

**T1 DATA MULTIPLEXER  
TESTS  
DIGITAL DATA SYSTEM**

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**1. GENERAL**

**1.01** This practice provides the preservice and troubleshooting tests for the T1DM (T1 data multiplexer).

**1.02** This practice is reissued to include information on the new secondary channel HL216 sync CP (circuit pack) which does not replace, but reduces the demand for the HL16B. Revision arrows are used to emphasize the more significant changes.

**1.03** ♦The HL216 (T1DM sync circuit pack) and the HL29 Series 2 T1DM -PM (performance monitor) are required to provide secondary channel service in a T1DM bay. It is not necessary to modify the T1DMs in those bays that have no secondary channel service demand. When the secondary channel service is added to a bay, the HL29 and HL16 or HL16B CPs must be modified. The HL29 in both near-end and far-end offices must be modified to an HL29 Series 2 before equipping a bay for secondary channel service. The HL16/16B may then be replaced on a digroup-by-digroup basis, as the modified HL29 Series 2 will monitor any of these sync circuit packs for proper performance. Due to the integrated nature of primary and secondary channel data, T1DM test procedures are unaffected by implementation of this service. The modified HL16 or HL16B is called the HL216 CP.♦

**1.04** Circuit pack HL16B or ♦HL216♦ is required in every T1DM to be used in the DTSS (Digital Transmission Surveillance System). The HL16B ♦or HL216 can be substituted for HL16, but HL16 cannot be substituted for HL16B or HL216. When an HL216 is used in the T1DM bay, the HL29 Series 2 must be used in the T1DM-PM circuit.♦ Test information for the DTSS is documented in Practice 314-984-500.

2. REFERENCES

2.01 The following AT&T practices provide additional information on the DDS (Digital Data System).

PRACTICE	TITLE
◆314-912-100	T1 Data Multiplexer—Description—Digital Data System◆
314-913-320	Digital Data System—Local Timing Supply—Maintenance and Troubleshooting
314-913-520	Digital Data System—Local Timing Supply—Tests
314-915-501	Digital Data System—T1WB4 Data-Voice Multiplexer—Trouble-Locating Procedures
314-915-510	Digital Data System—T1WB5 Data-Voice Multiplexer Local Office Bay—Trouble-Locating Procedures
314-916-500	Digital Data System—Bay Clock, Power, and Alarms Circuit—Tests
314-983-500	Digital Data System—T1 Data Multiplexer Performance Monitor—Tests
314-984-500	Digital Transmission Surveillance System—Overall System Maintenance Requirements and Test Procedures

3. PRESERVICE TESTS (CHARTS 1 AND 2, 3, OR 4)

3.01 Preservice tests are necessary to ensure that any 64-kb port circuit packs (HL18) added after the initial T1DM installation are ready to be placed in service. In the tests, no equipment should be connected to the ports of HL18. If equipment has been connected, it should be disconnected by removing the jumper wire at the DSX-0 (digital system cross-connect), or at the QTP (quad terminal panel), or by inserting a dummy plug into the TO FAR jack at the M-JCP (multiplexer jack and connector panel).

Also, the T1 facility between the multiplexers should be operational.

3.02 A specific test (chart) is associated with a particular arrangement as shown in Fig. 1. Chart 1 is used at each testing location to set up the test equipment. Chart 2, 3, or 4 is used (depending on equipment arrangements as shown in Fig. 2, 3, and 4) to test the port circuits in HL18. Chart 2 is used if a spare T1DM and a T1DM-PM are available in the T1DM bay containing the HL18 to be tested. If a spare T1DM and a T1DM-PM are *not* available, Chart 3 is used if the multiplexer at the far-end is a T1DM; and Chart 4 is used if the multiplexer at the far-end is a T1WB4 (T1WB4 data-voice multiplexer) or a T1WB5 (T1WB5 data-voice multiplexer).

4. TROUBLESHOOTING TESTS (Fig. 5 through 9)

4.01 Troubleshooting tests are necessary if a trouble is indicated during the installation or preservice test, or after the T1DM has been placed in service.

4.02 The troubleshooting tests are shown in Fig. 5 through 9. Reference to spare HL-coded circuit packs indicates specific units available for replacement troubleshooting and are *not* the units functioning within the spare T1DM shelf. Reference to the spare T1DM shelf means the entire spare T1DM shelf as a unit.

4.03 The power unit or circuit packs are replaced with spares, one at a time, in the sequences shown in Fig. 5 through 9 unless otherwise indicated. Before replacement of HL16B, ◆HL216,◆ HL95, or a power unit in a shelf that is equipped for DTSS, notification must be made to the Network Administration Center (see the circuit layout record card for the telephone number.) When a power unit is replaced, the associated fuse must be removed before replacement and returned after replacement to eliminate arcing at the edge connector. Since in the LTS (local timing supply) and T1DM assembly, the T1DM power units also supply power to the LTS, power units in this assembly *must* be replaced carefully. See AT&T practice 314-913-320 for LTS information.

**Caution:** *Prior to performing any troubleshooting tests on an in-service T1DM assembly with a PM, the connector plug from connector J7 located on the rear of HL20 on the spare T1DM should be re-*

*moved and a dummy plug (made up of a 247A plug, or equivalent) inserted into the SPARE jack located on HL34 of the T1DM-PM. The  displayed on the spare T1DM should be disregarded. After all troubleshooting tests have been performed, the T1DM and T1DM-PM should be returned to their pretest state.*

**4.04** If the trouble indication is unchanged after a circuit pack or power unit has been replaced, the original circuit pack or power unit is reinserted, following the same procedure, and the spare is returned to the proper storage area. If the trouble indication is cleared after a circuit pack has been replaced, the test can be stopped.

**4.05** Certain failures within the T1DM are not detected by the T1DM-PM and, therefore, produce no alarm indication. These failures include the input and output transformers on HL18, the pad and equalizers in series with the T1 line on HL10 or HL90, and the relays and relay drivers on HL10 or HL90. Removal of an HL10 or HL90 places all the ports of its associated T1DM out of service; removal of an HL18 places all its associated ports out of service.

**4.06** If the trouble is not cleared after all the indicated circuit packs have been replaced, the wiring and cabling of the bay associated with the T1DM, including the T1DM shelf wiring, should be checked.

## 5. PROCEDURAL CHARTS

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### CHART 1

#### SET UP DIGITAL TRANSMITTER AND DIGITAL RECEIVER

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#### APPARATUS:

KS-20908 DTS (Data Test Set) Digital Receiver and Test Point Adapter

KS-20909 DTS Digital Transmitter and Test Point Adapter

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STEP	PROCEDURE
1	Connect the power cords of the digital transmitter and the digital receiver to the office 117-V ac supply.
2	Depress the POWER ON pushbuttons on both DTSs.  <b>Requirement:</b> The POWER ON indicators light.
3	Depress the RESET pushbutton on the digital transmitter to clear all indicators.
4	Connect the clock cords for both DTSs to the TST1 and TST2 connectors on the BCPA (bay clock, power, and alarms) circuit or the LTS.  <b>Requirement:</b> The CLOCK lamps light on the digital transmitter and the digital receiver.

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CHART 1 (Contd)

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STEP	PROCEDURE
5	Set the digital receiver controls as follows:  INPUT to BIPOLAR  DATA RATE to 56 (or appropriate customer data rate)  TESTWORD to 2047  COUNTER to BIT ERRORS  COUNTER MODE momentarily to RESET and then to COUNT.
6	Set the digital transmitter controls as follows:  OUTPUT to BIPOLAR  DATA RATE to 56 (or appropriate customer data rate)  FUNCTION to 2047 TESTWORD  MODE to REPEAT.
7	Insert the test signal cord from the digital receiver to the digital transmitter SIG OUT jack located inside the cord storage compartment.  <i>Note:</i> The digital receiver will not terminate properly if the reverse connection is made.
8	Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.  <i>Requirement:</i> The TERMINATE indicator lights on the old and new models.
9	Depress the COUNTER MODE switch on the digital receiver momentarily to the RESET position and then to the COUNT position.  <i>Requirement:</i> The COUNTER on the digital receiver shows 000 errors.
10	Unplug the digital receiver test signal cord from the digital transmitter SIG OUT jack.
11	Interconnect the digital receiver test signal cord and a test point adapter.
12	Interconnect the digital transmitter test signal cord and a test point adapter.

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**CHART 2**


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**TEST PORT CIRCUITS (HL18) WHEN SPARE T1DM AND T1DM-PM ARE AVAILABLE IN T1DM BAY**


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**APPARATUS:**

KS-20908 DTS Digital Receiver and Test Point Adapter

KS-20909 DTS Digital Transmitter and Test Point Adapter

P3E-Type Cords as required

<b>STEP</b>	<b>PROCEDURE</b>
1	Set up the digital transmitter and the digital receiver for the local test arrangement (Fig. 2) according to the procedure in Chart 1.
2	Set the NORM/NO ALM/LOOP switch on the newly equipped T1DM, or on the T1DM containing the additional HL18 being tested, to the NO ALM position.
3	Connect a P3E-type cord between the OUT jack on HL10 or HL90 of the T1DM to the SPARE jack on HL34 of the T1DM-PM.  <i>Note:</i> The SPARE jack on the T1DM-PM is functional only if the spare is <i>not</i> in service.
4	Connect the digital transmitter output (test signal cord and test point adapter) to the first pair of IN test points on the HL18 being tested.  <i>Note:</i> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
5	Connect the digital receiver input (test signal cord and test point adapter) to the first pair of OUT test points on the HL18 of the spare T1DM in the same shelf position as the HL18 being tested.  <i>Note:</i> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
6	Connect the ground lead on the digital receiver test point adapter to test point 12 on HL17 of the spare T1DM.  <i>Note:</i> The metal contact point on the ground lead must face away from the test point number to make contact.
7	Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.  <i>Requirement:</i> The TERMINATE indicator lights on the old and new models.
8	Depress the COUNTER MODE switch on the digital receiver momentarily to the RESET position and then to the COUNT position.

## CHART 2 (Contd)

STEP	PROCEDURE
	<p><b>Requirement:</b> The COUNTER display on the digital receiver shows 000 errors.</p> <p><b>Note:</b> If the HL18 being tested is in a newly equipped T1DM and the requirement of Step 8 is not met, troubleshoot the T1DM. If the HL18 is added to a T1DM already in service and the requirement of Step 8 is not met, replace the HL18 and repeat Steps 4 through 8.</p>
9	<p>Repeat Steps 4 through 8 for the second, third, and fourth pairs of IN and OUT test points on HL18.</p> <p><b>Note 1:</b> A single HL18 provides four 64-kb/s data channels. Only the first four pairs of IN and OUT test points are functional; the fifth is not. Therefore, the first pair of IN and OUT test points on the second HL18 provides access to the fifth data channel, <i>not</i> the fifth pair on the first HL18. Likewise, the first pair of IN and OUT test points on the third HL18 provides access to the ninth data channel, <i>not</i> the fifth pair on the second HL18, and so on through a full complement of HL18s.</p> <p><b>Note 2:</b> The fourth pair of IN and OUT test points on HL18 in shelf position 56 is not used and cannot be tested.</p>
10	<p>Remove the digital receiver test point adapter from the OUT test points of the HL18 in the spare T1DM.</p>
11	<p>Remove the P3E-type cord from the OUT jack on HL10 or HL90.</p>
12	<p>Depress the COUNTER MODE switch on the digital receiver momentarily to the RESET position and then to the HOLD position.</p>
13	<p>Insert the digital receiver test point adapter into the first pair of OUT test points on the HL18 being tested.</p> <p><b>Note:</b> The metal contact points on the test point adapter must face away from the test point numbers to make contact.</p>
14	<p>Connect the ground lead on the test point adapter to test point 12 on HL17.</p> <p><b>Note:</b> The metal contact point on the ground lead must face away from the test point number to make contact.</p>
15	<p>Verify local test arrangement as shown in Fig. 2.</p>
16	<p>Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.</p> <p><b>Requirement 1:</b> The TERMINATE indicator lights on the old and new models.</p> <p><b>Requirement 2:</b> The UASGN MUX CHAN CONTROL CODE lamp lights or the unassigned multiplexer channel BYTE PATTERN (lamps 4 and 5) lights, or both.</p>

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**CHART 2 (Contd)**


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STEP	PROCEDURE
	<p><b>Note:</b> When the HL18 being tested is in a newly equipped T1DM and the requirements of Step 16 are not met, troubleshoot the T1DM. When the HL18 is added to a T1DM already in service and the requirements of Step 16 are not met, replace the HL18 and repeat Steps 13 through 16.</p>
17	<p>Repeat Steps 13 through 16 for the second, third, and fourth pairs of test points on the HL18 being tested.</p> <p><b>Note 1:</b> A single HL18 provides four 64-kb/s data channels. Only the first four pairs of IN and OUT test points are functional; the fifth is not. Therefore, the first pair of IN and OUT test points on the second HL18 provides access to the fifth data channel, <i>not</i> the fifth pair on the first HL18. Likewise, the first pair of IN and OUT test points on the third HL18 provides access to the ninth data channel, <i>not</i> the fifth pair on the second HL18, and so on through a full complement of HL18s.</p> <p><b>Note 2:</b> The fourth pair of IN and OUT test points on HL18 in shelf position 56 is not used and cannot be tested.</p>
18	Disconnect the digital transmitter and the digital receiver from the test points associated with the last port.
19	Set the NORM/NO ALM/LOOP switch on the T1DM to the NORM position.
20	Depress the POWER ON pushbuttons on both DTSSs.
	<p><b>Requirement:</b> The POWER ON lamps are off.</p>

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**CHART 3**
**TEST PORT CIRCUITS (HL18) WHEN SPARE T1DM AND T1DM-PM ARE NOT AVAILABLE IN T1DM BAY AND MULTIPLEXER AT FAR-END IS A T1DM**


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**APPARATUS:**

KS-20908 DTS Digital Receiver and Test Point Adapter

KS-20909 DTS Digital Transmitter and Test Point Adapter

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STEP	PROCEDURE
	<p><b>Note:</b> Figure 3 shows an end-to-end test arrangement between two T1DMs. In this test, an HL18 is tested by transmitting and receiving signals between the two T1DMs connected by the 1.544-Mb/s T1 facility. These two T1DMs are referred to as the near-end T1DM and the far-end T1DM. A digital transmitter and a digital receiver are required at each location.</p>
1	Set up the digital transmitter and the digital receiver at both the near-end and the far-end, according to the procedure in Chart 1.

