

TECHNICAL MANUAL

ORGANIZATIONAL  
TROUBLESHOOTING

VOLUME II - PART 2

TURRET  
FOR  
COMBAT ENGINEER VEHICLE,  
M728  
(2350-00-795-1797)

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CHAPTER 4 (CONT)

TURRET FAULT  
ISOLATION DIAGRAMS

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CHAPTER 5

FIRE CONTROL  
FAULT ISOLATION  
DIAGRAMS

5-1

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CHAPTER 6

CBR FAULT ISOLATION  
DIAGRAMS

6-1

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CHAPTER 7

LIGHTING FAULT  
ISOLATION DIAGRAMS

7-1

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FOLDOUTS

EQUIPMENT LOCATION  
INFORMATION AND  
SCHEMATICS

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This copy is a reprint which includes current  
pages from Changes 1 and 2

**WARNING**

**BE CAREFUL: CARBON MONOXIDE IS A GAS THAT CAN KILL YOU.**

Carbon monoxide is generated when something gets hot or burns - such as heaters, engines, etc. To keep carbon monoxide from making anyone sick or drowsy, there must be plenty of fresh air in the place where the heating or burning takes place. This gas has no color and no smell, but it is deadly poisonous. It can damage your brain, or kill you, if you do not have enough fresh air coming in to push the carbon monoxide out.

Follow these rules to keep from getting poisoned:

1. Do not operate engine or heater inside a building unless there is plenty of fresh air coming in.
2. Do not idle an engine unless you are sure there is plenty of fresh air in personnel compartments.
3. Do not drive a vehicle which has missing inspection plates, cover plates, or engine compartment doors except for very short maintenance times when necessary.
4. When operating vehicle, always be on the lookout for personnel who seem to be getting sick or drowsy. If you notice this happening, immediately get fresh air into personnel compartments. If this does not help, remove sick or drowsy personnel from vehicle and do the following:
  - a. Put him into fresh air.
  - b. Keep him covered.
  - c. Keep him still. Do not let him exercise. (Exercise will make him worse)
  - d. Give him artificial respiration, if necessary.
  - e. Get medical help.

CHANGE  
NO. 2

**HEADQUARTERS**  
**DEPARTMENT OF THE ARMY**  
WASHINGTON, DC, 22 May 1986

**TECHNICAL MANUAL**  
**ORGANIZATIONAL TROUBLESHOOTING**  
**VOLUME II-PART 2**  
**TURRET**  
**FOR**  
**COMBAT ENGINEER VEHICLE,**  
**M728**  
**(2350-00-795-1797)**

TM 9-2350-222-20-2-2-2, 15 September 1980, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.

Remove Pages

4-155 thru 4-182

Insert Pages

4-155 thru 4-181/(4-182 blank)

File this change sheet in back of the publication for reference purposes.

**By Order of the Secretary of the Army:**

**JOHN A. WICKHAM, JR.**  
*General, United States Army*  
*chief of staff*

**Official:**

**R. L. DILWORTH**  
*Brigadier General, United States Army*  
*The Adjutant General*

**DISTRIBUTION:**

To be distributed in accordance with DA Form 12-37, Organizational maintenance requirements for Vehicle, Combat Engineer, Full Tracked M728.



**CHANGE**

**No. 1**

**HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D C**

**14 February 1986**

**Technical Manual**

**ORGANIZATIONAL TROUBLESHOOTING**

**VOLUME II - PART 2**

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**FOR**

**COMBAT ENGINEER VEHICLE ,**

**M728**

**(2350-00-795-1797)**

TM 9-2350-222-20-2-2-2, 15 September 1980, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed material is indicated by a vertical bar in the margin of the page.

**REMOVE PAGES**

A/(B blank )  
I and II  
4-79 and 4-80  
4-85 and 4-86  
4-91 and 4-92  
4-99 and 4-100  
4-107 thru 4-110  
4-113 and 4-114  
4-139 thru 4-142  
NONE  
5-57 and 5-58  
5-61 and 5-62  
5-65 thru 5-100  
NONE

**INSERT PAGES**

NONE  
i and ii  
4-79 and 4-80  
4-85 and 4-86  
4-91 and 4-92  
4-99 and 4-100  
4-107 thru 4-110  
4-113 and 4-114  
4-139 thru 4-142  
4-142.1 thru 4-142 .7/(4-142.8 blank)  
5-57 and 5-58  
5-61 and 5-62  
5-65 thru 5-100  
7-49 thru 7-86

3. .File this change sheet in back of the publication for reference purposes.

By Order of the Secretary of the Army:

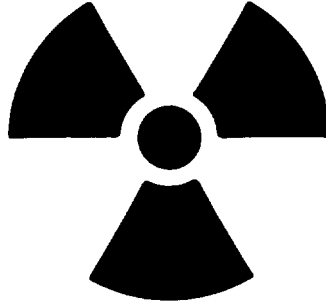
JOHN A. WICKHAM, JR.  
*General, United States Army*  
*Chief of Staff*

Official:

MILDRED E. HEDBERG  
*Brigadier General, United States Army*  
*The Adjutant General*

DISTRIBUTION:

To be distributed in accordance with DA Form 12-37, Organizational maintenance requirements for Vehicle, Combat Engineer, Full Tracked, M728.

**WARNING****WARNING  
RADIATION HAZARD**

Azimuth dial pointers in indicator may be tipped with radioactive material. This becomes dangerous when dial window is broken or removed. When this happens, make repairs as soon as possible.

If dial window is broken or removed, all maintenance must be done at depot level only, except replacement of lamps or replacement of whole indicator unit.

Protecting, handling, storing, and getting rid of radioactive material must be done in accordance with TB MED-232 and TB 750-237.

**WARNING**

When placing the turret (elev/trav) power switch in the ON position, ensure that the gunner's power control handles are not displaced. If handles are displaced, rapid movements of the turret traverse in azimuth may result in fatal injury.

**WARNING**

When turret is in the power mode the gun will elevate and depress without depressing the magnetic brake switch on the gunner's control handles.

**WARNING**

Assure crew are in safe positions and driver has lowered his seat and has head down before operating in power or manual traversing or elevating modes.

**WARNING**

Do not release magnetic brake switch or override in magnetic brake actuator while traversing until gunner's or commander's power control is returned to neutral position. This will reduce unnecessary wear and/or damage to magnetic brake.

**WARNING**

To prevent injury to personnel, remove all ammunition from weapons before start of troubleshooting.

**WARNING**

Before traversing turret or elevating/depressing gun check outside of tank and surrounding area for unwary personnel. Make sure crew members are in safe positions and driver has lowered his seat and has his head down.

**WARNING**

Manual traversing handle may spin when power is turned on. Stay out of path of manual traversing handle.

**WARNING**

Use safety gloves when handling wire-rope staylines and winch cables.

**WARNING**

To prevent injury to personnel, stay clear of boom cable swing area.

**WARNING**

If not latched, breech operating handle will spring up violently when breech is closed.

Technical Manual  
No. 9-2350-222-20-2-2-2

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, D.C., 15 September 1980

**Technical Manual**  
**Organizational Troubleshooting**

**Volume II - Part 2**

**TURRET**  
**FOR**  
**COMBAT ENGINEER VEHICLE,**  
**M728**  
**(2350-00-795-1797)**

**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 Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, US Army Armament, Munitions and Chemical Command, ATTN: AMSMC-MAS, Rock Island, IL 6129943000. A reply will be furnished to you.

\*This manual in conjunction with TM 9-2350-222-20-2-1, TM 9-2350-222-20-2-2-1, TM 9-2350-222-20-2-2-2, TM 9-2350-22-24-1, TM 9-2350-222-20-2 -3-2 supersedes the turret portion of TM 9-2350-222-20, September 1965, including all changes.

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**4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 1 OF 78)**

**SYMPTOM:** (15) Electric Drive (DC) Motor fails to run  
 (16) Electric Drive (DC) Motor makes excessive noise  
 (17 ) Electric Drive (DC) Motor runs continuously  
 (18 ) Incorrect accumulator gage pressure  
 (25 ) Main gun fails to elevate/depress with Manual Elevation Hand Pump  
 (26 ) Main gun fails to elevate/depress with Gunner's Handle  
 (27 ) Main gun fails to elevate/depress with Commander's Handle  
 (28 ) Main gun creeps or elevates/depresses without palm switch pressed  
 (29 ) Main gun oscillates or drives errtically.

**TEST EQUIPMENT** Multimeter

**PERSONNEL:** Two

<b>UNIT LOCATION:</b>	<b>FOLDOUT</b>	<b>CALLOUT</b>
Master Control Panel	4	4
Gunner's Control Box	1	2
Gunner's Control Handle	1	19
Commander's Control Handle	2	12
Equilibrator Pressure Gage	1	6
Turret Power and Searchlight Relay Box	1	9
Pressure Switch	1	11
Elevating Mechanism	3	8
Equilibrator Charging Assembly	1	7
Hydraulic Power Pack	1	10
Pressure Gage	1	18
Hand Traverse Drive	1	3
Manual Elevation Hand Pump	1	13

**REFERENCES:** (1) TM 9-2350-222 -20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to: Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedure to:  
 Lock and release turret traversing lock

**EQUIPMENT CONDITION:** Vehicle parked, power off.

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 2 OF 78)

— WARNING —  
DO NOT TRAVERSE  
TURRET OR ELEVATE  
GUN WITHOUT AN  
ASSISTANT TO WARN  
PERSONNEL IN THE  
AREA OF POTENTIAL  
SAFETY HAZARDS

NOTE  
DON'T OPERATE THE  
ELECTRICALLY  
DRIVEN PUMP FOR  
LONG PERIODS OF  
TIME. YOU WILL  
RUN DOWN THE  
BATTERIES

MAKE SURE THAT  
HYDRAULIC SYSTEM  
HAS NO EVIDENCE  
OF OIL LEAKAGE

RELEASE GUN  
TRAVEL LOCK  
(TM-10)

RELEASE TURRET  
TRAVERSING LOCK  
(TM-10)

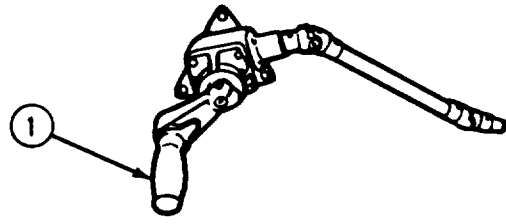
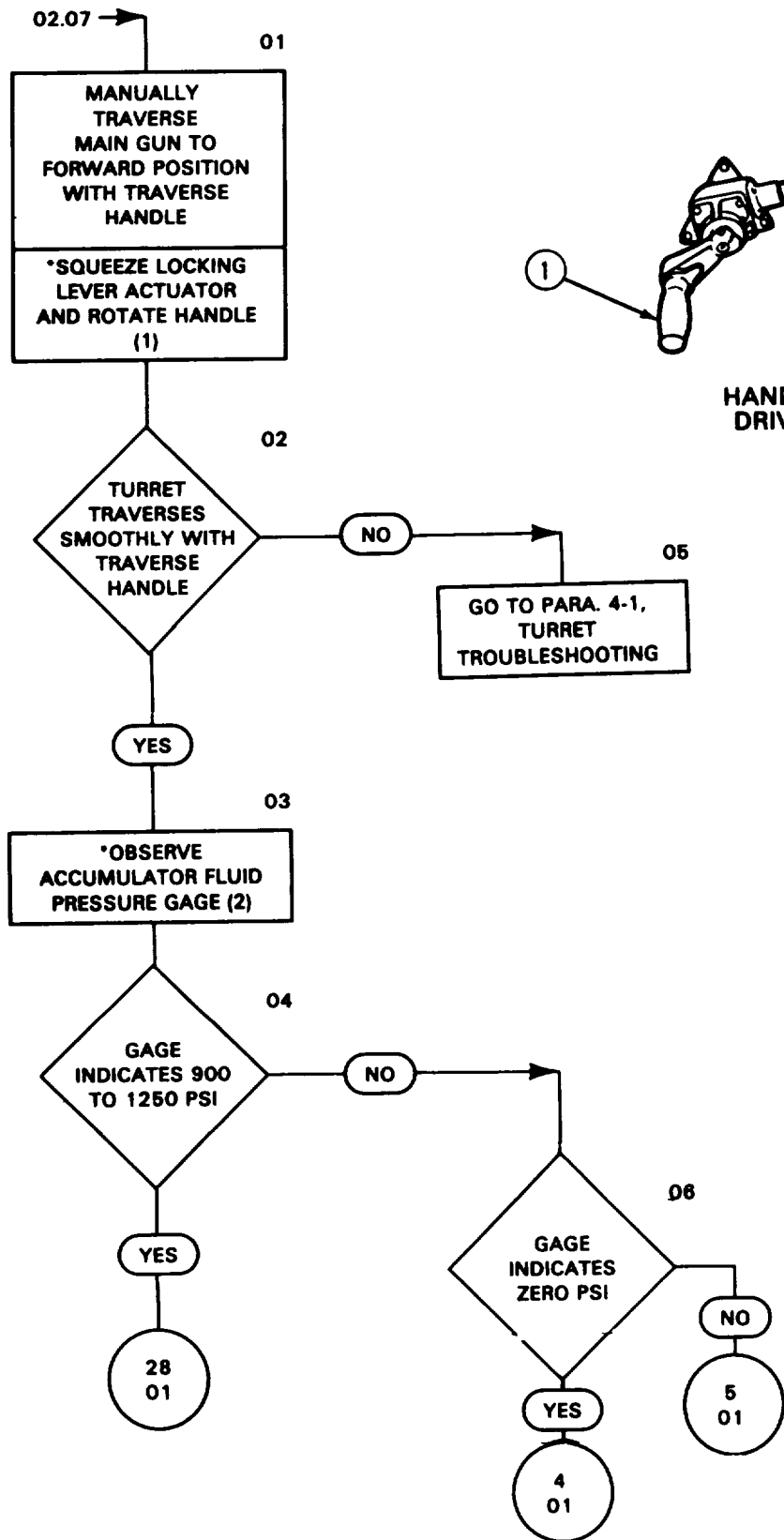
- WARNING -  
MAKE SURE CREW  
MEMBERS ARE IN  
SAFE POSITIONS  
AND DRIVER HAS  
LOWERED HIS SEAT  
AND HAS HEAD DOWN  
BEFORE OPERATING  
MANUAL TRAVERSING  
OR ELEVATING  
HANDLES

CAUTION  
DEFLATE HULL  
TURRET SEAL TO 0  
PSI (TM-10)

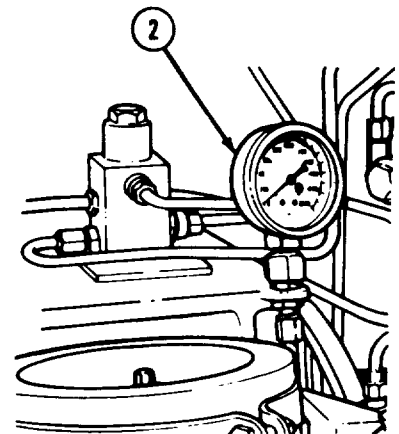
+ 3.01



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 3 OF 78)

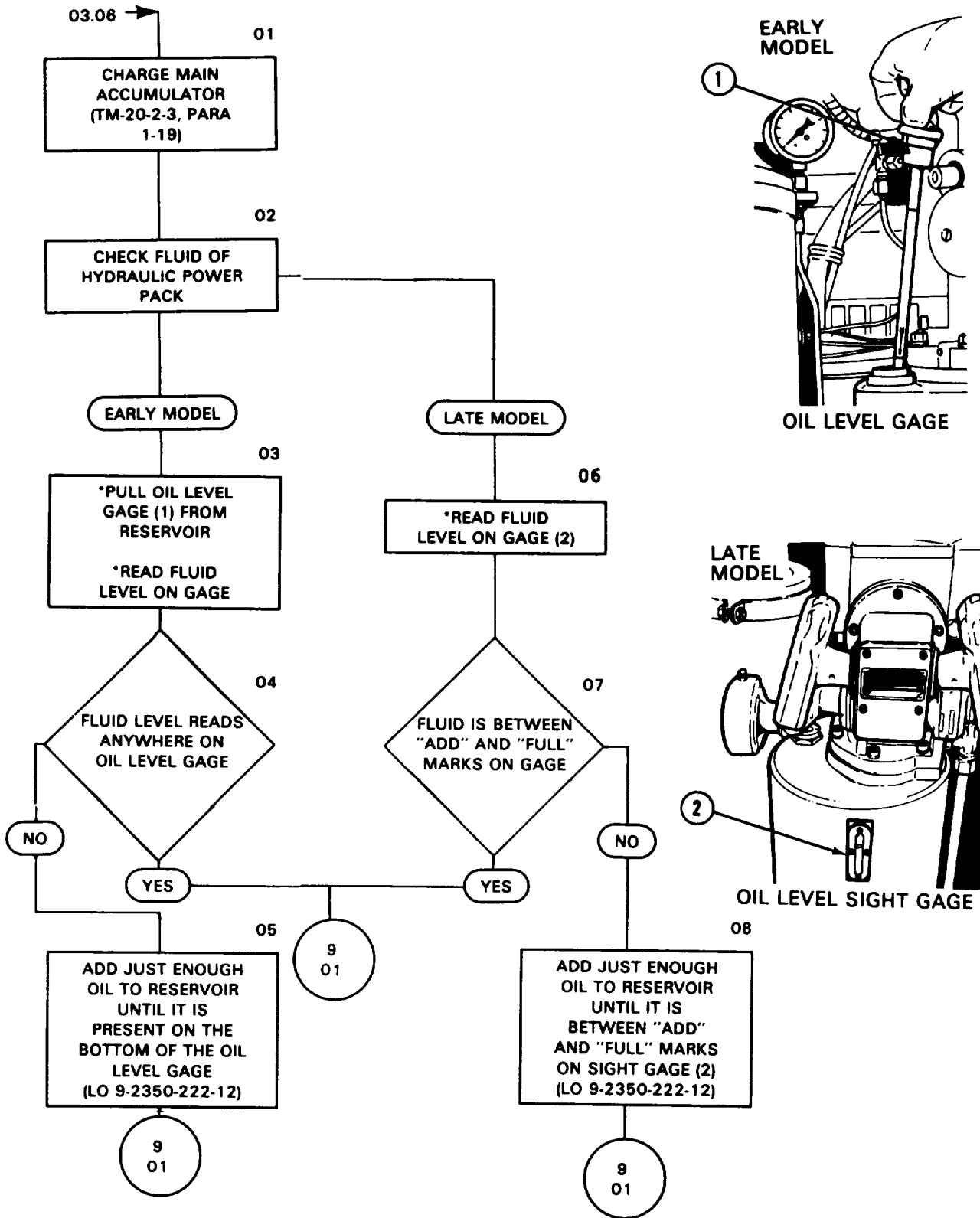


HAND TRAVERSING  
DRIVE ASSEMBLY



PRESSURE GAGE

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 4 OF 78)



4.2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 5 OF 78)

03.06 →

01

MANUALLY ELEVATE OR DEPRESS MAIN GUN TO LEVEL POSITION BY TURNING THE MANUAL ELEVATION PUMP HANDLE (1)

02

**CAUTION**

ENGAGE TURRET TRAVERSING LOCK BEFORE REDUCING HYDRAULIC PRESSURE TO ZERO TO PREVENT DAMAGE TO THE PIN LOCK (TM-10)

03

• ENGAGE TURRET TRAVERSING LOCK

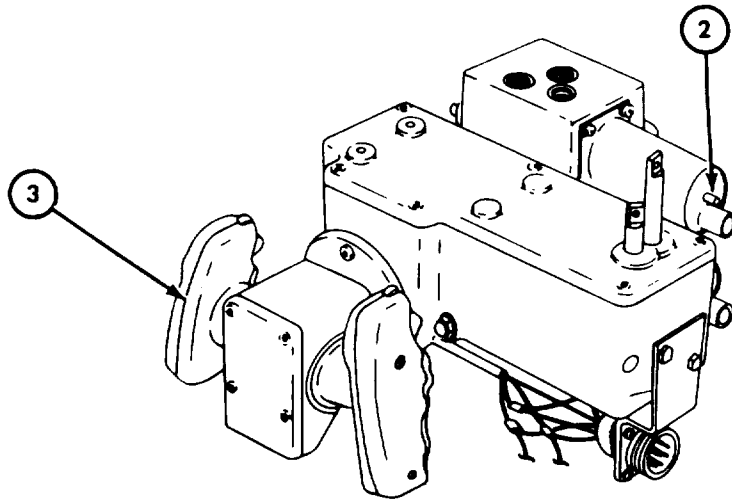
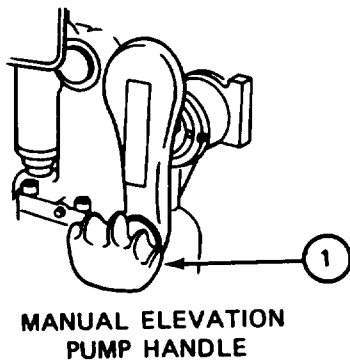
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REDUCE HYDRAULIC PRESSURE TO ZERO

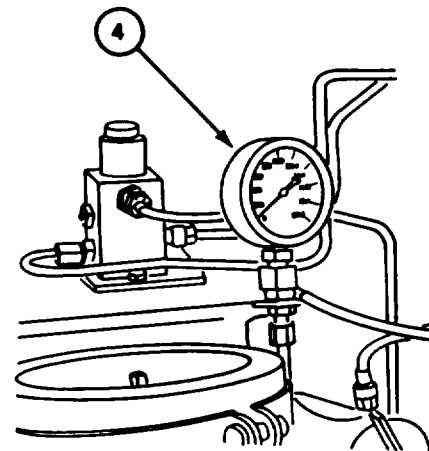
• PRESS AND HOLD POWER SOLENOID PLUNGER (2) IN

• SLOWLY ELEVATE GUNNER'S HANDLE (3)

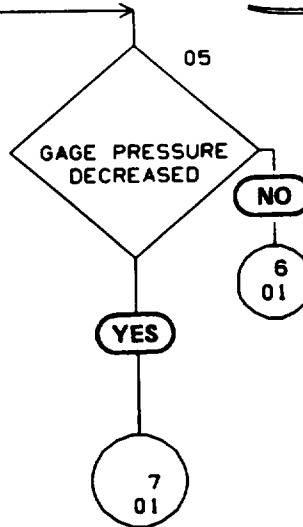
• OBSERVE ACCUMULATOR FLUID PRESSURE GAGE (4)



GUNNER'S CONTROL ASSEMBLY



PRESSURE GAGE



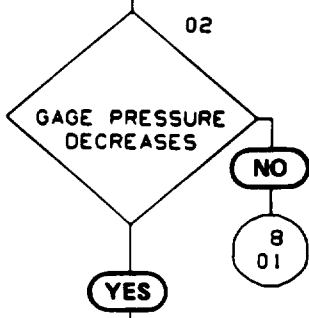
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 6 OF 78)

05.05 →

01

• STILL HOLDING POWER SOLENOID PLUNGER (1) IN, SLOWLY ELEVATE OR DEPRESS COMMANDER'S HANDLE (2)

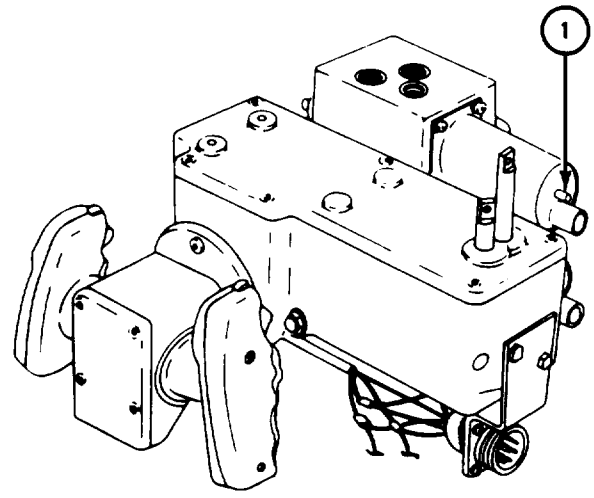
• OBSERVE ACCUMULATOR FLUID PRESSURE GAGE (3)



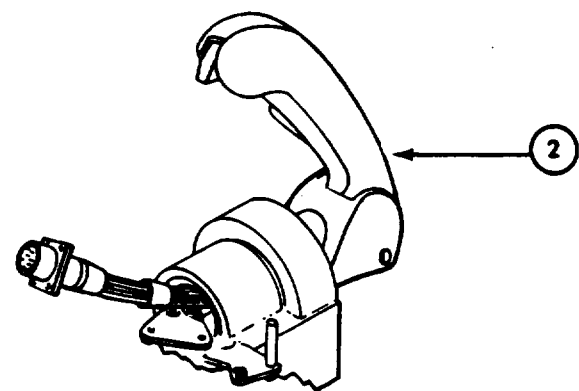
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DEFECTIVE GUNNER'S CONTROL ASSEMBLY

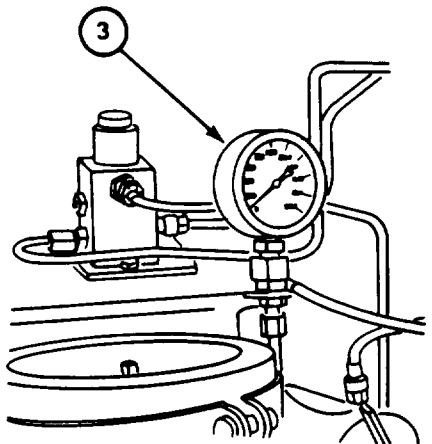
• REMOVE AND REPLACE GUNNER'S CONTROL ASSEMBLY (TM-20-2-3, PARA 37-18, 37-19)



GUNNER'S CONTROL ASSEMBLY

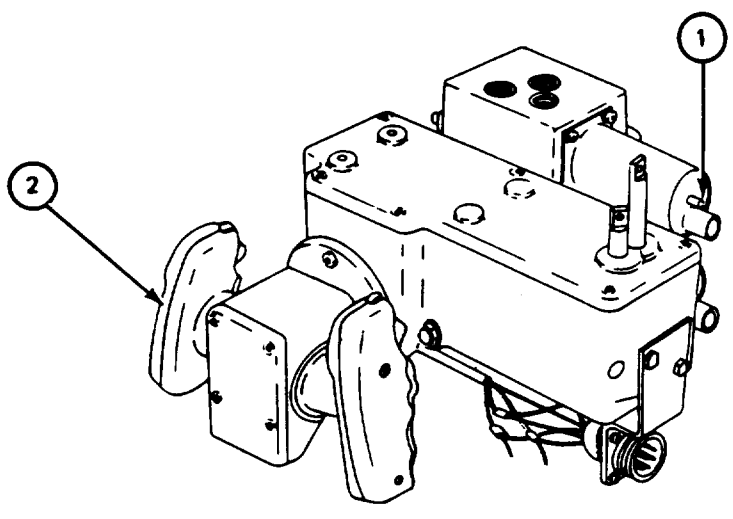
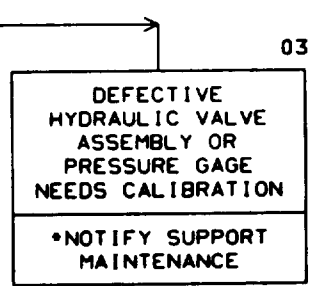
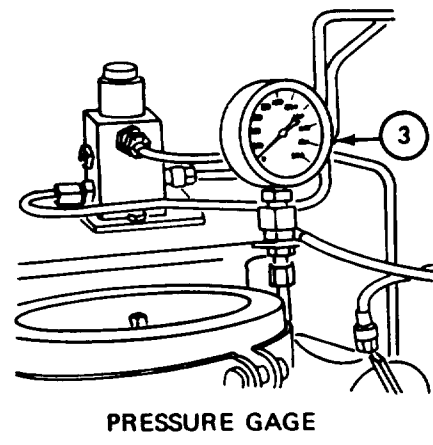
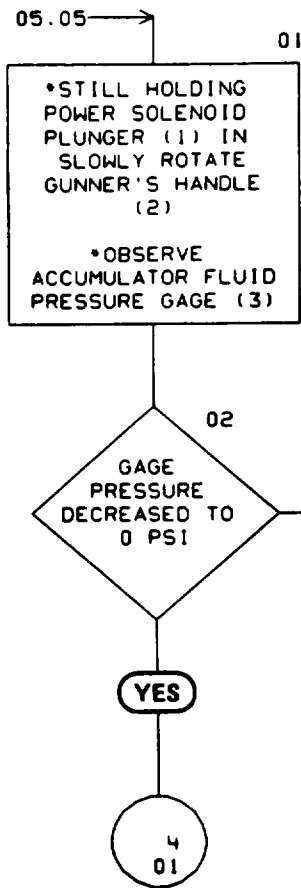


COMMANDER'S CONTROL HANDLE



PRESSURE GAGE

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 7 OF 78)



GUNNER'S CONTROL ASSEMBLY

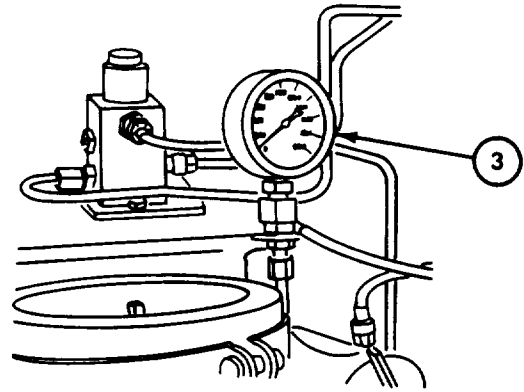
4.2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 8 OF 78)

06.02 →

01

\*STILL HOLDING  
POWER SOLENOID  
PLUNGER (1) IN,  
SLOWLY ROTATE  
GUNNER'S HANDLE  
(2)

\*OBSERVE  
ACCUMULATOR  
PRESSURE GAGE (3)



PRESSURE GAGE

02

GAGE PRESSURE  
DECREASES

NO

04

DEFECTIVE  
HYDRAULIC VALVE  
ASSEMBLY

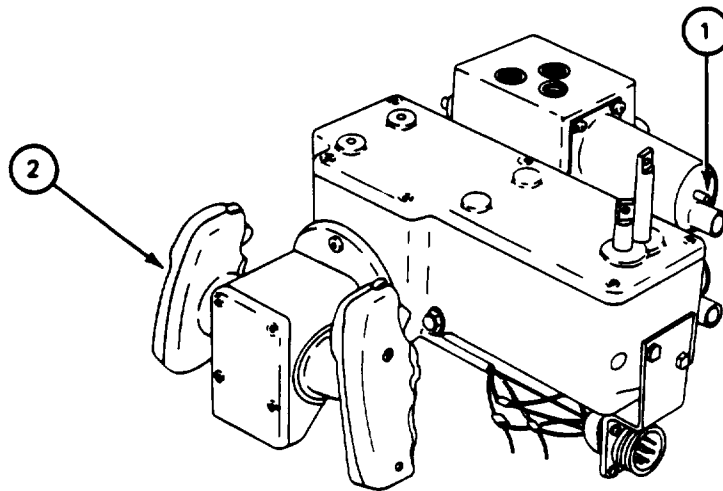
\*NOTIFY SUPPORT  
MAINTENANCE

YES

03

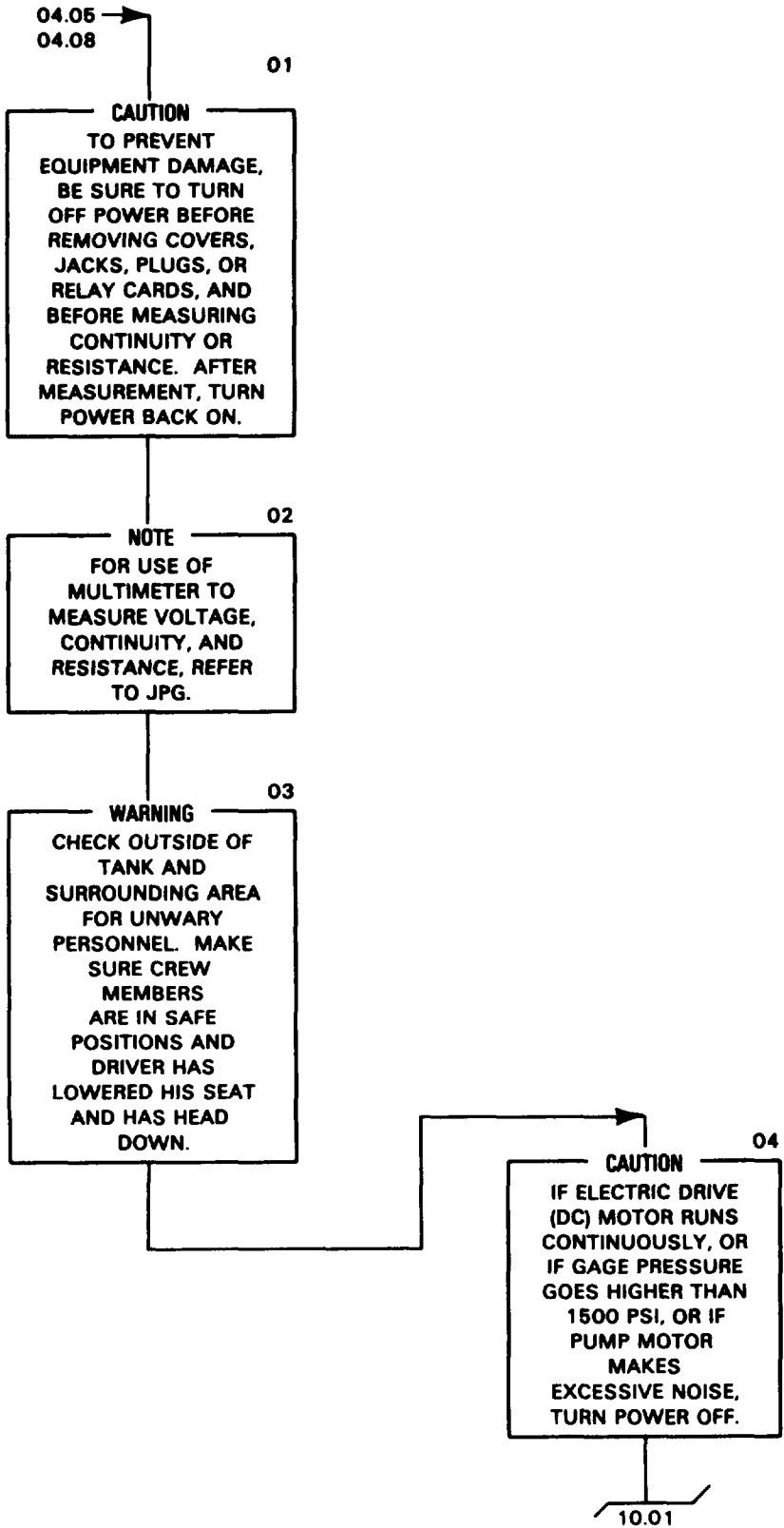
DEFECTIVE  
GUNNER'S CONTROL  
ASSEMBLY

\*REMOVE AND  
REPLACE GUNNER'S  
CONTROL ASSEMBLY  
(TM-20-2-3, PARA  
37-18, 37-19)

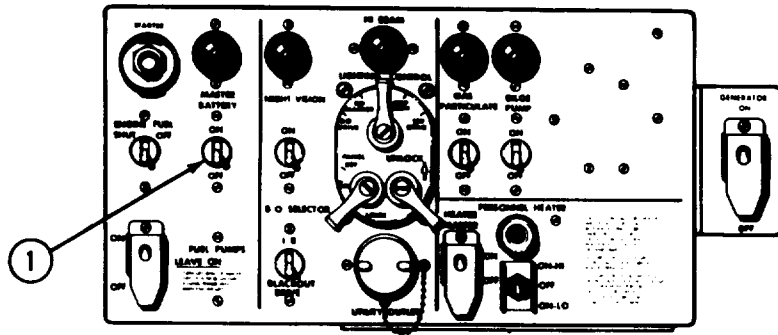
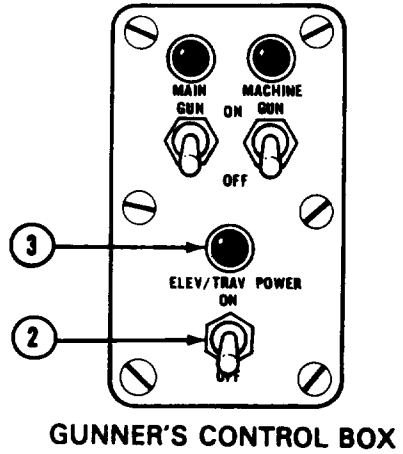
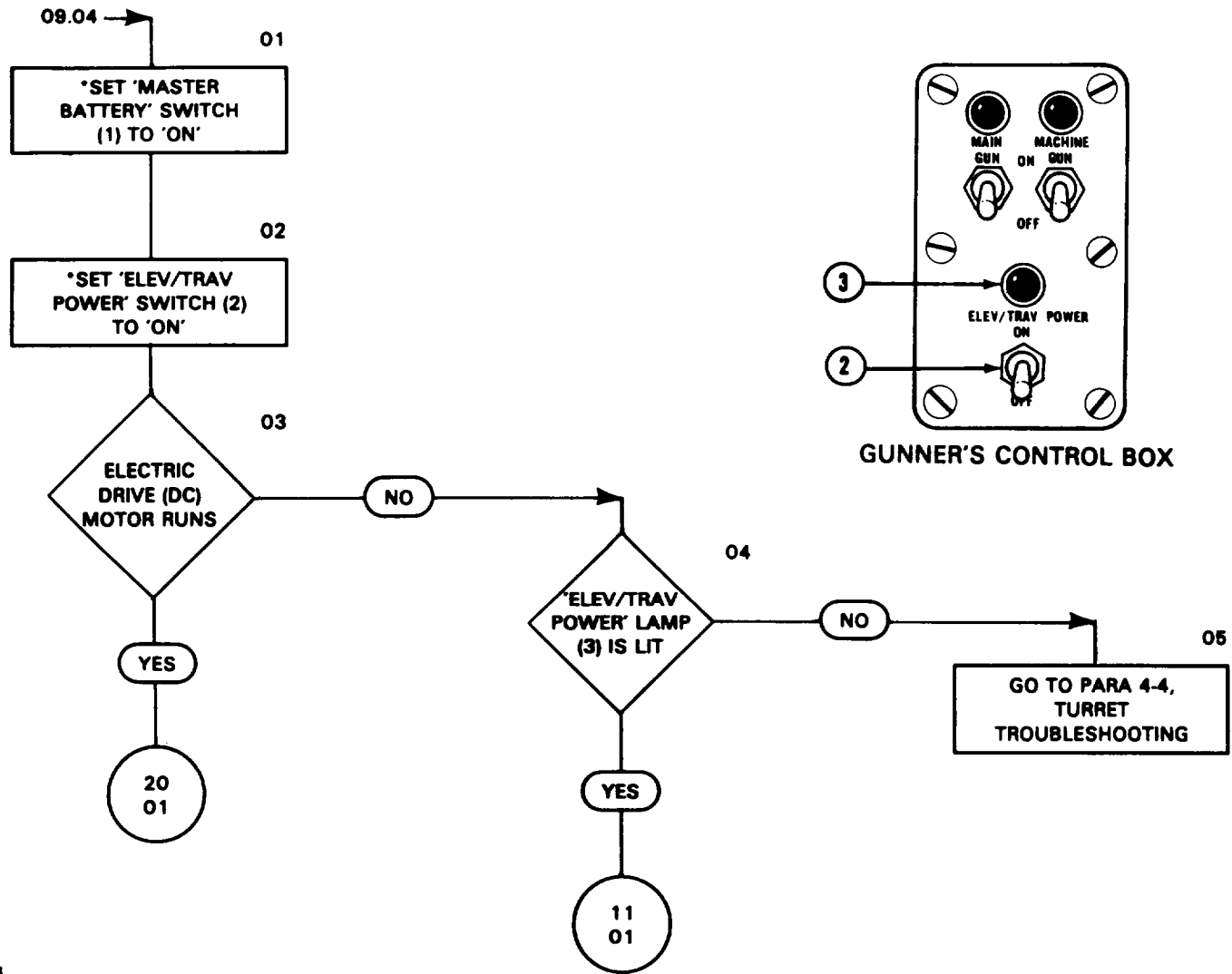


