

ROTO-SHEAR

MANUAL



Free Form Plastic Products

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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.

TABLE OF CONTENTS

| | |
|---|----|
| Important Notice – Putting Safety First | 1 |
| Tips to Avoid Accidents | 1 |
| Problems that may occur in heavy crops | 2 |
| ROTOSHEAR INSTALLATION INSTRUCTIONS | 2 |
| Roto-Shear Common Unit (27000-00) | 3 |
| Universal Header Kit (27000-01) | 7 |
| M.F. 5200 & AGCO 5000 Kit (27000-08/09/10) | 11 |
| M.F. & AGCO 5400 Kit (27001-30 or 27001-30-25/30/35/40) | 17 |
| Honeybee 2014 & Newer header kit (27000-04) | 25 |
| Honeybee 2013 & Older Header Kit (27000-03) | 29 |
| John Deere Draper Header Kit (27000-12) | 31 |
| MacDon 972 Header Kit (27000-05) | 33 |
| MacDon D50 & D60 Header Kit (27000-06) | 36 |
| Macdon D65 Header Kit (27000-07) | 39 |
| Parts List | 41 |
| Free Form Warranty Policy | 42 |
| Contact Us | 43 |

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 is 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 the 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. We also recommend that all orbit motors have case drain lines again to relieve excessive pressure on the seals.

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.

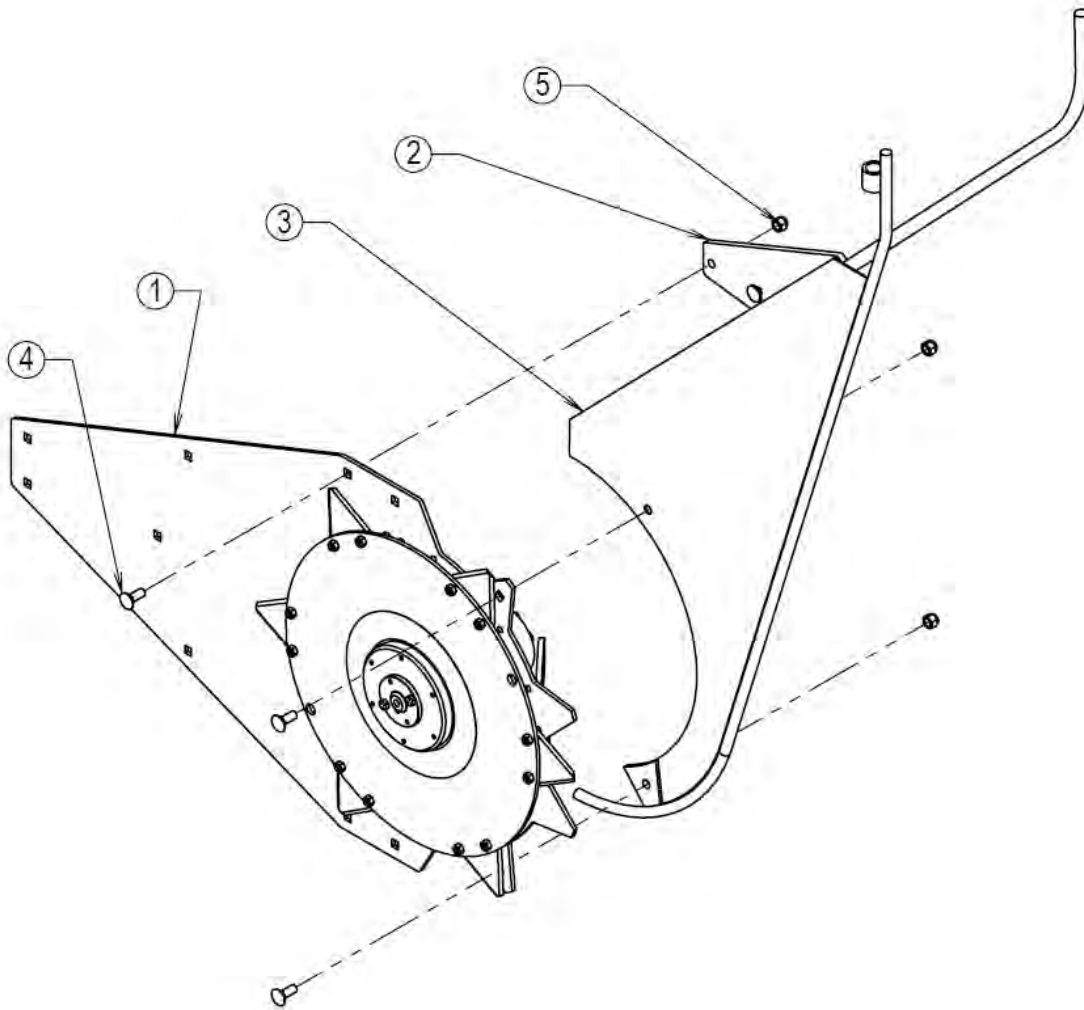


Figure 1- Roto-Shear Common Assembly (27000-00)

| | | | |
|----|----------|----------------------------|----|
| 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 |

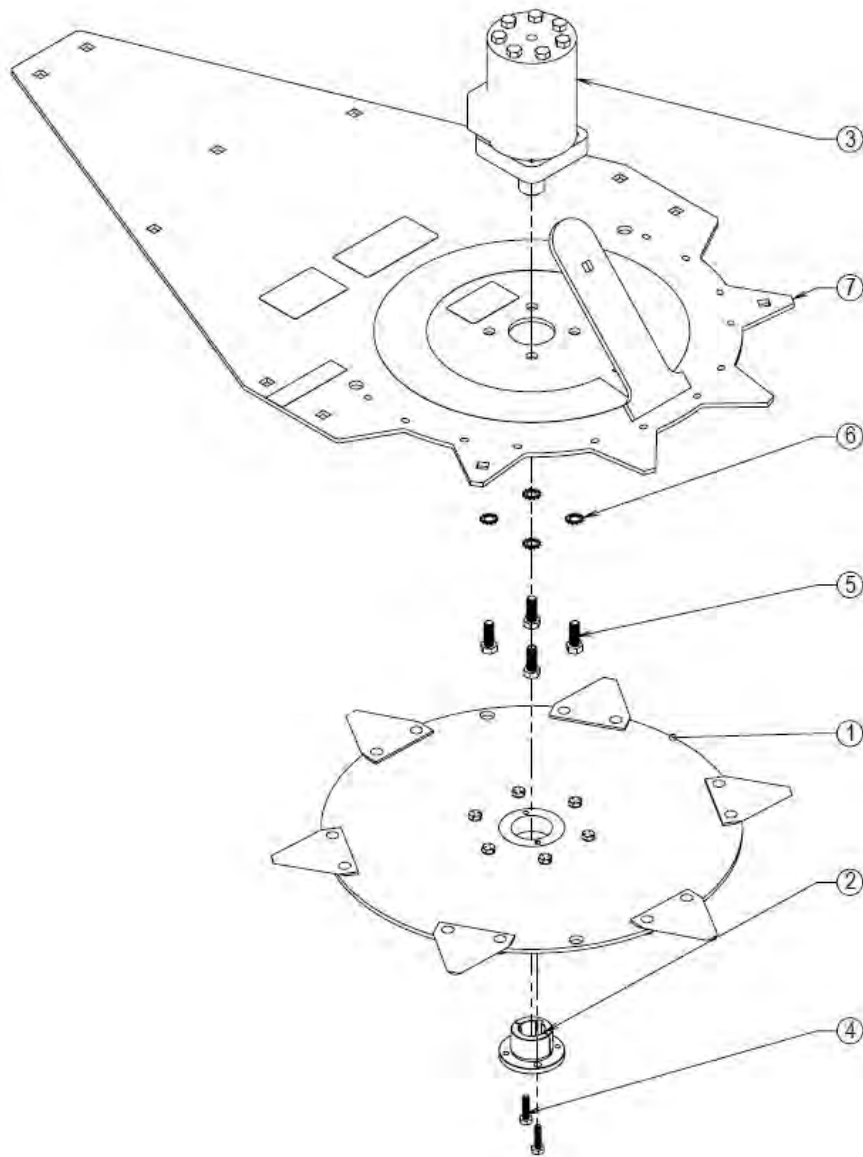


Figure 2 - Roto-Shear Common Unit (27000-13)

| | | | |
|----|----------|--------------------------------|----|
| 1- | 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"

The ideal operating speed of 400-500 RPM

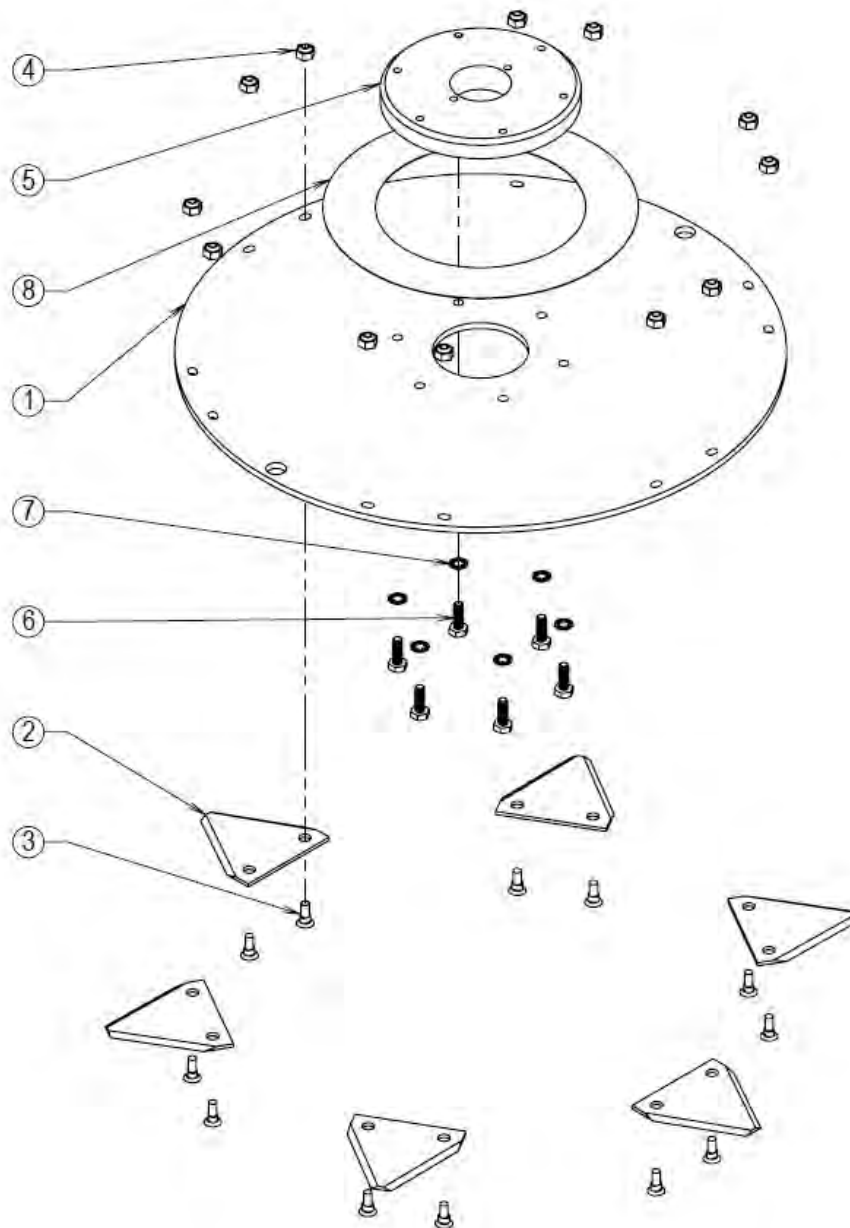


Figure 3- Roto-Shear Rotor C/W Hub & Sickles (ROTb13)

| | | | |
|----|----------|---------------------------|-----|
| 1- | ROT10 | ROTSHR ROTOR PAINTED ONLY | x1 |
| 2- | 27000-16 | ROTSHR SICKLE SECTIONS | x6 |
| 3- | 27000-17 | ROTSHR SICKLE BOLT | x12 |
| 4- | 27000-18 | ROTSHR SICKLE NUT | x12 |
| 5- | 27000-20 | ROTSHR ROTOR HUB LARGE | x1 |
| 6- | 1000-04 | BOLT 3/8X1 UNC GR8 PLD | x6 |
| 7- | 1350-73 | WSHR SERRATED LOCK 1/4 | x6 |
| 8- | 27000-72 | ROTSHR DCL RND SMALL 8" | x1 |

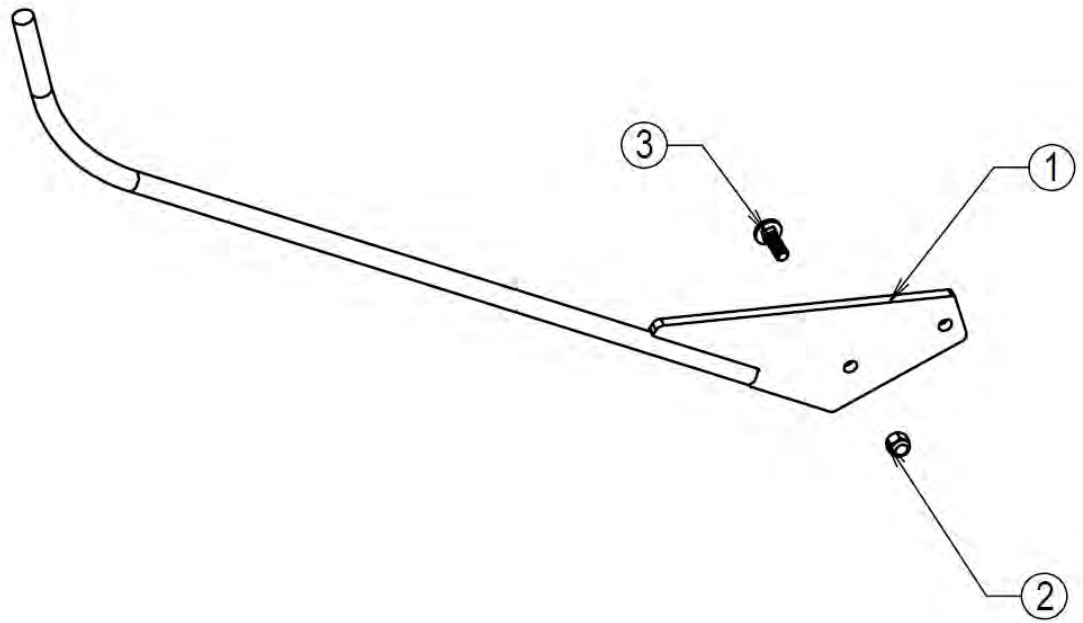


Figure 4 - Roto-Shear Collector Rod (CR02)

| | | | |
|----|----------|--------------------------------|----|
| 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)

