

#930 - "MARINER"

INSTALLATION AND GENERAL GAME OPERATION INSTRUCTIONS

INSTALLATION

On all games there are certain items that should be checked after shipment. These are visual inspections which may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable plugs and sockets may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord: -

1. Check that all cable plugs are firmly seated in proper sockets.
2. Check that cables are clear of all moving parts and relays.
3. Check for any wires that may have become disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
5. Check wires on relay coils for proper soldering, especially the bare (common) wire connecting a row of relay coils. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
6. Check that fuses are firmly seated and making good contact.
7. Check (manually) the stepping and resetting of all step-up units. The wiper action should not be sluggish.
8. Check transformer for any foreign material shorting across wiring lugs.
9. Check wiring of transformer to correspond to location voltage. (Transformer wiring card in front cabinet.)

Before line cord is plugged in: -

Check all plugs and sockets and dress cables:

- (A) Plugs in correct sockets.
- (B) Plugs securely seated in sockets.
- (C) Dress cables away from relays.

Check adjustment of the three (normally open) tilt switches:

- (A) Panel tilt on bottom of playfield panel.
- (B) Plumb-bob tilt on left side of cabinet near front door.
- (C) Ball tilt above plumb-bob tilt.

Insert one of the two balls into ball tilt assembly and adjust bracket so ball will roll over switch blade if front of cabinet is raised.

Check Adjustment of the Kick-Off and Slam Switches:

Check adjustment of the (normally closed) kick-off switch at rear of cabinet mounting board, near cable plugs. Check adjustment of the (normally closed) anti-slam switch, on front door.

GENERAL GAME OPERATION

Place ball onto playfield by out hole.

Plug in the line cord.

Coin Game:

If the coin should be rejected, move on-off master switch at the bottom right front corner of cabinet to "on" position, then coin game. The coin lock-out device rejects all coins when power (master switch) is off.

1A. If the coin is inserted in the 1st (nickel) coin chute and the game is set for 1 play-5¢, it will energize the "coin relay". If game is set for 1 play-10¢, the first coin inserted will advance the "2 coin unit", then the second coin inserted will energize the "coin relay" thru the 2 coin unit switch. (See 1st coin chute adjustment plug positions on game adjustments sheet).

1B. If the coin is inserted in the 2nd (dime) coin chute and the game is set for 1 play-10¢, it will energize the "coin relay". If game is set for 2 plays-10¢, it will energize the "2nd coin chute relay" and the 2nd coin chute relay will advance the "credit unit" (2 steps) thru the coin credit circuit. (See 2nd coin chute adjustment plug positions on game adjustments sheet).

1C. If the coin is inserted in the 3rd (quarter) coin chute and the game is set for 2-3-4-5-or 6 plays-25¢, it will energize the "3rd coin chute relay" and the 3rd coin chute relay will advance the "credit unit" (2-3-4-5-6 steps) thru the coin credit circuit. (See 3rd coin chute adjustment plug positions on game adjustments sheet).

1D. When the "credit unit" has been advanced from the 2nd or 3rd coin chute, (as described in section 1B and 1C) the front door "credit button" switch will energize the "credit relay" and then the credit relay will energize "coin relay".

- 2A. The coin relay, when energized by any of the ways described, (in sections 1A thru 1D) will stay energized thru its own hold-in switch and (normally closed) #8 score motor switch.
- 2B. The coin relay will energize the "lock relay" which stays energized thru its own hold-in switch and cabinet kick-off switch.
- 2C. The coin relay will energize the "reset relay" thru game over relay switch or ball count unit switch, operate the "score motor" and then thru the (normally open) #2 and #11 score motor switches, energize the "#1 and #2 score reset relays". The reset relay will continue to operate score motor and reset the "bonus unit" thru (normally open) #2 score motor switch, both the reset and the score reset relays will stay energized thru a normally closed #8 score motor switch, or until all "score counter units" are reset to "zero position".
- 2D. The coin relay, thru the normally open #3 score motor switch will advance the "total play meter", and thru the reset relay will reset the "coin unit", "ball count unit" and "player up unit". The coin relay will also reset the "credit unit" (1 step) when energized by credit button. The game over relay will be latched by the circuit that energized the reset relay when #4 score motor switch is closed.
- 3A. A ball on the out hole switch will energize the "out hole relay" thru a normally closed #1 score motor switch and bonus unit disc; and it will stay energized thru its own hold-in switch and normally closed #10 score motor switch.
- 3B. The out hole relay will operate the "score motor" and then energize the "out hole kicker" solenoid thru a normally open #7 score motor switch. The 1st ball is kicked thru the ball trough to the shooter alley and the game is now ready for the "1st player" to begin play.
- 3C. To condition the game for "2nd player", inserting coin (s) or use of the credit button (before 1st ball is played) will energize the "coin relay" again. This time, the coin relay will not energize the "reset relay". It will operate the "score motor", advance the "total play meter", subtract a credit from the "credit unit", (if credit button was used) and advance the "coin unit" thru a normally open #3 score motor switch. The game is now set for "2 players". Repeating this sequence will condition the game for the "3rd" and "4th player".

