Instruction Manual

EAGLE 500/550
EAGLE 700/750
EAGLE 900/950
EAGLE 1100/1150

THANK YOU FOR CHOOSING RAIN BIRD

We are aware that you have a choice, and we are happy you chose Rain Bird.
The Eagle Rotor series offers a wide range of features plus easy maintenance.
This manual shows how to perform common installation and maintenance procedures. If you have any comments or questions please call your local Rain Bird distributor.

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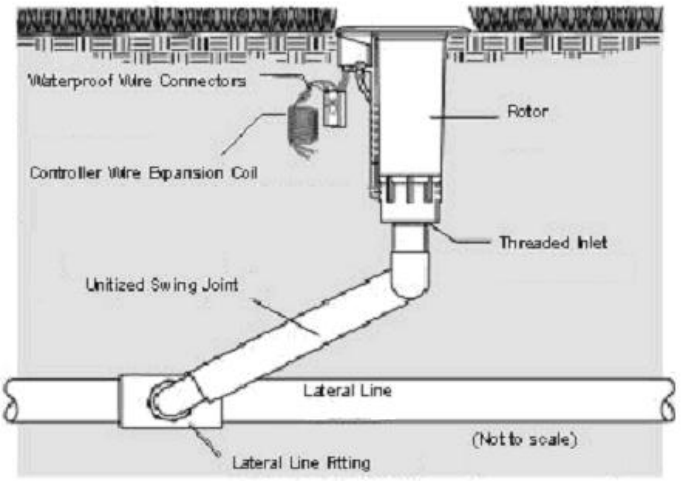
Important Installation & Maintenance Tips

- To avoid debris problems, flush the system before installing the ROTOR on the swing joints (or pipe riser). If debris gets in the line, flush the line.
- For NPT and BSP thread configurations: “Handbook of Design Guidelines and Precautions” (Biesner 1987) recommends using sufficient wraps (2 – 5 depending on tape thickness) to insure that threads do not “lock up” on make up. DO NOT use pipe dope.
- For ACME thread configuration, you must use an ACME thread swing joint assembly. DO NOT use Teflon tape or pipe dope. Do not tighten. Turn the rotor back counter-clockwise one-quarter (¼) of a turn only.
- Thread the rotor onto the thread connection and securely **hand** tighten, making sure the top of the rotor is level.
- Rain Bird does not recommend using metal fittings with Eagle Rotors. If metal fittings must be used, hand tighten only.
- For hydraulic rotors, before you connect the hydraulic tubing, make sure you bleed the air from the tube of the hydraulic control module.
- For part-circle applications, locate the fixed left edge by rotating the nozzle turret counterclockwise.

- On electric models, be careful to prevent any debris from entering the Pressure Regulating System when working on the valve or replacing the selector stem.

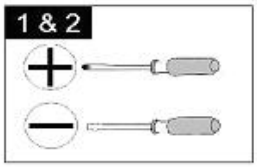
Eagle Rotors may be installed at ground level in all soil types.

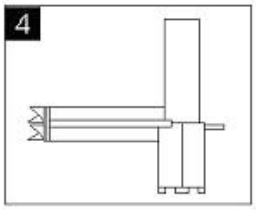


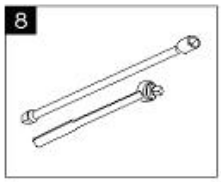
Required Maintenance Tools

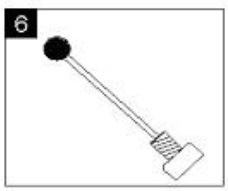
To perform maintenance on Eagle Series Rotors, you will need the following tools:

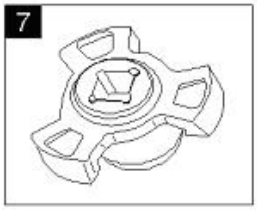
1. Phillips-head screwdriver
2. Flat-head screwdriver (#2 size preferred)
3. Snap-ring pliers — used to remove snap rings from inside the case of the Eagle Rotor.
   Rain Bird Part Number:
   For Eagle 900/950 — Part #D02203, Model: SRP
   For Eagle 700/750, 500/550 — Part #D02236, Model: SR-700
4. Selector valve key — used to manually operate and service electric Eagle Rotors.
   Rain Bird Part Number:
   For Eagle 900/950, 700/750, 500/550 — Part #B41720, Model: EGL-SVK
   7" Selector Valve Key — Part #D02215, Model: DR-SVK-7
   18" Selector Valve Key — Part #D02221, Model: DR-SVK-18
5. Nozzle pull-up tool — used to lift rotor head in dry mode. (Eagle 1100 & 1150 Models only)
   Rain Bird Part Number: ***Part #209227***
6. Valve insertion tool — used to insert the valve assembly to all Eagle models.
   Rain Bird Part Number:
   For Eagle 900/950 — Part #D41700, Model: VTDR
   For Eagle 700/750, 500/550 — Part #D41710, Model: VT-700
7. Installation Socket for Top-Serviceable Rock Screen and Replaceable Valve Seat on all Eagle valve-in-head models.
   Rain Bird Part number:
   Part #D02237, Model: IS-TSRS
8. 3/8" Socket Wrench & Extension or 3/8" Speed wrench & Extension
   A 10" (25,4 cm) minimum extension is required for Eagle 700 & 500 cases, and 12" (30,5 cm) minimum extension is required for Eagle 900 cases.



