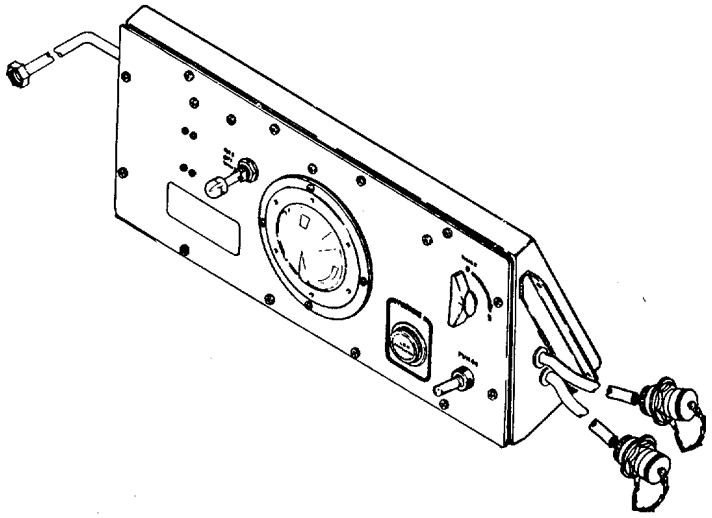
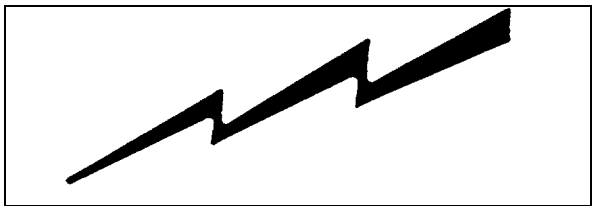
TECHNICAL MANUAL
DIRECT SUPPORT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS
AND SPECIAL TOOLS LIST)
FOR



PROTECTIVE ENTRANCE CONTROL MODULE
(NSN 4240-01-048-2803)

HEADQUARTERS, DEPARTMENT OF THE ARMY
JULY 1986

WARNINGS



HIGH VOLTAGE

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions when performing troubleshooting and maintenance procedures on the protective entrance control module.

DISCONNECT POWER SUPPLIES BEFORE PERFORMING MAINTENANCE TO PREVENT DEATH OR POSSIBLE SERIOUS PERSONAL INJURY.

TOXIC HAZARD

Do not remove covers to service components after toxic exposure without observing proper handling procedures. For electrical shock or toxic environment first aid, refer to FM 21-11 (TEST).

TECHNICAL MANUAL

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC

No. 3-4240-302-30&P-3

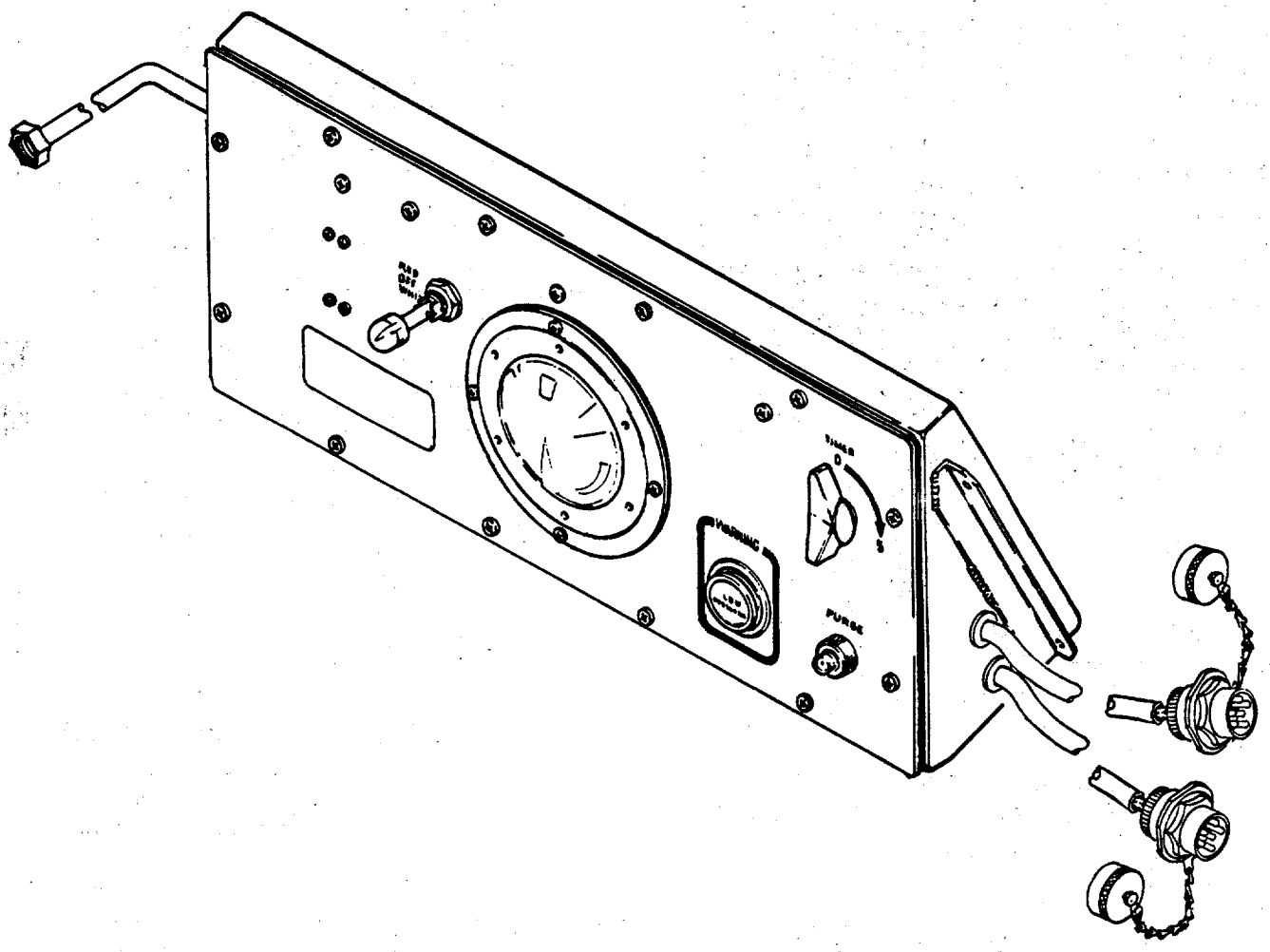
2 July 1986

DIRECT SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) FOR PROTECTIVE ENTRANCE CONTROL MODULE (NSN 4240-01-048-2803

Current as of *15 April 1986*

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAR-T(A), Aberdeen Proving Ground, MD 21010-5423. A reply will be furnished to you.



PROTECTIVE ENTRANCE CONTROL MODULE

CHAPTER 1
INTRODUCTION

Section I GENERAL INFORMATION

1-1. SCOPE.

a. Type of Manual. This manual provides direct support maintenance instructions for the protective entrance control module including repair parts and special tools list.

b. Equipment Name and Number.

Protective Entrance Control Module (PECM) (NSN 4240-01-048-2803)

c. Purpose of Equipment. The protective entrance control module monitors protective entrance pressure, provides light to the inside of the protective entrance, provides 5 minute times for personal decontamination, and provides PE occupied and low pressure signals to the compartment control module.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, The Army Maintenance Management System (TAMMS) as contained in Maintenance Management Update.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. Refer to TM 43-0002-31, Destruction of Chemical Weapons and Defense Equipment to Prevent Enemy Use.

1-4. NOMENCLATURE CROSS-REFERENCE LIST. Nomenclature cross-references used in this manual include the following:

Common Name	*Official Nomenclature*
Differential pressure gage	Gage, differential, dial indicating
Dome light switch	Toggle switch
LOW PRESSURE switch/indicator light DS4/S5	Push switch
Female hose adapter	Straight pipe to hose adapter
Interval TIMER switch S4	Interval timer
Lamp	Incandescent lamp
Diode	Semiconductor device. diode
Male hose adapter	Straight pipe to hose adapter
Panel	Lettered plate
Power card A1	Printed circuit board
Switching card A3	Printed circuit board
Pressure transducer MT1	Pressure transmitter
PURGE indicator light DS3	Indicator light
Tubing	Nonmetallic tubing

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If the collective protection equipment needs improvement, let us know. Send an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to the Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-QAD(R), Rock Island, IL 61299-6000. We will send you a reply.

Section II EQUIPMENT DESCRIPTION AND DATA

1-6. DESCRIPTION AND DATA

a. Organizational Maintenance Manual. Refer to appendix A for the applicable organizational maintenance manual.

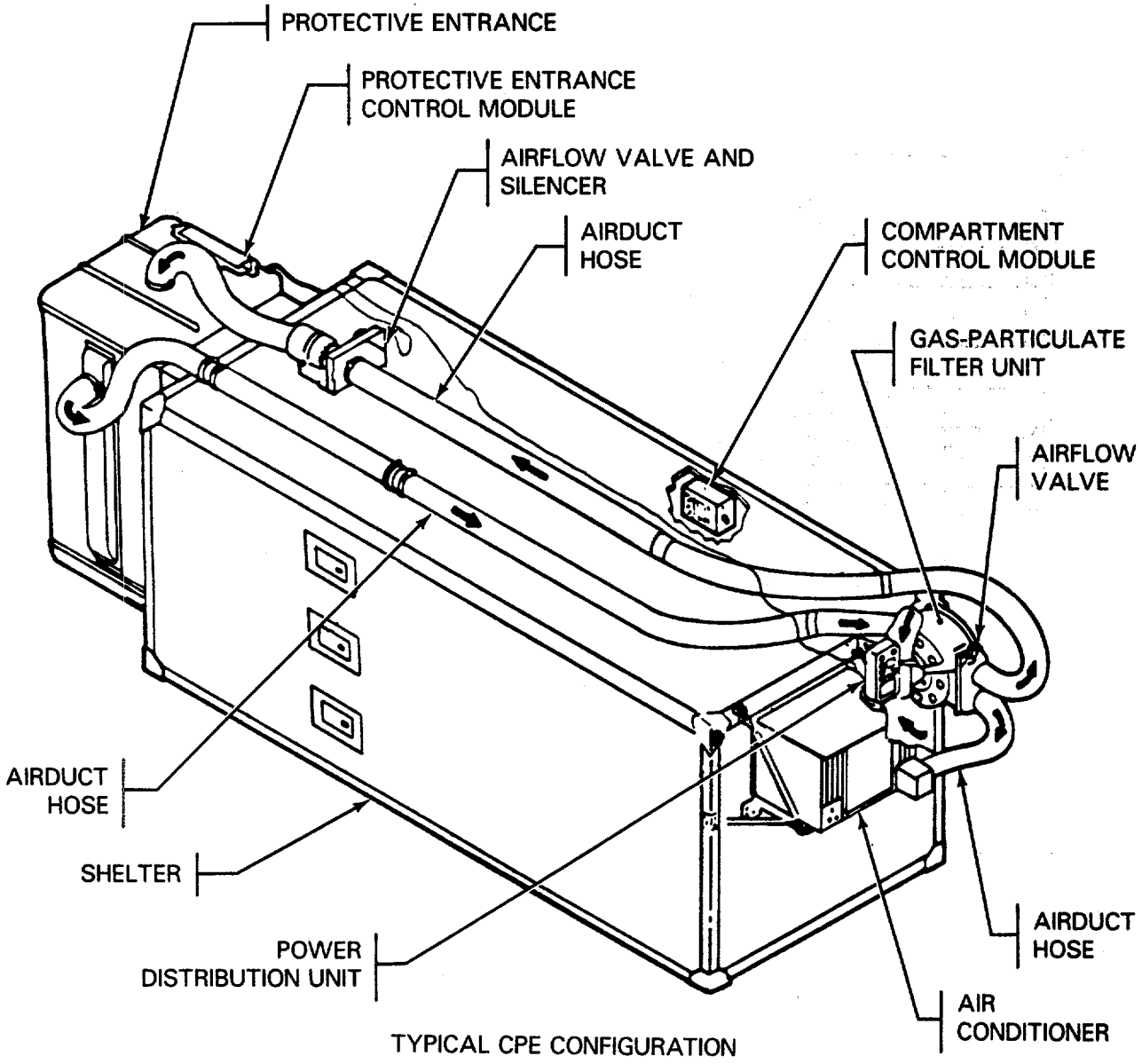
b. Characteristics. The PECM is part of the pressure regulation subsystem of the collective protection equipment (CPE) system.

c. Typical CPE System Description.

(1) The gas-particulate filter unit (GPFU) removes toxic gases and dust from the air supplied to the protective entrance and shelter. Outside and return air is drawn by the main fan through the air inlet of the filter unit. From the main fan, the air is pushed through the particulate and gas filters to the airflow valve. The filtered air passes through the airflow valve and is carried by airduct hoses to the protective entrance (PE) through the airflow valve and silencer and to the shelter through the air conditioner. Pressure sensing components in the compartment control module (CCM) automatically adjust the airflow valve to maintain a positive pressure in the shelter.

(2) The protective entrance provides a pressurized transition area between the shelter and the outside contaminated zone. Personnel entering from the outside must wait 5 minutes within the protective entrance before entering the shelter. Contamination is purged by the flow of filtered air. The PECM automatically adjusts the airflow valve and silencer assembly to maintain the proper air pressure inside the protective entrance.

d. CPE System Configurations. Collective protection equipment is configured to fit the needs of a specific application and may differ from the typical system discussed above.



TYPICAL CPE CONFIGURATION

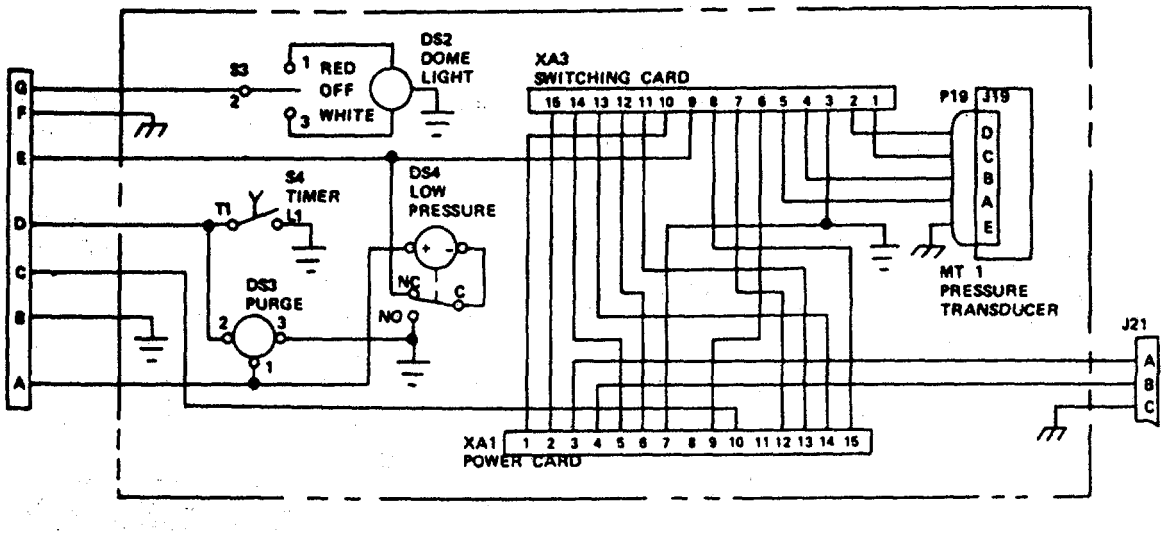
CHAPTER 2
MAINTENANCE INSTRUCTIONS

Section I REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT. For authorized common tools and equipment, refer to the modified table of organization and equipment (MTOE) applicable to your unit.

2-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT. No special tools, TMDE, or support equipment are required.

2-3. REPAIR PARTS. Repair parts are listed and illustrated in appendix B.

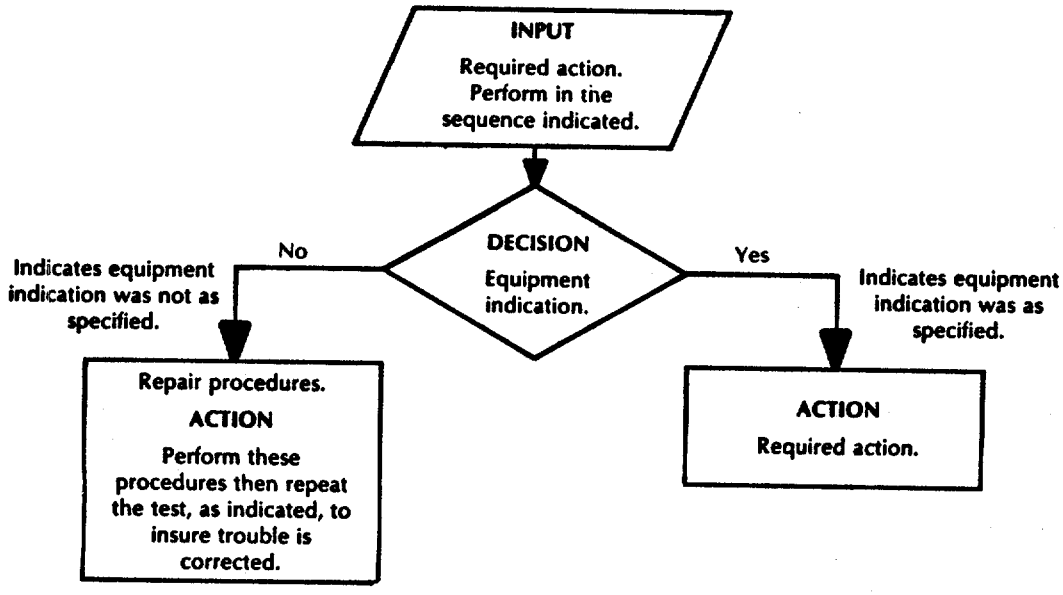


PROTECTIVE ENTRANCE CONTROL MODULE SCHEMATIC

Section II TROUBLESHOOTING

2-4. SCOPE. This section provides information for locating and correcting problems in the collective protection equipment. Use the following flow charts to isolate component problems and to locate repair instructions.

2-5. FLOW CHART PROCEDURES. This troubleshooting procedure is set up so that you actually are performing a module functional checkout. For example, if you have a good protective entrance control module (PECM), you perform only the functional checkout (yes path). If the PECM is defective (no path), the procedure directs you step-by-step to locate a defective component or a wiring problem. After module repair, you repeat the functional checkout at the point in the troubleshooting procedure where you originally dropped out. The following describes the troubleshooting chart symbols.



WARNING

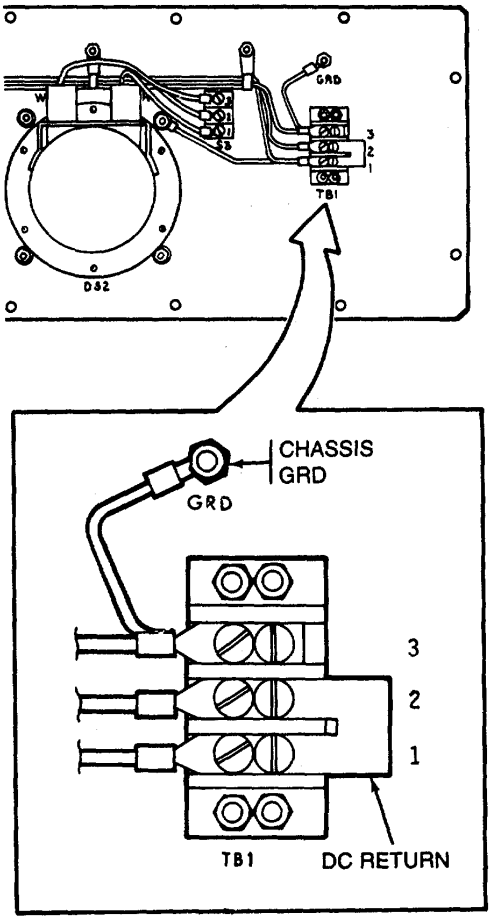
High voltage is used to power this equipment. Before removing or installing power cable, be sure that POWER switch on control module is set to OFF and power source is shut down to avoid personal injury or loss of life.

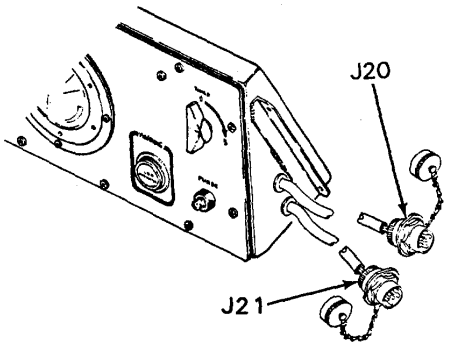
INDEX **PAGE**

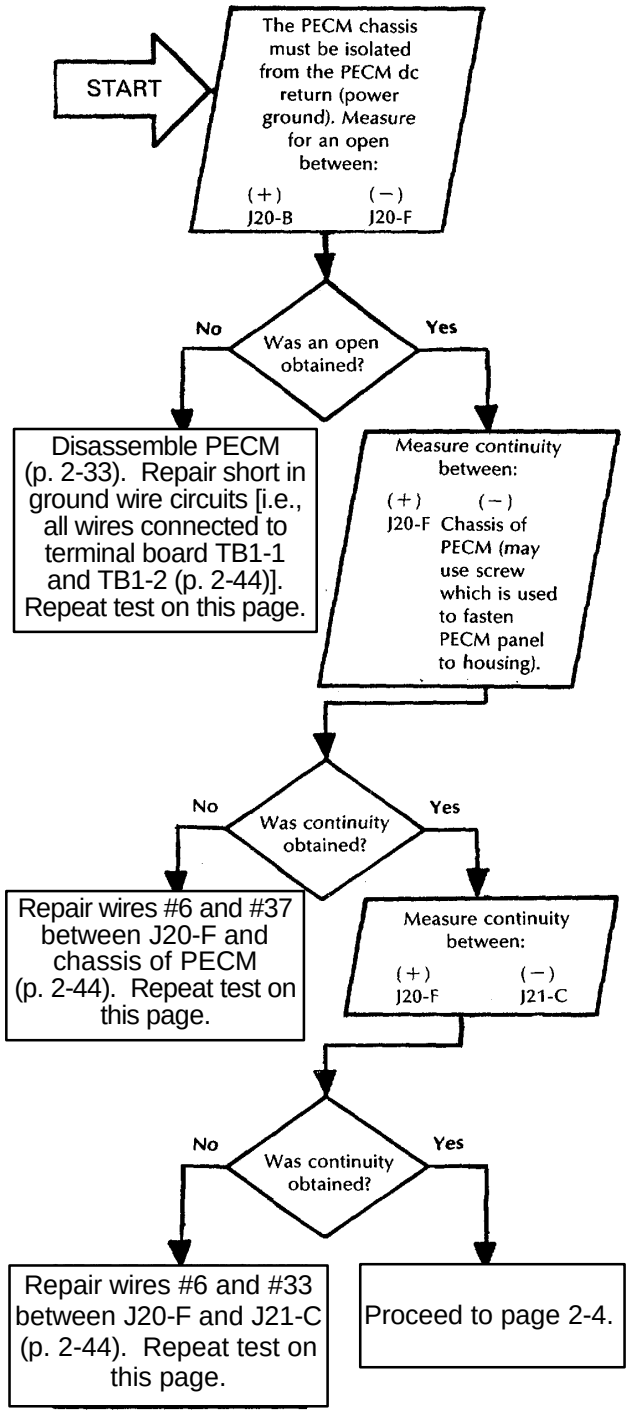
2-6. TROUBLESHOOTING PROCEDURES.

NOTE

All voltages are dc and are measured with respect to dc return (TB1-1) unless otherwise specified.







