

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT,  
AND GENERAL SUPPORT MAINTENANCE MANUAL, VOLUME II

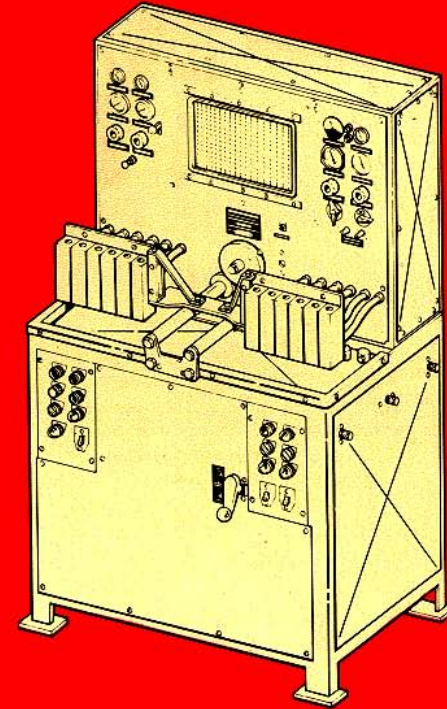
FOR  
**TESTER, FUEL INJECTOR PUMP:**

SINGLE END DRIVE, 150 TO 3600 RPM  
(4910-01-037-9417)

AND

**ADAPTER KITS, FUEL INJECTOR:**

AMERICAN BOSCH APE-6BB (4910-01-005-2850),  
AMERICAN BOSCH PSB-6A AND PSB-6 (4910-01-005-2851),  
AMERICAN BOSCH PSB-12BT (4910-01-005-2852),  
SIMMONDS SU (4910-01-005-2853),  
INTERNATIONAL HARVESTER 3200 (4910-01-006-3073),  
AMERICAN BOSCH PSJ-6A (4910-01-006-3072),  
CATERPILLAR (4910-01-005-2854),  
ROOSA MASTER (4910-01-005-2855),  
AND  
CUMMINS (4910-00-763-7495)



HEADQUARTERS, DEPARTMENT OF THE ARMY

**AUGUST 1982**

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MANUFACTURED  
ITEMS

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GENERAL  
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**WARNING**

**All personnel that operate and/or maintain the tester must be aware of the following precautions.**

**Electrical Shock Hazard**

High voltage is used in the operation of this equipment. Death on contact may result if tester is not properly grounded. In case of electrical shock, turn off main power source at once. If power cannot be turned off at once, free the victim from contact with the tester as quickly as possible. Avoid direct contact with either the tester or the victim's body.

**Noise Level Protection**

The tester can generate noise which may damage hearing if proper protective measures are not followed. A safety officer should check the noise level while testing fuel injector pumps on the tester. If noise level exceeds 85 decibels, ear protection will be required.

**Rotating and Moving Parts**

Many rotating and moving parts are exposed when the protective panels are removed. Caution should be taken when working in these areas.

Shut off main power source when performing maintenance.

**First Aid**

For first aid information, refer to FM 21-11.

TECHNICAL MANUAL )  
 )  
No. 9-4910-387-14-2 )

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, DC, 13 August 1982

**Operator, Organizational, Direct Support, and  
General Support Maintenance Manual  
FOR  
TESTER, FUEL INJECTOR PUMP:  
SINGLE END DRIVE, 150 TO 3600 RPM (4910-01-037-9417)  
AND  
ADAPTER KITS, FUEL INJECTOR:  
AMERICAN BOSCH APE-6BB (4910-014)05-2860),  
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AND  
CUMMINS (4910-00-763-7495)**

VOLUME II

**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 Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished to you.

\*This manual, together with TM 9-4910-387-14-1, 24 May 1982, supersedes TM 9-4910-387-12, 25 May 1962; and so much of TM 9-4910-387-14&P, 5 December 1974, as pertains to maintenance.

**NOTE**

Chapters 1 thru 5 are contained in Volume I

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\*\*This index contains combined entries for Volumes I and II.



**CHAPTER 6  
GENERAL SUPPORT MAINTENANCE INSTRUCTIONS**

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**Section I. TROUBLESHOOTING**

**6-1. TROUBLESHOOTING INTRODUCTORY INFORMATION**

**a.** The symptom index can be used as a quick guide to troubleshooting. Common malfunctions are listed in alphabetical order with a page number reference to the troubleshooting procedure where a test or inspection and corrective action are provided.

**b.** The troubleshooting procedures contain the common malfunctions which you may find during the operation or maintenance of the tester or its components. You should perform the tests or inspections and corrective actions in the order given.

**c.** This manual cannot mention all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not mentioned or is not corrected by specified corrective action, notify your supervisor.

**d.** Information in this section is also to be used with troubleshooting (p 415) in organizational maintenance. It provides instructions where the organizational troubleshooting refers to general support maintenance for corrective action.

**e.** Keep the following information in mind when performing troubleshooting checks.

**WARNING**

**Turn main power source off when performing troubleshooting checks.**

- For electrical wiring diagrams, refer to page 6-146.
- For electrical wiring table, refer to page 6-149.
- Retag all wires when replacement is made.
- Some starters have three thermal heaters while others have only two.
- Some tester panels will have to be removed to perform troubleshooting checks.
- Location of starter contact points may vary on different models of starters.
- The wiring diagram on page 6-146 describes wires by color as well as by wire number. Different testers will not always have the same color wires as those indicated on the diagram. Therefore, references in this manual are to wire numbers and all wires should be tagged accordingly.

- Some testers have different remote control motors. Location of contact points will vary.
- All electrical troubleshooting is done by continuity test, unless otherwise specified.

- To perform continuity checks the distance between test points may be greater than meter leads, so utilize slave wire.
- RH and LH control panels may have to be removed to make proper contact.

**6-2. TROUBLESHOOTING**

**SYMPTOM INDEX**

**Troubleshooting Procedure (Page)**

**AUXILIARY MOTOR**

Fails to start, AUXILIARY MOTOR switch is in the on position.

Auxiliary motor may be defective .....	6-35
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L2 or L3 wire may be open from main power source to forward side of starter .....	6-32
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**BULB TEMPERATURE GAGE**

Does not indicate.

BULB TEMPERATURE gage is defective .....	6-46
Manifold bulb assembly may be defective .....	6-46

**BURETTES**

Will not empty.

Burette(s) may be defective .....	6-145
Dumping shaft assembly is improperly positioned .....	6-145

Will not fill up.

Counting circuit does not function .....	6-144
Graduate rack neoprene tubing(s) may be plugged or twisted .....	6-144



**6-2. TROUBLESHOOTING (cont)**

**SYMPTOM INDEX (cont)**

**Troubleshooting  
Procedure  
(Page)**

**COUNTING CIRCUIT**

Does not function.

Counter pulse switch may be defective .....	6-100
500-1000-OFF count switch may be defective .....	6-101
Holding relay may be defective.....	6-97
Latching relay may be defective .....	6-98
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START COUNT switch may be defective.....	6-96
Starter microswitches may be defective .....	6-102
Stepping relay may be defective .....	6-99
Wires may be open .....	6-103

**COUNTING LIGHT**

Does not light.

Indicator light may be defective .....	6-112
Wires may be open .....	6-112

**DRIVE SPEED OF TESTER**

Will not decrease.

Low cam speed stop may be set incorrectly.....	6-133
Low speed microswitch may be defective .....	6-136
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SLOW button may be defective .....	6-134
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Clutch may be loose or defective .....	6-131
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**ENGINE PRIMER ASSEMBLY**

Does not function.

Copper tubing to engine primer assembly may be plugged or broken .....	6-84
Engine primer assembly is defective .....	6-84

**FUEL**

Does not circulate.

Fuel copper tubings may be plugged or broken .....	6-141
Fuel pump is defective .....	6-140

Will not heat to desired temperature.

FUEL HEAT switch may be defective .....	6-62
Tank heater in fuel tank assembly may be defective .....	6-62
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**FUEL HEAT LIGHT**

Does not light, FUEL HEAT switch is in the on position.

Female and/or male connector plugs may be defective .....	6-54
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FUEL HEAT switch may be defective .....	6-49
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6-2. TROUBLESHOOTING (cont)

SYMPTOM INDEX (cont)

Troubleshooting Procedure (Page)

FUEL TEMPERATURE GAGE

Does not indicate.

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LUBE HEAT LIGHT

Does not light, LUBE HEAT switch is in the on position.

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LUBE OIL

Does not circulate.

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Will not heat to desired temperature.

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**LUBE OIL TEMPERATURE GAGE**

Does not indicate.

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**MAIN DRIVE MOTOR**

Blows main power source fuses.

Main drive motor is stopped above lowest speed obtainable .....	6-139
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Fails to start, FORWARD-OFF-REVERSE switch is in FORWARD position.

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START switch may be defective .....	6-15
Starter forward coil may be defective .....	6-16
Starter microswitch may be defective .....	6-17
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Wire may be open from main power source to forward side of starter .....	6-13
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**6-2. TROUBLESHOOTING (cont)**

**SYMPTOM INDEX (cont)**

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Procedure  
(Page)**

**MAIN DRIVE MOTOR (cont)**

Fails to start, FORWARD-OFF-REVERSE switch is in REVERSE position.

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Main drive motor may be defective .....	6-30
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**MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE**

Does not function.

Copper tubing to MANF. PRESS. - CAPSULE PRESSURE selector valve may be disconnected.....	6-94
MANF. PRESS. - CAPSULE PRESSURE selector valve is defective .....	6-94

**MANIFOLD BULB ASSEMBLY**

Inoperative.

Manifold bulb assembly may be defective .....	6-45
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**MANIFOLD HEAT LIGHT**

Does not light.

Indicator light may be defective .....	6-41
Wires may be open .....	6-40

**POWER ON LIGHT**

Does not light.

Indicator light may be defective .....	6-37
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**PRESSURE REGULATOR**

Does not function.

Copper tubing from PRESSURE REGULATOR to VACUUM REGULATOR may be disconnected.....	6-90
PRESSURE REGULATOR is defective .....	6-90

**PUMP TEMPERATURE GAGE**

Does not indicate.

PUMP TEMPERATURE gage is defective .....	6-47
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**TACHOMETER INDICATOR ASSEMBLY**

Does not function, FORWARD-OFF-REVERSE switch is in FORWARD position.

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**6-2. TROUBLESHOOTING (cont)|**

**SYMPTOM INDEX (cont)**

**Troubleshooting  
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**TACHOMETER INDICATOR ASSEMBLY (cont)**

Does not function, FOWARD-OFF-REVERSE switch is in REVERSE position.

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Wires may be open .....	6-124

**24 VOLTS DC OUTLET ASSEMBLY**

No power.

Control transformer may be defective .....	6-66
Selenium rectifier may be defective .....	6-66
24-VDC switch may be defective .....	6-65
24 VOLTS DC outlet assembly may be defective .....	6-67
Wires may be open .....	6-68

**VACUUM - PRESS. SELECTOR VALVE**

Does not function.

Copper tubing to VACUUM - PRESS. selector valve may be disconnected.....	6-92
VACUUM - PRESS. selector valve is defective .....	6-92

**VACUUM REGULATOR**

Does not function.

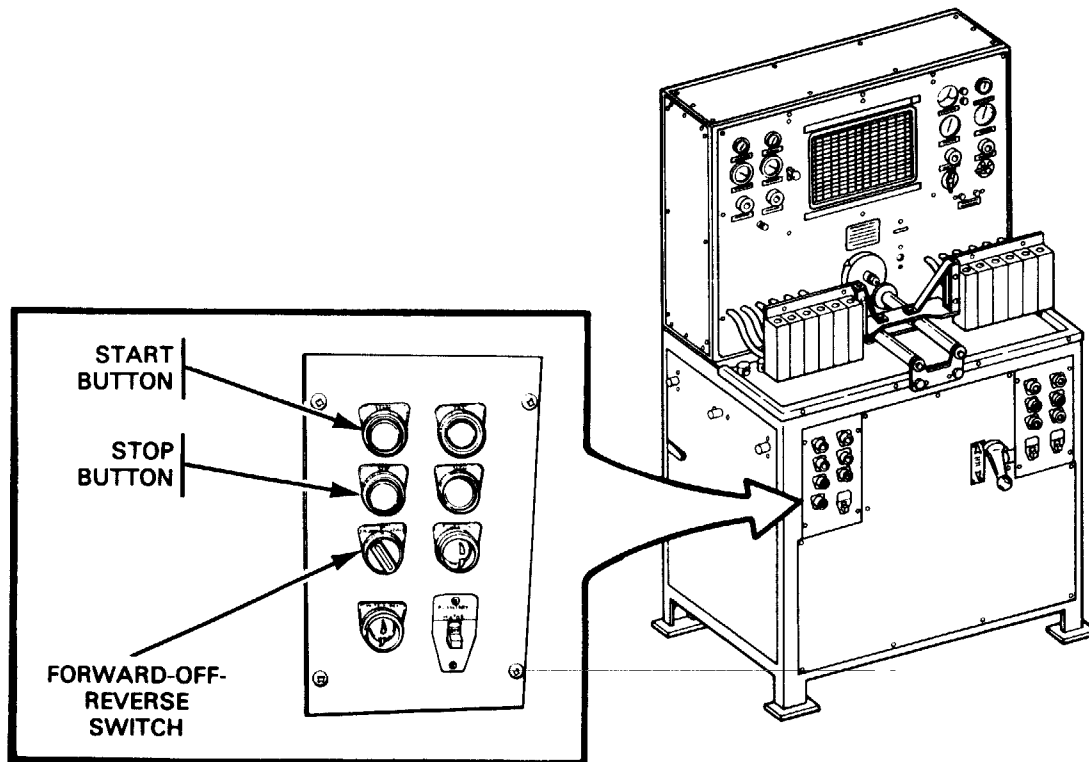
Copper tubing from VACUUM REGULATOR to vacuum pump may be disconnected .....	6-86
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VACUUM REGULATOR is defective .....	6-88



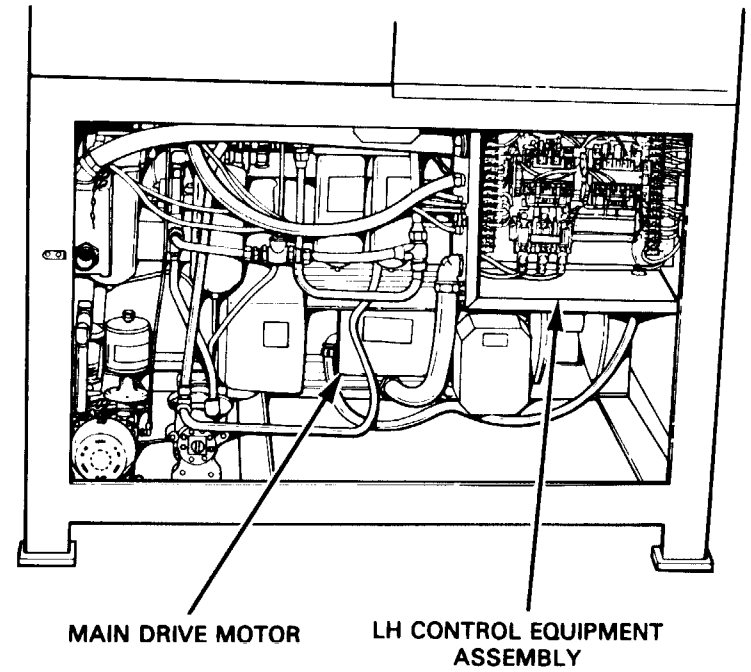
6-2. TROUBLESHOOTING (cont)

MAIN DRIVE MOTOR

FAILS TO START.  
FORWARD-OFF-REVERSE switch is in  
FORWARD position

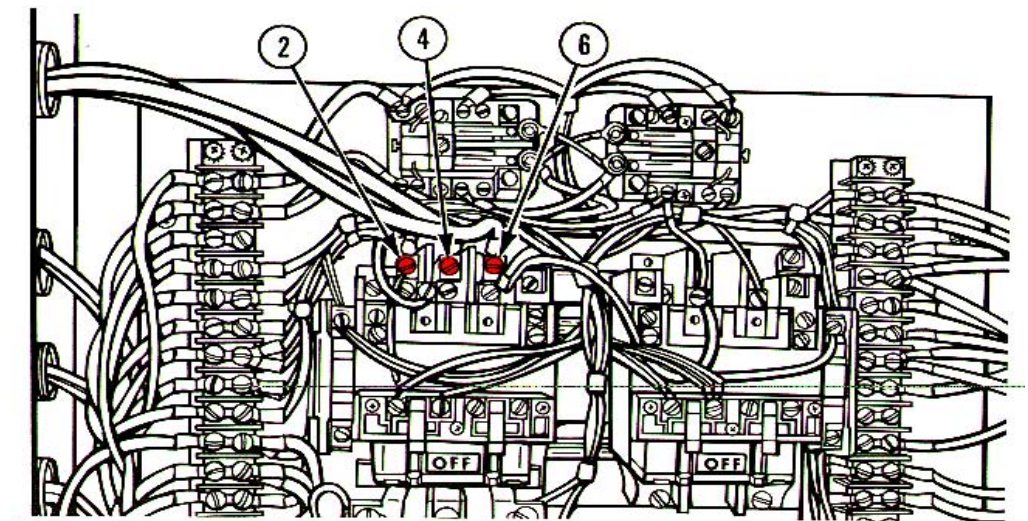
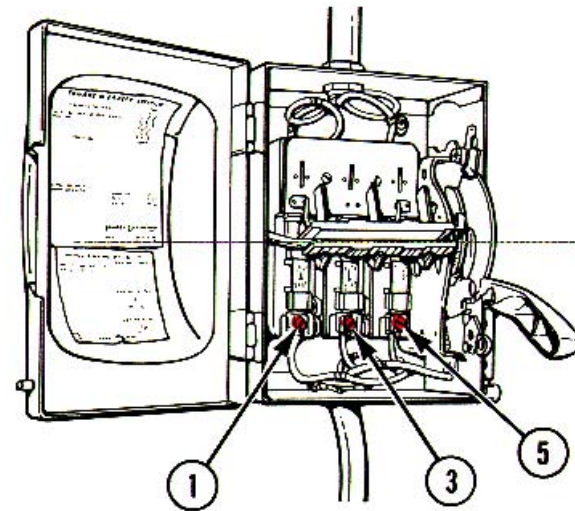


LOCATOR VIEW



**A. WIRE MAY BE OPEN FROM MAIN POWER SOURCE TO FORWARD SIDE OF STARTER.**

- 1 Connect one multimeter lead to contact L1 (1) at main power source and connect other lead to contact L1 (2) at forward side of starter.
- 2 Remove both leads. Connect one multimeter lead to contact L2 (3) at main power source and connect other lead to contact L2 (4) at forward side of starter.
- 3 Remove both leads. Connect one multimeter lead to contact L3 (5) at main power source and connect other lead to contact L3 (6) at forward side of starter.



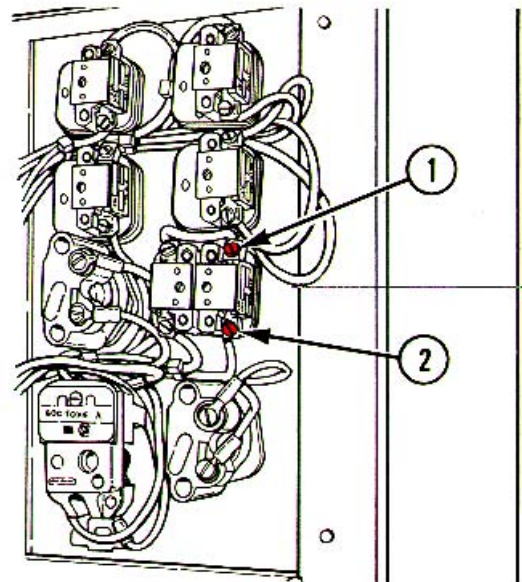
**6-2. TROUBLESHOOTING (cont)****A. WIRE MAY BE OPEN FROM MAIN POWER SOURCE TO FORWARD SIDE OF STARTER. (cont)**

4. Check for continuity. If continuity does not exist, replace the wire (p 6-219).
5. If main drive motor fails to start, proceed to step B.

1. Place the FORWARD-OFF-REVERSE switch in the REVERSE position. Push START button. If main drive motor fails to start, place the FORWARD-OFF-REVERSE switch back to FORWARD position.
2. Connect one multimeter lead to FORWARD-OFF-REVERSE switch contact (1) and connect other lead to FORWARD-OFF-REVERSE switch contact (2). FORWARD-OFF-REVERSE switch is normally open (N/O).
3. Check for continuity. If continuity does not exist, replace the FORWARD-OFF-REVERSE switch (p 6-219).
4. If main drive motor fails to start, proceed to step C.

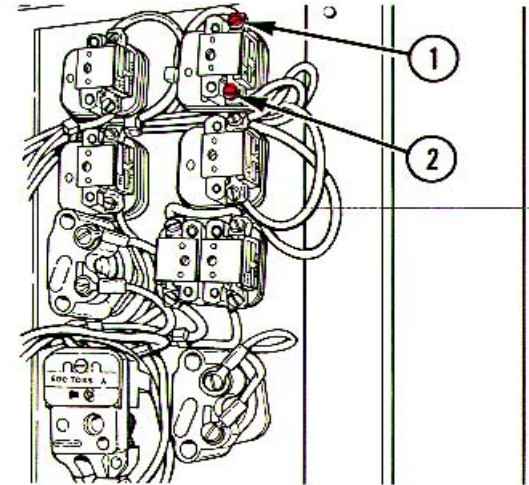
**B. FORWARD-OFF-REVERSE SWITCH MAY BE DEFECTIVE.****NOTE**

If the main drive motor starts when the FORWARD-OFF-REVERSE switch is in REVERSE position, this shows that the greatest portion of the starting circuit is functional.



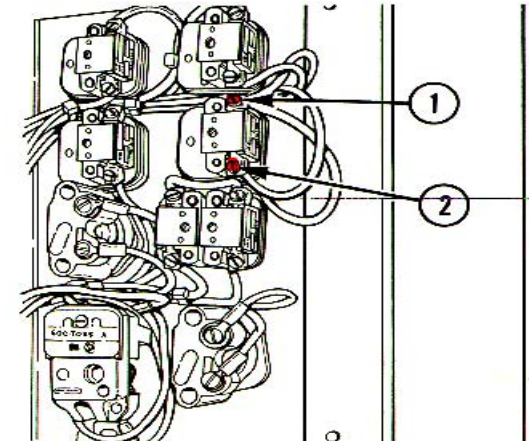
**C. START SWITCH MAY BE DEFECTIVE.**

- 1 Connect one multimeter lead to START switch contact (1) and connect other lead to START switch contact (2).
- 2 Push the START button and check for continuity. If continuity does not exist, replace the START switch (p 6-219).
- 3 If main drive motor fails to start, proceed to step D.



**D. STOP SWITCH MAY BE DEFECTIVE.**

- 1 Connect one multimeter lead to STOP switch contact (1) and connect other lead to STOP switch contact (2).
- 2 Check for continuity. If no continuity exists, replace the STOP switch (p 6-219). The STOP switch is normally closed (N/C).
- 3 If main drive motor fails to start, proceed to step E.





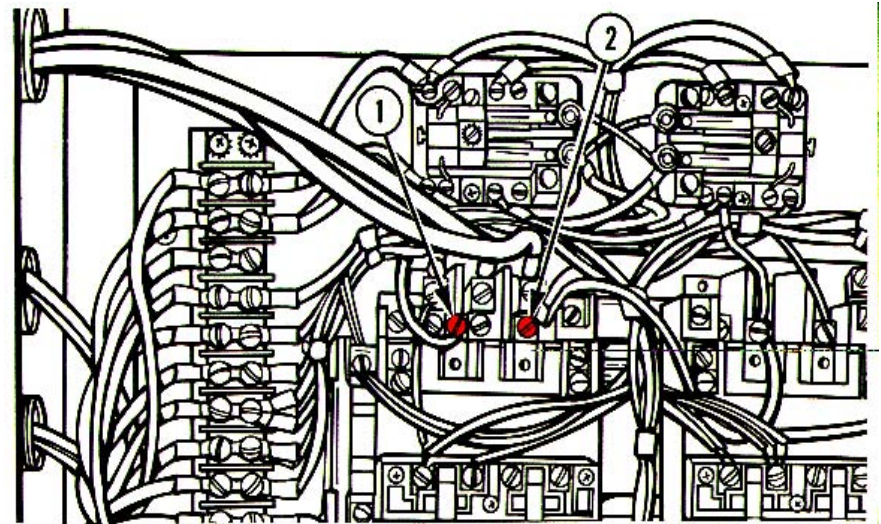
**6-2. TROUBLESHOOTING (cont)**

**E. STARTER FORWARD COIL MAY BE DEFECTIVE**

**NOTE**

The following check is for resistance.

- 1 Connect one multimeter lead to starter contact C1 (1) and connect other lead to starter contact C8 (2).
- 2 Check for approximate resistance reading of 100 ohms. If resistance is not present, replace the starter (p 6-219).
- 3 If main drive motor fails to start, proceed to step F.



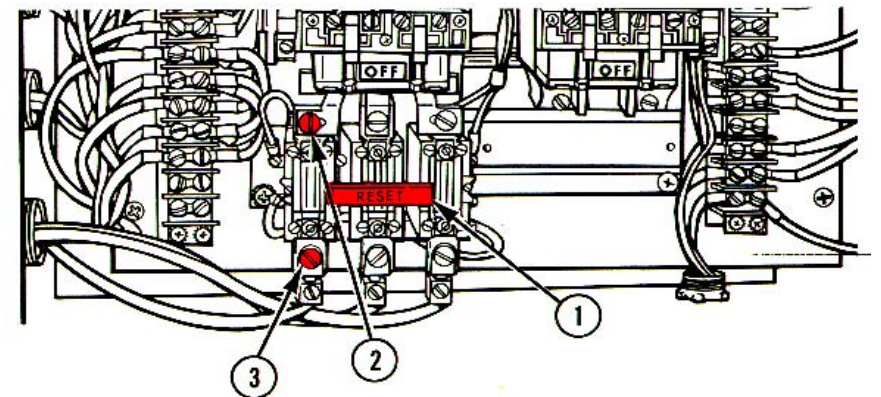
**F. STARTER THERMAL HEATERS' BUS BAR CONTACTS MAY BE DEFECTIVE**

**NOTE**

Ensure thermal heaters are reset by pushing in on the RESET bar (1).

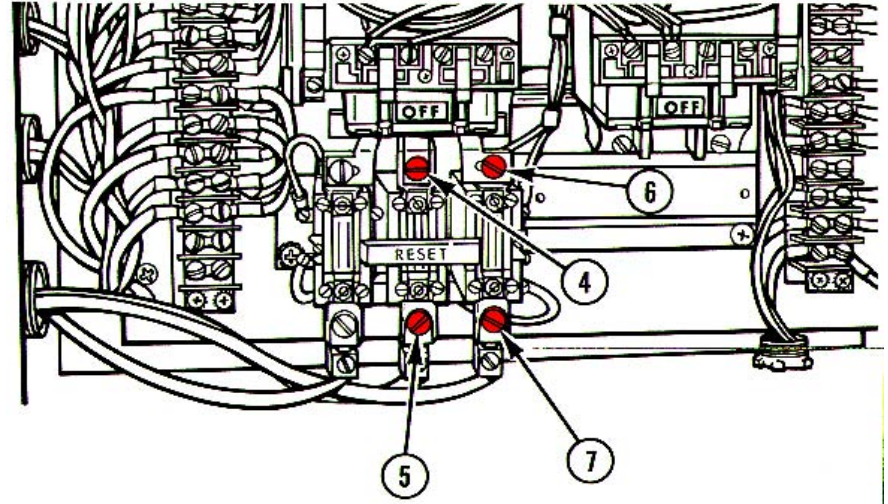
Some testers have starters which contain only two heaters.

- 1 Connect one multimeter lead to thermal heater contact (2) and connect other lead to thermal heater contact (3).



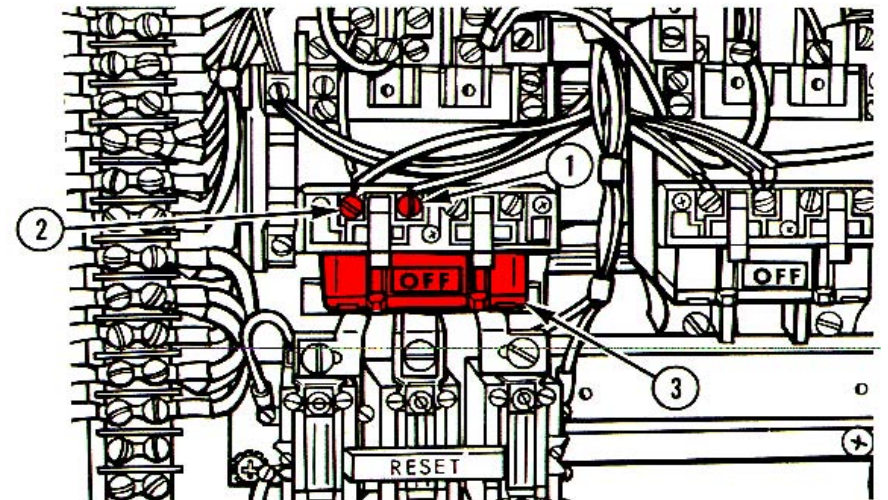


- 2 Remove both leads. Connect one multimeter lead to thermal heater contact (4) and connect other lead to thermal heater contact (5).
- 3 Remove both leads. Connect one multimeter lead to thermal heater contact (6) and connect other lead to thermal heater contact (7).
- 4 Check for continuity. If no continuity exists, replace the starter (p 6-219).
- 5 If main drive motor fails to start, proceed to step G.



**G. STARTER MICROWITCH MAY BE DEFECTIVE**

- 1 Connect one multimeter lead to starter contact C2 (1) and the other lead to starter contact C3 (2).
- 2 Push up on forward contact arm (3).



**6-2. TROUBLESHOOTING (cont)**

**G. STARTER MICROSWITCH MAY BE DEFECTIVE. (cont)**

3. Check for continuity. If no continuity exists, replace the starter (p 6-219).
4. If main drive motor fails to start, proceed to step H.

**NOTE**

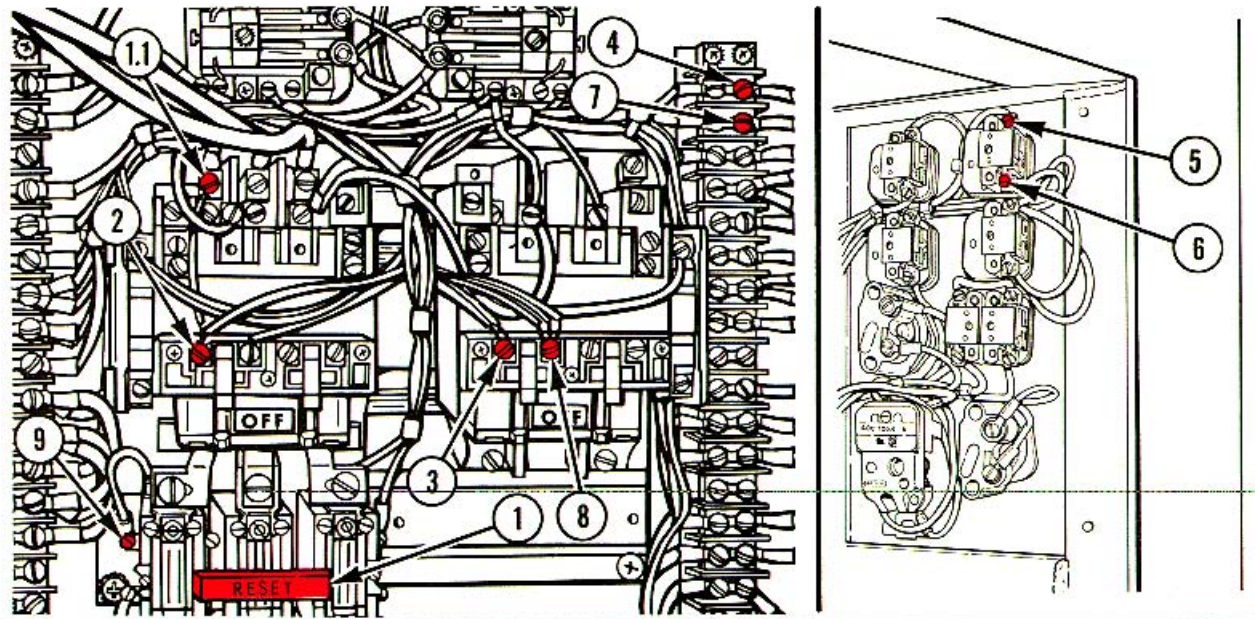
Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.

**H. WIRES MAY BE OPEN.**

**NOTE**

Ensure thermal heaters are reset by pushing in on the RESET bar (1).

- 1 Connect one multimeter lead to contact L1 (1.1) on forward side of starter. Connect other lead in sequence to starter contacts C3 (2) and C5 (3), terminal B1 (4), and on START switch contact (5).
- 2 Remove both leads. Connect one multimeter lead to the START switch contact (6). Connect other lead in sequence to terminal B2 (7), starter contact C4 (8), and thermal heater contact (9).





**NOTE**

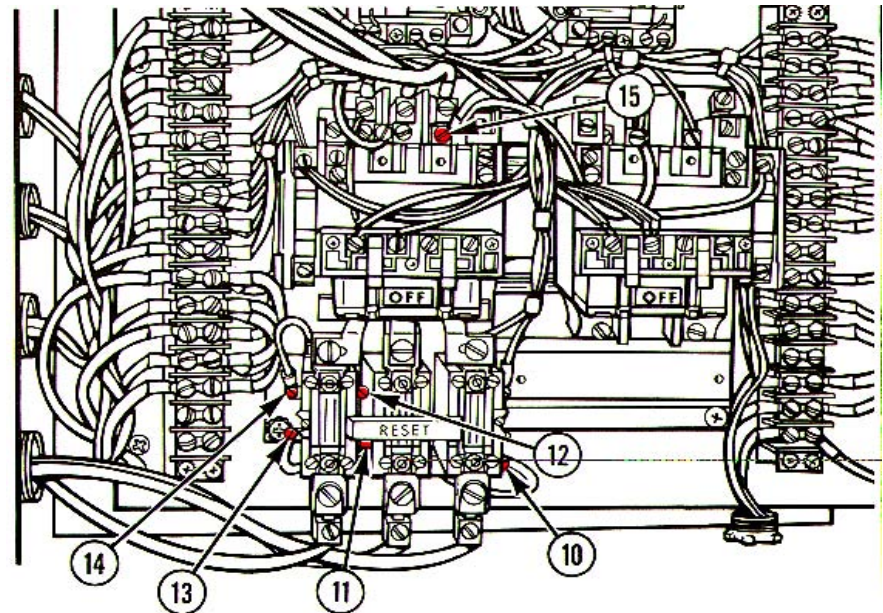
To ensure thermal heater is not shorted, set leads on contacts and pull out on RESET. On later model testers, remove heater element and push down on heater switch.

- 3 Remove both leads. Connect one multimeter lead to the thermal heater contact (10). Connect the other lead to the thermal heater contact (11).

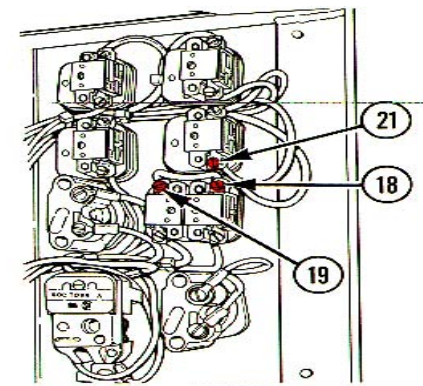
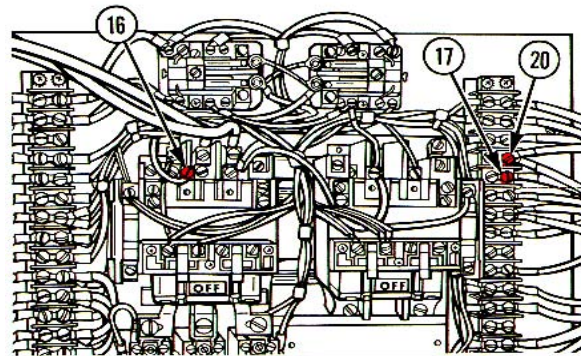
**NOTE**

Some testers have only two thermal heaters instead of three. For testers with two thermal heaters, omit steps 4 and 5.

- 4 Remove both leads. Connect one multimeter lead to the thermal heater contact (12) and the other lead to the thermal heater contact (13).
- 5 Remove both leads. Connect one multimeter lead to the thermal heater contact (14) and connect the other lead to starter contact C8 (15).

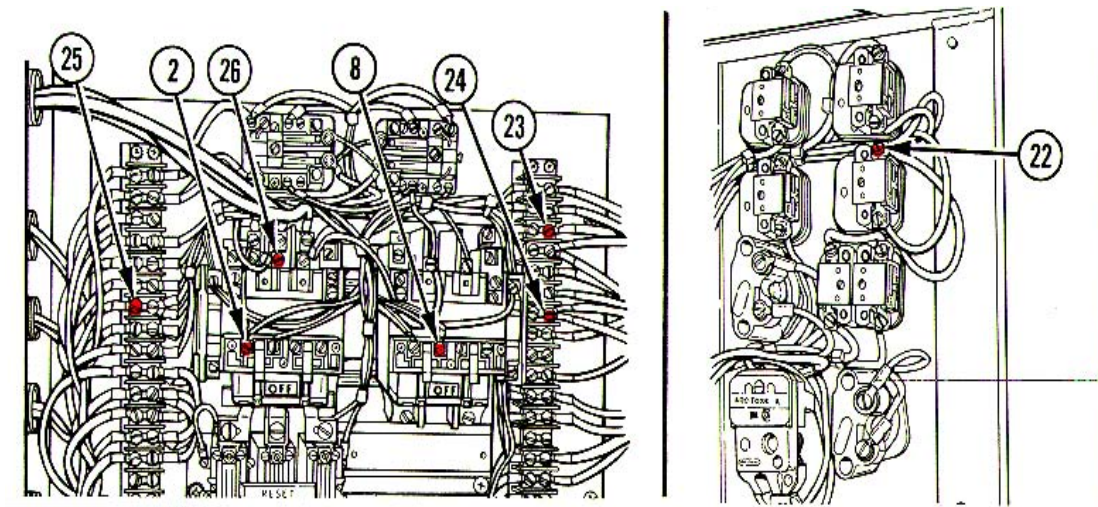


- 6 Remove both leads. Connect one multimeter lead to starter contact C1 (16). Connect other lead in sequence to terminal B5 (17) and to contact (18) on FORWARD-OFF-REVERSE switch.
- 7 Remove both leads. Connect one multimeter lead to contact (19) on FORWARD-OFF-REVERSE switch. Connect other lead in sequence to terminal B4 (20) and to contact (21) on STOP switch.



**6-2. TROUBLESHOOTING (cont)****H. WIRES MAY BE OPEN. (cont)**

- 8** Remove both leads. Connect one multimeter lead to contact (22) on STOP switch. Connect other lead in sequence to terminals B3 (23), B7 (24), A7 (25), and to starter contact L2 (26).
- 9** Remove both leads. Connect one multimeter lead to starter contact C4 (8). Connect other lead to starter contact C3 (2).

**I. WIRE MAY BE OPEN FROM STARTER TO MAIN DRIVE MOTOR.**

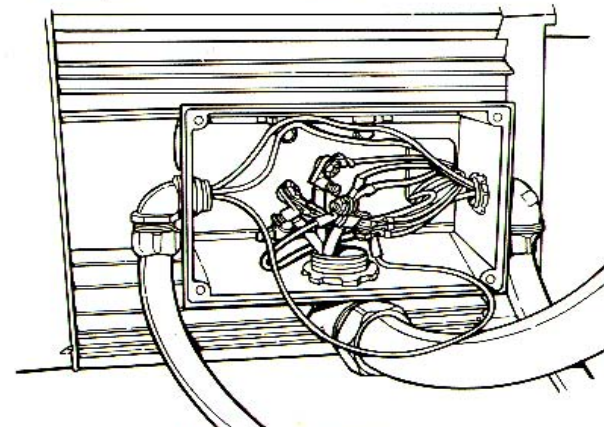
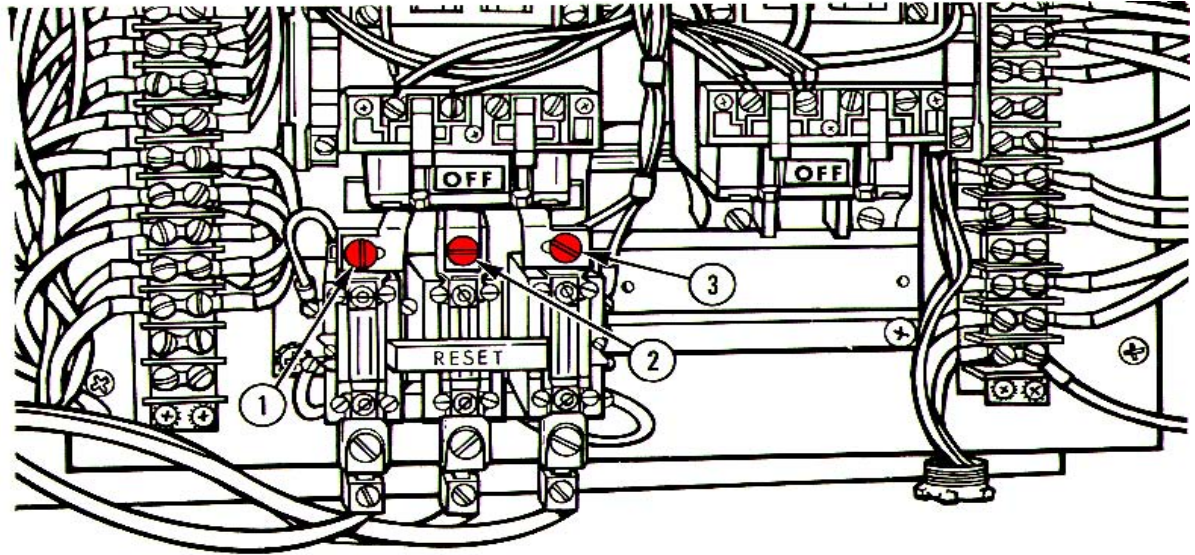
- 10.** Check for continuity. If continuity checks determine there is an open wire, replace the wire (p 219).
- 11.** If main drive motor start, proceed to step I.

**NOTE**

Wires at main drive motor that come from the starter are not tagged with a number. Identify wire by color when making continuity checks. Remove tape from wire ends. After making checks, apply new tape (item 19, app C).



- 1 Remove cover from wire outlet box on main drive motor. Connect one multimeter lead to contact L1 (1) at forward side of starter and connect other lead to L1 wire end that is attached to wires tagged no. 1 and 7 at the main drive motor.
- 2 Remove both leads. Connect one multimeter lead to contact L2 (2) at forward side of starter and connect other lead to L2 wire end that is attached to wires tagged no. 2 and 8 at the main drive motor.
- 3 Remove both leads. Connect one multimeter lead to contact L3 (3) at forward side of starter and connect other lead to L3 wire end that is attached to wires tagged no. 3 and 9 at the main drive motor.



MAIN DRIVE MOTOR



**62. TROUBLESHOOTING (cont)**

**I. WIRE MAY BE OPEN FROM STARTER TO MAIN DRIVE MOTOR. (cont)**

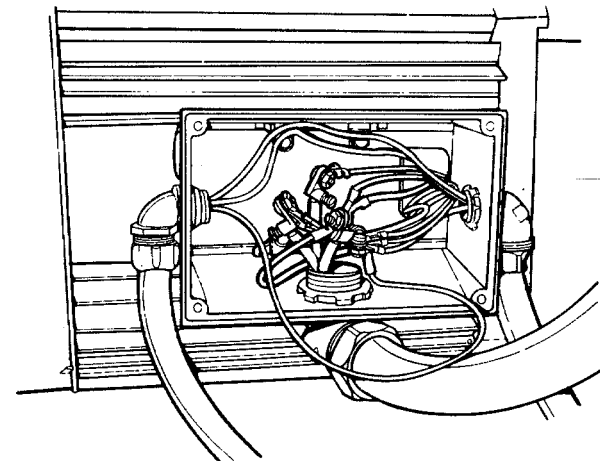
4. Check for continuity. If continuity does not exist, replace the wire (p 6-219).
5. If main drive motor fails to start, proceed to step J.

**J. MAIN DRIVE MOTOR MAY BE DEFECTIVE.**

**NOTE**

Wires from main drive motor are tagged for identification. Remove tape from wire ends to make continuity checks. After making checks, apply new tape (item 19, app C).

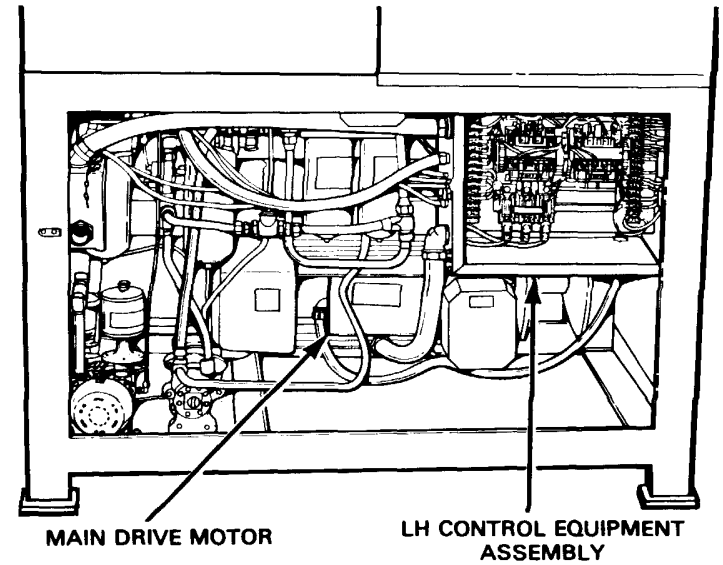
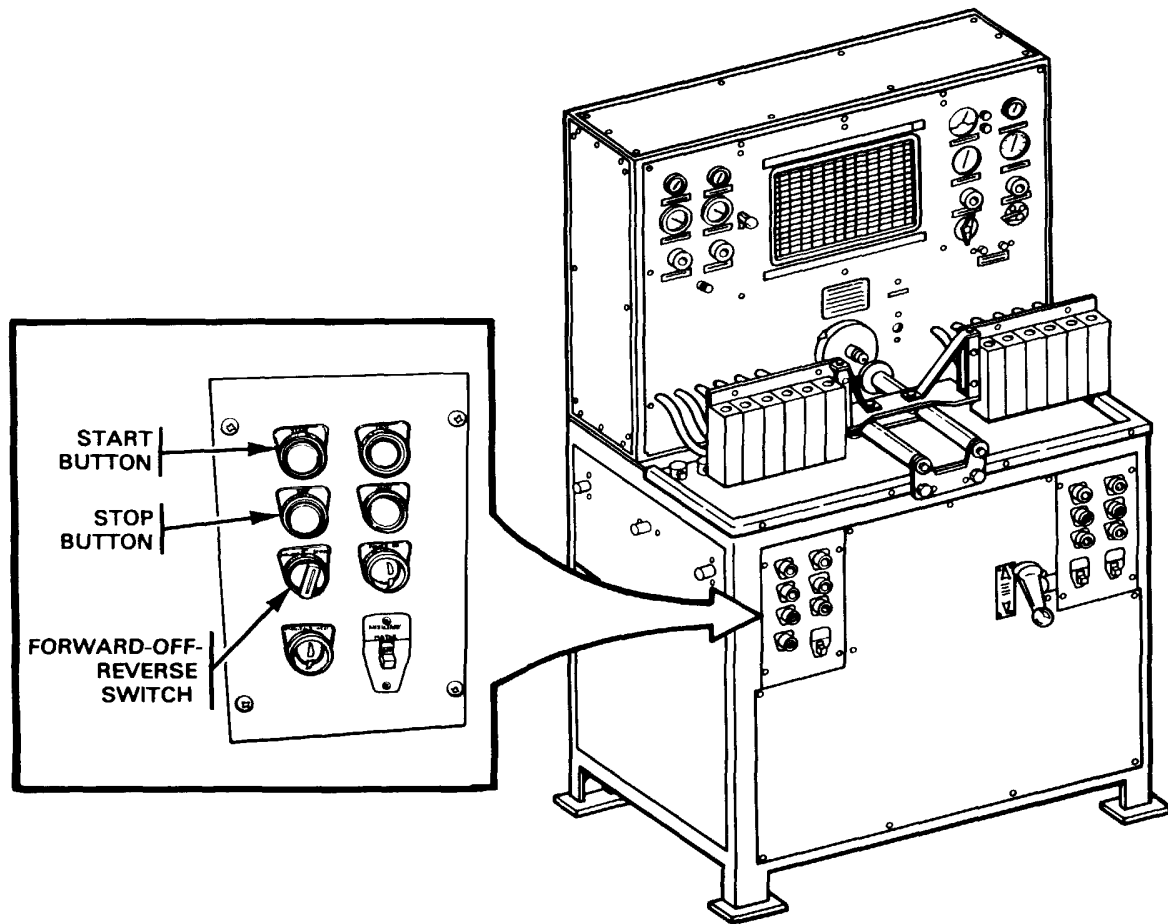
- 1 Remove cover from wire outlet box on main drive motor. Connect one multimeter lead to the wire tagged no. 1. Connect other lead to the wire tagged no. 7.
- 2 Remove both leads. Connect one multimeter lead to wire tagged no. 2. Connect the other lead to the wire tagged no. 8.
- 3 Remove both leads. Connect one multimeter lead to wire tagged no. 3. Connect the other lead to the wire tagged no. 9.
- 4 Check for continuity. If no continuity exists, replace the main drive motor (p 6-466).



**MAIN DRIVE MOTOR**

MAIN DRIVE MOTOR

FAILS TO START,  
FORWARD-OFF-REVERSE switch is in  
REVERSE position



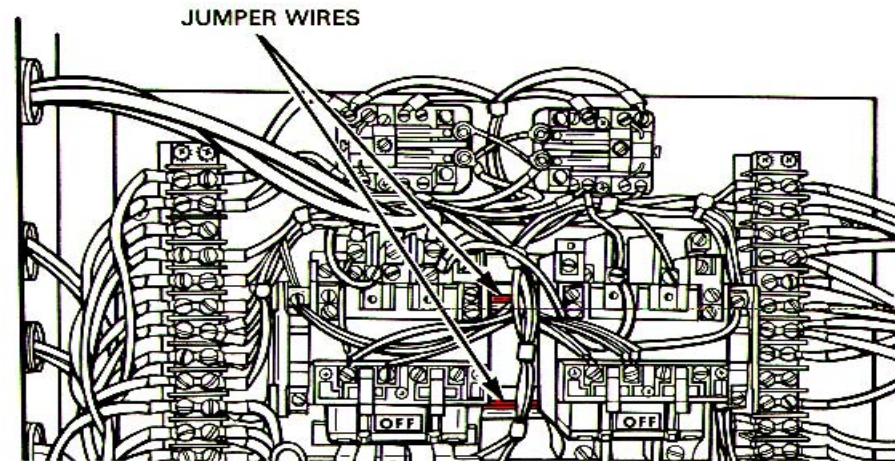
LOCATOR VIEW



**6-2. TROUBLESHOOTING (cont)**

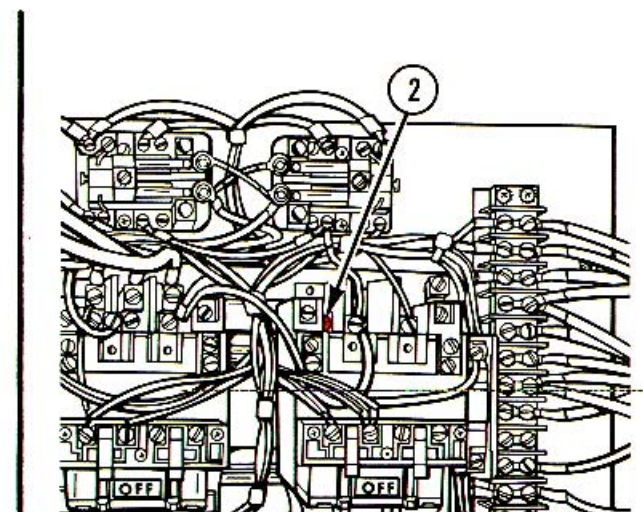
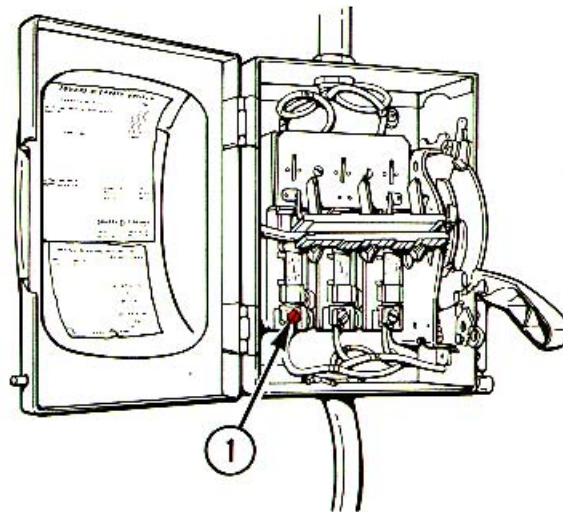
**NOTE**

There are jumper wires from the forward side of the starter to the reverse side of the starter.



**A. WIRE MAY BE OPEN FROM MAIN POWER SOURCE TO REVERSE SIDE OF STARTER.**

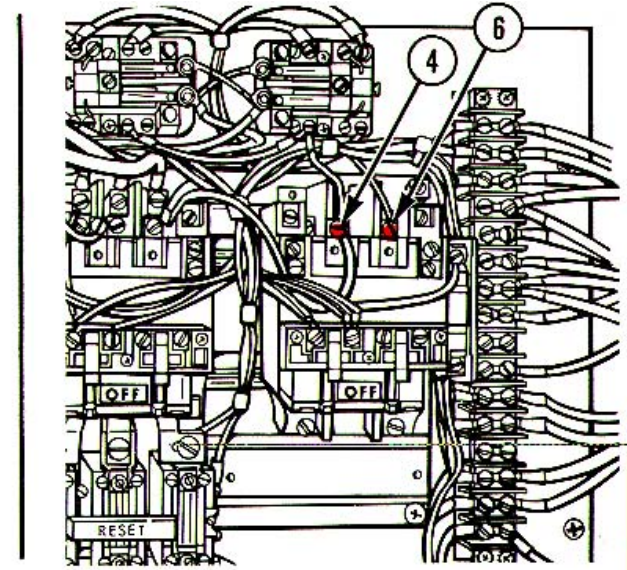
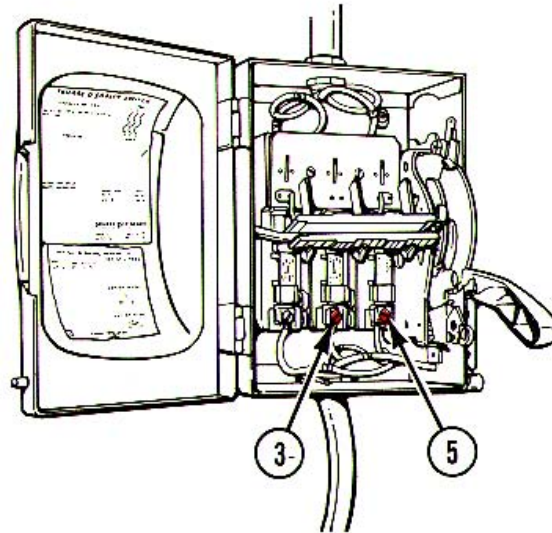
- 1 Connect one multimeter lead to contact L1 (1) at main power source and connect other lead to contact L1 (2) at reverse side of starter.





2 Remove both leads. Connect one multimeter lead to contact L2 (3) at main power source and connect other lead to contact L2 (4) at reverse side of starter.

3 Remove both leads. Connect one multimeter lead to contact L3 (5) at main power source and connect other lead to contact L3 (6) at reverse side of starter.



**B. FORWARD-OFF-REVERSE SWITCH MAY BE DEFECTIVE**

4. Check for continuity. If continuity does not exist, replace the wire (p 6-219).
5. If main drive motor fails to start, proceed to step B.

**NOTE**

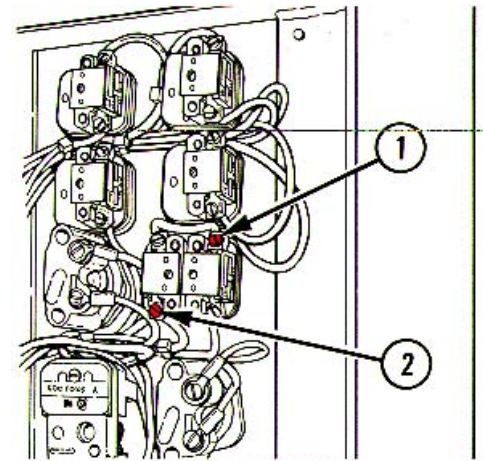
If the main drive motor starts when the FORWARD-OFF-REVERSE switch is in REVERSE position, this indicates that the greatest portion of the starting circuit is functional.



**6-2. TROUBLESHOOTING (cont)**

**B. FORWARD-OFF-REVERSE SWITCH MAY BE DEFECTIVE. (cont)**

- 1 Place the FORWARD-OFF-REVERSE switch in the FORWARD position. Push START button. If main drive motor fails to start, place the FORWARD-OFF-REVERSE switch back in the REVERSE position.
- 2 Connect one multimeter lead to FORWARD-OFF-REVERSE switch contact (1) and connect other lead to FORWARD-OFF-REVERSE switch contact (2).



**C. START SWITCH MAY BE DEFECTIVE.**

3. Check for continuity. If continuity does not exist, replace the FORWARD-OFF-REVERSE switch (p 6-219)
4. If main drive motor fails to start, proceed to step C.

Refer to page 6-15 for troubleshooting procedures.

**D. STOP SWITCH MAY BE DEFECTIVE.**

Refer to page 6-15 for troubleshooting procedures.

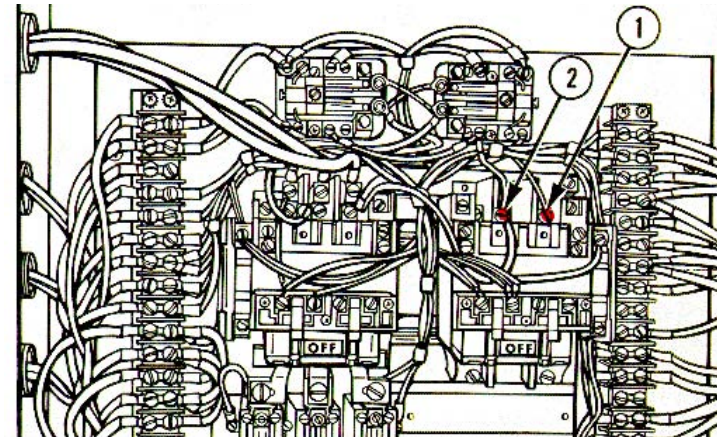
**E. STARTER REVERSE COIL MAY BE DEFECTIVE.**

TM 9-4910-387-14-2

**NOTE**

**The following check is for resistance.**

- 1 Connect one multimeter lead to starter contact C9 (1) and the other lead to starter contact (2).
- 2 Check for approximate resistance reading of 100 ohms. If resistance is not present, replace the starter (p 6-219).
- 3 If main drive motor fails to start, proceed to step F.

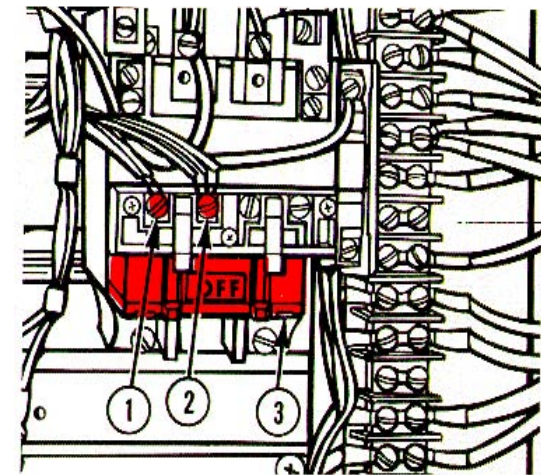


**F. STARTER THERMAL HEATERS' BUS BAR CONTACTS MAY BE DEFECTIVE.**

Refer to page 6-16 for troubleshooting procedures.

**G. STARTER MICROSWITCH MAY BE OPEN**

- 1 Connect one multimeter lead to starter contact C5 (1) and the other lead to starter contact C4 (2).
- 2 Push up on reverse contact arm (3).





**6-2. TROUBLESHOOTING (cont)**

**G. STARTER MICROSWITCH MAY BE OPEN. (cont)**

- 3 Check for continuity. If no continuity exists, replace the starter(p 6-219).
- 4 If main drive motor fails to start, proceed to step H.

**NOTE**

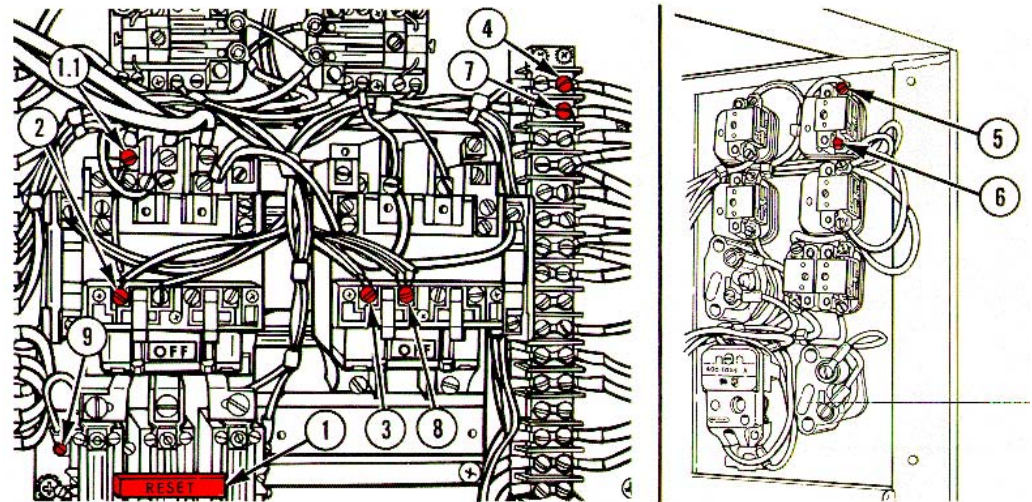
Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.

**H. WIRES MAY BE OPEN.**

**NOTE**

Ensure thermal heaters are reset by pushing in on the RESET bar (1).

- 1 Connect one multimeter lead to starter contact L1 (1.1) on forward side of starter. Connect other lead in sequence to starter contacts C3 (2) and C5 (3), terminal B1 (4), and on START switch contact (5).
- 2 Remove both leads. Connect one multimeter lead to the START switch contact (6). Connect other lead in sequence to terminal B2 (7), starter contact C4 (8), and thermal heater contact (9).



**NOTE**

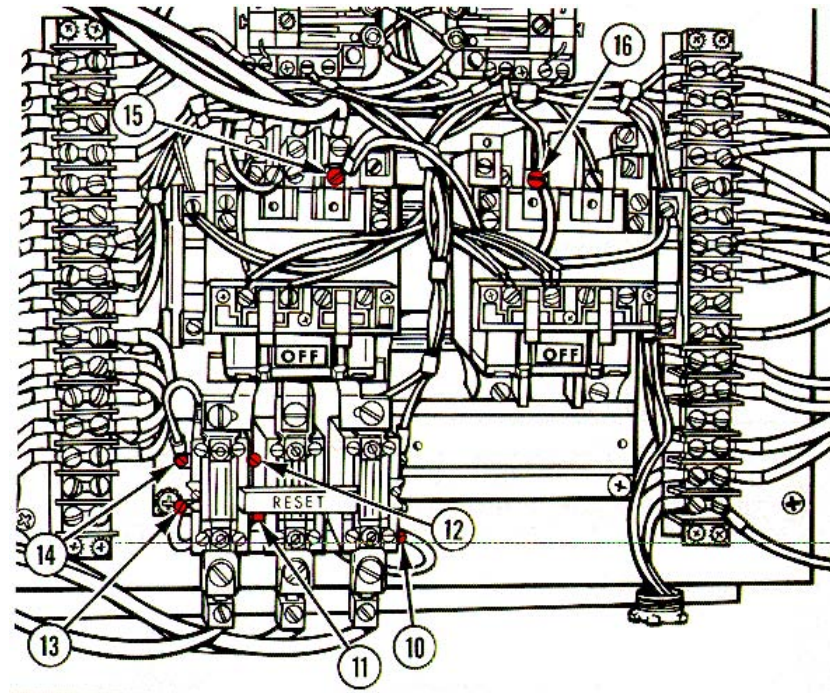
To ensure thermal heater is not shorted, set leads on contacts and pull out on RESET. On later model testers, remove heater element and push down on heater switch.

- 3 Remove both leads. Connect one multimeter lead to the thermal heater contact (10). Connect the other lead to the thermal heater contact (11).

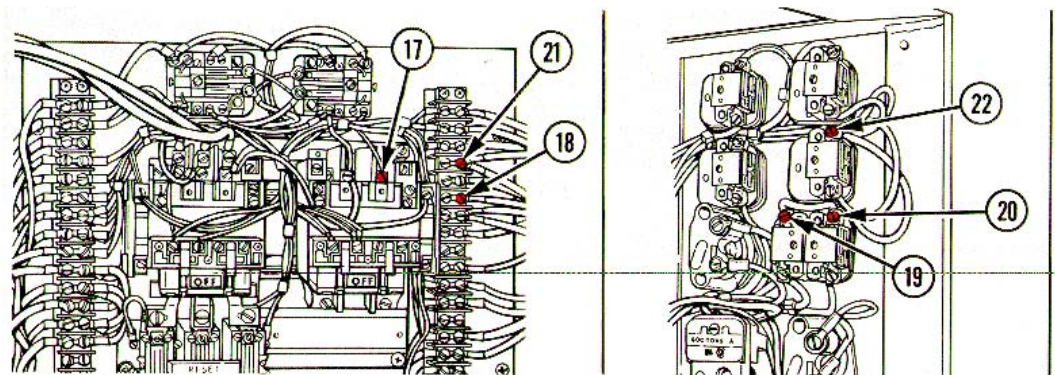
**NOTE**

Some testers have only two thermal heaters instead of three. For testers with two thermal heaters, omit steps 4 and 5.

- 4 Remove both leads. Connect one multimeter lead to the thermal heater contact (12) and the other lead to the thermal heater contact (13).
- 5 Remove both leads. Connect one multimeter lead to the thermal heater contact (14) and connect the other lead in sequence to starter contact C8 (15) and to starter contact (16) on reverse side of starter.



- 6 Remove both leads. Connect one multimeter lead to starter contact C9 (17). Connect other lead in sequence to terminal B6 (18) and to the FORWARD-OFF-REVERSE switch contact (19).
- 7 Remove both leads. Connect one multimeter lead to the FORWARDOFF-REVERSE switch contact (20). Connect other lead in sequence to terminal B4 (21) and to STOP switch contact (22).

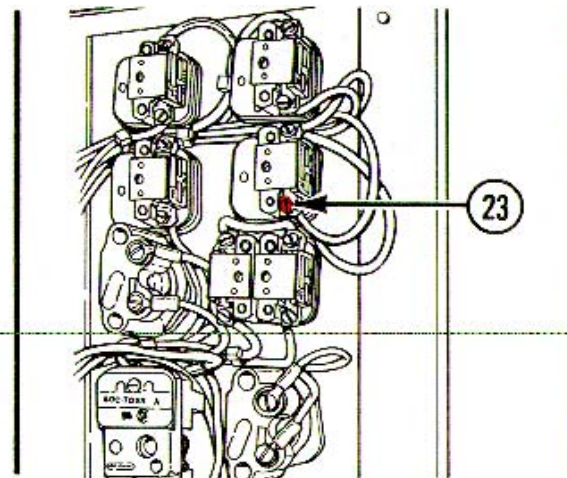
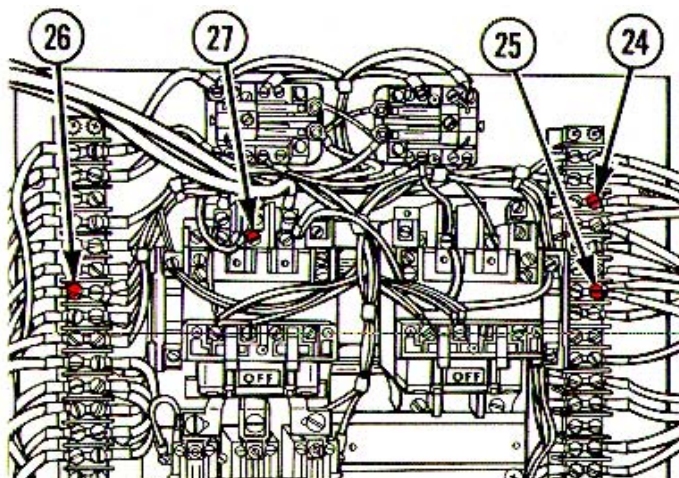




**6-2. TROUBLESHOOTING (cont) 1**

**H. WIRES MAY BE OPEN. (cont)**

**8** Remove both leads. Connect one multimeter lead to the STOP switch contact (23). Connect other lead in sequence to terminals B3 (24), B7 (25), A7 (26), and to starter contact L2 (27).



**I. WIRE MAY BE OPEN FROM STARTER TO MAIN DRIVE MOTOR.**

**J. MAIN DRIVE MOTOR MAY BE DEFECTIVE.**

**9** Check for continuity. If continuity checks determine there is an open wire, replace the wire (p 6-219). procedures.

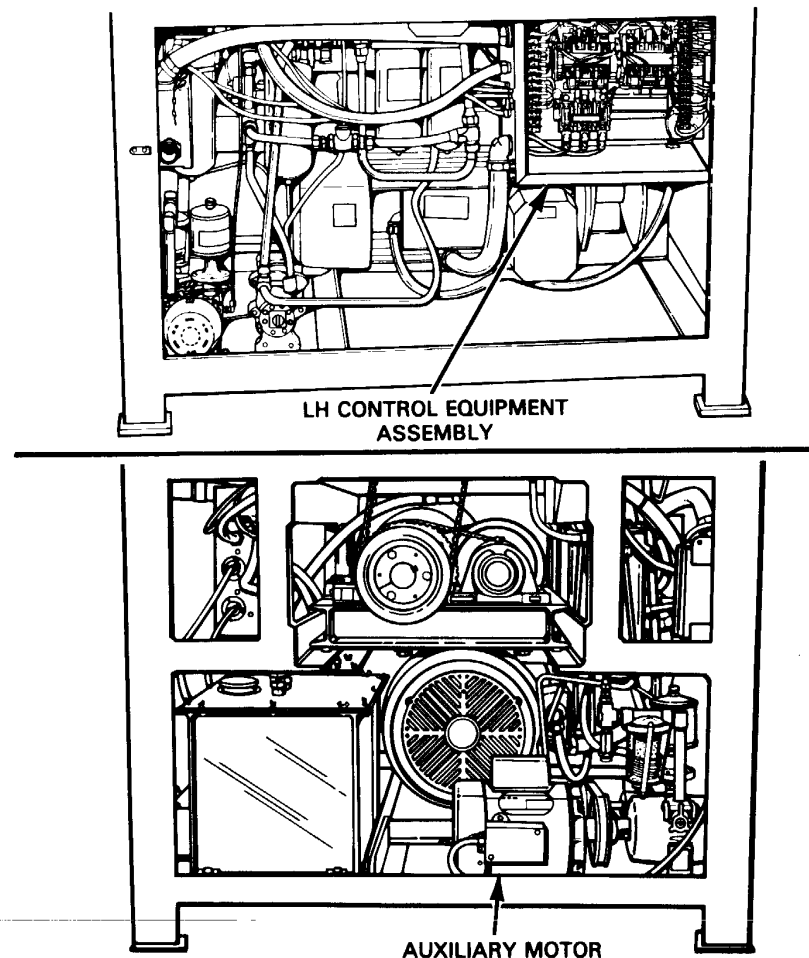
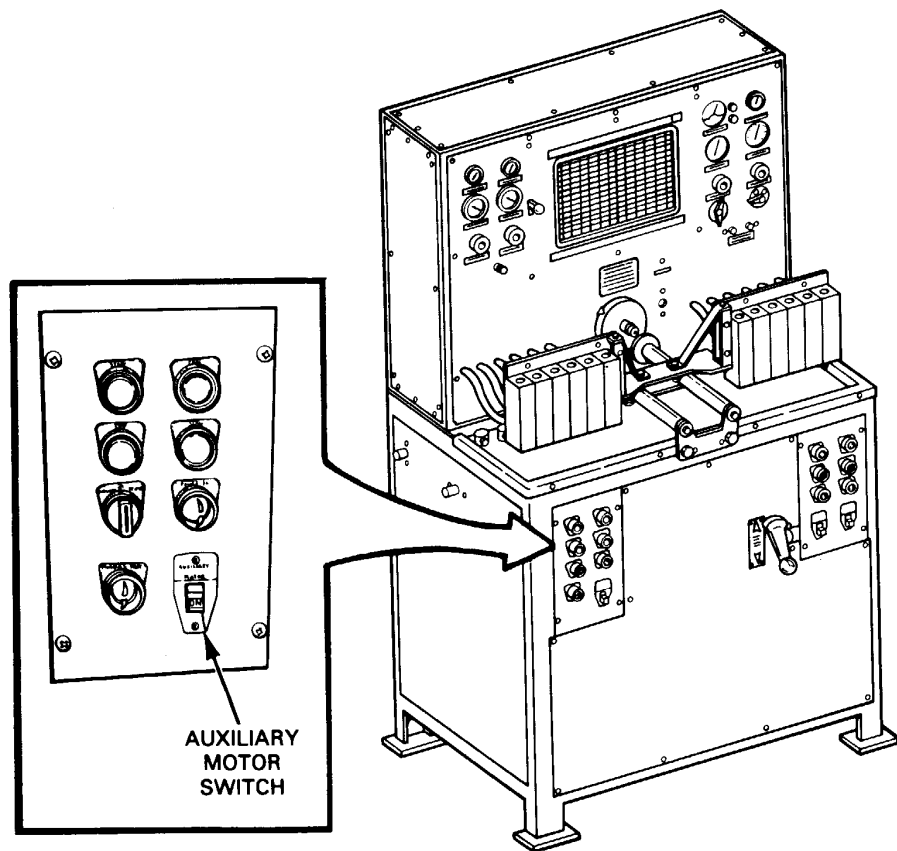
Refer to page 6-20 for troubleshooting procedures.

Refer to page 6-22 for troubleshooting

**10** If main drive motor fails to start, proceed to step I.

# AUXILIARY MOTOR

**FAILS TO START,  
AUXILIARY MOTOR switch is in the  
on position**



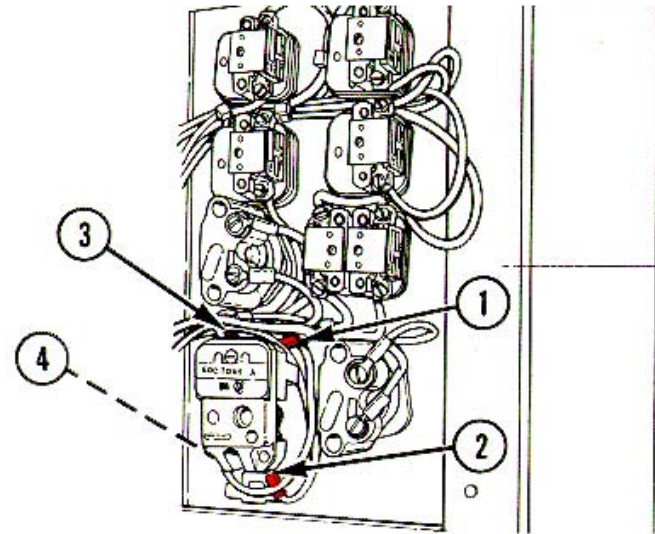
**LOCATOR VIEW**



**6-2. TROUBLESHOOTING (cont) I**

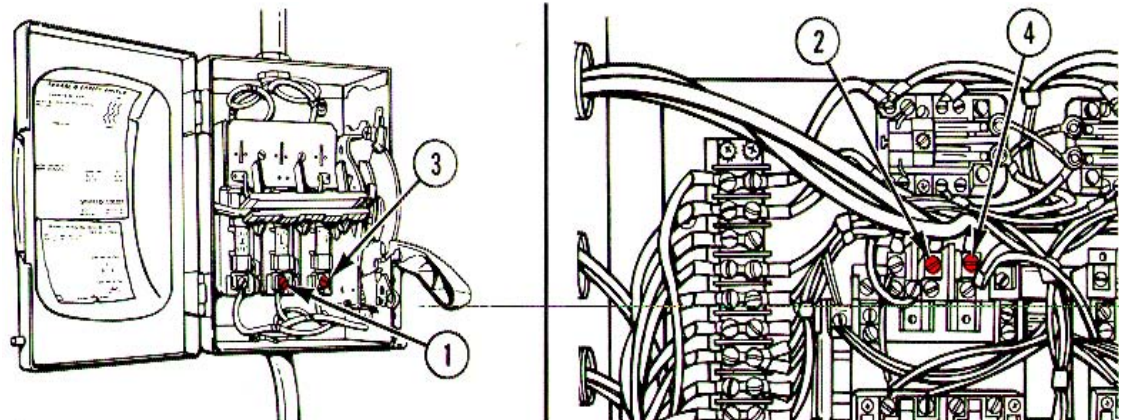
**A. AUXILIARY MOTOR SWITCH MAY BE DEFECTIVE.**

- 1 Connect multimeter leads to AUXILIARY MOTOR switch contacts (1 and 2). Turn on AUXILIARY MOTOR switch.
- 2 Remove both leads. Connect multimeter leads to AUXILIARY MOTOR switch contacts (3 and 4). Turn on AUXILIARY MOTOR switch.
- 3 Check for continuity. If continuity is not present, replace the AUXILIARY MOTOR switch (p 6-219).
- 4 If auxiliary motor fails to start, proceed to step B.



**B. L2 OR L3 WIRE MAY BE OPEN FROM MAIN POWER SOURCE TO FORWARD SIDE OF STARTER.**

- 1 Connect one multimeter lead to contact L2 (1) at main power source and connect other lead to contact L2 (2) at forward side of starter.
- 2 Remove both leads. Connect one multimeter lead to contact L3 (3) at main power source and connect other lead to contact L3 (4) at forward side of starter.





- 3 Check for continuity. If continuity is not present, replace the open wire (p 6-219).
- 4 If auxiliary motor fails to start, proceed to step C.

**NOTE**

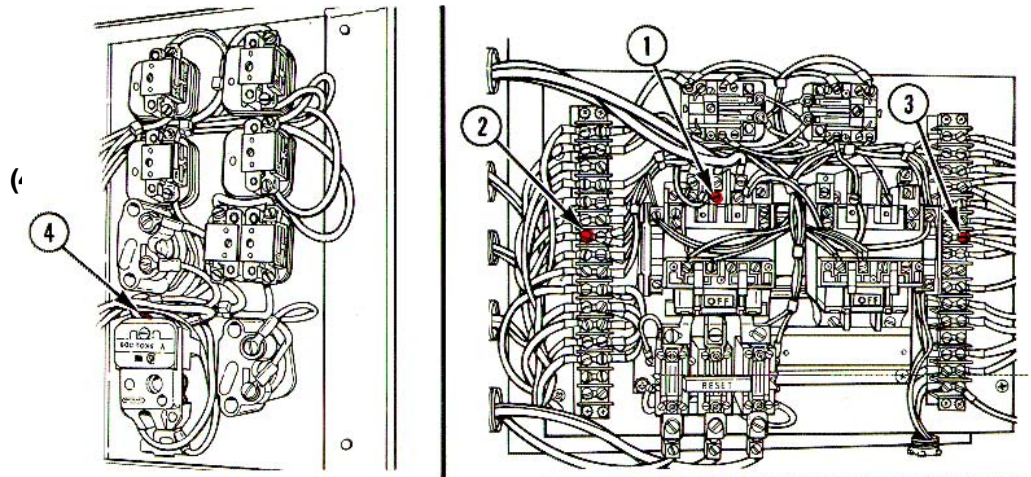
Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.

**C. WIRES MAY BE OPEN.**

**NOTE**

Wires coming from auxiliary motor are tagged for identification. Remove tape and wire nuts from wire ends to make continuity checks. After making checks, replace wire nuts and apply tape (item 19, app C).

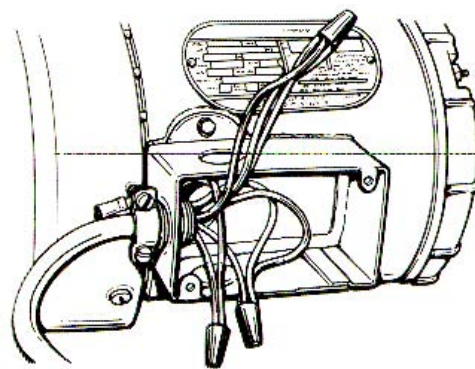
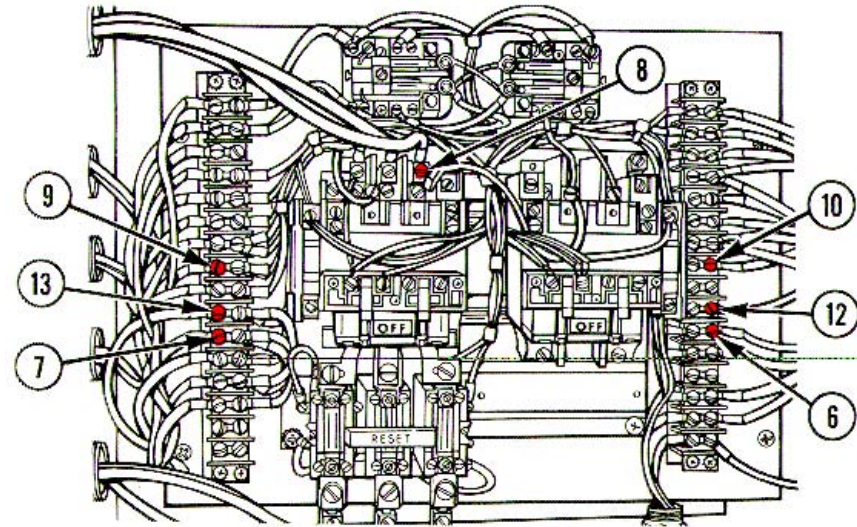
- 1 Connect one multimeter lead to L2 contact (1) on the forward side of starter. Connect the other lead in sequence to terminals A7 (2) and B7 (3), and to contact (4) on AUXILIARY MOTOR switch.



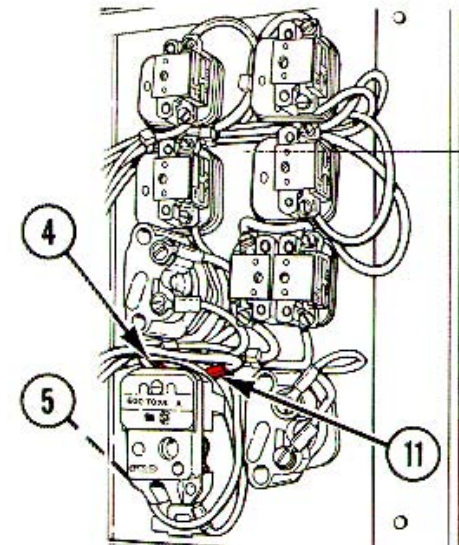
**6-2. TROUBLESHOOTING (cont)**

**C. WIRES MAY BE OPEN. (cont)**

- 2 Remove both leads. Remove cover from wire outlet box on auxiliary motor (p 6-31). Connect one multimeter lead to contact (5) of AUXILIARY MOTOR switch. Connect other lead in sequence to terminals B11 (6) and All (7), and to wire that is tagged no. 1 at auxiliary motor.
- 3 Remove both leads. Connect one multimeter lead to contact L3 (8) on the forward side of starter. Connect other lead in sequence to terminals A8 (9) and B8 (10), and to contact (11) on AUXILIARY MOTOR switch.
- 4 Remove both leads. Connect one multimeter lead to contact (4) of AUXILIARY MOTOR switch. Connect other lead in sequence to terminals B10 (12) and A10 (13), and to wires that are tagged no. 4 and 5 at auxiliary motor.
- 5 Check for continuity. If continuity checks determine that there is an open wire, replace the wire (p 6-219).
- 6 If auxiliary motor fails to start, proceed to step D.



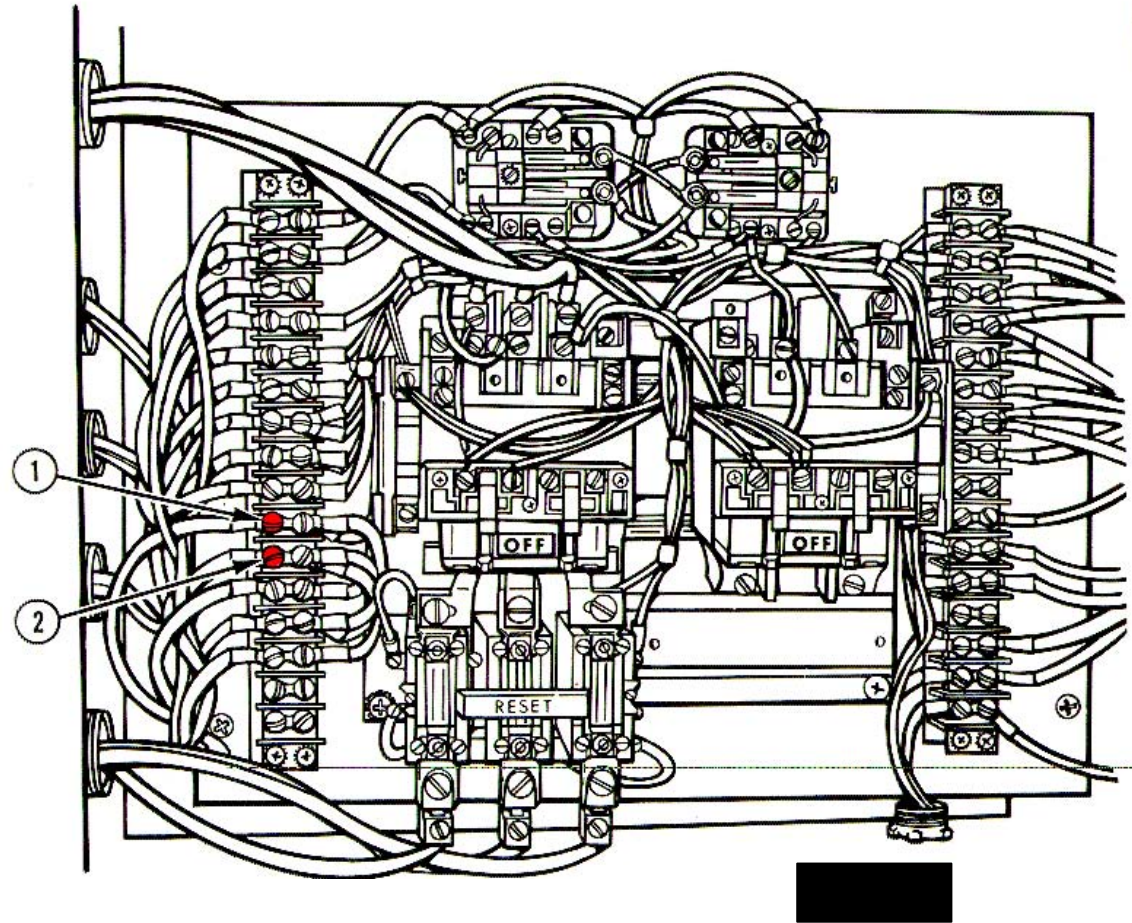
AUXILIARY MOTOR





**D. AUXILIARY MOTOR MAY BE DEFECTIVE.**

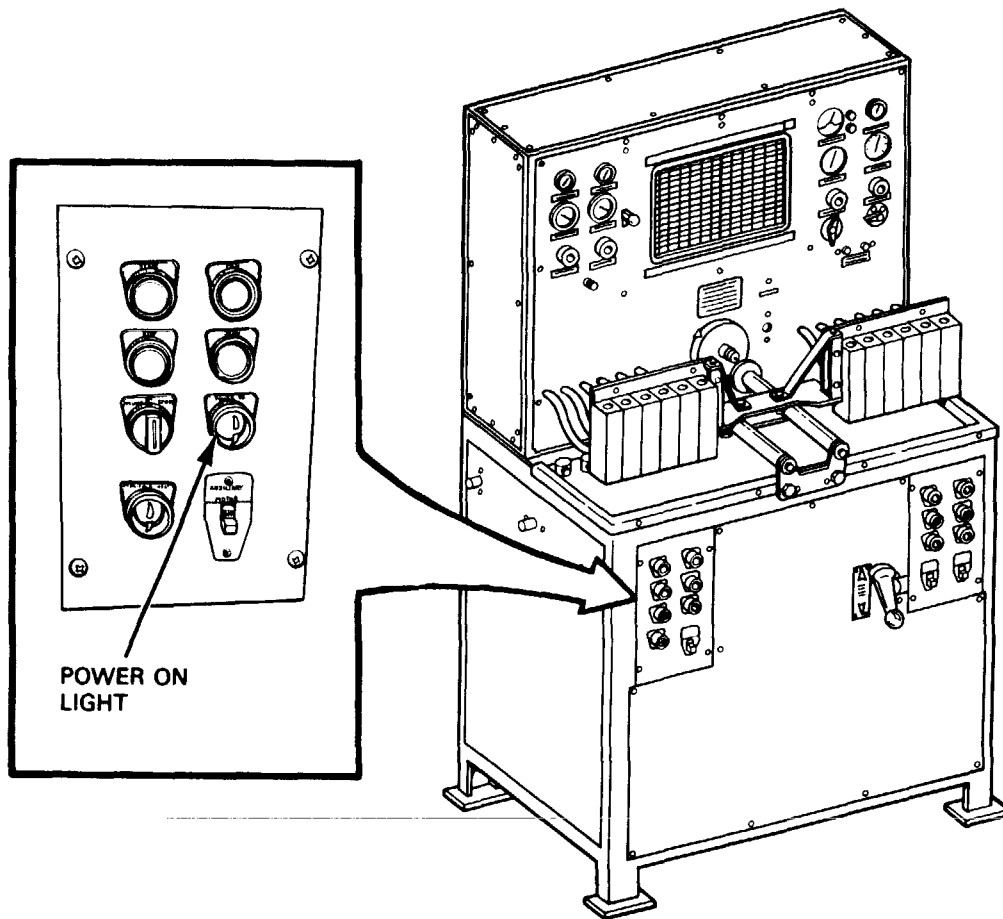
- 1 Connect one multimeter lead to terminal A10 (1) and the other lead to terminal A11 (2).
- 2 Check for continuity. Slight resistance is acceptable. If continuity does not exist, replace the auxiliary motor (p 6-525).



6-2. TROUBLESHOOTING (cont)

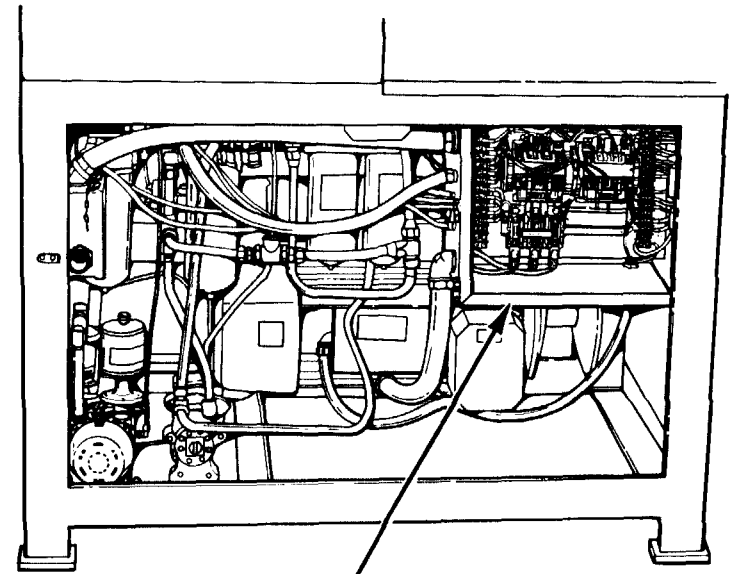
POWER ON LIGHT

DOES NOT LIGHT



POWER ON  
LIGHT

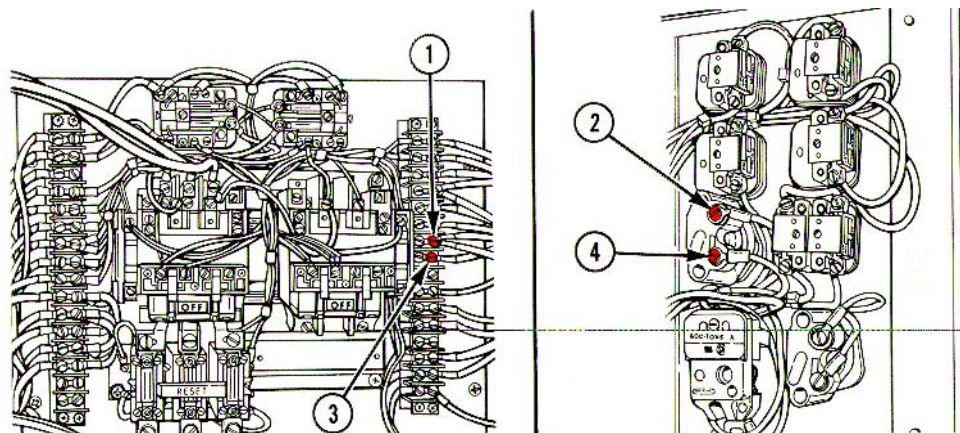
LOCATOR VIEW



LH CONTROL EQUIPMENT  
ASSEMBLY

**A. WIRES MAY BE OPEN.**

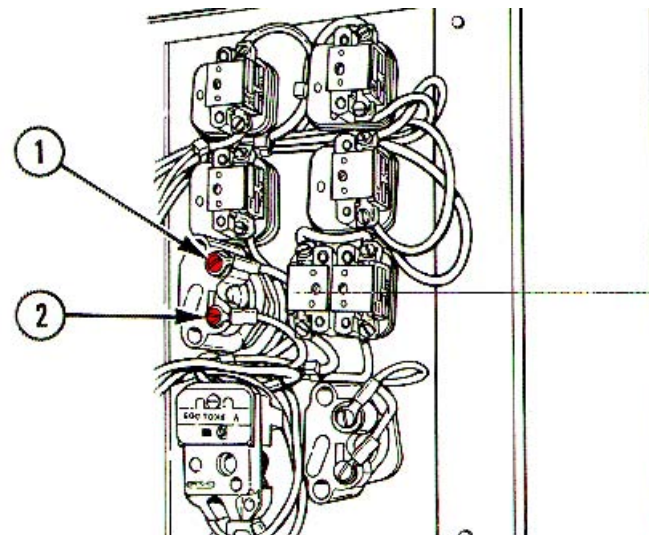
- 1 Connect one multimeter lead to terminal B7 (1) and connect other lead to contact (2) on indicator light.
- 2 Remove both leads. Connect one multimeter lead to terminal B8 (3) and other lead to contact (4) on indicator light.
- 3 Check for continuity. If continuity is not present, replace the open wires (p 6-219).
- 4 If POWER ON light does not light, proceed to step B.



**B. INDICATOR LIGHT MAY BE DEFECTIVE.**

**NOTE**  
The following check is for resistance.

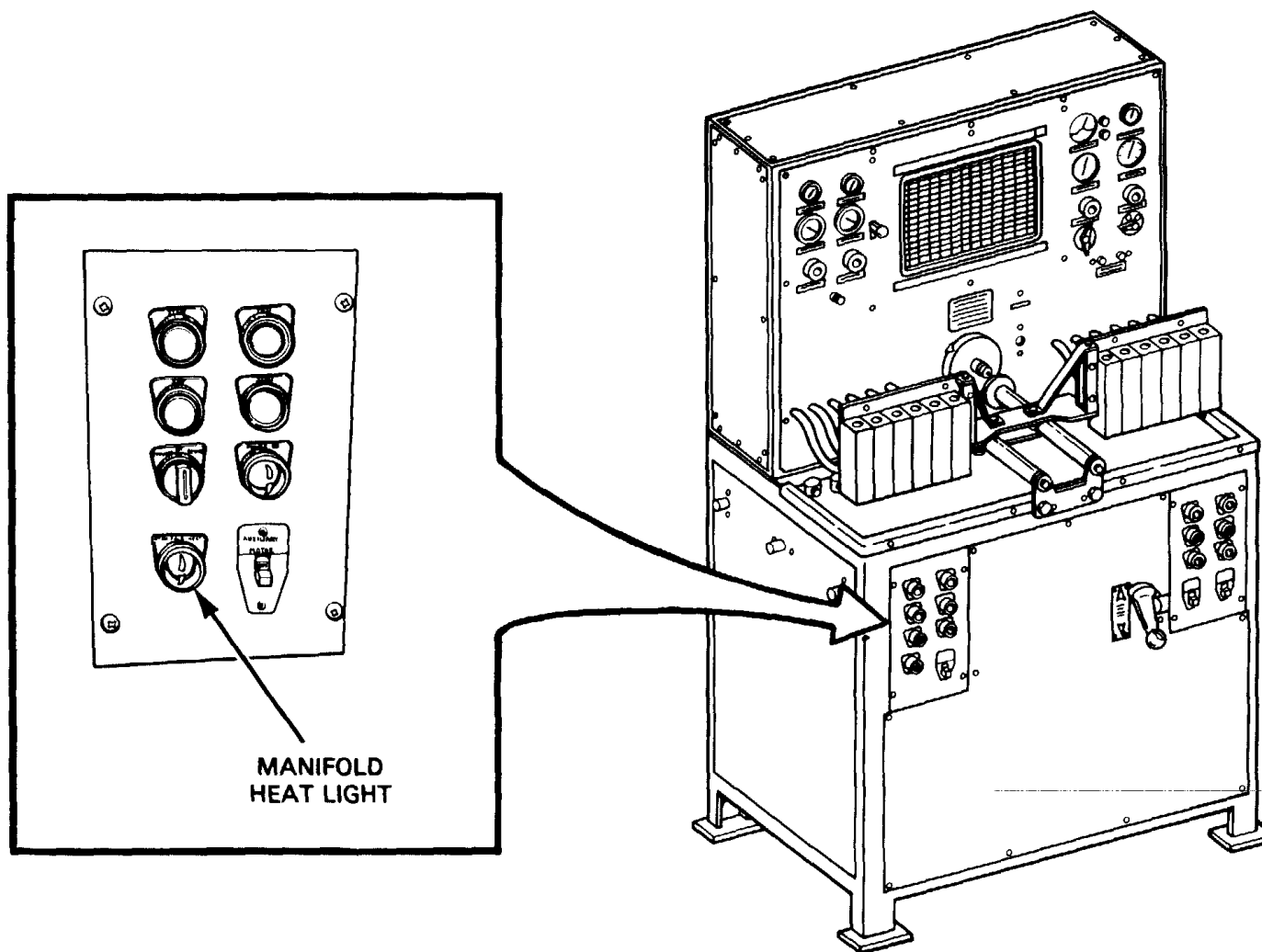
- 1 Connect one multimeter lead to contact (1) and other lead to contact (2) on indicator light.
- 2 Check for approximate resistance reading of 80 K ohms. If resistance is not present, replace the indicator light (p 6-219).



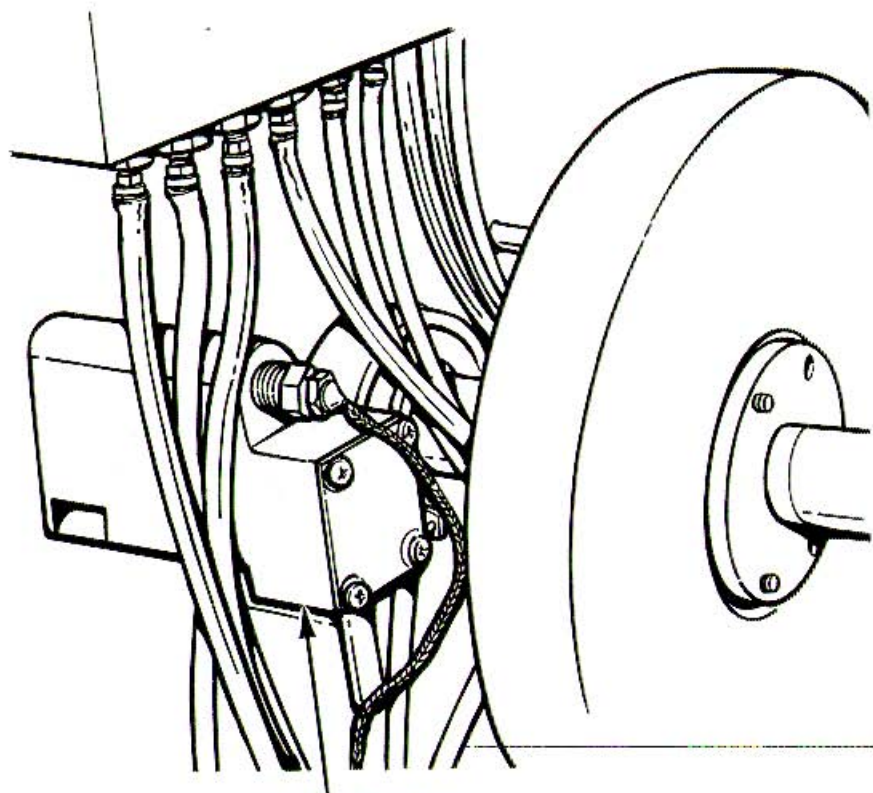
6-2. TROUBLESHOOTING (cont)

MANIFOLD HEAT LIGHT

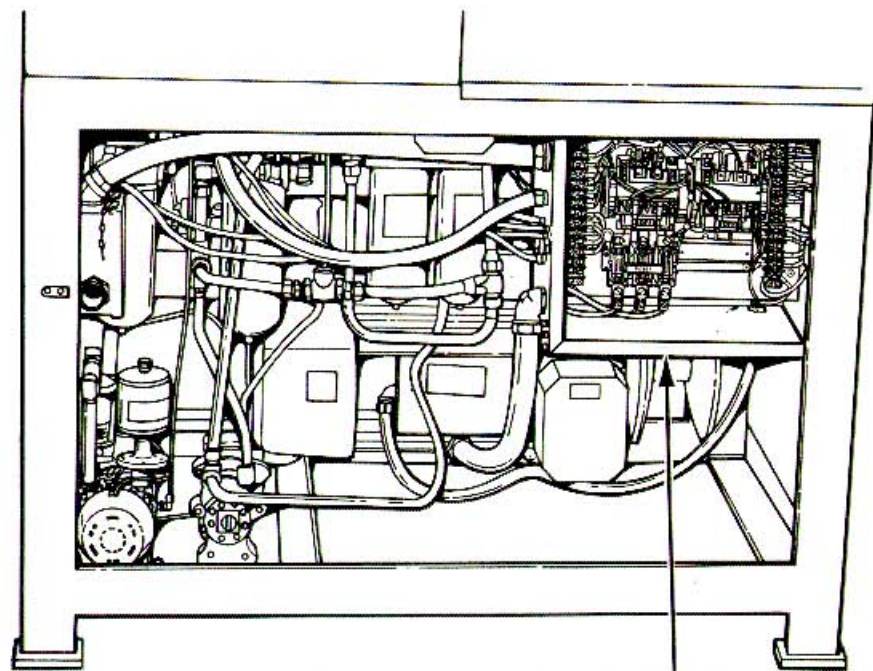
DOES NOT LIGHT







MANIFOLD BULB ASSEMBLY



LH CONTROL EQUIPMENT ASSEMBLY

LOCATOR VIEW



**6-2. TROUBLESHOOTING (cont)**

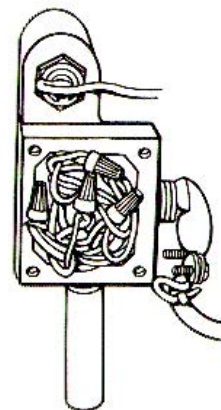
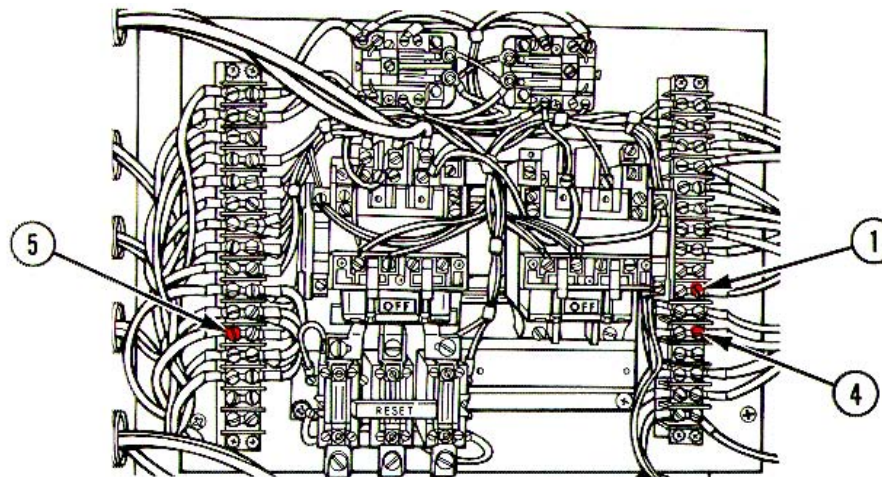
**A. WIRES MAY BE OPEN**

- 1 Remove lamp from indicator light (p 4-65). Connect one multimeter lead to terminal B10 (1) and other lead to contact (2) on indicator light.

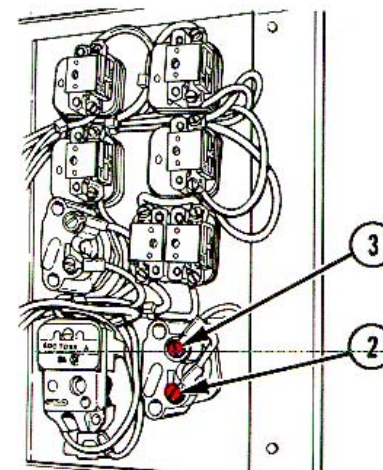
**NOTE**

Remove tape and wire nuts from wire ends at manifold bulb assembly before making continuity checks. After making checks, replace wire nuts and apply tape (item 19, app C).

- 2 Remove both leads. Remove cover on manifold bulb assembly. Connect one multimeter lead to contact (3) on indicator light. Connect other lead in sequence to terminals B12 (4) and A12 (5), and to wire at manifold bulb assembly from terminal A12 (5).



MANIFOLD BULB ASSEMBLY





3 Check for continuity. If continuity is not present, replace the open wire (p 6-219).

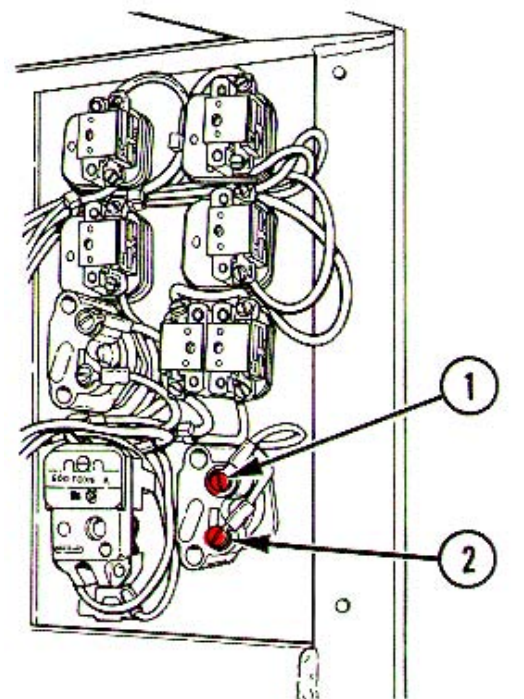
4 If MANIFOLD HEAT light does not light, proceed to step B.

**B. INDICATOR LIGHT MAY BE DEFECTIVE**

**NOTE**

The following check is for resistance.

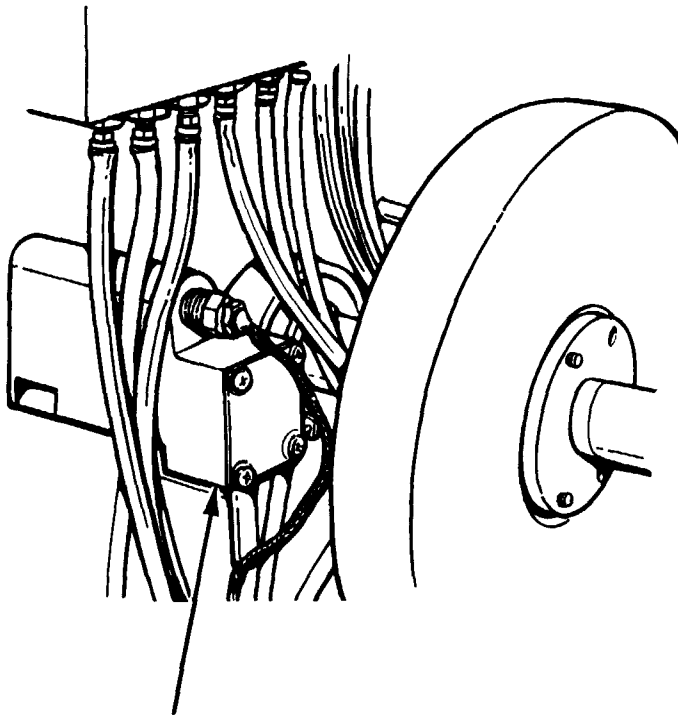
- 1 Connect one multimeter lead to contact (1) on indicator light and other lead to contact (2) on indicator light.
- 2 Check for approximate resistance reading of 80 K ohms. If resistance is not present, replace the indicator light (p 6-219).



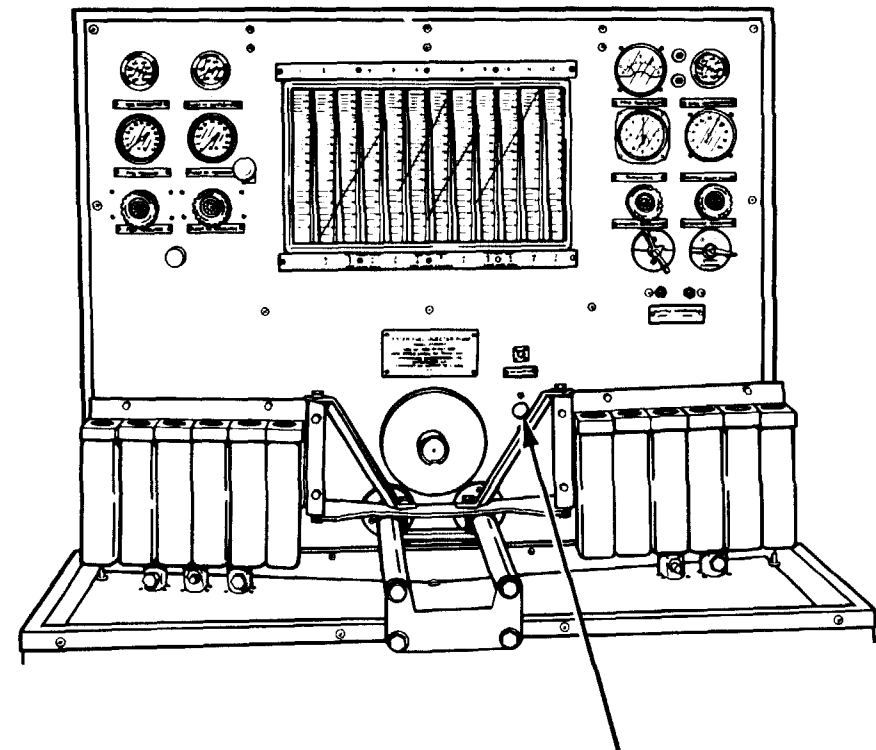
6-2. TROUBLESHOOTING (cont)

MANIFOLD BULB ASSEMBLY

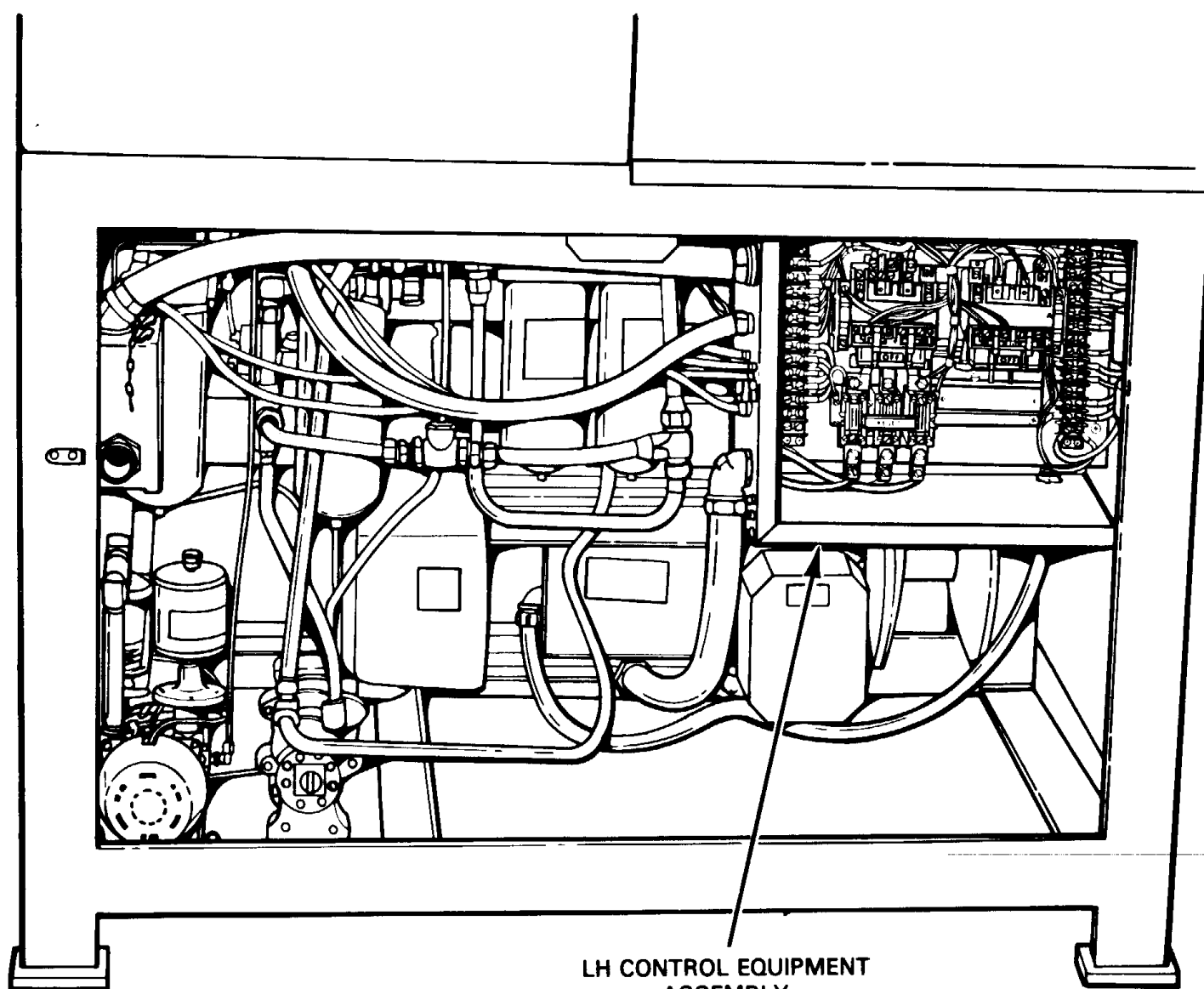
INOPERATIVE



MANIFOLD BULB ASSEMBLY



MANIFOLD BULB ASSEMBLY



LH CONTROL EQUIPMENT  
ASSEMBLY

LOCATOR VIEW



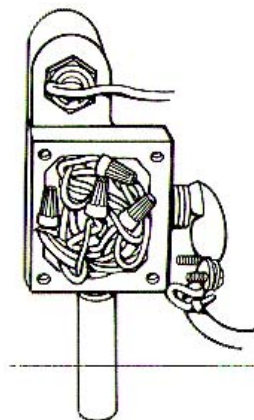
6-2. TROUBLESHOOTING (cont)

A. WIRES MAY BE OPEN

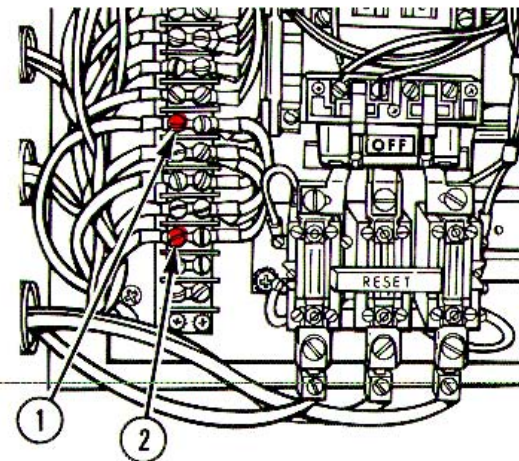
**NOTE**

Remove tape and wire nuts from wire ends at manifold bulb assembly before making continuity checks. After making checks, replace wire nuts and apply tape (item 19, app C).

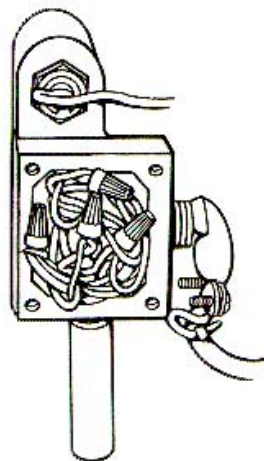
- 1 Remove cover on manifold bulb assembly. Connect one multimeter lead to terminal A10 (1). Connect other lead in sequence to terminal A14 (2) and to wire at manifold bulb assembly coming from terminal A14 (2).



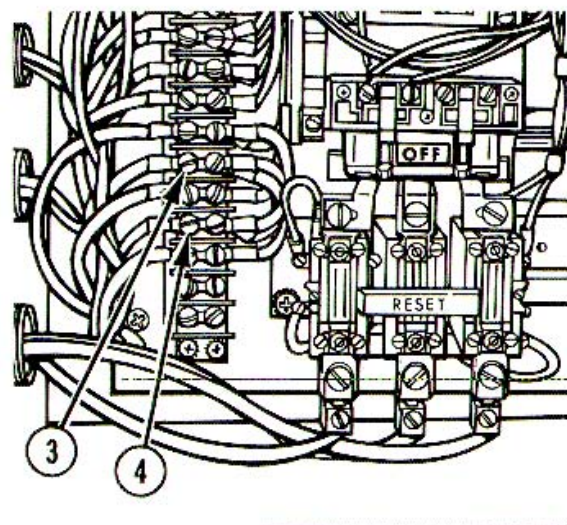
MANIFOLD BULB ASSEMBLY



- 2 Remove both leads. Connect one multimeter lead to terminal A11 (3). Connect other lead in sequence to terminal A13 (4) and to wire at manifold bulb assembly coming from terminal A13 (4).



MANIFOLD BULB ASSEMBLY



**B. MANIFOLD BULB ASSEMBLY MAY BE DEFECTIVE**

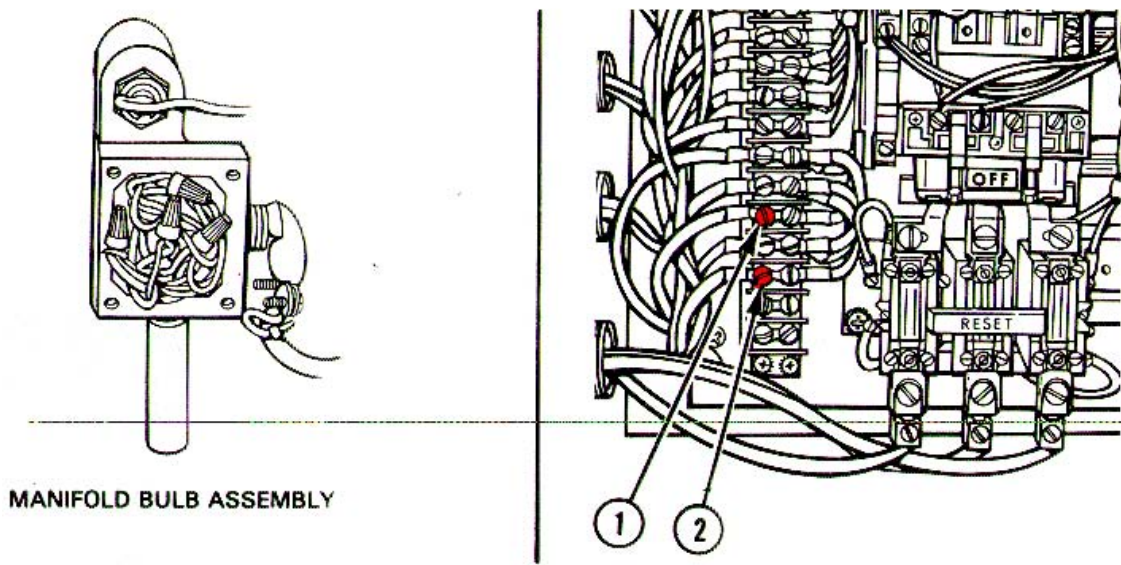
- 3 Check for continuity. If continuity does not exist, replace the open wire (p 6-219).
- 4 If manifold bulb assembly is still inoperative, proceed to step B.

**NOTE**

Wires at manifold bulb assembly are not tagged for identification. To identify contact points for continuity checks, follow wires from terminals. Remove tape and wire nuts from wire ends before performing continuity checks. After making checks, replace wire nuts and apply tape (item 19, app C).

- 1 Remove cover from manifold bulb assembly. Connect one multimeter lead to wire end where the wire from terminal A12 (1) is connected. Connect the other lead to wire end where the wire from terminal A14 (2) is connected.

- 2 Resistance should be indicated. If no resistance is indicated, replace manifold bulb assembly (p 6-307).



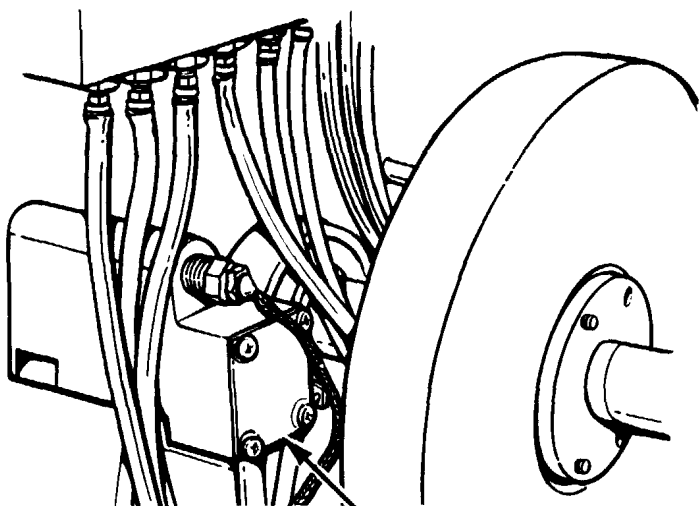
MANIFOLD BULB ASSEMBLY



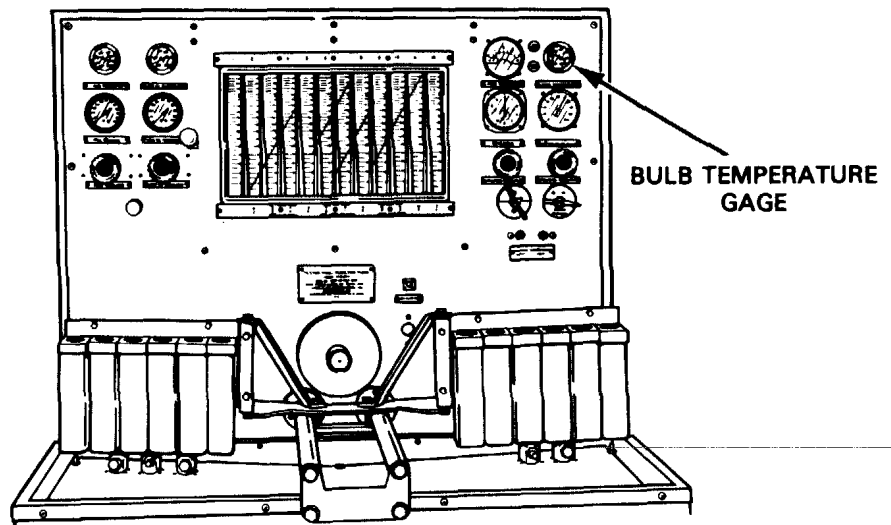


6-2. TROUBLESHOOTING (cont)

<b>BULB TEMPERATURE GAGE</b>	<b>DOES NOT INDICATE</b>
------------------------------	--------------------------



**MANIFOLD BULB ASSEMBLY**



**LOCATOR VIEW**

**A. MANIFOLD BULB ASSEMBLY MAY BE DEFECTIVE**

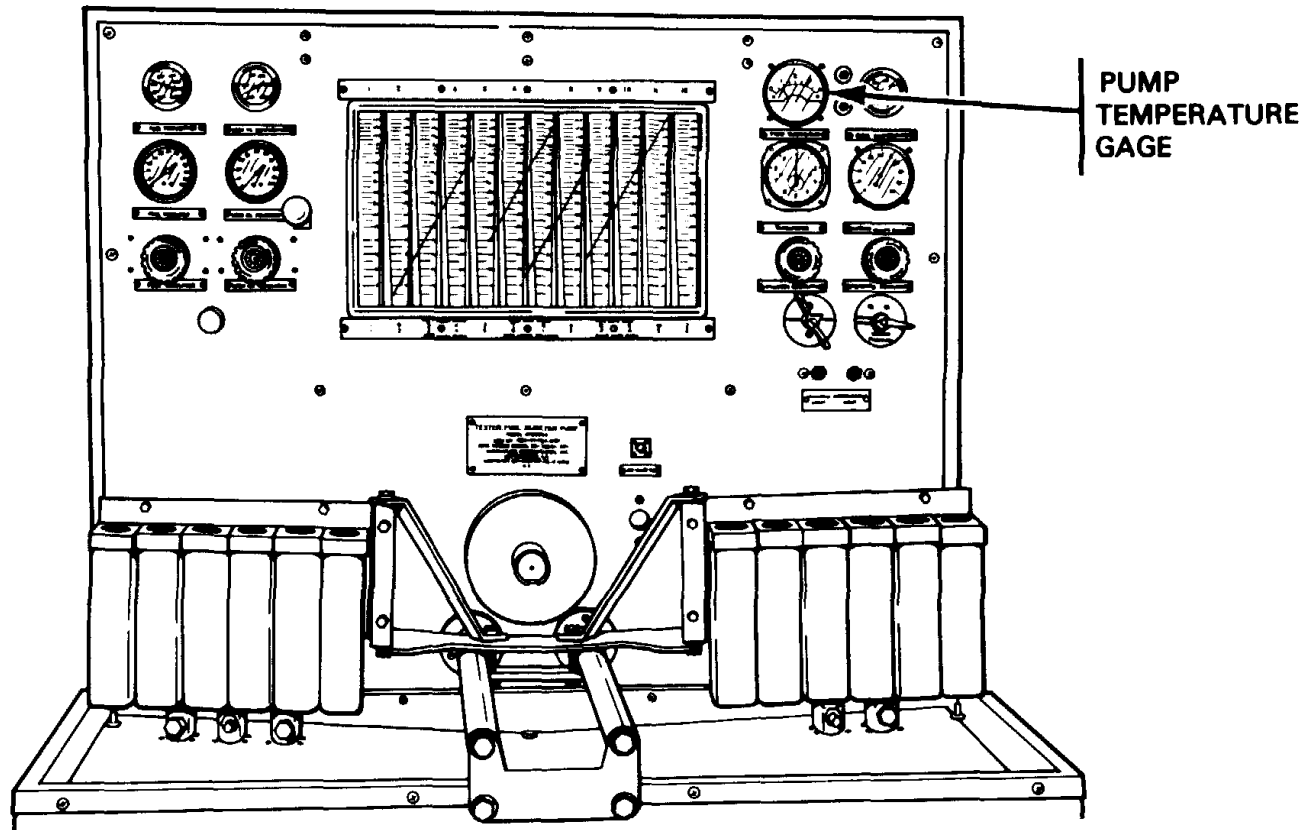
- 1 Perform troubleshooting procedures in steps A and B on pages 644 and
- 2 If BULB TEMPERATURE gage still does not indicate, proceed to step B.

**B. BULB TEMPERATURE GAGE IS DEFECTIVE**

Replace BULB TEMPERATURE gage (p 6-252).

**PUMP TEMPERATURE GAGE**

**DOES NOT INDICATE**



**LOCATOR VIEW**

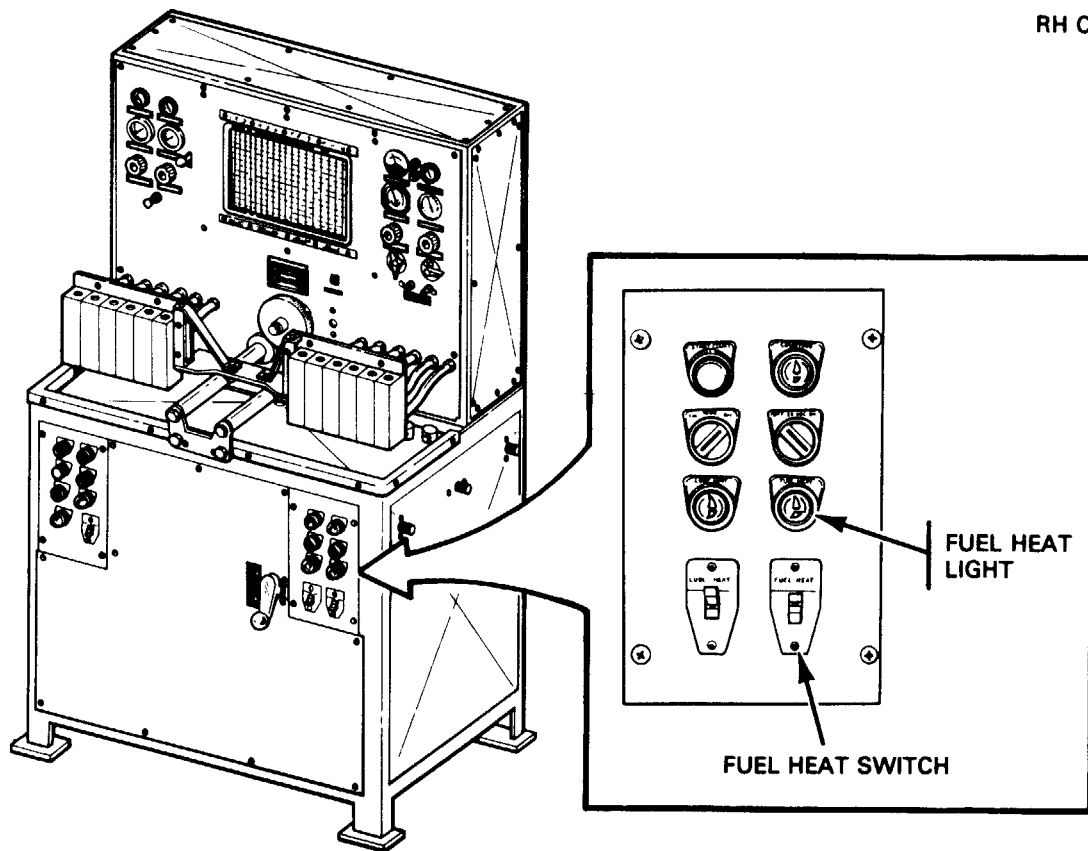
**PUMP TEMPERATURE GAGE IS DEFECTIVE**

Replace PUMP TEMPERATURE gage (p 6-252).



6-2. TROUBLESHOOTING (cont)

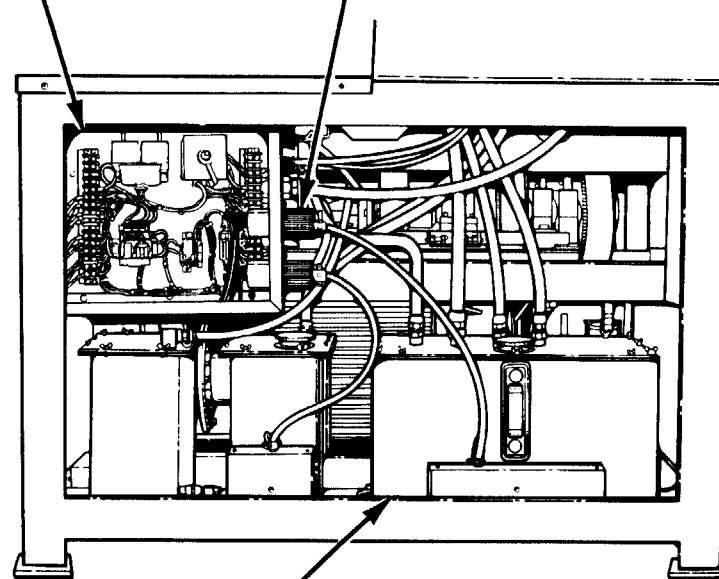
<b>FUEL HEAT LIGHT</b>	<b>DOES NOT LIGHT</b> FUEL HEAT switch is in the on position
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LOCATOR VIEW

RH CONTROL EQUIPMENT ASSEMBLY

MALE CONNECTOR PLUG



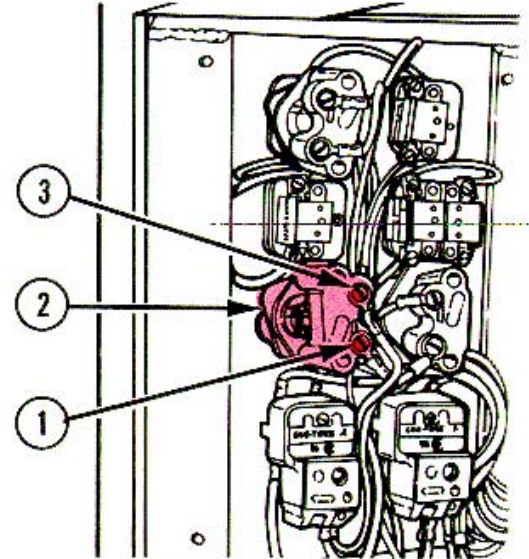
FUEL TANK ASSEMBLY

**A. FUEL HEAT INDICATOR LIGHT MAY BE DEFECTIVE**

**NOTE**

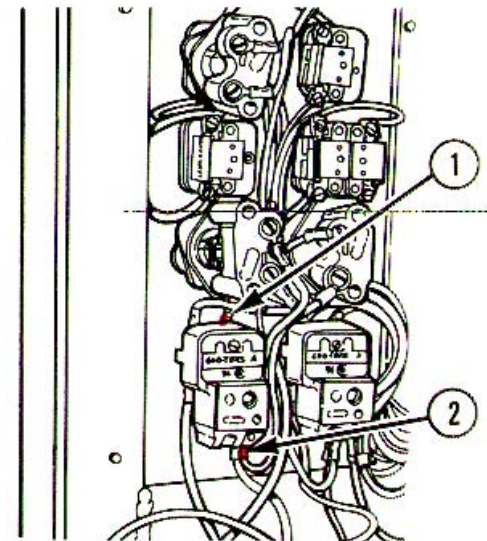
The following check is for resistance.

- 1 Disconnect the wire from contact (1) on indicator light (2).
- 2 Connect one multimeter lead to indicator light contact (1) and the other lead to indicator light contact (3).
- 3 Check for approximate resistance reading of 80 K ohms. If resistance is not present, replace the indicator light (2) (p 6-187).
- 4 If FUEL HEAT light does not light, proceed to step B.



**B. FUEL HEATSWITCH MAY BE DEFECTIVE**

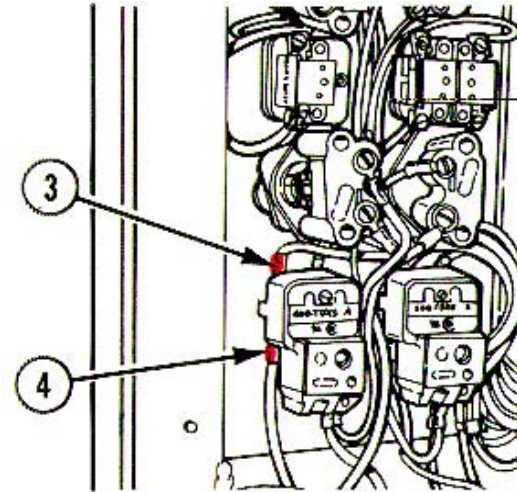
- 1 Connect one multimeter lead to FUEL HEAT switch contact (1) and connect other lead to FUEL HEAT switch contact (2).



**6-2. TROUBLESHOOTING (cont)**

**B. FUEL HEAT SWITCH MAY BE DEFECTIVE. (cont)**

- 2 Remove both leads. Connect one multimeter lead to FUEL HEAT switch contact (3) and connect other lead to FUEL HEAT switch contact (4).
- 3 Check for continuity. If continuity does not exist, replace FUEL HEAT switch (p 6-187).
- 4 If FUEL HEAT light does not light, proceed to step C.

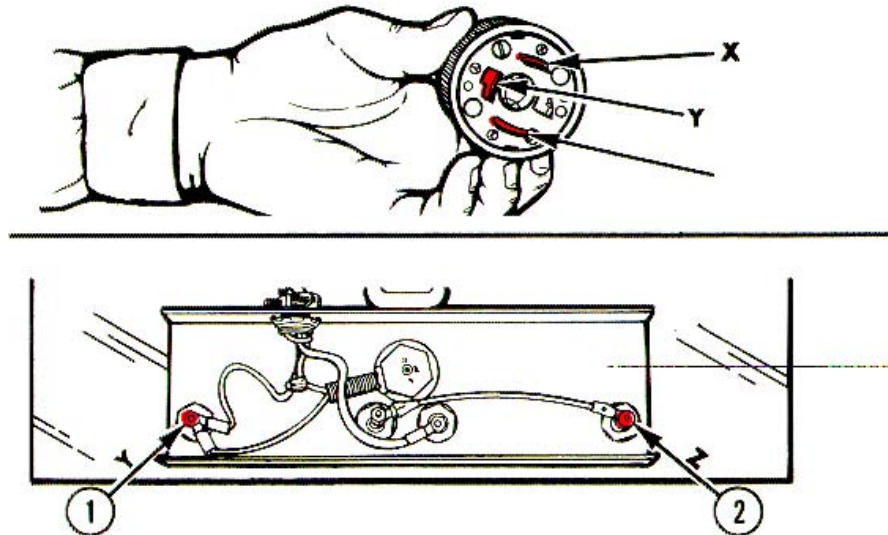


**C. THERMOSTAT FOR FUEL TANK ASSEMBLY MAY BE DEFECTIVE**

**NOTE**

For a quick resistance check of thermostat, go from pins Y and Z of male connector plug.

- 1 Remove box cover from fuel tank assembly (p 6-409).
- 2 Connect one multimeter lead to tank heater contact Y (1) and connect other lead to tank heater contact Z (2).
- 3 Resistance of 40 ohms should be indicated. If resistance is not indicated, replace the tank heater thermostat (p 6-409).
- 4 Heater element inside of fuel tank assembly must be visually inspected. See figure 41 of TM 9-4910-387-24P.
- 5 If FUEL HEAT light does not light, proceed to step D.



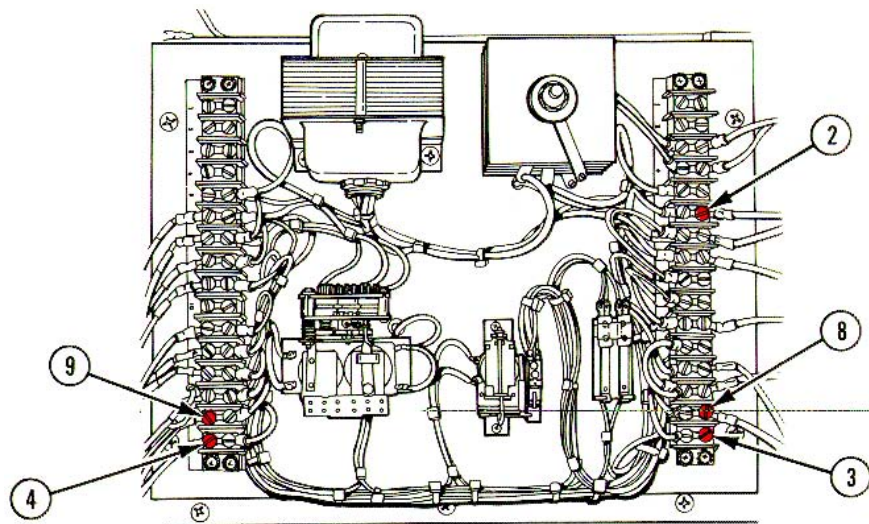


**D. WIRES MAY BE OPEN.**

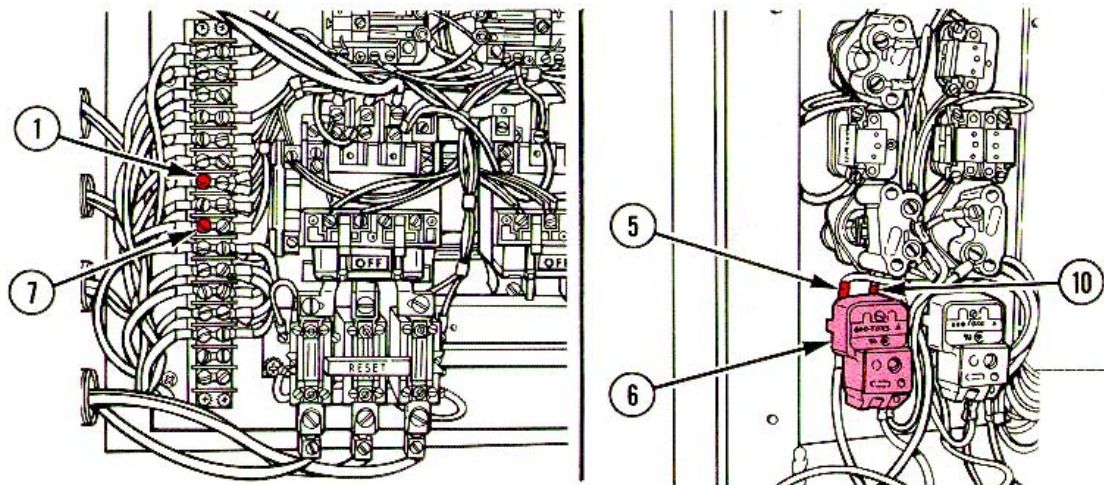
**NOTE**

On newer tester models, the red lead from A9 may be connected to D12 and the black lead from A8 will be on D15. However, this will not interfere with the operation of the tester.

1 Connect one multimeter lead to terminal A7 (1). Connect the other lead in sequence to terminals D6 (2), D16 (3), and C16 (4), and to contact (5) on FUEL HEAT switch (6).



2 Remove both leads. Connect one multimeter lead to terminal A9 (7). Connect the other lead in sequence to terminals D15 (8) and C15 (9), and to contact (10) on FUEL HEAT switch (6).



3 Check for continuity. If continuity does not exist, replace the open wire (p 6-187).



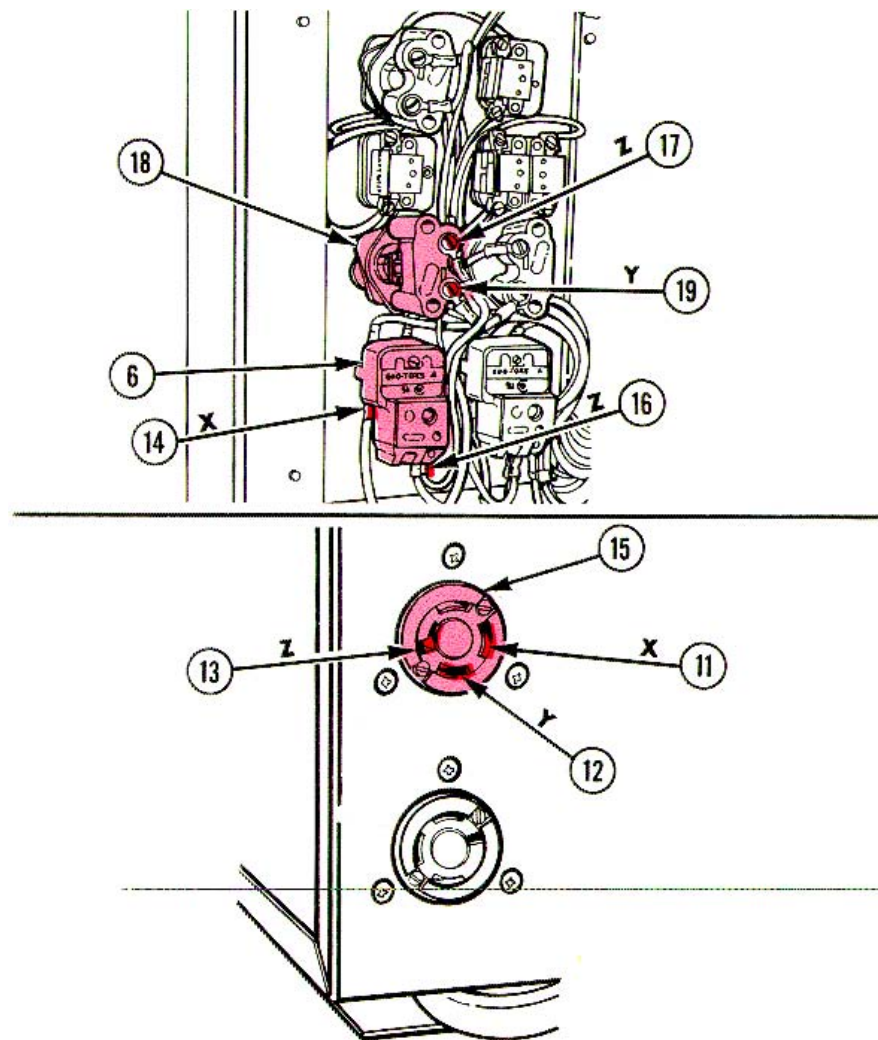
**6-2. TROUBLESHOOTING (cont)**

**D. WIRES MAY BE OPEN. (cont)**

**NOTE**

Relate X contact (11), Y contact (12), and Z contact (13) with male connector plug in case female connector plug is mounted differently than that illustrated.

- 4 Remove both leads. Connect one multimeter lead to contact (14) on FUEL HEAT switch (6). Connect the other lead to contact (11) on female connector plug (15) where cable wire X is connected.
- 5 Remove both leads. Connect one multimeter lead to contact (16) on FUEL HEAT switch (6). Connect the other lead in sequence to contact (13) on female connector plug (15) where cable wire Z is connected, and to contact (17) on indicator light (18).
- 6 Remove both leads. Connect one multimeter lead to contact (19) on indicator light (18). Connect the other lead to contact (12) on female connector plug (15) where cable wire Y is connected.
- 7 Check for continuity. If continuity does not exist on any of the checks performed in steps 4 thru 6 above, disassemble female connector plug (15) (p 6-187) and check if wires are connected to contacts.
  - a. Connect wires as necessary.
  - b. If wires are connected, replace the open wire (p 6-187).



8 Remove box cover from fuel tank assembly.

**NOTE**

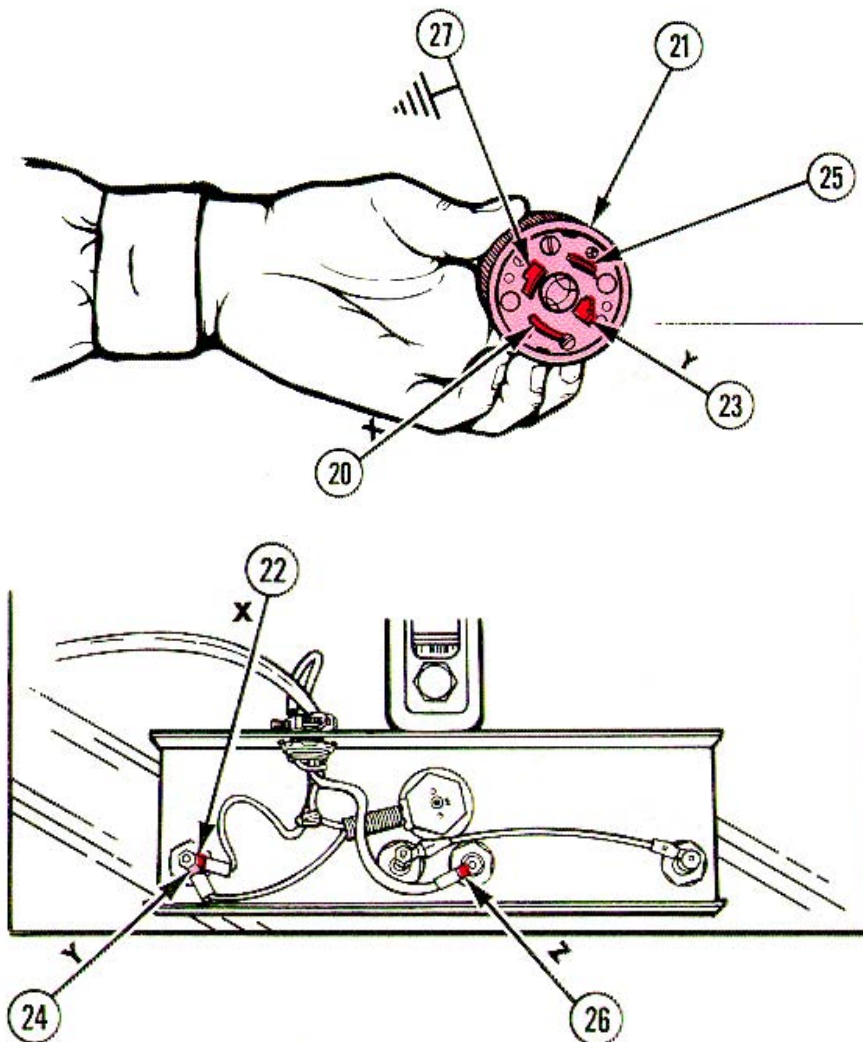
Contacts on the male connector plug are stamped with the letters X, Y, and z.

9 Connect one multimeter lead to contact X (20) on male connector plug (21) and connect the other lead to contact X (22) on the tank heater.

10 Remove both leads. Connect one multimeter lead to contact Y (23) on male connector plug (21) and connect the other lead to contact Y (24) on the tank heater.

11 Remove both leads. Connect one multimeter lead to contact Z (25) on male connector plug (21) and connect the other lead to contact Z (26) on the tank heater.

12 Remove both leads. Connect one multimeter lead to ground (27) and connect the other lead to tester frame.

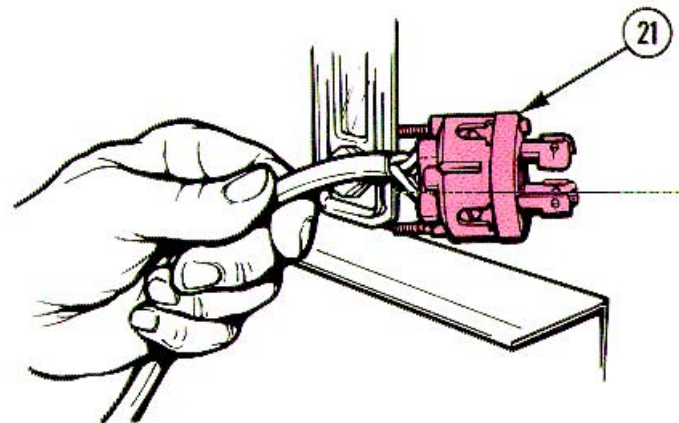




**6-2. TROUBLESHOOTING (cont)**

**D. WIRES MAY BE OPEN. (cont)**

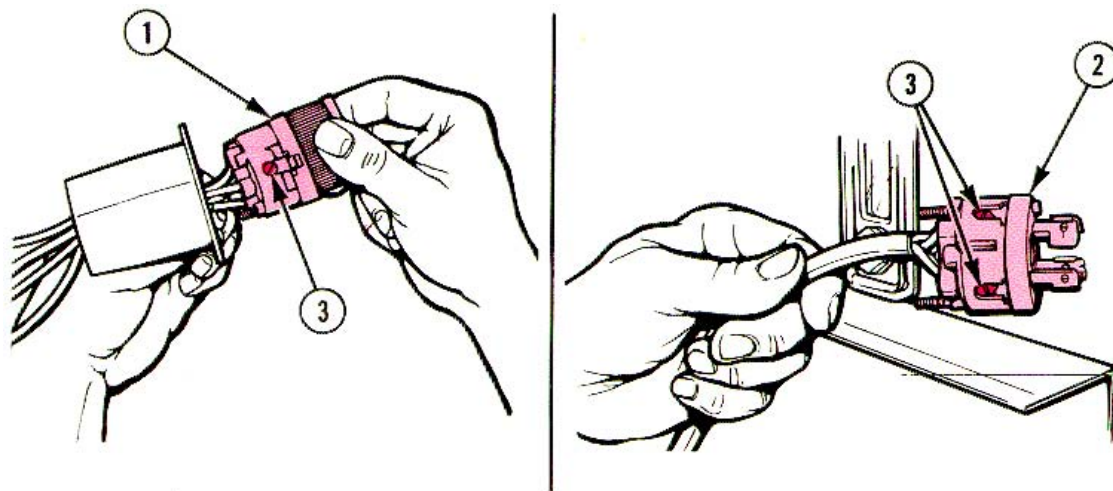
- 13 Check for continuity. If continuity does not exist on any of the checks performed in steps 8 thru 11 above, disassemble male connector plug (21) (p 6-409) and check if wires are connected to contacts.
- a. Connect wires as necessary.
  - b. If wires are connected, replace the open wire (p 6-409).



- 14 If FUEL HEAT light does not light, proceed to step E.

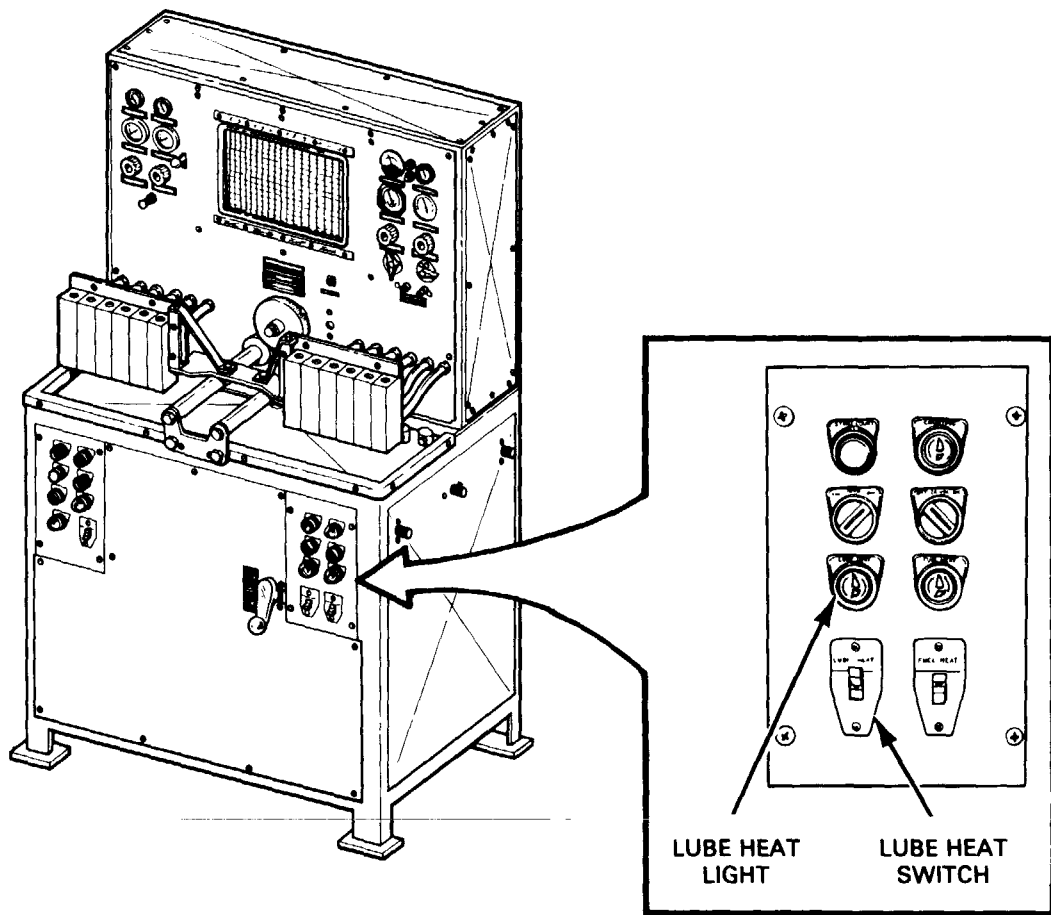
**E. FEMALE AND/OR MALE CONNECTOR PLUGS MAY BE DEFECTIVE.**

- 1 Disassemble female and male connector plugs (1 and 2) (p 6-187 and 6-409).
- 2 Check for burnt or corroded terminals (3).
- 3 Replace female and/or male connector plugs (p 6-187 and 6-409) if terminals are burnt or corroded.



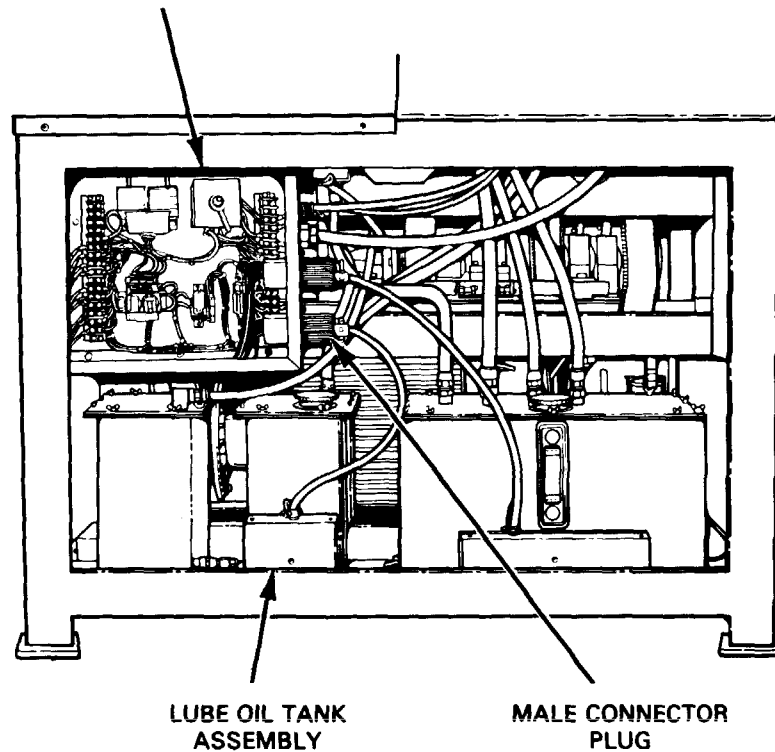
# LUBE HEAT LIGHT

**DOES NOT LIGHT**  
LUBE HEAT switch is in the on position



LOCATOR VIEW

## RH CONTROL EQUIPMENT ASSEMBLY





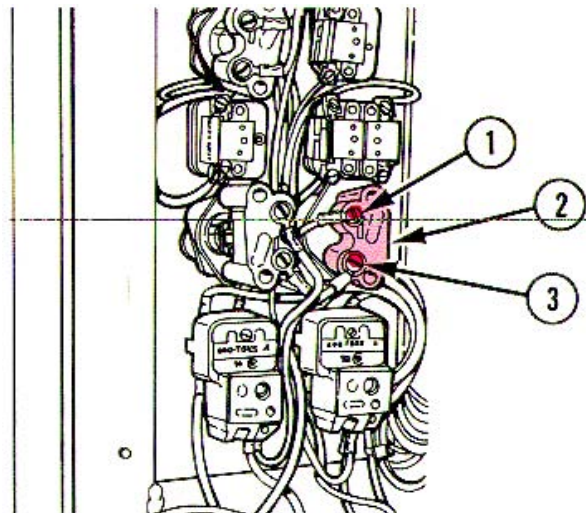
**6-2. TROUBLESHOOTING (cont)**

**A. LUBE HEAT INDICATOR LIGHT MAY BE DEFECTIVE**

**NOTE**

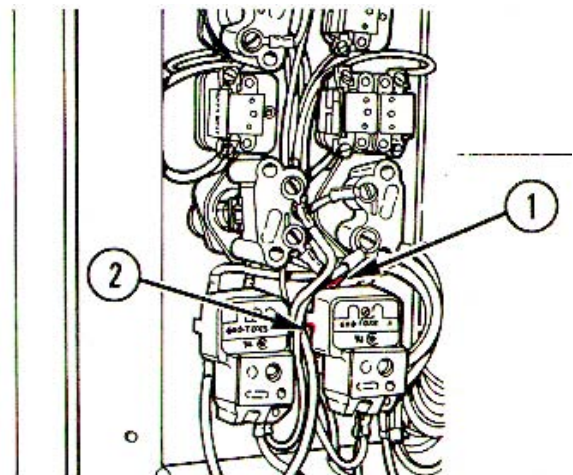
The following check is for resistance.

- 1 Disconnect the wire from contact (1) on indicator light (2).
- 2 Connect one multimeter lead to contact (1) and the other lead to contact (3) on the indicator light (2).
- 3 Check for approximate resistance reading of 80 K ohms. If resistance is not present, replace the indicator light (2) (p 6-187).
- 4 If LUBE HEAT light does not light, proceed to step B.

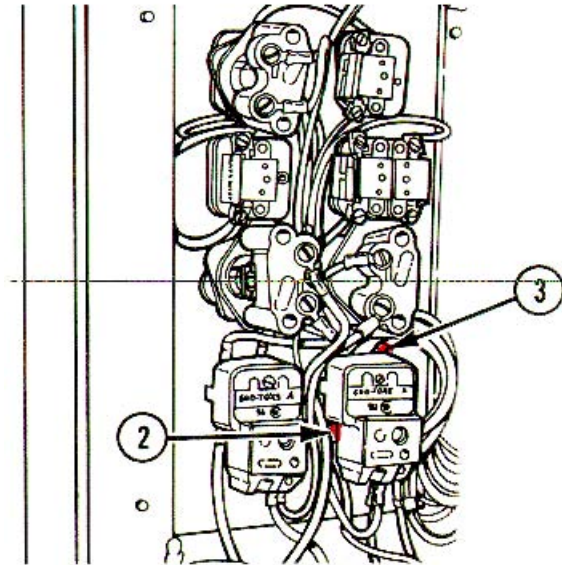


**B. LUBE HEAT SWITCH MAY BE DEFECTIVE**

- 1 Connect one multimeter lead to LUBE HEAT switch contact (1) and the other lead to LUBE HEAT switch contact (2).



2. Remove both leads. Connect one multimeter lead to LUBE HEAT switch contact (3) and the other lead to LUBE HEAT switch contact (2).
3. Check for continuity. If continuity is not present, replace LUBE HEAT switch (p 6-187).
4. If LUBE HEAT light does not light, proceed to step C.

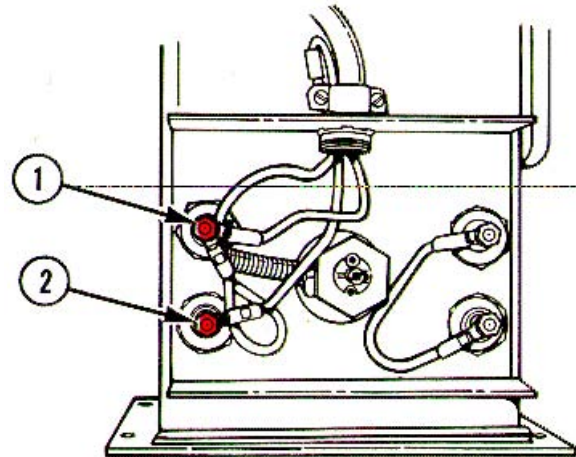


**C. THERMOSTAT FOR LUBE OIL TANK ASSEMBLY MAY BE DEFECTIVE.**

**NOTE**

For a quick resistance check of the thermostat, go from pins Y and Z of male connector plug.

1. Remove terminal box cover from lube oil tank assembly (p 6-395).
2. Connect one multimeter lead to tank heater contact (1) and the other lead to tank heater contact (2).
3. Resistance should be indicated. If resistance is not indicated, replace the thermostat (p 6-395).
4. If LUBE HEAT light does not light, proceed to step D.



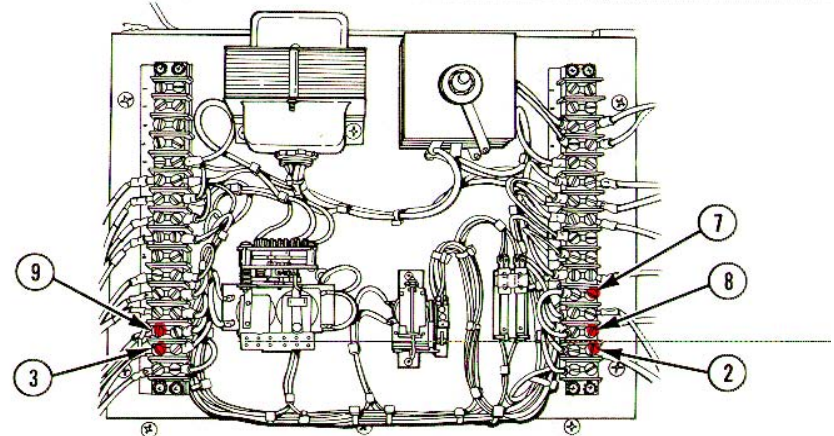
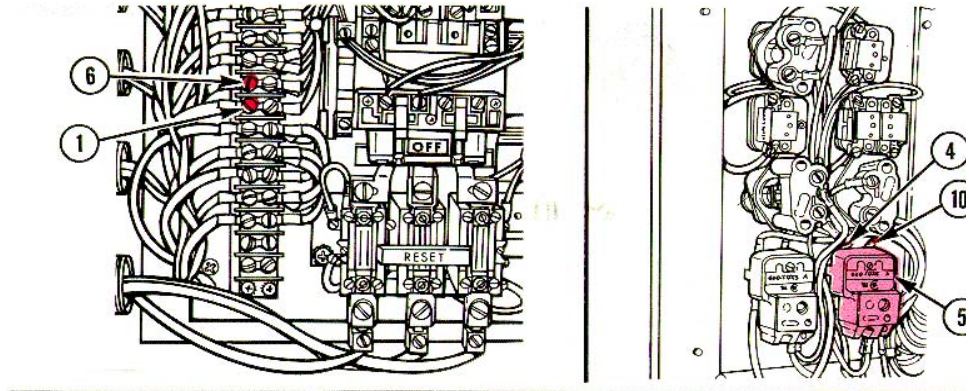
6-2. TROUBLESHOOTING (cont)|

D. WIRES MAY BE OPEN. I

**NOTE**

On newer tester models the red lead from A9 may be connected to D12 and the black lead from A8 will be on D15. However, this will not interfere with the operation of the tester.

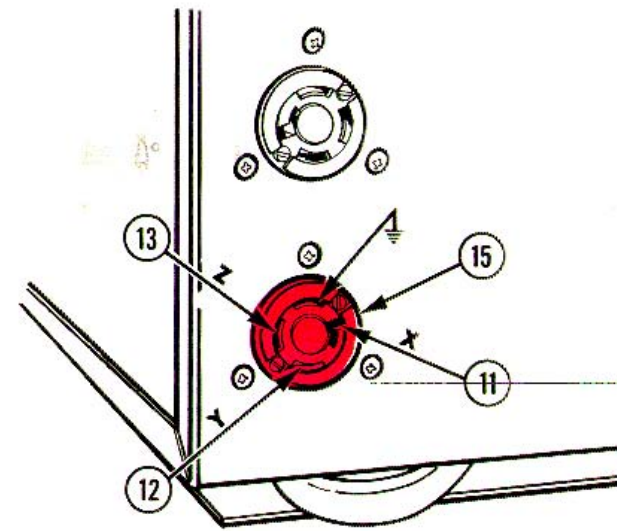
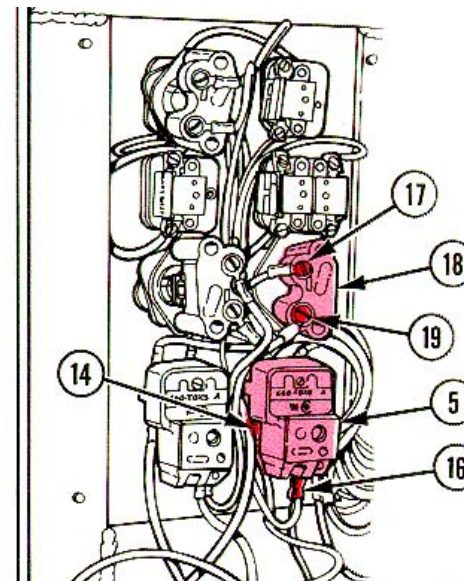
1. Connect one multimeter lead to terminal A9 (1). Connect the other lead in sequence to terminals D15 (2) and C15 (3), and to contact (4) on the LUBE HEAT switch (5).
2. Remove both leads. Connect one multimeter lead to terminal A8 (6). Connect other lead in sequence to terminals D12 (7), D14 (8), and C14 (9), and to contact (10) on the LUBE HEAT switch (5).
3. Check for continuity. If continuity does not exist, replace the open wire (p 6-187).



**NOTE**

Relate X contact (11), Y contact (12), and Z contact (13) with male connector plug in case female connector plug is mounted differently than that illustrated.

- 4 Remove both leads. Connect one multimeter lead to contact (14) on LUBE HEAT switch (5). Connect other lead to contact (11) on female connector plug (15) where cable wire X is connected.
- 5 Remove both leads. Connect one multimeter lead to contact (16) on LUBE HEAT switch (5). Connect other lead in sequence to contact (13) on female connector plug (15) where cable wire Z is connected, and to contact (17) on indicator light (18).
- 6 Remove both leads. Connect one multimeter lead to contact (19) on indicator light (18). Connect the other lead to contact (12) on female connector plug (15) where cable wire Y is connected.
- 7 Check for continuity. If continuity does not exist on any of the checks performed in steps 4 thru 6 above, disassemble female connector plug (15) (p 6-187) and check if wires are connected to contacts.
  - a. Connect wires as necessary.
  - b. If wires are connected, replace the open wire (p 6-187).





6-2. TROUBLESHOOTING (cont))

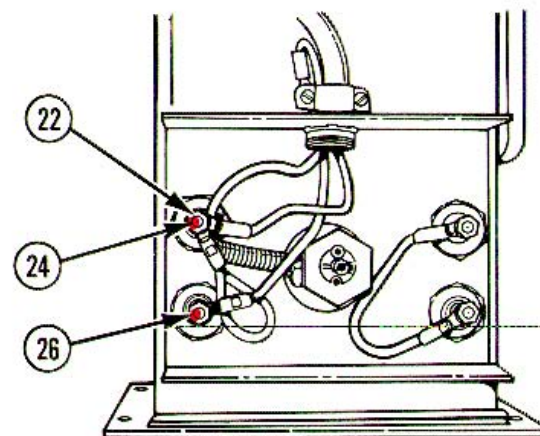
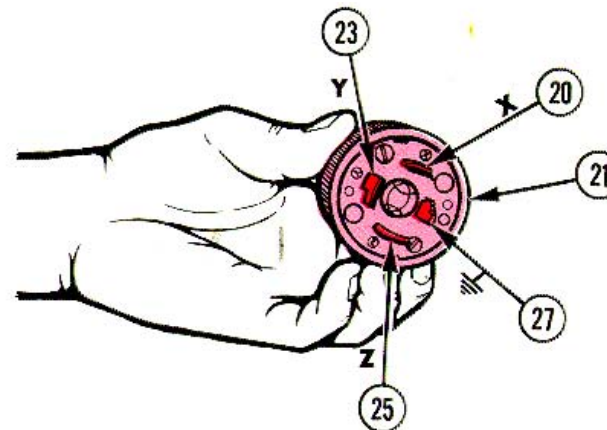
D. WIRES MAY BE OPEN. (cont)

8 Remove terminal box cover from lube oil tank assembly.

**NOTE**

**Contacts on the male connector plug are stamped with the letters X, Y, and z.**

- 9 Connect one multimeter lead to contact X (20) on male connector plug (21) and connect the other lead to contact X (22) on the tank heater.
- 10 Remove both leads. Connect one multimeter lead to contact Y (23) on male connector plug (21) and connect the other lead to contact Y (24) on the tank heater.
- 11 Remove both leads. Connect one multimeter lead to contact Z (25) on male connector plug (21) and connect the other lead to contact Z (26) on the tank heater.
- 12 Remove both leads. Connect one multimeter lead to ground (27) and connect the other lead to tester frame.

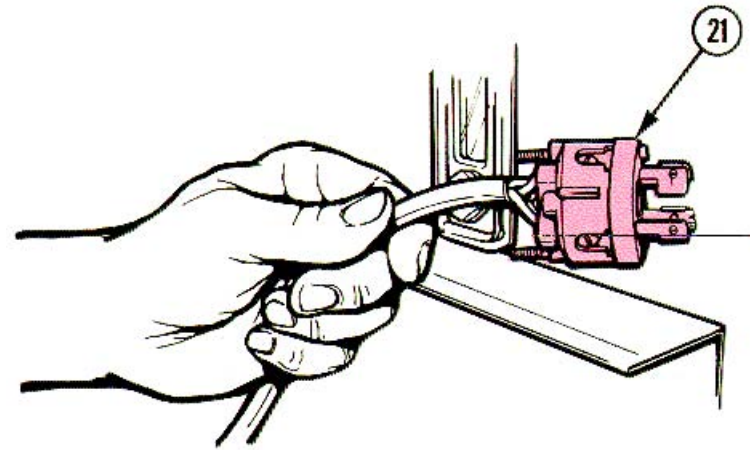




13 Check for continuity. If continuity does not exist on any of the checks performed in steps 8 thru 11 above, disassemble male connector plug (21) (p 6- 395) and check if wires are connected to contacts.

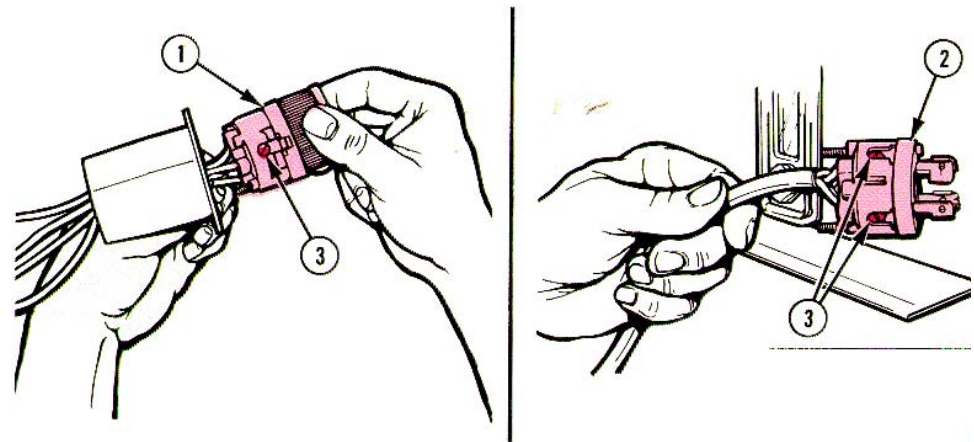
- a. Connect wires as necessary.
- b. If wires are connected, replace the open wire (p 6-395).

14 If LUBE HEAT light does not light, proceed to step E.



**E. FEMALE AND/OR MALE CONNECTOR PLUGS MAY BE DEFECTIVE.**

- 1 Disassemble female and male connector plugs (1 and 2) (p 6-187 and 6-395).
- 2 Check for burnt or corroded terminals (3).
- 3 Replace female and/or male connector plugs (p 6-187 and 6-395) if terminals are burnt or corroded.



6-2. TROUBLESHOOTING (cont)

**FUEL**

**WILL NOT HEAT TO DESIRED TEMPERATURE**

**A. FUEL HEAT SWITCH MAY BE DEFECTIVE**

Perform troubleshooting procedures on page 6-49, step B.

**B. TANK HEATER IN FUEL TANK ASSEMBLY MAY BE DEFECTIVE**

Perform troubleshooting procedures on page 6-50, step C.

**C. WIRES MAY BE OPEN.**

**NOTE**  
Continuity will not have to be checked between indicator light and FUEL HEAT switch.

Perform troubleshooting procedures on page 6-51, step D.

6-2. TROUBLESHOOTING (cont)

**LUBE OIL**

**WILL NOT HEAT TO DESIRED TEMPERATURE**

**A. FUEL HEAT SWITCH MAY BE DEFECTIVE.**

Perform troubleshooting procedures on page 6-56, step B.

**B. TANK HEATER IN FUEL TANK ASSEMBLY MAY BE DEFECTIVE.**

Perform troubleshooting procedures on page 6-57, step C.

**C. WIRES MAY BE OPEN.**

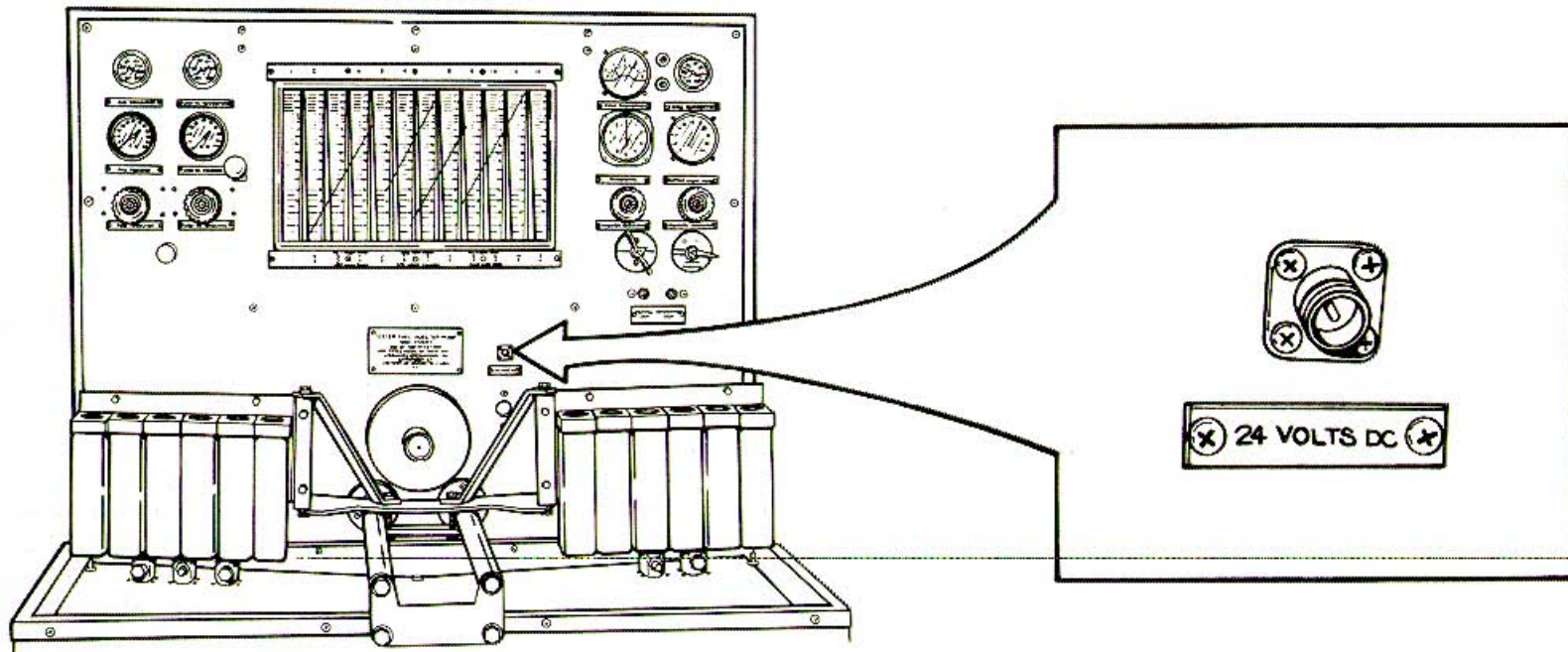
**NOTE**  
Continuity will not have to be checked between indicator light and FUEL HEAT switch.

Perform troubleshooting procedures on page 6-58, step D.

6-2. TROUBLESHOOTING (cont)

24 VOLTS DC OUTLET ASSEMBLY

NO POWER



LOCATOR VIEW

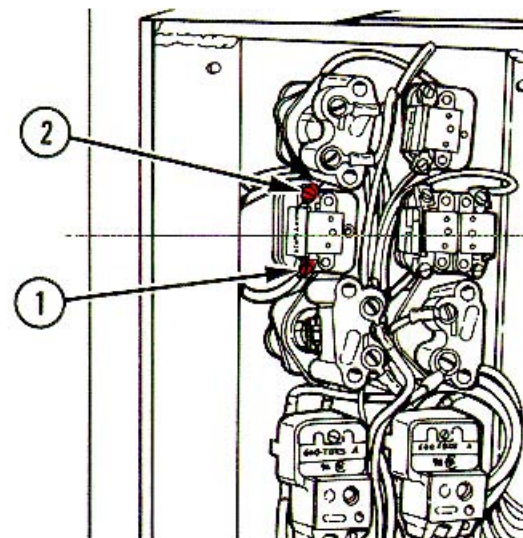
**A. 24-VDC SWITCH MAY BE DEFECTIVE.**

**NOTE**

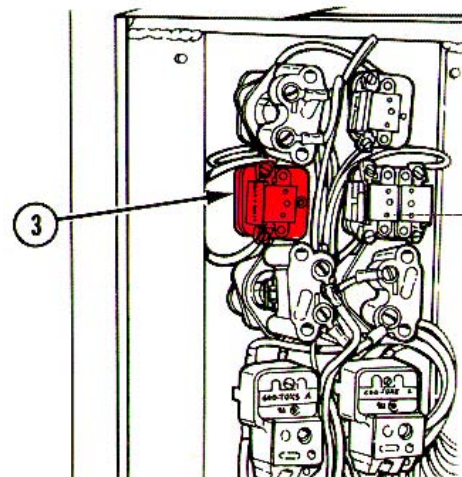
Some testers have an on off type 24-VDC switch while others will have a push-button type. Switch or button will function the same. (2).

Ensure LUBE HEAT and FUEL HEAT switches are turned off.

1. Connect one multimeter lead to 24-VDC switch contact (1). Connect other lead to 24-VDC switch contact (2).



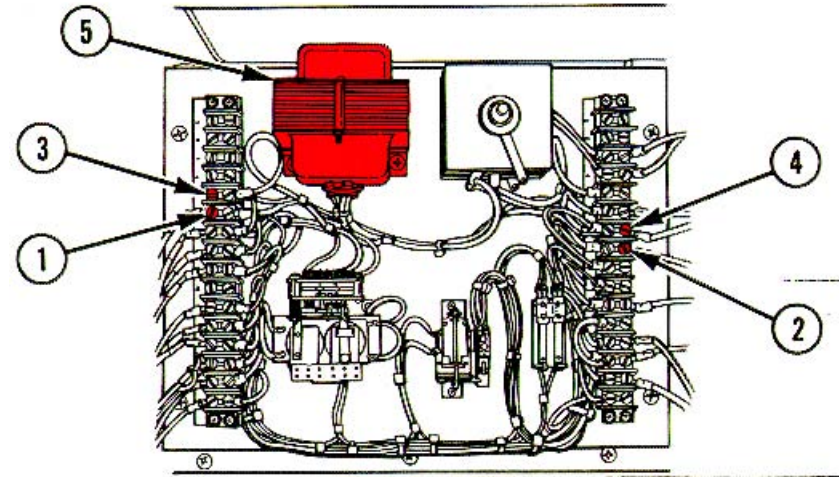
2. Turn 24-VDC switch (3) to the ON position.
3. Check for continuity. If continuity does not exist, replace the 24-VDC switch (3) (p 6-187).
4. If power is not present at 24 VOLTS DC outlet assembly, proceed to step B.





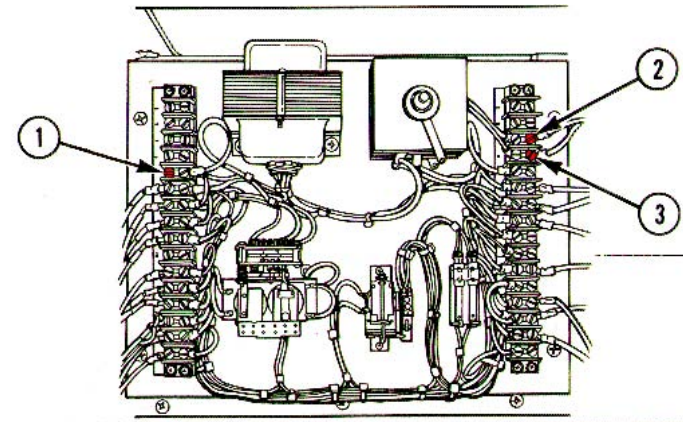
**6-2. TROUBLESHOOTING (cont)****B. CONTROL TRANSFORMER MAY BE DEFECTIVE.**

- 1 Connect one multimeter lead to terminal C6 (1) and the other lead to terminal D6 (2).
- 2 Remove both leads. Connect one multimeter lead to terminal C5 (3) and the other lead to terminal D5 (4).
- 3 Check for continuity. If continuity does not exist, replace the control transformer (5) (p 6-187).
- 4 If power is not present at 24 VOLTS DC outlet assembly, proceed to step C.

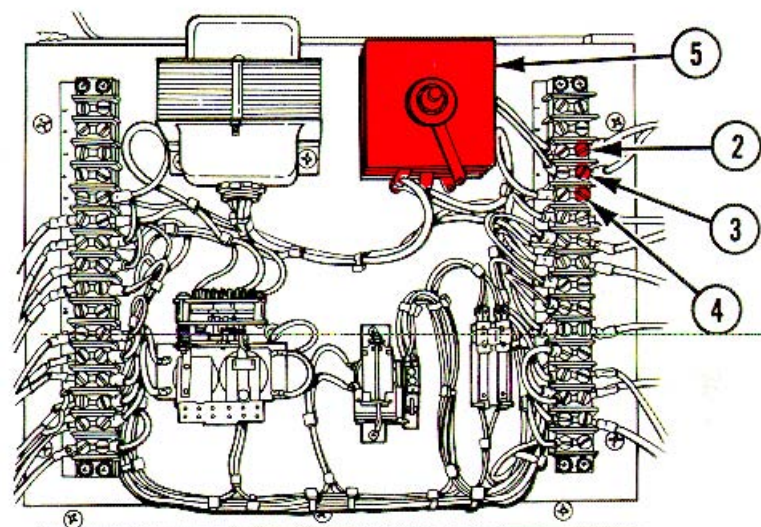
**C. SELENIUM RECTIFIER MAY BE DEFECTIVE.****NOTE**

The following checks are for resistance.

- 1 Connect the positive multimeter lead to terminal C5 (1) and the negative lead to terminal D3 (2). A high resistance reading should be indicated. Reverse the leads and a low resistance reading should be indicated.
- 2 Connect the positive multimeter lead to terminal C5 (1) and the negative lead to terminal D4 (3). A low resistance reading should be indicated. Reverse the leads and a high resistance reading should be indicated.

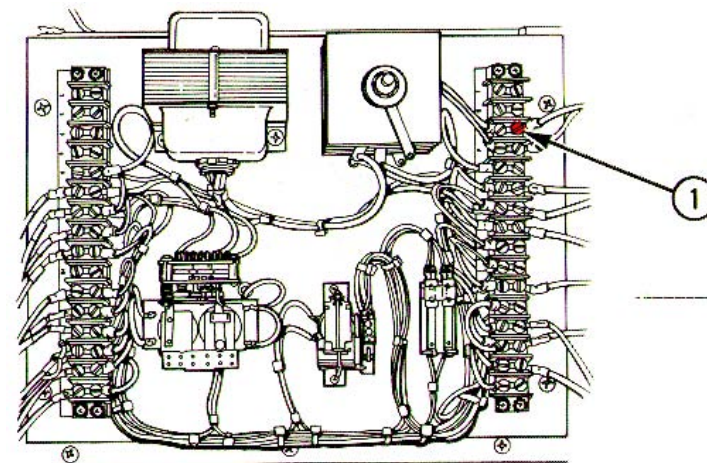


- 3 Connect the positive multimeter lead to terminal D4 (3) and the negative lead to terminal D5 (4). A high resistance reading should be indicated. Reverse the leads and a low resistance reading should be indicated.
- 4 Connect the positive multimeter lead to terminal D3 (2) and the negative lead to terminal D5 (4). A low resistance reading should be indicated. Reverse the leads and a high resistance reading should be indicated.
- 5 If high and low resistance readings are not indicated, replace the selenium rectifier (5) (p 6-187).
- 6 If power is not present at 24 VOLTS DC outlet assembly, proceed to step D.



**D. 24 VOLTS DC OUTLET ASSEMBLY MAY BE DEFECTIVE.**

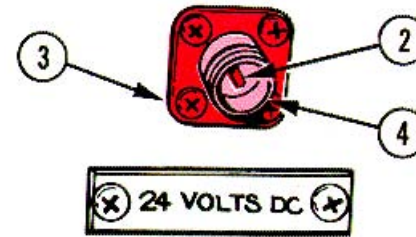
- 1 Disconnect the wire from terminal D3 (1).



**6-2. TROUBLESHOOTING (cont) |**

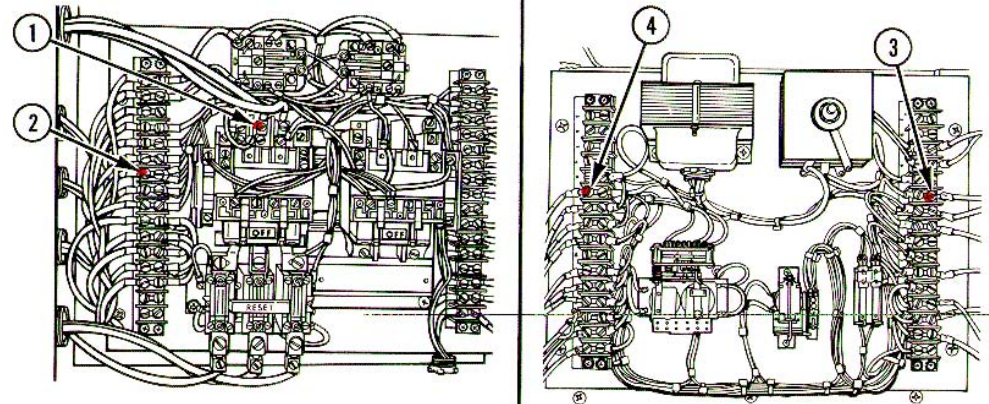
**D. 24 VOLTS DC OUTLET ASSEMBLY MAY BE DEFECTIVE. (cont)**

- 2 Connect one multimeter lead to the inner pin (2) of the 24 VOLTS DC outlet assembly (3) and one lead to the threaded case (4) of the 24 VOLTS DC outlet assembly (3).
- 3 Check for continuity. If continuity is present, replace the 24 VOLTS DC outlet assembly (3) (p 6-303). If continuity is not present, check that wire is connected to inner pin (2).
- 4 If power is not present at 24 VOLTS DC outlet assembly, proceed to step E.



**E. WIRES MAY BE OPEN.**

- 1 Connect one multimeter lead to starter center terminal (1) on the forward side of the starter. Connect other lead in sequence to terminals A7 (2), D6 (3), and C6 (4). Resistance will be indicated at terminal C6 (4).

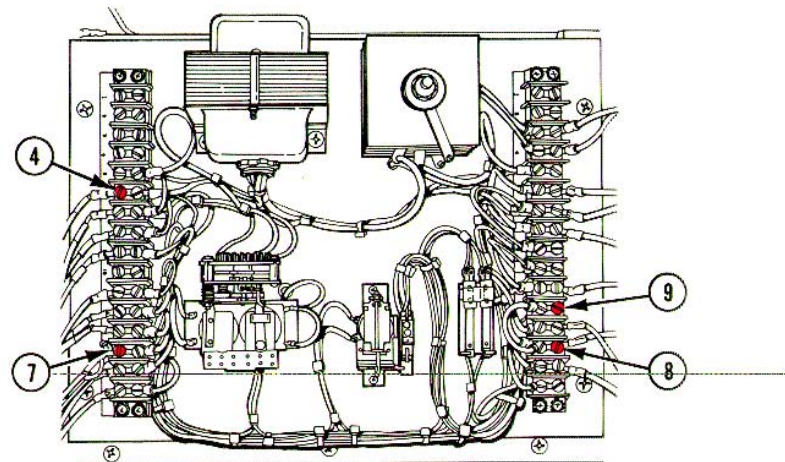
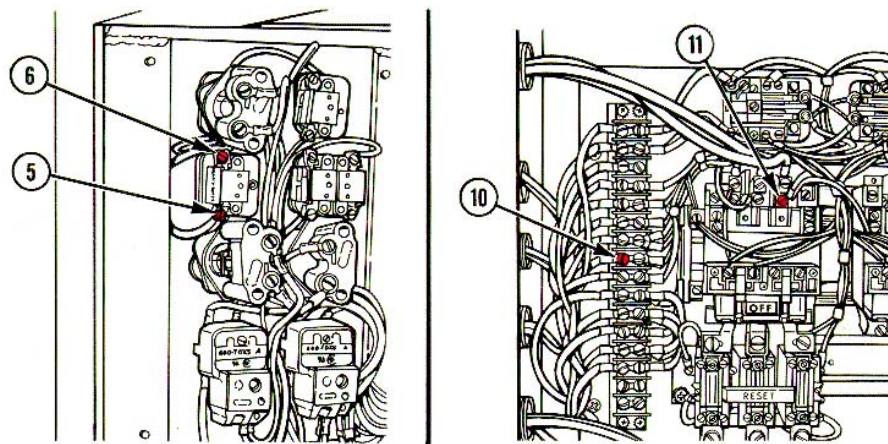




**NOTE**

On newer tester models the red lead from A9 may be connected to D12 and the black lead from A8 will be on D15. However, this will not interfere with the operation of the tester.

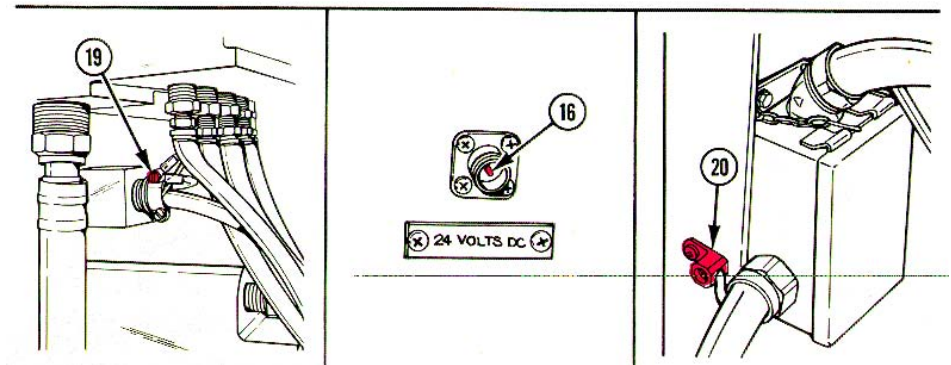
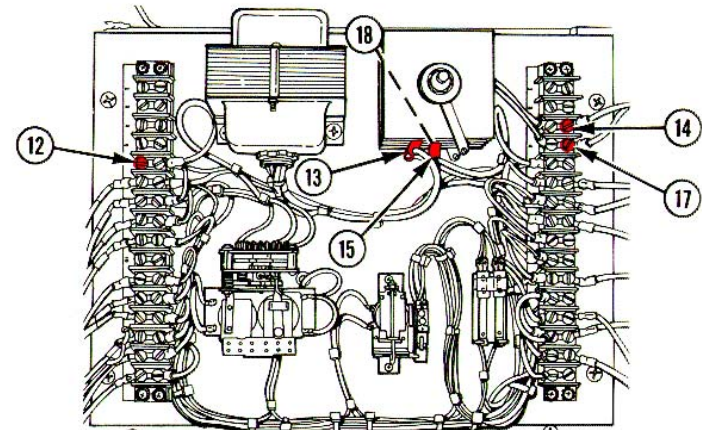
- 2 Remove both leads. Connect one multimeter lead to terminal C6 (4) and connect other lead to contact (5) on 24-VDC switch.
  
- 3 Remove both leads. Connect one multimeter lead to contact (6) on 24-VDC switch. Connect the other lead in sequence to terminals C14 (7), D14 (8), D12 (9), A8 (10), and to starter contact (11) on forward side of starter.



**6-2. TROUBLESHOOTING (cont)**

**E. WIRES MAY BE OPEN. (cont)**

- 4 Remove both leads. Connect one multimeter lead to terminal C5 (12) and connect other lead to contact (13) on the selenium rectifier.
- 5 Remove both leads. Connect one multimeter lead to terminal D3 (14). Connect the other lead in sequence to contact (15) on the selenium rectifier and to the center pin (16) of 24 VOLTS DC outlet assembly.
- 6 Remove both leads. Connect one multimeter lead to terminal D4 (17). Connect other lead in sequence to contact (18) on selenium rectifier, to ground wire contact (19) on 24 VOLTS DC outlet assembly, and to connector (20) on tester.
- 7 Check for continuity. If continuity checks determine that there is an open wire, replace the wire (p 6-187).

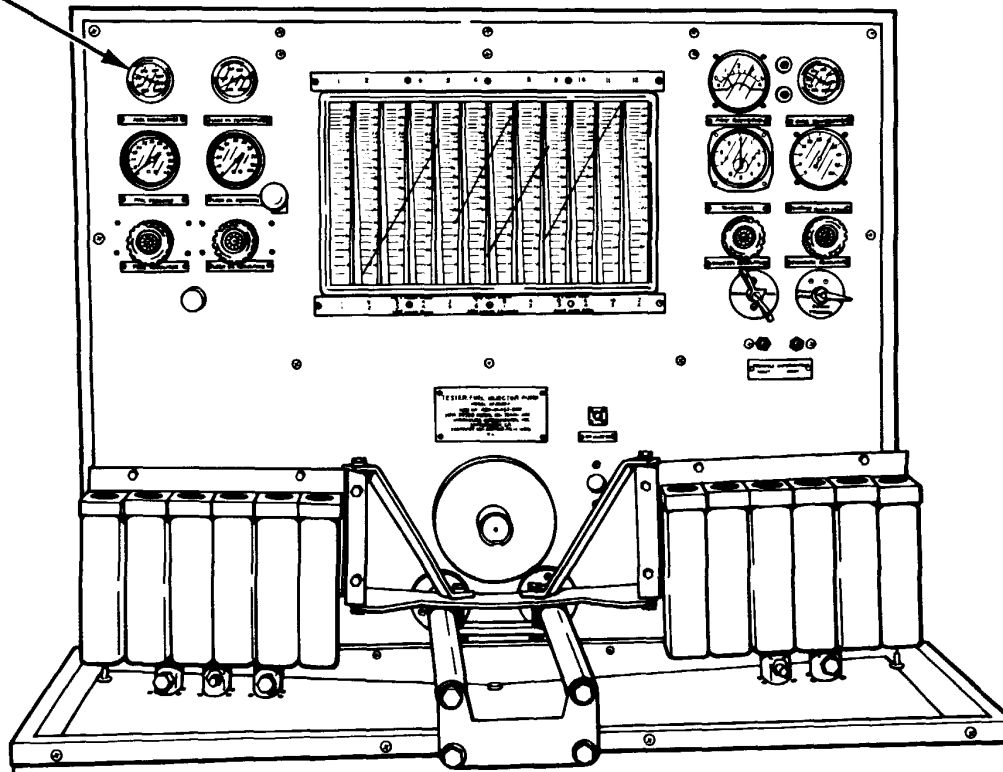




FUEL TEMPERATURE GAGE

DOES NOT INDICATE

FUEL TEMPERATURE GAGE



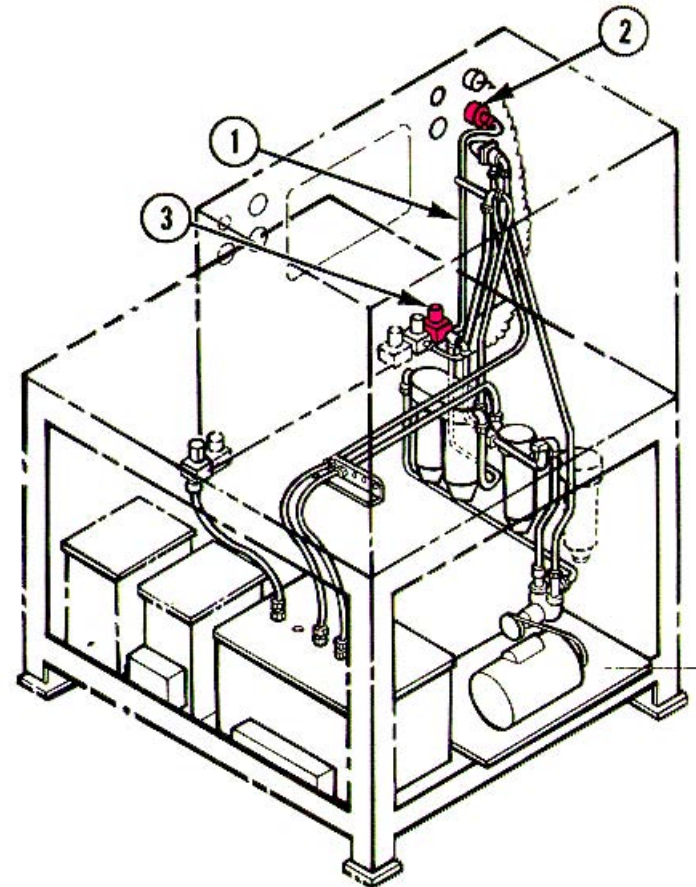
LOCATOR VIEW

6-71

**6-2. TROUBLESHOOTING (cont)****A. FUEL PRESSURE COPPER TUBING FROM FUEL INLET DISCHARGE BLOCK MAY BE DISCONNECTED.**

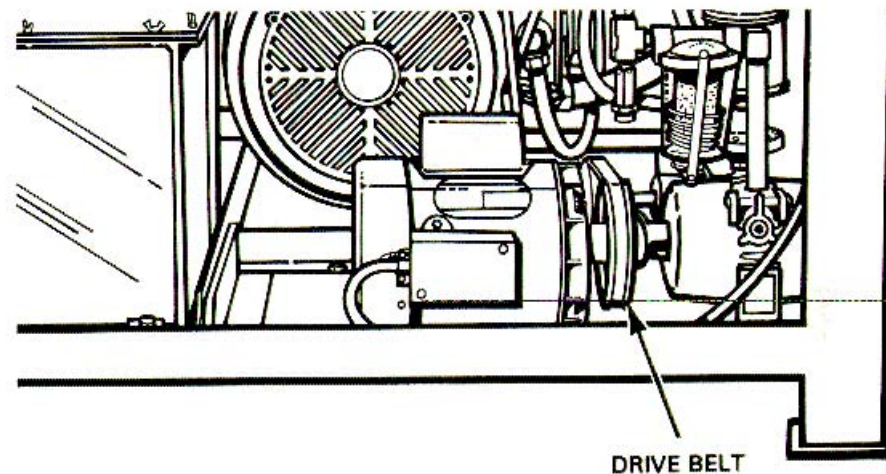
1 Ensure that fuel pressure copper tubing (1) is connected to FUEL PRESSURE gage (2) and fuel inlet discharge block (3).

2 If FUEL TEMPERATURE gage does not indicate, proceed to step B.

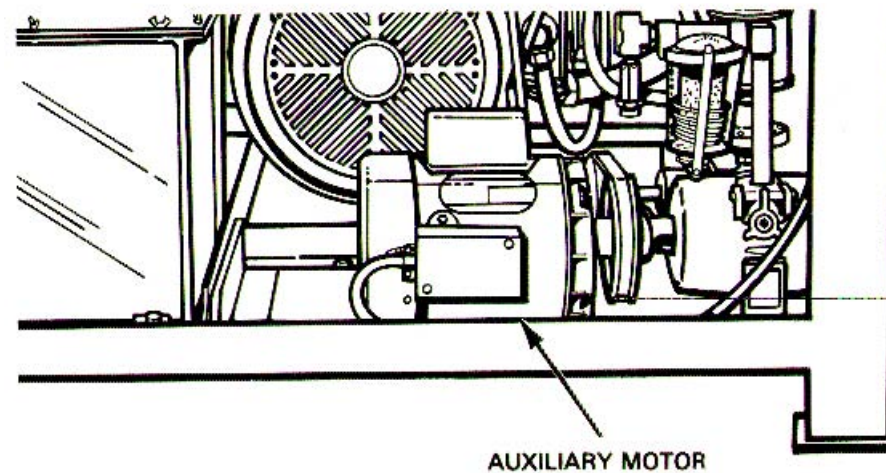


**B. DRIVE BELT ON FUEL AND LUBE OIL PUMPS MAY BE BROKEN.**

- 1 Check condition of drive belt. If needed, replace drive belt (p 6-525).
- 2 If FUEL TEMPERATURE gage does not indicate, proceed to step C.

**C. AUXILIARY MOTOR MAY BE DEFECTIVE.**

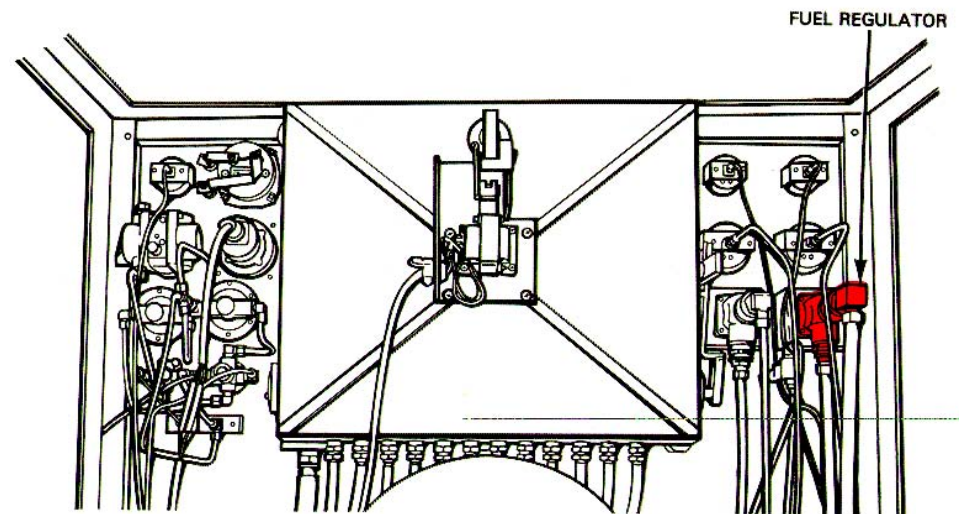
- 1 Perform troubleshooting procedures in steps A thru D, beginning on page 6-32.
- 2 If FUEL TEMPERATURE gage does not indicate, proceed to step D.



6-2. TROUBLESHOOTING (cont)

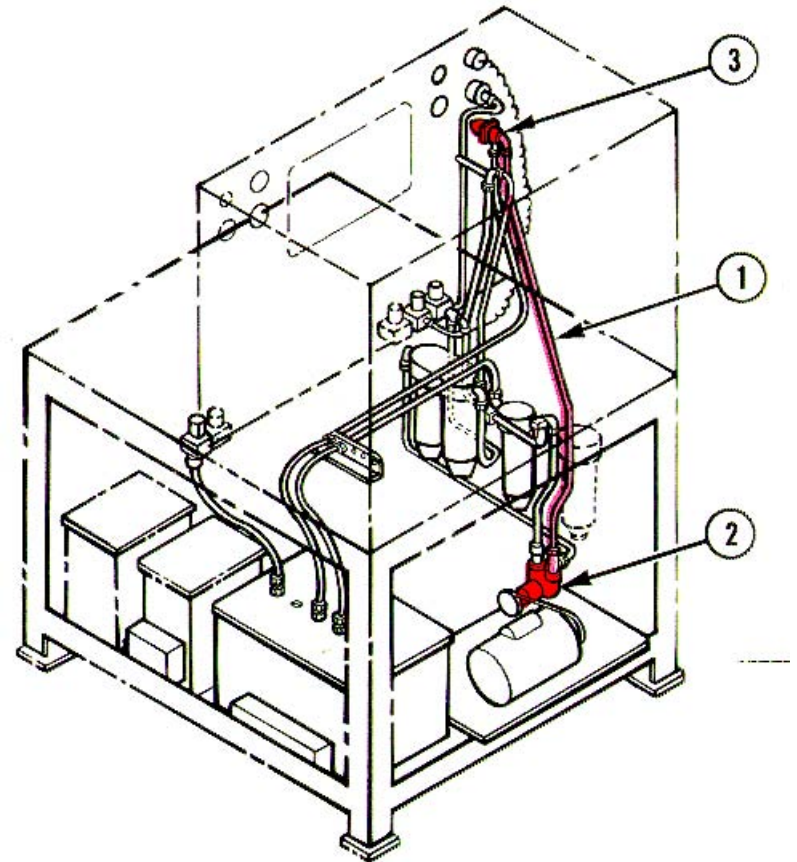
D. FUEL REGULATOR MAY BE DEFECTIVE.

- 1 Replace FUEL REGULATOR (p 6-252).
- 2 If FUEL TEMPERATURE gage does not indicate, proceed to step E.



**E. FUEL PRESSURE COPPER TUBING FROM FUEL PUMP TO FUEL REGULATOR MAY BE PLUGGED OR BROKEN.**

- 1 Remove fuel pressure copper tubing (1) from fuel pump (2) to FUEL REGULATOR (3). Blow air through copper tubing to clear any obstruction.
- 2 Replace fuel pressure copper tubing (fig. 4, app D) if broken.
- 3 If FUEL TEMPERATURE gage does not indicate, proceed to step F.

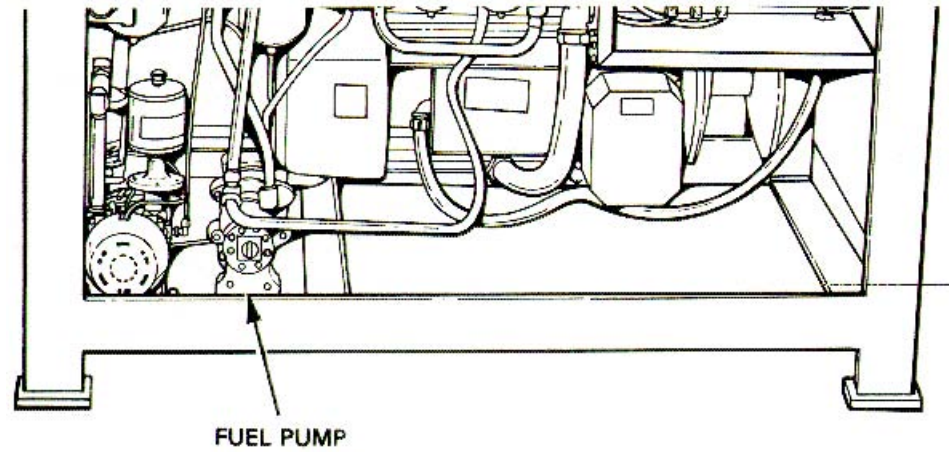




**6-2. TROUBLESHOOTING (cont)**

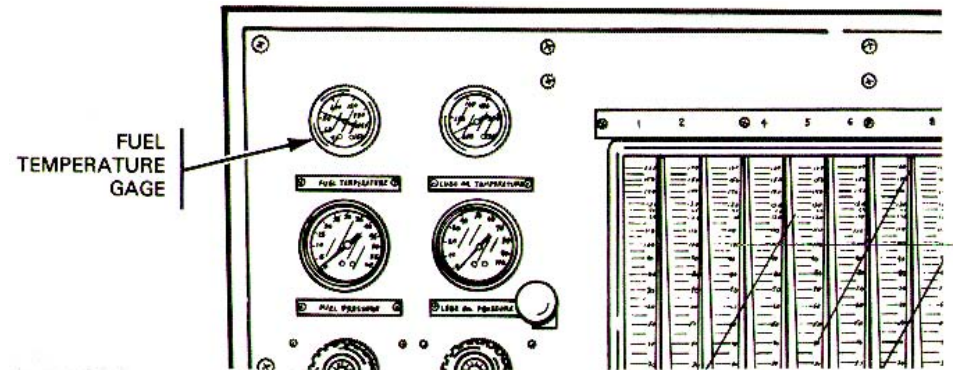
**F. FUEL PUMP IS DEFECTIVE.**

- 1 Replace fuel pump (p 6-525).
- 2 If FUEL TEMPERATURE gage does not indicate, proceed to step G.



**G. FUEL TEMPERATURE GAGE IS DEFECTIVE.**

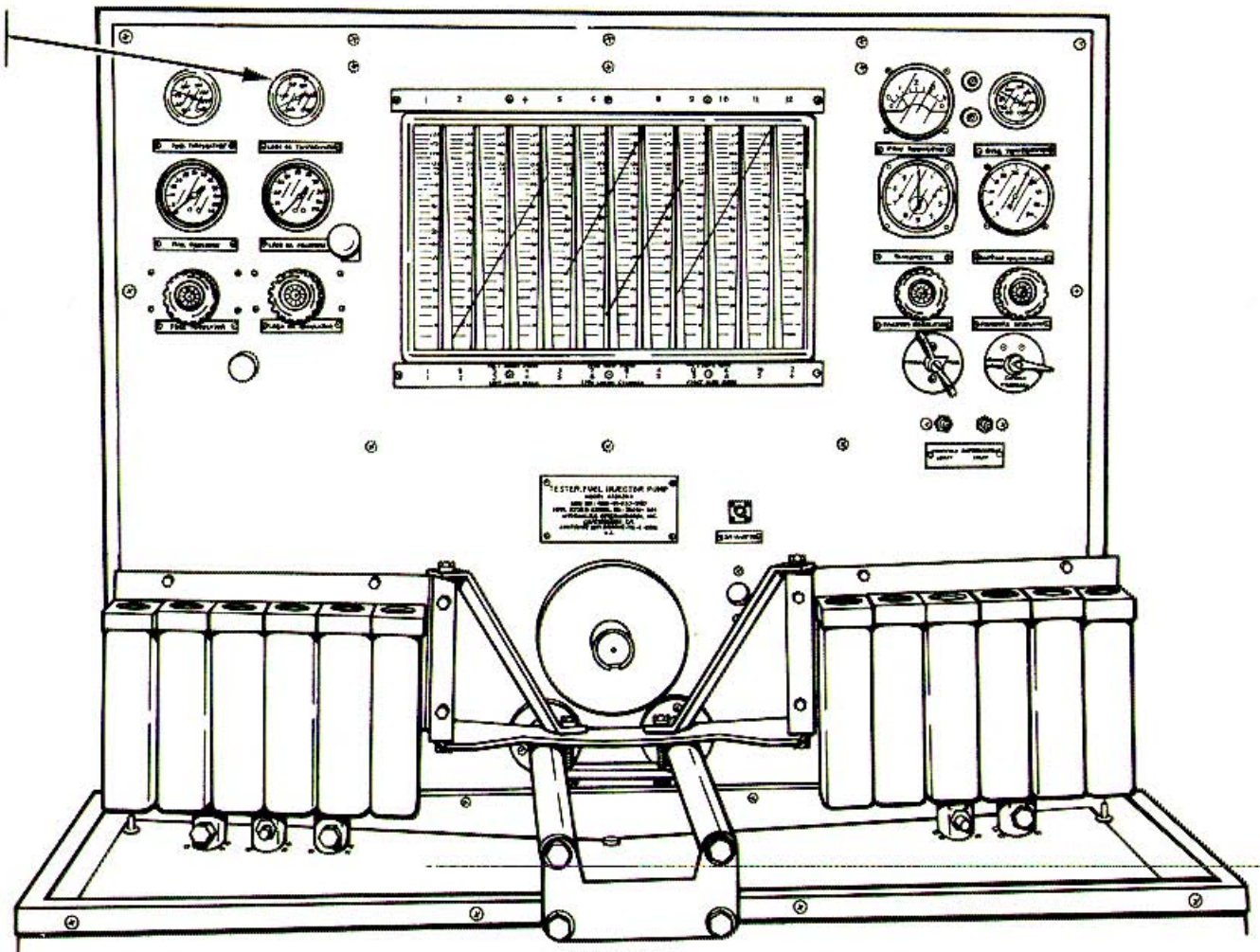
Replace FUEL TEMPERATURE gage (p 6-252).



LUBE OIL TEMPERATURE GAGE

DOES NOT INDICATE

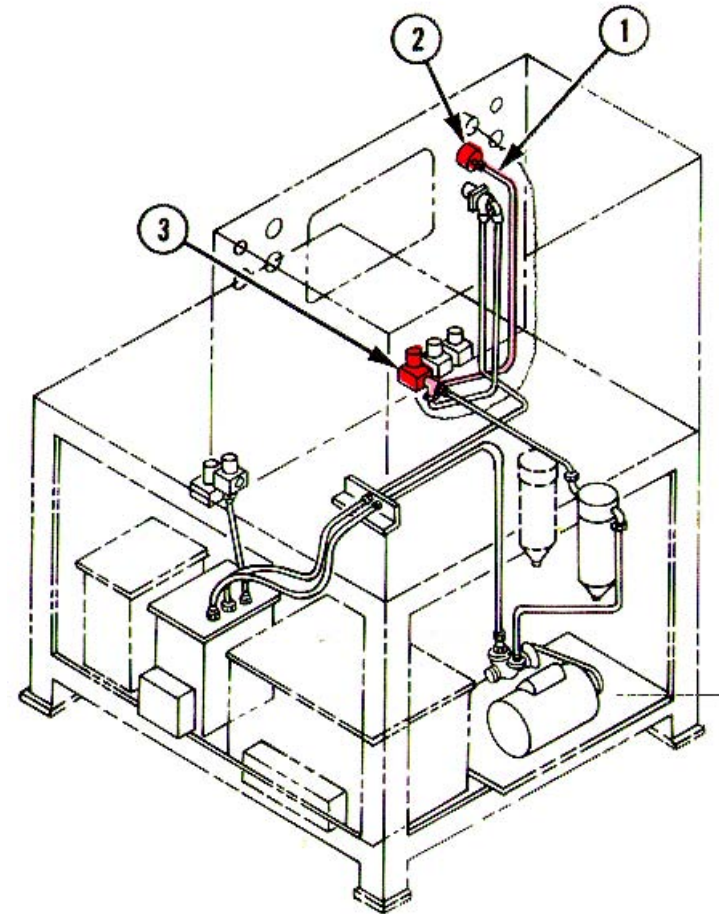
LUBE OIL  
TEMPERATURE GAGE



LOCATOR VIEW

**6-2. TROUBLESHOOTING (cont)****A. LUBE OIL PRESSURE COPPER TUBING FROM LUBE OIL INLET DISCHARGE BLOCK MAY BE DISCONNECTED. I**

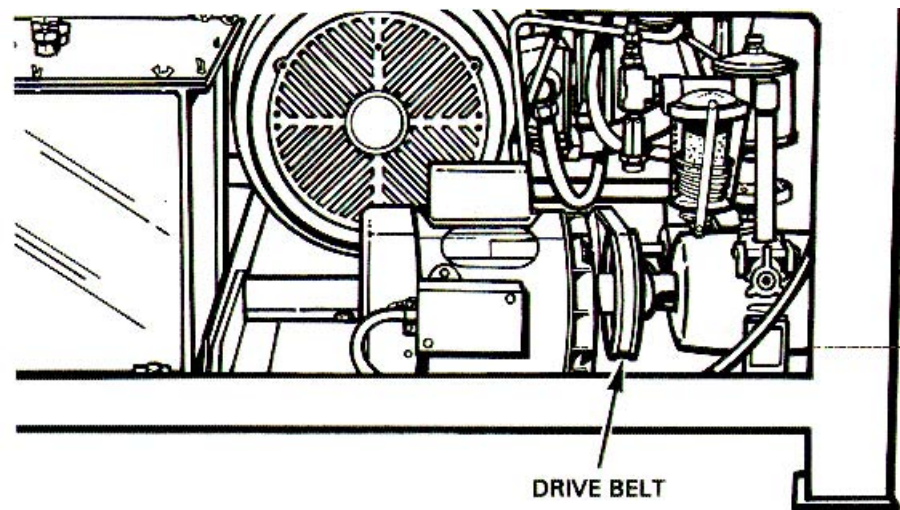
- 1 Ensure that lube oil pressure copper tubing (1) is connected to LUBE OIL PRESSURE gage (2) and lube oil inlet discharge block (3).
- 2 If LUBE OIL TEMPERATURE gage does not indicate, proceed to step B.



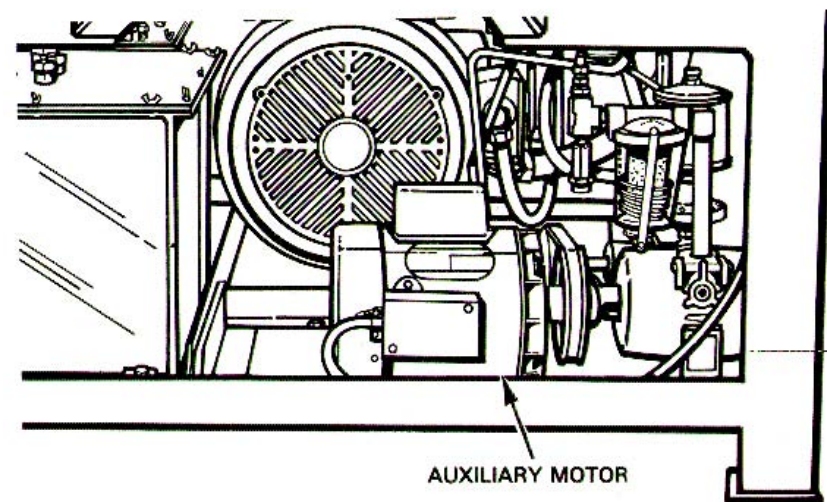


**B. DRIVE BELT ON FUEL AND LUBE OIL PUMPS MAY BE BROKEN.**

- 1 Check condition of drive belt. If needed, replace drive belt (p 6-525).
- 2 If LUBE OIL TEMPERATURE gage does not indicate, proceed to step C.

