

ROTO-SHEAR

MANUAL



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CONGRATULATIONS ON YOUR PURCHASE!

The Roto Shear that you have purchased will give you years of trouble free operating. We are pleased to provide you with a quality product we are proud to stand behind.

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IMPORTANT NOTICE — PUTTING SAFETY FIRST

Safety is extremely important when working near the cutter. When it is operating, it runs quietly, therefore, it can be very hazardous. It is recommended that the Roto Shear be plumbed into series with an orbit motor on the reel drive on the swather, preventing the Roto Shear from operating when the header is shut down. On a pull-type swather, without orbit motors to operate either the reel drive or canvas, it is recommended that an auxiliary pump be installed. The pump is driven by a pulley on the header which will shut down the Roto Shear when you disengage the PTO on the tractor or the control of a self-propelled swather.

The safety factor CANNOT be overstressed.

For your safety or that of others who you may have operating your swather or header with the Roto Shear, it is important that anyone working or being near the machine realizes the danger of the silent cutter. The lack of safety could cause serious bodily injury or death, therefore the Roto Shear should never operate with the operator dismounted or others nearby. Only qualified operators should operate the machine.

TIPS TO AVOID ACCIDENTS

1. Familiarize yourself with the possible danger of the silent cutter – Roto Shear.
2. Be sure no one comes near the Roto Shear when the header is operating, especially children.
3. Before dismounting the operator's seat, be sure all controls are shut off or in the neutral position.
4. Never wear loose clothing when working around the swather when the header is engaged.
5. While operating or standing still, never attempt to dislodge foreign material or objects from the rotor with your hands. Always use a long bar or appropriate tool to avoid unexpected movement of the rotor.
6. Be sure no one is near the control when you are working near the Roto Shear.
7. When stored or not in use, the ball valves should be open to prevent the Roto Shears from unexpected rotation. It is also recommended to install the divider board to cover the sharp blades.

PROBLEMS THAT MAY OCCUR IN HEAVY CROPS

In most years, with an average crop, everything works fine. Most swathers have enough hydraulics to go through heavy crops with little to no problems, ***with or without Roto Shear units***. When crops are above average and greater, and Roto Shears are installed, you are able to travel considerably faster because you have eliminated the plugging on the ends of your header. With the volume of material now on your table, your motors on your drapers may be underpowered, affecting the entire performance of the swather. Oil often heats up, adding to the problems. In severe cases, it is recommended to have an auxiliary pump just for the Roto Shear units. This will help somewhat. One manufacturer is designing this very system for their headers. Roto Shear will not be responsible for problems arising in the extremely heavy crops. These problems are not related to the installation of the Roto Shear units. There is minimal power required to operate the Roto Shear due to its design.

If you have an oil-heating problem, you might consider installing an oil cooler. One suggestion is to use pipe instead of hoses to go from one side of the header to the other and have it clamped to the steel frame to act as a heat transfer. Be sure to clean the interior of the pipe before using.

It is very important to have the Orbit motor on the Roto Shear be the last motor in series before the oil returns to the reservoir. This eliminates excessive backpressure in the Roto Shear motor, and possibly cause seal failure. We would prefer the Roto Shear units to be hooked in series with the reel motor because it is less of a problem for the reel to be underpowered, than the canvas.

ROTOSHEAR INSTALLATION INSTRUCTIONS

Use the kit part numbers provided in the headings below to complete the installation of your unit.

ROTO-SHEAR COMMON UNIT (27000-00)

The Roto-Shear common assembly is required in all kits. Refer to the assembly breakdowns below when completing an installation or shopping for replacement parts.

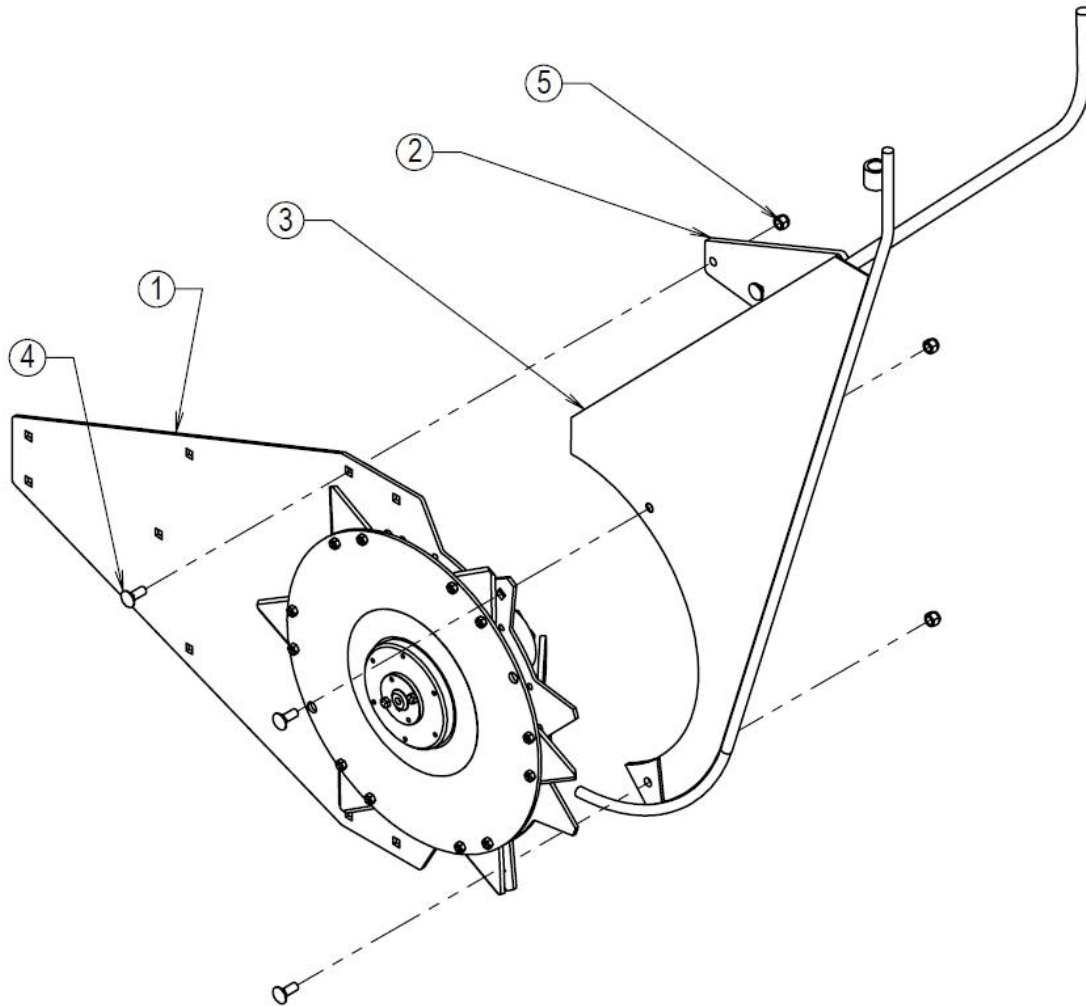


Figure 1- Roto-Shear Common Assembly (27000-00)

1-	27000-13	ROTSHR COMMON UNIT	x1
2-	CR02	ROTSHR COLLECTOR ROD	x1
3-	DB02	ROTSHR DIVIDER BOARD	x1
4-	1102-09	BOLT CRG 3/8X1 UNC GR5 PLD	x3
5-	1202-05	LKNT NYL 3/8 UNC PLD	x3

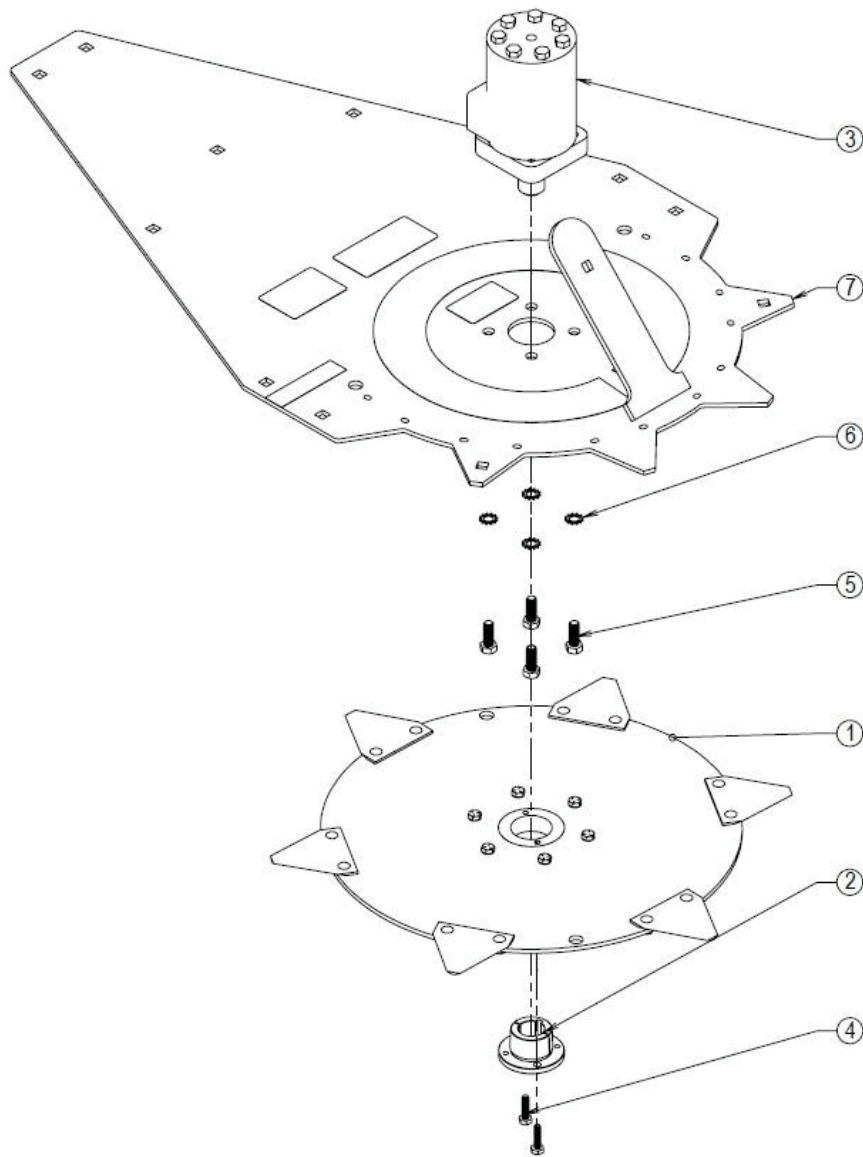


Figure 2 - Roto-Shear Common Unit (27000-13)

1-	SR09	ROTSHR SUNRISE	X1
1-	ROTB13	ROTSHR ROTOR C/W HUB & SICKLES	X1
2-	27000-19	ROTSHR ROTOR HUB SMALL	X1
3-	27000-15	ROTSHR HYD MTR W/ CASE DRAIN	X1
4-	1000-09	BOLT 1/4X1 UNC GR8 PLD	X2
5-	1004-16	BOLT 3/8X1 UNC GR8 PLD	X4
6-	1350-74	WSHR SERRATED LOCK 3/8	X4
7-	SR09	ROTSHR SUNRISE	X1

27000-15: Roto-Shear Hydraulic Motor with Case Drain (920 RPM @ 12 GPM):

27000-15-01 Seal kit for "BMPH"

27000-15-01N Seal kit for "BMPH-N"

Ideal operating speed of 400-500 RPM

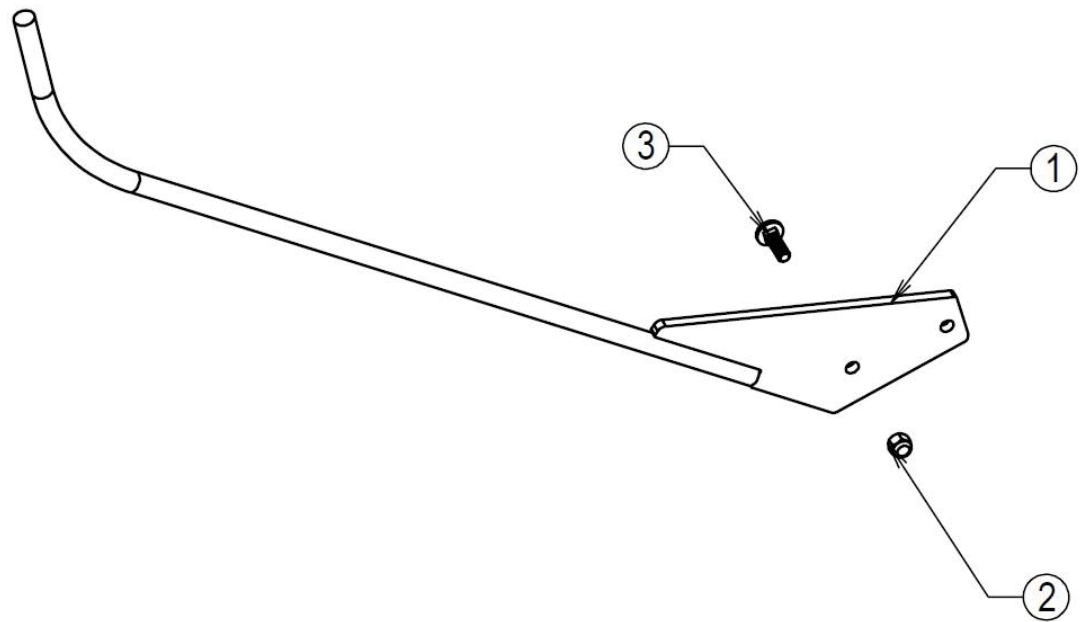


Figure 4 - Roto-Shear Collector Rod (CR02)

