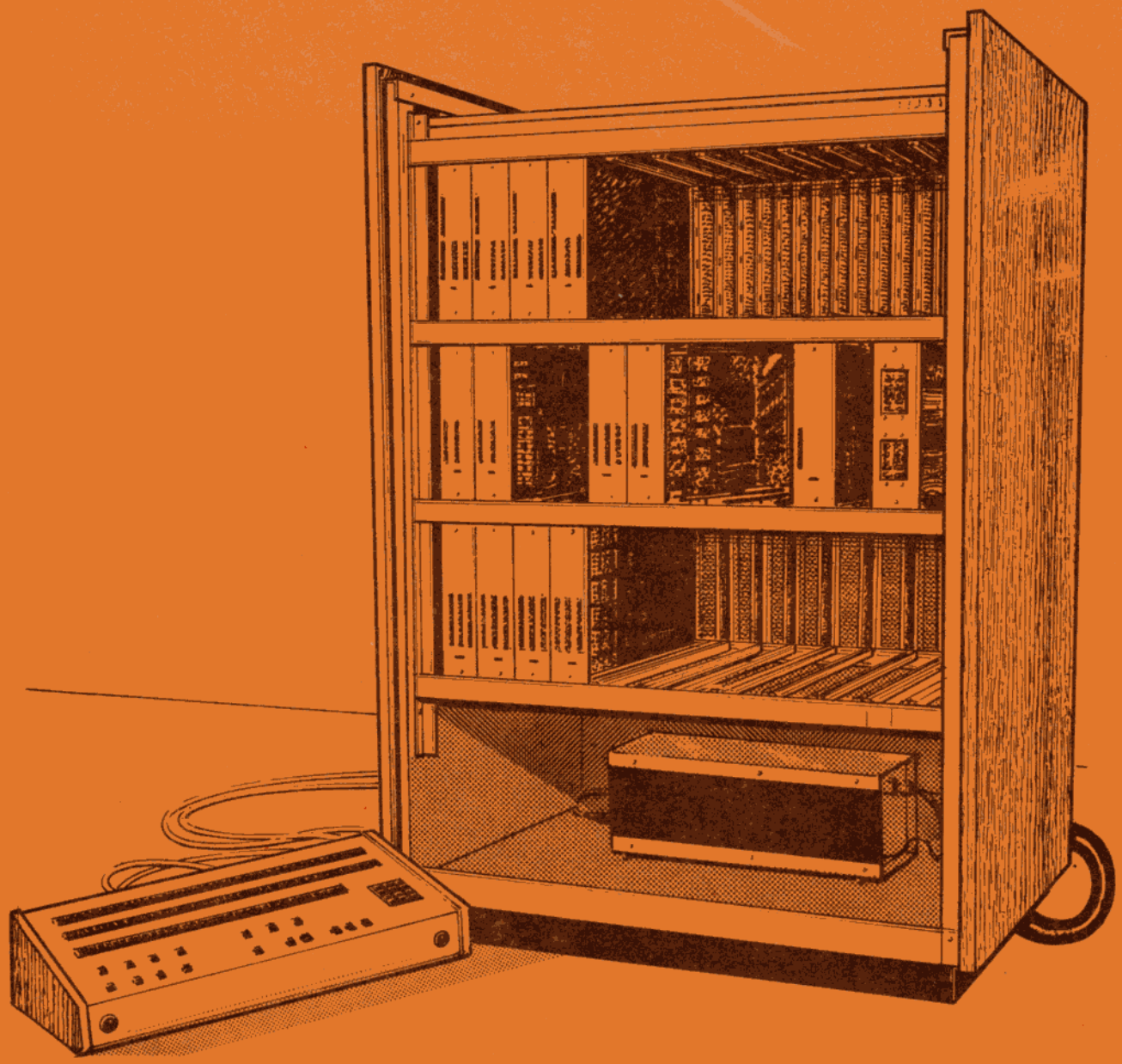
The Premiere Call Connect System (PMBX 12)



British TELECOM

VOCATIONAL TRAINING DIVISION

THQ/TP5.1.2

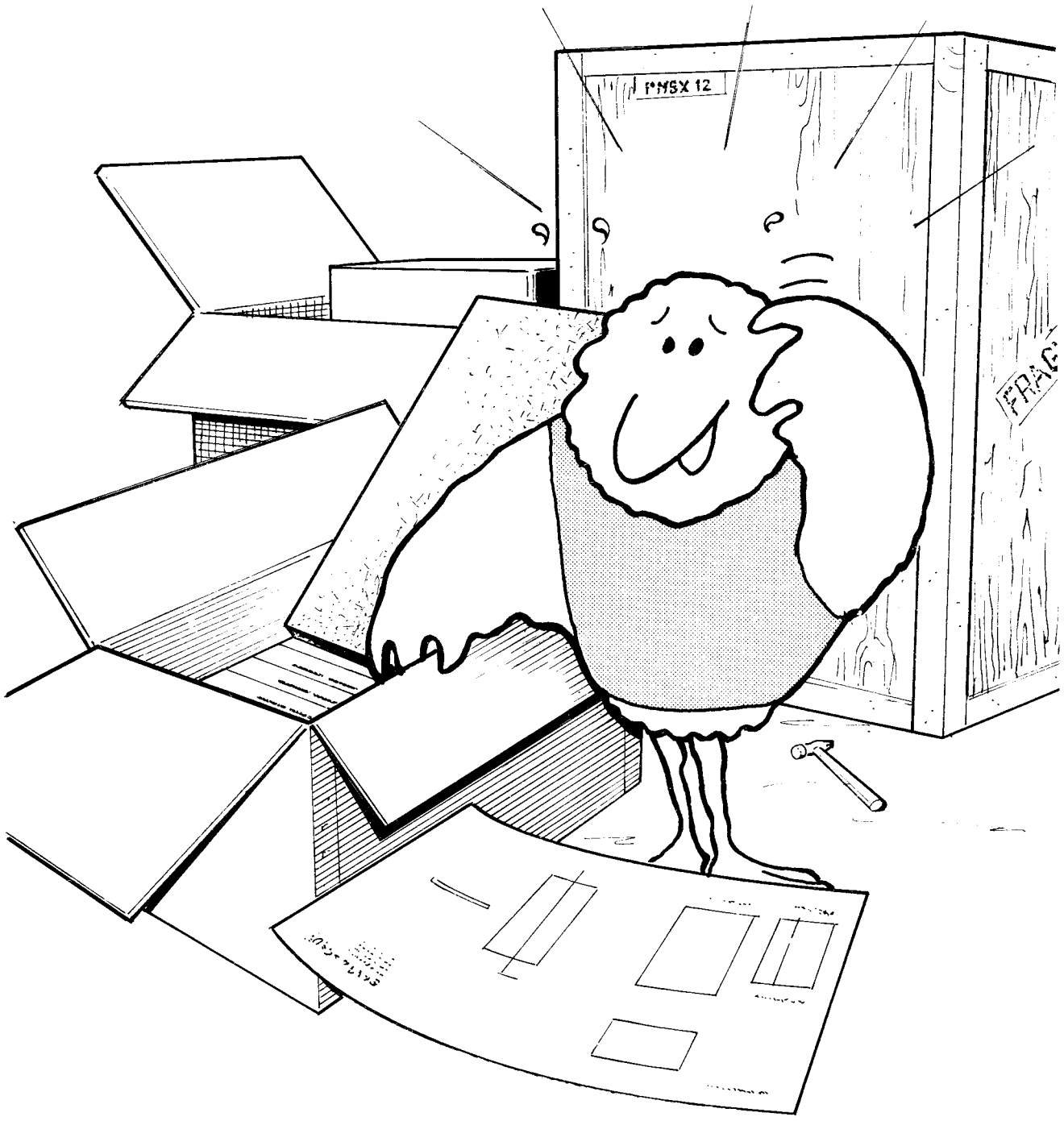
ISSUE 2
NOV 80

THE PREMIERE CALL CONNECT SYSTEM (PMBX 12)

This guide is intended to assist staff in the installation and maintenance of the PMBX 12 and should be used in conjunction with the other documents referred to on page (v).
It will enable a fitter to install the PMBX without reference to other documentation and will assist a faultsman to trace and locate faults.

Designed & Printed by PE/S/Reprographic Services

PRODUCED BY THQ/TP5.1.2


MSX 12
FRAG

CONTENTS

ADVICE NOTE ENTRIES

The following is an explanation of typical entries you will find on a customers Advice Note.

Typical entry	Explanation
PROVIDE 1 EXL	First Exchange line, the number is shown in the top right of the AN.
PROVIDE 6 AUXL 61232/7	6 auxiliary Exchange lines.
PROVIDE PREMIER CALL CONNECT SYSTEM	Type of installation (PMBX 12) shown elsewhere on the AN as PREM.
PROVIDE 7 EXL INFCE PREM	7 Exchange line interface. Each Plug-In Unit (PIU) caters for one Exchange line.
PROVIDE 30 INTNL SWBD EXTNS GREY	Colour and number of internal switchboard extensions
PROVIDE 30 EXTN INFCE PREM	Interface equipment for 30 extns. Each Plug-In Unit (PIU) caters for 4 extensions.
PROVIDE 1 ADDL CONNECT CCT PREM	1 additional Local Connector, two are always provided as standard. Each PIU comprises 1 connector.
PROVIDE 1 DOD PREM EXTNS 1–6 10–14	Direct Outward Dialling facility to be given to these extensions. 1 DOD Control PIU is always needed 1 DOD Access PIU serves each set of 12 extensions.
PROVIDE 1 NT/SVC ONE PREM SEE MANUAL RECORD EXL/EXTNS 61231/1 61232/2 61232/7	Night service 1 to be connected to the exchange/ extension numbers as indicated. The manual record is used in the GMs office.
PROVIDE 1 NT/SVC TWO PREM SEE MANUAL RECORD EXL/EXTNS 61231/1 61232/2 etc	As above but Night service number (mains fail)

EXTENSION TELEPHONE WIRING

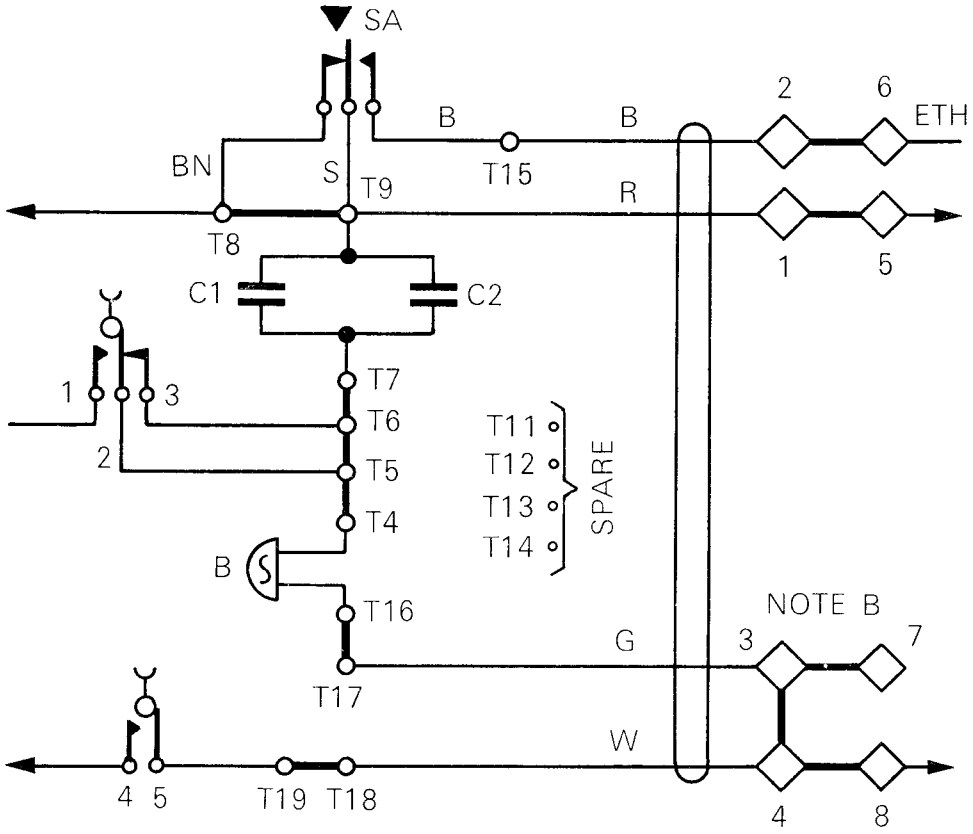
These should be wired as 2 wire earth loop recall. An extract of the N diagram for the telephone 746R is shown below. To prevent misoperation of the extension recall button, while the handset is on hook, from calling the switchboard operator it is advisable to connect the "A" wire to T9 and the "B" wire to T18. TI E5 D1415 refers.

2 WIRE PBX EXTENSIONS WITH RECALL TELEPHONE No. 746R CONNEXIONS AS ISSUED

USING:—

Telephone No. 746R
or
Telephone No. 746
Switch No. 5A-4 (5A)
Part 1/DBU/362
Part 1/DPL/1022
2 Parts 1/DPI/203

Note A



NOTE:—

A Use Telephone No. 746R if available in the required colour, alternatively use Telephone No.746 and fit the parts listed.

B When extension bell is required, remove Strap BT3-BT4 and connect bell to BT7-BT8.

DOCUMENTATION

A Circuit Diagram Folder No 15 should be provided and left in the PMBX cubicle. CDF No 15 contains the following:—

SA	10175	Trunking diagram
SAW	101750	Wiring tables
SAJ	101750	Equipment cubicle wiring
SAX	101750	Cross connexion diagram
SA/SAW	101760	Local connector
"	101770	Exchange line connector
"	101780	Position and miscellaneous circuit
"	101790	Extension line circuit
"	101800	Pre-determined night service circuit
"	101810	Direct outward dialling (DOD) access circuit
"	101820	" " " " common control circuit
"	101830	Inter-PBX circuit SCDC signalling
"	101840	" " " Manual balanced battery (M/BB) signalling
"	101850	Operators cordless switchboard circuit
"	101880	Keysender No 11A
"	101900	Common services
"	101920	Limiter No 1/SA 101920
"	102040	Dial unit SA 10204
"	101870	Power unit No 148A

Operating Instructions A4077 (2 copies)

Specification S 1368

These guide notes are step by step installation instructions. If space is at a premium in the customers premises the instructions should be completed in the order shown on the following pages.

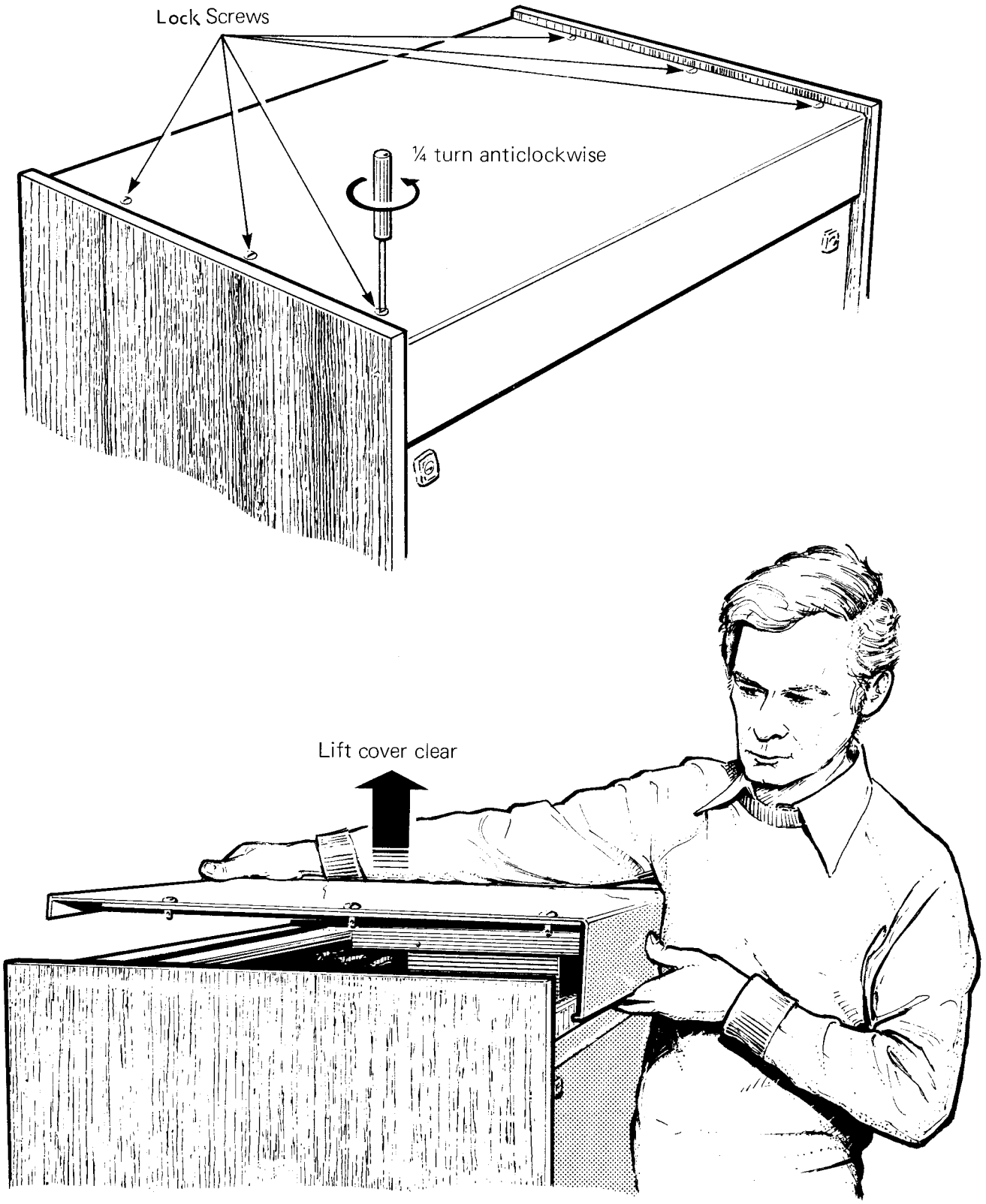
or

If you anticipate having to move the equipment cubicle during cabling operations then the Plug-in Units should be fitted last to reduce the total weight. In this case Remove the Covers (Section 1, pages 2 and 3) and then go direct to Routing of Cables and Cords (Section 4, page 16).

1. ACCESS TO CUBICLE

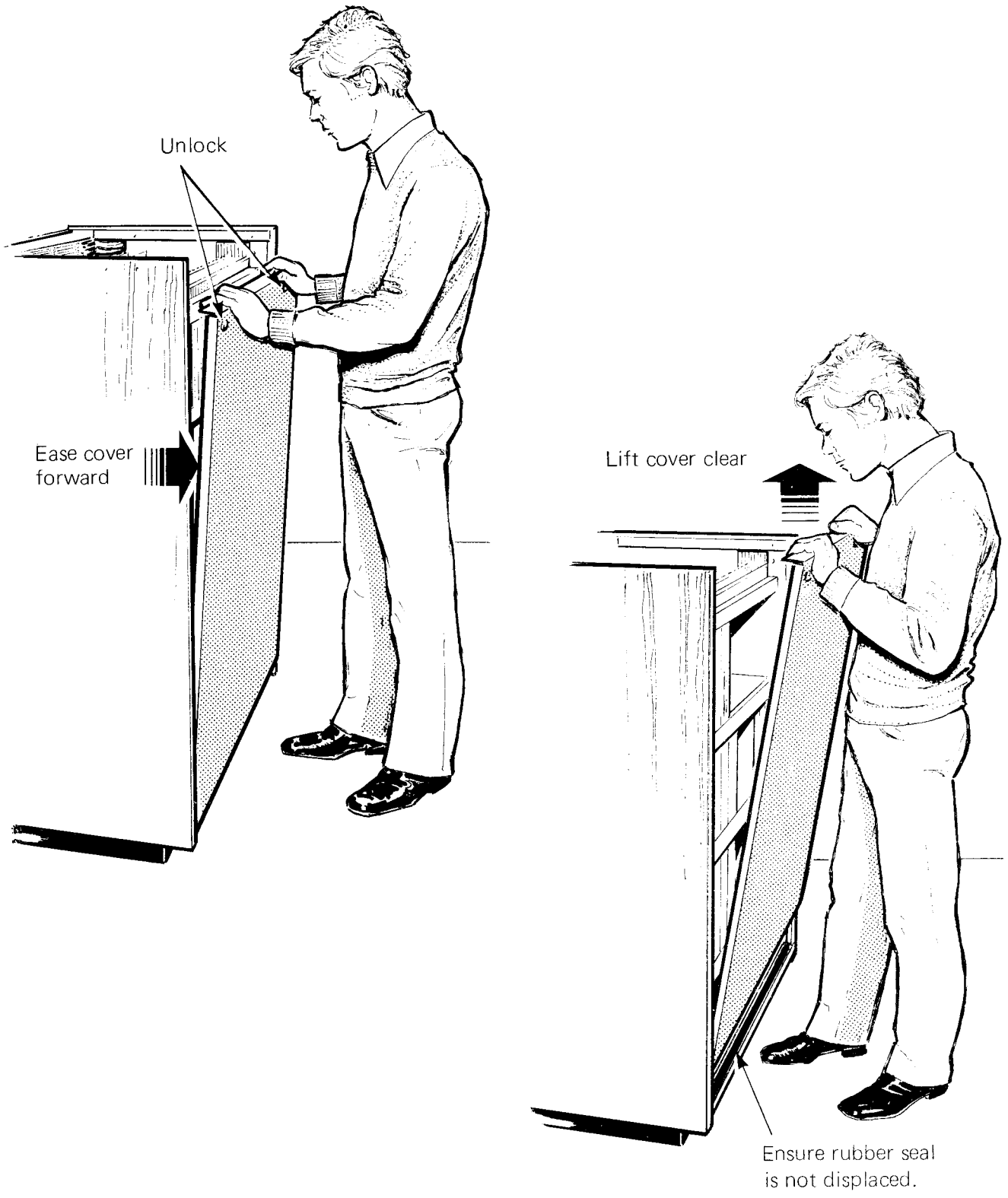
The keys to the front cover are normally stored inside the cubicle

1.1 Removing the Top Cover



N.B. Place cover in a safe position after removal.