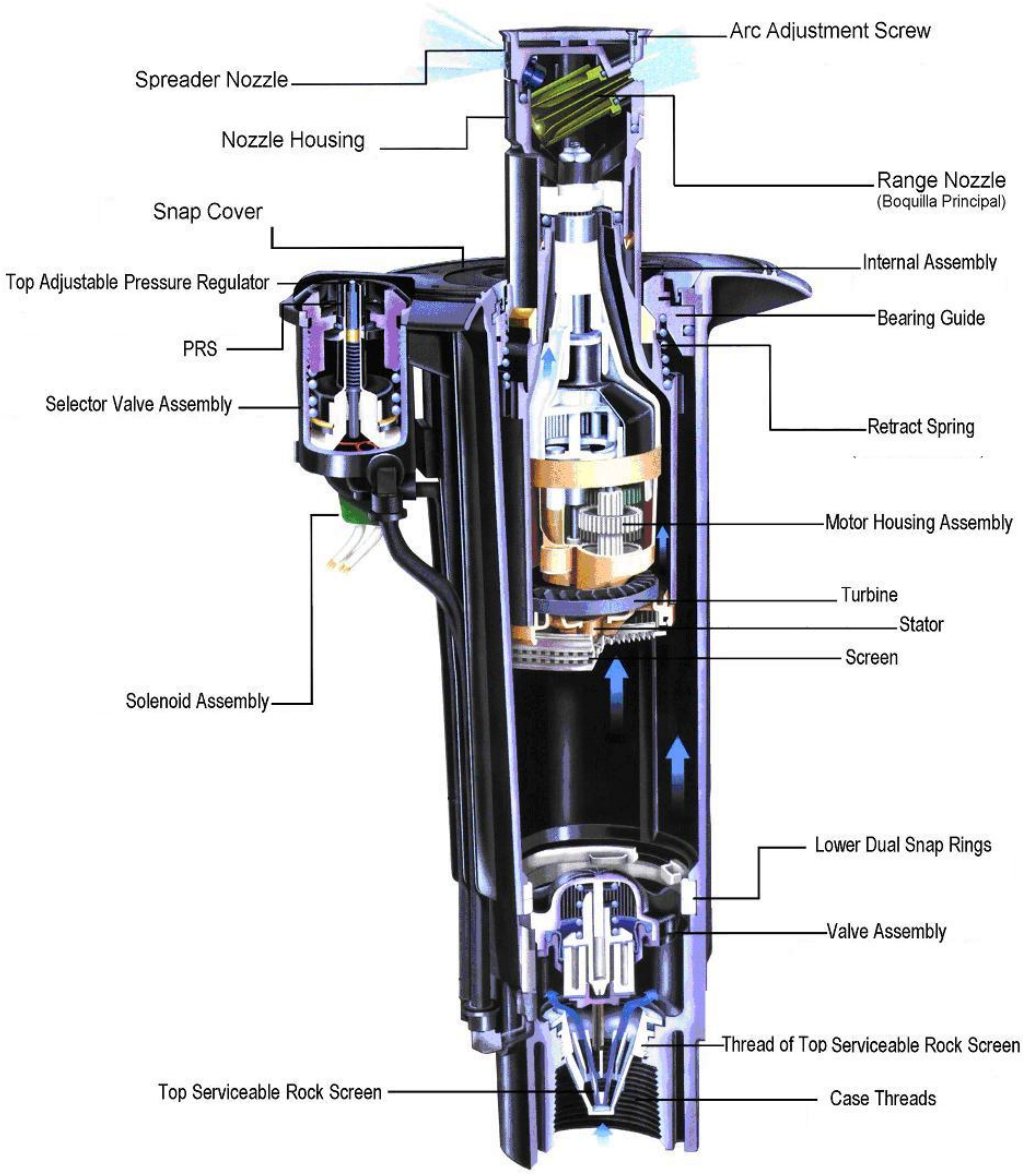








Eagle 700 Anatomy



Arc Adjustment

Required Tool: Flat-head screwdriver

1. On Eagle 550, 750, and 950 Series part-circle rotors, the LEFT leg of the sprinkler's arc is the fixed leg. Align the left leg where it is needed for your desired watering pattern while installing the rotor case on the swing joint.