GUNNER'S CONTROL ASSEMBLY

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 9 OF 78)



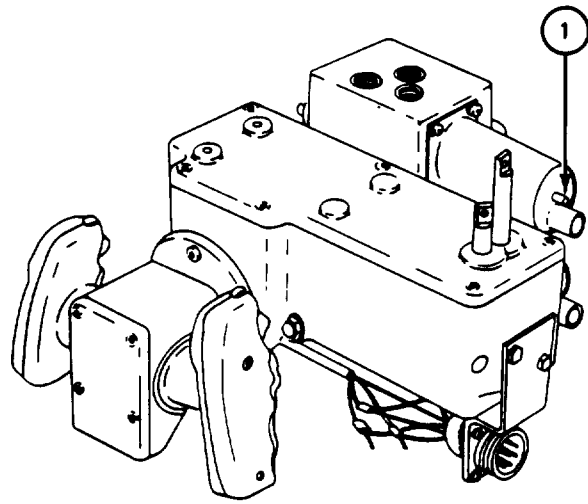
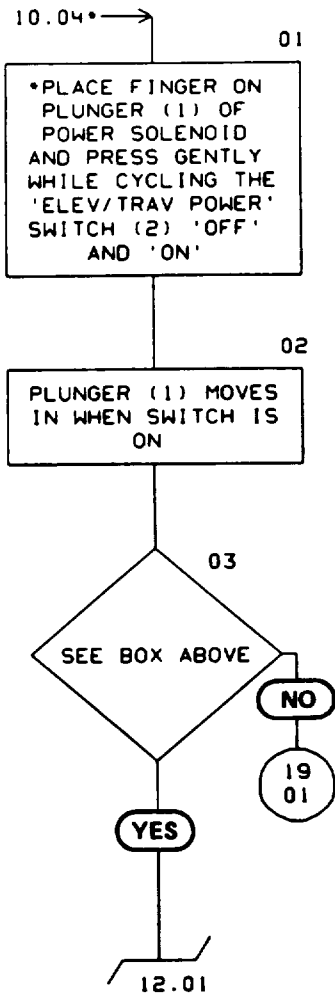
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 10 OF 78)



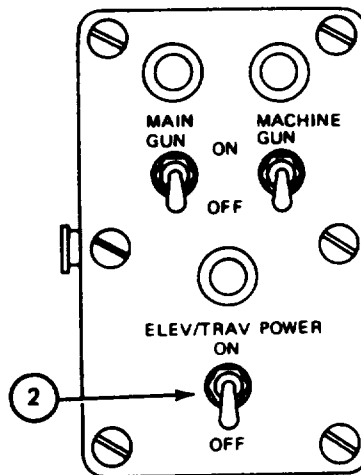
MASTER CONTROL PANEL



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 11 OF 78)



GUNNER'S CONTROL ASSEMBLY



GUNNER'S CONTROL BOX

4.2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 12 OF 78)

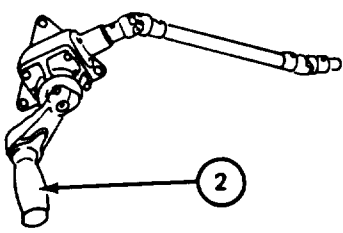
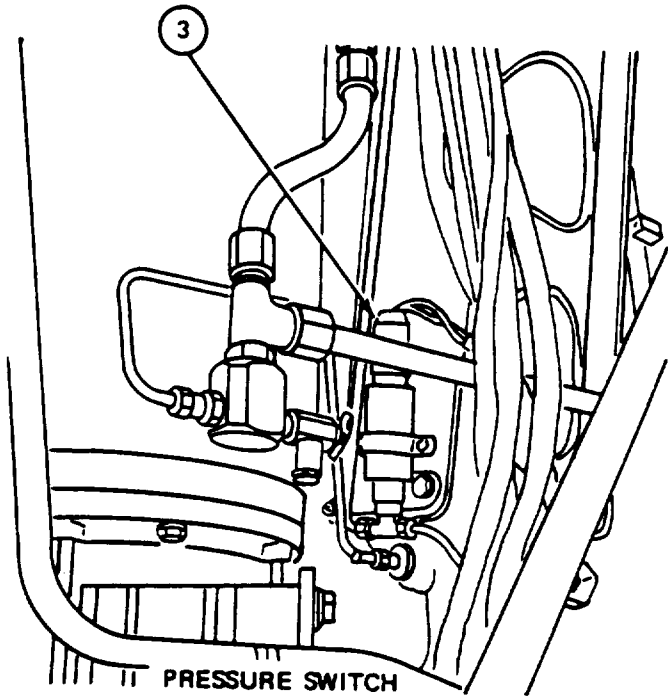
11.03 →

01

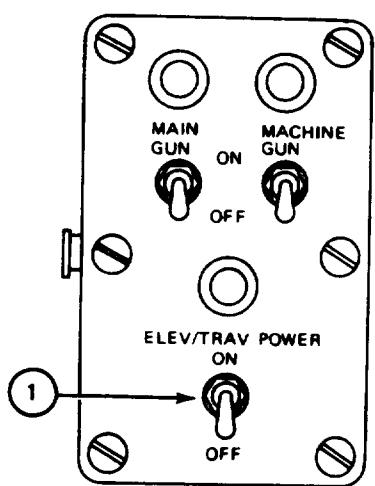
MEASURE VOLTAGE BETWEEN SOCKET A OF HARNESS CONNECTOR PRESSURE SWITCH AND GROUND

- TURN 'ELEV/TRAV POWER' SWITCH (1) TO 'OFF'
- MANUALLY TRAVERSE (2) TURRET TO GAIN ACCESS TO PRESSURE SWITCH FROM DRIVER'S COMPARTMENT
- ENGAGE TURRET TRAVERSING LOCK
- REMOVE HARNESS CONNECTOR FROM JACK (3) ON PRESSURE SWITCH
- TURN 'ELEV/TRAV POWER' SWITCH (1) TO 'ON'
- USING MULTIMETER, MEASURE DC VOLTAGE

13.01

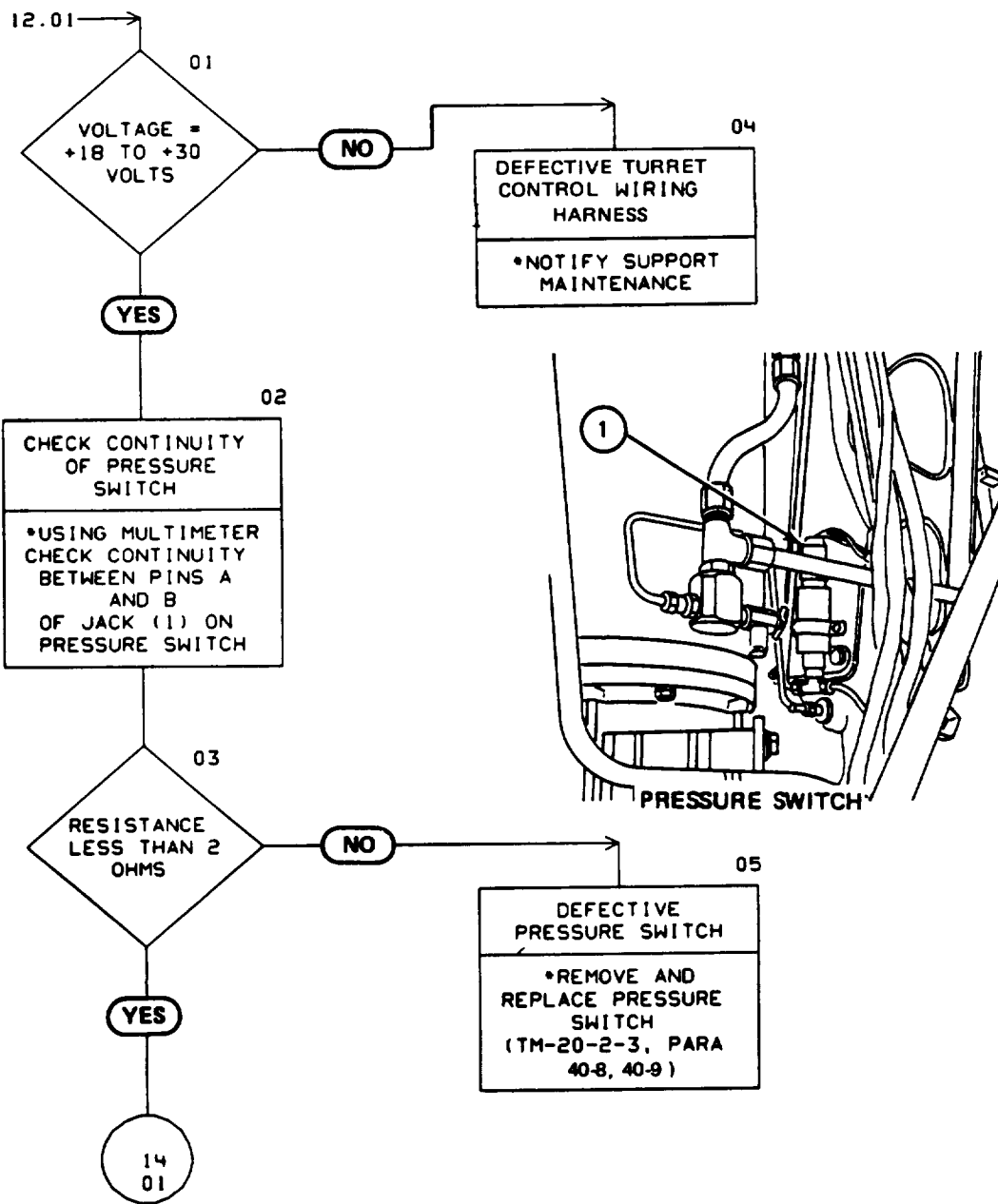


HAND TRAVERSING DRIVE ASSEMBLY

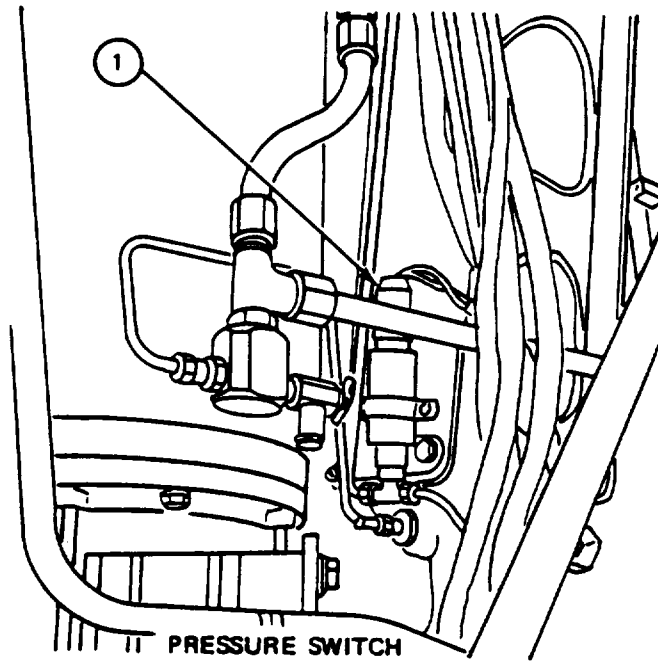
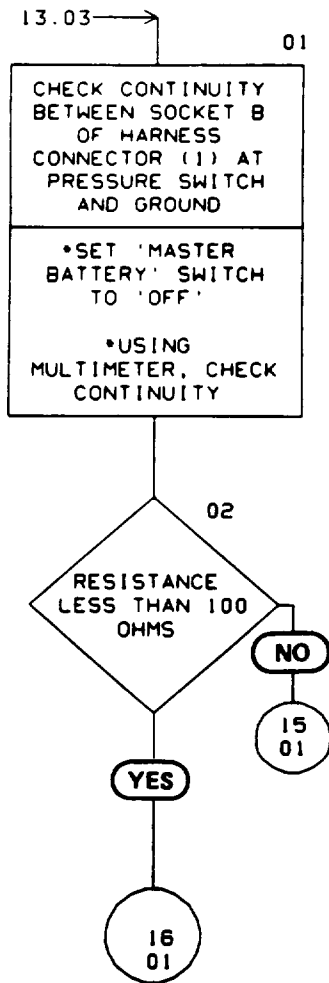


GUNNER'S CONTROL BOX

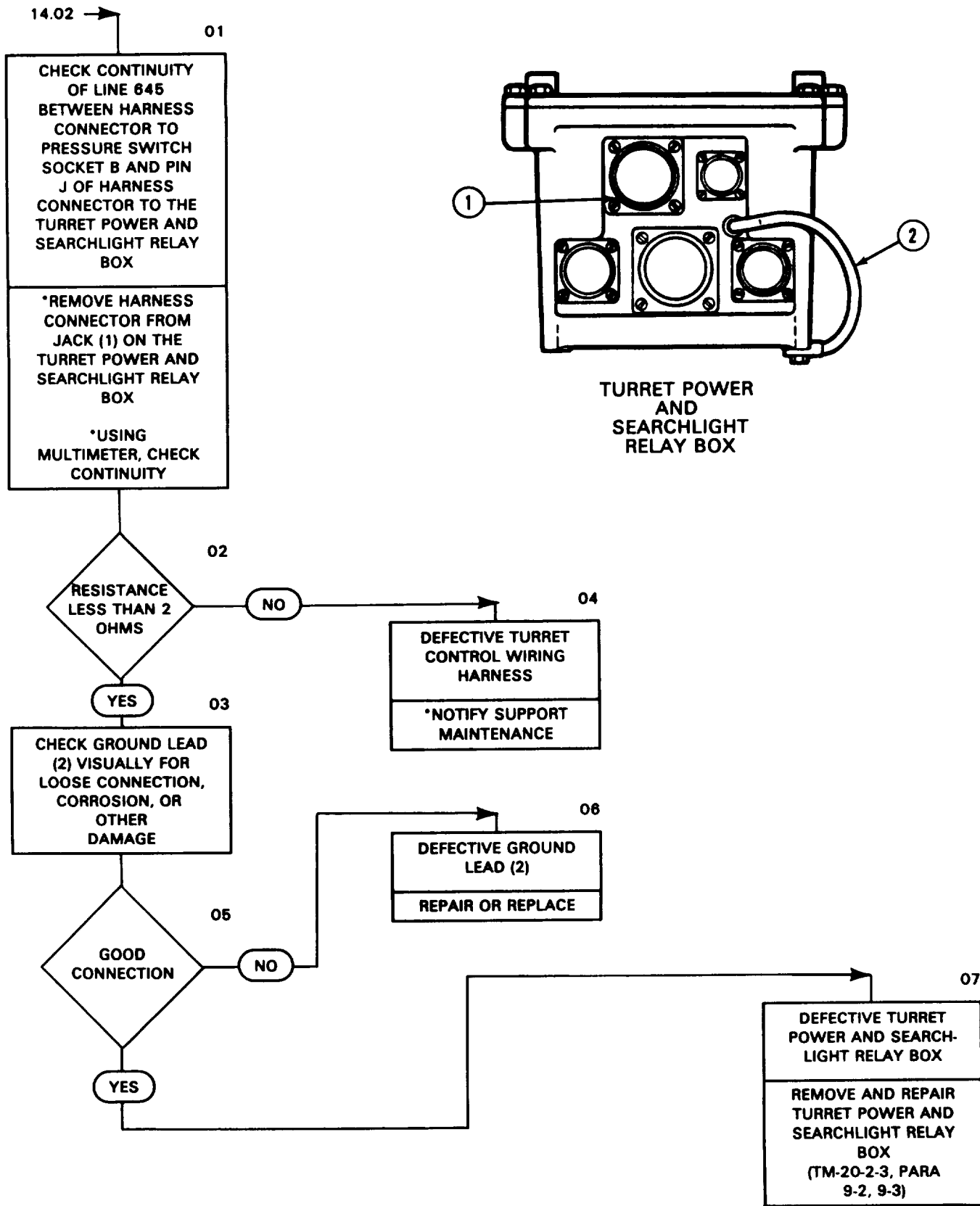
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 13 OF 78)



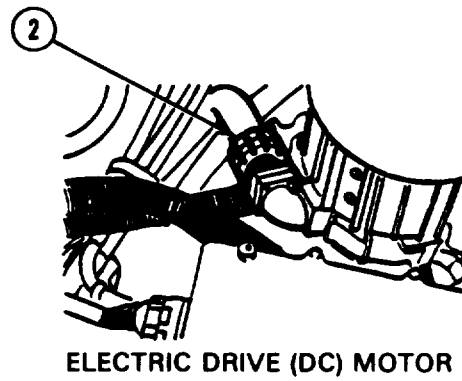
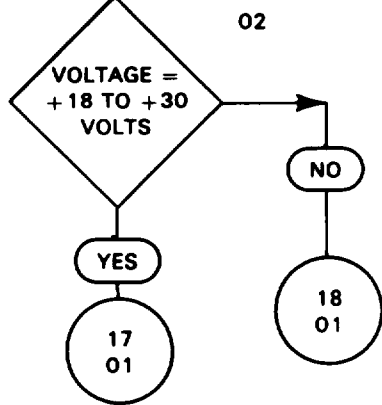
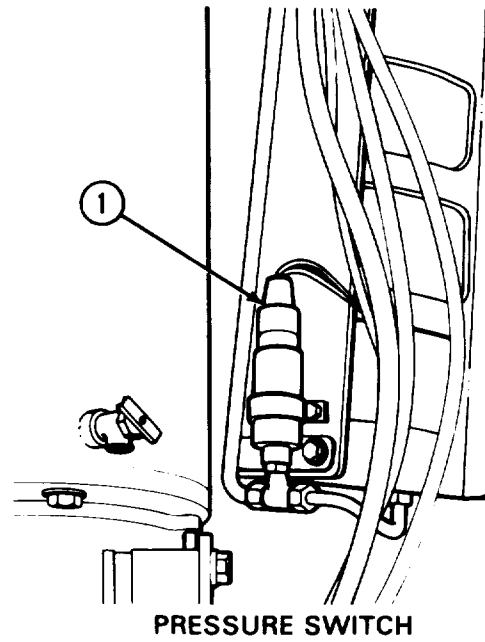
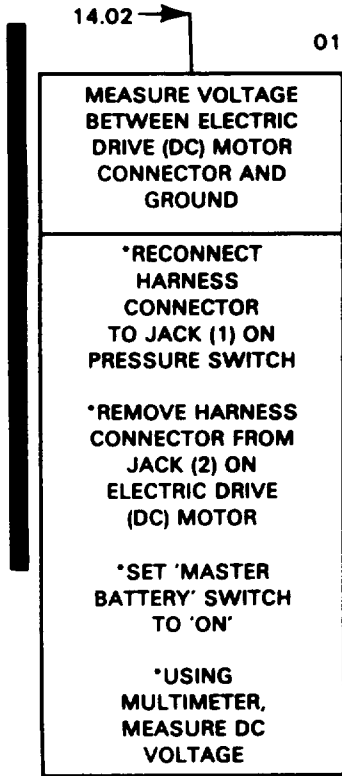
4.2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 14 OF 78)



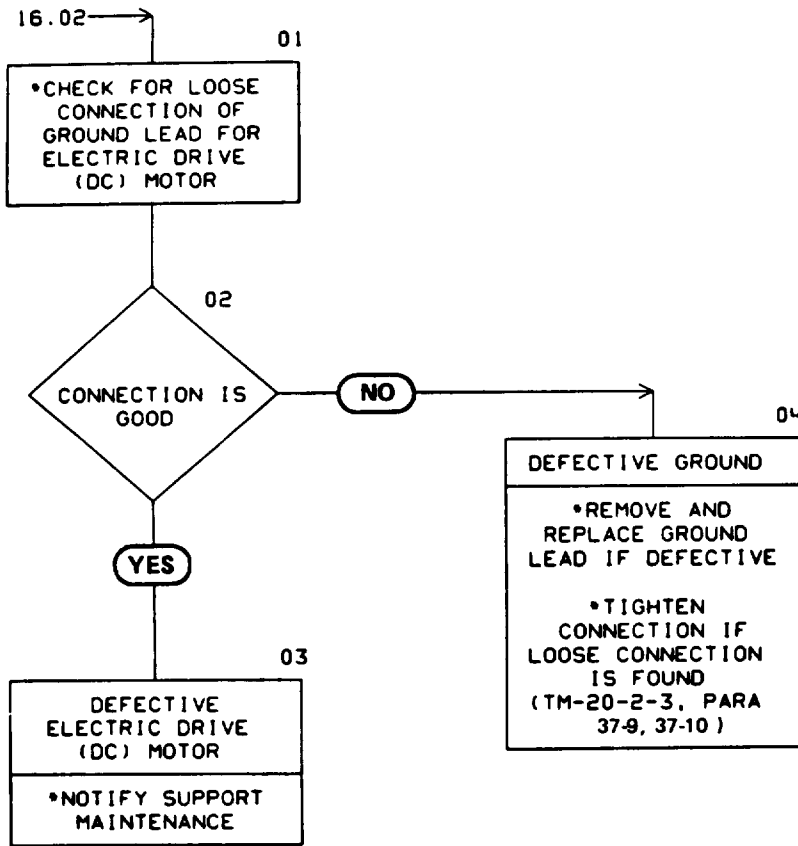
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 15 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 16 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 17 OF 78)



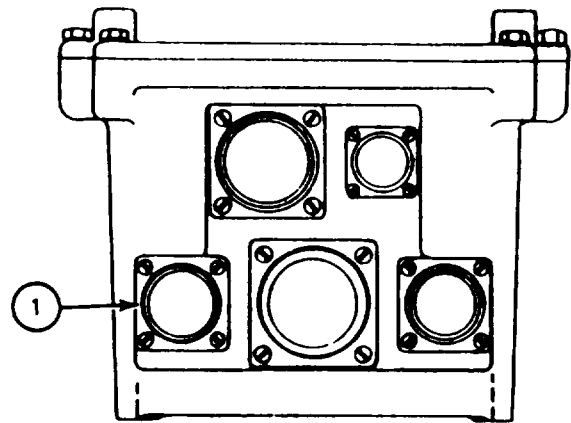
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 18 OF 78)

16.02 →

01

CHECK CONTINUITY OF LINE 104 BETWEEN HARNESS CONNECTOR OF ELECTRIC DRIVE (DC) MOTOR AND HARNESS CONNECTOR TO THE TURRET POWER AND SEARCHLIGHT RELAY BOX

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE HARNESS CONNECTOR FROM JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

18.03 → NOTE 05

CONTINUED FROM A PRIOR COLUMN

- REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

02

RESISTANCE LESS THAN 2 OHMS

YES

NO

04

DEFECTIVE TURRET POWER SEARCHLIGHT RELAY BOX TO POWER PACK MOTOR CABLE

- REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX TO POWER PACK MOTOR CABLE (TM-20-2-3 PARA 2-13, 2-14)

03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

18.05



4.2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 19 OF 78)

11.03 →

01

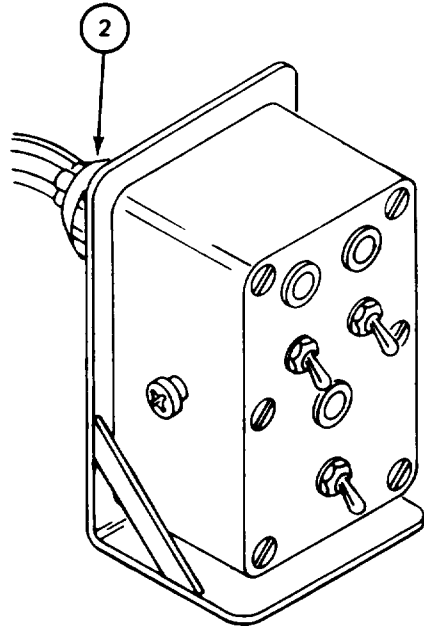
CHECK CONTINUITY BETWEEN SOCKET E OF HARNESS CONNECTOR AT GUNNER'S CONTROL BOX AND SOCKET A OF HARNESS CONNECTOR AT PRESSURE SWITCH

\*SET 'MASTER BATTERY' SWITCH TO 'OFF'

\*REMOVE HARNESS CONNECTOR FROM JACK (1) ON PRESSURE SWITCH

\*REMOVE HARNESS CONNECTOR FROM JACK (2) ON GUNNER'S CONTROL BOX

\*USING MULTIMETER, CHECK CONTINUITY



GUNNER'S CONTROL BOX

19.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

\*REMOVE AND REPLACE GUNNER'S CONTROL BOX (TM-20-2-3, PARA 10-2, 10-3)

02

RESISTANCE LESS THAN 2 OHMS

YES

03

DEFECTIVE GUNNER'S CONTROL BOX

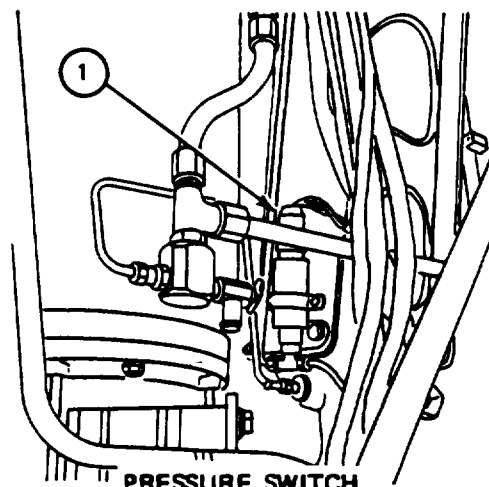
19.05

NO

04

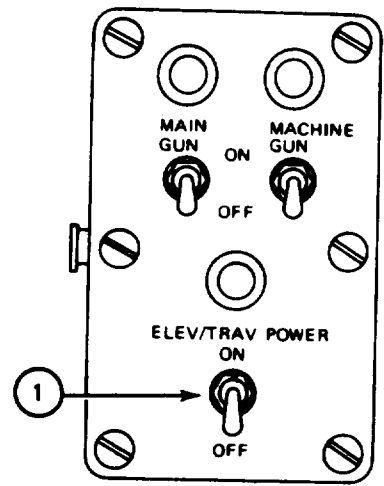
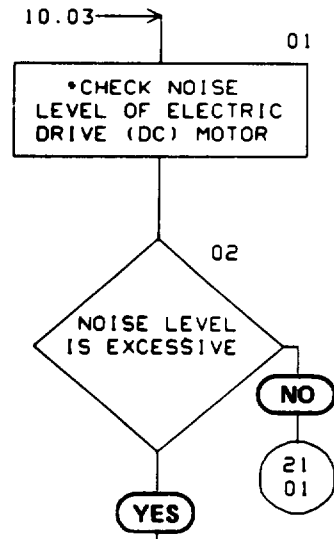
DEFECTIVE TURRET CONTROL WIRING HARNESS

\*NOTIFY SUPPORT MAINTENANCE

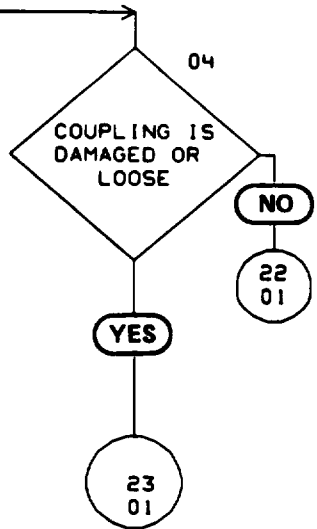
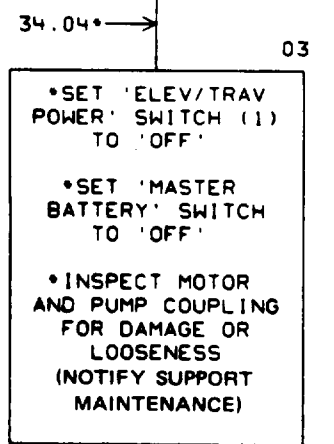


PRESSURE SWITCH

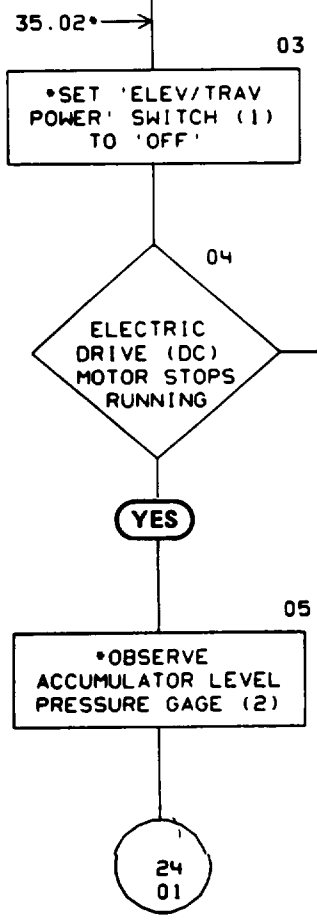
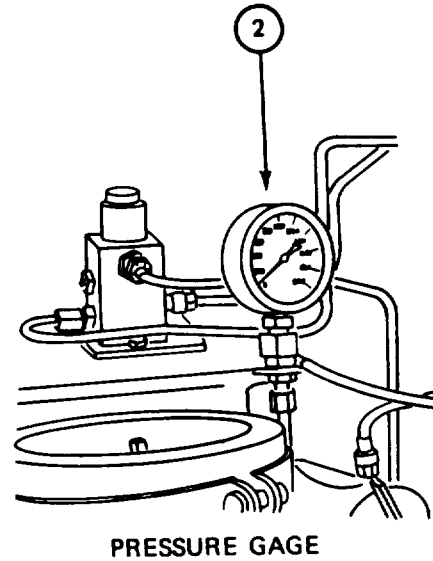
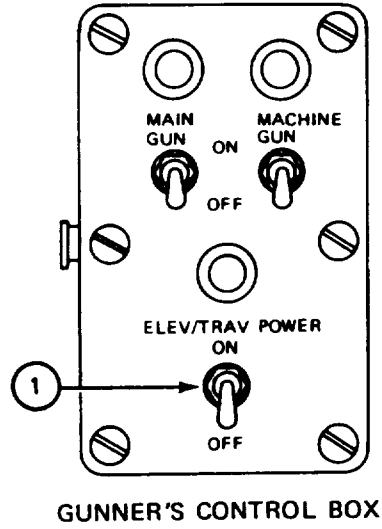
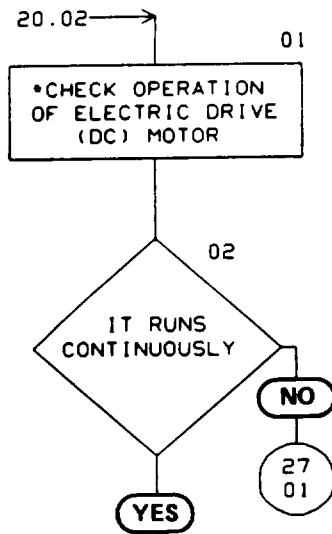
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 20 OF 78)



GUNNER'S CONTROL BOX



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 21 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 22 OF 78)

20.04 →

01

• REMOVE AND REPLACE ELECTRIC DRIVE (DC) MOTOR (NOTIFY SUPPORT MAINTENANCE)

02

• SET 'MASTER BATTERY' SWITCH TO 'ON'

• SET 'ELEV/TRAV POWER' SWITCH (1) TO 'ON'

03

• CHECK NOISE LEVEL OF ELECTRIC DRIVE (DC) MOTOR

04

NOISE LEVEL IS EXCESSIVE

YES

05

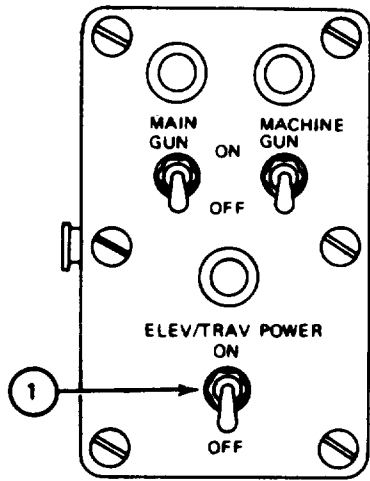
DEFECTIVE HYDRAULIC PUMP

• NOTIFY SUPPORT MAINTENANCE

NO

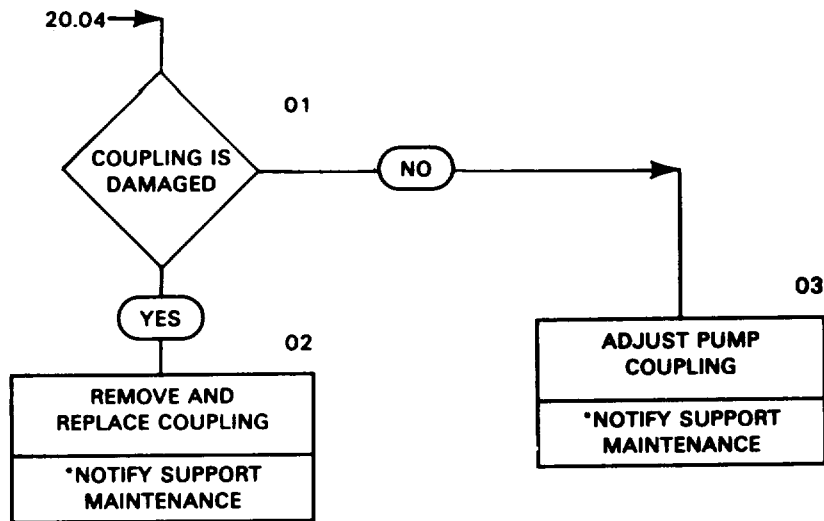
06

ELECTRIC DRIVE (DC) MOTOR WAS DEFECTIVE

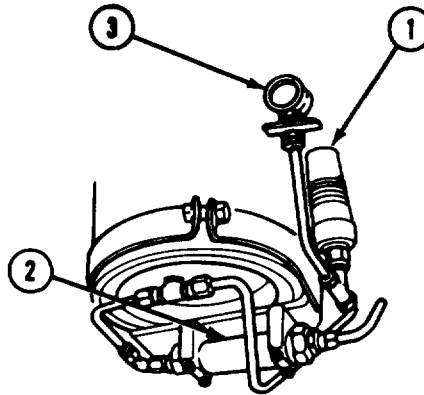
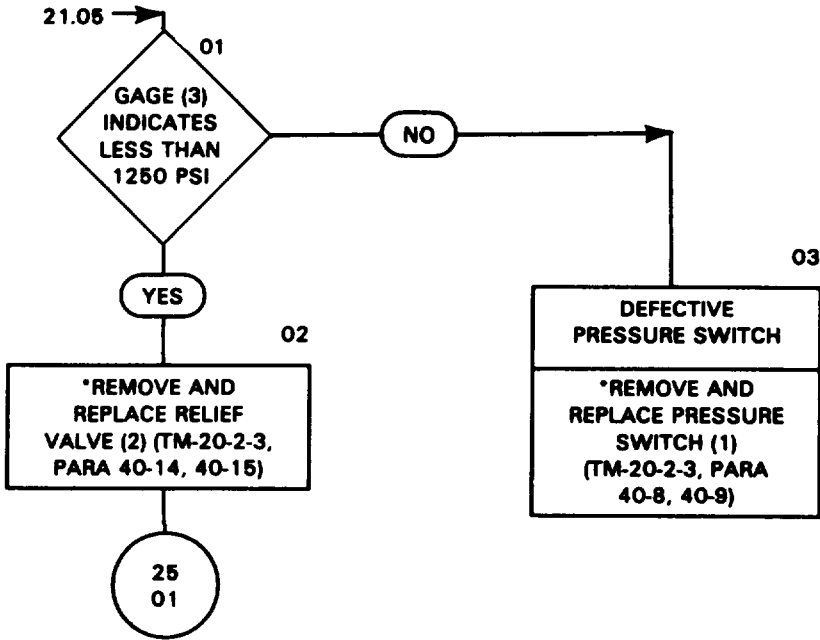


GUNNER'S CONTROL BOX

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 23 OF 78)

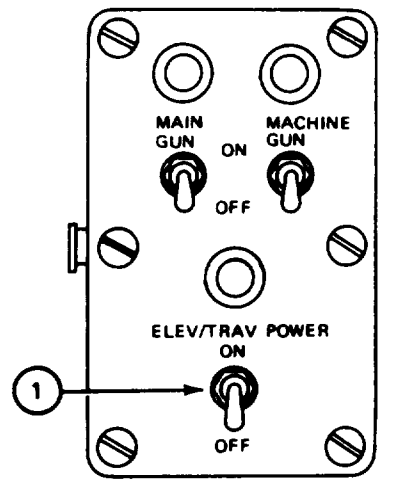
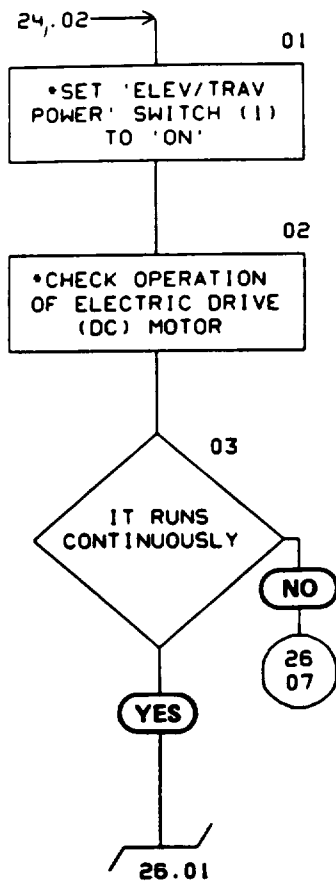


4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 24 OF 78)



