# REPEAIRING KS21479 "BLACK" AMP CONNECTORS D4, DCT AND SLC96 CHANNEL BANK BACKPLANES

CONTENTS



## 1. GENERAL

1.1 Scope of Section

1.11 This section covers the methods and general requirements for removing and replacing defective pins and/or housings on "Black" AMP connectors KS-21479 L6, 7,8,10,11,12,20,21,22.

1.12 Repair procecures for "WHITE" and "GRAY" Winchester KS21479 connectors will be found in HB9, Sect. 130.1. Components of the "WHITE", "GRAY" and "BLACK" connectors are not interchangeable.

1.13 Each figure in this section illustrates only the condition to which reference is made in the text and is not to be considered as covering requirements for other conditions that may be involved.

1.14 The requirements covered in this section shall be followed, except as modified by other applicable specifications.

1.2 Precautions

1.21 General precautions are covered in Handbook 0 and are to be observed at all times as they apply to particular operations to be performed. It is of utmost importance that injury to personnel, equipment damage and service interruptions be prevented.

1.22 This HB Section 130.2 is specifically for the "Black" AMP connector.

## 2. COMMON REQUIREMENTS AND METHODS

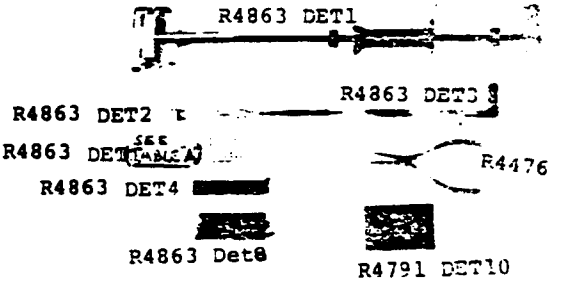
2.1 Disconnecting and Reconnecting wire wrapped connections - General Instructions in Sections 310, 311, 312, 313, 314, 315 and 350, Handbook 9, should be followed concerning the disconnecting and reconnecting of wire wrapped connections.

2.2 Other Preparation - Remove affected wire connections. Remove as many plug-ins as necessary for access to the connector in question.

.21 Place a protective cover on the shelf, where the plug-ins have been removed, to prevent contact pins from falling through the shelf openings and onto the plug-ins below. Wear safety glasses to protect against "flying" pins.

## 3. INSTALLING TOOLS

3.1 Tool set 545 for repair of contact pins and connector housings; and specific supplies/tools therein for the BLACK AMP KS 21479 connector. Do not mix the contact pins of this BLACK AMP connector with contact pins of other connectors in this tool set. See Para 4.311 Table A for replacement pin information.




REPAIR TOOLS/SUPPLIES
FOR BLACK AMP CONNECTOR

(IN T.S. 545)

3.2 In addition to the tools and supplies primarily needed to replace connector pins or housings, the following common tools may be required.

3.21 Tools for disconnecting and reconnecting 26 or 24 gauge wire wrapped connections on .025 square pins in D-4 backplanes.

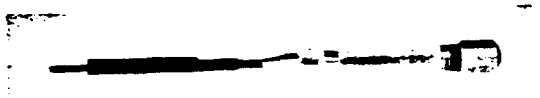
| Code | Description |
|---|---|
| R-4792 | Wire Wrap bit for 24 gauge wire |
| R-4187 | Wire Unwrapping Tool |
| R-4182 | Wire Unwrapping Tool |
| R-4660 | Wire Wrap bit for 26 gauge wire |
| R-4793 | Sleeve for R-4792 Bit |
| R-- | Wire Wrap Gun (Applicable) |
| R-4184 | Sleeve for R-4660 bit |
| R 4473 | Wire Stripper |

4. REPAIRING OR REPLACING TERMINAL PINS

4.1 Straightening Pins - The wrappable portion of a pin, if slightly bent so as to present a clearance defect, should be carefully straightened with either the R-4660 wire wrap bit, R4863 DET 2 pin removal tool, or R-4182 unwrapping tool. The tool used to straighten a terminal should encompass the entire wrappable portion of the pin. Excessive flexing of the terminal will weaken it.

