

CORVETTE

Manual Amendment

The following information has been updated or added to the Corvette manual since final printing. Please keep this amendment with your manual.

If experiencing difficulty with the Engine Assembly, read the new ZR-1 Adjust Test. This test will help solve the problem.

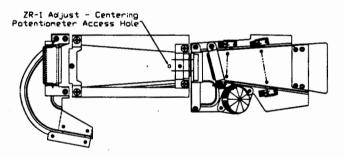
NEW Test Procedure:

T.18 ZR-1 ADJUST Select T.18 from the Test Menu and press "ENTER" to perform the ZR-1/LT-5 engine adjustment procedure.

The purpose of this procedure is to adjust the centering potentiometer of a malfunctioning engine assembly. In order to determine if the engine is malfunctioning, first run the ZR-1/LT-5 TEST, SELF TEST (T16). If the SELF TEST does not indicate failure, then this adjustment may not be necessary.

This test function enables the ZR-1/LT-5 engine power and places it at the center position. (Note, the door must be closed to turn on the engine power.)

With the engine held at the center position (the result of running this test), use a small flat blade screw driver to adjust the potentiometer located beneath the ramp, inside of the engine assembly. A hole in the ramp provides access to the potentiometer, as shown below.



A-19140 Engine & Ramp Assembly

Turning the potentiometer clockwise moves the engine to the left (as viewed from the front of the machine) and turning the potentiometer counter-clockwise moves the engine to the right.

The potentiometer should be adjusted to position the engine as close to the center of movement as possible.

Once this adjustment is complete, run the ZR-1/LT-5 TEST, SELF TEST (T16) again to verify the proper functionality of the engine assembly.

CHANGE to Test Procedures: Pages 1-16 and 1-17

T.16 ZR-1/LT-5 TEST Select T.16 from the Test Menu and press "ENTER" to begin the ZR-1/LT-5 (engine) test. Once the "SELF TEST" completes successfully, the "UP" and "DOWN" buttons can be used to select the following tests. Use the "ENTER" button to start the selected test, and the "ESCAPE" button to abort the selected test. (Note, the door must be closed to turn on the engine power.)

The status of the "FULL LEFT" and "FULL RIGHT" optical switches and the angular position are displayed on the dot matrix display during all tests.

SELF TEST - This test verifies that the engine is fully operational. This test is run automatically upon entry to the ZR-1/LT-5 TEST. It can also be started manually by pressing the "ENTER" button when selected. If this test fails, the ZR-1 ADJUST test (T.18) may need to be run.

AUTO RUN - This test runs the engine in an oscillatory fashion until the "ESCAPE" button is pressed. The test pauses the engine periodically.

ENGINE LEFT - This test moves the angular position of the engine to the left (counter-clockwise) until the "FULL LEFT" optical switch closes.

ENGINE RIGHT - This test moves the angular position of the engine to the right (clockwise) until the "FULL RIGHT" optical switch closes.

ENGINE CENTER - This test moves the angular position of the engine to the center. At this point, neither the "FULL LEFT" nor the "FULL RIGHT" optical switches should be closed.

T.17 RACE TEST Select T.17 from the Test Meriu and press "ENTER" to begin the RACE TRACK test. Once the "SELF TEST" completes successfully, the "UP" and "DOWN" buttons car be used to select the following tests. Use the "ENTER" button to start the selected test, and the "ESCAPE" button to abort the selected test. (Note, the door must be closed to turn on the race track power.)

The status of the "LEFT START", "RIGHT START", "LEFT ENCODER", and "RIGHT ENCODER" optical switches are displayed on the dot matrix display during all tests. The car position value is displayed when possible.

SELF TEST - This test verifies that the race track is operational. This test is run automatically upon entry to the RACE TEST. It can also be started manually by pressing the "ENTER" button when selected.

RESET - This test positions both cars to the starting line.

LEFT FORWARD - This test drives the left car forward while the "ENTER" button is pressed.

RIGHT FORWARD - This test drives the left car in reverse while the "ENTER" button is pressed.

T.19 Empty Balls Test Select T.19 from the Test Menu and press "ENTER" to begin the EMPTY BALLS test.

This test kicks out all balls loaded in troughs, lockups, poppers, and kickouts until no balls remain in those locations.

Note: As the trough kicks out balls, they will stack up in the shooter groove, which may require manual clearing in order to allow further balls to be kicked out.