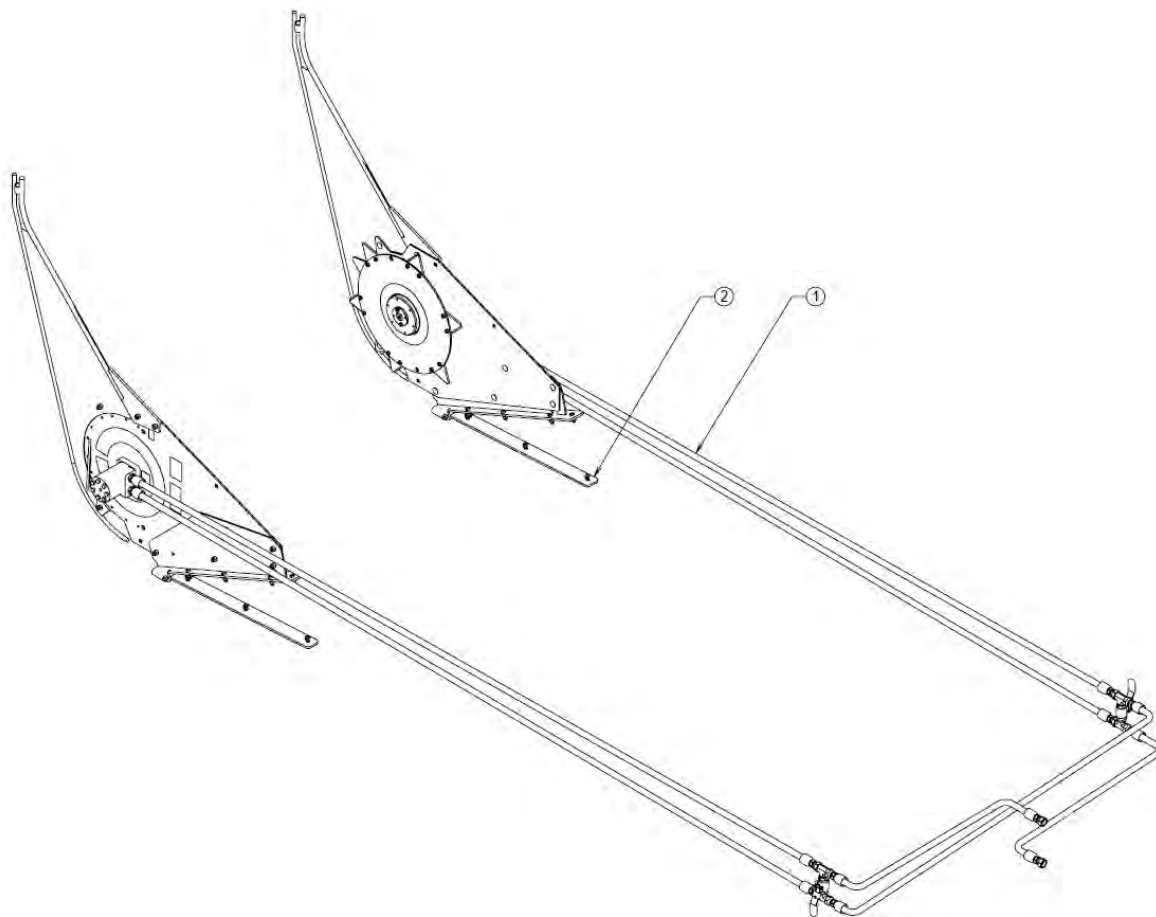


Figure 5 - Roto-Shear Universal Header Kit (27000-01)

| | | | |
|----|-------|---------------------|----|
| 1- | UHK15 | ROTSHR UNI HOSE PKG | x1 |
| 2- | MB08 | ROTSHR MNT BK UNI | x2 |

Three additional hoses will need to be produced locally, in order to complete the installation based on the header width.

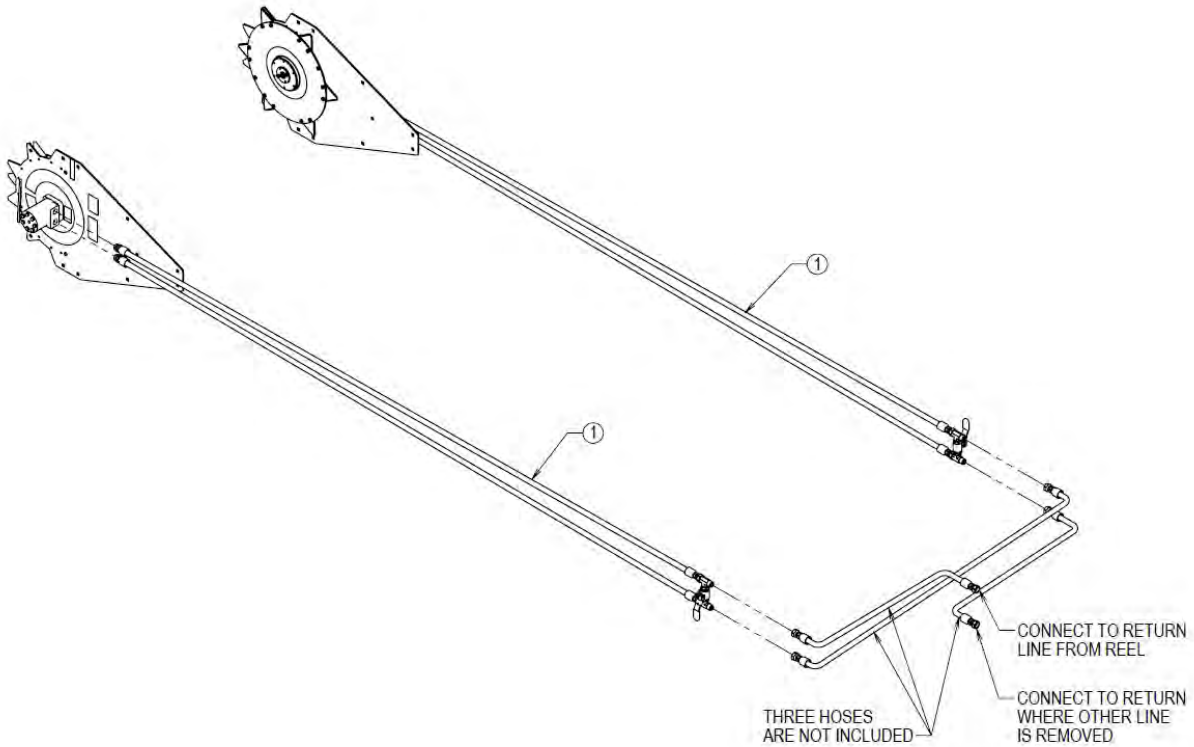


Figure 6 - Roto-Shear Universal Hose Package (UHK15)

1- UHK15-01 ROTSHR UNI HOSE PKG A x2

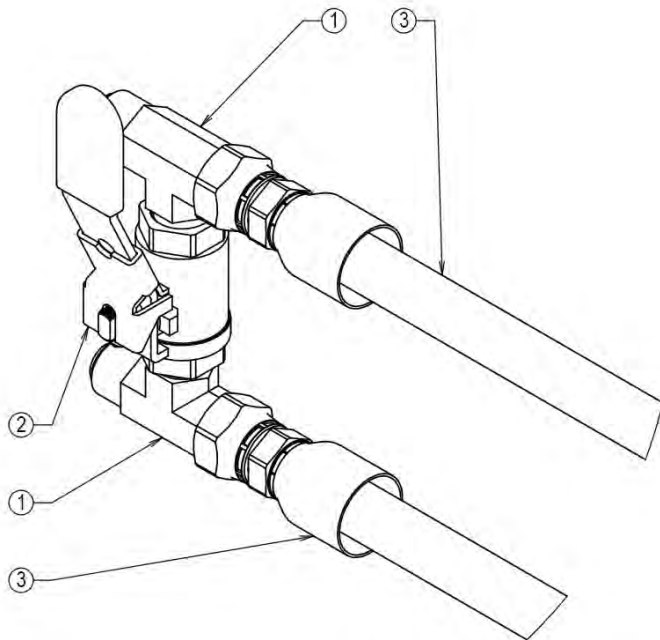


Figure 7 - Roto-Shear Universal Hose Package A (UHK15-01)

| | | | |
|----|----------|--------------------------------|----|
| 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 |

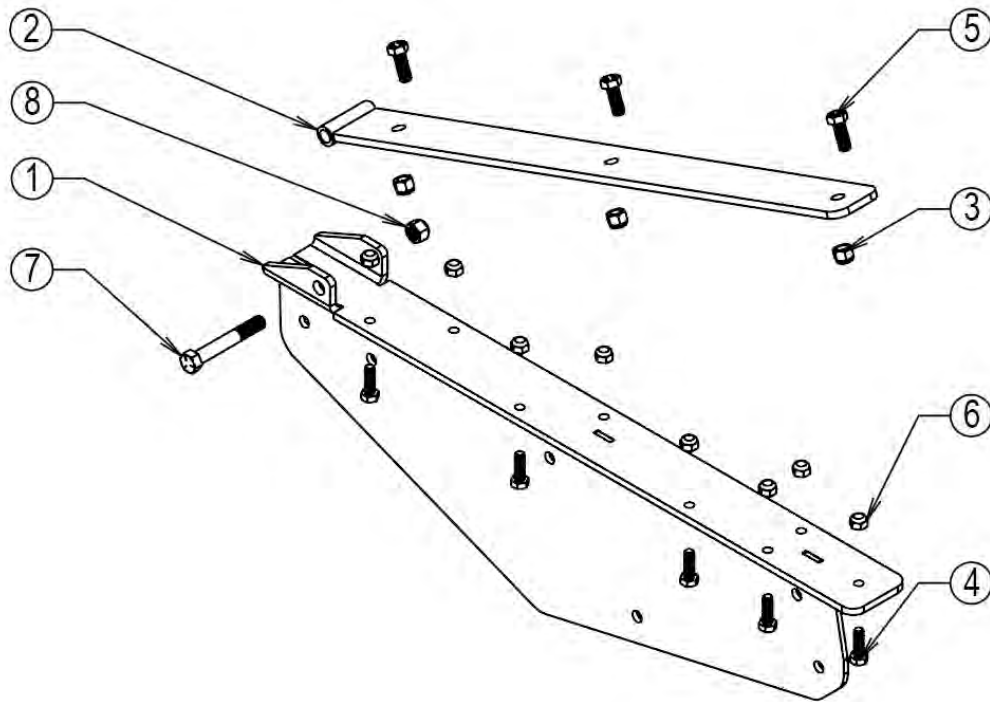


Figure 8 - Roto-Shear Mount Bracket Universal (MBo8)

| | | | |
|----|----------|---------------------------|----|
| 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. The 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.

