

THE MANDALORIAN SERVICE AND OPERATION MANUAL



WARNING

IMPORTANT HEALTH WARNING: PHOTOSENSITIVE SEIZURES - A very small percentage of people may experience a seizure when exposed to certain visual images, including flashing lights or patterns. Even people with no history of seizures of epilepsy may have an undiagnosed condition that can cause "photosensitive epileptic seizures" due to certain visual images, flashing lights or patterns. Symptoms can include lightheadedness, altered vision, eye or face twitching, jerking or shaking of arms or legs, disorientation, confusion, momentary loss of awareness, and loss of consciousness or convulsions that can lead to injury from falling down or striking nearby objects.

IMMEDIATELY STOP PLAYING AND CONSULT A DOCTOR IF YOU EXPERIENCE ANY OF THESE SYMPTOMS.

ATTENTION! IMPORTANT WARRANTY INFORMATION

The electronics system, node network architecture, mechanical devices and associated software control systems in this pinball machine are designed to work with genuine Stern Pinball accessories and devices.

Installation of non-authorized accessories, lamps, LED's, motors or other devices or modification of electro-mechanical devices may damage the system and will void your warranty.

Stern Pinball machines are assembled in Elk Grove Village, Illinois, USA. Stern Pinball has inspected each game element to ensure it meets our quality standards.

Each pinball machine has unique characteristics that make it a one-of-a-kind American made product. Each will have variations in appearance resulting from differences in the machine's particular wood parts, individual printed art and mechanical assemblies. No playfield is perfectly flat and varies depending on the season. Game play will result in playfield dimpling as the harder steel ball contacts the wood and coating; over time multiple dimples will blend to make them less noticeable. Normal plastic insert crazing (tiny stress cracks) and ghosting (small cloudy areas around insert edges) are often seen in pinball machines, due to a combination of plastic mold stress, pushing of inserts into purposely undersized holes, and heating and breaking of inserts' plastic "skin" when the playfield is sanded.

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Games configured for North America operate on 60 cycle electricity only. These games will not operate in countries with 50 cycle electricity (Europe, UK, Australia).



MANUAL #780-50S6-00
THE MANDALORIAN LE #500-55S6-01
THE MANDALORIAN PREMIUM #500-55S7-01

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2. SPIKE SYSTEM AND NODE GUIDE

2.1 SPIKE SYSTEM OVERVIEW

The SPIKE Pinball system is a rugged, distributed, and embedded platform custom-designed for the rigors of the pinball machine environment. SPIKE takes advantage of modern technologies to deliver an immersive pinball experience that supports modern features, reduces cabling, and increases serviceability and reliability.

A Stern Pinball machine based on the SPIKE system will have at least two nodes networked together with the SPIKE node bus, a custom industrial pinball control bus that is designed around industry standards and optimized for the pinball environment. The primary CPU node is networked to one or more input/output nodes over standard Category 5 UTP (unshielded twisted pair) ethernet cabling.

There are five primary types of nodes that are found in the game.

- CPU node (Node 0) - The primary node that controls other nodes in the system. Contains the primary game software for the system and provides SPIKE node bus power for other nodes.
- Cabinet 48V node (Node 1) - Specialized node with specific inputs and outputs for coin doors, tilt mechanisms, and other bottom-cabinet devices.
- 48V playfield node - Controls high power devices such as coils and flashers, and also supports a few switch and low-power outputs. Powered by the system 48V power supply.
- Light and switch node - High-density switch and low-power LED outputs, bus-powered from the node bus. These boards contain as many 32 switch inputs and light outputs.
- Node extensions - These sub-nodes add additional low-power input and outputs to a specific Power or I/O node and are connected with simple serial bus.

2.2 NODE BUS CABLING

The SPIKE node bus utilizes standard Ethernet-style RJ45 8-pin modular jacks, and off-the-shelf Category 5e or better ethernet cabling. The node bus is electrically different from Ethernet and does not utilize Ethernet or TCP/IP protocols or signaling standards. SPIKE nodes are not compatible with standard computer networking equipment.

CAUTION: Plugging a SPIKE Node or CPU board into a standard Ethernet port may damage one or both devices and void your warranty.

2.3 SYSTEM POWER

The SPIKE System is powered from an 48V DC power supply bus. Each SPIKE node converts this voltage to lower voltages required by the node and its specific components. A SPIKE 48V node typically controls high-power outputs such as game coil mechanisms and high-brightness LEDs. These powered nodes are supplied directly with 48V system power. SPIKE standard I/O nodes are low-power nodes that read switch inputs and output to standard-brightness LEDs. Standard I/O nodes use the node bus power, which is supplied by the main CPU node over the node bus modular jack connectors.

2.4 SPIKE NODE ADDRESSES

Each SPIKE node has a unique address ranging from 0 to 15. Not all addresses are used in all games. Nodes can be of the same part number, so the address is specified on the DIP switches on each node. When replacing a node, be certain that the correct address is set. Nodes can have 3-position and 4-position DIP switches. Refer to the appropriate table to set the address for each type of Node. The correct address for a node can be found in the SPIKE node reference section of the manual or in the game diagnostic software. Address 0 is reserved for the backbox CPU node, where the game software resides. Address 1 is reserved for the cabinet node, located inside the coin door. These two nodes do not have DIP switches as their address is not configurable.

Address	1	2	3
8	OFF	OFF	OFF
9	OFF	OFF	ON
10	OFF	ON	OFF
11	OFF	ON	ON
12	ON	OFF	OFF
13	ON	OFF	ON
14	ON	ON	OFF
15	ON	ON	ON

SPIKE node addresses for nodes with 3-position DIP switches. Addresses 0-7 are not used by SPIKE nodes with 3-position DIP switches.

Address	1	2	3	4
8	OFF	OFF	OFF	OFF
9	OFF	OFF	ON	OFF
10	OFF	ON	OFF	OFF
11	OFF	ON	ON	OFF
12	ON	OFF	OFF	OFF
13	ON	OFF	ON	OFF
14	ON	ON	OFF	OFF
15	ON	ON	ON	OFF

SPIKE node addresses for nodes with 4-position DIP switches. Addresses 0-7 are reserved for fixed-function nodes and do not require configuration.

SPIKE SYSTEM AND NODE GUIDE CONTINUED

2.5 SPIKE NODE PROGRAMMING

The SPIKE nodes are smart nodes that have on-board processors and run embedded code. The nodes are programmed automatically by the CPU node whenever software updates are installed to the CPU. When replacing a node, the CPU node will detect and update the node to the latest software with no user intervention. Always replace nodes with the power to the game turned OFF.

2.6 SPIKE SYSTEM TERMINOLOGY

MULTI GENERAL ILLUMINATION LIGHTING

General Illumination Lighting is two or more lights powered by one control source. These are often a number of LEDs connected in parallel and the system controls these as one large LED. A missing LED will not affect these circuits, however a shorted LED can cause the entire string of LEDs to turn off.

SINGLE LIGHTS

Single lights and LEDs are direct-controlled from SPIKE node boards. A common power source is grounded by individual transistors to turn individual LEDs on and off. Groups of LEDs, usually by node connector, share a common power source, so if a group of LEDs is out, check the wiring for the power source.

FLASHERS

SPIKE games treat flashers the same as single LEDs that draw more power. Flashers are controlled from the same circuits that power regular lights.

DRIVERS

A driver is a circuit that controls a high power-device such as a coil, magnet, or motor. Each device has a common 48V power source that is then connected to ground by a dedicated control transistor. Each driver is protected against shorting, static electricity, and over-current conditions. Take caution as 48V is always present on a device even when it is not energized.

OPTOS

Certain types of optical switches ("optos") require external signal conditioning. For these optos, they will interface to a SPIKE node via an opto signal conditioning board. Other optical switches connect directly to the Spike node board.

CAUTION: Unless explicitly directed by an Authorized Stern Repair technician, perform ALL work on your pinball machine with the power disabled!

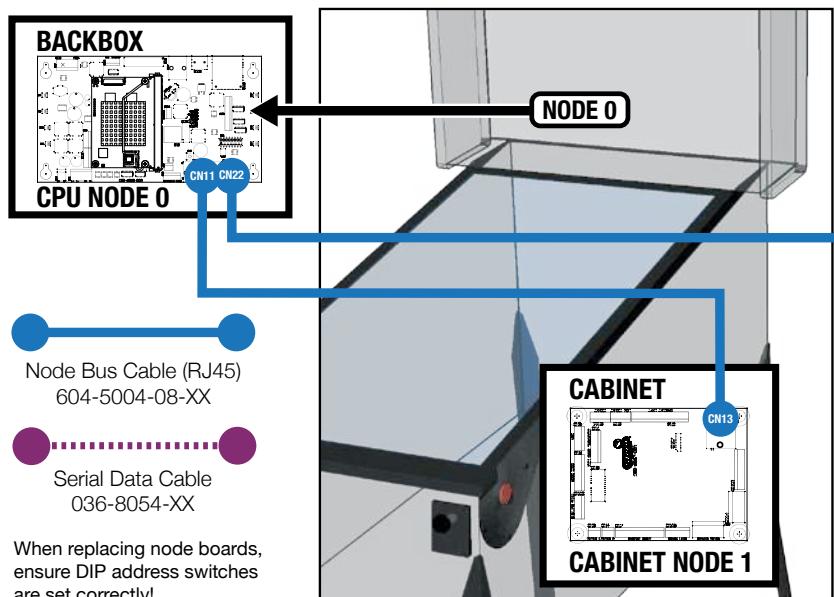
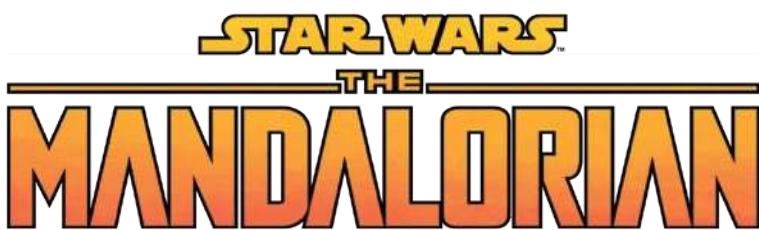
INPUT/OUTPUT PROTECTIONS

SPIKE features built-in short-circuit, static electricity, and other protections to maximize reliability. If an LED, coil or other device shorts, it will be disabled but will not shut down the entire system in most circumstances. Groups of LEDs, coils, and switches often share common power supplies or other circuits, so it is possible that a bad device will affect the group of related devices and require removal or repair to fix the group. The system diagnostics will inform the technician of shorted or otherwise malfunctioning devices whenever possible. While the system is protected against permanent damage, it is strongly recommended to repair or replace these bad components as soon as possible to minimize downtime and maximize game earnings.

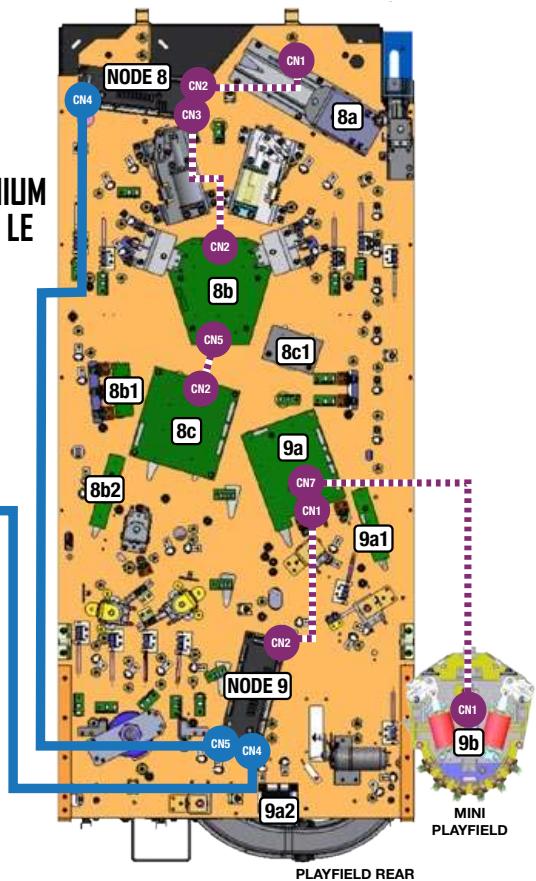
2.7 COMMON SPIKE NODE BOARDS

Description	Type	Part Number
SPIKE CPU Node	Node	509-1003-01
Cabinet Node	Node	520-6967-72
Playfield 48V Core-Driver Node	Node	520-7017-72
Trough Serial Opto Receiver Extension	Extension	520-8516-00

3. LIGHT, SWITCH, AND DRIVER REFERENCE



PREMIUM
AND LE



3.1 SPIKE NODE BOARDS

ID	DIP Address	Description	Location	Part Number
Node 0	n/a	SPIKE 2 CPU Node	Backbox	509-1003-01
Node 1	n/a	Cabinet Node	Cabinet	520-6967-72
Node 8	OFF-OFF-OFF-OFF	Playfield 48V Core-Driver Node	Lower Playfield	520-7017-72
8a	n/a	Trough Serial Opto Receiver Extension	Playfield	520-8516-00
8b	n/a	Lower Center LED Board	Playfield	520-8519-00
8b1	n/a	3-W LED Board	Playfield	520-8524-00
8b2	n/a	2-W 1-RGB LED Board	Playfield	520-8523-00
8c	n/a	Center Middle LED Board	Playfield	520-8520-00
8c1	n/a	3-RGB LED Board	Playfield	520-8522-00
Node 9	OFF-OFF-ON-OFF	Playfield 48V Core-Driver Node	Playfield	520-7017-72
9a	n/a	Center Right LED Board	Playfield	520-8518-00
9a1	n/a	2-W 1-RGB LED Board	Playfield	520-8523-00
9a2	n/a	Dual Motor Direct Driver Board	Playfield	520-5788-00
9b	n/a	Mini Playfield LED Board	Playfield	520-8517-00
Node 12	ON-OFF-OFF-OFF	HDMI Adapter-Topper (Optional)	Topper	520-8530-00

3.2 DRIVER REFERENCE

ID	Name	Node	Connector	Ret. Pin	Ret. Wire	Voltage	V+ Pin	V+ Color	Location	Type	Address	Part Number
1	Trough	8	CN8	7	ORG GRY	48V	1-4	GRY ORG	Playfield	Coil - 27-1500	8-DR-1	090-5004-ND
2	Auto Plunger	8	CN8	9	ORG WHT	48V	1-4	GRY ORG	Playfield	Coil - 23-800	8-DR-4	090-5001-ND
3	Left Flipper	8	CN8	6	ORG YEL	48V	1-4	GRY ORG	Playfield	Coil - 22-1080	8-DR-5	090-5032-ND
4	Right Flipper	8	CN8	5	ORG GRN	48V	1-4	GRY ORG	Playfield	Coil - 22-1080	8-DR-0	090-5032-ND
5	Left Slingshot	8	CN8	11	ORG BLU	48V	1-4	GRY ORG	Playfield	Coil - 26-1200	8-DR-3	090-5044-ND
6	Right Slingshot	8	CN8	10	ORG VIO	48V	1-4	GRY ORG	Playfield	Coil - 26-1200	8-DR-2	090-5044-ND
7	Shaker Motor	1	CN16	1	BLU	48V	5	RED	Cabinet	Motor	1-DR-0	041-5029-04
8	Mini PF Left Flipper	8	CN7	3	YEL BLK	48V	1	GRY ORG	Playfield	Coil - 22-1080	8-DR-6	090-5032-ND
9	Mini PF Right Flipper	8	CN7	4	YEL BRN	48V	1	GRY ORG	Playfield	Coil - 22-1080	8-DR-7	090-5032-ND
10												
11	Left Pop Bumper	9	CN8	10	ORG BLK	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-2	090-5044-ND
12	Right Pop Bumper	9	CN8	11	ORG BRN	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-3	090-5044-ND
13	Right Scoop	9	CN8	9	ORG RED	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-4	090-5044-ND
14	Left Eject	9	CN8	7	YEL WHT	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-1	090-5044-ND
15												
16	Magnet	9	CN7	4	BRN RED	48V	1	GRY BRN	Playfield	Coil - 22-650	9-DR-7	511-5065-ND
17	Top Up Post	9	CN7	2	YEL ORG	48V	1	GRY BRN	Playfield	Coil - 26-1200	9-DR-8	090-5044-ND
18												
19	Right Up Post	9	CN8	5	YEL BLU	48V	1-4	GRY BRN	Playfield	Coil - 26-1200	9-DR-0	090-5044-ND
20	Center Ramp Gate	9	CN8	6	YEL VIO	48V	1-4	GRY BRN	Playfield	Coil - 32-1800	9-DR-5	090-5031-00-ND
21	Divertor-Mini PF	9	CN7	3	YEL GRN	48V	1	GRY BRN	Playfield	Coil - 26-1200	9-DR-6	090-5044-ND
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33	Coin Meter	1	CN3	2	BLK	12V	1	RED	Cabinet	Digital Out	1-DR-2	500-9946-00
34	Ticket Meter	1	CN4	2	BLK	12V	1	RED	Cabinet	Digital Out	1-DR-3	500-9946-00
35	Ticket Dispenser	1	CN11	3		12V	1		Cabinet	Digital Out	1-DR-4	

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DRIVER REFERENCE CONTINUED

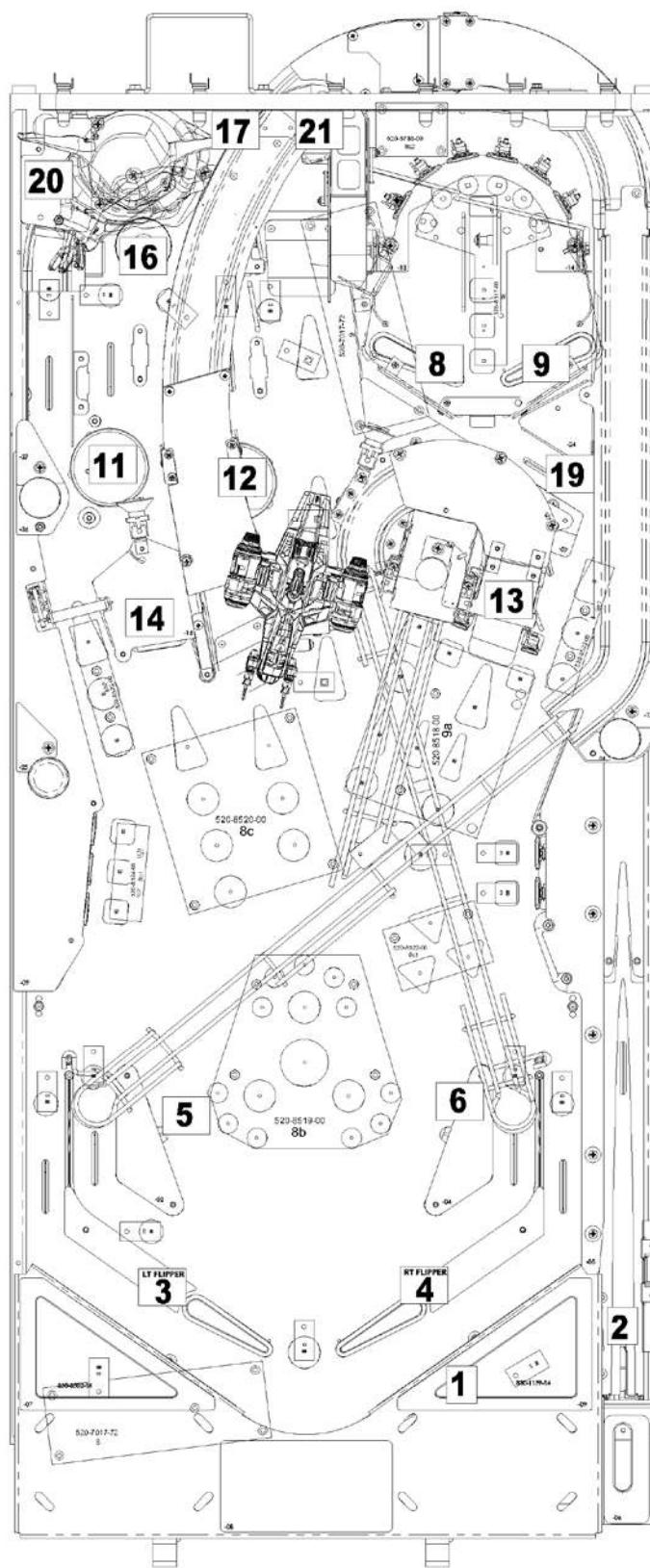


Figure 3.2.1. Playfield driver locations (top view).