Sequence of operation

- 1A. When the "1st ball" is played, the "ball index relay" will be energized by either the "100 point score relay" or "1000 point score relay", and it will stay energized thru its own hold-in switch, outhole relay switch and a normally closed #6 score motor switch.
- 1B. When the "1st ball played" returns to the outhole, it will energize the "bonus reset relay" thru a normally closed #1 score motor switch, if a "bonus score" of 2,000 to 10,000 was left (not collected) when the ball entered the outhole. The bonus reset relay stays energized thru its own hold-in switch and a normally closed #10 score motor switch. The bonus reset relay operates the "score motor", then resets the "bonus unit" thru a normally open #2 score motor switch. The "outhole relay" is then energized thru a normally closed #1 score motor switch and the bonus unit wiper at index position, and it stays energized thru its own hold-in switch and a normally closed #10 score motor switch.
- 1C. The outhole relay operates the "score motor", and if the game is set for a "single player", the "ball count unit" is advanced 1 step by a normally open #3 score motor switch, thru the coin unit, "0" position; or if game is set for "multiple players", (2 to 4) the "player-up unit" is advanced 1 step thru a normally open #4 score motor switch. The outhole relay then completes the circuit to the "outhole kicker solenoid" thru a normally open #7 score motor switch. The 1st ball is returned to the shooter alley and the game is now set for either "1st player - 2nd ball" or "2nd player - 1st ball". During "multiple player" game, when the last eligible players 1st ball returns to the outhole, the outhole relay advances the "ball count unit" 1 step thru a #3 score motor switch, "coin unit" and/or "player-up unit", then the ball count unit end of stroke switch energizes the "player reset relay". The player reset relay stays energized thru its own hold-in switch and a normally open #1 score motor switch, and resets the "player-up unit" thru normally open #4 score motor switch, and the game is set for "1st player - 2nd ball".
- 1D. When the last eligible players last ball returns to the outhole, the outhole relays final advance of the "ball count unit" will energize the game-over interlock relay trip coil and the game is completed.

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FEATURE OPERATION AND SCORING

Top Hole - Right Alley Bonus Feature:

Bonus scores 1000 thru 10,000 in 1000 increments.

Bonus scores are advanced by top roll-over buttons (2), by either flanking center mushroom-bumpers (2), and by (3) side rebounds.

Ball in top hole or right alley scores lit bonus score and resets bonus unit during scoring. After the scoring is completed, the ball is ejected from the top hole or the right alley.

The bonus unit is also reset to 1000 at start of game and when ball goes into outhole.

Mushroom-Bumper Bonus Feature:

Mushroom-bumper bonus lites are 1000 thru 5,000 in 1000 increments. These bonus lites are controlled by 00-90 unit, and change whenever 10 points is scored.

When ball hits center "up post" mushroom bumper, the game scores lighted mushroom-bumper bonus score. It also raises the post located between the flippers.

Left Alley Feature:

There are four lites in the left alley - "up post", "extra ball", "open gate" and "on blue bumpers". These lites are controlled by the 00-90 unit.

Ball thru left alley awards the lit bonus at times all four lites may be lit. Each bonus feature is described in detail under individual heading.

Thumper-Bumper lite feature:

Thumper-bumpers score 10 points or 100 points when lit.

Red thumper-bumpers (2) are lit when ball goes thru top left lane.

Blue thumper-bumpers (2) are lit when ball goes thru top right lane or goes into left alley when "on blue bumpers" is lit.

These lites go off at the start of a game and when the ball goes into the outhole.

Free Ball Gate Feature:

Free ball gate is located by the right out alley. When the gate is open, the ball is diverted from going to outhole to shooter alley. The same player shoots again.

When the ball hits "open gate" target when lit, or when the ball goes into the left alley when "open gate" light is lit, the free ball gate is opened. The gate remains open until a ball goes thru gate or the ball goes into the outhole. The gate is also closed at start of game or when game is tilted. Open gate target lights is controlled by 00-90 unit.

