flashing lights on the swather must be visible from behind when the MT2000 is secured in the transport position.

4. Be sure that the TB2000 is hitched positively to the towing vehicle and a retainer is used through the drawbar pin. Be sure that the MT2000 is secured properly with **both** transport locks and the pins are secured.
5. Keep to the right and yield the right-of-way to allow faster traffic to pass. Drive on the road shoulder, if permitted by law.
6. Do not exceed 20 m.p.h. (32 km/h). Reduce speed on rough roads and surfaces.

2 HYDRAULIC COMPONENTS INSTALL

2.1 HYDRAULIC FITTINGS ASSEMBLY

Refer to *Figures 2.1 & 2.2* for this step.

1. The LEFT hydraulic ram requires the following assemblies to be installed on the rod end.
 (#1) 2293 -180" Hydraulic Hose 6FJX-6FJX90 (#2)-6MJ-6MP fitting (#3)-6FPT fitting (#4)-6MP-6MP fitting (#5)- Quick Coupler Male x 6FP (#6)-Quick Coupler Female x 6FP (#7) 2291-130" Hydraulic Hose 6FJX-6FJX90.

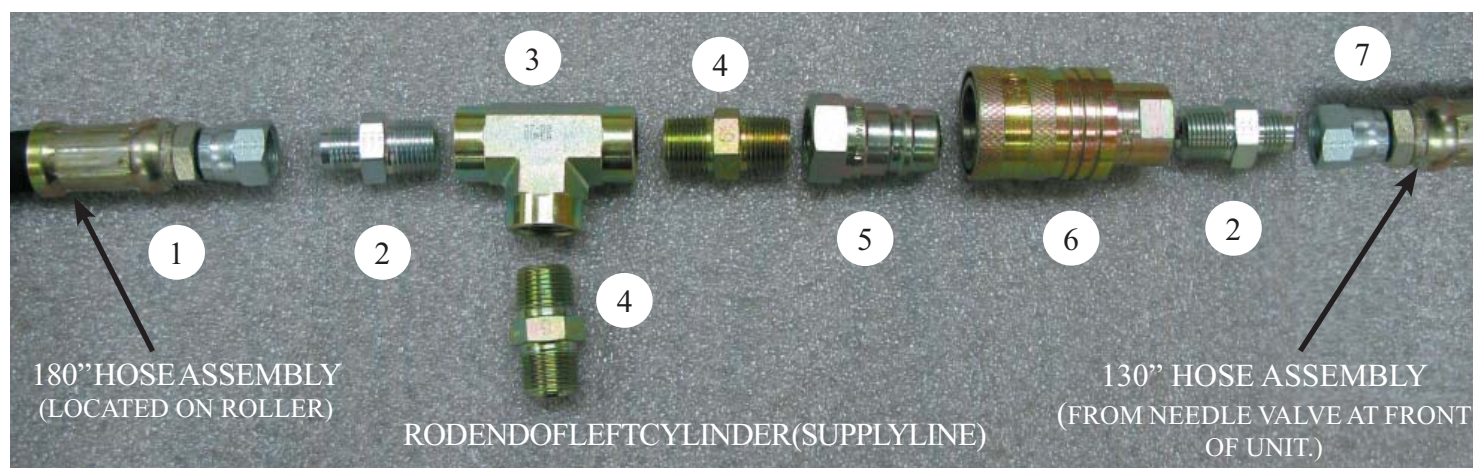


Figure 2.1 -Rod End Assembly of LEFT Cylinder

2. On the RIGHT cylinder, thread a 6MJ-6MP fitting (#2) into the rod end of the cylinder. Attach the 180" (#1) hydraulic line to it's corresponding end as per the assemblies of the LEFT cylinder. See *figure 2.2*

