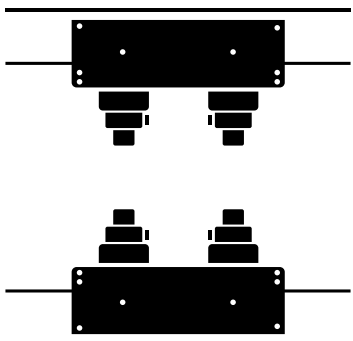
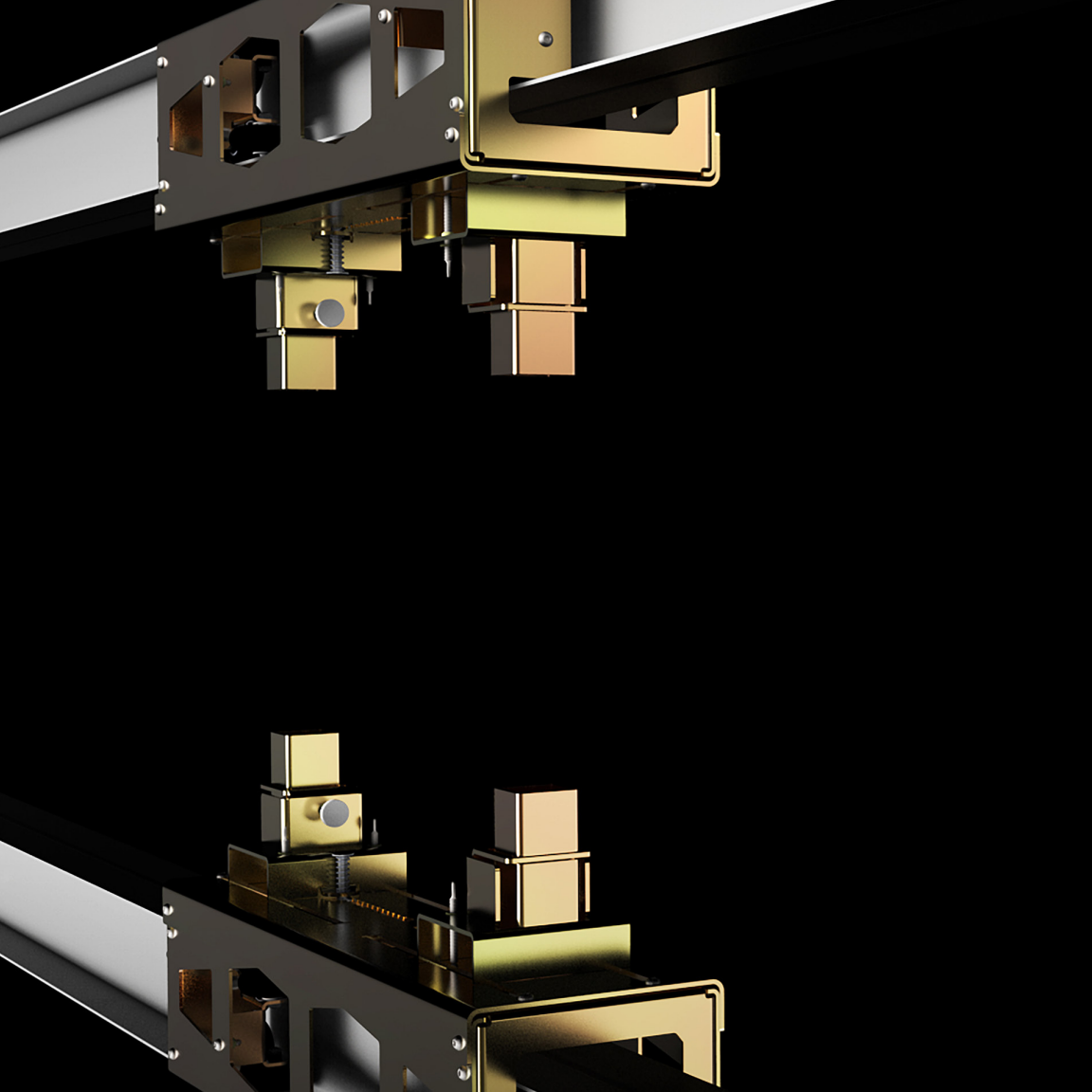
COMMAND TREADWELL™



spireOS™

MASTER TOUCHSCREEN CONTROL



COMMAND TREADWELL™

spireOS™

MASTER TOUCHSCREEN CONTROL MANUAL

Version 2.1 | Spire Ranges © 2019

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.