1.2 Removing the Front Cover

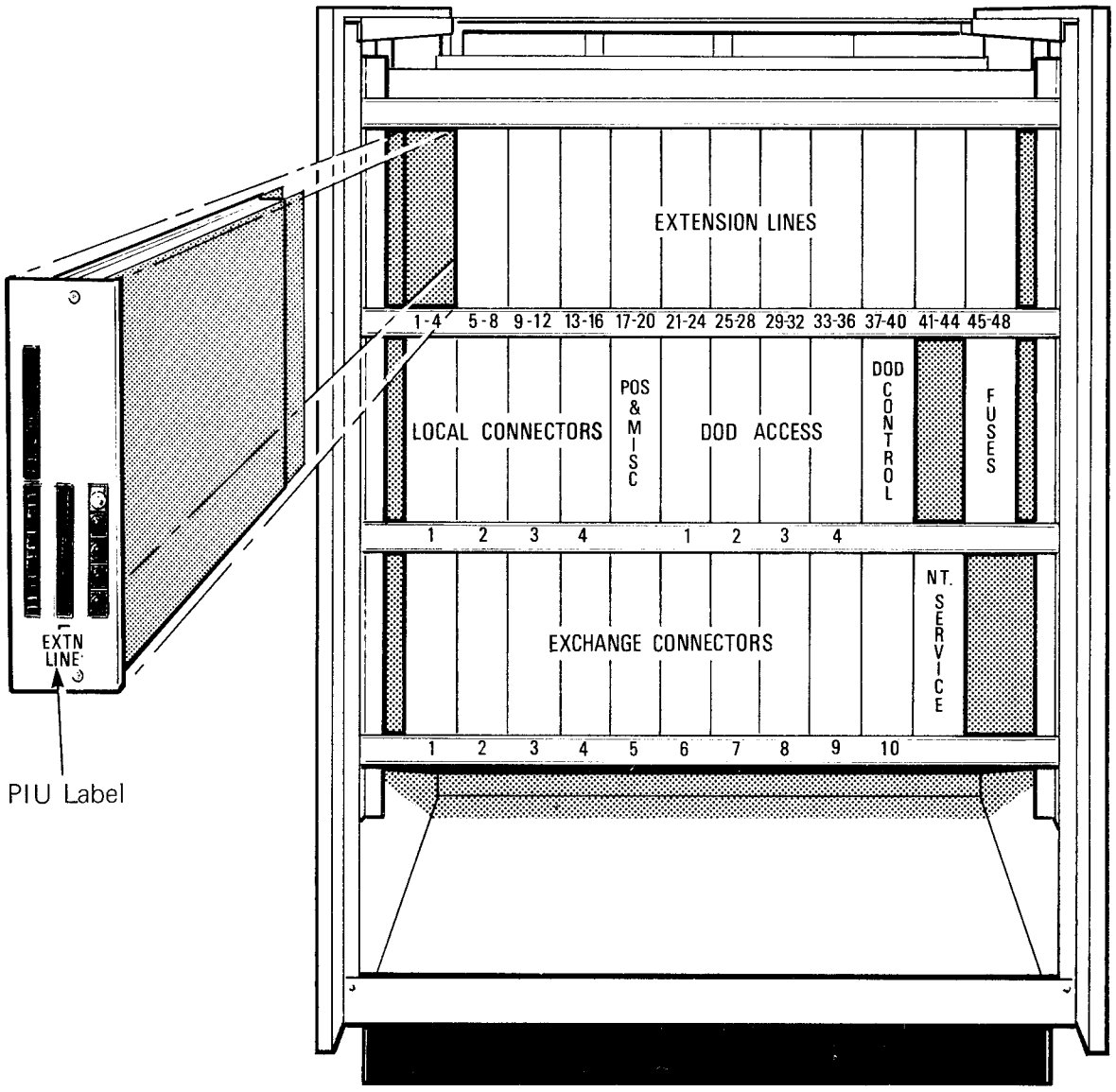


N.B. Place cover in a safe position

2. FITTING THE PLUG-IN UNITS (PIU's)

2·1 Positioning

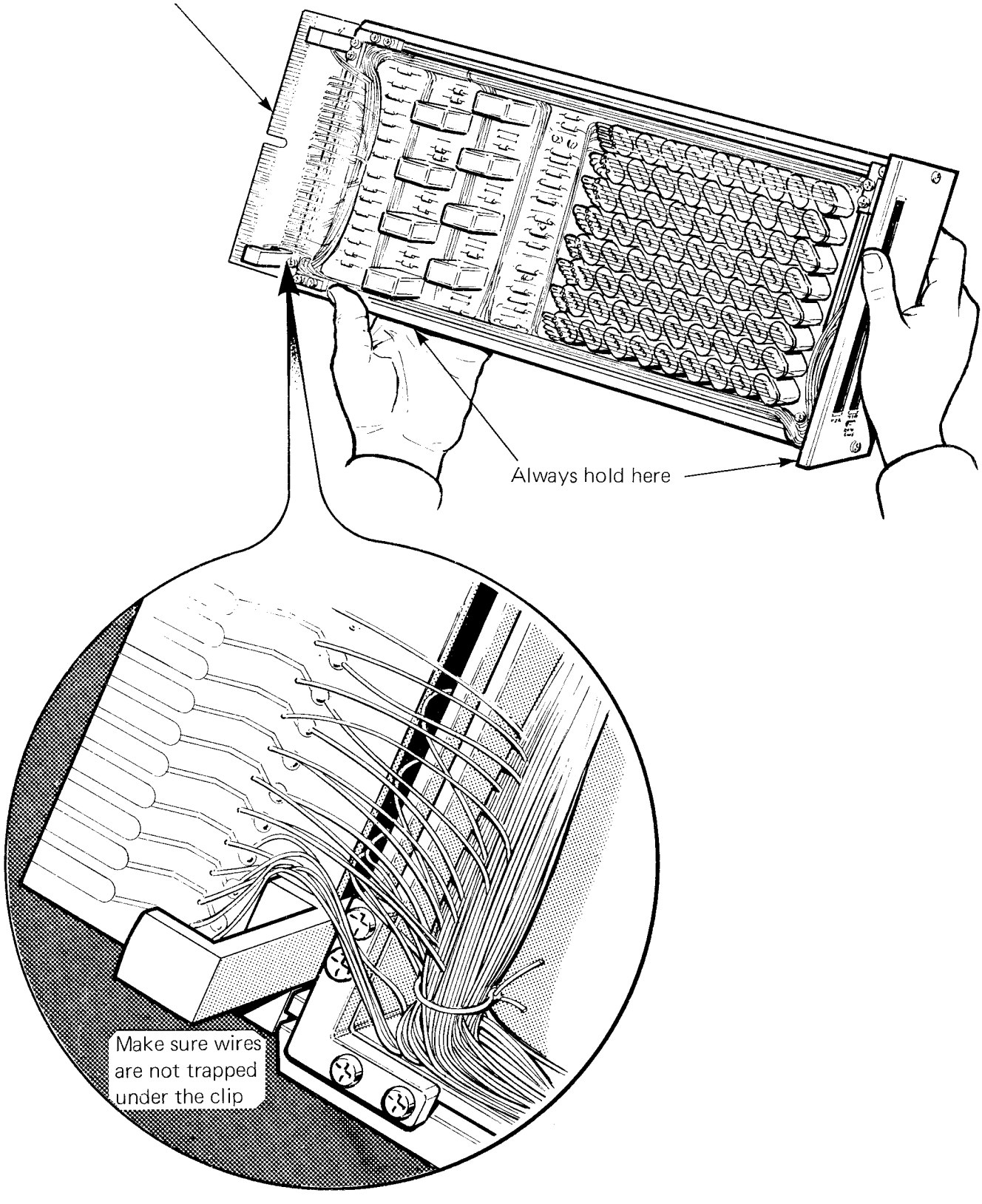
Each PIU is labelled on its front plate and must be inserted in its correct position in the cubicle which is also labelled.



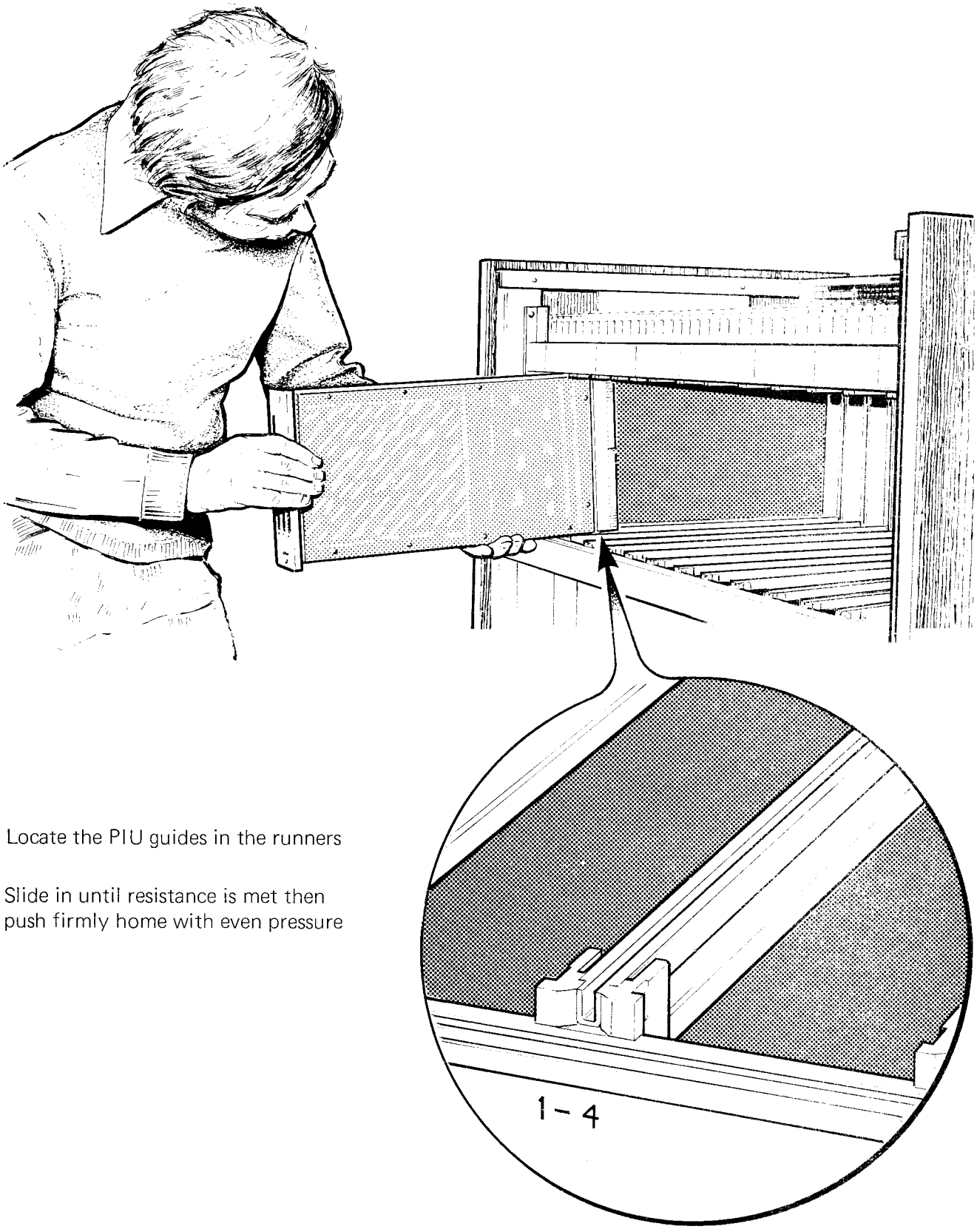
2.2 Unpacking

To avoid contamination of the gold plated contacts **do not touch** with fingers

Inspect the whole PIU for damage and check the operation of any 3000 type relays.



2.3 Insertion into the cubicle

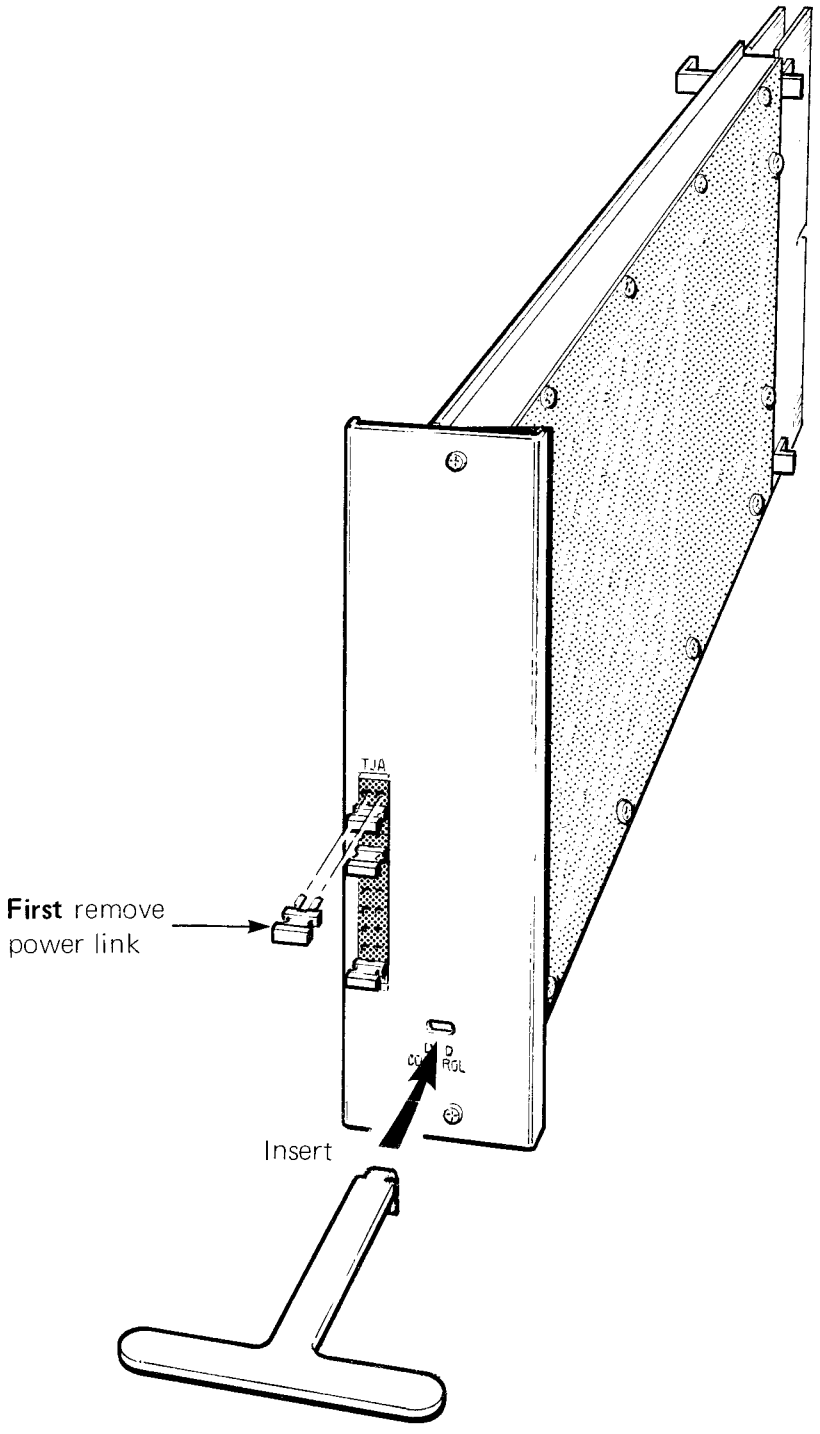


Locate the PIU guides in the runners

Slide in until resistance is met then push firmly home with even pressure

2.4 Removal of PIU's

If it is necessary to remove a PIU an Extractor 37A must be used

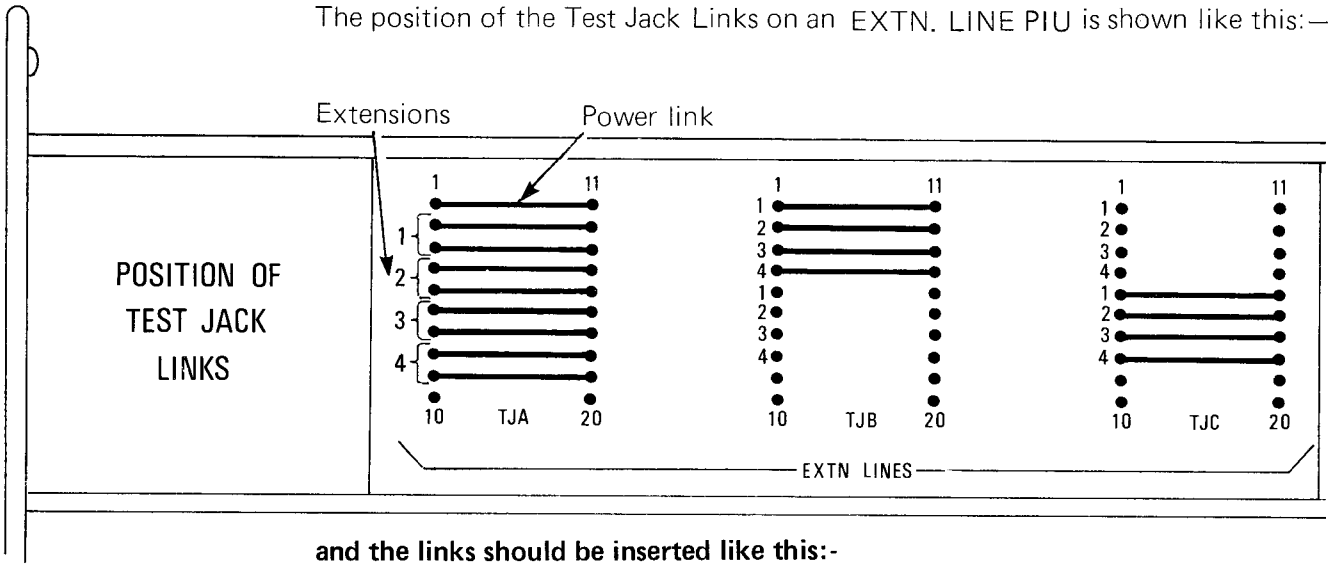


Pull to release then remove by hand.

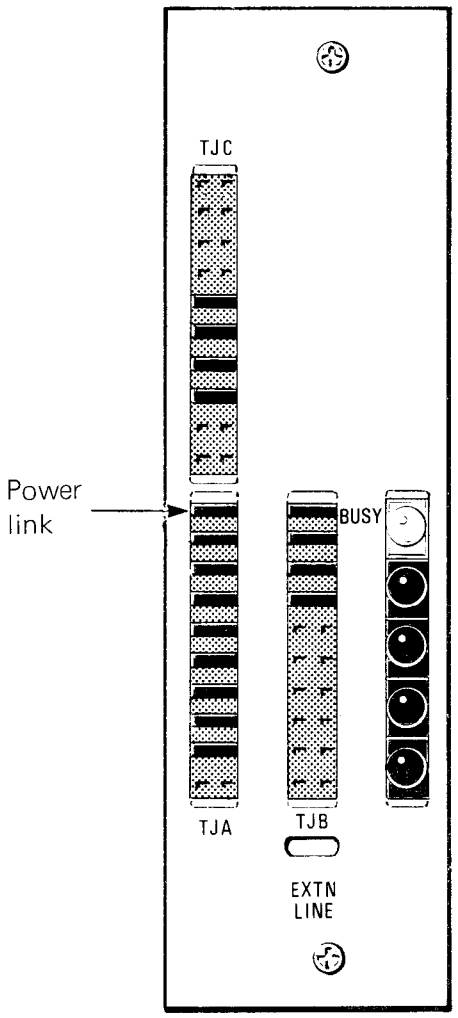
2.5 Insertion of Test Links

The position of these links for all the PIU's is shown in the cubicle above the top shelf.

The position of the Test Jack Links on an EXTN. LINE PIU is shown like this:—

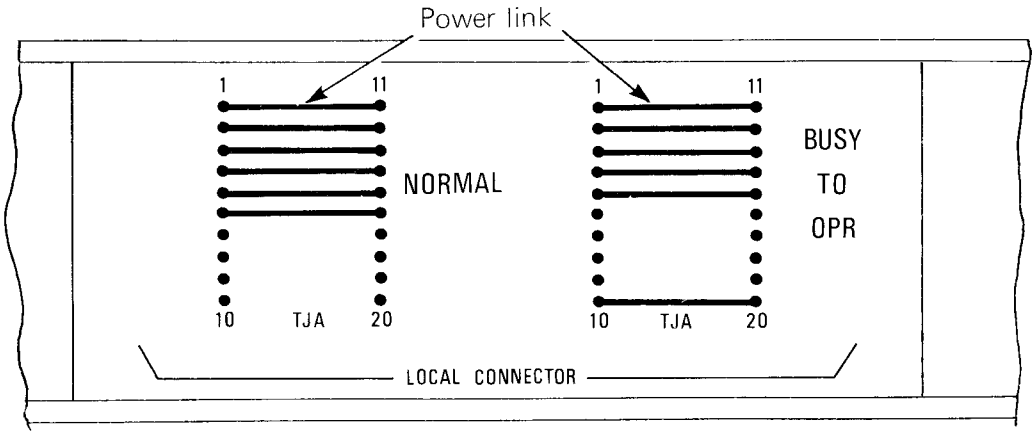


and the links should be inserted like this:-

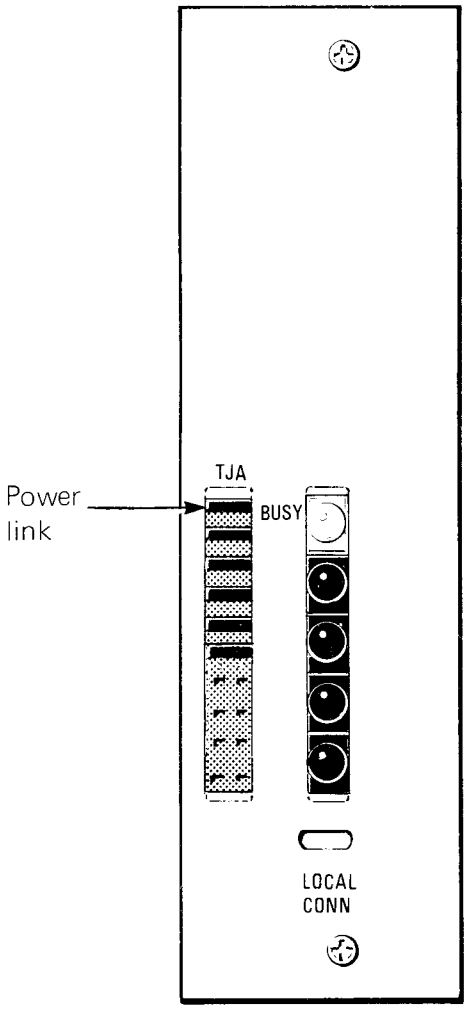


Each Extension Line PIU serves 4 Extensions

The LOCAL CONNECTOR PIU is shown like this:—

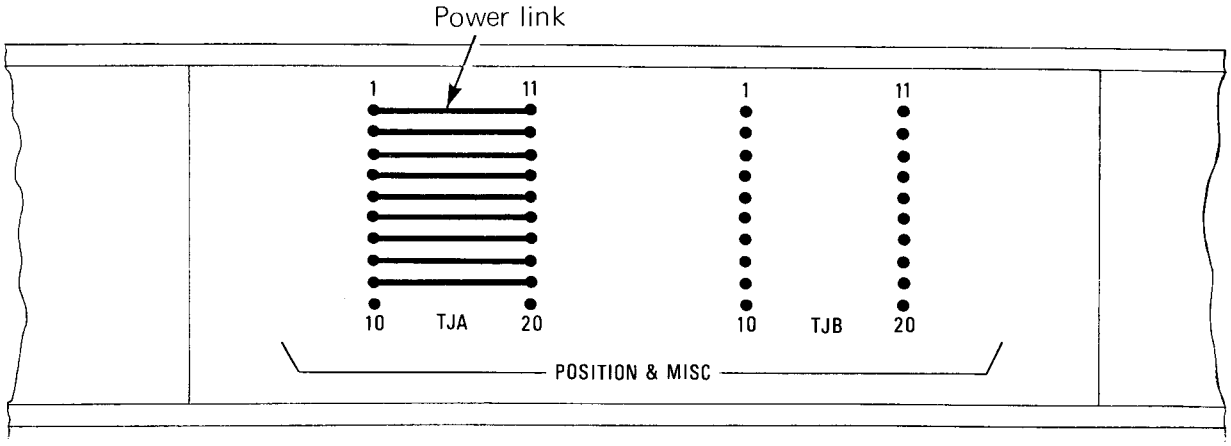


and for normal operation the links should be inserted like this:-

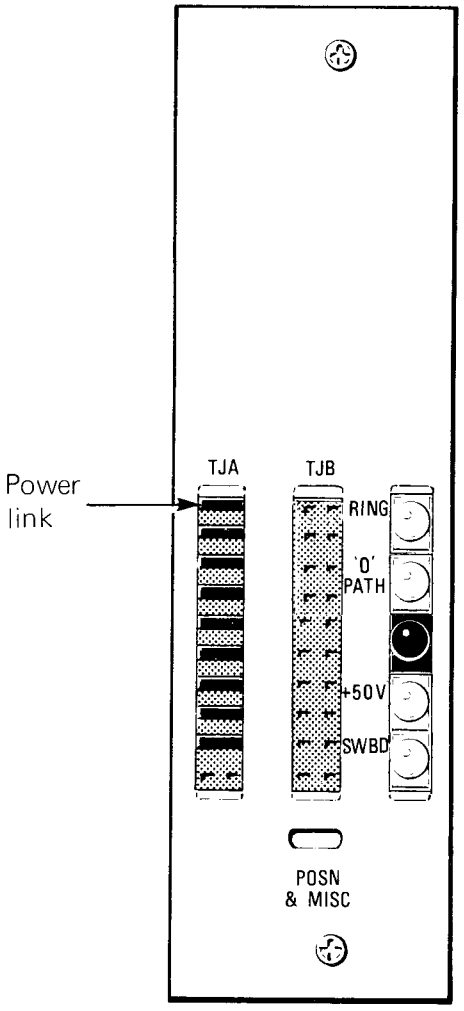


The Local Connector can be busied by moving the test link from TJA 6/16 to 10/20.