SPIKE SYSTEM AND NODE GUIDE

3.3 SWITCH REFERENCE

ID	Name	Node	Node Ext	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
1	Left Outlane	8	-	CN11	4	LGN RED	11-12	BLK ORG	Playfield	Rollover	8-SW-17	500-9935-04
2	Left Return Lane	8	-	CN11	5	LGN ORG	11-12	BLK ORG	Playfield	Rollover	8-SW-18	500-9935-04
3												
4												
5	Right Return Lane	8	-	CN11	6	LGN YEL	11-12	BLK ORG	Playfield	Rollover	8-SW-19	500-9935-04
6	Right Outlane	8	-	CN11	7	LGN BLU	11-12	BLK ORG	Playfield	Rollover	8-SW-20	500-9935-04
7	Left Slingshot	8	-	CN10	4	GRY BLU	8	BLK GRN	Playfield	Leaf	8-SW-30	180-5231-00
8	Right Slingshot	8	-	CN10	3	GRY VIO	8	BLK GRN	Playfield	Leaf	8-SW-29	180-5231-00
9	Left Flipper Button	8	-	CN9	4	GRY BRN	7	BLK GRN	Cabinet	Leaf	8-SW-25	180-5164-01
10	Right Flipper Button	8	-	CN9	3	GRY RED	7	BLK GRN	Cabinet	Leaf	8-SW-24	180-5164-01
11	Left Flipper EOS	8	-	CN10	6	GRY YEL	9	BLK GRN	Playfield	Leaf	8-SW-16	180-5149-00
12	Right Flipper EOS	8	-	CN10	5	GRY GRN	9	BLK GRN	Playfield	Leaf	8-SW-31	180-5149-00
13	Mini PF Left Flipper Button	8	-	CN9	6	VIO	7	BLK GRN	Playfield	Leaf	8-SW-27	180-5164-01
14	Mini PF Right Flipper Button	8	-	CN9	5	VIO WHT	7	BLK GRN	Playfield	Leaf	8-SW-26	180-5164-01
15	Trough 6	8	8a	CN14	-		-		Playfield	Opto	8-SW-32	520-5344-00 tx 520-8516-00 rx
16	Trough 5	8	8a	CN14	-		-		Playfield	Opto	8-SW-33	520-5344-00 tx 520-8516-00 rx
17	Trough 4	8	8a	CN14	-		-		Playfield	Opto	8-SW-34	520-5344-00 tx 520-8516-00 rx
18	Trough 3	8	8a	CN14	-		-		Playfield	Opto	8-SW-35	520-5344-00 tx 520-8516-00 rx
19	Trough 2	8	8a	CN14	-		-		Playfield	Opto	8-SW-36	520-5344-00 tx 520-8516-00 rx
20	Trough 1	8	8a	CN14	-		-		Playfield	Opto	8-SW-37	520-5344-00 tx 520-8516-00 rx
21	Trough Jam	8	8a	CN14	-		-		Playfield	Opto	8-SW-38	520-5344-00 tx 520-8516-00 rx
22	Shooter Lane	8	-	CN10	2	GRY WHT	7	BLK GRN	Playfield	Rollover	8-SW-28	180-5157-01
23	Mini PF Left Flipper EOS(reserved)	8	-	CN12	8	PNK BLK	10	BLK RED	Playfield	Leaf	8-SW-14	-
24	Mini PF Right Flipper EOS(reserved)	8	-	CN12	9	PNK BRN	10	BLK RED	Playfield	Leaf	8-SW-15	-
25	Skill Shot	9	-	CN11	9	TAN WHT	11-12	BLK GRY	Playfield	Rollover	9-SW-22	500-9935-04
26												
27												
28												
29	Left 3 Bank Target Top	8	-	CN12	2	WHT BRN	10	BLK RED	Playfield	Leaf, Target	8-SW-8	515-9783-00-00
30	Left 3 Bank Target Mid	8	-	CN12	3	WHT RED	10	BLK RED	Playfield	Leaf, Target	8-SW-9	515-9783-00-00
31	Left 3 Bank Target Bot	8	-	CN12	4	WHT ORG	10	BLK RED	Playfield	Leaf, Target	8-SW-10	515-9783-00-00
32	Left Spinner	9	-	CN10	5	GRY ORG	7/8/9	BLK BLU	Playfield	Micro	9-SW-31	180-5010-04
33												
34	Right 2 Bank Target Top	8	-	CN11	9	LGN GRY	11/12	BLK ORG	Playfield	Leaf, Target	8-SW-22	515-9783-00-00
35	Right 2 Bank Target Bot	8	-	CN11	10	LGN WHT	11/12	BLK ORG	Playfield	Leaf, Target	8-SW-23	515-9783-00-00
36												
37	Left Eject	9	-	CN10	6	GRY YEL	7/8/9	BLK BLU	Playfield	Micro	9-SW-16	180-5209-00
38	Left Pop Bumper	9	-	CN10	2	GRY BLK	7/8/9	BLK BLU	Playfield	Leaf	9-SW-28	180-5232-00
39	Right Pop Bumper	9	-	CN10	3	GRY BRN	7/8/9	BLK BLU	Playfield	Leaf	9-SW-29	180-5232-00
40	10pt Switch	9	-	CN10	4	GRY RED	7/8/9	BLK BLU	Playfield	Leaf	9-SW-30	180-5231-00
41												
42	(C)HILD Rollover	9	-	CN11	4	TAN-ORG	11/12	BLK GRY	Playfield	Rollover	9-SW-17	500-9935-03
43	C(H)ILD Rollover	9	-	CN11	5	TAN YEL	11/12	BLK GRY	Playfield	Rollover	9-SW-18	500-9935-03
44	CH(I)LD Rollover	9	-	CN11	6	TAN GRN	11/12	BLK GRY	Playfield	Rollover	9-SW-19	500-9935-03
45	CHI(L)D Rollover	9	-	CN11	7	TAN BLU	11/12	BLK GRY	Playfield	Rollover	9-SW-20	500-9935-03

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SWITCH REFERENCE CONTINUED

ID	Name	Node	Node Ext	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
46												
47												
48	Child Opto	9	-	CN9	4	LGN YEL	7/8	BLK BLU	Playfield	Opto	9-SW-25	515-0215-00 tx 515-0215-01 rx
49												
50	Left Ramp Enter Opto	9	-	CN12	5	WHT YEL	10	BLK WHT	Playfield	Opto	9-SW-11	515-0215-00 tx 515-0215-01 rx
51	Left Ramp Exit Opto	9	-	CN12	6	WHT GRN	10	BLK WHT	Playfield	Opto	9-SW-12	515-0215-00 tx 515-0215-01 rx
52	Center Ramp Exit Opto	9	-	CN9	3	LGN ORG	7/8	BLK BLU	Playfield	Opto	9-SW-24	515-0215-00 tx 515-0215-01 rx
53	Center Ramp Enter Opto	9	-	CN9	5	LGN BLU	7/8	BLK BLU	Playfield	Opto	9-SW-26	515-0215-00 tx 515-0215-01 rx
54	Right Ramp Exit Opto	9	-	CN13	4	PNK YEL	10	BLK BRN	Playfield	Opto	9-SW-2	515-0215-00 tx 515-0215-01 rx
55	Right Scoop Opto	9	-	CN13	5	PNK GRN	10	BLK BRN	Playfield	Opto	9-SW-3	515-0215-00 tx 515-0215-01 rx
56	Right Ramp Left Target	9	-	CN13	6	PNK BLU	10	BLK BRN	Playfield	Leaf, Target	9-SW-4	515-9785-00-00
57	Right Ramp Right Target	9	-	CN13	7	PNK VIO	10	BLK BRN	Playfield	Leaf, Target	9-SW-5	515-9785-00-00
58	Scoop Rollover	9	-	CN13	8	PNK WHT	10	BLK BRN	Playfield	Rollover	9-SW-6	500-9935-03
59	Battleground Exit	9	-	CN13	9	PNK	10	BLK BRN	Playfield	Micro	9-SW-7	180-5157-01
60	Right Orbit	9	-	CN12	4	WHT ORG	10	BLK WHT	Playfield	Rollover	9-SW-10	500-9935-03
61												
62												
63												
64	Razor Crest Hit Target	9	-	CN12	7	WHT BLU	10	BLK WHT	Playfield	Leaf, Target	9-SW-13	515-9784-00-00
65												
66	Mini PF Enter Opto	9	-	CN12	9	WHT GRY	10	BLK WHT	Playfield	Opto	9-SW-15	511-5815-00 tx 511-5815-01 rx
67												
68	Mini PF Up	9	-	CN13	2	PNK RED	10	BLK BRN	Playfield	Opto	9-SW-0	520-8470-00
69	Mini PF Down	9	-	CN13	3	PNK ORG	10	BLK BRN	Playfield	Opto	9-SW-1	520-8470-00
70	Mini PF Target 1 (Left)	9	b	CN2	1	PNK VIO	7	BLK BRN	Playfield	Leaf, Target	9-SW-32	515-9783-00-00
71	Mini PF Target 2	9	b	CN2	2	PNK BLU	7	BLK BRN	Playfield	Leaf, Target	9-SW-33	515-9783-00-00
72	Mini PF Target 3	9	b	CN2	3	PNK GRN	7	BLK BRN	Playfield	Leaf, Target	9-SW-34	515-9783-00-00
73	Mini PF Target 4	9	b	CN2	4	PNK YEL	7	BLK BRN	Playfield	Leaf, Target	9-SW-35	515-9783-00-00
74	Mini PF Target 5	9	b	CN2	5	PNK ORG	7	BLK BRN	Playfield	Leaf, Target	9-SW-36	515-9783-00-00
75	Mini PF Target 6 (Right)	9	b	CN2	6	PNK RED	7	BLK BRN	Playfield	Leaf, Target	9-SW-37	515-9783-00-00
76												
77												
78												
79												
80	Lockdown Button	1	-	CN7	8	TAN WHT	5	BLK WHT	Cabinet	Leaf	1-SW-2	180-5218-00
81												
82												
83	Start Button	1	-	CN6	10	GRY	5	BLK WHT	Cabinet	Micro	1-SW-11	500-1060-44-LED
84	Tournament Start Button	1	-	CN6	9	GRY WHT	5	BLK WHT	Cabinet	Micro	1-SW-12	500-6587-06-TL
85												
86	Left Coin	1	-	CN5	9	PNK BRN	3	BLK	Cabinet	Micro	1-SW-16	
87	Right Coin	1	-	CN5	7	PNK ORG	3	BLK	Cabinet	Micro	1-SW-18	
88	Center Coin	1	-	CN5	8	PNK RED	3	BLK	Cabinet	Micro	1-SW-17	
89	Fourth Coin	1	-	CN5	6		-		Cabinet	-	1-SW-19	

Continued on next page...



SPIKE SYSTEM AND NODE GUIDE

SWITCH REFERENCE CONTINUED

ID	Name	Node	Node Ext	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
90	Fifth Coin	1	-	CN5	5		-		Cabinet	-	1-SW-20	
91	Tilt Pendulum	1	-	CN6	7	WHT	5	BLK WHT	Cabinet	Plumb Bob	1-SW-14	516-0007-00
92	Sixth Coin	1	-	CN9	5		-		Cabinet	-	1-SW-21	
93	Ticket Notch	1	-	CN11	5		-		Cabinet	-	1-SW-8	
94	Slam Tilt	1	-	CN5	4	LGN RED	3	BLK	Cabinet	-	1-SW-22	
95												
96												
97												
98												
99												
100												
101												
C1	DIP 1	0	-	-	-		-		CPU Node	0-SW-0	-	
C2	DIP 2	0	-	-	-		-		CPU Node	0-SW-1	-	
C3	DIP 3	0	-	-	-		-		CPU Node	0-SW-2	-	
C4	DIP 4	0	-	-	-		-		CPU Node	0-SW-3	-	
C5	DIP 5	0	-	-	-		-		CPU Node	0-SW-4	-	
C6	DIP 6	0	-	-	-		-		CPU Node	0-SW-5	-	
C7	DIP 7	0	-	-	-		-		CPU Node	0-SW-6	-	
C8	DIP 8	0	-	-	-		-		CPU Node	0-SW-7	-	
C9	Service Select	0	-	CN25	4	LGN GRY	6	BLK	Coin Door	0-SW-8	515-1963-00	
C10	Service Plus	0	-	CN25	3	LGN VIO	6	BLK	Coin Door	0-SW-9	515-1963-00	
C11	Service Minus	0	-	CN25	2	LGN BLU	6	BLK	Coin Door	0-SW-10	515-1963-00	
C12	Service Back	0	-	CN25	1	LGN BLK	6	BLK	Coin Door	0-SW-11	515-1963-00	
C17	Headphone Detect	0	-	-	-	-	-	-	Coin Door	0-SW-16	-	
C18	Headphone Kit Cable Detect	0	-	CN3	5	BLK	4	BLK	CPU Node	0-SW-17	-	
C19	Volume Encoder 1	0	-	CN3	6	WHT	1	DRAIN	CPU Node	0-SW-18	-	
C20	Volume Encoder 2	0	-	CN3	7	GRN	1	DRAIN	CPU Node	0-SW-19	-	
C24	Coin Door Interlock	0	-	CN4	1	GRY	4	GRY RED	Backbox		0-SW-23	180-5248-00

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SWITCH REFERENCE CONTINUED

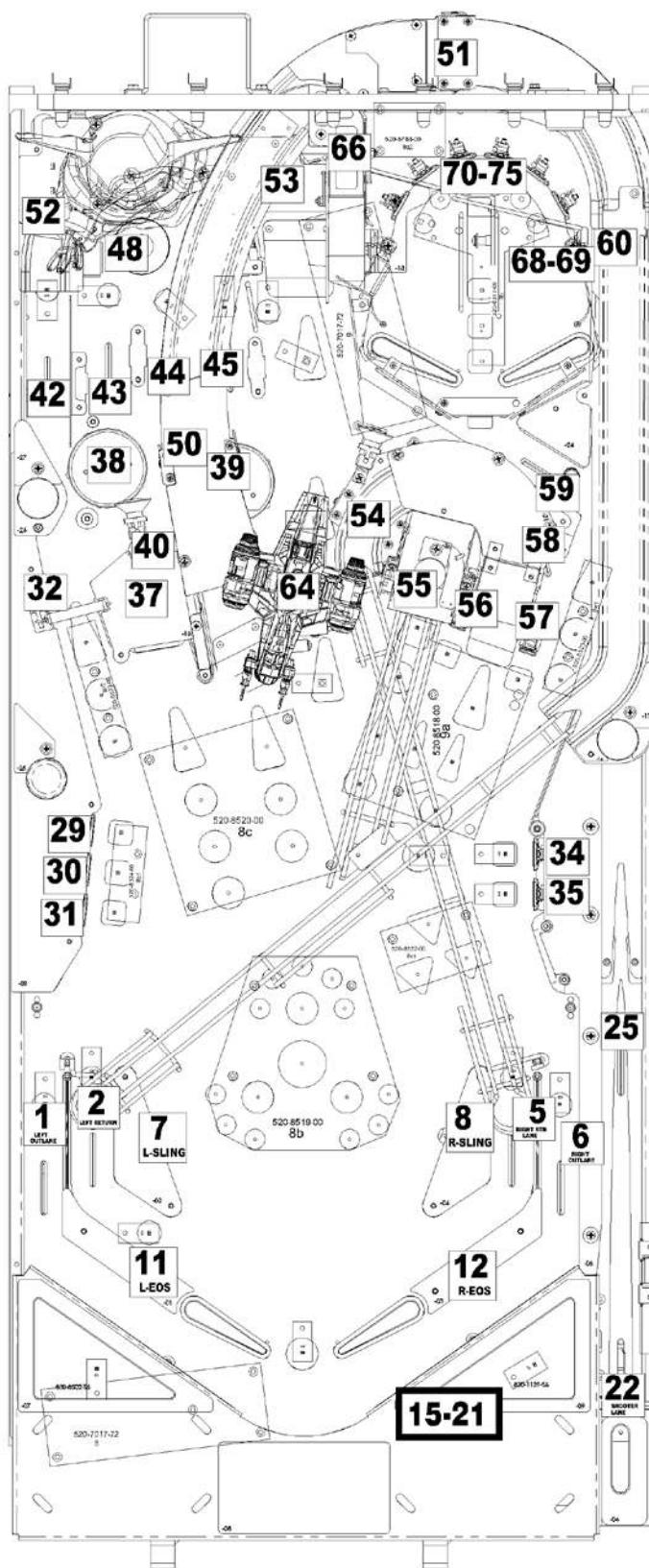


Figure 3.3.1. Playfield switch locations (top view).

LIGHT REFERENCE CONTINUED

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
152	Left Playfield GI-WHT(x11)	8	-	CN15	6	WHT BLK	2	YEL BLK	Playfield	G.I.	White	8-LP-1	112-5034-WW 520-7000-00 (Bot.Arch) 520-5307-00 (Bot.Arch)
153	Right Playfield GI-RED(11)	9	-	CN15	5	RED BLK	1	YEL RED	Playfield	G.I.	White	9-LP-0	112-5034-02F
154	Right Playfield GI-WHT(x13)	9	-	CN15	6	WHT BLK	2	YEL BLK	Playfield	G.I.	White	9-LP-1	112-5034-WW 520-7000-00 (Bot.Arch) 520-5307-00 (Bot.Arch)
155	Backpanel GI (x6)	9	-	CN15	7	GRN BLK	3	YEL GRN	Backpanel	G.I.	White	9-LP-2	112-5034-WW
156													
157													
158													
159													
160	Lower Left Flash	8	c	CN4	4	ORG WHT	1/2	RED	Playfield	Flash	White	8-LP-49	520-7000-00
161	Upper Left Flash	8	c	CN4	3	ORG VIO	1/2	RED	Playfield	Flash	White	8-LP-48	520-7000-00
162	Left Pop Bumper	8	c	CN4	5	BRN BLK	1/2	RED	Playfield	Flash	White	8-LP-50	520-8059-00
163	Right Pop Bumper	8	c	CN4	6	BRN	1/2	RED	Playfield	Flash	White	8-LP-51	520-8059-00
164													
165	Child Spot	8	c	CN4	7	ORG GRY	1/2	RED	Playfield	Flash	White	8-LP-52	113-5032-08
166													
167	Backpanel Flash	8	c	CN4	8	ORG BLU	1/2	RED	Playfield	Flash	White	8-LP-53	520-7000-00
168													
169	Mini PF Spot	9	a	CN3	4	ORG VIO	1/2	RED	Playfield	Flash	White	9-LP-22	113-5032-08
170	Scoop Flash	9	a	CN5	7	ORG WHT	1/2/3/4	RED	Playfield	Flash	White	9-LP-28	520-7000-00
171	Lower Right Flash	9	a	CN4	3	ORG	1	RED	Playfield	Flash	White	9-LP-24	520-7000-00
172													
173													
174													
175													
176													
177													
178													
179													

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SPIKE SYSTEM AND NODE GUIDE

LIGHT REFERENCE CONTINUED

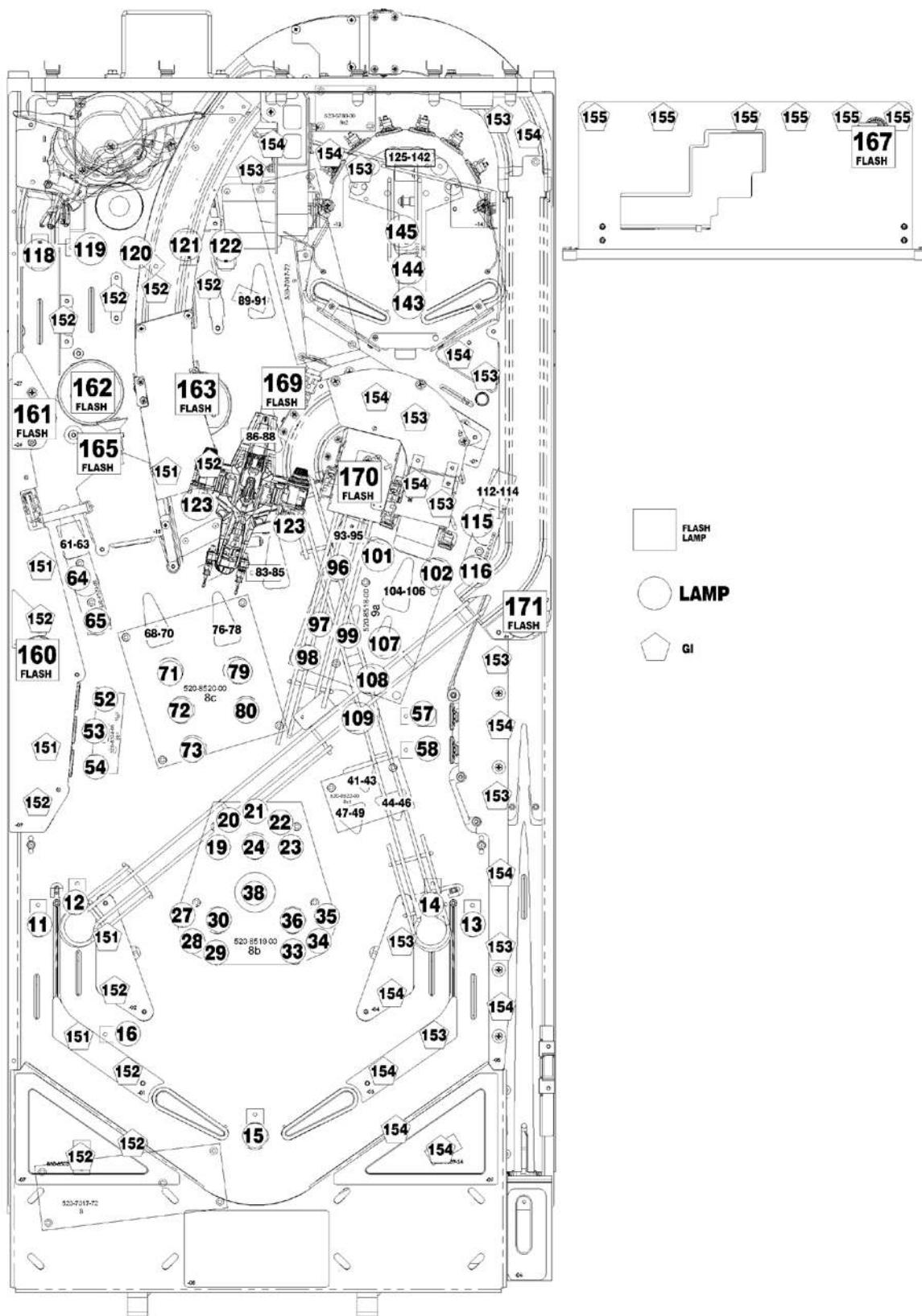


Figure 3.4.1. Playfield light locations (top view).

3.5 MOTOR REFERENCE

ID	Name	Node	Node Ext.	Conn.	Ret. Pin	Ret. Wire	Src. Pin	Src. Wire	Location	Type	Light Color	Address	Part Number
1													
2													
3													
4													
5													
6	Mini PF Control 1B	9	a	CN6	7	BRN-BLU	1/2/3/4	RED	Playfield	Motor	-	9-LP-34	520-8418-00
7	Mini PF Control 2B	9	a	CN6	8	BRN-VIO	1/2/3/4	RED	Playfield	Motor	-	9-LP-35	520-8418-00
8													
9													
10													

Bi-Direction													
MOTOR A				Coast		Brake		Brake		Dir. 1		Dir. 2	
x-LP-0	Enable A		H	L		L		L		L		L	
x-LP-1	Control 1A		H	L		H		L		L		H-PWM	
x-LP-2	Control 2A		H	L		H		H-PWM		L			
MOTOR B			Coast		Brake		Brake		Dir. 1		Dir. 2		
x-LP-3	Enable B		H	L		L		L		L		L	
x-LP-4	Control 1B		H	L		H		L		L		H-PWM	
x-LP-5	Control 2B		H	L		H		H-PWM		L			
x=Node #					L/Low=Lamp On								
					H/High=Lamp Off								
	Motor Wiring: Drive 1A&2A/1B&2B												
Single Direction													
MOTORS 1 & 2			Coast		Brake		Motor 1		Motor 2				
x-LP-0	Enable A		H	L		L		L		L			
x-LP-1	Control 1A		H	L		H-PWM		N/A					
x-LP-2	Control 2A		H	L		N/A		H-PWM					
MOTORS 3 & 4			Coast		Brake		Motor 3		Motor 4				
x-LP-3	Enable B		H	L		L		L		L			
x-LP-4	Control 1B		H	L		H-PWM		N/A					
x-LP-5	Control 2B		H	L		N/A		H-PWM					
x=Node #					L/Low=Lamp On								
					H/High=Lamp Off								
Single Direction Notes:									PWM Notes:				
	When Enable A is High both motors (1&2) are off (coast)								12V Motor - PWM of 25%				
	When Enable B is High both motors (3&4) are off (coast)								24V Motor - PWM of 50%				
	Motor Wiring: 48V & required drive												

4. ELECTRONIC PINOUTS AND SCHEMATICS

4.1 SPIKE-2 CPU NODE 0

509-1003-01

DIRECT SWITCH MAPPING (CN25)

The coin-door diagnostic switches are connected directly to the CPU node via the Cabinet Node. Note that both the CPU and Cabinet nodes are required for diagnostic switch operation.

