



Snail[®] Systems
BULLET TRAPS AND RANGES

Wet Snail Trap

Operation & Maintenance
Procedures

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SAFEGUARDS & WARNINGS**USING AMMUNITION THAT EXCEEDS THE RATED CAPACITY OF YOUR TRAP
MAY RESULT IN DAMAGE TO THE SNAIL TRAP AND INJURY TO THE RANGE
USERS.****WARNINGS**

- Wear proper Personal Protective Equipment (PPE) when using or maintaining the range or equipment.
- Wash hands after each use or maintenance procedure.

IMPORTANT SAFEGUARDS

Savage Range Systems, Inc. accepts no responsibility for the manner in which this range is used and maintained. The owner completely accepts all risk and responsibility for the use of this range, and shall take every precaution necessary to operate the range in a safe manner. The owner of the range must ensure that all applicable safety rules and regulations are followed. The range should only be used as detailed in the attached instructions. This range should be operated only by personnel trained in the safe use of firearms, and as instructed by the manual.

- Read all instructions
- Discard all bullets and bullet material in proper containers, as required by law and local ordinances
- Only use manufacturer's recommended products with this unit.
- Do not exceed the ammunition rating as printed in these instructions and on the nameplate on the bullet trap.
- Do not store materials on the back of the upper ramps. It should not be used as a storage area or as a means of accessing high level items (HVAC, power, etc.) above the bullet trap.

ROUTINE & PREVENTIVE MAINTENANCE

Daily

- Check water level in tank. Water should be above pump housing. Top up with clean water as necessary.
- Ensure that all edge protectors are in place. Replace / reinstall any missing deflectors.

Weekly

Bullet Trap

- Check Snail Oil concentration using the refractometer provided. See Section VIII for proper use of the refractometer. Oil concentration should be between 2% & 3%. Add oil as necessary. To raise oil concentration 1% add 1 gallon Snail Oil for each 8' section of trap.
- Clean T-strainers.
- Check level of spent bullets in the collection drum. If the range does not have an Automatic Bullet Recovery System, check the level of the spent bullets on the tray. They should be removed before the level reaches the top of the tray.
- Remove any debris (target backing, shot gun wads, etc.) from the front trough.
- Check edge protectors for sharpness. Replace / Reinstall any missing deflectors.
- Inspect the trap for signs of damage or excessive wear. If any damage is noted, stop use of the trap and call Savage Range Systems (1-800-370-0712) immediately and speak to Range Product Support.

Monthly

In addition to Weekly Maintenance items: -

Bullet Trap

- Inspect: -
 - Deceleration Chamber, Upper And Lower Ramps - check for dents, gouges, scoring or other signs of wear or misuse.
 - Front Trough - check for wear, sludge build up and blockage of return pipes.
 - Spraybar - check for blockage, proper alignment and general flow, adjust bolts if necessary. (See Section VIII for procedures for cleaning spraybars.)
 - Edge Protectors - check for sharpness of leading edge, dents, gouges, scoring or other signs of wear or misuse; proper alignment and tightness.
 - Sidewall Plates - check for tightness and wear.
 - Reservoir - for corrosion, dents, liquid level and concentration, leaks, pumps, bullet trays, blockage of return pipe, deterioration of pump hoses, tightness of connections and positioning of splash shields.
 - All Trap Components - for corrosion of plates, supports, and nuts and bolts.

Conveyor (if supplied)

- Refer to Mayfran Manual for complete maintenance procedures
- Check steel belt tension and adjust as necessary. Lubricate where required.
- Check Reducer oil level and add oil if required.

Quarterly

In addition to Monthly Maintenance items: -

Conveyor (if supplied)

- Lubricate bearings
- Check limit switch operation

Semi-annually

In addition to Quarterly Maintenance items: -

Conveyor (if supplied)

- Check Roller Chain adjustment / lubrication
- Check V-belt tension
- Check Sheave lubricant
- Change Gear Reducer oil

Annually

In addition to Semi-Annual Maintenance items: -

Bullet Trap

- Remove sludge from Reservoir and Front Trough (depending on volume of frangible rounds being used, it may be necessary to reduce the interval between cleanings)
- Check Pump condition and operation

TROUBLESHOOTING

Problem	Probable Cause	Possible Solution
No water flow	Pumps not turned on	Switch on pumps
	No power to pumps	Ensure pumps are plugged in Check circuit breaker
Poor water coverage	Pump is not working	Check power supply Plug pump into socket Reset pump - See Manufacturer's manual (Section IX) Replace pump
		Spraybar is blocked
	T-Strainer is dirty	Clean filter screen Replace filter screen
	Pump is not working	No power to pump
Pump has overheated and tripped out		Reset pump Low water level - bring water level to top of pump Excessive sludge around pump - remove sludge
Faulty pump		Replace pump
Conveyor not functioning	Not turned on	Switch conveyor on
	No power	Check supply / circuit breaker
	Refer also to Conveyor Manufacturer's literature	
Lubricating fluid is foaming	Insufficient foaming retardant	Add anti-foaming agent - contact SRS
	Excessive Snail Oil Concentration	Add water to dilute the Snail Oil concentration. Should be between 2 - 3%

REPLACEMENT OF PARTS / COMPONENTS

Replacement or repair of parts can be ordered directly from Savage Range Systems, Inc. Call (800) 370 0712, Range Product Support, for assistance or visit our website at www.snailtraps.com.