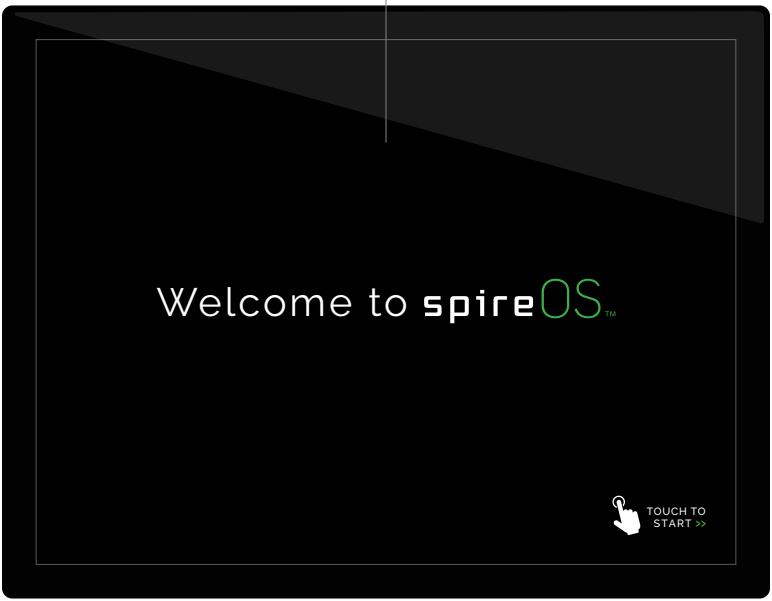
OUR MISSION?

EVERY HERO COMES HOME SAFE.

CONTENTS

NAVIGATION

Start by touching anywhere



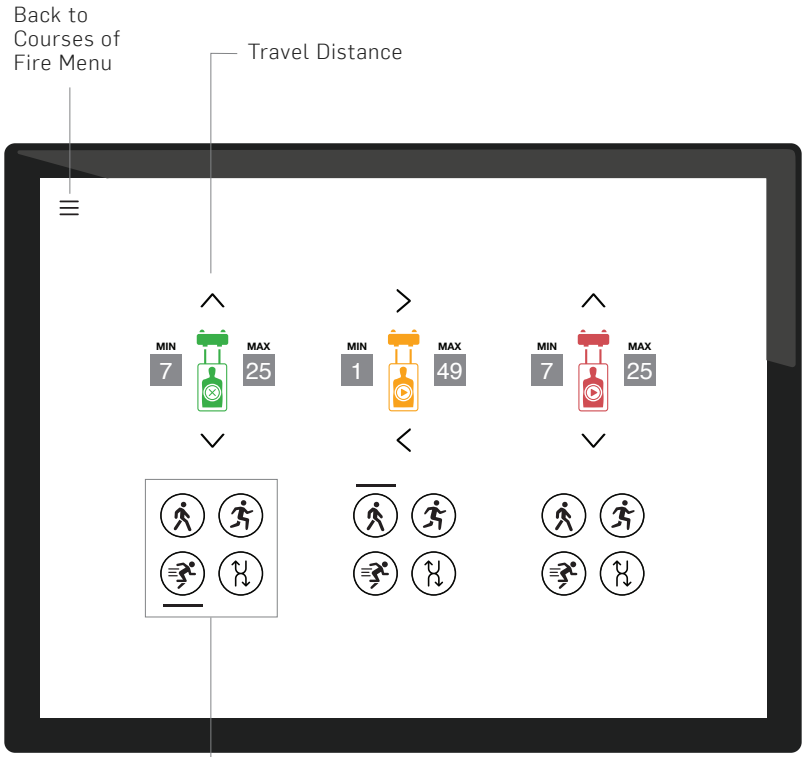
Manual Operation Screen

Courses of Fire Menu

Range Settings Menu

Treadwell Operation

MANUAL SESSION

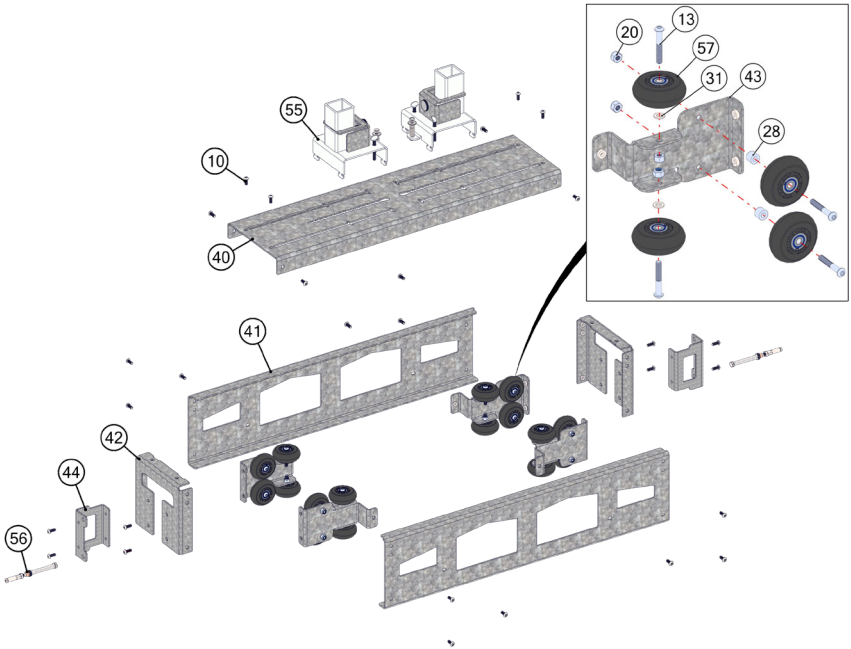

Back to
Courses of
Fire Menu
Travel Distance
MIN
7
MAX
25
MIN
1
MAX
49
MIN
7
MAX
25
Travel Speed
[Walk, Jog, Run, Random]

