DIALS, FINGERWHEELS, AND NUMBER CARDS DESCRIPTION

CONTENTS PAGE

1. GENERAL

1.01 This section provides information concerning the identification of various dials, fingerwheels, escutcheons, and number cards that are commonly used on telephone sets, data sets, teletypewriters, test boards, and tollboards.

1.02 This section is reissued to update the information on dials, fingerwheels, and number cards. The revisions are indicated by marginal arrows. Remove and destroy all copies of Section 473-820-100, Issue 2 and Appendix Issue 1.

2. DIALS

2.01 Dials in common use within the GTE system include the GTE Automatic Electric Types 24, 24A36, 51, 51A, 52, 53, 54, and 154A; the WECo Numbers 5, 6, 7, 8, and 9; the Kellogg equivalents of the WECo Numbers 7, 8, and 9; and the Stromberg-Carlson S-C Number 10A. GTE AE dials are customarily used on GTE AE telephone sets, data auxiliary sets, testboards, and tollboards, as well as on some Leich telephone sets, tollboards, and certain North telephone sets. WECo dials will be found on WECo telephone sets, data sets, data auxiliary sets, testboards, and tollboards as well as on Teletype teletypewriters and certain Leich and North telephone sets. GTE usage of Kellogg and Stromberg-Carlson dials is confined to their respective sets.

2.02 The GTE AE Type 24 dials, introduced in 1924, is a nonquieted-pawl type, in which the passage of the pawl over the ratchet gear emits a series of clicks as the fingerwheel is drawn back by the user. The Type 24A36 dial, introduced in 1936, provides pawl-quieting action through a flat spring placed over the pawl, which cushions its impact against the teeth of the ratchet gear. The Type 51 dial, introduced in 1951, provides silencing action through a friction-type pawl lever, which is pushed ahead by the pawl and by the contour of its contact edge keeps the pawl from engaging the teeth during windup. The three types are superficially similar in appearance, all being 3 inches in diameter, with single-contact springs, and equipped with D-78540 fingerwheels.

2.03 The GTE AE Type 51A dial, introduced in 1954 is similar to the Type 51 except for the use of twin-contact springs and the provision of tapped bosses in the base on which to mount an acrylic dust cover. The number plate of the Type 51A dial was revised in 1972 to reverse the position of the letters and numerals, placing the numerals above the letters. This change was made for better visibility of the numerals. Fingerwheels D-780649, D-780697-A, D-780896-A, and HD-780059-A can be used with this dial.

2.04 The GTE AE Type 52, 53A, and 53B dials, used with the Type 80 telephone set, have a mechanism similar to that of the Type 51A. They differ in the provision of an external number plate which is 4-1/4 inches in diameter. The Type 53A dial is equipped with an auxiliary spring assembly and cam to provide a party identity pulse or pulses on Type A Strowger Automatic Toll Ticketing (SATT) installations. The Type 53B dial is similarly equipped, except that the auxiliary cam provides a single pulse for identity in Type B SATT offices. Fingerwheels D-780649, D-780697-A, and D-780896-A, and HD-780059-A can be used with each of these three dial types.

2.05 The GTE AE Type 54 dial, used on the Type 182A and 192A sets, is a 3-inch diameter dial, similar to the Type 51A, but equipped with a rectangular number plate and integral electroluminescent lamp. The number plate of the Type 54 dial was revised in 1972 to reverse the positions of the letters and numerals, placing the numeral above the letters. This change was made for better visibility of the numerals. Fingerwheels D-780697-A, D-780896-A, and HD-780059-A can be used with this dial.

2.06 The GTE AE Type 154-A dial is used on the STYLELINE ® telephone. The number plate of this miniature dial is 2-1/2 inches in diameter and the polycarbonate fingerwheel, D-781050-A, is 2-3/8 inches in diameter. Both the pawl stop and finger stop are moveable. A set of four acetal reducing gears provide the necessary shunting while three shafts run in acetal bearings.

2.07 The WECo Number 5 dial, introduced about 1939, is 3 inches in diameter and has twin-contact springs and a fly bar governor. There is no pawl-and-ratchet disengagement of the drive and governor assembly during windup; a ten-lobed cam is drawn back, displacing the contact actuator, which emits a series of clicks. Black Number 5 dials are equipped with P-153971 aluminum fingerwheels, while white Number 5J dials are equipped with P-344837 acrylic fingerwheels.

2.08 The WECo Number 6 dial, introduced about 1953, is a modification of the Number 7 dial mechanism in a 3 inch assembly with the same contact arrangement as the Number 5 dial, which it supersedes. Although built on a cylindrical base like the latter, the Number 6 dial has virtually its entire mechanism mounted beneath the base, rather than partially above it as on the Number 5 assembly. Black Number 6 dials are equipped with P-349543 aluminum fingerwheels, and colored Number 6 dials are equipped with P-19B524 acrylic fingerwheels, except that the Number 6L dials used on CALL DIRECTOR ® sets are equipped with P-11E007 acrylic fingerwheels.

2.09 The WECo Number 7 dial, introduced in 1949 on the 500 series desk telephone set, is equipped with an external number ring 4-1/4 inches in diameter, a drive-bar governor, an acrylic dust cover over the mechanism and a single-lobe nylon cam, which actuates twin-contact springs directly. Although the cam itself is silent in operation, a train of spur gears which drives the governor at 24 times the fingerwheel speed, and the cam half as rapidly, is audible during windup and rundown. In the most common version, the off-normal springs are limited to a single make set. Most black Number 7 dials are equipped with P-349543 aluminum fingerwheels, while those to be externally illuminated and those with colored number rings are equipped with P-19B524 acrylic fingerwheels.

2.10 The WECo Number 8 dial, introduced in 1959 on the WECo 700 series compact desk set, is a 3-inch diameter dial constructed on a stamped steel frame. Mounted in the same manner as a Number 7, it is similar in operation with a substantially simplified construction, with a slightly different governor and a polyethylene shield over the mechanism. Noise reduction has been achieved by a change in gear diameters and use of an acetal gear on the governor shaft. A two-piece acrylic number plate permits optional rear illumination. Acrylic fingerwheel P-11E007 is used with this dial.