1-	CR02-01	ROTSHR COLLECTOR ROD	x1
2-	1202-05	LKNT NYL 3/8 UNC PLD	x1
3-	27000-67	BOLT 3/8-16X1-1/4" CRG FLAT HD	x1

UNIVERSAL HEADER KIT (27000-O1)

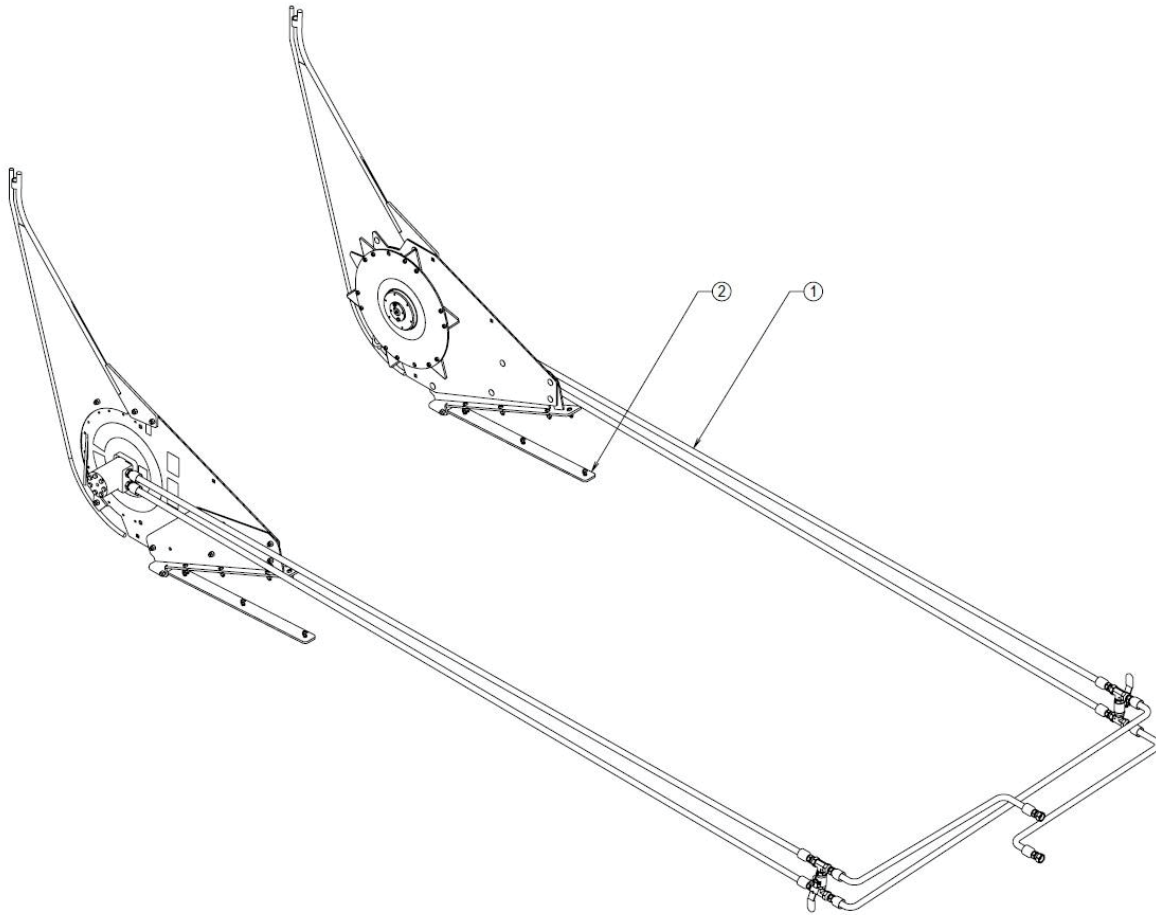


Figure 5 - Roto-Shear Universal Header Kit (27000-01)

1-	UHK15	ROTSHR UNI HOSE PKG	x1
2-	MBo8	ROTSHR MNT BK UNI	x2

Three additional hoses, that are to be produced locally, are required in order to complete the installation.

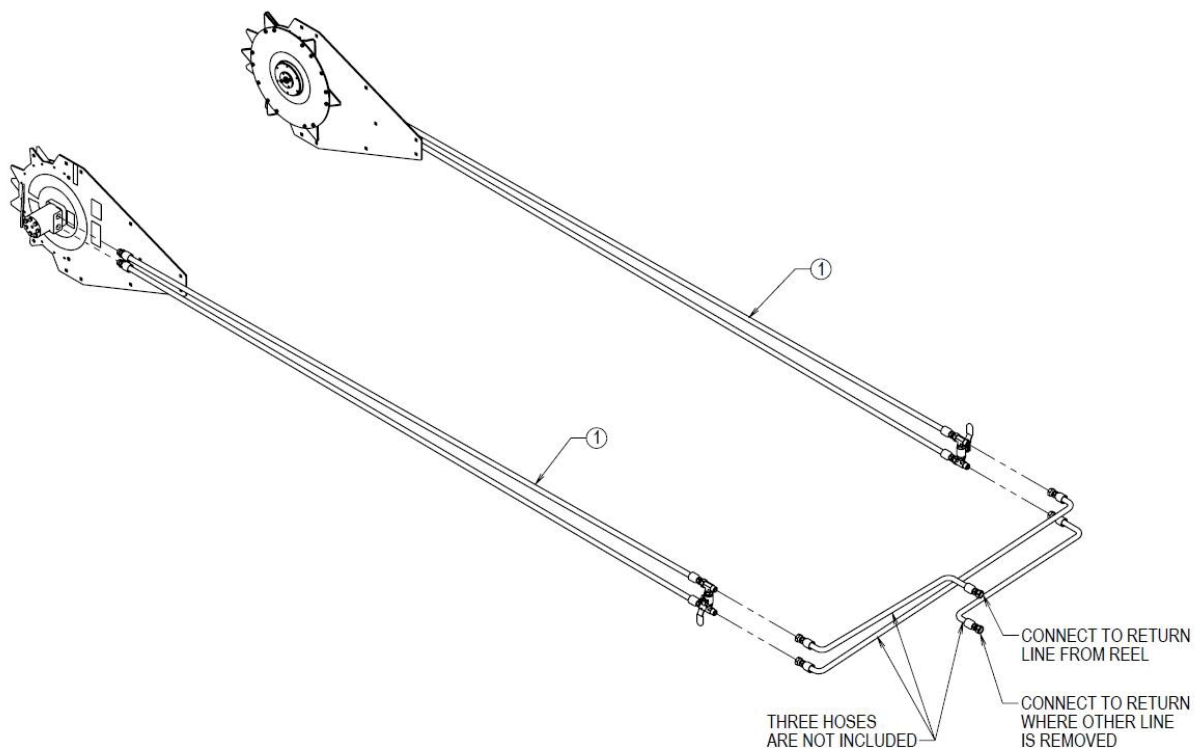


Figure 6 - Roto-Shear Universal Hose Package (UHK15)

1- UHK15-01 ROTSHR UNI HOSE PKG A x2

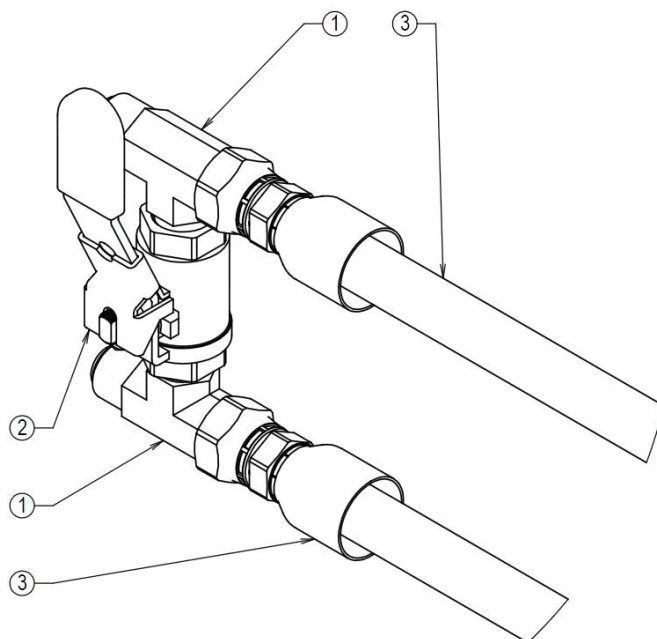


Figure 7 - Roto-Shear Universal Hose Package A (UHK15-01)

1-	27000-46	HYD FTG - 8MPL-10MJT	x2
2-	27000-47	VALVE HYD 1/2" SS BALL	x1
3-	27000-45	HOSEHYD#8/2WIR/120"/10MB/10FJX	x2

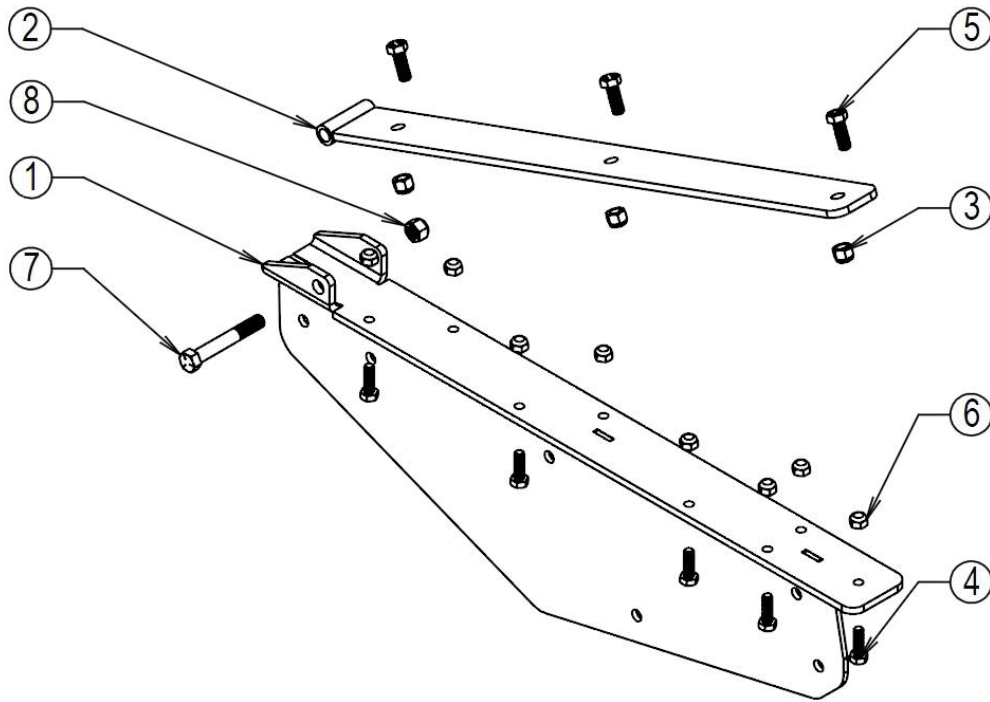


Figure 8 - Roto-Shear Mount Bracket Universal (MBo8)

1-	27001-09	ROTSHR UNI MNT B TOP	x1
2-	27001-11	ROTSHR UNI 3 HOLE TAB	x1
3-	1202-05	LKNT NYL 3/8 UNC PLD	x3
4-	1002-12	BOLT 5/16X1 UNC GR8 PLD	x7
5-	1004-16	BOLT 3/8X1 UNC GR8 PLD	x3
6-	1201-05	LKNT NYL 5/16 UNC PLD GR5	x7
7-	1006-23	BLT 7/16X3 UNC GR5 PL	x1
8-	1203-05	LKNT 7/16 UNC PLD	x1

1. Remove the rod on the divider board of the header.
2. Position the mounting bracket (MBo8) on the top of the divider board as far back as possible. The 1/4" x 2" flat bar(27001-11) which is hinged at the front and bottom of the mounting bracket will be the last part to be fastened. After the mounting bracket is securely fastened to the top of the divider board, the Roto Shear (27000-13) then should be installed to the mounting bracket. The collector rod (cro2) should be installed to the top of the Roto Shear.
3. Lower the reel to check for 1 – 2 inches of clearance between the Roto Shear and reel. If clearance is not adequate, you can tilt the Roto Shear by physically bending the Roto Shear out sideways. The material on the mounting bracket will bend at the base to give you the clearance needed.

