BUS DUCTS

TROLLEY TYPE

PIECE PART DATA AND REPLACEMENT PROCEDURES

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1. GENERAL

1.01 This section covers the information necessary for ordering parts to be used in the maintenance of trolley-type bus ducts. Rolling (terminal trolleys) and nonrolling (terminal twist-out) plugs with receptacles are available for use with rolling ladders and for manual positioning, respectively.

1.02 The reasons for reissuing this section are listed below. Since this reissue is a general revision, no revision arrows have been used to denote significant changes. The Equipment Test List is affected.

(1) To add replacement criteria

(2) To revise old paragraph 2.10

(3) To revise old paragraph 3.13

(4) To add new paragraph 1.03

(5) To renumber all paragraphs.

1.03 Part 3 of this section covers the criteria to be used for determining if parts should be replaced.

1.04 Part 4 of this section covers the KS-20085 list numbers and corresponding parts which are replaceable in the field. No attempt should be made to replace parts not designated. Part 4 also contains explanatory figures showing the different parts.

1.05 Part 5 of this section covers the approved procedures for the replacement of parts covered in Part 4.

1.06 The bus ducts, plain duct couplings, duct entrance couplings for trolleys, and duct end caps are stamped with warning notices and instructions for the protection of personnel. Stamping on the duct system also indicates the location of the neutral bus bar in the duct. All warnings and notices shall be carefully observed. When replacing any part of a duct system, all markings and warning notes that appeared on the parts being replaced shall be stamped on the new parts in approximately the same place and same manner as they appeared on parts removed.

1.07 When removing terminal trolleys or twist-out plugs, in order to replace any portion of them, markings and designations shall be duplicated and the colored wires of the cord shall be connected in exactly the same fashion as on the original or replaced item.

1.08 The figures contained in this section show parts of current design. When replacing parts in the field, no attempt should be made to obtain a part of the vintage found in use. The parts of the duct system have undergone a number of changes since they were first installed in central offices and the parts currently being furnished by the manufacturer are interchangeable with any found in the field.

2. APPARATUS

2.01 *List of Tools*

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
R-2512	Adjustable Wrench
AT-7825	E Screwdriver
—	7/32-inch Twist Drill
AT-8420	Combination Pliers (Replaces AT-7582-X)
—	Hand Drill, Stanley Tool No. 624 or equivalent

3. REPLACEMENT CRITERIA

3.01 All parts, except the terminal trolleys used with MDF's and IDF's should be checked annually for evidence of damage or excessive wear. The trolleys used with MDF's and IDF's should be checked quarterly.

3.02 The terminal trolley should be replaced if any of the following conditions are observed.

(1) The axle holes in the wheels have become enlarged so that the hole can be seen and excessive wheel play is noted.

(2) The grounding spring, if provided, is worn and/or deformed.

(3) The round face of the sliding brush contact has worn to a flat of 1/8 inch width.

4. PIECE-PART DATA

4.01 The figures included in this part show the replaceable parts in their proper relation to the other parts of the system.

4.02 When ordering parts for replacement purposes, orders shall specify: Duct, Bus, KS-20085 L (number). Do not refer to the BSP section number or figure numbers.

4.03 Trolley type bus ducts are supplied in four lengths as shown in Fig. 1. Although they can be bought commercially in other lengths, the 1-, 3-, 5-, and 10-foot lengths are the only ones used in the Bell System. Ducts cannot be cut on the job.

4.04 Plain duct couplings shown in Fig. 2 are used to join the ends of ducts.

4.05 Duct couplings with a trolley entrance are used in place of plain couplings to permit the insertion and removal of power trolleys within a duct system. Fig. 3 shows the current design. When entrance couplings of older vintages have to be replaced, they shall be replaced by couplings as shown in Fig. 3.

4.06 Duct end caps with trolley entrance in accordance with Fig. 4 may be located at the end of duct runs to permit insertion and removal of trolleys at the extreme ends of the system.

4.07 Duct feed-in end caps shown in Fig. 5 are located at the end of run for power service connections. A removeable cover permits access to wire terminals and a detachable end piece with a cord grip for a maximum of 3/8 inch flexible metal conduit or flexible cord is provided.