NOTE: On Eagle 1100/1150 Series part-circle rotors, the RIGHT leg is the fixed leg.

2. For 550, 750, and 950 Series rotors, the RIGHT leg of the arc is the adjustable leg. It is shipped from the factory at approximately 180 degrees from the fixed leg.

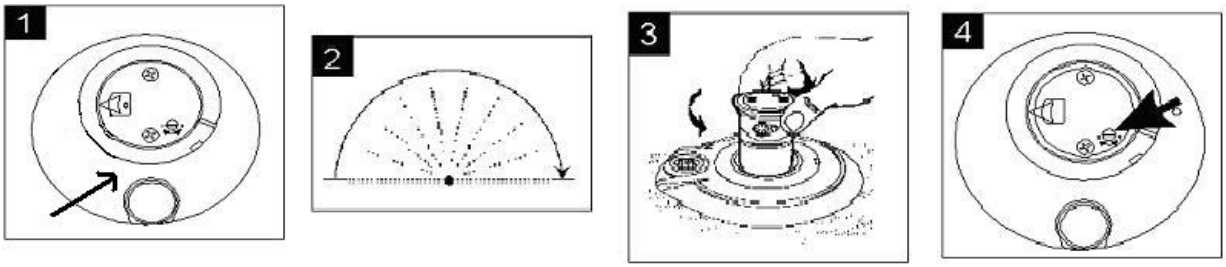
NOTE: For 1100/1150 Series rotors, the LEFT leg is the adjustable leg.

3. For best results, turn the head ON to see where both legs "trip" (the trip point is the point where the rotor turns and begins rotating in the opposite direction). To manually advance the nozzle housing, SLOWLY move it in the same direction it is currently moving. After noting where the head trips, return the head to the left trip point.

4. Using a flat-head screwdriver, turn the arc adjustment screw on top of the nozzle housing to reach your desired arc. Turn the screw counterclockwise to add arc, or clockwise to subtract arc. One complete turn of the adjustment screw equals approximately 20 degrees of arc.

NOTE: 1150 Series rotors adjust in the direction opposite from other Eagle Rotors (clockwise to add arc and counterclockwise to subtract arc), and are adjustable from 15° to 360°. Refer to the arrows on the rotor case.

Turn on the rotor and let it run through the forward and backward trip points to verify the arc setting. Repeat steps 1 through 4 as needed. You may also pull the internal assembly out of the rotor and adjust the arc. Then reinstall the internal assembly and check for performance.



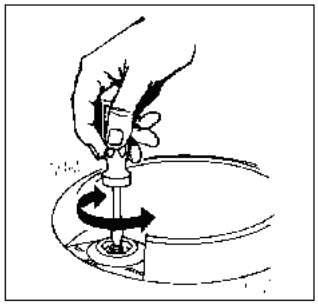
Pressure Regulation Adjustment

Electric model rotors only
Required Tool: Flat-head screwdriver

To adjust the pressure regulator, use a flat-head screwdriver to turn the adjustment screw in the center of the selector on top of the rotor head.
Turn the screw clockwise to increase pressure, and counterclockwise to decrease pressure. One full turn is approximately 10 psi (.7 Bars).

Factory pressure settings are indicated with a Blue dot for 70 psi (4,8 Bars), a White dot for 80 psi (5,5 Bars), and a Red dot for 100 psi (6,9 Bars).

NOTE: For Eagle 1100/1150 Series rotors only, an Orange dot indicates a pressure setting of 120 psi (8,3 Bars).



Manual Operation

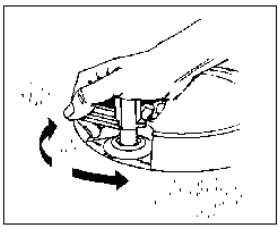
Electric model rotors only
Required Tool: Selector valve key

Pour l'ouverture manuelle de l'arroseur, tournez le sélecteur se trouvant sur le dessus à l'aide de la clé spéciale.

To manually operate the rotor, use the selector valve key to turn the selector on top of the rotor to the desired position shown on the rotor case.

The selector has three settings:
- COUNTERCLOCKWISE = manual ON
- CLOCKWISE = AUTO
- CENTER = OFF

IMPORTANT NOTE: Locate main nozzle arrow on top of the rotor. Stand to the left of the arrow to avoid getting sprayed. During pop-up, a flushing action occurs. Stand at arms reach to reduce getting wet.
When you are finished operating the rotor, return the selector to the AUTO position.