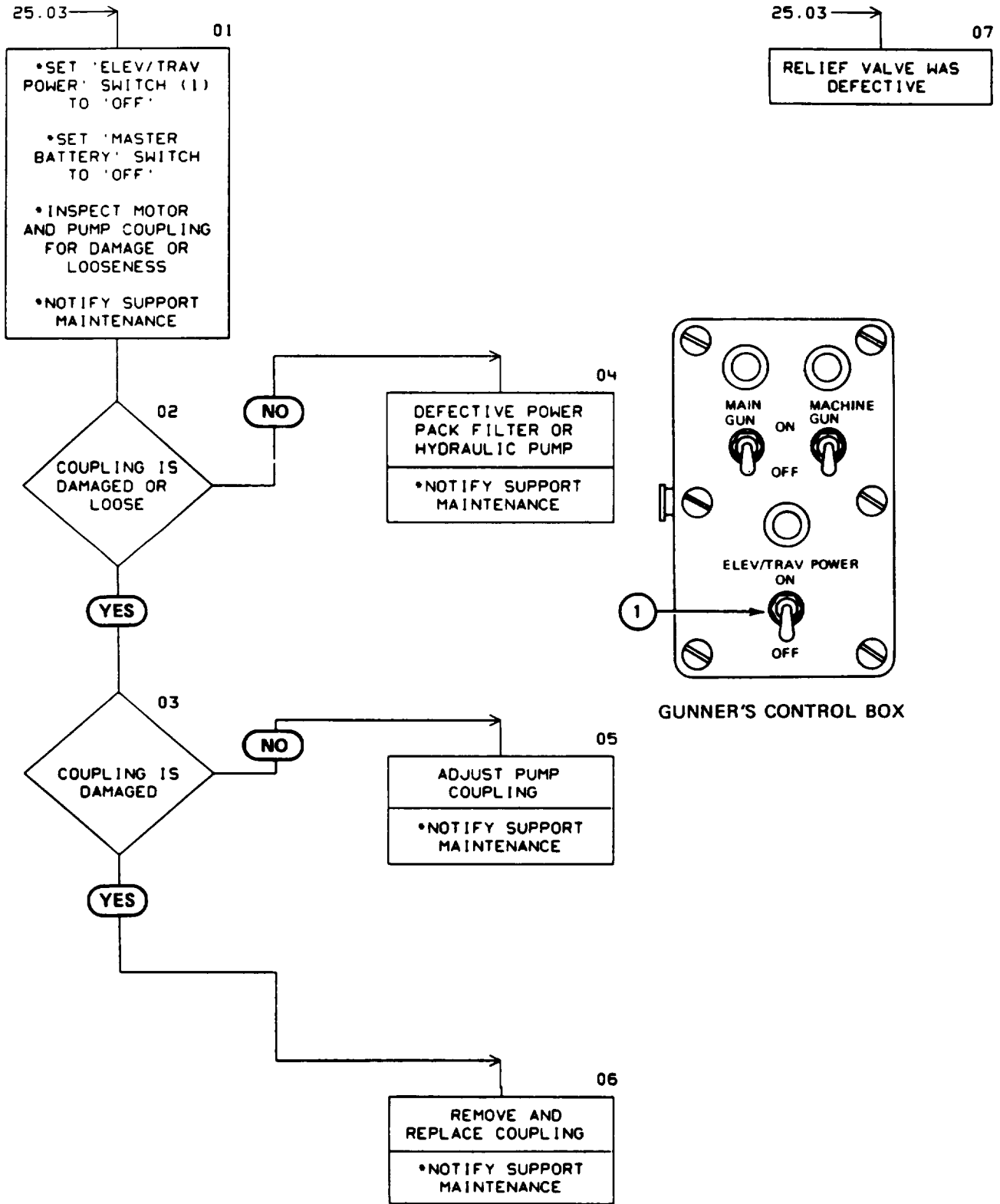
MAIN ACCUMULATOR  
HYDRAULIC  
POWERPACK

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 25 OF 78)



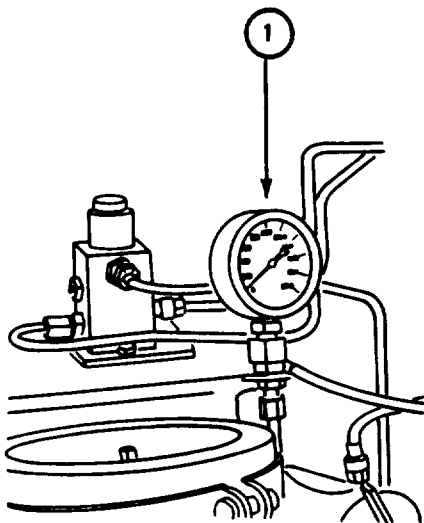
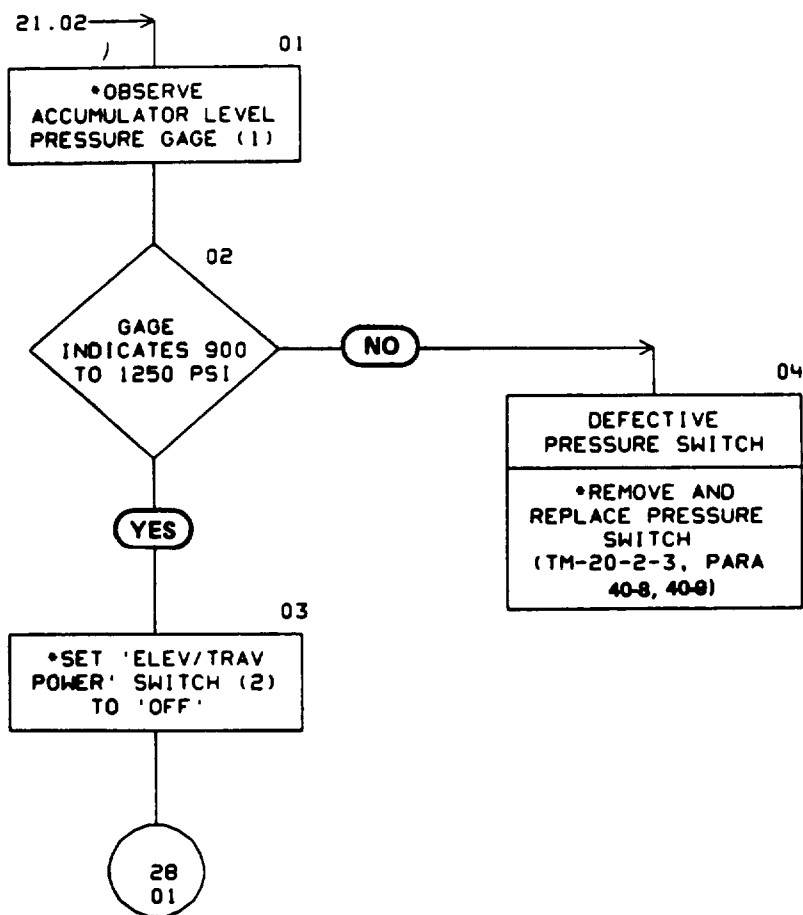
GUNNER'S CONTROL BOX

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 26 OF 78)

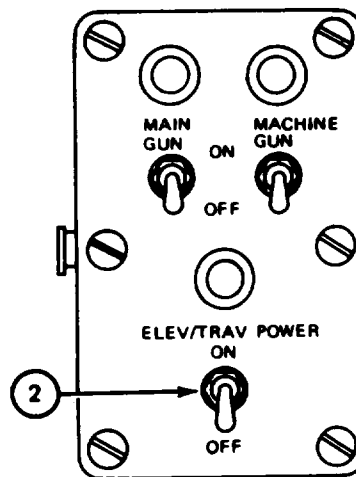




4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 27 OF 78)



PRESSURE GAGE

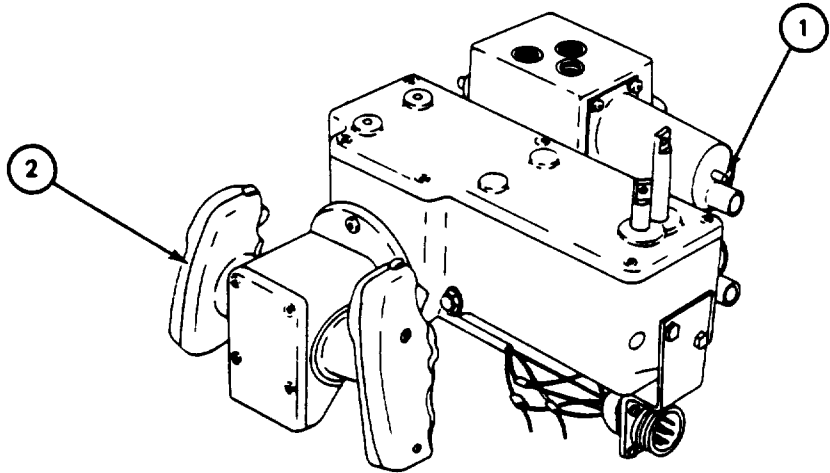
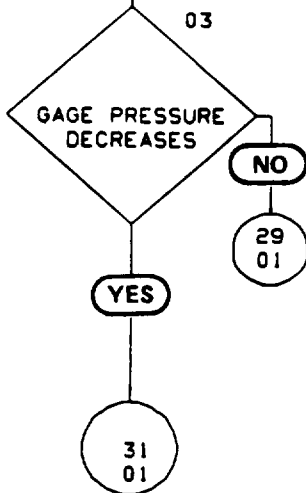


GUNNER'S CONTROL BOX

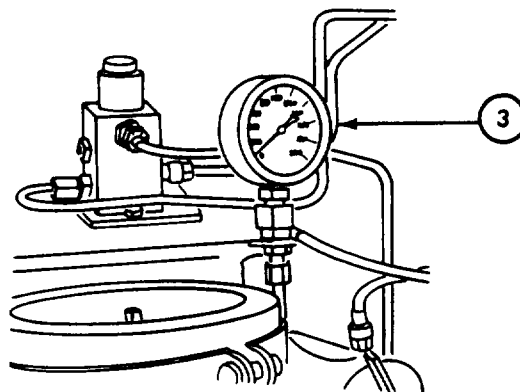
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 28 OF 78)

03.04\* →  
**NOTE** 01  
 IN THE FOLLOWING STEP, THE INDICATED GAGE PRESSURE SHOULD DECREASE. WHEN IT DECREASES TO THE ACCUMULATOR CHARGE PRESSURE, THE GAGE WILL DROP IMMEDIATELY TO 0 PSI. DETERMINE AT WHAT PRESSURE THIS RAPID PRESSURE CHANGE OCCURS

02  
**CHECK ACCUMULATOR PRESSURE**  
 •PRESS AND HOLD POWER SOLENOID PLUNGER (1) IN  
 •SLOWLY ELEVATE OR DEPRESS GUNNER'S HANDLE (2)  
 •OBSERVE ACCUMULATOR FLUID PRESSURE GAGE (3)

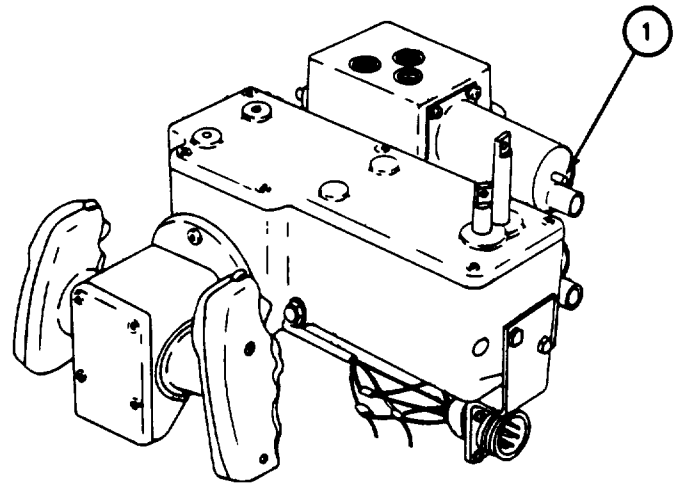
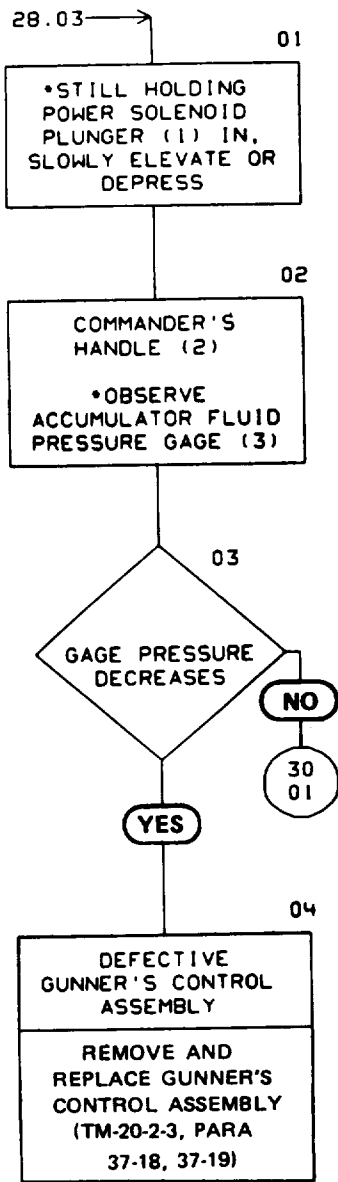


GUNNER'S CONTROL ASSEMBLY

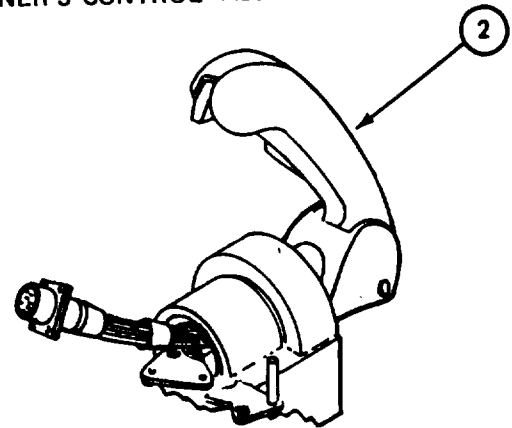


PRESSURE GAGE

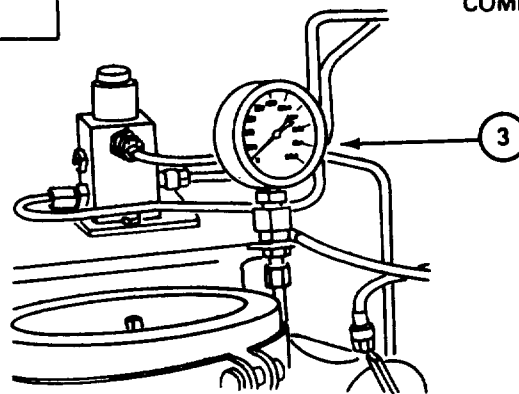
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 29 OF 78)



GUNNER'S CONTROL ASSEMBLY



COMMANDER'S CONTROL HANDLE



PRESSURE GAGE

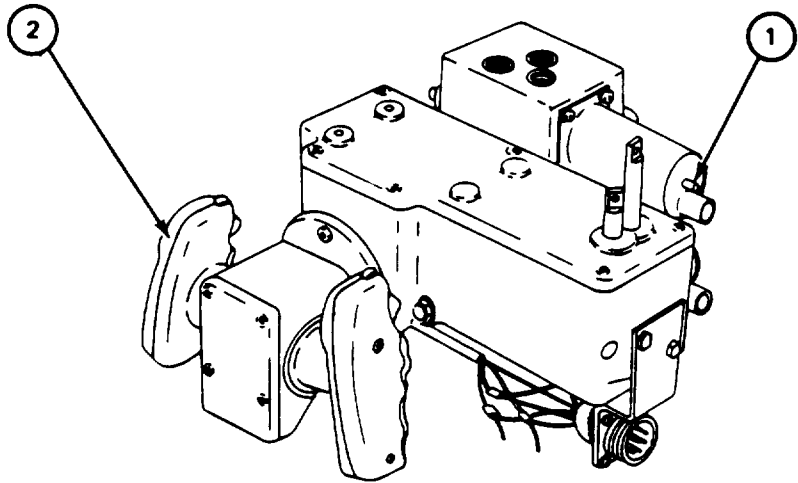
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 30 OF 78)

29.03 →

**CAUTION**

ENGAGE TURRET LOCK BEFORE REDUCING HYDRAULIC PRESSURE TO ZERO TO PREVENT DAMAGE TO THE PIN LOCK

01



GUNNER'S CONTROL ASSEMBLY

02

- ENGAGE TURRET TRAVERSING LOCK (TM-10)
- STILL HOLDING POWER SOLENOID PLUNGER (1) IN, SLOWLY ROTATE GUNNER'S HANDLE (2)
- OBSERVE ACCUMULATOR FLUID PRESSURE GAGE (3)

03

GAGE PRESSURE DECREASES

NO

05

DEFECTIVE POWER VALVE OF HYDRAULIC VALVE ASSEMBLY

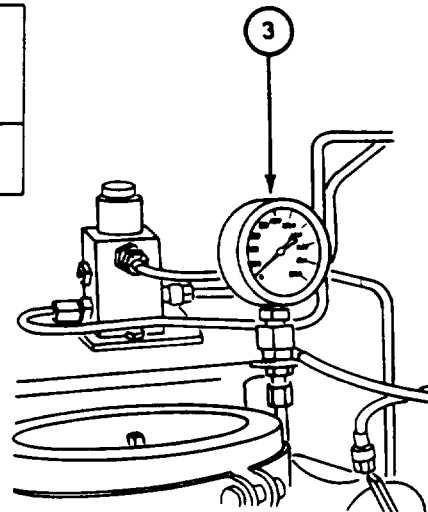
• NOTIFY SUPPORT MAINTENANCE

YES

04

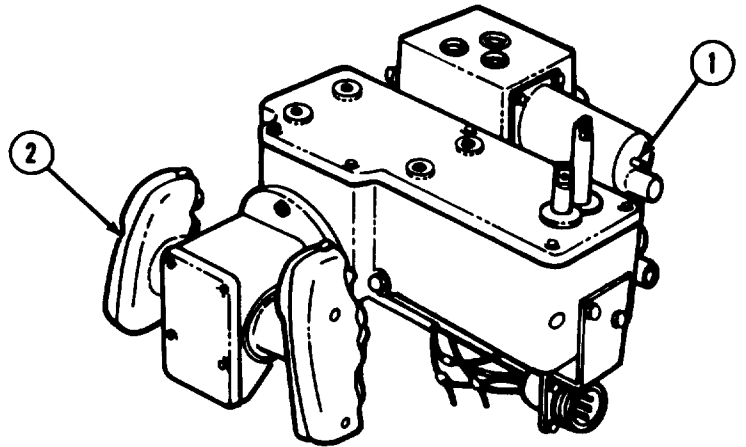
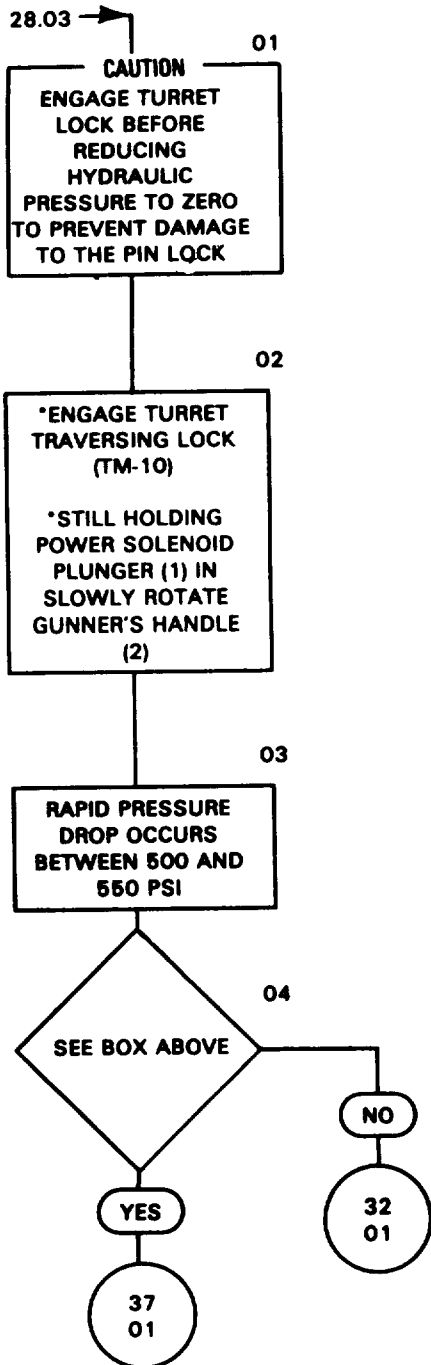
DEFECTIVE ELEVATION VALVE OF HYDRAULIC VALVE ASSEMBLY

• NOTIFY SUPPORT MAINTENANCE



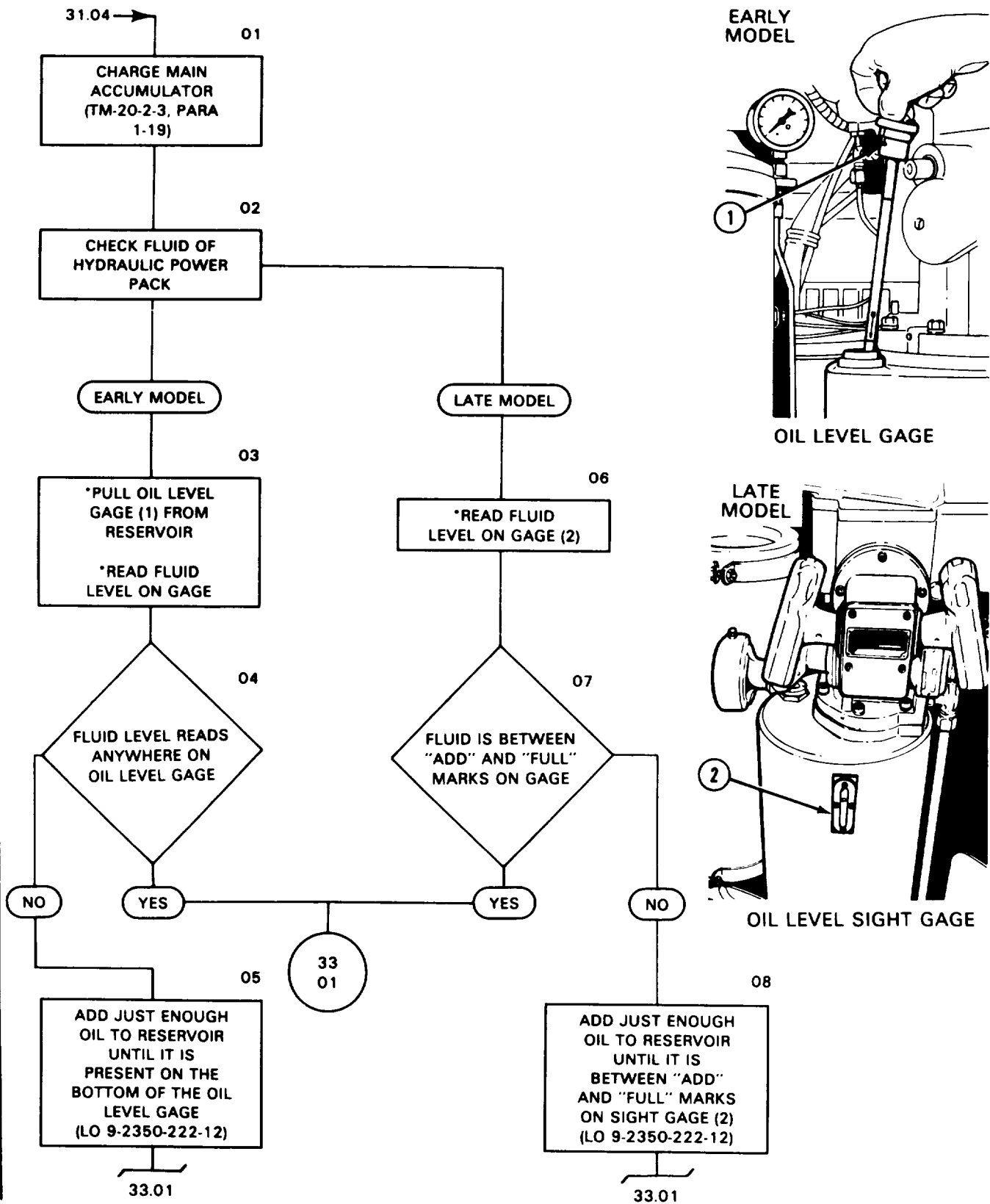
PRESSURE GAGE

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 31 OF 78)



GUNNER'S CONTROL ASSEMBLY

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 32 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 33 OF 78)

32.05  
32.08

01

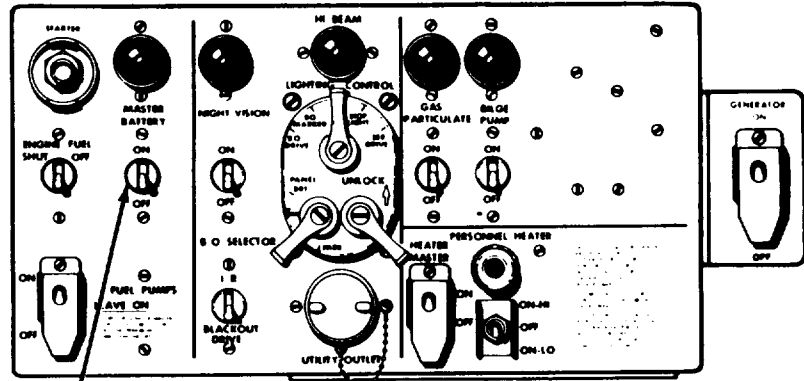
**CAUTION**  
TO PREVENT EQUIPMENT DAMAGE, BE SURE TO TURN OFF POWER BEFORE REMOVING COVERS, JACKS, PLUGS, OR RELAY CARDS, AND BEFORE MEASURING CONTINUITY OR RESISTANCE. AFTER MEASUREMENT, TURN POWER BACK ON.

02

**NOTE**  
FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, AND RESISTANCE, REFER TO JPG.

03

**WARNING**  
CHECK OUTSIDE OF TANK AND SURROUNDING AREA FOR UNWARY PERSONNEL. MAKE SURE CREW MEMBERS ARE IN SAFE POSITIONS AND DRIVER HAS LOWERED HIS SEAT AND HAS HEAD DOWN.



MASTER CONTROL PANEL

04

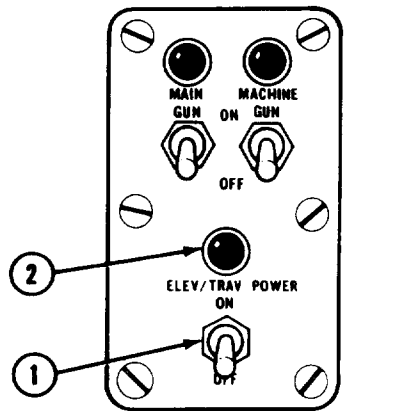
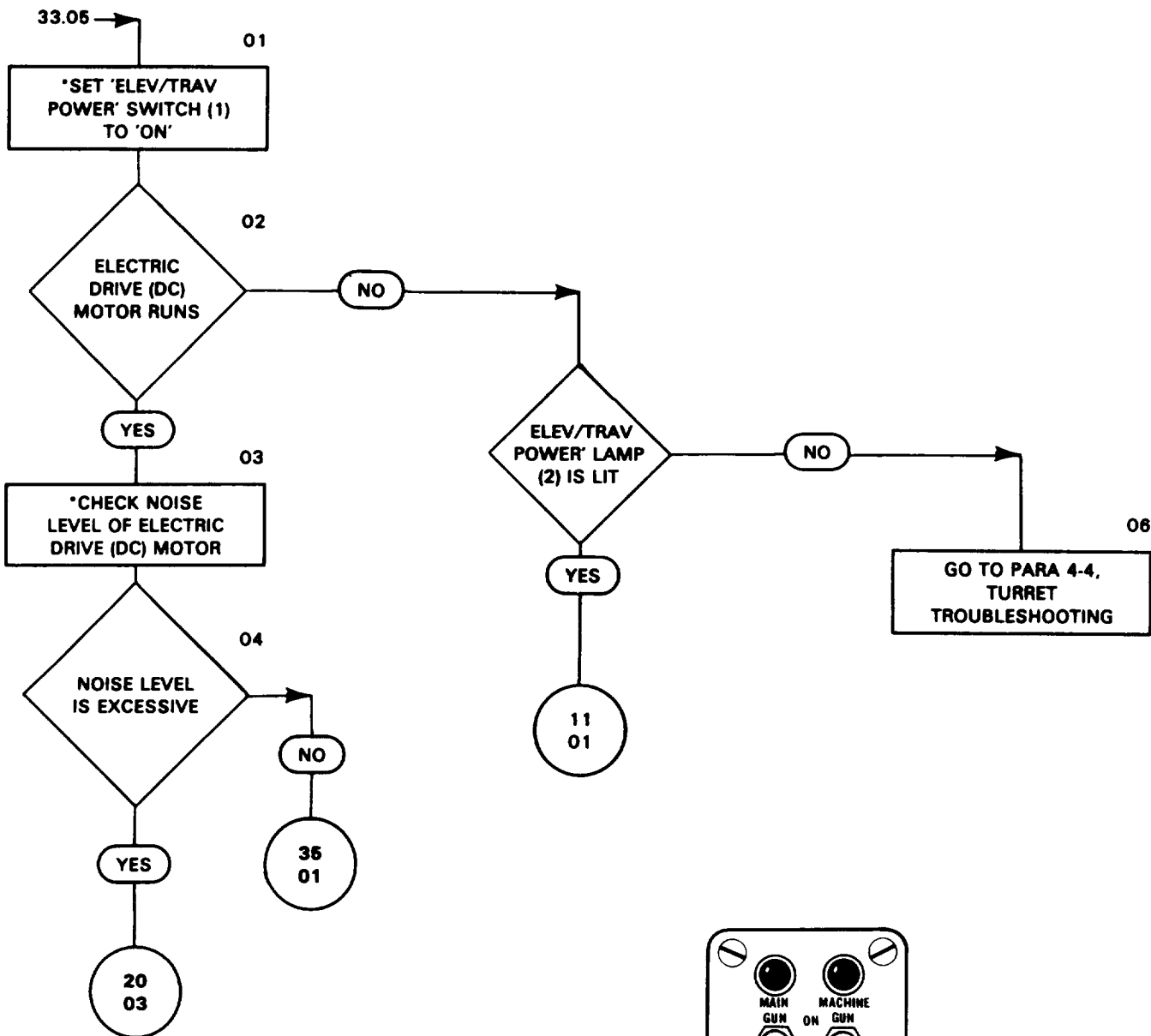
**CAUTION**  
IF ELECTRIC DRIVE (DC) MOTOR RUNS CONTINUOUSLY, OR IF GAGE PRESSURE GOES HIGHER THAN 1500 PSI, OR IF PUMP MOTOR MAKES EXCESSIVE NOISE, TURN POWER OFF.

05

\*SET VEHICLE 'MASTER BATTERY' SWITCH (1) TO 'ON'

34.01

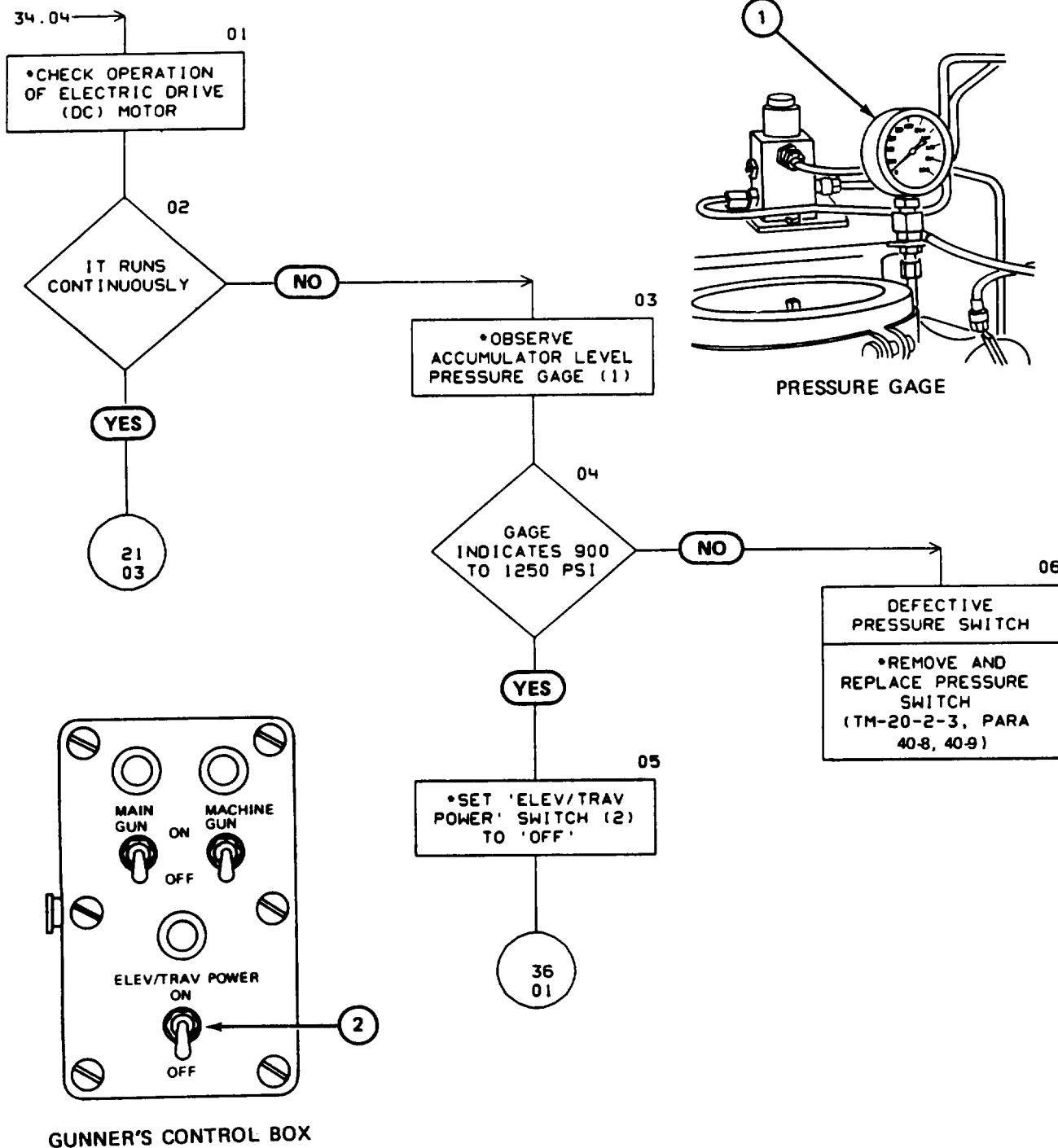
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 34 OF 78)



GUNNER'S CONTROL BOX



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 35 OF 78)



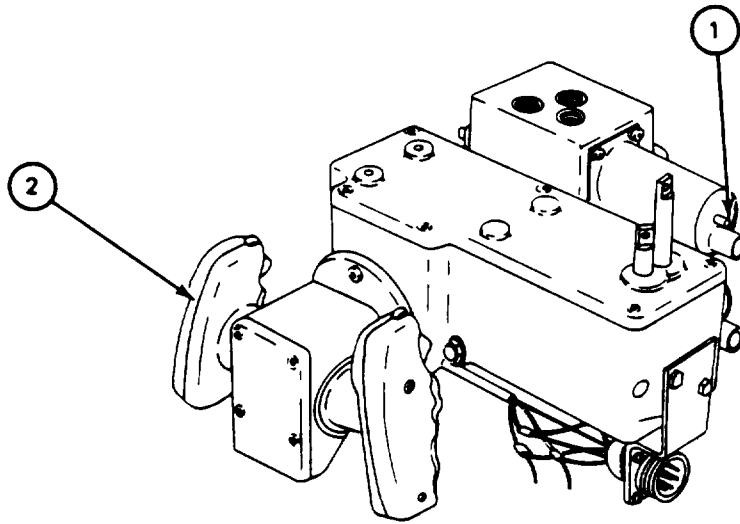
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 36 OF 78)

35.05 →

01

CHECK ACCUMULATOR PRESSURE AGAIN

- PRESS AND HOLD POWER SOLENOID PLUNGER (1) IN
- SLOWLY ROTATE GUNNER'S HANDLE (2)
- OBSERVE ACCUMULATOR FLUID PRESSURE GAGE (3)



GUNNER'S CONTROL ASSEMBLY

02

RAPID PRESSURE DROP OCCURS BETWEEN 500 AND 550 PSI

03

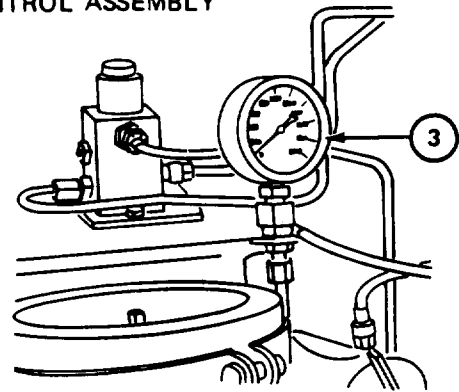
SEE BOX ABOVE

NO

05

DEFECTIVE MAIN ACCUMULATOR

- REMOVE AND REPLACE MAIN ACCUMULATOR (TM-20-2-3, PARA 40-2, 40-3)



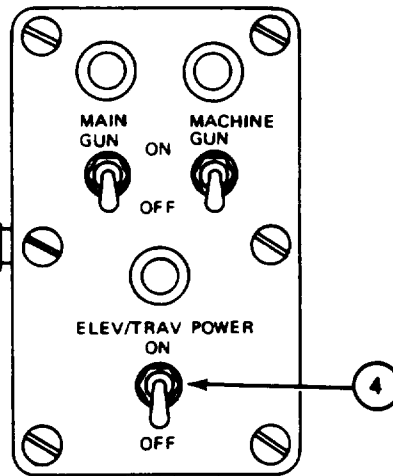
PRESSURE GAGE

YES

04

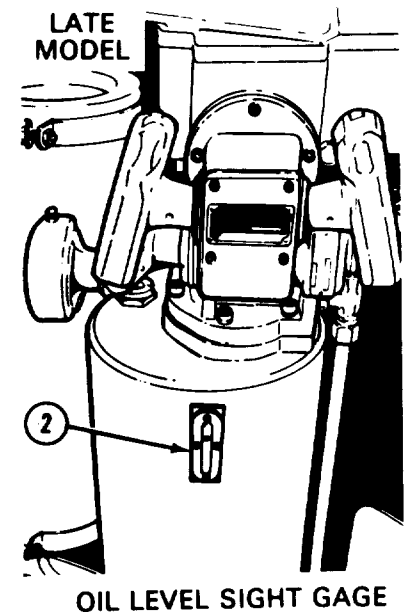
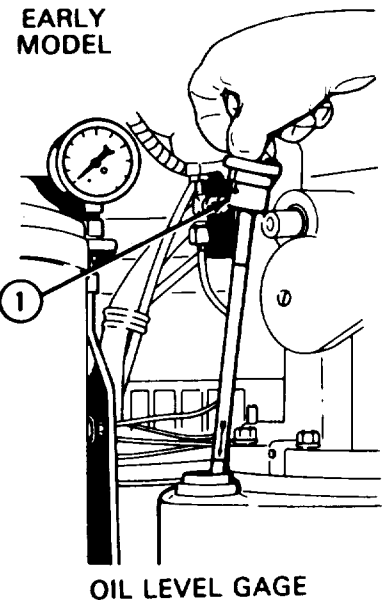
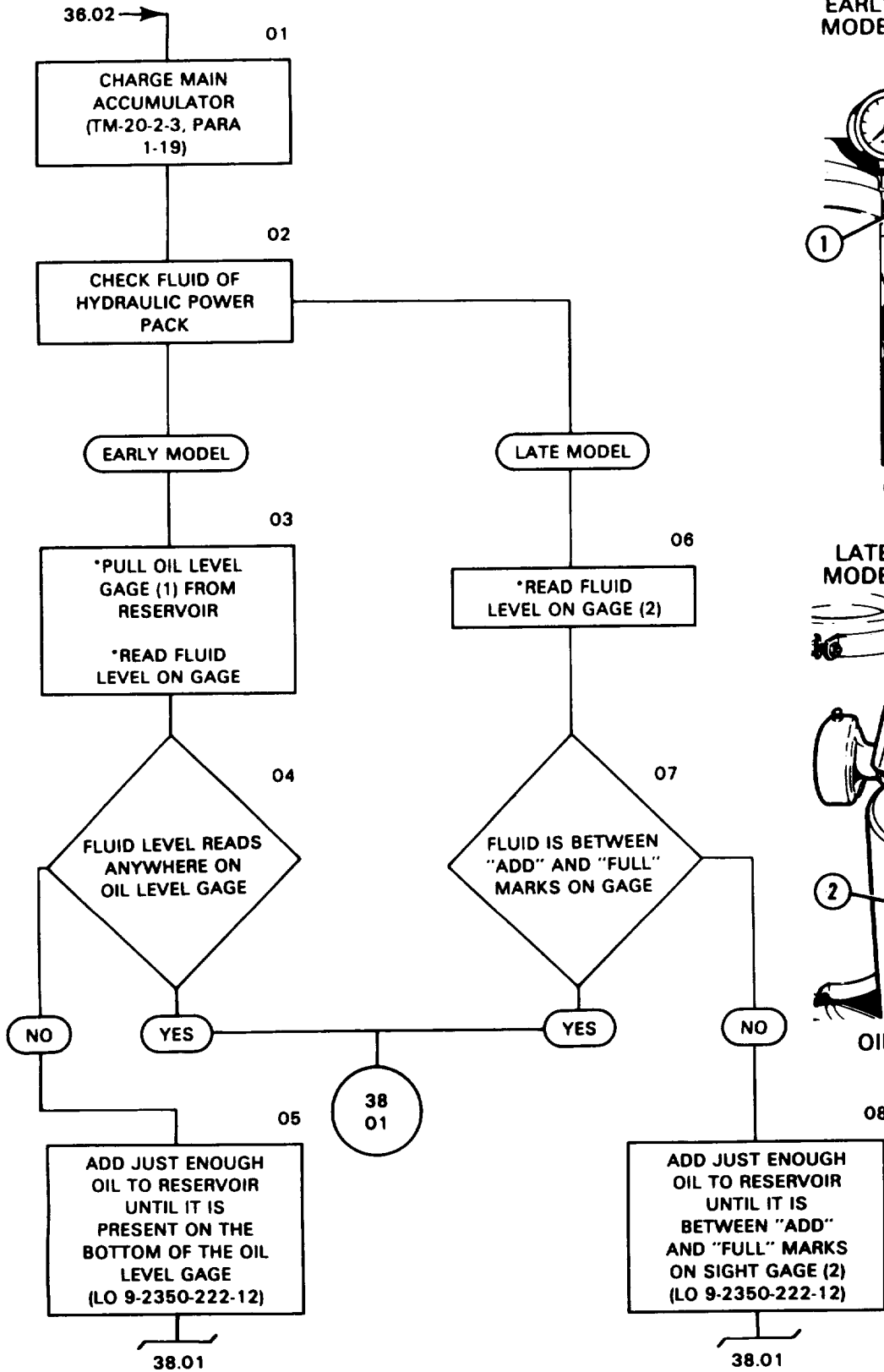
- SET 'ELEV/TRAV POWER' SWITCH (4) TO 'ON'
- WHEN PUMP SHUTS OFF, SET 'ELEV/TRAV POWER' SWITCH (4) TO 'OFF'

41  
01



GUNNER'S CONTROL BOX

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 37 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 38 OF 78)

37.05  
37.08

01

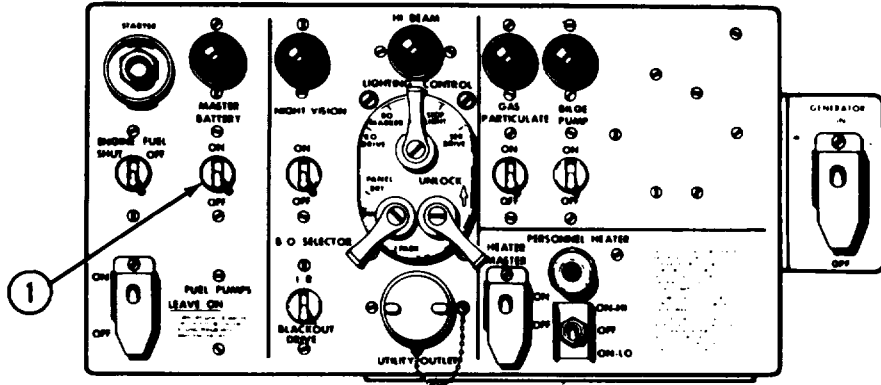
**CAUTION**  
TO PREVENT EQUIPMENT DAMAGE, BE SURE TO TURN OFF POWER BEFORE REMOVING COVERS, JACKS, PLUGS, OR RELAY CARDS, AND BEFORE MEASURING CONTINUITY OR RESISTANCE. AFTER MEASUREMENT, TURN POWER BACK ON.