2.11 The WECo Number 9 dial introduced in 1968 replaces the WECo Number 7 dial. Some of the features of the WECo Number 8 dial are incorporated into this dial to make the operation smoother and quieter than that of the WECo Number 7 dial. This dial is provided with a transparent plastic fingerwheel that does not require a separate card holder since the card holder is an integral part of the fingerwheel. The Number 9C dial, which replaces the Number 7A, C, and D dials is equipped with two pairs of contacts and is used with Number 500, 501, and similar type telephone sets. The number 9H dial, which replaces the Number 7E, G, and H dials, is equipped with three sets of contacts and intended for use with telephone sets associated with the Number 1 Speakerphone System. The Number 9L dial, which replaces the Number 7L dial forms part of the Number 691A-3 telephone set. The Number 9M dial is used with the Number 525 telephone set; Number 9N-3 and 9N-58 with the Number 568HN telephone set; Number 9N-51 and 9N-60 with the Number 568HS telephone set; Number 9N-61 with data auxiliary set Number 817-A1; and Number 9P-3 with the Number 529B-3 telephone set.

2.12 The Stromberg-Carlson S-C Number 10A dial was first produced in early 1968 for the SLENDERET ™ telephone set. The dial, 2-1/2 inches in diameter with a 2-3/8 inch polycarbonate fingerwheel (number 300001-531) can be optionally lighted for night use. The finger stop travels through an arc of 52 degrees during dialing and returns with the fingerwheel to normal after dialing. Because the dial is located in a handset, the off-normal contacts are eliminated.

2.13 The Northern Electric Type NE-6 dial is for use on those decorator telephone sets when the enclosure provides clearance for the finger stop

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only in the "four-o'clock" position. The NE-6QC dial has a chrome-plated fingerwheel, and the NE-6QD dial has a brass-plated fingerwheel.

3. FINGERWHEELS

3.01 The GTE AE D-78540 fingerwheel is manufactured from sheet brass (wartime production was of steel), with a deep wall around the periphery and shallower walls around each finger hole. The upper surface is essentially flat. At various times, this fingerwheel has been manufactured with black, gold, nickel, or chrome finish. The D-780649-A fingerwheel, introduced in 1954, supersedes the D-78540 and is available in the same choice of finishes. It differs in having a domed upper surface, so that the outer wall is not as deep. Each of these fingerwheels employs six or seven additional parts for mounting and for station identification (Figure 1).

3.02 The GTE AE D-780697-A fingerwheel is molded from clear acrylic, and is about 5/32 inch thick at the outer edge. Mounting and identification require seven additional parts (Figure 2).

3.03 The GTE AE D-780896-A fingerwheel, molded from clear acrylic or polycarbonate, supersedes the D-780697-A and is about 1/8 inch thick at the outer edge. It has no metal escutcheon but an integrally-molded window in the center. On most dials manufactured in May, 1964, or later, a clamping disc is spotwelded to the hub of the shaft, and no additional parts are required to mount the fingerwheel. A number card smaller than those previously used is required for identification. Two additional parts are included along with the D-780896-A acrylic or polycarbonate fingerwheel to complete the H-885503-1 Dial Fingerwheel Kit (Figure 3).

3.04 The GTE AE D-781050-A is a polycarbonate fingerwheel used on the miniature dial (Type 154A). Once the white fingerwheel cover is removed and the fingerwheel has been disengaged, the spring washer and finger stop is removable. Refer to Figure 4 for all the associated parts.

3.05 The GTE AE HD-780059-A fingerwheel (Figure 5) supersedes the D-780896-A fingerwheel. The HD-780059-A fingerwheel is molded from polycarbonate, and the top has a depressed circular area 1-1/4 inches in diameter used to house the number card and number card overlay. The center of the fingerwheel is drilled, and its upper surface counter-sunk, to accept a 5-40 x 5/16 inch flat Type 1A POZIDRIV ® head machine screw, by which it is directly fastened to the hub of the mainshaft. The Dracon Industries Type 12000 dial fingerwheel is interchangeable with the HD-780059-A. When the HD-780059-A fingerwheel is individually packaged with the HD-764004-D screw, the part number for the packet is HD-780059-AR. When the HD-780059-A fingerwheel is packaged in bulk with the HD-764004-D screw (120 each per tray), the part number is HD-780059-B.

3.06 The WECo P-153971 fingerwheel is stamped from sheet aluminum (early production was of brass) and is a perfectly flat disc with chamfered finger holes and a center opening to accept the hub of the shaft on a Number 5 dial. The P-349543 fingerwheel is similar except for the size and orientation of this opening, which is arranged to fit a Number 6 or 7 dial. Six or seven additional parts are required for mounting and identification purposes (Figure 6).

3.07 The WECo P-19B524 fingerwheel, molded from clear acrylic or polycarbonate, has no metal escutcheon. A raised portion surrounding an approximate 1-5/16 inch diameter center hole serves to retain a P-137593 acetate window, which is inserted from the rear. Including the window, six additional parts are required to mount the fingerwheel and provide identification. Two different clamp plates are available: P-10C193 is arranged to mount on the hub of a Number 5 dial, and P-11E206 on the hub of a Number 6 or 7 dial (Figure 7).

3.08 The WECo P-11E007 fingerwheel, molded from clear acrylic or polycarbonate, is similar to the P-19B524 but is not interchangeable with it because of a difference in the installed height above the number plate. In place of the center hole is an integrally-molded window, from which the surface sweeps to the edge in a smooth, gently convex line. When used on the Number 6L dial, five additional parts are required for mounting and identification (Figure 8). Since a combined clamp plate and card retainer forms part of the shaft assembly on the Number 8 dial, no additional parts are required for mounting, and only a number card for identification.

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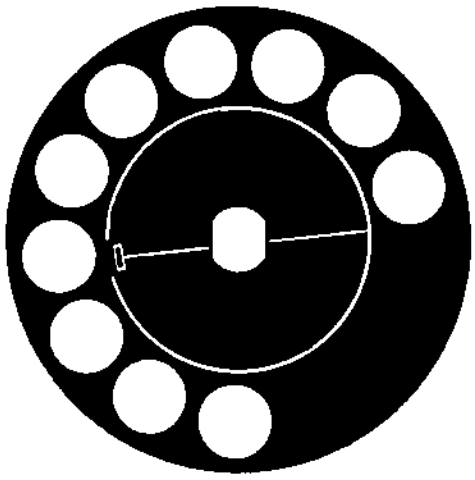
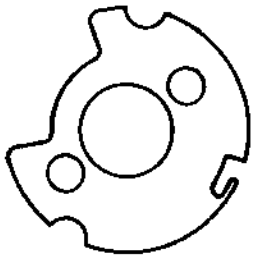
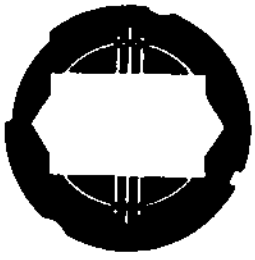