COMPONENTS

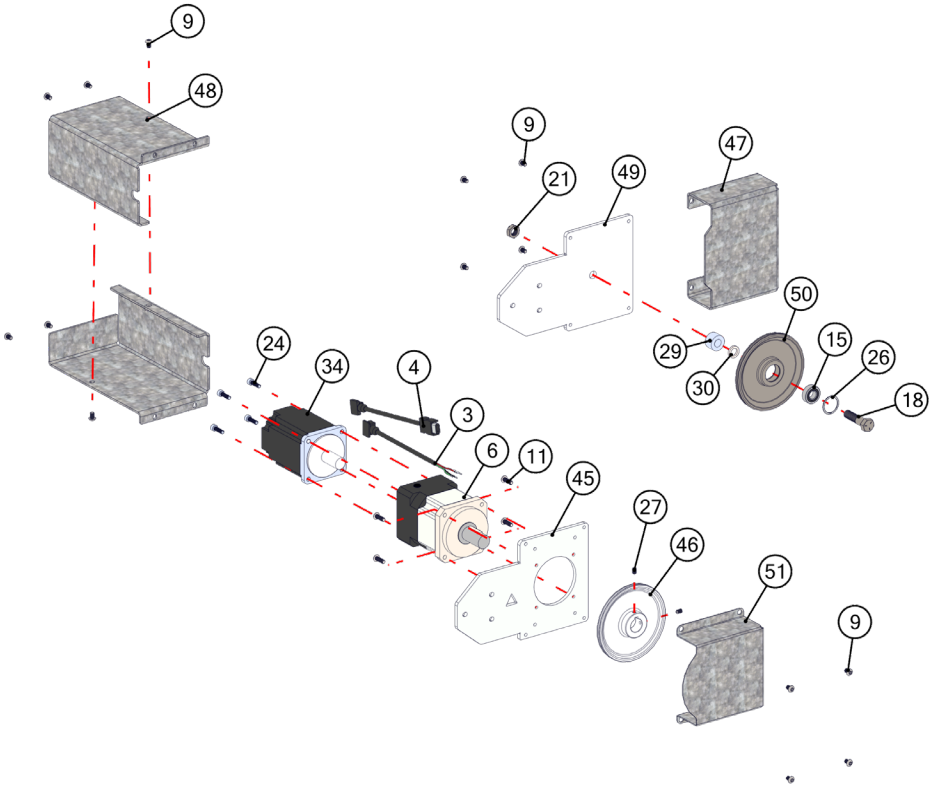
CODE	DESCRIPTION	PRT #	QTY
1	M12 RIGHT ANGLE FEMALE 4 POLE - 10M	ELE-1200-4P10	3
2	FIELD WIREABLE M12 RIGHT ANGLE 4 POLE FEMALE	ELE-12FW-4PF	1
3	MITSUBISHI MOTOR POWER CABLE - 10M (32.81 FT)	ELE-8231-310	1
4	MITSUBISHI ENCODER CABLE - 10M (32.81 FT)	ELE-8321-310	1
5	PROX SENSOR 12MM X 60MM 4 PIN	EPX-12060-007	4
6	TREADWELL DRIVE GEAR REDUCER	GDR-341922-007	1
7	1/2"-13 X 5-1/2" CONCRETE WEDGE ANCHOR	HAC-50013-550-ZN	2
8	1/2"-13 ALL THREAD - LENGTH VARIES BY RANGE	HAT-50013	1
9	1/4"-20 X 3/8" BUTTON HEAD SCREW - SS	HBH-25020-038-SS	14
10	1/4"-20 X 5/8" BUTTON HEAD SCREW - SS	HBH-25020-063-SS	28
11	1/4"-20 X 3/4" BUTTON HEAD SCREW - SS	HBH-25020-075-SS	4
12	1/4"-20 X 1-1/2" BUTTON HEAD SCREW - SS	HBH-25020-150-SS	2
13	1/4"-20 X 1-3/4" BUTTON HEAD SCREW - SS	HBH-25020-175-SS	16
14	1/2"-13 X 1" BUTTON HEAD SCREW - SS	HBH-50013-100-SS	2
15	1/2" X 1-1/8" X 3/8" 2RS BALL BEARING	HBR-1616-2RS	1
16	1/4"-20 X 1/2" HEX BOLT - ZN	HHB-25020-050-ZN	8
17	1/4"-20 X 1" HEX BOLT - ZN	HHB-25020-100-ZN	14
18	1/2"-13 X 2" HEX BOLT - ZN	HHB-50013-200-ZN	1
19	1/4"-20 THIN (JAM) NYLOCK NUT - ZN	HLN-25020-001-ZN	20
20	1/4"-20 NYLOCK NUT - ZN	HLN-25020-005-ZN	16
21	1/2"-13 THIN LOCK NUT - ZN	HLN-50013-001-ZN	2
22	1/2"-13 NYLOCK NUT - ZN	HLN-50013-005-ZN	2
23	1/4" X 1-1/2" X 1-1/2" RUBBER BUMPER	HRB-025150-150	2
24	6MM-1.0 X 20MM SOCKET HEAD SCREW - SS	HSH-06M10-020-SS	4
25	1/2"-13 STANDARD HEX NUT - ZN	HSN-50013-005-ZN	4
26	1-1/8" X .050" INTERNAL SPIRAL RETAINING RING	HSR-11305-050-PH	1
27	1/4"-20 X 3/8" CUP SET SCREW - SS	HSS-25020-038-SS	2
28	1/4"ID X 1/2"OD X 3/8" SPACER - AL	HSW-250500-375-AL	8
29	1/2" X 1" X 5/8" SPACER - AL	HSW-500100-625-AL	1