Removing the Internal Assembly

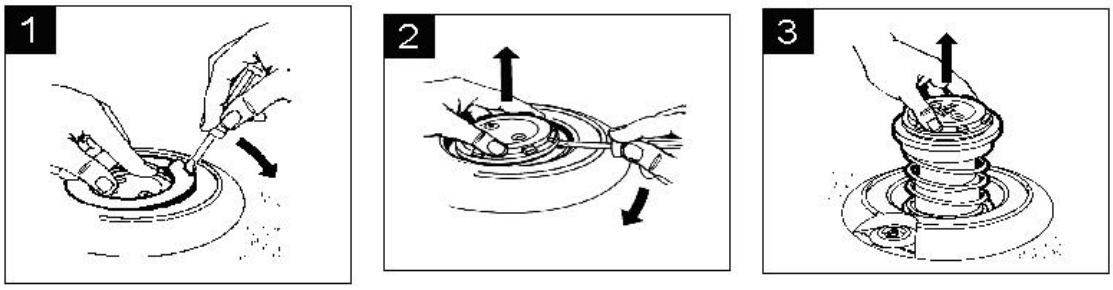
IMPORTANT NOTE: Make sure the sprinkler does not operate automatically while you are removing the internal assembly. On electric models, turn the selector to OFF, as shown in "Manual Operation" above. For hydraulic and SAM models, turn off the water.
CAUTION: Before removing the internal assembly, always tighten the nozzle housing screws securely. DO NOT remove the nozzle housing screws with the internal assembly removed from the case.

Required Tool: Flat-head screwdriver

1. While pressing down on the center of the nozzle housing, insert a screwdriver into the slot on the snap ring and pry up the snap ring from the top of the rotor case.

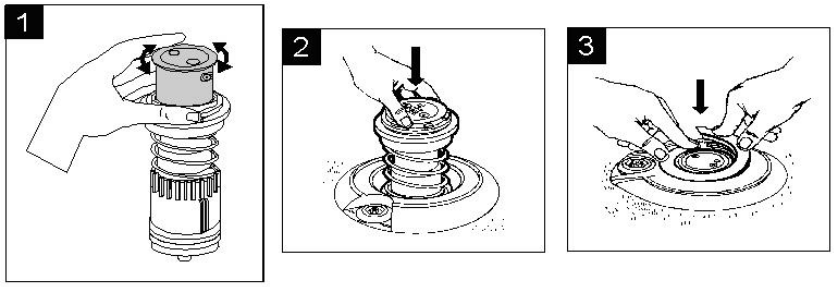
NOTE: You MUST press down on the nozzle housing when removing the snap ring.

2. Insert a flat-head screwdriver into the groove (or under the small tabs) on the outside edge of the bearing guide and use the screwdriver to gently pry up the internal assembly.
3. Lift the internal assembly up and out of the case.



For older 900/950 models only: a red or black u-cup seal may slip off into the case. Simply take it out.
NOTE: Check the bearing guide O-ring for swelling. If it is swelled (or stretched) allow it to dry out or replace it with a new one.

Installing the Internal Assembly



1. PART-CIRCLE ROTORS: To find the left-stop, turn the nozzle housing to the right until it reaches its "trip" point. Then turn the nozzle housing back to the left until it "trips" again. The location of the arrow on top of the nozzle housing indicates the direction of the nozzle. Align the arrow on the nozzle housing with the left edge of the grass line (left edge of your watering pattern). Then make your right arc adjustment

2. Lower the internal assembly back into the case and press down firmly until the internal assembly seats securely and evenly in the case.

3. Position the snap ring in the groove on the top of the rotor case with the bottom of the snap ring facing down.

   Press the end of the snap ring without the screwdriver slot into the groove. Press and twist the snap ring down in a circular motion until it is installed about two-thirds of the way.

   Step on or pound the snap ring (with your hand or a screwdriver handle) to insert it the rest of the way. Make sure the snap ring fastens securely in place and is flush with the top of the rotor case.

FULL-CIRCLE MODELS: Installing the full-circle internal assembly is the same as the part-circle, except that you do not need to adjust the arc.

Replacing the Nozzle

IMPORTANT NOTE: Make sure the sprinkler does not operate automatically while you are changing the nozzle. On electric models, turn the selector to OFF as shown in "Manual Operation" on page 7. For hydraulic and SAM models, turn off the water.
NOTE: Make sure the snap ring is securely in place before removing the nozzle housing screws.