D-780649-A FINGERWHEEL

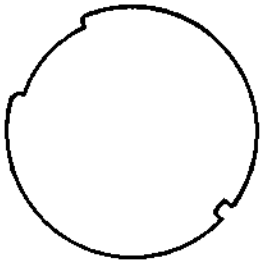


D-78541-A CLAMPING PLATE

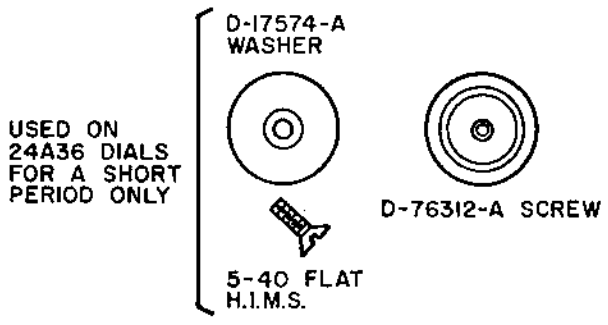


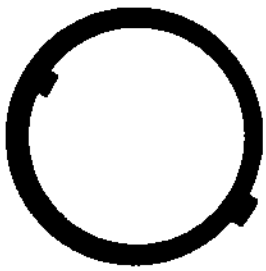
D-53620-A NUMBER CARD

D-5886-A ESCUTCHEON LOCK



D-53176-A ACETATE DISC





D-65112-D ESCUTCHEON RING

Figure 1. GTE AE Metal Fingerwheel Assembly.

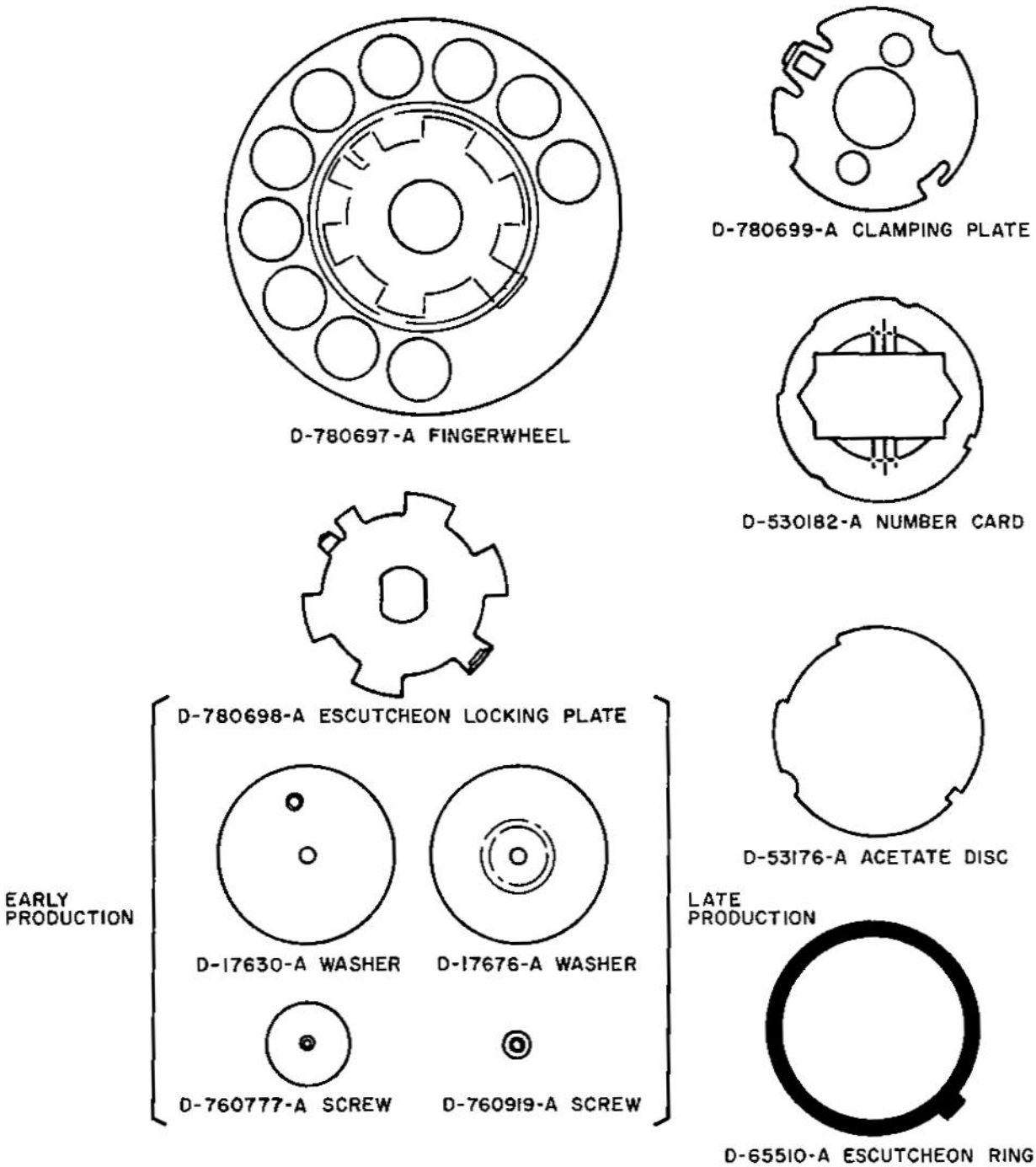


Figure 2. GTE AE D-780697-A Acrylic Fingerwheel and Assembly.