02

**NOTE**  
FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, AND RESISTANCE, REFER TO JPG.

03

**WARNING**  
CHECK OUTSIDE OF TANK AND SURROUNDING AREA FOR UNWARY PERSONNEL. MAKE SURE CREW MEMBERS ARE IN SAFE POSITIONS AND DRIVER HAS LOWERED HIS SEAT AND HAS HEAD DOWN.



MASTER CONTROL PANEL

04

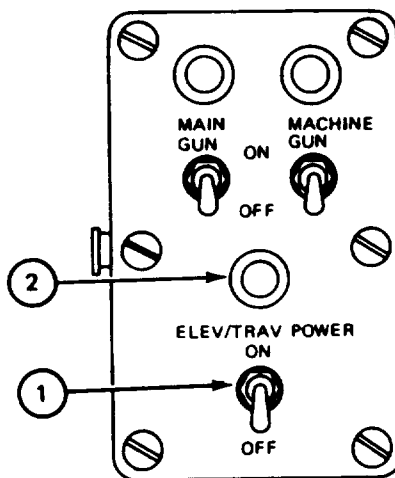
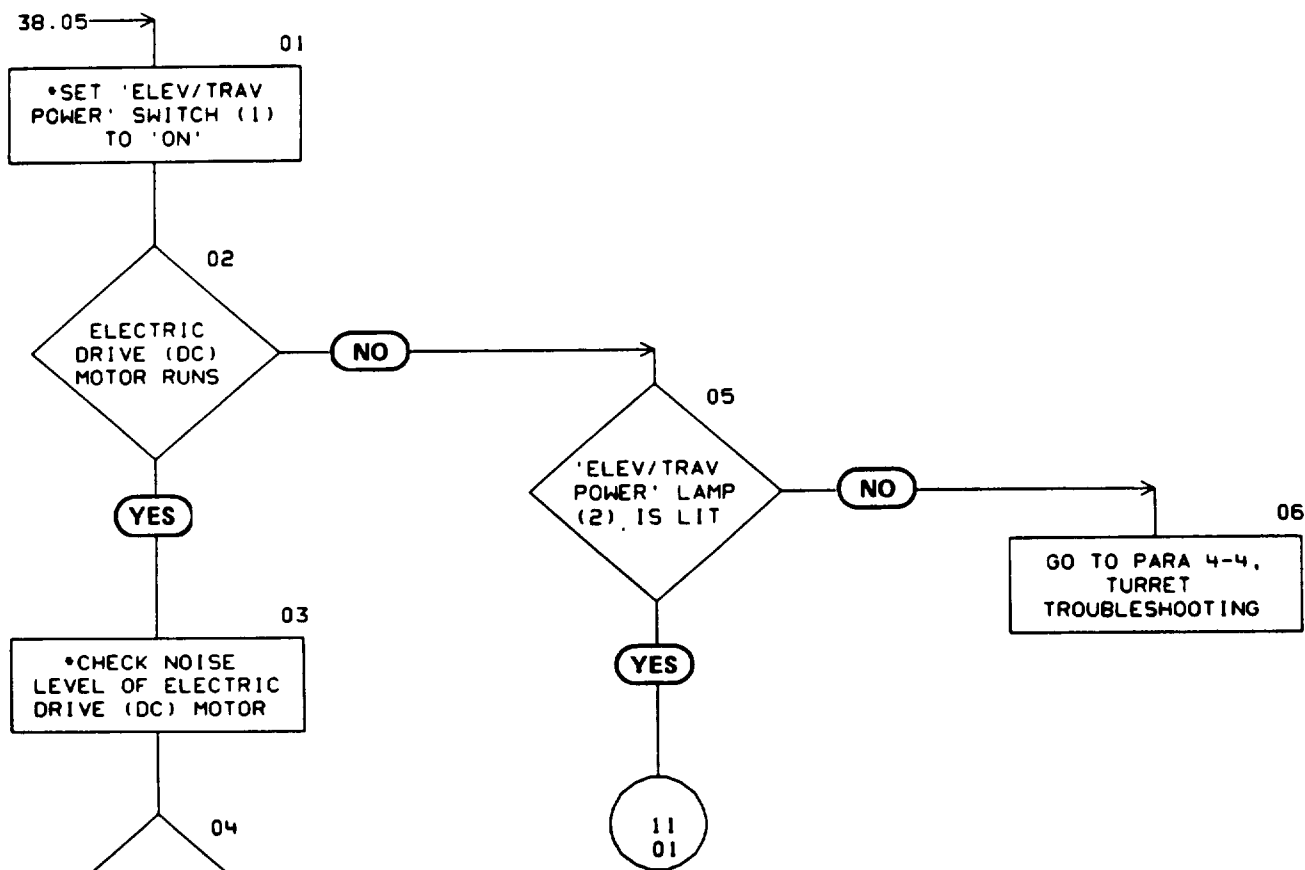
**CAUTION**  
IF ELECTRIC DRIVE (DC) MOTOR RUNS CONTINUOUSLY, OR IF GAGE PRESSURE GOES HIGHER THAN 1500 PSI, OR IF PUMP MOTOR MAKES EXCESSIVE NOISE, TURN POWER OFF.

05

\*SET VEHICLE 'MASTER BATTERY' SWITCH (1) TO 'ON'

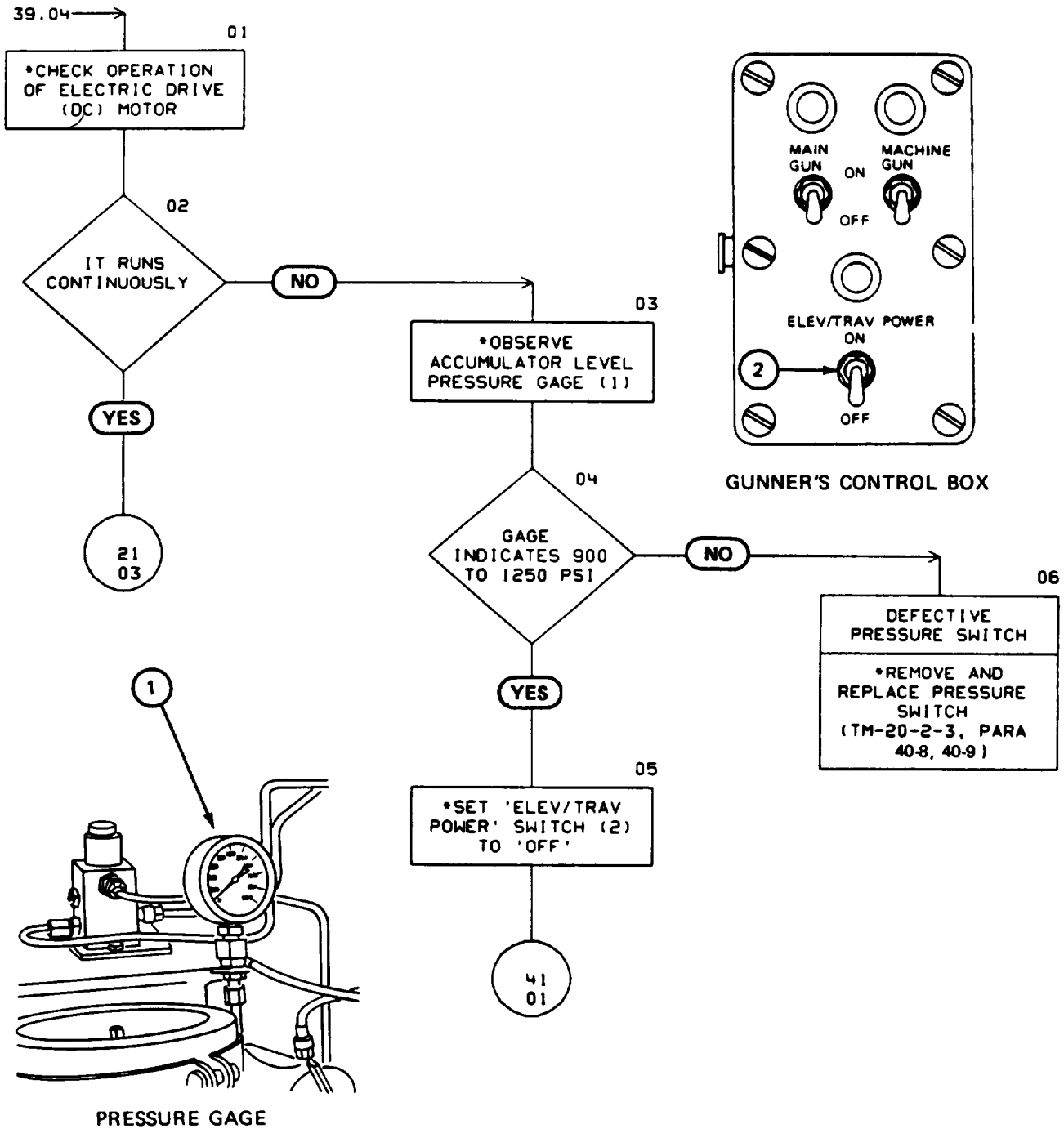
39.01

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 39 OF 78)

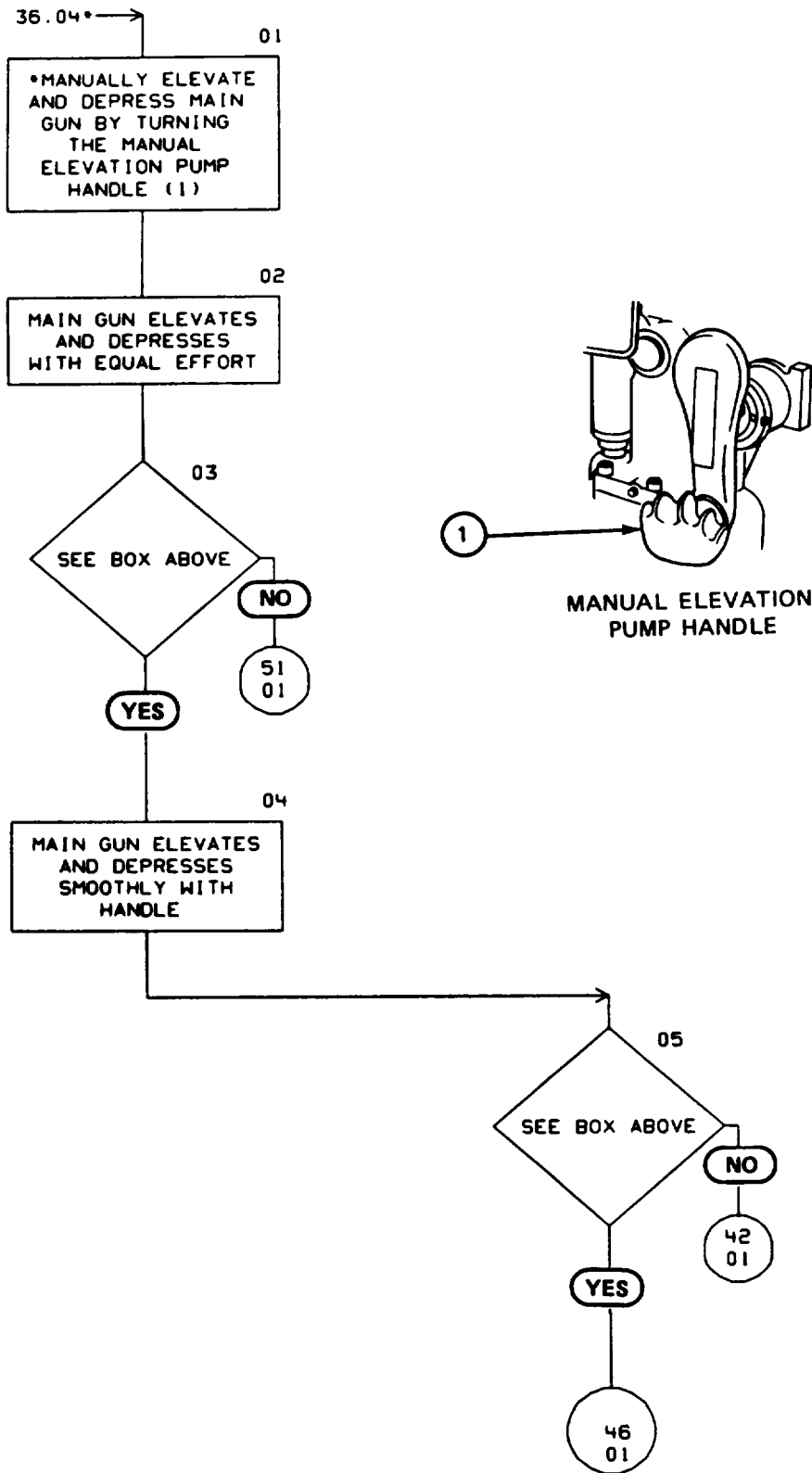


GUNNER'S CONTROL BOX

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 40 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 41 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 42 OF 78)

41.05 →

01

•SET 'ELEV/TRAV POWER' SWITCH (1) TO 'ON'

02

•PRESS GUNNER'S PALM SWITCH (2)

•ELEVATE AND DEPRESS GUNNER'S CONTROL HANDLE (3)

03

CHECK IF MAIN GUN ELEVATES AND DEPRESSES SMOOTHLY

04

MAIN GUN OPERATES SMOOTHLY

YES

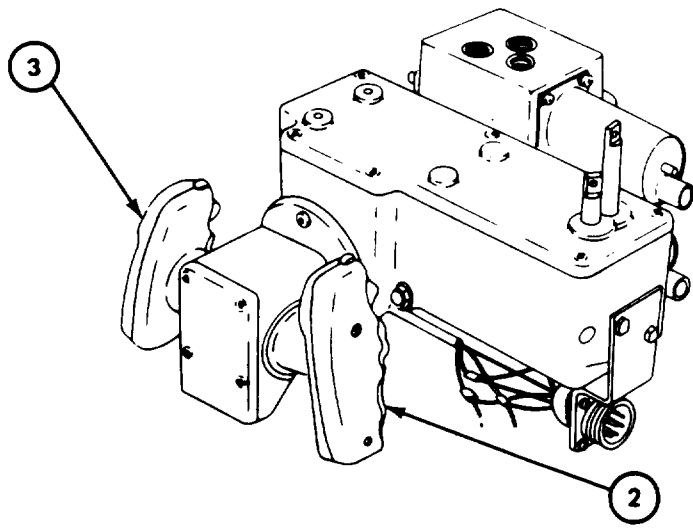
43  
01

NO

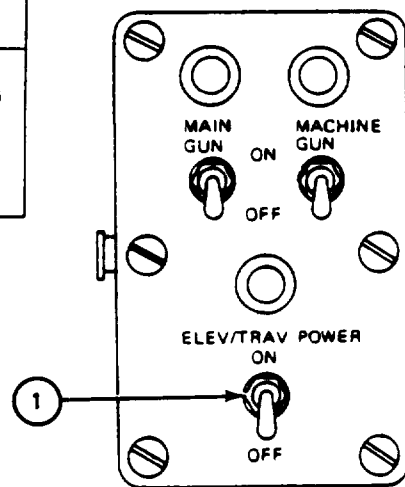
05

DEFECTIVE ELEVATING MECHANISM ASSEMBLY

•REMOVE AND REPLACE ELEVATING MECHANISM ASSEMBLY (TM-20-2-3, PARA 39-2, 39-3)



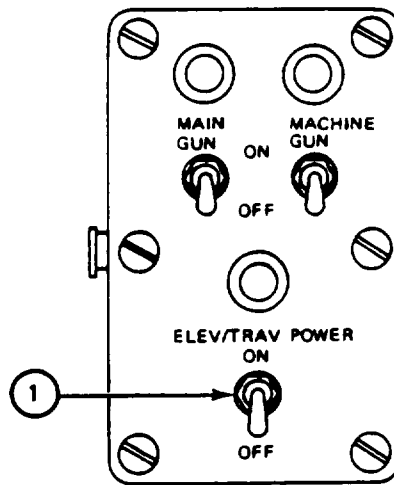
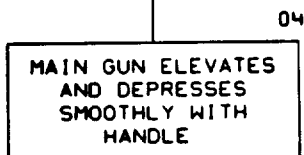
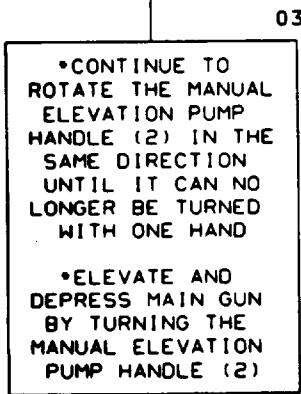
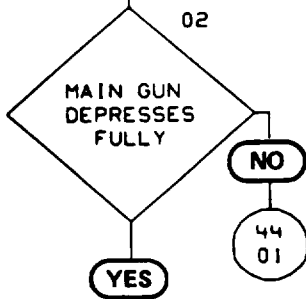
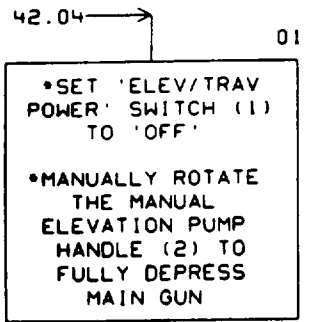
GUNNER'S CONTROL ASSEMBLY



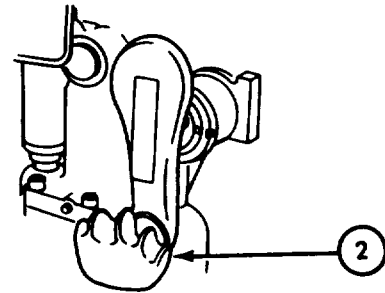
GUNNER'S CONTROL BOX



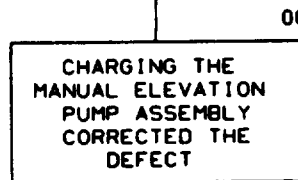
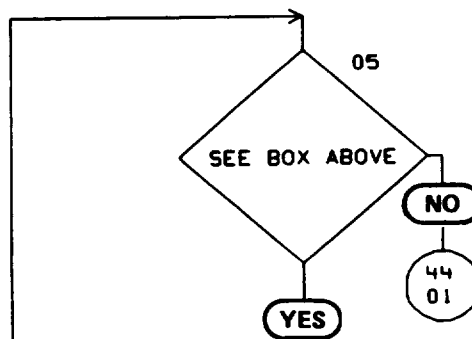
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 43 OF 78)



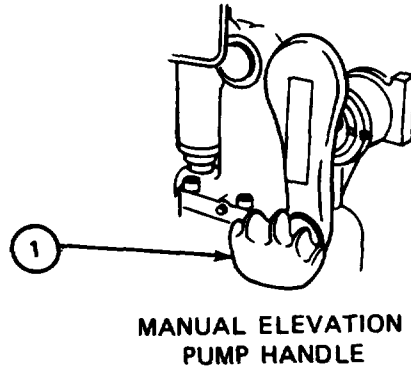
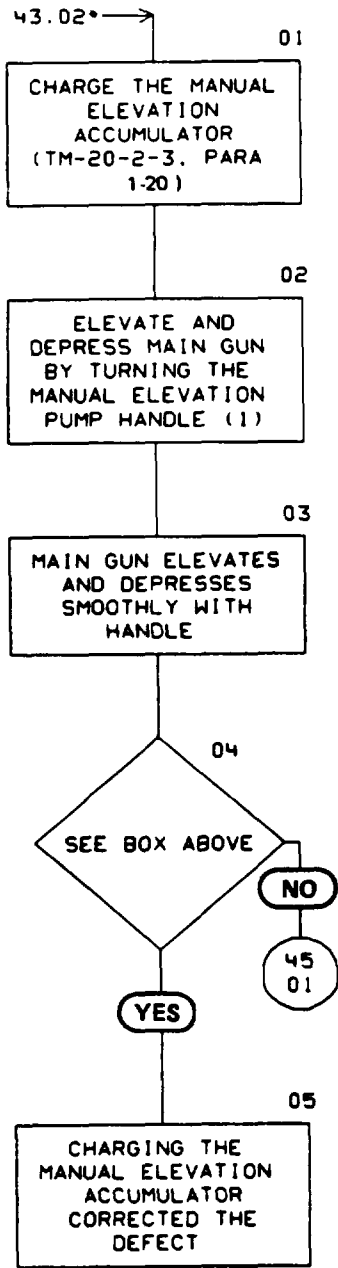
GUNNER'S CONTROL BOX



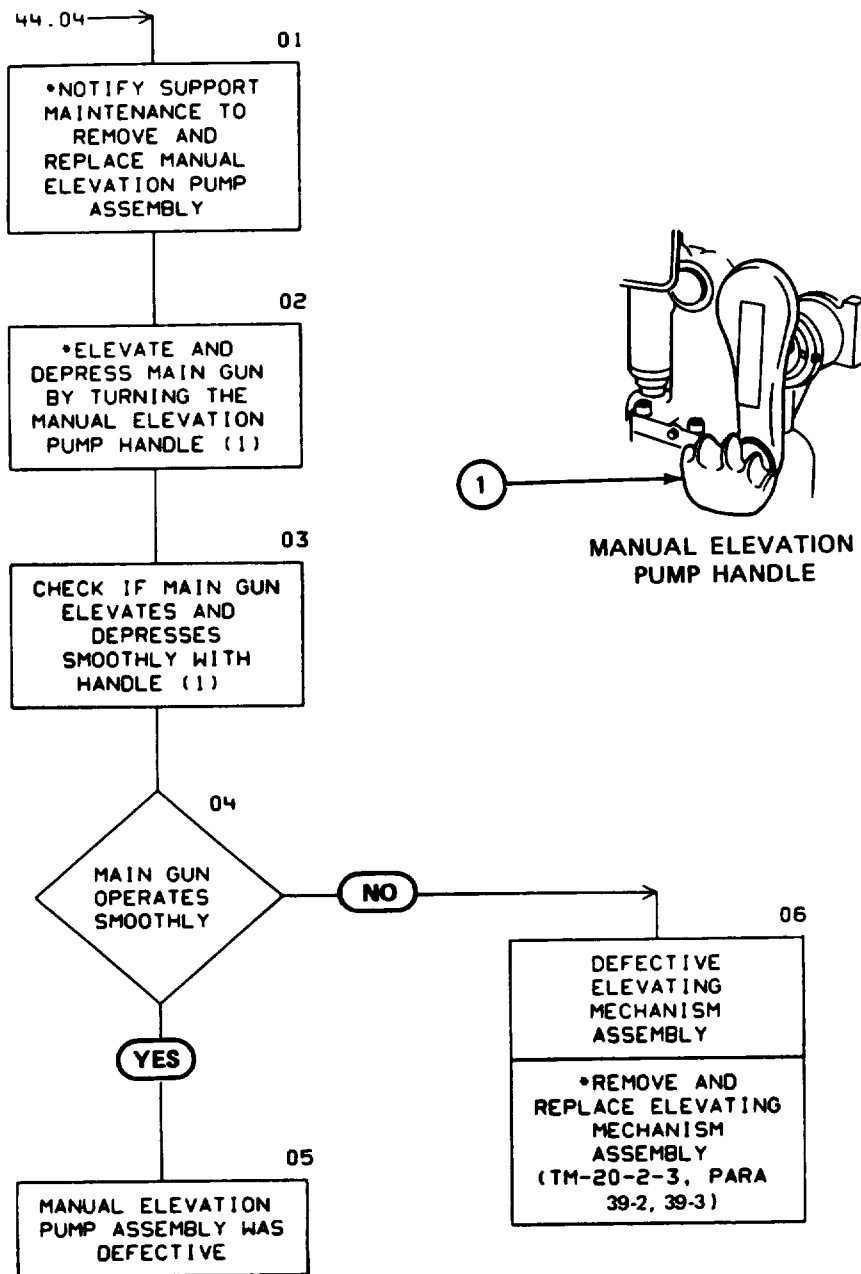
MANUAL ELEVATION PUMP HANDLE



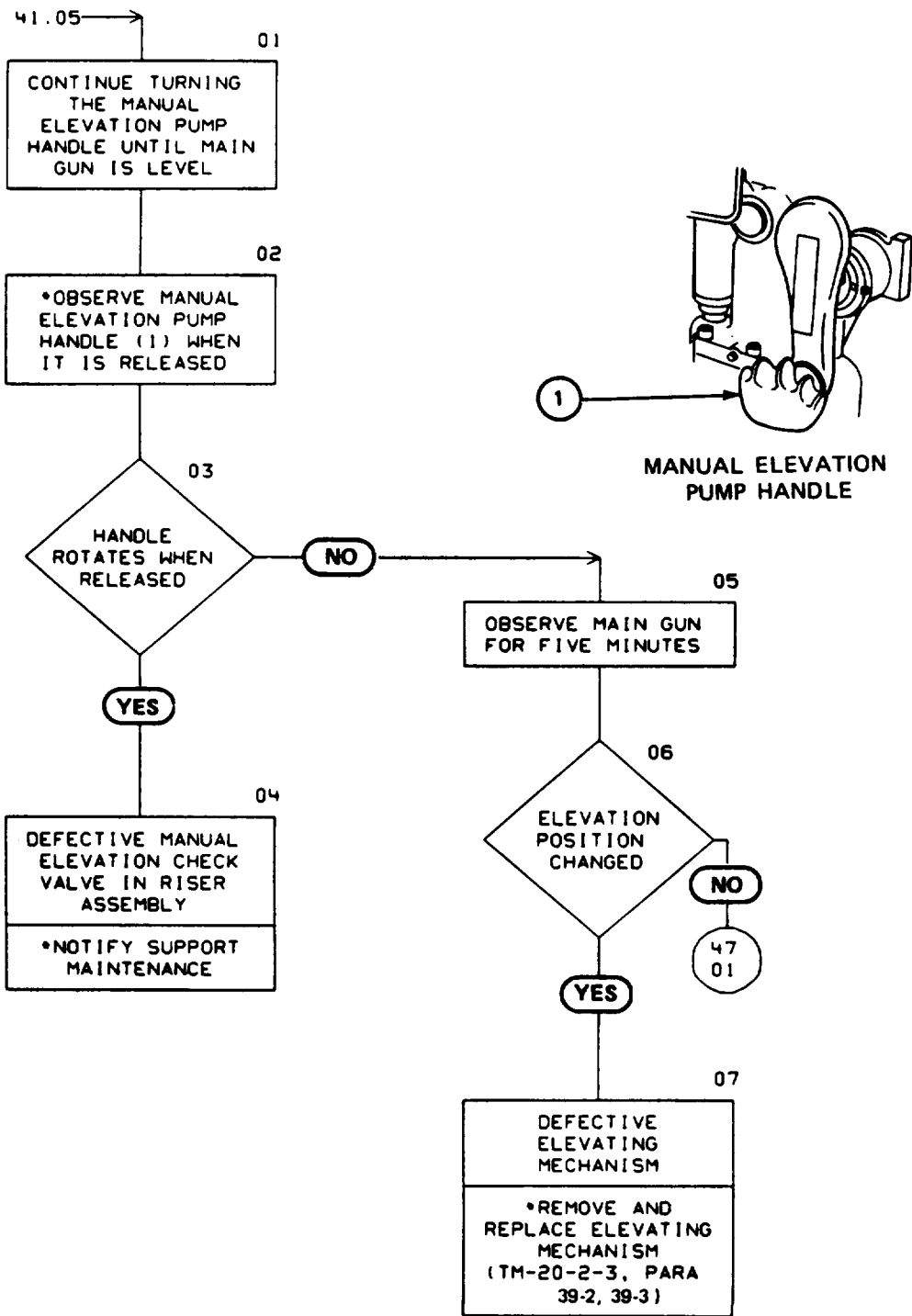
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 44 OF 78)



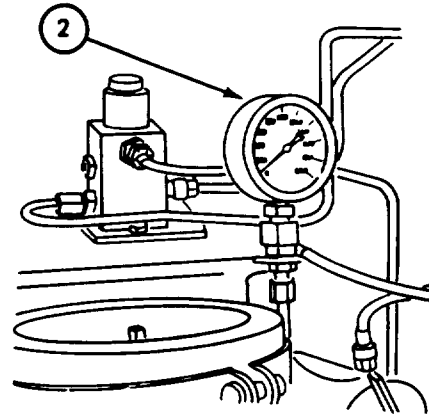
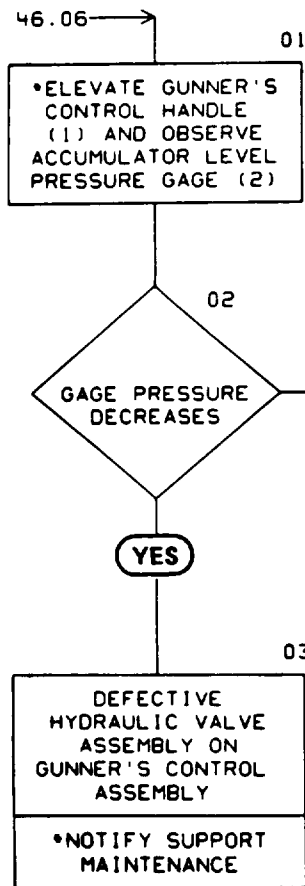
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 45 OF 78)



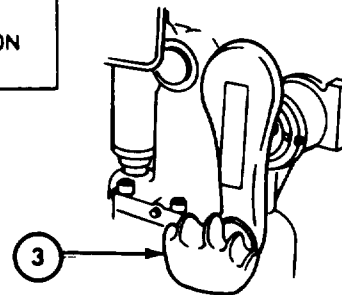
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 46 OF 78)



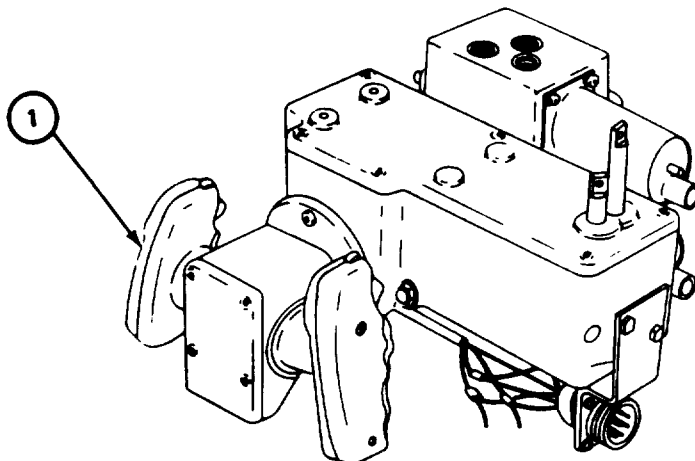
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 47 OF 78)



PRESSURE GAGE

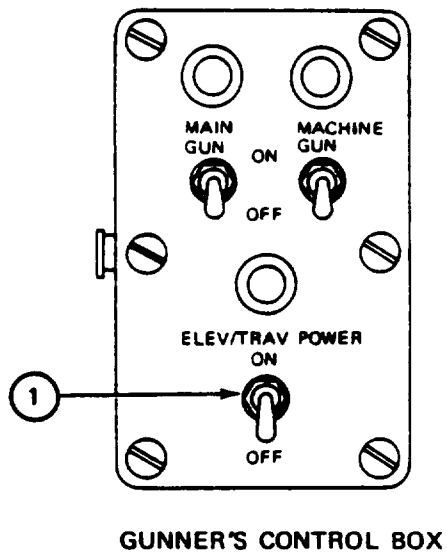
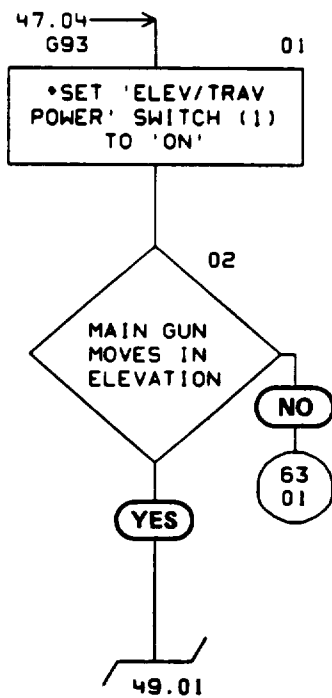


MANUAL ELEVATION  
PUMP HANDLE

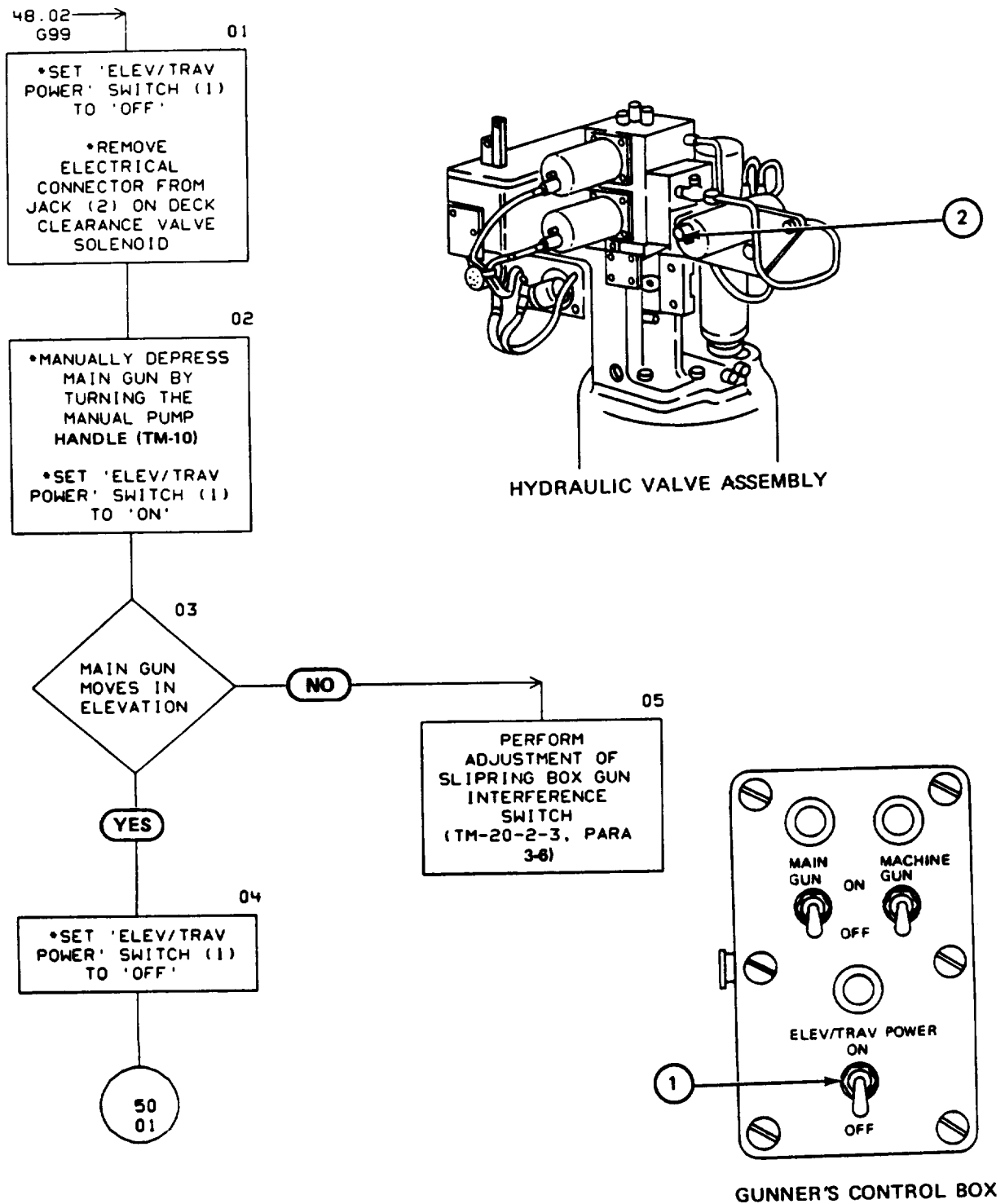


GUNNER'S CONTROL ASSEMBLY

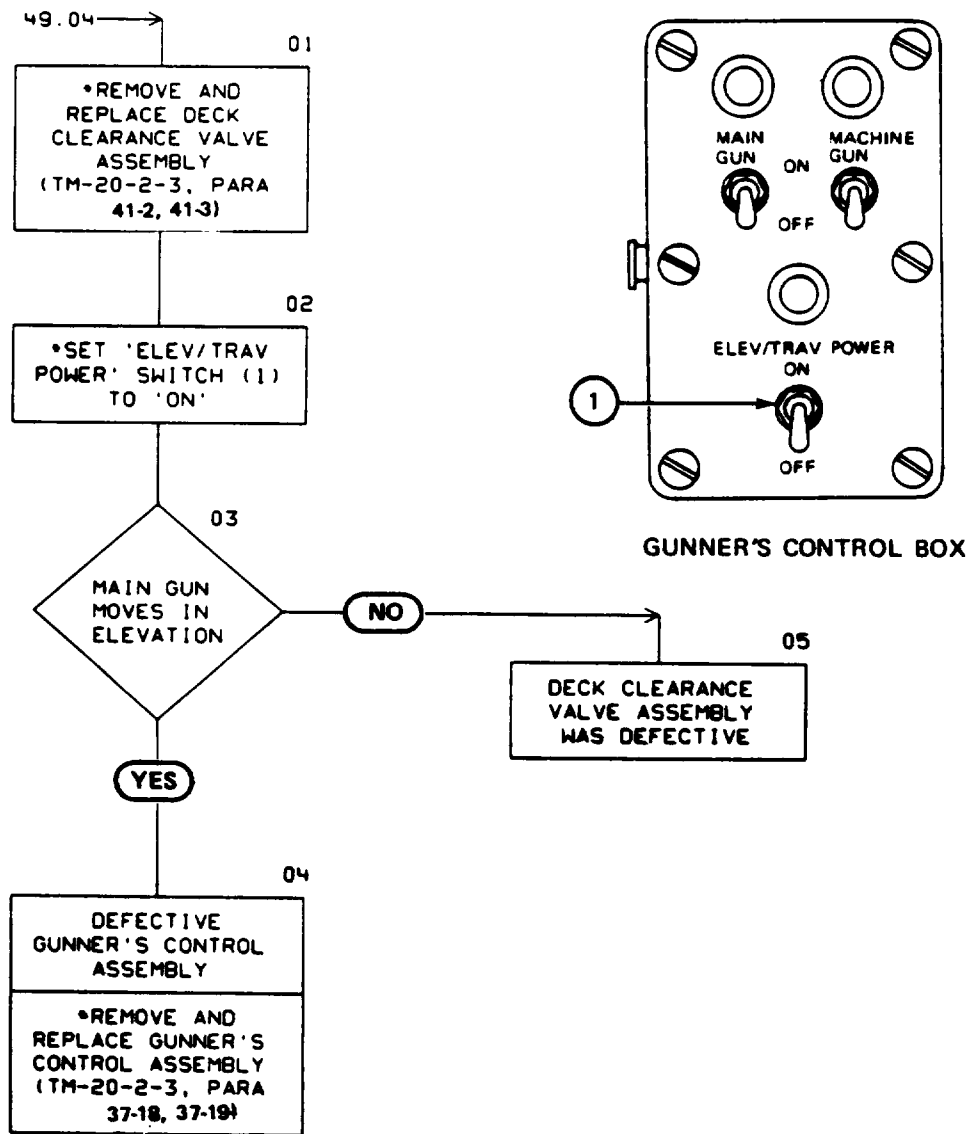
### 4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 48 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 49 OF 78)