Extra Ball Feature:

When the ball hits "extra ball" target when lit or when ball goes into left alley when "extra ball" light is lit, the game scores and extra ball and the "same player shoots again" is lighted on the playfield and on the score glass. The lite remains lit until the ball goes into the outhole. The player up shoots again; the ball in play does not advance.

Playmore Post (Up Post) Feature:

When the ball hits "up post" mushroom-bumper or when the ball goes into left alley when "up post" light is lit, the post located between the flippers is raised to block the ball from going into the outhole between the flippers.

The post goes down when the ball goes over the "down post" roll-over buttons, the ball goes into the outhole or when the game is tilted.

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GAME ADJUSTMENTSPLAYFIELD PANEL POST ADJUSTMENTS:

Game has (2) posts that can be moved to make game playing time and scoring more conservative. Spotting holes are provided for movement of posts, and "liberal" and "conservative" positions are shown on panel sketch FO-

BELL ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides positions to ring bell for "100" point scores, "1000" point scores, or both "100 & 1000" point scores.

HI-SCORE ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides a wide range of coverage at which hi-score "credits" or "extra balls" can be scored. (See "Score adjustment card" in back box for plug positions").

BALLS PER GAME ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides positions to operate game on "5 ball" or "3 ball" play.

MATCH FEATURE ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides positions to turn match feature "on" or "off".

1ST COIN CHUTE ADJUSTMENT PLUG:

Located on the 2 coin unit, on front cabinet mounting board. This plug provides positions to give "1 play for 1 coin" or "1 play for 2 coins" thru the 1st (nickel) coin chute.

2ND COIN CHUTE ADJUSTMENT PLUG:

Located on front cabinet mounting board. This plug provides positions to give "1 play for 1 coin" or "2 plays for 1 coin" thru the 2nd (dime) coin chute. Note: When this plug is set for "2 plays - 1 coin", brown-white (male plug) wire on 3rd coin chute adjustment must be in "position 2".

3RD COIN CHUTE ADJUSTMENT PLUG:

Located on front cabinet mounting board. This plug provides positions to give "2 to 6 plays for 1 coin" thru the 3rd (quarter) coin chute, orange-white (male plug) wire. See 2nd coin chute note above for use of brown-white (male plug) wire.

HI-SCORE FEATURE ADJUSTMENT PLUG:

Located on front cabinet mounting board. This plug provides positions to award "credits" or "extra balls" for preset hi-scores.