NOTE: USE HYDRAULIC APPROVED PIPE DOPE ON PIPE THREAD FITTINGS

3. In the cap end of each cylinder, install a breather plug (#18) as seen in *figure 2.3*.

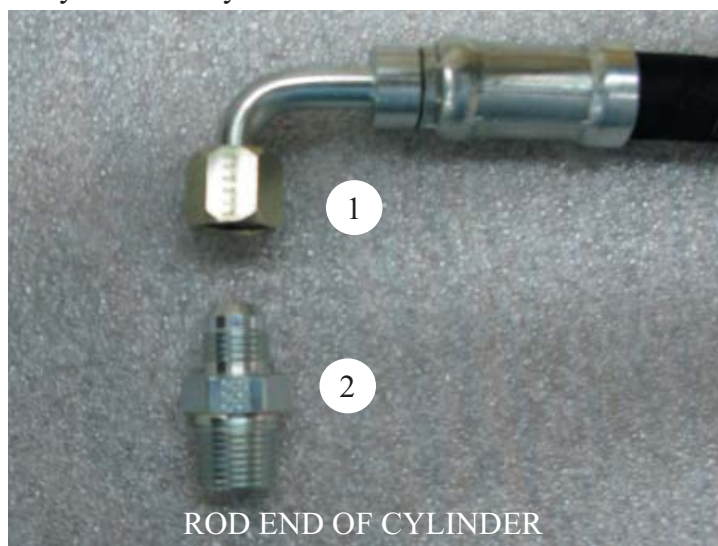


Figure 2.2 - Fitting Assembly of RIGHT Cylinder



Figure 2.3 - Fitting Assembly of RIGHT Cylinder

2.2 VALVE BLOCK “AUX LIFT” INSTALL

Refer to *Figures 2.4, 2.5, and the Hydraulic Diagram on page 12* for this step.

1. Assemble the hydraulic valve assembly as per *figure 2.4*. Refer to the Hydraulic Diagram on page 11 for the fitting assembly. This photo is to be used as a reference only; Location chosen is open due to the complexity added by the space requirements of various optional models and features. The fittings required will be the same as shown on the Hydraulic Diagram.
2. *Figure 2.5* illustrates the ideal setup for the hydraulic routing. The hydraulic cylinders (#17) are fed by a pressure line with a needle valve (#9) from the main switch block (#12) connected to port A. The one side of the block is tee'd into a fixed displacement pump (#19) circuit (#22) connecting to the block at port C. Port D on the block is tee'd into the tank line (#21). Port B is plugged (#14).
3. When the block is switched “UP” or “IN” (S1) the pump (#19) feeds the cylinders (#17) and the tank line (#21) is blocked. When the switch is in the middle position (OFF) the ram line is blocked, holding the cylinders either up or down. When the block is switched “DOWN” or “OUT” (S2), the cylinder line is connected to the tank

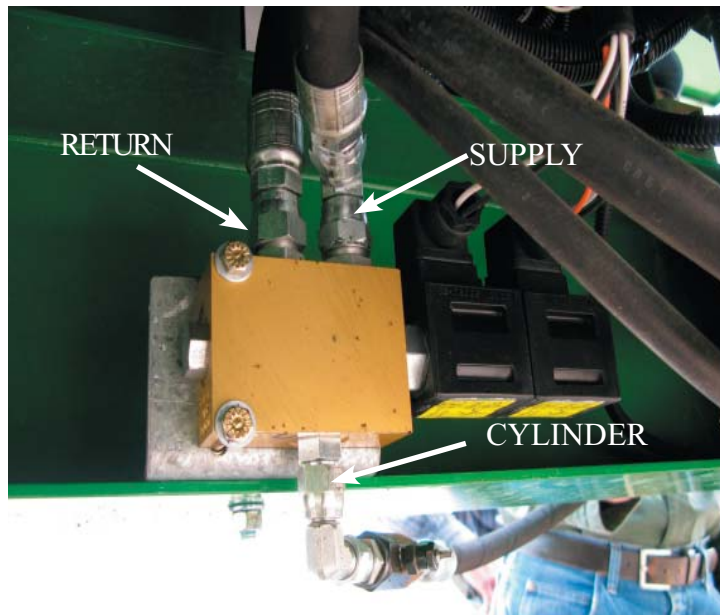


Figure 2.4 -Hydraulic Valve & fittings

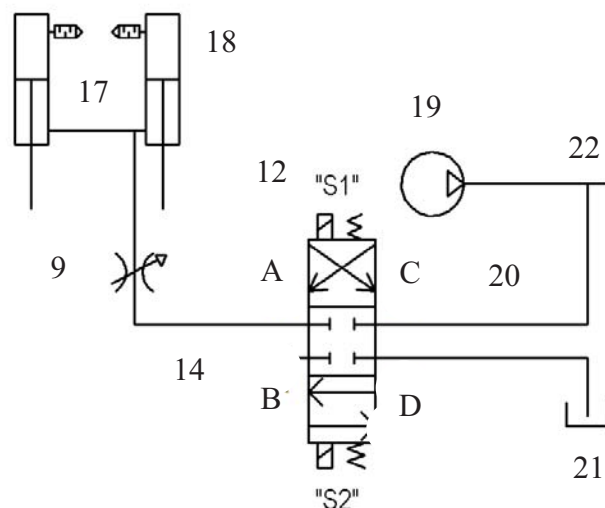


Figure 2.5 - Hydraulic Schematic

2.3 RETURN LINE HOOK UP

Refer to *Figures 2.6* for this step.