CHANGE to Rules: Pages E & F

LITE LT-5 LOCK: During main play, the left outer loop shot lights the LT-5 LOCK lamp on the ZR-1/LT-5 ramp for a timed period. The duration of the timed period becomes shorted with each successive multiball.

ROUTE 66: The Route 66 (right ramp) shot gives a progression of awards for every other completion of the shot. The qualifying shot tells the player what to expect for the next shot. The next shot gives an award as follows:

Award Level Award 0 Start Catch Me Award Challenge Car 1 2 Start Pitstop Hurryup **Enable QuadraJets** 3 Start Catch Me 4 5 Bonus X Increase **Award Points** 6 7 Start Pitstop Hurryup **Enable QuadraJets** 8 Start Catch Me 9 Bonus X Increase 10 **Award Points** 11 **Award Special** 12

PITSTOP HURRY UP: This is a timed sequence in which a point value is reduced until the player shoots the PIT-IN shot. If the shot is made before the time expires, a two ball multiball is started during which the PIT-IN shot becomes a JACKPOT worth the stopped point value.

NEW Rules:

FUTURE CAR CHAMPION: When a player collects the tenth car, they become the FUTURE CAR CHAMPION. The reward for this honor is to place their initials in the license plate of the car shown during game play, when the ball is in the shooter groove.

QUALIFY: Each time the RIGHT RETURN LANE switch is made, the QUALIFY lamp (left outer loop shot) is lit for a timed period. Making this shot awards an incremental point value.

CHANGE to Difficulty Settings Tables: Page 1-19

Game Difficulty Setting Table for U.S./Canadian/French Games

Adj. No.	Adjustment Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03	Hard U.0 04	Extra Hard U.9 05
A.2 05	Ball Saves	2	2	1	1	0
A.2 06	Ball Save Time	9	7	' 5	4	2
A.2 07	Lock Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 08	Race Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 09	Catch Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 10	Challenge Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard

Game Difficulty Setting Table for German/European Games

Adj. No.	Adjustment Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03	Hard U.0 04	Extra Hard U.9 05
A.2 05	Ball Saves	2	2	1	1	0
A.2 06	Ball Save Time	9	7	5	4	2
A.2 07	Lock Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 08	Race Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 09	Catch Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 10	Challenge Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard

CHANGE to Preset Game Adjustments Tables: Page 1-20

Preset Game Adjustments Table for U.S./Canadian Games

Adjustment Number	Adjustment Description	Install 3-Ball U.9 07 (factory)	Install 5 Ball U.9 06
A.1 01	Balls Per Game	3	5
A.1 07	Replay Start	850,000,000	1,200,000,000
A.2 04	Extra Ball Level	7	18
A.2 05	Ball Saves	1	1
A.2 06	Ball Save Time	5	4
A.2 07	Lock Difficulty	Medium	Hard
A.2 10	Challenge Difficulty	Easy	Medium

CHANGE to Feature Adjustments: Pages 1-27 thru 1-30

A.2 04 EX. BALL LEVEL

This is the number of SPARK PLUGS necessary to light the EXTRA BALL lamp. The machine will start with this value and modify it as necessary to achieve the percentage specified in A.2 03. To use a fixed level for the extra ball, set A.2 03 to FIXED, then set this level.

Setting:

4-60

Factory Default:

7

A.2 05 BALL SAVES

This determines how many times a ball will be saved when it drains. The ball will be saved only once per ball-in-play. The ball saver is available each ball until the adjusted number of ball saves is used by the player.

Settings:

OFF

1-5 1

Factory Default:

Example of ball save usage:

With BALL SAVES = 1 (factory default)

BALL 1:

Ball save available

Ball drains after ball saver time-out

BALL 2:

Ball save available

Ball drains during ball saver timer, and ball is delivered back

onto the playfield

BALL 3:

Ball save NOT available

Note: In addition to the BALL SAVES adjustment, a very short DEFAULT ball save is provided **after** the player has used all of their STANDARD ball saves when the ENABLE DEF SAVER (A.2 14) adjustment is set to YES.

A.2 06 BALL SAVE TIME

This sets the number of seconds that the ball saver is activated.

Setting:

4-15

Factory Default:

5

A.2 10 CHALLENGE DIFFICULTY

This determines the difficulty of the CORVETTE CHALLENGE feature. This affects the START CHALLENGE lamp.