## CHART 3 (Contd)

STEP	PROCEDURE
2	Set the NORM/NO ALM/LOOP switch on the newly equipped T1DM, or on the T1DM containing the additional HL18 being tested, to the NO ALM position.
3	Connect the digital transmitter output (test signal cord and test point adapter) to the first pair of IN test points on the HL18 at the near-end T1DM.  <i>Note:</i> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
4	Connect the digital receiver input (test signal cord and test point adapter) to the first pair of OUT test points on the corresponding HL18 at the far-end T1DM.  <i>Note:</i> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
5	Connect the ground lead on the digital receiver test point adapter to test point 12 on HL17 at both ends.  <i>Note:</i> The metal contact point on the ground lead must face away from the test point number to make contact.
6	Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.  <i>Requirement:</i> The TERMINATE indicator lights on the old and new models.
7	Depress the COUNTER switch on the digital receiver momentarily to the RESET position and then to the COUNT position.  <i>Requirement:</i> The COUNTER display on the digital receiver shows 000 errors.  <i>Note:</i> When the HL18 being tested is in a newly equipped T1DM and the requirement of Step 7 is not met, troubleshoot the T1DM. When the HL18 is added to a T1DM already in service and the requirement of Step 7 is not met, replace the HL18 and repeat Steps 3 through 7.
8	Repeat Steps 3 through 7 for the second, third, and fourth pairs of test points on HL18.  <i>Note 1:</i> A single HL18 provides four 64-kb/s data channels. Only the first four pairs of IN and OUT test points are functional; the fifth is not. Therefore, the first pair of IN and OUT test points on the second HL18 provides access to the fifth data channel, <i>not</i> the fifth pair on the first HL18. Likewise, the first pair of IN and OUT test points on the third HL18 provides access to the ninth data channel, <i>not</i> the fifth pair on the second HL18, and so on through a full complement of HL18s.  <i>Note 2:</i> The fourth pair of IN and OUT test points on HL18 in shelf position 56 is not used and cannot be tested.

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**CHART 3 (Contd)**


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STEP	PROCEDURE
9	Connect the digital transmitter output (test signal cord and test point adapter) to the first pair of IN test points on the HL18 at the far-end T1DM.  <i>Note:</i> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
10	Connect the digital receiver input to the first pair of OUT test points on the corresponding HL18 at the near-end T1DM.  <i>Note:</i> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
11	Connect the ground lead on the digital receiver test point adapter to test point 12 on HL17 at both ends.  <i>Note:</i> The metal contact point on the ground lead must face away from the test point number to make contact.
12	Verify the end-to-end test connection (between two T1DMs) as shown in Fig. 3.
13	Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.  <i>Requirement:</i> The TERMINATE indicator lights on the old and new models.
14	Depress the COUNTER switch on the digital receiver momentarily to the RESET position and then to the COUNT position.  <i>Requirement:</i> The COUNTER display on the digital receiver shows 000 errors.  <i>Note:</i> When the HL18 being tested is in a newly equipped T1DM and the requirement of Step 14 is not met, troubleshoot the T1DM. When the HL18 is added to a T1DM already in service and the requirement of Step 14 is not met, replace the HL18 and repeat Steps 9 through 14.
15	Repeat Steps 9 through 14 for the second, third, and fourth pairs of test points on HL18.  <i>Note 1:</i> A single HL18 provides four 64-kb/s data channels. Only the first four pairs of IN and OUT test points are functional; the fifth is not. Therefore, the first pair of IN and OUT test points on the second HL18 provides access to the fifth data channel, <i>not</i> the fifth pair on the first HL18. Likewise, the first pair of IN and OUT test points on the third HL18 provides access to the ninth data channel, <i>not</i> the fifth pair on the second HL18, and so on through a full complement of HL18s.  <i>Note 2:</i> The fourth pair of IN and OUT test points on HL18 in shelf position 56 is not used and cannot be tested.
16	Disconnect the digital transmitter and the digital receiver from the test points associated with the last port at both ends.

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CHART 3 (Contd)

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STEP	PROCEDURE
17	Set the NORM/NO ALM/LOOP switch on the T1DM to the NORM position.
18	Depress the POWER ON pushbuttons on both data test sets.
	<b>Requirement:</b> Both POWER ON indicators are off.

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CHART 4

TEST PORT CIRCUITS (HL18) WHEN SPARE T1DM  
AND T1DM-PM ARE NOT AVAILABLE IN T1DM BAY AND MULTIPLEXER AT FAR-END IS A T1WB4 OR T1WB5

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APPARATUS:

- KS-20908 DTS Digital Receiver and Test Point Adapter
- KS-20909 DTS Digital Transmitter and Test Point Adapter

STEP	PROCEDURE
	<b>Note:</b> Figure 4 shows an end-to-end test arrangement between a T1DM and a T1WB4 or T1WB5. In this test, an HL18 is tested by transmitting and receiving signals between the near-end T1DM and the far-end T1WB4 or T1WB5 connected by the 1.544-Mb/s T1 facility. A digital transmitter and a digital receiver are required at each location.
1	Set up the digital transmitter and the digital receiver according to the procedure in Chart 1.
2	Set the NORM/NO ALM/LOOP switch on the newly equipped T1DM or on the T1DM containing the additional HL18 being tested to the NO ALM position.
3	Connect the digital transmitter output (test signal cord and test point adapter) to the first pair of IN test points on the HL18 at the near-end T1DM.
	<b>Note:</b> The metal contact points on the test point adapter must face away from the test point number to make contact.
4	Connect the digital receiver input (test signal cord and test point adapter) to test points 6 and 7 of HL73 at the far-end T1WB4 or T1WB5 associated with the port on the HL18 being tested.
5	Connect the ground lead of the test point adapter to test point 9.
	<b>Note:</b> The metal contact points on the test point adapter must face away from the test point numbers to make contact.
6	Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.

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 CHART 4 (Contd)
 

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STEP	PROCEDURE
	<p><b>Requirement:</b> The TERMINATE indicator lights on the old and new models.</p>
7	<p>Depress the COUNTER switch on the digital receiver momentarily to the RESET position and then to the COUNT position.</p> <p><b>Requirement:</b> The COUNTER display on the digital receiver shows 000 errors.</p> <p><b>Note:</b> When the HL18 being tested is in a newly equipped T1DM and the requirement of Step 7 is not met, troubleshoot the T1DM. When the HL18 is added to a T1DM already in service and the requirement of Step 7 is not met, replace the HL18 and repeat Steps 3 through 7.</p>
8	<p>Repeat Steps 3 through 7 for the second, third, and fourth pairs of test points on HL18.</p> <p><b>Note 1:</b> A single HL18 provides four 64-kb/s data channels. Only the first four pairs of IN and OUT test points are functional; the fifth is not. Therefore, the first pair of IN and OUT test points on the second HL18 provides access to the fifth data channel, <b>not</b> the fifth pair on the first HL18. Likewise, the first pair of IN and OUT test points on the third HL18 provides access to the ninth data channel, <b>not</b> the fifth pair on the second HL18, and so on through a full complement of HL18s.</p> <p><b>Note 2:</b> The fourth pair of IN and OUT test points on HL18 in shelf position 56 is not used and cannot be tested.</p>
9	<p>Connect the digital transmitter output (test signal cord and test point adapter) to test points 4 and 5 of HL73 at the far-end T1WB4 or T1WB5 associated with the port on the HL18 being tested.</p> <p><b>Note:</b> The metal contact points on the test point adapter must face away from the test point numbers to make contact.</p>
10	<p>Connect the digital receiver input (test signal cord and test point adapter) to the first pair of OUT test points on the HL18 at the near-end T1DM.</p>
11	<p>Connect the ground lead of the test point adapter to test point 12 of HL17.</p> <p><b>Note:</b> The metal contact points on the test point adapter must face away from the test point numbers to make contact.</p>
12	<p>Verify end-to-end test connection between T1DM and T1WB4 or T1WB5 as shown in Fig. 4.</p>
13	<p>Depress the TERMINATE pushbutton on the old model of the digital receiver. If a new DTS is used, there is no TERMINATE pushbutton to operate.</p> <p><b>Requirement:</b> The TERMINATE indicator lights on the old and new models.</p>
14	<p>Depress the COUNTER switch on the digital receiver momentarily to the RESET position and then to the COUNT position.</p> <p><b>Requirement:</b> The COUNTER display on the digital receiver shows 000 errors.</p>

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**CHART 4 (Contd)**

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**STEP****PROCEDURE**

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**Note:** When the HL18 being tested is in a newly equipped T1DM and the requirement of Step 14 is not met, troubleshoot the T1DM. When the HL18 is added to a T1DM already in service and the requirement of Step 14 is not met, replace the HL18 and repeat Steps 9 through 14.

- 15 Repeat Steps 9 through 14 for the second, third, and fourth pairs of test points on HL18.

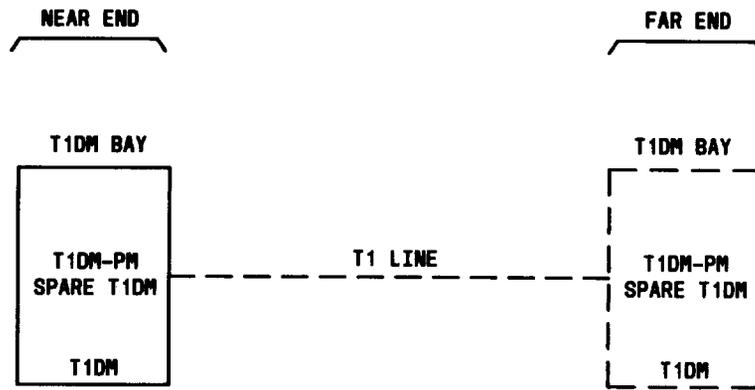
**Note 1:** A single HL18 provides four 64-kb/s data channels. Only the first four pairs of IN and OUT test points are functional; the fifth is not. Therefore, the first pair of IN and OUT test points on the second HL18 provides access to the fifth data channel, **not** the fifth pair on the first HL18. Likewise, the first pair of IN and OUT test points on the third HL18 provides access to the ninth data channel, **not** the fifth pair on the second HL18, and so on through a full complement of HL18s.

**Note 2:** The fourth pair of IN and OUT test points on HL18 in shelf position 56 is not used and cannot be tested.

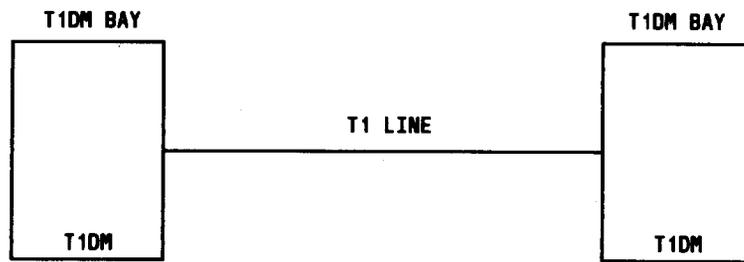
- 16 Disconnect the digital transmitter and the digital receiver from the test points associated with the last port.
- 17 Set the NORM/NO ALM/LOOP switch on the T1DM to the NORM position.
- 18 Depress the POWER ON pushbuttons on both data test sets.