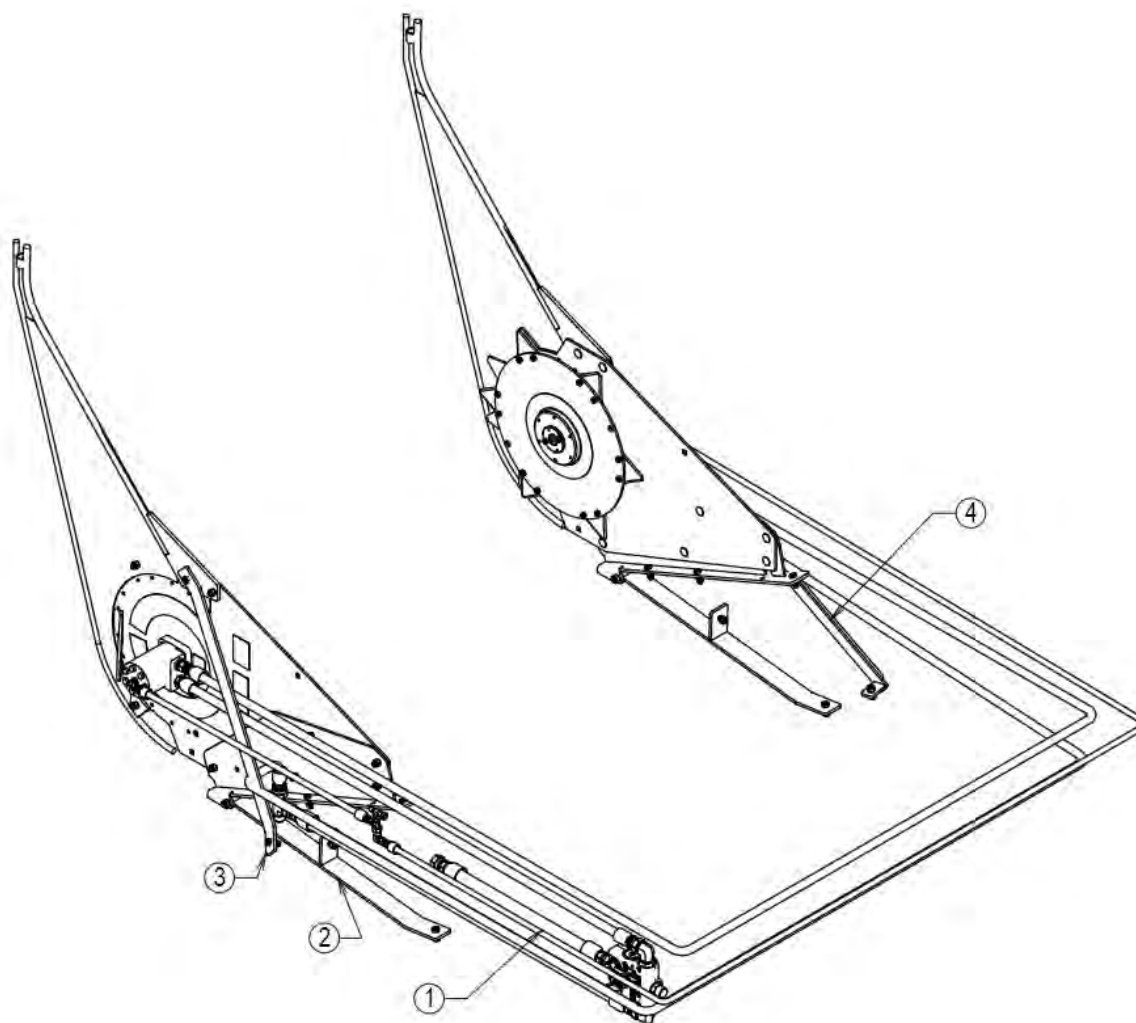


Figure 9- Roto-Shear MF 5200 AGCO 5000 (27000-08/09/10)

| | | |
|-----------|--------------------------------|----|
| 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 |

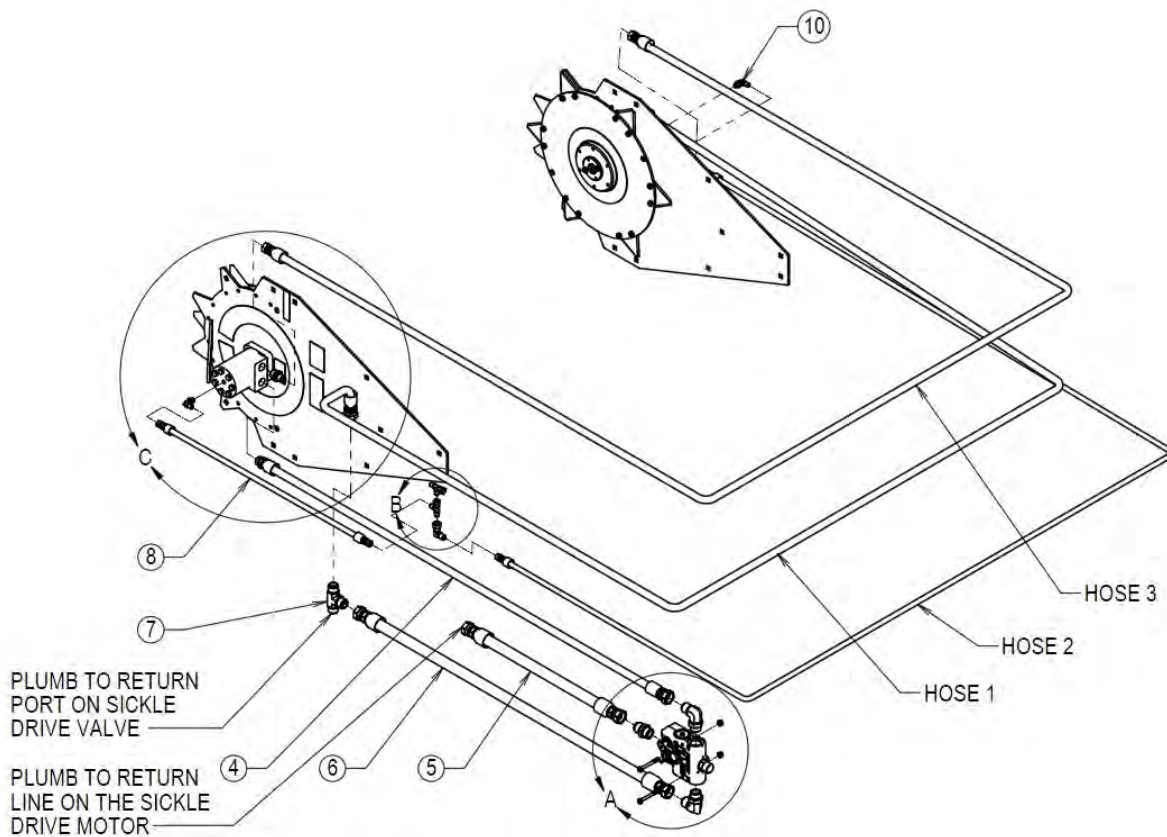
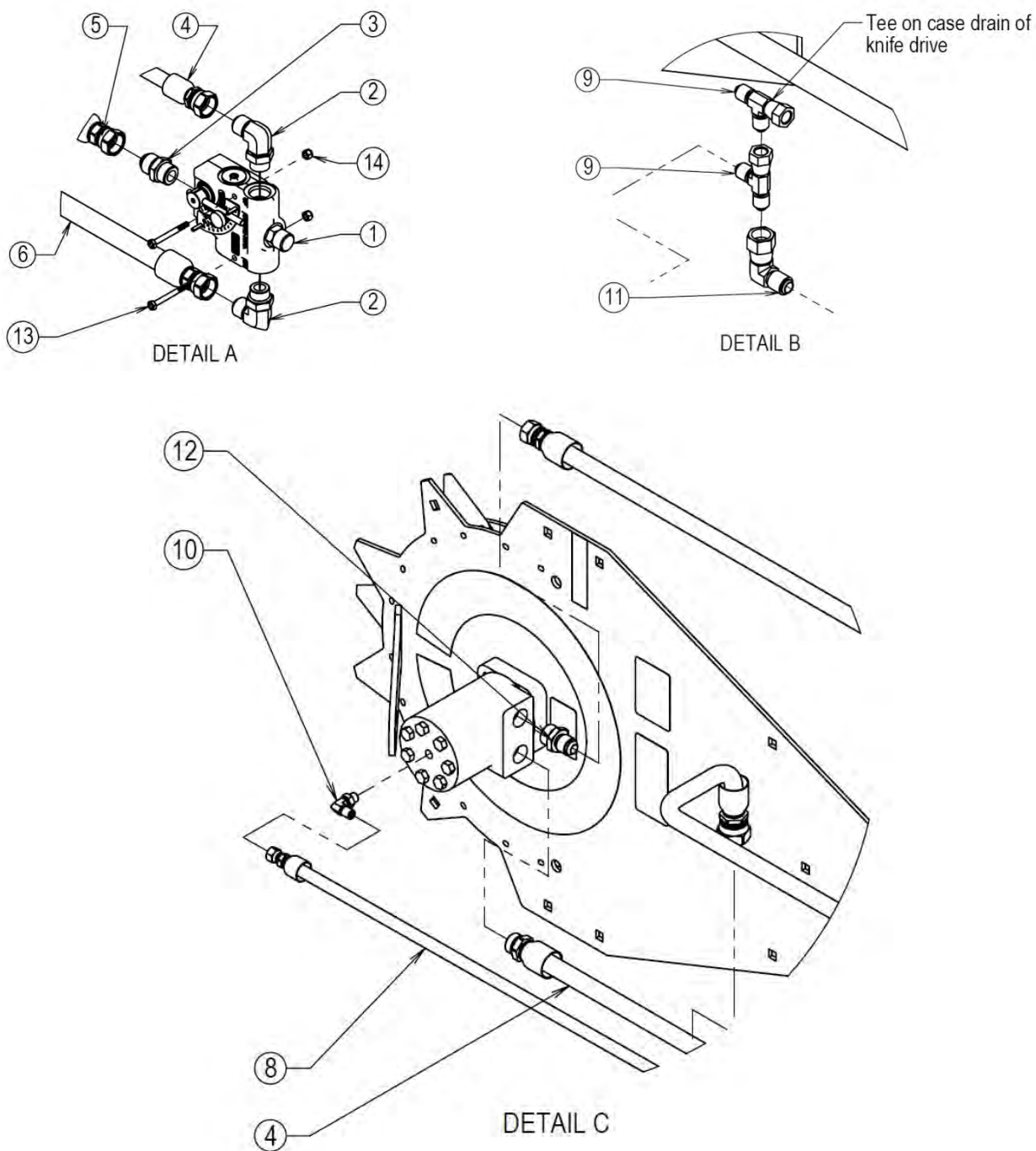


Figure 10 - Roto-Shear MF 5200 Hose Package (MF52HK)

| | | | |
|-----|----------|-------------------------------|----|
| 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.

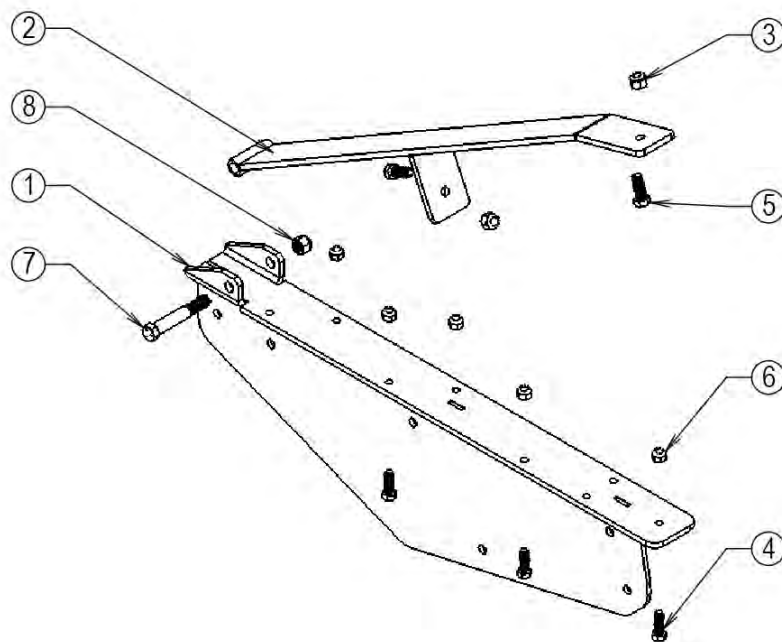


Figure 11 - Roto-Shear MF 5200 AGCO 5000 Mount Bracket (MAB-12)

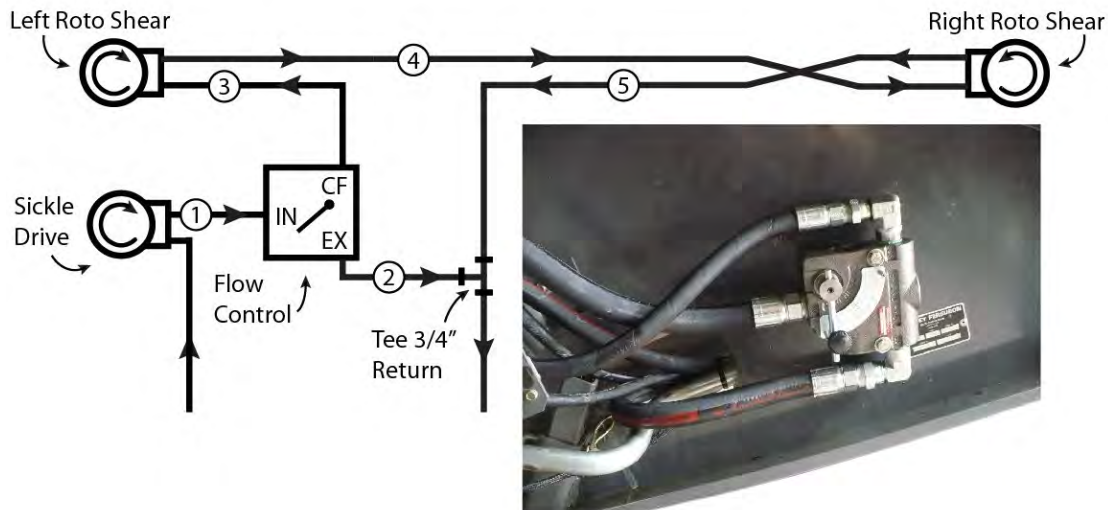
| | | | |
|----|----------|---------------------------|----|
| 1- | 27001-09 | ROTSR UNI MNT B TOP | x1 |
| 2- | 27001-00 | ROTSR MF 5200 2 HOLE TAB | x1 |
| 3- | 1202-05 | LKNT NYL 3/8 UNC PLD | x2 |
| 4- | 1002-12 | BOLT 5/16X1 UNC GR8 PLD | x5 |
| 5- | 1004-16 | BOLT 3/8X1 UNC GR8 PLD | x2 |
| 6- | 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 the right and left sides of the 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 the #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 rotohear (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.