Settings:

EXTRA EASY

EASY MEDIUM HARD

EXTRA HARD

Factory Default: EASY

	Game Start	Ball Start	Memory
	START	START	START
	CHALLENGE	CHALLENGE	CHALLENGE
Extra Easy		yes	yes
Easy	yes		yes
Medium	-		y e s
Hard			no
Extra Hard			no

NEW Feature Adjustments:

A.2 13 ENDGAME LOCK REL.

This determines whether balls locked in the ZR-1/LT-5 lockup are released or held at the end of a game.

Setting:

YES

NO

Factory Default: YES

A.2 14 ENABLE DEF SAVER

This determines whether the DEFAULT ball saver is enabled (see A.2 05 above).

Setting:

YES

NO

Factory Default: NO

A.2 15 ENABLE CENSOR

This determines whether the FUTURE CAR CHAMPION initials are censored before being displayed on the shooter groove car's license plate.

Setting:

YES

NO

Factory Default: NO

A.2 16 DISABLE ZR-1/LT-5

This disables the ZR-1/LT-5 engine assembly in the event that it becomes broken and lock-down bracket is installed.

Setting:

YES

NO

Factory Default: NO

A.2 17 NO MATCH SPEECH

This determines whether the end of match speech "Hey, these number don't match!" is said when the game is set for CREDIT PLAY. The speech is always said when the game is set for FREE PLAY.

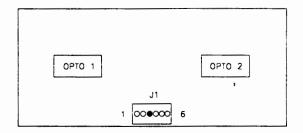
Setting:

YES

NO

Factory Default: NO

CHANGE to Opto Track Encoder P.C.B. A-18822: Page 3-21



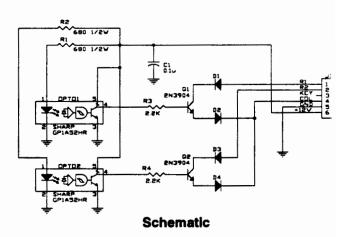
J1-1 White-Brown from J209-1

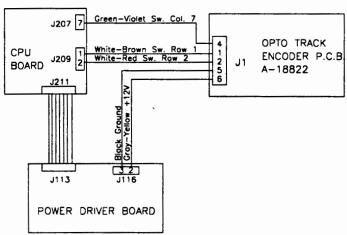
J1-2 White-Red from J209-2

J1-3 Key

J1-4 Green-Violet from J207-7

J1-5 Black ground from J116-3 J1-6 Gray-Yellow +12VDC from J116-2





SECTION 2 Corrections/Changes

Page 2-3

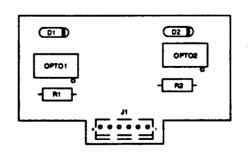
Cabinet Assembly

Item #5 changed to A-18531-1 4-Ball Cashbox Assembly.

Page 2-11

Printed Circuit Boards

Replace PCB A-18821 with A-19606 Opto Track Limit PCB Assembly.



Part No.	Designator	Description
5791-13830-06	J1	Connector, 6-pin
5010-08930-00	R1, R2	Res., 470, 1/2w, 5%
5070-09054-00	D1, D2	Diode, 1N4004
5490-12451-00	OPTO1,	Opto Integrated, 10m

Page 2-14

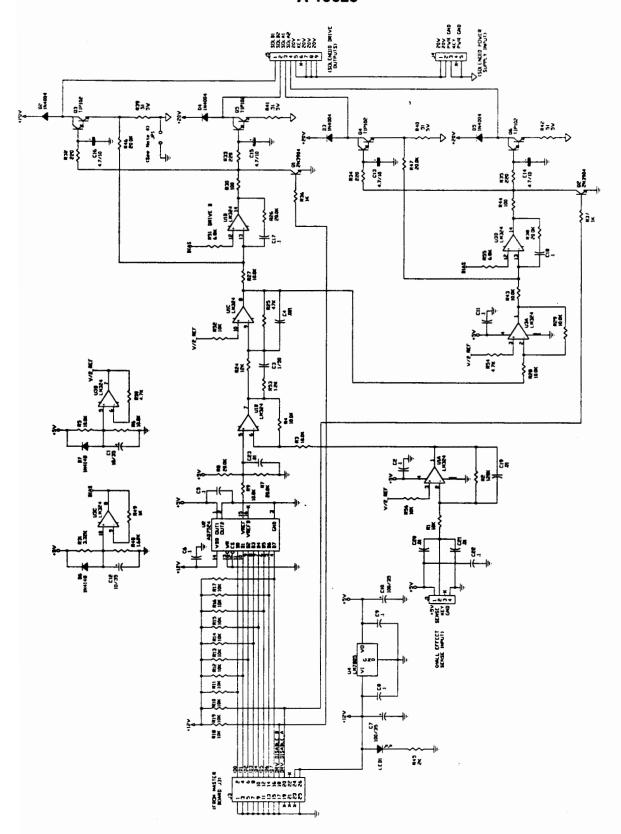
Printed Circuit Boards

Item #1 changed to A-19625 Motor Driver Slave Board Assembly.

