

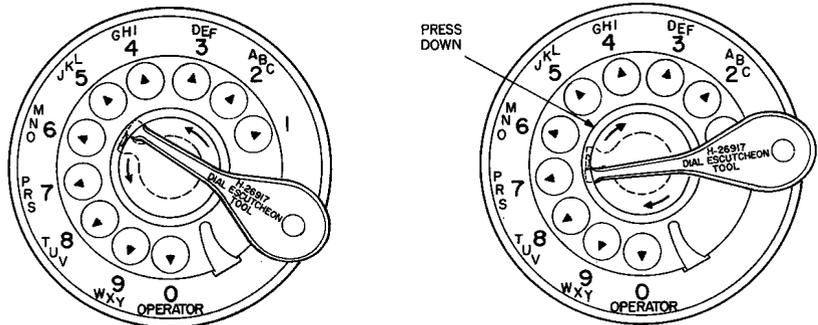
INSTALLATION AND REMOVAL
TELEPHONE SET DIAL FINGERWHEELS

1. GENERAL

1.01 This practice covers the installation and removal of fingerwheels and number cards from various dials commonly used on telephone instruments, data sets, teletypewriters, testboards and tollboards.

2. A.E. CO. DIALS

2.01 To remove the escutcheon assembly from an A.E. Co. metal fingerwheel, use either a small screwdriver with a blade that is both narrow (about 1/8") and thin, or standard escutcheon tool. Hold the tool parallel to the fingerwheel and insert its tip between the escutcheon ring and the acetate disc which covers the number card, passing under the edge of the ring at a point even with the 5/JKL hole (see Figure 1). Taking care not to scratch the acetate disc, press the tip of the tool downward slightly and move it counter-clockwise toward the 6/MNO hole. It should engage the tab of the escutcheon lock, and further movement of the tool toward the 7/PRS hole will then force the escutcheon lock counter-clockwise so that it no longer holds down the tab of the escutcheon ring. Lifting the tip of the tool when it reaches the 7/PRS hole should raise the entire escutcheon assembly out of the depression in the center of the fingerwheel.



1a. Removal

1b. Installation

FIGURE 1. Escutcheon Installation and Removal, A.E. Co. Metal Fingerwheel.

2.02 To remove an A.E. Co. metal fingerwheel from the dial shaft, use a screwdriver with a blade that is both broad (about 1/2") and thin. Loosen the broad-head screw, remove it and the escutcheon lock, and lift the fingerwheel off the hub of the shaft.

2.03 To take apart the metal escutcheon assembly from an A.E. Co. fingerwheel in order to install or change the number card, hold the assembly, rear side up, with the fingers of both hands and press on the clamping plate with the thumbs adjacent to the semicircular indentations on its edge (see Figure 2). Rotate the plate counter-clockwise until the indentations clear the ridges formed into the edge of the escutcheon ring, at which time the locking tongue will also

clear the channel similarly formed for it to engage. Push against the acetate disc with a finger to force the disc, number card and clamping plate out of the escutcheon ring, and slide these parts out from under the locking lug.

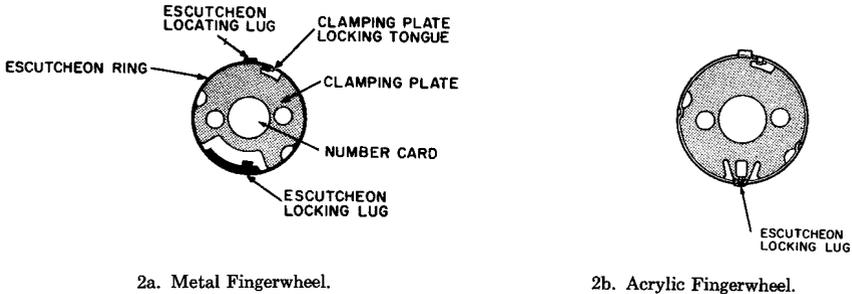


FIGURE 2. Escutcheon Disassembly, A.E. Co. Fingerwheels.