4. After having the clearance you require, you now install the ¼" x 2" flat bar(27001-11) on the bottom side of the divider board. It is recommended that you install the bolt(1004-16) as close as possible to the front to give added support. Drill a new hole if needed in the mounting bracket bar. The 7/16" bolt (1006-23) in the hinge should be tightened. It is important there is no movement in this area.
5. If you require added support, an angle iron brace should be installed on the front bolt of the top of the Roto Shear down to the bottom of the divider board.
6. Connect the Roto Shear orbit motor (27000-15) in *series* to the orbit motor of the reel with ½" hydraulic hoses.
7. Care must be taken when making up hydraulic hoses to ensure **all** foreign materials are blown from the inside of the hoses. Debris in the lines could cause motor failure.
8. When the Roto Shear divider board (DB02) is installed on the front of the Roto Shear, the 6-blade rotor must be disabled as the 3/8" bolts (1102-09) that fasten the divider board interfere with the rotor blades. The rotor can be shut down in 2 different ways:
 - a) Use quick couplers
 - b) A ½" ball valve(27000-47) installed between the two hoses going to the Roto Shear will create a by-pass when opened, stopping the rotor from spinning.
9. If your swather does not have hydraulics for the reels, an auxiliary pump with a reservoir should be installed on a rotating shaft on the swather. This will prevent the Roto Shear from operating when the header is stopped. The Roto Shear should not operate when the header is stopped for safety reasons. The Roto Shear operates so quietly that when standing next to it, the noise of the tractor or swather engine is louder than the Roto Shear. For this reason, we do not recommend using the hydraulics from the tractor on a pull-type swather. An injury with the Roto Shear could be serious or even fatal.
10. A flow control is not required for the Roto Shear except for Honey Bee headers that have ¾" hydraulic hoses to the reel. If you use the reel motor, you do not require a flow control. Ideal operating speed of the rotor is 400 – 500 rpm.
11. If the Roto Shear is installed using the hydraulics on the tractor (on the pull-type swathers), it is recommended you install a one-way valve between the two hydraulic hoses going into the Roto Shear. This allows the rotor to slow down at a rate that would avoid a sudden stop that could otherwise shear the hub from the rotor. The same damage can occur if the engine is at operating speed and the Roto Shear control is engaged. Therefore, we suggest you engage the control while the engine is at a lower rpm.
12. The rotation of the rotor is **upward** at the front, lifting the crop in an upward direction.

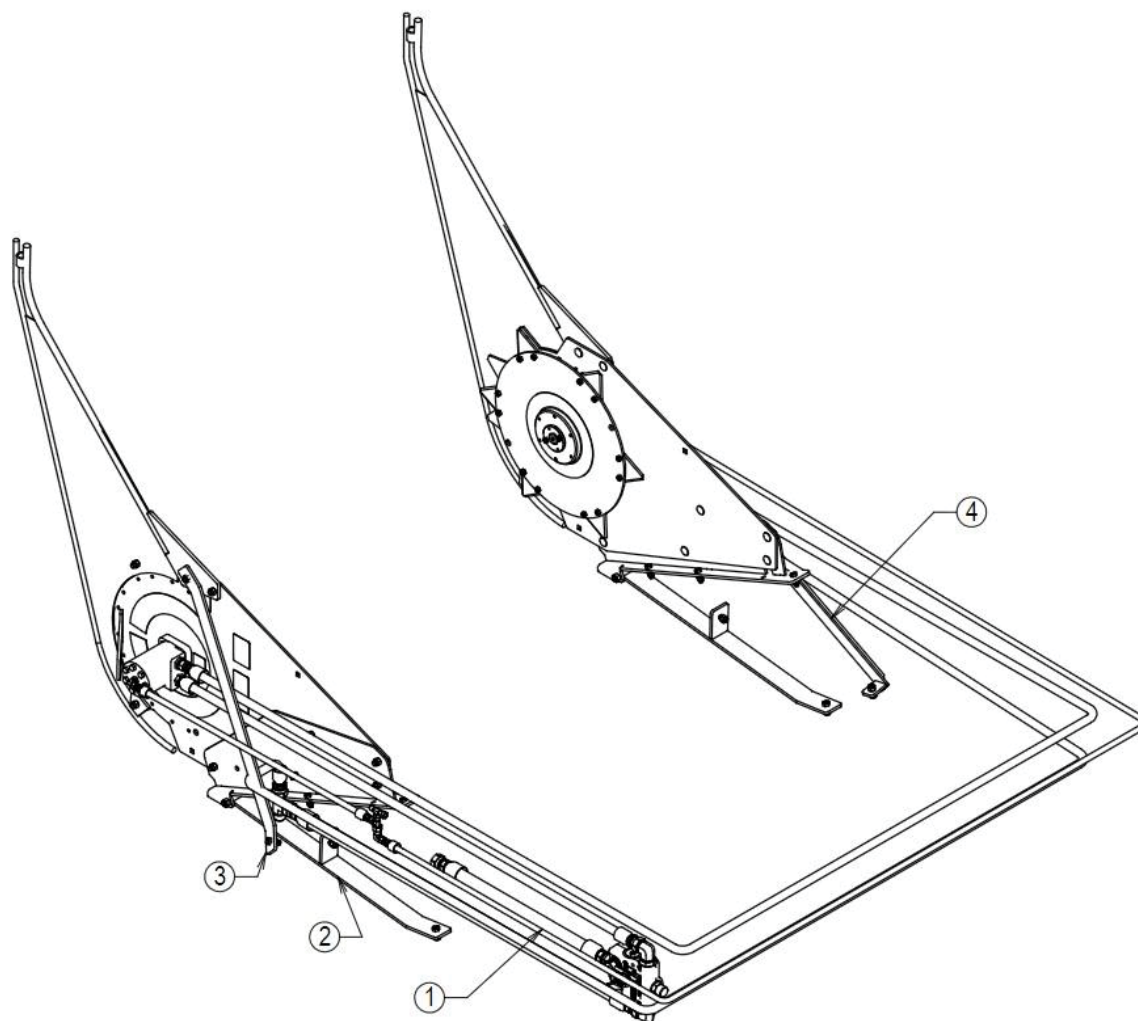


Figure 9- Roto-Shear MF 5200 AGCO 5000 (27000-08/09/10)

1-	MF52HK	ROTSHR MF5200 HOSE PKG	X1
2-	MAB12	ROTSHR MF5200AGCO5000 MNT BK	X2
3-	MLB08	ROTSHR MF5200AGCO5000 MNT B LS	X1
4-	MRB08	ROTSHR MF5200AGCO5000 MNT B RS	X1

Refer to note on chart below for the additional three hoses required for your installation.

FINAL ASSEMBLY	ADDITIONAL HOSE ASSEMBLY
27000-08	MF52HK25
27000-09	MF52HK30
27000-10	MF52HK36

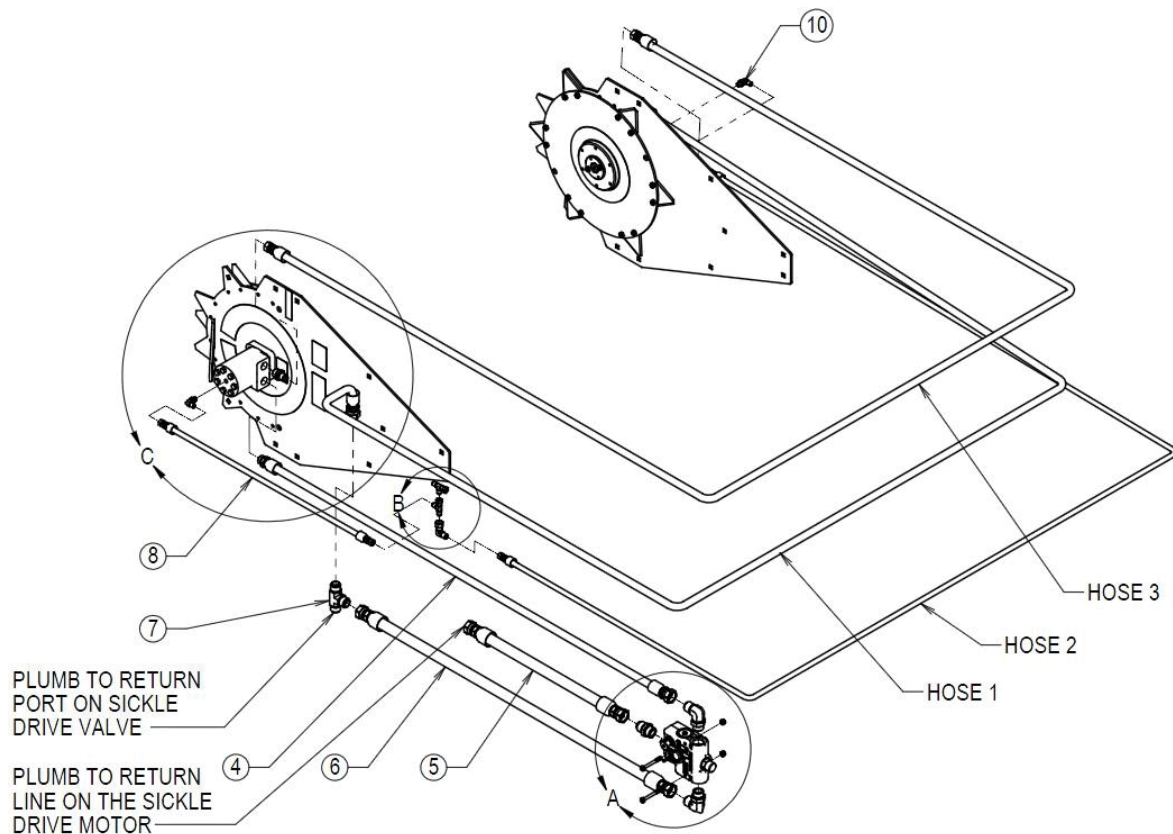
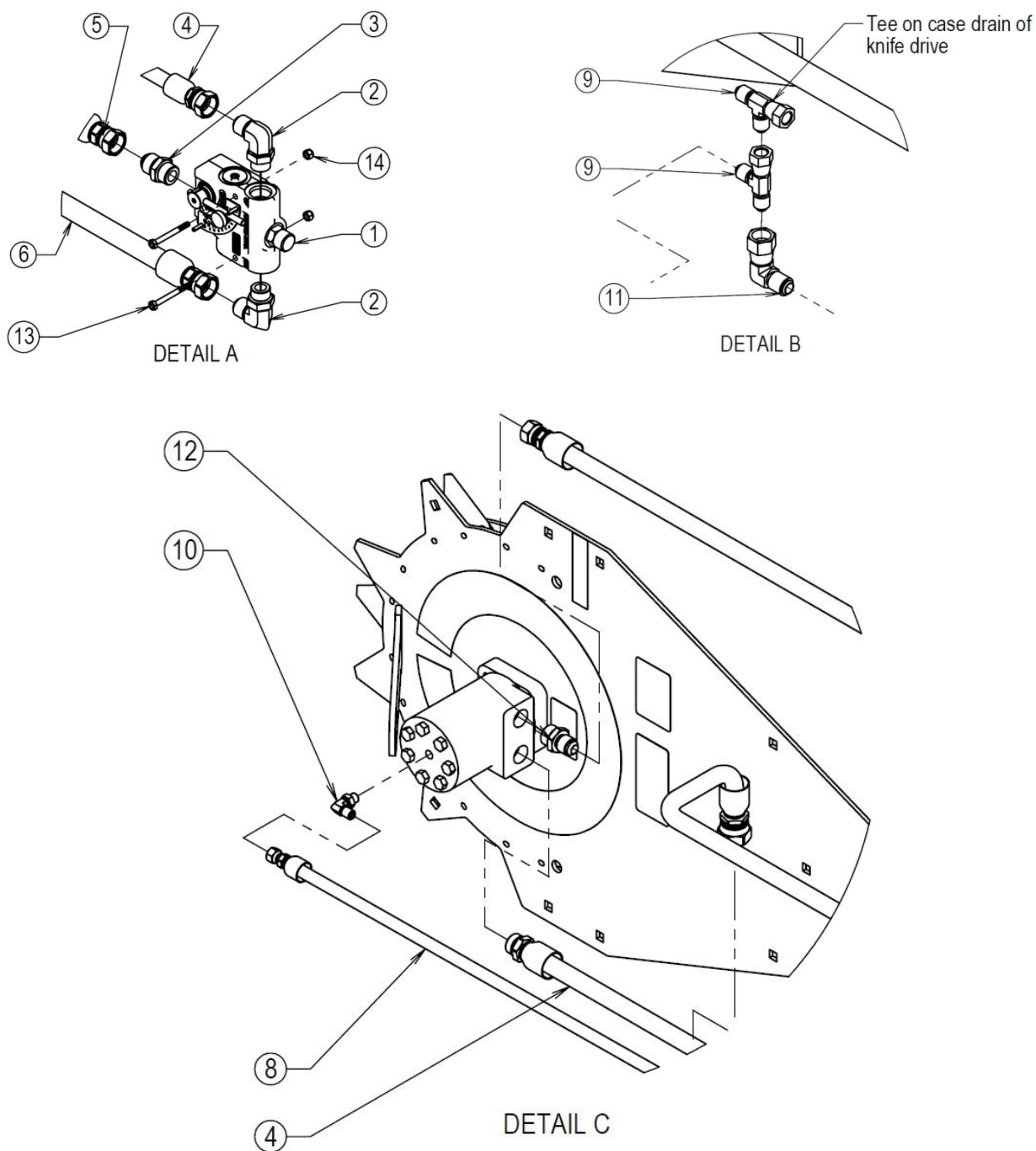