CODE	DESCRIPTION	PRT #	QTY
30	1/2" x 3/4" x 1/8" SHIM - SS	HSW-50175-013-SS	1
31	.267 x .500 x .057 FLAT WASHER - SS	HWS-26750-057-SS	8
32	.500 x 1.06 x .070 FLAT WASHER - ZN	HWS-500106-070-ZN	4
33	12" LENGTH 40LB ZIP TIE - BLACK	HZT-188-120	14
34	MITSUBISHI SERVO DRIVE MOTOR	MTR-34750-019	1
35	TREADWELL 3FT TRACK CHANNEL	TKP-7055-036-GV	2
36	TREADWELL 6FT TRACK SECTION	TKP-7055-072-GV	2
37	TREADWELL BUMPER/SENSOR BRACKET	TKP-7055-251	2
38	TREADWELL TRACK HANGER BRACKET	TKP-7055-261	1
39	TREADWELL TRACK FLOOR MOUNTING CLEAT	TKP-7055-361	2
40	TREADWELL CARRIER TOP PANEL	TWP-7721-001	1
41	TREADWELL CARRIER SIDE PANEL	TWP-7721-002	2
42	TREADWELL CARRIER END CAP	TWP-7721-003	2
43	TREADWELL WHEEL BRACKET	TWP-7721-004	4
44	TREADWELL CABLE BRACKET	TWP-7721-005	2
45	TREADWELL MOTOR MOUNTING PLATE	TWP-7723-002	1
46	TREADWELL DRIVE PULLEY	TWP-7723-003	1
47	TREADWELL RETURN PULLEY COVER	TWP-7723-006	1
48	TREADWELL MOTOR COVER	TWP-7723-012	2
49	TREADWELL RETURN PULLEY PLATE	TWP-7724-001	1
50	TREADWELL RETURN PULLEY	TWP-7724-002	1
51	TREADWELL MOTOR PULLEY COVER	TWP-7724-006	1
52	1/2"-13 CHANNEL STRUT NUT - ZN	USN-50013-001-ZN	3
53	P1000T STRUT - 14" SINGLE TRACK / 28" DOUBLE TRACK	UST-P1000T	1
54	1/2" NO-SPIN NOTCHED STRUT WASHER	USW-500NS-250	1
55	TREADWELL ADJUSTABLE CLAMP ASSEMBLY	TWA-7722-000	2
56	URBAN/TREADWELL CABLE GRIP ASSEMBLY	UTA-7123-150	2
57	ROLLER BLADE WHEEL ASSEMBLY	WHA-7010-001	16