2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-3

Set PECM dome light switch to OFF. Connect a 100 ohm, 10 W resistor to sockets A and B of connector J21. Connect multimeter between positive of 28 V dc power supply and J20-C. Connect negative of power supply to J20-B. Apply power and measure current draw on power supply.

Power application or removal on the following pages is accomplished by setting the power supply on or off.

Is current less than 1/2 A?

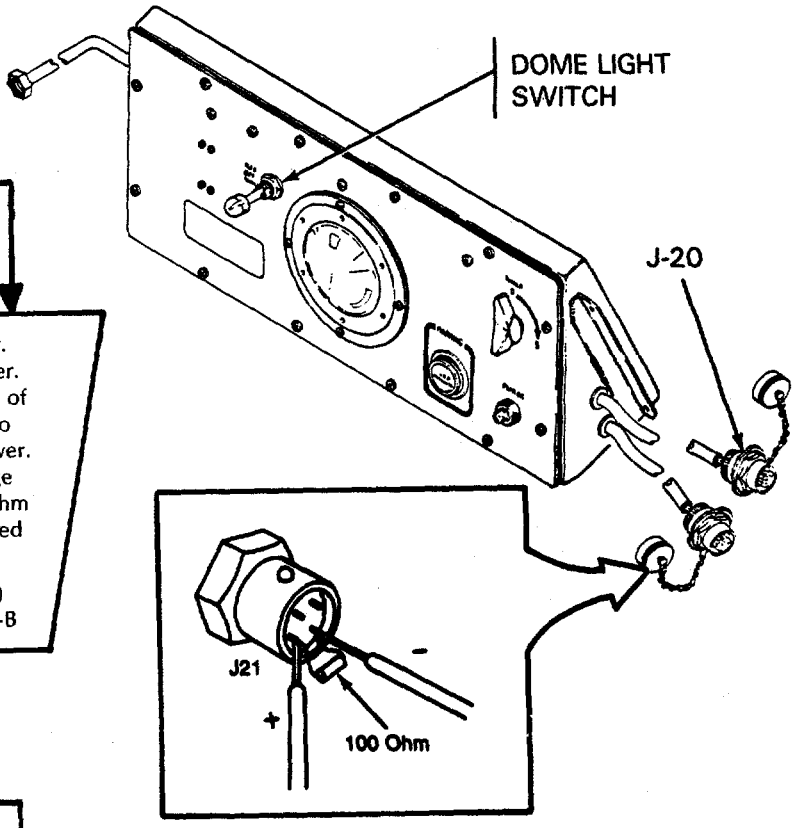
No

Yes

Proceed to page 2-21

Turn off power. Remove ammeter. Connect positive of power supply to J20-C. Apply power. Measure voltage across the 100 ohm resistor connected to:

(+)	(−)
J21-A	J21-B



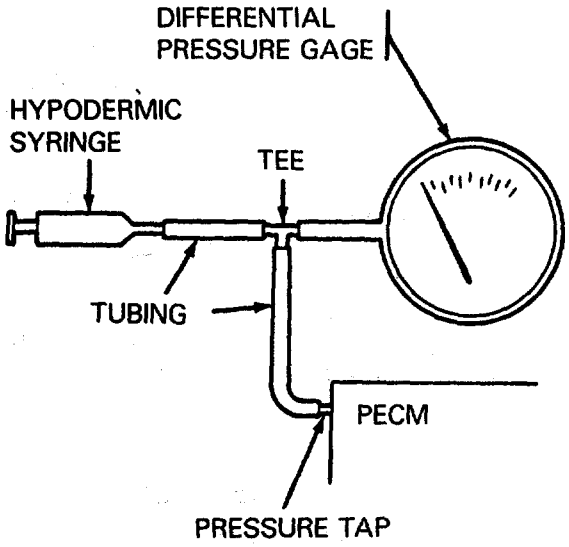
Was 22.5 to 26.5 V dc obtained?

No

Yes

Proceed to page 2-25.

Proceed to page 2-25.



Page 2-4

Connect low pressure side of differential pressure gage to vacuum source and to PECM pressure tap. Slowly increase vacuum to 0.4 in. wg and measure voltage across 100 ohm resistor connected to J21-A(+) and J21-B(−).

Was voltage 4.5 to 11.5 V dc?

No → Proceed to page 2-25.

Yes → Slowly increase vacuum to 0.8 in. wg. Reverse multimeter leads and measure voltage across 100 ohm resistor connected to J21-A(−) and J21-B(+).

Was voltage 4.5 to 11.5 V dc?

No → Proceed to page 2-25.

Yes → Increase vacuum to 1.3 in. wg and measure voltage across 100 ohm resistor connected to J21-A(−) and J21-B(+).

Was voltage 22.5 to 26.5 V dc?

No → Proceed to page 2-25.

Yes → Proceed to page 2-6.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-5

Apply 28 V dc to pin A of connector J20. (28 V dc is still being applied to pin C of J20). LOW PRESSURE and PURGE indicators should be off.

Is LOW PRESSURE switch/indicator off?

- No
- Yes

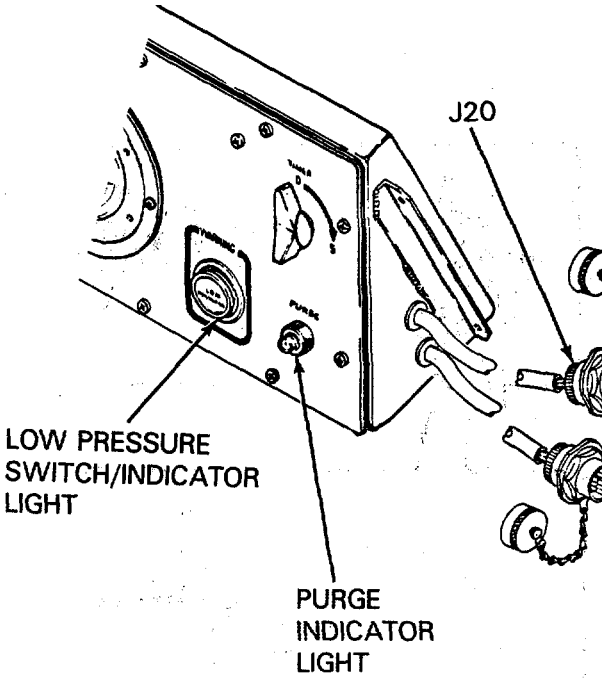
Is PURGE indicator light off?

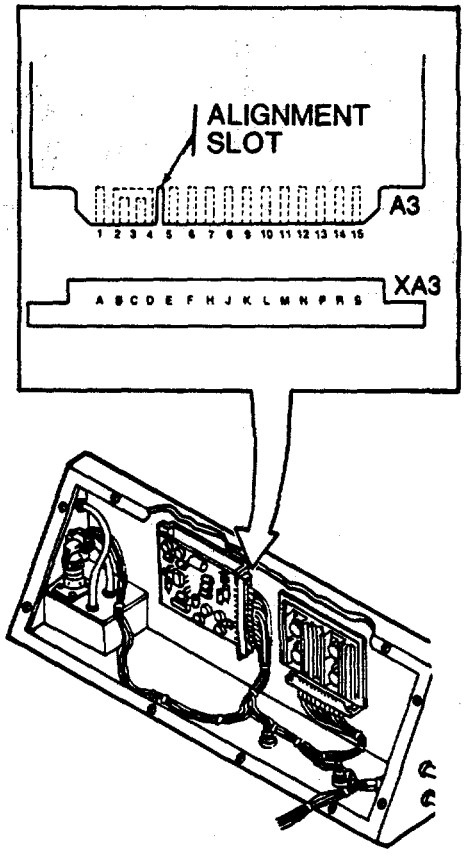
- No → Proceed to page 2-7.
- Yes → Proceed to page 2-9.

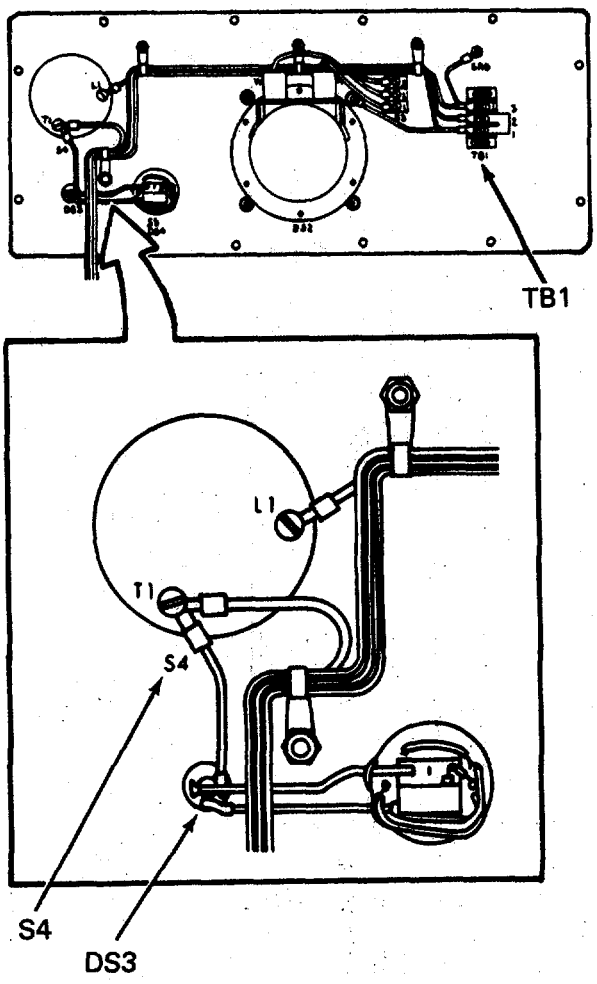
Remove power. Remove screws on PECM panel and lift up for access to components (p. 2-33). Remove switching card A3 (p. 2-39). Apply power.

Is LOW PRESSURE switch/indicator off?

- No → Proceed to page 2-8.
- Yes → Replace switching card A3 (p. 2-39). Repeat test on this page.







Page 2-6

Remove power. Remove screws on PECM panel and lift open for access to components (p. 2-33). Remove wire 10 at S4-T1. Measure for open between:

(+) S4-T1 (−) TB1-1

Was open obtained?

No

Remove wire 4 at S4-T1. Measure for open between:

(+) S4-T1 (−) TB1-1

Was open obtained?

No

Replace interval TIMER switch S4 (p. 2-37). Repeat test on page 2-6.

Yes

Repair wire 4 between S4-T1 and J20-D (p. 2-44). Repeat test on page 2-6.

Yes

Disconnect (unsolder) wire 10 at DS3-2. Measure for open between:

(+) DS3-2 (−) TB1-1

Was open obtained?

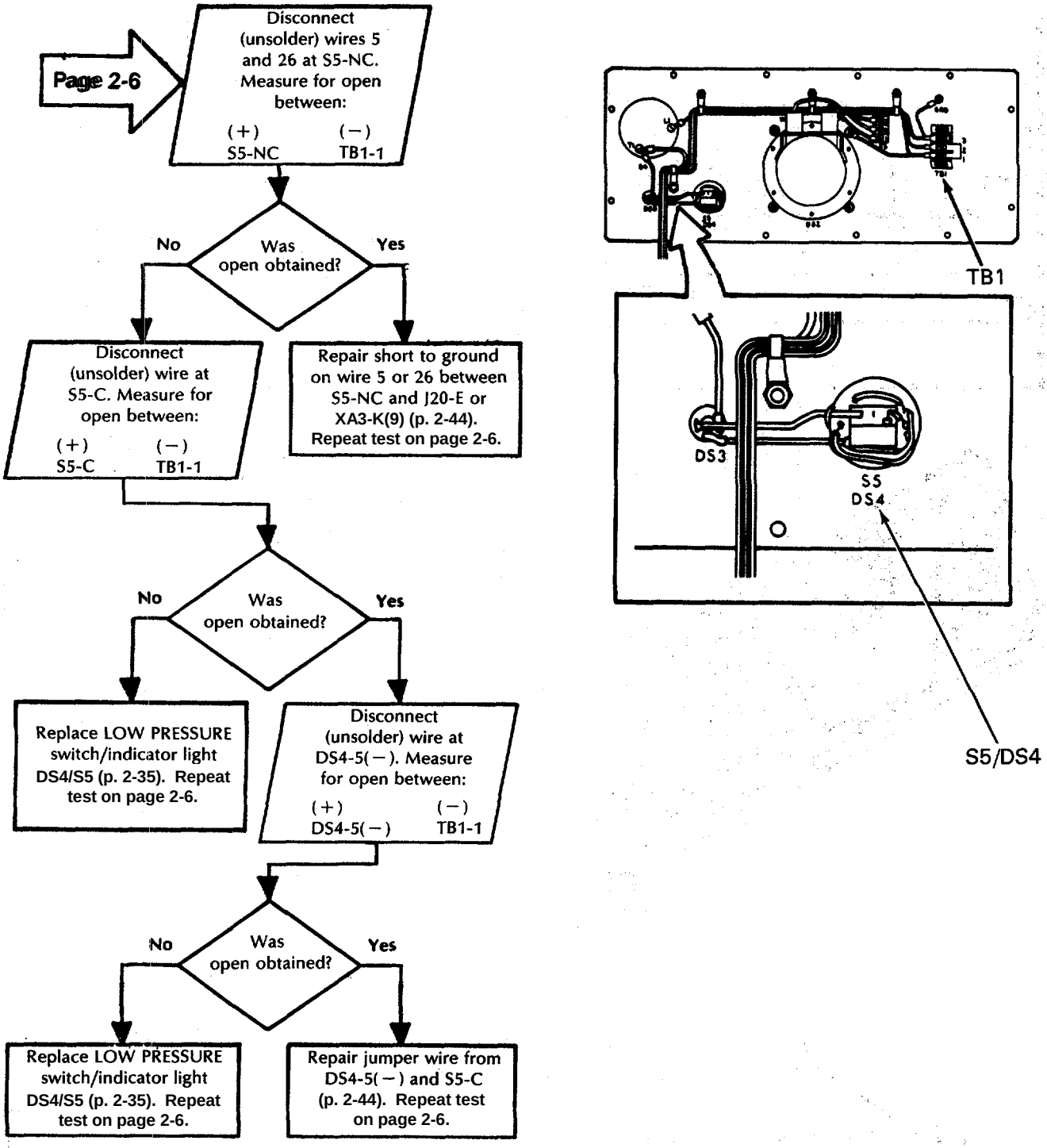
No

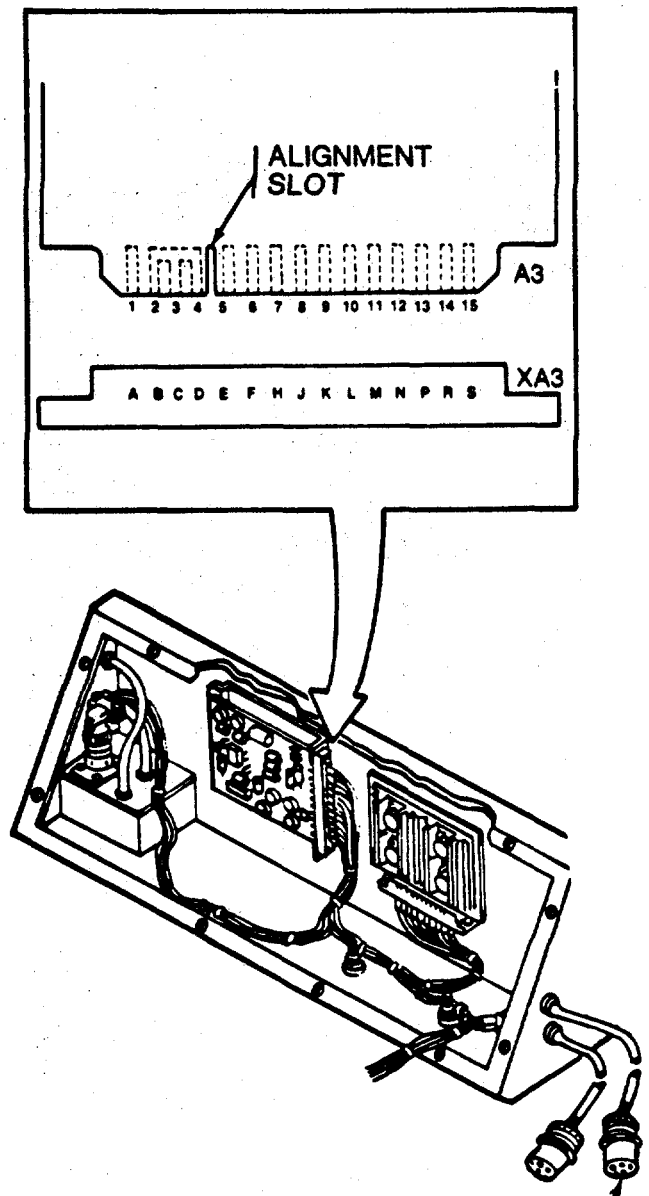
Replace PURGE indicator light DS3 (p. 2-36). Repeat test on page 2-6.

Yes

Repair wire 10 between DS3-2 and S4-T1 (p. 2-44). Repeat test on page 2-6.

2-6. TROUBLESHOOTING PROCEDURES (CONT).





Page 2-6

Press lens cover of LOW PRESSURE switch/indicator light DS4/D5.

Does LOW PRESSURE switch/ indicator light?

No

Yes

Does LOW PRESSURE switch/ indicator light go out when released?

No

Yes

Remove power. Replace LOW PRESSURE switch/indicator light DS4/S5 (p. 2-35). Apply power. Repeat test on this page.

Proceed to page 2-11.

Remove power. Remove lens cover on LOW PRESSURE switch/indicator light DS4/D5. Remove both lamps and check for continuity.

Are lamps good?

No

Yes

Replace lamps (p. 2-35). *Repeat test on this page.*

Remove power. Remove screws on PECM panel and lift open for access to components. Measure continuity between:

(+) S5-NO

(−) J20-B

Was continuity obtained?

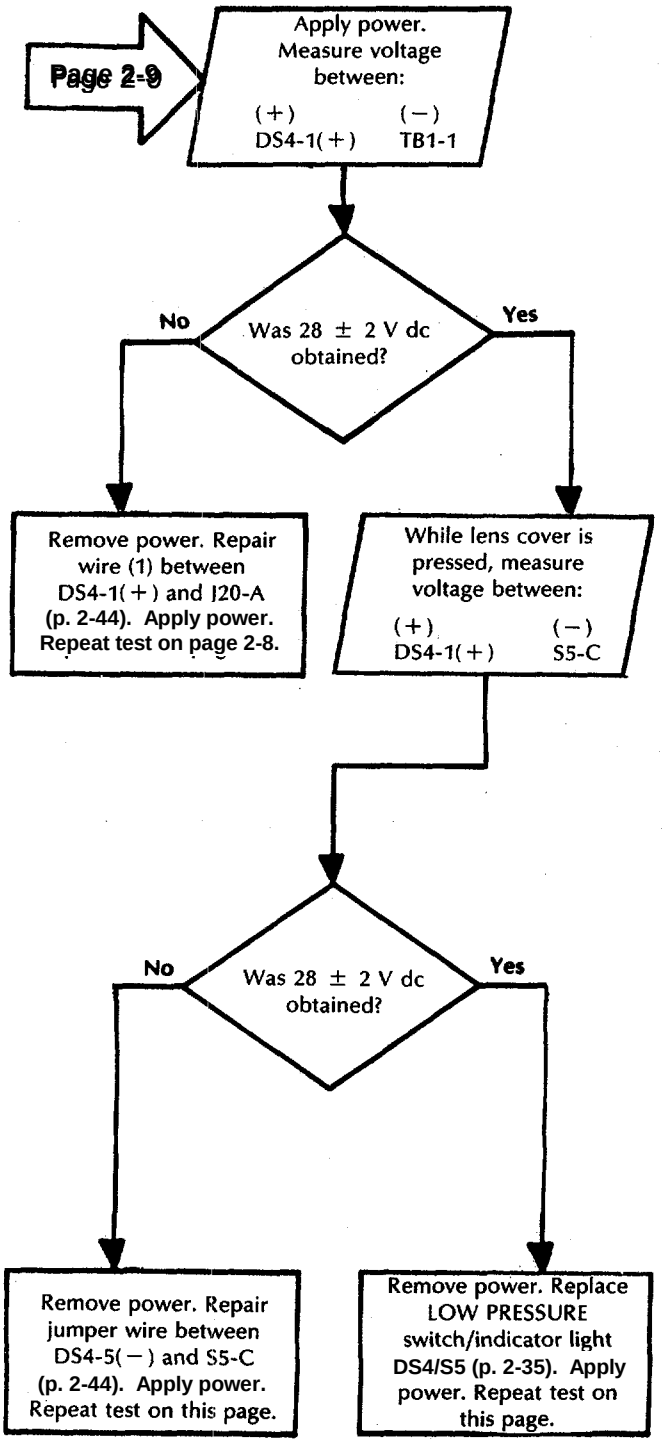
No

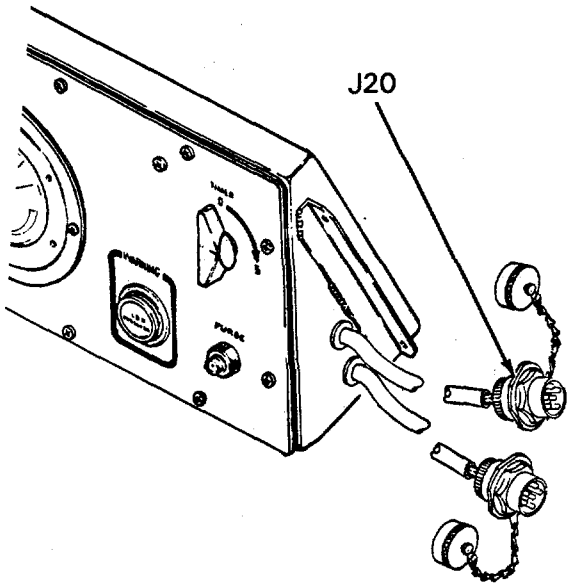
Yes

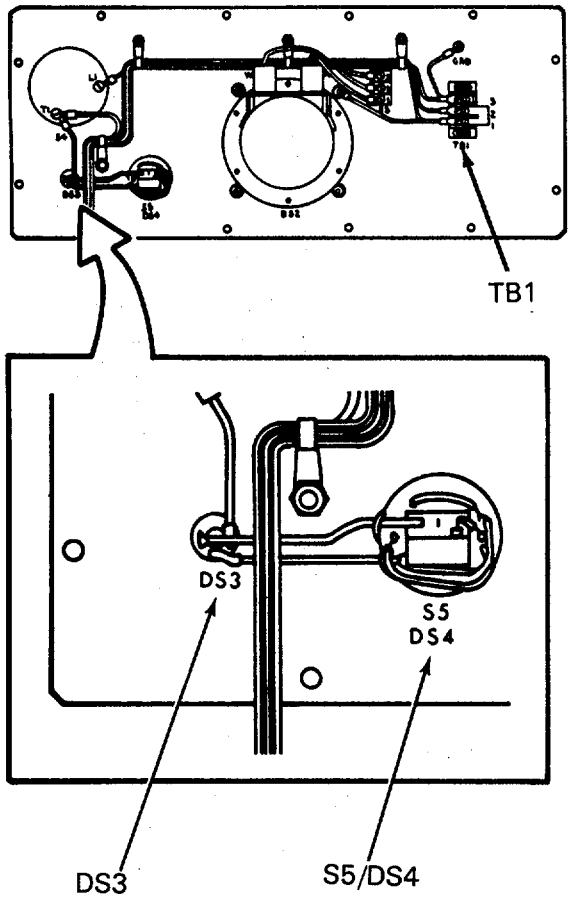
Repair open wires 13, 11, 9, 2 or jumper between S5-NO and J20-B (p. 2-44). Apply power. Repeat test on this page.