**Requirement:** Both POWER ON indicators are off.

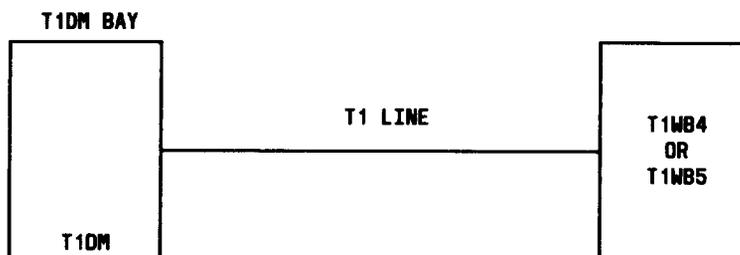
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(A) LOCAL TEST PROCEDURE IN CHART 2



(B) END-TO-END TEST PROCEDURE IN CHART 3



(C) END-TO-END TEST PROCEDURE IN CHART 4

Fig. 1—Test Procedures with Associated Equipment Arrangements

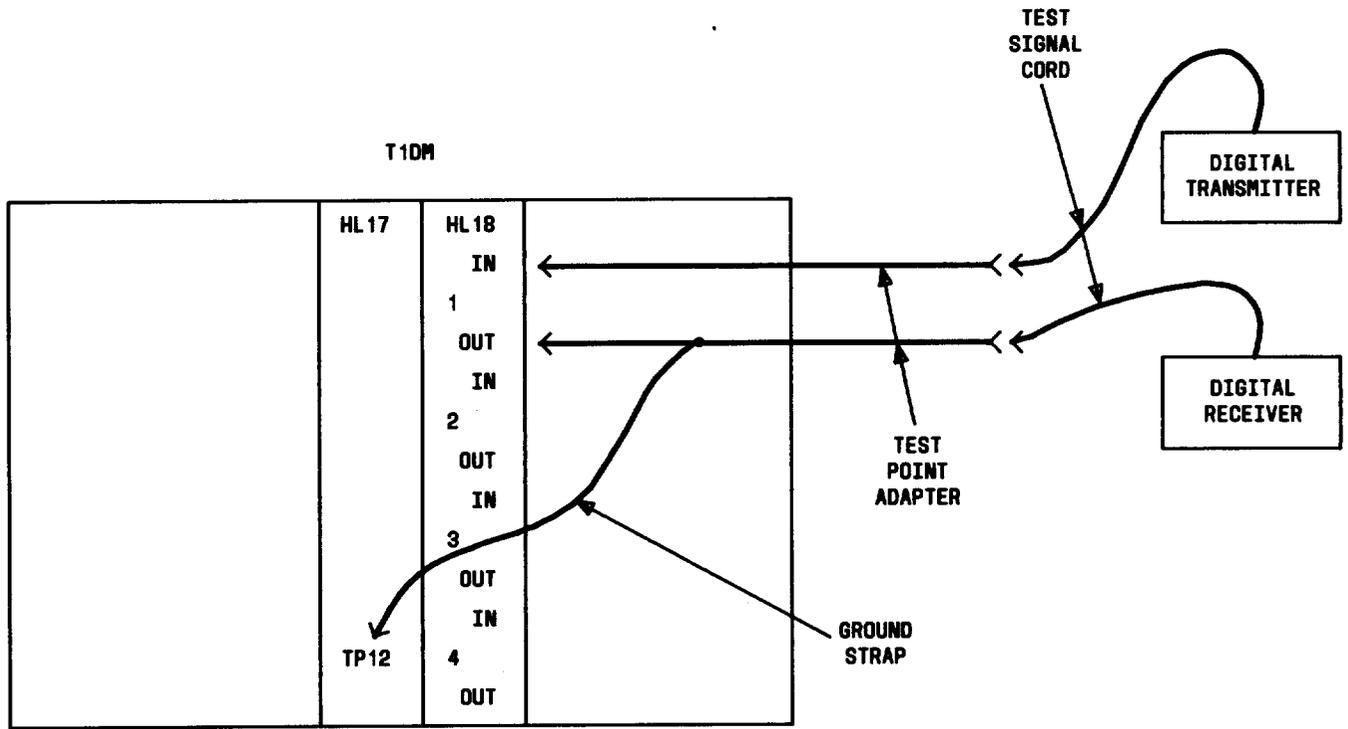


Fig. 2—Local Test Arrangement

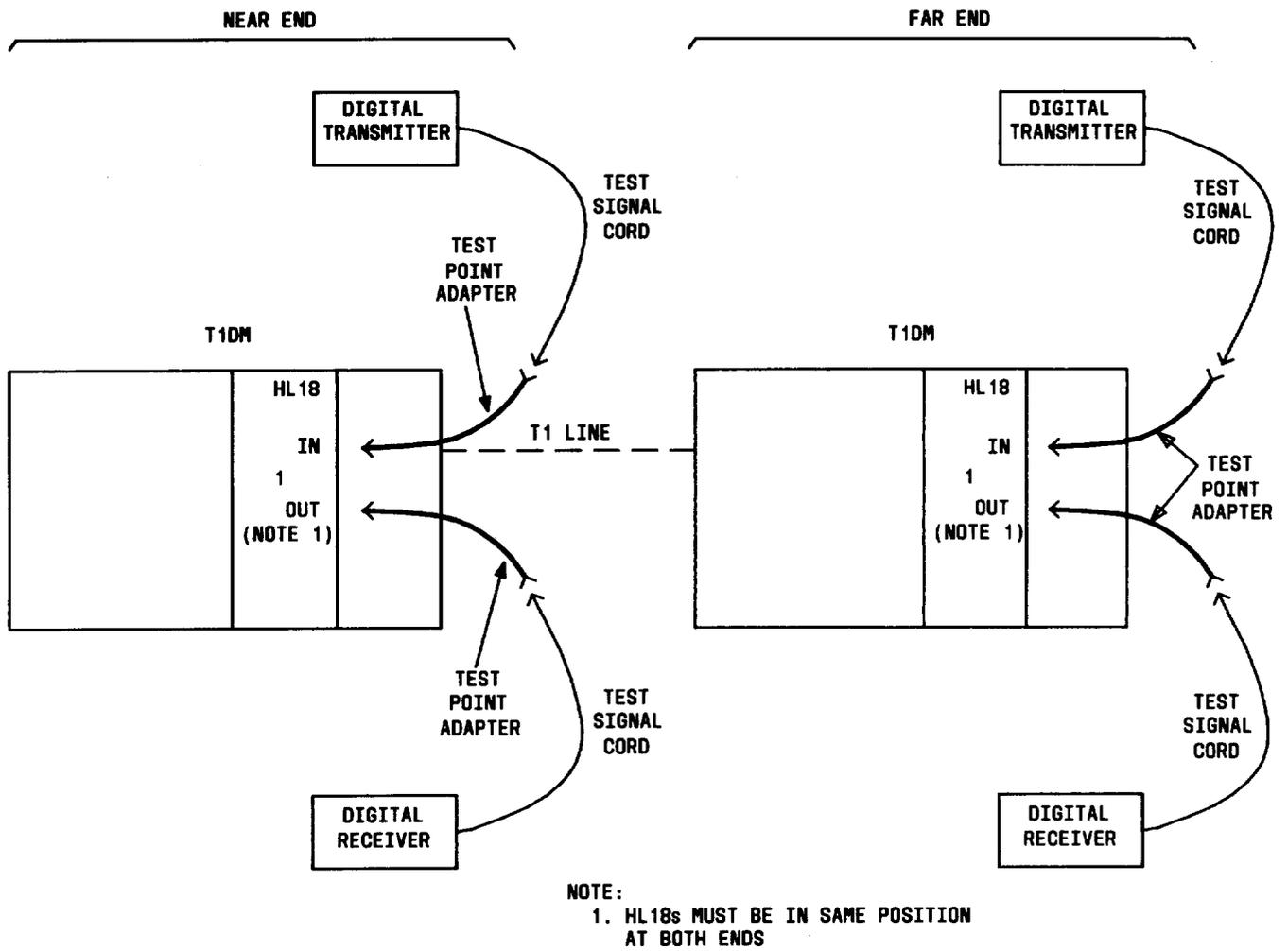


Fig. 3—End-to-End Test Arrangement (Between Two T1DMs)

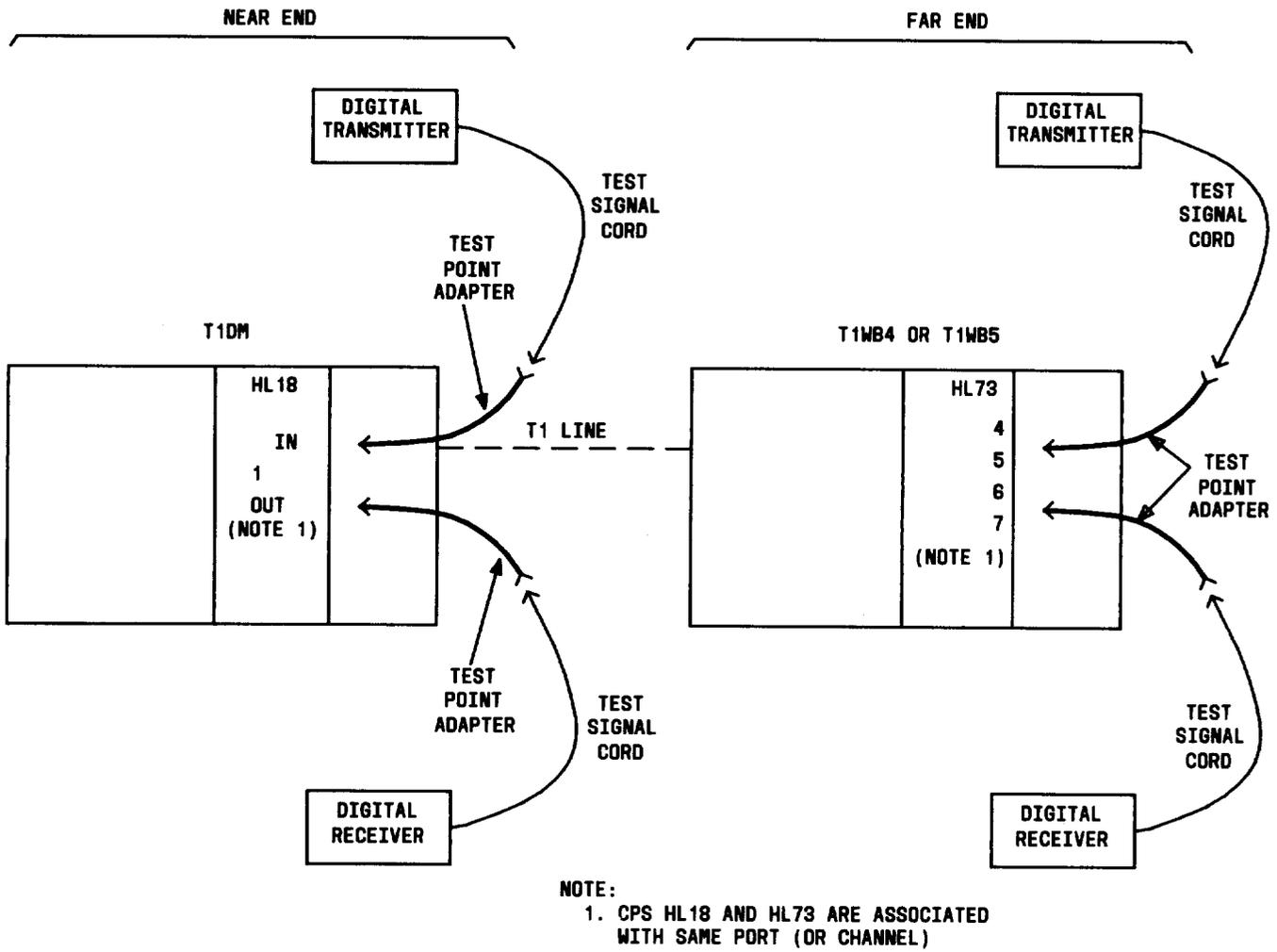


Fig. 4—End-to-End Test Arrangement (Between T1DM and T1WB4 or T1WB5)

