

#997 "DELTA QUEEN"

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 of front of cabinet is raised.

Check adjustment of the kick-off and slam switches:

Check adjustment of the normally open kick-off switch on cabinet mounting board. Check adjustment of the normally open slam switch, on front door. These switches energize the delay relay.

DOUBLE BONUS FEATURE

When the double bonus lite is lit and the ball goes into the bonus hole or the outhole, the game will score twice the bonus score lite lit.

The double bonus lite is lit when both the "A" and "B" targets are hit; the "A" and "B" target lites will go out. The double bonus lite when lit, will remain lit until the ball goes into the outhole, collecting the bonus score. The lite will go off if the game is tilted.

GENERAL GAME OPERATION

Place ball onto playfield by out hole. Plug in 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-5c, it will energize the coin relay. If game is set for 1 play-10c, 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-1N-, it will energize the coin relay. If game is set for 2 plays-10c, it will energize the 2nd coin chute relay and the 2nd coin chute relay will advance the credit unit (2 or more steps) thru the coin credit circuit. (See 2nd coin chute adjustment plug positions on game adjustments sheet. Also the 3rd coin chute adjustment plug for the number of credits).
- 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-25c, 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 a normally closed switch on the delay relay.
- 2C. The coin relay when energized will operate the score motor.
- 2D. The coin relay will energize the reset relay which will stay energized thru it's own switch until all drum unit zero switches are open and #8 score motor cam switch is open. The score reset relay is energized. The score reset relay provides the pulses to advance the drum units until the individual drum unit reads zero.
- 2E. The coin relay thru a normally closed #1 score motor cam switch will latch the game relay if the ball count unit is in index position or it will trip the game relay if the ball count unit is not in index position. If the game relay is tripped, it will lock in the coin relay and thru the combination of the two relays and the #2 score motor cam switch, they will reset the ball count unit to index position. With the ball count unit in zero position, the coin relay will latch the game relay when the score motor is back in index position. The coin relay is still locked in thru the #8 score motor cam switch. When the game relay is latched and the coin relay is energized, the ball count unit will advance twice for a 3-ball game thru #4 & #5 score motor cam switches or four steps for a 5-ball game thru #4 and #9 score motor cam switches. (#5 score motor cam pulse is cancelled out by the #9 score motor cam switch).
- 2F. If the game is adjusted to register game over when the game is tilted, the coin relay will latch the tilt relay thru the #3 score motor cam switch.
- 2G. A coin relay switch thru a normally open #3 score motor switch will advance the total play meter; if a credit was used to start the game, it will reset the credit unit one step.
- 3A. A ball on the out hole switch will energize the out hole relay thru a normally closed #1 score motor switch; 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 to play.

- 4A. This game has an add-a-ball circuit which is described under heading add-a-ball scoring. This game also has a tilt adjustment for ball-to-ball tilt or game over tilt.

Sequence of operation

- 1A. When a ball is played, the ball index relay will be energized by the 10 point relay, 100 point relay or 1000 point relay, and it will stay energized thru its own hold-in switch, normally closed outhole relay switch and normally closed #6 score motor switch.
- 1B. When the ball played returns to the outhole, the outhole relay is energized thru a normally closed #1 score motor switch, and it stays energized thru its own hold-in switch and a normally closed #10 score motor switch.
- 1C. The outhole relay will operate the score motor and thru a ball index relay switch and a normally open #5 score motor switch it will reset the ball count unit one step. Another outhole relay switch thru a normally open #7 score motor switch will operate the outhole kicker solenoid to return ball to the shooter alley.
- 1D. When 1 ball to play lite is lit, and the ball is played and returns to the outhole, the game over trip relay is tripped thru a series of switches on the outhole relay, ball index relay, ball count unit zero and a normally open #4 score motor switch.

Add-A-Ball Scoring

- 1A. If the game was completed before starting a new game:
 The game over trip relay is tripped.
 The ball count unit is in zero position.
 The game relay is tripped.
- 1B. A coin relay switch will latch the game relay thru a normally closed #1 score motor switch. Another coin relay switch will step up the ball count unit, 2 steps for 3 ball game or 4 steps for 5 ball game thru score motor switches.
- 1C. Unlike regular replay games, the ball count unit is reset one step at the end of each play, and extra balls are registered by stepping up the ball count unit. The "ball in play" lites now become "balls to play" lites. The game starts with either 3 balls to play or 5 balls to play. When an add-a-ball has been earned, the ball count unit steps up, adds another ball to play, up to 9 maximum. The game ends when 1 ball to play is lit and the game over lights.