M.F. & AGCO 5400 KIT (2700 1-30 OR 2700 1-30-25/30/35/40)

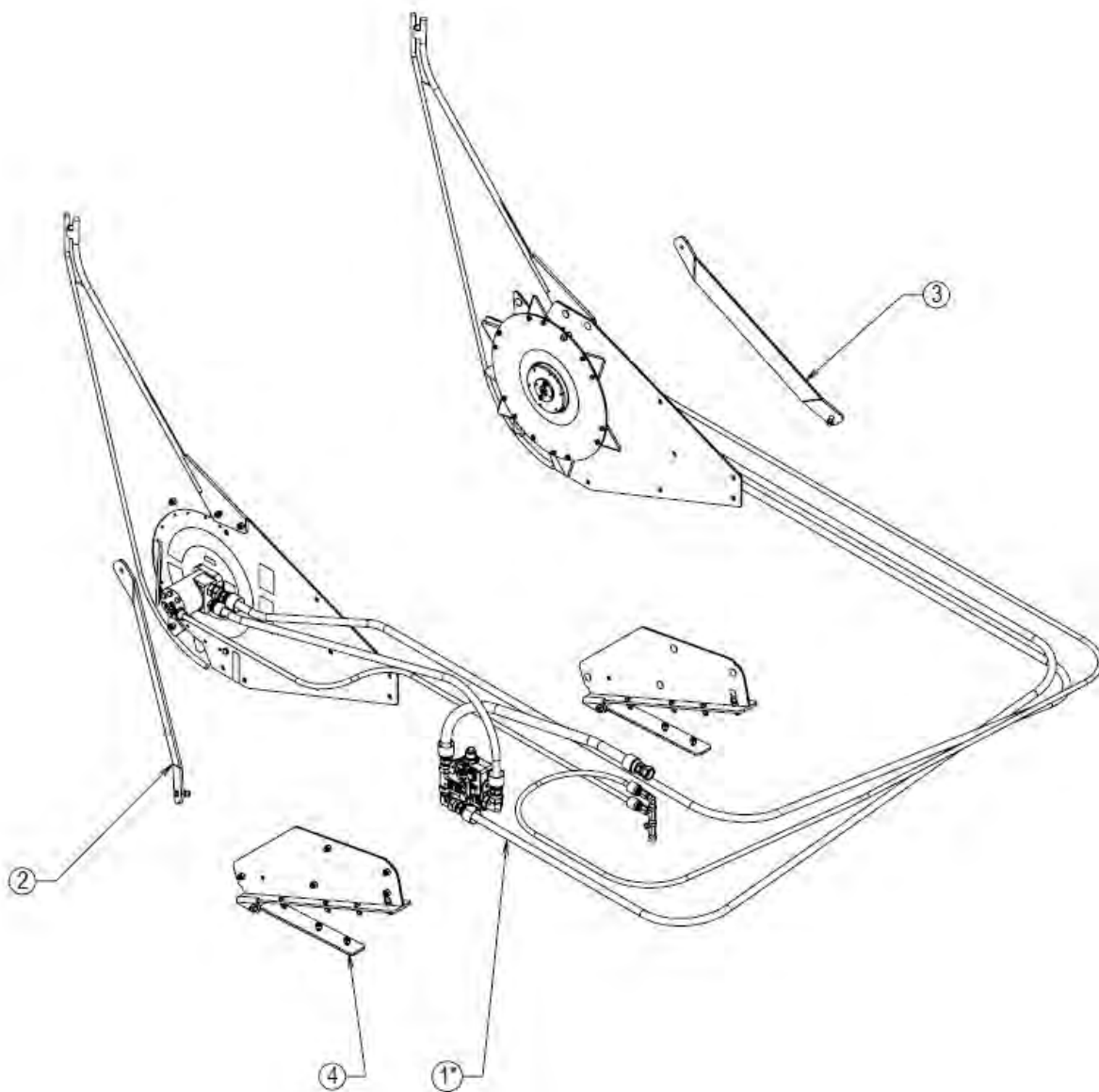


Figure 12 - Roto-Shear MF AGCO 5400

| | | | |
|----|----------|----------------------------|----|
| 1- | MFR54HK* | ROTSHR MF5400 HOSE PKG | x1 |
| 2- | MF53LB | ROTSHR MF5300 MNT BR LEFT | x1 |
| 3- | MF53RB | ROTSHR MF5300 MNT BR RIGHT | x1 |
| 4- | MAB15 | ROTSHR MF5300 MNT B | x2 |

*Hose kit varies by header width option chosen.

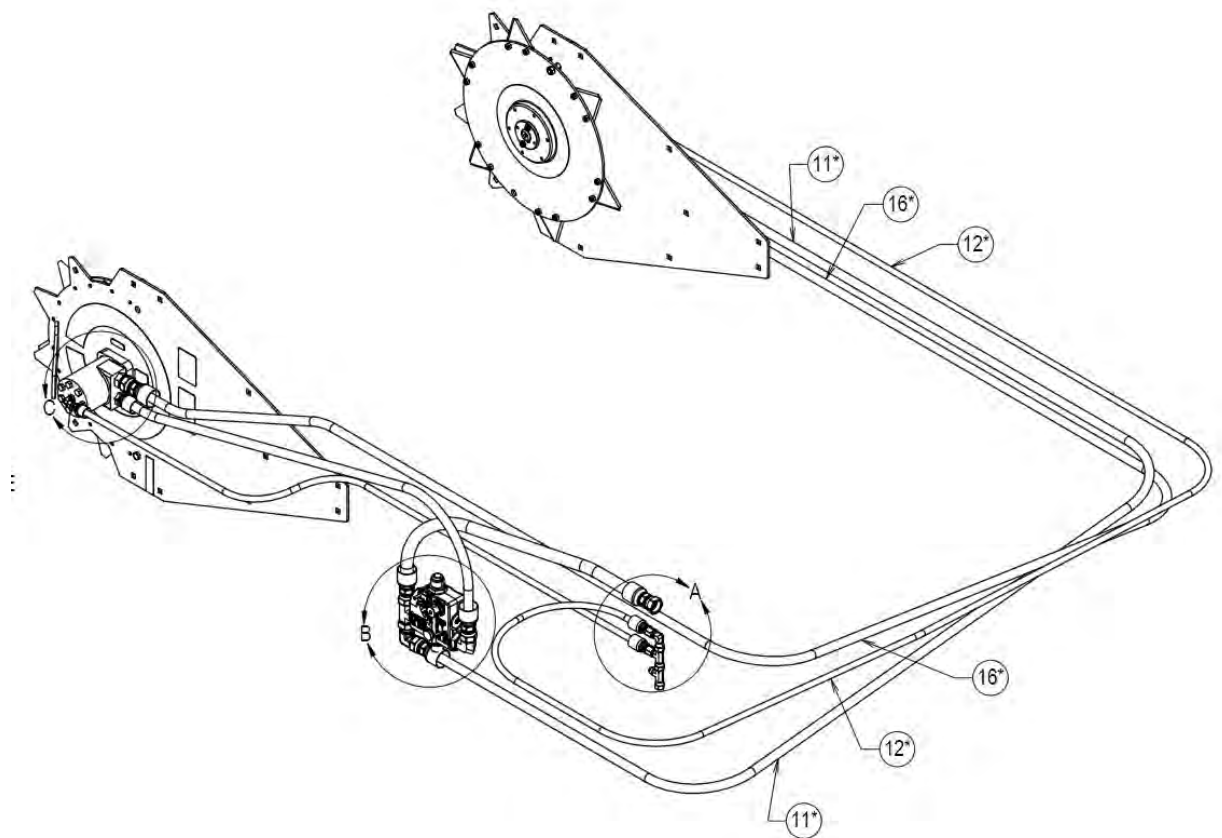
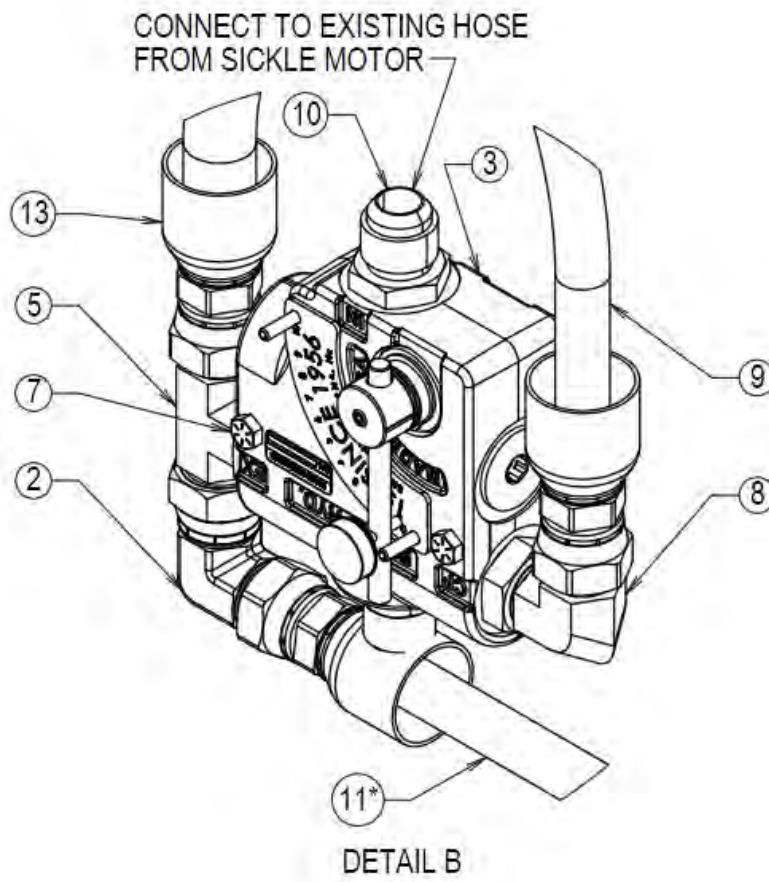
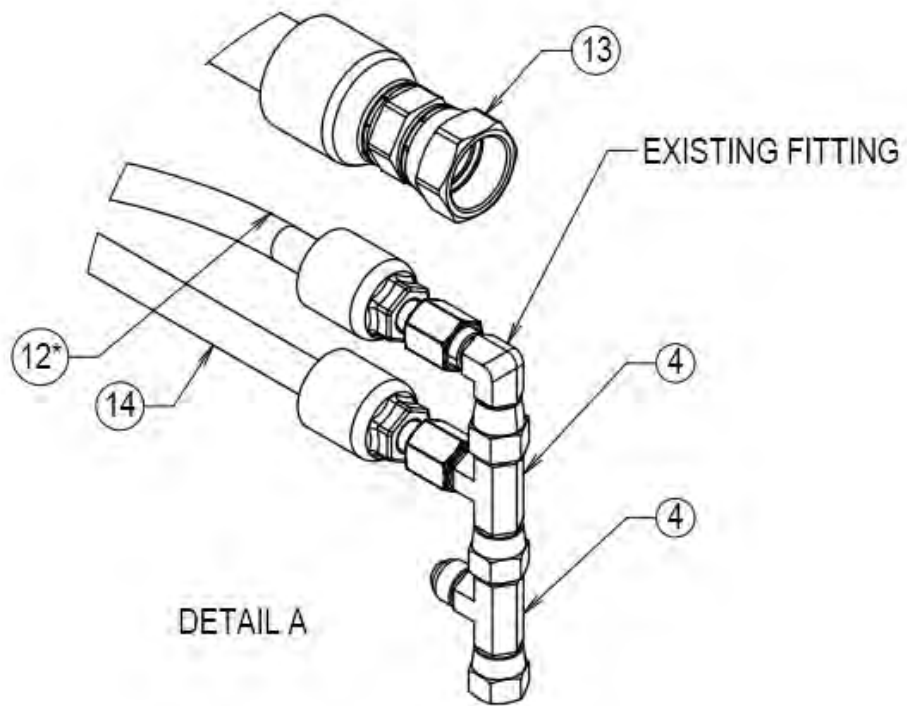


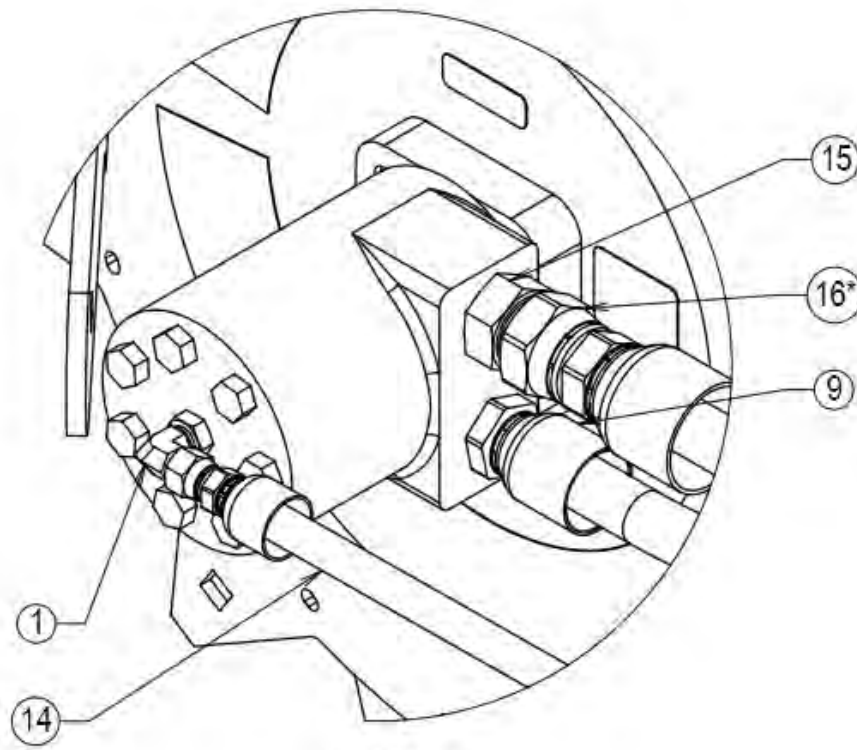
Figure 13 - Roto-Shear MF5400 Hose Package

*Hose length varies by header width option chosen.