Item	Part No.	Manufacturer / Supplier
Bullet Collection Tray		Savage Range Systems
Pump	215101	Zoeller Pumps
T-Strainer - Housing	215180	Savage Range Systems
T-Strainer - Filter	215103	Savage Range Systems
Spraybar	501004	Savage Range Systems
Front Trough Screen		Savage Range Systems
Edge Protector	215123	Savage Range Systems
Snail Oil		Savage Range Systems
1-gallon	191160	
5-gallon	191170	
55-gallon	191130	
Splash Guards	191240	Savage Range Systems
Ball Valve	215050	Savage Range Systems
Deleading Handwash	501022	Savage Range Systems
Refractometer	190121	
Conveyor Components - Mayfran International's literature		Mayfran International
Spent Bullet Containers		

MAINTENANCE TASKS

- Cleaning / Adjusting Spraybars
- Checking Oil Concentration
- Cleaning Bullet Collection Tray
- Removing the Sludge from the Fluid Tank / Dredging the Tank
- Replacing Edge Protector
- Cleaning / Replacing Filter Screen
- Replacing a Pump
- Welding Procedures for Leak Repair

Cleaning / Adjusting Spraybars

The spraybar should be producing a generally uniform sheet of water that covers the wet ramp while spraying the inside of the deceleration chamber. Occasionally, a dry patch may develop along the seams between adjacent wet ramp sections. This does not impact the performance of the bullet trap. The lead particulate is primarily formed inside the deceleration chamber and not on the ramps.

Before removing the spraybar, check the water level and the bottom of the pump to verify that there are no obstructions or lead sediment restricting the impeller from spinning freely. Check the T-Strainer screen, to make sure it's clean. If the screen requires cleaning refer to "Cleaning / Replacing Filter Screen". Verify that the ball valve is in the full open position. If no obvious obstructions / problems are discovered, the spraybar should be removed and cleaned.

1. Unplug the pump to ensure that it cannot be switched on while the spraybar is removed.
2. Remove the hose clamps on the 90° barb fittings and disconnect the 1" vinyl tubing.
3. Loosen the two bolts that hold the bar in place. Remove the spraybar from the deceleration chamber.
4. Check the spray holes in the bar for any obvious blockage. Use a piece of wire to clear any obstructions.
5. To flush the debris from the inside the spraybar, remove the plugs from each end of the spraybar. Using a garden hose, flush with clean water until all foreign material is removed.
6. Replace the plugs.
7. To re-install the spraybar, reverse the sequence on Steps 1 - 3 above.

Checking Snail Oil Concentration

For an accurate reading, run the system for at least 5 minutes to circulate / mix the water and Snail Oil.

1. Remove the refractometer from the bag along with the dropper that is in a small Velcro pouch inside. The manufacturer recommends calibrating the refractometer using distilled water on a regular basis to ensure its accuracy.
2. With the dropper, collect a sample of the fluid from the tank.
3. Open the clear plastic flap on the refractometer and apply a few drops to the glass portion that was covered by the plastic flap.
4. Keeping the drops centered on the glass, close the clear plastic flap.

5. Hold the refractometer to the light and read the concentration percentage in the viewfinder. This is the blue / white horizon that you see in the viewfinder. Adjust the focus by turning the rubber section at the eyecup.
6. Additional oil should be added if the concentration is below 2%. The recommended concentration is between 2% and 3%. One gallon of Snail Oil per 8 ft. section will increase the concentration approximately 1%.
7. After testing the oil level, rinse off the end of the refractometer, dry and return to the bag.

Cleaning the Bullet Collection Tray

Recommended tools for removing the spent bullets from the collection tray are a flat-faced shovel and gardening hoe.

1. Run the pumps for 2 - 3 minutes prior to clearing the trap to ensure that there is no dried dust on the material in the tray.
2. Using the hoe, push the rubber skirt away from you and rake the spent bullets to the edge of the trap nearest you.
3. Use the flat-faced shovel to remove the bullets from the tray and place in your chosen reclamation container.
4. Repeat Steps 2 and 3 until all material is removed from the bullet collection tray.