- 1D. The first ball played will trip the game relay.
- 2A. If the game is started before the game is completed: The ball count unit is off the zero position. The game relay may or may not be tripped.
- 2B. A coin relay switch will trip the game relay thru a normally closed #1 score motor switch and a ball count unit zero switch. Another coin relay switch will trip the game over trip relay thru a normally closed #1 score motor switch and resets the ball count unit thru a normally open #2 score motor switch. When the ball count unit has been reset to zero position the game relay is latched thru a normally closed #1 score motor switch. The coin relay remains energized for another half cycle during which time the ball count unit is stepped up as described under 1C.

#997 DELTA QUEEN
FEATURES OPERATION AND SCORING

BONUS FEATURE

1. The bonus score lite is 1000 at the start of a game and at the start of each ball play.
2. The bonus score lite is advanced 1000 by each of three top right roll-over buttons, by left and right ball return roll-overs and by the advance bonus targets.
3. The bonus score lighted is scored when the ball goes into the bonus hole or into the outhole, (provided the game is not tilted). The ball in the bonus collect hole does not reset the bonus score light, but the bonus score lite is reset to 1000 after the bonus score is collected in the outhole, also at the start of a game and when the game is tilted.
4. All bonus scoring is actuated by the bonus score relay and the 5000 relay. The 2X and the 4X relays serve to keep the bonus score relay and the 5000 relay energized during the double bonus scoring.

DOUBLE BONUS FEATURE

Extra ball - Special features:

There are 3 adjustments on the hi-score special features adjustment plug:

- "C" Position: Hi-score feature scores credits, top center lane roll-over and the center hole score a credit or an extra ball when lit.
- "AB" Position: Hi-score feature scores an add-a-ball. Top center lane roll-over and the center hole scores an add-a-ball, when extra ball or special is lit.
- "NOV" Position: This is the novelty position. In this position, all hi-score adjustment plugs should be un-plugged and the novelty adjustment plug should be in #2 position. In the novelty position, no credits, extra ball or add-a-ball is awarded. In this position, the special awards 5000 score, when the special is lit, and the ball goes thru the top center lane or into the center hole.
- Extra Ball Award: The extra ball relay is energized which allows the player to shoot again without deducting a ball to play. Only one extra ball per ball in play, when an extra ball is earned, this ball must be played off before another extra ball can be awarded.

Add-A-Ball Award: An Add-a-ball award advances the ball count unit. The player can earn and maintain up to 9 balls to play. These awards are registered by the balls to play lites on the score glass.

Novelty Award: This adjustment was added for locations where NO credits, add-a-ball or extra ball may be awarded. The only award is a 5000 score.

THUMPER BUMPER LITE FEATURE:

The thumper-bumpers score 10 or 100 when lit, except the center thumper-bumper which scores 100 points at all times.

Left thumper-bumper is lit by the top right and center lane roll-overs. Right thumper-bumper is lit by the top left and center lane roll-overs.

TILT ADJUSTMENT:

The game is adjustable for game over when tilted or ball-to-ball tilt. In the latter, the game when tilted will not score during the play of that ball only.

GAME ADJUSTMENTS

HI-SCORE ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides a wide range of coverage at which hi-score credits or add-a-ball can be scored. Remove all high score adjustment plugs when game is adjusted for novelty play (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 turn match feature "on" or "off".

1ST COIN CHUTE ADJUSTMENT PLUG:

Located on the 2 coin unit, on the 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 the 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, brownwhite (male plug) wire on 3rd coin chute adjustment must be in position 2.

3RD COIN CHUTE ADJUSTMENT PLUG:

Located on the 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 SPECIAL FEATURE ADJUSTMENT PLUG:

Located on front cabinet mounting board. This plug provides positions to award credits, add-a-ball or 5000 points for special award.

TILT ADJUSTMENT PLUG:

Located on the front cabinet mounting board. This plug provides for ball-to-ball tilt or game tilt adjustment.

NOVELTY FEATURE ADJUSTMENT PLUG:

Located on the bottom of the playfield panel. This controls the extra ball lites at the top center lane and the center hole. This should be plugged into #1 position except when the game is adjusted for novelty play at which time it should be plugged into position #2.