Figure 10 - Roto-Shear MF 5200 Hose Package (MF52HK)

1-	27000-48	VALVE HYD FLOW CNTRL - PCCR	x1
2-	26001-71	HYD FTG- 12MB-12MJ90	x2
3-	26001-70	HYD FTG- 12MB-12MJ	x1
4-	26001-57	HOSE HYD #8/58/12FJX/10MB	x1
5-	26001-55	HOSE HYD #12/22/12FJX/12FJX	x1
6-	26001-56	HOSE HYD #12/44/12FJX/12FJX	x1
7-	26001-68	HYD FTG- 12MJT	x1
8-	26001-64	HOSE HYD #4/30/4FJX/6FJX	x1
9-	2938	HYD FTG-6FJXR-6MJT TEE	x2
10-	26001-69	HYD FTG- 4MB-4MJ90	x2
11-	26003-00	HYD FTG 6MJ-6FJX90	x1
12-	30204	HYD,FIT,ADAPTER,10MB-8MJ	x3
13-	1000-40	BOLT 1/4X2-1/2 UNC GR5 PLD	x2
14-	1200-10	LKNT NYL INSR 1/4 UNC ZDW GR5	x2



FINAL ASSEMBLY	HOSE 1	HOSE 2	HOSE 3
27000-08 +M52HK25	27001-18 HOSE HYD #8/492/8FJX/12FJX	26001-65 HOSE HYD #4/540/4FJX/6FJX	27001-24 HOSE HYD #8/540/8FJX/8FJX
27000-09 +M52HK30	27001-19 HOSE HYD #8/552/8FJX/12FJX	26001-66 HOSE HYD #4/600/4FJX/6FJX	27001-25 HOSE HYD #8/600/8FJX/8FJX
27000-10 +M52HK36	27000-20 HOSE HYD #8/624/8FJX/12FJX	26001-67 HOSE HYD #4/672/4FJX/6FJX	27001-26 HOSE HYD #8/672/8FJX/8FJX

Use the chart above to determine the required the three hoses for your machine.

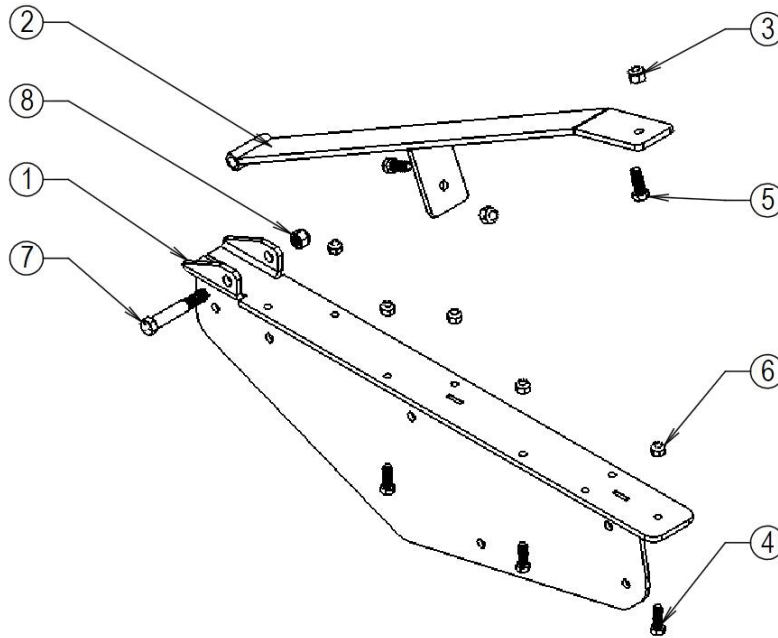


Figure 11 - Roto-Shear MF 5200 AGCO 5000 Mount Bracket (MAB-12)

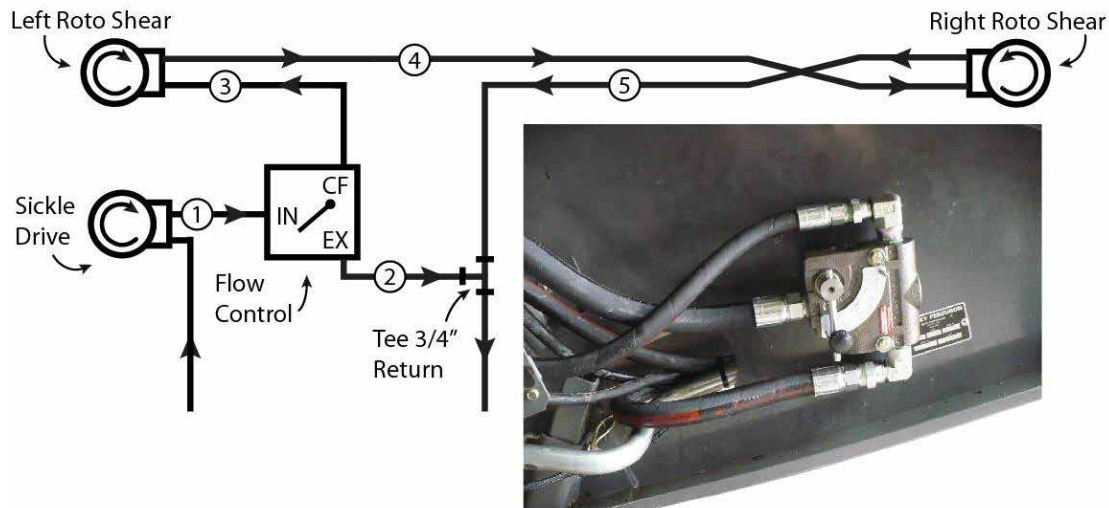
1-	27001-09	ROTSHR UNI MNT B TOP	x1
2-	27001-00	ROTSHR MF 5200 2 HOLE TAB	x1
3-	1202-05	LKNT NYL 3/8 UNC PLD	x2
4-	1002-12	BOLT 5/16X1 UNC GR8 PLD	x5
5-	1004-16	BOLT 3/8X1 UNC GR8 PLD	x2
6-	1201-05	LKNT NYL 5/16 UNC PLD GR5	x5
7-	1006-23	BLT 7/16X3 UNC GR5 PL	x1
8-	1203-05	LKNT 7/16 UNC PLD	x1

1. Remove existing divider board point from right and left sides of header.
2. Fasten the lower 1/4" x 2" flat bar (27001-00) of the mounting bracket (MAB12) to the divider board, using the hole where the divider board point was removed.
3. Rest the Roto Shear mounting bracket on the top of the divider board. Lift the mounting bracket up at the front until it is parallel to the top of the divider board, putting an offset in the lower 1/4" x 2" flat bar. Drill and bolt (1002-12) the mounting bracket to the top of the divider board.
4. Install mounting bolts as close to the front of the divider board as possible at the upper and lower flat bars of the mounting bracket. Be sure to tighten the 7/16"(1006-26) bolt at the hinge. This bolt should be should be extra tight to avoid movement.

5. Install the Roto Shear(27000-13) to the mounting bracket, followed by the collector rod(CRo2) at the front and top of the Roto Shear.
6. Set the reel down and forward as far as possible. If you do not have 1½" to 2" of clearance between the reel or reel arm, manually grab the Roto Shear at the top and pull it out to the side until you have the required clearance.
7. Install the braces (MLBo8 & MRBo8) provided for both sides.



HYDRAULICS INSTALLATION



- #1 Hose Connect #1 hose (#12 male JIC) to the return line on the sickle drive. Connect the other end of #1 hose to the **IN**-port of the flow control and fasten the flow control to the divider board as indicated in the photo.
- #2 Hose Connect #2 hose (#12 male JIC) to the **EX**-port of the flow control then feed it through the hole as seen in the photo and install the #12x12x12 JIC tee to the hose end.
- #3 Hose Connect #3 hose (#10 MORB) to the left Roto Shear, then the #12 male JIC to the **CF**-port of the flow control.
- #4 Hose Connect #4 hose (#10 ORB on both ends) to the left Roto Shear, then to the bottom port of the right Roto Shear.
- #5 Hose Connect #5 hose (#10 ORB on one end and #12 female JIC on the other end) to the top port of the right Roto Shear, then to the #12 JIC tee return.

Both Roto Shears must have the case drains connected to the return line of the case drain on the sickle drive. Unplug the end of the motor (27000-15) and replace the plug with a #4MB-4MJ90 (26001-69) on each side. Use two #6FJXR-6MJT (2938) fittings to tee in on the sickle drive drain. Then use the two hoses to connect the sickle drive drain to the case drains on the rotoshear (26001-64 & HOSE 2).

NOTE: The 3/4" steel line from the return port on the sickle drive must be removed completely and left off.



HONEYBEE 2014 & NEWER HEADER KIT (27000-04)

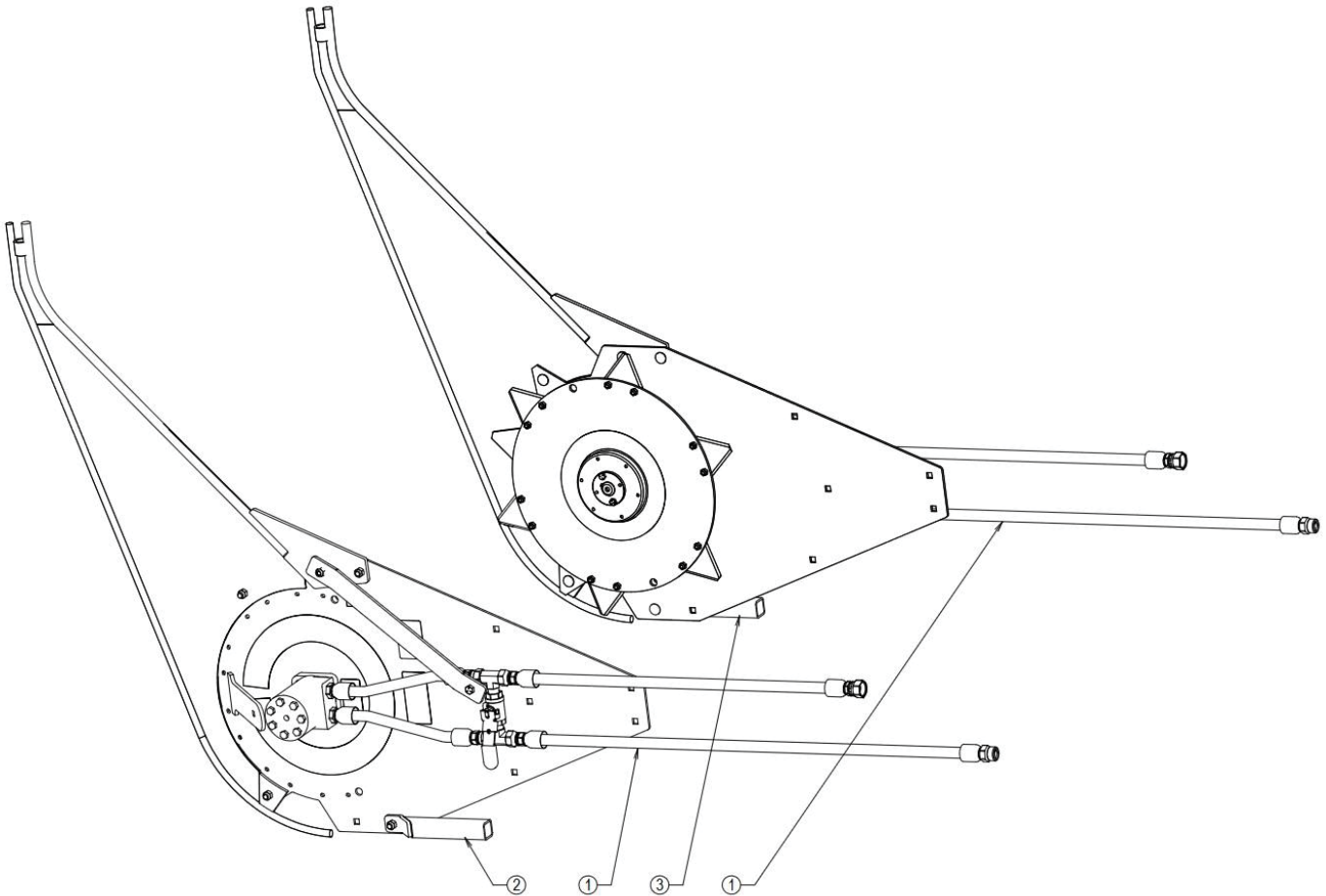


Figure 12 - Roto-Shear Honeybee 2014 & Newer (27000-04)

1-	HBHK14	ROTSR HONEYB HOSEPKG (2014+)	x1
2-	HBLB14	ROTSR HONEYB 2014+ MNT B LS	x1
3-	HBRB14	ROTSR HONEYB 2014+ MNT B RS	x1

This kit requires the machine to be equipped with the Roto-Shear ready option from Honeybee. To check for this you can look for capped connections under the end cover. If it does not have this you will need to contact your local CNH dealer to purchase the items required to make it Roto-Shear ready.