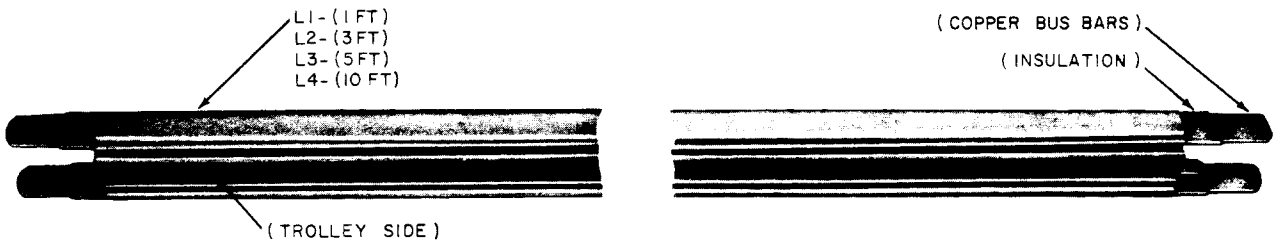


Fig. 1—KS-20085 Bus Duct, Trolley Type

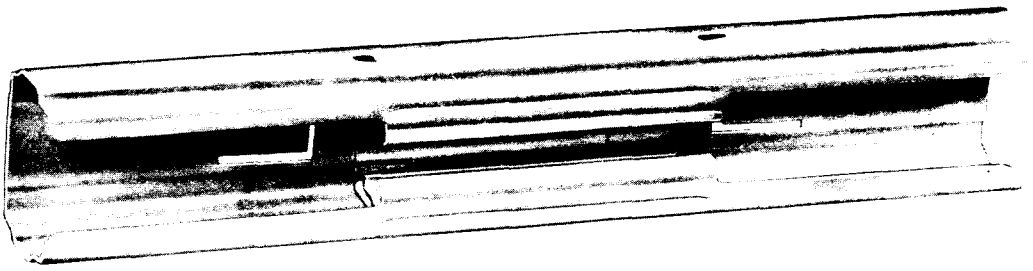
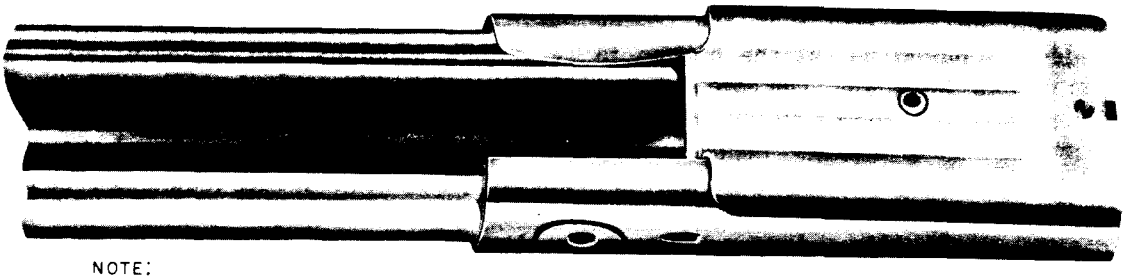


Fig. 2—KS-20085 L5 Plain Coupling

Fig. 3—KS-20085 L6 Duct Coupling With Trolley Entrance



NOTE:
END CAP INCLUDES THE END SECTION, THE INSULATING STRIP, AND THE COVER; AND SHOULD BE REPLACED AS A UNIT.

Fig. 4—KS-20085 L7 Duct End Cap With Trolley Entrance

4.08 ***Twist-out plugs (Fig. 6) and terminal trolleys shall be equipped with KS-15143 No. 14-3 conductor flexible cable (3 feet long) connected to a parallel-bladed, grounded-type receptacle. Any existing 2-conductor cordage with either a 2-wire or 3-wire receptacle shall be replaced by cordage and receptacle referred to above. Table A may be used for reference.***

4.09 When replacing parts of the trolley or wiring on the upper part of rolling ladders, the trolley shall be replaced by a KS-20085 L12 terminal trolley shown in Fig. 7. In conjunction with the trolley replacement, the trolley bracket shall be P-43D185 and coil springs attached as shown in Fig. 8. The flexible cordage between the trolley and the junction box on the ladder shall be KS-15143 No. 14-3 conductor flexible cordage, 3 feet long.

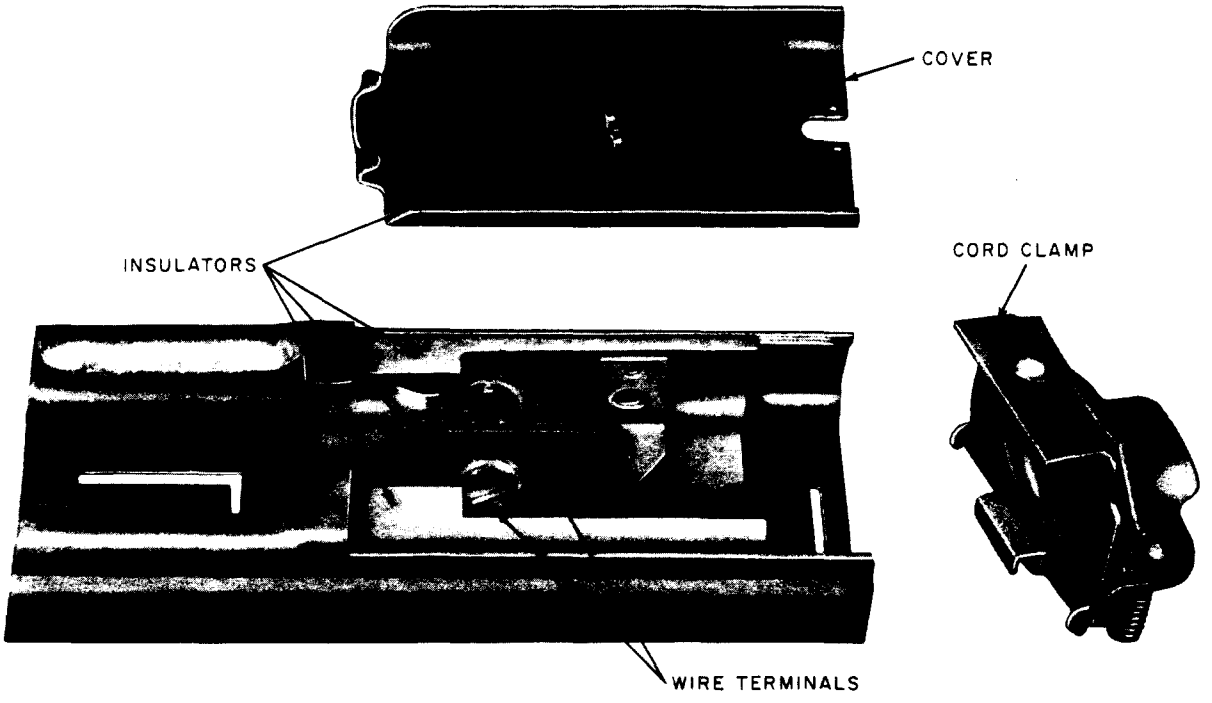


Fig. 5—KS-20085 L8 Duct Feed-In End Cap (Disassembled)

The junction box, if replaced, shall be a Union Insulation Company 5020 box and a 5052 blank cover. In running the flexible cordage from the trolley to the ladder, sufficient slack shall be provided to eliminate any strain on the trolley when the ladder is pulled out at the bottom to the maximum permissible angle. The cordage shall be dressed vertically for approximately 6 inches and then carried in the shallow bends to the junction box at the top of the ladder as shown.