ID	Name	Conn.	Input Pin	Input Wire	GND Pin	Ground Wire	Location	Type	Address	Part Number
C1	DIP 1	-	-	-	-	-	CPU Node		0-SW-0	-
C2	DIP 2	-	-	-	-	-	CPU Node		0-SW-1	-
C3	DIP 3	-	-	-	-	-	CPU Node		0-SW-2	-
C4	DIP 4	-	-	-	-	-	CPU Node		0-SW-3	-
C5	DIP 5	-	-	-	-	-	CPU Node		0-SW-4	-
C6	DIP 6	-	-	-	-	-	CPU Node		0-SW-5	-
C7	DIP 7	-	-	-	-	-	CPU Node		0-SW-6	-
C8	DIP 8	-	-	-	-	-	CPU Node		0-SW-7	-
C9	Service Select	CN25	1	LGN-GRY	11	BLK-WHT	Coin Door		0-SW-9	180-5192-04
C10	Service Plus	CN25	2	LGN-VIO	11	BLK-WHT	Coin Door		0-SW-10	180-5192-02
C11	Service Minus	CN25	3	LGN-BLU	11	BLK-WHT	Coin Door		0-SW-11	180-5192-02
C12	Service Back	CN25	4	LGN-BLK	11	BLK-WHT	Coin Door		0-SW-12	180-5192-00

CONNECTORS

ID	Connector Type	Description
CN1	5-Pin .156" Header	Backbox 2-channel amplified speaker out
CN2	3-Pin .100" Header	Console Port
CN3	7-Pin .100" Header	Headphone connector
CN4	2-Pin .156"	Cabinet 1-channel amplified speaker out
CN5	7-Pin .100" Header	Line In/Out
CN6	34 Pin 2.00mm Header	LCD display connector
CN7	5-Pin .156" Header	48V supply from main power supply
CN8	6-Pin .100" Header	SPI Serial
CN9	USB	USB connector - for software updates, audit dumps, and expansion modules
CN9	USB	USB connector - for software updates, audit dumps, and expansion modules
CN10	HDMI	HDMI Out
CN11	RJ45	SPIKE node bus - to cabinet node N1
CN12	RJ45	SPIKE node bus - To Topper accessory Kit
CN13	SD CARD	SD Card connector
CN14	5-Pin .100" Header	LCD Backlight
CN15	3-Pin .100" Header	Backbox Light
CN16	4-Pin .100" Header	3.3v / 5v / 12v
CN17	ETHERNET	ETHERNET connector
CN21	SATA Header	SATA connector
CN22	RJ45	SPIKE node bus - to playfield node
CN25	12-Pin .100" Header	Dedicated switch inputs - service, volume switches

COMPONENTS

ID	Name
S1	DIP Switches
S2	Reset Switch
SD CARD (CN13)	For system SD card. Note: only to be removed if instructed to by Stern Service.
BT1	BR1225 3V Lithium battery for game clock between power cycles

STATUS LEDS

LED ID	Name	Color	Description
48V	+48V Supply In	Red	ON: Main system power is connected. OFF: No 48V system power. Check power supply connections, cables, and fuses.
3.3V	+3.3V Logic	Red	ON: Logic power supply is good. OFF: Logic power supply bad, call tech support.
5V	+5V Logic	Red	ON: Logic power supply is good. OFF: Logic power supply bad, call tech support.
12V	+12V Backbox Illumination	Red	ON: Back box LED power good. OFF: Backbox LED power bad, call tech support.
VA	+30V Audio	Red	ON: Audio power supply is good. OFF: Audio power supply off, call tech support.
VNB	+9V Node Bus	Red	Power for the Node bus. ON: Power for node bus good. OFF: Power to node bus not detected, call tech support.
5V (CPU)	+5V Logic	Red	ON: Logic power supply is good. OFF: Logic power supply bad, call tech support.
SDIO ACT	Not Used	Red	Should remain unlit as it is not currently used.
STATUS	CPU Heartbeat, System Status	Red	Double blink ~1/2 second: Good, Processor running. OFF: Processor not running, call tech support.
μSD ACT	Activity indicator for micro SD Card	Red	Should blink rapidly when reading or writing to micro SD card.
D23	Netbridge Status	Red	Should blink once every ~1/2 second.

SPIKE-2 CPU NODE 0 CONTINUED

AUDIO PINOUTS

ID	Type	Pin	Description	Minimum Impedance	Max Power (RMS)
CN1	.156" 5-pin Header	1	Speaker Right Ground (-)	4 Ohms	-
		2	Speaker Right (+)	4 Ohms	20W
		3	n/c	-	-
		4	Speaker Left Ground (-)	4 Ohms	-
		5	Speaker Left (+)	4 Ohms	20W
CN3	.100" 7-pin Header	1	GND	-	-
		2	L-HP	16 Ohms	15 mW
		3	R-HP	16 Ohms	15 mW
		4	GND	-	-
		5	Headphone Detect	-	-
		6	Headphone vol +	-	-
		7	Headphone vol -	-	-
CN4	.156" 2-pin Header	1	Woofer Ground (-)	8 Ohms	-
		2	Woofer Out (+)	8 Ohms	40W
CN5	.100" 7-pin Header	1	GND	-	-
		2	L-IN	30K Ohms	0.6VRMS
		3	R-IN	30K Ohms	0.6VRMS
		4	GND	-	-
		5	L-OUT	10K Ohms	1.5V
		6	R-OUT	10K Ohms	1.5V
		7	Woofer Line Out	10K Ohms	1.5V

COUNTRY CODES (DIP S2)

	DIP S2							
Country	1	2	3	4	5	6	7	8
USA	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Austria	ON	OFF						
Australia	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
Belgium	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
Canada 1	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
Canada 2	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
China	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
Croatia	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
Denmark	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
Finland	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
France	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
Germany	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
Greece	ON	ON	ON	ON	OFF	OFF	OFF	OFF
Italy	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
Japan	ON	OFF	ON	OFF	ON	OFF	OFF	OFF
Middle East	ON	ON	ON	OFF	ON	OFF	OFF	OFF
Netherlands	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
New Zealand	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Norway	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
Portugal	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
Russia	ON	OFF	OFF	ON	ON	OFF	OFF	OFF
S. Africa	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
Spain	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
Sweden	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
Switzerland	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
Taiwan	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
United Kingdom	OFF	ON	ON	ON	OFF	OFF	OFF	OFF

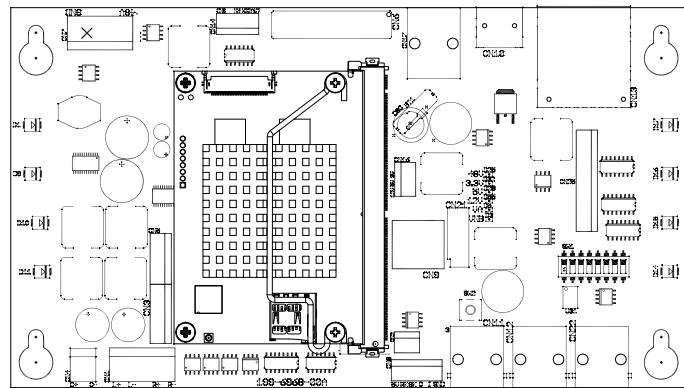


Figure 4.1.1. SPIKE 2 CPU Node connector detail.

COIN DOOR SERVICE SWITCH WIRING

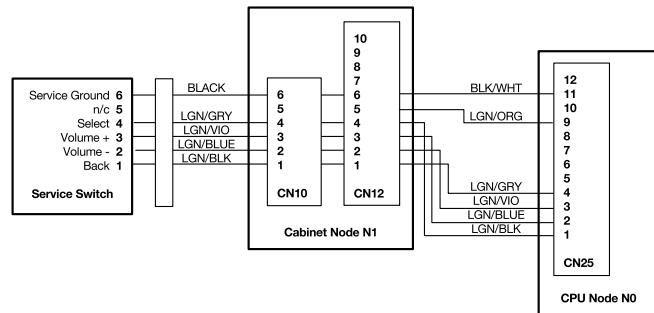


Figure 4.1.2. Service switch wiring. Note that the Cabinet Node must be present and CN10 and CN12 connected for the Coin Door Service Switches to function correctly.

EURO SUMMARY & INTERNATIONAL (EURO) STANDARD PRICING SELECT TABLE

CPU/SOUND PCB DIP SWITCH SW1 SETTING	COUNTRY SETTING OPTION(S)	COIN MECHANISMS (SWITCHES)				PRICING SCHEME		Requires SPI Coin Card(s) Part Number
		COINS THRU ... SLOT:				Number of Plays (Credits) for Price Amount Shown See "Appendix J" for Coin Cards Examples & Info!		
Pos.	1 2 3 4 5 6 7 8	LEFT	CENTER	RIGHT	4TH			
ON	S E E B E L O W					Euro 1	1/0.50	755-5401-01-Y
OFF	S E T T I N G S					Euro 2	1/0.50 2/1.00	755-5401-02-Y
						Euro 3	3/1.00	755-5401-03-Y
						Euro 4	2/1.00	755-5401-04-Y
						Euro 5	4/1.00	755-5401-05-Y
						Euro 6	2/0.50	755-5401-06-Y
						Euro 7	1/1.00 2/2.00	755-5401-07-Y
						Euro 8	3/3.00	755-5401-08-Y
						Euro 9	5/4.00	755-5401-09-Y
						Euro 10	1/1.00	755-5401-10-Y
						Euro 11	3/2.00	755-5401-11-Y
						Euro 12	7/3.00	755-5401-12-Y
							4/2.00	
							6/3.00	
							9/4.00	

For a different Euro Pricing Scheme (other than Factory Default listed below), scroll through Standard Adjustment 18: Euro 1-12 or CUSTOM* for new setting (reference above Euro 1-12 Summary). Keep the Country Dip Switch Setting the same as listed below.

Pos.	1 2 3 4 5 6 7 8	Default Highlighted	EUR // EUROPEAN UNION EUROS // €1				
ON	A U S T R I A		0.50	1.00	2.00		1/1.00 2/1.50 3/2.00 755-5401-09-Y
OFF	Euro 9						
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	B E L G I U M		0.50	1.00	2.00	1/0.50	755-5401-01-Y
OFF	Euro 1						
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	F I N L A N D		0.50	1.00	2.00	1/1.00 3/2.00	755-5401-08-Y
OFF	Euro 8						
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	F R A N C E		0.50	1.00	2.00	1/1.00 3/2.00 7/3.00	755-5401-10-Y
OFF	Euro 10						
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	G E R M A N Y 1		0.50	1.00	2.00	1/0.50	755-5401-01-Y
OFF	G E R M A N Y 2					1/0.50 2/1.00 3/1.50	755-5401-02-Y
Pos.	1 2 3 4 5 6 7 8	Default Highlighted				5/2.00	755-5401-04-Y
ON	G E R M A N Y 3					3/1.50	6/2.00
OFF							
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	G R E E C E		0.50	1.00	2.00	1/1.00 3/2.00	755-5401-08-Y
OFF	Euro 8						
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	I T A L Y 1		0.50		0.50	1/0.50 1/1.00	755-5401-01-Y
OFF	I T A L Y 2					3/2.00	755-5401-08-Y
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	N E T H E R L A N D S		0.50	1.00	2.00	1/0.50 3/1.00	755-5401-03-Y
OFF	Euro 3						
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	P O R T U G A L		0.50		0.50	1/0.50	755-5401-01-Y
OFF							
Pos.	1 2 3 4 5 6 7 8	Default Highlighted					
ON	S P A I N		0.50	1.00	2.00	1/1.00 3/2.00	755-5401-08-Y
OFF	Euro 8						

HIGHLIGHTED = Factory Default

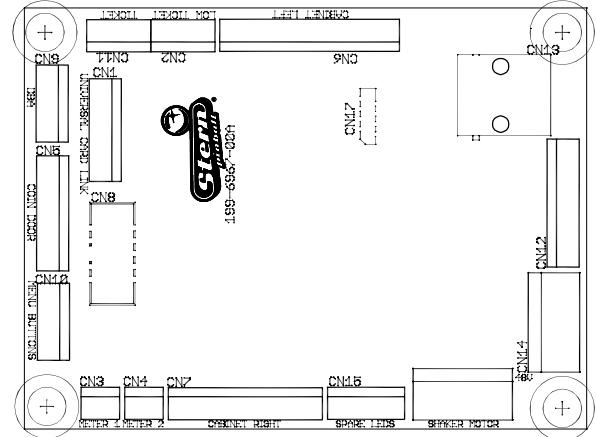
HIGHLIGHTED = Not Shown on Coin Card

ELECTRONIC PINOUTS AND SCHEMATICS

4.2 CABINET NODE 1

520-6967-72

ID	Type	Pin	Description	Wire Color
CN1	.100" 8-Pin Header Universal Card Link	1	12V	-
		2	Coin 1	-
		3	Meter 1	-
		4	N/C	-
		5	Notch	-
		6	Coin Enable	-
		7	Ticket Enable	-
		8	Ground	-
CN2	.100" 5-Pin Header low ticket	1	Ground	-
		2	Ticket Low sw.	-
		3	Key	-
		4	Ticket Low	-
		5	5V Out	-
CN3	.100" 3-Pin Header Meter 1	1	Meter 12V (+)	RED
		2	Meter (-)	BLK
		3	N/C	-
CN4	.100" 3-Pin Header Meter 2	1	Meter 12V (+)	RED
		2	Meter (-)	BLK
		3	N/C	-
CN5	.100" 9-Pin Header	1	5V Out	YEL/WHT
		2	Coin LED Out	YEL
		3	Ground	BLK
		4	Slam Tilt In	LGN/RED
		5	Coin 5	PNK/GRN*
		6	Coin 4	PNKYEL*
		7	Coin 3	PNK/ORN*
		8	Coin 2	PNK/RED*
		9	Coin 1	PNK/BRN*
CN6	.100" 14-Pin Header Cabinet Left	1	5V LED Power	RED
		2	Start 2 LED	YEL-RED
		3	Start 1 LED	YEL-BRN
		4	Spare LED	-
		5	Ground	BLK-WHT
		6	Spare Left	-
		7	Tilt Input	WHT
		8	Door Open	-
		9	Start 2 Switch	GRY-WHT
		10	Start 1 Switch	GRY
		11	N/C	-
		12	N/C	-
		13	N/C	-
		14	N/C	-
CN7	.100" 12-Pin Header Cabinet Right	1	5V LED Power	RED
		2	Plunge 2 LED	RED-WHT
		3	Plunge 1 LED	GRN-WHT
		4	Spare LED 2	BLU-WHT
		5	Ground	BLK-WHT
		6	Spare Right In	-
		7	Plunge 2 Switch	-
		8	Plunge 1 Switch	-
		9	N/C	-
		10	N/C	-
		11	N/C	-
		12	N/C	-
CN8	.100" 10-Pin Header dual row. Electronic Coin Mech	1	Ground	-
		2	12V	-
		3	Coin 5	-
		4	Coin 6	-
		5	N/C	-
		6	Coin Enable/Inhibit (+)	-
		7	Coin 1	-
		8	Coin 2	-
		9	Coin 3	-
		10	Coin 4	-

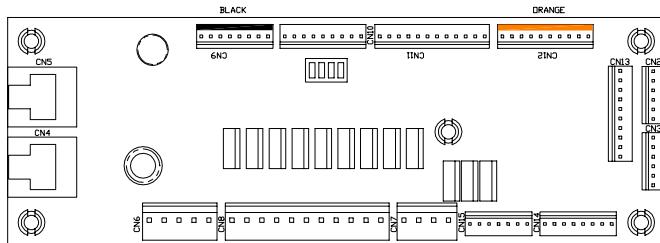


CN9	.100" 6-Pin Header Dollar Bill Acceptor	1	Coin Enable/DBA Inhibit (-)	-
		2	Coin Enable/DBA Inhibit (+)	-
CN10	.100" 6-Pin Header Service Switch In	3	Key	Key
		4	DBA 12V	ORG
CN11	.100" 5-Pin Header Ticket Dispenser	5	Coin 6 / DBA Credit	-
		6	Ground	BLK-ORG
CN12	.100" 10-Pin Header CPU Direct Switches	1	Service Back (To Coindoor)	LGN-BLK
		2	Service Down (To Coindoor)	LGN-BLU
CN14	.156" 5-Pin Header Power Input	3	Service Up (To Coindoor)	LGN-VIO
		4	Service Select (To Coindoor)	LGN-GRY
CN15	.100" 6-Pin Header Spare LED's	5	Key	Key
		6	Service Ground (To Coindoor)	BLK
CN16	.156" 5-Pin Header Shaker Motor	1	12V	RED
		2	N/C	-
*Varies by country model				



4.3 LOWER PLAYFIELD 48V DRIVER PINOUT NODE 8

520-7017-72



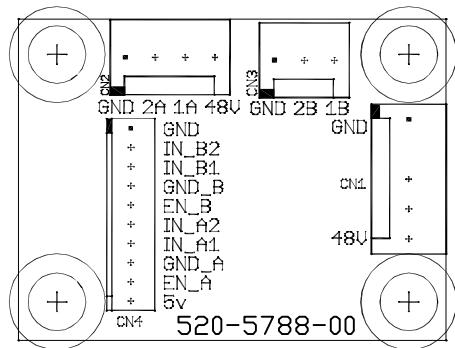
ID	Type	Pin	Description	Wire Color
SW1	Address DIP	-	Node 8 - OFF-OFF-OFF-OFF-OFF	-
CN4	RJ45	-	SPIKE Node Bus	Multi
CN5	RJ45	-	SPIKE Node Bus	Multi
CN6 .156" 5-Pin Header Node Power	1	Ground	BLK	
	2	Key	Key	
	3	N/C	-	
	4	N/C	-	
	5	48VDC In	GRY	
CN7 .156" 4-Pin Header (White)	1	48V Driver Power	GRY-ORG	
	2	8-DR-8 Driver Return	-	
	3	8-DR-6 Driver Return	YEL-BLK	
	4	8-DR-7 Driver Return	YEL-BRN	
CN8 .156 11-Pin Header (White)	1	48V Driver Power	GRY-ORG	
	2	48V Driver Power	GRY-ORG	
	3	48V Driver Power	GRY-ORG	
	4	48V Driver Power	GRY-ORG	
	5	8-DR-0 Driver Return	ORG-GRN	
	6	8-DR-5 Driver Return	ORG-YEL	
	7	8-DR-1 Driver Return	ORG-GRY	
	8	8-DR-8 Driver Return	-	
	9	8-DR-4 Driver Return	ORG-WHT	
	10	8-DR-2 Driver Return	ORG-VIO	
	11	8-DR-3 Driver Return	ORG-BLU	
CN9 .100" 8-Pin Header (Black)	1	V+	-	
	2	V+	-	
	3	8-SW-24 Switch	GRY-RED	
	4	8-SW-25 Switch	GRY-BRN	
	5	8-SW-26 Switch	VIO-WHT	
	6	8-SW-27 Switch	VIO	
	7	Ground	BLK-GRN	
	8	Ground	BLK-VIO	
CN10 .100" 9-Pin Header	1	V+	-	
	2	8-SW-28 Switch	GRY-WHT	
	3	8-SW-29 Switch	GRY-VIO	
	4	8-SW-30 Switch	GRY-BLU	
	5	8-SW-31 Switch	GRY-GRN	
	6	8-SW-16 Switch	GRY-YEL	
	7	Ground	BLK-GRN	
	8	Ground	BLK-GRN	
	9	Ground	BLK-GRN	

CN11 .100" 12-Pin Header	1	V+	-
	2	8-SW-26 Switch	-
	3	8-SW-27 Switch	-
	4	8-SW-17 Switch	LGN-RED
	5	8-SW-18 Switch	LGN-ORG
	6	8-SW-19 Switch	LGN-YEL
	7	8-SW-20 Switch	LGN-BLU
	8	8-SW-21 Switch	-
	9	8-SW-22 Switch	LGN-GRY
	10	8-SW-23 Switch	LGN-WHT
	11	Ground	BLK-ORG
	12	Ground	BLK-ORG
CN12 .100" 10-Pin Header (Orange)	1	V+	-
	2	8-SW-8 Switch	WHT-BRN
	3	8-SW-9 Switch	WHT-RED
	4	8-SW-10 Switch	WHT-ORG
	5	8-SW-11 Switch	-
	6	8-SW-12 Switch	-
	7	8-SW-13 Switch	-
	8	8-SW-14 Switch	PNK-BLK
	9	8-SW-15 Switch	PNK-BRN
	10	Ground	BLK-RED
CN13 .100" 10-Pin Header	1	V+	-
	2	8-SW-0 Switch	-
	3	8-SW-1 Switch	-
	4	8-SW-2 Switch	-
	5	8-SW-3 Switch	-
	6	8-SW-4 Switch	-
	7	8-SW-5 Switch	-
	8	8-SW-6 Switch	-
	9	8-SW-7 Switch	-
	10	Ground	-
	11	Ground	-
CN14 .100" 8-Pin Header	1	Ground	-
	2	8-LP-7 Driver Return	BRN-RED
	3	8-LP-6 Driver Return	BRN-ORG
	4	8-LP-5 Driver Return	BRN
	5	8-LP-4 Driver Return	BRN-YEL
	6	8-LP-3 Driver Return	BRN-BLU
	7	LED V+	YEL
	8	LED V+	YEL
CN15 .100" 7-Pin Header	1	LED V+	YEL-RED
	2	LED V+	YEL-BLK
	3	LED V+	-
	4	-	-
	5	8-LP-0 GI Return	RED-BLK
	6	8-LP-1 GI Return	WHT-BLK
	7	8-LP-2 GI Return	-
CN2 .100" 6-Pin Header, Node Extension Bus	1	Ground	BLK
	2	DIN	VIO-BLK
	3	DOUT	VIO-BRN
	4	SCK	VIO-RED
	5	RCK	VIO-ORG
	6	V+	RED
CN3 .100" 6-Pin Header, Node Extension Bus	1	Ground	BLK
	2	DIN	VIO-BLK
	3	DOUT	VIO-BRN
	4	SCK	VIO-RED
	5	RCK	VIO-ORG
	6	V+	RED