Proceed to page 2-10.

2-6. TROUBLESHOOTING PROCEDURES (CONT).







Page 2-9

Press lens cover of PURGE indicator light DS3.

Does PURGE indicator light?

No

Yes

Does PURGE indicator light go out when lens cover is released?

No

Yes

Remove power. Replace PURGE indicator light DS3 (p. 2-36). Apply power. Repeat test on this page.

Proceed to page 2-13.

Unscrew lens. Remove lamp and check for continuity.

Are lamps good?

No

Yes

Replace lamps (p. 2-36). Repeat test on this page.

Remove power. Remove screws on PECM panel and lift open for access to components (p. 2-33). Measure continuity between:

(+) DS3-3

(−) TB1-1

Was continuity obtained?

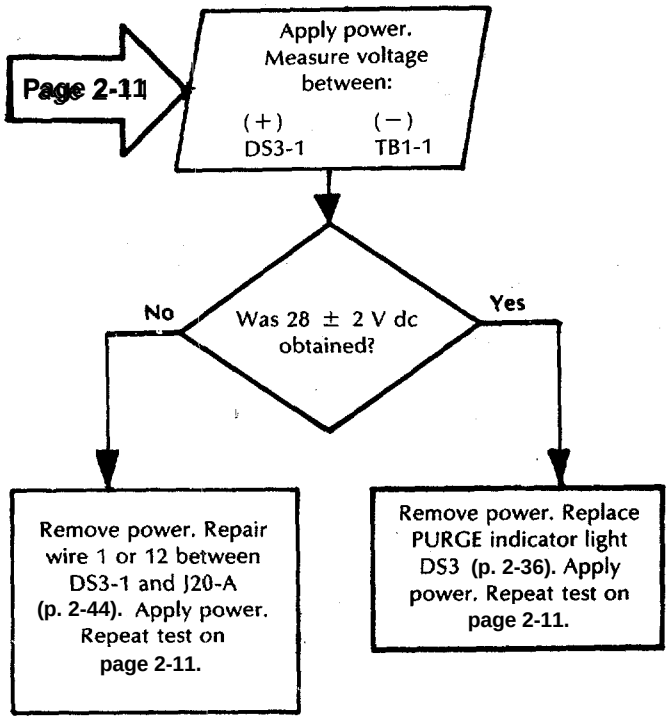
No

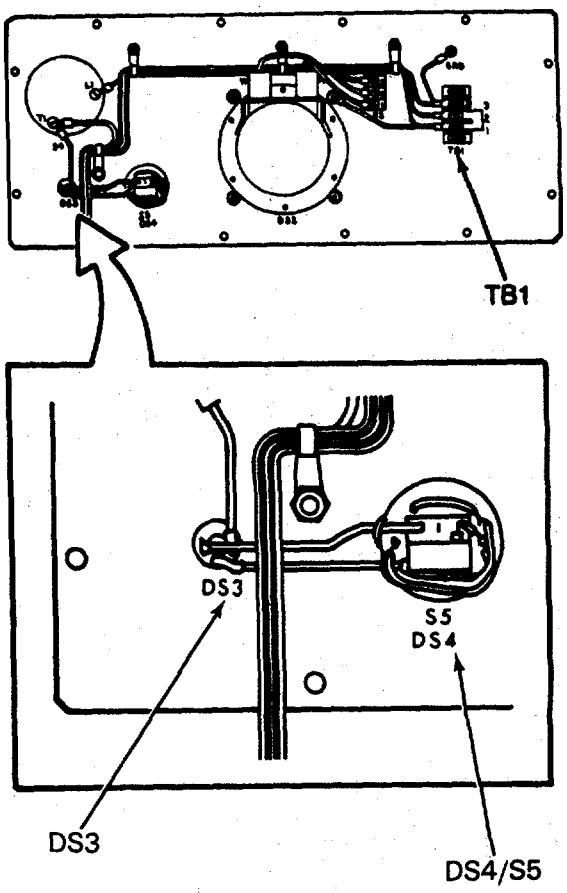
Yes

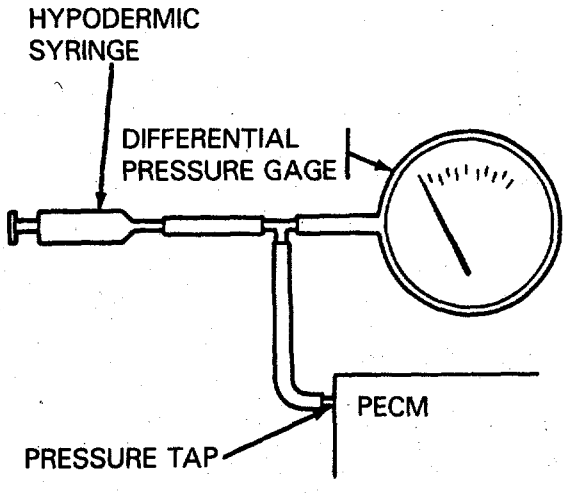
Repair wire 9 or 11 between DS3-3 and TB1-1 (p. 2-44). Repeat test on this page.

Proceed to page 2-12.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

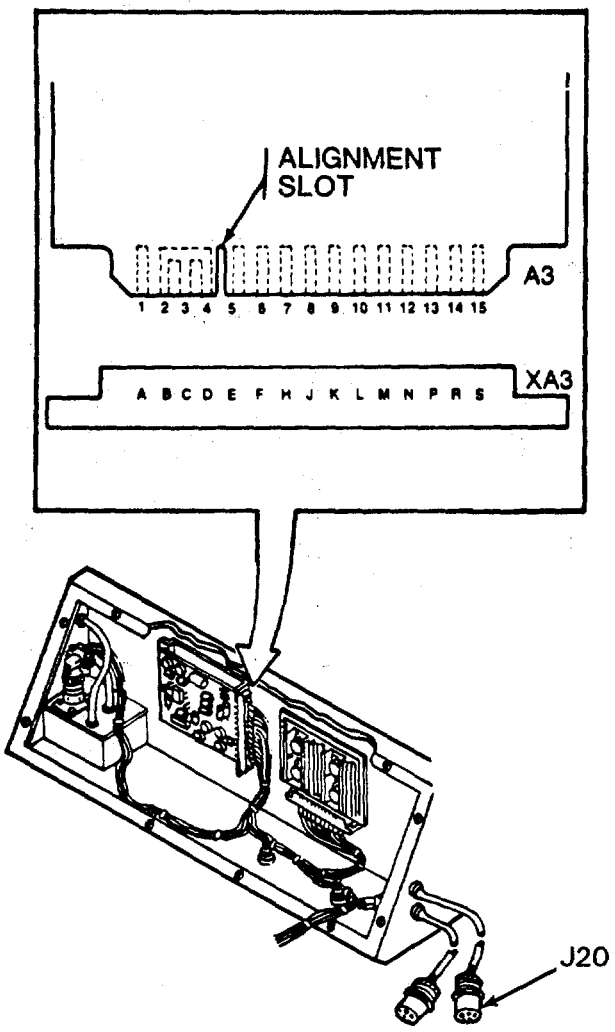






CAUTION

Do not touch other pins in J20 to avoid shorting out components on XA3 switching card.



Page 2-11

Measure voltage between:

(+) 28 V dc positive (−) J20-E

Slowly decrease vacuum from 1.3 in. wg until LOW PRESSURE switch/ indicator light DS4/D5 comes on and voltmeter indicates 28 ± 2 V dc. Both indications should occur between 0.10 and 0.30 in. wg.

Did LOW PRESSURE indicator light in range of 0.10 to 0.30 in. wg?

No

Yes

Did voltmeter indicate 28 ± 2 V dc?

No

Yes

Repair wire (5) between S5-NC and J20-E (p. 2-44). Repeat test on this page.

Proceed to page 2-15.

Vary vacuum from 0 in. wg to 2.0 in. wg.

Did LOW PRESSURE switch/indicator light at any vacuum in this range?

No

Yes

Proceed to page 2-14.

Replace switching card A3 (p. 2-39). Repeat test on this page.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-13

Remove power. Remove screws on PECM panel and lift up for access to components (p. 2-33). Apply power and adjust vacuum to 0 in. wg. Measure voltage between:

(+) 28 V dc positive (−) XA3-K(9)

Was 28 ± 2 V dc obtained?

No

Remove power. Replace switching card A3 (p. 2-39). Apply power. Repeat test on page 2-13.

Yes

Measure voltage between:

(+) S5-NC (−) TB1-1

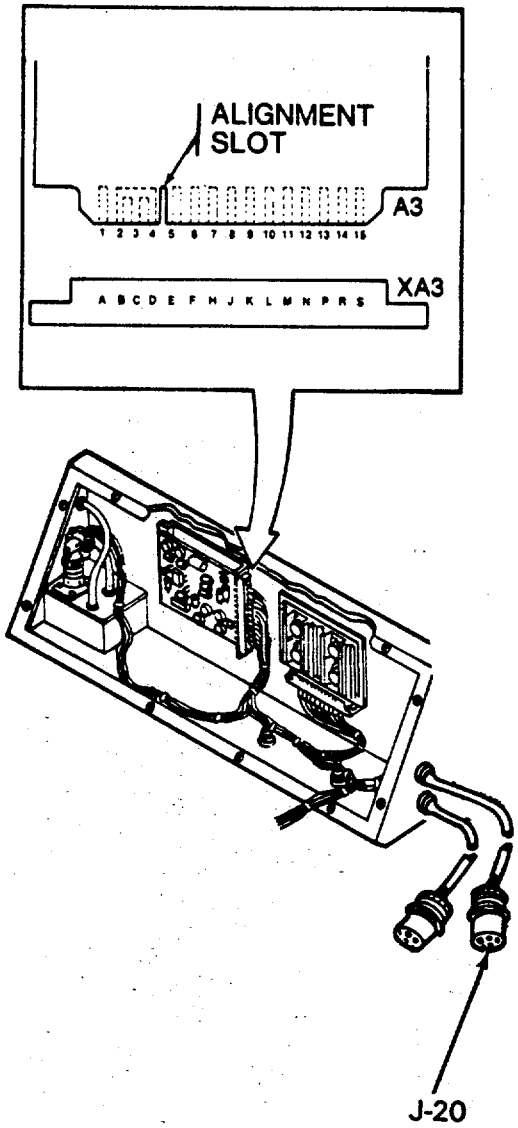
Was 0 V dc obtained?

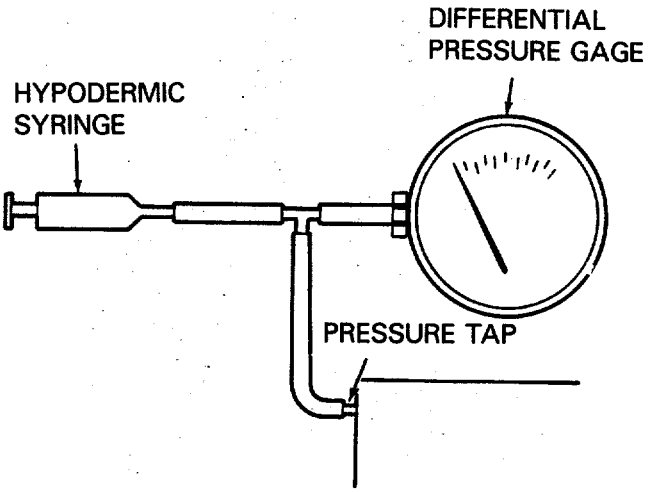
No

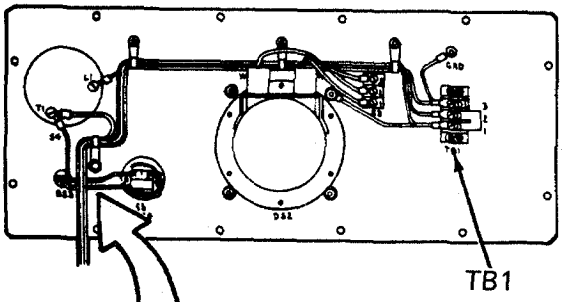
Remove power. Repair wire (26) between XA3-K(9) and S5-NC (p. 2-44). Apply power. Repeat test on page 2-13.

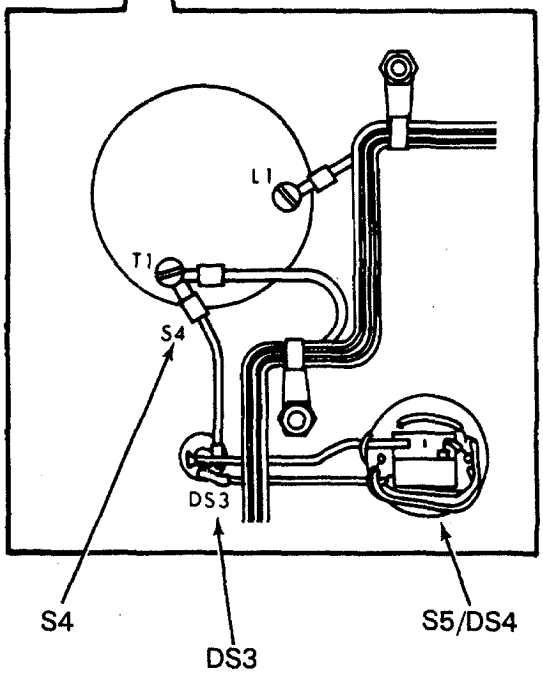
Yes

Remove power. Replace LOW PRESSURE switch/indicator light DS4/S5 (p. 2-35). Apply power. Repeat test on page 2-13.









Page 2-13

Measure voltage between:
(+) (-)
28 V dc positive J20-D

Turn timer slightly to right (1/4 of way to 5 position).

Did purge indicator light?

Did multimeter indicate 28 ± 2 V dc?

Remove power. Remove screws on PECM panel and lift up for access to components (p 2-33). Repair wire (4) between S4-T1 and J20-D (p. 2-44). Apply power. Repeat test on this page.

Proceed to page 2-16.

Remove power. Remove screws on PECM panel and lift up for access to components (p. 2-33). Apply power. Measure voltage between:
(+) (-)
S4-T1 TB1-1

Was 0 V dc obtained?

Measure voltage between: (Make sure timer is running.)
(+) (-)
DS3-2 TB1-1

Measure voltage between:
(+) (-)
S4-L1 TB1-1

Was 0 V dc obtained?

Was 0 V dc obtained?

Remove power. Repair wires #2, #9, and TB1 jumper from S4-L1 (p. 2-44). Apply power. Repeat test on this page.

Remove power. Replace interval TIMER switch S4 (p. 2-37). Apply power. Repeat test on this page.

Remove power. Repair wire (10) between DS3-2 and S4-T1 (p. 2-44). Apply power. Repeat test on this page.

Remove power. Replace PURGE indicator light DS3 (p. 2-36). Apply power. Repeat test on this page.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-15

The PURGE indicator light DS3 should go out and multimeter should indicate zero when interval TIMER switch nears 0 position.

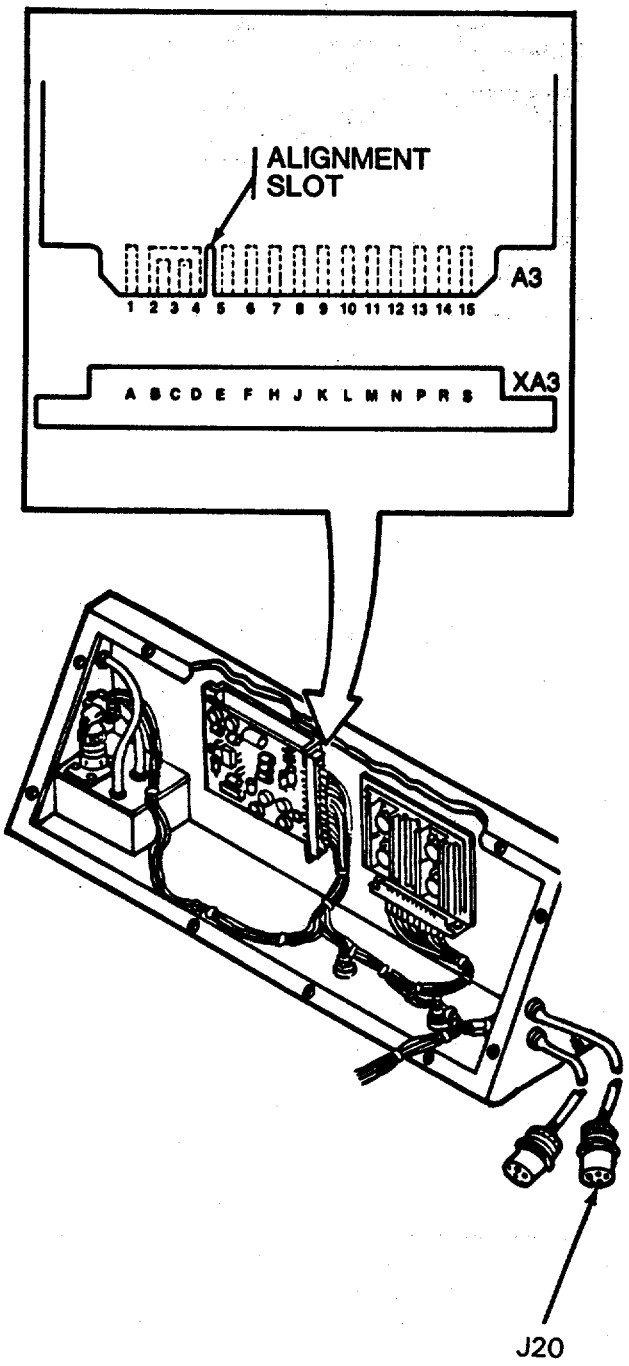
Does PURGE indicator light go out and the voltmeter read zero?

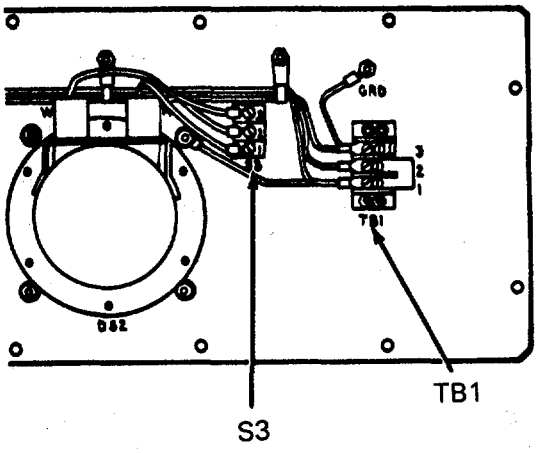
No

Remove power. Replace timer switch S4 (p. 2-37). Apply power. Repeat test on page 2-14.

Yes

Proceed to 2-17.





Page 2-16

Apply 28 V dc to J20 as follows:

J20-G – Positive
J20-B – Negative

Dome light switch should be in OFF position.

Is dome light off?

No

Remove power. Replace dome light switch S3 (p. 2-34). Apply power. Repeat test on this page.

Yes

Switch dome light switch to RED position.

Does red light come on?

No

Remove power. Remove screws on PECM panel and lift up for access to components Apply power. Measure voltage.

(+)	(–)
S3-2	TB1-1

Was 28 ± 2 V dc obtained?

No

Remove power. Repair wire (7) from J20-G to S3-2 (p. 2-44). Apply power. Repeat test on this page.

Yes

Proceed to page 2-18.

Yes

Switch dome light switch to WHITE position.

Does white light come on?

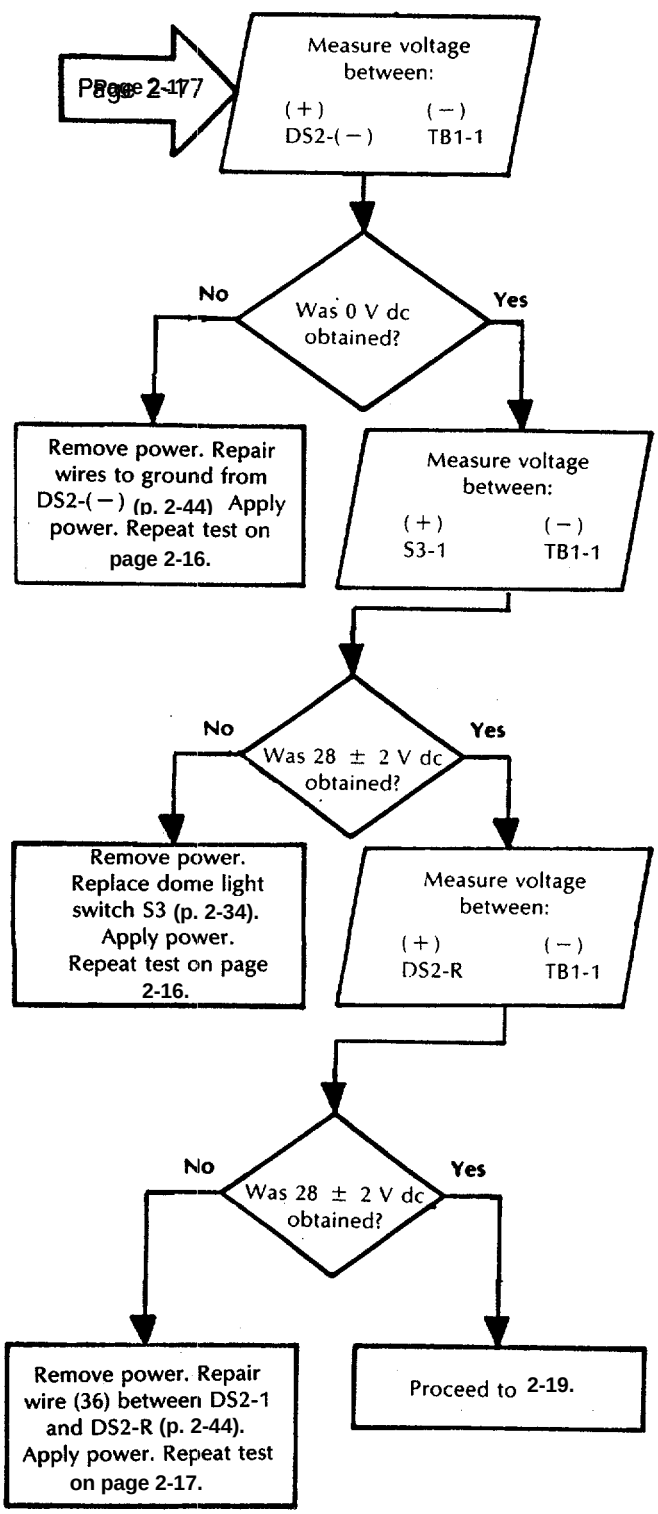
No

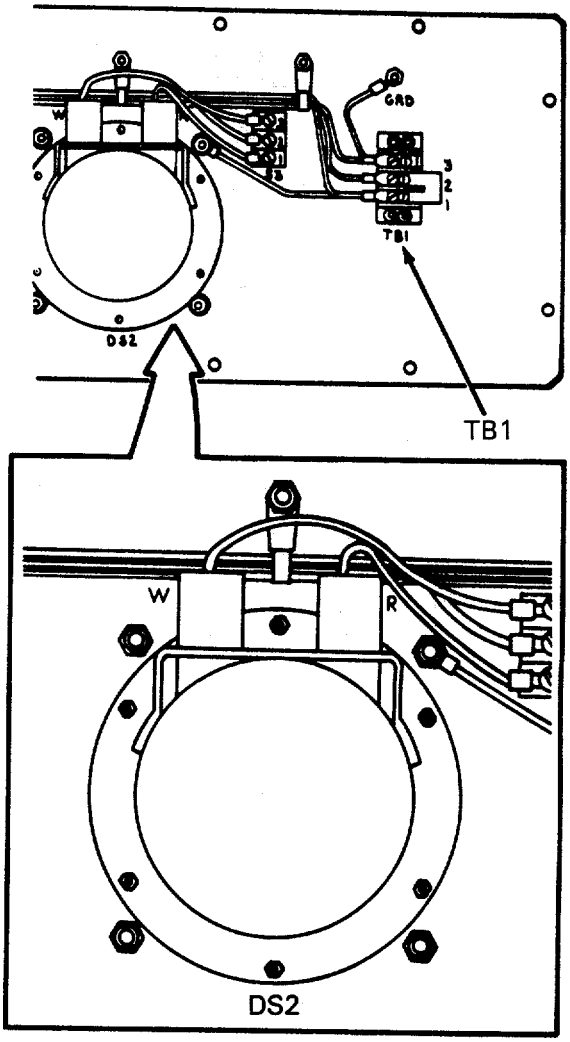
Proceed to page 2-20.