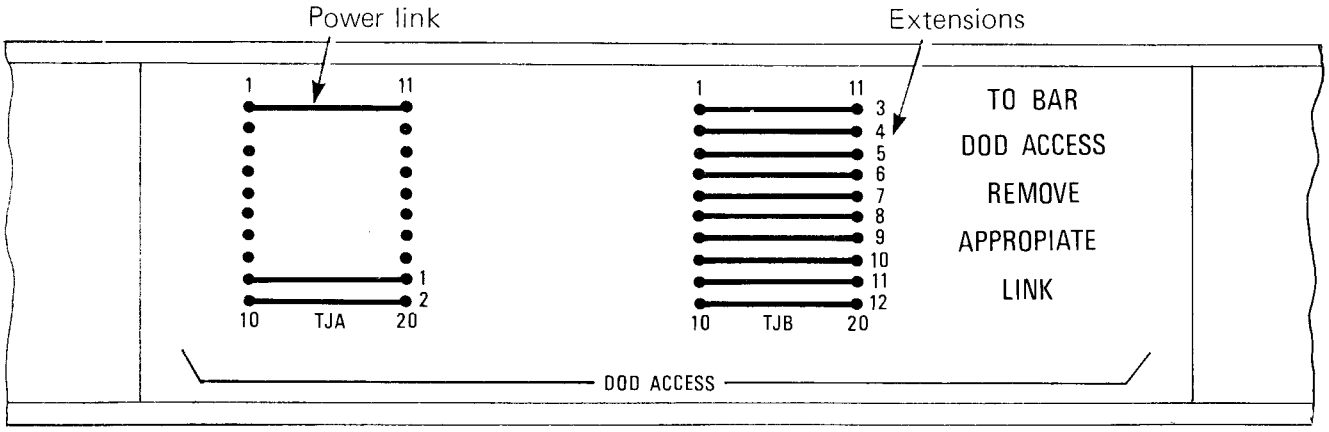
The POSITION AND MISCELLANEOUS PIU is shown like this:—



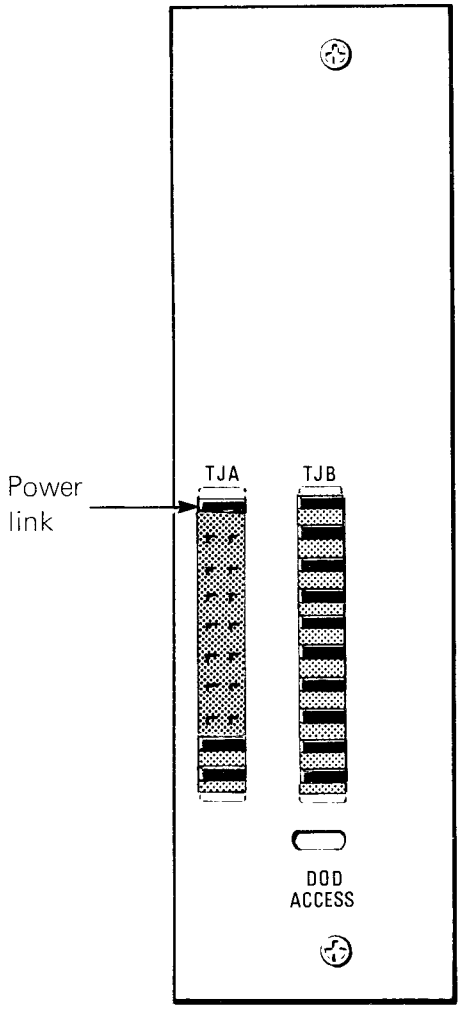
and the links should be inserted like this:-



The DOD (DIRECT OUTWARD DIALLING) ACCESS PIU is shown like this:-



and the links should be inserted like this:-

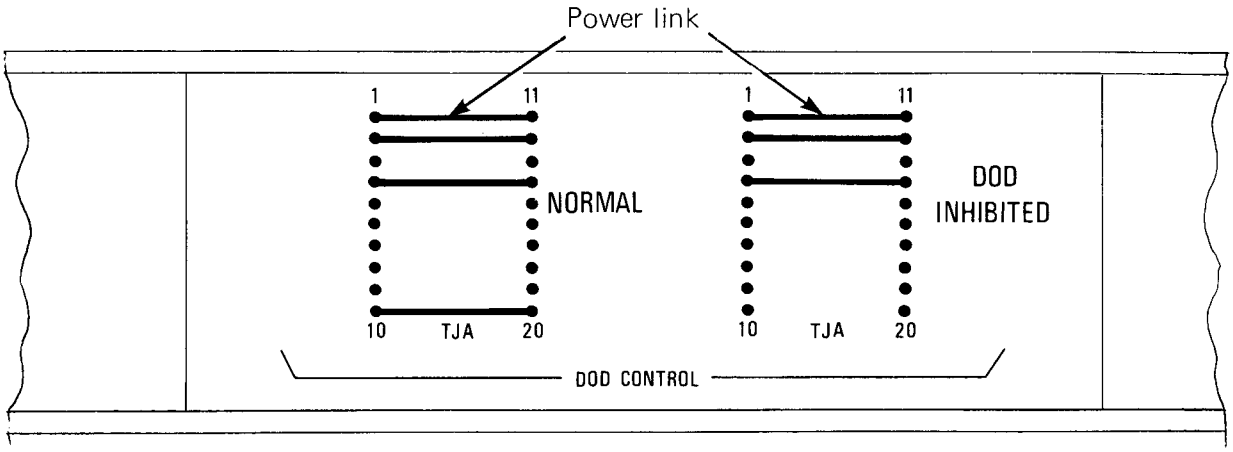


To bar DOD access the appropriate link must be removed.

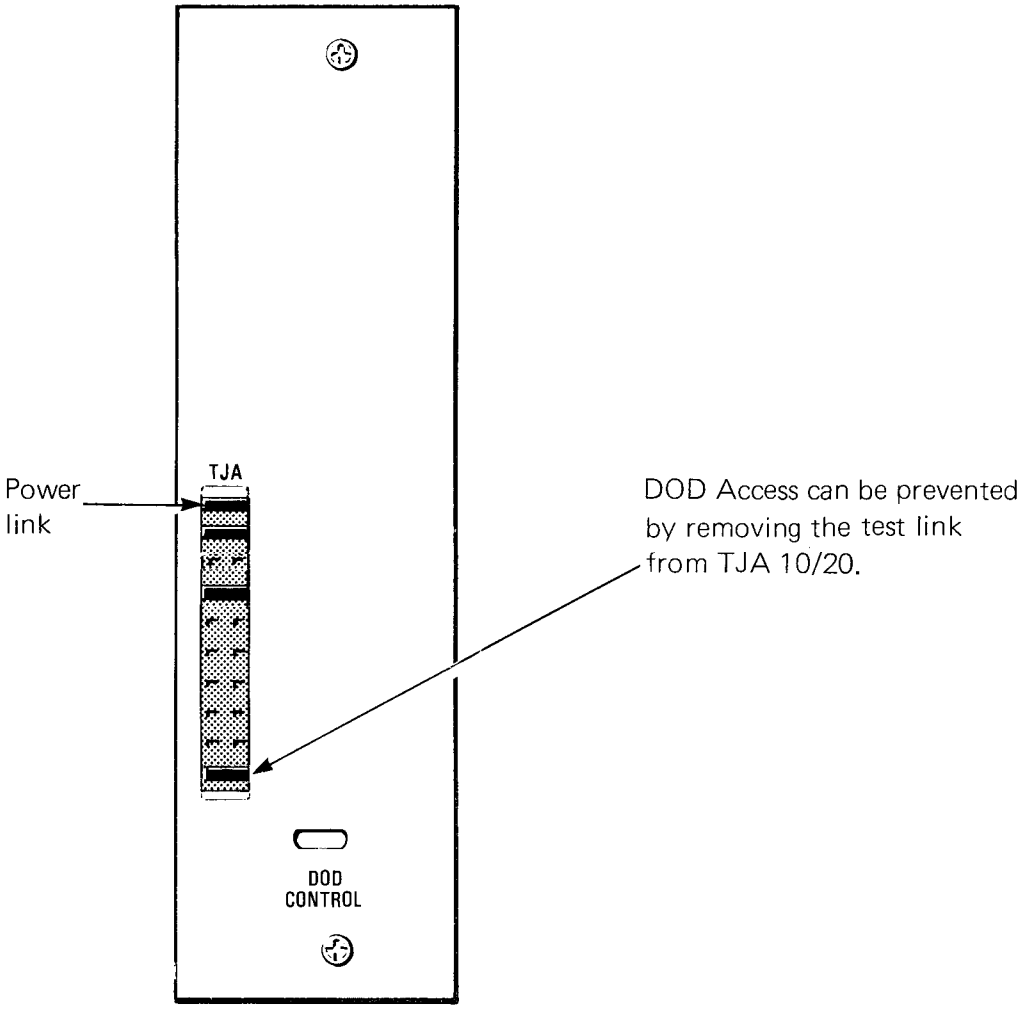
The 12 extensions associated with the PIU are numbered 1 to 12.

DOD ACCESS		EXTNS
1	———	1 - 12
2	———	13 - 24
3	———	25 - 36
4	———	37 - 48

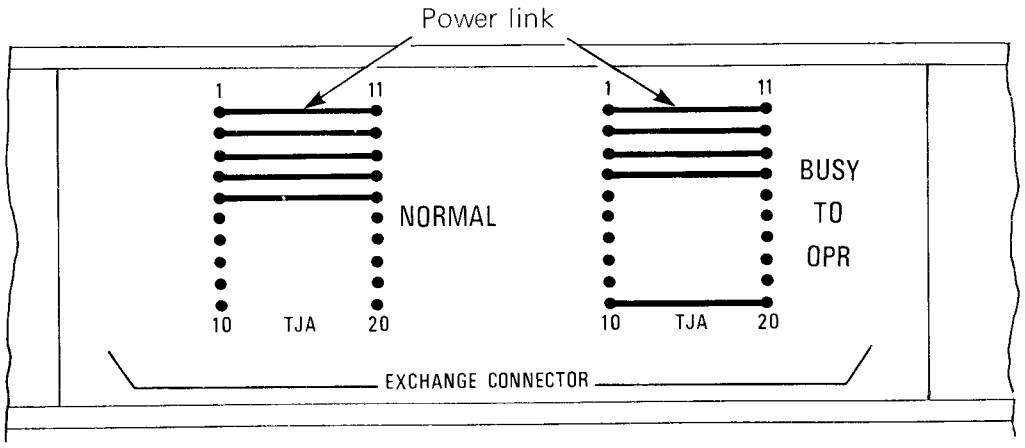
The DOD CONTROL PIU is shown like this:—



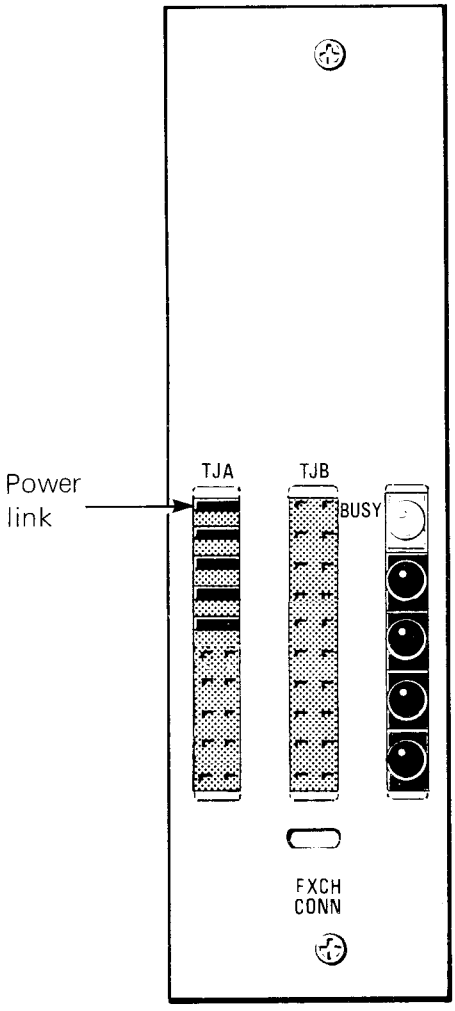
and the links should be inserted like this:-



The EXCHANGE CONNECTOR PIU is shown like this:—

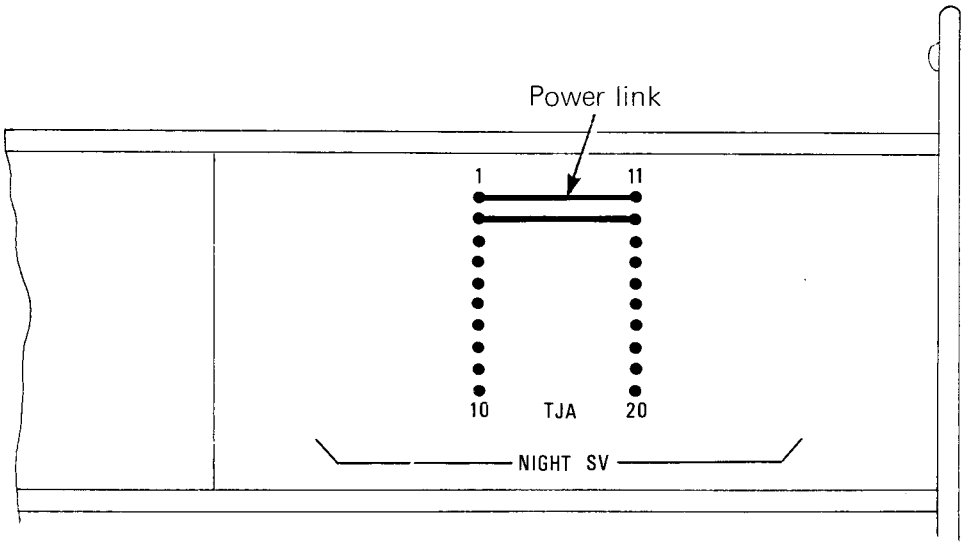


and the links should be inserted like this:-

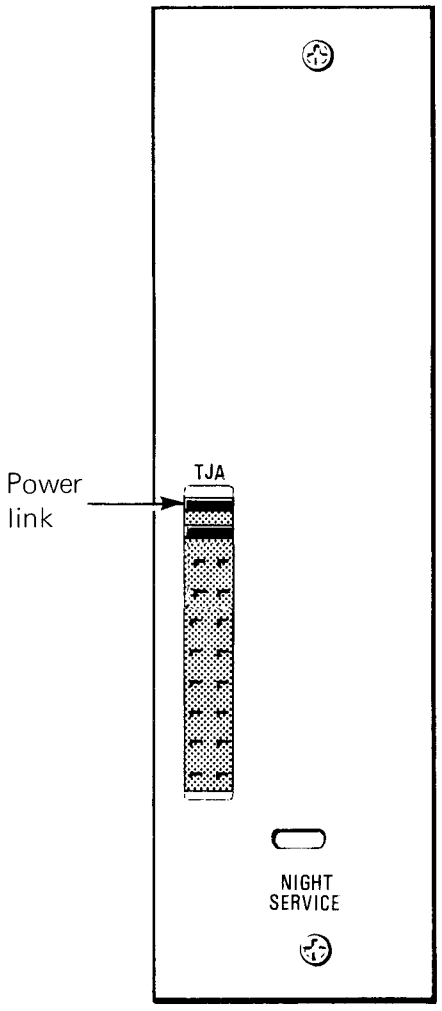


The Exchange Connector can be busied by moving the test link from TJA 5/15 to 10/20.

The NIGHT SERVICE PIU is shown like this:—



and the links should be inserted like this:-

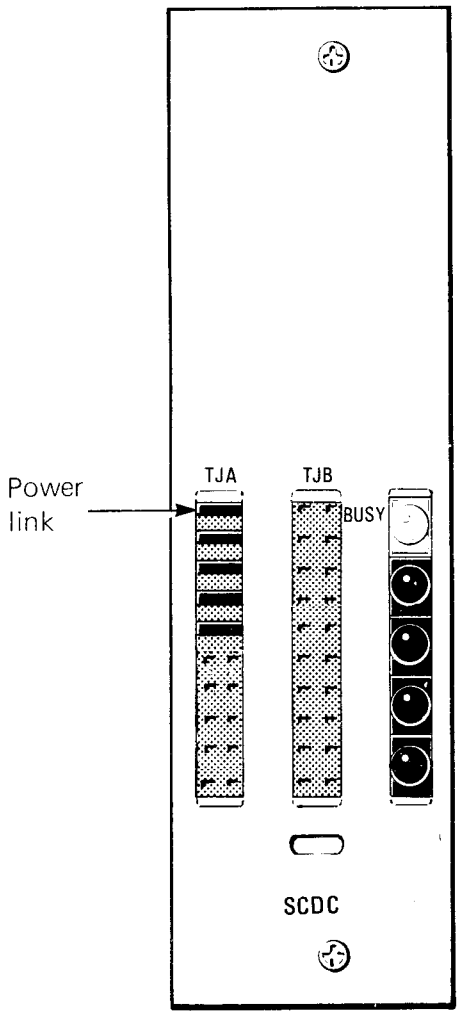


The link positions are not shown on the PMBX label but should be inserted as illustrated with additional links dependent on the circuit requirements as in A or B below. Diagram SA/SAW 101830 refers.

A) If routing digits are required at the distant end insert links in TJB 5/15 and 10/20.

OR

B) If routing digits are not required at the distant end insert links in TJB 6/16 and 7/17.



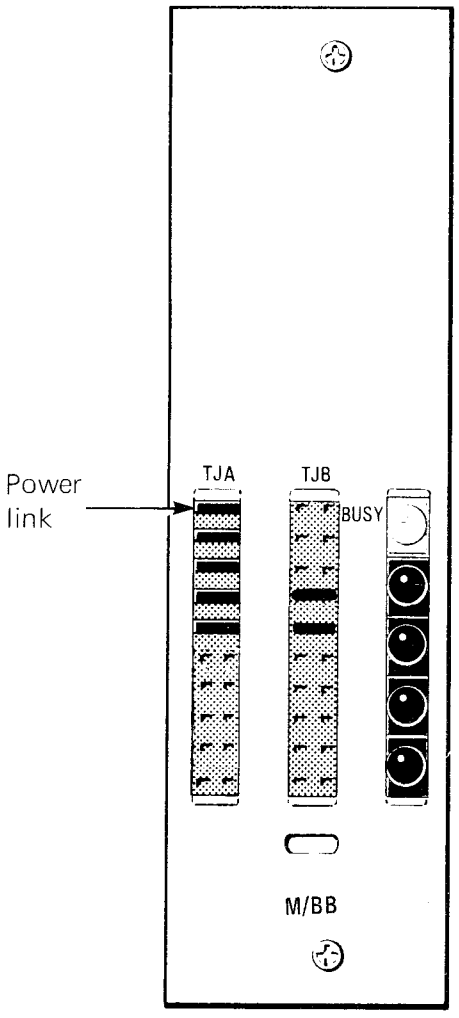
The circuit can be busied by moving the test link from TJA 5/15 to 10/20.

The link positions are not shown on the PMBX label but should be inserted as illustrated. Diagram SA/SAW 101840 refers.

Note that;

If distant end clearing is required test link TJB 5/15 should be moved to TJB 8/18.

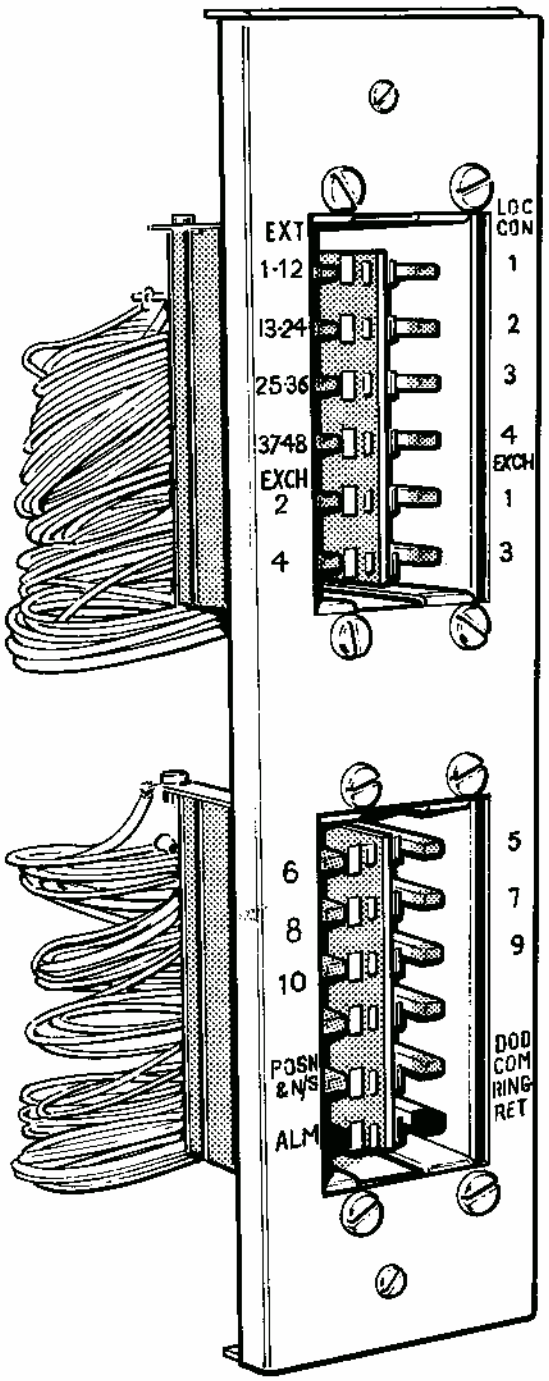
If a clear signal is required at the distant end then test links TJA 3/13 and TJB 4/14 should be moved to TJB 6/16 and TJB 7/17.

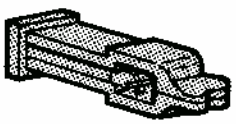


The circuit can be busied by moving the test link from TJA 5/15 to 10/20.

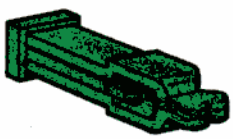
3. FITTING FUSES

Insert fuses as required.





