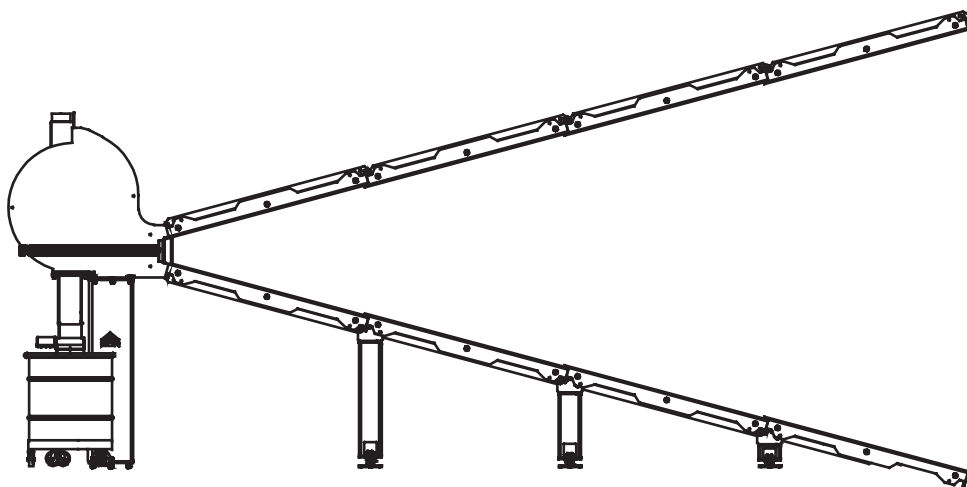
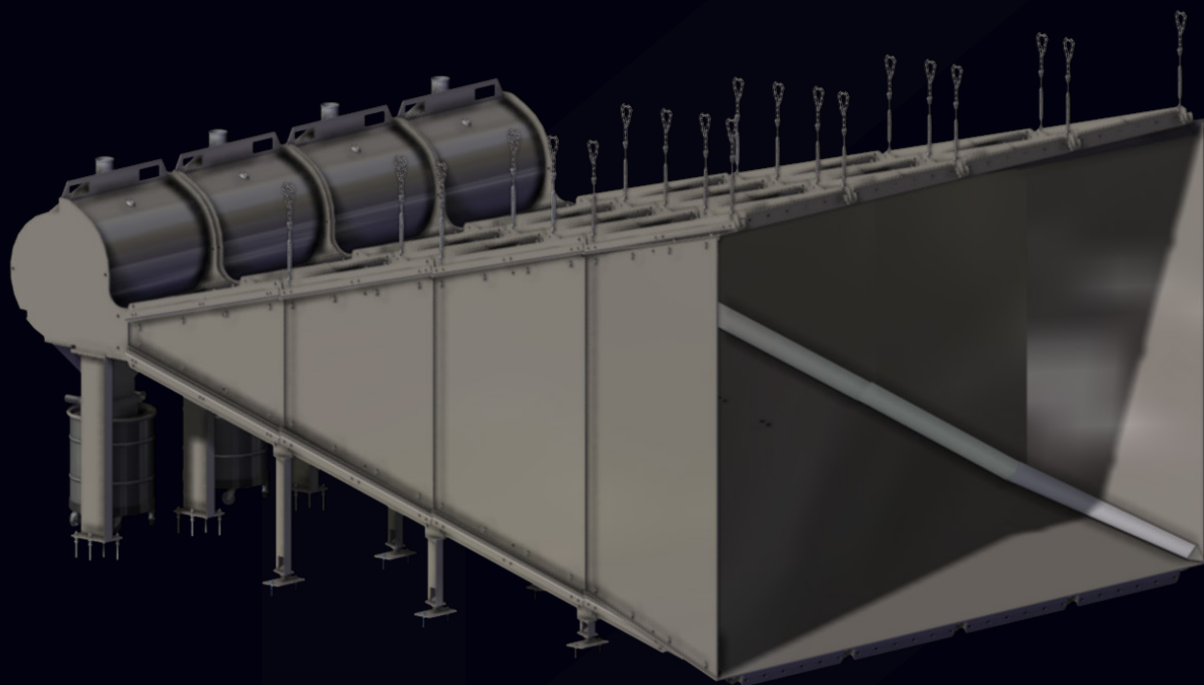


HELIX STEEL TRAP™



MAINTENANCE MANUAL



1 800 761 1231

HELIX STEEL TRAP™
MAINTENANCE MANUAL
Version 1.5 | Spire Ranges © 2023

Our customers are the heroes who make our world, countries, and communities safer. At Spire, we create exceptional shooting range systems that prepare them for when duty calls.

OUR MISSION?

**EVERY HERO COMES
HOME SAFE.**



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HELIX TRAP INTRODUCTION

The Helix Steel Bullet Trap system provides complete ballistic protection ideal for fixed firing line and tactical advancing live fire ranges. The Helix utilizes 3/8" AR500 steel providing the ability to handle rounds from handguns to rifles. The lead collection system is designed to maximize a clean and efficient ability to maintain the traps with no down time.

IMPORTANT SAFETY INFORMATION



Maintenance and use must adhere to the guidelines in this manual. Improper use of any of the equipment can result in poor performance, product damage and even serious physical injury. Properly trained personnel should only operate the equipment within the range. For technical, mechanical and electrical maintenance, it is recommended that a trained professional be consulted. Protective headwear, eyewear and gloves should always be worn when performing any maintenance. Danger risks include, but are not limited to, electric shock, head injuries, limb or body crushing, and eye trauma.

WARRANTY OF EQUIPMENT

Refer to agreement documents for specific warranty details for your range. Consumables, negligence, and improper use of equipment (including firing armor-piercing rounds or calibers not approved for your range's ballistic rating) are excluded from all warranties.

All products provided and installed by Spire Ranges are warranted against defects in material or workmanship under normal use and service, subject to limitations detailed below. Warranty period begins at the conclusion of the original installation.

This warranty applies to the original installation only. This warranty does not cover damages caused by improper installation, misuse, or lack of proper maintenance. This warranty does not cover damages caused by alterations or repairs made by anyone who is not pre-authorized in writing by Spire Ranges to modify, alter, repair, or otherwise handle in any way the product.

Spire Ranges reserves the right to determine if any part is defective and to repair or replace parts as it elects. This warranty does not cover shipping costs of defective parts from the owner's site. Return shipping to the site is covered by Spire Ranges during the warranty period. This warranty covers on site labor, travel expenses and accommodations if applicable.

