(M) MORRIS RAZR RAZR DRILL TRAINING Module 4 : Service & Maintenance Tips

PURPOSE

This training module aims to cover some common system operation and maintenance tips for the Razr disc drills. Some of these procedures can also be applied to the C2 Contour drill.

Always refer to your operator's manual for more specific information/instructions on certain topics.



HYDRAULIC SYSTEM OPERATION

Normal Operation

The opener ball valve is in the unlocked position. This ball valve is open. The operation valve is screwed in fully to the operating position. This needle valve is closed.

To lower the openers, oil flows through the hose to port "A" of valve block. The oil is allowed to flow simultaneously through ports "D" and "F". Port "F" charges up the accumulator to operating pressure set by the pressure valve. Port "D" charges the butt end of the opener cylinders causing the openers to lower.

Once the operating pressure is reached the oil will stop flowing.

From port "A" of valve block, oil flows through the pressure reducing valve, to the pilot operated check valve unseating the check valve and out of Port "D" to the butt end of the opener cylinders causing the openers to lower. Simultaneously, oil flows from the check valve through the directional lock out valve and out of Port "F" to the accumulator.

When all of the opener cylinders are extended to working position, the hydraulic pressure continues to build in the accumulator, hydraulic lines, cylinders and at the reducing valve. When the pressure has risen to what the reducing valve has been set to the reducing valve closes, preventing a further increase in pressure.

When the hydraulic flow to the pilot operated check valve is stopped, the check valve seats, holding the pressure in the opener circuit.

The oil returning from the gland side of the cylinders flows to the opener ball valve into port "E" of the valve block and out of port "B" back to the tractor.



Accumulator

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Normal Operation



RAZR

HYDRAULIC SYSTEM OPERATION RAZR

Normal Operation

Normal Operation - Continued

To raise the openers, oil flows from the tractor hose to port "B" of the valve block and out of port "E" to the opener valve and on to the gland side of the cylinders. Oil is also felt on the line that operates the pilot operated check valve. This causes the check valve to open and allow return oil back to the tractor.

Oil from the butt side of the cylinders travels to port "D" and through the opened pilot operated check valve to the pressure relief valve. Oil can not go through the relief valve in this direction and is directed to the one way check valve. The oil then travels through the one way check valve to port "A" of the valve block.

The oil flows through the port "A" of the valve block and back to the tractor.

Oil is also felt on the line that operates the directional lock out valve. This causes the directional lock out valve to close preventing the oil in the accumulator from returning back to the tractor. The directional lock out valve maintains the pressure in the accumulator in this position.





OPENER DOWN FORCE

- Opener force bias while operating in the ground will be approximately 2/3 on disc blade, 1/3 on packer tire.
- Maximum down force on the opener will be limited by available drill weight divided by the number of openers on the drill. This gives the following values of available opener down force for different seed row spacings:
 - 7.5" spacing = 465lbs/opener
 - 10" spacing = 550lbs/opener
 - 15" spacing = 690lbs/opener (hydraulically limited, not weight limited)

*Additional weight kits are available if desired.

Hydraulic Pressure	Force at Opener
400 psi (2758 kPa)	350 lbs (158.8 kg)
600 psi (4137 kPa)	440 lbs (199.6 kg)
800 psi (5516 kPa)	510 lbs (231.3 kg)
1000 psi (6895 kPa)	600 lbs (272.2 kg)
1200 psi (8274 kPa)	690 lbs (313 kg)

Note: Due to the variation of friction effects, this down force is approximate.







PRESSURE ADJUSTMENT

ASSEMBLY 225 - OPENER IDENTIFICATION

- Left opener and Right opener identifies which side the scraper is mounted to the disc.
- In the Assembly Manual (S51368-00) the note on each opener layout has the number of openers required reversed.

Note: The Right openers (S51185) mount to the left side on the machine and the Left openers (S51190) mount to the right side on the machine.