| FINAL ASSEMBLY | HOSE 11* | HOSE 12* | HOSE 16* |
|-------------------------|---|---------------------------------------|--|
| 27001-30 | - | - | - |
| 27001-30-25 +M54HK25 | 26002-93 HOSE HYD #08/450/12FJX/12FJX | 26002-83 HOSE HYD #4/450/4FJX/6FJX | 26002-91 HOSE HYD #08/492/12FJX/12FJX |
| 27001-30-30 +M54HK30 | 26002-94 HOSE HYD #08/510/12FJX/12FJX | 26002-82 HOSE HYD #4/510/4FJX/6FJX | 26002-90 HOSE HYD #08/552/12FJX/12FJX |
| 27001-30-35 +M54HK35 | 26002-95 HOSE HYD #08/570/12FJX/12FJX | 26002-84 HOSE HYD #4/570/4FJX/6FJX | 26002-89 HOSE HYD #08/612/12FJX/12FJX |
| 27001-30-40 +M54HK40 | 26002-96 HOSE HYD #08/630/12FJX/12FJX | 26002-85 HOSE HYD #4/630/4FJX/6FJX | 26002-92 HOSE HYD #08/672/12FJX/12FJX |

IF YOU ARE INSTALLING THIS ON A 5300 YOU WILL REQUIRE AN ADDITIONAL PUMP FROM AGCO





DETAIL C

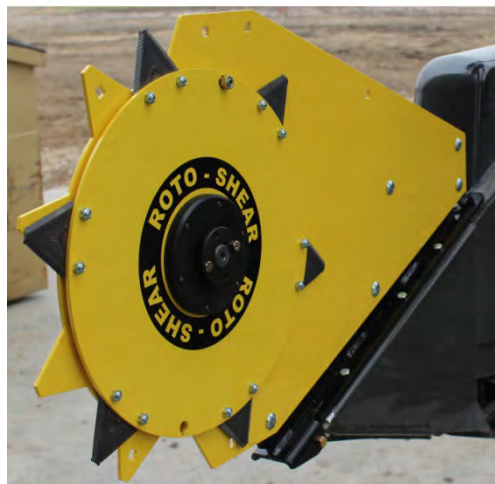
| | | | |
|-----|-----------|-------------------------------|----|
| 1- | 26001-69 | HYD FTG- 4MB-4MJ90 | x2 |
| 2- | 26002-81 | HYD FTG- 12MJ-12FJX90 | x1 |
| 3- | 27000-48 | VALVE HYD FLOW CNTRL - PCCR | x1 |
| 4- | 2938 | HYD FTG-6FJXR-6MJT TEE | x2 |
| 5- | 26002-86 | HYD FTG- 12MBL-12MJT | x1 |
| 6- | 1200-10 | LKNT NYL INSR 1/4 UNC ZDW GR5 | x2 |
| 7- | 1000-40 | BOLT 1/4X2-1/2 UNC GR5 PLD | x2 |
| 8- | 26001-71 | HYD FTG- 12MB-12MJ90 | x1 |
| 9- | 26002-87 | HOSE HYD #8/70/10MB/12FJX | x1 |
| 10- | 26001-70 | HYD FTG- 12MB-12MJ | x1 |
| 11- | 26002-93* | HOSE HYD #08/450/12FJX/12FJX* | x1 |
| 12- | 26002-83* | HOSE HYD #4/450/4FJX/6FJX* | x1 |
| 13- | 26002-79 | HOSE HYD #12/32/12FJX/12FJX | x1 |
| 14- | 26002-80 | HOSE HYD #4/90/4FJX/6FJX | x1 |
| 15- | 26002-88 | HYD FTG- 10MB-12MJ | x3 |
| 16- | 26002-91* | HOSE HYD #08/492/12FJX/12FJX* | x1 |

Assembly:

Refer to the above figure and details during this installation:



1. You will need to cut off the factory divider rod on the end of the divider board to allow installation of the brackets.
2. Remove the upper bolt to allow you to set the mounting bracket onto the divider board. Re-install the bolt and leave the spacer underneath the bracket.
3. Align the mounting bracket so that it points directly forward on the divider board and check that the bottoms brace matches up to the support underneath the brace. Once alignment is correct you can mark holes to drill for installation of the 5/16 x 1" bolts. You are able to drill and install a minimum of 5 bolts in the bracket.
4. You can hold the bottom mount bar up and mark those holes.
5. Install the 3/8" x 1" bolts in the bottom bar.



6. After installation of the brackets, you can install the Roto-Shear Sunrise onto the mounting bracket with 5 carriage bolts (3/8" x 1") per bracket supplied with the common package.

7. Install the collector rod to the outside with the 3/8" x 1-1/4" Carriage head flat bolt that comes within the front most hole and uses a 3/8" x 1" carriage bolt that came with the Rotoshear common for the other hole.



8. You will need to cut holes into the top of the guard to allow the hoses to come out to the Rotoshears. We have supplied trim to be used around the edge of the holes to protect the hoses when they come through.
9. Remove the flow control valve and install the fittings into it as required. You will put a 12MB-12MJ into the "IN" port, a 12MB-12MJ90 into the "CF" port and a 12MBL-12MJT into the "EX" port. You will add fitting #26002-81 (12MJ-12FJX90) to the bottom side of the tee fitting as well.
10. You will install this on the left side header in an area to allow access to connect the hoses. You will need to mark and drill holes through the divider board to fasten it using the supplied 1/4" x 2-1/2" bolts with locknuts.



11. Using the braces attach the top of the brace to the rearward bolt on the collector rod.
12. Applying outward pressure to the Rotoshear so that you have a little more clearance to the reel mark, drill a hole in the side of the divider board, and attach the bottom of the brace with a 3/8" x 7/8" bolt and lock nut.
13. Using the hose #26002-87 (70" long c/w 10MB and 12FJX ends) install the 10MB end into the bottom port on the Left Rotoshear motor and route the hose through the drilled access hole to the "CF" port on the flow control valve previously installed.

14. Using fitting #26002-88 (10MB-12MJ) install into the top port of the motor as well as both ports in the other Rotoshear motor.
15. Using fitting #26001-69 (4MB-4MJ90) install into the end of both Rotoshear motors. Refer to the Detail B of the above figure for the next steps:
16. Using hose #26002-80 (90" long c/w 4FJX and 6FJX ends) install the 4FJX end onto the end of the left Rotoshear motor and route the hose through the drilled access hole to the hydraulic block located inside the panel near the back edge of the header (on the left side, do not connect yet)



17. Using the 2 fittings #6FJXR-6MJT, remove the existing 90° elbow and install underneath them as shown to the left on the rear hydraulic block on the left side of the header
18. You can reattach the 90° elbow you just removed to the top of the tee fitting as shown to the right.
19. You can now connect the hose that you ran from the end of the Left Rotoshear motor to one of the open sides of the tee fittings.
20. The remaining spot is to be connected to the end of the Right Rotoshear once that hose is run.
21. Remove the factory hose that runs from the Left Sickle motor to the Return port on the factory valve block shown on the left side. Connect this hose to the "IN" port on the flow control valve.
22. Using hose #26002-79 (32" long c/w 12FJX both ends) connect from the Return port of hydraulic valve to the "EX" port on the hydraulic valve.
23. Additional hoses are required that are specific to the width of the header as listed below.
24. Hose to go from Left Rotoshear top port to Right Rotoshear bottom port are:

| | |
|------------|--|
| 25' header | P/N#26002-91 (492" long c/w 12FJX both ends) |
| 30' header | P/N#26002-90 (552" long c/w 12FJX both ends) |
| 35' header | P/N#26002-89 (612" long c/w 12FJX both ends) |
| 40' header | P/N#26002-92 (672" long c/w 12FJX both ends) |

25. Hose to go from Right Rotoshear bottom port to "EX" port on the flow control are:
- 25' header P/N#26002-93 (450" long c/w 12FJX both ends)
 - 30' header P/N#26002-94 (510" long c/w 12FJX both ends)
 - 35' header P/N#26002-95 (570" long c/w 12FJX both ends)
 - 40' header P/N#26002-96 (630" long c/w 12FJX both ends)
26. Hose to go from Right Rotoshear drain port to hydraulic valve block on the Left side rear drain port are:
- 25' header P/N#26002-83 (450" long c/w 4FJX/6FJX)
 - 30' header P/N#26002-82 (510" long c/w 4FJX/6FJX)
 - 35' header P/N#26002-84 (570" long c/w 4FJX/6FJX)
 - 40' header P/N#26002-85 (630" long c/w 4FJX/6FJX)

HONEYBEE 2014 & NEWER HEADER KIT (27000-04)

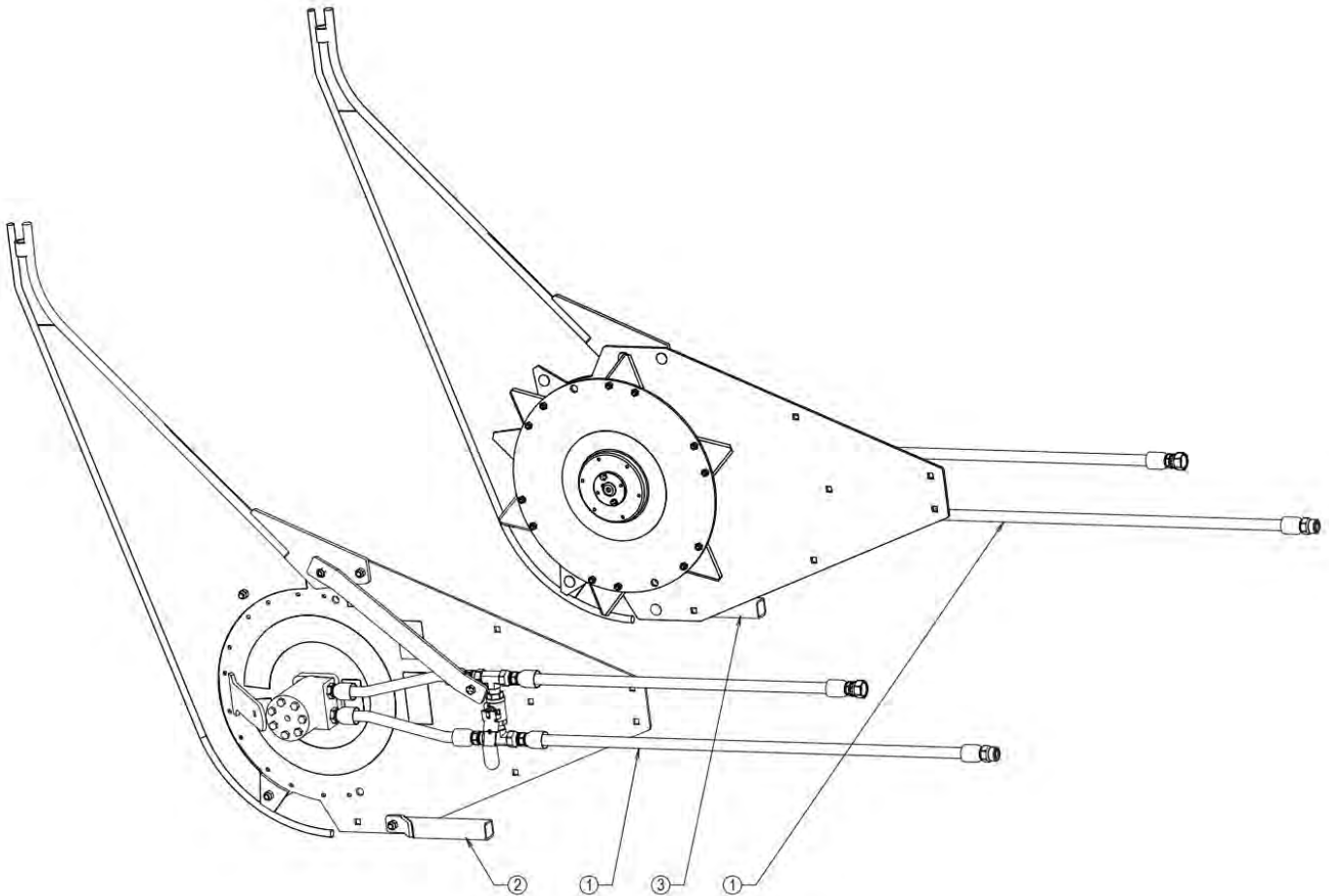


Figure 14 - Roto-Shear Honeybee 2014 & Newer (27000-04)

| | | | |
|----|--------|-------------------------------|----|
| 1- | HBHK14 | ROTSHR HONEYB HOSEPKG (2014+) | X1 |
| 2- | HBLB14 | ROTSHR HONEYB 2014+ MNT B LS | X1 |
| 3- | HBRB14 | ROTSHR 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.