- 2.04 When installing a new number card in an A.E. Co. metal escutcheon assembly, wipe the acetate disc to remove dirt and fingermarks. If the disc is scratched or discolored, replace it. Hold the escutcheon ring with its rear side up, and insert the edge of the acetate disc under the locking lug of the ring at the point where the edge of the disc has a long indentation. Lay the narrow indentation or slot in the opposite edge of the disc over the channel formed inside the edge of the ring. With a blunt-ended object, such as the eraser end of a pencil, snap the disc over the two ridges formed in the edge of the ring, so that the disc is seated. Insert the number card in the same manner. Its edge has two semicircular indentations which allow it to clear the ridges in the ring. Insert the clamping plate with its concave side up, and push down its edges with the thumbs to flatten it. Once flat, rotate the plate clockwise until its edges are caught beneath the ridges in the wall of the escutcheon ring, and its locking tongue is seated in the channel formed inside the wall.
- 2.05 To install an A.E. Co. metal fingerwheel on the dial shaft, position its center hole on the shaft hub so that the finger holes are aligned with the designations on the number plate. Lay the escutcheon lock over the hub so that it sits between the two detents located at the 5/JKL and 7/PRS positions. Using a broad-bladed screwdriver with a thin edge, insert the broad-head screw in the hole in the hub and drive it part way. Center the circular portion of the escutcheon lock so that it rides free of the lip on the under surface of the screw head, then tighten the screw.
- 2.06 To install the escutcheon assembly on an A.E. Co. metal fingerwheel, move the escutcheon lock counter-clockwise until it strikes the detent, and insert the index tab on the escutcheon ring into the slot in the wall of the depression in the fingerwheel at a point just above the finger stop. Press the opposite edge of the escutcheon ring into the depression and insert a blade such as described in Paragraph 2.01 between the ring and the acetate disc. Keeping the tool parallel with the fingerwheel and taking care not to scratch the disc, insert the tip under the edge of the ring at a point even with the 7/PRS hole. Press the tip of the tool downward slightly and move it clockwise toward the 6/MNO hole. It should engage the tab of the escutcheon lock, and further movement of the tool toward the 5/JKL hole will then force the escutcheon lock clockwise so that it holds down the tab of the escutcheon ring.
- 2.07 To remove the chrome escutcheon assembly from an A.E. Co. acrylic fingerwheel, use a small screwdriver with a blade that is narrow (about 1/8"), and thin. Hold the blade parallel to the

fingerwheel and insert its tip between the escutcheon ring and the acetate disc which covers the number card, passing under the edge of the ring at a point midway between the 5/JKL and 6/MNO holes (see Figure 3). With the tip of the blade seated against the outer wall of the escutcheon ring, gently apply force upward and outward until the latch releases with a click. Then lift the escutcheon assembly clear of the fingerwheel with the screwdriver.

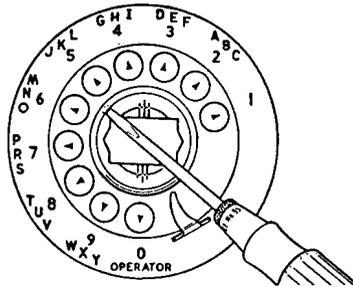


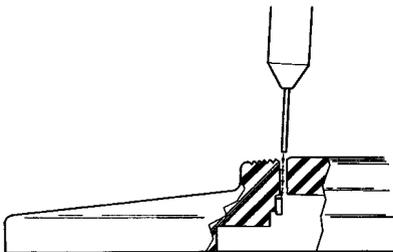
FIGURE 3. Escutcheon Removal

- 2.08 To remove an A.E. Co. acrylic fingerwheel from the dial shaft, select a screwdriver appropriate to the type of fastening used. Early production of these fingerwheels used a flat steel washer and a screw with an 11/16" diameter head. This appears similar to the screw used on metal fingerwheels, but has a longer thread and lacks any lip on the under surface of its head. In later production, a dished washer was used which has a depression in the center and is fastened by a conventional binding head screw. For the broad-head screw, use a screwdriver with a blade that is both broad (about 1/2") and thin. For the binding-head screw, a breadth of approximately 1/4" should suffice. Loosen the screw, remove it and the washer, and lift off the fingerwheel. Ordinarily, the escutcheon locking plate will remain in contact with the fingerwheel, because of the snug fit of their mating segments. Raise the fingerwheel until the center opening in the locking plate is free of the hub on the dial shaft, and slide both toward the upper left, away from the finger stop.
- 2.09 To disassemble the chrome escutcheon assembly from an A.E. Co. acrylic fingerwheel, follow the same procedure as specified in Paragraph 2.03. This is simplified somewhat, since the escutcheon locking lug is not in the way on the escutcheon ring, but protrudes from the clamping plate and makes the latter easier to rotate.
- 2.10 To install a new number card in the chrome escutcheon assembly from an A.E. Co. acrylic fingerwheel, follow the same procedure as specified in Paragraph 2.04. The escutcheon ring has no locking lug, and the long indentation in the edge of the acetate disc and number card serves no purpose in this assembly.
- 2.11 To install an A.E. Co. acrylic fingerwheel on the dial shaft, insert the escutcheon locking plate into the openings in the rear of the fingerwheel. Ordinarily, the snug fit of the segments of the plate in the mating depressions in the fingerwheel is sufficient to keep the two in contact. With the locking plate and fingerwheel held together, slide the assembly over the pawl plate and under the finger stop, align the finger holes with the designations on the number plate, and position the center opening in the locking plate over the hub of the dial shaft. Install the proper screw through the large washer into the hub of the dial shaft, and drive the screw until firmly seated, but not so tightly as to stress the plastic and crack it. When using the flat style of washer, be sure to install it with the stamped circle, denoting the slightly convex surface,