1. The return line connects to the “Reservoir” as shown in *figure 2.6*. Refer to the Hydraulic Diagram on *page 12* for correct fitting size. You may also be able to tee into an existing tank line with the use of the 6FXORS tee that is in the kit. DO NOT TEE INTO A SUCTION LINE AS PUMP DAMAGE COULD RESULT.

Note: The oil in the reservoir may need to be drained to make this connection. If machine has been operating oil may be hot.



Figure 2.6 - Return line hook up

2.4 SUPPLY LINE HOOK UP

Refer to *Figure 2.7* for this step if installing on a A400.

1. The supply line connects to the “Fixed Displacement Gear Pump”. Insert the 12FXORS tee where the arrow points as shown in *figure 2.7*. Refer to the Hydraulic Diagram on *page 12* for all correct fitting sizes.



Figure 2.7 - Supply line hook up location

2.5 ELECTRICAL HARNESS

Refer to the *electrical diagram on page 10* & *Figure 2.8* for this step.

1. The supplied wiring harness will allow you to plug and play with the existing wiring harness on your factory “Open Center” valve. To hook up your electrical circuit using harness #2703 on a W235 you need to tee the harness into wire labeled simply as “OC” for open center *as shown in Figure 2.8*.
2. Feed the switch which is connected to harness #2607 into the cab of the swather through an access port.
3. Using wire harness #2606 connect the black wire to a chassis ground or the NEG terminal of the battery and connect the red wire to an ignition switched terminal.
Note: Connecting directly to live power will leave the roller operational in the downward motion.
4. There is a 5A fuse built in for circuit protection.

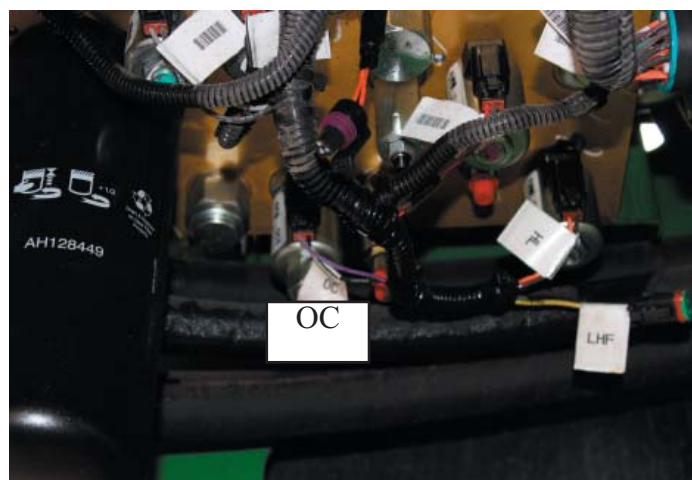


Figure 2.8 - Electrical Harness

2.6 SOLENOID ELECTRICAL

Refer to *Figure 2.9* for this step.

1. Locate the solenoid connectors (#15A & #15B) on the end of the wire harness. The connector (15B) with the orange wire is the “UP” circuit and must be connected to plug (S1). The connector (15A) with the white wire is to be connected to plug (S2).
2. Ensure that the supplied gasket is installed between the connector and the solenoid. The gaskets and mounting screws are in a small bag attached to the harness.

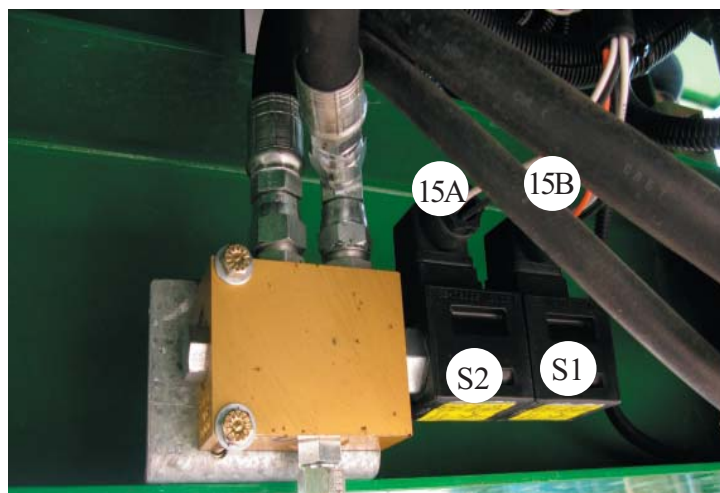


Figure 2.9 - Solenoid Connections

2.7 SWITCH INSTALL

Refer to *Figures 2.10* for this step.