CARRIER ASSEMBLY

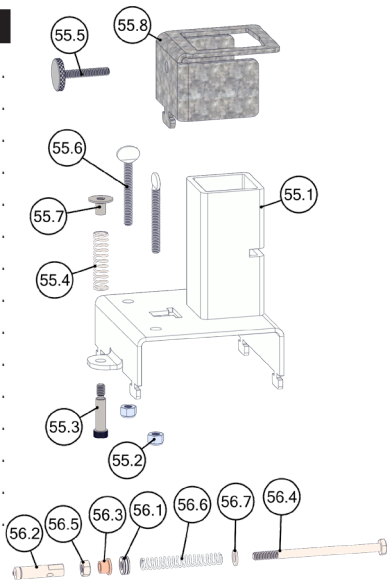


PULLEY ASSEMBLIES

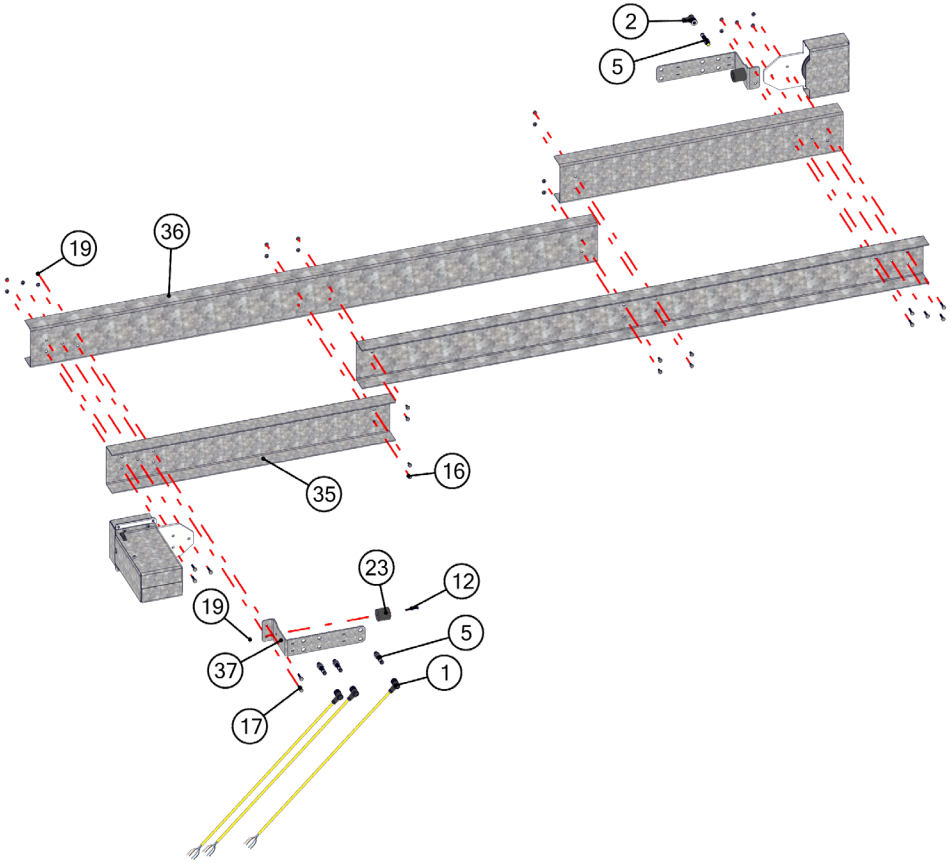


CLAMP ASSEMBLY

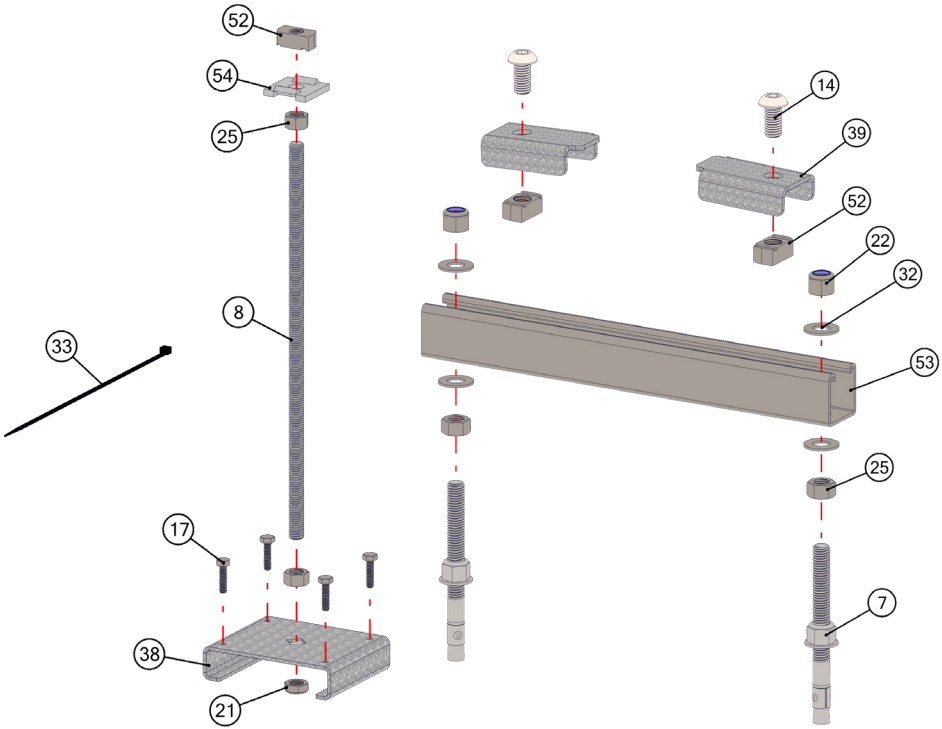
CODE	DESCRIPTION	PRT #	QTY
55.1	M12 RIGHT ANGLE FEMALE 4 POLE-10M	TWW-7722-000	2
55.2	FIELD WIREABLE M12 RIGHT ANGLE 4 POLE	HLN-25020-005-ZN	4
55.3	MITSUBISHI MOTOR POWER CABLE 10M	HSB-313100-25020	2
55.4	MITSUBISHI ENCODER CABLE-10M	HSP-455377-175	2
55.5	PROX SENSOR 12MM x 60MM 4 PIN	HTS-25020-200	2
55.6	TREADWELL DRIVE GEAR REDUCER	HTS-25020-200	4
55.7	1/2"-13 x 5-1/2" CONCRETE WEDGE ANCHOR	HWN-25020-438-SS	2
55.8	1/2"-13 ALL THREAD	TWP-7722-003	2
56.1	1/4"-20 x 3/8" BUTTON HEAD SCREW SS	HBR-2500-112	2
56.2	1/4"-20 x 5/8" BUTTON HEAD SCREW SS	HCG-25020-063	2
56.3	1/4"-20 x 3/4" BUTTON HEAD SCREW SS	HFB-250375-313	2
56.4	1/4"-20 x 1 -1/2" BUTTON HEAD SCREW SS	HHB-25020-005-SS	2
56.5	1/4"-20 x 1-3/4" BUTTON HEAD SCREW SS	HSN-25020-005-SS	2
56.6	1/2"-13 x 1" BUTTON HEAD SCREW SS	HSP-362742-250	2
56.7	1/2" x 1-1/8" x 3/8" 2RS BALL BEARING	HWS-26750-057-SS	2