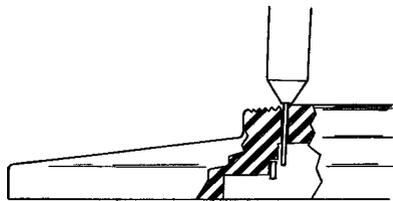
on the upper side (away from the fingerwheel), and to use a broad-head screw. Only the type which has no lip or shoulder on the under surface of its head will be found long enough to fasten the assembly. When using the dished style of washer, be sure to use a binding head screw with a conventional-sized head, as a broad-head screw will protrude too far above the dished washer to permit installing the escutcheon.

2.12 To install the chrome escutcheon assembly on an A.E. Co. acrylic fingerwheel, insert the index tab on the escutcheon ring into the slot in the formed ear of the locking plate which protrudes through the fingerwheel adjacent to the finger stop. Placing a thumb just inside the escutcheon ring on the opposite side, between the 5/JKL and 6/MNO finger holes, press down firmly against the acetate disc and number card until the latching tab on the clamping plate engages the protruding lug of the escutcheon locking plate with a click. In some cases it may be necessary to use a small screwdriver to apply the proper force to engage the latch. Wipe the acetate disc free of finger marks.

2.13 To remove an A.E. Co. acrylic fingerwheel from the dial shaft, either for replacement or to install the number card, use a standard escutcheon tool, and insert the end into the small hole located in the ribbed area of the fingerwheel surrounding the number card, adjacent to the 6/MNO finger hole. As may be seen in Figure 4, the end of the tool must engage the narrow edge of the latching lug on the clamping disc. To insure this, insert the tool in the hole at a slight angle, so that the end below the surface of the fingerwheel is aimed in the direction of the 6/MNO finger hole. Once the end is seated against the latching lug, push gently downward on the tool. This should force the lug down and out of its latching detent, where it is held under tension, and allow it to spring free along a shoulder molded into the under surface of the fingerwheel. Once this is done, the lug will be clear of the small hole, and even if the wire be reinserted, it will not again engage the lug. Insert a finger in the zero hole, wind the dial in the usual manner, and with another finger turn the wheel farther in the clockwise direction, until the zero hole again reaches, and goes slightly beyond, the zero position on the number plate. Release the fingerwheel and allow it to return to rest, at which point the zero hole will be found between the 8/TUV and 9/WXY positions on the number plate. Lift the fingerwheel slightly, until it clears the projections on the clamping disc, and slide it toward the upper left, away from the finger stop.



4. Insertion. End of Standard Escutcheon Tool Engages Edge of Latching Tab and Forces it Downward.



4b. Withdrawal. Latching Tab has Snapped into Recess Molded in Fingerwheel, out of Reach of Tool.

FIGURE 4. Use of Standard Escutcheon Tool

NOTE: If the latching lug on the clamping disc fails to spring out of its detent when pushed down by the wire, the zero finger hole will not pass beyond the finger stop when the dial is wound. In this case, hold the fingerwheel in the fully-wound position, insert the tool, and press against the lug, while turning the fingerwheel farther in the clockwise direction.