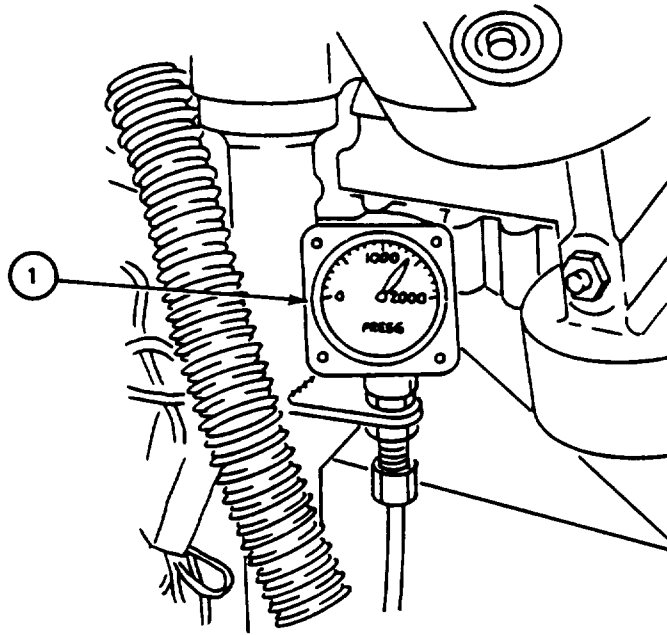
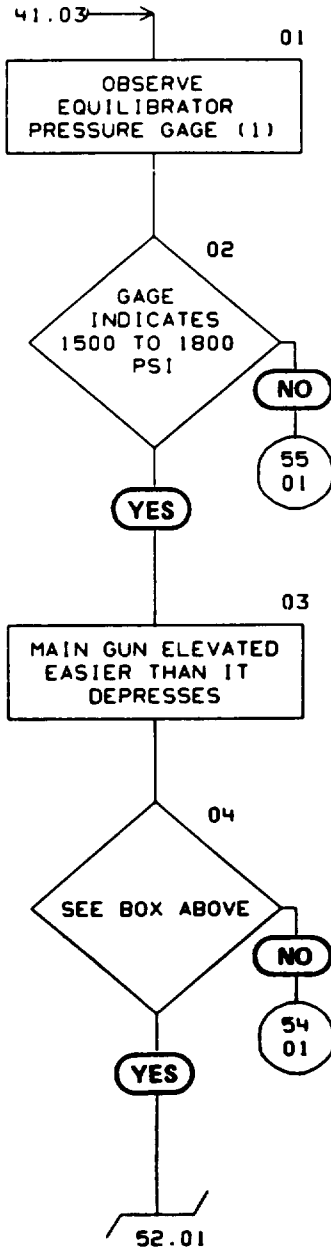


### 4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 50 OF 78)





4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 51 OF 78)



EQUILIBRATOR PRESSURE GAGE

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 52 OF 78)

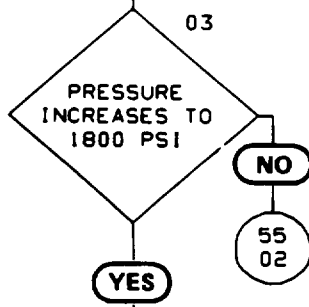
51.04\* →

01

TURN 'CHARGING VALVE' (1) ONE TURN COUNTERCLOCKWISE

02

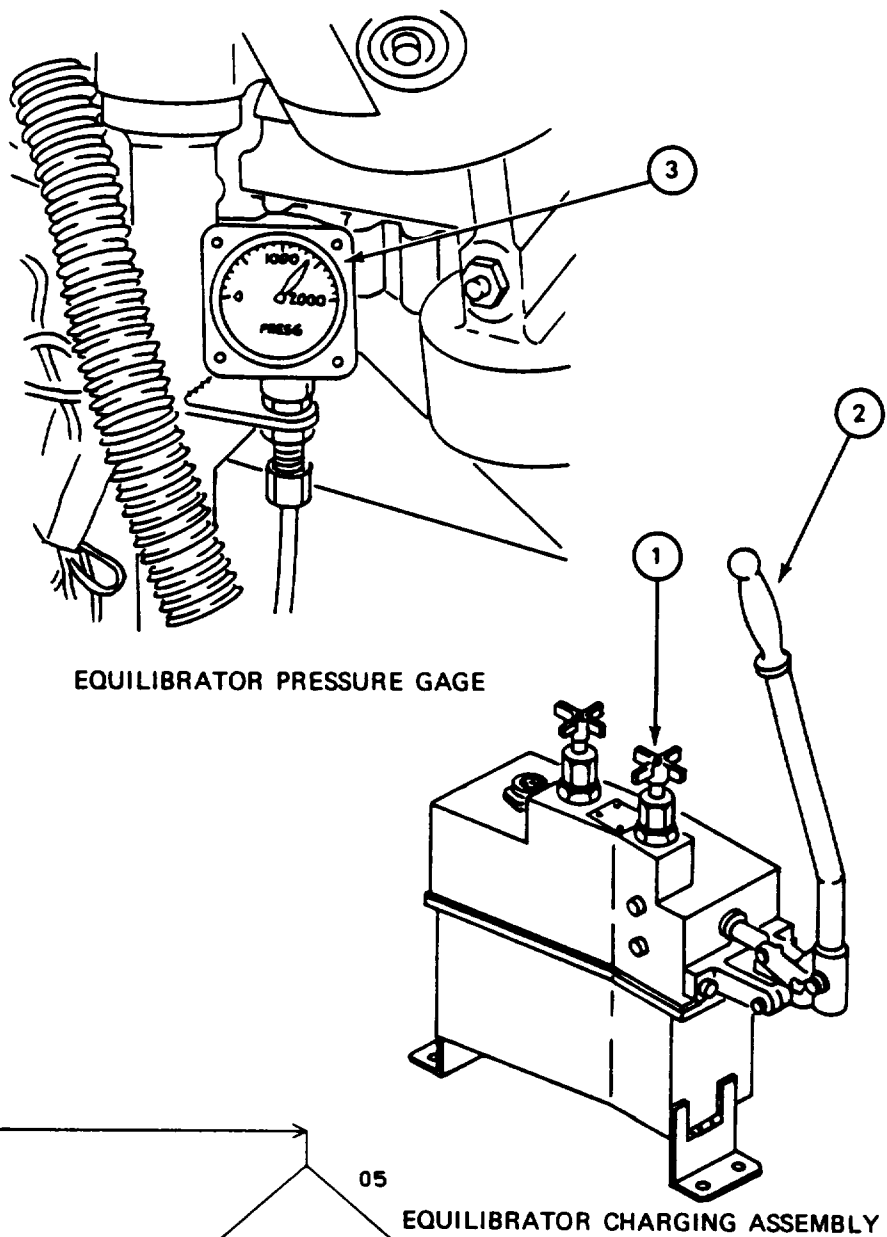
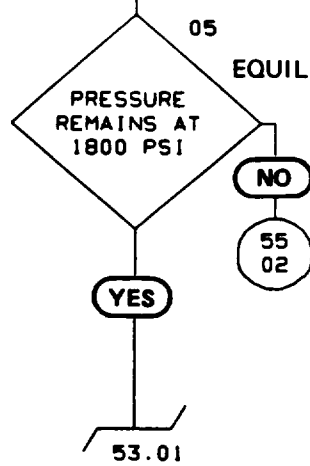
PUMP HANDLE (2) WHILE OBSERVING EQUILIBRATOR PRESSURE GAGE (3)



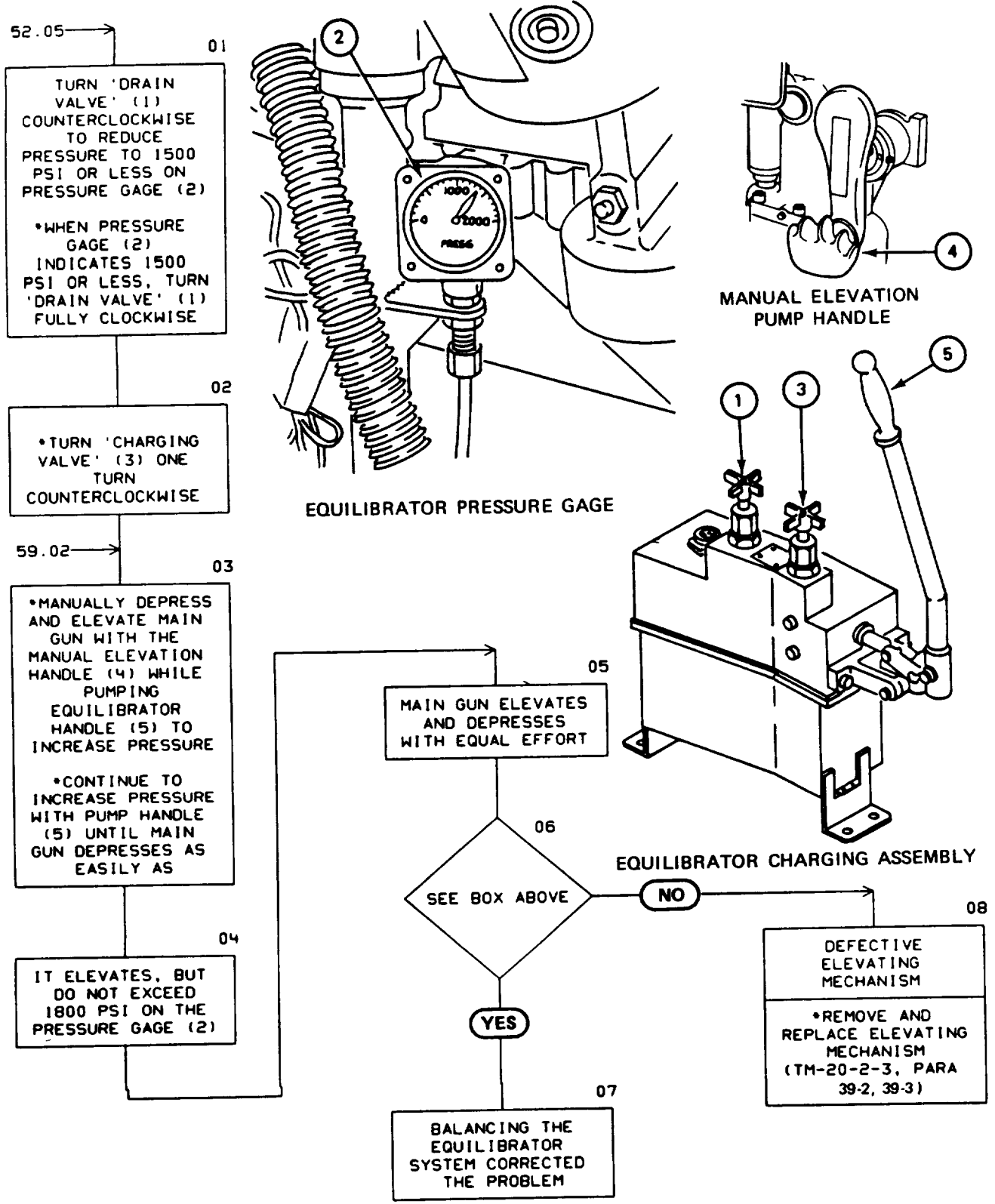
04

\*TURN 'CHARGING VALVE' (1) FULLY CLOCKWISE

\*OBSERVE PRESSURE GAGE (3) FOR 5 MINUTES



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 53 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 54 OF 78)

51.04\* →

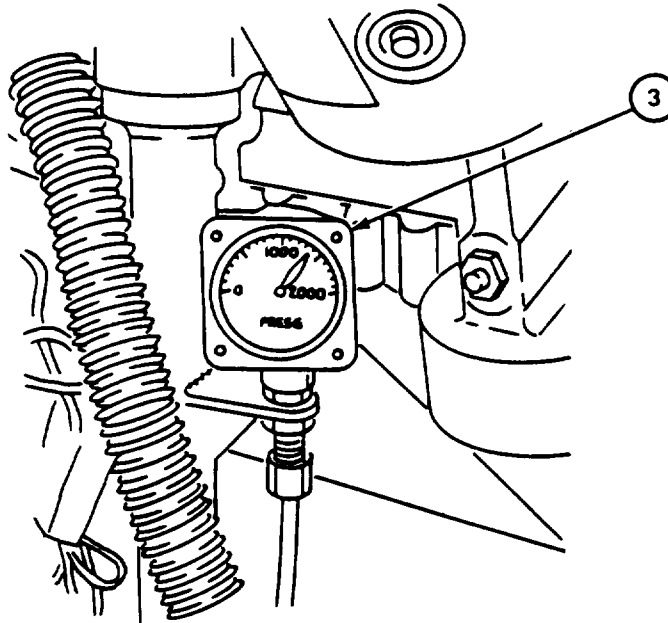
**WARNING** 01

FULLY ELEVATE  
MAIN GUN BEFORE  
DRAINING  
EQUILIBRATOR

02

•FULLY ELEVATE  
MAIN GUN WITH THE  
MANUAL ELEVATION  
HANDLE (1)

•TURN 'DRAIN  
VALVE' (2)  
COUNTERCLOCKWISE  
AND OBSERVE  
EQUILIBRATOR  
PRESSURE GAGE (3)



EQUILIBRATOR PRESSURE GAGE

03

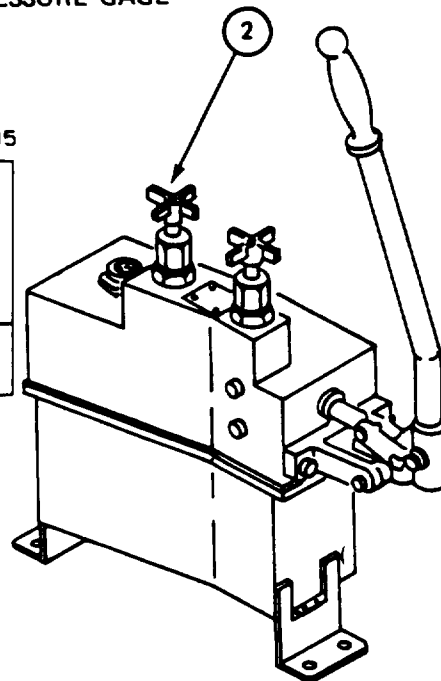
GAGE PRESSURE  
DECREASES

NO

05

DEFECTIVE  
EQUILIBRATOR  
PRESSURE GAGE OR  
EQUILIBRATOR  
CHARGING MANIFOLD  
ASSEMBLY

•NOTIFY SUPPORT  
MAINTENANCE



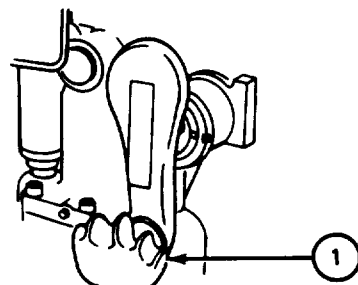
EQUILIBRATOR CHARGING ASSEMBLY

YES

04

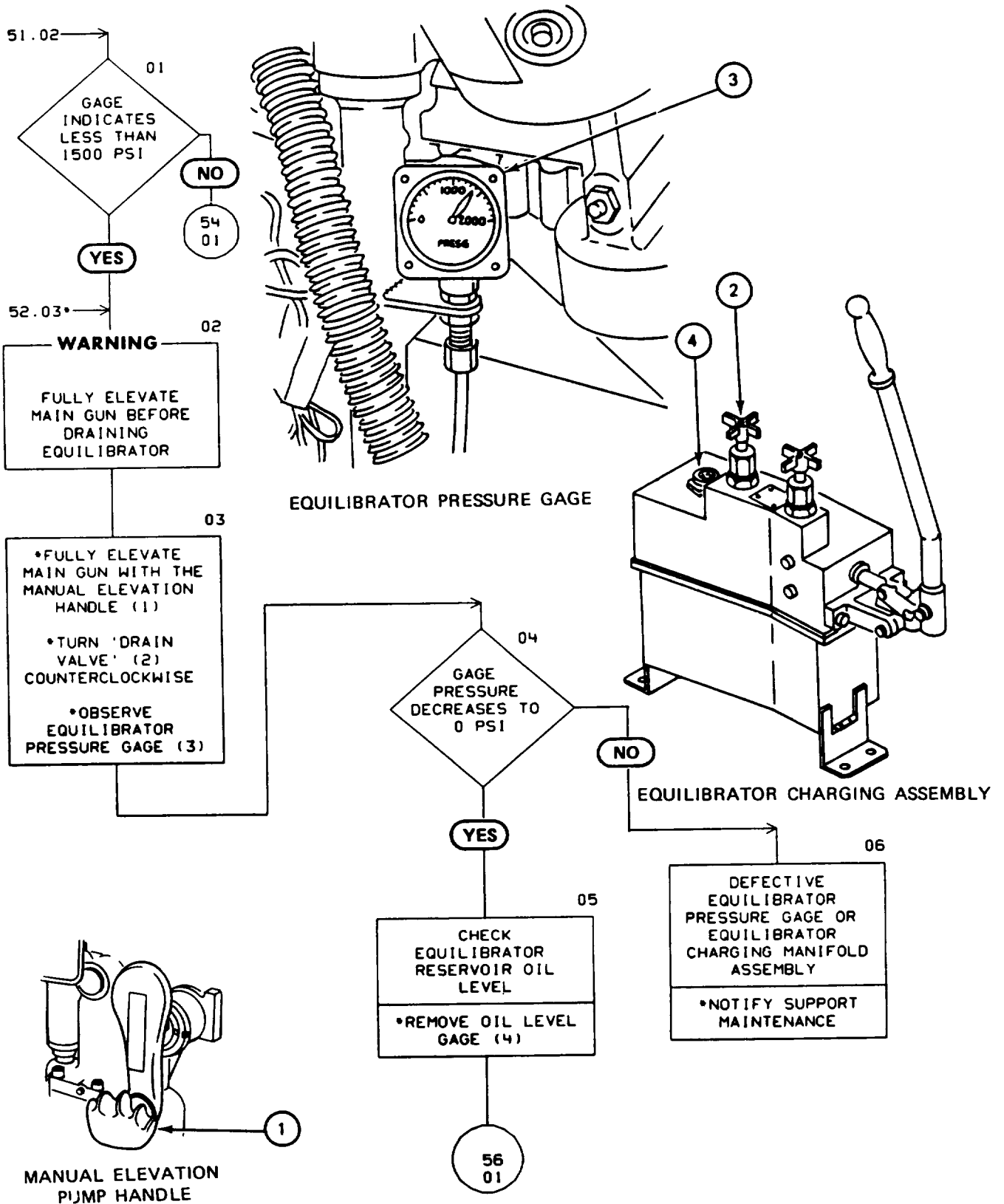
•WHEN GAGE (3)  
INDICATES 1500  
PSI OR LESS, TURN  
'DRAIN VALVE' (2)  
FULLY CLOCKWISE

52  
01

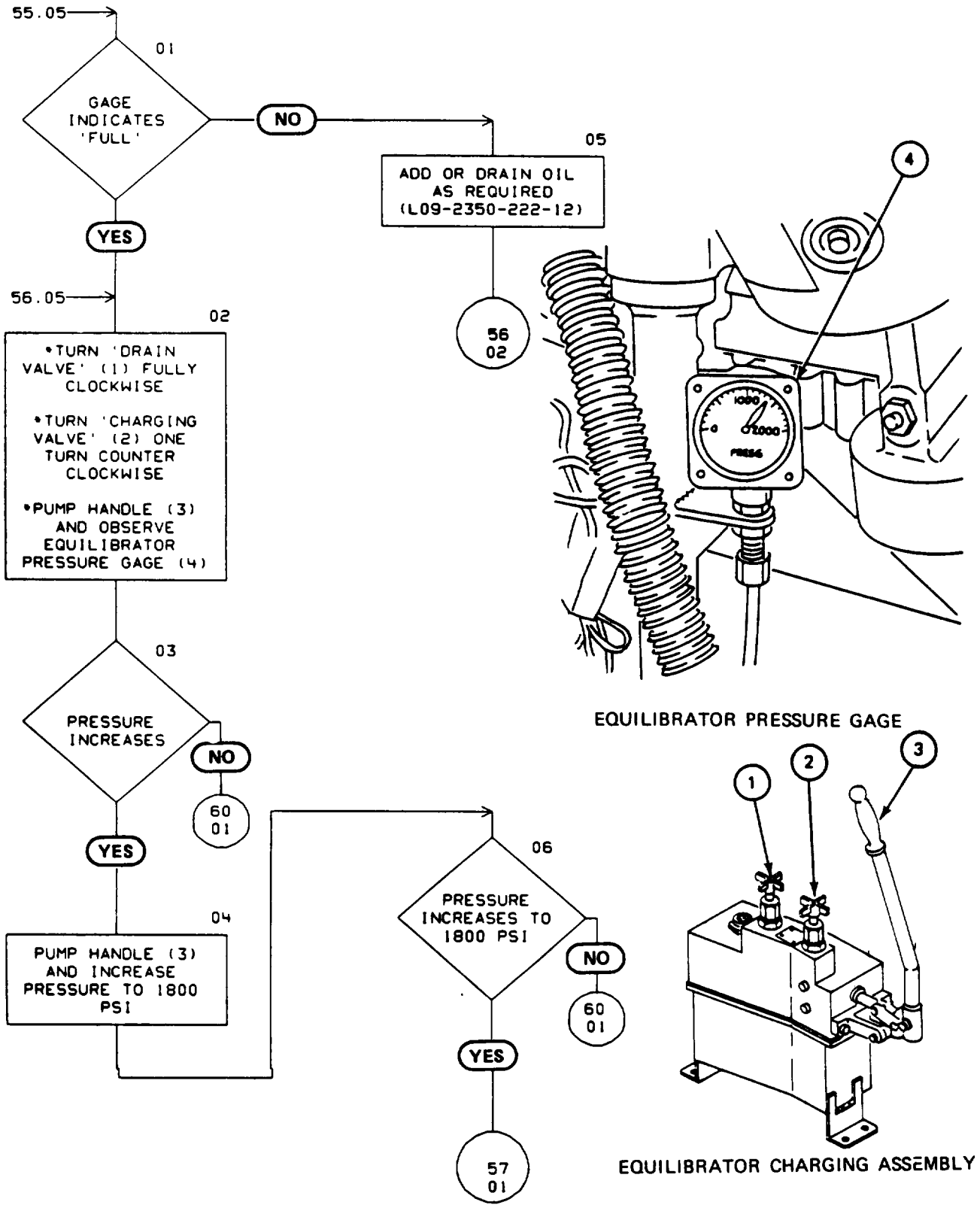


MANUAL ELEVATION  
PUMP HANDLE

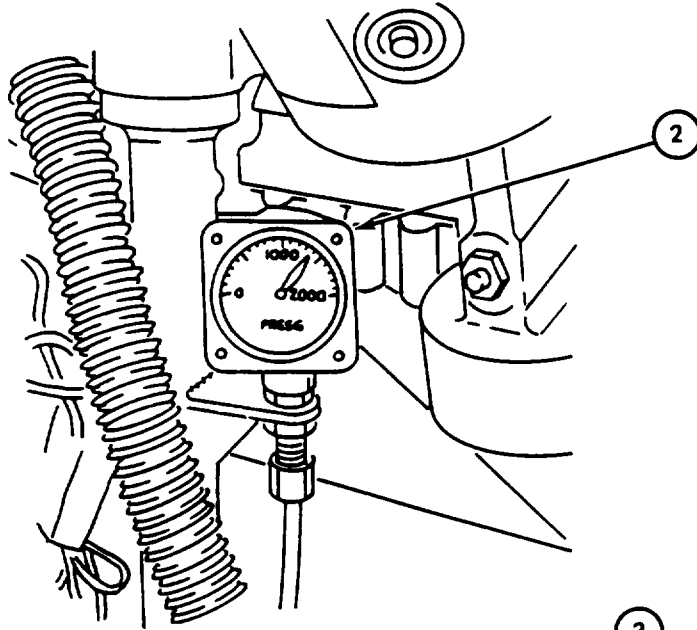
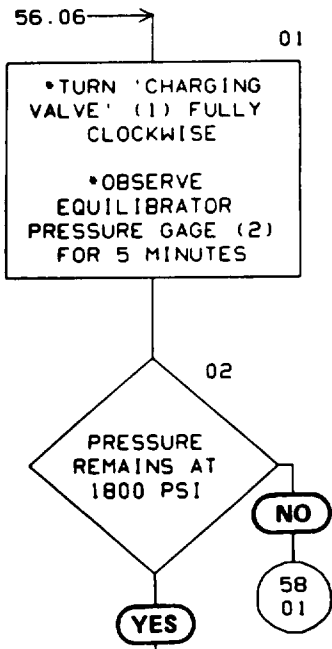
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 55 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 56 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 57 OF 78)



EQUILIBRATOR PRESSURE GAGE

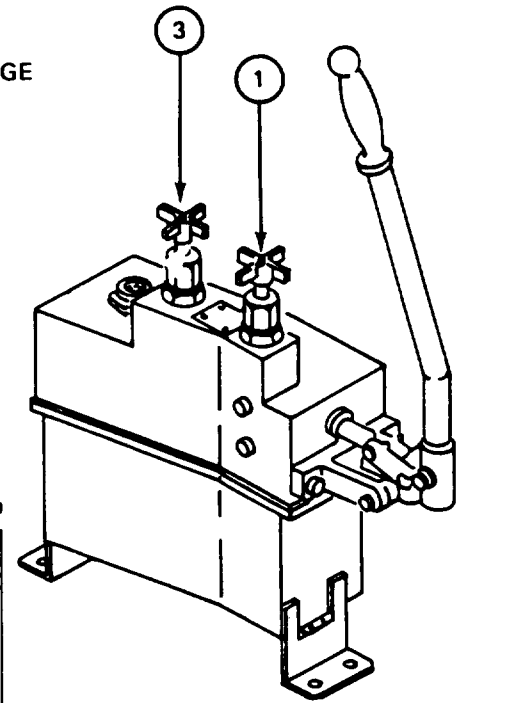
03

IN THE FOLLOWING STEP, THE GAGE NEEDLE WILL DECREASE SLOWLY UNTIL IT REACHES THE NITROGEN PRECHARGE PRESSURE IN THE EQUILIBRATOR ACCUMULATOR. AT THIS PRESSURE, THE NEEDLE WILL DROP QUICKLY TO ZERO

04

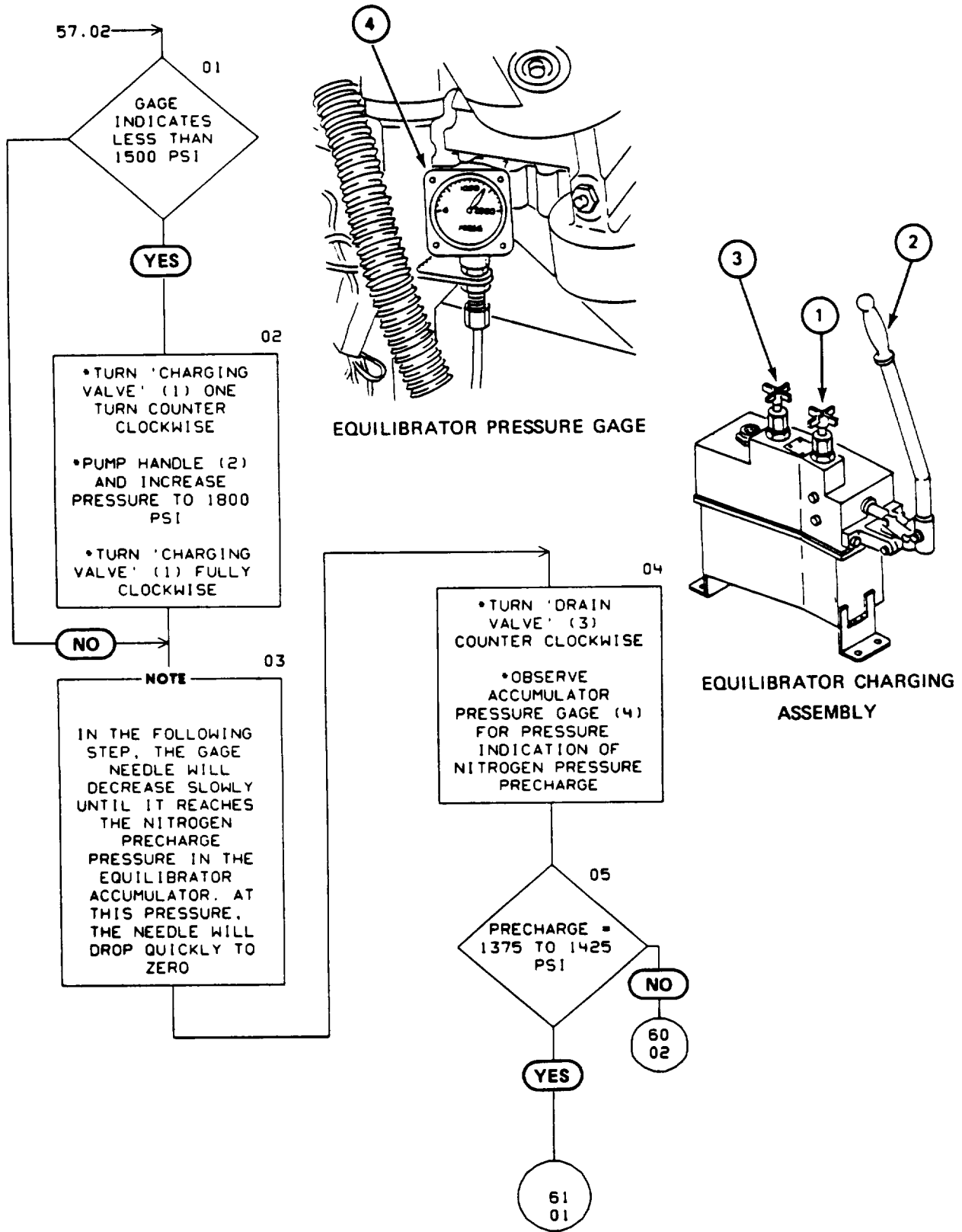
- TURN 'DRAIN VALVE' (3) COUNTER CLOCKWISE
- OBSERVE ACCUMULATOR PRESSURE GAGE (2) FOR PRESSURE INDICATION OF NITROGEN PRECHARGE

59  
01



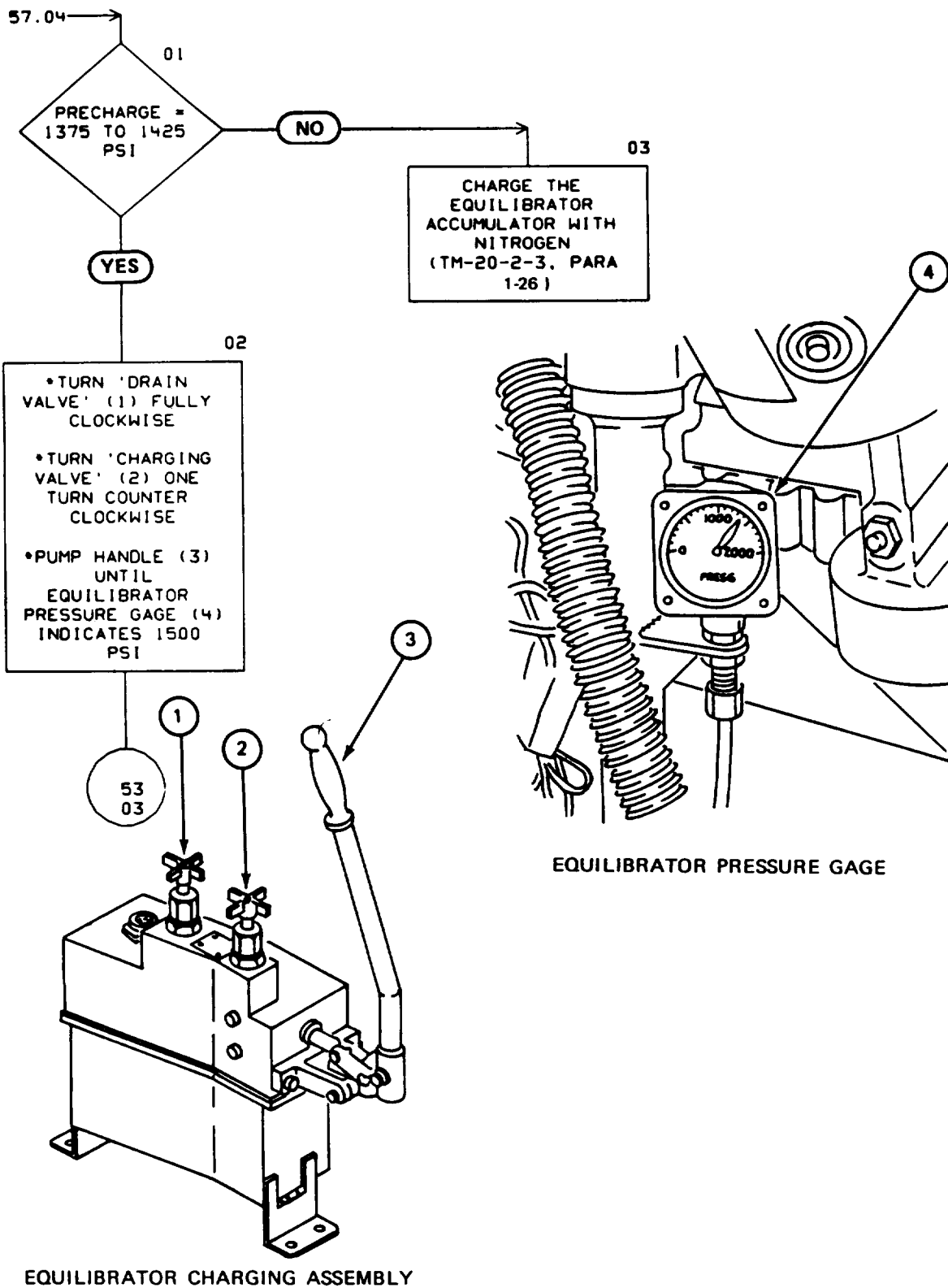
EQUILIBRATOR CHARGING ASSEMBLY

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 58 OF 78)





4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 59 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 60 OF 78)

56.03\* → 01

•TURN 'CHARGING VALVE' (1) FULLY CLOCKWISE

•TURN 'DRAIN VALVE' (2) COUNTER CLOCKWISE

58.05 → 02

PERFORM CHARGING PROCEDURE OF THE EQUILIBRATOR ACCUMULATOR (TM-20-2-3, PARA 1-26)

03

CHARGING PROCEDURE PERFORMED PROPERLY

04

SEE BOX ABOVE

YES

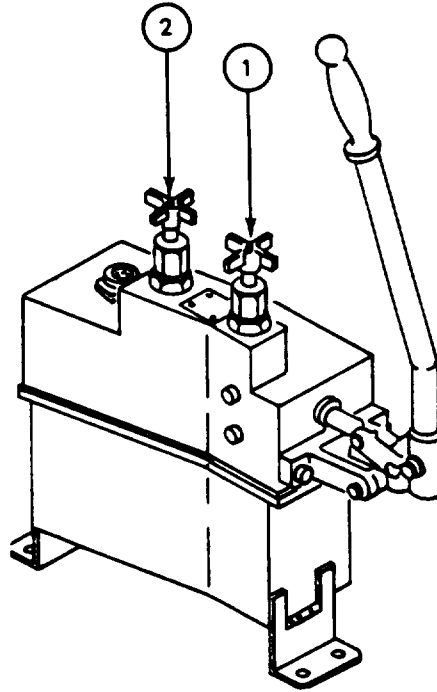
61  
01

NO

05

DEFECTIVE EQUILIBRATOR ACCUMULATOR

•NOTIFY SUPPORT MAINTENANCE



EQUILIBRATOR CHARGING ASSEMBLY

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 61 OF 78)