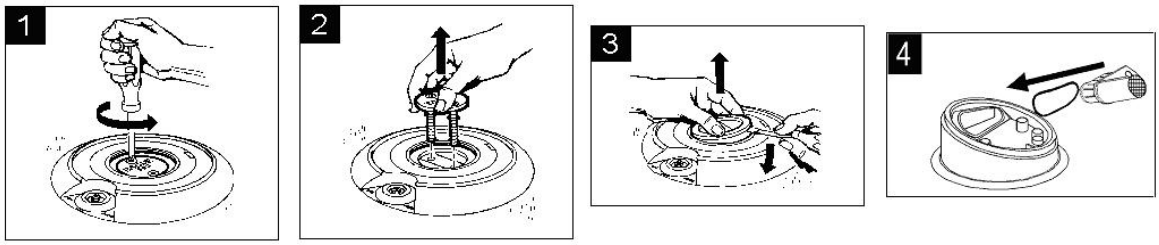
Required Tools: Phillips-head screwdriver; Flat-head screwdriver; (Eagle 1100/1150 may require a nozzle pull-up tool)

1. Use a Phillips-head screwdriver to loosen the nozzle housing screws.
2. Remove the nozzle housing screws and cover.
3. Use a flat-head screwdriver to pry the nozzle housing out of the case. Then press the old nozzle out of the nozzle housing.
4. Press the replacement nozzle assembly into the nozzle housing, making sure the nozzle front is flush with the outside of the housing. An O-ring seal is required on the following Eagle nozzles: All nozzles for the 700/750/950; the 900 models #20, #26, #28, #30, #32; and all 900 high performance nozzles.

CAUTION: If the nozzle is not flush and seated properly in the nozzle housing, the rotor may not perform properly.

NOTE: When changing nozzle to a different size, you may also need to change the stator to maintain consistent rotation.

On Eagle 1100 & 1150 you may need to adjust to a new STATOR SETTING.



Replacing the Stator

IMPORTANT NOTE: Make sure the sprinkler does not operate automatically while you are changing the stator. On electric models, turn the selector to OFF, as shown in "Manual Operation" on page 7. For hydraulic and SAM models, turn off the water.

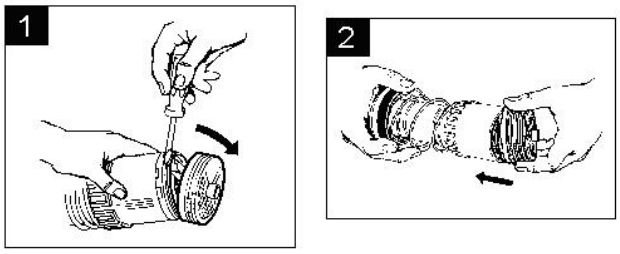
Required Tool: Flat-head screwdriver

NOTE: Before replacing the stator, you must remove the internal assembly.
NOTE: The purpose of the stator is to control the speed of the rotor. When changing the stator, make sure to use all the parts in the nozzle/stator kit.

1. For Eagle 550, 750, and 950 Series Rotors, use a flat-head screwdriver to pry the stator and/or internal screen from the internal assembly.

NOTE: For 1100/1150 Series Rotors, unscrew the bottom screen (counterclockwise) using the four posts on the bottom screen to remove the stator.

2. Replace with the appropriate stator replacement kit. Position the poppet (if required) as shown on the Rotor Stator Instruction Sheet. Snap the new stator/internal screen onto the rotor and place the internal assembly back in the case. See "Installing the Internal Assembly" .



Adjusting the Stator Setting

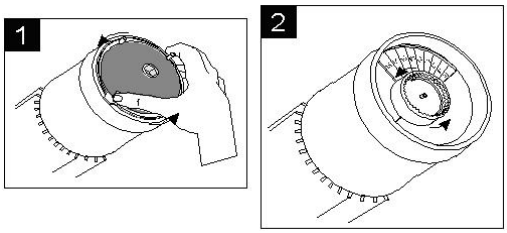
NOTE: Eagle 1100/1150 Series Rotors only

Eagle 1100/1150 Rotors allow you to adjust the stator setting to more precisely control rotation speed.
Refer to “Appendix 1” for rotation speeds produced by various stator settings and nozzle combinations.

IMPORTANT NOTE: Make sure the sprinkler does not operate automatically while you are adjusting the stator setting. On electric models, turn the selector to OFF, as shown in “Manual Operation” on page 7. For hydraulic and SAM models, turn off the water.

NOTE: Before adjusting the stator setting, you must remove the internal assembly

1. Use the four pegs on the internal assembly bottom screen to turn the screen counterclockwise and remove it.
2. Turn the white knob on the stator to adjust the stator to the desired setting (from 1 to 16). See stator guide.
3. Replace the bottom screen and turn it clockwise until it is hand tight.



Replacing the Motor

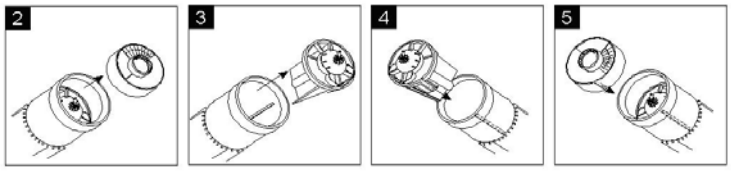
NOTE: Eagle 1100/1150 Series Rotors only

Eagle 1100/1150 Rotors allow you to remove and clean or replace the internal motor if it becomes clogged with rocks or debris.