1. Once the solenoid connectors are connected, run the switch into the cab of the swather.
2. Using the supplied hardware, connect the mounting bracket to the desired location
3. Test the switch's operation by operating the roller up and down with the switch.
4. If the roller is moving opposite to the switch. Unplug the two solenoid connectors (#15) and swap their positions. The switch should now operate the roller accordingly.



Figure 2.10 - Switch Installation

2.8 FINAL ASSEMBLY

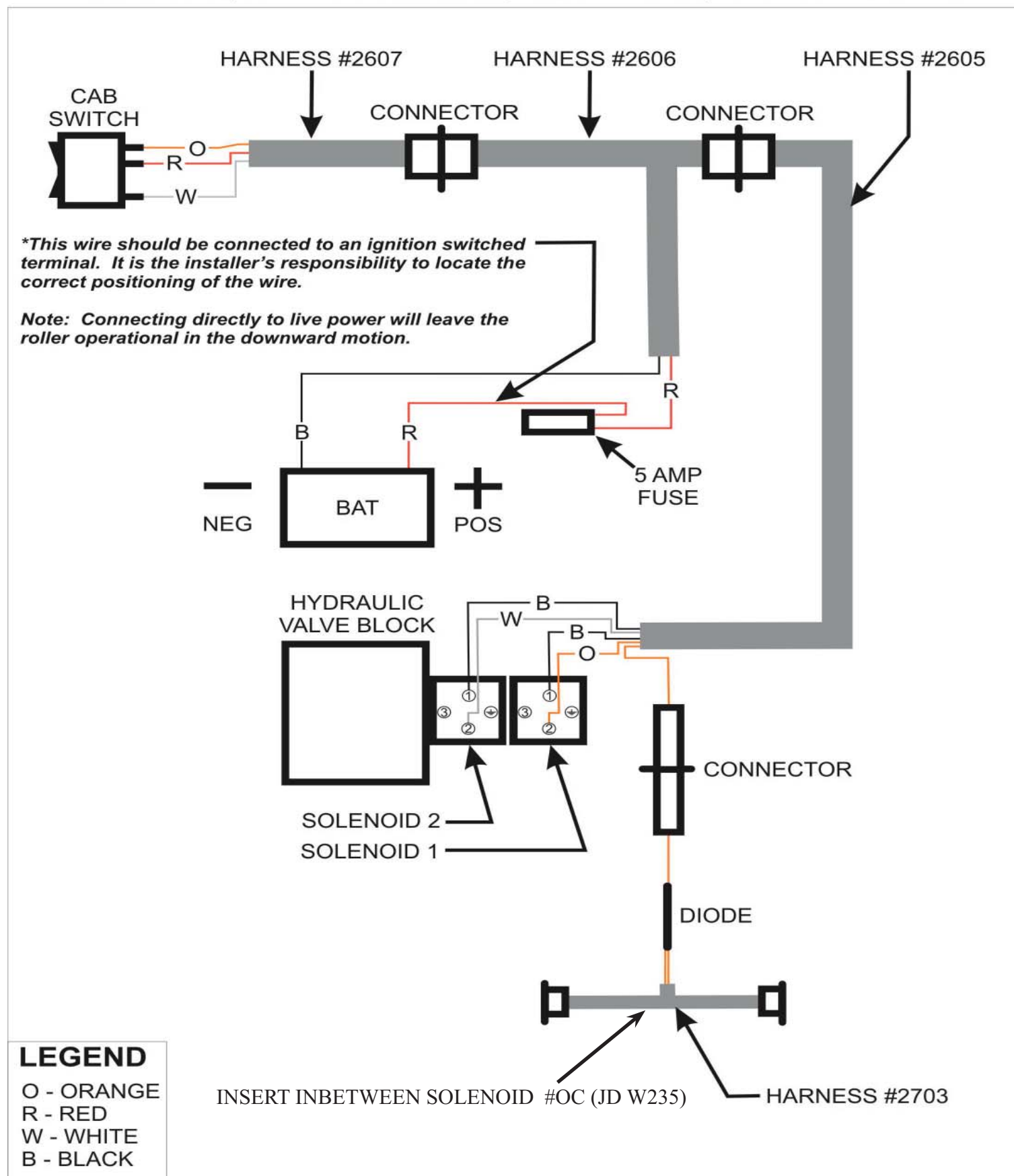
Adjust the swath roller assembly up and down.
Check for binding, interference, or loose bolts.
Check that the transport arms can lock into place.

Note: The SMV (Slow Moving Vehicle) sign and lights must be visible from the rear. Move the SMV sign and/or lights if required to ensure their visibility.