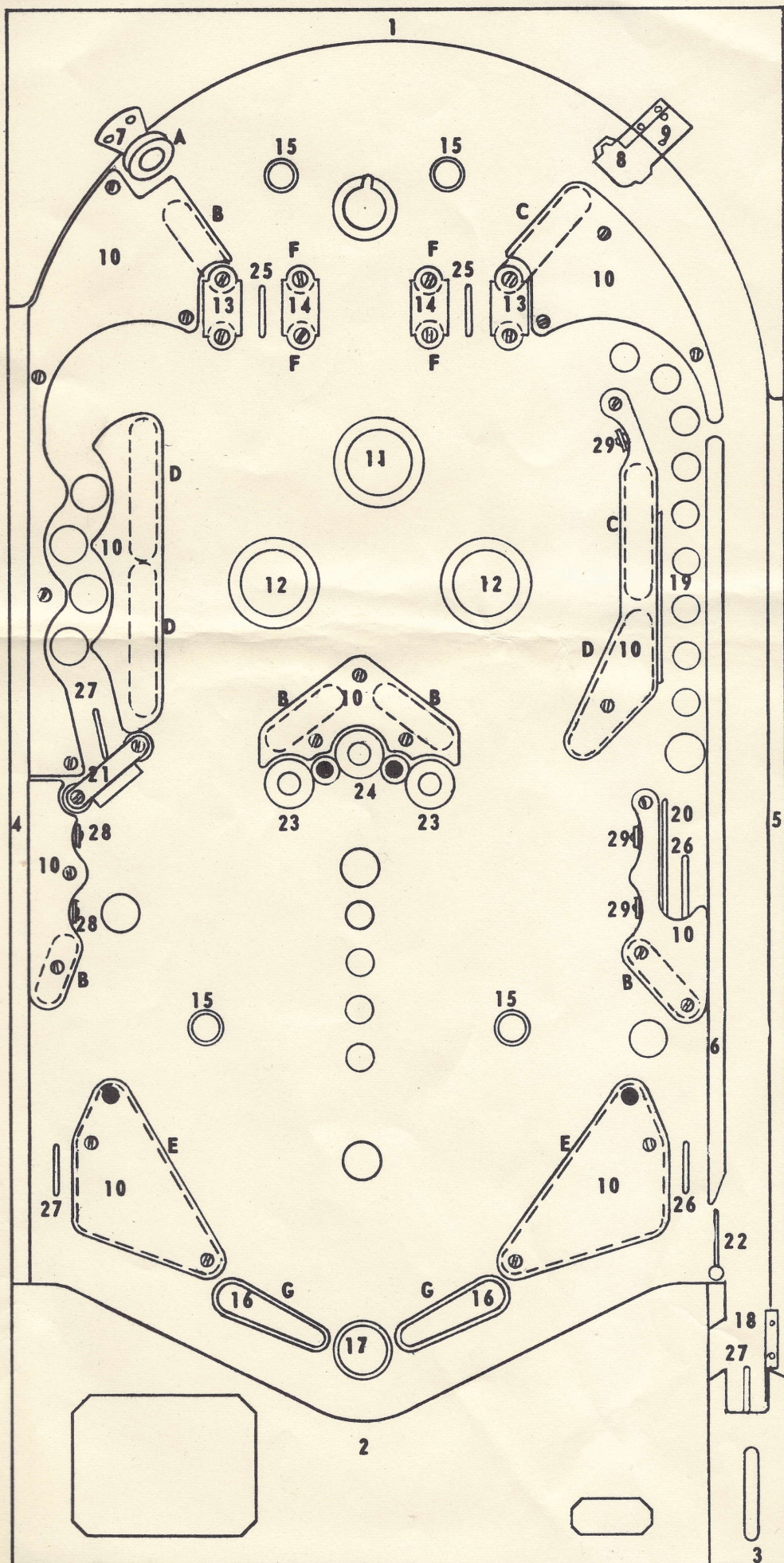
RUBBER PARTS

A	R-115-4	REBOUND RUBBER
B	R-521-1	1' (5)
C	R-521-2	1-1/2' (2)
D	R-521-3	2' (3)
E	R-521-6	3-1/2' (2)
F	R-243	5/16' (15)
G	R-406-3	YELLOW (2)

PANEL TOP PARTS

1	TOP ARCH	P-5839-68
2	BOTTOM ARCH	P-5871-38
3	SHOOTER GAUGE	P-6359-10
4	SIDE RAIL (L)	CA-1208-2
5	SIDE RAIL (R)	CA-1208-1
6	INNER RAIL	CA-1208-9
7	REBOUND ASSEMBLY	AS-493-3
8	BALL GATE	A-1475-1
9	BALL GATE COVER	P-2996-5
10	LITE SHIELDS	A-2890-76
11	BUMPER CAP (RED)	C-719-12
12	BUMPER CAP (BLUE)	C-719-16
13	GUIDE RAIL	C-693-1
14	GUIDE RAIL	C-694-1
15	ROLLOVER BUTTON	C-387-5
16	FLIPPER (WHITE)	C-611-5
17	BUMPER	C-810
18	PROTECTIVE ANGLE	P-7639
19	BALL GUIDE WIRE	M-121-33
20	BALL GUIDE WIRE	M-121-18
21	BALL GATE & WIRE	AS-2250-11
22	FREE GATE WIRE	M-1335-1
23	MUSHROOM BUMPER	AS-2291-4
24	MUSHROOM BUMPER	AS-2291
25	ROLLOVER WIRE	M-1336-10
26	ROLLOVER WIRE	M-1336-2
27	ROLLOVER WIRE	M-1336-3
28	TARGET ASSY. (RED)	AS-982-699
29	TARGET ASSY. (RED)	AS-982-723

● INDICATES MOVABLE POSTS
FOR SCORING ADJUSTMENTS



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PARTS LISTMISCELLANEOUS

Transformer
Score Motor (Domestic)
Score Motor (Export)
Meter (Total Play)

PART NO.
E-122-95
E-119-354
E-119-411
E-32-1700

ASSEMBLY COILS

Coin Lockout
Red T-B
Left Blue T-B
Right Blue T-B
Post
Top Hole Eject
Right Alley Kicker
Knocker
Bell
Outhole Kicker
Gate
Left Slingshot
Right Slingshot
Left Flipper
Right Flipper

PART NO.