ELECTRONIC PINOUTS AND SCHEMATICS

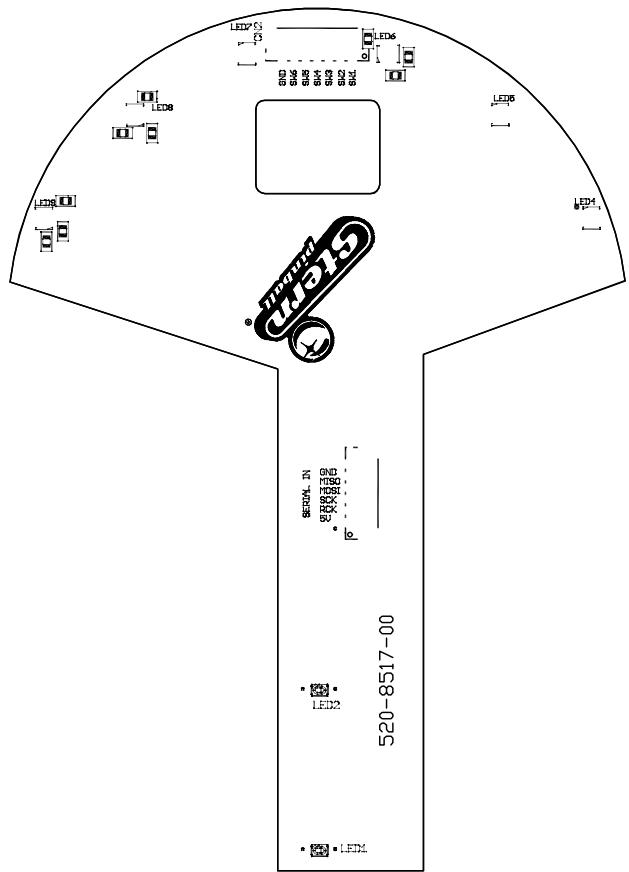
4.12 DUAL MOTOR DIRECT DRIVER BOARD 9A2

520-5788-00



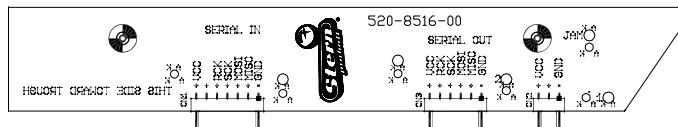
4.13 MINI PLAYFIELD LED BOARD 9B

520-8517-00



4.14 TROUGH SERIAL OPTO RECEIVER 8A

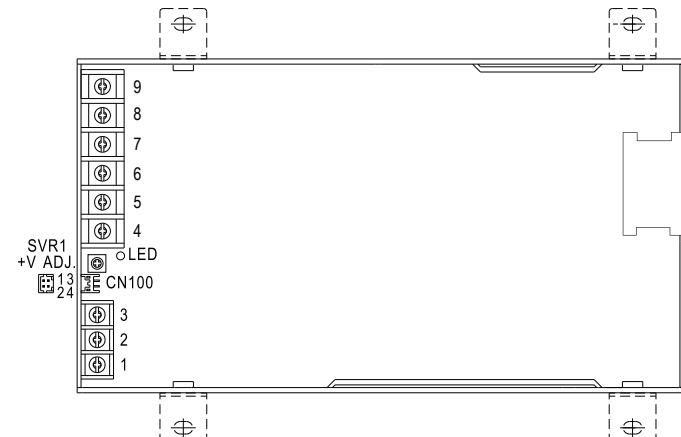
520-8516-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 7-Pin Header	1	Ground	BLK
		2	MISO Output Data	VIO-BLK
		3	MOSI Input Data	VIO-BRN
		4	SCK Serial Clock	VIO-RED
		5	RCK Register Clock	VIO-ORG
		6	N/C	-
		7	+5 VDC IN	RED
CN2	.100" 3-Pin Header	1	Ground	-
		2	N/C	-
		3	+5 VDC IN	-
CN3	.100" 6-Pin Header	1	Ground	-
		2	MISO Output Data	-
		3	MOSI Input Data	-
		4	SCK Serial Clock	-
		5	RCK Register Clock	-
		6	V+	-

4.16 MAIN POWER SUPPLY

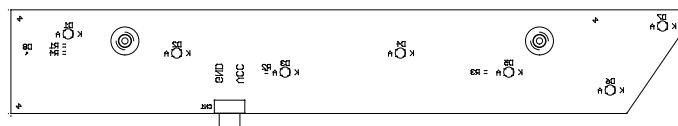
011-5003-00



ID	Type	Pin	Description	Wire Color
CN1	Screw Terminal	1	AC Line Hot In	BLK
		2	AC Line Neutral In	WHT
		3	Earth Ground In	GRN
		4	DC Ground	BLK
		5	DC Ground	BLK
		6	DC Ground	BLK
		7	+48 V System Power	GRY
		8	+48 V System Power	GRY
		9	+48 V System Power	GRY

4.15 TROUGH SERIAL OPTO TRANSMITTER

520-5344-00



ID	Type	Pin	Description	Wire Color
CN1	.100" 3-Pin Header	1	Ground	BLK
		2	N/C	-
		3	+5 VDC IN	RED

5. PARTS REFERENCE

5.1 PLAYFIELD RUBBER PARTS

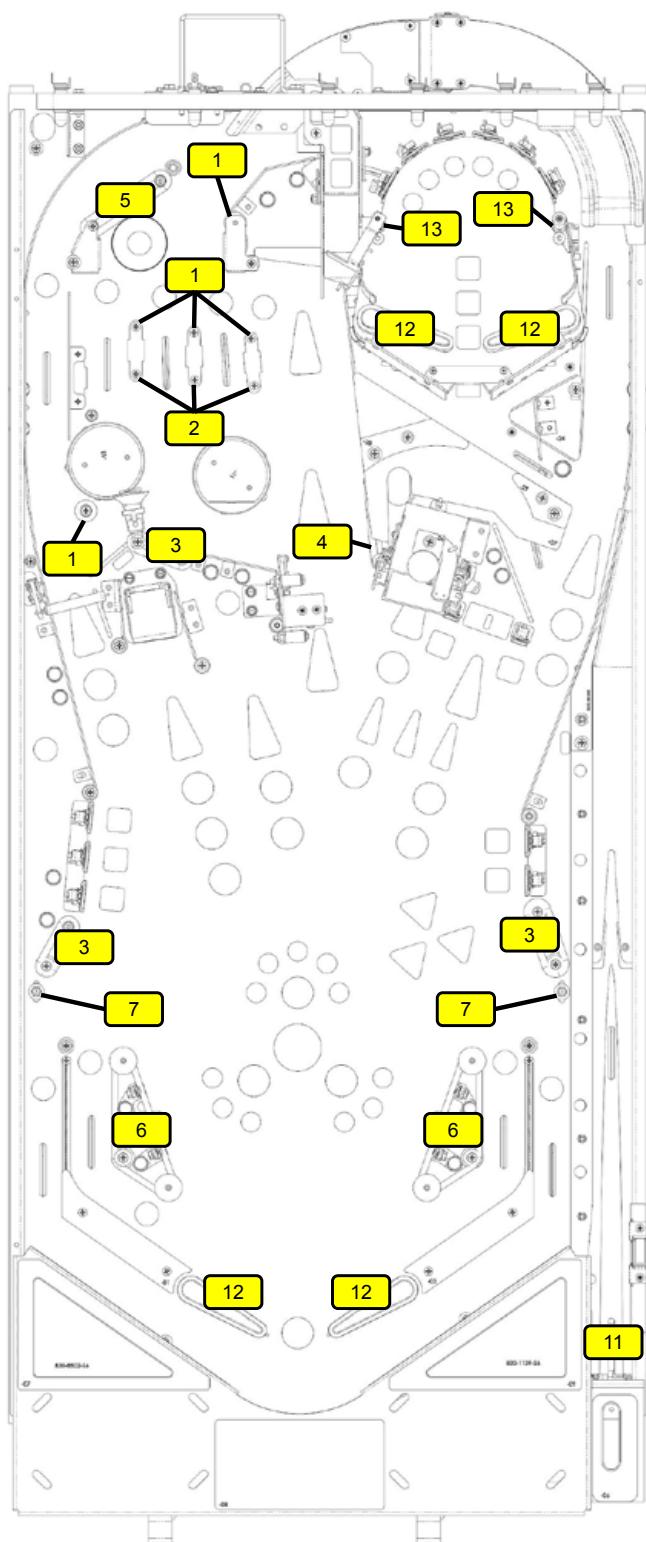


Figure 5.1.1. Rubber o-ring part locations

RUBBER O-RINGS

ID	Qty	Size (ID)	Size (OD)	Durometer	Color	Part Number
1	6	3/16"		50	Black	545-5348-01
2	4	5/16"		50	Black	545-5348-02
3	3	1"		50	Black	545-5348-05
4	1	1-1/4"		50	Black	545-5348-06
5	1	1-1/2"		50	Black	545-5348-07
6	2	2-1/2"		50	Black	545-5348-09
7	4		7/16"	50	Black	545-5348-17

Figure 5.1.2. Rubber o-ring part numbers and usage. ID: Inner Diameter, OD: Outer Diameter, Durometer: Higher number is firmer, less bounce, and more durable.

ID	Qty	Description	Color	Part Number
11	1	Plunger Tip	Black	545-5276-00
12	4	Flipper Rubber	Black	545-5277-00
13	9	Post Sleeve	Black	545-5308-00
14	2	Bumper Pad (Sub assemblies)	Black	545-5105-00
15	4	Bumper Pad (Flippers)	Black	545-5428-00

Figure 5.1.3. Other rubber part numbers and usage

5.2 RUBBER SIZE CHART

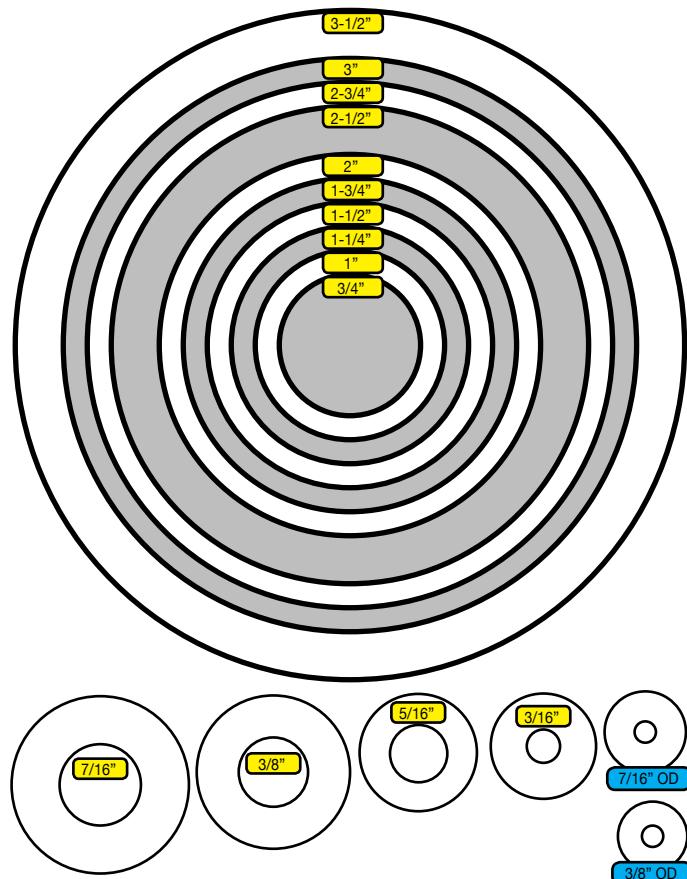
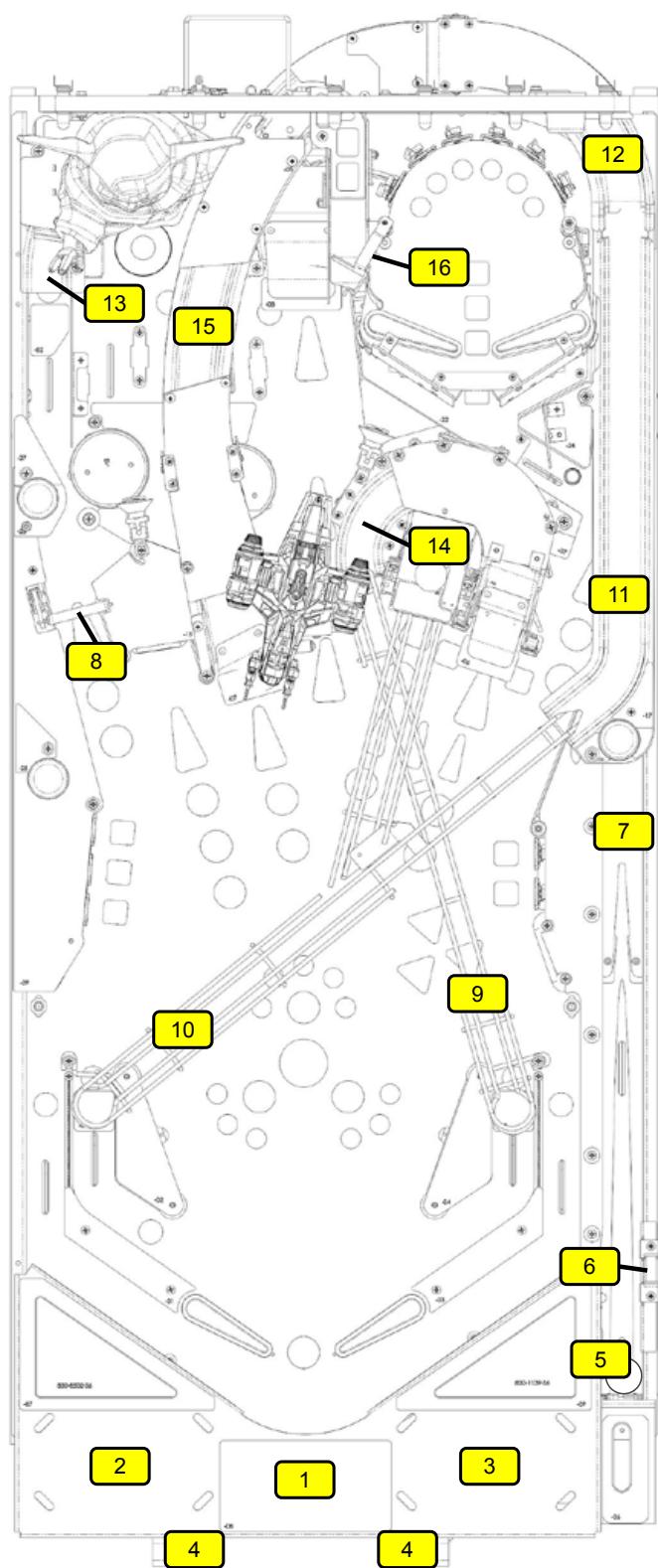


Figure 5.2.1. Rubber ring inner diameter sizing tool. Hold ring up to chart and read largest size on inside of ring. Dimensions are Inner Diameter (ID) unless otherwise noted as Outer Diameter (OD).

PARTS REFERENCE

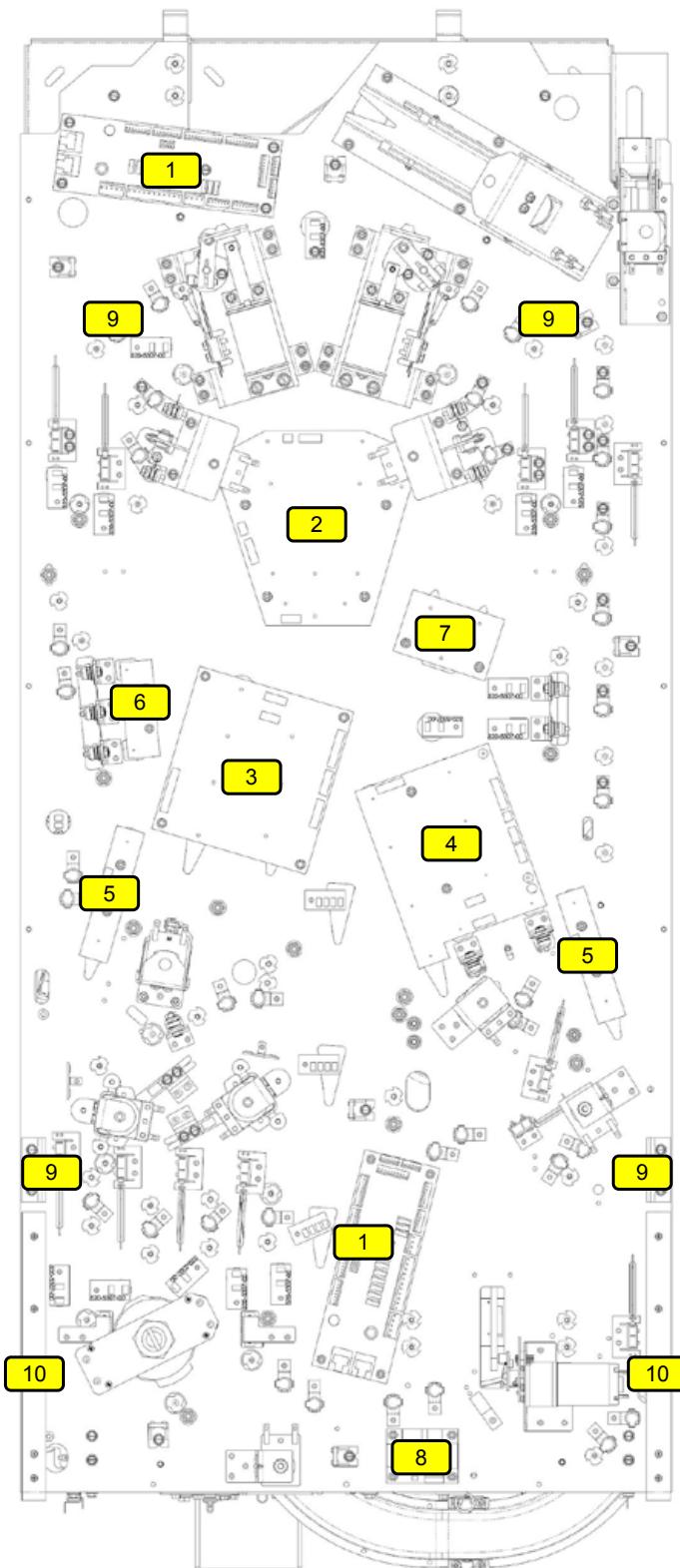
5.3 PLAYFIELD ASSEMBLIES, TOP



ID	Part Number	Description	Qty
1	500-2534-S6	Bottom Arch Assembly [LE]	1
	500-2549-S7	Bottom Arch Assembly [Premium]	1
2	755-51S6-12-Y	Instruction Card	1
3	755-7665-00	SPI Card	1
4	535-8385-01	Welded Hanger Bracket	2
5	260-5000-00	Pinballs	6
6	500-6815-00	Bubble Level Assembly	1
7	535-8145-01	Shooter Lane Ramp	1
8	535-1591-00	Spinner Bracket	1
	515-7088-00	Spinner Target	1
9	515-2378-01	Right Ramp Exit	1
10	515-2378-02	Left Ramp Exit	1
11	545-1242-01	Ramp Extension	1
12	545-1242-04	Rear Ramp	1
13	545-1242-03	Center Ramp	1
14	545-1242-02	Right Ramp	1
15	545-1242-00	Left Ramp	1
16	535-5307-03	One-Way Wire	1

Figure 5.3.1. Major playfield assemblies, Top locations.

5.4 PLAYFIELD ASSEMBLIES, BOTTOM



ID	Part Number	Description	Qty
1	520-7017-72	Core Node Driver Board	2
2	520-8519-00	LED Board - 8b	1
3	520-8520-00	LED Board - 8c	1
4	520-8518-00	LED Board - 9a	1
5	520-8523-00	LED Board - 8b2, 9a1	2
6	520-8524-00	LED Board - 8b1	1
7	520-8522-00	LED Board - 8c1	1
8	520-5788-00	Motor Driver Board	1
9	535-0781-01	Playfield Support Rail	2
10	530-5133-00	Pivot Pin	2
11	535-5988-01	Edge Slide Bracket	2

Figure 5.4.1. Major playfield assemblies, Bottom locations.