2.9 ELECTRICAL DIAGRAM

FFP Universal Swathroller Electrical Diagram

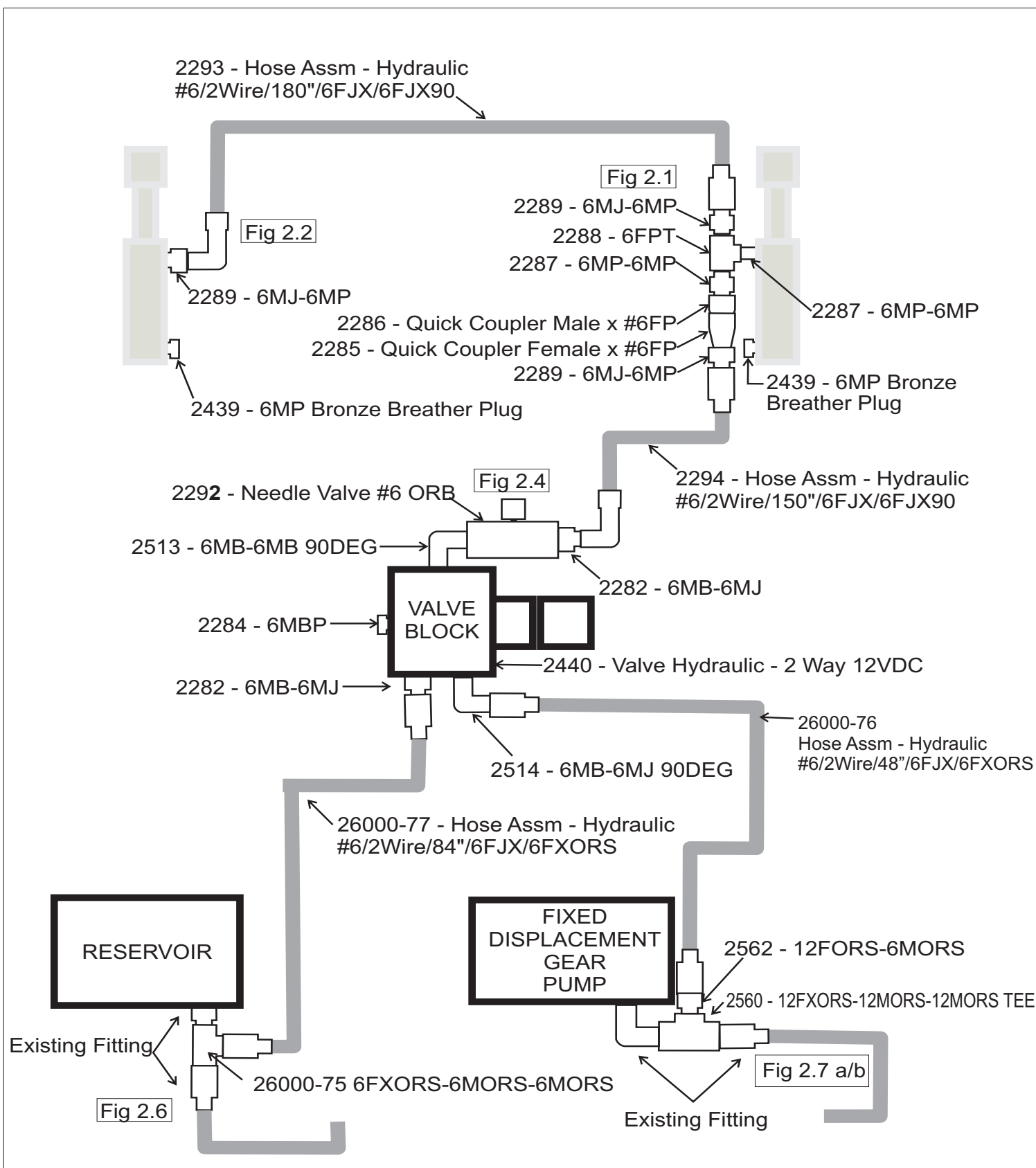
Macdon M100, New Holland 8000 Series, Case WD 3 Series, John Deere R450/R400



2.10 HYDRAULIC DIAGRAM

JOHN DEERE W235 FFP Swathroller Hydraulic Diagram

2684-01 - FFP Swath Roller MT2000H - JD W235 PKG



3 HYDRAULIC SWATH ROLLER USE AND OPERATION

3.1 ADJUSTING THE SWATH ROLLER

Refer to *Figure 3.1* for this step.