A-19243 Motor Driver Slave Board & Bracket Assembly

Part Number	Designator	Description	Part Number	Designator	Description
1 A-19625 5040-12808-00 5040-10974-00 5040-12751-00 5043-12807-00 5043-09845-00 5043-08996-00 5370-12960-00 5371-12727-00 5250-09157-00 5070-09054-00	C1, C12 C7, C10 C13-C16 C3 C4	Motor Driver Slave Board Cap., 10µFd, 35v, Axial Cap., 100µFd, 35v, Radial Cap., 4.7µFd, 10v, Axial Cap., 1µFd, 50v, Axial Cap., 1KP, 50v, ±20% Axial Cap., 0.1µFd, 50v, ±20% Ax	5010-09314-00 5705-12454-00 4004-01005-06 4404-01119-00 5010-09035-00 5010-09036-00 5010-09091-00 5010-09086-00 5010-09086-00 5043-08980-00	R53 Q3 - Q6 Q3 - Q6 Q3 - Q6 R25 R30, R44 R50, R54 R51, R55 C19-C21, C23	Res., 1.2KW, 1/4w, 5% Heatsink, w/pins Mach. Screw, 4-40 x 3/6 Nut, 4 x 40 SNUT Res., 47KW, 1/4w, 5% Res., 100W, 5%, 1/4w Res., 4.7KW, 1/4w, 5% Res., 6.8KW, 1/4w, 5%
\$160-10269-00 \$162-12635-00 \$13-14455-00 \$671-13732-00 \$5013-14135-00 \$5010-09269-00 \$5013-14136-00 \$5013-14456-00 \$5010-12065-00 \$5010-09534-00 \$5010-09934-00 \$5010-09999-00 \$5070-08919-00 \$5010-09160-00 \$5012-14318-00 \$791-10862-09 \$791-10850-00 \$791-13830-04	Q1, Q2 Q3 - Q6 R48 LED1 R3-R6, R9, R27-R29, R43 R24 R7, R8, R26, R38, R46, R47 R31 R2 JP1	Trans 2N3904 NPN Trans TiP102 Res., 1.62KW, 1/4w, 1% Display LED Red Res., 10KW, 1/4w, 1% Res., 12KW, 1/4w, 5% Res., 20KW, 1/4w, 1%			
			8		\

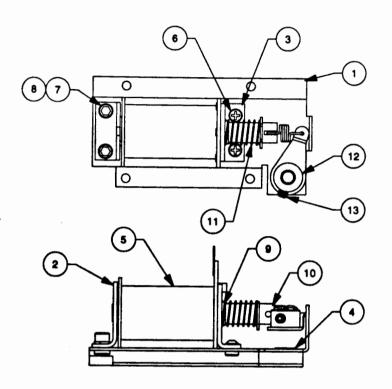
Motor Driver Slave Board Schematic A-19625



Page 2-21

Ramp Diverter

The Ramp Diverter Assembly has changed. The new part number is A-19630 and contains the following:



Item	Part No.	Description
1.	01-11957	Mounting Bracket
2.	A-16886	Flipper Stop Bracket
3.	01-7695	Solenoid Bracket
4.	20-8790	Nyliner Bearing
5.	A-15943-1	Flipper Coil Assembly
6.	4006-01017-04	MS, #6-32 x 1/4"
7.	4010-01066-06	MS, #10-32 x 3/8"
8.	4701-00004-00	Lockwasher #10 Split
9.	03-7066-5	Coil Tubing
10.	A-16636	Diverter Plunger Assembly
11.	10-303	Spring
12.	A-14185	Drive Arm Assembly
13.	4010-01169-04	SetScrew, #10-32 x 1/4"