PARTS REFERENCE

5.5 BACKBOX PARTS

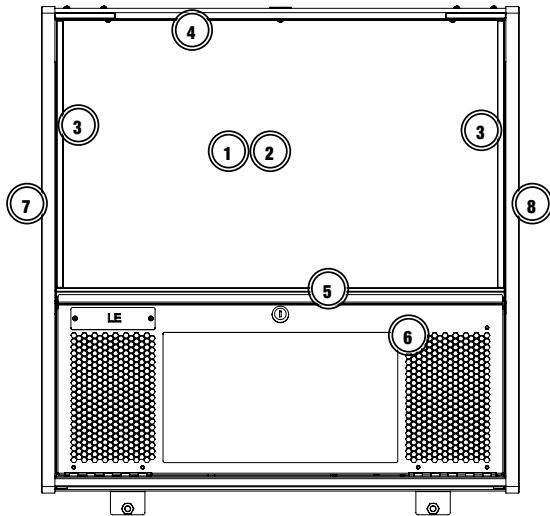


Figure 5.5.1. Backbox external assemblies and components

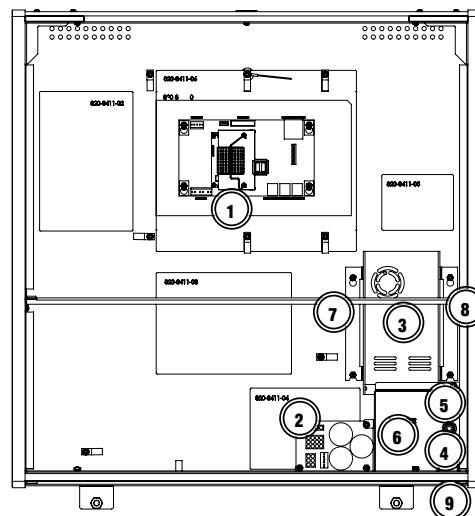


Figure 5.5.2. Backbox internal assemblies and components

EXTERNAL

ID	Part Number	Description	Qty
1	660-5053-00	Backglass	1
2	830-8426-S6	Mirror Backglass [LE]	1
	830-8427-S7	Translite Art [Premium]	1
3	545-5018-17	Plastic Extrusion 15-.450"	2
4	545-5018-15	Glass Channel 26"	1
5	545-6313-01	Glass Lift Channel 26"	1
6	500-9996-00	LCD Speaker Panel Assembly	1
7	820-76S6-01	Left Backbox Decal [LE]	1
	820-76S7-01	Left Backbox Decal [Premium]	1
8	820-76S6-02	Right Backbox Decal [LE]	1
	820-76S7-02	Right Backbox Decal [Premium]	1

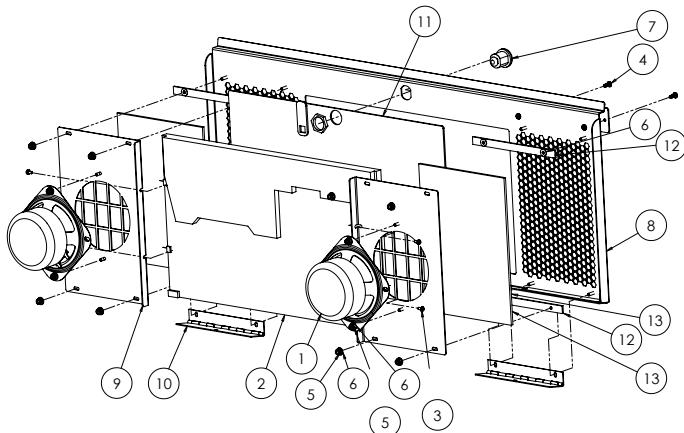
INTERNAL

ID	Part Number	Description	Qty
1	509-1003-01	CPU Node Board	1
2	520-8096-00	Power Distribution Board	1
3	011-5003-00	Power Supply 48V/500W	1
4	515-9769-00	Utility Outlet (USA)	1
5	205-5001-00	Fuse Holder-Screw in	1
	200-5000-05	8A Fuse	1
6	535-1130-00	Cover AC	1
7	535-1129-00	Power Supply Bracket	1
8	535-1129-01	Power Supply Bracket	1
9	180-5001-03	Power Switch	1

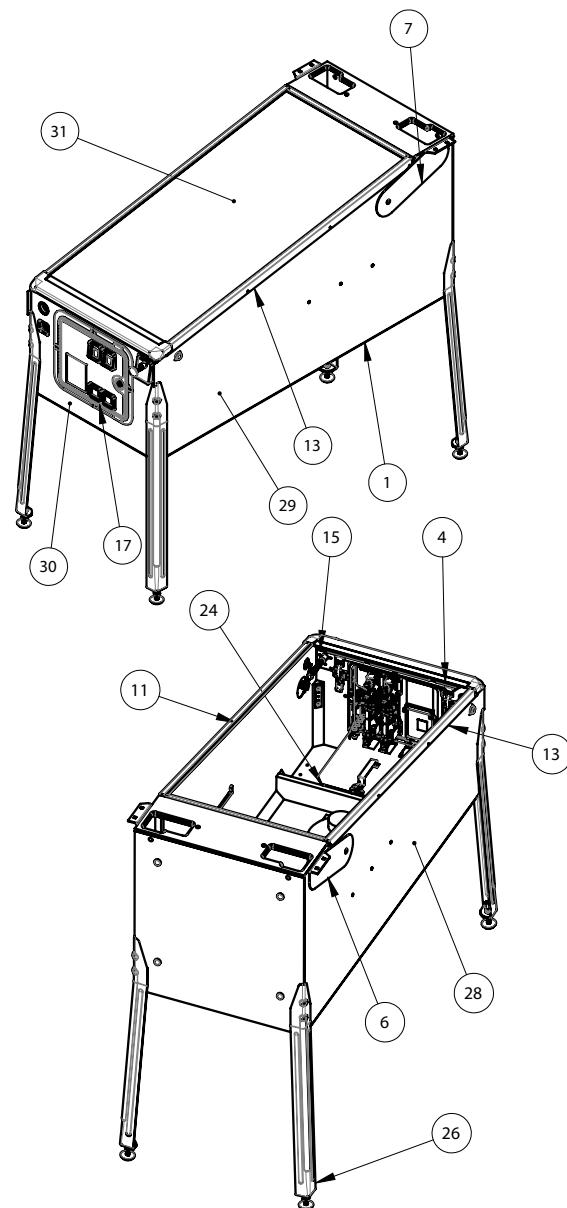
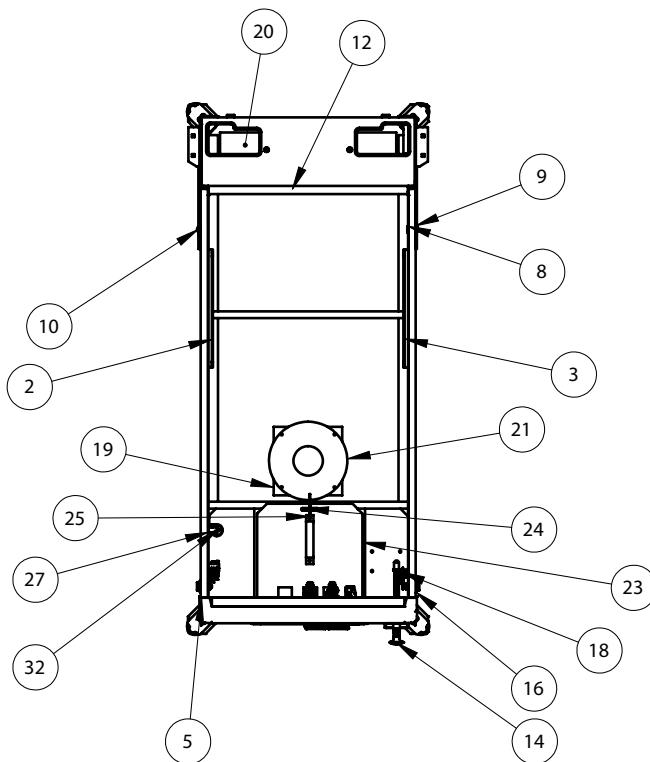
5.6 SPEAKER PANEL PARTS

500-9996-00 / 500-2442-S6

ID	Part Number	Description	Qty
1	031-5004-02	Speaker [Premium]	2
	031-5017-00	Speaker Upgrade 35w 4ohm 5-1/4" Dia. [LE]	2
2	116-0023-00	1366 x 768 Display LCD Panel	1
3	237-6188-01	Screw, M3x0.5 X 6MM PPH Sems Zinc	4
4	237-6307-06	6-32 X 3/8" Torx Stainless Steel Screw	2
5	240-5005-00	6-32 Nylon Stop Nut	12
6	242-5001-00	#6 Washer	16
7	355-5168-00-00	Nut: Lock w/ Cam	1
8	515-9842-00	Speaker Panel - LCD	1
9	515-9843-00	Speaker Plate [Premium]	2
	515-1941-00	Speaker Plate 5-1/4" [LE]	2
10	515-9845-00	Hinge, Speaker Panel, LCD	2
11	545-9877-00	LCD Window	1
12	545-9877-01	Spacer, Small - LCD Speaker Panel	4
13	626-5109-00	Speaker Foam - LCD Panel [Premium]	2
14	545-1046-00	Speaker Black Ring [LE]	2
15	626-5113-00	Speaker Gasket [LE]	2



5.7 CABINET PARTS



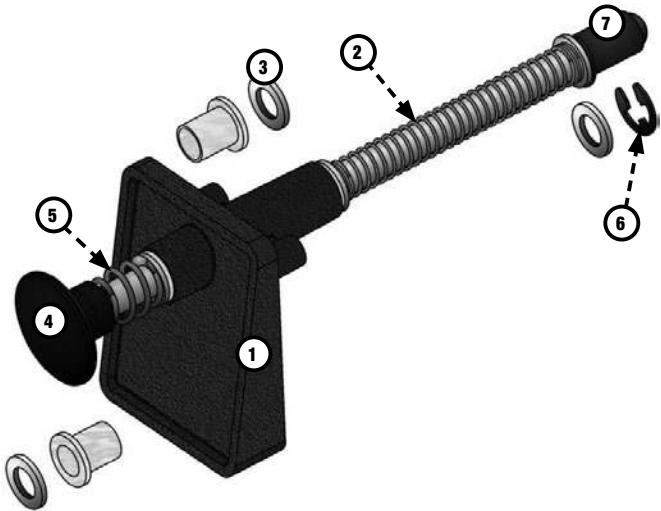
ID	Part Number	Description	Qty
1	525-9750-01	Cabinet (Melamine Single Button)	1
2	535-5989-00	Slide & Pivot Bracket - Left Side	1
3	535-5990-00	Slide & Pivot Bracket - Right Side	1
4	535-2051-00	Cabinet Playfield Support Bracket	1
5	500-2440-59	Front Molding Assembly - Metallic [LE]	1
	500-2440-00	Front Molding Assembly - Wrinkle Black [Premium]	1
6	535-7999-59L	Pivot Hinge, Left - Metallic [LE]	1
	535-7999-00	Pivot Hinge, Left - Wrinkle Black [Premium]	1
7	535-7999-59R	Pivot Hinge, Right - Metallic [LE]	1
	535-7999-01	Pivot Hinge, Right - Wrinkle Black [Premium]	1
8	254-5042-00	Spacer Nut, Hex, 1/2"OD, 1/4-20	2
9	242-5084-00	Washer, 1/2" I.D., 3/16" THK	2
10	231-5072-00	1/4-20 X 1/2" Carriage Bolt	2
11	545-5017-00	Plastic Channel	2
12	545-9802-00	Glass Rear Extrusion	1
13	535-2521-00	Side Armor Left - Metallic [LE]	1
	535-2521-01	Side Armor Right - Metallic [LE]	1
	535-7297-02	Side Armor - Wrinkle Black [Premium]	2
14	500-2600-07-07	Ball Shooter Assembly	1
15	535-5027-01	Plunger Support Plate, Notched	1
16	500-1169-00	Flipper Button Assembly (Black)	2
17	501-5018-173	Coin Door 2-Chute No Emboss	1
18	180-5164-01	Flipper Switch, Double	2
19	545-5072-03	Grill - Speaker / Vent	1
20	545-5072-02	Grill - Speaker / Vent	1
21	031-5007-01	Speaker, Cabinet 8" Round, 4 ohm	1
22	545-5090-00	Cash Box - Plastic	1

23	535-5013-03	Cash Box Cover	1
24	535-7562-00	Cash Box Lock Bracket Wire	1
25	535-7772-00	Hair Pin Clip	1
26	500-5921-59	Leg Assembly - Metallic [LE]	4
	500-5921-50	Leg Assembly - Wrinkle Black [Premium]	4
27	516-0007-00	Tilt Assembly	1
28	820-76S6-03	Decal, Cabinet Left, The Mandalorian LE	1
	820-76S7-03	Decal, Cabinet Left, The Mandalorian Premium	1
29	820-76S6-04	Decal, Cabinet Right, The Mandalorian LE	1
	820-76S7-04	Decal, Cabinet Right, The Mandalorian Premium	1
30	820-76S6-05	Decal, Cabinet Front, The Mandalorian LE	1
	820-76S7-05	Decal, Cabinet Front, The Mandalorian Premium	1
31	660-5001-00	Playfield Glass [Premium]	1
	660-5053-00	High Resolution Glass [LE]	1
32	520-6967-72	Cabinet Node Board	1
33	031-5016-00	Woofer 8" RD 4 OHM	1
	820-76S6-XX 820-76S7-XX	Cabinet Decal Replacement Set	

PARTS REFERENCE

5.8 BALL SHOOTER ASSEMBLY

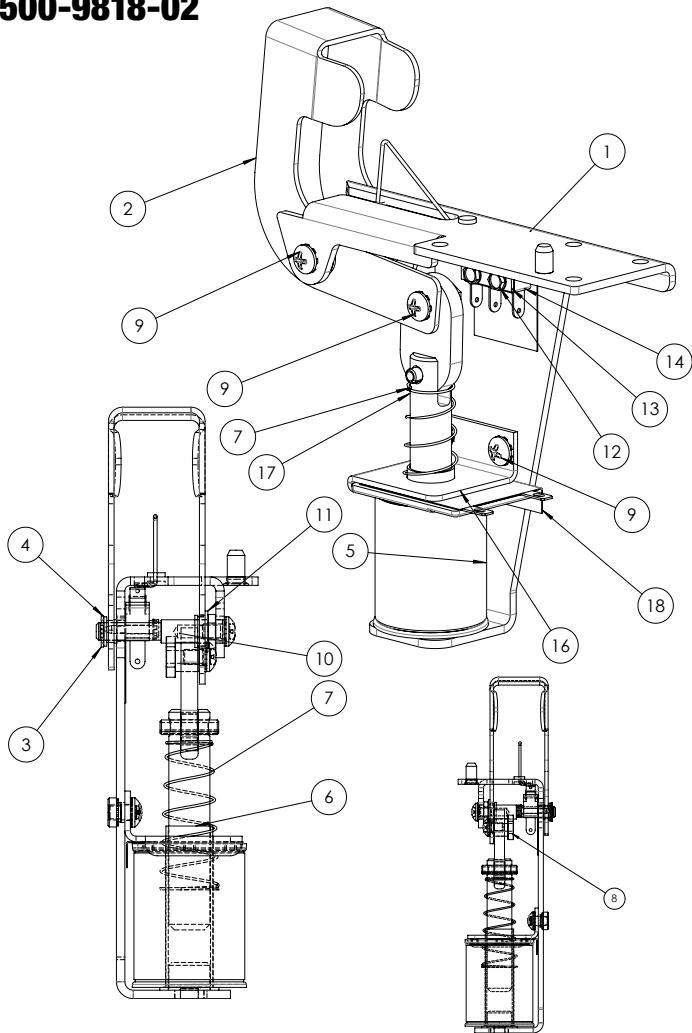
500-2600-07-07



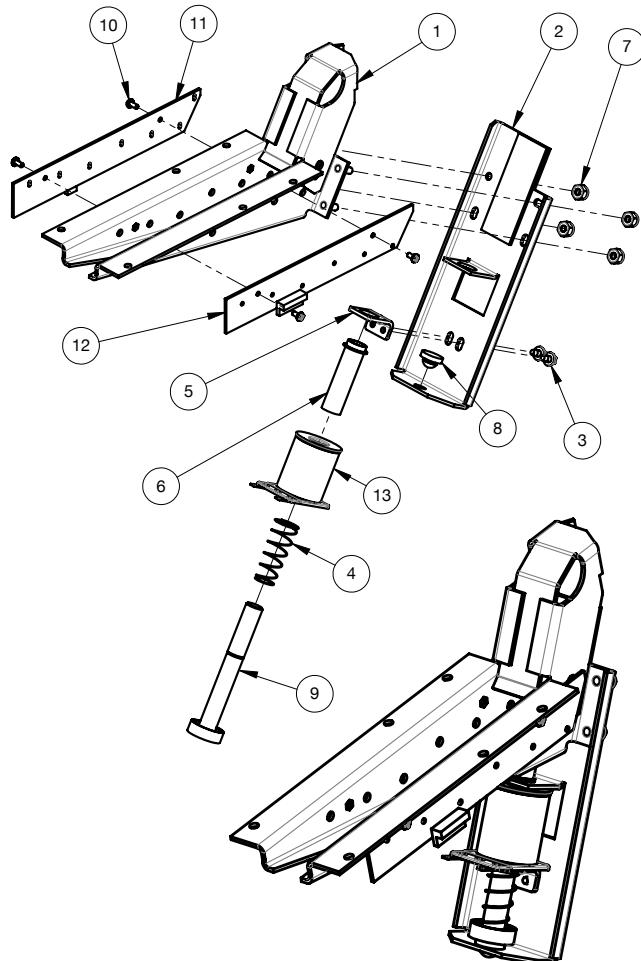
ID	Part Number	Description	Qty
1	535-5067-02	HOUSING ASSEMBLY	1
2	266-5001-07	COMPRESSED SPRING (LONG) - ORANGE	1
3	242-5014-00	WASHER 3/8 ID X 5/8 OD X 1/16"	3
4	515-6557-00	ROD ASSEMBLY	1
5	266-5010-00	COMPRESSED SPRING (SHORT)	1
6	270-5012-00	RETAINING RING, 3/8"	1
7	545-5276-00	RUBBER TIP	1

5.9 AUTO LAUNCH ASSEMBLY

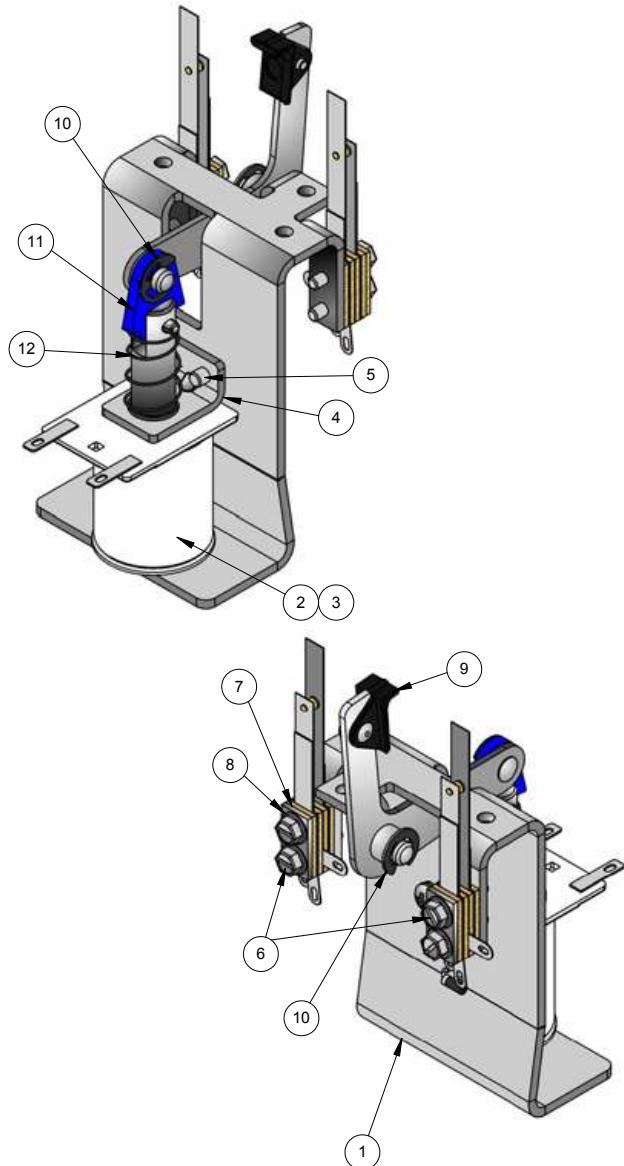
500-9818-02



ID	Part Number	Description	Qty
1	515-9689-00	MAIN BRKT: AUTO-PLUNGER	1
2	535-0728-00	KICKER ARM, AUTO-PLUNGER	1
3	270-5001-00	RETAINING E-RING, 3/16" SHAFT OD	1
4	545-5352-00	NYLINER, 3/16" SHAFT	1
5	090-5044-ND	COIL - 23-800, NO DIODE	1
6	545-5411-00	COIL SLEEVE	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	530-7834-00	PIN: KICKER ARM, AUTO-PLUNGER	1
9	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	4
10	530-7835-00	PIVOT, AUTO-PLUNGER	1
11	545-5423-00	NYLINER, 1/4" SHAFT, 4L1-FF	1
12	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	2
13	535-6539-00	SWITCH BODY PROTECT PLATE	1
14	180-5157-01	SHOOTER SWITCH - SHORT ARM	1
15	545-6268-00	FISCHE PAPER	1
16	535-0762-00	COIL BRACKET-AUTOPLUNGER	1
17	515-6304-03	PLUNGER / LINK ASSEMBLY	1
18	545-0762-00	FISCHE PAPER: AUTO-LAUNCHER	1

5.10 BALL TROUGH ASSEMBLY**500-9820-01**

ID	Part Number	Description	Qty
1	515-7811-00	MAIN BRKT. BALL TROUGH	1
2	515-7812-00	COIL BRACKET, BALL TROUGH	1
3	237-5975-04	SCREW, 8-32 X 1/4" HWH SWAGE SERR	2
4	266-5020-00	COMPRESSION SPRING-CONICAL	1
5	535-5203-03	COIL RETAINING BRACKET	1
6	545-5076-01	COIL SLEEVE	1
7	240-5102-00	8-32 NYLON LOCK NUT	4
8	545-5105-00	RUBBER BUMPER	1
9	515-7309-01	PLUNGER ASSEMBLY	1
10	237-5909-00	SCREW, 4-40 X 1/4" PPH SEMS	4
11	520-5344-00	TRough BOARD #1 - ILED TRANSMITTER	1
12	520-8516-00	TRough BOARD #2 - RECEIVER	1
13	090-5004-ND	COIL 27-1500 - NO DIODE	1
98*	605-5006-00	SHRINK TUBING 1/8"	.42 FT.
99*	036-5611-11-F5	CABLE TROUGH OPTOS	1

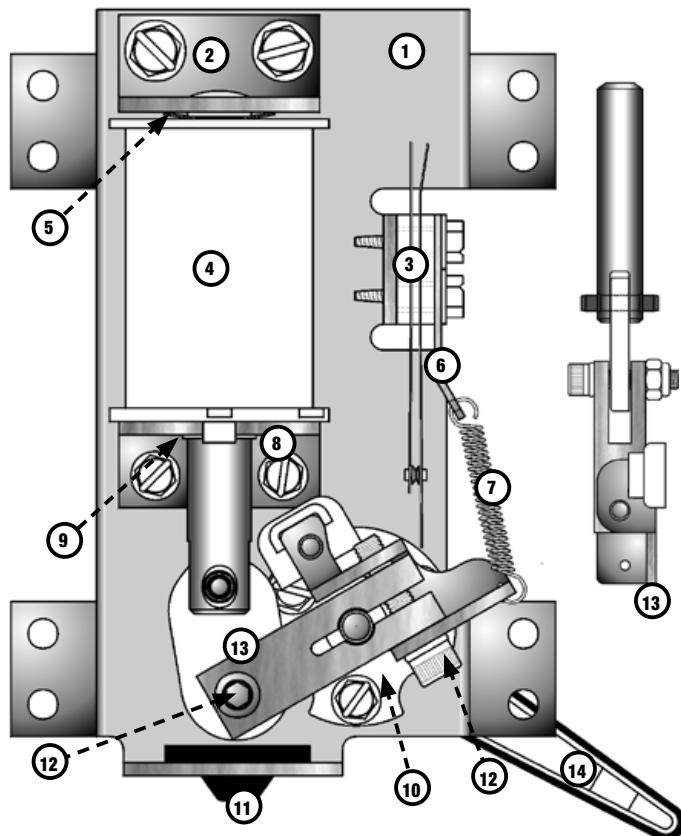
5.11 SLINGSHOT ASSEMBLY**500-9920-01**

ID	Part Number	Description	Qty
1	515-5339-01	SLINGSHOT BRACKET ASSEMBLY	1
2	090-5044-ND	COIL 26-1200 - NO DIODE	1
3	545-5031-00	COIL SLEEVE	1
4	535-5203-03	COIL RETAINER BRACKET	1
5	232-5301-00	8-32 X 3/8 PPH MS EXT SEMS ZC	2
6	180-5231-00	SWITCH SLING SHOT 2 LUG CENTER	2
7	535-5045-00	SWITCH PLATE	2
8	237-5976-04	6-32 X 5/8 SLOT SER HWH SW	4
9	515-5340-01	ARM & TIP ASSEMBLY	1
10	270-5002-00	RETAINING RING - 1/4 DIA	2
11	515-5338-00	PLUNGER & LINK ASSEMBLY	1
12	266-5020-00	COMP SPRING CONICAL	1
13	036-5604-00	4" GENERIC JUMPER	2