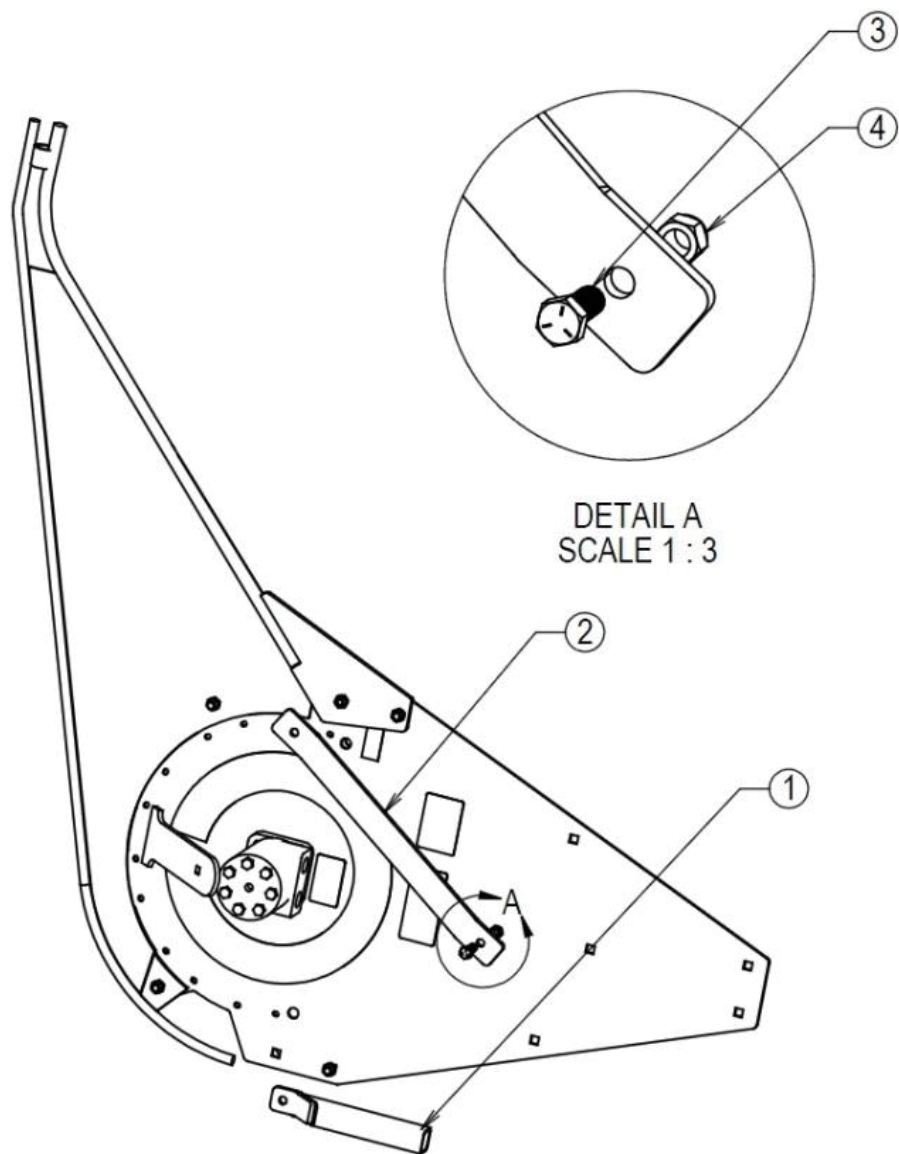


Figure 13 - Roto-Shear Honeybee 2014+ Mount Bracket Left Side (HBLB14)

1-	HBBT14	ROTSHR HONEYB 2014+ MNT BOOT	x1
2-	27000-84	ROTSHR HONEYBEE L BRACE BAR 14	x1
3-	1004-01	BOLT 3/8X1 UNC GR5 PLD	x1
4-	1202-05	LKNT NYL 3/8 UNC PLD	x1

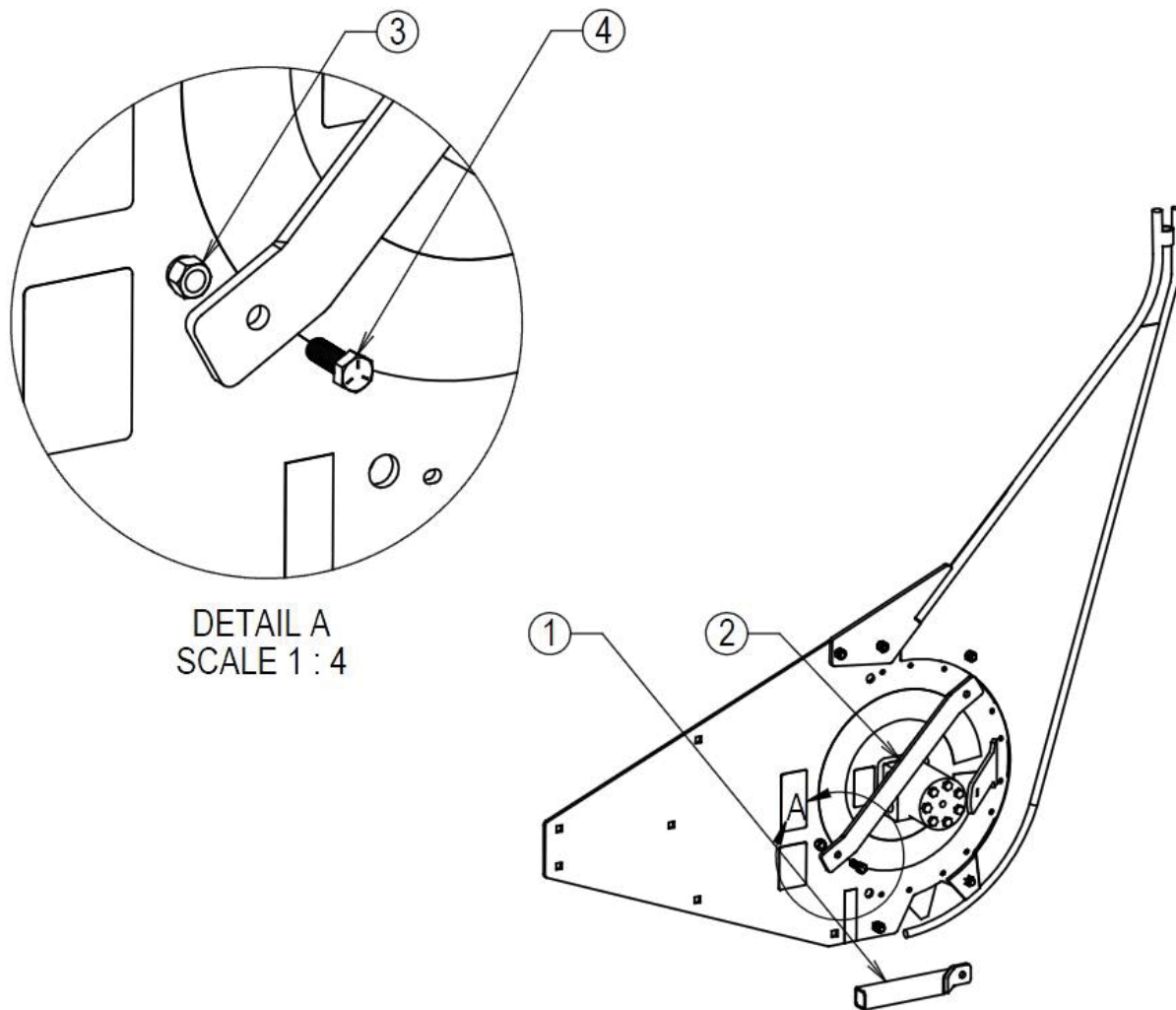


Figure 14 - Roto-Shear Honeybee 2014+ Mount Bracket Right Side (HBRB14)

1-	HBBT14	ROTSHR HONEYB 2014+ MNT BOOT	X1
2-	27000-85	ROTSHR HONEYBEE L BRACE BAR 14	X1
3-	1202-05	LKNT NYL 3/8 UNC PLD	X1
4-	1004-01	BOLT 3/8X1 UNC GR5 PLD	X1

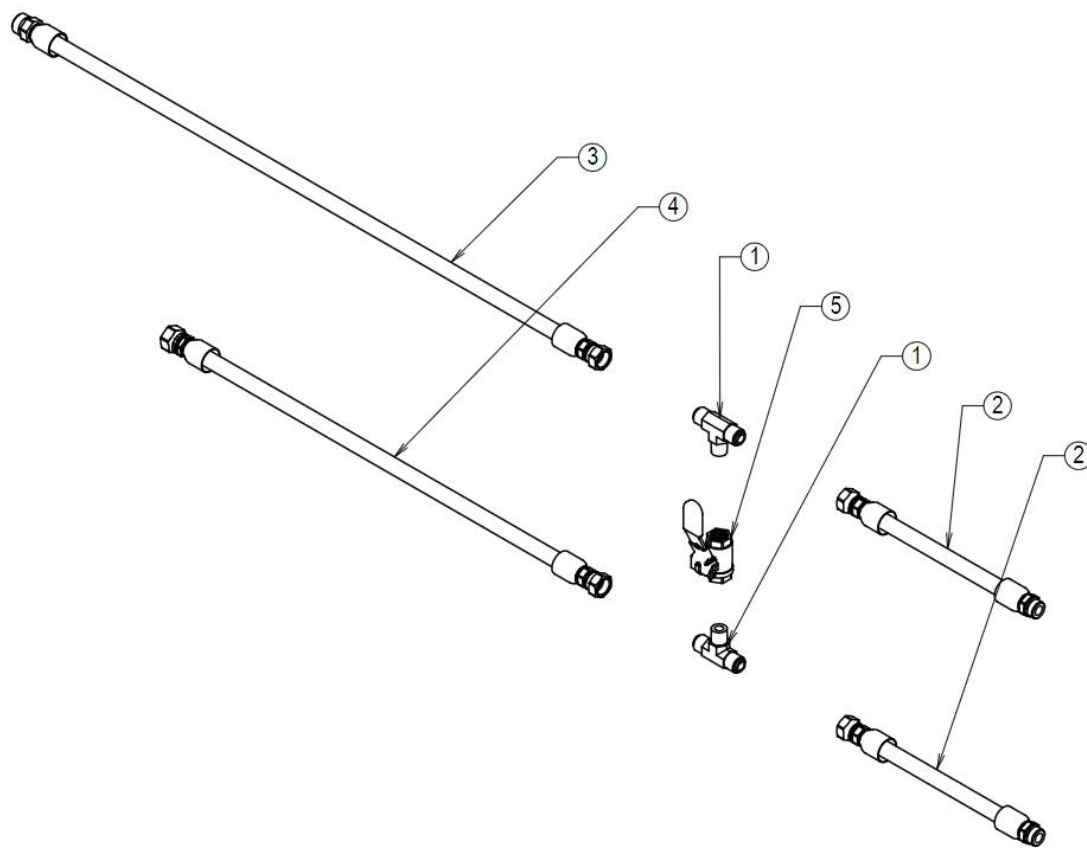


Figure 15 - Roto-Shear Honeybee Hose Package (2014+) A (HBHK14-01)

1-	27000-46	HYD FTG - 8MPL-10MJT	x2
2-	27001-05	HOSE HYD #8/13/10MORS/10FJX	x2
3-	27001-06	HOSE HYD #8/39/10FJX/10MORS	x1
4-	27001-07	HOSE HYD #8/29/10FJX/10FORSX	x1
5-	27000-47	VALVE HYD 1/2" SS BALL	x1

HONEYBEE 2013 & OLDER HEADER KIT (27000-03)