1. To adjust the width of your swath roller, loosen the two pins on each end of the swath roller.
2. Slide the ends in or out to the desired width. The width of the roller is marked on the main drum. It is recommended to adjust the roller width so as to place the the average width of crop half way up the tapered end.
3. Tighten the pins once the width is set.

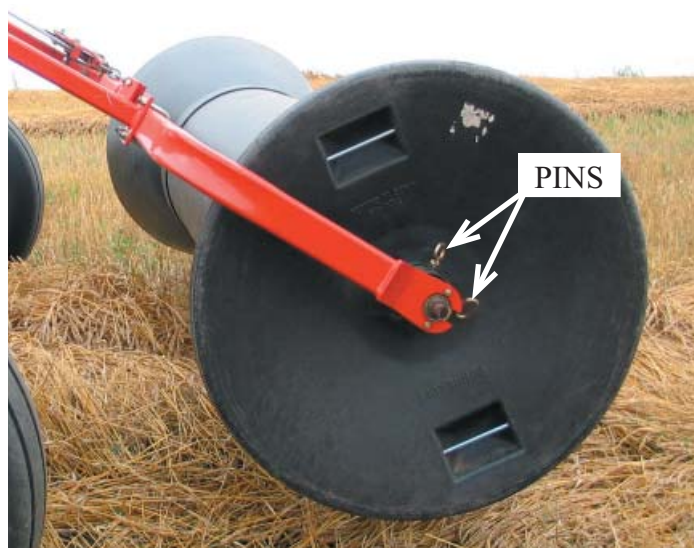


Figure 3.1 - Roller Adjustment

3.2 SETTING THE HYDRAULICS

Refer to *Figure 3.2* for this step.

1. The roller is adjustable up and down using the switch in the cab.
2. The needle valve at the front hydraulic block is used to control the rate of movement.
3. Turning the knob **CLOCKWISE** will **SLOW** the roller's rate of movement while turning the knob **COUNTER CLOCKWISE** will **INCREASE** the roller's rate of movement.
4. After cycling the roller up and down a few times, check the swather's hydraulic fluid level and top up if required.

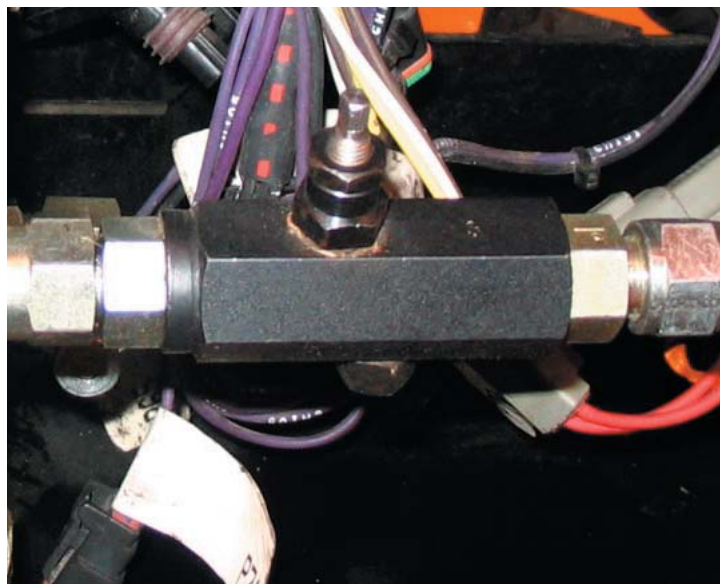


Figure 3.2 - Needle Valve
(Photo may not match the valve supplied)

3.3 SETTING THE DEPTH

Refer to *Figure 3.3* for this step.

1. The roller assembly can be set to lower to a predetermined stop point using the bars next to the hydraulic rams.
2. Using a combination of the holes on the main bar and the holes of the sliding collar (#20), you can set the roller's minimum height.
3. Secure the collar (#20) with the supplied locking pin (#13).

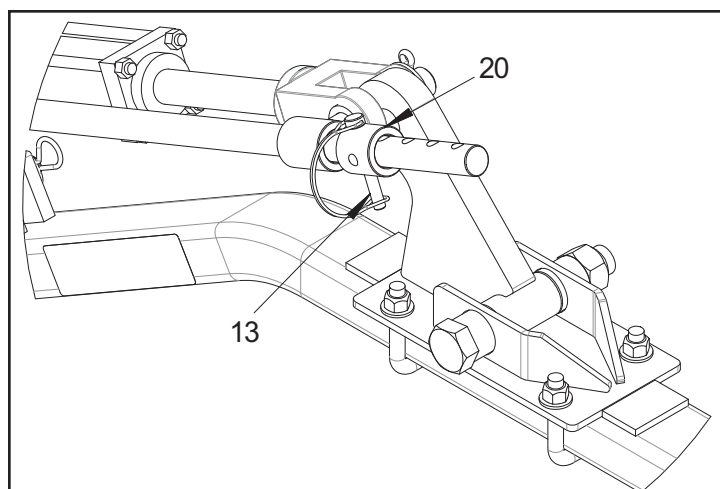


Figure 3.3 - Depth Adjustment

3.4 TRANSPORT LOCKS

Refer to *Figure 3.4* for this step.