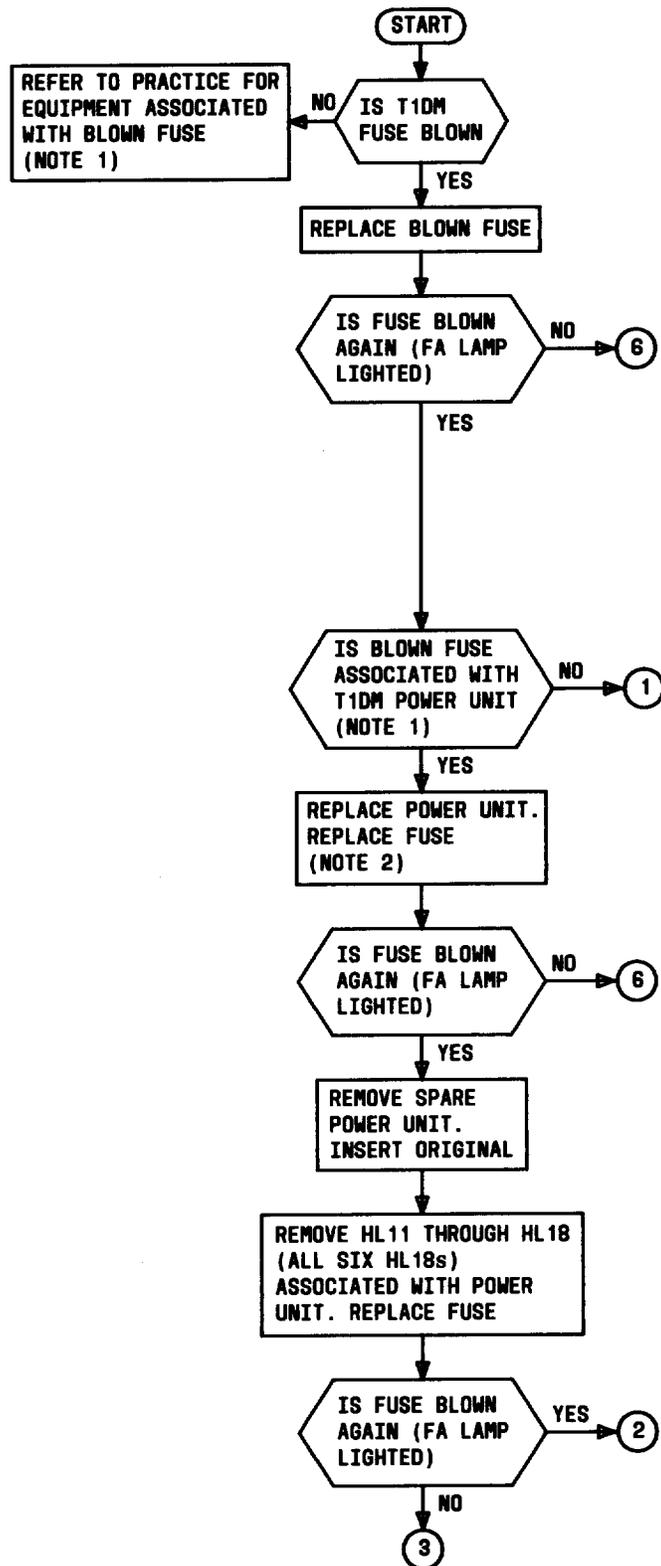


Fig. 5—T1DM Troubleshooting Tests When FA Lamp Is Lighted on BCPA Circuit or LTS  
(Sheet 1 of 3)

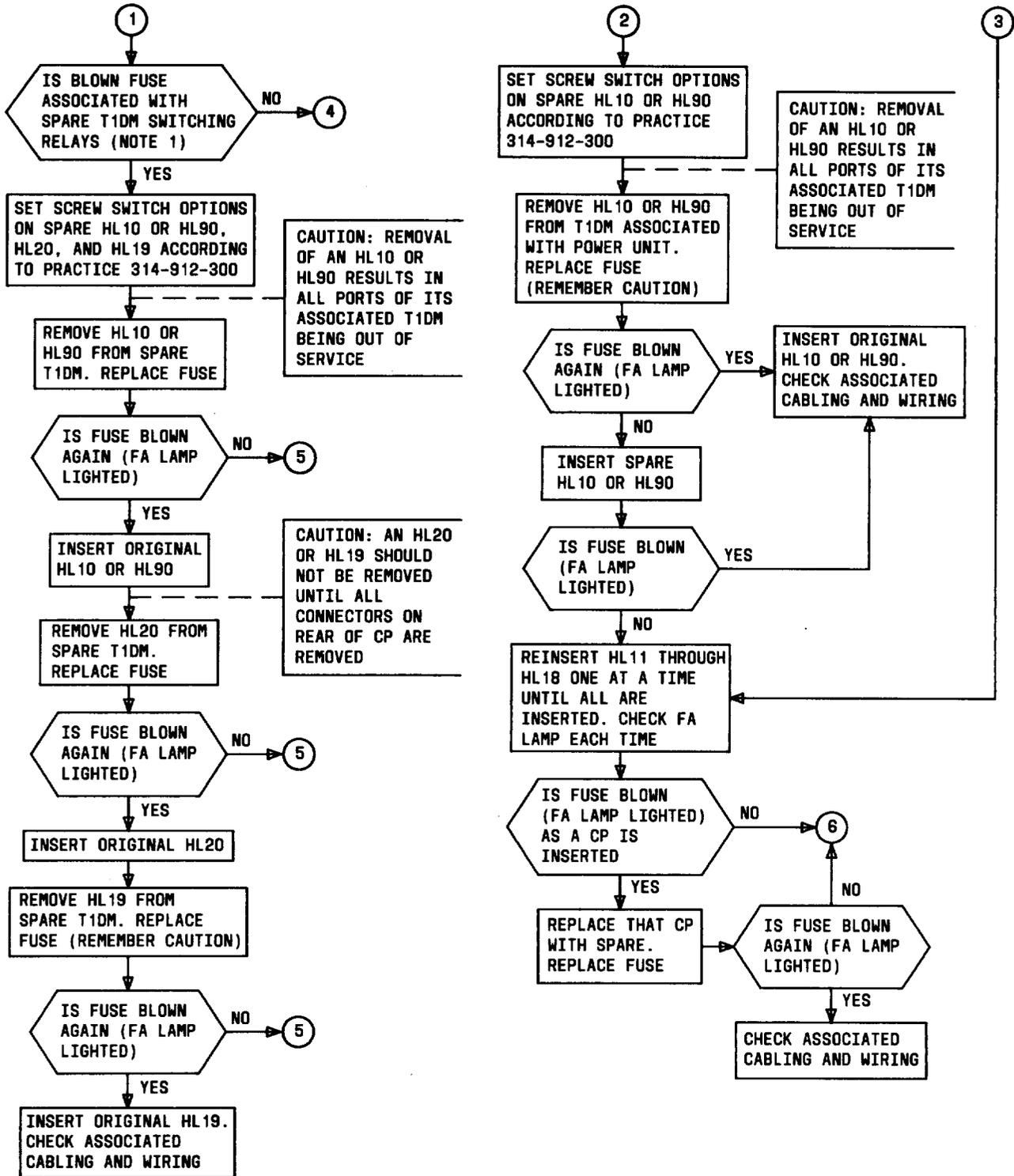
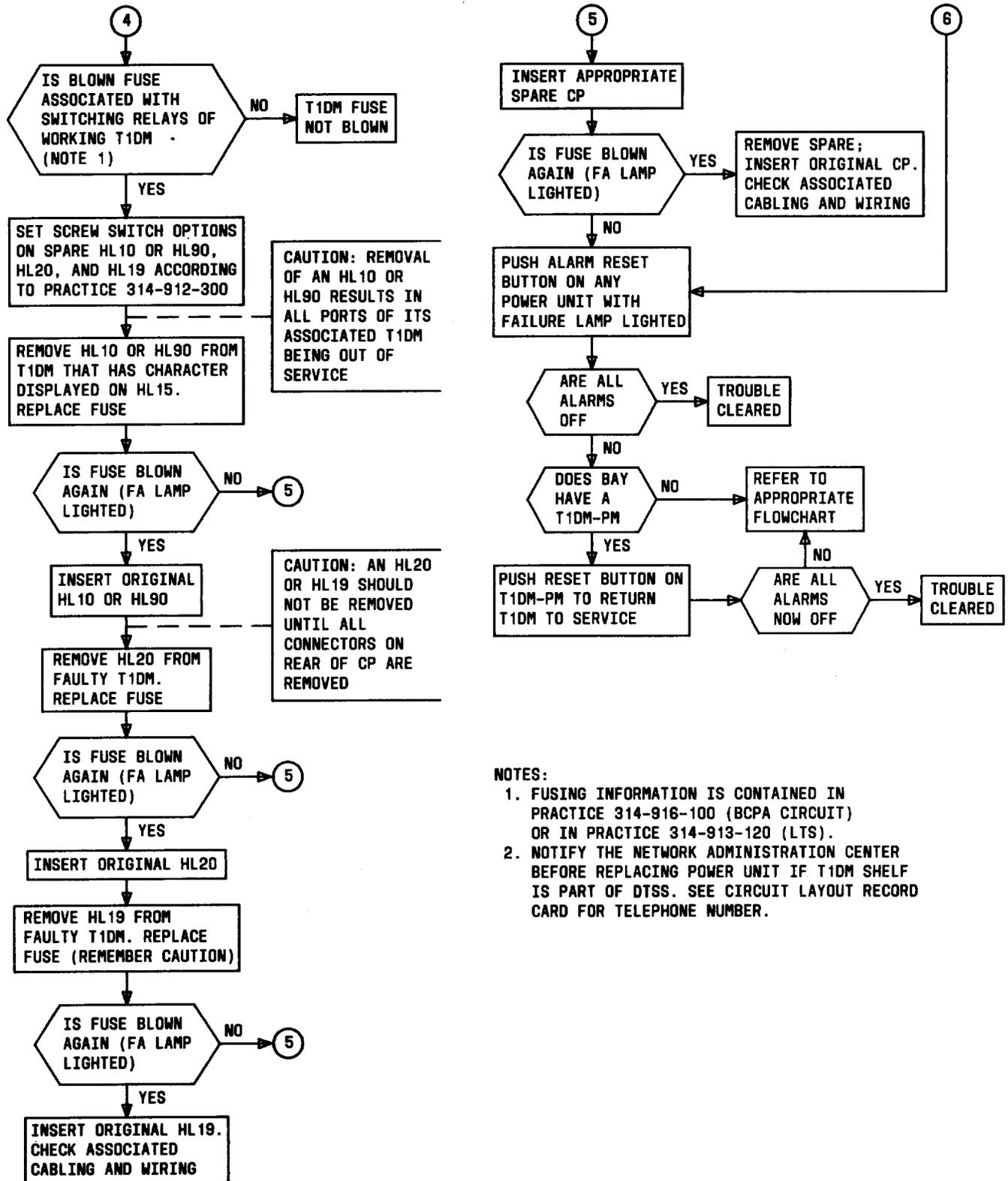
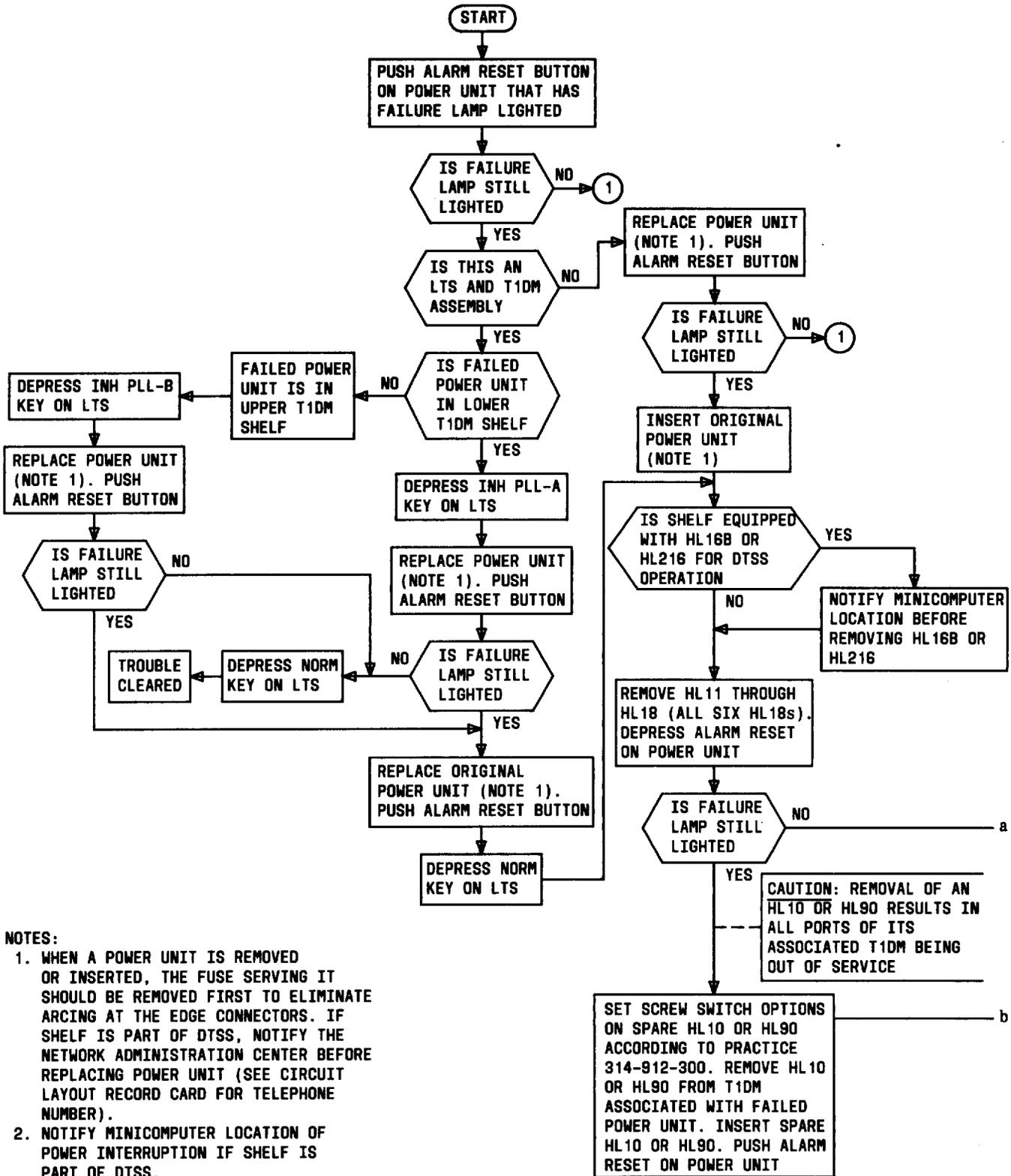


Fig. 5—T1DM Troubleshooting Tests When FA Lamp Is Lighted on BCPA Circuit or LTS  
(Sheet 2 of 3)



- NOTES:
1. FUSING INFORMATION IS CONTAINED IN PRACTICE 314-916-100 (BCPA CIRCUIT) OR IN PRACTICE 314-913-120 (LTS).
  2. NOTIFY THE NETWORK ADMINISTRATION CENTER BEFORE REPLACING POWER UNIT IF T1DM SHELF IS PART OF DTSS. SEE CIRCUIT LAYOUT RECORD CARD FOR TELEPHONE NUMBER.