IMPORTANT NOTE: Make sure the sprinkler does not operate automatically while you are replacing the motor . On electric models, turn the selector to OFF, as shown in “Manual Operation” on page 7. For hydraulic and SAM models, turn off the water.

NOTE: Before replacing the motor, you must remove the internal assembly

1. Turn the bottom screen counter-clockwise to remove it, as shown in step 1 of “Adjusting the Stator Setting”
2. Lift out the stator.
3. To replace or remove the motor – pull in the direction of the arrow. A large allen wrench is used as a hook may also help in loosen the motor from the internal.
4. To reinstall the motor, align the two grooves on the side of the motor with the raised rib on the inside of the internal assembly. Then lower the motor into place. Make sure to fully insert the motor into the internal assembly.
5. Align the groove on the side of the stator with the raised rib on the inside of the internal assembly and replace the stator. Then replace the bottom screen and turn it clockwise until it is hand tight.



Replacing the Selector Stem

IMPORTANT NOTE: Electric model rotors only
Turn off the water to the sprinkler before attempting to replace the selector stem. Make sure you relieve the pressure on the rotor by closing the isolation or main valve.

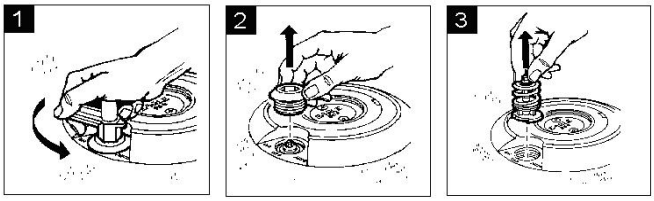
Required Tool: Eagle selector valve key

1. Insert the HEX end of the Eagle selector valve key into the selector cap on top of the rotor. Turn the tool counter-clockwise to loosen the selector cap.
2. Remove the selector cap from the case.
3. Remove the selector stem cartridge from the case. Before replacing the selector cartridge, make sure that the selector seal is flat and seated in the bottom of the selector housing.

   Place the selector stem cartridge into the selector housing making sure the stem is pointed to the OFF position. Tighten the selector cap, using the HEX end of the selector valve key tool. Press down hard while tightening.

NOTE: If debris has entered the Pressure Regulating system, you may be able to flush the debris out without disassembly. Slightly loosen the selector cap

as shown in STEP 1 until water starts to flow from the cap.
WARNING: The rotor will likely turn on. After a few seconds, tighten the cap back on.
NOTE: If possible, keep the line pressure to a minimum (20-30 psi or 1,4 to 2,1 Bars) during this process.



Removing the Valve Assembly

IMPORTANT NOTE: Turn off the lateral mainline valve to the sprinkler before replacing the rotor valve.

Required Tools: Flat-head screwdriver; snap-ring pliers
NOTE: Remove the internal assembly, and remove any water remaining in the case before removing the valve.

Push down on top of the valve with the blunt end of a hammer or screwdriver to relieve any pressure on the valve.

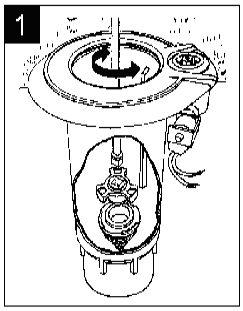
Insert the snap-ring pliers into the case and grasp the top snap ring. Pull up to release the snap ring and remove it from the case. Remove the second snap ring in the same way.

Lift out the valve with the snap-ring pliers.

Removing / Installing the Top Serviceable Rock Screen and ReplacEable Valve Seat

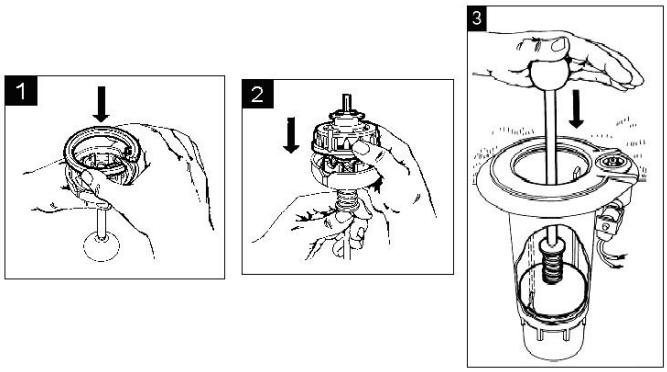
Required Tools: Installation Socket (P/N: 211619-01) 3/8" Socket Drive or 3/8" Speed Wrench; Drive Extension

Attach the installation socket to the socket drive/drive extension. Insert the installation socket and socket drive/drive extension assembly into the case. Align the installation socket to the slots on the top serviceable rock screen. Twist the Drive Extension counter-clockwise to remove the rock screen and clockwise to install the rock screen.