- 2.14 To remove the clamping disc from an older A.E. Co. dial which has been equipped with an acrylic fingerwheel, use a screwdriver with a blade that is both broad (about 1/2") and thin to loosen the broad-head screw which fastens the clamping disc to the hub on the dial shaft. On most dials manufactured after May, 1964, a clamping disc is welded in place to accommodate this fingerwheel. If such a disc has been damaged, the entire pawl plate assembly must be replaced. Since the hub is not drilled to accept a screw, it is not possible to pry off the damaged disc and install a removable disc or a metal fingerwheel.
- 2.15 Before installing a new number card in an A.E. Co. acrylic fingerwheel, wipe the window area in the center to remove dirt and fingermarks. If this area has been scratched or defaced, the entire fingerwheel must be replaced.
- 2.16 To install a clamping disc on an older A.E. Co. dial in order to adapt it to the acrylic fingerwheel, position the center hole of the disc over the hub of the dial shaft so that the latching tab lies in the upper left quadrant, adjacent to the 5/JKL and 6/MNO designations on the number plate (see Figure 5). Using a broad-bladed screwdriver with a thin edge, fasten the clamping plate to the shaft with the broad-head screw provided with the clamping disc.

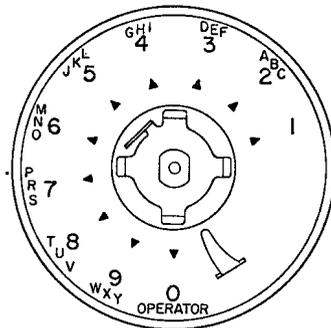
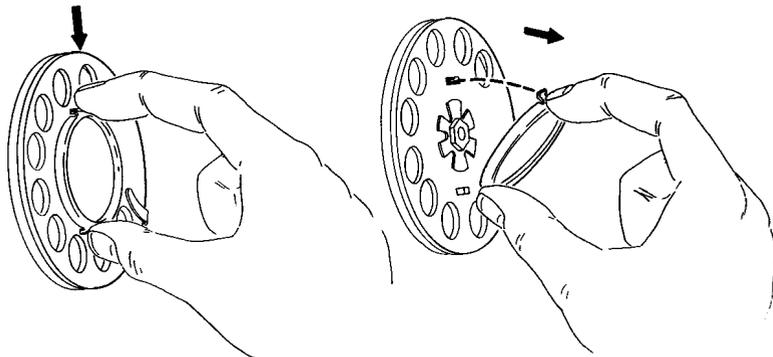


FIGURE 5. Proper Position of Clamping Disc When Installing A.E.Co. Acrylic Fingerwheel.

- 2.17 To install an A.E. Co. acrylic fingerwheel on a dial equipped with the accompanying clamping disc, hold the fingerwheel parallel to the number plate, with its zero hole positioned between the 8/TUV and 9/WXY designations. Move the fingerwheel toward the upper left, then tip it so that the lower right edge slides under the finger stop, and guide it back into its previous position. With the center portion resting on the projections of the clamping disc, rotate the fingerwheel counterclockwise, parallel to the number plate, as the zero hole passes the 9/WXY position. When the zero position is reached, the latching lug on the clamping disc should engage its detent in the fingerwheel with a click.
- ### 3. W.E. CO. DIALS
- 3.01 To remove the card holder assembly from a W.E. Co. metal fingerwheel, press against the upper edge of the card holder frame, between the 2/ABC and 3/DEF finger holes, with a forefinger, while stabilizing the lower edge of the frame with a thumb. With the frame thus pinched slightly out of round, the upper locking tab will clear the edge of its slot in the fingerwheel, and may be withdrawn from the slot (see Figure 6). Then tilt the card holder assembly forward and disengage the lower locking tab from its slot. Except in unusually stubborn cases, avoid the use of metal tools, such as a screwdriver or knife blade, to pry off the card holder assembly, since the finish on both it and the fingerwheel is very easily scratched.



6a. Depressing Upper Locking Tab.

6b. Tilting Card Holder Forward and Out.

FIGURE 6. Removal of Card Holder Assembly from W.E.Co. Metal Fingerwheel.

- 3.02 To remove a W.E. Co. metal fingerwheel from the dial shaft, use a $7/16$ " nut driver to loosen the fingerwheel clamping nut. Separate the nut and lock washer from the shaft stud, and lift the fingerwheel off the hub of the shaft.
- 3.03 To take apart the card holder assembly from a W.E. Co. metal fingerwheel in order to install or change the number card, grasp the two protruding prongs of the card retainer spring between the thumb and forefinger, pinch them together and withdraw the spring from the frame. Push against the acetate window with a finger to force the window, number card and card retainer out of the card holder frame. On more recent assemblies which lack the card retainer and spring, a card support with a serrated edge is used, and is considerably more difficult to remove. Insert the tips of a pair of long nose pliers in the serrations which lie second from the top on each side, and gently compress the card support while drawing it out of the card holder frame (see Figure 7).