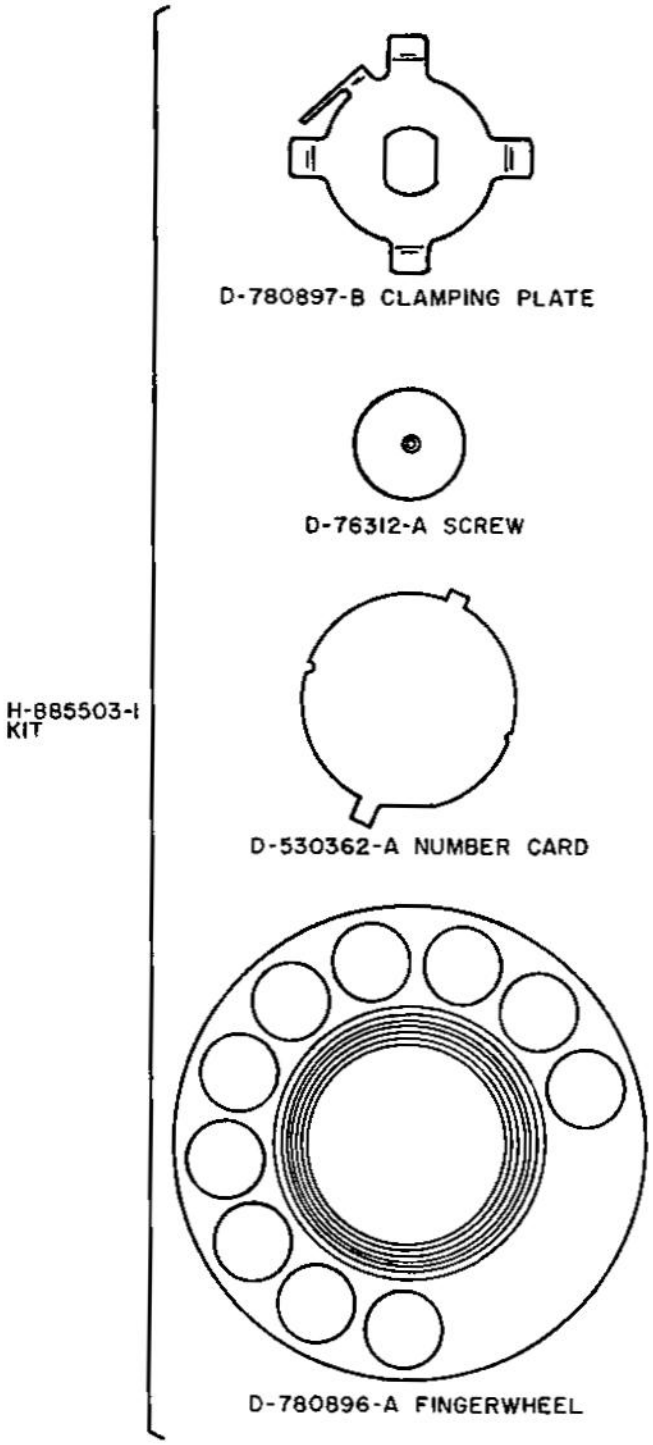


Figure 3. GTE AE D-780896-A Acrylic or Polycarbonate Fingerwheel and Assembly.

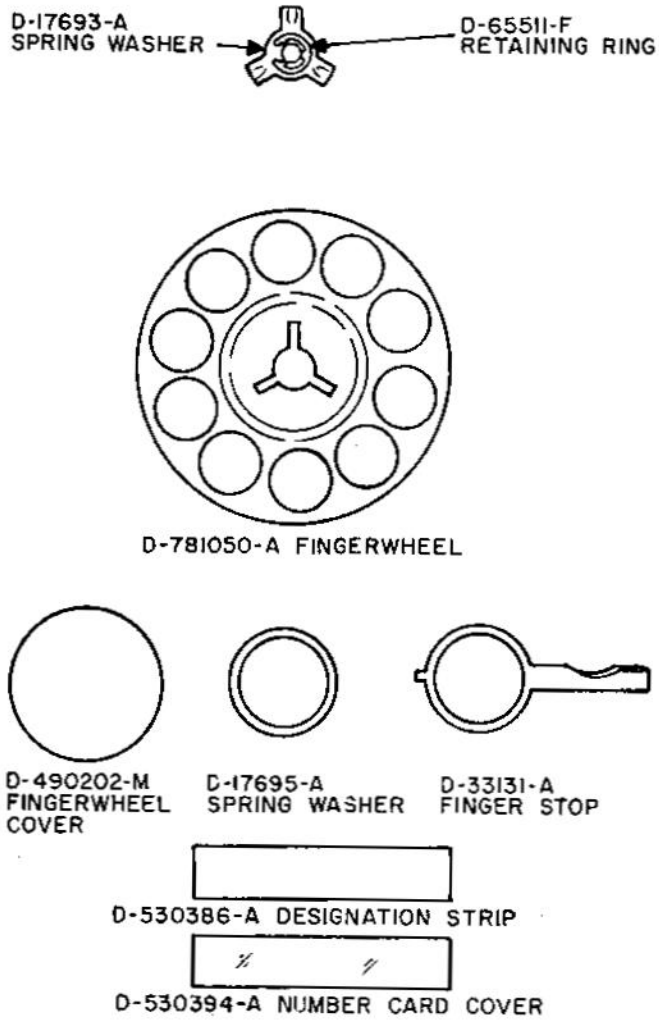
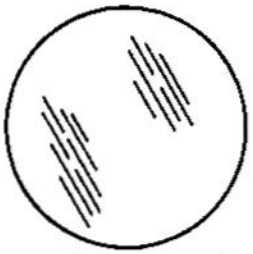
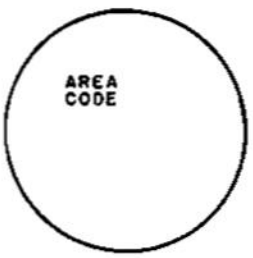


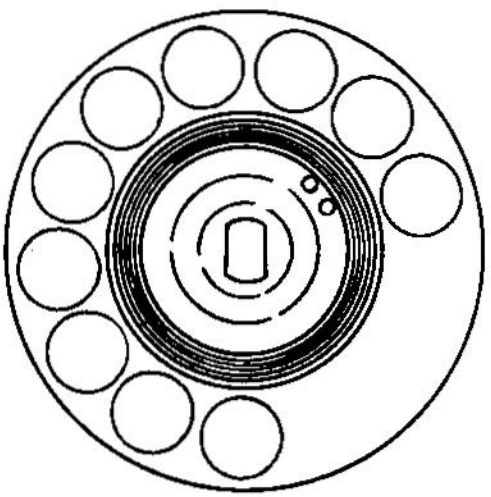
Figure 4. GTE AE D-781050-A Polycarbonate Fingerwheel and Assembly.



ACETATE OVERLAY



NUMBER CARD



HD-780059-A FINGERWHEEL

Figure 5. GTE AE Polycarbonate Fingerwheel and Adhesive Number Card.

3.09 The Stromberg-Carlson number 300001-531 is the 2-3/8 inch fingerwheel molded from clear polycarbonate for the S-C Number 10A dial. This fingerwheel is used on the miniature dial only. The fingerwheel does not contain a number card but in its place is a colored dial insert. The telephone number is located above the dial in the handset housing. See Figure 9 for complete color listing for the dial inserts and part listings.