Damage of Spire Ranges equipment resulting in utilizing armor piercing (AP) ammunition or tracer rounds will not be covered under warranty. In addition, high velocity rounds (both ball and frangible) traveling at speeds more than 3000 fps may result in wear, dimpling and pocking of the 1/4" AR500 ballistic shields and target clamps depending on the angle of impact. Such wear, dimpling, and pocking under these conditions is not covered under warranty.

BALLISTIC RATINGS

Ammunition specs listed below are examples of energy and velocity only. Note, any use of Armor Piercing (AP), Steel Core, or Tracer Rounds will void the warranty.

PLATE RATING	MUNITIONS TYPE	MAX ENERGY	MAX VELOCITY
1/4" AR500	Pistol	1175 ft-lbs	1485 fps
3/8" AR500	Pistol/Rifle	3600 ft-lbs	3300 fps
TYP. AMMO	BULLET WEIGHT	MAX ENERGY	MAX VELOCITY
.22 LR	40 gr HP	140 ft-lbs	1400 fps
9MM LUGER	124 gr FMJ	460 ft-lbs	1293 fps
.357 MAG	158 gr JSP	663 ft-lbs	1375 fps
.44 MAG	240 gr SWC	1175 ft-lbs	1485 fps
5.56X45MM NATO	55 gr FMJ	1402 ft-lbs	3388 fps
7.62X51MM NATO	150 gr FMJ	3048 ft-lbs	3025 fps
.308 WIN	150 gr SPTZ	2800 ft-lbs	2900 fps
30-06	180 gr SPTZ	3360 ft-lbs	2900 fps
300 WM	190 gr BTHP	3548 ft-lbs	2900 fps

Spire Ranges products can handle .50 BMG in moderation; however, due to the large amounts of energy exerted from the round, the following applies:

Repeatedly using .50 BMG will shorten the life expectancy of the product and may void warranty.

Repeated impacts of .50 BMG fired in the same location of the product can cause damage in as few as 50 rounds.

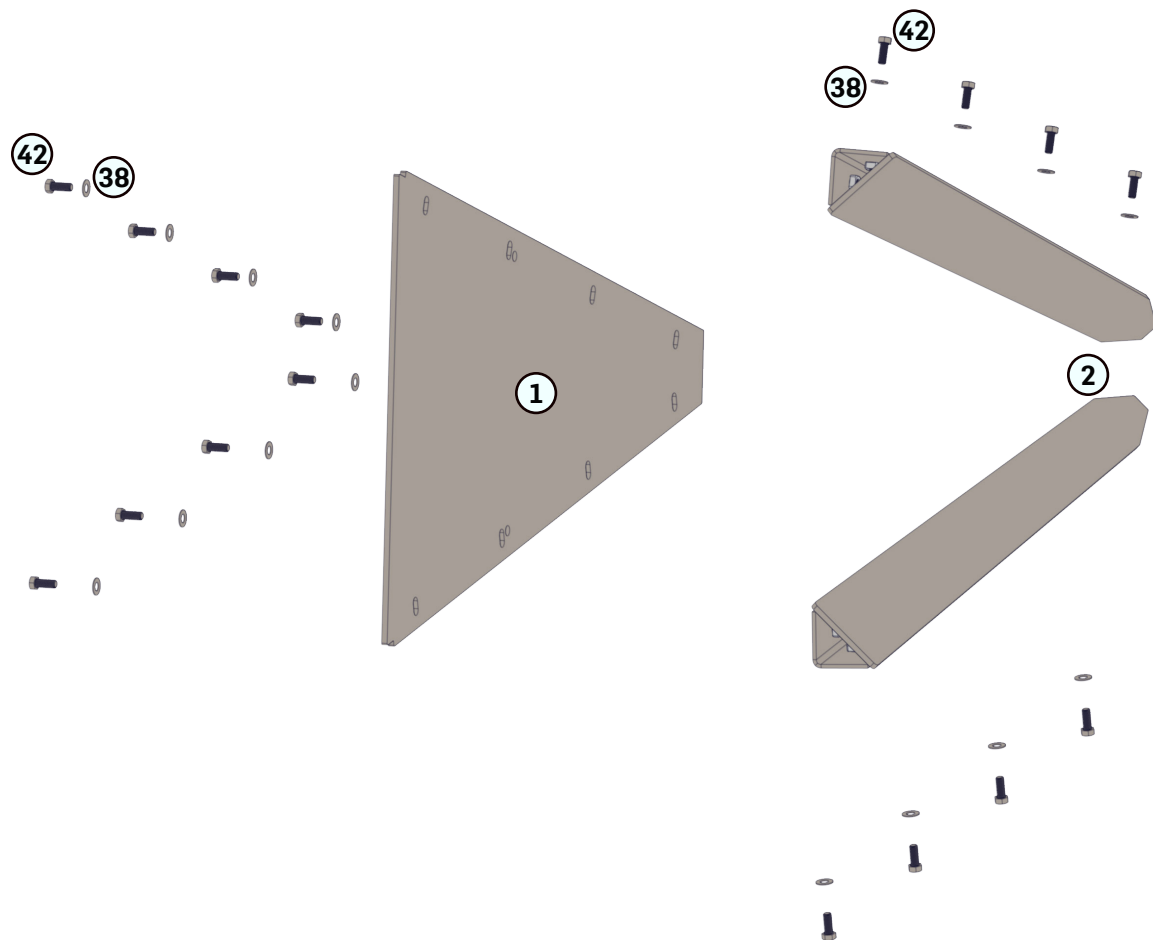
Any armor piercing (AP) rounds, particularly those from .50 BMG will void any warranty.