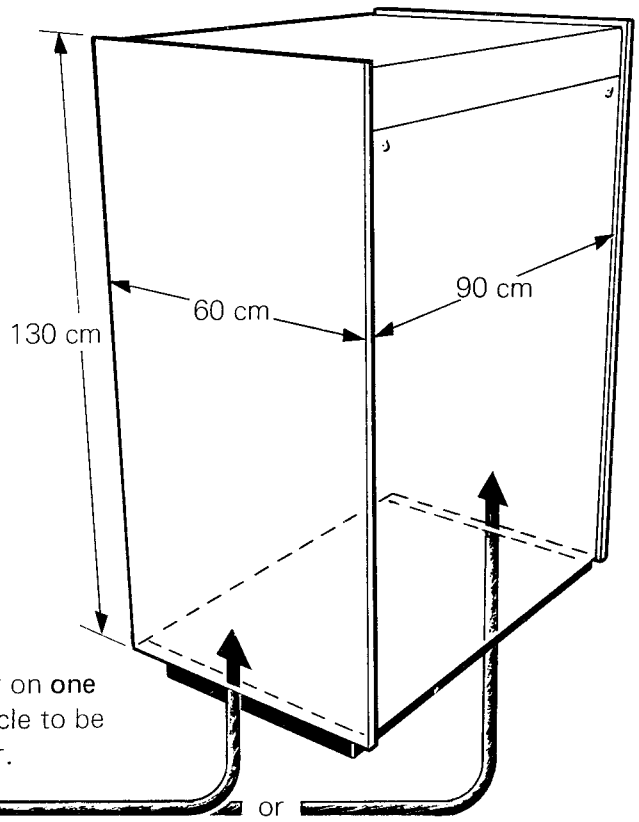
FUSE 1.7A GREY
PIECE PART 34CPR10004AAC



FUSE 0.55A GREEN
PIECE PART 34CPR10004AAD

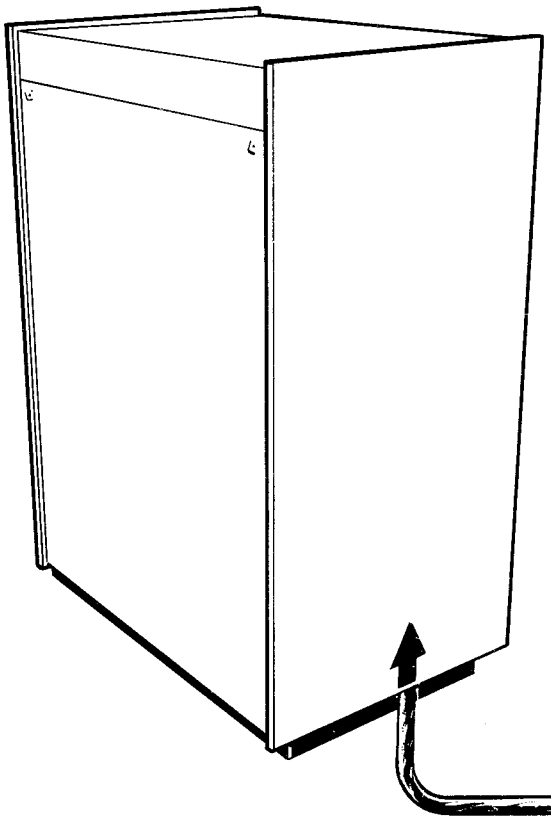
Fuse must be the same colour as the marking on the peg end.

4. ROUTING OF CABLES AND CORDS



Distribution cables must enter on **one side only,** this allows the cubicle to be swivelled for access to the rear.

FULLY EQUIPPED WEIGHT 450 lbs
(200 kg)

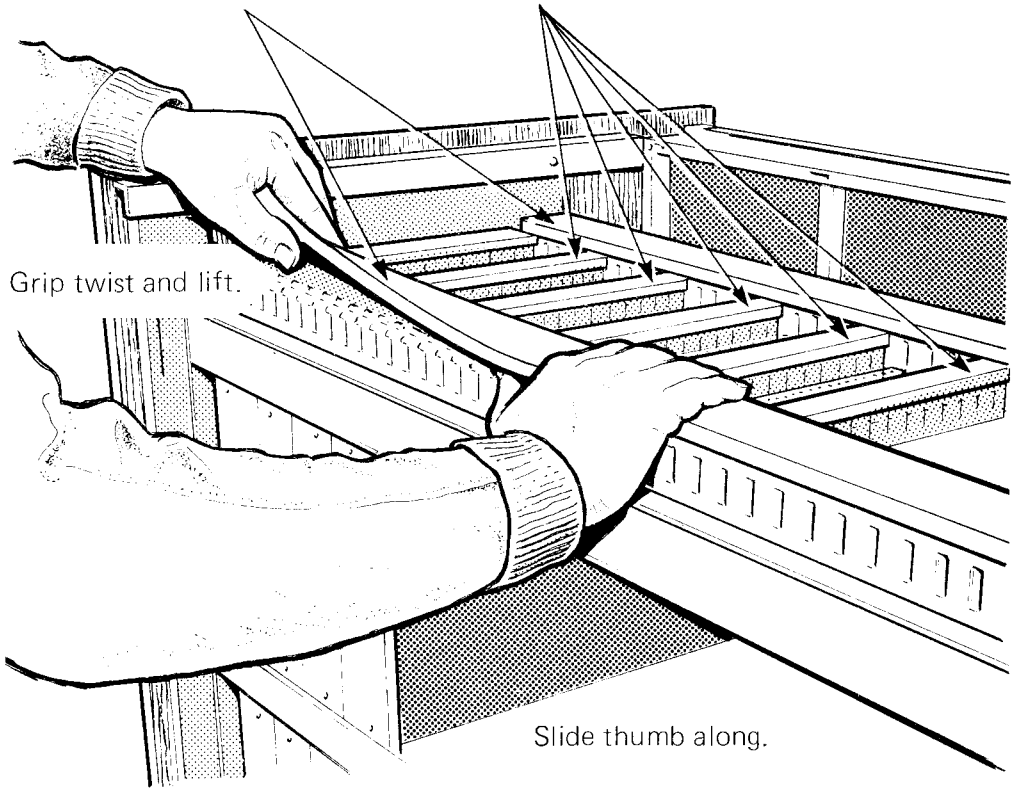


It is recommended that the **cords connecting** enter the cubicle from the **right hand side.**

5. CONNECTION OF DISTRIBUTION CABLES

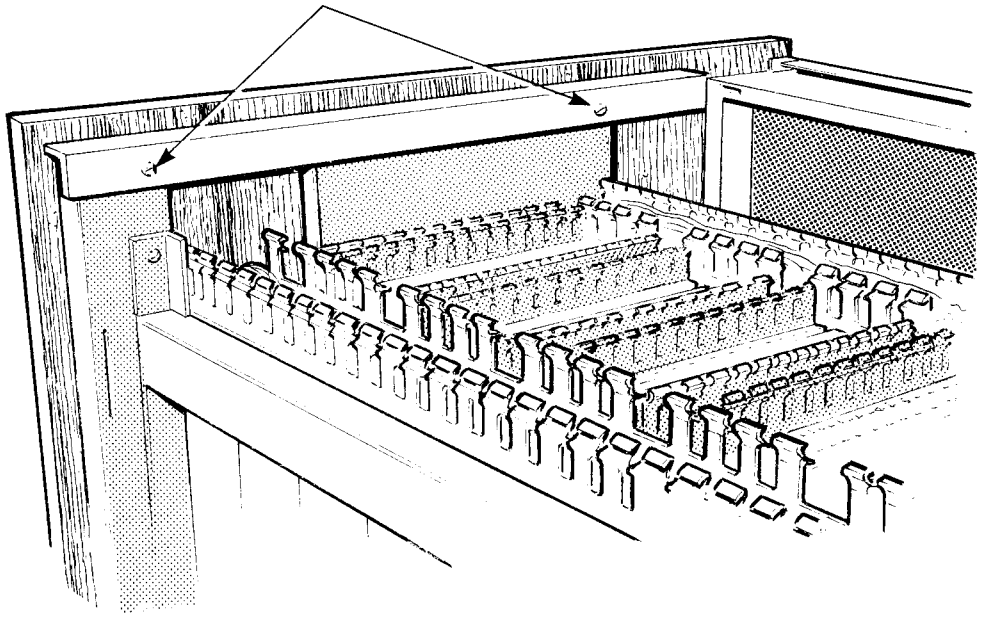
5.1 Removal of Trunking Covers

The cables and jumpers are laid within trunking fixed in the cubicle, remove the two large covers and all the small ones.



5.2 Routing of Cables

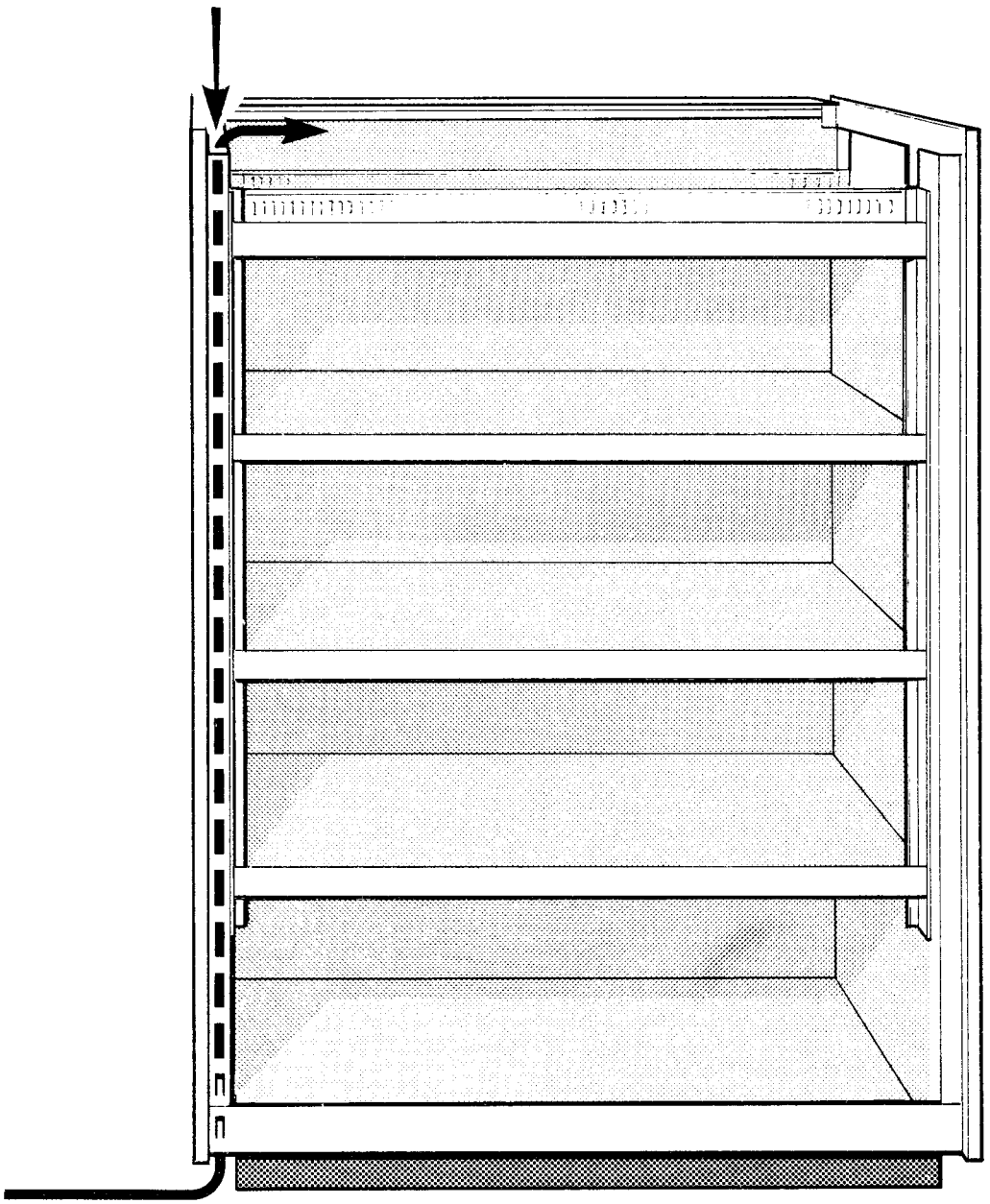
Unscrew and remove angle piece for access to cable entry.



NOTE — Protect cables and hands from sharp edges.

The angle piece is removed to permit access to the cavity in the side of the cubicle.

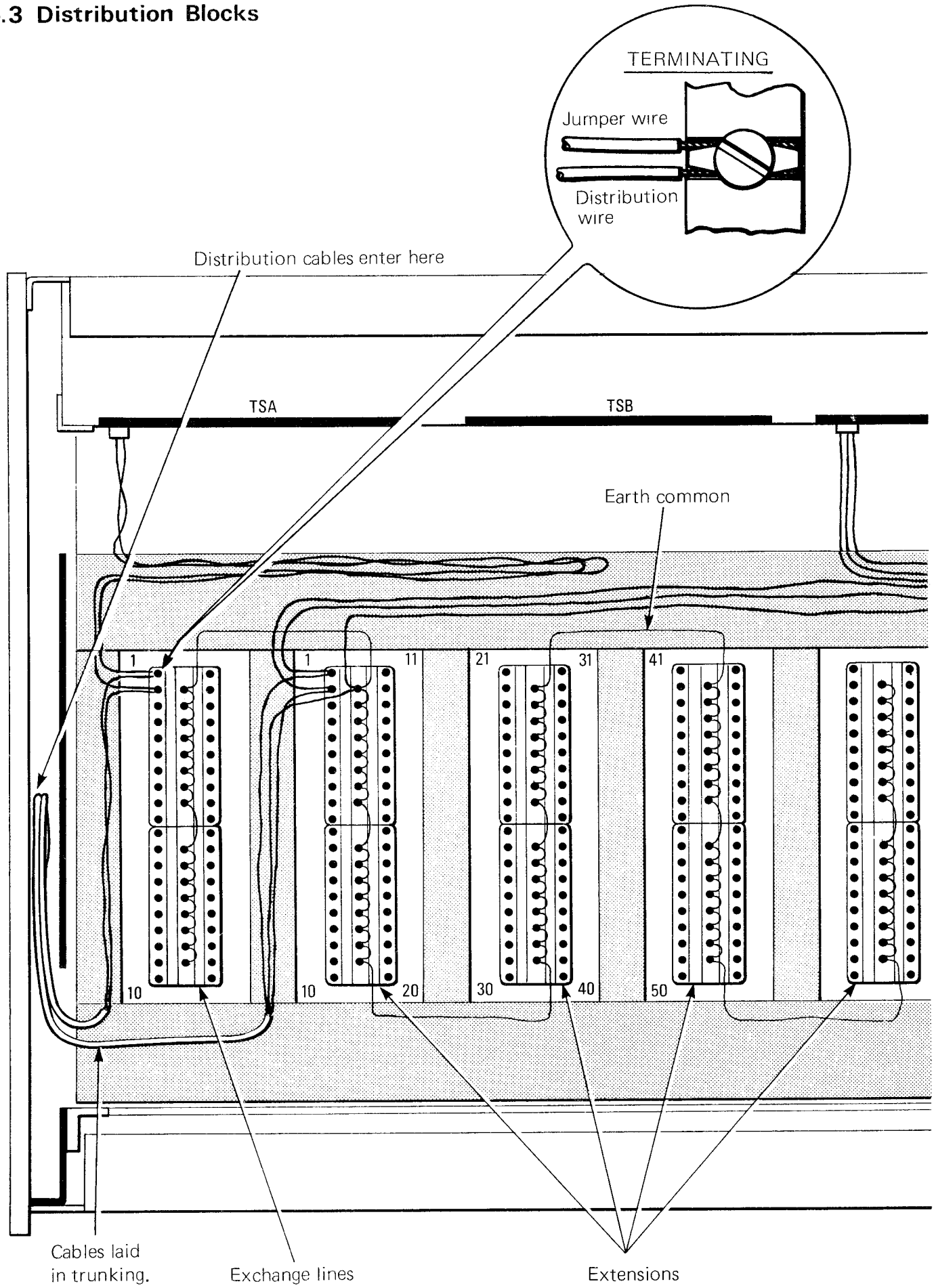
Pass draw wire down through side cavity.

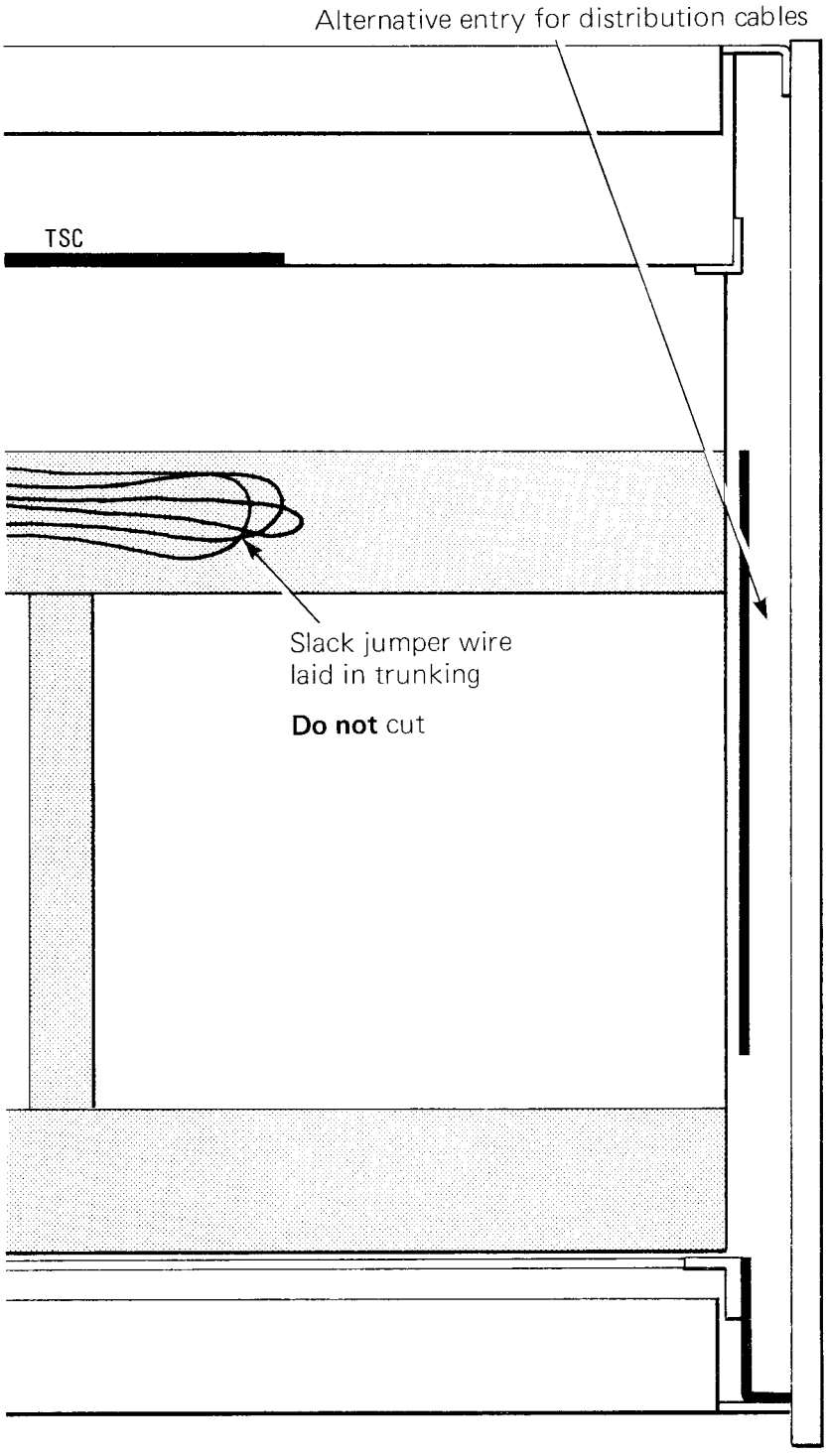


Cables enter one side only.

The signalling earth should be taken into the base of the cubicle and terminated on the earth bar.

5.3 Distribution Blocks



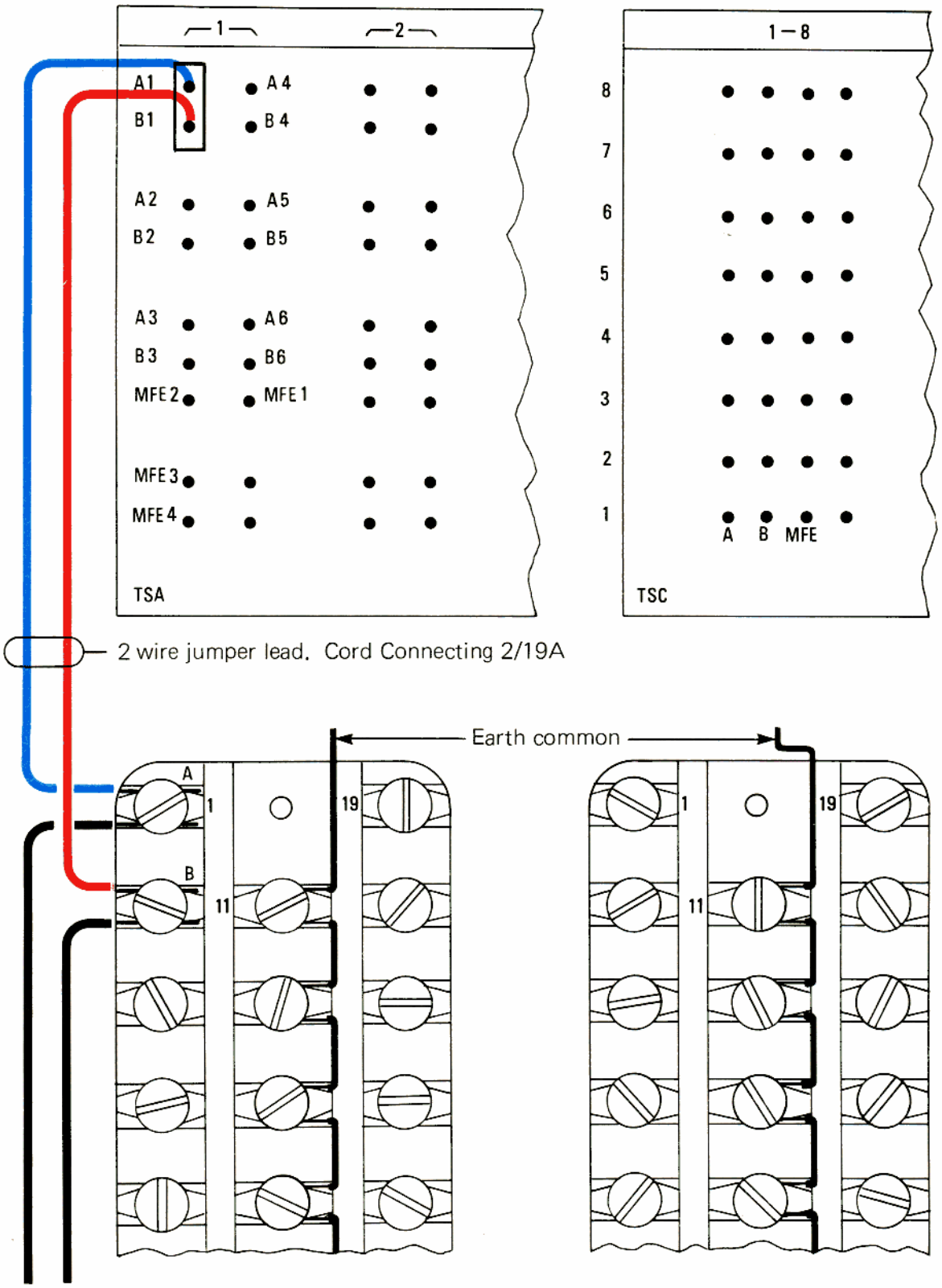


Turn over for jumpering arrangements

6. CONNECTION OF JUMPERS

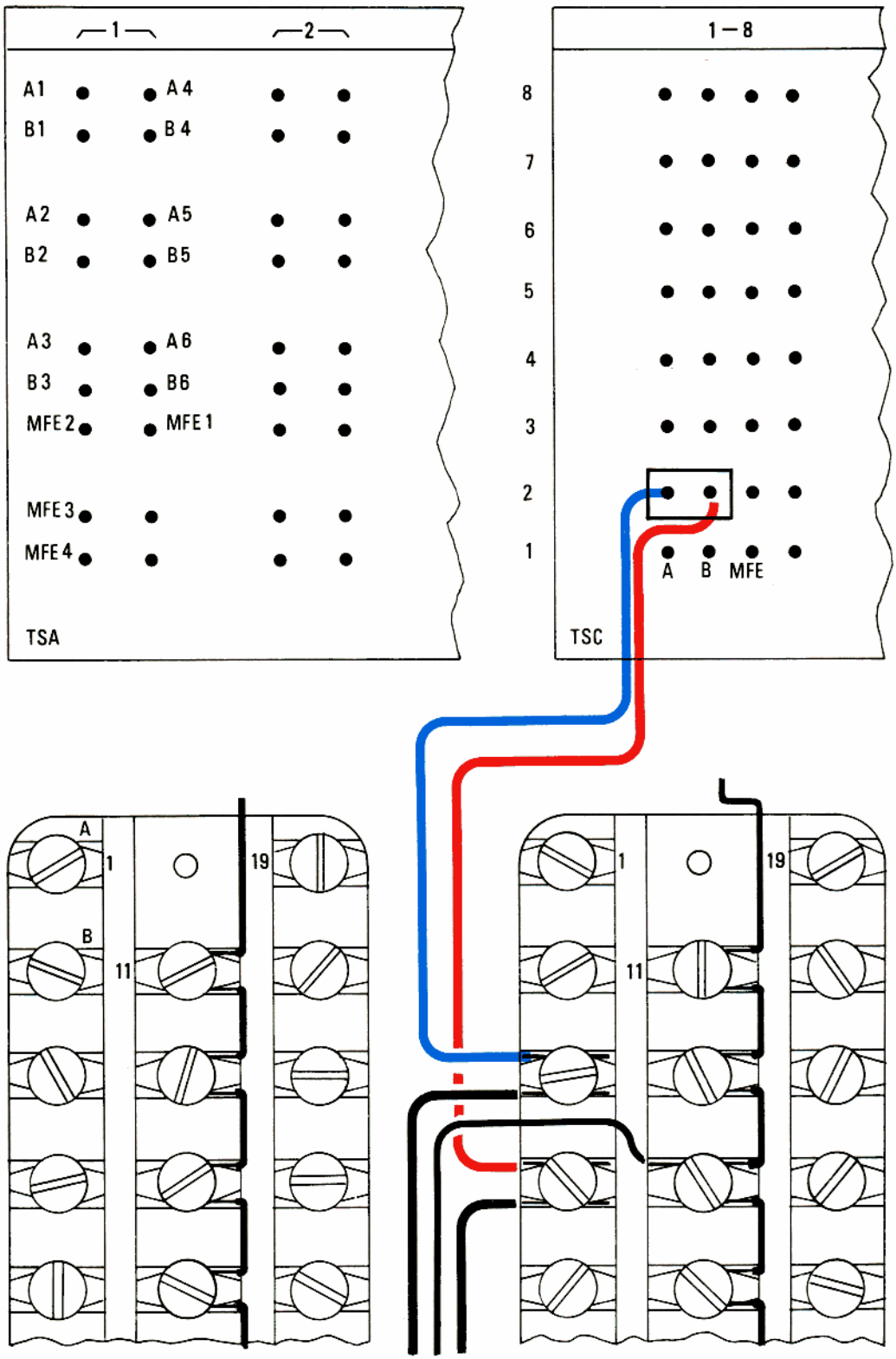
6.1 DEL (DIRECT EXCHANGE LINE)

EXAMPLE:— Exchange line 1.