4. ESCUTCHEONS AND DIAL CARDS

4.01 In addition to their use on fingerwheels, escutcheons and card holders are also required on manual telephone sets. Some monophone sets for manual service are assembled with apparatus blanks equipped with an escutcheon lock that permits use of the same escutcheon assembly as is used with GTE AE metal fingerwheels. Similarly, black WECo manual sets are arranged to mount the same card holder assembly as is used on WECo metal fingerwheels. Other monophone manual telephone sets and all Leich sets for manual service were assembled with Leich apparatus blanks arranged to mount the two-pronged escutcheon assembly shown in Figure 10. This assembly is also used on the generator crank of 900 series magneto telephone sets.

4.02 GTE AE dials beginning with the Type 24 used black number card D-53620-A, its number space having been enlarged from time to time (see Figure 11). Assembly D-530155-A provided four such cards die-cut to be broken out of a 9-1/2 inch x 2-inch strip. For use on colored Type 52 dials, white number card D-530182-A was provided singly, and in strips of four as D-530184-A. Beginning in May, 1964, all dials manufactured with metal fingerwheels were equipped with a number card D-53340-A, a completely blank white card otherwise identical to D-530182-A, which it superseded. At the same time, the smaller-diameter D-530362-A card, also plain white, was introduced for use with the D-780896-A acrylic fingerwheel. Strip D-530361-A provides four cards of either type by means of two concentric die cuts. This strip supersedes D-530184-A. The following differences between the individual cards and those broken from the strip should be noted:

(a) D-53340-A – As provided individually it has an unbroken expanse to its outer edge. As provided on breakout card D-530361-A, the inner die cut is visible when mounted in a metal escutcheon ring.

(b) D-530362-A -

(1) As provided individually it has one straight section along its edge as a reference point from which to align the station number. This is intended to fall at the bottom of the disc. In case it should be used as the top edge by mistake, a second semi-

circular indentation permits clearance for the insertion of the removal tool if the card is installed upside down. However, this does not permit the reverse side of the card to be used, because the indentations and the locating tabs do not fall at 90° intervals. As provided on breakout card D-530361-A it is perfectly circular except for the tabs and indentations, the aligning straight portion of the edge not being necessary since the edge of the strip can be used for indexing purposes if the card has not already been detached from the strip.

(2) As provided individually it has one elongated locating tab, which may be bent up during insertion so as to serve as a handle for removing the disc from the fingerwheel. This is not possible with the breakout card from the dual-purpose strip, since the edge of such a tab would intersect the edge of the larger-diameter card. Use of tape, pressed against the back of the card, is suggested as a means of removal where no elongated tab is available.

4.03 The new HD-780059-A fingerwheel requires the use of the 1-1/4 inch diameter, circular, adhesive-backed number card. This number card conceals the mounting screw, and fits in the depressed area in the center of the fingerwheel. To protect the number card, an overlay disc of the same size is used on coin telephones and may also be used in other applications where high usage makes it advisable. This overlay disc is made of clear acetate with a transparent adhesive backing.

4.04 The GTE AE Type 154A dial does not accept a number card in the center of the fingerwheel. A small rectangular designation strip (D-530386-A) and a number card cover (D-530394-A) is located directly above the dial in the handset housing. The designation strip and number card cover is shown in Figure 4 with the other fingerwheel parts.

4.05 Leich telephone sets equipped with GTE AE Types 51 and 51A dials having black fingerwheels were provided with black number card 12404. With the advent of colored dials, the material and design of the card were changed to a neutral gray. Leich manual telephone sets were provided with a 12285 card, identical in design but smaller in size and having two semicircular indentations to clear the prongs of the escutcheon assembly (Figure 10). Monophone manual telephone sets with Leich apparatus blanks were equipped with a 15303 card, identical in size to 12285 but printed on white stock to match D-530182-A. As NL-15303-A, this card is still supplied on 900 series magneto telephone sets. It can also be used in WECo card holders.

4.06 WECo dials with metal fingerwheels are arranged to use a 1-1/2 inch diameter number card with a notch at the right side to clear the locating tab in the card holder frame (Figure 11). The older black cards with white space for the station number have been replaced in most applications by plain cards of a neutral gray shade. For use with the P-11E007 acrylic fingerwheel, a card is required without the notch but with a nick in the upper left edge. WECo dials, telephone sets, data sets, and teletypewriters are sold with no number cards equipped or povided. The sale of cards is discouraged by the supplier. Breakout cards in strips of four are arranged with the locating nick, and with a notch provided optionally by tearing out a perforated area. GTE AE NL-15303-A cards, though slightly smaller in diameter than WECo cards, are an adequate substitute when installed in metal card holder frames. In this case, the right-hand indentation may require trimming to clear the locating tab. In the same manner, the cards may be nicked to fit WECo acrylic fingerwheels. The left-hand indentation will be visible, however.

4.07 The Stromberg-Carlson Number 10A dial is similar to the GTE AE Type 154A dial in so much as the fingerwheel does not contain a number card. The station number card (300001-911) and cover (303944-518) are located directly above the dial in the handset housing.