**C. AUXILIARY MOTOR MAY BE DEFECTIVE.**

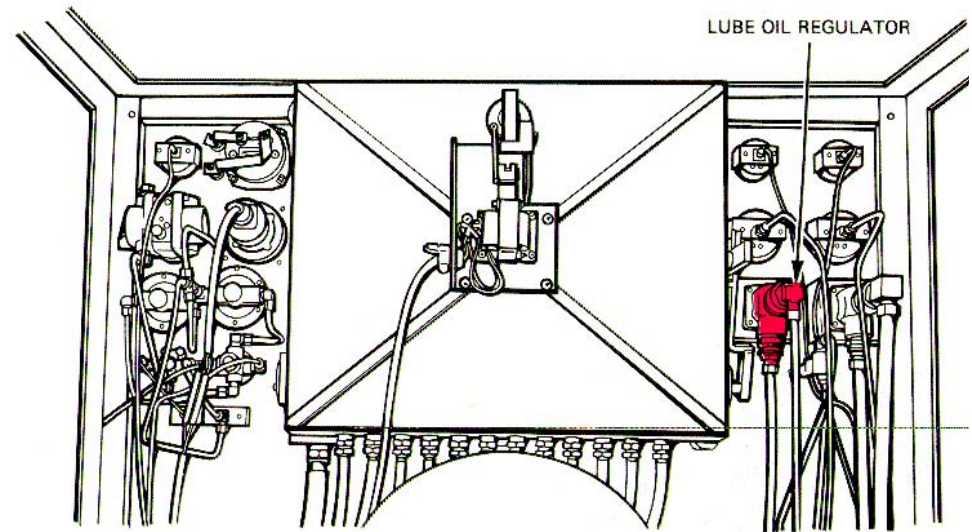
- 1 Perform troubleshooting procedures in steps A thru D, beginning on page 6-32.
- 2 If LUBE OIL TEMPERATURE gage does not indicate, proceed to step D.



6-2. TROUBLESHOOTING (cont)

D. LUBE OIL REGULATOR MAY BE DEFECTIVE.

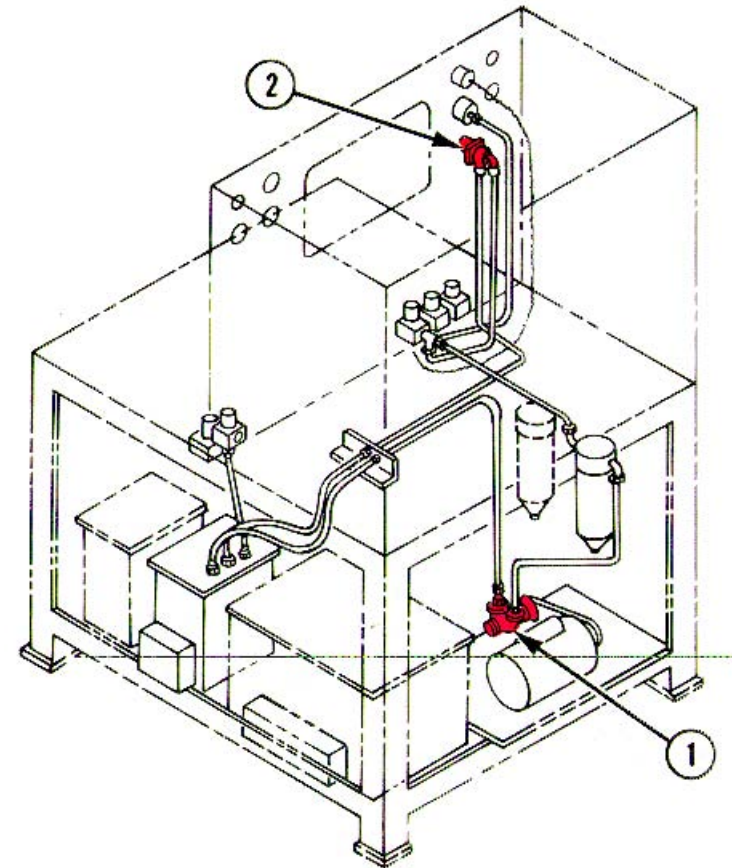
- 1 Replace LUBE OIL REGULATOR (p 6-252).
- 2 If LUBE OIL TEMPERATURE gage does not indicate, proceed to step E.





**E. LUBE OIL PRESSURE COPPER TUBING FROM LUBE OIL PUMP TO LUBE OIL REGULATOR MAY BE PLUGGED OR BROKEN.**

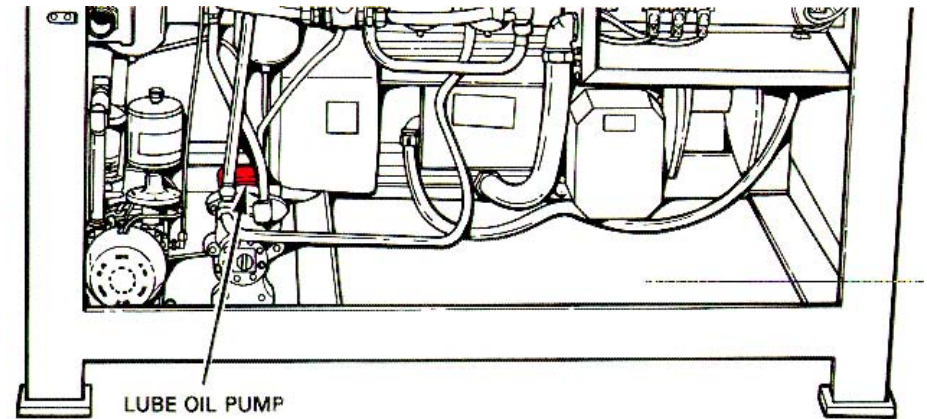
- 1 Remove all lube oil pressure copper tubing between lube oil pump (1) and LUBE OIL REGULATOR (2). Blow air through copper tubing to clear any obstruction.
- 2 Replace lube oil pressure copper tubing (fig. 4, app D) if broken.
- 3 If LUBE OIL TEMPERATURE gage does not indicate, proceed to step F.



**6-2. TROUBLESHOOTING (cont)**

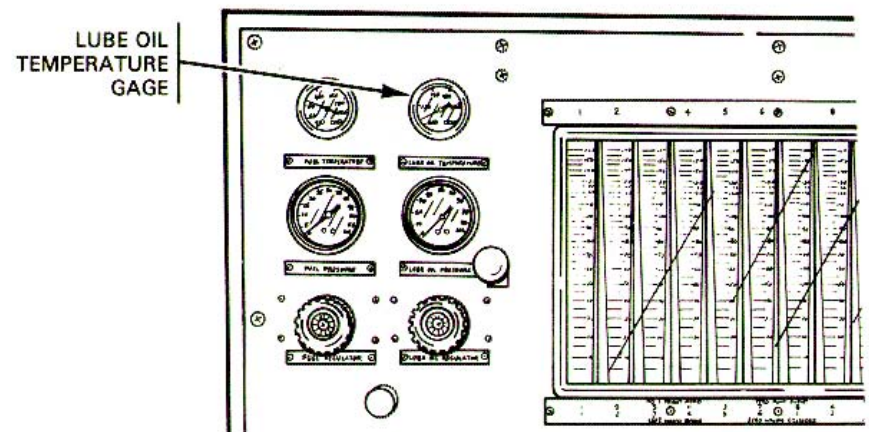
**F. LUBE OIL PUMP IS DEFECTIVE.**

- 1 Replace lube oil pump (p 6-525).
- 2 If LUBE OIL TEMPERATURE gage does not indicate, proceed to step G.



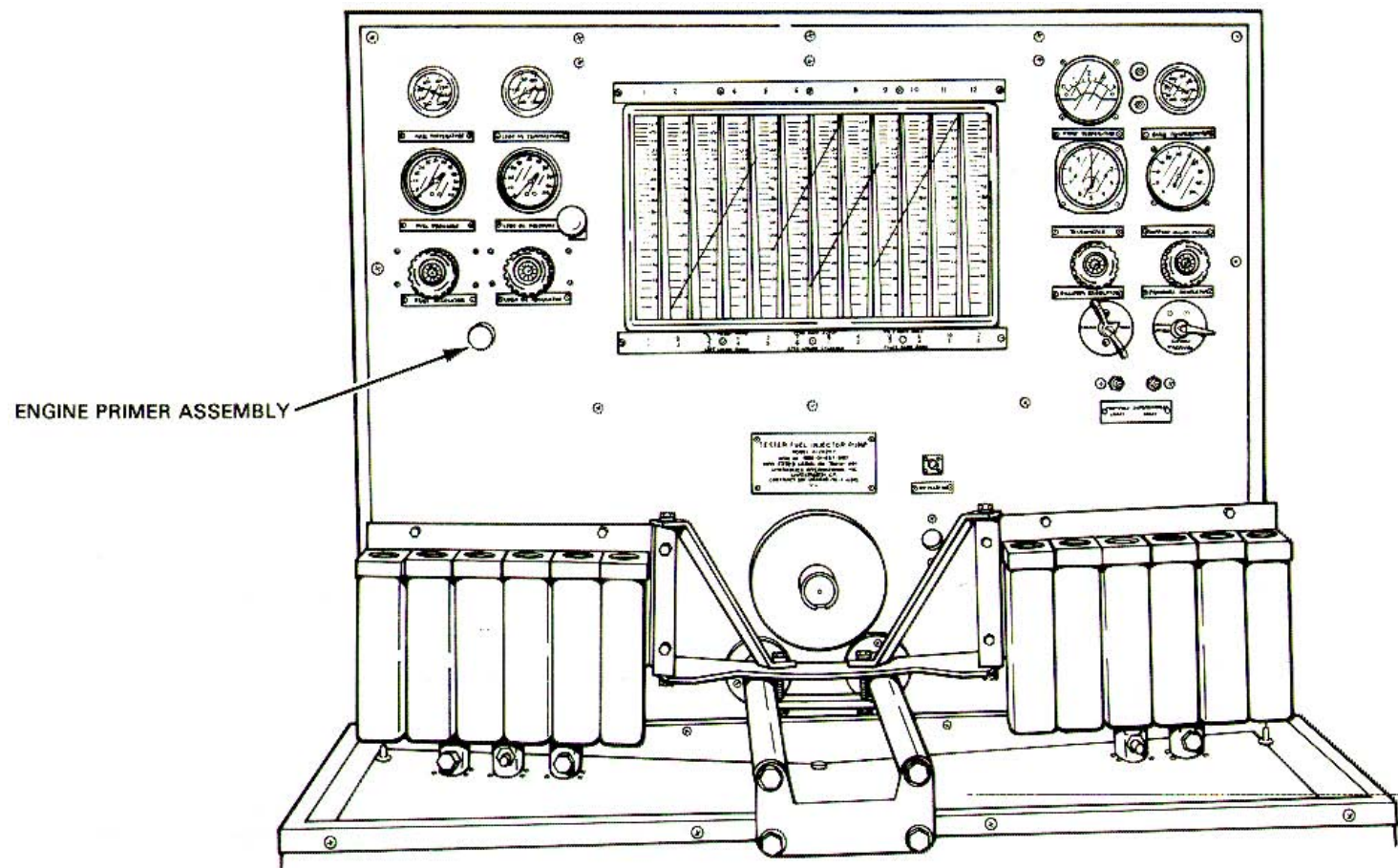
**G. LUBE OIL TEMPERATURE GAGE IS DEFECTIVE.**

Replace LUBE OIL TEMPERATURE gage (p 6-252).



ENGINE PRIMER ASSEMBLY

DOES NOT FUNCTION

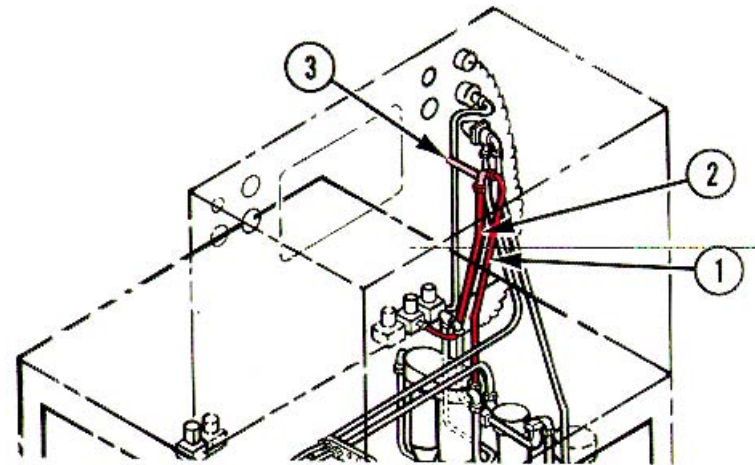


LOCATOR VIEW

**6-2. TROUBLESHOOTING (cont)**

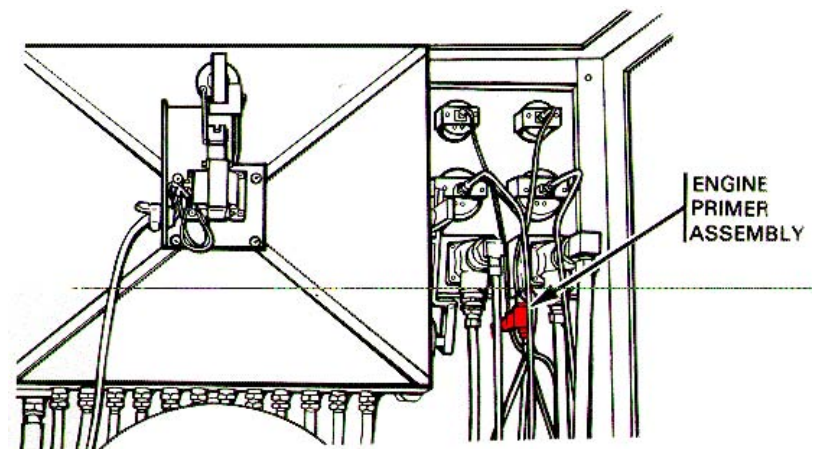
**A. COPPER TUBING TO ENGINE PRIMER ASSEMBLY MAY BE PLUGGED OR BROKEN.**

- 1 Remove copper tubings (1 and 2) from engine primer assembly (3).  
Blow air through copper tubing to clear any obstruction.
- 2 Replace copper tubing (fig. 4, app D) if broken.
- 3 If engine primer assembly does not function, proceed to step B.



**B. ENGINE PRIMER ASSEMBLY IS DEFECTIVE.**

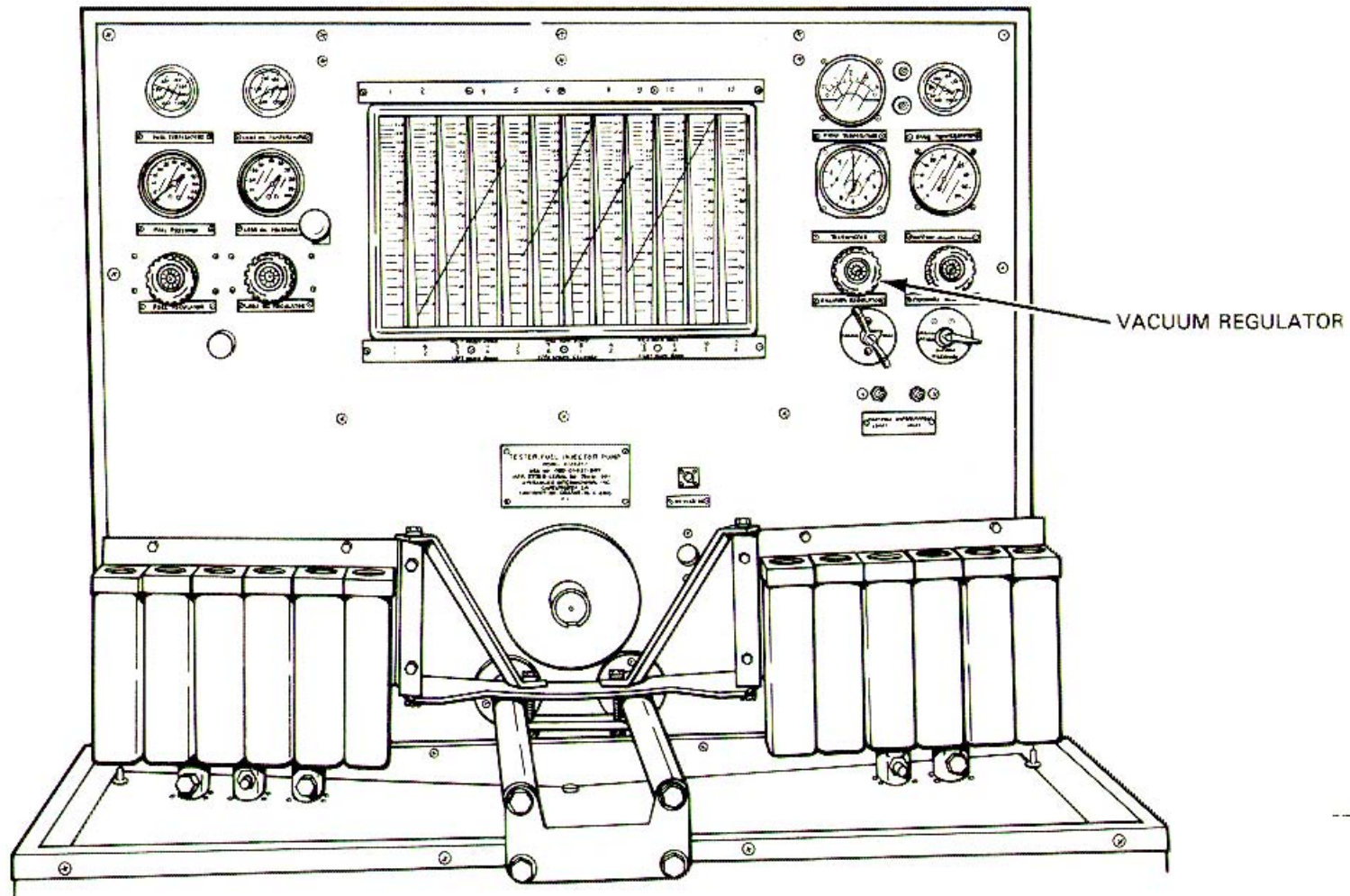
Replace engine primer assembly (p 6-331).





VACUUM REGULATOR

DOES NOT FUNCTION



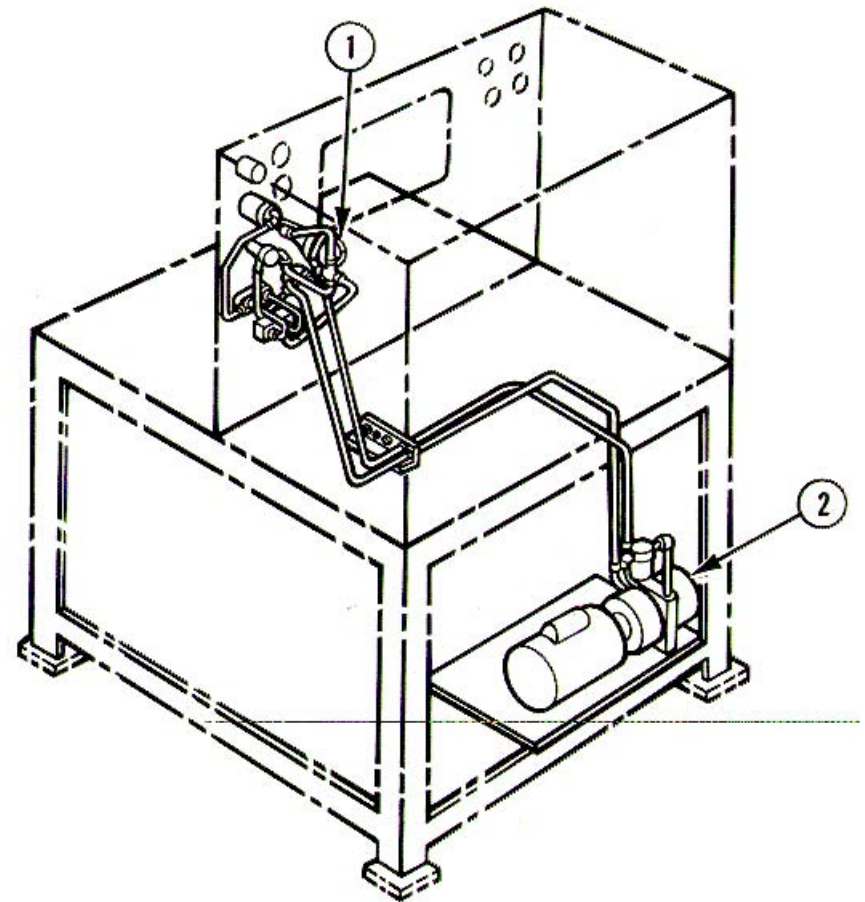
LOCATOR VIEW

6-85



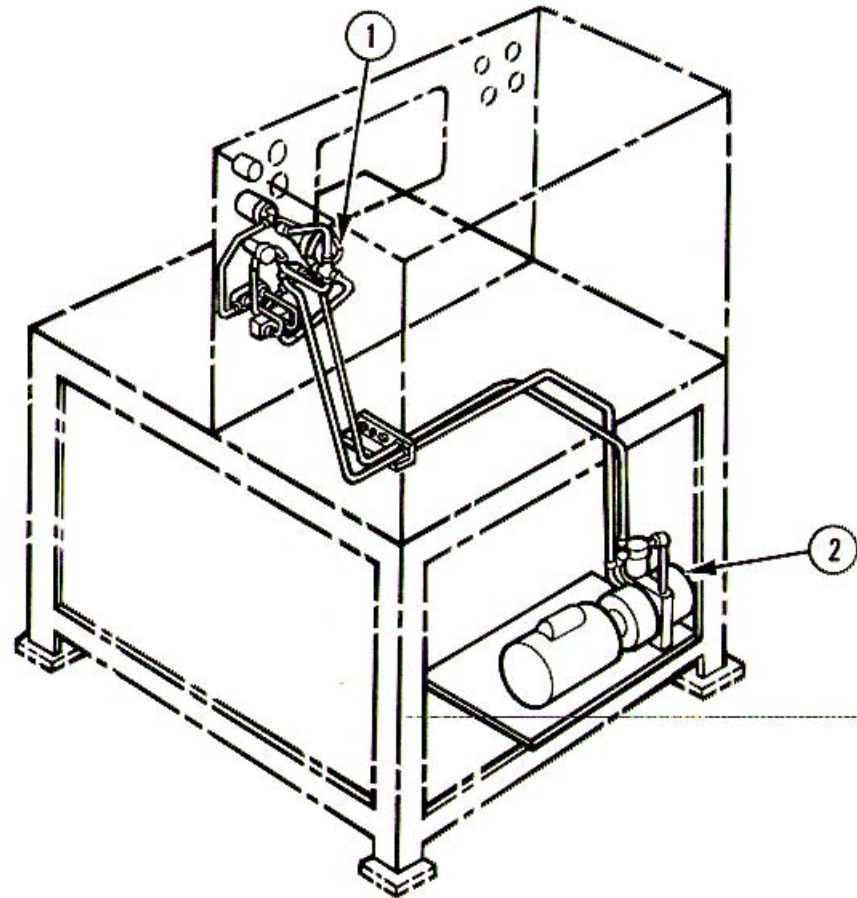
**6-2. TROUBLESHOOTING (cont)****A. COPPER TUBING FROM VACUUM REGULATOR TO VACUUM PUMP MAY BE DISCONNECTED.**

- 1 Check if all copper tubing is connected between VACUUM REGULATOR (1) and vacuum pump (2). Connect if needed.
- 2 If VACUUM REGULATOR does not function, proceed to step B.



**B. COPPER TUBING FROM VACUUM REGULATOR TO VACUUM PUMP MAY BE PLUGGED OR BROKEN.**

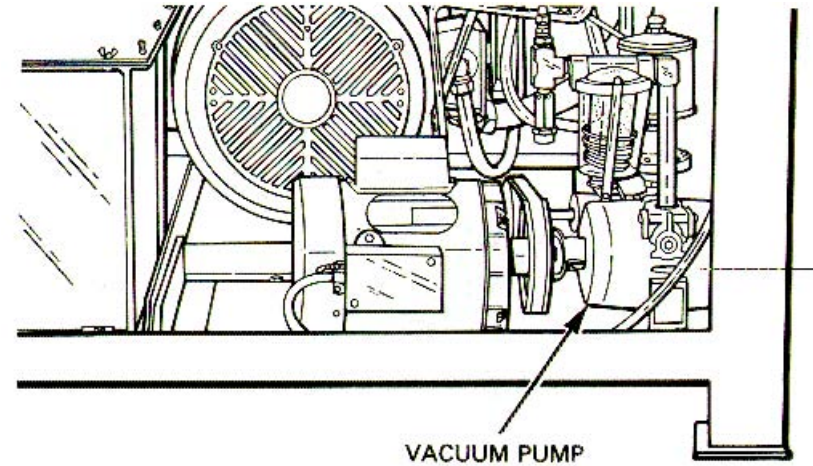
- 1 Remove all copper tubing between VACUUM REGULATOR (1) and vacuum pump (2). Blow air through copper tubing to remove any obstruction.
- 2 Replace copper tubing (fig. 4, app D) if broken.
- 3 If VACUUM REGULATOR does not function, proceed to step C.



6-2. TROUBLESHOOTING (cont)|

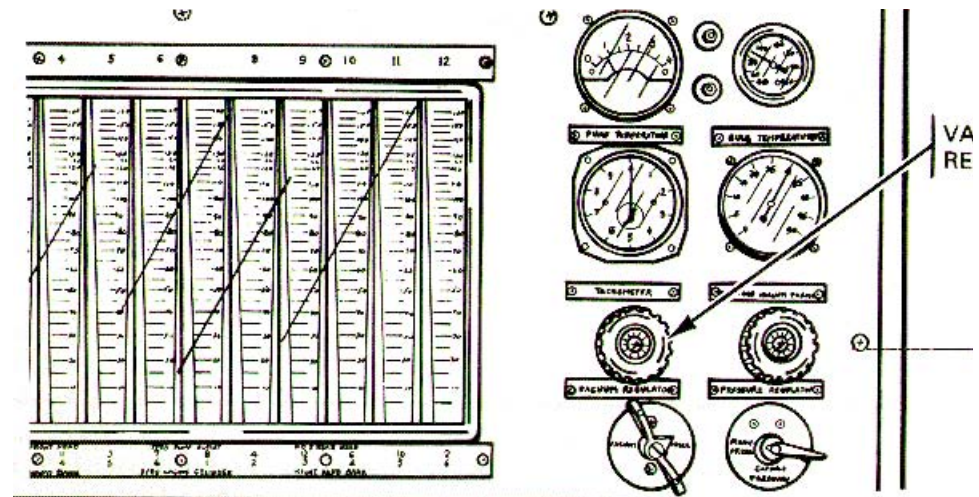
C. VACUUM PUMP IS DEFECTIVE.

- 1 Replace vacuum pump (p 6-525).
- 2 If VACUUM REGULATOR does not function, proceed to step D.



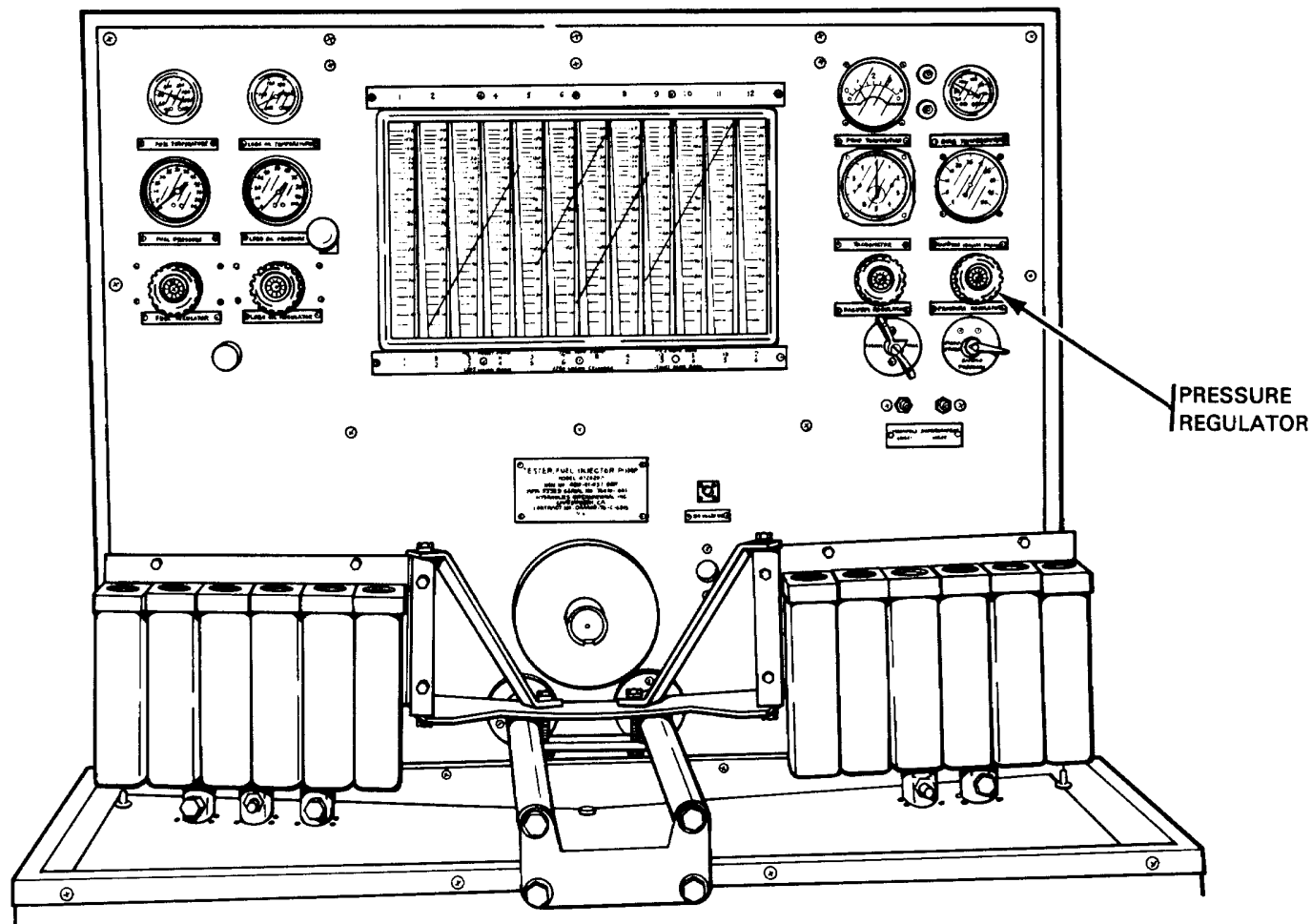
D. VACUUM REGULATOR IS DEFECTIVE.

Replace VACUUM REGULATOR (p 6-252).



PRESSURE REGULATOR

DOES NOT FUNCTION

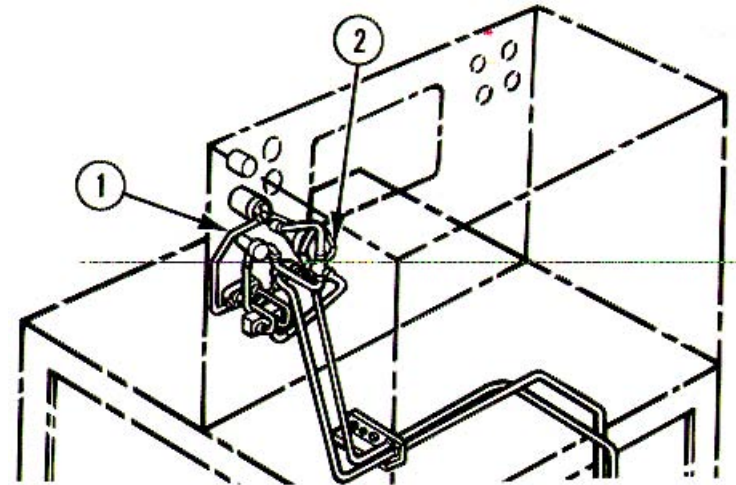


LOCATOR VIEW

**6-2. TROUBLESHOOTING (cont)**

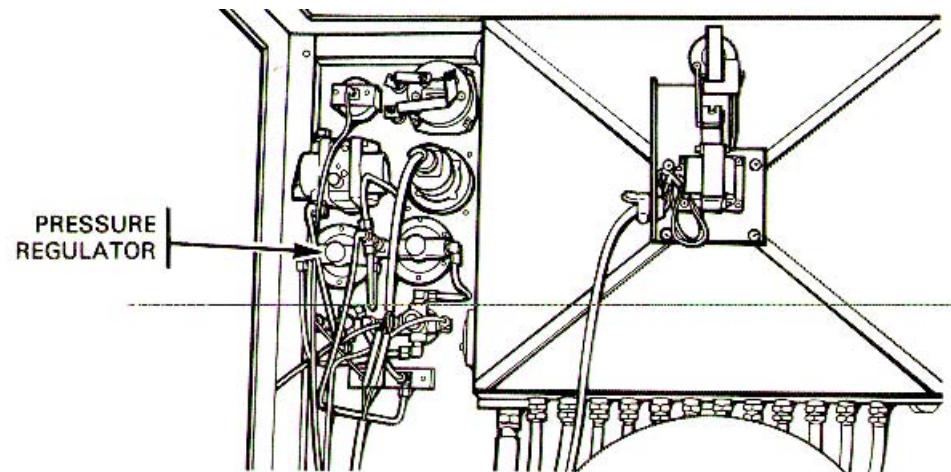
**A. COPPER TUBING FROM PRESSURE REGULATOR TO VACUUM REGULATOR MAY BE DISCONNECTED.**

- 1 Check if all copper tubing is connected between PRESSURE REGULATOR (1) and VACUUM REGULATOR (2). Connect if needed.
- 2 If PRESSURE REGULATOR does not function, proceed to step B.



**B. PRESSURE REGULATOR IS DEFECTIVE.**

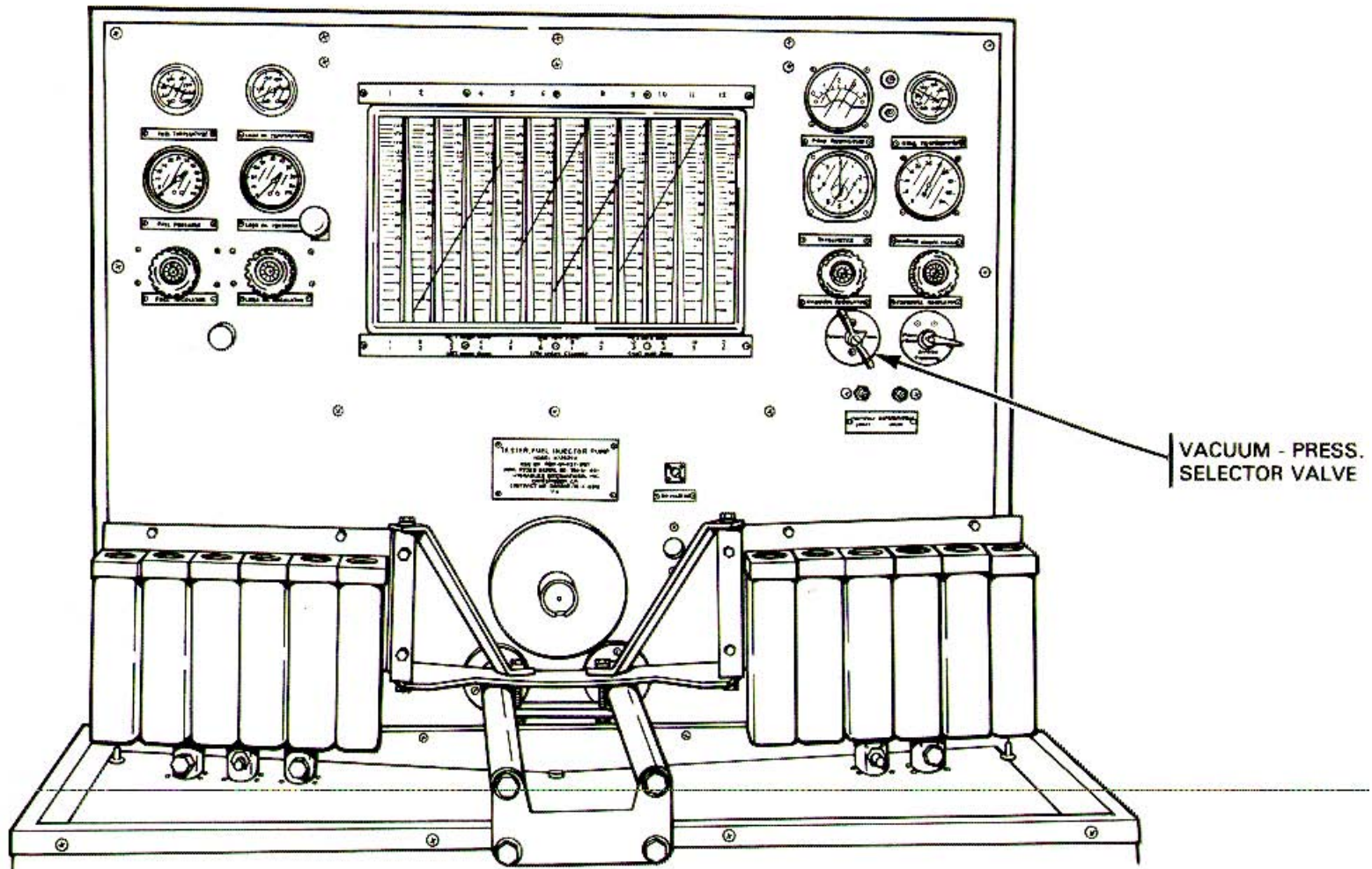
Replace PRESSURE REGULATOR (p 6-252).





VACUUM-PRES. SELECTOR VALVE

DOES NOT FUNCTION



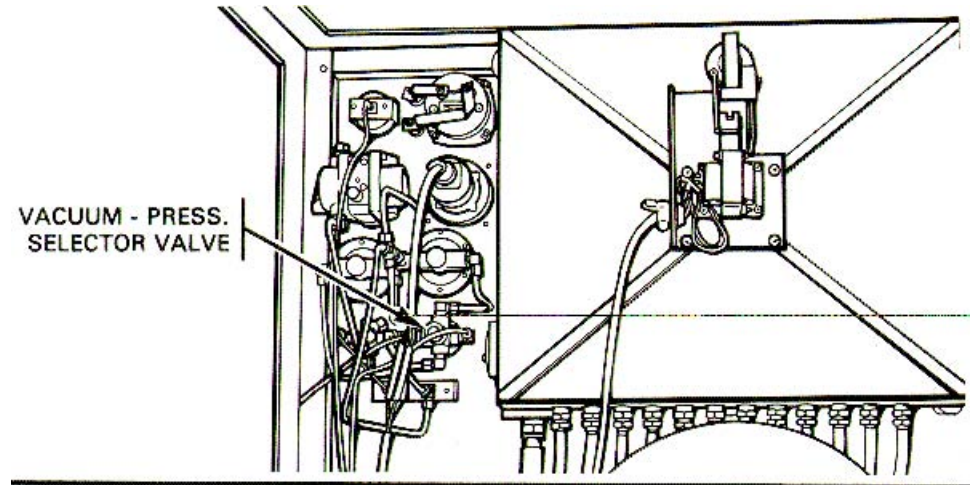
VACUUM - PRESS.  
SELECTOR VALVE

LOCATOR VIEW

**6-2. TROUBLESHOOTING (cont)**

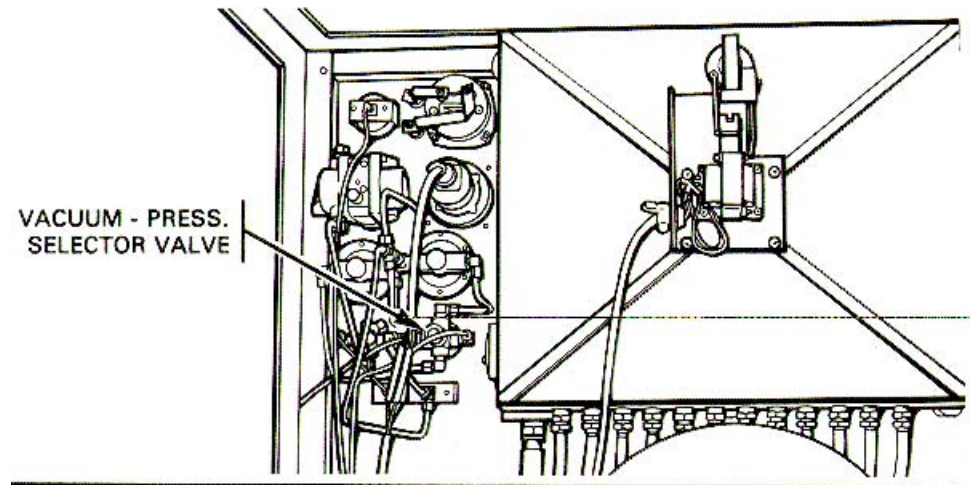
**A. COPPER TUBING TO VACUUM - PRESS. SELECTOR VALVE MAY BE DISCONNECTED.**

- 1 Check if all copper tubing is connected to VACUUM PRESS. selector valve. Connect if needed.
- 2 If VACUUM PRESS. selector valve does not function, proceed to step B.



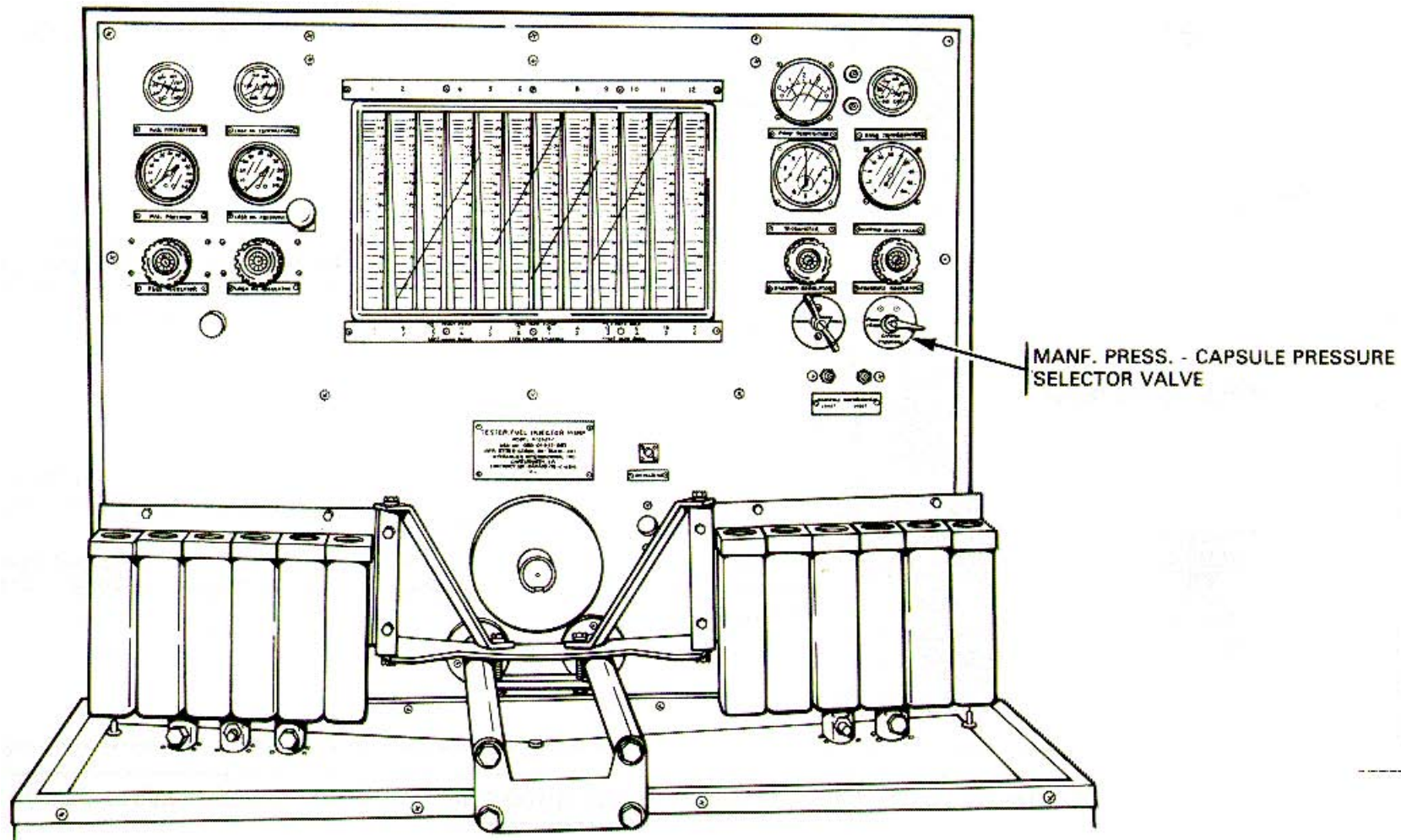
**B. VACUUM - PRESS. SELECTOR VALVE IS DEFECTIVE.**

Replace VACUUM - PRESS. selector valve (p 6-296).



**MANF. PRESS.-CAPSULE PRESSURE  
SELECTOR VALVE**

DOES NOT FUNCTION



MANF. PRESS. - CAPSULE PRESSURE  
SELECTOR VALVE

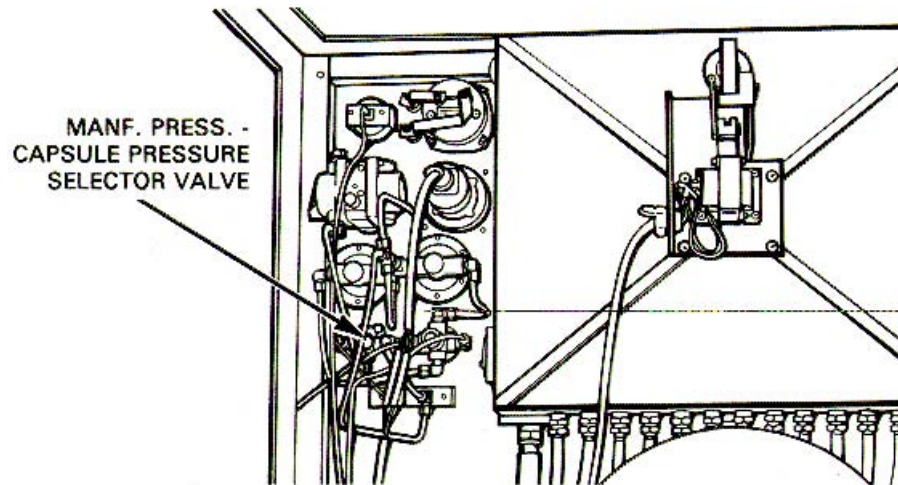
LOCATOR VIEW



**6-2. TROUBLESHOOTING (cont)**

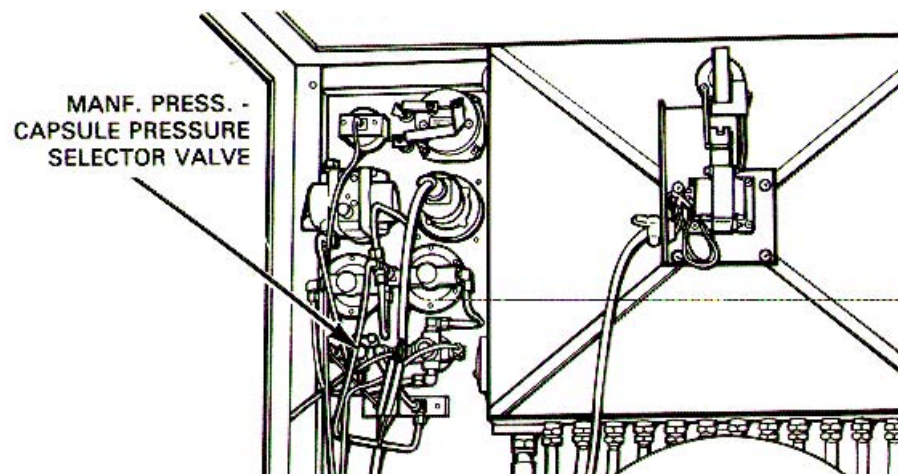
**A. COPPER TUBING TO MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE MAY BE DISCONNECTED. I**

- 1 Check if all copper tubing is connected to MANF. PRESS. -CAPSULE PRESSURE selector valve. Connect if needed.
- 2 If MANF. PRESS. CAPSULE PRESSURE selector valve does not function, proceed to step B.



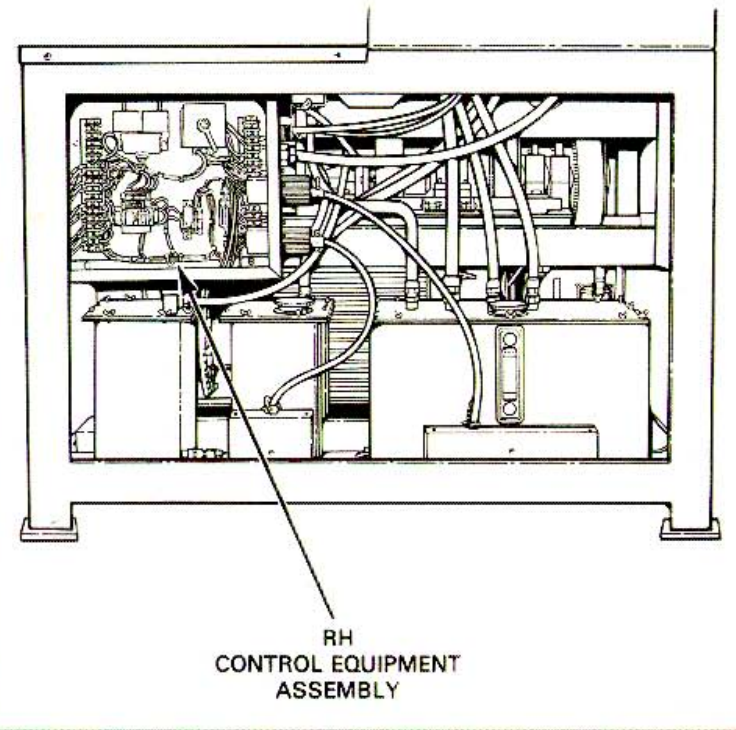
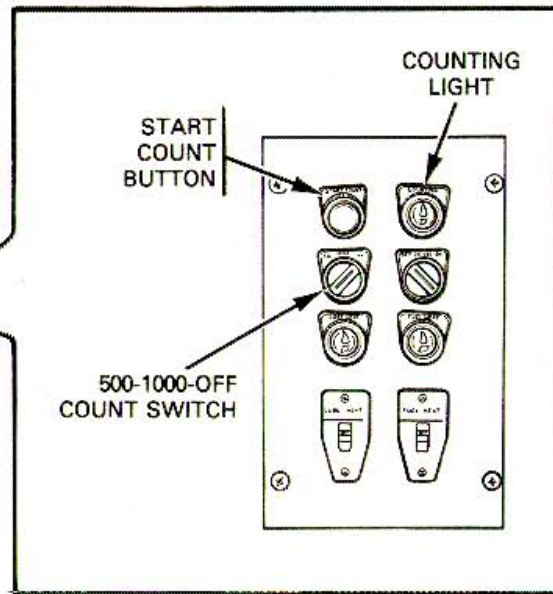
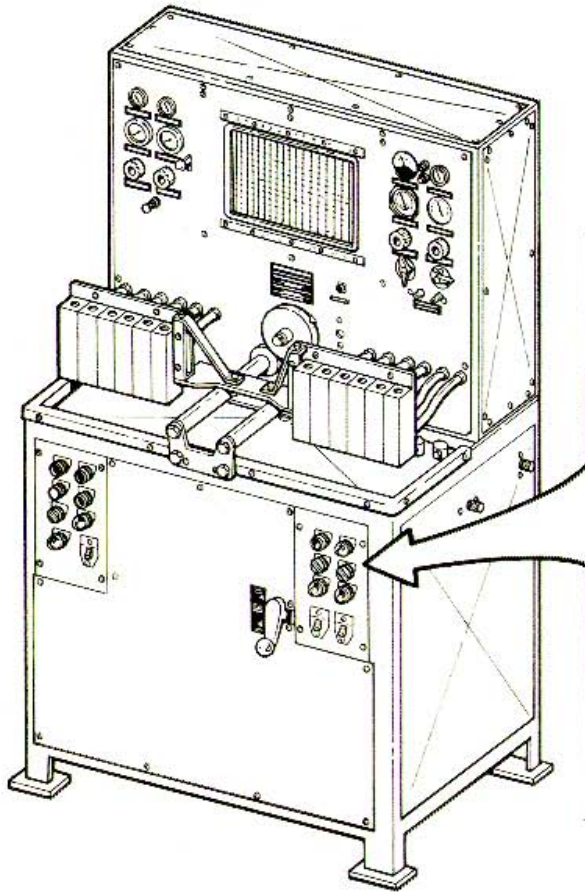
**B. MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE IS DEFECTIVE.**

Replace MANF. PRESS. - CAPSULE PRESSURE selector valve (p 6-292).



**COUNTING CIRCUIT**

DOES NOT FUNCTION



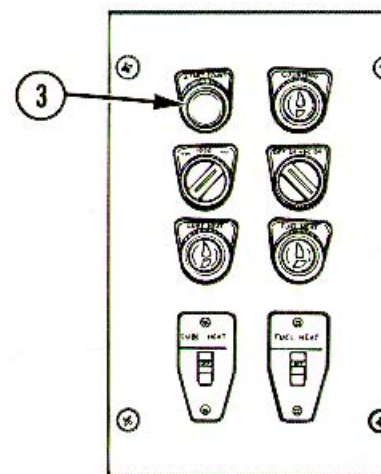
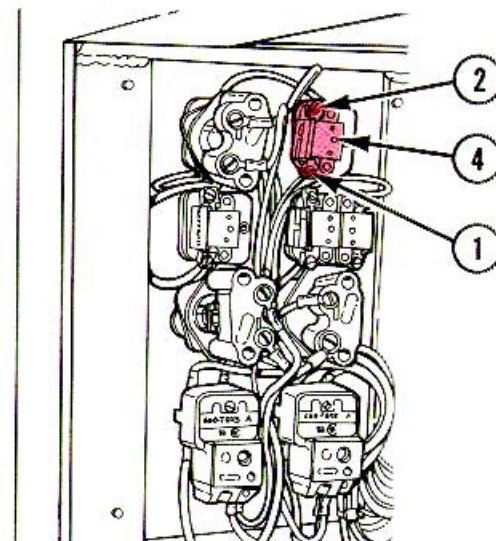
**LOCATOR VIEW**



6-2. TROUBLESHOOTING (cont)

A. START COUNT SWITCH MAY BE DEFECTIVE.

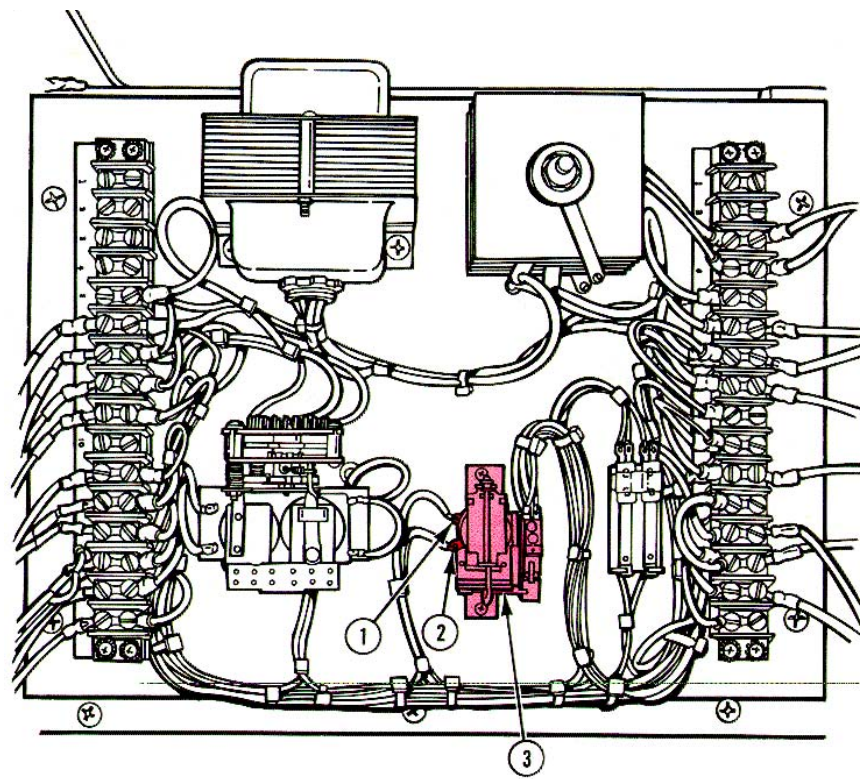
- 1 Connect one multimeter lead to START COUNT switch contact (1) and connect other lead to START COUNT switch contact (2).
- 2 Press START COUNT button (3) and check for continuity. If continuity is not present, replace START COUNT switch (4) (p 6-187).
- 3 If counting circuit does not function, proceed to step B.



**B. HOLDING RELAY MAY BE DEFECTIVE.****NOTE**

The following check is for resistance.

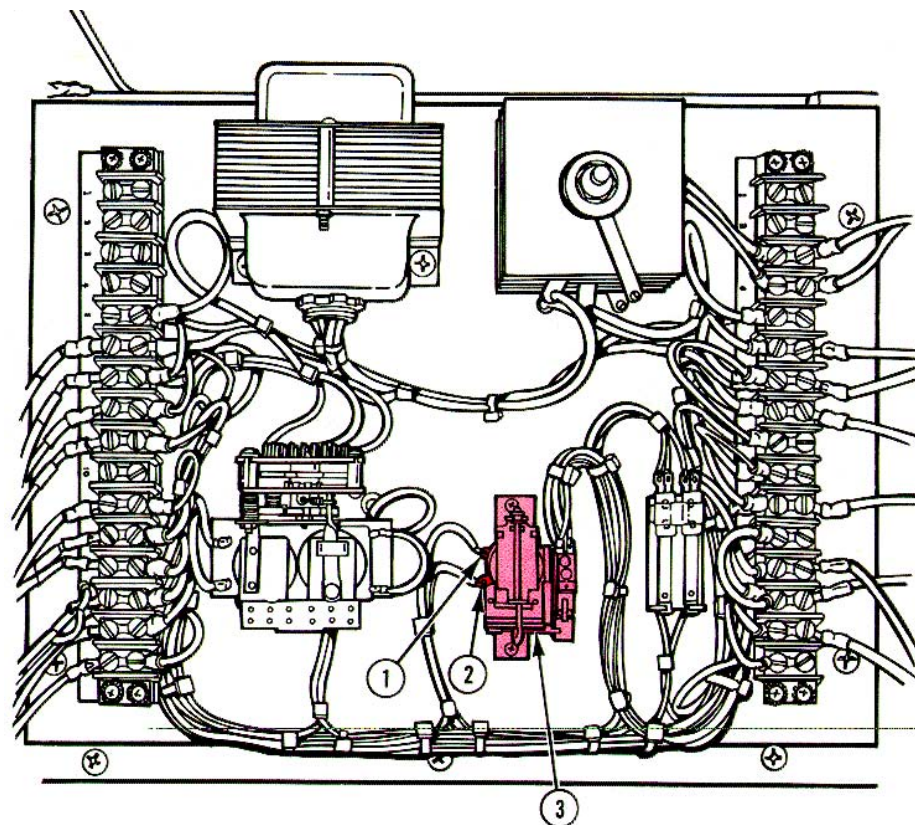
- 1 Connect one multimeter lead to holding relay coil contact (1) and connect the other lead to holding relay coil contact (2).
- 2 Check for approximate resistance reading of 30 K ohms.
- 3 Check holding relay contacts to ensure that they are not burned or welded together.
- 4 If resistance is not present or holding relay coil contacts are damaged, replace the holding relay (3) (p 6-187).
- 5 If resistance circuit does not function, proceed to step C.



**6-2. TROUBLESHOOTING (cont)****C. LATCHING RELAY MAY BE DEFECTIVE.****NOTE**

The following check is for resistance.

- 1 Connect one multimeter lead to latching relay coil contact (1) and connect the other lead to latching relay coil contact (2).
- 2 Check for approximate resistance reading of 250 ohms.
- 3 Check latching relay coil contacts to ensure that they are not burned or welded together.
- 4 If resistance is not present or latching relay coil contacts are damaged, replace the latching relay (3) (p 6-187).
- 5 If counting circuit does not function, proceed to step D.



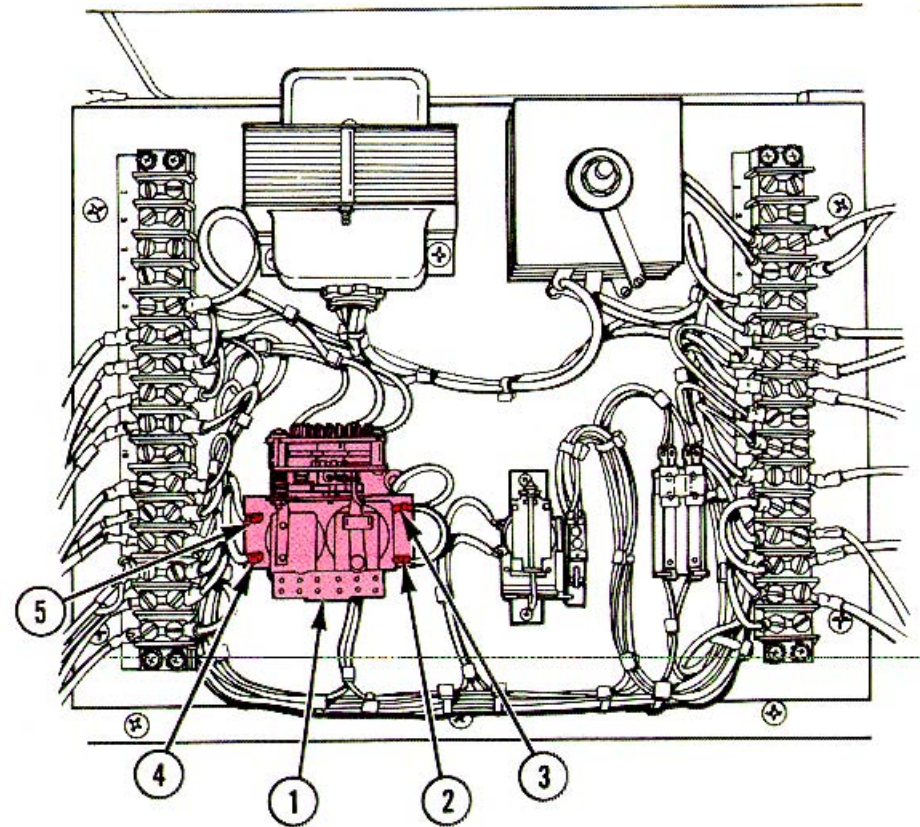


**D. STEPPING RELAY MAY BE DEFECTIVE.****NOTE**

The stepping relay (1) has two coils. One coil is for the stepper and the other coil is for reset.

The following checks are for resistance.

- 1 Connect one multimeter lead to stepping relay coil contact (2) and connect the other lead to stepping relay coil contact (3). Resistance should be approximately 300 ohms.
- 2 Remove both leads. Connect one multimeter lead to stepping relay coil contact (4) and connect the other lead to stepping relay coil contact (5). Resistance should be approximately 18 K ohms.
- 3 Check stepping relay coil contacts to ensure that they are not burned or welded together.
- 4 If resistance is not present or stepping relay coil contacts are damaged, replace the stepping relay (1) (p 6-187).
- 5 If counting circuit does not function, proceed to step E.



6-2. TROUBLESHOOTING (cont)

E. SOLENOID MAY BE DEFECTIVE.

**NOTE**

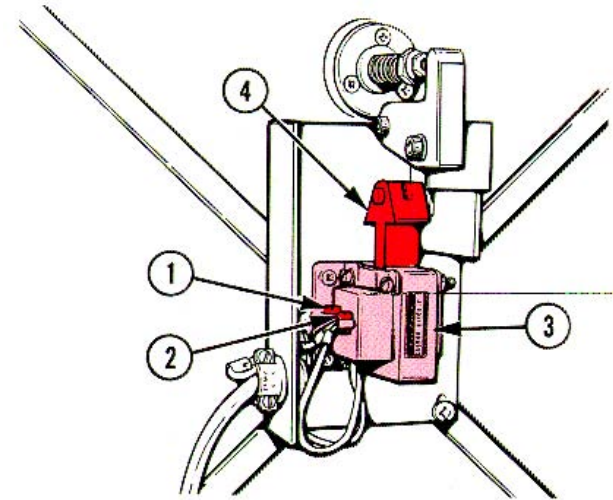
The following check is for resistance.

- 1 Connect one multimeter lead to solenoid contact (1) and connect the other lead to solenoid contact (2).

**CAUTION**

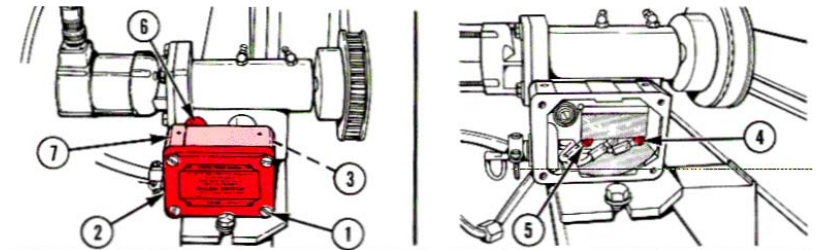
When replacing the solenoid (3), make sure the iron core (4) is inserted into the solenoid. If this is not done, the solenoid will burn out when power is turned on to the tester and the START COUNT button is pushed in.

- 2 Check for approximate resistance reading of 55 ohms. If resistance does not exist, replace the solenoid (3) (p 6-366).
- 3 If counting circuit does not function, proceed to step F.



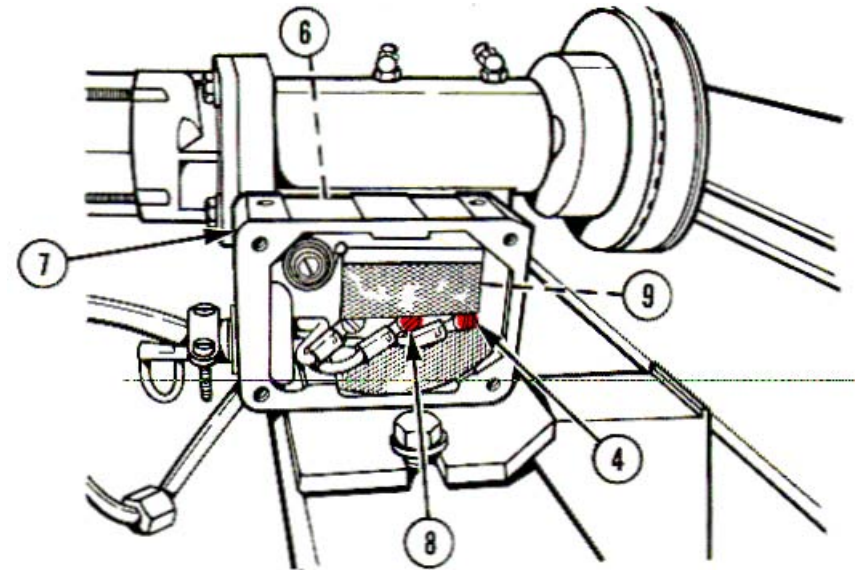
F. COUNTER PULSE SWITCH MAY BE DEFECTIVE.

- 1 Loosen four screws (1). Remove cover (2) and plate (3).
- 2 Connect one multimeter lead to microswitch contact (4) and connect the other lead to microswitch contact (5). Push down on arm (6) behind switchbox (7). Check for open circuit.



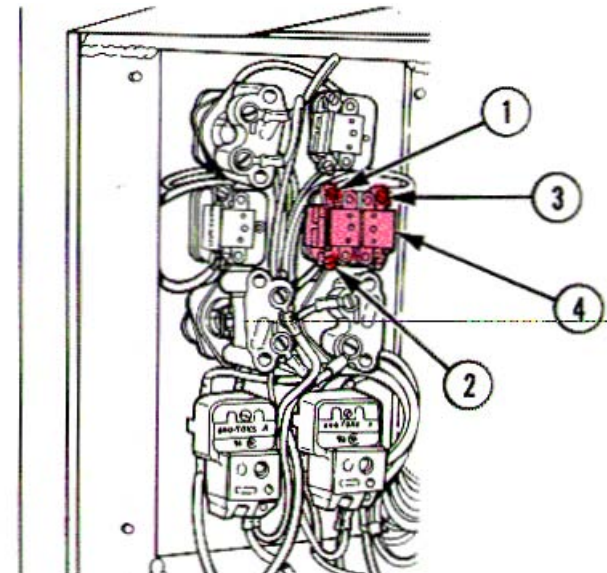


- 3 Remove the multimeter lead from microswitch contact (4) and connect it to microswitch contact (8). Push down on arm (6) behind switchbox (7).
- 4 Check for continuity. If continuity is not present, replace the microswitch (9) (p 6-445).
- 5 If counting circuit does not function, proceed to step G.



**G. 500-1000-OFF COUNT SWITCH MAY BE DEFECTIVE.**

- 1 Connect one multimeter lead to 500-1000-OFF count switch contact (1) and connect the other lead to 500-1000-OFF count switch contact (2) with switch in the 500 position.
- 2 Remove both leads. Connect one multimeter lead to 500-1000-OFF count switch contact (3) and connect the other lead to 500-1000-OFF count switch contact (2) with switch in the OFF position.
- 3 Check for continuity. If continuity is not present, replace the 500-1000-OFF count switch (4).
- 4 If counting circuit does not function, proceed to step H.



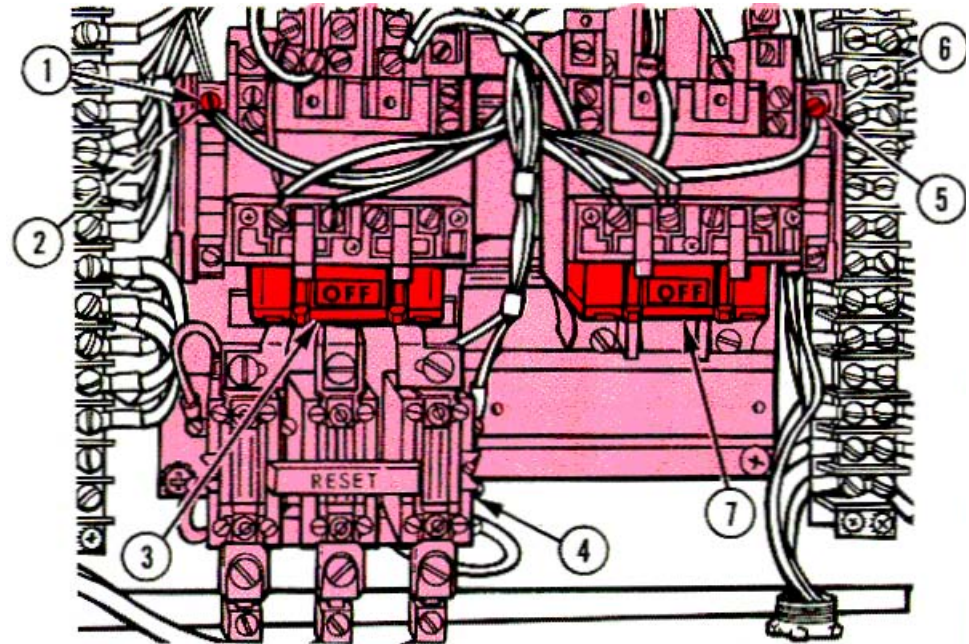
## 6-2. TROUBLESHOOTING (cont)

### H. STARTER MICROSWITCHES MAY BE DEFECTIVE.

There are two starter microswitches on the newer tester models and four on the older models.

- 1 Connect one multimeter lead to microswitch contact (1) and connect the other lead to microswitch contact (2). Push up on forward contact arm (3).
- 2 Check for continuity. If continuity does not exist, replace the starter (4) (p 6-219).
- 3 Remove both leads. Connect one multimeter lead to microswitch contact (5) and connect the other lead to microswitch contact (6). Push in on reverse contact arm (7).
- 4 Check for continuity. If continuity does not exist, replace the starter (4) (p 6-219).
- 5 If counting circuit does not function, proceed to step I.

#### NOTE



#### NOTE

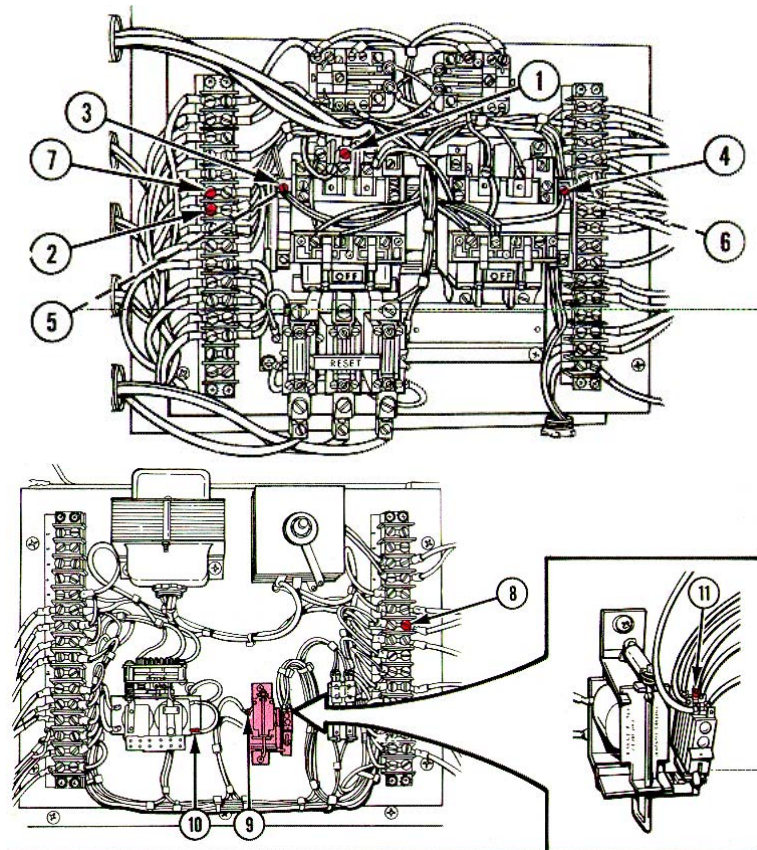
Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.

I. WIRES MAY BE OPEN.

**NOTE**

The following two microswitches are located on older tester models between the forward and reverse sections, toward the rear of the tester.

- 1 Connect one multimeter lead to center starter terminal contact (1). Connect the other lead in sequence to terminal A7 (2), rear microswitch contact (3), and rear microswitch contact (4).
- 2 Remove both leads. Connect one multimeter lead to front microswitch contact (5). Connect the other lead in sequence to front microswitch contact (6), terminals A6 (7) and D7 (8), latching relay coil contact (9), stepping relay coil contact (10), and to latching relay contact (11).

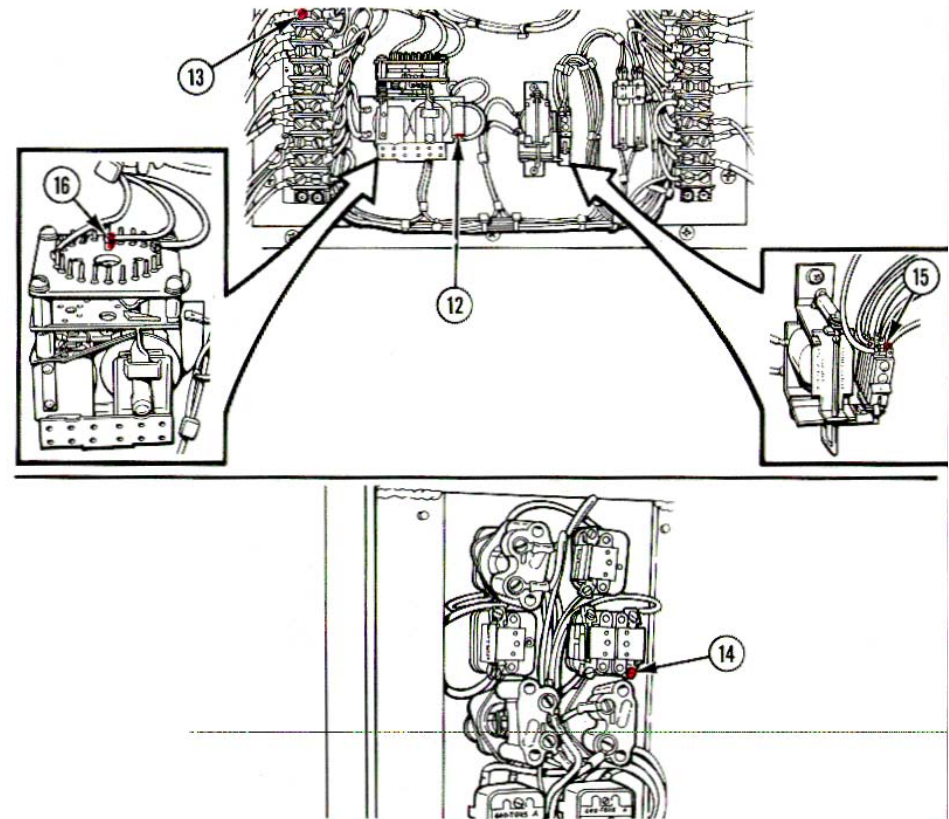




6-2. TROUBLESHOOTING (cont)

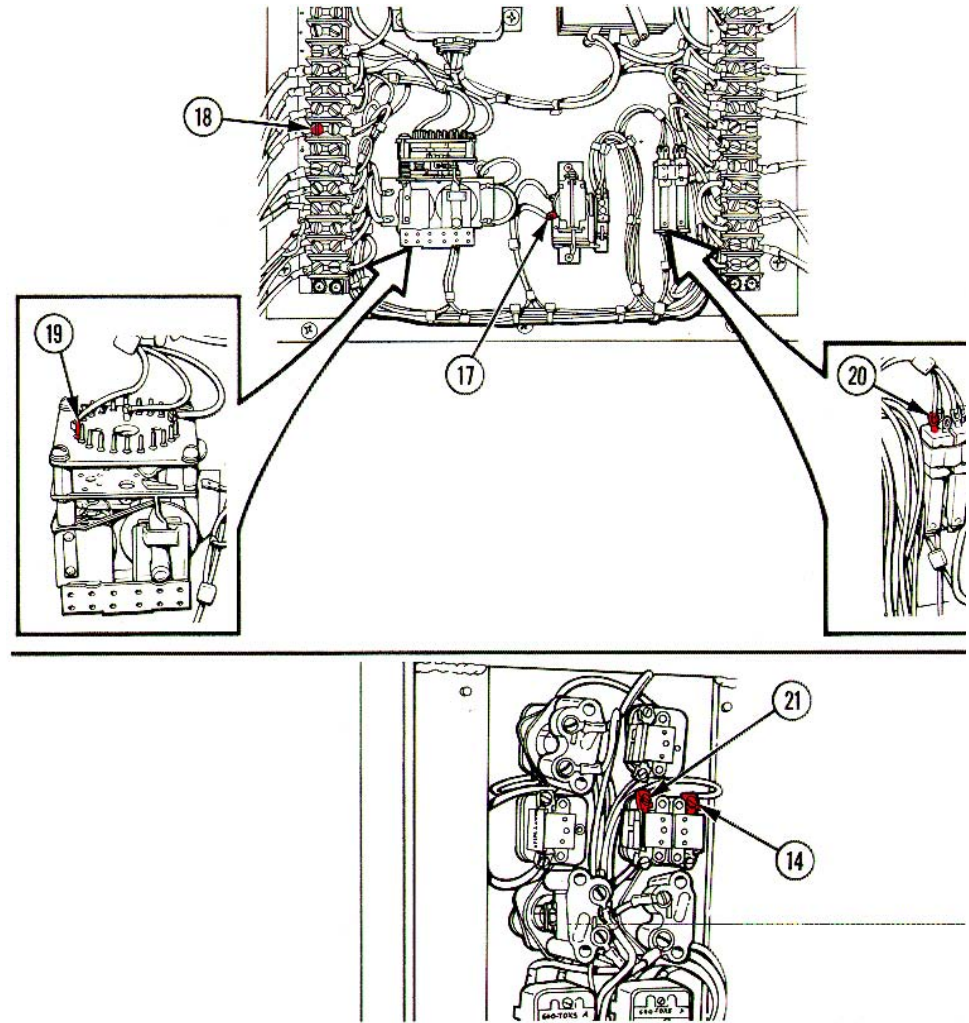
I. WIRES MAY BE OPEN. (cont)

- 3 Remove both leads. Connect one multimeter lead to stepper relay coil contact (12). Connect other lead in sequence to terminal C7 (13), 500-1000-OFF count switch contact (14), latching relay contact (15), and to stepping relay contact (16).





- 4 Remove both leads. Connect one multimeter lead to latching relay coil contact (17). Connect other lead in sequence to terminal C9 (18), stepping relay contact (19), holding relay contact (20), 500-1000-OFF count switch contact (21), and the 500-1000-OFF count switch contact (14).



6-2. TROUBLESHOOTING (cont)

I. WIRES MAY BE OPEN. (cont)

**NOTE**

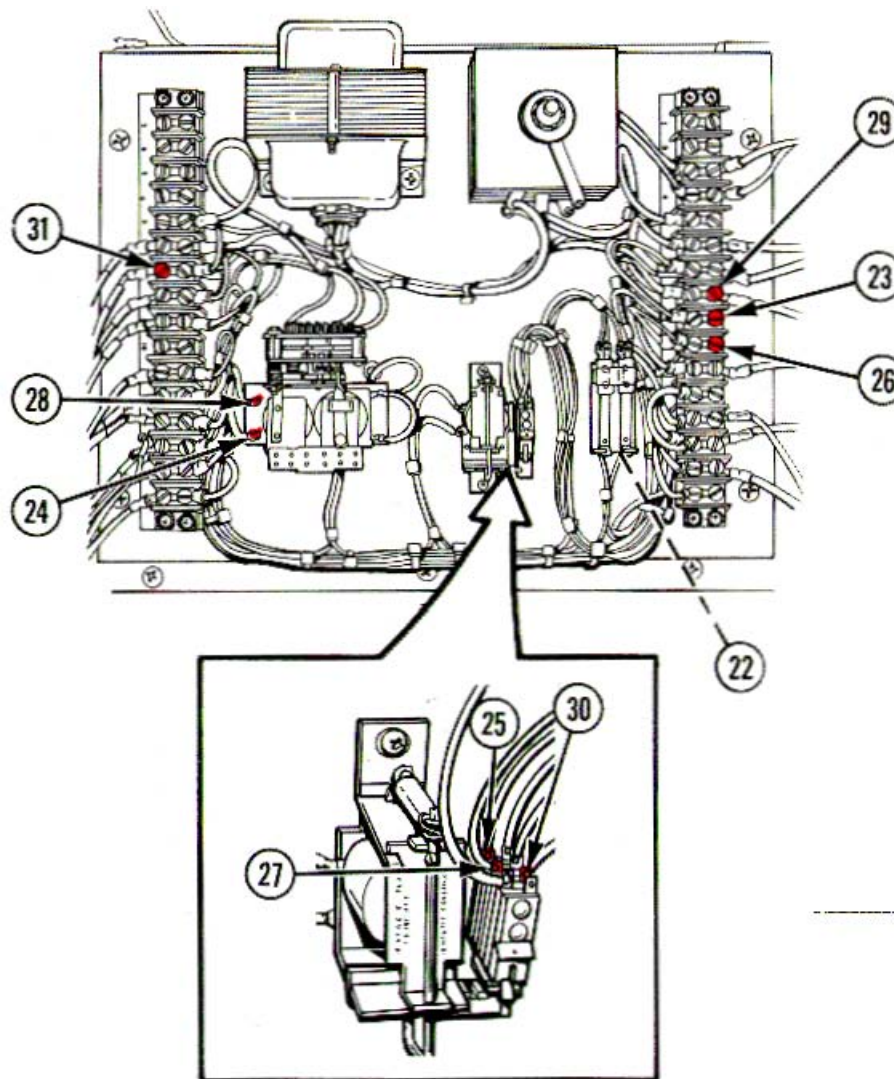
Reset relay is part of the stepping relay.

- 5 Remove both leads. Connect one multimeter lead to holding relay coil contact (22). Connect other lead in sequence to terminal D9 (23), reset relay coil contact (24), and to latching relay contact (25).
- 6 Remove both leads. Connect one multimeter lead to terminal D10 (26). Connect other lead in sequence to latching relay contact (27) and reset relay coil contact (28).

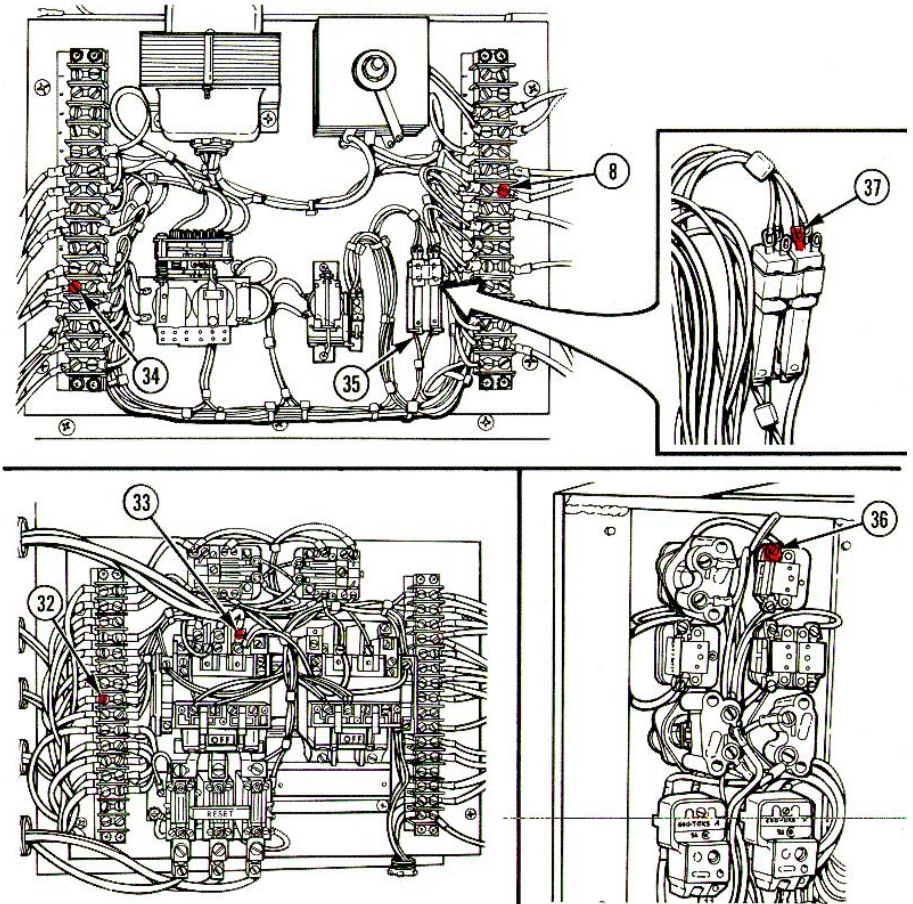
**NOTE**

The following checks are for resistance.

- 7 Remove both leads. Connect one multimeter lead to terminal D8 (29). Connect other lead in sequence to latching relay contact (30) and to terminal C7 (31).



- 8 Remove both leads. Connect one multimeter lead to terminal D7 (8). Connect other lead in sequence to terminal A6 (32) and to starter contact (33).
- 9 Remove both leads. Connect one multimeter lead to terminal C12 (34). Connect the other lead in sequence to holding relay coil contact (35), START COUNT switch contact (36), and to holding relay contact (37).

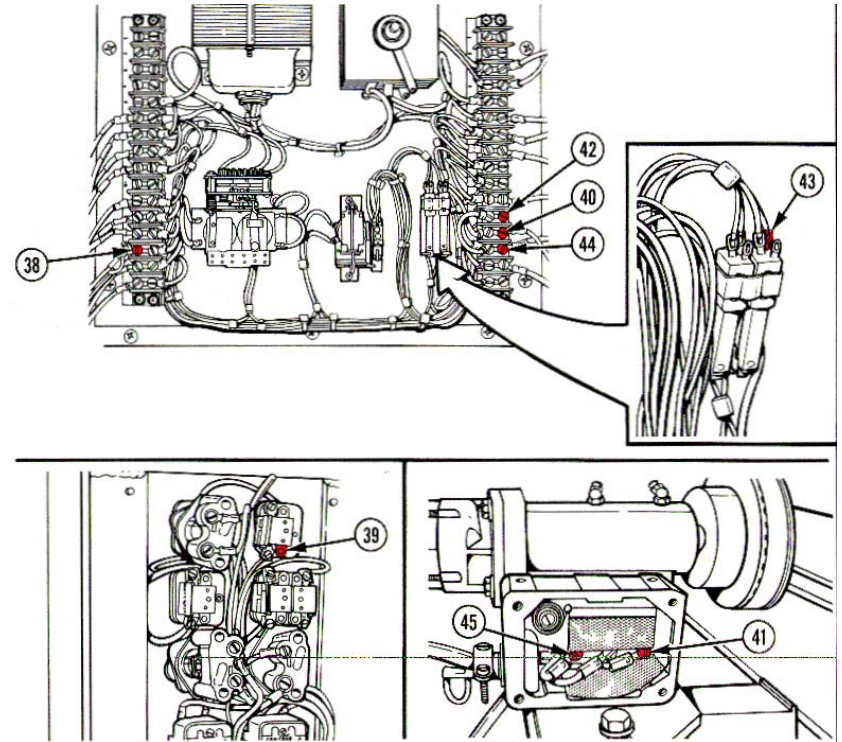




6-2. TROUBLESHOOTING (cont)

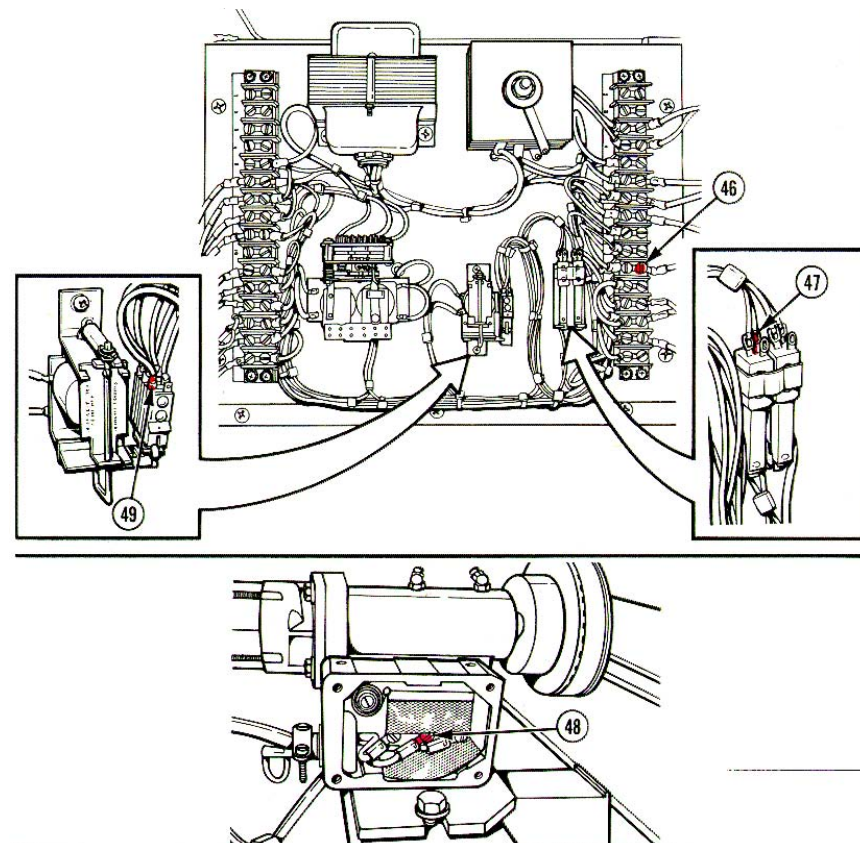
I. WIRES MAY BE OPEN. (cont)

- 10 Loosen four screws and remove cover and plate from counter pulse switchbox (p 6-100).
- 11 Remove both leads. Connect one multimeter lead to terminal C13 (38). Connect the other lead in sequence to START COUNT switch contact (39), terminal D13 (40), and to microswitch contact (41).
- 12 Remove both leads. Connect one multimeter lead to terminal D12 (42). Connect the other lead in sequence to holding relay contact (43), terminal D14 (44), and to microswitch contact (45).





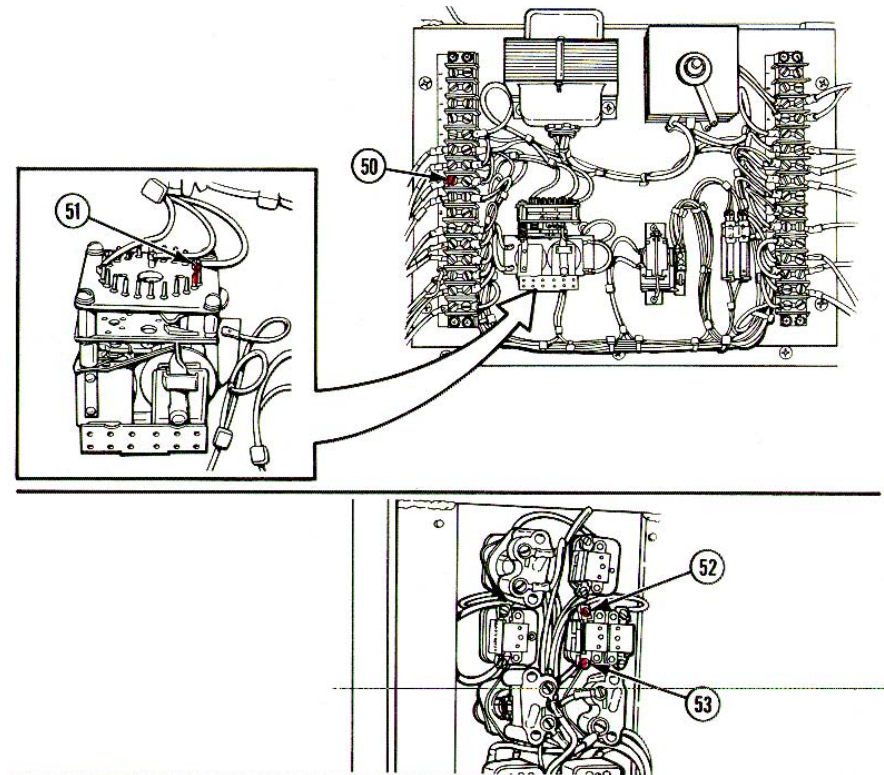
- 13 Remove both leads. Connect one multimeter lead to terminal D11 (46). Connect other lead in sequence to holding relay contact (47), microswitch contact (48), and to latching relay contact (49).



**6-2. TROUBLESHOOTING (cont)**

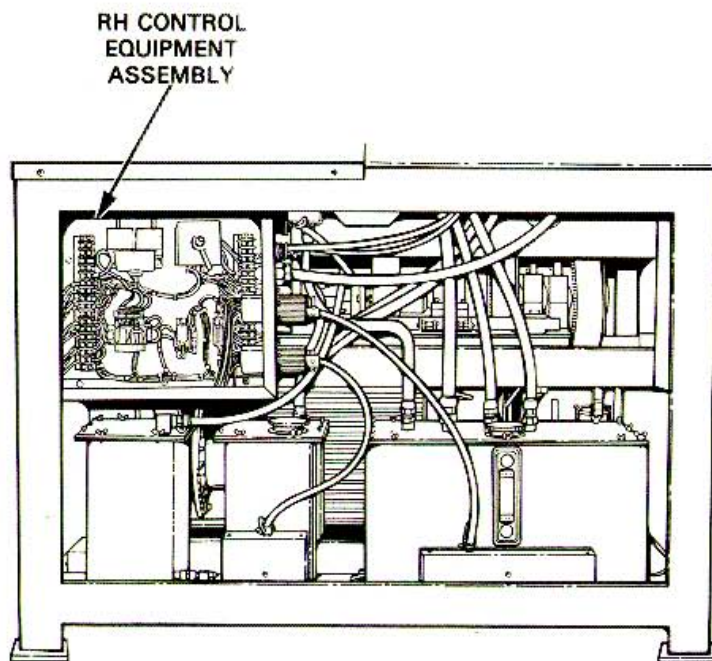
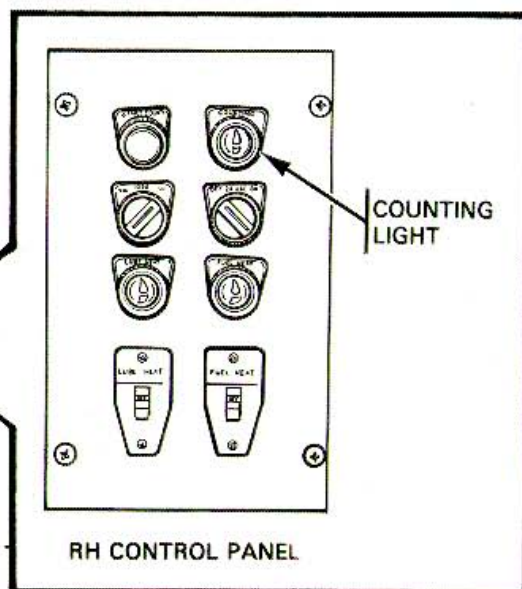
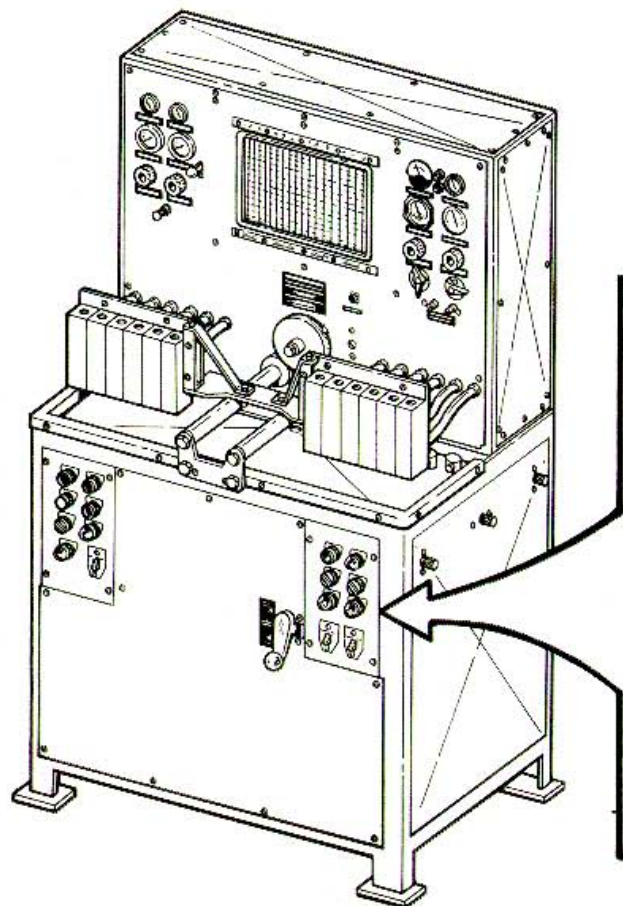
**I. WIRES MAY BE OPEN. (cont)**

- 14 Remove both leads. Connect one multimeter lead to terminal C8 (50). Connect the other lead in sequence to stepping relay contact (51) and to 500-1000-OFF count switch contact (52). On older tester models use 500-1000-OFF count switch contact (53).
- 15 Check for continuity. If continuity checks determine that there is an open wire, replace the wire (p 6-187).



COUNTING LIGHT

DOES NOT LIGHT



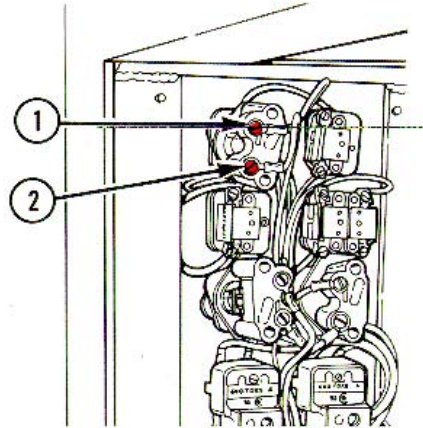
LOCATOR VIEW

6-2. TROUBLESHOOTING (cont)

A. INDICATOR LIGHT MAY BE DEFECTIVE.

**NOTE**  
The following check is for resistance.

- 1 Connect one multimeter lead to indicator light contact (1) and the other lead to indicator light contact (2).

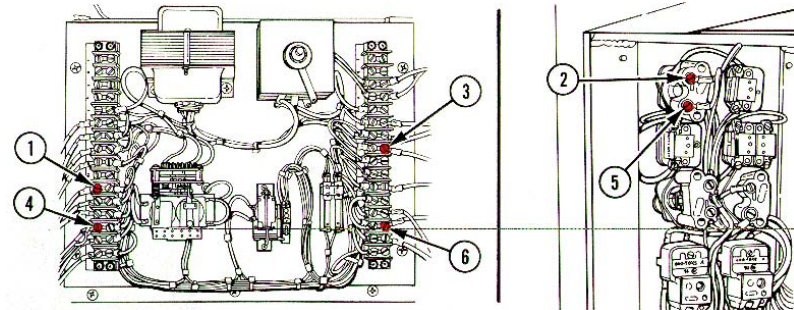


- 2 Check for resistance. If approximate resistance reading of 80 K ohms is not present, replace indicator light (p 6-187).

- 3 If COUNTING light does not light, proceed to step B.

B. WIRES MAY BE OPEN.

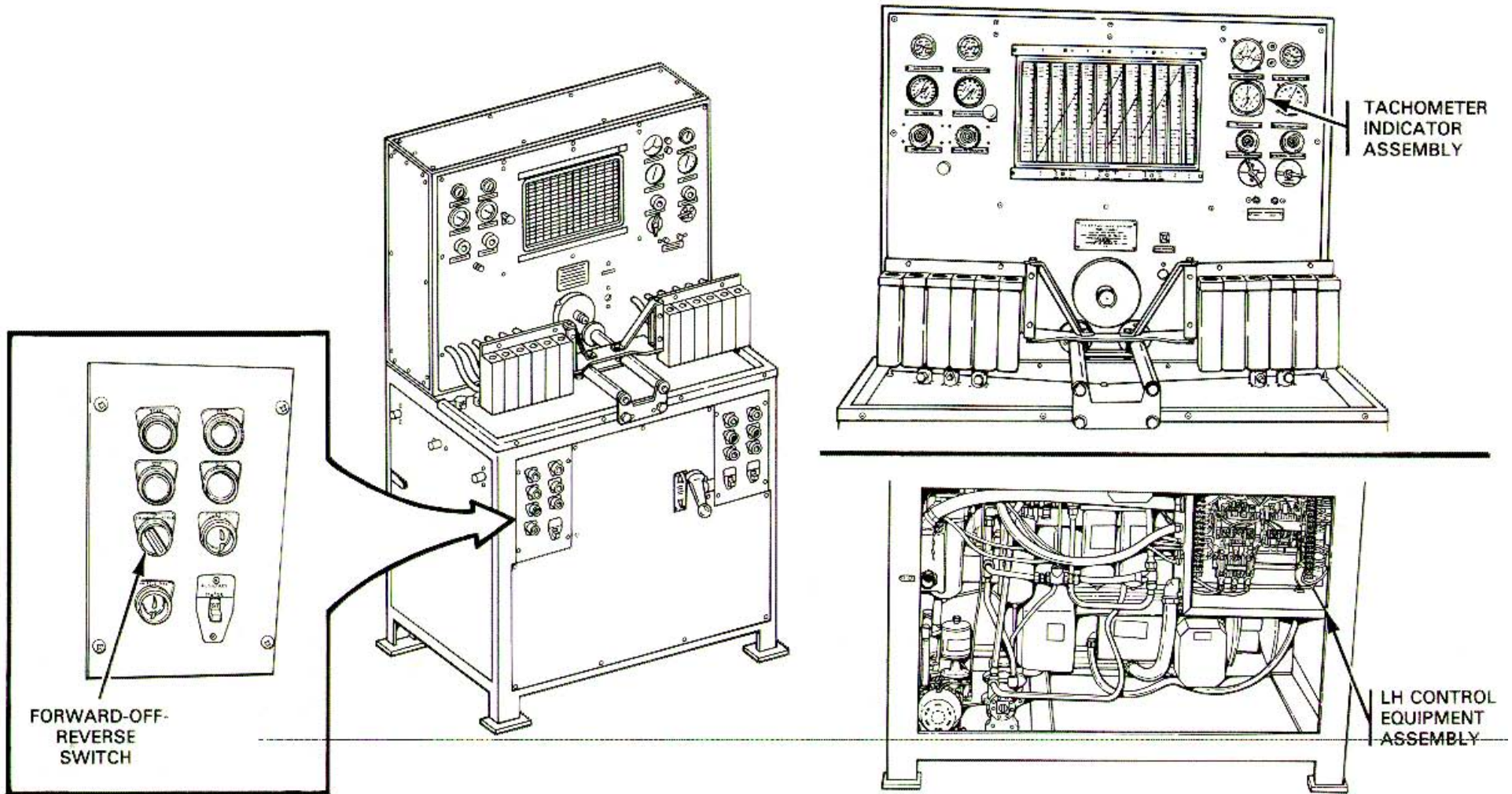
- 1 Connect one multimeter lead to terminal C11 (1). Connect the other lead in sequence to indicator light contact (2) and to terminal D8 (3).
- 2 Remove both leads. Connect one multimeter lead to terminal C14 (4). Connect other lead in sequence to indicator light contact (5) and to terminal D14 (6).
- 3 Check for continuity. If continuity is not present, replace the open wire (p 6-187).





TACHOMETR INDICATOR ASSEMBLY

DOES NOT FUNCTION,  
FORWARD-OFF-REVERSE switch  
is in FORWARD position



LOCATOR VIEW

**6-2. TROUBLESHOOTING (cont)**

**A. FORWARD-OFF-REVERSE SWITCH MAY BE DEFECTIVE.**

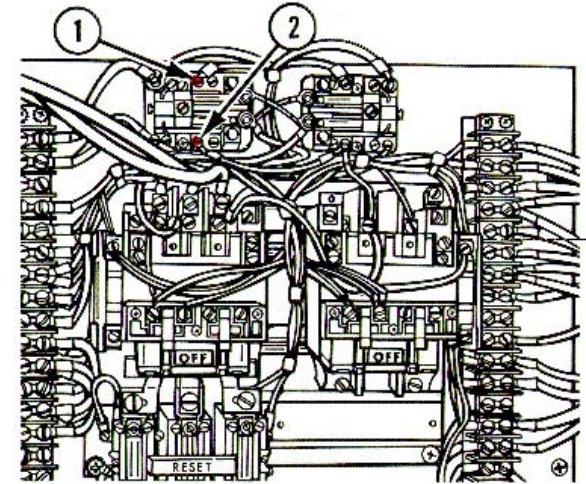
- 1 Refer to page 6-14 for troubleshooting procedures.
- 2 If TACHOMETER indicator assembly does not function, proceed to step B.

**B. FORWARD TACHOMETER REVERSING RELAY MAY BE DEFECTIVE.**

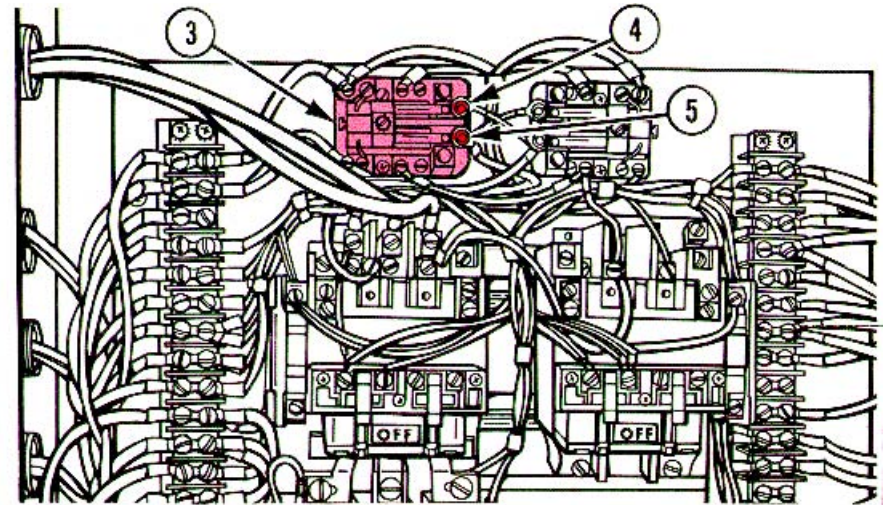
**NOTE**

The following check is for resistance.

- 1 Connect one multimeter lead to forward tachometer relay contact (1) and connect the other lead to forward tachometer relay contact (2).



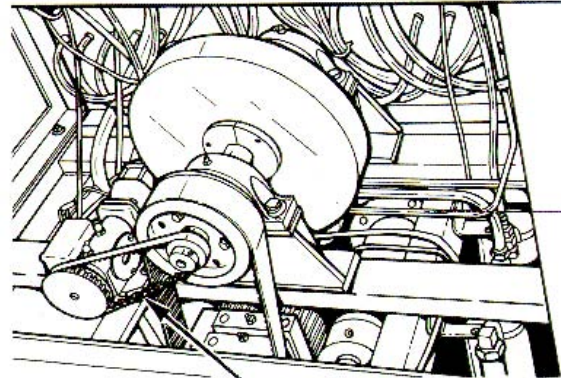
- 2 Check for approximate resistance reading of 100 ohms. If resistance is not present, replace forward tachometer reversing relay (3) (p 6-219).
- 3 Check if forward tachometer reversing relay contacts (4 and 5) are pitted or welded together. If damaged, replace forward tachometer reversing relay (p 6-219).
- 4 If TACHOMETER indicator assembly does not function, proceed to step C.





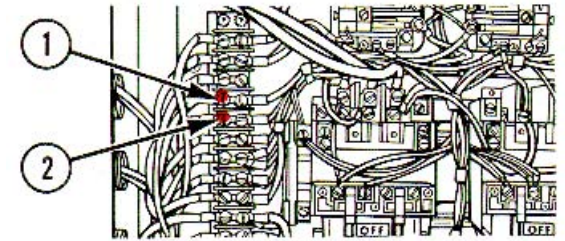
**C. FRONT TIMING BELT MAY BE BROKEN.**

- 1 Replace front timing belt (p 6-174) if needed.
- 2 If TACHOMETER indicator assembly does not function, proceed to step D.



FRONT TIMING BELT

**D. TACHOMETER GENERATOR MAY BE DEFECTIVE.**



**NOTE**

The following check is for resistance.

- 1 Connect one multimeter lead to terminal A4 (1) and connect the other lead to terminal A5 (2). Resistance reading should be approximately 25 ohms.

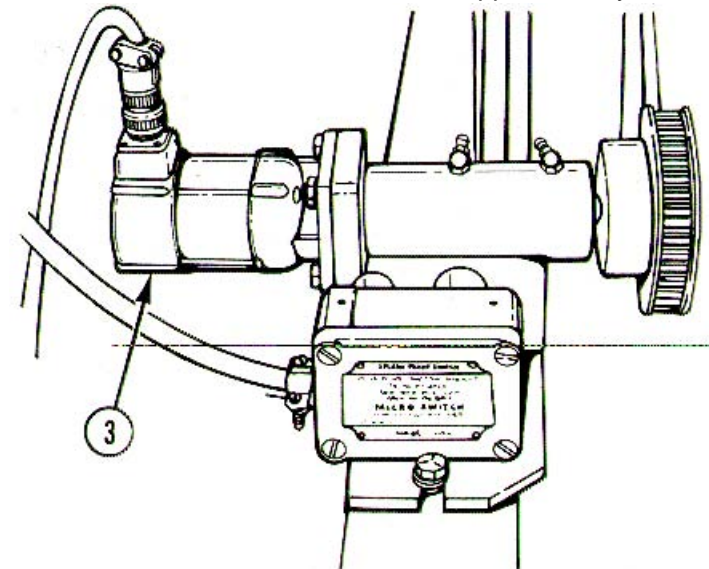
**WARNING**

High voltage is used in, the operation of the tester. Avoid bodily contact with any electrical components.

**NOTE**

The following is an ac voltage check with a voltmeter at 50 volts ac range.

- 2 Turn main power source on and push START button.
- 3 Check multimeter for ac voltage. If ac voltage is not present, turn main power source off and replace tachometer generator (3).
- 4 If TACHOMETER indicator assembly does not function, proceed to step E.



6-2. TROUBLESHOOTING (cont)

E. TACHOMETER INDICATOR ASSEMBLY MAY BE DEFECTIVE.

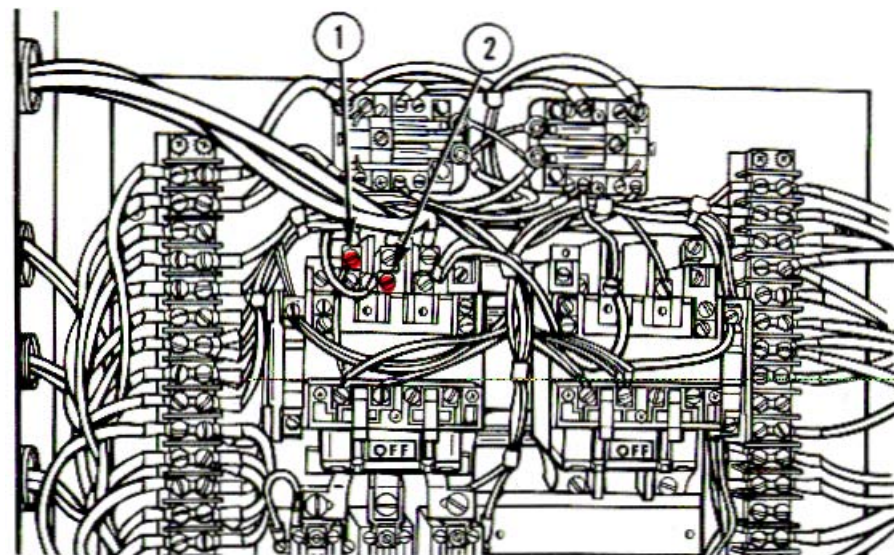
**WARNING**

High voltage is used in the operation of the tester. Avoid bodily contact with any electrical components.

**NOTE**

With FORWARD-OFF-REVERSE switch in either FORWARD or REVERSE, the TACHOMETER indicator assembly should give a reading in a clockwise direction. If not, turn off main power source and proceed with step 1.

- 1 Reverse L1 wire (1) and L2 wire (2) at forward side of starter.
- 2 Turn main power source on. Push START button.
- 3 If TACHOMETER indicator assembly does not indicate, proceed to step F.



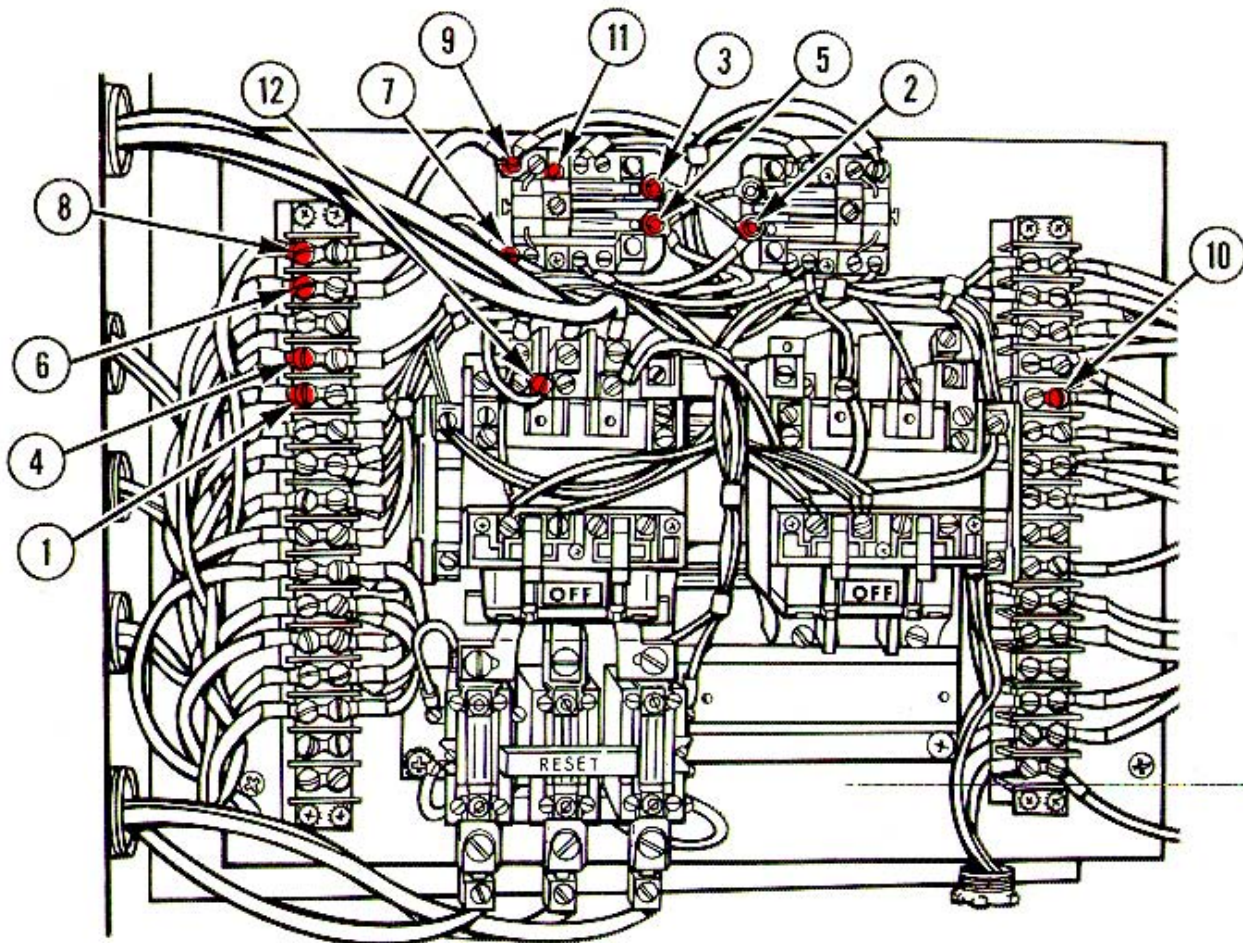
**NOTE**

Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.



**F. WIRES MAY BE OPEN.**

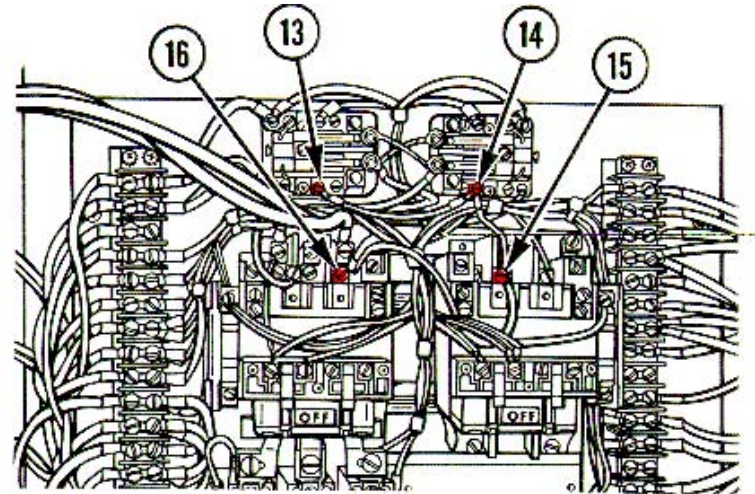
- 1 Connect one multimeter lead to terminal A5 (1). Connect other lead in sequence to reverse tachometer reversing relay contact (2) and to forward tachometer reversing relay contact (3).
- 2 Remove both leads. Connect one multimeter lead to terminal A4 (4) and connect other lead to forward tachometer reversing relay contact (5).
- 3 Remove both leads. Connect one multimeter lead to terminal A2 (6) and connect the other lead to forward tachometer reversing relay contact (7).
- 4 Remove both leads. Connect one multimeter lead to terminal A1 (8) and connect the other lead to forward tachometer reversing relay contact (9).
- 5 Remove both leads. Connect one multimeter lead to terminal B5 (10). Connect the other lead in sequence to forward tachometer reversing relay coil contact (11) and to forward starter coil contact (12).



**6-2. TROUBLESHOOTING (cont)**

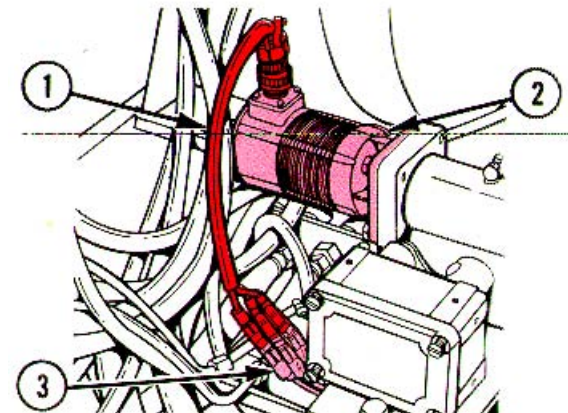
**F. WIRES MAY BE OPEN. (cont)**

- 6 Remove both leads. Connect one multimeter lead to forward tachometer reversing relay coil contact (13). Connect the other lead in sequence to reverse tachometer reversing relay coil contact (14), to reverse starter coil contact (15), and to forward starter coil contact (16).
- 7 Check for continuity. If continuity is not present, replace the open wire (p 6-219).
- 8 If TACHOMETER indicator assembly does not indicate, proceed to step G.



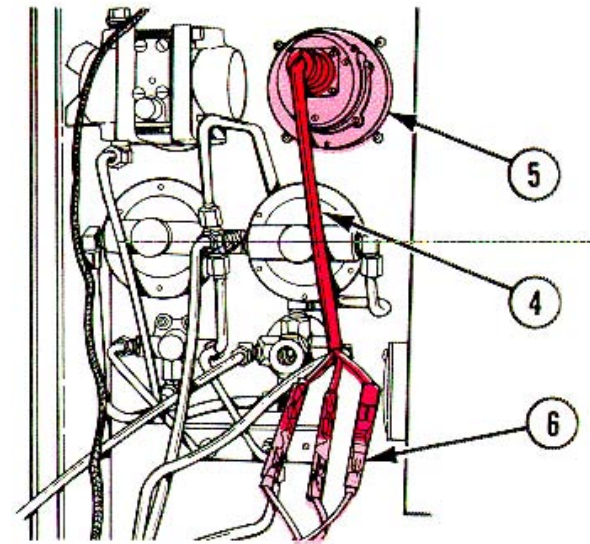
**G. TACHOMETER GENERATOR CABLE ASSEMBLY OR TACHOMETER INDICATOR CABLE ASSEMBLY MAY BE DEFECTIVE.**

- 1 Disconnect tachometer generator cable assembly (1) from tachometer generator (2) and wire leads (3).





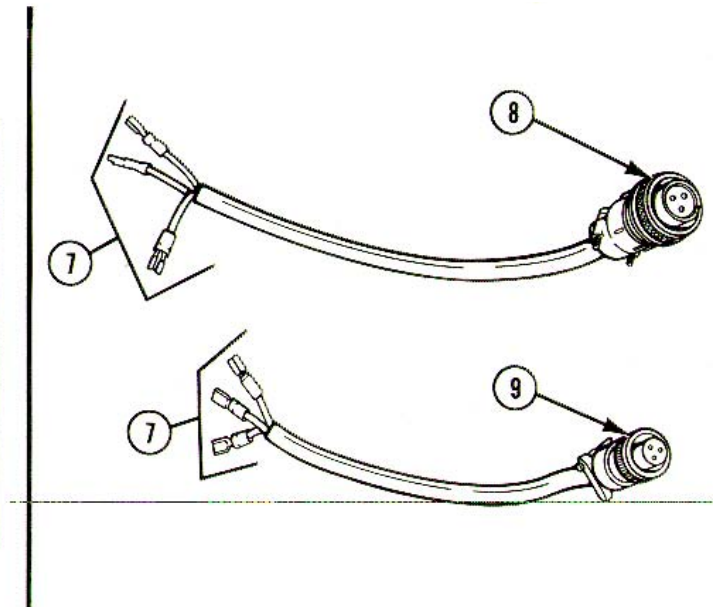
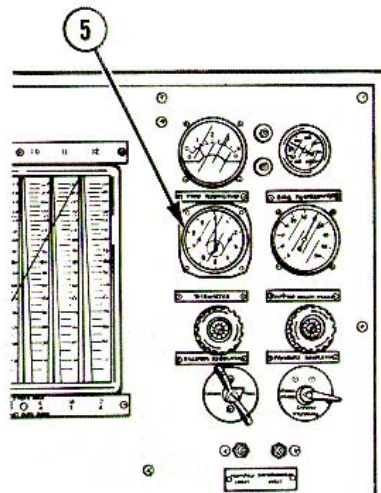
- 2 Disconnect tachometer indicator cable assembly (4) from TACHOMETER indicator assembly (5) and wire leads (6).



**NOTE**

Both cables are made up of three different colors of wire. To perform continuity checks you must follow the color from end to end.

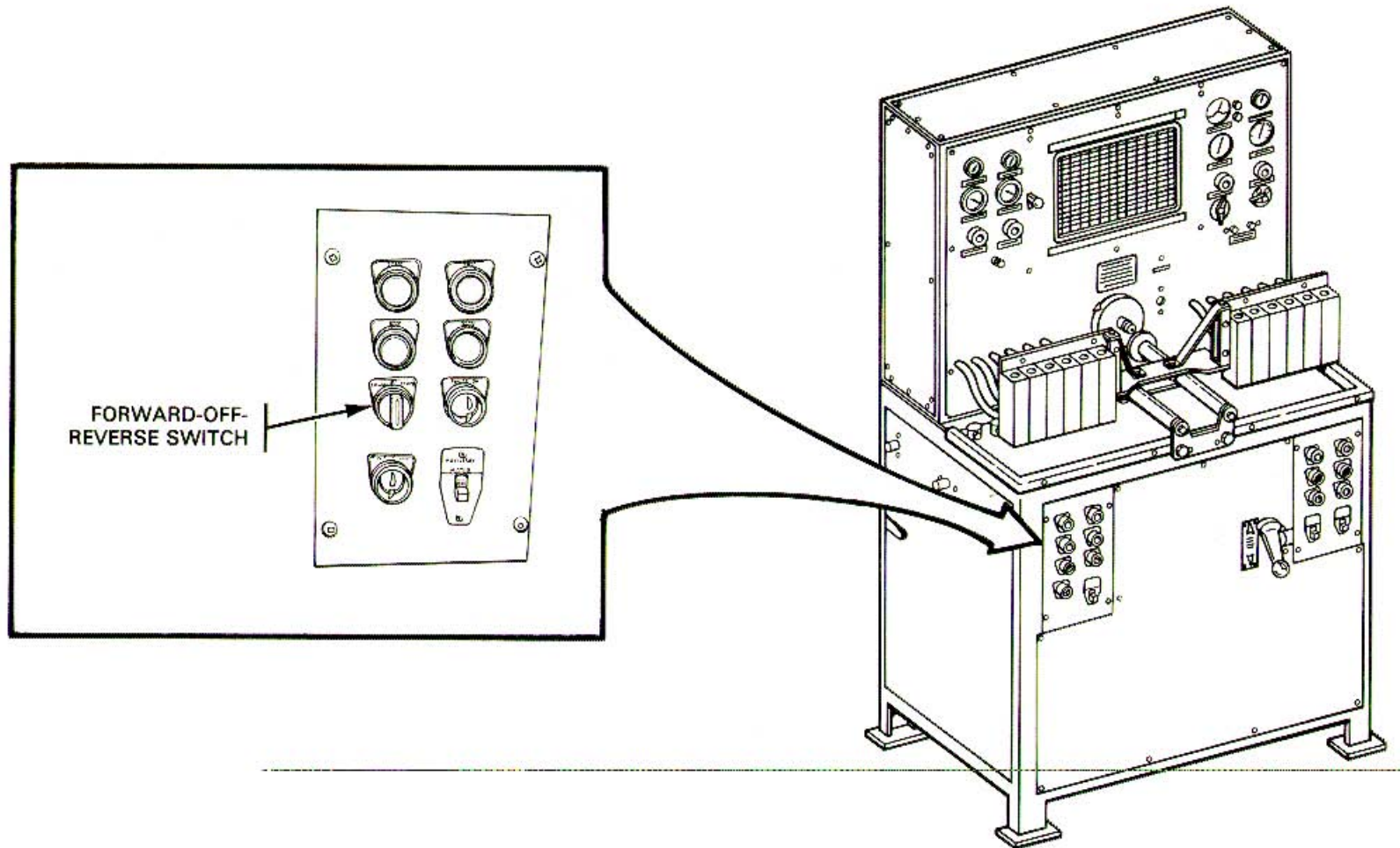
- 3 Connect one multimeter lead to the end of each wire lead (7) and connect the other lead to each contact on quick-disconnect plugs (8 and 9). This applies to both cable assemblies.
- 4 Check for continuity. If continuity does not exist, replace the cable(s) (p 6-317 and 6440).
- 5 If TACHOMETER indicator assembly (5) does not indicate, turn main power source off and replace TACHOMETER indicator assembly (p 6-314).



6-2. TROUBLESHOOTING (cont)

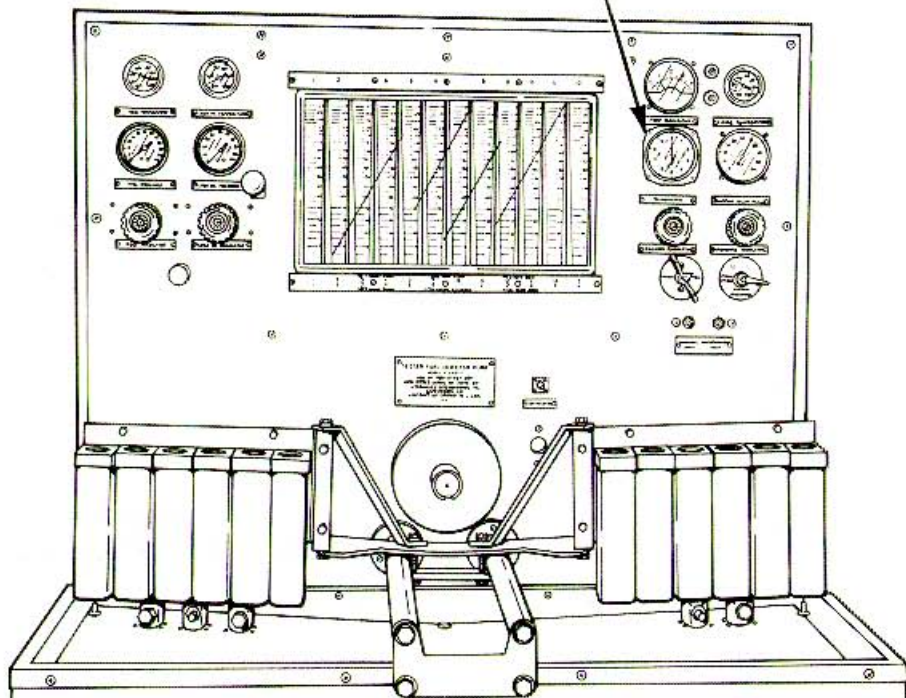
**TACHOMETER INDICATOR ASSEMBLY**

**DOES NOT FUNCTION,  
FORWARD-OFF-REVERSE switch  
is in REVERSE position**

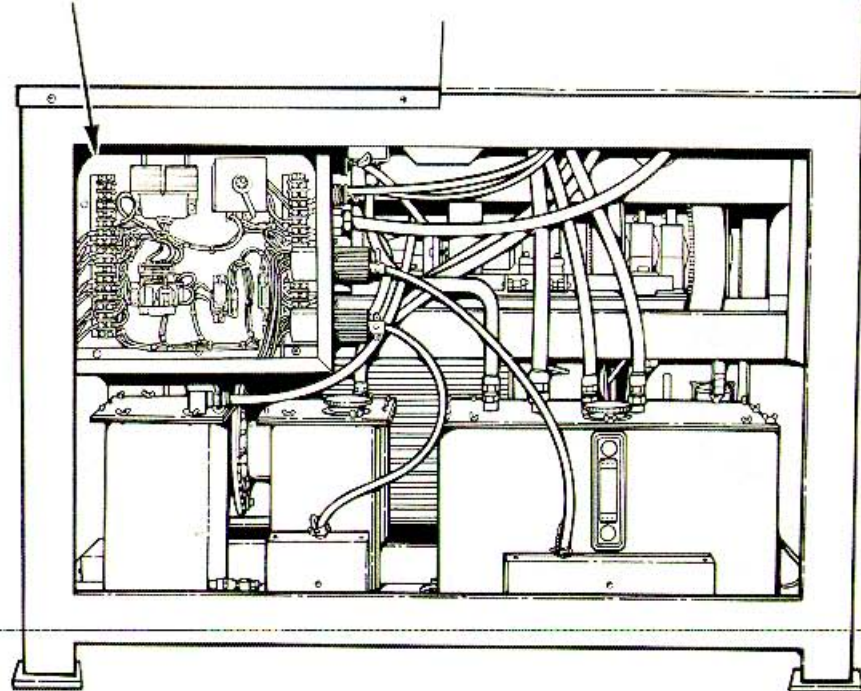




TACHOMETER INDICATOR  
ASSEMBLY



LH CONTROL  
EQUIPMENT  
ASSEMBLY



LOCATOR VIEW

6-2. TROUBLESHOOTING (cont)

A. FORWARD-OFF-REVERSE SWITCH MAY BE DEFECTIVE.

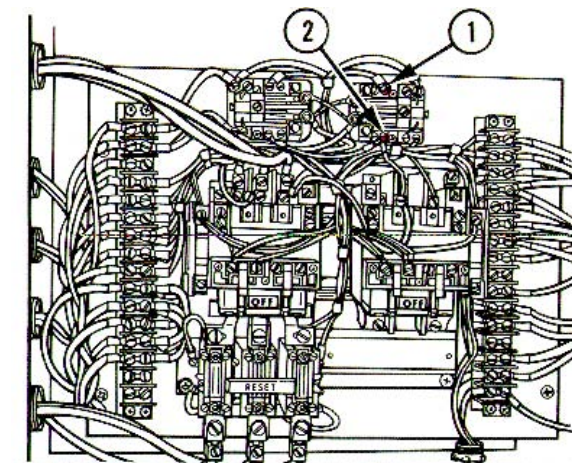
- 1 Refer to page 6-14 for troubleshooting procedures.
- 2 If TACHOMETER indicator assembly does not function, proceed to step B.

B. REVERSE TACHOMETER REVERSING RELAY MAY BE DEFECTIVE

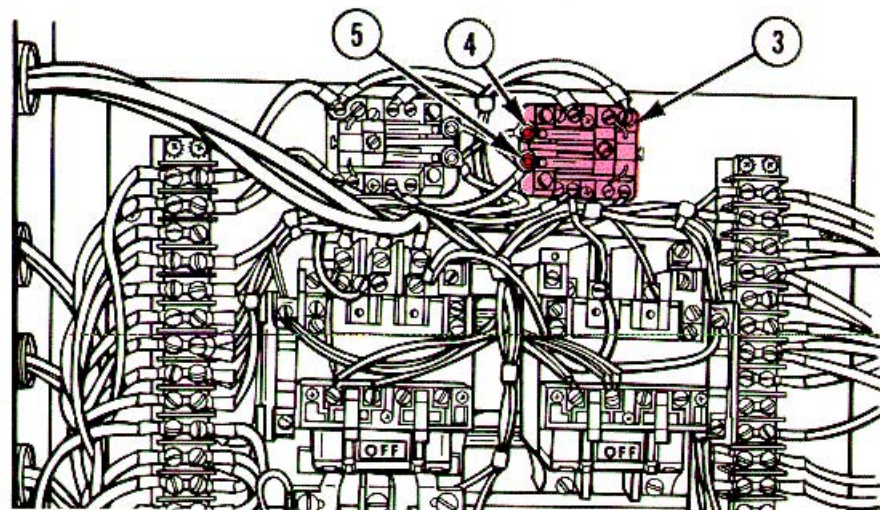
NOTE

The following check is for resistance.

- 1 Connect one multimeter lead to reverse tachometer reversing relay coil contact (1) and connect the other lead to reverse tachometer reversing relay coil contact (2).



- 2 Check for approximate resistance reading of 100 ohms. If resistance is not present, replace the reverse tachometer reversing relay (3) (p 6-219).
- 3 Check the reverse tachometer reversing relay contacts (4 and 5) to see if they are pitted or welded together. If damaged, replace reverse tachometer reversing relay (3) (p 6-219).
- 4 If TACHOMETER indicator assembly does not function, proceed to step C.



**C. FRONT TIMING BELT MY BE BROKEN.**

- 1 Replace front timing belt (p 6-174) if needed.
- 2 If TACHOMETER indicator assembly does not function, proceed to step D.

**E. TACHOMETER INDICATOR ASSEMBLY MAY BE DEFECTIVE.**

Refer to page 6-116 for troubleshooting procedures.

**D. TACHOMETER GENERATOR MAY BE DEFECTIVE.**

Refer to page 6-115 for troubleshooting procedures.

**NOTE**

Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.



## 6-2. TROUBLESHOOTING (cont)

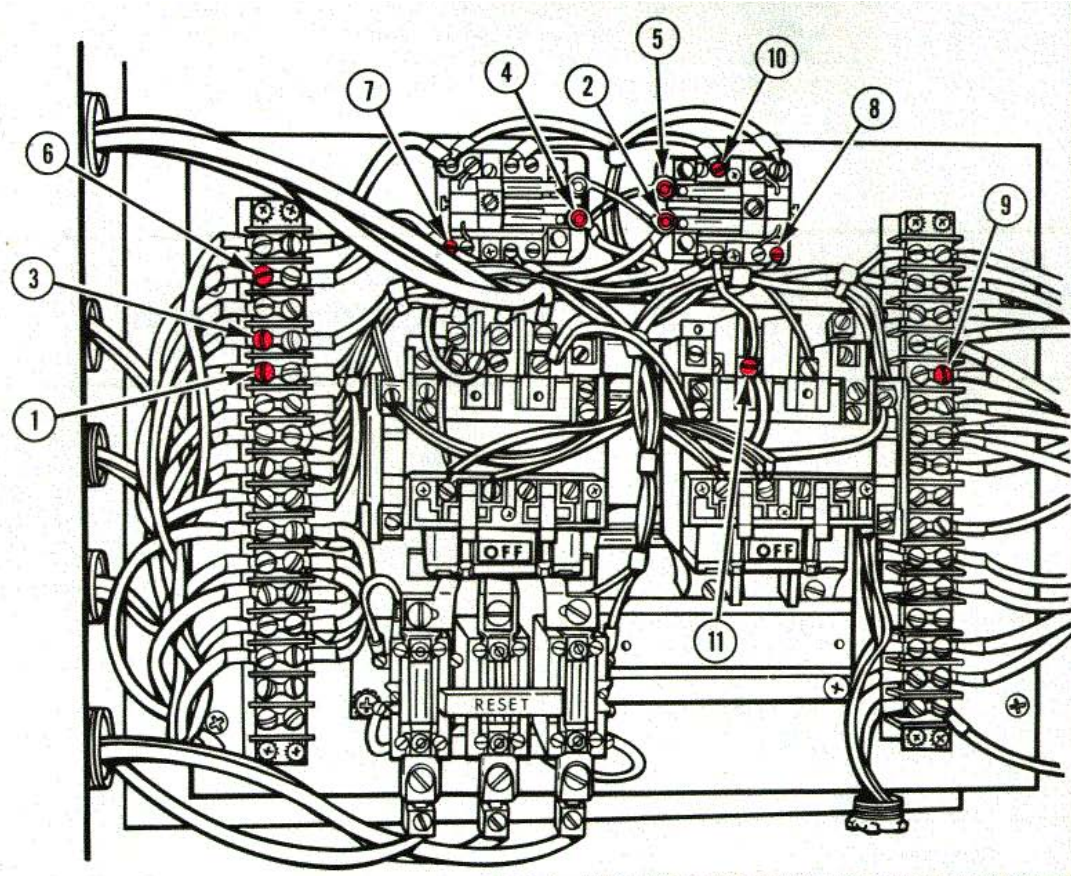
### F. WIRES MAY BE OPEN.

- 1 Connect one multimeter lead to terminal A5 (1) and connect the other lead to reverse tachometer reversing relay contact (2).
- 2 Remove both leads. Connect one multimeter lead to terminal A4 (3). Connect the other lead in sequence to forward tachometer reversing relay contact (4) and to reverse tachometer reversing relay contact (5).
- 3 Remove both leads. Connect one multimeter lead to terminal A2 (6). Connect the other lead in sequence to forward tachometer reversing relay contact (7) and to reverse tachometer reversing relay contact (8).

#### NOTE

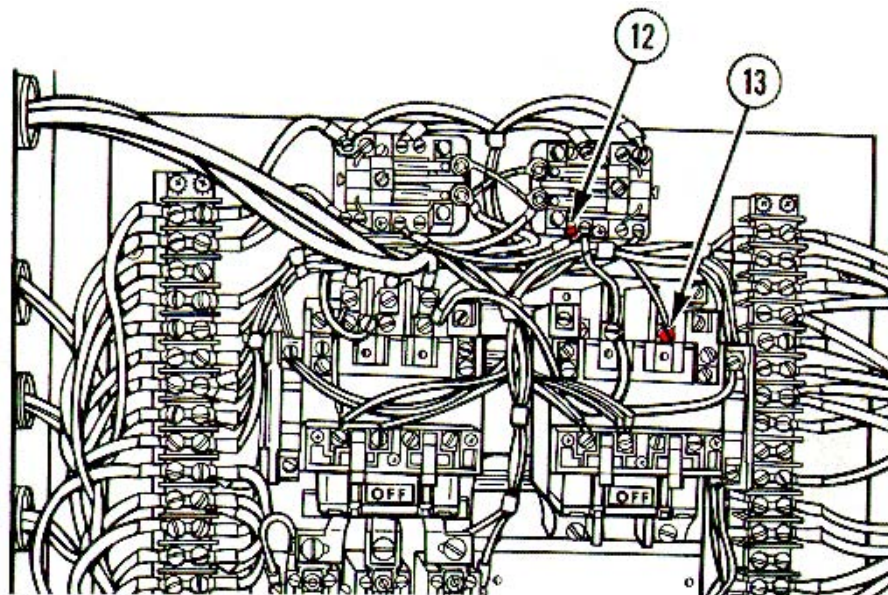
The following checks are for resistance

- 4 Remove both leads. Connect one multimeter lead to terminal B5 (9). Connect the other lead in sequence to reverse tachometer reversing relay coil contact (10) checking for reading of approximately 200 ohms, and to reverse starter coil contact (11) checking for reading of approximately 100 ohms.





- 5 Remove both leads. Connect one multimeter lead to reverse tachometer reversing relay coil contact (12) and to reverse starter coil contact (13) checking for reading of approximately 100 ohms.



**G. TACHOMETER GENERATOR CABLE ASSEMBLY OR TACHOMETER INDICATOR CABLE ASSEMBLY MAY BE DEFECTIVE.**

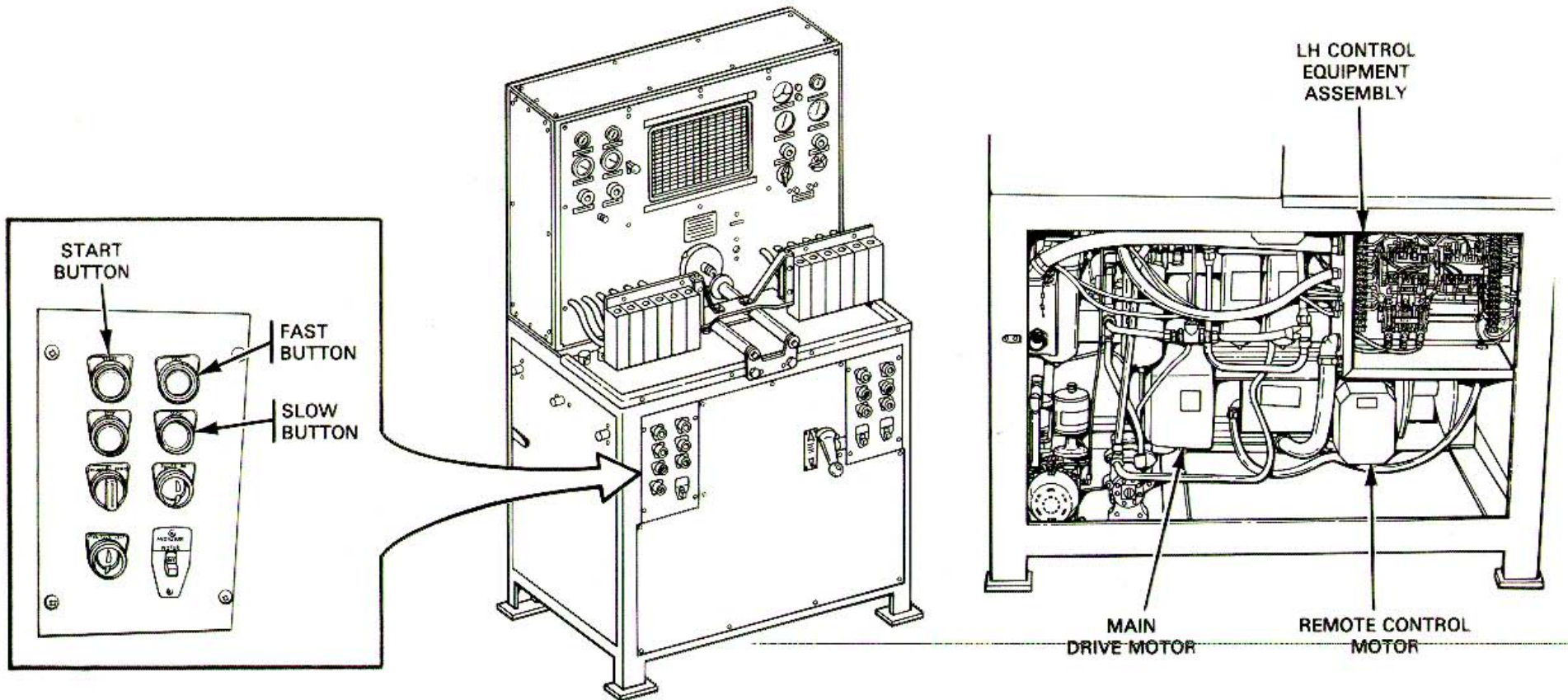
- 6 If resistance is not present, replace the open wire (p 6-219).
- 7 If TACHOMETER indicator assembly does not indicate, proceed to step G.

Refer to page 6-118 for troubleshooting procedures.

6-2. TROUBLESHOOTING (cont)

**DRIVE SPEED OF TESTER**

**WILL NOT INCREASE**



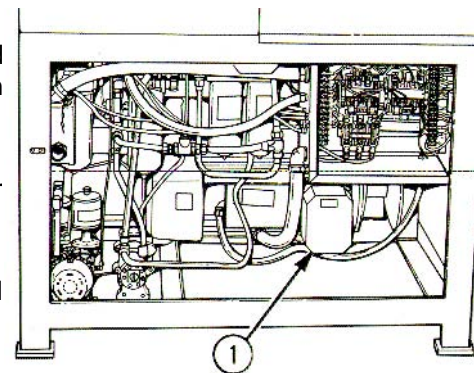
**LOCATOR VIEW**

**A. HIGH CAM SPEED STOP MAY BE SET INCORRECTLY.**

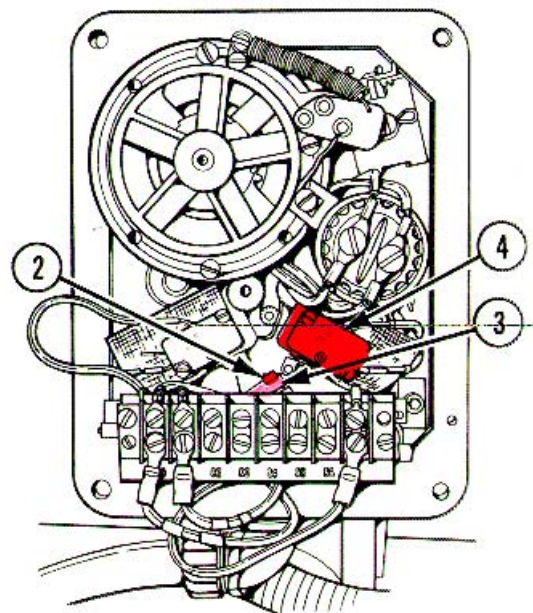
**NOTE**

Configurations and troubleshooting checks of remote control motor may vary from tester to tester. For older tester models, refer to wiring diagram 6-1 on page 6-146 and page 6-147.

- 1 Turn main power source on and set speed at lowest point by pushing START button and then SLOW button.
- 2 Push STOP button and turn main power source off.
- 3 Remove cover (1) on remote control motor.



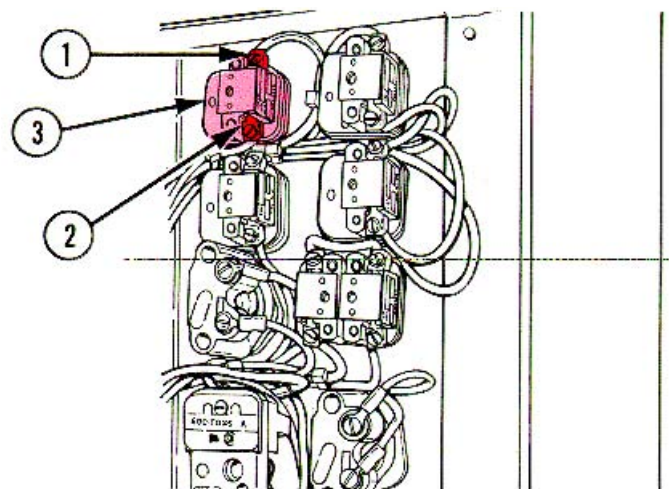
- 4 Loosen screw (2) and move high cam speed stop (3) further away from high speed microswitch (4). Tighten screw (2).
- 5 If drive speed of tester will not increase, proceed to step B.



**6-2. TROUBLESHOOTING (cont)**

**B. FAST BUTTON MAY BE DEFECTIVE.**

- 1 Remove wire from FAST button switch contact (1).
- 2 Connect one multimeter lead to FAST button switch contact (1) and connect other lead to FAST button switch contact (2).
- 3 Check for continuity. If continuity is present, replace the FAST button switch (3).
- 4 If drive speed of tester will not increase, proceed to step C.



**NOTE**

If configuration of remote control motor is different from that described in troubleshooting procedures, continuity of wires must be checked by tracing wire termination points by color.

**NOTE**

Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.



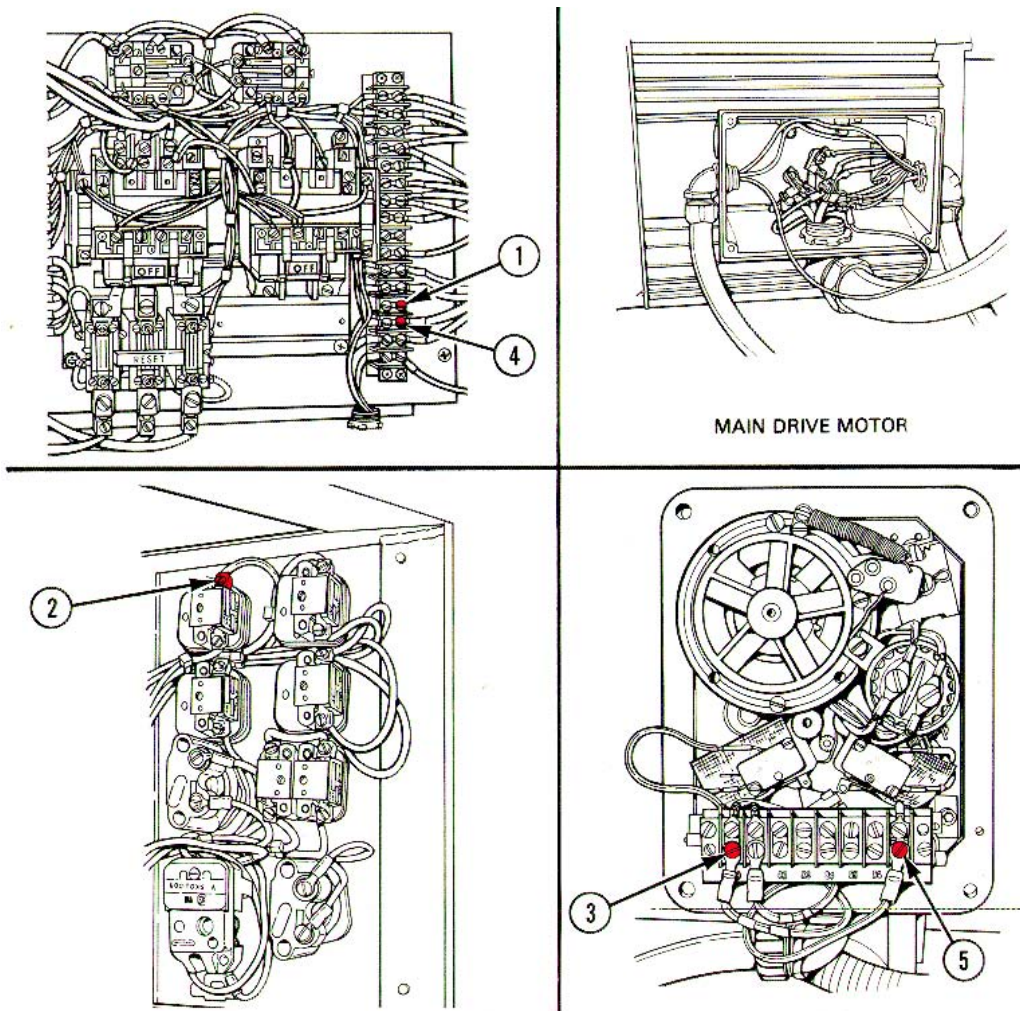
**C. WIRES MAY BE OPEN.**

- 1 Connect one multimeter lead to terminal B14 (1). Connect the other lead in sequence to FAST switch contact (2) and remote control motor contact (3).

**NOTE**

Wire at main drive motor that comes from the remote control motor is not tagged with a number. Identify wire by color when making continuity checks. Remove tape from wire ends. After making checks, apply new tape (item 19, app C).

- 2 Remove both leads. Remove cover from wire outlet box on main drive motor. Connect one multimeter lead to terminal B15 (4). Connect the other lead to wire end that is connected to wires tagged no. 1 and 7 at main drive motor.
- 3 Remove both leads. Connect one multimeter lead to remote control motor contact (5) and connect other lead to the wire end that is connected to wires tagged no. 4, 5, and 6 at main drive motor.



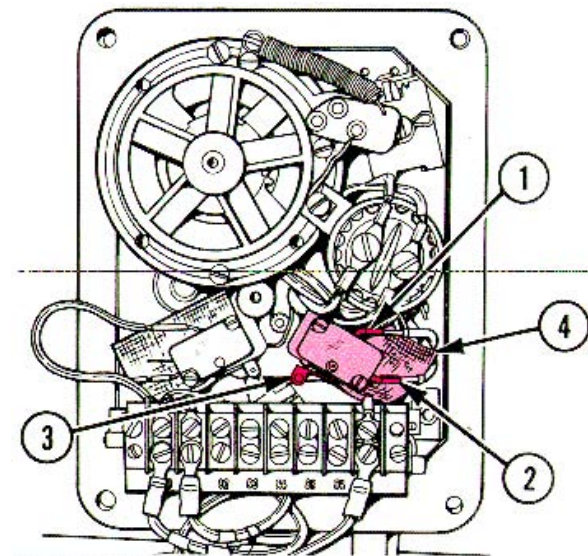
**6-2. TROUBLESHOOTING (cont)**

**C. WIRES MAY BE OPEN. (cont)**

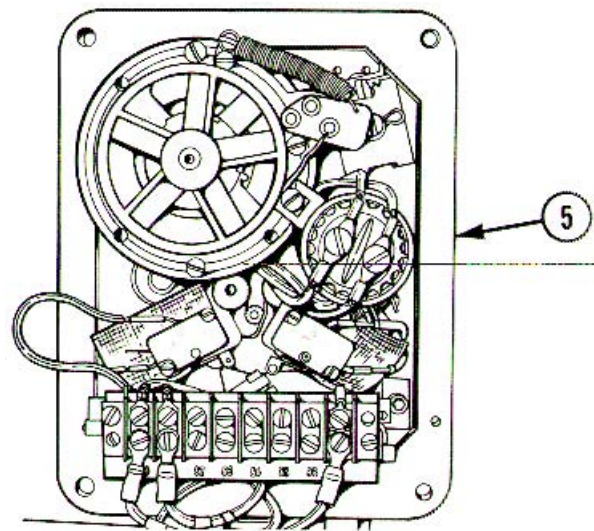
- 4 Check for continuity. If continuity is not present, replace the open wire (p 6-219).
- 5 If drive speed of tester will not increase, proceed to step D.

**D. HIGH SPEED MICROSWITCH MAY BE DEFECTIVE.**

- 1 Connect one multimeter lead to high speed microswitch contact (1) and connect the other lead to high speed microswitch contact (2).
- 2 Push up on contact arm (3) on high speed microswitch (4).



- 3 Check for continuity. If continuity is not present, replace the remote control motor (5) (p 6-466).
- 4 If drive speed of tester will not increase, proceed to step E.

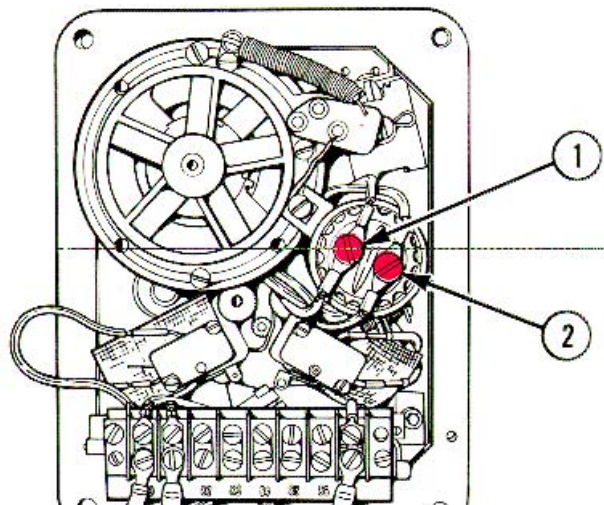


**E. REMOTE CONTROL MOTOR MAY BE DEFECTIVE.**

**NOTE**

**The following check is for resistance.**

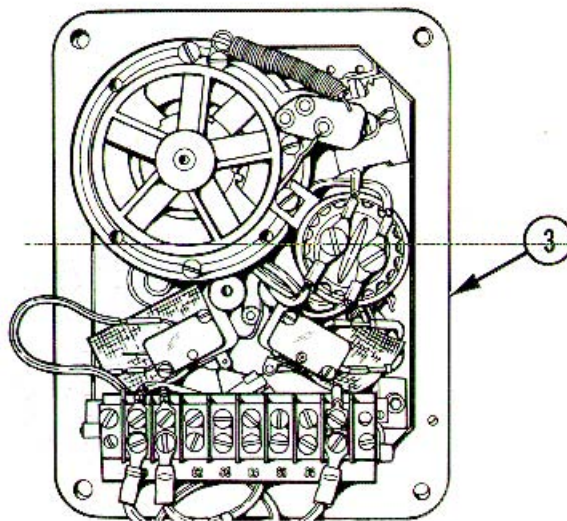
- 1 Connect one multimeter lead to remote control motor contact (1) and connect the other lead to remote control motor contact (2).



**F. CLUTCH MAY BE LOOSE OR DEFECTIVE.**

- 2 Check for approximate resistance reading of 30 ohms. If resistance is not present, replace the remote control motor (3) (p 6-466).
- 3 If drive speed of tester will not increase, proceed to step F.

- 1 Adjust clutch (p 6-502) if needed.
- 2 If adjustment of clutch cannot be made, repair clutch (p 6-502).

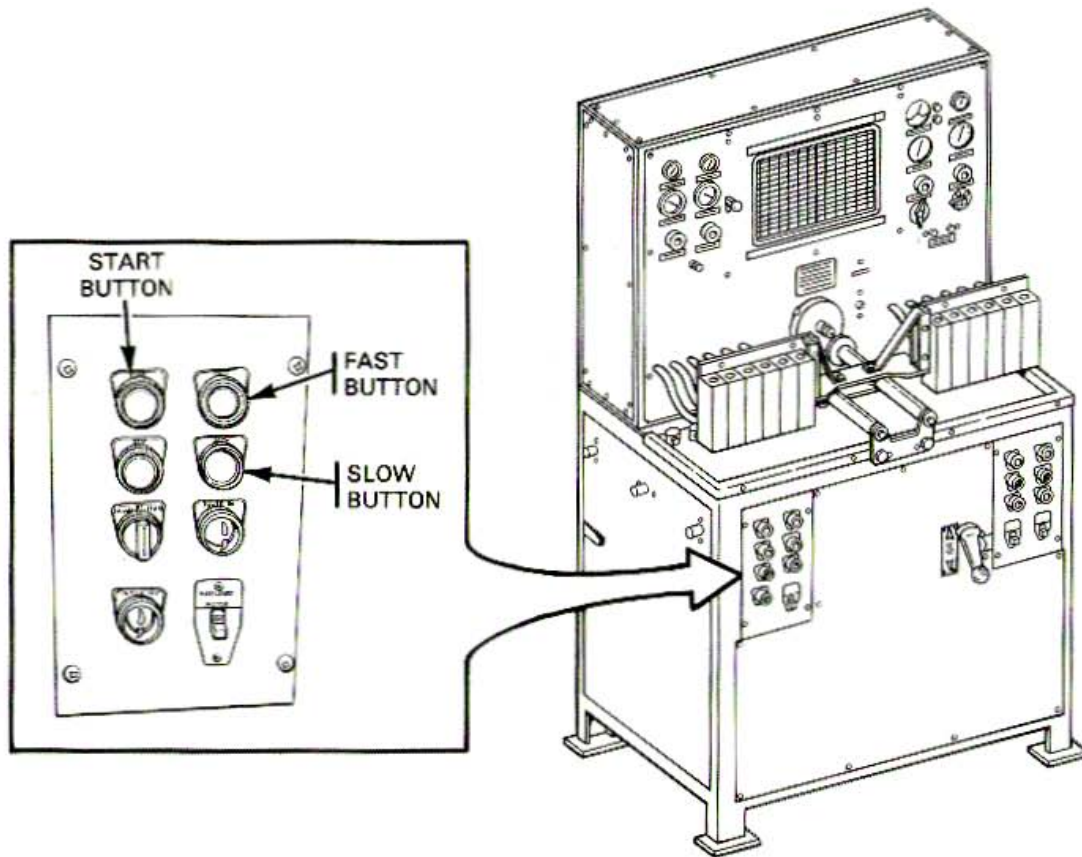




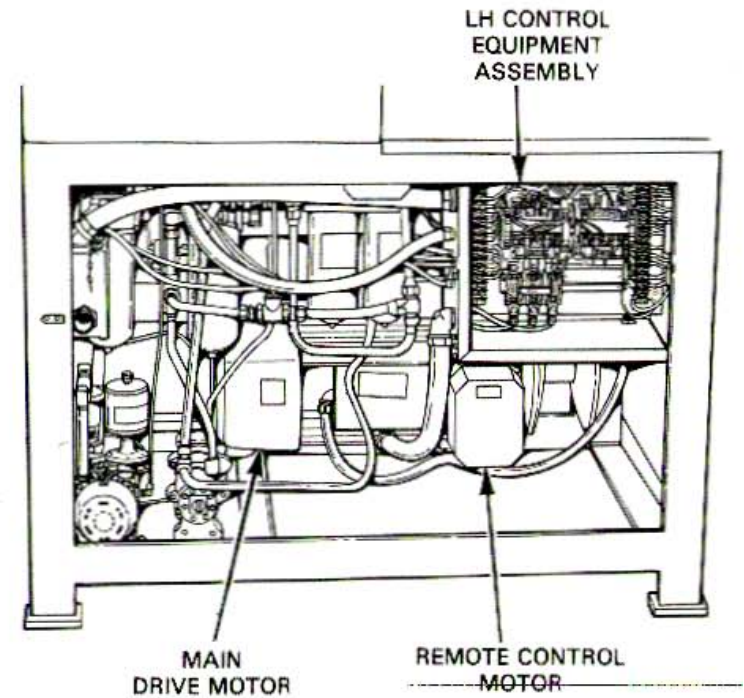
6-2. TROUBLESHOOTING (cont)

**DRIVE SPEED OF TESTER**

**WILL NOT DECREASE**



**LOCATOR VIEW**



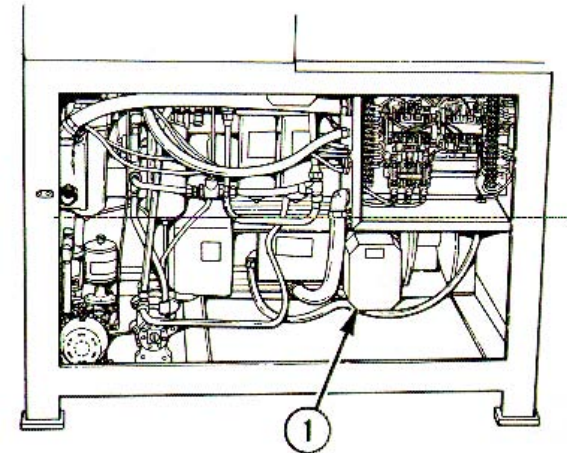


**A. LOW CAM SPEED STOP MAY BE SET INCORRECTLY.**

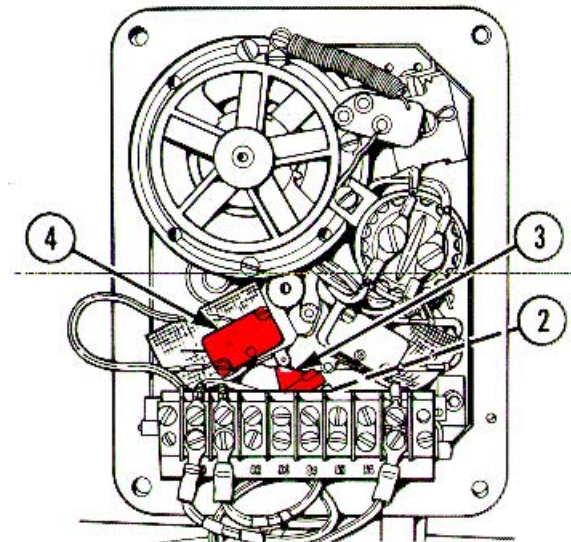
**NOTE**

Configurations and troubleshooting checks of the remote control motor may vary from tester to tester. For older tester models, refer to wiring diagram 6-1 on page 6-146 and page 6-147.

- 1 Turn main power source on and set speed at lowest point by pushing START button and then SLOW button.
- 2 Push STOP button and turn main power source off.
- 3 Remove cover (1) on remote control motor.



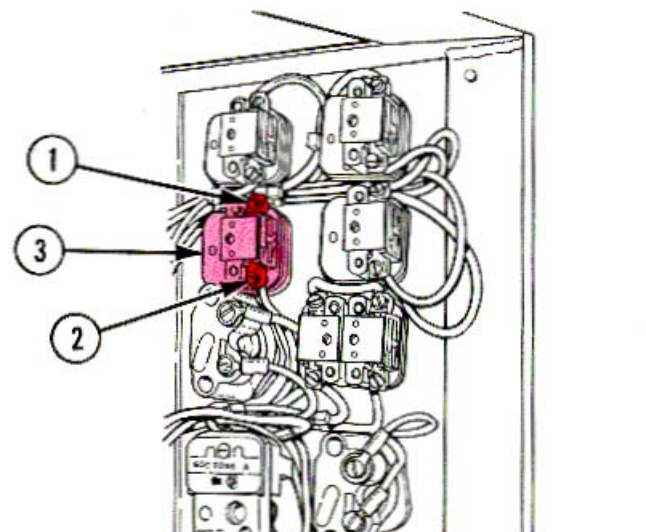
- 4 Loosen screw (2) and move low cam speed stop (3) further away from low speed microswitch (4). Tighten screw (2).
- 5 If drive speed of tester will not decrease, proceed to step B.



6-2. TROUBLESHOOTING (cont)

B. SLOW BUTTON MAY BE DEFECTIVE.

- 1 Remove wire from SLOW button switch contact (1).
- 2 Connect one multimeter lead to SLOW button switch contact (2) and connect the other lead to SLOW button switch contact (1).
- 3 Check for continuity. If continuity is present, replace the SLOW button switch (3).
- 4 If drive speed of tester will not decrease, proceed to step C.



**NOTE**

If configuration of remote control motor is different from that described in the troubleshooting procedures, continuity of wires must be checked by tracing wire termination points by color.

**NOTE**

Each wire that is tested for continuity should also be tested for a short to the tester frame. This is done by placing one multimeter lead on the wire terminal and the other lead to the tester frame. Check for continuity. If continuity exists, the wire is shorted to ground and must be replaced. This only applies to wires not connected to ground.

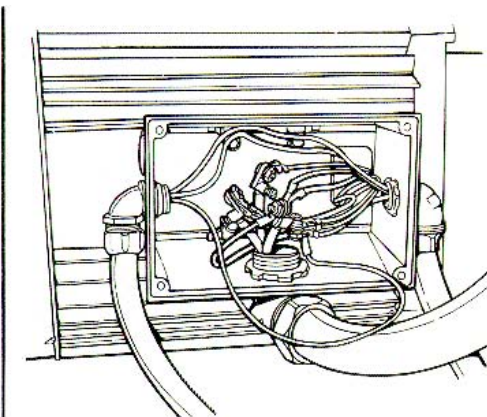
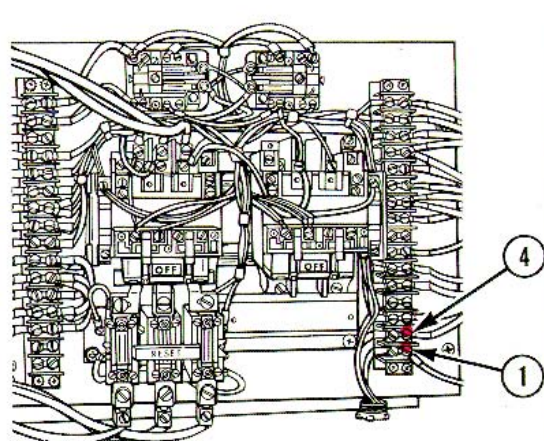
**C. WIRES MAY BE OPEN.**

- 1 Connect one multimeter lead to terminal B16 (1). Connect the other lead in sequence to SLOW switch contact (2) and to remote control motor contact (3).

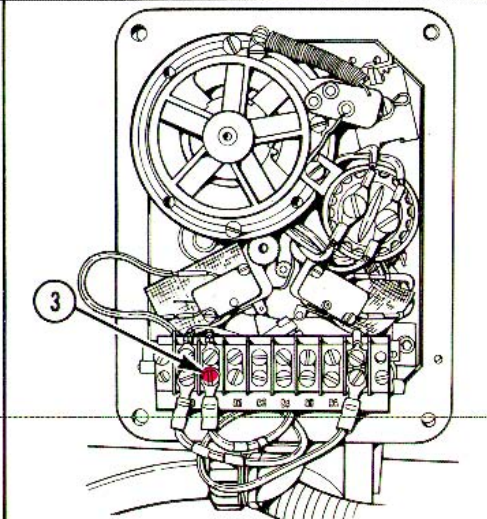
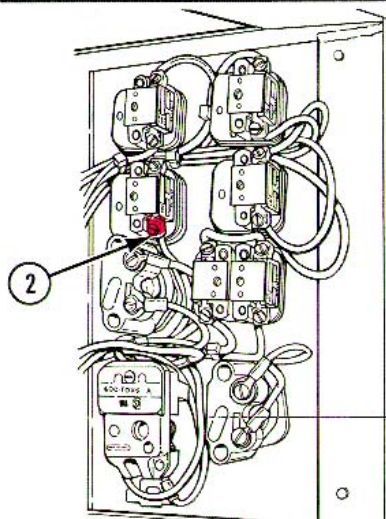
**NOTE**

**Wire at main drive motor that comes from the remote control motor is not tagged with a number. Identify wire by color when making continuity checks. Remove tape from wire ends. After making checks, apply new tape (item 19, app C).**

- 2 Remove both leads. Remove cover from wire outlet box on main drive motor. Connect one multimeter lead to terminal B15 (4). Connect the other lead to wire end that is connected to wires tagged no. 1 and 7 at main drive motor.



MAIN DRIVE MOTOR

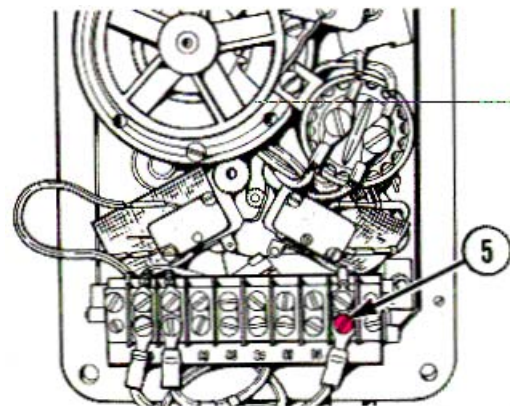




**6-2. TROUBLESHOOTING (cont)**

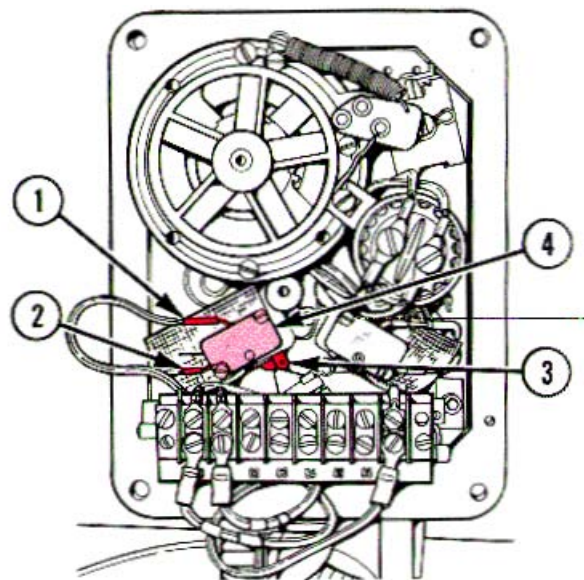
**C. WIRES MAY BE OPEN. (cont)**

- 3 Remove both leads. Connect one multimeter lead to remote control motor contact (5) and the other lead to wire end that is connected to wires tagged no. 4, 5, and 6 at main drive motor.
- 4 Check for continuity. If continuity is not present, replace the open wire (p 6-219).
- 5 If drive speed of tester will not decrease, proceed to step D.



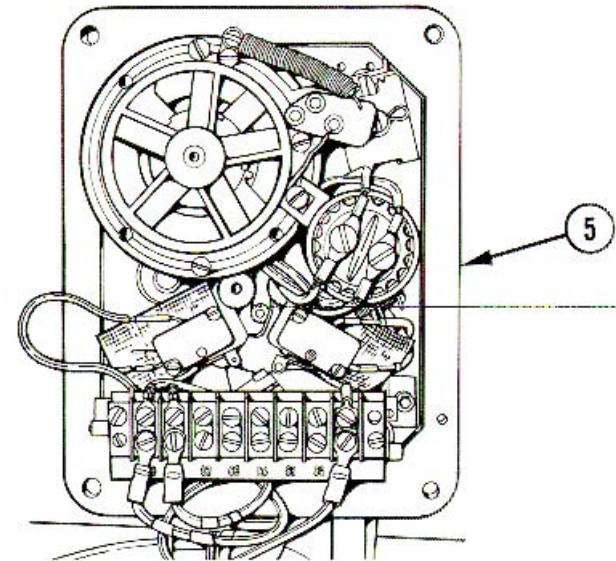
**D. LOW SPEED MICROSWITCH MAY BE DEFECTIVE.**

- 1 Connect one multimeter lead to low speed microswitch contact (1) and connect the other lead to low speed microswitch contact (2).
- 2 Push up on contact arm (3) on low speed microswitch (4).





- 3 Check for continuity. If continuity is not present, replace the remote control motor (5) (p 6-466).
- 4 If drive speed of tester will not decrease, proceed to step E.

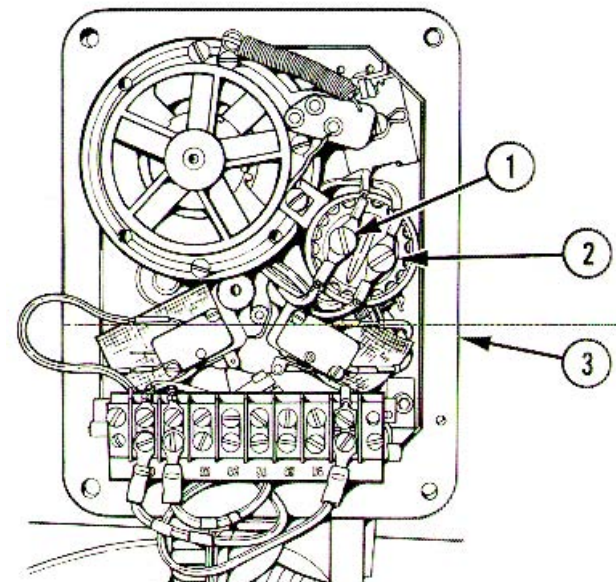


**E. REMOTE CONTROL MOTOR MAY BE DEFECTIVE.**

**NOTE**

**The following check is for resistance.**

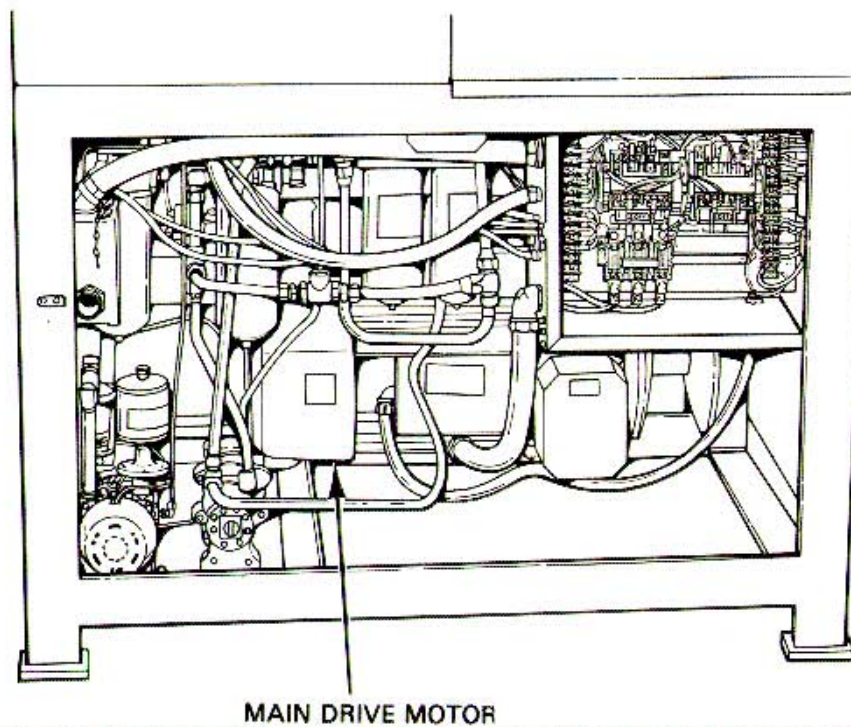
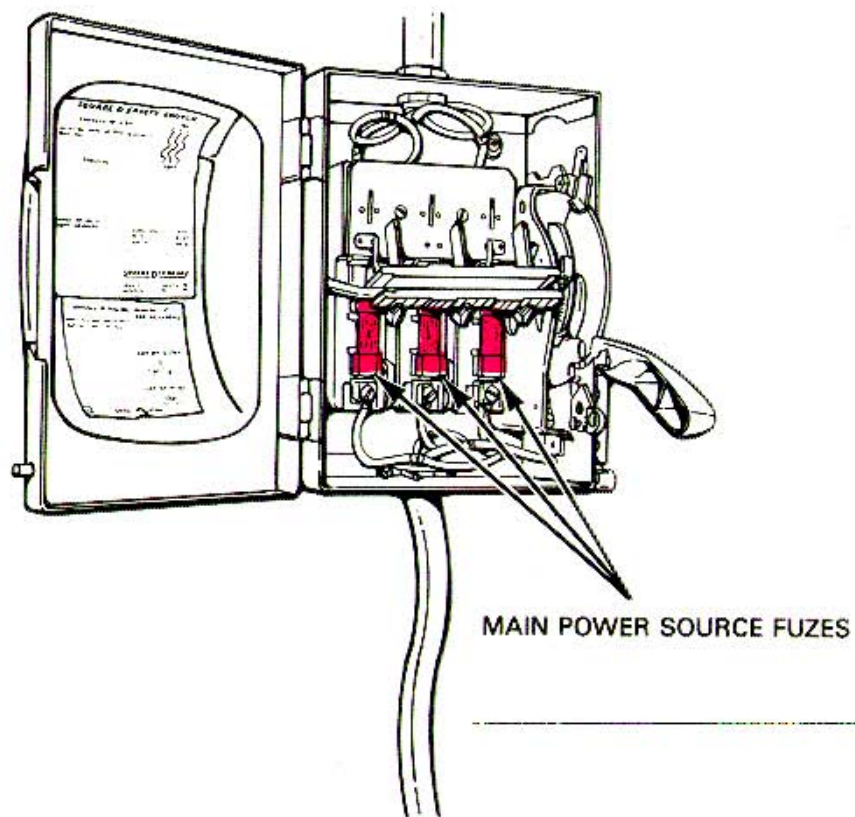
- 1 Connect one multimeter lead to remote control motor contact (1) and the other lead to remote control motor contact (2).
- 2 Check for approximate resistance reading of 30 ohms. If resistance is not present, replace the remote control motor (3) (p 6-466).



6-2. TROUBLESHOOTING (cont)

**MAIN DRIVE MOTOR**

**BLOWS MAIN POWER  
SOURCE FUZES**



LOCATOR VIEW

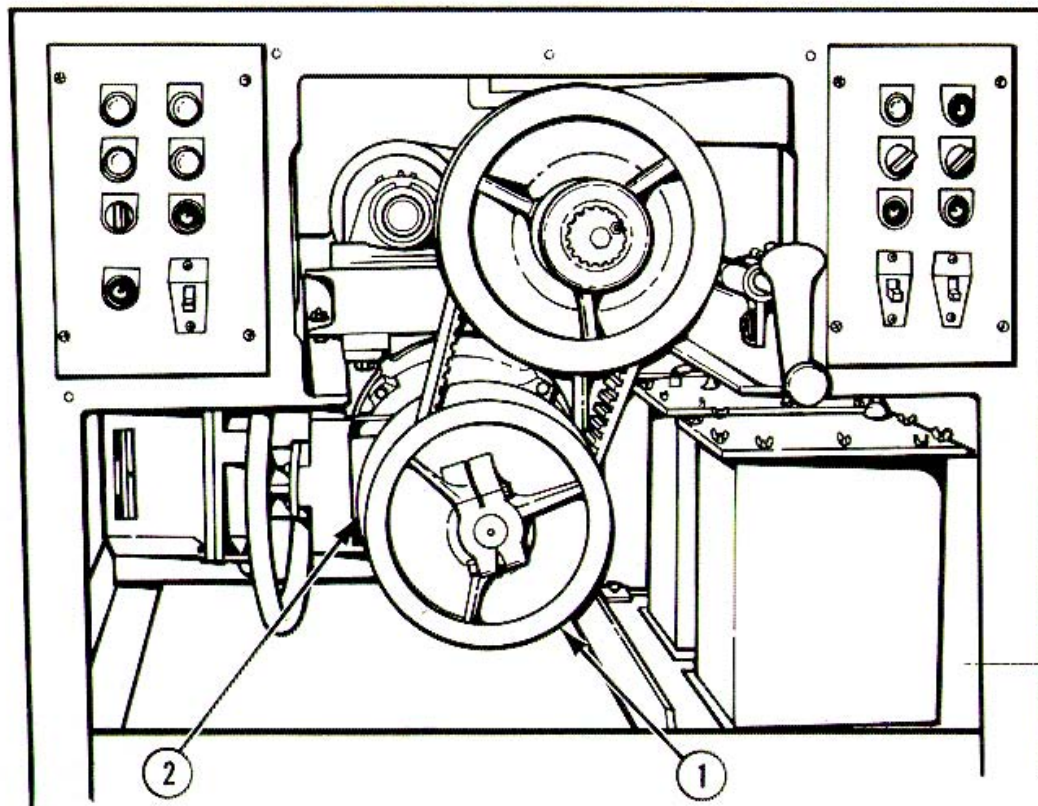
**MAIN DRIVE MOTOR IS STOPPED ABOVE LOWEST SPEED OBTAINABLE.**

- 1 Remove front panel.
- 2 Loosen two setscrews and remove outer lower varidrive disk (1).

**WARNING**

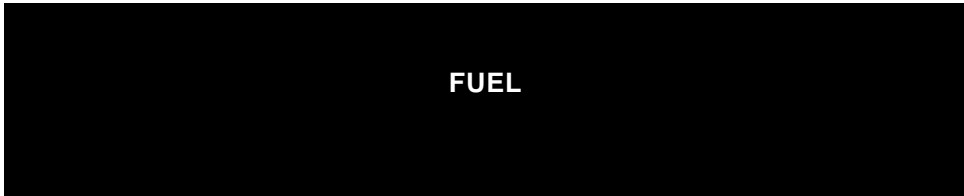
**Stand away from front of tester.**

- 3 Turn main power source on and press START button.
- 4 Press SLOW button until inner lower varidrive disk (2) stops moving inward toward rear of tester.
- 5 Turn main power source off, reinstall outer lower varidrive disk (1) and tighten two setscrews.

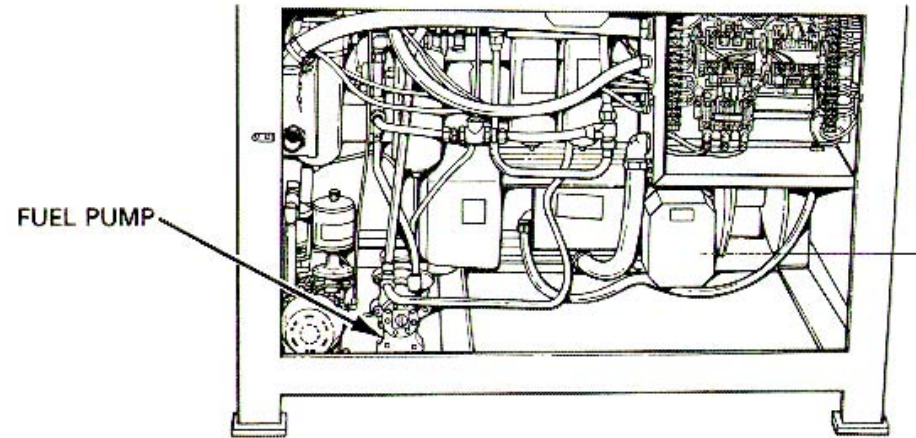




6-2. TROUBLESHOOTING (cont)



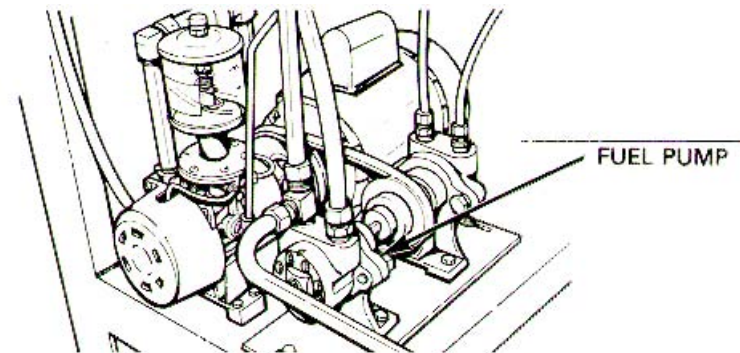
DOES NOT CIRCULATE



LOCATOR VIEW

A. FUEL PUMP IS DEFECTIVE.

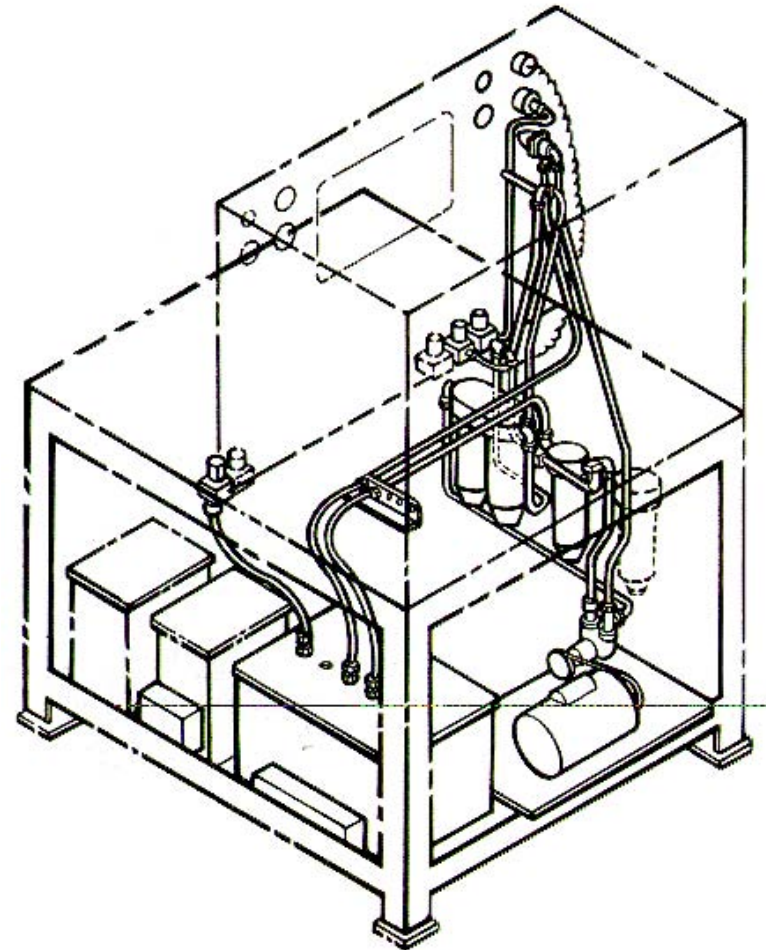
- 1 Replace fuel pump (p 6-525).
- 2 If fuel does not circulate, proceed to step B.



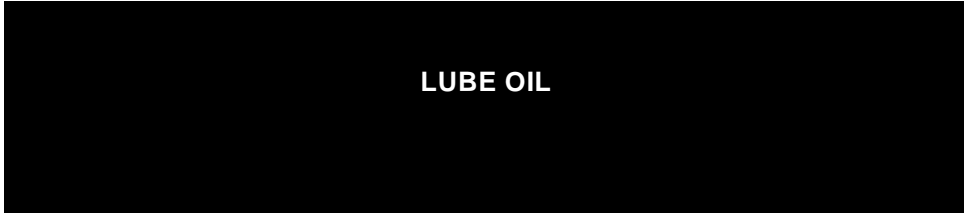


**B. FUEL COPPER TUBING(S) MAY BE PLUGGED OR BROKEN.**

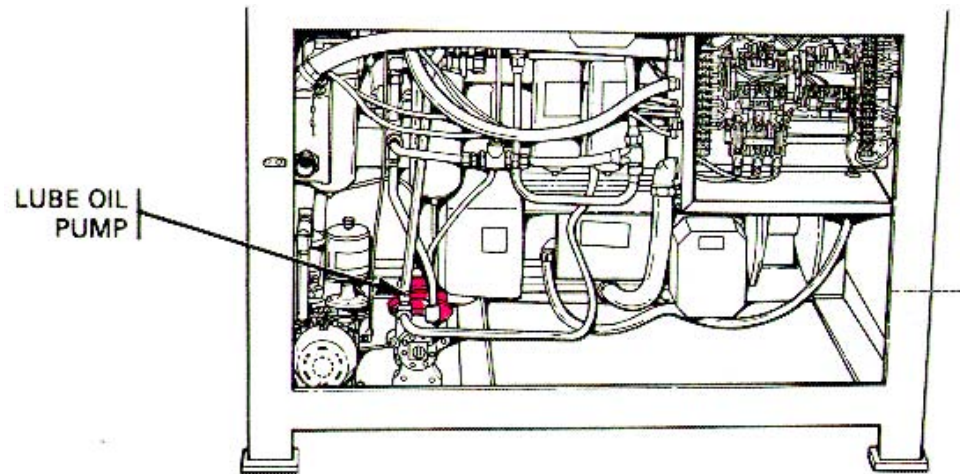
- 1 Check all fuel copper tubings for damage or blockage.
- 2 If damaged, replace the damaged copper tubing(s) (p 6-588).
- 3 If plugged, disconnect and blow air through the fuel copper tubing(s).



6-2. TROUBLESHOOTING (cont)



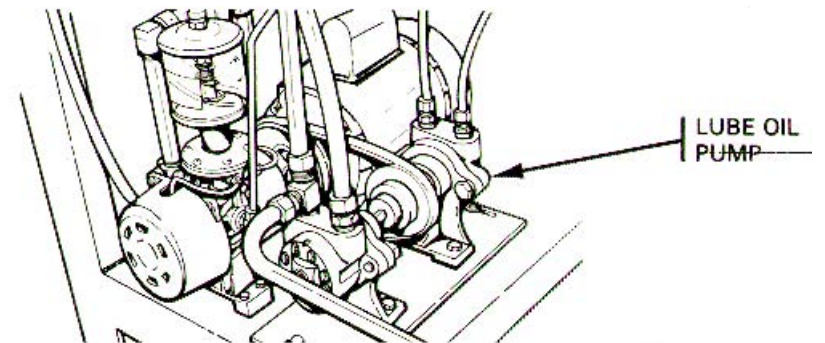
DOES NOT CIRCULATE



LOCATOR VIEW

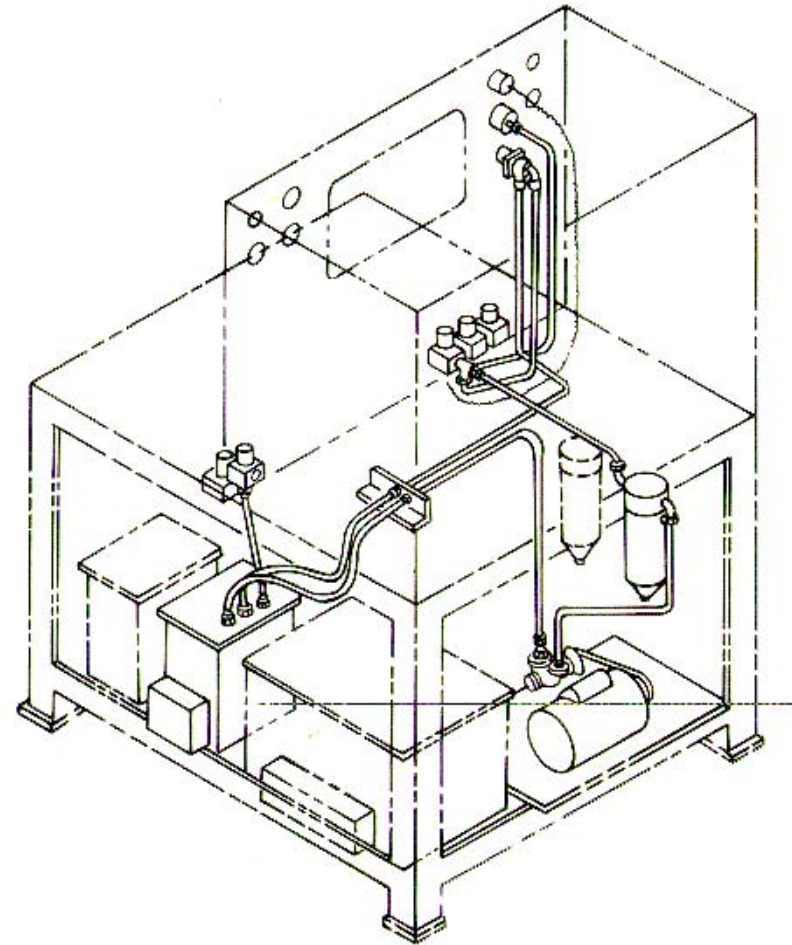
**A LUBE OIL PUMP IS DEFECTIVE**

- 1 Replace lube oil pump (p 6-525).
- 2 If lube oil does not circulate, proceed to step B.

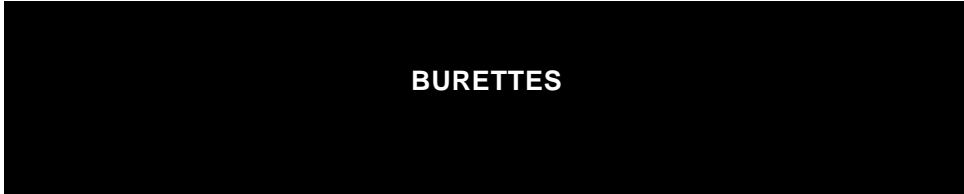


**B. LUBE OIL COPPER TUBING(S) MAY BE PLUGGED OR BROKEN.**

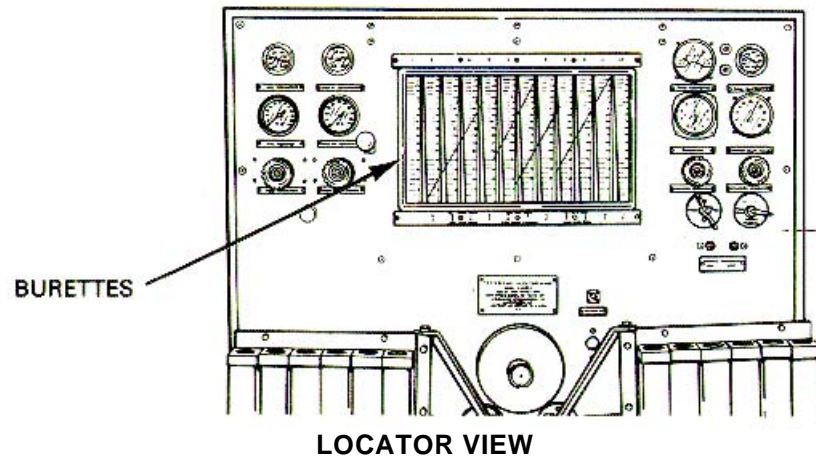
- 1 Check all lube oil copper tubings for damage or blockage.
- 2 If damaged, replace the damaged lube oil copper tubing(s) (p 6-574).
- 3 If plugged, disconnect and blow air through lube oil copper tubing(s).



6-2. TROUBLESHOOTING (cont)



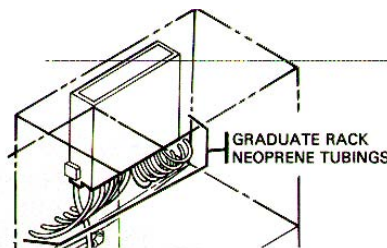
WILL NOT FILL UP



A. GRADUATE RACK NEOPRENE TUBING(S) MAY BE PLUGGED OR TWISTED.

B. COUNTING CIRCUIT DOES NOT FUNCTION.

- 1 Untwist or replace neoprene tubing(s) (p 6-335)
- 2 If burettes will not fill up, proceed to step B.

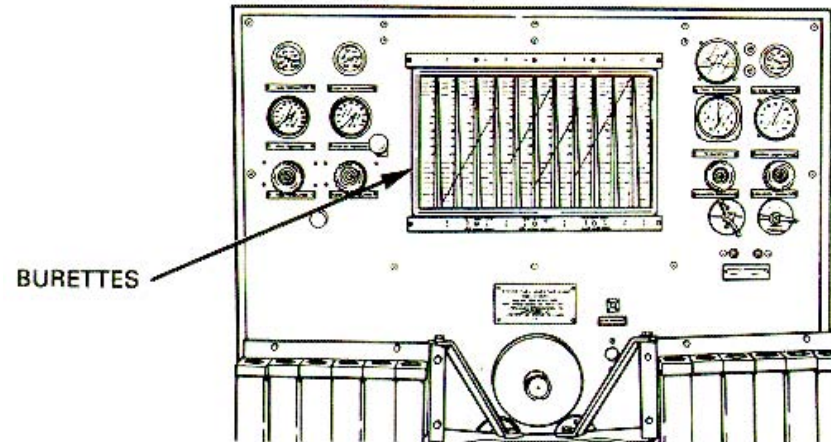


Refer to page 6-95 for troubleshooting procedures.



**BURETTES**

**WILL NOT EMPTY**



**LOCATOR VIEW**

**A. BURETTE(S) MAY BE DEFECTIVE.**

- 1 Replace burette(s) (p 6-335).
- 2 If burettes will not empty, proceed to step B.

**B. DUMPING SHAFT ASSEMBLY IS IMPROPERLY POSITIONED.**

Position dumping shaft assembly properly (p 6-335).





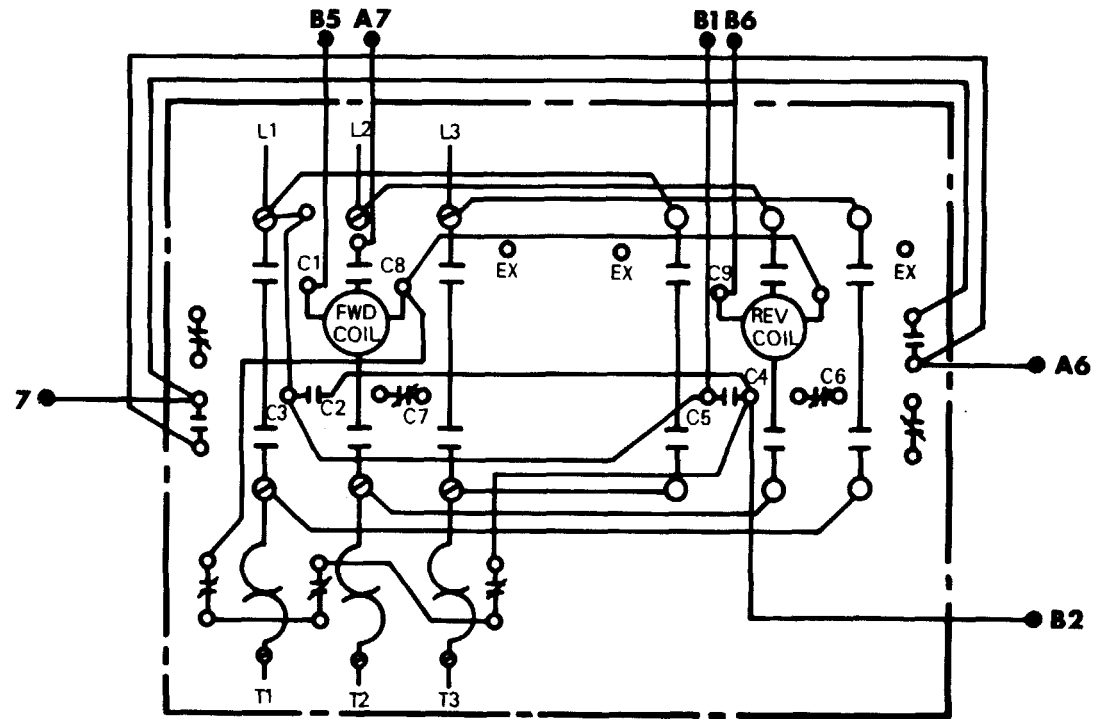


Figure 6-2. Updated main drive motor starter.

Figure 6-2. Updated main drive motor starter.

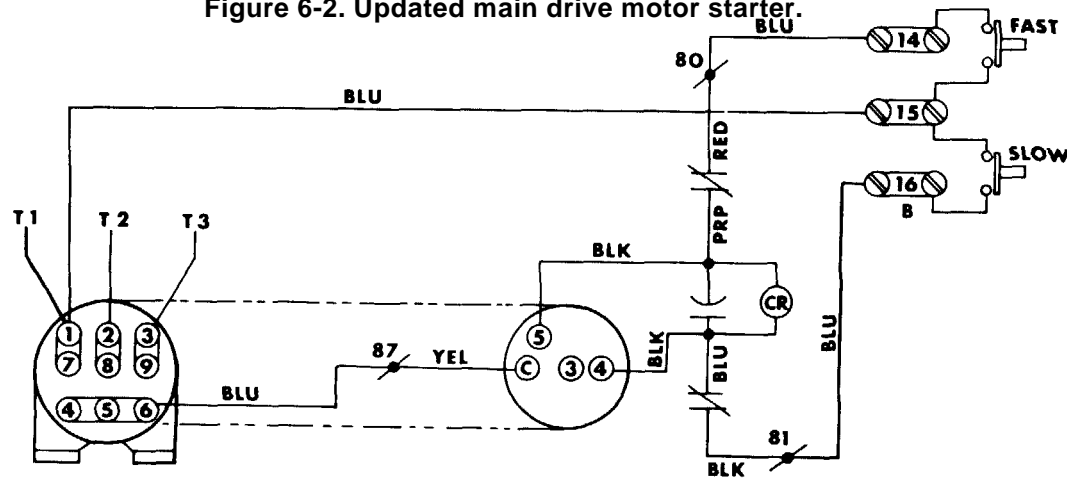


Figure 6-3. Updated remote control motor circuitry.



**\*TABLE 6-1. WIRE TABLE****Termination**

<b>Size</b>	<b>Color</b>	<b>From</b>	<b>To</b>
14	Green	Terminal A1	Tachometer reversing relays (forward)
14	Green	Terminal A2	Tachometer reversing relays (forward)
14	Green	Terminal A4	Tachometer reversing relays (forward)
14	Green	Terminal A5	Tachometer reversing relays (reverse)
14	Blue	Terminal A6	Terminal D7
14	Blue	Terminal A6	Starter microswitch
14	White	Terminal A7	Terminal D6
14	White	Terminal A7	Terminal B7
14	White	Terminal A7	Starter L2
14	White	Terminal A7	Starter microswitch
14	Black	Terminal A8	Terminal B8
14	Black	Terminal A8	Terminal D12
14	Black	Terminal A8	Starter L3
14	Red	Terminal A9	Terminal D15

\*All wire is stranded. All insulation is stripped back 0.50 in. (1.27 cm) from each end. For replacement of terminal lugs, refer to items 21 thru 24, app C.

**\*TABLE 6-1. WIRE TABLE (cont)****Termination**

<b>Size</b>	<b>Color</b>	<b>From</b>	<b>To</b>
14	Red	Terminal A9	Starter L3
14	Black	Terminal A10	Terminal B10
14	Black	Terminal A10	Terminal A14
14	White	Terminal All	Terminal B11
14	White	Terminal All	Terminal A13
14	Yellow	Terminal A12	Terminal B12
14	Red	Terminal B1	Starter C5
14	Red	Terminal B1	START switch
14	Red	Terminal B2	Starter C4
14	Red	Terminal B2	START switch
14	White	Terminal B3	Terminal B7
14	White	Terminal B3	STOP switch
14	White	Terminal B4	STOP switch
14	White	Terminal B4	FORWARD-OFF-REVERSE switch
14	White	Terminal B5	FORWARD-OFF-REVERSE switch
14	White	Terminal B5	Tachometer reversing relays (forward)

14	White	Terminal B5	Starter C1
14	White	Terminal B6	Starter C9
14	White	Terminal B6	Tachometer reversing relays (reverse)
14	White	Terminal B6	FORWARD-OFF-REVERSE switch
14	White	Terminal B7	AUXILIARY MOTOR switch
14	White	Terminal B7	POWER ON light
14	Black	Terminal B8	POWER ON light
14	Black	Terminal B8	AUXILIARY MOTOR switch
14	Black	Terminal B10	AUXILIARY MOTOR switch
14	Black	Terminal B10	MANIFOLD HEAT light
14	White	Terminal B11	AUXILIARY MOTOR switch
14	Yellow	Terminal B12	MANIFOLD HEAT light
14	Blue	Terminal B14	FAST switch
14	Blue	Terminal B14	Remote control motor
14	Blue	Terminal B15	FAST switch
14	Blue	Terminal B15	SLOW switch
14	Blue	Terminal B15	Main drive motor
14	Blue	Terminal B16	SLOW switch
14	Blue	Terminal B16	Remote control motor

\*All wire is stranded. All insulation is stripped back 0.50 in. (1.27 cm) from each end. For replacement of terminal lugs, refer to items 21 thru 24, app C.

**\*TABLE 6-1. WIRE TABLE (cont)****Termination**

<b>Size</b>	<b>Color</b>	<b>From</b>	<b>To</b>
14	Blue	Main drive motor	Remote control motor
14	Red	Starter C5	Starter C3
14	Red	Starter C4	Starter C2
14	Red	Starter	Tachometer reversing relays (reverse)
14	Red	Starter C4	Thermal heater
8	Red	Main power source L1	Starter L1
8	White	Main power source L2	Starter L2
8	Black	Main power source L3	Starter L3
8	Red	Thermal heater T1	Main drive motor
8	White	Thermal heater T2	Main drive motor
8	Black	Thermal heater T3	Main drive motor
8	Black	Forward starter thermal heater	Reverse starter thermal heater
8	Black	Forward starter thermal heater	Reverse starter thermal heater
8	Black	Forward starter thermal heater	Reverse starter thermal heater
14	Red	Forward starter contact	Reverse starter contact



14	Red	Forward starter contact	Reverse starter contact
14	Red	Forward starter contact	Reverse starter contact
14	Red	Forward starter contact	Reverse starter contact
14	Green	Forward tachometer reversing relay	Reverse tachometer reversing relay
14	Green	Forward tachometer reversing relay	Reverse tachometer reversing relay
14	Green	Forward tachometer reversing relay	Reverse tachometer reversing relay
14	Green	Forward tachometer reversing relay	Reverse tachometer reversing relay
14	Red	Forward tachometer reversing relay	Reverse tachometer reversing relay
14	Green	Terminal C5	Selenium rectifier
14	Green	Terminal C5	Transformer X1
14	Green	Terminal C6	Transformer H1
14	Green	Terminal C6	24-VDC switch
18	Black	Terminal C7	Stepping relay coil
14	Black	Terminal C7	500-1000-OFF switch (OFF position)
18	Black	Terminal C7	Latching relay
18	Black	Terminal C7	Stepping relay

\*All wire is stranded. All insulation is stripped back 0.50 in. (1.27 cm) from each end. For replacement of terminal lugs, refer to items 21 thru 24, app C.

**\*TABLE 6-1. WIRE TABLE (cont)****Termination**

<b>Size</b>	<b>Color</b>	<b>From</b>	<b>To</b>
14	Black	Terminal C8	500-1000-OFF switch (500 position)
18	Black	Terminal C8	Stepping relay
14	Black	Terminal C9	500-1000-OFF switch (1000 position)
18	Black	Terminal C9	Stepping relay
18	Black	Terminal C9	Latching relay coil
18	Black	Terminal C9	Holding relay
14	Blue	Terminal C11	COUNTING light
14	Blue	Terminal C11	Terminal D8
14	Black	Terminal C12	START COUNT switch
18	Black	Terminal C12	Holding relay coil
18	Black	Terminal C12	Holding relay
14	Black	Terminal C13	Terminal D13
14	Black	Terminal C13	START COUNT switch
14	Black	Terminal C14	COUNTING light
14	Black	Terminal C14	24-VDC switch
14	Black	Terminal C14	LUBE HEAT switch

14	Black	Terminal C14	Terminal D14
14	Red	Terminal C15	LUBE HEAT switch
14	Red	Terminal C15	FUEL HEAT switch
14	Red	Terminal C15	Terminal D15
14	White	Terminal C16	FUEL HEAT switch
14	White	Terminal C16	Terminal D16
14	Green	Terminal D3	Selenium rectifier
14	Green	Terminal D4	Selenium rectifier
14	Green	Terminal D5	Selenium rectifier
14	Green	Terminal D5	Transformer X2
14	Green	Terminal D6	Transformer H4
14	White	Terminal D6	Terminal D16
18	Blue	Terminal D7	Stepping relay coil
18	Blue	Terminal D7	Latching relay coil
18	Blue	Terminal D7	Latching relay
18	Blue	Terminal D8	Latching relay
18	Blue	Terminal D9	Latching relay
18	Blue	Terminal D9	Holding relay coil

\*All wire is stranded. All insulation is stripped back 0.50 in. (1.27 cm) from each end. For replacement of terminal lugs, refer to items 21 thru 24, app C.

**\*TABLE 6-1. WIRE TABLE (cont)****Termination**

<b>Size</b>	<b>Color</b>	<b>From</b>	<b>To</b>
18	Blue	Terminal D9	Reset coil on stepping relay
18	Black	Terminal D10	Reset coil on stepping relay
18	Black	Terminal D10	Latching relay
18	Black	Terminal D11	Latching relay
18	Black	Terminal D11	Holding relay
18	Black	Terminal D12	Holding relay
14	Black	Terminal D12	Terminal 14
14	White	FUEL HEAT switch	FUEL HEAT receptacle X
14	Red	FUEL HEAT switch	FUEL HEAT receptacle Z
14	Yellow	FUEL HEAT light	FUEL HEAT receptacle Y
14	Red	LUBE HEAT switch	LUBE HEAT receptacle X
14	Black	LUBE HEAT switch	LUBE HEAT receptacle Z
14	Yellow	LUBE HEAT light	LUBE HEAT receptacle Y

**\*\*NOTE**

The cable from the TACHOMETER indicator assembly consists of the following three wires.



14	White	Terminal A1	TACHOMETER indicator assembly
14	Green	Terminal A2	TACHOMETER indicator assembly
14	Black	Terminal A3	TACHOMETER indicator assembly

**\*\*NOTE**

**The cable from the tachometer generator consists of the following three wires.**

14	Green	Terminal A3	Tachometer generator
14	Black	Terminal A4	Tachometer generator
14	White	Terminal A5	Tachometer generator

**\*\*NOTE**

**The cable from the auxiliary motor consists of the following three wires.**

14	Black	Terminal A10	Auxiliary motor
14	White	Terminal All	Auxiliary motor
14	Green	Ground	Auxiliary motor

**\*\*NOTE**

**The cable from 24 VOLTS DC outlet assembly consists of the following three wires.**

14	Black	Terminal D3	24 VOLTS DC outlet assembly
14	White	Terminal D4	24 VOLTS DC outlet assembly
14	Green	Ground	24 VOLTS DC outlet assembly

\*All wire is stranded. All insulation is stripped back 0.50 in. (1.27 cm) from each end. For replacement of terminal lugs, refer to items 21 thru 24, app C.

\*\*If cable is not available, #14 wire can be used to fabricate. Use color identification to maintain continuity.

**\*TABLE 6-1. WIRE TABLE (cont)**

**Termination**

Size	Color	From	To
------	-------	------	----

**\*\*NOTE**

**The cable from the solenoid assembly consists of the following three wires.**

14	Black	Terminal D8	Solenoid assembly
14	White	Terminal D12	Solenoid assembly
14	Green	Ground	Solenoid assembly

**\*\*NOTE**

**The cable from counter pulse assembly switch consists of the following four wires.**

14	Black	Terminal D11	Counter pulse switch
14	Red	Terminal D13	Counter pulse switch
14	White	Terminal D14	Counter pulse switch
14	Green	Ground	Counter pulse switch

**\*\*NOTE**

**The cable from manifold bulb assembly consists of the following four wires.**

14	Red	Terminal A12	Manifold bulb assembly
14	White	Terminal A13	Manifold bulb assembly
14	Black	Terminal A14	Manifold bulb assembly
14	Green	Ground	Manifold bulb assembly

**\*\*NOTE**

**The cable, with male connector plug, from fuel tank assembly consists of the following four wires.**

14	Green	Ground	Fuel tank assembly
14	Black	FUEL HEAT receptacle Z	Fuel tank assembly
14	White	FUEL HEAT receptacle X	Fuel tank assembly
14	Red	FUEL HEAT receptacle Y	Fuel tank assembly

**\*\*NOTE**

**The cable, with male connector plug, from lube oil tank assembly consists of the following four wires.**

14	Red	LUBE HEAT receptacle Y	Lube oil tank assembly
14	White	LUBE HEAT receptacle X	Lube oil tank assembly
14	Black	LUBE HEAT receptacle Z	Lube oil tank assembly
14	Green	Ground	Lube oil tank assembly

\*All wire is stranded. All insulation lb stripped back 0.50 in. (1.27 cm) from each end. For replacement of terminal lugs, refer to items 21 thru 24, app C.

\*\*If cable is not available, #14 wire can be used to fabricate. Use color identification to maintain continuity.

Section II. MAINTENANCE PROCEDURES

SECTION INDEX

	Page		Page
Auxiliary Motor and Pump Assembly-.....		Lube Oil Tank Assembly-	
Maintenance Instructions.....	6-525	Maintenance Instructions.....	6-395
Clutch Assembly--Maintenance Instructions.....	6-502	MANF. PRESS. - CAPSULE PRESSURE	
Counter Pulse Switch-.....		Selector Valve-- Maintenance Instructions.....	6-292
Maintenance Instructions.....	6-445	Manifold Bulb Assembly-	
Counter Pulse Switch and Tachometer.....		Maintenance Instructions.....	6-307
Generator Assembly-.....		MANIFOLD INLET - SUPERCHARGER INLET-	
Maintenance Instructions.....	6-424	Maintenance Instructions.....	6-299
Drive Unit Assembly-.....		Moisture and Oil Trap-	
Maintenance Instructions.....	6-466	Maintenance Instructions.....	6-546
Dumping Shaft Assembly-.....		Piping Assembly - Maintenance Instructions.....	6-560
Maintenance Instructions.....	6-374	Primary Fuel Filter-	
Engine Primer Assembly--.....		Maintenance Instructions.....	6-552
Maintenance Instructions.....	6-331	RH Control Equipment Assembly-	
Fitting Bracket Assembly--.....		Maintenance Instructions.....	6-187
Maintenance Instructions.....	6-459	Secondary Fuel Filter-	
Fuel Injector Pump Tester-.....		Maintenance Instructions.....	6-555
Maintenance Instructions.....	6-161	Service Connection Assembly-	
Fuel Injector Pump Tester.....		Maintenance Instructions.....	6-516
Miscellaneous Parts-.....		Shift Control Rod Assembly-	
Maintenance Instructions.....	6-174	Maintenance Instructions.....	6-376
FUEL REGULATOR-- Maintenance Instructions.....	6-327	Solenoid Assembly-	
Fuel Tank Assembly- Maintenance Instructions.....	6-409	Maintenance Instructions.....	6-366
Graduate Rack Assembly-.....		Support Assembly-- Maintenance Instructions.....	6-514
Maintenance Instructions.....	6-335	Switch Actuating Cam Assembly-	
Input Shaft Assembly-.....		Maintenance Instructions.....	6-453
Maintenance Instructions.....	6-456	Tachometer Generator Cable Assembly-	
Instrument Panel Assembly--.....		Maintenance Instructions.....	6-440
Maintenance Instructions.....	6-252	TACHOMETER Indicator Assembly-	
LH Control Equipment Assembly--.....		Maintenance Instructions.....	6314
Maintenance Instructions.....	6-219	Tachometer Indicator Cable Assembly-	
Lube Oil Filter- Maintenance Instructions.....	6-549	Maintenance Instructions.....	6-317
LUBE OIL REGULATOR-.....		Tray and Discharge Blocks Assembly-	
Maintenance Instructions.....	6-323	Maintenance Instructions.....	6-381



24 VOLTS DC Outlet Assembly- .....  
 Maintenance Instructions ..... 6-303  
 VACUUM - PRESS. Selector Valve-  
 Maintenance Instructions ..... 6-296

Waste Tank Assembly- .....  
 Maintenance Instructions ..... 6-391

**6-3. FUEL INJECTOR PUMP TESTER- MAINTENANCE INSTRUCTIONS**

---

**INITIAL SETUP**

Tools and Special Tools  
 General mechanic's automotive tool kit (5180-00-177-7033)  
 Multimeter (TS352 B/U)

6-501 Test/adjustment procedure of the drive unit assembly  
 6-472 Disassembly procedure of the drive unit assembly  
 6-484 Reassembly/alignment procedure of the drive unit assembly  
 TM 9-4910-387-24P

Materials/Parts  
 Abrasive cloth (item 4, app C)  
 Cleaning compound (item 3, app C)  
 Grease (item 7, app C)  
 Rag (item 14, app C)  
 Solder (item 18, app C)  
 Tape (item 19, app C)

**Equipment Conditions**

Main power source to tester is turned off (para 6-4 thru 6-41d)  
 4-33 RH upper side panel is removed (para 6-4, 6-7 thru 6-14, 6-26 thru 6-32, and 6-41a thru 6-41d)  
 4-40 RH panel assembly is removed (para 6-4, 6-5, 6-21, 6-22, 6-23, 6-32, 6-36, 6-37, and 6-41a thru 6-41d)  
 4-32 Upper back panel is removed (para 6-4, 6-7, 6-18, 6-19, 6-20, 6-26 thru 6-32, and 6-41a thru 6-41d)  
 4-34 LH upper side panel is removed (para 6-4, 6-7, 6-15, 6-16, 6-17, 6-32, and 6-41a thru 6-41d)  
 4-42 LH panel assembly is removed (para 6-4, 6-6, 6-22, 6-24, 6-25, 6-32, 6-35, and 6-38 thru 6-41c)  
 6-174 Mounting rail parts are removed (para 6-7)

References  
 4-8 Operation of TACHOMETER  
 2-26 Hookup of fuel injector pump  
 6-338 Disassembly procedure of graduate rack assembly  
 6-349 Reassembly procedure of graduate rack assembly  
 6-424 Removal and disassembly procedures for the counter pulse switch and tachometer generator assembly  
 6-431 Reassembly/alignment and installation procedures for the counter pulse switch and tachometer generator assembly  
 6-502 Removal/disassembly of the clutch assembly

**6-3. FUEL INJECTOR PUMP TESTER- MAINTENANCE INSTRUCTIONS (cont)**

**INITIAL SETUP (cont)**

Equipment Conditions (cont)

- |       |  |       |  |
|-------|--|-------|--|
| 4-36  | Accumulator mounting parts are removed (para 6-7)  | 4-33  | Lower back panel is removed (para 6-32, 6-35, 6-36, 6-37, 6-41a, 6-41b, and 6-41c) |
| 4-35  | Front panel is removed (para 6-21, 6-22, and 6-23) | 4-76  | Lubricating oil is drained from lube oil filter (para 6-38)                        |
| 4-53  | LH accumulator assembly is removed (para 6-22)     | 4-80  | Fuel is drained from primary fuel filter (para 6-39)                               |
| 4-45  | RH accumulator assembly is removed (para 6-22)     | 4-83  | Fuel is drained from secondary fuel filter (para 6-40)                             |
| 6-174 | Mounting rails are removed (para 6-22)             | 6-472 | Drive unit assembly is disassembled (para 6-33)                                    |
| 3-26  | Waste tank assembly is empty (para 6-23)           | 6-467 | Drive unit assembly is removed (para 6-34)   |
| 6-446 | Forklift is available (para 6-32)                  |       | Counter pulse switch is removed (para 6-29)  |

<b>LIST OF TASKS (cont)</b>			
<b>Task No.</b>	<b>Task</b>	<b>Task Ref (page)</b>	<b>Troubleshooting Ref No.(Page)</b>
1	Maintain fuel injector pump tester miscellaneous parts: <ul style="list-style-type: none"> <li>a. Repair of mounting rail parts.</li> <li>b. Repair of shouldered shaft parts.</li> <li>c. Adjustment of shouldered shaft rear timing belt.</li> <li>d. Adjustment of shouldered shaft front timing belt.</li> <li>e. Repair of RH latch bracket.</li> <li>f. Repair of LH latch bracket.</li> <li>g. Repair of grounding connector.</li> </ul>	6-174 6-176 6-183 6-185 6-185 6-186 6-186	

2

Maintain RH control equipment assembly:

- a. Remove.
- b. Disassemble RH control panel assembly.
- c. Disassemble RH mounting board assembly.
- d. Disassemble RH enclosure assembly.
- e. Service.
- f. Repair.
- g. Reassemble RH enclosure assembly.
- h. Reassemble RH mounting board assembly.
- i. Reassemble RH control panel assembly.
- j. Install.
- k. Test.