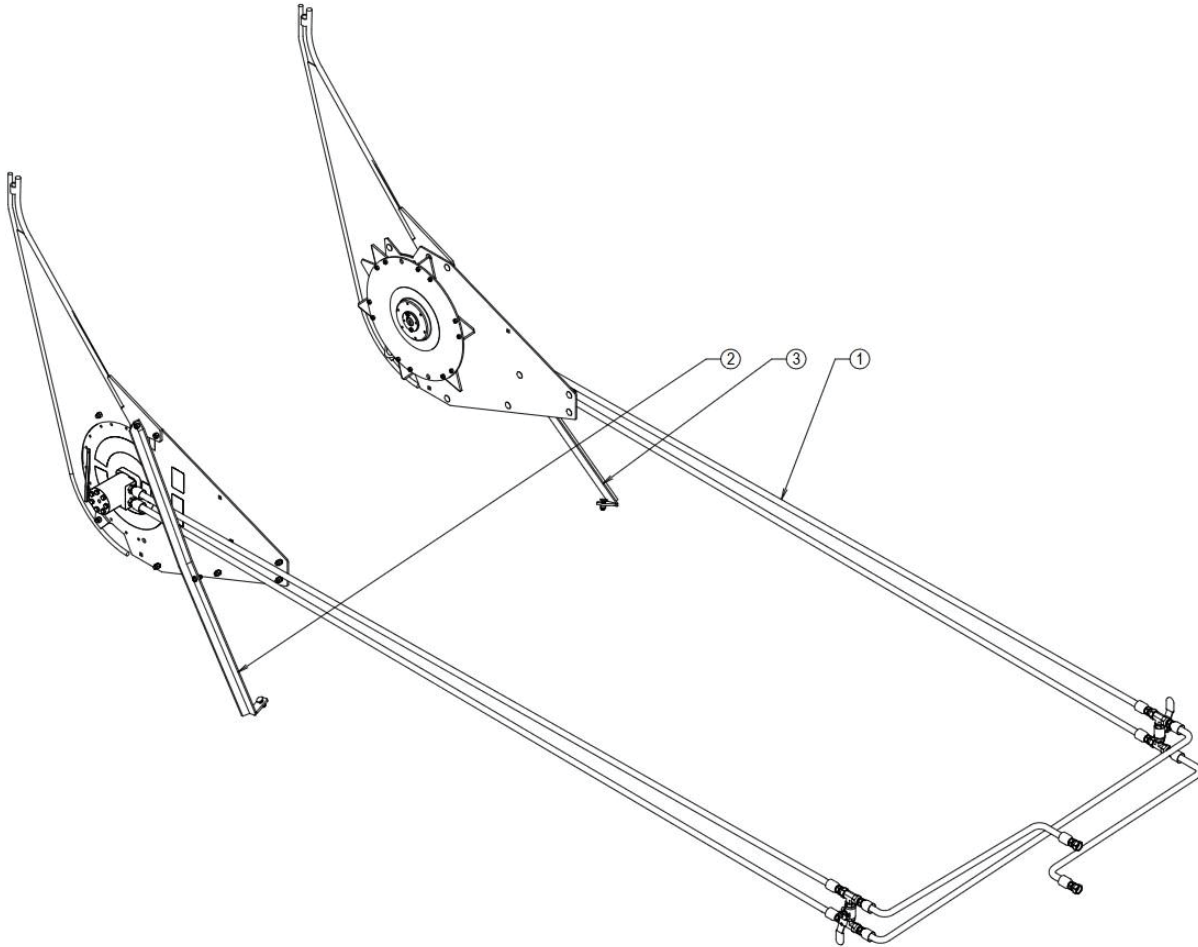


Figure 16 - Roto-Shear Honeybee Pre 2013 (27000-03)

1-	UHK15	ROTSHR UNI HOSE PKG	x1
2-	HBLB08	ROTSHR HONEYB -2013 MNT B LS	x1
3-	HBRB08	ROTSHR HONEYB -2013 MNT B RS	x1

Three additional hoses, that are to be produced locally, are required in order to complete the installation.

1. Remove the rod from in front of the divider board.
2. Drill a 3/8" hole in the extreme point of the divider board, leaving enough clearance for a 9/16" socket.
3. Install the Roto Shear using the second hole from the front on the bottom of the Roto Shear.
4. Drill a second hole at the back top of the Roto Shear approximately 1" below the top of the divider board on the swather.
5. Drill 3/8" holes in the balance of holes in the Roto Shear, install bolts(1102-09), and secure.

The Roto Shear should be located between the reel and reel arm to prevent contact when operating.

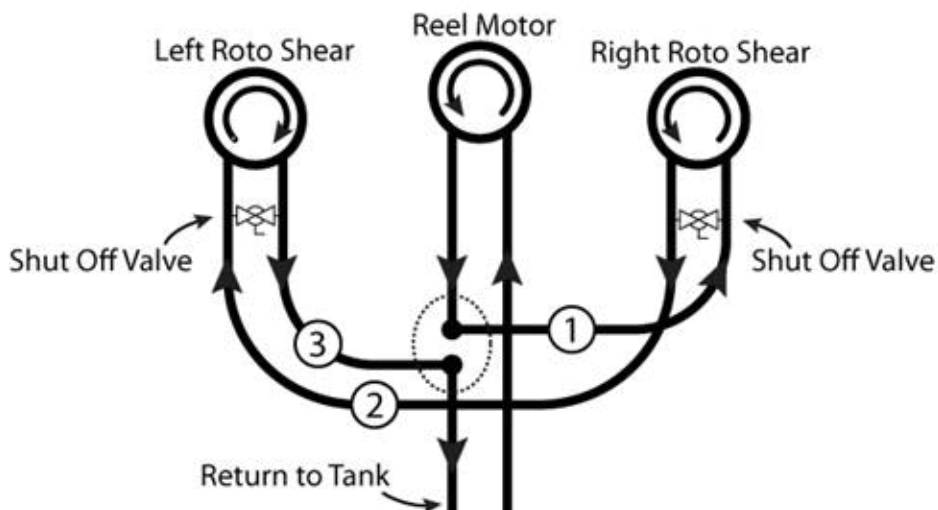
6. Angle iron braces (HBLBo8 & HBRBo8), which are supplied, are to be installed from the front bolt of the collector rod down to the $\frac{1}{2}$ " bolt on the sickle drive. A third bolt should be installed by drilling a $\frac{3}{8}$ " hole midway along the brace into the divider board of the swather.

Without this midway support, the angle iron brace will fail.



HYDRAULICS INSTALLATION

The preferred method is to take the hydraulics from the reel motor. If there are $\frac{3}{4}$ " hydraulic lines to and from the orbit motor, you will require a flow control. You may use a draper motor, providing the header is not designed for double swathing. Regardless of which place you draw from, it is important that you come off of the *RETURN* port of the motor. To identify the return port of any orbit motor, check the rotation of the motor. The oil passes through the motor the same direction that it turns. From that, you can determine which port the oil enters and which port the oil exits the motor (the *RETURN* port).



JOHN DEERE DRAPER HEADER KIT (27000-12)

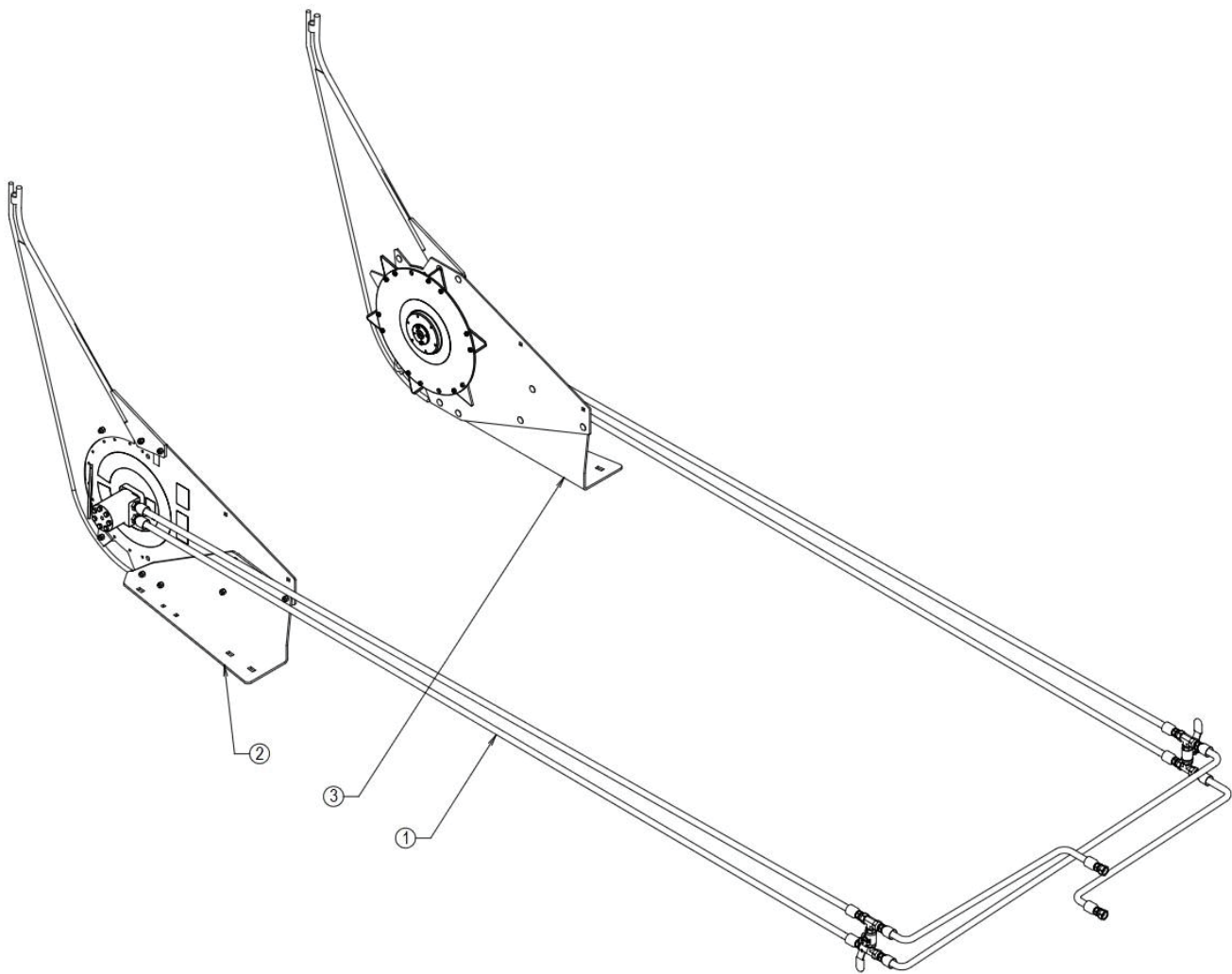
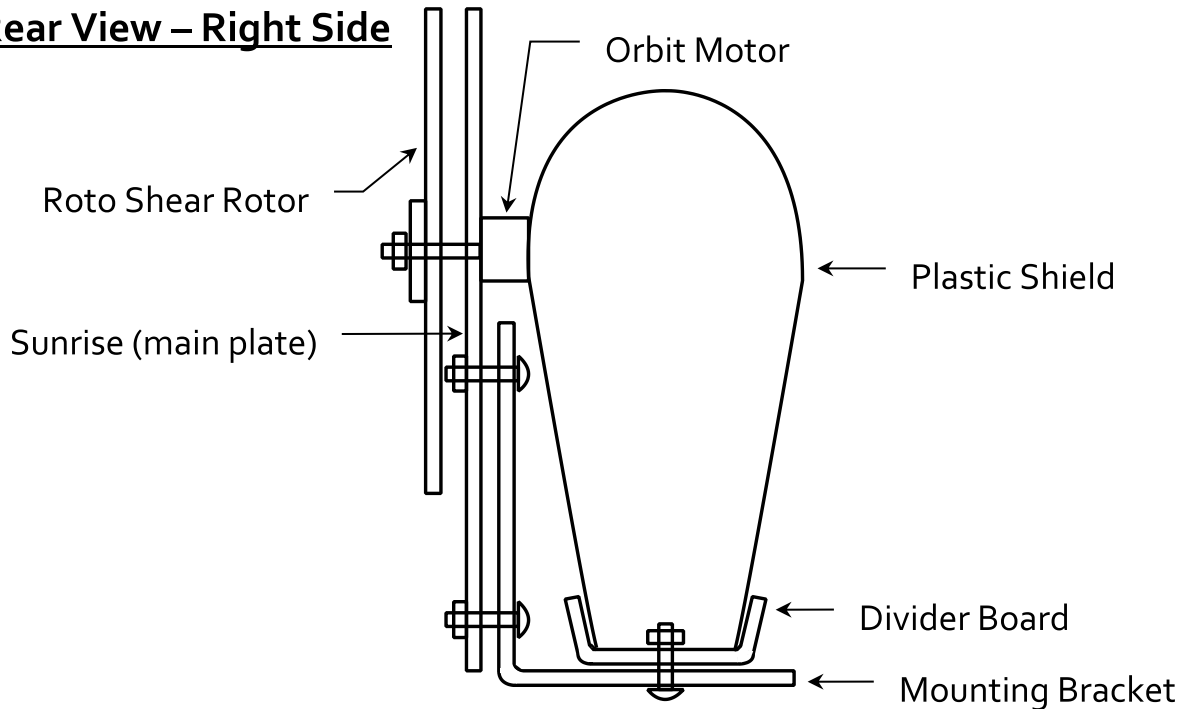


Figure 17 - Roto-Shear John Deere Draper Header (27000-12)

1-	UHK15	ROTSHR UNI HOSE PKG	x1
2-	JDLB11	ROTSHR JD DRAPER MNT B LS	x1
3-	JDRB11	ROTSHR JD DRAPER MNT B RS	x1

Three additional hoses, that are to be produced locally, are required in order to complete the installation.

Rear View – Right Side



WARNING: *Extreme caution must be taken with the sharp rotor blades. To avoid injury, follow each of the following steps.*

1. For your safety, install a 3/8" bolt in rotor and sunrise to prevent the rotor blades from rotating during installation.
2. Install the Roto Shear(27000-13) to the outside of the mounting bracket(JDLB11 & JDRB11) with the head of the bolts(1102-09) against the plastic shield.
3. Install the Roto Shear (with the mounting bracket fastened to it) to the bottom side of the divider board. Be sure all holes at the base are used to assure maximum security.
4. Remove safety bolt from the rotor and sunrise after installation is complete.