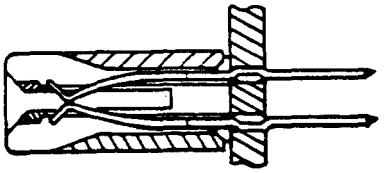
4.2 Removing Pins from PWB and Housing

4.21 R-4863 DET2, adjustable contact pin removal tool, is used for pressing the pin out of the backplane. CAUTION - watch for "flying" pins on the front side of bay when using this tool for pin removal.



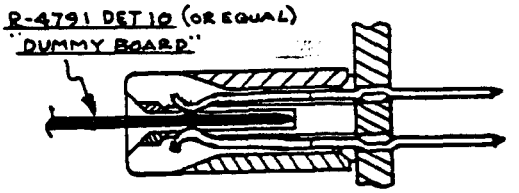
R-4863 DET 2

4.22 NOTE - CAUTION: The shorting pins in the Black AMP KS21479-L7 connector are not restrained by the housing preload barrier. When two opposing shorting pins must be removed and/or replaced, remove and replace one pin at a time before working on the second (opposing) pin. If a shorting pin is pushed out without an opposing pin in place, the pin being pushed out will jam in the connector. See Para. 4.221.



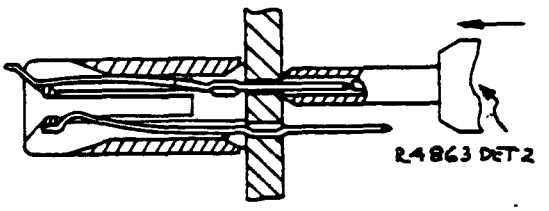
SHORTING PINS
SEE 4.22, 4.221 BEFORE REMOVING PINS

4.221 A preferred shorting pin removal method is to place a dummy board such as R-4791 DET 10 (or equivalent) in the connector plug-in slot (between the opposing pins) when removing the pins. This will prevent the pin from jamming in the connector. It is advisable to leave the dummy board in place if the alternate pin insertion method Para. 4.321 is to be used.

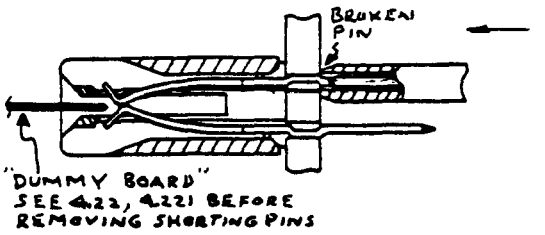



SHORTING PINS
SEE 4.22, 4.221 BEFORE REMOVING PINS

4.23 If the wrappable portion of a pin is intact and is not bent, place R-4863-DET 2 pin removal tool fully on the terminal until the tool bottoms on the terminal. Keeping the tool axially aligned with the terminal, firmly grasp and push the pin removal tool until a sharp, snap-hammer action drives the pin loose. Pull the contact pin at the contact end, from the connector housing, with R-4476 longnose pliers.




4.24 R-4863-DET 2 can also be used if the wrappable portion of a pin is broken close to the compliant section. Take care that the end of the tip is firmly set on the broken pin, and will not slip off when the tool is activated as in Para. 4.23. Pull the pin at the contact as in Para. 4.23. See Para 4.22, 4.221, when removing shorting pins.



4.3 INSERTING REPLACEMENT PINS

4.31 R-4863-DET 3 insertion tool is used to insert single contact pins into the KS-21479 Black AMP connector housing, and the Richmond D-4 Backplane Printed Circuit Board. Where it is required to insert a contact pin in an extreme left or right row of connectors, adjacent to the metal frame of the bank, R-4863 DET 3 is designed for use in close quarters as described in Para. 4.32. However, only if necessary, an alternate pin insertion procedure is described in Para. 4.321.

R-4863 DET 3

4.311 Replacement pins for KS21479 "BLACK" AMP connector on Richmond backplanes (for D4, DCT, SLC96).

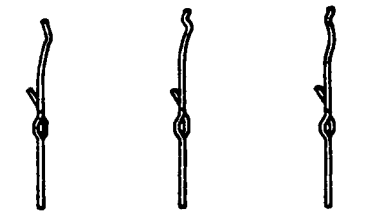
TABLE A

AMP KS21479 BLACK CONNECTOR

| R-4863 DETAIL | ORDER NO. | TYPE PIN | CONNECTOR LIST NOTES |
|---|---|---|---|
| 5 | 23486305 | SHORTING | L7,10,11,12,21,22 |
| 6 | 23486306 | EARLY MAKE | L6,7,10,11,12,21,22 |
| 7 | 23486307 | LATE MAKE | L6,7,10,11,12,21,22 |
| 9 | 23486309 | EARLY MAKE | L8 (HEAVY GOLD) |
| 10 | 23486310 | LATE MAKE | L8 (HEAVY GOLD) |
| 11 | 23486311 | EARLY MAKE | L20(SHORT TAIL) |
| 12 | 23486312 | LATE MAKE | L20(SHORT TAIL) |
| 4 | 23486304 | HOUSING | REPLACEMENT |