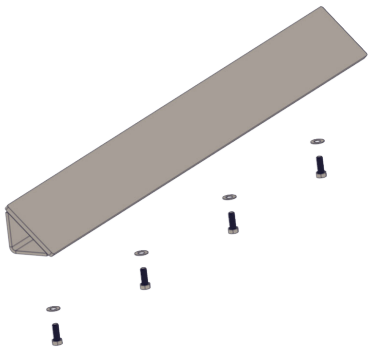
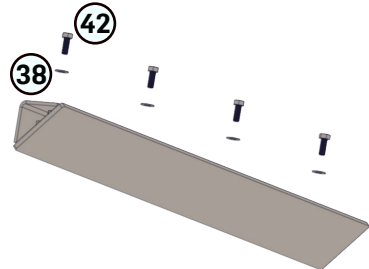
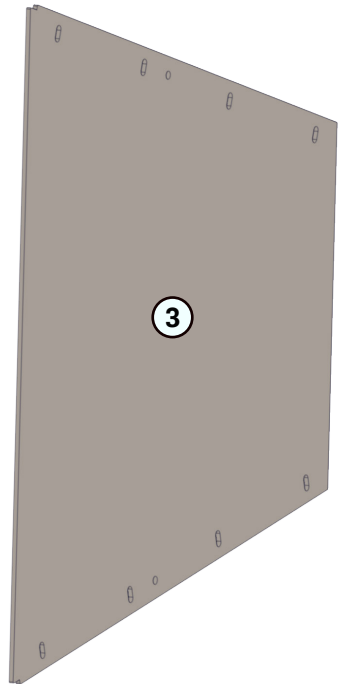
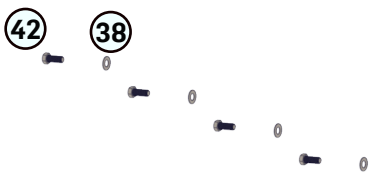
LIMITATION OF LIABILITY

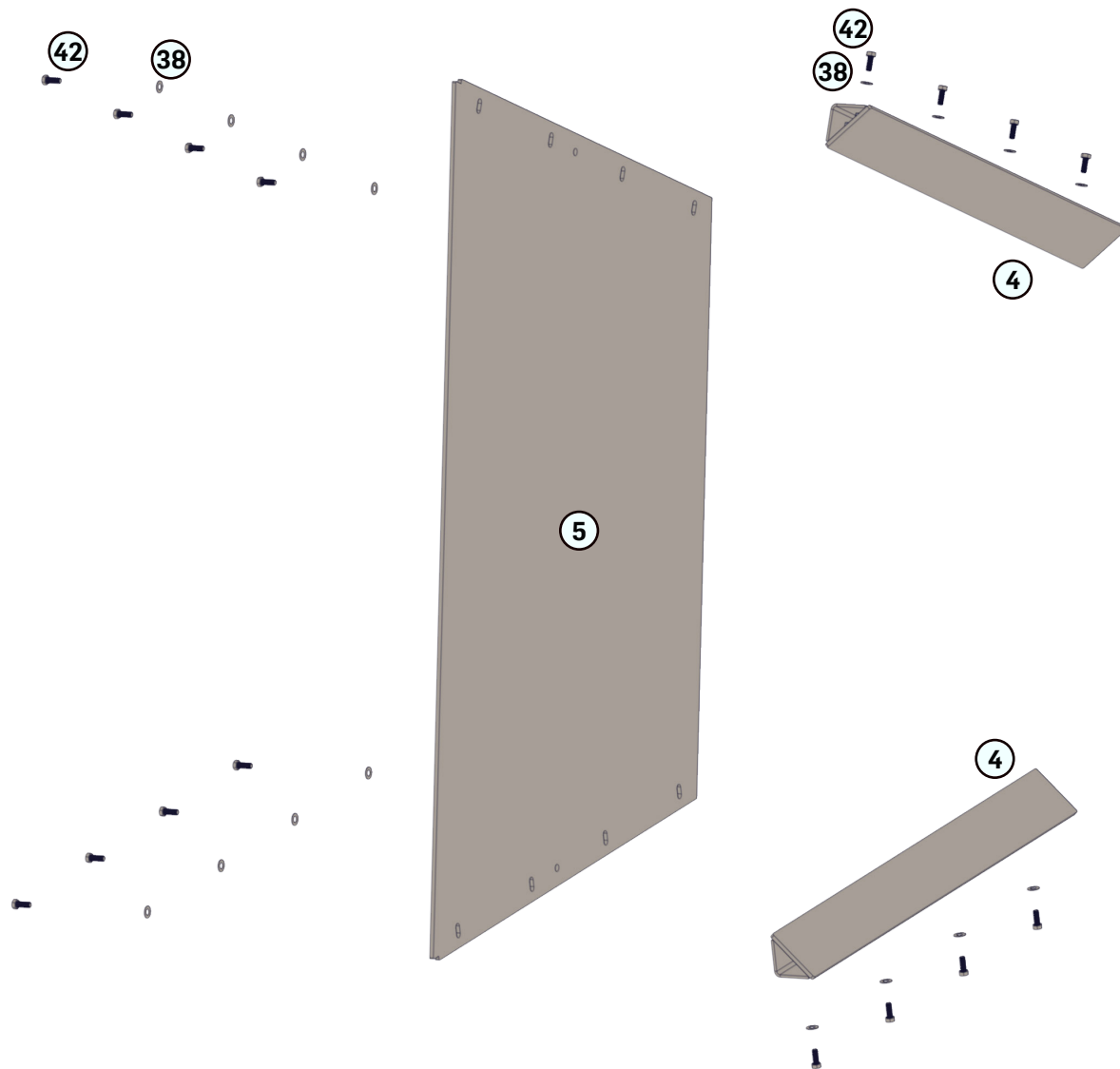
Neither Spire Ranges, nor any company affiliated with it, makes any warranties, representations or promise as to the performance or quality of the product other than what is specified in the original agreement between Spire Ranges and the range Owner. The liability of Spire Ranges to the Owner for damages arising out of the manufacture, sale, delivery, use of resale of this product shall be limited to and shall not exceed the cost of repair or replacement of defective parts. Spire Ranges shall not be liable for loss of use, inconvenience or any other incidental, indirect or consequential damages.