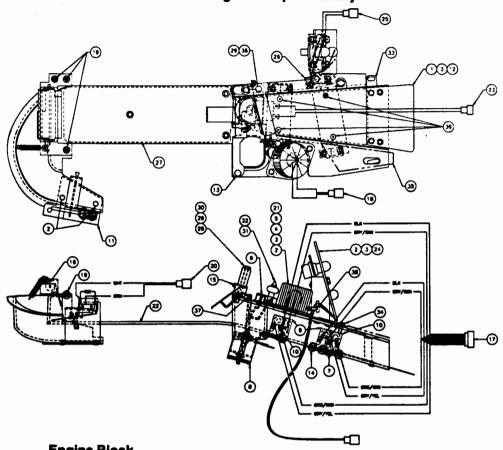
Page 2-28

Engine RampPictorial and parts list were revised.

A-19008 **Engine Ramp Assembly**

Item	Part No.	Description	Item	Part No.	Description
1.	01-13130	Skirt-Engine	20.	H-18214-3	Cable - Engine Switch
2.	07-6688-20N	Rivet, 1/4"	21.	24-8802	Bulb #906
3.	4700-00003-00	Flatwasher, 1/8x9/32x21ga.	22.	03-9213.5	Ramp
4.	A-14265-13	Recpt Skt. Assy., Clear	23.	H-19183	Cable - V8 Rev Gate
5.	03-8171-9	T-L Mini Dome, Trans. Red	24.	A-19155	Challenge Lamp Assembly
6.	A-19002	Flopgate Assembly	25.	H-19218.1	Cable - Challenge Lamps
7.	A-19688	Opto Plate 2-Eng. Ramp	26.	01-11985	Shield - Opto
8.	A-19253	Opto/Actuator Assembly	27.	31-1997-1	Decal
9.	A-16908	Opto LED Assembly-RTV	28.	02-4433	Post Spacer, #8 x 1-3/16"
10.	A-16909	Opto Photo Trans. Assy., -RTV	29.	4406-01119-00	
11.	A-19092	Ramp Switch - Engine	30.	4006-01005-24	Mach. Screw, #6-32x1-1/2"
12.	07-6688-18N	Rivet, 7/32"	31.	02-3905	Post
13.	4608-01081-07		32.	23-6694-1	Rubber Ring, Black 3/32I.D.
14.		Sh. Metal Screw, #6 x 3/8"	33.	01-13434	Ramp Guard
15.	A-19110	Frontgate	34.	4106-01115-06	Sh. Metal Screw, #6x3/8"
16.	A-19099	Backgate	35.	31-1997-5	Decal
17.	H-19219	Cable - Optos	36.	4006-01005-06	Mach. Screw, #6-32x3/8*
18.	H-18219-1	Cable - Flasher	37.	03-7796-1	Washer, Nylon
19.		Mach. Screw, #6-32x5/16"			

A-19008 Engine Ramp Assembly



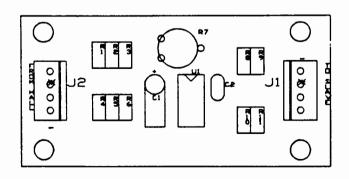
Page 2-29

Engine Block

Items #7 and 14 were changed; item #15, 16, 17 and 18 were added.

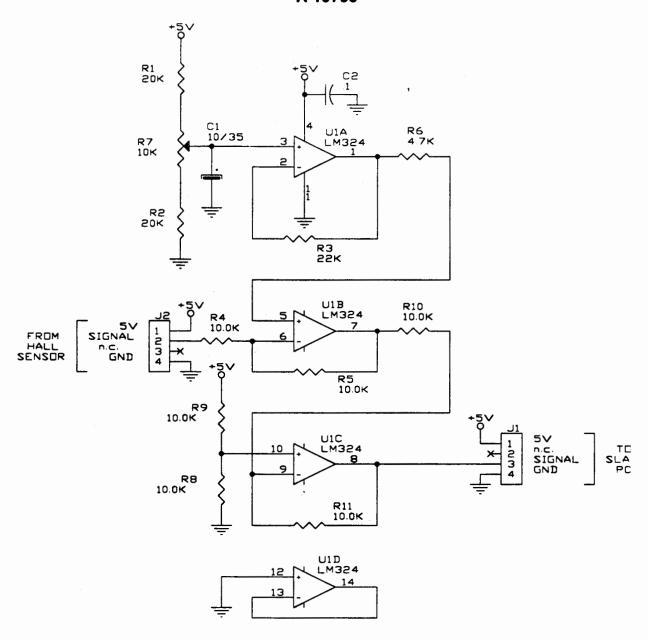
Item	Part No.	Description
7 .	4006-01003-06	MS #6-32 x 3/16°
14.	4006-09168-02	MS #6-32 x 1/8"
15.	H-19182	V8 Sw/FI Cable
16.	23-6622	Double Sided Tape
17.	03-7655-4	Cable Clamp
18.	A-19711	Hall Adjustment Assembly (See assembly below)