58.05\* →

01

• REMOVE EQUILIBRATOR PRESSURE LINE (1) FROM ELEVATING MECHANISM

02

**WARNING**

THE PLUG INSTALLED IN THE HYDRAULIC LINE IN THE FOLLOWING STEP MUST BE ABLE TO HOLD 2000 PSI

03

• INSTALL CAP OVER FITTING (2) ON ELEVATING MECHANISM

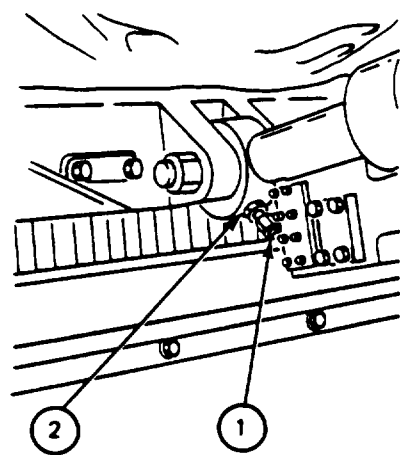
• INSTALL PLUG IN LINE (1) THAT WAS DISCONNECTED FROM THE ELEVATING MECHANISM

04

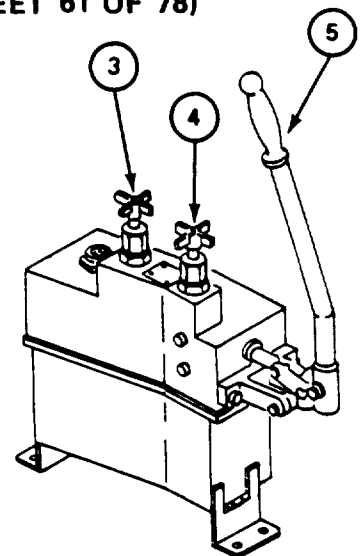
• TURN 'DRAIN VALVE' (3) FULLY CLOCKWISE

• TURN 'CHARGING VALVE' (4) ONE TURN COUNTER CLOCKWISE

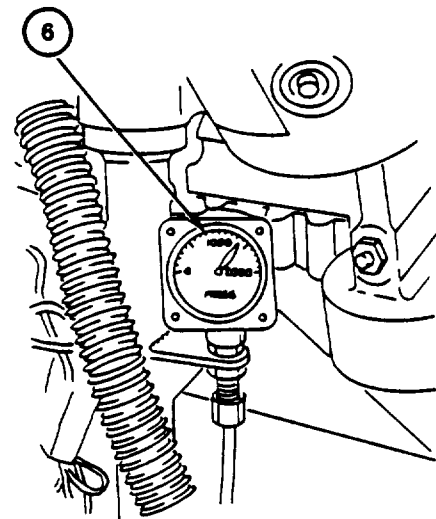
• PUMP HANDLE (5) TO INCREASE PRESSURE ON PRESSURE GAGE (6)



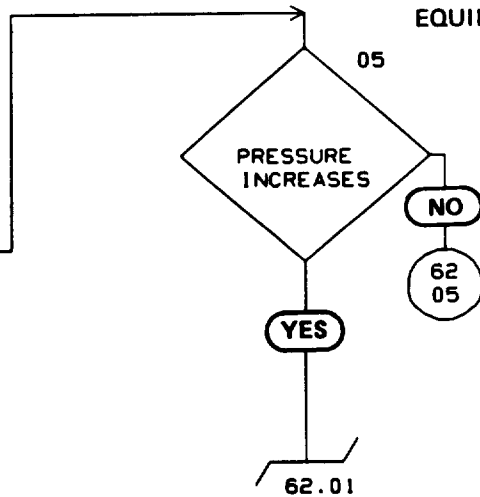
ELEVATING MECHANISM



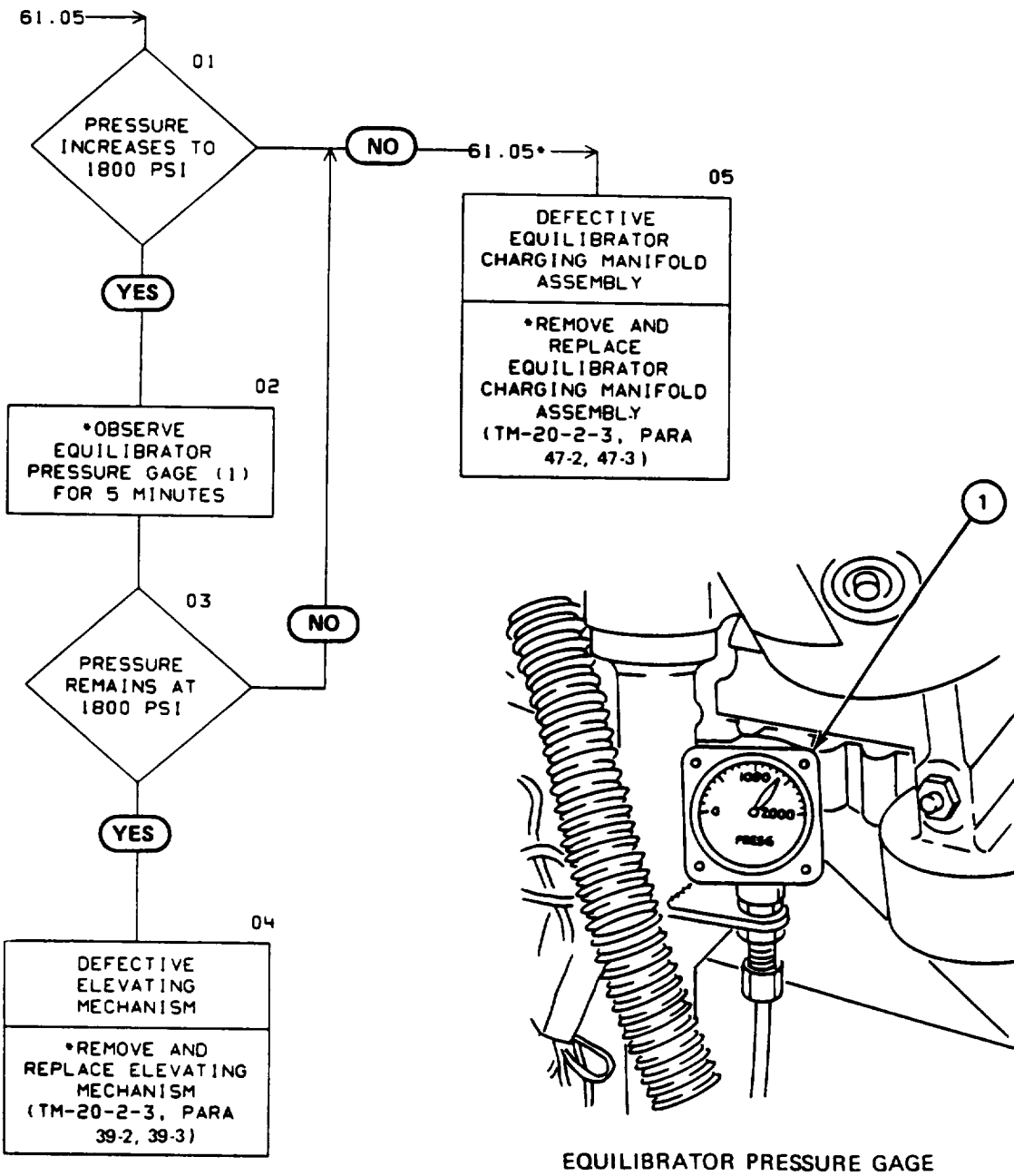
EQUILIBRATOR CHARGING ASSEMBLY



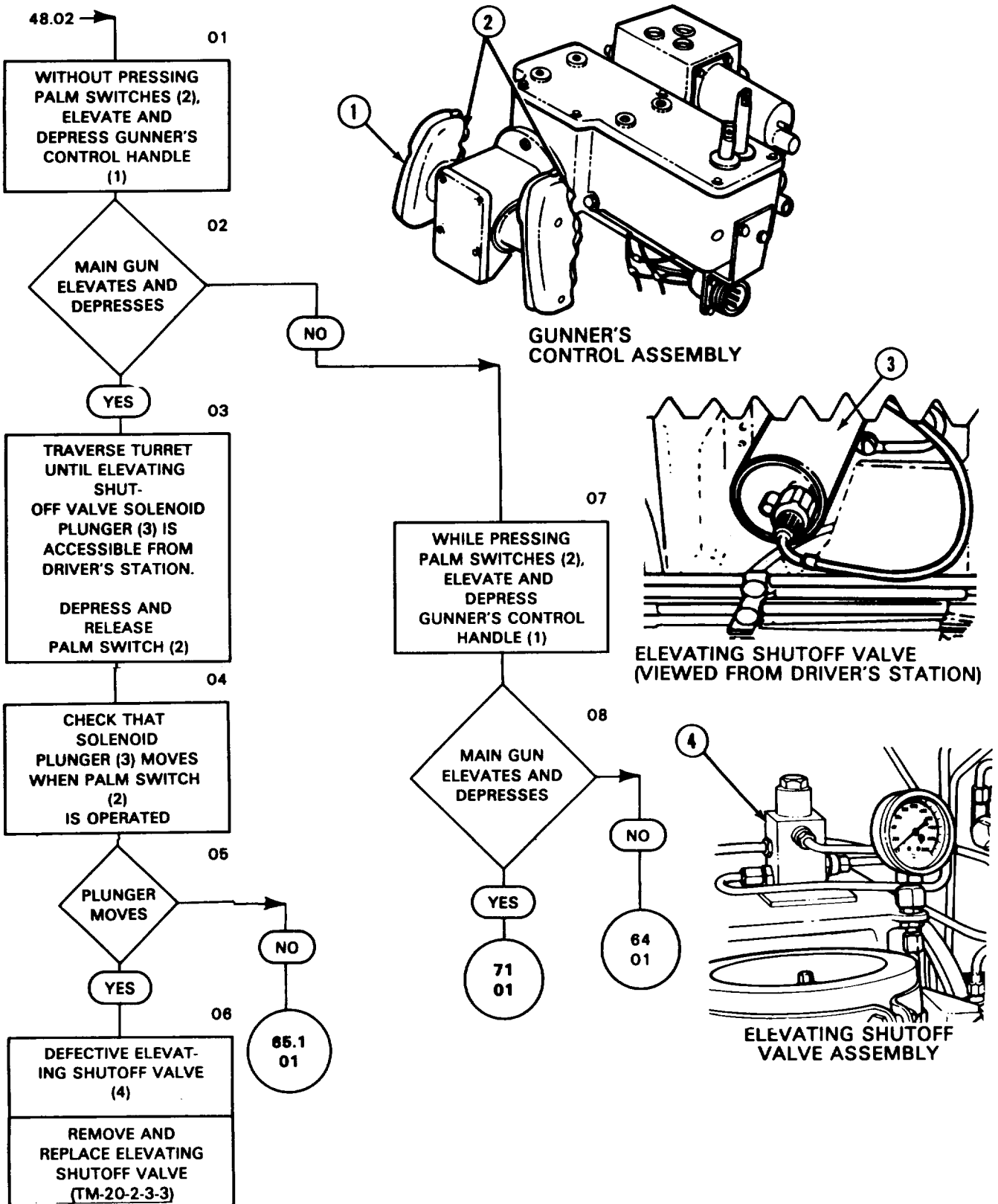
EQUILIBRATOR PRESSURE GAGE



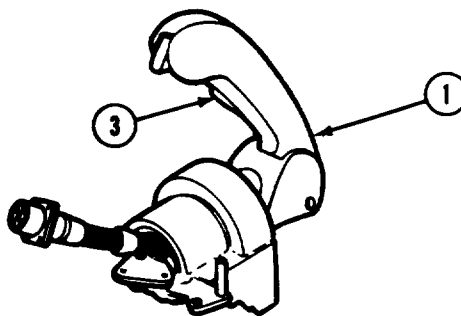
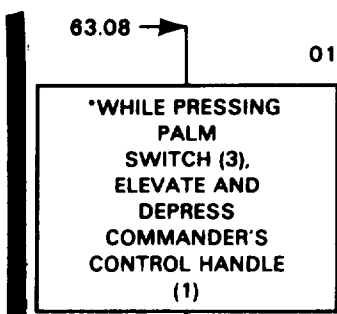
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 62 OF 78)



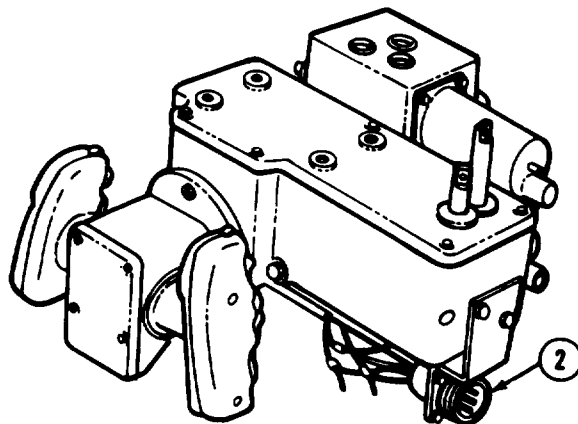
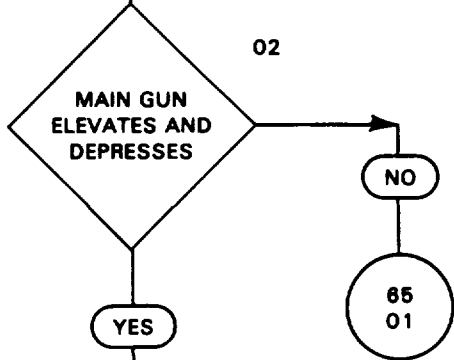
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 63 OF 78)



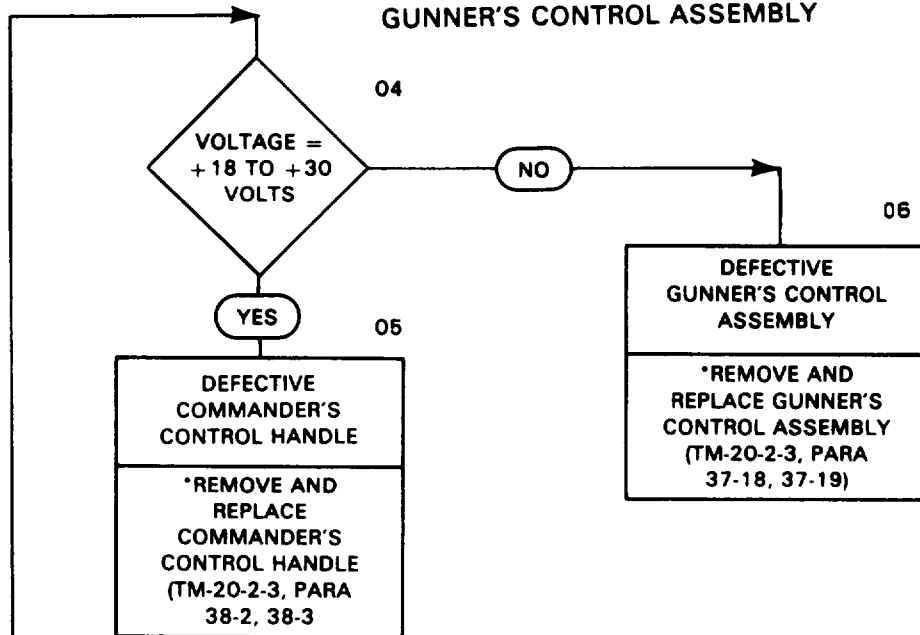
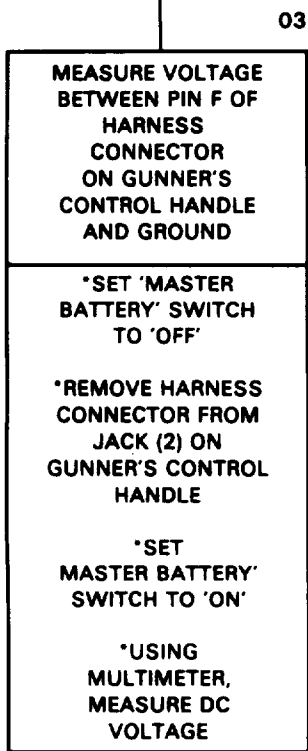
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 64 OF 78)



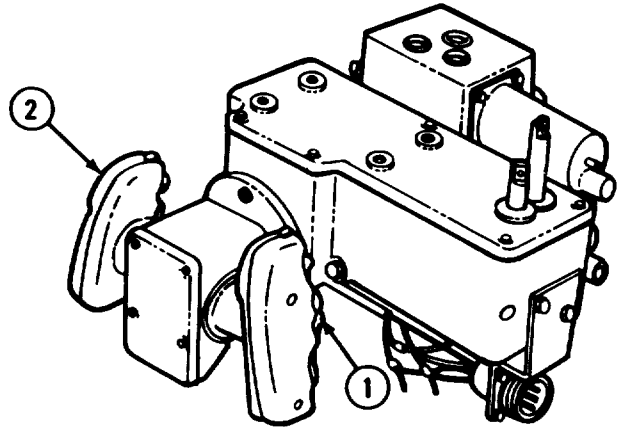
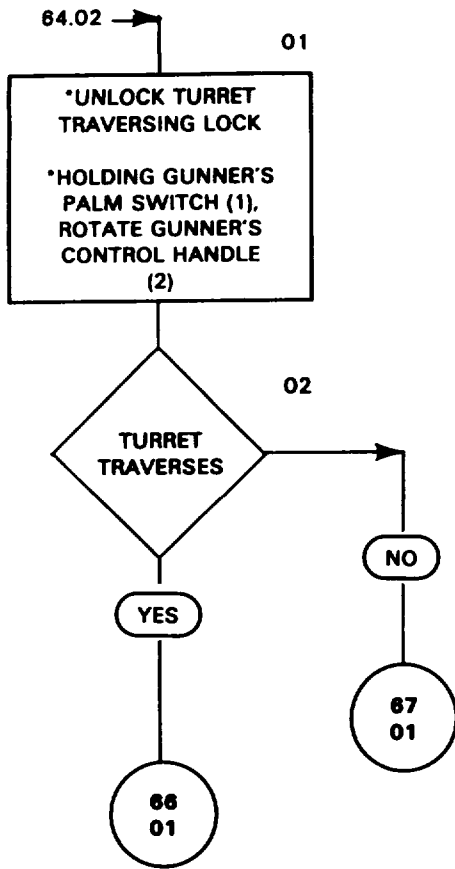
COMMANDER'S CONTROL HANDLE



GUNNER'S CONTROL ASSEMBLY

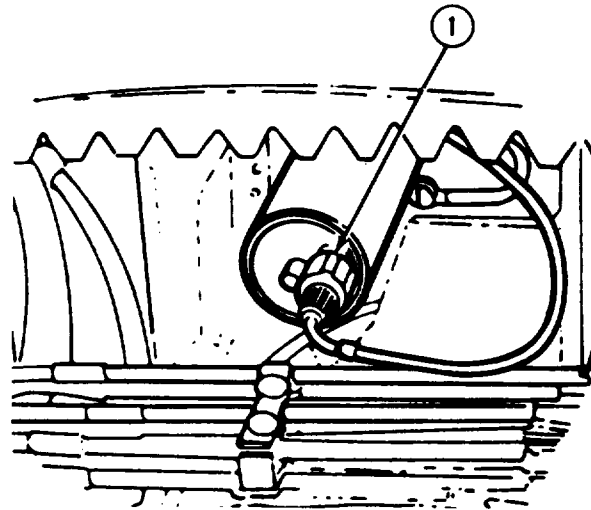
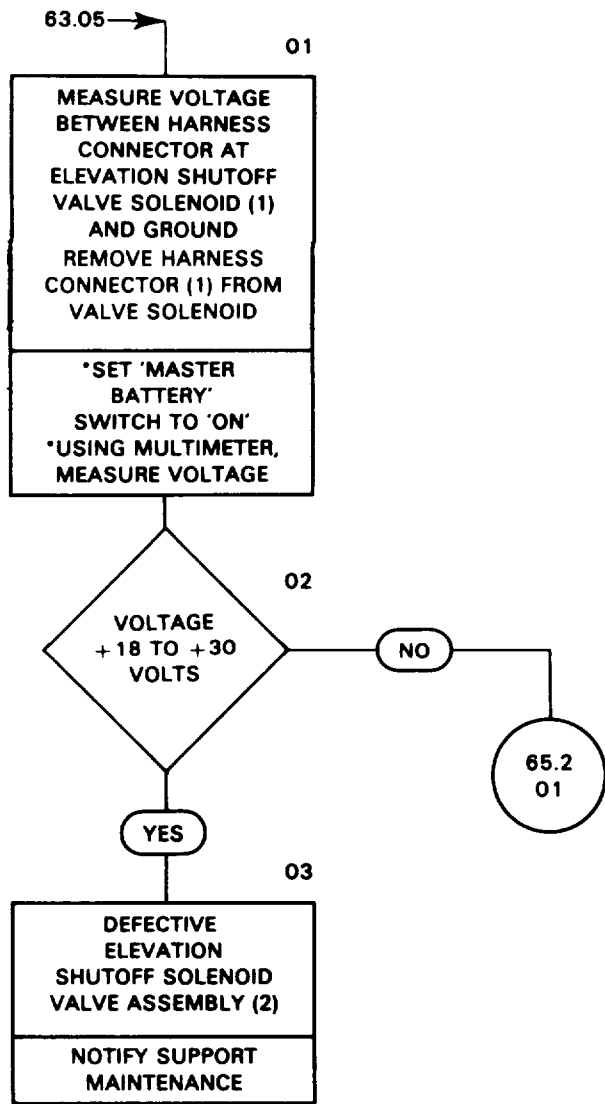


4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65 OF 78)

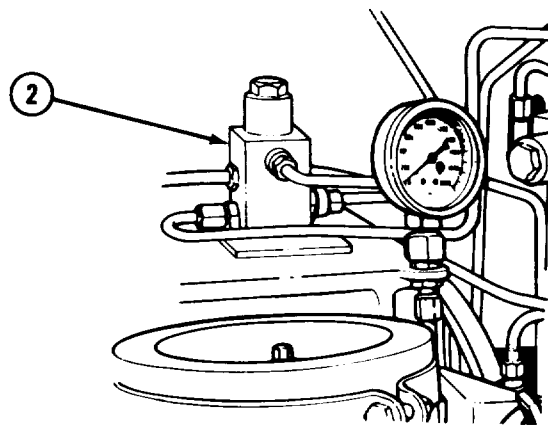


GUNNER'S CONTROL ASSEMBLY

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65.1 OF 78)



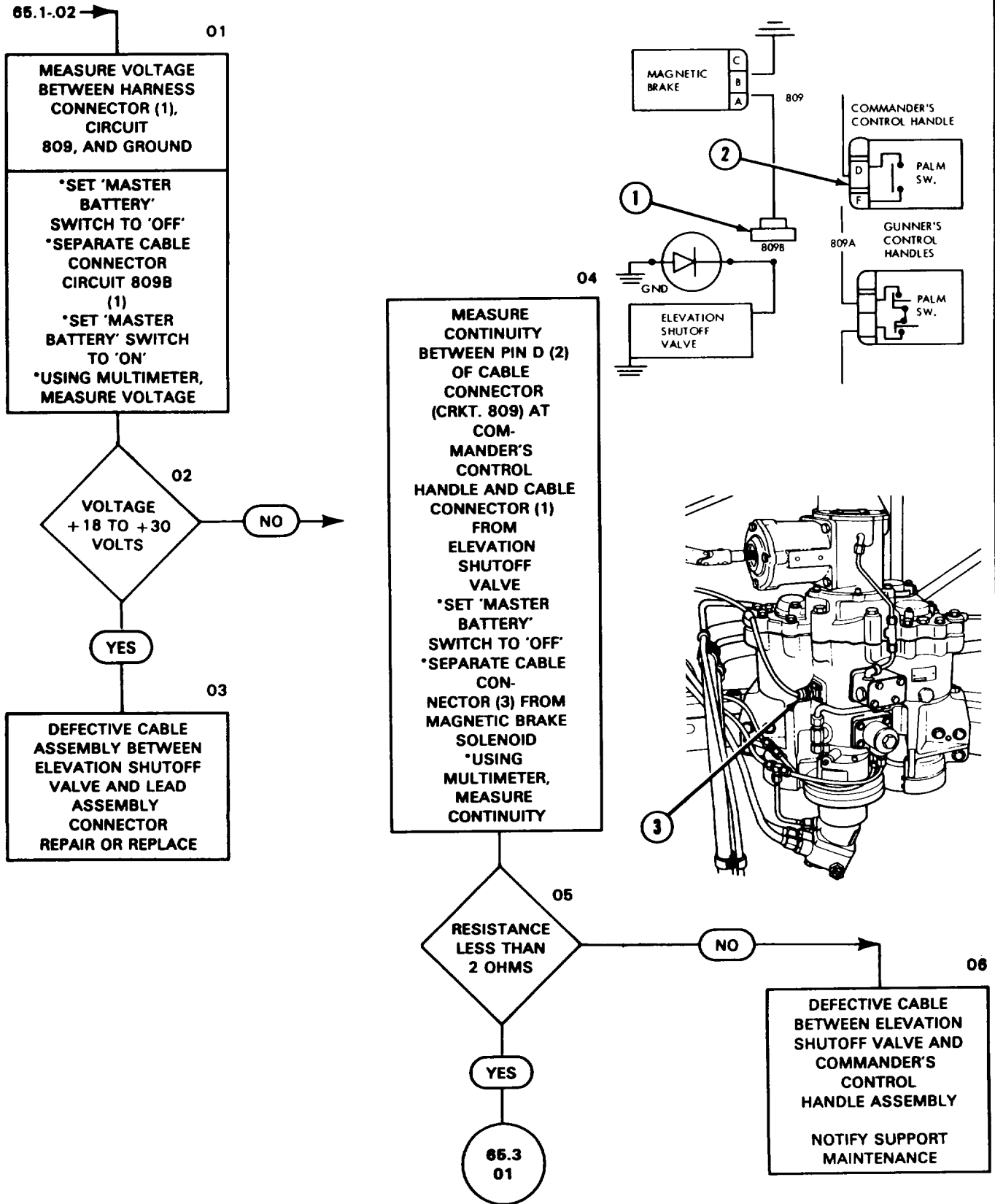
ELEVATION SHUTOFF VALVE



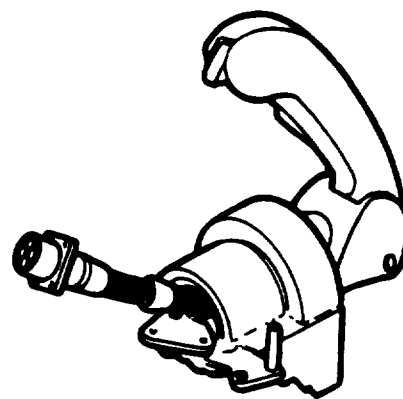
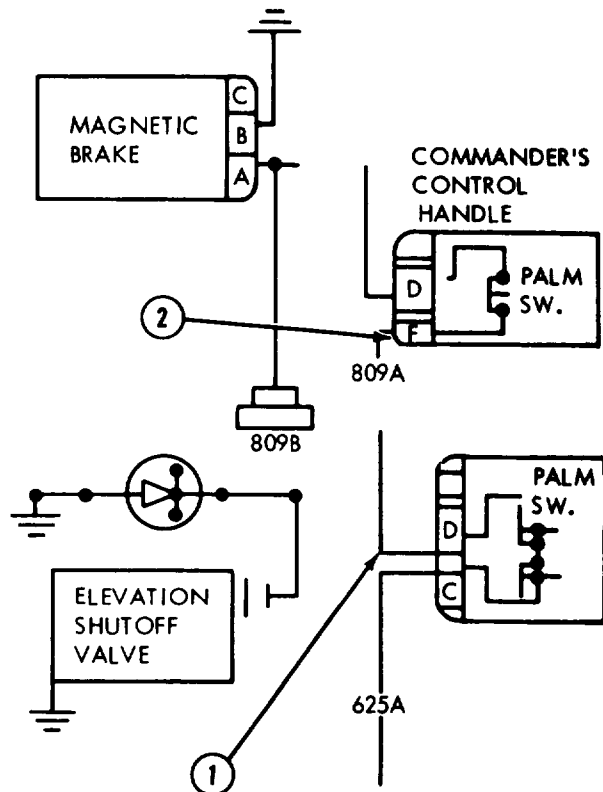
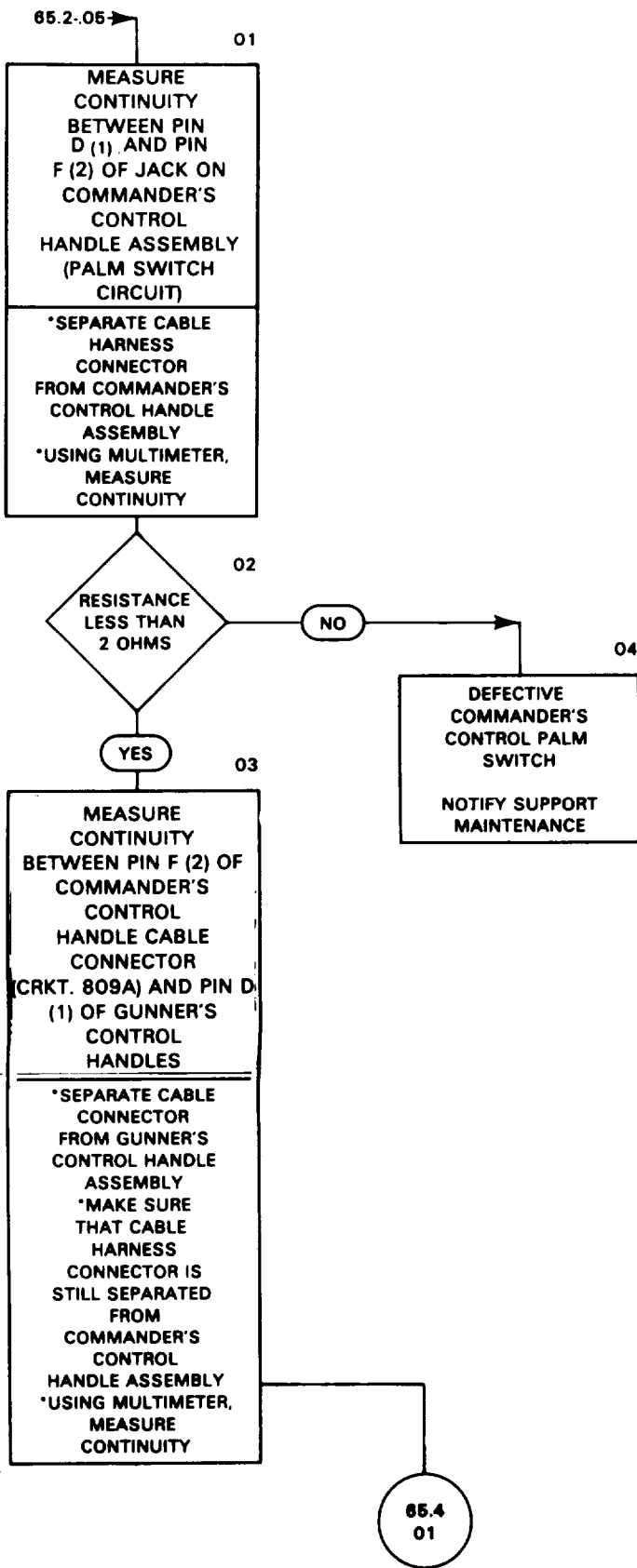
ELEVATION SHUTOFF VALVE



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65.2 OF 78)

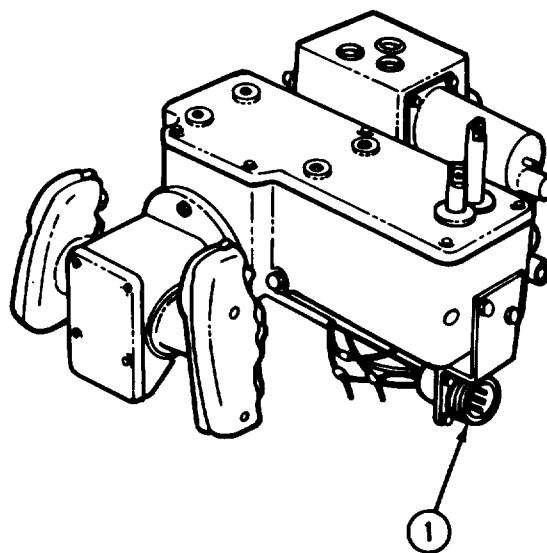
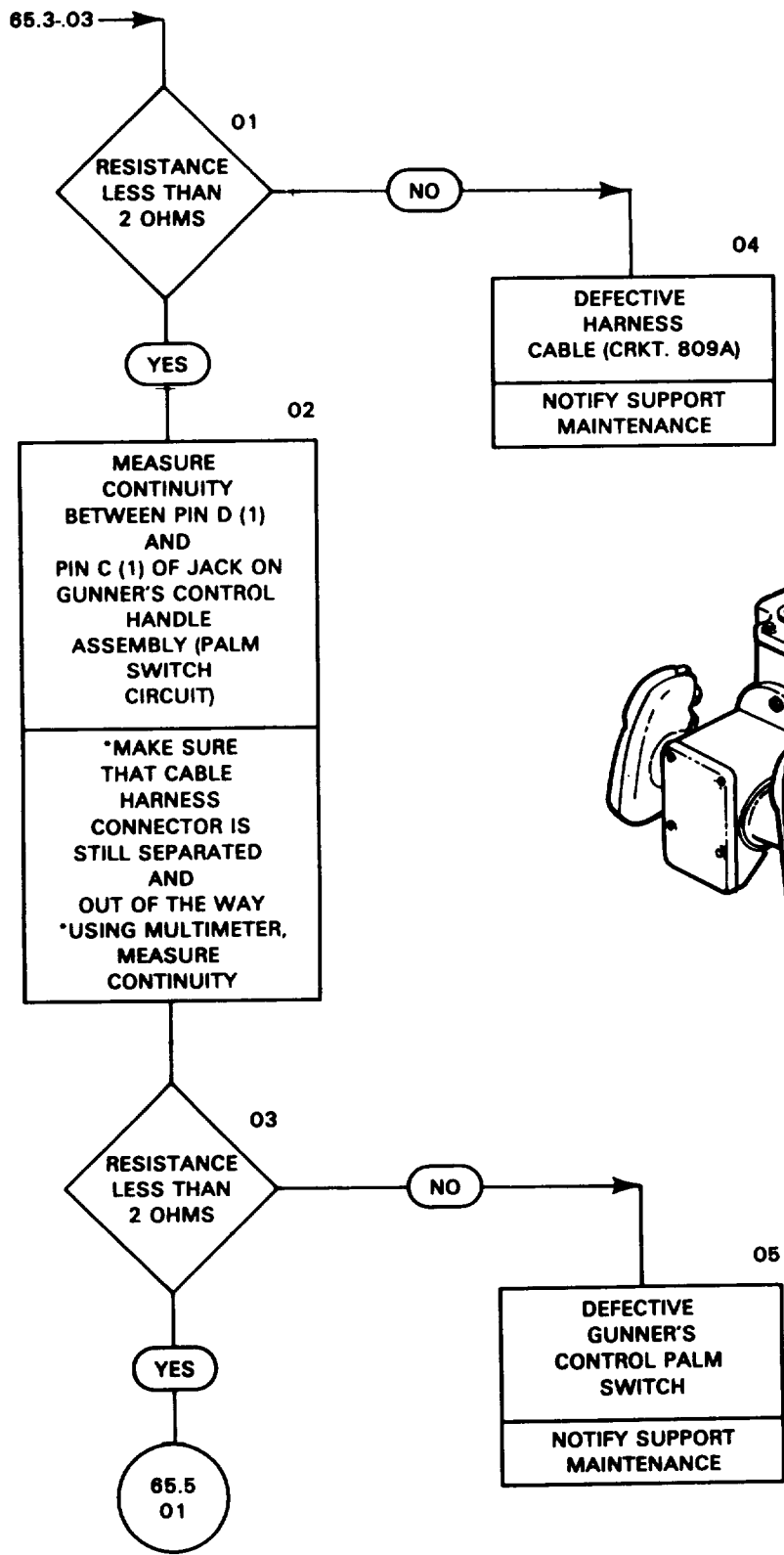


4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65.3 OF 78)

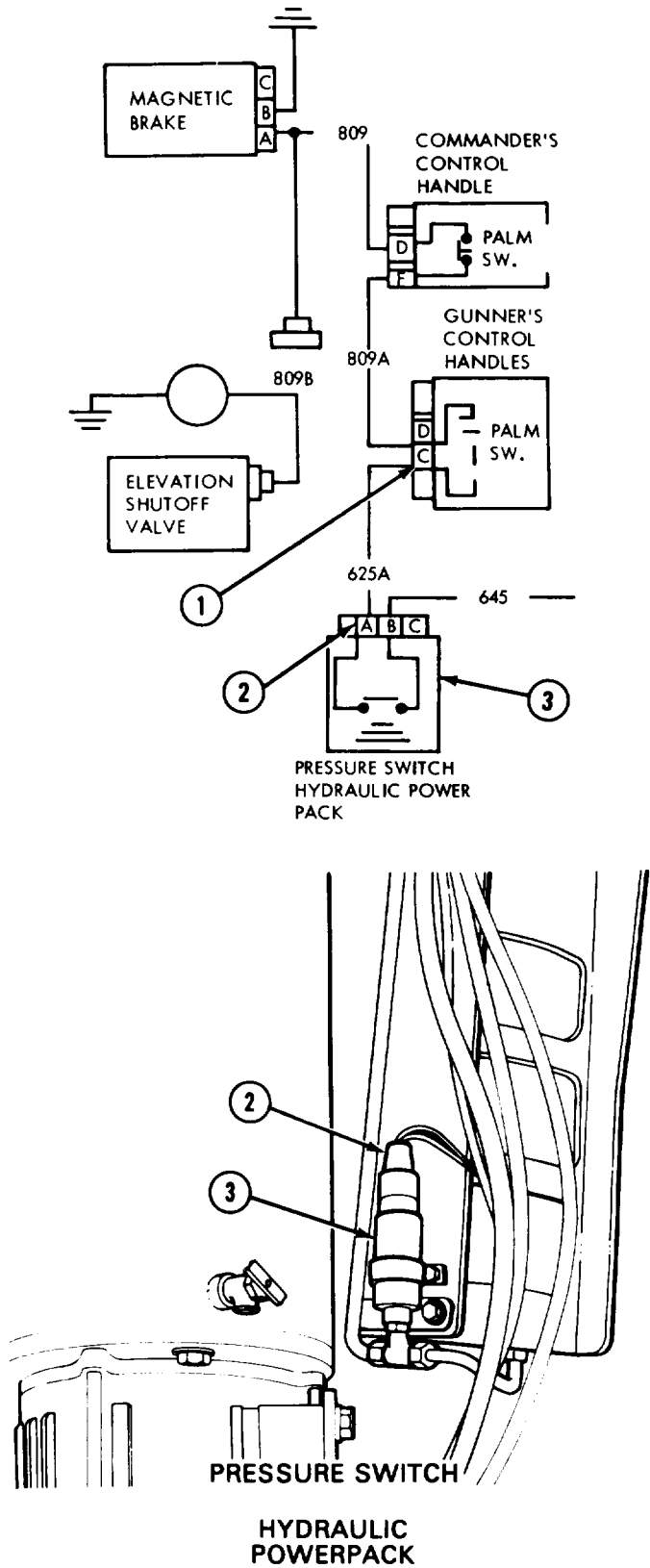
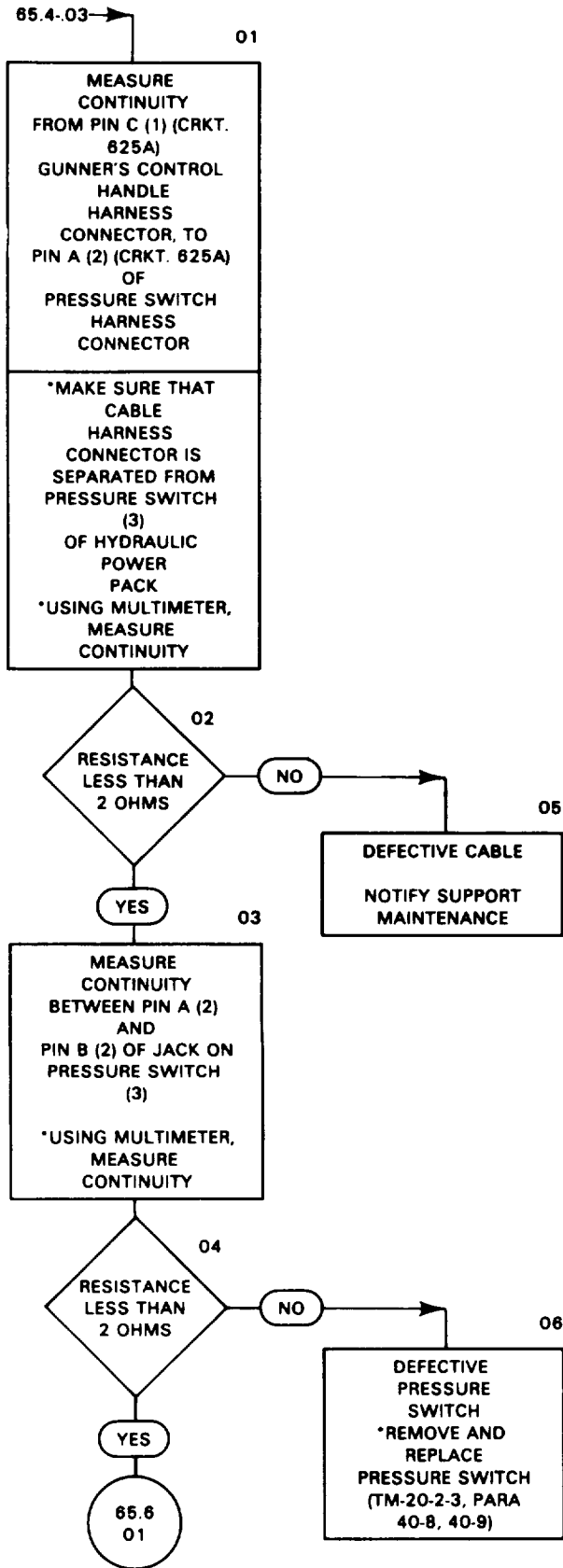