Fig. 5—T1DM Troubleshooting Tests When FA Lamp Is Lighted on BCPA Circuit or LTS (Sheet 3 of 3)



NOTES:

1. WHEN A POWER UNIT IS REMOVED OR INSERTED, THE FUSE SERVING IT SHOULD BE REMOVED FIRST TO ELIMINATE ARCING AT THE EDGE CONNECTORS. IF SHELF IS PART OF DTSS, NOTIFY THE NETWORK ADMINISTRATION CENTER BEFORE REPLACING POWER UNIT (SEE CIRCUIT LAYOUT RECORD CARD FOR TELEPHONE NUMBER).
2. NOTIFY MINICOMPUTER LOCATION OF POWER INTERRUPTION IF SHELF IS PART OF DTSS.

Fig. 6—T1DM Troubleshooting Tests When a FAILURE Lamp is Lighted on a T1DM Power Unit (Sheet 1 of 2)

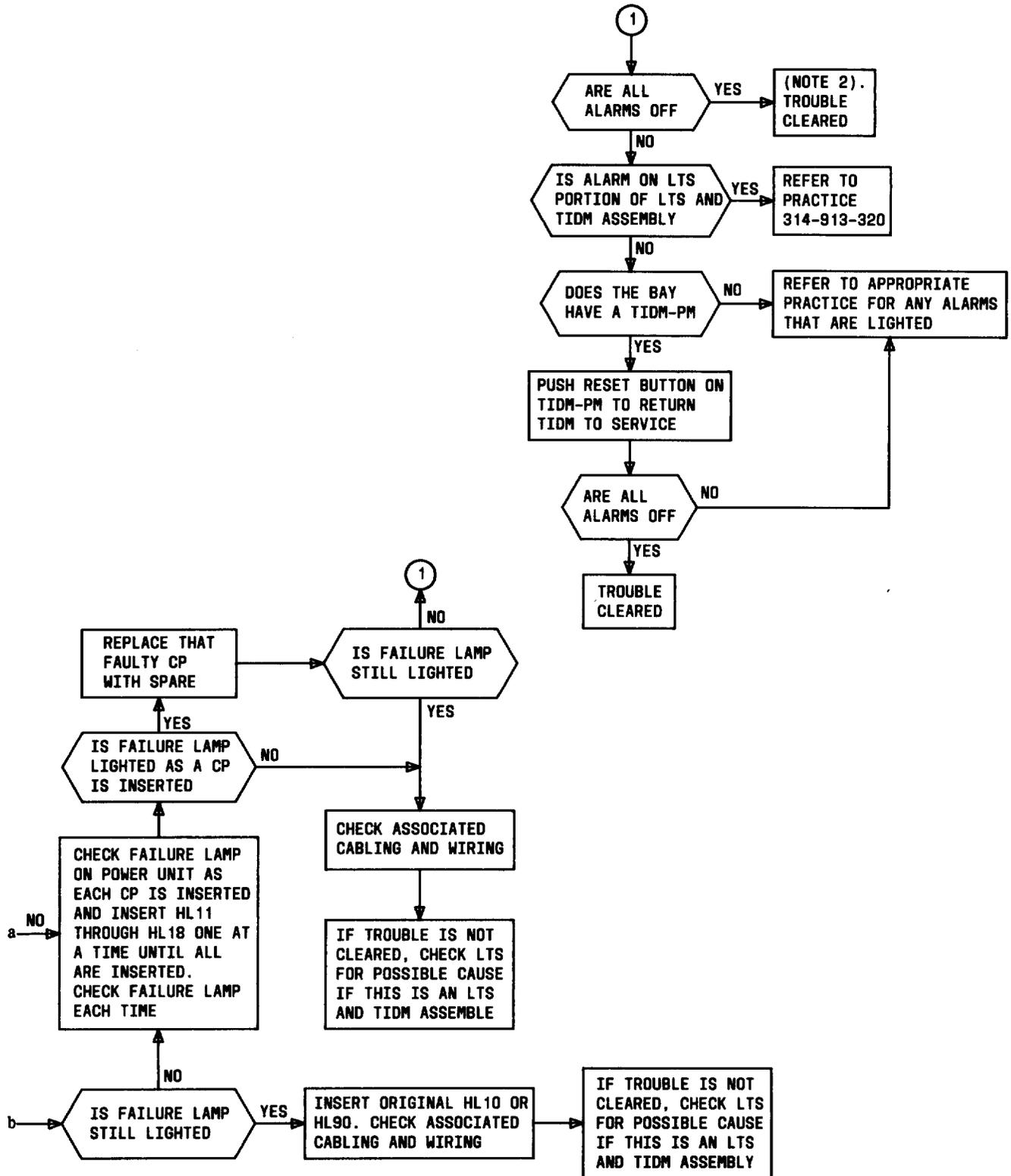
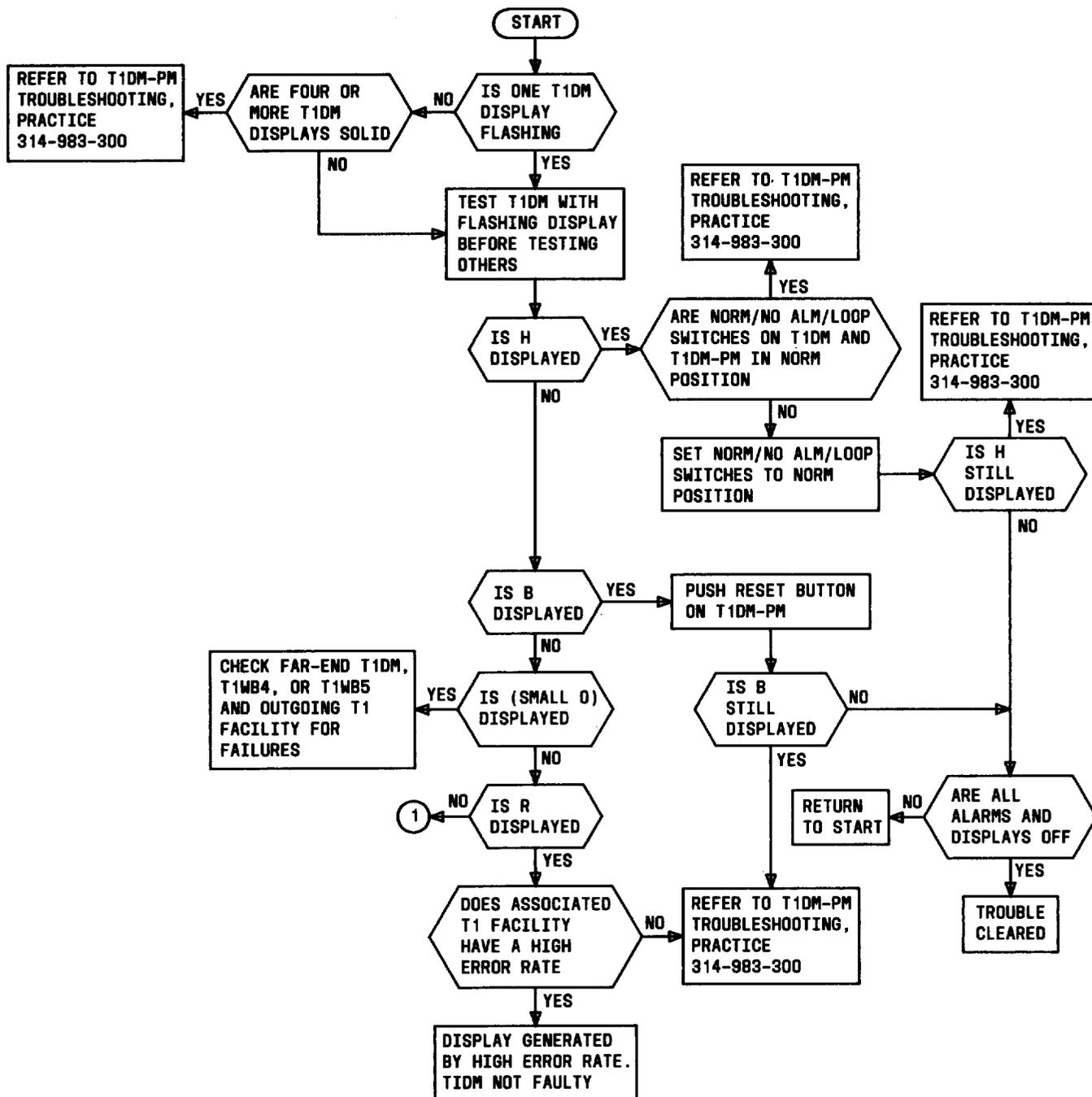


Fig. 6—T1DM Troubleshooting Tests When a FAILURE Lamp is Lighted on a T1DM Power Unit (Sheet 2 of 2)



NOTE:

1. NOTIFY THE NETWORK ADMINISTRATION CENTER WHEN REPLACING CP HL16B OR HL216 IF T1DM SHELF IS PART OF DTSS. (SEE CIRCUIT LAYOUT RECORD CARD FOR TELEPHONE NUMBER).

Fig. 7—T1DM Troubleshooting Tests in a T1DM-PM Bay - MJ or MN Lamp Lighted and Alphanumeric Character Displayed on T1DM(s) (Sheet 1 of 3)



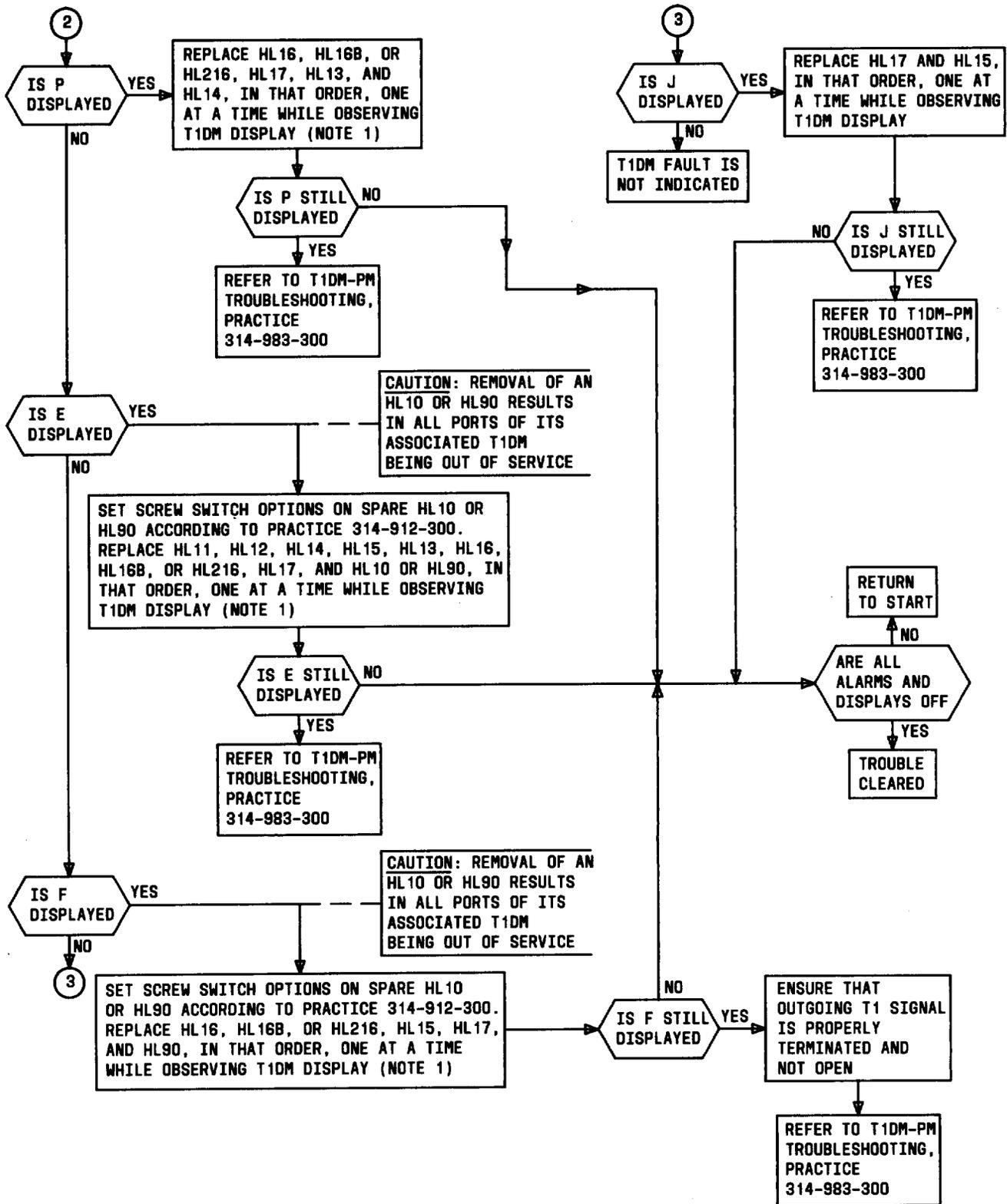


Fig. 7—T1DM Troubleshooting Tests in a T1DM-PM Bay - MJ or MN Lamp Lighted and Alphanumeric Character Displayed on T1DM(s) (Sheet 3 of 3)