Warning: Avoid large loops between the trolley and junction box that might exert undue pressure on the trolley and cause it to be damaged.

4.10 The trolley assembly coded TTG-714WE is so constructed that the green or third wire connection is made to only one pair of the two pairs of trolley wheels. Action should be taken to provide an improved redundant ground by strapping the two ground tabs to the ends of the stove bolt which is used to secure the sides of the U-shaped cord holder. Fig. 9 shows this modification. Trolley assemblies, coded TTG-714WE-2, with built-in mechanical connections between the trolley rollers, have replaced the older design TTG-714WE. See Table A for replacement information.

4.11 Since many vintages of ladders, both of WECo manufacture and those supplied by outside suppliers, will be encountered in the field, no attempt is made in this section to cover the replacements for all of the varieties of power facilities on the ladders beyond the junction box. The parts on the ladder requiring replacement shall be replaced as nearly as possible with similar parts. Unusual or special arrangements shall be considered individually.

5. REPLACEMENT PROCEDURES

Danger: Before any repair work is done on, or replacements are made in a power trolley system, the system shall be disconnected either by throwing the switch at the aisle end or by removing fuses in power cabinets. In either case, the proper warning tags shall be placed on the switch box or the fuse holders. Such a tag (I.D. 1270-A) is available from WECo. In addition, the duct system shall be

TABLE A

ITEM REMOVED	REPLACE WITH
TPG-712 Twist-Out Plug	KS-20085 L10 Twist-Out Plug (Shown in Fig. 6)
TTG-714WE or TTG-714WE-2 Terminal Trolley and KS-20085 L11 Terminal Trolley	KS-20085 L12 Terminal Trolley (Shown in Fig. 7)
2- or 3-Conductor Flexible Cordage	KS-15143 No. 14-3 Conductor Cordage. When cordage is furnished in a continuous length, cut to desired lengths to suit job requirements.
2-wire or 3-wire Connector (3 radial slots)	KS-20201 L12 Cord Connector Body
Junction Box with Blank Cover	No. 5020 Union Insulating Co. Junction Box with 5052 Blank Cover.
Outlet Box with Receptacle Cover	No. 5020 Union Insulating Co. Junction Box with 5053 Cover for duplex receptacle and 5054 Cover for single receptacle.

checked to verify the absence of power. This may be done by plugging a lamp into the outlet end of a new trolley, or a trolley that is known to be good, and moving the trolley the full length of the trolley duct run.

5.01 Twist-out plugs and trolleys shall be removed from the duct system when a complete run is being replaced, but the trolleys may be pushed into an adjoining section of duct when a single section or a portion of a run is being replaced.

Note: When there is a possibility of damaging the trolleys by the replacement of duct sections, it is advisable to remove the trolleys.

5.02 Normally the duct sections are held in place by standard hangers that are fastened to a support by a flat head screw. At the extreme ends of the duct run, a fastening screw is placed through the duct and hanger to prevent the duct from creeping. When replacing the end section of a duct run, it will be necessary to drill a 7/32-inch hole in the new duct section to coincide with the hole in the hanger and the associated structural member.

Warning: The screws that pass through the hangers and the ducts shall occur at the extreme end sections of duct only. Their presence in the middle of the duct system deforms the ducts and interferes with the operation of the trolleys.

5.03 Before removing sections of the duct, the position of couplings shall be marked on some adjacent surface, if practicable, to facilitate