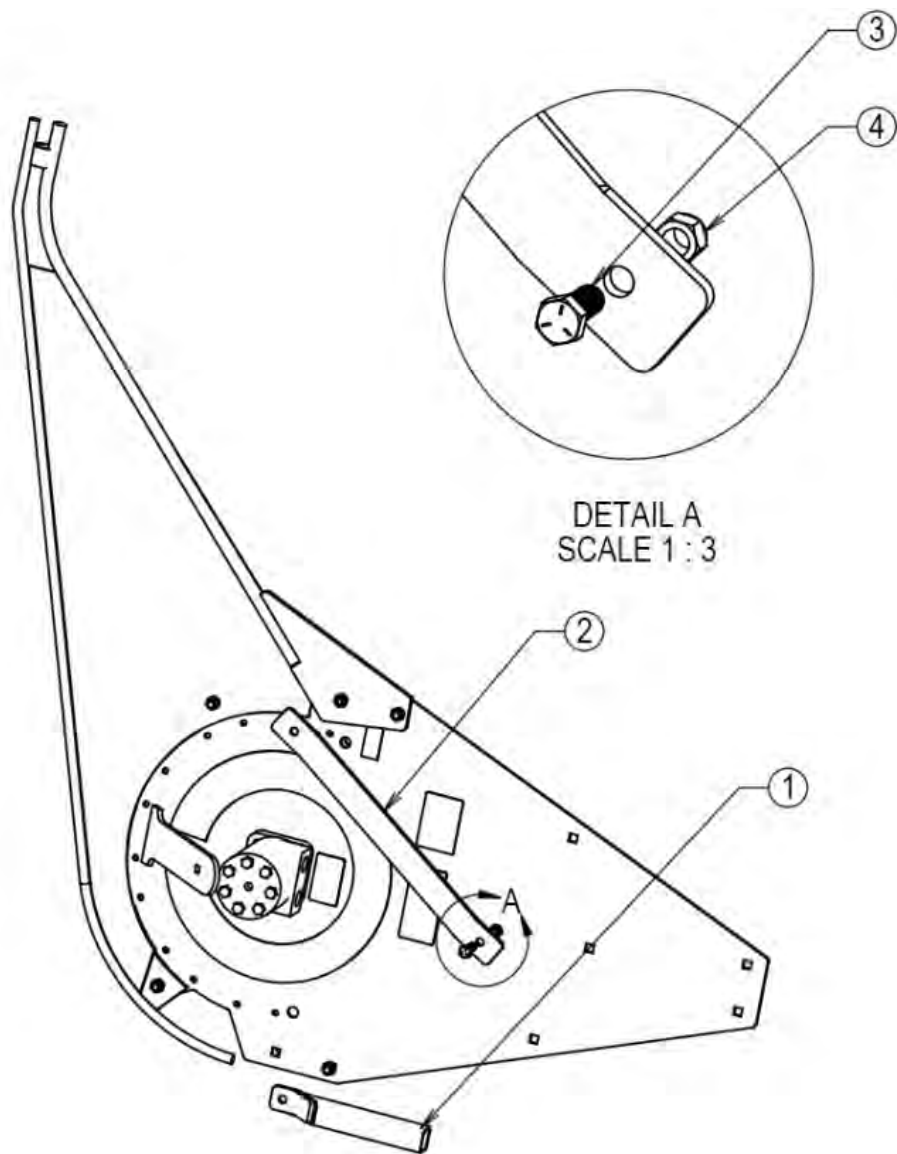


Figure 15 - Roto-Shear Honeybee 2014+ Mount Bracket Left Side (HBLB14)

| | | | |
|----|----------|--------------------------------|----|
| 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 |

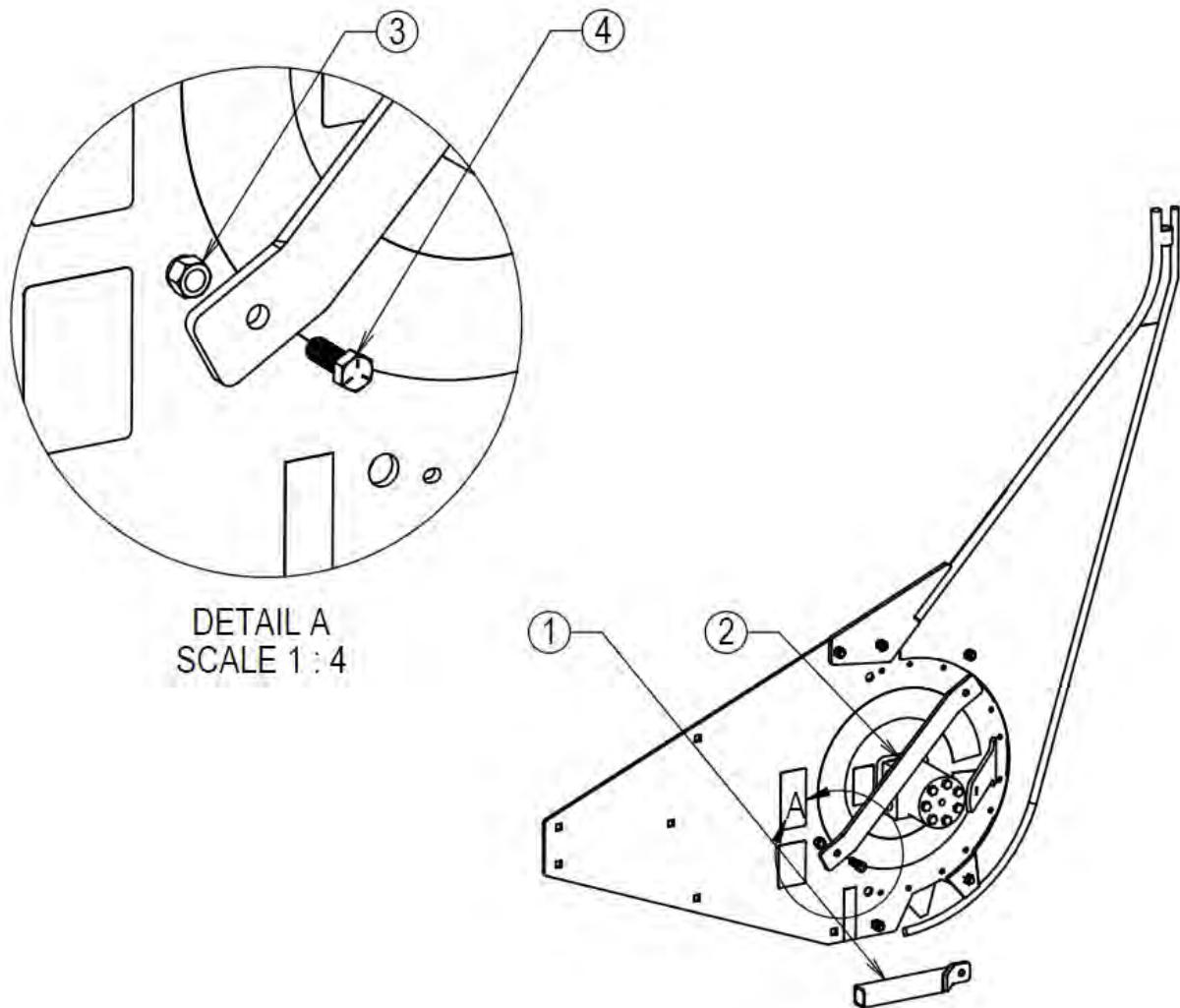


Figure 16 - Roto-Shear Honeybee 2014+ Mount Bracket Right Side (HBRB14)

| | | | |
|----|----------|--------------------------------|----|
| 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 |

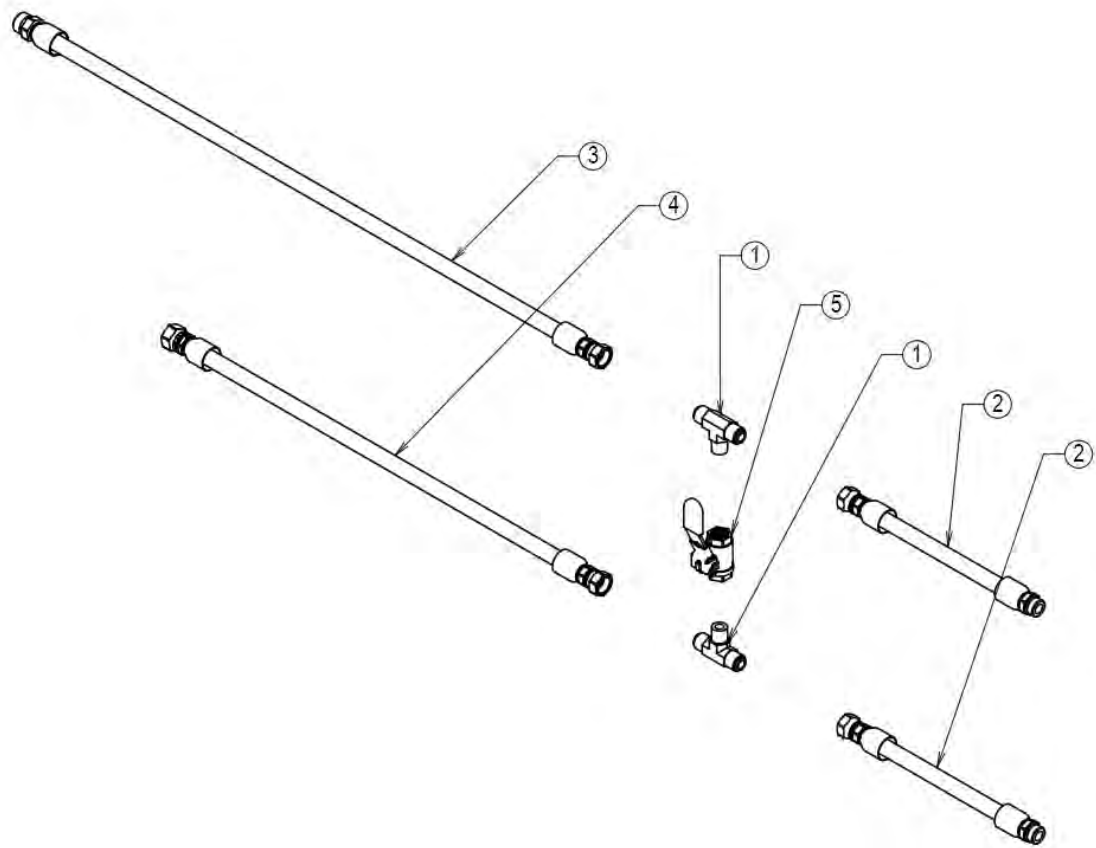


Figure 17- Roto-Shear Honeybee Hose Package (2014+) A (HBHK14-01)

| | | | |
|----|----------|------------------------------|----|
| 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)

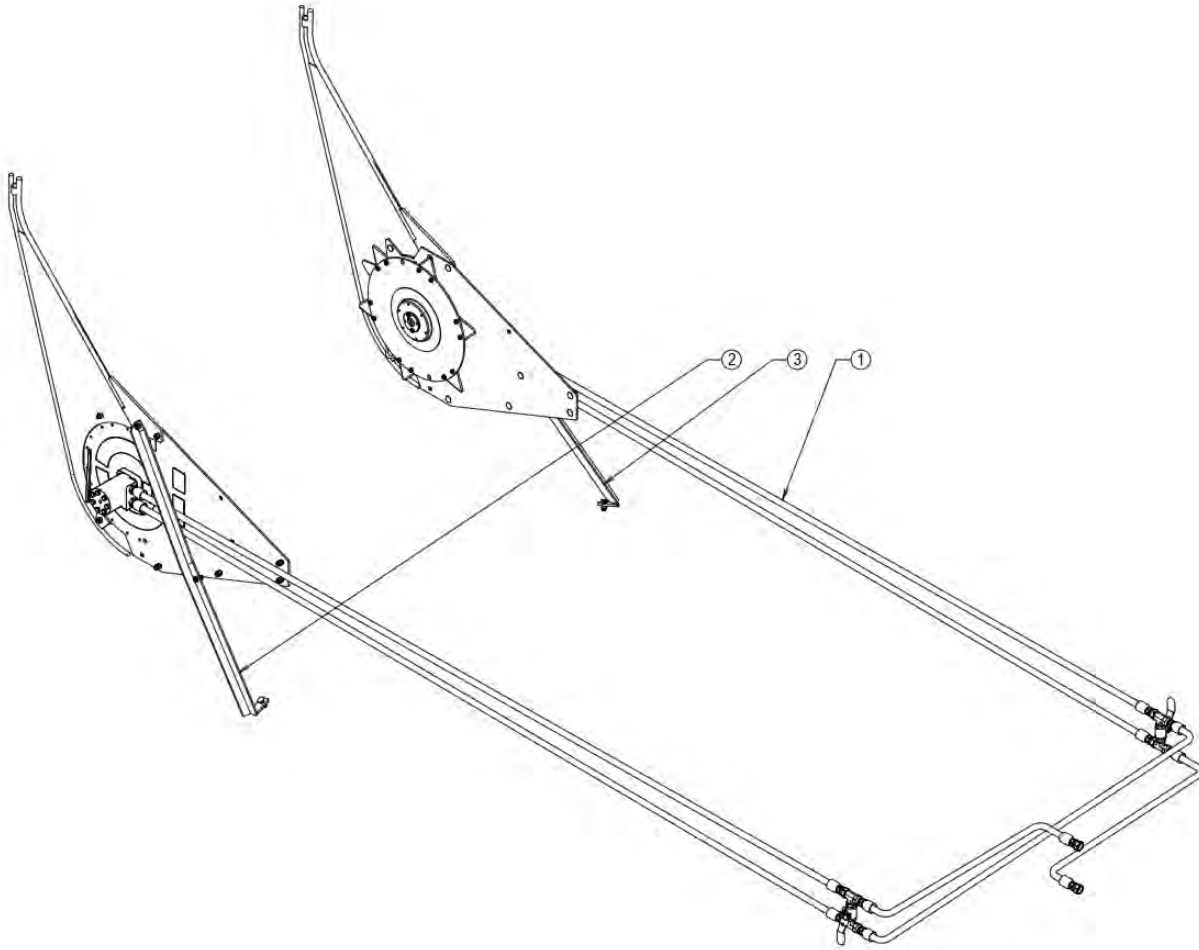


Figure 12 - Roto-Shear Honeybee Pre 2013 (27000-03)

| | | | |
|----|--------|------------------------------|----|
| 1- | UHk15 | ROTSHR UNI HOSE PKG | x1 |
| 2- | HBLBo8 | ROTSHR HONEYB -2013 MNT B LS | x1 |
| 3- | HBRBo8 | ROTSHR HONEYB -2013 MNT B RS | x1 |

Three additional hoses will need to be produced locally, in order to complete the installation based on the header width.

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 the 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.