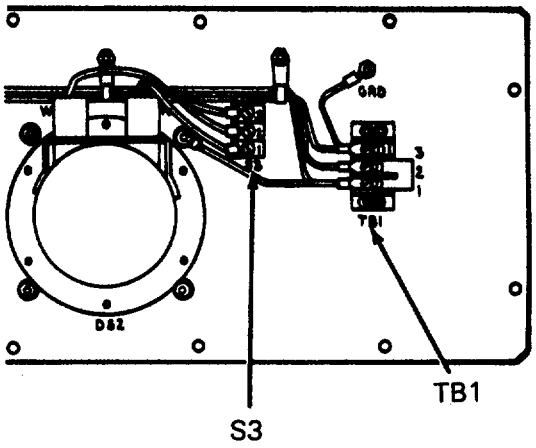
Yes

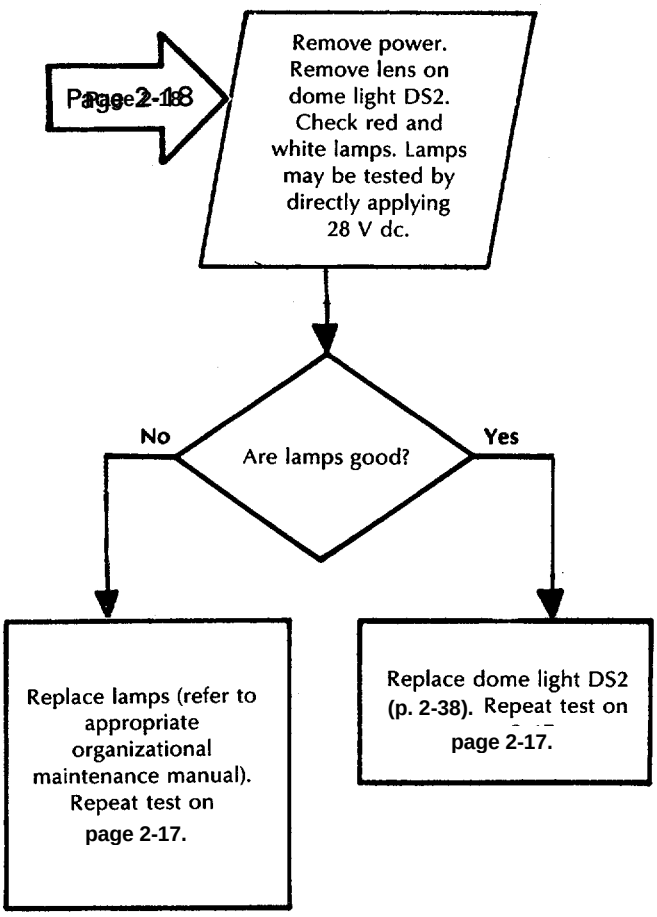
This completes checkout of PECM. Remove power and vacuum connections.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

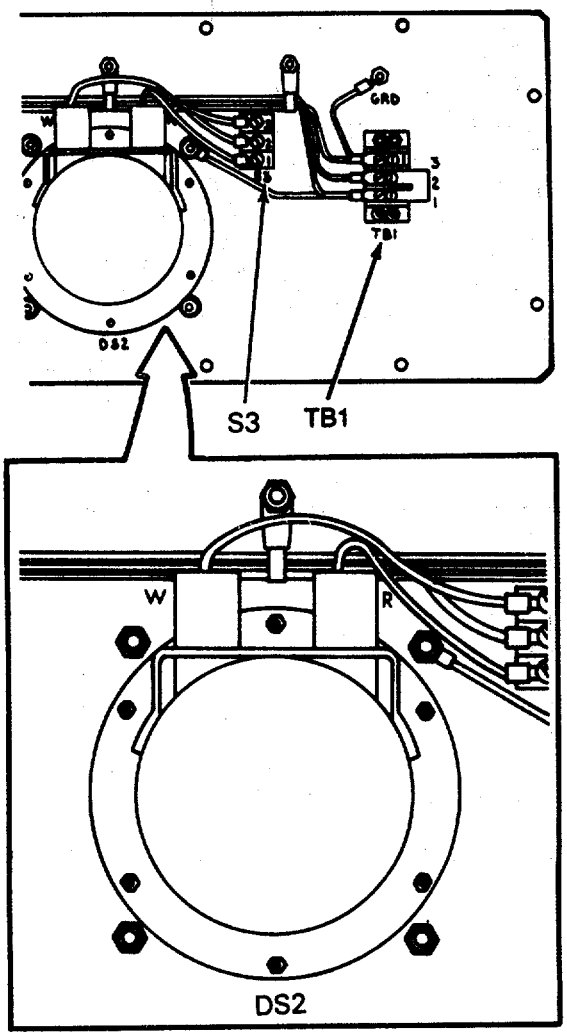





GRD
3
2
1
TB1
DS2
S3
TB1


Page 2-18
Remove power. Remove lens on dome light DS2. Check red and white lamps. Lamps may be tested by directly applying 28 V dc.
No
Are lamps good?
Yes
Replace lamps (refer to appropriate organizational maintenance manual). Repeat test on page 2-17.
Replace dome light DS2 (p. 2-38). Repeat test on page 2-17.

2-6. TROUBLESHOOTING PROCEDURES (CONT).



Page 2-17

Remove power. Remove screws on PECM panel and lift up for access to components (p. 2-33). Apply power. Measure voltage between:

(+)	(−)
S3-3	TB1-1

Was 28 ± 2 V dc obtained?

No → Remove power. Replace dome light switch S3 (p. 2-34). Repeat test on page 2-17.

Yes → Measure voltage between:

(+)	(−)
DS2-W	TB1-1

Was 28 ± 2 V dc obtained?

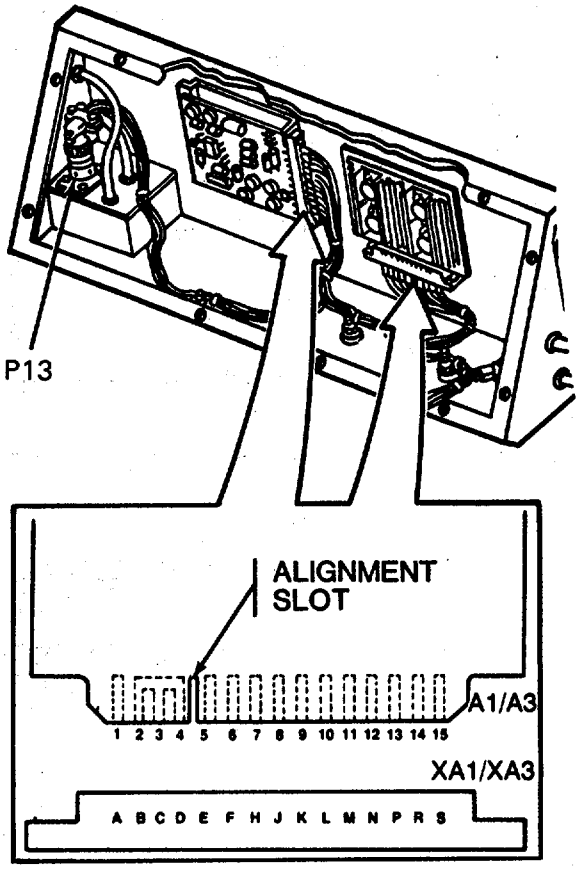
No → Remove power. Repair wire (35) between S2-3 and DS2-W (p. 2-44). Apply power. Repeat test on page 2-17.

Yes → Remove power. Remove lens on dome light DS2. Check white lamp. Lamp may be checked by applying 28 V dc directly to it.

Is lamp good?

No → Replace lamp (refer to appropriate organizational manual). Repeat test on page 2-17.

Yes → Replace dome light DS2 (p. 2-38). Repeat test on page 2-17.



Page 2-4

Remove power. Remove screws from PECM panel and lift up for access to components (p. 2-33) Remove printed circuit cards A1 and A3 (p. 2-39 and 2-40).

Install jumpers as indicated.

From	To
XA1-L(10)	XA3-E(5)
XA3-C(3)	XA3-D(4)

Apply 28 V dc power as described on page 2-44.

Is current less than 1/2 A?

No

Remove power. Disconnect pressure transducer plug P13. Apply power.

Is current less than 1/2 A?

No

Remove power. Repair wire #3 (short) from J20-C to XA1-L(10) or wire #5 from XA3-E to P13-A(p. 2-44). Reconnect plug P13 and install cards A1 and A3. Repeat test on page 2-4.

Yes

Remove power. Replace pressure transducer MT1 (p. 2-41). Remove jumpers and install cards A1 and A3. Repeat test on page 2-4.

Yes

Remove power. Remove jumpers and connect as follows:

From	To
XA1-K(10)	XA1-L(9)

This connection completes the power to the switching card A3 which is normally provided by the power card A1. Apply power.

Is current less than 1/2 A?

No

Remove power. Repair wire #29 between XA1-9 and XA3-6 (p. 2-44). Install cards A1 and A3. Repeat test on page 2-4.

Yes

Remove jumper. Proceed to page 2-22.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-21

Remove power.
Measure diodes on switching card A3 to verify that they are not shorted.
Measure resistance between:

Diode	(+)	(−)
A3CR2	TP-J	TP-H
A3CR3	TP-J	A3-B(3)
A3CR4	TP-K	A3-B(3)
A3CR5	TP-K	TP-L

Was resistance greater than 1 K ohm for all measurements?

No → Replace switching card A3 (p. 2-39). Repeat test on page 2-4.

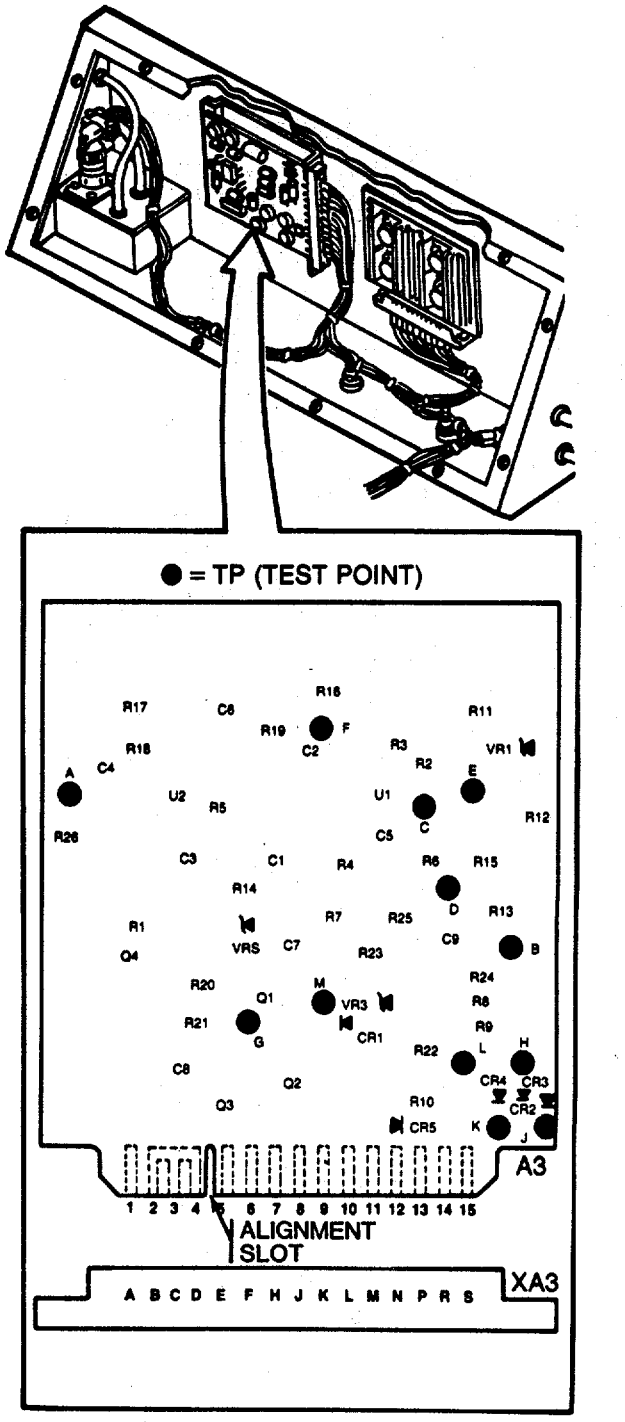
Yes → Measure the resistance at the output of switching card A3 between:

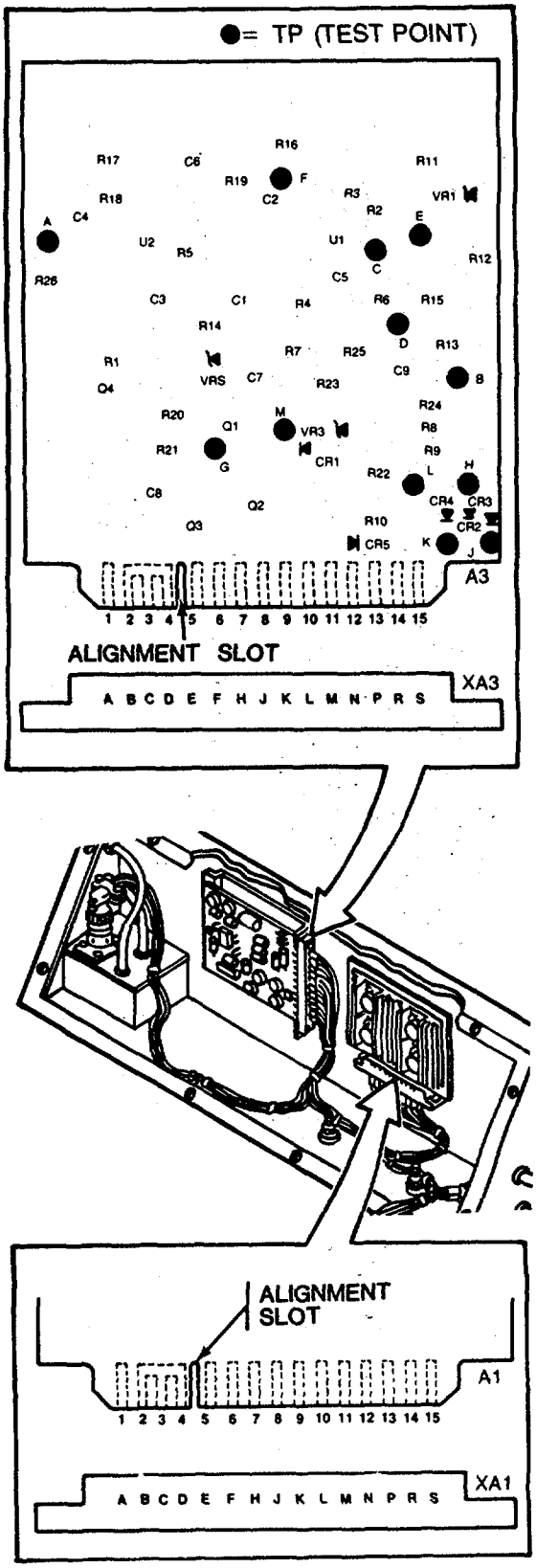
(+)	(−)
A3-TP-M	A3-C(3)
A3-TP-G	A3-C(3)

Was resistance greater than 1 K ohm obtained?

No → Replace switching card A3 (p. 2-39). Repeat test on page 2-4.

Yes → Proceed to page 2-23.





Page 2-22

Install switching card A3 and power card A1. Measure resistance between:

(+)	(−)
A3-TP-M	TB1-1
A3-TP-H	TB1-1
A3-TP-G	TB1-1
A3-TP-L	TB1-1

Was resistance greater than 1 kilo ohm obtained?

No → Repair wiring (p. 2-44) connected to terminals of XA1-B(2), C(3), D(4), E(5), N(12), P(13), R(14), or S(15). Repeat test on page 2-4.

Yes → Remove power card A1. Connect jumper between XA1-K (9) and XA1-L (10). Apply power.

Is current less than 1/2 A?

No → Remove power. Replace switching card A3 (p. 2-39). Remove jumper and install card A1. Repeat test on page 2-4.

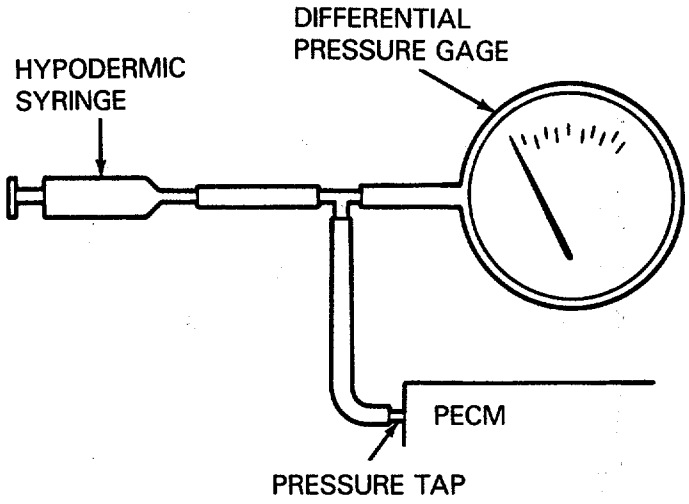
Yes → Proceed to page 2-24.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-23

Apply vacuum to the PECM as indicated below and measure test point (TP) voltage on switching card A3 with respect to TB1-1 as indicated:

Vacuum (in. wg)	Volts TP-M	TP-G
0	25 ± 2	< 1
0.4	9.3 ± 3.5	< 1
0.6	< 1	< 1
0.8	< 1	9.3 ± 3.5
1.3	< 1	25.3 ± 2



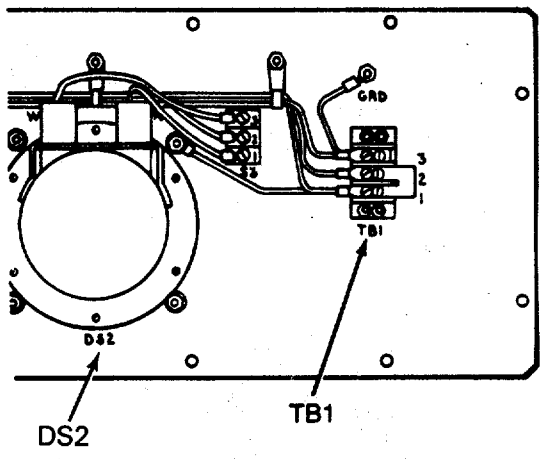
Was specified voltage obtained in all cases?

No

Remove power. Replace switching card A3 (p. 2-39). Repeat test on page 2-4.

Yes

Remove power. Remove XA1 jumper. Install power card A1. Apply power.



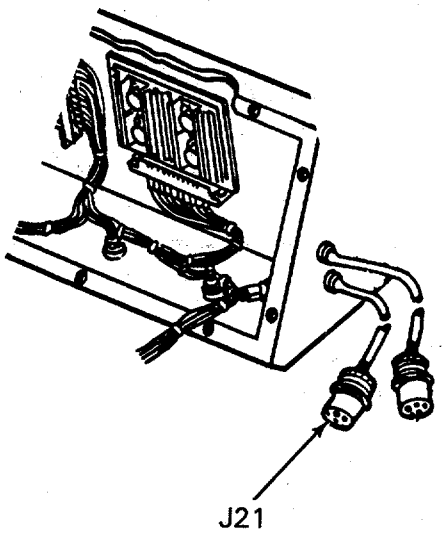
Is current less than 1/2 A?

No

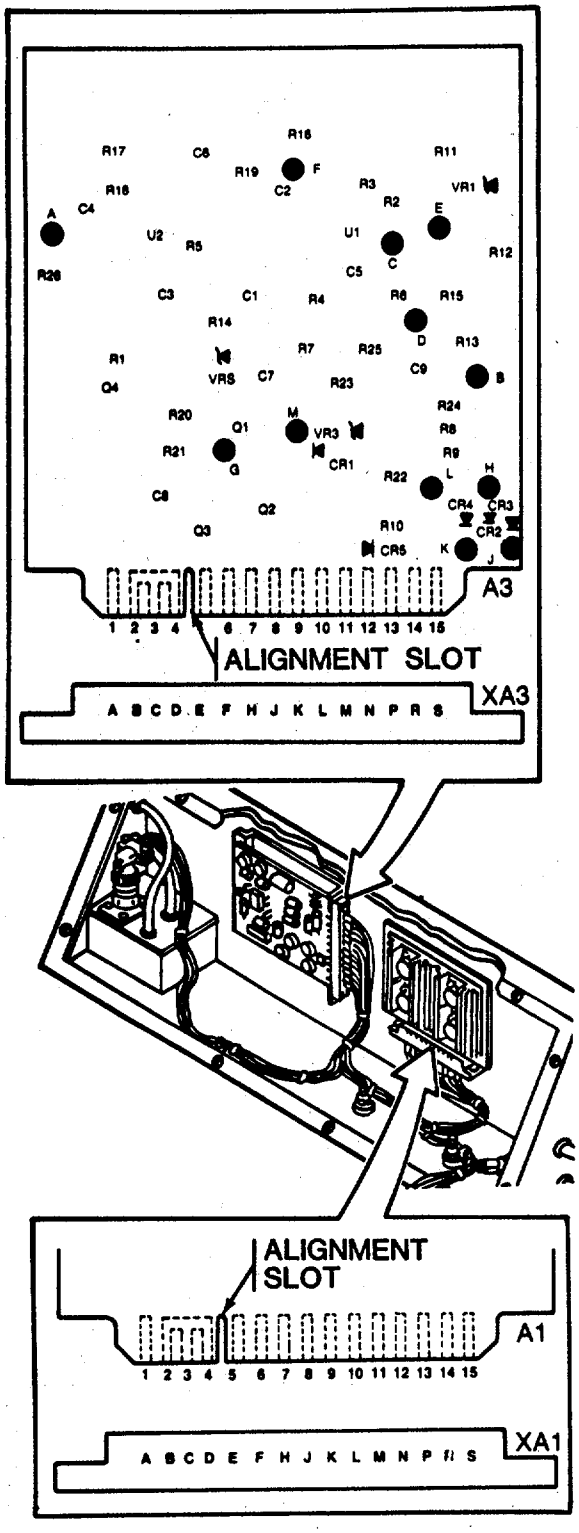
Remove power. Replace power card A1 (p. 2-40). Repeat test on page 2-4.

Yes

Repeat test on page 2-4.



● = TP (TEST POINT)



Page 2-4 and Page 2-5

Remove power. Remove screws from PECM panel and lift up for access to components (p. 2-33). Apply power. Measure voltage between:

(+) A3-TP-J (−) A3-TP-K

Was 22.5 to 26.5 V dc obtained?