A-19711 Hail Adjustment Assembly



Designator	Description
-	Hall Offset Adjustmen
C1	Cap., 10µFd, 35v Axia
C2	Cap., 0.1M, 50v, ±20°
U1	IC. LM324 N OPAM
J1, J2	Connector, 4-pin
R7	Pot 10K, 1/4w, ±20%
R3	Res., 22K, ¼w, 5%
R6	Res., 4.7K, ¼w, 5%
R1, R2	Res., 20K, ¼w, 5%
R4, R5, R8-R11	Res., 10K, ¼w, 5%
•	Adjust Board Bracket
-	Support Post
•	Cable Assembly
	- C1 C2 U1 J1, J2 R7 R3 R6 R1, R2 R4, R5,

Hall Offset Asjust P.C.B. Schematic A-19706



Page 2-31

Exhaust Pipe

Added item #14, 03-7520-2 Nylon Tie-Wrap 3-7/8".

Page 2-32

Back Panel

Item #11 changed to 31-1995-11 Decal,

Item #13 changed to A-17983 Light & Socket Assembly,

Item #14 changed to 03-8022-4 Spacer 1/4".

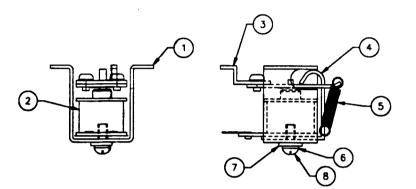
Page 2-33

Kick-Out Coil

Added item #17, RM-22-08 Tape.

Page 2-33

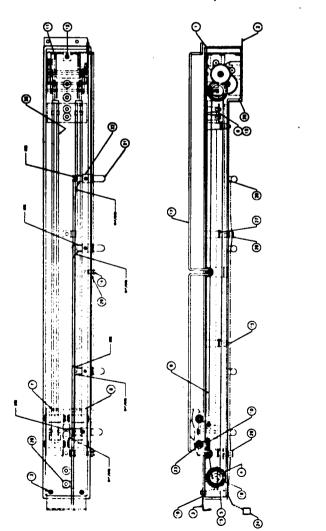
Bail Gate Actuator Added assembly.



Item	Part Number	Description
1.	01-12348	Ball Gate Coil Bracke
2.	SMI-35-4000-DC	Coil Assembly
3.	A-11146	Armature Assembly
4.	A-6892	Frame & Eyelet Asse
5.	10-96	Spring
6.	4701-00003-00	Lockwasher #8 Split
7 .	4700-00089-00	FW, 11/64 x 7/16 x 16
8.	4008-01021-07	MS, #8-32 x 7/16"

Page 2-34

Pictorial and parts list were revised.



Item	Part No.	Description
1.	03-9217	Racetrack Frame
2.	01-13069.1	Track Bottom
3.	01-13272	Top Bracket - Racetra
4.	03-9221	Opto - Pulley
5 .	A-19141	Opto Board Assembly
6.	A-19606	Limits Opto Board As
7 .	A-19146	Right Car Assembly
8.	A-19145	Left Car Assembly
9.	20-10116	Cord
10.	10-489	Spring-Cord
11.	A-19134	Gear Box Assembly
12.	4004-01041-04	Mach. Screw, #4-40 >
13.	4006-01003-06	Mach. Screw, #6-32 >
14.	4006-01003-10	Mach. Screw, #6-32 >
15.	4106- 01114 -0 8	Sh. Metal Screw, #6-0
16.	A-19013	Bottom Bracket, Race
17.	12-7226	Wireform
18.	02-5087	Shaft- Opto Pulley
19.	H-19608	Cable, Track Opto G
20.	07-6688-16N	Rivet
21.	03-8063-6	Bulb Sleeve, Yellow
22.	A-12887	Socket & Bulb
23.	10-491	Loop Spring
24.	H-19607	Cable
25.	*31-1996-1	Decal - Top
26.	*31-1995-7	Decal - Side
27 .	03-7520-2	Tie Wrap, Nylon
28.	03-7655-4	Wire Harness Clip, 1/
29.	4700-00011-00	Flatwasher, 11/64 x 7