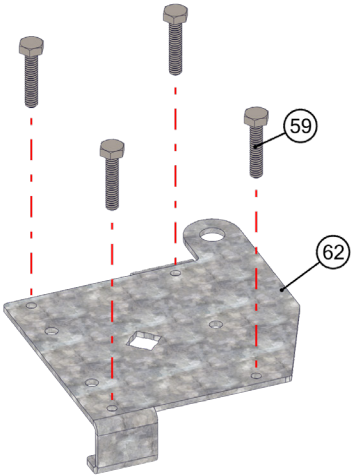
TRACK ASSEMBLY

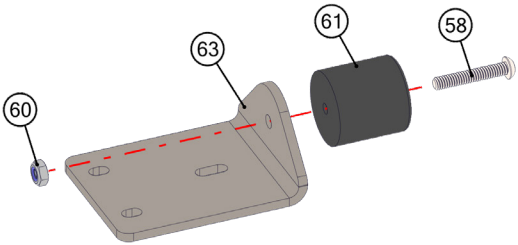


TRACK MOUNT ASSEMBLIES



PRE MARCH 2021 BRACKETS





CODE	DESCRIPTION	PRT #	QTY
58	1/4"-20 x 1-1/2" BUTTON HEAD SCREW SS	HBH-25020-150-SS	1
59	1/4"-20 x 1-1/4" HEX BOLT ZN	HHB-25020-125-ZN	4
60	1/4"-20 THING NYLOCK NUT ZN	HLN-25020-001-ZN	1
61	1/4" 1-1/2" RUBBER BUMPER	HRB-025150-150	1
62	TK-TW-PROX SENSOR BRKT	TKP-7055-271	1
63	TREADWELL STOP BRKT	TKP-7055-251 REV 0	1

SCHEMATICS

SCHEMATICS

Refer to the Stryker Fury Operations Manual for schematics. For more information or additional support, please contact the Spire technical team.

Spire technical support: 800-761-1231

TROUBLESHOOTING

TROUBLESHOOTING

The following are possible causes and solutions for system problems. This manual also provides sequential steps intended to help you troubleshoot each cause and solution listed. If a problem persists after following these troubleshooting guidelines, please immediately contact the Spire technical team for additional support.

Spire technical support: 800-761-1231

HMI TOUCH SCREEN

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Dark, blank touch screen	Screen is in sleep mode	Touch the screen to bring the HMI out of sleep mode.
	No power supplied to HMI	(1) Check for a power supply connection. (2) If the power supply is connected properly, check the circuit breaker to see if the breaker is tripped. (3) If the problem persists, contact Spire for technical support: 800-761-1231.
Nonresponsive screen	HMI error	(1) Navigate to the Menu Screen. (2) Select Power Off to reset the HMI Touch Screen. If integrated within another Spire system, refer to the other Spire operations manual. (3) If the problem is still not resolved, check the power supply to the PLC. If the PLC has power, turn the power off and back on. (4) If there is no indicator light for power to the PLC, check the circuit breaker to see if it is tripped. (5) If the problem persists, contact Spire for technical support: 800-761-1231.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Nonresponsive screen cont'd	HMI/PLC fault	(1) Power the HMI off and back on. (2) Power the PLC off and back on. (3) If the problem persists, contact Spire for technical support: 800-761-1231.
Communication error	Dead carrier	(1) Check the LED in the overhead unit (charge box). Green = Not Charging; Red = Charging. (2) Check the brass bolts on the charge bracket and the target carrier for a good connection. (3) Check if the breaker in the overhead unit is tripped.
	Cat5 cable unplugged or smashed	(1) Check all cat5 connections in the control panel. (2) Remove the screen bolts and check the cat5 connection to the screen. (3) Follow the cat5 cable up the stalls to ensure they are not smashed or damaged.