No

Remove power. Repair wiring (p. 2-44) for continuity between:

Wire No.	From (+)	To (−)
20	XA3-S(15)	XA1-B(2)
21	XA3-R(14)	XA1-E(5)
31	XA1-C(3)	J21-A
32	XA1-D(4)	J21-B

Repeat test on page 2-4

Yes

Measure voltage between:

(+) A2-TP-B (−) TB1-1

Was 28 ± 2 V dc obtained?

No

Remove power. Repair wire (3) between J20-C and XA1-10 (p. 2-44) Apply power. Repeat test on page 2-4.

Yes

Measure voltage between:

(+) A3-TP-B (−) XA3-C(3)

Was 28 ± 2 V dc obtained?

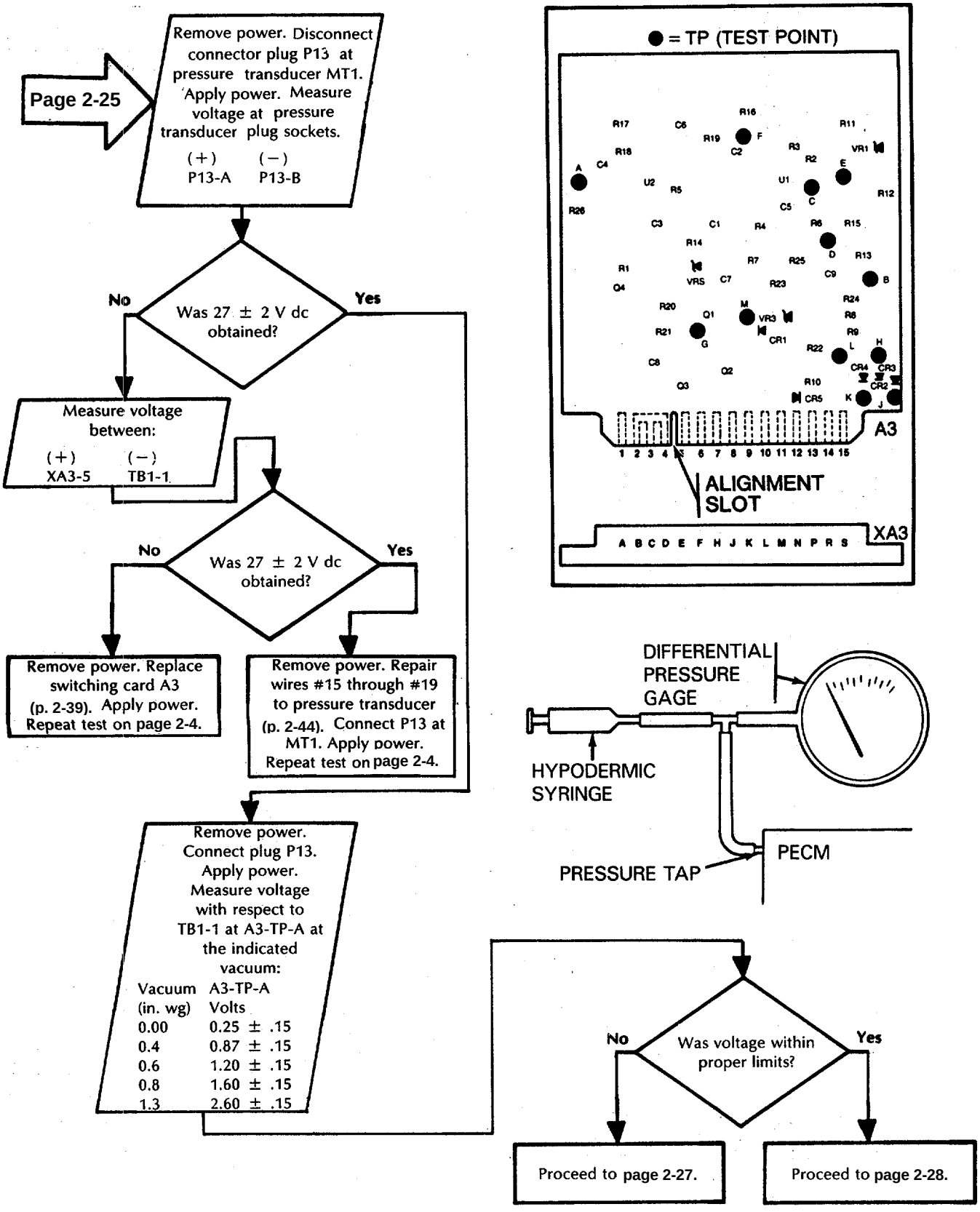
No

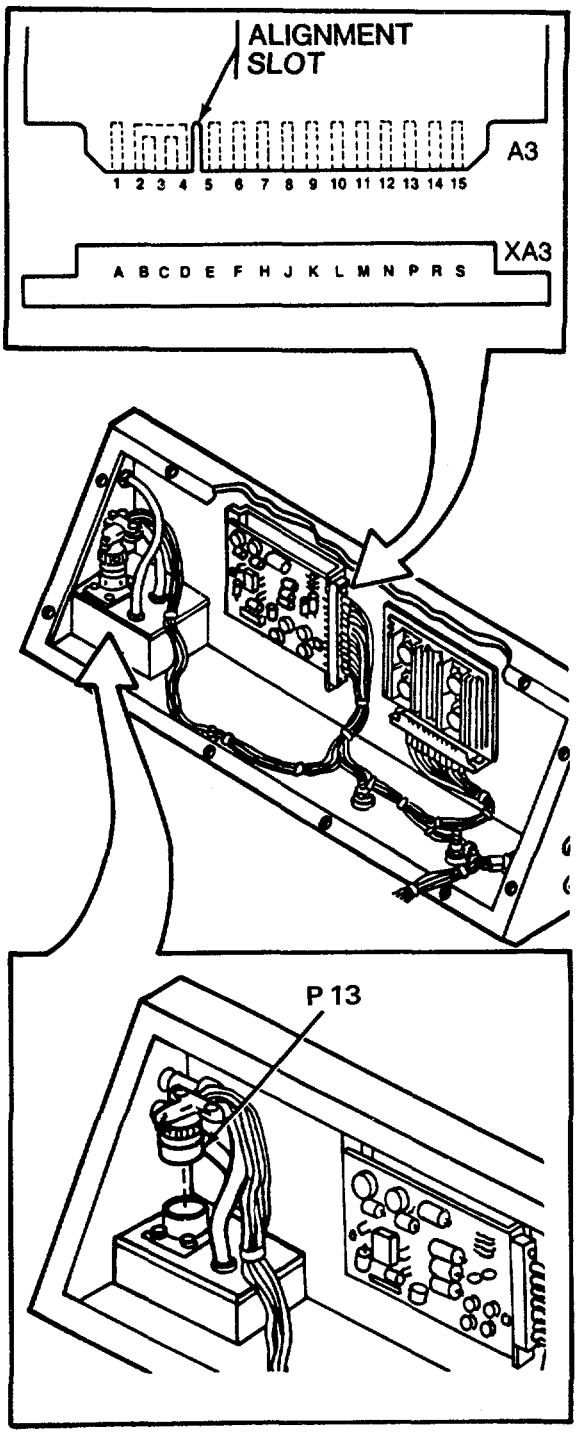
Remove power. Repair wire #30 between TB1-1 and XA3-C(3) and wire #34 between TB1-1 and XA1-H(7) (p. 2-44) Apply power and repeat test on page 2-4.

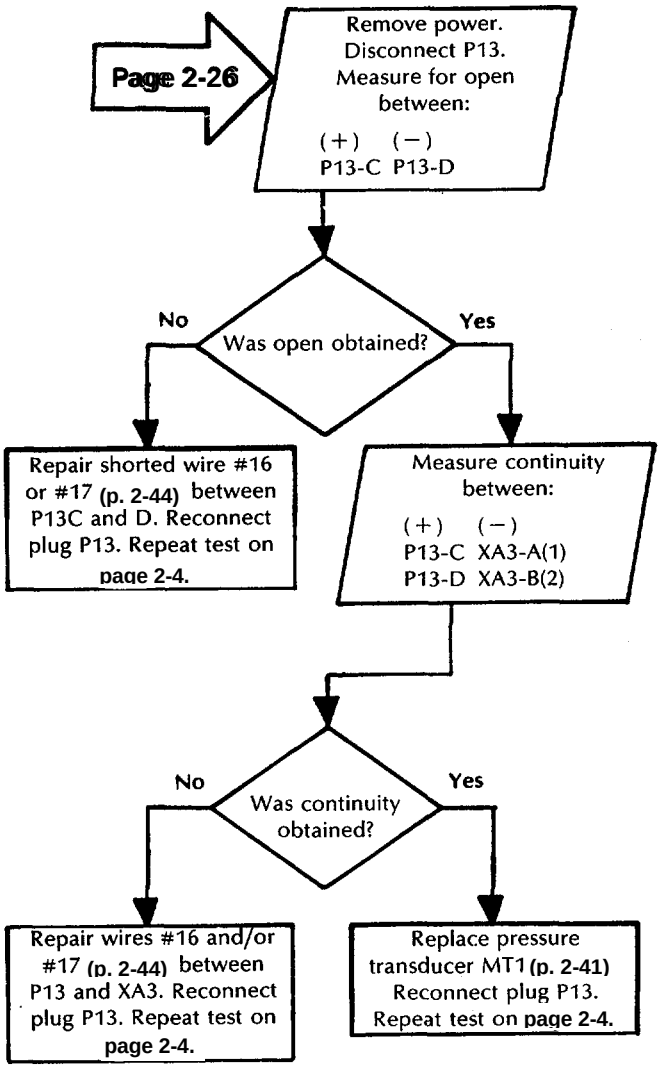
Yes

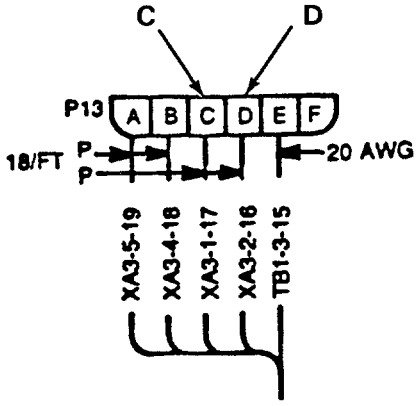
Proceed to page 2-26.

2-6. TROUBLESHOOTING PROCEDURES (CONT).




ALIGNMENT SLOT
A3
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
XA3
A B C D E F H J K L M N P R S
P 13


Page 2-26
Remove power. Disconnect P13. Measure for open between:
(+) P13-C
(−) P13-D
Was open obtained?
No
Yes
Repair shorted wire #16 or #17 (p. 2-44) between P13C and D. Reconnect plug P13. Repeat test on page 2-4.
Measure continuity between:
(+) P13-C XA3-A(1)
(−) P13-D XA3-B(2)
Was continuity obtained?
No
Yes
Repair wires #16 and/or #17 (p. 2-44) between P13 and XA3. Reconnect plug P13. Repeat test on page 2-4.
Replace pressure transducer MT1 (p. 2-41) Reconnect plug P13. Repeat test on page 2-4.


C
D
P13
A B C D E F
18/FT
20 AWG
XA3-5-19
XA3-4-18
XA3-1-17
XA3-2-16
TB1-3-15

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-26

Remove power.
Remove switching card A3 (p. 2-39).
Measure diodes on switching card to verify that they are not shorted.
Measure resistance between:

Diode	(+)	(−)
A3CR2	TP-J	TP-H
A3CR3	TP-J	A3-C(3)
A3CR4	TP-K	A3-C(3)
A3CR5	TP-K	TP-L

Was resistance greater than 1 kilohm for all measurements?

No → Replace switching card A3 (p. 2-39). Repeat test on page 2-4.

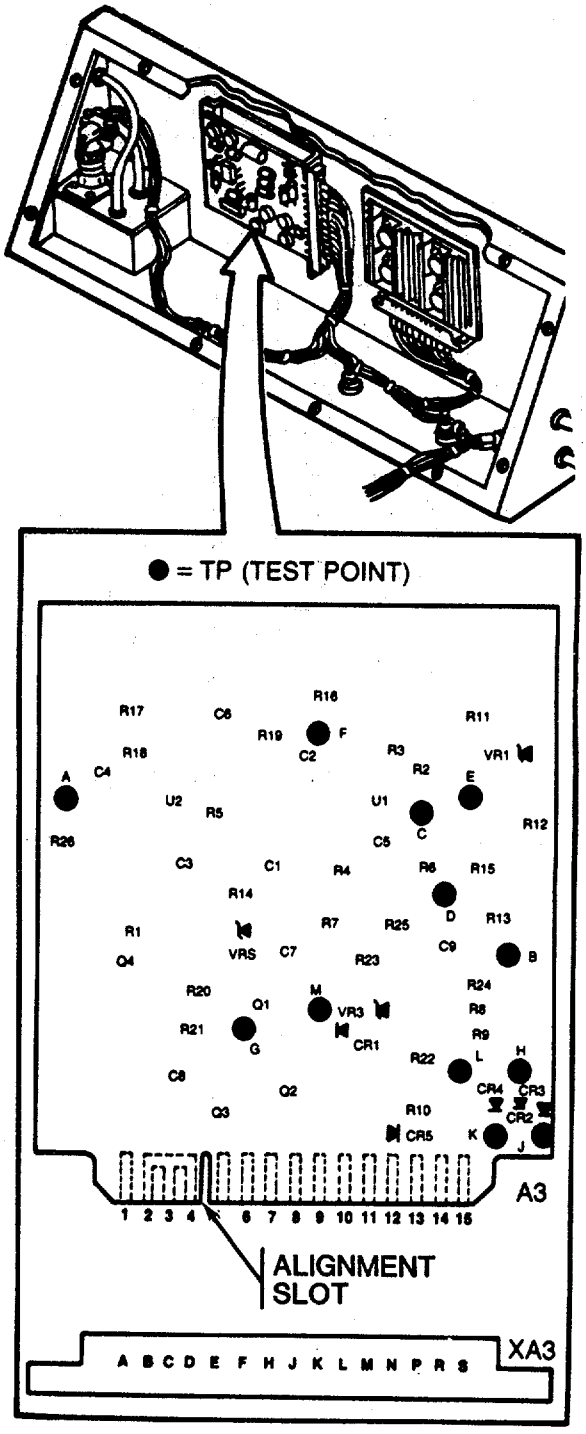
Yes → Measure resistance at output of switching card A3 between:

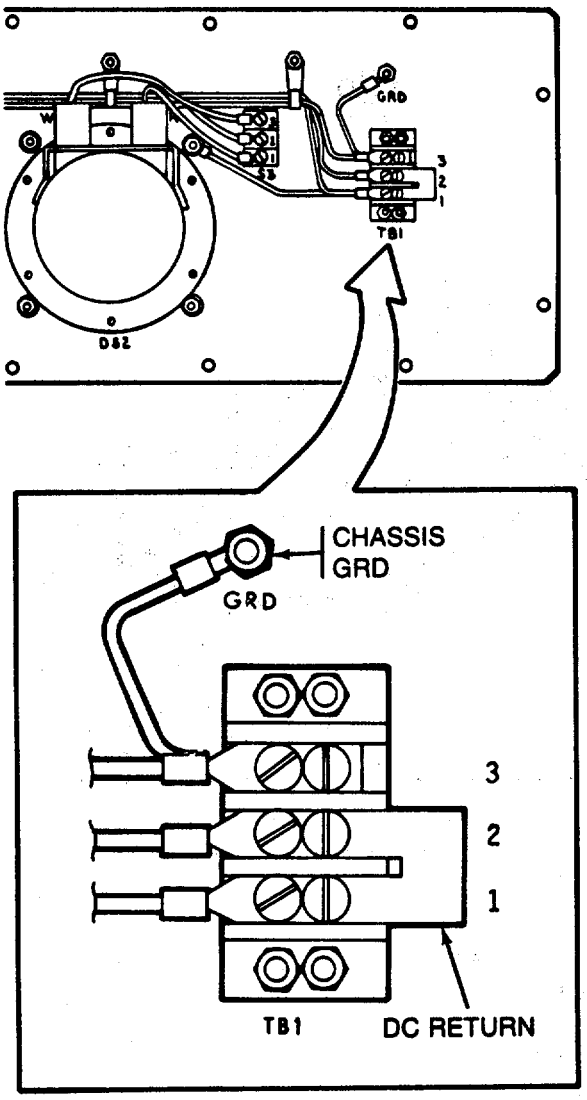
(+)	(−)
A3-TP-M	A3-C(3)
A3-TP-G	A3-C(3)

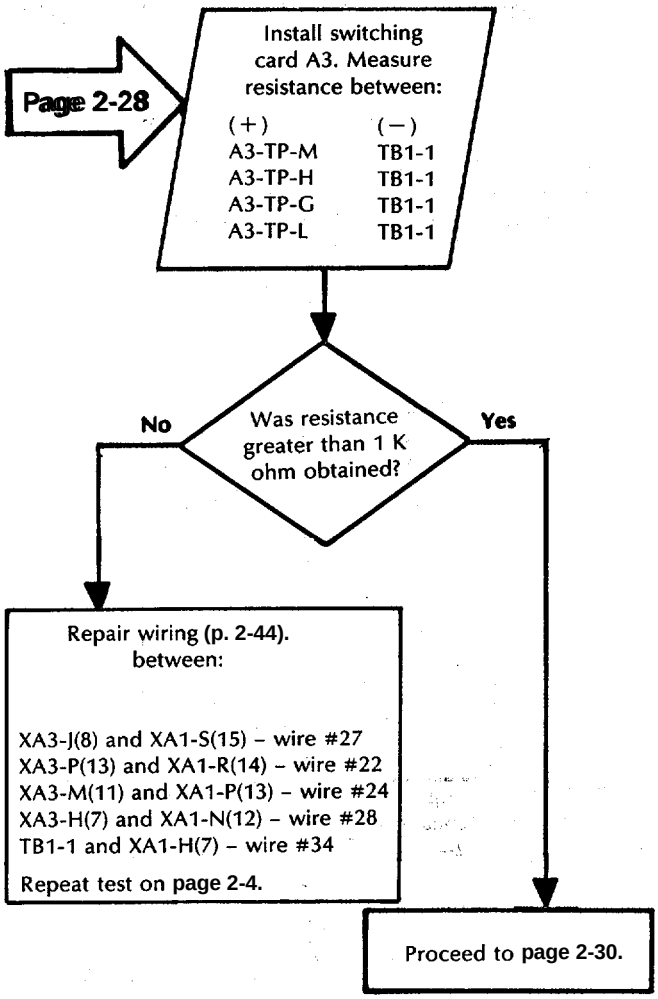
Was resistance greater than 1 kilohm obtained?

No → Replace switching card A3 (p. 2-39). Repeat test on page 2-4.

Yes → Proceed to page 2-29.




GRD
3
2
1
TB1
DS2
CHASSIS
GRD
GRD
3
2
1
TB1
DC RETURN


Page 2-28
Install switching card A3. Measure resistance between:
(+) (−)
A3-TP-M TB1-1
A3-TP-H TB1-1
A3-TP-G TB1-1
A3-TP-L TB1-1
Was resistance greater than 1 K ohm obtained?
No
Yes
Repair wiring (p. 2-44). between:
XA3-J(8) and XA1-S(15) – wire #27
XA3-P(13) and XA1-R(14) – wire #22
XA3-M(11) and XA1-P(13) – wire #24
XA3-H(7) and XA1-N(12) – wire #28
TB1-1 and XA1-H(7) – wire #34
Repeat test on page 2-4.
Proceed to page 2-30.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-29

Remove power card A1. Connect jumpers as follows:

(From)	(To)
XA1-L(10)	XA1-K(9)

This connection completes power to switching card A3 which is normally provided when power card A1 is removed so that switching card A3 is not electrically loaded by defective power card. Apply 28 V dc power and vacuum to the PECM as indicated below and measure test point (TP) voltage on switching card A3 with respect to ground TB1-1 as indicated:

Vacuum (in. wg)	Voltage at test points (volts) A3-TP-M	A3-TP-G
0	25 ± 2	< 1
0.4	9.3 ± 3.5	< 1
0.6	1	< 1
0.8	1	9.3 ± 3.5
1.3	1	25.3 ± 2

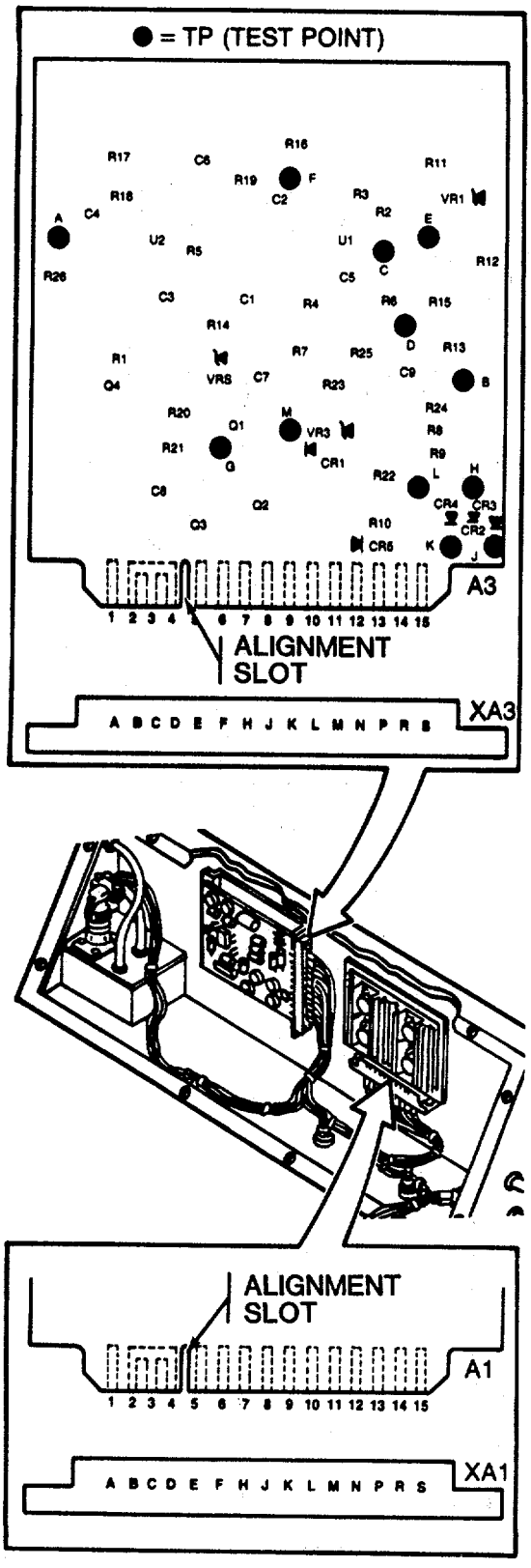
Was specified voltage obtained in all cases?

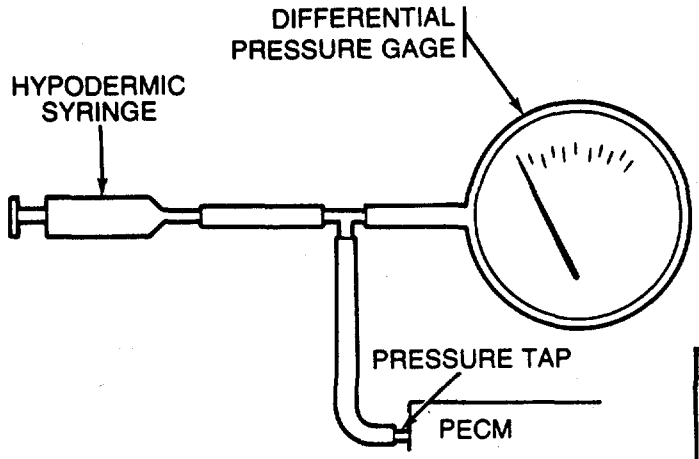
No

Yes

Remove power. Remove jumper. Replace the switching card A3 (p. 2-39). Repeat test on page 2-4.