1. When transporting the swather or while driving the unit on roadways, use the roller assembly's transport locks. This will take the weight off of the hydraulic components and increase service life.
2. Remove the pin (#16) from the ram/cylinder mounting tab (#24), location "A".
3. Raise the swath roller until the hole in transport lock lever (#25) lines up with the holes on the ram/cylinder mounting tab (#24).
4. Insert the pin (#16) through all holes and secure with a cotter pin (#12).
5. Lower the roller to relieve pressure on the hydraulics.

NOTE: If you are having trouble getting the pins into the transportation locks you can rotate(thread) the rod clevis end to adjust to fit.

Caution: Before operation of machine ensure adequate distance between the roller and the exhaust pipe. Heat from the exhaust can cause roller deformation. This will void warranty on the roller.

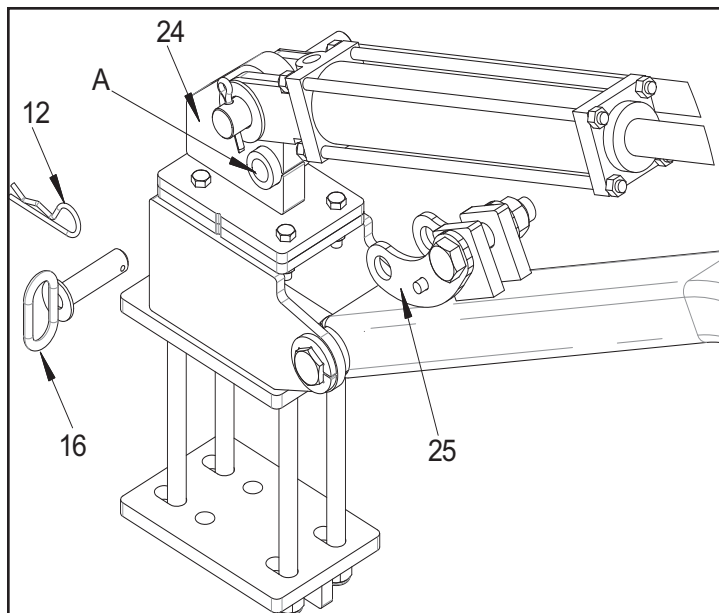


Figure 3.4 - Transport Lock

4 EXTENSION BRACKETS

NOTE: This kit is required if you are mounting a hydraulic version of our roller (winch version is not available on the W235) extensions as shown, refer to [figure 4.1](#).

4.1 EXTENSION BRACKET INSTALL

The extension brackets provide a location to install the mounted swath roller on the back of the W235.

1. With two installers have one technician hold the extension bracketed with the two locating tabs resting over the rear axle as shown in [figure 4.2](#). Then fasten in place with the provided 3/4" U-bolts; Tighten to 260 ft*lbs. Repeat for other side.