PARTS REFERENCE

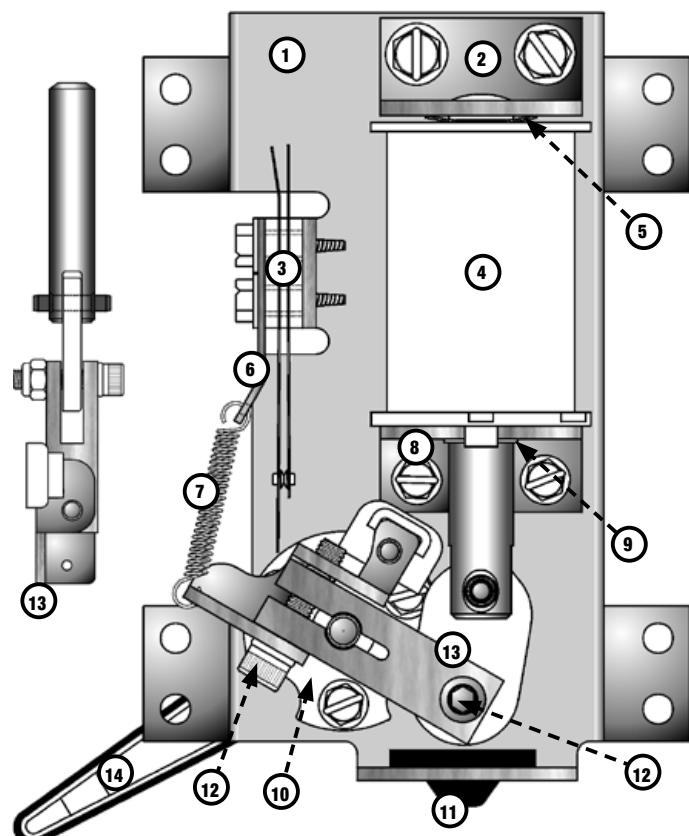
5.12 FLIPPER ASSEMBLY, LEFT

500-6543-12-ND



5.13 FLIPPER ASSEMBLY, RIGHT

500-6543-02-ND

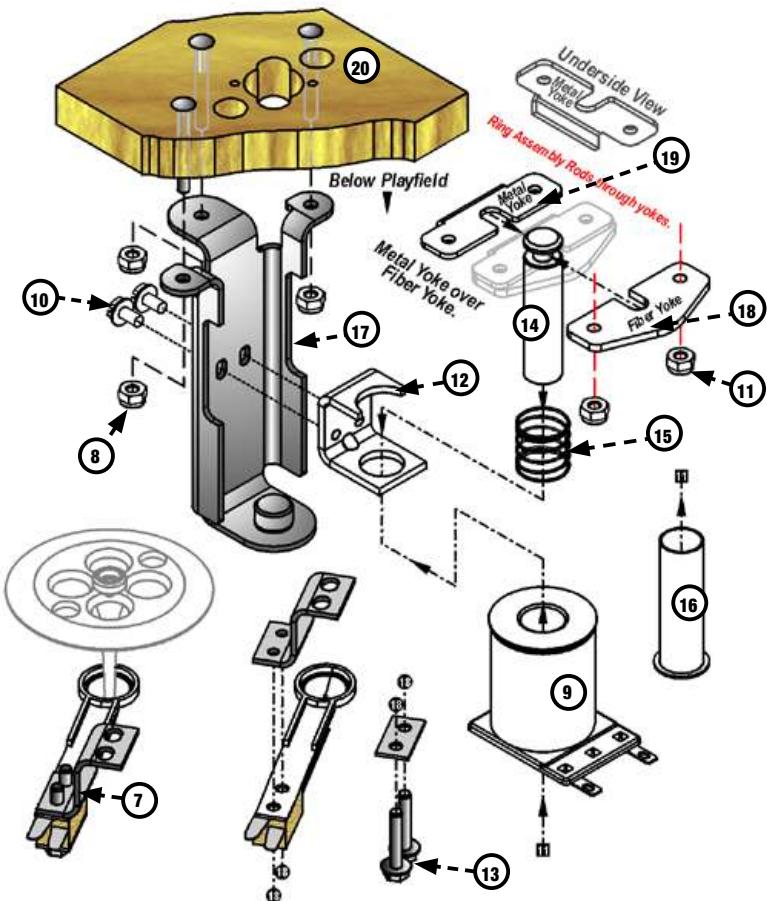
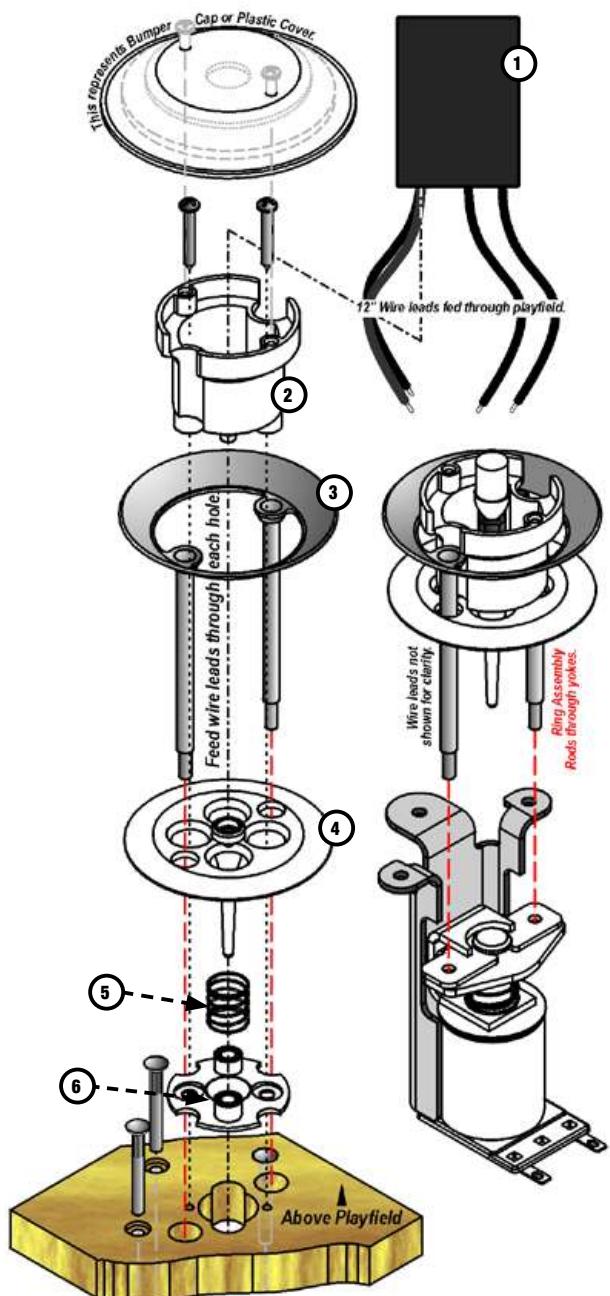


ID	Part Number	Description	Qty
1	515-6617-01	FLIPPER BASE PLATE LEFT KIT W/ BRACKET MOUNT HARDWARE	1
2	515-6308-01	COIL STOP BRACKET	1
3	180-5149-00	SWITCH - END OF STROKE N/C	1
4	090-5032-ND	COIL	1
5	269-5002-00	SPRING WASHER	1
6	535-7354-00	SWITCH RETURN SPRING BRACKET	1
7	265-5035-00	SPRING FLIPPER RETURN	1
8	535-7356-00	COIL SUPPORT BRACKET	1
9	545-5388-00	COIL SLEEVE, FLIPPER	1
10	545-5070-00	FLIPPER BAT BUSHING	1
11	545-5428-00	FLIPPER BUMPER PAD	1
12	237-6144-00	SET SCREW #10-32 x 3/4" SOCKET	2
13	515-7203-01	PLUNGER/CRANK ASSEMBLY, LEFT	1
14	515-5133-06-06	FLIPPER BAT AND SHAFT*	1
	500-6307-10	FLIPPER REBUILD KIT, LEFT	
		* Refer to game rubber chart for flipper rubber color and part number.	

ID	Part Number	Description	Qty
1	515-6617-00	FLIPPER BASE PLATE RIGHT KIT W/ BRACKET MOUNTING HARDWARE	1
2	515-6308-01	COIL STOP BRACKET	1
3	180-5149-00	SWITCH - END OF STROKE N/C	1
4	090-5032-ND	COIL	1
5	269-5002-00	SPRING WASHER	1
6	535-7354-00	SWITCH RETURN SPRING BRACKET	1
7	265-5035-00	SPRING FLIPPER RETURN	1
8	535-7356-00	COIL SUPPORT BRACKET	1
9	545-5388-00	COIL SLEEVE, FLIPPER	1
10	545-5070-00	FLIPPER BAT BUSHING	1
11	545-5428-00	FLIPPER BUMPER PAD	1
12	237-6144-00	SET SCREW #10-32 x 3/4" SOCKET	2
13	515-7203-00	PLUNGER/CRANK ASSEMBLY	1
14	515-5133-06-06	FLIPPER BAT AND SHAFT*	1
	500-6307-00	FLIPPER REBUILD KIT, RIGHT	
		* Refer to game rubber chart for flipper rubber color and part number.	

5.14 POP BUMPER ASSEMBLY

516-6784-XX



Part Number	Description	Qty
515-6459-01L	BUMPER/RING TOP ASSY, W/ LED 1	1
515-6459-04-ND	BUMPER BOTTOM ASSY, NO DIODE	1

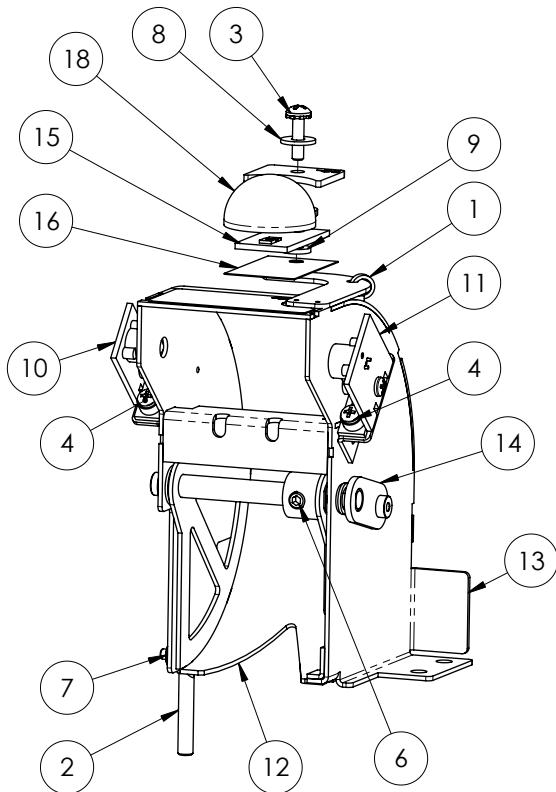
ID	Part Number	Description	Qty
7	500-9934-01	POP BUMPER SWITCH ASSY-2 - LUG-LEFT	1
8	240-5005-00	6-32 NYLON STOP NUT	3
9	090-5044-ND	COIL - 26-1200	1
10	237-5976-01	#6-32 X 1/4" SHWH SWAGE ZN	2
11	240-5005-00	#6-32 NYLON STOP NUT	2
12	535-7347-00	METAL YOKE STOP	1
13	234-5101-00	* 8 X 1/2 SLT	6
14	530-5348-00	PLUNGER, POP BUMPER	1
15	266-5047-00	COMPRESSION SPRING, POP BUMPER	1
16	545-5031-00	COIL SLEEVE	1
17	515-5939-00	COIL BRACKET POP BUMPER ASSY	1
18	545-5609-00	FIBER YOKE	1
19	535-7346-00	METAL YOKE	1
20	237-5957-00	#6-32 x 1-3/16" SPIRAL FIN SHANK SCREW	3

ID	Part Number	Description	Qty
1	520-5307-03	POP BUMPER LED MODULE	1
2	545-5197-00	BUMPER BODY	1
3	515-5085-00	RING AND ROD ASSY	1
4	545-5607-00	BUMPER SKIRT	1
5	266-5048-00	BUMPER SKIRT COMP SPRING	1
6	545-5195-00	BUMPER BASE	1

PARTS REFERENCE

5.15 SCOOP ASSEMBLY

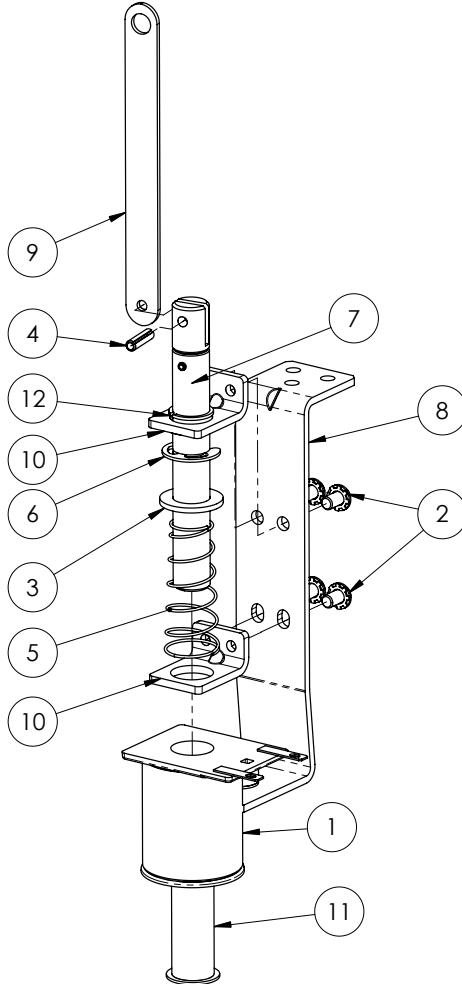
500-2563-00



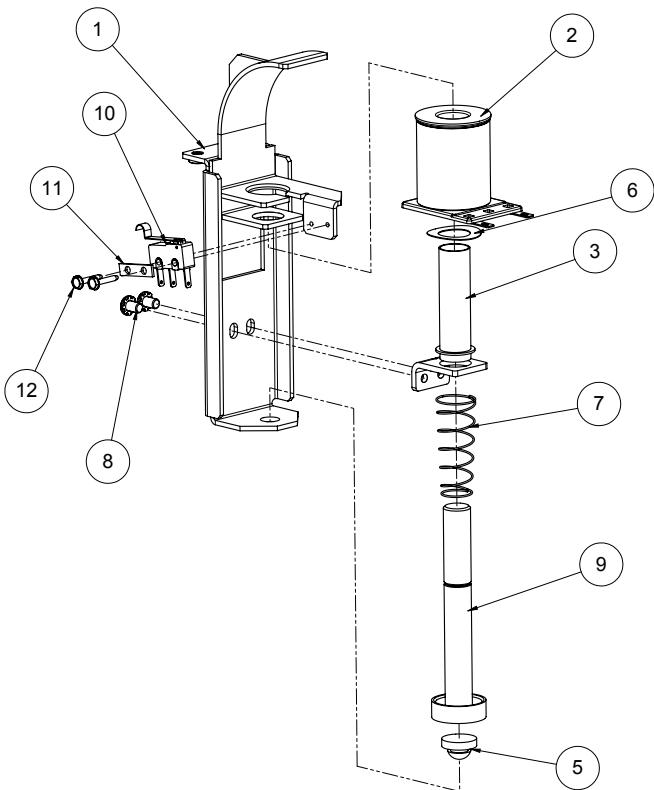
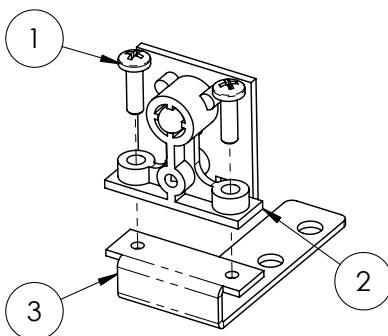
ID	Part Number	Description	Qty
1	040-5001-00B	CABLE TIE-BLACK	2
2	231-5071-00	SPADE BOLT - OFFSET	1
3	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	1
4	237-5997-00	#4-40 X 1/4 PPH MS ZINC	4
5	237-6151-00	4-40 X 5/16 PFH U/C MS	1
6	237-6310-00	SET SCREW, 10-32 X 1/4", SOCKET CUP PT	1
7	240-5318-00	4-40 KEPS NUT	1
8	242-5079-00	.150 I.D. X .312 O.D. X .050 THICK WHITE TEFLON WASHER	1
9	242-5001-00	#6 WASHER	1
10	515-0215-00	LONG RANGE OPTO: Emitter ASSY	1
11	515-0215-01	LONG RANGE OPTO: RECIEVER ASSY	1
12	515-2379-00	SCOOP: MANDALORIAN	1
13	515-2380-00	SCOOP COVER: MANDALORIAN	1
14	515-2381-00	SCOOP LEVER ASSY	1
15	520-7000-00	SINGLE FLASH LED BOARD	1
16	523-0035-00	FISCHE PAPER	1
17	545-5423-00	NYLINER, 1/4" SHAFT, 4L1-FF	2
18	550-5510-02	HAT - TRIMMED - RED SB	1
19	820-1154-42	DECAL: MANDALORIAN -42	1
20	830-8452-36	PFP: MANDALORIAN -36	1

5.16 SCOOP COIL ASSEMBLY

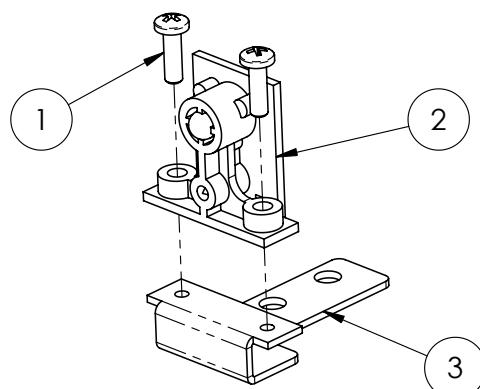
511-1063-00



ID	Part Number	Description	Qty
1	090-5044-ND	COIL 26-1200 - NO DIODE	1
2	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	4
3	242-5081-00	WASHER - NYLON .75 OD x .44 ID	1
4	251-5020-00	ROLL PIN, 1/8 X 1/2	1
5	266-5020-01	COMPRESSION SPRING-CONICAL	1
6	270-5005-00	RETAINING E-RING, 7/16" SHAFT OD	1
7	515-1892-00	SLOTTED PLUNGER, PULL	1
8	515-2426-00	SCOOP LOCKING MTG BRKT	1
9	535-5203-03	COIL RETAINING BRACKET	2
10	535-2594-00	LIFT LINK: MANDALORIAN	1
11	545-5411-00	COIL SLEEVE	1
12	545-5418-01	NYLINER - PLASTIC, 7/16"	1

5.17 EJECT VUK ASSEMBLY**500-1050-00****5.18 CHILD OPTO 01 ASSEMBLY****511-3019-00**

ID	Part Number	Description	Qty
1	237-5997-00	SCREW, 4-40 X 3/8" PPH MS BLACK	2
2	515-0215-01	LONG RANGE OPTO: RECIEVER ASSY	1
3	535-2473-00	BRKT: OPTO MTG	1

5.19 CHILD OPTO 02 ASSEMBLY**511-3020-00**

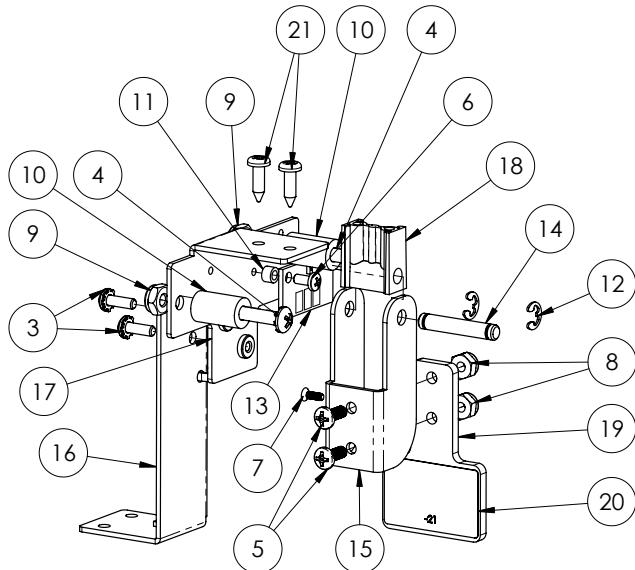
ID	Part Number	Description	Qty
1	515-9984-00	BRACKET - EJECT	1
2	090-5004-ND	COIL 27-1500 - NO DIODE	1
3	545-5076-01	COIL SLEEVE	1
4	535-5203-03	COIL RETAINING BRACKET	1
5	545-5105-00	RUBBER BUMPER	1
6	269-5002-00	SPRING WASHER	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
9	515-7309-00	PLUNGER ASSEMBLY	1
10	180-5209-00	SUB MINIATURE SWITCH - SIM. ROLLER	1
11	535-6539-00	SWITCH BODY PROTECT PLATE	1
12	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	2
	036-5541-00	GENERIC COIL CABLE	1

ID	Part Number	Description	Qty
1	237-5997-00	SCREW, 4-40 X 3/8" PPH MS BLACK	2
2	515-0215-00	LONG RANGE OPTO: Emitter ASSY	1
3	535-2473-01	BRKT: OPTO MTG #2	1