Installing the Valve Assembly

Required Tool: Valve insertion tool



1. To install the valve assembly, insert the two snap rings into the valve insertion tool, with their rounded edges facing down, and the slotted tabs on the snap rings 180 degrees apart.
2. Insert the valve into the valve insertion tool. Align the pilot flow port on the valve with the large rounded notch of the valve tool.
3. Insert the valve tool into the rotor case, aligning the two ribs on the inside of the case with the notches on the side of the tool. Push the handle down until the head of the tool reaches the bottom of the case. Then push down firmly on the tool to seat the valve and the snap rings. Remove the valve tool, and check to make sure that both snap rings are securely in place.

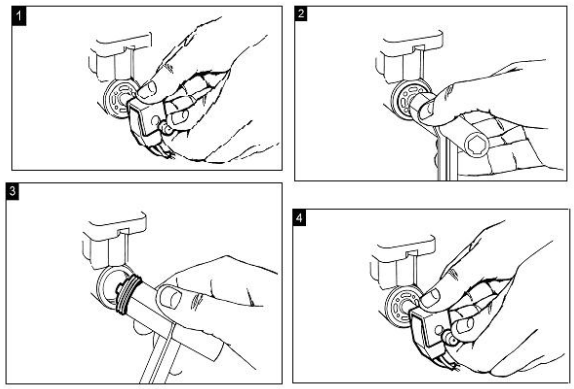
   Reinstall the internal assembly and upper snap ring. Turn on the water and test the valve by operating the sprinkler manually

Replacing the Solenoid Assembly

IMPORTANT NOTE: Turn off the water to the sprinkler, and make sure the plunger area of the selector assembly is kept clean and free of debris.

Required Tool: Selector Valve Key

1. Twist the orange cap counterclockwise and remove it. Slide the U-frame and coil assembly off the solenoid tube (post).
2. Using the selector valve key, place the key against the solenoid base nut and align with the holes in the base nut. Holding the tool firmly, twist counterclockwise and remove the solenoid tube (post)/base nut and plunger assembly.
3. Before re-installing the new solenoid assembly, be sure the o_ring is seated properly. Place the solenoid tube (post)/base nut and plunger assembly against the selector housing and hand tighten. Firmly tighten the base nut with the selector valve key.
4. Slide the U-Frame and coil onto the solenoid tube (post) and re-install the orange cap.



Appendix 1 — Eagle 1100/1150 Stator Setting Guide

Blue Nozzle	Full-circle rotation time (Min:Sec)		
Stator Setting	80 psi (5,5 Bars)	100 psi (6,9 Bars)	110 psi (7,5 Bars)
1	---	---	---
2	---	---	---
3	---	---	---
4	2:28	2:08	2:02
5	2:39	2:26	2:22
6	3:09	2:50	2:24
7	3:37	3:13	2:38
8	---	3:26	2:58
9	---	---	---
10	---	---	---

Yellow Nozzle	Full-circle rotation time (Min:Sec)		
Stator Setting	80 psi (5,5 Bars)	100 psi (6,9 Bars)	110 psi (7,5 Bars)
1	---	---	---
2	---	---	---
3	---	---	---
4	1:57	1:52	1:41
5	2:20	1:59	1:51
6	2:32	2:15	1:58
7	2:38	2:20	2:08
8	3:05	2:27	2:16
9	3:10	2:52	2:26
10	3:30	2:55	2:34
11	---	---	2:48
12	---	---	---

Orange Nozzle	Full-circle rotation time (Min:Sec)		
Stator Setting	80 psi (5,5 Bars)	100 psi (6,9 Bars)	110 psi (7,5 Bars)
1	---	---	---
2	---	---	---
3	---	---	---
4	1:52	1:36	1:27
5	2:09	1:48	1:41
6	2:25	2:04	1:57
7	2:31	2:08	2:11
8	2:51	2:38	2:26
9	3:15	2:41	2:30
10	3:20	2:50	2:36
11	3:28	3:00	2:43
12	4:00	3:38	2:50
13	---	3:52	3:50
14	---	---	4:18
15	---	---	---

Green Nozzle	Full-circle rotation time (Min:Sec)		
Stator Setting	80 psi (5,5 Bars)	100 psi (6,9 Bars)	110 psi (7,5 Bars)
1	---	---	---
2	---	---	---
3	---	---	---
4	1:45	1:35	1:24
5	1:57	1:40	1:30
6	2:16	1:47	1:45
7	2:30	2:02	1:59
8	2:37	2:06	2:10
9	2:39	2:30	2:15
10	2:45	2:36	2:19
11	3:15	2:40	2:29
12	3:22	3:04	2:42
13	3:49	3:22	2:48
14	---	3:26	3:16
15	---	---	3:52