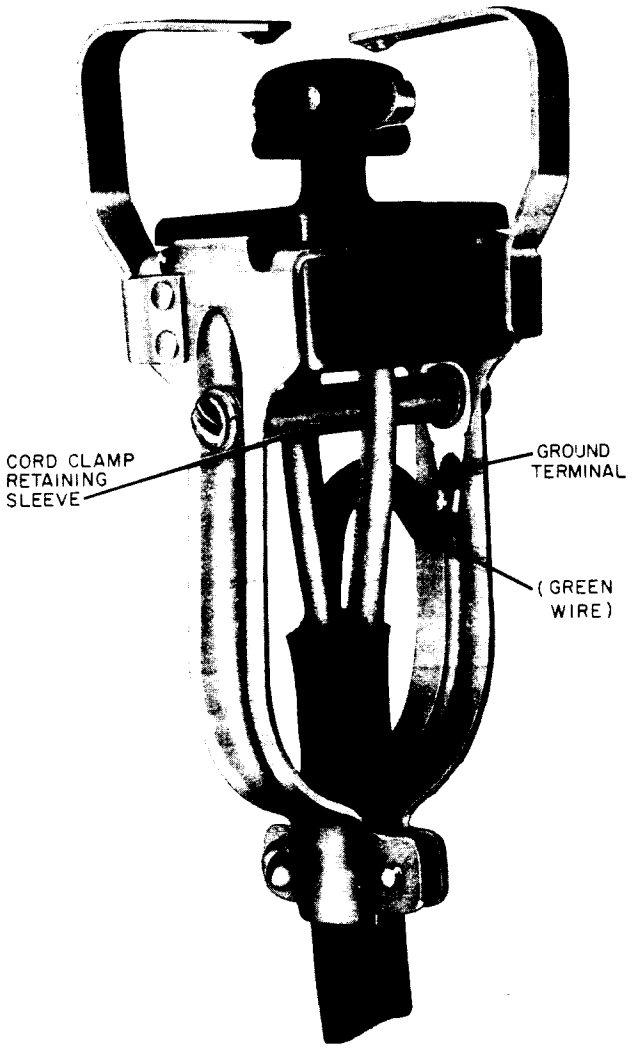


Fig. 6—KS-20085 L10 Twist-Out Plug

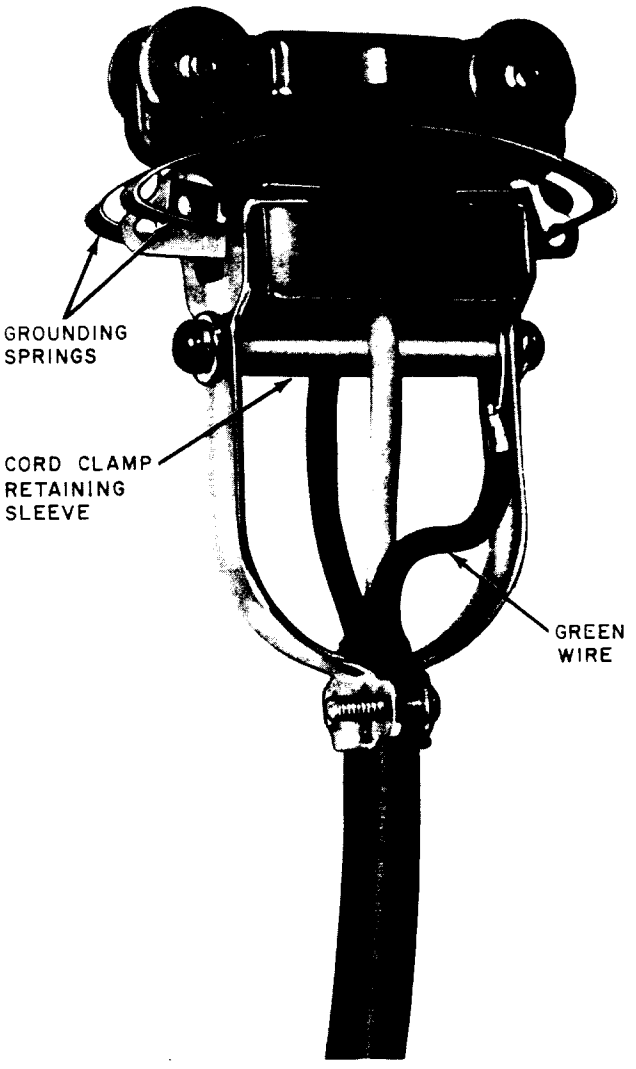


Fig. 7—KS-20085 L12 Terminal Trolley

replacement of the couplings in approximately the same locations.

5.04 To remove a section or sections of the duct, the screws, nuts, and washers at the ends of the duct runs shall be removed to permit slipping the duct section apart after opening the tab in the coupling. The dimpled tab may be lifted from the top of the duct as shown in Fig. 10 or it may be pushed up from the bottom by inserting a screwdriver between the flanges of the duct.

5.05 When replacing a section of duct, the duct section shall be inserted into the coupling and pushed until the dimpled tab on the coupling engages the square hole in the duct section. See Fig. 11 and 12.

5.06 An older type of trolley entrance coupling is shown in Fig. 13 in its closed position, and in Fig. 14 in its sprung or open position which permits insertion of trolley. To open the leaves, press the lower edges of spring leaves toward the duct. This will permit the leaves to spring open. To close, press the open leaves back to closed position.

5.07 The KS-20085 L6 trolley entrance coupling is shown in Fig. 3. To insert the terminal trolley, the knurled wheel at the top is rotated