PARTS REFERENCE

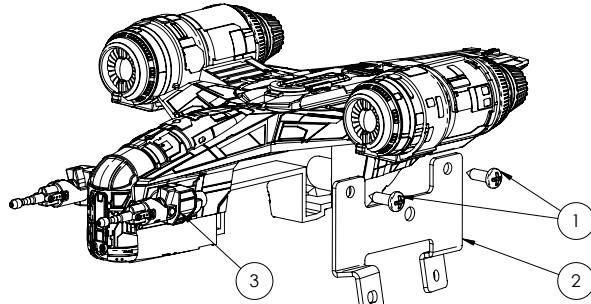
5.20 RAZOR CREST ASSEMBLY

511-5791-00



5.21 RAZOR CREST SHIP ASSEMBLY

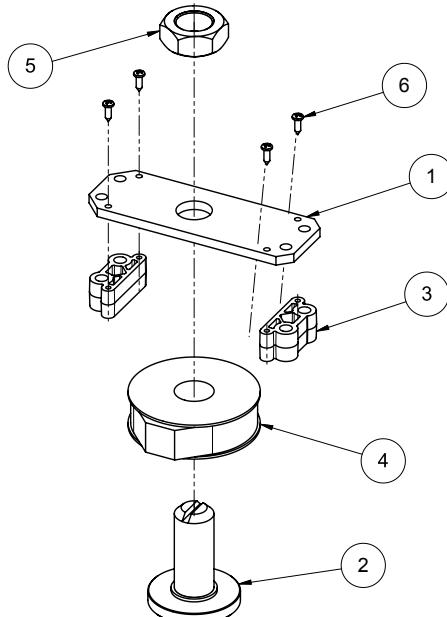
511-5792-00



ID	Part Number	Description	Qty
1	237-5815-00	SCREW, #4 X 3/8" PPH AB	2
2	535-5999-25	BALL GUIDE: MANDALORIAN -25	1
3	880-6256-00	RAZOR CREST	1

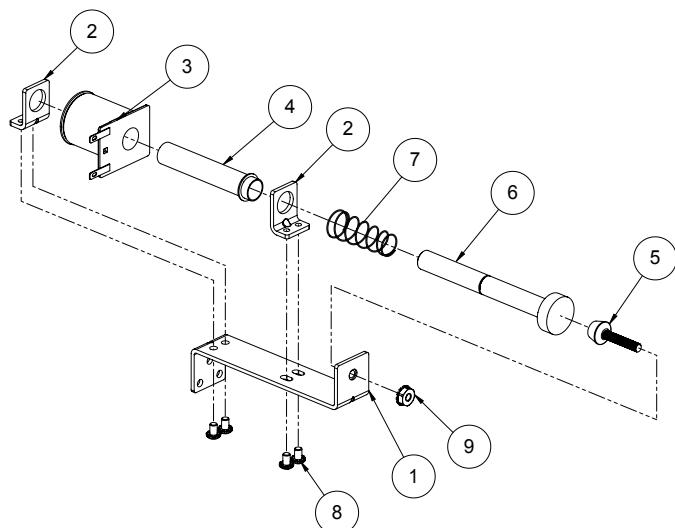
5.22 PLAYFIELD MAGNET ASSEMBLY

500-1171-01

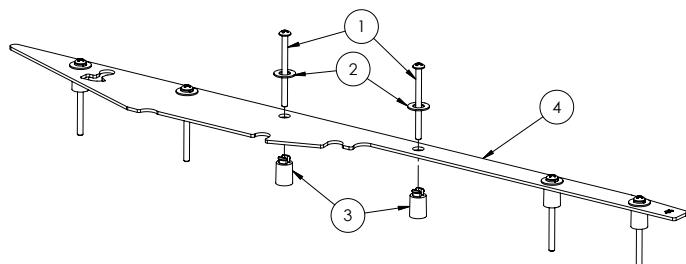


ID	Part Number	Description	Qty
1	040-5001-00B	CABLE TIE-BLACK	1
2	090-5097-00	MAGNET, 1/4" X .125", #2 CSINK, AXIAL	1
3	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	2
4	232-5306-00	SCREW, 8-32 X 1.00" PPH SEMS	2
5	237-5805-00	SCREW, #6 X 1/2" PPH AB BLACK	2
6	237-6322-00	#6-32 x 3/8" PAN, PHILL, BLACK	2
7	237-6331-00	SCREW, 4-40 X 1/4" PPH MS BLACK	2
8	237-6366-00	2-56 x 1/4" PFH MS	1
9	240-5005-00	6-32 NYLON STOP NUT	2
10	240-5105-00	8-32 NYLON LOCK NUT, LOW-PROFILE	2
11	254-5000-14	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 5/8"	2
12	254-5090-03	PLASTIC SPACER #4 SCREW, 3/16" OD - 1/8" LENGTH	2
13	270-5001-00	RETAINING E-RING, 3/16" SHAFT OD	2
14	520-8528-00	PCA MAG SENSOR OMNI-POL	1
15	530-7812-13	PIVOT PIN-.188 DIA.	1
16	535-2501-01	FOR PRO	1
17	535-5999-17	BALL GUIDE -17, MANDALORIAN	1
18	535-5999-28	MOUNTING BRKT RC	1
19	545-1269-00	PIVOT BLOCK, RC	1
20	545-1294-00	TARGET RC	1
21	820-1154-21	DECAL: MANDALORIAN -21	1

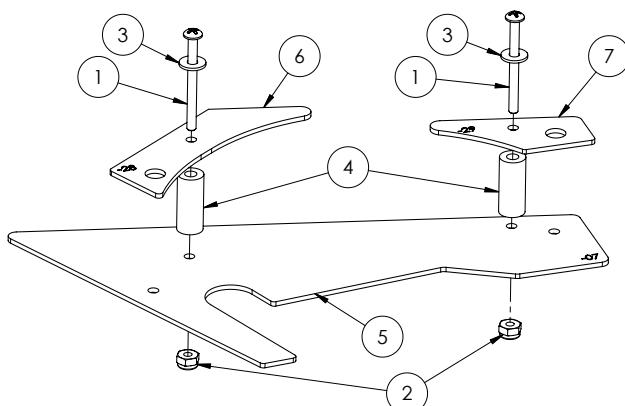
ID	Part Number	Description	Qty
1	535-2063-01	PLATE, OFFSET MAGNET MOUNT, NON-FERROUS	1
2	530-5320-07	MAGNET CORE W/ STAINLESS PROTECTOR	1
3	550-7365-00	MAGNET MOUNTING BLOCK	2
4	511-5065-ND	MAGNET / CONNECTOR ASSY, 22-650	1
5	240-5315-00	3/4-16 HEX JAM NUT	1
6	237-5815-00	SCREW, #4 X 3/8" PPH AB	4

5.23 BALL DEFLECTOR ASSEMBLY**500-7081-02**

ID	Part Number	Description	Qty
1	535-9248-00	BRACKET	1
2	535-5203-03	COIL RETAINING BRACKET	2
3	090-5044-ND	COIL 26-1200 - NO DIODE	1
4	545-5847-00	COIL SLEEVE	1
5	280-5014-00	ADJUSTABLE BUMPER/STOP	1
6	515-7653-00	PLUNGER ASSEMBLY	1
7	266-5020-00	COMPRESSION SPRING-CONICAL	1
8	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	4
9	240-5208-00	10-32 KEPS NUT	1

5.24 PLASTIC 05 ASSEMBLY**511-3000-05**

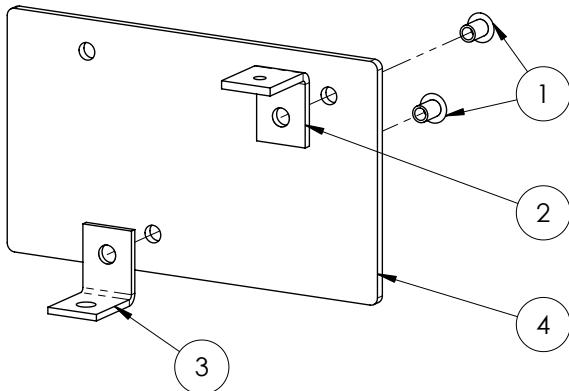
ID	Part Number	Description	Qty
1	237-5511-00	SCREW, 6-32 X 1-3/4" PPH	6
2	242-5091-00	WASHER, 1/2 X 17/64 X .03 - DT	6
3	254-5054-00	PLASTICS MTG SPACER, .500	6
4	830-8452-05	PFP: MANDALORIAN -05	1

5.25 PLASTIC 07 ASSEMBLY**511-3000-07**

ID	Part Number	Description	Qty
1	237-5510-00	SCREW, 6-32 X 1-1/2" PPH	2
2	240-5005-00	6-32 NYLON STOP NUT	2
3	242-5001-00	#6 WASHER	2
4	254-5000-11	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 7/8"	2
5	830-8452-07	PFP: MANDALORIAN -07	1
6	830-8452-28	PFP: MANDALORIAN -28	1
7	830-8452-29	PFP: MANDALORIAN -29	1

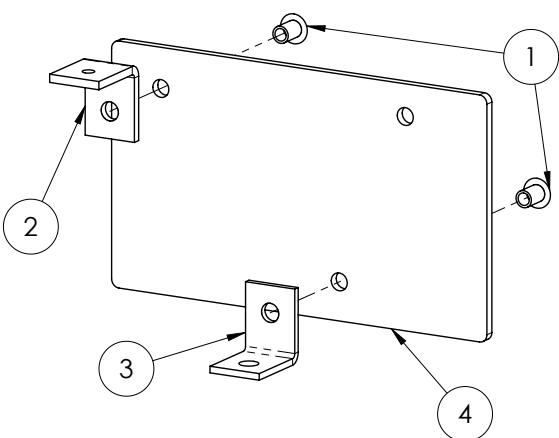
PARTS REFERENCE

5.26 RIVETED PLASTIC 06 ASSEMBLY 510-7920-06



ID	Part Number	Description	Qty
1	249-5001-00	RIVET - 1/8 X 3/16	2
2	535-1305-00	BRACKET - PLASTIC MTG	1
3	535-8941-04	BRACKET - PLASTIC MTG	1
4	830-1153-06	PFP: MANDALORIAN -06	1

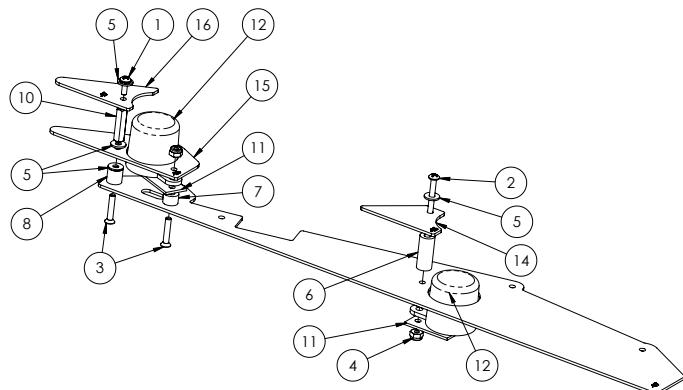
5.27 RIVETED PLASTIC 07 ASSEMBLY 510-7920-07



ID	Part Number	Description	Qty
1	249-5001-00	RIVET - 1/8 X 3/16	2
2	535-1305-00	BRACKET - PLASTIC MTG	1
3	535-8941-04	BRACKET - PLASTIC MTG	1
4	830-1153-07	PFP: MANDALORIAN -07	1

5.28 PLASTIC 09 ASSEMBLY

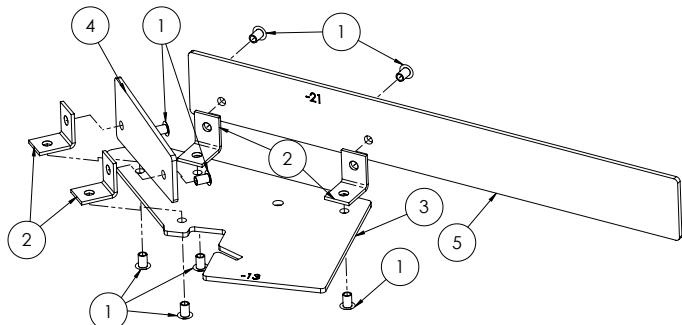
511-3000-09



ID	Part Number	Description	Qty
1	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	1
2	237-5511-00	SCREW, 6-32 X 1-3/4" PPH	1
3	237-5836-00	SCREW, 6-32 X 3/4" PFH ZINC	2
4	242-5001-00	#6 WASHER	4
5	240-5005-00	6-32 NYLON STOP NUT	2
6	254-5008-05	HEX SPACER - 7/8 "	1
7	254-5000-09	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 1/4"	1
8	254-5000-11	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 7/8"	1
9	254-5000-12	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 3/8"	1
10	254-5000-19	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 1/8"	1
11	520-7000-00	SINGLE FLASH LED BOARD	2
12	550-7418-02	MINI MARS W/ EARS - RED SB	2
13	830-8452-09	PLASTIC: MANDALORIAN -09	1
14	830-8452-25	PFP: MANDALORIAN -25	1
15	830-8452-26	PFP: MANDALORIAN -26	1
16	830-8452-27	PFP: MANDALORIAN -27	1

5.29 RIVETED PLASTIC 13 ASSEMBLY

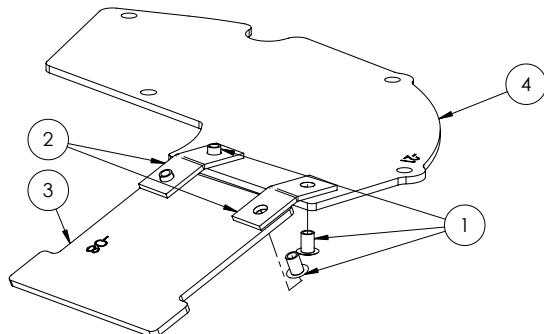
510-7920-13



ID	Part Number	Description	Qty
1	249-5001-00	RIVET - 1/8 X 3/16	8
2	535-8941-04	BRACKET - PLASTIC MTG	4
3	830-1153-13	PFP: MANDALORIAN -13	1
4	830-1153-15	PFP: MANDALORIAN -15	1
5	830-1153-21	PFP: MANDALORIAN -21	1

5.31 RIVETED PLASTIC 21 ASSEMBLY

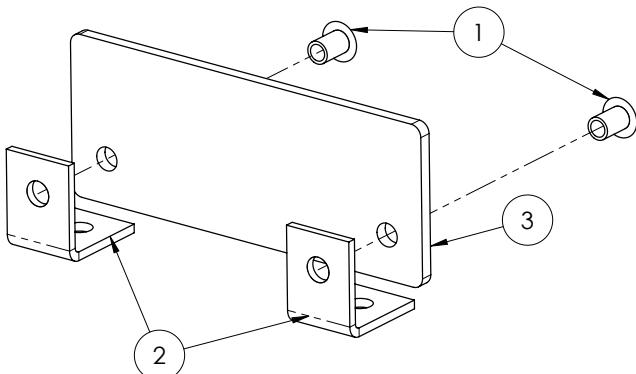
510-7920-21



ID	Part Number	Description	Qty
1	249-5001-00	RIVET - 1/8 X 3/16	4
2	535-8941-09	BRACKET - PLASTIC MTG	2
3	830-1153-08	PFP: MANDALORIAN -08	1
4	830-8452-21	PFP: MANDALORIAN -20	1

5.30 RIVETED PLASTIC 19 ASSEMBLY

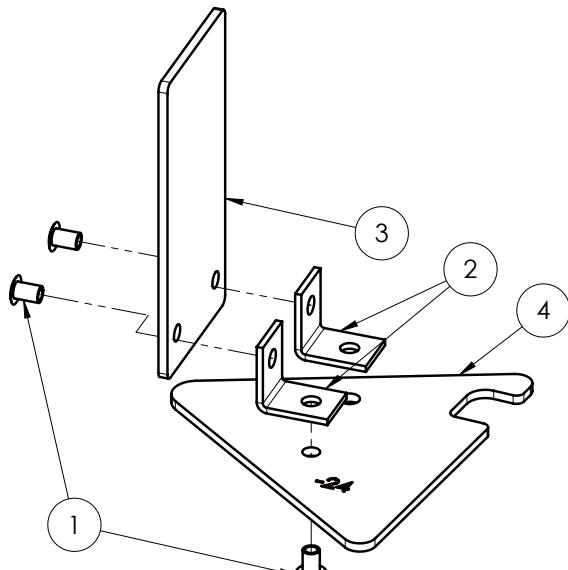
510-7920-19



ID	Part Number	Description	Qty
1	249-5001-00	RIVET - 1/8 X 3/16	2
2	535-8941-04	BRACKET - PLASTIC MTG	2
3	830-1153-19	PFP: MANDALORIAN -19	1

5.32 RIVETED PLASTIC 24 ASSEMBLY

510-7920-24

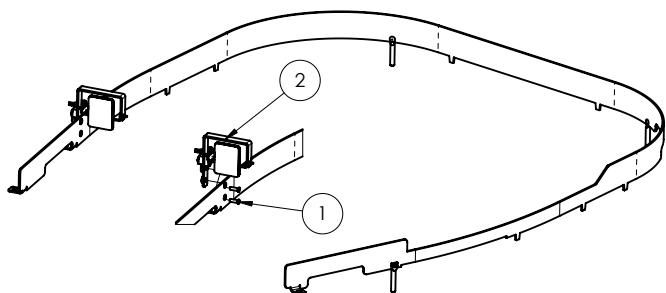


ID	Part Number	Description	Qty
1	249-5001-00	RIVET - 1/8 X 3/16	3
2	535-8941-04	Ø0.14 X Ø0.14 X 90°	2
3	830-1153-20	PFP: MANDALORIAN -20	1
4	830-8452-24	PFP MANDALORIAN -24	1

PARTS REFERENCE

5.33 BALL GUIDE 01 ASSEMBLY

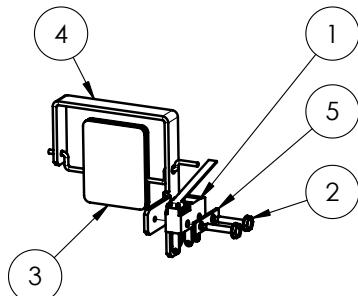
511-2999-01



ID	Part Number	Description	Qty
1	237-5983-01	SCREW, 4-40 X 3/8" PFH MS, SS	2
2	511-7877-00	SPINNER ASSY, BALL GUIDE MNT	1
3	535-5999-01	BALL GUIDE: MANDALORIAN -01	1

5.35 BALL GUIDE SPINNER ASSEMBLY

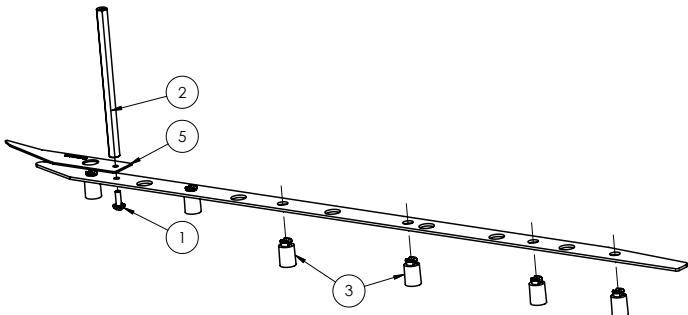
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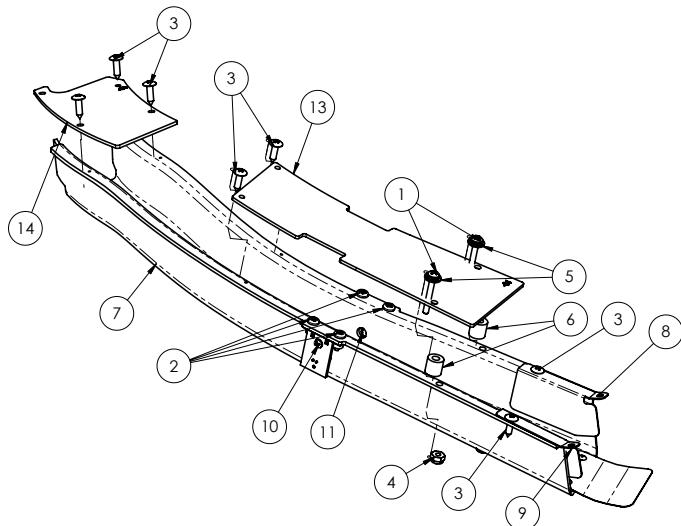
ID	Part Number	Description	Qty
1	180-5010-04	MICRO-SWITCH	1
2	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	2
3	515-7088-00	SPINNER TARGET, NARROW	1
4	535-1591-00	SPINNER BRACKET, BALL GUIDE MNT	1
5	535-6539-00	SWITCH BODY PROTECT PLATE	1

5.34 BALL GUIDE 02 ASSEMBLY

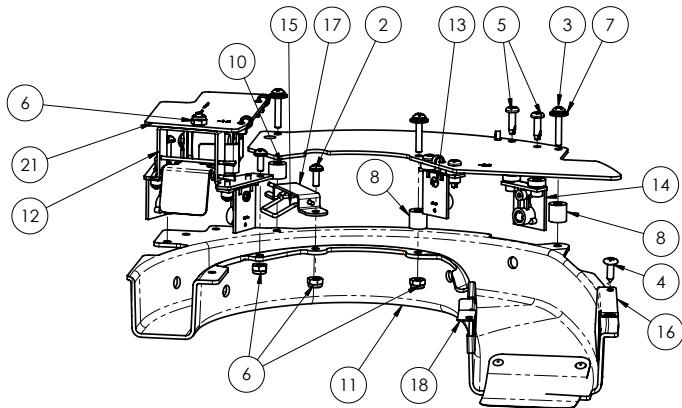
511-2999-02



ID	Part Number	Description	Qty
1	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	1
2	254-5008-36	HEX SPACER - 3 3/4 "	1
3	254-5054-00	PLASTICS MTG SPACER, .500	6
4	535-5999-02	BALL GUIDE: MANDALORIAN -02	1
5	830-8512-02	PFP: MANDALORIAN	1

5.36 LEFT RAMP ASSEMBLY**500-2564-00**

ID	Part Number	Description	Qty
1	232-5206-00	SCREW, 6-32 X 1" PPH SEMS	2
2	237-5880-00	SCREW, #6 X 3/8 PPH T-25	4
3	237-5809-00	SCREW, #6 X 1/2" PTH A	7
4	240-5005-00	6-32 NYLON STOP NUT	2
5	242-5001-00	#6 WASHER	2
6	254-5000-12	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 3/8"	2
7	510-7838-00	RIVETED ASM, LT RAMP, MANDALORIAN	1
8	535-2514-00	RAMP GUARD, RIGHT	1
9	535-2513-00	RAMP GUARD, LEFT	1
10	515-0215-00	LONG RANGE OPTO: Emitter ASSY	1
11	515-0215-01	LONG RANGE OPTO: RECIEVER ASSY	1
12	820-6956-00	DECAL BACKSIDE: MANDALORIAN	1
13	830-1153-04	PFP: MANDALORIAN -04	1
14	830-1153-05	PFP: MANDALORIAN -05	1