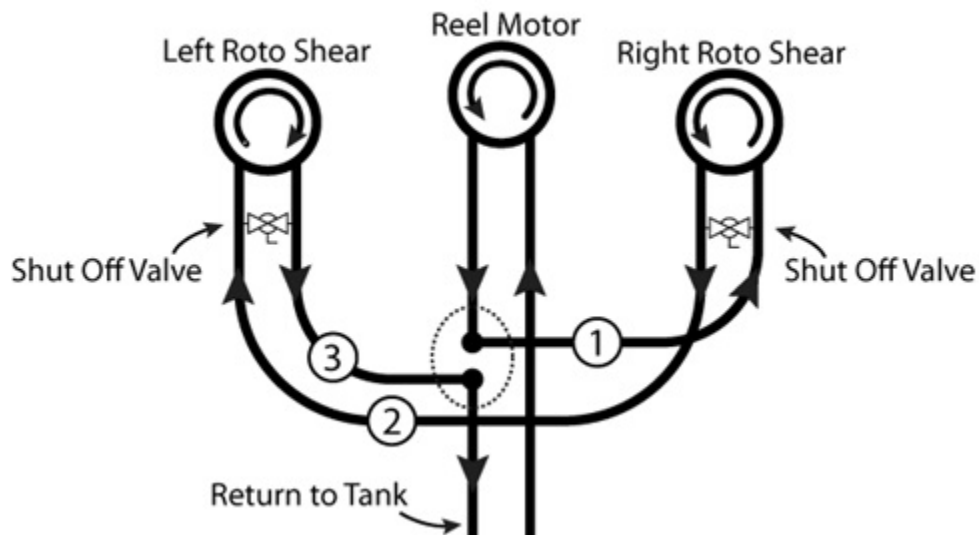
6. Angle iron braces (HBLBo8 & HBRBo8), which are supplied, are to be installed from the front bolt of the collector rod down to the $\frac{1}{2}$ " bolt on the sickle drive. A third bolt should be installed by drilling a $\frac{3}{8}$ " hole midway along the brace into the divider board of the swather.

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 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 in 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)

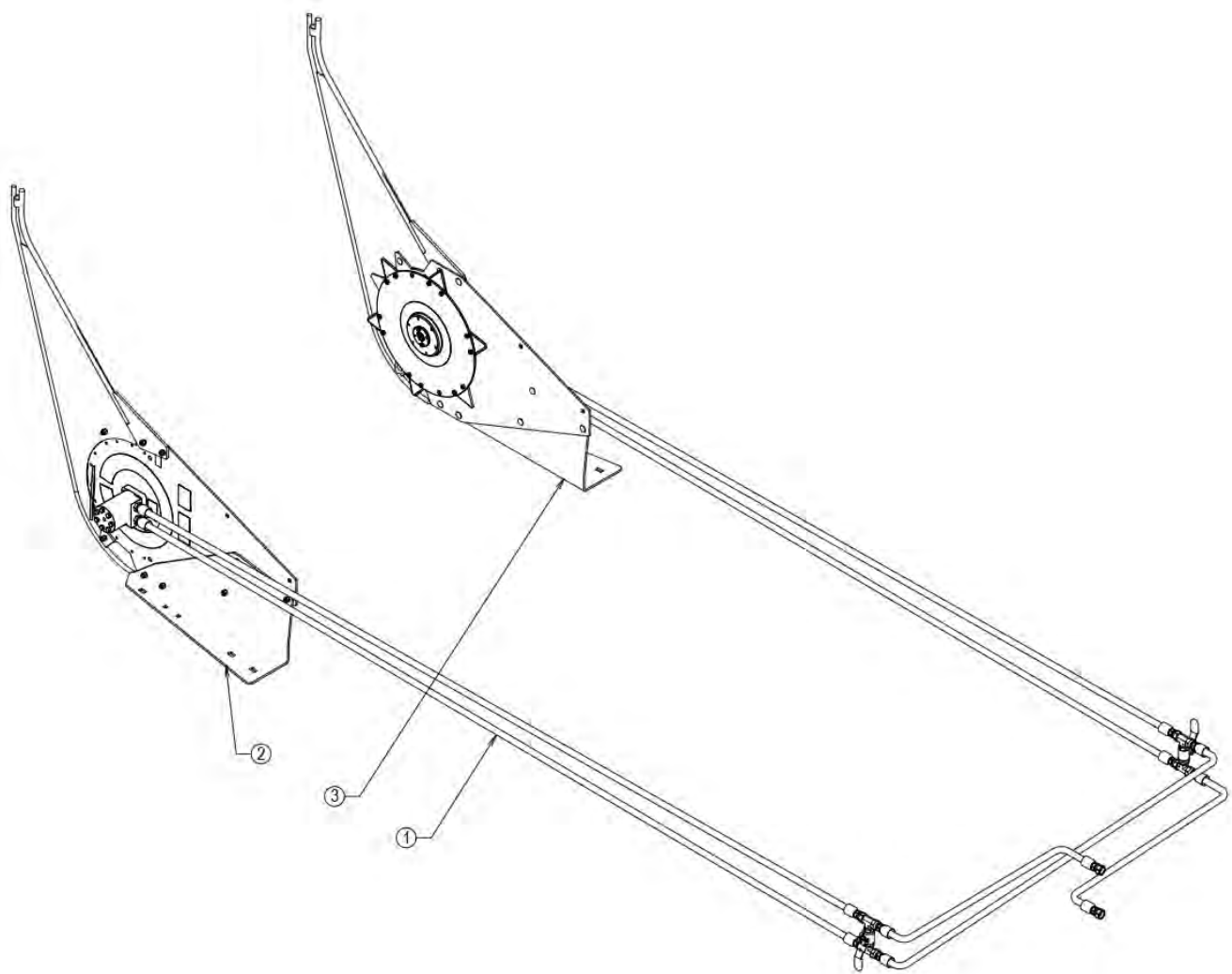
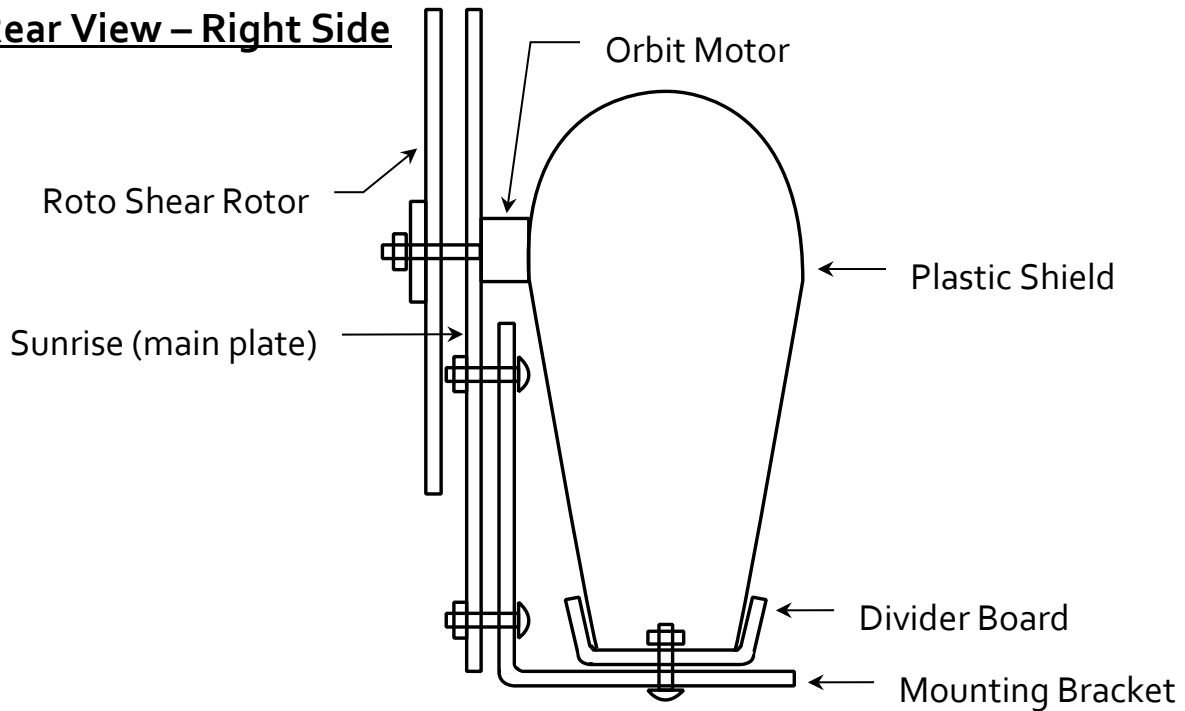


Figure 19 - Roto-Shear John Deere Draper Header (27000-12)

| | | | |
|----|--------|---------------------------|----|
| 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 will need to be produced locally, in order to complete the installation based on the header width.

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 the safety bolt from the rotor and sunrise after installation is complete.



MACDON 972 HEADER KIT (27000-05)

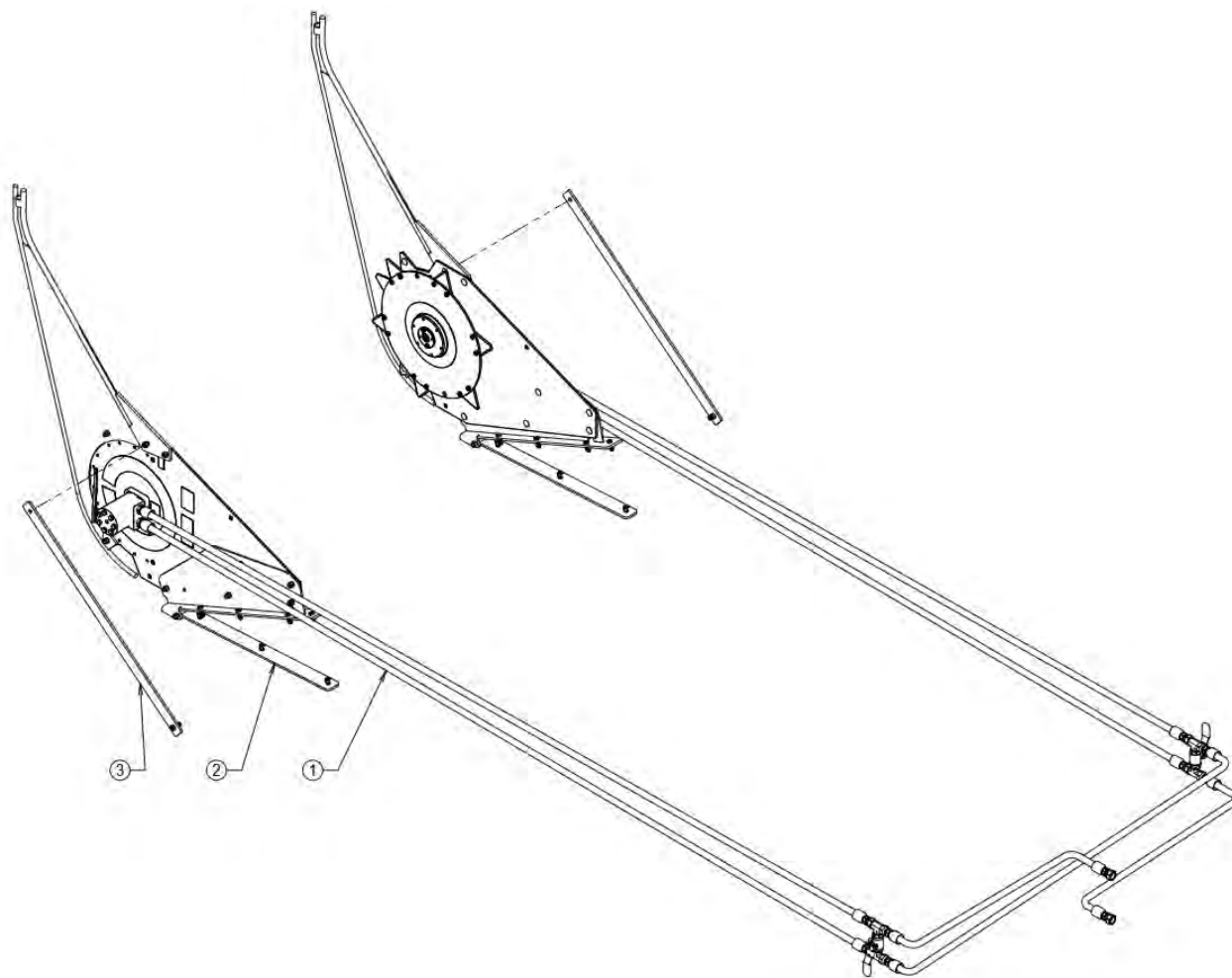


Figure 20 - Roto-Shear MacDon 972 Header (27000-05)

| | | | |
|----|----------|-------------------------|----|
| 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 will need to be produced locally, in order to complete the installation based on the header width.



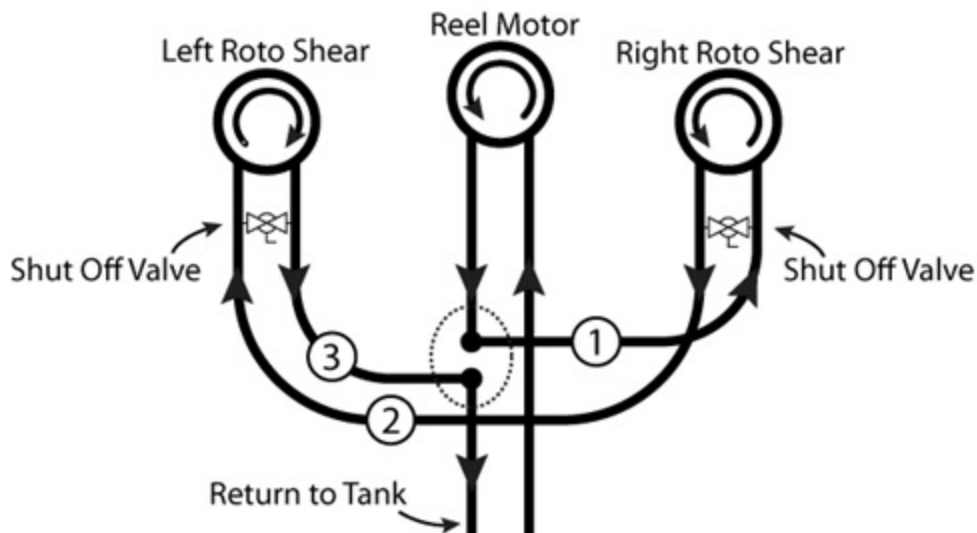
1. The knob at the point of the divider board needs to be removed to accommodate the mounting bracket. Slide a straight edge down the top of the divider board until it touches the knob, mark it, then cut it off approximately $\frac{1}{4}$ " shorter using a zip grinding wheel on an angle grinder. Take 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 (MD972B13) 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" center to center.