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PARTS LIST

MISCELLANEOUS

Transformer	E-122-95
Score motor (Domestic)	E-119-354
Score motor (Export)	E-119-411
Total Play Meter	E-32-1700

RELAYS

Delay	G-31-1600
Coin	G-31-2000
2nd coin chute	G-31-2000
3rd coin chute	G-31-2000
Credit	G-31-2000
Lock	G-33-2800
Reset	G-31-2000
Score Reset	G-30-1500
Game over (Latch)	G-31-2000
Game over (Trip)	G-31-2000
Tilt (Latch)	G-31-2000
Tilt (Trip)	G-31-2000
100,000 (Latch)	G-31-2000
100,000 (Trip)	G-31-2000
Game (Latch)	G-31-2000
Game (Trip)	G-31-2000
Bonus Hole	G-31-2000
Center Hole	G-31-2000
Top Center Lane	G-31-2000
Out Bonus	G-31-2000
Outhole	G-31-2000
Control	G-31-2000
Ball Index	G-32-2500
Extra Ball	G-32-2500
Roll-over button	G-31-2000
Advance bonus	G-31-2000
Bonus Score	G-31-2000
5000	G-31-2000
2X	G-32-2500
4X	G-32-2500
"A"	G-32-2500
"B"	G-32-2500
500	G-31-2000
Special	G-31-2000
Alternator	G-32-2500
1000 Point	G-31-2000
100 Point	G-31-2000
10 Point	G-31-2000
Lite Left thumper bumper	G-32-2500

RELAYS

Lite Right Thumper Bumper	G-32-2500
Center Thumper Bumper	G-31-2000
Left Thumper Bumper	G-31-2000
Right Thumper Bumper	G-31-2000

ASSEMBLY COILS

Coin Lock-out	FC-33-2600
Outhole Kicker	A-25-950
Knocker	C-27-1000
Chimes (3)	CC-31-2000
Thumper-bumper (3)	A-25-1000
Bonus hole eject	A-27-1100
Center hole Eject	A-27-1100
Left Sling-shot	A-26-1200
Right Sling-shot	A-26-1200
Left Flipper	AF-25-600/28-800
Right Flipper	AF-25-600/28-800

UNIT COILS

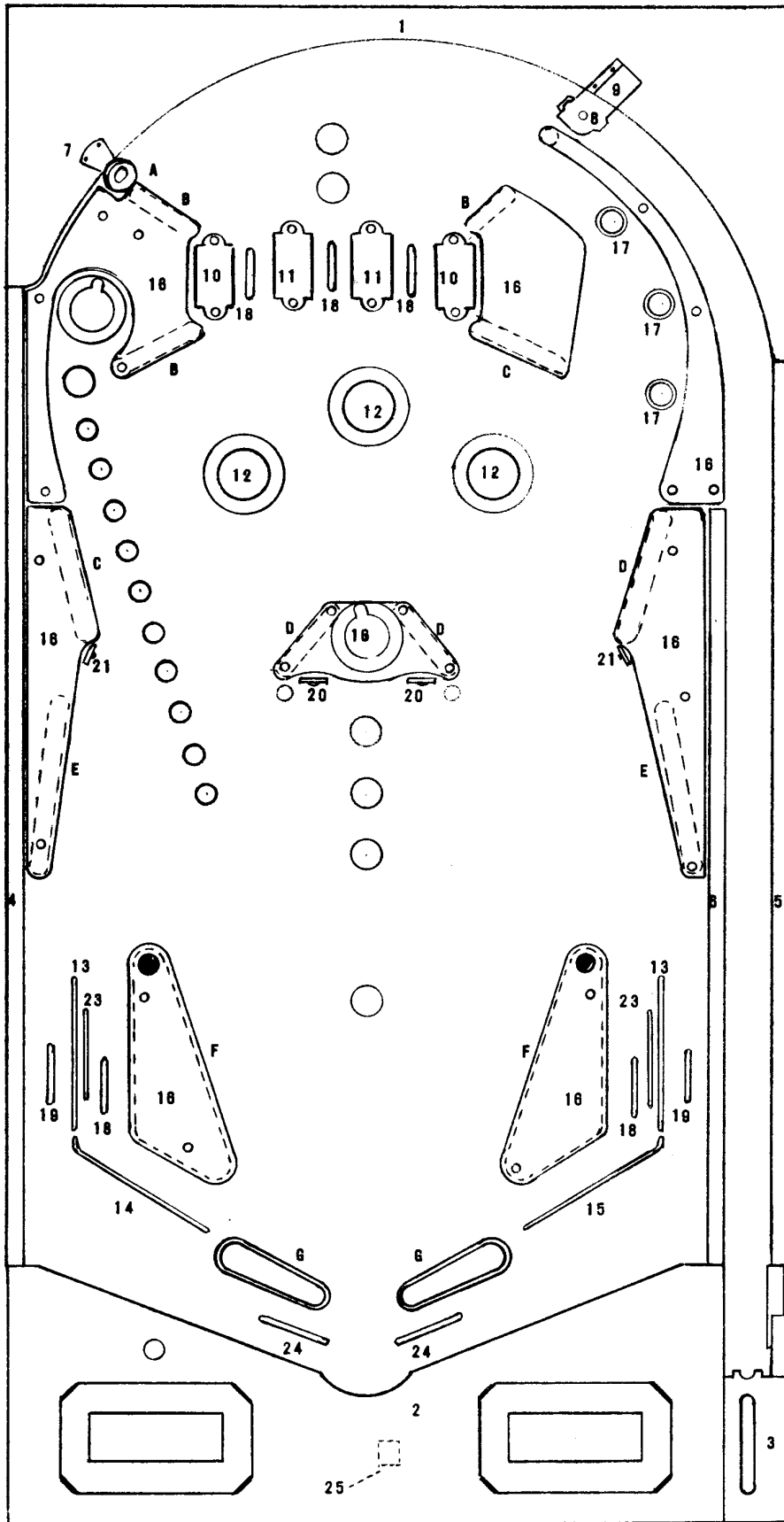
2 Coin step-up.	CD-29-1600
Credit (step-up)	B-26-1100
Credit (Reset)	C-28-1100
Score drums (4) step-up	CD-29-1600
00-90 (step-up)	CD-29-1600
Bonus (step-up)	B-26-1100
Bonus (Reset)	C-28-1100
Ball Count (step-up)	B-26-1100
Ball count (reset)	C-28-1100