FC-33-2600
A-25-1000
A-25-1000
A-25-1000
AP-31-3000
A-26-1100
A-26-1200
C-27-1000
CB-31-2000
A-25-1050
AF-27-1000/32-1300
AP-26-1200
AP-26-1200
AF-26-650/30-1200
AF-26-650/30-1200

INTERLOCK RELAYS

Game Over (Trip)
Game Over (Latch)

G-31-1800
G-31-1800

"G" RELAYS

Coin
2nd Coin Chute
3rd Coin Chute
Credit
Lock
Top Hole
Right Alley
Reset
#1 Score Reset
#2 Score Reset
Player Reset
Outhole
Bonus Reset
Ball Index
Tilt
Extra Ball
Post
Bonus Zero
Advance Bonus
Up Post M-B
Left Alley
Red T-B Lite
Blue T-B Lite
Up Post
Gate Target
Extra Ball Target
1000 Point
100 Point
10 Point
Red T-B
Left Blue T-B
Right T-B

G-31-1800
G-31-1800
G-31-1800
G-31-1800
G-33-2800
G-31-1800
G-31-1800
G-31-1800
G-30-1500
G-30-1500
G-32-2500
G-31-1800
G-31-1800
G-32-2500
G-32-2500
G-32-2500
G-32-2500
G-31-1800
G-30-1500
G-30-1500
G-31-1800
G-32-2500
G-32-2500
G-31-1800
G-30-1500
G-30-1500
G-30-1500
G-30-1500
G-30-1500
G-31-1800
G-31-1800
G-31-1800

UNIT COILS

2 Coin (Step Up)
Credit (Step Up)
Credit (Reset)
Coin (Step Up)
Coin (Reset)
Ball Count (Step Up)
Ball Count (Reset)
Player Up (Step Up)
Player Up (Reset)
00-90 (Step Up)
Score Drums (16)
(Step Up)
Bonus (Step Up)
Bonus (Reset)

CD-29-1600
B-26-1100
C-28-1100
B-26-1100
C-28-1100
B-26-1100
C-28-1100
B-26-1100
C-28-1100
B-26-1100
CD-29-1600
B-26-1100
C-28-1100

UNITS CONTACT DISCS

Coin
Ball Count
Player Up
00-90
Bonus

W-923-260
W-1043-17
W-923-207
W-1123-12
W-1072-16

UNITS WIPER ASS'YS

Coin
Ball Count
Player Up
00-90
Bonus

AS-1024-108
AS-1046-648
AS-1046-620
AS-1046-654
AS-1046-630

BALLY MFG. CORP.

Jan. 6, 1971

NEW COIL NUMBERS

FO-319a

OLD COIL NUMBER

NEW BALLY COIL NUMBER

CO-25A-7	A-25-1050
CO-25GG-7	B-25-925
CO-25H-7	BC-25-925
CO-26A-9	A-26-1100
CO-26GG-9	B-26-1100
CO-27R-11	C-27-1000
CO-28R-15	C-28-1100
E-184-41	BF-27-1250
E-184-46	EA-30-1150
E-184-47	EA-32-1550
E-184-55	B-29-1200
E-184-56	A-27-1100
E-184-74	CF-28-1025
E-184-75	E-32-1700
E-184-112	EA-29-950
E-184-135	BA-25-925
E-184-155	D-27-425
E-184-156	D-28-500
E-184-160	B-25-750
E-184-175	AP-27-1300
E-184-180	CE-33-4800
E-184-190	AF-25-600/31-1000
E-184-204	AF-27-1000/32-1300
E-184-205	B-27-1300
E-184-206	CD-29-1600
E-184-207	A-27-1400
E-184-213	A-27-1300
E-184-218	F-31-1500
E-184-224	F-31-2100
E-184-231	CA-29-800/31-900
E-184-235	AK-25-1050
E-184-236	J-28-1100
E-184-237	BA-26-1040
E-184-241	AF-25-600/31-1000
E-184-243	A-26-1200
E-184-248	FC-30-1300
E-184-249	BF-28-1500
E-184-250	D-30-700
E-184-252	BB-26-655/32-1245
E-184-254	FC-30-1400
E-184-257	AP-25-1050
E-184-260	B-28-1600
E-184-261	AP-31-3000
E-184-262	A-26-1200
E-184-263	AF-27-775/31-861
E-184-264	A-28-1900
E-184-265	AF-25-600/31-1000
E-184-266	D-29-675
E-184-268	AF-26-750/31-900
E-184-269	FC-33-2600
E-184-270	AB-31-3000
E-184-271	AK-24-750
E-184-272	A-25-1000
E-184-274	FC-32-2100

NOTE:

THESE COILS MAY BE ORDERED BY THE OLD COIL NUMBER OR BY THE NEW COIL NUMBER OR BY BOTH.