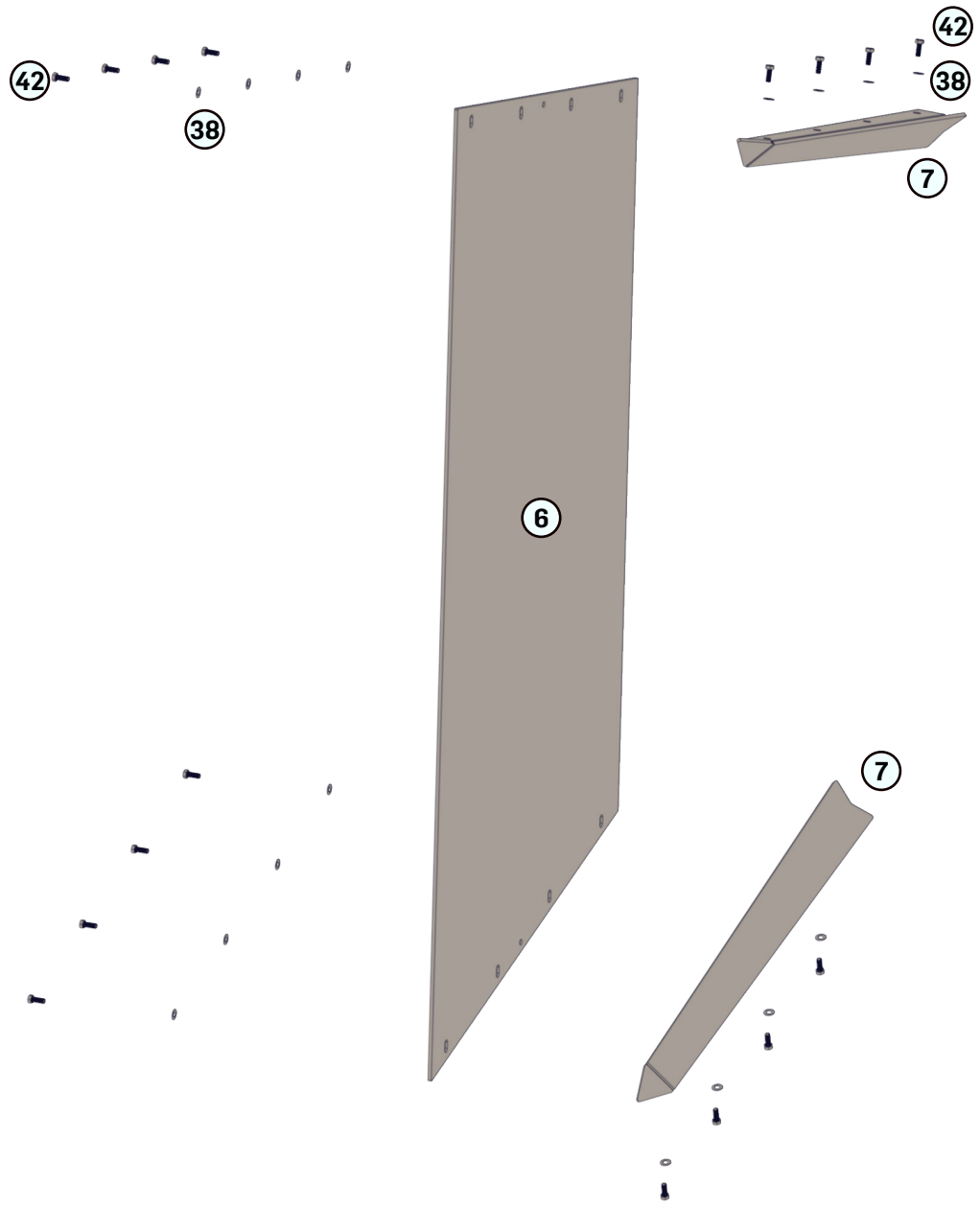
No representative of Spire Ranges has the authority to make any representation or promise on behalf of Spire Ranges or to alter or modify the terms or limitations of warranties in any way.

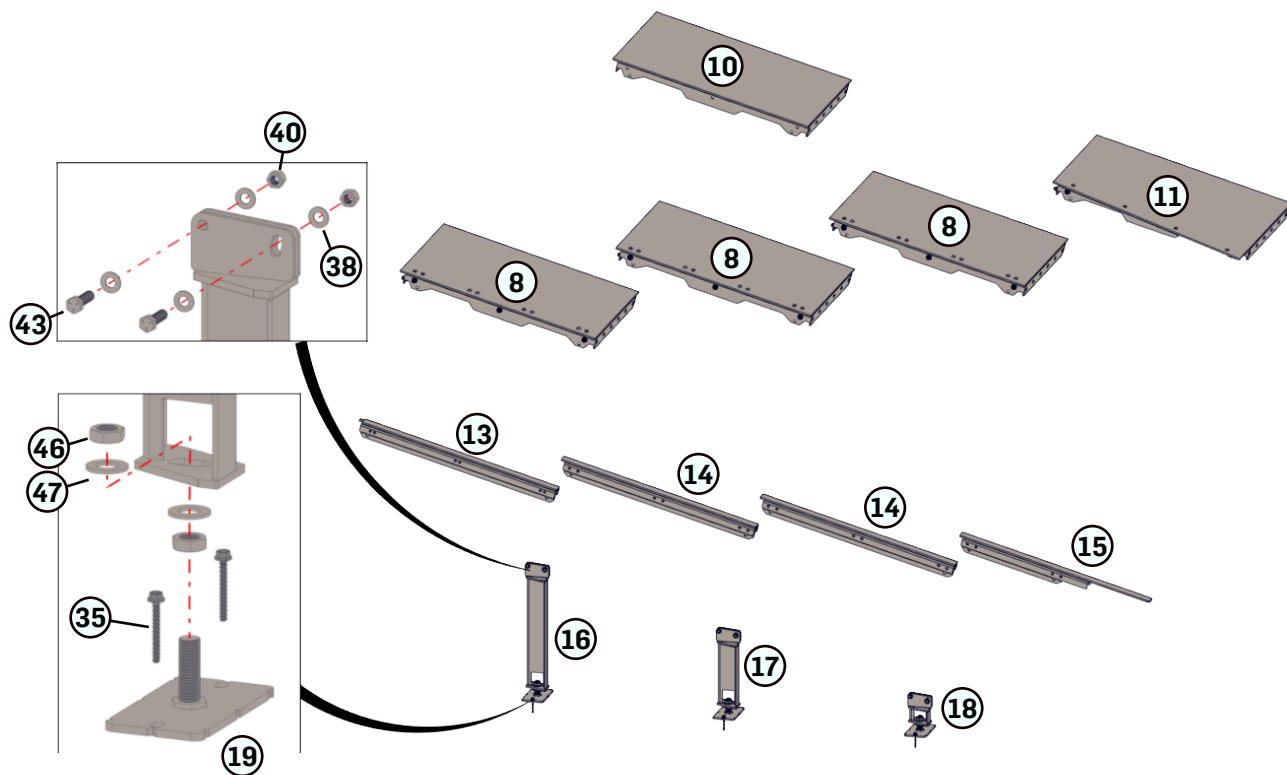
HELIX STEEL TRAP COMPONENTS:

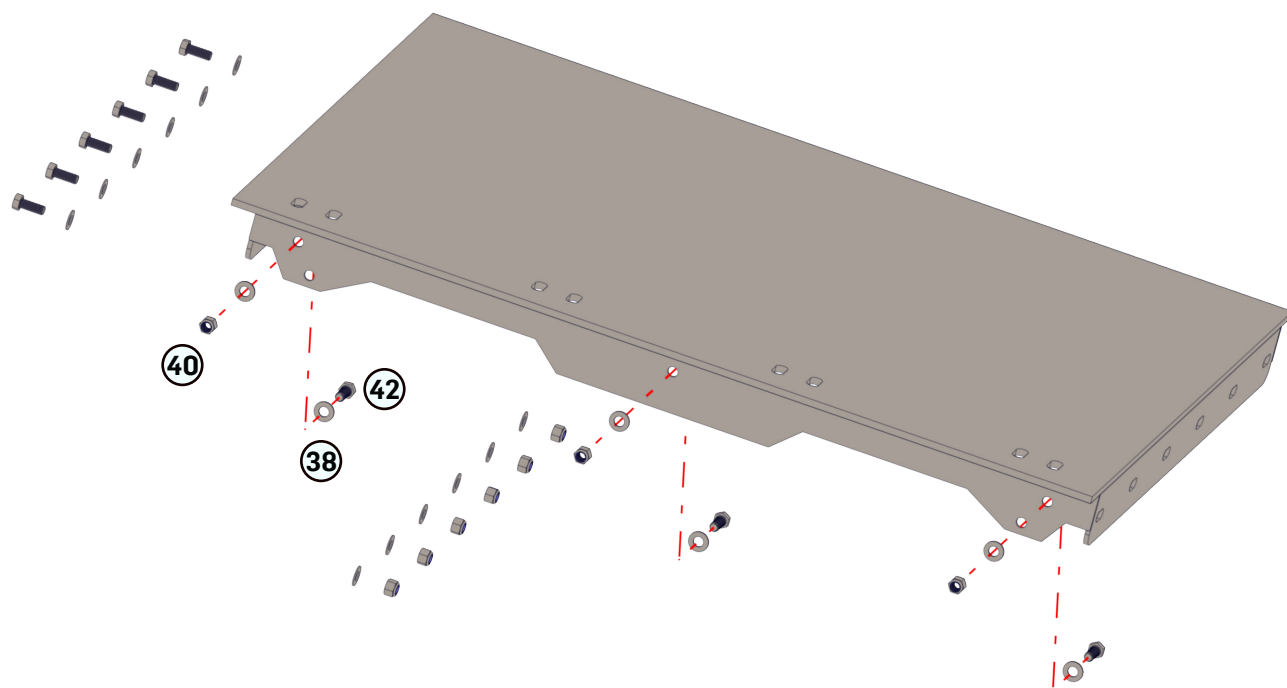


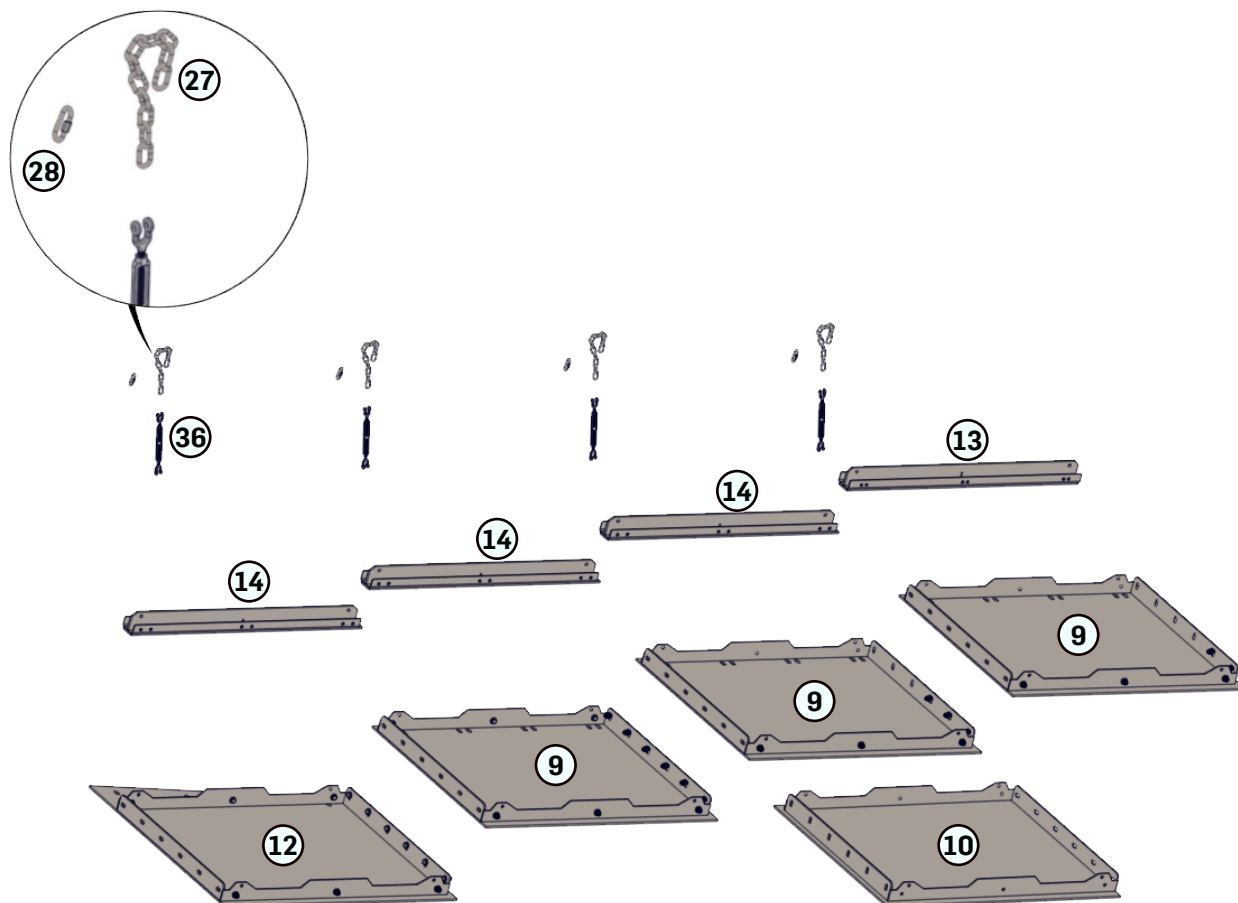


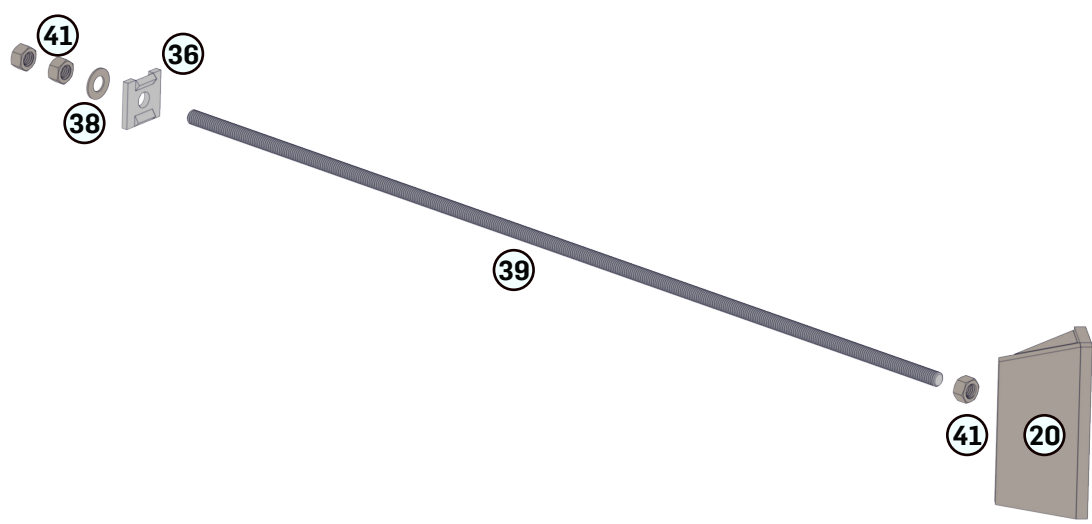


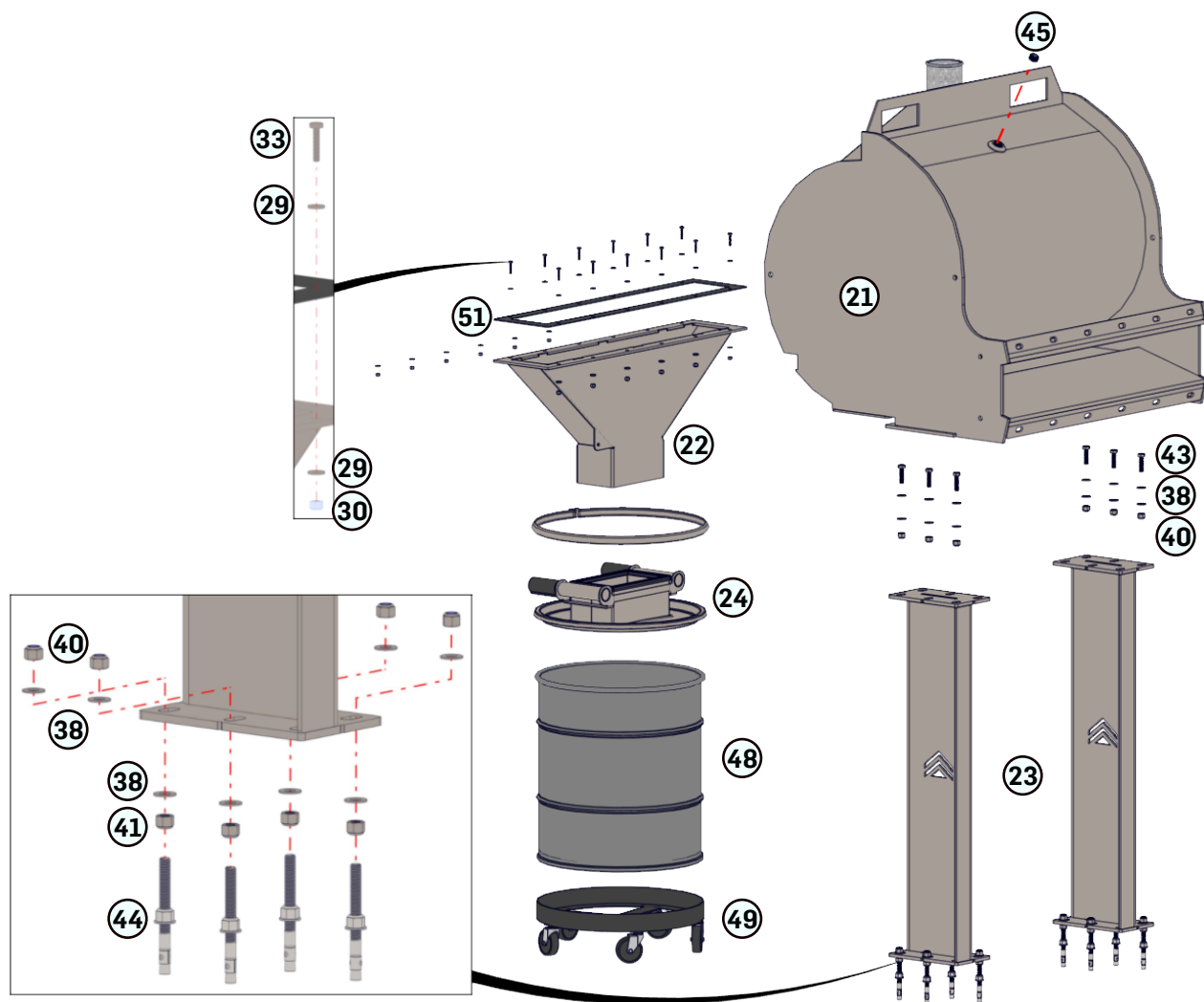


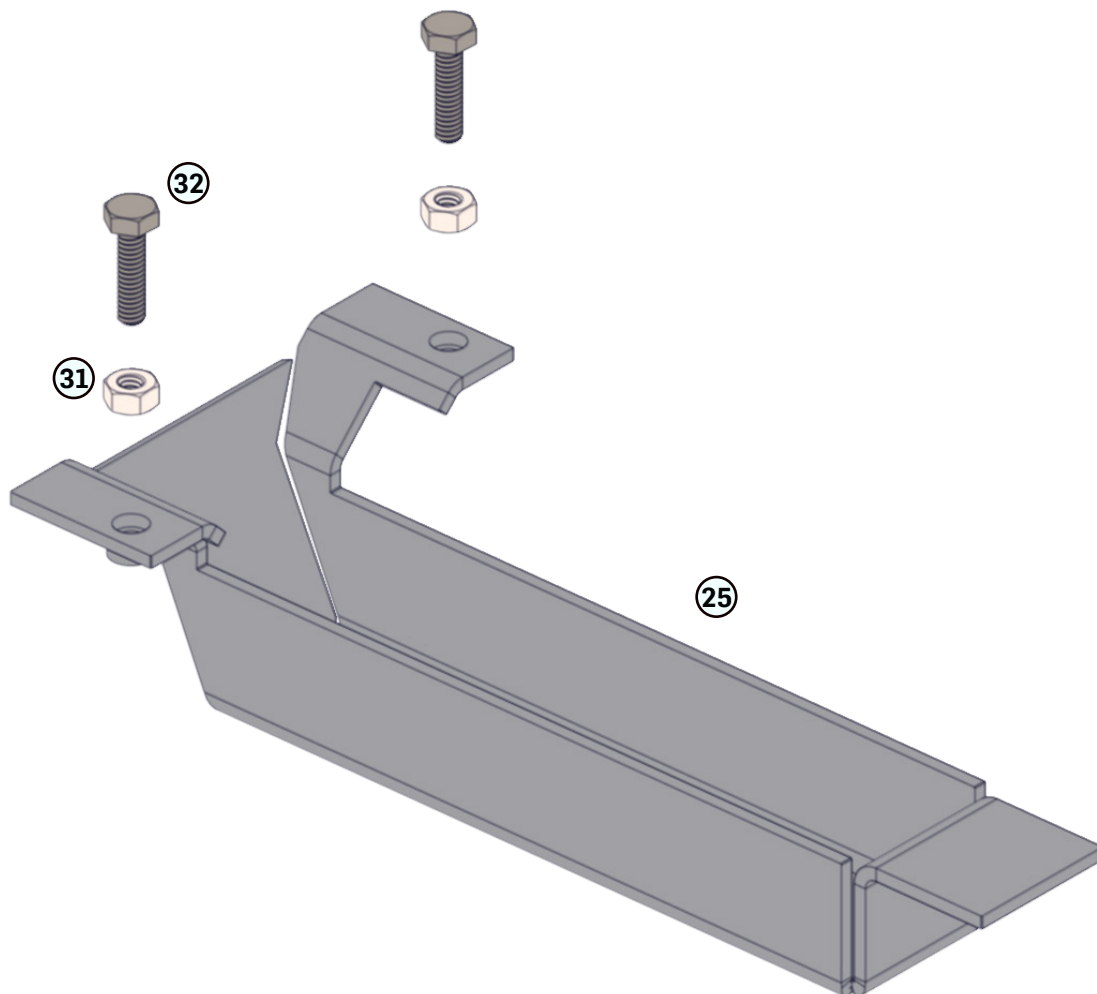


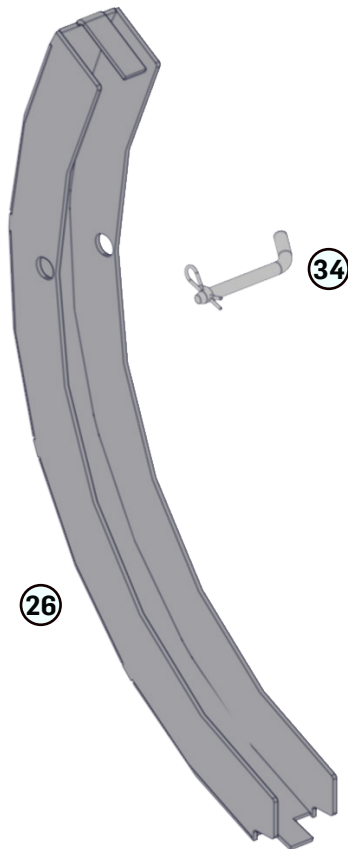












CODE	DESCRIPTION	PRT #	QTY
1	REAR SIDE PLATE	THP-6620-911	2
2	REAR CORNER BATTEN	THW-6620-410	4
3	REAR-MID SIDE PLATE	THP-6620-912	2
4	MID CORNER BATTEN	THW-6620-420	8
5	FORWARD-MID SIDE PLATE	THP-6620-913	2
6	FORWARD SIDE PLATE	THP-6620-917 (7" & 10" Flare) THP-6620-9112 (12" Flare)	1
7	FORWARD CORNER BATTEN	THW-6620-440	1
8	EDGE TRAP RAMP PLATE BL/TR	THW-66##-633	6
9	EDGE TRAP RAMP PLATE TL/BR	THW-66##-632	6