6.2 Normal Extension

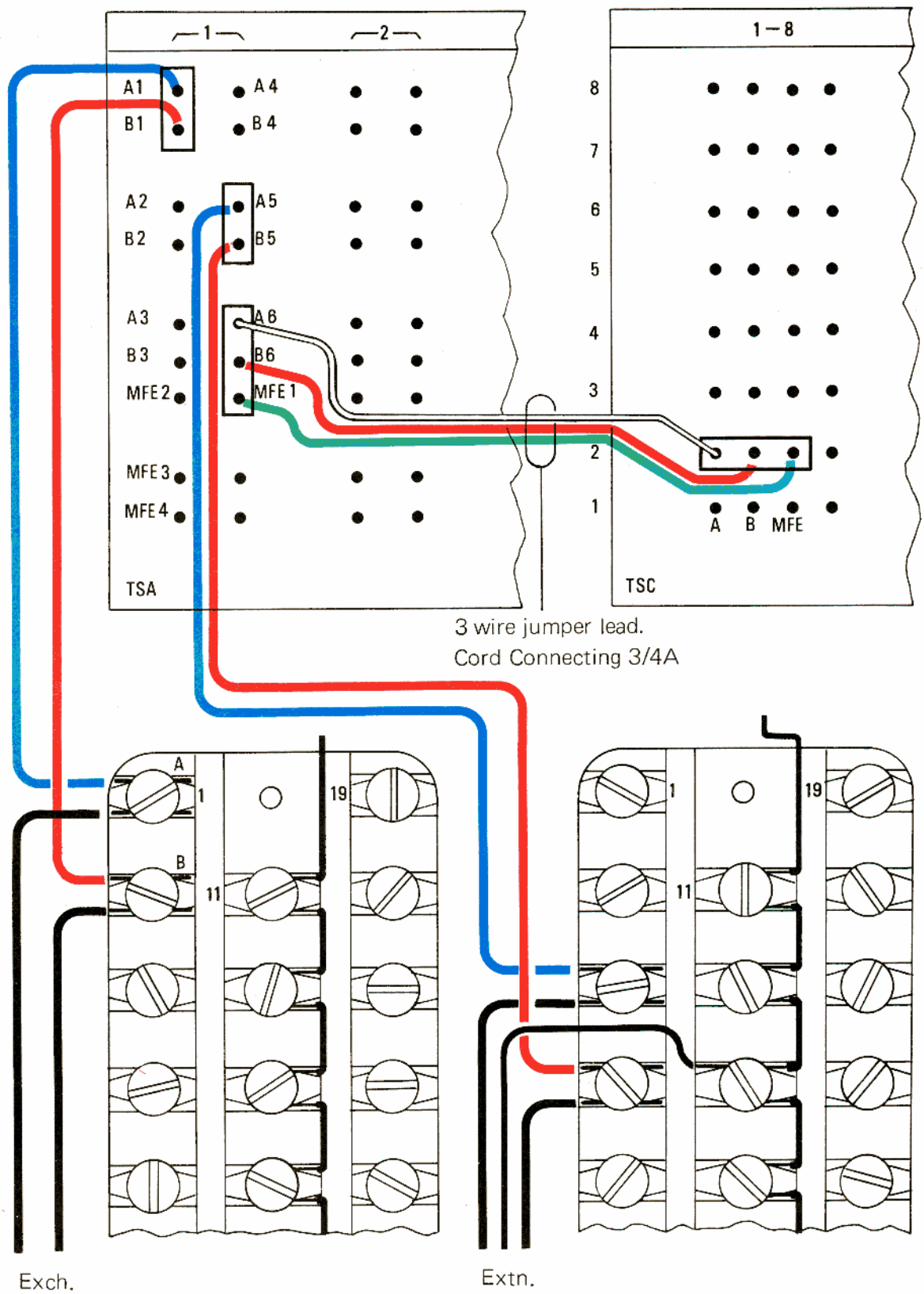
EXAMPLE:– Extension No. 2.



Extension distribution cables.

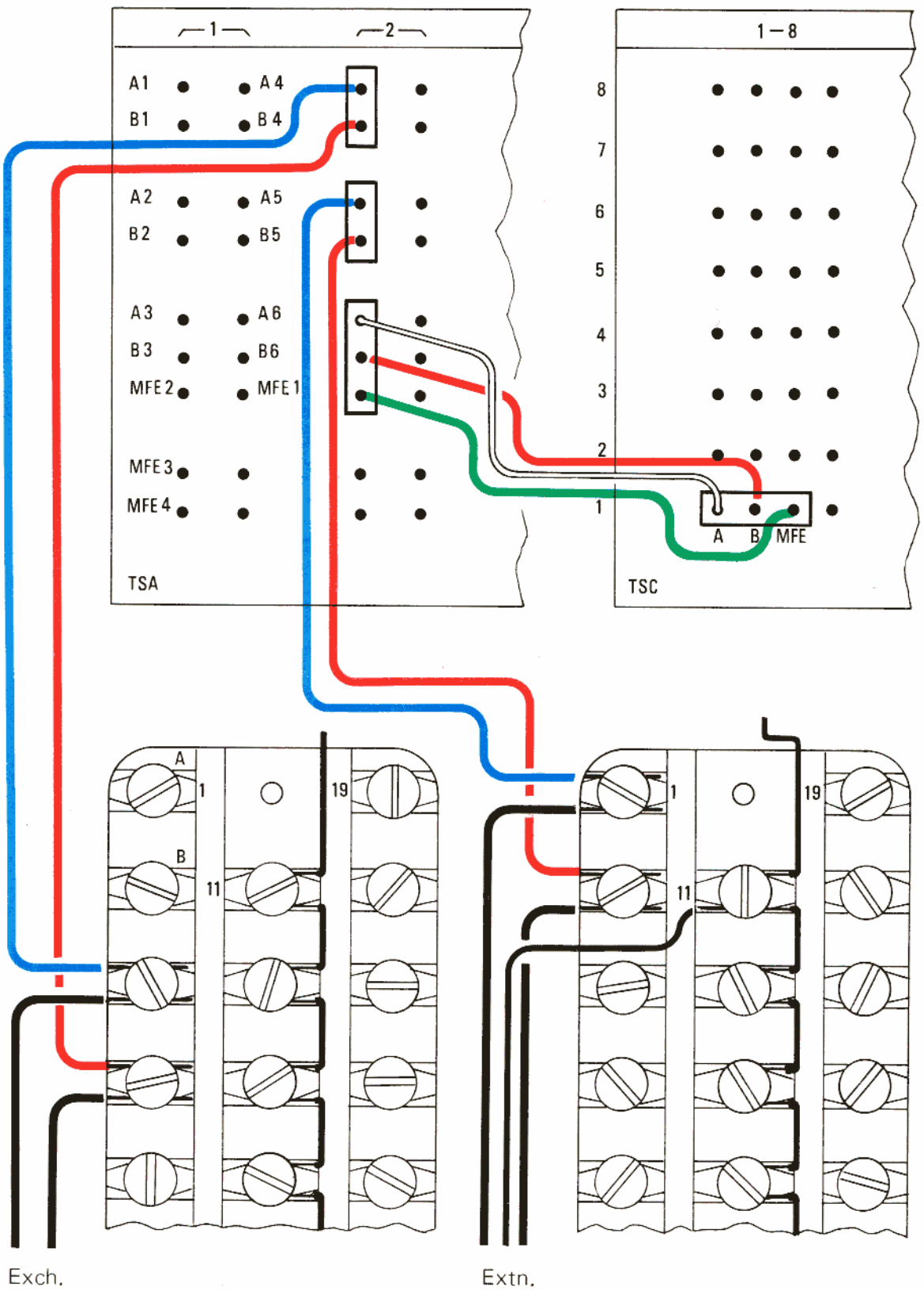
6.3 Mains fail Extension. (Night service No.2)

EXAMPLE:— Extension 2 on Exchange Line 1.



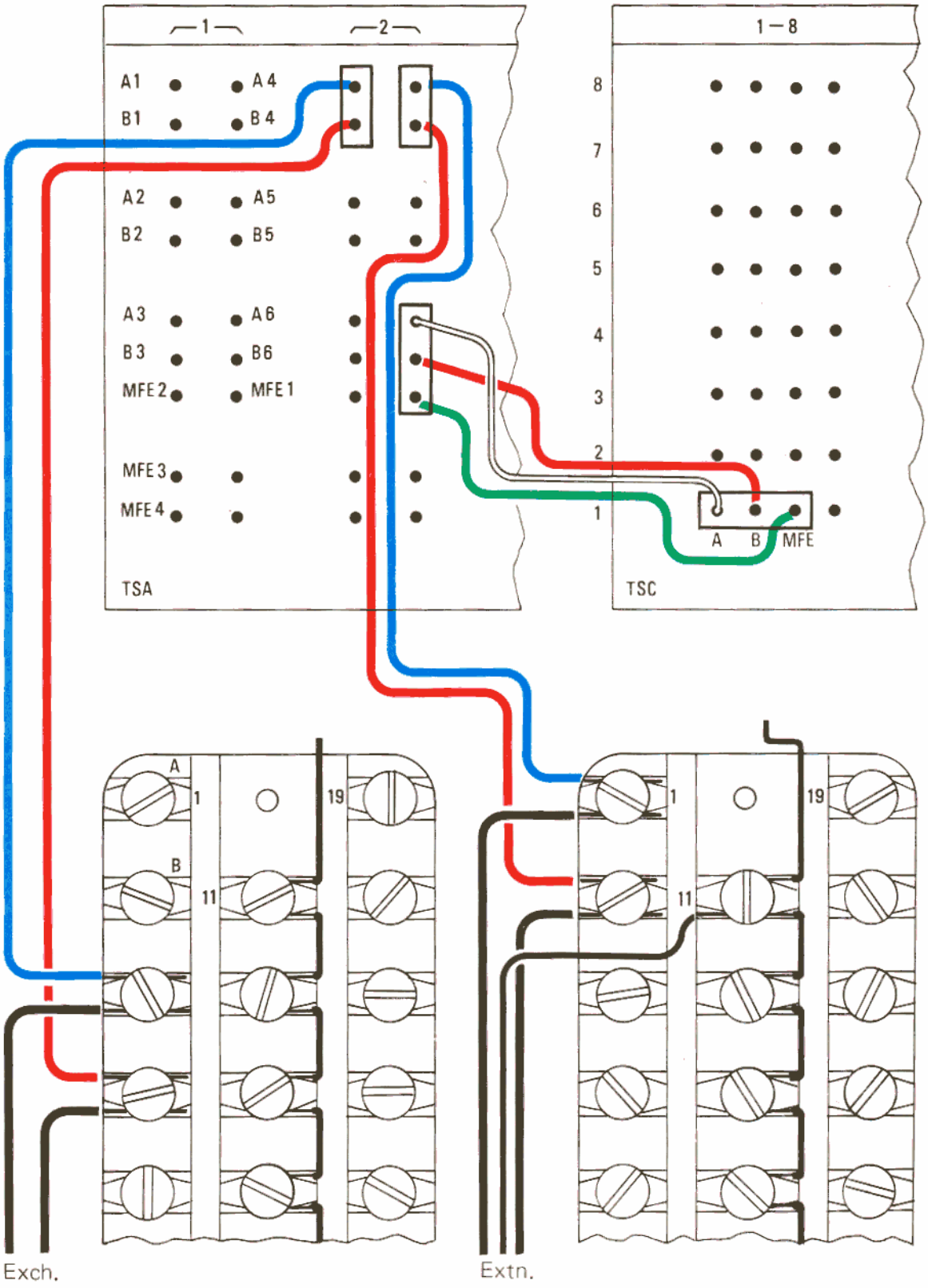
6.4 Night service Extension. (Night service No.1)

EXAMPLE:– Extension 1 on Exchange Line 2.



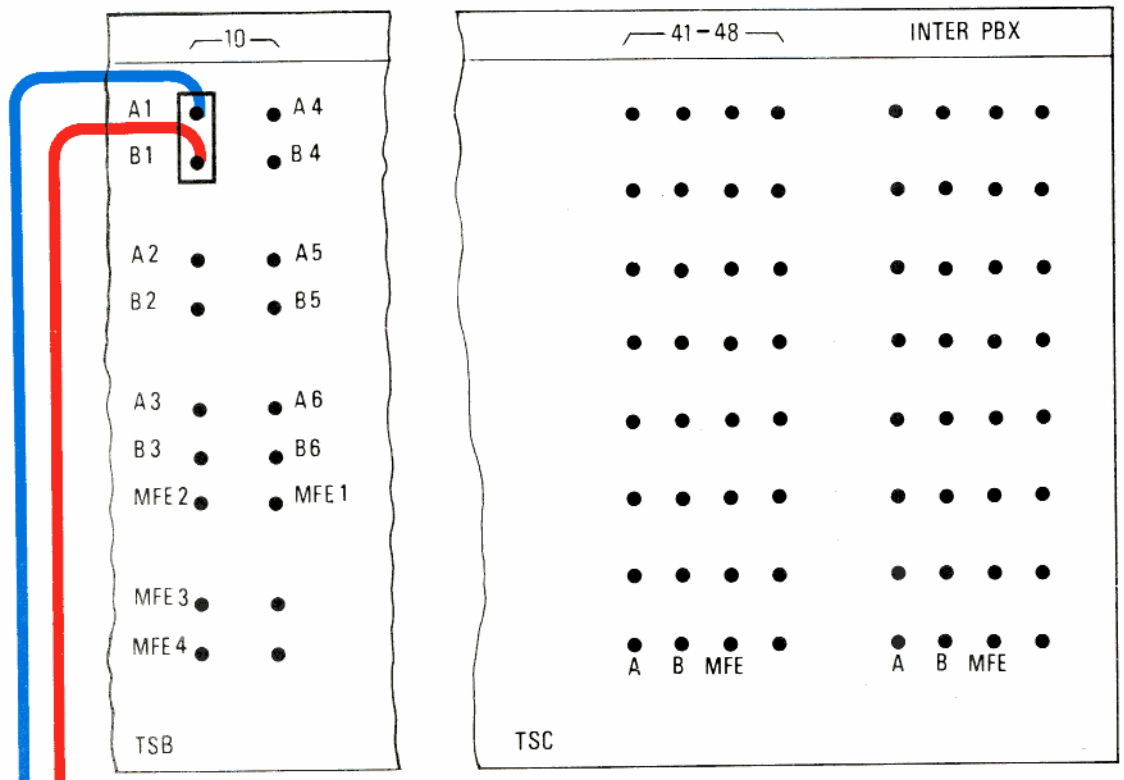
6.5 Extension connected to Night service and Mains fail on the same Exchange Line (When a Night Service PIU is not provided).

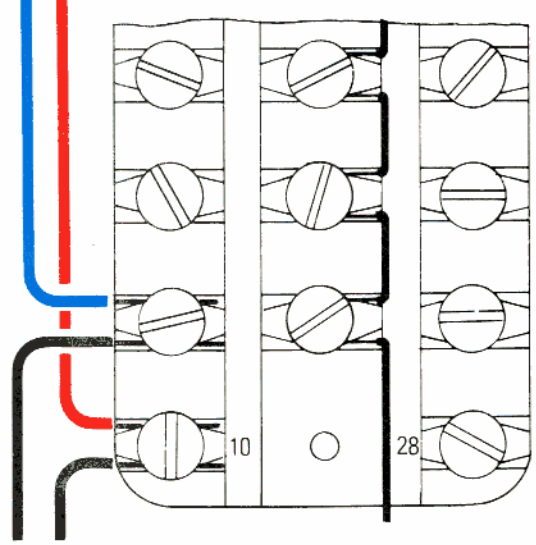
EXAMPLE:– Extension 1 on Exchange Line 2.



6.6 Inter PBX Private Cct

EXAMPLE:– Using Exchange Line 10.



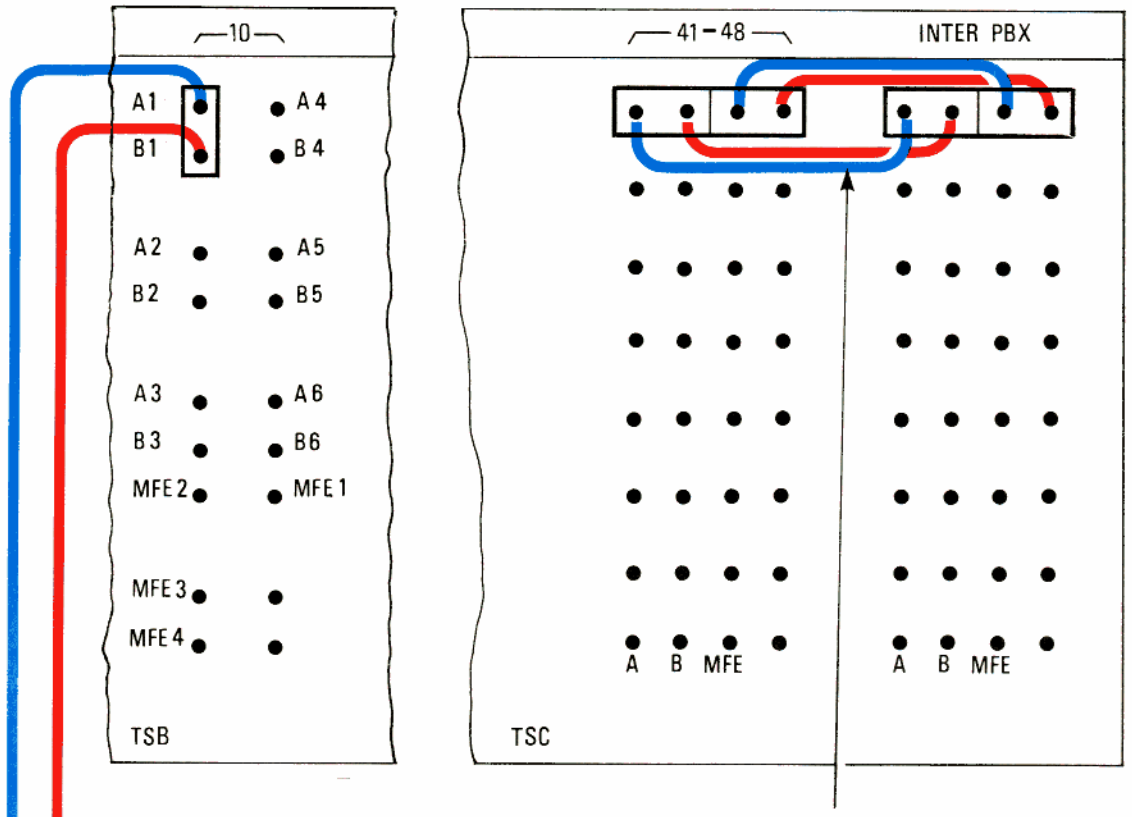


I/C Cct.

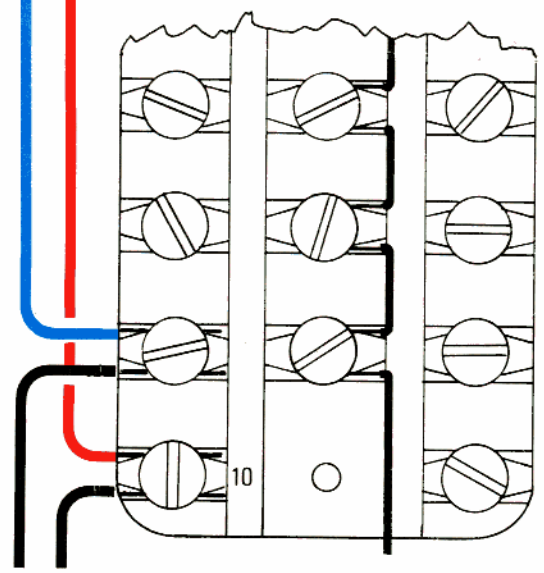
NOTE:- **Only exchange lines 10, 9, 8 and 7 can be used.**

6.7 Inter PBX Extension

EXAMPLE:– Extension 48 using Exchange Line 10.



Double ended jumpers constructed from Cords Connecting 2/19A



I/C Cct.

NOTE: **Only exchange lines 10, 9, 8, & 7 and extensions 48, 47, 46, & 45 can be used.**

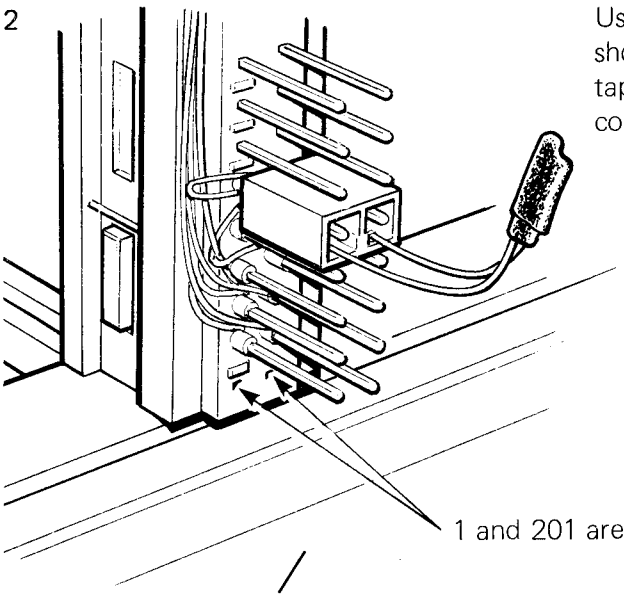
Do not forget to replace trunking covers.