MACDON 972 HEADER KIT (27000-05)

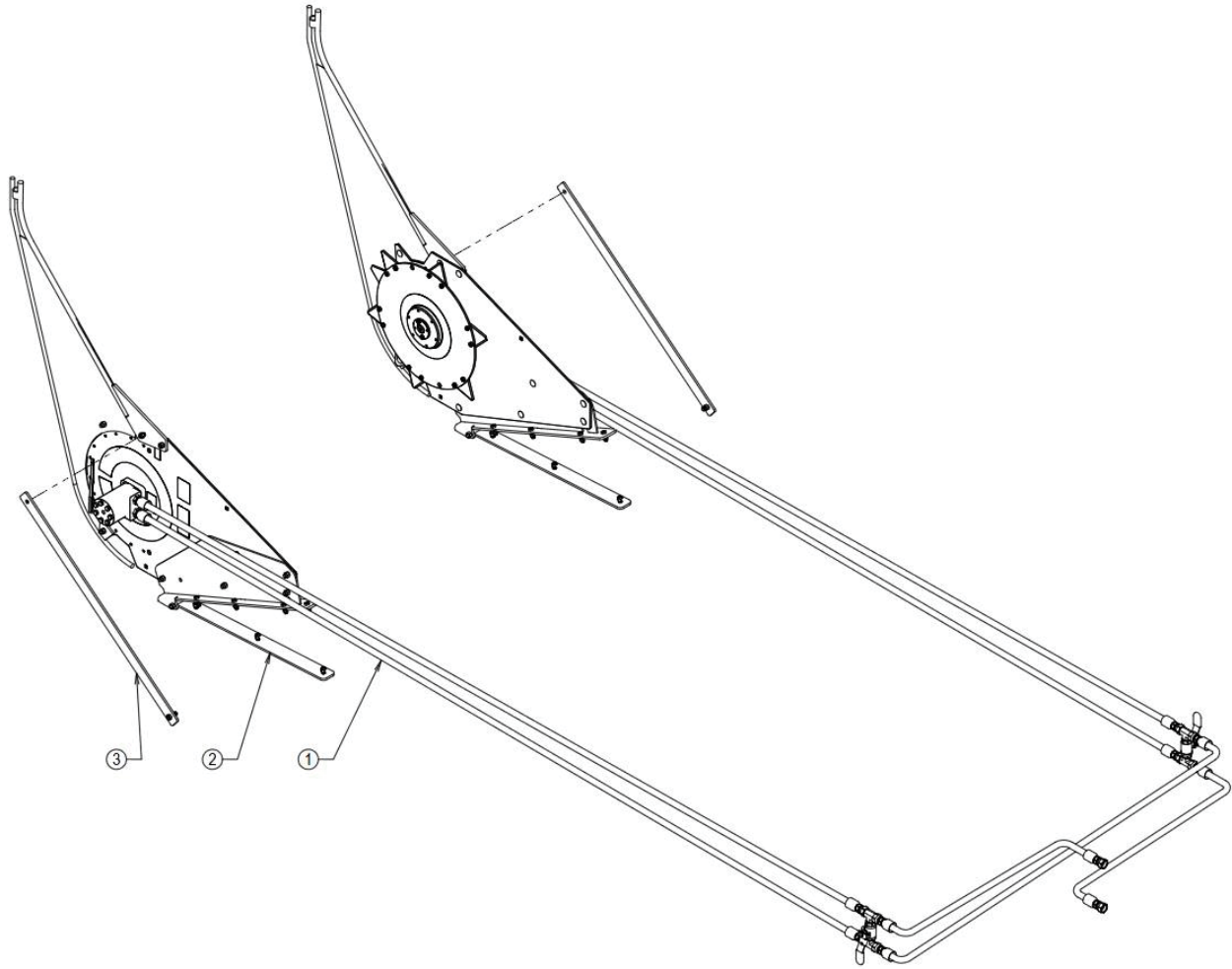


Figure 18 - Roto-Shear MacDon 972 Header (27000-05)

1-	UHK15	ROTSHR UNI HOSE PKG	x1
2-	MB08	ROTSHR MNT BK UNI	x2
3-	MD972B13	ROTSHR MACDON 972 MNT B	x2

Three additional hoses, that are to be produced locally, are required in order to complete the installation.



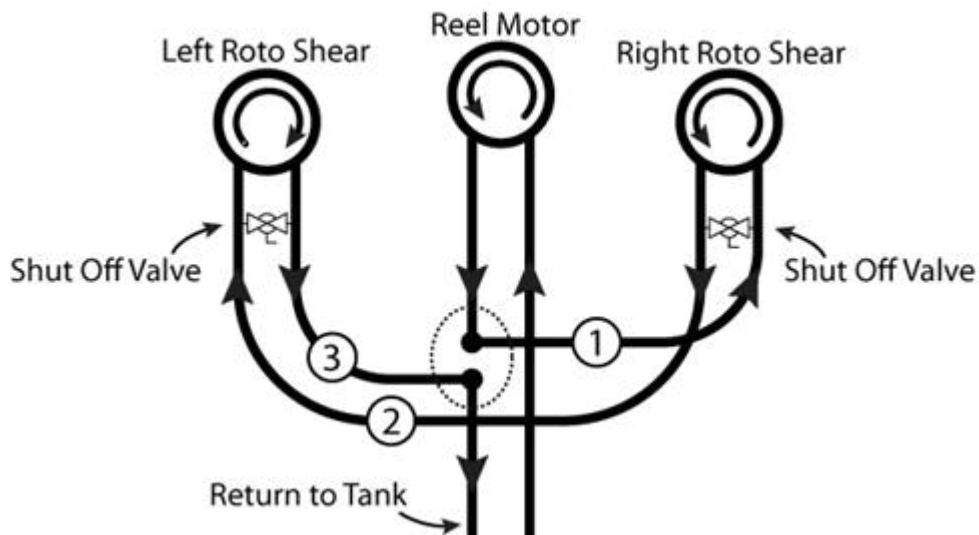
1. The knob at the point of the divider board needs to be removed to accommodate the mounting bracket. Slide a straight edge down the top of the divider board until it touches the knob, mark it, then cut it off approximately $\frac{1}{4}$ " shorter using a zip grinding wheel on an angle grinder. Take the knob and put it on the rod that was earlier removed from the point of the divider board and install both in the side of the divider board.
2. Install the mounting bracket(MBo8) as far up the divider board as possible, leaving the $\frac{1}{4}$ " x 2" flat bar that hinges at the front, the last to be installed. Drill all the holes and install and fasten the bolts securely.
3. Install the Roto Shear(27000-13) to the inside of the mounting bracket using the hardware provided. Install the collector rod(CRo2) at the top and front of the Roto Shear.
4. Approximately 2" of the clearance is needed between the rod arm and the Roto Shear. Push the reel ahead as far as possible and lower the reel down all the way. To get the clearance needed, you must bend the mounting bracket that the Roto Shear is attached to. This is achieved by grabbing the Roto Shear at the top side and physically pulling it outwards until you have the clearance needed. You may require assistance, but do not worry about damaging the Roto Shear.
5. After getting the 2" of clearance between the reel arm and the Roto Shear, you can now install the $\frac{1}{4}$ " x 2" flat bar to the bottom side of the divider board. The first hole in the front of the bar may not be in a good location. If necessary, re-drill the hole in an area where you will get good support. Drill and install fasteners in the remaining holes. After securing the 3 bolts in the bottom bar, tighten the front bolt in the hinge. It is important that there is NO movement in this area.
6. A $\frac{1}{4}$ " x $1\frac{1}{4}$ " or $1\frac{1}{2}$ " flat bar brace(MDg72B13) should be installed from the top front bolt on the collector rod down to the point of the divider board where you can find good support. You need approximately a 33" bar with a $\frac{3}{8}$ " hole, 1" in from the ends, giving you 30" centre to centre.

HYDRAULICS INSTALLATION

If you can double swath, you will be required to take your hydraulics from your reel motor. You MUST take it from the RETURN side of the reel motor.

To find out which is the return port, check on the rotation of the motor. The oil goes through the motor in the same direction that the motor turns. For example, if the motor is turning clockwise and you have your ports on the top of the motor, the oil is going in on the right port and coming out on the left port. Therefore, you must connect to the line on the left port and go to the bottom port of the right Roto Shear. You then go from the top port of the right Roto Shear to the bottom port of the left Roto Shear. From the top port of the left Roto Shear, you go back to the return line that returns to the tank.

Roto Shear units must be the LAST motor on the line. If you have the other motors behind the Roto Shear motor you will have problems blowing out the seals.



MACDON D50 & D60 HEADER KIT (27000-06)

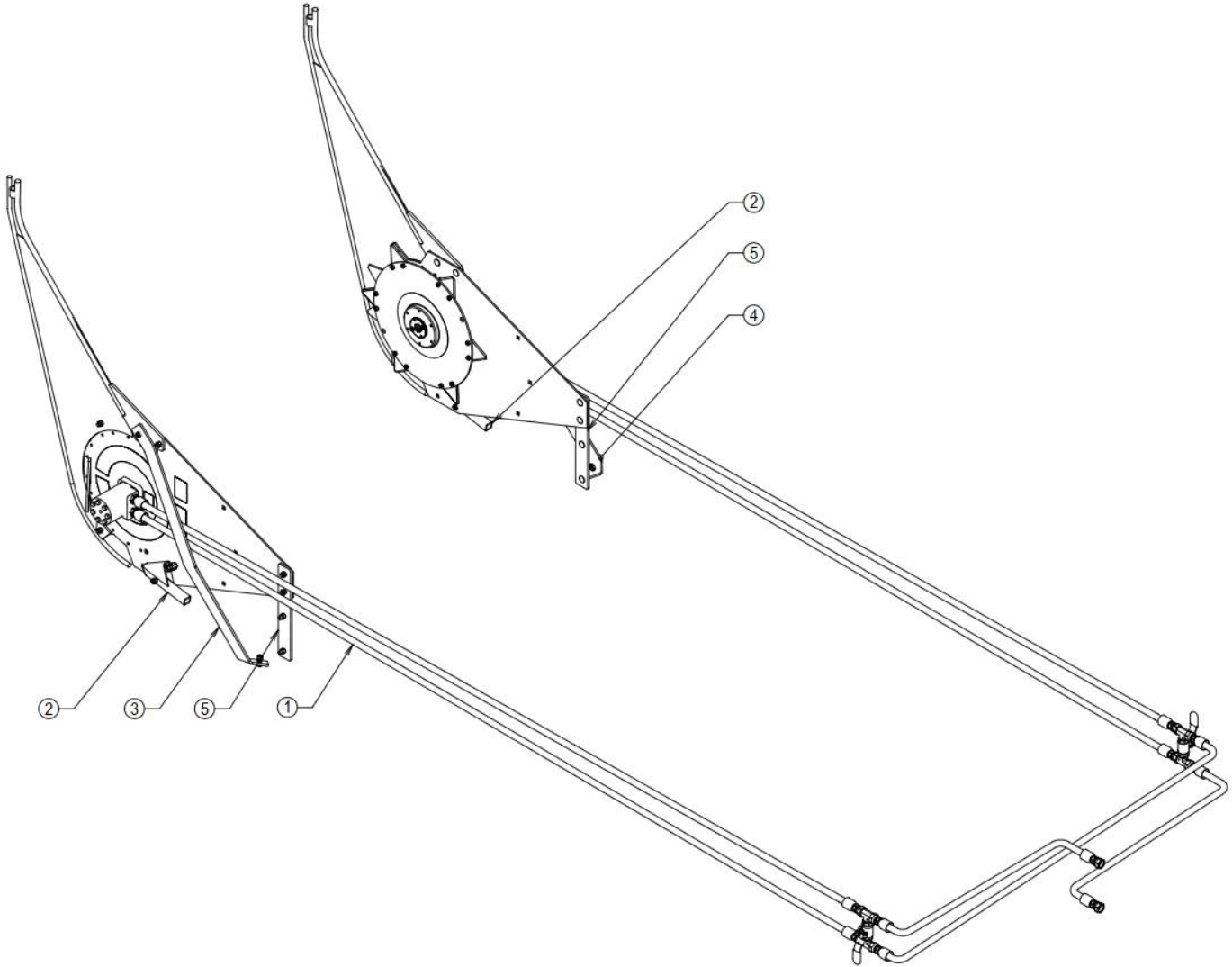


Figure 19 - Roto-Shear MacDon D50 & D60 (27000-06)

1-	UHK15	ROTSHR UNI HOSE PKG	x1
2-	MDBTo8	ROTSHR MACDON D50&D60 MNT BOOT	x2
3-	MDLBo8	ROTSHR MACDON D50&D60 MNT B LS	x1
4-	MDRBo8	ROTSHR MACDON D50&D60 MNT B RS	x1
5-	SMDB11	ROTSHR MACDON D50&D60 MNT B S	x2

Three additional hoses are required, to be produced locally, in order to complete the installation.