6-188  
6191  
6-193  
6-198  
6-199  
6199  
6199  
6-200  
6-211  
6-216  
6-219

6-48, 655,  
6-62, 6-63,  
6-64, 695,  
6-111, 6-144

3

Maintain LH control equipment assembly:

- a. Remove.
- b. Disassemble LH control panel assembly.
- c. Disassemble LH mounting board assembly.
- d. Disassemble LH enclosure assembly.
- e. Service.
- f. Repair.
- g. Reassemble LH enclosure assembly.
- h. Reassemble LH mounting board assembly.
- i. Reassemble LH control panel assembly.
- j. Install.
- k. Test.

6-220  
6224  
6-227  
6-229  
6-229  
6-229  
6-230  
6-230  
6242  
6-246  
6-251

6-12, 6-23,  
6-31, 6-36,  
6-38,  
6-113, 6-120,  
6-126, 6-132

6-3. FUEL INJECTOR PUMP TESTER-MAINTENANCE INSTRUCTIONS (cont)

LIST OF TASKS (cont)			
Task No.	Task	Task Ref (page)	Troubleshooting Ref No.(Page)
4	Maintain instrument panel assembly:	6-42, 6-46,	6-47, 6-64, 6-71, 6-77, 6-83, 6-85, 6-89, 6-91, 6-93, 6-113, 6-120
	a. Remove.	6-253	
	b. Disassemble.	6-261	
	c. Inspect/service.	6-272	
	d. Repair.	6-272	
	e. Reassemble.	6-272	
	f. Install.	6-284	
	g. Test.	6-291	
5	Maintain MANF. PRESS. - CAPSULE PRESSURE selector valve:		6-93
	a. Remove/disassemble.	6-292	
	b. Inspect/service.	6-294	
	c. Repair.	6-294	
	d. Reassemble/install.	6-294	
6	Maintain VACUUM - PRESS. selector valve:		6-91
	a. Remove/disassemble.	6-296	
	b. Inspect/service.	6-297	
	c. Repair.	6-298	
	d. Reassemble/install.	6-298	



7	<p>Maintain MANIFOLD INLET - SUPERCHARGER INLET:</p> <ul style="list-style-type: none"> <li>a. Remove.</li> <li>b. Disassemble.</li> <li>c. Inspect/service.</li> <li>d. Repair.</li> <li>e. Reassemble.</li> <li>f. Install.</li> </ul>	<p>6-300 6-301 6-301 6-301 6-301 6-302</p>	
8	<p>Maintain 24 VOLTS DC outlet assembly:</p> <ul style="list-style-type: none"> <li>a. Remove/disassemble.</li> <li>b. Inspect/service.</li> <li>c. Repair.</li> <li>d. Reassemble/install.</li> </ul>	<p>6-303 6-305 6-305 6-305</p>	6-64
9	<p>Maintain manifold bulb assembly:</p> <ul style="list-style-type: none"> <li>a. Remove/disassemble.</li> <li>b. Inspect/service.</li> <li>c. Repair.</li> <li>d. Reassemble/install.</li> <li>e. Test.</li> </ul>	<p>6-308 6-310 6-310 6-311 6-313</p>	6-42, 6-46
10	<p>Maintain TACHOMETER indicator assembly:</p> <ul style="list-style-type: none"> <li>a. Remove/disassemble.</li> <li>b. Inspect/service.</li> <li>c. Repair.</li> <li>d. Reassemble/install.</li> <li>e. Test.</li> </ul>	<p>6-314 6-315 6-315 6-316 6-316</p>	6-113, 6-120
11	<p>Maintain tachometer indicator cable assembly:</p> <ul style="list-style-type: none"> <li>a. Remove.</li> <li>b. Disassemble.</li> <li>c. Inspect/service.</li> <li>d. Repair.</li> <li>e. Reassemble.</li> <li>f. Test.</li> <li>g. Install.</li> </ul>	<p>6-317 6-318 6-320 6-320 6-320 6-322 6-322</p>	6-113, 6-120

6-3. FUEL INJECTOR PUMP TESTER-MAINTENANCE INSTRUCTIONS (cont)

LIST OF TASKS (cont)			
Task No.	Task	Task Ref (page)	Troubleshooting Ref No.(Page)
12	Maintain LUBE OIL REGULATOR: a. Remove/disassemble. b. Inspect/service. c. Repair. d. Reassemble/install.	6323 6-325 6-325 6-325	6-77
13	Maintain FUEL REGULATOR: a. Remove/disassemble. b. Inspect/service. c. Repair. d. Reassemble/install.	6-328 6329 6-329 6-330	6-71
14	Maintain engine primer assembly: a. Remove/disassemble. b. Inspect/service. c. Repair. d. Reassemble/install.	6-332 6-333 6-333 6-334	6-83
15	Maintain graduate rack assembly: a. Remove. b. Disassemble. c. Inspect/service. d. Repair. e. Reassemble.	6-336 6-338 6-348 6-348 6-349	6-95, 6-144, 6145

	f. Install.	6-361
	g. Test.	6-363
16	Maintain solenoid assembly:	6-95
	a. Remove.	6-366
	b. Disassemble.	6-368
	c. Inspect/service.	6-369
	d. Repair.	6-369
	e. Reassemble.	6370
	f. Install.	6-372
	g. Test.	6-373
17	Maintain dumping shaft assembly:	6-145
	a. Remove.	6-374
	b. Disassemble.	6-374
	c. Inspect.	6-375
	d. Repair.	6-375
	e. Reassemble.	6-375
	f. Install.	6-375
18	Maintain shift control rod assembly:	
	a. Remove.	6376
	b. Disassemble.	6-377
	c. Inspect/service.	6-378
	d. Repair.	6-378
	e. Reassemble.	6-378
	f. Install.	6-379
19	Maintain tray and discharge blocks assembly:	
	a. Remove.	6-381
	b. Disassemble.	6-384
	c. Inspect/service.	6386
	d. Repair.	6-386
	e. Reassemble.	6386
	f. Install.	6-389

6-3. FUEL INJECTOR PUMP TESTER-MAINTENANCE INSTRUCTIONS (cont)

LIST OF TASKS (cont)			
Task No.	Task	Task Ref (page)	Troubleshooting Ref No.(Page)
20	Maintain waste tank assembly: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install.	6-392 6-392 6-393 6-393 6-394	
21	Maintain lube oil tank assembly: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install. f. Test.	6-395 6-396 6-401 6-401 6-407 6-408	6-55, 6-63
22	Maintain fuel tank assembly: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install. f. Test.	6-409 6-410 6-416 6-416 6-422 6-423	6-48, 6-62



23	Maintain counter pulse switch and tachometer generator assembly:	<ul style="list-style-type: none"> <li>a. Remove. 6-424</li> <li>b. Disassemble. 6-426</li> <li>c. Inspect/service. 6-430</li> <li>d. Repair. 6431</li> <li>e. Reassemble/align. 6-431</li> <li>f. Install. 6-435</li> <li>g. Align/adjust. 6-437</li> <li>h. Test. 6-439</li> </ul>	6-95, 6-113, 6-120
24	Maintain tachometer generator cable assembly:	<ul style="list-style-type: none"> <li>a. Remove. 6-440</li> <li>b. Disassemble. 6-440</li> <li>c. Inspect/service. 6-442</li> <li>d. Repair. 6-443</li> <li>e. Reassemble. 6443</li> <li>f. Test. 6-445</li> <li>g. Install. 6-445</li> </ul>	6-113, 6-120
25	Maintain counter pulse switch:	<ul style="list-style-type: none"> <li>a. Remove/disassemble. 6-446</li> <li>b. Inspect/service. 6-448</li> <li>c. Repair. 6-449</li> <li>d. Reassemble/install. 6-449</li> <li>e. Test. 6-452</li> </ul>	6-95
26	Maintain switch actuating cam assembly:	<ul style="list-style-type: none"> <li>a. Remove. 6-453</li> <li>b. Disassemble. 6-454</li> <li>c. Inspect/service. 6-454</li> <li>d. Repair. 6455</li> <li>e. Reassemble. 6-455</li> <li>f. Install. 6-455</li> </ul>	

6-3. FUEL INJECTOR PUMP TESTER-MAINTENANCE INSTRUCTIONS (cont)

LIST OF TASKS (cont)			
Task No.	Task	Task Ref (page)	Troubleshooting Ref No.(Page)
27	Maintain input shaft assembly: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install.	6-456 6-456 6-458 6-458 6-459	
28	Maintain fitting bracket assembly: a. Remove. b. Disassemble. c. Inspect/service. d. Repair. e. Reassemble. f. Install.	6-460 6462 6462 6-463 6-463 6-464	
29	Maintain drive unit assembly:  a. Remove. b. Disassemble. c. Inspect/service. d. Repair. e. Reassemble/aline. f. Install. g. Test/adjust.	6-467 6-472 6-483 6-483 6-484 6-496 6-501	612, 6-23, 6-126, 6-132, 6-138

30	Maintain clutch assembly: a. Remove/disassemble. b. Inspect/service. c. Repair. d. Reassemble/install. e. Adjust.	6-126 6-502 6-507 6-507 6-508 6-513	
31	Maintain support assembly: a. Disassemble. b. Inspect/service. c. Repair. d. Reassemble.	6-514 6-515 6-515 6-515	
32	Maintain service connection assembly: a. Remove. b. Disassemble. c. Inspect/service. d. Repair. e. Reassemble. f. Install. g. Test.	6-516 6-519 6-520 6-520 6-520 6-522 6-524	
33	Maintain auxiliary motor and pump assembly:  a. Remove. b. Disassemble. c. Inspect/service. d. Repair. e. Reassemble/aline. f. Adjust. g. Install. h. Test.	6-525 6-528 6-532 6-532 6-533 6-541 6-542 6-545	6-31, 6-71, 6-77, 6-85, 6-140, 6-142

6-3. FUEL INJECTOR PUMP TESTER-MAINTENANCE INSTRUCTIONS (cont)

LIST OF TASKS (cont)			
Task No.	Task	Task Ref (page)	Troubleshooting Ref No.(Page)
34	Maintain moisture and oil trap: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install.	6-546 6-547 6-547 6-547 6-548	
35	Maintain lube oil filter: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install.	6-549 6-550 6-550 6-550 6-551	
36	Maintain primary fuel filter: a. Remove. b. Disassemble. c. Repair. d. Reassemble. e. Install.	6-552 6-553 6-553 6-553 6-554	
37	Maintain secondary fuel filter: a. Remove. b. Disassemble. c. Repair.	6-555 6-557 6-558	

<p>38</p>	<ul style="list-style-type: none"> <li>d. Reassemble.</li> <li>e. Install.</li> <li>Maintain piping assembly:             <ul style="list-style-type: none"> <li>a. Maintain vacuum system:                 <ul style="list-style-type: none"> <li>(1) Remove/disassemble.</li> <li>(2) Inspect/service.</li> <li>(3) Repair.</li> <li>(4) Reassemble/install.</li> <li>(5) Test.</li> </ul> </li> <li>b. Maintain lube oil system:                 <ul style="list-style-type: none"> <li>(1) Remove/disassemble.</li> <li>(2) Inspect/service.</li> <li>(3) Repair.</li> <li>(4) Reassemble/install.</li> <li>(5) Test.</li> </ul> </li> <li>c. Maintain fuel system:                 <ul style="list-style-type: none"> <li>(1) Remove/disassemble.</li> <li>(2) Inspect/service.</li> <li>(3) Repair.</li> <li>(4) Reassemble/install.</li> <li>(5) Test.</li> </ul> </li> <li>d. Maintain oil drain and accumulator system:                 <ul style="list-style-type: none"> <li>(1) Remove/disassemble.</li> <li>(2) Inspect/service.</li> <li>(3) Repair.</li> <li>(4) Reassemble/install.</li> <li>(5) Test.</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>6-558</li> <li>6-559</li> <li></li> <li>6-561</li> <li>6-566</li> <li>6-566</li> <li>6-566</li> <li>6-573</li> <li></li> <li>6-575</li> <li>6-580</li> <li>6-580</li> <li>6-580</li> <li>6-587</li> <li></li> <li>6-140</li> <li>6-589</li> <li>6-597</li> <li>6-597</li> <li>6-597</li> <li>6-605</li> <li></li> <li>6-606</li> <li>6-609</li> <li>6-609</li> <li>6-609</li> <li>6-609</li> <li>6-613</li> </ul>	<ul style="list-style-type: none"> <li></li> <li></li> <li>6-85, 6-89, 6-91, 6-93</li> <li></li> <li></li> <li></li> <li></li> <li></li> <li>6-77, 6-142</li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li>6-71, 6-83,</li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> <li></li> </ul>
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**6-4. FUEL INJECTOR PUMP TESTER- MISCELLANEOUS PARTS - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |   |                                  |
|---|----------------------------------|
| a. Repair of mounting rail parts                    | e. Repair of RH latch bracket    |
| b. Repair of shouldered shaft parts                 | f. Repair of LH latch bracket    |
| c. Adjustment of shouldered shaft rear timing belt  | g. Repair of grounding connector |
| d. Adjustment of shouldered shaft front timing belt |                                  |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Abrasive cloth (item 4, app C)

Cleaning compound (item 3, app C)

Rag (item 14, app C)

**References**

TM 9-4910-387-24P

**Equipment Conditions**

Main power source to tester is turned off

4-33 RH upper side panel is removed

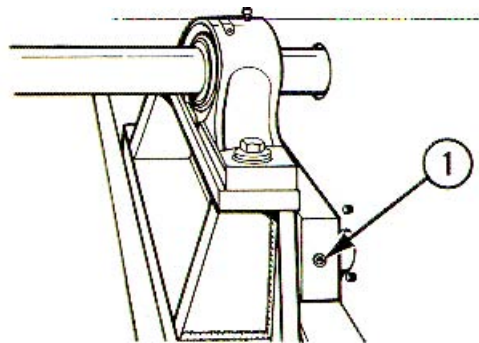
4-40 RH panel assembly is removed

4-32 Upper back panel is removed

4-34 LH upper side panel is removed

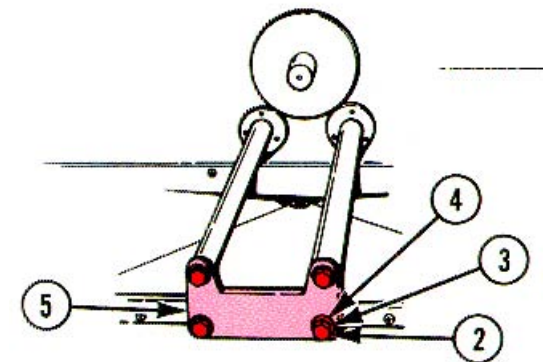
4-42 LH panel assembly is removed

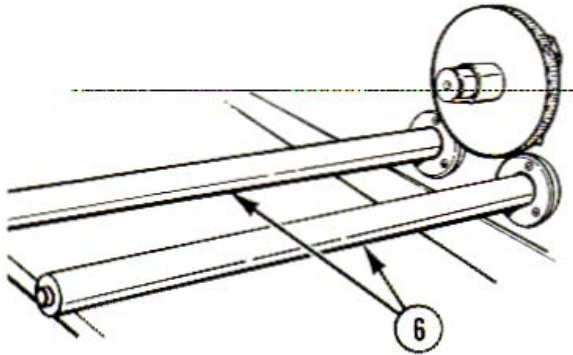
**REPAIR OF MOUNTING RAIL PARTS**



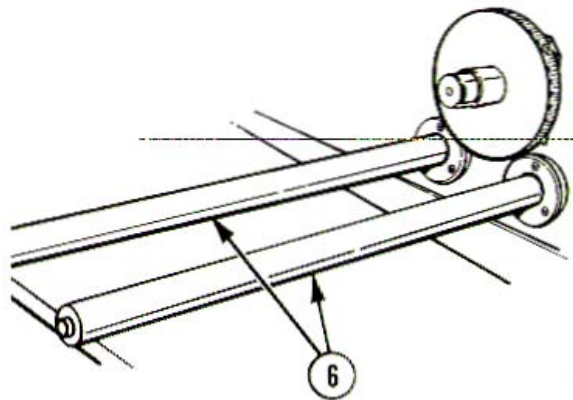
1 TWO SETSCREWS (1). Loosen.

2. FOUR SCREWS (2), FOUR LOCKWASHERS (3), FOUR FLAT WASHERS (4), AND RAIL SUPPORT (5). Remove.





3 TWO MOUNTING RAILS (6). Pull out and remove.



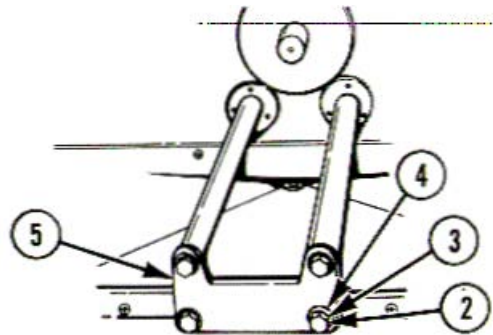
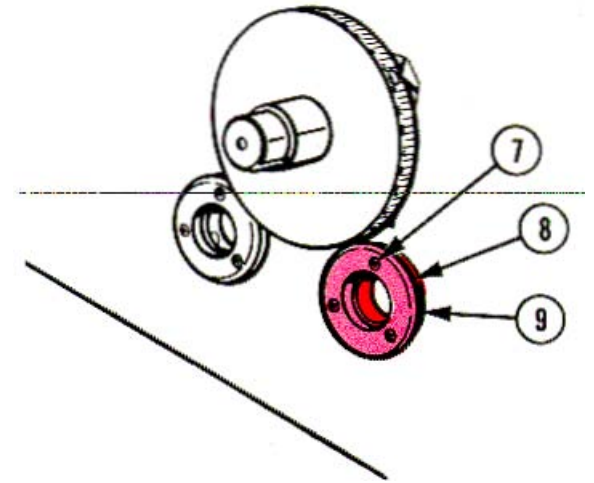
6 TWO MOUNTING RAILS (6). Install

- 4 SIX SCREWS (7), TWO FLANGES (8), AND TWO FLANGE GASKETS (9). Remove.

**NOTE**

Repair is by replacement of authorized parts (TM 94910-387-24P) as required.

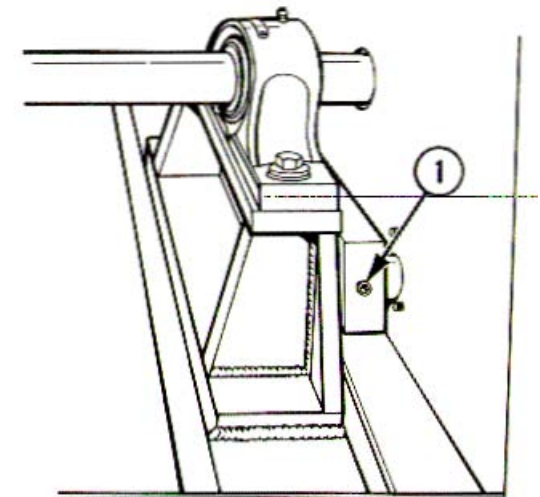
- 5 TWO FLANGE GASKETS (9), TWO FLANGES (8), AND SIX SCREWS (7). Install



**NOTE**

Pins in rail support (5) must align with holes in tester.

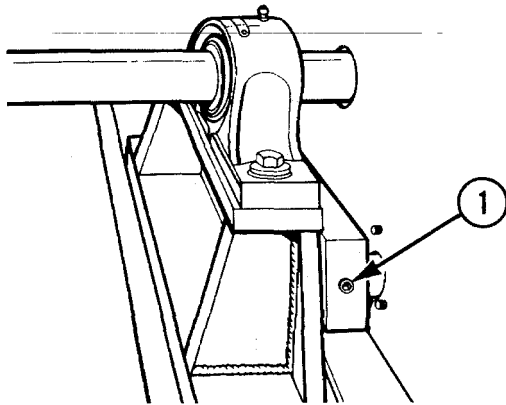
- 7 RAIL SUPPORT (5), FOUR FLAT WASHERS (4), FOUR LOCKWASHERS (3), AND FOUR SCREWS (2). Install



8 TWO SETSCREWS (1). Tighten.

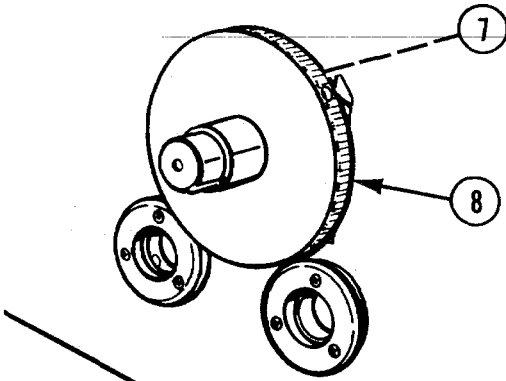
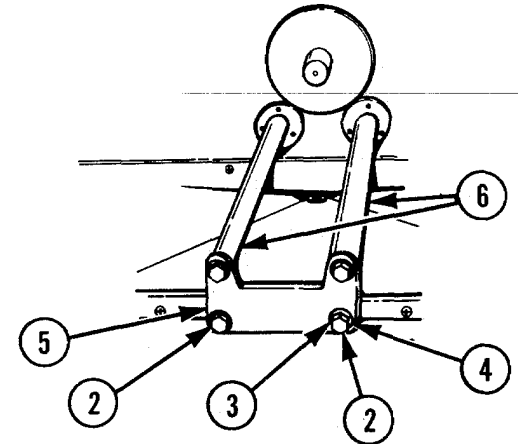
6-4. FUEL INJECTOR PUMP TESTER- MISCELLANEOUS PARTS - MAINTENANCE INSTRUCTIONS (cont)

REPAIR OF SHOULDERED SHAFT PARTS



1 TWO SETSCREWS (1). Loosen.

- 2 TWO SCREWS (2), TWO LOCKWASHERS (3), AND TWO FLAT WASHERS (4). Remove.
- 3 RAIL SUPPORT (5) AND TWO MOUNTING RAILS (6). Remove 4 SETSCREW (7). Loosen.



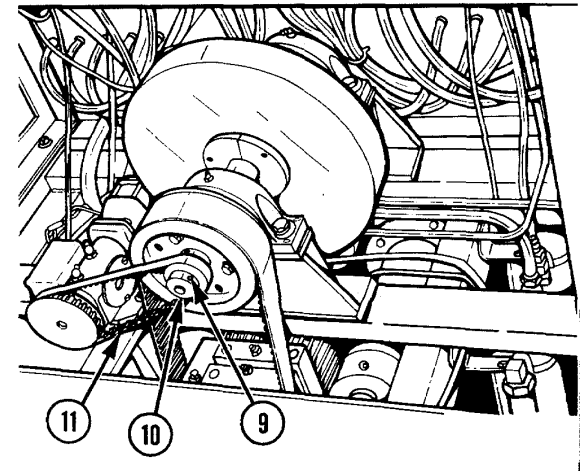
4 SETSCREW (7). Loosen  
5 PLATE (8). Remove.

- 6 SETSCREW (9). Loosen.

**NOTE**

Mark and measure location of parts on shouldered shaft before removal, to mark placement for reassembly.

- 7. TIMING BELT PULLEY 10) AND FRONT TIMING BELT (11). Remove.

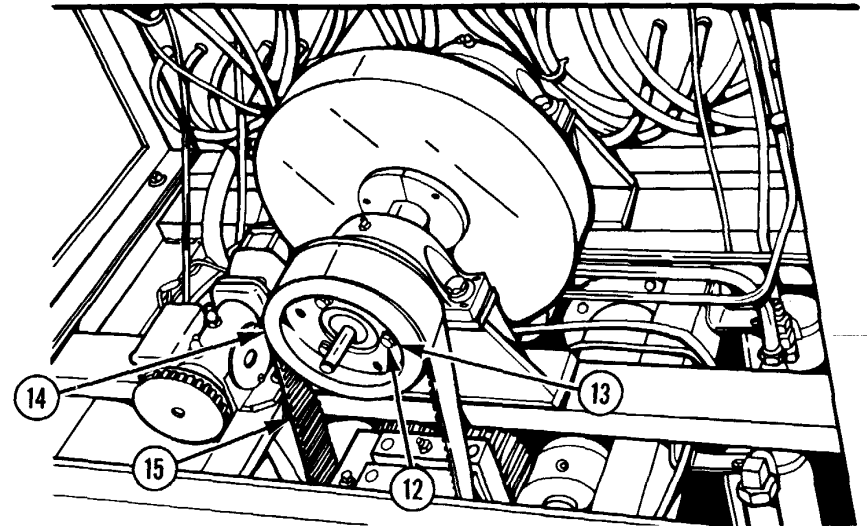


- 8 THREE SCREWS (12) AND THREE LOCKWASHERS (13).  
Remove.

**NOTE**

A gear puller may be necessary to remove sprocket.

9. SPROCKET (14) AND REAR TIMING BELT (15). Remove.

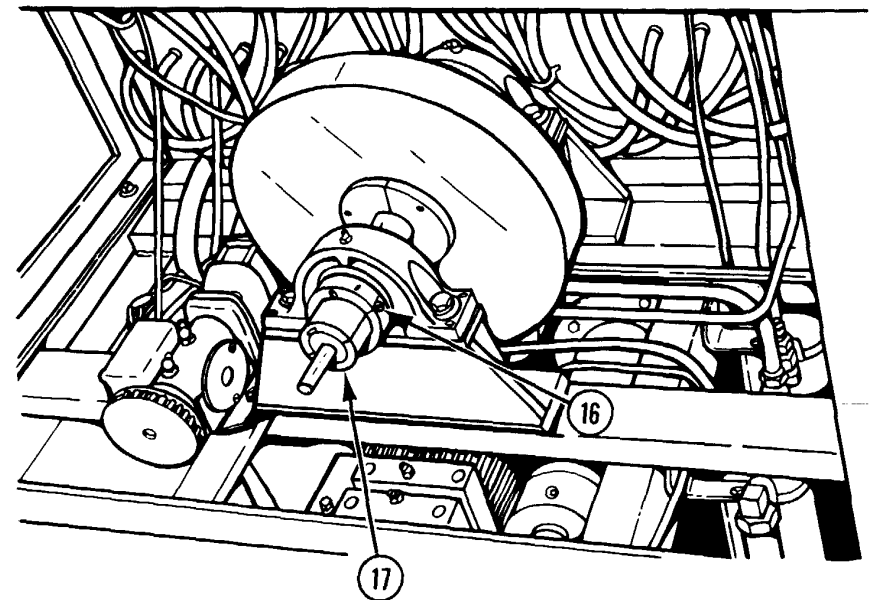


10. SETSCREW (16). Loosen.

**NOTE**

A gear puller may be necessary to remove bushing.

11. BUSHING (17). Remove.



6-4. FUEL INJECTOR PUMP TESTER MISCELLANEOUS PARTS-MAINTENANCE INSTRUCTIONS (cont)

REPAIR OF SHOULDERED SHAFT PARTS (cont)

12. KEY (18), FOUR SCREWS (19), FOUR LOCKWASHERS (20), AND FOUR FLAT WASHERS (21). Remove.

**NOTE**

On some tester models, the shaft pillow blocks are pinned to the tester frame. Pins will have to be driven out before removal.

13. TWO SHAFT PILLOW BLOCKS (22). Remove from tester frame.

**WARNING**

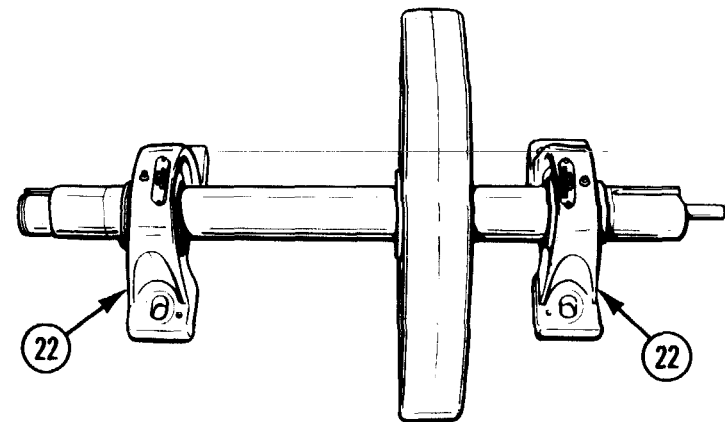
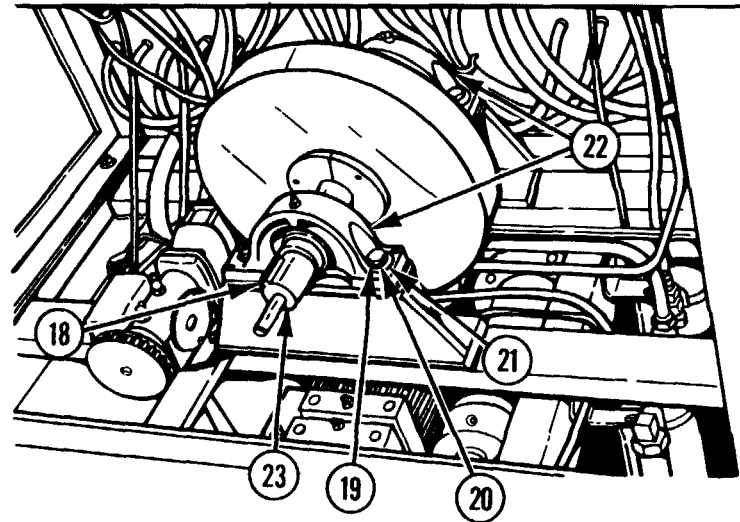
Shouldered shaft with remaining parts weighs approximately 100 lbs (45.36 kg). Be careful when removing.

14. SHOULDERED SHAFT (23) WITH ATTACHED PARTS. Pull up and out of tester.

**NOTE**

A gear puller may be necessary to remove shaft pillow blocks.

15. TWO SHAFT PILLOW BLOCKS (22).Remove.



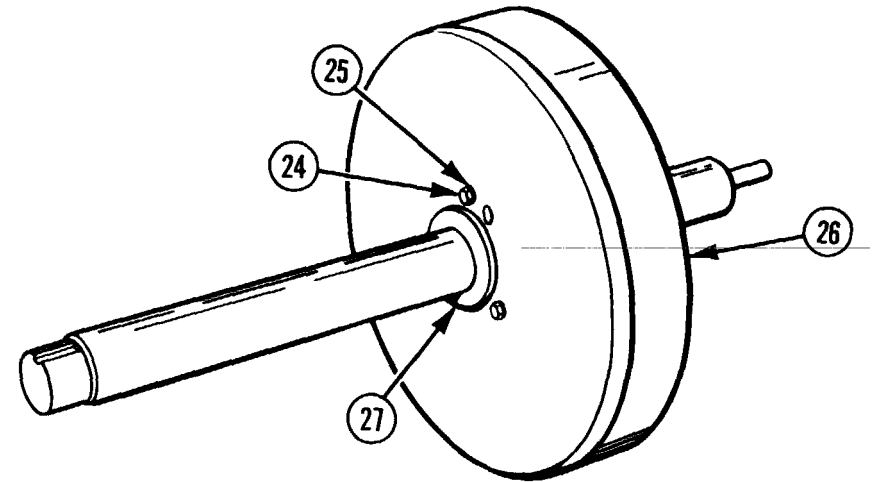


16. THREE SCREWS (24) AND THREE LOCKWASHERS (25).  
Remove.

**WARNING**

A press may be needed to remove flywheel from bushing. Grasp shouldered shaft tightly at a smooth location, not at keyway, and hold as pressure is applied. Shouldered shaft will drop as pressure is applied and could cause injury.

17. FLYWHEEL (26). Remove from bushing (27).

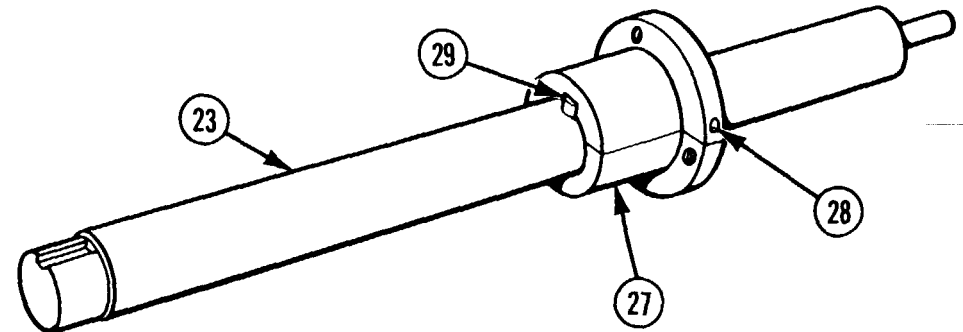


18. SETSCREW (28). Loosen.

**WARNING**

A press or gear puller may be needed to remove bushing from shouldered shaft. Grasp shouldered shaft tightly at a smooth location, not at keyway, and hold as pressure is applied. Shouldered shaft will drop as pressure is applied and could cause injury.

19. BUSHING (27) AND KEY (29).  
Remove from shouldered shaft (23).



6-4. FUEL INJECTOR PUMP TESTER MISCELLANEOUS PARTS-MAINTENANCE INSTRUCTIONS (cont)

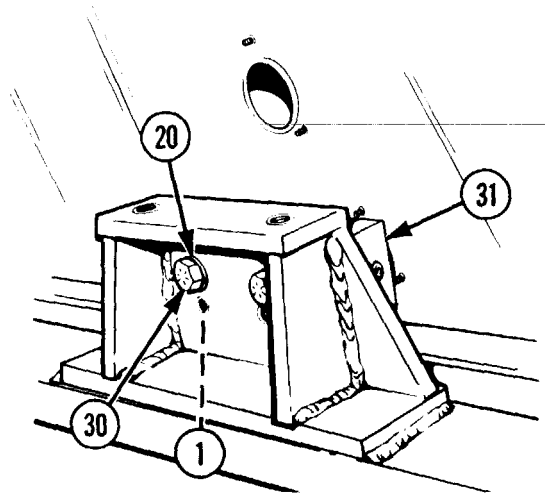
REPAIR OF SHOULDERED SHAFT PARTS (cont)

- 20. SIX SETSCREWS (1). Remove.
- 21. TWO SCREWS (30) AND TWO LOCKWASHERS (20). Remove.

**NOTE**

Rail anchor block is pinned, not welded, to tester frame. It may be necessary to pry rail anchor block from tester frame with screwdriver.

- 22. RAIL ANCHOR BLOCK (31). Remove.



**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

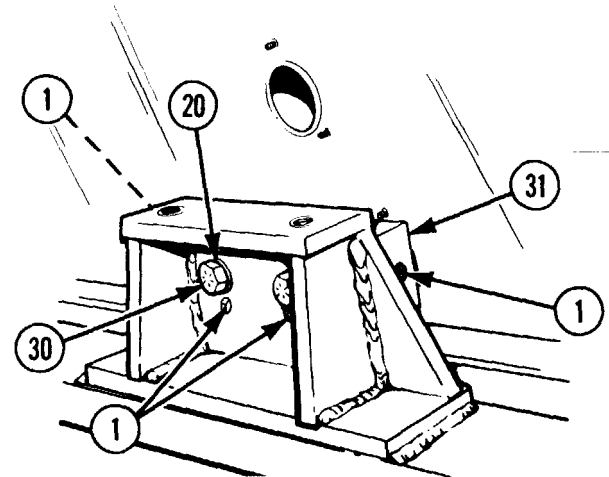
- 23. ALL PARTS. Clean with cleaning compound (item 3, app C) and rag (item 14, app C) before reassembly. Use of abrasive cloth (item 4, app C) may be necessary.

**NOTE**

Pins in rail anchor block must align with holes in tester frame.

Use four setscrews to level rail anchor block (31) with tester frame.

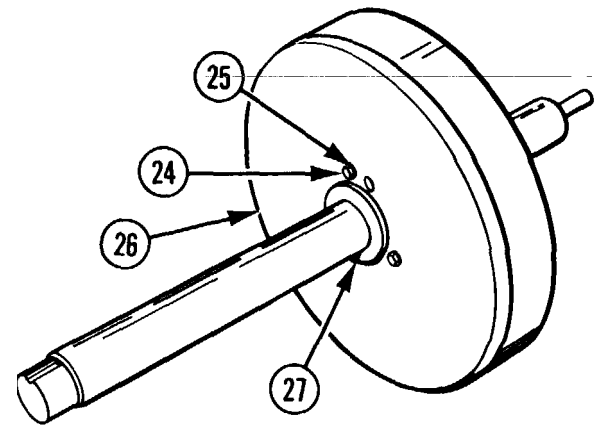
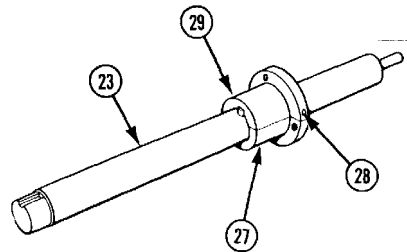
- 24. RAIL ANCHOR BLOCK (31), TWO LOCKWASHERS (20), TWO SCREWS (30), AND SIX SETSCREWS (1). Install.



**NOTE**

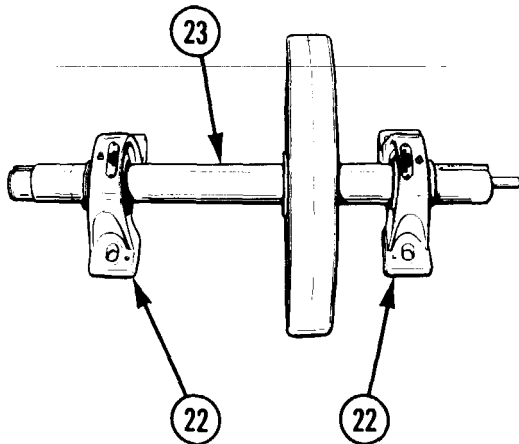
Shouldered shaft part locations should be marked and measured for reassembly.

A press may be necessary to install bushings, flywheel, shaft pillow blocks, and sprocket.



- 25 KEY (29) AND BUSHING (27). Install in shouldered shaft (23).
- 26 SETSCREW (28). Tighten.

- 27 FLYWHEEL (26), THREE LOCK WASHERS (25), AND THREE SCREWS (24). Install on bushing (27).

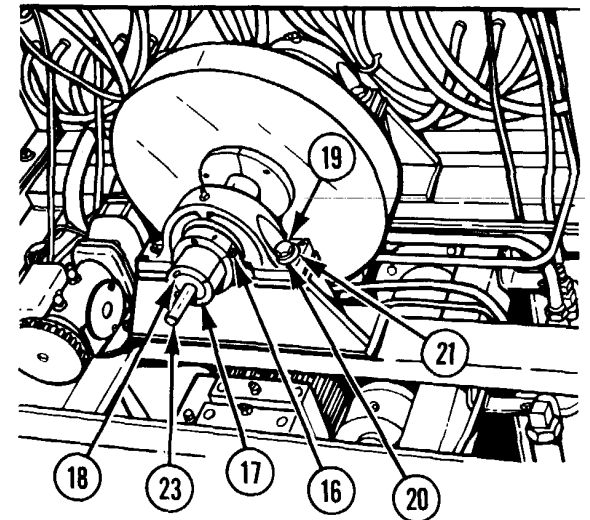


- 28 TWO SHAFT PILLOW BLOCKS (22). Install on shouldered shaft (23).

**NOTE**

Some tester models have pins to secure shaft pillow blocks to tester frame. Aline holes in shaft pillow blocks and tester frame, then drive pins in.

- 29 SHOULDERED SHAFT (23) WITH ATTACHED PARTS. Position on tester and locate shaft pillow blocks on tester frame.
- 30 FOUR FLAT WASHERS (21), FOUR LOCKWASHERS (20), AND FOUR SCREWS (19). Install.
- 31 KEY (18) AND BUSHING (17). Install on shouldered shaft (23).
- 32 SETSCREW (16). Tighten.



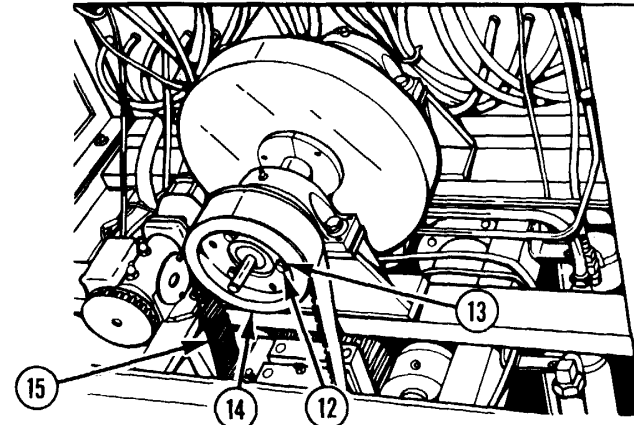
6-4. FUEL INJECTOR PUMP TESTER MISCELLANEOUS PARTS-MAINTENANCE INSTRUCTIONS (cont)

REPAIR OF SHOULDERED SHAFT PARTS (cont)

**NOTE**

Rear timing belt must be adjusted at this time, refer to page 6-183.

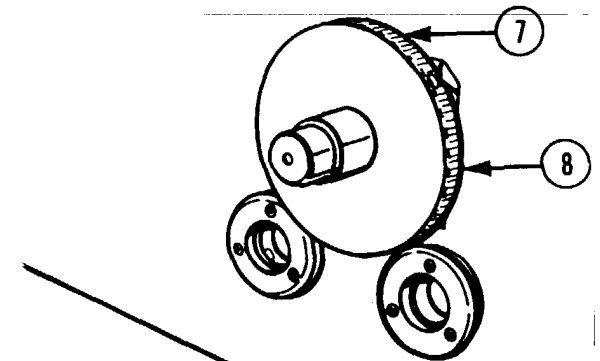
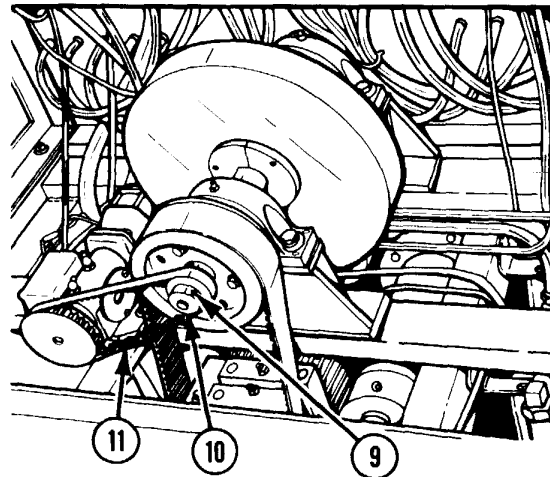
- 33 REAR TIMING BELT (15) AND SPROCKET (14). Install.
- 34 THREE LOCKWASHERS (13) AND THREE SCREWS (12). Install.



**NOTE**

Front timing belt must be adjusted at this time, refer to page 6-185.

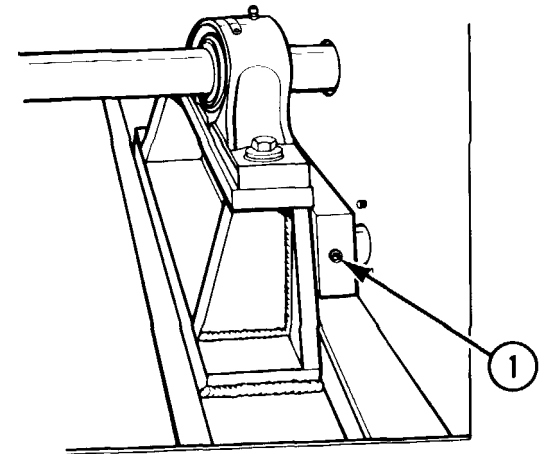
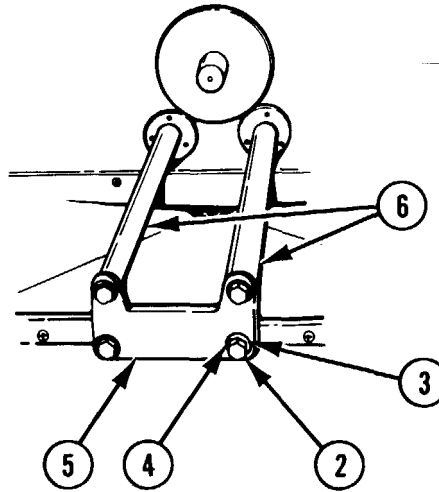
- 35 FRONT TIMING BELT (11) AND TIMING BELT PULLEY (10). Install.
- 36 SETSCREW (9). Tighten.



- 37 PLATE (8). Install.
- 38 SETSCREW (7). Tighten.

39 TWO MOUNTING RAILS (6) AND RAIL SUPPORT (5). Position on tester.

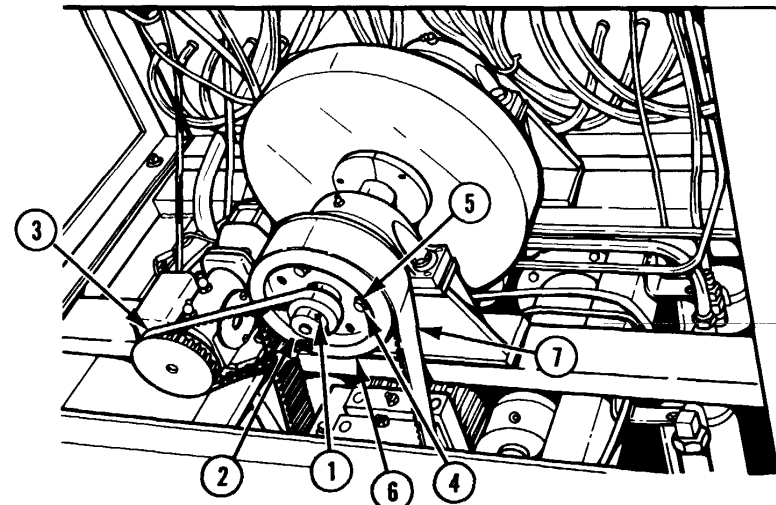
40 TWO FLAT WASHERS (4), TWO LOCKWASHERS (3), AND TWO SCREWS (2). Install.



41 TWO SETSCREWS (1). Tighten.

#### ADJUSTMENT OF SHOULDERED SHAFT REAR TIMING BELT

- 1 SETSCREW (1). Loosen.
- 2 TIMING BELT PULLEY (2) AND FRONT TIMING BELT (3). Remove.
- 3 THREE SCREWS (4) AND THREE LOCKWASHERS (5). Remove.
- 4 SPROCKET (6) AND REAR TIMING BELT (7). Remove.

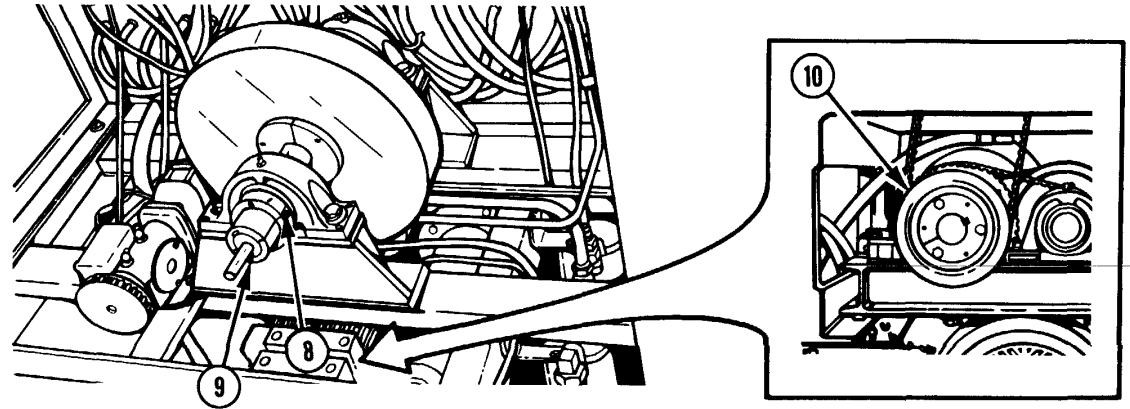




6-4. FUEL INJECTOR PUMP TESTER MISCELLANEOUS PARTS-MAINTENANCE INSTRUCTIONS (cont)

ADJUSTMENT OF SHOULDERED SHAFT REAR TIMING BELT (cont)

- 5 SETSCREW (8). Loosen.
- 6 BUSHING (9). Line up with timing belt sprocket (10) on drive unit assembly.
- 7 SETSCREW (8). Tighten.

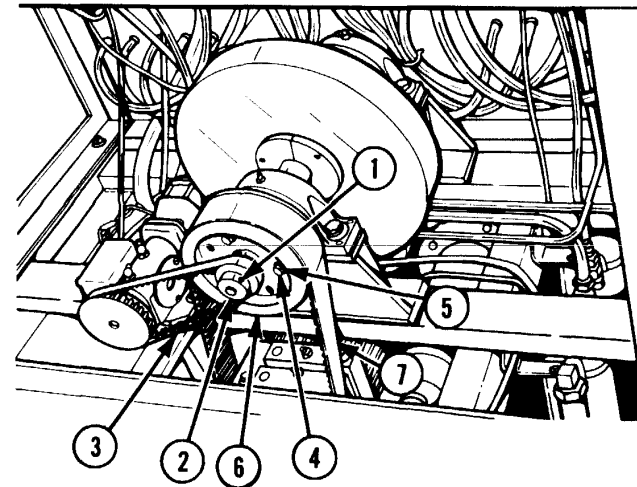


- 8 REAR TIMING BELT (7) AND SPROCKET (6). Install.
- 9 THREE LOCKWASHERS (5) AND THREE SCREWS (4). Install.
- 10 REAR TIMING BELT (7).
  - a. Check alinement.
  - b. If not alined, repeat steps 3 thru 9 above.

**NOTE**

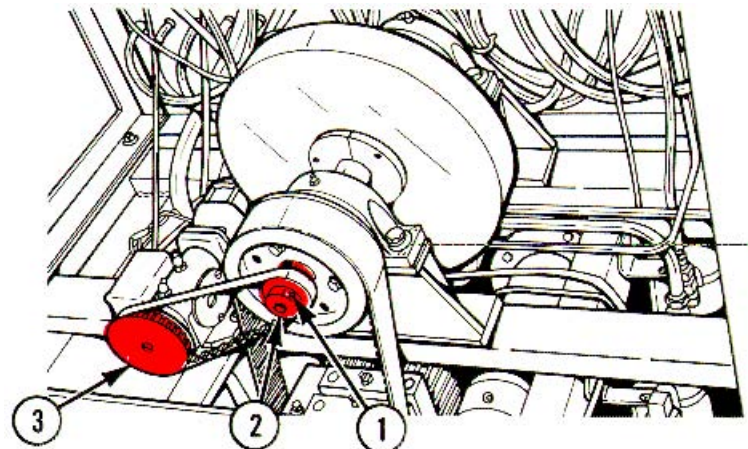
To adjust front timing belt, refer to page 6-185.

- 11 FRONT TIMING BELT (3) AND TIMING BELT PULLEY (2). Install.
- 12 SETSCREW (1). Tighten.



**ADJUSTMENT OF SHOULDERED SHAFT FRONT TIMING BELT.**

- 1 SETSCREW (1). Loosen.
- 2 TIMING BELT PULLEY (2). Line up with timing belt pulley (3).
- 3 SETSCREW (1). Tighten.



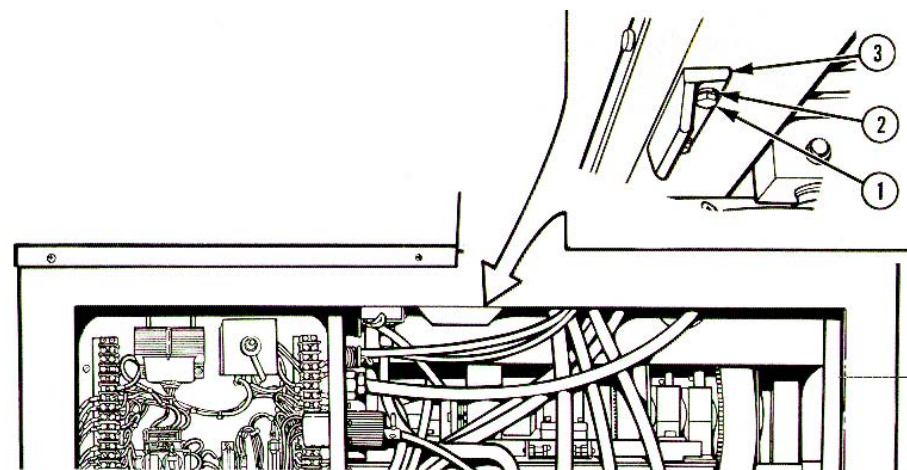
**REPAIR OF RH LATCH BRACKET**

- 1 TWO SCREWS (1), TWO LOCKWASHERS (2), AND LATCH BRACKET (3). Remove.

**NOTE**

Repair is by replacement of authorized parts (TM 94910-387-24P) as required.

- 2 LATCH BRACKET (3), TWO LOCKWASHERS (2), AND TWO SCREWS (1). Install.



6-4. FUEL INJECTOR PUMP TESTER MISCELLANEOUS PARTS-MAINTENANCE INSTRUCTIONS (cont)

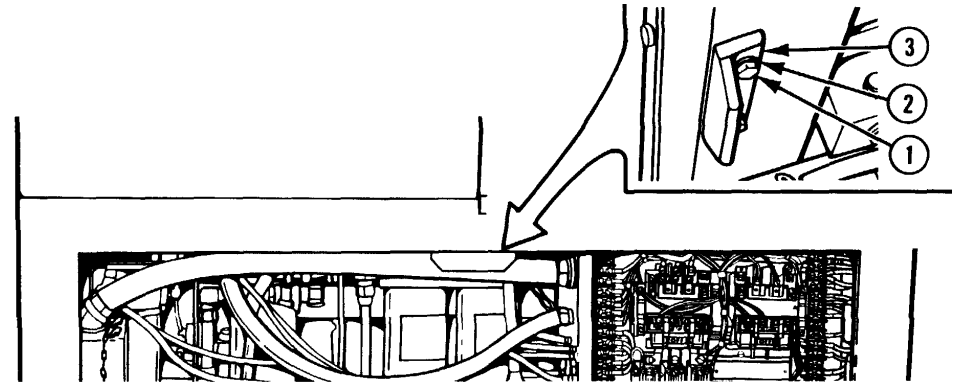
REPAIR OF LH LATCH BRACKET

- 1 TWO SCREWS (1), TWO LOCKWASHERS (2), AND LATCH BRACKET (3). Remove.

**NOTE**

Repair is by replacement of authorized parts (TM 94910-387-24P) as required.

- 2 LATCH BRACKET (3), TWO LOCKWASHERS (2), AND TWO SCREWS (1). Install.



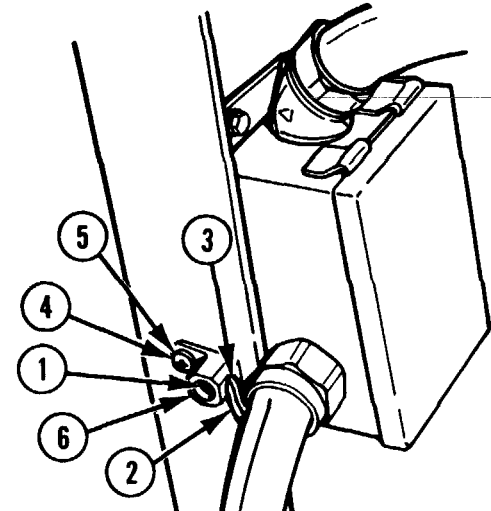
REPAIR OF GROUNDING CONNECTOR

- 1 SETSCREW (1). Remove.
- 2 TWO GROUND WIRES (2 AND 3). Pull out.
- 3 SCREW (4), WASHER (5), AND CONNECTOR (6). Remove.

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

- 4 CONNECTOR (6), WASHER (5), AND SCREW (4). Install.
- 5 TWO GROUND WIRES (2 AND 3). Insert into side of connector (6).
- 6 SETSCREW (1). Install and tighten down on two ground wires (2 and 3).



**6-5. RH CONTROL EQUIPMENT ASSEMBLY - MAINTENANCE INSTRUCTION****THIS TASK COVERS:**

- |  |   |
|--|---|
| a. Removal                                   | g. Reassembly of RH enclosure assembly      |
| b. Disassembly of RH control panel assembly  | h. Reassembly of RH mounting board assembly |
| c. Disassembly of RH mounting board assembly | i. Reassembly of RH control panel assembly  |
| d. Disassembly of RH enclosure assembly      | j. Installation                             |
| e. Servicing                                 | k. Test                                     |
| f. Repair                                    |   |

**INITIAL SETUP**

## Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

## Materials/Parts

Abrasive cloth (item 4, app C)  
 Cleaning compound (item 3, app C)  
 Rag (item 14, app C)  
 Solder (item 18, app C)

## References

TM 9-4910-387-24P

## Troubleshooting References

6-144 Burettes will not fill up  
 6-95 Counting circuit does not function

6-111 COUNTING light does not light

6-48 FUEL HEAT light does not light, FUEL HEAT switch is on

6-62 Fuel will not heat to desired temperature

6-55 LUBE HEAT light does not light, LUBE HEAT switch is on

6-63 Lube oil will not heat to desired temperature

6-64 No power at 24 VOLTS DC outlet assembly

## Equipment Conditions

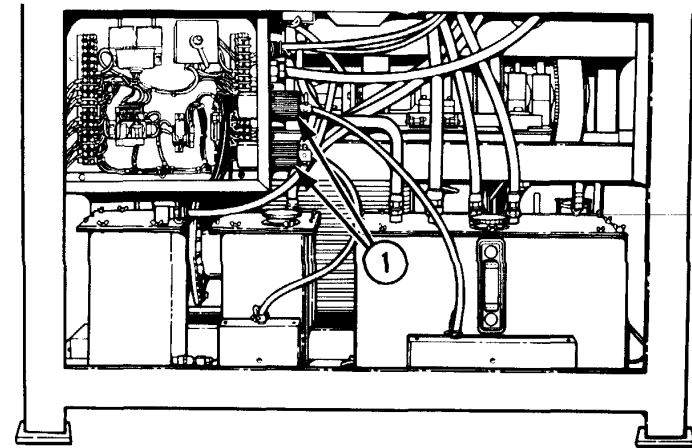
Main power source to tester is turned off

4-40 RH panel assembly is removed

## 6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

## REMOVAL

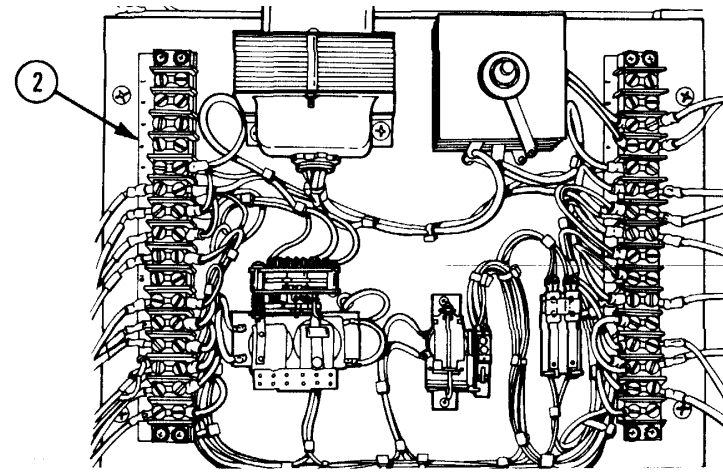
- 1 TWO MALE CONNECTOR PLUGS (1). Remove.

**NOTE**

Before disconnecting and removing wires, ensure that wires are identified and tagged for reassembly.

The terminal strip on the LH side of the RH mounting board assembly is referred to as terminal strip C.

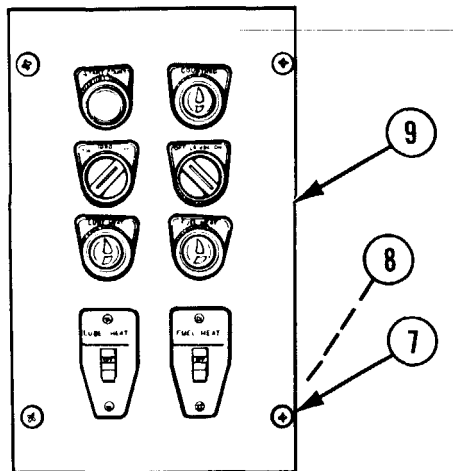
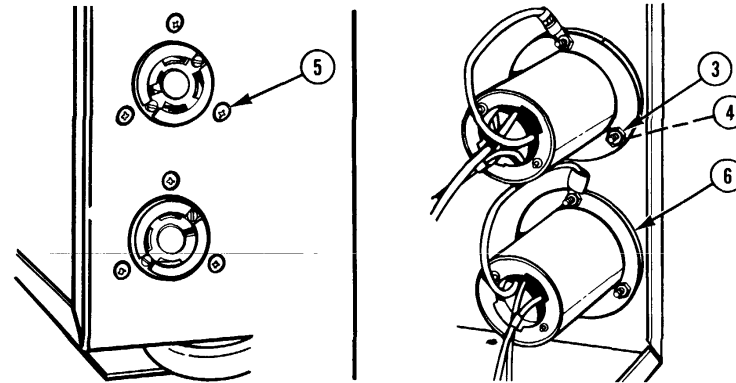
- 2 TERMINAL STRIP C (2). Remove ten screws and disconnect the thirteen wires connected to the LH terminals.





3 SIX NUTS (3), SIX LOCKWASHERS (4), AND SIX SCREWS (5). Remove.

4 TWO FLUSH MOTOR BASES (6). Remove.

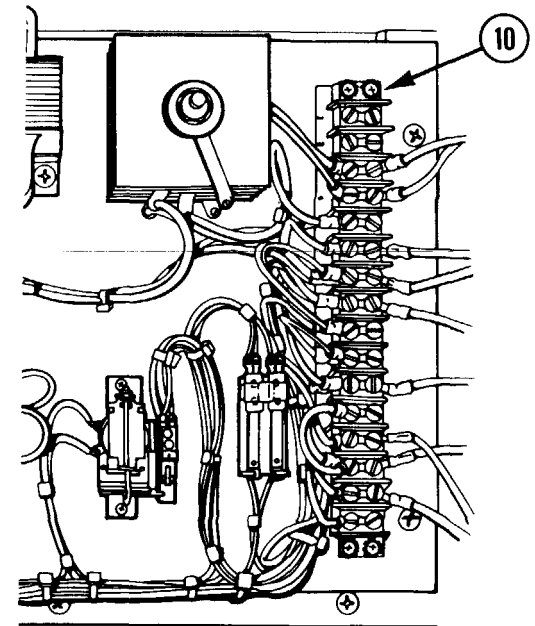


5 FOUR SCREWS (7) AND FOUR LOCKWASHERS (8). Remove.

6 RH CONTROL PANEL ASSEMBLY (9). Remove.

**NOTE**  
The terminal strip on the RH side of the RH mounting board assembly is referred to as terminal strip D.

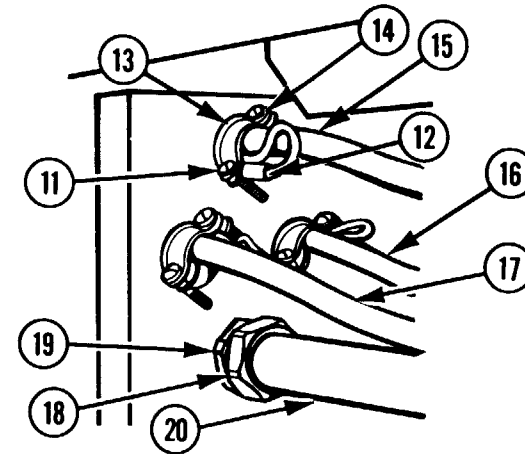
7 TERMINAL STRIP D (10). Remove nine screws and disconnect the nine wires connected to the RH terminals.



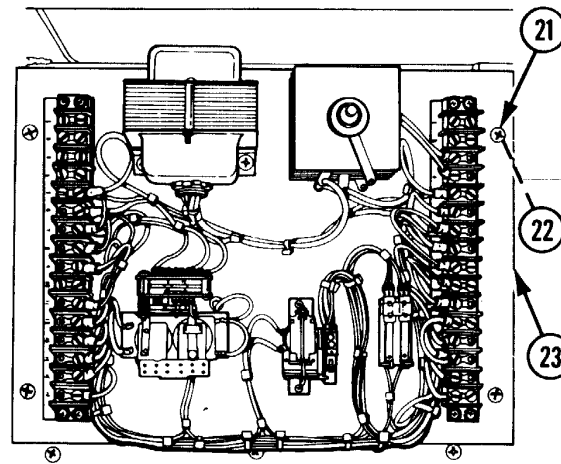
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

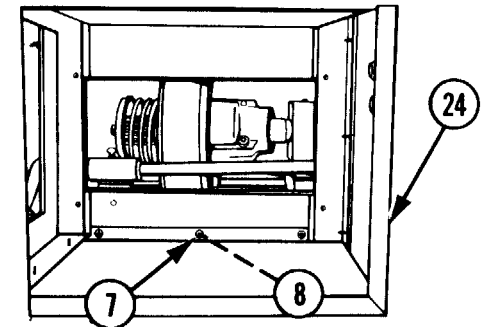
- 8 THREE SCREWS (11) AND THREE GROUND WIRES EACH WITH A TERMINAL LUG (12). Remove from three straight box connectors (13).
- 9 THREE SCREWS (14). Loosen.
- 10 THREE WIRE CABLES (15, 16, AND 17). Pull through three straight box connectors (13).
- 11 NUT (18). Remove from straight box connector (19).
- 12 WIRE CABLE (20). Pull through straight box connector (19).



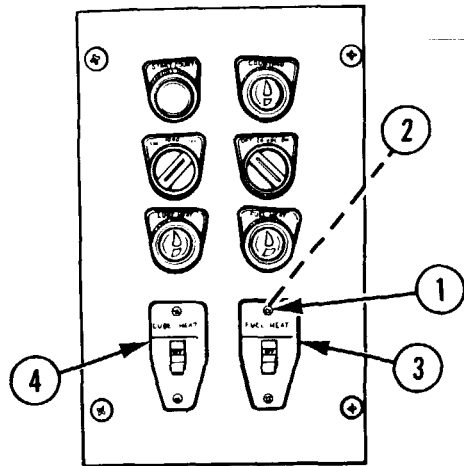
- 13 FOUR SCREWS (21) AND FOUR LOCKWASHERS (22). Remove.
- 14 RH MOUNTING BOARD ASSEMBLY (23). Remove.



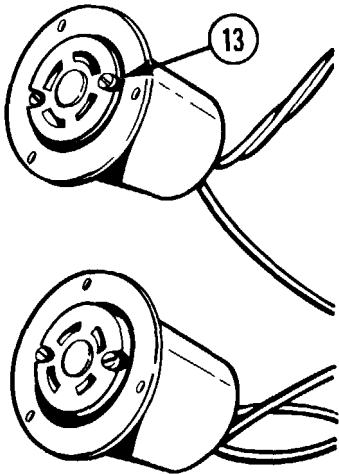
- 15 EIGHT SCREWS (7) AND EIGHT LOCKWASHERS (8). Remove.
- 16 RH ENCLOSURE ASSEMBLY (24). Remove.



**DISASSEMBLY OF RH CONTROL PANEL ASSEMBLY**



1 FOUR SCREWS (1), FOUR LOCKWASHERS (2), AND TWO SWITCH PLATES (3 AND 4). Remove.

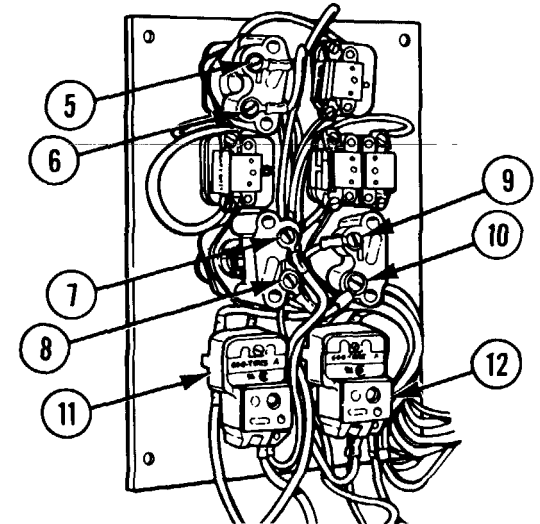


4 FOUR SCREWS (13). Remove.

**NOTE**

Before disconnecting and removing wires, ensure that all wires are identified and tagged for reassembly.

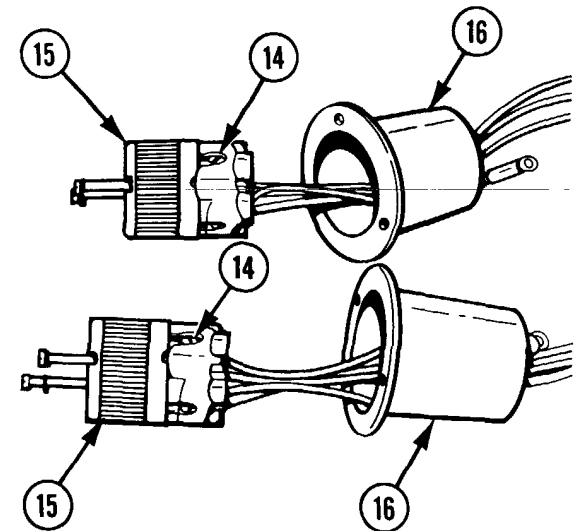
- 2 SIX SCREWS (5 THRU 10) AND SIX ATTACHED WIRES. Remove.
- 3 FUEL HEAT SWITCH (11) AND LUBE HEAT SWITCH (12). Remove.



**NOTE**

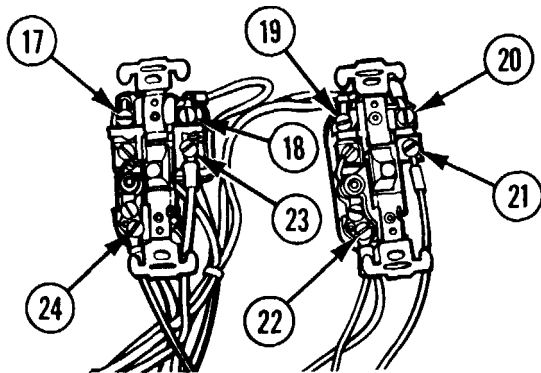
Mark wires and both female connector plugs for reassembly. Plugs are part of flush motor bases.

- 5 EIGHT SCREWS (14). Loosen and remove eight attached wires.
- 6 TWO FEMALE CONNECTOR PLUGS (15). Remove.
- 7 TWO FLUSH MOTOR BASES (16). Remove.



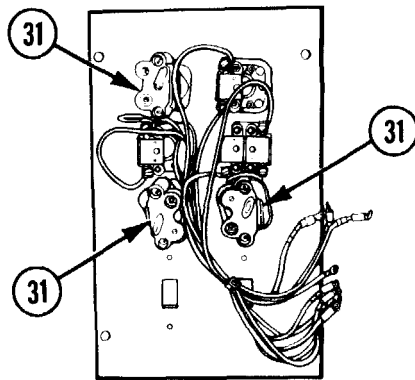
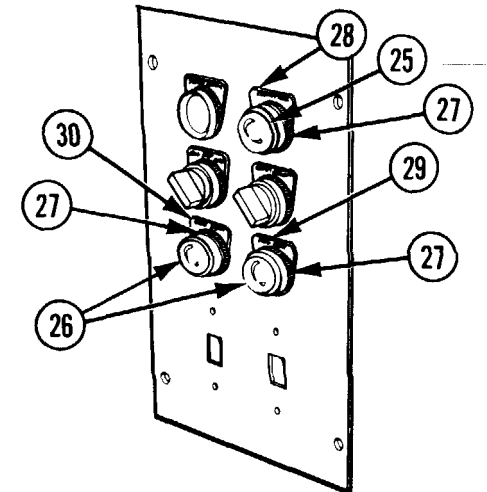
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY OF RH CONTROL PANEL ASSEMBLY (cont)

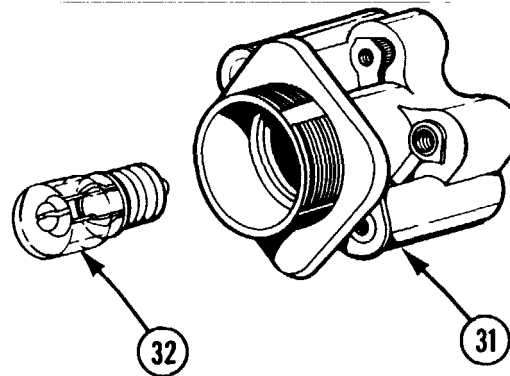


8 EIGHT SCREWS (17 THRU 24) AND TEN ATTACHED WIRES. Remove.

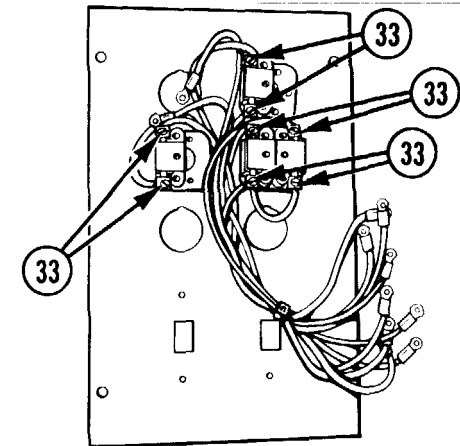
9 AMBER LENS (25), TWO CLEAR LENSES (26), THREE LENS CAPS (27), AND THREE LEGEND PLATES (28, 29, AND 30). Remove.



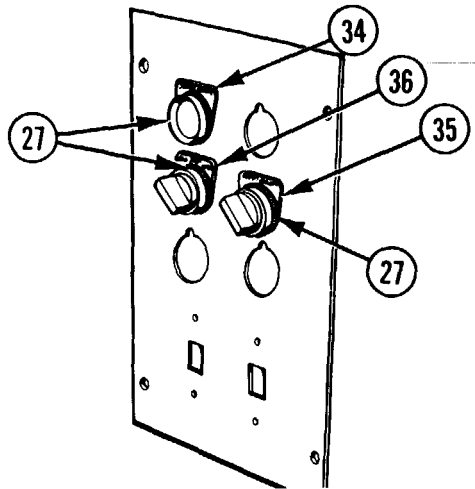
10 THREE INDICATOR LIGHTS (31) FOR COUNTING LIGHT, LUBE HEAT LIGHT, AND FUEL HEAT LIGHT. Remove



11 THREE CLEAR LAMPS (32). Remove from three indicator lights (31).



12 EIGHT SCREWS (33) AND EIGHT REMOVE. ATTACHED WIRES..



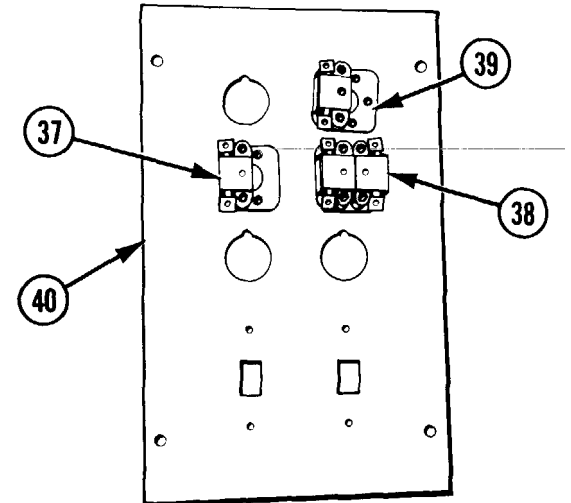
13 THREE LENS CAPS (27) AND THREE LEGEND PLATES (34, 35, AND 36). Remove.

**DISASSEMBLY OF RH MOUNTING BOARD ASSEMBLY**

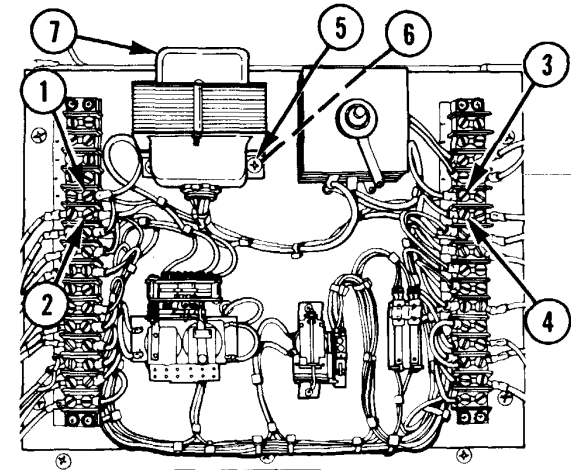
**NOTE**

Before disconnecting and removing wires, ensure that wires are identified and tagged for reassembly. Remove wire ties to facilitate removal of wires.

14 24-VDC SWITCH (37), 500-1000-OFF SWITCH (38), AND START COUNT SWITCH (39). Remove from RH control panel (40).



- 1 TWO SCREWS (1 AND 2) AND THREE ATTACHED WIRES. Remove from terminals C5 and C6.
- 2 TWO SCREWS (3 AND 4) AND FOUR ATTACHED WIRES. Remove from terminals D5 and D6.
- 3 FOUR SCREWS (5) AND FOUR LOCKWASHERS (6). Remove.
- 4 CONTROL TRANSFORMER (7). Remove.

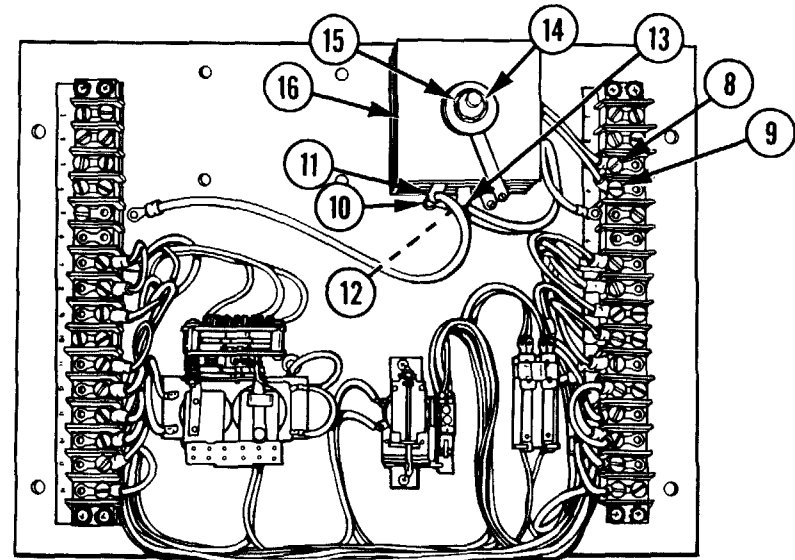




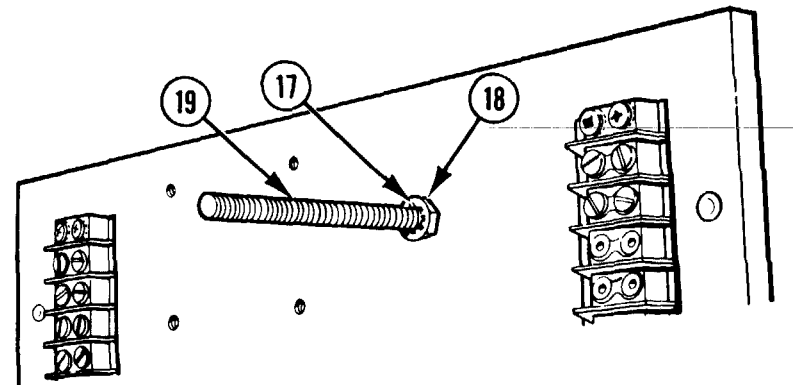
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)

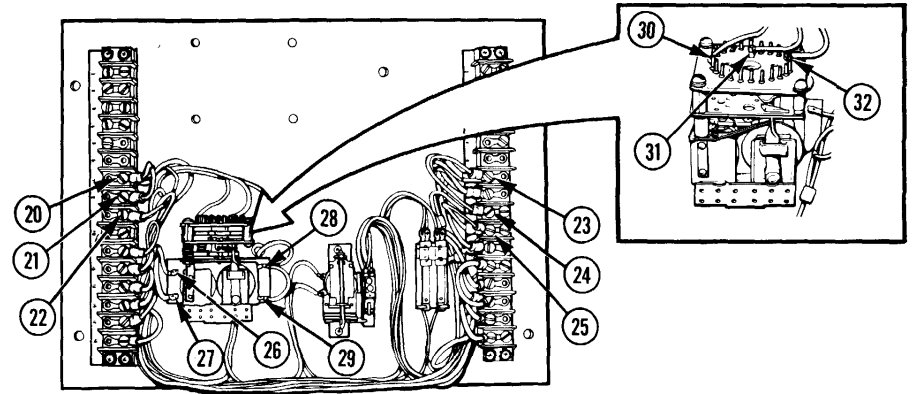
- 5 TWO SCREWS (8 AND 9) AND TWO ATTACHED WIRES. Remove from terminals D3 and D4.
- 6 FOUR SELENIUM RECTIFIER CONTACTS (10 THRU 13). Desolder and remove four wires.
- 7 NUT (14) AND WASHER (15). Remove.
- 8 SELENIUM RECTIFIER (16). Remove.



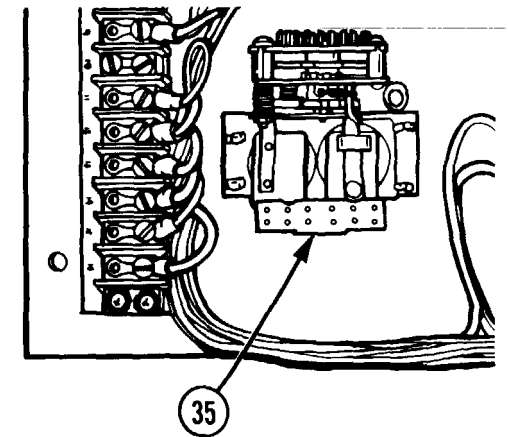
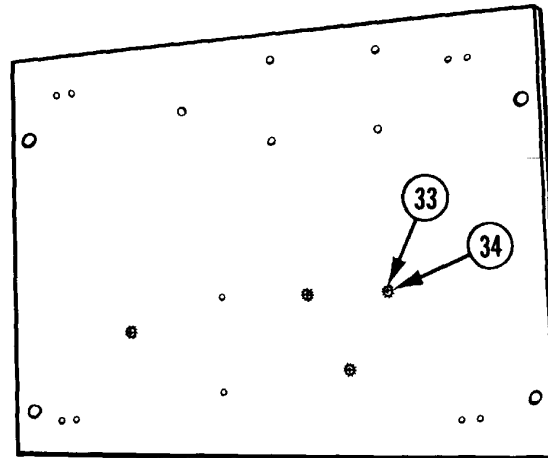
- 9 LOCKWASHER (17), NUT (18), AND BOLT (19). Remove.



- 10 THREE SCREWS (20, 21, AND 22) AND SEVEN ATTACHED WIRES. Remove from terminals C7, C8, and C9.
- 11 THREE SCREWS (23, 24, AND 25) AND EIGHT ATTACHED WIRES. Remove from terminals D7, D9, and D10.
- 12 FOUR CONTACTS (26 THRU 29). Desolder and remove four wires.
- 13 THREE CONTACTS (30, 31, AND 32). Desolder and remove three wires.



- 14 THREE SCREWS (33) AND THREE LOCKWASHERS (34). Remove.

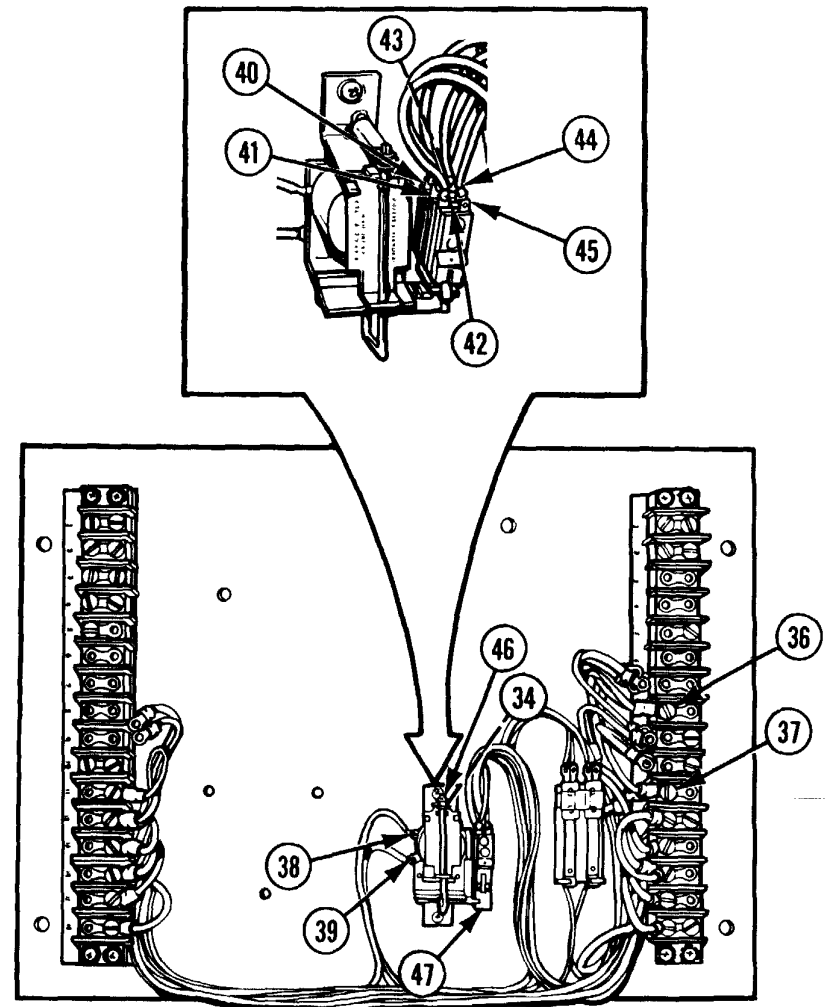


- 15 STEPPING RELAY (35). Remove.

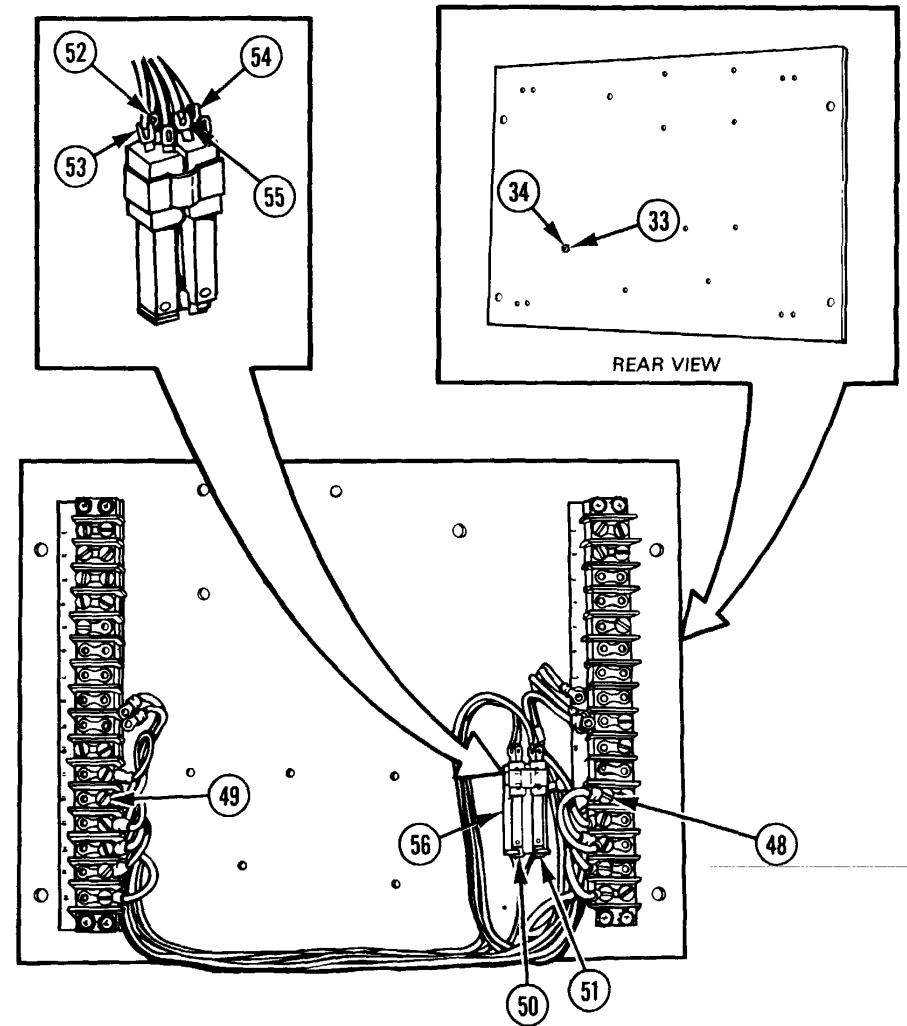
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)

- 16 TWO SCREWS (36 AND 37) AND FOUR ATTACHED WIRES.  
Remove from terminals D8 and D11.
- 17 TWO CONTACTS (38 AND 39). Desolder and remove two wires.
- 18 SIX CONTACTS (40 THRU 45). Desolder and remove six wires.
- 19 TWO SCREWS (46) AND TWO LOCKWASHERS (34). Remove.
- 20 LATCHING RELAY (47). Remove.



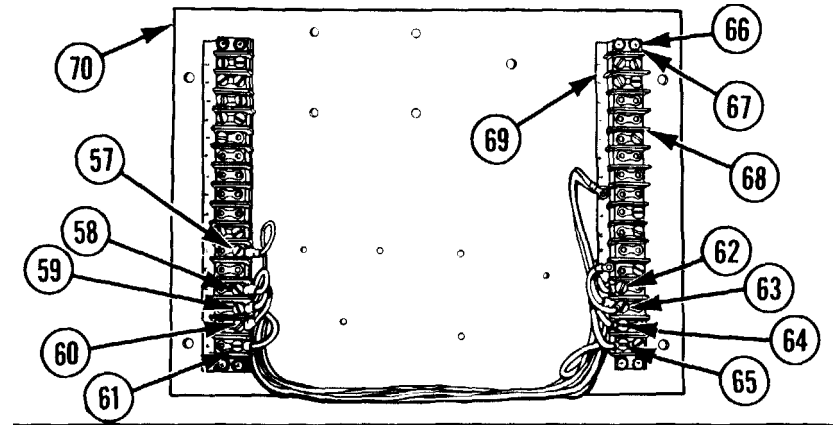
- 21 SCREW (48) AND TWO ATTACHED WIRES. Remove from terminal D12.
- 22 SCREW (49) AND TWO ATTACHED WIRES. Remove from terminal C12.
- 23 TWO CONTACTS (50 AND 51). Desolder and remove two attached wires.
- 24 FOUR CONTACTS (52 THRU 55). Desolder and remove four wires.
- 25 SCREW (33) AND LOCKWASHER (34). Remove.
- 26 HOLDING RELAY (56). Remove.



**6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

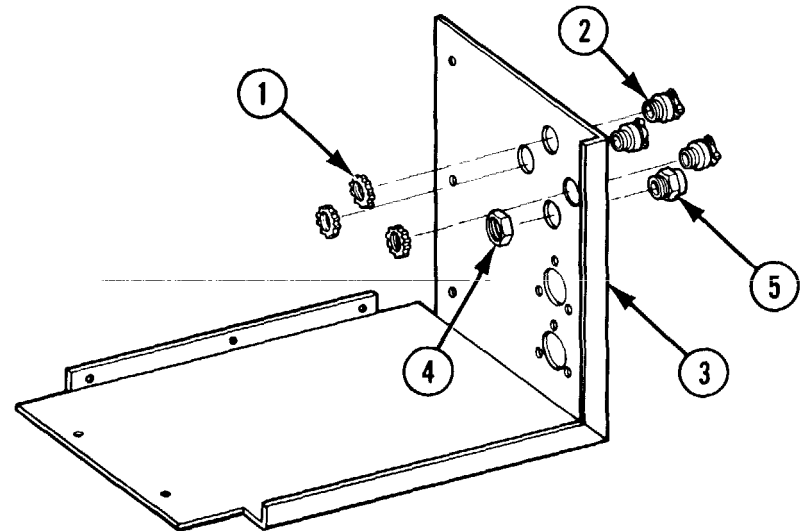
**DISASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)**

- 27 NINE SCREWS (57 THRU 65) AND ELEVEN ATTACHED WIRES. Remove from terminals C11, C13 thru C16, and terminals D13 thru D16.
- 28 EIGHT SCREWS (66), EIGHT LOCKWASHERS (67), TWO TERMINAL STRIPS (68), AND TWO NUMBER STRIPS (69). Remove from RH mounting board (70).



**DISASSEMBLY OF RH ENCLOSURE ASSEMBLY**

- 1 THREE NUTS (1). Remove.
- 2 THREE STRAIGHT BOX CONNECTORS (2). Remove from RH enclosure (3).
- 3 NUT (4). Remove.
- 4 STRAIGHT BOX CONNECTOR (5). Remove from RH enclosure (3).





**SERVICING**

- 1 ALL ELECTRICAL PARTS. Remove dust using rag (item 14, app C).
- 2 ELECTRICAL CONTACTS. Clean with abrasive cloth (item 4, app C).
- 3 RH CONTROL PANEL AND RH EN CLOSURE. Clean with cleaning compound (item 3, app C) using rag (item 14, app C).

**REASSEMBLY OF RH ENCLOSURE ASSEMBLY**

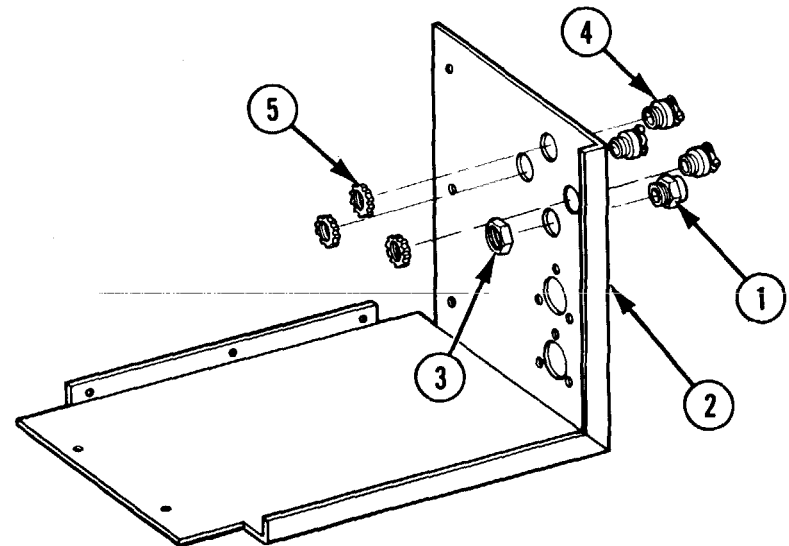
- 1 STRAIGHT BOX CONNECTOR (1). Install in RH enclosure (2).
- 2 NUT (3). Install on straight box connector (1).
- 3 THREE STRAIGHT BOX CONNECTORS (4). Install in RH enclosure (2).
- 4 THREE NUTS (5). Install on three straight box connectors (4).

**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

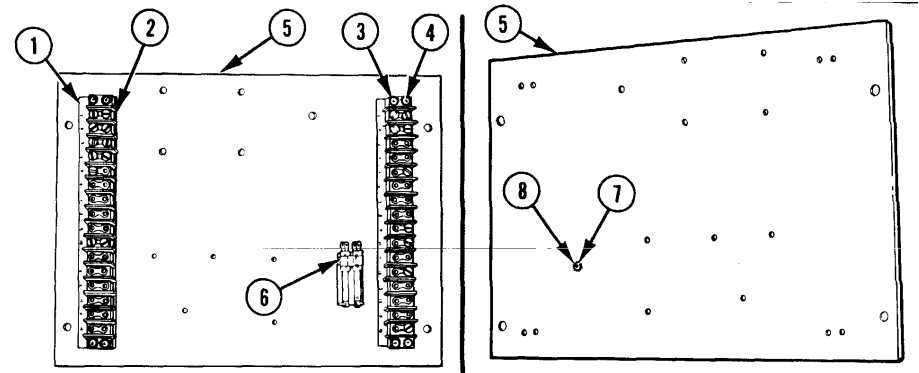
For replacement of wire, refer to items 25 thru 32, app C. Refer also to wiring diagram, p 6-146, and wire table, p 6-149. Fabricate new wire by using old wire as template. Crimp appropriate terminal lug (items 21 thru 24, app C) on wire end as required. Be sure to tag termination points on any new wire.



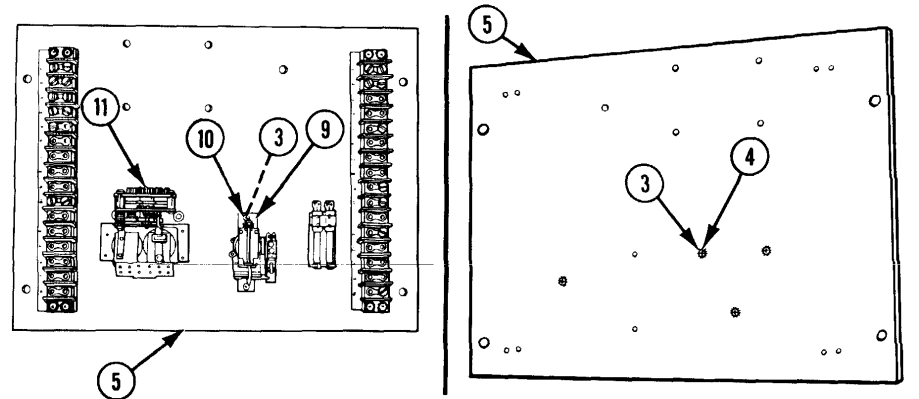
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY OF RH MOUNTING BOARD ASSEMBLY

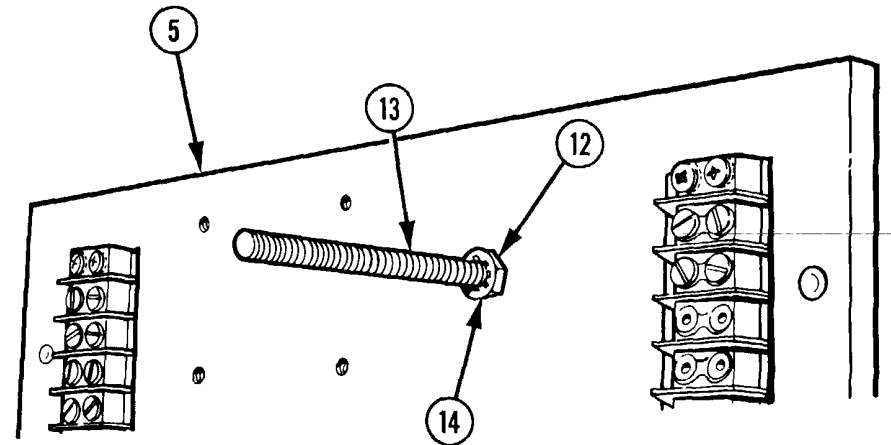
- 1 TWO NUMBER STRIPS (1), TWO TERMINAL STRIPS (2), EIGHT LOCKWASHERS (3), AND EIGHT SCREWS (4). Install on RH mounting board (5).
- 2 HOLDING RELAY (6). Position on RH mounting board (5).
- 3 LOCKWASHER (7) AND SCREW (8). Install through rear of RH mounting board (5) into holding relay.



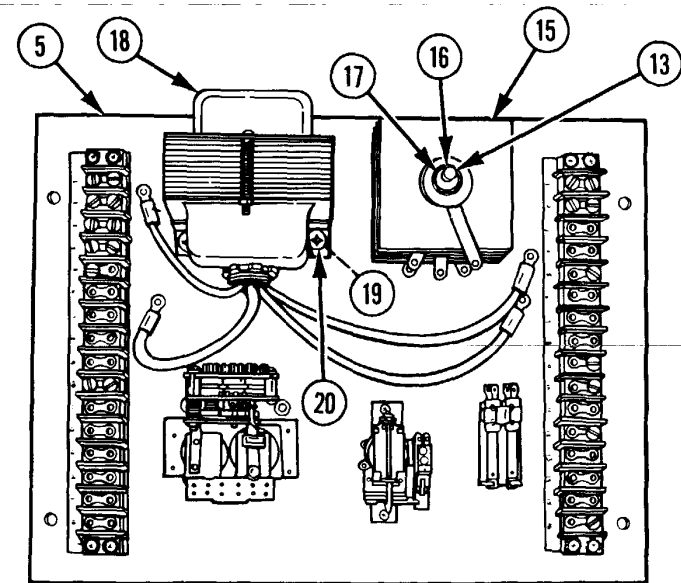
- 4 LATCHING RELAY (9), TWO LOCKWASHERS (3), AND TWO SCREWS (10). Install on RH mounting board (5).
- 5 STEPPING RELAY (11). Position on RH mounting board (5).
- 6 THREE LOCKWASHERS (3) AND THREE SCREWS (4). Install through rear of RH mounting board (5) into stepping relay.



- 7 NUT (12). Install on bolt (13) approximately 1 in. (2.54 cm) from end of bolt (13).
- 8 BOLT (13). Screw into RH mounting board (5) until nut (12) touches RH mounting board (5).
- 9 LOCKWASHER (14). Install on bolt (13).



- 10 SELENIUM RECTIFIER (15), WASHER (16), AND NUT (17). Install on bolt (13).
- 11 CONTROL TRANSFORMER (18), FOUR LOCKWASHERS (19), AND FOUR SCREWS (20). Install on RH mounting board (5).



## 6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

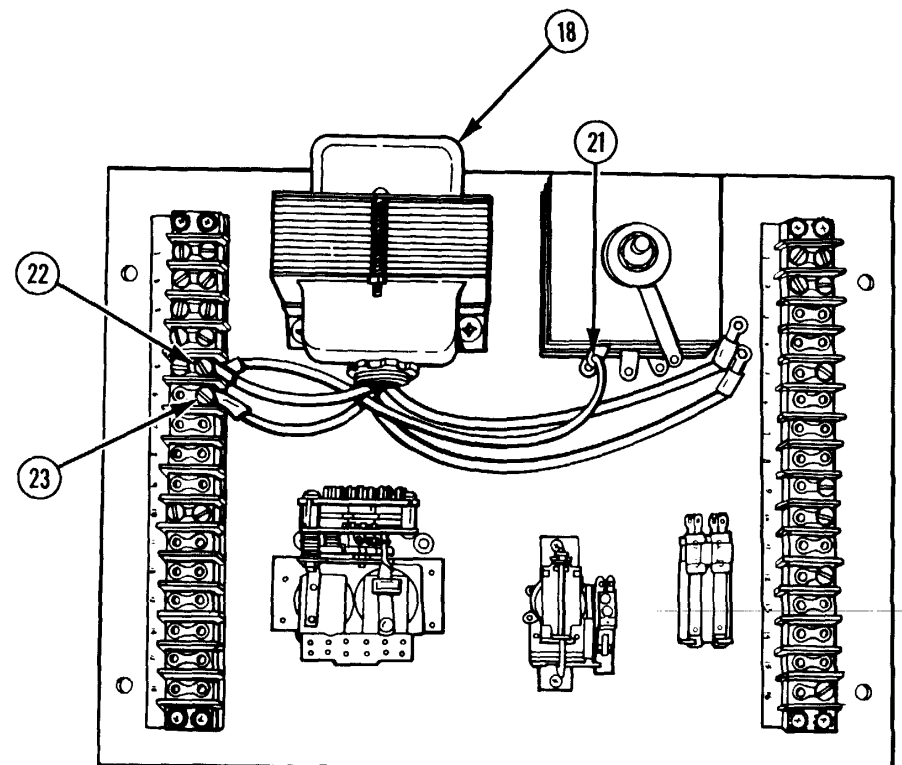
## REASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)

**NOTE**

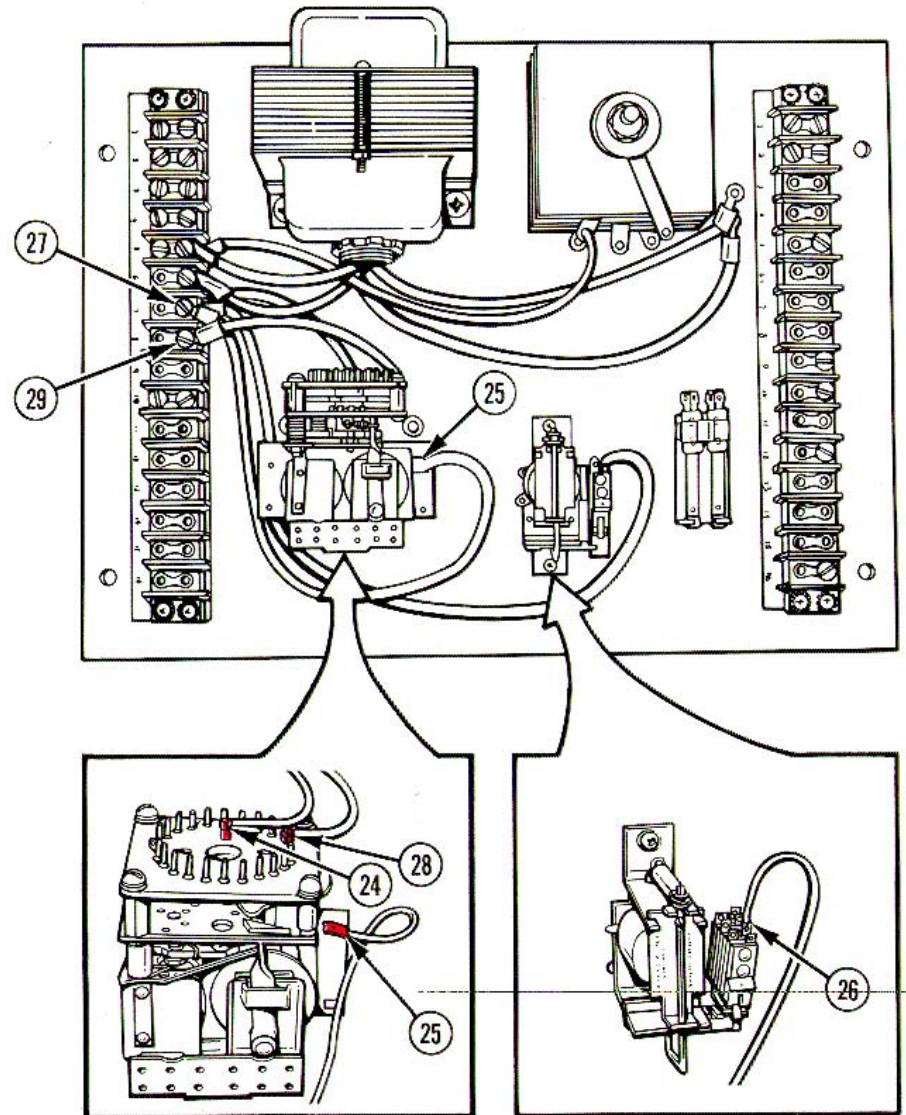
Wires were tagged with termination points at disassembly. Ensure that wires are connected to correct locations.

Use solder (item 18, app C ) for all the following soldering procedures.

- 12 WIRE. Solder bare end to selenium rectifier contact (21) and position other end with terminal lug on terminal C5.
- 13 WIRE WITH TERMINAL LUG TAGGED XI FROM CONTROL TRANSFORMER (18). Position on terminal C5.
- 14 SCREW (22). Install through two terminal lugs into terminal C5.
- 15 WIRE WITH TERMINAL LUG TAGGED H1 FROM CONTROL TRANSFORMER (18). Position on terminal C6.
- 16 SCREW (23). Install through terminal lug into terminal C6.



- 17 THREE WIRES. Solder bare ends to stepping relay contact (24), stepping relay coil contact (25), and latching relay contact (26). Position other ends with terminal lugs on terminal C7.
- 18 SCREW (27). Install through three terminal lugs into terminal C7.
- 19 WIRE. Solder bare end to stepping relay contact (28) and position other end with terminal lug on terminal C8.
- 20 SCREW (29). Install through terminal lug into terminal C8.

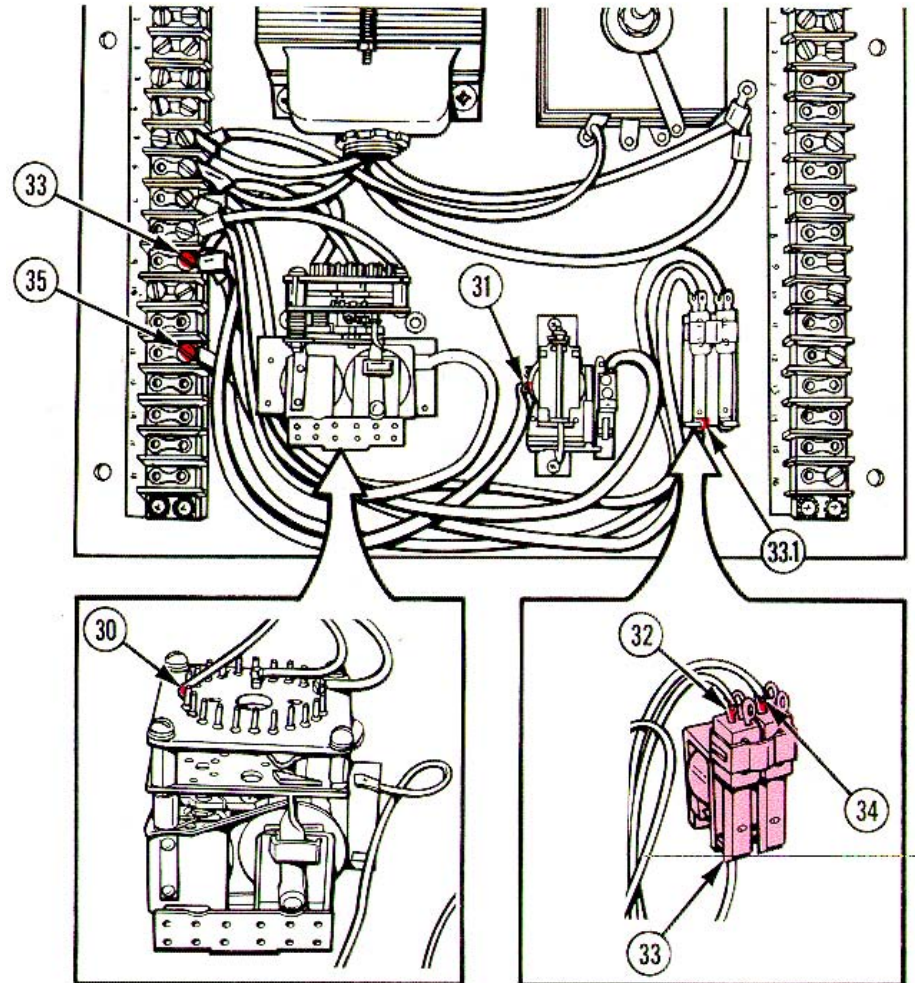




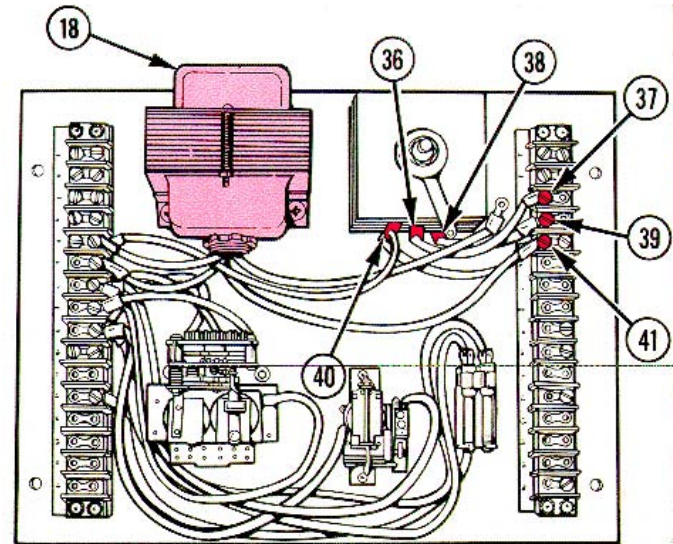
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)

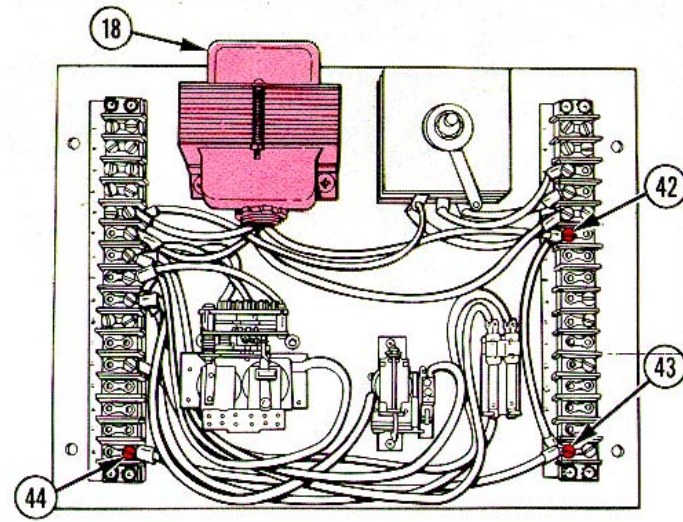
- 21 THREE WIRES. Solder bare ends to stepping relay contact (30), latching relay coil contact (31), and holding relay contact (32). Position other ends with terminal lugs on terminal C9.
- 22 SCREW (33). Install through three terminal lugs into terminal C9.
- 23 TWO WIRES. Solder bare ends to holding relay coil contact (33.1) and holding relay contact (34). Position other ends with terminal lugs on terminal C12.
- 24 SCREW (35). Install through two terminal lugs into terminal C12.



- 25 WIRE. Solder bare end to selenium rectifier contact (36) and position other end with terminal lug on terminal D3.
- 26 SCREW (37). Install through terminal lug into terminal D3.
- 27 WIRE. Solder bare end to selenium rectifier contact (38) and position other end with terminal lug on terminal D4.
- 28 SCREW (39). Install through terminal lug into terminal D4.
- 29 WIRE. Solder bare end to selenium rectifier contact (40) and position other end with terminal lug on terminal D5.
- 30 WIRE WITH TERMINAL LUG TAGGED X2 FROM CONTROL TRANSFORMER (18). Position on terminal D5.
- 31 SCREW (41). Install through two terminal lugs into terminal D5.



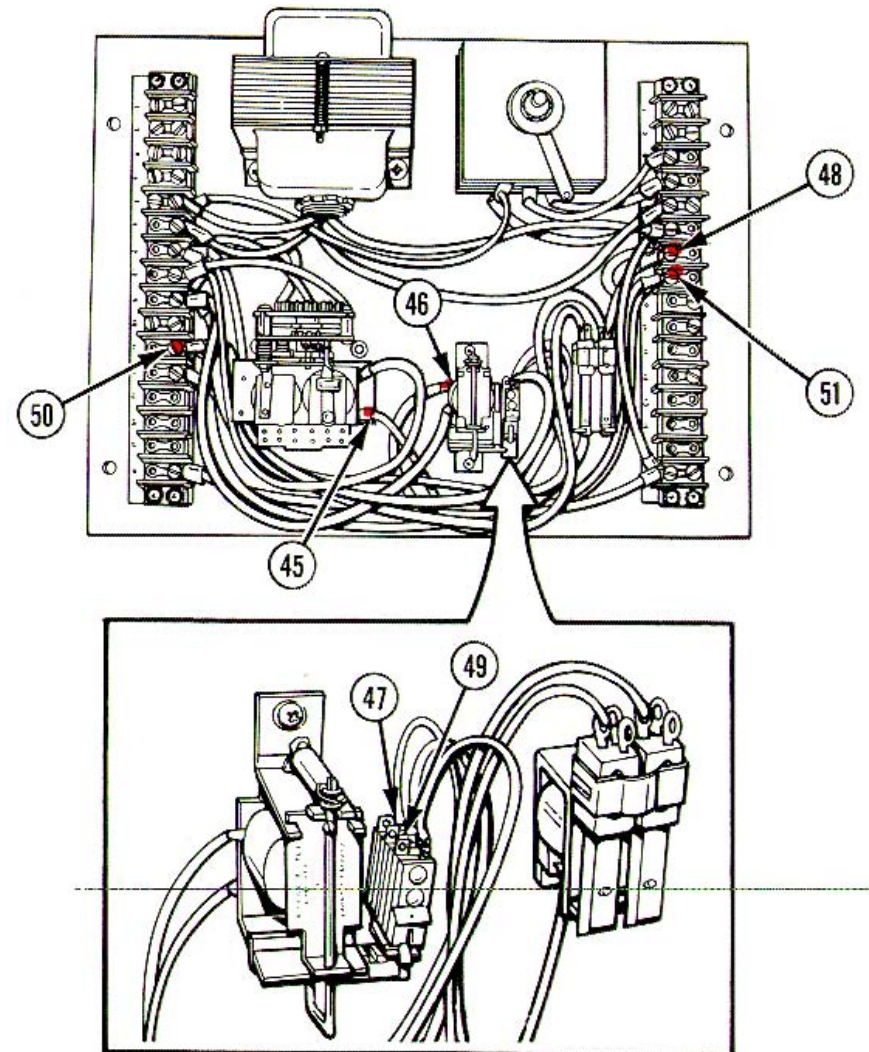
- 32 WIRE WITH TERMINAL LUG TAGGED H4 FROM CONTROL TRANSFORMER (18). Position on terminal D6.
- 33 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal D6 and other end on terminal D16.
- 34 SCREW (42). Install through two terminal lugs into terminal D6.
- 35 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal D16 and other end on terminal C16.
- 36 SCREW (43). Install through two terminal lugs into terminal D16.
- 37 SCREW (44). Install through terminal lug into terminal C16.



## 6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

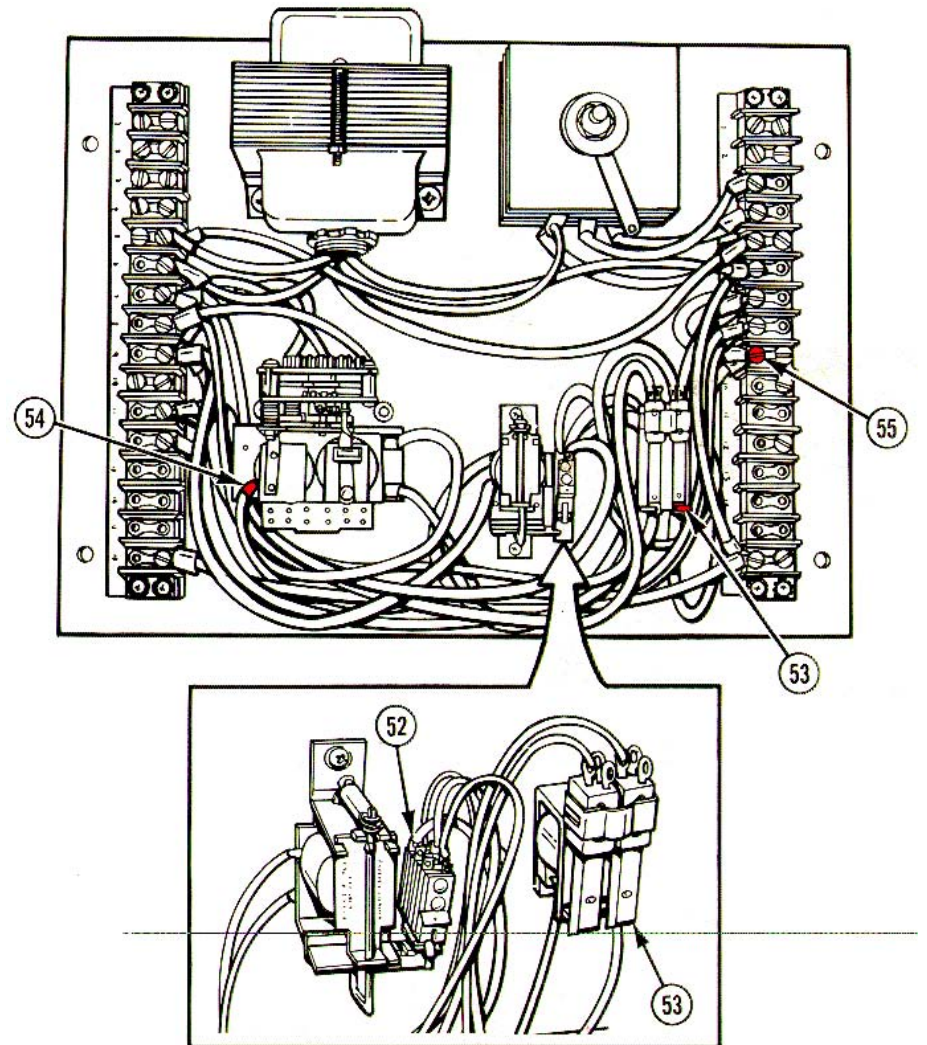
## REASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)

- 38 THREE WIRES. Solder bare ends to stepping relay coil contact (45), latching relay coil contact (46), and latching relay contact (47). Position other ends with terminal lugs on terminal D7.
- 39 SCREW (48). Install through three terminal lugs into terminal D7.
- 40 WIRE. Solder bare end to latching relay contact (49) and position other end with terminal lug on terminal D8.
- 41 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal C11 and other end on terminal D8.
- 42 SCREW (50). Install through terminal lug into terminal C11.
- 43 SCREW (51). Install through two terminal lugs into terminal D8.





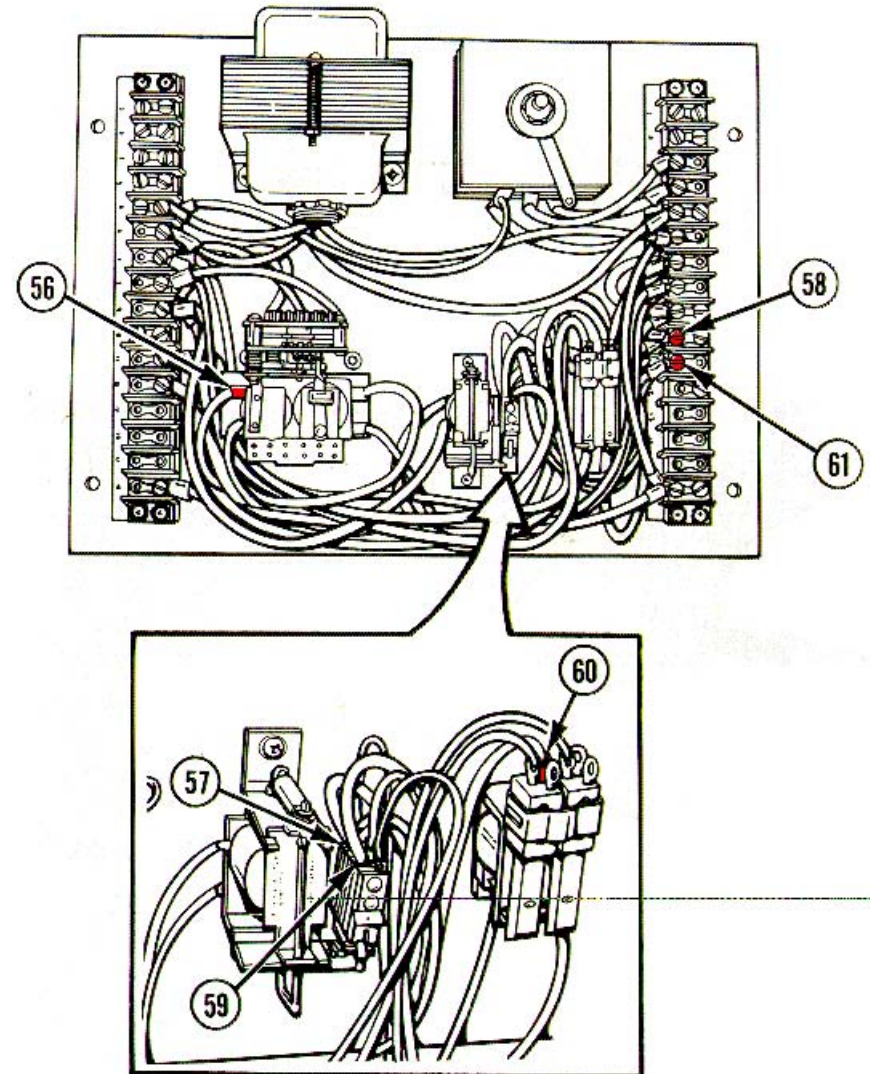
- 44 WIRE. Solder bare end to latching relay contact (52) and position other end with terminal lug on terminal D9.
- 45 WIRE. Solder bare end to holding relay coil contact (53) and position other end with terminal lug on terminal D9.
- 46 WIRE. Solder bare end to stepping relay reset coil contact (54) and position other end with terminal lug on terminal D9.
- 47 SCREW (55). Install through three terminal lugs into terminal D9.



6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

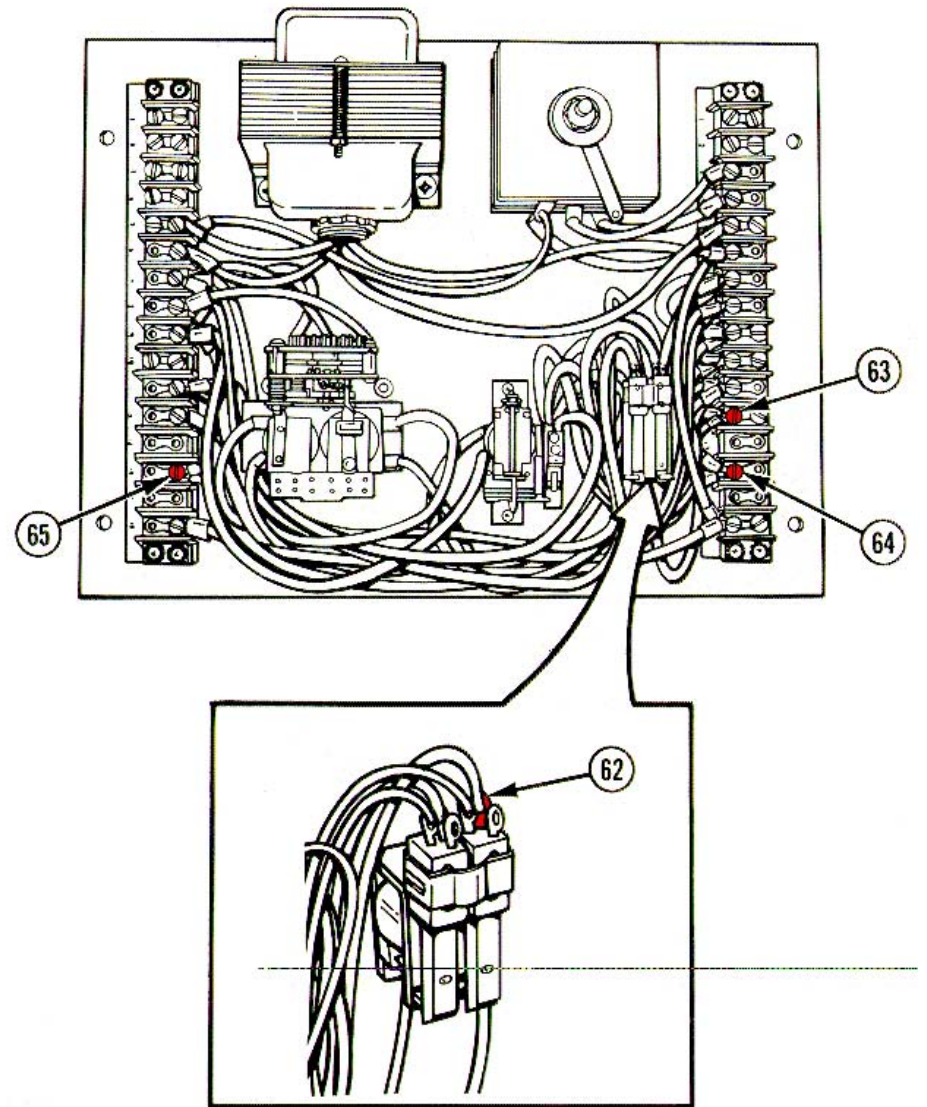
REASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)

- 48 WIRE. Solder bare end to stepping relay reset coil contact (56) and position other end with terminal lug on terminal D10.
- 49 WIRE. Solder bare end to latching relay contact (57) and position other end with terminal lug on terminal D10.
- 50 SCREW (58). Install through two terminal lugs into terminal D10.
- 51 WIRE. Solder bare end to latching relay contact (59) and position other end with terminal lug on terminal D11.
- 52 WIRE. Solder bare end to holding relay contact (60) and position other end with terminal lug on terminal D11.
- 53 SCREW (61). Install through two terminal lugs into terminal D11.





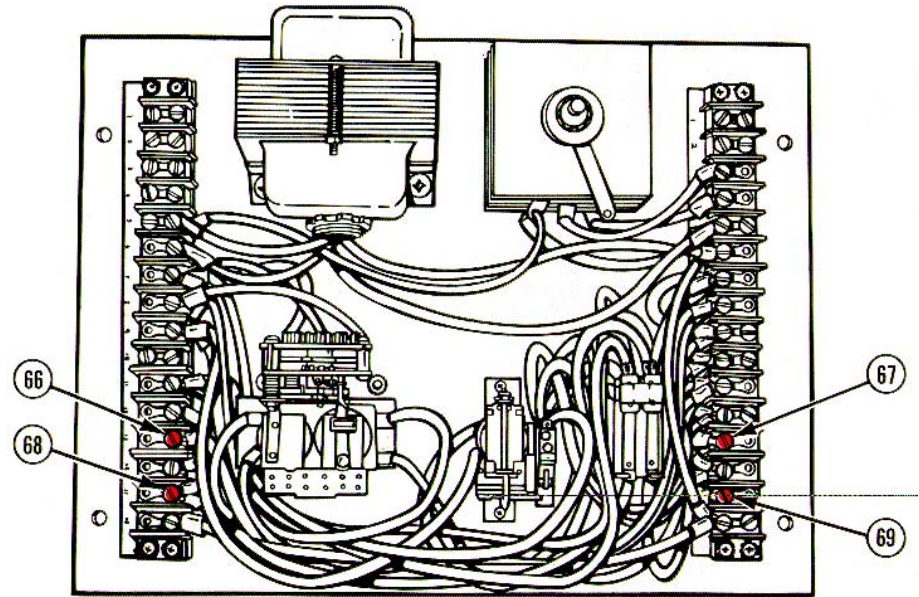
- 54 WIRE. Solder bare end to holding relay terminal (62) and position other end with terminal lug on terminal D12.
- 55 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal D12 and other end on terminal D14.
- 56 SCREW (63). Install through two terminal lugs into terminal D12.
- 57 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal D14 and other end on terminal C14.
- 58 SCREW (64). Install through two terminal lugs into terminal D14.
- 59 SCREW (65). Install through terminal lug into terminal C14.



**6-. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY OF RH MOUNTING BOARD ASSEMBLY (cont)**

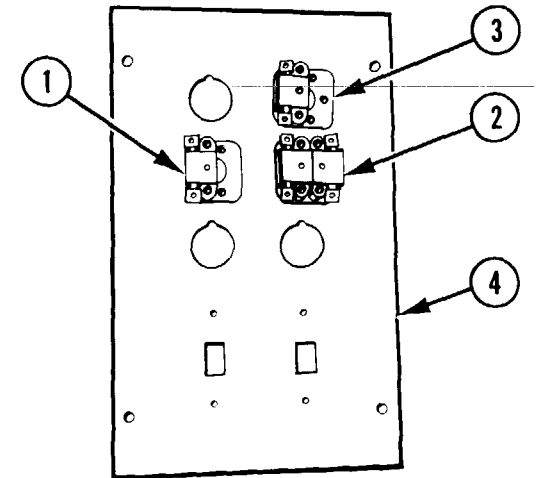
- 60 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal C13 and other end on terminal D13.
- 61 SCREW (66). Install through terminal lug into terminal C13.
- 62 SCREW (67). Install through terminal lug into terminal D13.
- 63 WIRE WITH TWO TERMINAL LUGS. Position one end on terminal C15 and other end on terminal D15.
- 64 SCREW (68). Install through terminal lug into terminal C15.
- 65 SCREW (69). Install through terminal lug into terminal D15.



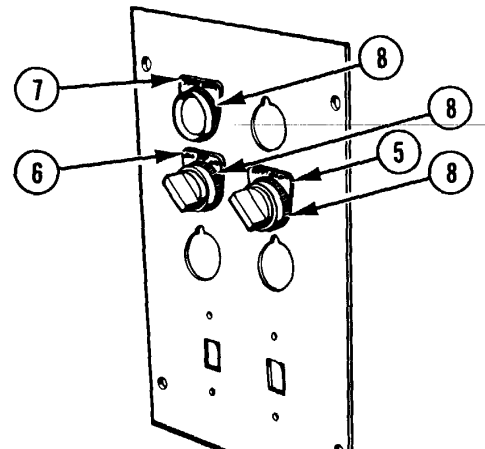
REASSEMBLY OF RH CONTROL PANEL ASSEMBLY

**NOTE**

Wires were tagged with 1 termination points at disassembly. Ensure that wires are connected to correct locations.

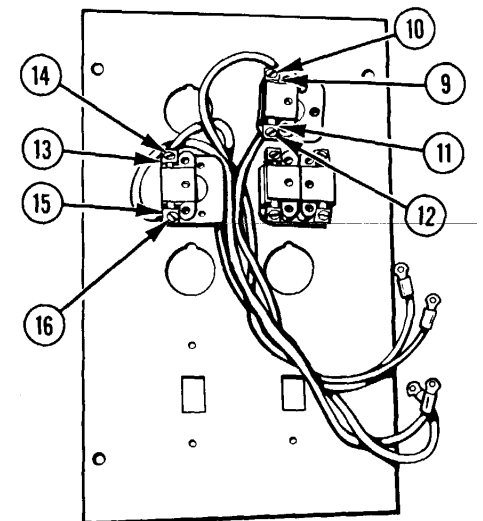


- 1 24-VDC SWITCH (1), 500-1000-OFF SWITCH (2), AND START COUNT SWITCH (3). Position on RH control panel (4).



- 2 THREE LEGEND PLATES (5, 6, AND 7) AND THREE LENS CAPS (8). INSTALL

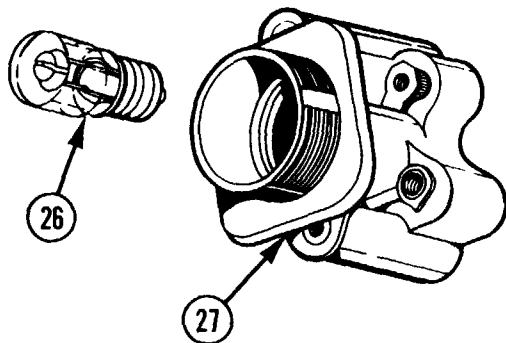
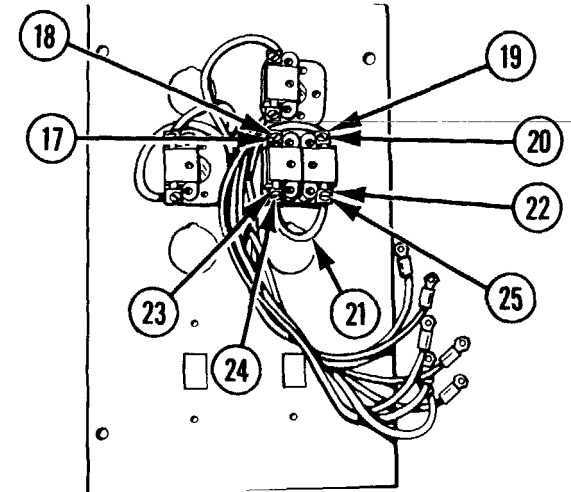
- 3 WIRE TAGGED C13. Position one end on START COUNT switch contact (9), install screw (10) and tighten.
- 4 WIRE TAGGED C12. Position one end on START COUNT switch contact (11), install screw (12) and tighten.
- 5 WIRE TAGGED C14. Position one end on 24-VDC switch contact (13), install screw (14) and tighten.
- 6 WIRE TAGGED C6. Position one end on 24-VDC switch contact (15), install 2 THREE LEGEND PLATES (5, 6, AND 7) AND THREE LENS CAPS (8). INSTALL



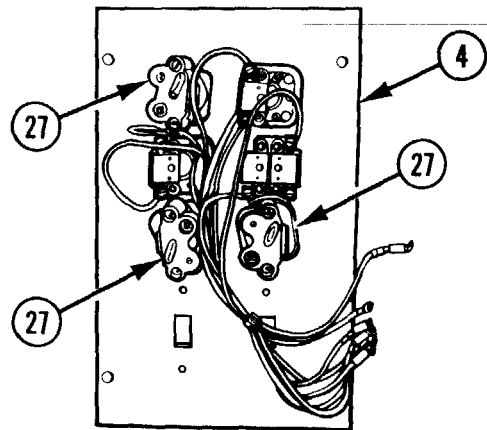
**6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont) I**

**REASSEMBLY OF RH CONTROL PANEL ASSEMBLY (cont)**

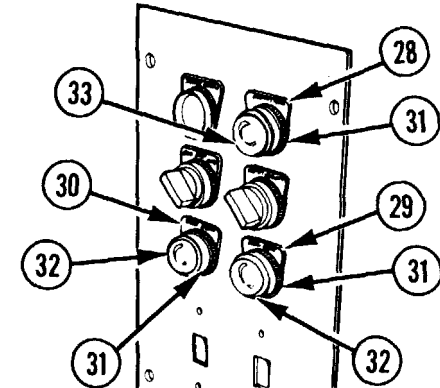
- 7 WIRE TAGGED C8. Position one end on 500-1000-OFF switch contact (17), install screw (18) and tighten.
- 8 WIRE TAGGED C7. Position one end on 500-1000-OFF switch contact (19), install screw (20) and tighten.
- 9 JUMPER WIRE (21). Position one end on 500-1000-OFF switch contact (22) and other end to 500-1000-OFF switch contact (23).
- 10 WIRE TAGGED C9. Position one end on 500-1000-OFF switch contact (23), install two screws (24 and 25) and tighten.



- 11 THREE CLEAR LAMPS (26). Install into three indicator lights (27) for COUNTING light, LUBE HEAT light, and FUEL HEAT light.

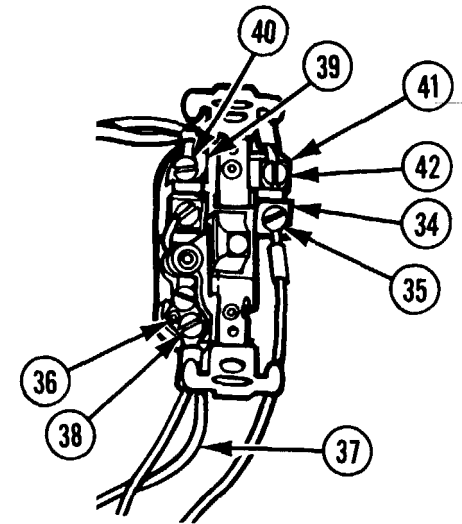


- 12 THREE INDICATOR LIGHTS (27). Install in RH control panel (4).

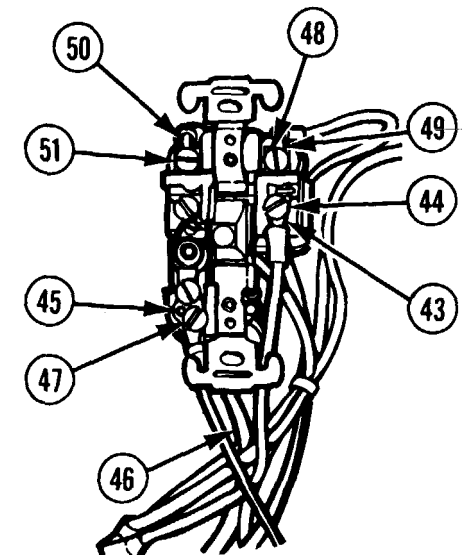


- 13 THREE LEGEND PLATES (28, 29, AND 30), THREE LENS CAPS (31), TWO CLEAR LENSES (32), AND AMBER LENS (33). Install

- 14 WIRE TAGGED X. Position one end with terminal lug on FUEL HEAT switch contact (34), install screw (35) and tighten.
- 15 WIRE TAGGED Z. Position one end with terminal lug on FUEL HEAT switch contact (36).
- 16 JUMPER WIRE (37). Position one end with terminal lug on FUEL HEAT switch contact (36), install screw (38) and tighten.
- 17 WIRE TAGGED C15. Position one end with terminal lug on FUEL HEAT switch contact (39), install screw (40) and tighten.
- 18 WIRE TAGGED C16. Position one end with terminal lug on FUEL HEAT switch contact (41), install screw (42) and tighten.



- 19 WIRE TAGGED X. Position one end with terminal lug on LUBE HEAT switch contact (43), install screw (44) and tighten.
- 20 WIRE TAGGED Z. Position one end with terminal lug on LUBE HEAT switch contact (45).
- 21 JUMPER WIRE (46). Position one end with terminal lug on LUBE HEAT switch contact (45), install screw (47) and tighten.
- 22 WIRE TAGGED C15. Position one end with terminal lug on LUBE HEAT switch contact (48), install screw (49) and tighten.
- 23 WIRE TAGGED C14. Position one end with terminal lug on LUBE HEAT switch contact (50), install screw (51) and tighten.

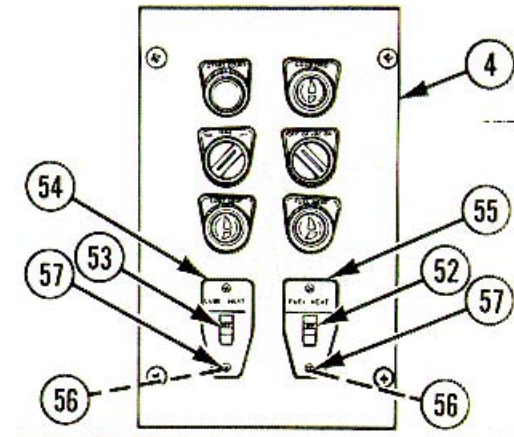




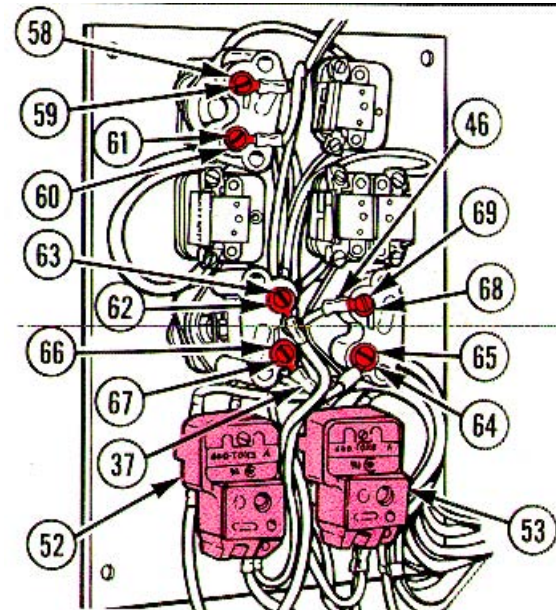
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont) |

REASSEMBLY OF RH CONTROL PANEL ASSEMBLY (cont)

- 24 FUEL HEAT SWITCH (52) AND LUBE HEAT SWITCH (53). Position on RH control panel (4), install two legend plates (54 and 55), four lockwashers (56), and four screws (57).



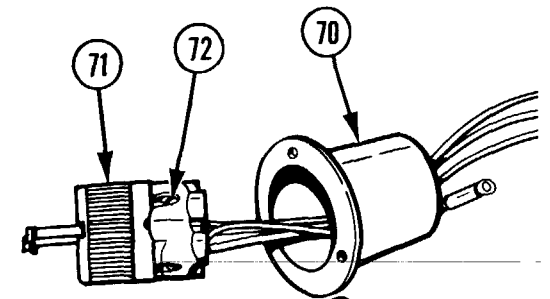
- 25 WIRE TAGGED C11. Position one end with terminal lug on COUNTING light indicator contact (58), install screw (59) and tighten.
- 26 WIRE TAGGED C14. Position one end with terminal lug on COUNTING light indicator contact (60), install screw (61) and tighten.
- 27 WIRE TAGGED Y. Position one end with terminal lug on FUEL HEAT indicator light contact (62), install screw (63) and tighten.
- 28 WIRE TAGGED Y. Position one end with terminal lug on LUBE HEAT indicator light contact (64), install screw (65) and tighten.
- 29 JUMPER WIRE (37) FROM FUEL HEAT SWITCH (52). Position on FUEL HEAT indicator light contact (66), install screw (67) and tighten.
- 30 JUMPER WIRE (46) FROM LUBE HEAT SWITCH (53). Position on LUBE HEAT indicator light contact (68), install screw (69) and tighten.



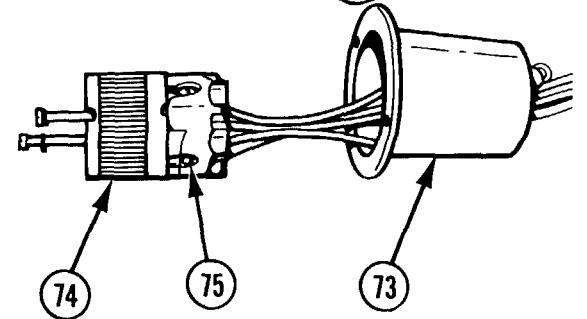
**NOTE**

Wires and both female connector plugs were marked at disassembly. Ensure that wires connect to correct contact points

31 THREE WIRES (TAGGED X, Y, AND Z COMING FROM FUEL HEAT SWITCH AND FUEL HEAT INDICATOR LIGHT) AND GROUND WIRE. Pull through flush motor base (70), connect to female connector plug (71), and secure by tightening four screws (72).

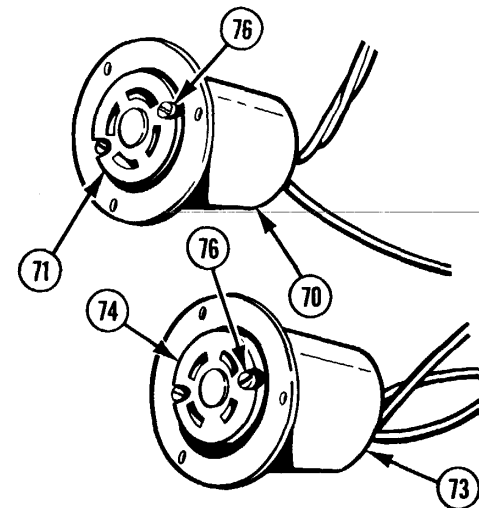


32 THREE WIRES (TAGGED X, Y, AND Z COMING FROM LUBE HEAT SWITCH AND LUBE HEAT INDICATOR LIGHT) AND GROUND WIRE. Pull through flush motor base (73), connect to female connector plug (74), and secure by tightening four screws (75).



33 TWO FLUSH MOTOR BASES (70 AND 73). Position over two female connector plugs (71 and 74).

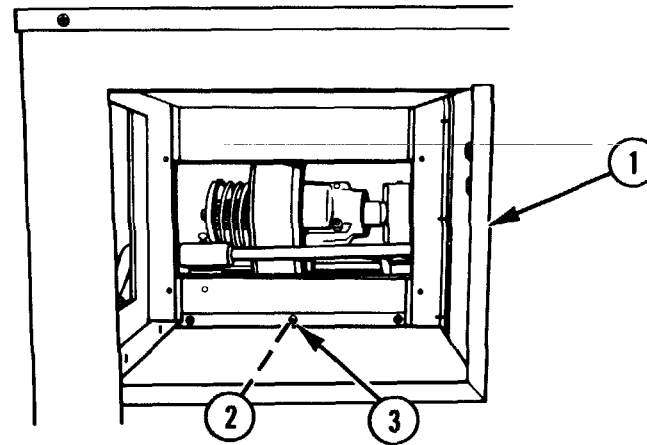
34 FOUR SCREWS (76). Install.



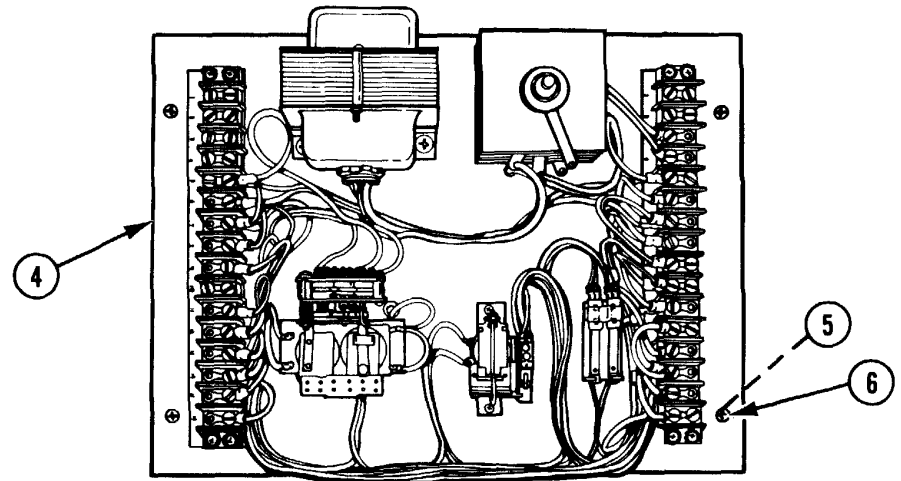
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION

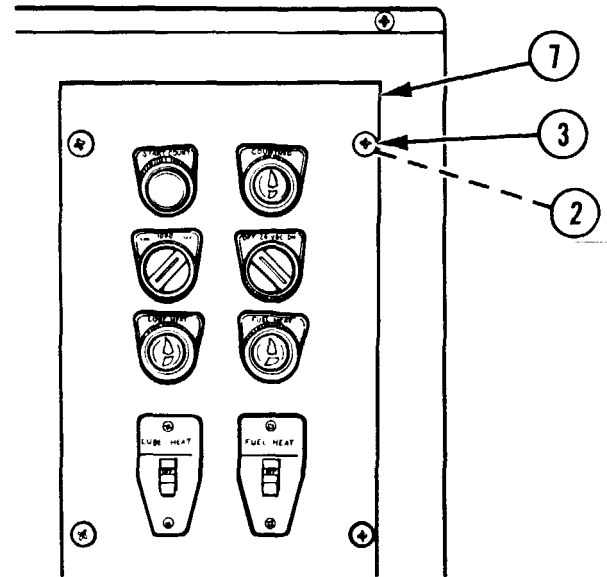
- 1 RH ENCLOSURE ASSEMBLY (1). Position on tester.
- 2 EIGHT LOCKWASHERS (2) AND EIGHT SCREWS (3). Install.



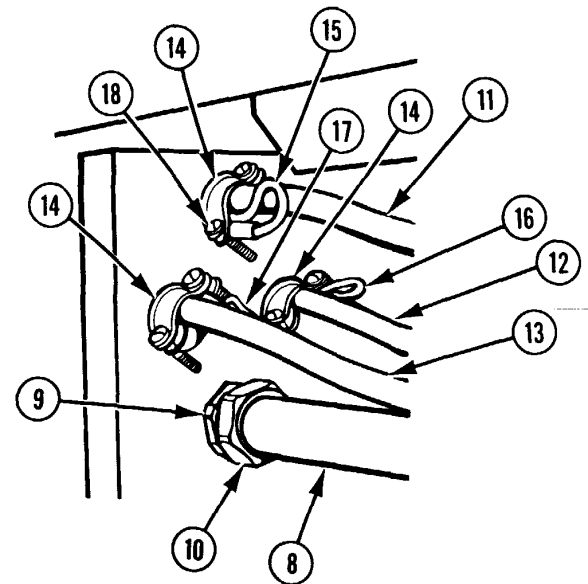
- 3 RH MOUNTING BOARD ASSEMBLY (4). Position on tester.
- 4 FOUR LOCKWASHERS (5) AND FOUR SCREWS (6). Install.



- 5 RH CONTROL PANEL ASSEMBLY (7). Position on tester.
- 6 FOUR LOCKWASHERS (2) AND FOUR SCREWS (3). Install.



- 7 WIRE CABLE (8). Install through straight box connector (9).
- 8 NUT (10). Tighten.
- 9 THREE WIRE CABLES (11, 12, AND 13). Install through three straight box connectors (14).
- 10 THREE GROUND WIRES (15, 16, AND 17) WITH ONE TERMINAL LUG EACH.
  - a. Install in three straight box connectors (14).
  - b. Install three screws (18).
  - c. Tighten six screws (18).



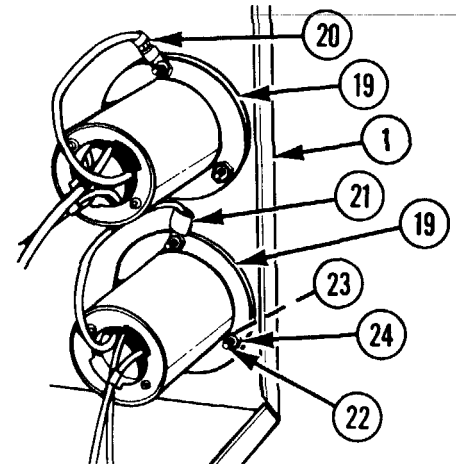
6-5. RH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

**NOTE**

Flush motor base with wires from FUEL HEAT switch must be installed on top.

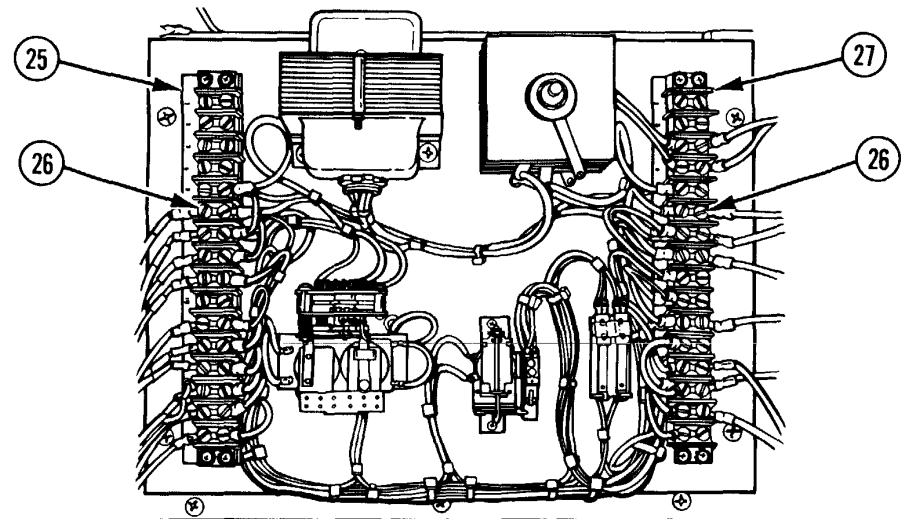
- 11 TWO FLUSH MOTOR BASES (19). Position on RH enclosure assembly (1).
- 12 TWO GROUND WIRES (20 AND 21) WITH ONE TERMINAL LUG EACH, SIX SCREWS (22), SIX LOCKWASHERS (23), AND SIX NUTS (24). Install.



**NOTE**

Wires to be connected to terminal strip C and terminal strip D were tagged with termination points at disassembly. Ensure that wires are connected to correct locations.

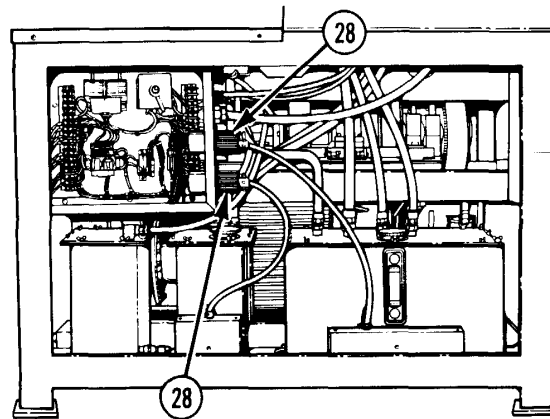
- 13 THIRTEEN WIRES. Position on the LH terminals of terminal strip C (25) as marked and secure with ten screws (26).
- 14 NINE WIRES. Position on RH terminals of terminal strip D (27) as marked and secure with nine screws (26).





**TEST**

- 15 TWO MALE CONNECTOR PLUGS (28). Install.



**NOTE**

All controls on RH control panel assembly must be visually observed for proper functioning. Refer to chapter 2, page 2-3, for explanation of operation of each control.

**6-6. LH CONTROL EQUIPMENT ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |  |   |
|--|---|
| a. Removal                                   | g. Reassembly of LH enclosure assembly      |
| b. Disassembly of LH control panel assembly  | h. Reassembly of LH mounting board assembly |
| c. Disassembly of LH mounting board assembly | i. Reassembly of LH control panel assembly  |
| d. Disassembly of LH enclosure assembly      | j. Installation                             |
| e. Servicing                                 | k. Test                                     |
| f. Repair                                    |   |

**INITIAL SETUP**

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

Cleaning compound (item 3, app C)

Rag (item 14, app C)

Materials/ Parts

Abrasive cloth (item 4, app C)

**6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**INITIAL SETUP (cont)**

References

TM 9-4910-387-24P

Troubleshooting References

- 6-31 Auxiliary motor fails to start, AUXILIARY MOTOR switch is in the on position
- 6-132 Drive speed of tester will not decrease
- 6-126 Drive speed of tester will not increase
- 6-12 Main drive motor fails to start, FORWARD-OFF-REVERSE switch is in FORWARD position
- 6-23 Main drive motor fails to start, FORWARD-OFF-REVERSE switch is in REVERSE position

- 6-38 MANIFOLD HEAT light does not light
- 6-36 POWER ON light does not light
- 6-113 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch is in FORWARD position
- 6-120 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch is in REVERSE position

Equipment Conditions

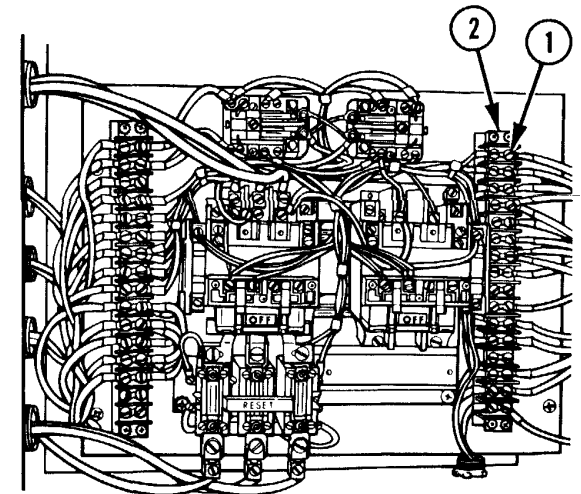
- Main power source to tester is turned off
- 4-42 LH panel assembly is removed

**REMOVAL**

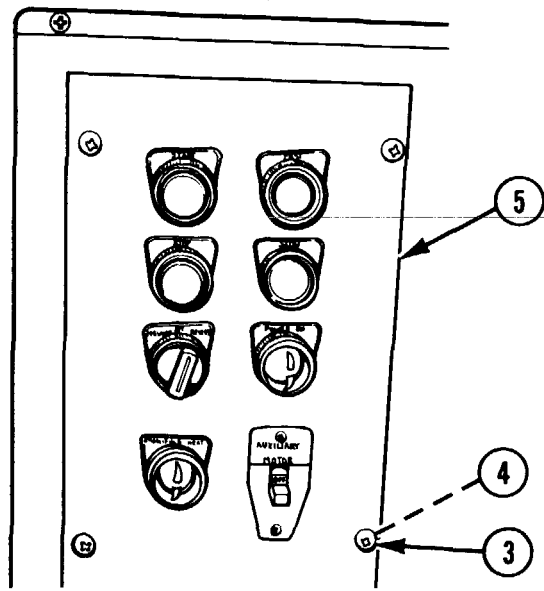
**NOTE**

Before disconnecting and removing wires, ensure that wires are identified and tagged for reassembly. The terminal strip on the RH side of the LH mounting board assembly is referred to as terminal strip B.

- 1 FOURTEEN SCREWS (1) AND NINETEEN ATTACHED WIRES ON THE RH TERMINALS OF TERMINAL STRIP B (2). Remove.

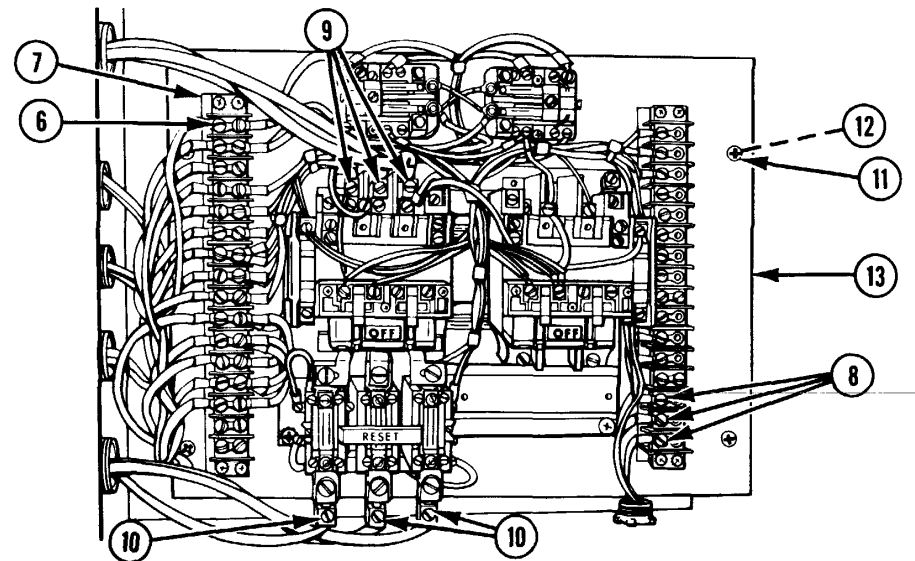


- 2 FOUR SCREWS (3), FOUR LOCKWASHERS (4), AND LH CONTROL PANEL ASSEMBLY (5). Remove.



**NOTE**  
The terminal strip on the LH side of the LH mounting board assembly is referred to as terminal strip A.

- 3 FOURTEEN SCREWS (6) AND FIFTEEN ATTACHED WIRES ON THE LH TERMINALS OF TERMINAL STRIP A (7). Remove.
- 4 THREE SCREWS (8) AND THREE ATTACHED WIRES. Remove.
- 5 THREE SCREWS (9). Loosen and remove six attached wires.
- 6 THREE SCREWS (10). Loosen and remove three wires.
- 7 FOUR SCREWS (11), FOUR LOCKWASHERS (12), AND LH MOUNTING BOARD ASSEMBLY (13). Remove.



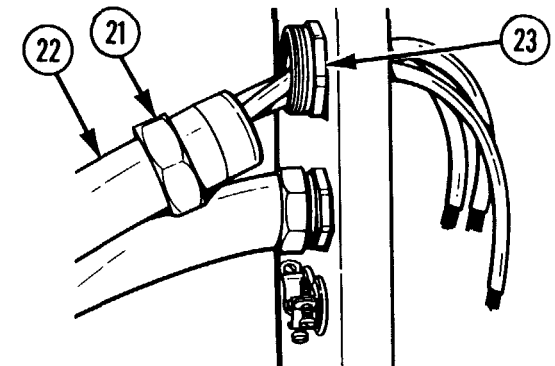
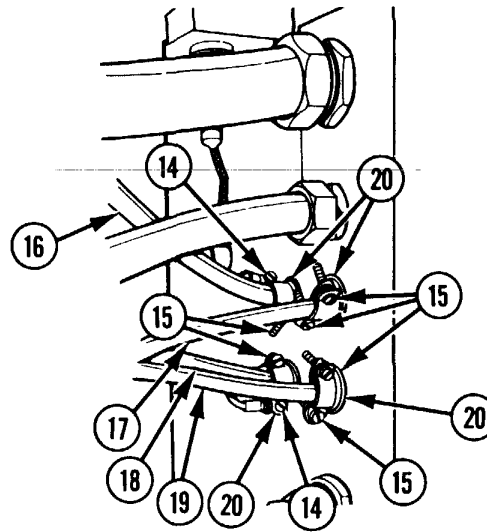
6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

8 TWO SCREWS (14) AND TWO ATTACHED GROUND WIRES. Remove.

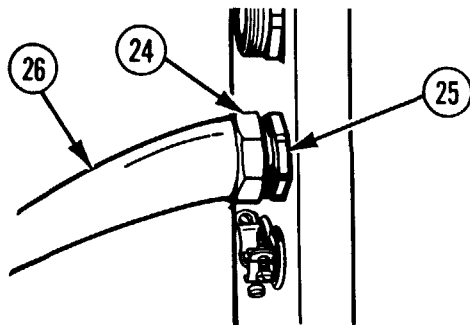
9 SIX SCREWS (15). Loosen.

10 FOUR WIRE CABLES (16 THRU 19). Pull through four straight box connectors (20).



11 NUT (21). Loosen.

12 CONDUIT (22) AND ATTACHED ELECTRICAL CONNECTOR (23). Remove.

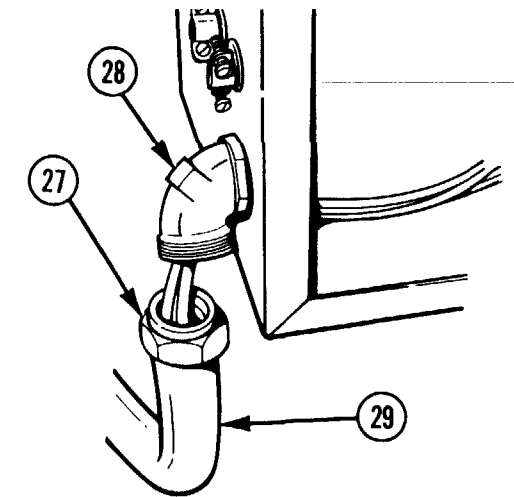


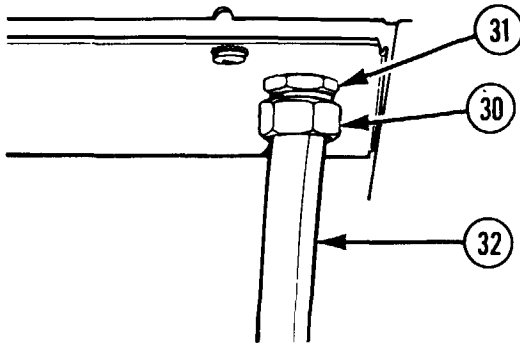
13 NUT (24). Remove from straight 90 series connector (25).

14 WIRE CABLE (26). Remove.

15 NUT (27). Remove from electrical box connector (28).

16 CONDUIT (29). Remove.





17 NUT (30). Remove from straight 90 series connector (31).

18 WIRE CABLE (32). Remove.

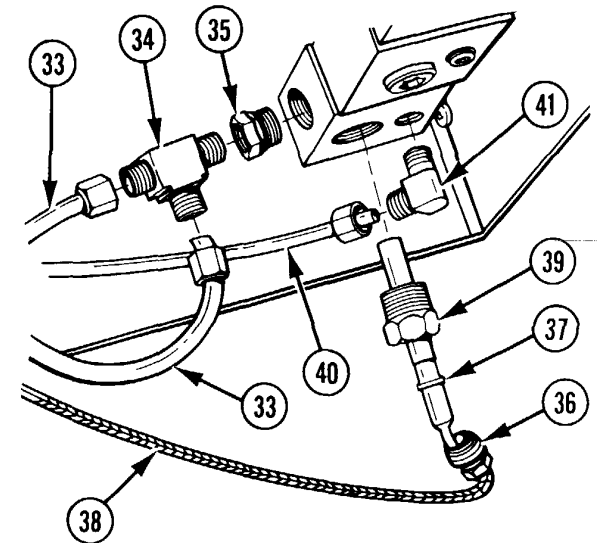
19 TWO COPPER TUBINGS (33), MALE RUN TEE (34), AND REDUCER BUSHING (35). Remove.

**CAUTION**

**Bulbs are fragile. Use care when removing or installing bulbs to prevent damage.**

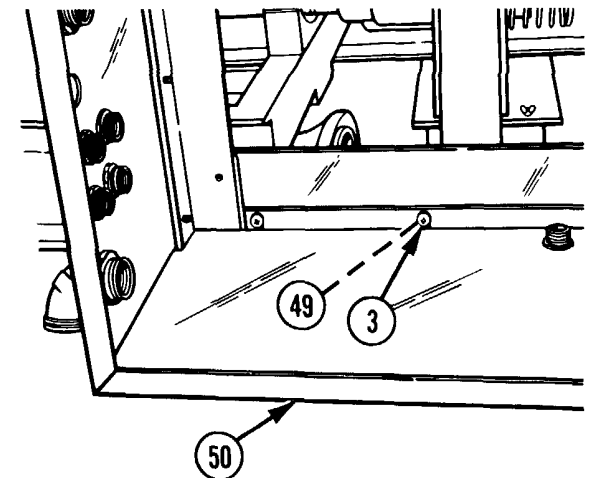
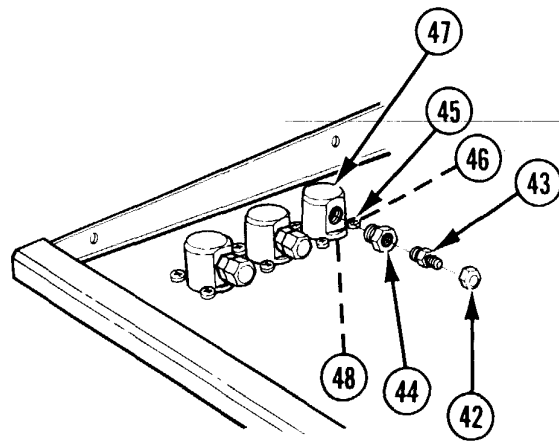
20 NUT (36), BULB (37) WITH BRAIDED TUBE (38), AND ADAPTER (39). Remove.

21 COPPER TUBING (40) AND MALE ELBOW (41). Remove.



22 CAP (42), CONNECTOR (43), AND REDUCER BUSHING (44). Remove.

23 FOUR MACHINE SCREWS (45), FOUR LOCKWASHERS (46), LUBE OIL PRESSURE DISCHARGE BLOCK (47), AND DISCHARGE BLOCK GASKET (48). Remove.



24 EIGHT SCREWS (3), EIGHT LOCKWASHERS (49), AND LH ENCLOSURE ASSEMBLY (50). Remove.



6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY OF LH CONTROL PANEL ASSEMBLY

**NOTE**

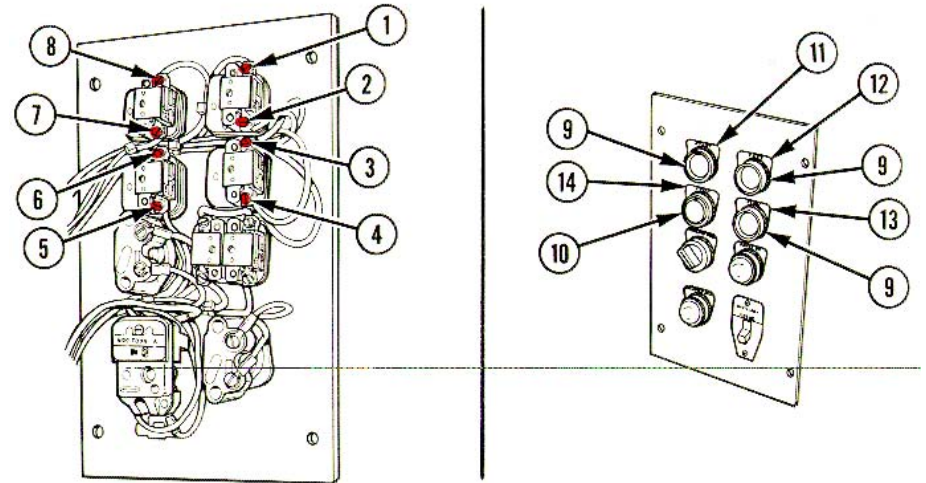
Before disconnecting and removing wires, ensure that all wires are identified and tagged for reassembly.

- 1 EIGHT SCREWS (1 THRU 8). Loosen and remove eight attached wires.

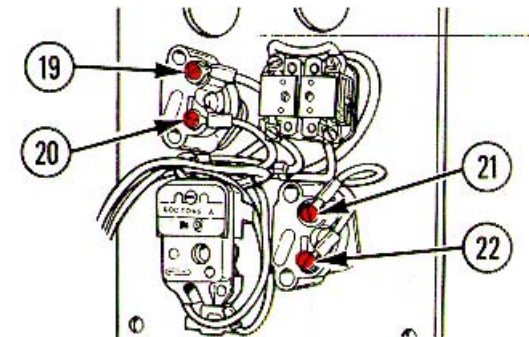
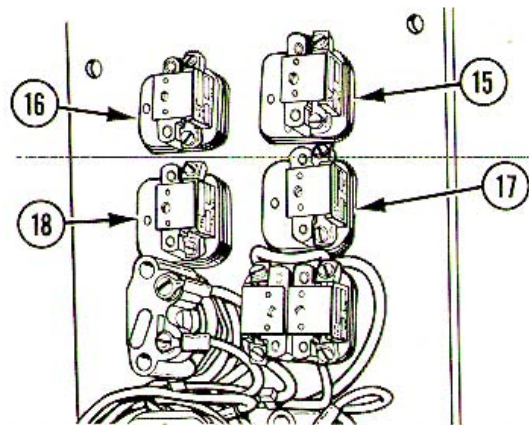
**NOTE**

Before removing legend plates, note location of each for proper reassembly.

- 2 THREE LENS CAPS (9), LENS CAP (10), AND FOUR LEGEND PLATES (11 THRU 14). Remove.

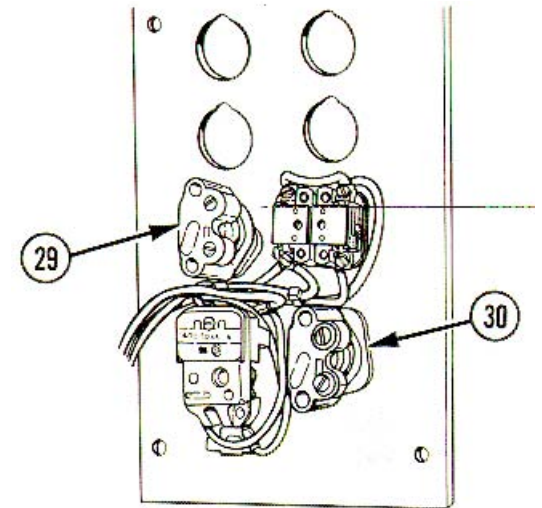
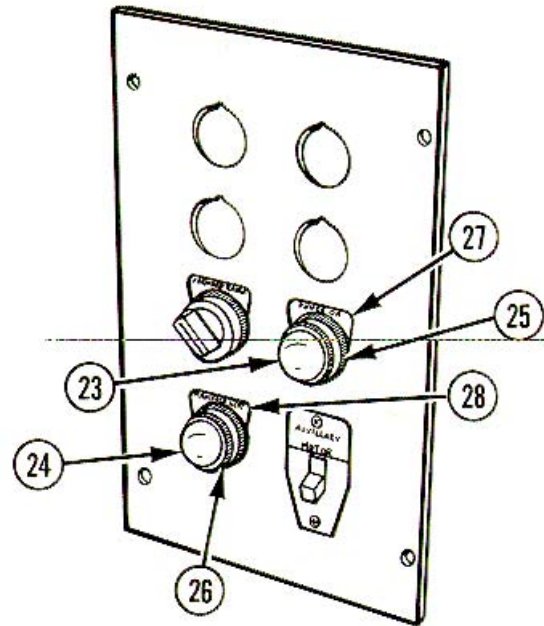


- 3 START SWITCH (15), FAST SWITCH (16), STOP SWITCH (17), AND SLOW SWITCH (18). Remove.

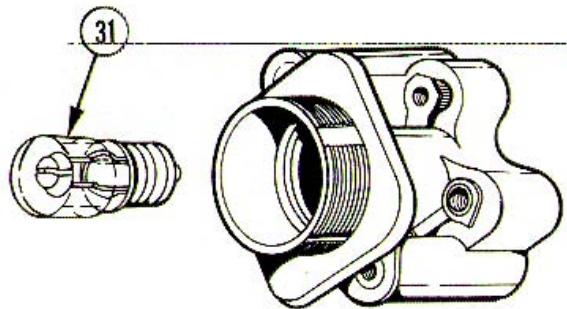


- 4 FOUR SCREWS (19 THRU 22) AND FOUR ATTACHED WIRES. Remove.

5 AMBER LENS (23), CLEAR LENS (24), TWO LENS CAPS (25 AND 26), AND TWO LEGEND PLATES (27 AND 28). Remove.

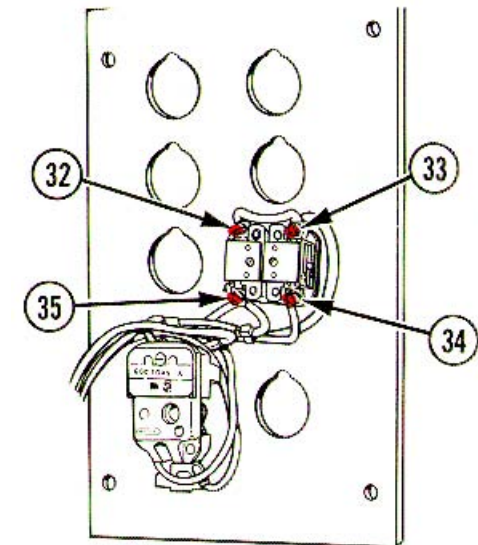


6 TWO INDICATOR LIGHTS (29 AND 30) FOR MANIFOLD HEAT LIGHT AND POWER ON LIGHT. Remove.



7 TWO CLEAR LAMPS (31). Remove from two indicator lights for MANIFOLD HEAT light and POWER ON light.

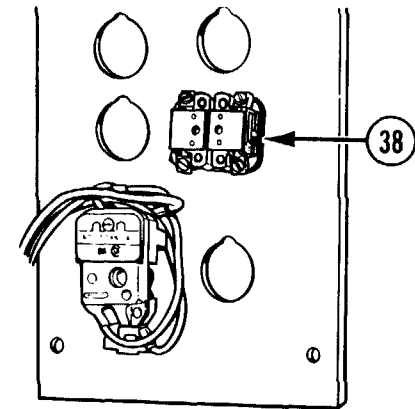
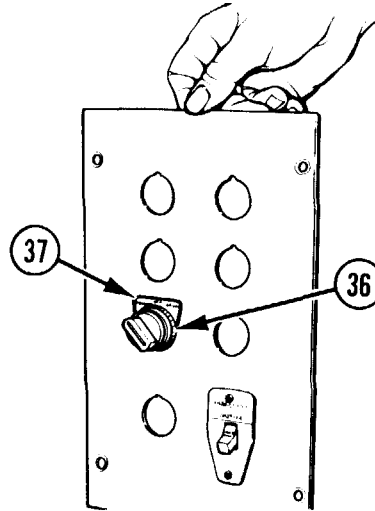
8 FOUR SCREWS (32 THRU 35). Loosen and remove four attached wires.



6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

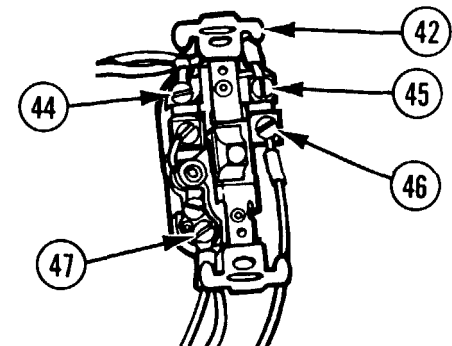
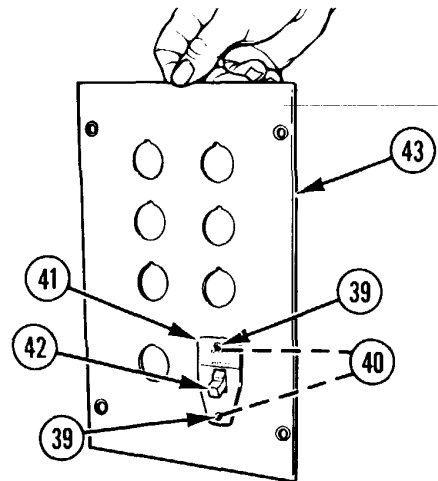
DISASSEMBLY OF LH CONTROL PANEL ASSEMBLY (cont)

9 LENS CAP (36) AND LEGEND PLATE (37). Remove.



10 FORWARD-OFF-REVERSE SWITCH (38). Remove.

11 TWO MACHINE SCREWS (39), TWO LOCKWASHERS (40), SWITCH PLATE (41), AND AUXILIARY MOTOR SWITCH (42). Remove from LH control panel (43).



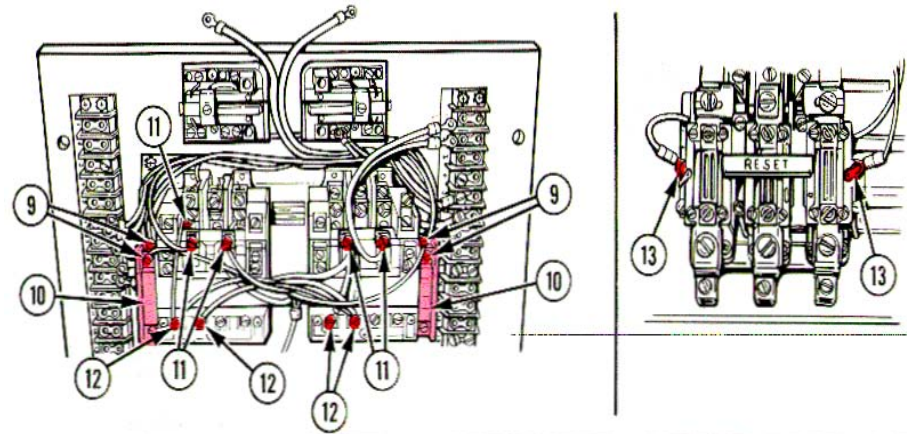
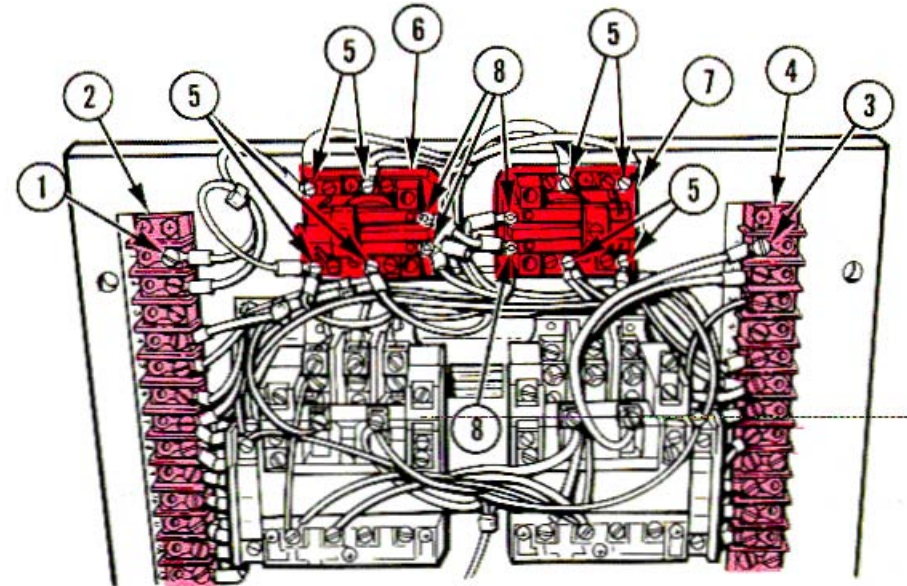
12 FOUR SCREWS (44 THRU 47) AND FOUR ATTACHED WIRES. Remove from AUXILIARY MOTOR switch (42).

**DISASSEMBLY OF LH MOUNTING BOARD ASSEMBLY**

**NOTE**

Before disconnecting and removing wires, ensure that wires are identified and tagged for reassembly. Remove wire ties to facilitate removal of wires.

- 1 THIRTEEN SCREWS (1) AND SIXTEEN ATTACHED WIRES. Remove from terminal strip A (2).
- 2 TEN SCREWS (3) AND TWELVE ATTACHED WIRES. Remove from terminal strip B (4).
- 3 EIGHT SCREWS (5) AND EIGHT ATTACHED WIRES. Remove from forward and reverse tachometer reversing relays (6 and 7).
- 4 FOUR TERMINAL CAPS (8) AND FOUR ATTACHED WIRES. Remove from forward and reverse tachometer reversing relays (6 and 7).
- 5 FOUR SCREWS (9). Loosen and remove four attached wires from two starter microswitches (10).
- 6 FIVE SCREWS (11). Loosen and remove six attached wires.
- 7 FOUR SCREWS (12). Loosen and remove six attached wires.
- 8 TWO SCREWS (13) AND TWO ATTACHED WIRES. Remove.

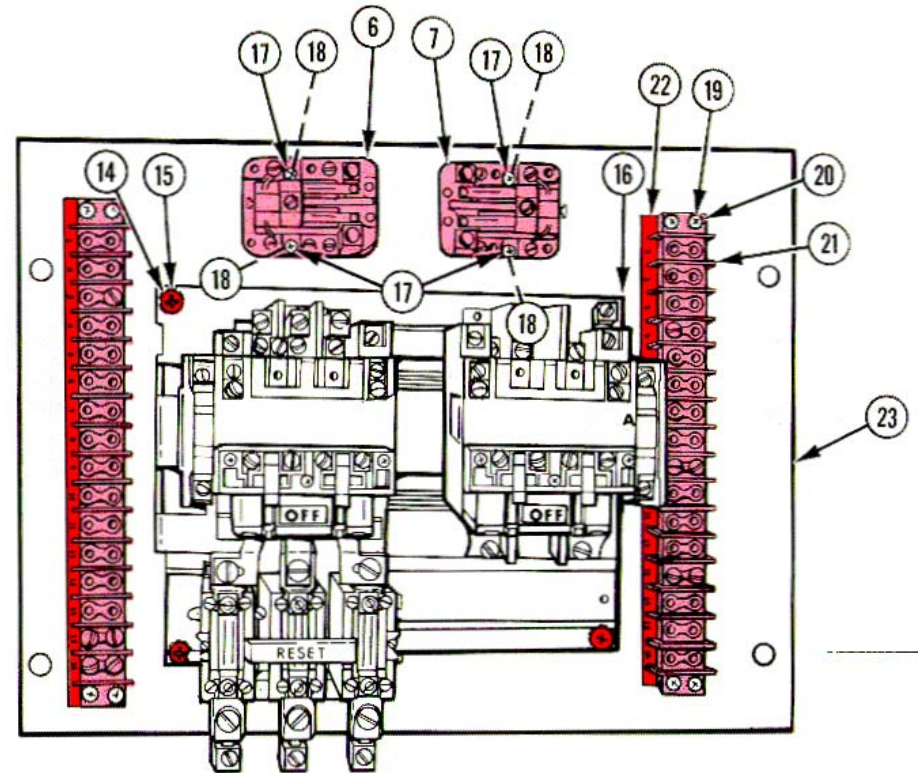




6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY OF LH MOUNTING BOARD ASSEMBLY (cont)

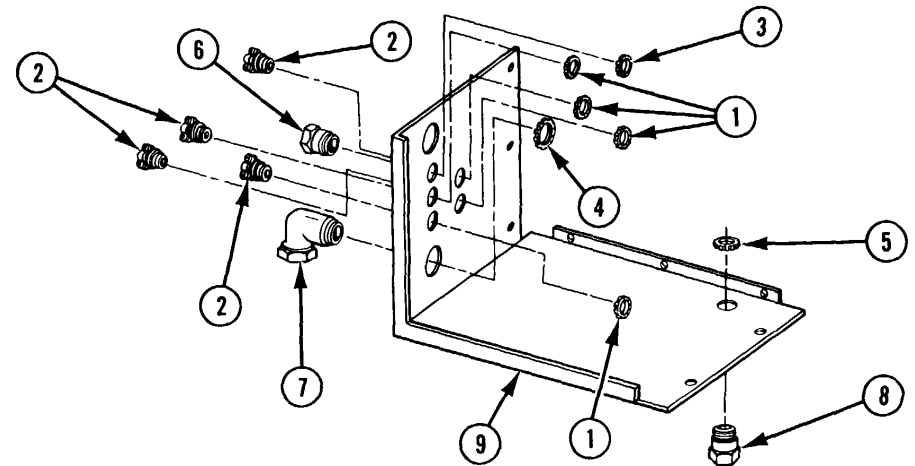
- 9 FOUR MACHINE SCREWS (14), FOUR LOCKWASHERS (15), AND STARTER (16). Remove.
- 10 FOUR MACHINE SCREWS (17), FOUR LOCKWASHERS (18), FORWARD TACHOMETER REVERSING RELAY (6), AND REVERSE TACHOMETER REVERSING RELAY (7). Remove.
- 11 EIGHT MACHINE SCREWS (19), EIGHT LOCKWASHERS (20), TWO TERMINAL STRIPS (21), AND TWO NUMBER STRIPS (22). Remove from LH mounting board (23).





**DISASSEMBLY OF LH ENCLOSURE ASSEMBLY**

- 1 FOUR NUTS (1) AND FOUR STRAIGHT BOX CONNECTORS (2). Remove.
- 2 THREE NUTS (3, 4, AND 5), STRAIGHT 90 SERIES CONNECTOR (6), ELECTRICAL BOX CONNECTOR (7), AND STRAIGHT 90 SERIES CONNECTOR (8). Remove from LH enclosure (9).

**SERVICING**

- 1 ALL ELECTRICAL PARTS. Remove dust using rag (item 14, app C).
- 2 ELECTRICAL CONTACTS. Clean with abrasive cloth (item 4, app C).
- 3 LH CONTROL PANEL AND LH ENCLOSURE. Clean with cleaning compound (item 3, app C) using rag (item 14, app C).

**REPAIR****NOTE**

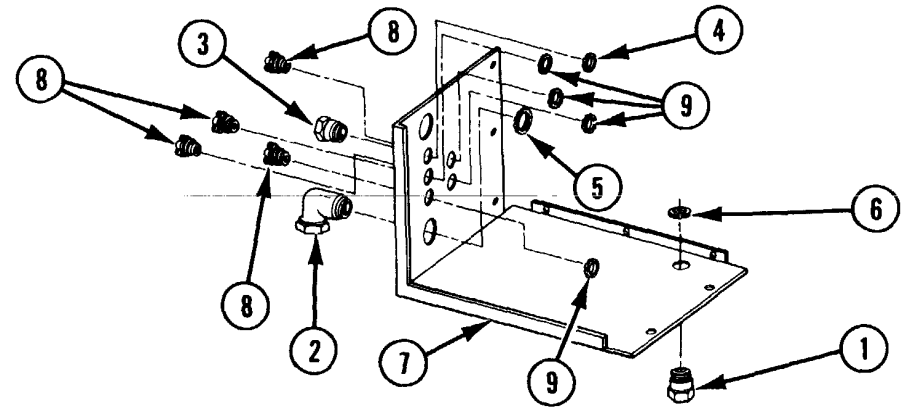
Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

For replacement of wire, refer to items 25 thru 30, 33, 34, and 35, app C. Refer also to wiring diagram, p 6-146, and wire table, p 6-149. Fabricate new wire by using old wire as template. Crimp terminal lugs (items 21 thru 24, app C) on wire ends as required. Be sure to tag termination points on any new wire.

6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

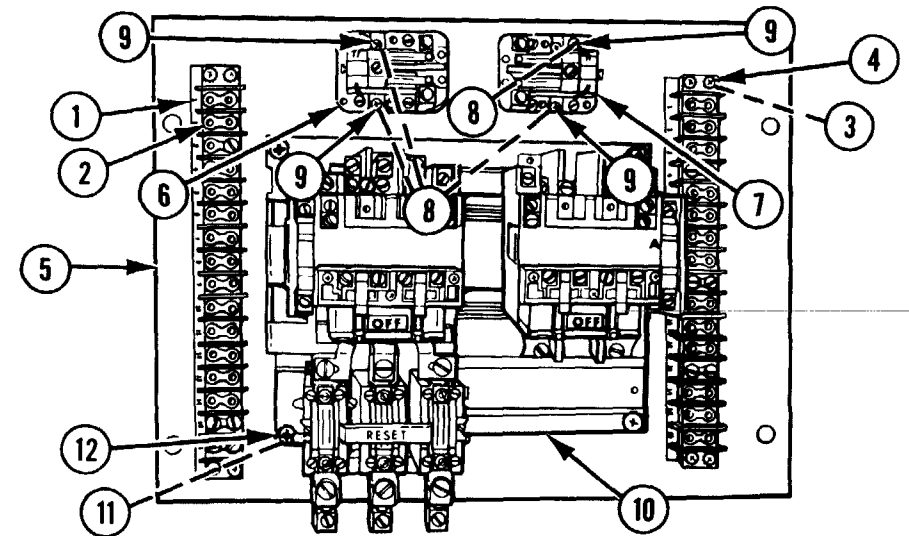
REASSEMBLY OF LH ENCLOSURE ASSEMBLY

- 1 STRAIGHT 90 SERIES CONNECTOR (1), ELECTRICAL BOX CONNECTOR (2), STRAIGHT 90 SERIES CONNECTOR (3), AND THREE NUTS (4, 5, AND 6). Install in LH enclosure (7).
- 2 FOUR STRAIGHT BOX CONNECTORS (8) AND FOUR NUTS (9). Install.



REASSEMBLY OF LH MOUNTING BOARD ASSEMBLY

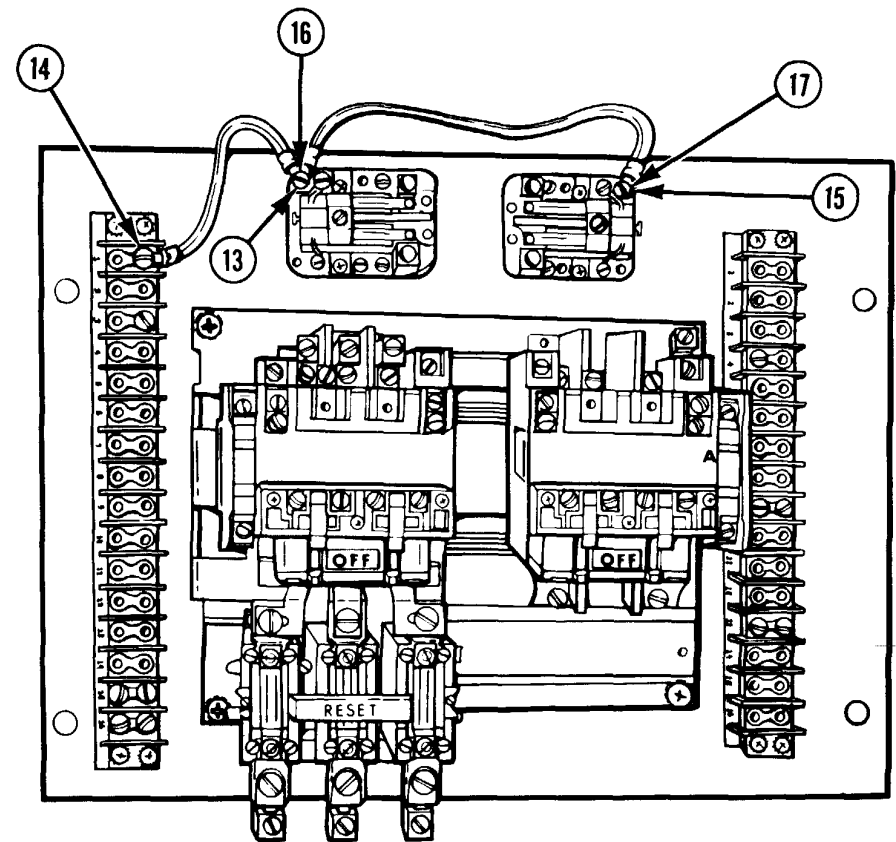
- 1 TWO NUMBER STRIPS (1), TWO TERMINAL STRIPS (2), EIGHT LOCKWASHERS (3), AND EIGHT MACHINE SCREWS (4). Install on LH mounting board (5).
- 2 FORWARD TACHOMETER REVERSING RELAY (6), REVERSE TACHOMETER REVERSING RELAY (7), FOUR LOCKWASHERS (8), AND FOUR MACHINE SCREWS (9). Install on LH mounting board (5).
- 3 STARTER (10), FOUR LOCKWASHERS (11), AND FOUR MACHINE SCREWS (12). Install on LH mounting board (5).



**NOTE**

Wires were tagged with termination points at disassembly. Ensure that wires are connected to correct locations.

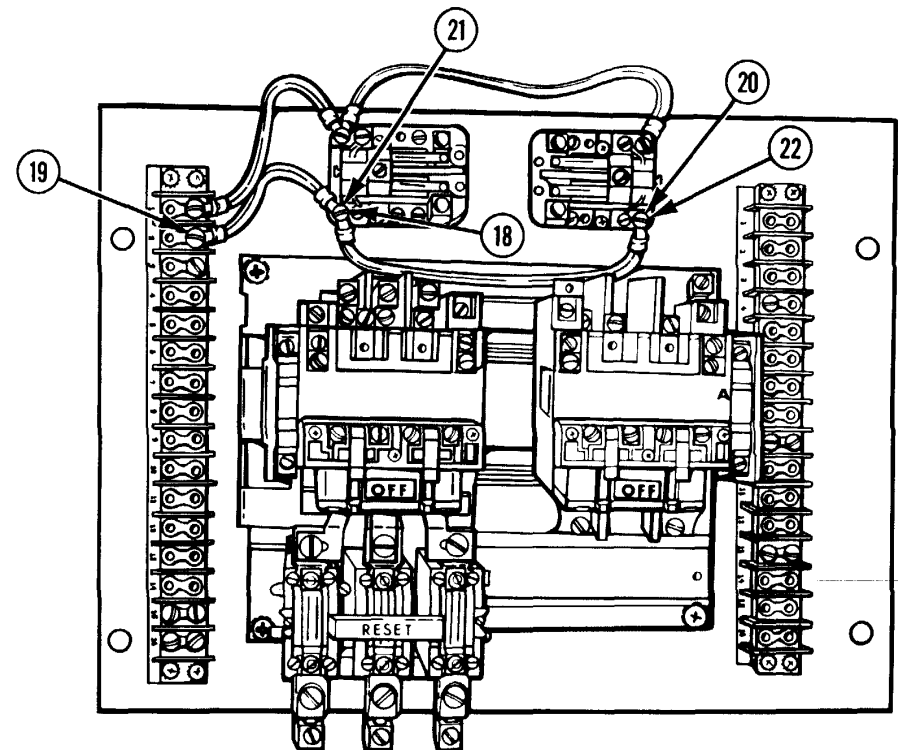
- 4 WIRE. Position one end with terminal lug on terminal A1 and position other end with terminal lug on forward tachometer reversing relay contact (13).
- 5 SCREW (14). Install through terminal lug into terminal A1.
- 6 WIRE. Position one end with terminal lug on forward tachometer reversing relay contact (13) and position other end with terminal lug on reverse tachometer reversing relay contact (15).
- 7 TWO SCREWS (16 AND 17). Install.



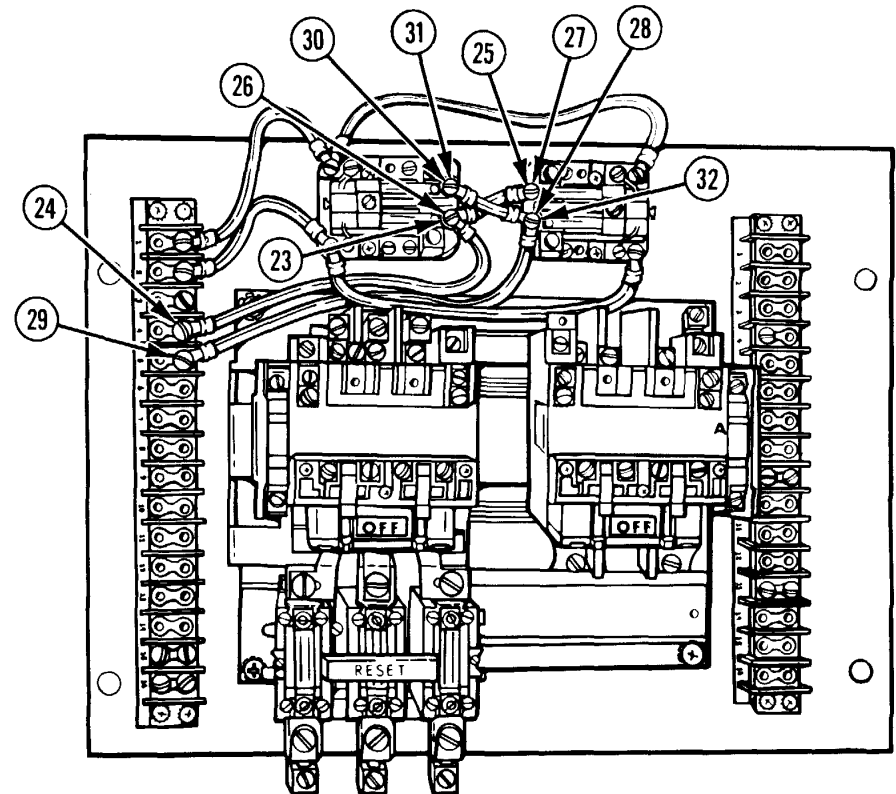
6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY OF LH MOUNTING BOARD ASSEMBLY (cont)

- 8 WIRE. Position one end with terminal lug on terminal A2 and position other end with terminal lug on forward tachometer reversing relay contact (18).
- 9 SCREW (19). Install through terminal lug into terminal A2.
- 10 WIRE. Position one end with terminal lug on forward tachometer reversing relay contact (18) and position other end with terminal lug on reverse tachometer reversing relay contact (20).
- 11 TWO SCREWS (21 AND 22). Install.



- 12 WIRE. Position one end with terminal lug on terminal A4 and position other end with terminal lug on forward tachometer reversing relay contact (23).
- 13 SCREW (24). Install through terminal lug into terminal A4.
- 14 WIRE. Position one end with terminal lug on forward tachometer reversing relay contact (23) and position other end with terminal lug on reverse tachometer reversing relay contact (25).
- 15 TWO TERMINAL CAPS (26 AND 27). Install.
- 16 WIRE. Position one end with terminal lug on terminal A5 and position other end with terminal lug on reverse tachometer reversing relay contact (28).
- 17 SCREW (29). Install through terminal lug into terminal A5.
- 18 WIRE. Position one end with terminal lug on reverse tachometer reversing relay contact (28) and position the other end with terminal lug on forward tachometer reversing relay contact (30).
- 19 TWO TERMINAL CAPS (31 AND 32). Install.

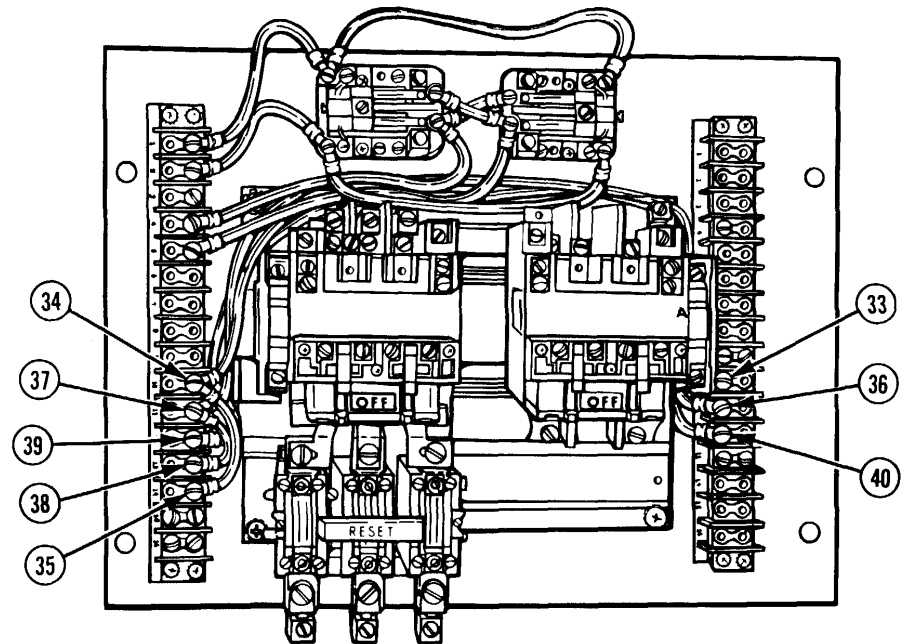




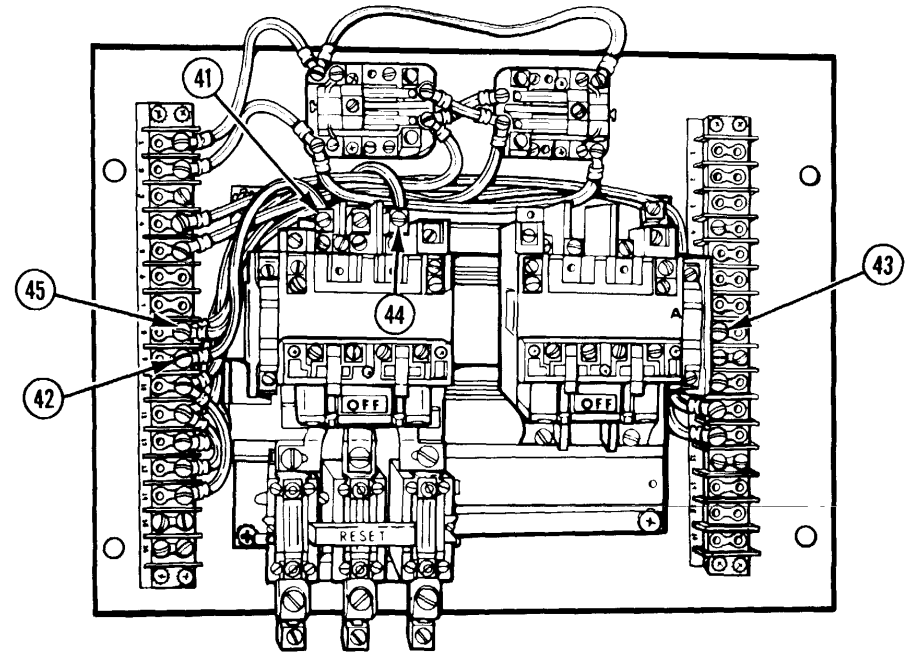
**6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY OF LH MOUNTING BOARD ASSEMBLY (cont)**

- 20 WIRE. Connect one end with terminal lug on terminal B10 and position other end with terminal lug on terminal A10.
- 21 SCREW (33). Install through terminal lug into terminal B10.
- 22 WIRE. Position one end with terminal lug on terminal A10 and position other end on terminal A14.
- 23 TWO SCREWS (34 AND 35). Install.
- 24 WIRE. Position one end with terminal lug on terminal B11 and position other end with terminal lug on terminal A11.
- 25 SCREW (36). Install through terminal lug into terminal B11.
- 26 WIRE. Position one end with terminal lug on terminal A11 and position other end with terminal lug on terminal A13.
- 27 TWO SCREWS (37 AND 38). Install.
- 28 WIRE. Position one end with terminal lug on terminal A12 and position other end with terminal lug on terminal B12.
- 29 TWO SCREWS (39 AND 40). Install.



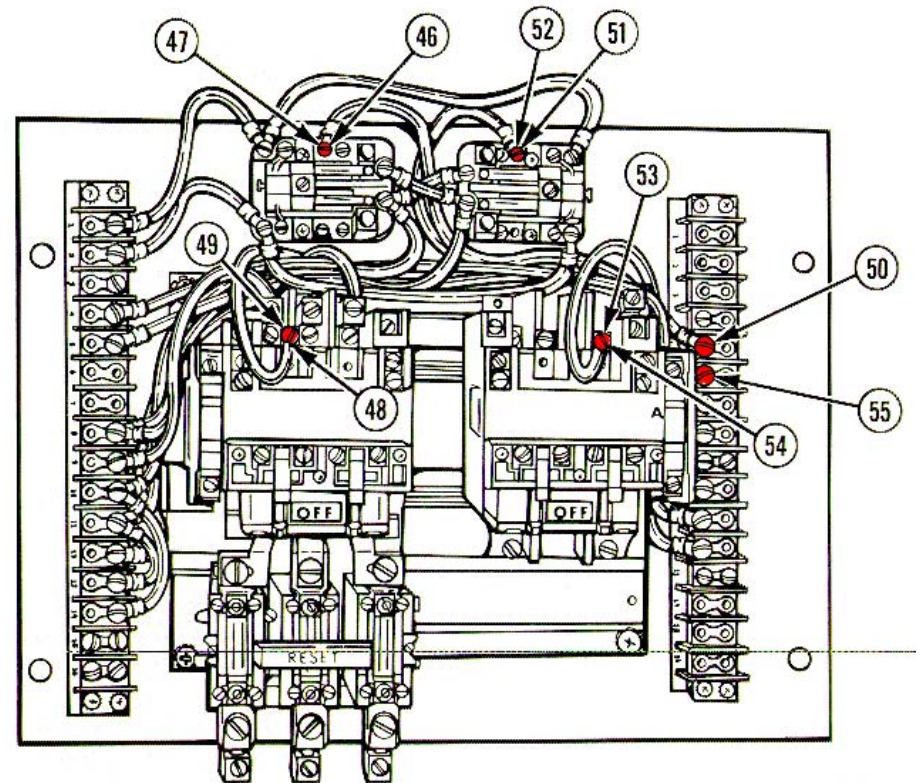
- 30 WIRE. Position one end with terminal lug on terminal A9 and position other end on starter contact (41).
- 31 SCREW (42). Install through terminal lug into terminal A9.
- 32 WIRE. Position one end with terminal lug on terminal B8 and position other end with terminal lug on terminal A8.
- 33 SCREW (43). Install through terminal lug into terminal B8.
- 34 WIRE. Position one end with terminal lug on terminal A8 and position other end on starter contact (44).
- 35 SCREW (45). Install through two terminal lugs into terminal A8.



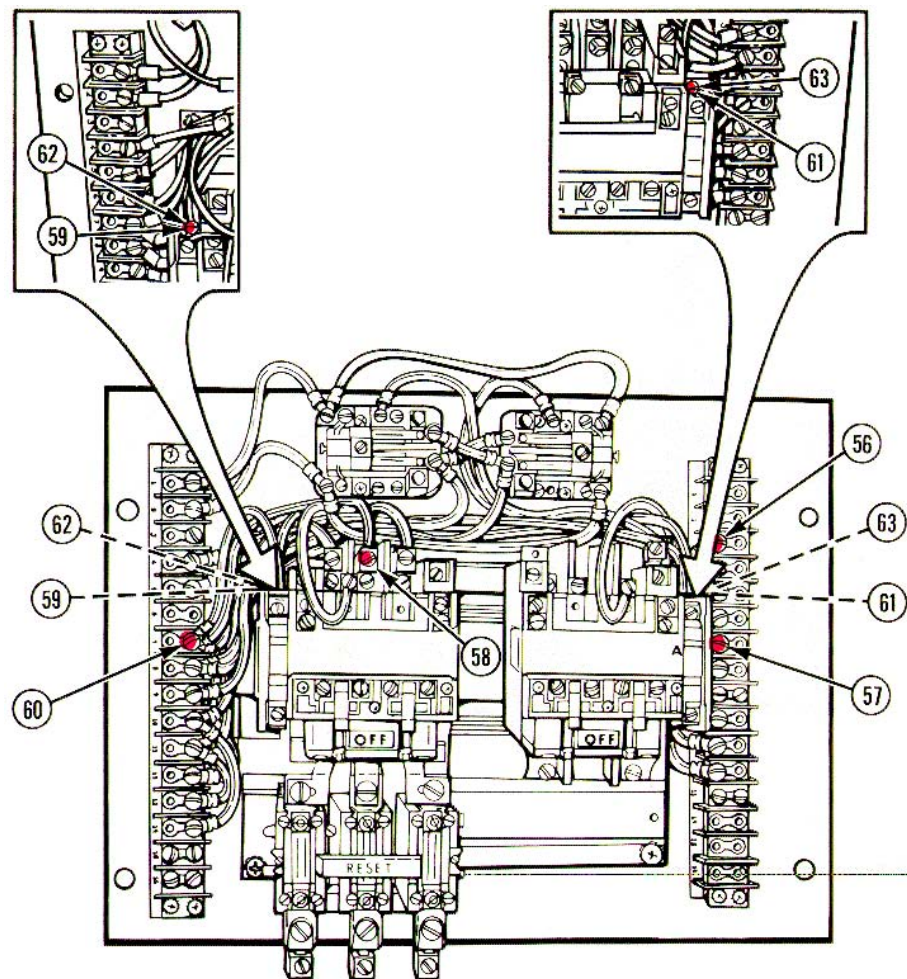
**6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY OF LH MOUNTING BOARD ASSEMBLY (cont)**

- 36 WIRE. Position one end with terminal lug to forward tachometer reversing relay contact (46) and position other end with terminal lug on terminal B5.
- 37 SCREW (47). Install.
- 38 WIRE. Position one end with terminal lug on terminal B5 and secure other end on starter contact (48) with screw (49).
- 39 SCREW (50). Install through two terminal lugs into terminal B5.
- 40 WIRE. Position one end with terminal lug to reverse tachometer reversing relay contact (51) and position other end with terminal lug on terminal B6.
- 41 SCREW (52). Install.
- 42 WIRE. Position one end with terminal lug on terminal B6 and secure other end on starter contact (53) with screw (54).
- 43 SCREW (55). Install through two terminal lugs into terminal B6.



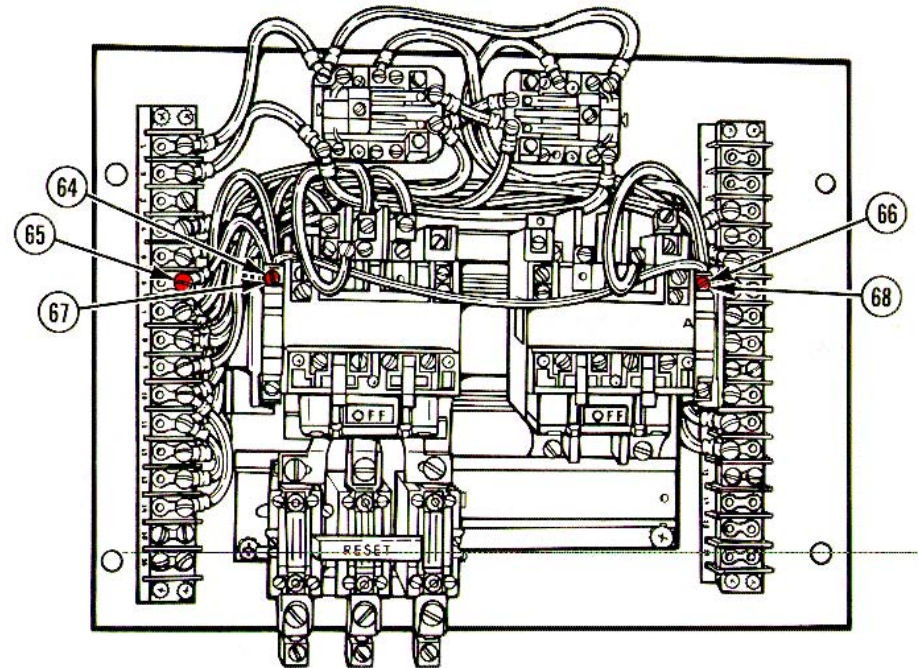
- 44 WIRE. Position one end with terminal lug on terminal B3 and position other end on terminal B7.
- 45 SCREW (56). Install through terminal lug into terminal B3.
- 46 WIRE. Position one end with terminal lug on terminal B7 and position other end with terminal lug on terminal A7.
- 47 SCREW (57). Install through two terminal lugs into terminal B7.
- 48 WIRE. Position one end with terminal lug on terminal A7 and position other end on starter contact (58).
- 49 WIRE. Position one end with terminal lug on terminal A7 and position other end on starter microswitch contact (59).
- 50 SCREW (60). Install through three terminal lugs into terminal A7.
- 51 WIRE. Position one end on starter microswitch contact (59) and position other end on starter microswitch contact (61).
- 52 TWO SCREWS (62 AND 63). Tighten.



6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

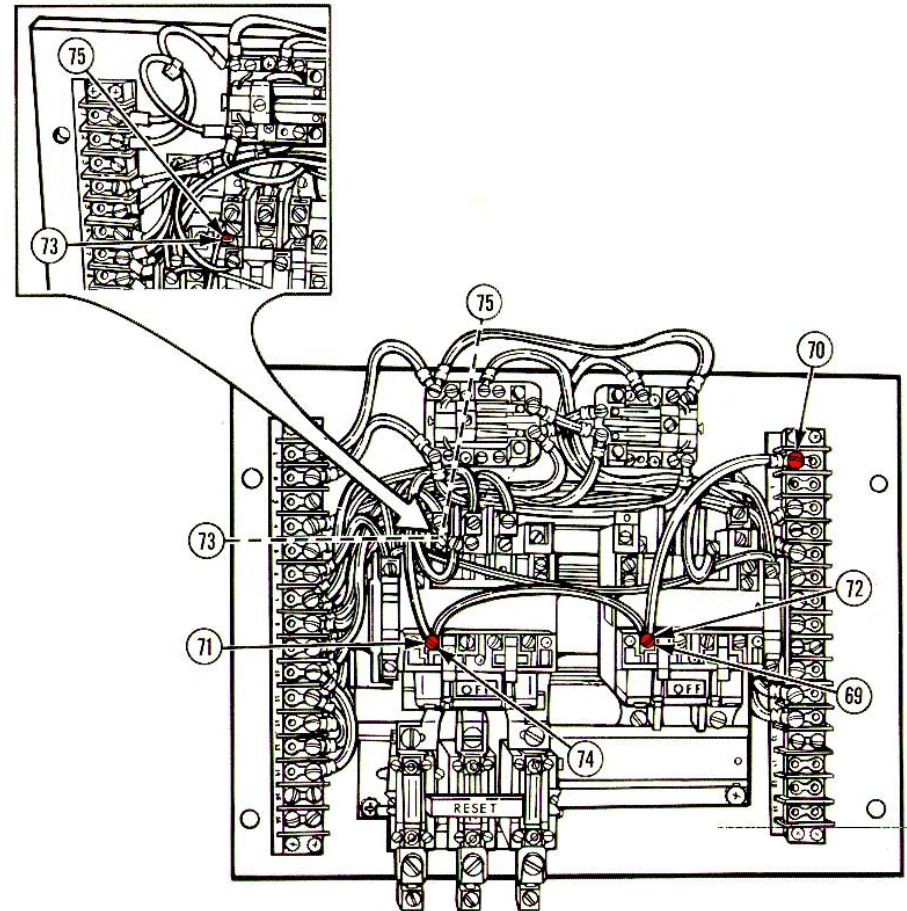
REASSEMBLY OF LH MOUNTING BOARD ASSEMBLY (cont)

- 53 WIRE. Position one end with terminal lug on terminal A6 and position other end on starter microswitch contact (64).
- 54 SCREW (65). Install through terminal lug into terminal A6.
- 55 WIRE. Position one end on starter microswitch contact (64) and position other end on starter microswitch contact (66).
- 56 TWO SCREWS (67 AND 68). Tighten.





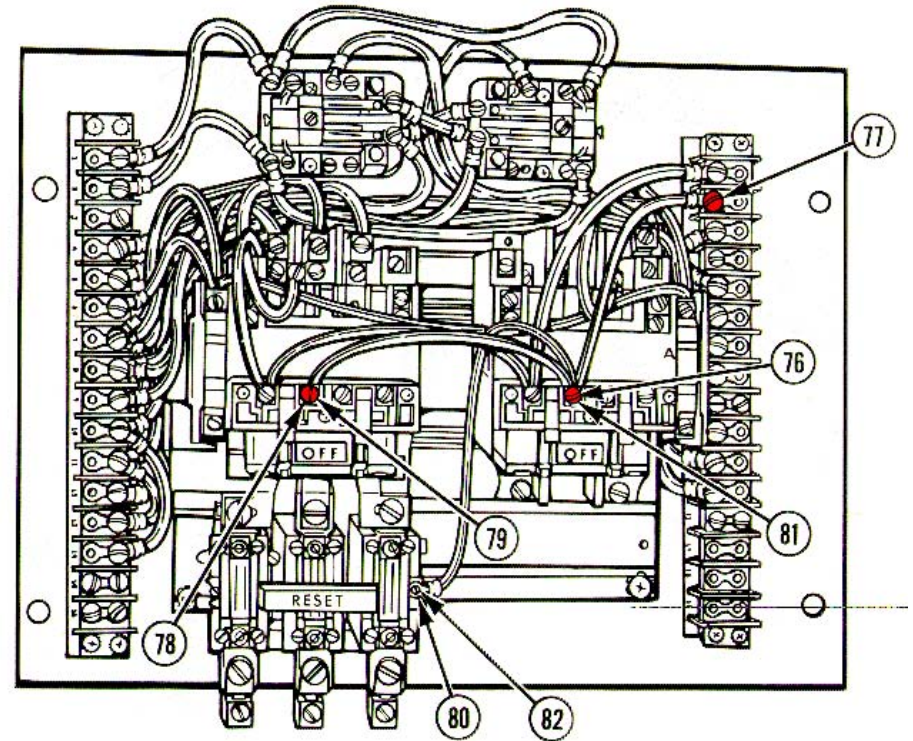
- 57 WIRE. Position one end with terminal lug on terminal B1 and position other end on starter contact (69).
- 58 SCREW (70). Install through terminal lug into terminal B1.
- 59 WIRE. Position one end on starter contact (69) and position other end on starter contact (71).
- 60 SCREW (72). Tighten.
- 61 WIRE. Position one end on starter contact (71) and position other end on starter contact (73).
- 62 TWO SCREWS (74 AND 75). Tighten.