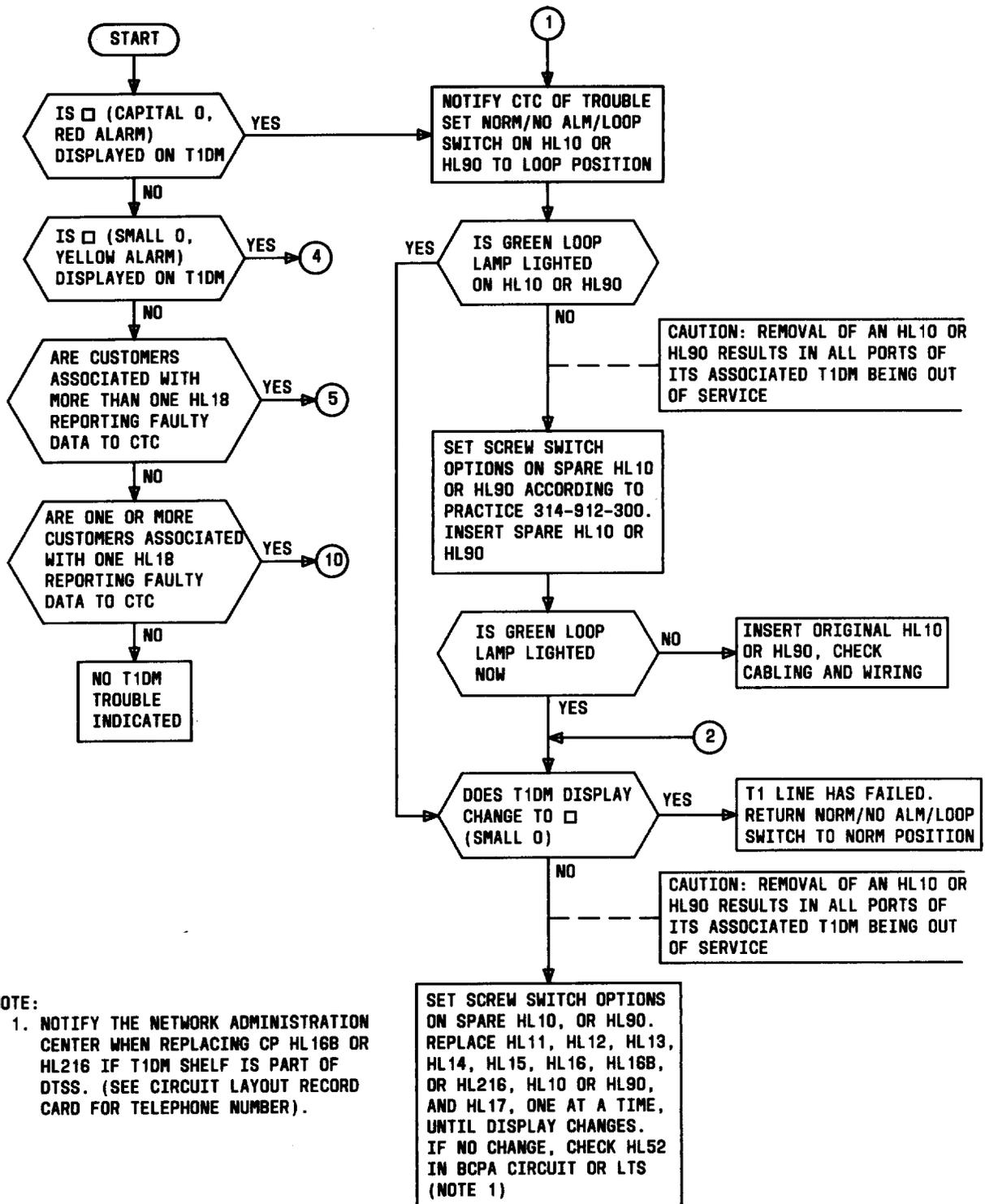
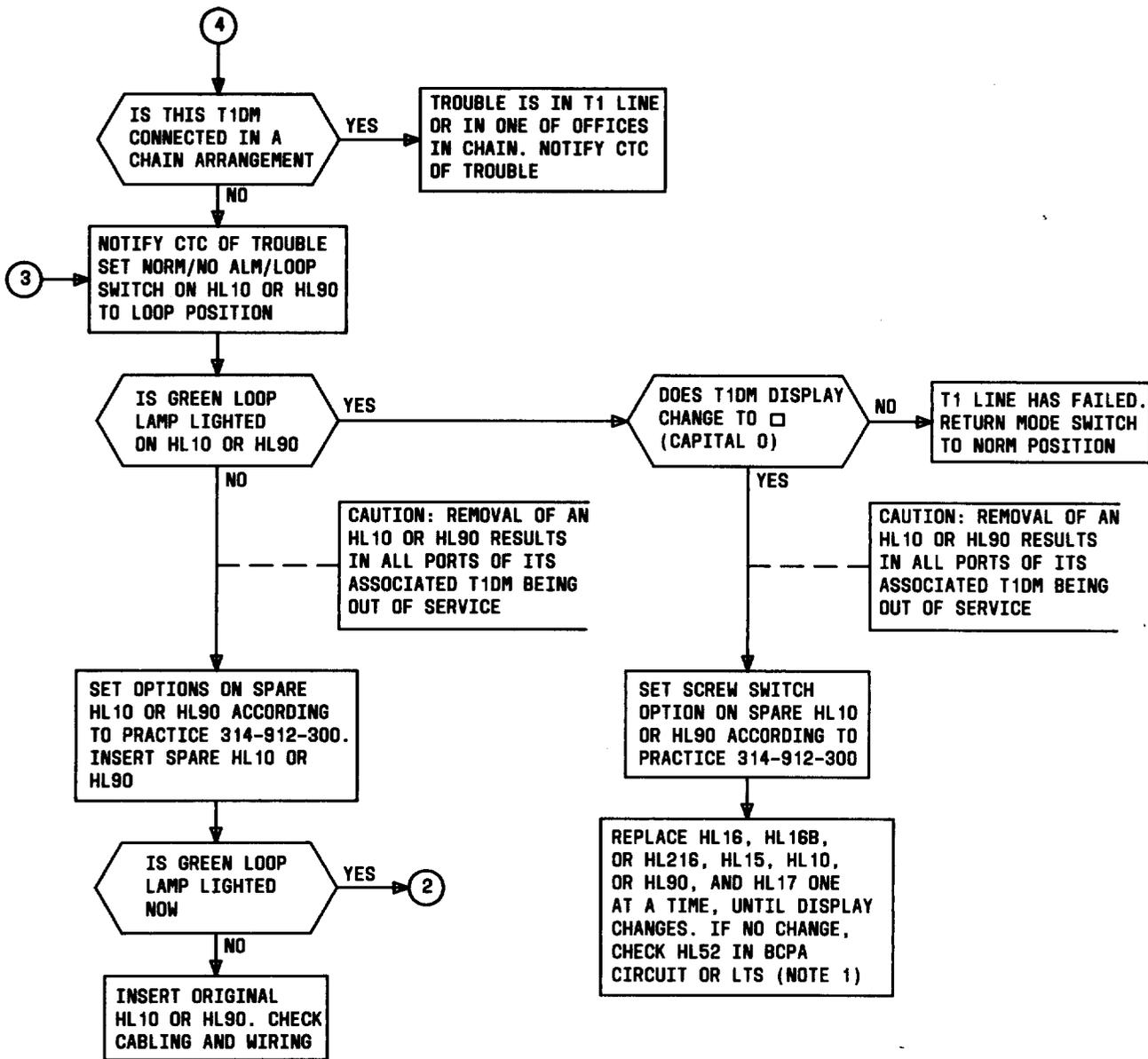


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 1 of 8)



NOTE:

1. NOTIFY THE NETWORK ADMINISTRATION CENTER WHEN REPLACING CP HL16B OR HL216 IF T1DM SHELF IS PART OF DISS. (SEE CIRCUIT LAYOUT RECORD CARD FOR TELEPHONE NUMBER)

Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 2 of 8)

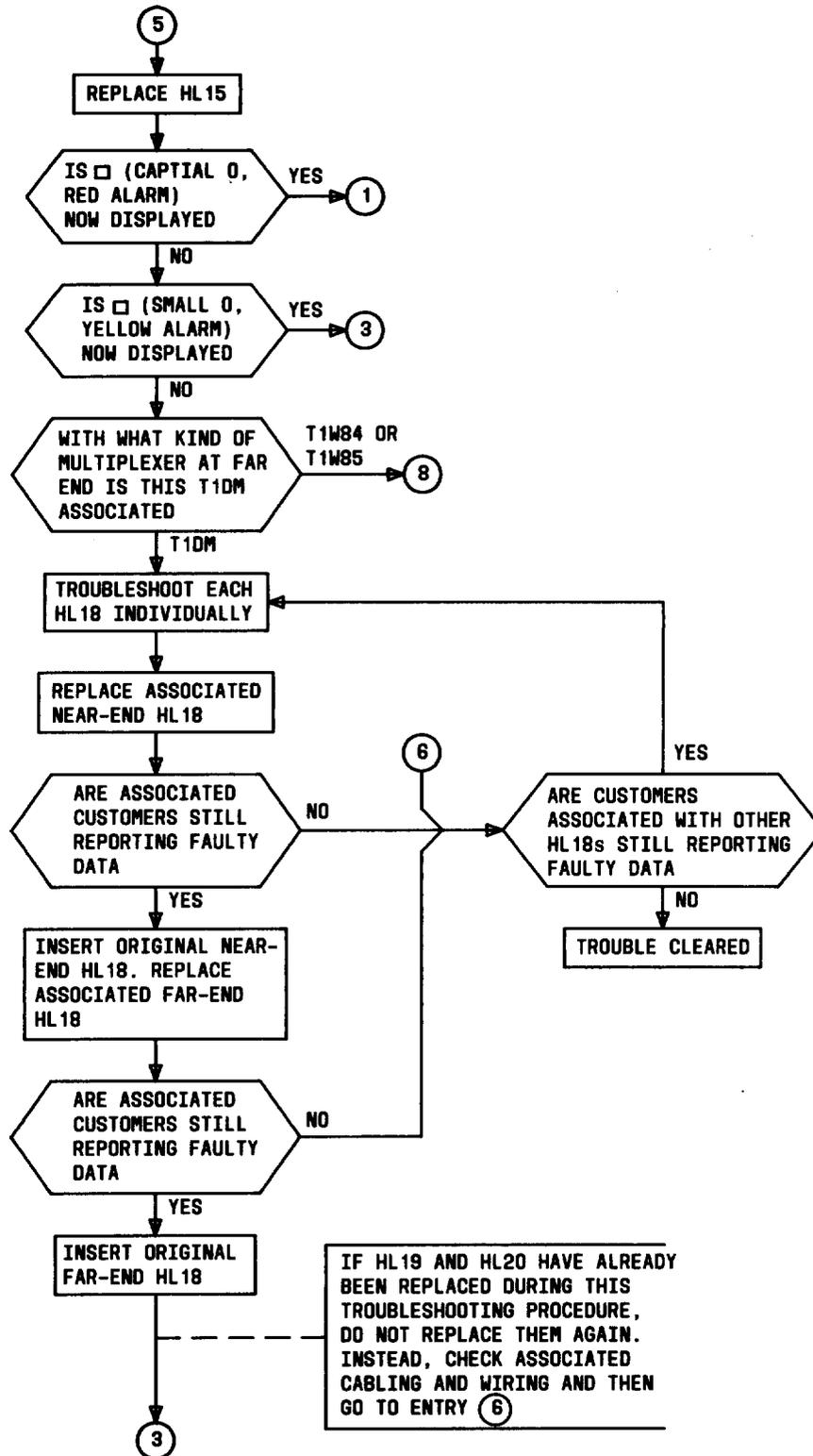


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 3 of 8)