4.32 Using Tool R-4863-DET 3

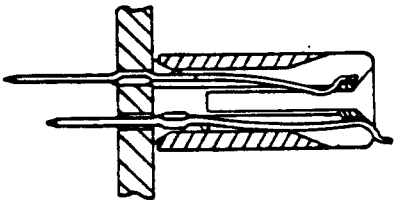
a) Select the identical type of contact pin to replace the faulty pin which has been removed from the Backplane Connector Housing. See TABLE A.



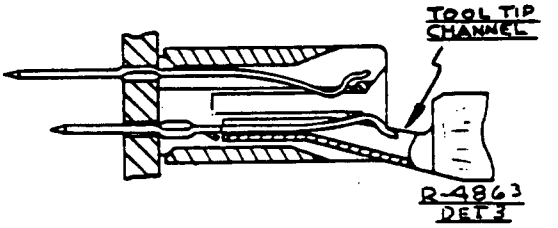
DET 5 DET 6 DET 7

TYPICAL PINS for "BLACK" AMP CONNECTOR SEE TABLE A

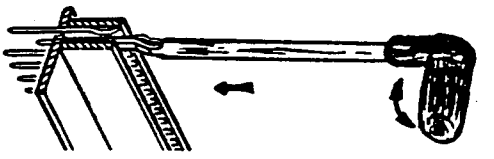
b) Place the new pin in the correct connector pin slot as shown in the following sketch. Be sure the pin contact is correctly positioned in the slot. Slide the pin contact gently into the housing as shown until it stops. Do not force the pin further. The terminal pin contact will be extending out of the connector housing. The wire end of pin will be extending through the printed circuit board part way. Do not deform the contact pin in any way.



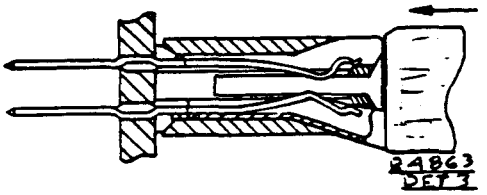
c) Place tool R-4863 DET 3, correctly positioned on the terminal, as shown in the following sketch. The tool tip must be in the pin slot with the tool tip channel facing the connector plug-in slot. The tip of the tool rests on the terminal pin shoulder just above the pin lock tab.




d) Note that the tool can be turned and handle swiveled for a pin contact which is in a constricted location. The tool tip is offset from the centerline for this purpose.

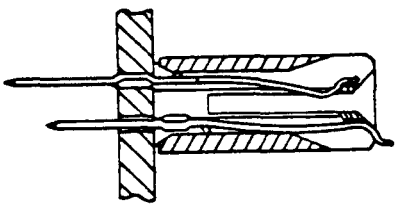


e) Grasp the tool firmly and, while holding it straight in line with the contact pin, press the contact pin into the connector housing until the tool rests on housing. Care must be used so as not to twist the tool and damage the housing preload barrier. Remove the tool and check the contact pin for position and level with respect to adjacent contact pins. Replace protective cap on Tip of R-4863 DET 3.



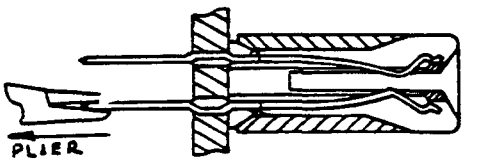

4.321 Alternate Pin Insertion Method. Due to possible interference between the contact pin insertion tool and the bank frame, insertion of pins in the extreme end connectors may require the following alternate method to para. 4.32: This alternate method must be done with care to prevent damage to the wiring end of the pin. It is to be used only if absolutely necessary. NOTE: When using this method to insert shorting pins, the "dummy board" mentioned in Para. 4.22, 4.221 should be used.

a) Place the appropriate contact pin, correctly positioned, in the connector pin slot as in 4.32(b). Carefully slide the pin, so as not to distort it, through the hole in the Backplane Printed Circuit Board until the wrappable portion protrudes on the wiring side. Do Not Press the Pin any further.