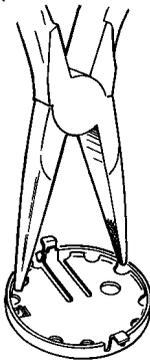


FIGURE 7. Removal of Card Support from W.E.Co. Card Holder Frame.

- 3.04 When installing a new number card in a W.E. Co. card holder assembly, wipe the acetate window to remove dirt and fingerprints. If the window is scratched or discolored, replace it. Hold the card holder frame with its rear side up, and lay the notch in the acetate window over the locating tab in the frame. Insert the number card in the same manner, followed by the card retainer and card retainer spring. Each part is notched to fit over the locating tab. On more recent assemblies which lack the card retainer and spring, press the serrated edge of the card support into the frame until the lip on the edge is flush with or below the edge of the frame.
- 3.05 To install a W.E. Co. metal fingerwheel on the dial shaft, position its center hole on the shaft hub so that the chamfered or beveled side of the finger holes is facing out, and the holes are aligned with their respective designations on the number plate. Lay the lock washer over the stud of the dial shaft, start the fingerwheel clamping nut on the stud by hand, and tighten it with a 7/16" nut driver.
- 3.06 To install the card holder assembly on a W.E. Co. metal fingerwheel, engage the lower locking tab of the card holder frame in the larger of the two slots in the fingerwheel, between the 8/TUV and 9/WXY positions. While stabilizing this lower edge with a thumb, press against the upper locking tab with a forefinger, so that the frame is pinched slightly out of round and the upper locking tab can be inserted in its slot in the fingerwheel.
- 3.07 To remove a W.E. Co. acrylic fingerwheel from the dial shaft, either for replacement or to install the number card, use standard escutcheon tool and insert the end into the small hole in the raised rim around the number card, between the 9/WXY and zero finger holes. Insert a finger in the zero hole, wind the dial in the usual manner, and with another finger turn the wheel farther in the clockwise direction while pressing the wire of the tool into the small hole. As may be seen in Figure 8, the end of the wire presses against the broad surface of the latching lug on the clamp plate, forcing it out of its latching detent so that the fingerwheel can be turned on the clamp plate until the zero hole passes the finger stop and goes slightly beyond the zero position on the number plate. Remove the wire, release the fingerwheel and allow it to return to rest, at which point the zero hole will be found at about the 9/WXY position on the number plate. Lift the fingerwheel slightly, until it clears the projections on the clamp plate, rotate it clockwise until the zero hole is above the 8/TUV position, and slide it toward the upper left, away from the finger stop.

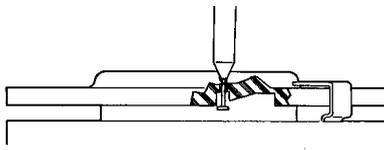
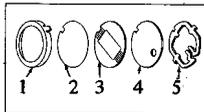


FIGURE 8. Use of Standard Escutcheon Tool
to Unlatch W.E.Co. Acrylic Fingerwheel.

- 3.08 To remove the clamp plate from a W.E. Co. Number 5, 6, or 7 dial equipped with an acrylic fingerwheel, use a 7/16" nut driver to loosen the fingerwheel clamping nut. Separate the nut and lock washer from the shaft stud, and lift the clamp plate off the hub of the shaft.
- 3.09 To remove the number card from a W.E. Co. acrylic fingerwheel, hold the assembly rear side up and rotate the card support about 60° in a clockwise direction to free its projections from the grooves in the inner wall of the window retaining portion.