CARRIER UNITS

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Powered but nonresponsive drive unit	Motor error	(1) Power the system off for 30 seconds to manually reset. (2) Power system back on.
	Drive fault	Contact Spire for technical support: 800-761-1231.
Nonresponsive carrier unit	Drive system error	(1) Power the system off for 30 seconds to manually reset. (2) Power system back on. (3) If the problem persists, contact Spire for technical support: 800-761-1231.
	Aircraft cable fault	(1) Inspect aircraft cable for a break or tear. (2) Inspect both pulleys to ensure that the aircraft cable is riding properly on the pulleys. (3) Verify that the cable tension is snug. (4) Replace as necessary. (See p. 28 for instructions on how to attach a new cable to the carrier unit.)
	Debris obstruction	(1) Shut off power to the drive unit in the breaker room. (2) Manually push the carrier to make sure it can move. If it cannot move, there is an obstruction. (3) Remove obstruction and manually return carrier to home position.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Carrier unit fails to decelerate, hitting *home* end-stop with excessive force	Proximity sensor error (See p. 12 to locate proximity sensors)	(1) Test proximity sensors by sending the carrier unit downrange. (2) Place a steel-based tool just below the proximity sensor. (3) Verify that the proximity sensor light flashes on and that the carrier unit stops appropriately. (4) Inspect spacing between carrier unit and proximity sensor switch; spacing should not exceed 1/8" (4mm).
	Proximity sensor fault	If light does not illuminate but there is power to the unit, contact Spire for technical support: 800-761-1231.
Carrier unit fails to decelerate, hitting *far* end-stop with excessive force	Programming issue	The Max Distance programming needs to be adjusted according to the range's specs. Contact Spire for technical support: 800-761-1231.
	Drive unit error	Contact Spire for technical support: 800-761-1231.

CARRIER UNITS CONT'D

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Abnormal and/ or excessive noise from carrier	Debris on the track	Remove any debris.
	Damaged track	(1) Inspect the top and bottom of the track's flanges for damage. (2) Use hand tools (e.g., C-clamp, vise grips, adjustable wrench, etc.) as necessary to remove damage to the track. (3) Replace damaged sections of track as necessary. (4) Note: the top surface of the bottom track flanges is the critical surface area to maintain as smooth as possible.
	Damaged or worn carriage wheels (See p. 09 to locate the carrier wheel assembly)	(1) Inspect wheels to assess wear or damage; replace if necessary. (2) Ensure that all bolts are tightened to 12 ft-lbs of torque.
Carrier unit stops abruptly or prematurely	Debris on the track	Remove any debris.
	Damaged track	(1) Inspect the top and bottom of the track's flanges for damage. (2) Use hand tools (e.g., C-clamp, vise grips, adjustable wrench, etc.) as necessary to remove damage to the track.

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Carrier unit stops abruptly or prematurely cont'd	Damaged track cont'd	(3) Replace damaged sections of track as necessary. (4) Note: the top surface of the bottom track flanges is the critical surface area to maintain as smooth as possible.
	Damaged or worn carriage wheels (See p. 09 to locate the carrier wheel assembly)	(1) Inspect wheels to assess wear or damage; replace if necessary. (2) Ensure that all bolts are tightened to 12 ft-lbs of torque.
Target braces fall out of clamp	Target braces are too thin or the wrong size	Ensure that the target braces are the right size. The ideal brace size is 1 1/2in (38mm) × 1 1/2in (38mm).
	Clamp screw fell out or is too lose	Ensure that clamp screw is tightened properly.
Target braces too narrow or wide for target backer	Target brace clamps are too narrowly or widely positioned	Adjust the width of the target brace clamps to position wood nearest to the outside edge of the target. (See p. 27 step 1.)

PREVENTATIVE MAINTENANCE

It is recommended that the following inspections and preventative maintenance be performed quarterly to ensure maximum longevity of your range's target system.