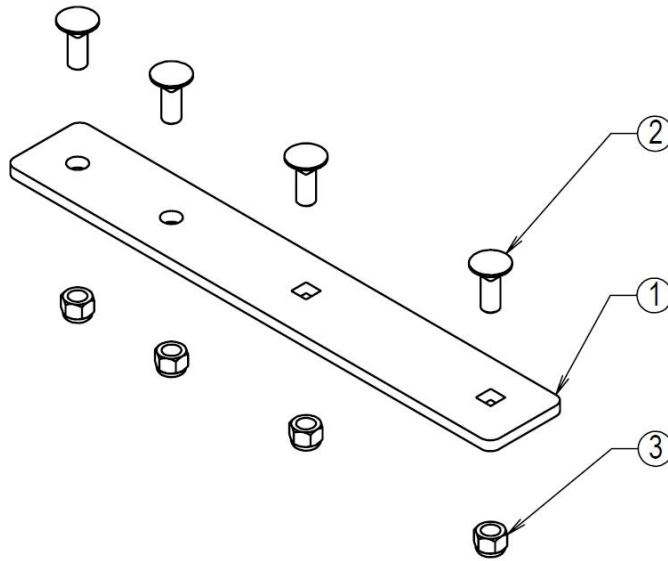


Figure 20 - Roto-Shear MacDon D50 & D60 Mount Bracket Side (SMDB11)

1-	27000-83	ROTSR MACDON D50&D60 MNT BS4	x1
2-	1102-09	BOLT CRG 3/8X1 UNC GR5 PLD	x4
3-	1202-05	LKNT NYL 3/8 UNC PLD	x4

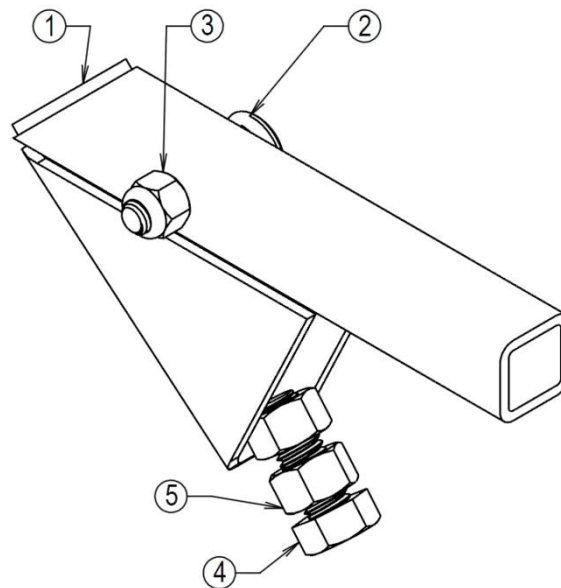


Figure 21 - Roto-Shear MacDon D50 & D60 Mount Boot (MDBTo8)

1-	MDBTo8-01	ROTSR MACDON D50&D60 MNT BOOT	x1
2-	1102-13	BOLT CRG 3/8X1-3/4 UNC GR5 PLD	x1
3-	1202-05	LKNT NYL 3/8 UNC PLD	x1
4-	1007-07	BOLT 1/2X1-1/4 UNC GR5 PLD	x1
5-	1204-15	NUT 1/2 UNC PLD GR5	x1

1. Remove the rod from the point of the divider board, and then install the boot on the same location.
2. Install the collector rod on the Roto Shear.
3. Install the Roto Shear on the inside of the divider board and in the 2nd hole from the front of the Roto Shear.
4. Lower the reel down and ahead as far as possible.
5. Raise the Roto Shear allowing approximately 1 – 2 inches between the collector rod and the reel arm.
6. Drill and fasten the Roto Shear (27000-13) to the inside of the divider board.
7. Install the brace provided to the front bolt of the collector rod and to the tab at the rear and base of the removable point of the divider board of the header.
8. Install hydraulic hoses to the return port of the orbit motor of the reel motor.
 - The Roto Shear must be hooked up in series.
 - The Roto Shear must also be the last motor on the line.*If they are ahead of another orbit motor the seals in the Roto Shear may fail due to backpressure.*



MACDON D65 HEADER KIT (27000-07)

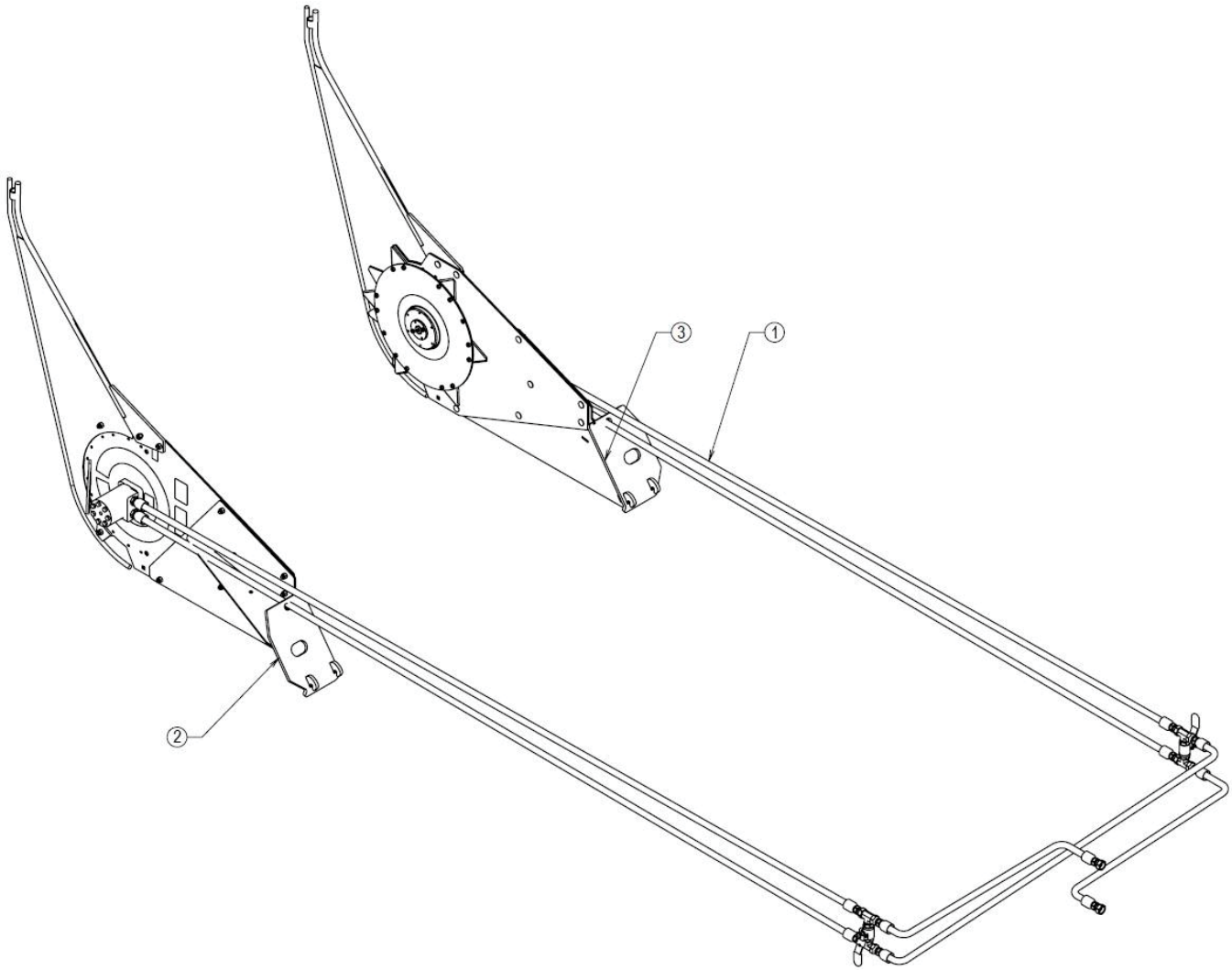


Figure 22 - Roto-Shear MacDon D65 & John Deere 400D (27000-07)

1-	UHK15	ROTSHR UNI HOSE PKG	x1
2-	MDD65LB13	ROTSHR MACDON D65 MNTBK LS	x1
3-	MDD65RB13	ROTSHR MACDON D65 MNTBK RS	x1

Three additional hoses are required in order to complete the installation.

1. Remove point from divider boards on both sides.
2. Install the mounting brackets provided for the D65 using the $\frac{3}{4}$ " bolt and washer. Be sure to tighten bolt extremely tight to avoid loosening.
3. Install the Roto Shear to the inside of the mounting brackets, securing it with the bolts supplied.

HYDRAULICS INSTALLATION

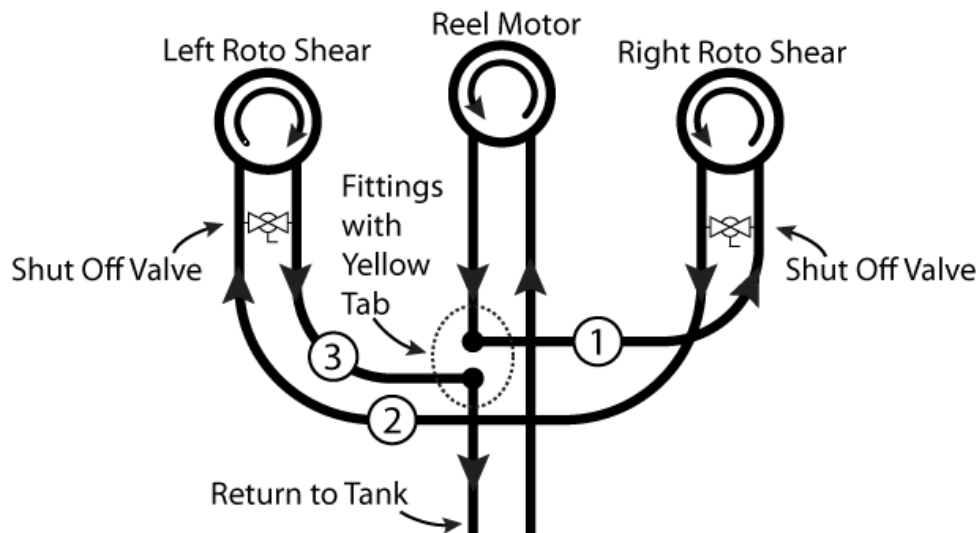
A universal hose kit (UKH15) is provided in this kit. This kit contains two preassembled hose(27000-45) sets consisting each of two 10-ft hoses, joined by ½" full-port, high-pressure, stainless steel ball valves(27000-47). These hose sets attach to the Roto Shear and the rear corner of the header. The ball valves will allow you to shut the Roto Shear off on either end.

IMPORTANT NOTE: *Three additional hoses* are required to complete the hydraulics installation, but *not included* in this kit due to the variance of header lengths. You will need to determine the lengths of these hoses, according to the three hose placements listed below.

It is recommended that the oil be taken from the return of the reel motor.

1. Begin by locating the fitting with the yellow tie strap, located on the quick disconnect near the right drive wheel. Remove the hose from that fitting, adding a length of hose, long enough to reach the ball valve port that goes to the bottom port of the right Roto Shear orbit motor.
2. Then run another hose from the top port of the right Roto Shear to the bottom valve port, leading to the left Roto Shear.
3. Finally, your third hose will run from the top port of the left Roto Shear, to the open port of the quick disconnect, where the first hose was removed at the yellow tie strap, in step 1 above.

You can now shut off either side independently.



PARTS LIST

DESCRIPTION	PART No.
Orbit Motor ORB with case drain.....	27000-15
Orbit Motor Seal Kit (BMPH-N motor).....	27000-15-01N
Orbit Motor Seal Kit (BMPH motor).....	27000-15-01
Sunrise with Decals	SR09
Divider Board.....	DB02
Collector Rod.....	CR02
Rotor without sections and bolts	ROT10
with sections and bolts installed	ROTB13
John Deere Mounting Right Bracket	JDRB11
Left Bracket	JDLB11
Honey Bee Mounting Left Brace.....	HBLB08
(2013 and older) Right Brace	HBRB08
Honey Bee Mounting Left Brace.....	HBLB14
(2014 and newer) Right Brace.....	HBRB14
Boot.....	HBBT14
MacDon 972 Mounting Brace.....	MD972B13
MacDon D50 or D60 Mounting	
Left Brace	MDLB08
Right Brace	MDRB08
Short Brace	SMDB08
Boot.....	MDBT08
MacDon D65 Mounting	
Left Bracket	MDD65LB13
Right Bracket	MDD65RB13
Massey 5200 Mounting	
Universal Mounting Bracket.....	MAB12
Left Brace	MLB08
Right Brace	MRB08
Massey 5300 Mounting	
Mounting Bracket	MAB15
Left Brace	MF53LB
Right Brace	MF53RB
Universal Mounting Bracket	MB08
Flat Head Carriage Bolt for Collector Rod.....each.....	27000-67
Sickle Sections	each.....27000-15
Sickle Section Bolts	each.....27000-16
Sickle Section Bolts	each.....27000-17

CONTACT YOUR LOCAL DEALER FOR PRICES

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FREE FORM WARRANTY POLICY

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

Warranties 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) 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:

i. Loss or damage during shipment (see: Free Form Whole goods Shipping Policy)

ii. Failures resulting from the lack of or improper maintenance.

iii. Damage caused by operator abuse, negligence, or improper operation.

iv. Non-defective items replaced due to customer demand unless authorized by Free Form.

v. No reimbursable maintenance items including but not limited to oil, etc.

vi. Any and all costs for repairs or replacement of parts not shown to be defective.

vii. Damage due to accidents.

c) **The Orbit motor** is **not** covered under this warranty policy, due to a limited warranty by the motor's manufacturer.

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 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.

3) 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.

CONTACT US

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