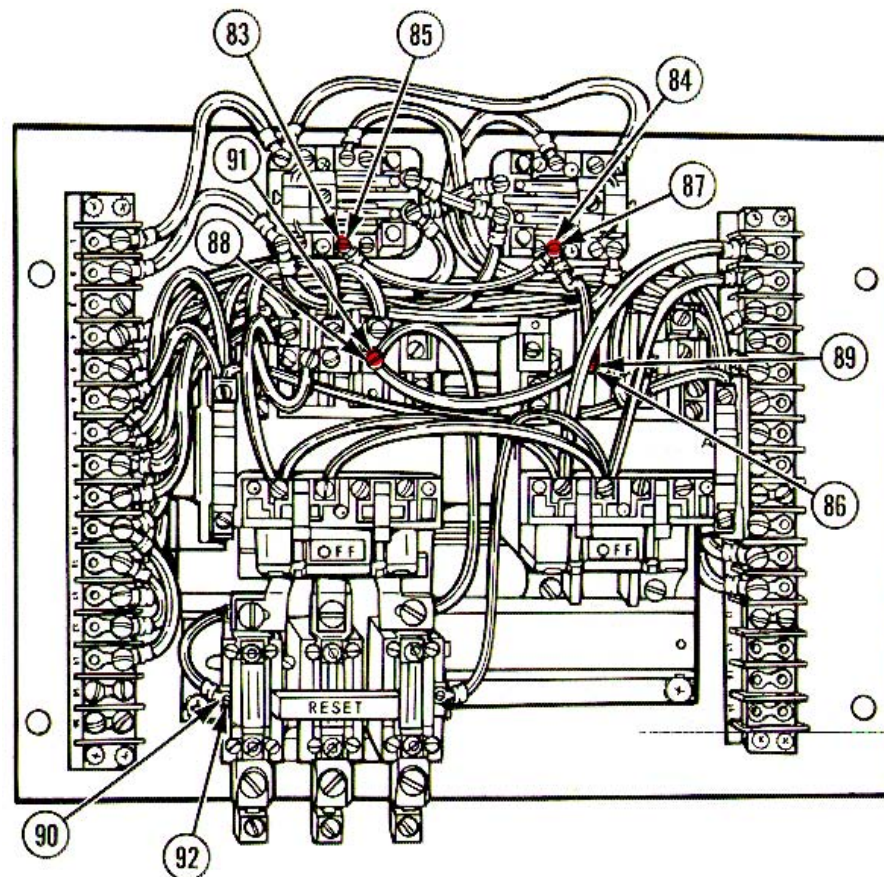
**6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY OF LH MOUNTING BOARD ASSEMBLY (cont)**

- 63 WIRE. Position one end with terminal lug on terminal B2 and position other end on starter contact (76).
- 64 SCREW (77). Install through terminal lug into terminal B2.
- 65 WIRE. Position one end on starter contact (78) and position other end on starter contact (76).
- 66 SCREW (79). Tighten.
- 67 WIRE. Position one end on starter contact (76) and position other end on starter contact (80).
- 68 SCREW (81). Tighten.
- 69 SCREW (82). Install.



- 70 WIRE. Position one end with terminal lug on forward tachometer reversing relay contact (83) and position other end with terminal lug on reverse tachometer reversing relay contact (84).
- 71 SCREW (85). Install.
- 72 WIRE. Position one end with terminal lug on reverse tachometer reversing relay contact (84) and position other end on starter contact (86).
- 73 SCREW (87). Install.
- 74 WIRE. Position one end on starter contact (86) and position other end on starter contact (88).
- 75 SCREW (89). Tighten.
- 76 WIRE. Position one end on starter contact (88) and position the other end on starter contact (90).
- 77 SCREW (91). Tighten.
- 78 SCREW (92). Install.



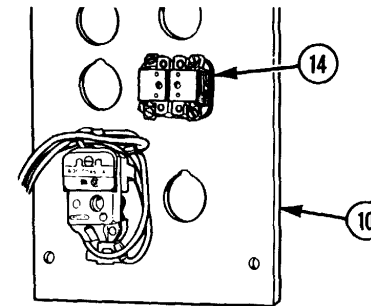
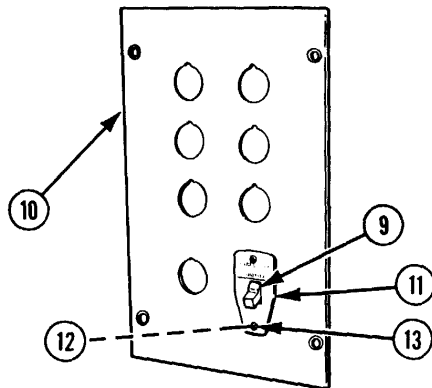
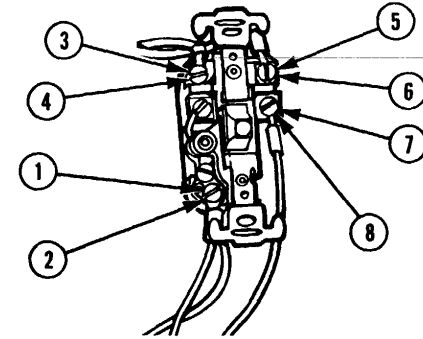
6-6-. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY OF LH CONTROL PANEL ASSEMBLY

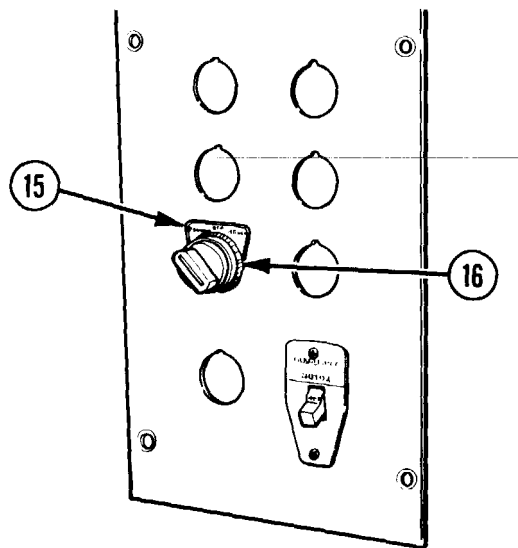
**NOTE**

Wires were tagged with termination points at disassembly. Ensure that wires are connected to correct locations.

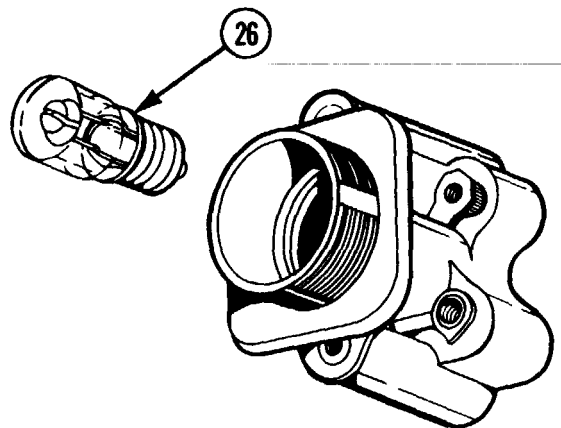
- 1 WIRE TAGGED B10. Position one end with terminal lug on AUXILIARY MOTOR switch contact (1), install screw (2) and tighten.
- 2 WIRE TAGGED B8. Position one end with terminal lug on AUXILIARY MOTOR switch contact (3), install screw (4) and tighten.
- 3 WIRE TAGGED B7. Position one end with terminal lug on AUXILIARY MOTOR switch contact (5), install screw (6) and tighten.
- 4 WIRE TAGGED B11. Position one end with terminal lug on AUXILIARY MOTOR switch contact (7), install screw (8) and tighten.
- 5 AUXILIARY MOTOR SWITCH (9). Position on LH control panel (10).
- 6 SWITCH PLATE (11), TWO LOCKWASHERS (12), AND TWO MACHINE SCREWS (13). Install.



- 7 FORWARD-OFF-REVERSE SWITCH (14). Position on LH control panel (10).



8 LEGEND PLATE (15) AND LENS CAP (16). Install.



14 TWO CLEAR LAMPS (26). Install in two indicator lights for MANIFOLD HEAT light and POWER ON light.

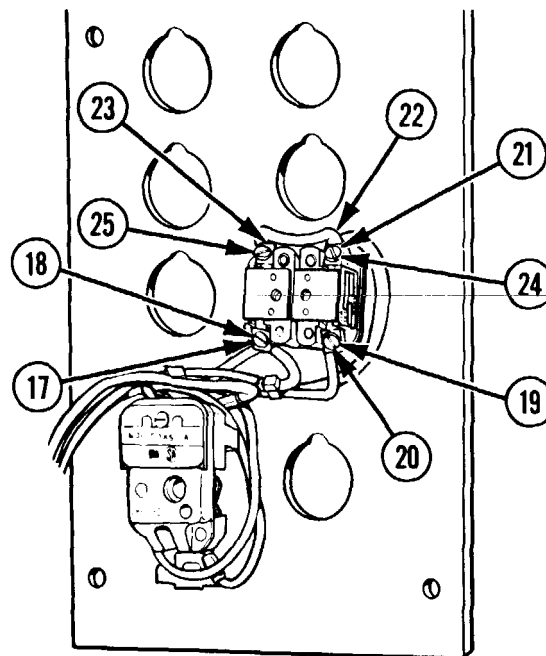
9 WIRE TAGGED B6. Position one end on FORWARD-OFF-REVERSE switch contact (17) and tighten screw (18).

10 WIRE TAGGED B5. Position one end on FORWARD-OFF-REVERSE switch contact (19) and tighten screw (20).

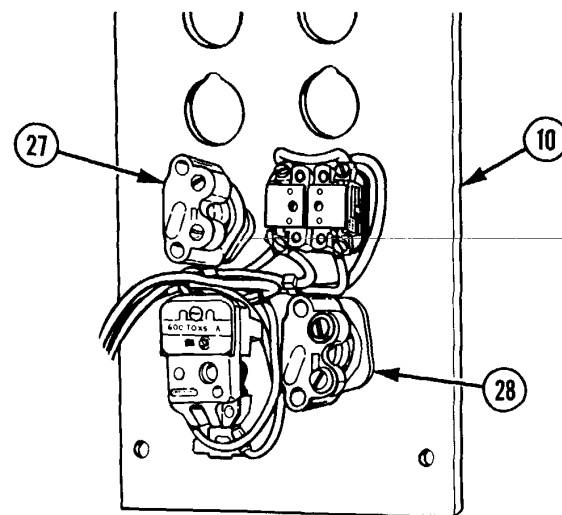
11 WIRE TAGGED B4. Position one end on FORWARD-OFF-REVERSE switch contact (21).

12 JUMPER WIRE (22). Position one end on FORWARD-OFF-REVERSE switch contact (21) and position other end on FORWARD-OFF-REVERSE switch contact (23).

13 TWO SCREWS (24 AND 25). Tighten.



15 TWO INDICATOR LIGHTS (27 AND 28). Position on LH control panel (10).

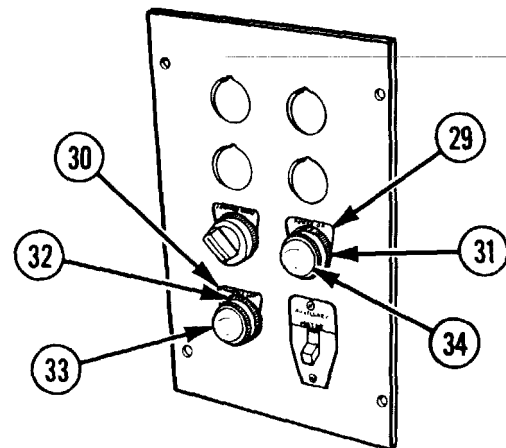




**6-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY OF LH CONTROL PANEL ASSEMBLY (cont)**

**16** TWO LEGEND PLATES (29 AND 30), TWO LENS CAPS (31 AND 32), CLEAR LENS (33), AND AMBER LENS (34). Install.

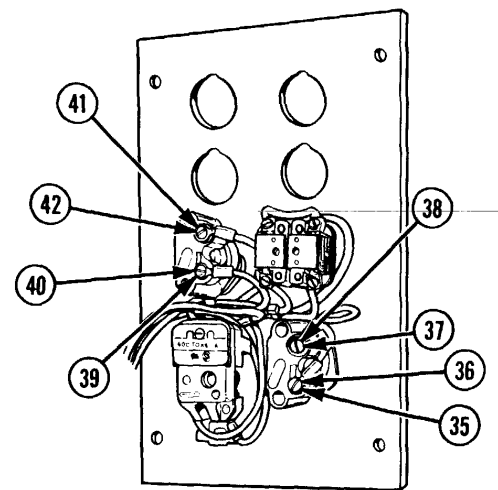


**17** WIRE TAGGED B10. Position one end with terminal lug on MANIFOLD HEAT light indicator contact (35), install screw (36) and tighten.

**18** WIRE TAGGED B12. Position one end with terminal lug on MANIFOLD HEAT light indicator contact (37), install screw (38) and tighten.

**19** WIRE TAGGED B8. Position one end with terminal lug on POWER ON light indicator contact (39), install screw (40) and tighten.

**20** WIRE TAGGED B7. Position one end with terminal lug on POWER ON light indicator contact (41), install screw (42) and tighten.

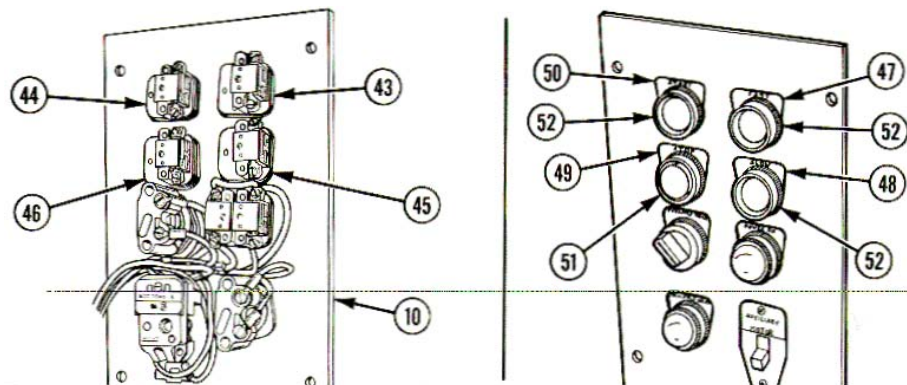


21 START SWITCH (43), FAST SWITCH (44), STOP SWITCH (45), AND SLOW SWITCH (46). Position on LH control panel (10).

**NOTE**

**Ensure each legend plate is in proper location.**

22 FOUR LEGEND PLATES (47 THRU 50), LENS CAP (51), AND THREE LENS CAPS (52). Install.



23 WIRE TAGGED B4. Position one end on STOP switch contact (53) and tighten screw (54).

24 WIRE TAGGED B3. Position one end on STOP switch contact (55) and tighten screw (56).

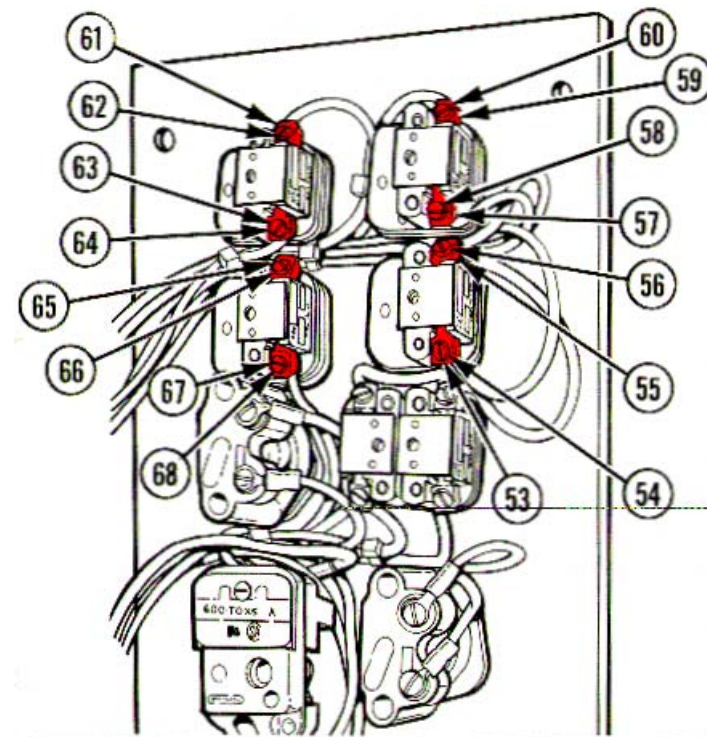
25 WIRE TAGGED B1. Position one end on START switch contact (57) and tighten screw (58).

26 WIRE TAGGED B2. Position one end on START switch contact (59) and tighten screw (60).  
D WIRE TAGGED B14. Position one end on FAST switch contact (61) and tighten screw (62).

28 WIRE TAGGED B15. Position one end on FAST switch contact (63) and tighten screw (64).

29 WIRE TAGGED B15. Position one end on SLOW switch contact (65) and tighten screw (66).

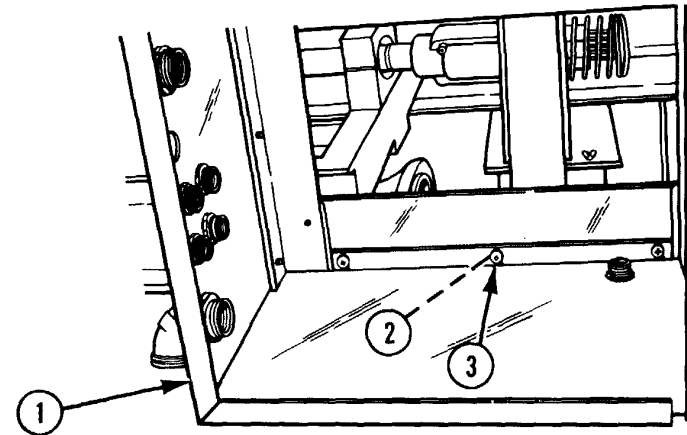
30 WIRE TAGGED B16. Position one end on SLOW switch contact (67) and tighten screw (68).



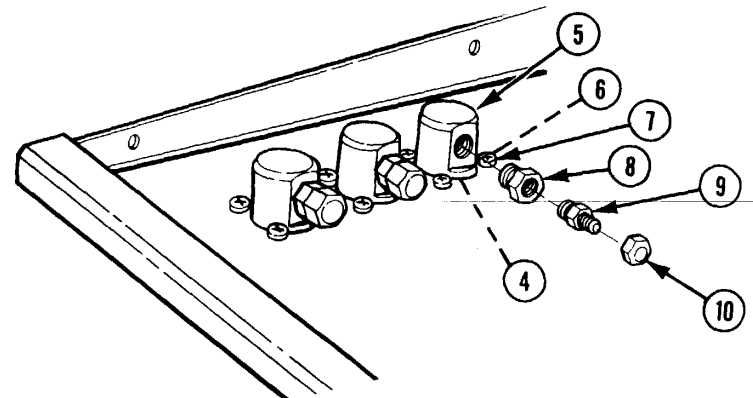
16-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION

- 1 LH ENCLOSURE ASSEMBLY (1). Position on tester.
- 2 EIGHT LOCKWASHERS (2) AND EIGHT SCREWS (3). Install.



- 3 DISCHARGE BLOCK GASKET (4), LUBE OIL PRESSURE DISCHARGE BLOCK (5), FOUR LOCKWASHERS (6), AND FOUR MACHINE SCREWS (7). Install.
- 4 REDUCER BUSHING (8), CONNECTOR (9), AND CAP (10). Install.



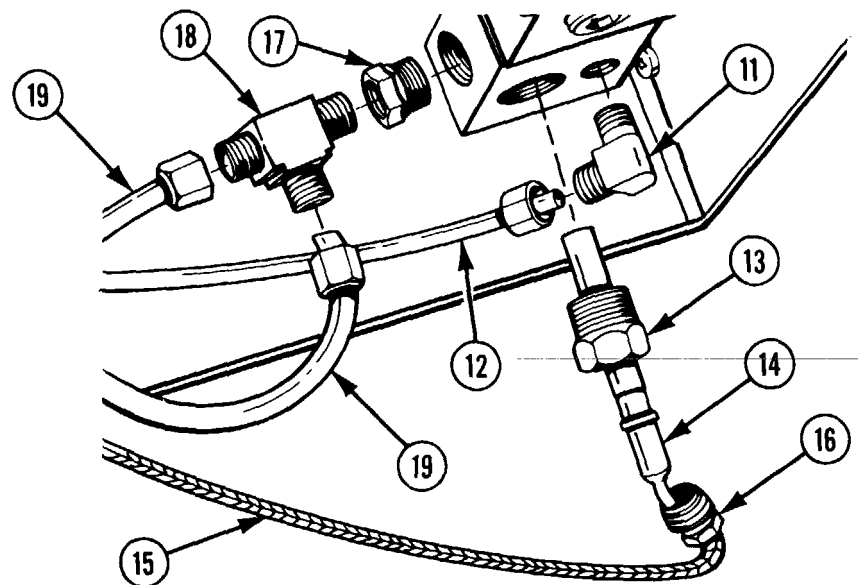
5 MALE ELBOW (11) AND COPPER TUBING (12). Install.

**CAUTION**

**Bulbs are fragile. Use care when removing or installing bulbs to prevent damage.**

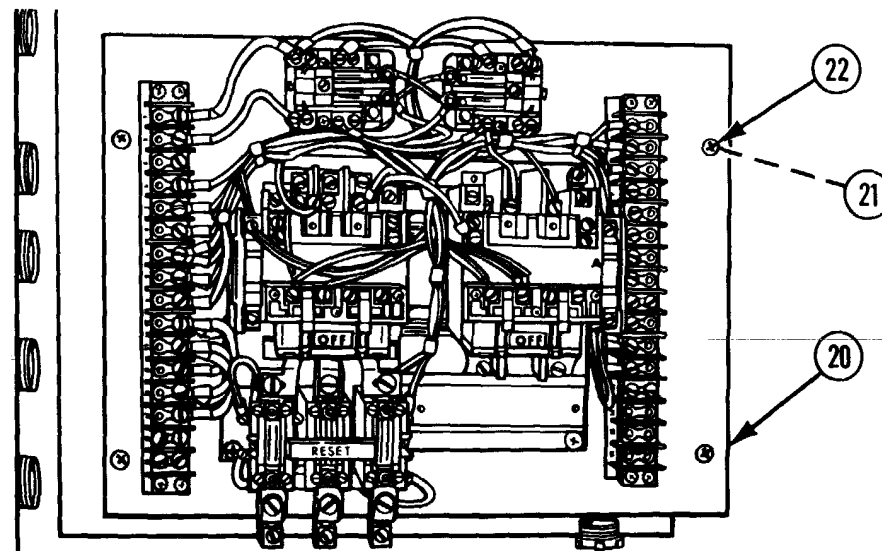
6 ADAPTER (13), BULB (14) WITH BRAIDED TUBE (15), AND NUT (16). Install.

7 REDUCER BUSHING (17), MALE RUN TEE (18), AND TWO COPPER TUBINGS (19). Install.



8 LH MOUNTING BOARD ASSEMBLY (20). Position on tester.

9 FOUR LOCKWASHERS (21) AND FOUR SCREWS (22). Install.

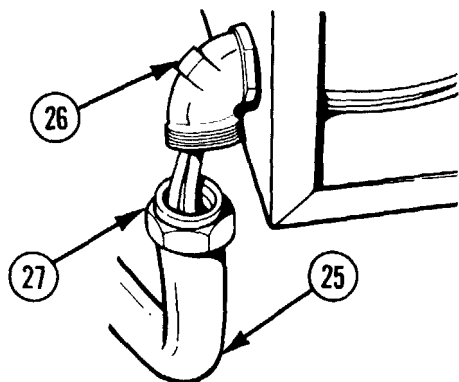


16-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

10 LH CONTROL PANEL ASSEMBLY (23). Position on tester.

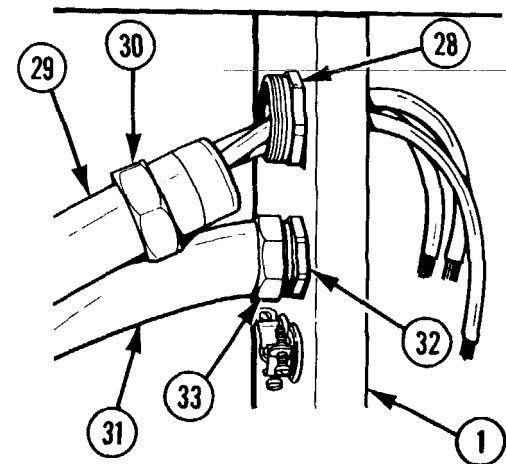
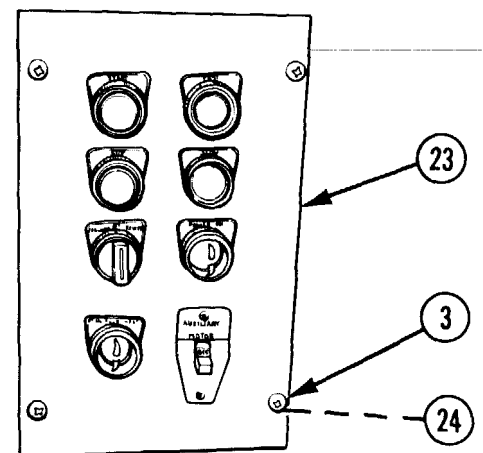
11 FOUR LOCKWASHERS (24) AND FOUR SCREWS (3). Install.



12 CONDUIT (25). Install three wires through electrical box connector (26) and install nut (27).

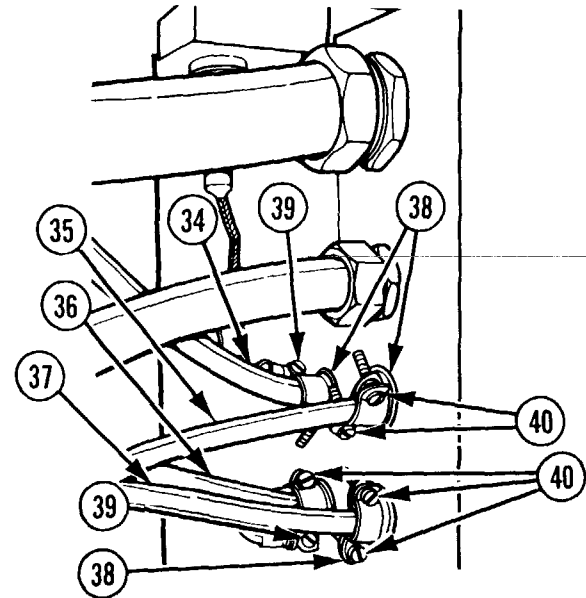
13 ELECTRICAL CONNECTOR (28) AND CONDUIT (29). Install in LH enclosure assembly (1) and tighten nut (30).

14 WIRE CABLE (31). Install through straight 90 series connector (32) and install nut (33).

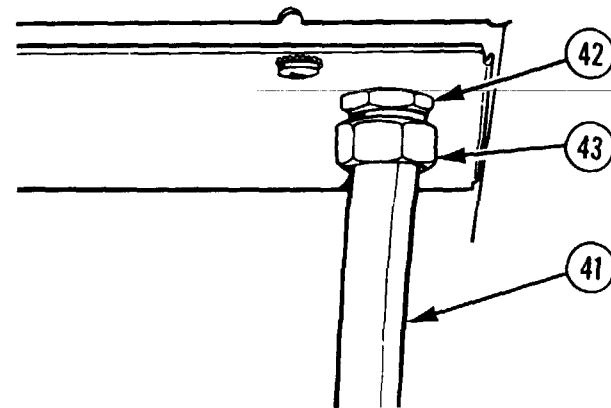




- 15 FOUR WIRE CABLES (34 THRU 37). Install through four straight box connectors (38).
- 16 TWO GROUND WIRES WITH TERMINAL LUGS. Connect to two straight box connectors, install two screws (39) and tighten.
- 17 SIX SCREWS (40). Tighten.



- 18 WIRE CABLE (41). Install three wires through straight 90 series connector (42) and install nut (43).



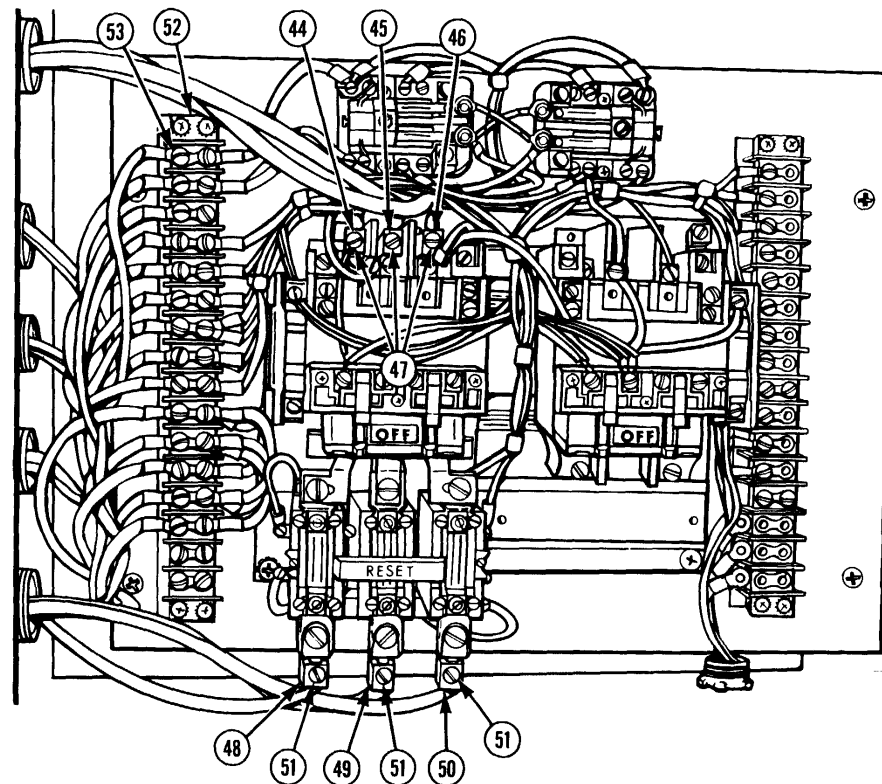
16-6. LH CONTROL EQUIPMENT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

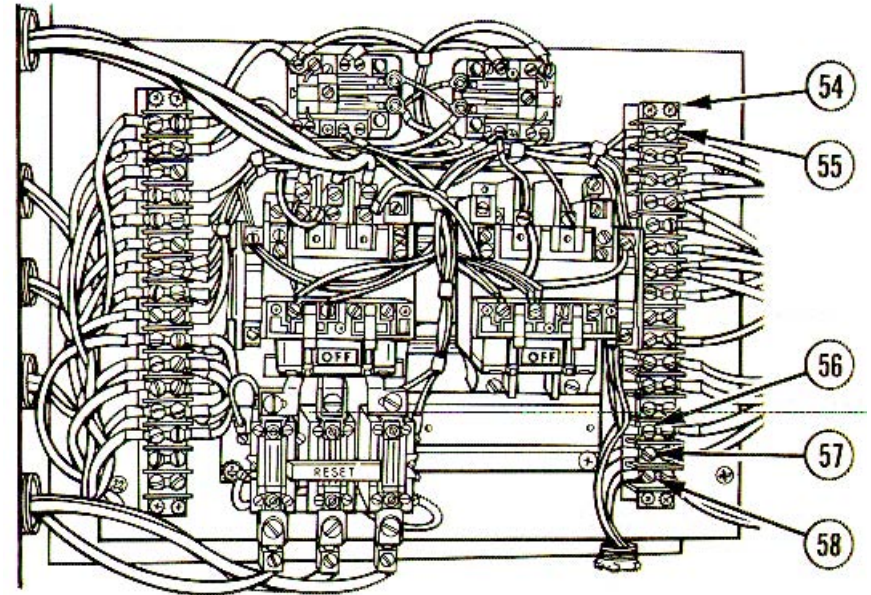
**NOTE**

Wires to be connected to starter, terminal strip A, and terminal strip B were tagged with termination points at disassembly. Ensure that wires are connected to correct locations.

- 19 THREE WIRES. Install on starter contacts (44, 45, and 46) and tighten three screws (47).
- 20 THREE WIRES. Install on starter contacts (48, 49, and 50) and tighten three screws (51).
- 21 FIFTEEN WIRES. Position on the LH terminals of terminal strip A (52) as marked, install fourteen screws (53) and tighten.



- 22 NINETEEN WIRES. Position on the RH terminals of terminal strip B (54) as marked, install fourteen screws (55) and tighten.
- 23 THREE WIRES. Install on terminals C14 (56), C15 (57), and C16 (58).

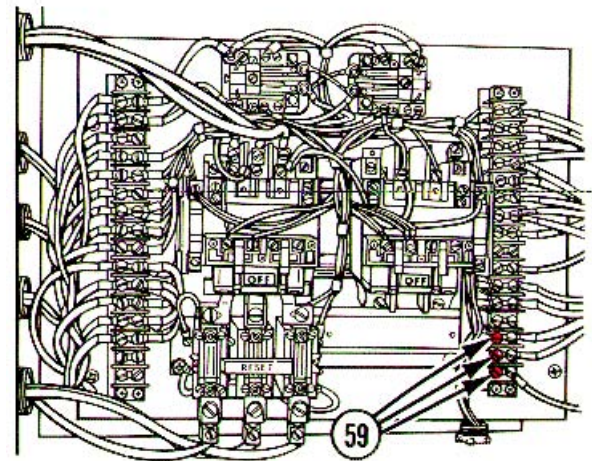


**TEST**

**NOTE**

All controls on LH control panel assembly must be visually observed for proper functioning. Refer to chapter 2, page 2-4, for explanation of operation of each control.

- 24 THREE SCREWS (59). Install.



H  
**16-6. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS**

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**THIS TASK COVERS:**

- |                         |                 |
|-------------------------|-----------------|
| a. Removal              | e. Reassembly   |
| b. Disassembly          | f. Installation |
| c. Inspection/servicing | g. Test         |
| d. Repair               |                 |
- 

**INITIAL SETUP**

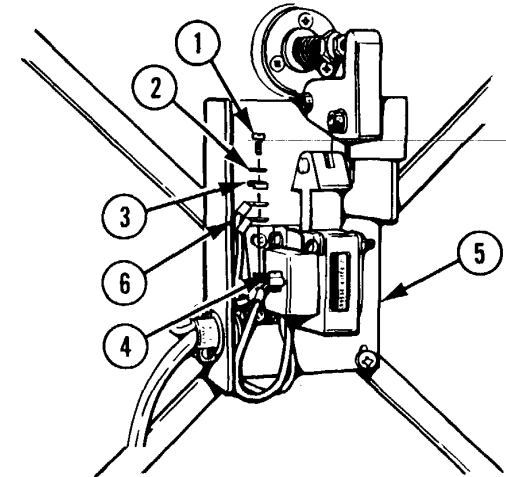
Tools and Special Tools	6-89	PRESSURE REGULATOR does not function
General mechanic's automotive tool kit (5180-00-177-7033)	6-47	PUMP TEMPERATURE gage is defective
	6-113	TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at FORWARD
Materials/Parts		
Abrasive cloth (item 4, app C)		
Cleaning compound (item 3, app C)	6-120	TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at REVERSE
Rag (item 14, app C)		
References	6-91	VACUUM - PRESS. selector valve does not function
TM 9-4910-387-24P	6-85	VACUUM REGULATOR does not function
Troubleshooting References		
6-46	BULB TEMPERATURE gage does not indicate	Equipment Conditions
6-83	Engine primer assembly does not function	Main power source to tester is turned off
6-71	FUEL TEMPERATURE gage does not indicate	4-33
6-77	LUBE OIL TEMPERATURE gage does not indicate	RH upper side panel is removed
6-42	Manifold bulb assembly is inoperative	4-32
6-93	MANF. PRESS. - CAPSULE PRESSURE selector valve does not function	Upper back panel is removed
6-64	No power at 24 VOLTS DC outlet assembly	4-34
		LH upper side panel is removed
		6-174
		Mounting rail parts are removed
		4-36
		Accumulator mounting parts are removed

**REMOVAL**

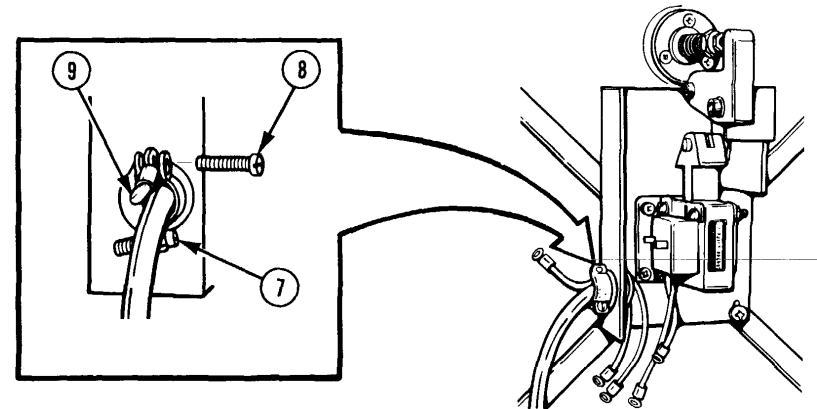
- 1 TWO SCREWS (1), TWO LOCKWASHERS (2), AND TWO CLIPS (3). Remove from two terminals (4) of solenoid assembly (5).

**NOTE**  
**Tag all wires at removal.**

- 2 FOUR WIRES (6) WITH ONE TERMINAL LUG EACH. Disconnect.



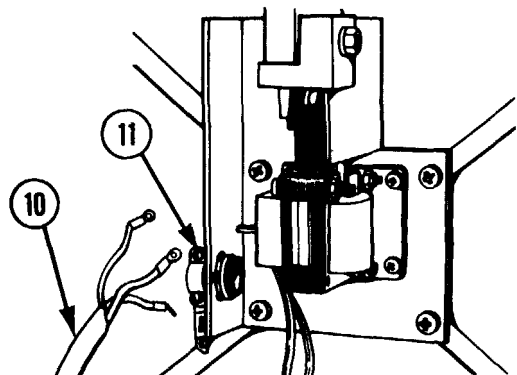
- 3 SCREW (7). Loosen.
- 4 SCREW (8). Remove.
- 5 GREEN WIRE (9) WITH TERMINAL LUG. Disconnect.





6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

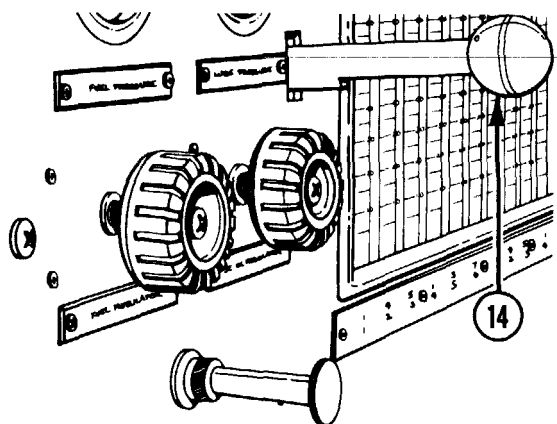
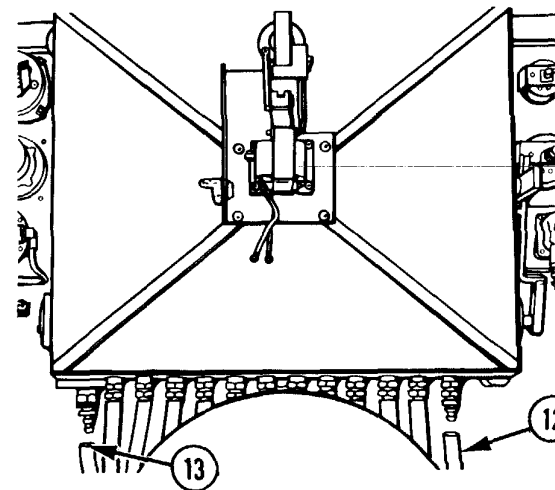
REMOVAL (cont)



6 WIRE CABLE (10). Pull through straight box connector (11).

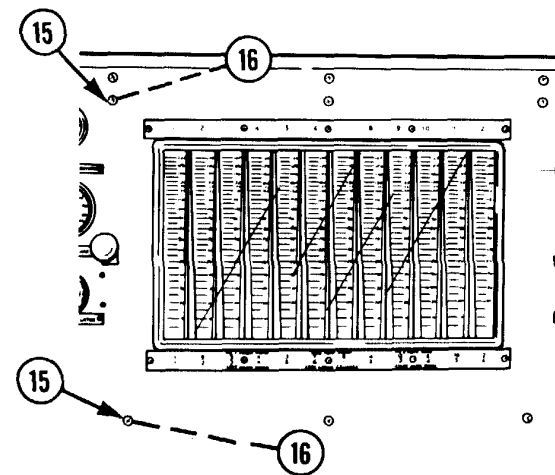
**NOTE**  
Tag all hoses at removal.

7 TWELVE HOSES (12) AND HOSE (13) Disconnect.

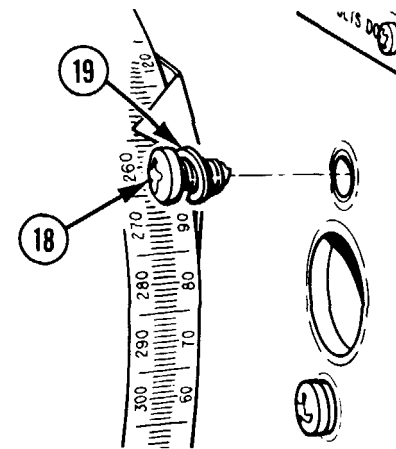
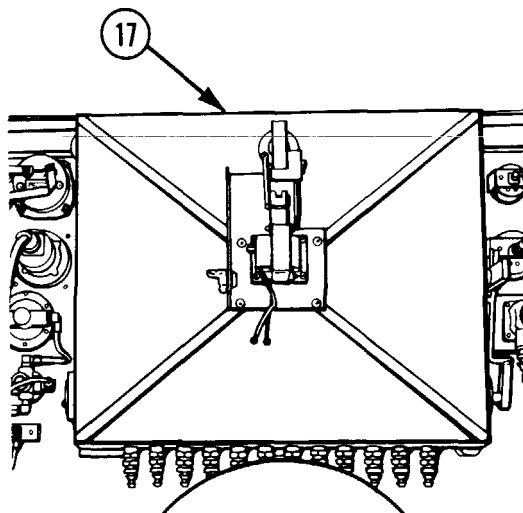


8 BALL KNOB (14). Remove.

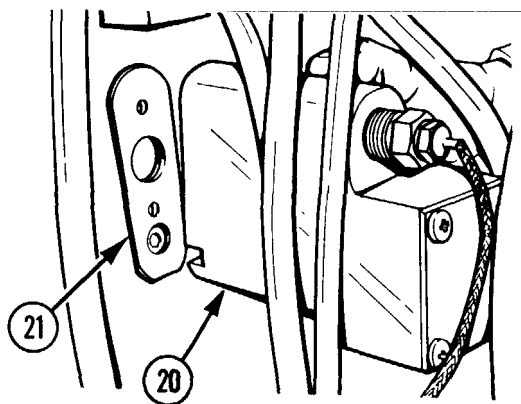
9 SIX SCREWS (15) AND SIX LOCK-WASHERS (16). Remove.



10 GRADUATE RACK ASSEMBLY (17).  
Remove.



11 TWO SCREWS (18) AND TWO  
LOCKWASHERS (19). Remove.

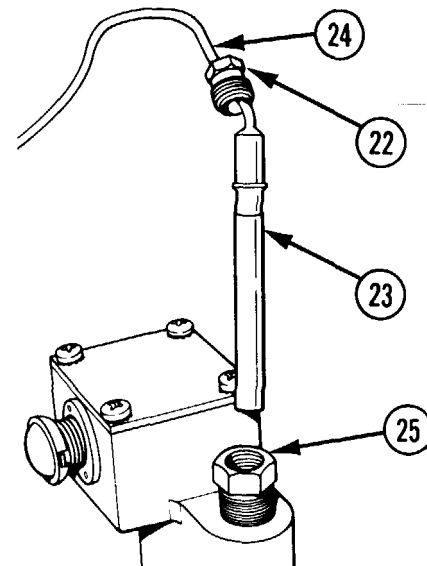


12 MANIFOLD CHAMBER (20). Pull  
gently away from instrument panel  
assembly.

13 GASKET (21). Remove.

**CAUTION**  
Be careful when removing  
bulbs as they are fragile and  
can damage easily.

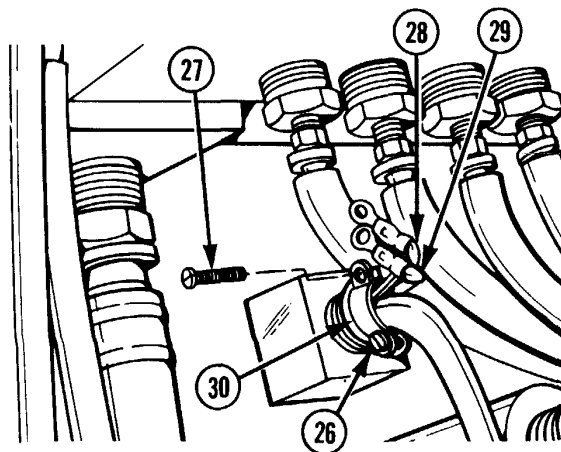
14 NUT (22), BULB (23) WITH BRAIDED  
TUBE (24), AND ADAPTER (25).  
Remove.



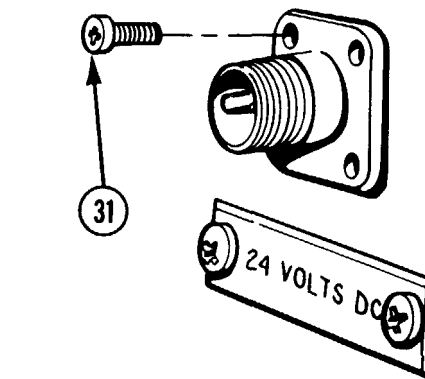
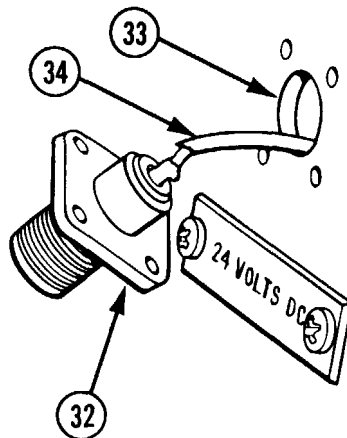
16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

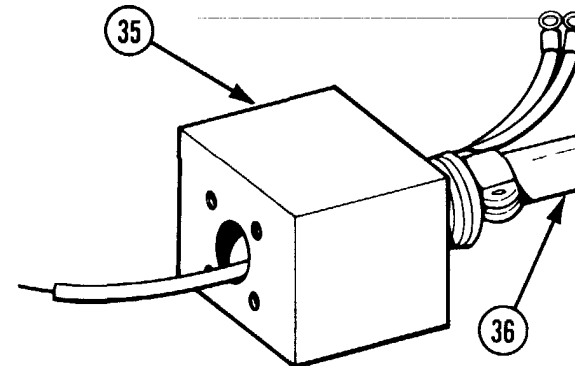
- 15 SCREW (26). Loosen.
- 16 SCREW (27). Remove.
- 17 TWO WIRES (28 AND 29) WITH ONE TERMINAL LUG EACH. Remove from connector (30).



- 19 RECEPTACLE CONNECTOR (32). Pull away from instrument panel assembly (33).
- 20 WIRE (34). Unsolder from receptacle connector (32).
- 21 RECEPTACLE CONNECTOR (32). Remove.



- 18 FOUR SCREWS (31). Remove.

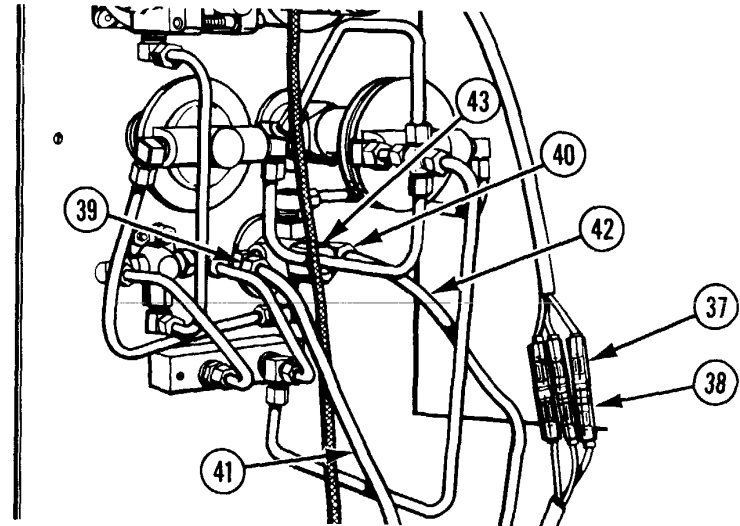


- 22 FITTING (35). Remove from wire cable (36).

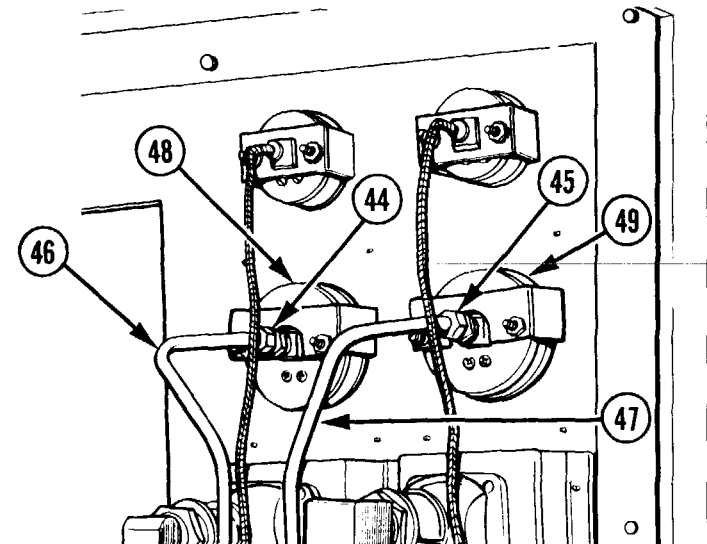
- 23 THREE FEMALE SOLDERLESS CONNECTORS (37). Disconnect from three male solderless connectors (38).

**NOTE**  
**Tag all copper tubings at removal.**

- 24 TWO NUTS (39 AND 40). Loosen.
- 25 TWO COPPER TUBINGS (41 AND 42). Move carefully away from VACUUM PRESS. selector valve (43).



- 26 TWO NUTS (44 AND 45). Loosen.
- 27 TWO COPPER TUBINGS (46 AND 47). Move carefully away from LUBE OIL PRESSURE gage (48) and FUEL PRESSURE gage (49).

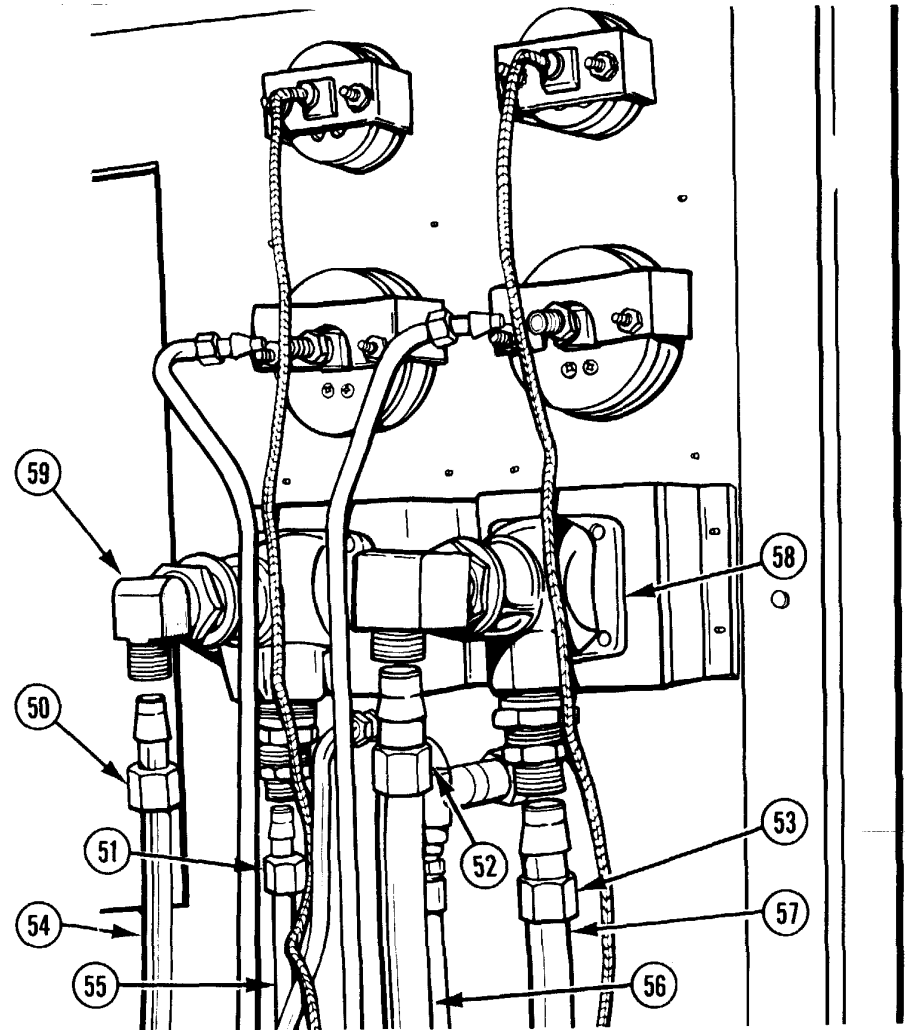


6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

28 FOUR NUTS (50 THRU 53). Loosen.

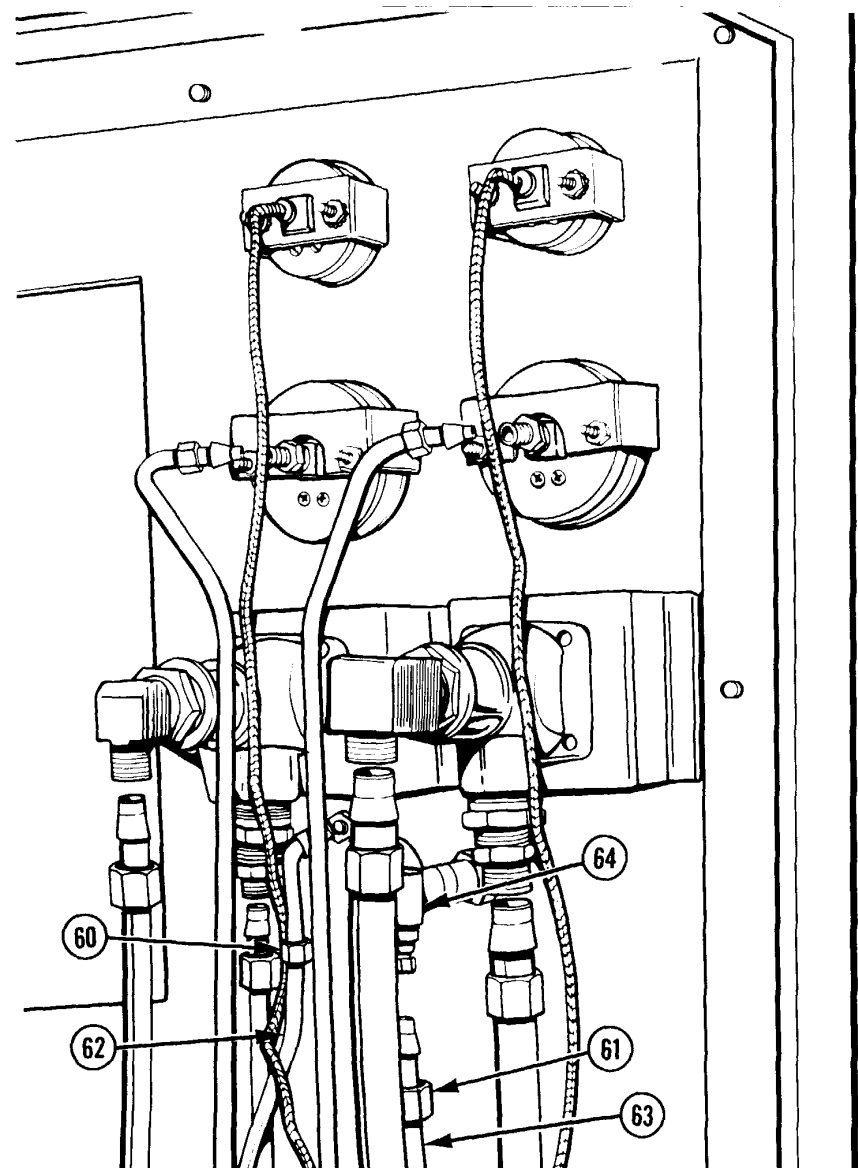
29 FOUR COPPER TUBINGS (54 THRU 57). Move carefully away from FUEL REGULATOR (58) and LUBE OIL REGULATOR (59).





30 TWO NUTS (60 AND 61). Loosen.

31 TWO COPPER TUBINGS (62 AND 63). Move carefully away from engine primer assembly (64).



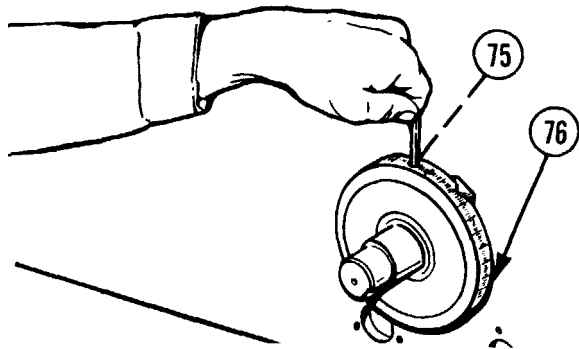
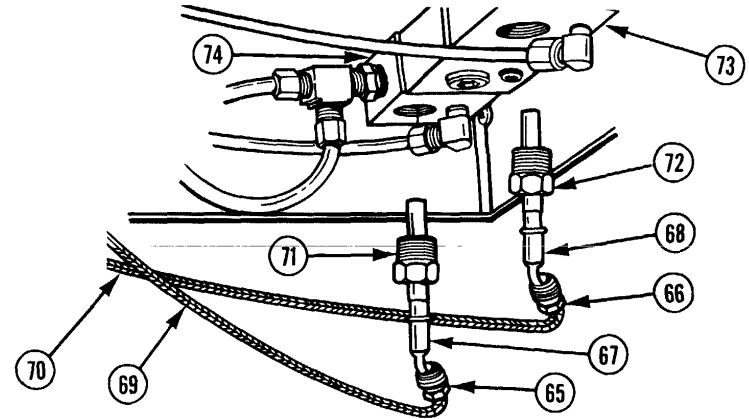
16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

**CAUTION**

Be careful when removing bulbs as they are fragile and can damage easily.

32 TWO NUTS (65 AND 66), TWO BULBS (67 AND 68) WITH BRAIDED TUBES (69 AND 70), AND TWO ADAPTERS (71 AND 72). Remove from fuel pressure discharge block (73) and lube oil pressure discharge block (74).

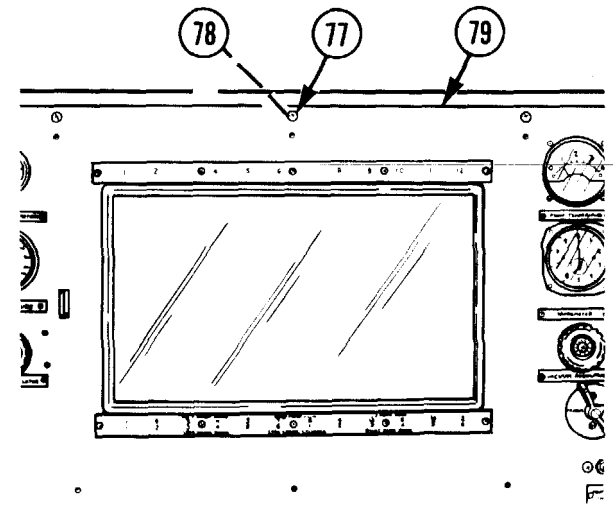


33 SETSCREW (75). Loosen and back off.

34 PLATE (76). Remove.

35 NINE SCREWS (77) AND NINE LOCKWASHERS (78). Remove.

36 INSTRUMENT PANEL ASSEMBLY (79). Remove.

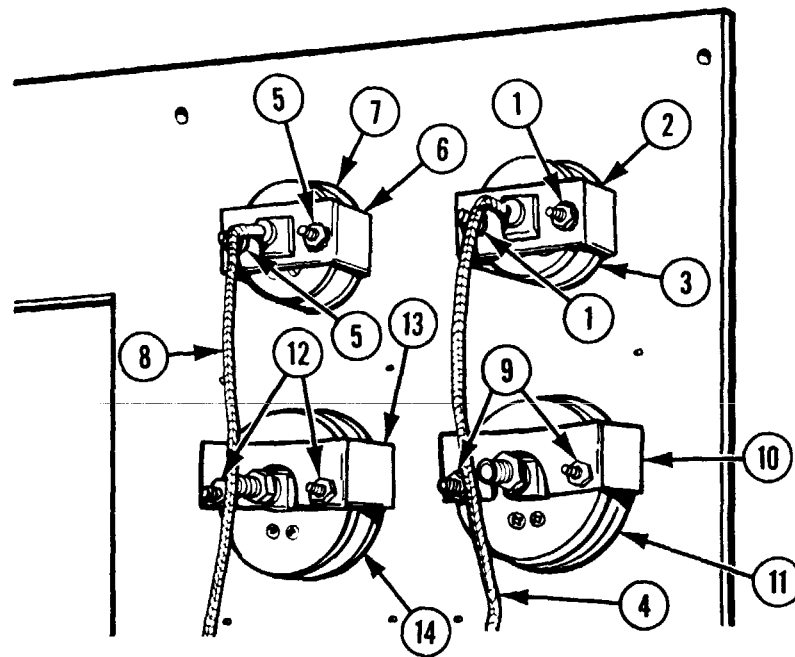


**DISASSEMBLY**

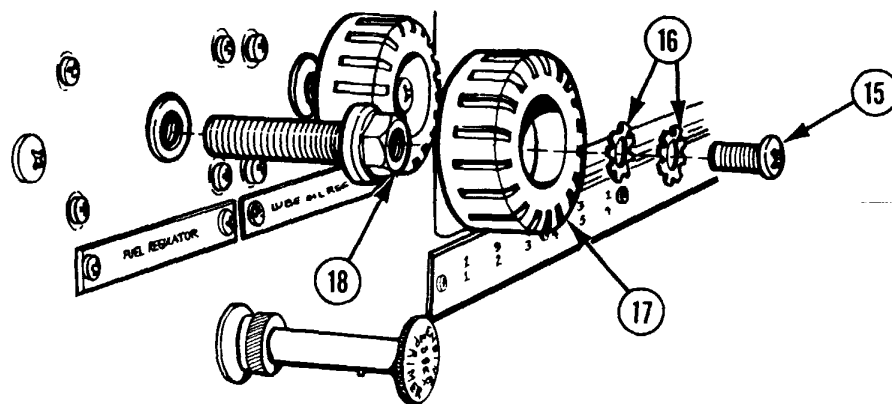
**NOTE**

**Mark all parts for proper reassembly.**

- 1 TWO NUTS (1), BRACKET (2), AND GAGE (3) WITH BRAIDED TUBE (4) FOR FUEL TEMPERATURE GAGE. Remove.
- 2 TWO NUTS (5), BRACKET (6), AND GAGE (7) WITH BRAIDED TUBE (8) FOR LUBE OIL TEMPERATURE GAGE. Remove.
- 3 TWO NUTS (9), BRACKET (10), AND GAGE (11) FOR FUEL PRESSURE GAGE. Remove.
- 4 TWO NUTS (12), BRACKET (13), AND GAGE (14) FOR LUBE OIL PRESSURE GAGE. Remove.



- 5 SCREW (15), TWO LOCKWASHERS (16), AND HANDLE (17). Remove.
- 6 STEM (18). Remove.



6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

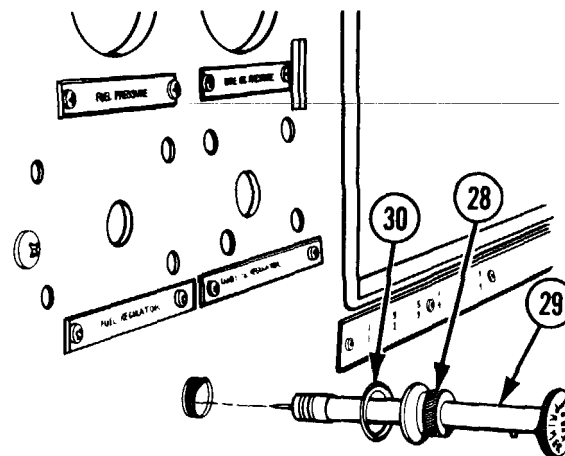
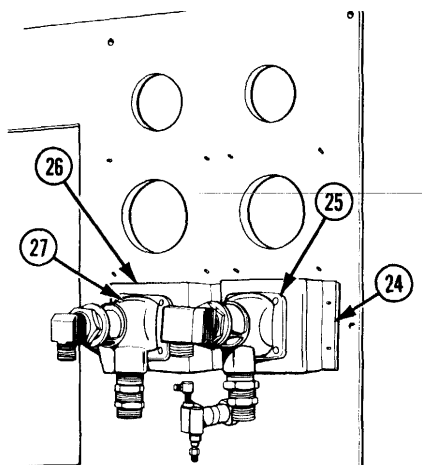
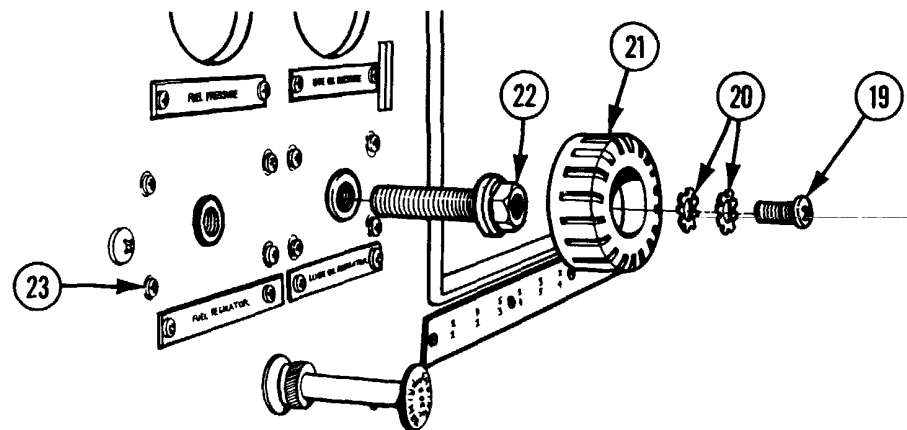
7 SCREW (19), TWO LOCKWASHERS (20), AND HANDLE (21).  
Remove.

8 STEM (22). Remove.

9 EIGHT SCREWS (23). Remove.

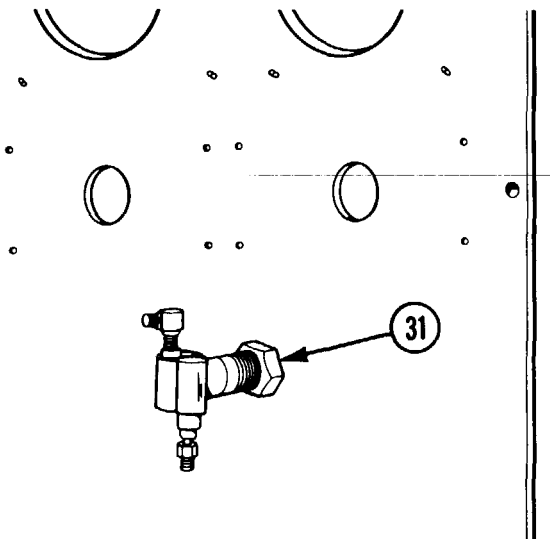
10 BRACKET (24) AND REGULATOR (25) FOR FUEL REGULATOR.  
Remove.

11 BRACKET (26) AND REGULATOR (27) FOR LUBE OIL  
REGULATOR.  
Remove.



12 KNURLED FITTING (28). Unscrew.

13 HANDLE (29), KNURLED FITTING (28), AND WASHER (30).  
Remove.



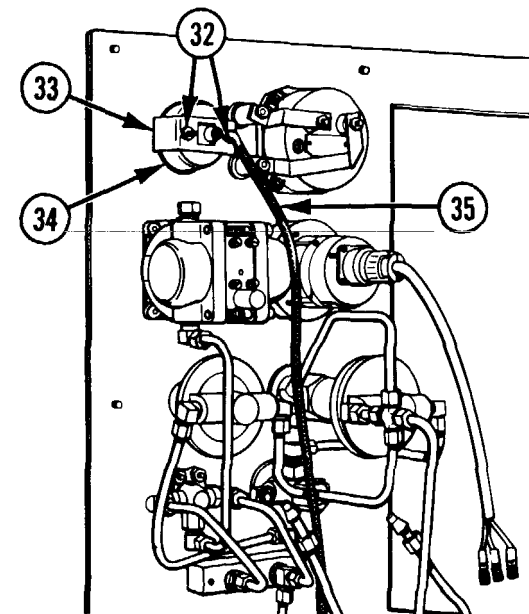
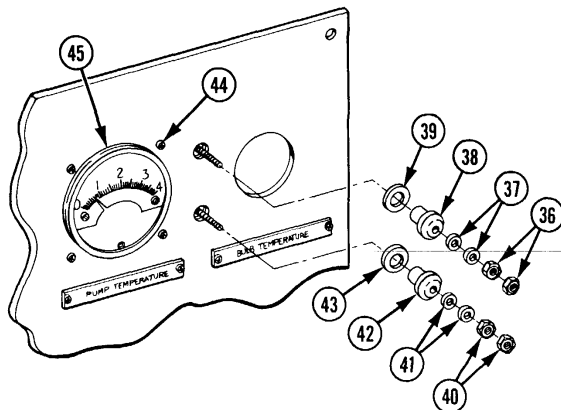
14 ENGINE PRIMER (31). Remove.

16 TWO NUTS (36), TWO WASHERS (37), INSULATOR (38), AND GASKET (39) FOR THRU-PANEL INSULATOR. Remove.

17 TWO NUTS (40), TWO WASHERS (41), INSULATOR (42), AND GASKET (43) FOR THRU-PANEL INSULATOR. Remove.

18 FOUR SCREWS (44) AND PUMP TEMPERATURE GAGE (45) WITH ATTACHED PARTS. Remove.

15 TWO NUTS (32), BRACKET (33), AND GAGE (34) WITH BRAIDED TUBE (35) FOR BULB TEMPERATURE GAGE. Remove.





**6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

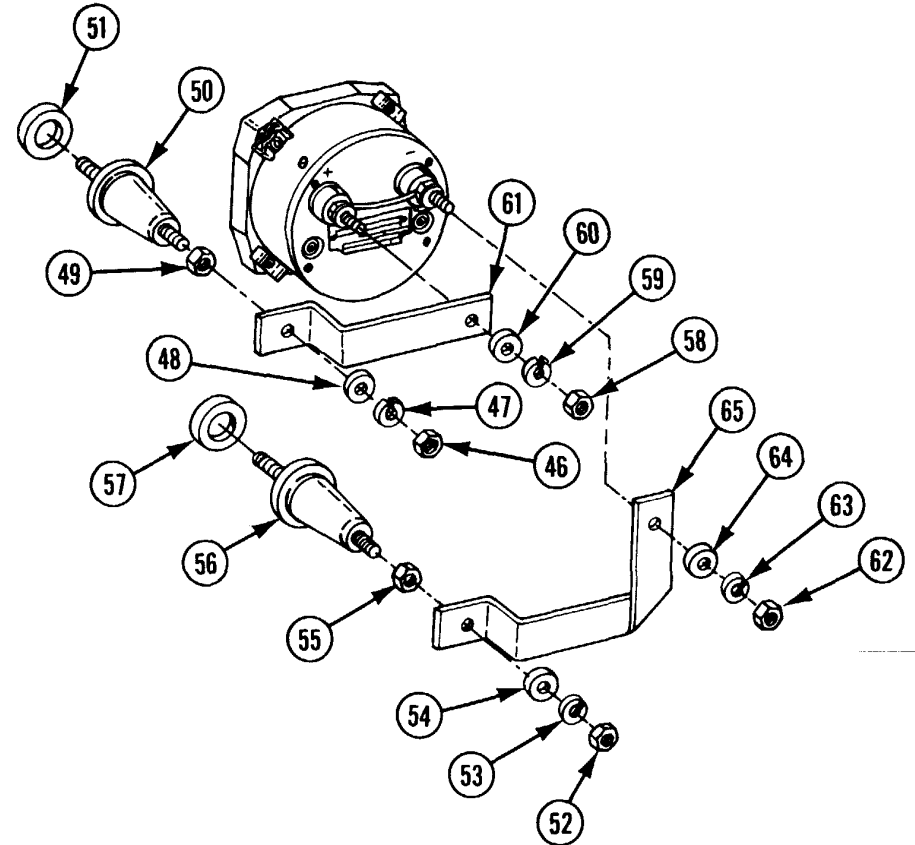
**DISASSEMBLY (cont)**

**19** NUT (46), LOCKWASHER (47), WASHER (48), NUT (49), INSULATOR (50), AND GASKET (51).  
Remove.

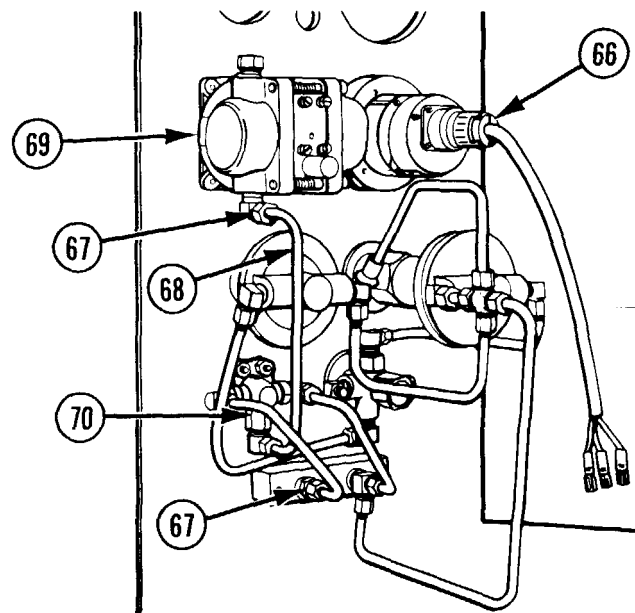
**20** NUT (52), LOCKWASHER (53), WASHER (54), NUT (55), INSULATOR (56), AND GASKET (57).  
Remove.

**21** NUT (58), LOCKWASHER (59), WASHER (60), AND PYROMETER POSITIVE LEAD (61). Remove.

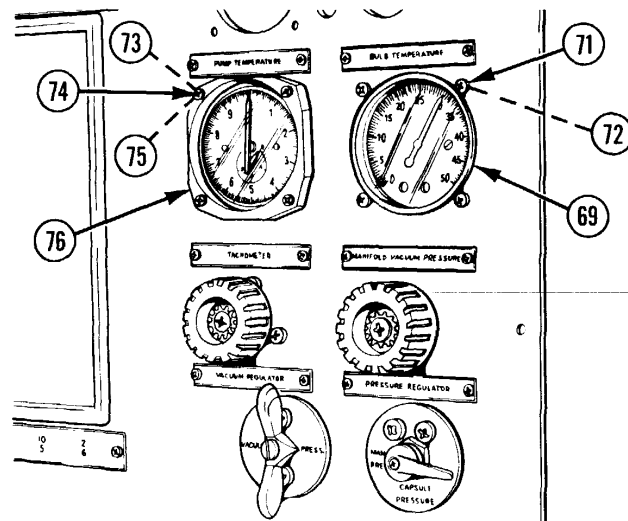
**22** NUT (62), LOCKWASHER (63), WASHER (64), AND PYROMETER NEGATIVE LEAD (65). Remove.



- 23 TACHOMETER INDICATOR CABLE ASSEMBLY (66). Remove.
- 24 TWO NUTS (67). Loosen.
- 25 COPPER TUBING (68). Remove carefully from MANIFOLD VACUUM PRESSURE gage (69) and MANF. PRESS. CAPSULE PRESSURE selector valve (70).



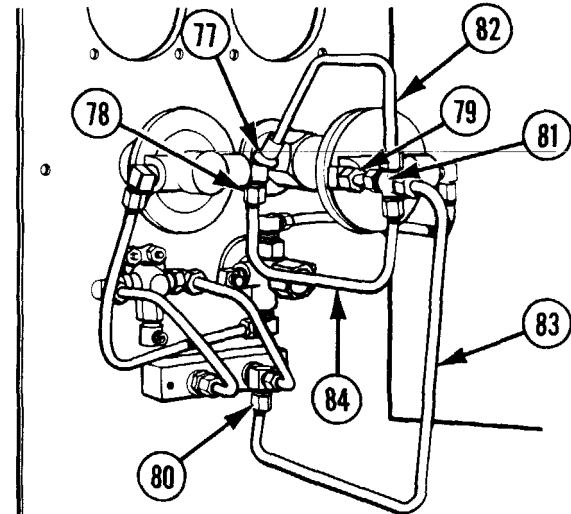
- 26 FOUR SCREWS (71), FOUR WASHERS (72), AND MANIFOLD VACUUM PRESSURE GAGE (69). Remove.
- 27 FOUR NUTS (73), FOUR SCREWS (74), FOUR LOCKWASHERS (75), AND TACHOMETER (76). Remove.



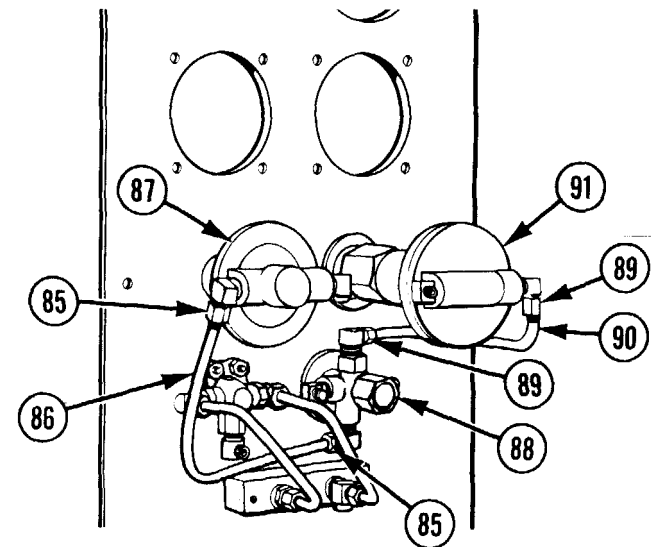
6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

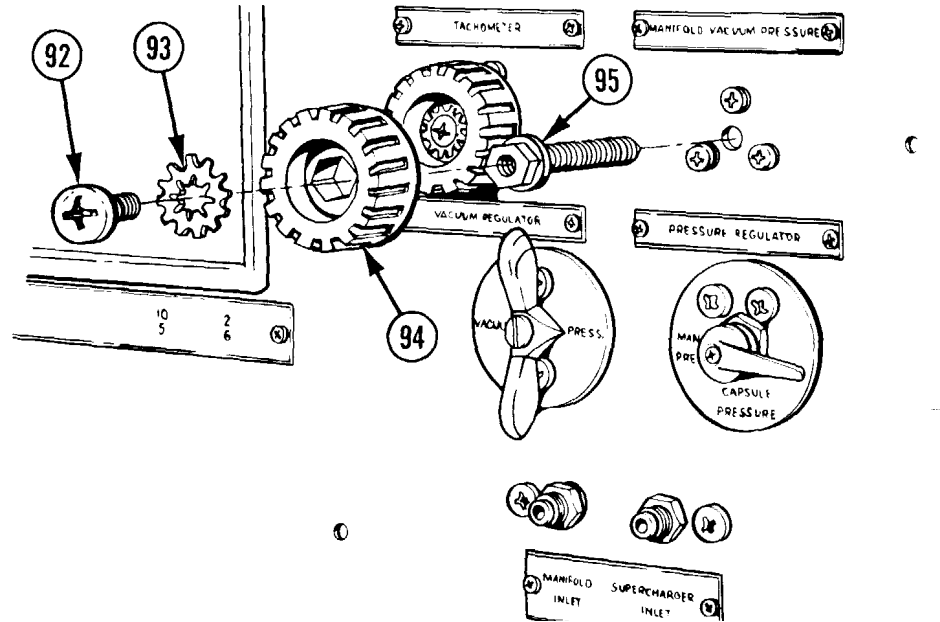
- 28 FOUR NUTS (77 THRU 80). Loosen.
- 29 CROSS UNION (81) WITH THREE COPPER TUBINGS (82, 83, AND 84). Remove carefully.



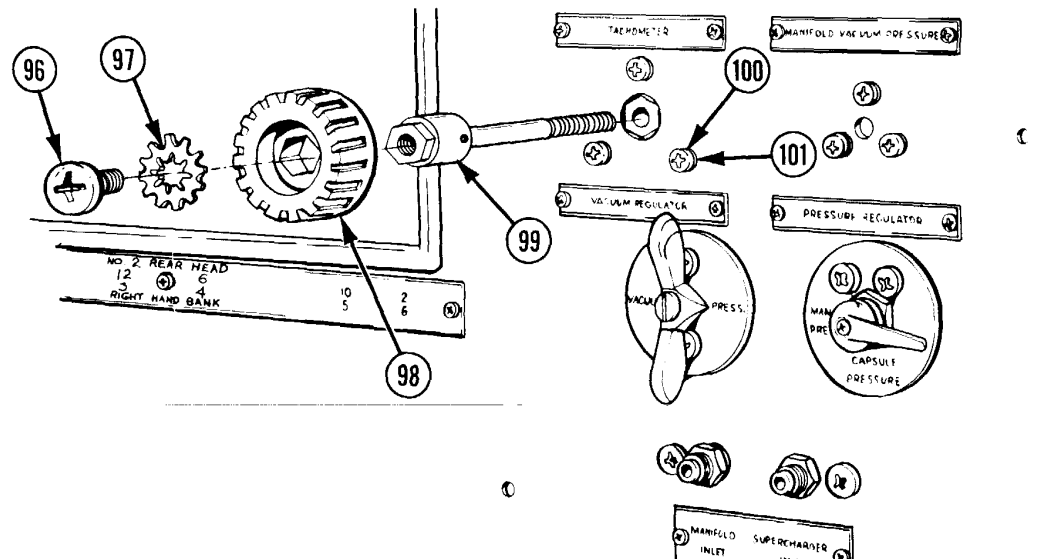
- 30 TWO NUTS (85). Loosen.
- 31 COPPER TUBING (86). Remove carefully from PRESSURE REGULATOR (87) and VACUUM PRESS. selector valve (88).
- 32 TWO NUTS (89). Loosen.
- 33 COPPER TUBING (90). Remove carefully from VACUUM REGULATOR (91) and VACUUM PRESS. selector valve (88).



- 34 SCREW (92), LOCKWASHER (93), AND HANDLE (94). Remove.
- 35 STEM (95). Remove.



- 36 SCREW (96), LOCKWASHER (97), AND HANDLE (98). Remove.
- 37 STEM (99). Remove.
- 38 SIX SCREWS (100) AND SIX LOCKWASHERS (101). Remove.



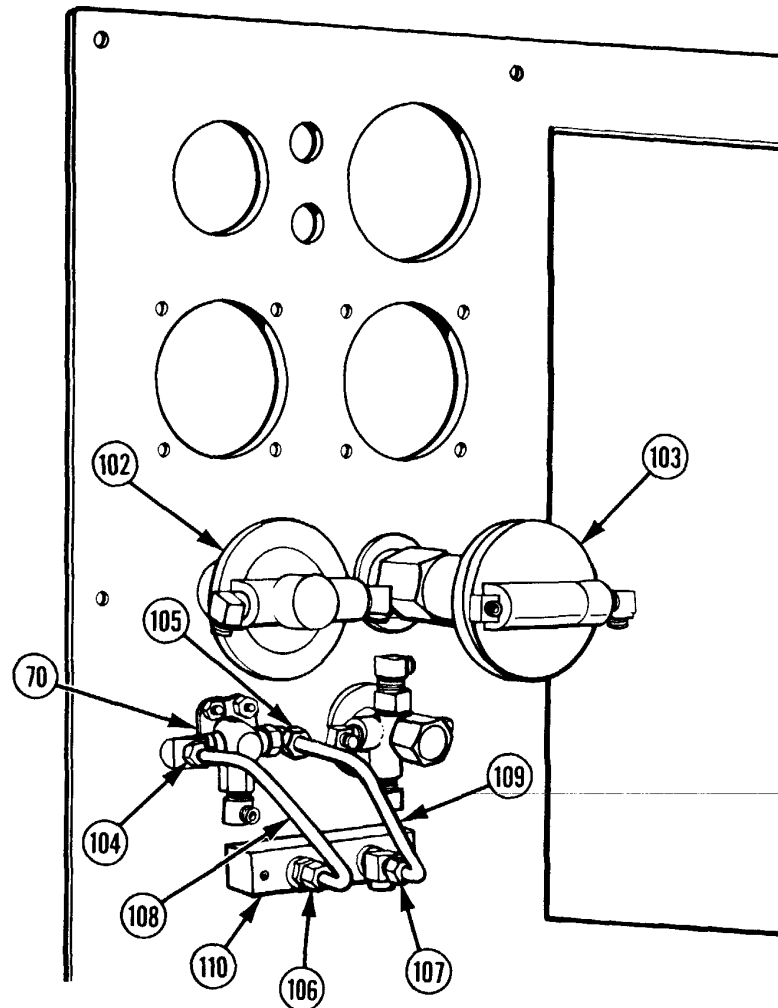
16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont) I

DISASSEMBLY (cont)

39 TWO REGULATORS (102 AND 103)  
FOR PRESSURE REGULATOR AND  
VACUUM REGULATOR. Remove.

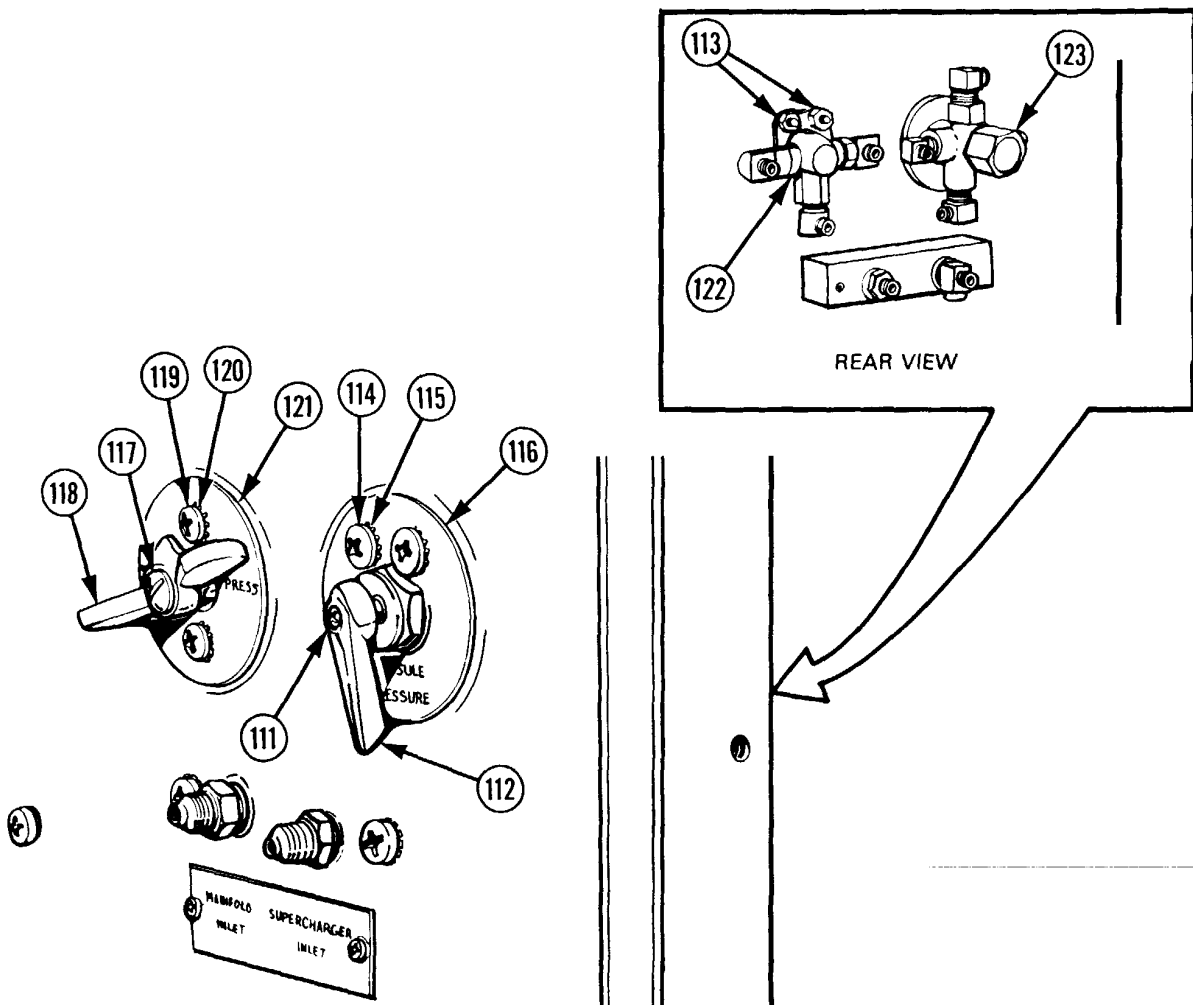
40 FOUR NUTS (104 THRU 107).  
Loosen.

41 TWO COPPER TUBINGS (108 AND  
109). Remove carefully from MANF.  
PRESS. - CAPSULE PRESSURE se-  
lector valve (70) AND MANIFOLD  
INLET- SUPERCHARGER INLET  
(110).





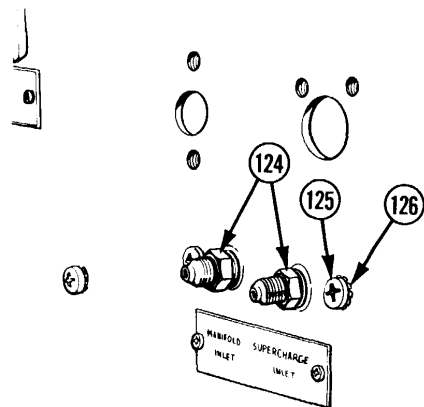
- 42 SCREW (111) AND HANDLE (112).  
Remove.
- 43 TWO NUTS (113), TWO SCREWS (114), TWO LOCKWASHERS (115), AND NAMEPLATE (116). Remove.
- 44 SCREW (117) AND HANDLE (118).  
Remove.
- 45 TWO SCREWS (119), TWO LOCKWASHERS (120), AND NAMEPLATE (121). Remove.
- 46 TWO PLUG COCKS (122 AND 123) FOR MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE AND VACUUM - PRESS. SELECTOR VALVE. Remove.



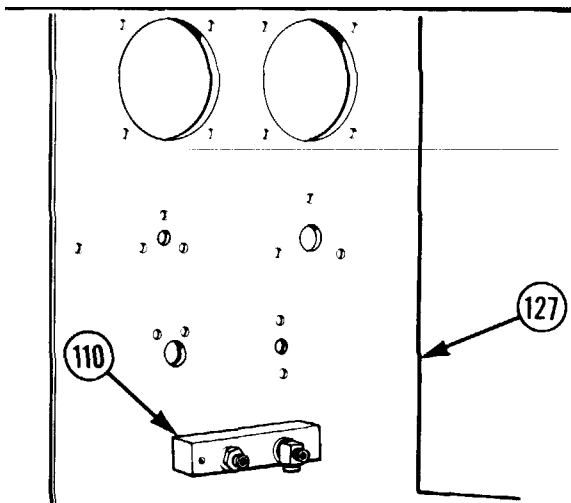
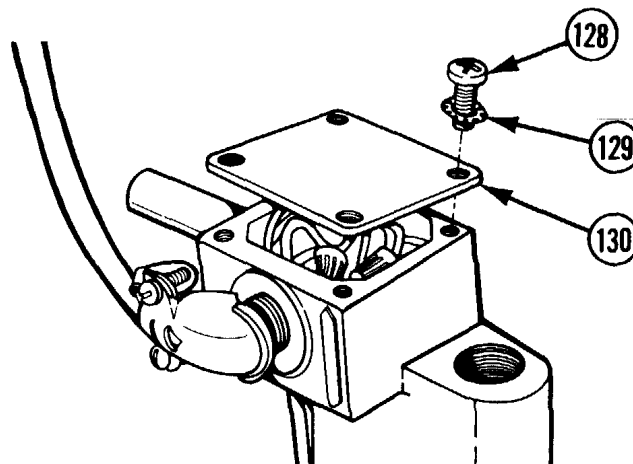
6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

- 47 TWO MALE CONNECTORS (124).  
Remove.
- 48 TWO SCREWS (125) AND TWO  
LOCKWASHERS (126). Remove.

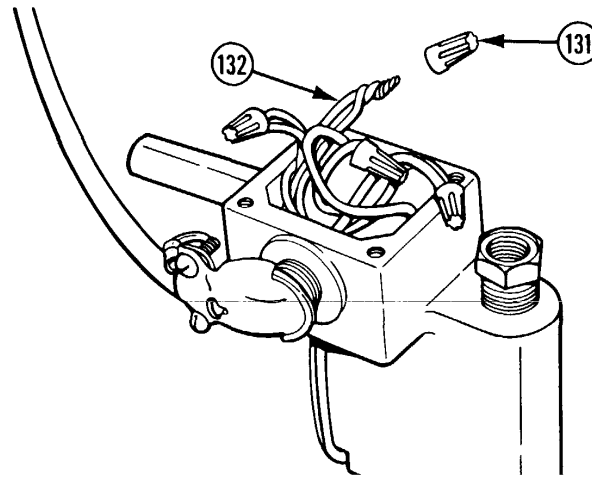


- 50 FOUR SCREWS (128) AND FOUR LOCKWASHERS (129). Remove.
- 51 COVER (130). Remove.

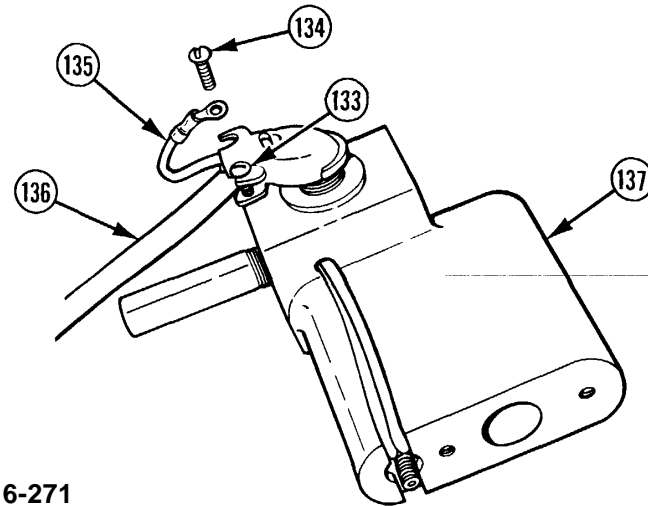


- 49 MANIFOLD INLET - SUPERCHARGER INLET (110). Remove from instrument panel (127).

- 52 FOUR CONDUCTOR SPLICES (131).  
Remove.
- 53 NINE WIRES (132). Separate.



- 54 SCREW (133). Loosen.
- 55 SCREW (134). Remove.
- 56 GREEN WIRE (135) WITH TERMINAL LUG. Disconnect.
- 57 WIRE CABLE (136). Pull away from manifold chamber (137).



**6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

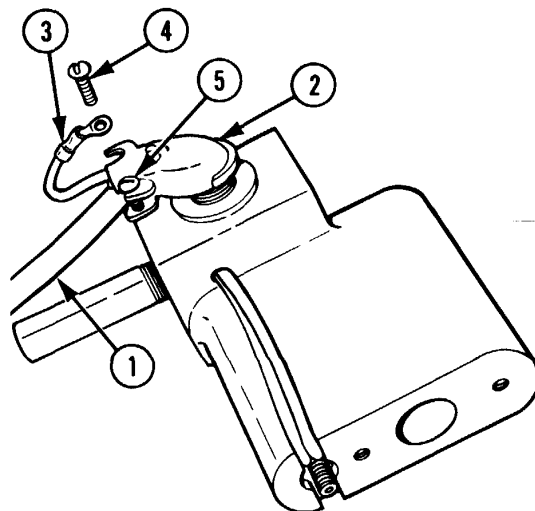
**INSPECTION/SERVICING**

**INSTRUMENT PANEL ASSEMBLY.**

- a. Check for broken, cracked, or missing parts.
- b. Check for damaged threads.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- d. Clean electrical contacts with abrasive cloth (item 4, app C).

**REASSEMBLY**

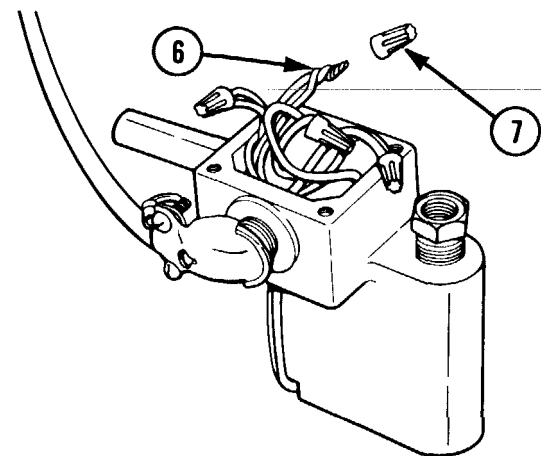
- 1 WIRE CABLE (1). Push through box connector (2).
- 2 GREEN WIRE (3) WITH TERMINAL LUG. Install on box connector (2) and secure with screw (4).
- 3 SCREW (5). Tighten.



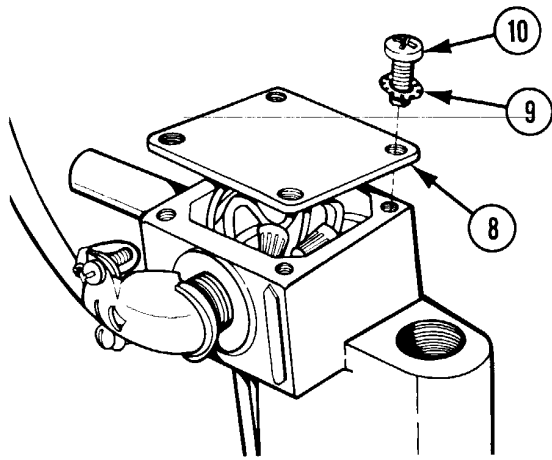
**REPAIR**

**NOTE**

**Repair is by replacement of authorized parts (TM 9- 4910-387-24P) as required.**



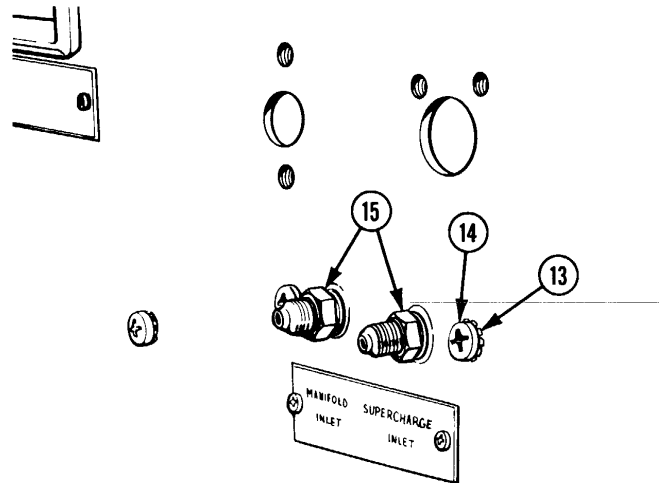
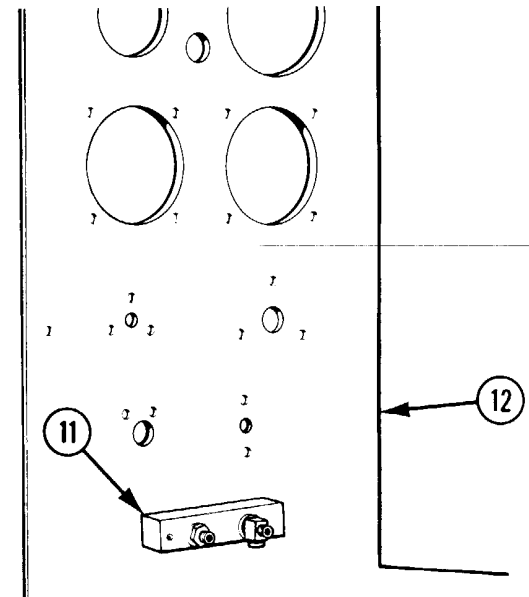
- 4 NINE WIRES (6). Reconnect.
- 5 FOUR CONDUCTOR SPLICES (7). Install.



6 COVER (8). Install and secure with four lockwashers (9) and four screws (10).

8 TWO LOCKWASHERS (13) AND TWO SCREWS (14). Install.  
 9 TWO MALE CONNECTORS (15). Install.

7 MANIFOLD INLET - SUPERCHARGER INLET (11). Position on instrument panel (12).

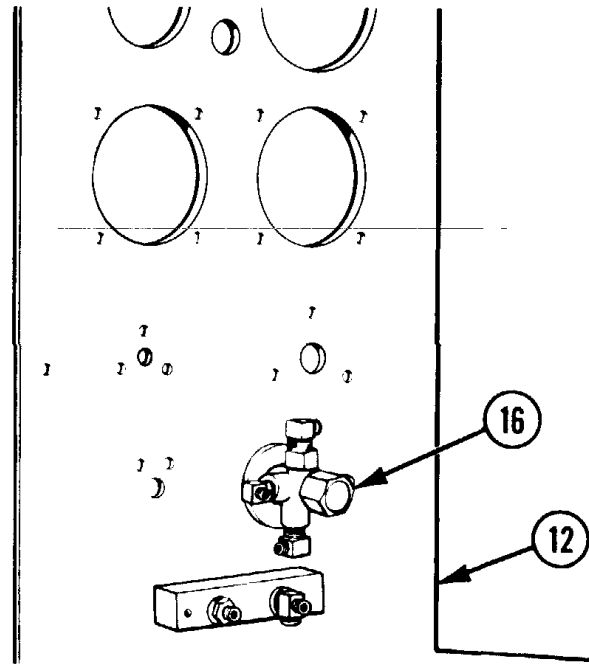




16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTION (cont)

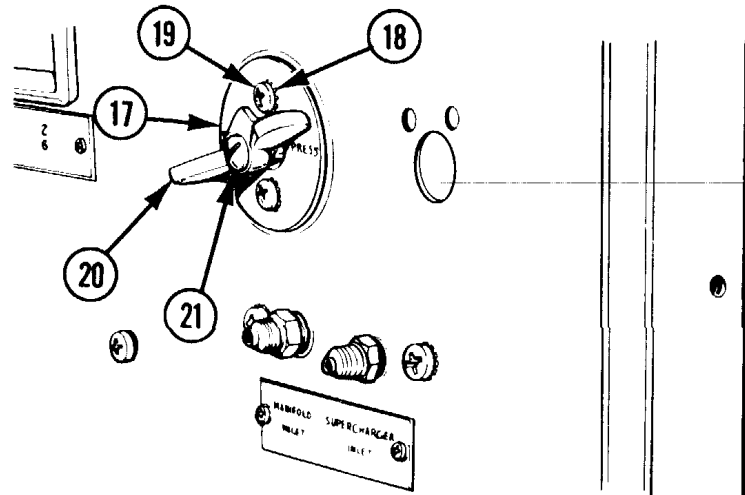
REASSEMBLY (cont)

10 PLUG COCK (16) FOR VACUUM - PRESS. SELECTOR VALVE. Position on instrument panel (12).

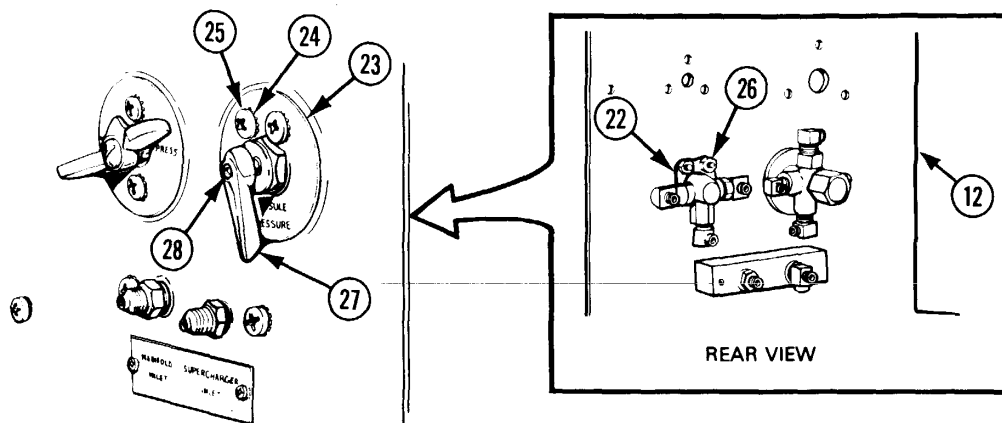


11 NAMEPLATE (17), TWO LOCK-WASHERS (18), AND TWO SCREWS (19). Install.

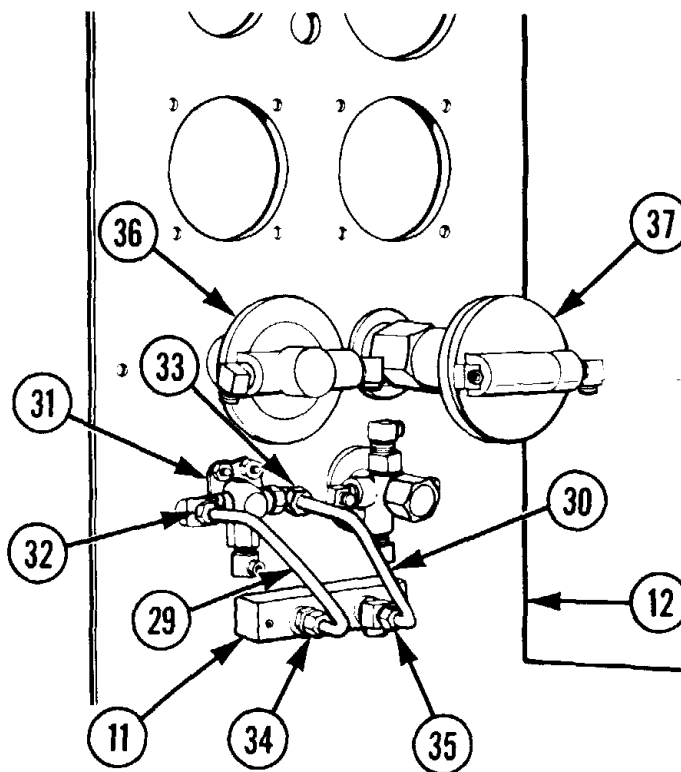
12 HANDLE (20) AND SCREW (21). Install.



- 13 PLUG COCK (22) FOR MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE. Position on instrument panel (12).
- 14 NAMEPLATE (23), TWO LOCK-WASHERS (24), TWO SCREWS (25), AND TWO NUTS (26). Install.
- 15 HANDLE (27) AND SCREW (28). Install.



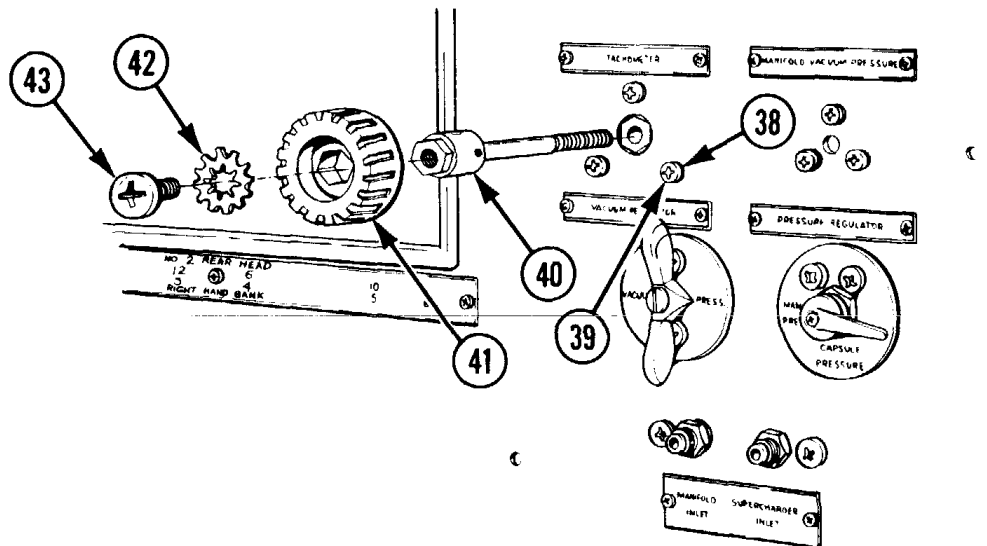
- 16 TWO COPPER TUBINGS (29 AND 30) Install on MANF. PRESS. - CAPSULE PRESSURE selector valve (31) and on MANIFOLD INLET - SUPERCHARGER INLET (11).
- 17 FOUR NUTS (32 THRU 35). Tighten.
- 18 TWO REGULATORS (36 AND 37) FOR PRESSURE REGULATOR AND VACUUM REGULATOR. Position on instrument panel (12).



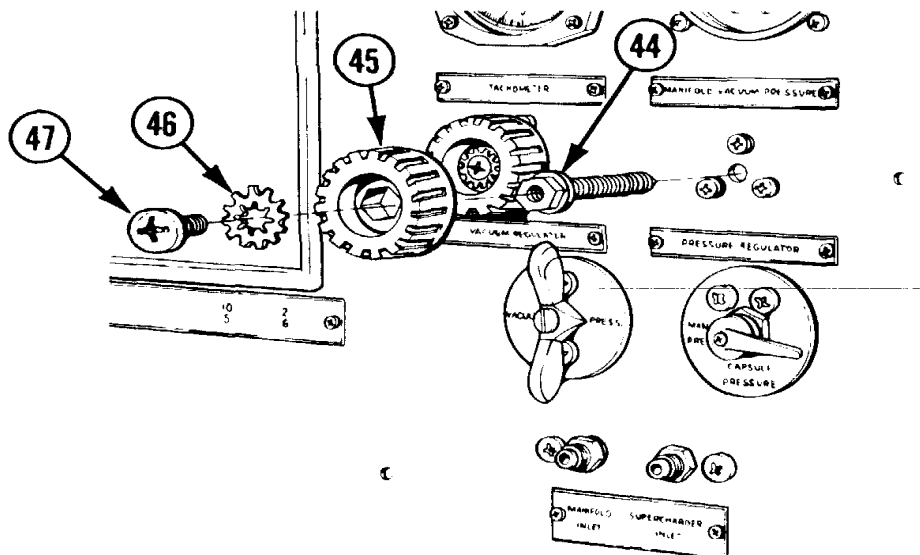
6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

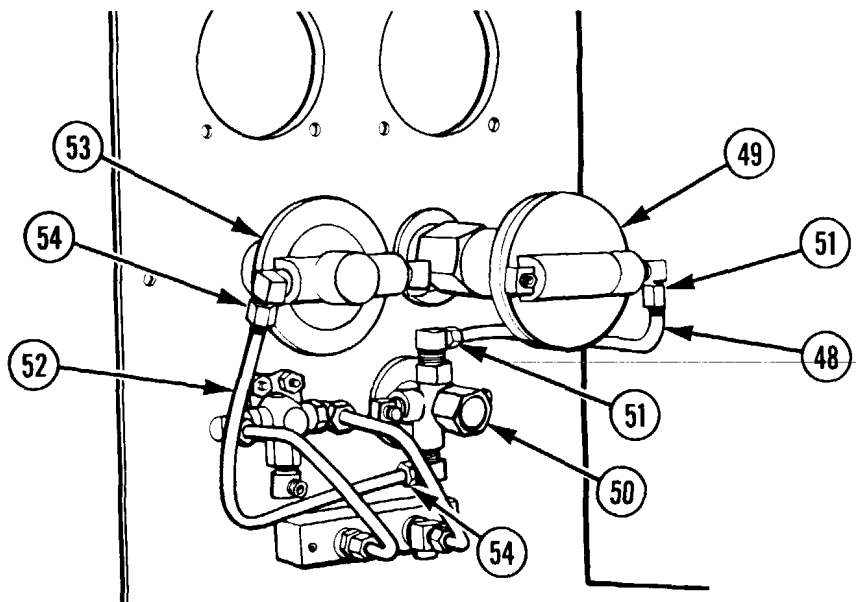
- 19 SIX LOCKWASHERS (38) AND SIX SCREWS (39). Install.
- 20 STEM (40). Install.
- 21 HANDLE (41), LOCKWASHER (42), AND SCREW (43). Install.



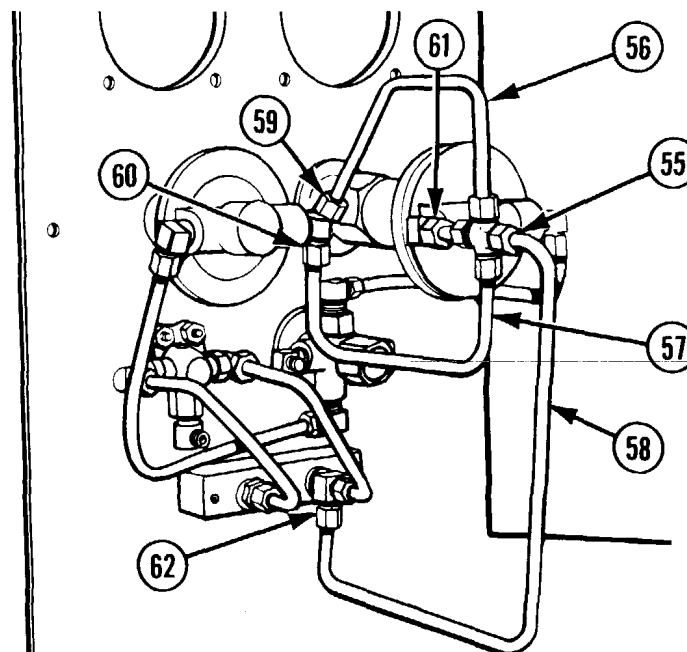
- 22 STEM (44). Install.
- 23 HANDLE (45), LOCKWASHER (46), AND SCREW (47). Install.



- 24 COPPER TUBING (48). Install one end on VACUUM REGULATOR (49) and other end on VACUUM - PRESS. selector valve (50).
- 25 TWO NUTS (51). Tighten.
- 26 COPPER TUBING (52). Install one end on PRESSURE REGULATOR (53) and other end on VACUUM - PRESS. selector valve (50).
- 27 TWO NUTS (54). Tighten.



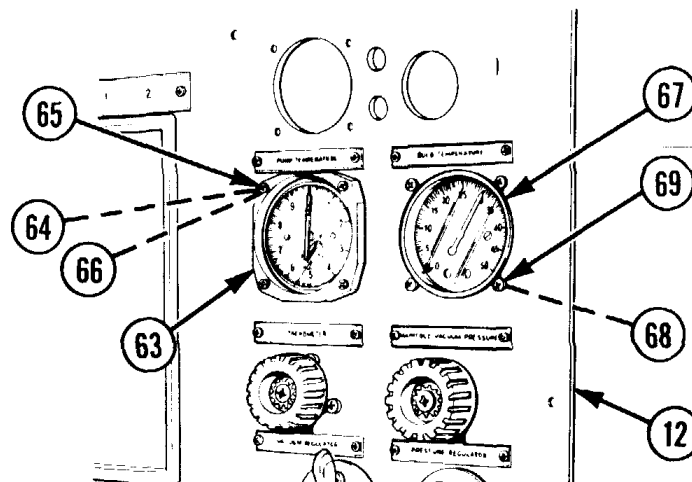
- 28 CROSS UNION (55) WITH THREE COPPER TUBINGS (56, 57, AND 58). Install.
- 29 FOUR NUTS (59 THRU 62). Tighten.



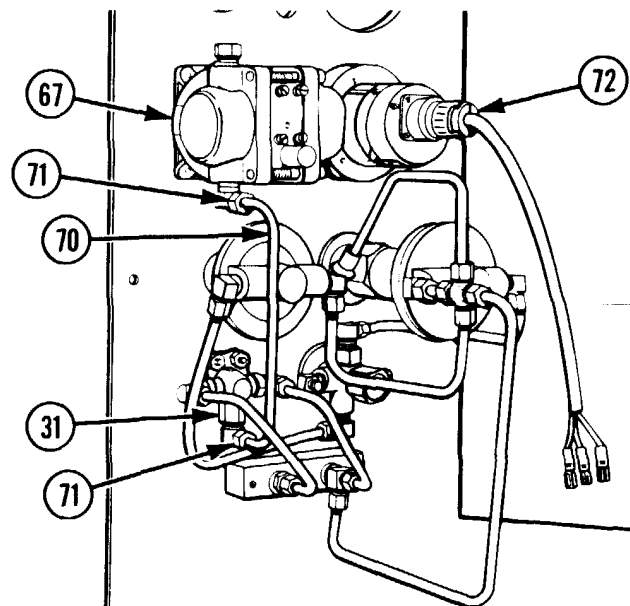
16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

- 30 TACHOMETER (63). Position on instrument panel (12).
- 31 FOUR LOCKWASHERS (64), FOUR SCREWS (65), AND FOUR NUTS (66) Install.
- 32 MANIFOLD VACUUM PRESSURE GAGE (67). Position on instrument panel (12).
- 33 FOUR WASHERS (68) AND FOUR SCREWS (69). Install.



- 34 COPPER TUBING (70). Install one end on MANIFOLD VACUUM PRESSURE gage (67) and other end on MANF. PRESS. - CAPSULE PRESSURE selector valve (31).
- 35 TWO NUTS (71). Tighten.
- 36 TACHOMETER INDICATOR CABLE ASSEMBLY (72). Install.

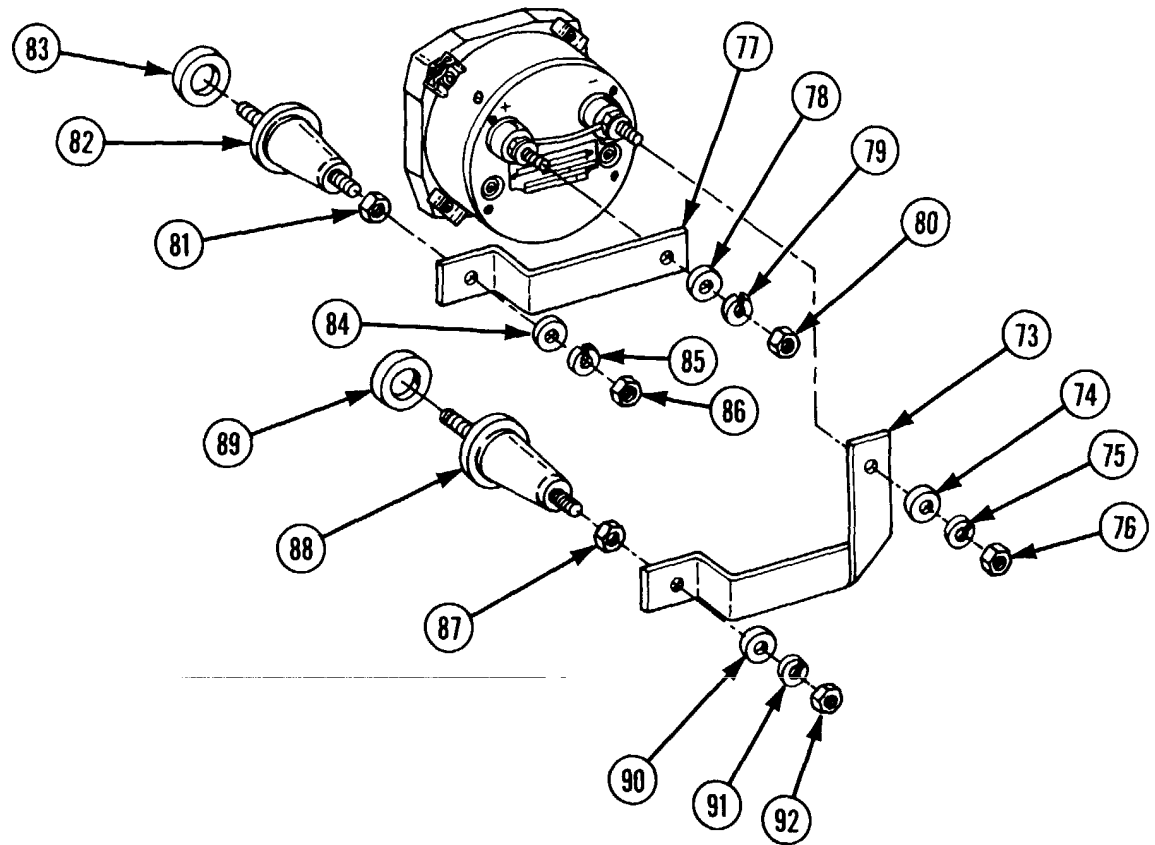


**37** PYROMETER NEGATIVE LEAD (73), WASHER (74), LOCKWASHER (75), AND NUT (76). Install.

**38** PYROMETER POSITIVE LEAD (77), WASHER (78), LOCKWASHER (79), AND NUT (80). Install.

**39** NUT (81), INSULATOR (82), GAS-KET (83), WASHER (84), LOCK-WASHER (85), AND NUT (86). Install.

**40** NUT (87), INSULATOR (88), GAS-KET (89), WASHER (90), LOCK-WASHER (91), AND NUT (92). Install.

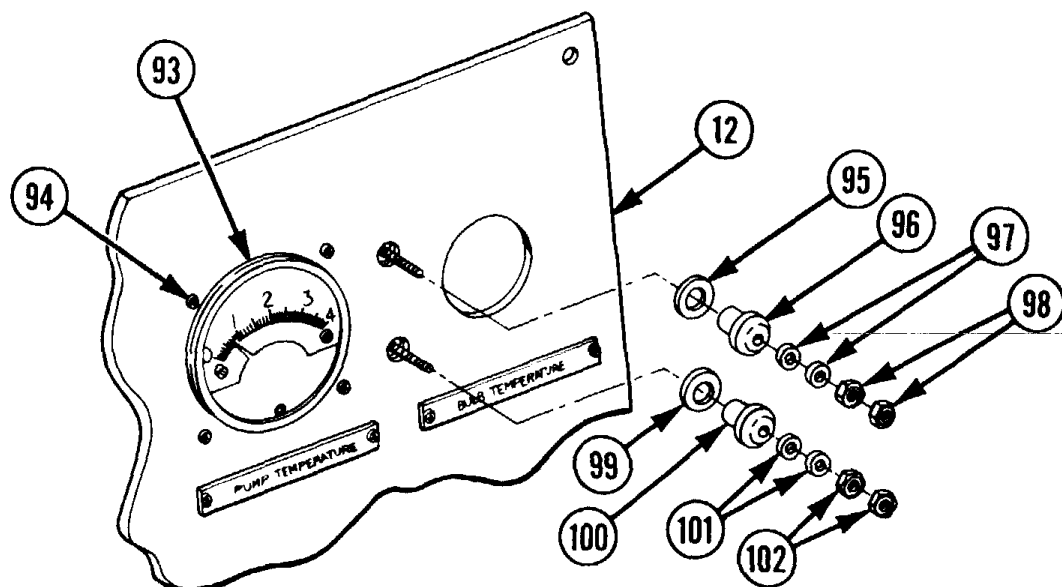




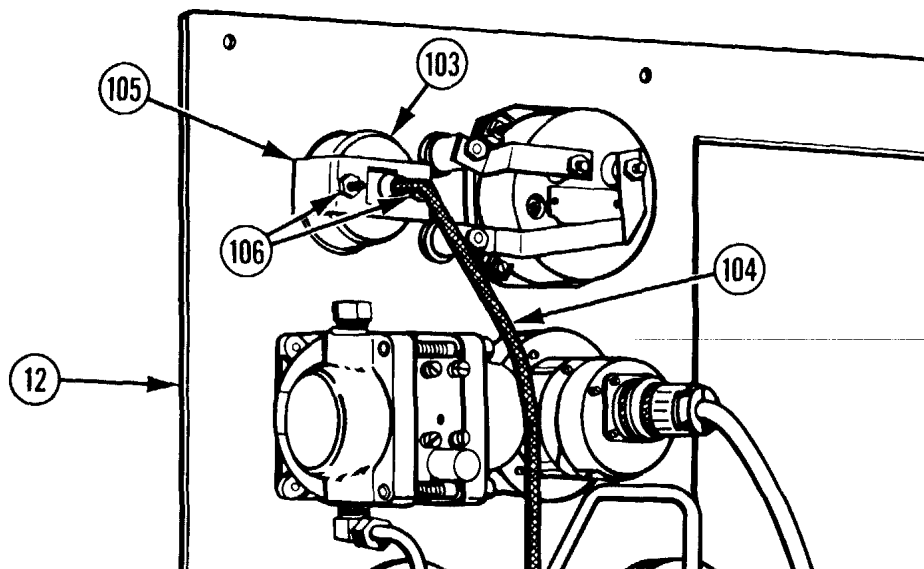
16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

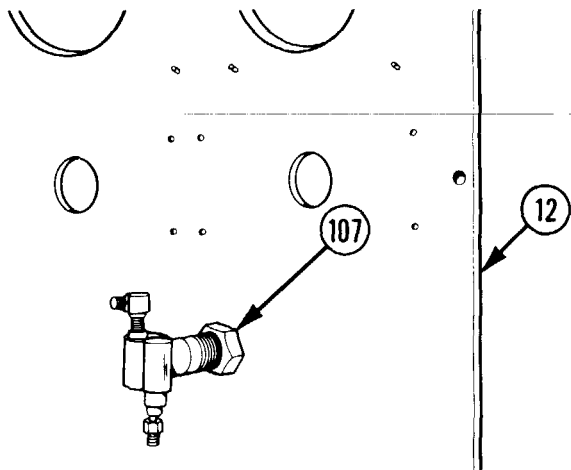
REASSEMBLY (cont)

- 41 PUMP TEMPERATURE GAGE (93) WITH ATTACHED PARTS. Position on instrument panel (12).
- 42 FOUR SCREWS (94). Install.
- 43 GASKET (95), INSULATOR (96), TWO WASHERS (97), AND TWO NUTS (98) FOR THRU-PANEL INSULATOR. Install.
- 44 GASKET (99), INSULATOR (100), TWO WASHERS (101), AND TWO NUTS (102) FOR THRU-PANEL INSULATOR. Install.



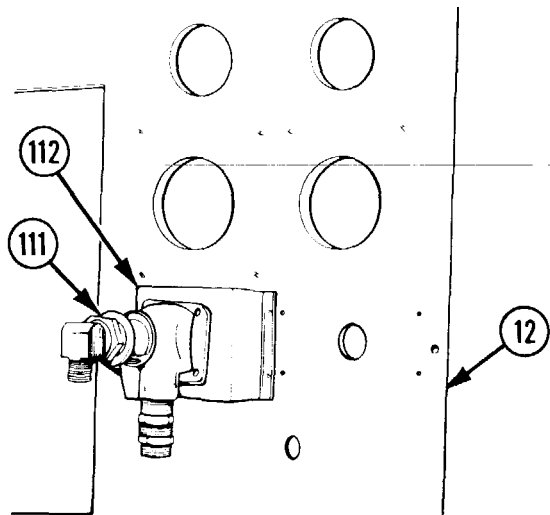
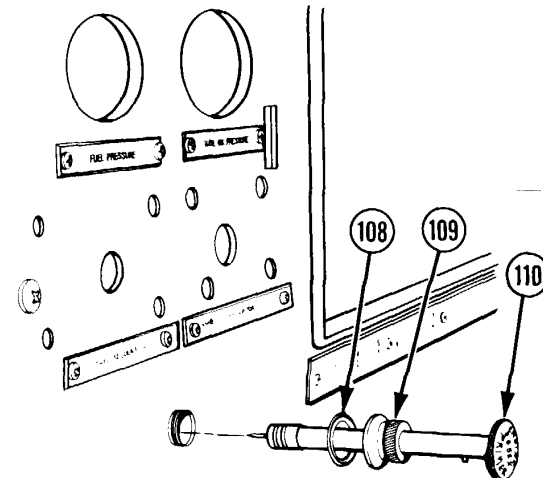
- 45 GAGE (103) WITH BRAIDED TUBE (104) FOR BULB TEMPERATURE GAGE. Position on instrument panel (12)
- 46 BRACKET (105) AND TWO NUTS (106). Install.



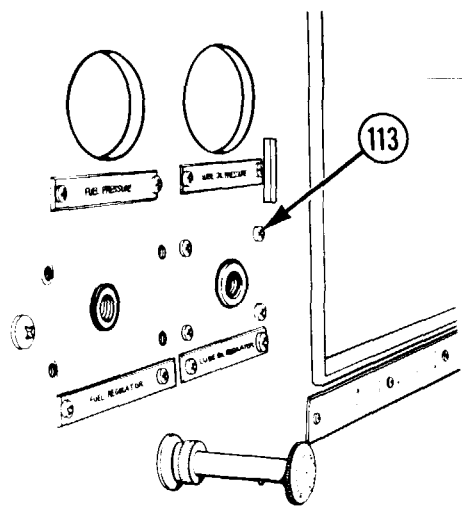


47 ENGINE PRIMER (107). Position on instrument panel (12).

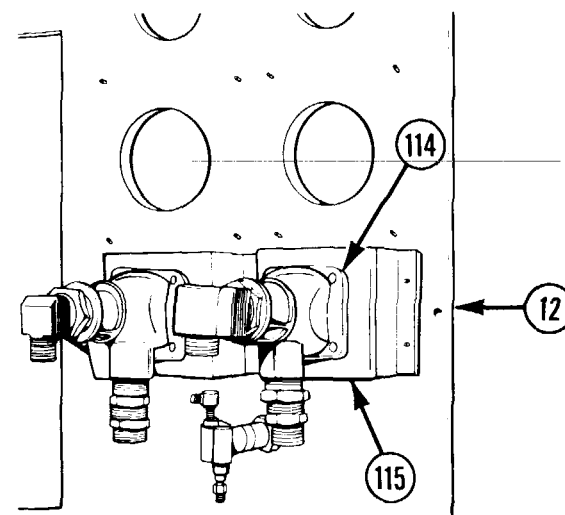
- 48 WASHER (108), KNURLED FITTING (109), AND HANDLE (110). Install.
- 49 KNURLED FITTING (109). Tighten.



50 REGULATOR (111) AND BRACKET (112) FOR LUBE OIL REGULATOR. Position on instrument panel (12).



51 FOUR SCREWS (113). Install

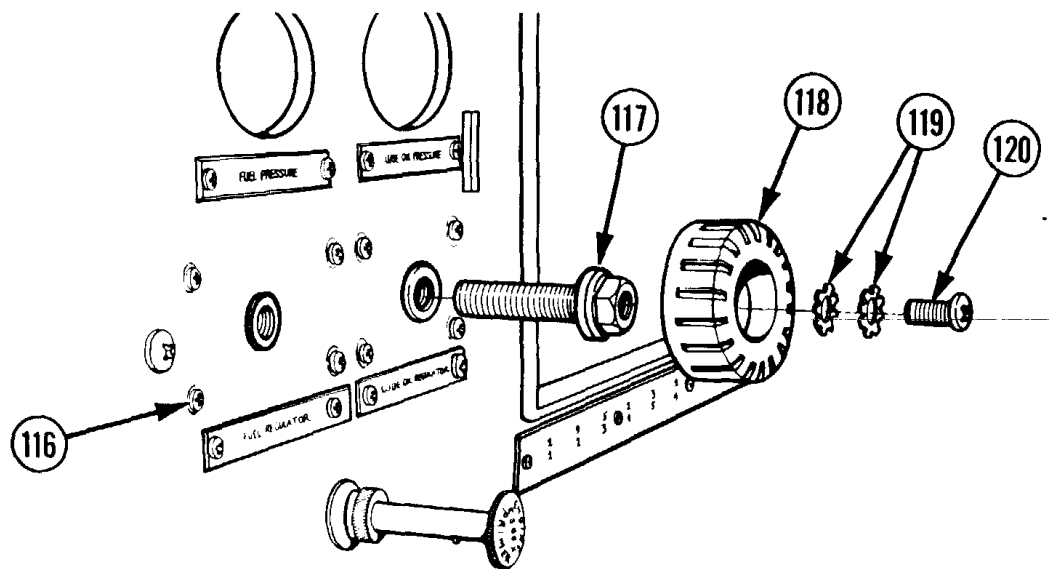


52 REGULATOR (114) AND BRACKET (115) FOR FUEL REGULATOR. Position on instrument panel (12).

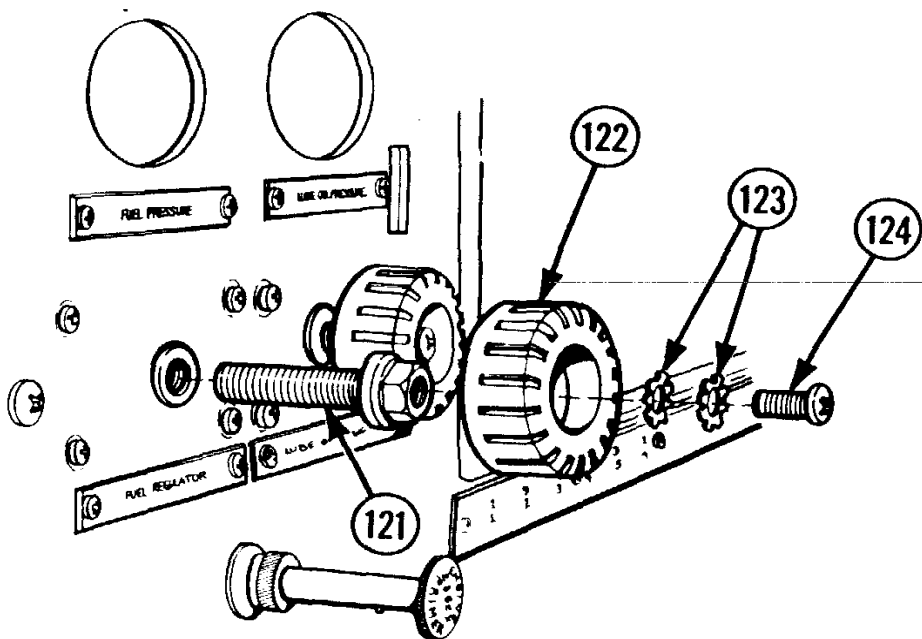
6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

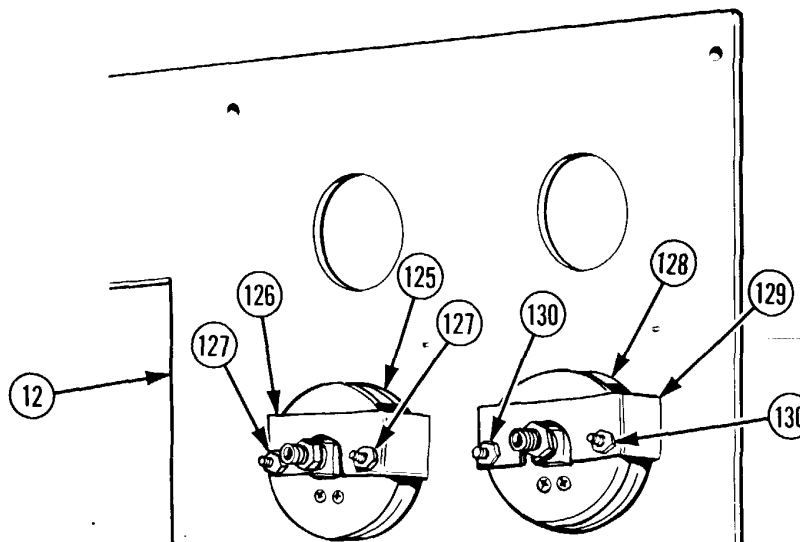
- 53 FOUR SCREWS (116). Install.
- 54 STEM (117). Install.
- 55 HANDLE (118), TWO LOCK-WASHERS (119), AND SCREW (120). Install.



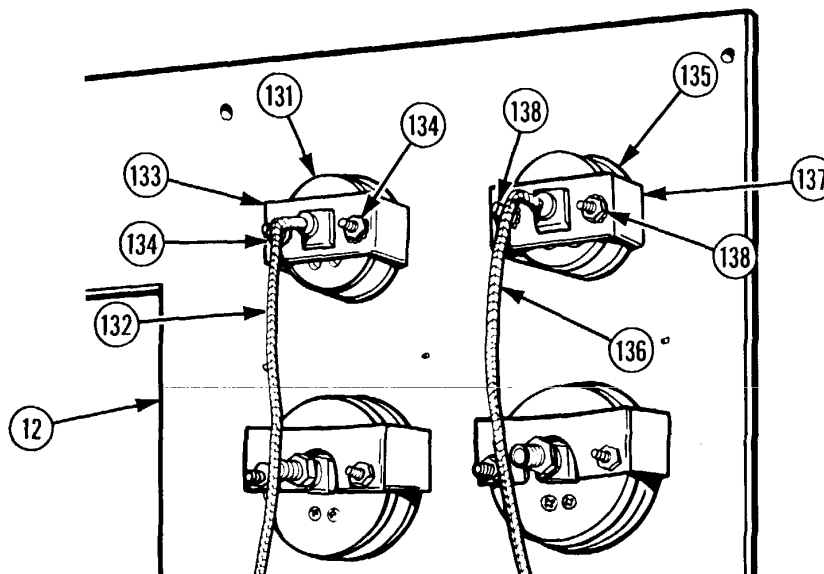
- 56 STEM (121). Install.
- 57 HANDLE (122), TWO LOCK-WASHERS (123), AND SCREW (124). Install.



- 58 GAGE (125) FOR LUBE OIL PRES-SURE GAGE. Position on instrument panel (12).
- 59 BRACKET (126) AND TWO NUTS (127). Install.
- 60 GAGE (128) FOR FUEL PRESSURE GAGE. Position on instrument panel (12)
- 61 BRACKET (129) AND TWO NUTS (130). Install.



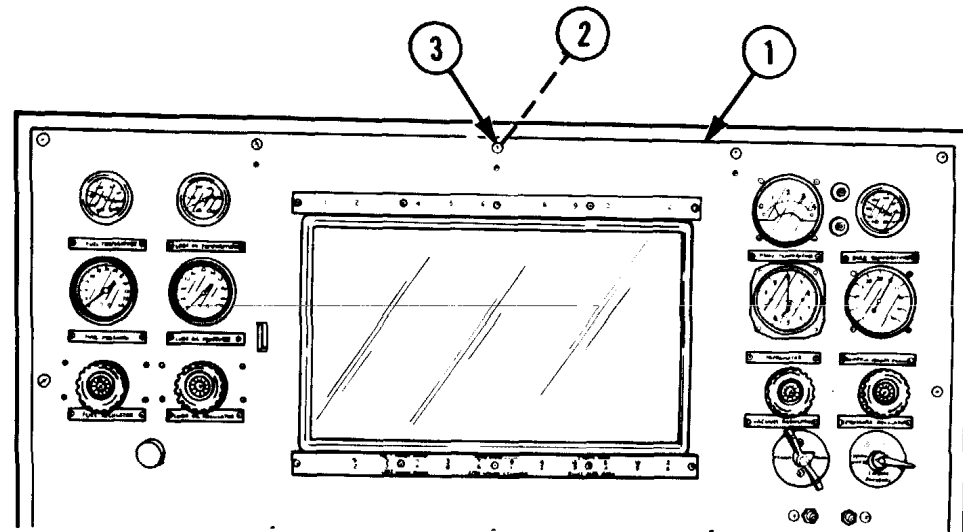
- 62 GAGE (131) WITH BRAIDED TUBE (132) FOR LUBE OIL TEMPERATURE GAGE. Position on instrument panel (12)
- 63 BRACKET (133) AND TWO NUTS (134). install.
- 64 GAGE (135) WITH BRAIDED TUBE (136) FOR FUEL TEMPERATURE GAGE. Position on instrument panel (12)
- 65 BRACKET (137) AND TWO NUTS (138). Install.



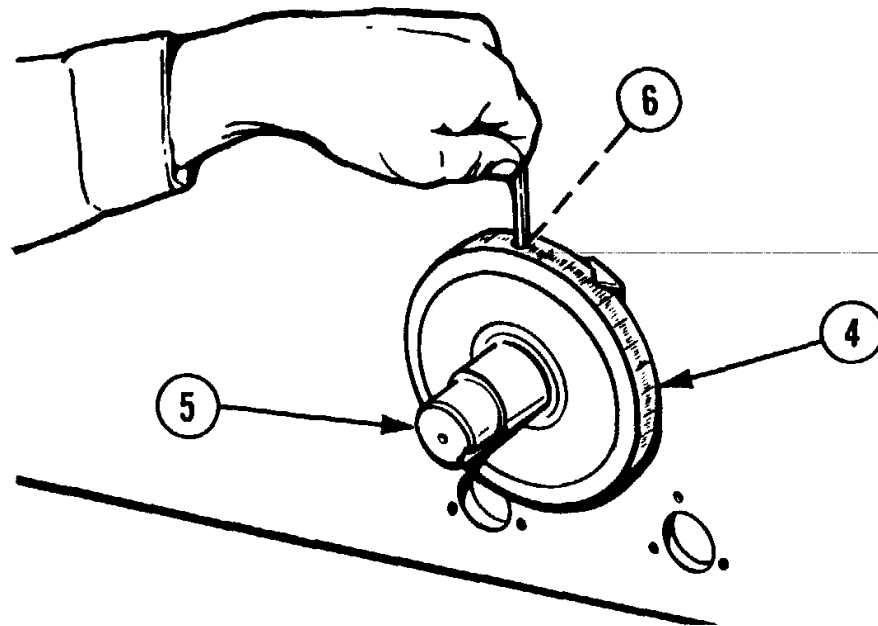
67. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION

- 1 INSTRUMENT PANEL (1). Position on tester.
- 2 NINE LOCKWASHERS (2) AND NINE SCREWS (3). Install.



- 3 PLATE (4). Position on shouldered shaft (5).
- 4 SETSCREW (6). Tighten.



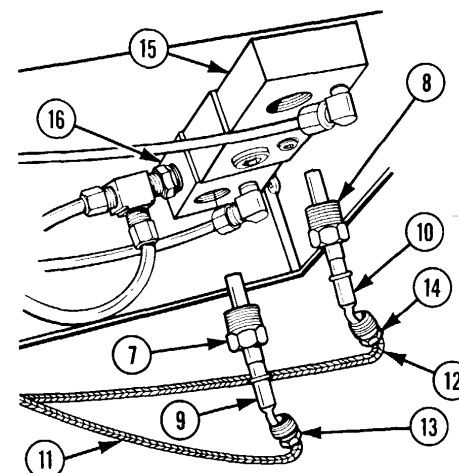
**CAUTION**

Be careful when installing bulbs as they are fragile and can damage easily.

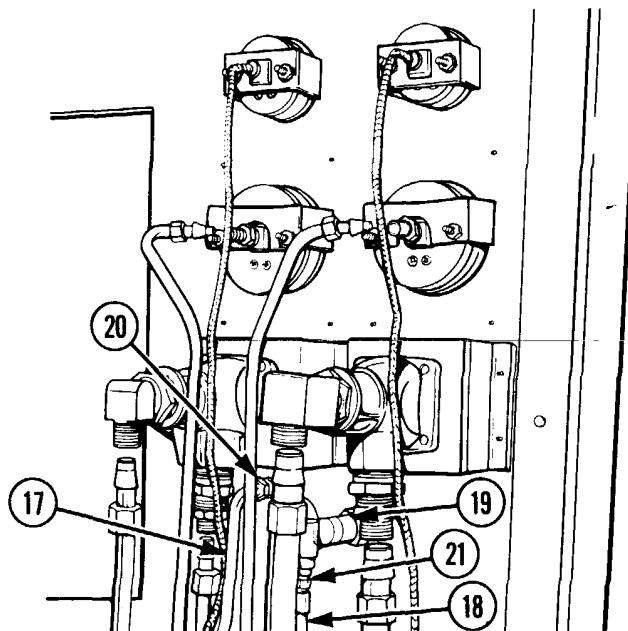
**NOTE**

Be sure that braided tube from LUBE OIL TEMPERATURE gage is installed in lube oil pressure discharge block and that braided tube from FUEL TEMPERATURE gage is installed in fuel pressure discharge block.

- 5 TWO ADAPTERS (7 AND 8), TWO BULBS (9 AND 10) WITH BRAIDED TUBES (11 AND 12), AND TWO NUTS (13 AND 14). Install in fuel pressure discharge block (15) and lube oil pressure discharge block (16).



- 6 TWO COPPER TUBINGS (17 AND 18) Install on engine primer assembly (19)
- 7 TWO NUTS (20 AND 21). Tighten.

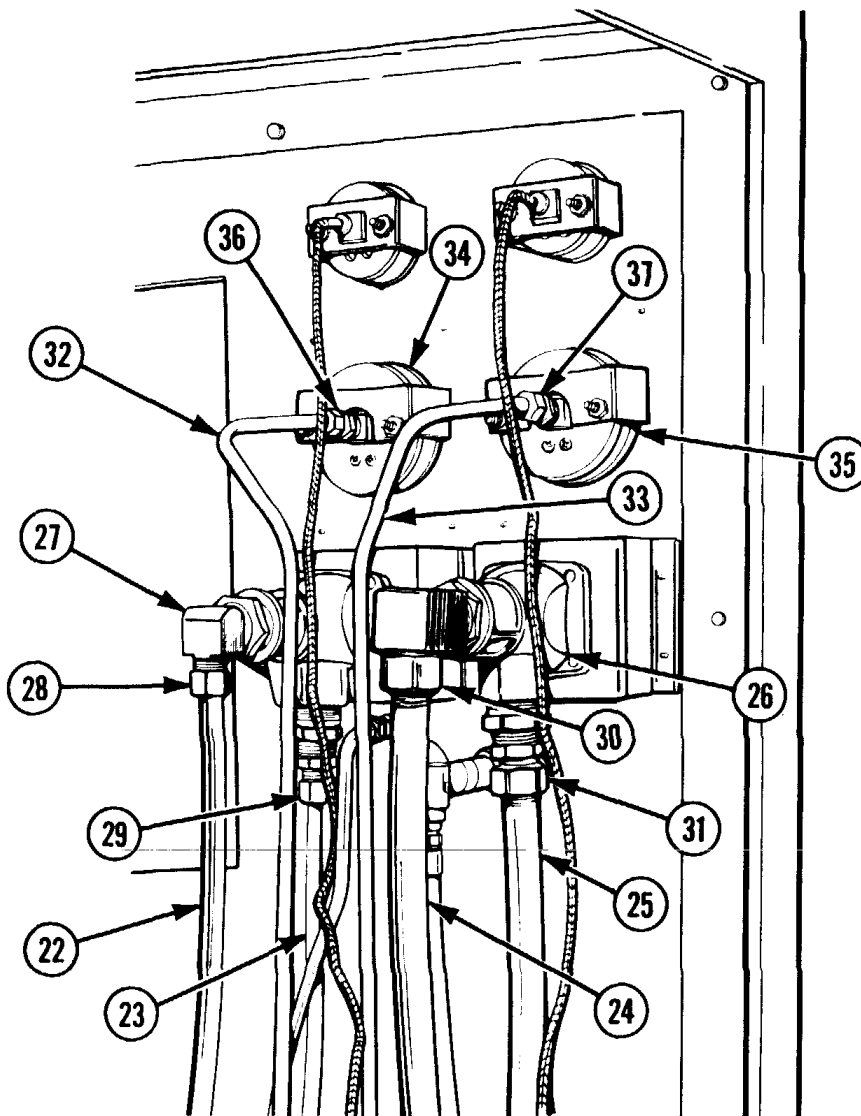




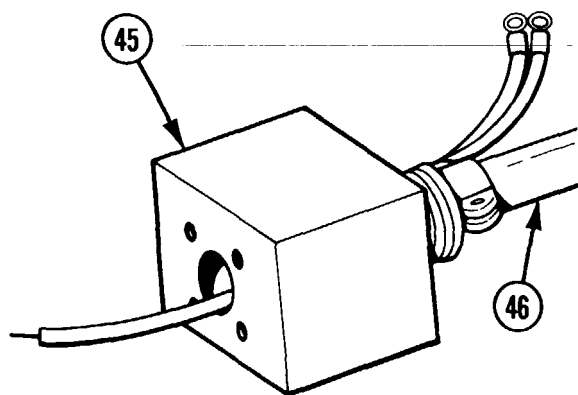
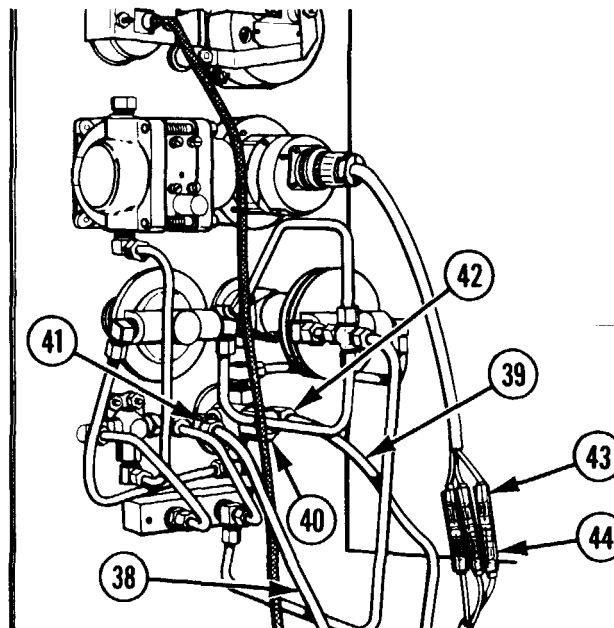
6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

- 8 FOUR COPPER TUBINGS (22 THRU 25) Install on FUEL REGULATOR (26) AND LUBE OIL REGULATOR (27)
- 9 FOUR NUTS (28 THRU 31). Tighten.
- 10 TWO COPPER TUBINGS (32 AND 33) Install on LUBE OIL PRESSURE gage (34) AND FUEL PRESSURE gage (35).
- 11 TWO NUTS (36 AND 37). Tighten.

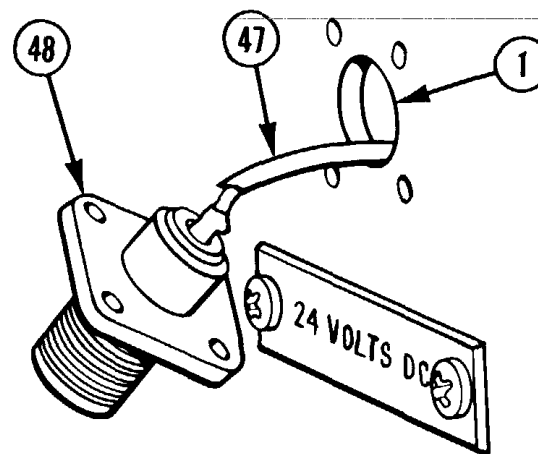


- 12 TWO COPPER TUBINGS (38 AND 39) Install on VACUUM - PRESS. selector valve (40).
- 13 TWO NUTS (41 AND 42). Tighten.
- 14 THREE FEMALE SOLDERLESS CONNECTORS (43). Connect with three male solderless connectors (44).



- 15 FITTING (45). Install over wire cable (46)

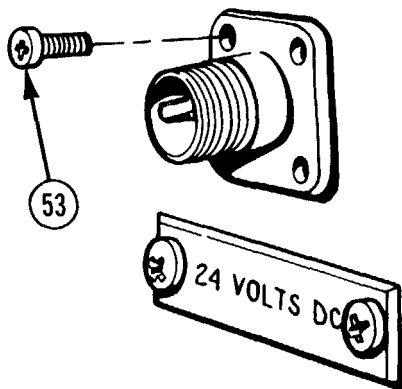
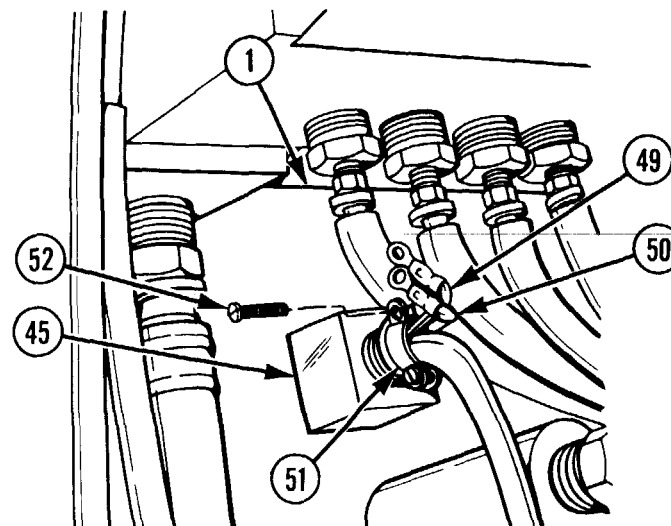
- 16 WIRE (47).
  - a. Push through hole in instrument panel (1) and insert into receptacle connector (48).
  - b. Solder to receptacle connector (48)



6-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont) I

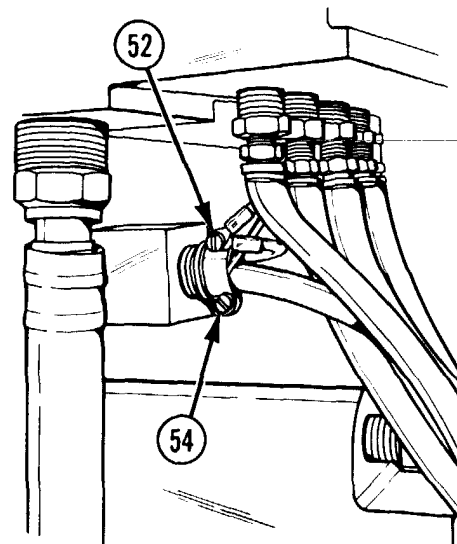
INSTALLATION (cont)

- 17 TWO WIRES (49 AND 50) WITH ONE TERMINAL LUG EACH. Install on connector (51) and secure by loosely installing screw (52).
- 18 FITTING (45). Position on instrument panel (1).



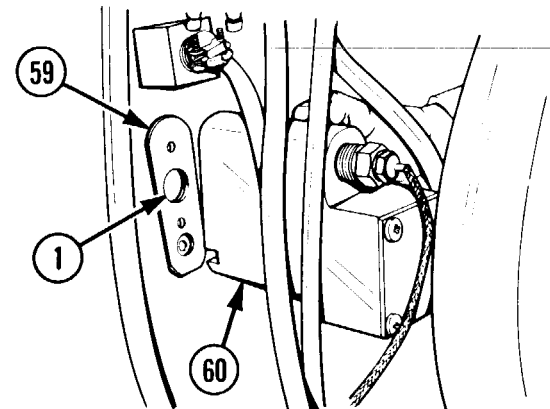
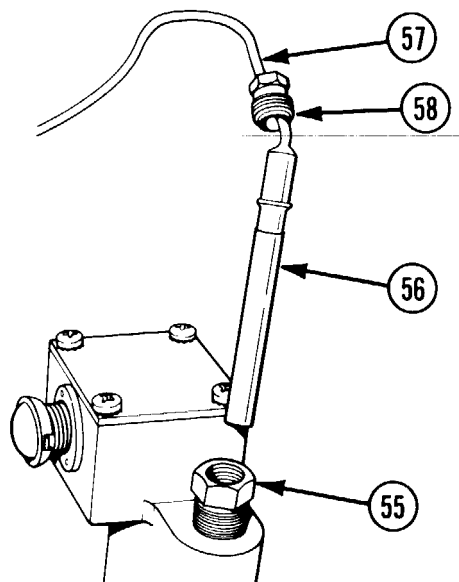
- 19 FOUR SCREWS (53). Install.

- 20 TWO SCREWS (52 AND 54). Tighten.

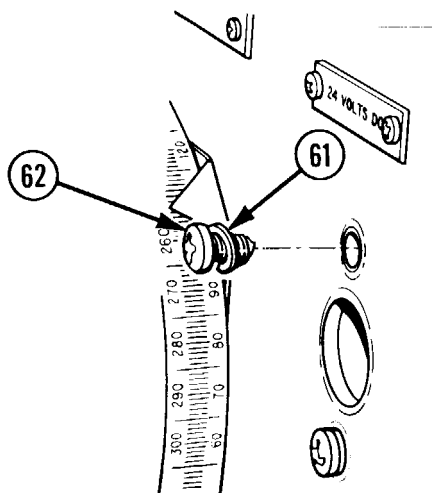


**CAUTION**  
 Be careful when installing bulbs as they are fragile and can damage easily.

21 ADAPTER (55), BULB (56) WITH BRAIDED TUBE (57), AND NUT (58). Install.

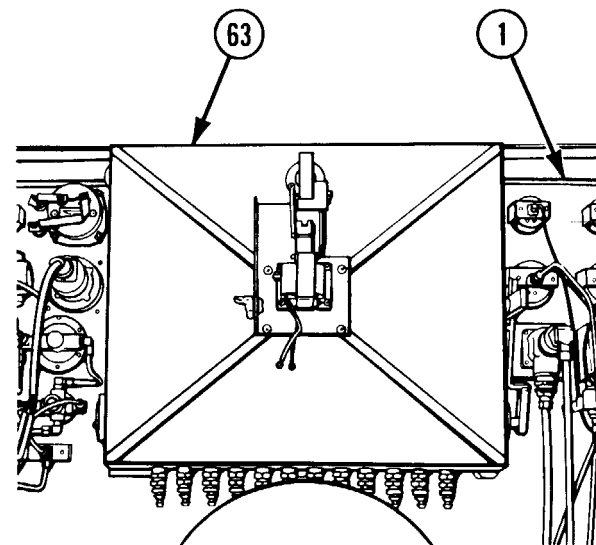


22 GASKET (59) AND MANIFOLD CHAMBER (60). Position on instrument panel (1).



23 TWO LOCKWASHERS (61) AND TWO SCREWS (62). Install.

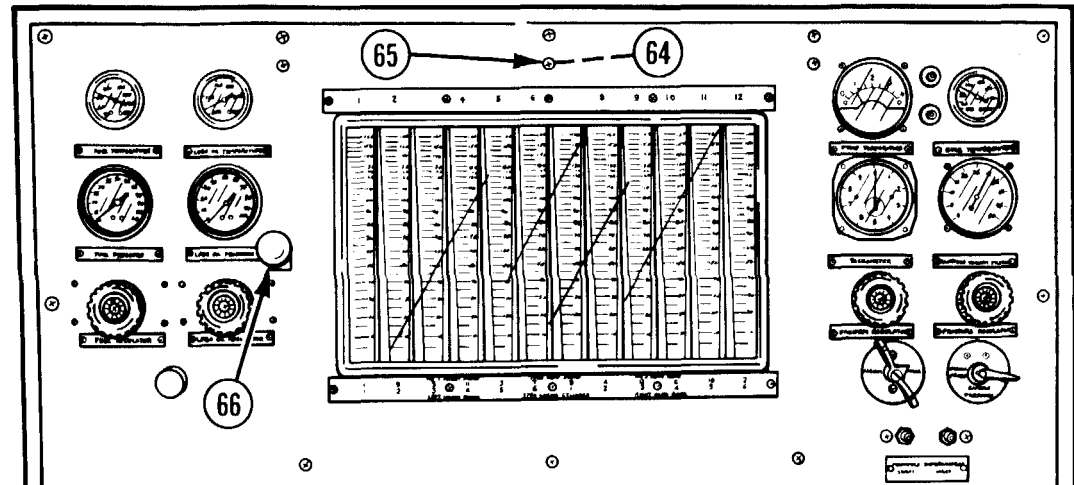
24 GRADUATE RACK ASSEMBLY (63). Position on instrument panel (1).



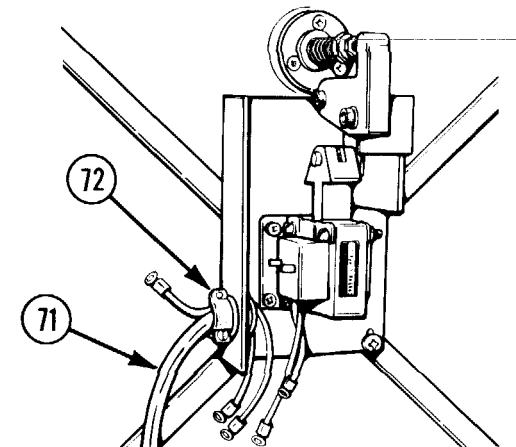
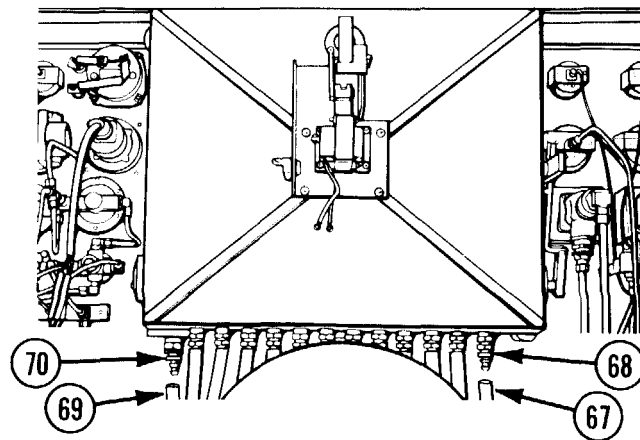
16-7. INSTRUMENT PANEL ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

- 25 SIX LOCKWASHERS (64) AND SIX SCREWS (65). Install.
- 26 BALL KNOB (66). Install.



- 27 TWELVE HOSES (67). Install on twelve socketless fittings (68).
- 28 HOSE (69). Install on socketless fitting (70).

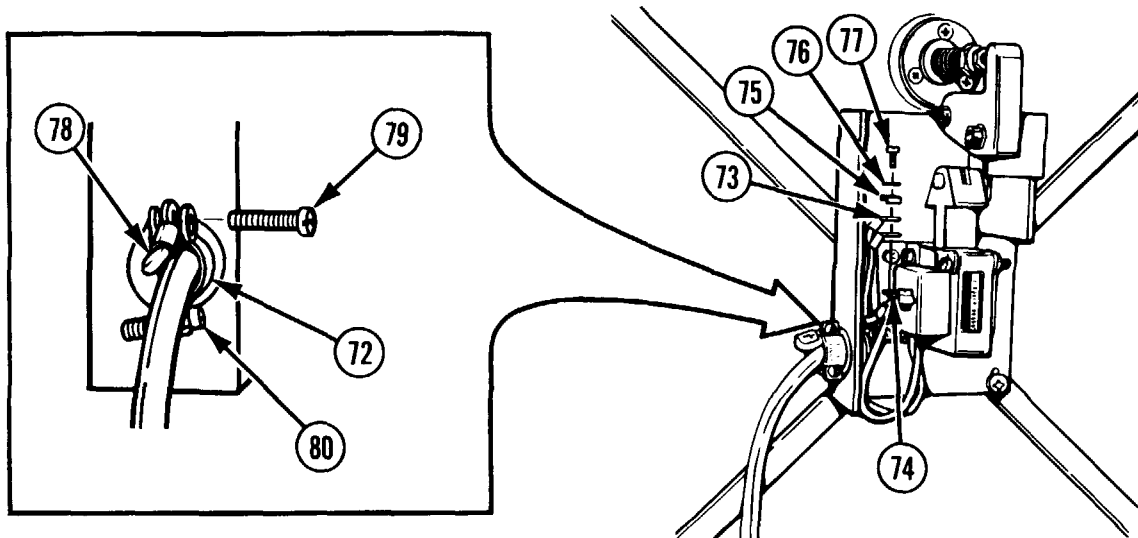


- 29 WIRE CABLE (71). Install in straight box connector (72).

**NOTE**

Refer to wiring diagram (p 6-146) before connecting wires.

- 30 FOUR WIRES (73) WITH ONE TERMINAL LUG EACH. Install on two terminals (74) and secure with two clips (75), two lockwashers (76), and two screws (77).
- 31 GREEN WIRE (78) WITH TERMINAL LUG. Install on straight box connector (72) and secure with screw (79).
- 32 TWO SCREWS (79 AND 80). Tighten.

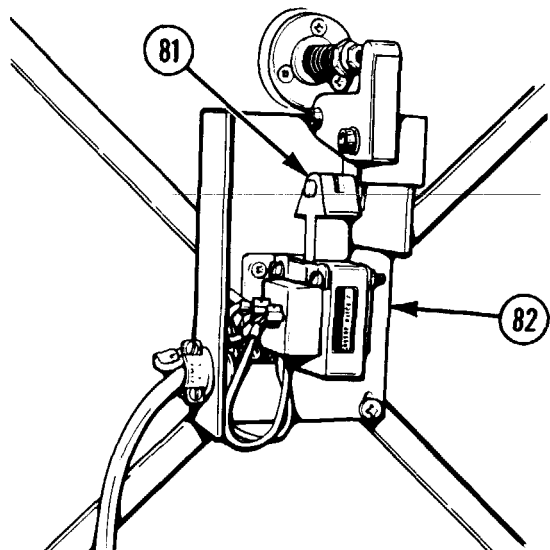


**TEST**

All controls and indicators on instrument panel assembly must be tested for correct operation. Refer to chapter 2, page 2-5, for explanation of operation of each control and indicator.

**CAUTION**

Make sure the iron core (81) is inserted into the solenoid (82). If this is not done, the solenoid will burn out when power is turned on to the tester and the START COUNT button is pushed in.





**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation

**INITIAL SETUP****Tools and Special Tools**

General mechanic's automotive tool kit  
(5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

**References**

TM 9-4910-387-24P

**Troubleshooting References**

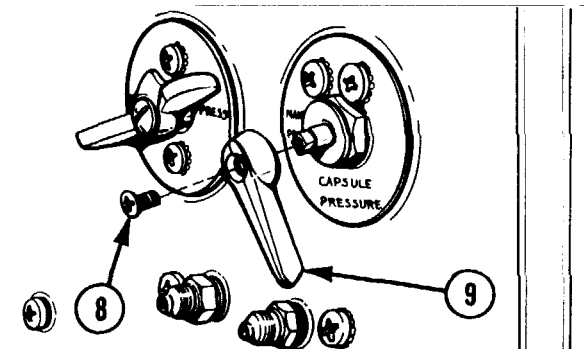
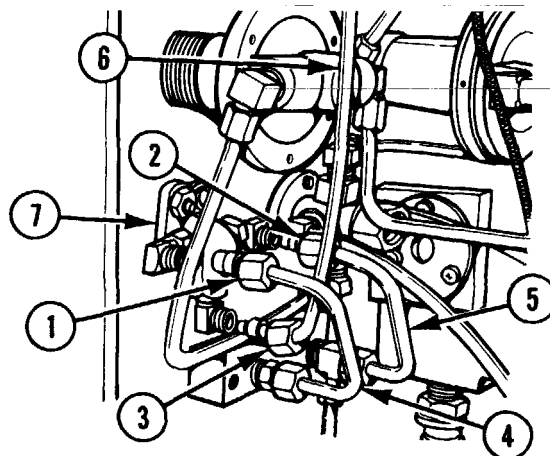
6-93 MANF. PRESS. - CAPSULE PRESSURE selector  
valve does not function

**Equipment Conditions**

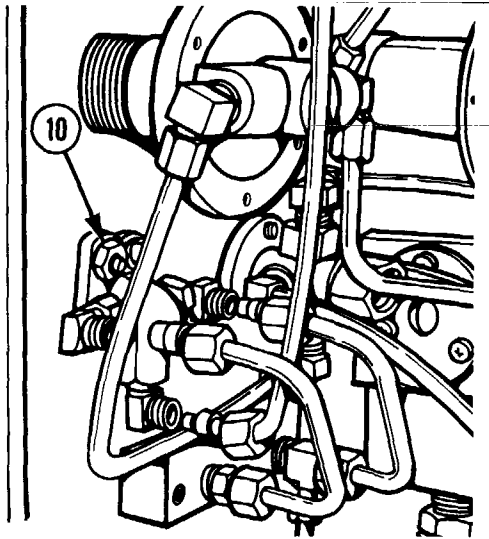
Main power source to tester is turned off  
4-33 RH upper side panel is removed

**REMOVAL/DISASSEMBLY**

- 1 THREE NUTS (1, 2, AND 3). Loosen.
- 2 THREE COPPER TUBINGS (4, 5, AND 6). Pull gently away from MANF. PRESS. - CAPSULE PRESSURE selector valve (7).

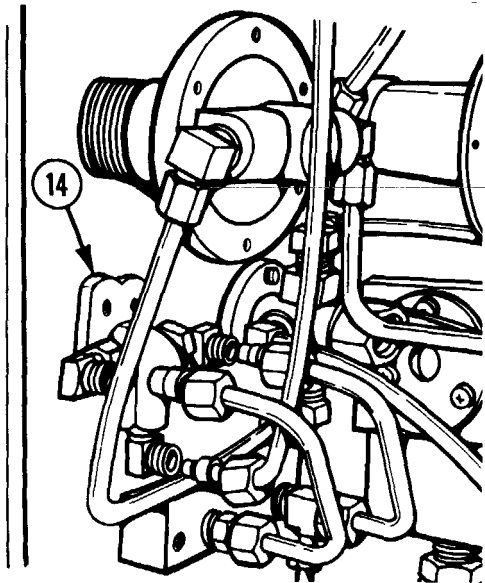
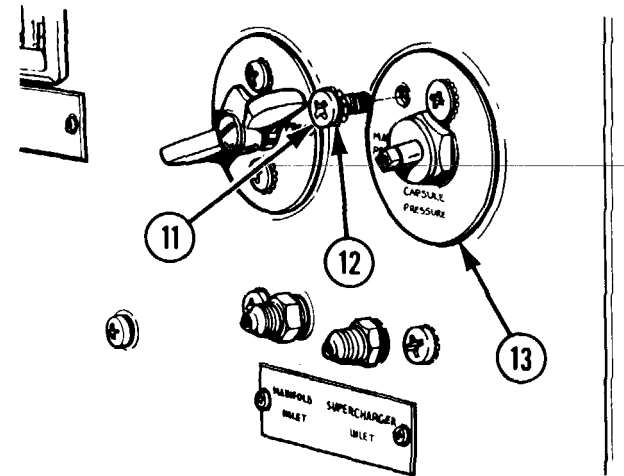


- 3 SCREW (8) AND HANDLE (9). Remove.



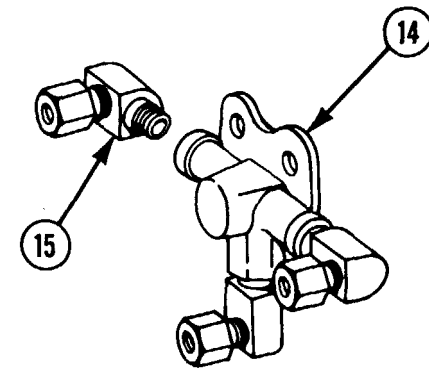
4 TWO NUTS- (10). Remove.

5 TWO SCREWS (11), TWO LOCK-WASHERS (12), AND NAMEPLATE (13) Remove.



6 PLUG COCK (14). Remove.

7 THREE MALE ELBOWS (15). Remove from plug cock (14).

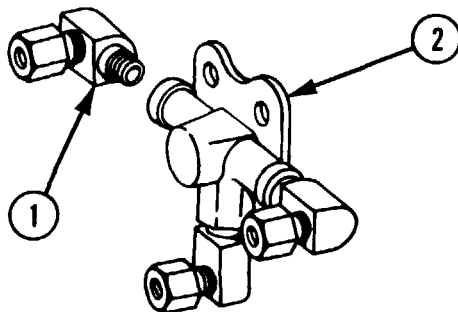


6-8. MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE-MAINTENANCE INSTRUCTIONS (t)

**INSPECTION/SERVICING**

THREE MALE ELBOWS (1) AND PLUG COCK (2).

- a. Check for broken or missing parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



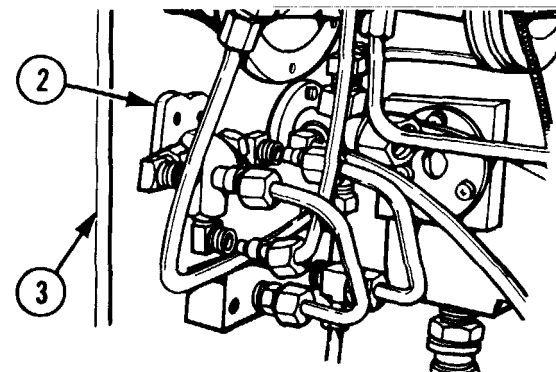
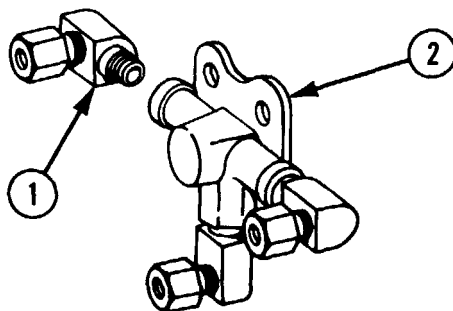
**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

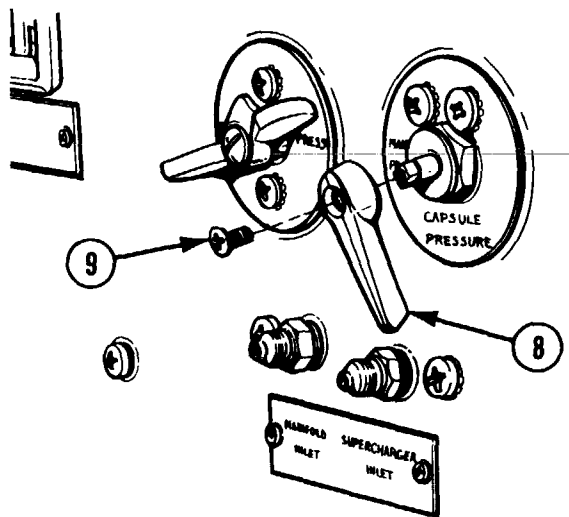
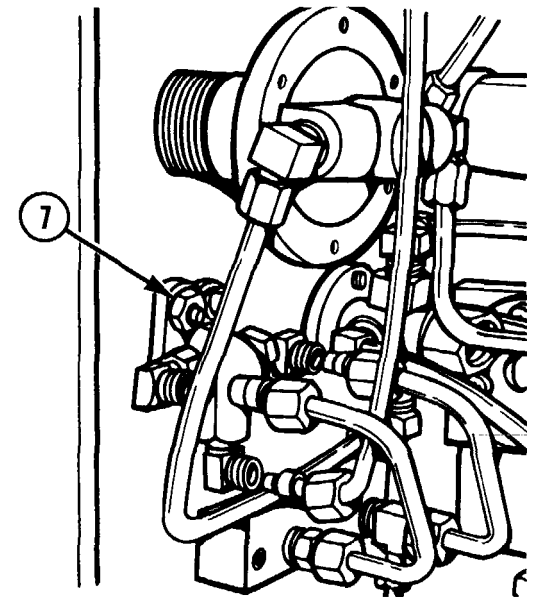
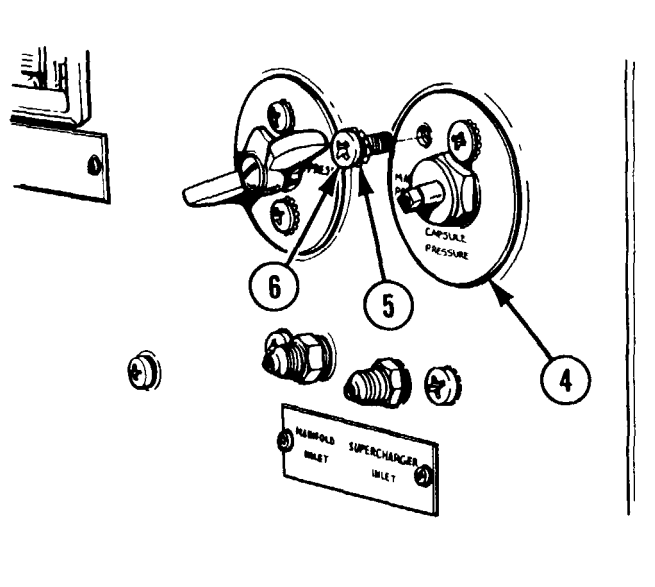
**REASSEMBLY/INSTALLATION**

- 1 THREE MALE ELBOWS (1). Install on plug cock (2).



- 2 PLUG COCK (2). Position on instrument panel assembly (3).

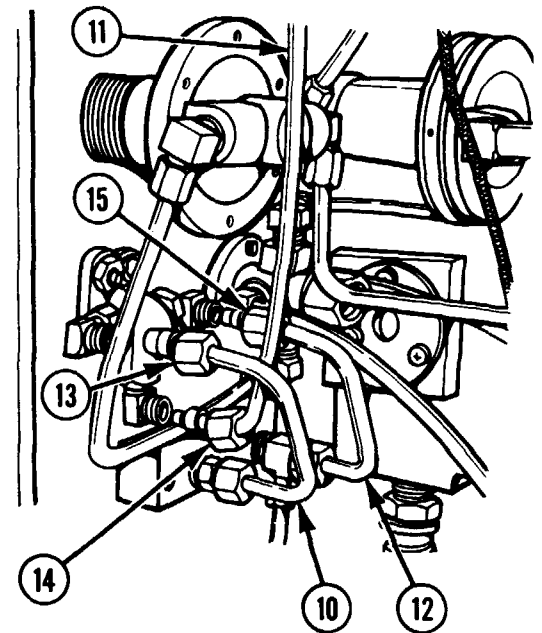
3 NAMEPLATE (4), TWO LOCKWASHERS (5), TWO SCREWS (6), AND TWO NUTS (7). Install.



4 HANDLE (8) AND SCREW (9). Install.

5 THREE COPPER TUBINGS (10, 11, AND 12). Install.

6 THREE NUTS (13, 14, AND 15). Tighten.



**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/ installation

**INITIAL SETUP****Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

**References**

TM 9-4910-387-24P

**Troubleshooting References**

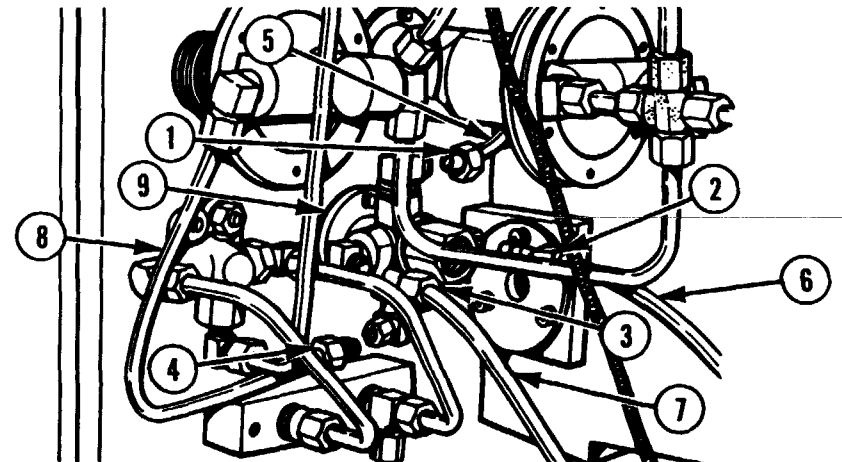
6-91 VACUUM - PRESS. selector valve does not function

**Equipment Conditions**

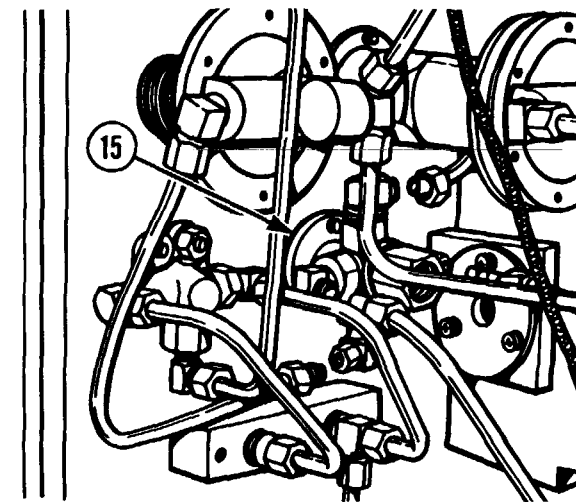
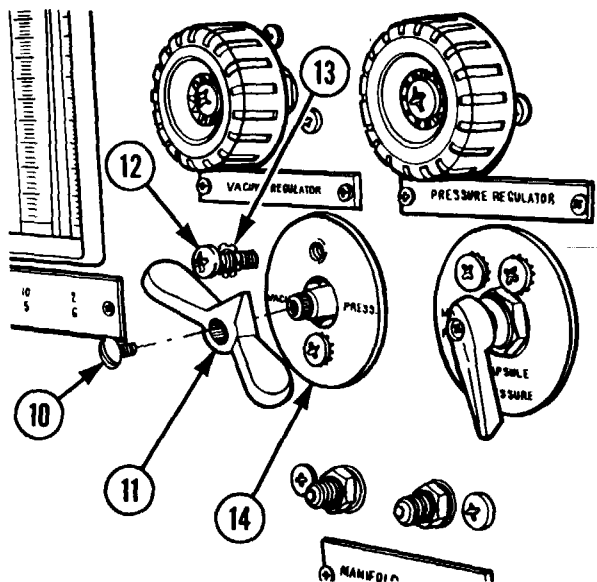
Main power source to tester is turned off  
4-33 RH upper side panels removed

**REMOVAL/DISASSEMBLY**

- 1 FOUR NUTS (1 THRU 4). Loosen.
- 2 FOUR COPPER TUBINGS (5 THRU 8) Pull carefully away from VACUUM - PRESS. selector valve (9).



- 3 SCREW (10) AND HANDLE (11).  
Remove.
- 4 TWO SCREWS (12), TWO LOCK-  
WASHERS (13), AND NAMEPLATE  
(14). Remove.

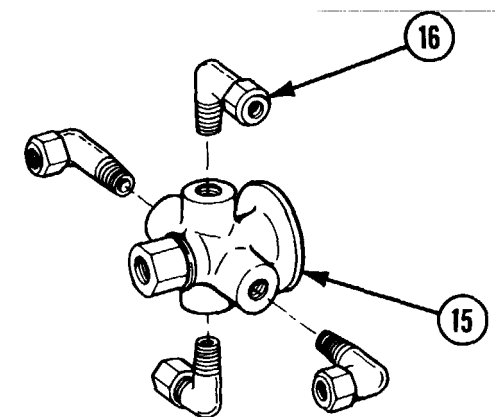


5 PLUG COCK (15). Remove.

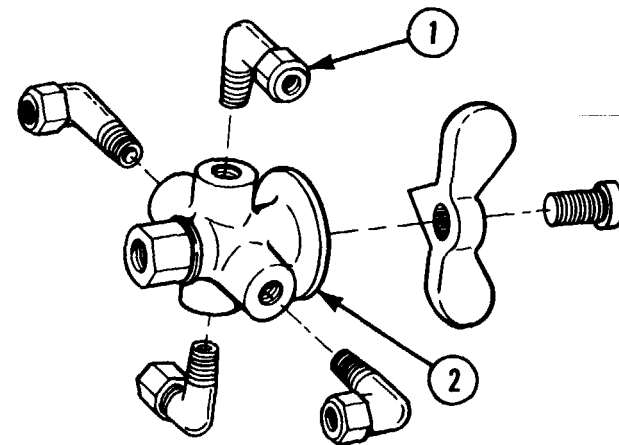
**INSPECTION/SERVICING**

FOUR PIPE-TO-TUBE ELBOWS (1) AND  
PLUG COCK (2).

- a. Check for cracked, broken, or missing parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



- 6 FOUR PIPE-TO-TUBE ELBOWS (16).  
Remove from plug cock (15)



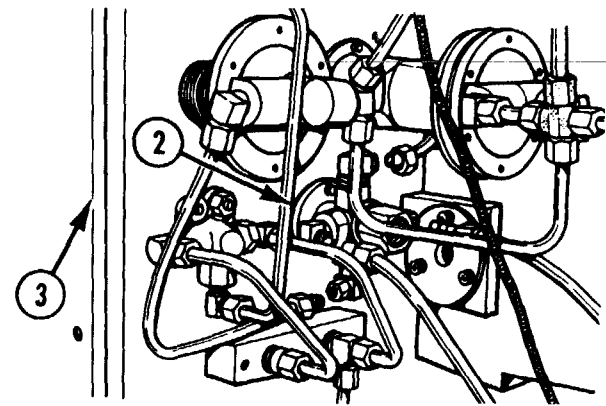


6-9. VACUUM - PRESS. SELECTOR VALVE-MAINTENANCE INSTRUCTIONS (cont)

REPAIR

NOTE

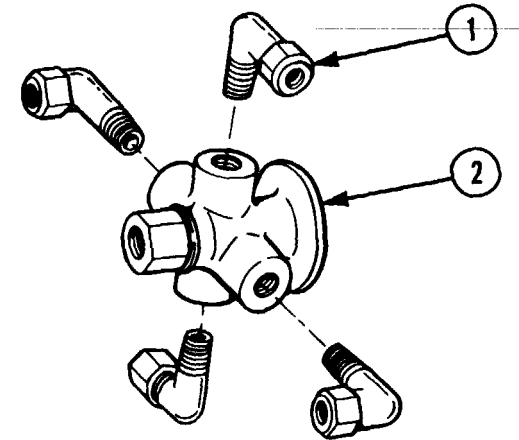
Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.



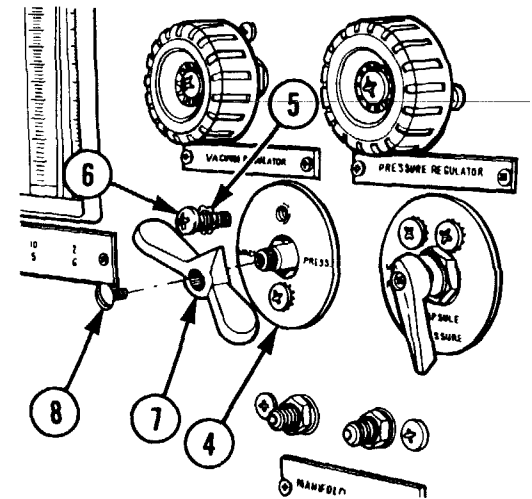
2 PLUG COCK (2). Position on instrument panel assembly (3).

REASSEMBLY/INSTALLATION

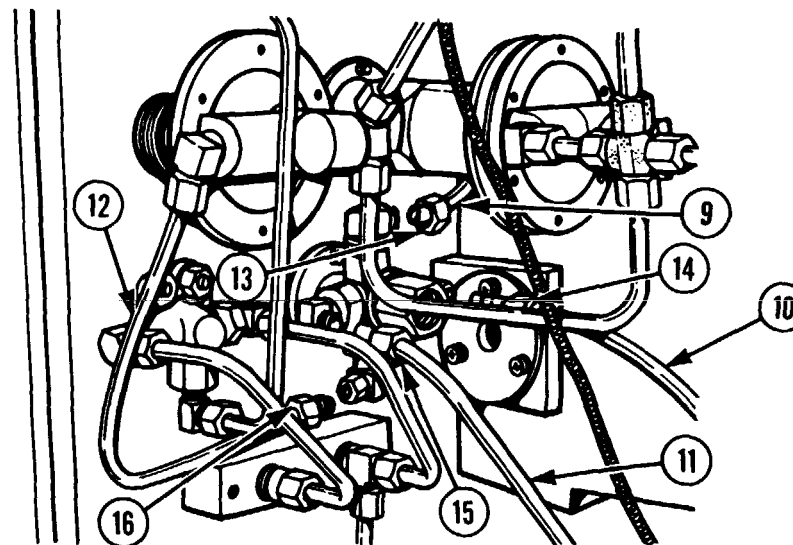
- 1 FOUR PIPE-TO-TUBE ELBOWS (1). Install on plug cock (2).



- 3 NAMEPLATE (4), TWO LOCK-WASHERS (5), AND TWO SCREWS (6). Install.
- 4 HANDLE (7) AND SCREW (8). Install.



- 5 FOUR COPPER TUBINGS (9 THRU 12). Install.
- 6 FOUR NUTS (13 THRU 16). Tighten.



**6-10. MANIFOLD INLET - SUPERCHARGER INLET - MAINTENANCE INSTRUCTION:**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Installation

**INITIAL SETUP**

Tools and Special Tools  
 General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts  
 Cleaning compound (item 3, app C)  
 Rag (item 14, app C)

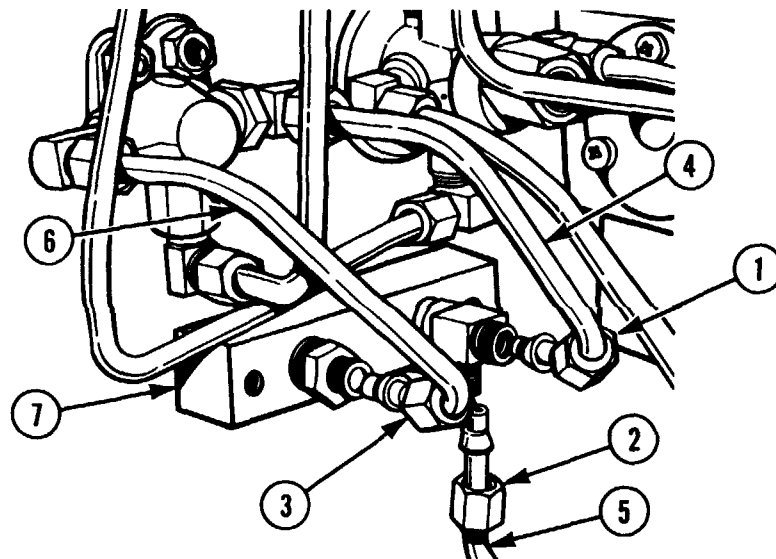
References  
 TM 94910-387-24P

Equipment Conditions  
 Main power source to tester is turned off  
 4-33 RH upper side panel is removed

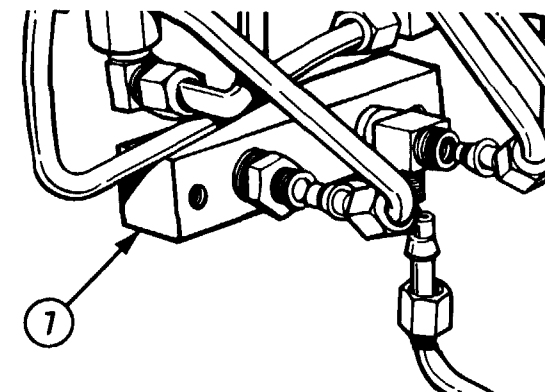
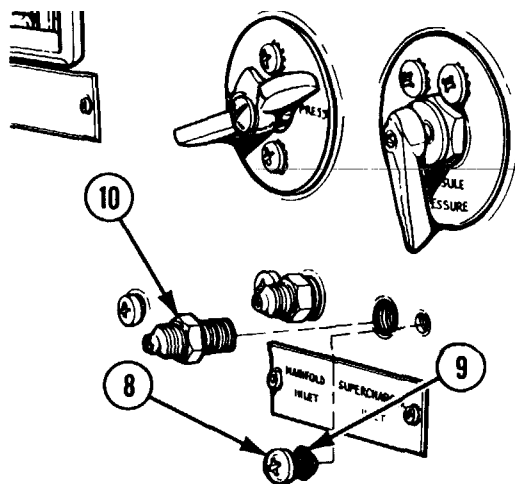
**6-10. MANIFOLD INLET - SUPERCHARGER INLET-MAINTENANCE INSTRUCTIONS (cont)**

**REMOVAL**

- 1 THREE NUTS (1, 2, AND 3). Loosen.
- 2 THREE COPPER TUBINGS (4, 5, AND 6). Pull carefully away from MANIFOLD INLET - SUPERCHARGER INLET (7).

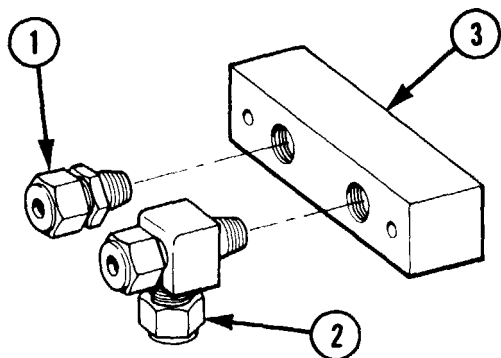


- 3 TWO SCREWS (8) AND TWO LOCK-WASHERS (9). Remove.
- 4 TWO MALE CONNECTORS (10). Remove.



- 5 MANIFOLD INLET- SUPERCHARGER INLET (7). Remove.

**DISASSEMBLY**



TWO MALE CONNECTORS (1 AND 2)  
AND BLOCK (3).

**REPAIR**

**NOTE**

Repair is by replacement of  
authorized parts (TM 9-4910-  
387-24P) as required.

**INSPECTION/SERVICING**

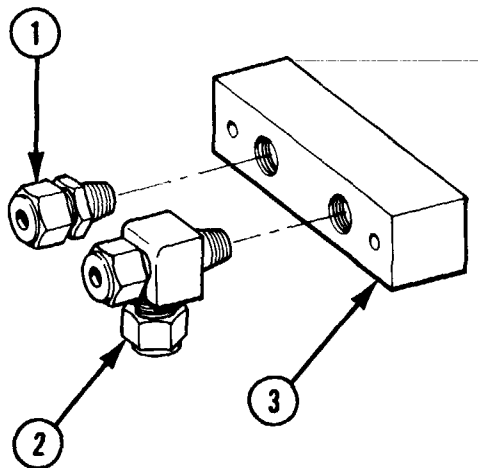
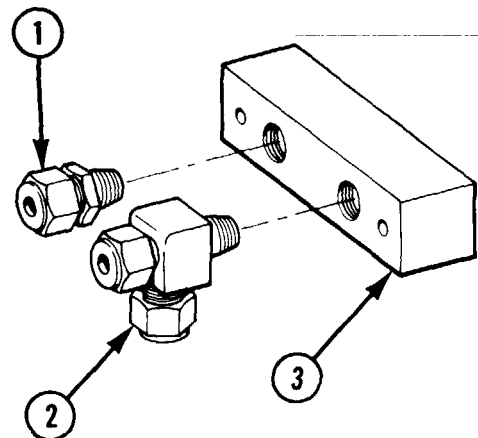
TWO MALE CONNECTORS (1 AND 2).

Remove from block (3).

- a. Check for broken, cracked, or missing parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

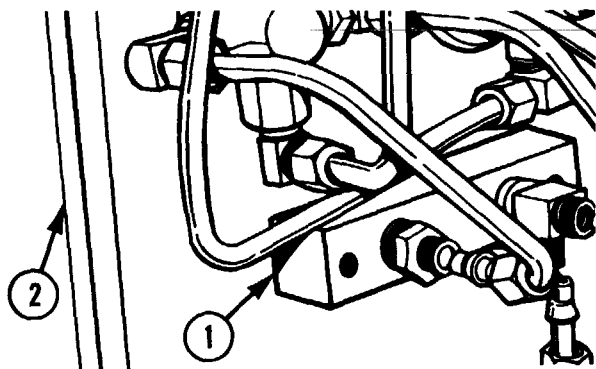
**REASSEMBLY**

TWO MALE CONNECTORS (1 AND 2). Install  
on block (3).



6-10. MANIFOLD INLET - SUPERCHARGER INLET - MAINTENANCE INSTRUCTIONS (cont)

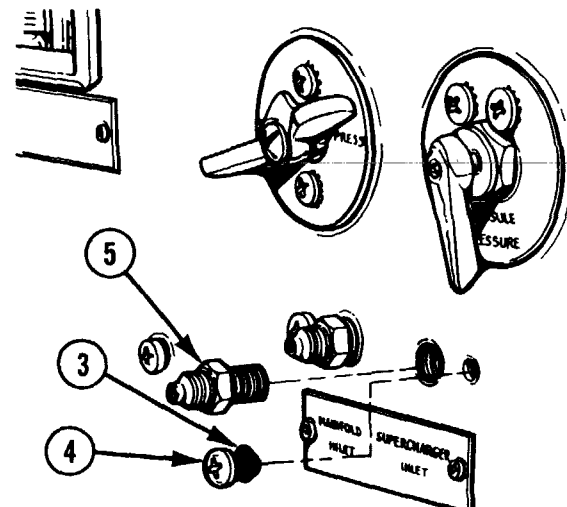
INSTALLATION



1 MANIFOLD INLET- SUPERCHARGER INLET (1). Position on instrument panel assembly (2).

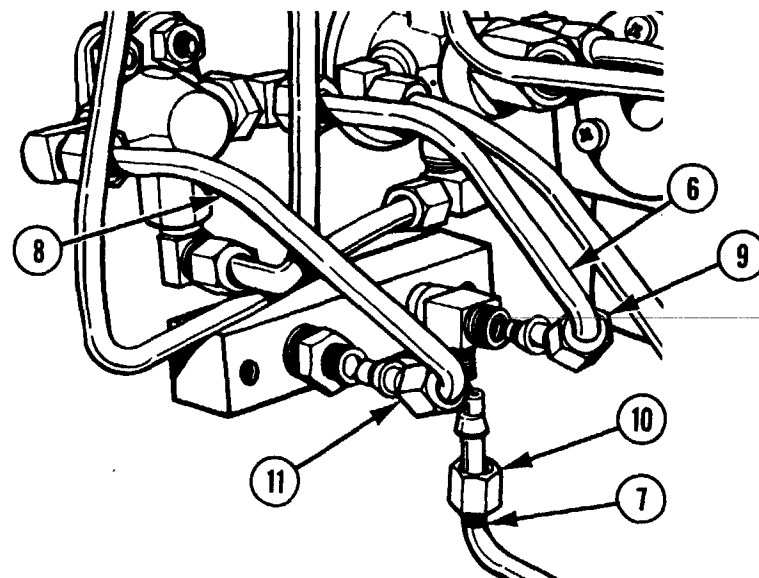
2 TWO LOCKWASHERS (3) AND TWO SCREWS (4). Install.

3 TWO MALE CONNECTORS (5). Install.



4 THREE COPPER TUBINGS (6, 7, AND 8). Install.

5 THREE NUTS (9, 10, AND 11). Tighten.



**6-11. 24 VOLTS DC OUTLET ASSEMBLY - MAINTENANCE INSTRUCTION:**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

- Abrasive cloth (item 4, app C)
- Cleaning compound (item 3, app C)
- Rag (item 14, app C)

**References**

TM 9-4910-387-24P

**Troubleshooting References**

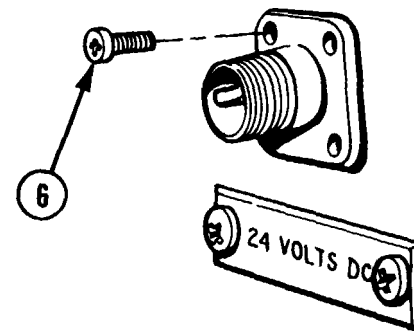
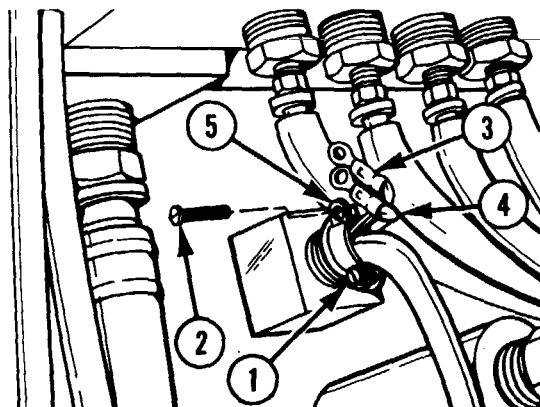
6-64 No power at 24 VOLTS DC outlet assembly

**Equipment Conditions**

- Main power source to tester is turned off
- 4-33 RH upper side panel is removed

**REMOVAL/DISASSEMBLY**

- 1 SCREW (1). Loosen.
- 2 SCREW (2). Remove.
- 3 TWO WIRES (3 AND 4) WITH ONE TERMINAL LUG EACH. Remove from connector (5).



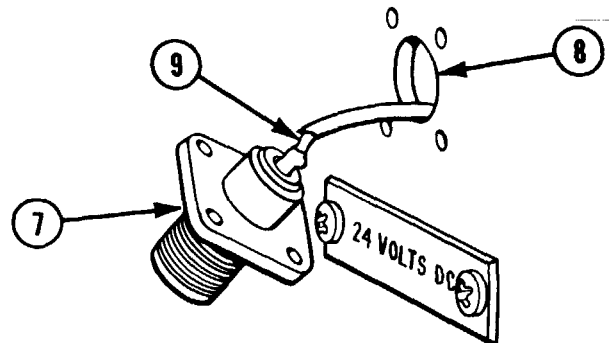
- 4 FOUR SCREWS (6). Remove.



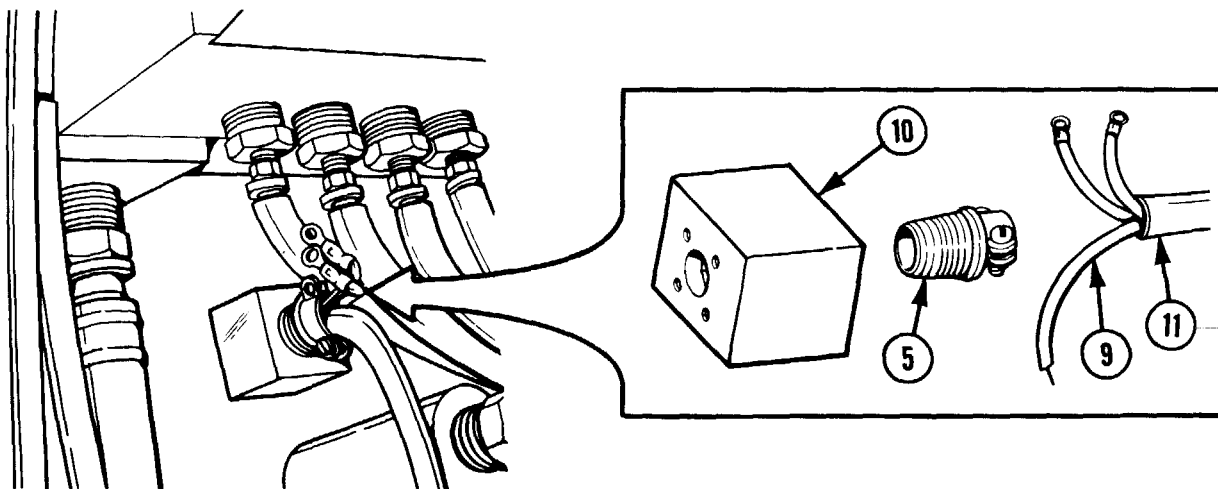
**6-11. 24 VOLTS DC OUTLET ASSEMBLY - MAINTENANCE INSTRUCTIONS (cont)**

**REMOVAL/DISASSEMBLY (cont)**

- 5 RECEPTACLE CONNECTOR (7). Pull away from instrument panel assembly (8).
- 6 WIRE (9). Unsolder from receptacle connector (7).
- 7 RECEPTACLE CONNECTOR (7). Remove.

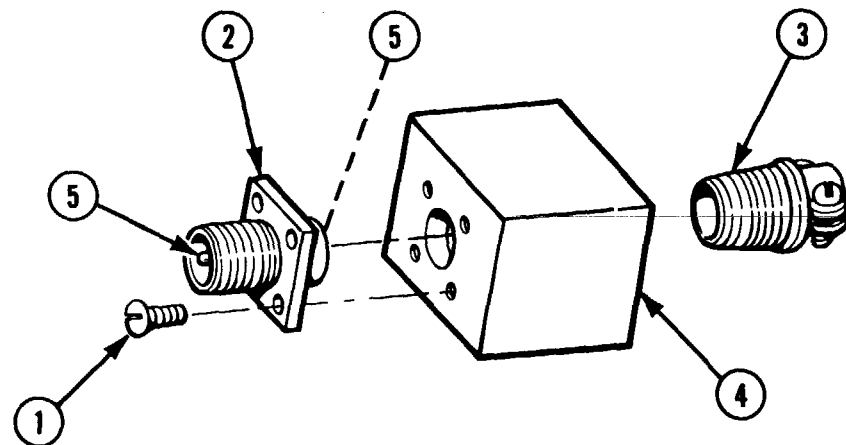


- 8 FITTING (10). Remove from connector (5) and wire (9).
- 9 CONNECTOR (5). Remove from wire cable (11).



**INSPECTION/SERVICING**

- 1 FOUR SCREWS (1), RECEPTACLE CONNECTOR (2), CONNECTOR (3), AND FITTING (4).
  - a. Check for broken, cracked, or missing parts.
  - b. Check for damaged threads.
  - c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- 2 ELECTRICAL CONTACTS (5). Clean with abrasive cloth (item 4, app C).

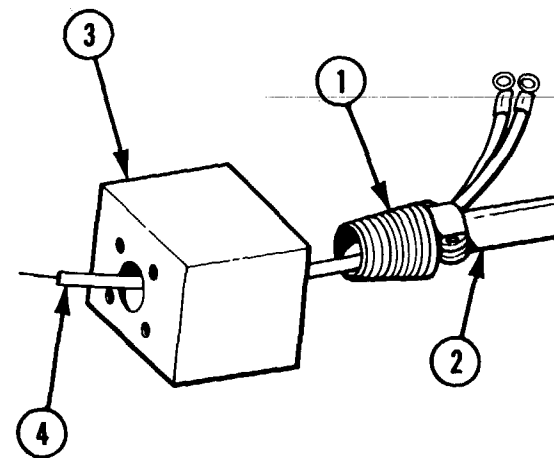


**REPAIR**

**NOTE**  
 Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

**REASSEMBLY/INSTALLATION**

- 1 CONNECTOR (1). Install over wire cable (2).
- 2 FITTING (3). Install over wire (4).

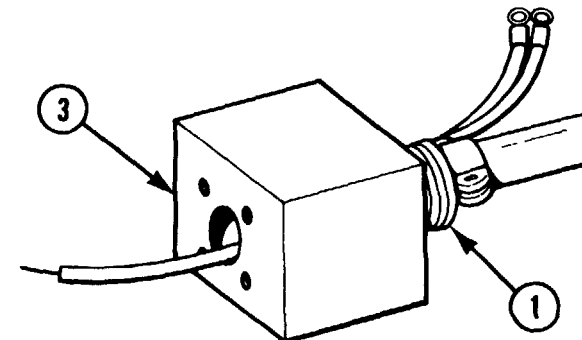
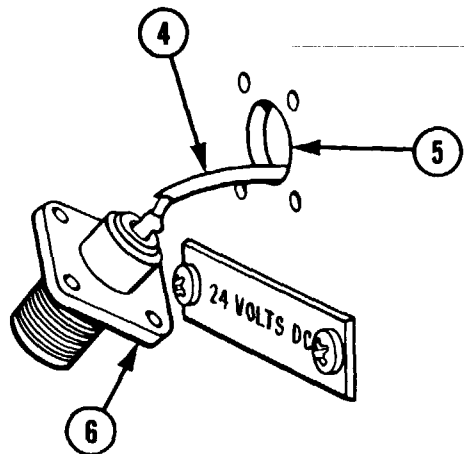


6-11. 24 VOLTS DC OUTLET ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)i

REASSEMBLY/INSTALLATION (cont)

3 WIRE (4).

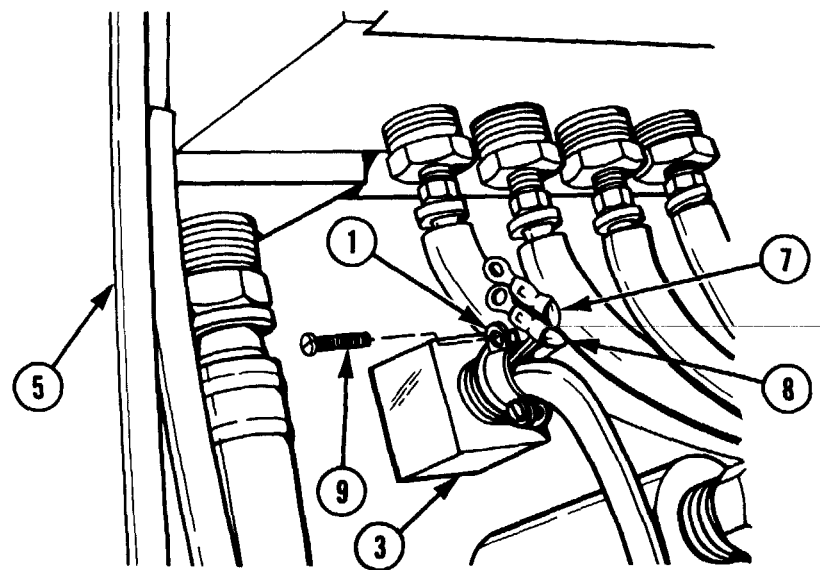
- a. Push through hole in instrument panel assembly (5) and insert into receptacle connector (6).
- b. Solder to receptacle connector (6).

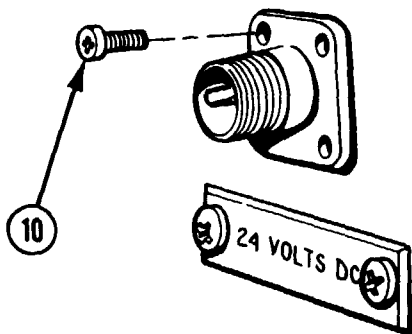


4 FITTING (3). Screw onto connector (1).

5 TWO WIRES (7 AND 8) WITH ONE TERMINAL LUG EACH. Install on connector (1) and secure by loosely installing screw (9).

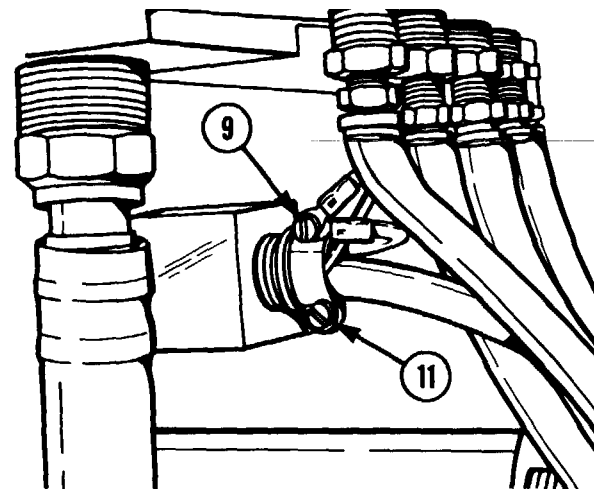
6 FITTING (3). Position on instrument panel assembly (5).





7 FOUR SCREWS (10). Install.

8 TWO SCREWS (9 AND 11). Tighten.



**6-12. MANIFOLD BULB ASSEMBLY - MAINTENANCE INSTRUCTION**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation
- e. Test

**INITIAL SETUP**

Tools and Special Tools  
 General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts  
 Abrasive cloth (item 4, app C)  
 Cleaning compound (item 3, app C)  
 Rag (item 14, app C)

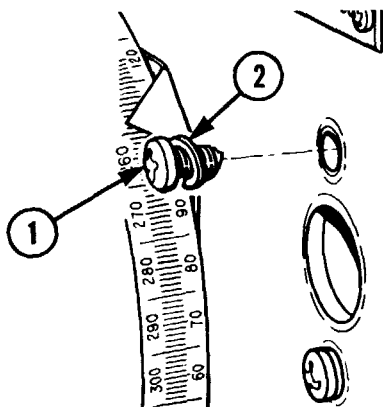
References  
 TM 9-4910-387-24P

Troubleshooting References  
 6-46 BULB TEMPERATURE gage does not indicate  
 6-42 Manifold bulb assembly is inoperative

Equipment Conditions  
 Main power source to tester is turned off  
 4-33 RH upper side panel is removed

6-12. MANIFOLD BULB ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

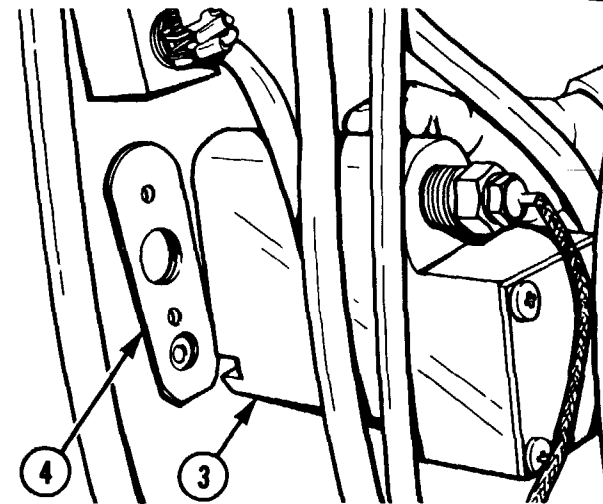
REMOVAL/DISASSEMBLY



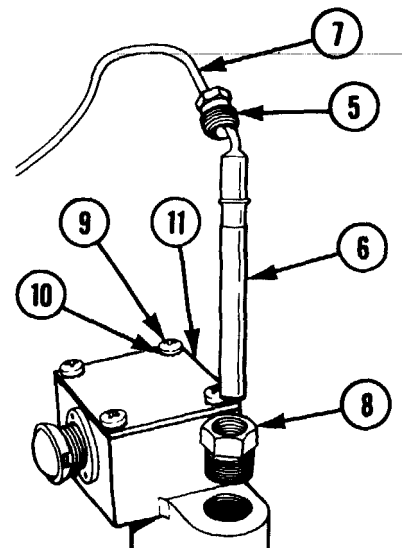
1 TWO SCREWS (1) AND TWO LOCK-WASHERS (2). Remove.

**CAUTION**  
Be careful when removing bulbs as they are fragile and can damage easily.

- 2 MANIFOLD CHAMBER (3). Pull gently away from instrument panel assembly.
- 3 GASKET (4). Remove.

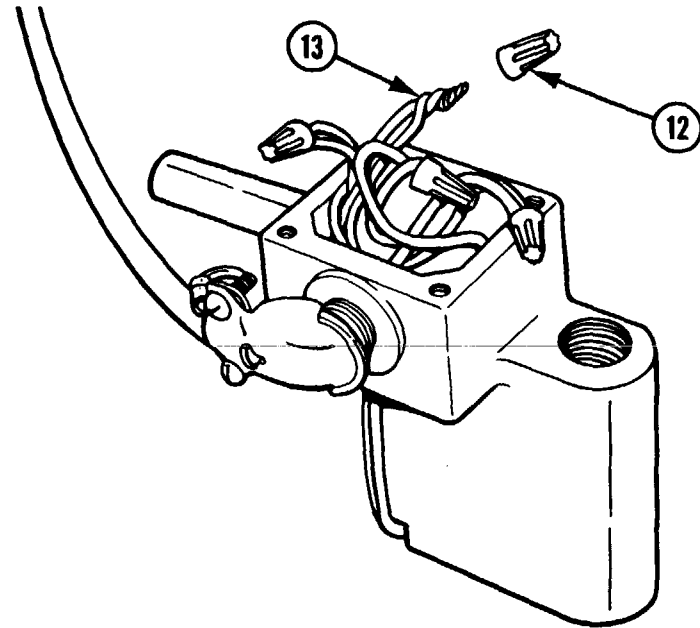


- 4 NUT (5), BULB (6) WITH BRAIDED TUBE (7), AND ADAPTER (8).
- 5 FOUR SCREWS (9) AND FOUR LOCKWASHERS (10). Remove.
- 6 COVER (11). Remove.

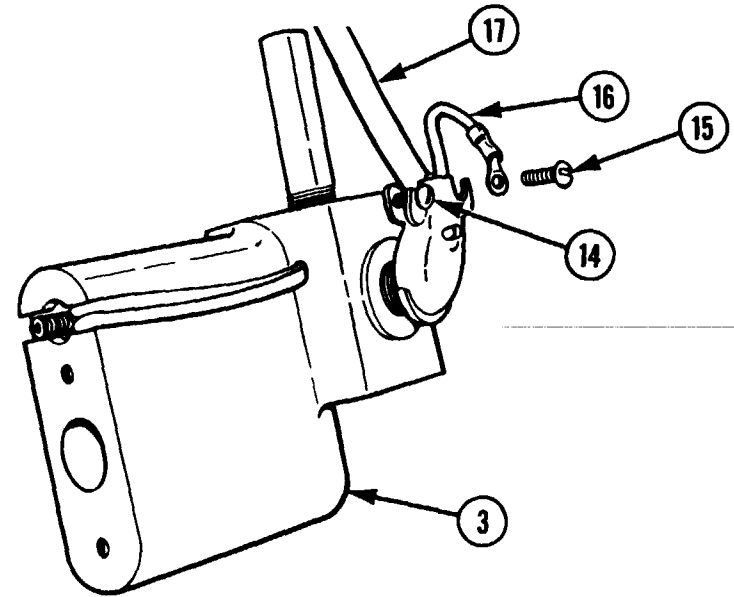


**NOTE**  
**Tag all wires before disassembly.**

- 7 FOUR CONDUCTOR SPLICES (12). Remove.
- 8 NINE WIRES (13). Separate.



- 9 SCREW (14). Loosen.
- 10 SCREW (15). Remove.
- 11 GREEN WIRE (16) WITH TERMINAL LUG. Disconnect.
- 12 WIRE CABLE (17). Pull from manifold chamber (3).

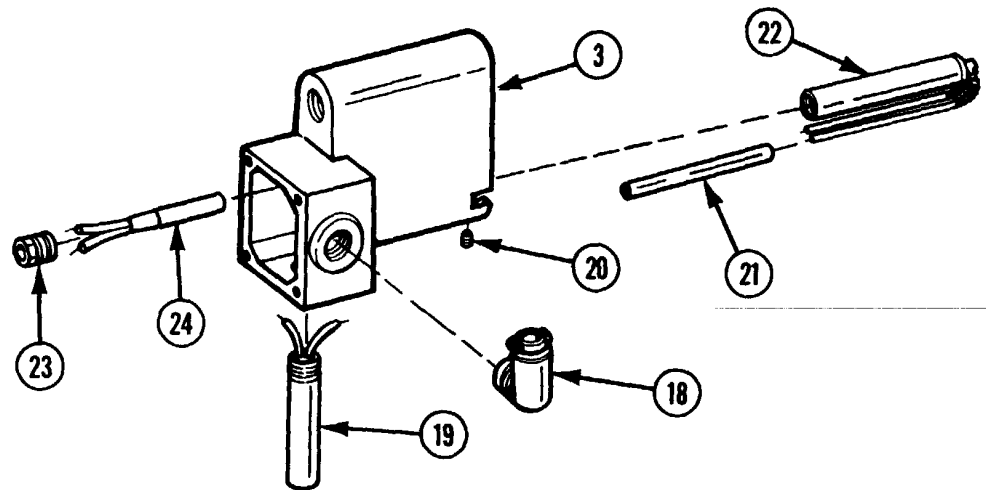




**6-12. MANIFOLD BULB ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

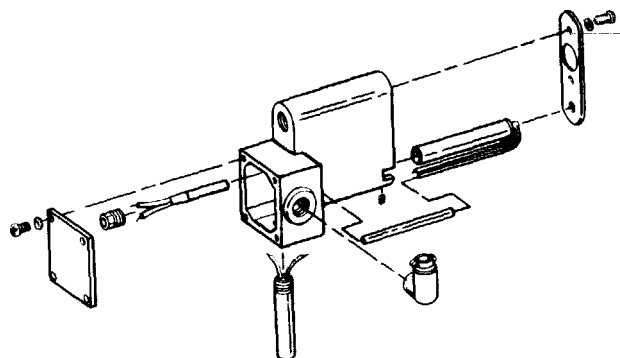
**REMOVAL/DISASSEMBLY (cont)**

- 13 BOX CONNECTOR (18). Remove.
- 14 RESISTANCE CAPSULE (19). Remove.
- 15 SETSCREW (20). Remove.
- 16 TWO SPAGHETTI TUBINGS (21). Remove.
- 17 THERMOSTATIC SWITCH (22). Remove.
- 18 TUBE INVERTED NUT (23) AND HEATER (24). Remove.
- 19 MANIFOLD CHAMBER (3). Remove.



**INSPECTION/SERVICING**

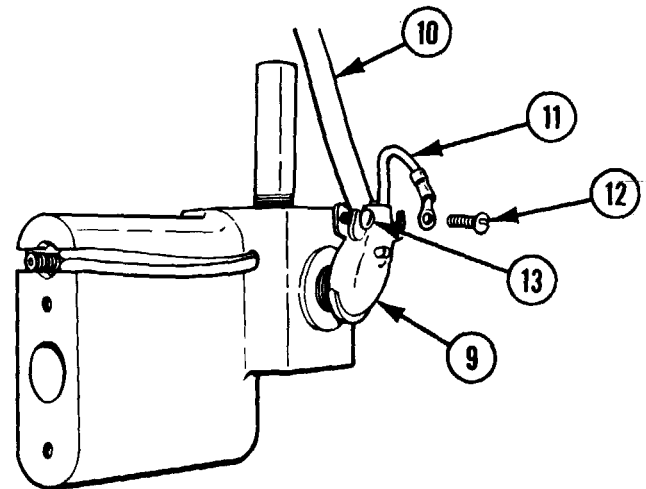
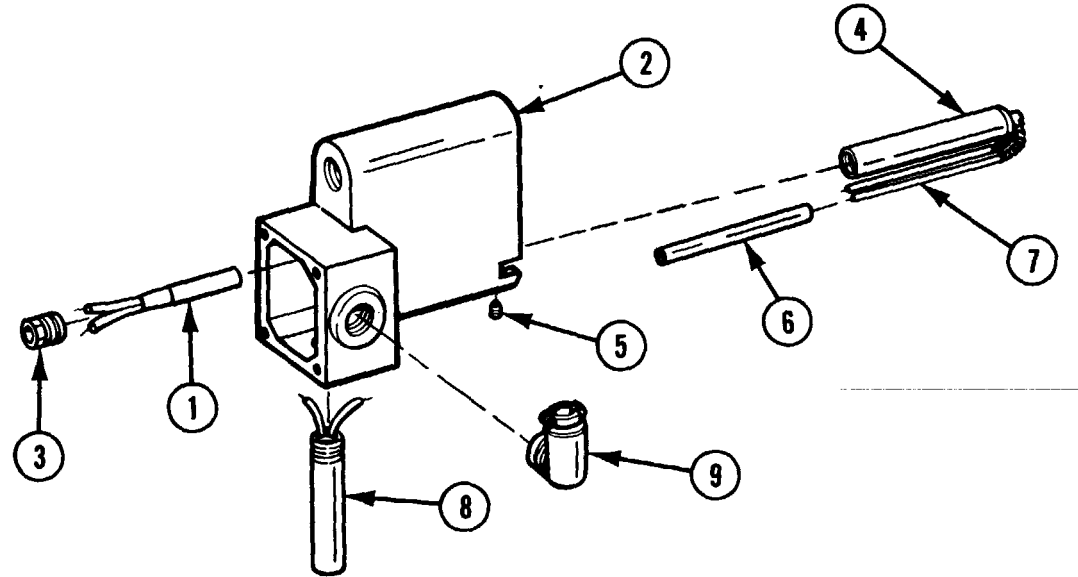
- 1 MANIFOLD BULB ASSEMBLY.
  - a. Check for broken, cracked, or missing parts.
  - b. Check threads for damage.
  - c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- 2 ELECTRICAL CONTACTS. Clean with abrasive cloth (item 4, app C).