Proceed to page 2-31. Remove jumper.





Page 2-30

Remove power. Install power card A1. Apply power. Repeat measurements of test points M and G on switching card A3 at specified pressures (vacuum).

Was specified voltage obtained in all cases?

No

Yes

Remove power. Replace power card A1 (p. 2-40). Repeat test on page 2-4.

Measure test point voltages with respect to TB1-1 at following applied pressures:

Pressure (in. wg)	Voltage at test point (volts) A3-TP-H	A3-TP-L
0	24.3 ± 2	< 1
0.4	8.6 ± 3.5	< 1
0.6	< 1	< 1
0.8	< 1	8.6 ± 3.5
1.3	< 1	24.3 ± 2.0

Were specified voltages obtained?

No

Yes

Proceed to page 2-32.

Remove power. Remove power card A1. Measure continuity between:

(+)	(−)
A3-J(8)	A1-S(15)
A1-R(14)	A3-P(13)
A3-H(7)	A1-N(12)
A1-P(13)	A3-M(11)

Was continuity obtained?

No

Yes

Repair open wiring (p. 2-44). Repeat test on page 2-4.

Replace power card A1 (p. 2-40). Repeat test on page 2-4.

2-6. TROUBLESHOOTING PROCEDURES (CONT).

Page 2-30

Measure test point voltages with respect to TB1-1 on switching card A3 at following applied vacuum:

Vacuum (in. wg)	Voltage at test points (volts) A3-TP-J	A3-TP-K
0	23.7 ± 2.0	< 1
0.4	8.0 ± 3.5	< 1
0.6	< 1	< 1
0.8	< 1	8.0 ± 3.5
1.3	< 1	23.7 ± 2.0

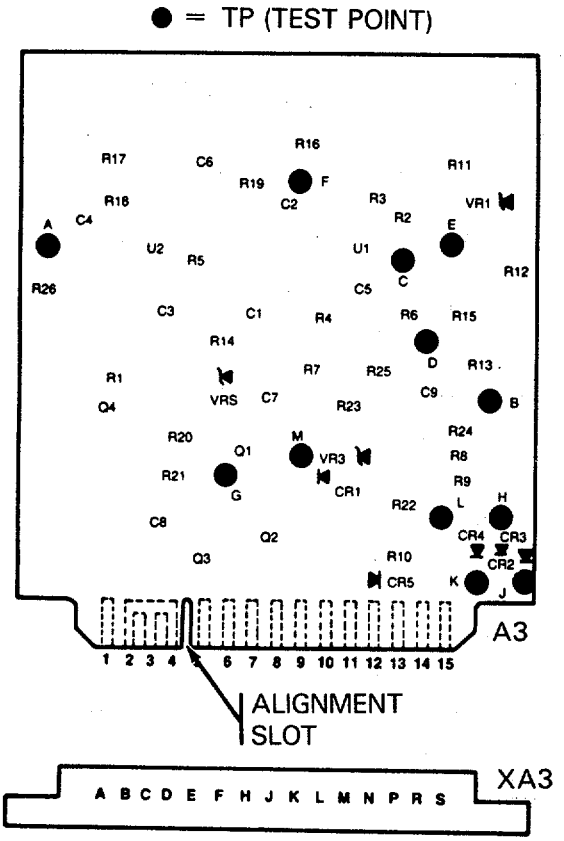
Was voltage in specified limits?

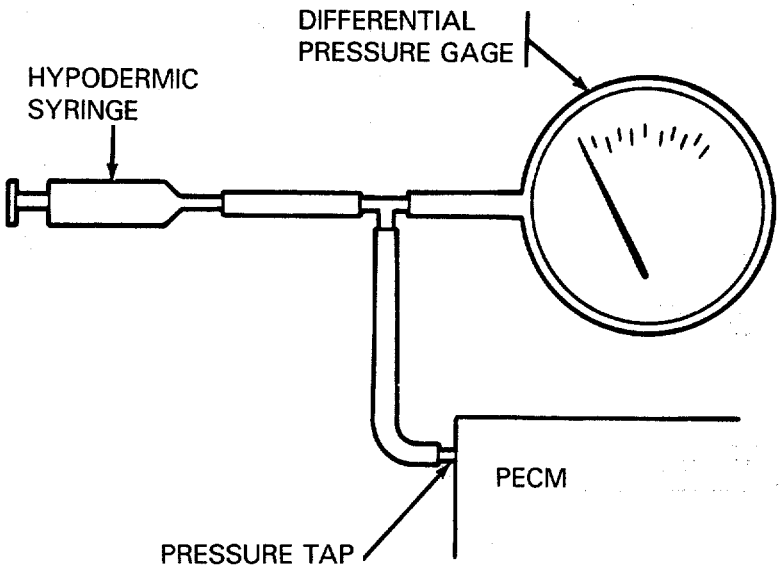
No

Yes

Remove power. Replace switching card A3 (p. 2-39). Repeat test on page 2-4.

This part of pressure control system is working properly. Repeat test on page 2-4.





Section III MAINTENANCE PROCEDURES

2-7. PROTECTIVE ENTRANCE CONTROL MODULE.

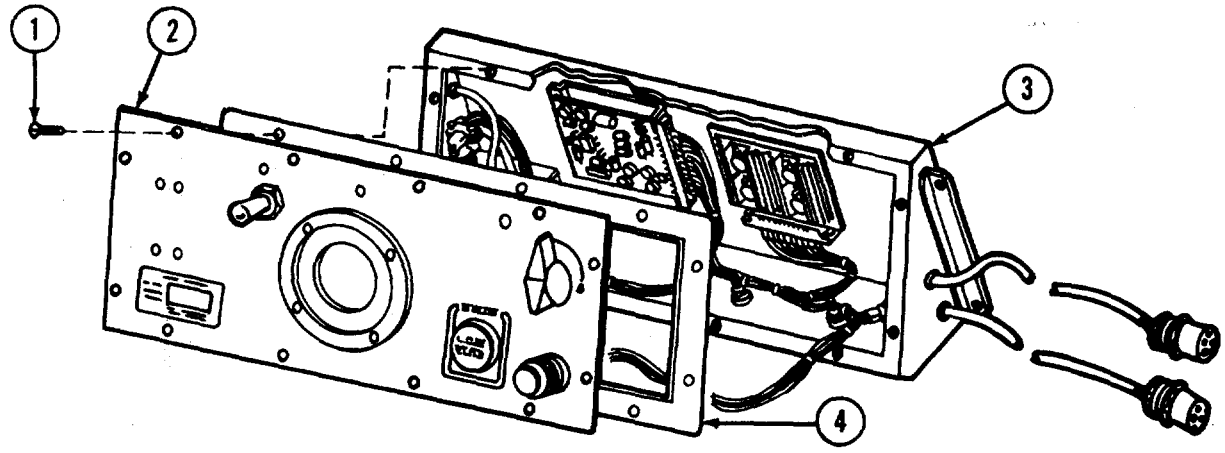
This task covers the removal, 'disassembly, repair, reassembly and installation of the following:

a. Housing/panel (p. 2-33)
b. Toggle switch S3 (p. 2-34)
c. LOW PRESSURE switch/indicator light DS4/S5 (p. 2-35)
d. PURGE indicator light DS3 (p. 2-36)
e. Interval TIMER switch S4 (p. 2-37)
f. Dome light DS2 (p. 2-38)
g. Switching card A3 (p. 2-39)
h. Power card Al (p. 2-40)
i. Pressure transducer MT1 (p. 2-41)
j. Female hose adapter (p. 2-42)
k. Male hose adapter (p. 2-43)
l. Wiring (p. 2-44, 2-45)

INITIAL SETUP

Tools
Electronic Equipment Tool Kit
TK-105/G
References
TB SIG 222
Troubleshooting References
Refer to page 2-2
Equipment Condition
PECM removed from the protective entrance

LOCATION	*ITEM*	*ACTION*
DISASSEMBLY		
Protective Entrance Control Module	Housing/panel	1. Remove twelve screws (1) from panel (2). 2. Carefully pull panel (2) away from housing (3).



REPAIR		
	Gasket	Replace gasket (4) if defective.
REASSEMBLYI		
		1. Place panel (2) on housing (3), and secure with twelve screws (1).

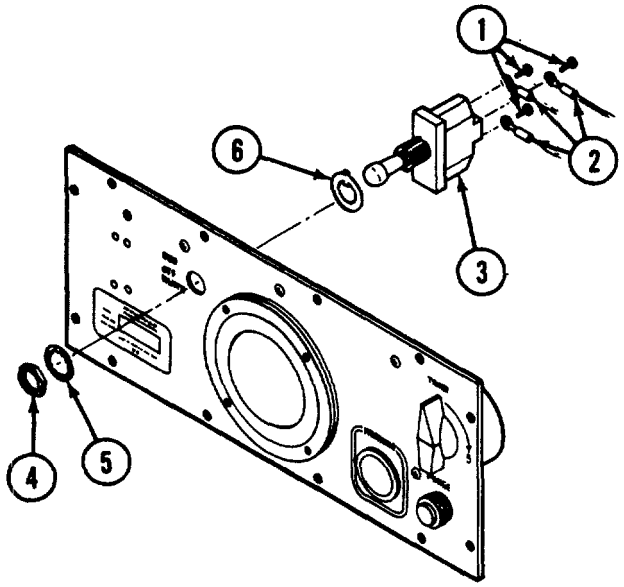
2-7. PROTECTIVE ENTRANCE CONTROL MODULE (CONT).

LOCATION	*ITEM*	*ACTION*

REMOVAL

Panel — Toggle switch S3

1. Disassemble PECM (p. 2-33).
2. Remove three screws (1) and wires (2) from toggle switch S3 (3). Tag wires.
3. Remove nut (4) and washer (5).
4. Remove toggle switch S3 (3) and keying washer (6).



INSTALLATION

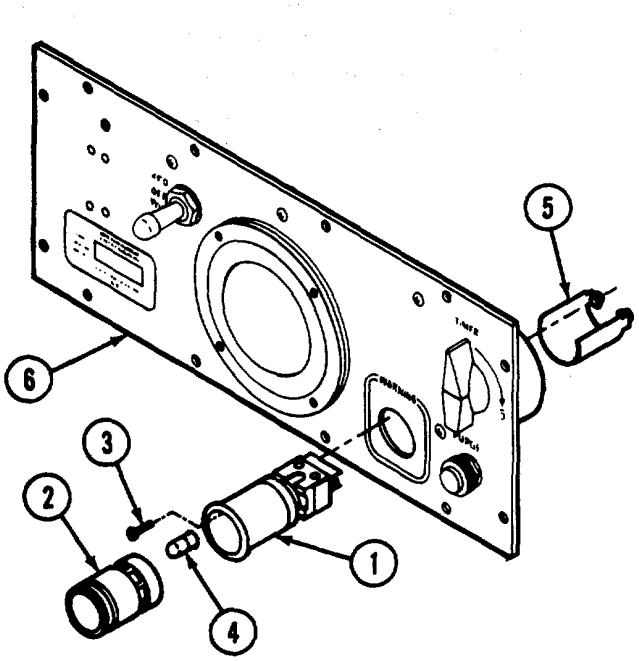
1. Install keying washer (6) on toggle switch S3 (3).
2. Insert toggle switch S3 in panel and secure with washer (5) and nut (4).
3. Attach wires (2) to toggle switch S3 using three screws (1). Refer to wiring diagram (p. 2-44).
4. Reassemble PECM (p. 2-33).

LOCATION	ITEM	ACTION

REMOVAL

Panel — LOW PRESSURE switch/indicator light DS4/S5

1. Disassemble PECM (p. 2-33).
2. Unsolder and tag wires from LOW PRESSURE switch/indicator light DS4/S5 (1). Remove twine lacing.
3. Pry out and remove lamp module (2).
4. Remove two screws (3) and two lamps (4).
5. Remove sleeve (5) from back of panel (6) and pull LOW PRESSURE switch/indicator light DS4/S5 (1) from front of panel (6).



INSTALLATION

1. Insert LOW PRESSURE switch/indicator light DS4/S5 (1) in panel.
2. Place sleeve (5) over LOW PRESSURE switch/indicator light DS4/S5 (1) and secure with screws (3). Install lamps (4).

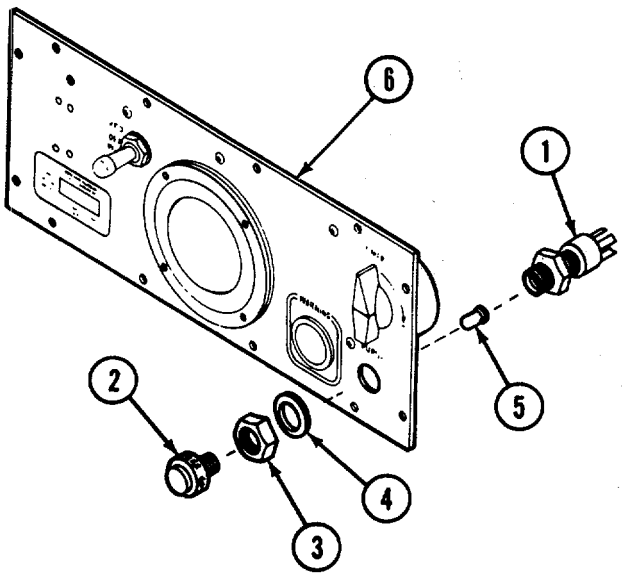
NOTE

Lamp module (2) is keyed to fit into LOW PRESSURE switch/indicator light DS4/S5 at only one rotational position. It may be necessary to turn the lamp module (2) to find the keyway.

3. Press lamp module (2) into LOW PRESSURE switch/indicator light DS4/S5 (1).
4. Connect and solder wires to LOW PRESSURE switch/indicator light DS4/S5 (1). Refer to wiring diagram (p. 2-44).
5. Reassemble PECM (p. 2-33).

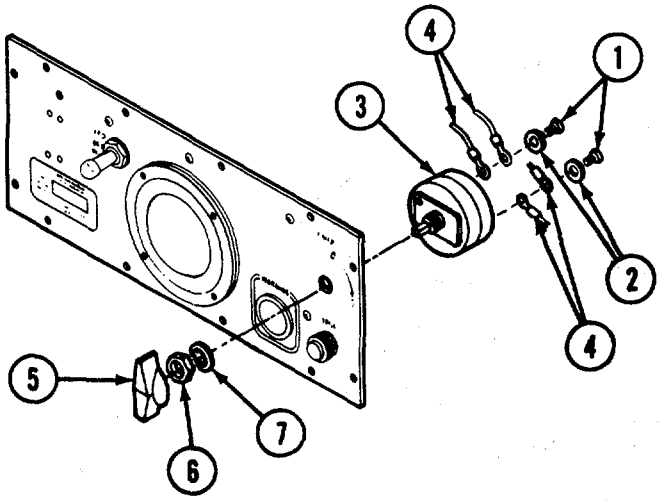
2-7. PROTECTIVE ENTRANCE CONTROL MODULE (CONT).

LOCATION	*ITEM*	*ACTION*
REMOVAL		
Panel	PURGE indicator light DS3	1. Disassemble PECM (p. 2-33). 2. Remove insulation sleeving, and unsolder and tag wires from PURGE indicator light DS3 (1). 3. Unscrew knurled lens (2) and nut (3). 4. Remove washer (4) and PURGE indicator light DS3 (1). 5. Remove lamp (5) from PURGE indicator light DS3 (1).



INSTALLATION		
		1. Install lamp (5) in PURGE indicator light DS3 (1). 2. Insert PURGE indicator light DS3 (1) in panel (6) and install washer (4) and nut (3), and knurled lens (2). 3. Slide insulation sleeving (item 1, app C) over wires. 4. Connect and solder wires to PURGE indicator light DS3 (1). Refer to wiring diagram (p. 2-44). 5. Slide insulation sleeving over connections and shrink. 6. Reassemble PECM (p. 2-33).

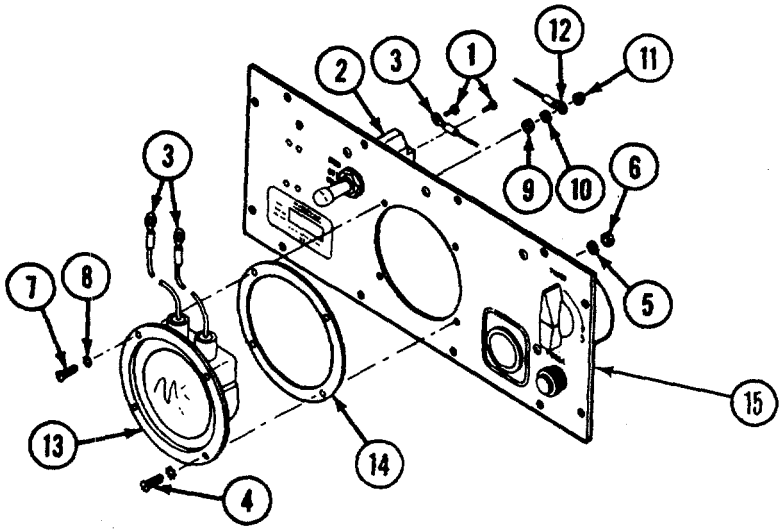
LOCATION	*ITEM*	*ACTION*
REMOVAL		
Panel	Interval TIMER switch S4	1. Disassemble PECM (p. 2-33). 2. Remove two screws (1) and two washers (2) from interval TIMER switch S4 (3). Remove and tag wires (4). 3. Pull off knob (5). 4. Remove nut (6) and washer (7) from interval TIMER switch S4 (3). 5. Remove interval TIMER switch S4 (3).



INSTALLATION		
		1. Install interval TIMER switch S4 (3) in panel using washer (7) and nut (6). 2. Push knob (5) on shaft of interval TIMER switch S4 (3) with pointer at the zero mark on panel. 3. Install wire leads (4) on interval TIMER switch S4 (3) using washers (2) and screws (1). Refer to wiring diagram (p. 2-44). 4. Reassemble PECM (p. 2-33).

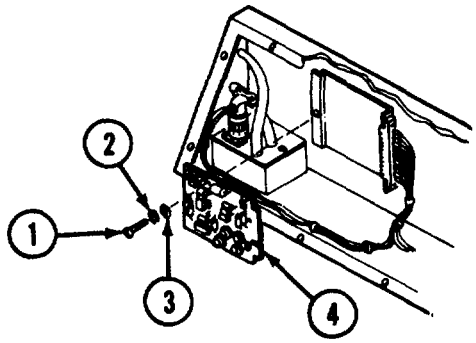
2-7. PROTIECTIVE ENTRANCE CONTROL MODULE (CONT).

LOCATION	*ITEM*	*ACTION*
REMOVAL		
Panel	Dome light DS2	1. Disassemble PECM (p. 2-33). 2. Remove two screws (1) from toggle switch (2) and release wires (3). 3. Remove three screws (4), nonmetallic washers (5), and nuts (6). 4. Remove one screw (7), washers (8 and 9), nuts (10 and 11), and wire (12). Tag wire. 5. Remove dome light DS2 (13) and gasket (14).



REPAIR		
	Gasket	Replace torn or broken gasket. Fabricate replacement gasket (FIG. D-1, app D).
INSTALLATION		
	Dome light DS2	1. Crimp terminals (3) on dome light wires. 2. Install gasket (14) and dome light DS2 (13) in panel (15) using three screws (4), washers (5), and nuts (6). 3. Install wire lead (12) on one screw (7) and secure with washers (8 and 9) and nuts (10 and 11). Install wire leads (3) on toggle switch (2) using two screws (1). Refer to wiring diagram (p. 2-44). 4. Reassemble PECM (p. 2-33).

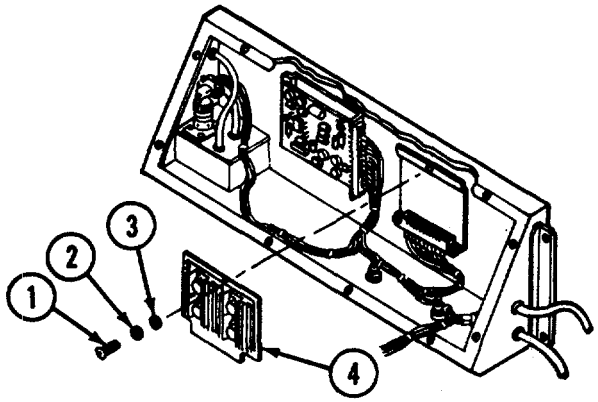
LOCATION	*ITEM*	*ACTION*
REMOVAL		
Housing	Switching card A3	1. Disassemble PECM (p. 2-33). 2. Remove screw (1) and washers (2 and 3). 3. Lift switching card A3 (4) slightly and pull from socket.



INSTALLATION		
		1. Insert switching card A3 (4) into socket in housing. 2. Secure switching card A3 (4) with screw (1) and washers (2 and 3). 3. Reassemble PECM (p. 2-33).

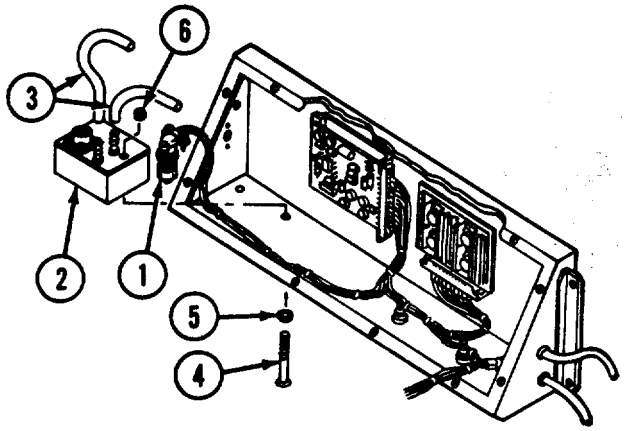
2-7. PROTECTIVE ENTRANCE CONTROL MODULE (CONT).

LOCATION	*ITEM*	*ACTION*
REMOVAL		
Housing	Power card A1	1. Disassemble PECM (p. 2-33). 2. Remove screw (1) and washers (2 and 3). 3. Lift power card Al (4) slightly and pull from socket.



INSTALLATION

1. Insert power card Al (4) into socket in housing.
2. Secure power card Al (4) with screw (1) and washers (2 and 3).
3. Reassemble PECM (p. 2-33).

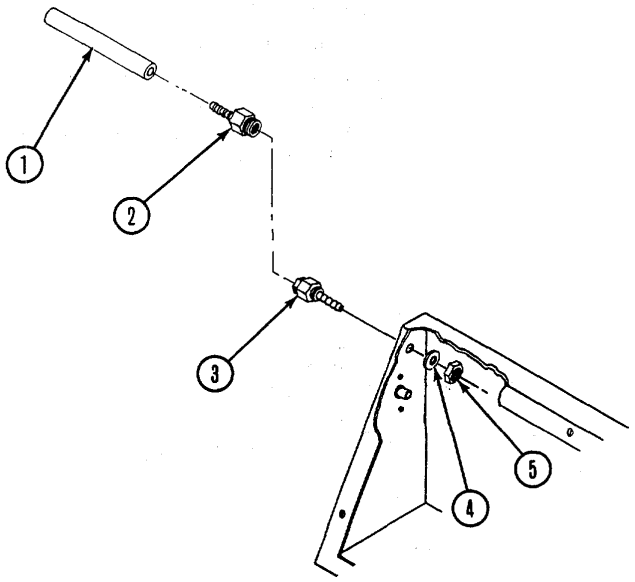
LOCATION	*ITEM*	*ACTION*
REMOVAL		
Housing	Pressure transducer MT1	1. Disassemble PECM (p. 2-33). 2. Remove connector plug (1) from pressure transducer MT1 (2). 3. Remove tubing (3). 4. Remove two screws (4), washers (5), and nuts (6). 5. Remove pressure transducer MT1 (2).
		