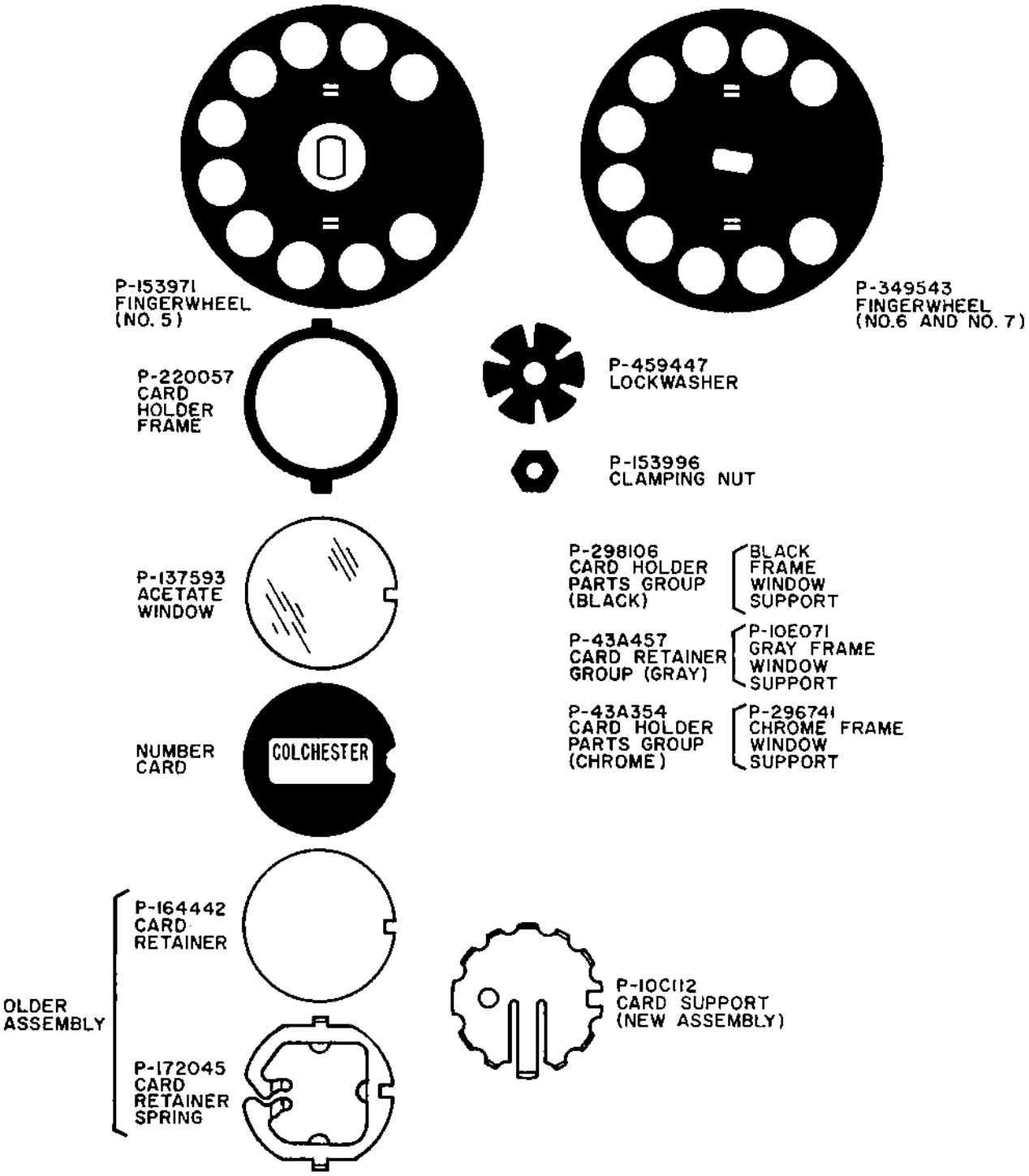


Figure 6. WECo Metal Fingerwheel Assemblies.

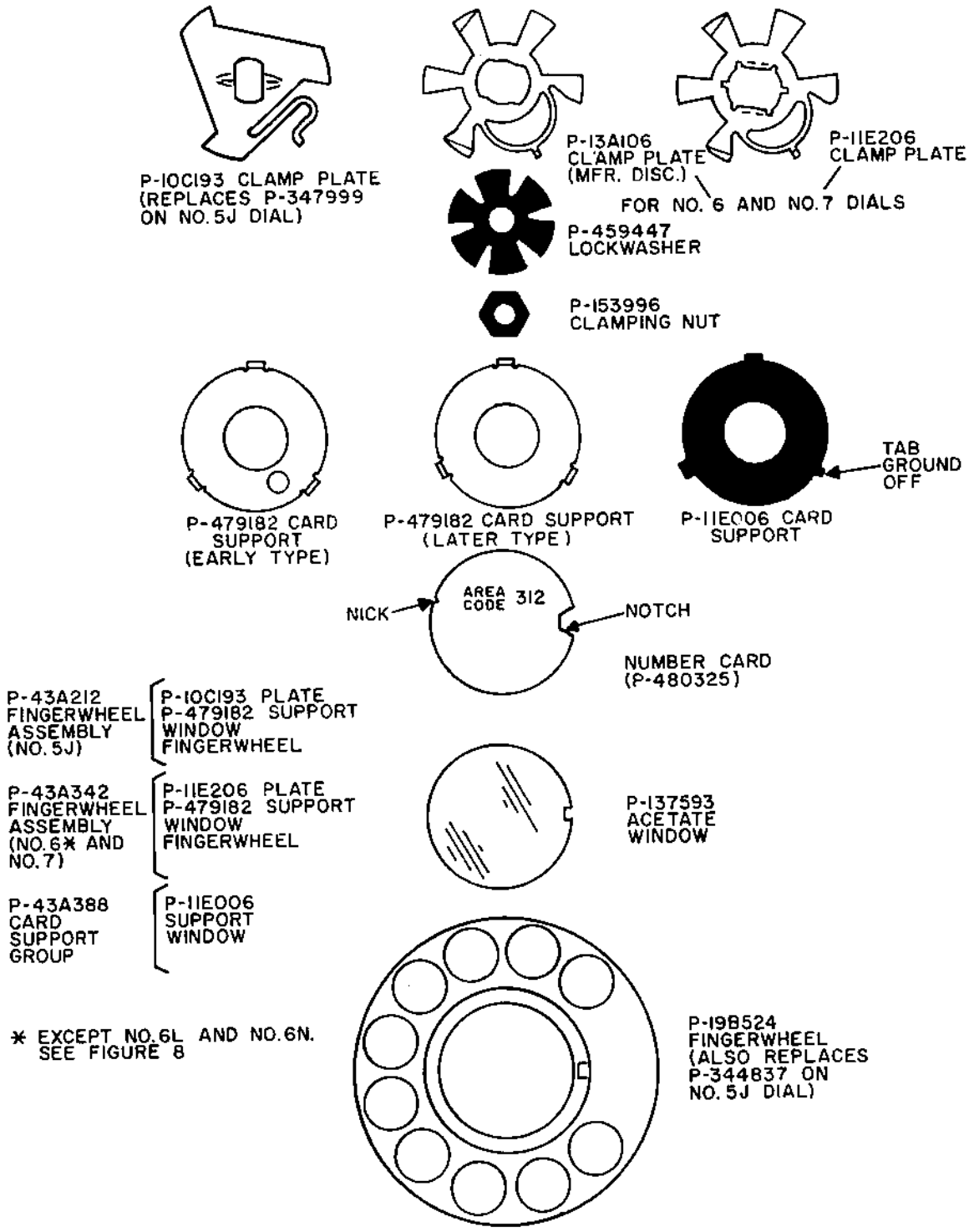


Figure 7. WECo Acrylic or Polycarbonate Fingerwheel Assemblies with Separate Window.