**NOTE**  
 Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

**REASSEMBLY/INSTALLATION**

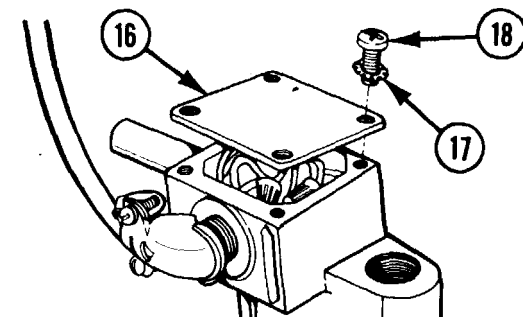
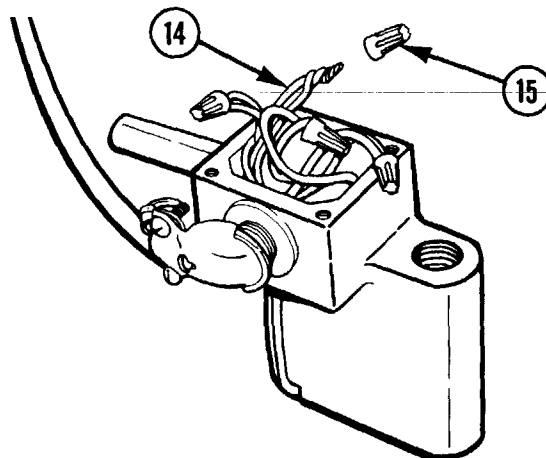
- 1 HEATER (1). Install in manifold chamber (2) and secure with tube inverted nut (3).
- 2 THERMOSTATIC SWITCH (4). Install and secure with setscrew (5).
- 3 TWO SPAGHETTI TUBINGS (6).
  - a. Install on the two thermostatic switch wires (7).
  - b. Insert in manifold chamber (2).
- 4 RESISTANCE CAPSULE (8). Install.
- 5 BOX CONNECTOR (9). Install on manifold chamber (2).
- 6 WIRE CABLE (10). Push through box connector (9).
- 7 GREEN WIRE (11) WITH TERMINAL LUG. Install on box connector (9) and secure with screw (12).
- 8 SCREW (13). Tighten.



6-12. MANIFOLD BULB ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

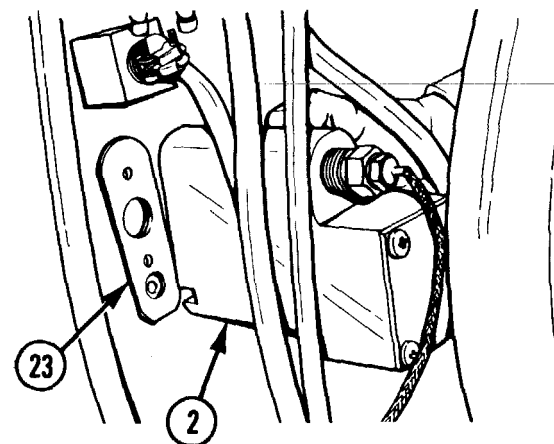
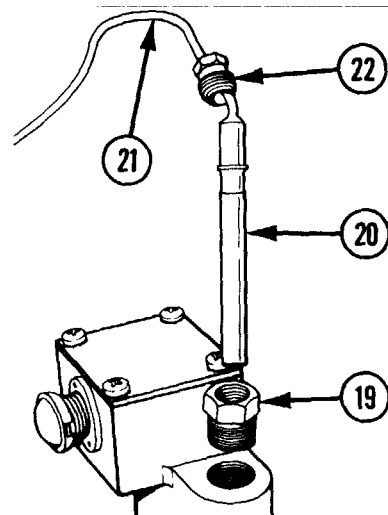
- 9 NINE WIRES (14). Reconnect.
- 10 FOUR CONDUCTOR SPLICES (15). Install.



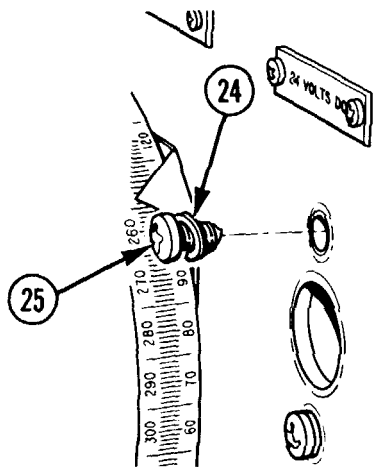
- 11 COVER (16). Install and secure with four lockwashers (17) and four screws (18).

**CAUTION**  
Be careful when installing bulbs as they are fragile and can damage easily.

- 12 ADAPTER (19), BULB (20) WITH BRAIDED TUBE (21), AND NUT (22). Install.



- 13 GASKET (23) AND MANIFOLD CHAMBER (2). Install on instrument panel assembly.

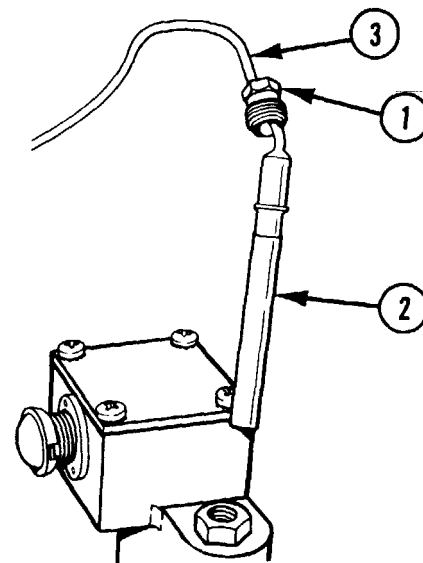


14 TWO WASHERS (24) AND TWO SCREWS (25). Install.

**TEST**

**CAUTION**  
Be careful when removing bulbs as they are fragile and can damage easily.

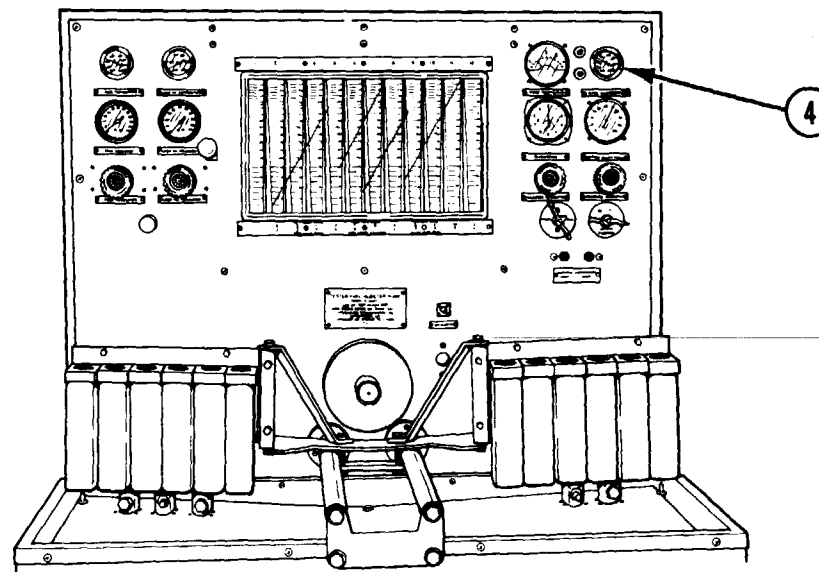
1 NUT (1) AND BULB (2) WITH BRAIDED TUBE (3). Remove from manifold bulb assembly.



**NOTE**

Temperature must be checked after a 5minute wait.

2 BULB TEMPERATURE GAGE (4). Check to ensure that room temperature is indicated.



**6-13. TACHOMETER INDICATOR ASSEMBLY - MAINTENANCE INSTRUCTION****THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation
- e. Test

**INITIAL SETUP**

## Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

## Materials/Parts

Abrasive cloth (item 4, app C)  
 Cleaning compound (item 3, app C)  
 Rag (item 14, app C)

## References

4-8 Operation of TACHOMETER  
 TM 9-4910-387-24P

## Troubleshooting References

6-113 TACHOMETER indicator assembly does not function,  
 FORWARD-OFF-REVERSE switch set at FORWARD

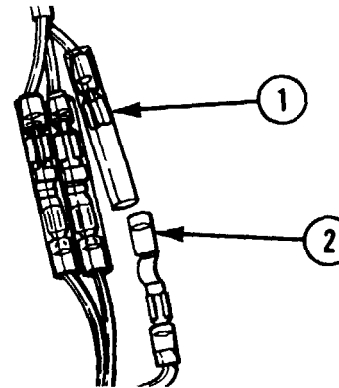
6-120 TACHOMETER indicator assembly does not function,  
 FORWARD-OFF-REVERSE switch set at REVERSE

## Equipment Conditions

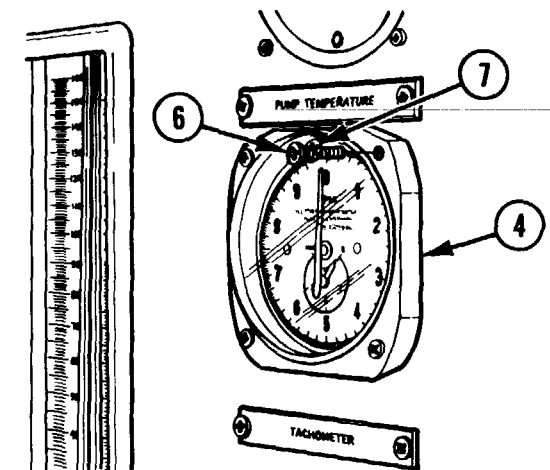
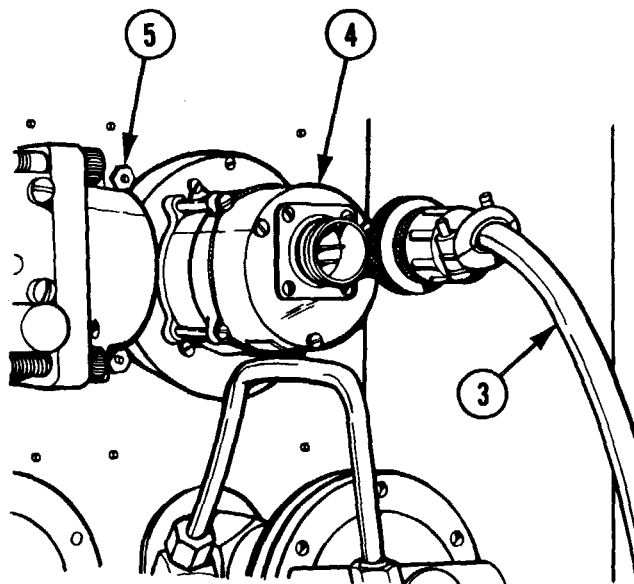
Main power source to tester is turned off  
 4-33 RH upper side panel is removed

**REMOVAL/DISASSEMBLY**

- 1 THREE FEMALE SOLDERLESS CONNECTORS (1). Disconnect from three male solderless connectors (2).



- 2 TACHOMETER INDICATOR CABLE ASSEMBLY (3). Unscrew from TACHOMETER (4) and remove.
- 3 FOUR NUTS (5). Remove.

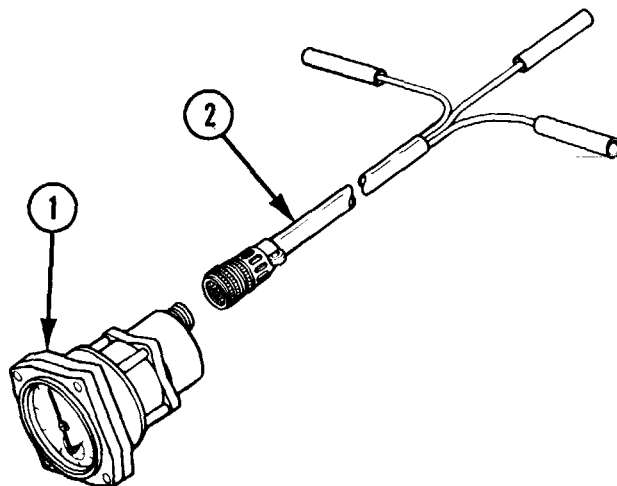


- 4 FOUR SCREWS (6) AND FOUR LOCKWASHERS (7). Remove.
- 5 TACHOMETER (4). Remove.

**INSPECTION/SERVICING**

TACHOMETER (1) AND TACHOMETER INDICATOR CABLE ASSEMBLY (2).

- a. Check for missing or damaged parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- d. Clean electrical contacts with abrasive cloth (item 4, app C).



**REPAIR**

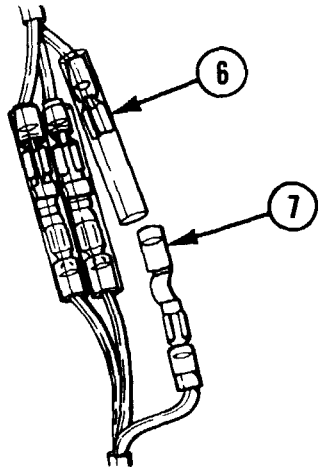
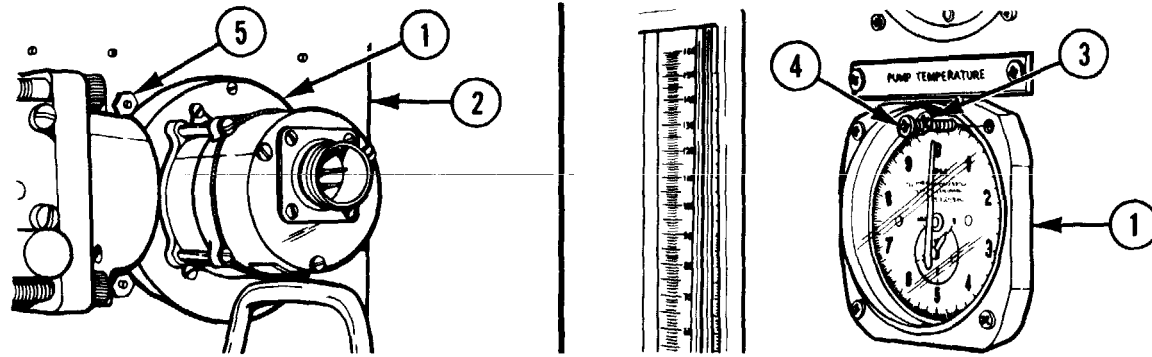
**NOTE**  
 Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.



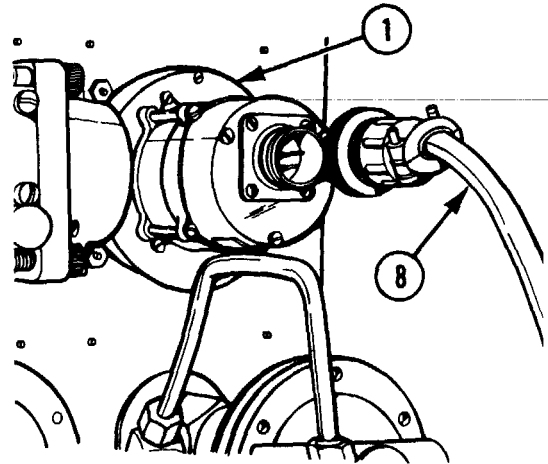
6-13. TACHOMETER INDICATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION

1 TACHOMETER (1). Install on instrument panel assembly (2) and secure with four lockwashers (3), four screws (4), and four nuts (5).



2 THREE FEMALE SOLDERLESS CONNECTORS (6). Connect to three male solderless connectors (7).



3 TACHOMETER INDICATOR CABLE ASSEMBLY (8). Install on TACHOMETER (1).

TEST

TACHOMETER INDICATOR ASSEMBLY. Check for proper operation (Refer to paragraph 4-7, p 4-8.) with the tester started and the shift control rod assembly set for high range.

**6-14. TACHMOMETER INDICATOR CABLE ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Test
- g. Installation

**INITIAL SETUP**

**Tools and Special Tools**

- General mechanic's automotive tool kit (5180-00-177-7033)
- Multimeter (TS352 B/U)

**Materials/Parts**

- Abrasive cloth (item 4, app C)
- Cleaning compound (item 3, app C)
- Rag (item 14, app C)
- Solder (item 18, app C)

**References**

- TM 94910-387-24P

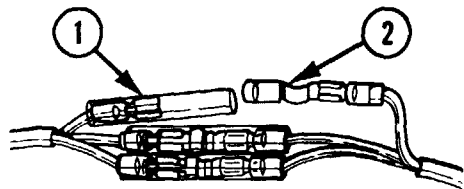
**Troubleshooting References**

- 6-113 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at FORWARD
- 6-120 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at REVERSE

**Equipment Conditions**

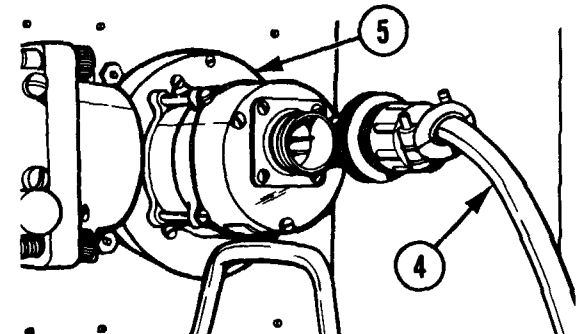
- Main power source to tester is turned off
- 4-33 RH upper side panel is removed

**REMOVAL**



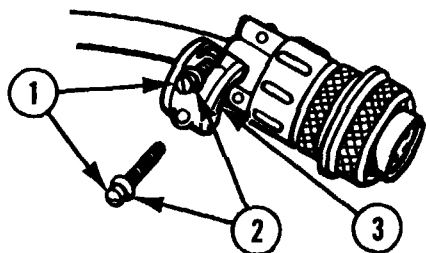
- 1 THREE FEMALE SOLDERLESS CONNECTORS (1). Disconnect from three male solderless connectors (2).

- 2 TACHOMETER INDICATOR CABLE ASSEMBLY (4). Unscrew from TACHOMETER (5) and remove.



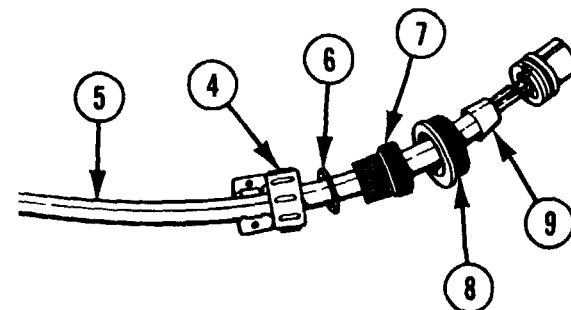
6-14. TACHOMETER INDICATOR CABLE ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY



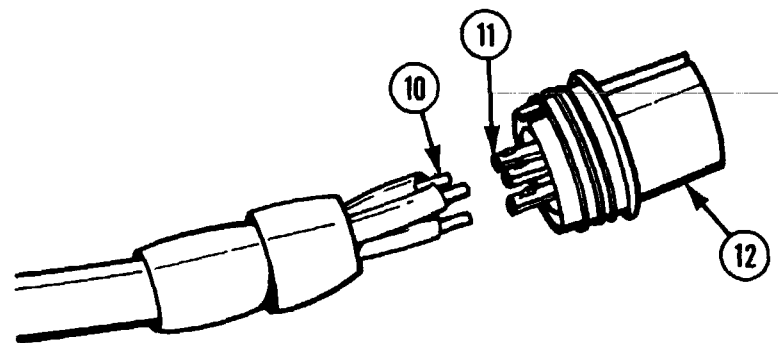
- 1 TWO SCREWS (1) AND TWO WASHERS (2). Remove.
- 2 CABLE CLAMP HALF (3). Remove.

- 3 CABLE CLAMP (4). Unscrew and slide back along neoprene covered cable (5).
- 4 WASHER (6). Slide back along neoprene covered cable (5).
- 5 KNURLED FITTING (7). Unscrew and slide back along neoprene covered cable (5).
- 6 CLAMPING NUT (8). Slide back along neoprene covered cable (5).
- 7 RUBBER BUSHING (9). Pull back along neoprene covered cable (5).

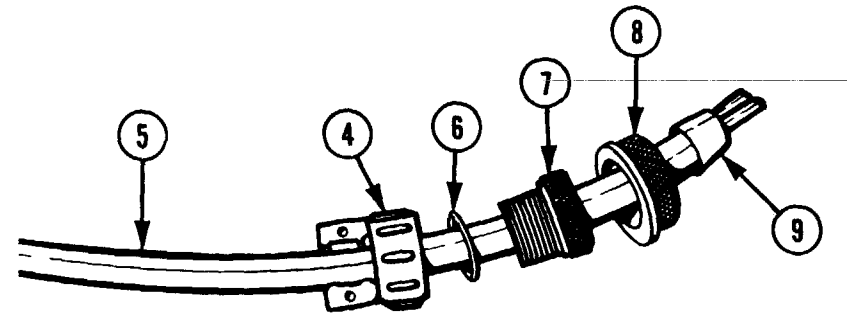


**NOTE**  
Tag wires at disassembly.

- 8 THREE WIRES (10). Unsolder from three pins (11).
- 9 CONNECTOR (12). Remove.



- 10 RUBBER BUSHING (9), CLAMPING NUT (8), KNURLED FITTING (7), WASHER (6), AND CABLE CLAMP (4). Remove from neoprene covered cable (5).

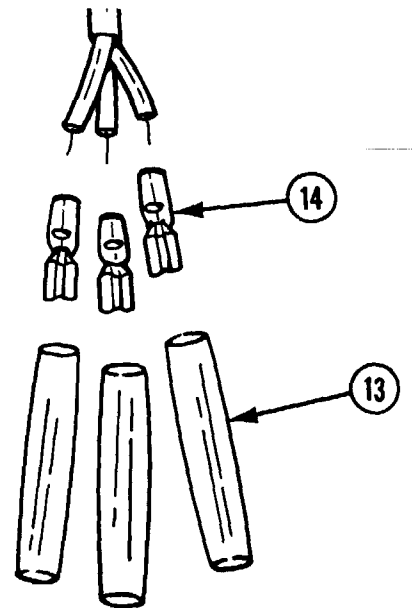


- 11 THREE SPLICE CONNECTORS (13). Remove.

**NOTE**

Remove female solderless connectors only if necessary for replacement.

- 12 THREE FEMALE SOLDERLESS CONNECTORS (14). Remove.

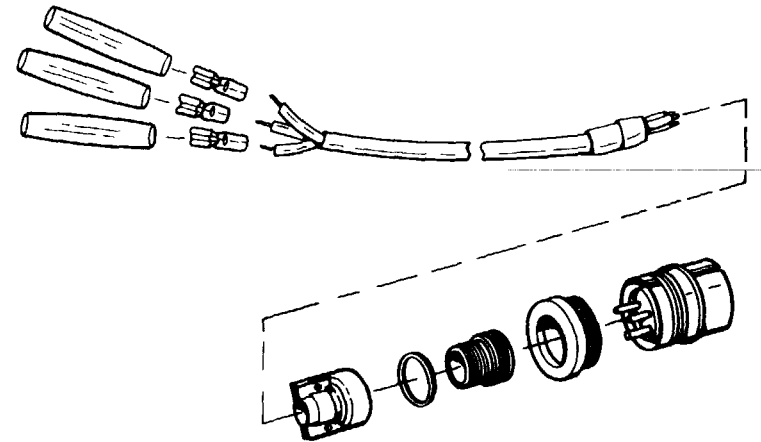


**6-14. TACHOMETER INDICATOR CABLE ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**INSPECTION/SERVICING**

TACHOMETER INDICATOR CABLE ASSEMBLY.

- a. Check for missing or damaged parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- c. Clean electrical contacts with abrasive cloth (item 4, app C).



**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

For replacement of neoprene covered cable, refer also to fig. 2, app D.

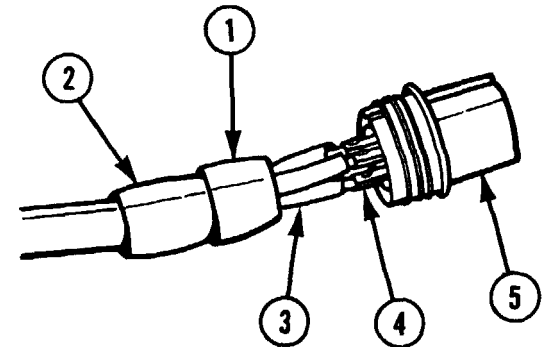
**REASSEMBLY**

- 1 RUBBER BUSHING (1). Slide onto neoprene covered cable (2).

**NOTE**

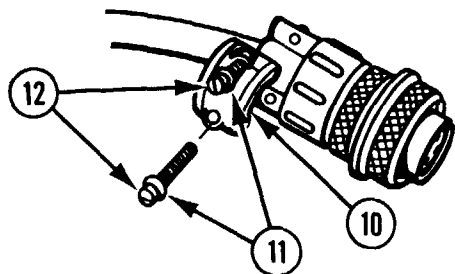
When wiring connector, follow information in table 6-2 for proper polarity.

- 2 THREE WIRES (3). Solder to three pins (4) on connector (5) using solder (item 18, app C).



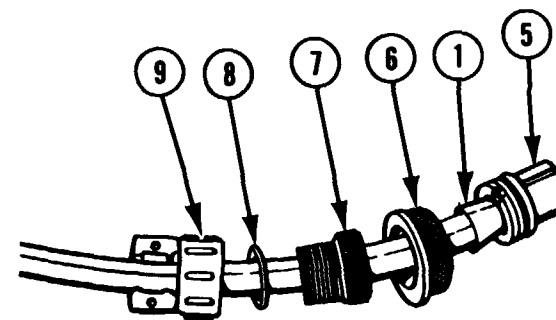
**Table 6-2. WIRING OF CONNECTOR CONTACTS**

Wire Color	Contact Designation
White	A
Black	B
Green	C

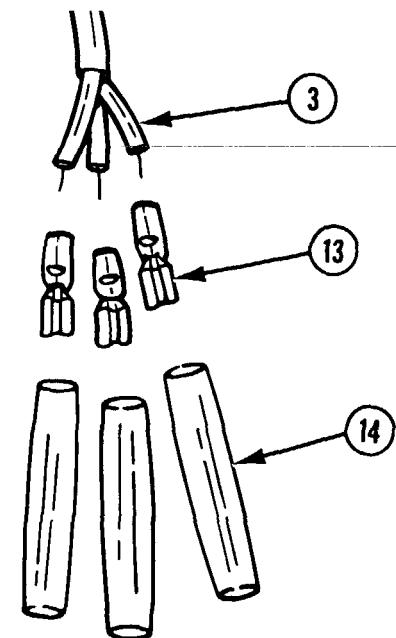


8 CABLE CLAMP HALF (10). Install and secure with two washers (11) and two screws (12).

- 3 RUBBER BUSHING (1). Push against connector (5).
- 4 CLAMPING NUT (6). Install.
- 5 KNURLED FITTING (7). Install on connector (5).
- 6 WASHER (8). Install.
- 7 CABLE CLAMP (9). Install on knurled fitting (7).



- 9 THREE FEMALE SOLDERLESS CONNECTORS (13). Crimp on three wires (3).
- 10 THREE SPLICE CONNECTORS (14). Install on three female solderless connectors (13).





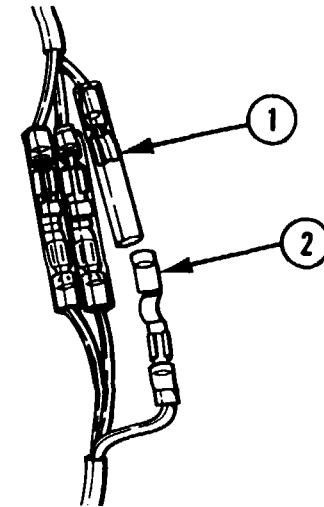
6-14. TACHOMETER INDICATOR CABLE ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

TEST

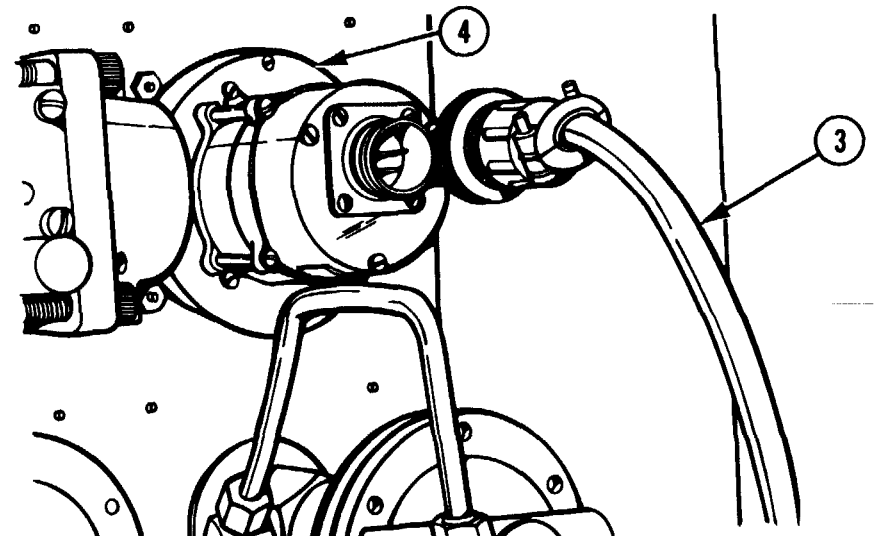
TACHOMETER INDICATOR CABLE ASSEMBLY. Perform continuity check with multimeter.

INSTALLATION

1 THREE FEMALE SOLDERLESS CONNECTORS (1). Install on three male solderless connectors (2).



2 TACHOMETER INDICATOR CABLE ASSEMBLY (3). Install on TACHOMETER (4).



**6-15. LUBE OIL REGULATOR - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)

Rag (item 14, app C)

**References**

TM 9-4910-387-24P

**Troubleshooting References**

6-77 LUBE OIL TEMPERATURE gage does not indicate

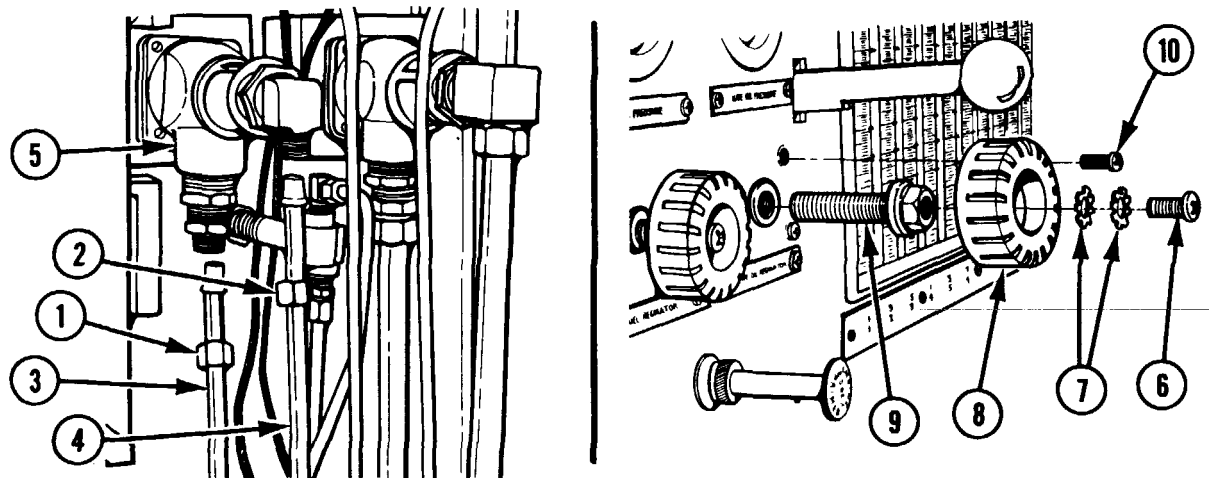
**Equipment Conditions**

Main power source to tester is turned off

4-34 LH upper side panel is removed

**REMOVAL/DISASSEMBLY**

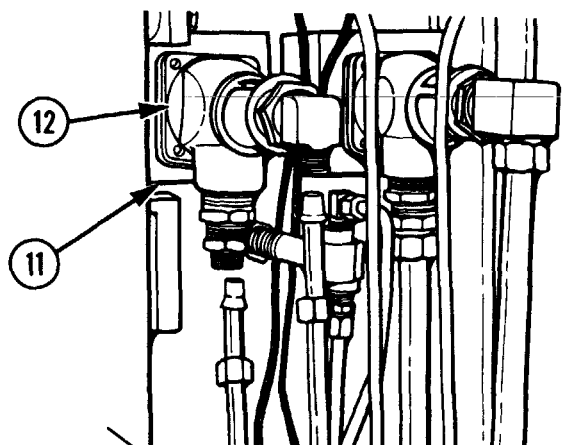
- 1 TWO NUTS (1 AND 2). Unscrew.
- 2 TWO COPPER TUBINGS (3 AND 4). Move carefully away from LUBE OIL REGULATOR (5).
- 3 SCREW (6), TWO LOCKWASHERS (7), AND HANDLE (8). Remove.
- 4 STEM (9). Remove.
- 5 FOUR SCREWS (10). Remove.



6-323

6-15. LUBE OIL REGULATOR-MAINTENANCE INSTRUCTIONS (cont)

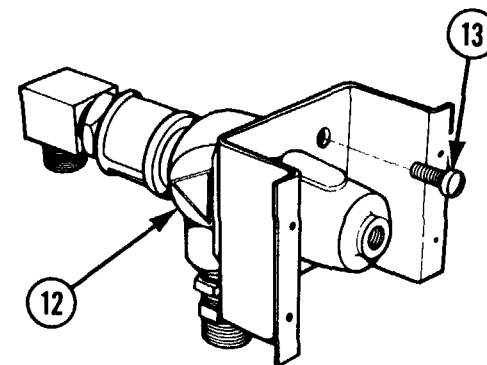
REMOVAL/DISASSEMBLY (cont)



6 BRACKET (11) AND REGULATOR (12). Remove.

7 FOUR SCREWS (13). Remove.

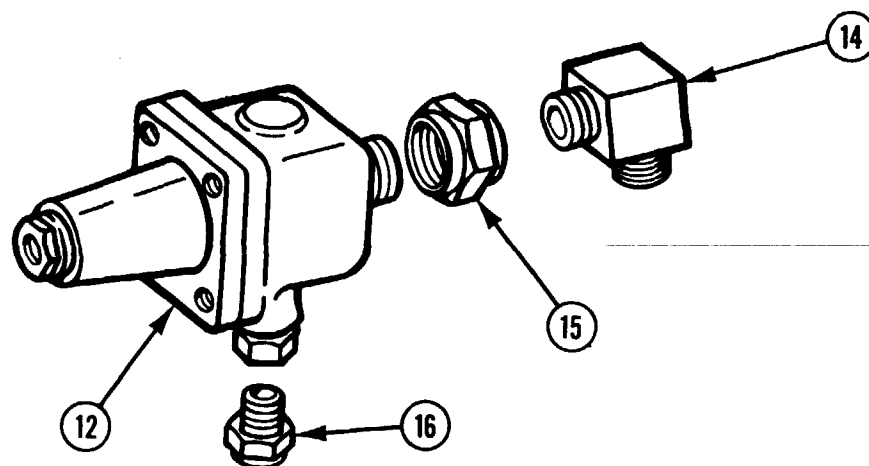
8 REGULATOR (12). Remove.



9 FEMALE ELBOW (14). Remove from regulator (12).

10 PIPE COUPLING (15). Remove.

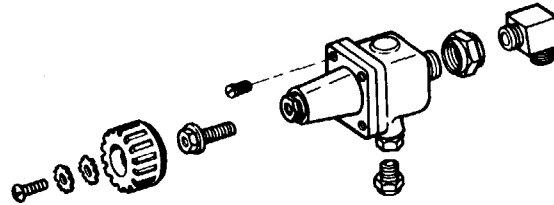
11 MALE CONNECTOR (16). Remove.



**INSPECTION/SERVICING**

**LUBE OIL REGULATOR.**

- a. Check for broken, cracked, or missing parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



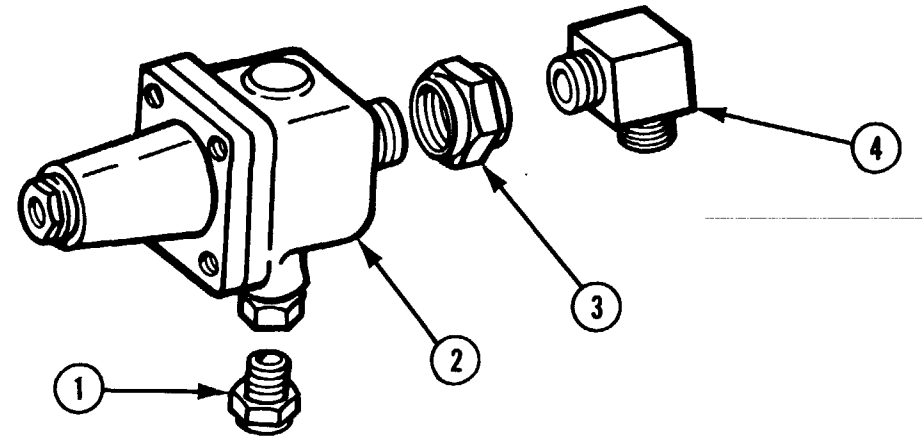
**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

**REASSEMBLY/INSTALLATION**

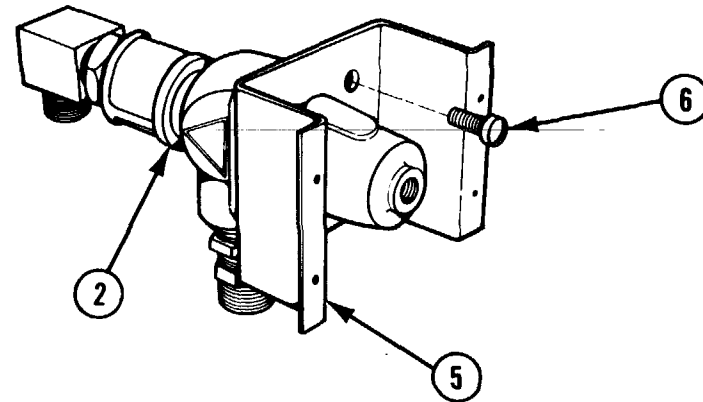
- 1 MALE CONNECTOR (1). Install on regulator (2).
- 2 PIPE COUPLING (3). Install.
- 3 FEMALE ELBOW (4). Install.



6-15. LUBE OIL REGULATOR-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

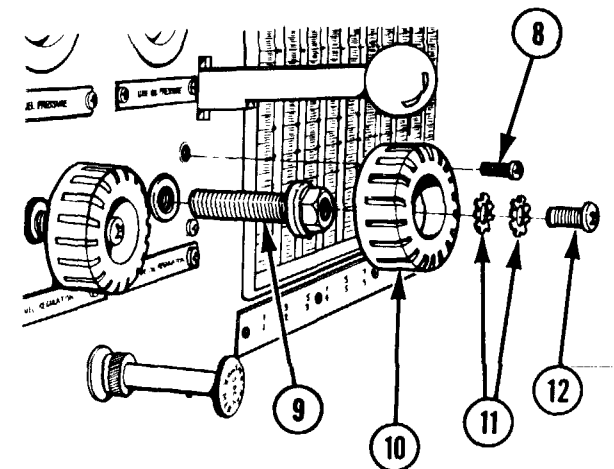
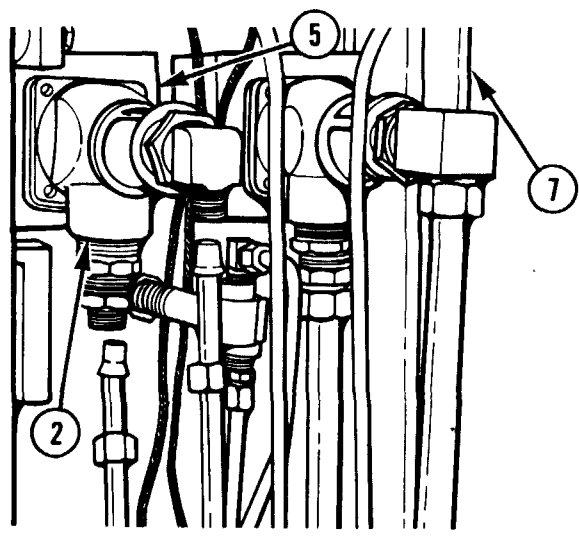
- 4 REGULATOR (2). Install on bracket (5) and secure with four screws (6).



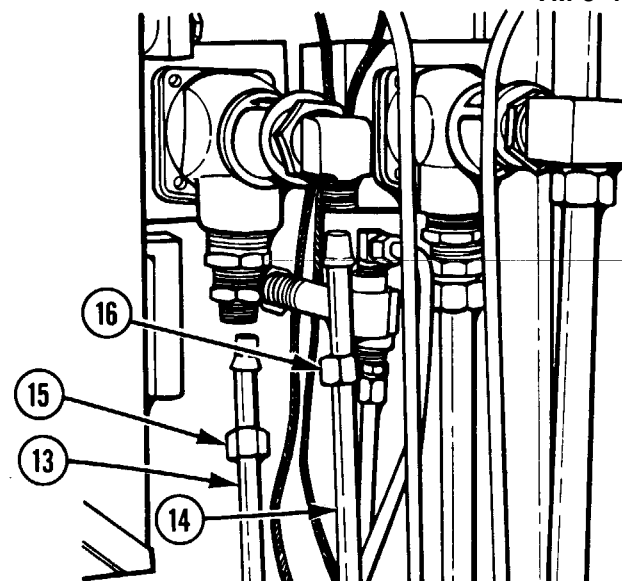
- 5 REGULATOR (2) AND BRACKET (5). Install on instrument panel assembly (7) and secure with four screws (8).

- 6 STEM (9). Install.

- 7 HANDLE (10), TWO LOCKWASHERS (11), AND SCREW (12). Install.



- 8 TWO COPPER TUBINGS (13 AND 14). Install.
- 9 TWO NUTS (15 AND 16). Tighten.



**6-16. FUEL REGULATOR - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation

**INITIAL SETUP**

**Tools and Special Tools**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Troubleshooting References**

6-71 FUEL TEMPERATURE gage does not indicate

**Materials/Parts**

Cleaning compound (item 3, app C)

Rag (item 14, app C)

**Equipment Conditions**

Main power source to tester is turned off

4-34 LH upper side panel is removed

**References**

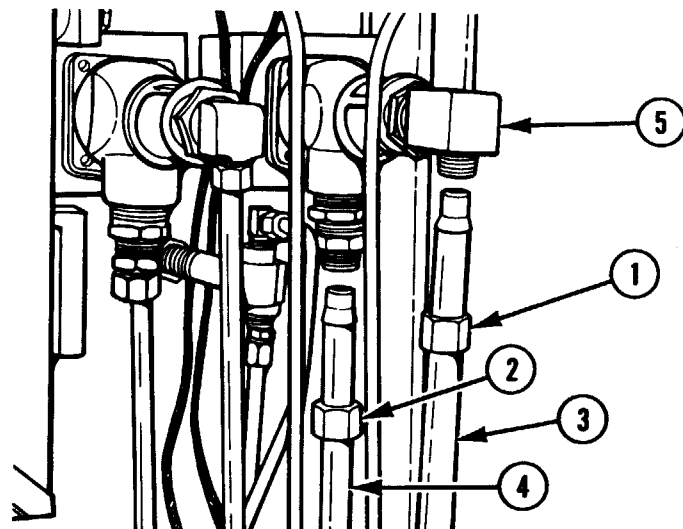
TM 9-4910-387-24P



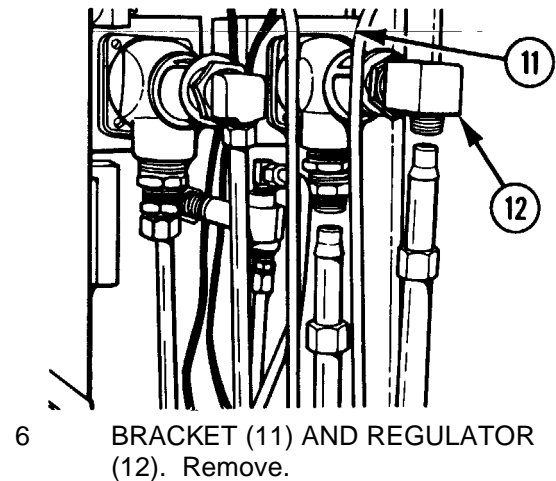
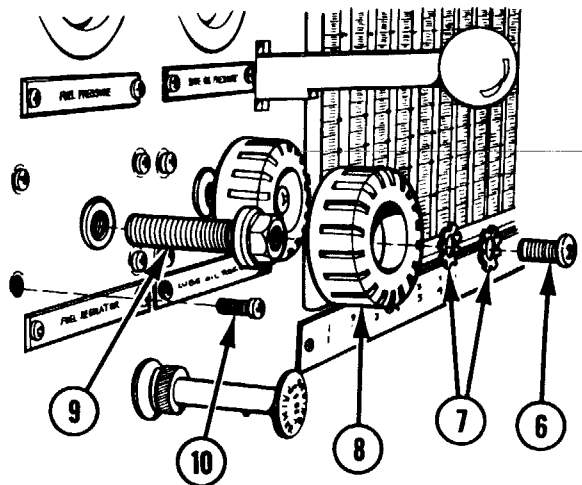
**6-16. FUEL REGULATOR-MAINTENANCE INSTRUCTIONS (cont)**

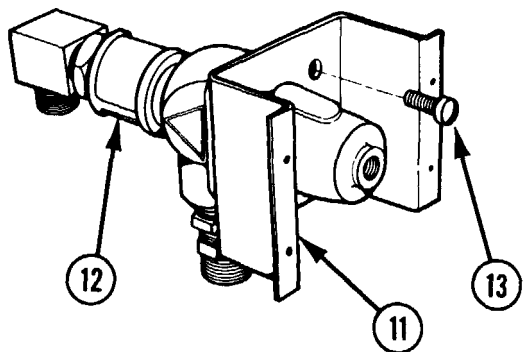
**REMOVAL/DISASSEMBLY**

- 1 TWO NUTS (1 AND 2). Unscrew.
- 2 TWO COPPER TUBINGS (3 AND 4). Move carefully away from FUEL REGULATOR (5).



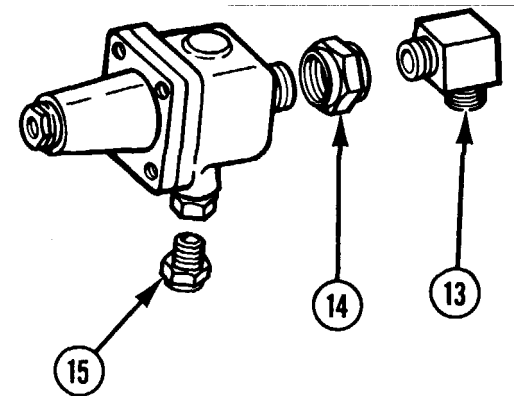
- 3 SCREW (6), TWO LOCKWASHERS (7), AND HANDLE (8). Remove.
- 4 STEM (9). Remove.
- 5 FOUR SCREWS (10). Remove.





- 7 FOUR SCREWS (13). Remove.
- 8 REGULATOR (12). Remove from bracket (11).

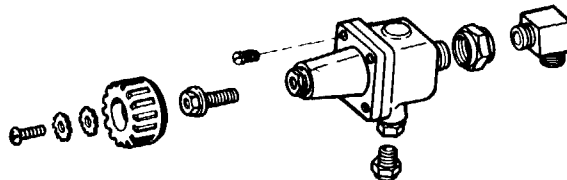
- 9 FEMALE ELBOW (13). Remove.
- 10 PIPE COUPLING (14). Remove.
- 11 MALE CONNECTOR (15). Remove.



## INSPECTION/SERVICING

### FUEL REGULATOR.

- a. Check for broken, cracked, or missing parts
- b. Check threads for damage
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



## REPAIR

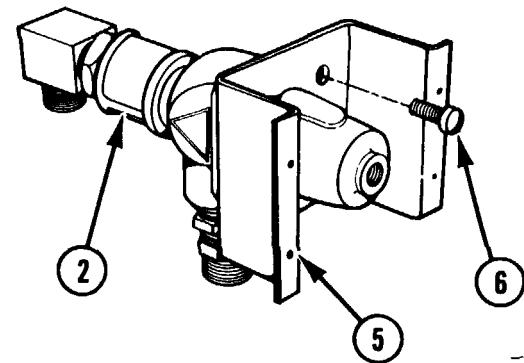
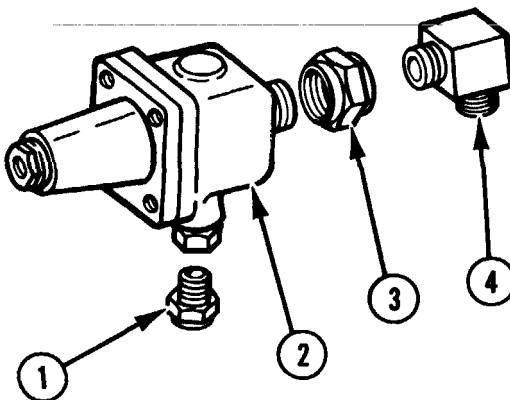
### NOTE

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

6-16. FUEL REGULATOR-MAINTENANCE INSTRUCTIONS (cont)

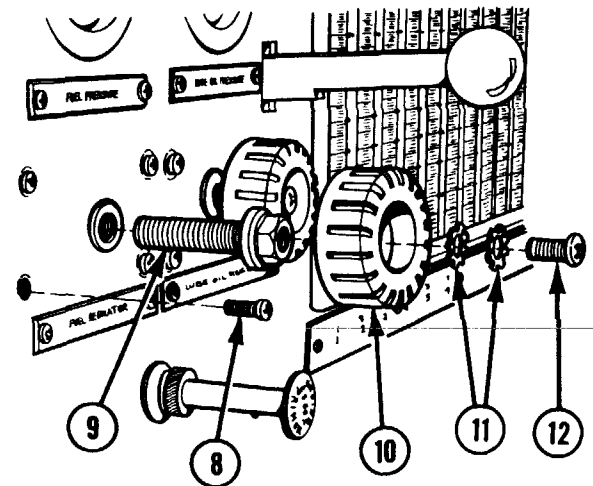
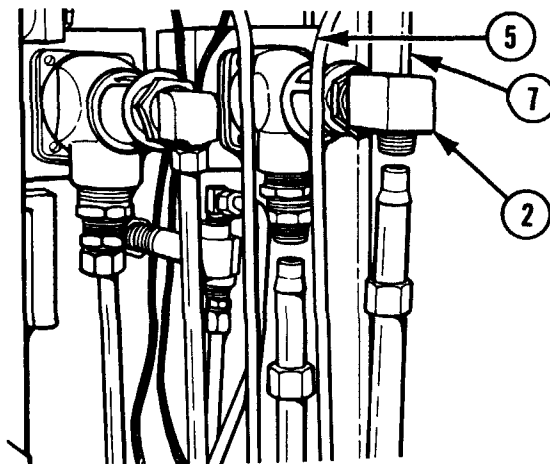
REASSEMBLY/INSTALLATION

- 1 MALE CONNECTOR (1). Install on regulator (2).
- 2 PIPE COUPLING (3). Install.
- 3 FEMALE ELBOW (4). Install.

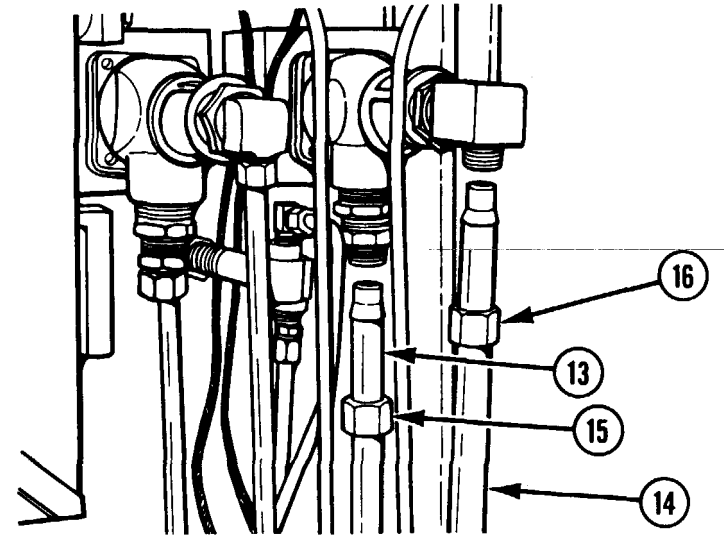


- 4 REGULATOR (2). Install on bracket (5) and secure with four screws (6).

- 5 REGULATOR (2) AND BRACKET (5). Install on instrument panel assembly (7) and secure with four screws (8).
- 6 STEM (9). Install.
- 7 HANDLE (10), TWO LOCKWASHERS (11), AND SCREW (12). Install.



- 8 TWO COPPER TUBINGS (13 AND 14). Install.
- 9 TWO NUTS (15 AND 16). Tighten.



**6-17. ENGINE PRIMER ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Troubleshooting References**

6-83 Engine primer assembly does not function

**Materials/Parts**

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

**Equipment Conditions**

Main power source to tester is turned off  
4-34 LH upper side panel is removed

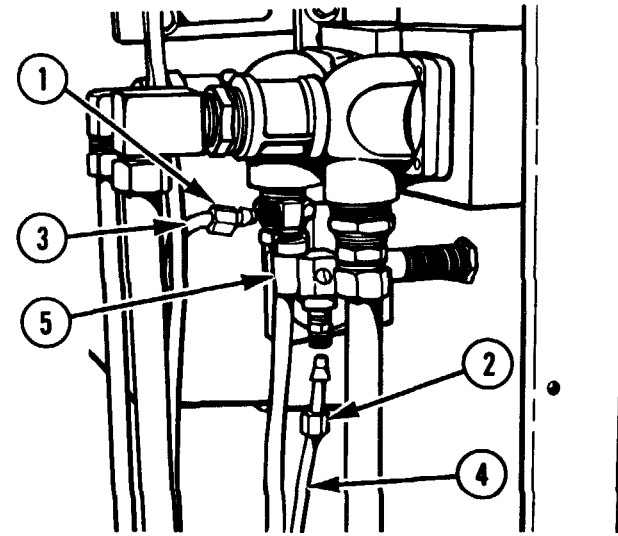
**References**

TM 9-4910-387-24P

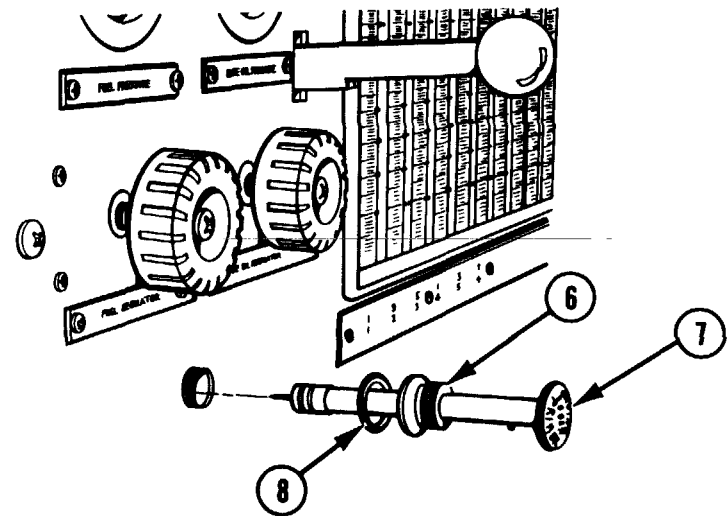
6-17. ENGINE PRIMER ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

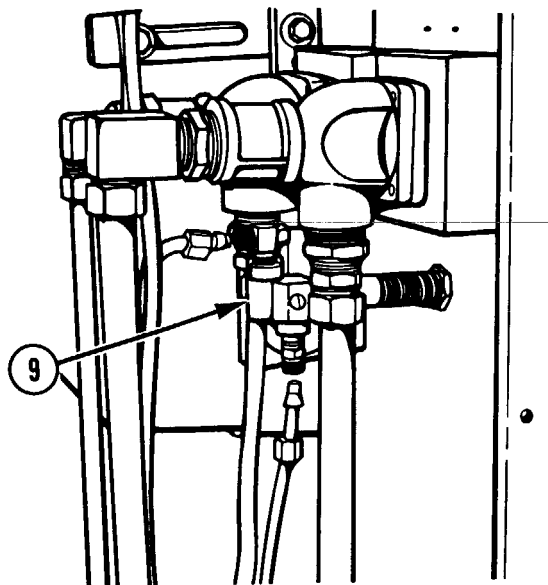
REMOVAL/DISASSEMBLY

- 1 TWO NUTS (1 AND 2). Loosen.
- 2 TWO COPPER TUBINGS (3 AND 4). Pull carefully away from engine primer assembly (5).



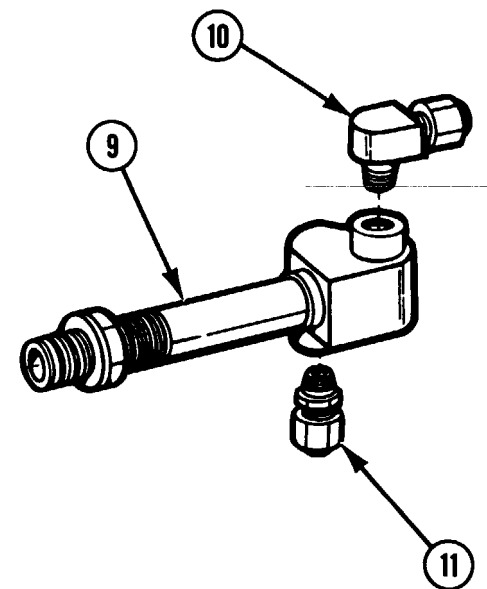
- 3 KNURLED FITTING (6). Unscrew.
- 4 HANDLE (7), KNURLED FITTING (6), AND WASHER (8). Remove.





5 ENGINE PRIMER (9). Remove.

- 6 MALE ELBOW (10). Remove from engine primer (9).
- 7 MALE CONNECTOR (11). Remove.



**INSPECTION/SERVICING**

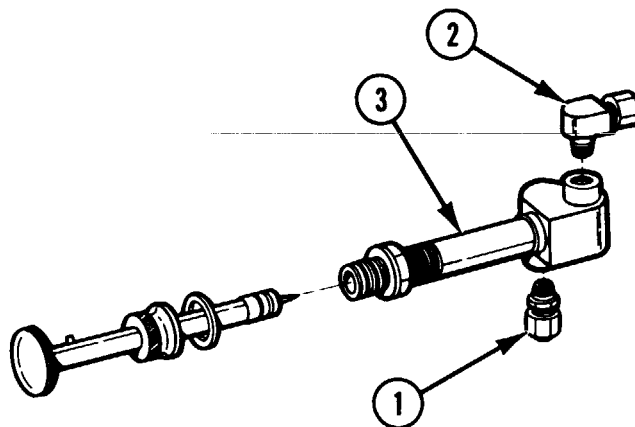
MALE CONNECTOR (1), MALE ELBOW (2), AND ENGINE PRIMER (3).

- a. Check for broken, cracked, or missing parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

**REPAIR**

**NOTE**

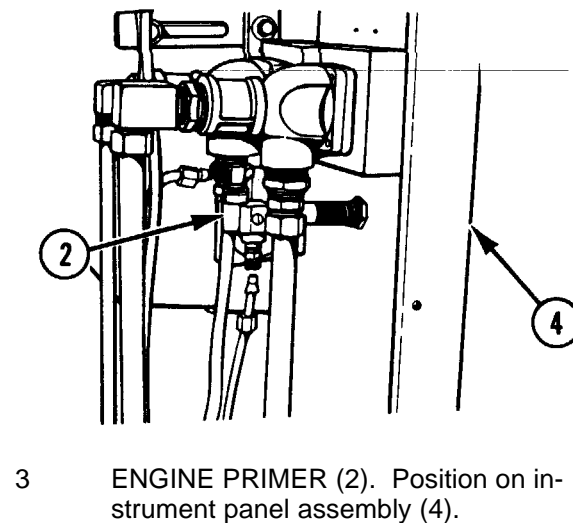
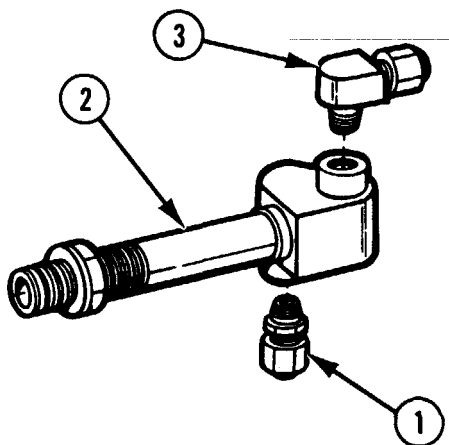
Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.



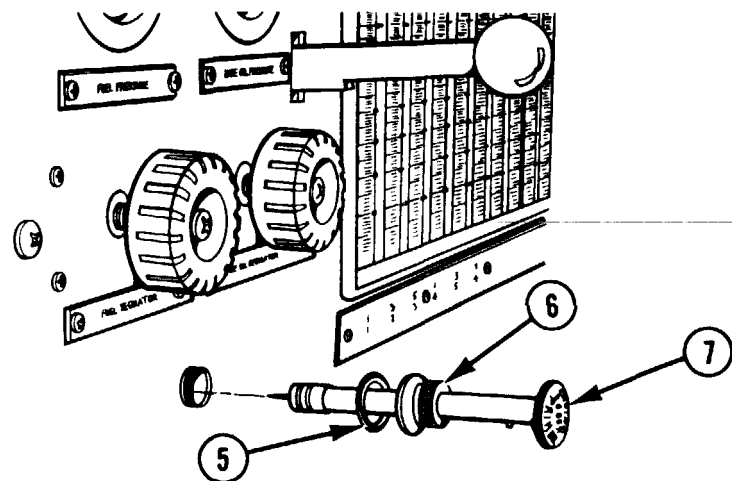
6-17. ENGINE PRIMER ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION

- 1 MALE CONNECTOR (1). Install on engine primer (2).
- 2 MALE ELBOW (3). Install.

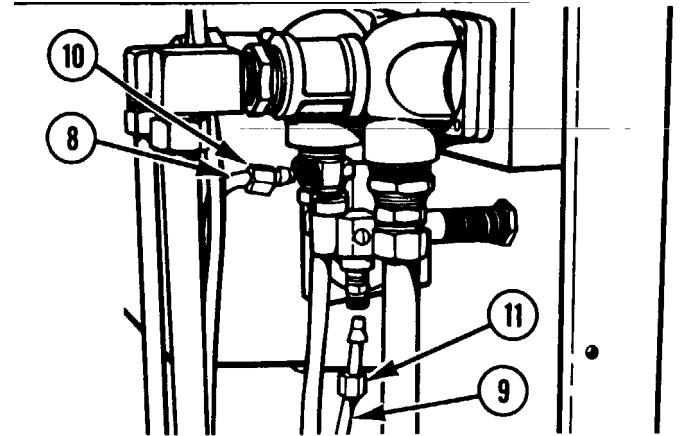


- 4 WASHER (5), KNURLED FITTING (6), AND HANDLE (7).
  - a. Install.
  - b. Tighten knurled fitting (6).





- 5 TWO COPPER TUBINGS (8 AND 9). Install.
- 6 TWO NUTS (10 AND 11). Tighten.



**6-18. GRADUATE RACK ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |                         |                 |
|-------------------------|-----------------|
| a. Removal              | e. Reassembly   |
| b. Disassembly          | f. Installation |
| c. Inspection/servicing | g. Test         |
| d. Repair               |                 |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

- Abrasive cloth (item 4, app C)
- Cleaning compound (item 3, app C)
- Grease (item 7, app C)
- Rag (item 14, app C)

**References**

- 2-26 Hookup of fuel injector pump
- TM 94910-387-24P

**Troubleshooting References**

- 6-145 Burettes will not empty
- 6-144 Burettes will not fill up
- 6-95 Counting circuit does not function

**Equipment Conditions**

- Main power source to tester is turned off
- 4-32 Upper back panel is removed

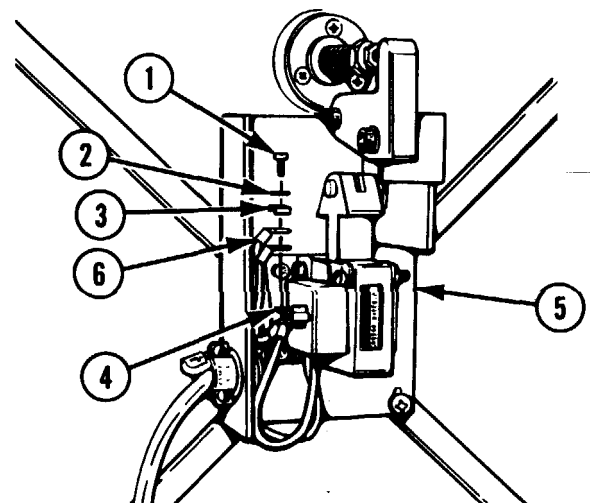
6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL

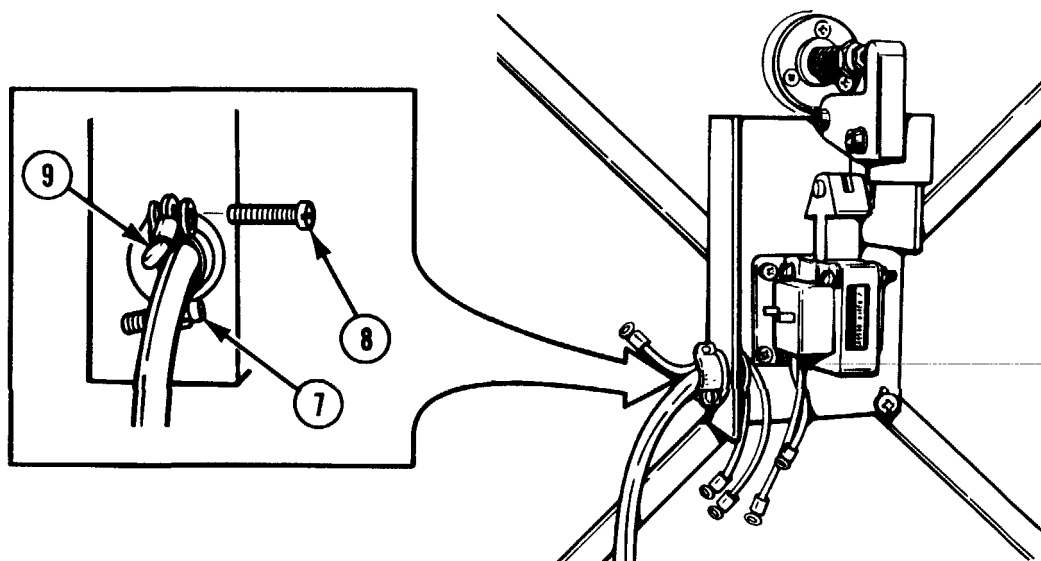
- 1 TWO SCREWS (1), TWO LOCKWASHERS (2), AND TWO CLIPS (3). Remove from two terminals (4) of solenoid assembly (5).

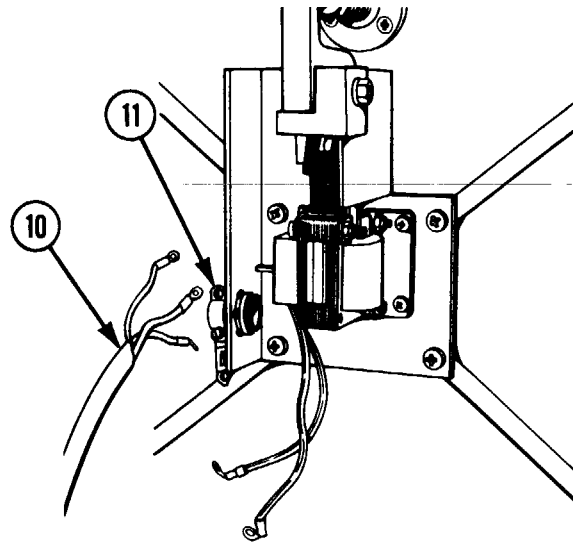
**NOTE**  
Tag all wires at removal.

- 2 FOUR WIRES (6) WITH ONE TERMINAL LUG EACH. Disconnect.



- 3 SCREW (7). Loosen.
- 4 SCREW (8). Remove.
- 5 GREEN WIRE (9) WITH TERMINAL LUG. Disconnect.

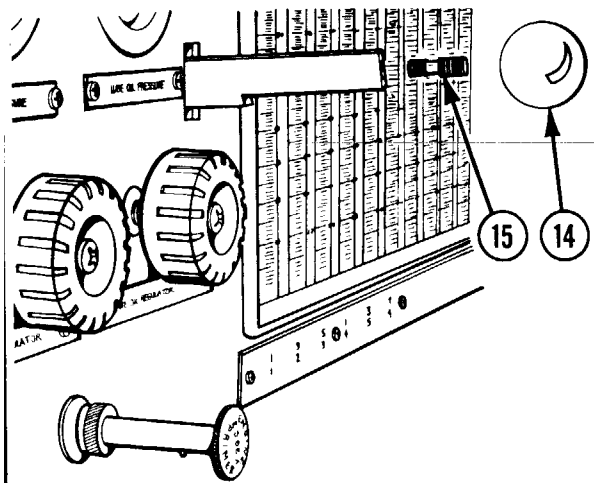
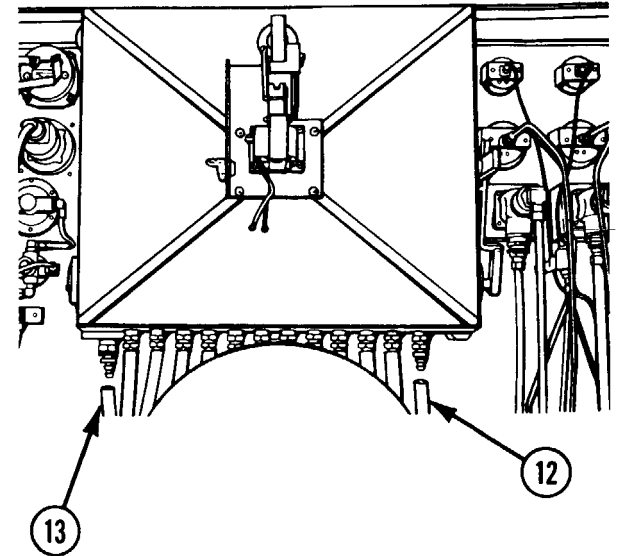




6 WIRE CABLE (10). Pull through straight box connector (11).

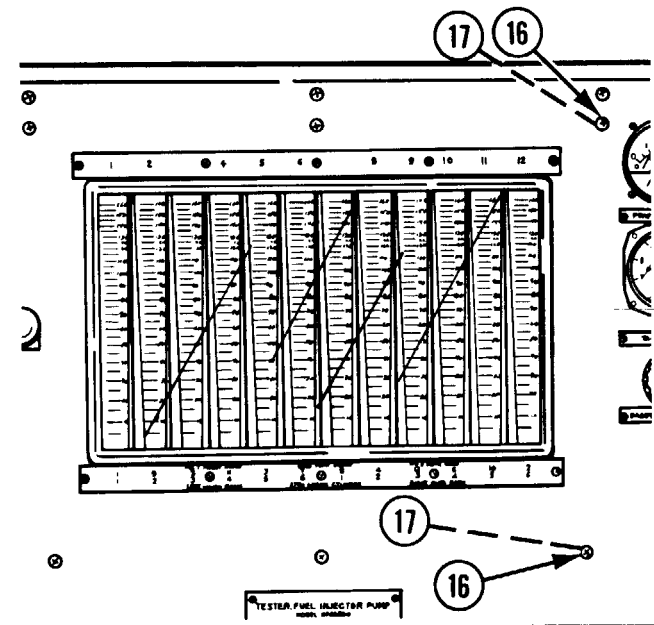
**NOTE**  
Tag all hoses at removal.

7 TWELVE HOSES (12) AND HOSE (13). Disconnect.



8 BALL KNOB (14) AND BALL KNOB STUD (15). Remove.

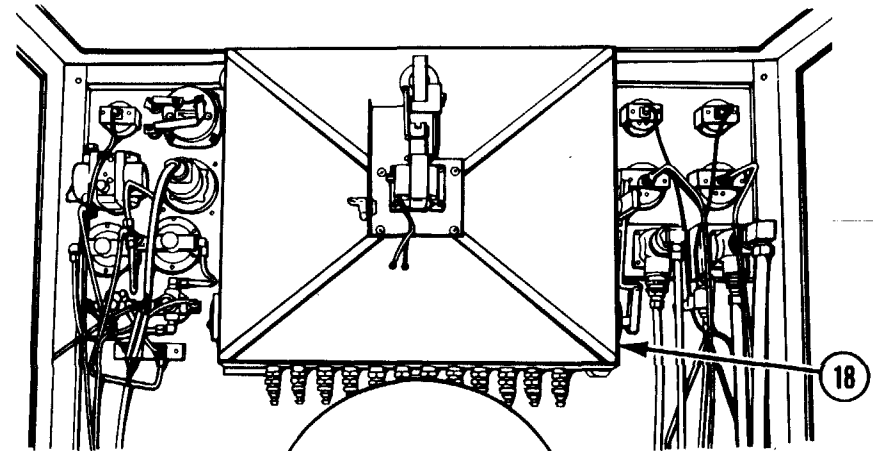
9 SIX SCREWS (16) AND SIX LOCK-WASHERS (17). Remove.



16-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

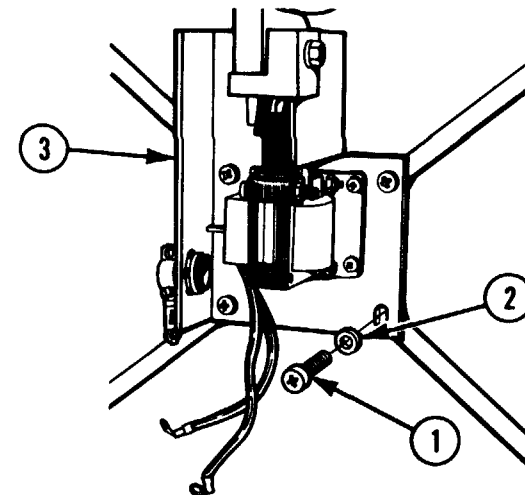
REMOVAL (cont)

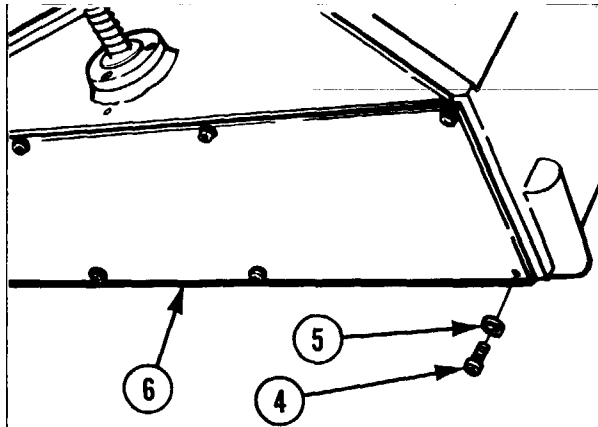
- 10 GRADUATE RACK ASSEMBLY (18). Remove.



DISASSEMBLY

- 1 FOUR MACHINE SCREWS (1) AND FOUR LOCKWASHERS (2). Remove.
- 2 SOLENOID ASSEMBLY (3). Remove.



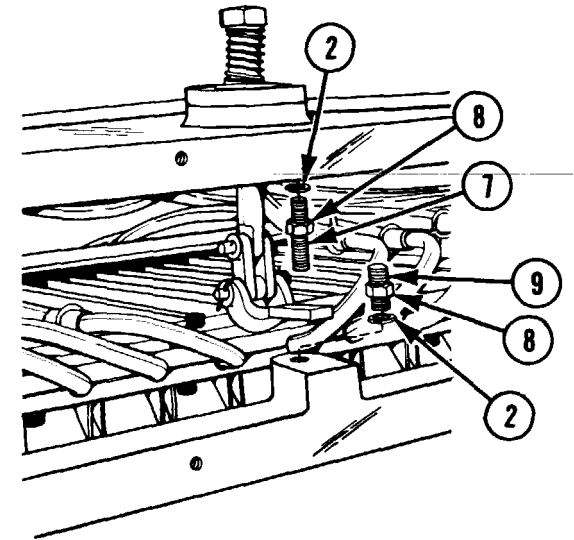


3 EIGHT MACHINE SCREWS (4) AND EIGHT LOCKWASHERS (5). Remove.

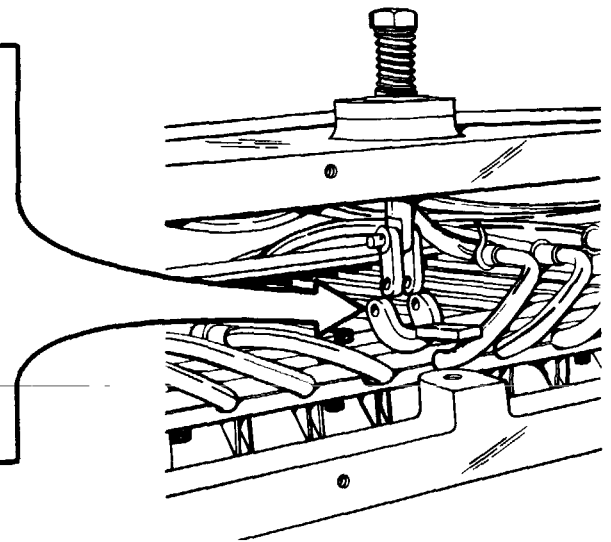
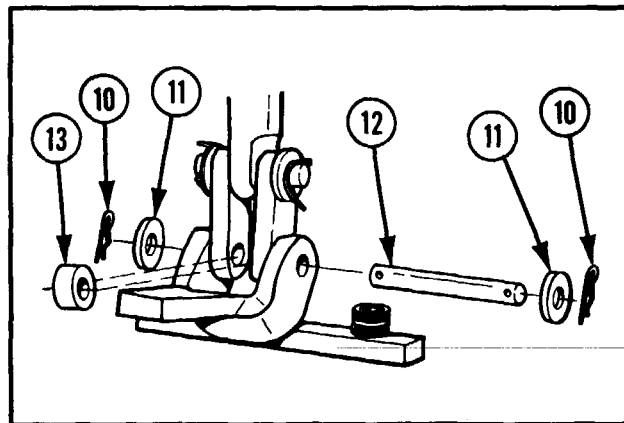
4 COVER PLATE (6). Remove.

5 SETSCREW (7), NUT (8), AND LOCKWASHER (2). Remove.

6 SETSCREW (9), NUT (8), AND LOCKWASHER (2). Remove.



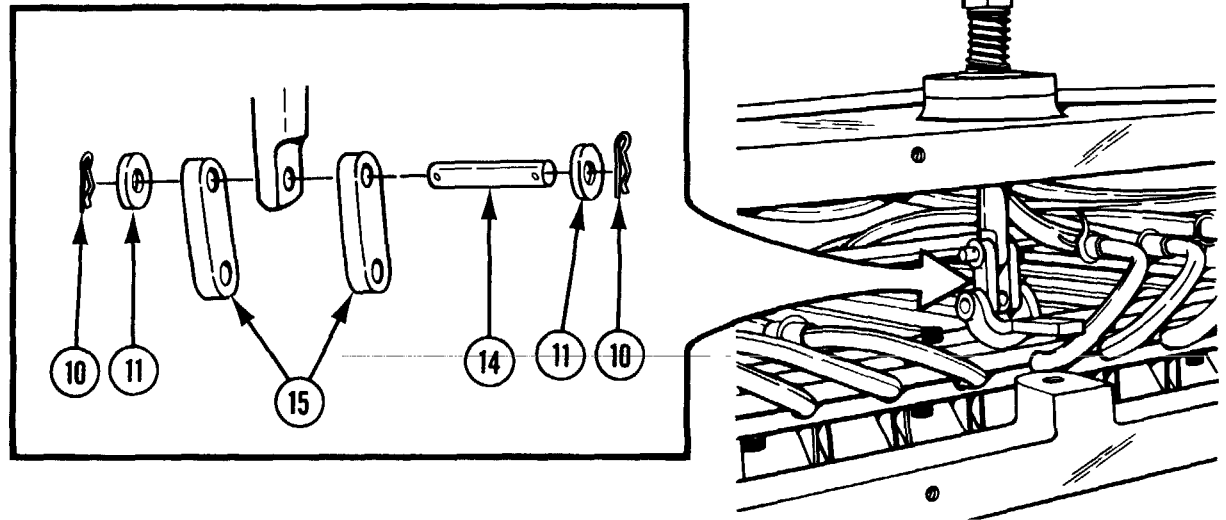
7 TWO COTTER PINS (10), TWO FLAT WASHERS (11), PIN (12), AND SPACER (13). Remove.



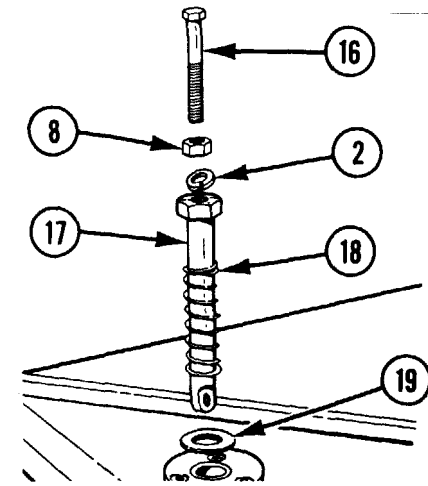
6 -18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

- 8 TWO COTTER PINS (10), TWO FLAT WASHERS (11), LINK PIN (14), AND TWO PUSH ROD LINKS (15). Remove.



- 9 CAPSCREW (16), NUT (8), LOCKWASHER (2), GRADUATE PUSH ROD (17), GRADUATE SPRING (18), AND FLAT WASHER (19). Remove.



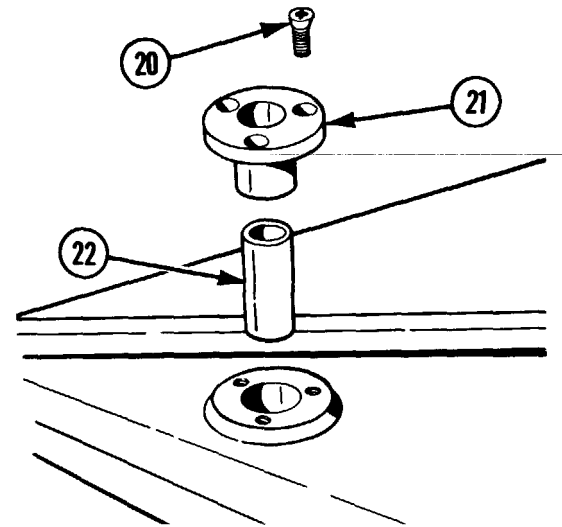
10 THREE MACHINE SCREWS (20). Remove.

11 BUSHING (21). Remove.

**CAUTION**

**Do not remove bearing unless replacement is necessary as removal will damage the bearing.**

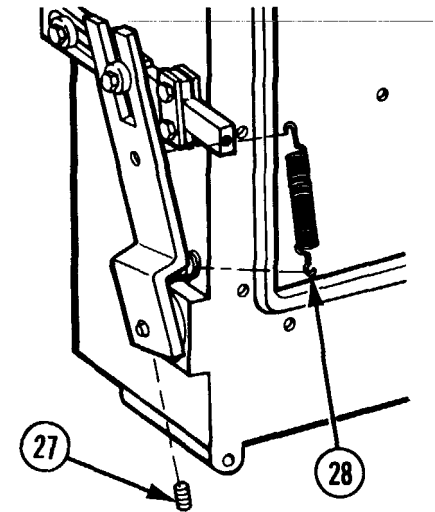
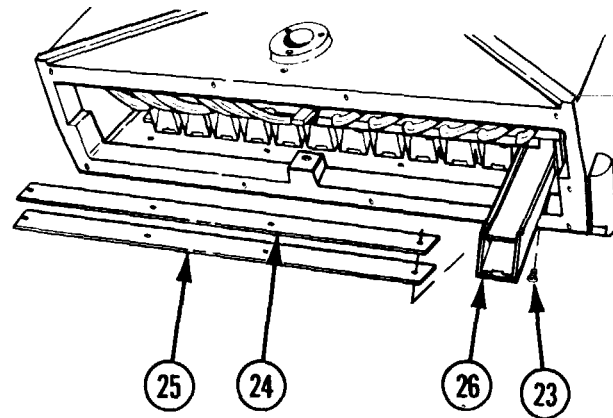
12 BEARING (22). Remove.



13 FOUR MACHINE SCREWS (23).  
Remove.

14 HOLDING STRIP (24) AND GASKET  
CUSHION (25). Remove.

15 TWELVE BURETTES (26). Remove.



16 SETSCREW (27). Remove.

17 SPRING (28). Remove.

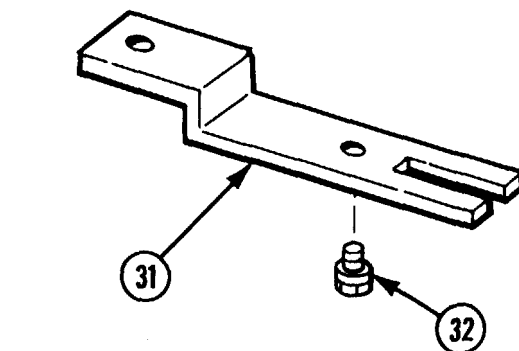
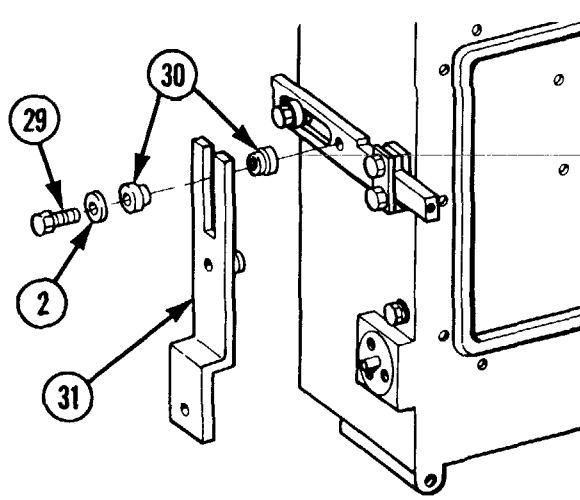


6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

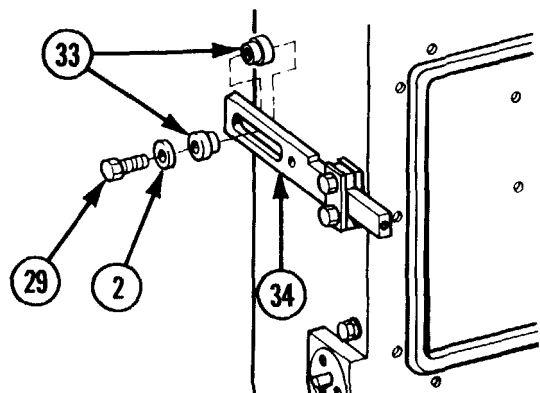
DISASSEMBLY (cont)

18 SCREW (29), WASHER (2), AND TWO SLIDE SPACERS (30). Remove.

19 LEVER WELDMENT (31). Remove.



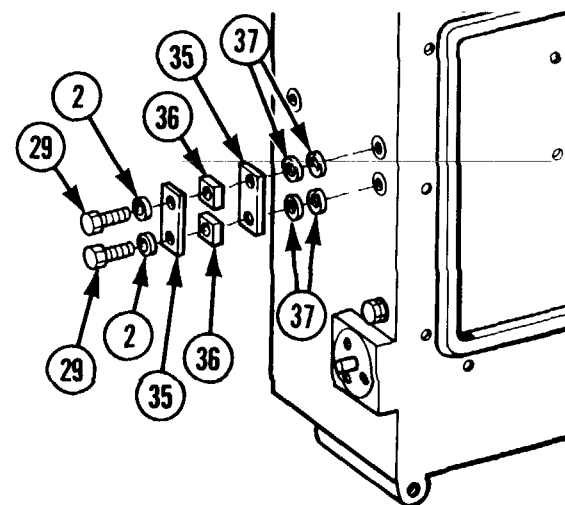
20 SPRING STUD (32). Remove from lever weldment (31).



21 SCREW (29), WASHER (2), AND TWO SPACERS (33). Remove.

22 DUMPING LEVER (34). Remove.

23 TWO SCREWS (29), TWO WASHERS (2), BAR (35), TWO BAR SLIDE BLOCKS (36), BAR (35), AND FOUR WASHERS (37). Remove.



**NOTE**

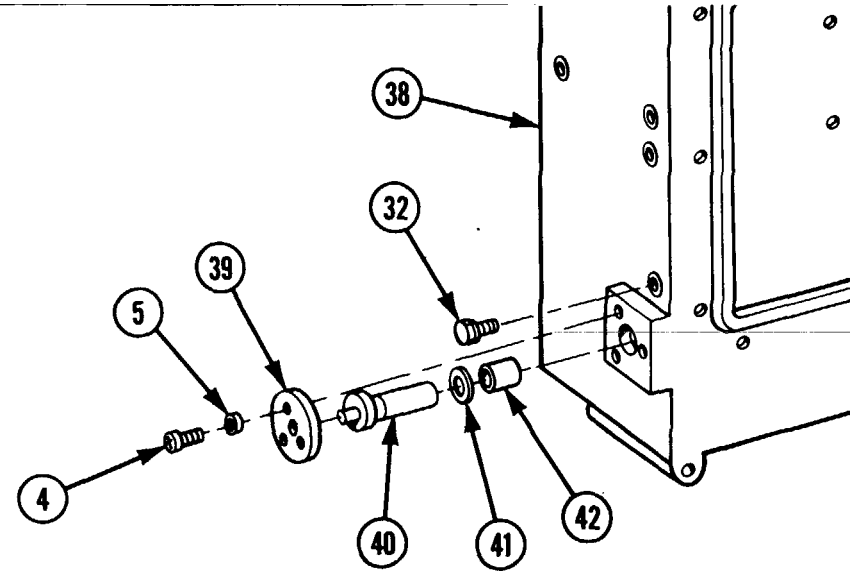
Do not perform steps 24 thru 29 unless replacement of indicated parts is necessary as alignment at reassembly is difficult.

- 24 SPRING STUD (32). Remove from graduate housing casting (38).
- 25 THREE MACHINE SCREWS (4), THREE LOCKWASHERS (5), RETAINER (39), DUMPING SHAFT BEARING (40), AND PREFORMED PACKING (41). Remove.

**CAUTION**

Do not remove bearing from graduate housing casting unless replacement is necessary as removal will damage bearing.

- 26 BEARING (42). Remove.

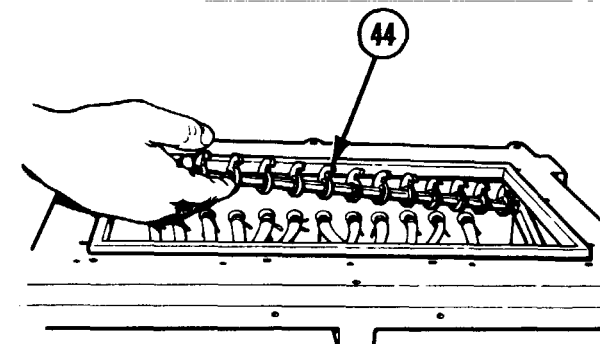
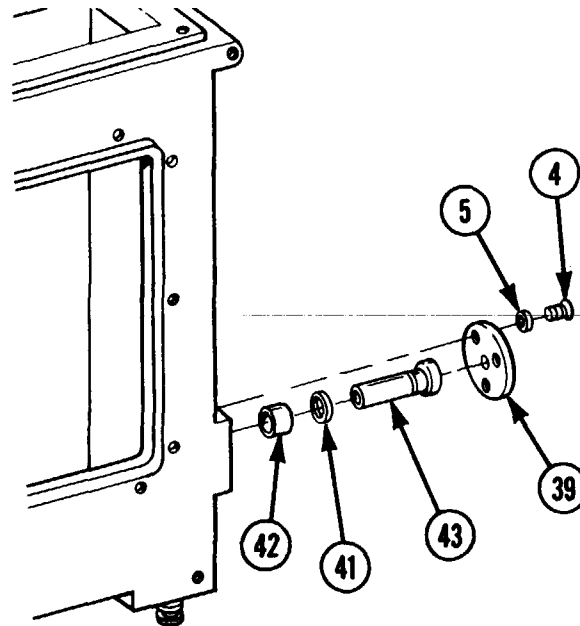


- 27 THREE MACHINE SCREWS (4), THREE LOCKWASHERS (5), RETAINER (39), DUMPING SHAFT BEARING (43), AND PREFORMED PACKING (41). Remove.

**CAUTION**

Do not remove bearing from graduate housing casting unless replacement is necessary as removal will damage bearing.

- 28 BEARING (42). Remove.

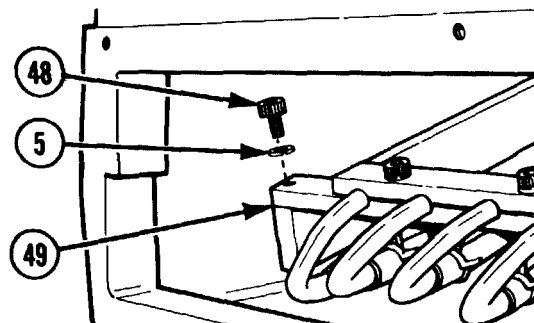
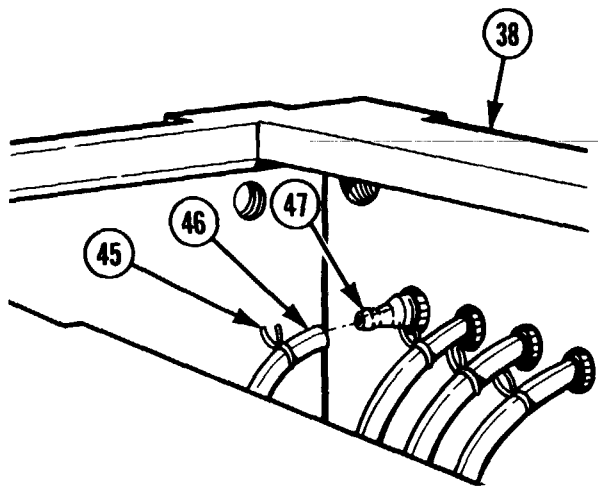


- 29 DUMPING SHAFT ASSEMBLY (44). Remove.

6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

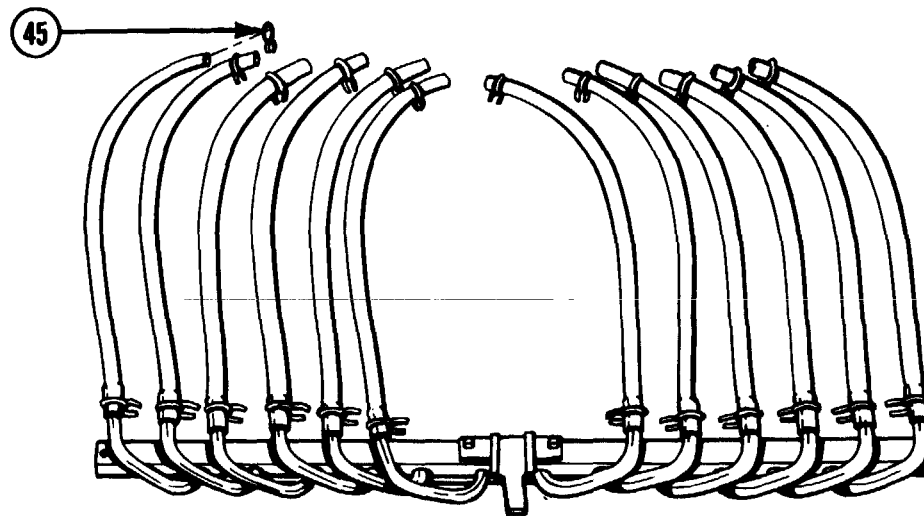
DISASSEMBLY (cont)

- 30 TWELVE HOSE CLAMPS (45). Move approximately 1 in. (2.54 cm) away from bottom of graduate housing casting (38).
- 31 TWELVE NEOPRENE TUBINGS (46). Disconnect from twelve socketless fittings (47).

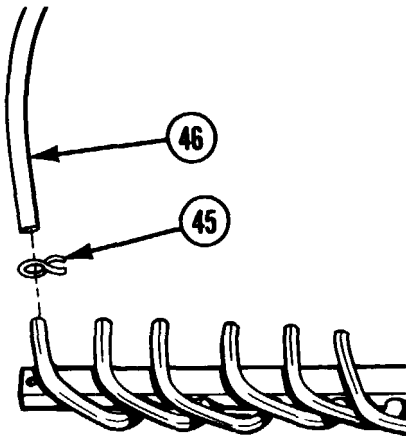
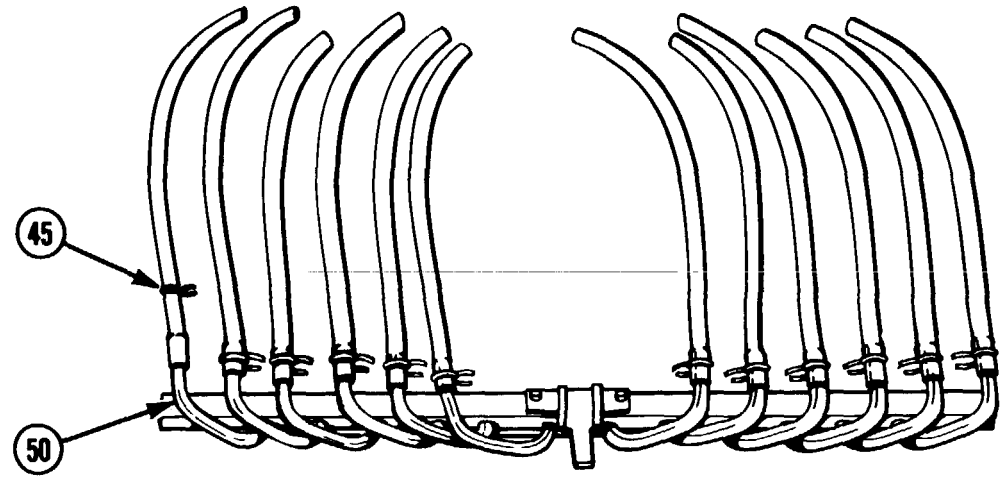


- 32 TWO SCREWS (48) AND TWO LOCKWASHERS (5). Remove.
- 33 TUBE CLAMP BAR (49) WITH ATTACHED PARTS. Remove.

- 34 TWELVE HOSE CLAMPS (45). Remove.

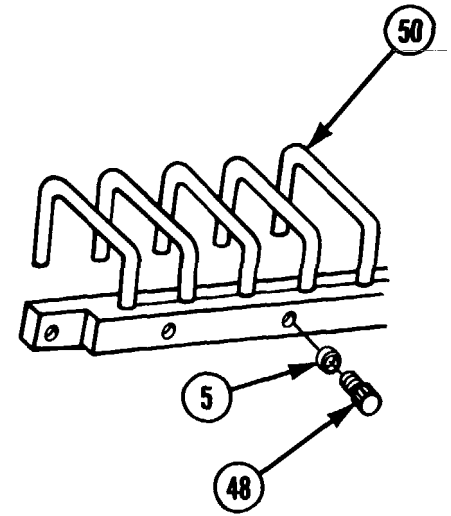


- 35 TWELVE HOSE CLAMPS (45). Move away from twelve graduate discharge tubes (50).



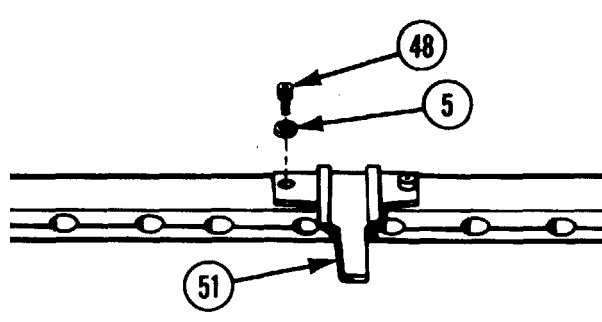
- 36 TWELVE NEOPRENE TUBINGS (46). Remove.
- 37 TWELVE HOSE CLAMPS (45). Remove.

- 38 SIX SCREWS (48) AND SIX LOCKWASHERS (5). Remove.
- 39 TWELVE GRADUATE DISCHARGE TUBES (50). Remove.



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)



40 TWO SCREWS (48) AND TWO LOCKWASHERS (5). Remove.

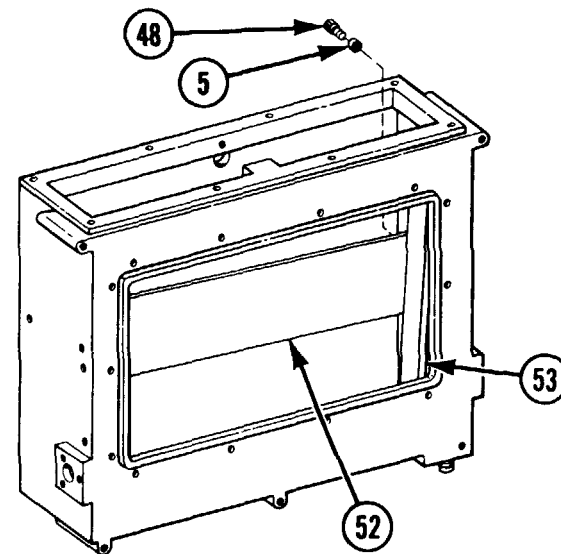
41 BRACKET (51). Remove.

**NOTE**  
Steps 42 and 43 can not be performed if disassembly steps 24 thru 29 were omitted.

Tube clamp support stiffener and two tube clamp supports must be disassembled before removal.

42 SIX SCREWS (48) AND SIX LOCKWASHERS (5). Remove.

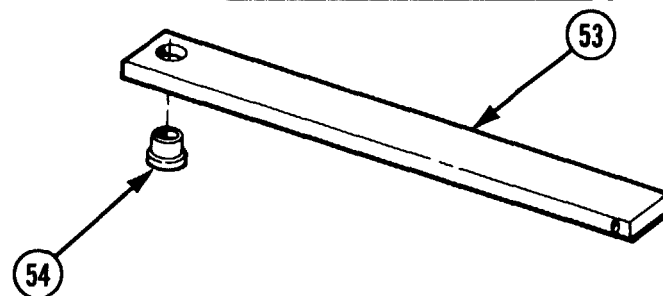
43 TUBE CLAMP SUPPORT STIFFENER (52) AND TWO TUBE CLAMP SUPPORTS (53). Remove.



**CAUTION**

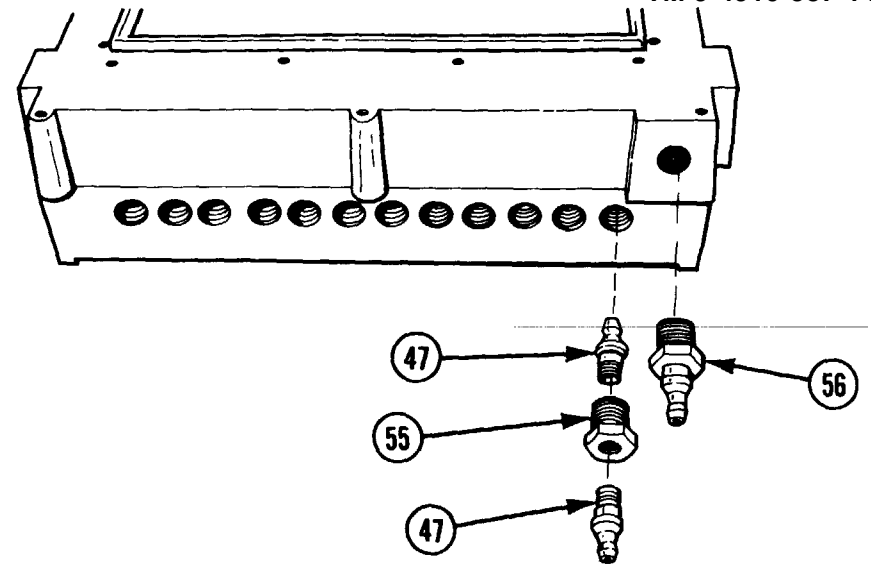
Do not remove bearings unless replacement is necessary as removal will damage the bearings.

44 TWO BEARINGS (54). Remove from two tube clamp supports (53).



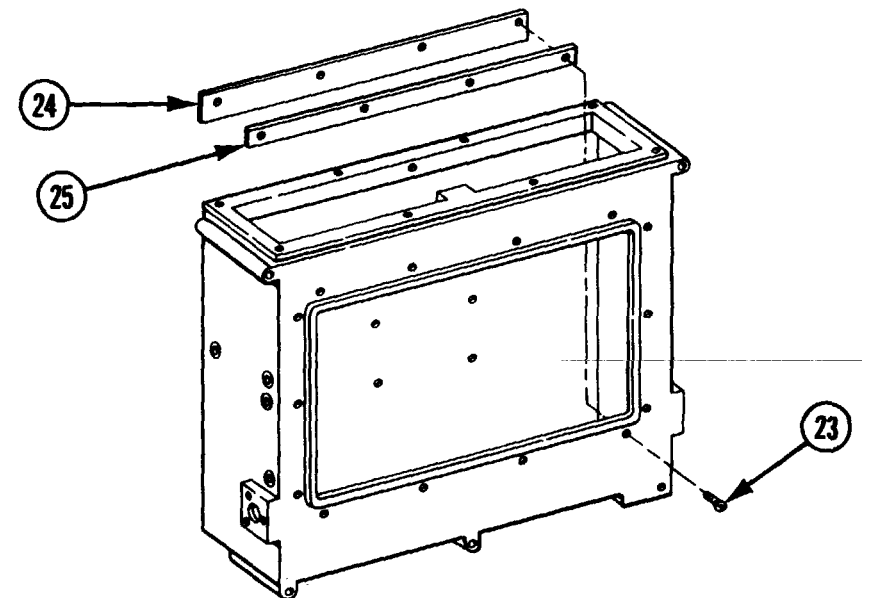
45 TWELVE SOCKETLESS FITTINGS (47), TWELVE FEMALE PIPE CONNECTORS (55), AND TWELVE SOCKETLESS FITTINGS (47). Remove.

46 SOCKETLESS FITTING (56). Remove.



47 FOUR MACHINE SCREWS (23). Remove.

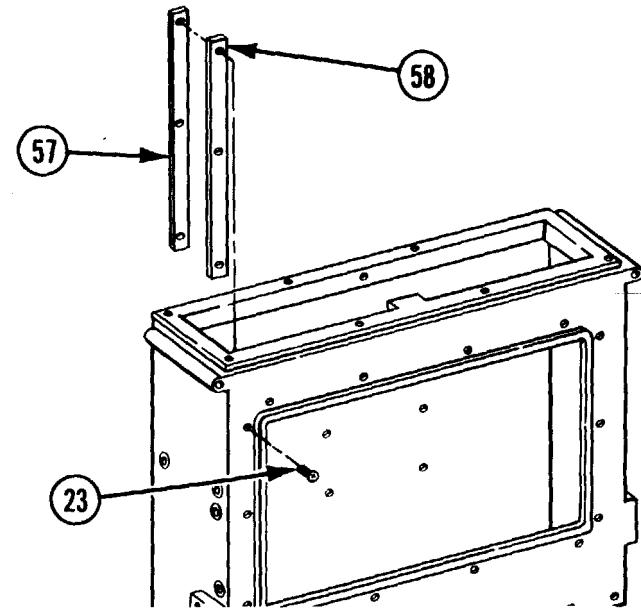
48 HOLDING STRIP (24) AND GASKET CUSHION (25). Remove.



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

- 49 SIX MACHINE SCREWS (23). Remove.
- 50 TWO GRADUATE SIDE CLAMPS (57) AND TWO GASKET CUSHIONS (58). Remove.



INSPECTION/SERVICING

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1 GRADUATE RACK ASSEMBLY.                     <ul style="list-style-type: none"> <li>a. Check for broken, cracked, worn, or missing parts.</li> <li>b. Check threads for damage.</li> <li>c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>2 ELECTRICAL PARTS. Clean with abrasive cloth (item 4, app C).</li> <li>3 ALL BEARINGS                     <ul style="list-style-type: none"> <li>a. Check for binding or loose condition.</li> <li>b. Lubricate with grease (item 7, app C).</li> </ul> </li> </ul> |
|---|---|

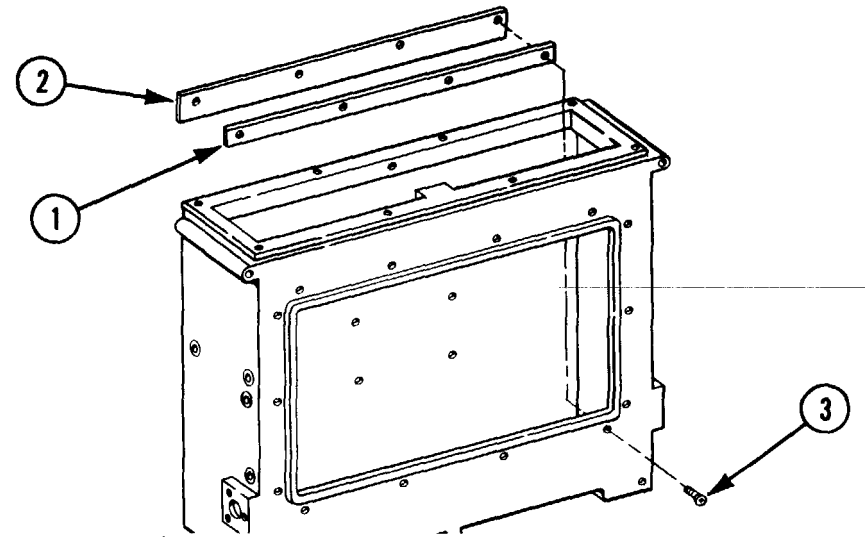
REPAIR

**NOTE**  
 Repair is by replacement of authorized parts (TM 94910-387-24P) as required.

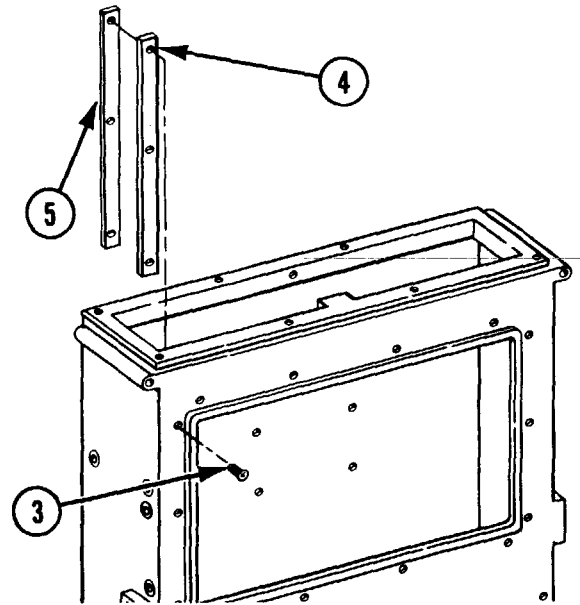


REASSEMBLY

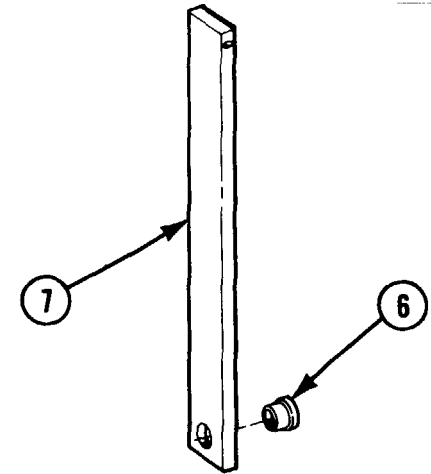
- 1 GASKET CUSHION (1) AND HOLDING STRIP (2). Install on bottom and secure with four machine screws (3).



- 2 TWO GASKET CUSHIONS (4) AND TWO GRADUATE SIDE CLAMPS (5). Install and secure with six machine screws (3).



- 3 TWO BEARINGS (6). Install in two tube clamp supports (7).



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (14)

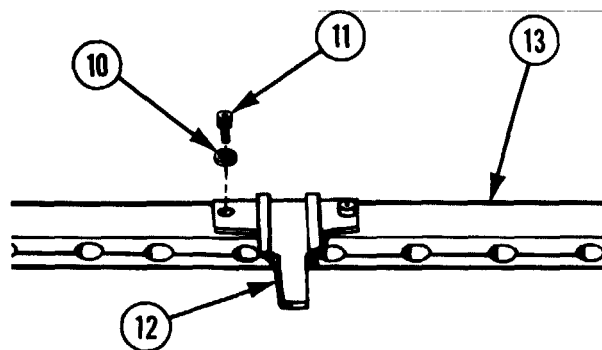
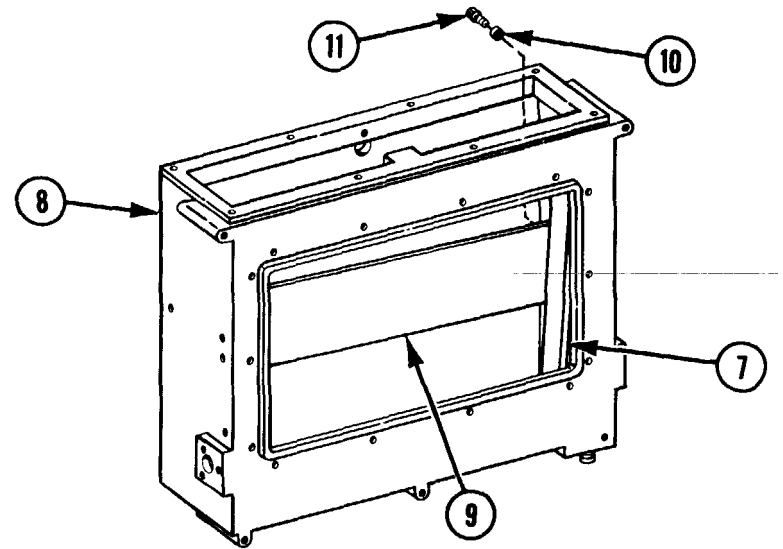
REASSEMBLY (cont)

- 4 TWO TUBE CLAMP SUPPORTS (7). Install in graduate housing casting (8).

**NOTE**

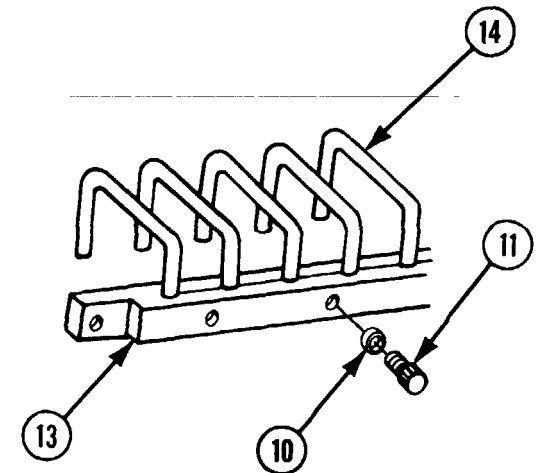
**Tube clamp support stiffener must be installed on tube clamp supports while inside graduate housing casting.**

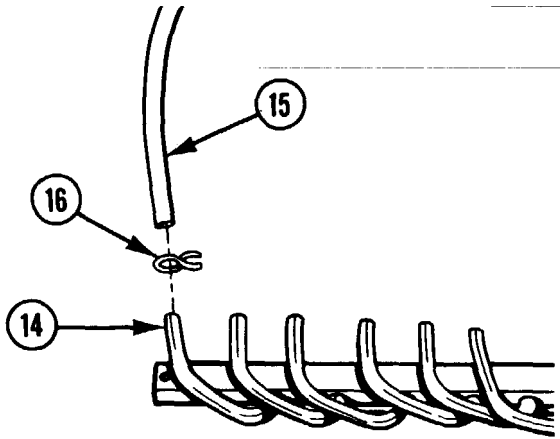
- 5 TUBE CLAMP SUPPORT STIFFENER (9). Install on two tube clamp supports (7) and secure with six lockwashers (10) and six screws (11).



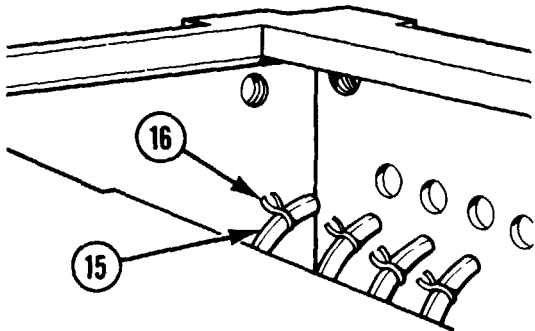
- 6 BRACKET (12). Install on tube clamp bar (13) and secure with two lockwashers (10) and two screws (11).

- 7 TWELVE GRADUATE DISCHARGE TUBES (14). Install in tube clamp bar (13) and secure with six lockwashers (10) and six screws (11).



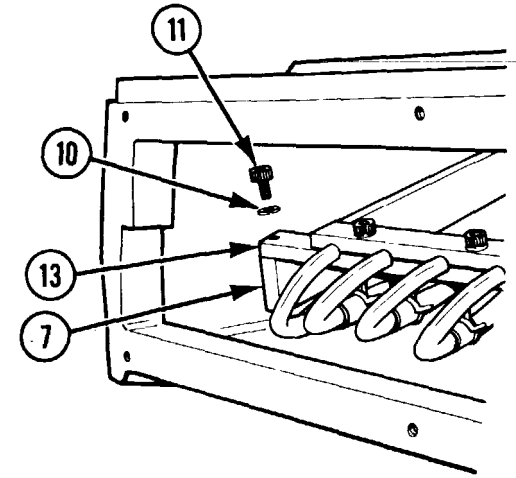


8 TWELVE NEOPRENE TUBINGS (15). Install on twelve discharge tubes (14) and secure with twelve hose clamps (16).

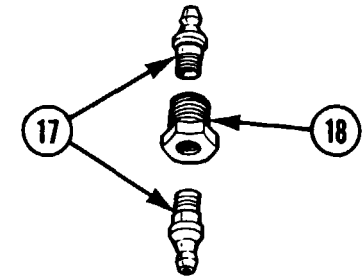
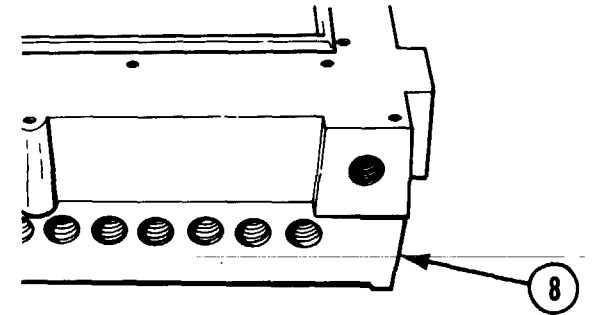


10 TWELVE HOSE CLAMPS (16). Install approximately 1 in. (2.54 cm) from free end of twelve neoprene tubings (15).

9 TUBE CLAMP BAR (13) WITH ATTACHED PARTS. Install on two tube clamp supports (7) and secure with two lockwashers (10) and two screws (11).



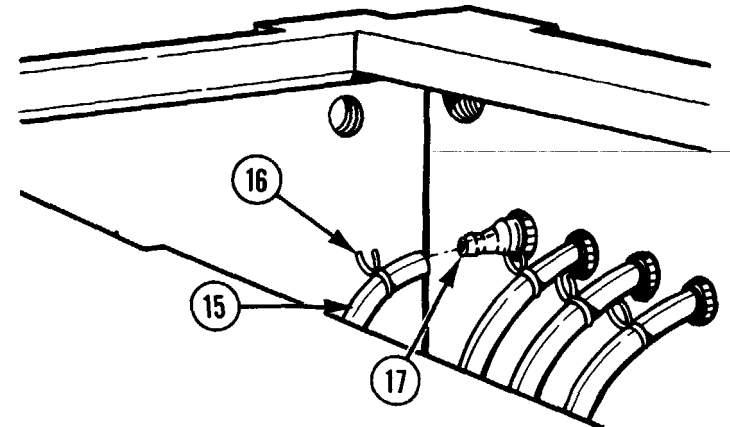
11 TWELVE SOCKETLESS FITTINGS (17), TWELVE FEMALE PIPE CONNECTORS (18), AND TWELVE SOCKETLESS FITTINGS (17). Install in graduate housing casting (8).



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

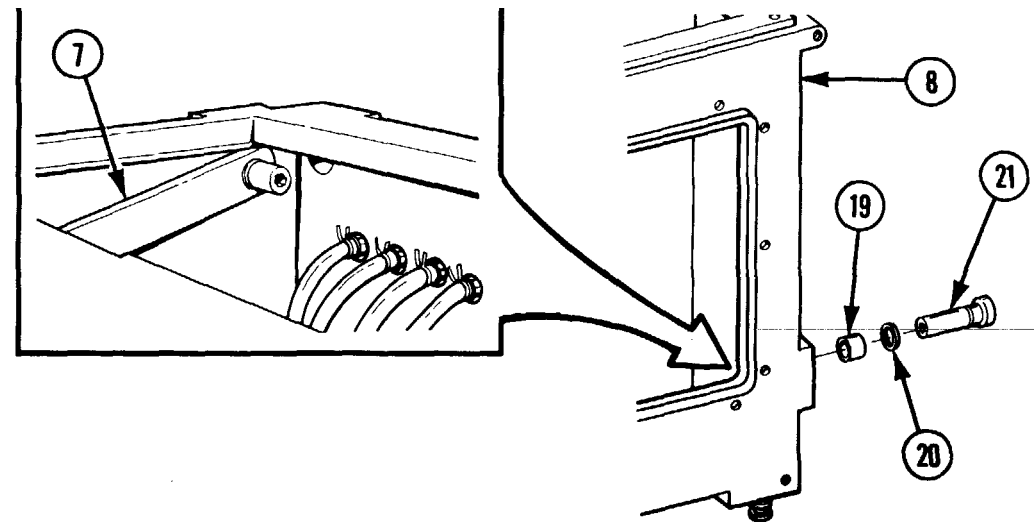
- 12 TWELVE NEOPRENE TUBINGS (15). Install on twelve socket-less fittings (17) and secure with twelve hose clamps (16).



- 13 BEARING (19). Install in dump port side of graduate housing casting (8).

- 14 PREFORMED PACKING (20). Install.

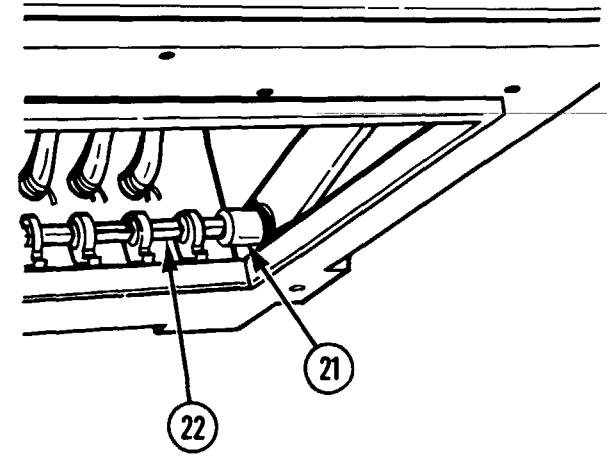
- 15 DUMPING SHAFT BEARING (21). Install in dump port side of graduate housing casting (8) and tube clamp support (7).



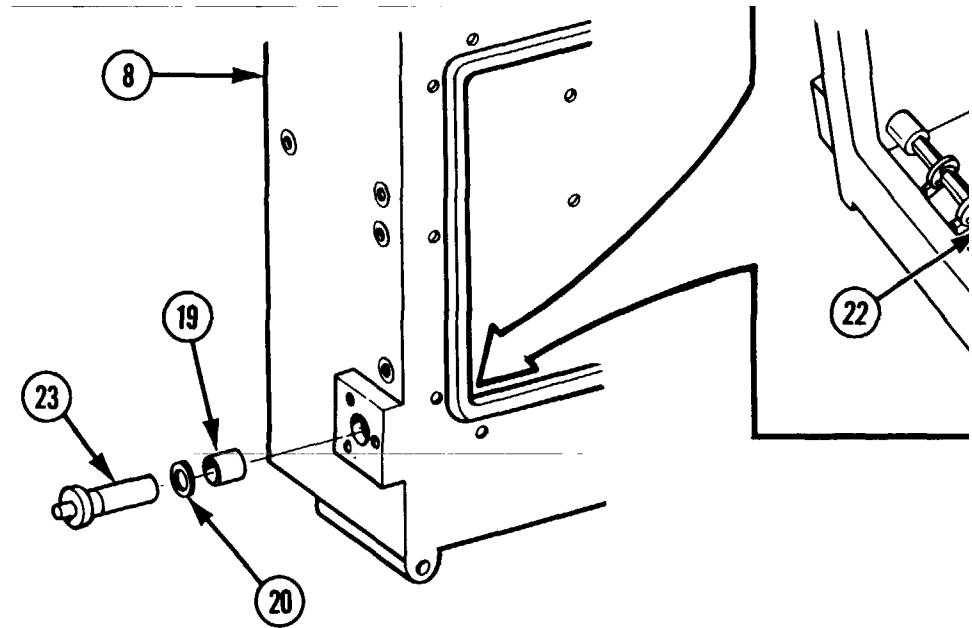
**NOTE**

Dumping shaft assembly must be positioned so that valve lifters will contact valves on bottom of burettes.

- 16 DUMPING SHAFT ASSEMBLY (22).  
Install in dumping shaft bearing (21).



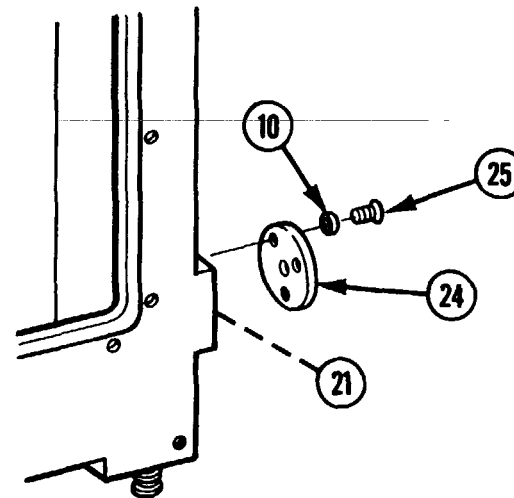
- 17 BEARING (19). Install in graduate housing casting (8).
- 18 PREFORMED PACKING (20). Install.
- 19 DUMPING SHAFT BEARING (23). Install in graduate housing casting (8) and onto dumping shaft assembly (22).



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

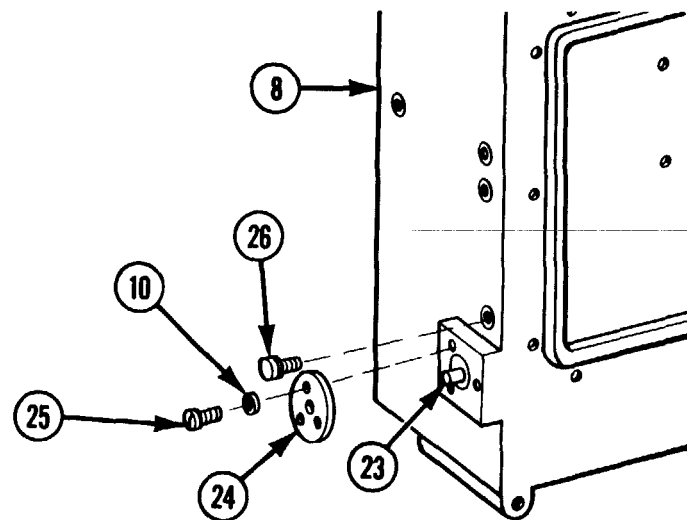
REASSEMBLY (cont)

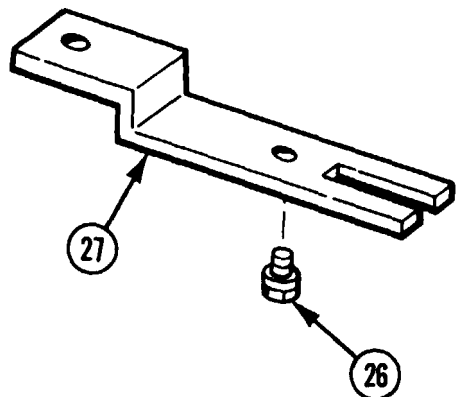
20 RETAINER (24), THREE LOCKWASHERS (10), AND THREE MACHINE SCREWS (25). Install on outside of dumping shaft bearing (21).



21 RETAINER (24), THREE LOCKWASHERS (10), AND THREE MACHINE SCREWS (25). Install on outside of dumping shaft bearing (23).

22 SPRING STUD (26). Install on graduate housing casting (8).





23 SPRING STUD (26). Install on lever weldment (27).

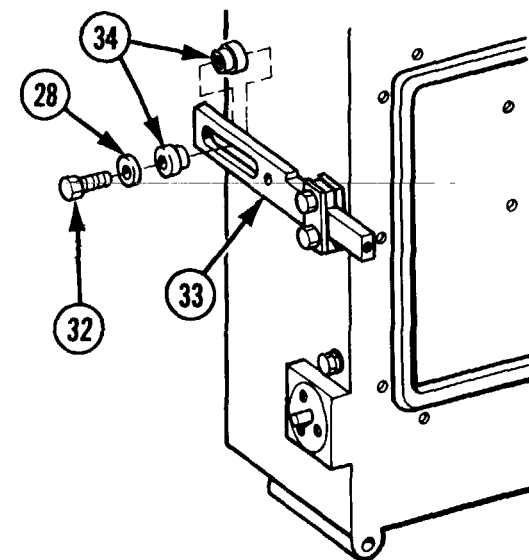
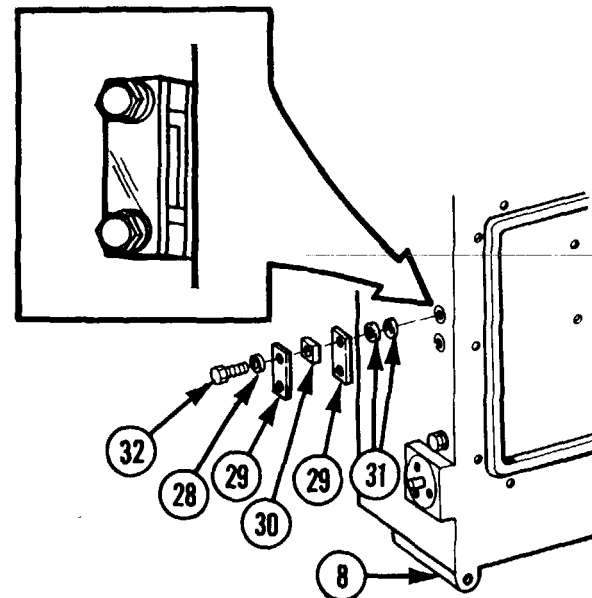
**NOTE**  
Notch in center of dumping lever must be toward top of graduate housing casting.

**NOTE**  
Bar slide blocks must be installed with notches toward each other and facing the rear of graduate housing casting.

24 TWO WASHERS (28), BAR (29), TWO BAR SLIDE BLOCKS (30), BAR (29), AND FOUR WASHERS (31). Install on two screws (32).

25 TWO SCREWS (32) WITH ATTACHED PARTS. Install on graduate housing casting (8).

26 DUMPING LEVER (33). Install and secure with two spacers (34), washer (28), and screw (32).

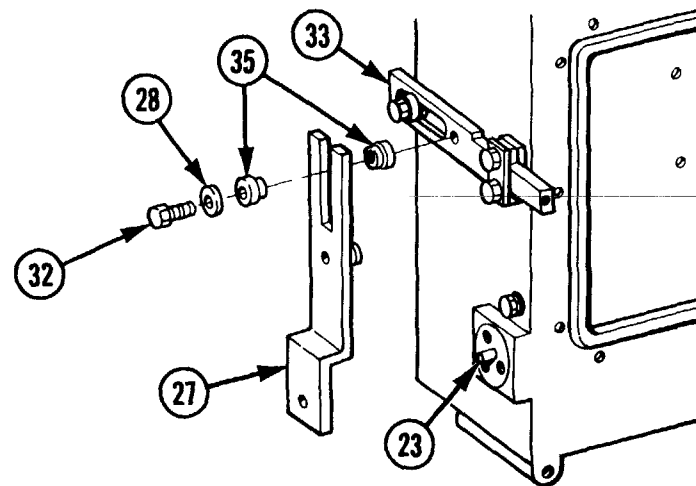




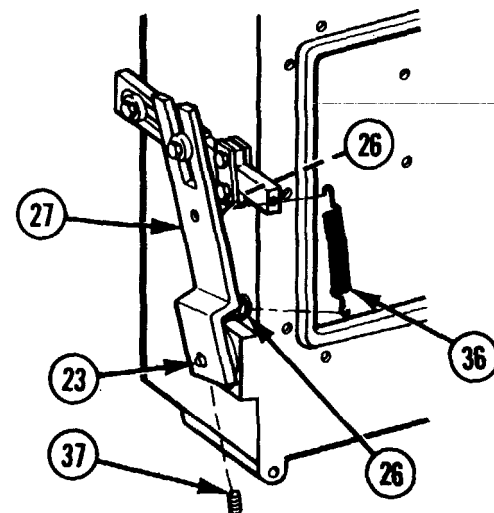
6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

- 27 LEVER WELDMENT (27). Install on dumping shaft bearing (23).
- 28 TWO SLIDE SPACERS (35), WASHER (28), AND SCREW (32). Install on lever weldment (27) and dumping lever (33).



- 29 SPRING (36). Install on two spring studs (26).
- 30 LEVER WELDMENT (27).
  - a. Adjust position on dumping shaft bearing (23) so that it moves freely.
  - b. Install setscrew (37).

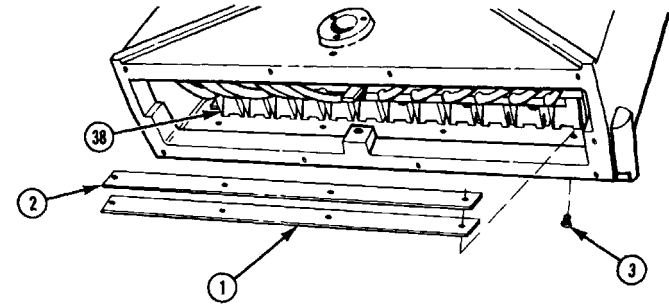


**NOTE**

Install burettes so that scribed numbers increase going toward the top of graduate housing casting.

31 TWELVE BURETTES (38). Install.

32 GASKET CUSHION (1) AND HOLDING STRIP (2). Install and secure with four machine screws (3).

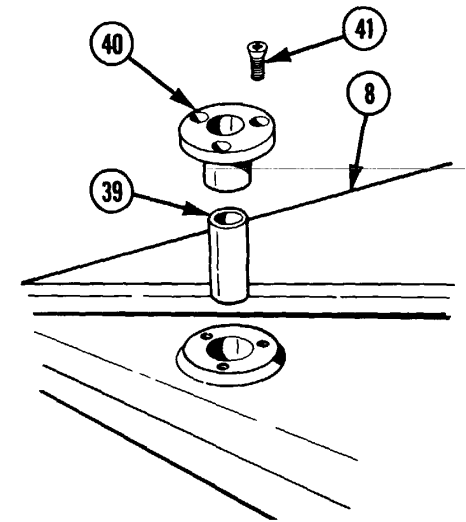


**NOTE**

Move dumping lever forward and backward to ensure the dumping shaft assembly opens and closes the valves in the burettes. Adjust lever weldment if necessary by loosening setscrew.

33 BEARING (39) AND BUSHING (40).

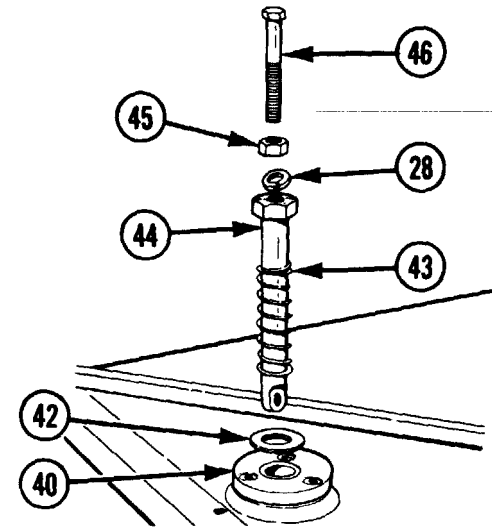
- a. Install in graduate housing casting (8).
- b. Secure with three machine screws (41).



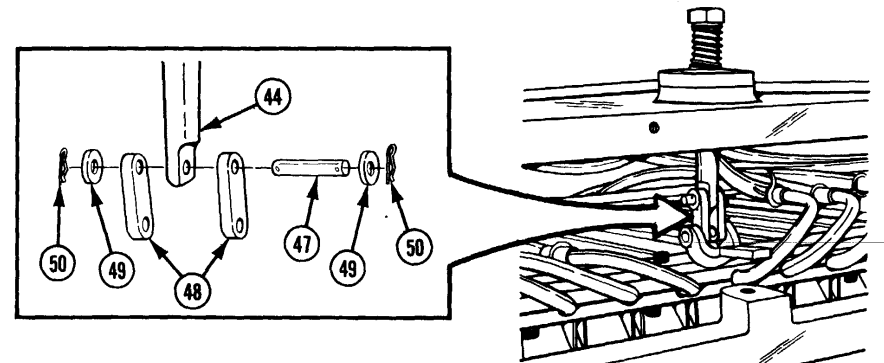
6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

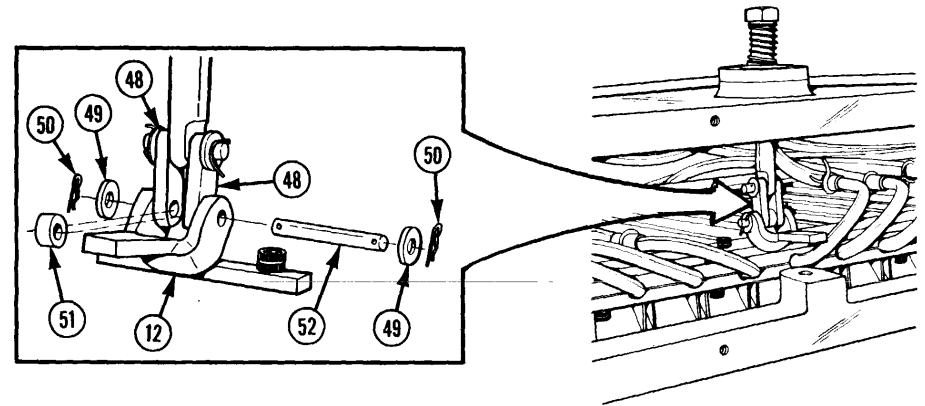
34 FLAT WASHER (42), GRADUATE SPRING (43), GRADUATE PUSH ROD (44), LOCKWASHER (28), NUT (45), AND CAPSCREW (46). Install in bushing (40).



35 LINE PIN (47), TWO PUSH ROD LINKS (48), TWO FLAT WASHERS (49), AND TWO COTTER PINS (50). Install on graduate push rod (44).

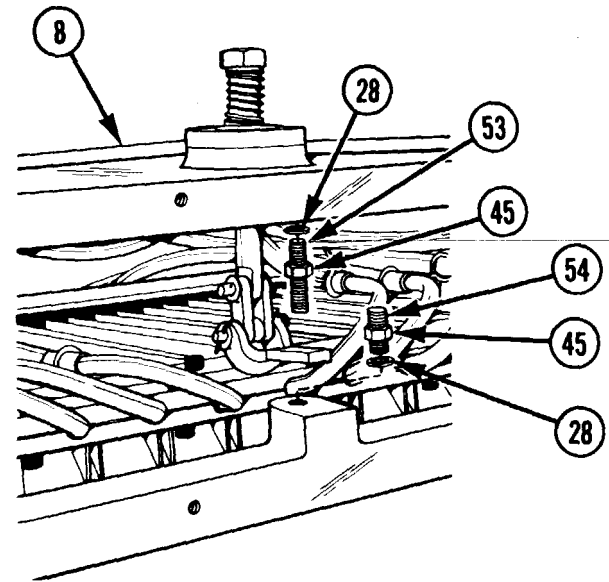


**36** SPACER (51), PIN (52), TWO FLAT WASHERS (49), AND TWO COTTER PINS (50). Install on two push rod links (48) and bracket (12).



**37** LOCKWASHER (28), NUT (45), AND SETSCREW (53). Install in graduate housing casting (8).

**38** LOCKWASHER (28), NUT (45), AND SETSCREW (54). Install in graduate housing casting (8).



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

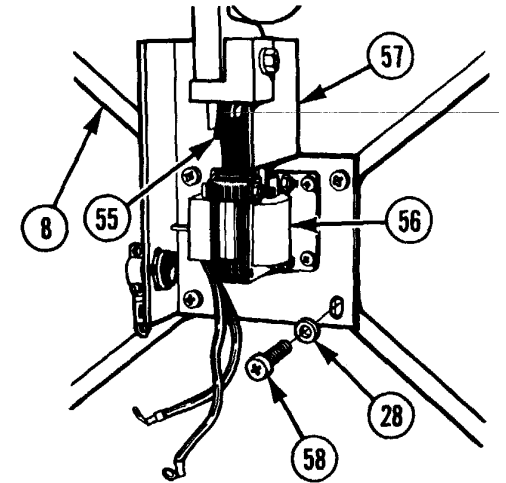
**NOTE**

Move tube clamp bar forward to ensure the graduate discharge tubes are above the burettes. Move tube clamp bar backwards to ensure the graduate discharge tubes are not above the burettes. Adjust setscrew if necessary.

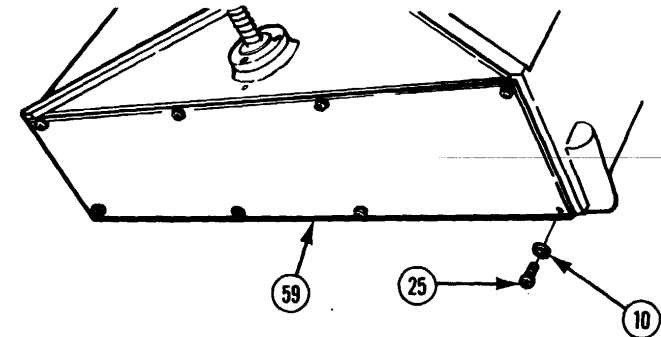
**CAUTION**

When installing the solenoid assembly, make sure the iron core (55) is inserted into the solenoid (56). If this is not done, the solenoid will burn out when power is turned on to the tester and the START COUNT button is pushed in.

- 39 SOLENOID ASSEMBLY (57). Install on graduate housing casting (8) and secure with four lockwashers (28) and four machine screws (58).

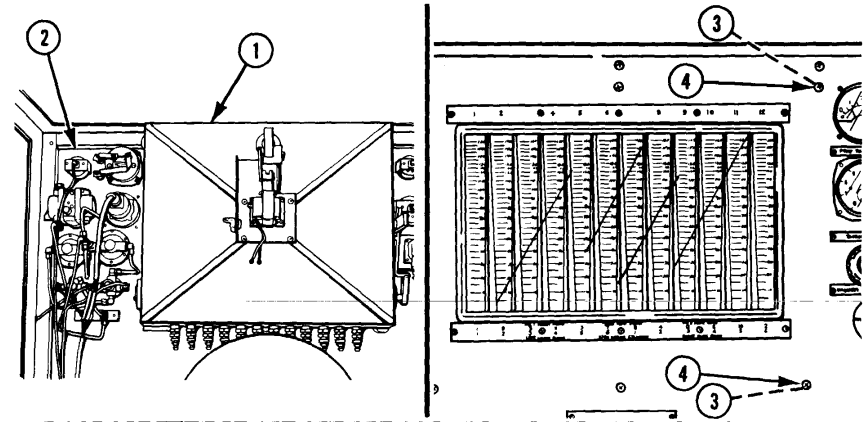


- 40 COVER PLATE (59). Install and secure with eight lockwashers (10) and eight machine screws (25).

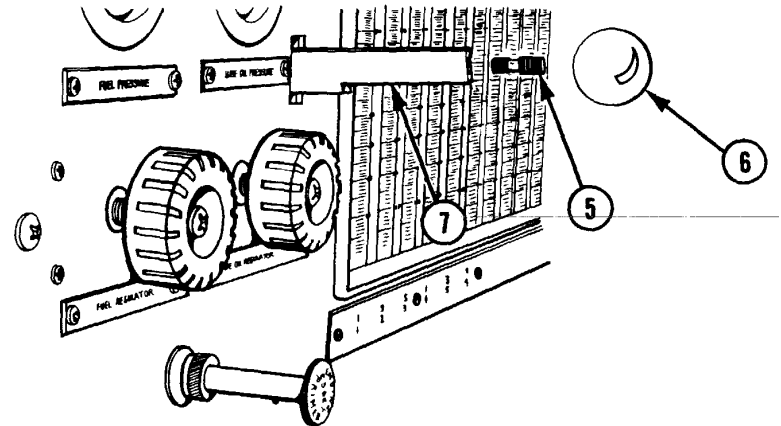


**INSTALLATION**

- 1 GRADUATE RACK ASSEMBLY (1). Install on instrument panel assembly (2) and secure with six lockwashers (3) and six screws (4).



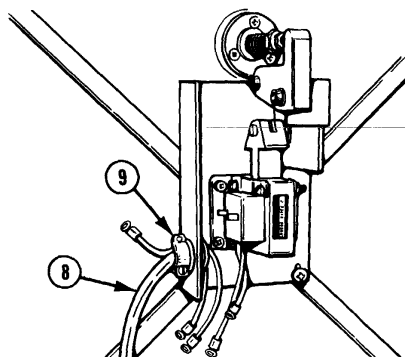
- 2 BALL KNOB STUD (5) AND BALL KNOB (6). Install on dumping lever (7).



6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

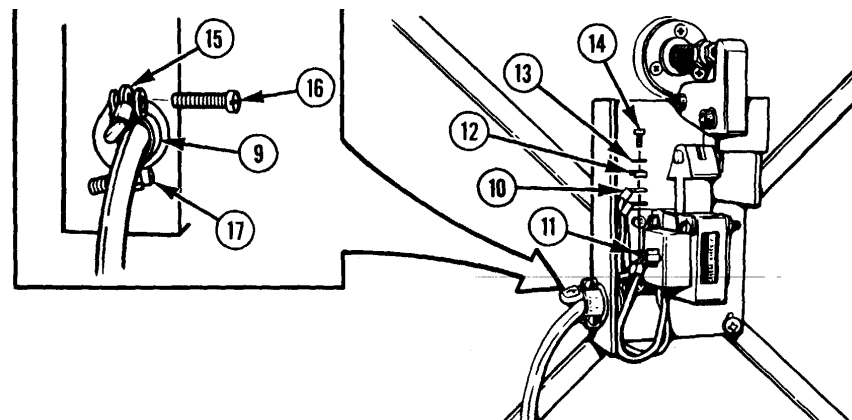
INSTALLATION (cont)

- 3 WIRE CABLE (8). Install in straight box connector (9).



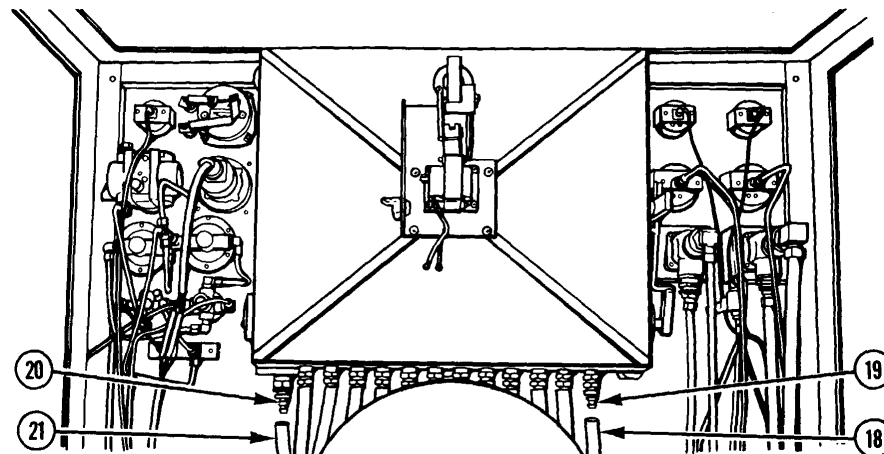
**NOTE**  
Refer to wiring diagram (p 6-146) before connecting wires.

- 4 FOUR WIRES (10) WITH ONE TERMINAL LUG EACH. Install on two terminals (11) and secure with two clips (12), two lockwashers (13), and two screws (14).
- 5 GREEN WIRE (15) WITH TERMINAL LUG. Install on straight box connector (9) and secure with screw (16).
- 6 TWO SCREWS (16 AND 17). Tighten.





- 7 TWELVE HOSES (18). Install on twelve socketless fittings (19).
- 8 SOCKETLESS FITTING (20) AND HOSE (21). Install.



**TEST**

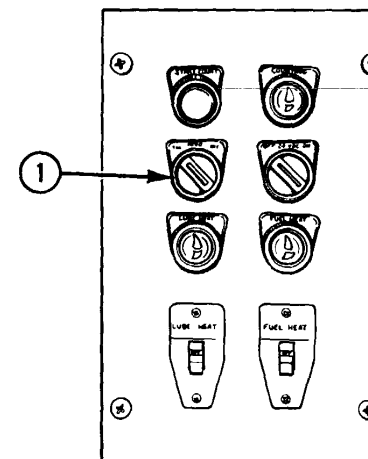
- 1 MAIN POWER SOURCE. Turn on.

**NOTE**

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual.

- 2 TESTER. Hook up a fuel injector pump and have it running.

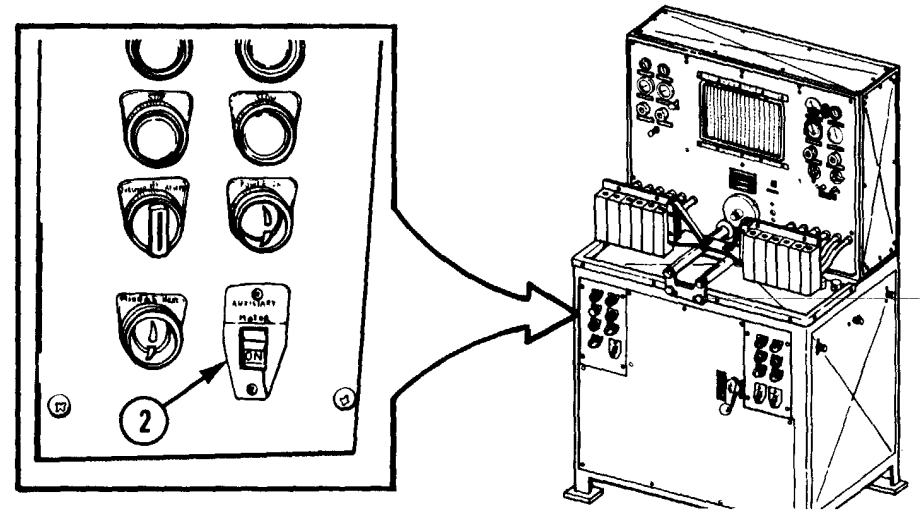
- 3 500-1000-OFF COUNT SWITCH (1). Set at 500.



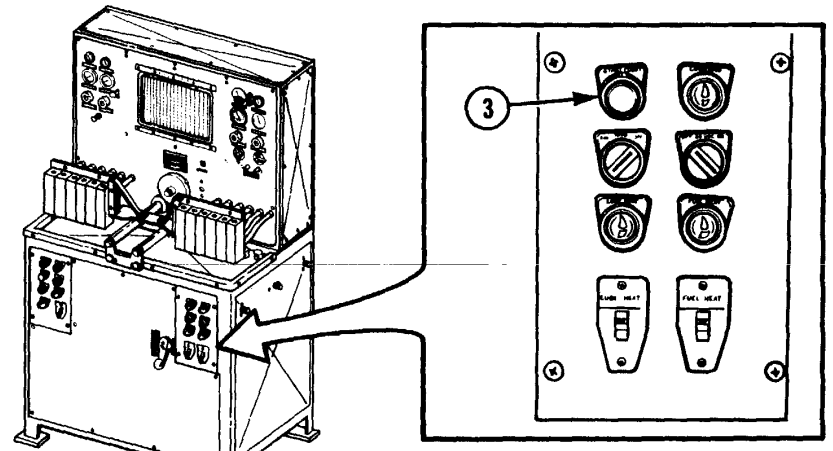
6-18. GRADUATE RACK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

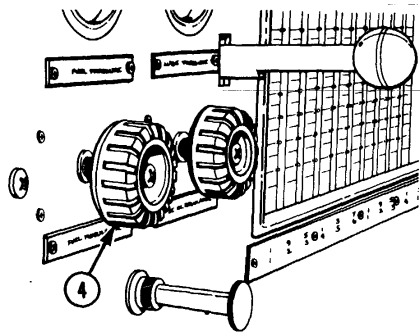
TEST (cont)

4 AUXILIARY MOTOR SWITCH (2). Turn on.



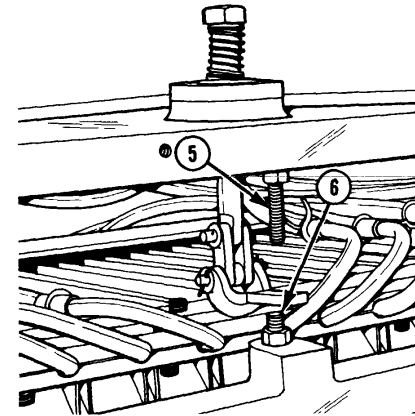
5 START COUNT BUTTON (3). Push in.





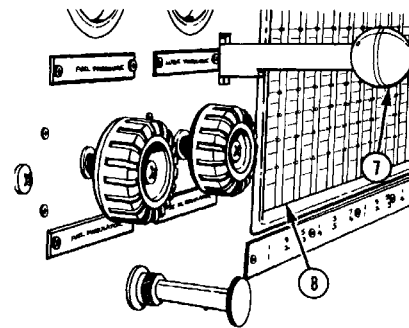
6 FUEL REGULATOR (4). Ensure that it is open.

7 SETSCREW (5) AND SETSCREW (6). Adjust if necessary.



8 DUMPING LEVER (7).

- a. Pull out and check that fuel in burettes (8) is not draining out.
- b. Push in and check that fuel in burettes (8) is emptying.



9 DUMPING SHAFT ASSEMBLY. Readjust (p 6-353) if fuel is not being retained or drained in step 8.

**6-19. SOLENOID ASSEMBLY - MAINTENANCE INSTRUCTIONS**

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**THIS TASK COVERS:**

- |                         |                 |
|-------------------------|-----------------|
| a. Removal              | e. Reassembly   |
| b. Disassembly          | f. Installation |
| c. Inspection/servicing | g. Test         |
| d. Repair               |                 |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033) 6-95 Counting circuit does not function

**Troubleshooting References**

**Materials/Parts**

Abrasive cloth (item 4, app C)  
 Cleaning compound (item 3, app C)  
 Rag (item 14, app C)

**Equipment Conditions**

Main power source to tester is turned off  
 4-32 Upper back panel is removed

**References**

2-26 Hookup of fuel injector pump  
 TM 9-4910-387-24P

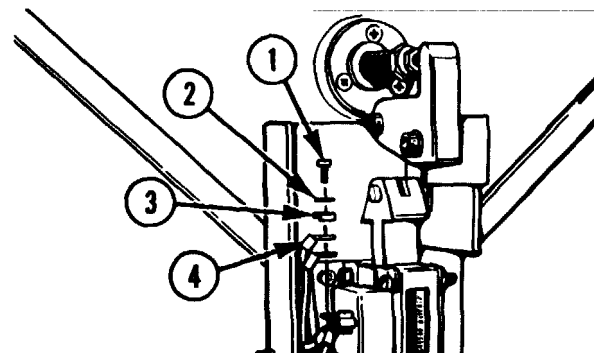
**REMOVAL**

- 1 TWO SCREWS (1), TWO LOCKWASHERS (2), AND TWO CLIPS (3).  
 Remove.

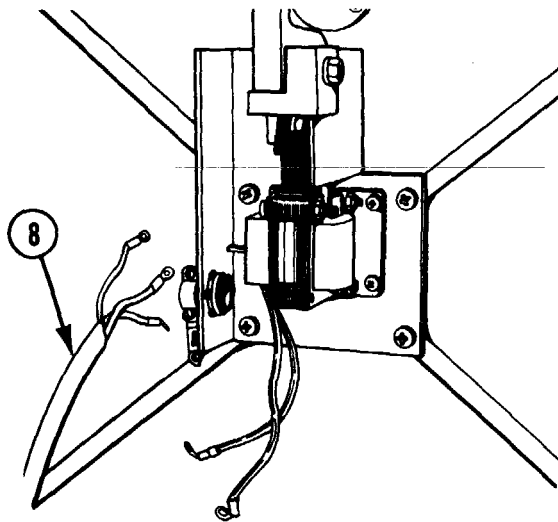
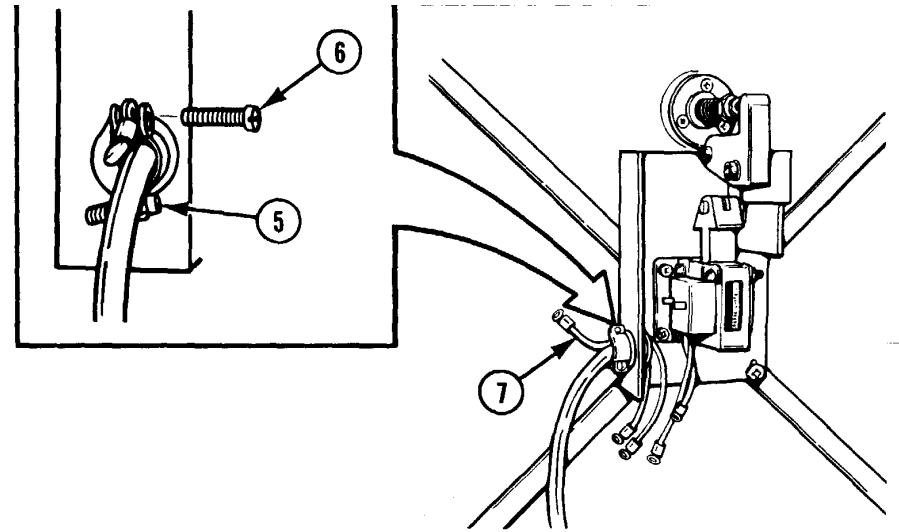
**NOTE**

Tag all wires at removal.

- 2 FOUR WIRES (4) WITH FOUR TERMINAL LUGS. Disconnect.

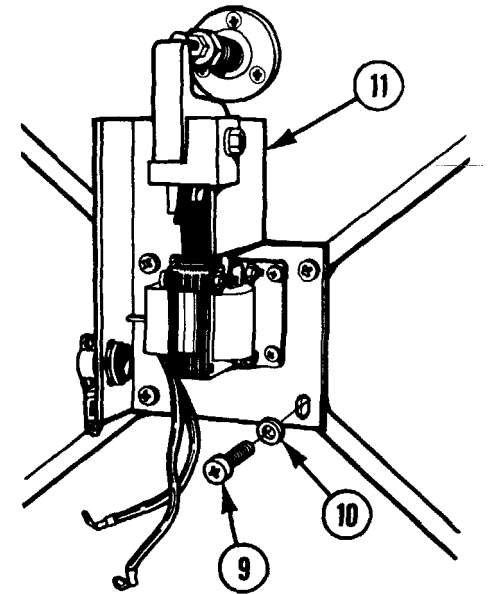


- 3 SCREW (5). Loosen.
- 4 SCREW (6). Remove.
- 5 GREEN WIRE (7) WITH TERMINAL LUG. Disconnect.



6 WIRE CABLE (8). Remove.

- 7 FOUR MACHINE SCREWS (9) AND FOUR LOCKWASHERS (10). Remove.
- 8 SOLENOID ASSEMBLY (11). Remove.

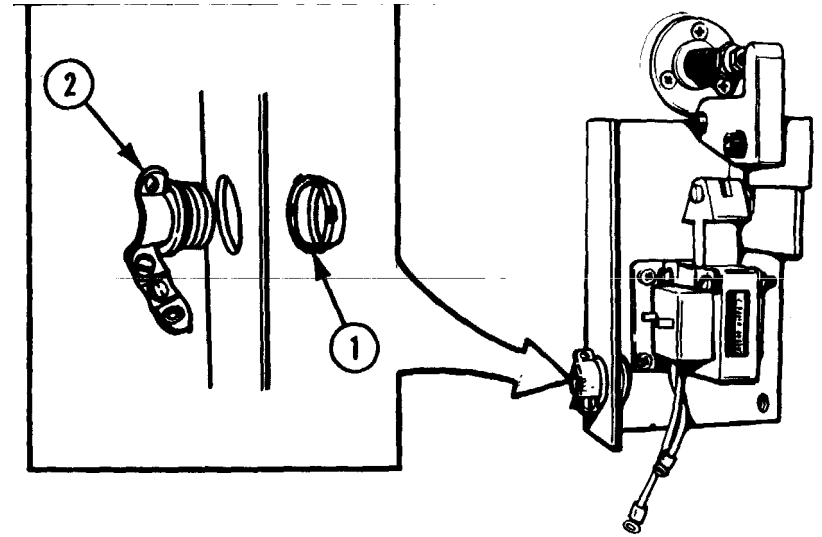


## 6-19. SOLENOID ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

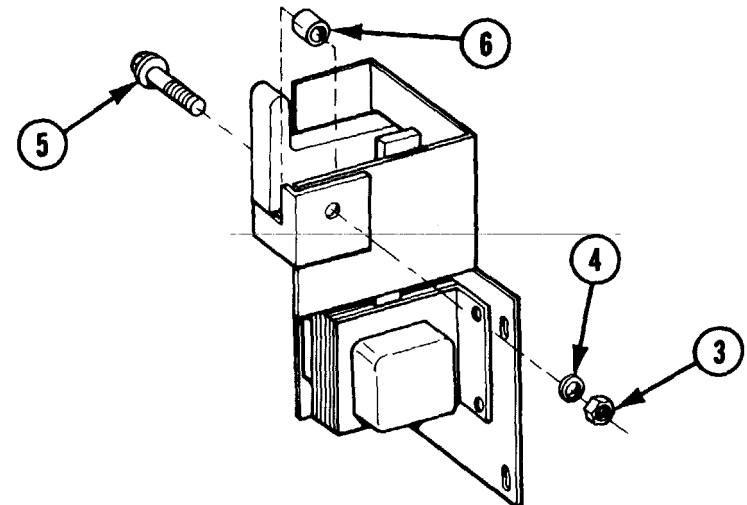
### DISASSEMBLY

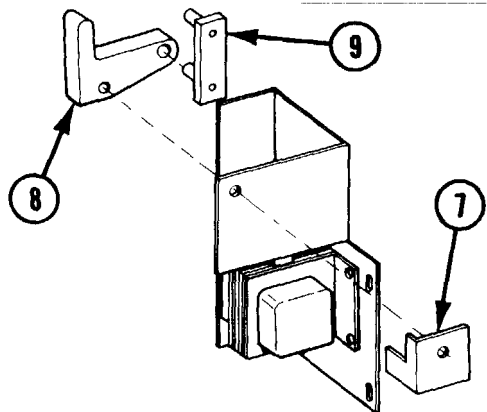
1 NUT (1). Remove.

2 STRAIGHT BOX CONNECTOR (2).  
Remove.



3 NUT (3), WASHER (4), SHOULDERED SCREW (5), AND SPACER (6). Remove.

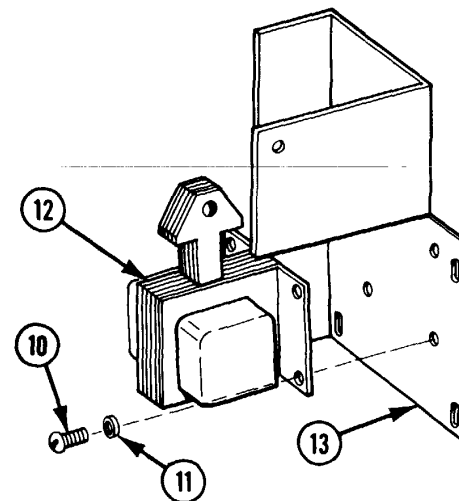




4 SOLENOID CRANK STOP (7), CRANK ASSEMBLY (8), AND SOLENOID LINK ASSEMBLY (9). Remove.

5 FOUR MACHINE SCREWS (10) AND FOUR LOCKWASHERS (11). Remove.

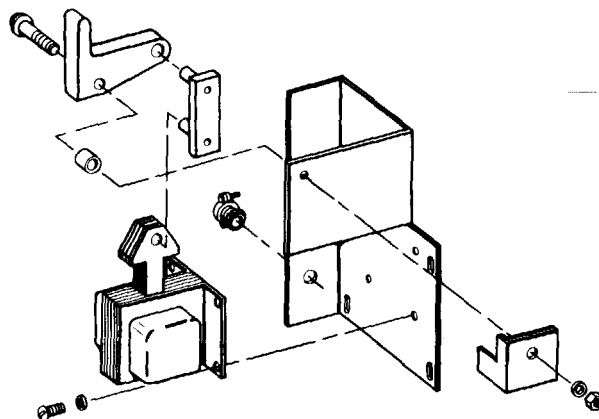
6 SOLENOID (12). Remove from solenoid bracket (13).



**INSPECTION/SERVICING**

**SOLENOID ASSEMBLY.**

- a. Check for broken, cracked, or missing parts.
- b. Check threads for damage.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- d. Clean electrical contacts with abrasive cloth (item 4, app C).



**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9 49-387-24P) as required.

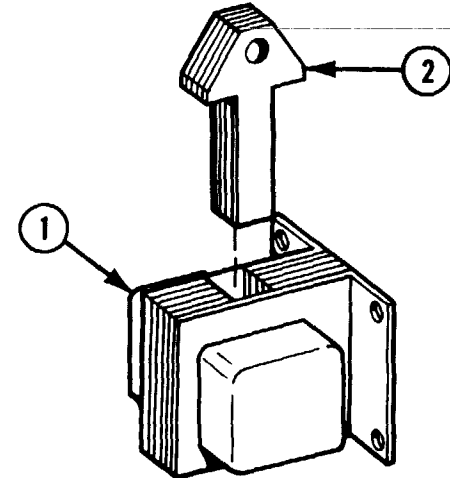


## 6-19. SOLENOID ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

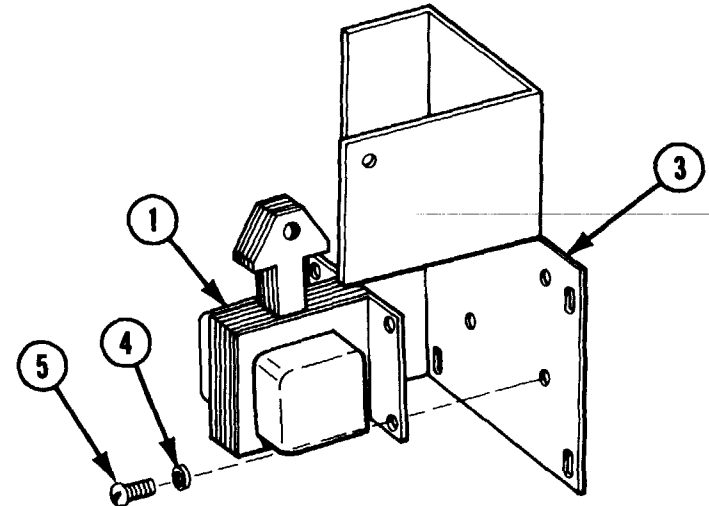
## REASSEMBLY

**CAUTION**

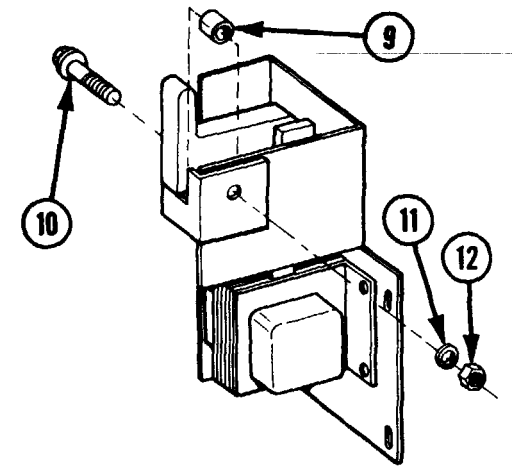
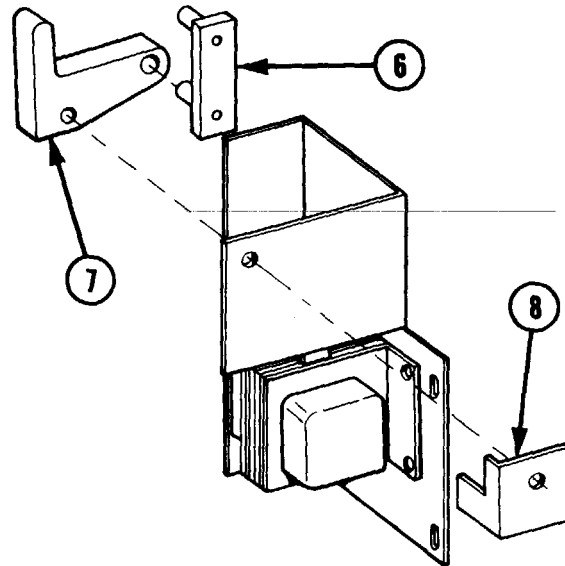
When installing the solenoid (1), make sure the iron core (2) is inserted into the solenoid. If this is not done, the solenoid will burn out when power is turned on to the tester and the START COUNT button is pushed in.



- 1 SOLENOID (1). Install on solenoid bracket (3).
- 2 FOUR LOCKWASHERS (4) AND FOUR MACHINE SCREWS (5). Install.

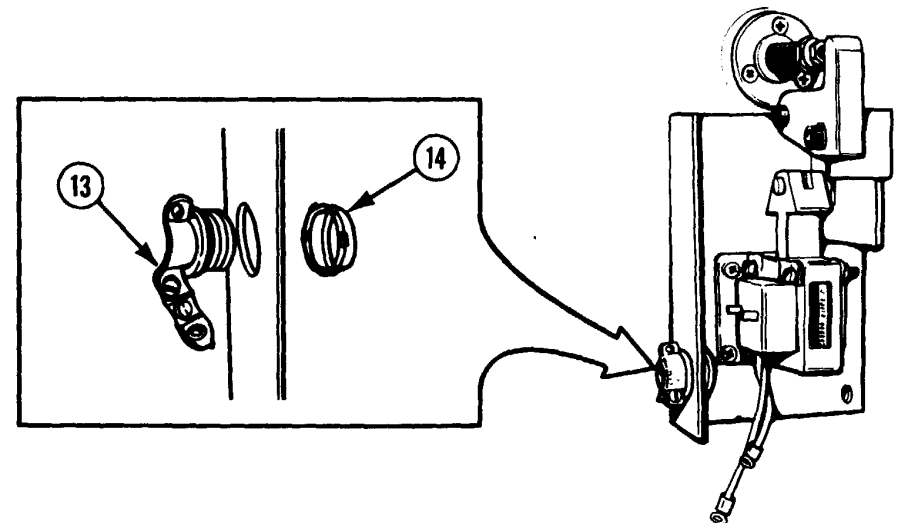


3 SOLENOID LINK ASSEMBLY (6),  
CRANK ASSEMBLY (7), AND  
SOLENOID CRANK STOP (8). Install.



4 SPACER (9), SHOULDERED SCREW  
(10), WASHER (11), AND NUT (12).  
Install.

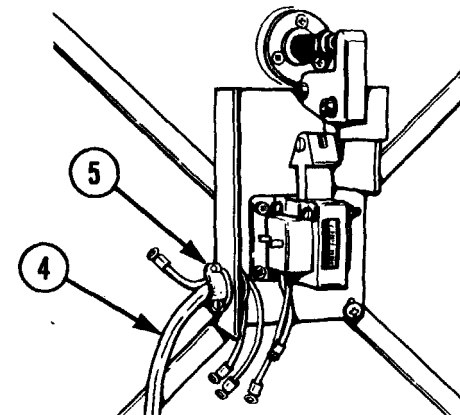
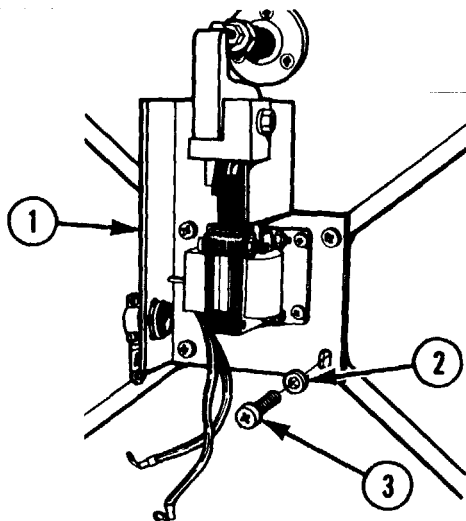
5 STRAIGHT BOX CONNECTOR (13).  
Install and secure with nut (14).



6-19. SOLENOID ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION

1 SOLENOID ASSEMBLY (1). Install on graduate rack assembly and secure with four lockwashers (2) and four machine screws (3).

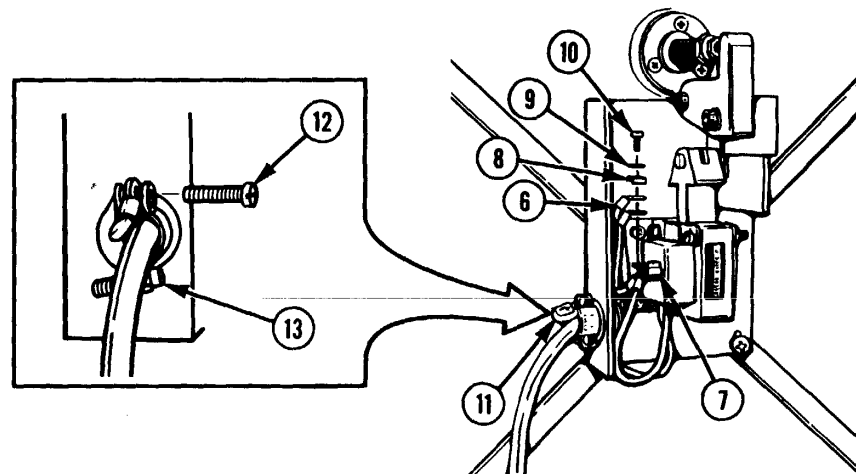


2 WIRE CABLE (4). Install in straight box connector (5).

NOTE

Refer to wiring diagram (p 6-146) before connecting wires.

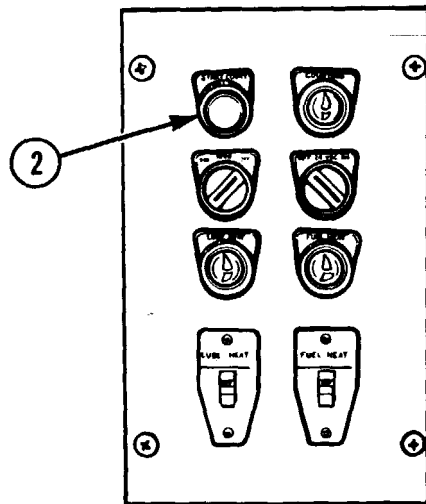
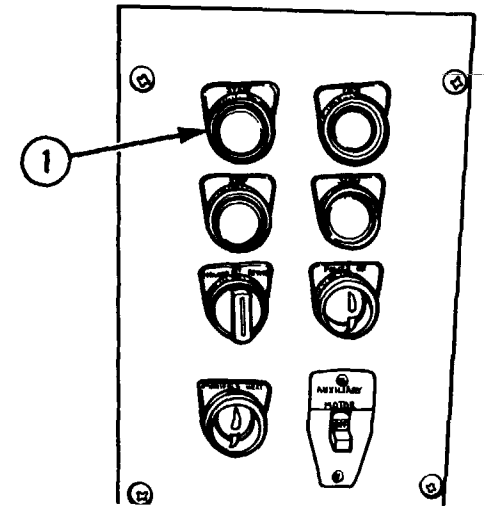
- 3 FOUR WIRES (6) WITH FOUR TERMINAL LUGS. Install on two terminals (7) and secure with two clips (8), two lockwashers (9), and two screws (10).
- 4 GREEN WIRE (11) WITH TERMINAL LUG. Install on straight box connector and secure with screw (12).
- 5 TWO SCREWS (12 AND 13). Tighten.



**TEST**

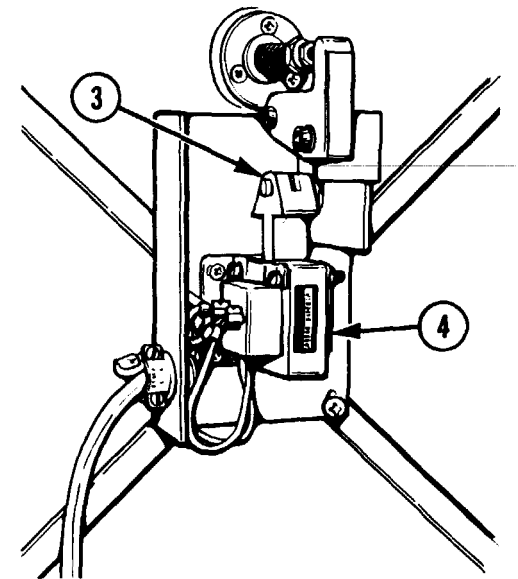
- 1 TESTER. Hook up a fuel injector pump.  
(Refer to chapter 2, beginning on p 2-26.).
- 2 MAIN POWER SOURCE. Turn on.

- 3 START BUTTON (1). Push.



- 4 START COUNT BUTTON (2). Push.

- 5 IRON CORE (3). Check that it drops in solenoid (4).



**6-21. DUMPING SHAFT ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection
- d. Repair
- e. Reassembly
- f. Installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Troubleshooting References**

6-145 Burettes will not empty

**References**

6-338 Disassembly procedure of graduate rack assembly

6-349 Reassembly procedure of graduate rack assembly

TM 9-4910-387-24P

**Equipment Conditions**

Main power source to tester is turned off

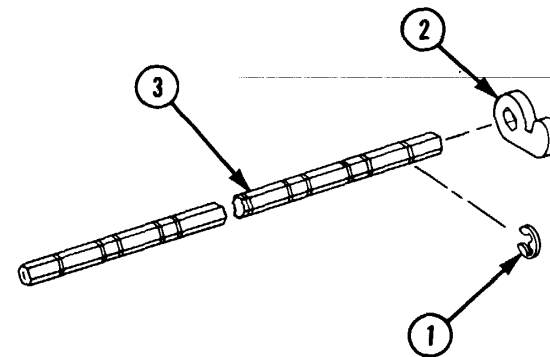
4-32 Upper back panel is removed

**REMOVAL**

For removal of the dumping shaft assembly, refer to the disassembly procedure of the graduate rack assembly, p 6-338.

**DISASSEMBLY**

TWENTY-SIX RINGS (1) AND TWELVE VALVE LIFTERS (2). Remove from dumping shaft (3).

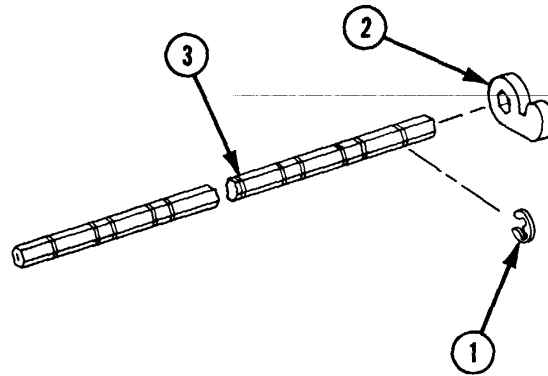


## INSPECTION

TWENTY-SIX RINGS (1), TWELVE VALVE LIFTERS (2), AND DUMPING SHAFT (3).

Check for broken, cracked, or missing parts.

## REPAIR



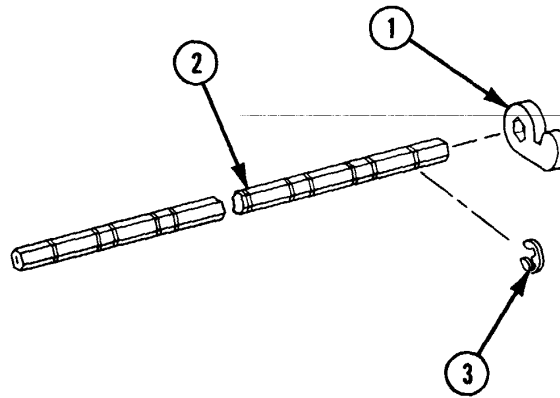
**NOTE**  
Repair is by replacement of authorized parts (TM 9-4910387-24P) as required.

## REASSEMBLY INSTALLATION

### NOTE

Be sure all valve lifters are facing the same way.

- 1 TWELVE VALVE LIFTERS (1). Install on dumping shaft (2).
- 2 TWENTY-SIX RINGS (3). Install.



For installation of the dumping shaft assembly, refer to the reassembly procedure of the graduate rack assembly, p 6-349.

**6.21. SHIFT CONTROL ROD ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)

Grease (item 7, app C)

Rag (item 14, app C)

**References**

TM 9-4910-387-24P

**Equipment Conditions**

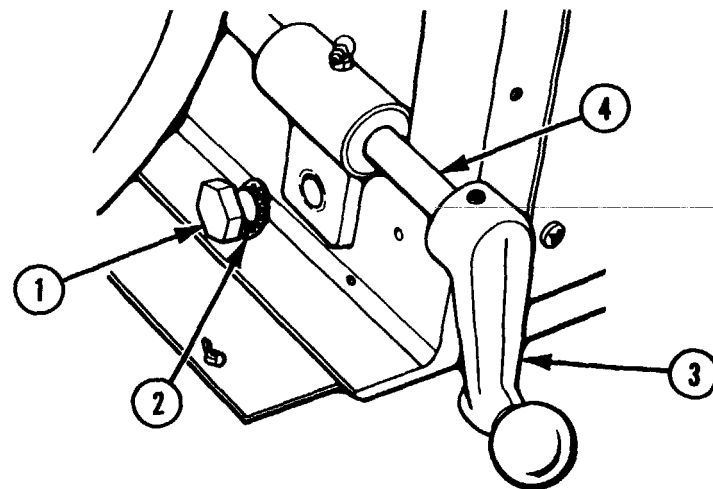
Main power source to tester is turned off

4-35 Front panel is removed

4-40 RH panel assembly is removed

**REMOVAL**

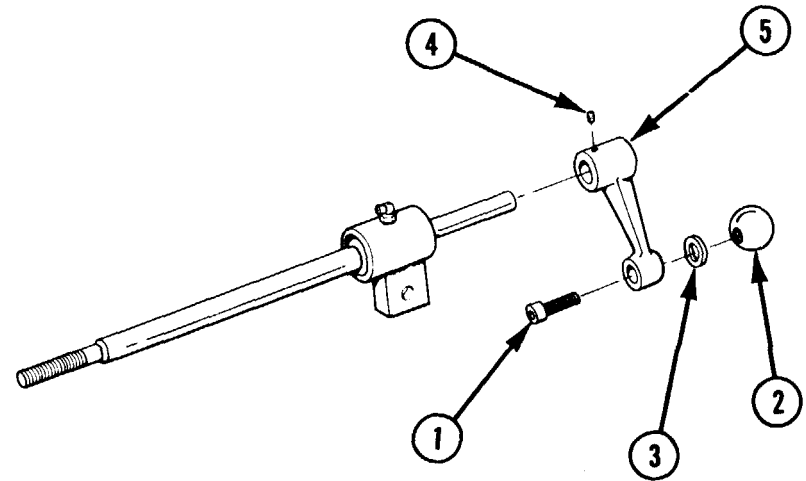
- 1 CAPSCREW (1) AND LOCKWASHER (2). Remove.
- 2 HAND CRANK (3). Turn counterclockwise.
- 3 SHIFT CONTROL ROD ASSEMBLY (4). Remove.



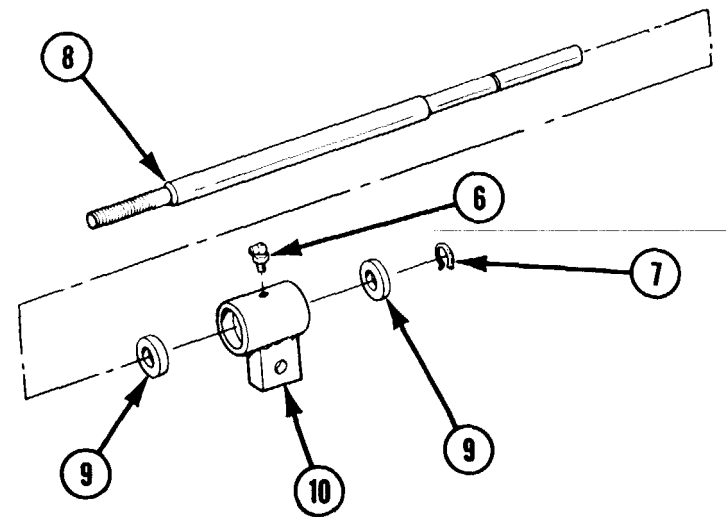


## DISASSEMBLY

- 1 SELF-LOCKING SCREW (1), BALL KNOB (2), AND BUSHING (3). Remove.
- 2 SETSCREW (4) AND HAND CRANK (5). Remove.



- 3 LUBRICATION FITTING (6) AND RETAINING RING (7).  
Remove.
- 4 CONTROL ROD (8). Remove.
- 5 TWO BALL BEARINGS (9) AND TUBE AND LUG WELDMENT (10). Remove.

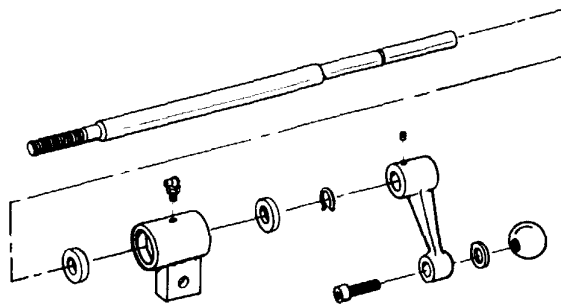


6-21. SHIFT CONTROL ROD ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSPECTION/SERVICING

1 SHIFT CONTROL ROD ASSEMBLY.

- a. Check for broken, cracked, or missing parts.
- b. Check threads for damage.
- c. Check bearings for excessive wear or binding.
- d. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



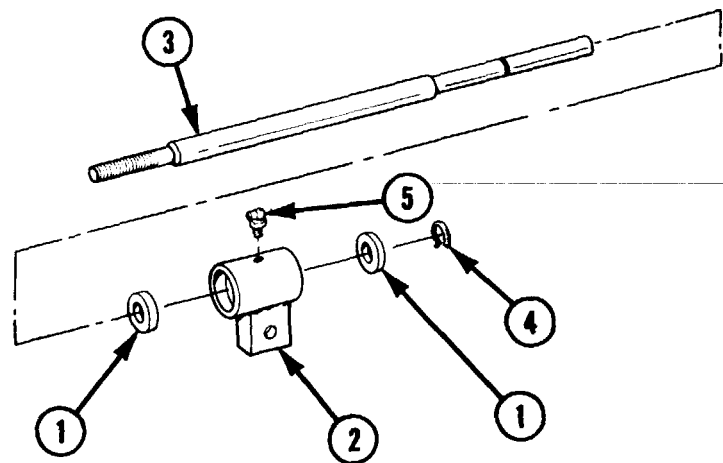
REPAIR

NOTE

Repair is by replacement of authorized parts (TM 9 4910-387-24P) as required.

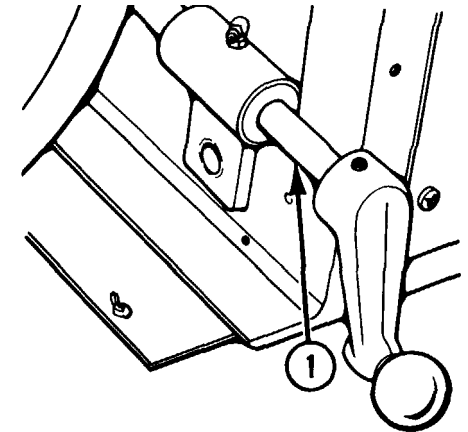
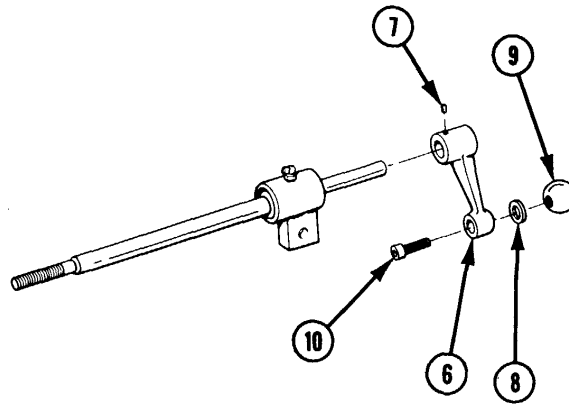
REASSEMBLY

- 1 TWO BALL BEARINGS (1). Install in tube and lug weldment (2).
- 2 CONTROL ROD (3). Install.
- 3 RETAINING RING (4) AND LUBRICATION FITTING (5). Install.



## INSTALLATION

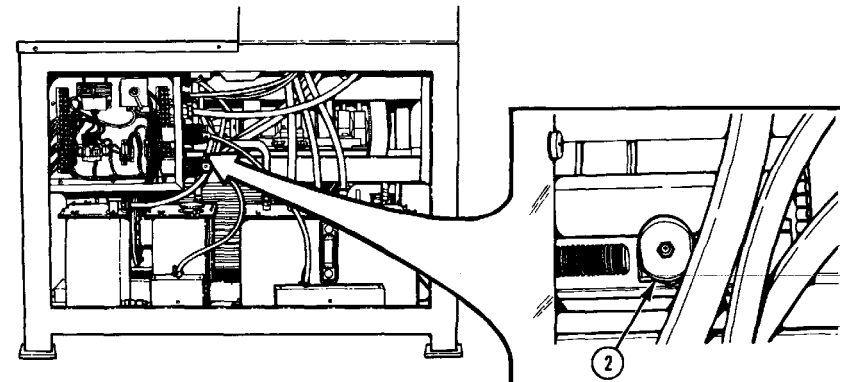
- 4 HAND CRANK (6). Install and secure with setscrew (7).
- 5 BUSHING (8), BALL KNOB (9), AND SELF-LOCKING SCREW (10). Install.



1 SHIFT CONTROL ROD ASSEMBLY (1).

a. Install.

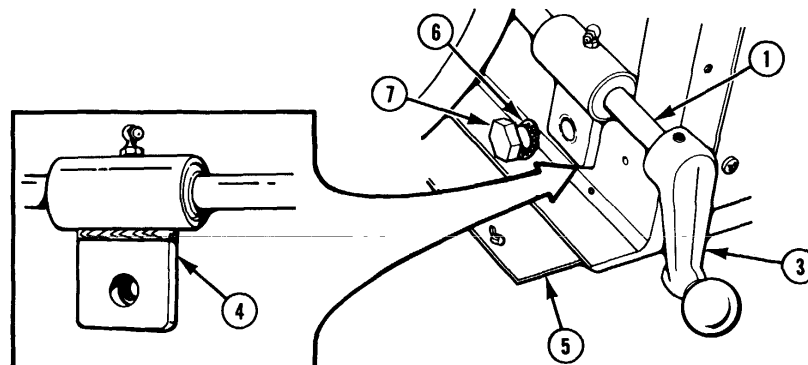
- b. Insert threaded end in clutch shifting nut (2).



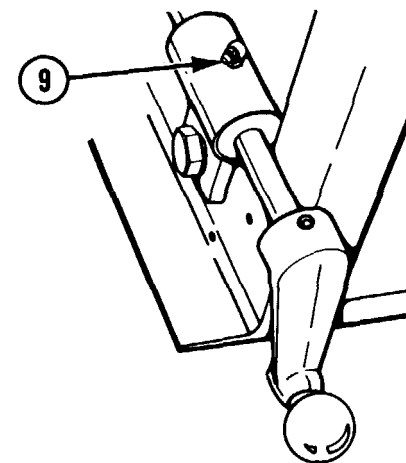
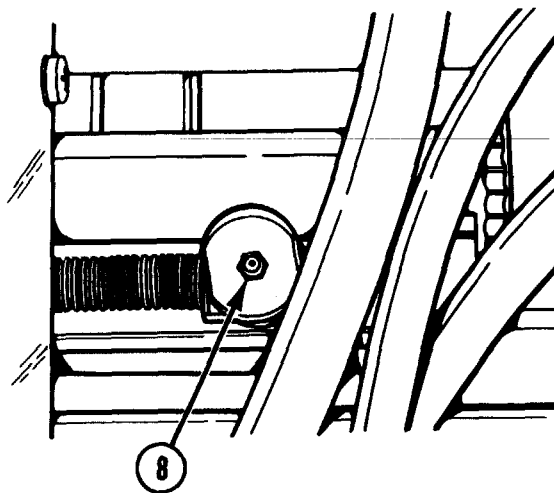
6-21. SHIFT CONTROL ROD ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

- 1 SHIFT CONTROL ROD ASSEMBLY (1). (cont)
  - c. Turn hand crank (3) clockwise until hole in tube lug (4) is aligned with threaded hole in tester frame (5).
- 2 LOCKWASHER (6) AND CAPSCREW (7). Install.



- 3 FITTING (8). Lubricate with grease (item 7, app C).



- 4 LUBRICATION FITTING (9). Lubricate with grease (item 7, app C).

6-22. TRAY AND DISCHARGE BLOCKS ASSEMBLY - MAINTENANCE INSTRUCTIONS

THIS TASK COVERS:

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Installation

INITIAL SETUP

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts

Cleaning compound (item 3, app C)  
 Rag (item 14, app C)

References

TM 9-4910-387-24P

Equipment Conditions

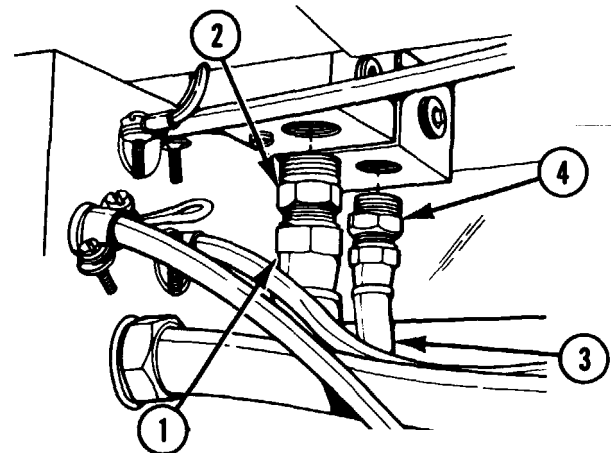
- Main power source to tester is turned off
- 4-53 LH accumulator assembly is removed
- 4-45 RH accumulator assembly is removed
- 6-174 Mounting rails are removed
- 4-42 LH panel assembly is removed
- 4-35 Front panel is removed
- 4-40 RH panel assembly is removed

REMOVAL

NOTE

Tag all hoses and tubing before removal.

- 1 HOSE ASSEMBLY (1) AND MALE CONNECTOR (2). Remove.
- 2 HOSE ASSEMBLY (3) AND MALE CONNECTOR (4). Remove.



## 6-22. TRAY AND DISCHARGE BLOCKS ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

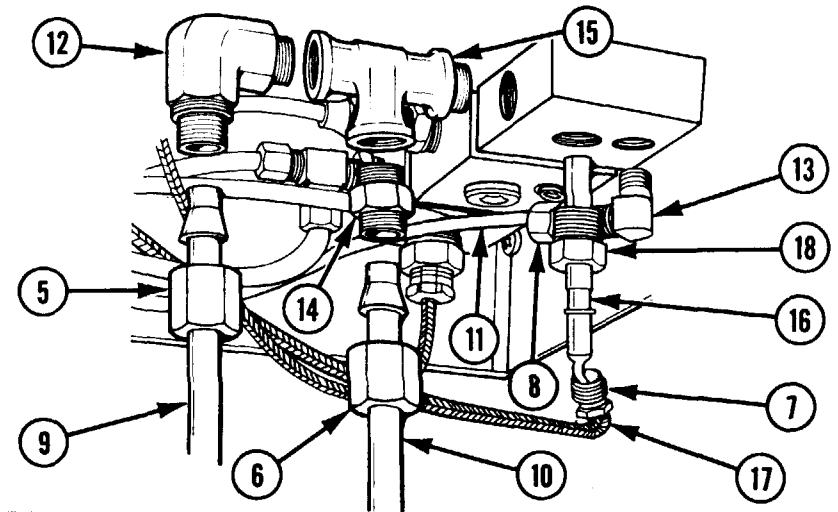
### REMOVAL (cont)

- 3 FOUR NUTS (5 THRU 8). Loosen.
- 4 THREE COPPER TUBINGS (9, 10, AND 11). Disconnect.
- 5 TWO MALE ELBOWS (12 AND 13), MALE CONNECTOR (14), AND MALE TEE (15). Remove.

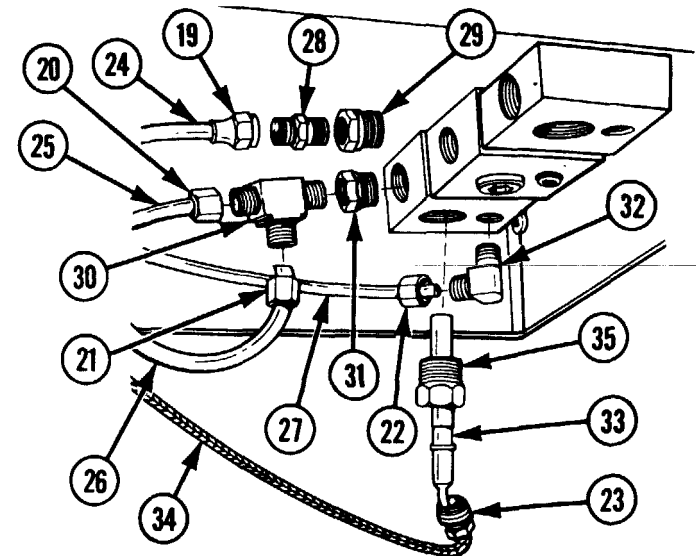
#### CAUTION

Bulbs are fragile. Use care when removing or installing bulbs to prevent damage.

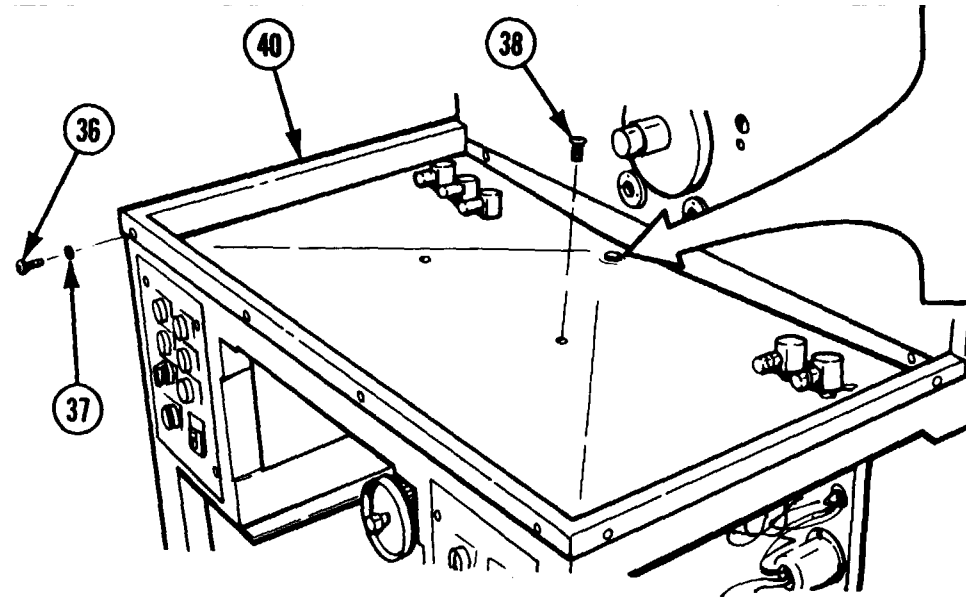
- 6 BULB (16) WITH BRAIDED TUBE (17) AND ADAPTER (18). Disconnect.



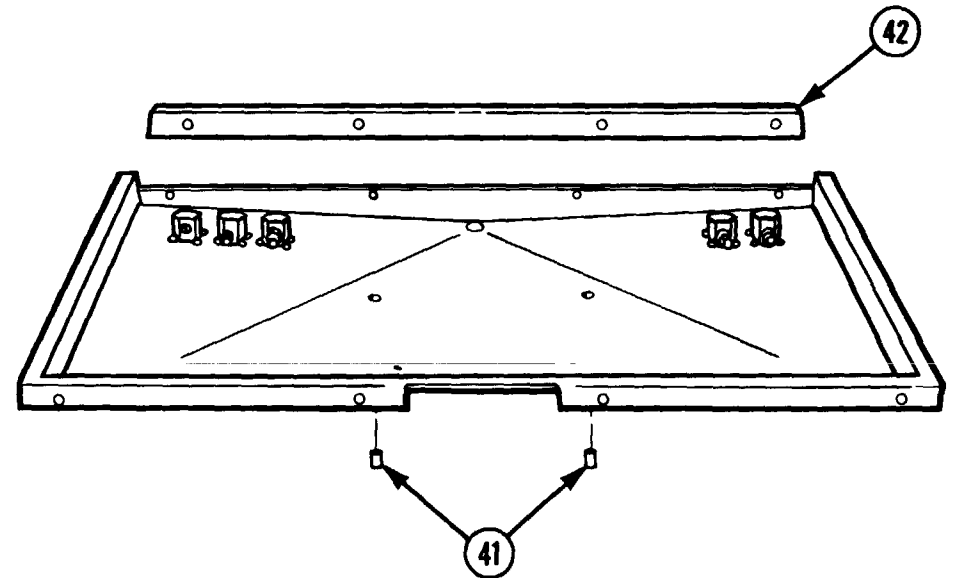
- 7 FIVE NUTS (19 THRU 23). Loosen.
- 8 FOUR COPPER TUBINGS (24 THRU 27). Disconnect.
- 9 MALE CONNECTOR (28), REDUCER BUSHING (29), MALE RUN TEE (30), REDUCER BUSHING (31), AND MALE ELBOW (32). Remove.
- 10 BULB (33) WITH BRAIDED TUBE (34) AND ADAPTER (35). Disconnect.



- 11 TWELVE MACHINE SCREWS (36) AND TWELVE LOCKWASHERS (37).  
Remove.
- 12 TWO MACHINE SCREWS (38).
- 13 HOSE ASSEMBLY (39). Remove.
- 14 TRAY AND DISCHARGE BLOCKS ASSEMBLY (40).  
Remove.



- 15 TWO SPACERS (41) AND PANEL GASKET (42). Remove.

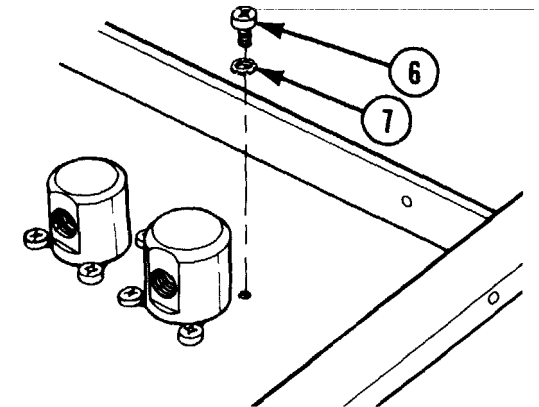
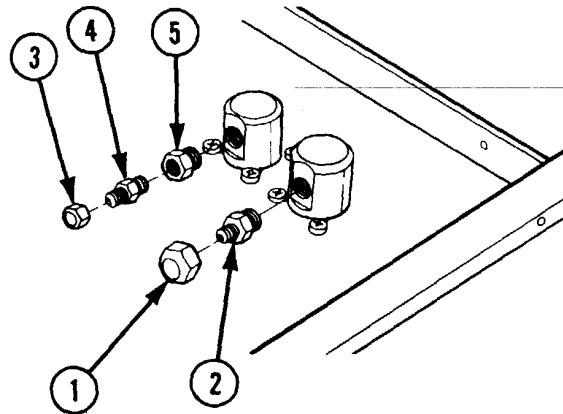




6-22. TRAY AND DISCHARGE BLOCKS ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

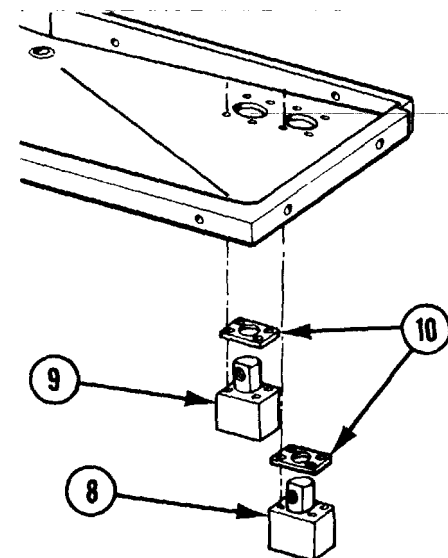
DISASSEMBLY

- 1 CAP (1) AND CONNECTOR (2).  
Remove.
- 2 CAP (3), CONNECTOR (4), AND  
REDUCER BUSHING (5). Remove.

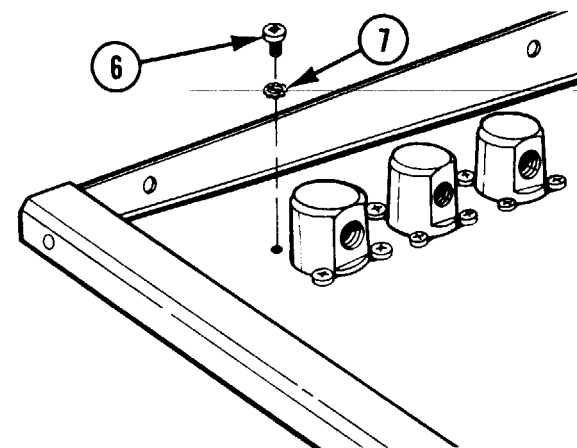
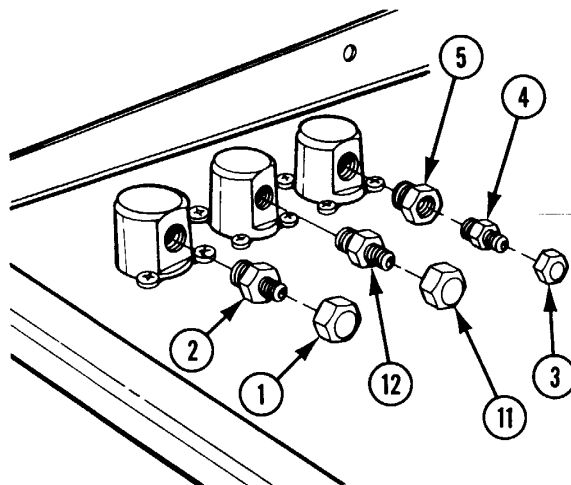


- 3 EIGHT MACHINE SCREWS (6) AND  
EIGHT LOCKWASHERS (7). Remove.

- 4 FUEL RETURN DISCHARGE BLOCK (8), LUBE OIL RETURN  
DISCHARGE BLOCK (9), AND TWO DISCHARGE BLOCK  
GASKETS (10). Remove.

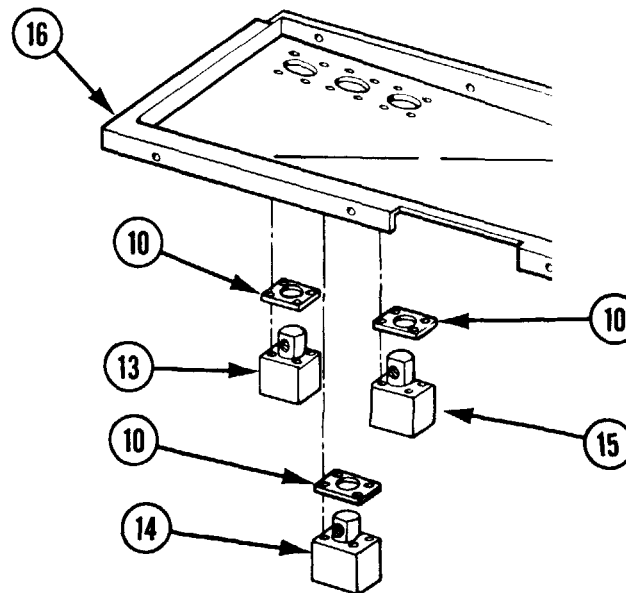


- 5 CAP (1) AND CONNECTOR (2).  
Remove.
- 6 CAP (11) AND CONNECTOR (12).  
Remove.
- 7 CAP (3), CONNECTOR (4), AND  
REDUCER BUSHING (5). Remove.



- 8 TWELVE MACHINE SCREWS (6) AND  
TWELVE LOCKWASHERS (7).  
Remove.

- 9 FUEL PRESSURE DISCHARGE BLOCK (13), PRIMER OUTLET  
DISCHARGE BLOCK (14), LUBE OIL PRESSURE DISCHARGE  
BLOCK (15), AND THREE DISCHARGE BLOCK GASKETS (10).  
Remove from tray and fitting assembly (16).

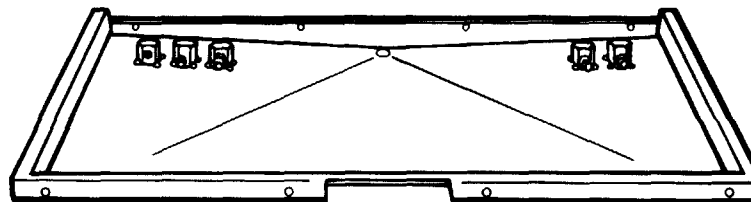


6.22. TRAY AND DISCHARGE BLOCKS ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSPECTION/SERVICING

TRAY AND DISCHARGE BLOCKS ASSEMBLY.

- a. Check for cracks, corrosion, and broken or missing parts.
- b. Check threads for good condition.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



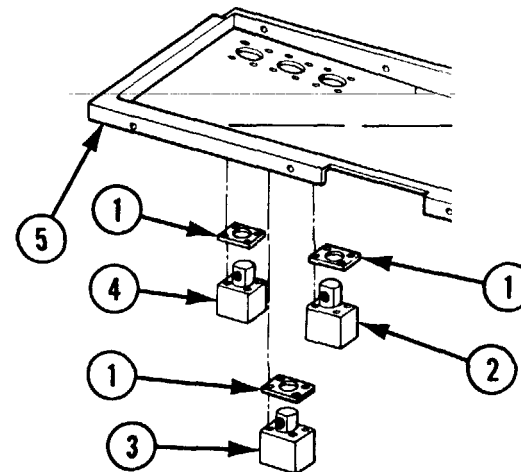
REPAIR

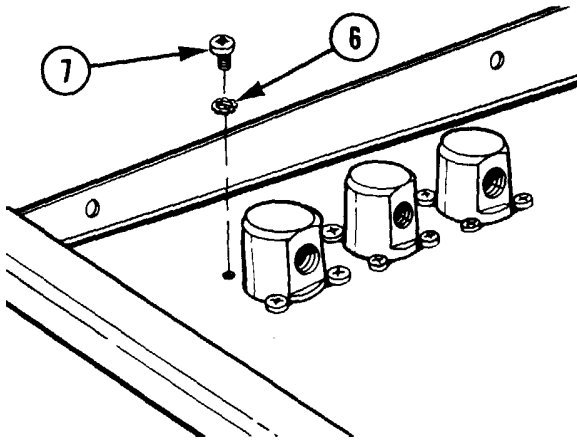
NOTE

Repair is by replacement of authorized parts (TM 949-387-24P) as required.

REASSEMBLY

- 1 THREE DISCHARGE BLOCK GASKETS (1), LUBE OIL PRESSURE DISCHARGE BLOCK (2), PRIMER OUTLET DISCHARGE BLOCK (3), AND FUEL PRESSURE DISCHARGE BLOCK (4). Install on tray and fitting assembly (5).



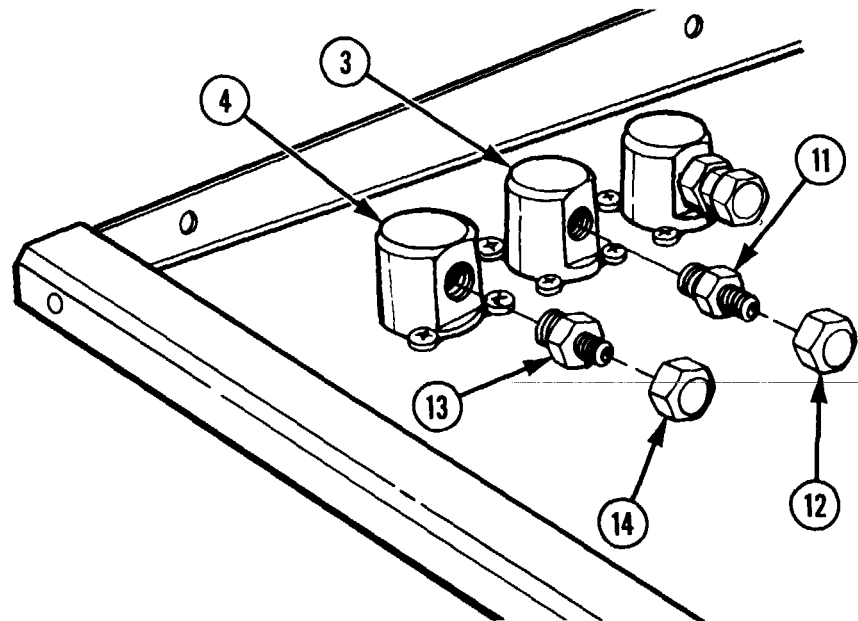
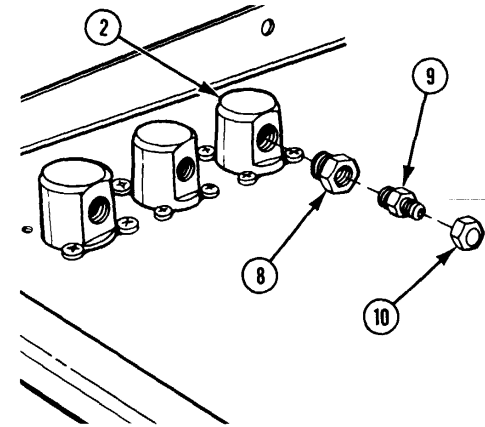


2 TWELVE LOCKWASHERS (6) AND TWELVE MACHINE SCREWS (7). Install.

4 CONNECTOR (11) AND CAP (12). Install on primer outlet discharge block (3).

5 CONNECTOR (13) AND CAP (14). Install on fuel pressure discharge block (4).

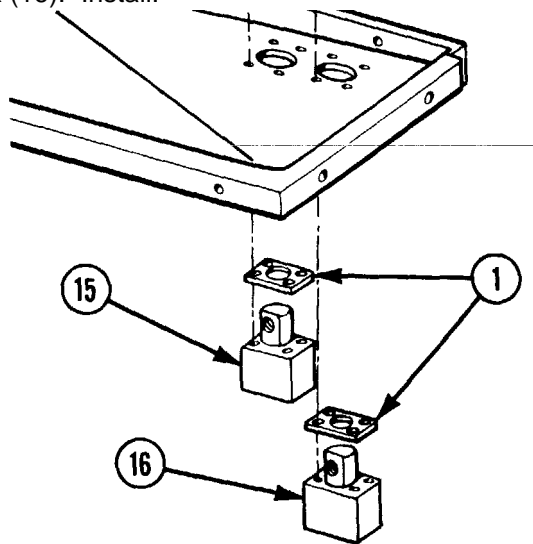
3 REDUCER BUSHING (8), CONNECTOR (9), AND CAP (10). Install on lube oil pressure discharge block (2).



6-22. TRAY AND DISCHARGE BLOCKS ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

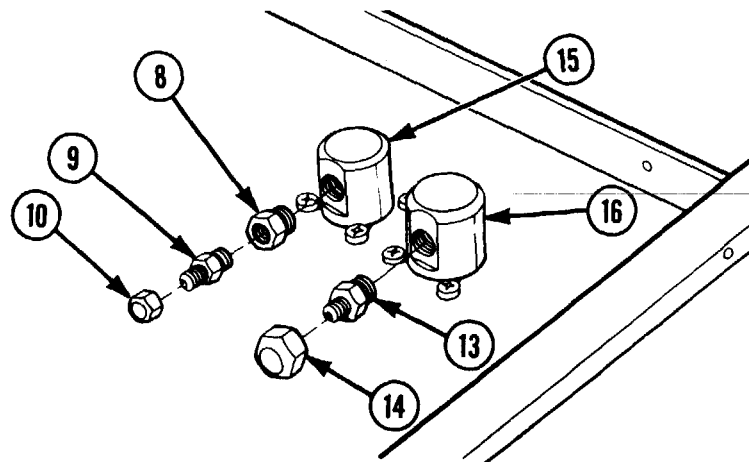
REASSEMBLY (cont)

6 TWO DISCHARGE BLOCK GASKETS (1), LUBE OIL RETURN DISCHARGE BLOCK (15), AND FUEL RETURN DISCHARGE BLOCK (16). Install.

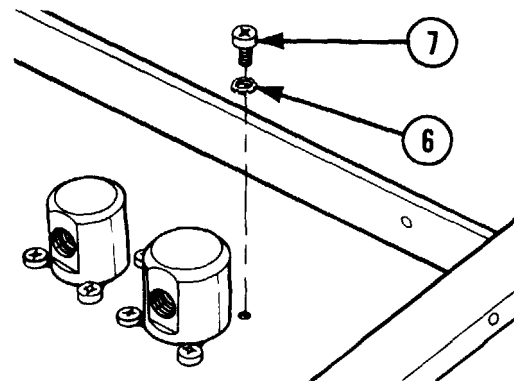


8 REDUCER BUSHING (8), CONNECTOR (9), AND CAP (10). Install on lube oil return discharge block (15).

9 CONNECTOR (13) AND CAP (14). Install on fuel return discharge block (16).

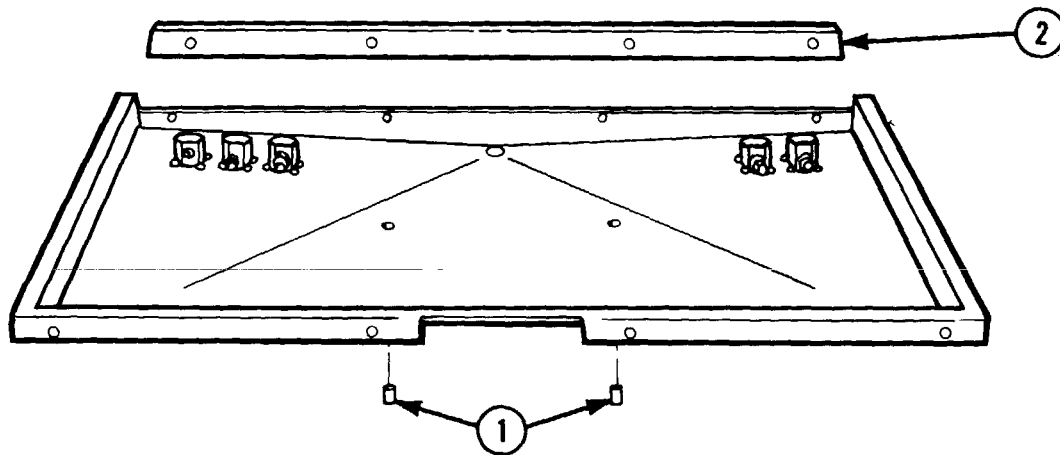


7 EIGHT LOCKWASHERS (6) AND EIGHT MACHINE SCREWS (7). Install.



**INSTALLATION**

1 TWO SPACERS (1) AND PANEL GASKET (2). Install.

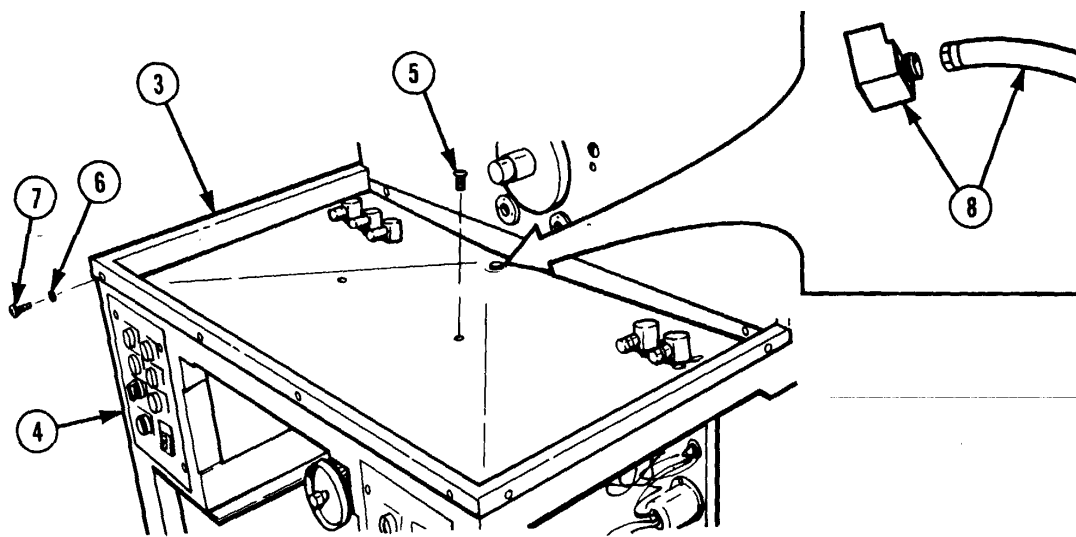


2 TRAY AND DISCHARGE BLOCKS ASSEMBLY (3). Install on tester (4).

3 TWO MACHINE SCREWS (5). Install.

4 TWELVE LOCKWASHERS (6) AND TWELVE MACHINE SCREWS (7). Install.

5 HOSE ASSEMBLY (8). Install on tray and discharge blocks assembly (3) from underneath.



6-22. TRAY AND DISCHARGE BLOCKS ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

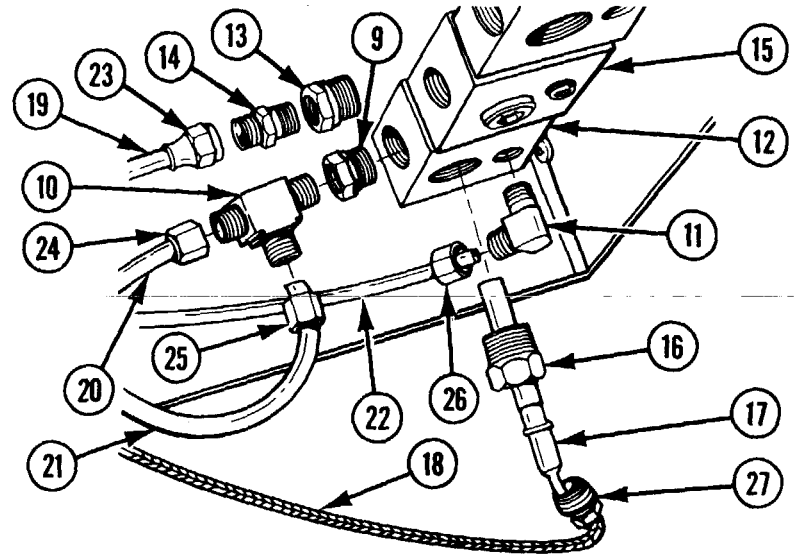
INSTALLATION (cont)

- 6 REDUCER BUSHING (9), MALE RUN TEE (10), AND MALE ELBOW (11). Install on lube oil pressure discharge block (12).
- 7 REDUCER BUSHING (13) AND MALE CONNECTOR (14). Install on primer outlet discharge block (15).