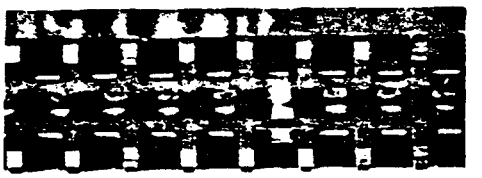


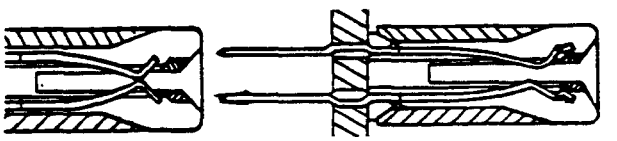
b) Using R-4476 longnose pliers, carefully grasp and pull the protruding wrap end of pin straight, until the compliant section has been pulled through the hole and the pin is firmly seated.

CAUTION: Do not pull any more than necessary to seat the pin; avoid flexing or bending the pin.




d) Check that the contact pin is properly aligned with respect to the housing, and the adjacent contact pins in the connector. Check that the pin is level with adjacent pins on wiring side of backplane.

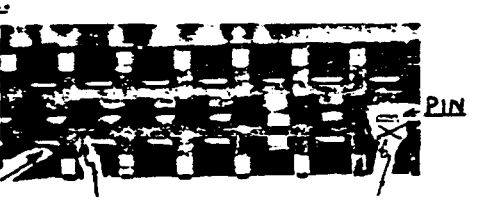





5. REMOVING OR REPLACING CONNECTOR HOUSING R-4863 DET 4

Extreme caution will be required if it is necessary to remove or replace a Backplane Connector Housing. R-4863 DET1 Housing removal tool is designed to extract the connector housing.

Replace damaged housings; also, if any pin preload barrier for early or late make pins is broken.




PIN PRELOAD BARRIER BROKEN BARRIER

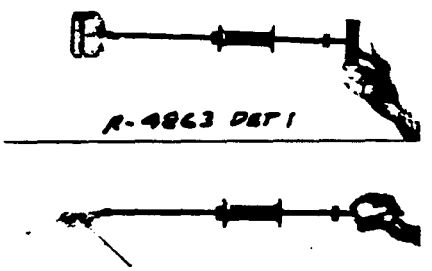
5.1 Working on Connector Housing with Contact pins and Wiring Intact:

a) Determine first that it would be beneficial to leave the contact pins and/or wiring in place.

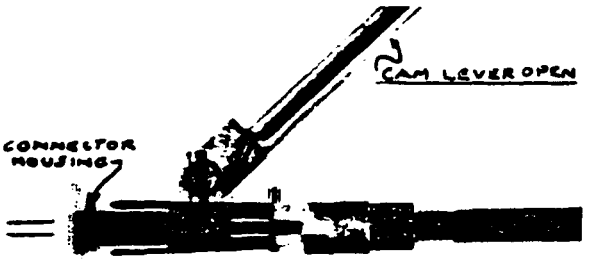
b) Remove surrounding plug-in units for free access to the connector Housing in question.

c) Be sure that no adjacent items will be damaged when R-4863 DET 1 removal tool is manipulated.

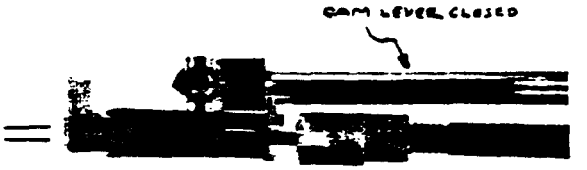
5.11 Using R-4863 DET 1, Housing Removal Tool (The protective cover in para 2.21 will also help prevent housing damage during removal)




a) Place the CAM lever in the OPEN position. Fit the tool center insert guide into the connector plug-in slot, and bottom tool on the housing. If there is insufficient clearance between the connector housing and shelf frame, place the thinner tool grip plate on the interference side.