Appendix 2 — Eagle Rotor Troubleshooting Guide

Problem	Possible Cause	*Correction*
Cracked rotor case	High pressure	Minimize water/air hammer. Check the system's pressure regulating valve. Replace case if needed.
	Improper installation	Check installation for over tightening. Check case for chemical damage. Replace case if needed.
	Freeze damage	Make sure to winterize system properly. Blow out water line if susceptible to freezing temperatures. Replace case if needed.
Failure to pop up and/or seal properly	Sand or rock particles may have wedged between the bearing guide and the riser	Pull the internal assembly and clean. Brush any rocks or debris away from the head of the rotor.
	Low pressure	See solutions for Problem #6 "Low Pressure."
	Jammed or clogged selector assembly	Clear or clean poppet, or replace selector assembly.
	Tube crimped or pinched, or blockage in tubes	Make sure tubes are not bent or pinched. Check tubes for blockage. Clear tubes, if needed.
	Solenoid coil not working	Check solenoid for proper operation. Replace if needed.
Failure to turn on	No power to solenoid	Check for power to solenoid.
	Selector/PRS set to OFF	Check selector and PRS. Set to AUTO or ON, as desired.
	Jammed solenoid plunger	Clean out debris around plunger. Replace plunger assembly, if needed.
Failure to turn off	Cracked selector housing	Check and replace housing.
	Selector/PRS set to MANUAL	Turn stem to AUTO or OFF, as desired.
	Diaphragm failure	Replace valve assembly.
	Valve housing cracked	Replace valve.
	Jammed solenoid plunger	Clean out debris around plunger. Replace plunger assembly, if needed.
	Plugged valve filter	Remove valve. Clean and reinstall filter screen.
	Debris under plunger and selector housing "volcano"	Clean out area around selector volcano and plunger.
Freeze damage (Hydraulic rotor will not open. Water continually drains at controller while attempting to open valve).	Failure to winterize	Make sure to winterize the system properly. Repair and replace damaged parts as needed.
Low pressure	Incorrect valve assembly in the rotor	Check for proper valve assembly. Replace if needed.
	Plugged or damaged nozzle	Clean or replace nozzle.
	PRS out of adjustment	Adjust pressure by turning adjusting screw using a screwdriver.
	PRS not holding pressure setting	Replace PRS cartridge in selector.
	Broken valve filter screen	Replace screen and clean out valve assembly.
	Blockage in tubes or case probe	Locate and clear blockage.
	Tube crimped or pinched	Repair or replace tube.
	Debris obstructing internal assembly screen	Clean internal assembly screen.
	Inlet rock screen clogged	Remove case. Clean and reinstall rock screen.
	Debris in PRS assembly	Clean out any debris between poppet and lower stem.
Mechanical failure to retract	Retract spring may be installed with an end coil doubled over, preventing internal retraction	Remove internal assembly and without disassembling, compress the spring down until you free up the end coil. Reseat the end coil and reinstall the internal assembly.

Problem	Possible Cause	*Correction*
	Sand or rock particles may have wedged between the bearing guide and the riser	Pull the internal assembly and clean. Brush any rocks or debris away from the head of the rotor.
Non-rotation/ Stalling / Tripping	Stator missing, or wrong stator installed	Remove internal assembly. Check for proper stator.
	Debris or algae clogging the internal assembly screen	Clean internal screen.
	Nozzle clogged	Clean nozzle.
	Inlet screen clogged	Clean inlet screen. This may be difficult if debris has fallen back down out of sight. Examine and clean thoroughly.
	Arc was misadjusted and left in neutral Arc setting too small	Turn the nozzle housing through the next trip point. Reset arc to no less than 45 degrees.
Sprinkler rotates too slowly	Insufficient water pressure	See solutions for Problem #6 “Low Pressure.”
	Improper nozzle/stator combination	Check for proper stator configurations and nozzle/stator combinations. Clean as needed.
	Blinded filter screen	Clean as needed.
Short radius	Improper sprinkler spacing	Review spacing requirements.
	Blockage in tube	Locate and clear blockage.
	Jammed poppet	Clear poppet or replace selector assembly.
	PRS set too low	Reset PRS.
	Solenoid plunger jammed	Clean out debris around plunger and free plunger.
	Selector/PRS not set correctly	Set selector to AUTO or MANUAL.
	Low pressure	See solutions for Problem #6, “Low Pressure.”
	Course design problems	Check capacity vs. nozzle size, number of heads, spacing, etc.
	Wind	Raise water pressure, review watering schedule, renozzle.
Weeping	Incorrect stator configuration	Verify proper stator/nozzle match.
	Leakage between inlet seal and case seat	Check for debris lodged between seat and seal. Replace or repair damaged inlet seal on valve. If case seat is damaged, replace case.