Removing the Sludge from the Fluid Tank

Recommended tools for removing the sludge from the tank are flat head shovel, trowel and pump for transferring the fluid. We recommend that you wear rubber / latex gloves when handling the sludge. As the sludge is wet, inhalation exposure is not an immediate concern.

1. Remove the spent bullets from the bullet collection tray.
2. Remove the trays from the tank and set aside. Take this opportunity to inspect the condition of the tray and make any necessary repairs.
3. Either using a separate sump pump or one of the existing pumps in the tank, transfer the fluid from the tank to 55-gallon, open top drums. If you use one of the trap pumps, it will be necessary to disconnect it from the filter & spray bar assembly. It will also be necessary to move the pump from section to section. We recommend using a separate sump pump (similar to a Little Giant Model 5-MSP) with a 1" discharge. This is usually more convenient than using one of the existing pumps. Pump as much fluid from the tank as possible.
4. After the fluid has been removed from the tank, use the flat head shovel to remove the sludge from the tank. The sludge should be placed in containers appropriate for disposal of lead waste. It may be necessary to use a trowel to get the sludge from in the corners of the tank and along the edges.
5. After the sludge has been removed, using the pump from Step 3, transfer the fluid from the holding barrels / drums back to the tank. If there is a considerable amount of suspended solids in the fluid, you may wish to pump the fluid through a bag filter first. Top up the water level as necessary. Check the Snail Oil Concentration and add oil as necessary to obtain the correct concentration. See "Checking Snail Oil Concentration".
6. Reinstall the bullet collection trays.
7. Turn on the pumps to ensure proper operation of all units.

Inspecting / Re-sharpening / Replacing the Edge Protector

The edge protector is designed to prevent bullets hitting the welded seam of the deceleration chamber endplates. This eliminates the hazard of bullet fragments returning towards the firing line while protecting the weld from damage. If the edge protector starts to have a flat face measuring more than 3/16" across, it must be sharpened.

If the edge protectors are subjected to frequent bullet strikes, the weld may weaken and the unit could fall off. IT MUST BE REPLACED / REINSTALLED AS A MATTER OF URGENCY.

1. Remove the edge protector by grinding the welds and use a hammer to loosen the protector.
2. Using a hard disc grinder, re-shape the edge protector to provide a sharp edge to the unit. **Proper PPE should always be worn when using grinding / rotating equipment.**
3. If there is insufficient material remaining to enable you to re-shape the unit, a new edge protector must be installed.
4. Re-install the edge protector by welding the tab to the deceleration chamber endplate and the top edge of the protector to the upper ramp. Maintain approximately 1/8" clearance between the bottom of the edge protector and the bottom ramp.

Cleaning / Replacing Filter Screen

1. Unplug / isolate the pump to ensure that it cannot be inadvertently started while the T-strainer is disassembled.
2. Turn the clear cup counter clockwise to loosen. Care should be taken when removing the housing to ensure that the orange gasket is not lost or damaged.
3. Using a stiff bristle nylon brush and warm water, clean the screen filter element.
4. Rinse the clear housing to remove any sediment. Check the gasket to ensure that there is no sediment on it that could cause a leak.
5. Re-install the screen filter and clear housing, turning clockwise to tighten.
6. Plug the pump cord into socket and switch on.
7. Check for leaks. If there are leaks, tighten the housing. If this does not stop the leak, turn off the pump and isolate as in Step 1. Remove the clear housing and inspect the gasket for damage or sediment. Clean the gasket, re-install the housing and re-test.

Replacing a Pump

1. Unplug / isolate the electrical supply to the pump.
2. Remove the bullet collection tray if a conveyor is not present. If necessary, remove the spent bullets from the tray as described previously.
3. Remove the pump from the tank.
4. Loosen the hose clamp securing the vinyl tubing to the barb fitting.
5. Remove the vinyl tubing from the fitting. It may be necessary to use a pair of channel locks to loosen the tubing on the fitting. Care should be taken not to damage the tubing.
6. Remove the barb fitting from the old pump.
7. Install the barb fitting removed above into the new pump. Attached the vinyl tubing to the fitting using the hose clamp to secure it.
8. Place the pump into the tank. Run the pump to verify that the proper flow rate is obtained.
9. Replace the bullet collection tray if there is no conveyor.

Welding Procedures for Leak Repair

Proper PPE should always be worn when using welding / cutting equipment.

1. Heat the area to repaired with a heating torch to dry thoroughly and remove all Snail Oil residues.
2. Clean the area with a wire wheel or grinder.
3. Groove out the crack in the weld. This assures good penetration for the repair.
4. After the repair area is cleaned, weld the crack using 7018 welding rods.
5. Allow the weld to cool before leak testing.
6. Dry the area using the heating torch and touch up with gray primer.