REPAIR		
	Nonmetallic tubing	Fabricate replacement tubing (3) (item 2, app B, bulk material). Cut to same length as tubing being replaced.
INSTALLATION		
		1. Place pressure transducer MT1 (2) in housing and secure with two screws (4), washers (5), and nuts (6). 2. Install tubing (3). 3. Connect plug (1) to pressure transducer MT1. 4. Reassemble PECM (p. 2-33).

2-7. PROTECTIVE ENTRANCE CONTROL MODULE (CONT).

LOCATION	*ITEM*	*ACTION*

REMOVAL

Female hose adapter



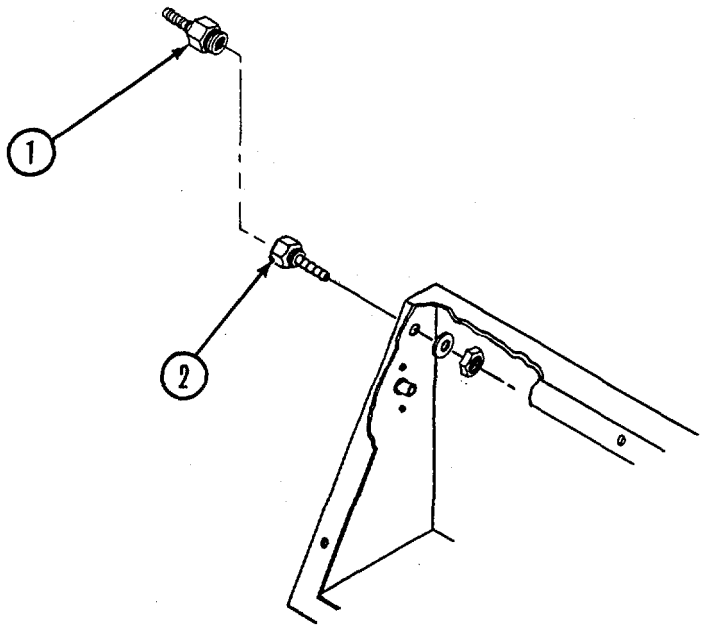
1. Secure female hose adapter (3) with wrench and use second wrench to loosen male hose adapter (2) from female hose adapter (3).
2. Unscrew male hose adapter (2). Retain for further use.
3. Remove PECM panel (p. 2-33) and retain.
4. Remove tubing (1) from female hose adapter (3).
5. Secure nut (5) with wrench and use second wrench to loosen female hose adapter (3).
6. Unscrew female hose adapter (3) from nut (5) and discard female hose adapter (3) and

INSTALLATION

Female hose adapter

1. Insert replacement female hose adapter (3) through hole in PECM housing.
2. Place replacement packing (4) over barbed end of female hose adapter (3).
3. Secure nut (5) to female hose adapter (3) by hand. Tighten finger tight.
4. Secure nut (5) with wrench and use second wrench to tighten female hose adapter (3) to nut (5).
5. Connect tubing (1) to female hose adapter (3).
6. Reinstall PECM panel (p. 2-33).
7. Insert previously removed male hose adapter (2) into female hose adapter (3). Hand tighten.
8. Secure female hose adapter (3) with wrench and use second wrench on male hose adapter (2). Tighten, taking care not to over tighten.

LOCATION	*ITEM*	*ACTION*
REMOVAL		
	Male hose adapter	1. Secure female hose adapter (2) with wrench and use second wrench to loosen male hose adapter (1) from female hose adapter (2). 2. Unscrew male hose adapter (1) from female hose adapter (2). 3. Examine threads of both adapters (1, 2). Male hose adapter 4. If threads of female hose adapter (2) are stripped, replace (p. 2-42). 5. If threads of male hose adapter (1) are stripped, install replacement.

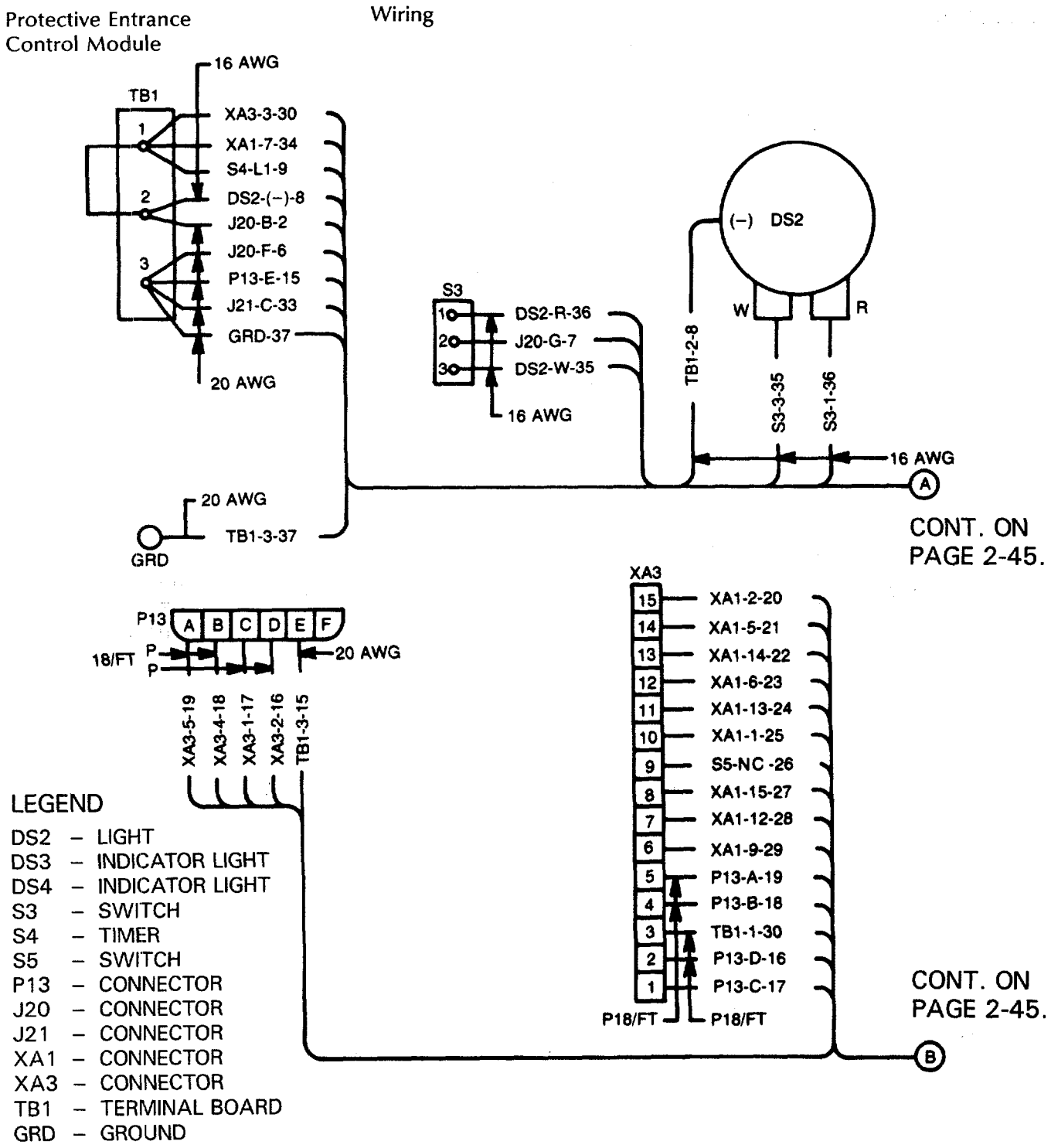


INSTALLATION		
	Male hose adapter	1. Secure female hose adapter (2) with wrench. 2. Insert replacement male hose adapter (1) into female hose adapter (2). Hand tighten. 3. Using second wrench on male hose adapter (1), tighten, taking care not to over tighten.

2-7. PROTECTIVE ENTRANCE CONTROL MODULE (CONT).

LOCATION	ITEM	ACTION

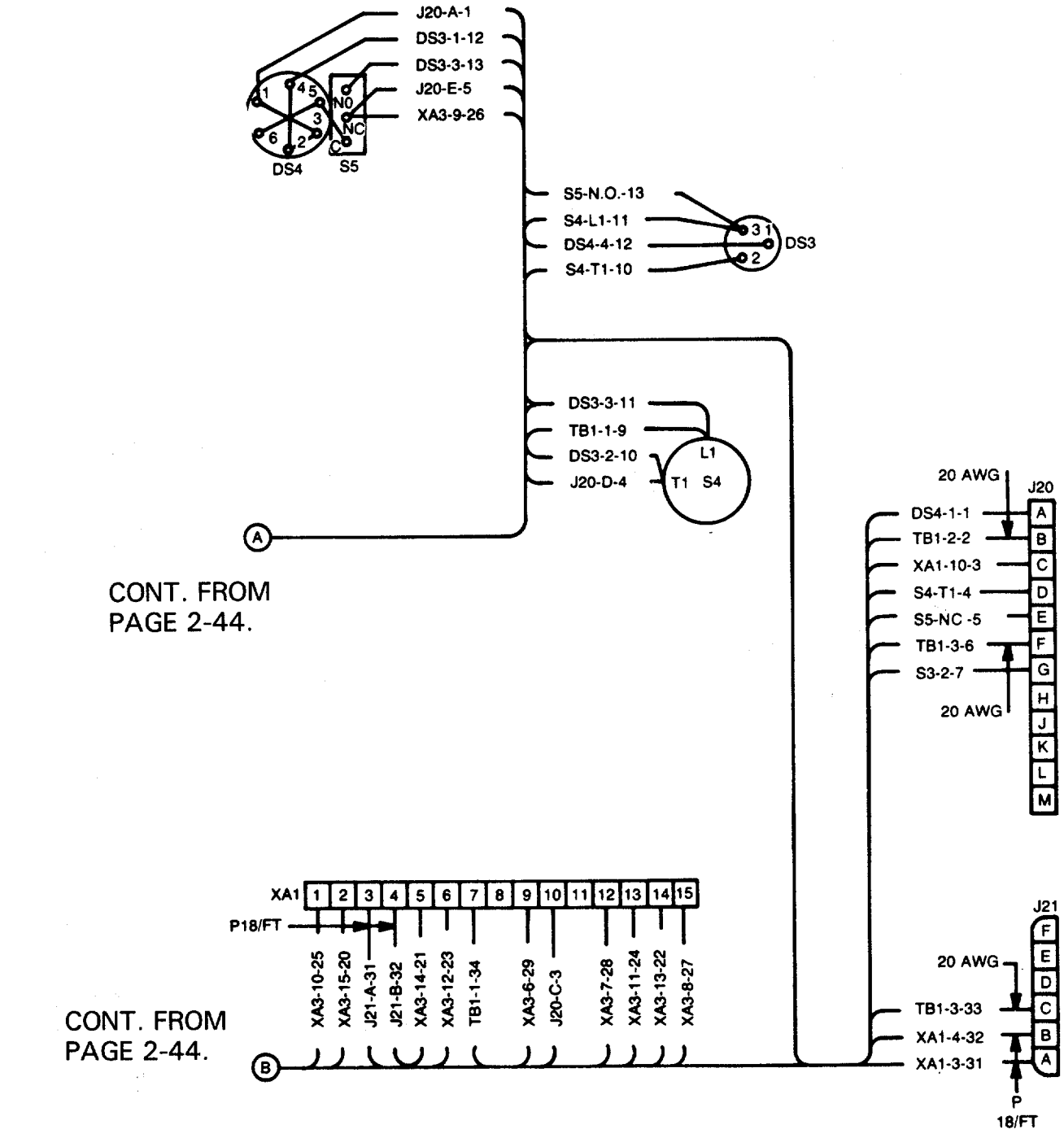
REPAIR



LOCATION	ITEM	ACTION

Protective Entrance Control Module

Wiring



APPENDIX A

REFERENCES

The following publications are related to information contained in this manual.

A-1. TECHNICAL MANUALS.

TM 9-1430-651-12	Operator's and Organizational Maintenance Manual, Emplacement and Preparation for Travel, Missile Air Defense System, AN/TSQ-73
TM 3-4240-286-20&P	Organizational Maintenance Manual, (Including Repair Parts and Special Tools List) for Collective Protection Equipment, Guided Missile Air Defense System, AN/TSQ-73; Consisting of Entrance, Protective, Pressurized, Collapsible, M12 (NSN 4240-01-048-2923); Filter Unit, Gas-Particulate, 200 CFM, 208 V, 400 Hz, M56 (NSN 4240-00-237-0227); and Installation Kit, CBR, Protective Equipment, AN/TSQ-73, M263 (NSN 4240-01-063-7679)
TM 3-4240-308-20&P	Organizational Maintenance Manual (Including Repair Parts and Special Tools List) for Collective Protection Equipment, TACFIRE UCE
TM 3-4240-309-20&P	Organizational Maintenance Manual (Including Repair Parts and Special Tools List) for Collective Protection Equipment, GUARDRAIL
TM 3-4240-284-20&P	Organizational Maintenance Manual, (Including Repair Parts and Special Tools List) for Collective Protection Equipment, Fire Direction System, Artillery, TACFIRE
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 43-0002-31	Destruction of Chemical Weapons and Defense Equipment to Prevent Enemy Use

A-2. COMMON TABLE OF ALLOWANCES.

CTA 50-970	Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items)
CTA 8-100	Army Medical Department Expendable/Durable Items

A-3. SUPPLY BULLETIN.

SB 708-41/42 ..... Federal Supply Code for Manufacturers; United States and Canada - Code to Name and Name to Code

A-4. SUPPLY CATALOGS.

SC 5180-91-CL-R07 ..... .Tool Kit, Electronic Equipment TK-105/G
SC 5180-90-CL-N26 ..... .Tool Kit, General Mechanics; Automotive

A-5. TECHNICAL BULLETIN.

TB SIG 222 ..... Solder and Soldering

A-6. FIELD MANUAL.

FM 21-11 (TEST) ..... First Aid for Soldiers

A-7. DA PAMPHLET.

DA Pam 738-750 ..... The Army Maintenance Management System (TAMMS) as Contained in Maintenance Management Update

APPENDIX B

REPAIR PARTS AND SPECIAL TOOLS LIST

Section I INTRODUCTION

B-1. SCOPE. This RPSTL lists and authorizes spares and repair parts, special tools, special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of direct support maintenance of the protective entrance control module. It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

B-2. GENERAL. In addition to Section I, Introduction, this Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed by item name in FIG. BULK at the end of the section.

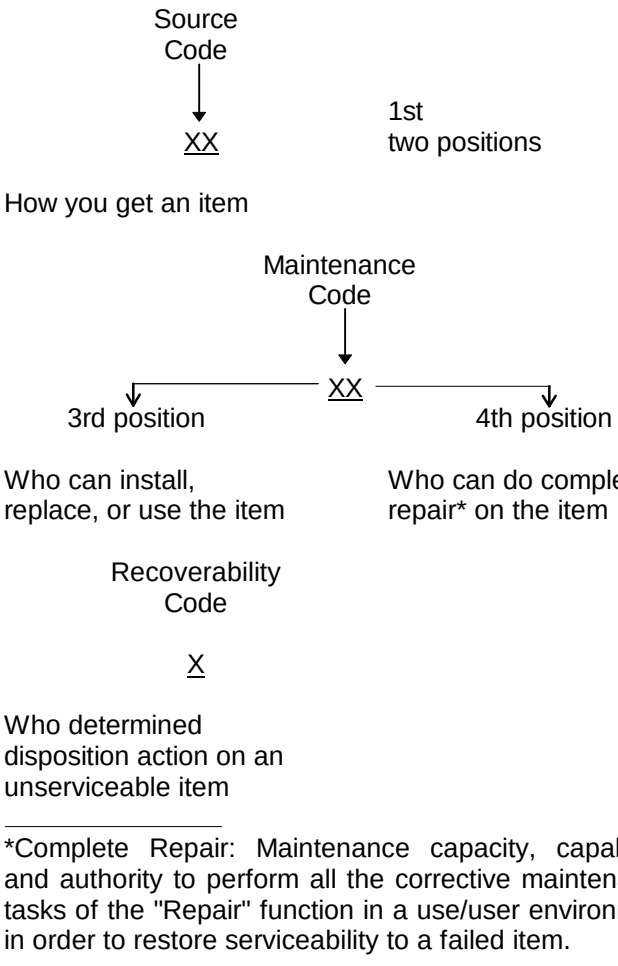
b. Section III. Special Tools List. Not applicable.

c. Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbered items appearing in the listing, followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

B-3. EXPLANATION OF COLUMNS (SECTION II).

a. ITEM NO. [Column (1)]. Indicates the number used to identify items called out in the illustration.

b. SMR CODE [Column (2)]. The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and disposition instruction, as shown in the following breakout:



*Complete Repair: Maintenance capacity, capability, and authority to perform all the corrective maintenance tasks of the "Repair" function in a use/user environment in order to restore serviceability to a failed item.

B-3. EXPLANATION OF COLUMNS (SECTION II) (CONT).

(1) *Source Code.* The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

Code	*Explanation*
PA PB PC** PD PE PF PG	Stocked items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3d position of the SMR code. ****NOTE** Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3d position of the SMR code. The complete kit must be requisitioned and applied.
MO - (Made at Org/AVUM Level) MF - (Made at DS/AVUM, Level) MH - (Made at GS Level) ML - (Made at Specialized Repair Act) (SRA) MD - (Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in this RPSTL. If the item is authorized to you by the 3d position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.

Code	*Explanation*
AO - (Assembled by Org/ AVUM Level) AF - (Assembled by DS/AVIM Level) AH - (Assembled by GS) Category) AL - (Assembled by SRA) AD - (Assembled by Depot)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3d position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

Code	*Explanation*
XA	Do not requisition an "XA"-coded item. Order its next higher assembly. (Also, refer to the NOTE below.)
XB	If an "XB" item is not available from salvage, order it using the FSCM and part number given.
XC	Installation drawing, diagram, instruction sheet, field service drawings, that is identified by manufacturer's part number.
XD	Item is not stocked. Order an "XD"-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded XA.

B-3. EXPLANATION OF COLUMNS (SECTION II)

(2) *Maintenance Code.* Maintenance codes tells you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance:

Code	*Application/Explanation*
C	Crew or operator maintenance done within organizational maintenance.
O	Organizational category can remove, replace, and use the item.
F	Direct support level can remove, replace, and use the item.
H	General support level can remove, replace, and use the item.
L	Specialized repair activity can remove, replace, and use the item.
D	Depot level can remove, replace, and use the item.

(b) The maintenance code entered in the fourth position tells whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). [NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.] This position will contain one of the following maintenance codes.

Code	Application/Explanation
O	Organizational is the lowest level that can do complete repair of the item.
F	Direct support is the lowest level that can do complete repair of the item.
H	General support is the lowest level that can do complete repair of the item.
L	Specialized repair activity (designate the specialized repair activity) is the lowest level that can do complete repair of the item.
D	Depot is the lowest level that can do complete repair of the item.
Z	Nonreparable, no repair is authorized.
B	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B" coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) *Recoverability Code.* Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR code as follows:

Recoverability Codes	*Application/Explanation*
Z	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3d position of SMR code.
O	Reparable item. When uneconomically reparable, condemn and dispose of the item at organizational level.
F	Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.

B-3. EXPLANATION OF COLUMNS (SECTION II) (CONT).

Recoverability

Codes	*Application/Explanation*
L	Reparable item. Condemnation and disposal not authorized below specialized repair activity (SRA).
A	Item requires special handling or condemnation procedures because of specific reasons (e.g., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. *FSCM [Column (3)].* The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

d. PART NUMBER [Column (4)]. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When you use a NSN to requisition an item, the item you receive may have a different part number from the part ordered.

e. DESCRIPTION AND USABLE ON CODE (UOC) [Column (5)]. This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(3) The statement "END OF FIGURE" appears just below the last item description in column *(5)* for a given figure in section II.

f. QTY[Column (6)]. The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that the quantity is variable and the quantity may vary from application to application.

B-4. EXPLANATION OF COLUMNS (SECTION IV).

a. NATIONAL STOCK NUMBER (NSN) INDEX.

(1) *STOCK NUMBER Column.* This column lists the NSN by National item identification number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN

NSN

(i.e., 5305-01-674-1467).

NIIN

When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) *FIG. Column.* This column lists the number of the figure where the item is identified/located. The figures are in numerical order in section 11.

(3) *ITEM Column.* The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

b. PART NUMBER INDEX. Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

(1) FSCM Column. The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc, that supplies the item.

(2) PART NUMBER Column. Indicates the primary number used by the manufacturer (individual, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

B-4. EXPLANATION OF COLUMNS (SECTION IV).

(3) *STOCK NUMBER Column.* This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM columns to the left.

(4) *FIG. Column.* This column lists the number of the figure where the item is identified/located in section II.

(5) *ITEM Column.* The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

B-5. SPECIAL INFORMATION.

a. Fabrication Instructions. Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the description column of the line item entry for the item to be manufactured/fabricated.

b. Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in section II.

B-6. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Not Known.

(1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.

(2) *Second.* Find the figure covering the assembly group or subassembly group to which the item belongs.

(3) *Third.* Identify the item on the figure and note the item number.

(4) Fourth. Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.

(5) *Fifth.* Refer to the Part Number Index to find the NSN, if assigned.

b. When National Stock Number or Part Number is Known.