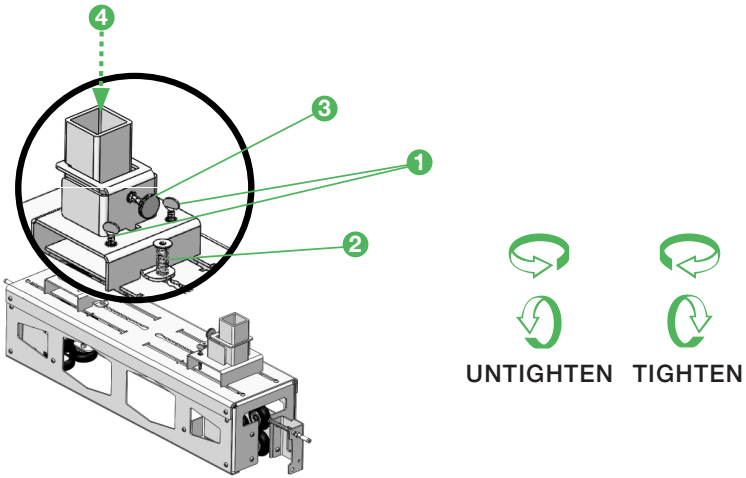
Spire technical support: 800-761-1231

UNIT	PREVENTATIVE MAINTENANCE
Aircraft Cable	Inspect aircraft cable to make sure it's not fraying and that the tension is snug. Replace as necessary. Reference aircraft cable attachment steps on p. 28.
Carrier Unit Track	(1) Inspect the top of the track to ensure that no debris is jammed in it, or wedged between the track hanger and the track. Remove debris as necessary. (2) Inspect under the proximity sensor switch bracket and make sure that no debris is jammed in it. Remove debris as necessary. (3) Inspect the top and bottom of the track for damage. Smooth out damage with hand tools as necessary. See p. 23 for more information.
Carrier Unit Wheels	Shut power off to the drive unit. Manually move the carrier to check how smoothly it moves down the track. Return the carrier to the home position and turn the drive unit back on. Replace wheels as necessary. See p. 09 for the location of the carrier's wheel assembly.
System Usage	If the range is used on a daily basis, the system can remain on. If the range is not used for more than a week, it is recommended that the system be shut down, and then restarted when in operation. For Treadwells with an independent control console, see p. 02 for the Power Off button in the Menu Screen. If other target units are integrated within your SpireOS, reference your other Spire product operations manual for instructions on target operation.

ADJUSTING & ATTACHING TARGET BRACES

The target clamp holds the wood target braces. Target backers are attached to the target braces, and targets are then attached to target backers.

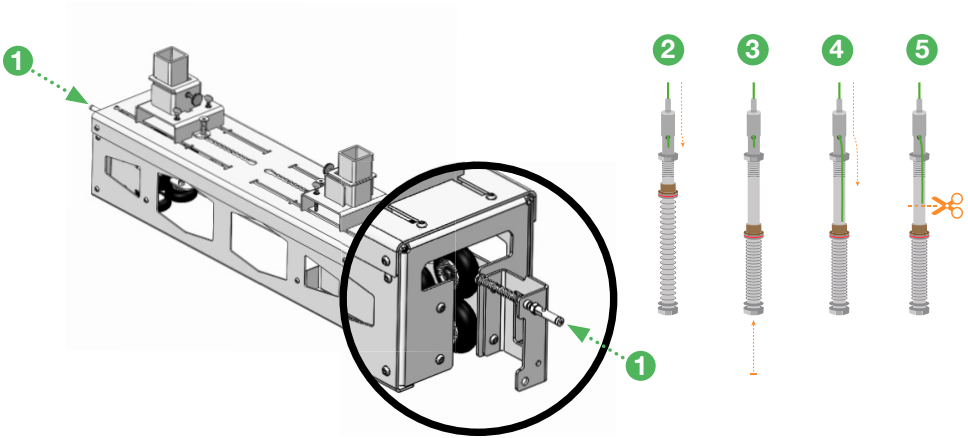
1. Adjust target width using the following steps. Loosen thumb screws, then push down on lock slides. Reference 1 for thumbscrews and 2 for lock slides in the figure below.
2. Clamp wood target braces using the following steps. Start by untightening the clamp thumbscrews at the left and right of the carrier. Reference 3 in the figure below.
3. Remove old target braces (if necessary) and insert new target braces into the wood slots. Reference 4 in the figure below. Note: the target dotted arrow indicates the direction in which to insert the target braces into the carrier unit's clamp slot.
4. Tighten to clamp once again. Reference 3 in the figure below.



ATTACHING AIRCRAFT CABLE TO CARRIER

Occasionally, the aircraft cable will need to be replaced. Reference the troubleshooting section and the guidelines below for instructions on how to replace the aircraft cable.

1. Run the cable over the pulleys and through the center of nay bracketing, bringing the cable to both ends. Reference 1 in the figure below.
2. Thread the cable through the opening of each clamp and out the top hole. Reference 2 in the figure below.
3. Tension the cable by compressing the spring bolt fully and pull the cable taut. Reference 3 and 4 in the figure below.
4. Cut off excess cable, leaving approximately 1" of the cable extending from each clamp to prevent unravelling. Reference 5 in the figure below.



TRAIN THE BEST™