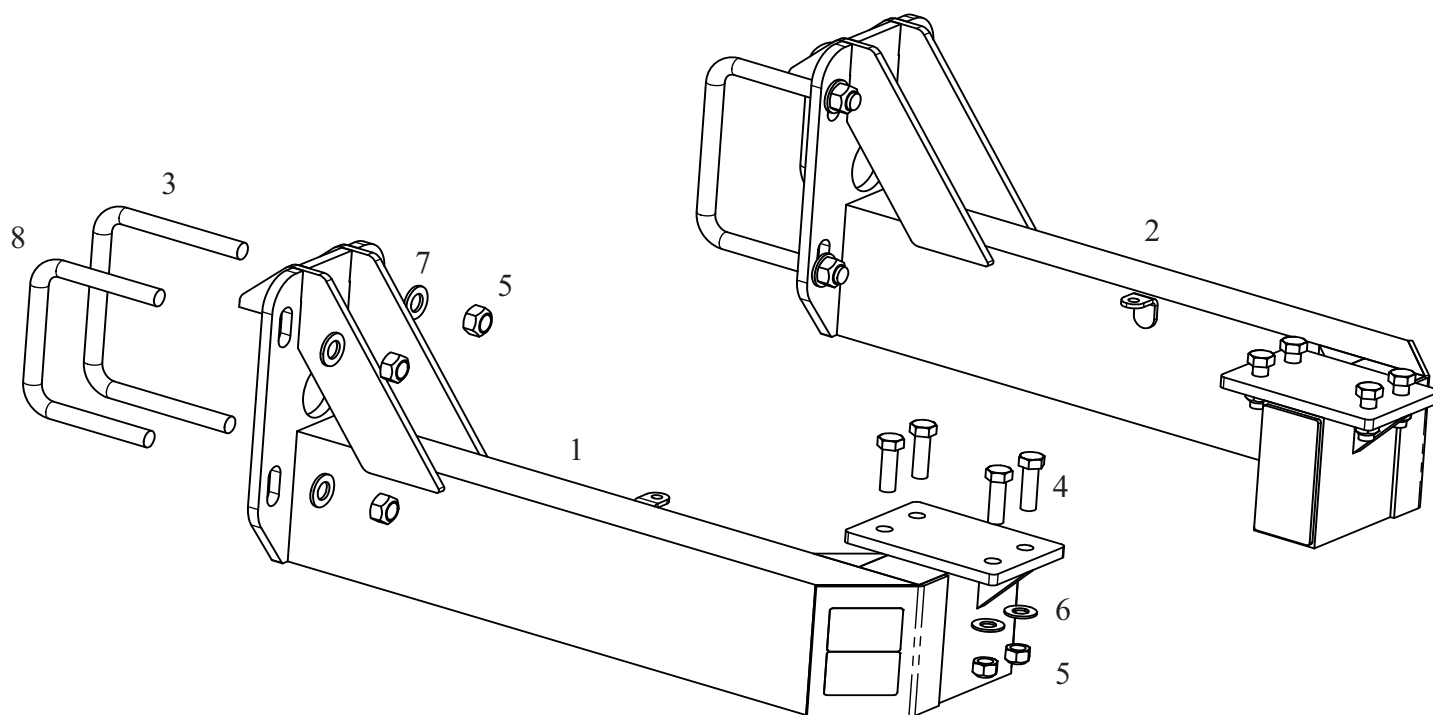
Figure 4.1 -Axle Extension



Figure 4.2 -Extention Bracket

5 PARTS

5.1 W235 EXT



#	PART #	DESCRIPTION	QTY.
1	2685-L	W235 EXT LEFT	1
2	2685-R	W235 EXT RIGHT	1
3	1181-15	UBLT SQ 3/4X7-1/4X6-1/2 G5 UNC.....	2
4	1010-20	BOLT 5/8X2 UNC GR5 PLD.....	8
5	1206-07	NUT PTRQ TL 5/8 UNC GR B ZDW	8
6	1325-33	WSHR 5/8 SAE PLD	8
7	1325-39	WSHR 3/4 SAE PLD	8
8	1181-16	UBLT SQ 3/4X5-3/4X5-1/2 G5 UNC.....	2
9	1207-07	NUT PTRQ TL 3/4 UNC GR B	8

5.2 HYDRAULIC FITTINGS

#	PART #	DESCRIPTION	QTY.
1	2932	VALVE HYD-NEEDLE #6 ORB.....1	
2	2282	HYD FTG-6MB-6MJ2	
3	2284	HYD FTG- 6MBP1	
4	2285	HYD FTG-QUICK CPLR FEMALE#6FP.....1	
5	2286	HYD FTG-QUICK CPLR MALE#6FP1	
6	2287	HYD FTG-6MP-6MP2	
7	2288	HYD FTG- 6FPT.....2	
8	2289	HYD FTG- 6MJ-6MP4	
9	2294	HOSEHYD#6/2WIR/150/6FJX/6FJX901	
10	2293	HOSEHYD#6/2WIR/180/6FJX/6FJX901	
11	2439	HYD FTG-6MPBRNZBREATHERPLUG2	
12	2440	VALVE HYD-2 WAY 12VDC1	
13	2513	HYD FTG-6MB-6MB 90 DEG.....1	
14	2514	HYD FTG-6MB-6MJ 90 DEG1	
15	2560	HYD FTG-12FXORS12MORS12MORSTE ..1	
16	2562	HYD FTG-12FXORS-6MORS REDUCER ...1	
18	26000-75	HYD FTG - 6FXORS-6MORS-6MORS1	
19	26000-76	HOSEHYD#6/2WIR/48"/6FJX/6FXORS.....1	
20	26000-77	HOSEHYD#6/2WIR/84"/6FJX/6FXORS.....1	