- 3.10 Before installing a new number card in a W.E. Co. acrylic fingerwheel, wipe the acetate window, or the window area in the center of the fingerwheel, to remove dirt and fingermarks. If an acetate window is scratched or discolored, replace it. If the window area on a fingerwheel has been scratched or defaced, the entire fingerwheel must be replaced. For use on an acrylic fingerwheel, the card must have not only the notch used with metal card holder assemblies, but a nick in the edge adjacent to the 5/JKL finger hole, for locating purposes. On a fingerwheel, insert the acetate window and the number card from the rear, followed by the card support with its projections facing away from the window. Rotate the card support about 60° in a counter-clockwise direction until its projections are seated in the grooves in the inner wall of the window retaining portion of the fingerwheel. On a fingerwheel used on a Number 6L dial, follow the same procedure, but eliminate the acetate window, since a window is molded integrally with the wheel. In this case the narrow projection of the card support must be engaged in the short groove to the right (as viewed from the rear) of the cut-out portion of the wall, in order for the other two wider projections to reach the ends of their longer grooves. On a fingerwheel used on a Number 8 dial, it is necessary only to insert the number card, since the clamp plate on the shaft assembly also serves as a card support.
- 3.11 To install the clamp plate on a W.E. Co. Number 5, 6 or 7 dial in order to adapt the latter to an acrylic fingerwheel, position its center hole on the shaft hub so that the locking tab lies between the 9/WXY and zero positions on the number plate. Lay the lock washer over the stud of the dial shaft, start the fingerwheel clamping nut on the stud by hand, and tighten it with a 7/16" nut driver.
- 3.12 To install a W.E. Co. acrylic fingerwheel on a dial equipped with the accompanying clamp plate, hold the fingerwheel parallel to the number plate, with its zero hole positioned above the 8/TUV designation. Move the fingerwheel toward the upper left, then tip it so that its lower right edge slides under the finger stop, and guide it back into its previous position. With the center portion resting on the serrations of the clamp plate, rotate the fingerwheel counter-clockwise, parallel to the number plate, as the zero hole moves beyond the 9/WXY position. When the zero position is reached, the latching lug on the clamp plate should engage its detent in the fingerwheel with a click.
4. **KELLOGG DIAL**
- 4.01 To install the number card on a dial-type set, remove and disassemble the number card assembly. Place the number card between the protector and the retainer disc. Reassemble and remount the number card assembly on the dial.
- 4.02 To install the number card on a manual-type set, if the dummy plug assembly is already installed, mount the number card in the same manner as explained for the dial-type set. However, if a dial set is to be converted for manual service, remove the dial and mount the dummy plug assembly. Then, mount the number card in the number card assembly. See Figure 9.



1. Retaining Ring
2. Protector
3. Number Card
4. Retaining Disc
5. Retaining Spring

FIGURE 9

5. LUCITE FINGER PLATE AND NUMBER CARD

- 5.01 Revolve the finger plate (A) in a clockwise direction as far as it will go. Then insert one end of an opened paper clip (B) into the tab release hole (C) and depress the tab approximately $1/8$ ". With the locking tab depressed, continue to turn the finger plate in a clockwise direction until a second stop is reached. Remove the paper clip (B) and lift the finger plate from the dial. (See Figure 10).

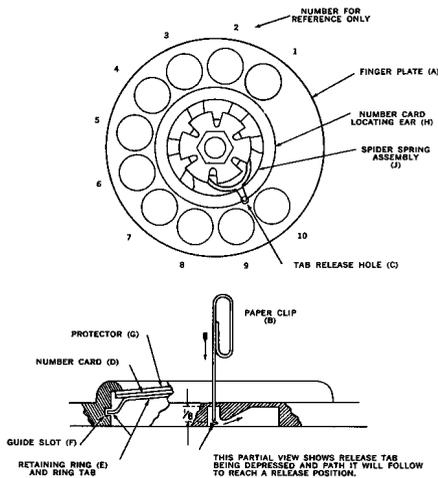


FIGURE 10

- 5.02 To remove the number card, the finger plate must first be removed as outlined in paragraph 3.02. Then turn the finger plate assembly over and revolve the retaining ring (E) until the three tabs of the ring are clear of the guide slots (F). Then lift the ring, card (D) and protector (G) out of the finger plate.
- 5.03 For assembly of protector, number card and retaining ring, place the protector (G) and number card (D) in the finger plate (A). Note that the notches of these parts fit into a locating ear (H) of the finger plate (A). Then place the ring tabs (E) in the guide slots (F) of the finger plate (A) and turn until the ring (E) is properly seated.
- 5.04 To assemble the finger plate (See Note), place the finger plate (A) squarely over the spider spring assembly (J) on the dial with the Number 10 hole of the finger plate (A) directly over the center of the Number 9 dot on the numeral ring. Turn the finger plate (A) firmly in a counter-clockwise direction until the finger plate (A) locks in place.

NOTE: Before assembling the finger plate on the dial, the number card, protector and retaining ring must be assembled.