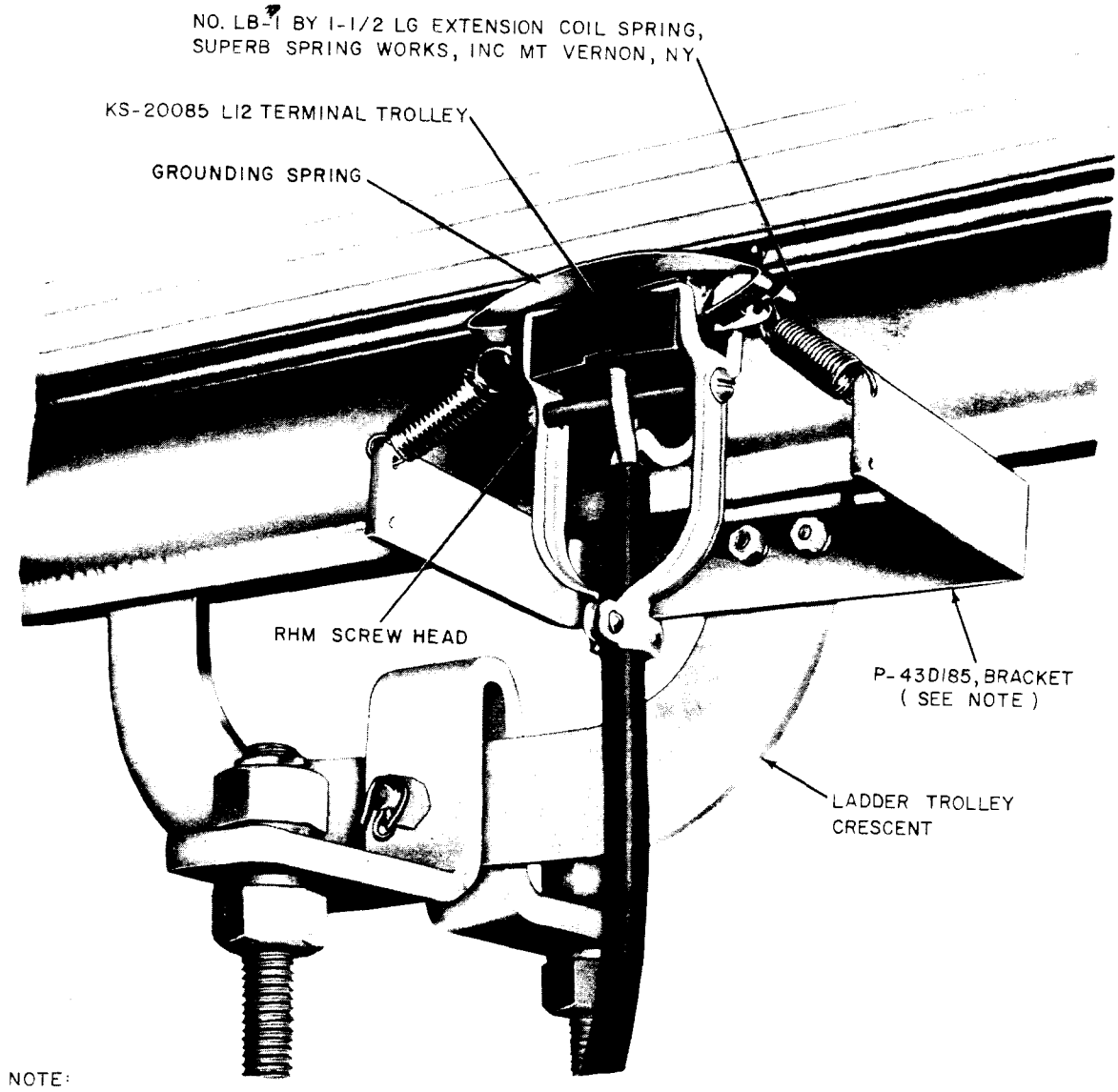


Fig. 8—KS-20085 L12 Terminal Trolley With Bracket and Tension Springs for Ladders Without Brake (See Note)

clockwise (viewed from the bottom) as far as it will go. The entire coupling is then pulled down until it can be moved to either side of the entrance. The trolley can then be easily inserted. The operations are shown in Fig. 15, 16, and 17.

5.08 After inserting KS-20085 L12 trolley, for ladder application, the coil springs shall be connected between the trolley ground tabs and the trolley bracket as shown in Fig. 8.

5.09 To remove the trolley, the insertion procedure (5.07) shall be followed except that the coil springs must first be unhooked from the trolley bracket before lowering the trolley out of the bus duct.

5.10 To replace either type of trolley entrance coupling, the coupling shall be disconnected from the duct in the same manner as a plain

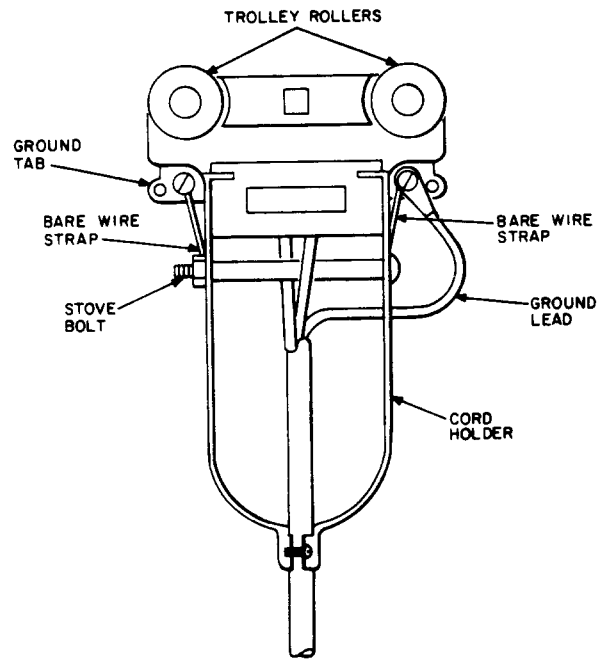


Fig. 9—TTG-714WE Terminal Trolley Assembly Modified

coupling (5.04) and the new trolley entrance coupling shall be inserted similarly to the plain coupling.

5.11 Duct end caps (Fig. 4) shall be removed and replaced entirely. Care shall be exercised in the fitting of the insulating strip to ensure that no portion of the copper strips in the duct is exposed to create a hazardous condition. The insulating strip shall fit snugly in the end cap and present no obstruction to the easy removal and insertion of trolleys (Fig. 18 and 19).

> ***Note:*** When replacing trolley entrance end cap, a P-40F018 transfer (disconnect ac before opening) shall be made to adhere to the door of the end cap.

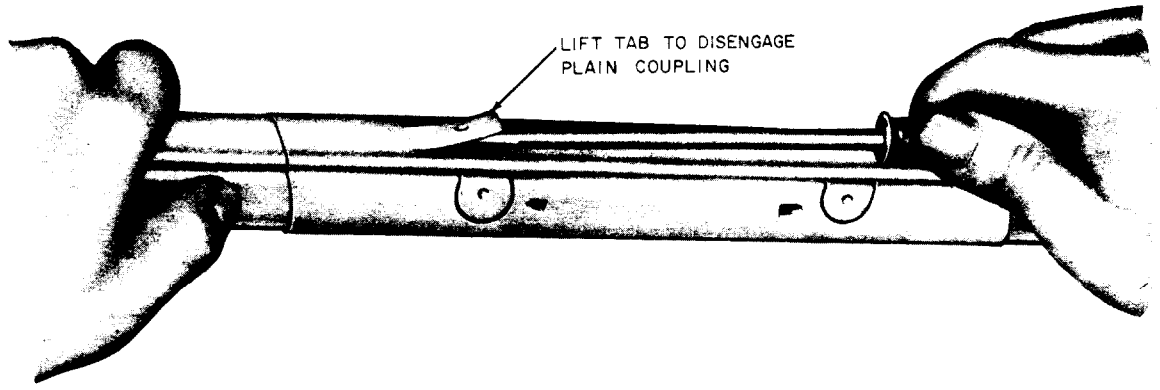


Fig. 10—Method of Disconnecting Duct Couplings

5.12 When required, a KS-20085 L9 standard bus duct hanger (Fig. 20) is used for supporting bus duct. The means used to support the hanger should have a reliable and adequate bearing surface.