10	MID TRAP RAMP PLATE	THW-66##-631	8/non-edge lane
11	BL/TR FLARE RAMP PLATE	THW-66##-637 (7" Flare) THW-66##-639 (10" Flare) THW-66##-635 (12" Flare)	2
12	TL/BR FLARE RAMP PLATE	THW-66##-636 (7" Flare) THW-66##-638 (10" Flare) THW-66##-634 (12" Flare)	2
13	REAR RAIL BATTEN	THW-6620-510	2/lane +2
14	MID RAIL BATTEN	THW-6620-520	5/lane +5
15	FORWARD RAIL BATTEN	THW-6620-540	1/lane +1
16	REAR TRAP LEG	THW-6620-231	1/lane +1
17	MID TRAP LEG	THW-6620-232	1/lane +1

NOTE: Replace ## in the PRT# with Width of Trap Section 36" or 48"

CODE	DESCRIPTION	PRT #	QTY
18	FORWARD TRAP LEG	THW-6620-233	1/lane +1
19	TRAP LEG FOOT	THW-6620-241	1/lane +1
20	CHAMBER DELFECTOR	THW-6600-200	1/lane +1
21	DECELERATION CHAMBER	THW-66##-100	1/lane
22	HOPPER	THW-66##-361	1/lane
23	CHAMBER LEG	THW-6620-201	1/lane +1
24	30GAL. BARREL LID	THA-6621-830	1/lane
25	HELIX TRAP TRAY	THW-6620-120	1/lane -1
26	TRAP MOHAWK	THW-6620-110	1/lane -1
27	TRAP HANGING CHAIN	THP-6646-043	15ft/lane +15ft
28	CHAIN CONNECT LINK	HCL-250-175-ZN	4/lane +4
29	1/4" WASHER	HWS-250750-060	32/lane
30	1/4"-20 LOCK NUT	HLN-25020-005	16/lane
31	1/2"-20 NUT	HSN-25020-005-ZN	2/lane -2
32	1/4"-20 x 1" BOLT	HHB-25020-100-ZN	2/lane -2
33	1/4"-20 X 1-1/4" BOLT	HHB-25020-125	16/lane
34	3/8" x 2-1/2" BENT CLEVIS PIN	HCP-375-250-ZN	1/lane -1
35	3/8" X 3" CONCRETE ANCHOR	HTC-37508-300-BC	6/lane +6
36	3/8"-16 TURN BUCKLE	HTB-37516-600	4/lane +4