^{*} Not available for individual sale. Order [31-1995 and 31-1996 respectively.+

Unique Parts List

Part Number	Description	Part Number	Description
A-12359-4-B	Side Molding Assembly, Black	A-19208-↑	Flipper Guide Right Lane Assy.
A-13204-50036	Bottom Arch Assembly	A-19208-2	Flipper Guide Left Lane Assemb
A-13769-50036	Playfield & Insert Assembly	A-19223-R	Flipper Assembly Complete
A-15368-1	Eject Assembly	A-19242	Dual H-Driver & Bracket Assemt
A-16917-50036	Sound Board Assembly	A-19243	Motor Driver Slave & Bracket As
A-17347-1	3-Lamp Assembly & Spacer	A-19259	Xmas Tree Lamp & Bracket Assy
A-17651-50036	WPC CPU Security Board	A-19260	Right Wire Ramp Assembly
A-17730-2	Ball Shooter Assy., w/Knob (Black)	A-19294	3-Bank Standup Target
A-17814-50036	Backbox Assembly	A-19314-1	Playfield Plastic Assembly
A-18532	Motor Driver Master Board	A-19314-2	Playfield Plastic Assembly
A-18587	Ball Guide Assembly #1	A-19314-3	Playfield Plastic Assembly
A-18588.2	Ball Guide Assembly #2	A-19316	Ramp Cover Assembly #1
A-18589	Ball Guide Assembly #3	A-19317	Ramp Cover Assembly #2
A-18590	Bali Guide Assembly #4	A-19332	Lt-5 Engine Wire Assembly
A-18591	Ball Guide Assembly #5	A-19521	Bumper Gate Assembly
A-18592	Ball Guide Assembly #8	A-19630	Ramp Diverter Assembly
A-18593	Bell Guide Assembly #9	01-13020	Ball Guide #6
A-18594.2	Bell Guide #11	01-13021	Ball Guide #7
A-18614	Speaker/Display Panel Assembly	01-13022.2	Ball Guide #10
A-18967	Bell Guide #3	01-13023.1	Ball Guide #12
A-18975	Garage Guide Weld Assembly	01-131 86 .1	Opto Mounting Bracket
A-18977	Diverter Flag Rivet Assembly	01-13223	Race Track Bracket
A-18982	Spinner Gate Assembly	01-13245.1	Front Gate Engine Bracket
A-19001	Ball Gate Special Assembly	01-13273.1	Arch Ball Guide
A-19003	2-Switch & Bracket Assembly	01-13296	Left Corner Bracket
A-19004	Race Track Assembly	01-13297.3	Right Corner Bracket
A-19005	Popper Assembly	01-13298	Car Light Baffle
A-19007	Loop Ramp Assembly	01-13413.1	Right Lane Divider
A-19009	Race Track Ramp Assembly	01-13424	Bracket
A-19035-1	4-Lamp PCB & Spacers	02-4425-3	Post Fastner, 8-32 x 5/8"
A-19036-1	5-Lamp PCB & Spacers	02-5108	Post Standoff-Loop Ramp
A-19037-1	9-Lamp PCB & Spacers	11-1213	Cabinet
A-19038-1	2-Lamp Board & Spacers	11-1214-A	Wood Rail
A-19039-1	3-Lamp Board & Spacers	11-121 4-B	Wood Rail
A-19123	Front Molding, Black	11-1214-C	Wood Rail
A-19140	Engine & Ramp Assembly #6	12-7214.1	Left Wire Ramp
A-19151	Upper Loop Switch Assembly	12-7215	Garage Wire Ramp
A-19154	Exhaust Pipe Assembly	12-7231	Right Lane Wire #2
A-19175	Linear Hail PCB Assembly	5795 -14325-00	Ribbon Cable V-8 Mtr. Control
A-19177	Back Panel Assembly		

Page 2-40	Upper Playfield Parts Item #27 changed to A-18594.1 Ball Guide, Item #40 changed to A-19630 Ramp Diverter Assembly, Item #66 changed to 01-13273.1 Bottom Arch Ball Guide, Item #68 changed to A-18587.1 Ball Guide.	
Page 2-42	Lower Playfield Parts Item #27 changed to A-19630 Ramp Diverter Assembly.	