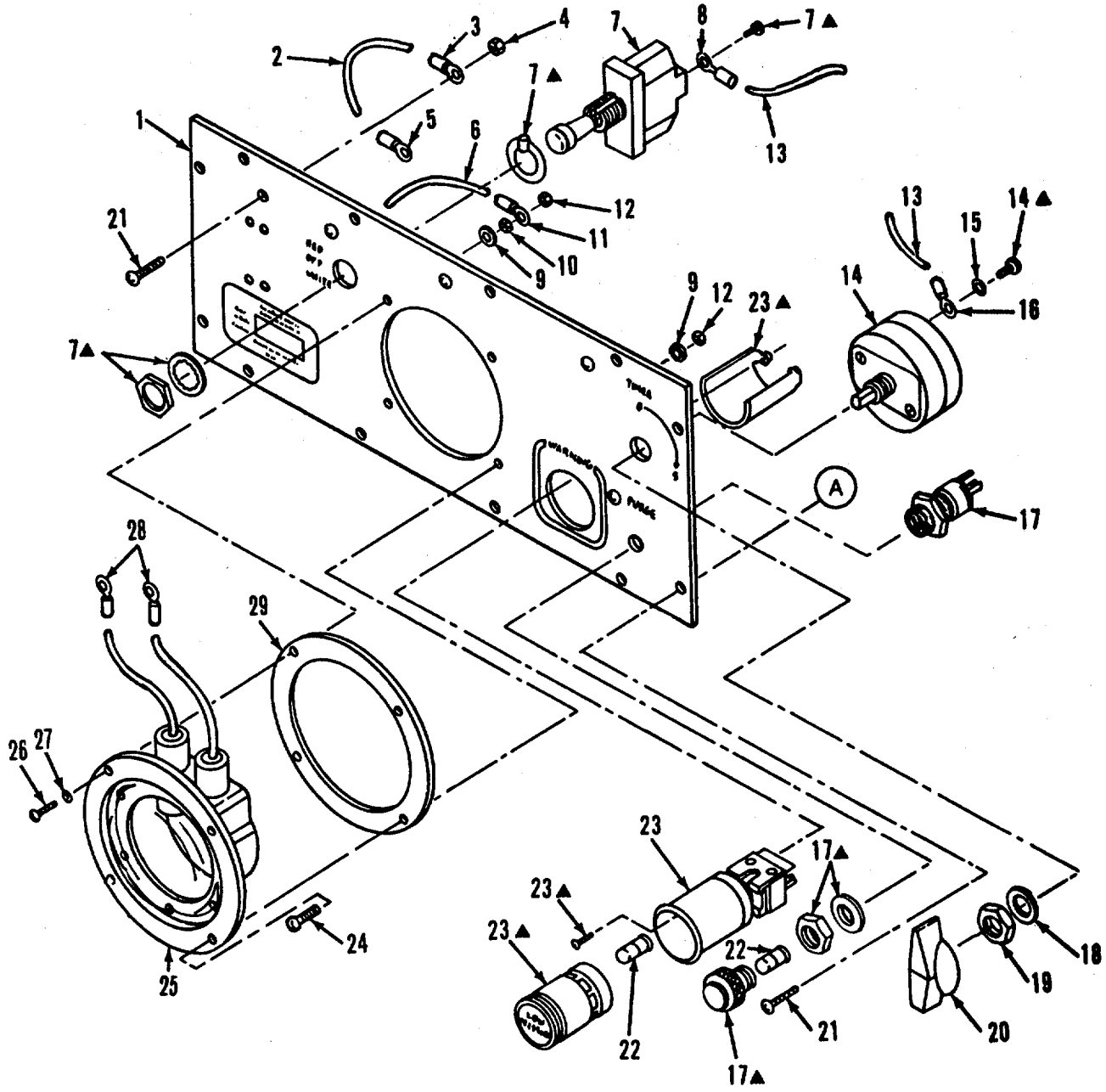
(1) *First.* Using the Index of National Stock Numbers and Part Numbers, find the pertinent National Stock Number or Part Number. The NSN index is in National Item Identification Number (NIIN) sequence [see B-4.a.(1)]. The part numbers in the Part Number index are listed in ascending alphanumeric sequence (see B-4.b.). Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.

(2) *Second.* After finding the figure and item number, verify that the item is the one you are looking for, then locate the item number in the repair parts list for the figure.

B-7. ABBREVIATIONS.

(Not Applicable)

Section II REPAIR PARTS LIST



▲ FURNISHED WITH BASIC ITEM

Figure B-1. Protective Entrance Control Module (Sheet 1 of 2)

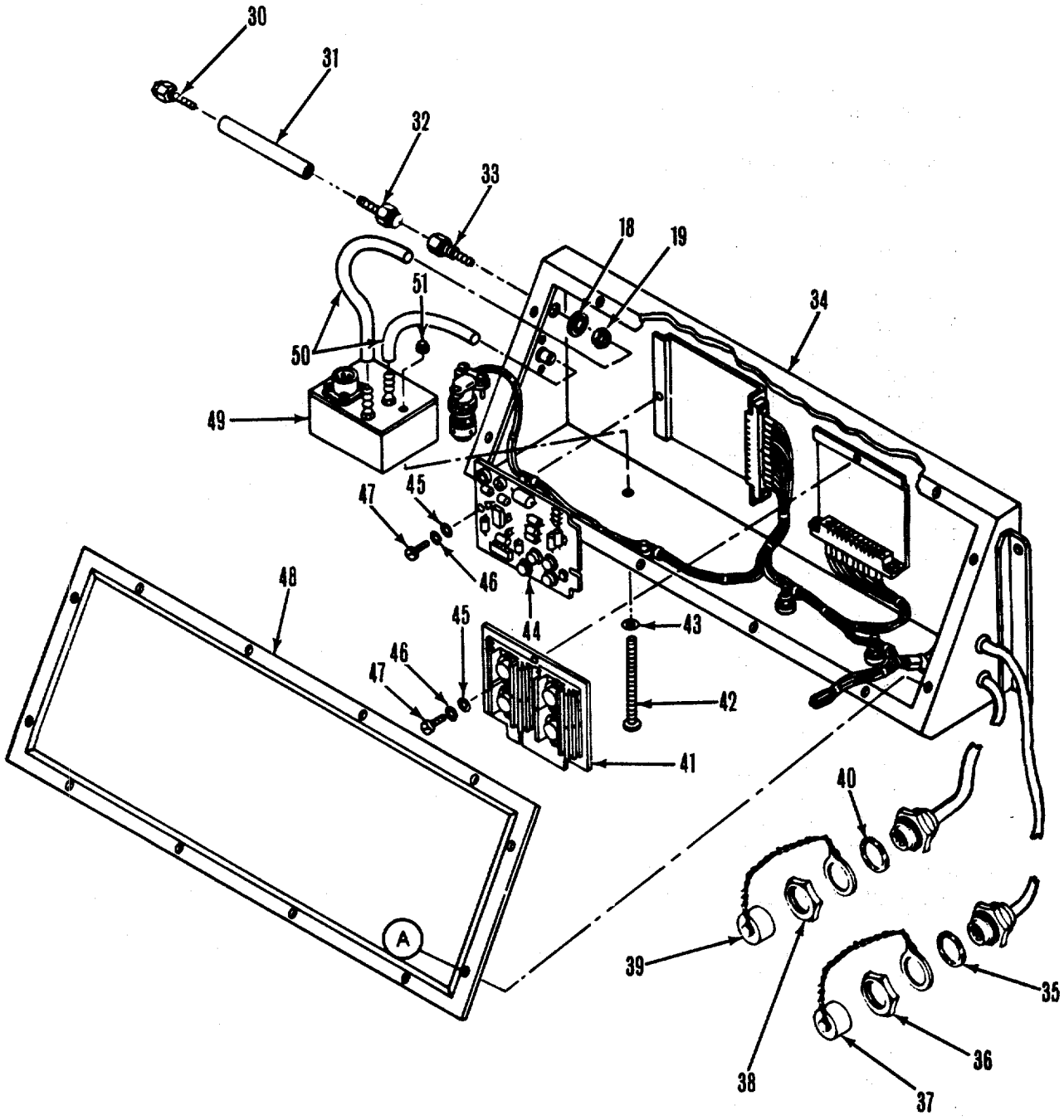


Figure B-1. Protective Entrance Control Module (Sheet 2 of 2)

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 01 PROTECTIVE ENTRANCE CONTROL MODULE E5-19-6357 FIG. B-1 PROTECTIVE ENTRANCE CONTROL MODULE	
1	XAFZZ	81361	E5-19-6360	PLATE, LETTERED	1
2	MFFZZ	81349	M5086/1-20-9	WIRE,ELECTRICAL MAKE FROM WIRE, ...P/ V N M5086/1-20-9	
3	PAFZZ	96906	MS25036-103	TERMINAL,LUG	1
4	PAFZZ	96906	MS21044N3	NUJT,SELF-LOCKING HEXAGON	1
5	PAFZZ	96906	MS17143-10	TERMINAL,LUG	9
6	MFFZZ	81349	M5086/1-16-9	WIRE,ELECTRICAL MAKE FROM WIRE, ...P/V N M5086/1-16-9	
7	PAFZZ	96906	MS24658-21M	SWITCH,TOGGLE	1
8	PAFZZ	96906	MS25036-102 .	TERMINAL,LUG	1
9	PAFZZ	83330	2660	WASHER,SHOULDERED	4
10	PAFZZ	96906	MS35649-244	NUT,PLAIN,HEXAGON	1
11	PAFZZ	96906	MS25036-152	TERMINAL,LUG	1
12	PAFZZ	96906	MS21044N04	NUT,SELF-LOCKING, HEXAGON	4
13	MFFZZ	81349	M5086/1-22-9	WIRE,ELECTRICAL MAKE FROM WIRE, ... P/V N M5086/1-22-9	
14	PAFZZ	79919	71015	TIMER,INTERVAL	1
15	PAFZZ	96906	MS35333-38	WASHER,LOCK	2
16	PAFZZ	96906	MS25036-149	TERMINAL,LUG	4
17	PAFZZ	99993	Z17L76765-1842	LIGHT,INDICATOR	1
18	PAFZZ	80205	NAS1598-6Y	PACKING WITH RETAINER	2
19	PAFZZ	98906	MS35650-3385	NUT,PLAIN,HEXAGON	2
20	PAOZZ	79919	K35B1	KNOB	1
21	PAFZZ	96906	MS3213-36	SCREW,MACHINE	13
22	PAOZZ	81348	W-L-00111/7	LAMP,INCANDESCENT	3
23	PAFZZ	81361	ES5-19-6376-155	SWITCH,PUSH	1
24	PAFZZ	90906	MS3213-5	SCREW,MACHINE	3
25	PAFFF	96906	MS25358-8	LIGHT,DOME	1
26	PAFZZ	96906	MS35206-219	SCREW,MACHINE	1
27	PAFZZ	96906	MS35335-57	WASHER,LOCK	1
28	PAFZZ	96906	MS25036-107	TERMINAL,LUG	2
29	MFFZZ	81361	C5-19-5676	GASKET MAKE FROM RUBBER SHEET, P/N MIL-R-3065/NSN 9320-00-249-6166	1
30	PAOZZ	30327	KFO3-04RV	ADAPTER,STRAIGHT, PIPE TO HOSE	1
31	MOOZZ	81361	E5-19-6357-111	HOSE,NONMETALLIC MAKE FROM HOSE, P/1 N C403	
32	PAOZZ	30327	KFO3-02PS	ADAPTER,STRAIGHT, PIPE TO HOSE	1
33	PAFZZ	81361	B5-19-6362	ADAPTER,STRAIGHT, PIPE TO HOSE	1
34	XAFZZ	81361	E5-19-6358	HOUSING	1
35	PAOZZ	96906	MS29513-024	PACKING,PREFORMED	1
36	PAOZZ	96906	MS3186-43	NUT,PLAIN,HEXAGON	1
37	PAOZZ	96906	MS3181-14N	COVER,ELECTRICAL CONNECTOR	1
38	PAOZZ	96906	MS3186-34	NUT,PLAIN,IHEXAGON	1
39	PAOZZ	96906	MS3181-10N	COVER,ELECTRICAL CONNECT OR	1
40	PAOZZ	96906	MS29513-019	PACKING,PREF'ORMED	1
41	PAFZZ	81361	C5-19-6197	PRINTED CIRCUIT BOARD	1
42	PAFZZ	12909	500881	SCREW,MACHINE	2

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
43	PAFZZ	80205	NAS1598-06Y	PACKING WITH RETAINER	2
44	PAFZZ	81361	D5-19-6193-20	PRINTED CIRCUIT BOARD	1
45	PAFZZ	96906	MS27183-5	WASHER,FLAT	2
46	PAFZZ	96906	MS35338-41	WASHER,LOCK	2
47	PAFZZ	96906	MS51849-33	SCREW,MACHINE	2
48	PAFZZ	81361	5-19-6361	GASKET	1
49	PAFZZ	33107	P92-1020	TRANSMITTER, PRESSURE	1
50	MFFZZ	81361	E5-19-6357-47	TUBING, NONMETALLIC MAKE FROM ..... TUBING, P/N ZZ-R-765/NSN 9330-01-073-1011	13
51	PAFZZ	96906	MS21044N06	NJT, SELF-LOCKING, HEXAGON	2

END OF FIGURE

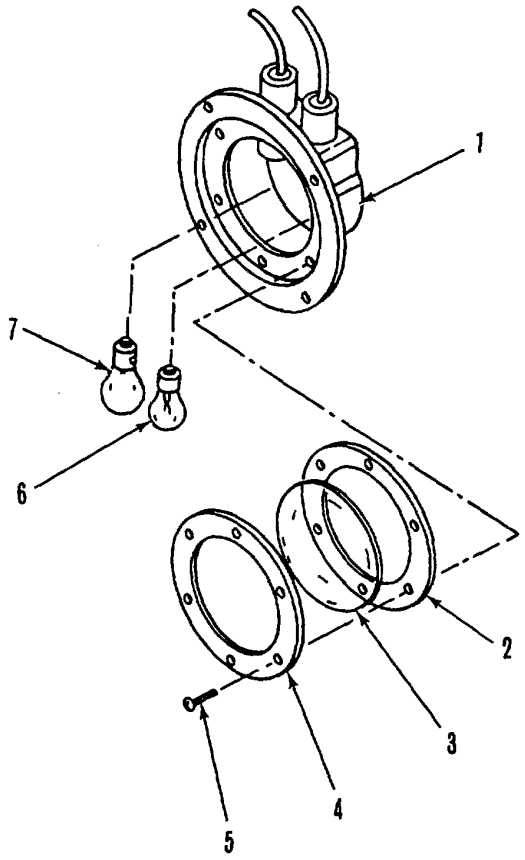


Figure B-2. Dome Light

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 0101 DOME LIGHT MS25358-8 FIG. B-2 DOME LIGHT	
1	XAFZZ	96906	MS25358-3	HOUSING,DOME LIGHT	1
2	PAOZZ	96906	MS25358-6	GASKET	1
3	PAOZZ	96906	MS25358-4	LENS,LIGHT	1
4	XAOZZ	96906	MS25358-5	RETAINER,LIGHT	1
5	PAOZZ	96906	MS35206-217	SCREW,MACHINE	6
6	PAOZZ	96906	MS35478-307	LAMP,INCANDESCENT	1
7	PAOZZ	96906	MS25235R311	LAMP,INCANDESCENT	1
				END OF FIGURE	

(1) ITEM NO	(2) SMR CODE	(3) FSCM	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES(UOC)	(6) QTY
				GROUP 99 BULK MATERIALS FIG. BULK	
1	PAOZZ	30327	C403	HOSE,NONMETALLIC	1
2	PAFZZ	81349	MIL-R-3065	RUBBER SHEET, SOLID	1
3	PAFZZ	81348	ZZ-R-765	TUBING,NONMETALLIC	2
4	PAFZZ	81349	M5086/1-16-9	WIRE,ELECTRICAL	3
5	PAFZZ	81349	M5086/1-20-9	WIRE,ELECTRICAL	.7
6	PAFZZ	81349	M5086/1-22-9	WIRE,ELECTRICAL	59
				END OF FIGURE	

Section III SPECIAL TOOLS LIST

(Not Applicable)

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIGURE NO.	ITEM NO.
5310-00-045-4007	B-1	46
5930-00-057-5848	B-1	7
5310-00-058-3599	B-1	27
4720-00-065-8682	BULK	1
5310-00-081-8087	B-1	51
5310-00-088-0551	B-1	12'
5940-00-113-8179	B-1	28
5940-00-143-4771	B-1	3
5330-00-143-8571	B-2	2
5305-00-148-1286	B-1	21
1240-00-155-7784	B-2	6
5310-00-199-1056	B-1	19
5940-00-204-8966	B-1	8
5305-00-227-1543	B-1	47
5330-00-248-3849	B-1	40
9320-00-249-6166	BULK	2
5330-00-250-0236	B-1	35
6220-00-283-9732	B-2	3
6220-00-299-7136	B-1	25
5310-00-435-8983	B-1	36
5940-00-557-1629	B-1	16
5310-00-559-0070	B-1	15
5310-00-575-5292	B-1	9
6145-00-578-7517	BULK	4
6145-00-578-7519	BULK	5
6145-00-578-7520	BULK	6
5940-00-615-6073	B-1	11
6210-00-635-4700	B-1	17
6240-00-763-7744	B-1	22
5355-00-821-5225	B-1	20
5940-00-825-3699	B-1	5
5310-00-877-5797	B-1	4
5305-00-889-2999	B-2	5
5935-00-912-9599	B-1	39
5305-00-920-0327	B-1	42
5330-00-928-0290	B-1	43
5310-00-934-9748	B-1	10
5330-00-954-6684	B-1	18
5310-00-983-8483	B-1	45
5305-00-984-4976	B-1	26
5935-00-990-5580	B-1	37
4730-01-017-5119	B-1	32
5999-01-050-4635	B-1	41
5999-01-050-4636	B-1	44
4730-01-050-7540	B-1	30
5930-01-052-7684	B-1	23
4730-01-053-5923	B-1	33
5310-01-054-4643	B-1	38
6685-01-056-5283	B-1	49
5305-01-057-7206	B-1	24
*6240-00-155-7932	B-2	7
9330-01-073-1011	BULK	3
5330-01-085-3267	B-1	48
6645-01-113-2525	B-1	14

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

PART NUMBER INDEX

FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81361	B5-19-6362	4730-01-053-5923	B-1	33
30327	C403	4720-00-065-8682	BULK	1
81361	C5-19-5676		B-1	29
81361	C5-19-6197	5999-01-050-4635	B-1	41
81361	D5-19-6193-20	5999-01-050-4636	B-1	44
81361	E5-19-6357-111		B-1	31
81361	E5-19-6357-47		B-1	50
81361	E5-19-6358		B-1	34
81361	E5-19-6360		B-1	1
81361	E5-19-6376-155	5930-01-052-7684	B-1	23
30327	KF03-02PS	4730-01-017-5119	B-1	32
30327	KF03-04RV	4730-01-050-7540	B-1	'30
79919	K35B1	5355-00-821-5225	B-1	20
81349	MIL-R-3065	9320-00-249-6166	BULK	2
96906	MS17143-10	5940-00-825-3699	B-1	5
96906	MS21044N04	5310-00-088-0551	B-1	12
96906	MS21044N06	5310-00-081-8087	B-1	51
96906	MS21044N3	5310-00-877-5797	B-1	4
96906	MS24658-21M	5930-00-057-5848	B-1	7
96906	MS25036-102	5940-00-204-8966	B-1	8
96906	MS25036-103	5940-00-143-4771	B-1	3
96906	MS25036-107	5940-00-113-8179	B-1	28
96906	MS25036-149	5940-00-557-1629	B-1	16
96906	MS25036-152	5940-00-615-6073	B-1	11
96906	MS25235R311	6240-00-155-7932	B-2	7
96906	MS25358-3		B-2	1
96906	MS25358-4	6220-00-283-9732	B-2	3
96906	MS25358-5		B-2	4
96906	MS25358-6	5330-00-143-8571	B-2	2
96906	MS25358-8	6220-00-299-7136	B-1	25
96906	MS27183-5	5310-00-983-8483	B-1	45
96906	MS29513-019	5330-00-248-3849	B-1	40
96906	MS29513-024	5330-00-250-0236	B-1	35
96906	MS3181-10N	5935-00-912-9599	B-1	39
96906	MS3181-14N	5935-00-990-5580	B-1	37
96906	MS3186-34	5310-01-054-4643	B-1	38
96906	MS3186-43	5310-00-435-8983	B-1	36
96906	MS3213-36	5305-00-148-1286	B-1	21
96906	MS3213-5	5305-01-057-7206	B-1	24
96906	MS35206-217	5305-00-889-2999	B-2	5
96906	MS35206-219	5305-00-984-4976	B-1	26
96906	MS35333-38	5310-00-559-0070	B-1	15
96906	MS35335-57	5310-00-058-3599	B-1	27
96906	MS35338-41	5310-00-045-4007	B-1	46
96906	MS35478-307	6240-00-155-7784	B-2	6
96906	MS35649-244	5310-00-934-9748	B-1	10
96906	MS35650-3385	5310-00-199-1056	B-1	19
96906	MS51849-33	5305-00-227-1543	B-1	47
81349	M5086/1-16-9		B-1	6
		6145-00-578-7517	BULK	4
81349	M5086/1-20-9		B-1	2

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

PART NUMBER INDEX

FSCM	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81349	M5086/1-20-9	6145-00-578-7519	BULK	5
81349	M5086/1-22-9		B-1	13
		6145-00-578-7520	BULK	6
80205	NAS1598-06Y	5330-00-928-0290	B-1	43
80205	NAS1598-6Y	5330-00-954-6684	B-1	18
33107	P92-1020	6685-01-056-5283	B-1	49
81348	W-L-00111/7	6240-00-763-7744	B-1	22
81348	ZZ-R-765	9330-01-073-1011	BULK	3
99993	Z17L76765-1842	6210-00-635-4700	B-1	17
83330	2660	5310-00-575-5292	B-1	9
81361	5-19-6361	5330-01-085-3267	B-1	48
12909	500881	5305-00-920-0327	B-1	42
79919	71015	6645-01-113-2525	B-1	14

APPENDIX C
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

C-1. SCOPE. This appendix lists expendable/ durable supplies and materials you will need to maintain the protective entrance control module.
This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, expendable/durable items (except medical, class V, repair parts, and heraldic items) or CTA 8-100, Army Medical Department expendable/durable items.

C-2. EXPLANATION OF COLUMNS.

a. Column (1)- Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., Use insulation sleeving, item 1, app C).

b. Column (2)- Level. This column identifies the lowest level of maintenance that requires the listed item.

F - Direct Support Maintenance

c. Column(3)- National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4)- Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column (5)- Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) *ITEM NUMBER*	*(2)* *LEVEL*	*(3)* *NATIONAL STOCK NUMBER*	*(4)* *DESCRIPTION*	*(5)* *U/M*
1	F	5970-00-812-2969	INSULATION SLEEVING: 1/8 x I ft lg (06090)RNF100-1-8 black,	FT

APPENDIX D
ILLUSTRATED LIST OF MANUFACTURED ITEMS

D-1. INTRODUCTION.

a. This appendix includes complete instructions for making items authorized to be manufactured or fabricated at direct support maintenance level.

b. All bulk materials needed for manufacture of an item are listed by National Stock Number in a tabular list on the illustration.

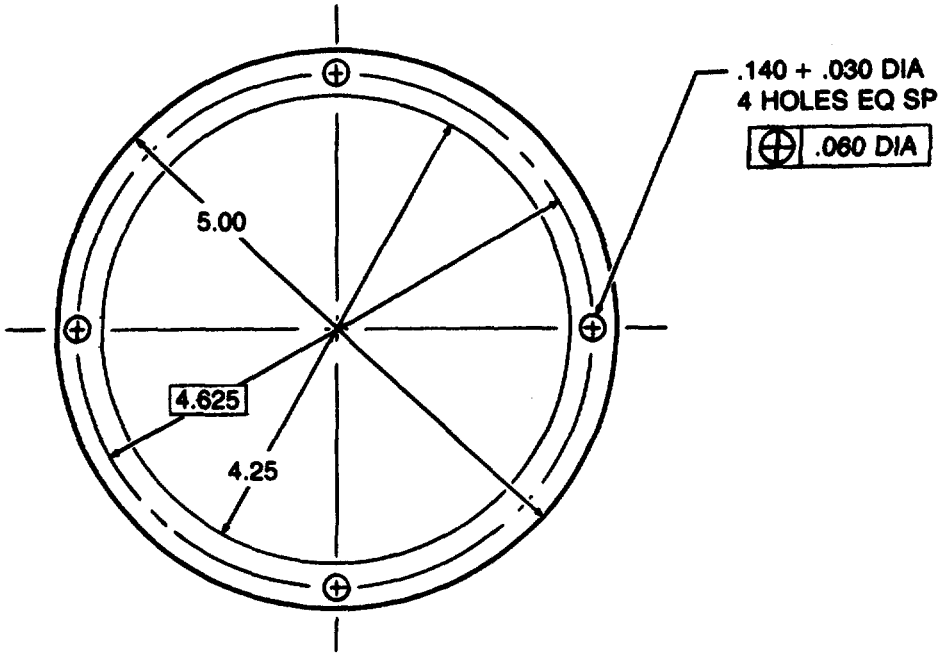


Figure D-1. Gasket

NOTES:
1. Fabricate from NSN 9320-00-249-6166 stock.
2. All dimensions are in inches.
3. Part no. C5-19-5676.

ALPHABETICAL INDEX

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 060067-000