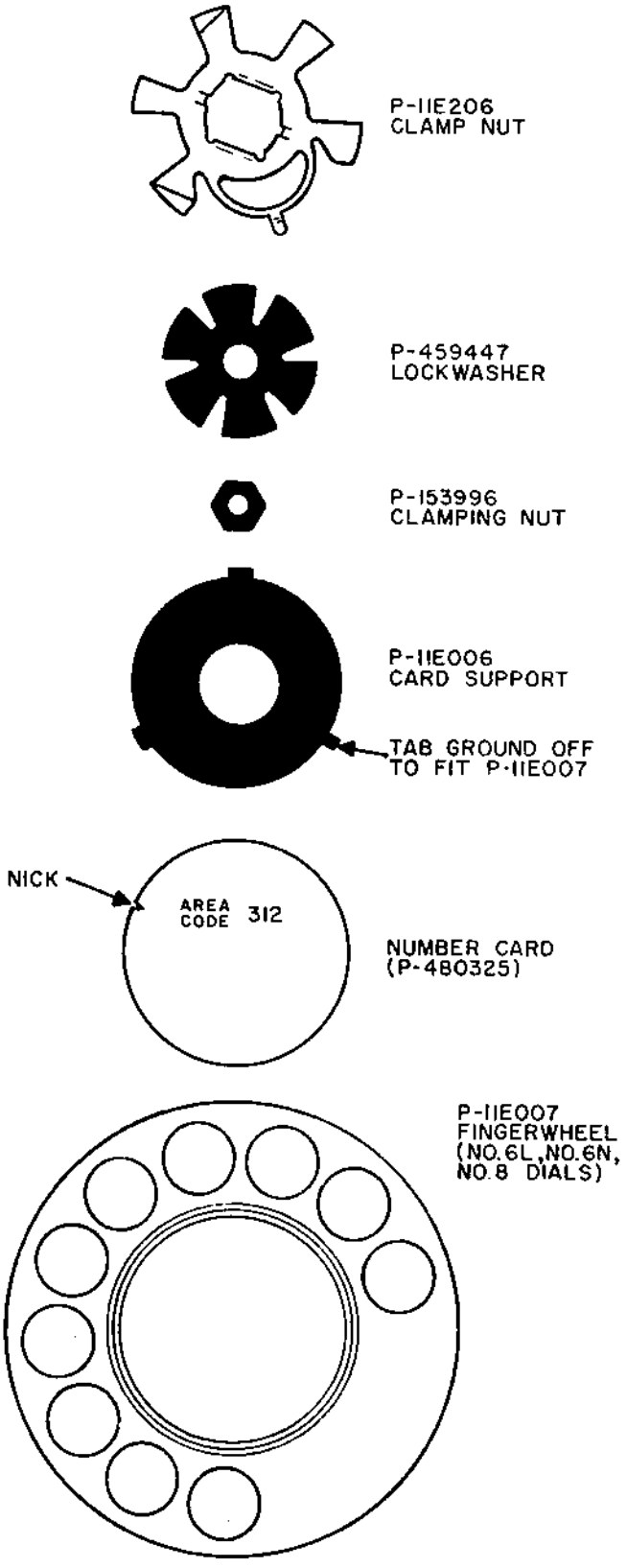


Figure 8. WECo Acrylic or Polycarbonate Fingerwheel Assembly with Integrally-Molded Window.