6.8 Out of Area Exchange Lines

The following modification should be made to each Out of Area Exchange line to prevent it being used by DOD extensions.

Procedure

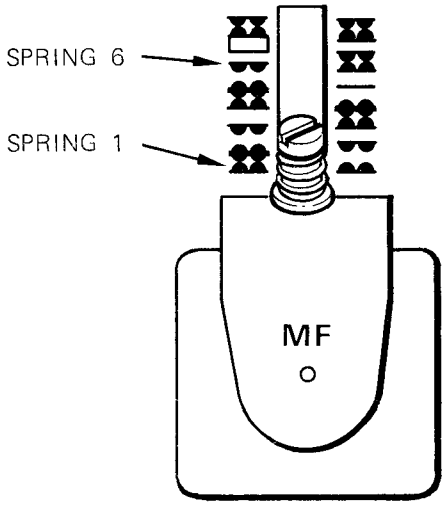
1 Remove the back of the cubicle to gain access to the permanent wiring on the back of the Exchange connector

2 

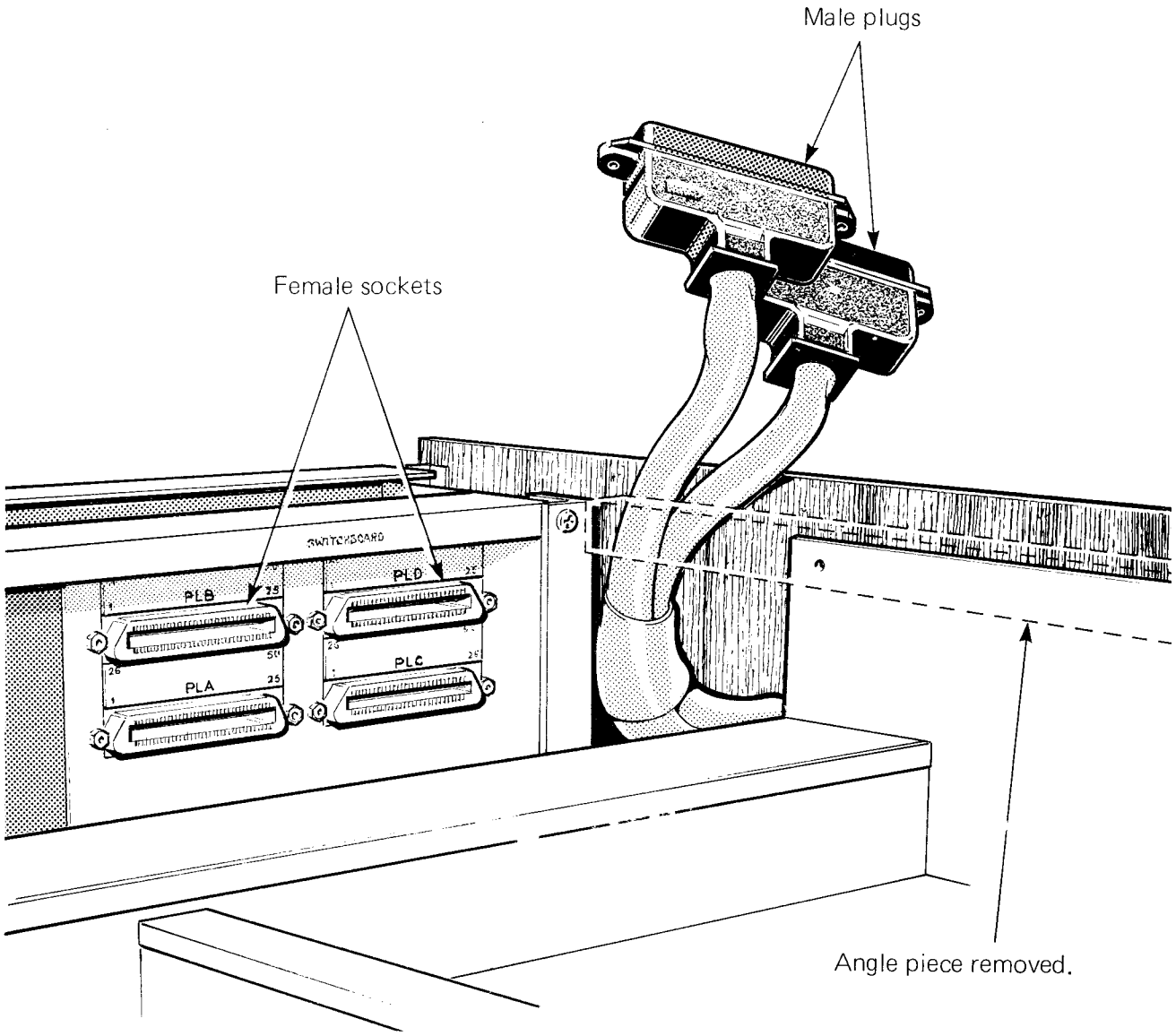
Use a 2 wire jumper, whose ends should be soldered together and taped, to strap the Exchange connector jack tags 6 to 206.

3 Place a paper sleeve over spring 6 of relay MF in the Exchange connector PIU. (See diagram for spring numbering)

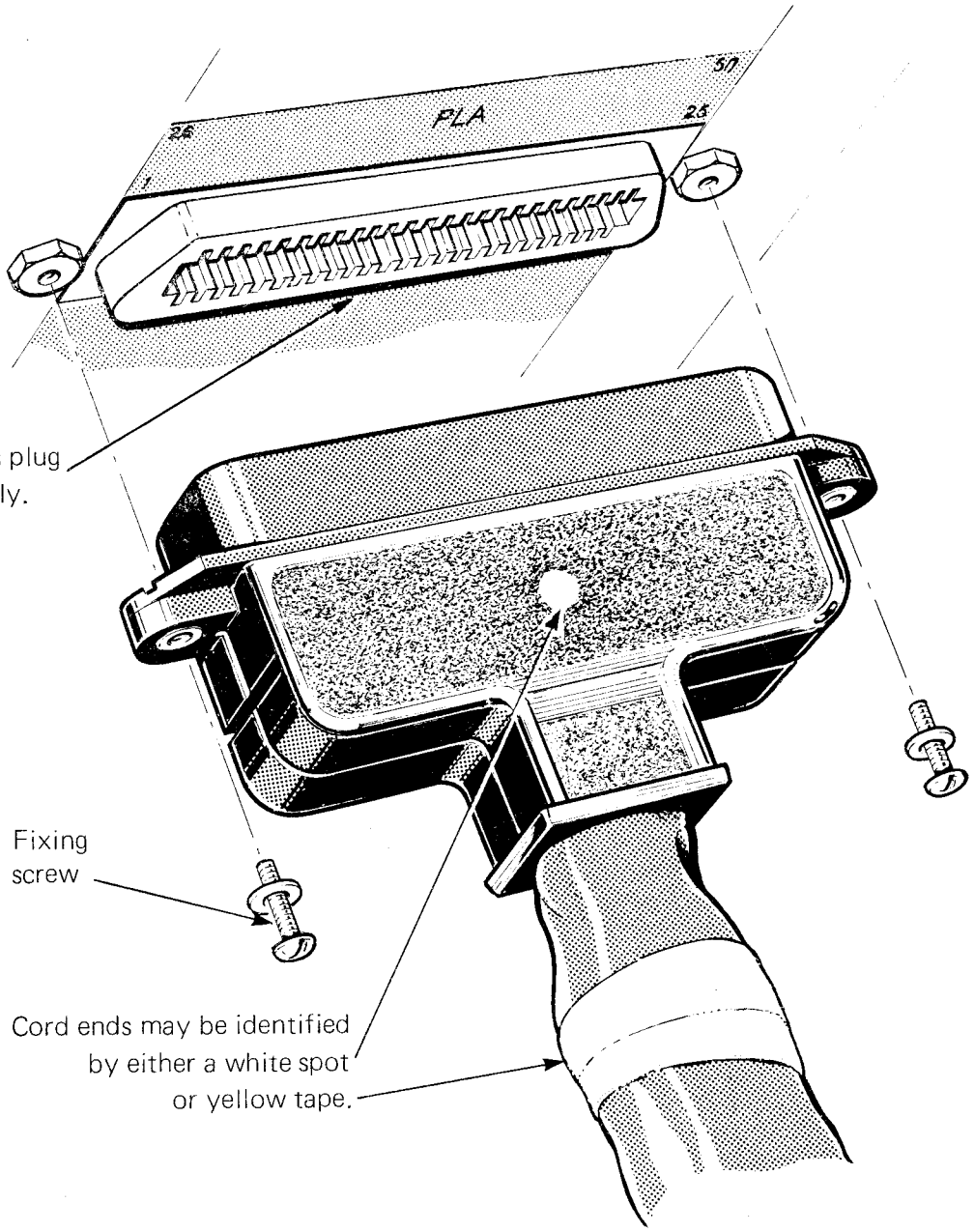
4 Mark the front of the Exchange connector PIU to indicate that it has been modified as an Out of Area Exchange line to TI E5 D1415.



7. CONNECTION OF SWITCHBOARD



To aid identification connect cords one at a time.



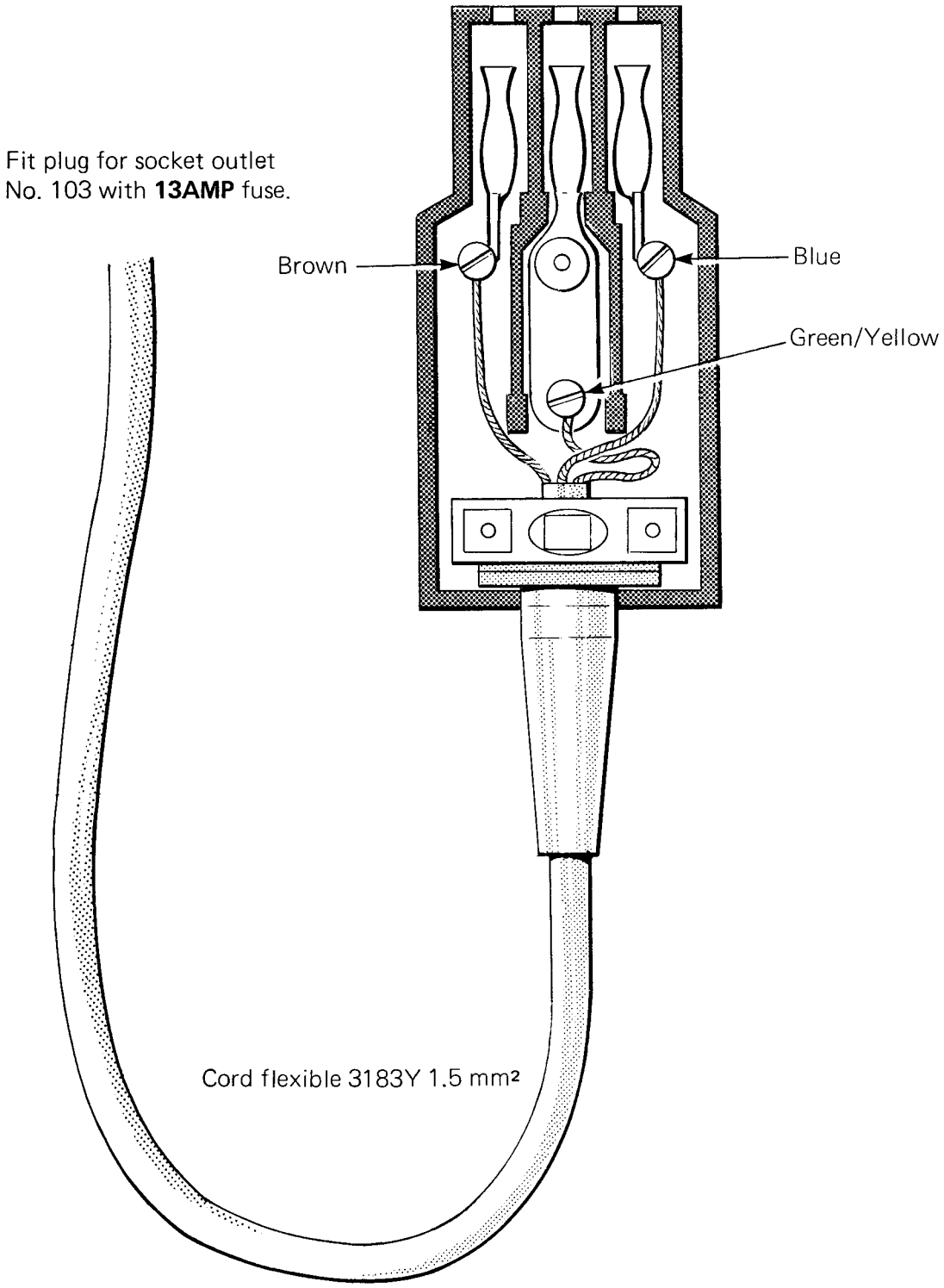
CORD CONNEXIONS

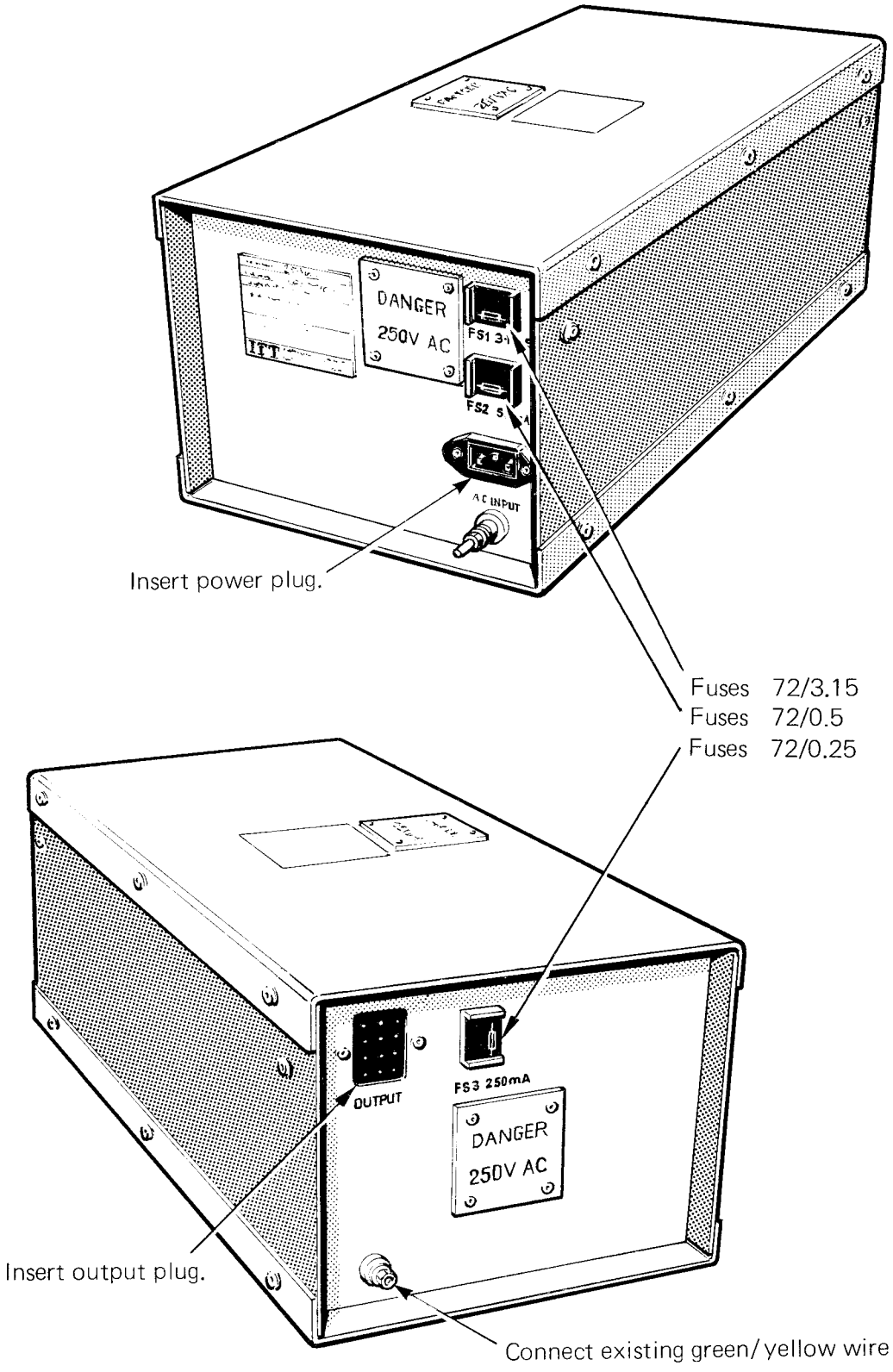
CUBICLE		SWITCHBOARD
PLA	◄——►	SKA
PLB	◄——►	SKB
PLC	◄——►	SKC
PLD	◄——►	SKD

FOR EASE OF CONNEXION STAND SWBD ON END

8. CONNECTION OF POWER UNIT

The power unit is self contained and free standing in the base of the cubicle.





Have you connected the signalling earth to the earth bar in the base of the cubicle?

9. FUNCTIONAL TESTS

The following has been extracted from Specification S 1368 which deals with the installation of the PMBX 12.

The Operating Instructions A4077should be used to verify the correct operating procedures.

Check that:—

1 The "power on" lamp adjacent to the operators handset jack is working.

2 An outgoing call can be made, from the switchboard, on each exchange line.

3 An incoming exchange line call can be received on each exchange line, extended to an extension and that the recall facility functions correctly.

4 Each extension can call the switchboard.

5 Each extension can be called from the switchboard.

6 Each local connector functions correctly on extension to extension calls.

7 Direct Outward Dialling is working on those extensions allowed the facility.

8 The DOD Cut-Off key functions correctly (if DOD is provided).

9 The intrusion facility - presence of "warn tone" (clicking), is functioning when the operator interrupts a call.

10 The release keys function correctly.

11 The fuse alarm circuit functions correctly.

12 The unequipped connector lamps glow when the "busy test" key is used.

13 The speak exchange and speak extension splitting keys function correctly.

14 The exchange cancel key functions correctly.

15 Night service 1 and 2 keys switch the correct extensions.

16 The call alarm key alters the volume of the switchboard buzzer.

17 The standby dial functions correctly.

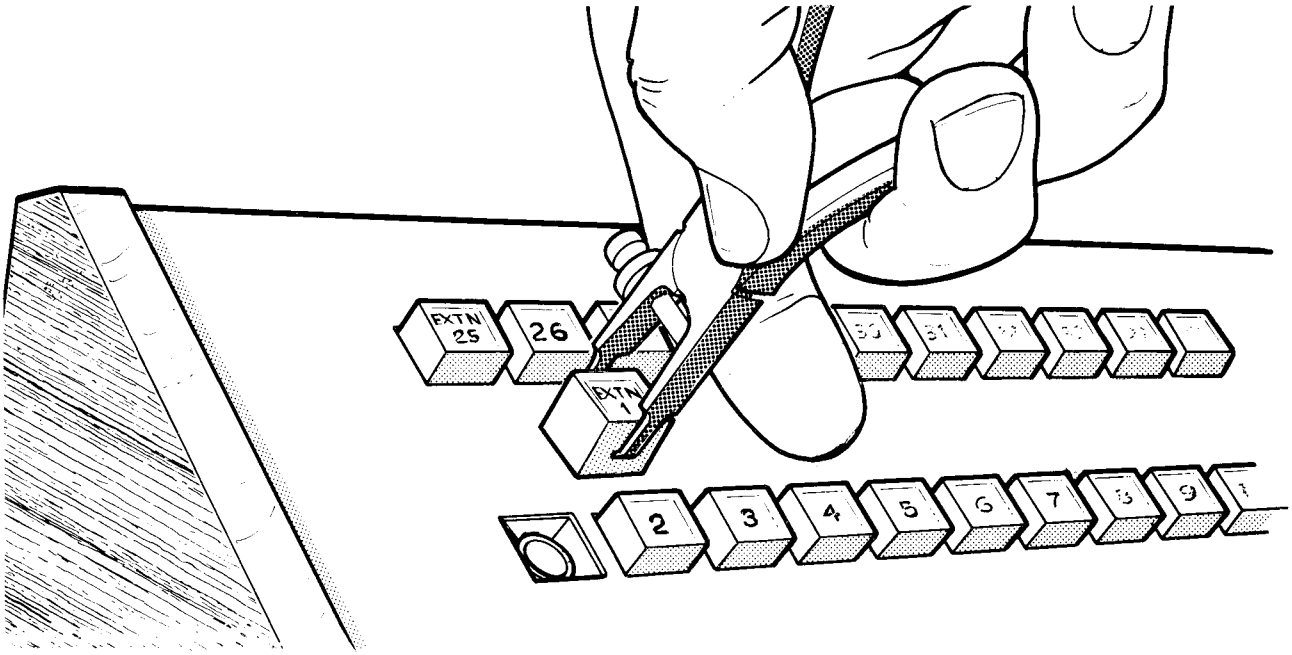
18 With the public mains switched off the exchange lines are switched to the correct extensions (night service 2).

The following sections are concerned with the maintenance aspects of the PMBX 12. It is important that you read pages 37 and 38 before using the faulting charts.

10. SWITCHBOARD

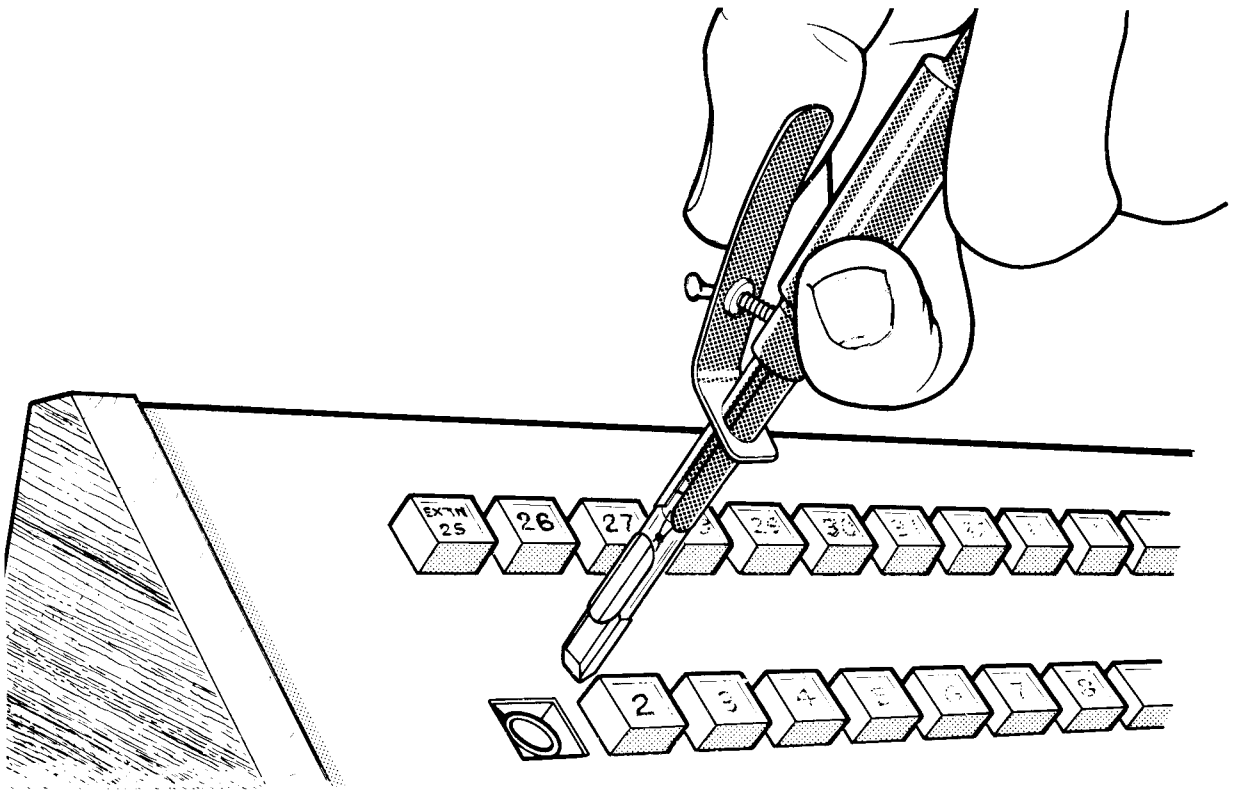
10.1 Changing Switchboard Lamps

Removing a Key Top. To avoid damage on Extractor No 4 **must** be used.