COMMANDER'S CONTROL HANDLE

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65.4 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65.5 OF 78)



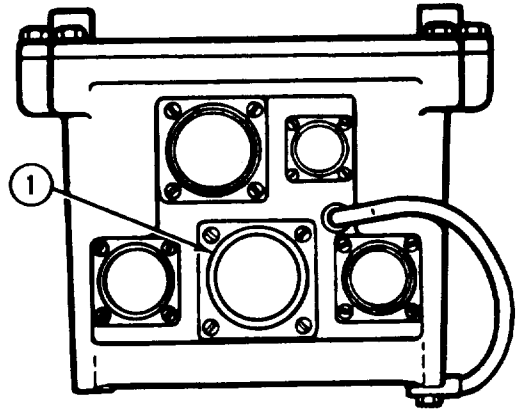
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 65.6 OF 78)

65.5-04 → 01

CHECK CONTINUITY OF LINE 645 BETWEEN HARNESS CONNECTOR TO PRESSURE SWITCH (2) SOCKET B AND PIN J OF HARNESS CONNECTOR TO THE TURRET POWER AND SEARCHLIGHT RELAY BOX

\*REMOVE HARNESS CONNECTOR FROM JACK (1) ON THE TURRET POWER AND SEARCHLIGHT RELAY BOX

\*USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

RESISTANCE LESS THAN 2 OHMS

NO

YES

02

04

DEFECTIVE WIRING HARNESS

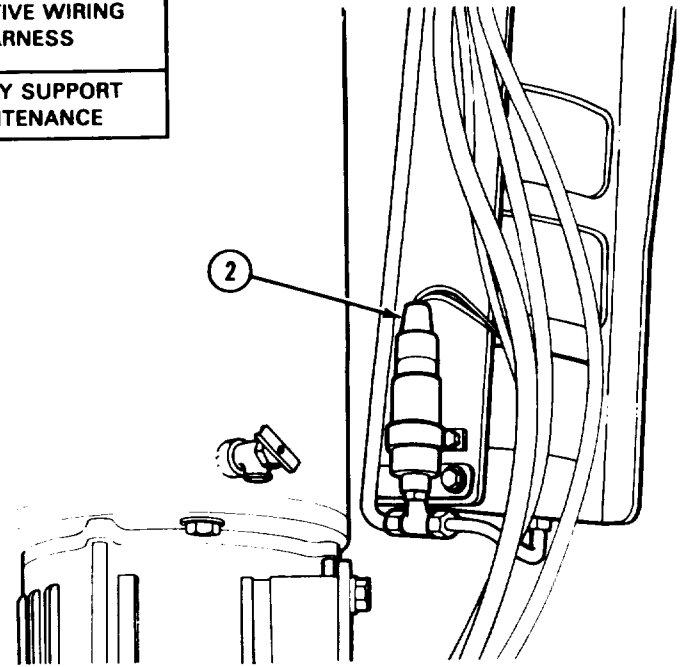
\*NOTIFY SUPPORT MAINTENANCE

03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

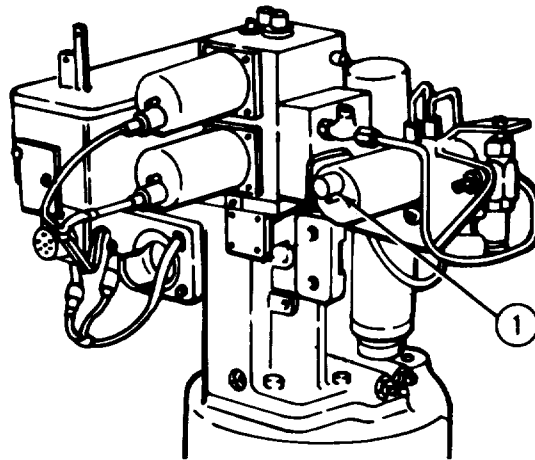
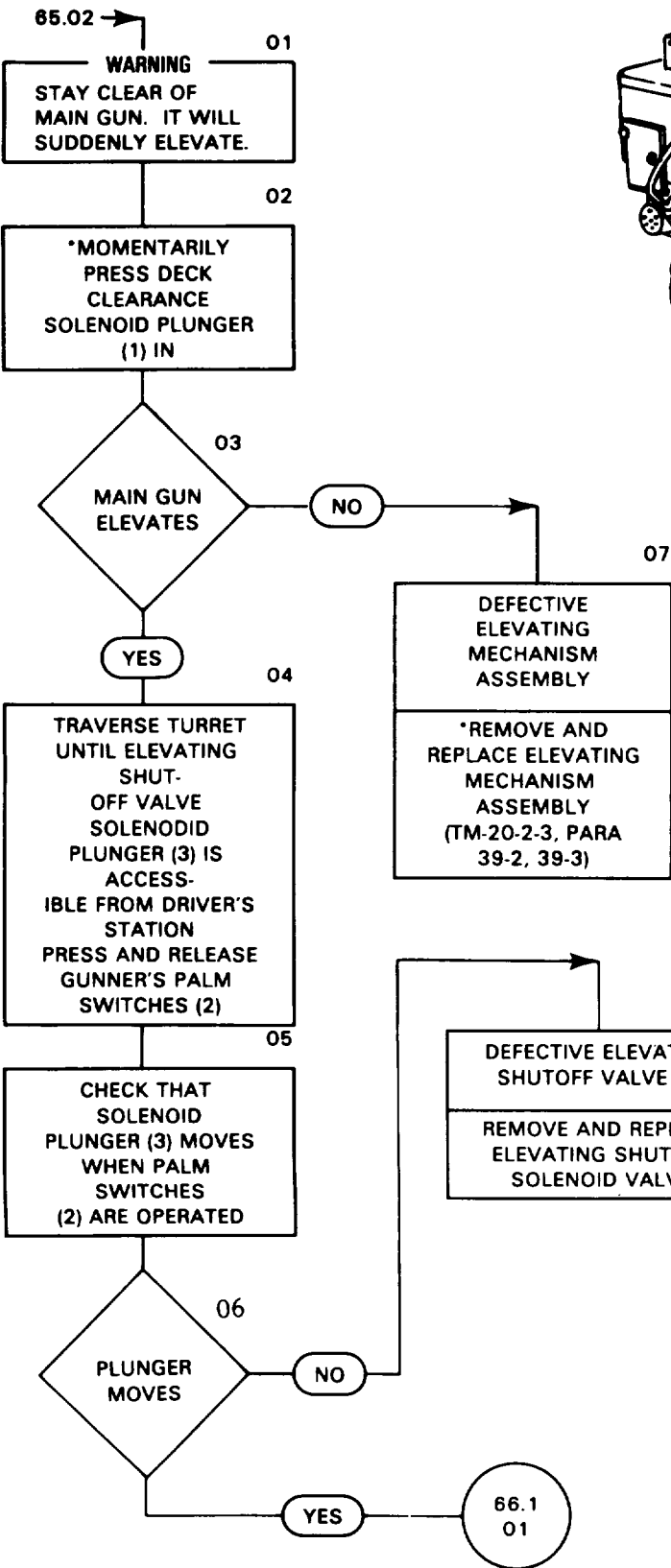
\*REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

NOTE REINSTALL HARNESS CABLE CONNECTORS ON EQUIPMENT ASSEMBLIES AFTER TROUBLESHOOTING OF THIS SYMPTOM IS COMPLETED.

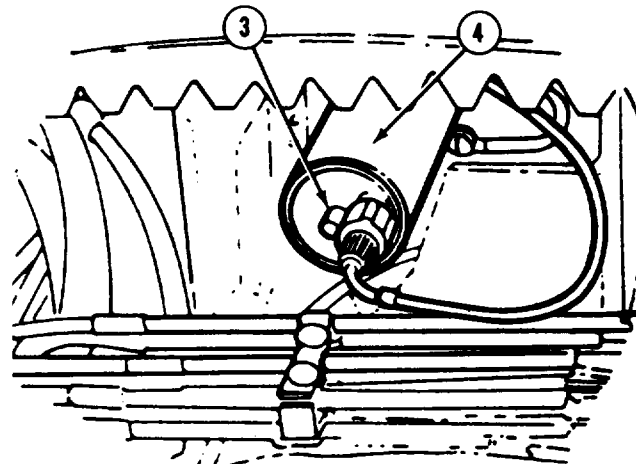


PRESSURE SWITCH HYDRAULIC POWERPACK

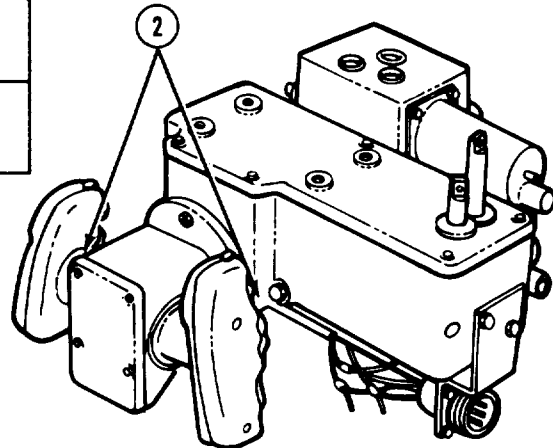
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 66 OF 78)



HYDRAULIC VALVE ASSEMBLY

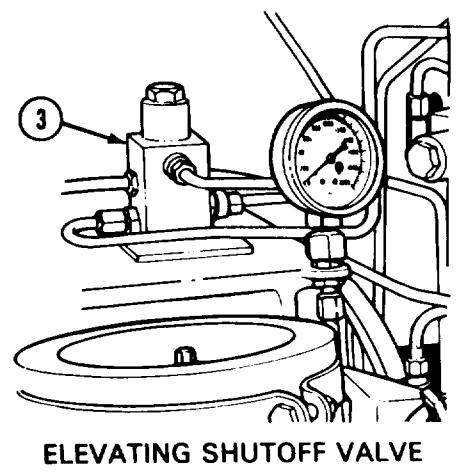
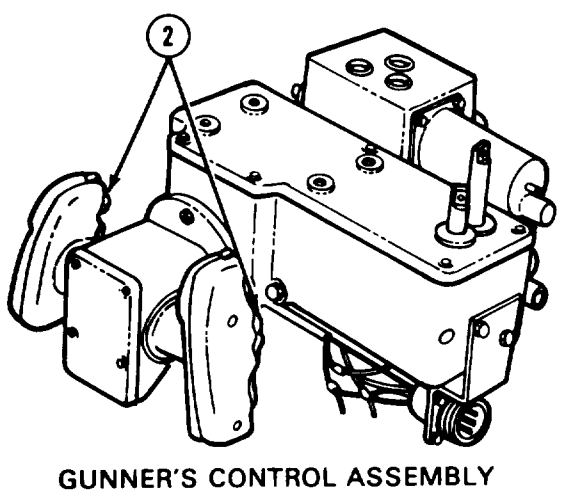
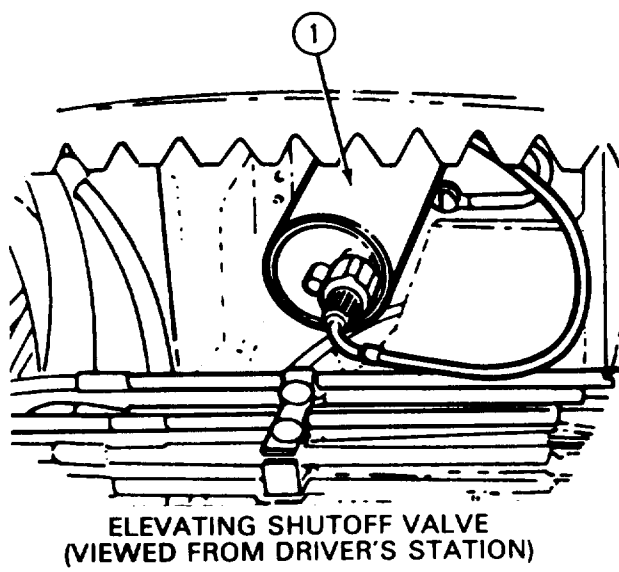
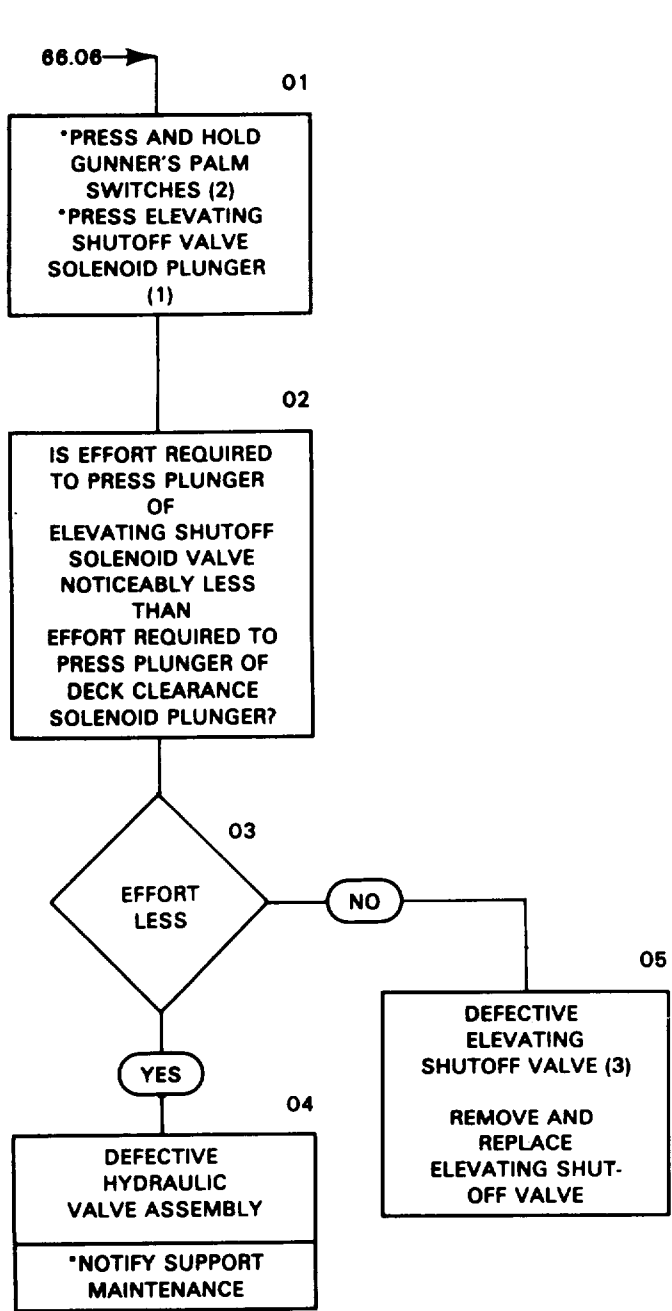


ELEVATING SHUTOFF VALVE  
(VIEWED FROM DRIVER'S STATION)



GUNNER'S CONTROL ASSEMBLY

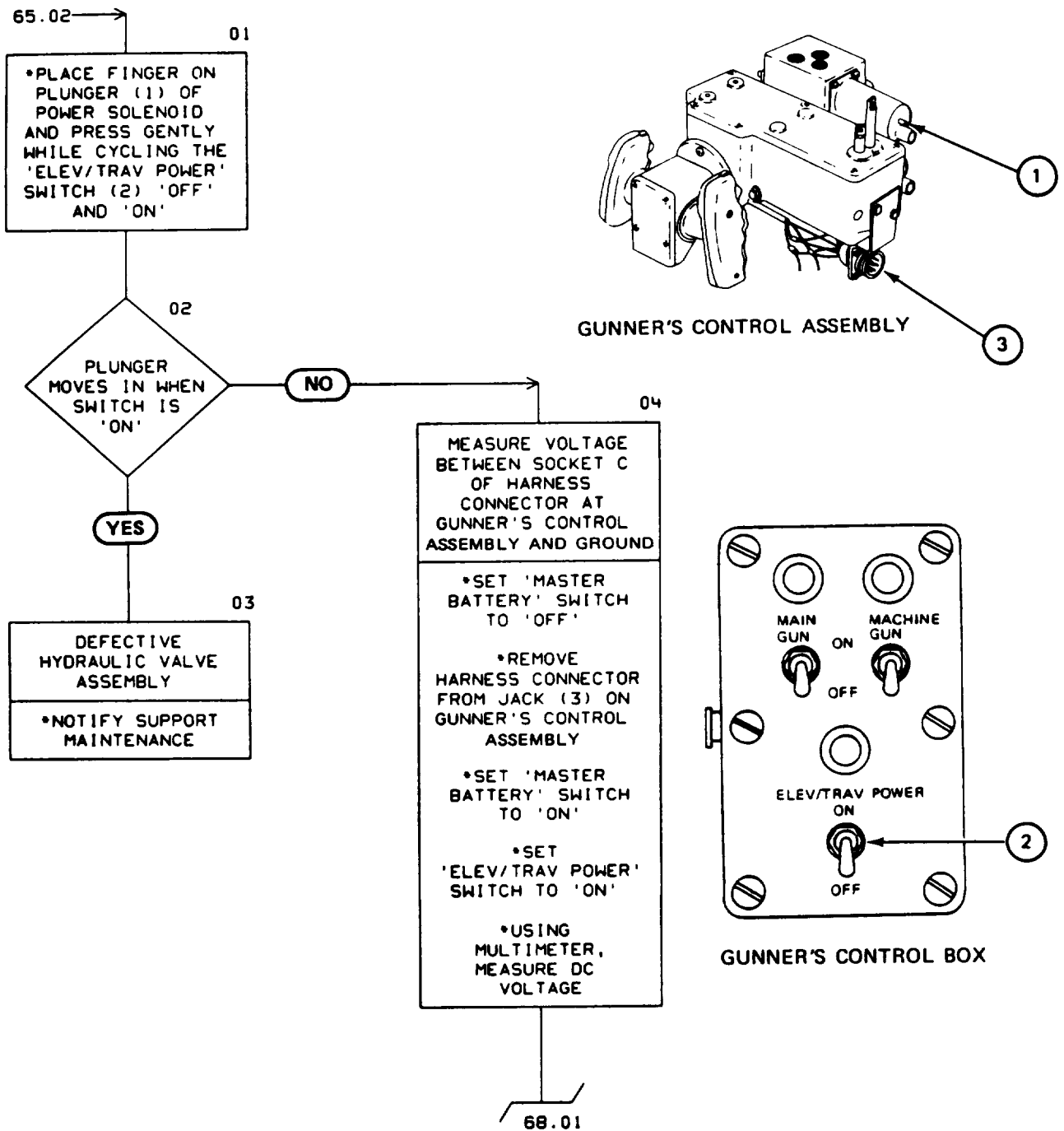
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 66.1 OF 78)



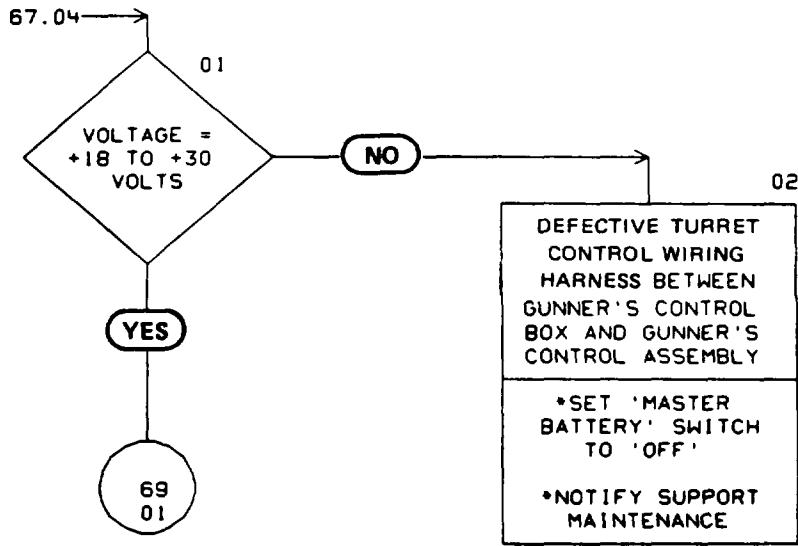




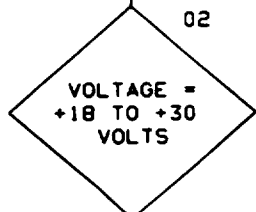
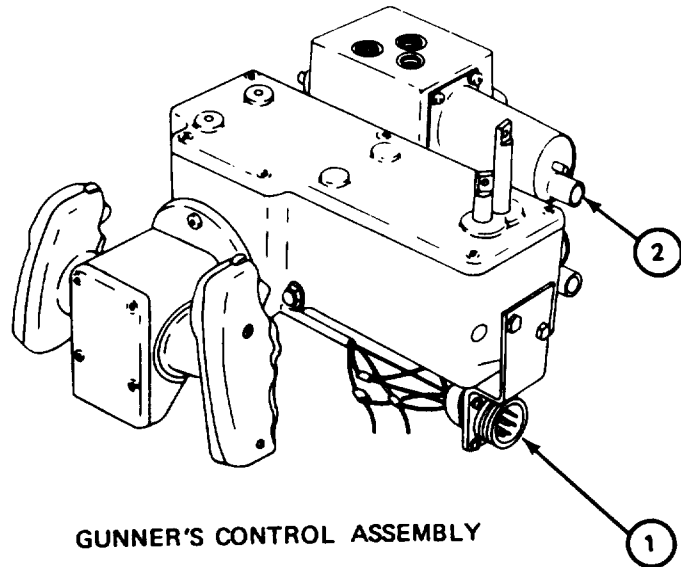
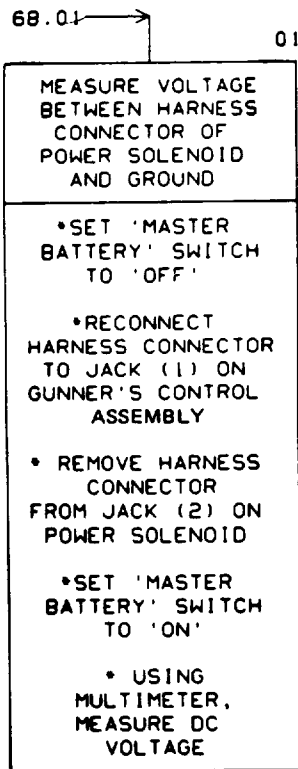
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 67 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 68 OF 78)



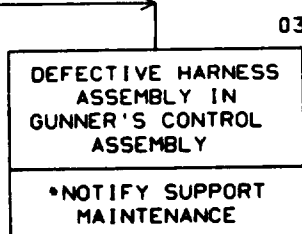
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 69 OF 78)



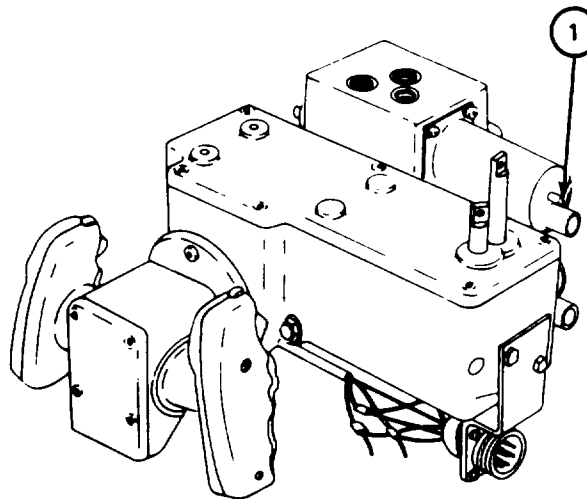
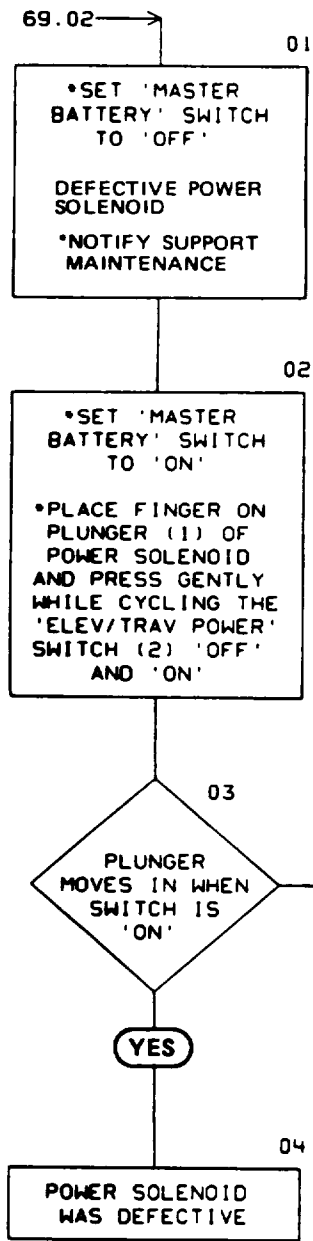
YES

70  
01

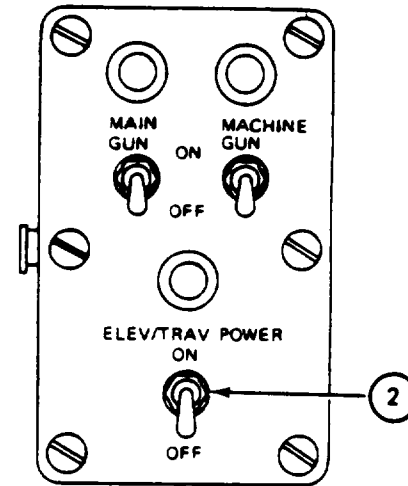
NO



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 70 OF 78)

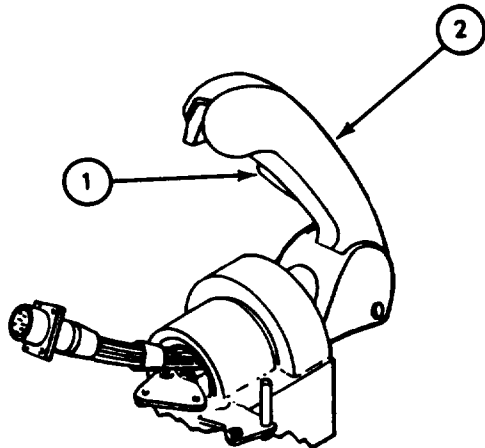
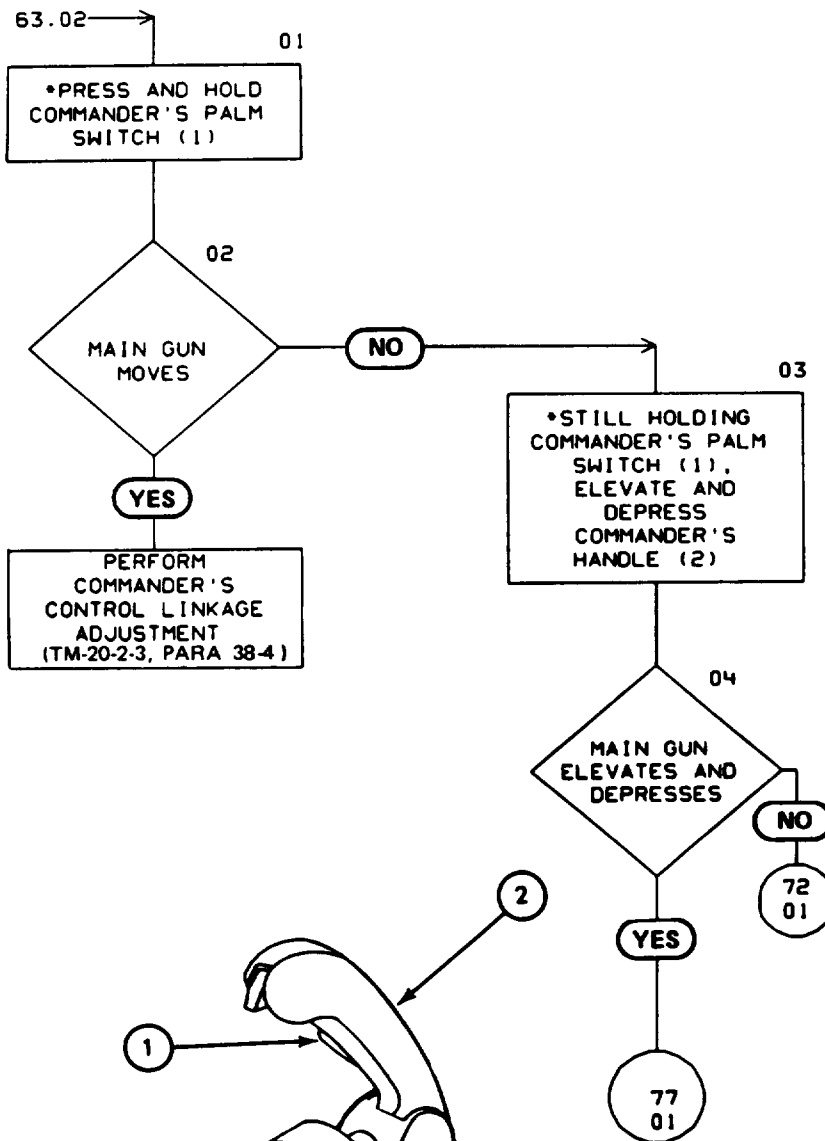


GUNNER'S CONTROL ASSEMBLY



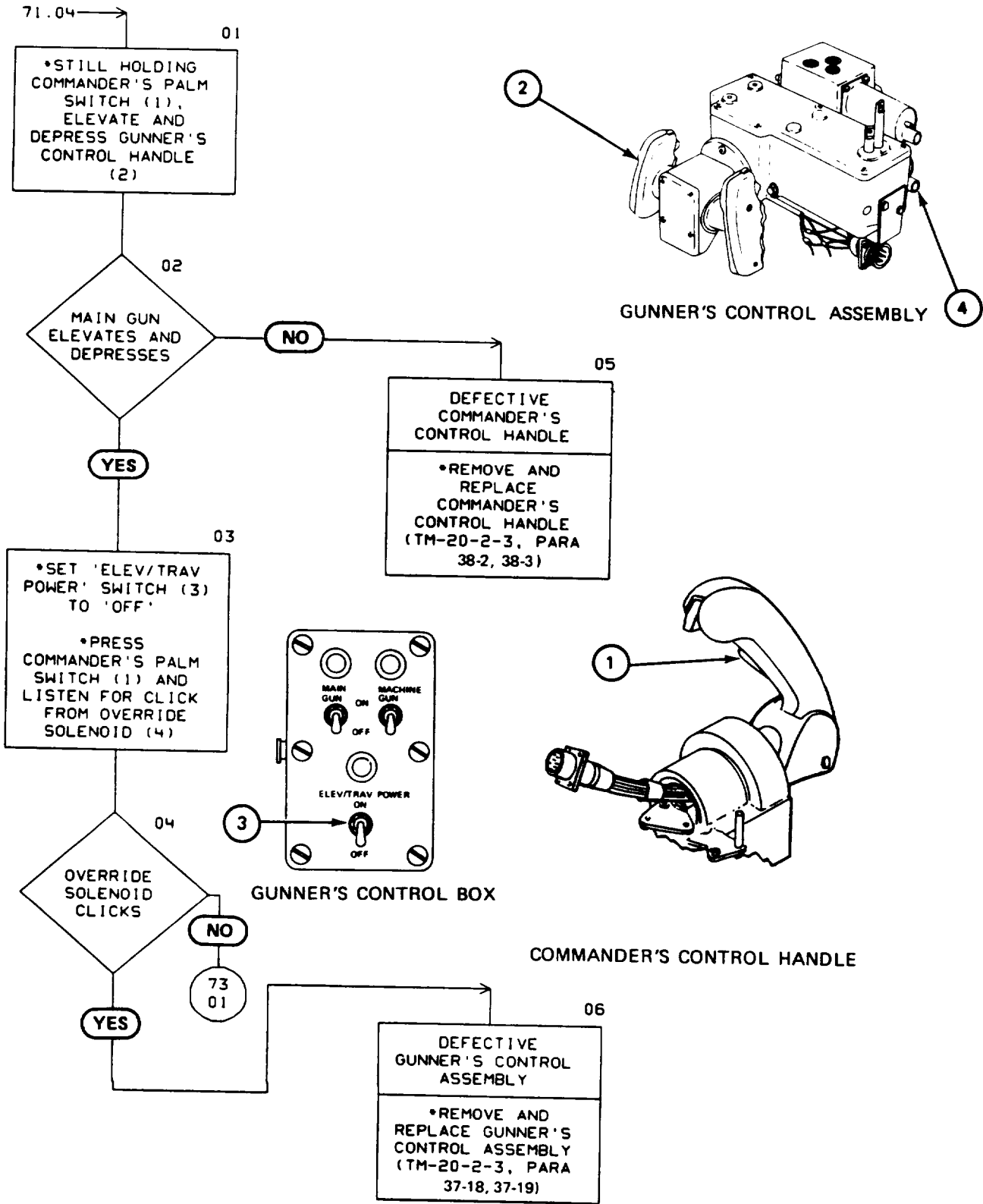
GUNNER'S CONTROL BOX

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 71 OF 78)

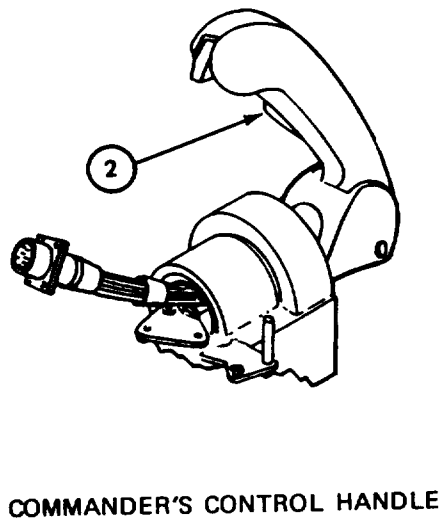
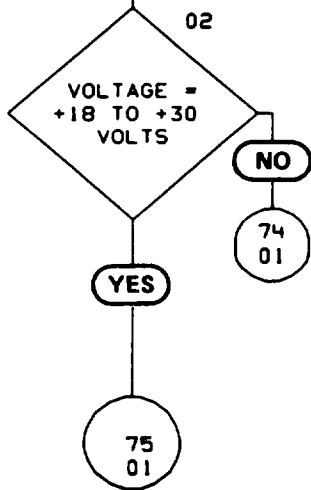
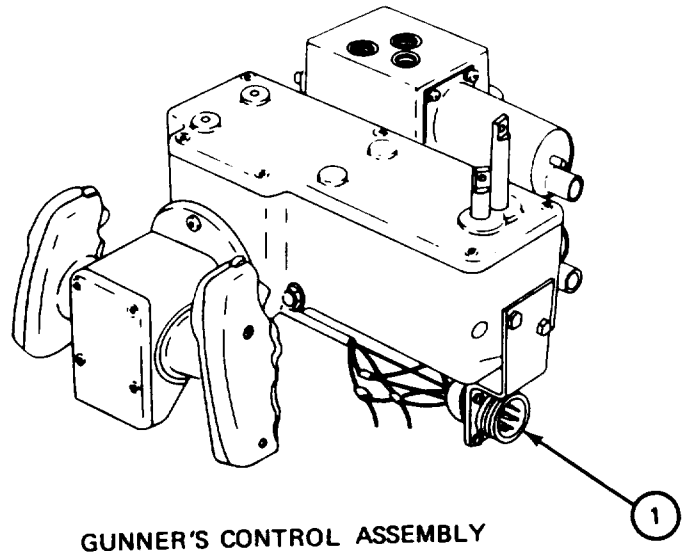
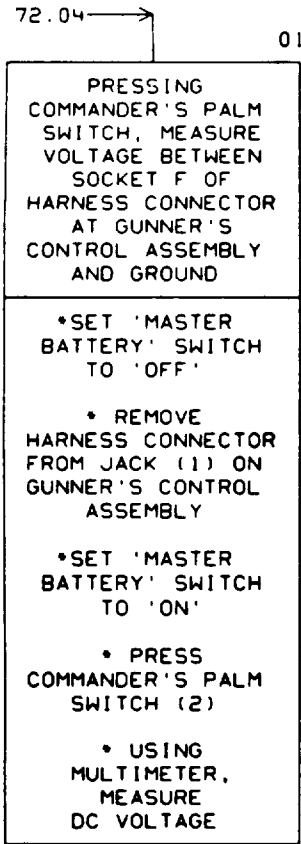


COMMANDER'S CONTROL HANDLE

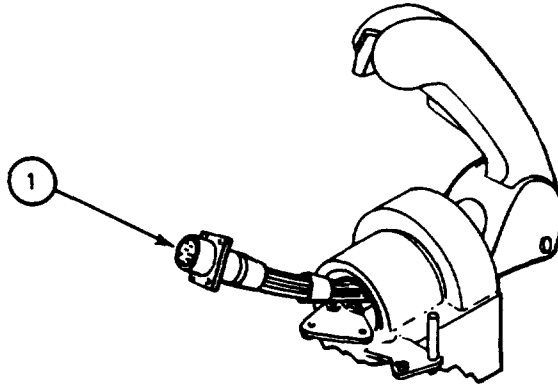
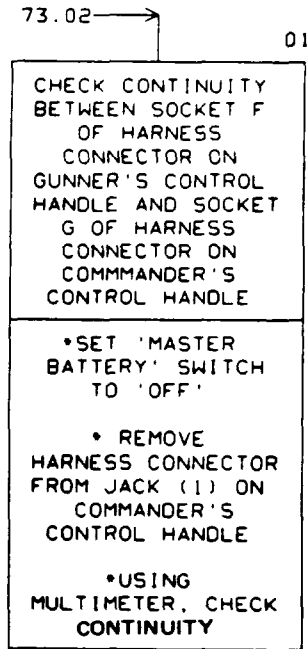
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 72 OF 78)