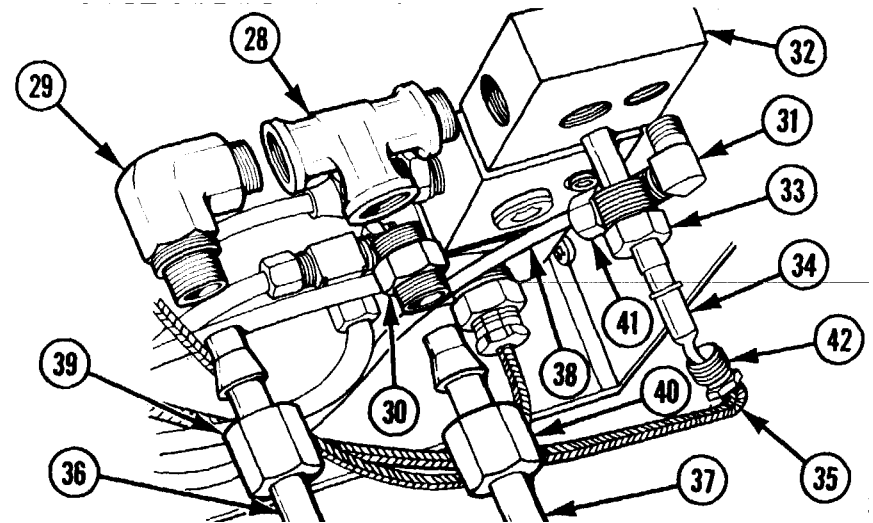
**CAUTION**

**Bulbs are fragile. Use care when removing or installing bulbs to prevent damage.**

- 8 ADAPTER (16) AND BULB (17) WITH BRAIDED TUBE (18). Install on lube oil pressure discharge block (12).
- 9 FOUR COPPER TUBINGS (19 THRU 22). Install.
- 10 FIVE NUTS (23 THRU 27). Tighten.

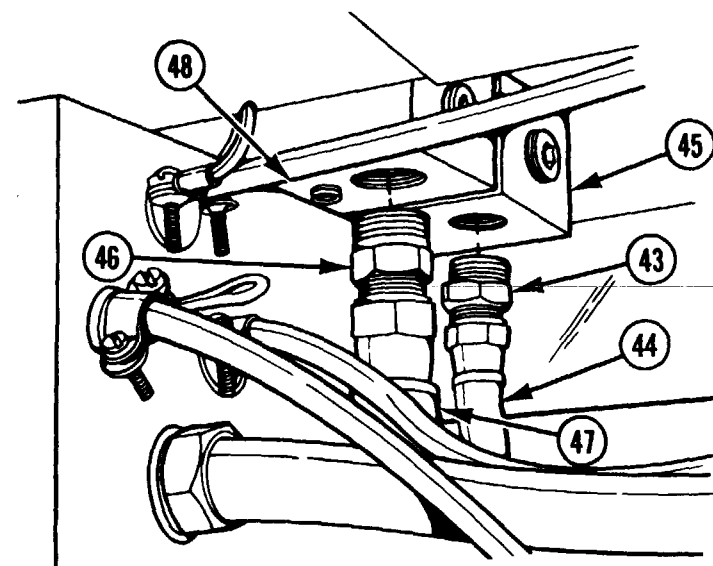


- 11 MALE TEE (28), MALE ELBOW (29), MALE CONNECTOR (30), AND MALE ELBOW (31). Install on fuel pressure discharge block (32).
- 12 ADAPTER (33) AND BULB (34) WITH BRAIDED TUBE (35). Install.
- 13 THREE COPPER TUBINGS (36, 37, AND 38). Install.
- 14 FOUR NUTS (39 THRU 42). Tighten.





- 15 MALE CONNECTOR (43) AND HOSE ASSEMBLY (44). Install on lube oil return discharge block (45).
- 16 MALE CONNECTOR (46) AND HOSE ASSEMBLY (47). Install on fuel return discharge block (48).



**6-23. WASTE TANK ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |                |                 |
|----------------|-----------------|
| a. Removal     | d. Reassembly   |
| b. Disassembly | e. Installation |
| c. Repair      |                 |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-0077-7033)

**References**

TM 9-4910-387-24P

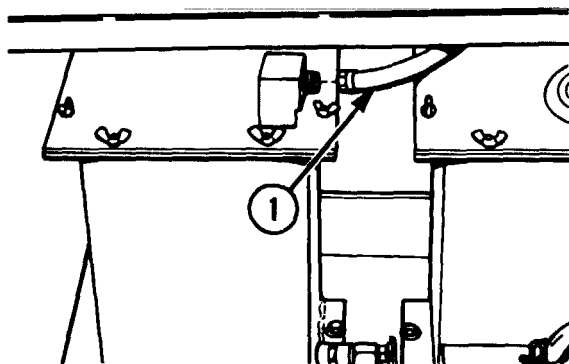
**Equipment Conditions**

- Main power source to tester is turned off
- 4-35 Front panel is removed
- 4-40 RH panel assembly is removed
- 3-26 Waste tank assembly is empty

6-23. WASTE TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL

1 HOSE (1). Disconnect.

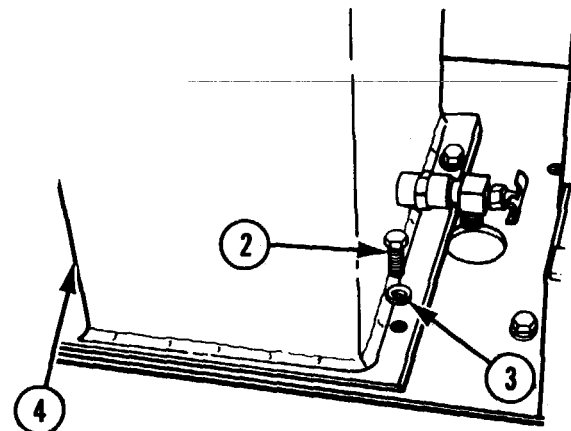


2 FOUR SCREWS (2) AND FOUR WASHERS (3). Remove.

NOTE

Lift waste tank assembly out through front of tester.

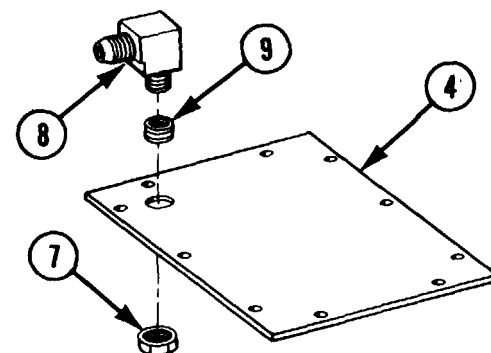
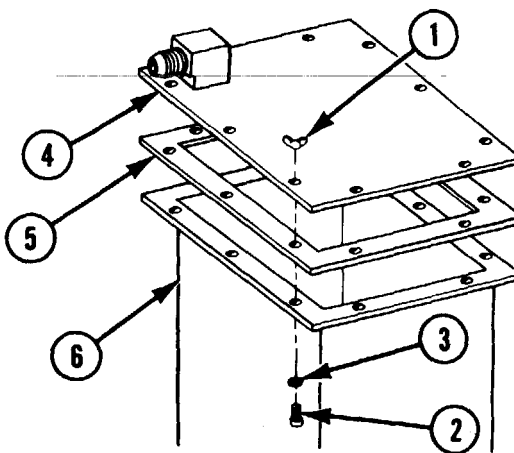
3 WASTE TANK ASSEMBLY (4). Remove.



DISASSEMBLY

1 TEN WINGNUTS (1), TEN SCREWS (2), AND TEN WASHERS (3). Remove.

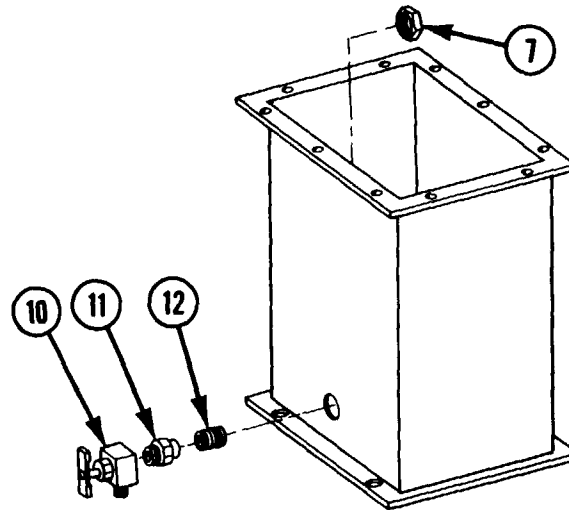
2 COVER (4) AND GASKET (5). Remove from tank (6).



3 NUT (7), MALE ELBOW (8), AND NIPPLE (9). Remove from cover (4).

REPAIR

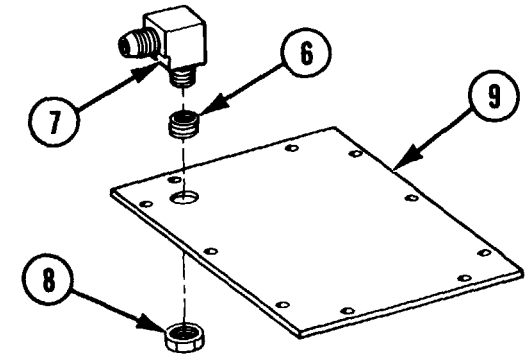
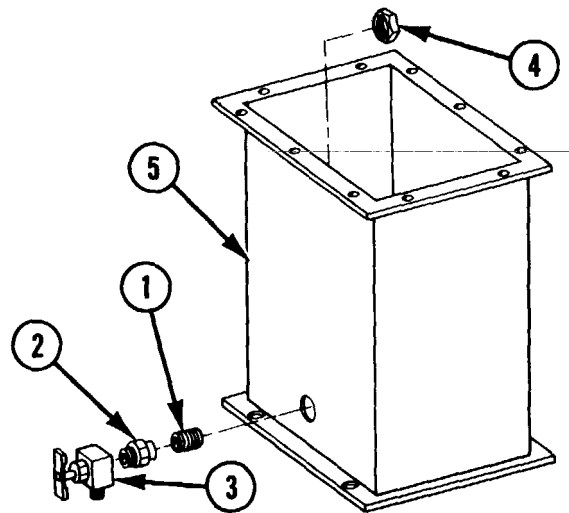
- 4 NUT (7), VALVE (10), PIPE COUPLING (11), AND NIPPLE (12). Remove.



**NOTE**  
Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

REASSEMBLY

- 1 NIPPLE (1), PIPE COUPLING (2), VALVE (3), AND NUT (4). Install on tank (5).

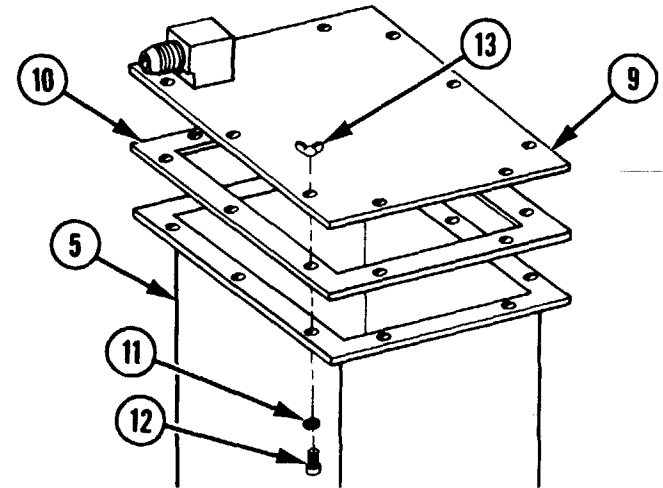


- 2 NIPPLE (6), MALE ELBOW (7), AND NUT (8). Install on cover (9).

**6-23. WASTE TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

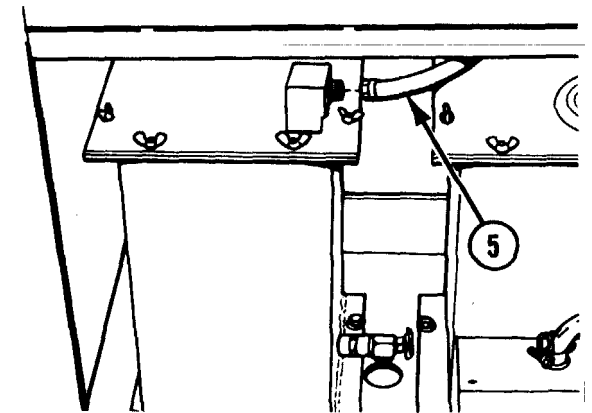
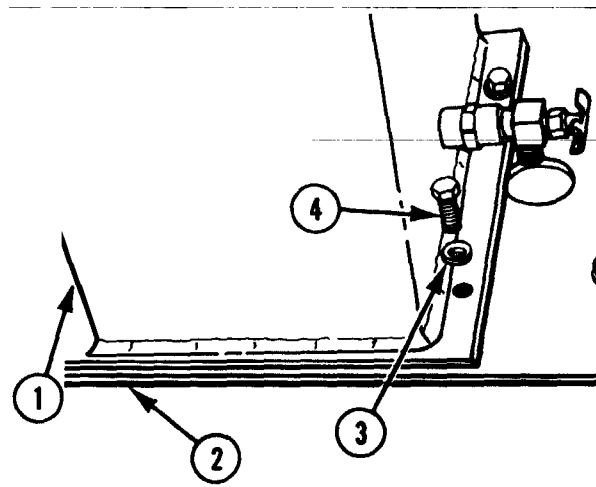
**REASSEMBLY (cont)**

- 3 GASKET (10) AND COVER (9). Install on tank (5) and secure with ten washers (11), ten screws (12), and ten wingnuts (13).



**INSTALLATION**

- 1 WASTE TANK ASSEMBLY (1). Install in tester (2) and secure with four washers (3) and four screws (4).



2 HOSE (5). Install.

**6-24. LUBE OIL TANK ASSEMBLY - MAINTENANCE INSTRUCTIO**

**THIS TASK COVERS:**

- |                |                 |
|----------------|-----------------|
| a. Removal     | d. Reassembly   |
| b. Disassembly | e. Installation |
| c. Repair      | f. Test         |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Equipment Conditions**

Main power source to tester is turned off  
4-42 LH panel assembly is removed

**References**

TM 9-4910-387-24P

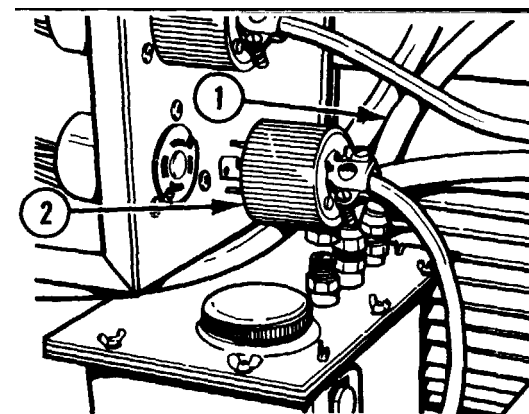
**Troubleshooting References**

- 6-55 LUBE HEAT light does not light, LUBE HEAT switch is on
- 6-63 Lube oil will not heat to desired temperature

**REMOVAL**

**NOTE**  
Tag hoses before disconnecting.

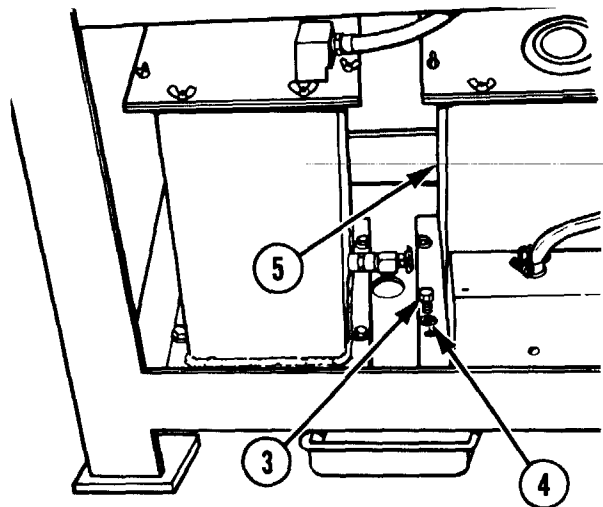
- 1 THREE HOSES (1). Disconnect.
- 2 MALE CONNECTOR PLUG (2). Disconnect.



6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

- 3 FOUR SCREWS (3) AND FOUR WASHERS (4). Remove.
- 4 LUBE OIL TANK ASSEMBLY (5). Remove.

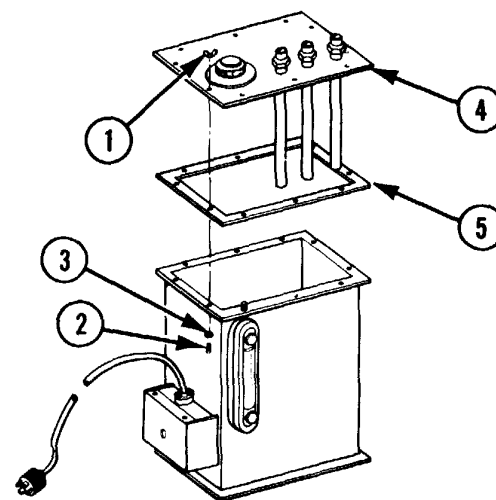


- 1 TEN WINGNUTS (1), NINE SCREWS (2), AND NINE WASHERS (3). Remove.
- 2 COVER ASSEMBLY (4) AND TANK GASKET (5). Remove.

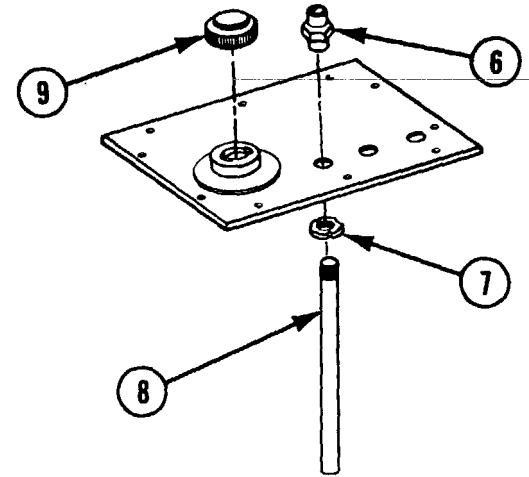
DISASSEMBLY

NOTE

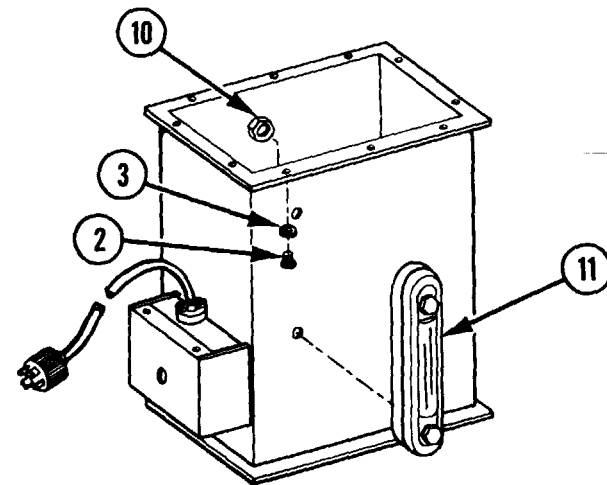
Screw and washer above lube oil level sight. Gage will not come out until lube oil level sight is removed.



- 3 THREE FEMALE CONNECTORS (6), THREE SEAL NUTS (7), AND THREE TANK SUCTION TUBES (8). Remove.
- 4 CAP (9). Remove.



- 5 TWO SELF-LOCKING NUTS (10). Remove.
- 6 LUBE OIL LEVEL SIGHT GAGE (11). Remove.
- 7 SCREW (2) AND WASHER (3). Remove.

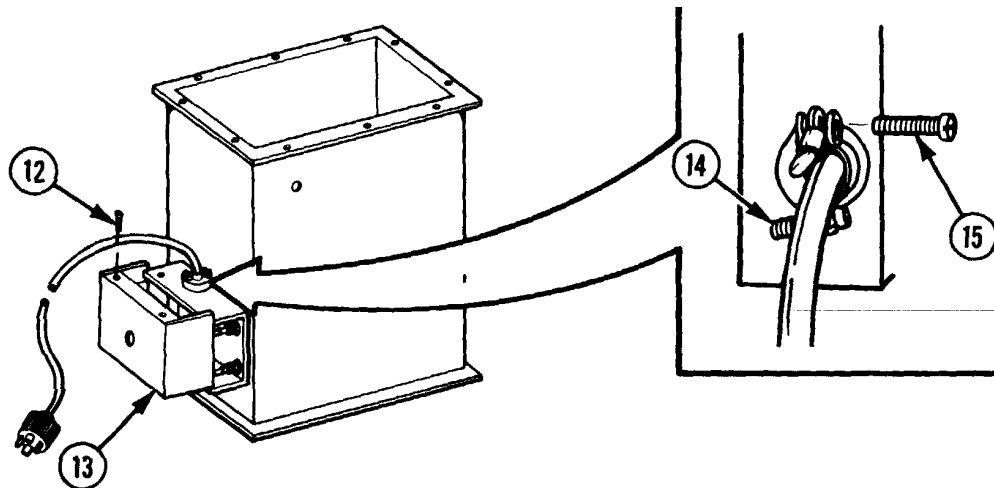




6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

- 8 FOUR TAPPING SCREWS (12). Remove.
- 9 TERMINAL BOX COVER (13). Remove.
- 10 SCREW (14). Loosen.
- 11 SCREW (15). Remove.



**NOTE**

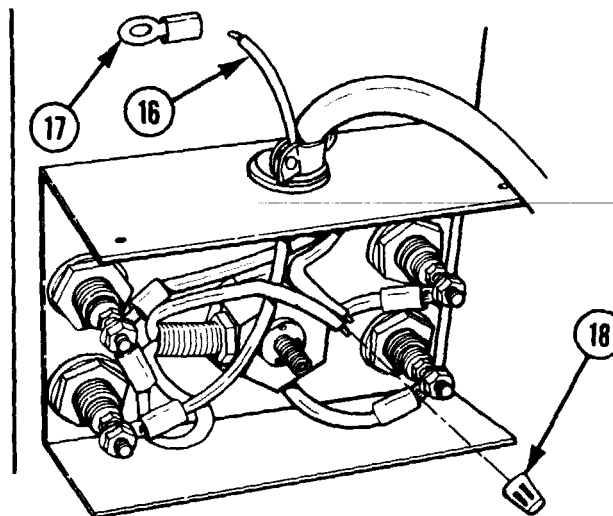
Tag all wires before disconnecting.

- 12 GREEN WIRE (16) WITH TERMINAL LUG (17). Disconnect.

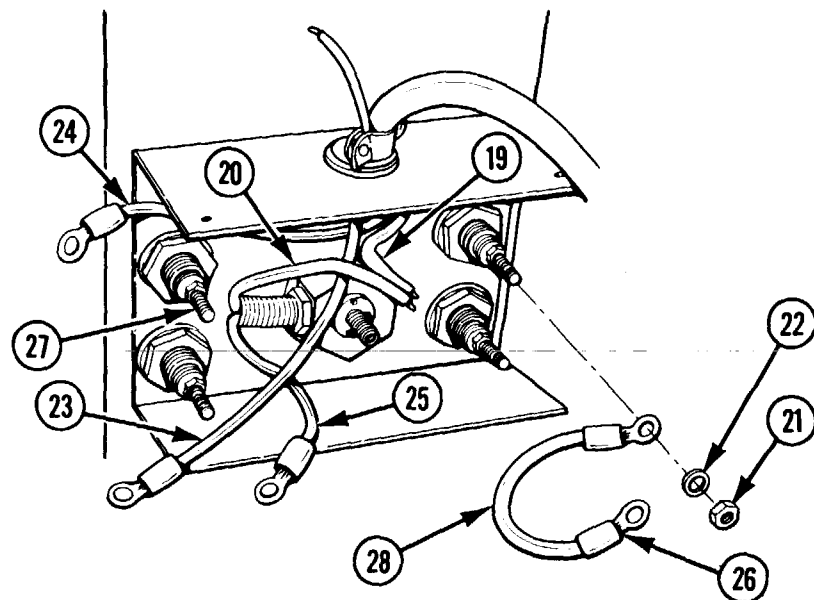
**NOTE**

Do not remove terminal lug unless replacement is necessary.

- 13 TERMINAL LUG (17). Remove if necessary.
- 14 WIRE NUT (18). Remove.



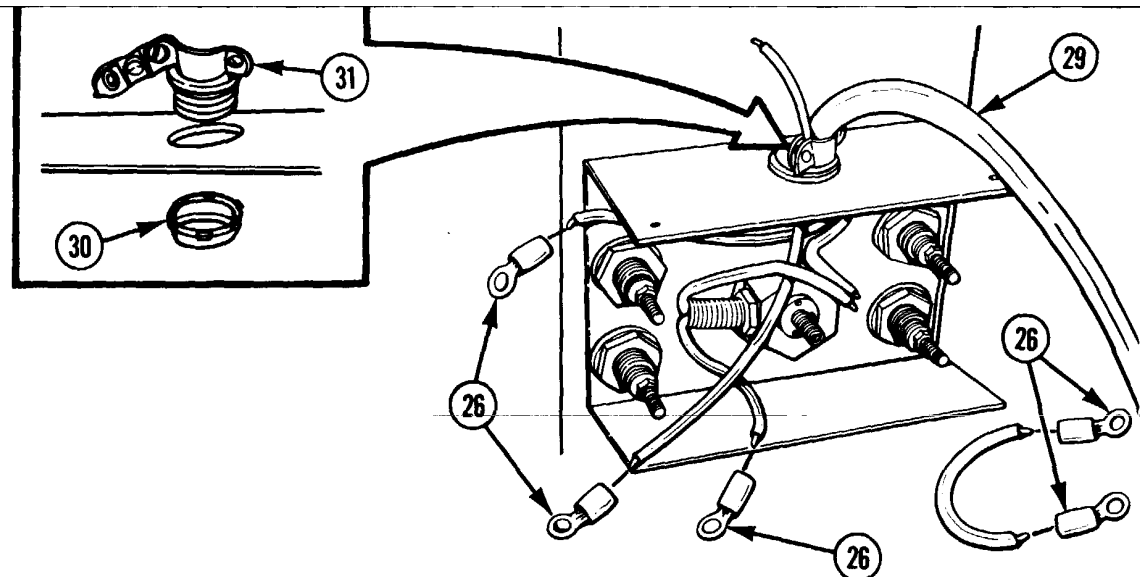
- 15 TWO WHITE WIRES (19 AND 20). Separate.
- 16 FOUR NUTS (21) AND FOUR FLAT WASHERS (22). Remove.
- 17 BLACK WIRE (23), RED WIRE (24), AND WHITE WIRE (25), WITH ONE TERMINAL LUG (26) EACH. Disconnect from two heater terminals (27).
- 18 WHITE WIRE (28) WITH TWO TERMINAL LUGS (26). Remove.



**NOTE**

**Do not remove terminal lugs unless replacement is necessary.**

- 19 FIVE TERMINAL LUGS (26). Remove if necessary.
- 20 WIRE CABLE (29). Remove.
- 21 NUT (30). Remove.
- 22 STRAIGHT BOX CONNECTOR (31). Remove.

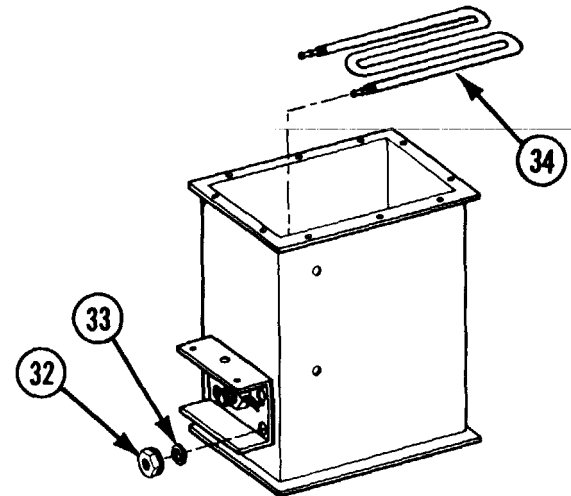


6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

23 FOUR NUTS (32) AND FOUR WASHERS (33). Remove.

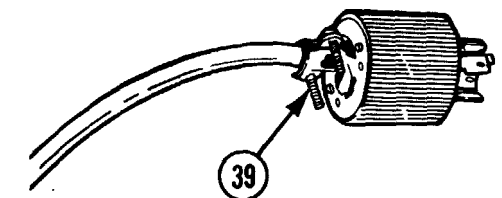
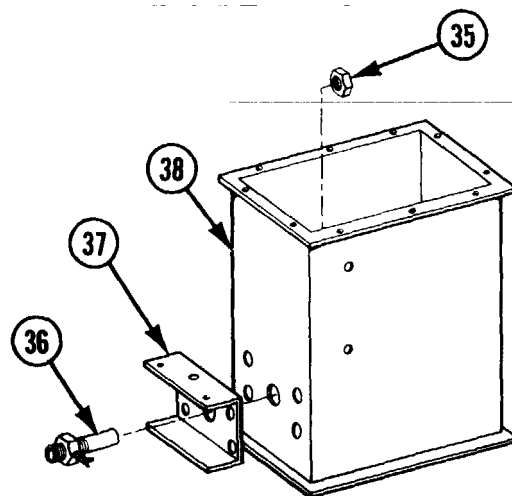
24 TWO TANK HEATER ELEMENTS (34). Remove.



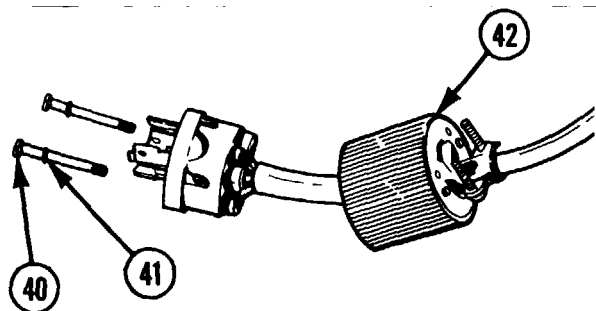
25 SEAL NUT (35). Remove.

26 THERMOSTAT (36). Remove.

27 TERMINAL BOX (37). Remove from tank (38).

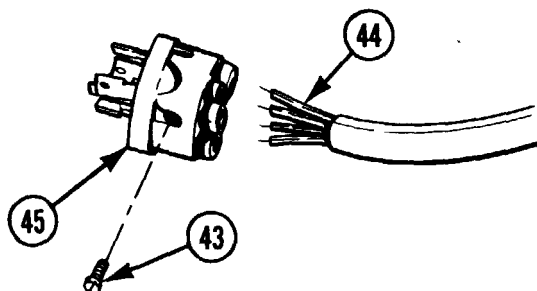


28 TWO SCREWS (39). Loosen.



- 29 TWO SCREWS (40) AND TWO LOCKWASHERS (41). Remove.
- 30 COVER (42). Remove.

**REPAIR**



- 31 FOUR SCREWS (43). Remove.
- 32 FOUR WIRES (44). Remove from male connector plug (45).

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

For replacement of wire cable, refer also to fig. 1, app D.

**REASSEMBLY**

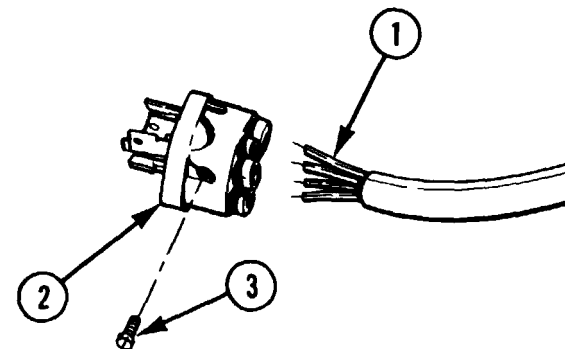
**TABLE 6-3. CONNECTOR PLUG POLARITY**

Wire Color	Connector Plug Terminals
White	X
Red	Y
Black	Z
Green	O

**NOTE**

Wire male connector plug according to table 6-3.

- 1 FOUR WIRES (1). Install on male connector plug (2) and secure with four screws (3).

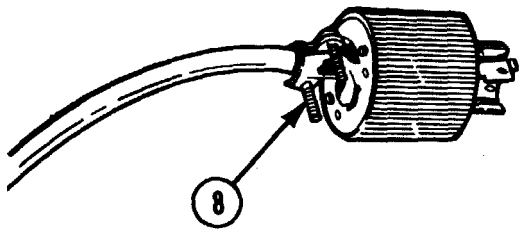
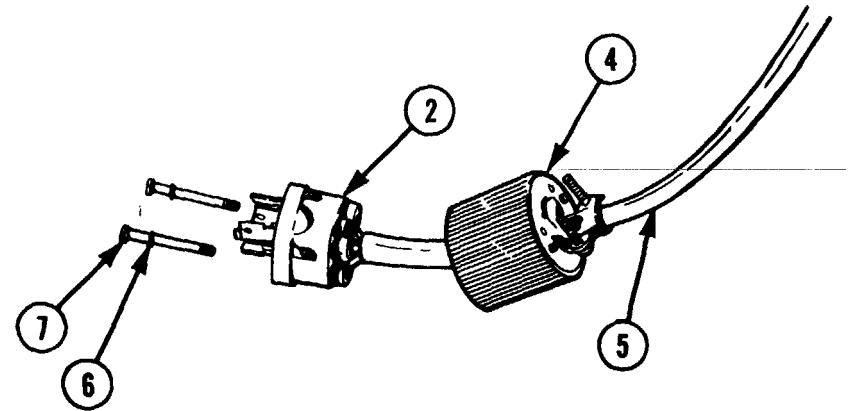


6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

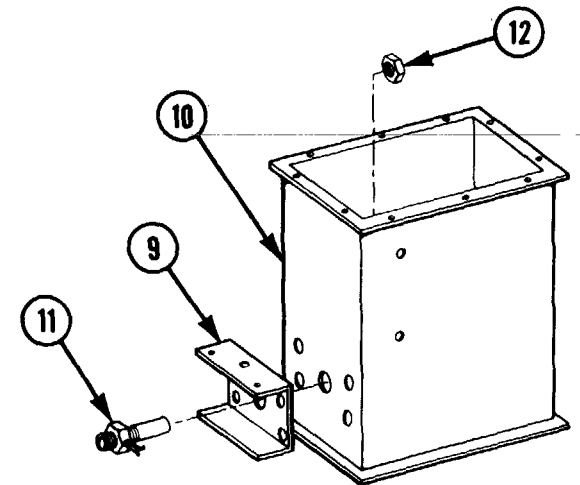
2 COVER (4).

- a. Slide on wire cable (5).
- b. Install on male connector plug (2).
- c. Secure with two lockwashers (6) and two screws (7).

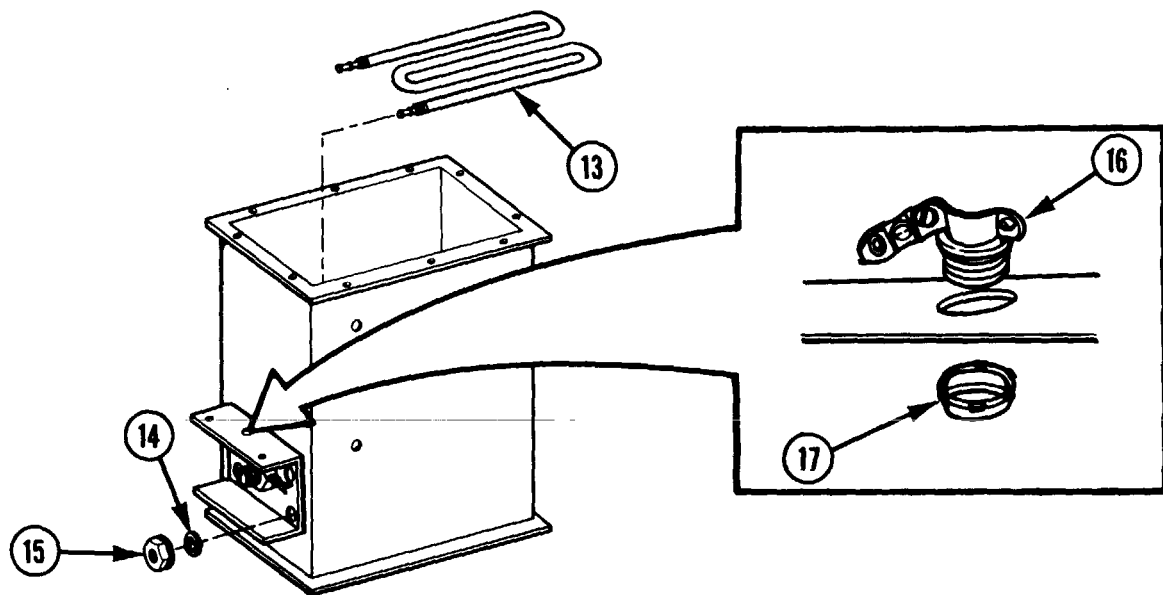


3 TWO SCREWS (8). Tighten.

- 4 TERMINAL BOX (9). Install on tank (10).
- 5 THERMOSTAT (11) AND SEAL NUT (12). Install.



- 6 TWO TANK HEATER ELEMENTS (13), FOUR WASHERS (14), AND FOUR NUTS (15). Install.
- 7 STRAIGHT BOX CONNECTOR (16) AND NUT (17). Install.

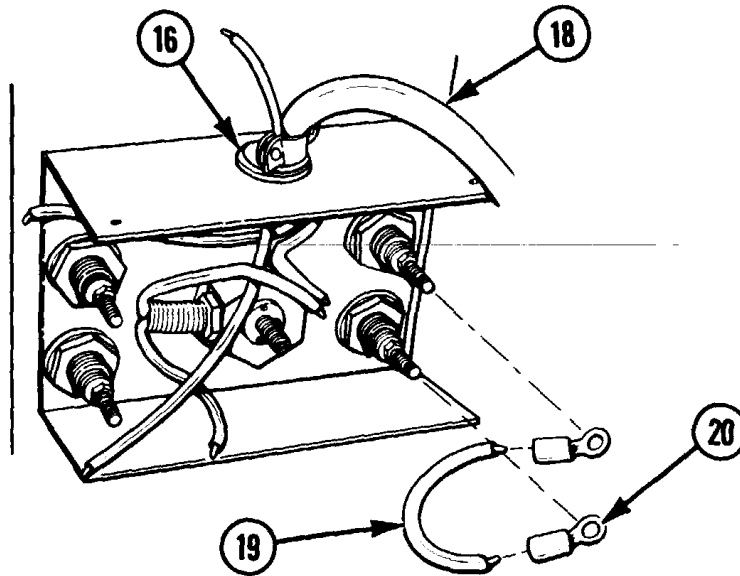


- 8 WIRE CABLE (18). Insert through straight box connector (16).

**NOTE**

Before connecting wires, refer to wiring diagram, figure 6-1, on page 6-146.

- 9 WHITE WIRE (19).
  - a. Install two terminal lugs (20), if previously removed.
  - b. Install.

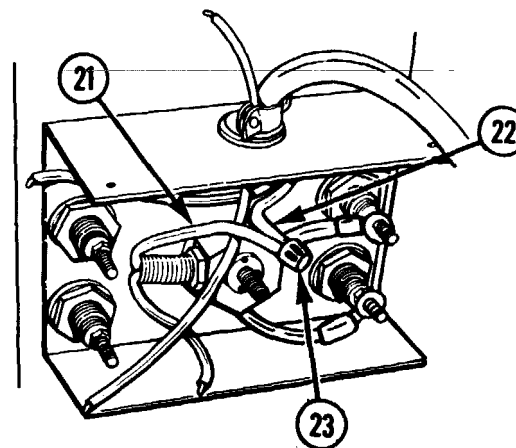


**6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY (cont)**

**10** WHITE WIRE (21) AND WHITE WIRE (22). Connect.

**11** WIRE NUT (23). Install.



**12** WHITE WIRE (24) AND RED WIRE (25).

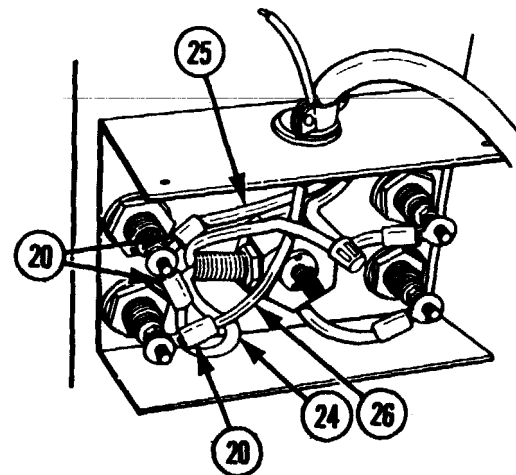
a. Install one terminal lug (20) on each wire, if previously removed.

b. Install.

**13** BLACK WIRE (26).

a. Install one terminal lug (20), if previously removed.

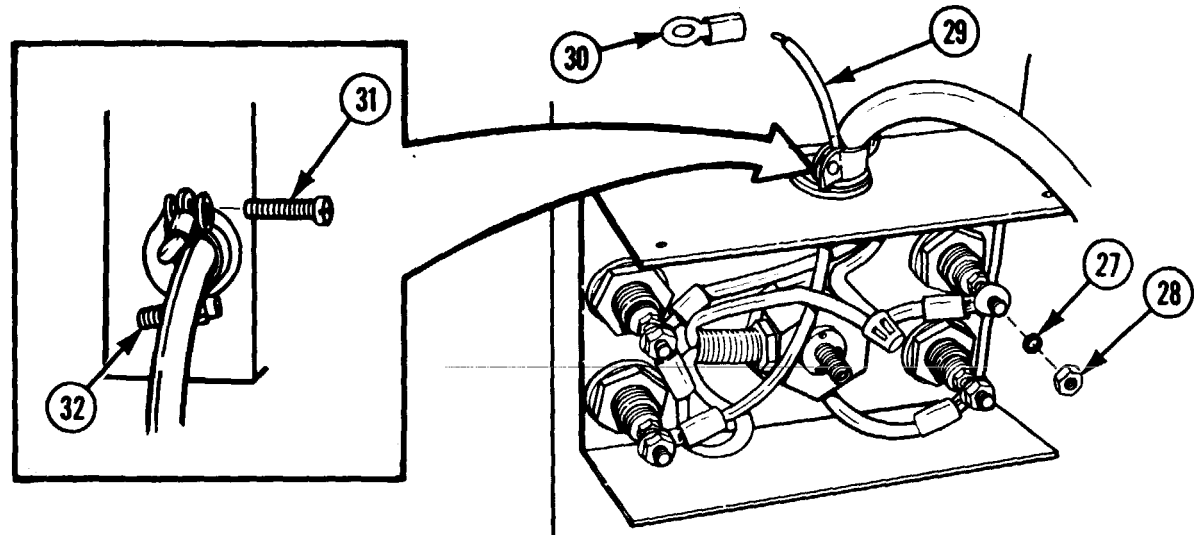
b. Install.



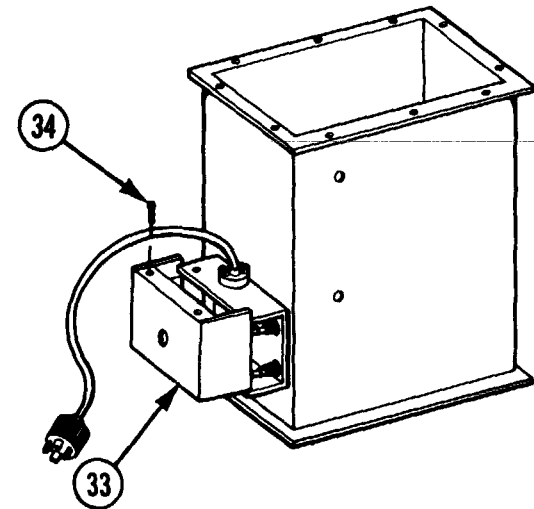
14 FOUR FLAT WASHERS (27) AND FOUR NUTS (28). Install.

15 GREEN WIRE (29).

- a. Install one terminal lug (30), if previously removed.
- b. Install.
- c. Secure with screw (31).
- d. Tighten screw (32).



16 TERMINAL BOX COVER (33). Install and secure with four tapping screws (34).

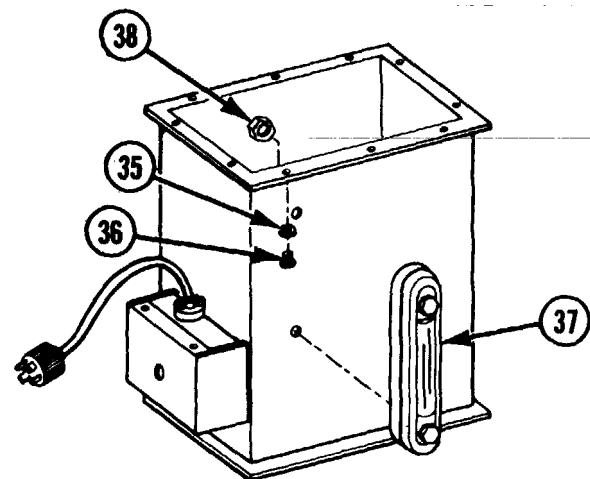




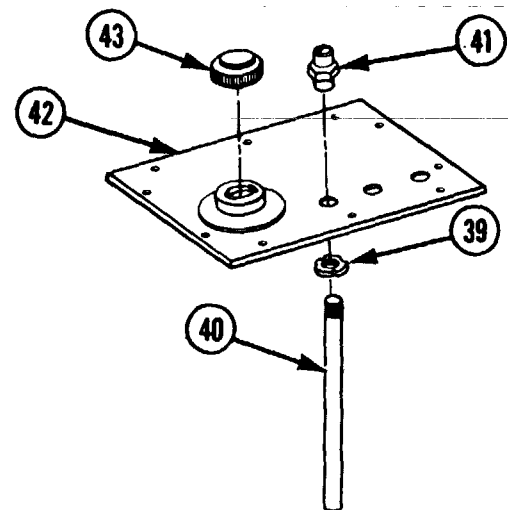
**6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY (cont)**

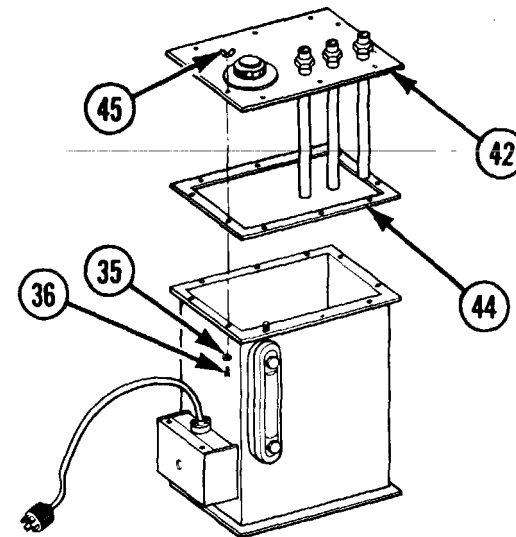
- 17 WASHER (35) AND SCREW (36). Install.
- 18 LUBE OIL LEVEL SIGHT GAGE (37). Install and secure with two self-locking nuts (38).



- 19 THREE SEAL NUTS (39), THREE TANK SUCTION TUBES (40), AND THREE FEMALE CONNECTORS (41). Install on cover assembly (42).
- 20 CAP (43). Install.

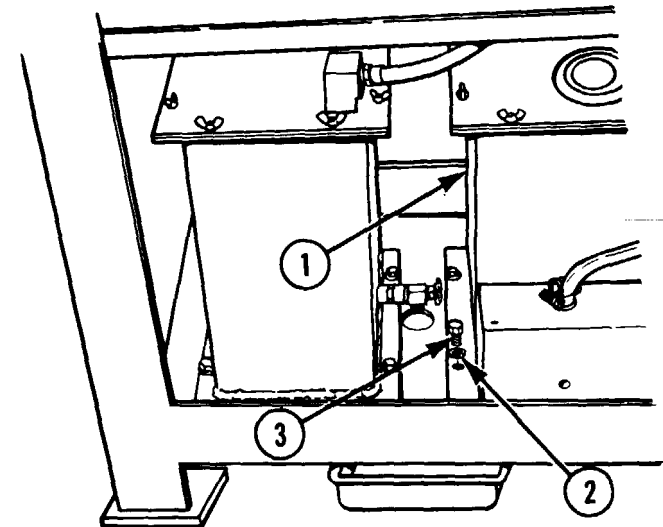


- 21 TANK GASKET (44) AND COVER ASSEMBLY (42). Install.
- 22 NINE WASHERS (35), NINE SCREWS (36), AND TEN WING-NUTS (45).



**INSTALLATION**

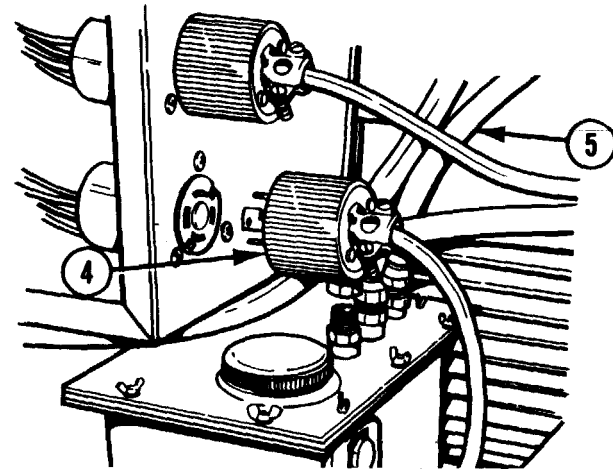
- 1 LUBE OIL TANK ASSEMBLY (1). Install.
- 2 FOUR WASHERS (2) AND FOUR SCREWS (3). Install.



6-24. LUBE OIL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

- 3 MALE CONNECTOR PLUG (4). Install.
- 4 THREE HOSES (5). Install.



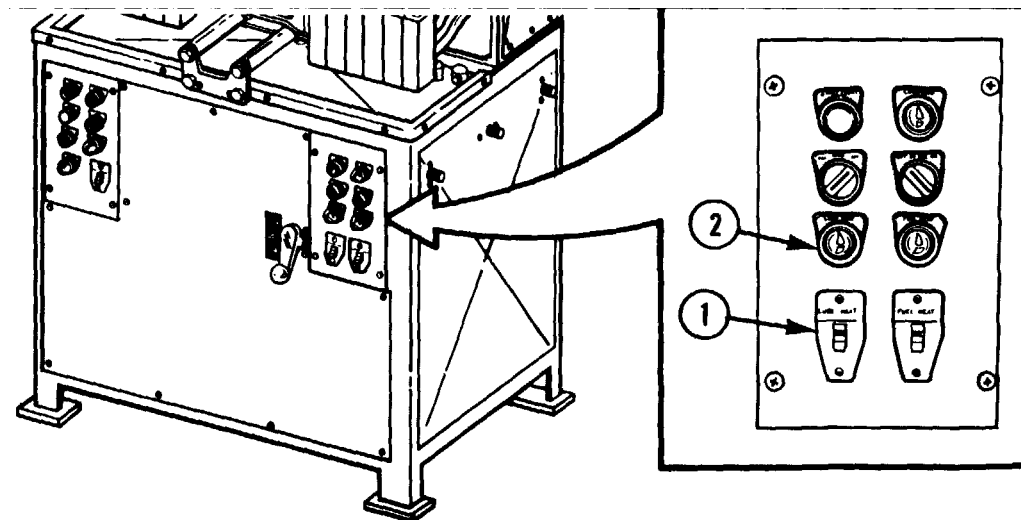
TEST

- 1 MAIN POWER SOURCE. Turn on.
- 2 LUBE HEAT SWITCH (1). Turn on.

**NOTE**

**LUBE HEAT** light indicates whether heater is operating or not.

- 3 LUBE HEAT LIGHT (2). Check that it lights.



**6-25. FUEL TANK ASSEMBLY - MAINTENANCE INSTRUCTION**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Repair
- d. Reassembly
- e. Installation
- f. Test

**INITIAL SETUP**

**Tools and Special Tools**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Equipment Conditions**

Main power source to tester is turned off

4-42 LH panel assembly is removed

**References**

TM 9-4910-387-24P

**Troubleshooting References**

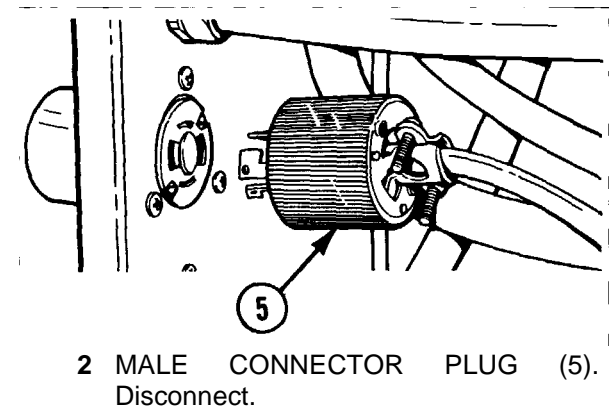
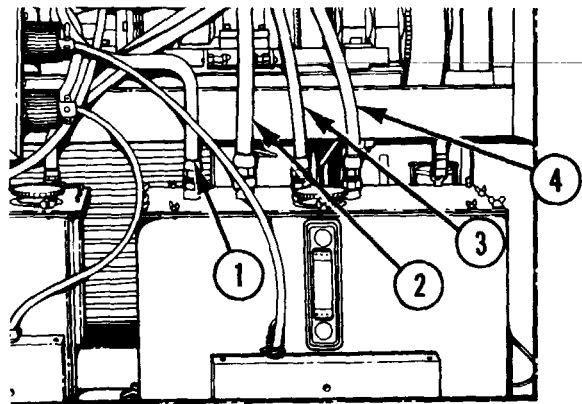
6-62 Fuel will not heat to desired temperature

6-48 FUEL HEAT light does not light, FUEL HEAT switch is on

**REMOVAL**

**NOTE**  
Tag hoses before disconnecting.

- 1 FOUR HOSES (1 THRU 4). Disconnect.

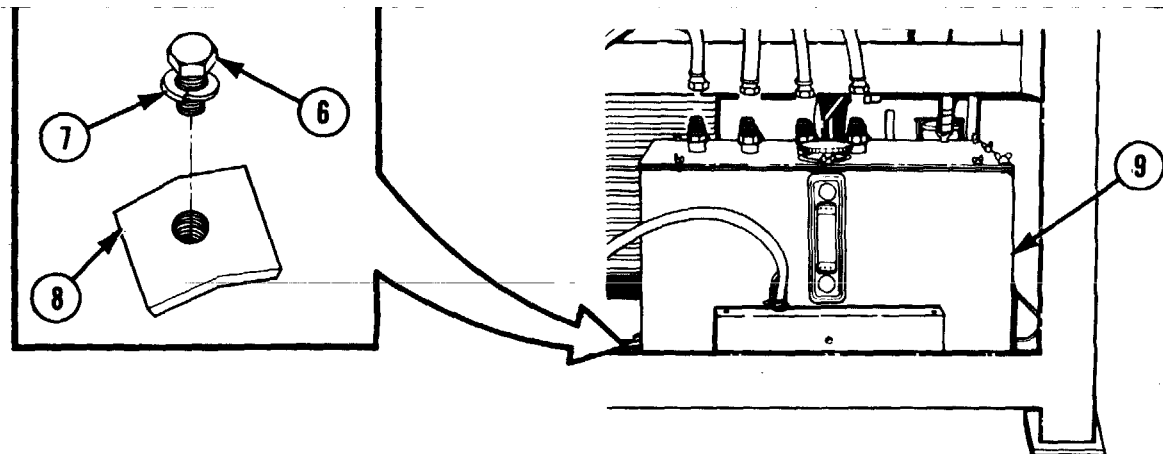


- 2 MALE CONNECTOR PLUG (5). Disconnect.

6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

- 3 FOUR SCREWS (6), FOUR WASHERS (7), AND FOUR CLAMPS (8). Remove.
- 4 FUEL TANK ASSEMBLY (9). Remove.

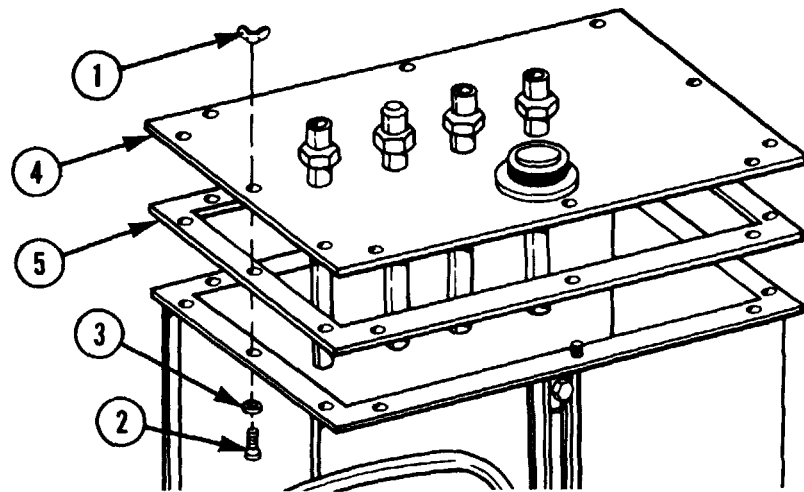


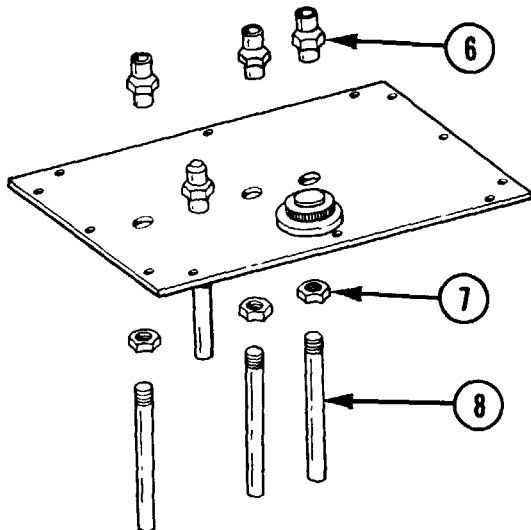
DISASSEMBLY

NOTE

Screw and washer above fuel level sight gage will not come out until fuel level sight gage is removed.

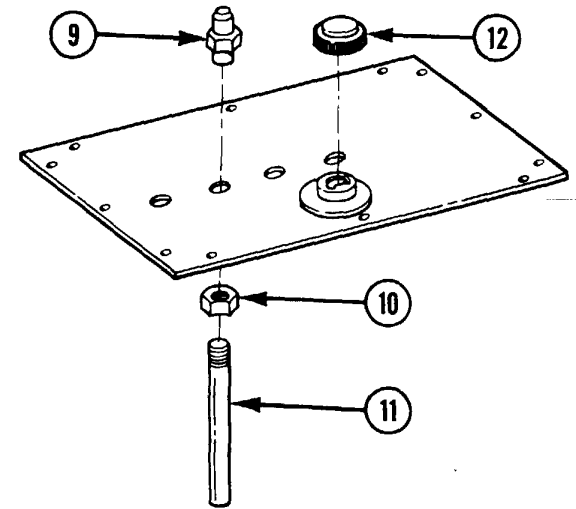
- 1 TWELVE WINGNUTS (1), ELEVEN SCREWS (2), AND ELEVEN WASHERS (3). Remove.
- 2 COVER ASSEMBLY (4) AND FUEL TANK GASKET (5). Remove.



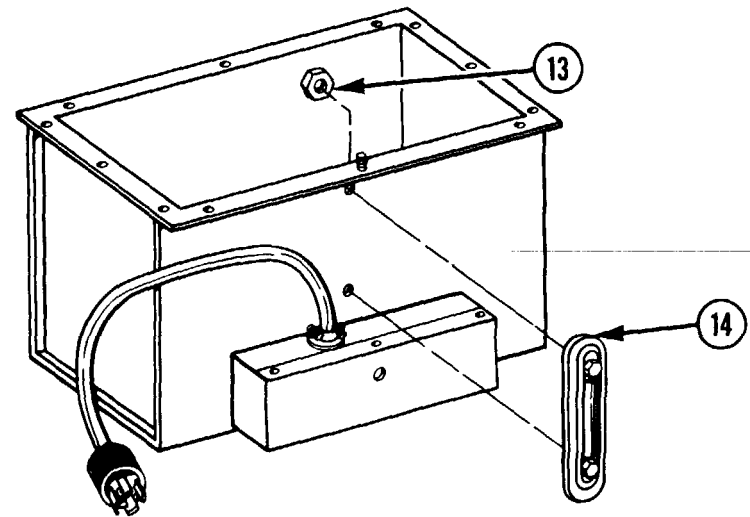


3 THREE FEMALE CONNECTORS (6), THREE SEAL NUTS (7), AND THREE TANK SUCTION TUBES (8). Remove.

4 FEMALE CONNECTOR (9), SEAL NUT (10), AND TANK DRAIN TUBE (11). Remove.  
 5 CAP (12). Remove.



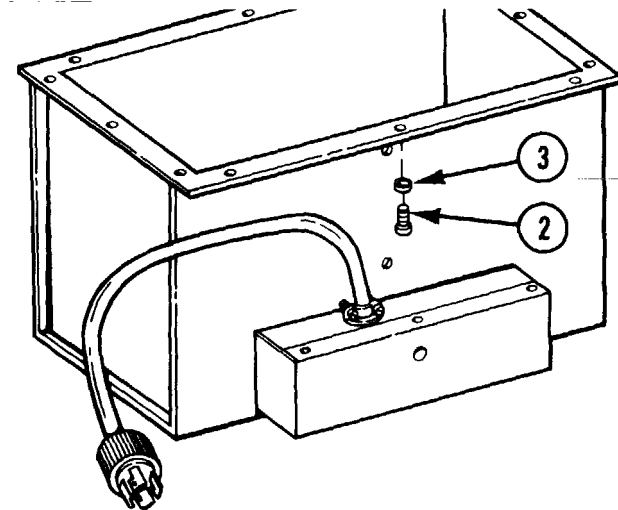
6 TWO SELF-LOCKING NUTS (13). Remove.  
 7 FUEL LEVEL SIGHT GAGE (14). Remove.



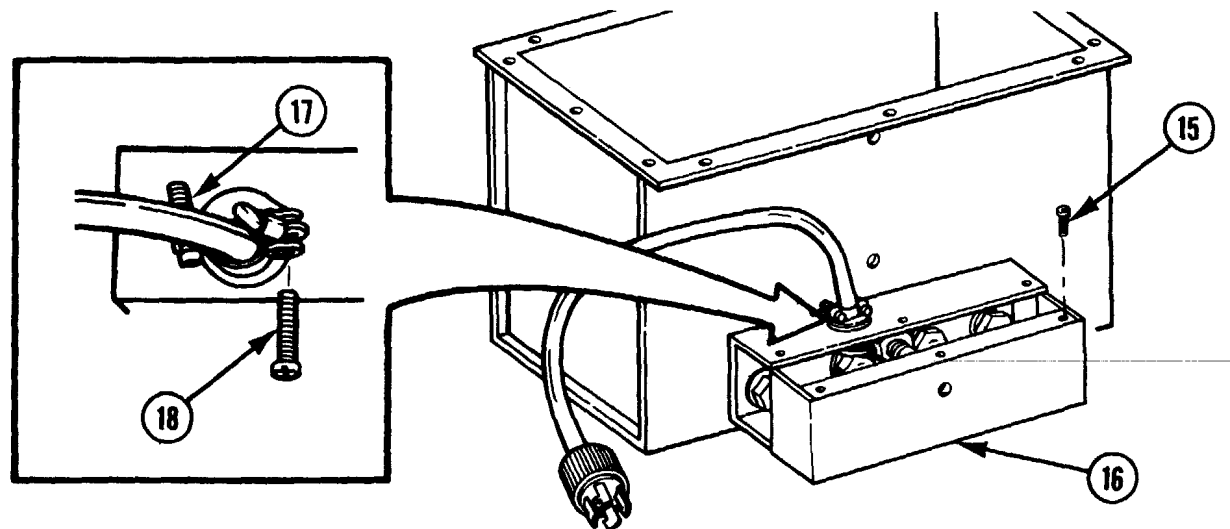
6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

8 SCREW (2) AND WASHER (3). Remove.



- 9 SIX TAPPING SCREWS (15). Remove.
- 10 TERMINAL BOX COVER (16). Remove.
- 11 SCREW (17). Loosen.
- 12 SCREW (18). Remove.



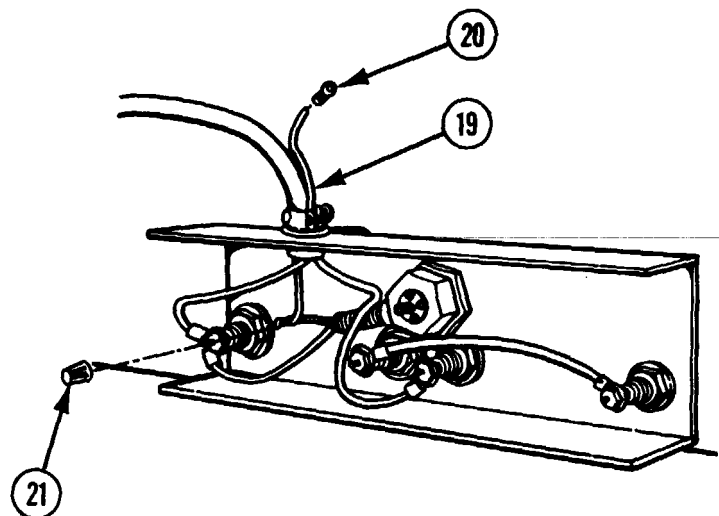
**NOTE**  
**Tag all wires before disconnecting.**

13 GREEN WIRE (19) WITH TERMINAL LUG (20). Disconnect.

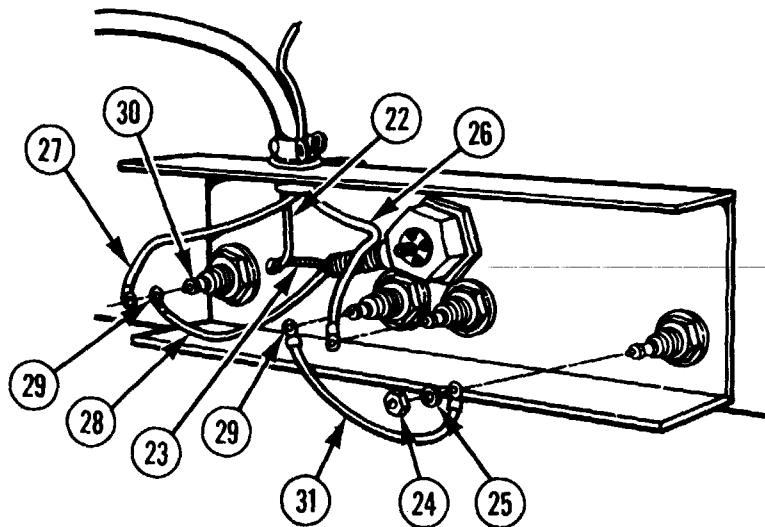
**NOTE**  
**Do not remove terminal lug unless replacement is necessary.**

14 TERMINAL LUG (20). Remove if necessary.

15 WIRE NUT (21). Remove.



- 16 TWO WHITE WIRES (22 AND 23). Separate.
- 17 FOUR NUTS (24) AND FOUR FLAT WASHERS (25). Remove.
- 18 BLACK WIRE (26), RED WIRE (27), AND WHITE WIRE (28), WITH ONE TERMINAL LUG (29) EACH. Disconnect from two heater terminals (30).
- 19 WHITE WIRE (31) WITH TWO TERMINAL LUGS (29). Remove.





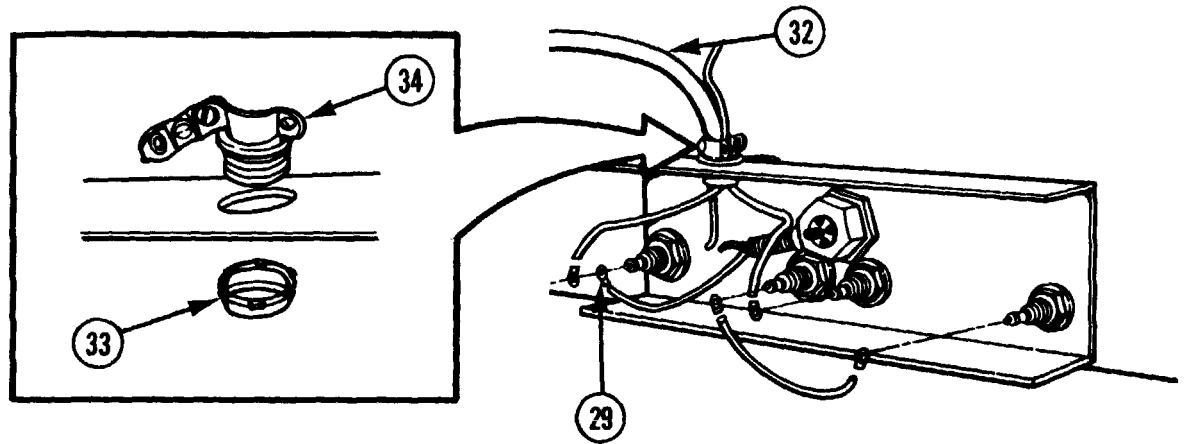
6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

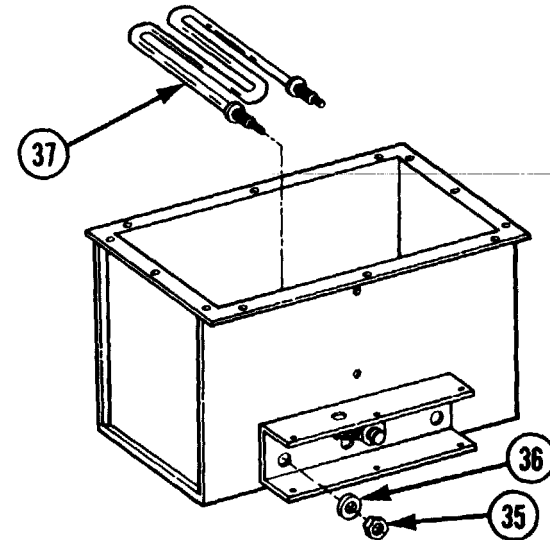
**NOTE**

Do not remove terminal lugs unless replacement is necessary.

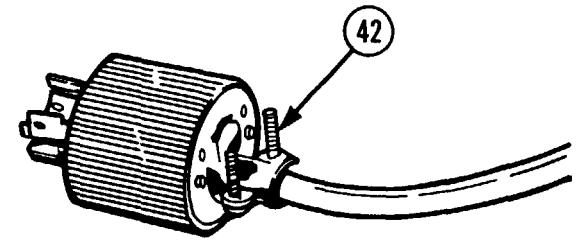
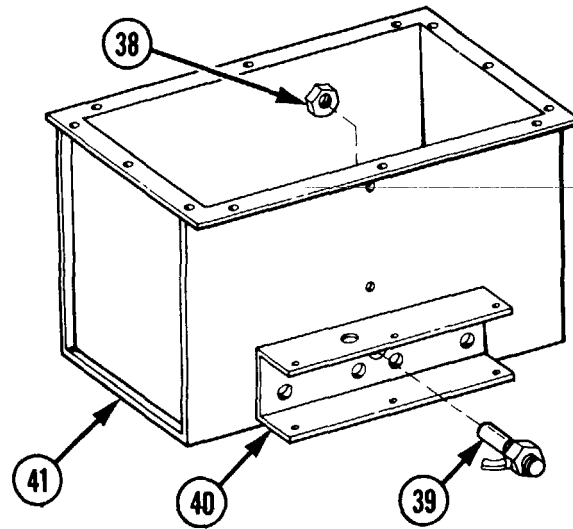
- 20 FIVE TERMINAL LUGS (29). Remove if necessary.
- 21 WIRE CABLE (32). Remove.
- 22 NUT (33). Remove.
- 23 STRAIGHT BOX CONNECTOR (34). Remove.



- 24 FOUR NUTS (35) AND FOUR WASHERS (36). Remove.
- 25 TWO TANK HEATER ELEMENTS (37). Remove.

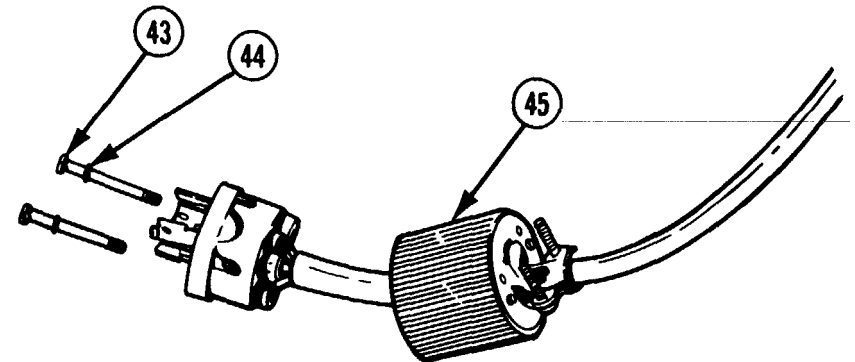


- 26 SEAL NUT (38). Remove.
- 27 THERMOSTAT (39). Remove.
- 28 TERMINAL BOX (40). Remove from tank (41).



- 29 TWO SCREWS (42). Loosen.

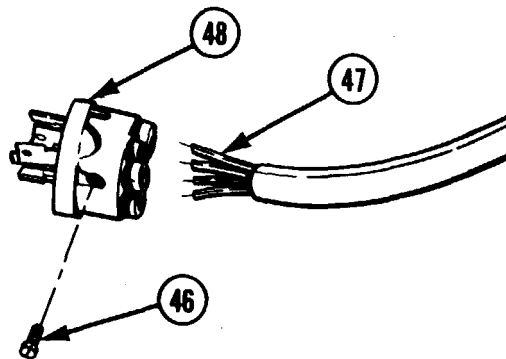
- 30 TWO SCREWS (43) AND TWO LOCKWASHERS (44). Remove.
- 31 COVER (45). Remove.



6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

- 32 FOUR SCREWS (46). Remove.
- 33 FOUR WIRES (47). Remove from male connector plug (48).



REPAIR

NOTE

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

For replacement of wire cable, refer also to fig. 1, app D.

REASSEMBLY

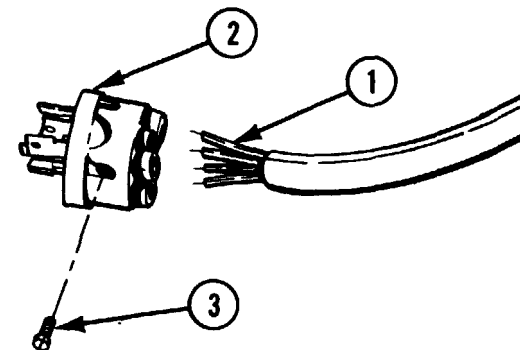
TABLE 6-4. CONNECTOR PLUG POLARITY

Wire Color	Connector Plug Terminals
White or Yellow	X
Red	Y
Black	Z
Green	O

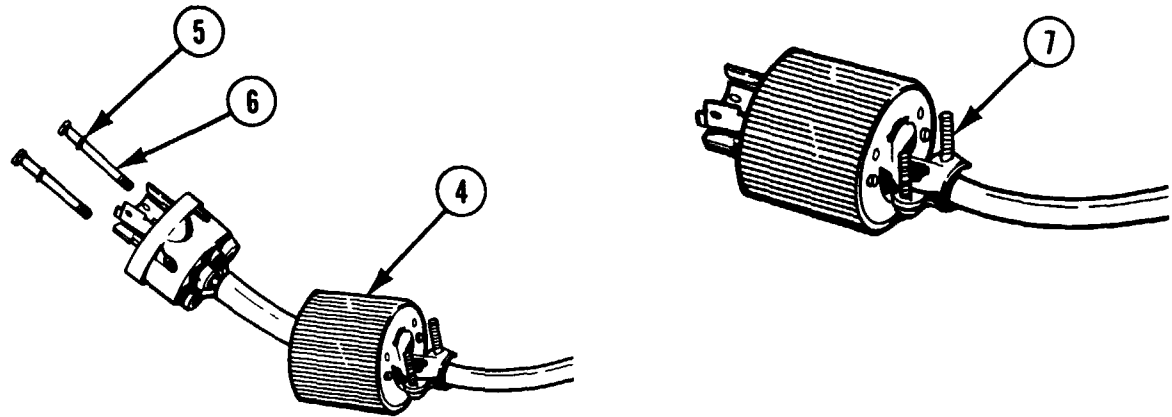
NOTE

Wire male connector plug according to table 6-4.

- 1 FOUR WIRES (1). Install on male connector plug (2) and secure with four screws (3).



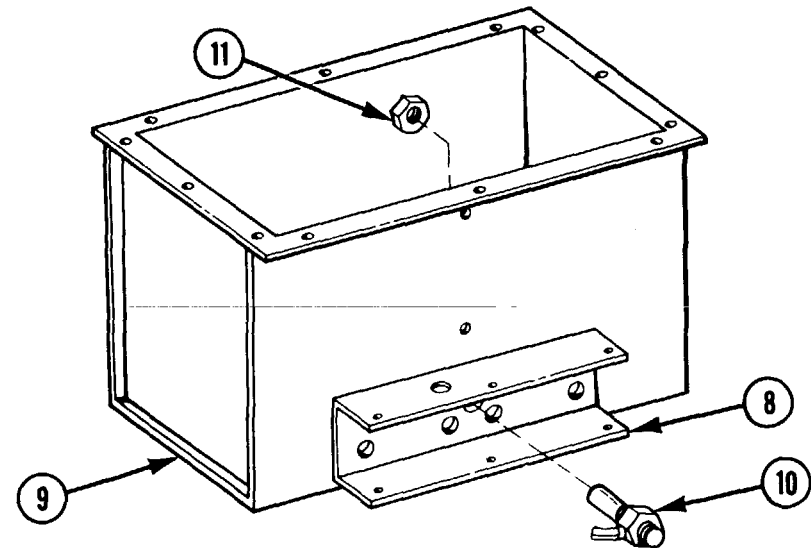
2 COVER (4). Install and secure with two lockwashers (5) and two screws (6).



3 TWO SCREWS (7). Tighten.

4 TERMINAL BOX (8). Install on tank (9).

5 THERMOSTAT (10) AND SEAL NUT (11). Install.

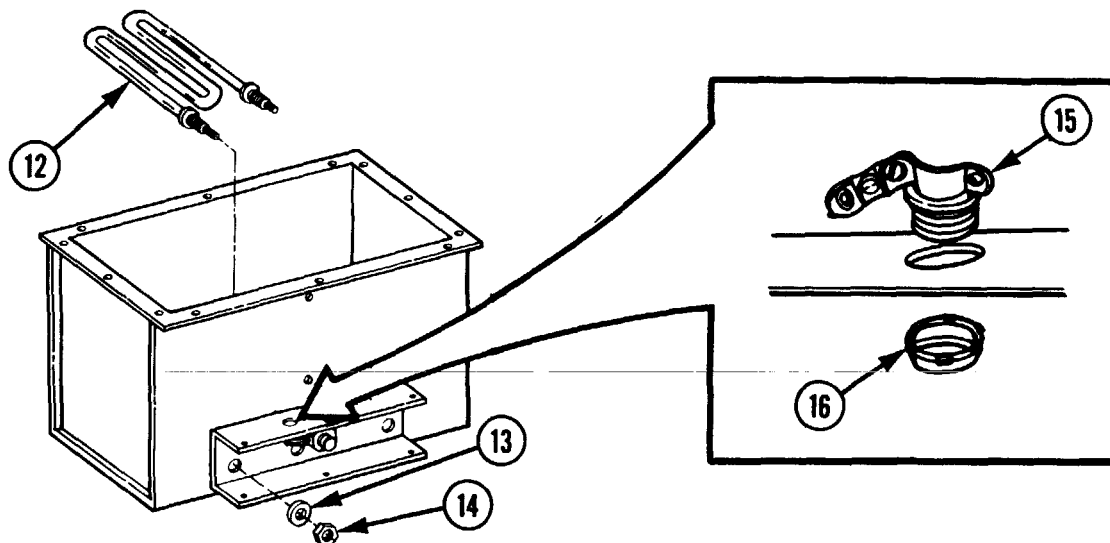


6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

6 TWO TANK HEATER ELEMENTS (12), FOUR WASHERS (13), AND FOUR NUTS (14). Install.

7 STRAIGHT BOX CONNECTOR (15) AND NUT (16). Install.



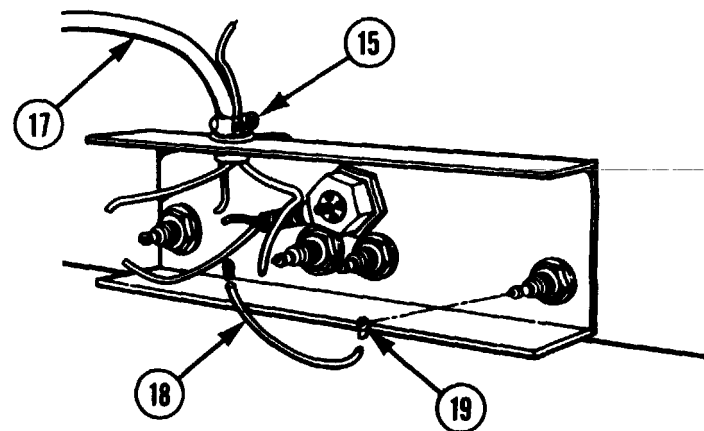
8 WIRE CABLE (17). Insert through straight box connector (15).

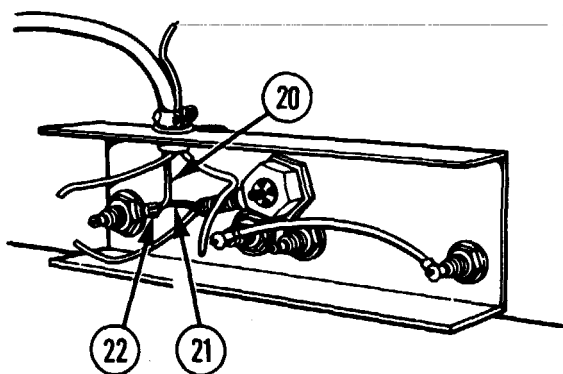
**NOTE**

Before connecting wires, refer to wiring diagram, figure 6-1, on page 6-146.

9 WHITE WIRE (18).

- a. Install two terminal lugs (19), if previously removed.
- b. Install.





10 WHITE WIRE (20) AND WHITE WIRE (21). Connect.

11 WIRE NUT (22). Install.

14 FOUR FLAT WASHERS (26) AND FOUR NUTS (27). Install.

15 GREEN WIRE (28).

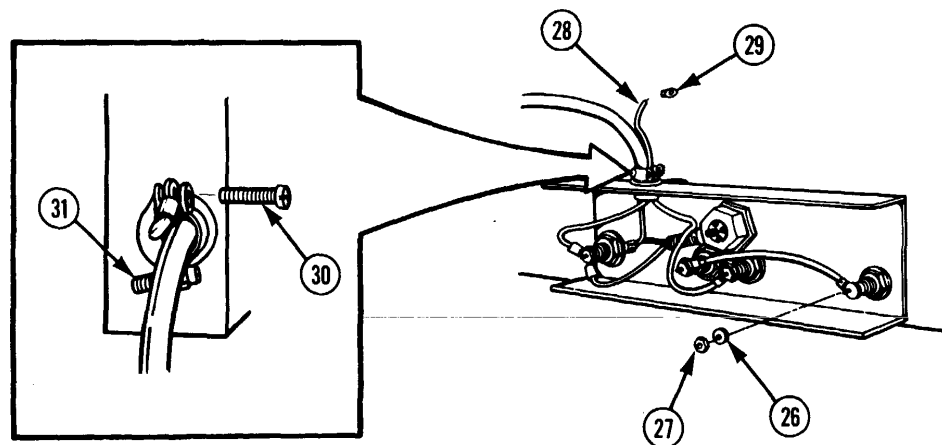
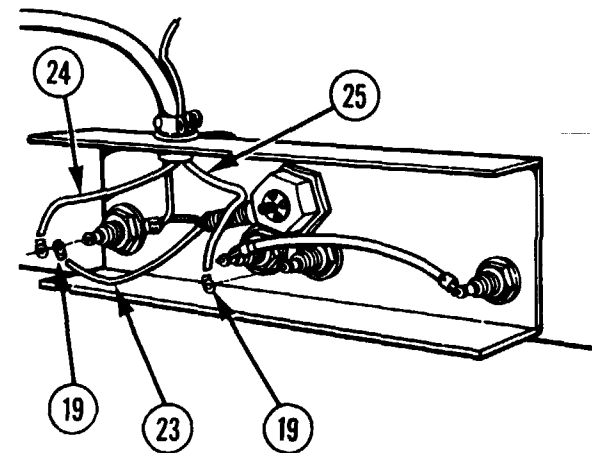
- a. Install one terminal lug (29), if previously removed.
- b. Install.
- c. Secure with screw (30).
- d. Tighten screw (31).

12 WHITE WIRE (23) AND RED WIRE (24).

- a. Install one terminal lug (19) on each wire, if previously removed.
- b. Install.

13 BLACK WIRE (25).

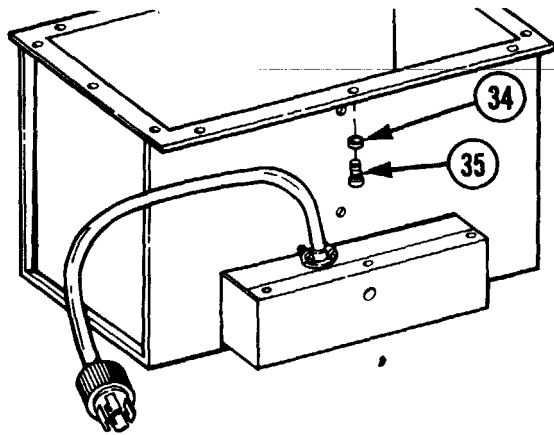
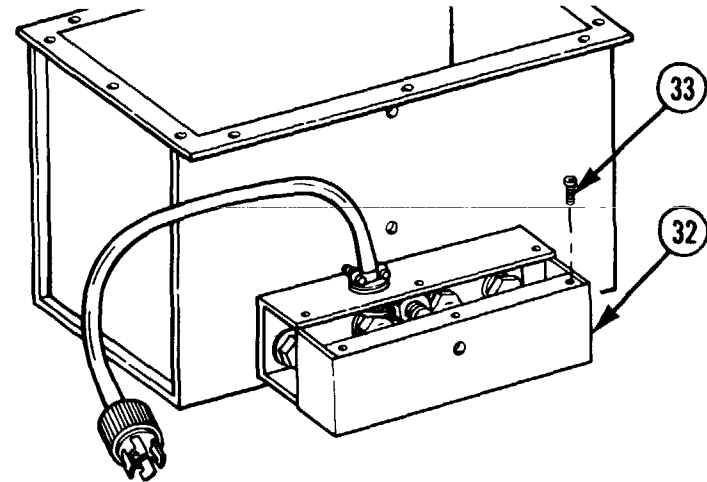
- a. Install one terminal lug (19), if previously removed.
- b. Install.



6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont) I

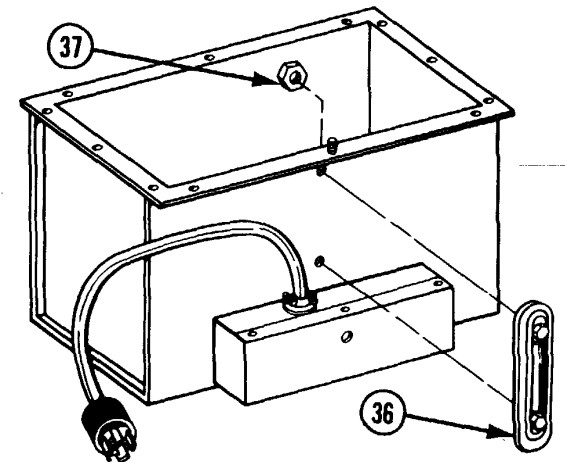
REASSEMBLY (cont)

16 TERMINAL BOX COVER (32). Install and secure with six tapping screws (33).

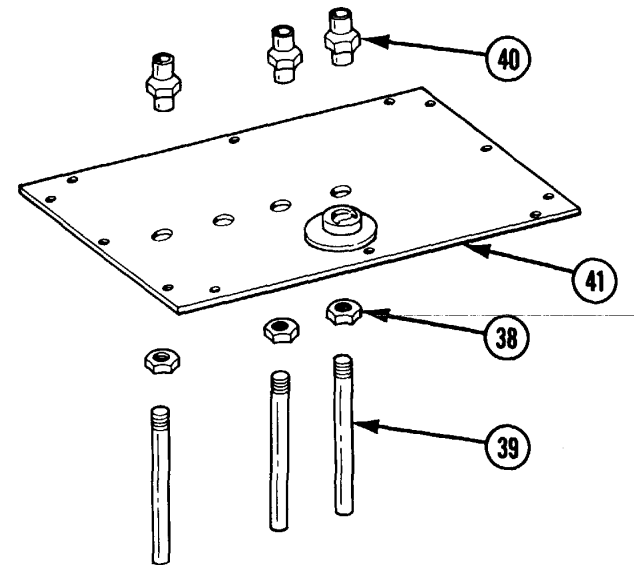


17 WASHER (34) AND SCREW (35). Install.

18 FUEL LEVEL SIGHT GAGE (36). Install and secure with two self-locking nuts (37).

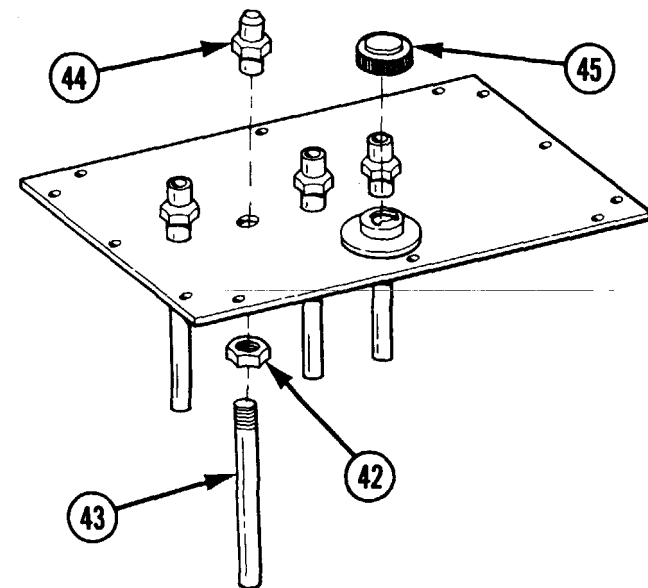


19 THREE SEAL NUTS (38), THREE TANK SUCTION TUBES (39), AND THREE FEMALE CONNECTORS (40). Install on cover assembly (41).



20 SEAL NUT (42), TANK DRAIN TUBE (43), AND FEMALE CONNECTOR (44). Install.

21 CAP (45). Install.



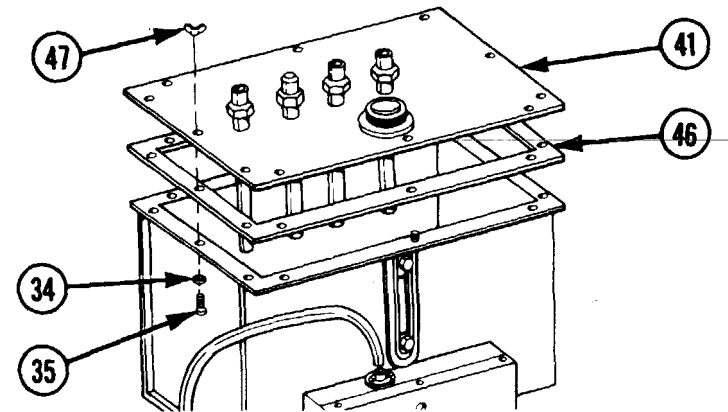


**6-25. FUEL TANK ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY (cont)**

**22** FUEL TANK GASKET (46) AND COVER ASSEMBLY (41). Install.

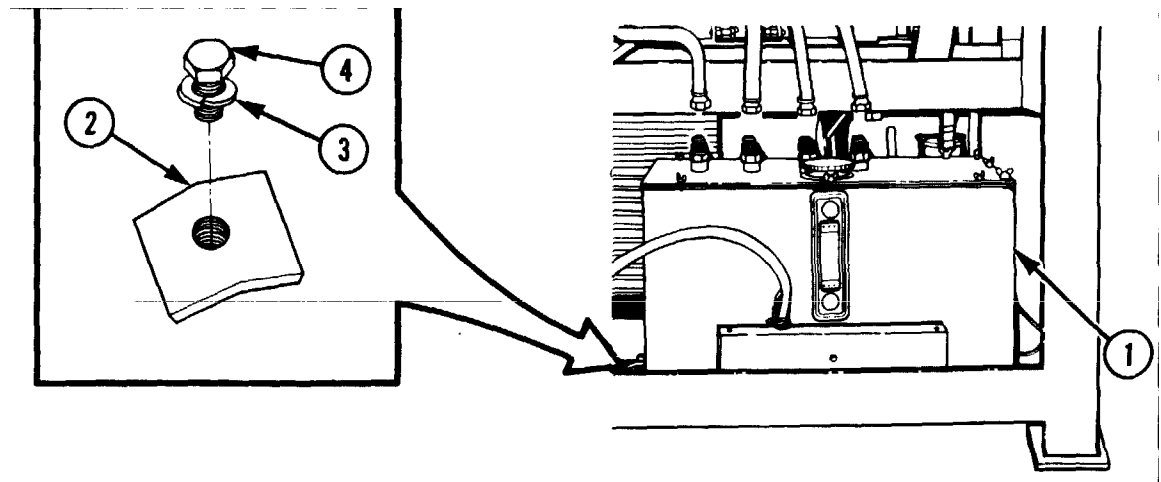
**23** ELEVEN WASHERS (34), ELEVEN SCREWS (35), AND TWELVE WINGNUTS (47). Install.

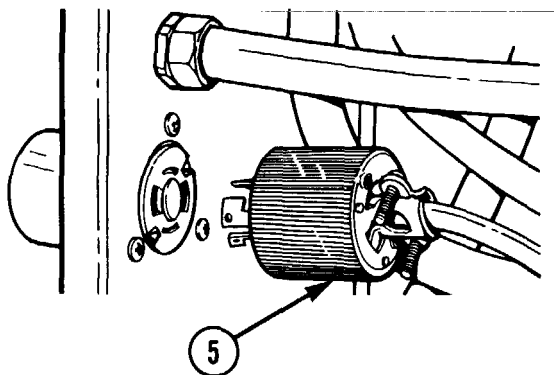


**INSTALLATION**

**1** FUEL TANK ASSEMBLY (1). Install.

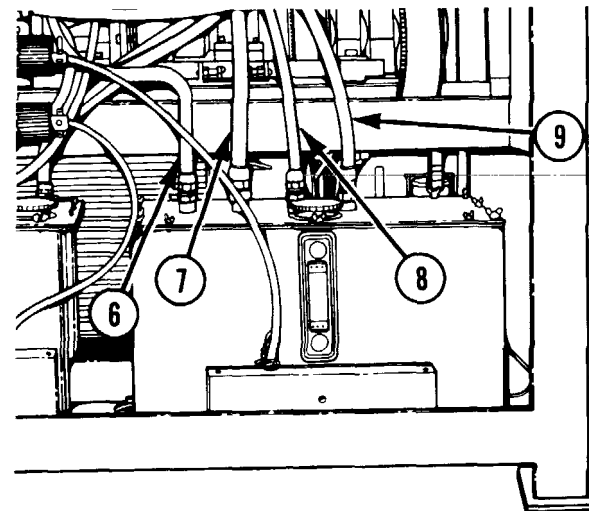
**2** FOUR CLAMPS (2), FOUR WASHERS (3), AND FOUR SCREWS (4). Install.





3 MALE CONNECTOR PLUG (5). Install.

4 FOUR HOSES (6 THRU 9). Install.



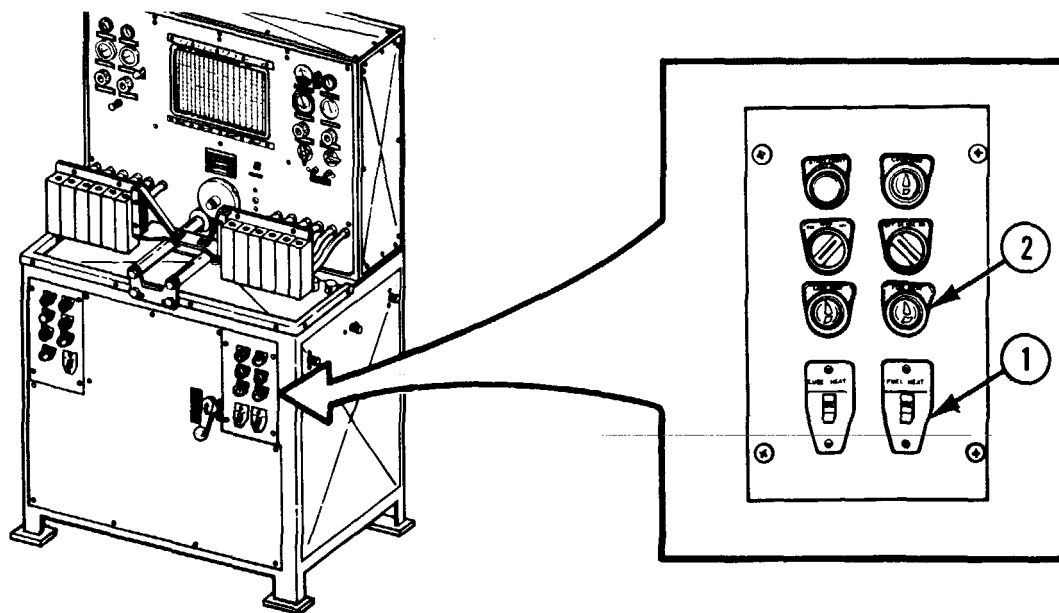
**TEST**

1 MAIN POWER SOURCE. Turn on.

2 FUEL HEAT SWITCH (1). Turn on.

**NOTE**  
**FUEL HEAT light indicates whether heater is operating or not.**

3 FUEL HEAT LIGHT (2). Check that it lights.



**6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly/alinement
- f. Installation
- g. Alinement/adjustment
- h. Test

**INITIAL SETUP**

Tools and Special Tools  
 General mechanic's automotive tool kit (5180)00-177-7033)

Materials/Parts  
 Cleaning compound (item 3, app C)  
 Grease (item 7, app C)  
 Rag (item 14, app C)

References  
 TM 9-4910-387-24P

Troubleshooting References  
 6-95 Counting circuit does not function

- 6-113 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at FORWARD
- 6-120 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at REVERSE

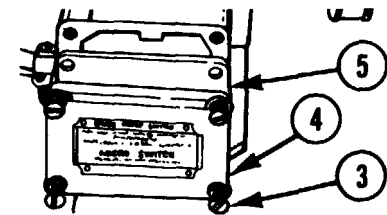
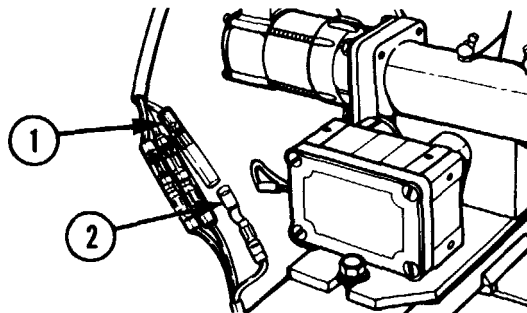
Equipment Conditions  
 Main power source to tester is turned off  
 4-32 Upper back panel is removed  
 4-33 RH upper side panel is removed

**REMOVAL**

**NOTE**

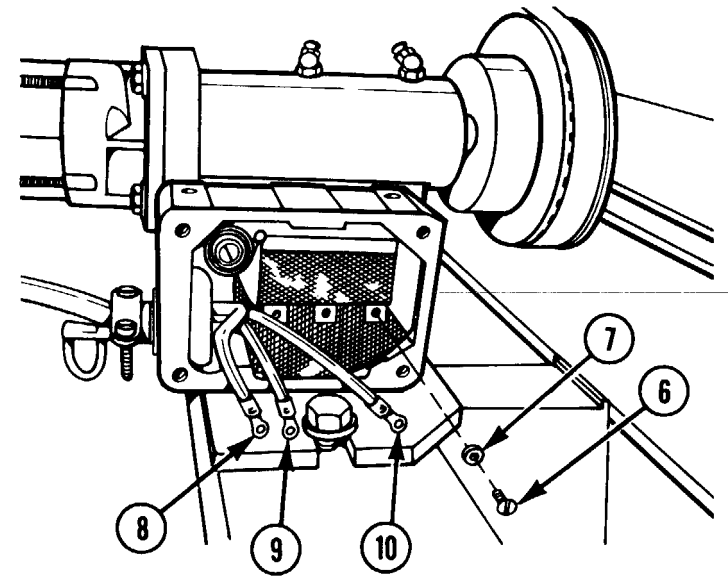
Tag all wires before disconnecting.

- 1 THREE FEMALE SOLDERLESS CONNECTORS (1). Disconnect from three male solderless connectors (2).

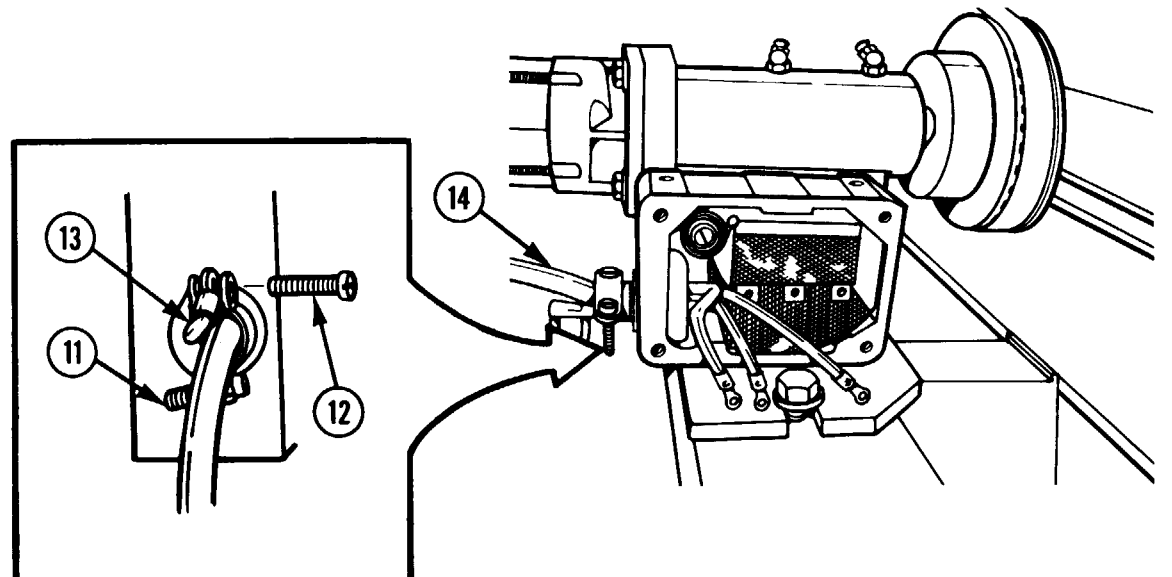


- 2 FOUR SCREWS (3). Loosen.
- 3 COVER (4) AND PLATE (5). Remove.

- 4 THREE SCREWS (6) AND THREE WASHERS (7). Remove.
- 5 WHITE WIRE (8), BLACK WIRE (9), AND RED WIRE (10). Disconnect.



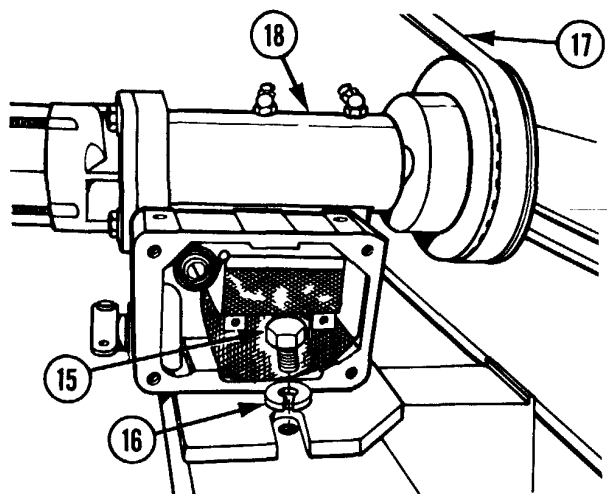
- 6 SCREW (11). Loosen.
- 7 SCREW (12). Remove.
- 8 GREEN WIRE (13) WITH TERMINAL LUG. Disconnect.
- 9 WIRE CABLE (14). Remove.



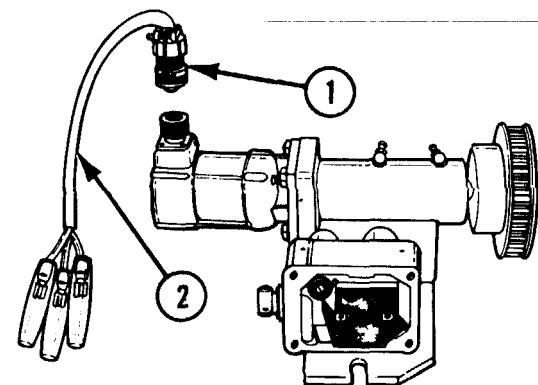
6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

- 10 TWO SCREWS (15) AND TWO LOCKWASHERS (16). Remove.
- 11 FRONT TIMING BELT (17). Remove.
- 12 COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY (18). Remove.

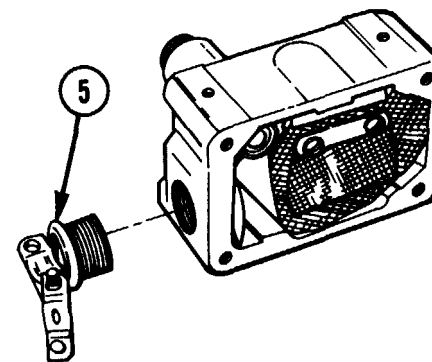
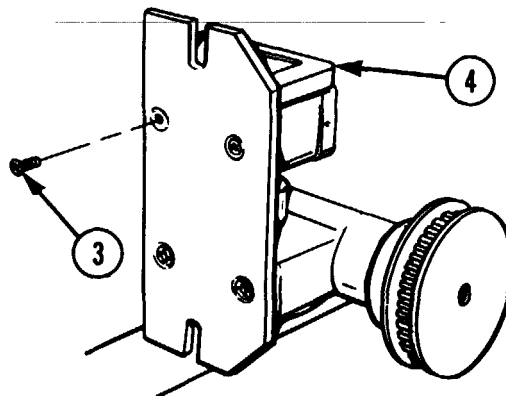


DISASSEMBLY

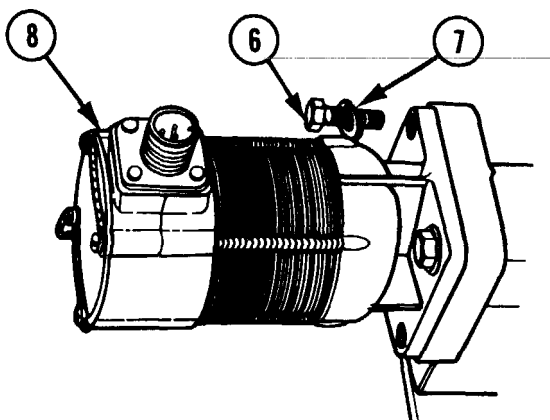


- 1 SOCKET (1). Unscrew.
- 2 TACHOMETER GENERATOR CABLE ASSEMBLY (2). Remove.

- 3 TWO SCREWS (3). Remove.
- 4 COUNTER PULSE SWITCH (4). Remove.



- 5 BOX CONNECTOR (5). Remove.



6 FOUR SCREWS (6) AND FOUR LOCKWASHERS (7). Remove.

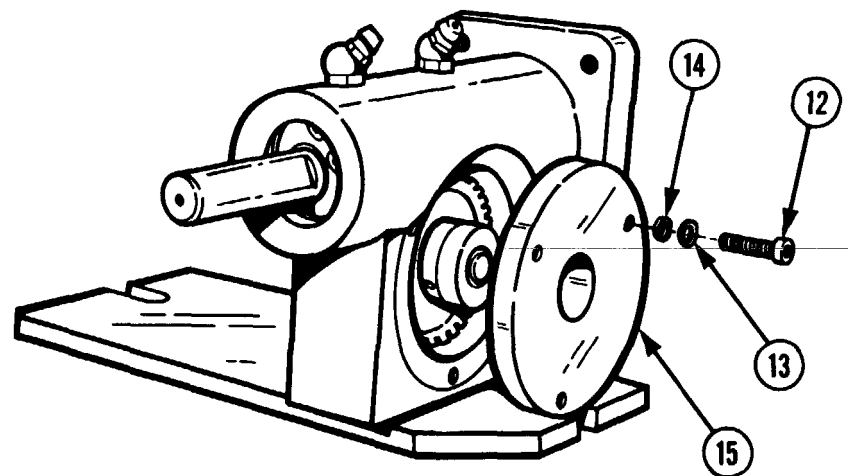
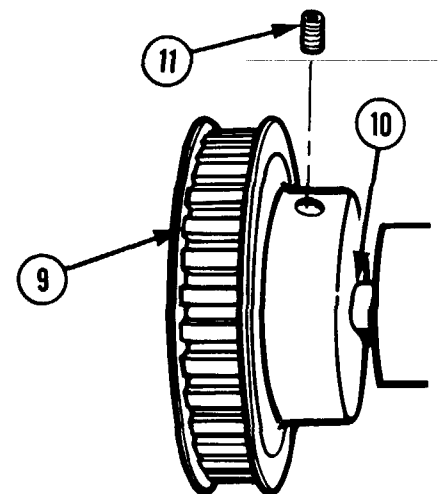
7 TACHOMETER GENERATOR (8). Remove.

9 THREE SCREWS (12), THREE LOCKWASHERS (13), AND THREE FLAT WASHERS (14). Remove.

10 GEAR COVER (15). Remove.

8 TIMING BELT PULLEY (9).

- a. Scribe a mark on the shaft (10) on each side of the timing belt pulley (9) for proper alignment during reassembly.
- b. Remove setscrew (11).
- c. Remove timing belt pulley (9).

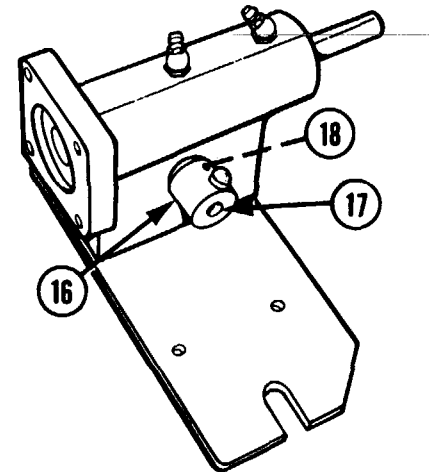


## 6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

## DISASSEMBLY (cont)

## 11 SWITCH ACTUATING CAM ASSEMBLY (16).

- a. Scribe a mark on the gear shaft (17) on both sides of the switch actuating cam assembly (16) for proper alignment during reassembly.
- b. Loosen setscrew (18).
- c. Remove switch actuating cam assembly (16).



## 12 GEAR SHAFT (17) AND ATTACHED PARTS. Remove.

**NOTE**

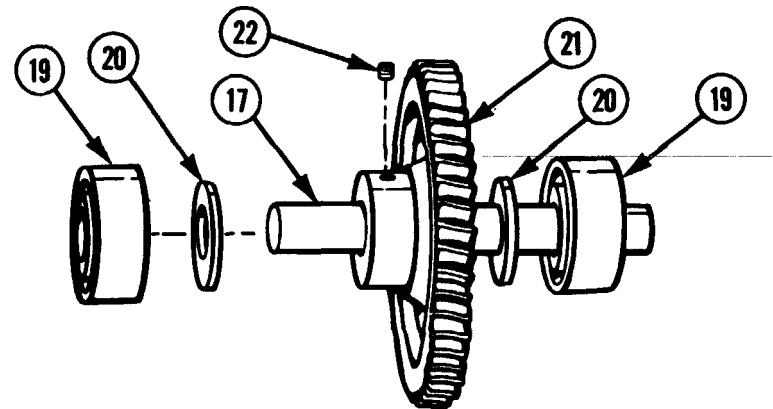
Do not remove bearings unless necessary for replacement of parts attached to gear shaft as removal may damage the bearings.

## 13 BEARING (19) AND GEAR SPACER (20). Remove.

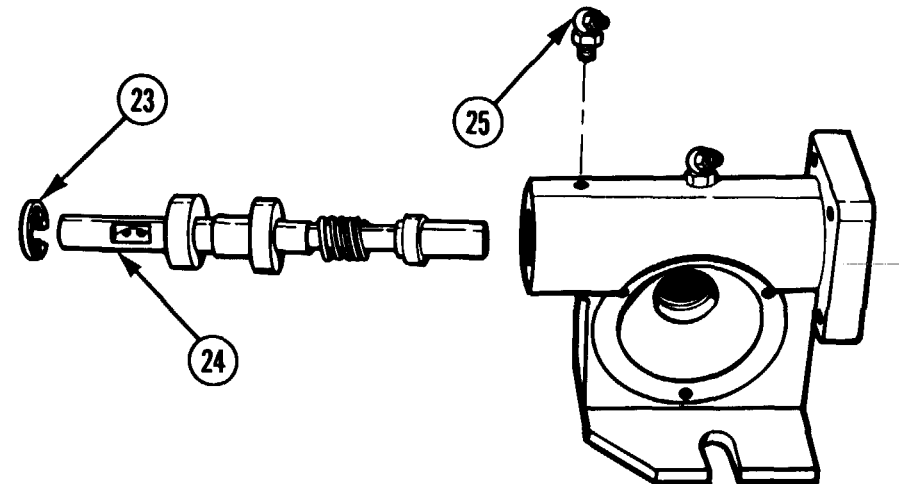
## 14 GEAR SHAFT (17). Scribe with mark for proper alignment of worm gear (21) during reassembly.

## 15 SETSCREW (22). Remove.

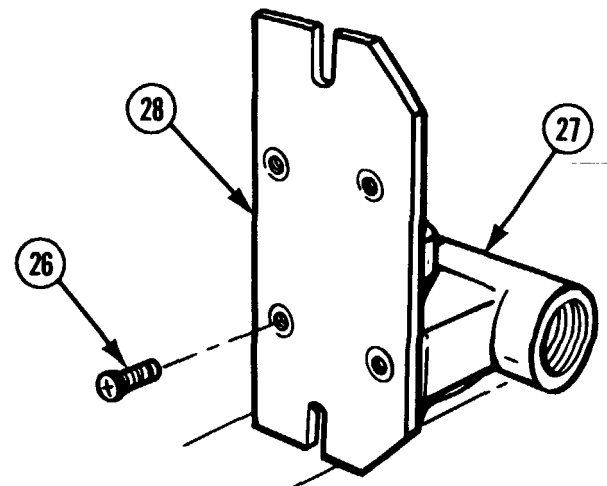
## 16 WORM GEAR (21), GEAR SPACER (20), AND BEARING (19). Remove from gear shaft (17).



- 17 RETAINING RING (23). Remove.
- 18 INPUT SHAFT ASSEMBLY (24). Remove.
- 19 TWO LUBRICATION FITTINGS (25). Remove.



- 20 TWO SCREWS (26). Remove.
- 21 GEAR HOUSING (27). Remove from mounting plate (28).



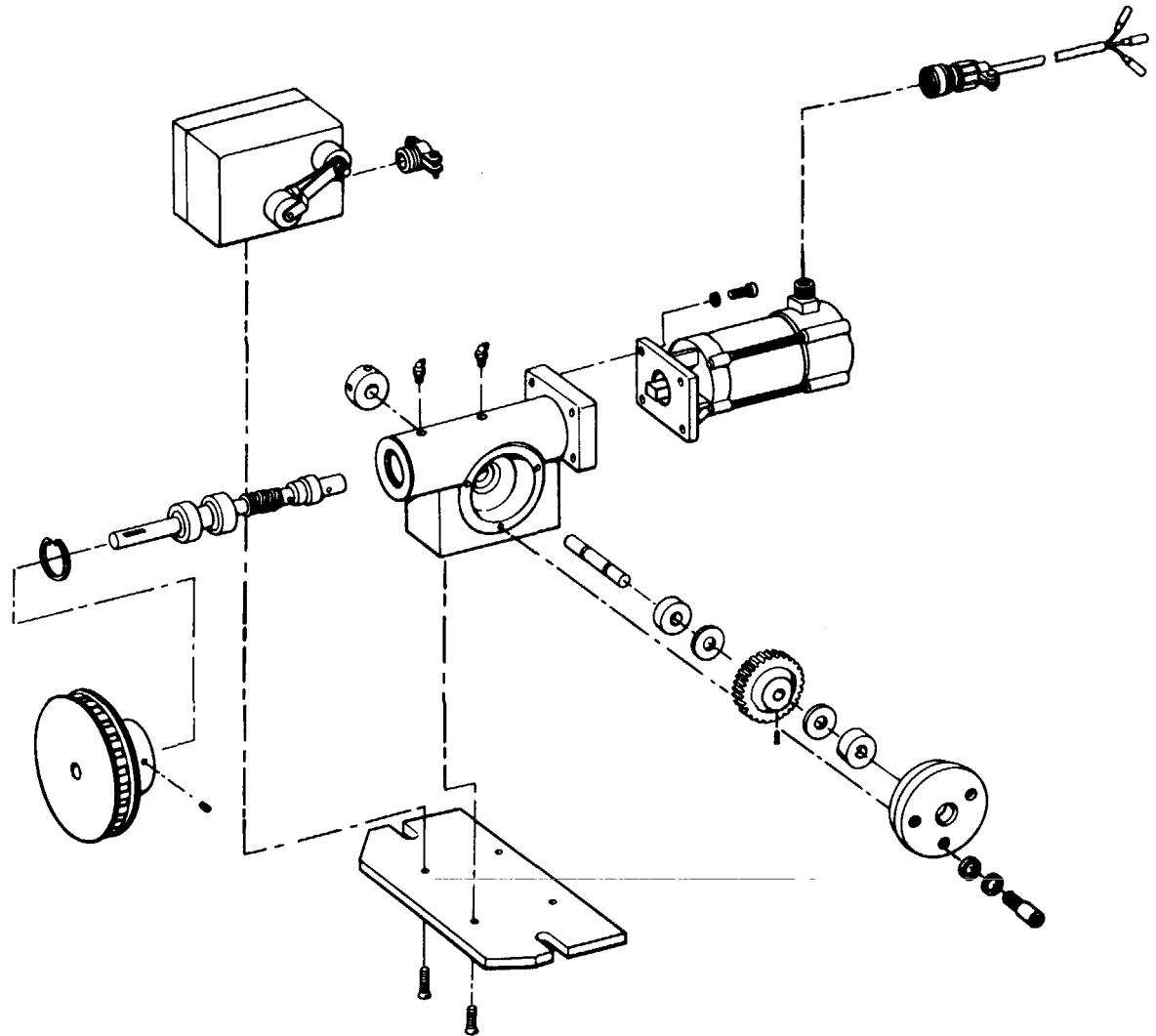


6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSPECTION/SERVICING

COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY.

- a. Check for broken, cracked, worn, or missing parts.
- b. Check gear teeth for damage.
- c. Check bearings for binding or loose condition.
- d. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

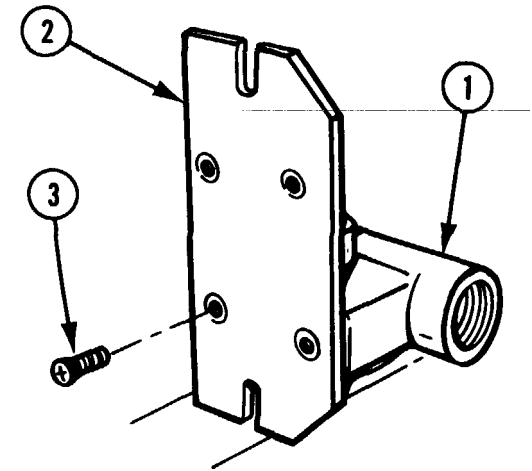


REPAIR

REASSEMBLY/ALINEMENT

**NOTE**  
 Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

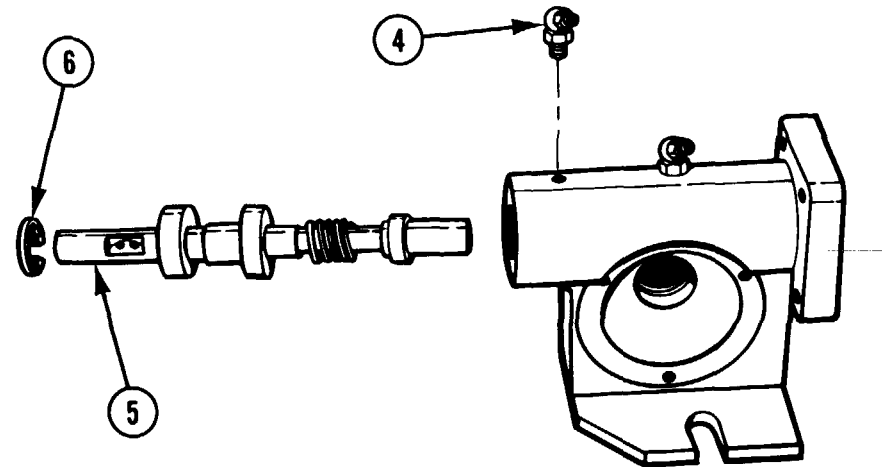
1 GEAR HOUSING (1). Install on mounting plate (2) and secure with two screws (3).



2 TWO LUBRICATION FITTINGS (4). Install.

3 INPUT SHAFT ASSEMBLY (5). Install.

4 RETAINING RING (6). Install.

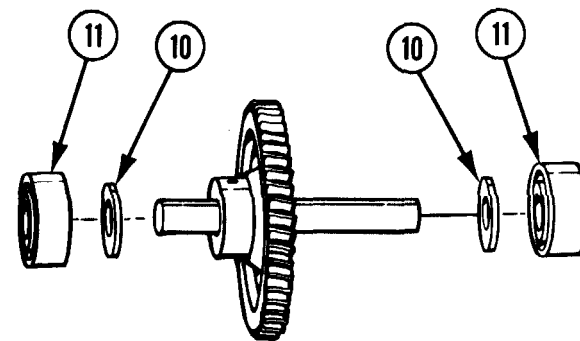
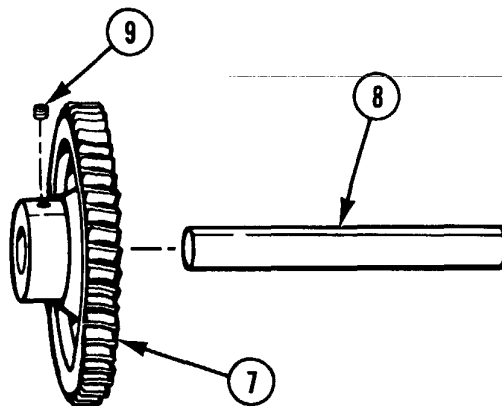


6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

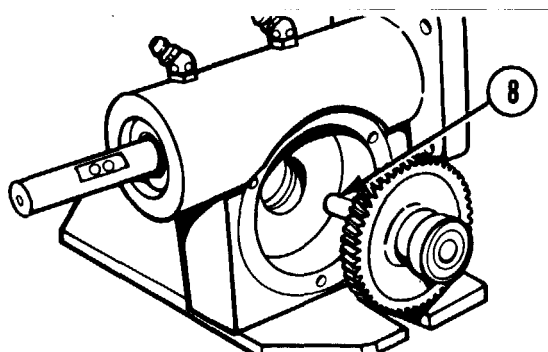
REASSEMBLY/ALINEMENT (cont)

5 WORM GEAR (7).

- a. Install on gear shaft (8).
- b. Aline with scribed mark.
- c. Aline hole on worm gear (7) with flat segment on gear shaft (8).
- d. Install setscrew (9).



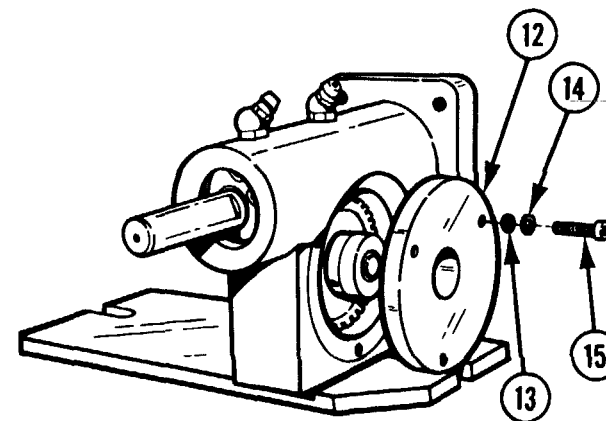
6 TWO GEAR SPACERS (10) AND TWO BEARINGS (11). Install.



**NOTE**  
Ensure gear teeth mesh.

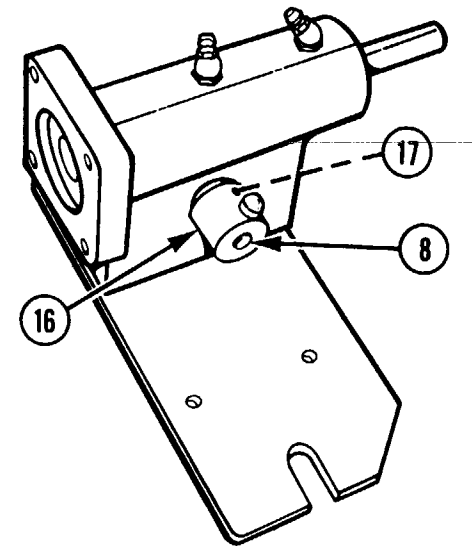
7 GEAR SHAFT (8) AND ATTACHED PARTS. Install.

8 GEAR COVER (12). Install and secure with three flat washers (13), three lockwashers (14), and three screws (15).



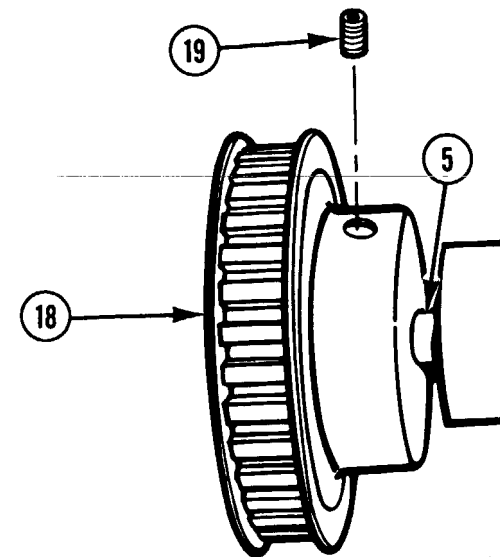
**9 SWITCH ACTUATING CAM ASSEMBLY (16).**

- a. Install on gear shaft (8).
- b. Aline with scribed mark.
- c. Aline hole in switch actuating cam assembly (16) with flat segment on gear shaft (8).
- d. Tighten setscrew (17).



**10 TIMING BELT PULLEY (18).**

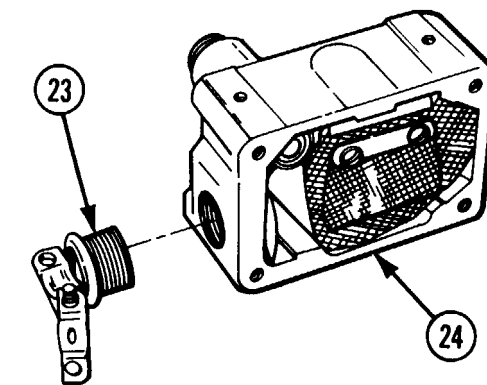
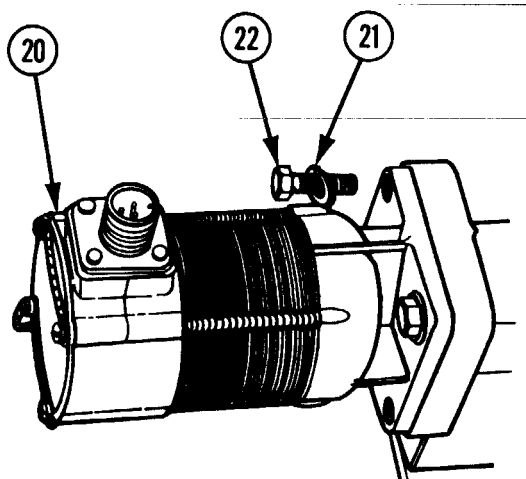
- a. Install on input shaft assembly (5).
- b. Aline with scribed mark.
- c. Aline hole in timing belt pulley (18) with flat segment on input shaft assembly (5).
- d. Install setscrew (19).



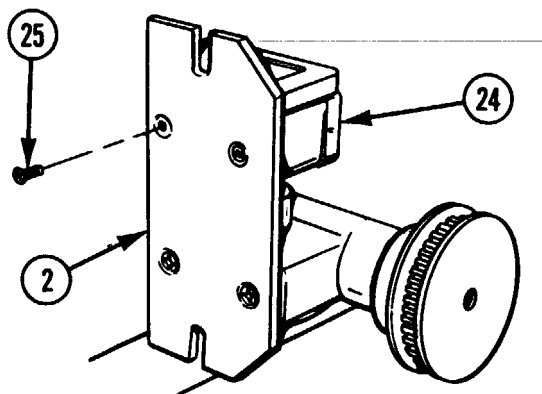
6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

11 TACHOMETER GENERATOR (20).  
Install and secure with four lockwashers (21) and four screws (22).

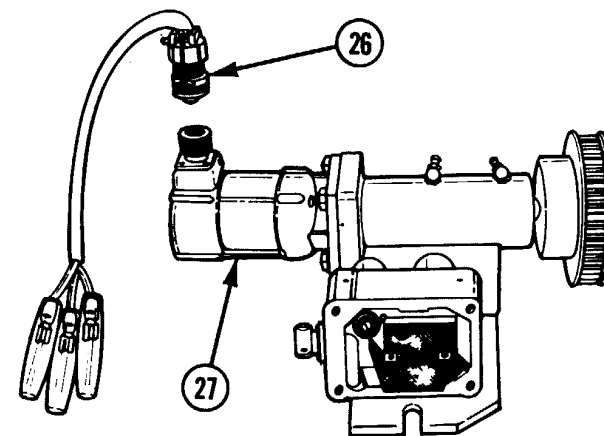


12 BOX CONNECTOR (23). Install on counter pulse switch (24).



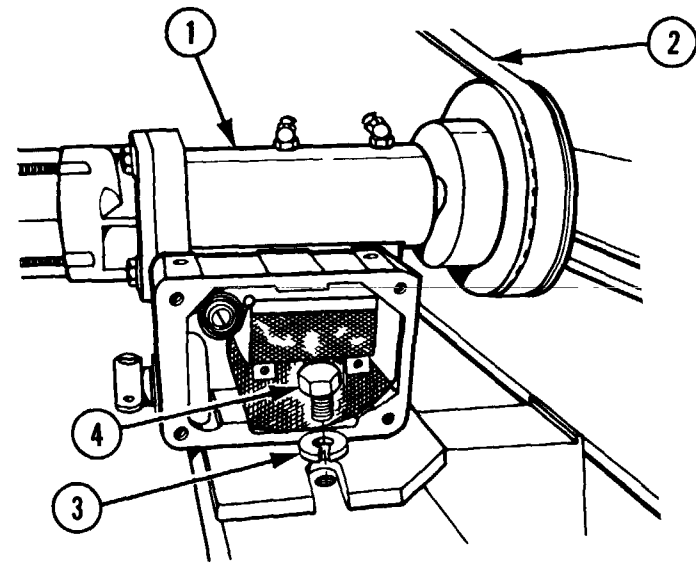
13 COUNTER PULSE SWITCH (24).  
Install on mounting plate (2) and secure with two screws (25).

14 SOCKET (26). Install on tachometer generator (27).



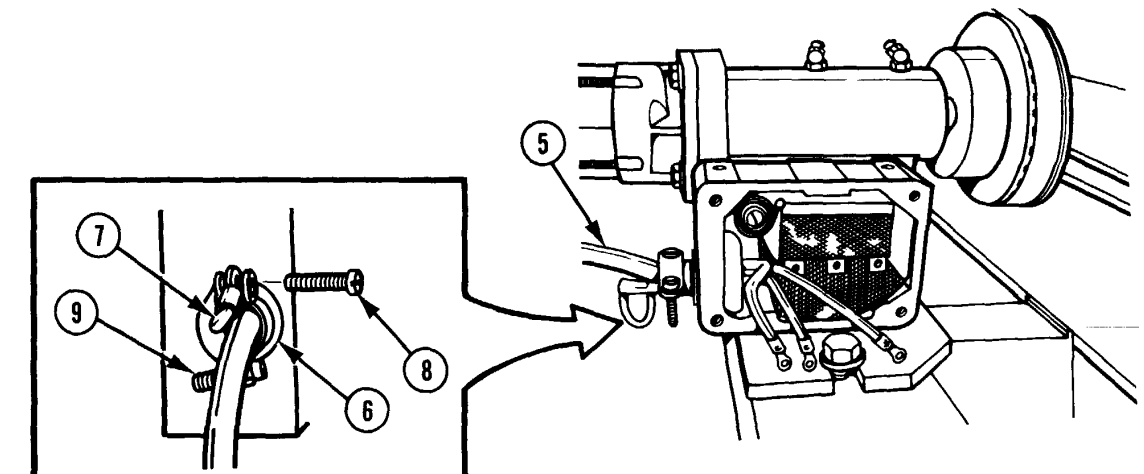
**INSTALLATION**

- 1 COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY (1). Install.
- 2 FRONT TIMING BELT (2). Install.
- 3 TWO LOCKWASHERS (3) AND TWO SCREWS (4). Install.



- 4 WIRE CABLE (5). Install through box connector (6).
- 5 GREEN WIRE (7) WITH TERMINAL LUG.

- a. Install on box connector (6).
- b. Install screw (8).
- c. Tighten screws (8 and 9).



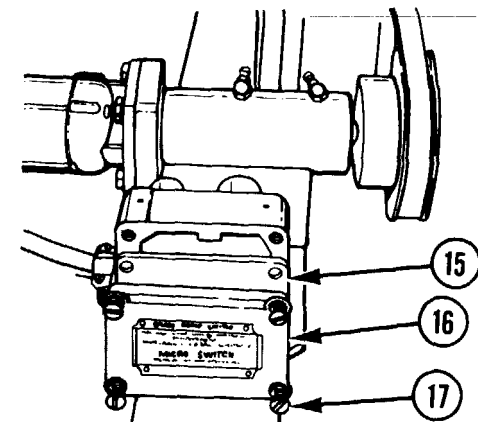
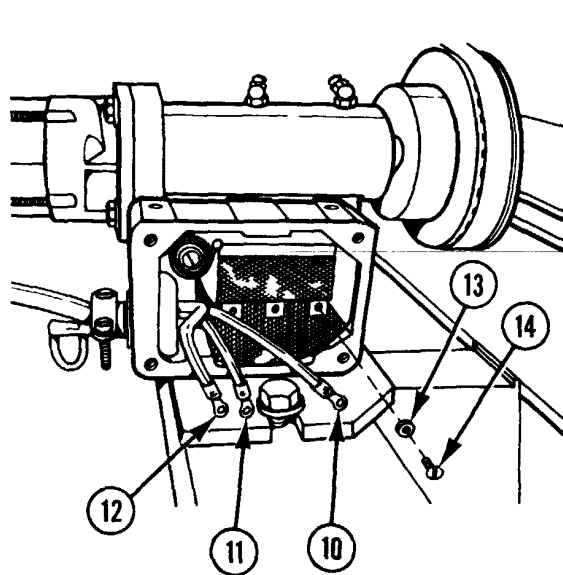
6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

**NOTE**

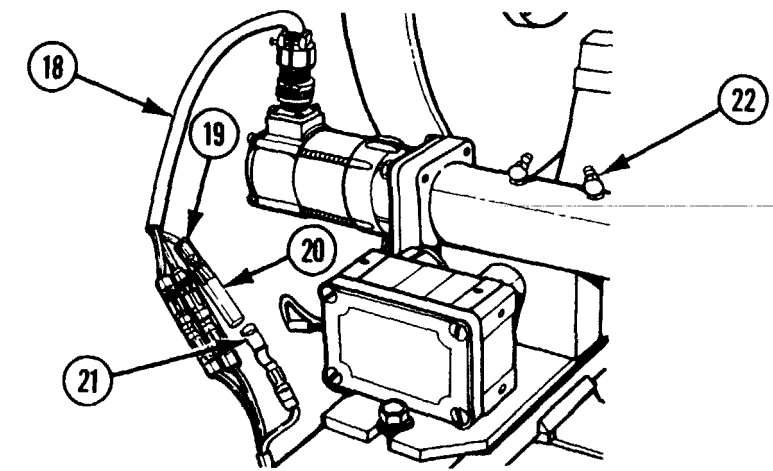
Refer to wiring diagram, figure 6-1 on page 6-146, before connecting wires.

- 6 RED WIRE (10), BLACK WIRE (11), AND WHITE WIRE (12), WITH ONE TERMINAL LUG EACH. Install and secure with three washers (13) and three screws (14).



- 7 PLATE (15) AND COVER (16). Install and secure by tightening four screws (17).

- 8 TACHOMETER GENERATOR CABLE ASSEMBLY (18). Connect three female solderless connectors (19) and three splice connectors (20) to three male solderless connectors (21).
- 9 TWO LUBRICATION FITTINGS (22). Apply grease (item 7, app C).



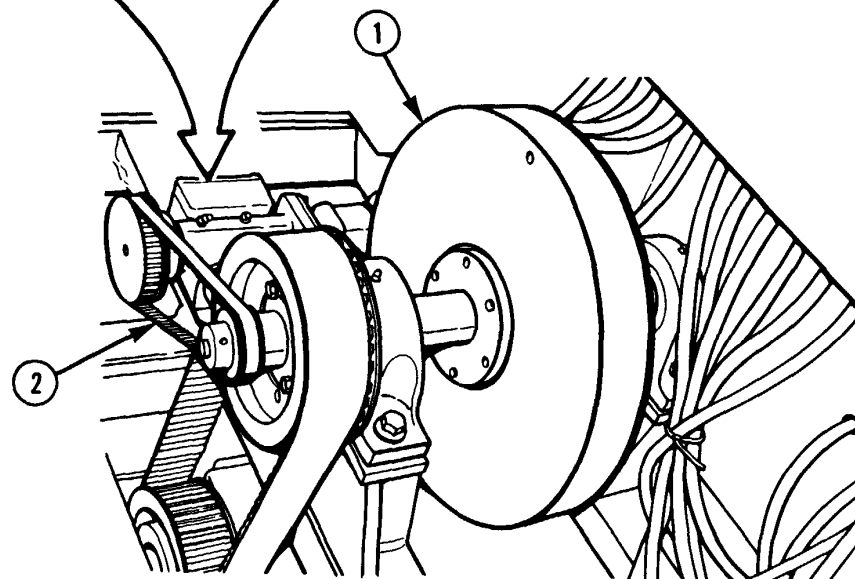
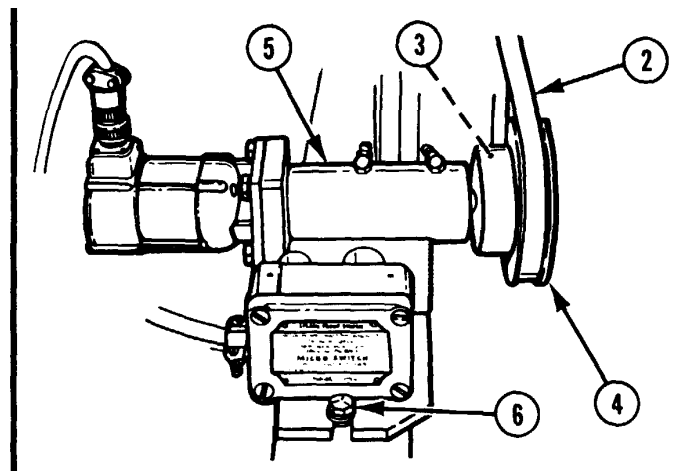
**ALINEMENT/ADJUSTMENT**

**1 FLYWHEEL (1).**

- a. Manually turn.
- b. Check that front timing belt (2) is properly aligned and is tight but not stretched.

**2 FRONT TIMING BELT (2).**

- a. Aline if necessary by loosening setscrew (3) and moving timing belt pulley (4) toward or away from counter pulse switch and tachometer generator assembly (5).
- b. Tighten setscrew (3).
- c. Adjust front timing belt tension if necessary by loosening two screws (6) and moving counter pulse switch and tachometer generator assembly (5) toward or away from flywheel (1).
- d. Tighten two screws (6).



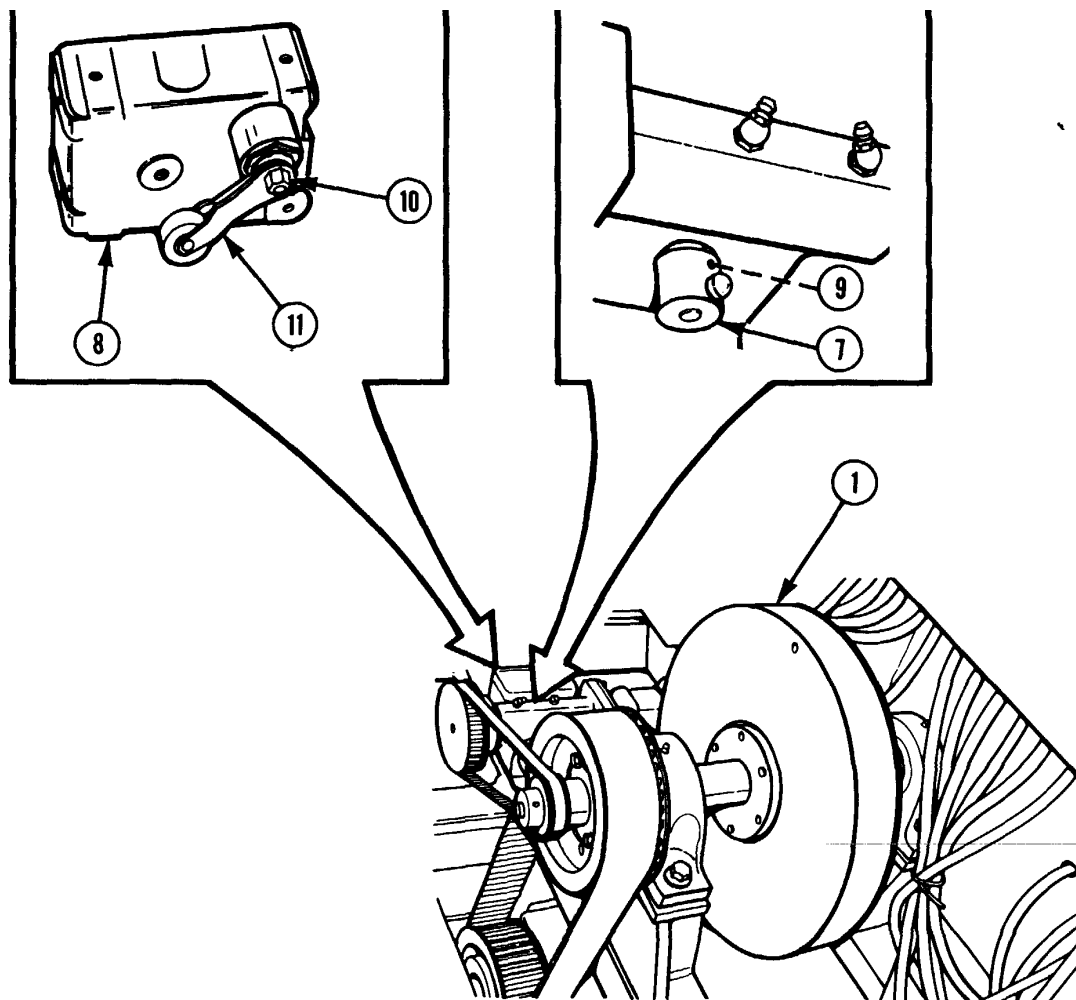


## 6-26. COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

## ALIGNMENT/ADJUSTMENT (cont)

## 3 SWITCH ACTUATING CAM ASSEMBLY (7) AND COUNTER PULSE SWITCH (8).

- a. Check operation by rotating flywheel (1) and listening for audible "click" of counter pulse switch (8).
- b. Adjust switch actuating cam assembly (7) if necessary by loosening setscrew (9) and moving switch actuating cam assembly (7) toward or away from counter pulse switch (8).
- c. Tighten setscrew (9).
- d. Adjust counter pulse switch (8) if necessary by loosening nut (10) and repositioning arm (11).
- e. Tighten nut (10).

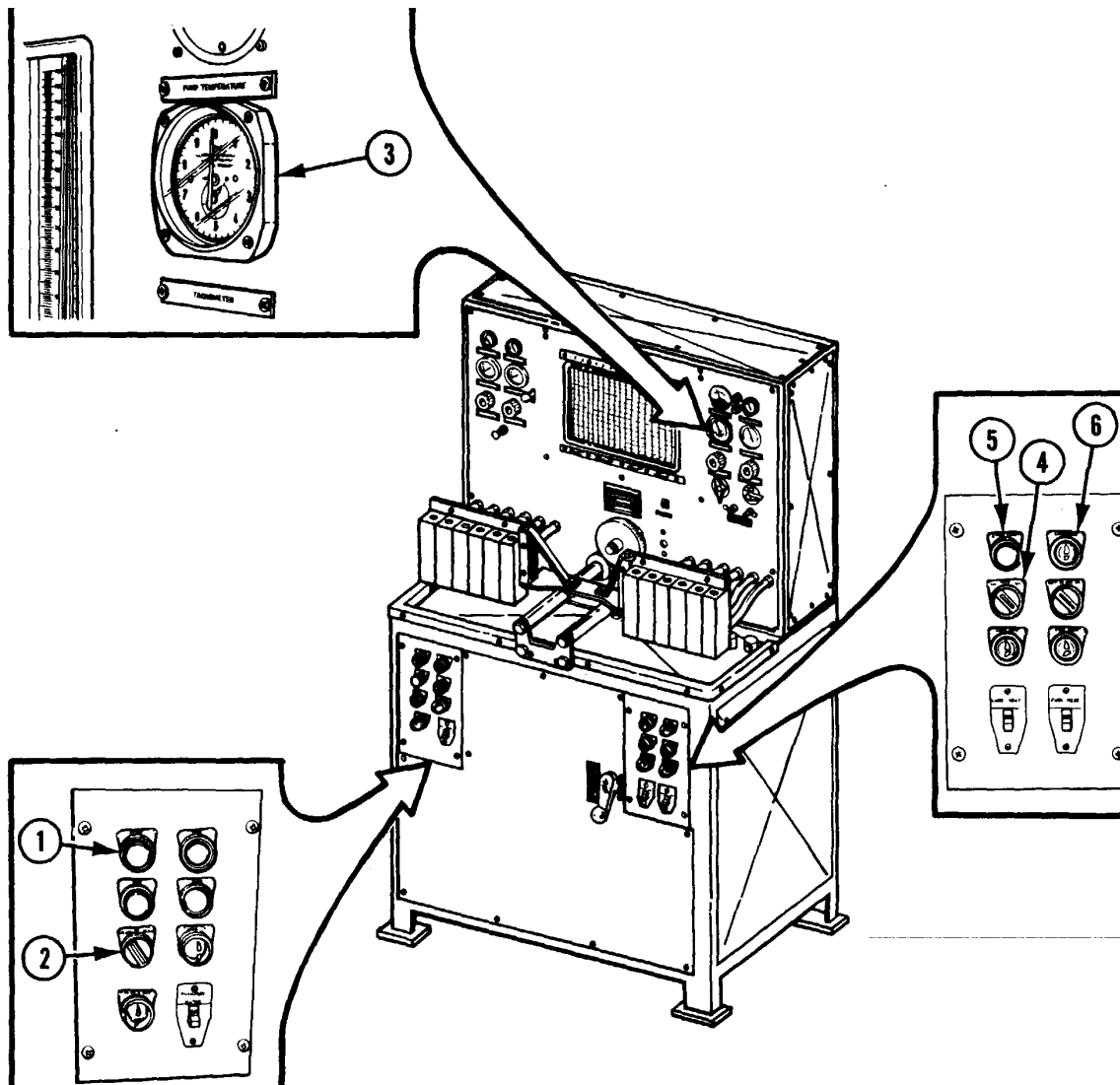


TEST

**NOTE**

Ensure the **AUXILIARY MOTOR** switch is off.

- 1 MAIN POWER SOURCE. Turn on.
- 2 START BUTTON (1). Push in.
- 3 FORWARD-OFF-REVERSE SWITCH (2). Set to FORWARD.
- 4 TACHOMETER (3). Check for proper indication.
- 5 500-1000-OFF SWITCH (4). Set to 500.
- 6 START COUNT BUTTON (5). Push in.
- 7 COUNTING LIGHT (6). Check that it lights.



**6-27. TACHOMETER GENERATOR CABLE ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Test
- g. Installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)  
Multimeter (TS352 B/U)

**Materials/Parts**

Abrasive cloth (item 4, app C)  
Cleaning compound (item 3, app C)  
Rag (item 14, app C)  
Solder (item 18, app C)

**References**

TM 94910-387-24P

**Troubleshooting References**

- 6-113 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at FORWARD
- 6-120 TACHOMETER indicator assembly does not function, FORWARD-OFF-REVERSE switch set at REVERSE

**Equipment Conditions**

- Main power source to tester is turned off
- 4-32 Upper back panel is removed
- 4-33 RH upper side panel is removed

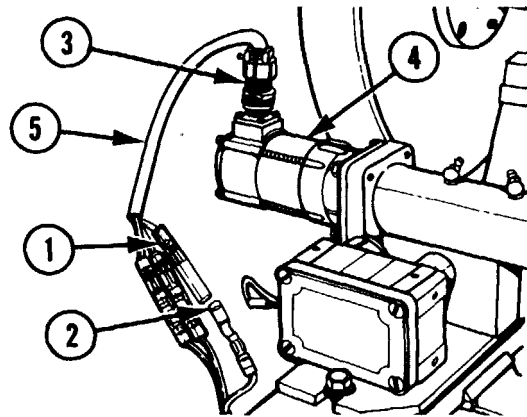
**REMOVAL**

**NOTE**

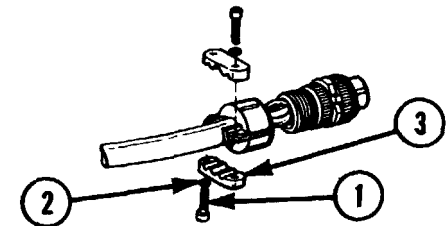
**Tag all wires before disconnecting.**

- 1 THREE FEMALE SOLDERLESS CONNECTORS (1). Disconnect from three male solderless connectors (2).
- 2 SOCKET (3). Unscrew from tachometer generator (4).
- 3 TACHOMETER GENERATOR CABLE ASSEMBLY (5). Remove.

**DISASSEMBLY**

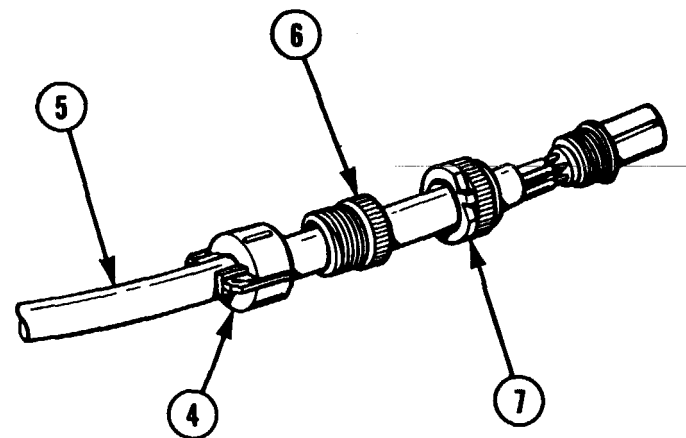


6-440



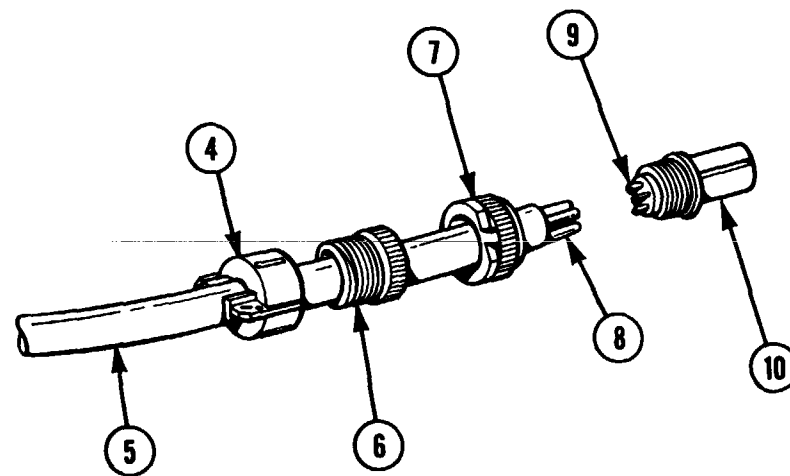
- 1 TWO SCREWS (1) AND TWO LOCKWASHERS (2). Remove.
- 2 TWO CLAMP HALVES (3). Remove.

- 3 CLAMP (4). Unscrew and slide back along neoprene covered cable (5).
- 4 KNURLED FITTING (6). Unscrew and slide back along neoprene covered cable (5).
- 5 CLAMPING NUT (7). Slide back along neoprene covered cable (5).



**NOTE**  
Tag wires at disassembly.

- 6 THREE WIRES (8). Unsolder from three pins (9).
- 7 SOCKET (10). Remove.
- 8 CLAMPING NUT (7), KNURLED FITTING (6), AND CLAMP (4). Remove from neoprene covered cable (5).



6-27. TACHOMETER GENERATOR CABLE ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

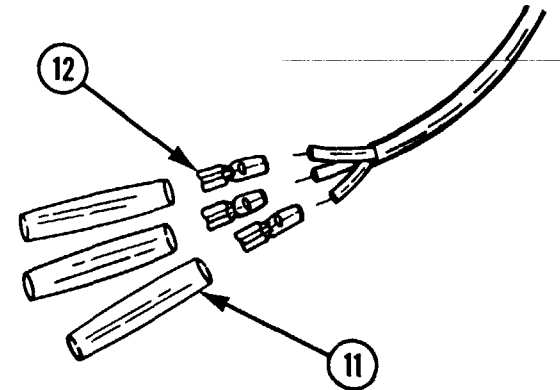
DISASSEMBLY (cont)

9 THREE SPLICE CONNECTORS (11). Remove.

**NOTE**

Remove female solderless connectors only if necessary for replacement.

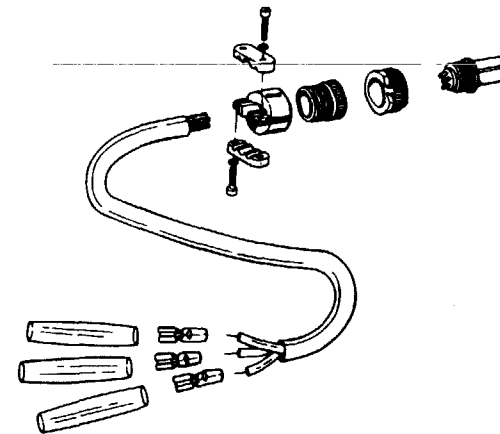
10 THREE FEMALE SOLDERLESS CONNECTORS (12). Remove.



INSPECTION/SERVICING

TACHOMETER GENERATOR CABLE ASSEMBLY.

- a. Check for missing or damaged parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- c. Clean electrical contacts with abrasive cloth (item 4, app C).



REPAIR

REASSEMBLY

TABLE 6-5. WIRING OF SOCKET CONTACTS

Wire Color	Contact Designation
White	A
Black	B
Green	C

NOTE

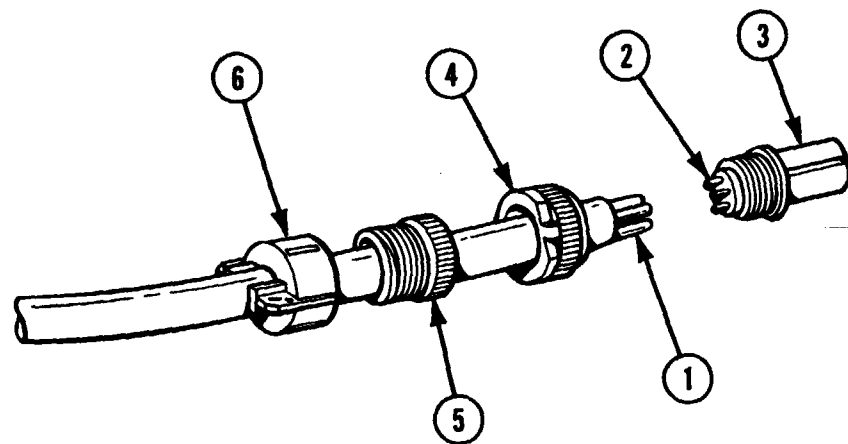
Repair is by replacement of authorized parts (TM 9 4910-387-24P) as required.

For replacement of neoprene covered cable, refer also to fig. 3, app D.

NOTE

When wiring socket, follow information in table 6-5 for proper polarity.

- 1 THREE WIRES (1). Solder to three pins (2) in socket (3) using solder (item 18, app C).
- 2 CLAMPING NUT (4). Install on socket (3).
- 3 KNURLED FITTING (5). Install and screw onto socket (3).
- 4 CLAMP (6). Install and screw onto knurled fitting (5).



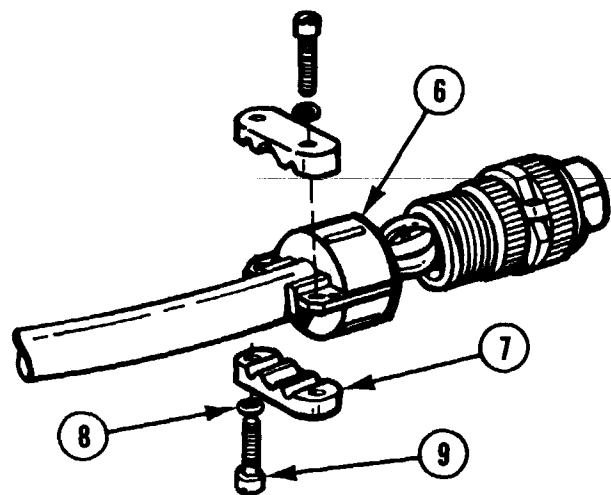
6-7. TACHOMETER GENERATOR CABLE ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont)

**NOTE**

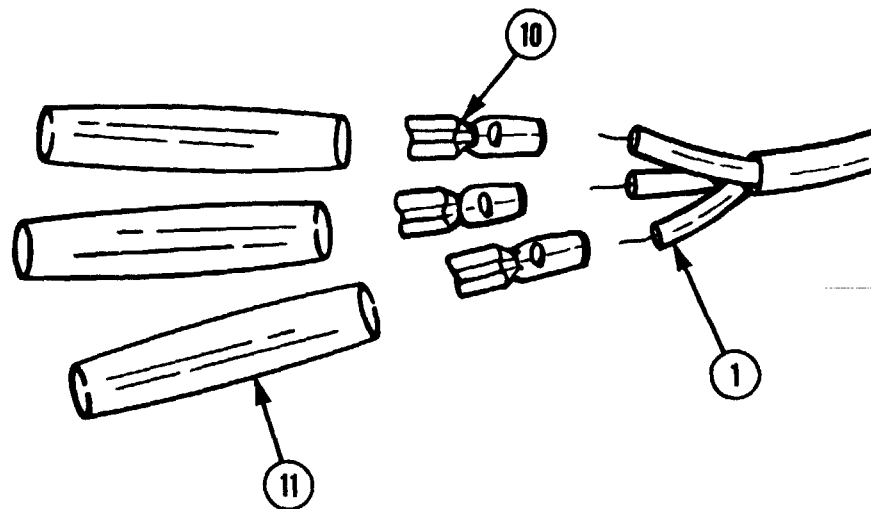
The two screws are installed in opposite directions.

- 5 TWO CLAMP HALVES (7). Install on clamp (6) and secure with two lockwashers (8) and two screws (9).



- 6 THREE FEMALE SOLDERLESS CONNECTORS (10). Crimp on three wires (1).

- 7 THREE SPLICE CONNECTORS (11). Install on three female solderless connectors (10).

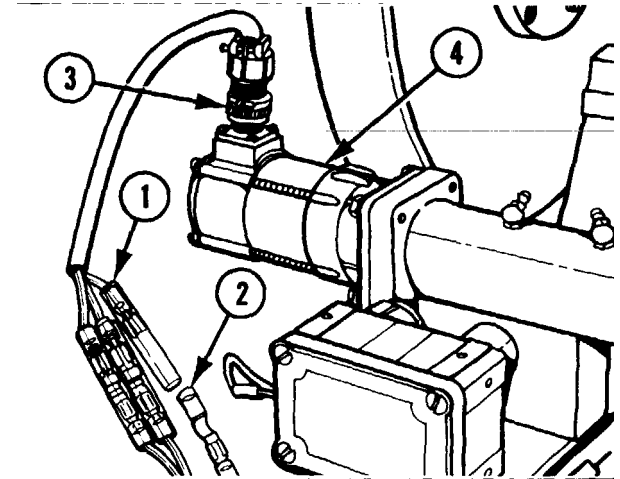


**TEST**

TACHOMETER GENERATOR CABLE ASSEMBLY. Perform continuity check with multimeter.

**INSTALLATION**

- 1 THREE FEMALE SOLDERLESS CONNECTORS (1). Install on three male solderless connectors (2).
- 2 SOCKET (3). Screw onto tachometer generator (4).



**6-28. COUNTER PULSE SWITCH - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>a. Removal/disassembly</li> <li>b. Inspection/servicing</li> <li>c. Repair</li> </ol> | <ol style="list-style-type: none"> <li>d. Reassembly/installation</li> <li>e. Test</li> </ol> |
|--|---|

**INITIAL SETUP**

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts

- Abrasive cloth (item 4, app C)
- Cleaning compound (item 3, app C)
- Rag (item 14, app C)

References

TM 94910-387-24P

Troubleshooting References

6-95 Counting circuit does not function

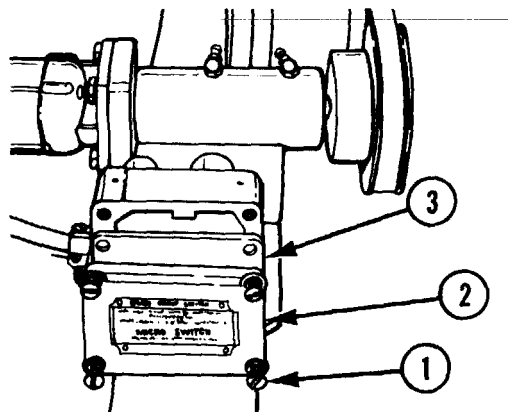
Equipment Conditions

- Main power source to tester is turned off
- 4-32 Upper back panel is removed
- 4-33 RH upper side panel is removed



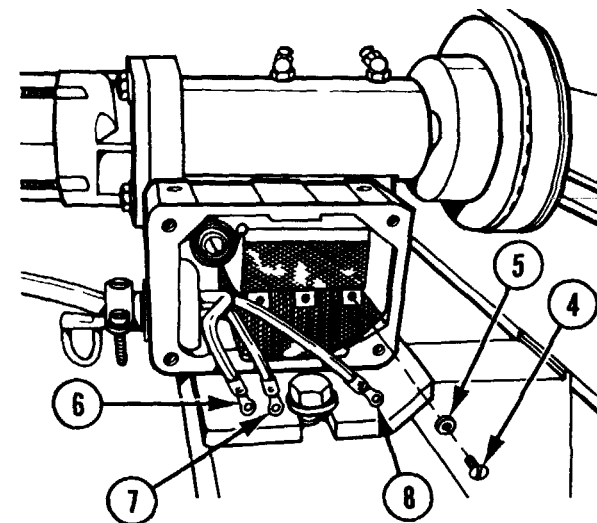
6-28. COUNTER PULSE SWITCH-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY

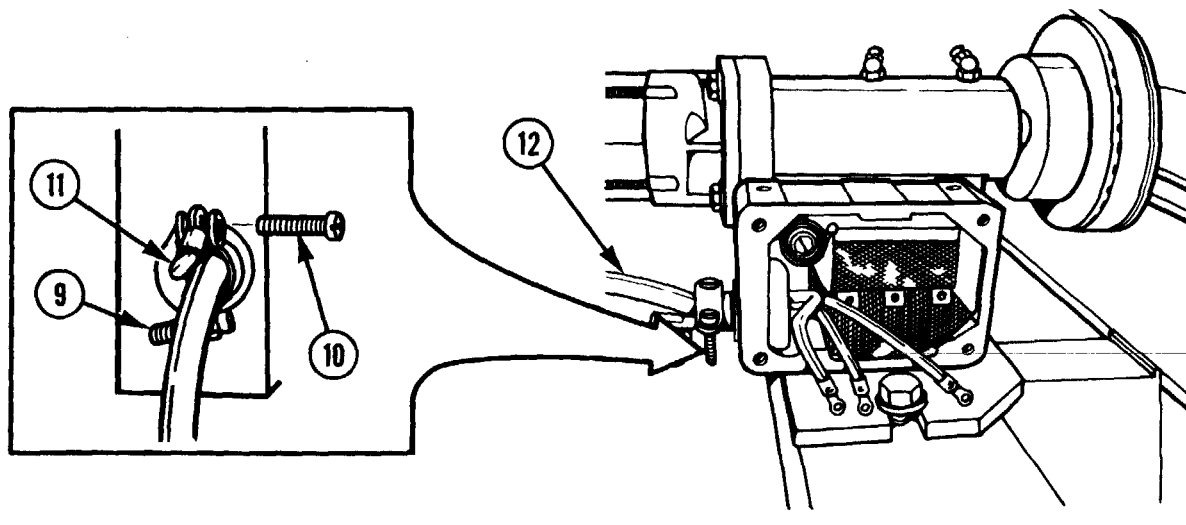


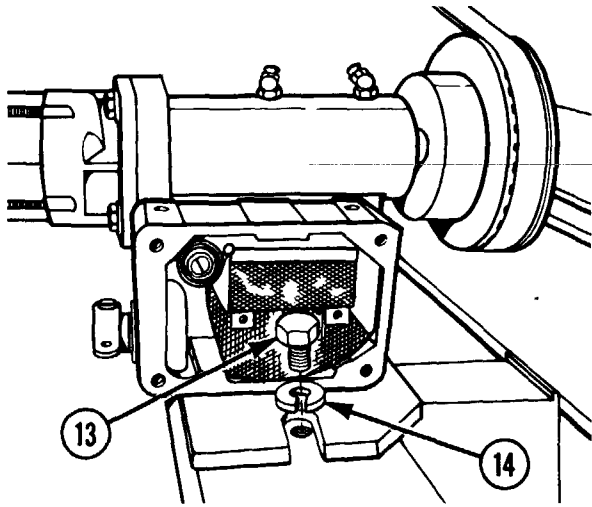
- 1 FOUR SCREWS (1). Loosen.
- 2 COVER (2) AND PLATE (3). Remove.

- 3 THREE SCREWS (4) AND THREE WASHERS (5). Remove.
- 4 WHITE WIRE (6), BLACK WIRE (7), AND RED WIRE (8). Disconnect.

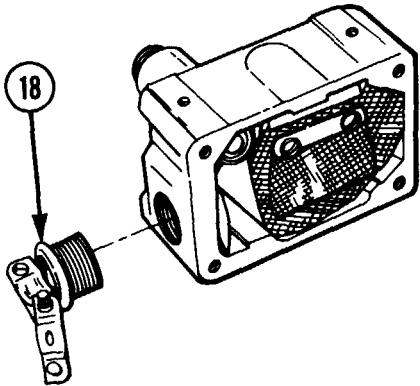


- 5 SCREW (9). Loosen.
- 6 SCREW (10). Remove.
- 7 GREEN WIRE (11) WITH TERMINAL LUG. Disconnect.
- 8 WIRE CABLE (12). Remove.





9 TWO SCREWS (13) AND TWO LOCKWASHERS (14). Remove.

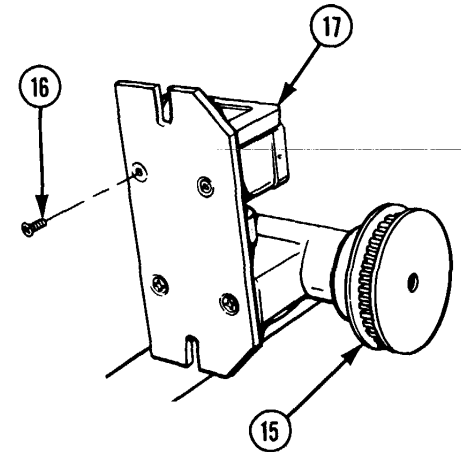


13 BOX CONNECTOR (18). Remove.

10 COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY (15). Lift up.

11 TWO SCREWS (16). Remove.

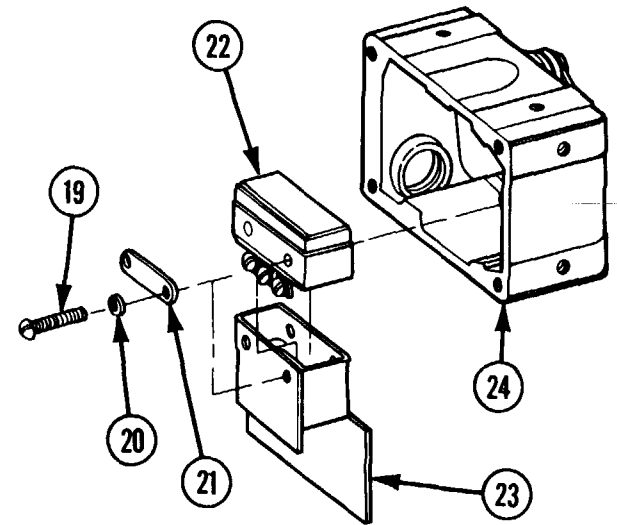
12 COUNTER PULSE SWITCH (17).



14 TWO SCREWS (19), TWO WASHERS (20), AND BRACKET (21). Remove.

15 MICROSWITCH (22) AND HOLDER (23). Remove from switchbox (24).

16 MICROSWITCH (22). Remove from holder (23).



## 6-28. COUNTER PULSE SWITCH-MAINTENANCE INSTRUCTIONS (cont)

## INSPECTION/SERVICING I

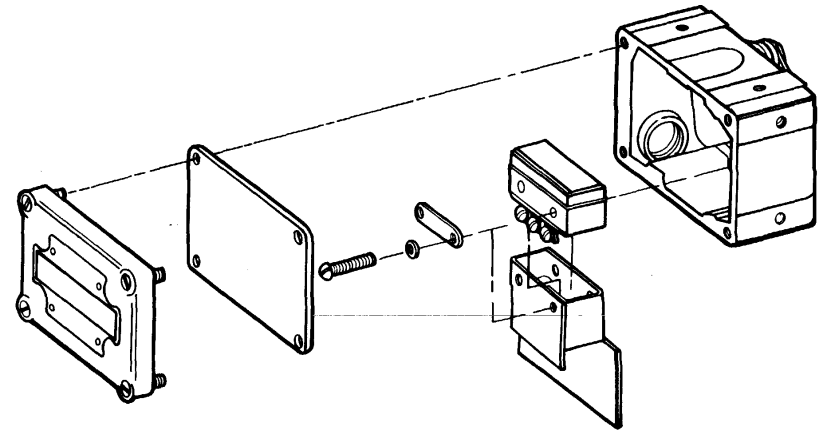
## COUNTER PULSE SWITCH.

- a. Check for broken, cracked, worn, corroded, or missing parts.

**CAUTION**

**Do not use cleaning compound on microswitch, as the electrical components will be damaged.**

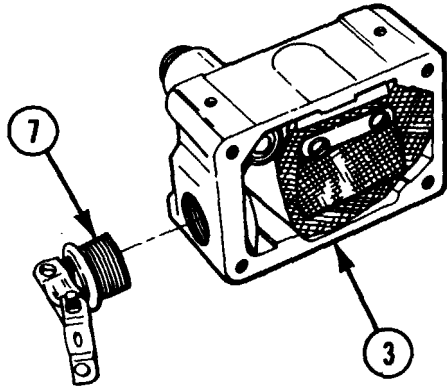
- b. Clean all parts except microswitch with cleaning compound (item 3, app C) and rag (item 14, app C).
- c. Clean electrical contacts on microswitch with abrasive cloth (item 4, app C) and wipe off with rag (item 14, app C).



REPAIR

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.



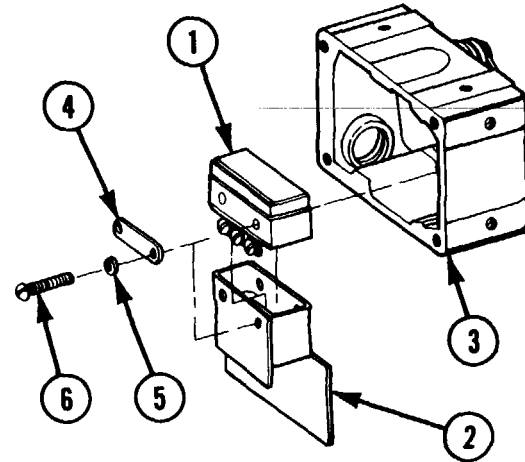
3 BOX CONNECTOR (7). Install in switchbox (3).

REASSEMBLY/INSTALLATION I

**NOTE**

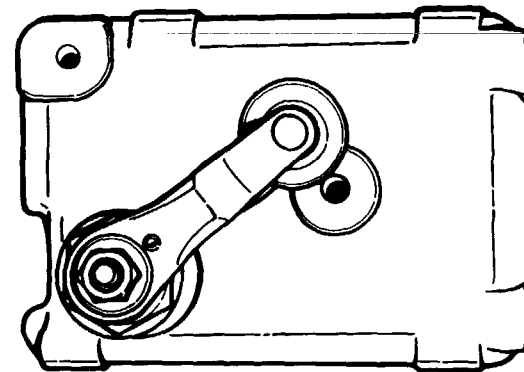
Ensure that front flap of holder covers electrical contacts on microswitch.

1. MICROSWITCH (1). Install in holder (2).
2. MICROSWITCH (1) AND HOLDER (2).
  - a. Install in switchbox (3).
  - b. Secure with bracket (4), two washers (5), and two screws (6).



**NOTE**

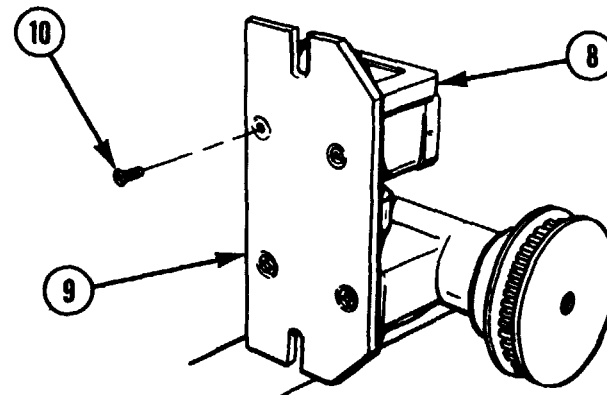
Be sure the roller is aligned with the hole in the center of the switchbox as illustrated.



6-28. COUNTER PULSE SWITCH-MAINTENANCE INSTRUCTIONS (cont)

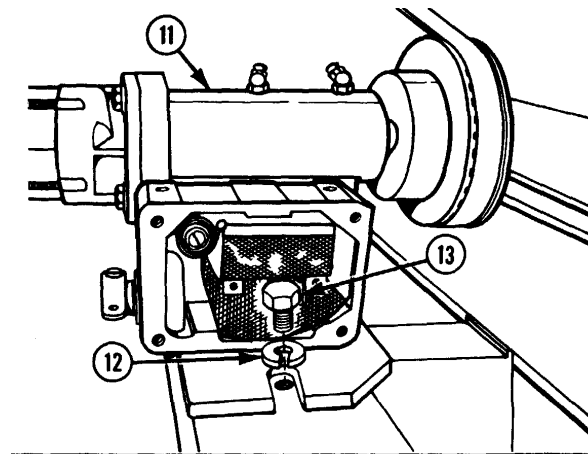
REASSEMBLY/INSTALLATION (cont)

4 COUNTER PULSE SWITCH (8). Install on mounting plate (9) and secure with two screws (10).

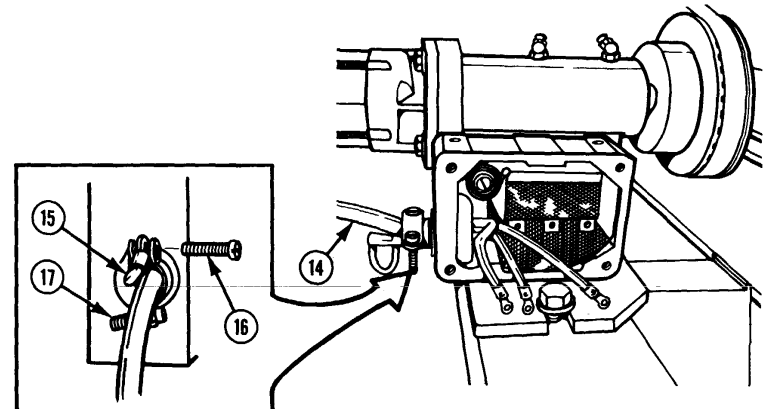


5 COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY (11).

Install and secure with two lockwashers (12) and two screws (13).



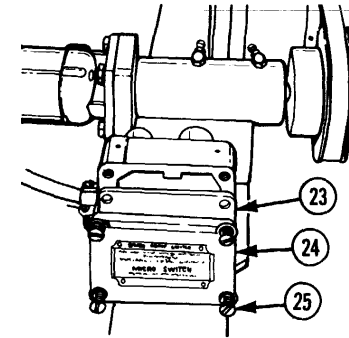
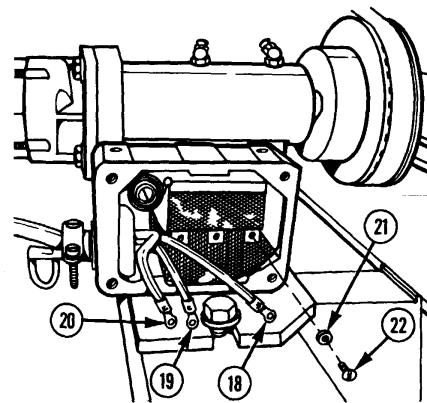
- 6 WIRE CABLE (14). Install.
- 7 GREEN WIRE (15) WITH TERMINAL LUG. Install and secure with screw (16)
- 8 SCREW (17). Tighten.



**NOTE**

Refer to wiring diagram, figure 6-1 on page 6-146, before connecting wires.

- 9 RED WIRE (18), BLACK WIRE (19), AND WHITE WIRE (20), WITH ONE TERMINAL LUG EACH. Install and secure with three washers (21) and three screws (22).



- 10 PLATE (23) AND COVER (24). Install and secure by tightening four screws (25).

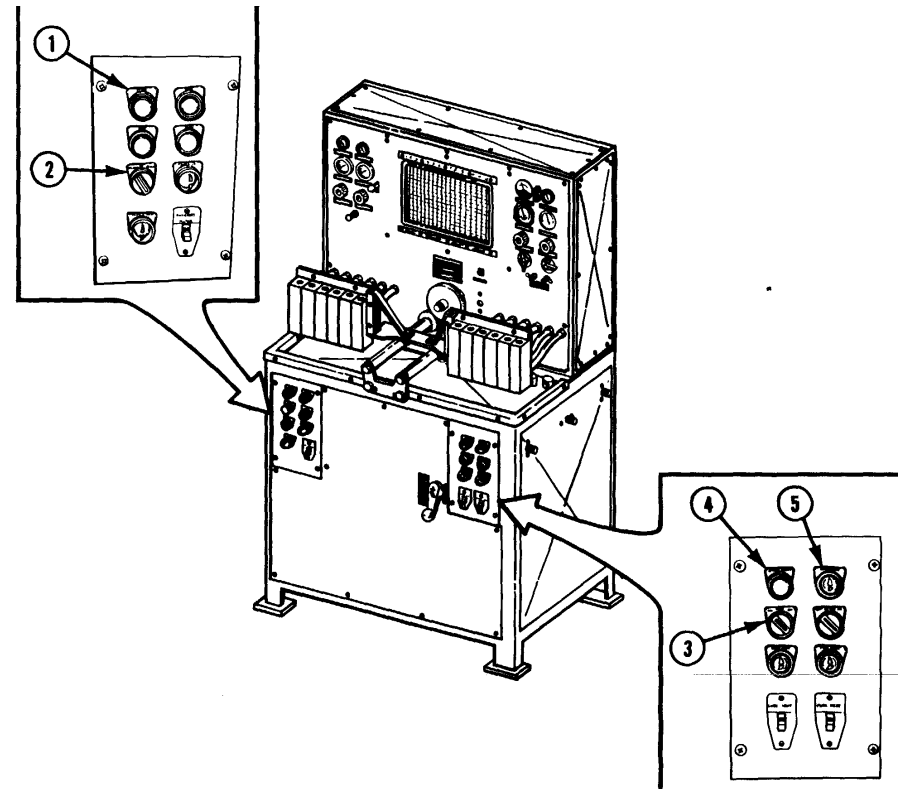
6-28. COUNTER PULSE SWITCH-MAINTENANCE INSTRUCTIONS (cont)

TEST

**NOTE**

Ensure the **AUXILIARY MOTOR** switch is off.

- 1 MAIN POWER SOURCE. Turn on.
- 2 START BUTTON (1). Push in.
- 3 FORWARD-OFF-REVERSE SWITCH (2). Set to FORWARD.
- 4 500-1000-OFF SWITCH (3). Set to 500.
- 5 START COUNT BUTTON (4). Push in.
- 6 COUNTING LIGHT (5). Check that it lights.



**6-29. SWITCH ACTUATING CAM ASSEMBLY - MAINTENANCE INSTRUCTIONS****THIS TASK COVERS:**

- |                         |                 |
|-------------------------|-----------------|
| a. Removal              | d. Repair       |
| b. Disassembly          | e. Reassembly   |
| c. Inspection/servicing | f. Installation |

**INITIAL SETUP****Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

**References**

TM 9-4910-387-24P

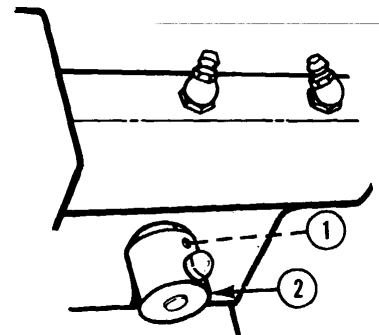
**Equipment Conditions**

Main power source to tester is turned off
4-32 Upper back panel is removed
433 RH upper side panel is removed
6-446 Counter pulse switch is removed

**REMOVAL**

**NOTE** Before removal, scribe a mark on the gear shaft on both sides of the switch actuating cam assembly for proper alignment during reassembly.

- 1 SETSCREW (1). Loosen.
- 2 SWITCH ACTUATING CAM ASSEMBLY (2). Remove.





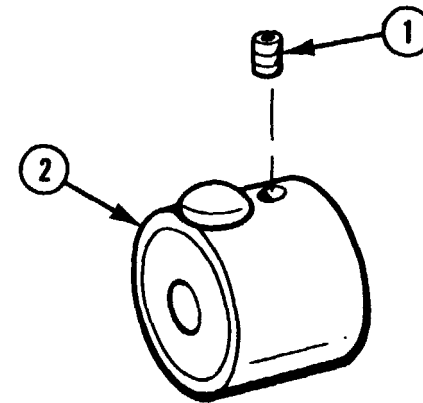
6-29. SWITCH ACTUATING CAM ASSEMBLY-MAINTENANCE INSTRUCTIONS (t)

DISASSEMBLY

SETSCREW (1). Remove from cam (2).

**NOTE**

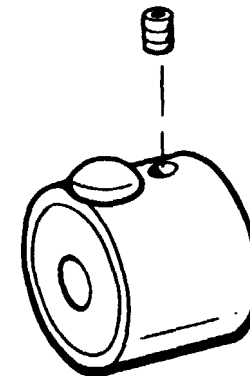
The drive screw cannot be removed without damage to the drive screw and the cam.



INSPECTION/SERVICING

SWITCH ACTUATING CAM ASSEMBLY.

- a. Check for broken, cracked, worn, or missing parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



## REPAIR

### NOTE

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

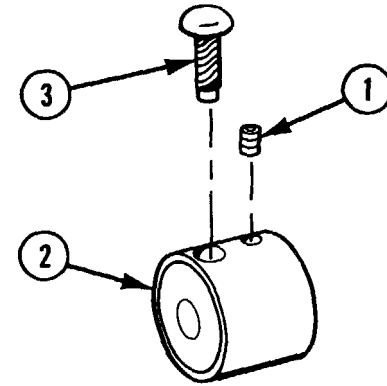
## REASSEMBLY

- 1 SETSCREW (1). Install in cam (2).

### NOTE

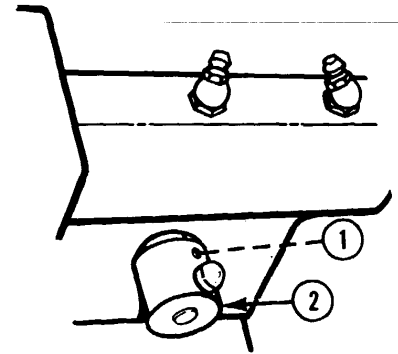
Step 2 is only needed for initial installation or when installing a new drive screw and cam.

- 2 DRIVE SCREW (3). Install in cam (2).



## INSTALLATION

- 1 SWITCH ACTUATING CAM ASSEMBLY (1). Install on gear shaft (2), aligning with scribed mark.
- 2 SETSCREW (3). Tighten.



## 6-30. INPUT SHAFT ASSEMBLY-MAINTENANCE INSTRUCTIONS

TM 9-4910-387-14-2

### THIS TASK COVERS:

- a. Removal
- b. Disassembly
- c. Repair
- d. Reassembly
- e. Installation

### INITIAL SETUP

Tools and Special Tools  
General mechanic's automotive tool kit (5180-00-177-7033) for the counter pulse switch and tachometer generator assembly  
TM 94910-387-24P

### References

- |       |   |                      |   |
|-------|---|----------------------|---|
| 6-424 | Removal and disassembly procedures for the counter pulse switch and tachometer generator assembly | Equipment Conditions | Main power source to tester is turned off |
|       |   | 4-32                 | Upper back panel is removed               |
| 6-431 | Reassembly/alinement and installation procedures  | 4-33                 | RH upper side panel is removed            |

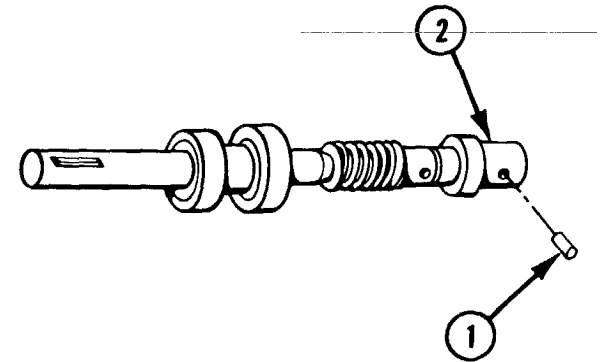
### REMOVAL

#### NOTE

For removal instructions for the input shaft assembly, refer to removal and disassembly procedures for the counter pulse switch and tachometer generator assembly, p 6-424.

### DISASSEMBLY

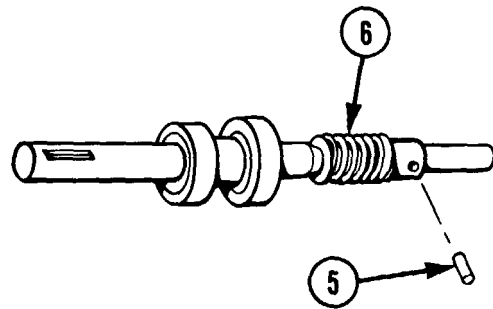
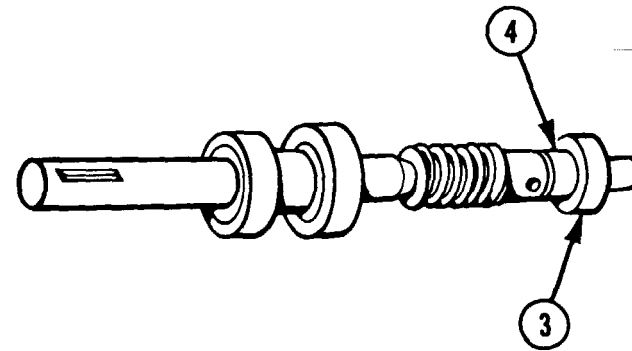
- 1 SPRING PIN (1). Remove
- 2 TACHOMETER GENERATOR COUPLING (2). Remove.



**NOTE**

Do not remove bearing unless necessary for replacement, as removal may damage the bearing.

- 3 BEARING (3). Remove.
- 4 WORM AND BEARING SPACER (4). Remove.

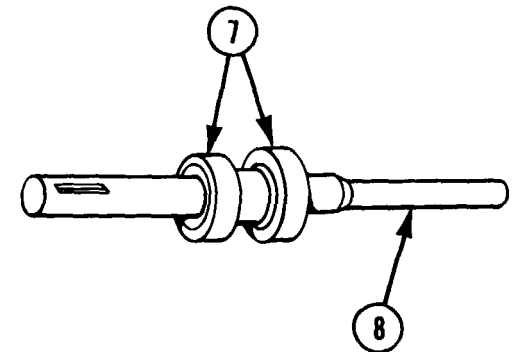


- 5 PIN (5). Remove.
- 6 WORM (6). Remove.

**NOTE**

Do not remove bearings unless necessary for replacement, as removal may damage the bearings.

- 7 TWO BEARINGS (7). Remove from shaft (8).

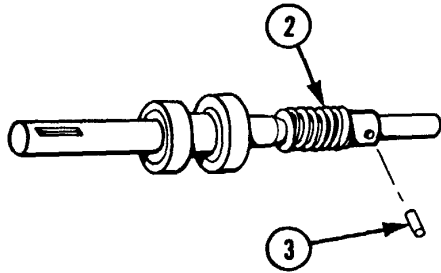


6-30. INPUT SHAFT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REPAIR

**NOTE**

Repair is by replacement of authorized parts (TM 9 4910-387-24P) as required.



2 WORM (2). Install.

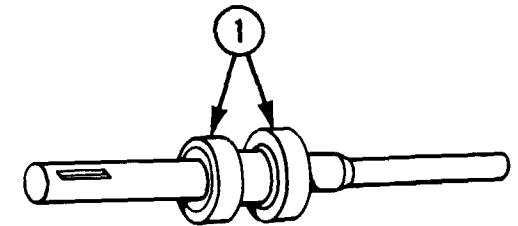
3 PIN (3). Install.

REASSEMBLY

**NOTE**

Install bearings with shields facing away from each other.

1 TWO BEARINGS (1). Install.

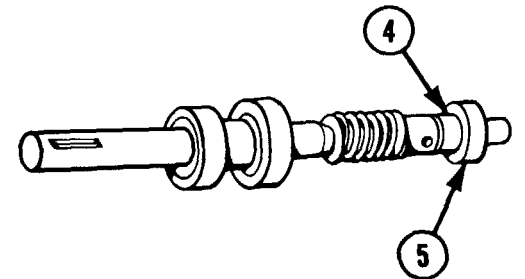


4 WORM AND BEARING SPACER (4). Install.

**NOTE**

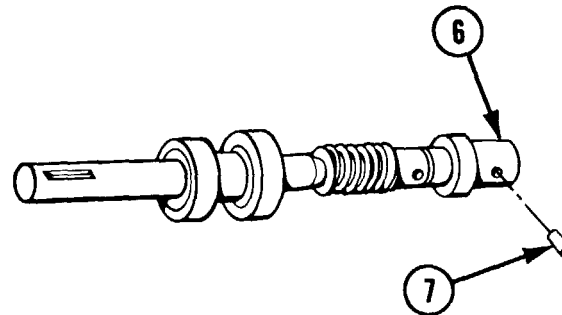
Install bearing with shield away from worm.

5 BEARING (5). Install.



**INSTALLATION**

- 6 TACHOMETER GENERATOR COUPLING (6). Install.
- 7 SPRING PIN (7). Install.



**NOTE**  
 For installation instructions for the input shaft assembly, refer to reassembly/alignment and installation procedures for the counter pulse generator assembly, p 6-431.

**6-31. FITTING BRACKET ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**References**

TM 9-4910-387-24P

**Materials/Parts**

- Cleaning compound (item 3, app C)
- Rag (item 14, app C)

**Equipment Conditions**

- Main power source to tester is turned off
- 4-32 Upper back panel is removed
- 4-33 RH upper side panel is removed

6-31. FITTING BRACKET ASSEMBLY-MAINTENANCE INSTRUCTIONS (ht)

REMOVAL

**NOTE**

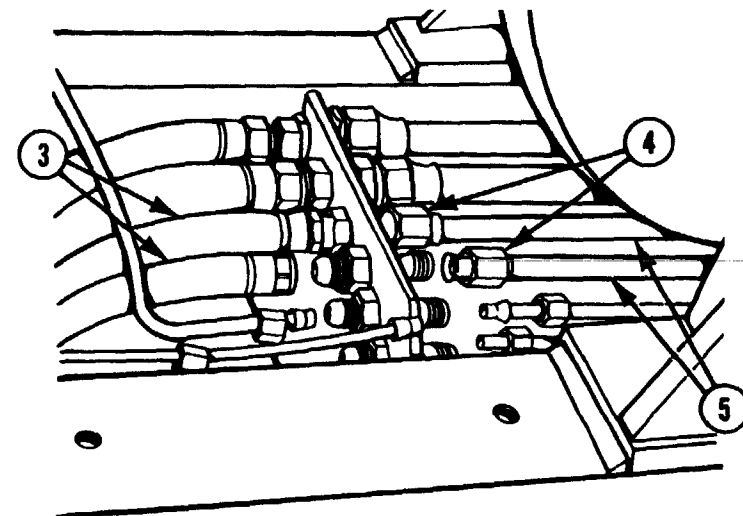
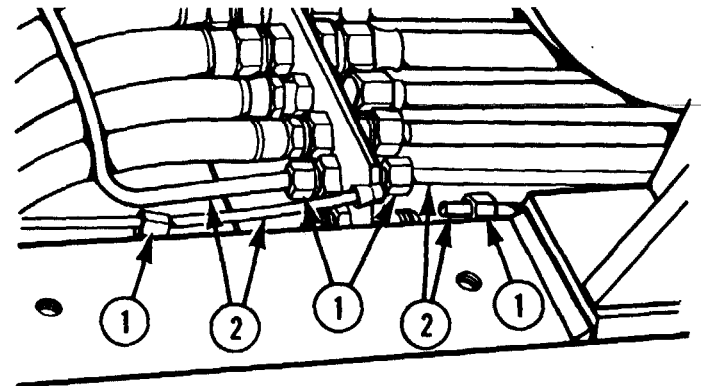
Tag tubings and hoses before removal.

1 FOUR NUTS (1) AND FOUR COPPER TUBINGS (2).  
Disconnect.

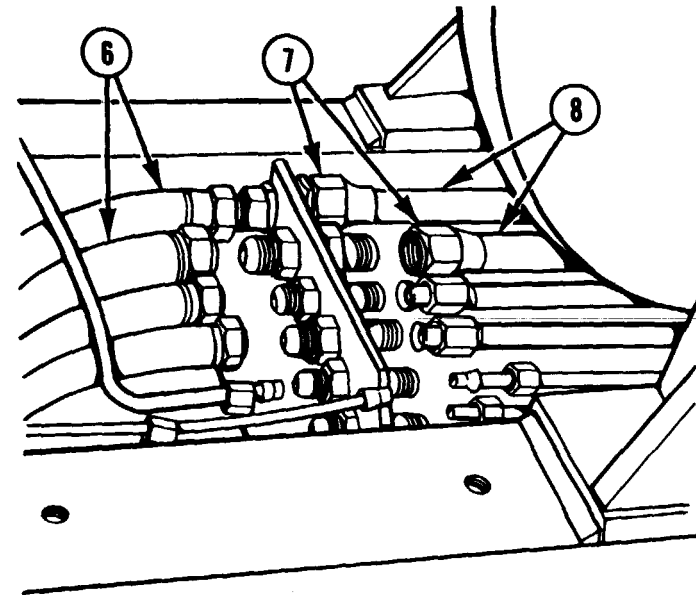
2 TWO HOSES (3), TWO NUTS (4), AND TWO COPPER TUBINGS (5). Disconnect.

**NOTE**

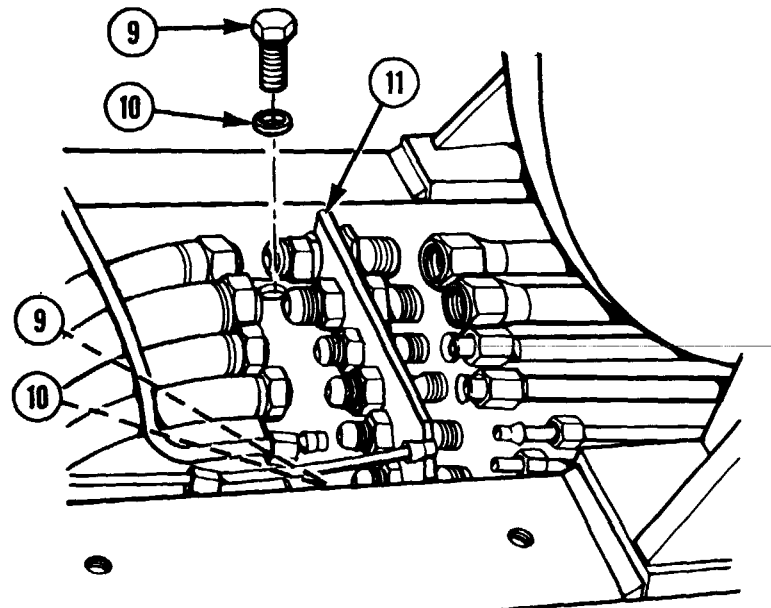
THE COUNTER PULSE SWITCH AND TACHOMETER GENERATOR ASSEMBLY HAS BEEN REMOVED FOR CLARITY.



- 3 TWO HOSES (6), TWO NUTS (7), AND TWO COPPERTUBINGS (8). Disconnect.



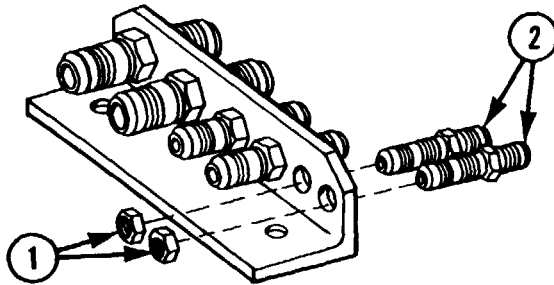
- 4 TWO SCREWS (9) AND TWO LOCKWASHERS (10). Remove.  
 5 FITTING BRACKET ASSEMBLY (11). Remove.



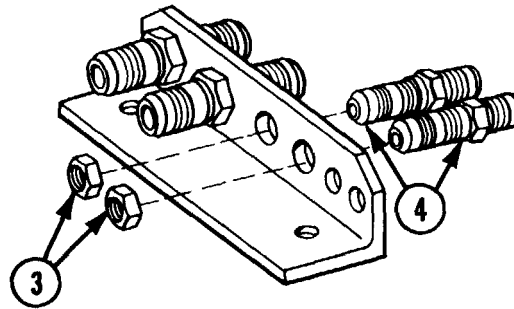


6-31. FITTING BRACKET ASSEMBLY-MAINTENANCE INSTRUCTIONS (ht)

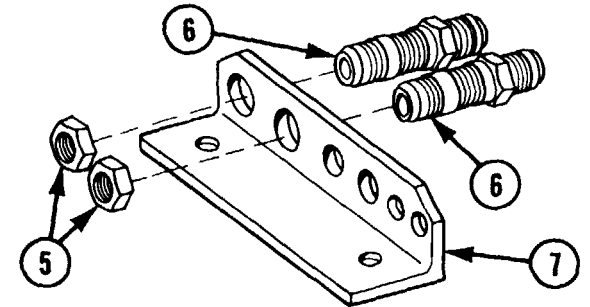
DISASSEMBLY



- 1 TWO NUTS (1). Remove.
- 2 TWO BULKHEAD UNIONS (2). Remove.



- 3 TWO NUTS (3). Remove.
- 4 TWO TUBE FITTINGS (4). Remove.

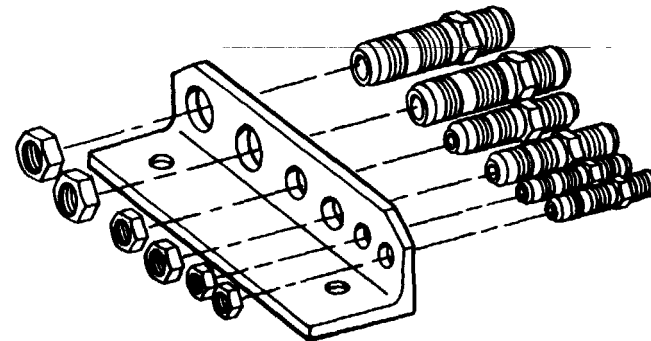


- 5 TWO NUTS (5). Remove.
- 6 TWO TUBE FITTINGS (6). Remove from fitting bracket (7).

INSPECTION/SERVICING

FITTING BRACKET ASSEMBLY.

- a. Check for broken, cracked, or missing parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).



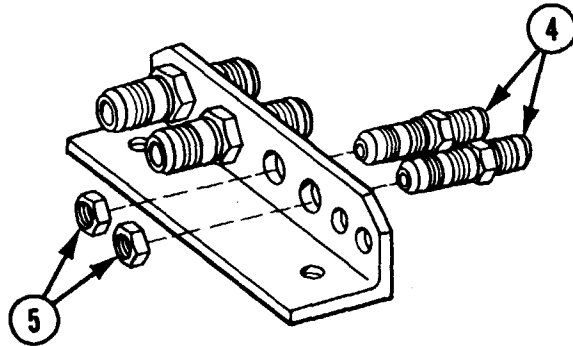
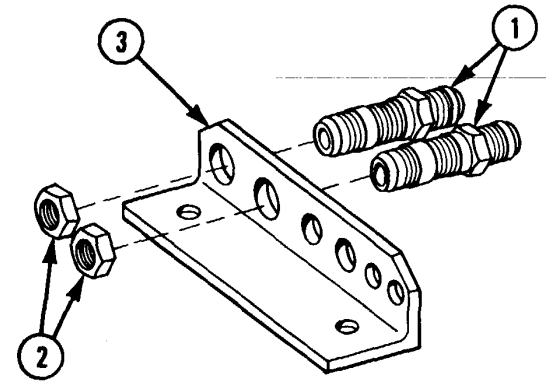
**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

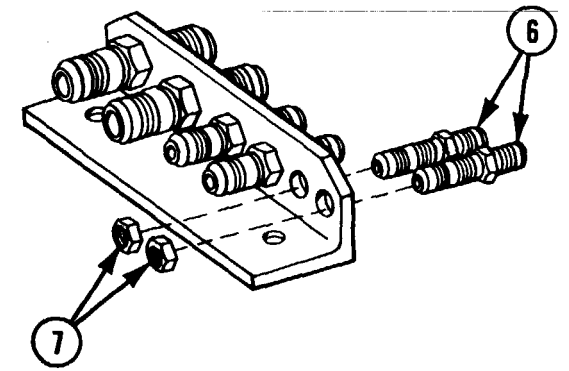
**REASSEMBLY**

1 TWO TUBE FITTINGS (1) AND TWO NUTS (2). Install on fitting bracket (3).



2 TWO TUBE FITTINGS (4) AND TWO NUTS (5). Install.

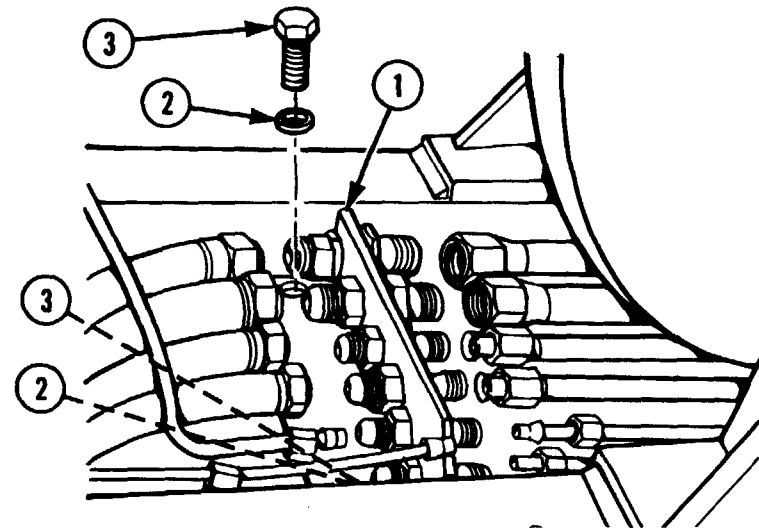
3 TWO BULKHEAD UNIONS (6) AND TWO NUTS (7). Install.



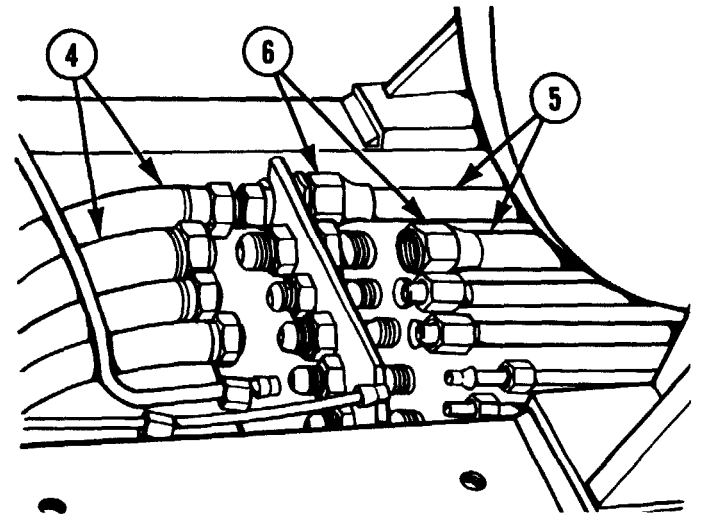
6-31. FITTING BRACKET ASSEMBLY-MAINTENANCE INSTRUCTIONS (ht)

INSTALLATION

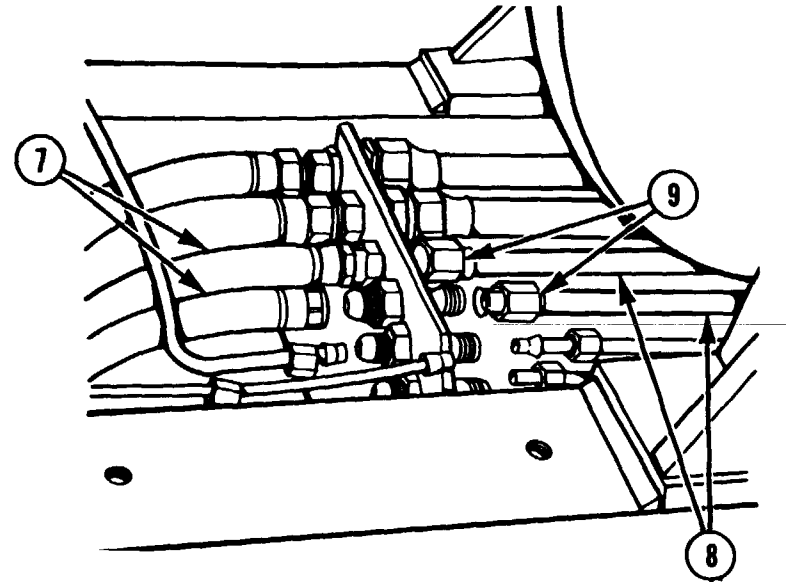
1 FITTING BRACKET ASSEMBLY (1). Install and secure with two lockwashers (2) and two screws (3).



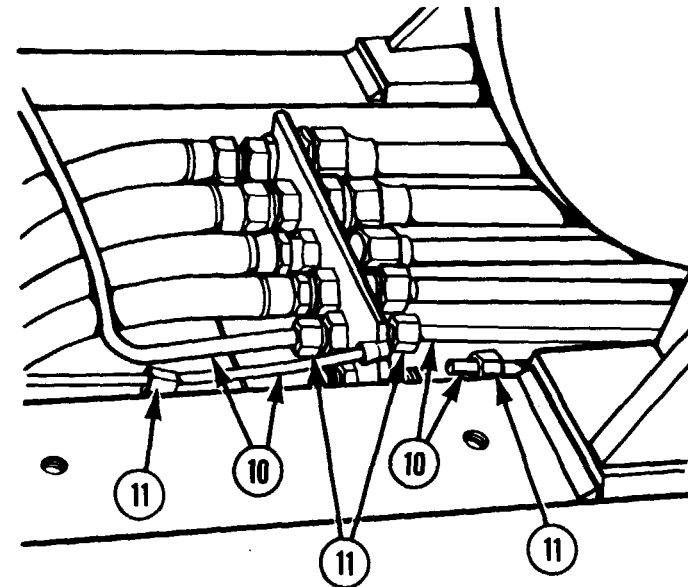
2 TWO HOSES (4), TWO COPPER TUBINGS (5), AND TWO NUTS (6). Install.



3 TWO HOSES (7), TWO COPPER TUBINGS (8), AND TWO NUTS (9). Install.



4 FOUR COPPER TUBINGS (10) AND FOUR NUTS (11). Install.



**6-32. DRIVE UNIT ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly/alinement
- f. Installation
- g. Test/adjustment

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit  
(5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)  
Grease (item 7, app C)  
Rag (item 14, app C)  
Tape (item 19, app C)

**References**

2-26 Fuel injector pump hookup  
6-502 Removal/disassembly procedure of the clutch  
assembly  
TM 9-4910-387-24P

**Troubleshooting References**

6-132 Drive speed of tester will not decrease

- 6-126 Drive speed of tester will not increase
- 6-138 Main drive motor blows main power source fuzes
- 6-12 Main drive motor fails to start, FORWARD-OFF-REVERSE switch is in FORWARD position
- 6-23 Main drive motor fails to start, FORWARD-OFF-REVERSE switch is in REVERSE position

**Equipment Conditions**

Main power source to tester is turned off  
4-33 RH upper side panel is removed  
4-30 RH panel assembly is removed  
4-32 Upper back panel is removed  
4-33 Lower back panel is removed  
4-34 LH upper side panel is removed  
4-42 LH panel assembly is removed  
Forklift is available

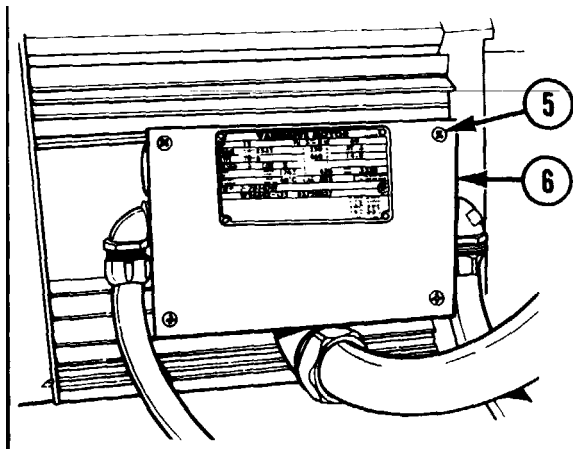
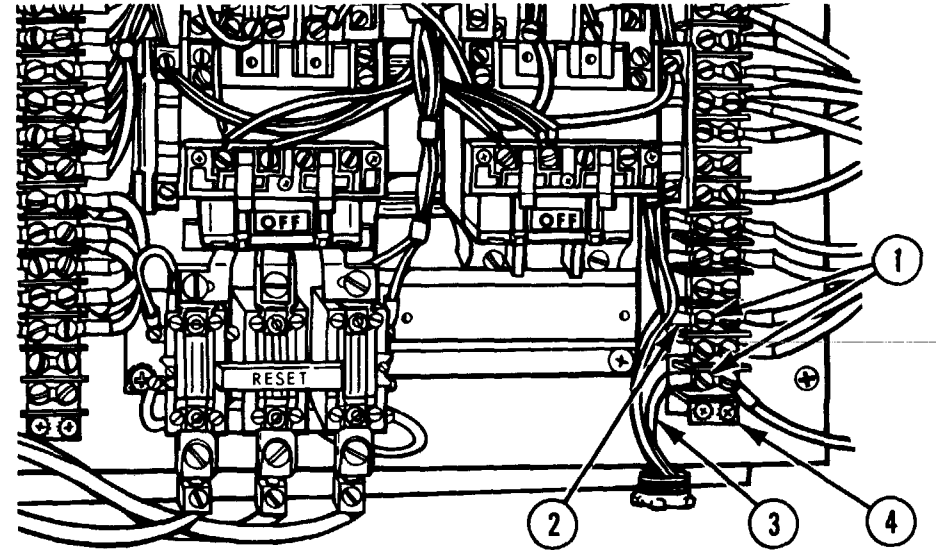
**REMOVAL**

**NOTE**  
Tag all wires at disassembly.

1 TWO SCREWS (1). Remove.

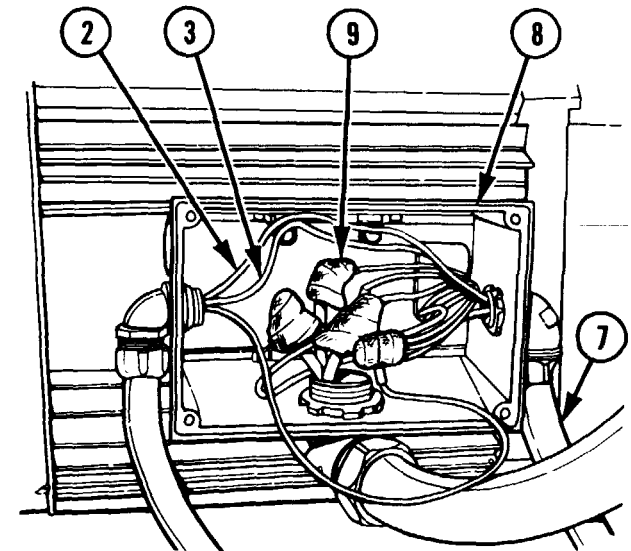
**NOTE**  
The terminal strip on the RH side of the LH mounting board assembly is referred to as terminal strip B.

2 TWO BLUE WIRES (2 AND 3) WITH TERMINAL LUGS CONNECTED TO B14 AND B16 ON TERMINAL STRIP B (4). Disconnect.



3 FOUR SCREWS (5). Remove.  
4 COVER (6). Remove.

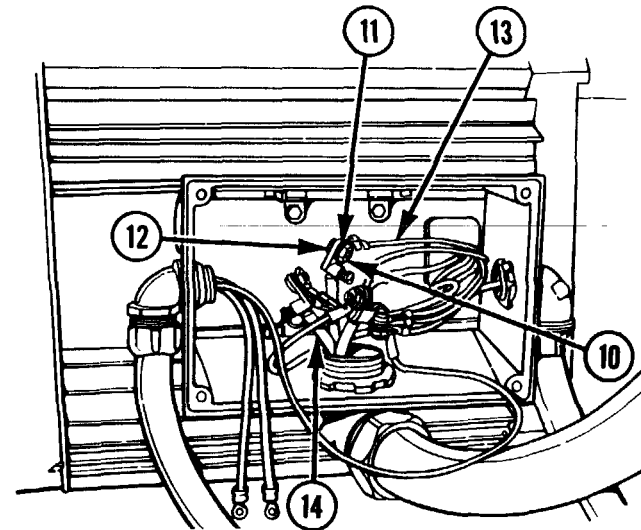
5 TWO BLUE WIRES (2 AND 3) WITH TERMINAL LUGS. Pull through flexible conduit (7) into outlet box (8).  
6 TAPE (9). Remove from wire ends.



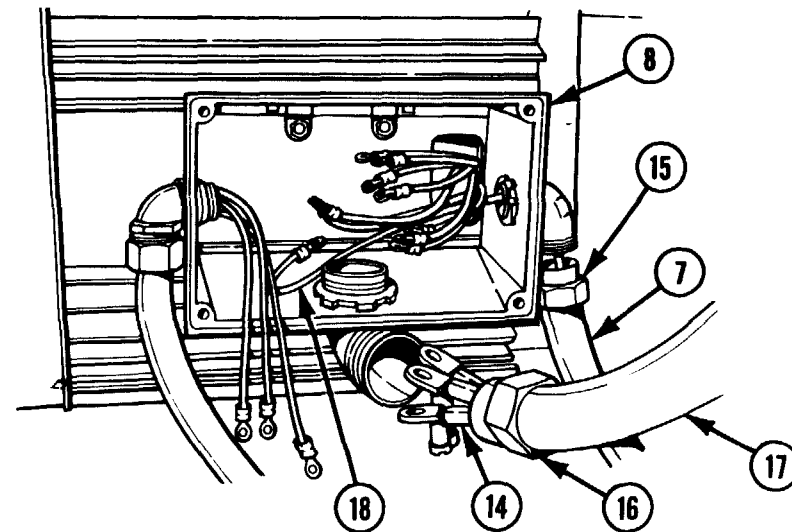
6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

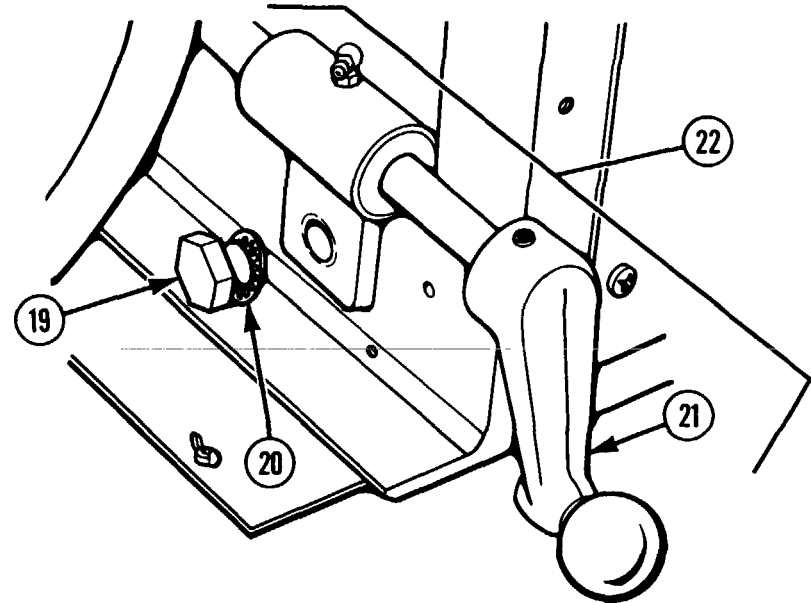
- 7 FOUR NUTS (10), FOUR WASHERS (11), AND FOUR SCREWS (12). Remove.
- 8 NINE WIRES (13) WITH TERMINAL LUGS AND THREE WIRES (14) WITH CONNECTORS. Disconnect.



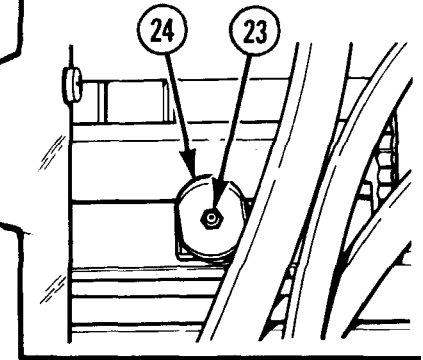
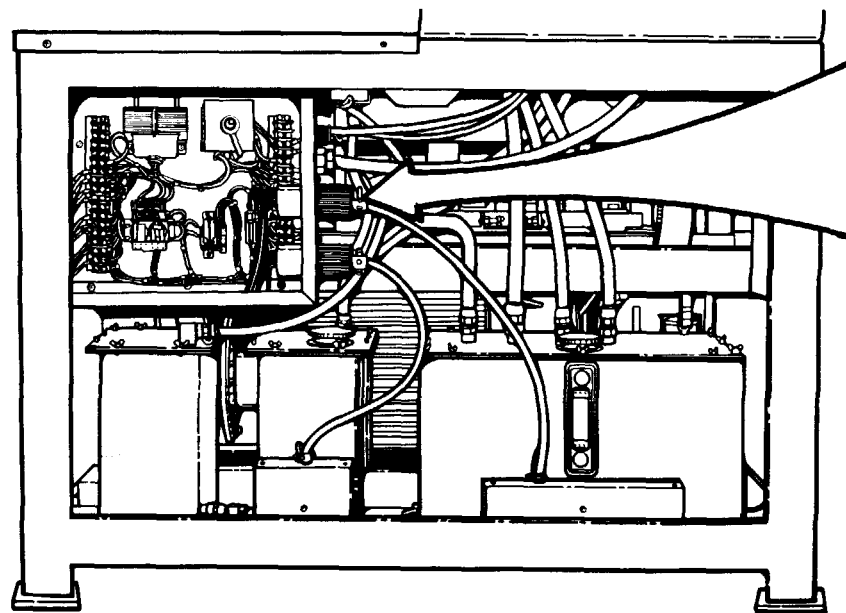
- 9 TWO NUTS (15 AND 16). Loosen.
- 10 TWO FLEXIBLE CONDUITS (7 AND 17). Pull away from outlet box (8).
- 11 BLUE WIRE (18) WITH TERMINAL LUG CONNECTED TO B15 ON TERMINAL STRIP B. Pull out of outlet box (8).
- 12 THREE WIRES (14) WITH CONNECTORS. Pull out of outlet box (8).