UNIT CONTACT DISC

00-90 (inside)	W-999-28
00-90 (outside)	W-999-29
Bonus	W-1072-37b
Ball Count	W-1043-19

UNIT WIPER ASS'Y.

00-90 (inside)	A-1618-3a
00-90 (outside)	A-1618-4a
Bonus	AS-1046-750a
Ball count	AS-1046-681a



- A. R-115-4 REBOUND 1
- B. R-521-1 1° 3
- C. R-521-3 2° 2
- D. R-521-2 1-1/2° 3
- E. R-521-4 2-1/2° 2
- F. R-521-5 3° 2
- G. R-408-3 FLIPPER 2
- H. R-243 5/16" 8

PANEL TOP PARTS

- 1. TOP ARCH P-5839-57
- 2. BOTTOM ARCH P-5871-47
- 3. SHOOTER GAUGE P-6359-13
- 4. SIDE RAIL (L) CA-1208-24
- 5. SIDE RAIL (R) CA-1208-22
- 6. INSIDE RAIL CA-1208-25
- 7. REBOUND ASSEMBLY AS-493-3
- 8. BALL GATE A-1475-1
- 9. BALL GATE COVER P-2998-5
- 10. PLASTIC GUIDE RAIL C-694-1
- 11. PLASTIC GUIDE RAIL C-693-1
- 12. BUMPER CAP (BLUE) A-3713-11
- 13. BALL GUIDE WIRE M-121-18
- 14. BALL GUIDE WIRE M-121-43
- 15. BALL GUIDE WIRE M-121-44
- 16. LITE SHIELDS A-2890-97
- 17. ROLLOVER BUTTON C-387-5
- 18. ROLLOVER WIRE M-1338-10
- 19. ROLLOVER WIRE M-1338-2
- 20. TARGET ASSEMBLY AS-982-752
- 21. TARGET ASSEMBLY AS-982-723
- 22. FLIPPER & PIN ASSEM. AS-2214-19
- 23. BALL GUIDE WIRE (2) M-121-24
- 24. BALL GUIDE WIRE (2) M-121-53
- 25. BALL RETURN WIRE M-1338-21

● INDICATES MOVABLE POSTS FOR SCORING ADJUSTMENT

TIME DELAY CIRCUIT

Purpose of the time delay circuit is to prevent unnecessary abuse of the machine it is installed in.

The time delay relay is energized anytime one of the slam switches are made to contact. There are two factory installed slam switches, one on the front door and one on the mechanism mounting board. (Any number of slam switches could be installed by the operator, to meet his individual requirement). The switches should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing the gap between contacts will make switch more sensitive. Opening the gap will reduce sensitivity.

The total time the delay relay is energized can be varied by changing the #455 lite bulb mounted on the delay relay frame. If unable to get a short enough time of delay, get a Westinghouse #455 bulb; these units are considerably faster. If still unable to bring the time down, check the location voltage. It should not be under 49,5 V.A.C. on the transformer secondary.

Jan. 6, 1971

NEW COIL NUMBERSOLD COIL NUMBERNEW 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-2600-9	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-27-1000/32-130C
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-3a-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	As-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