NOTE: Replace ## in the PRT# with Width of Trap Section 36" or 48"

CODE	DESCRIPTION	PRT #	QTY
37	NO-SPIN SQUARE WASHER	USW-500NS-250	1/lane +1
38	1/2" WASHER	HWS-500106-070	308/lane
39	1/2"-13 ALL THREAD	HAT-50013-032	1/lane +1
40	1/2"-13 LOCK NUT	HLN-50013-005ZN	122/lane
41	1/2"-13 NUT	HSN-50013-005	3/lane +3
42	1/2"-13 X 1 1/4" BOLT	HHB-50013-125-ZN	160/lane
43	1/2"-13 X 1 3/4" BOLT	HHB-50013-175ZN	18/lane
44	1/2"-13 WEDGE ANCHOR	HAC-50013-550	4/lane +4
45	3/4" NPT MALE PLUG	HDW-001422	1/lane
46	1"-14 NUT	HSN-100014-001ZN	6/lane +6
47	1" WASHER	HWS-1000200-125	6/lane +6
48	20GAL. BARREL	THP-6620-821	1/lane
49	30GAL. BARREL DOLLY	THP-6620-823	1/lane
50	20-30GAL. BARREL RING CLAMP	THP-6620-822	1/lane
51	SILICONE ALL PURPOSE SEALER	THP-6620-##5	1/lane

NOTE: Replace ## in the PRT# with Width of Trap Section 36" or 48"

MAINTENANCE:

ROUTINE MAINTENANCE

TIME TABLE	PROCEDURE
Weekly	1. Check lead collection barrels by tapping sides with hammer. It is recommended to empty barrels before 75% of capacity for ease of mobility. WARNING: If barrels are over filled, chambers can fill with lead, preventing rounds from properly decelerating and causing danger or even harm to shooters. 2. Check deflectors in-between each chamber have remained tight. If not: Using the nut in-between each chamber, tighten the threaded rod using a 3/4" open-end wrench. While tightening you will need another person holding the deflector in the correct vertical orientation. 3. Check DCU system is properly running and that any flex tubing connecting to chamber has remained intact and securely fastened to the chamber. 4. Check mohawks & trays in-between each chamber have remained in place & tight. NOTE: All maintenance for DCU needs to be referenced from the DCU manufacturers manuals and followed per their specifications/guidelines.

TOOLS

LIST OF TOOLS

- 7/16" Wrench x2
- 3/4" Wrench x2
- 7/16" Socket
- 3/4" Socket
- Socket Wrench
- Low Strength Purple Thread Locker
- Medium Strength Blue Thread Locker
- Hammer

SERVICE PLANS:

OVERVIEW

At the core of Spire Ranges is our commitment to keep our installed equipment in each range running at its optimum performance. To maintain that standard, below is a list of the different service package levels available to our clients. We look forward to providing your range with a quote that is unique to your range.

LEVEL	TRIPS PER YEAR	PARTS DISCOUNT
Bronze	1	0%
Silver	2	5%
Gold	4	10%

SERVICES OFFERED WITH EACH SITE VISIT:

- Provided Refresher Training
- Software Update/Reconfiguration
- Test all Motors, Valves, Cylinders, Lights, & Proximity Switches
- Target Clamp Inspection/Adjustment
- Check/Secure Electrical Connections
- Verify Proper Voltages
- Verify Controller(s) (HMI's/Computer) Functionality
- Assess Cable Tension & Adjust
- Assess Track Health & Tighten/Replace any Loose/Missing Hardware
- Verify Proper Charging of Targets
- Stall/Bench Inspection
- Trap Inspection
- Overall Range Health Inspection

TROUBLESHOOTING:

Given below are possible causes and solutions for system problems. Within this section, you will find sequential steps that can be used to help troubleshoot a problem. If a problem persists after following these troubleshooting guidelines, please contact the Spire support team.

1.0 HELIX STEEL TRAP

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
1.1 Bullets Escaping Between Chambers	(1) Deflector is not tight (2) Deflector has been damaged due to direct fire	(1) Using the nut in-between each chamber, tighten the threaded rod using a 3/4" open end wrench. While tightening you will need another person holding the deflector in the correct vertical orientation while tightening. (1) Remove the threaded rod that tightens the deflector to the trap mouth. (2) Loosen jam nut and remove deflector from the threaded rod. (3) Contact Spire for technical support or to get new parts ordered.
..... 1.2 Hopper Throat Clogged	 (1) Overfull Barrel	 (1) Remove barrel from under Helix hopper. (2) Remove the 12 screws and nuts that secures hopper to the chamber. (Note; the gasket will need to remain with the hopper and needs to be re-used when the hopper is bolted back on.) (3) Clean out the lead that has overflowed into the chamber. Lead may be stuck to chamber and can be removed by tapping the back of chamber with a hammer.

GLOSSARY OF TERMS:

TERM	DEFINITION
Calibration	Adjusting the various parts of the system precisely for their particular function.
Consumable Components	Products that are expected to wear out and that get used up throughout the lifetime of the product (will need to be replaced on a regular basis).
Course (of Fire)	The programmed set of actions for each shooting target.
Edge	The side of the shooting target (not face or back).
Error / Warning / Alarm	A minor problem with the system, but the system will still run.
Exposure Times	The amount of time the face (not the edge) will be positioned toward the shooter.
Fault	A major problem with the system. The system will not run.
HMI	A human-machine interface, which is a feature of any device that enables humans to engage and interact with machines. Common examples include touchscreens and keyboards.
Loctite	A brand of adhesives that is used to prevent loosening of metal fasteners caused by vibrations.
PLC	A programmable logic controller, which is a computer control system, that controls other devices based on various information available to it.
Range Master	The person in charge of any given session.
Stage	A step in the Course (of Fire).



THE PINNACLE OF SHOOTING RANGES™