- 13 CAPSCREW (19) AND LOCKWASHER (20). Remove.
- 14 HAND CRANK (21). Turn counterclockwise.
- 15 SHIFT CONTROL ROD ASSEMBLY (22). Remove.



- 16 FITTING (23) AND CLUTCH SHIFTING NUT (24). Remove.



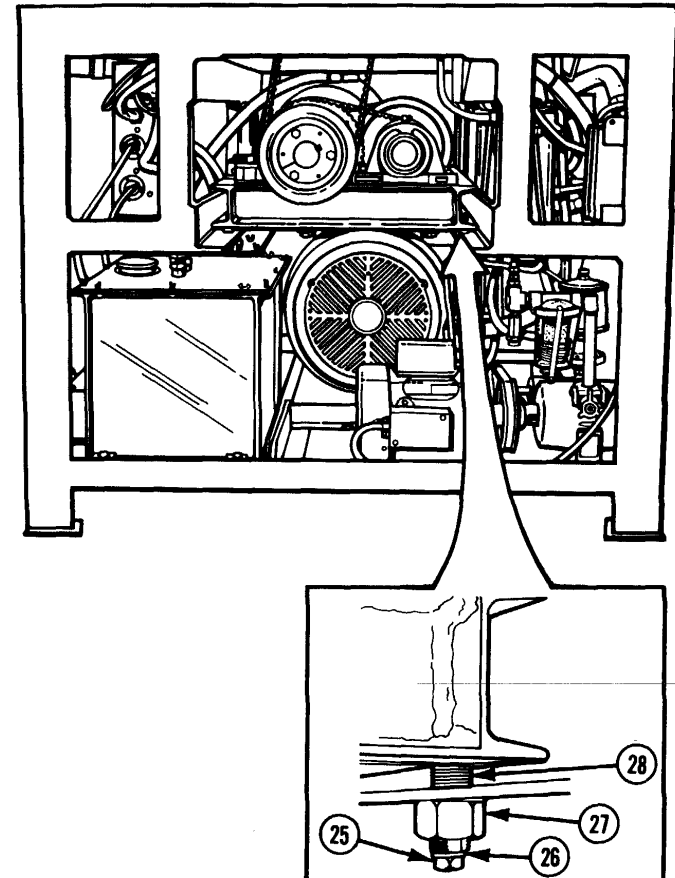


6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

17 FOUR SCREWS (25) AND FOUR LOCKWASHERS (26). Remove.

18 FOUR NUTS (27) AND FOUR JACKSCREWS (28). Remove.



**WARNING**

Remove the drive unit assembly only with an available forklift as the drive unit assembly weighs approximately 530 lbs (240.41 kg). Serious injury to personnel could result if not careful.

**NOTE**

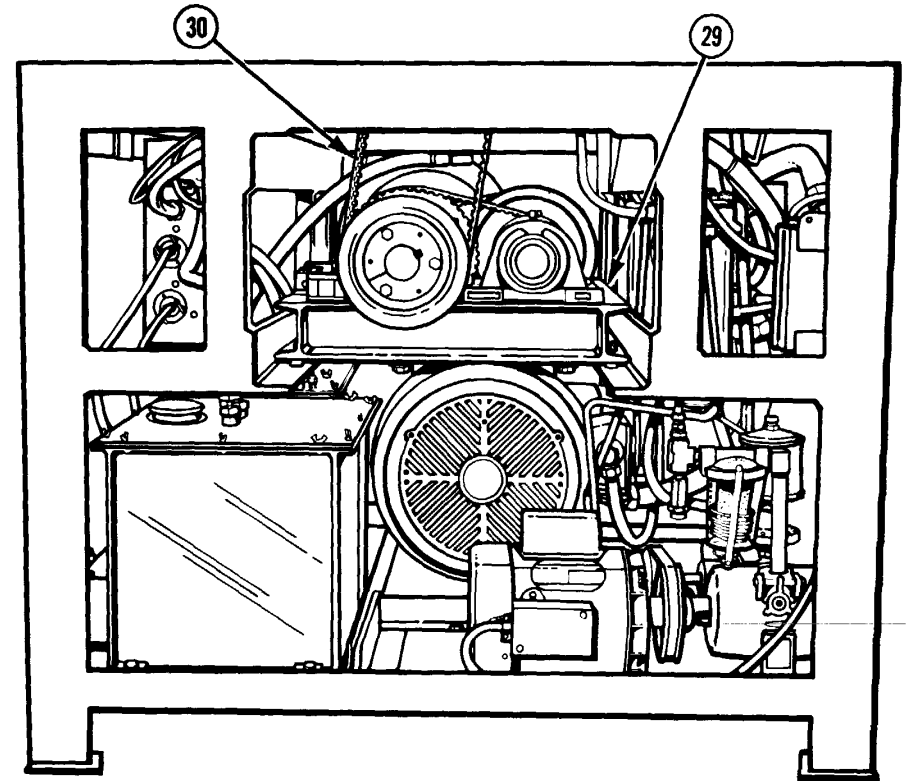
The drive unit assembly can only be removed from the front of the tester.

- 19 DRIVE UNIT ASSEMBLY (29). Raise approximately 2 in. (5.08 cm).
- 20 REAR TIMING BELT (30). Remove.

**CAUTION**

Make sure a suitable sturdy frame is available on which to rest the drive unit assembly.

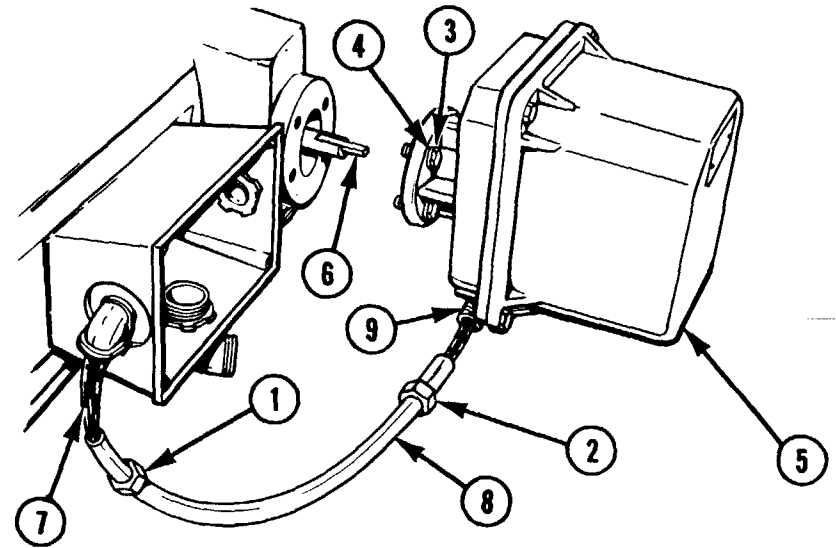
- 21 DRIVE UNIT ASSEMBLY (29). Remove.



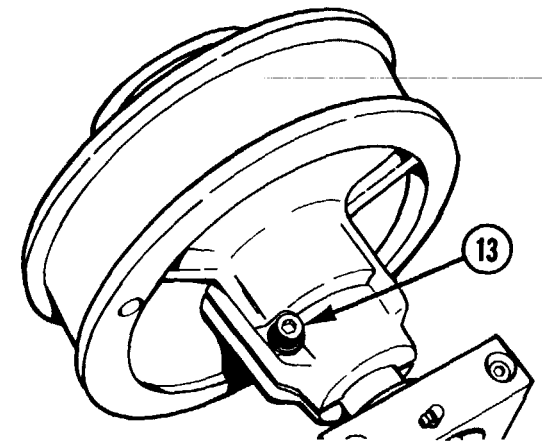
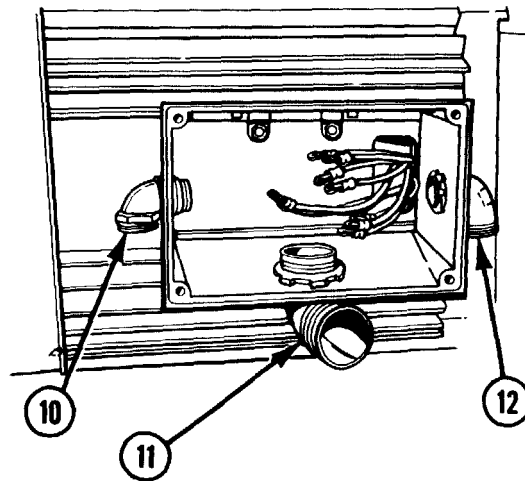
6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS(Cont)

DISASSEMBLY

- 1 TWO NUTS (1 AND 2). Loosen.
- 2 FOUR SCREWS (3) AND FOUR LOCKWASHERS (4).  
Remove.
- 3 REMOTE CONTROL MOTOR (5) AND KEY (6). Remove.
- 4 THREE BLUE WIRES (7) WITH TERMINAL LUGS. Pull through flexible conduit (8).
- 5 FLEXIBLE CONDUIT (8) AND ELECTRICAL BOX CONNECTOR (9). Remove.

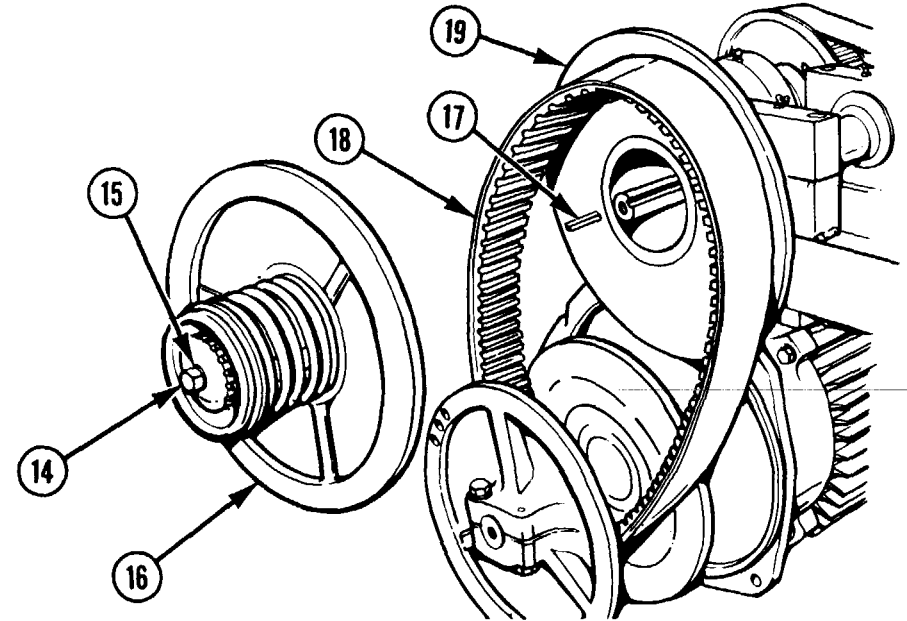


- 6 ELECTRICAL BOX CONNECTOR (10) AND TWO CONNECTORS (11 AND 12). Remove.



- 7 TWO SETSCREWS (13). Loosen.

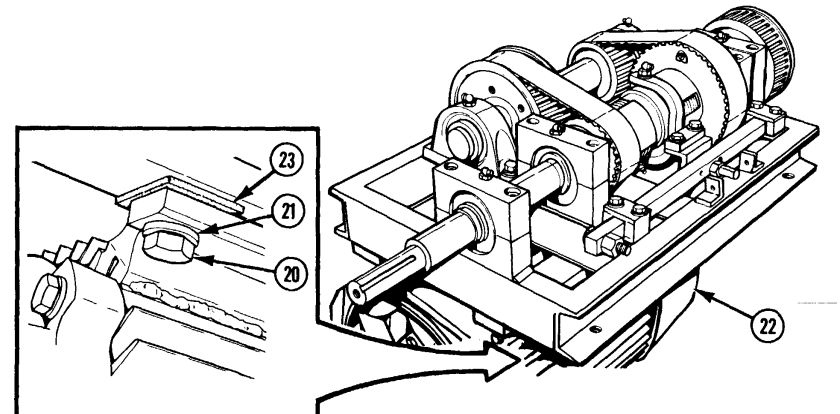
- 8 VARIDRIVE STUD (14) AND LOCKWASHER (15). Remove.
- 9 FRONT PULLEY HALF (16), KEY (17), AND VARIDRIVE BELT (18). Remove.
- 10 REAR PULLEY HALF (19). Remove.



**WARNING**

Be sure main drive motor is supported before removal as it weighs approximately 200 lbs (90.72 kg). Injury to personnel could result if main drive motor is not supported.

- 11 FOUR SCREWS (20) AND FOUR LOCKWASHERS (21). Remove.
- 12 MAIN DRIVE MOTOR (22) AND FOUR MOUNTING PADS (23). Remove.



**6-32 DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

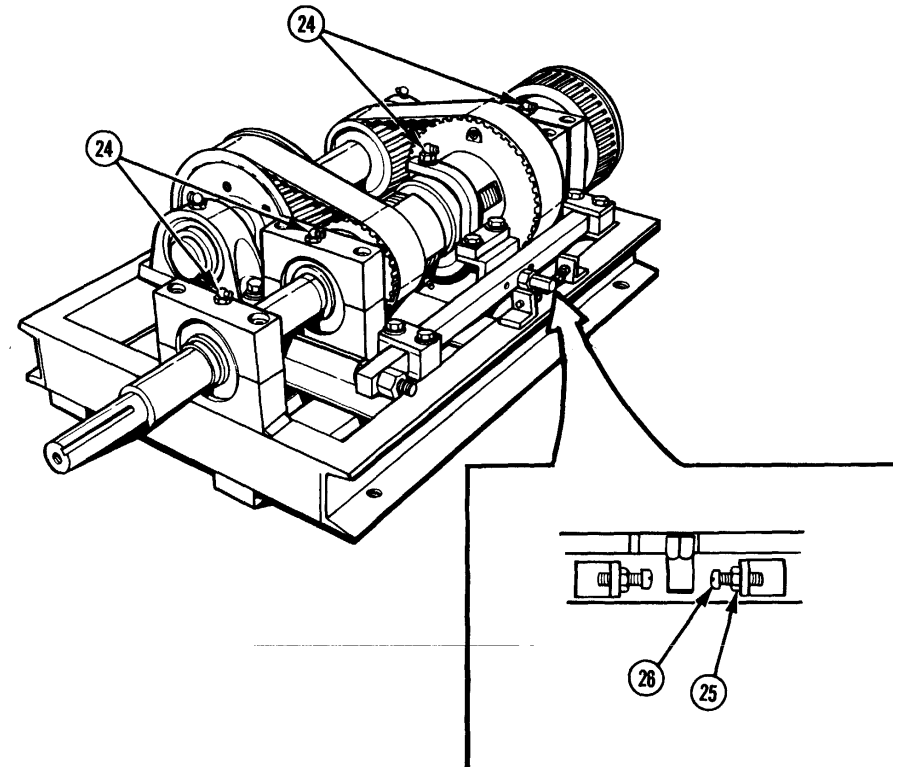
**DISASSEMBLY (cont)**

13 FOUR FITTINGS (24). Remove.

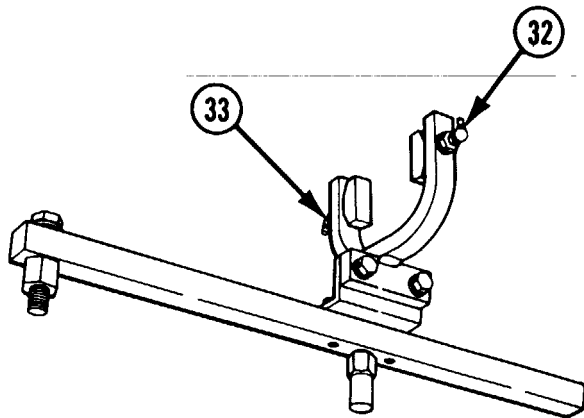
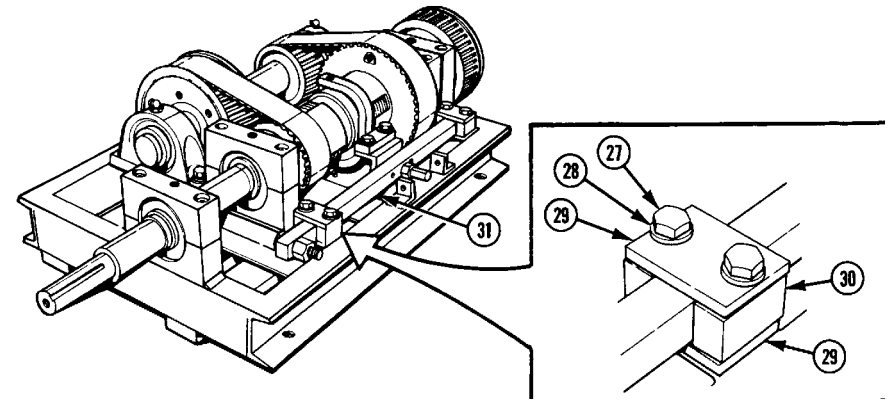
14 TWO NUTS (25) AND TWO SCREWS (26).

a. Loosen two nuts (25).

b. Remove two screws (26) and two nuts (25).

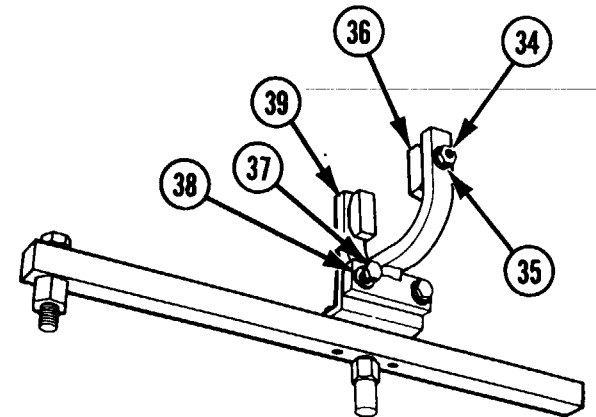


- 15 FOUR SCREWS (27) AND FOUR LOCKWASHERS (28). Remove.
- 16 TWO SLIDE CAPS (29) AND FOUR SLIDE BLOCKS (30). Remove.
- 17 CLUTCH SLIDE BAR (31) AND ATTACHED PARTS. Remove.
- 18 TWO SLIDE CAPS (29). Remove.



- 19 TWO FITTINGS (32 AND 33). Remove.

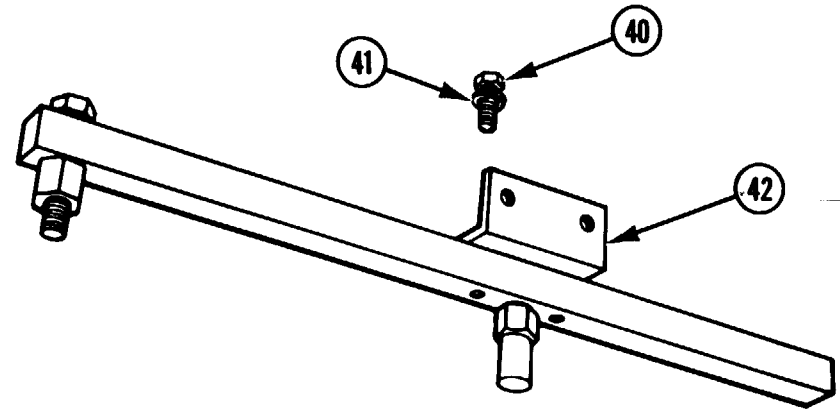
- 20 TWO CLUTCH SHOE STUDS (34), TWO LOCKWASHERS (35), AND TWO CLUTCH SHOES (36). Remove.
- 21 TWO SCREWS (37), TWO LOCKWASHERS (38), AND FORK (39). Remove.



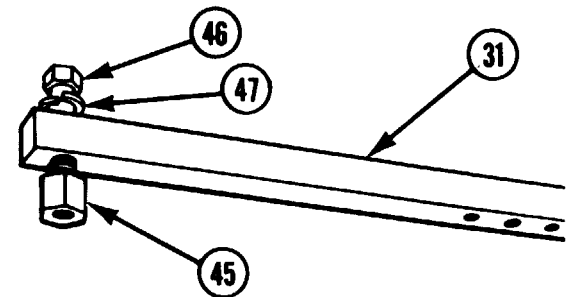
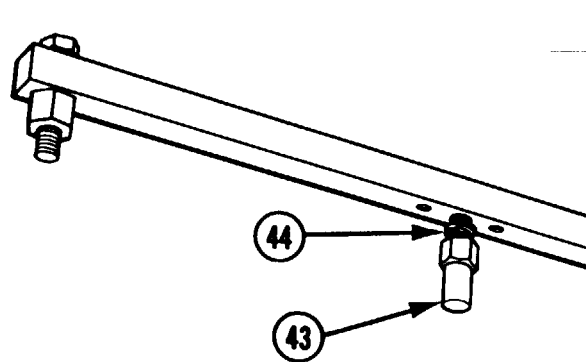
6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

22 TWO SCREWS (40), TWO LOCKWASHERS (41), AND FORK BRACKET (42). Remove.



23 SHIFTER STOP (43) AND LOCK-WASHER (44). Remove.

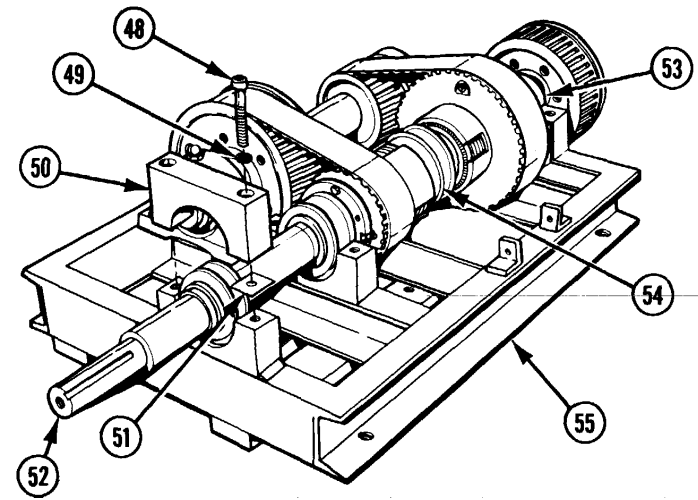


24 NUT (45), SCREW (46), AND LOCK-WASHER (47). Remove from clutch slide bar (31).

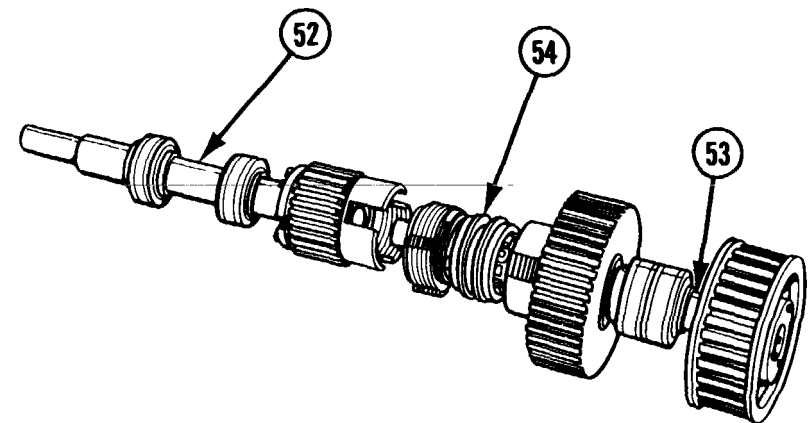
**NOTE**

Mark support pillow block halves, support assembly, and shims for proper reassembly.

- 25 EIGHT SCREWS (48), EIGHT LOCKWASHERS (49), FOUR SUPPORT PILLOW BLOCK HALVES (50), AND SHIMS (51). Remove.
- 26 INPUT SHAFT (52), OUTPUT SHAFT (53), CLUTCH ASSEMBLY (54), AND ATTACHED PARTS. Remove from support assembly (55).



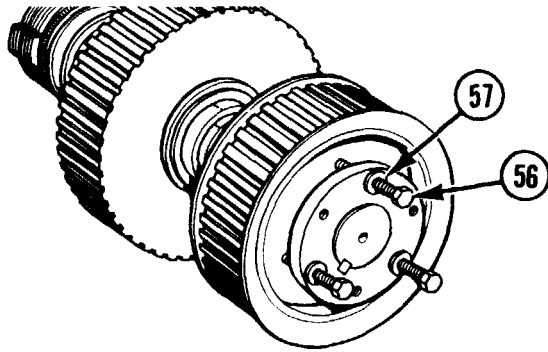
- 27 OUTPUT SHAFT (53) AND CLUTCH ASSEMBLY (54) WITH ATTACHED PARTS. Remove from input shaft (52) with attached parts.





6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)



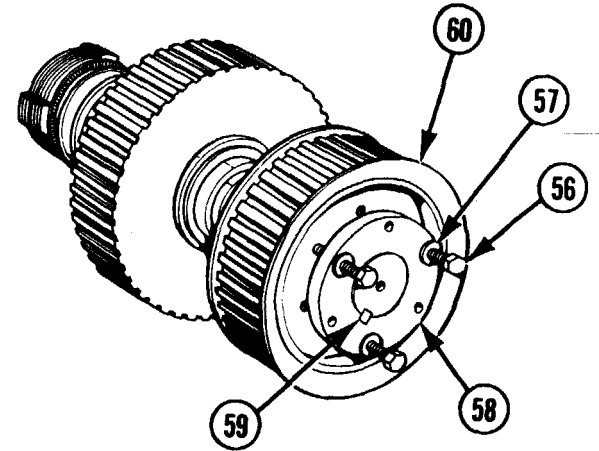
28 THREE SCREWS (56) AND THREE LOCKWASHERS (57)

a. Remove.

- b. Install in threaded holes.
- c. Tighten alternately.

29 BUSHING (58), THREE SCREWS (56), THREE LOCKWASHERS (57), AND KEY (59). Remove.

30 SPROCKET (60). Remove.



31 FOUR SETSCREWS (61). Loosen.

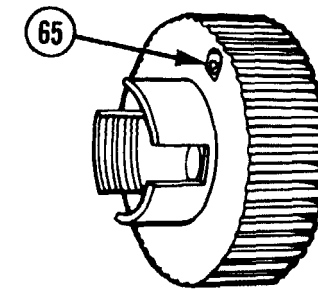
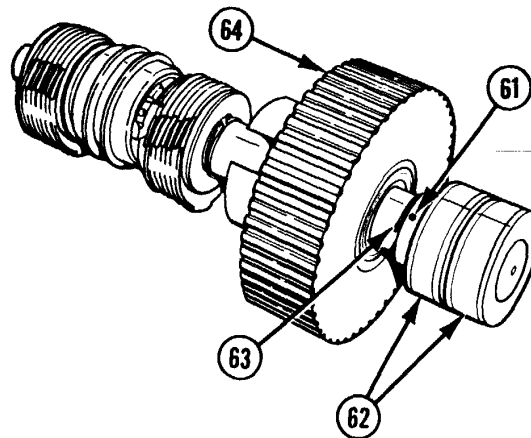
**CAUTION**

Do not remove bearing units unless necessary for replacement as damage to bearing units may occur.

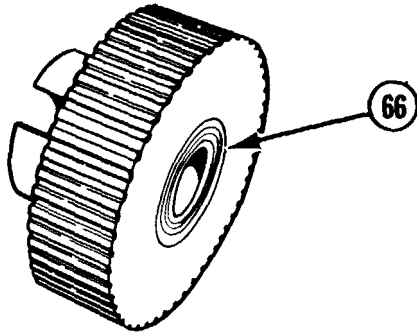
32 TWO BEARING UNITS (62). Remove.

33 RETAINING RING (63). Remove.

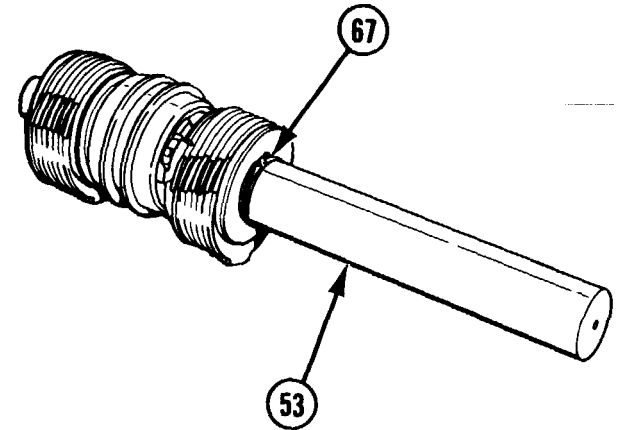
34 PULLEY (64). Remove.



35 FITTING (65). Remove.



37 RETAINING RING (67). Remove from output shaft (53).



**CAUTION**

Do not remove bearing unless necessary for replacement as damage to bearing may occur.

36 BEARING (66). Remove.

**NOTE**

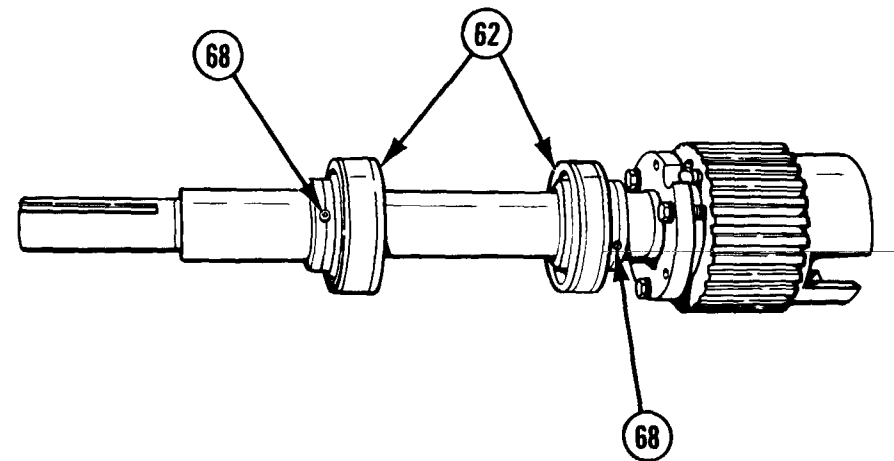
Clutch assembly can not be removed from output shaft without completely disassembling the clutch assembly. If replacement of output shaft is necessary, refer to para 6-33, p 6-502, for removal/disassembly of the clutch assembly.

38 FOUR SETSCREWS (68). Loosen.

**CAUTION**

Do not remove bearing units unless necessary for replacement as damage to bearing units may occur.

39 TWO BEARING UNITS (62). Remove.

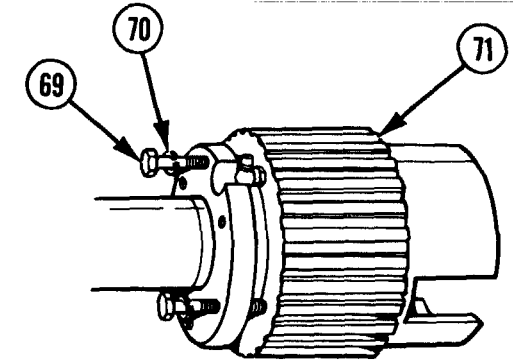
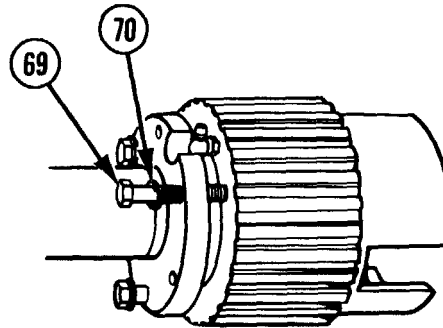


6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont) |

DISASSEMBLY (cont)

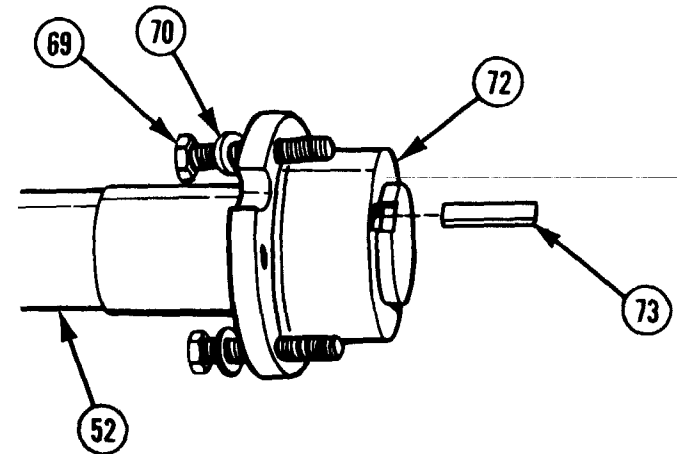
40 THREE SCREWS (69) AND THREE LOCKWASHERS (70).

- a. Remove.
- b. Install in threaded holes.
- c. Tighten alternately.



41 CLUTCH CUP AND TIMING BELT PULLEY (71). Remove.

42 MODIFIED HUB (72) WITH THREE SCREWS (69) AND THREE LOCKWASHERS (70), AND KEY (73). Remove from input shaft (52).

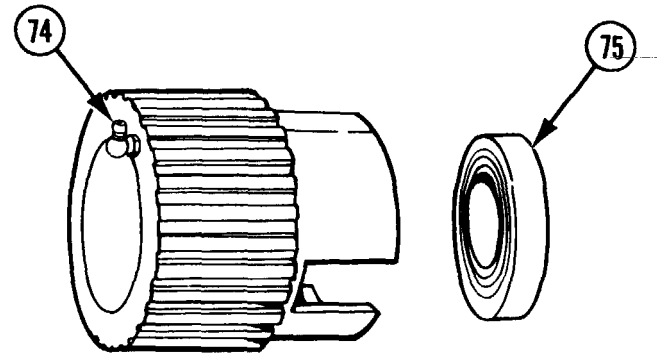


43 THREE SCREWS (69) AND THREE LOCKWASHERS (70). Remove from modified hub (72).

**NOTE**

Do not remove bearing unless necessary for replacement as damage to the bearing may occur.

44 FITTING (74) AND BEARING (75). Remove.

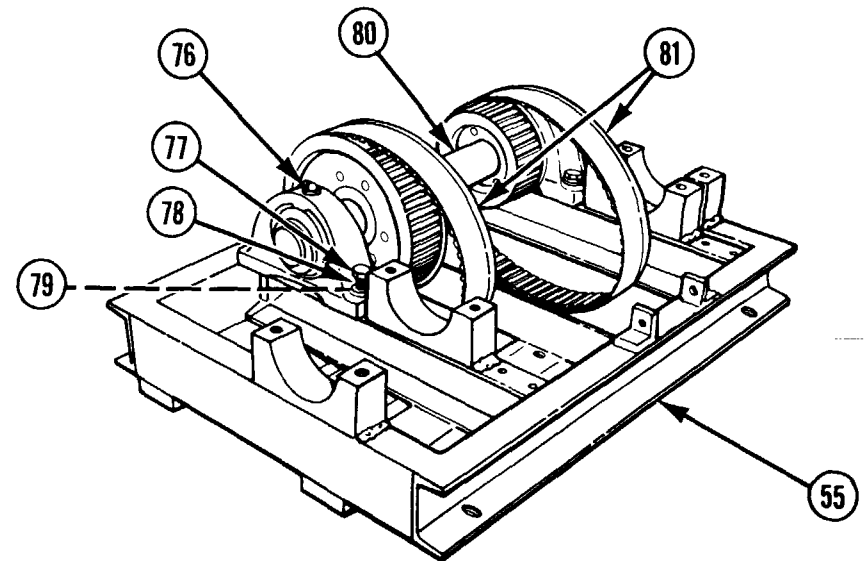


45 TWO FITTINGS (76). Remove.

46 FOUR SCREWS (77), FOUR LOCKWASHERS (78), AND FOUR FLAT WASHERS (79). Remove.

47 REDUCTION SHAFT (80) AND ATTACHED PARTS. Remove from support assembly (55).

48 TWO POSITIVE DRIVE BELTS (81). Remove.

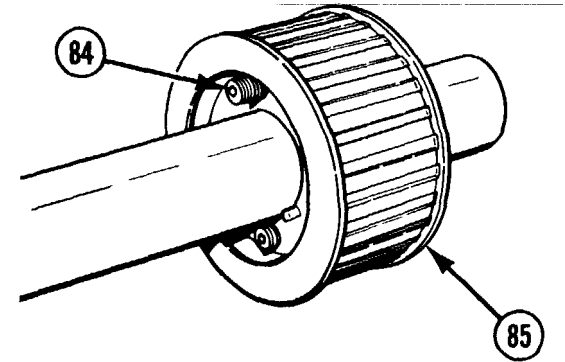
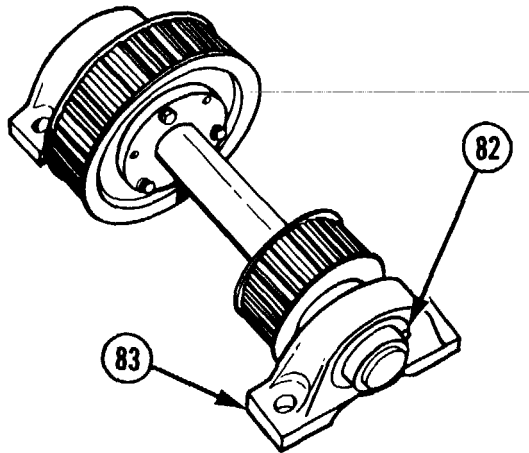


6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY (cont)

49 FOUR SETSCREWS (82). Loosen.

50 TWO SHAFT PILLOW BLOCKS (83).  
Remove.



51 TWO SETSCREWS (84). Remove.

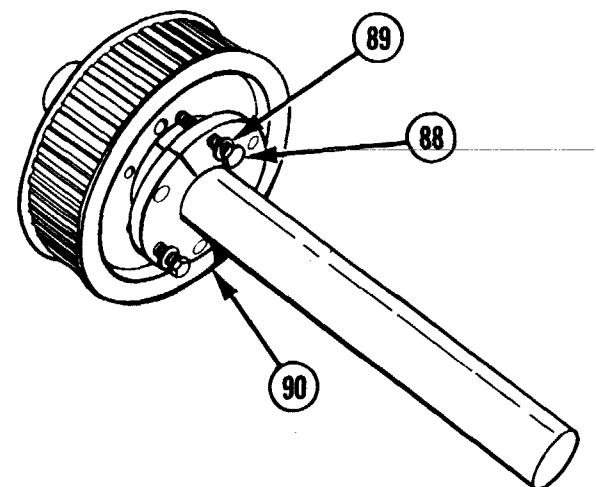
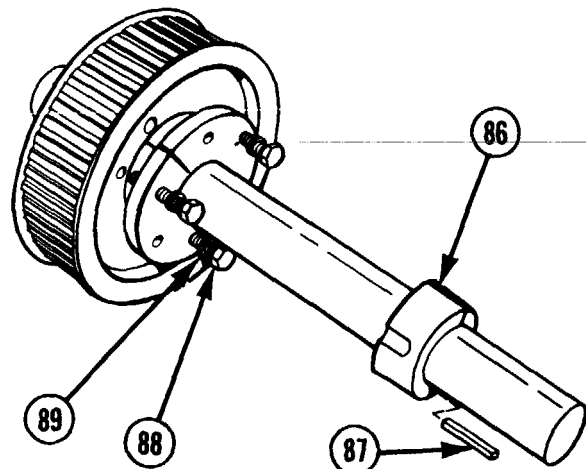
52 TIMING BELT PULLEY (85). Remove.

53 TAPER-LOCK FITTING (86) AND KEY  
(87). Remove.

54 THREE SCREWS (88) AND THREE  
LOCKWASHERS (89).

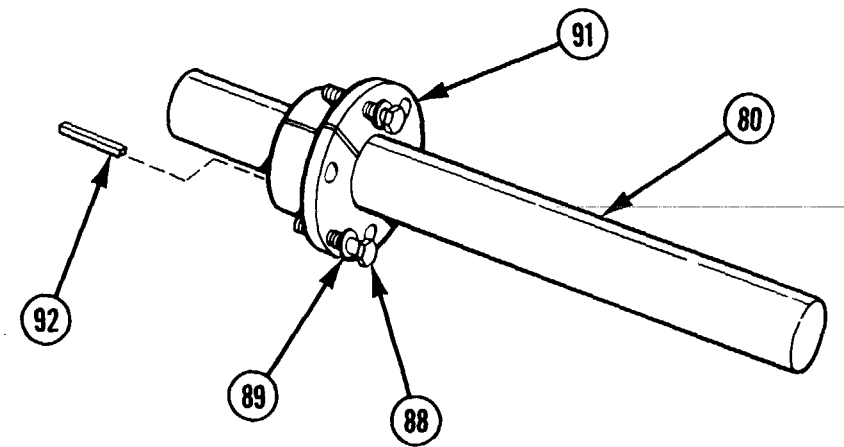
- a. Remove.
- b. Install in threaded holes.
- c. Tighten alternately.

56 TIMING BELT SPROCKET (90).  
Remove.



56 BUSHING (91) WITH THREE SCREWS (88) AND THREE LOCKWASHERS (89), AND KEY (92). Remove from reduction shaft (80).

57 THREE SCREWS (88) AND THREE LOCKWASHERS (89). Remove from bushing (91).



**REPAIR**

**INSPECTION/SERVICING**

- 1 DRIVE UNIT ASSEMBLY. Inspect for damaged, cracked, broken, or missing parts.
- 2 BEARINGS. Inspect for looseness and wear.
- 3 WIRES. Inspect for frayed or burnt insulation.
- 4 ALL PARTS. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

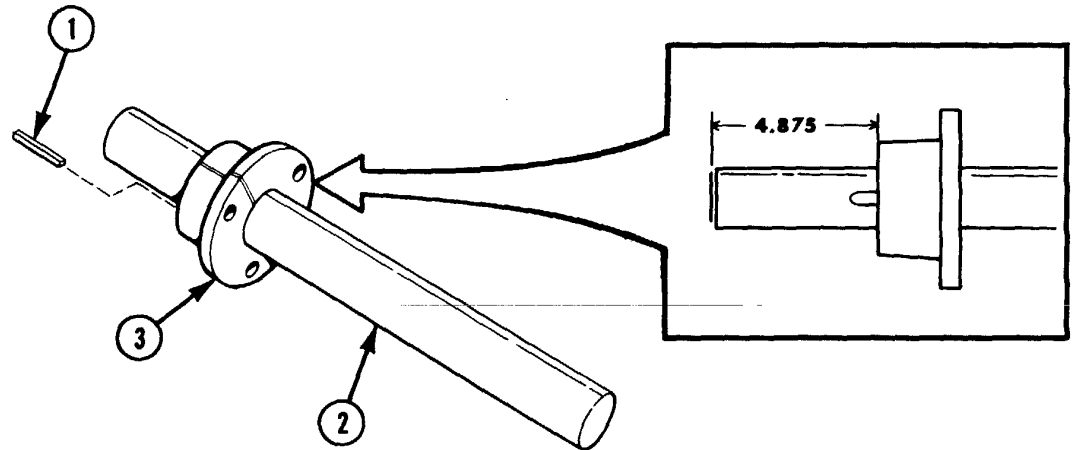
**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

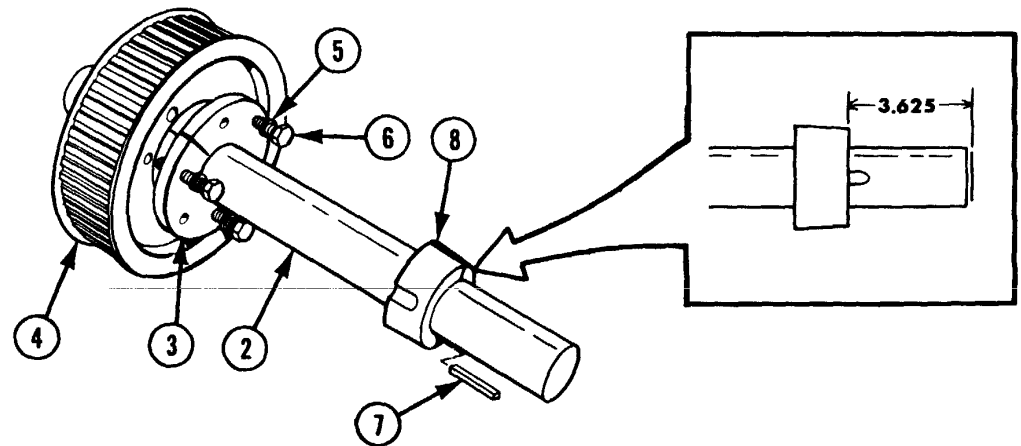
6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT

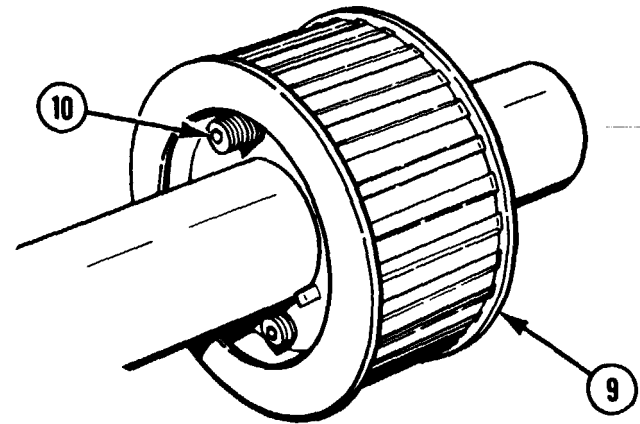
- 1 KEY (1). Install on reduction shaft (2).
- 2 BUSHING (3). Install approximately 4.875 in. (12.383 cm) from end of reduction shaft (2).



- 3 TIMING BELT SPROCKET (4). Install and secure with three lockwashers (5) and three screws (6) inserted in unthreaded holes of bushing (3).
- 4 KEY (7). Install.
- 5 TAPER-LOCK FITTING (8). Install approximately 3.625 in. (9.208 cm) from end of reduction shaft (2).



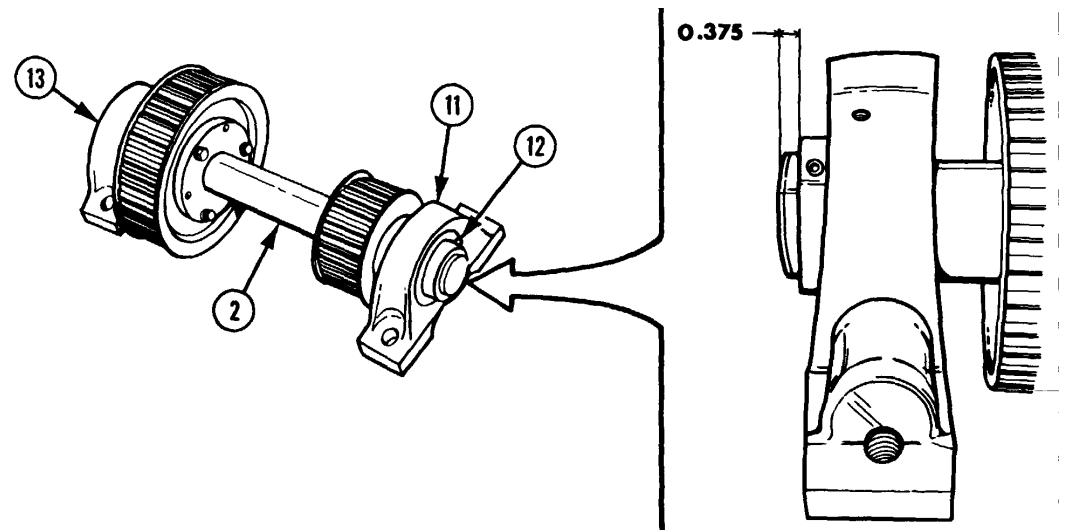
6 TIMING BELT PULLEY (9). Install and secure with two setscrews (10).



7 SHAFT PILLOW BLOCK (11). Install approximately 0.375 in. (0.953 cm) from end of reduction shaft (2).

8 TWO SETSCREWS (12). Tighten.

9 SHAFT PILLOW BLOCK (13). Install.

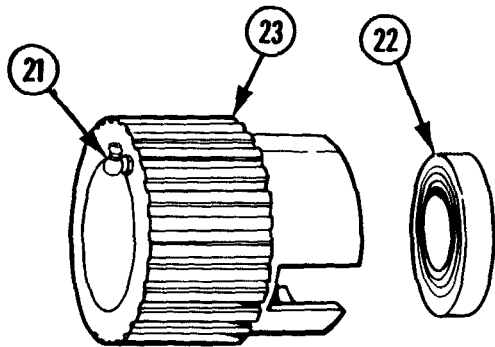
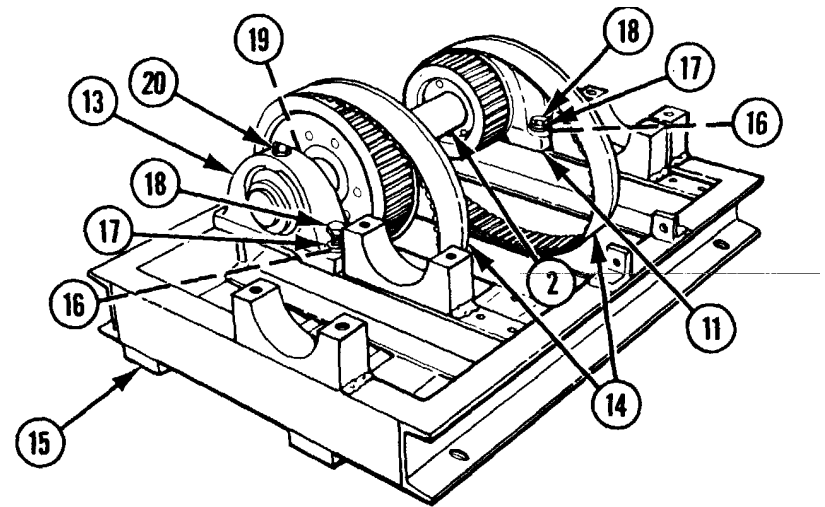




**6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY/ALINEMENT (cont)**

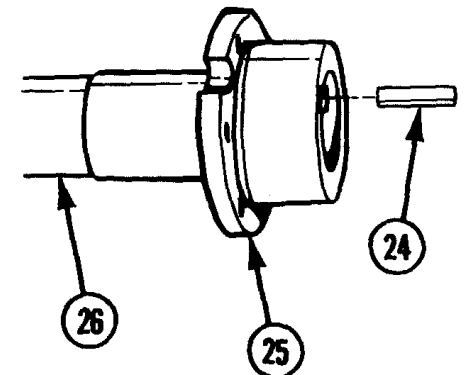
- 10 TWO POSITIVE DRIVE BELTS (14) AND REDUCTION SHAFT (2) WITH ATTACHED PARTS. Install on support assembly (15).
- 11 TWO FLAT WASHERS (16), TWO LOCKWASHERS (17), AND TWO SCREWS (18). Install on shaft pillow block (11).
- 12 SHAFT PILLOW BLOCK (13). Aline and secure with two flat washers (16), two lockwashers (17), and two screws (18).
- 13 TWO SETSCREWS (19). Tighten.
- 14 TWO FITTINGS (20). Install.



- 15 FITTING (21) AND BEARING (22). Install on clutch cup and timing belt pulley (23).

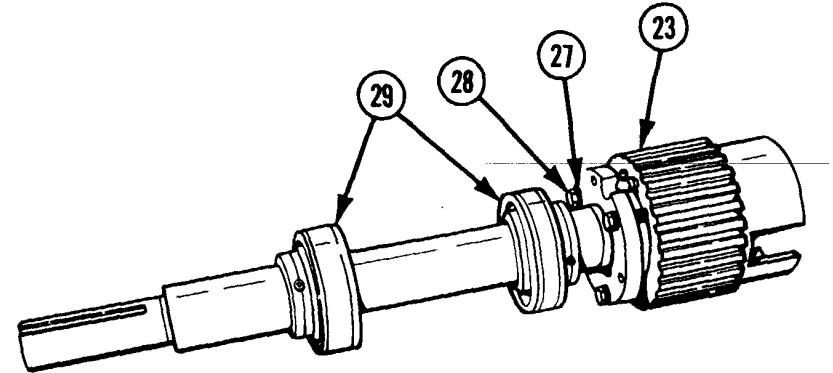
- 16 KEY (24). Install.

- 17 MODIFIED HUB (25). Install flush with end of input shaft (26).

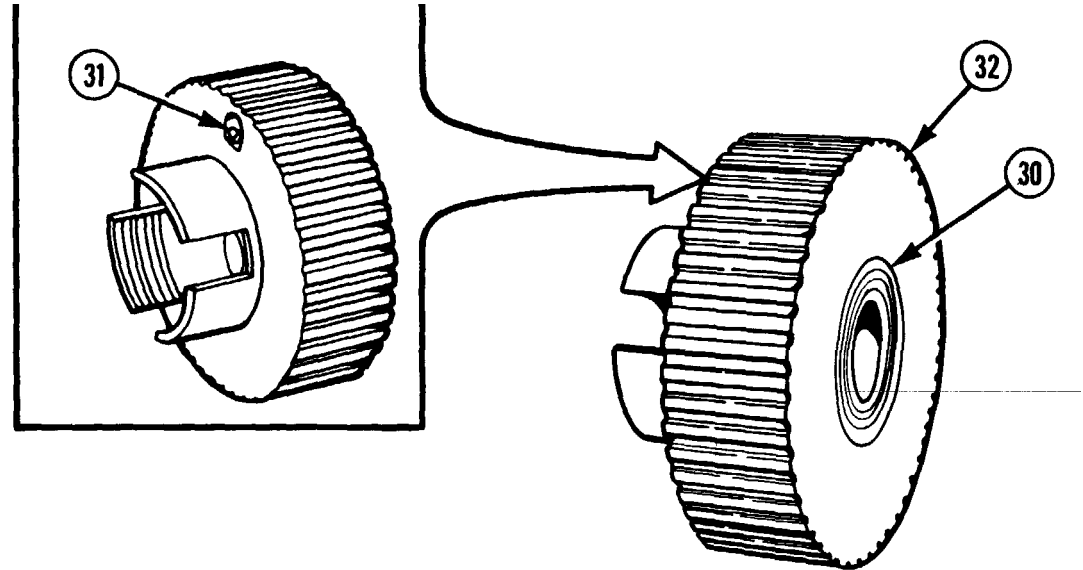


18 CLUTCH CUP AND TIMING BELT PULLEY (23). Install and secure with three lockwashers (27) and three screws (28).

19 TWO BEARING UNITS (29). Install.



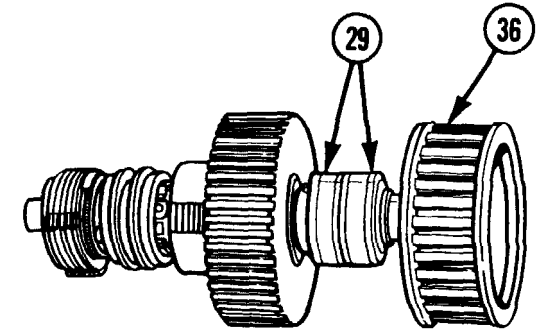
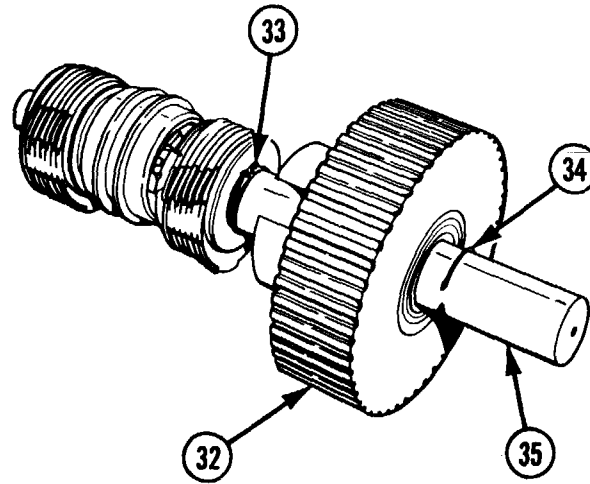
20 BEARING (30) AND FITTING (31). Install in pulley (32).



6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

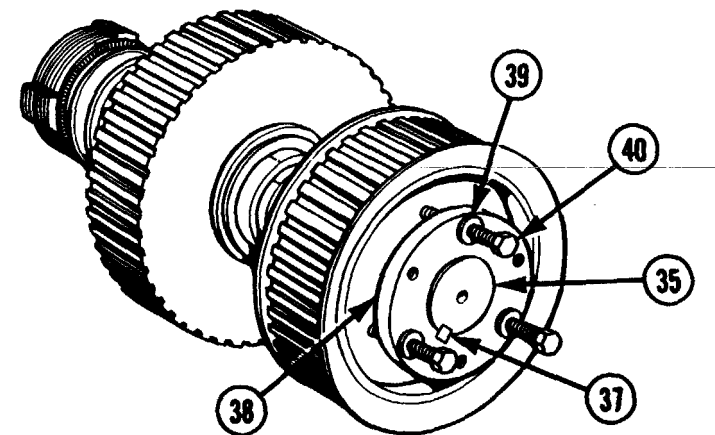
21 RETAINING RING (33), PULLEY (32), AND RETAINING RING (34). Install on output shaft (35).



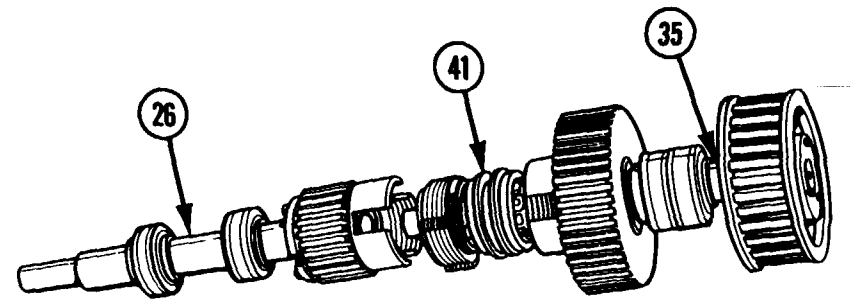
22 TWO BEARING UNITS (29). Install.

23 SPROCKET (36). Install.

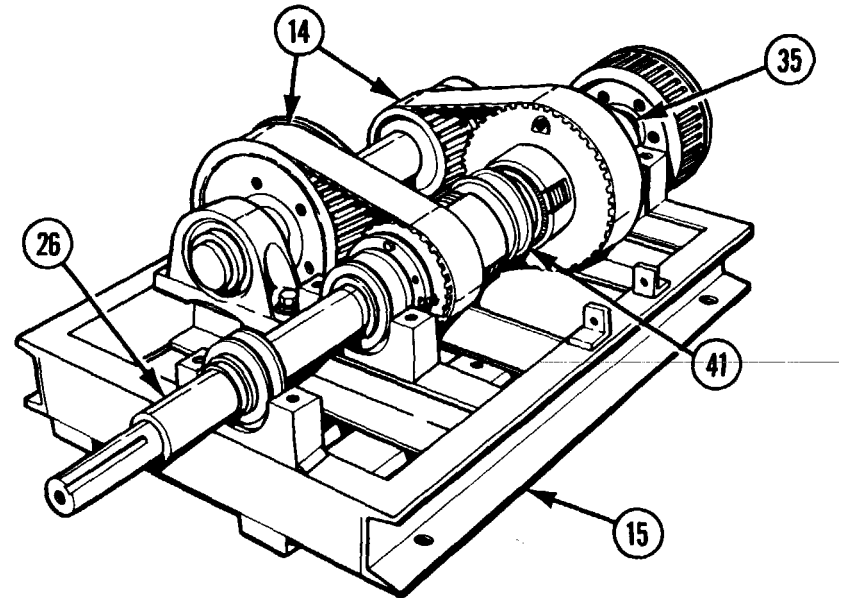
24 KEY (37) AND BUSHING (38). Install flush with end of output shaft (35) and secure with three lockwashers (39) and three screws (40).



**25** OUTPUT SHAFT (35) WITH CLUTCH ASSEMBLY (41) AND ATTACHED PARTS. Install on input shaft (26) with attached parts.



**26** OUTPUT SHAFT (35) WITH CLUTCH ASSEMBLY (41) AND INPUT SHAFT (26) WITH ATTACHED PARTS. Install through two positive drive belts (14) and onto support assembly (15).



6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

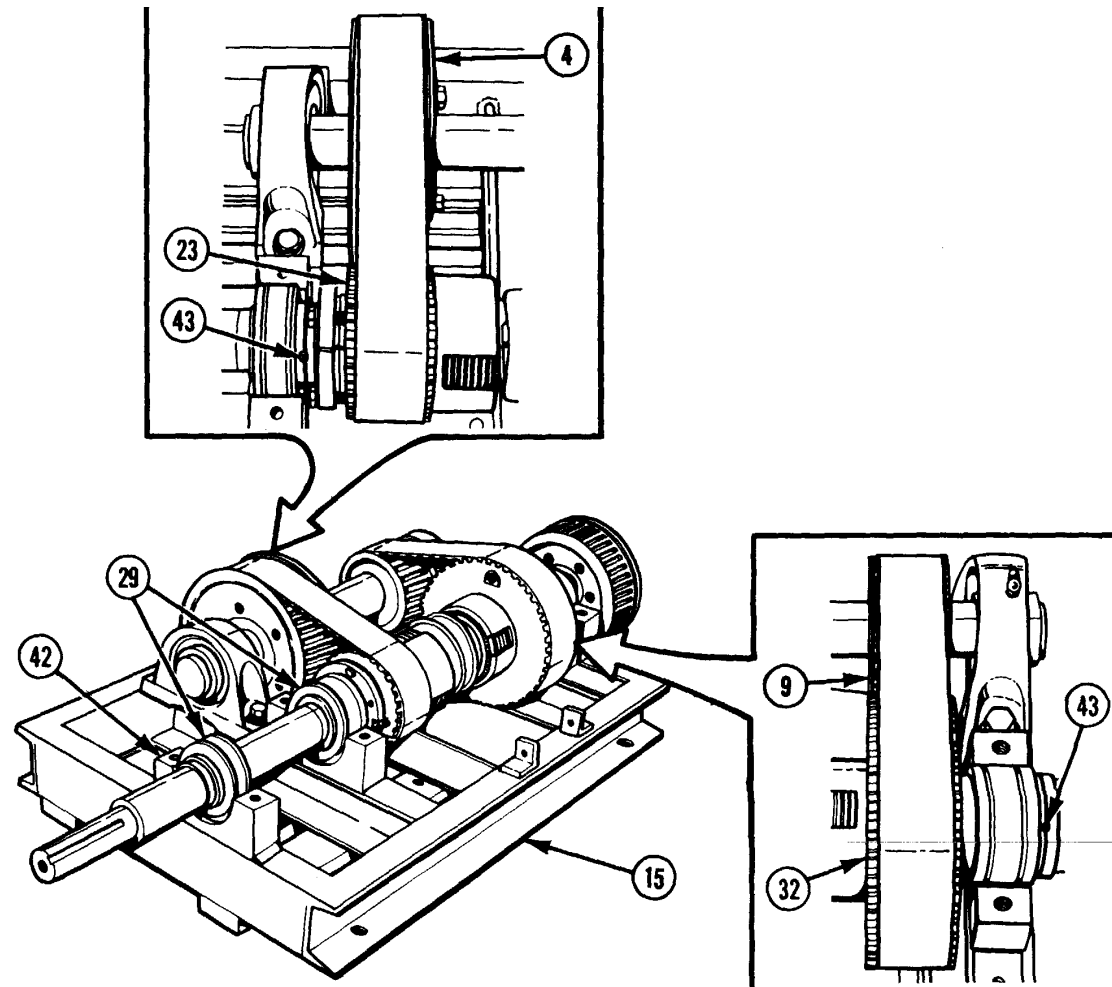
REASSEMBLY/ALINEMENT (cont)

27 FOUR BEARING UNITS (29). Aline and center on four shaft pillow block halves (42) on support assembly (15).

28 CLUTCH CUP AND TIMING BELT PULLEY (23). Aline with timing belt sprocket (4).

29 PULLEY (32). Aline with timing belt pulley (9).

30 EIGHT SETSCREWS (43). Tighten.

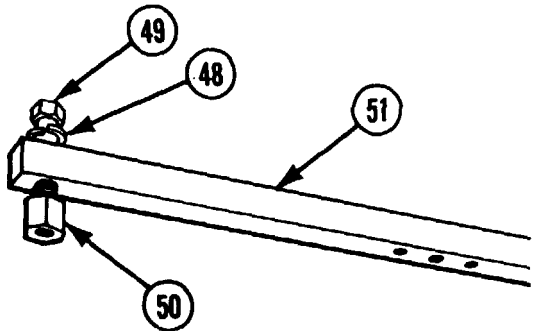
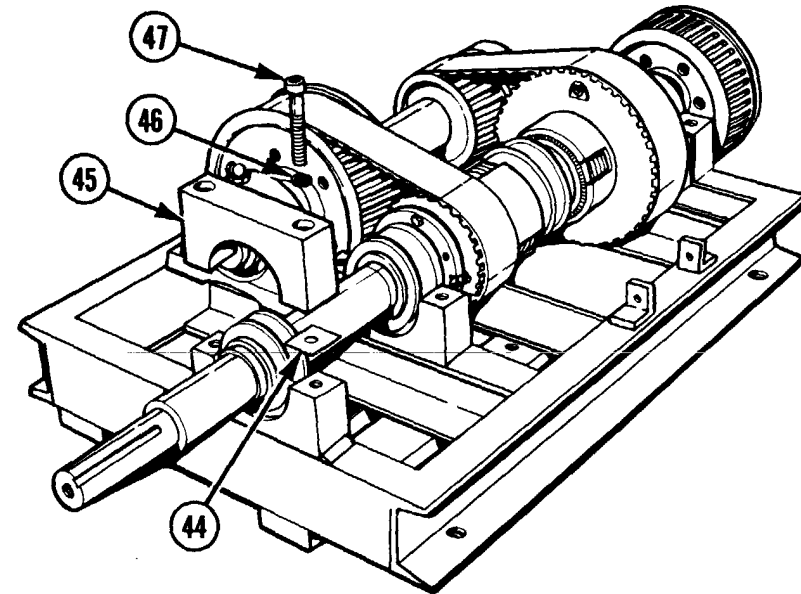


**NOTE**

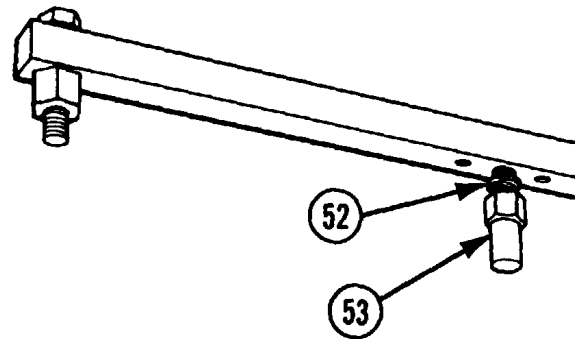
Support pillow block halves and shims were marked for reassembly. Be sure they are installed in correct location.

31 SHIMS (44) AS REQUIRED, FOUR SUPPORT PILLOW BLOCK HALVES (45), EIGHT LOCKWASHERS (46), AND EIGHT SCREWS (47).

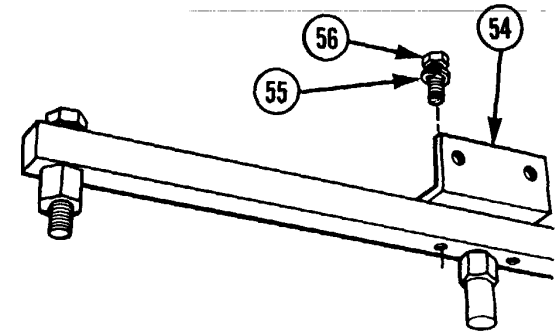
- a. Install.
- b. Tighten eight screws (47) alternately.



32 LOCKWASHER (48), SCREW (49), AND NUT (50). Install on clutch slide bar (51).



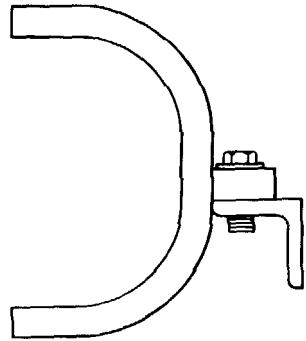
33 LOCKWASHER (52) AND SHIFTER STOP (53). Install.



34 FORK BRACKET (54), TWO LOCKWASHERS (55), AND TWO SCREWS (56). Install.

6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

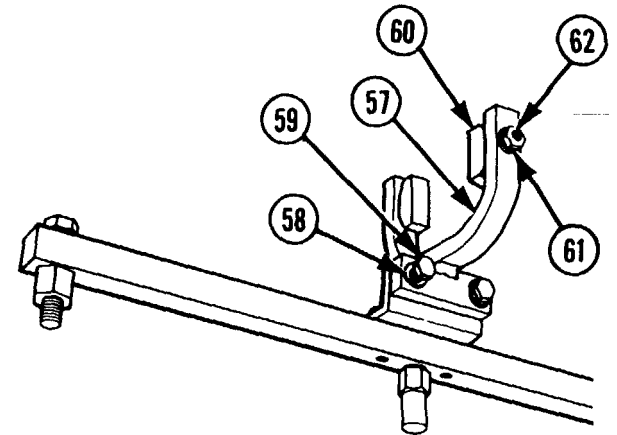


**NOTE**

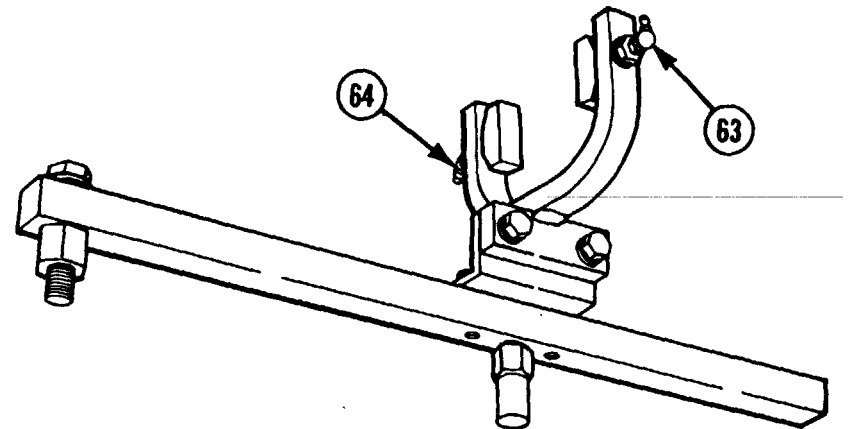
Install the fork with the longer portion up as illustrated.

35 FORK (57), TWO LOCKWASHERS (58), AND TWO SCREWS (59). Install.

36 TWO CLUTCH SHOES (60), TWO LOCKWASHERS (61), AND TWO CLUTCH SHOE STUDS (62). Install.



37 TWO FITTINGS (63 AND 64). Install.

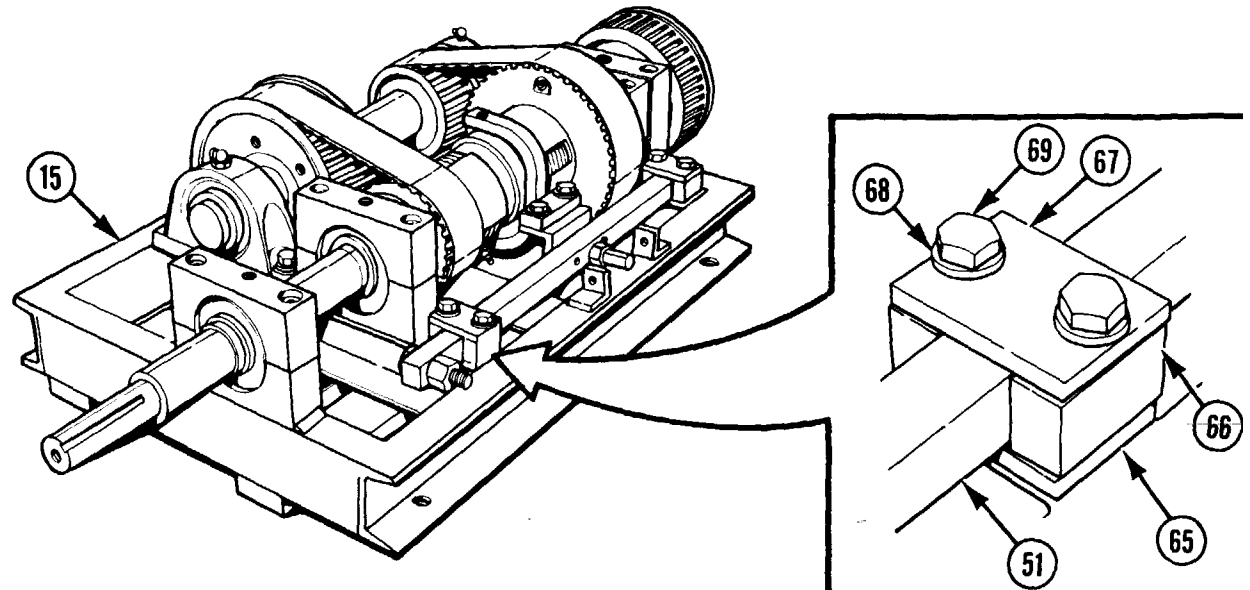


**NOTE**

Be sure clutch shoes engage the clutch assembly as illustrated.

38 TWO SLIDE CAPS (65) AND CLUTCH SLIDE BAR (511 WITH ATTACHED PARTS. Install on support assembly (15).

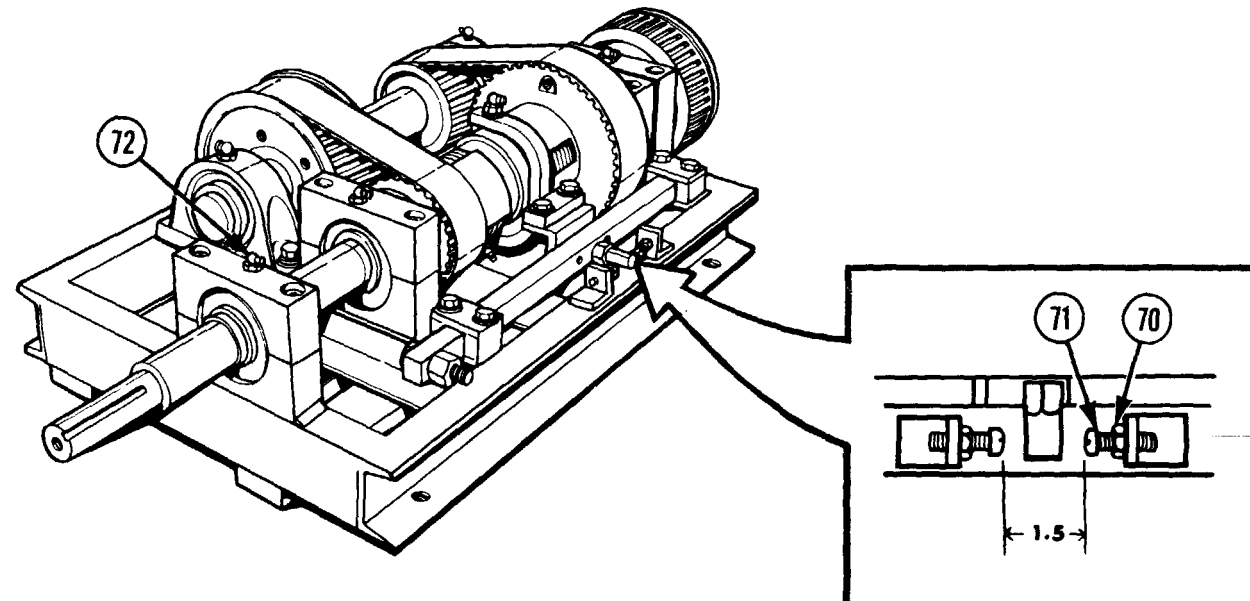
39 FOUR SLIDE BLOCKS (66), TWO SLIDE CAPS (67), FOUR LOCKWASHERS (68), AND FOUR SCREWS (69). Install.



40 TWO NUTS (70) AND TWO SCREWS (71).

- a. Install.
- b. Adjust distance between two screws (71) to be approximately 1.50 in. (3.81 cm).
- c. Tighten two nuts (70).

41 FOUR FITTINGS (72). Install.





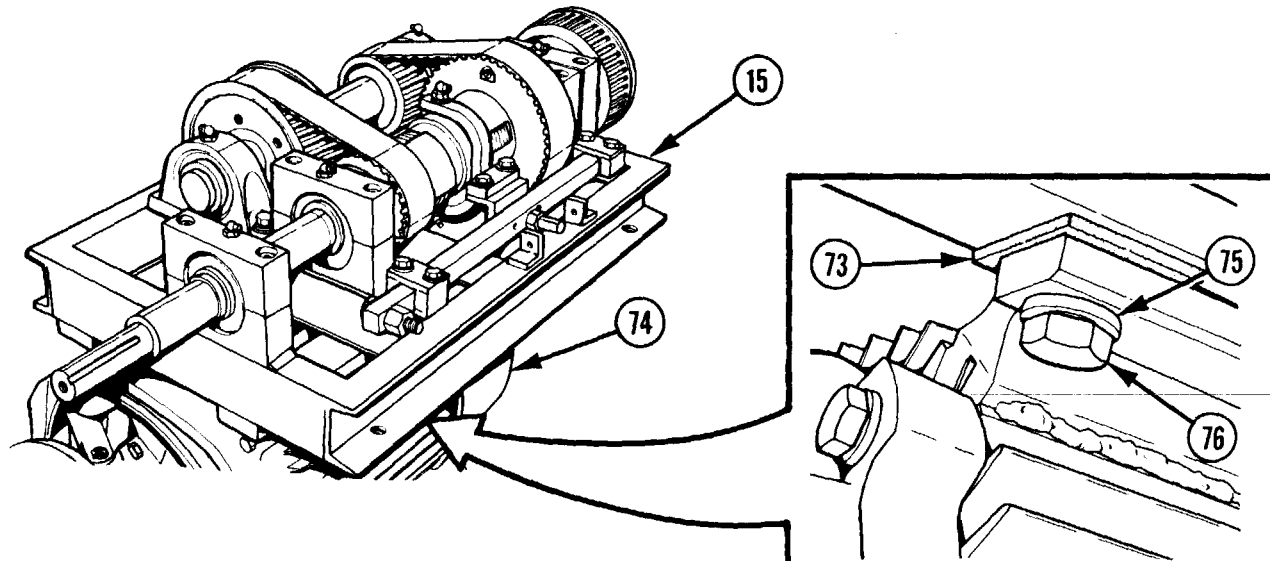
6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

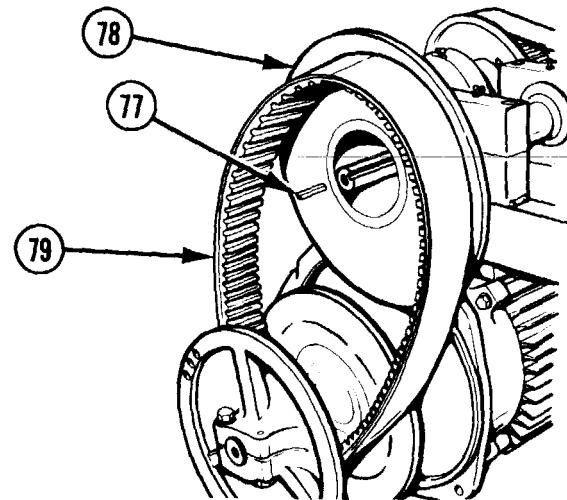
**WARNING**

Be sure support assembly and main drive motor are supported for reassembly as the assembled drive unit assembly weighs approximately 530 lbs (240.41 kg). Injury to personnel could result from careless handling.

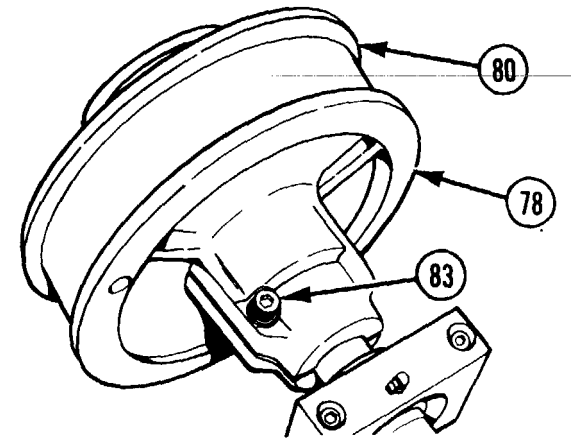
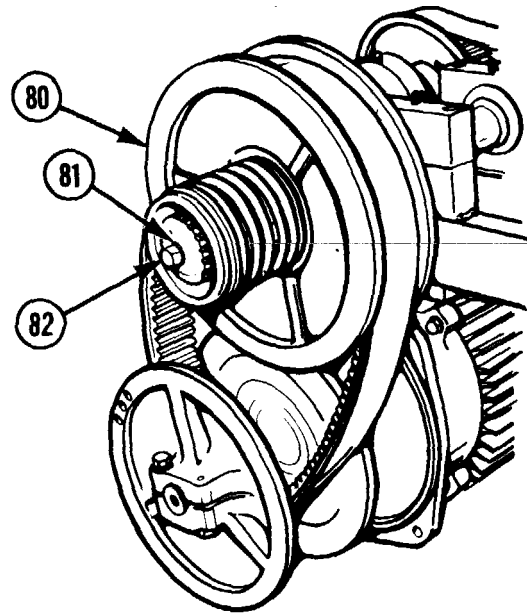
- 42 FOUR MOUNTING PADS (73) AND MAIN DRIVE MOTOR (74). Install on support assembly (15) and secure with four lockwashers (75) and four screws (76).



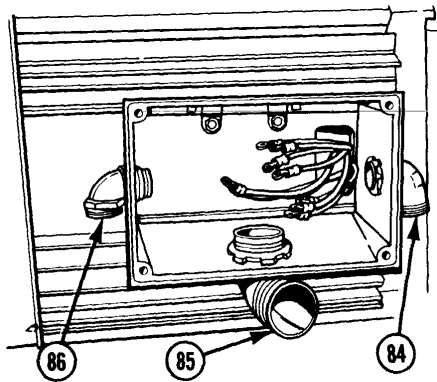
- 43 KEY (77), REAR PULLEY HALF (78), AND VARIDRIVE BELT (79). Install.



44 FRONT PULLEY HALF (80), LOCKWASHER (81), AND VARIDRIVE STUD (82). Install.



45 REAR PULLEY HALF (78). Pull toward front pulley half (80) and tighten two setscrews (83).



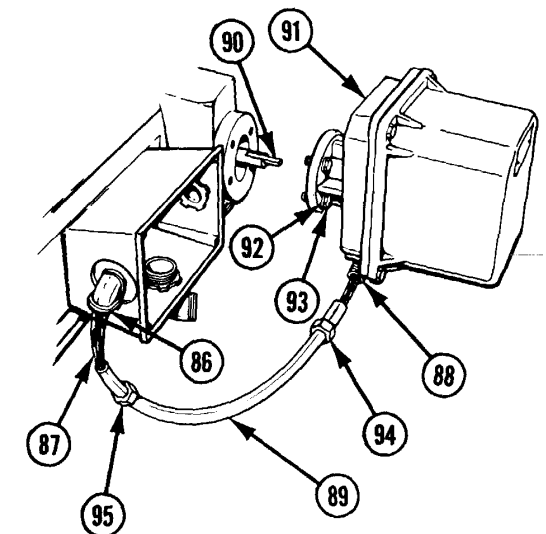
46 TWO CONNECTORS (84 AND 85) AND ELECTRICAL BOX CONNECTOR (86). Install.

47 THREE BLUE WIRES (87) WITH TERMINAL LUGS. Push through electrical box connector (88), flexible conduit (89), and electrical box connector (86).

48 ELECTRICAL BOX CONNECTOR (88) AND FLEXIBLE CONDUIT (89). Install.

49 KEY (90) AND REMOTE CONTROL MOTOR (91). Install and secure with four lockwashers (92) and four screws (93).

50 TWO NUTS (94 AND 95). Tighten.



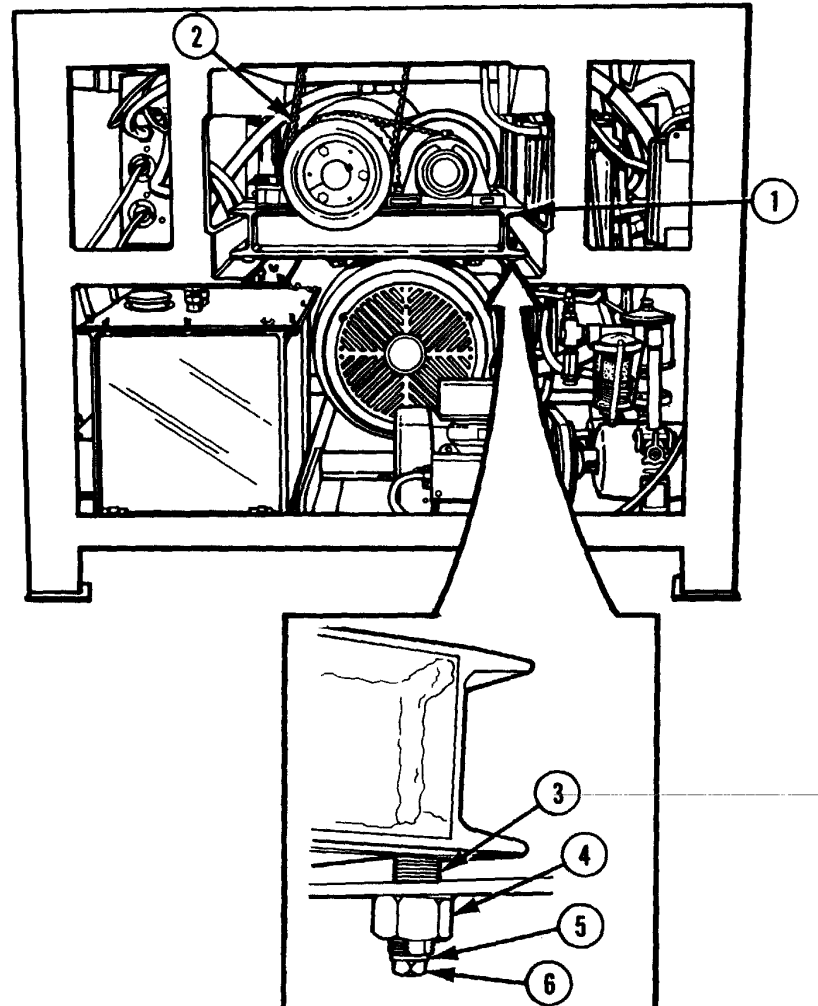
6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

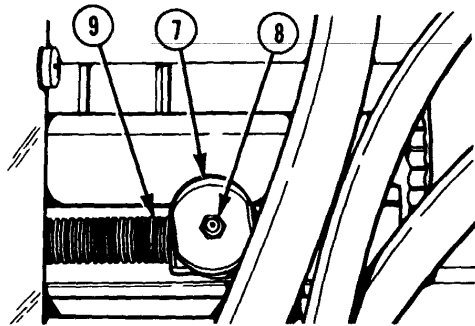
INSTALLATION

**WARNING**

Install the drive unit assembly only with an available forklift, as the drive unit assembly weighs approximately 530 lbs (240.41 kg). Serious injury to personnel could result if not careful.

- 1 DRIVE UNIT ASSEMBLY (1).
  - a. Install.
  - b. Raise approximately 2 in. (5.08 cm).
- 2 TIMING BELT (2). Install.
- 3 DRIVE UNIT ASSEMBLY (1). Lower in place.
- 4 FOUR JACKSCREWS (3), FOUR NUTS (4), FOUR LOCKWASHERS (5), AND FOUR SCREWS (6). Install.

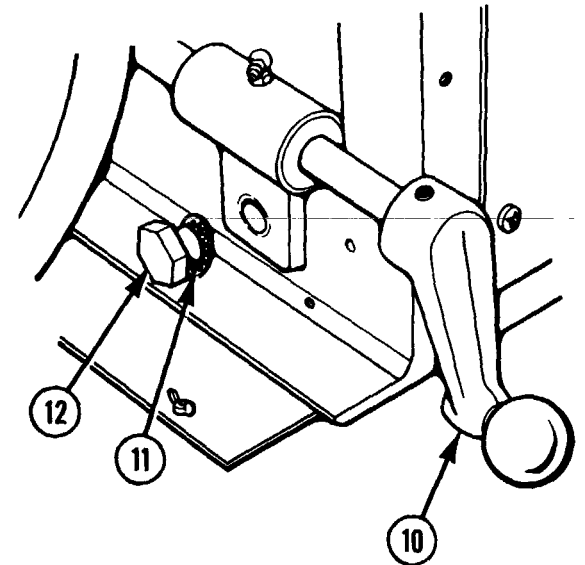




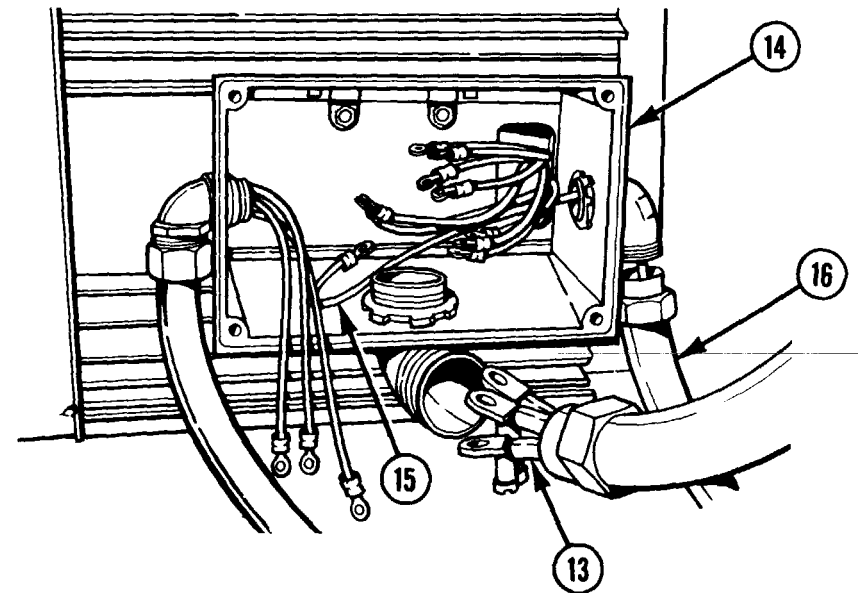
- 5 CLUTCH SHIFTING NUT (7) AND FITTING (8). Install.
- 6 SHIFT CONTROL ROD ASSEMBLY (9). Install in clutch shifting nut (7).

7 HAND CRANK (10).

- a. Turn clockwise.
- b. Aline holes.
- c. Install lockwasher (11) and capscrew (12).



- 8 THREE WIRES (13) WITH CONNECTORS. Install in outlet box (14).
- 9 BLUE WIRE (15) WITH TERMINAL LUG CONNECTED TO B15 ON TERMINAL STRIP B. Pull through flexible conduit (16).



6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)

10 TWO FLEXIBLE CONDUITS (16 AND 17). Install on two connectors (18 AND 19).

11 TWO NUTS (20 AND 21). Tighten.

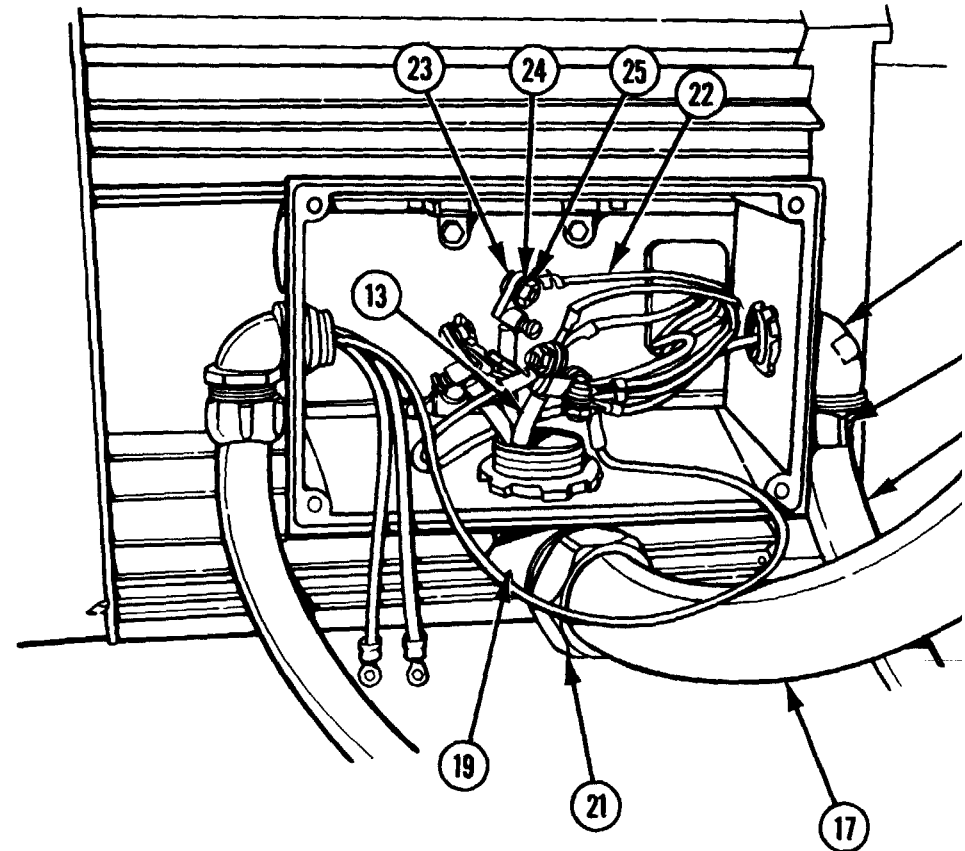
**NOTE**

Refer to wiring diagram (fig. 6-1, p 6-146) before connecting any wires.

12 NINE WIRES (22) WITH TERMINAL LUGS AND THREE WIRES (13) WITH CONNECTORS.

a. Connect.

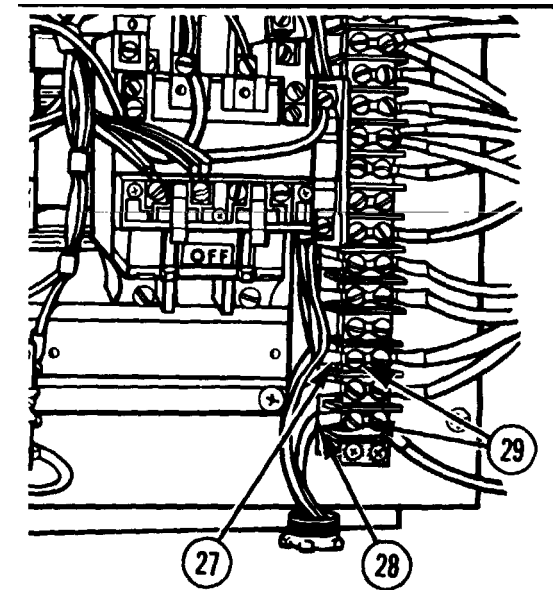
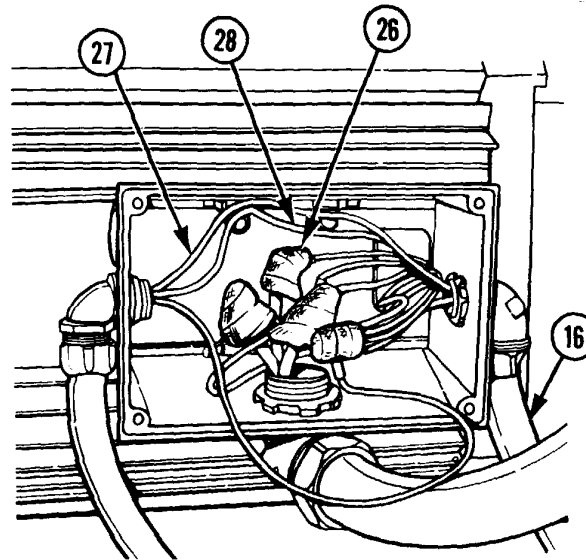
b. Install four screws (23), four washers (24), and four nuts (25).



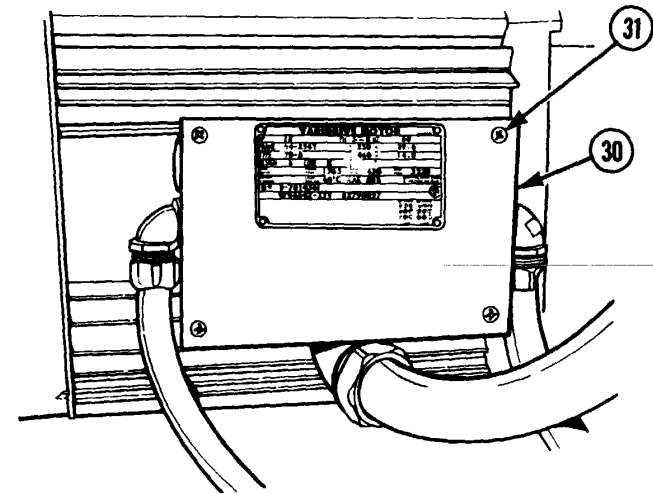
- c. Apply new tape (26) (item 19, app C).

**13 TWO BLUE WIRES (27 AND 28) TAGGED B14 AND B16.**

- a. Push through flexible conduit (16).
- b. Connect to B14 and B16 on terminal strip B.
- c. Install two screws (29).

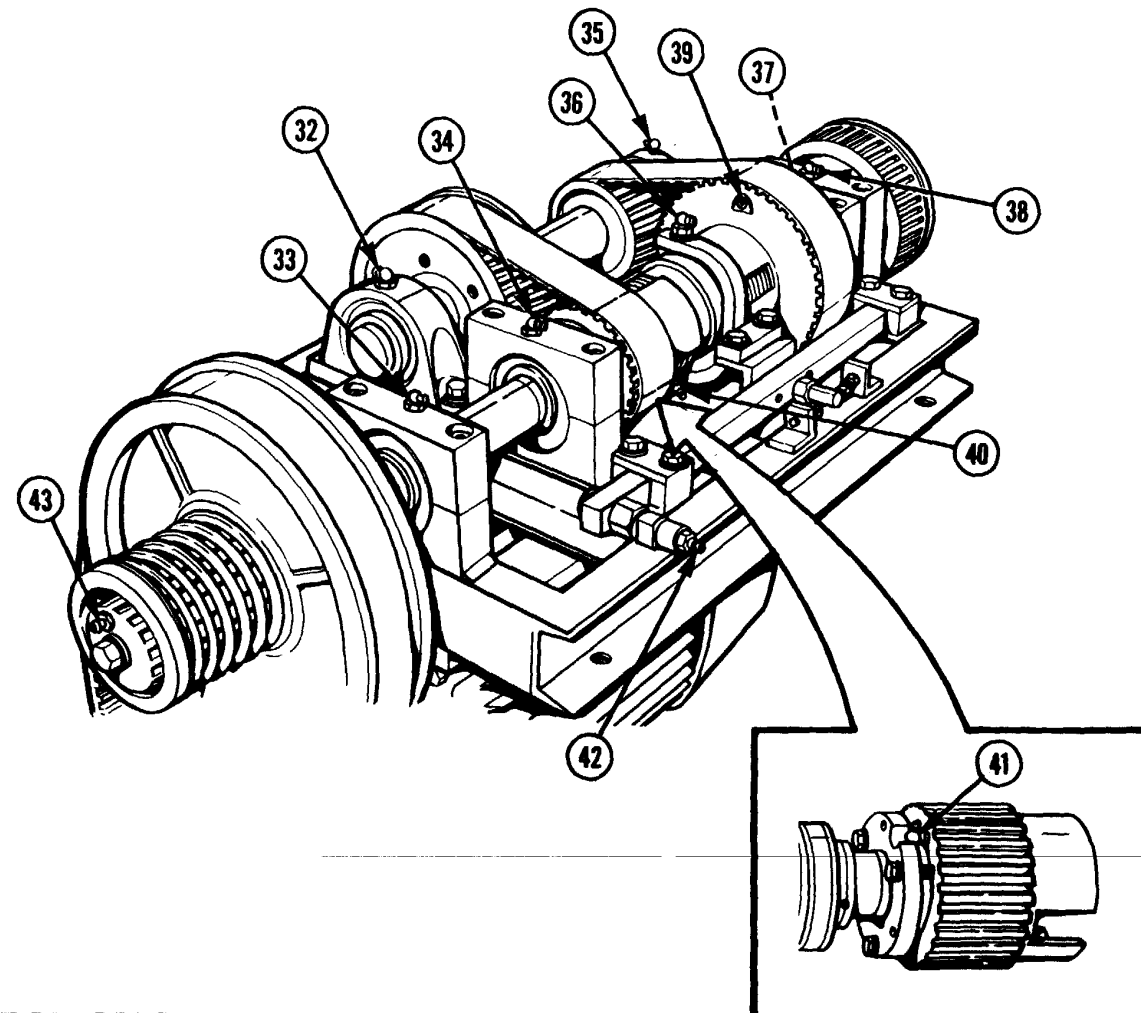


**14 COVER (30). Install and secure with four screws (31).**



6-32. DRIVE UNIT ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION (cont)



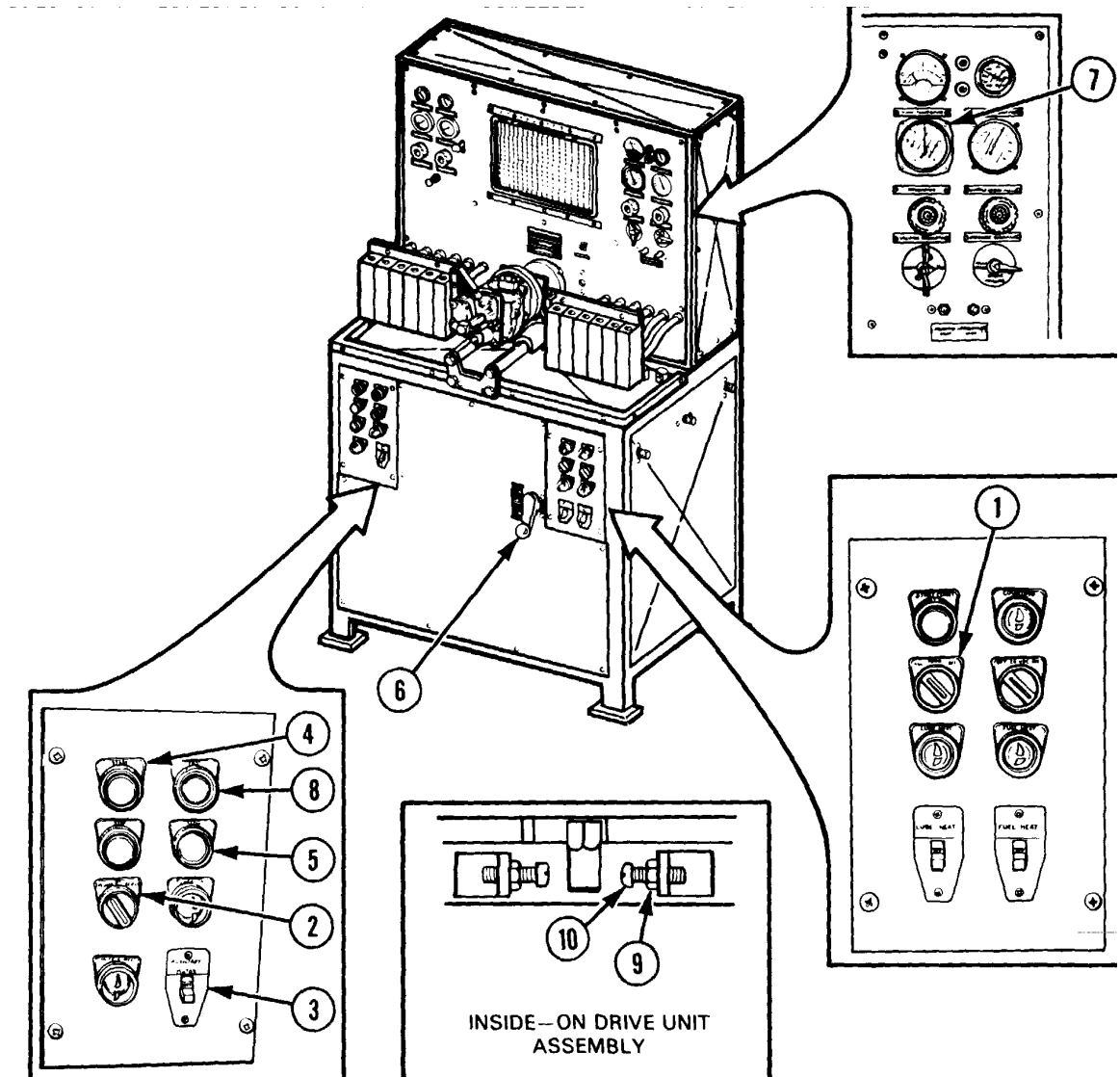
15 ELEVEN FITTINGS (32 THRU 43).  
Lubricate with grease (item 7, app C).

TEST/ADJUSTMENT

NOTE

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual.

- 1 TESTER. Hook up a fuel injector pump.
- 2 MAIN POWER SOURCE. Turn on.
- 3 500-1000-OFF COUNT SWITCH (1). Set at 500.
- 4 FORWARD-OFF-REVERSE SWITCH (2). Set at FORWARD.
- 5 AUXILIARY MOTOR SWITCH (3). Turn on.
- 6 START BUTTON (4). Press in.
- 7 SLOW BUTTON (5). Press in.
- 8 HAND CRANK (6). Turn dockwise.
- 9 TACHOMETER (7). Check for reading of 150 rpm.
- 10 FAST BUTTON (8). Press in.
- 11 HAND CRANK (6). Turn counterclockwise.
- 12 TACHOMETER (7). Check for indication of 3600 rpm.
- 13 TWO NUTS (9) AND TWO SCREWS (10). Adjust for proper rpm if necessary.





**6-33. CLUTCH ASSEMBLY - MAINTENANCE INSTRUCTION**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation
- e. Adjustment

**INITIAL SETUP**

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts

Cleaning compound (item 3, app C)

Rag (item 14, app C)

References

6-501 Test/adjustment procedure of the drive unit assembly

TM 9-4910-387-24P

Troubleshooting References

6-126 Drive speed of tester will not increase

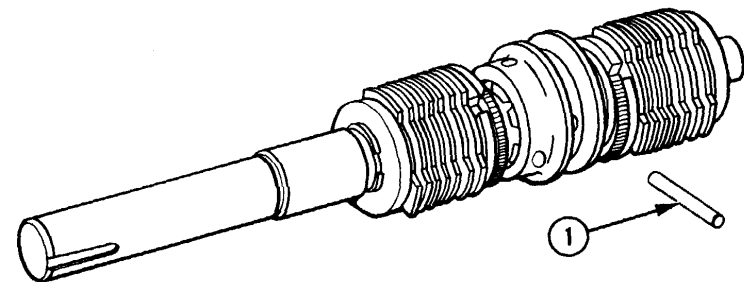
Equipment Conditions

Main power source to tester is turned off

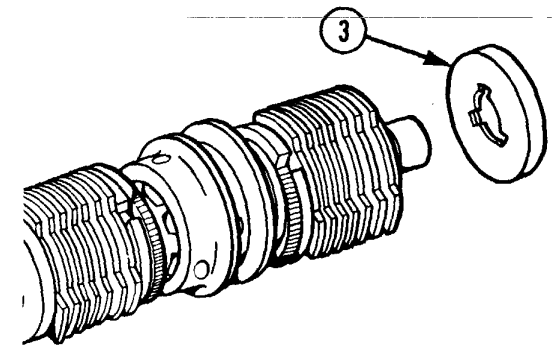
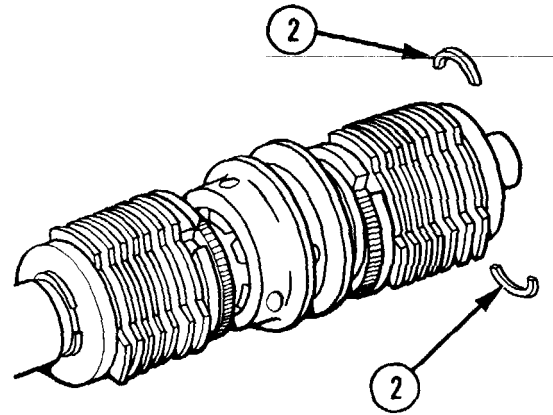
6472 Drive unit assembly is disassembled

**REMOVAL/DISASSEMBLY**

- 1 ANCHOR PIN (1). Remove.

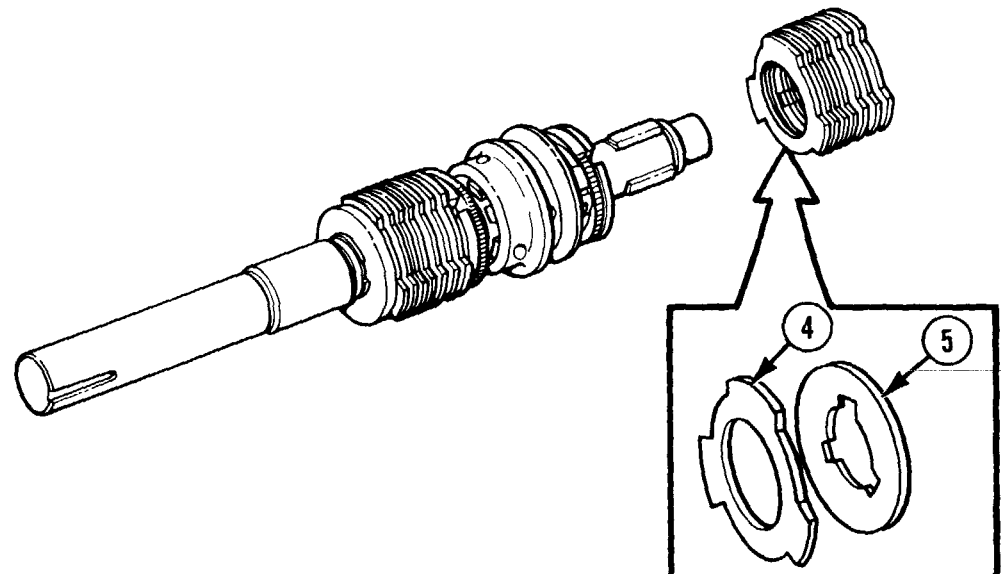


2 CLUTCH ASSEMBLY RING SET (2).  
Remove.



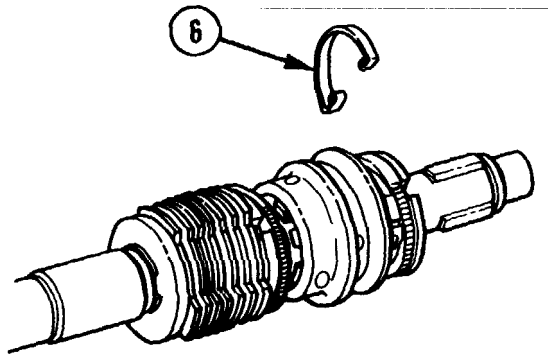
3 THRUST PLATE (3). Remove.

4 SEVEN OUTER DISKS (4) AND SIX  
CLUTCH INNER DISKS (5). Remove.



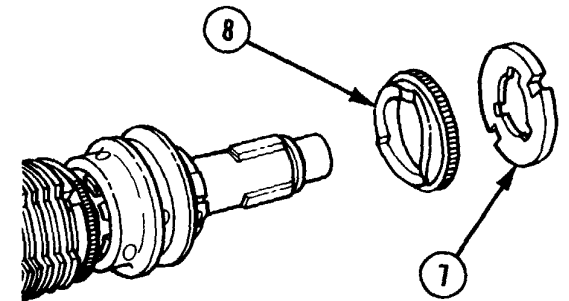
6-33. CLUTCH ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)



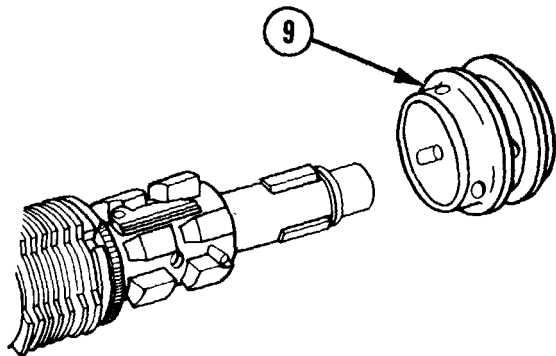
5 RETAINING RING (6). Remove.

6 PRESSURE PLATE (7) AND ADJUSTMENT COLLAR (8). Remove.



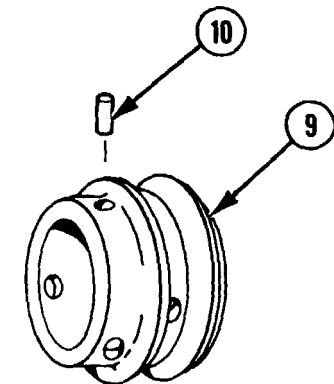
**CAUTION**

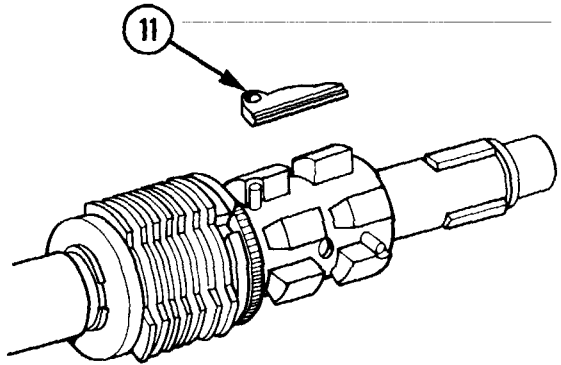
Do not remove dog pressure pins unless necessary for replacement, as they may be damaged during removal.



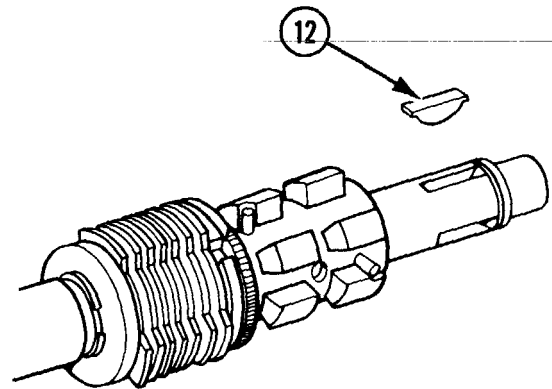
7 SHIPPER SLEEVE (9). Remove.

8 SIX DOG PRESSURE PINS (10). Remove from shipper sleeve (9).

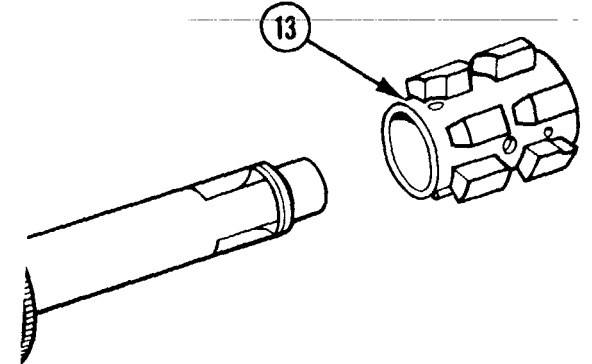




9 SIX LOCK DOG PAWLS (11).  
Remove.



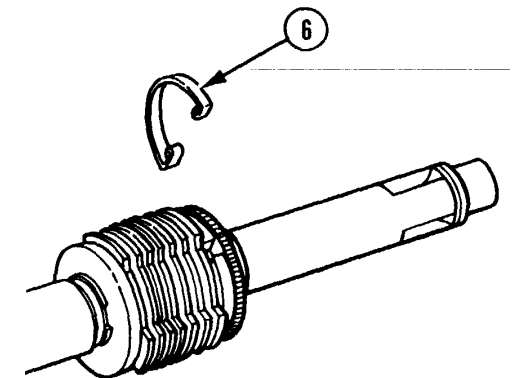
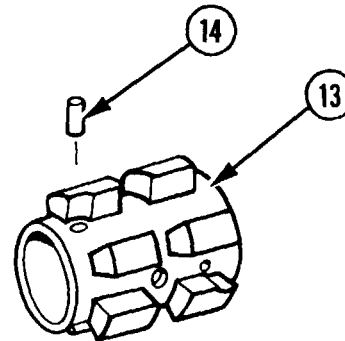
11 DOUBLE CLUTCH BODY (13).  
Remove.



10 THREE KEYS (12). Remove.

**CAUTION**  
Do not remove dog pivot pins unless necessary for replacement as they may be damaged during removal.

12 SIX DOG PIVOT PINS (14). Remove from double clutch body (13).

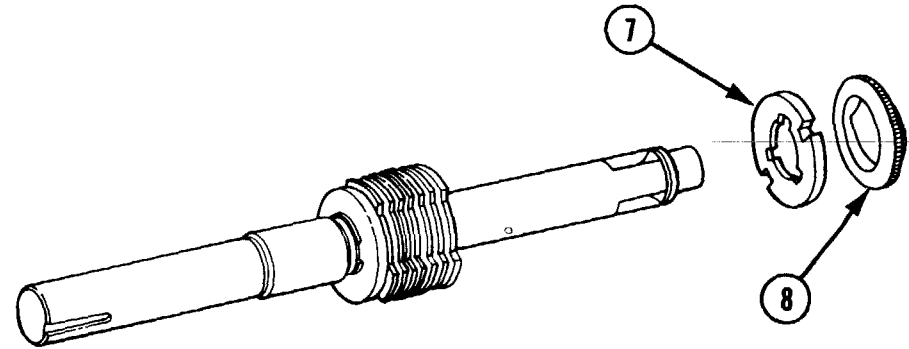


13 RETAINING RING (6). Remove.

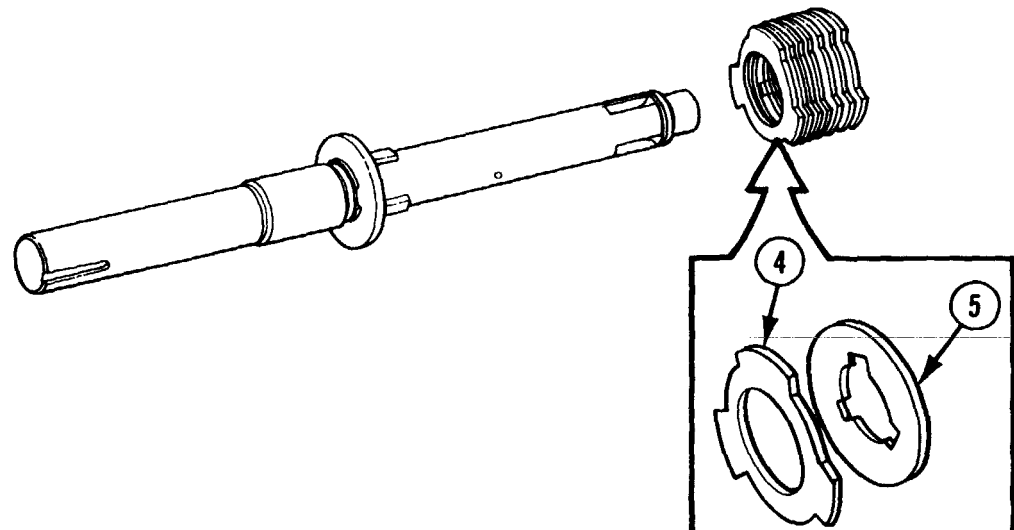
6-33. CLUTCH ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

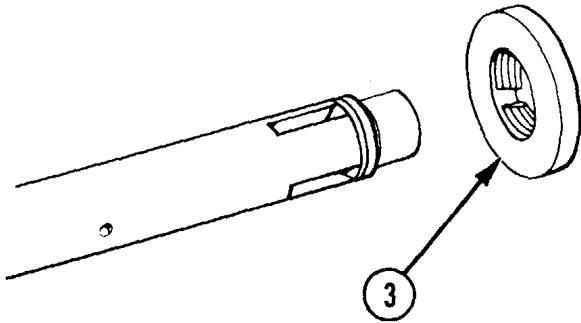
REMOVAL/DISASSEMBLY (cont)

14 ADJUSTMENT COLLAR (8) AND PRESSURE PLATE (7). Remove.



15 SEVEN OUTER DISKS (4) AND SIX CLUTCH INNER DISKS (5). Remove.

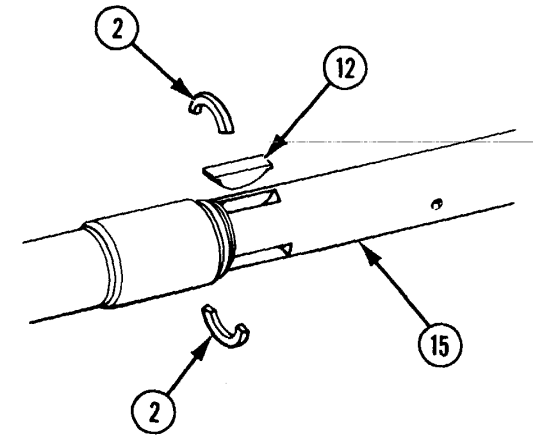




16 THRUST PLATE (3). Remove.

17 CLUTCH ASSEMBLY RING SET (2).  
Remove.

18 THREE KEYS (12). Remove from out-  
put shaft (15).



**INSPECTION/SERVICING**

**CLUTCH ASSEMBLY.**

- a. Check for cracked, broken, worn, or missing parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

**REPAIR**

**NOTE**

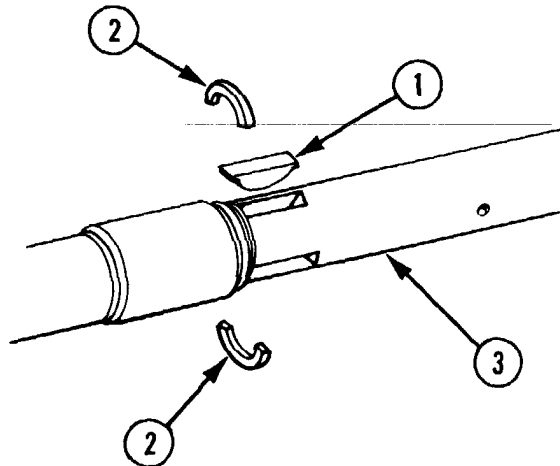
**Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.**

6-33. CLUTCH ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

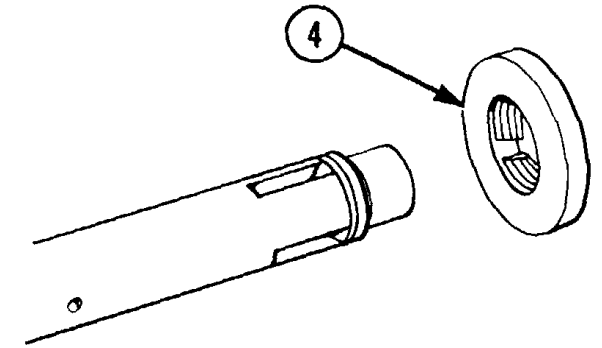
REASSEMBLY/INSTALLATION

1 THREE KEYS (1). Install.

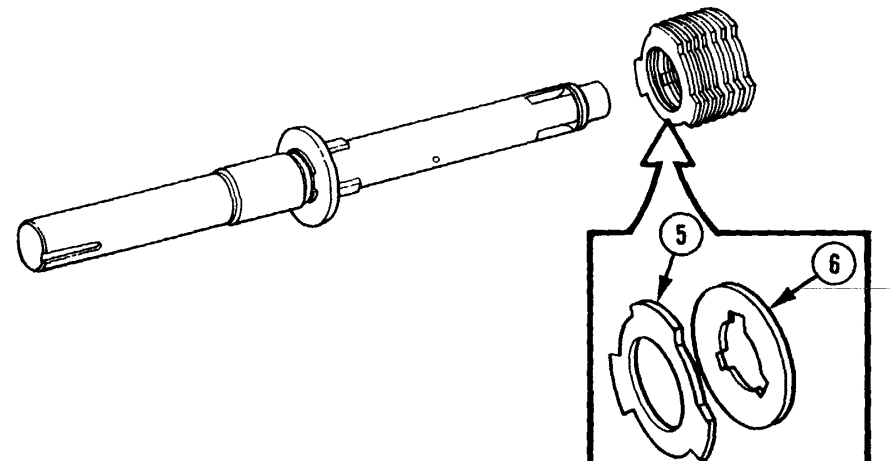
2 CLUTCH ASSEMBLY RING SET (2).  
Install in groove in output shaft (3).



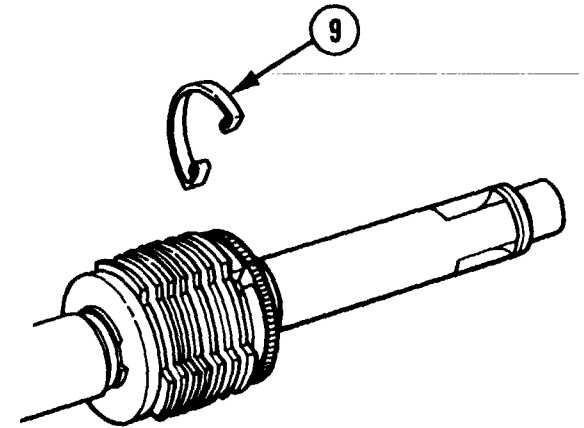
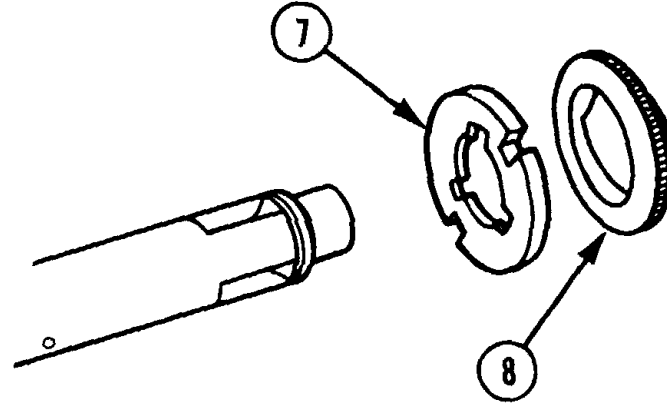
3 THRUST PLATE (4). Install.



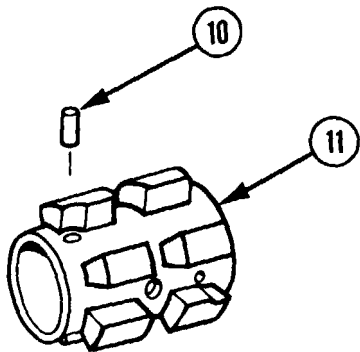
4 SEVEN OUTER DISKS (5) AND SIX CLUTCH  
INNER DISKS (6). Install.



5 PRESSURE PLATE (7) AND  
ADJUSTMENT COLLAR (8).  
Install.

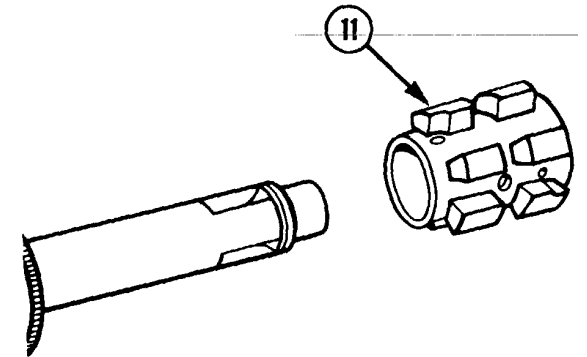


6 RETAINING RING (9). Install.



7 SIX DOG PIVOT PINS (10). Install in  
double clutch body (11).

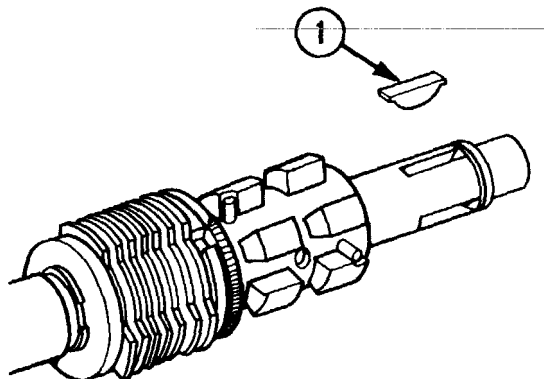
8 DOUBLE CLUTCH BODY (11). Install.



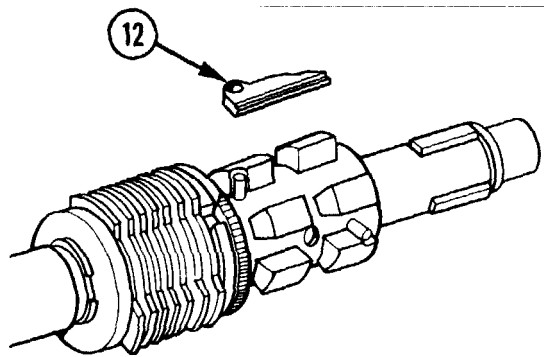


6-33. CLUTCH ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

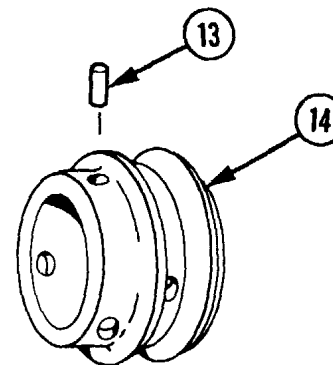
REASSEMBLY/INSTALLATION (cont)



9 THREE KEYS (1). Install.

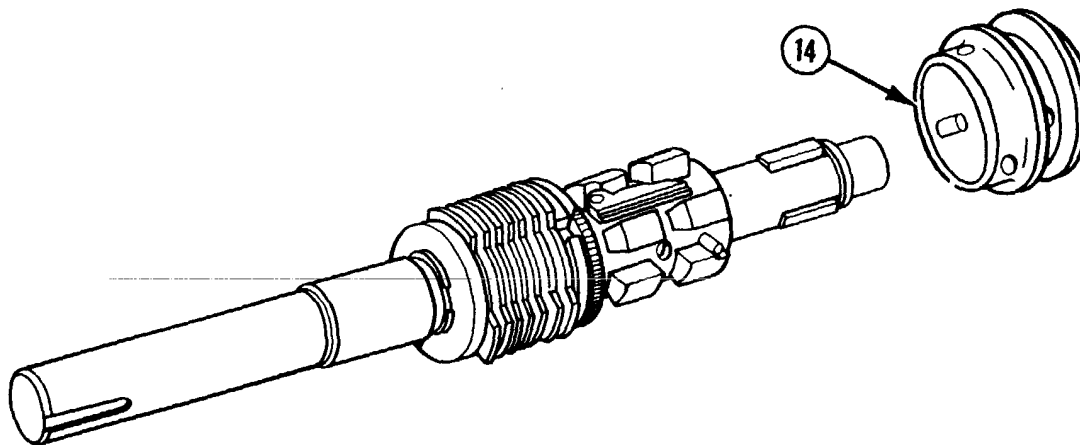


10 SIX LOCK DOG PAWLS (12). Install.

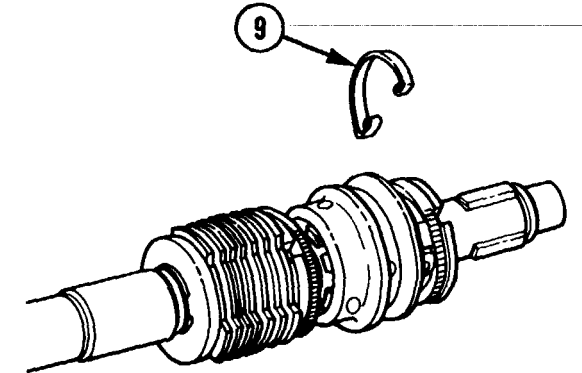
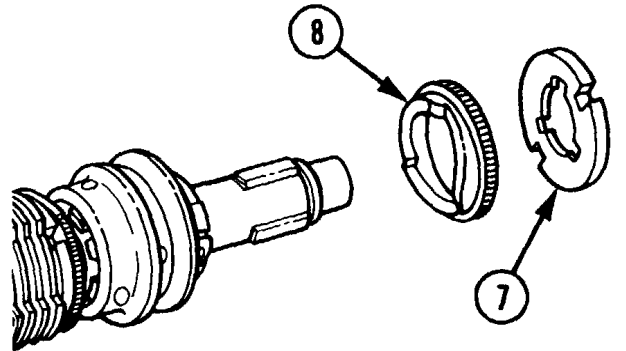


11 SIX DOG PRESSURE PINS (13). Install in shipper sleeve (14).

12 SHIPPER SLEEVE (14). Install.

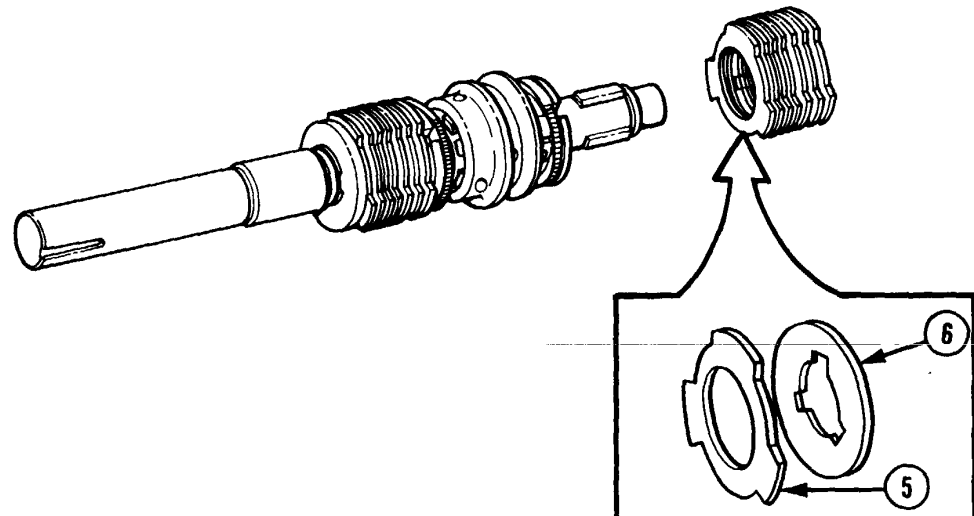


13 ADJUSTMENT COLLAR (8) AND PRESSURE PLATE (7). Install.



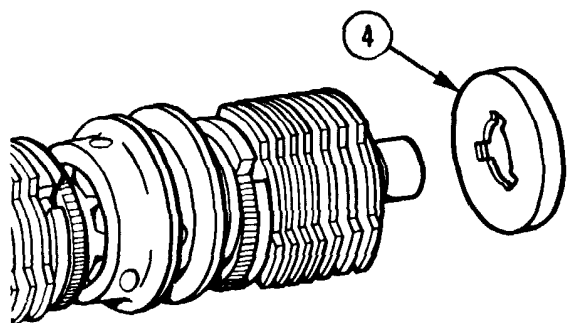
14 RETAINING RING (9). Install.

15 SEVEN OUTER DISKS (5) AND SIX CLUTCH INNER DISKS (6). Install.



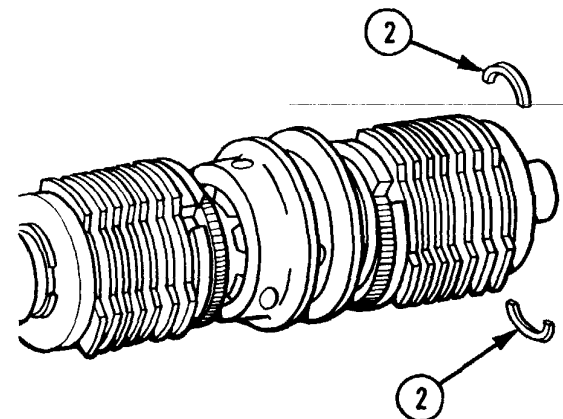
6-33. CLUTCH ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

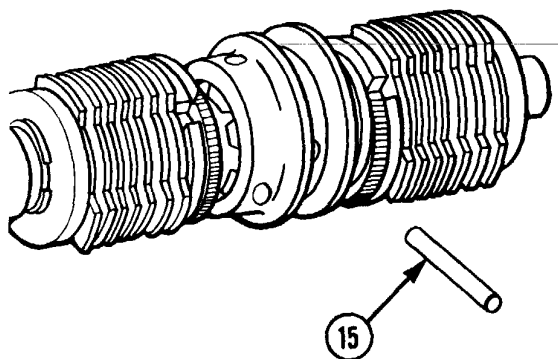


16 THRUST PLATE (4). Install.

17 CLUTCH ASSEMBLY RING SET (2). Install.



18 ANCHOR PIN (15). Install



6-512

NOTE

The clutch assembly must be adjusted at this time. Refer to the following adjustment procedures.

## ADJUSTMENT

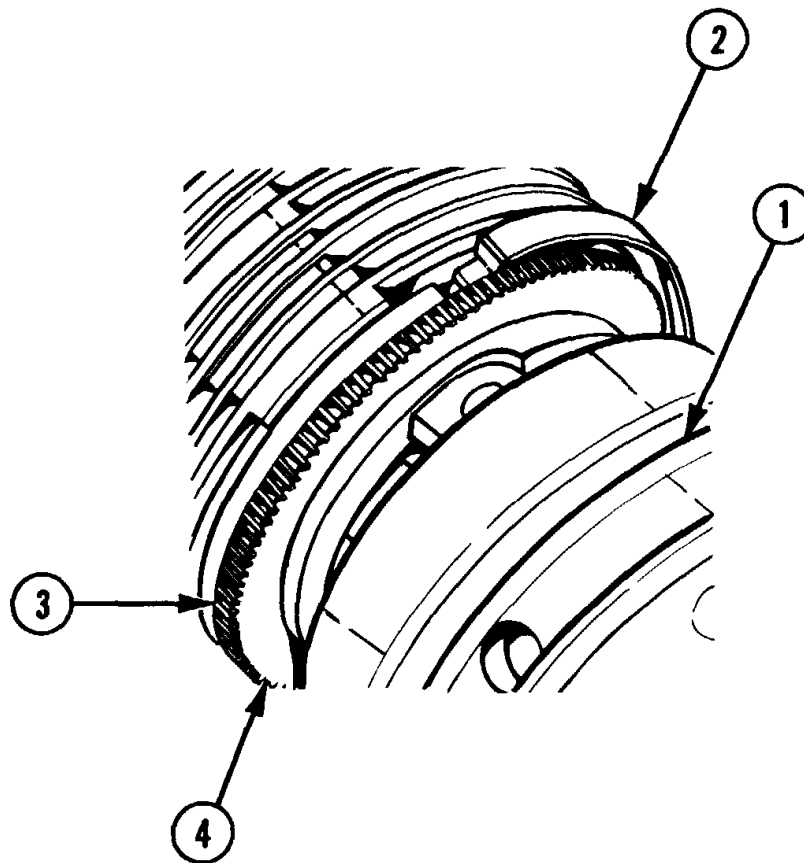
### NOTE

The adjustment procedures must be performed on both adjustment collars. Repeat the procedures for the other adjustment collar. If adjustment is required during operation, adjustment may be performed without removing the clutch assembly from the tester.

- 1 SHIPPER SLEEVE (1). Position in neutral (center of travel).
- 2 RETAINING RING (2). Lift high enough to clear teeth (3) on adjustment collar (4).
- 3 ADJUSTMENT COLLAR (4). Turn counterclockwise by hand as far as it will go, then turn clockwise one notch.
- 4 RETAINING RING (2). Release so it engages teeth (3) on adjustment collar (4).

### NOTE

During operation of the tester, further adjustment of the clutch assembly may be necessary. Refer to test/adjustment procedure of the drive unit assembly, steps 7 thru 13, on page 6-501.



6-34. SUPPORT ASSEMBLY - MAINTENANCE INSTRUCTIONS

THIS TASK COVERS:

- a. Disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly

INITIAL SETUP

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

6-472 Disassembly procedure of the drive unit assembly

6-484 Reassembly/alinement procedure of the drive unit assembly

Materials/Parts

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

Equipment Conditions

Main power source to tester is turned off  
6-467 Drive unit assembly is removed

References

TM 9-4910-387-24P

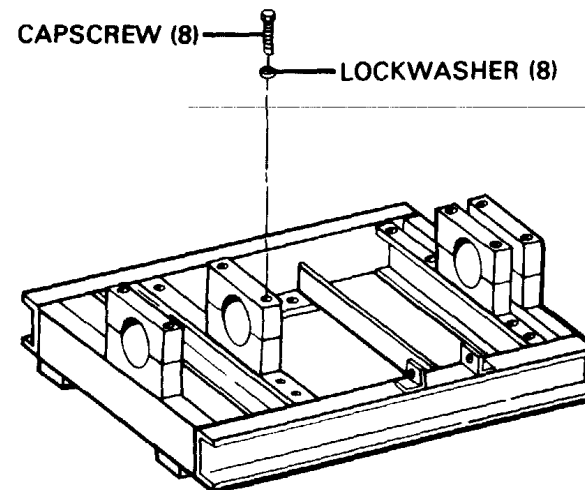
DISASSEMBLY

NOTE

The support assembly consists of a weldment, eight capscrews, and eight lockwashers. However, on some models of the tester the support is not a weldment but assembles together with screws, washers, and nuts.

NOTE

For disassembly of the support assembly, refer to the disassembly procedure of the drive unit assembly beginning on page 6-472.



**INSPECTION/SERVICING**

**SUPPORT ASSEMBLY.**

- a. Check for broken, cracked, or missing parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

**REASSEMBLY**

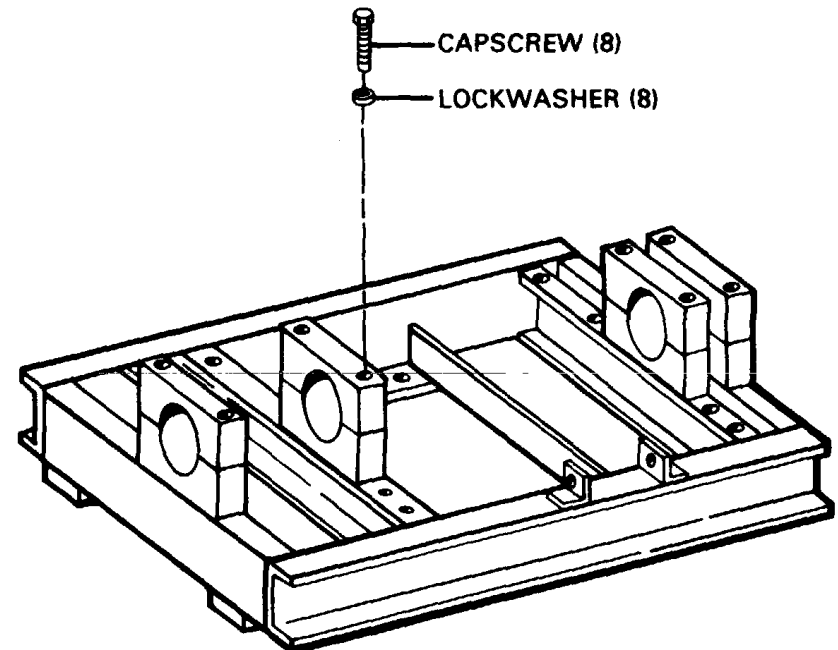
**NOTE**

For reassembly of the support assembly, refer to the reassembly/alinement procedure of the drive unit assembly beginning on page 6-484.

**REPAIR**

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.



**6-35. SERVICE CONNECTION ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Inspection/servicing
- d. Repair
- e. Reassembly
- f. Installation
- g. Test

**INITIAL SETUP**

**Tools and Special Tools**

- General mechanic's automotive tool kit (5180-00-177-7033)
- Multimeter (TS352 B/U)

**Materials/Parts**

- Abrasive cloth (item 4, app C)
- Cleaning compound (item 3, app C)
- Rag (item 14, app C)

**References**

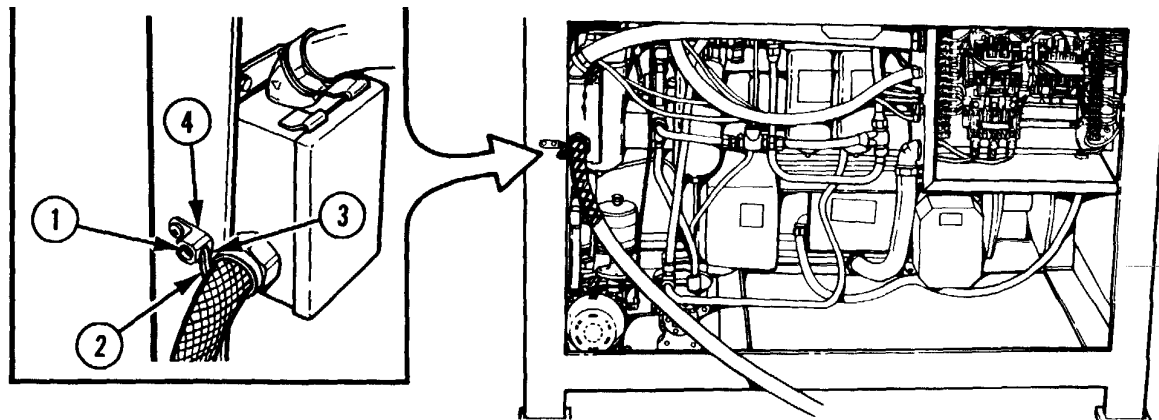
TM 9-4910-387-24P

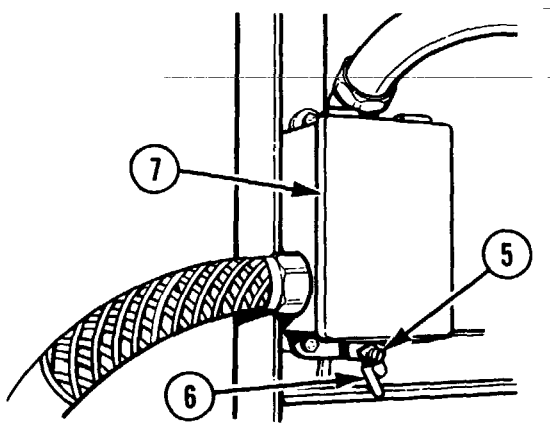
**Equipment Conditions**

- Main power source to tester is turned off
- 4-42 LH panel assembly is removed
- 4-33 Lower back panel is removed

**REMOVAL**

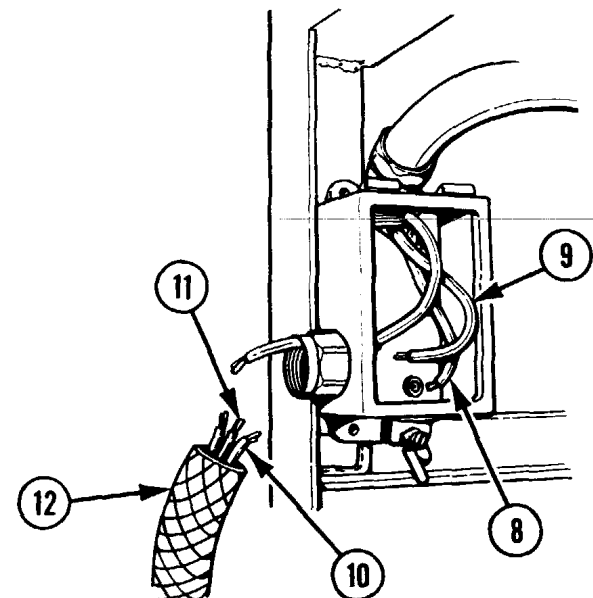
- 1 SETSCREW (1). Loosen.
- 2 WHITE GROUND WIRE (2) AND WHITE GROUND WIRE (3). Remove from connector (4).



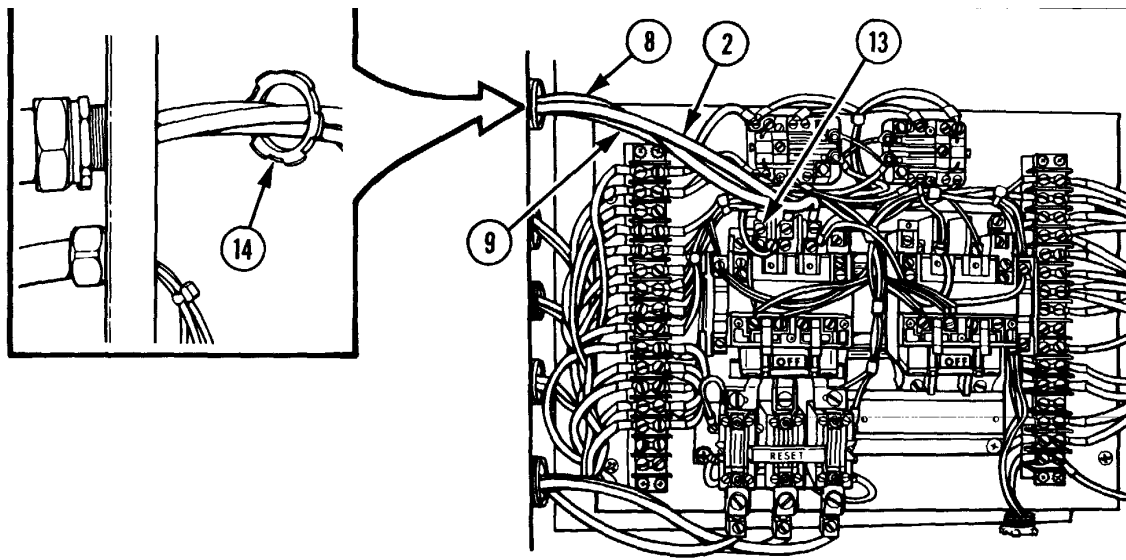


- 3 SCREW (5). Loosen.
- 4 CLAMP (6). Rotate out of the way.
- 5 COVER (7). Remove.

- 6 RED WIRE (8) AND BLACK WIRE (9). Disconnect from red wire (10) and black wire (11).
- 7 POWER CABLE (12). Remove.



- 8 THREE SCREWS (13). Remove.
- 9 RED WIRE (8), WHITE GROUND WIRE (2), AND BLACK WIRE (9). Disconnect.
- 10 NUT (14). Remove.

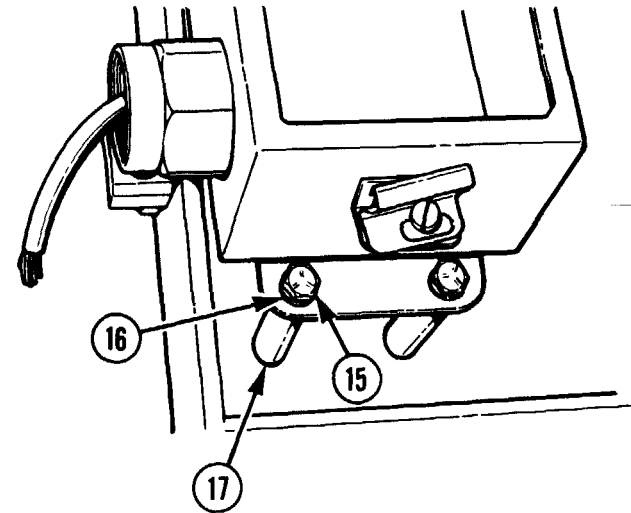




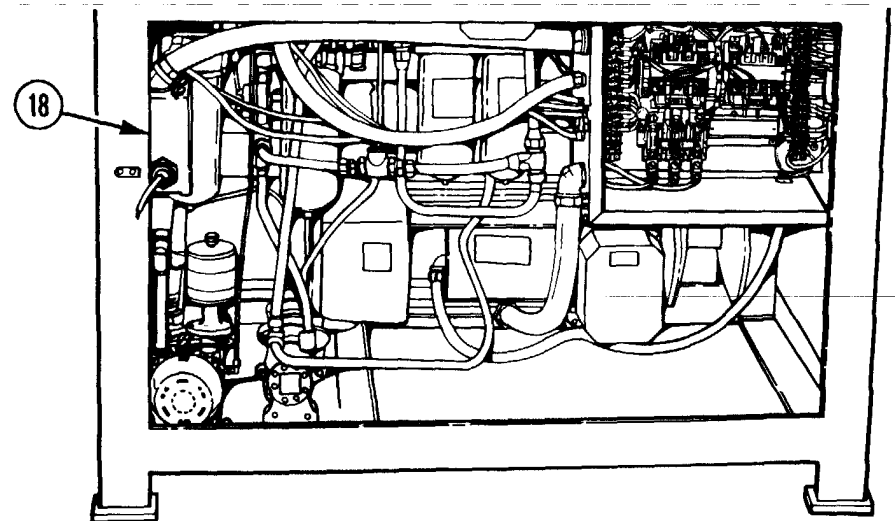
6-35. SERVICE CONNECTION ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

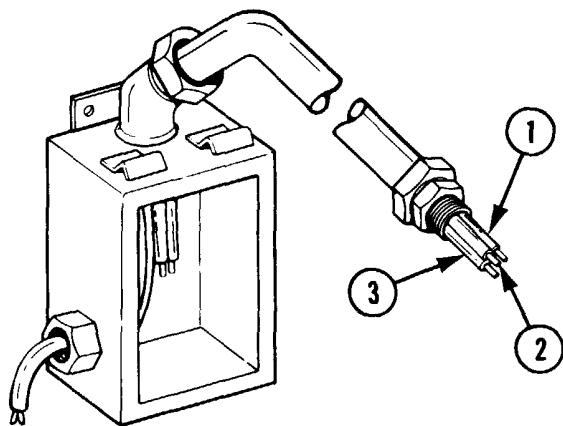
11 THREE SCREWS (15), THREE LOCKWASHERS (16), AND THREE WIRING BOX SPACERS (17). Remove.



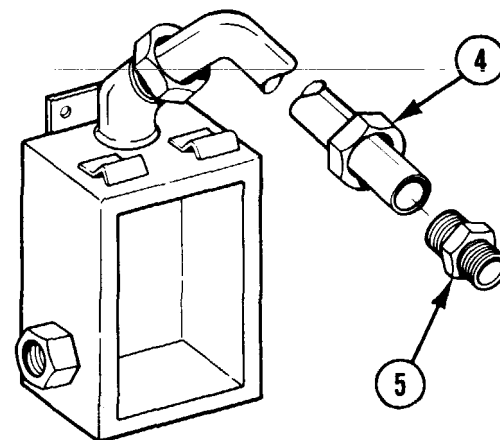
12 SERVICE CONNECTION ASSEMBLY (18). Remove.



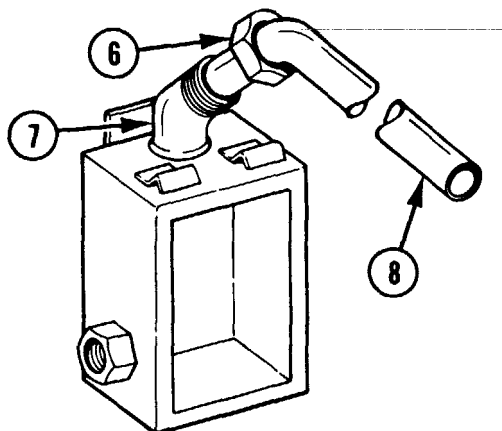
**DISASSEMBLY**



1 RED WIRE (1), WHITE GROUND WIRE (2), AND BLACK WIRE (3). Remove.

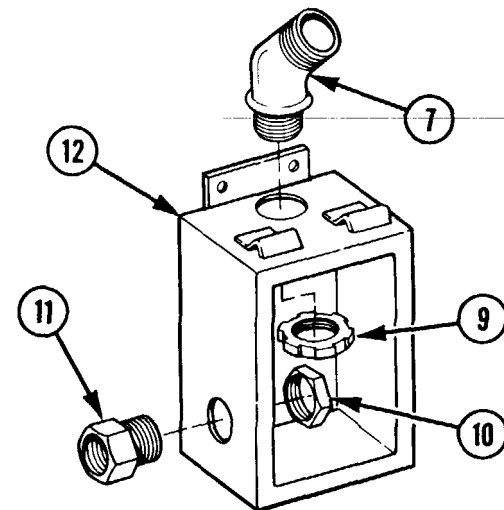


2 NUT (4). Remove from electrical connector (5).  
3 ELECTRICAL CONNECTOR (5) AND NUT (4). Remove.



4 NUT (6). Remove from electrical box connector (7).  
5 CONDUIT (8) AND NUT (6). Remove.

6 NUT (9). Remove.  
7 ELECTRICAL BOX CONNECTOR (7). Remove.  
8 NUT (10). Remove.  
9 CONDUIT HUB (11). Remove from box (12).



**6-35. SERVICE CONNECTION ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

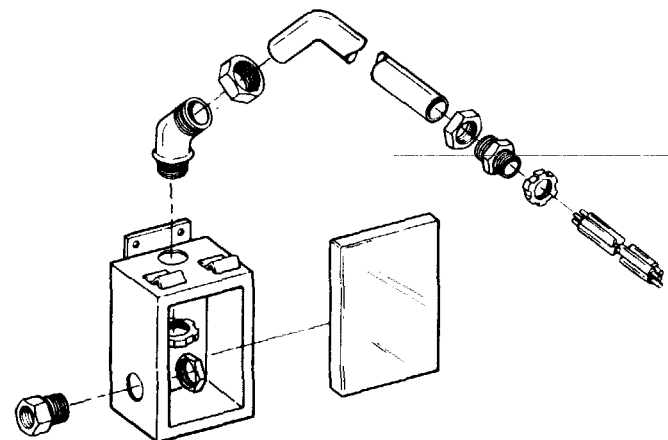
**INSPECTION/SERVICING**

**1 SERVICE CONNECTION ASSEMBLY.**

- a. Check for broken, cracked, corroded, or missing parts.
- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

**2 WIRES.**

- a. Check for cracked or broken insulation and broken or frayed wires.
- b. Clean wire ends with abrasive cloth (item 4, app C).



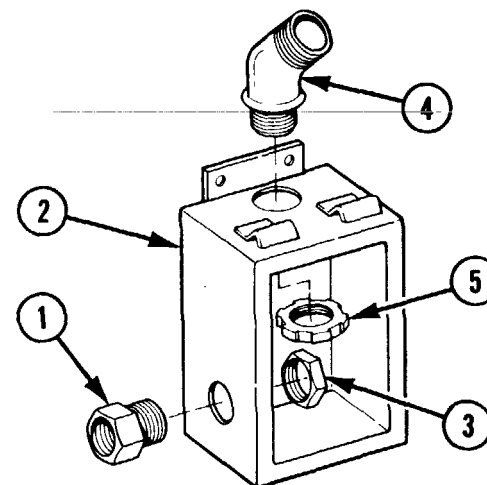
**REPAIR**

**REASSEMBLY**

**NOTE**

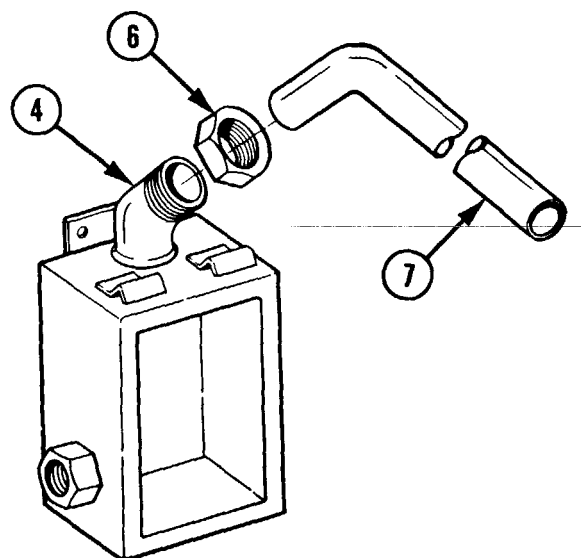
Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

- 1 CONDUIT HUB (1). Install in box (2) and secure with nut (3).
- 2 ELECTRICAL BOX CONNECTOR (4). Install in box (2) and secure with nut (5).



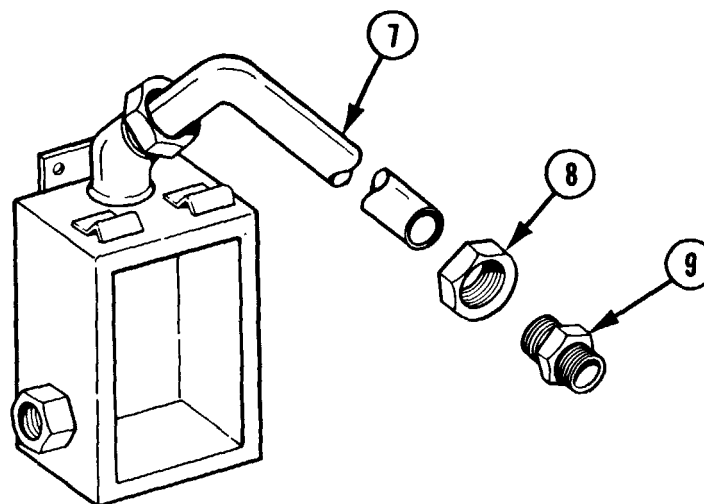
3 NUT (6) AND CONDUIT (7).

- a. Install in electrical box connector (4).
- b. Tighten nut (6).



4 NUT (8) AND ELECTRICAL CONNECTOR (9).

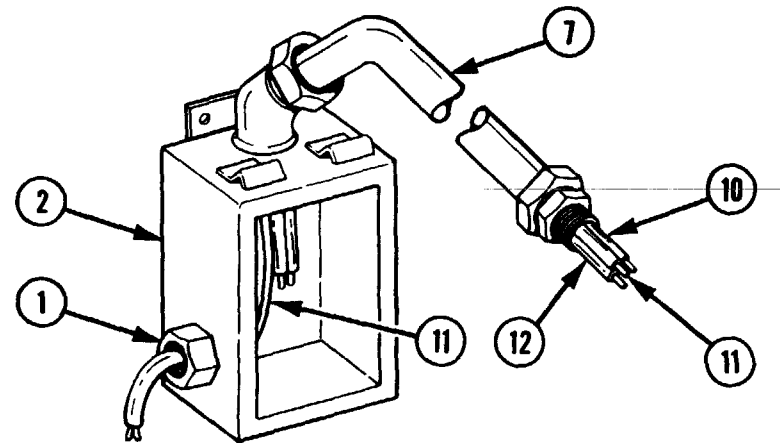
- a. Install on conduit (7).
- b. Tighten nut (8).



**6-35. SERVICE CONNECTION ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

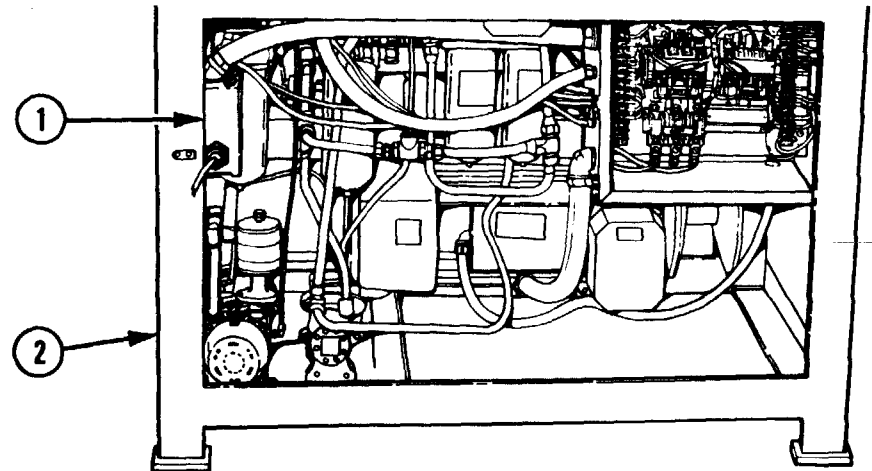
**REASSEMBLY (cont)**

- 5 RED WIRE (10), WHITE GROUND WIRE (11), AND BLACK WIRE (12). Install through conduit (7) and into box (2).
- 6 WHITE GROUND WIRE (11). Pull through conduit hub (1).

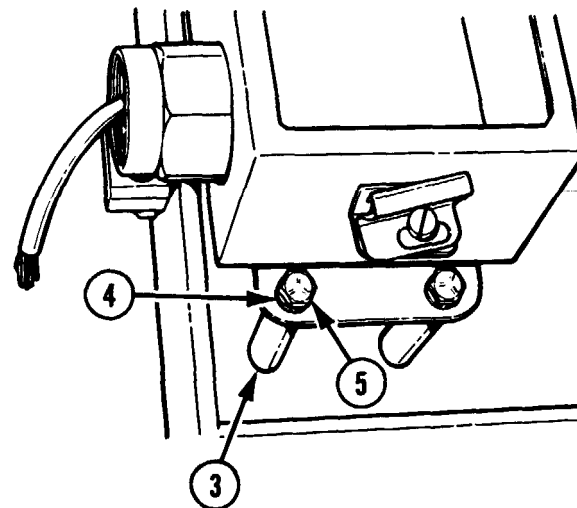


**INSTALLATION**

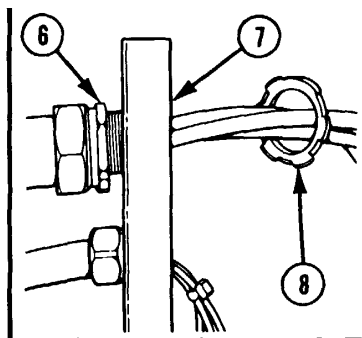
- 1 SERVICE CONNECTION ASSEMBLY (1). Install in tester (2).



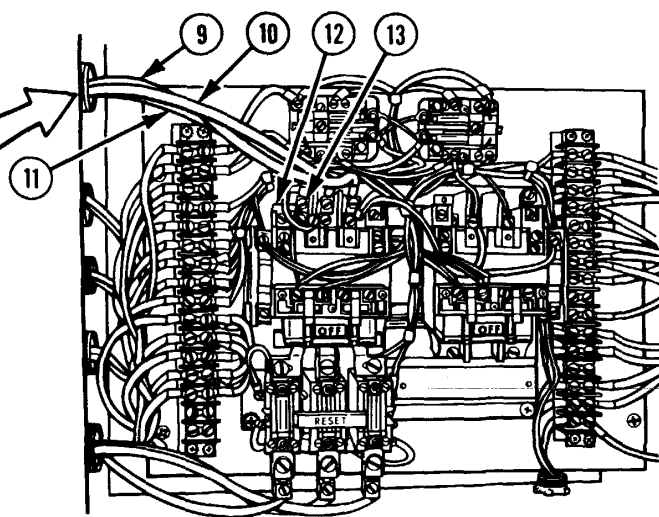
- 2 THREE WIRING BOX SPACERS (3), THREE LOCKWASHERS (4), AND THREE SCREWS (5). Install.



- 3 STRAIGHT CONNECTOR (6). Install through LH enclosure (7) and secure with nut (8).



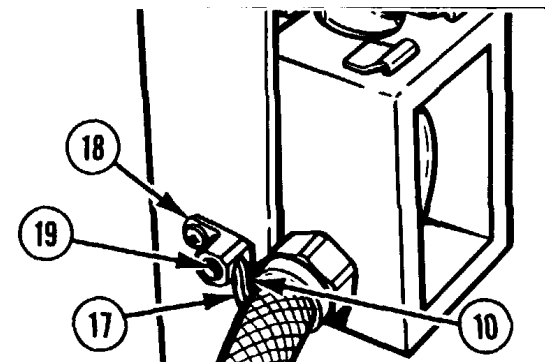
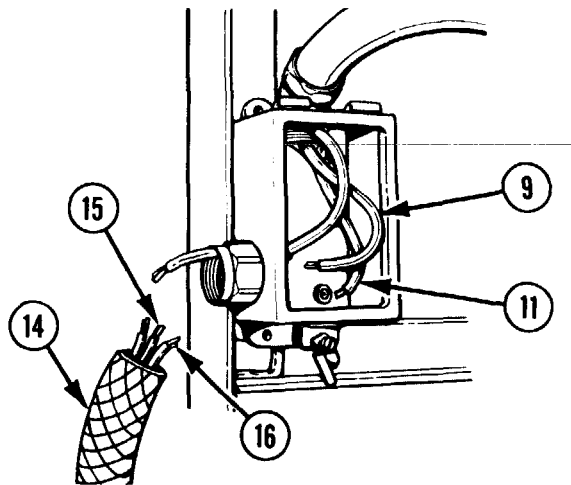
- 4 RED WIRE (9), WHITE GROUND WIRE (10), AND BLACK WIRE (11). Install on starter (12) and secure with three screws (13).



**6-35. SERVICE CONNECTION ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**INSTALLATION (cont)**

- 5 POWER CABLE (14). Install.
- 6 RED WIRE (15). Connect to red wire (9).
- 7 BLACK WIRE (16). Connect to black wire (11).

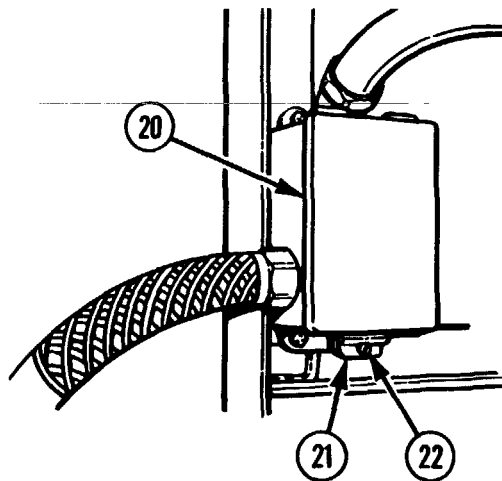


- 8 WHITE GROUND WIRE (17) AND WHITE GROUND WIRE (10). Install in connector (18) and secure by tightening setscrew (19).

**TEST**

**SERVICE CONNECTION ASSEMBLY.**  
Check for continuity with multimeter.

- 9 COVER (20). Install and secure by positioning clamp (21) and tightening screw (22).



**6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |                         |                         |
|-------------------------|-------------------------|
| a. Removal              | e. Reassembly/alinement |
| b. Disassembly          | f. Adjustment           |
| c. Inspection/servicing | g. Installation         |
| d. Repair               | h. Test                 |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

**References**

2-26 Hookup of fuel injector pump  
TM 9-4910-387-24P

**Troubleshooting References**

6-31 Auxiliary motor fails to start, AUXILIARY MOTOR switch is on

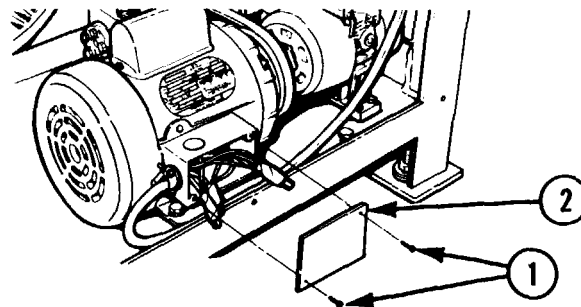
- 6-140 Fuel does not circulate  
6-71 FUEL TEMPERATURE gage does not indicate  
6-142 Lube oil does not circulate  
6-77 LUBE OIL TEMPERATURE gage does not indicate  
6-85 VACUUM REGULATOR does not function

**Equipment Conditions**

- Main power source to tester is turned off  
4-40 RH panel assembly is removed  
4-33 Lower back panel is removed

**REMOVAL**

- 1 TWO SCREWS (1). Remove.
- 2 COVER (2). Remove.





6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL (cont)

**NOTE**

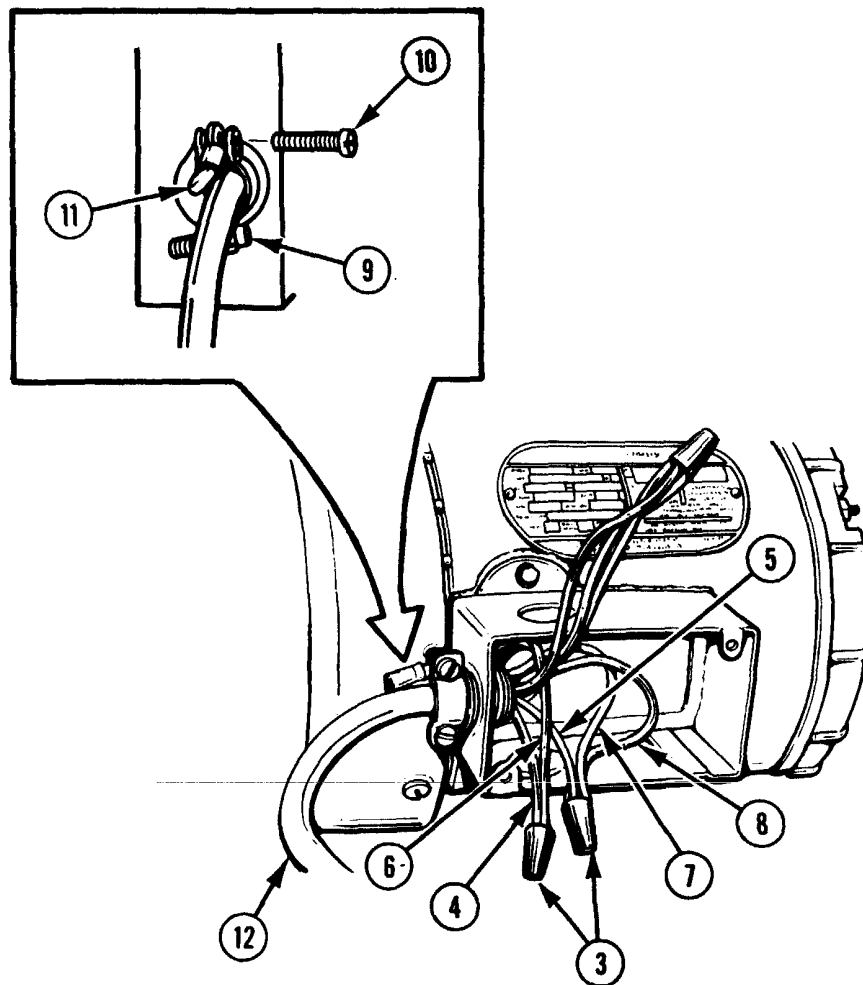
Remove only the two wire nuts which secure the white wire and black wire coming through the connector.

- 3 TWO WIRE NUTS (3). Remove.

**NOTE**

Tag all wires before disconnecting.

- 4 WHITE WIRE (4) AND BLACK WIRE (5). Disconnect from three motor wires (6, 7, and 8).
- 5 SCREW (9). Loosen.
- 6 SCREW (10). Remove.
- 7 GREEN WIRE (11) WITH TERMINAL LUG. Disconnect.
- 8 WIRE CABLE (12). Remove.



**NOTE**

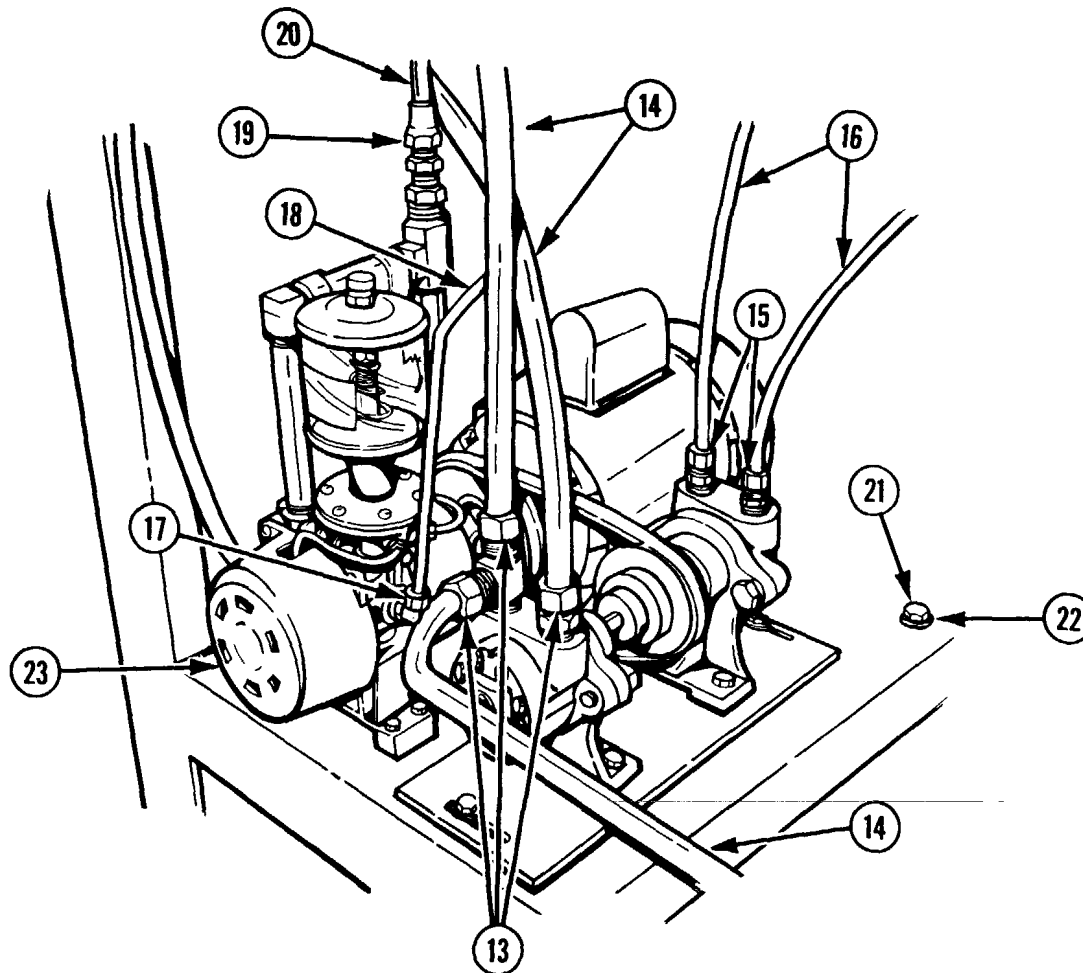
**Tag all tubing before disconnecting.**

- 9 THREE NUTS (13) AND THREE COPPER TUBINGS (14). Disconnect.
- 10 TWO NUTS (15) AND TWO COPPER TUBINGS (16). Disconnect.
- 11 NUT (17) AND COPPER TUBING (18). Disconnect.
- 12 NUT (19) AND COPPER TUBING (20). Disconnect.
- 13 FOUR SCREWS (21) AND FOUR LOCKWASHERS (22). Remove.

**WARNING**

The auxiliary motor and pump assembly weighs approximately 81 lbs (36.74 kg). Use care when removing from the tester.

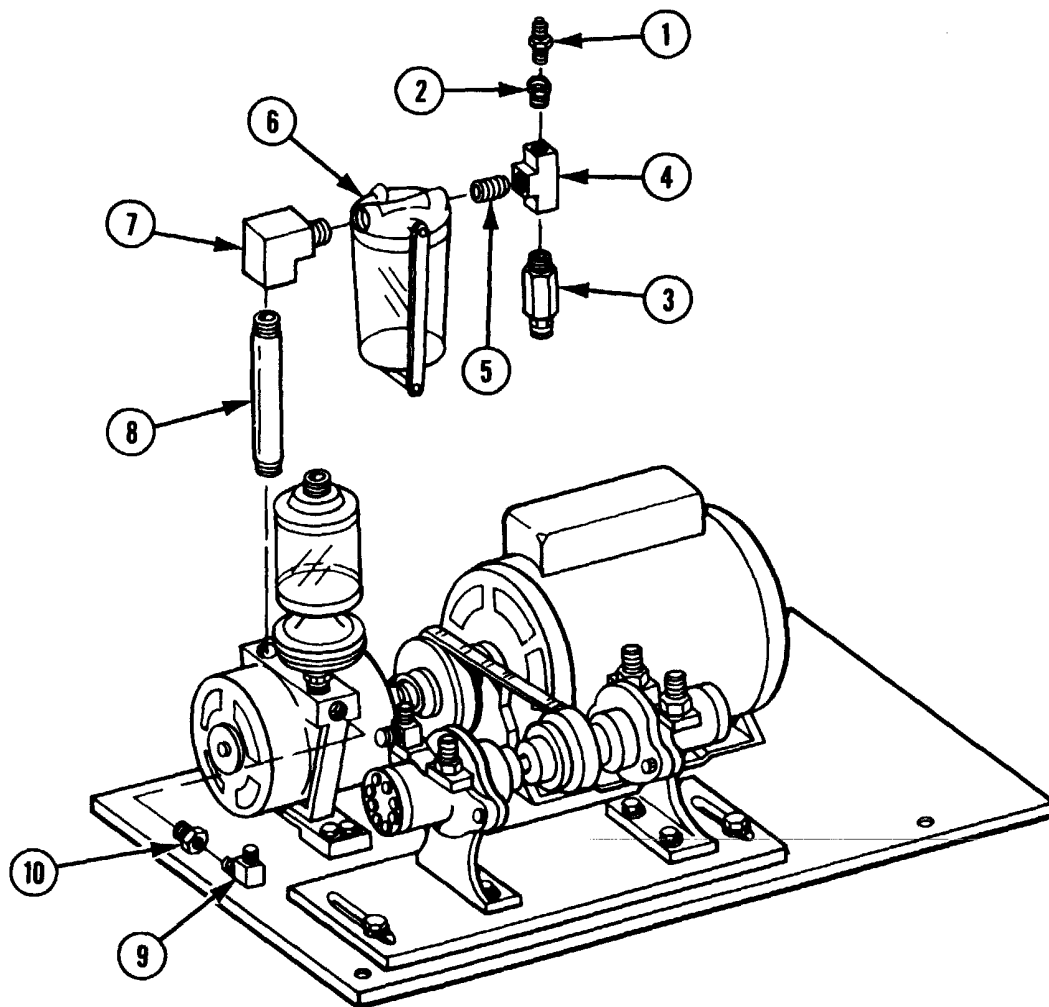
- 14 AUXILIARY MOTOR AND PUMP ASSEMBLY (23). Remove.



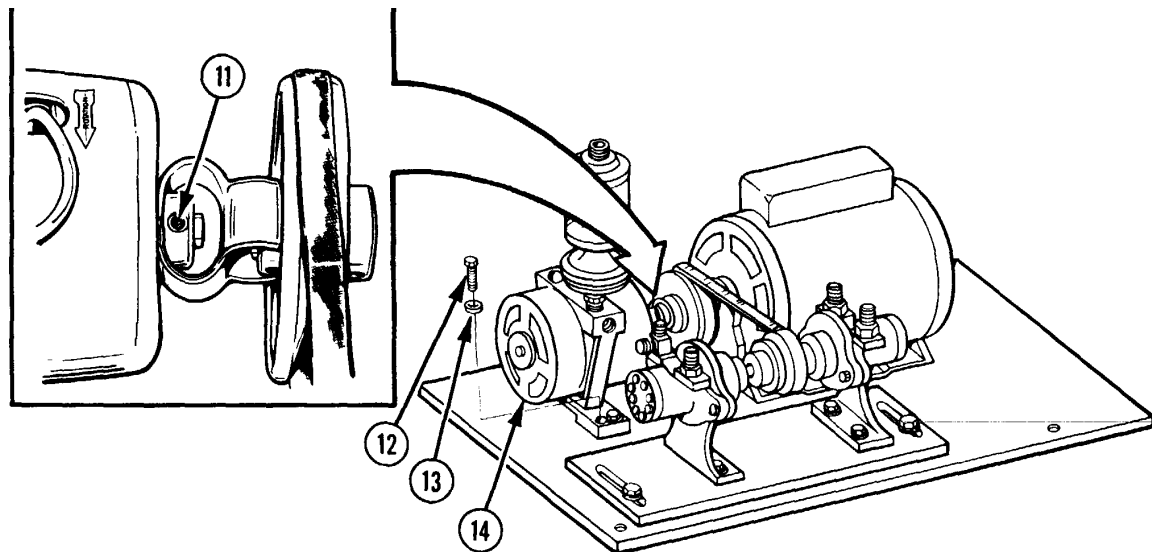
6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY

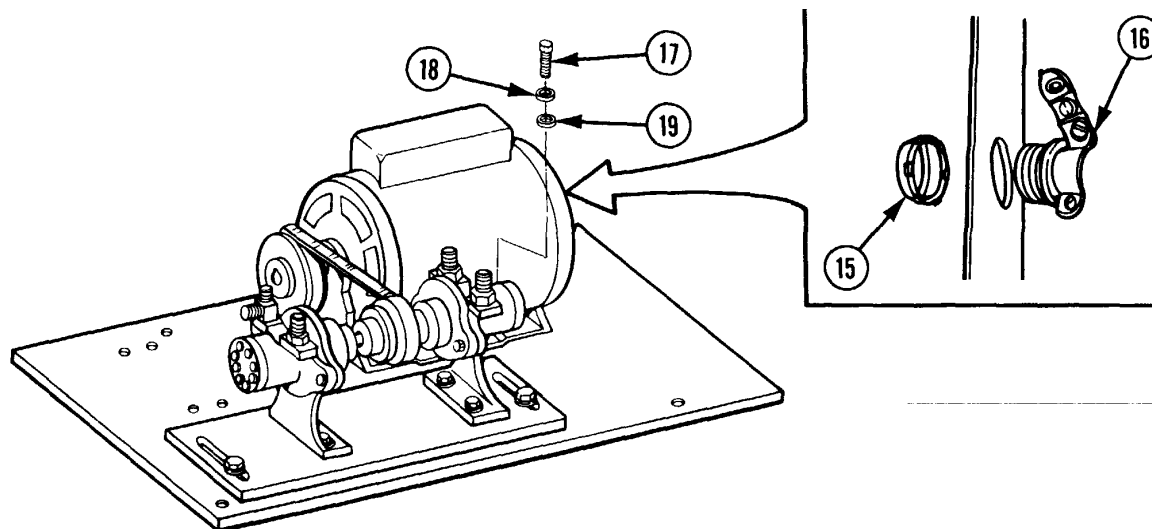
- 1 MALE CONNECTOR (1), BUSHING (2), AND RELIEF VALVE (3). Remove.
- 2 STREET TEE (4) AND CLOSE NIPPLE (5). Remove.
- 3 MOISTURE AND OIL TRAP (6). Remove.
- 4 STREET ELBOW (7) AND IRON PIPE NIPPLE (8). Remove.
- 5 MALE ELBOW (9) AND BUSHING (10). Remove.



- 6 SETSCREW (11). Loosen.
- 7 FOUR SCREWS (12) AND FOUR LOCKWASHERS (13). Remove.
- 8 VACUUM PUMP (14). Remove.



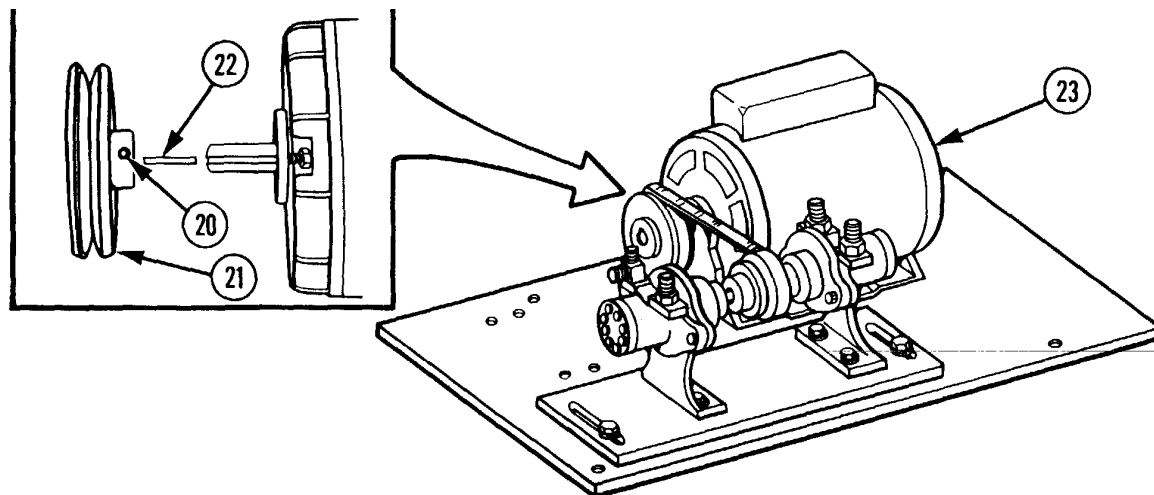
- 9 NUT (15). Remove.
- 10 STRAIGHT BOX CONNECTOR (16). Remove.
- 11 FOUR BOLTS (17), FOUR LOCKWASHERS (18), AND FOUR FLAT WASHERS (19). Remove.



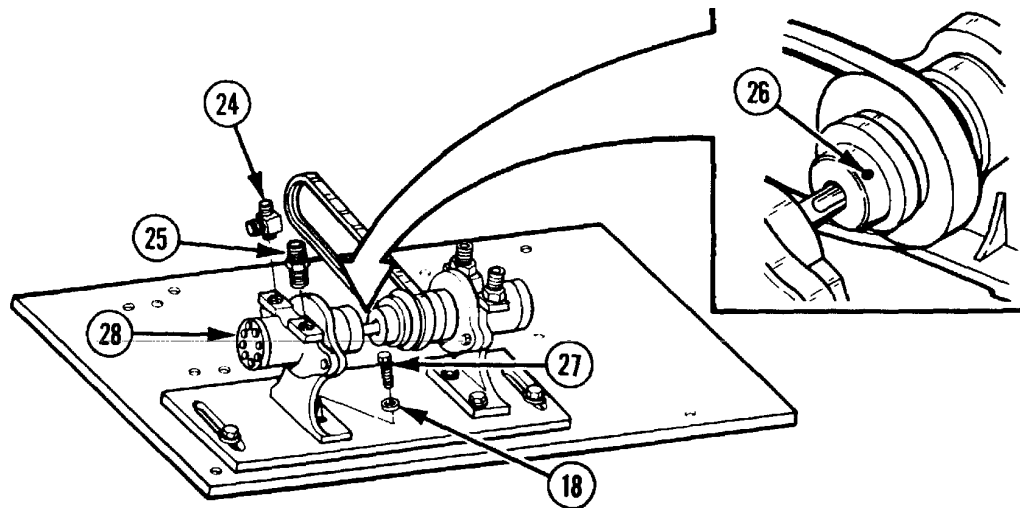
6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

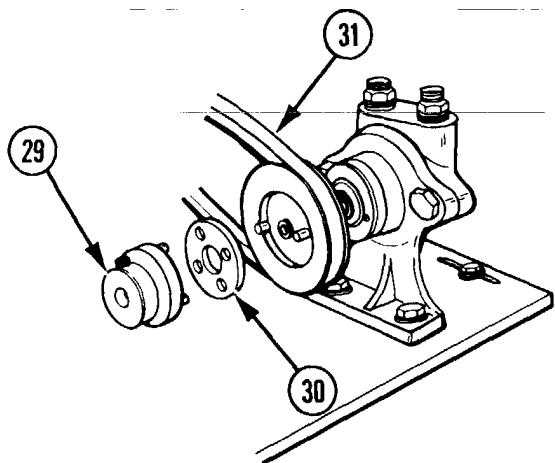
DISASSEMBLY (cont)

- 12 SETSCREW (20). Loosen.
- 13 SHEAVE (21) AND KEY (22). Remove.
- 14 AUXILIARY MOTOR (23). Remove.



- 15 MALE RUN TEE (24) AND MALE CONNECTOR (25). Remove.
- 16 SETSCREW (26). Loosen.
- 17 TWO BOLTS (27) AND TWO LOCK-WASHERS (18). Remove.
- 18 FUEL PUMP (28). Remove.





19 HALF COUPLING (29), BUFFER (30), AND BELT (31). Remove.

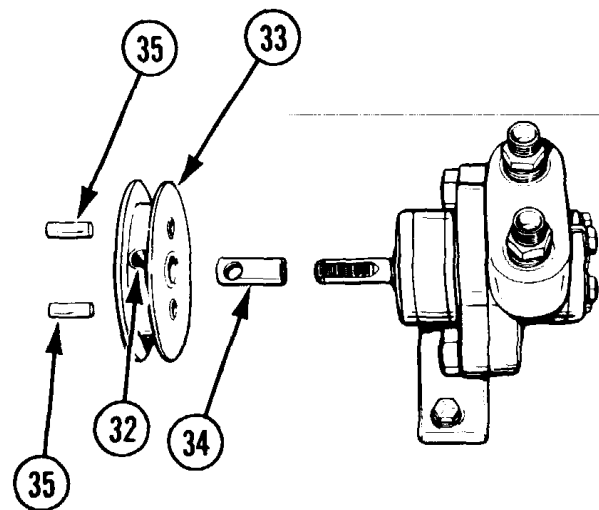
20 SETSCREW (32). Loosen.

21 COUPLING SHEAVE ASSEMBLY (33) AND BUSHING (34). Remove.

**CAUTION**

Do not remove pins unless necessary for replacement, as removal will damage the pins and the coupling sheave assembly.

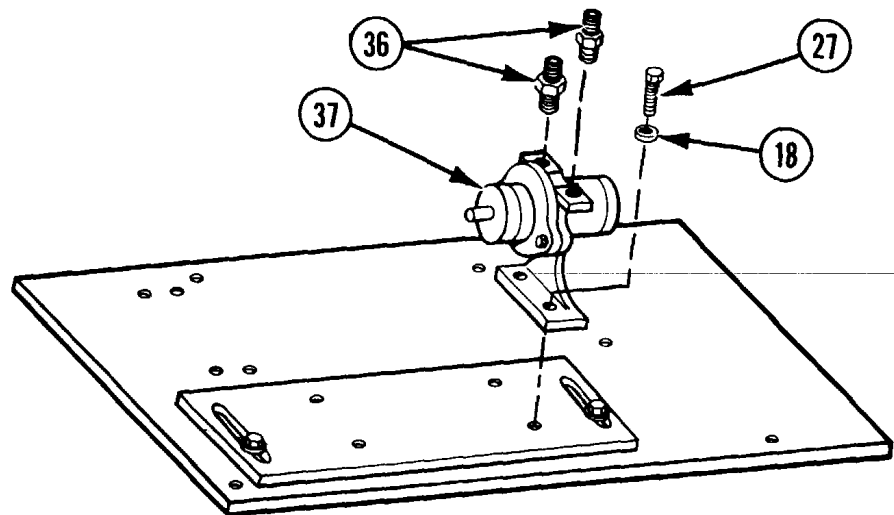
22 TWO PINS (35). Remove.



23 TWO MALE CONNECTORS (36). Remove.

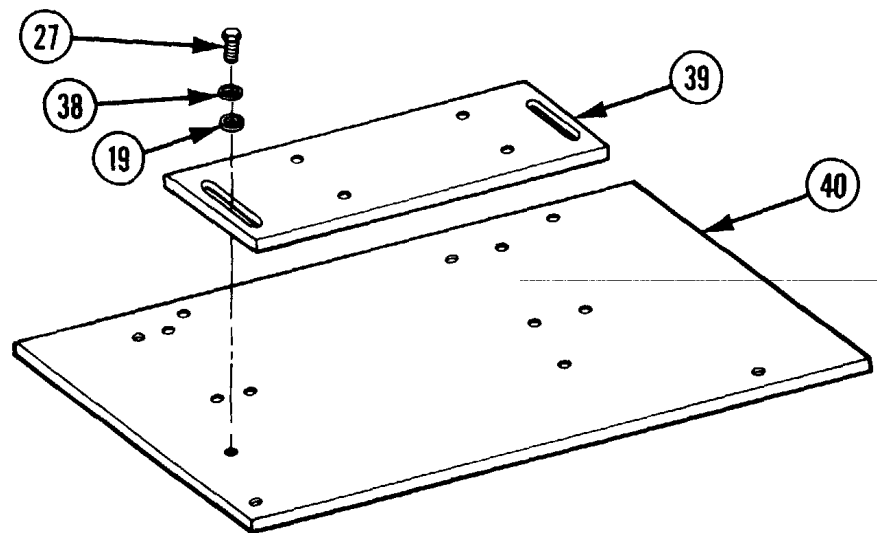
24 TWO BOLTS (27) AND TWO LOCKWASHERS (18). Remove.

25 LUBE PUMP (37). Remove.



**6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**  
**DISASSEMBLY (cont)**

- 26 TWO BOLTS (27), TWO LOCKWASHERS (38), AND TWO FLAT WASHERS (19). Remove.
- 27 PUMP MOUNTING PLATE (39). Remove from auxiliary motor base plate (40).



**INSPECTION/SERVICING**

**AUXILIARY MOTOR AND PUMP ASSEMBLY.**

- a. Check for broken, cracked, worn, corroded, or missing parts.

**CAUTION**

Do not allow cleaning compound to get inside the auxiliary motor, as the motor will be damaged.

- b. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).

**REPAIR**

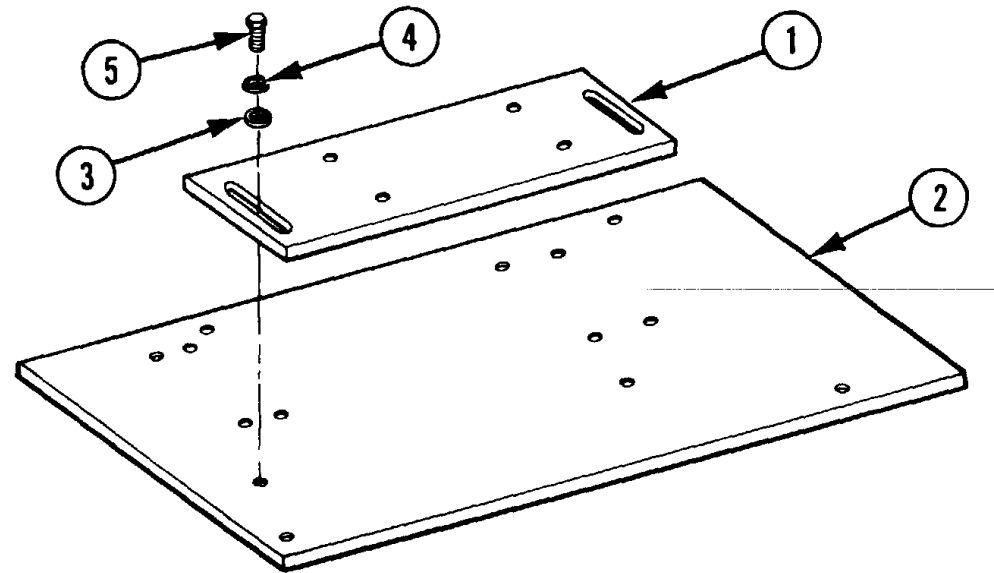
**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

**REASSEMBLY/ALINEMENT**

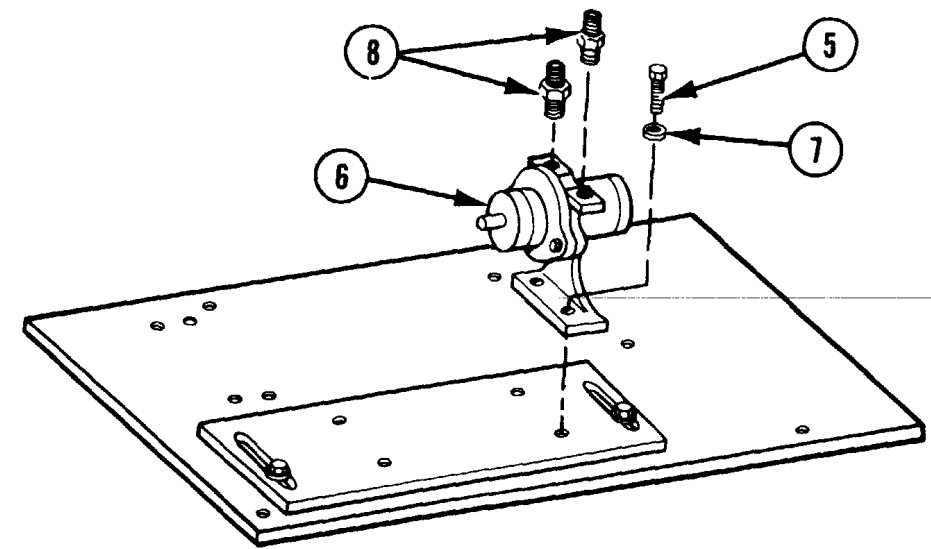
**1 PUMP MOUNTING PLATE (1).**

- a. Install on auxiliary motor base plate (2).
- b. Install, but do not tighten, two flat washers (3), two lock-washers (4), and two bolts (5).



**2 LUBE PUMP (6).** Install and secure with two lockwashers (7) and two bolts (5).

**3 TWO MALE CONNECTORS (8).** Install.





6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

4 TWO PINS (9). Install in coupling sheave assembly (10).

5 BUSHING (11).

a. Aline hole with setscrew in coupling sheave assembly (10).

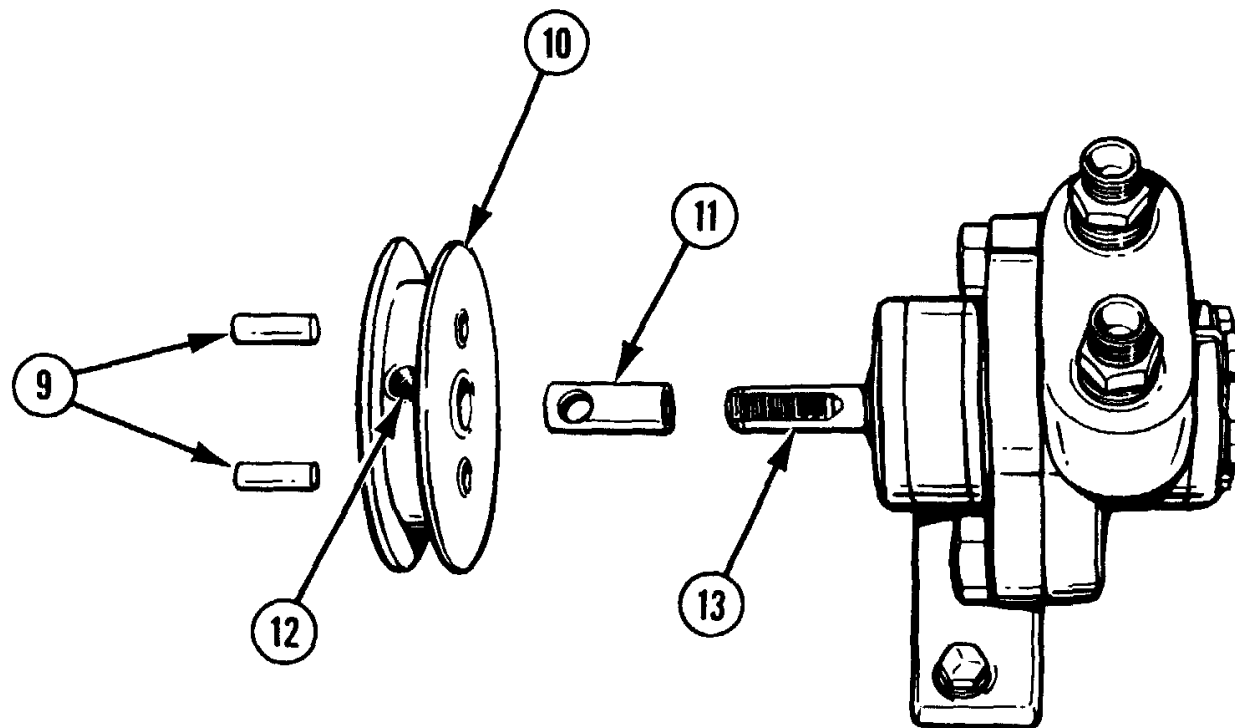
b. Install in coupling sheave assembly (10).

6 COUPLING SHEAVE ASSEMBLY (10).

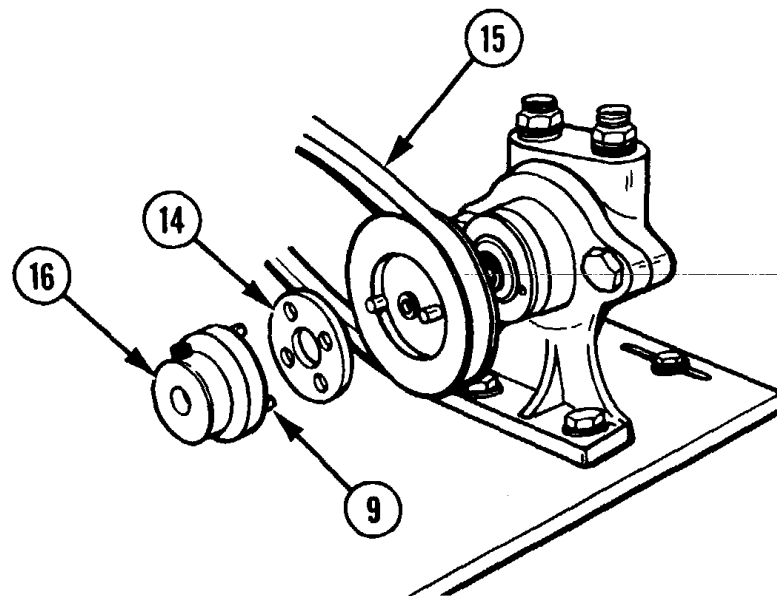
a. Aline setscrew (12) with flat segment on lube pump shaft (13).

b. Install.

c. Tighten setscrew (12).

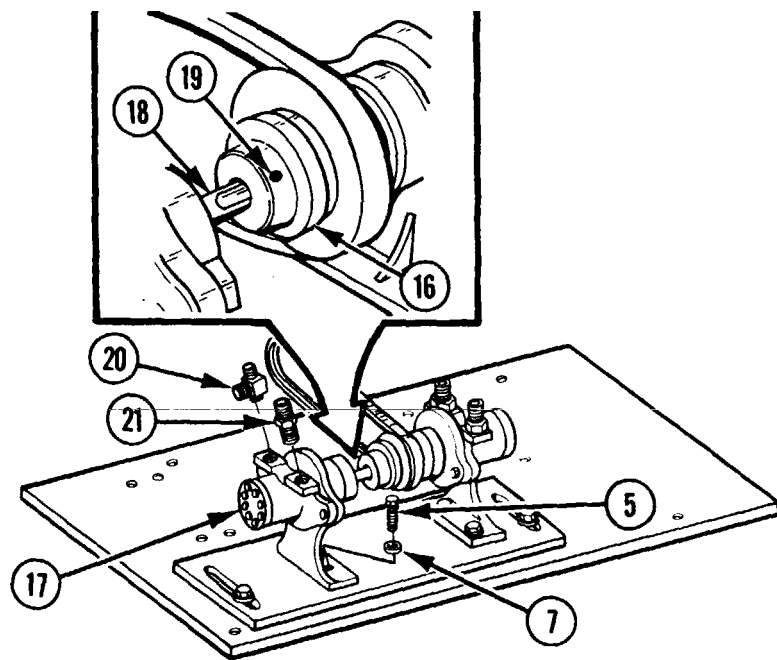


- 7 BUFFER (14) AND BELT (15). Install.
- 8 HALF COUPLING (16). Aline two pins (9) with two holes in buffer (14) and install.
- 9 FUEL PUMP (17).



- a. Aline flat segment on shaft (18) with setscrew (19) in half coupling (16).
- b. Install.
- c. Secure with two lockwashers (7) and two bolts (5).

- 10 SETSCREW (19). Tighten.
- 11 MALE RUN TEE (20) AND MALE CONNECTOR (21). Install.

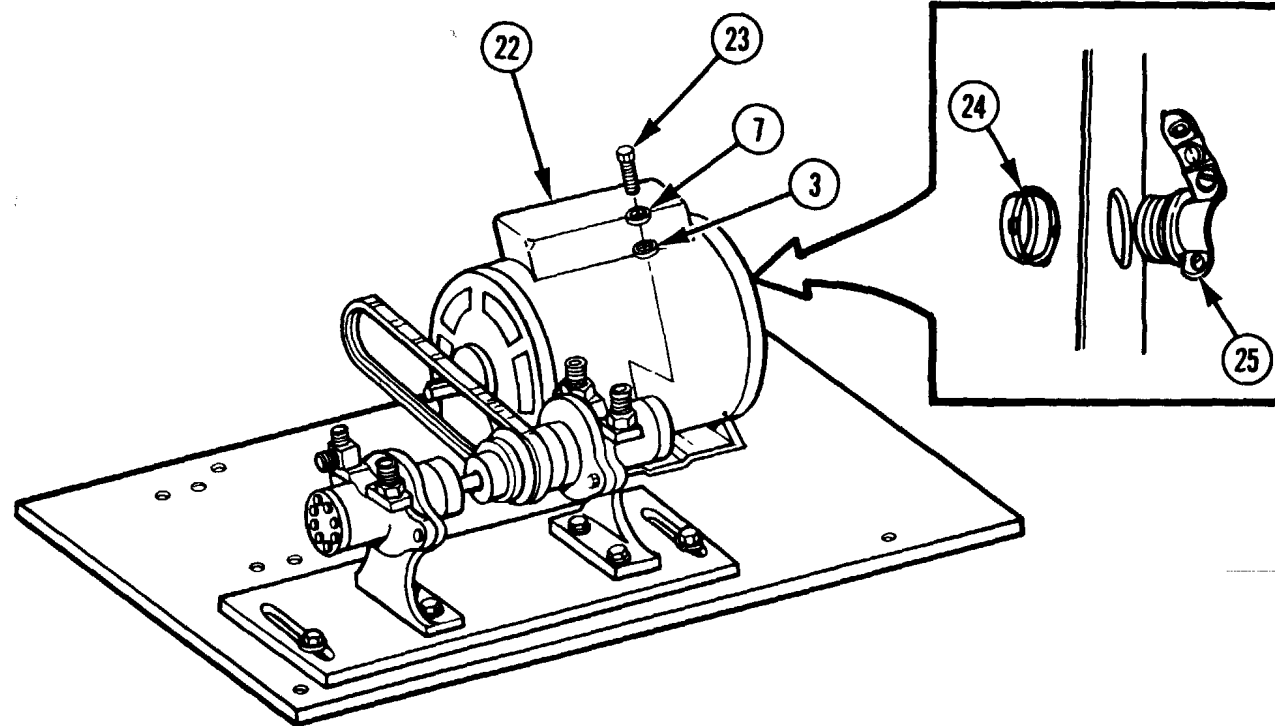


6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

12 AUXILIARY MOTOR (22). Install and secure with four flat washers (3), four lockwashers (7), and four bolts (23).

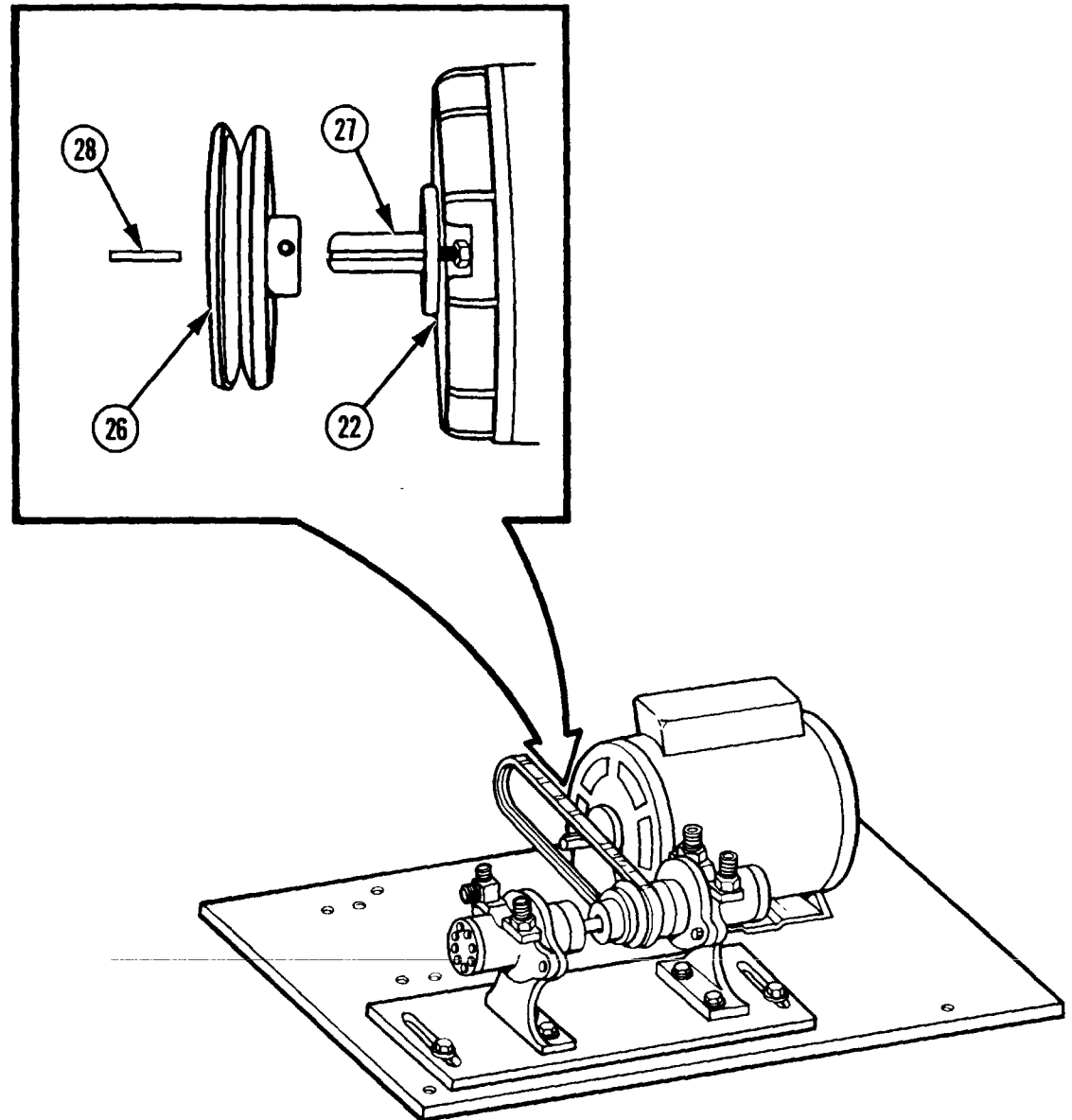
13 NUT (24) AND STRAIGHT BOX CONNECTOR (25). Install.



**14 SHEAVE (26).**

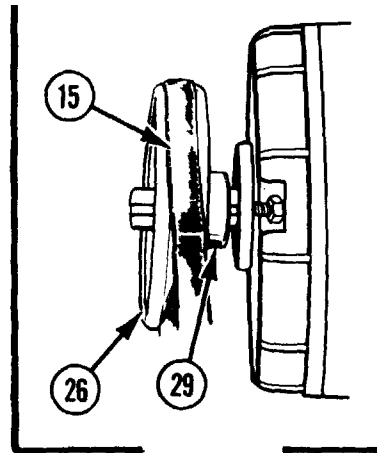
- a. Install on auxiliary motor shaft (27) to within approximately 0.125 in. (0.318 cm) of the auxiliary motor (22).
- b. Aline slot with slot in shaft (27).

- 15 KEY (28).** Install in slot in shaft (27) and slot in sheave (26), leaving end of key (28) flush with end of shaft (27).



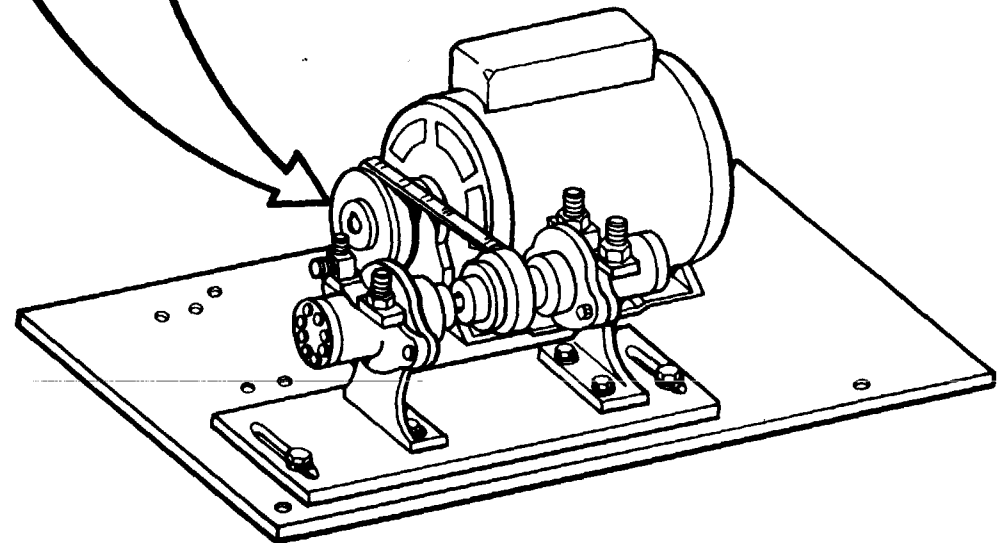
6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)



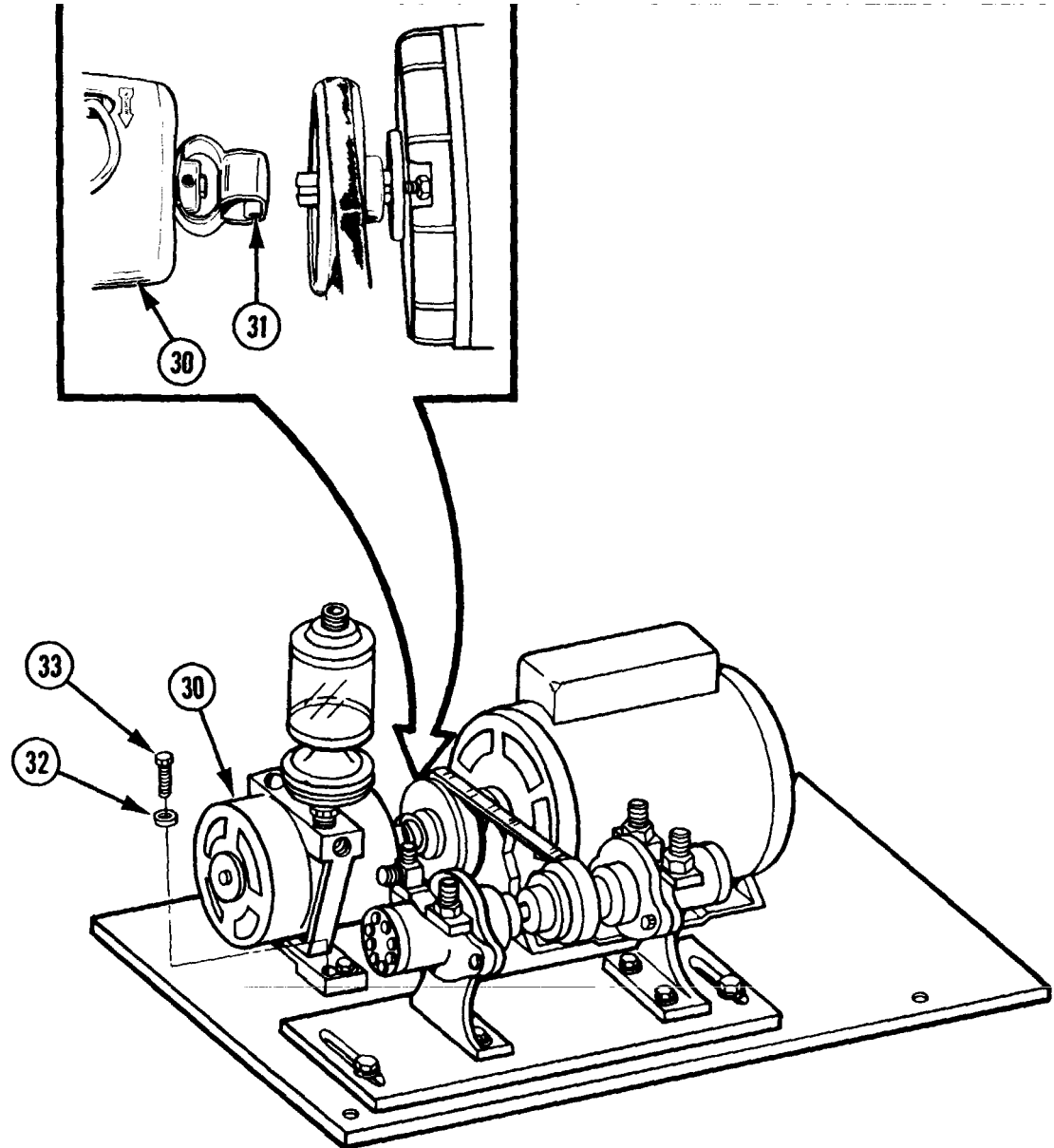
16 SETSCREW (29). Tighten.

17 BELT (15). Install on sheave (26).



18 VACUUM PUMP (30).

- a. Install.
- b. Tighten setscrew (31).
- c. Secure with four lockwashers (32) and four screws (33).



6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/ALINEMENT (cont)

19 BUSHING (34) AND MALE ELBOW (35). Install on vacuum pump (30).

20 IRON PIPE NIPPLE (36) AND STREET ELBOW (37). Install.

**NOTE**

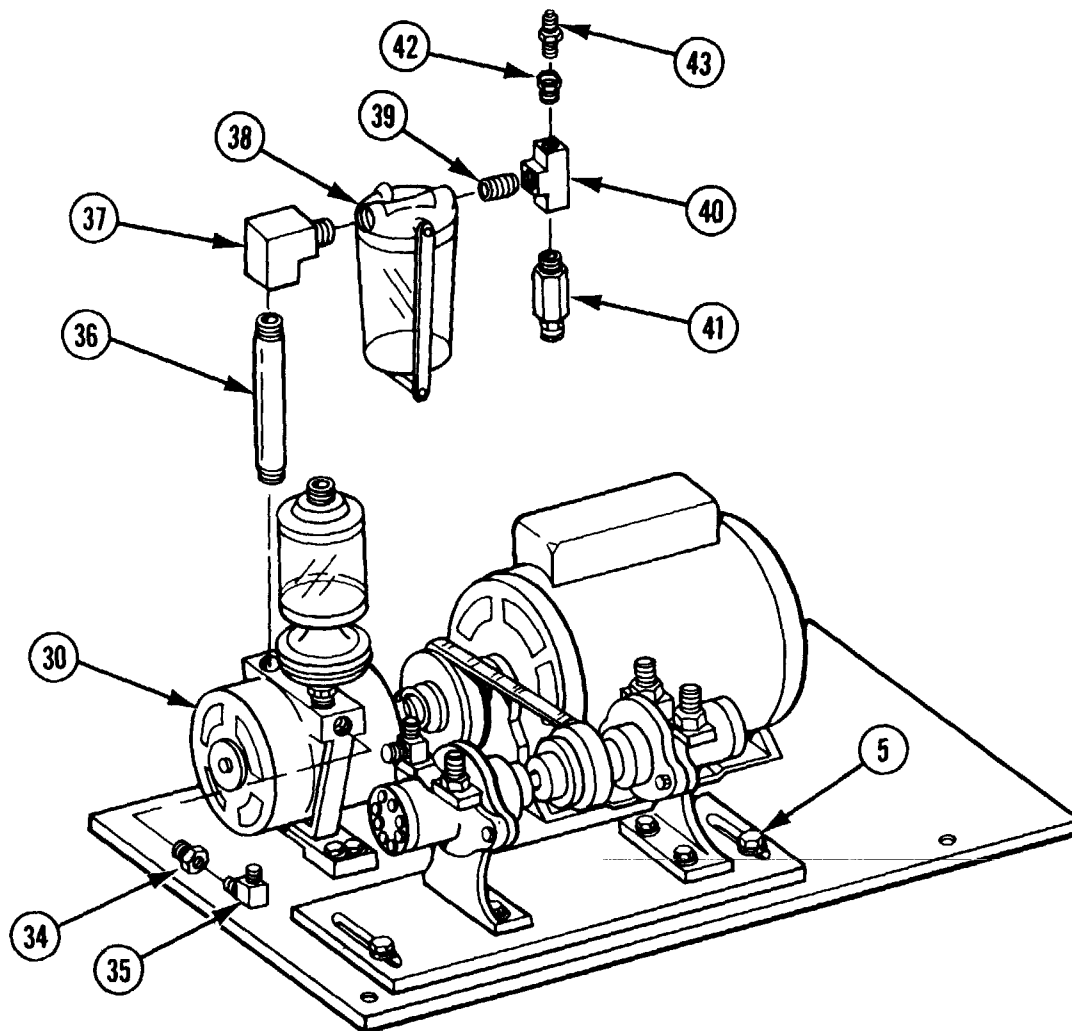
Install moisture and oil trap with arrow pointing toward auxiliary motor.