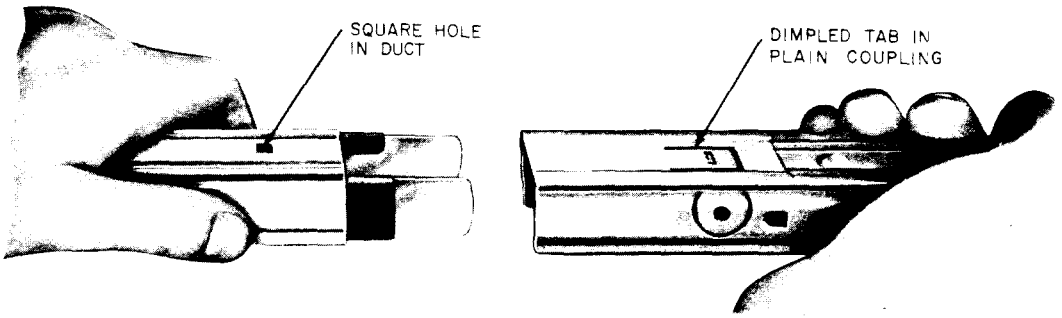


Fig. 11—Replacing a Duct Section

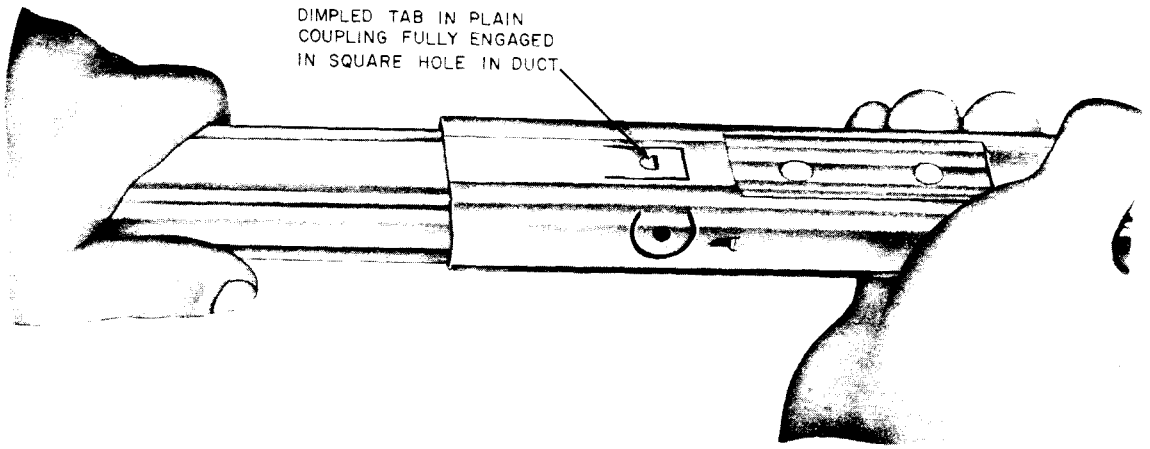


Fig. 12—Duct Coupling Fully Engaged

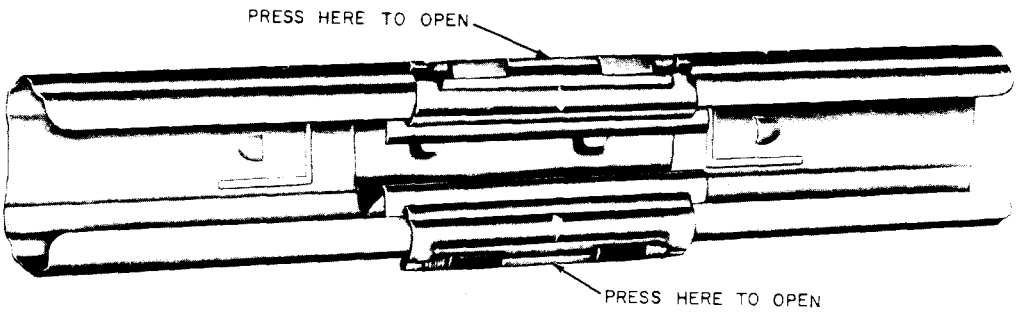


Fig. 13—Older Type Trolley Entrance Coupling (Closed)

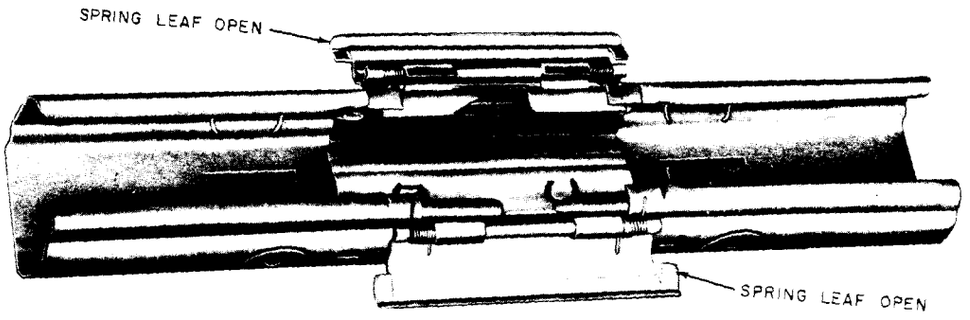


Fig. 14—Older Type Trolley Entrance Coupling (Open)