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)

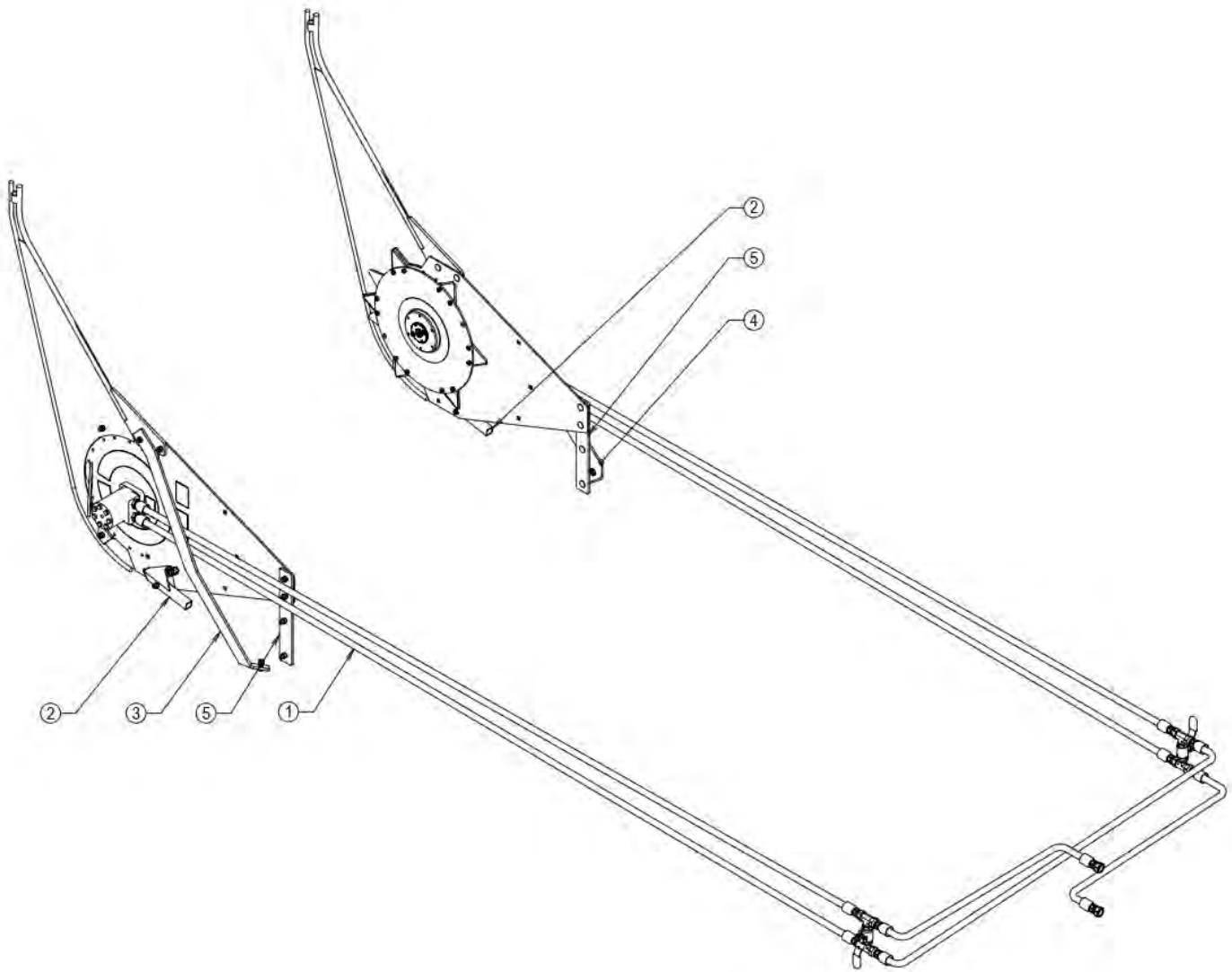


Figure 21 - Roto-Shear MacDon D50 & D60 (27000-06)

| | | | |
|----|--------|--------------------------------|----|
| 1- | UHK15 | ROTSHR UNI HOSE PKG | X1 |
| 2- | MDBT08 | ROTSHR MACDON D50&D60 MNT BOOT | X2 |
| 3- | MDLB08 | ROTSHR MACDON D50&D60 MNT B LS | X1 |
| 4- | MDRB08 | 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.

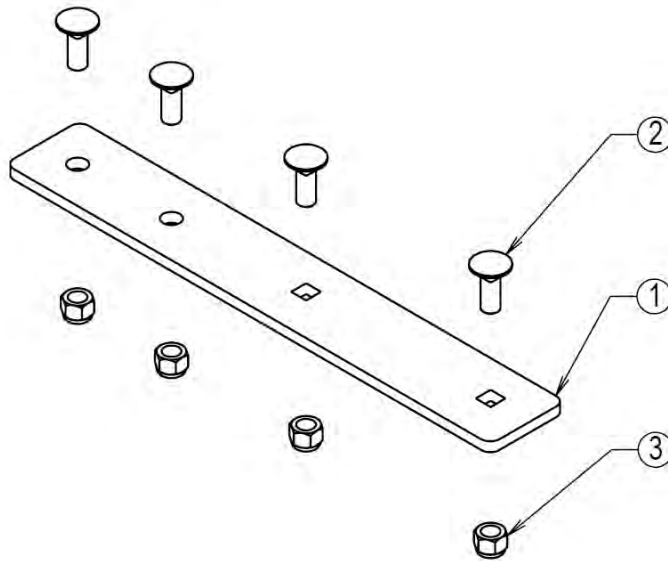


Figure 13 - Roto-Shear MacDon D50 & D60 Mount Bracket Side (SMDB11)

| | | | |
|----|----------|-------------------------------|----|
| 1- | 27000-83 | ROTSHR 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 |

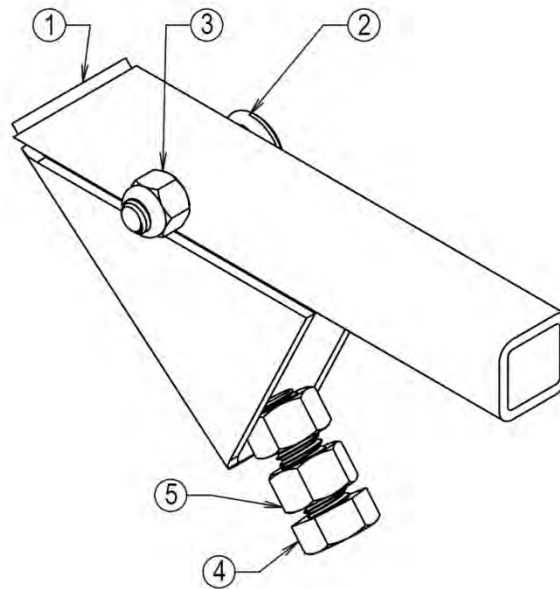


Figure 23 - Roto-Shear MacDon D50 & D60 Mount Boot (MDBT08)

| | | | |
|----|-----------|--------------------------------|----|
| 1- | MDBT08-01 | ROTSHR 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)

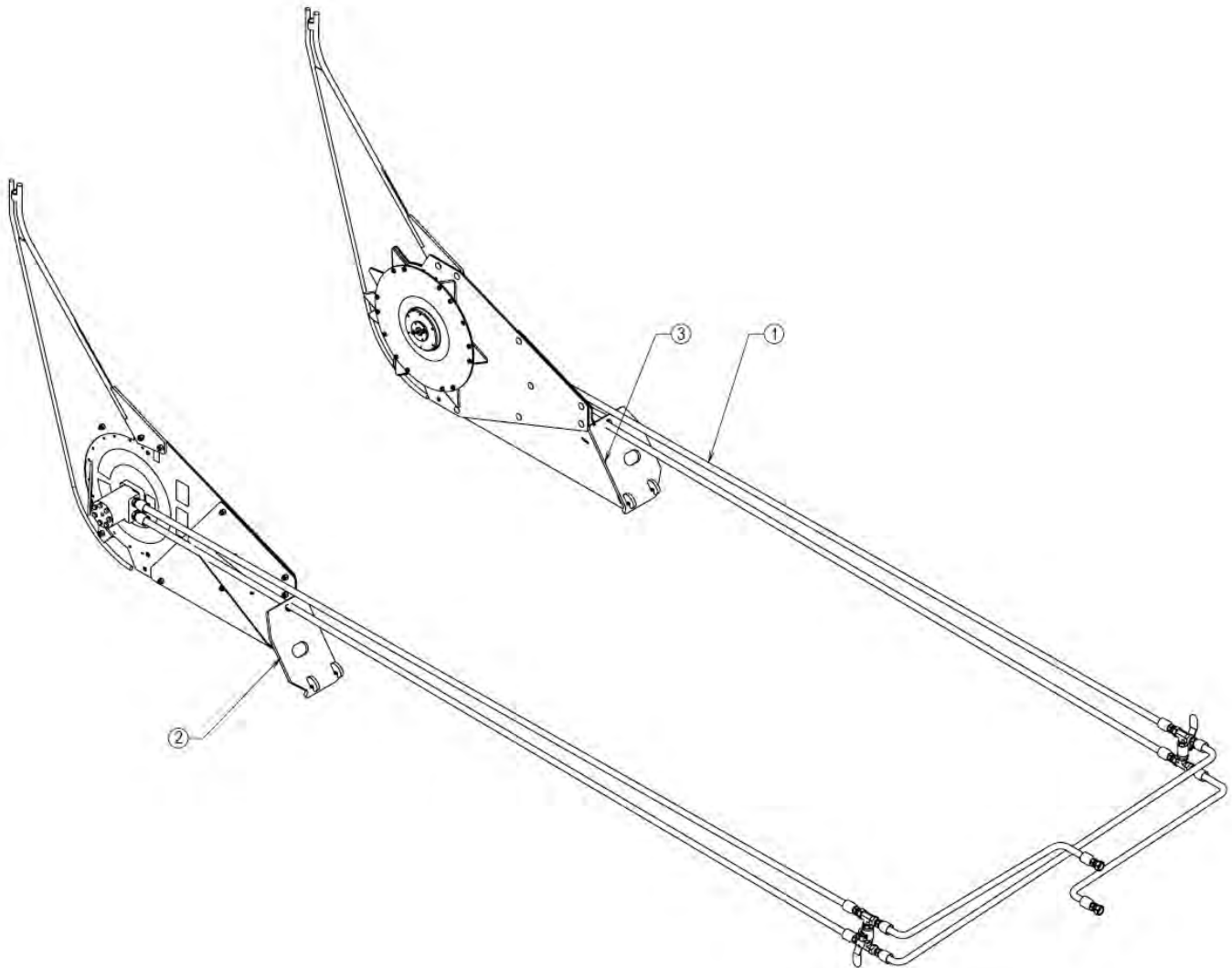


Figure 14 - Roto-Shear MacDon D65 & John Deere 400D (27000-07)

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

4- *Three additional hoses will need to be produced locally, in order to complete the installation based on the header width.*

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

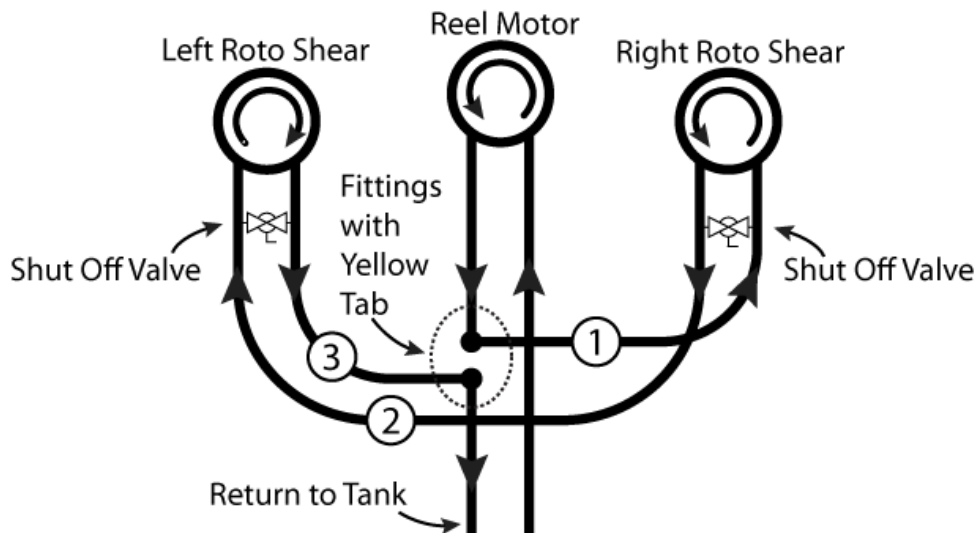
A universal hose kit (UKH15) is provided in this kit. This kit contains two preassembled hose(27000-45) sets consisting each of two 10-ft hoses, joined by ½" full-port, high-pressure, stainless steel ball valves(27000-47). These hose sets attach to the Roto Shear and the rear corner of the header. The 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 is 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 5300/5400 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

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 a 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 a 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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Dear Valued Customer,

Thank you for your interest in our system.

We welcome all questions. We appreciate your feedback, good or bad, on our website at www.rotoshear.com. We will pay \$100 CAD for the testimonials we select to post on our website! You are also welcome to share your testimonial at the website www.combineforum.com.