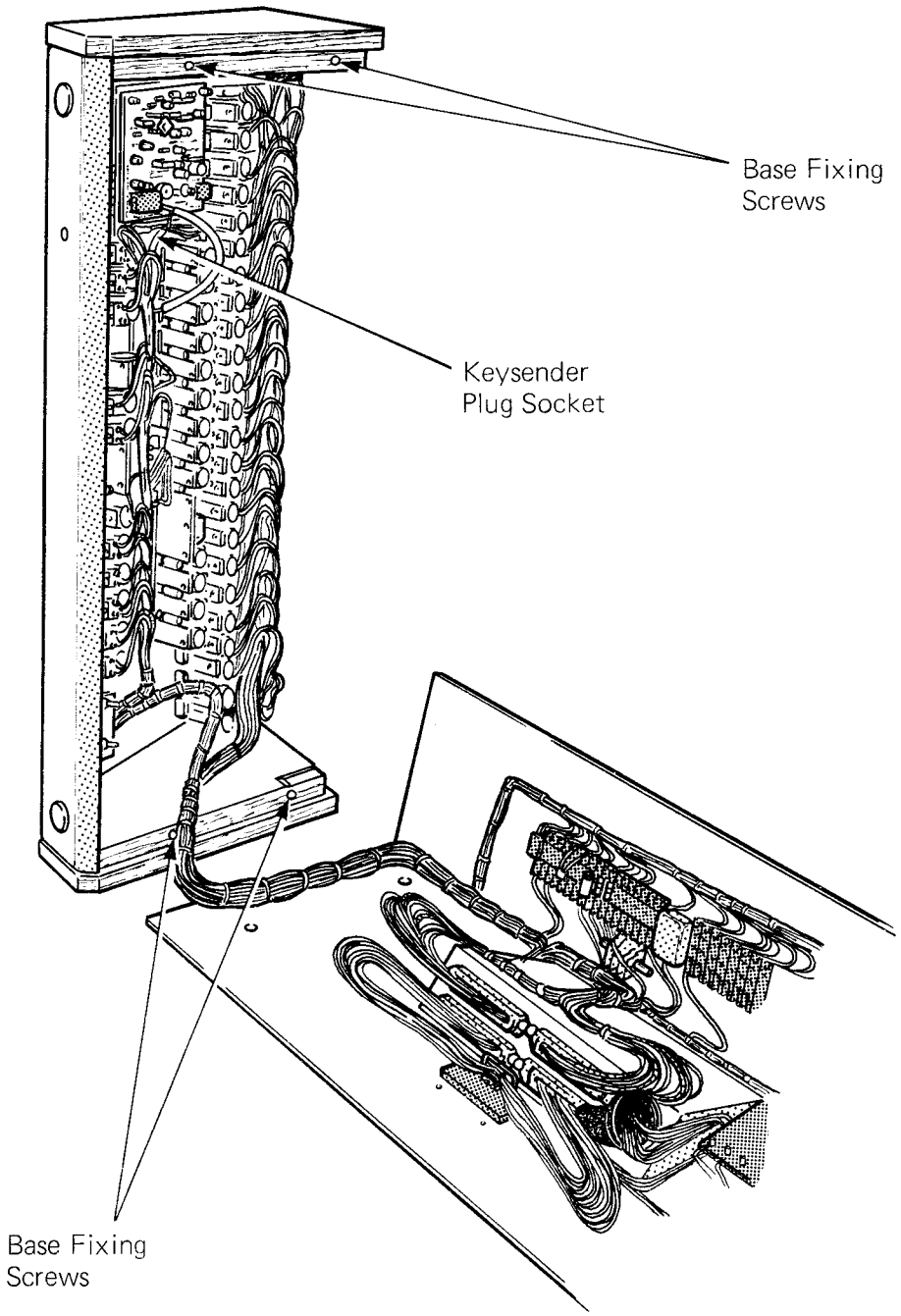


10.2 Removing Lamps

Removing a Lamp No 2 (6v) using an Extractor No 5.



10.3 Removing Switchboard Base



11. FAULT LOCATING

11.1 Faulting Procedure

1 Read this page and the next one BEFORE using the faulting charts, it may save you a lot of unnecessary work when faulting.

2 Question the operator and if necessary check the Operating Instructions to make sure that you are aware of ALL the missing or faulty facilities.

3 Check how many circuits are affected, if a number of circuits are involved decide which equipment is common to them, this is probably where the fault lies. The faulting charts on the subsequent pages, will help.

4 If the fault is apparently specific to one circuit substitute the Plug-in-Unit (PIU) involved, for another, to prove the location of the fault. You should not normally clear faults on PIUs at a customer's' premises unless it is a physical fault that can easily be remedied. If a PIU is faulty it should be changed. A temporary clear can be arranged, in some circumstances, by moving the circuit to a spare position in the same or another PIU.
WHEN MOVING A PIU DON'T FORGET TO FIRST REMOVE THE POWER LINK TJA 1-11, this is to avoid arcing at the connector points.

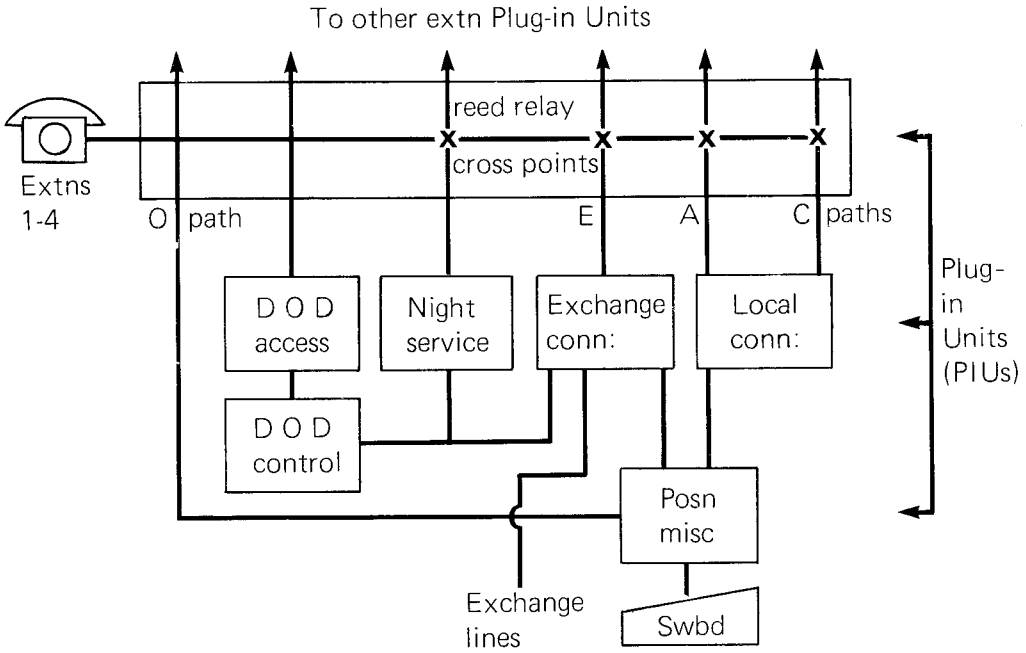
5 **EXTENSION FAULTS (FAULTING CHARTS 1-3).** You can prove initially by testing on the distribution connexion strip in the top of the cubicle, an easy method is to change over the plug ended jumper of a good circuit with the faulty one, use an extension in another PIU (group of 4). See pages 21-27 for the jumpering arrangements.

6 **SWITCHING MATRIX FAULTS.** If several extensions are fault affected and you suspect that a reed relay or switching matrix is faulty remove each extension PIU in turn and observe if the fault clears.

7 **EXCHANGE CIRCUIT FAULTS (FAULTING CHARTS 4-7).** You can prove the fault in or out by changing over the plug-in jumpers in the top of the cubicle. See pages 21-27 for the jumpering arrangements. If you suspect that an Exchange connector PIU is faulty prove by substituting with another from the installation.

8 **SWITCHBOARD PMBX No.12.** Faulty lamps, keysenders, buzzer, bracket No 19A and handsets No 10A-2 can be replaced on site. Policy at the date of issue of this guide is that broken or faulty push buttons should not be changed, but the complete switchboard replaced with a maintenance spare. TI E5 D1415 refers.

11.2 PMBX Block Diagram



1 The block diagram shows the circuit layout of the PMBX 12, from this you can work out which PIUs are involved in various types of call.

2 The EXTENSIONS initially call and speak to the operator over the O path.

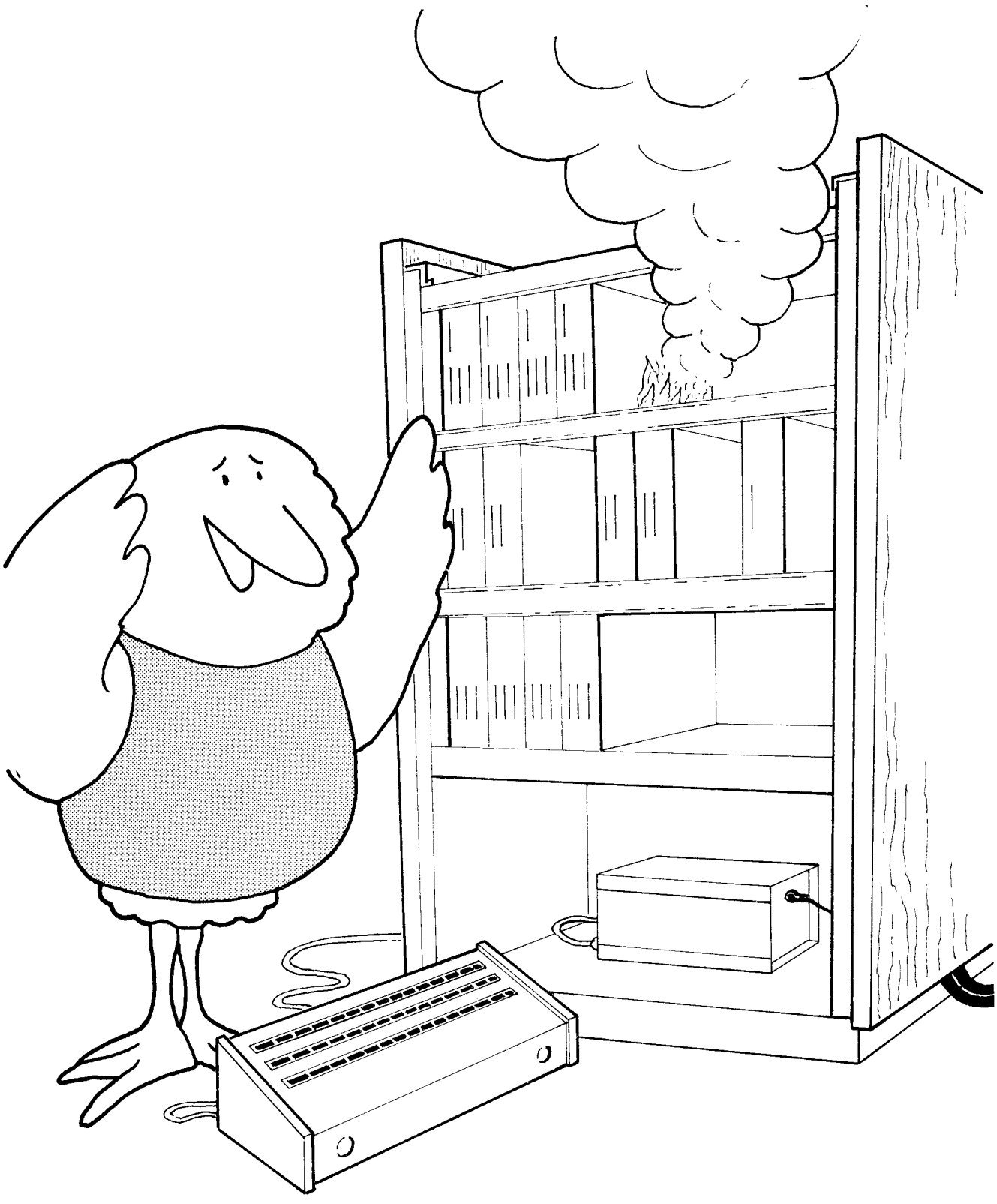
3 An EXTENSION TO EXTENSION call is set up by the operator using the LOCAL CONNECTOR which contains a transmission bridge and the automatic ringing circuit. The calling extension uses the A path and the called extension uses the C path.

4 An EXTENSION TO EXCHANGE call is routed through the extension PIU over the E path, through the EXCHANGE CONNECTOR PIU to the exchange line.

5 The DIRECT OUTWARD DIALLING (DOD) facility is set up for an individual extension by the DOD ACCESS PIU. The overall setting up for all circuits is arranged by the DOD CONTROL PIU. When the call has been set up the connexion is from the extension through the E path and the EXCHANGE CONNECTOR as a normal extension to exchange call.

6 PRE-DETERMINED NIGHT SERVICE is arranged by the NIGHT SERVICE PIU under the control of the operator.
Night service 1 is an optional service that may be provided.
Night service 2 is always provided. It is the same arrangement that is used under power failure conditions.

7 POWER AND TONES. The 50v DC and ringing are supplied by the Power Unit in the base of the cubicle. The WARN TONE, RINGING CADENCE and FLICKER EARTH generators are contained in the Position and Miscellaneous PIU.



11.3 Faulting Charts

The following charts will enable you to locate faults to plug-in-units, keys or lamps. If wiring faults occur you will obviously need the SA/SAW diagrams supplied with the installation.

Don't forget to remove the power link TJA 1-11 BEFORE withdrawing a plug-in-unit.

To locate a fault start at the top of the chart and follow the path indicated.

Chart	Subject
1-3	Extension to extension calls
4-6	Incoming exchange line calls
7	Outgoing exchange line calls
8	Direct outward dialling (DOD)
9	Miscellaneous

NOTE:- **For Inter PBX Circuits use charts 6 and 7 substituting the words "Inter PBX Circuit" for "Exchange". References to dial tone only apply to PABX Circuits.**

CHART 1 EXTENSION TO EXTENSION CALLS

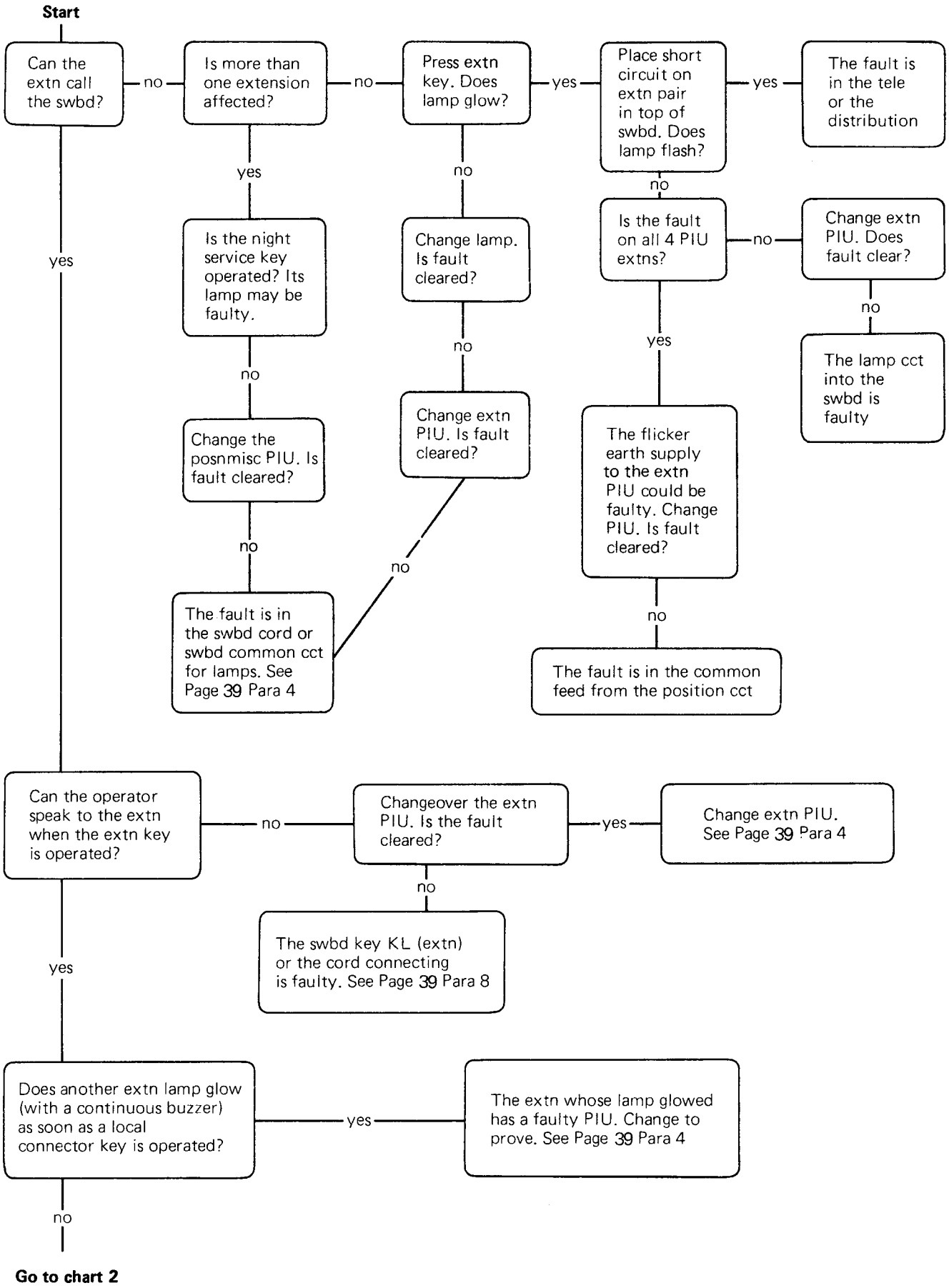


CHART 2 EXTENSION TO EXTENSION CALLS (Continued)

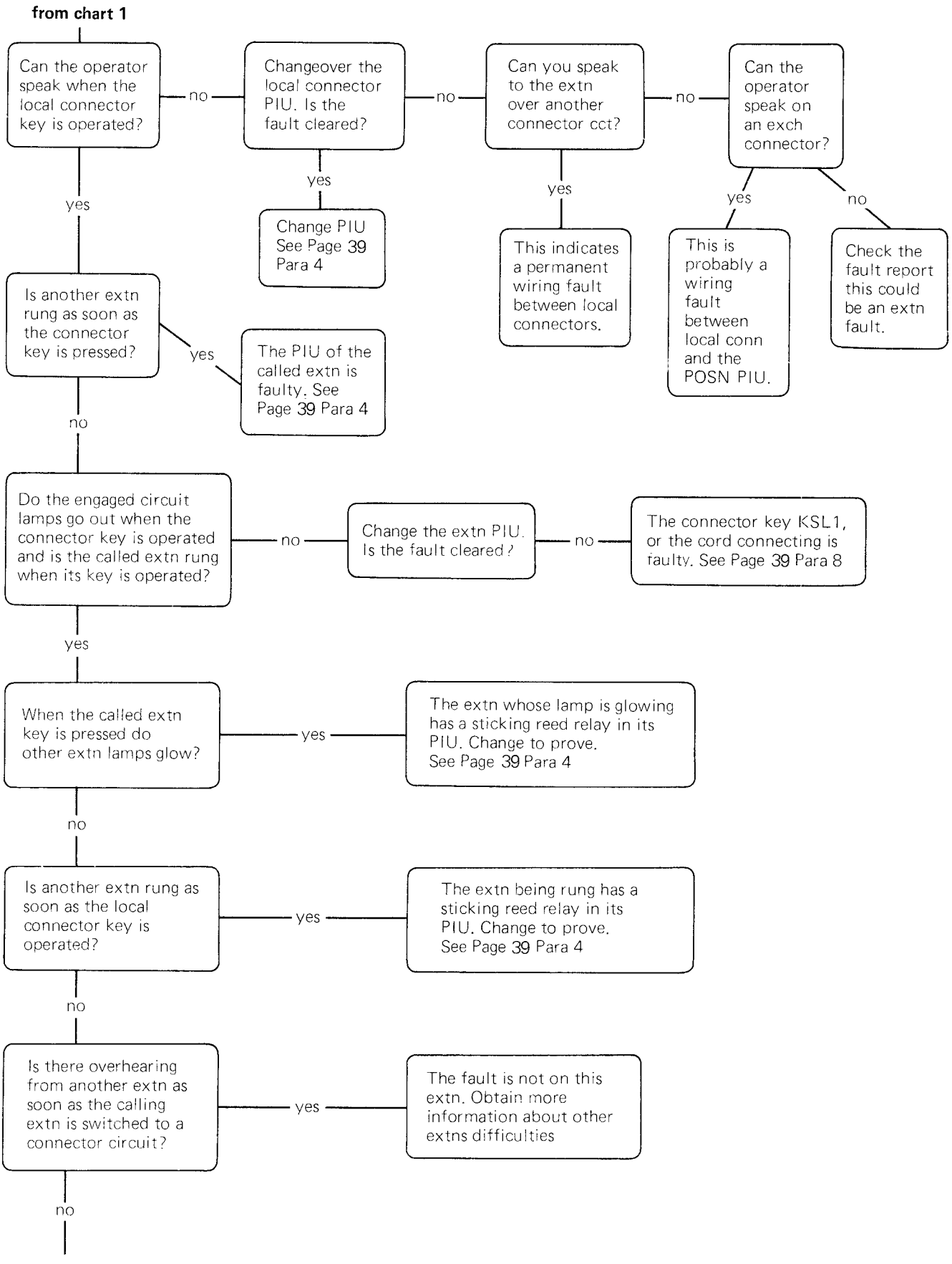


CHART 3 EXTENSION TO EXTENSION CALLS (Continued)