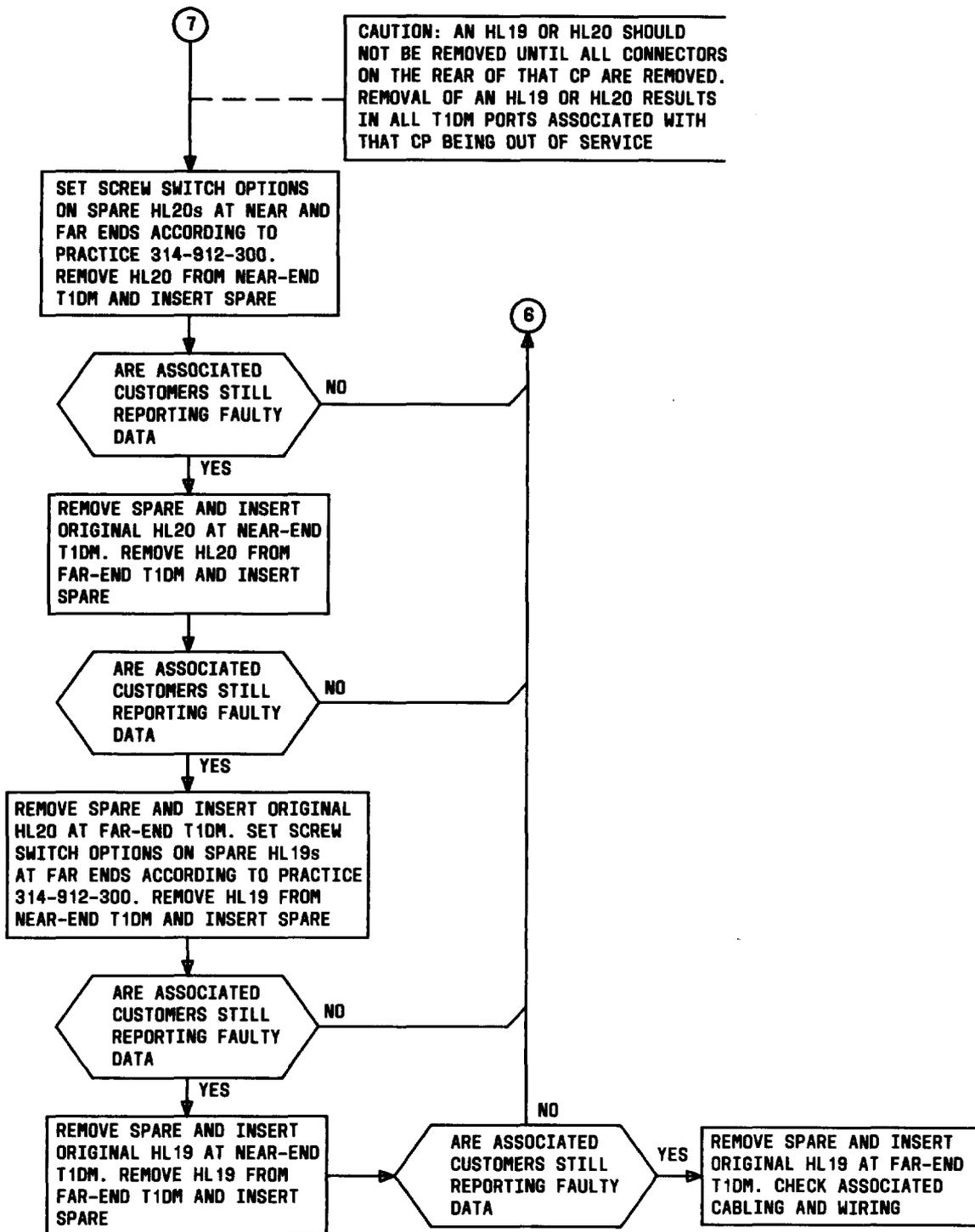


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 4 of 8)

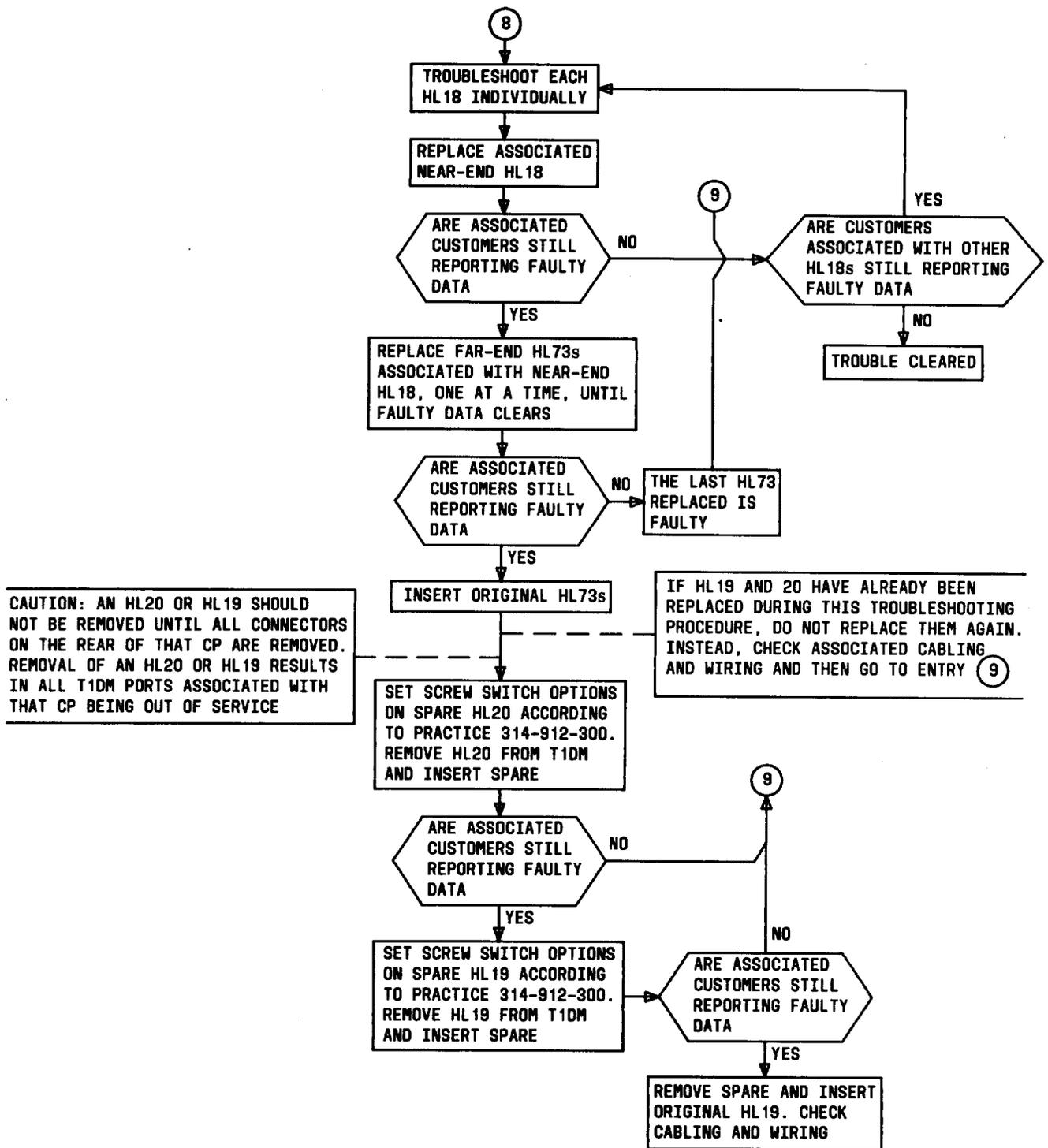


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 5 of 8)

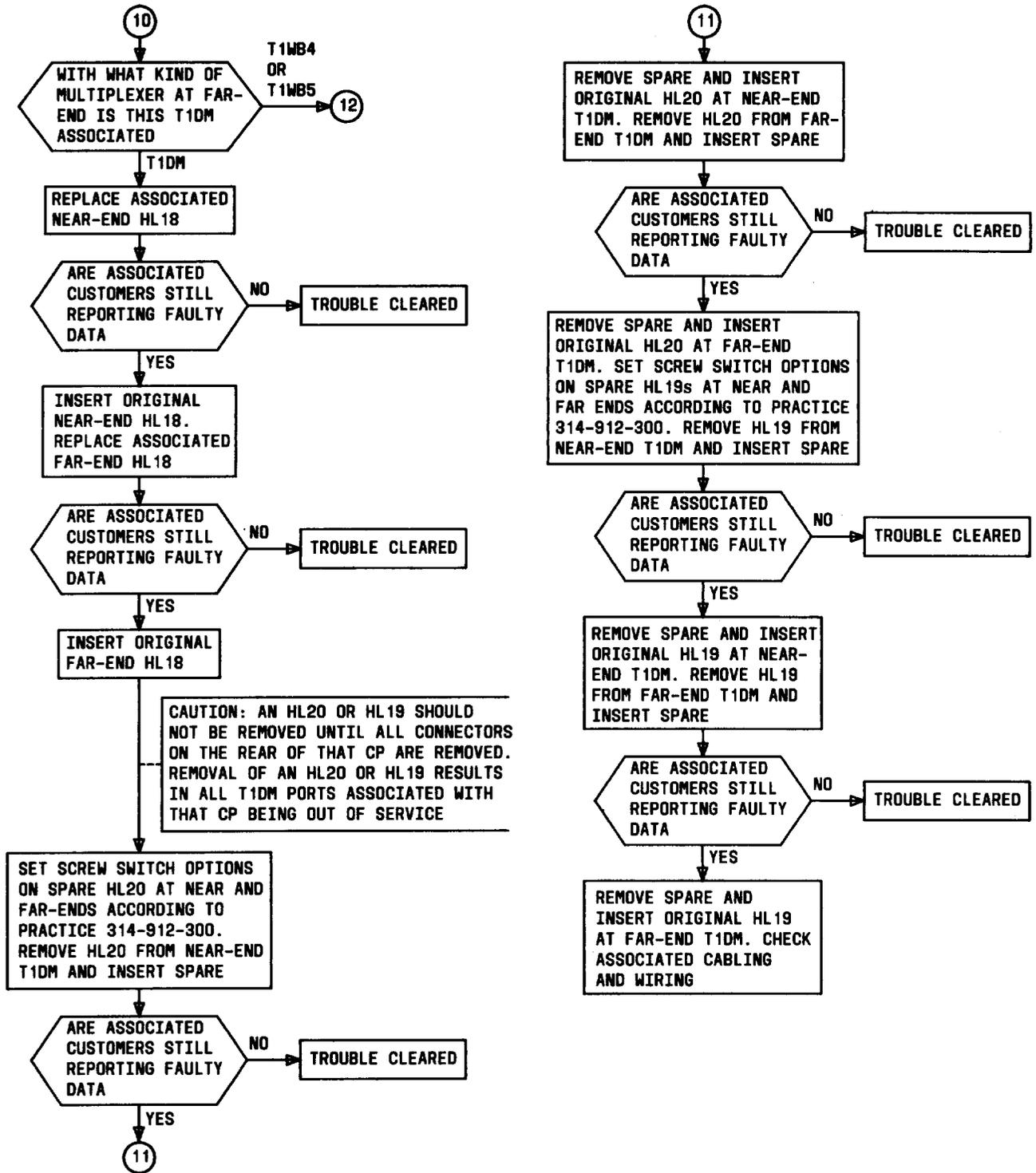


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 6 of 8)