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ACCUMULATOR

The accumulator is mounted on the drill frame, behind the hydraulic control manifold. (**Pre-charged to 350 psi**)

Its function is to provide hydraulic oil under pressure to operate the opener cylinders. It receives oil when the tractor hydraulics are engaged to lower the openers on the drill. The amount of oil placed into the accumulator is determined by the pressure that is set by the pressure adjusting valve. When operating in the field if an opener trips, the cylinder collapses and the oil is displaced into the accumulator. When the opener has cleared the obstacle the accumulator oil under pressure is sent to the cylinder to reengage it to its operating position.





BLEEDING THE ACCUMULATOR

1. To release the pressure in the accumulator, open the operate/service valve on the valve block about two full turns.





BLEEDING THE ACCUMULATOR

- 2. Next, place the tractor hydraulic valve for the openers in float position.
- 3. This allows pressure in the accumulator to drop to zero.





BLEEDING THE ACCUMULATOR

- 4. Once the pressure has fallen all the way down to zero, proceed by then lifting the openers and locking the ball valve.
- 5. The ball valve is closed when the handle is not inline with the flow of oil.





OPENER LEAK IDENTIFICATION RAZR

Sound Method

- 1. Run the tractor hydraulics in the lift position.
- 2. Listen closely to the cylinders to try and hear any oil bypassing within it. Use a **stethliscope** if you have access to one.
- 3. This may only be possible if the cylinder has a really bad leak.





OPENER LEAK IDENTIFICATION

Temperature Method

- 1. Run the tractor hydraulics in **lift** position.
- 2. Crack the bleed-off valve to allow oil to circulate, but not allow openers to drop.
- 3. The leaky cylinder will be warmer than the rest because oil will be passing through it. Use a **temperature gun** if you have access to one for accurate readings.





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OPENER LEAK IDENTIFICATION RAZR

Open Circuit Method

- 1. Bleed off the hydraulic pressure from the accumulator.
- 2. Lift and lock the openers up.
- 3. Turn off the tractor oil supply system.





OPENER LEAK IDENTIFICATION

- 4. Open the hydraulic line at the T on the cylinder end of the hydraulic ram.
- 5. Cap the T to prevent the oil from shooting out if openers lower by mistake.





MODULE 4: SERVICE & MAINTENANCE TIPS

RAZR

OPENER LEAK IDENTIFICATION RAZR

- 6. Hold the open line into a drain bucket.
- 7. Activate the hydraulics to the lift position.
- 8. If oil continues to flow out of the open cylinder line, then the ram is defective.





TECH 388 – SCRAPER TRASH OPTIONS

- For customers with trash plugging concerns Morris is introducing the following Kits which can be ordered through Morris' Parts Department.
 - **S56458** Trash Guard For Right Hand Openers to prevent trash flowing into the top of the seed boot.
 - **S56564** Trash Guard For Left Hand Openers to prevent trash flowing into the top of the seed boot.
 - **S56694** Scraper Bushing Kit The bushing replaces the current spring (S51163) and bushing (S47395) combo.
- This prevents the scraper from pulling away from the disc blade in tough trash conditions.





TECH 389 – RESIDUE DEFLECTORS

For customers with heavy residue Morris is introducing the following Kits which can be ordered through Morris' Parts Department.

- **S56696** Residue Deflector Kit For 2014 and older RAZR Drills that still have the lugs out front on the walking beam arm.
- **S56075** Trash Shield For 2014 units equipped with the shorter walking beam and no lugs up front on the walking beam arm. No additional hardware is required; it bolts directly onto the front hub bolts.





TIE RODS & TORQUEING

Wing Tie-Rods

Mainframe Tie-Rods





CHECKING U-BOLTS

It is very important to periodically check that opener mount U-bolts are set and torqued properly.

They should sit straight and square to the frame.





DOUBLE SHOOT HYDRAULICS

The double-shoot option hydraulics are plumbed into the regular seeding circuit.

They can be adjusted so that only the fertilizer or only the seeding circuit is used, or both at the same time.





NEW WEIGHT KIT MOUNT

New Center Frame Mount