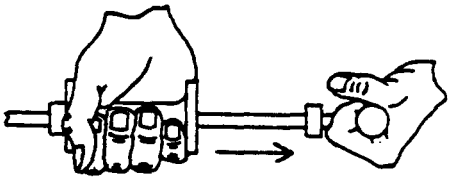



b) Close the CAM handle fully to compress the tool gripping plates against the connector housing.




c) Grip the tool handle with one hand. Grip the sliding hammer with the other hand. Hold the tool straight out.

d) Use several quick strikes outward for hammering action against the tool anvil, to loosen the housing.



e) Lift the housing straight off the terminal contacts. Care should be taken to avoid damaging or displacing the contacts.

f) Open the tool CAM lever to release the connector housing.

NOTE: Although it is preferrable to use a new housing for repair, housings which have been removed and have sustained no damage can be saved for emergency use. The inapplicable list number would have to be removed from the connector housing marking.

g) Inspect the contact pins for damage or dislocation. Remove damaged contact pins. Replace contact pins after new housing is on. Note: There should always be some contact pins left in place, even if damaged, to facilitate the positioning og a repair housing on the backplane. These contact

pins can be replaced, after other repair contact pins have been previously inserted to hold the housing in position. See para. 5.2.

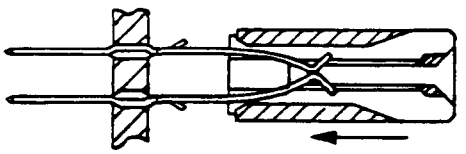
5.12 Use Housing Assembly Tool R4863 DET 8 to Install Connector Housing R4863 DET 4 (With contact pins in place on Backplane)

a) Remove any damaged or defective terminals before the Housing is replaced. Insert replacement terminals after the new Housing is in place. See para. 5.11 (g) and 5.2.

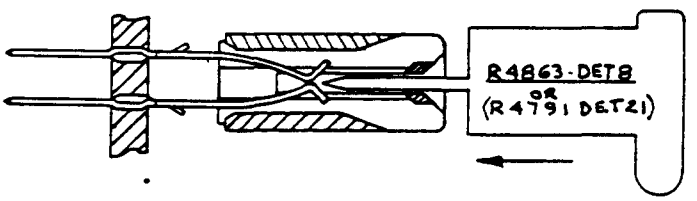
b) R4863 DET 4 is a Black AMP connector housing (54 pin) with no list markings on the side. It can be used as a replacement for the lists in TABLE "A". See Para. 5.11 (f) note.

c) CAUTION: DO NOT PRESS HOUSING ONTO CONTACT PINS WITHOUT ASSEMBLY TOOL R4863 DET 8.

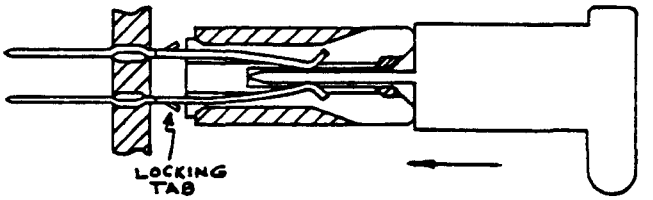
Extreme care is necessary when installing a new Housing, so that it is correctly positioned on the backplane contacts. DO NOT stub the contacts on the housing. Place the housing loosely on the contact pins as shown.



d) Fit blade of tool R4863 DET 8 into the center plug-in slot of the connector housing as shown. Note that the tool is designed to fit into confined locations on the shelf.

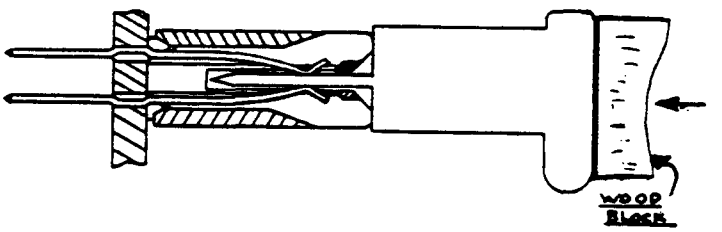



e) By hand lightly press the assembly tool down until housing rests on contact pin locking tabs. Do not force the tool past the contact pin locking tabs at this time. The housing will be approximately 3/32" off the backplane surface as shown.