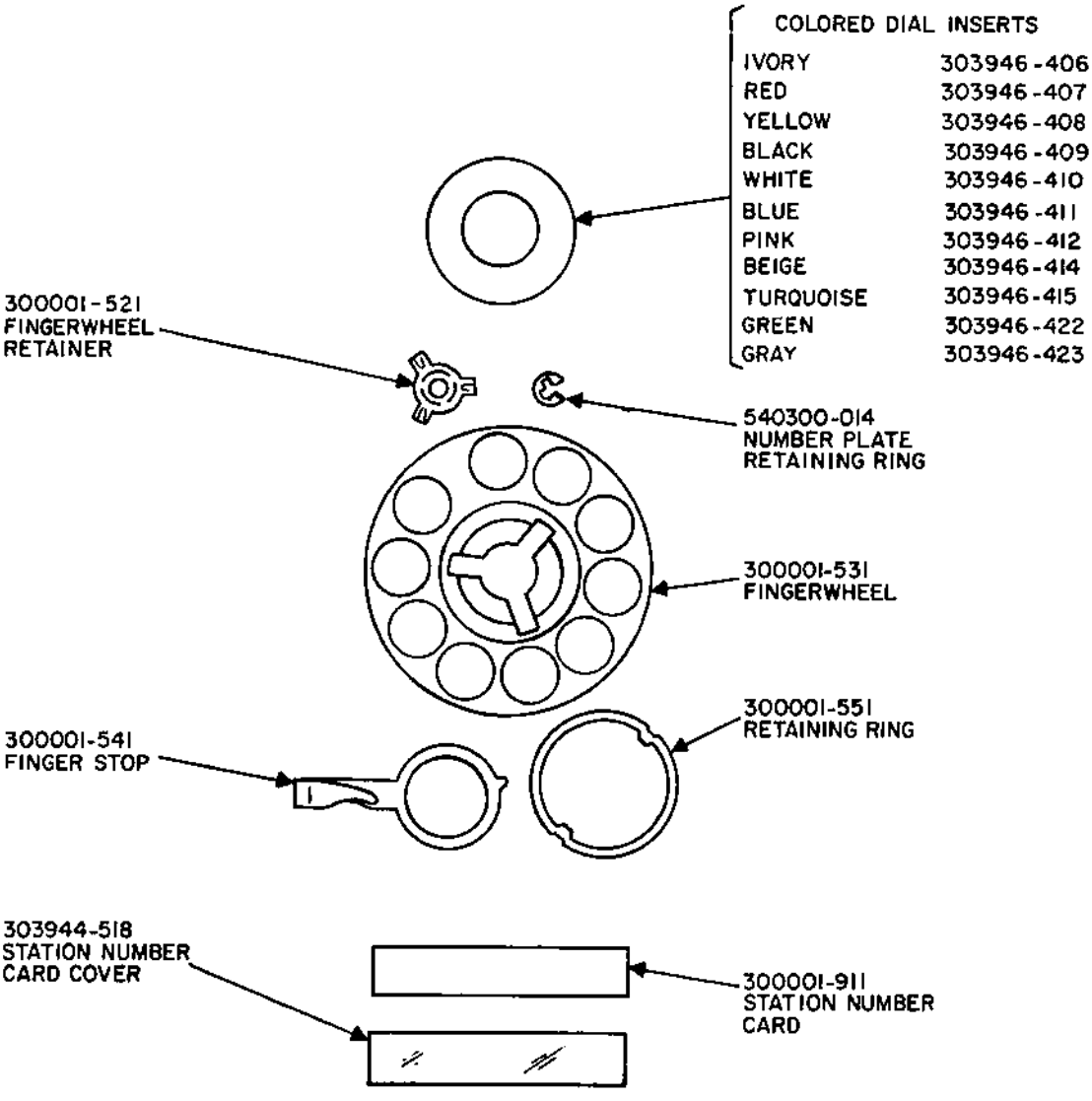


Figure 9. Stromberg-Carlson Number 300001-531 Polycarbonate Fingerwheel and Assembly.

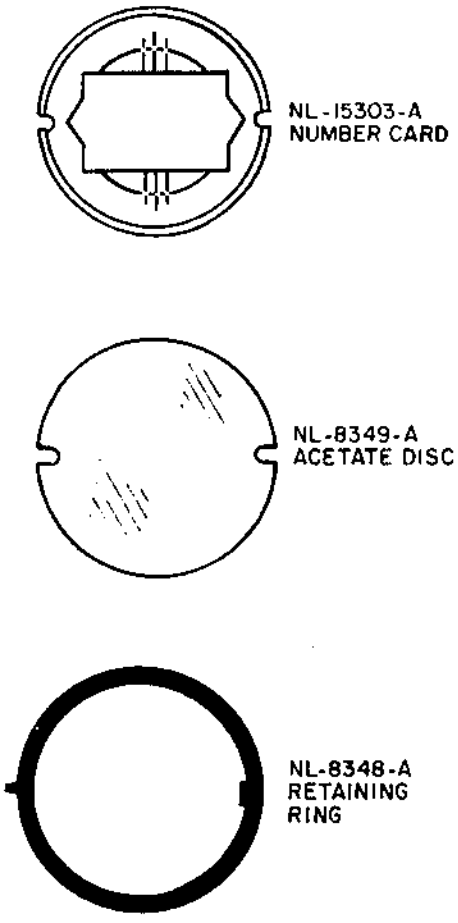


Figure 10. Escutcheon Assembly for Leich Dial Blanks and Generator Handles.

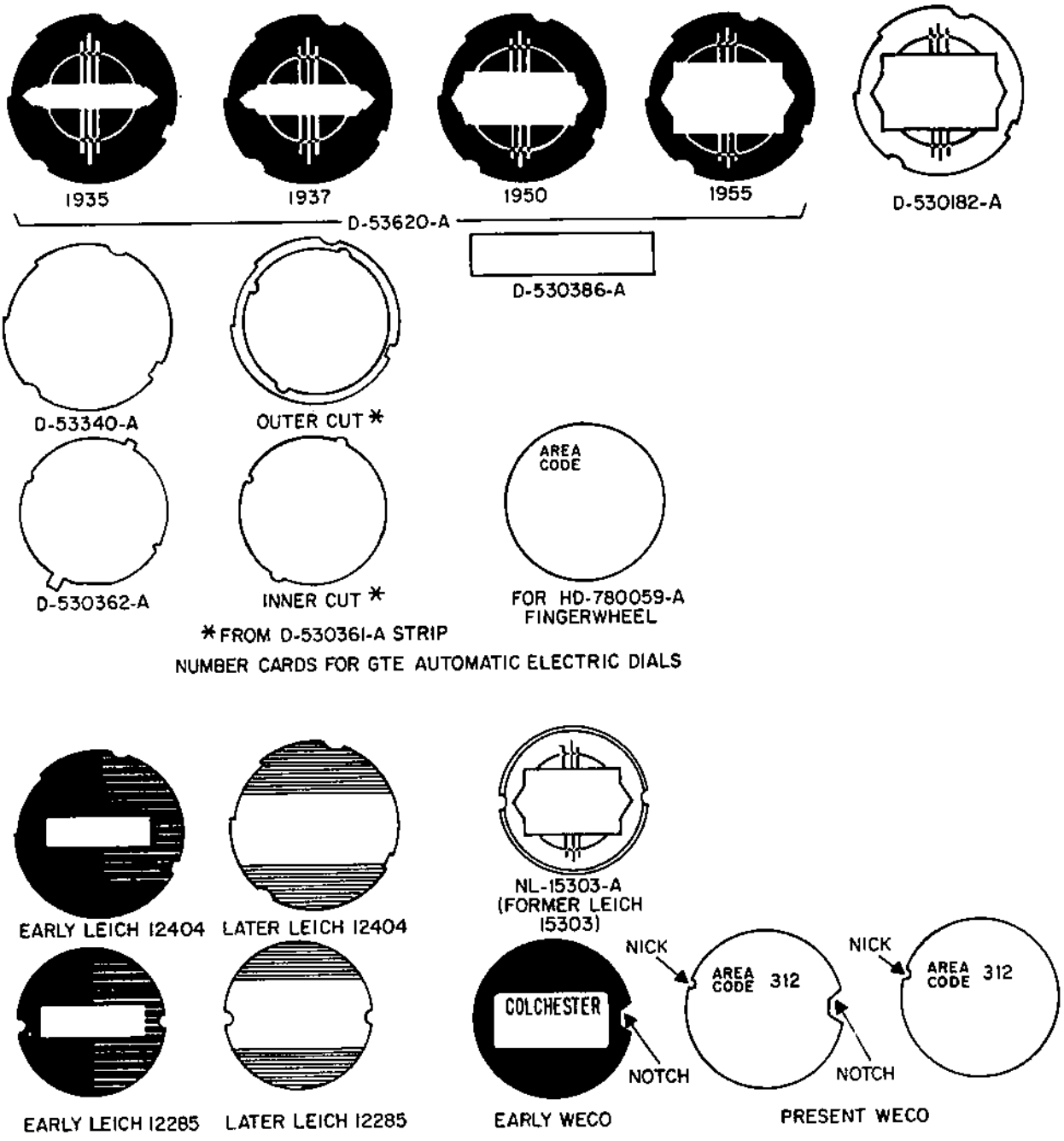


Figure 11. Number Cards.