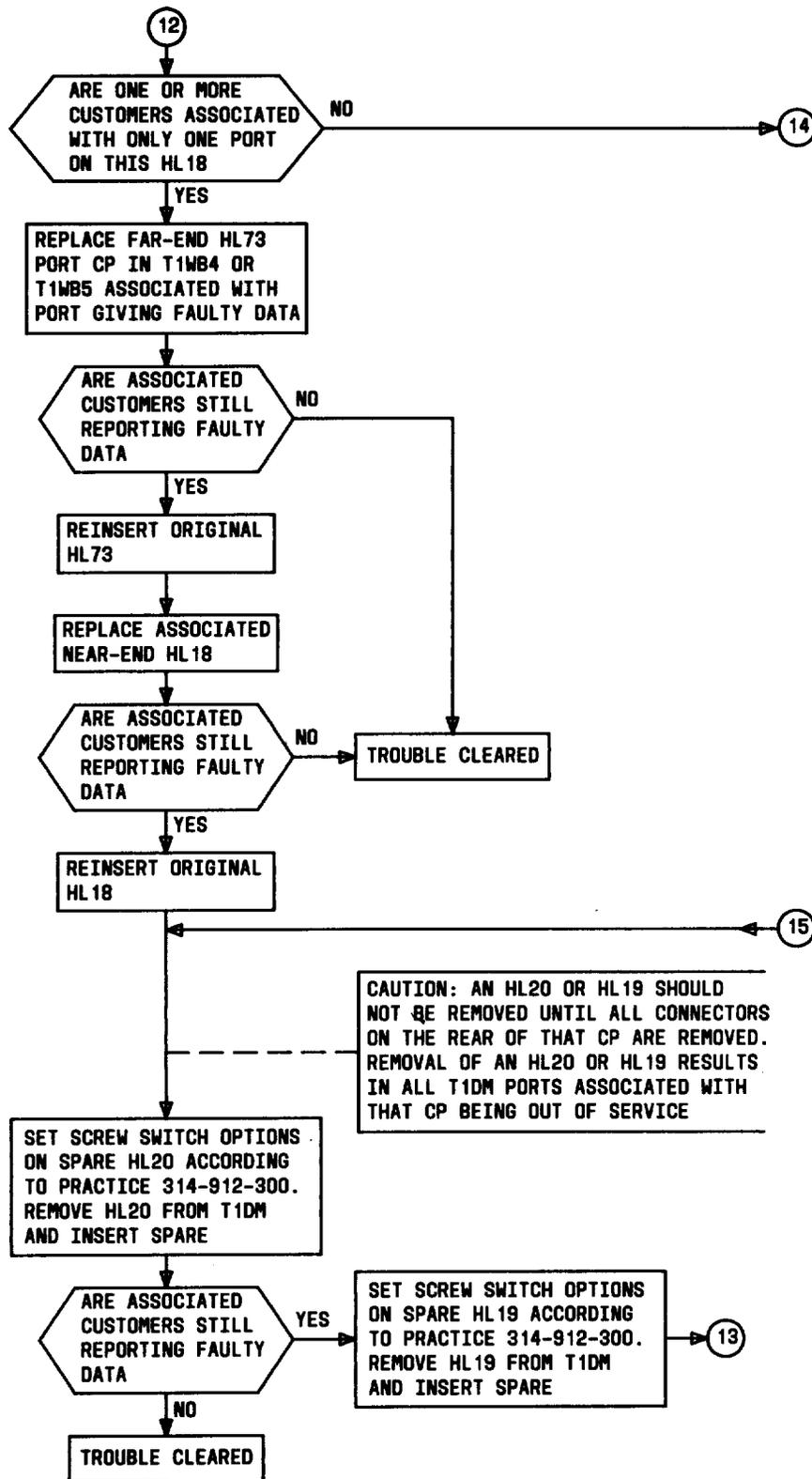


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 7 of 8)

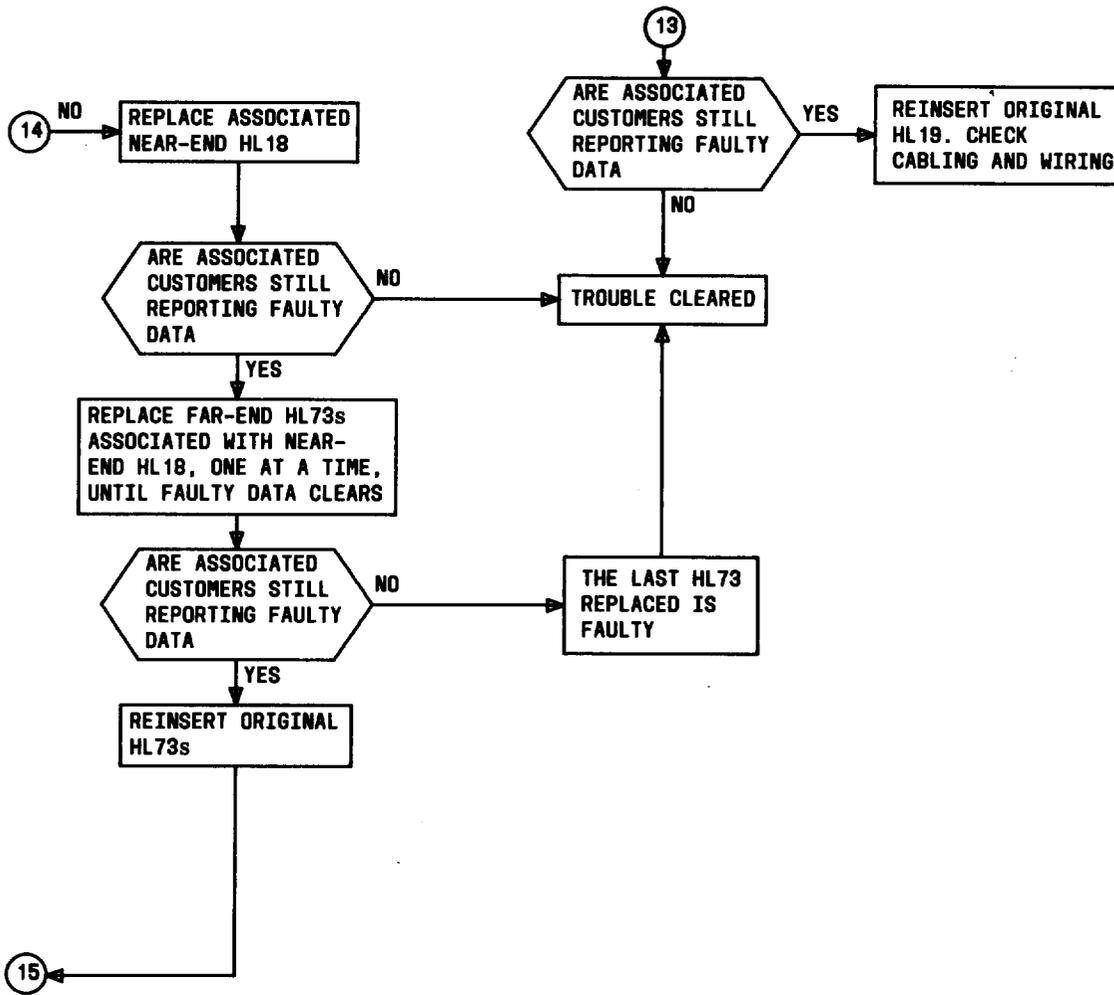


Fig. 8—T1DM Troubleshooting Tests in a Bay Without a T1DM-PM (Sheet 8 of 8)

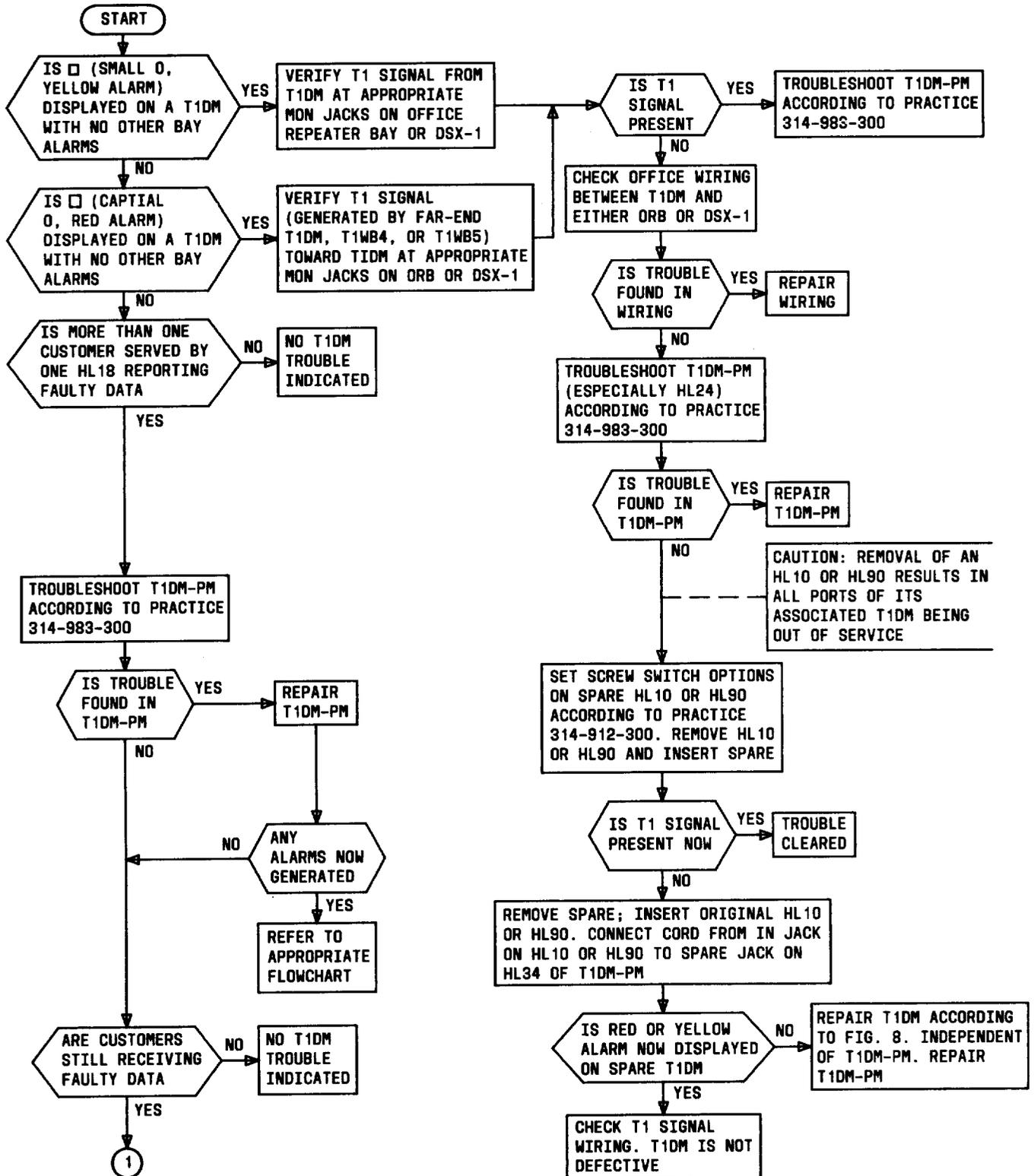


Fig. 9—T1DM Troubleshooting Tests When Failures Are Not Detected by the T1DM-PM (Sheet 1 of 3)



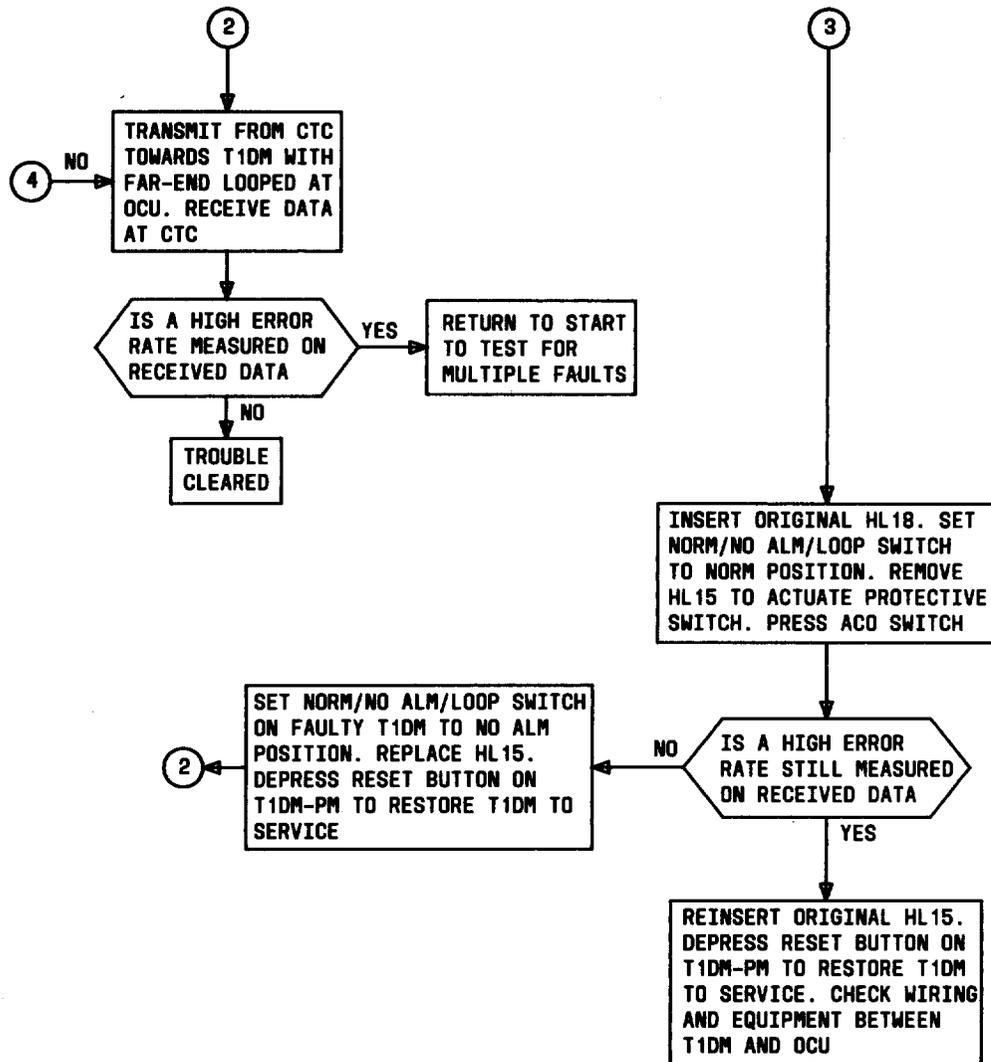


Fig. 9—T1DM Troubleshooting Tests When Failures Are Not Detected by the T1DM-PM  
(Sheet 3 of 3)