21 MOISTURE AND OIL TRAP (38). Install.

22 CLOSE NIPPLE (39) AND STREET TEE (40). Install.

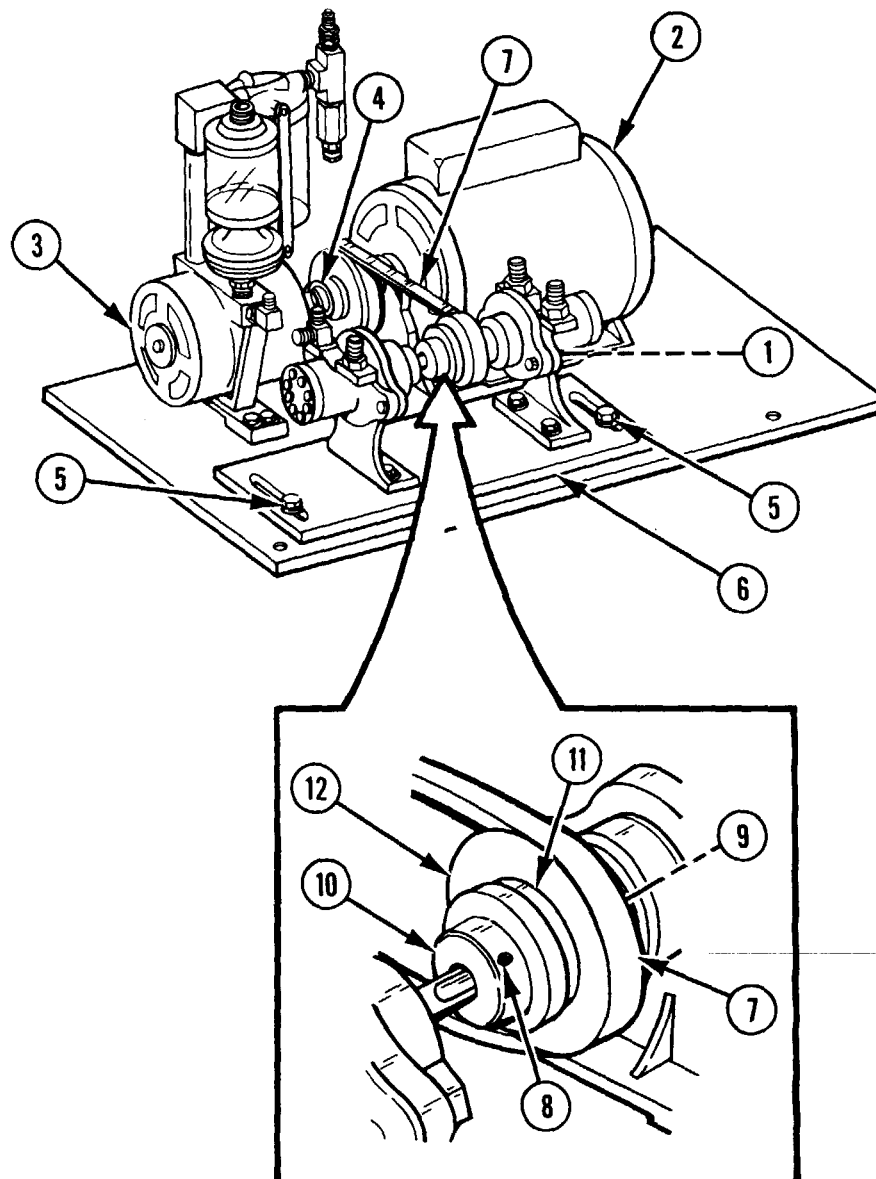
23 RELIEF VALVE (41), BUSHING (42), AND MALE CONNECTOR (43). Install.

24 TWO BOLTS (5). Tighten.



**ADJUSTMENT**

- 1 FOUR BOLTS (1). Loosen.
- 2 AUXILIARY MOTOR (2). Reposition and aline with vacuum pump (3) so that drive coupling (4) does not bind.
- 3 FOUR BOLTS (1). Tighten.
- 4 TWO BOLTS (5). Loosen.
- 5 PUMP MOUNTING PLATE (6). Reposition so that belt (7) is tight and does not slip.
- 6 TWO BOLTS (5). Tighten.
- 7 SETSCREW (8) AND SETSCREW (9). Loosen.
- 8 HALF COUPLING (10), BUFFER (11), AND COUPLING SHEAVE ASSEMBLY (12). Reposition so that belt (7) does not bind.
- 9 SETSCREW (8) AND SETSCREW (9). Tighten.





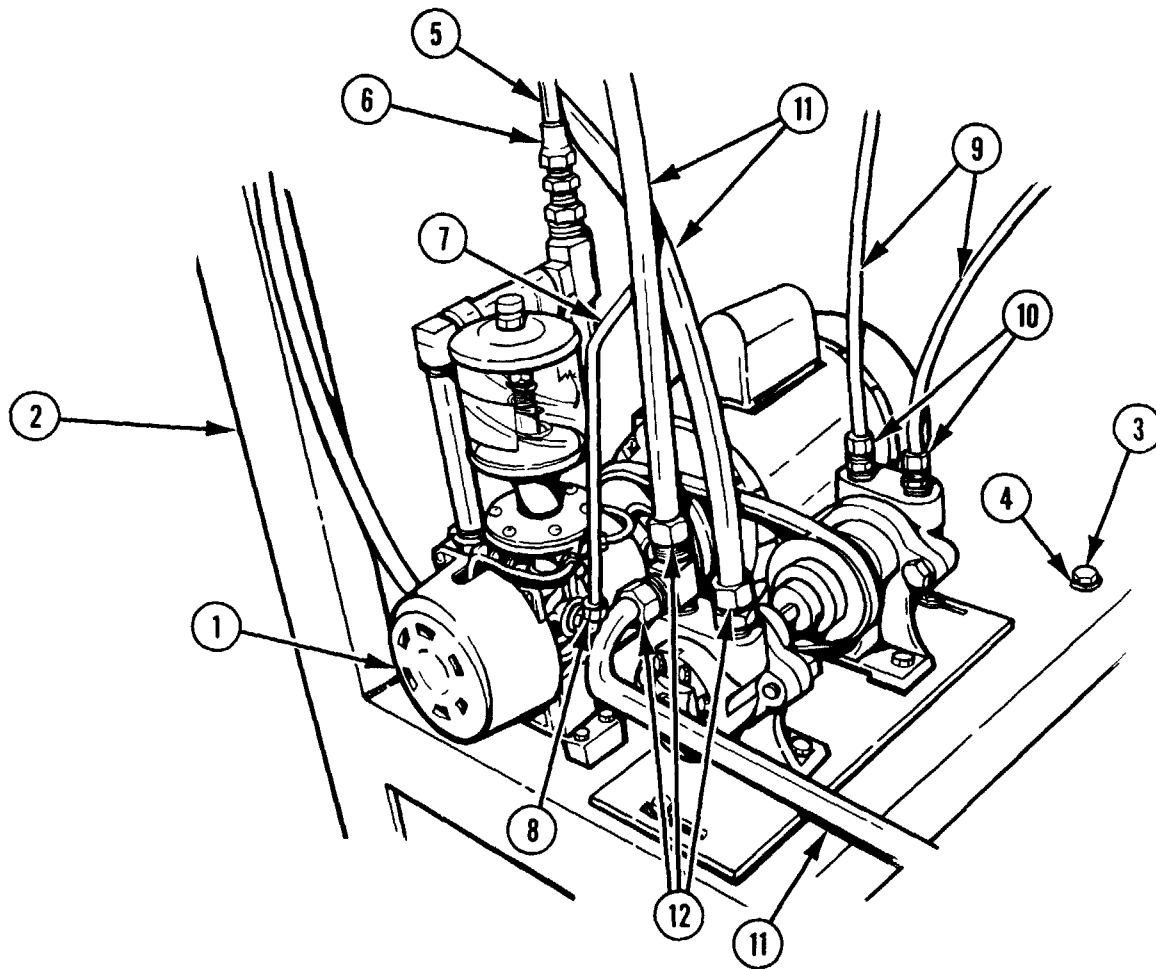
## 6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

## INSTALLATION

**WARNING**

The auxiliary motor and pump assembly weighs approximately 81 lbs (36.74 kg). Use care when installing in the tester.

- 1 AUXILIARY MOTOR AND PUMP ASSEMBLY (1). Install in tester (2).
- 2 FOUR LOCKWASHERS (3) AND FOUR SCREWS (4). Install.
- 3 COPPER TUBING (5) AND NUT (6). Install.
- 4 COPPER TUBING (7) AND NUT (8). Install.
- 5 TWO COPPER TUBINGS (9) AND TWO NUTS (10). Install.
- 6 THREE COPPER TUBINGS (11) AND THREE NUTS (12). Install.



7 WIRE CABLE (13). Install.

8 GREEN WIRE (14) WITH TERMINAL LUG.

- a. Install.
- b. Install screw (15).
- c. Tighten screws (15 and 16).

**NOTE**

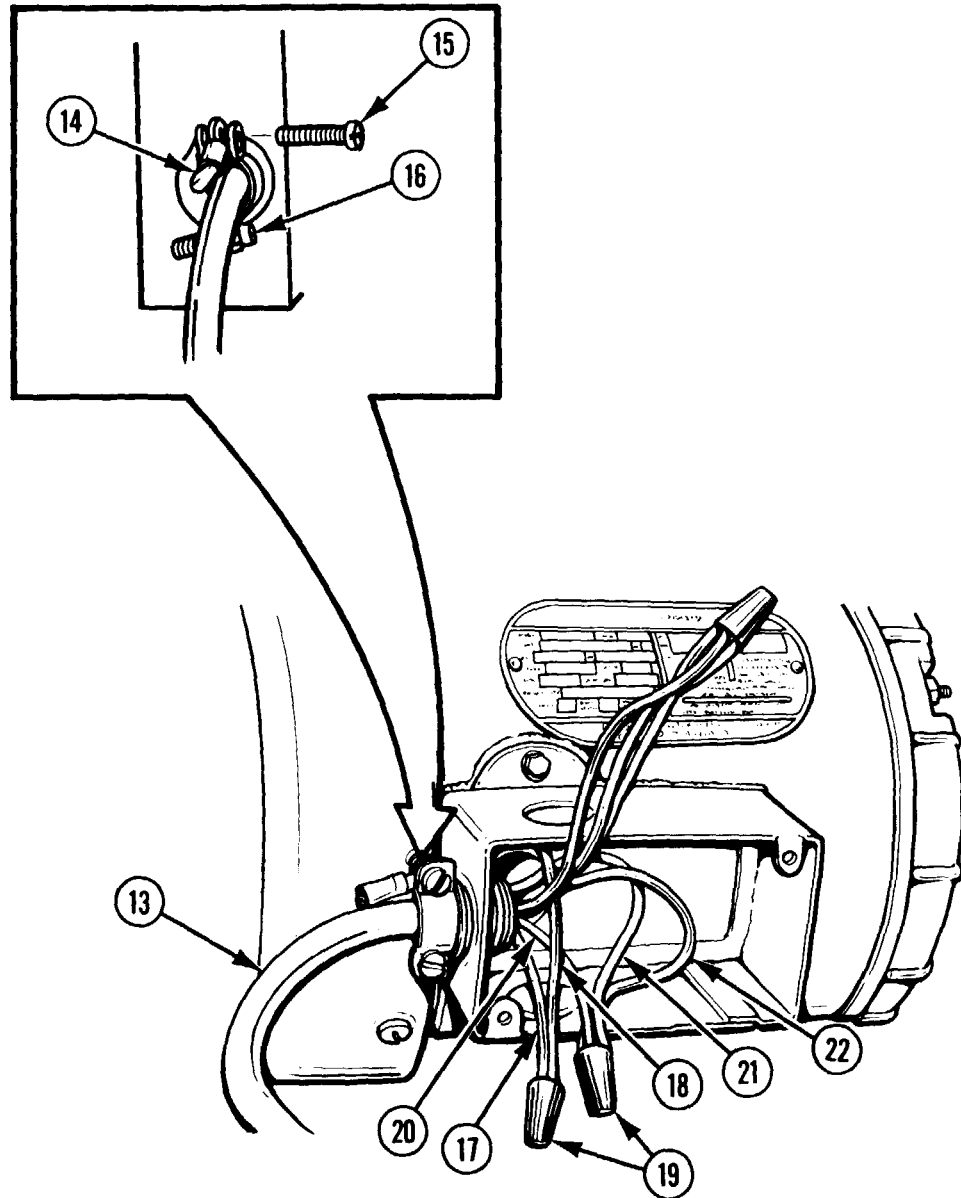
Refer to wiring diagram, p 6-146, before connecting wires.

9 WHITE WIRE (17).

- a. Connect to motor wire (18).
- b. install wire nut (19).

10 BLACK WIRE (20).

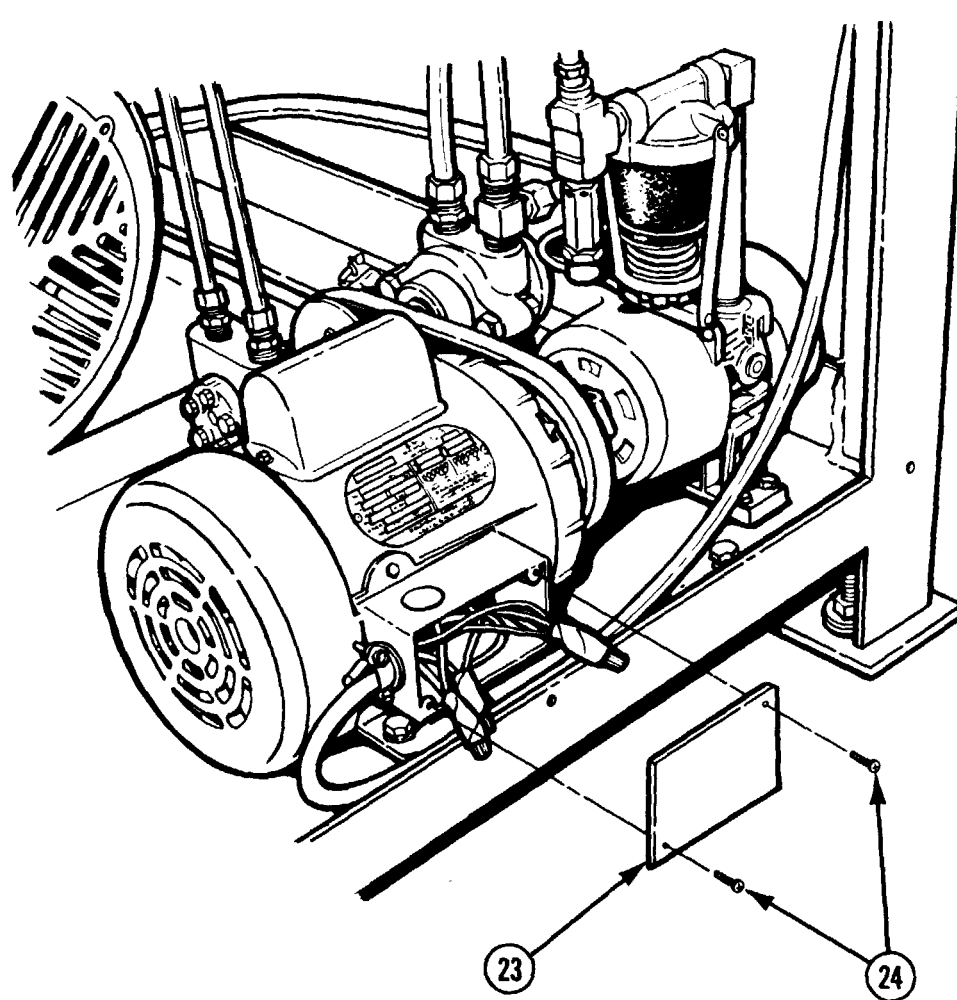
- a. Connect to two motor wires (21 and 22).
- b. Install wire nut (19).



## 6-36. AUXILIARY MOTOR AND PUMP ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

## INSTALLATION (cont)

- 11 COVER (23). Install and secure with two screws (24).

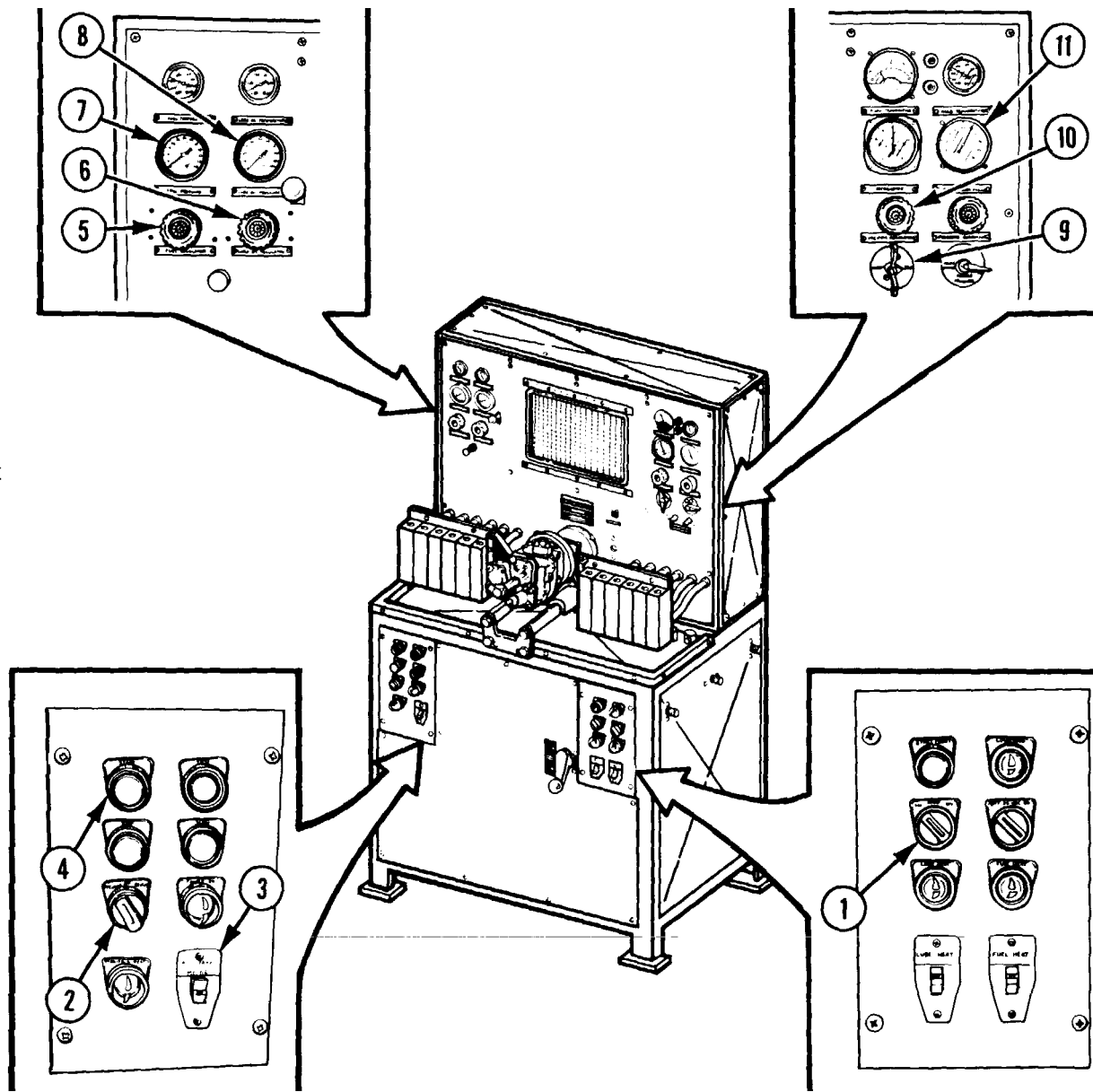


TEST

**NOTE**

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual. Use any fuel injector pump which requires a vacuum hookup.

- 1 TESTER. Hook up a fuel injector pump.
- 2 MAIN POWER SOURCE. Turn on.
- 3 500-1000-OFF COUNT SWITCH (1). Set at 500.
- 4 FORWARD-OFF-REVERSE SWITCH (2). Set at FORWARD.
- 5 AUXILIARY MOTOR SWITCH (3). Turn on.
- 6 START BUTTON (4). Press in.
- 7 FUEL REGULATOR (5) AND LUBE OIL REGULATOR (6). Adjust flow of fuel and lube oil.
- 8 FUEL PRESSURE GAGE (7) AND LUBE OIL PRESSURE GAGE (8). Check for indication.
- 9 VACUUM-PRESS. SELECTOR VALVE (9). Turn to VACUUM.
- 10 VACUUM REGULATOR (10). Adjust.
- 11 MANIFOLD VACUUM PRESSURE GAGE (11). Check for indication.



**6-37. MOISTURE AND OIL TRAP - MAINTENANCE INSTRUCTION:**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Repair
- d. Reassembly
- e. Installation

**INITIAL SETUP**

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

References

TM 9-4910-387-24P

Equipment Conditions

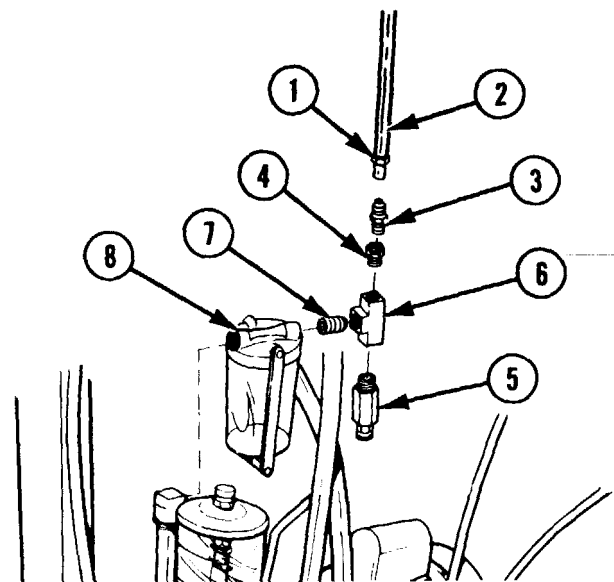
Main power source to tester is turned off

4-33 Lower back panel is removed

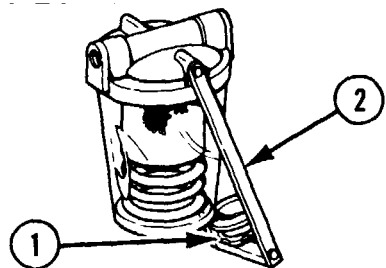
4-40 RH panel assembly is removed

**REMOVAL**

- 1 NUT (1) AND COPPER TUBING (2). Disconnect.
- 2 MALE CONNECTOR (3), BUSHING (4), RELIEF VALVE (5), STREET TEE (6), AND CLOSE NIPPLE (7). Remove.
- 3 MOISTURE AND OIL TRAP (8). Remove.



**DISASSEMBLY**



1 THUMBSCREW (1). Loosen.

**NOTE**

Hold jar when swinging bail to one side or jar will drop.

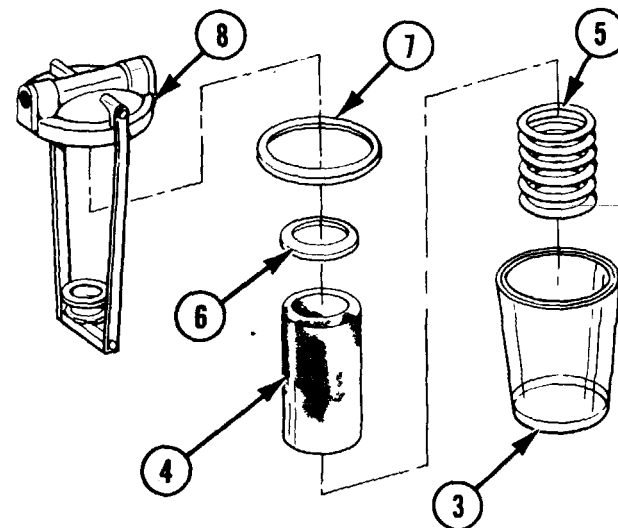
2 BAIL (2). Swing out of the way.

**REPAIR**

**NOTE**

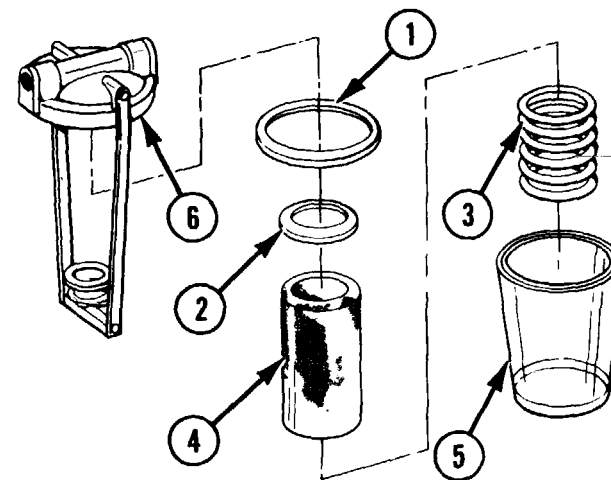
Repair is by replacement of authorized parts (TM 94910-387-24P) as required.

3 JAR (3), ELEMENT GASKET (4), SPRING (5), ELEMENT GASKET (6), AND JAR GASKET (7). Remove from cover and bail assembly (8).



**REASSEMBLY**

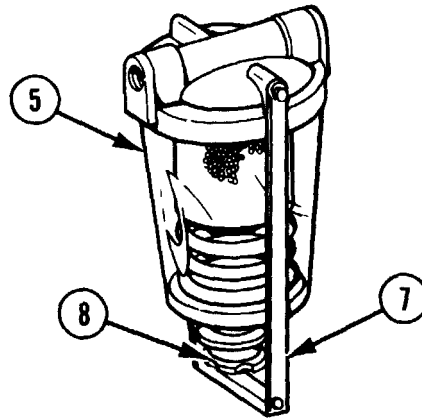
1 JAR GASKET (1), ELEMENT GASKET (2), SPRING (3), ELEMENT (4), AND JAR (5). Install in cover and bail assembly (6).



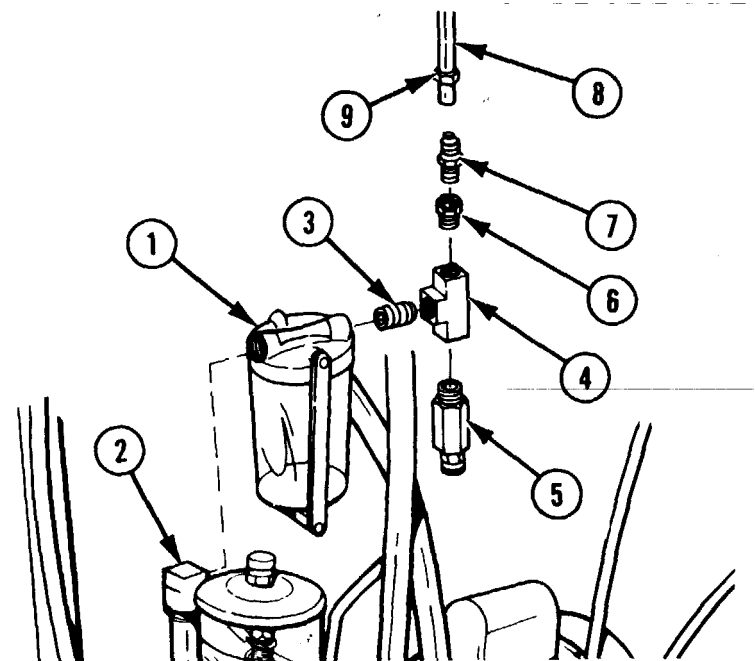
6-37. MOISTURE AND OIL TRAP-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY (cont )

- 2 BAIL (7). Position to secure jar (5).
- 3 THUMBSCREW (8). Tighten finger tight.



- 1 MOISTURE AND OIL TRAP (1). Install on street elbow (2).
- 2 CLOSE NIPPLE (3), STREET TEE (4), RELIEF VALVE (5), BUSHING (6), AND MALE CONNECTOR (7). Install.
- 3 COPPER TUBING (8) AND NUT (9). Connect.



INSTALLATION

**NOTE**  
Install moisture and oil trap with arrow pointing toward auxiliary motor.

**6-38. LUBE OIL FILTER - MAINTENANCE INSTRUCTION**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Repair
- d. Reassembly
- e. Installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**References**

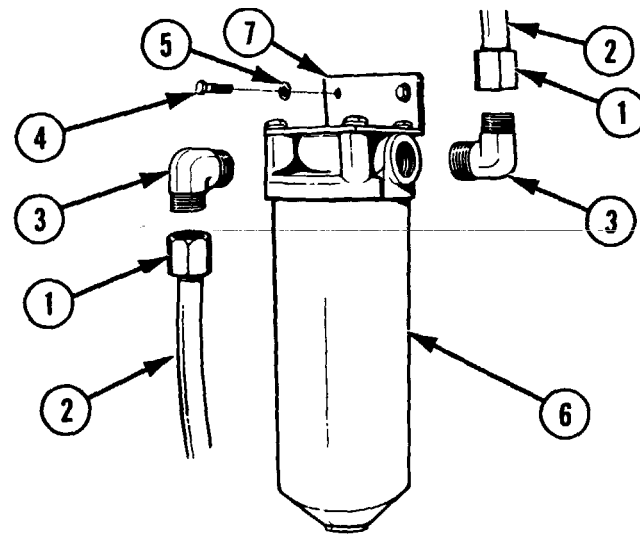
TM 9-4910-387-24P.

**Equipment Conditions**

- Main power source to tester is turned off
- 4-42 LH panel assembly is removed
- 4-76 Lubricating oil is drained from lube oil filter

**REMOVAL**

- 1 TWO NUTS (1) AND TWO COPPER TUBINGS (2). Disconnect.
- 2 TWO MALE ELBOWS (3). Remove.
- 3 TWO SCREWS (4) AND TWO LOCKWASHERS (5). Remove.
- 4 LUBE OIL FILTER (6) AND BRACKET (7). Remove.

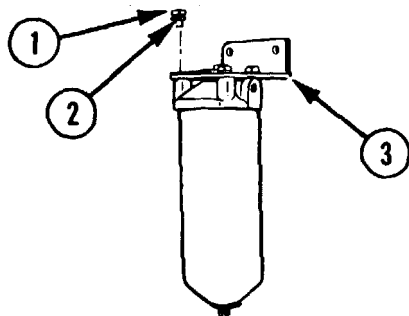


(SOME PARTS HAVE BEEN REMOVED FOR CLARITY.)



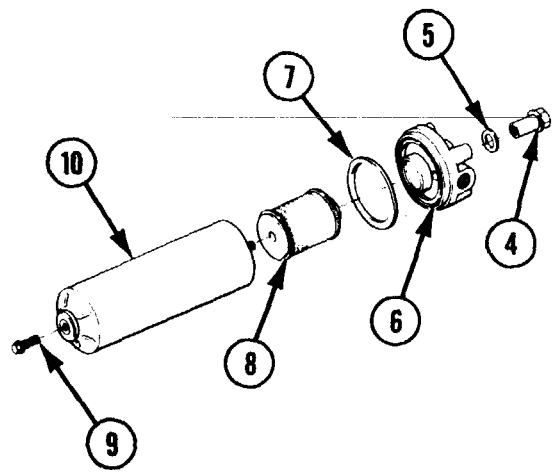
6-38. LUBE OIL FILTER-MAINTENANCE INSTRUCTIONS (cont)

DISASSEMBLY



- 1 FOUR SCREWS (1) AND FOUR LOCKWASHERS (2). Remove
- 2 BRACKET (3). Remove.

- 3 BOLT ASSEMBLY (4) AND GASKET (5). Remove.
- 4 COVER (6) AND GASKET (7). Remove.
- 5 FILTER ELEMENT (8). Remove.
- 6 PLUG (9). Remove from body assembly (10).



REPAIR

NOTE

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

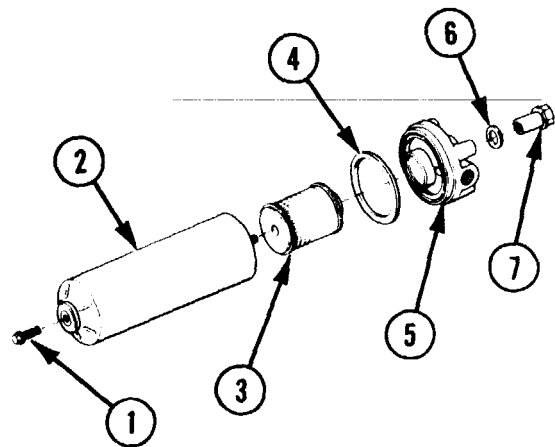
REASSEMBLY

- 1 PLUG (1). Install in body assembly (2).

NOTE

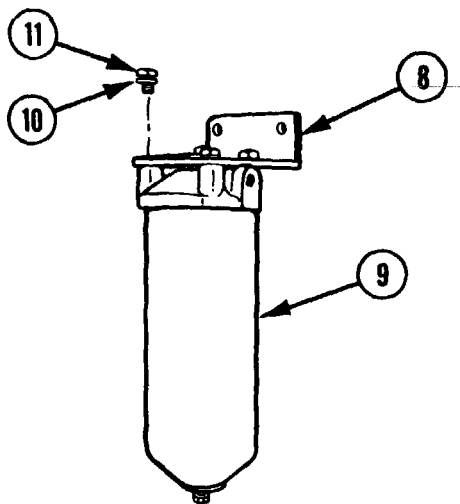
Install filter element with end marked TOP at top of body assembly

- 2 FILTER ELEMENT (3). Install.
- 3 GASKET (4) AND COVER (5). Install.
- 4 GASKET (6) AND BOLT ASSEMBLY (7). Install.



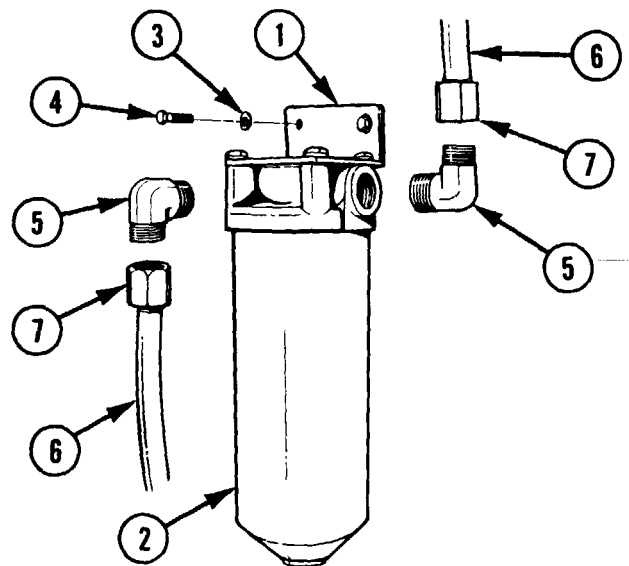
INSTALLATION

5 BRACKET (8). Install on lube oil filter (9) and secure with four lockwashers (10) and four screws (11).



**NOTE**  
Install lube oil filter and bracket with outlet toward rear of tester.

1 BRACKET (1) AND LUBE OIL FILTER (2). Install on tester and secure with two lockwashers (3) and two screws (4).  
2 TWO MALE ELBOWS (5). Install.  
3 TWO COPPER TUBINGS (6) AND TWO NUTS (7). Install.



**6-39. PRIMARY FUEL FILTER - MAINTENANCE INSTRUCTION****THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Repair
- d. Reassembly
- e. Installation

**INITIAL SETUP**

## Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

## References

TM 9-4910-387-24P

## Equipment Conditions

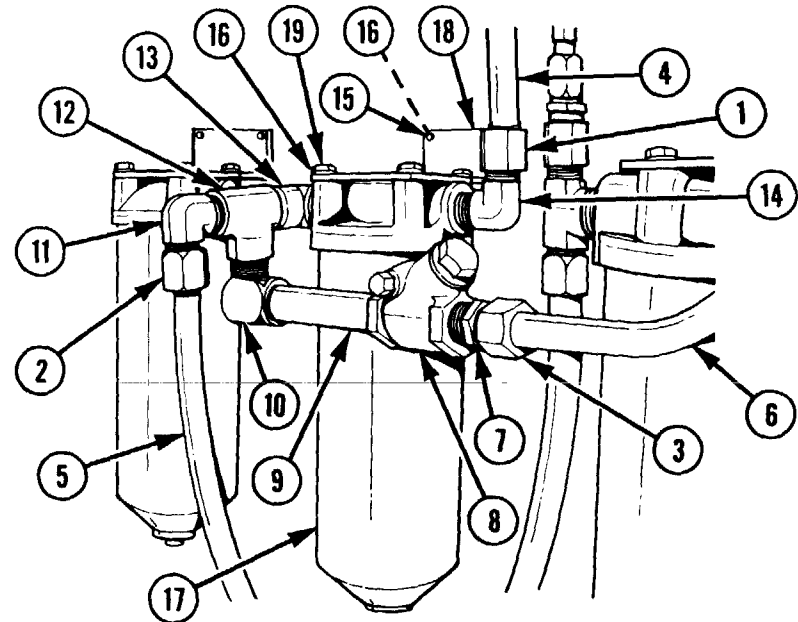
Main power source to tester is turned off

4-42 LH panel assembly is removed

4-80 Fuel is drained from primary fuel filter

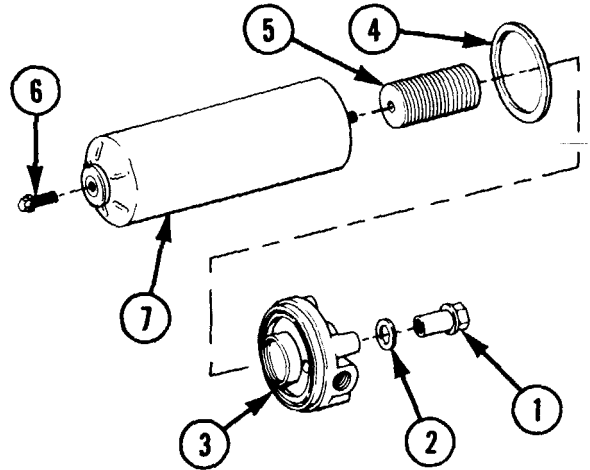
**REMOVAL**

- 1 THREE NUTS (1, 2, AND 3). Loosen and disconnect three copper tubings (4, 5, and 6).
- 2 MALE CONNECTOR (7), SWING CHECK VALVE (8), NIPPLE (9), 90 DEGREE STREET ELBOW (10), MALE ELBOW (11), STREET TEE (12), 90 DEGREE STREET ELBOW (13), AND MALE ELBOW (14). Remove.
- 3 TWO SCREWS (15) AND TWO LOCKWASHERS (16). Remove.
- 4 PRIMARY FUEL FILTER (17) AND FILTER BRACKET (18). Remove.
- 5 FOUR SCREWS (19) AND FOUR LOCKWASHERS (16). Remove.
- 6 FILTER BRACKET (18). Remove from primary fuel filter (17).



**DISASSEMBLY**

- 1 BOLT ASSEMBLY (1) AND FLAT WASHER (2). Remove.
- 2 HEAD (3) AND GASKET (4). Remove.
- 3 FLUID FILTER ELEMENT (5). Remove.
- 4 PLUG (6). Remove from body assembly (7).

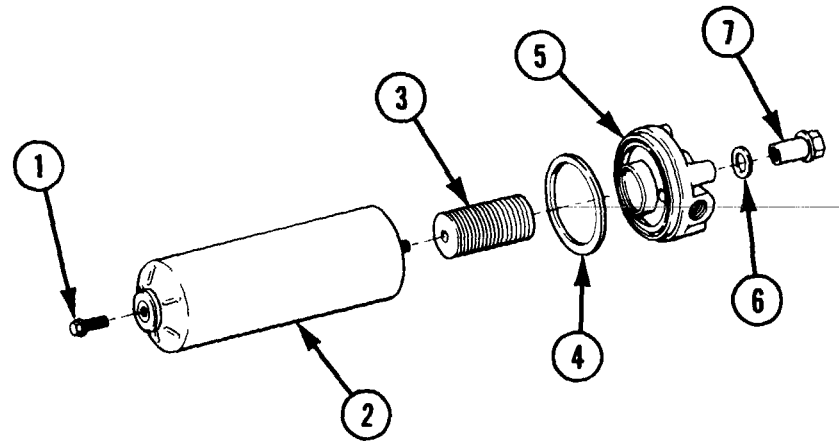


**REPAIR**

**NOTE**  
Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

**REASSEMBLY**

- 1 PLUG (1). Install in body assembly (2).
- 2 FLUID FILTER ELEMENT (3). Install.
- 3 GASKET (4) AND HEAD (5). Install.
- 4 FLAT WASHER (6) AND BOLT ASSEMBLY (7). Install.



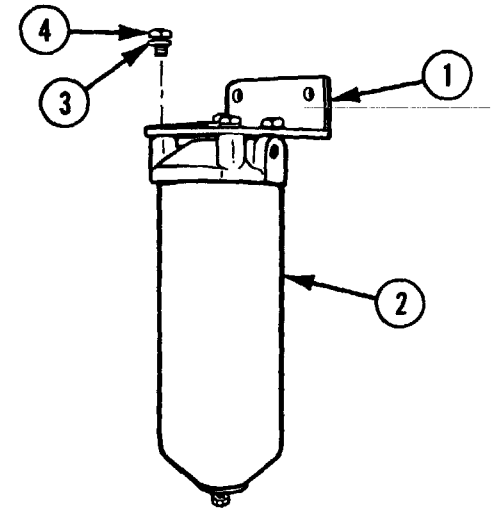
6-39. PRIMARY FUEL FILTER-MAINTENANCE INSTRUCTIONS (cont)

INSTALLATION

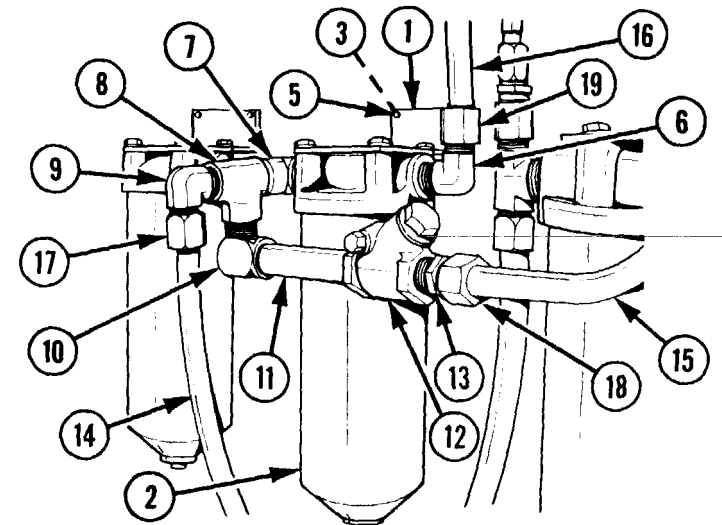
NOTE

Install primary fuel filter and filter bracket with outlet toward rear of tester.

- 1 FILTER BRACKET (1). Install on primary fuel filter (2) and secure with four lockwashers (3) and four screws (4).



- 2 FILTER BRACKET (1) AND PRIMARY FUEL FILTER (2). Install on tester and secure with two lockwashers (3) and two screws (5).
- 3 MALE ELBOW (6), 90 DEGREE STREET ELBOW (7), STREET TEE (8), MALE ELBOW (9), 90 DEGREE STREET ELBOW (10), NIPPLE (11), SWING CHECK VALVE (12), AND MALE CONNECTOR (13). Install.
- 4 THREE COPPER TUBINGS (14, 15, AND 16). Install and tighten three nuts (17, 18, and 19).



**6-40. SECONDARY FUEL FILTER - MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal
- b. Disassembly
- c. Repair
- d. Reassembly
- e. Installation

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**References**

TM 9-4910-387-24P

**Equipment Conditions**

Main power source to tester is turned off

4-42 LH panel assembly is removed

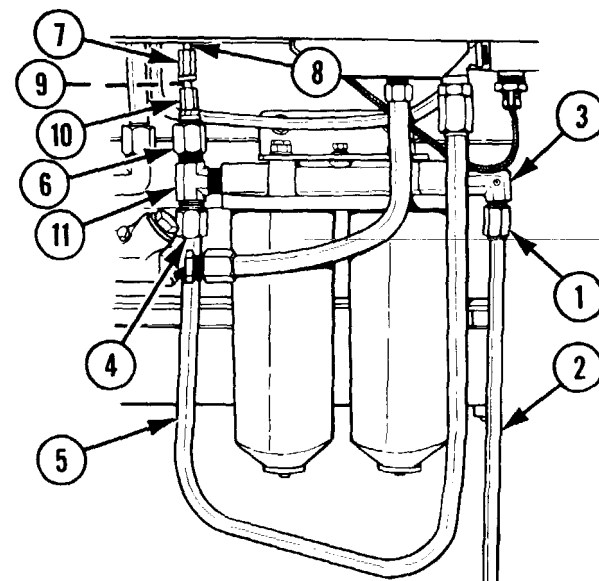
4-83 Fuel is drained from secondary fuel filter

**REMOVAL**

**NOTE**

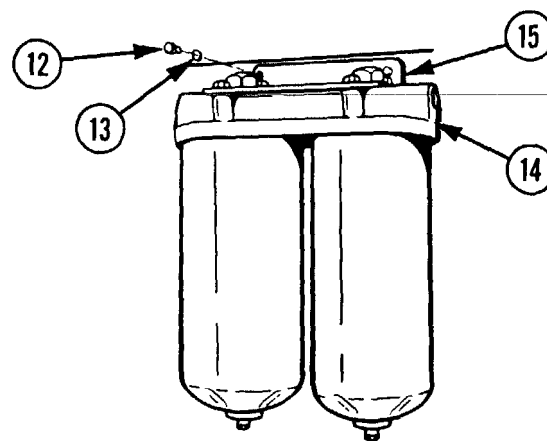
Some testers have dual secondary fuel filters while other testers have only one. Disregarding quantity differences the maintenance instructions are the same for both except where noted. The following procedures are for testers with dual secondary fuel filters

- 1 NUT (1) AND COPPER TUBING (2). Disconnect.
- 2 MALE ELBOW (3). Remove.
- 3 NUT (4) AND COPPER TUBING (5). Disconnect.
- 4 TWO NUTS (6 AND 7). Loosen.
- 5 COPPER TUBING (8), FERRULE (9), AND TUBE REDUCER (10). Remove.
- 6 MALE TEE (11). Remove.

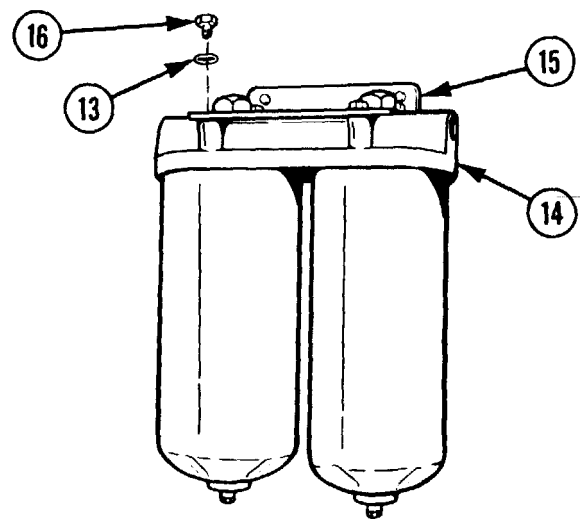


**6-40. SECONDARY FUEL FILTER-MAINTENANCE INSTRUCTIONS (cont)****REMOVAL (cont)**

- 7 TWO SCREWS (12) AND TWO LOCKWASHERS (13). Remove.
- 8 SECONDARY FUEL FILTER (14) AND FILTER BRACKET (15). Remove.



(SOME PARTS HAVE BEEN REMOVED FOR CLARITY.)



- 9 FOUR SCREWS (16) AND FOUR LOCKWASHERS (13). Remove.
- 10 FILTER BRACKET (15). Remove from secondary fuel filter (14).

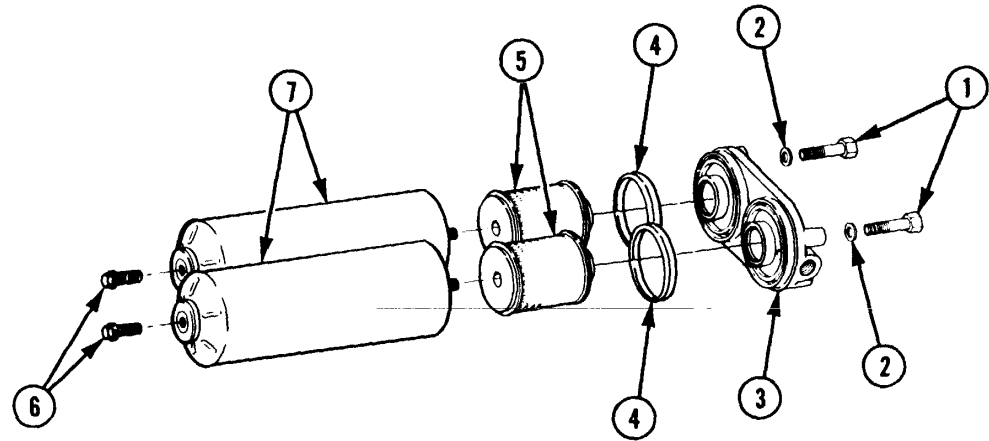
**DISASSEMBLY**

- 1 TWO CAPSCREWS (1) AND TWO GASKETS (2). Remove.
- 2 CAP (3) AND TWO GASKETS (4). Remove.
- 3 TWO FLUID FILTER ELEMENTS (5). Remove.

**NOTE**

For testers with a single secondary fuel filter, omit step 4 as there is not a plug to remove.

- 4 TWO PLUGS (6). Remove from two body assemblies (7).





6-40. SECONDARY FUEL FILTER-MAINTENANCE INSTRUCTIONS (cont)

REPAIR

**NOTE**

Repair is by replacement of authorized parts (TM 9-4910-387-24P) as required.

REASSEMBLY

**NOTE**

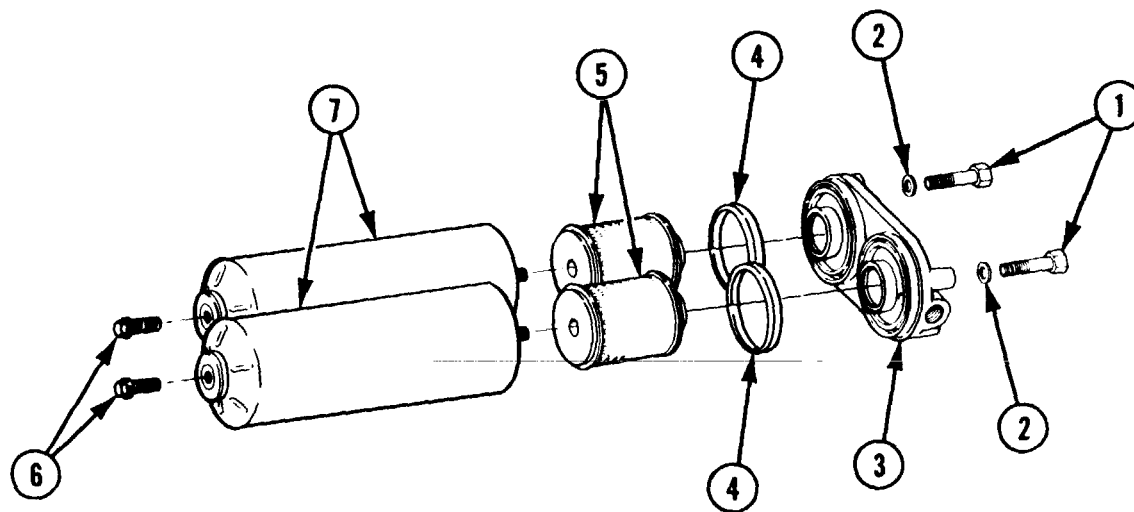
For testers with a single secondary fuel filter, omit step 1.

- 1 TWO PLUGS (1). Install in two body assemblies (2).

**NOTE**

Install fluid filter elements with ends marked TOP at top of body assemblies.

- 2 TWO FLUID FILTER ELEMENTS (3). Install.
- 3 TWO GASKETS (4) AND CAP (5). Install.
- 4 TWO GASKETS (6) AND TWO CAPSCREWS (7). Install.

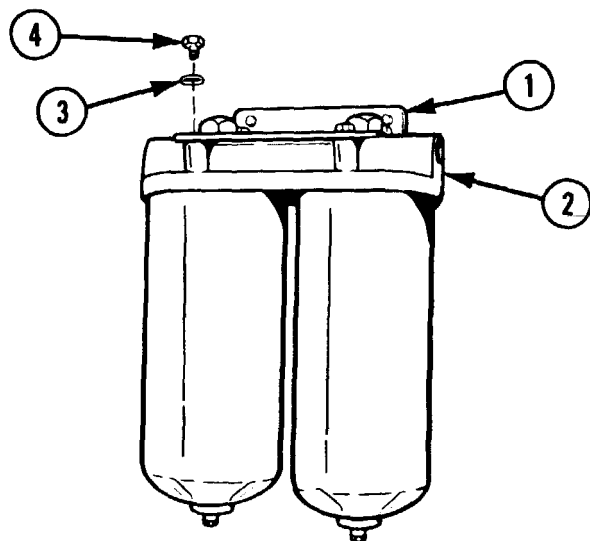


**INSTALLATION**

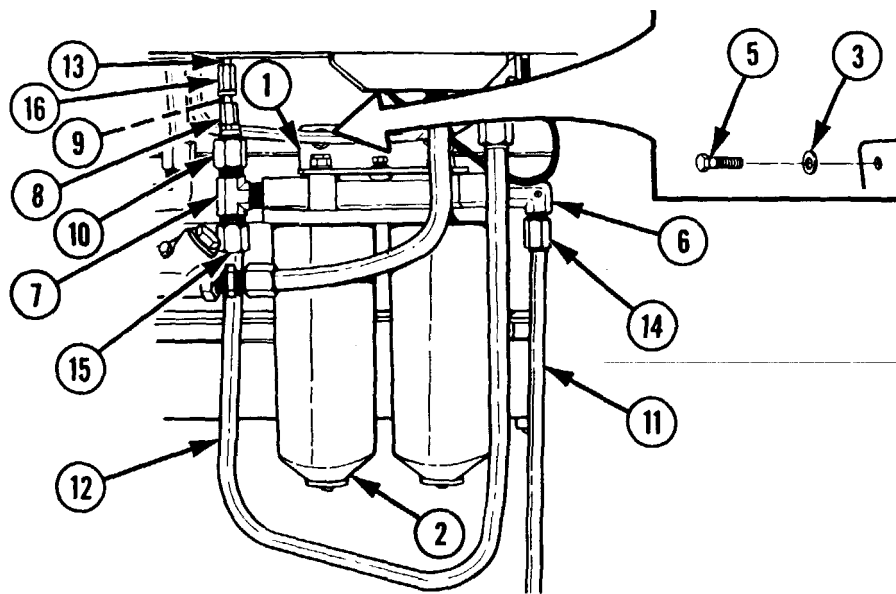
**NOTE**

Install secondary fuel filter with outlet toward rear of tester.

- 1 FILTER BRACKET (1). Install on secondary fuel filter (2) and secure with four lockwashers (3) and four screws (4).



- 2 FILTER BRACKET (1) AND SECONDARY FUEL FILTER (2). Install on tester and secure with two lockwashers (3) and two screws (5).
- 3 MALE ELBOW (6). Install.
- 4 MALE TEE (7). Install.
- 5 TUBE REDUCER (8) AND FERRULE (9). Install and secure with nut (10).
- 6 THREE COPPER TUBINGS (11, 12, AND 13). Install.
- 7 THREE NUTS (14, 15, AND 16). Tighten.



**6-41. PIPING ASSEMBLY - MAINTENANCE INSTRUCTIONS**

**a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation
- e. Test

**INITIAL SETUP**

Tools and Special Tools  
 General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts  
 Cleaning compound (item 3, app C)  
 Rag (item 14, app C)

References  
 2-26 Hookup of fuel injector pump  
 TM 9-4910-387-24P

Troubleshooting References  
 6-93 MANF. PRESS. - CAPSULE PRESSURE selector  
 valve does not function

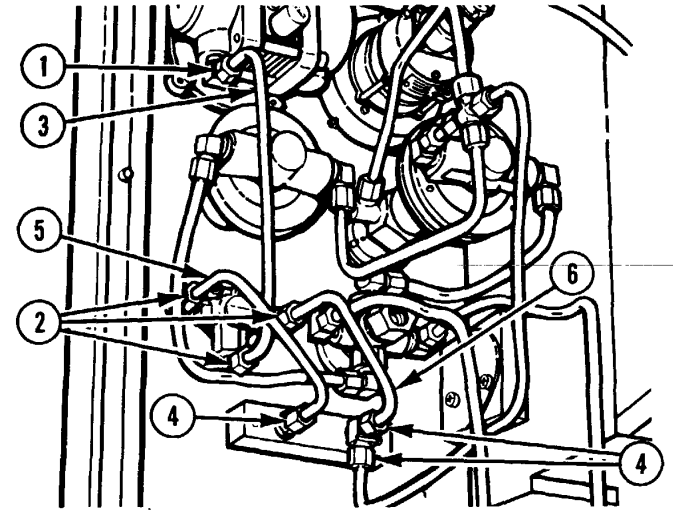
6-89 PRESSURE REGULATOR does not function  
 6-91 VACUUM - PRESS. selector valve does not  
 function  
 6-85 VACUUM REGULATOR does not function

**Equipment Conditions**

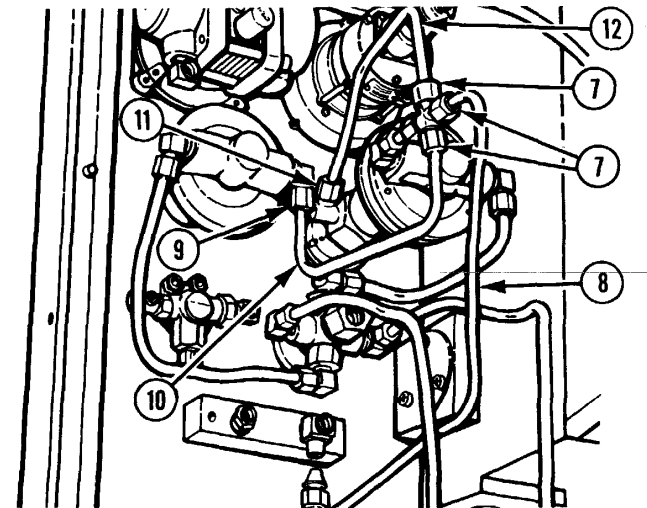
Main power source to tester is turned off  
 4-33 RH upper side panel is removed  
 4-40 RH panel assembly is removed  
 4-32 Upper back panel is removed  
 4-33 Lower back panel is removed  
 4-34 LH upper side panel is removed  
 4-42 LH panel assembly is removed

**REMOVAL/DISASSEMBLY**

- 1 NUT (1). Loosen.
- 2 THREE NUTS (2). Loosen.
- 3 COPPER TUBING (3). Remove.
- 4 THREE NUTS (4). Loosen.
- 5 TWO COPPER TUBINGS (5 AND 6). Remove.



- 6 THREE NUTS (7). Loosen.
- 7 COPPER TUBING (8). Remove.
- 8 NUT (9). Loosen.
- 9 COPPER TUBING (10). Remove.
- 10 NUT (11). Loosen.
- 11 COPPER TUBING (12). Remove.



6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)

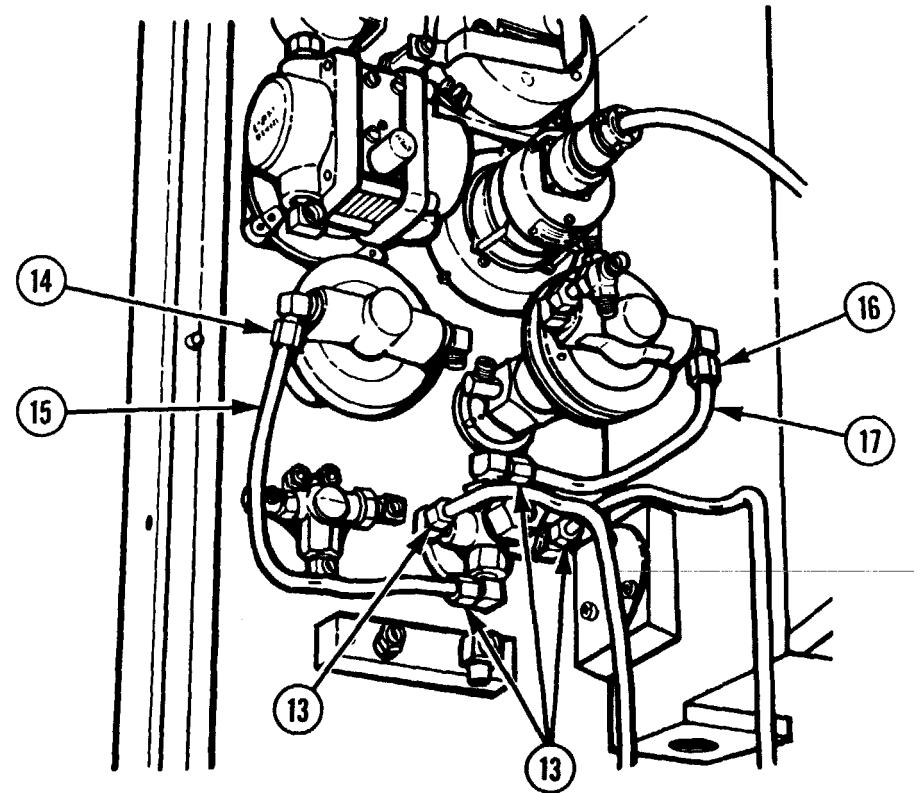
12 FOUR NUTS (13). Loosen.

13 NUT (14). Loosen.

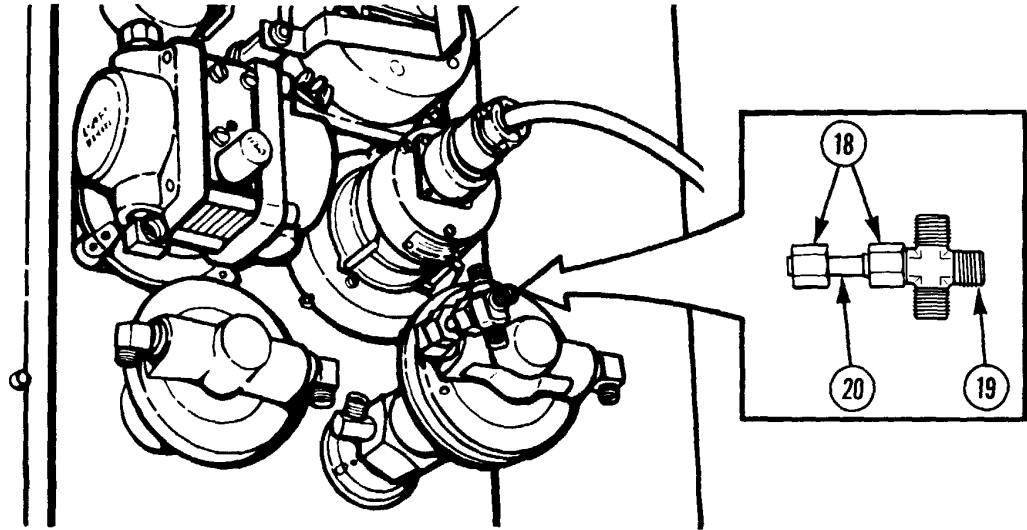
14 COPPER TUBING (15). Remove.

15 NUT (16). Loosen.

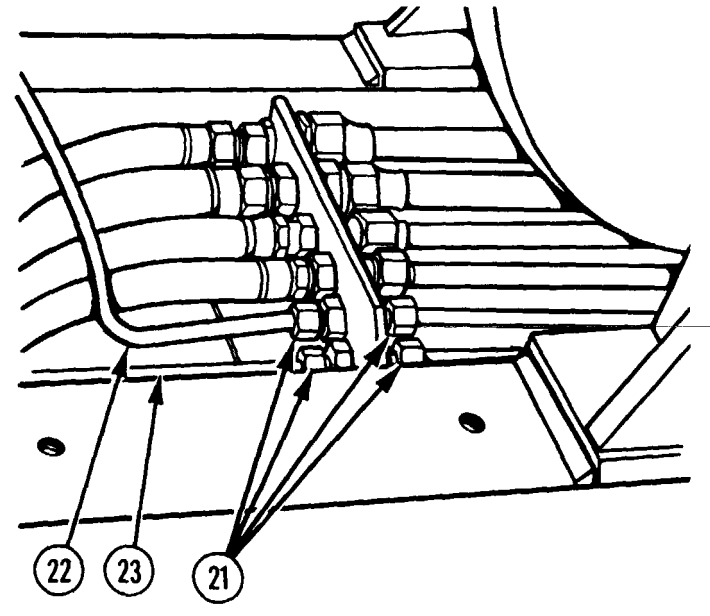
16 COPPER TUBING (17). Remove.



- 17 TWO NUTS (18). Loosen.
- 18 CROSS UNION (19) AND COPPER TUBING (20). Remove.



- 19 FOUR NUTS (21). Loosen.
- 20 TWO COPPER TUBINGS (22 AND 23). Remove.



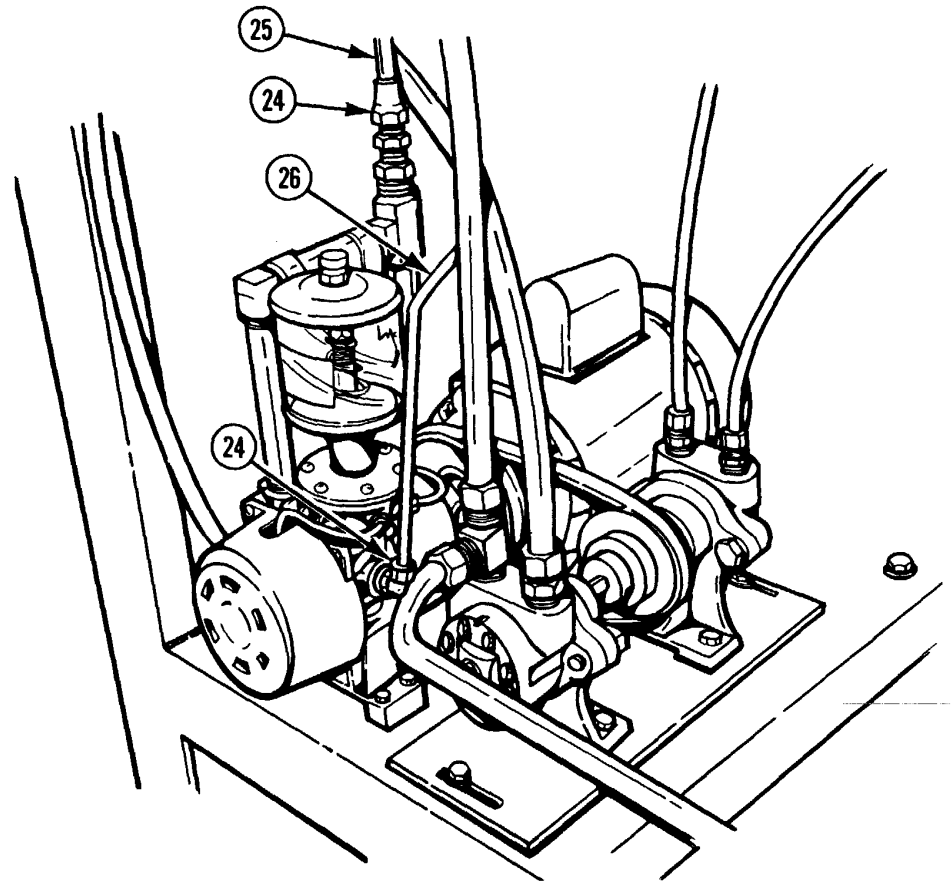
6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)

21 TWO NUTS (24). Loosen.

22 TWO COPPER TUBINGS (25 AND 26).  
Remove.



**CAUTION**

Do not remove clinch sleeves from copper tubings unless necessary for replacement, as clinch sleeves or tubings may be damaged during removal.

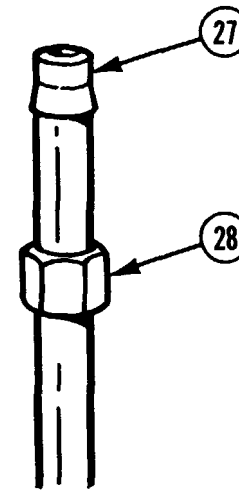
**NOTE**

Nuts cannot be removed from copper tubings without first removing clinch sleeves. Nuts are not part of the copper tubings, but are part of components to which the tubings are connected.

Each copper tubing, when removed, has one clinch sleeve and one nut located at each end. Repeat the following procedures as required for each tubing

23 CLINCH SLEEVE (27). Remove from copper tubing by cutting.

24 NUT (28). Remove.





**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**INSPECTION/SERVICING**

**REPAIR**

**VACUUM SYSTEM.**

- a. Check for cracked, broken, or missing parts.
- b. Check for damaged threads.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- d. Clean clogged parts by blowing out with air.

- 1 COPPER TUBINGS. Repair by fabrication (fig. 4, app D).
- 2 CROSS UNION. Repair by replacement (TM 9-4910-387-24P).
- 3 CLINCH SLEEVES. Repair by replacement (item 15, app C).

**REASSEMBLY/INSTALLATION**

**CAUTION**

Be sure to align nuts carefully when installing as improper alignment will damage the ferrules and the copper tubing.

**NOTE**

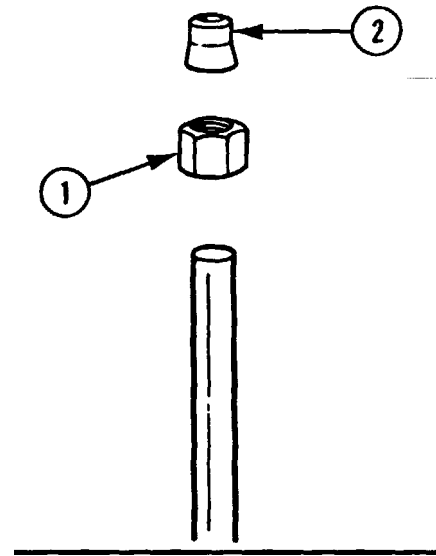
Clinch sleeves must be replaced with new items if previously removed.

Nuts are not part of the copper tubings, but are part of the components to which the tubings are connected.

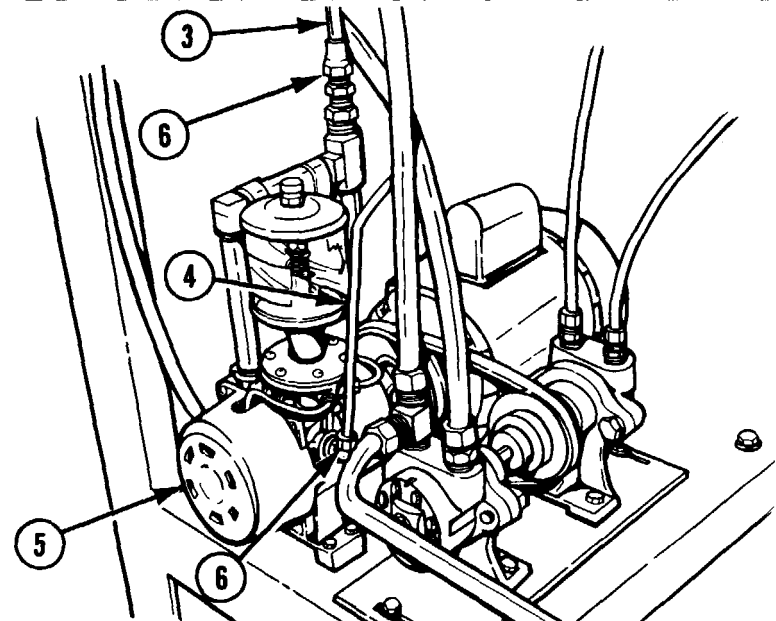
Each copper tubing has one clinch sleeve and one nut located at each end. Repeat steps 1 and 2 as required for each tubing.

1 NUT (1). Install on copper tubing.

2 CLINCH SLEEVE (2). Install.



3 TWO COPPER TUBINGS (3 AND 4). Install on vacuum pump (5) and secure with two nuts (6).

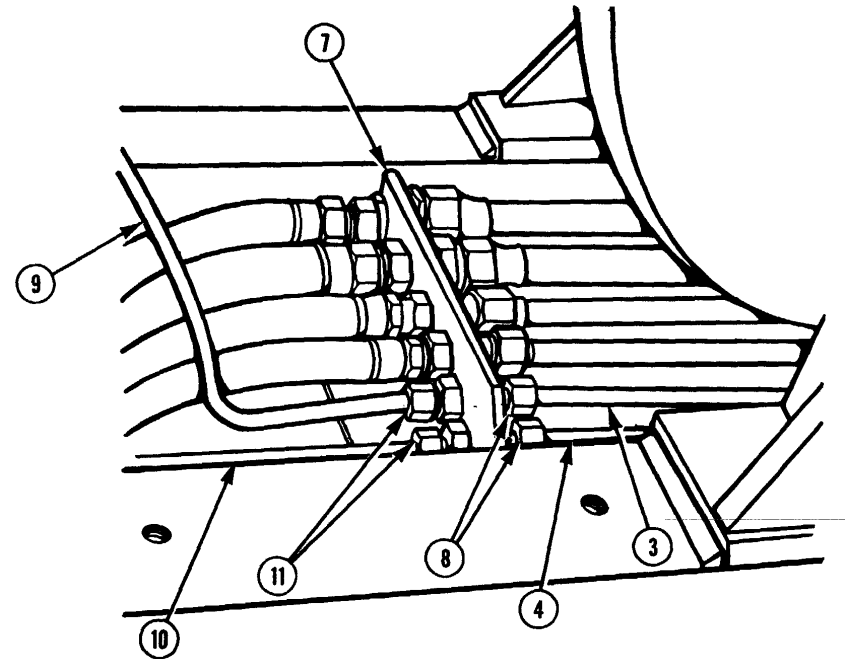


**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

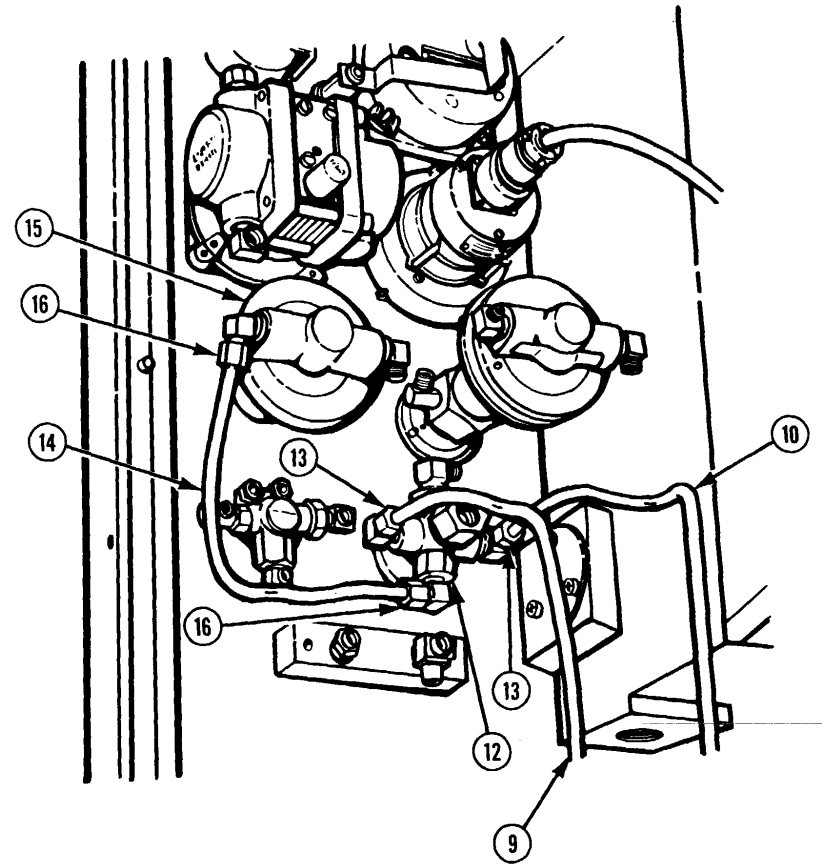
**a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY/INSTALLATION (cont)**

- 4 TWO COPPER TUBINGS (3 AND 4). Install on fitting bracket assembly (7) and secure with two nuts (8).
- 5 TWO COPPER TUBINGS (9 AND 10). Install on fitting bracket assembly (7) and secure with two nuts (11).



- 6 TWO COPPER TUBINGS (9 AND 10). Install on VACUUM PRESS. selector valve (12) and secure with two nuts (13).
- 7 COPPER TUBING (14). Install on VACUUM PRESS. selector valve (12) and PRESSURE REGULATOR assembly (15) and secure with two nuts (16).

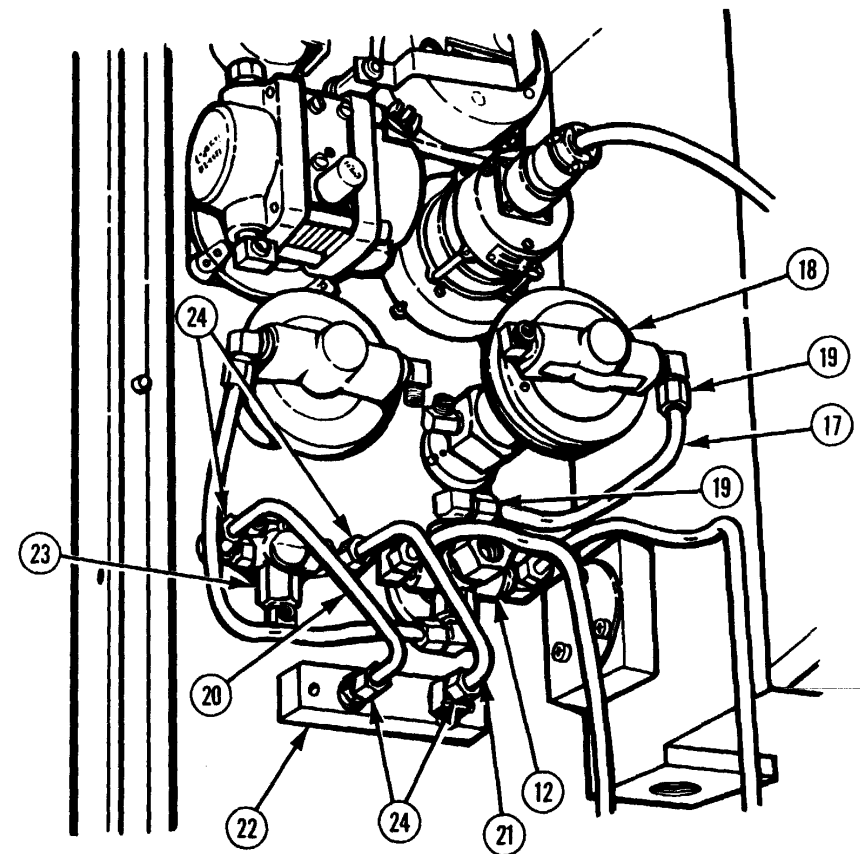


**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

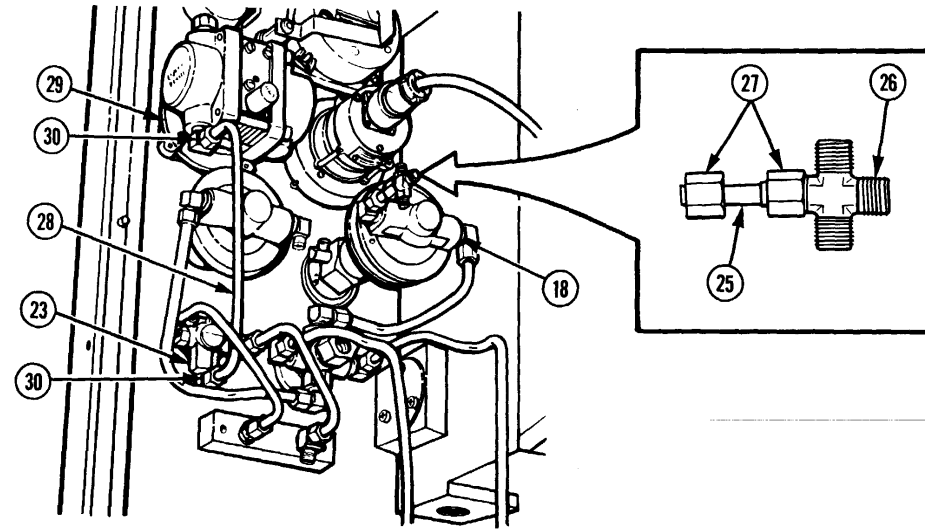
**a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY/INSTALLATION (cont)**

- 8 COPPER TUBING (17). Install on VACUUM PRESS. selector valve (12) and VACUUM REGULATOR assembly (18) and secure with two nuts (19).
- 9 TWO COPPER TUBINGS (20 AND 21). Install on MANIFOLD INLET SUPERCHARGER INLET (22) and MANF. PRESS. CAPSULE PRESSURE selector valve (23) and secure with four nuts (24).



- 10 COPPER TUBING (25) AND CROSS UNION (26). Install on VACUUM REGULATOR assembly (18) and secure with two nuts (27).
- 11 COPPER TUBING (28). Install on MANIFOLD VACUUM PRESSURE assembly (29) and MANF. PRESS. CAPSULE PRESSURE selector valve (23) and secure with two nuts (30).



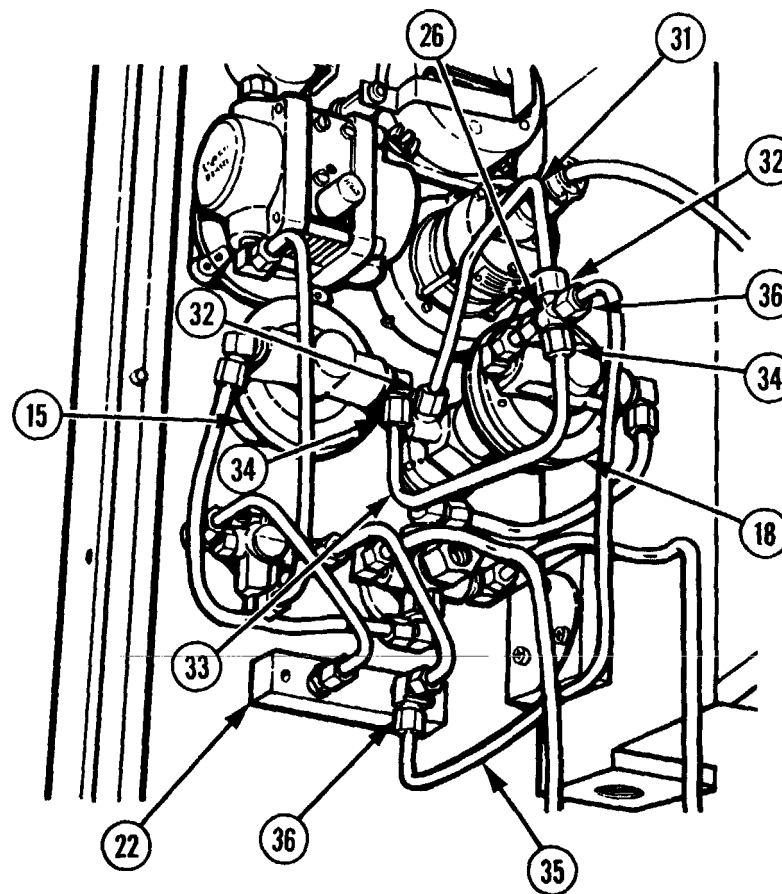
6-571

**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY/INSTALLATION (cont)**

- 12 COPPER TUBING (31). Install on cross union (26) and VACUUM REGULATOR assembly (18) and secure with two nuts (32).
- 13 COPPER TUBING (33). Install on cross union (26) and PRESSURE REGULATOR assembly (15) and secure with two nuts (34).
- 14 COPPER TUBING (35). Install on cross union (26) and MANIFOLD INLET SUPERCHARGER INLET (22) and secure with two nuts (36).

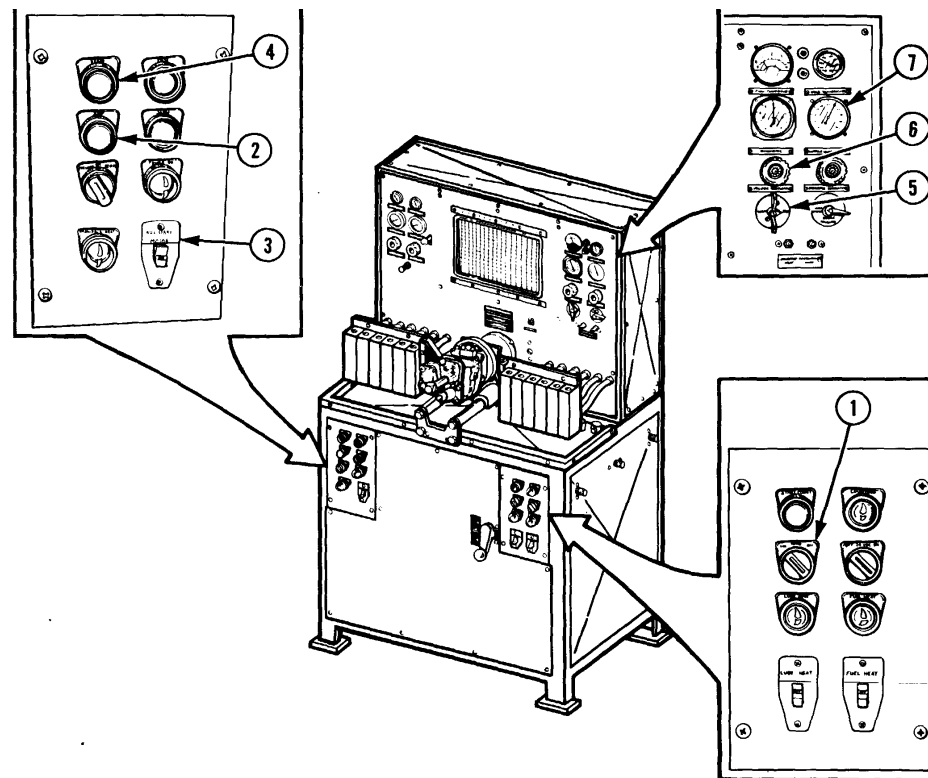


TEST

**NOTE**

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual. Use any fuel injector pump which requires a vacuum hookup.

- 1 TESTER. Hook up a fuel injector pump.
- 2 MAIN POWER SOURCE. Turn on.
- 3 500-1000-OFF COUNT SWITCH (1). Set at 500.
- 4 FORWARD-OFF-REVERSE SWITCH (2). Set at FORWARD.
- 5 AUXILIARY MOTOR SWITCH (3). Turn on.
- 6 START BUTTON (4). Press in.
- 7 VACUUM-PRESS. SELECTOR VALVE (5). Turn to VACUUM.
- 8 VACUUM REGULATOR (6). Adjust.
- 9 MANIFOLD VACUUM PRESSURE GAGE (7). Check for indication.



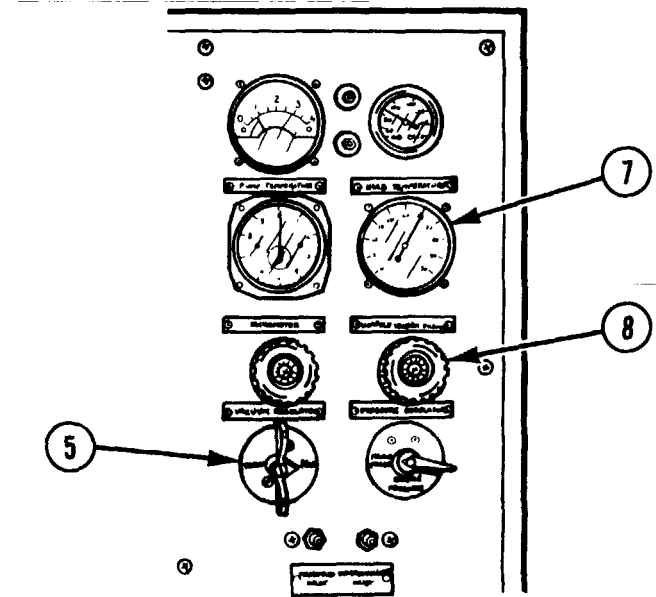


**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**a. VACUUM SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**TEST (cont)**

- 10 VACUUM-PRESS. SELECTOR VALVE (5). Turn to PRESS.
- 11 PRESSURE REGULATOR (8). Adjust.
- 12 MANIFOLD VACUUM PRESSURE GAGE (7). Check for indication.
- 13 VACUUM SYSTEM. Check for leaks.



**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS**

**b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation
- e. Test

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**Materials/Parts**

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

**References**

2-26 Hookup of fuel injector pump  
TM 9-4910-387-24P

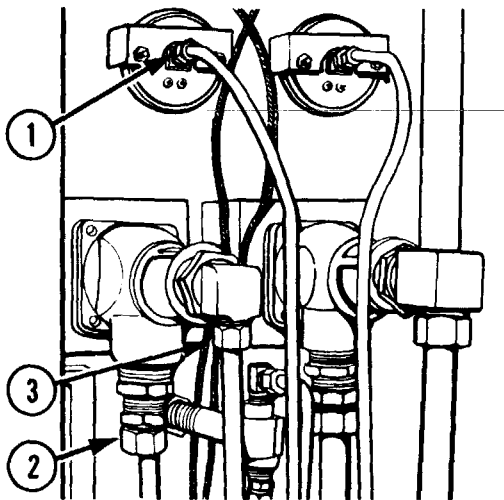
**Troubleshooting References**

6-142 Lube oil does not circulate  
6-77 LUBE OIL TEMPERATURE gage does not indicate

**Equipment Conditions**

Main power source to tester is turned off  
4-33 RH upper side panel is removed  
4-40 RH panel assembly is removed  
4-32 Upper back panel is removed  
433 Lower back panel is removed  
4-34 LH upper side panel is removed  
4-42 LH panel assembly is removed

**REMOVAL/DISASSEMBLY**

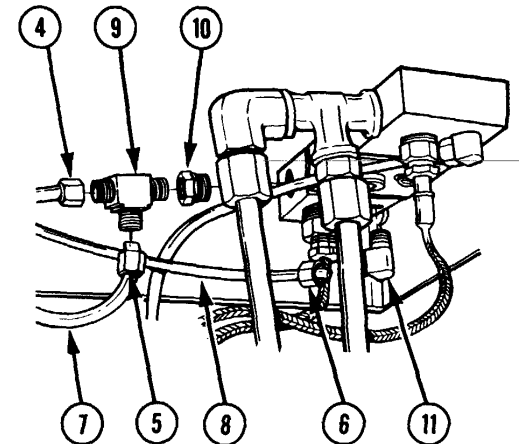


1 THREE NUTS (1, 2, AND 3.) Loosen.

2 THREE NUTS (4, 5, AND 6).  
Loosen.

3 TWO COPPER TUBINGS (7  
AND 8). Remove.

4 MALE RUN TEE (9),  
REDUCER BUSHING (10),  
AND MALE ELBOW

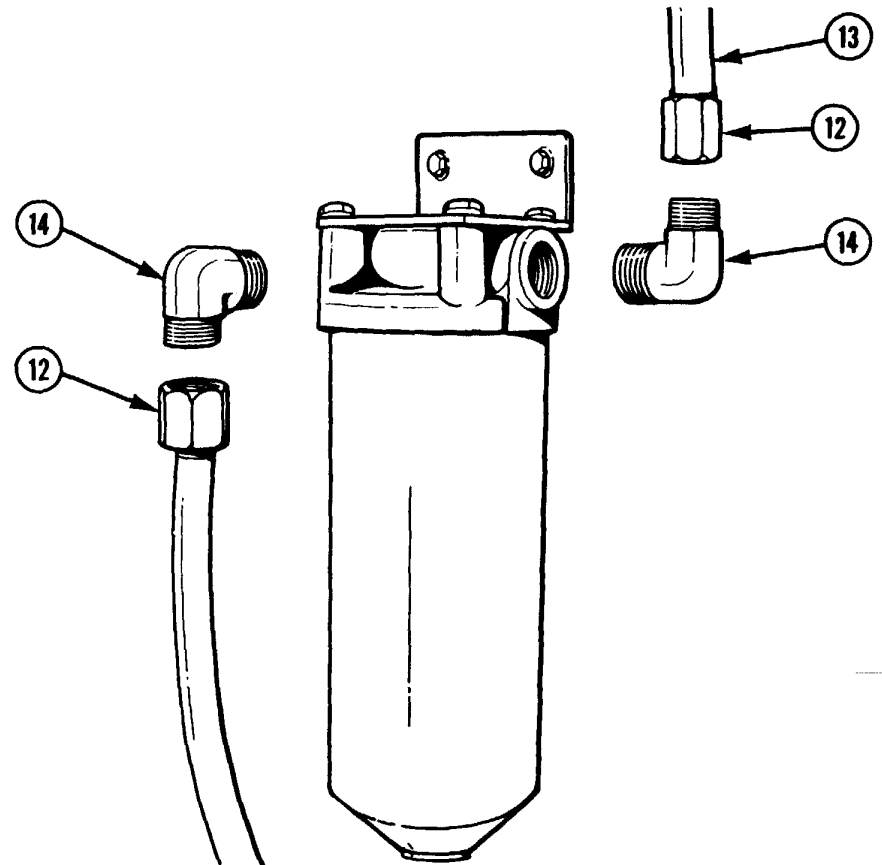


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)

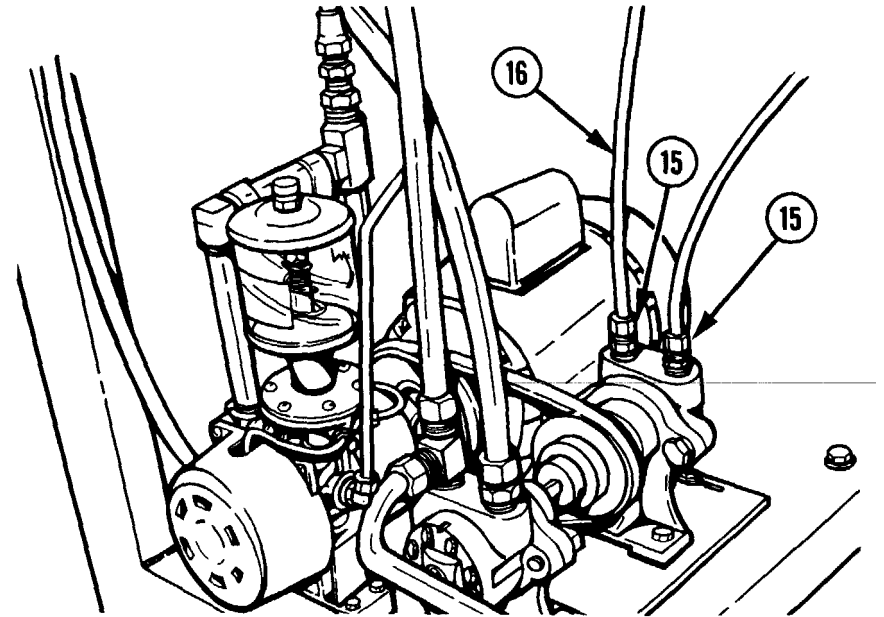
- 5 TWO NUTS (12). Loosen.
- 6 COPPER TUBING (13). Remove.
- 7 TWO MALE ELBOWS (14). Remove.



(SOME PARTS HAVE BEEN REMOVED FOR CLARITY.)

8 TWO NUTS (15). Loosen.

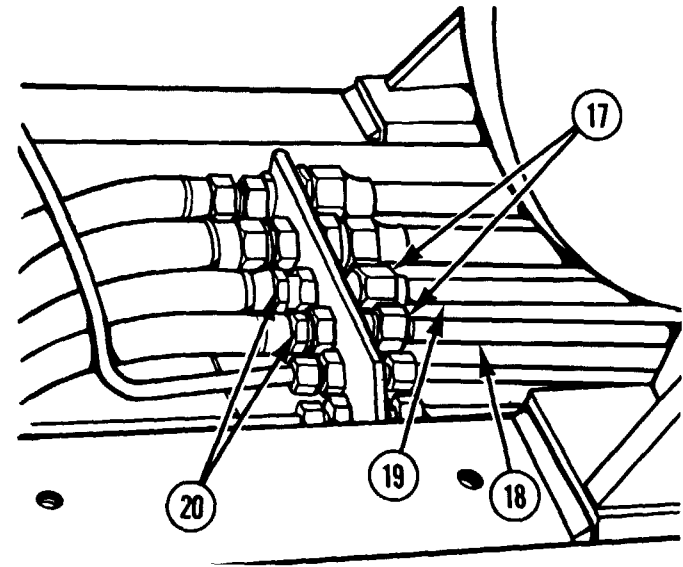
9 COPPER TUBING (16). Remove.



10 TWO NUTS (17). Loosen.

11 TWO COPPER TUBINGS (18 AND 19). Remove.

12 TWO NUTS (20). Loosen.



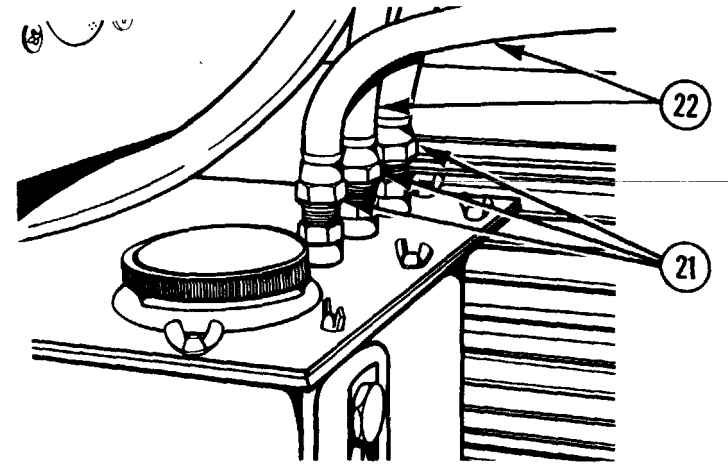
6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)

13 THREE NUTS (21). Loosen.

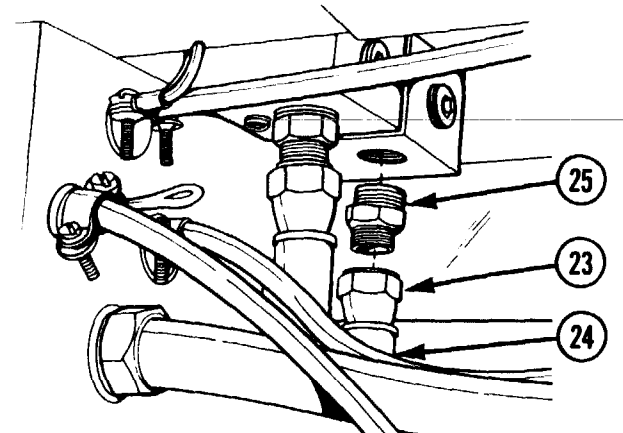
14 TWO HOSE ASSEMBLIES (22). Remove.



15 NUT (23). Loosen.

16 HOSE ASSEMBLY (24). Remove.

17 MALE CONNECTOR (25). Remove.



**CAUTION**

Do not remove clinch sleeves from copper tubings unless necessary for replacement, as clinch sleeves or tubings may be damaged during removal. damaged during removal. required for each tubing.

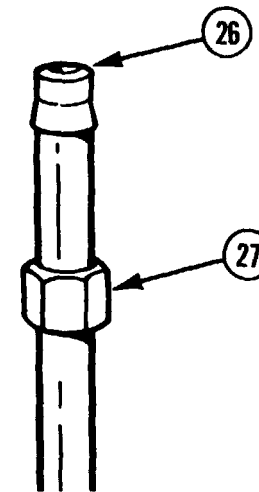
**NOTE**

Nuts cannot be removed from copper tubings without first removing clinch sleeves. Nuts are not part of the copper tubings, but are part of components to which the tubings are connected.

Each copper tubing, when removed, has one clinch sleeve and one nut located at each end. Repeat the following procedures as

18 CLINCH SLEEVE (26). Remove from copper tubing by cutting.

19 NUT (27). Remove.



**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**INSPECTION/SERVICING**

**LUBE OIL SYSTEM**

- a. Check for cracked, broken, or missing parts.
- b. Check for damaged threads.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- d. Clean clogged parts by blowing out with air.

**REASSEMBLY/INSTALLATION**

**CAUTION**

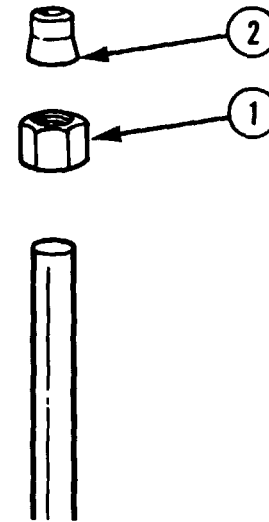
Be sure to align nuts carefully when installing as improper alignment will damage the ferrules and the copper tubing.

**REPAIR**

- 1 COPPER TUBINGS. Repair by fabrication (fig. 4, app D).
- 2 CLINCH SLEEVES. Repair by replacement (items 15 and 16, app C).
- 3 HOSE ASSEMBLIES, MALE CONNECTOR, MALE ELBOWS, REDUCER BUSHING, AND MALE RUN TEE. Repair by replacement (TM 9-4910-387-24P).

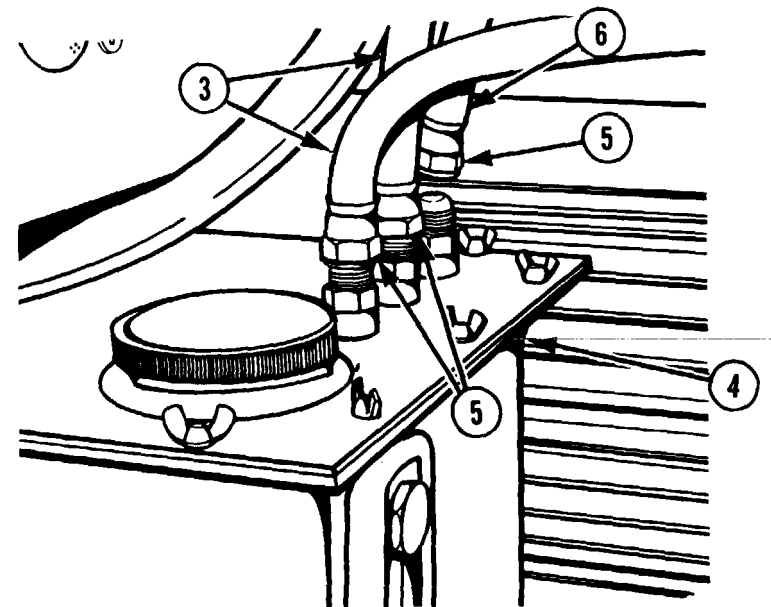
**NOTE**

Clinch sleeves must be replaced with new items if previously removed.  
Nuts are not part of the copper tubings, but are part of the components to which the tubings are connected. Each copper tubing has one clinch sleeve and one nut located at each end. Repeat steps 1 and 2 as required for each tubing.



1 NUT (1). Install on copper tubing.

2 CLINCH SLEEVE (2). Install.



3 TWO HOSE ASSEMBLIES (3). Install on lube oil tank assembly (4) and secure with two nuts (5).

4 HOSE ASSEMBLY (6). Install and secure with nut (5).

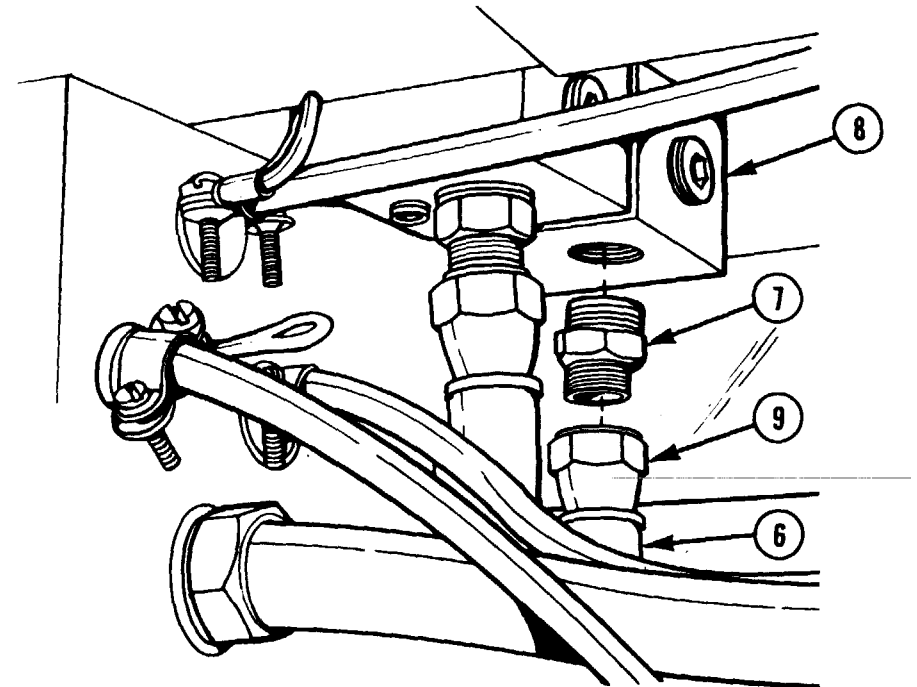


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

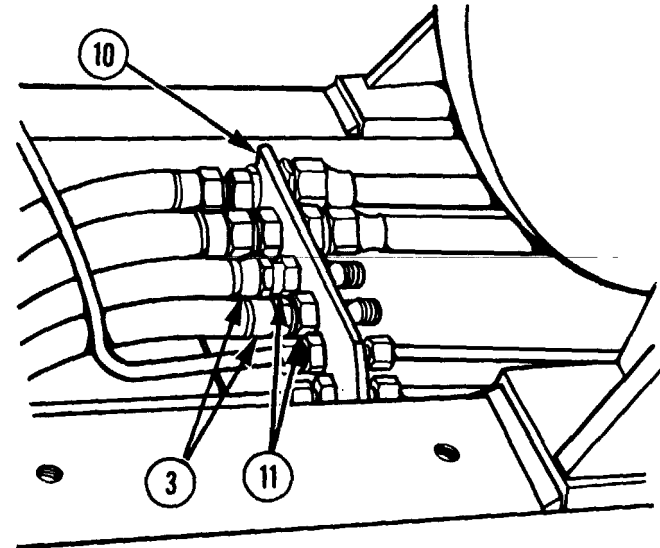
b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

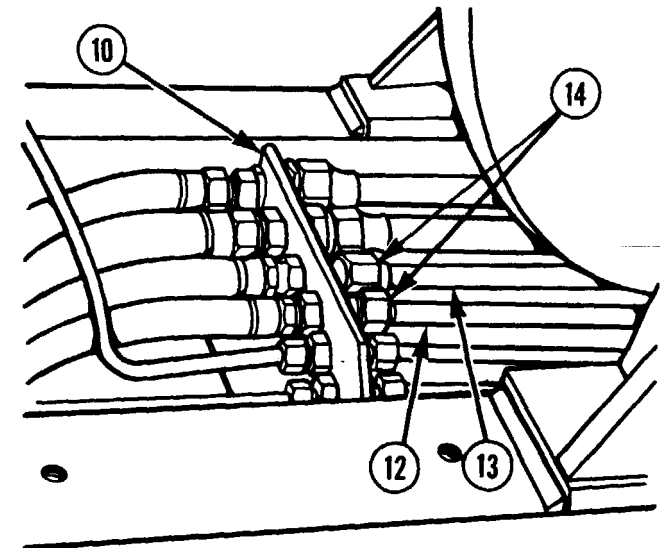
5 MALE CONNECTOR (7) AND HOSE ASSEMBLY (6). Install on lube oil return discharge block (8) and secure with nut (9).



6 TWO HOSE ASSEMBLIES (3). Install on fitting bracket assembly (10) and secure with two nuts (11).



7 TWO COPPER TUBINGS (12 AND 13). Install on fitting bracket assembly (10) and secure with two nuts (14).

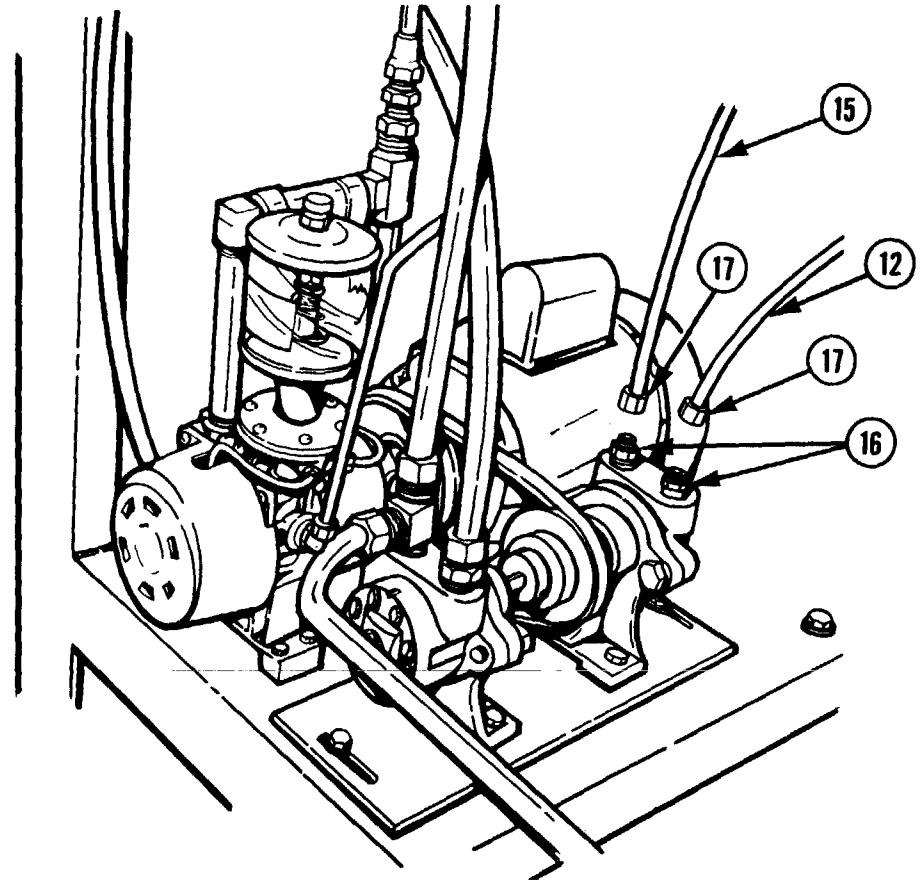


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

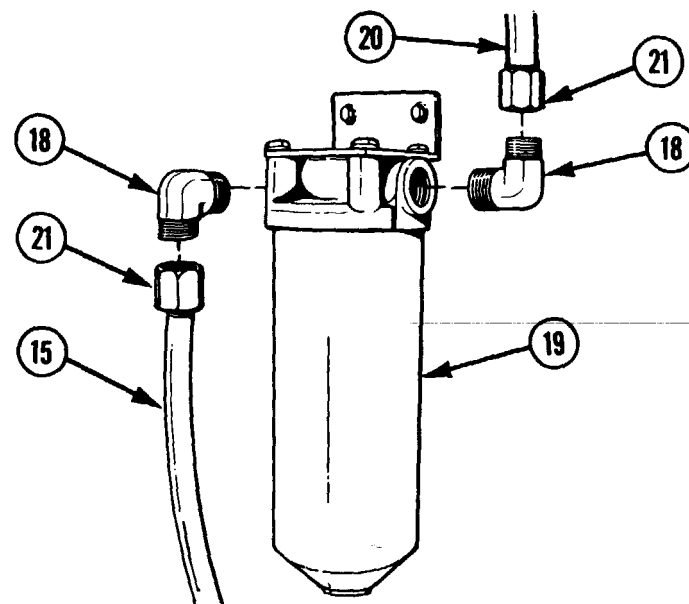
b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

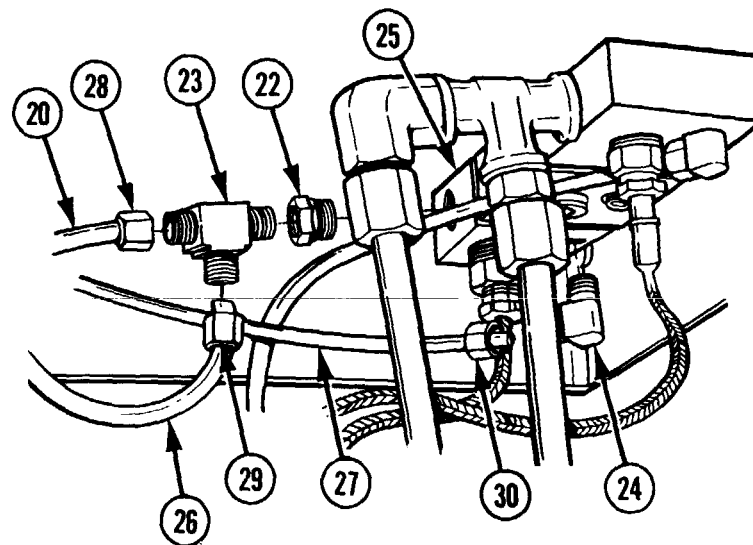
8 TWO COPPER TUBINGS (12 AND 15). Install on two male connectors (16) and secure with two nuts (17).



- 9 TWO MALE ELBOWS (18). Install on lube oil filter (19).
- 10 TWO COPPER TUBINGS (15 AND 20). Install and secure with two nuts (21).



- 11 REDUCER BUSHING (22), MALE RUN TEE (23), AND MALE ELBOW (24). Install on lube oil pressure discharge block (25).
- 12 THREE COPPER TUBINGS (20, 26, AND 27). Install and secure with three nuts (28, 29, and 30).



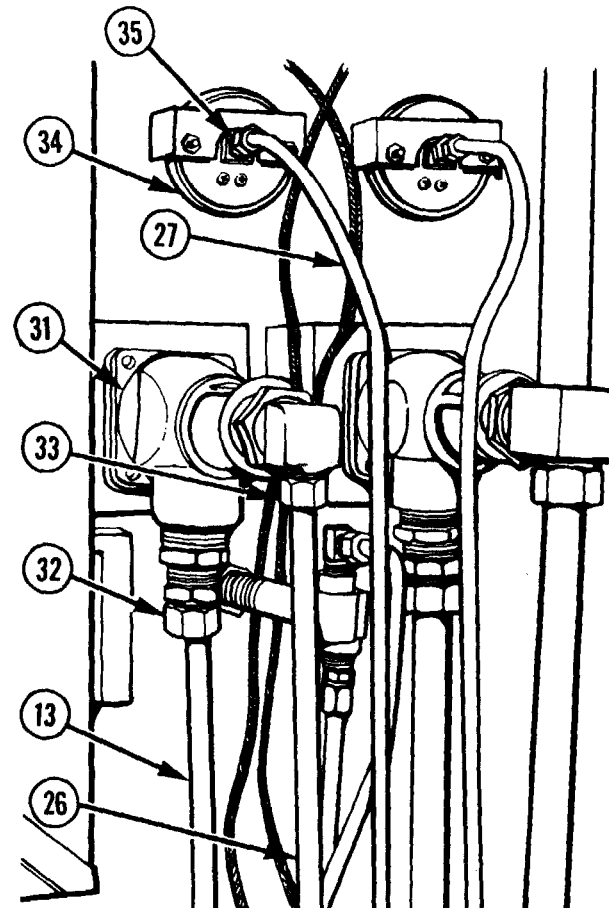
6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

b. LUBE OIL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

13 TWO COPPER TUBINGS (13 AND 26). Install on LUBE OIL REGULATOR (31) and secure with two nuts (32 and 33).

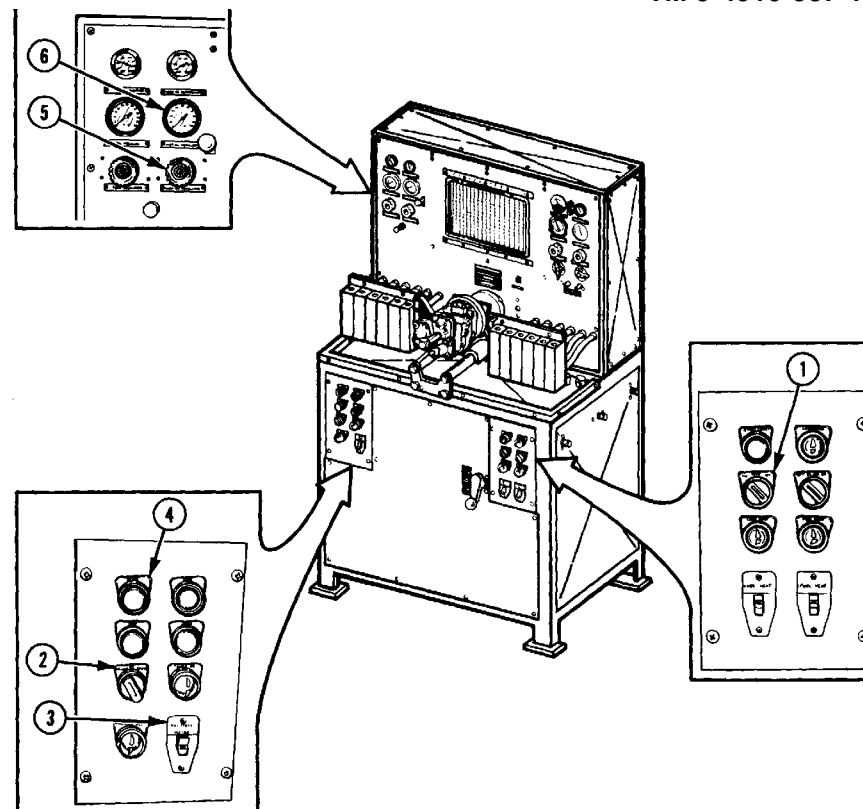
14 COPPER TUBING (Z7). Install on LUBE OIL PRESSURE gage (34) and secure with nut (35).



**NOTE**

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual.

- 1 TESTER. Hook up a fuel injector pump.
- 2 MAIN POWER SOURCE. Turn on.
- 3 500-1000-OFF COUNT SWITCH (1). Set at 500.
- 4 FORWARD-OFF-REVERSE SWITCH (12). Set at FORWARD..
- 5 AUXILIARY MOTOR SWITCH (3). Turn on.
- 6 START BUTTON (41). Press in.
- 7 LUBE OIL REGULATOR (5). Adjust.
- 8 LUBE OIL PRESSURE GAGE (6). Check for indication.
- 9 LUBE OIL SYSTEM. Check for leaks.



**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS**

**c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- a. Removal/disassembly
- b. Inspection/servicing
- c. Repair
- d. Reassembly/installation
- e. Test

**INITIAL SETUP**

Tools and Special Tools

General mechanic's automotive tool kit (5180-00-177-7033)

Materials/Parts

Cleaning compound (item 3, app C)  
Rag (item 14, app C)

References

2-26 Hookup of fuel injector pump  
TM 9-4910-387-24P

Troubleshooting References

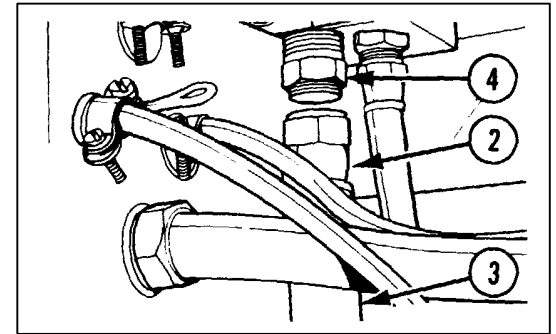
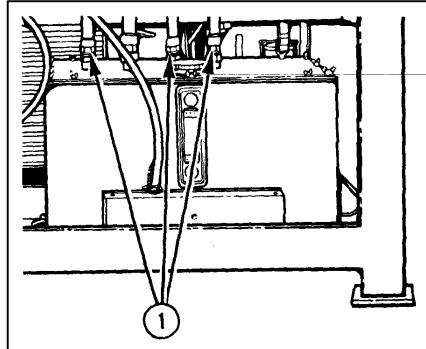
6-83 Engine primer assembly does not function  
6-140 Fuel does not circulate  
6-71 FUEL TEMPERATURE gage does not indicate

Equipment Conditions

Main power source to tester is turned off  
4-33 RH upper side panel is removed  
4-40 RH panel assembly is removed  
4-32 Upper back panel is removed  
4-33 Lower back panel is removed  
4-34 LH upper side panel is removed  
4-42 LH panel assembly is removed

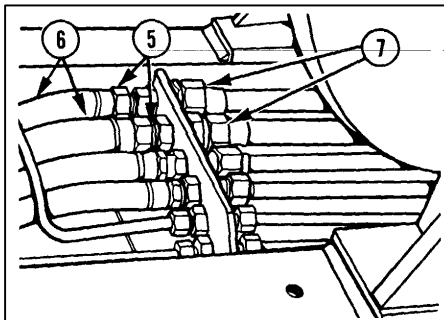
**REMOVAL/DISASSEMBLY**

1 THREE NUTS (1). Loosen.



2 NUT (2). Loosen.

3 HOSE ASSEMBLY (3) AND MALE CONNECTOR (4). Remove.

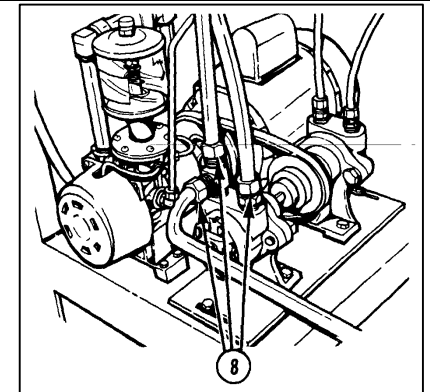


4 TWO NUTS (5). Loosen.

5 TWO HOSE ASSEMBLIES (6).

6 TWO NUTS (7). Loosen.

7 THREE NUTS (8). Loosen.



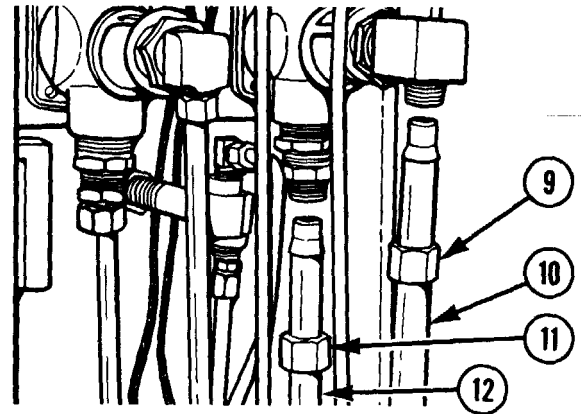


**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

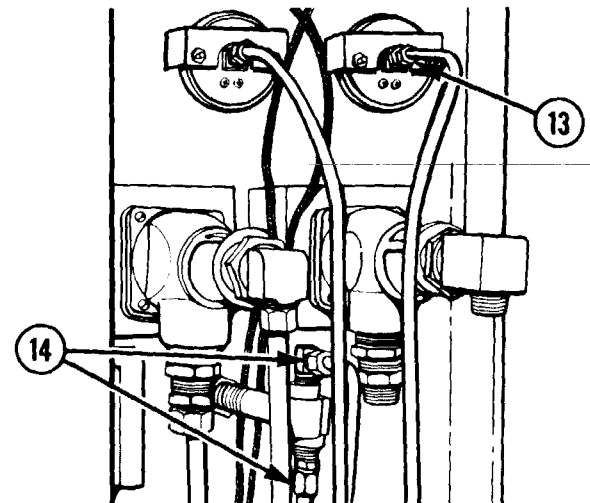
**c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**REMOVAL/DISASSEMBLY (cont)**

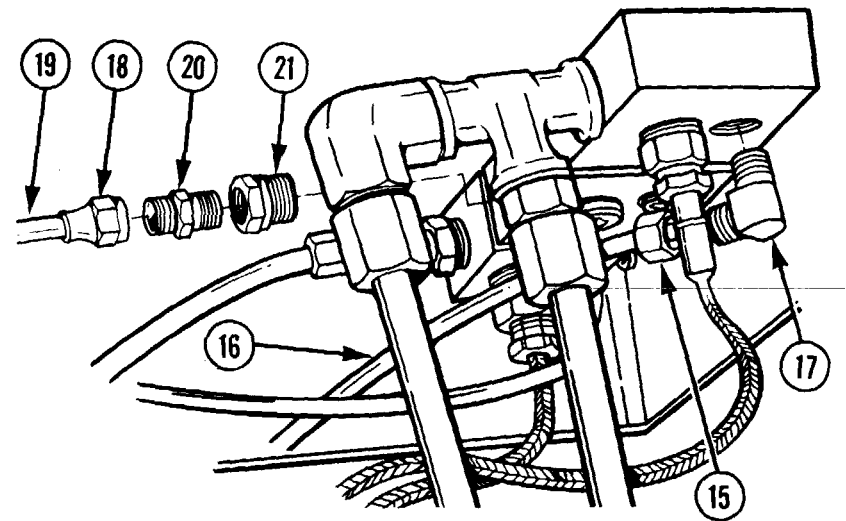
- 8 NUT (9). Loosen.
- 9 COPPER TUBING (10). Remove.
- 10 NUT (11). Loosen.
- 11 COPPER TUBING (12). Remove.



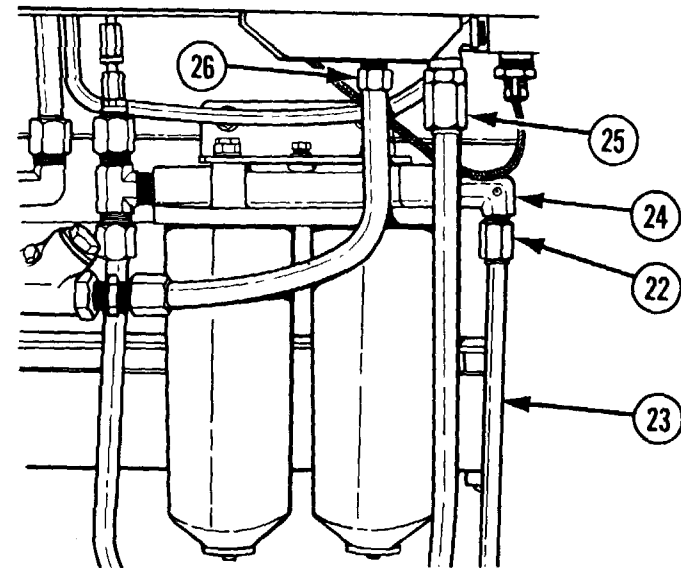
- 12 NUT (13). Loosen.
- 13 TWO NUTS (14). Loosen.



- 14 NUT (15). Loosen.
- 15 COPPER TUBING (16) AND MALE ELBOW (17). Remove.
- 16 NUT (18). Loosen.
- 17 COPPER TUBING (19), MALE CONNECTOR (20), AND REDUCER BUSHING (21). Remove.



- 18 NUT (22). Loosen.
- 19 COPPER TUBING (23) AND MALE ELBOW (24). Remove.
- 20 TWO NUTS (25 and 26). Loosen.

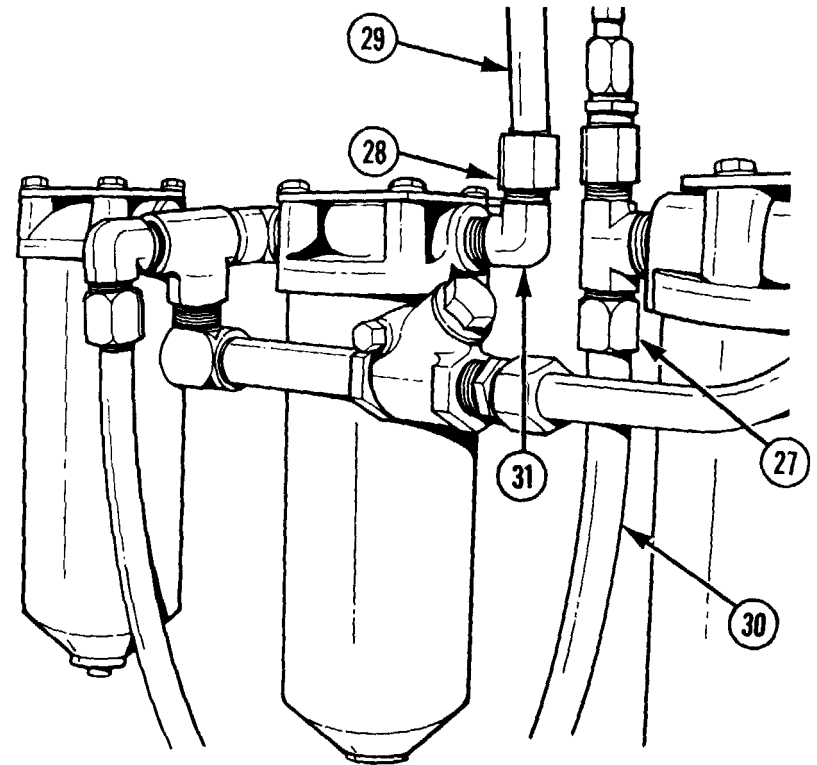


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

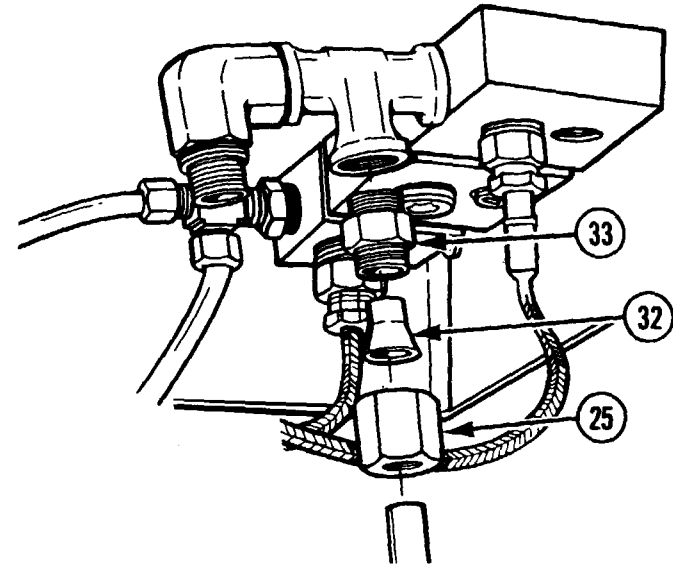
REMOVAL/DISASSEMBLY (cont)

- 21 TWO NUTS (27 and 28). Loosen.
- 22 TWO COPPER TUBINGS (29 and 30). Remove.
- 23 MALE ELBOW (31). Remove.



(SOME PARTS HAVE BEEN REMOVED FOR CLARITY.)

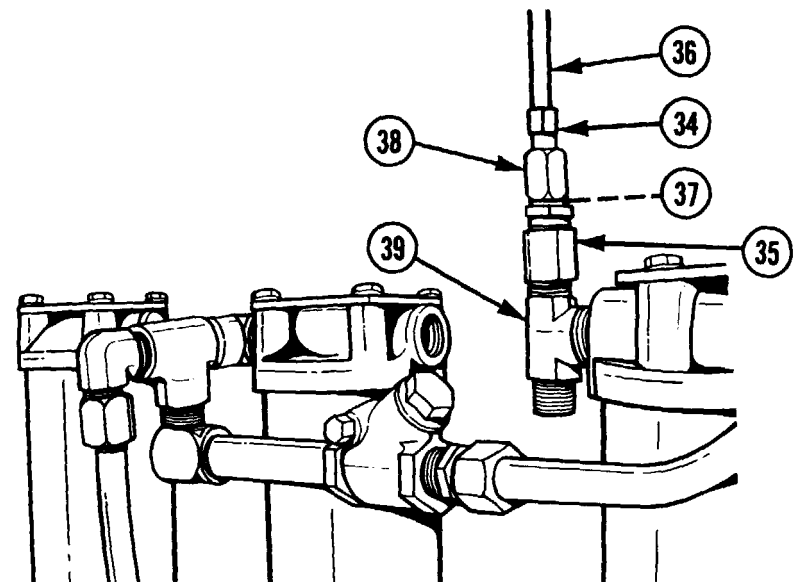
24 NUT (25), FERRULE (32), AND MALE CONNECTOR (33).  
Remove.



25 TWO NUTS (34 and 35). Loosen.

26 COPPER TUBING (36), FERRULE (37), AND TUBE REDUCER (38). Remove.

27 MALE TEE (39). Remove.

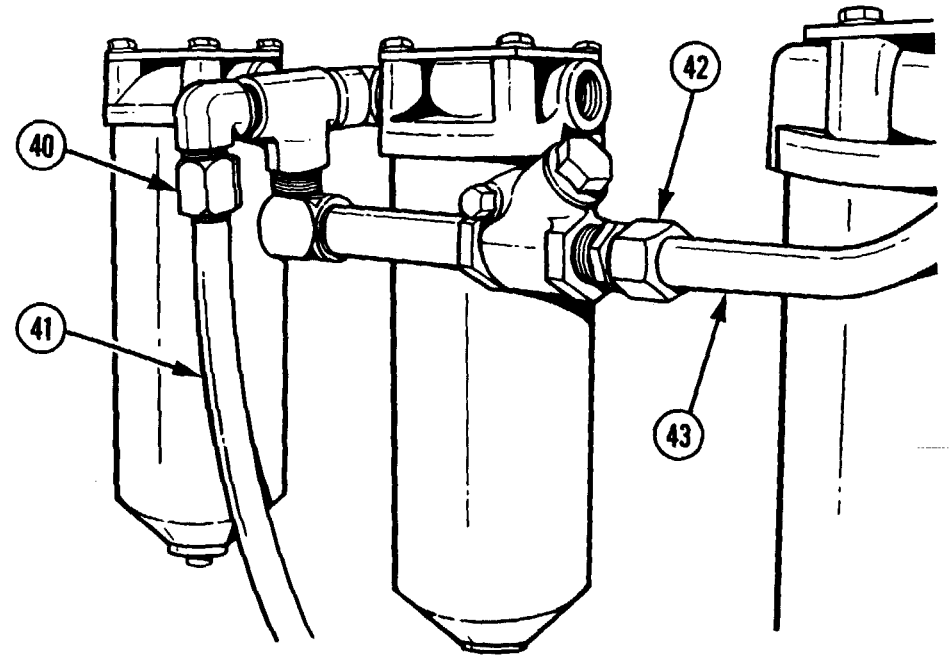


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

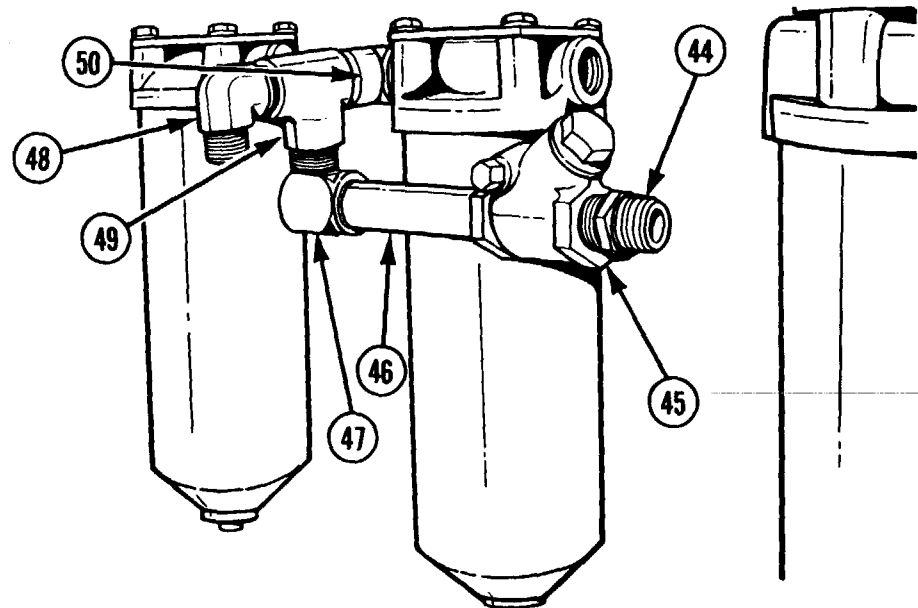
c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)

- 28 NUT (40). Loosen.
- 29 COPPER TUBING (41). Remove.
- 30 NUT (42). Loosen.
- 31 TUBE (43). Remove.



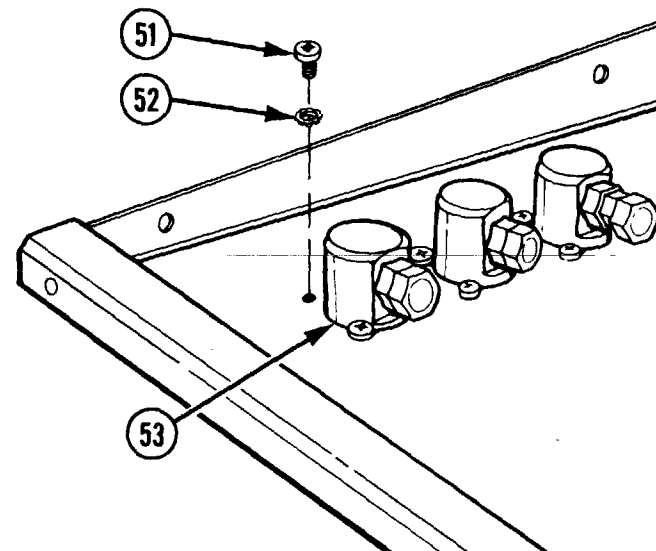
- 32 MALE CONNECTOR (44), SWING CHECK VALVE (45), AND NIPPLE (46). Remove.
- 33 90 DEGREE STREET ELBOW (47). Remove.
- 34 MALE ELBOW (48). Remove.
- 35 STREET TEE (49). Remove.
- 36 90 DEGREE STREET ELBOW (50). Remove.



**NOTE**

The fuel pressure discharge block must be moved down and away from the tray and fitting assembly before the male elbow and street tee can be removed.

- 37 FOUR MACHINE SCREWS (51) AND FOUR LOCKWASHERS (52). Remove.
- 38 FUEL PRESSURE DISCHARGE BLOCK (53) WITH DISCHARGE BLOCK GASKET. Pull down.

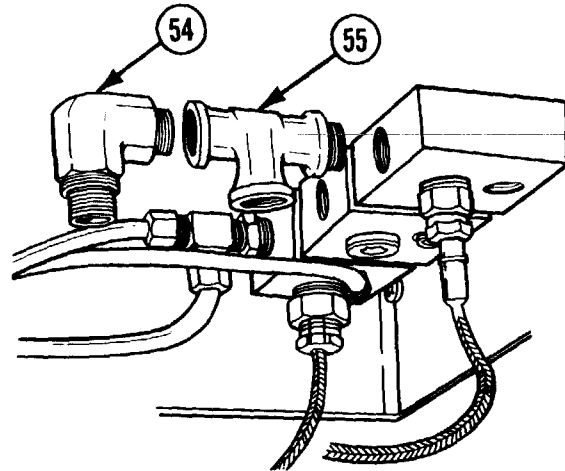


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REMOVAL/DISASSEMBLY (cont)

39 MALE ELBOW (54) AND MALE TEE (55). Remove.

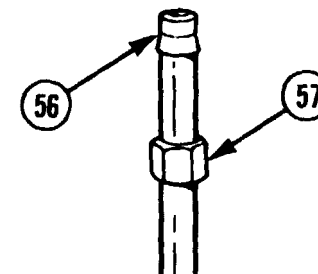


**CAUTION**  
Do not remove clinch sleeves from copper tubings unless necessary for replacement, as clinch sleeves or tubings may be damaged during removal.

**NOTE**

Nuts cannot be removed from copper tubings without first removing clinch sleeves. Nuts are not part of the copper tubings, but are part of components to which the tubings are connected.

Each copper tubing, when removed, has one clinch sleeve and one nut located at each end. Repeat the following procedures as required for each tubing.



40 CLINCH SLEEVE (56). Remove from copper tubing by cutting.

41 NUT (57). Remove.

**INSPECTION/SERVICING****FUEL SYSTEM**

- a. Check for cracked, broken, or missing parts.
- b. Check for damaged threads.
- c. Clean with cleaning compound (item 3, app C) and rag (item 14, app C).
- d. Clean clogged parts by blowing out with air.

**REASSEMBLY/INSTALLATION****CAUTION**

Be sure to align nuts carefully when installing as improper alignment will damage the ferrules and the copper tubing.

**REPAIR**

- 1 COPPER TUBINGS. Repair by fabrication (fig. 4, app D).
- 2 CLINCH SLEEVES. Repair by replacement (items 15 and 17, app C).
- 3 ALL REMAINING PARTS. Repair by replacement (TM 9-4910-387-24P).

**NOTE**

Clinch sleeves must be replaced with new items if previously removed.

Nuts are not part of the copper tubings, but are part of the components to which the tubings are connected.

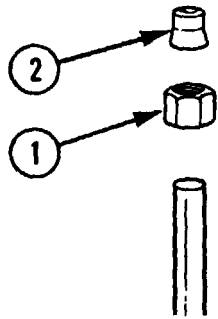
Each copper tubing has one clinch sleeve and one nut located at each end. Repeat steps 1 and 2 as required for each tubing.



6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

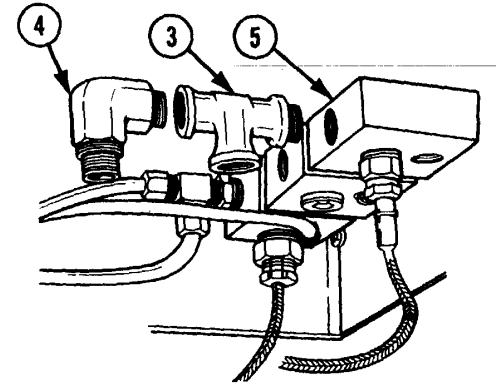
c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

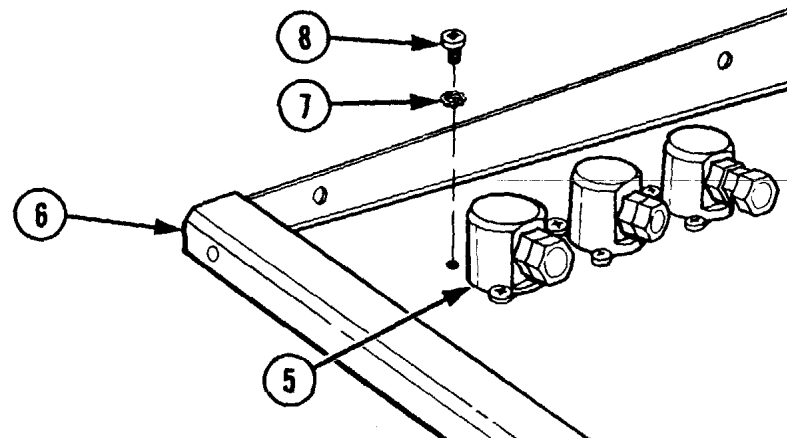


- 1 NUT (1). Install on copper tubing.
- 2 CLINCH SLEEVE (2). Install.

- 3 MALE TEE (3) AND MALE ELBOW (4). Install on fuel pressure discharge block (5).

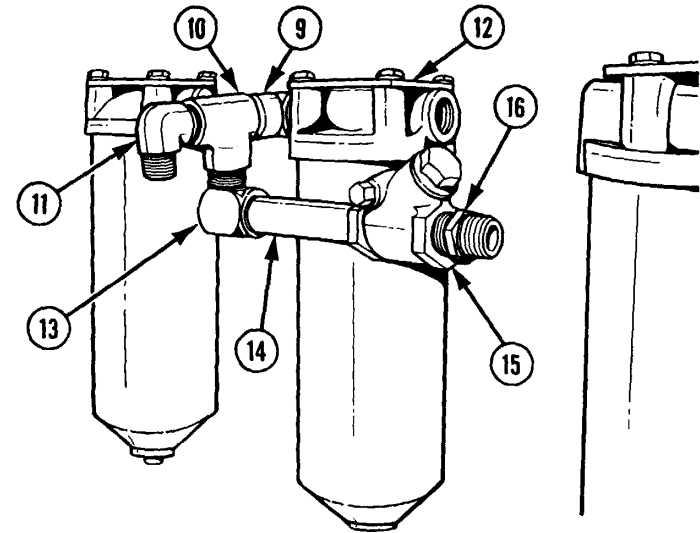


- 4 FUEL PRESSURE DISCHARGE BLOCK (5) WITH DISCHARGE BLOCK GASKET. Install on tray and fitting assembly (6) and secure with four lockwashers (7) and four machine screws (8).

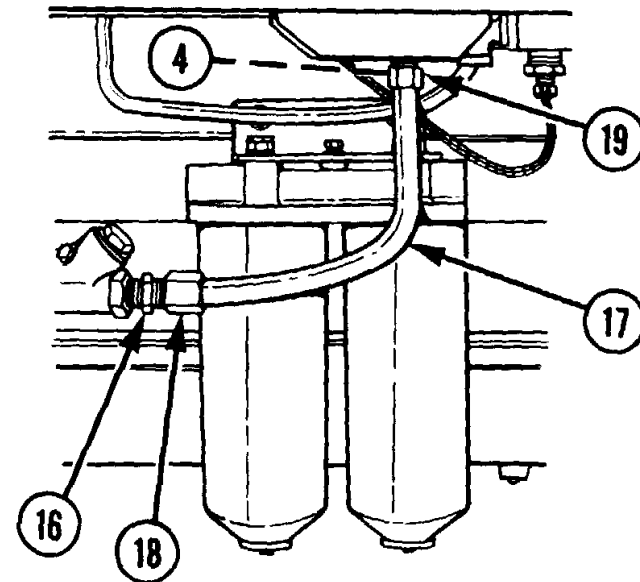


5 90 DEGREE STREET ELBOW (9), STREET TEE (10), AND MALE ELBOW (11). Install on primary fuel filter (12).

6 90 DEGREE STREET ELBOW (13), NIPPLE (14), SWINGCHECK VALVE (15), AND MALE CONNECTOR (16). Install.



7 TUBE (17). Install between male connector (16) and male elbow (4) and secure with two nuts (18 and 19).

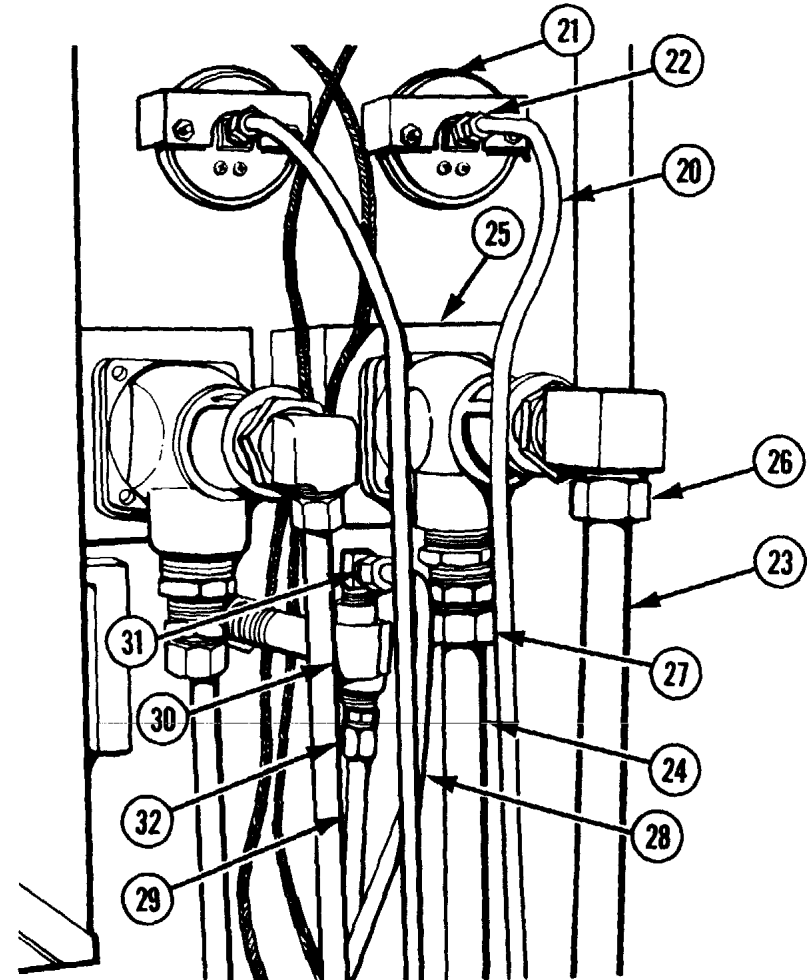


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

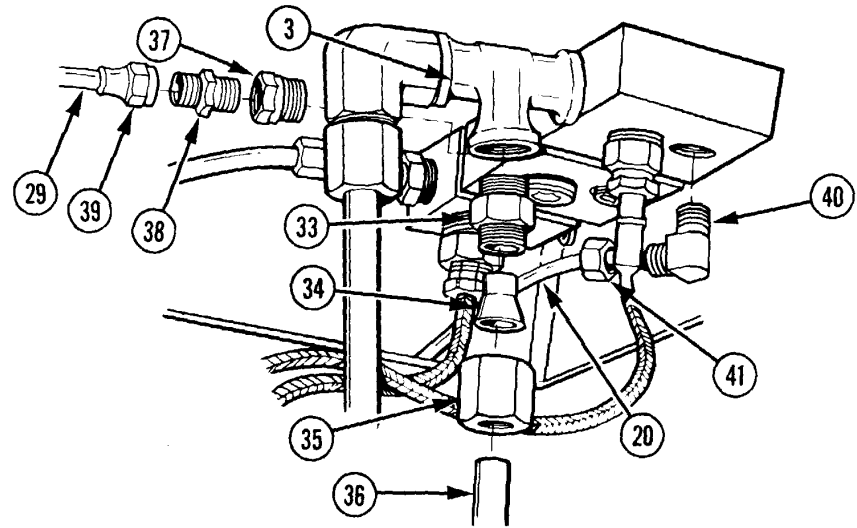
c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

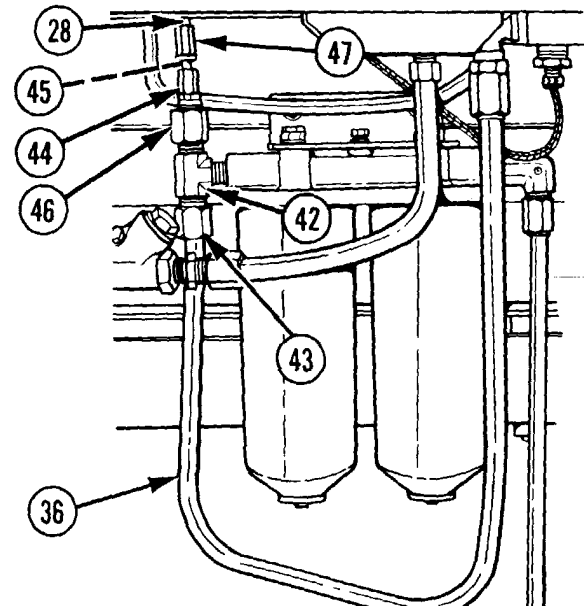
- 8 COPPER TUBING (20). Install on FUEL PRESSURE gage (21) and secure with nut (22).
- 9 TWO COPPER TUBINGS (23 and 24). Install on FUEL REGULATOR (25) and secure with two nuts (26 and 27).
- 10 TWO COPPER TUBINGS (28 and 29). Install on engine primer (30) and secure with two nuts (31 and 32).



- 11 MALE CONNECTOR (33), FERRULE (34), NUT (35), AND COPPER TUBING (36). Install on street tee (3) and tighten nut (35).
- 12 REDUCER BUSHING (37), MALE CONNECTOR (38), AND COPPER TUBING (29). Install and secure with nut (39).
- 13 MALE ELBOW (40) AND COPPER TUBING (20). Install and secure with nut (41).



- 14 MALE TEE (42). Install.
- 15 COPPER TUBING (36). Install on male tee (42) and secure with nut (43).
- 16 TUBE REDUCER (44) AND FERRULE (45). Install and secure with nut (46).
- 17 COPPER TUBING (28). Install and secure with nut (47).



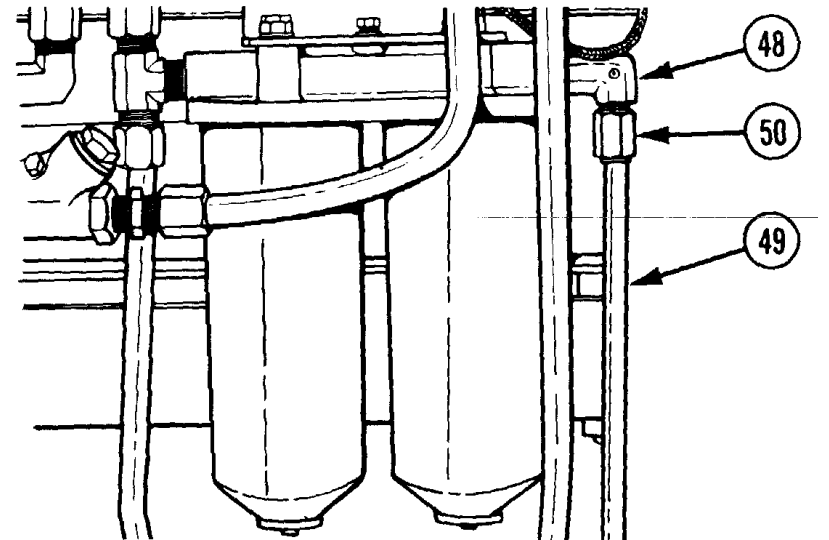
**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

**REASSEMBLY/INSTALLATION (cont)**

**18** MALE ELBOW (48). Install.

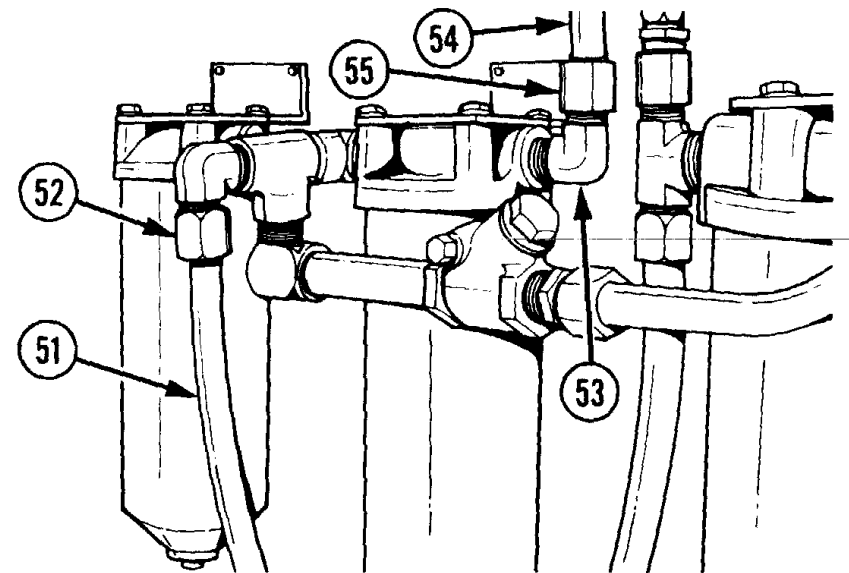
**19** COPPER TUBING (49). Install and secure with nut (50).



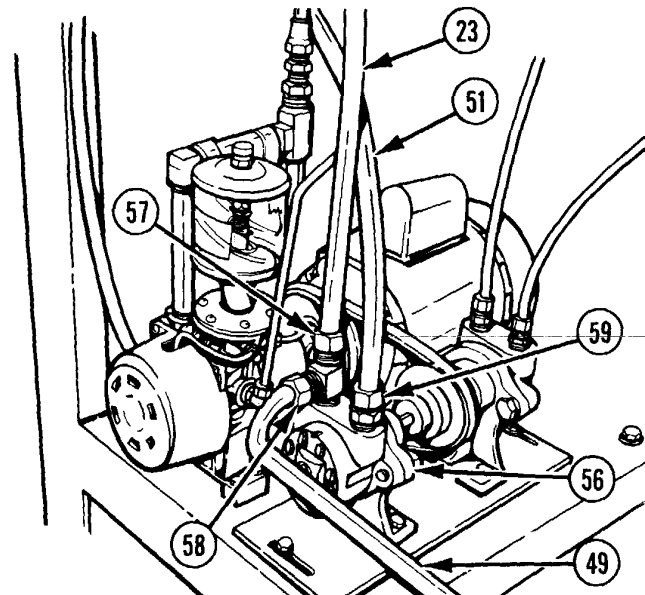
**20** COPPER TUBING (51). Install and secure with nut (52).

**21** MALE ELBOW (53). Install.

**22** COPPER TUBING (54). Install and secure with nut (55).

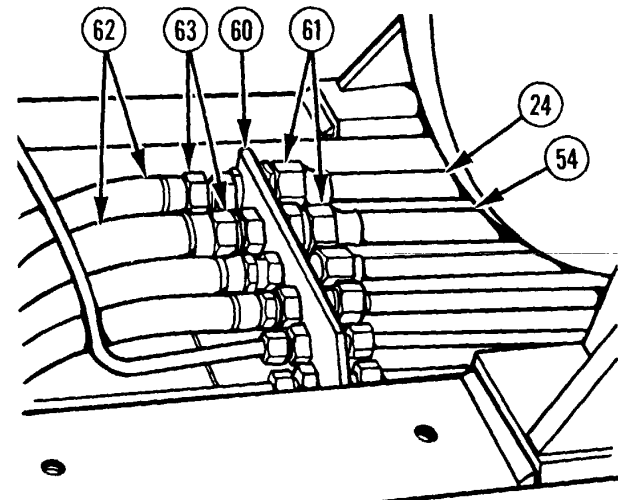


**23** THREE COPPER TUBINGS (23, 49, AND 51). Install on fuel pump (56) and secure with three nuts (57, 58, and 59).



**24** TWO COPPER TUBINGS (24 AND 54). Install on fitting bracket assembly (60) and secure with two nuts (61).

**25** TWO HOSE ASSEMBLIES (62). Install and secure with two nuts (63).



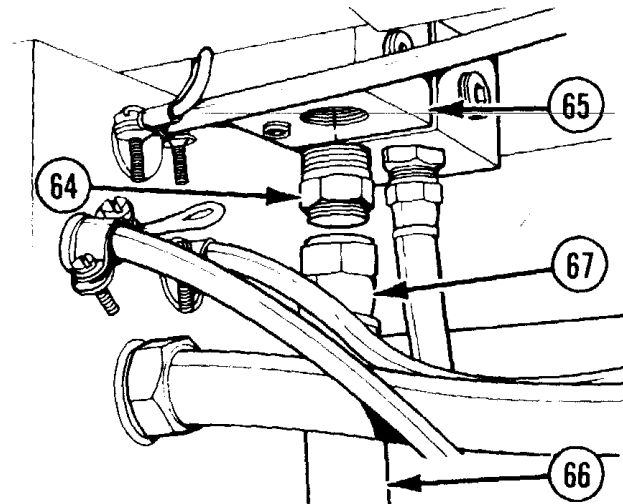
**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)**

**c. FUEL SYSTEM-MAINTENANCE INSTRUCTIONS (cont)**

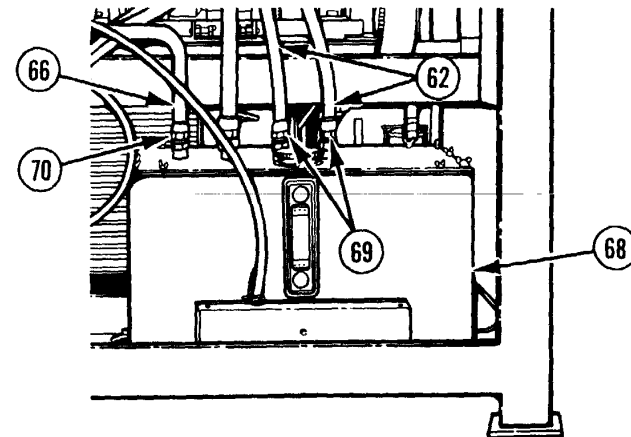
**REASSEMBLY/INSTALLATION (cont)**

**26** MALE CONNECTOR (64). Install on fuel return discharge block (65).

**27** HOSE ASSEMBLY (66). Install and secure with nut (67).



**28** TWO HOSE ASSEMBLIES (62) AND HOSE ASSEMBLY (66). Install on fuel tank assembly (68) and secure with two nuts (69) and nut (70).

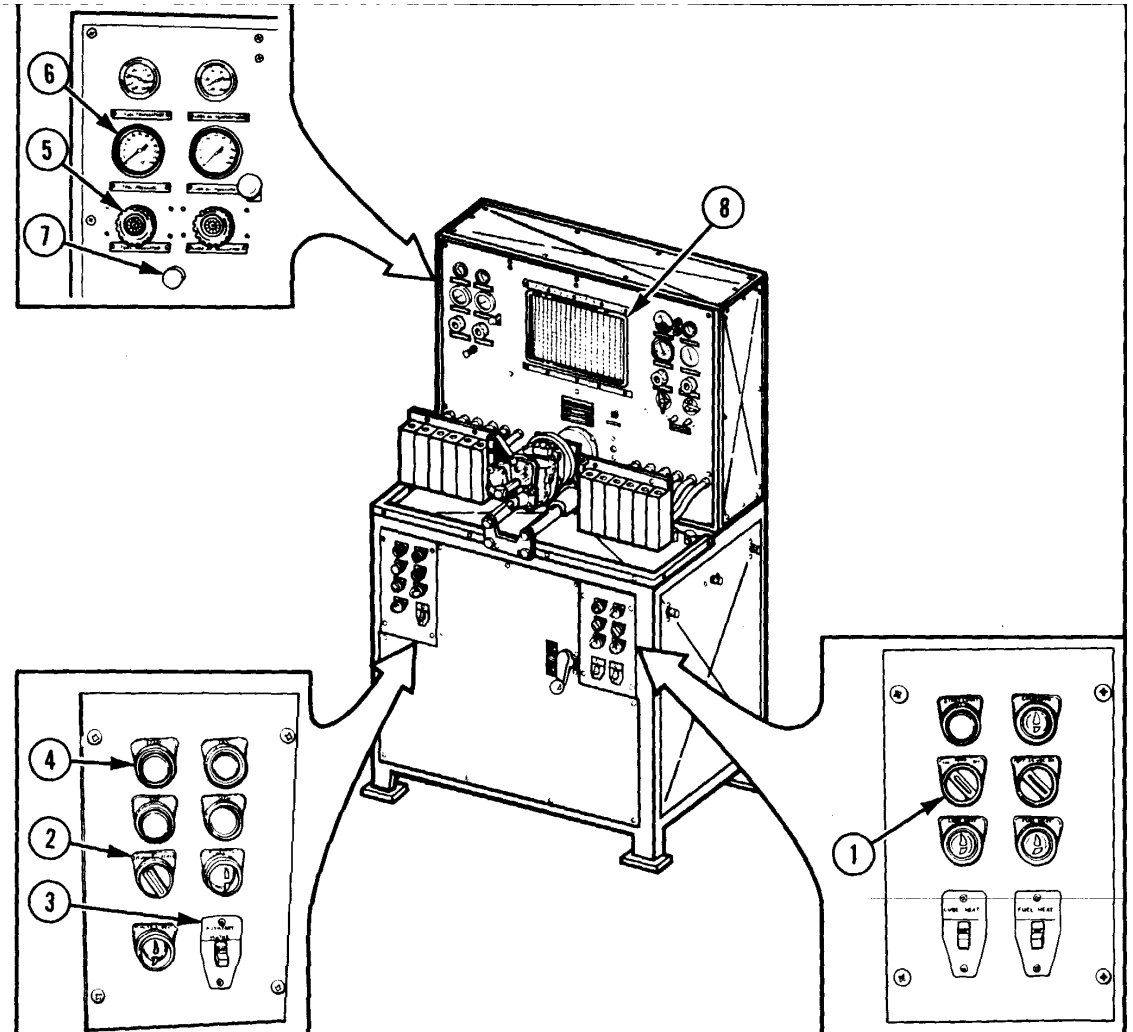


TEST

**NOTE**

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual.

- 1 TESTER. Hook up a fuel injector pump.
- 2 MAIN. POWER SOURCE. Turn on.
- 3 500-1000-OFF COUNT SWITCH (1). Set at 500.
- 4 FORWARD-OFF-REVERSE SWITCH (2). Set at FORWARD.
- 5 AUXILIARY MOTOR SWITCH (3). Turn on.
- 6 START BUTTON (4). Press in.
- 7 FUEL REGULATOR (5). Adjust flow of fuel.
- 8 FUEL PRESSURE GAGE (6). Check for indication.
- 9 ENGINE PRIMER ASSEMBLY (7). Pump several times and check that fuel is entering graduate rack assembly (8).
- 10 FUEL SYSTEM. Check for leaks.





**6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS**

**d. OIL DRAIN AND ACCUMULATOR SYSTEM-MAINTENANCE INSTRUCTIONS**

**THIS TASK COVERS:**

- |                         |                            |
|-------------------------|----------------------------|
| a. Removal/disassembly  | d. Reassembly/installation |
| b. Inspection/servicing | e. Test                    |
| c. Repair               |                            |

**INITIAL SETUP**

**Tools and Special Tools**

General mechanic's automotive tool kit (5180-00-177-7033)

**References**

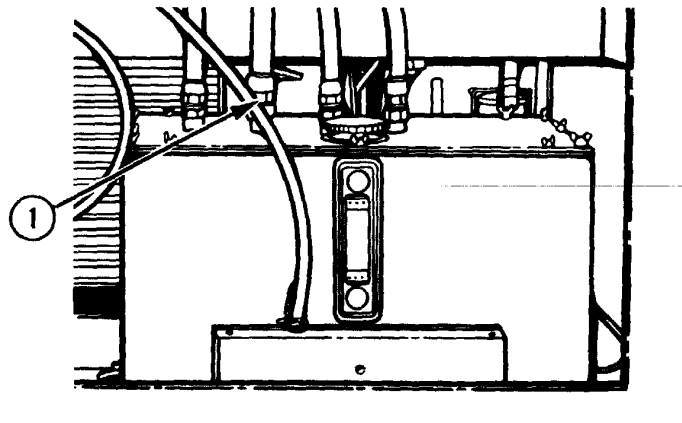
2-26 Hookup of fuel injector pump  
 TM 9-4910-387-24P

**Equipment Conditions**

Main power source to tester is turned off  
 4-33 RH upper side panel is removed  
 4-40 RH panel assembly is removed  
 4-32 Upper back panel is removed  
 4-34 LH upper side panel is removed

**REMOVAL/DISASSEMBLY**

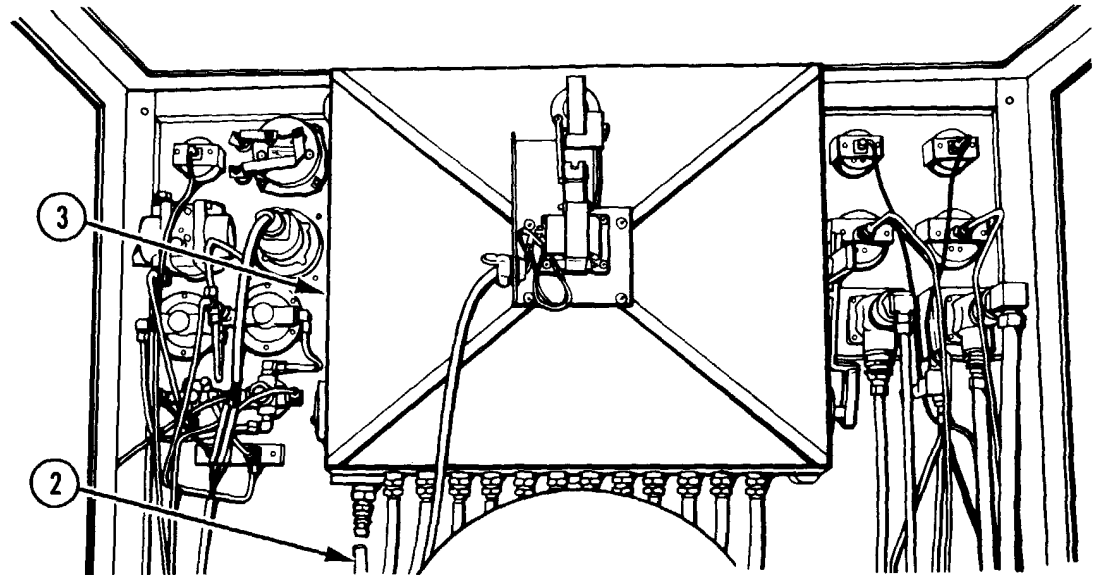
- 1 NUT (1). Loosen.



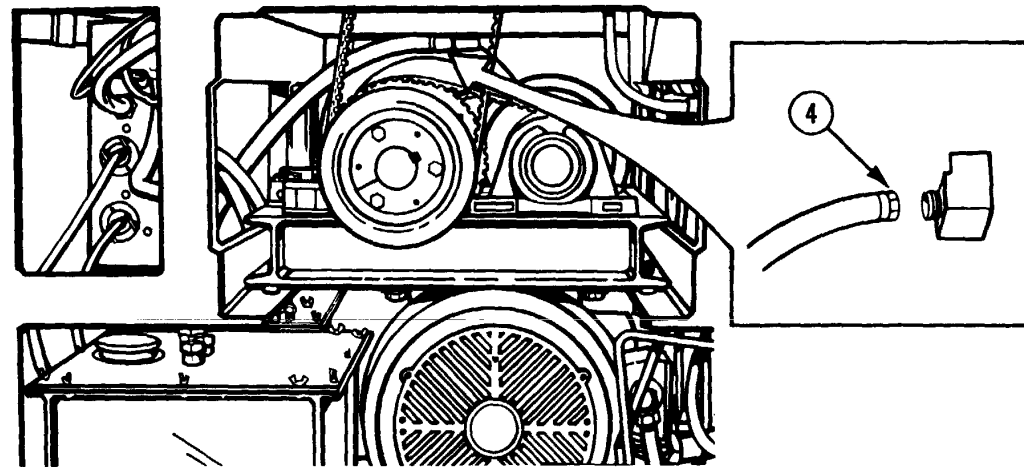
**NOTE**

Do not remove hose assembly unless necessary for replacement.

- 2 HOSE ASSEMBLY (2). Remove from graduate rack assembly (3) by cutting.



- 3 NUT (4). Loosen.

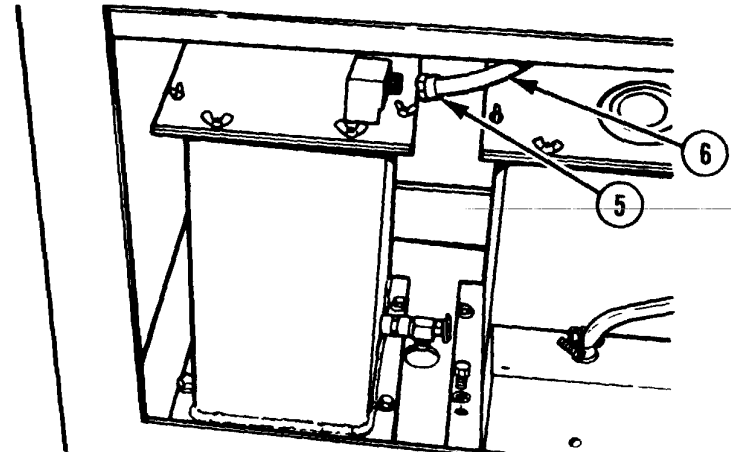


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

d. OIL DRAIN AND ACCUMULATOR SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

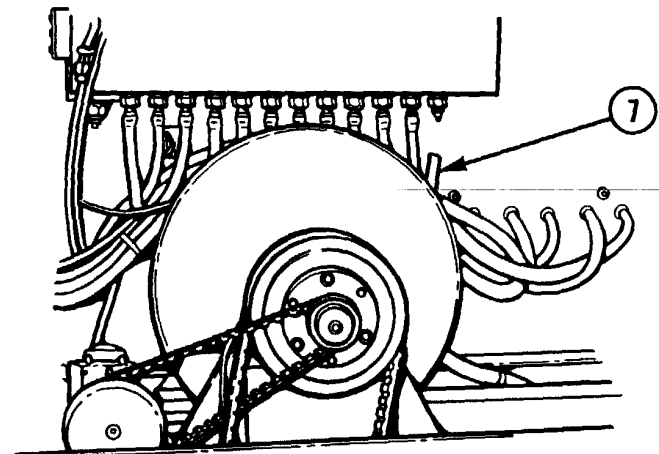
REMOVAL/DISASSEMBLY (cont)

- 4 NUT (5). Loosen.
- 5 HOSE ASSEMBLY (6). Remove.



**NOTE**  
Do not remove hoses unless necessary for replacement.

- 6 TWELVE HOSES (7). Remove by cutting.



**INSPECTION/SERVICING**

**TWELVE HOSES AND TWO HOSE ASSEMBLIES.**

- a. Check for cracks or tears.
- b. Clean clogged parts by blowing out with air.

**REPAIR**

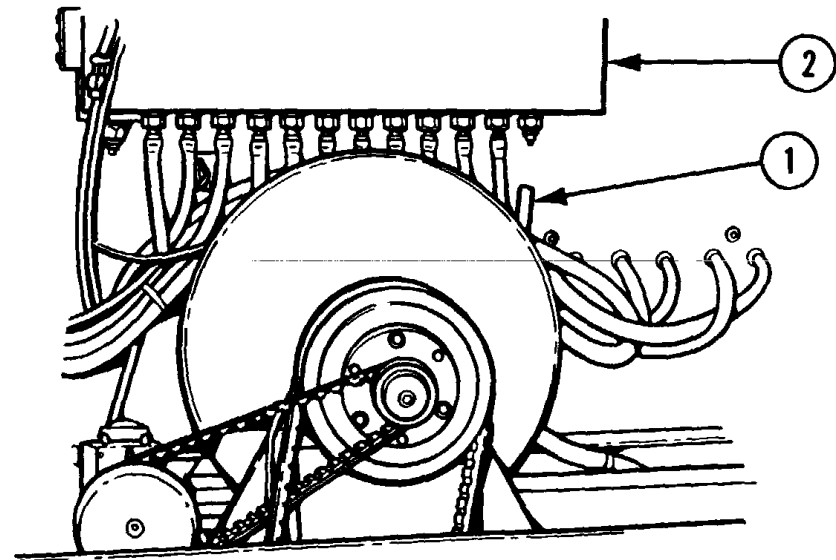
**NOTE**

Repair is by replacement of authorized parts (TM 9-authorized parts (TM 9-4910-387-24P) as required.

**REASSEMBLY/INSTALLATION**

**1 TWELVE HOSES (1).**

- a. Install on twelve socketless fittings on graduate rack assembly (2).
- b. Insert free ends through instrument panel assembly and install on twelve male hose fittings.

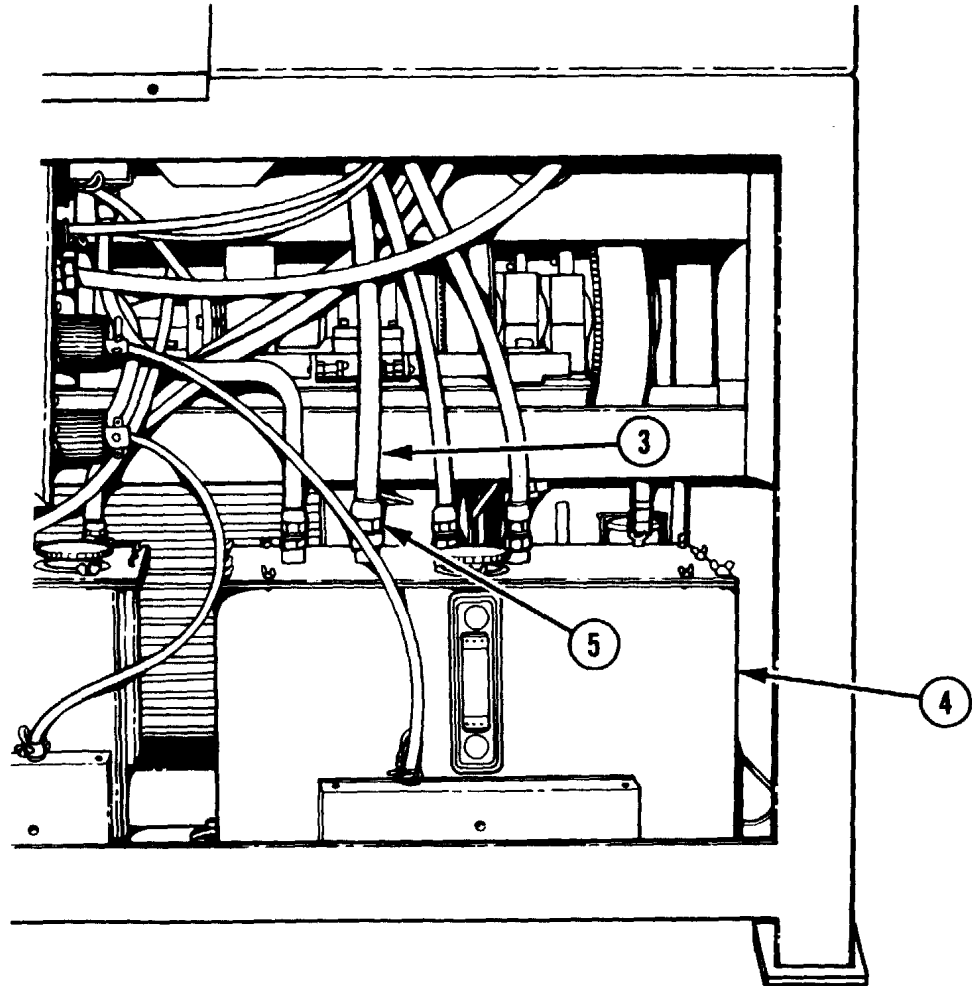


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

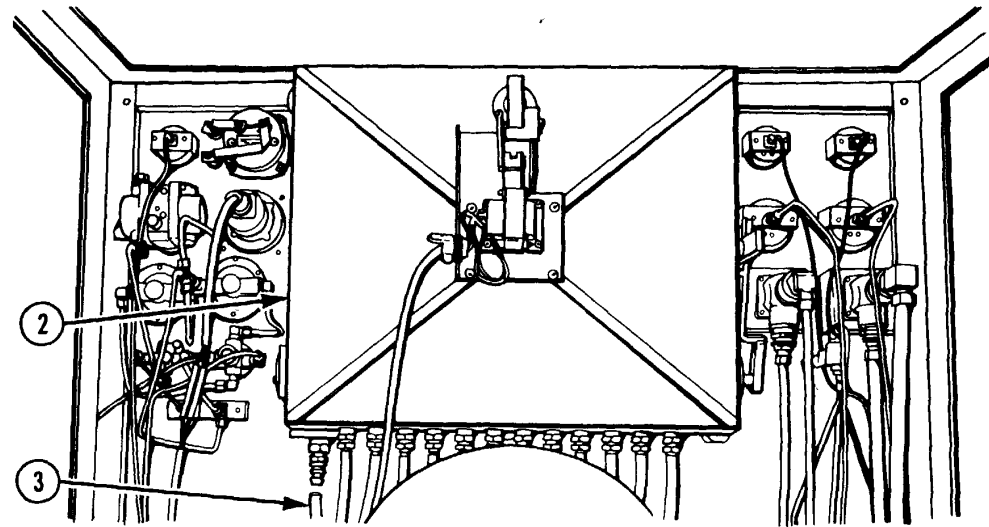
d. OIL DRAIN AND ACCUMULATOR SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

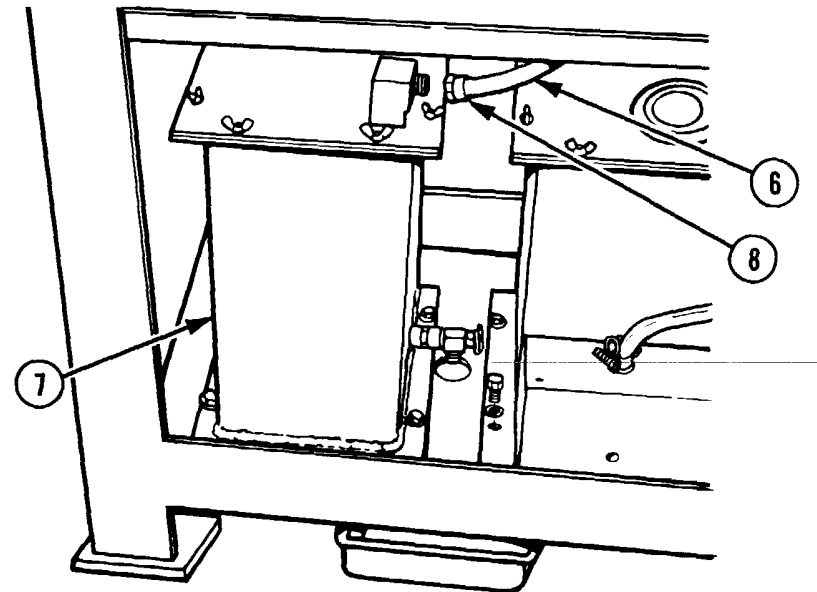
2 HOSE ASSEMBLY (3). Install on female connector on fuel tank assembly (4) and secure with nut (5).



3 HOSE ASSEMBLY (3). Install on socketless fitting on graduate rack assembly (2).



4 HOSE ASSEMBLY (6). Install on male elbow on waste tank assembly (7) and secure with nut (8).

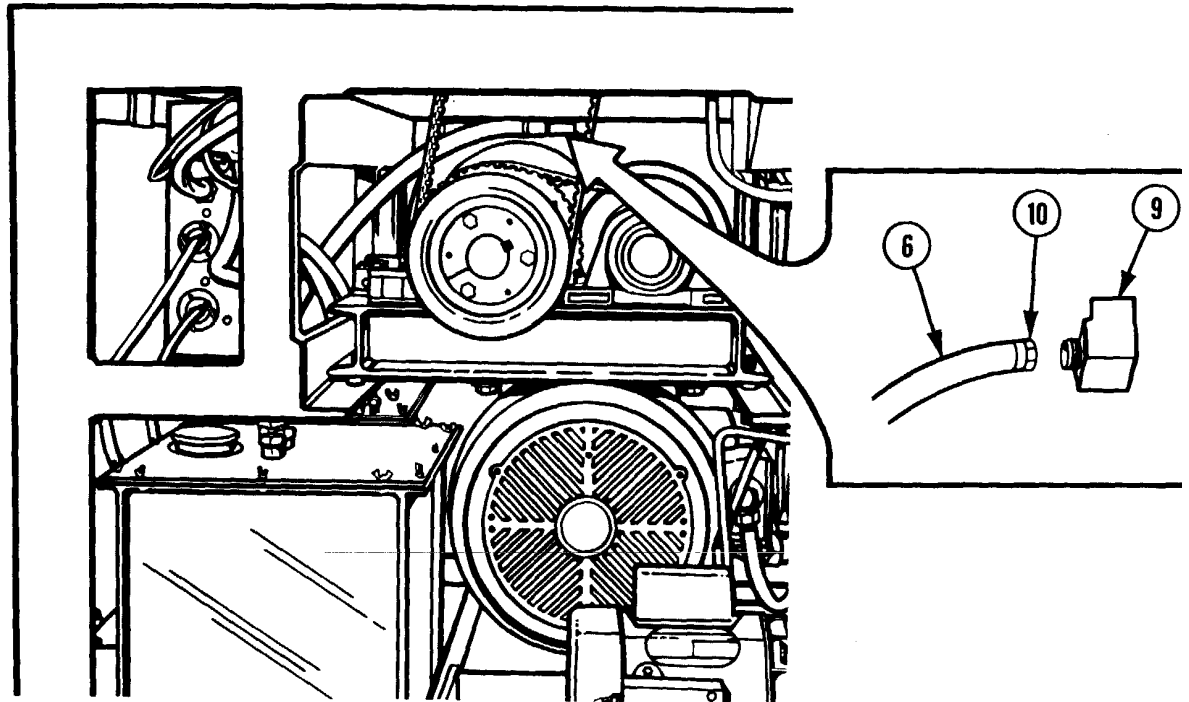


6-41. PIPING ASSEMBLY-MAINTENANCE INSTRUCTIONS (cont)

d. OIL DRAIN AND ACCUMULATOR SYSTEM-MAINTENANCE INSTRUCTIONS (cont)

REASSEMBLY/INSTALLATION (cont)

- 5 HOSE ASSEMBLY (6). Install on tray and discharge blocks assembly (9) and secure with nut (10).

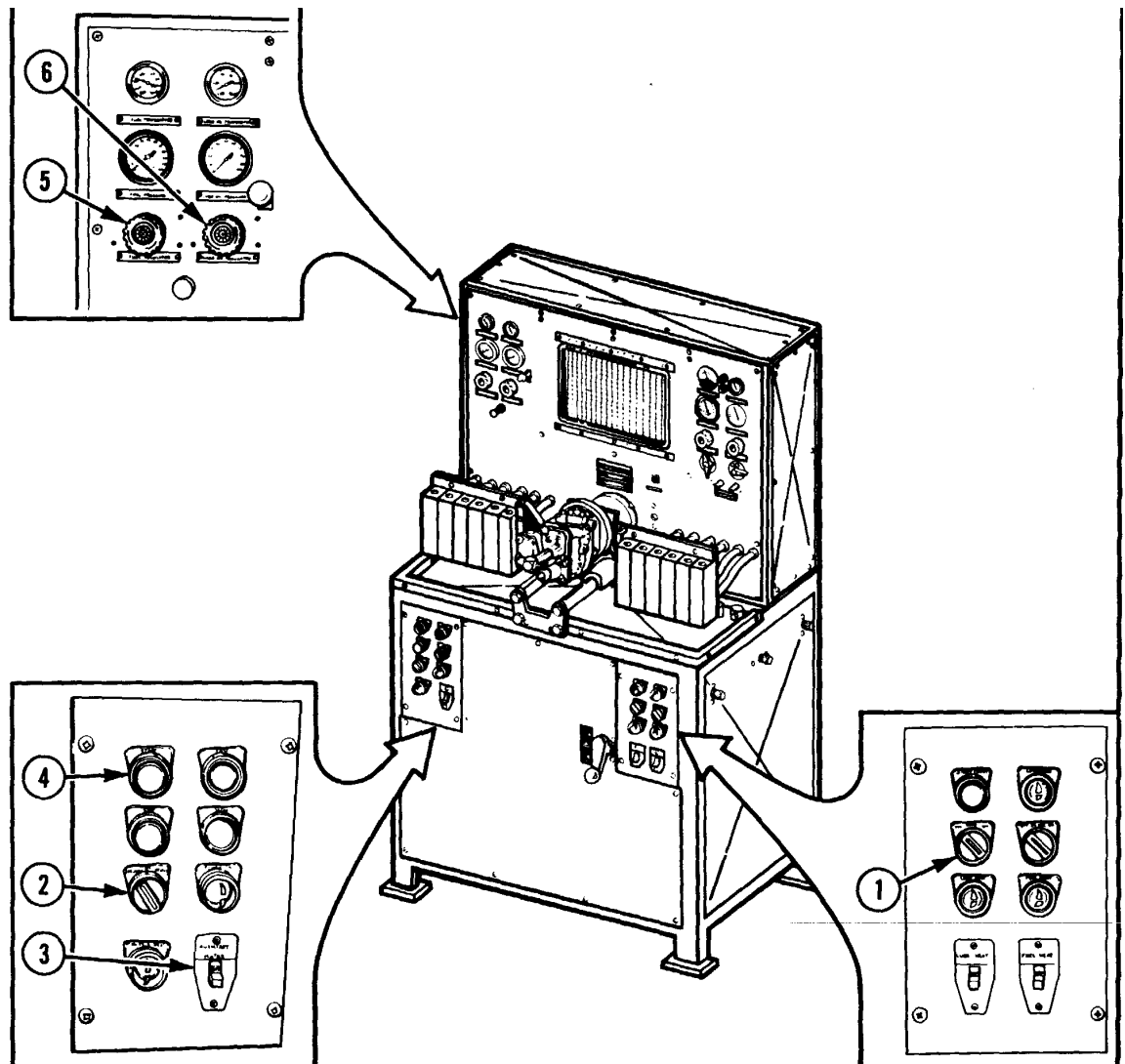


TEST

**NOTE**

Hookup procedures for the fuel injector pumps begin on page 2-26. For further information on operating the fuel injector pump, refer to the appropriate fuel injector pump manual.

- 1 TESTER. Hook up a fuel injector pump.
- 2 MAIN POWER SOURCE. Turn on. 3 500-1000-OFF COUNT SWITCH (1). Set at 500.
- 4 FORWARD-OFF-REVERSE SWITCH (2). Set at FORWARD.
- 5 AUXILIARY MOTOR SWITCH (3). Turn on.
- 6 START BUTTON (4). Press in.
- 7 FUEL REGULATOR (5) AND LUBE OIL REGULATOR (6). Adjust flow of fuel and lube oil.
- 8 OIL DRAIN AND ACCUMULATOR SYSTEM. Check for leaks.





APPENDIX A  
REFERENCES

**A-1. TECHNICAL MANUALS (TM)**

TM 38-750 ..... The Army maintenance management system (TAMMS).

TM 9-4910-387-24P ..... Operator, organizational, direct support, and general support maintenance repair parts and special tools list for tester, fuel injector pump: single end drive, 150 to 3600 rpm (4910-01-037-9417) and adapter kits, fuel injector: American Bosch APE-6BB (4910-01-005-2850), American Bosch PSB-6A and PSB-6 (4910-01-005-2851), American Bosch PSB-12BT (4910-01-005-2852), Simmonds SU (4910-01-005-2853), International Harvester 3200 (4910-01 006-3073), American Bosch PSJ-6A (4910-01-006-3072), Caterpillar (4910-01-005-2854), Roosa Master (4910-01-005-2855), and Cummins (4910-00-763-7495).

**A-2. FIELD MANUALS (FM)**

FM 21-11 ..... First aid for soldiers.

FM 525 ..... Explosives and demolition.

FM 9-6 ..... Ammunition service in the theater of operation.

**A-3. OTHER**

DA Form 2028 ..... Recommended changes to publications and blank forms.

DA Form 2028-2 ..... Recommended changes to equipment technical manuals.

MWO 94910-387-40-1 ..... Modification of 220-v 60-hz 3-ph fuel injector pump tester to revise accumulator mounting method and remove pump-related components.

SF 368 ..... Quality deficiency report.

## APPENDIX B MAINTENANCE ALLOCATION CHART

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### Section I. INTRODUCTION

#### B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions. c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

#### B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. **Inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. **Test.** To verify serviceability by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. **Adjust.** To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. **Aline.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. **Install.** The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. **Replace.** The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

**MAINTENANCE FUNCTIONS (cont)**

**i. Repair.** The application of maintenance services<sup>1</sup> or other maintenance actions<sup>2</sup> to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

**j. Overhaul.** That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

**k. Rebuild.** Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc) considered in classifying Army equipments/components.

**B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION I**

**a. Column 1, Group Number.** Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

<sup>1</sup>Services-inspect, test, service, adjust, aline, calibrate, or replace.

<sup>2</sup>Actions--welding, grinding, riveting, straightening, facing, remachining, or resurfacing.

**b. Column 2, Component/Assembly.** Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

**c. Column 3, Maintenance Function.** Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see para B-2.)

**d. Column 4, Maintenance Category.** Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

- C..... Operator or crew.
- O..... Organizational maintenance.
- F..... Direct support maintenance.
- H..... General support maintenance.
- D..... Depot maintenance.

**e. Column 5, Tools and Equipment.** Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

**f. Column 6, Remarks.** This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

#### **B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III**

**a. Column 1, Reference Code.** The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

**b. Column 2, Maintenance Category.** The lowest category of maintenance authorized to use the tool or test equipment.

**c. Column 3, Nomenclature.** Name or identification of the tool or test equipment.

**d. Column 4, National Stock Number.** The National stock number of the tool or test equipment.

**e. Column 5, Tool Number.** The manufacturer's part number.

Section II. MAINTENANCE ALLOCATION CHART FOR TESTER

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
00	TESTER, FUEL INJECTOR PUMP	Service	0.2						
		Repair		0.5		2.0		1	
		Adjust	0.2			0.5		1	
01	PANEL ASSEMBLY, RH	Inspect	0.1						
		Replace		0.1				1	
		Repair	0.3	0.4				1	
02	PANEL ASSEMBLY, LH	Inspect	0.1						
		Replace		0.1				1	
		Repair	0.3	0.4				1	
03	ACCUMULATOR ASSEMBLY, RH	Inspect	0.1						
		Replace		0.3				1	
		Repair	0.2	0.3				1	
0301	ACCUMULATOR ASSEMBLY	Inspect		0.1					
		Replace		0.2				1	
		Repair		0.2				1	
04	ACCUMULATOR ASSEMBLY, LH	Inspect	0.1						
		Replace		0.3				1	
		Repair	0.2	0.3				1	
0401	ACCUMULATOR ASSEMBLY	Inspect		0.1					
		Replace		0.2				1	
		Repair		0.2				1	
05	CONTROL EQUIPMENT ASSEMBLY, RH	Inspect	0.1	0.5					
		Test				1.0			
		Replace				4.0		1	
		Repair		0.2		1.0		1	

06	CONTROL EQUIPMENT ASSEMBLY, LH	Inspect	0.1	0.5	1.0					
		Test							0.5	
		Replace							4.0	1
		Repair							1.0	1
07	INSTRUMENT PANEL ASSEMBLY	Inspect	0.1	0.2	0.2					
		Test							1.0	
		Service							0.2	
		Replace							5.0	1
		Repair							1.0	1
0701	MANF. PRESS. - CAPSULE PRESSURE SELECTOR VALVE	Inspect			0.1					
		Replace			0.5		1			
		Repair			1.0		1			
0702	VACUUM - PRESS. SELECTOR VALVE	Inspect			0.1					
		Replace			0.5		1			
		Repair			1.0		1			
0703	MANIFOLD INLET-SUPERCHARGER INLET	Inspect			0.2					
		Replace			0.5		1			
		Repair			0.3		1			
0704	24 VOLTS DC OUTLET ASSEMBLY	Inspect			0.2					
		Replace			0.4		1			
		Repair			0.3		1			
0705	CHAMBER ASSEMBLY, MANIFOLD BULB (MANIFOLD BULB ASSEMBLY)	Inspect			0.2					
		Test			0.3		1			
		Replace			0.5		1			
		Repair			0.5		1			
0706	TACHOMETER INDICATOR ASSEMBLY	Inspect			0.2					
		Test			0.3					
		Replace			0.2		1			
		Repair			0.5		1			

MAINTENANCE ALLOCATION CHART FOR TESTER (cont)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
070601	CABLE ASSEMBLY, TACHOMETER INDICATOR	Inspect				0.2			
		Test				0.3		2	
		Replace				0.2		1	
		Repair				0.5		1	
0707	LUBE OIL REGULATOR	Inspect				0.2			
		Replace				0.5		1	
		Repair				0.5		1	
0708	FUEL REGULATOR	Inspect				0.2			
		Replace				0.5		1	
		Repair				0.5		1	
0709	ENGINE PRIMER ASSEMBLY	Inspect				0.1			
		Replace				0.3		1	
		Repair				0.3		1	
08	GRADUATE RACK ASSEMBLY	Inspect	0.1			0.3			
		Test				0.5		1	
		Replace				3.0		1	
		Repair	0.2			3.0		1	
0801	SOLENOID ASSEMBLY	Inspect				0.2			
		Test				0.3		1	
		Replace				0.4		1	
		Repair				0.3		1	
0802	DUMPING SHAFT ASSEMBLY	Inspect				0.5			
		Replace				3.0		1	
		Repair				1.0		1	

09	ROD ASSEMBLY, SHIFT CONTROL	Inspect Replace Repair		0.2		0.2 2.0 1.0		1 1	
10	TRAY AND DISCHARGE BLOCKS ASSEMBLY	Inspect Replace Repair	0.2 0.2			0.2 2.0 1.0		1 1	
11	TANK ASSEMBLY, WASTE	Inspect Service Replace Repair	0.1 0.3			1.0 0.5		1 1	
12	TANK ASSEMBLY, UBE OIL	Inspect Test Service Replace Repair Adjust	0.1 0.3			0.5 0.5 2.0		1 1 1	
13	TANK ASSEMBLY, FUEL	Inspect Test Service Replace Repair Adjust	0.1 0.3			0.5 0.5 2.0		1 1 1	
14	GENERATOR ASSEMBLY, COUNTER PULSE SWITCH AND TACHOMETER	Inspect Test Service Replace Repair Adjust Aline	0.2			0.3 0.5 0.5 2.0 0.1 0.1		1 1 1 1	
1401	CABLE ASSEMBLY, TACHOMETER GENERATOR	Inspect Test Replace Repair				0.2 0.3 0.2 0.5		2 1 1	



MAINTENANCE ALLOCATION CHART FOR TESTER (cont)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
1402	COUNTER PULSE SWITCH	Inspect				0.1			
		Test				0.5			
		Service	0.2						
		Replace				0.3		1	
		Repair				0.5		1	
1403	CAM ASSEMBLY, SWITCH ACTUATING	Inspect				0.1			
		Replace				0.3		1	
		Repair				0.1		1	
1404	INPUT SHAFT ASSEMBLY	Replace				1.0		1	
		Repair				0.5		1	
15	BRACKET ASSEMBLY, FITTING	Inspect				0.2			
		Replace				0.5		1	
		Repair				0.5		1	
16	DRIVE UNIT ASSEMBLY	Inspect	0.2			0.2			
		Test				1.0		1	
		Service	0.1						
		Adjust				1.0		1	
		Replace				12.0		1	
		Repair	0.5			5.0		1	
1601	CLUTCH ASSEMBLY	Inspect				0.2			
		Adjust				0.5		1	
		Replace				6.0		1	
		Repair				2.0		1	
1602	SUPPORT ASSEMBLY	Inspect				0.2			
		Repair				0.5		1	

17	CONNECTION ASSEMBLY, SERVICE	Inspect			0.2		
		Test			0.3		2
		Replace			0.5		1
		Repair			0.5		1
18	AUXILIARY MOTOR AND PUMP ASSEMBLY	Inspect	0.2		0.2		1
		Test			0.5		1
		Service	0.1				1
		Replace			1.0		1
		Repair	0.3		1.0		1
		Adjust			0.1		1
		Align			0.1		1
1801	MOISTURE AND OIL TRAP	Inspect	0.2				1
		Service	0.3				1
		Replace			0.4		1
		Repair	0.3	0.3	0.5		1
19	FILTER, FLUID PRESSURE (LUBE OIL FILTER)	Inspect	0.2				
		Service	0.3				
		Replace			0.8		1
		Repair	0.3	0.3	0.5		1
20	FILTER, FLUID PRESSURE (PRIMARY FUEL FILTER)	Inspect	0.2				
		Service	0.3				
		Replace			0.8		1
		Repair	0.3	0.3	0.5		1
21	FILTER, FLUID PRESSURE (SECONDARY FUEL FILTER)	Inspect	0.2				
		Service	0.3				
		Replace			0.8		1
		Repair	0.3	0.3	0.5		1
22	PIPING ASSEMBLY	Inspect			0.5		
		Test			1.0		1
		Replace			10.0		1
		Repair			0.5		1
23	ACCESSORIES SET	Inspect	0.3				
		Repair	0.3	0.1			

MAINTENANCE ALLOCATION CHART FOR TESTER (cont)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
2301	COUPLING, DRIVE	Inspect Repair	0.1 0.1	0.1				1	
2302	RING ASSEMBLY, ADAPTER	Inspect Repair	0.1 0.1	0.5				1	
2303	COUPLING, DRIVEN	Inspect Repair	0.1 0.1	0.5				1	
2304	LEVER ASSEMBLY	Inspect Repair	0.1 0.1	0.2				1	
2305	TEST SET, FUEL INJECTION	Inspect Repair	0.3 0.3	0.1					
230501	CONNECTOR SET	Inspect Repair	0.3 0.3	0.1					
24	ADAPTER KIT, AMERICAN BOSCH APE-6BB	Inspect Repair	0.3 0.3	0.1					
25	ADAPTER KIT, AMERICAN BOSCH PSB-6A AND PSB-6	Inspect Repair	0.3 0.3	0.1					
26	ADAPTER KIT, AMERICAN BOSCH PSB-12BT	Inspect Repair	0.3 0.3	0.1					
27	ADAPTER KIT, SIMMONDS SU	Inspect Repair	0.3 0.3	0.1					

28	ADAPTER KIT, INTERNATIONAL HARVESTER 3200	Inspect Repair	0.3 0.3	0.1	
29	ADAPTER KIT, AMERICAN BOSCH PSJ-6A	Inspect Repair	0.3 0.3	0.1	
30	ADAPTER KIT, CATERPILLAR	Inspect Repair	0.3 0.3	0.1	
31	ADAPTER KIT, ROOSA MASTER	Inspect Repair	0.3 0.3	0.1	
32	ADAPTER KIT, CUMMINS	Inspect Repair	0.3 0.3	0.1	
3201	AUXILIARY PANEL ASSEMBLY	Inspect Replace Repair	0.3 0.3 0.3	0.3 0.5	1 1

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR TESTER

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/ NATO STOCK NUMBER	TOOL NUMBER
1	C	TOOL KIT, GENERAL MECHANIC'S AUTOMOTIVE	5180-00-177-7033	...
2	H	MULTIMETER	6625-00-553-0142	TS352B/U

APPENDIX C  
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the tester. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. EXPLANATION OF COLUMN

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 cleaning compound, item 3, app C.").

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

- C ..... Operator/Crew
- O ..... Organizational Maintenance
- H ..... General 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 part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

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 SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	C	7930-00-269-1272	ABSORBENT MATERIAL, OIL AND WATER: P-A-1056 (81348) 50 lb (22.68 kg)	SK
2	H	5999-00-914-2318	CLAMP, ELECTRICAL: brass, 42332-2 (00779) 0.574 in. (1.458 cm)	EA
3	C	6850-00-224-6665	CLEANING COMPOUND, SOLVENT: MIL-C-11090 (81349) 5 gal. (18.93 l)	PL
4	H	5350-00-246-0330	CLOTH, ABRASIVE: type 1, class 1, P-C-451 (81348) 50 sheets	PK
5	H	5940-00-861-2566	CONDUCTOR, SPLICE: 321235 (00779)	EA
6	C	8010-00-298-2300	ENAMEL: high-gloss alkyd, gray (no. 16187), TT-E-489 (81348) 1 qt (0.95 l)	CN
7	C	9150-00-526-4205 9150-00-663-9795	GREASE, BALL AND ROLLER BEARING (BR): corrosion resistant, MIL-G-18709 (18349) 1 lb (0.45 kg) 5 lb (2.27 kg)	CN CN

8	O	9140-00-242-4750	KEROSENE: VV-K-220A (81348)	...
9	C	9150-00-189-6727	LUBRICATING OIL, ENGINE: SAE 10, MIL-L-2104 (81349) 1 qt (0.95 l)	CN
10	C	9150-00-068-9475	LUBRICATING OIL, ENGINE: SAE 20, HAVOLINE 20 (59595) 1 qt (0.95 l)	CN
11	C	9150-00-188-9858	LUBRICATING OIL, ENGINE: SAE 30, MIL-L-2104 (81349) 5 gal. (18.93 l)	PL
12	C	9150-00-231-6689	LUBRICATING OIL, GENERAL PURPOSE: corrosion and oxidation resistant, W-L-800 (81348) 1 qt (0.95 l)	CN
13	C	6850-00-974-3738	OIL, CALIBRATING: GULF 45A (81348) 55 gal. (208.20 l)	DR
14	C	7920-00-205-1711	RAG, WIPING: cotton, DDD-R-30 (81348) 50 lb (22.68 kg)	BE
15	H	4730-00-004-4265	SLEEVE, CLINCH, TUBE FITTING: MS51825-3 (96906) 0.250 in. (0.635 cm)	EA
16	H	4730-00-800-3129	SLEEVE, CLINCH, TUBE FITTING: MS51825-5P (96906) 0.375 in. (0.953 cm)	EA
17	H	4730-00-146-0333	SLEEVE, CLINCH, TUBE FITTING: MS51825-7 (96906) 0.625 in. (1.588 cm)	EA



## EXPENDABLE SUPPLIES AND MATERIALS LIST (cont)

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
18	H	3943-00-006-7764	SOLDER: QQ-S-571 (81348)	LB
19	H	5970-00-644-3167	TAPE, INSULATION, ELECTRICAL: 895-75 (44940) 0.750 in. (1.905 cm)	FT
20	C	7510-00-266-5016	TAPE, PRESSURE SENSITIVE ADHESIVE: olive drab, type 4, class 1, PPP-T-60 (81348) 2 in. x 60 yd (5.08 cm x 54.86 m)	FT
21	H	5240-00-283-5280	TERMINAL, LUG: for 14 AWG wire MS25036-106 (96906)	EA
22	H	5240-00-557-1629	TERMINAL, LUG: for 18 AWG wire MS25036-149 (96906)	EA
23	H	5940-00-815-4809	TERMINAL, LUG: for 14 AWG wire 32959 (00779)	EA
24	H	5940-00-711-4568	TERMINAL, LUG: for 14 AWG wire 34823 (00779)	EA
25	H	6145-00-942-4657	WIRE, ELECTRICAL: copper stranded, single conductor, 14 AWG, black, THW-06-F-1/14-T-UJ-O (81348)	FT
26	H	6145-00-727-6561	WIRE, ELECTRICAL: copper stranded, single conductor, 14 AWG, blue, THW06CF1-14TUJ6 (81348)	FT

27	H	6145-00-435-9221	WIRE, ELECTRICAL: copper stranded, single conductor, 14 AWG, green, 14AWG7AP06101GRNTYPETHW (14013)	FT
28	H	6145-00-059-5765	WIRE, ELECTRICAL: copper stranded, single conductor, 14 AWG, red, THW06CF1-14TUJ2 (81348)	FT
29	H	6145-00-435 9222	WIRE, ELECTRICAL: copper stranded, single conductor, 14 AWG, white, 14AWG7AP06101WHTTYPETHW (14013)	FT
30	H	6145-00-150-5020	WIRE, ELECTRICAL: copper stranded, single conductor, 14 AWG, yellow, THW06CF1/14TUJ4 (81348)	FT
31	H	6145-00-067-6418	WIRE, ELECTRICAL: copper stranded, single conductor, 18 AWG, black, NAS702-80205 (80205)	FT
32	H	6145-00-964-8859	WIRE, ELECTRICAL: copper stranded, single conductor, 18 AWG, blue, NAS702-80205 (80205)	FT
33	H	6145-00-059-5773	WIRE, ELECTRICAL: copper stranded, single conductor, 8 AWG, black, THW06CF1-8TUJO (81348)	FT
34	H	6145-00-847-2323	WIRE, ELECTRICAL: copper stranded, single conductor, 8 AWG, red, RSE13329AJTMRED (90484)	FT
35	H	6145-00-050-7393	WIRE, ELECTRICAL: copper stranded, single conductor, 8 AWG, white, J-C-30THW06CF1/8TUJ9 (81348)	FT

**APPENDIX D  
ILLUSTRATED LIST OF MANUFACTURED ITEMS**

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**D-1. INTRODUCTION**

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

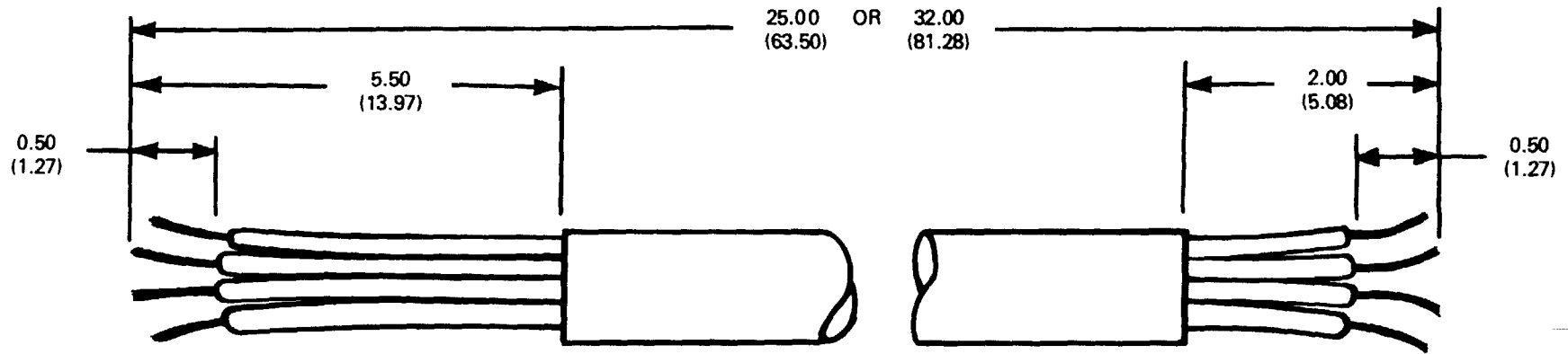
a. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.

b. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

**D-2. MANUFACTURED ITEMS PART NUMBER INDEX**

<b>Part No.</b>	<b>Figure No.</b>
MIL-C-5756B .....	1
11020254-5 .....	2
11020292 .....	4
11020491-5 .....	3

D-3. MANUFACTURED ITEMS INSTRUCTIONS



ARR 81-1836

Figure 1. Neoprene cable (part no. MIL-C-5756B).

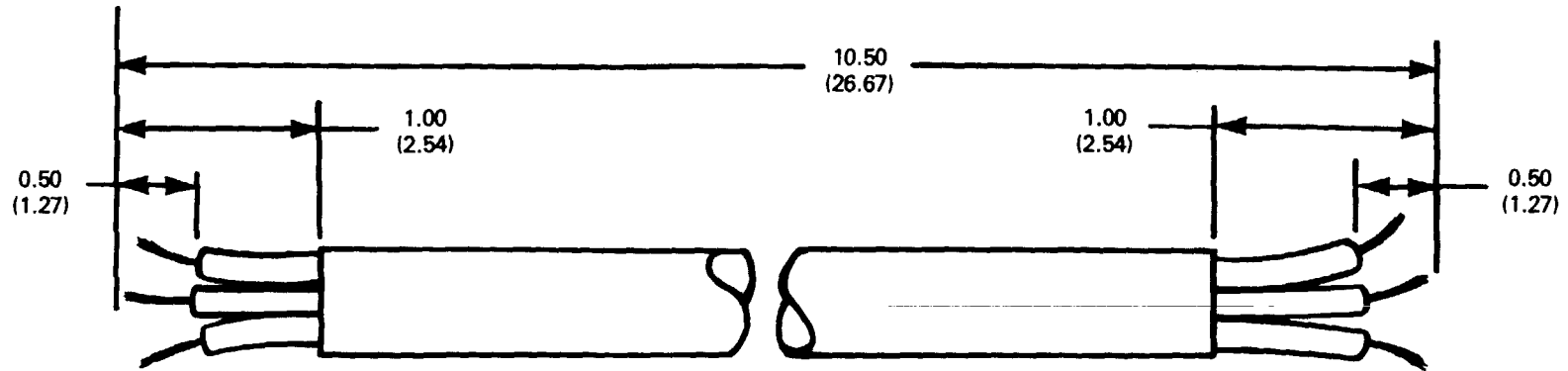
**NOTE**

All dimensions shown are in inches with the metric conversion to centimeters in parenthesis. Tolerance on 25.00 in. (63.50 cm) or 32.00 in. (81.28 cm) is +0.50 in. (+ 1.27 cm). Tolerance for all remaining dimensions is + 0.125 in. ( $\pm$  0.317 cm).

**NOTES:**

1. Fabricate from NSN 6145-00-5481106 stock.
2. Neoprene cable contains one black, one white, one red, and one green insulated wire that is 14 AWG.
3. The 25.00 in. (63.50 cm) length is required for the lube tank assembly cable.
4. The 32.00 in. (81.28 cm) length is required for the fuel tank assembly cable.
5. Strip sheathing from both ends of neoprene cable as illustrated.
6. Strip insulation from all four wire ends as illustrated.

## D-3. MANUFACTURED ITEMS INSTRUCTIONS (cont)



ARR 81-1837

Figure 2. Neoprene cable (part no. 11020254-5).

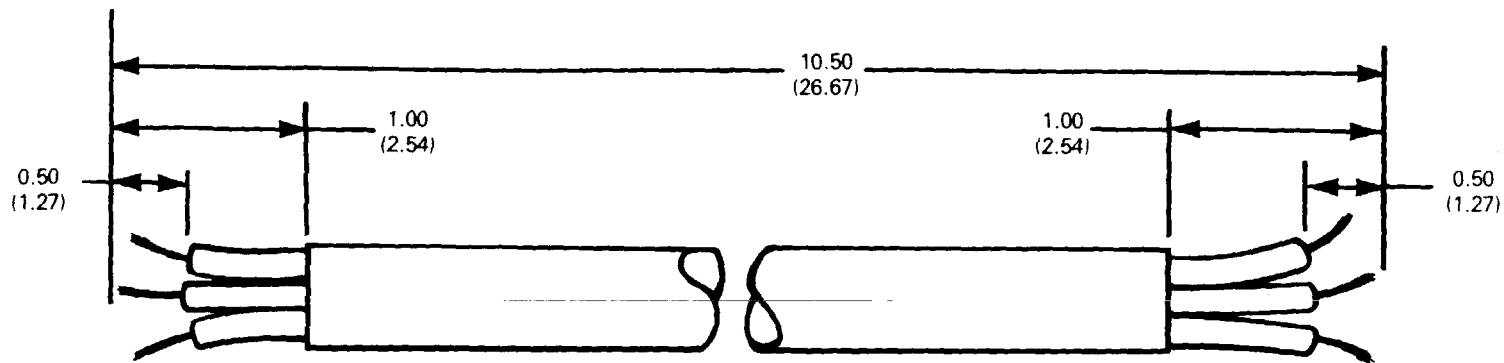
**NOTE**

All dimensions shown are in inches with the metric conversion to centimeters in parenthesis. Tolerance on 10.50 in. (26.67 cm) is +0.50 in. (+1.27 cm). Tolerance for all remaining dimensions is  $\pm 0.125$  in. ( $\pm 0.317$  cm).

**NOTES:**

1. Fabricate from NSN 6145-00-9355242 stock.
2. Neoprene cable contains one black, one white, and one green insulated wire that is 14 AWG.
3. Strip sheathing from both ends of neoprene cable as illustrated.
4. Strip insulation from all three wire ends as illustrated.

## D-3. MANUFACTURED ITEMS INSTRUCTIONS (cont)



ARR 81-1838

Figure 3. Neoprene cable (part no. 11020491-5).

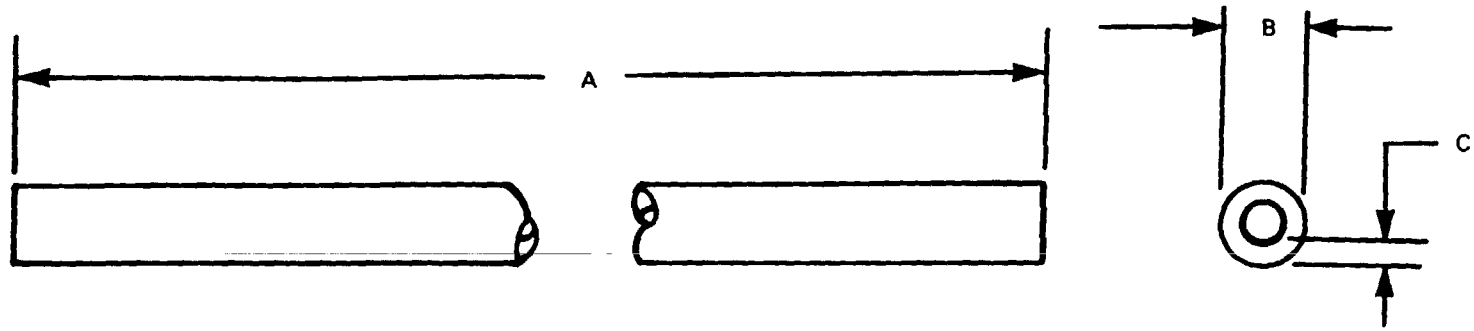
**NOTE**

All dimensions shown are in inches with the metric conversion to centimeters in parenthesis. Tolerance on 10.50 in. (26.67 cm) is +0.50 in. (+ 1.27 cm). Tolerance for all remaining dimensions is  $\pm 0.125$  in. ( $\pm 0.317$  cm).

**NOTES:**

1. Fabricate from NSN 614500-935-5242 stock.
2. Neoprene cable contains one black, one white, and one green insulated wire that is 14 AWG.
3. Strip sheathing from both ends of neoprene cable as illustrated.
4. Strip insulation from all three wire ends as illustrated.

D-3. MANUFACTURED ITEMS INSTRUCTIONS (cont)



ARR 81-1839

**NOTE**  
Refer to chart on pages D-8 and 9 for all the A, B, and C dimensions.

Figure 4. Copper tubing (part no. 11O20292).



**NOTE**

Tolerances on A dimension are the following: up to 6.00-in. (15.24-cm) length is +0.03 in. (+0.076 cm); 6.00to 24-in. (15.24to 60.96-cm) length is +0.06 in. (+ 0.152 cm); and 24to 72-in. (60.96to 182.88-cm) length is + 0.09 in. (+0.228 cm).

Tolerance on B dimension is + 0.002 in. ( $\pm 0.005$  cm).

Tolerance on C dimension is +0.003 in. ( $\pm 0.007$  cm).

**NOTES:**

1. Fabricate 0.250-in. (0.635-cm) outer diameter copper tubing from NSN 4710-00-203-3171 stock.
2. Fabricate 0.375in. (0.953-cm) outer diameter copper tubing from NSN 4710-00-203-3172 stock.
3. Fabricate 0.625-in. (1.588-cm) outer diameter copper tubing from NSN 4710-00-203-3174 stock.
4. Copper tubing shall be dehydrated and sealed extra soft, deoxidized, and bright annealed.
5. Bends in copper tubing will be done at installation using existing copper tubing as template.

**NOTE**

**Nuts and clinch sleeves (items 15, 16, and 17, app C) are not part of the copper tubings. Nuts are part of the components to which the copper tubings are connected.**

6. Install clinch sleeves and nuts at installation, refer to page 6-566.

**D-3. MANUFACTURED ITEMS INSTRUCTIONS (cont)**

PART NUMBER	A		B		C	
	IN.	CM	IN.	CM	IN.	CM
11020292-1	43.00	109.22	0.250	0.635	0.030	0.076
11020292-2	47.25	120.02	0.250	0.635	0.030	0.076
11020292-3	31.00	78.74	0.250	0.635	0.030	0.076
11020292-4	17.00	43.18	0.250	0.635	0.030	0.076
11020292-5	6.50	16.51	0.250	0.635	0.030	0.076
11020292-6	9.50	24.13	0.250	0.635	0.030	0.076
11020292-7	2.00	5.08	0.250	0.635	0.030	0.076
11020292-8	11.00	27.94	0.250	0.635	0.030	0.076
11020292-9	9.62	24.43	0.250	0.635	0.030	0.076
11020292-10	9.25	23.50	0.250	0.635	0.030	0.076
11020292-11	8.00	20.32	0.250	0.635	0.030	0.076
11020292-12	34.00	86.36	0.250	0.635	0.030	0.076
11020292-13	8.25	20.96	0.250	0.635	0.030	0.076
11020292-14	42.00	106.68	0.250	0.635	0.030	0.076
11020292-15	26.50	67.31	0.250	0.635	0.030	0.076
11020292-16	42.00	106.68	0.250	0.635	0.030	0.076
11020292-17	26.00	66.04	0.250	0.635	0.030	0.076

11020292-18	45.00	114.30	0.375	0.953	0.032	0.081
11020292-19	36.00	91.44	0.375	0.953	0.032	0.081
11020292-20	21.00	53.34	0.375	0.953	0.032	0.081
11020292-21	26.00	66.04	0.375	0.953	0.032	0.081
11020292-22	48.00	121.92	0.375	0.953	0.032	0.081
11020292-23	44.50	113.03	0.625	1.588	0.035	0.089
11020292-24	24.00	60.96	0.625	1.588	0.035	0.089
11020292-25	34.00	86.36	0.625	1.588	0.035	0.089
11020292-26	30.00	76.20	0.625	1.588	0.035	0.089
11020292-27	18.00	45.72	0.625	1.588	0.035	0.089
11020292-28	46.00	116.84	0.625	1.588	0.035	0.089

D-9/(D-10 blank)

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\*OP - Operator  
 ORG - Organizational  
 GS - General Support

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\*OP - Operator  
 ORG - Organizational  
 GS - General Support

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**\*OP - Operator**  
**ORG - Organizational**  
**GS - General Support**



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By Order of the Secretary of the Army

E. C. MEYER  
*General, United States Army*  
*Chief of Staff*

Official:

ROBERT M. JOYCE  
*Brigadier General, United States Army*  
*The Adjutant General*

DISTRIBUTION:

To be distributed in accordance with DA Form 12-25A, Operator Maintenance Requirements for Shop Equipment, Miscellaneous.



## 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 decigrams = .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 milliliters = .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
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PIN: 051332-000