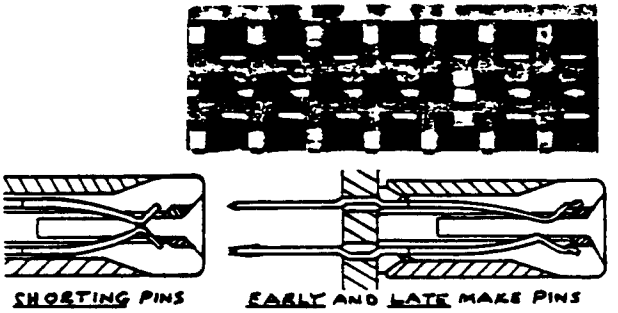



f) If a pin has been bent or damaged and impedes the correct installation of the housing, it will be necessary to remove the housing and pin. If the housing has not been damaged, it may be used again. A new pin can be inserted after the housing has been installed.

g) Rest the end of a piece of wood approximately 1" X 2" X 12" long, with squared ends, on the assembly tool R4863 DET 8. Hammer lightly, carefully and uniformly on the wood until the connector housing snaps past the contact pin locking tabs, and is resting flush on the backplane surface.



h) Check that each contact pin is properly positioned and aligned with respect to the housing and the other pin contacts. The contact end of each pin should be in the correct housing slot as shown (opposing shorting pins should be in contact) and restrained by the housing preload barrier.




5.2 Installing a Connector Housing Where Most or all Pins Must be Replaced.

a) Determine which of the pins have contacts that are still in good condition. Leave these contact pins in place, even if the wiring ends are damaged, to aid in installing a new housing.

b) Remove all other damaged pins.

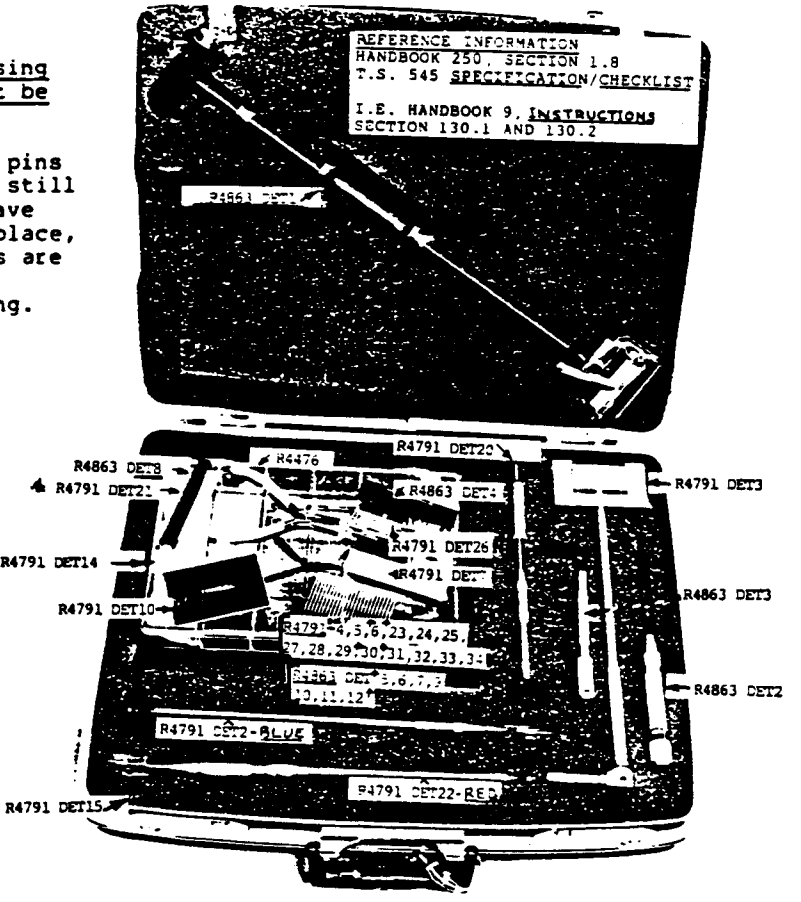
c) Remove connector housing as in Para. 5.

d) Install new connector housing as in Para. 5.12.

e) Replace the damaged contact pins which first were removed, and then any damaged contact pins (one at a time) which were left in place. Follow instructions in Para. 4.

f) Check the connector housing and contact pins for position and alignment.

5.3 Reconnect wiring per HB9 requirements, Sections 310, 311, 312, 313, 314, 315 and 350.




T.S.545

REASON FOR REISSUE:

1. To update information; for D4, DCT and SLC96.
2. Supercecdes Section 130.2, 8/22/79.

Manager, Engineering Transmission Products