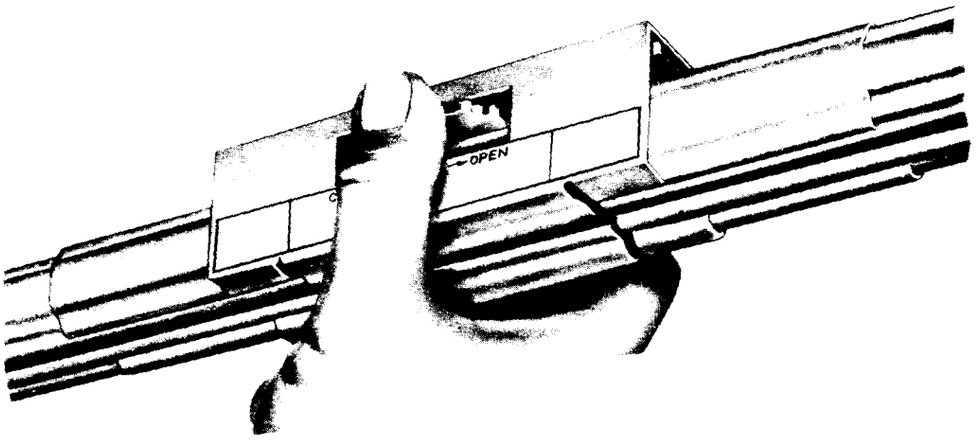


Fig. 15—Rotating Knurled Wheel of KS-20085 L6 Coupling

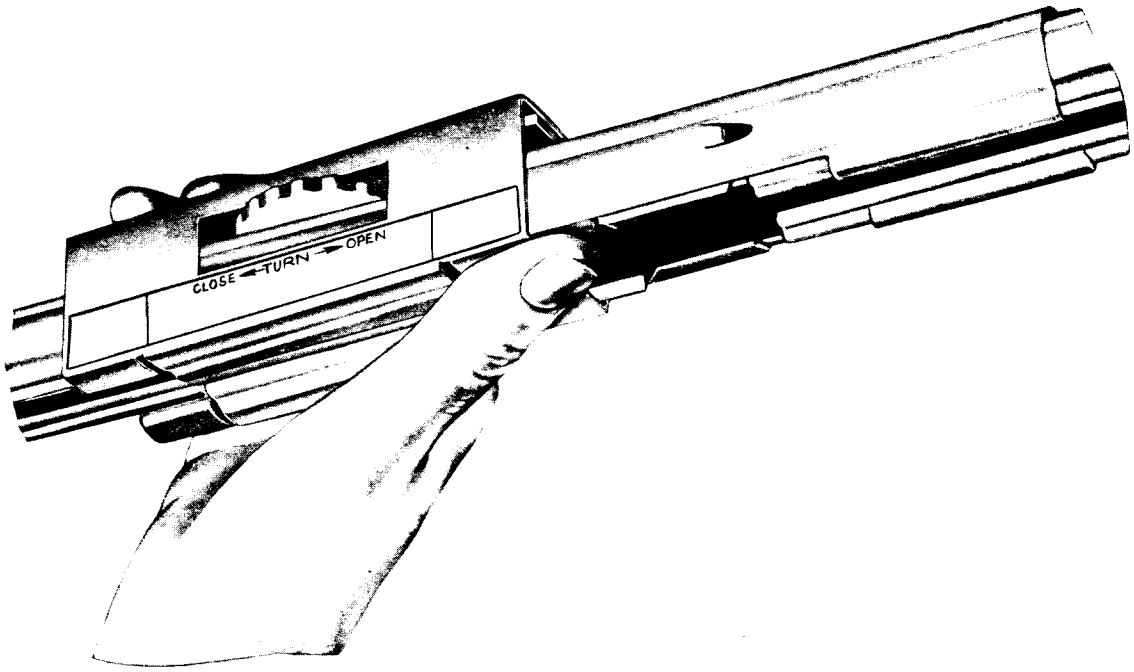


Fig. 16—Uncovering The Trolley Entrance

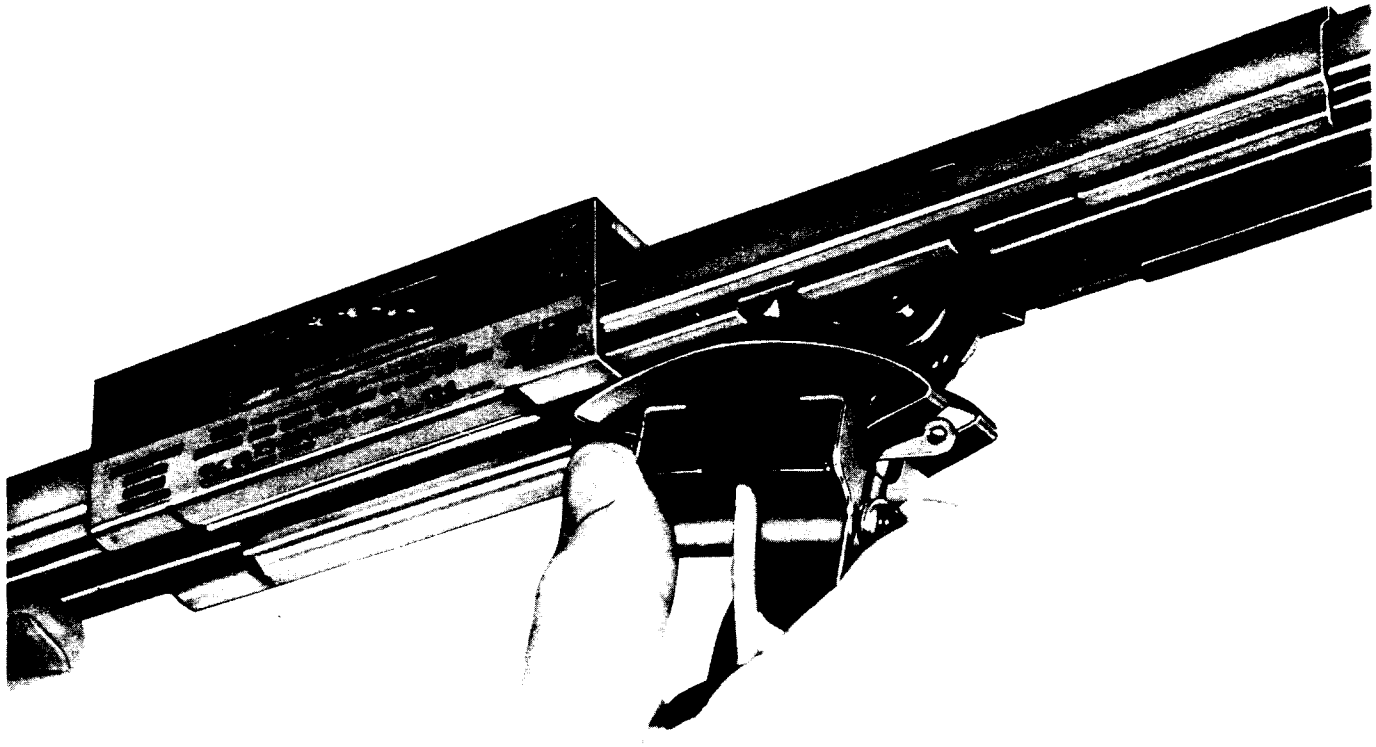


Fig. 17—Inserting or Removing Trolley