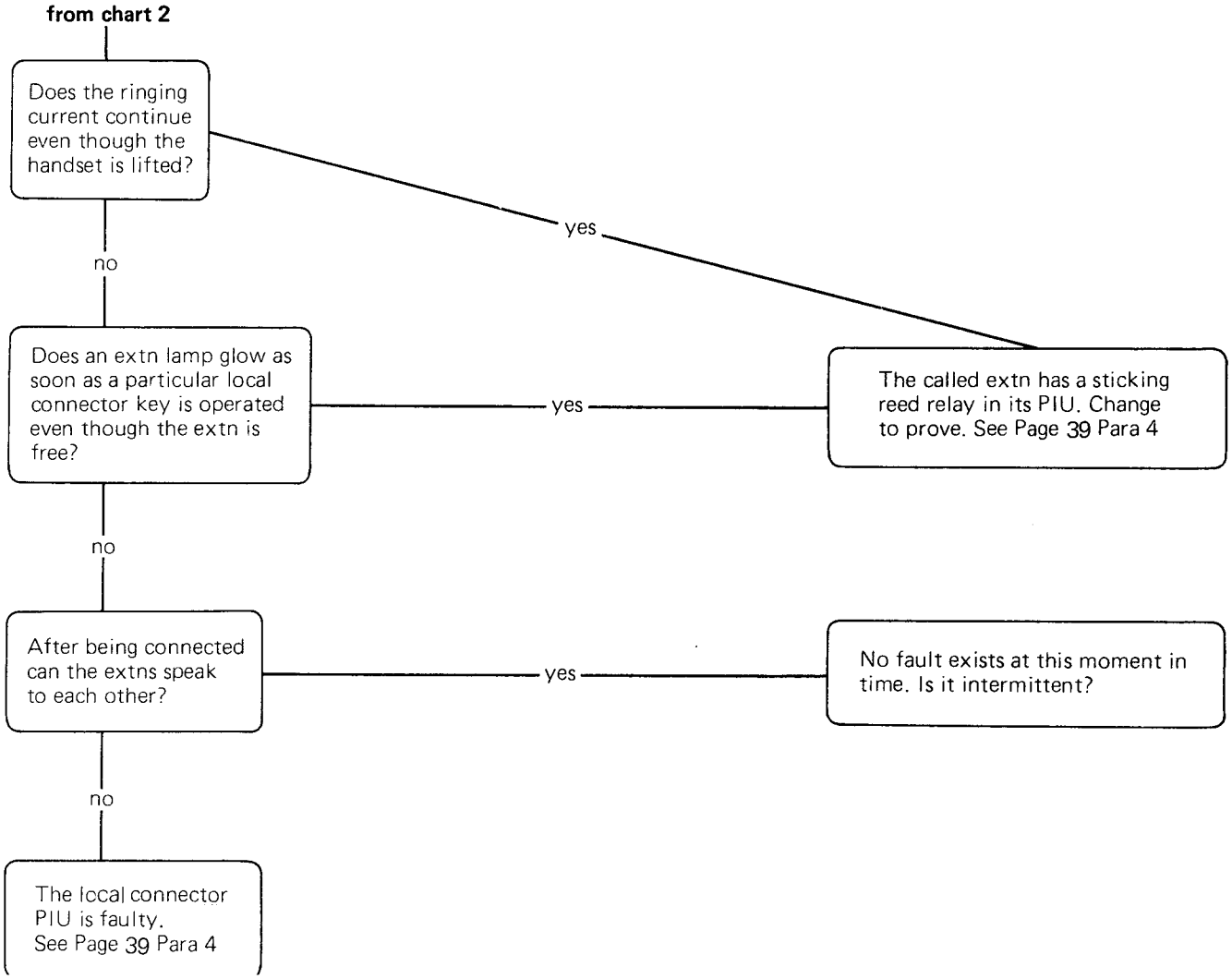


CHART 4 INCOMING EXCHANGE LINE CALLS

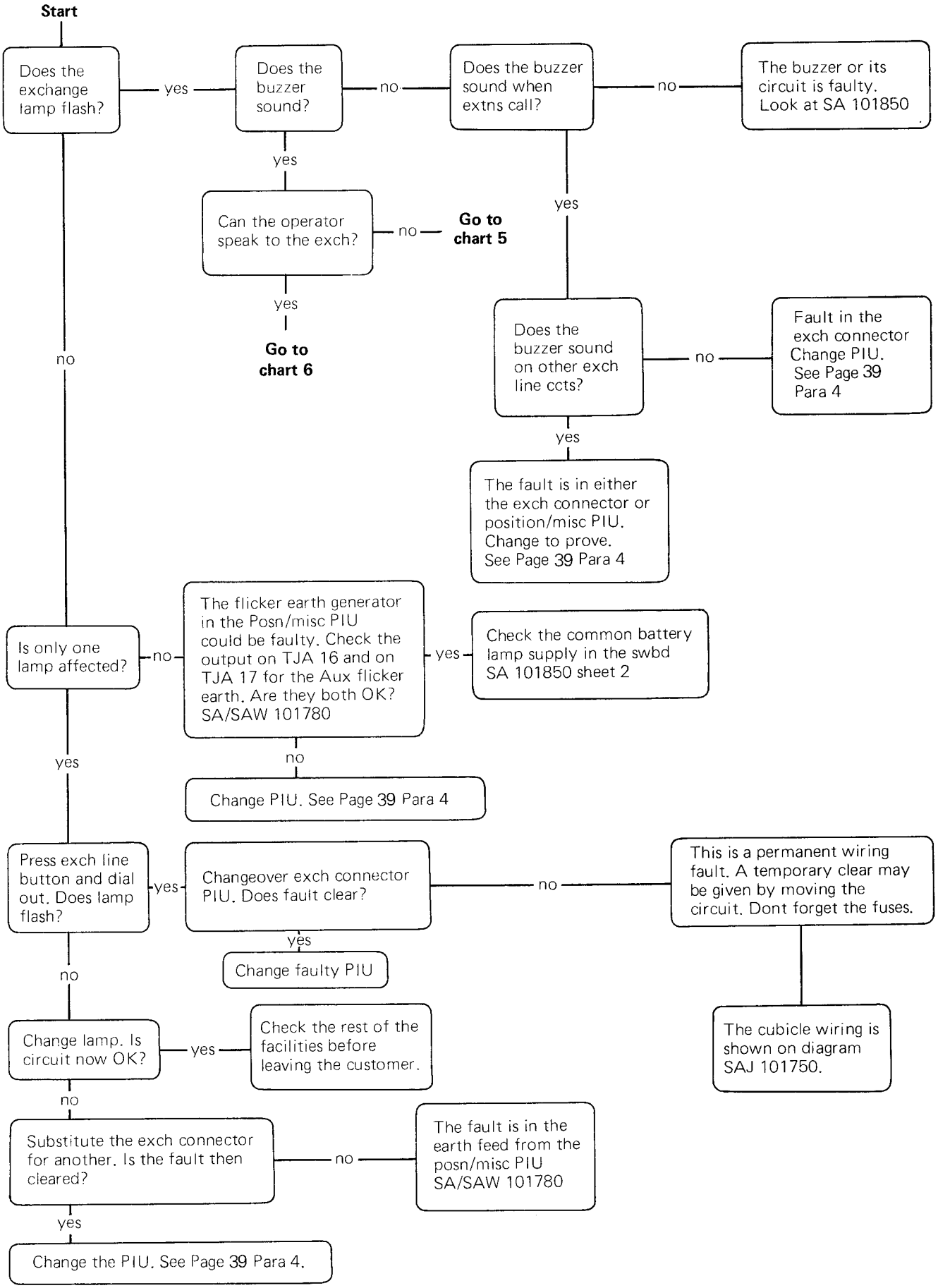


CHART 5 INCOMING EXCHANGE LINE CALLS (Continued)

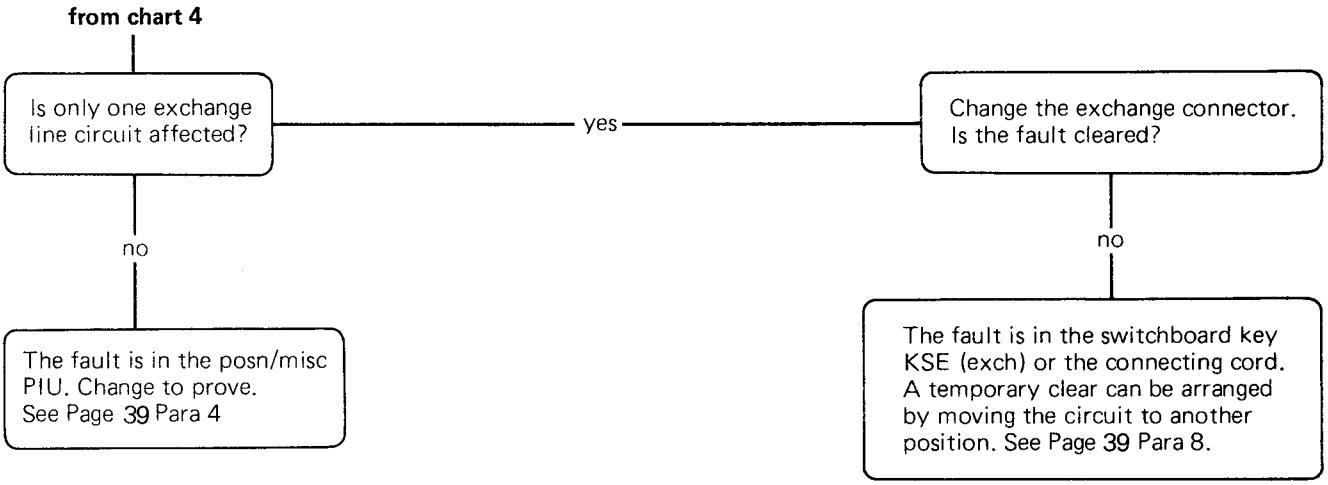


CHART 6 INCOMING EXCHANGE LINE CALLS (Continued)

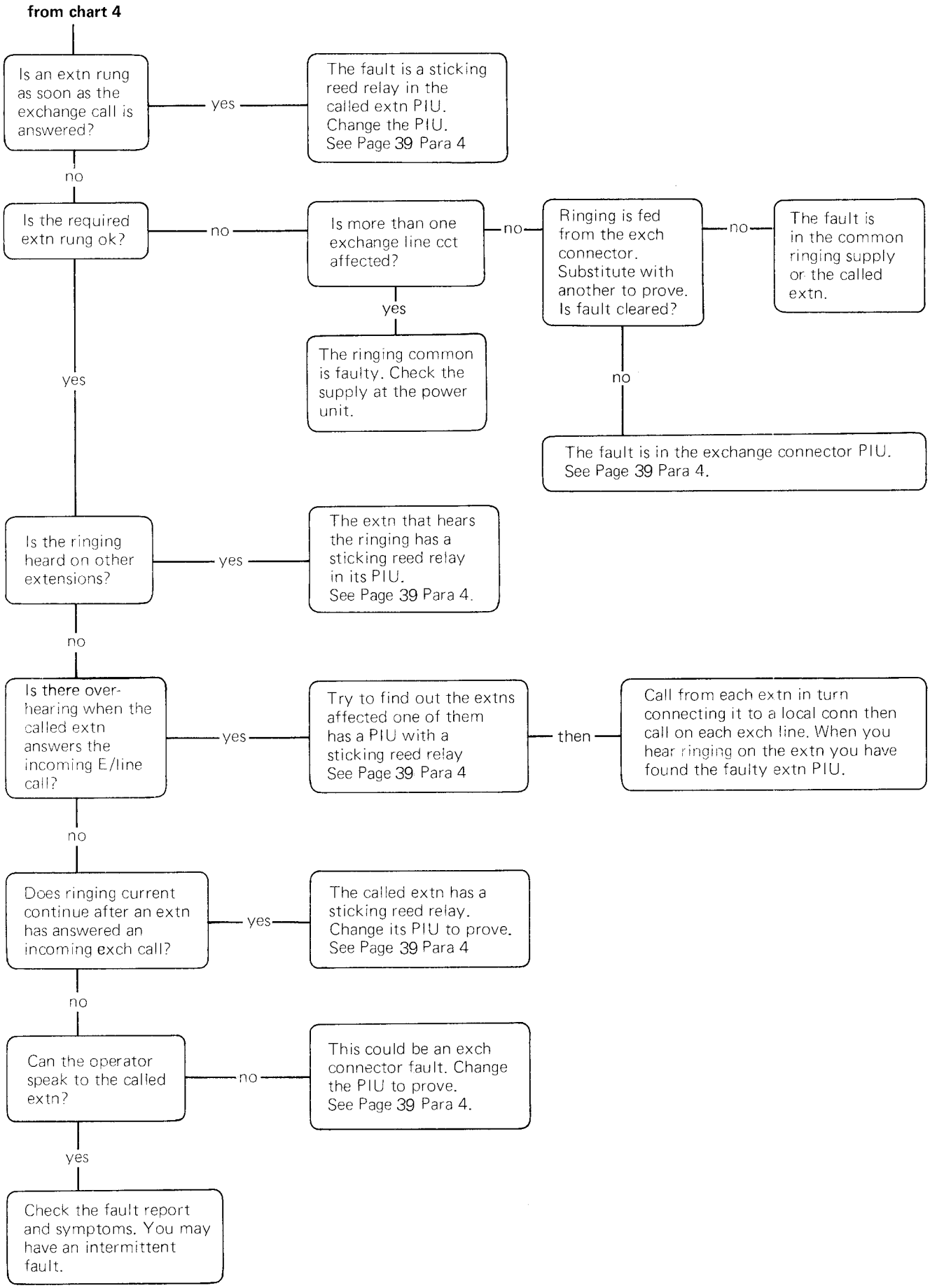


CHART 7 OUTGOING EXCHANGE LINE CALLS

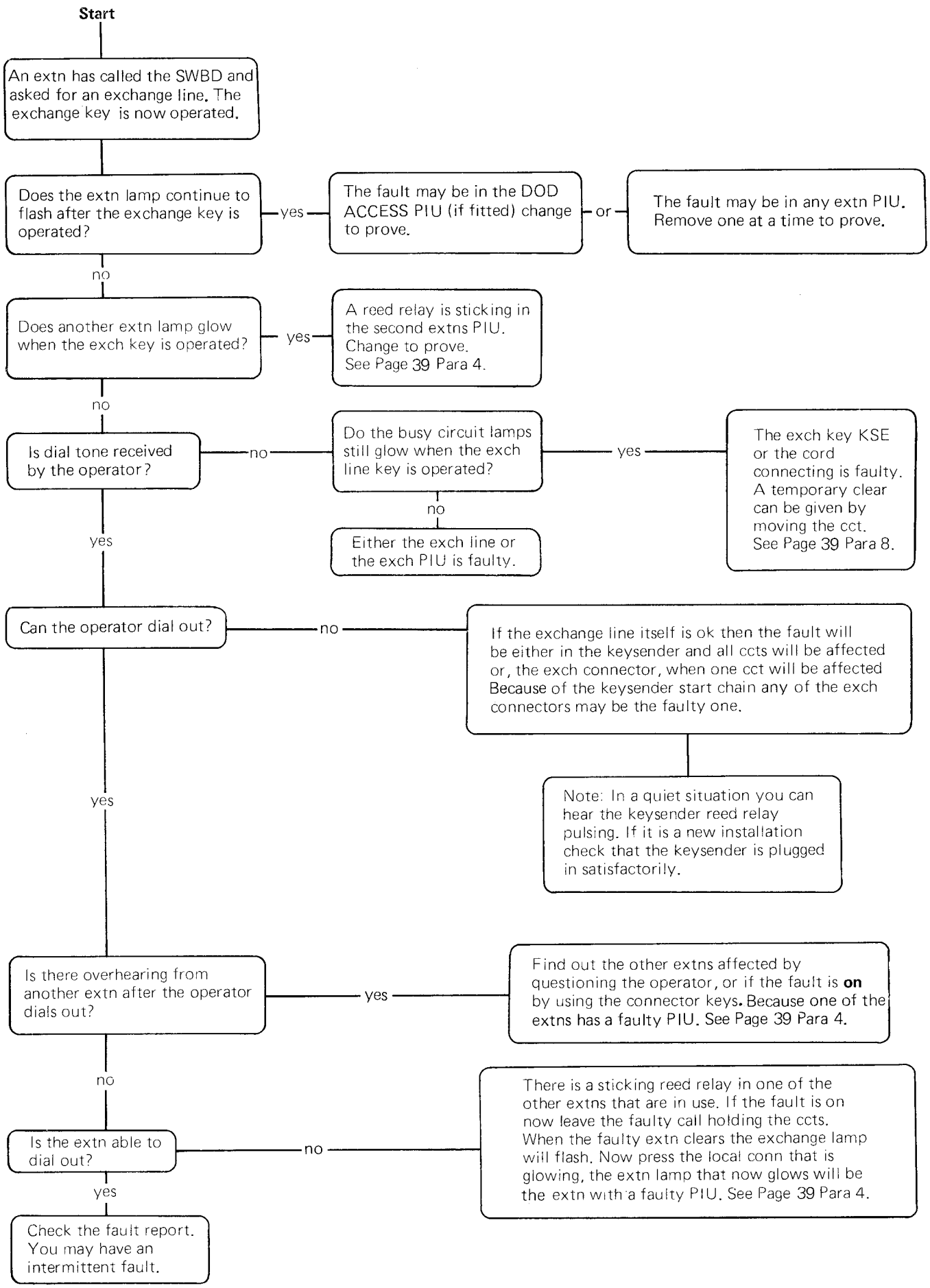


CHART 8 DIRECT OUTWARD DIALLING (DOD) CALLS

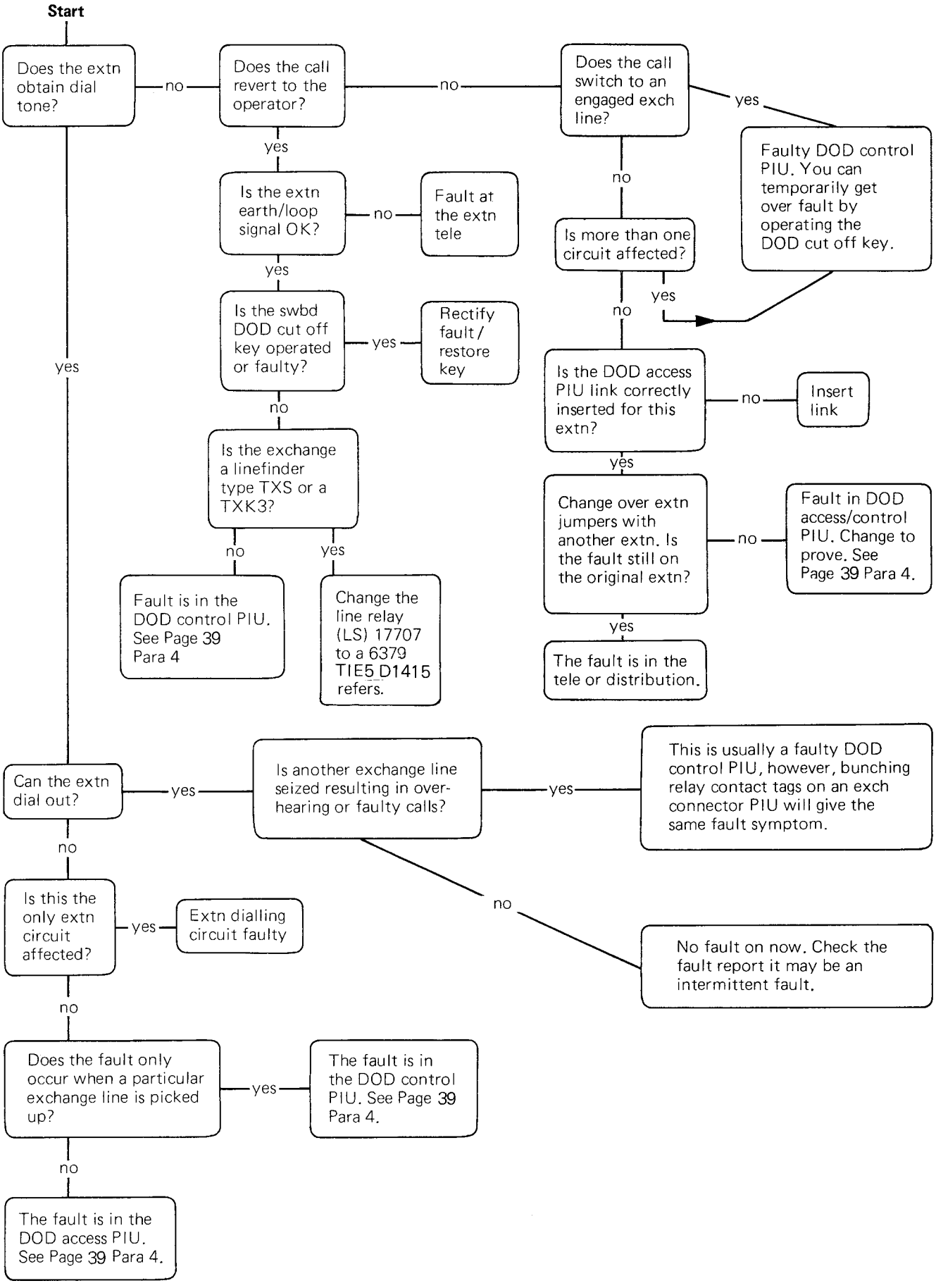
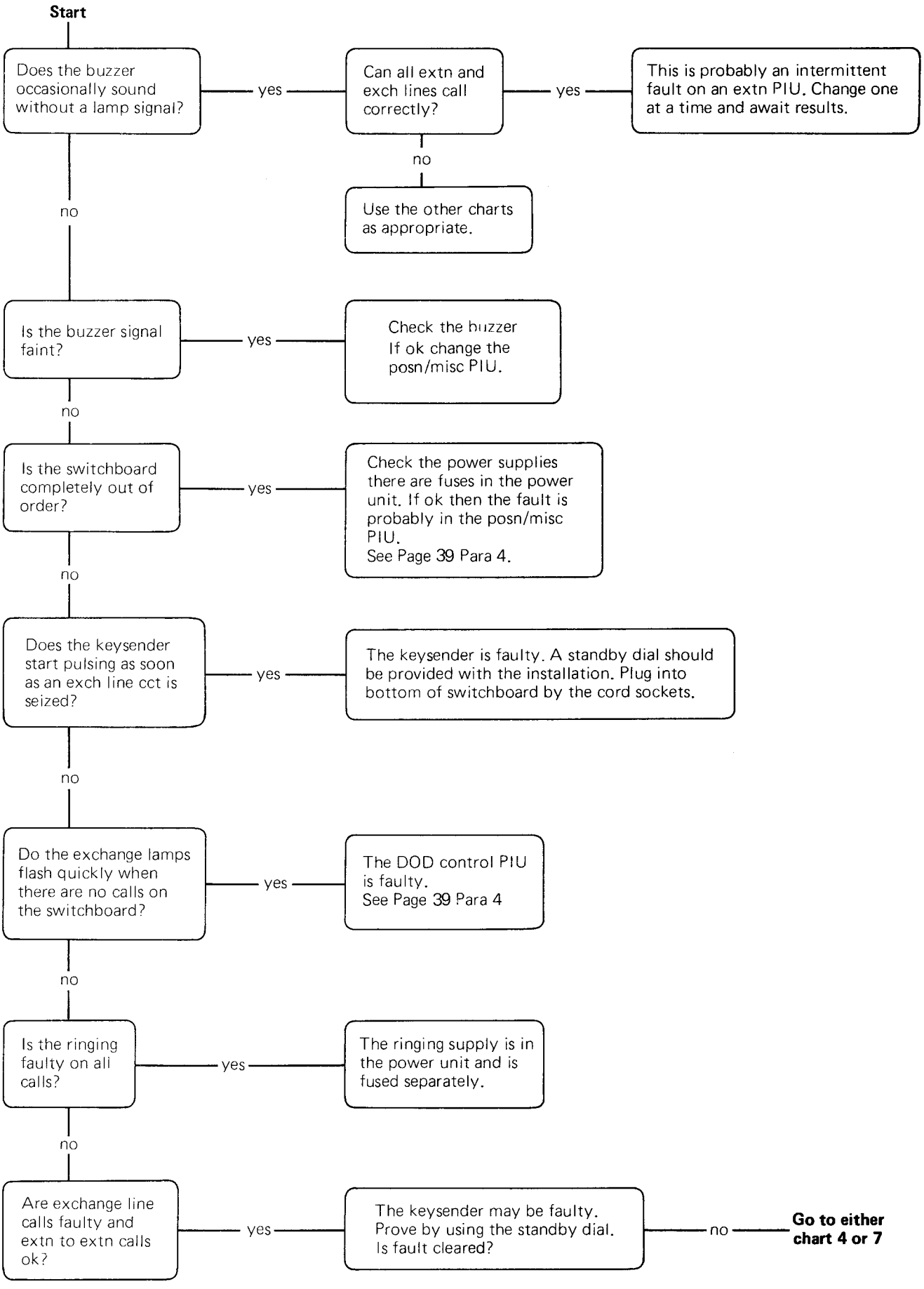


CHART 9 MISCELLANEOUS FAULTS




BUZBL