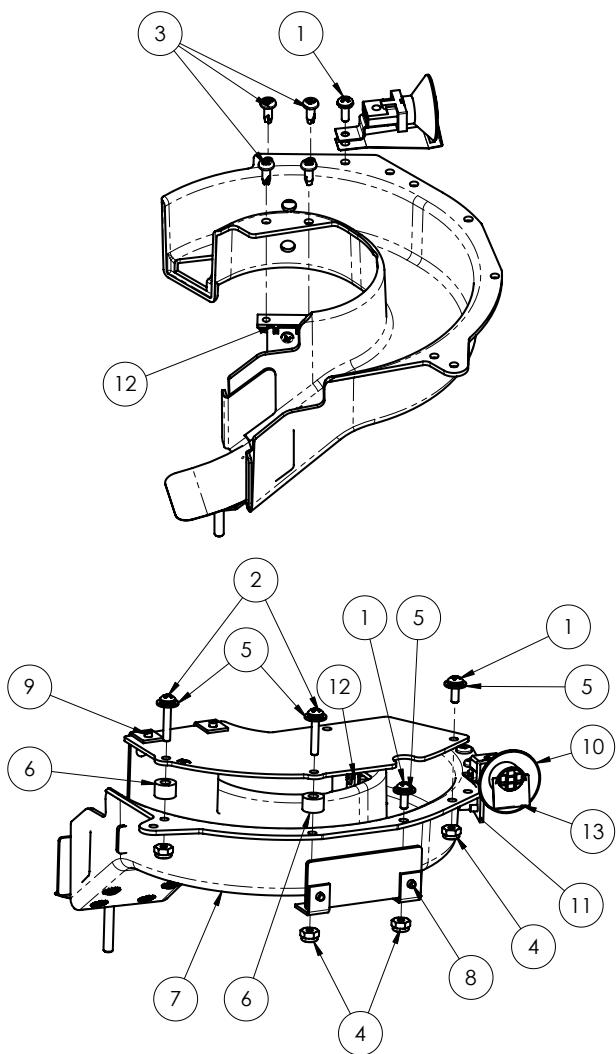
5.37 CENTER RAMP ASSEMBLY**500-2536-00**

ID	Part Number	Description	Qty
1	040-5001-00B	CABLE TIE-BLACK	5
2	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	3
3	232-5204-00	SCREW, 6-32 X 3/4" PPH SEMS	3
4	237-5809-00	SCREW, #6 X 1/2" PTH A	1
5	237-5880-02	SCREW, #6 X 1/2 PPH T-25	4
6	240-5005-00	6-32 NYLON STOP NUT	7
7	242-5001-00	#6 WASHER	3
8	254-5000-12	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 3/8"	2
9	254-5000-19	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 1/8"	4
10	254-5000-20	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 5/16"	1
11	510-7821-00	RIVETED ASM, CTR RAMP, MANDALORIAN	1
12	511-5788-00B	GATE: CENTER RAMP ASSEMBLY	1
13	515-0215-00	LONG RANGE OPTO: Emitter ASSY	1
14	515-0215-01	LONG RANGE OPTO: RECIEVER ASSY	1
15	535-1958-00	WIRE, ONE WAY GATE	1
16	535-2519-00	RAMP GUARD, CR, LEFT	1
17	535-5269-03	ONE WAY GATE BRACKET	1
18	535-2589-00	RAMP GUARD, CR, RIGHT	1
19	820-6956-03	DECAL BACKSIDE: MANDALORIAN -03	1
20	830-1153-02	PFP: MANDALORIAN -02	1
21	830-8452-16	PFP: MANDALORIAN -16	1

PARTS REFERENCE

5.38 RIGHT RAMP ASSEMBLY

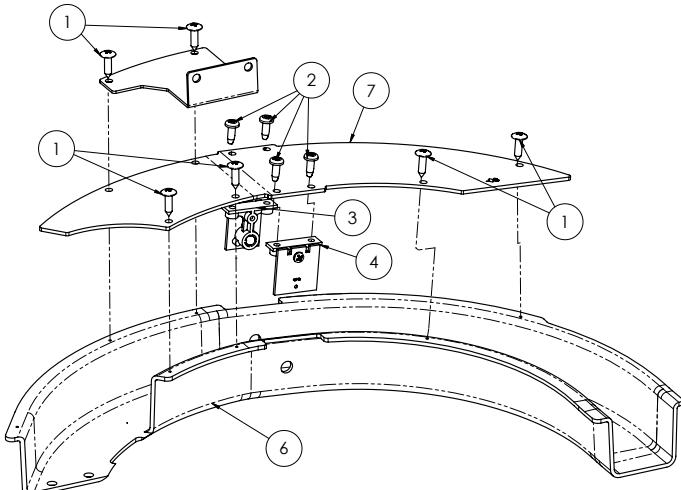
500-2537-00



ID	Part Number	Description	Qty
1	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	3
2	232-5204-00	SCREW, 6-32 X 3/4" PPH SEMS	2
3	237-5880-00	SCREW, #6 X 3/8 PPH T-25	4
4	242-5001-00	#6 WASHER	4
5	240-5005-00	6-32 NYLON STOP NUT	5
6	254-5000-09	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 1/4"	2
7	510-7822-00	RAMP: MANDALORIAN, RIGHT	1
8	510-7920-19	RIVETED ASSEMBLY: PFP -19	1
9	510-7920-21	PFP RIVETED ASM: MANDALORIAN -21	1
10	511-5240-XX	SPOTLIGHT - LED FLASHER	1
11	515-0215-00	LONG RANGE OPTO: Emitter ASSY	1
12	515-0215-01	LONG RANGE OPTO: RECIEVER ASSY	1
13	535-1324-01	W.B. LED SPOTLAMP RETAINER CLIP	1
14	820-6956-02	DECAL BACKSIDE: MANDALORIAN-02	1

5.39 REAR BACKPANEL RAMP ASSEMBLY

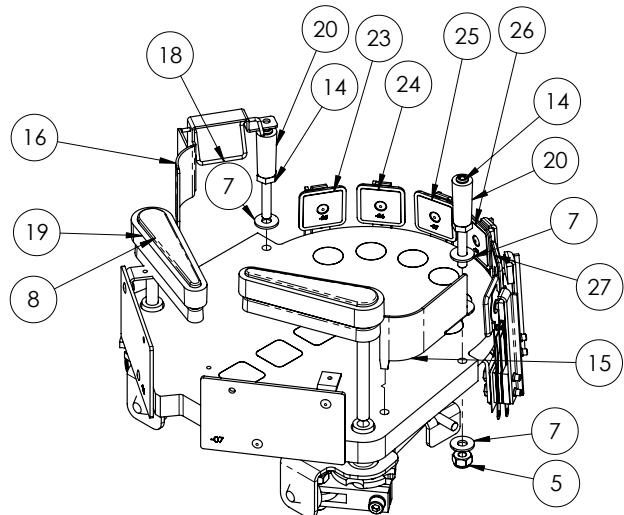
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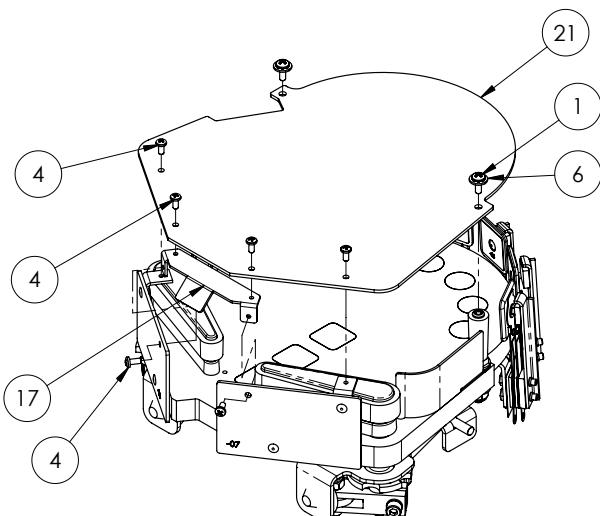
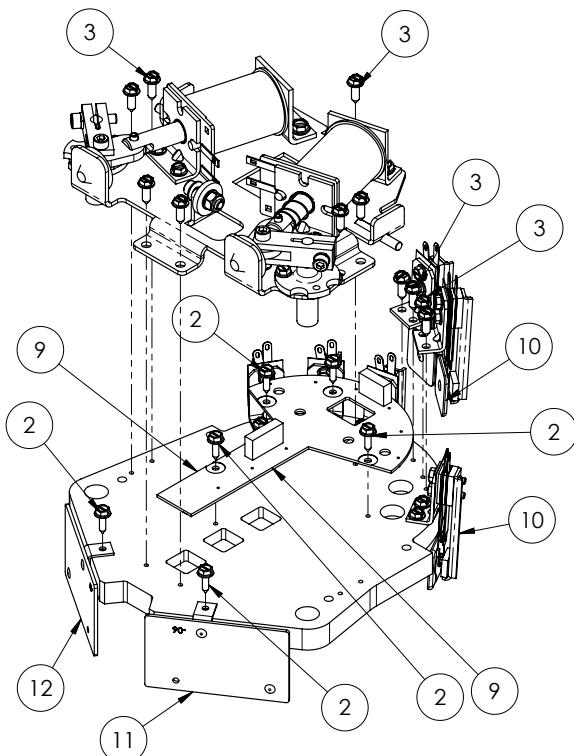
ID	Part Number	Description	Qty
1	237-5809-00	SCREW, #6 X 1/2" PTH A	6
2	237-5880-00	SCREW, #6 X 3/8 PPH T-25	4
3	515-0215-00	LONG RANGE OPTO: Emitter ASSY	1
4	515-0215-01	LONG RANGE OPTO: RECIEVER ASSY	1
5	535-2561-00	REAR RAMP BRACKET	1
6	545-1242-04	PLASTIC RAMP; REAR	1
7	830-1153-03	PFP: MANDALORIAN -03	1

5.40 MINI PLAYFIELD ASSEMBLY

500-1195-00

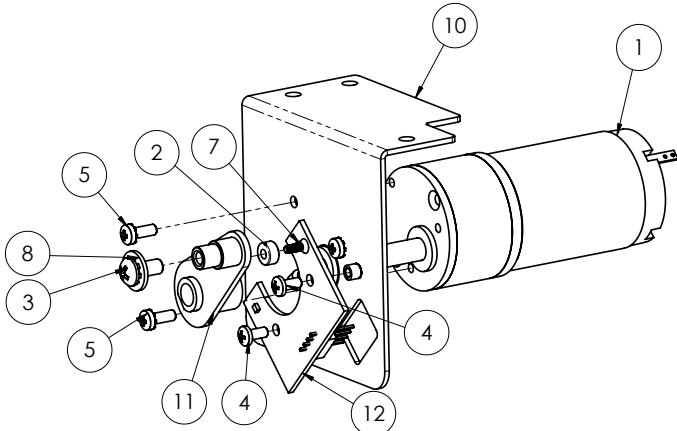


ID	Part Number	Description	Qty
1	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	2
2	234-5001-02	SCREW, #6 X 1/2" HWH	6
3	234-5101-00	SCREW, #8 X 1/2" SLT HWH AB ZINC	19
4	237-6331-00	SCREW, 4-40 X 1/4" PPH MS BLACK	6
5	240-5203-00	10-32 NYLON LOCK NUT	2
6	242-5001-00	#6 WASHER	2
7	242-5010-00	#10 WASHER, .50 O.D. X .047 THK	4
8	515-5033-08-06	FLIPPER BAT ASSEMBLY	2
9	520-8517-00	PCB: MINI: MANDALORIAN	1
10	500-9904-00-XX	1" SQ. S/U TARGET ASS'Y - ANTILOFT - 2 LUG - FLUOR. BLACK	6
11	510-7920-06	PFP RIVETED ASM: MANDALORIAN -06	1
12	510-7920-07	PFP RIVETED ASM: MANDALORIAN -07	1
13	511-3015-00	FLIPPER ASM MINI: MANDALORIAN	1
14	530-5332-01	HEX BUMPER POST	2
15	535-2454-02	BALL GUIDE: MINI MANDALORIAN -02	1
16	535-2454-03D	BALL GUIDE: MINI, MANDALORIAN	1
17	535-2454-05	BALL GUIDE: MINI PF, MANDALORIAN -05	1
18	535-5307-03	ONE-WAY WIRE GATE	1
19	545-5277-00	RUBBER RING, 1-1/2" X 1/2"	2
20	545-5308-00	POST - RUBBER - 3/8 O.D.	2
21	830-1153-01	PF PLASTIC -01	1
22	830-71S6-XX	MINI PLAYFIELD ASSEMBLY: MANDALORIAN	1
23	820-1154-25	DECAL: MANDALORIAN -25	1
24	820-1154-26	DECAL: MANDALORIAN -26	1
25	820-1154-27	DECAL: MANDALORIAN -27	1
26	820-1154-28	DECAL: MANDALORIAN -28	1
27	820-1154-29	DECAL: MANDALORIAN -29	1
28	820-1154-30	DECAL: MANDALORIAN -30	1



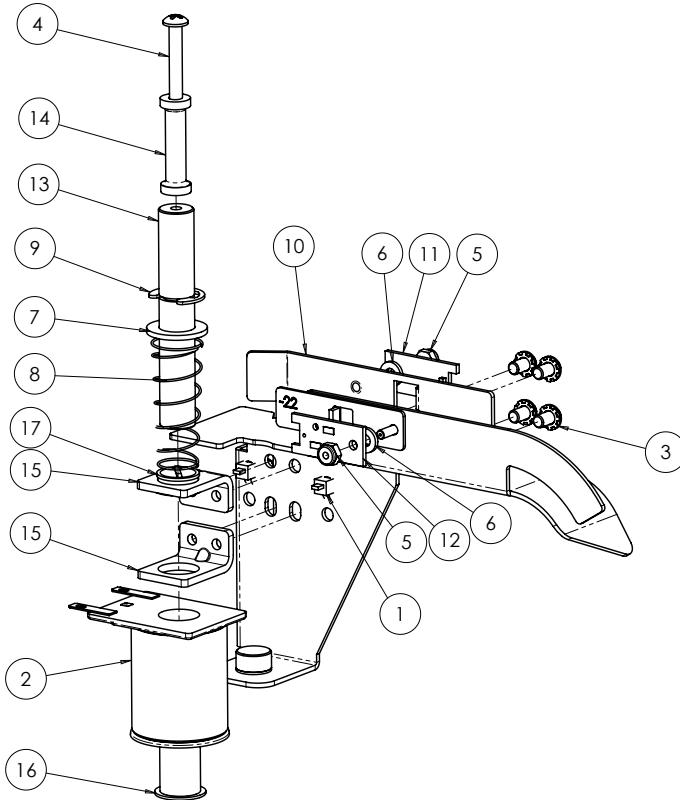
PARTS REFERENCE

5.41 MINI PLAYFIELD MOTOR ASSEMBLY 511-3014-00



ID	Part Number	Description	Qty
1	041-5132-00	DC GEARHEAD MOTOR, 24 VDC 10 RPM	1
2	090-5097-00	MAGNET, 1/4" X .125", #2 CSINK, AXIAL	1
3	232-5301-00	SCREW, 8-32 X 3/8" PPH SEMS	1
4	237-6169-00	SCREW, 4-40 X 1/4 PPH MS	2
5	237-6188-00	SCREW, M3x0.5 X 8MM PPH SEMS ZINC	3
6	237-6317-00	10-32 X 3/16 SS CUP POINT SET SCREW	1
7	237-6366-00	2-56 x 1/4" PFH MS	1
8	242-5005-00	#8 WASHER	1
9	242-5072-01	NYLON WASHER .252 ID X .472 OD	1
10	515-2387-00	MOTOR BRACKET MINI PF, MANDALORIAN	1
11	515-2388-00	CRANK, MINI PF, MANDALORIAN	1
12	520-8470-00	PCA MAG SENSOR DUAL 180 OMNI	1

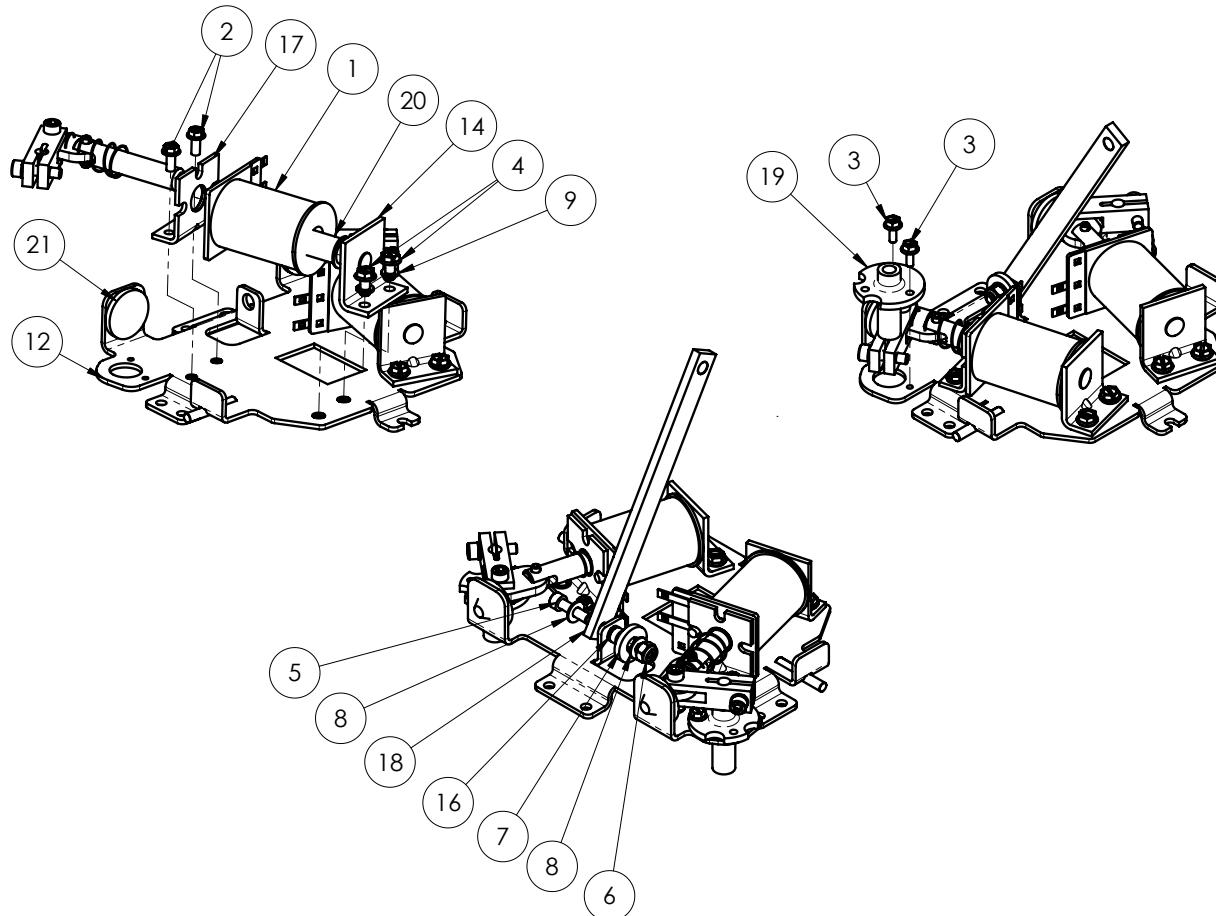
5.42 MINI PLAYFIELD CHUTE ASSEMBLY 511-3022-00



ID	Part Number	Description	Qty
1	040-5001-00B	CABLE TIE-BLACK	2
2	090-5044-ND	COIL 26-1200 - NO DIODE	1
3	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	4
4	237-6376-00	#8-32 X 1-1/2" BRASS PPH SCREW	1
5	240-5303-00	4-40 NYLON LOCK NUT	2
6	242-5079-00	.150 I.D. X .312 O.D. X .050 THICK WHITE TEFLON WASHER	2
7	242-5081-00	WASHER - NYLON .75 OD x .44 ID	1
8	266-5020-00	COMPRESSION SPRING-CONICAL	1
9	270-5005-00	RETAINING E-RING, 7/16" SHAFT OD	1
10	515-2386-00	CHUTE, MINI PF	1
11	520-8115-00PO	PCB, IR OPTO EMITTER, ANTI-ROTATION	1
12	520-8116-00PO	PCB, IR OPTO RECEIVER, ANTI-ROTATION	1
13	530-1102-00	PLUNGER, MINI PF, MANDALORIAN	1
14	530-6254-00	PLUNGER TOP	1
15	535-5203-03	COIL RETAINING BRACKET	2
16	545-5411-00	COIL SLEEVE	1
17	545-5418-01	NYLINER - PLASTIC, 7/16"	1
18	830-1153-22	PFP: MANDALORIAN -21	1

5.43 MINI PLAYFIELD FLIPPER PLATE ASSEMBLY

511-3015-00



ID	Part Number	Description	Qty
1	090-5032-ND	COIL - 22-1080 - NO DIODE	2
2	237-5975-00	SCREW, 8-32 X 3/8" HWH SWAGE ZN	4
3	237-5976-02	SCREW, 6-32 X 3/8" HWH SWAGE	4
4	237-5985-00	10-32 X 3/8 SHWH SWAGE SCREW	4
5	237-6144-00	SCREW, 10-32 X 3/4" SHCS	5
6	240-5203-00	10-32 NYLON LOCK NUT	3
7	242-5078-00	WASHER, NYLON, .75 X .32 X .13	1
8	242-5088-00	NYLON WASHER .195" X .437" X .031"	2
9	244-5003-00	#10 LOCK WASHER, SPLIT	6
10	266-5020-00	COMPRESSION SPRING-CONICAL	2

11	269-5002-00	SPRING WASHER	2
12	515-2382-00	PLATE W/PINS	1
13	515-6304-03	PLUNGER / LINK ASSEMBLY	2
14	515-6308-01	COIL STOP ASSEMBLY	2
15	530-5070-02	CRANK BAR	2
16	530-5139-00	BUSHING (CRANK BAR)	3
17	535-7356-00	COIL BRACKET	2
18	545-1290-00	LINK, MINI PF	1
19	545-5070-00	FLIPPER BUSHING	2
20	545-5388-00	COIL SLEEVE	2
21	545-5428-00	RUBBER BUMPER	2



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MANUAL #780-50S6-00