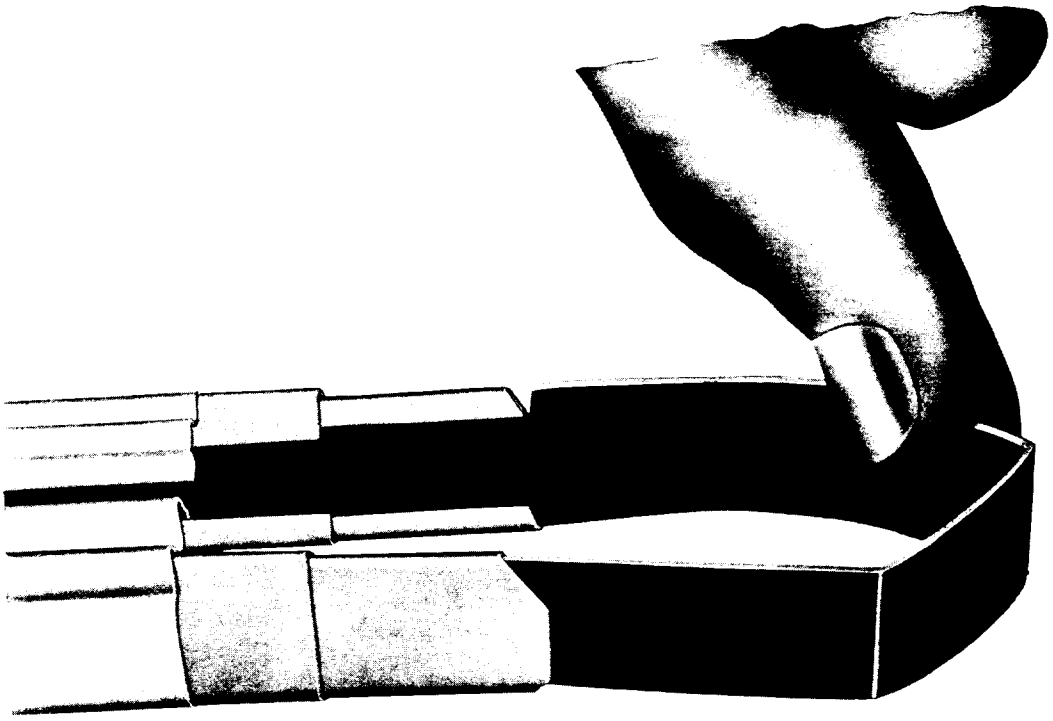


Fig. 18—Insulating Strip for Duct End Cap

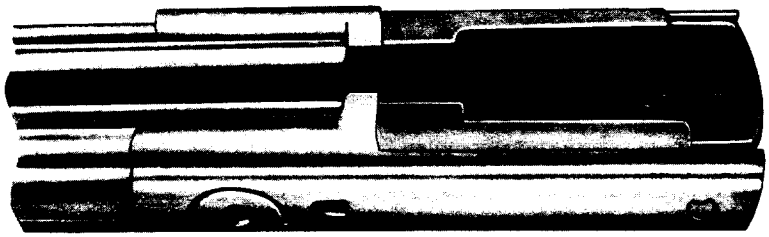


Fig. 19—Duct End Cap With Trolley Entrance (Cover Removed)

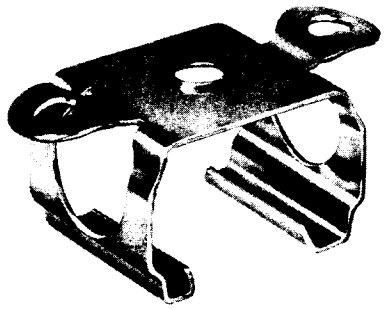


Fig. 20—KS-20085 L9 Standard Bus Hanger