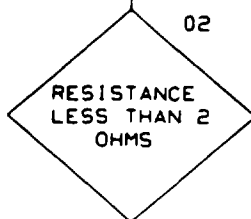
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 73 OF 78)



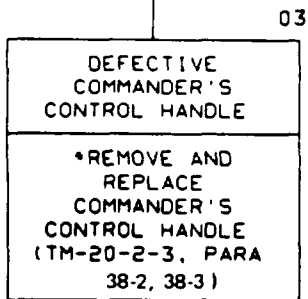
4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 74 OF 78)



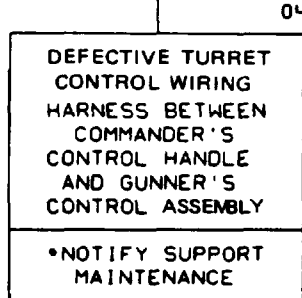
COMMANDER'S CONTROL HANDLE



YES



NO





4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 75 OF 78)

73.02 →

01

PRESSING  
COMMANDER'S PALM  
SWITCH MEASURE  
VOLTAGE BETWEEN  
HARNES CONNECTOR  
OF OVERRIDE  
SOLENOID AND  
GROUND

---

\*SET 'MASTER  
BATTERY' SWITCH  
TO 'OFF'

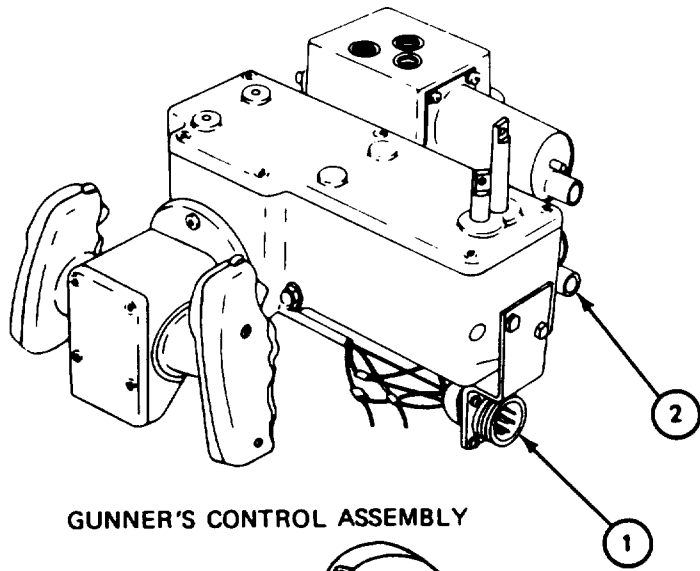
\*RECONNECT  
HARNES CONNECTOR  
TO JACK (1) ON  
GUNNER'S CONTROL  
ASSEMBLY

\*REMOVE HARNES  
CONNECTOR FROM  
JACK (2) ON  
OVERRIDE  
SOLENOID

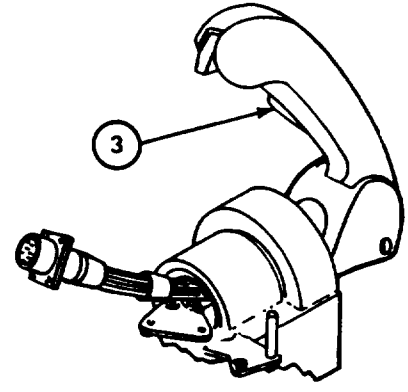
\*SET 'MASTER  
BATTERY' SWITCH  
TO 'ON'

\*PRESS  
COMMANDER'S PALM  
SWITCH (3)

\*USING  
MULTIMETER,  
MEASURE DC  
VOLTAGE



GUNNER'S CONTROL ASSEMBLY



COMMANDER'S CONTROL HANDLE

02

VOLTAGE =  
+18 TO +30  
VOLTS

NO

YES

03

DEFECTIVE  
GUNNER'S CONTROL  
ASSEMBLY WIRING  
HARNES

---

\*NOTIFY SUPPORT  
MAINTENANCE

76  
01

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 76 OF 78)

75.02 →

01

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

DEFECTIVE OVERRIDE SOLENOID

•NOTIFY SUPPORT MAINTENANCE

02

•SET 'MASTER BATTERY' SWITCH TO 'ON'

•PRESS COMMANDER'S PALM SWITCH (1) AND LISTEN FOR CLICK FROM OVERRIDE SOLENOID (2)

03

OVERRIDE SOLENOID CLICKS

YES

04

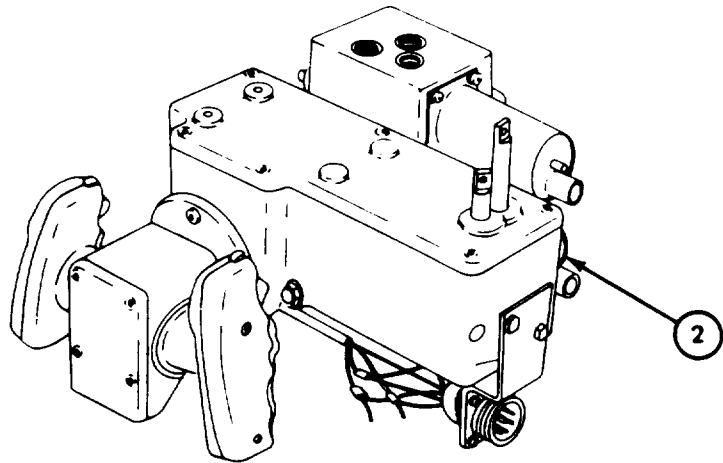
OVERRIDE SOLENOID WAS DEFECTIVE

NO

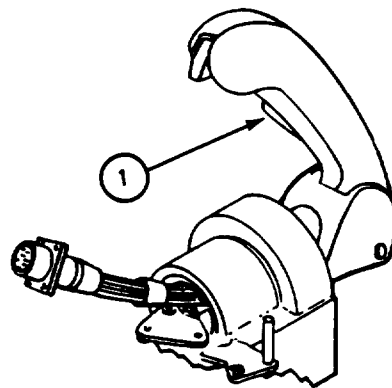
05

DEFECTIVE HYDRAULIC VALVE ASSEMBLY

•NOTIFY SUPPORT MAINTENANCE

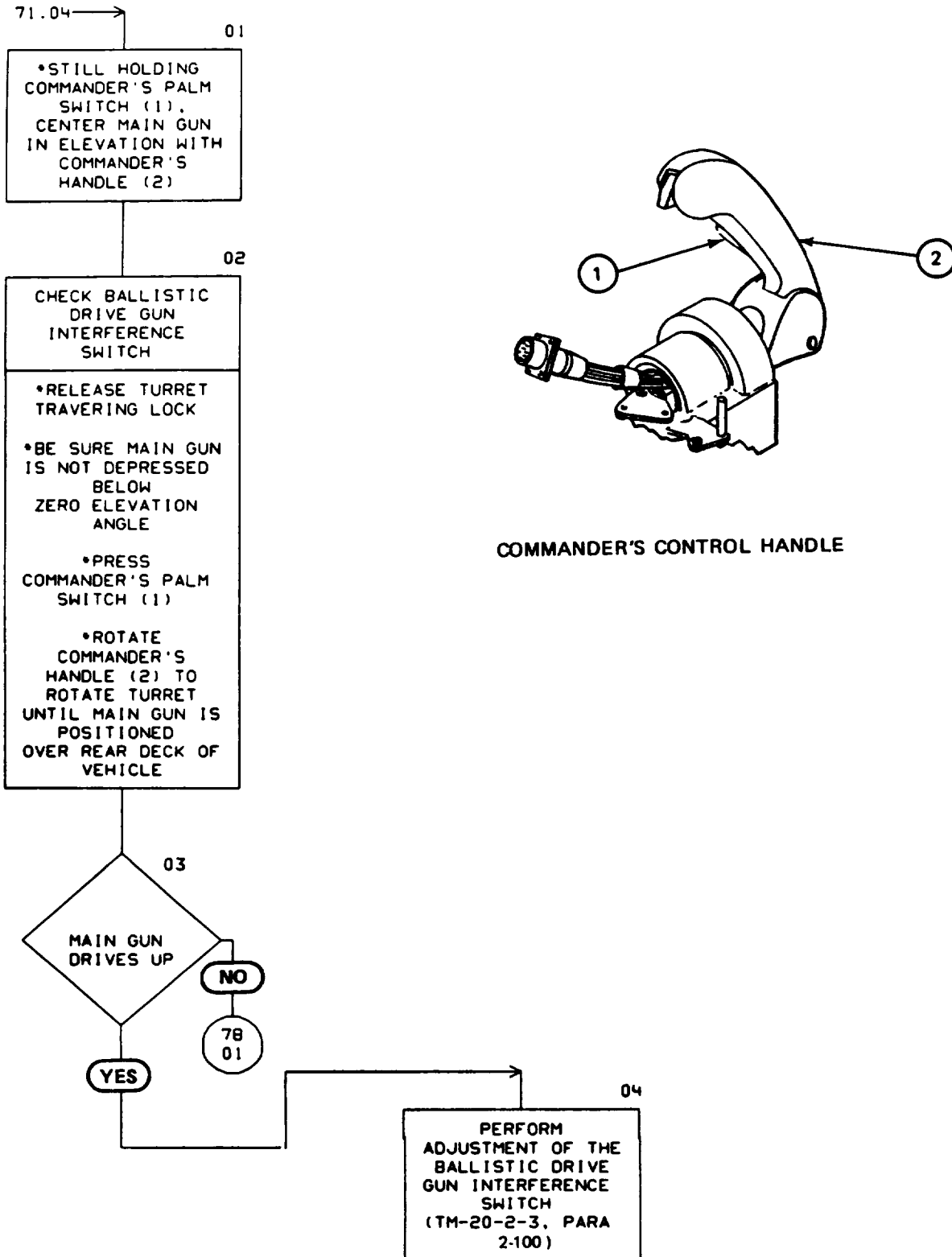


GUNNER'S CONTROL ASSEMBLY

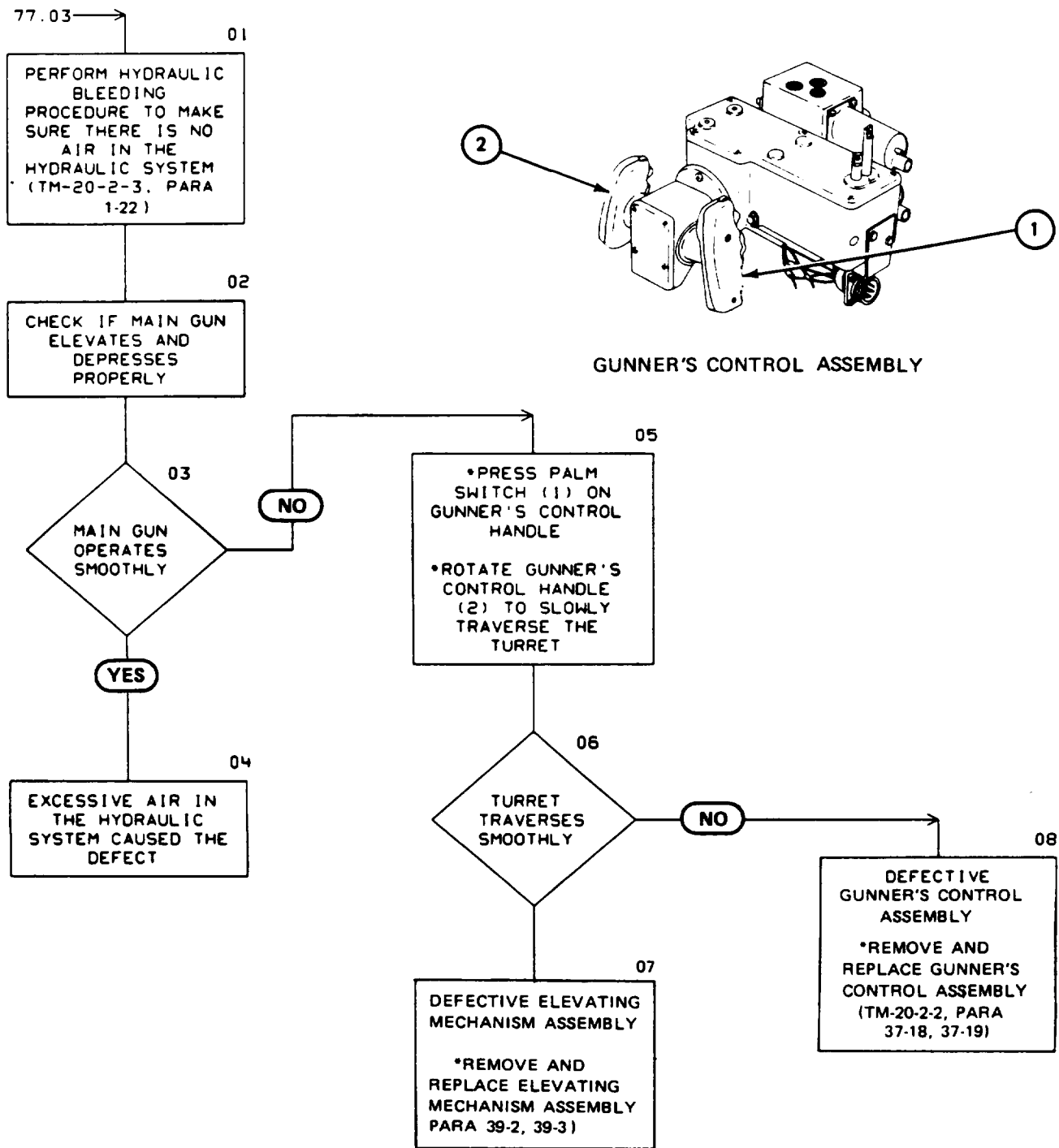


COMMANDER'S CONTROL HANDLE

4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 77 OF 78)



4-2. MAIN GUN ELEVATE/DEPRESS TROUBLESHOOTING (SHEET 78 OF 78)



**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 1 OF 27)**

- SYMPTOM:**
- (30) Winch fails to operate properly
    - a. Winch cable fails to pay-out
    - b. Winch fails to lift load (reel-in)
    - c. Winch fails to hold in raised position (under load)
    - d. Winch fails to lower load slowly
  - (31) Boom fails to operate properly
    - a. Boom fails to erect
    - b. Boom fails to stow

**NOTE**

Preliminary Procedures must be performed prior to performing any winch or boom troubleshooting procedure.

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

<b>UNIT LOCATION:</b>	<b>FOLDOUT</b>	<b>CALLOUT</b>
Selector Control Valve	4	1
Hydraulic Pump Switch	4	3
Winch Gearshift Lever	5	2
Winch-Boom Control Valve	2	10
Counterbalance and Shuttle Valves	2	5
Winch	5	1
Boom Erect Cylinder	5	4
Moldboard Directional Control Valve	4	2

- REFERENCES:**
- (1) TM 9-2350-222-20-2-3 for removal and replacement of components
  - (2) ETM 643-091-9400R/JPG for procedures to:
    - Use multimeter
    - Disconnect electrical connectors
  - (3) TM 9-2350-222-20-1-2 for hydraulic pump troubleshooting

**EQUIPMENT CONDITION:** Vehicle parked, power off.

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 2 OF 27)**  
**Preliminary Procedures**

01.01 →

**01**

**WARNING**  
 USE SAFETY GLOVES  
 WHEN HANDLING  
 WIRE-ROPE  
 STAYLINES AND  
 WINCH CABLES

**02**

**NOTE**  
 MAKE SURE THAT  
 HYDRAULIC SYSTEM  
 IS INTACT WITH NO  
 OIL LEAKS

**03**

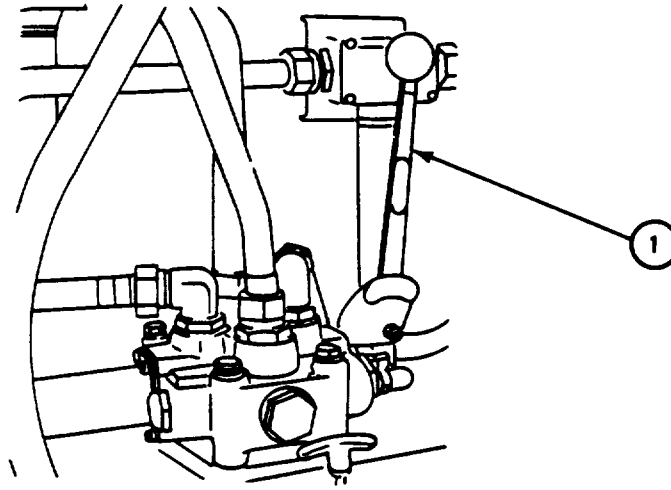
OPEN TWO BOOM  
 TRAVEL LOCKS AND  
 RELEASE TWO STAYLINES  
 FROM J  
 HOOKS ON SIDE OF  
 BOOM AND TURRET  
 (TM-10)

**04**

CHECK OIL LEVEL  
 OF RESERVOIR IN  
 DRIVER'S  
 COMPARTMENT  
 (LO9-2350-222-12)

**05**

SET 'SELECTOR  
 CONTROL VALVE'  
 (1) TO 'NEUTRAL'



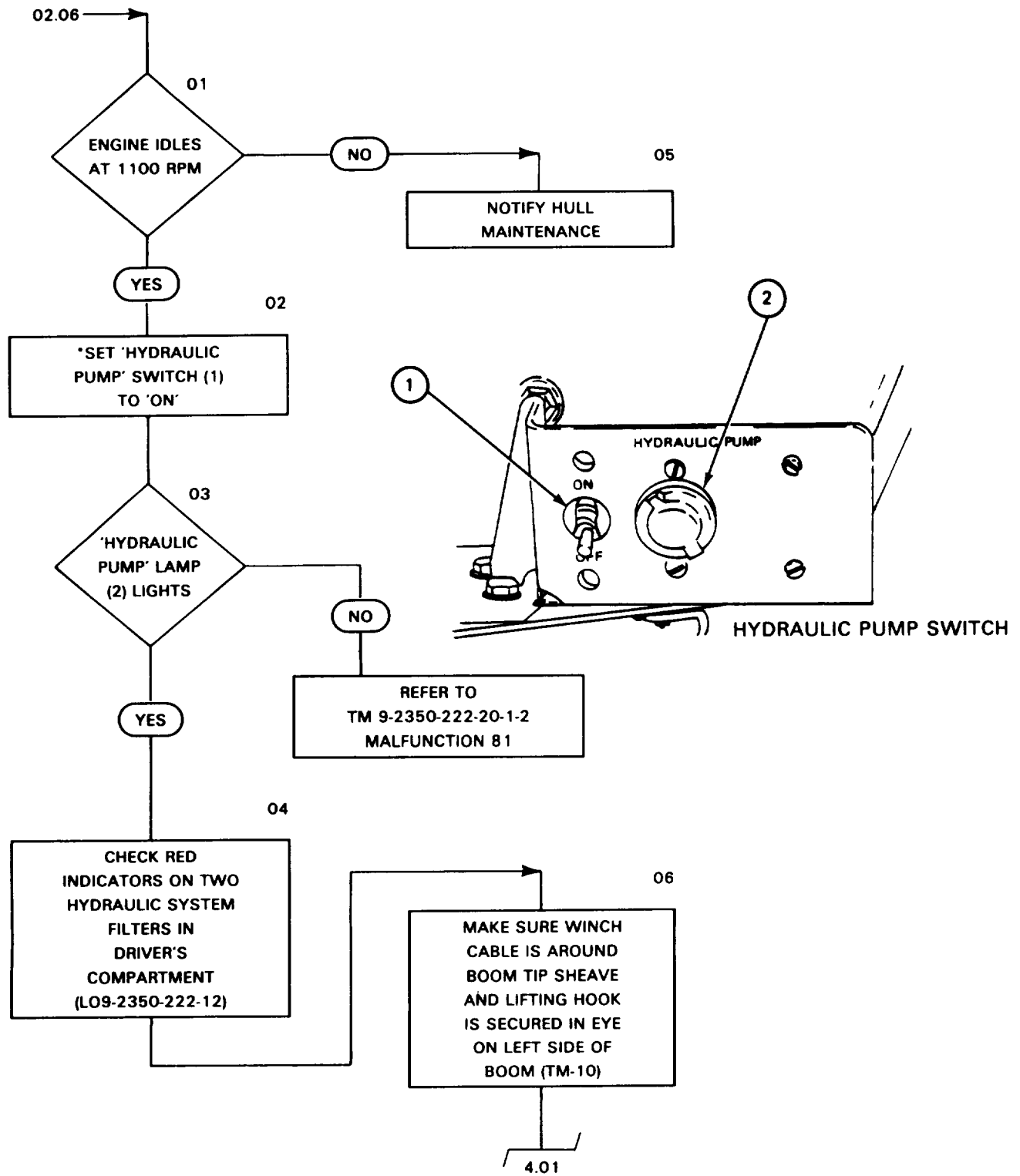
**SELECTOR CONTROL VALVE**

**06**

START ENGINE AND  
 IDLE AT 1100 RPM  
 (TM-10)

3.01

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 3 OF 27)**  
**Preliminary Procedures (Continued)**



**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 4 OF 27)**  
**Preliminary Procedures (Continued)**

03.06 →

01

\*SET 'SELECTOR CONTROL VALVE' (1) TO 'TURRET'

02

**CAUTION**  
 TO PREVENT DAMAGE TO WINCH BRAKE, WINCH GEARSHIFT (2) MUST BE FULLY ENGAGED IN 'HI' OR 'LO' POSITIONS BEFORE USING WINCH

03

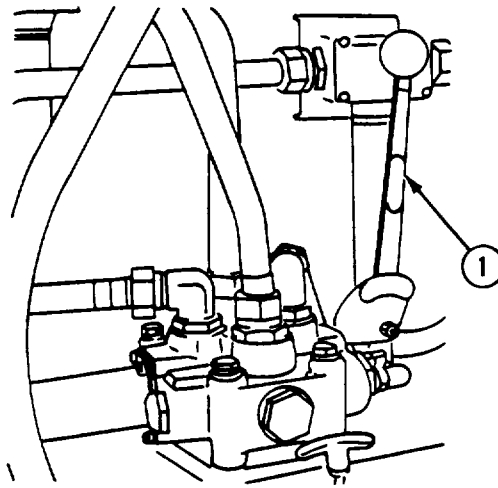
\*SET WINCH GEARSHIFT (2) TO 'LO'

04

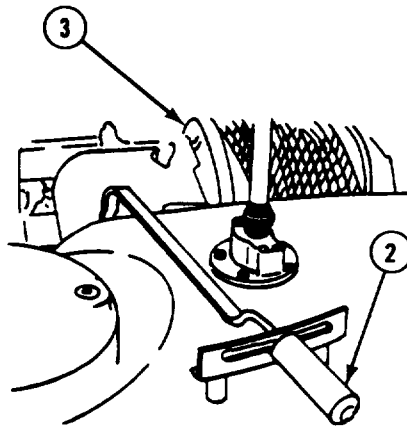
**NOTE**  
 THE WINCH GEARSHIFT (2) SHOULD NOT BE FORCED INTO PLACE. IF SHIFTING FROM CENTER TO 'HI' OR 'LO' IS DIFFICULT A SMALL ROTATION OF WINCH DRUM (3) WILL PERMIT EASY SHIFTING

05

PROCEED TO APPLICABLE MALFUNCTION



SELECTOR CONTROL VALVE

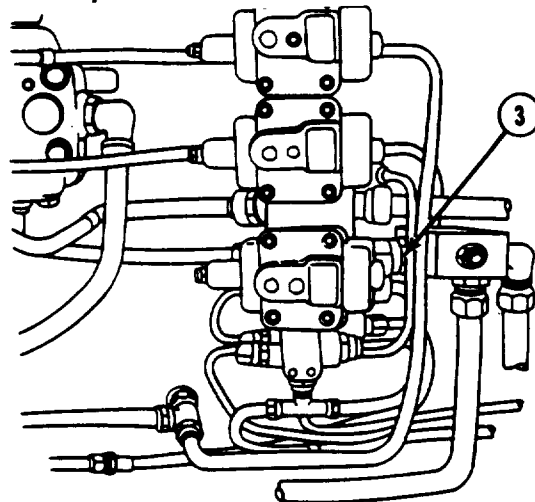
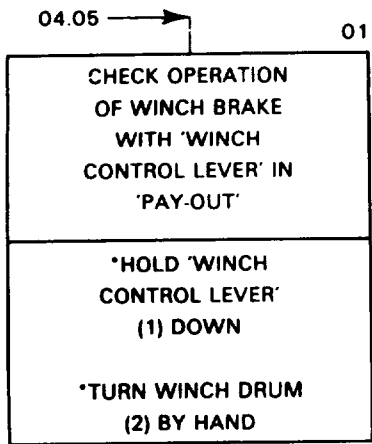


WINCH GEARSHIFT LEVER

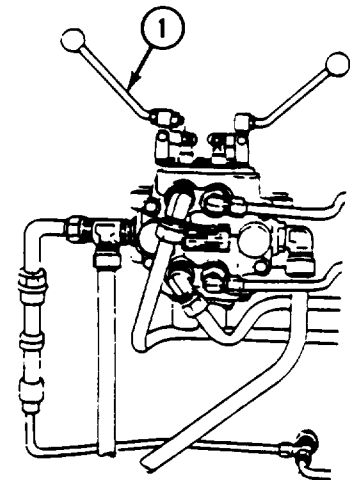
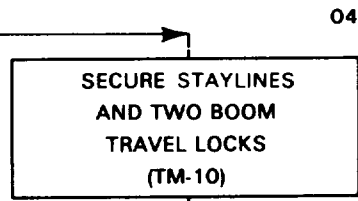
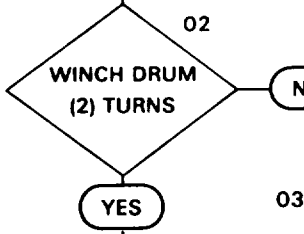


4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 5 OF 27)

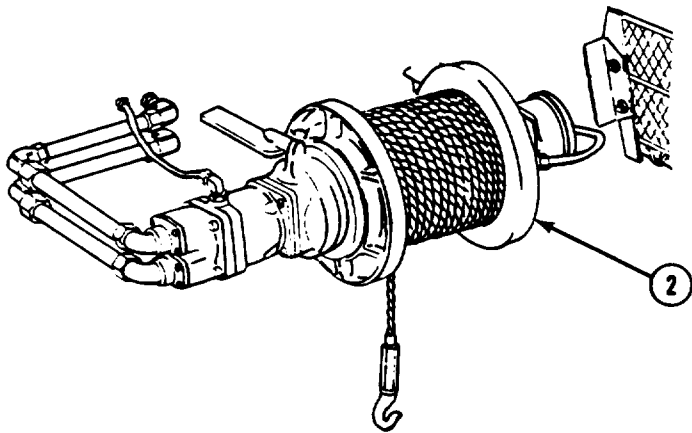
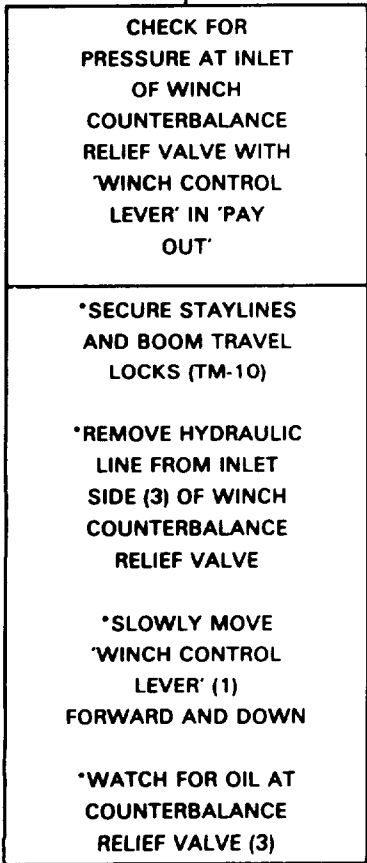
30 a. Winch Cable Fails to Pay-Out



COUNTERBALANCE VALVES AND SHUTTLE VALVES



WINCH-BOOM CONTROL VALVE



WINCH ASSEMBLY

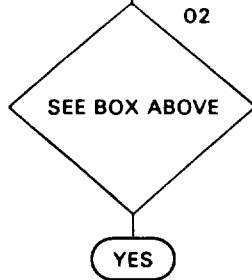
06.01

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 6 OF 27)**  
**30 a. Winch Cable Fails to Pay-Out (Continued)**

05.03 →

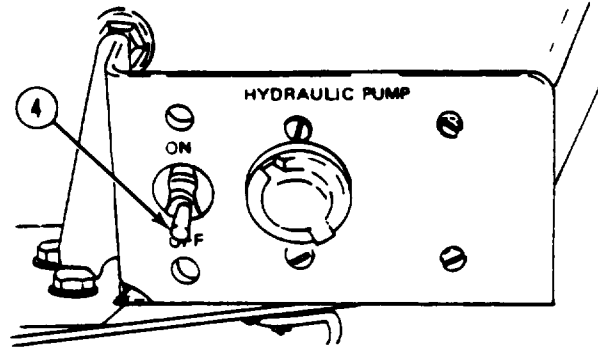
01

OIL FLOWS FROM INLET (1) OF WINCH COUNTERBALANCE RELIEF VALVE

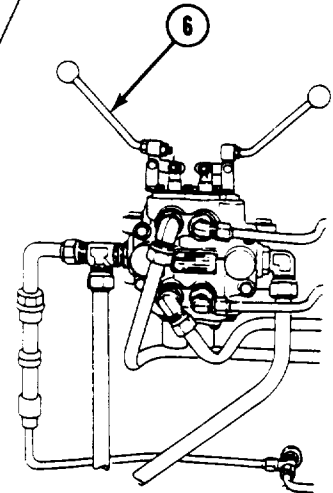


DEFECTIVE WINCH COUNTERBALANCE VALVE

- \*SET WINCH GEAR-SHIFT (2) TO CENTER POSITION
- \*SET 'SELECTOR CONTROL VALVE' (3) TO 'NEUTRAL'
- \*SET 'HYDRAULIC PUMP' SWITCH (4) TO 'OFF'
- \*STOP ENGINE (TM-10)
- \*CONNECT HYDRAULIC LINE TO INLET SIDE (1) OF WINCH COUNTERBALANCE RELIEF VALVE
- \*REMOVE AND REPLACE WINCH COUNTERBALANCE VALVE (TM-20-2-3, PARA 64-8, 64-9)



HYDRAULIC PUMP SWITCH

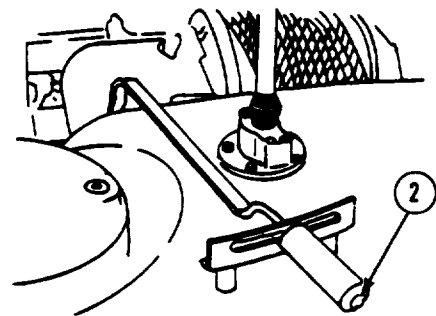


WINCH-BOOM CONTROL VALVE

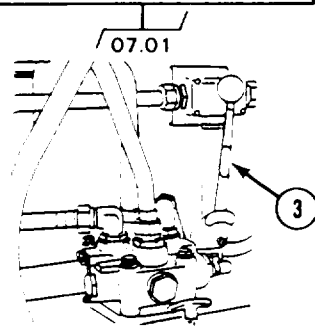
04

CHECK FOR PRESSURE AT OUTLET SIDE OF WINCH COUNTERBALANCE RELIEF VALVE WITH 'WINCH CONTROL LEVER' IN 'PAY-OUT'

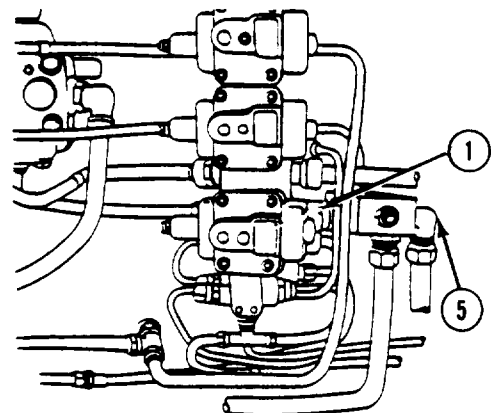
- \*REMOVE HYDRAULIC LINE FROM OUTLET SIDE (5) OF WINCH COUNTERBALANCE RELIEF VALVE
- \*SLOWLY MOVE 'WINCH CONTROL LEVER' (6) DOWN
- \*WATCH FOR OIL AT DISCONNECTED LINE (5)



WINCH GEARSHIFT LEVER

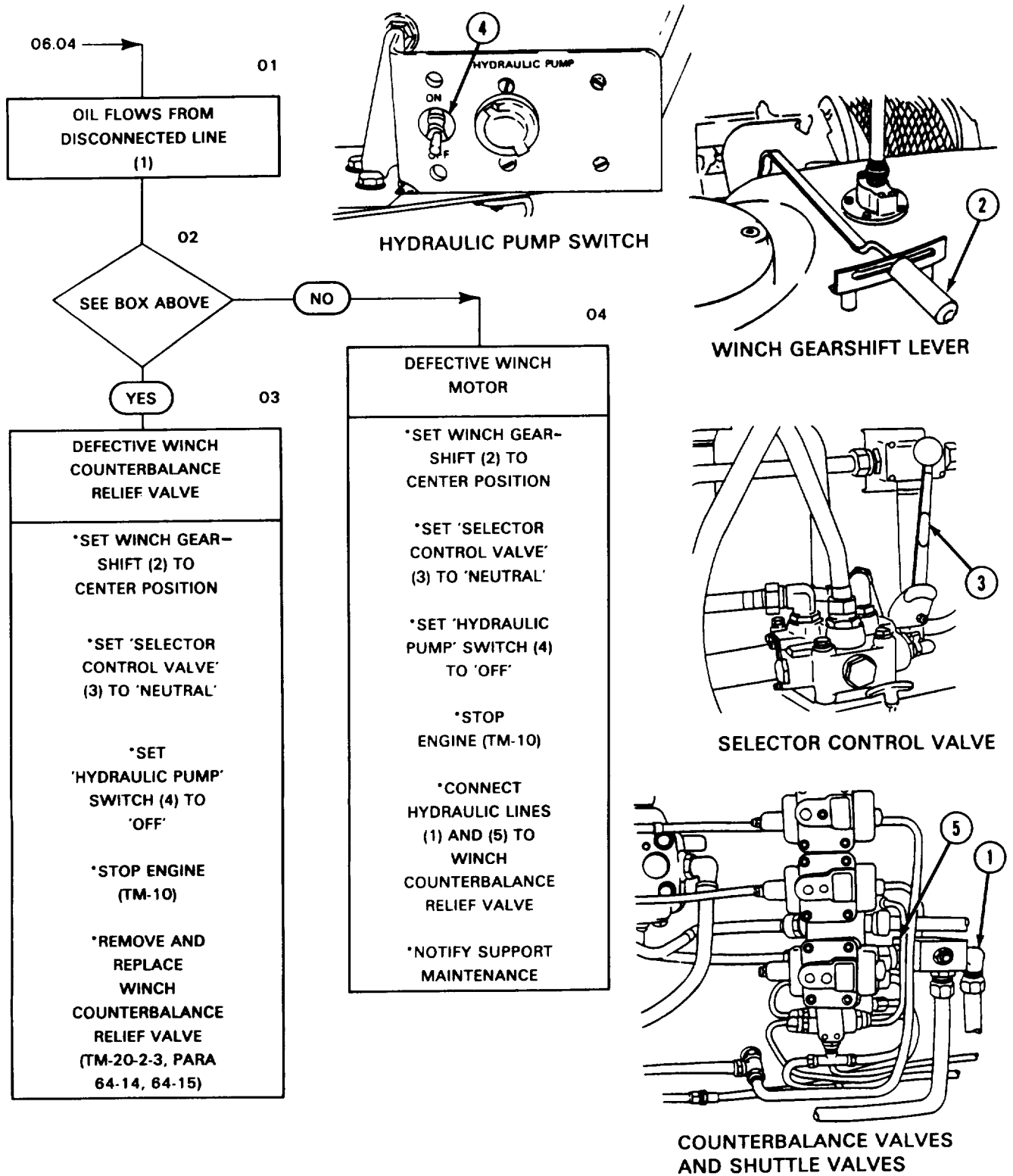


SELECTOR CONTROL VALVE



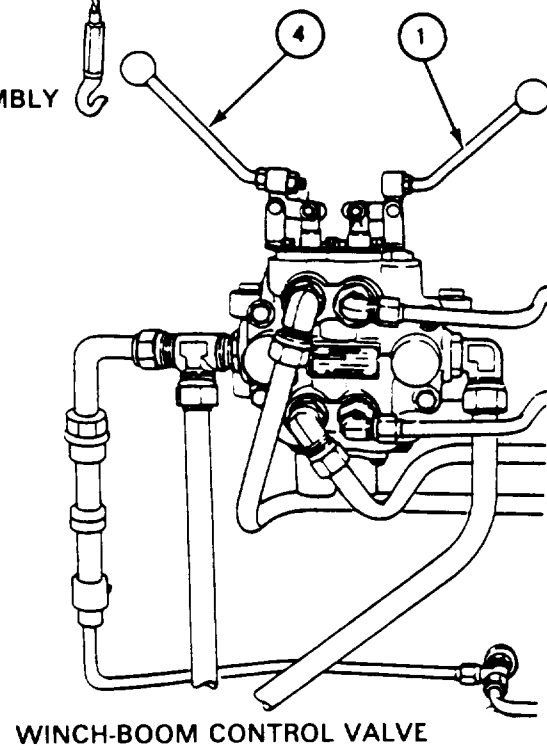
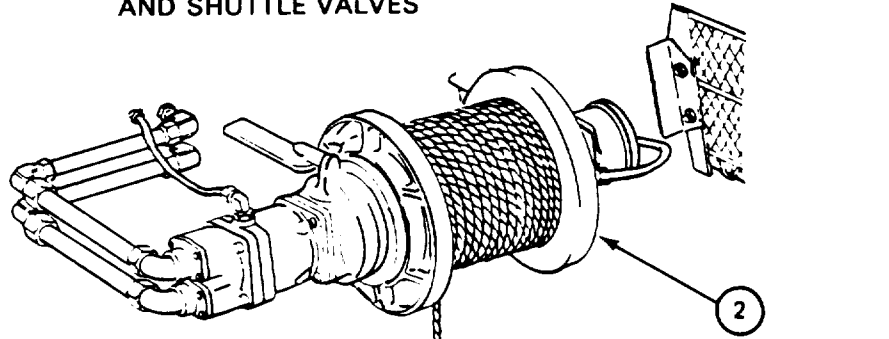
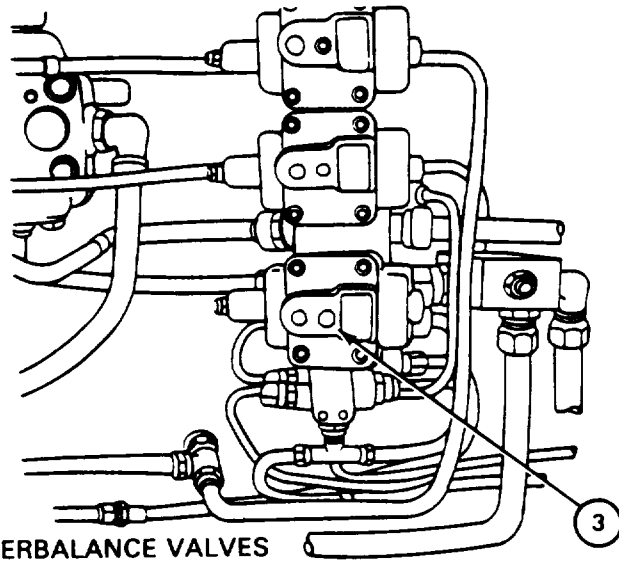
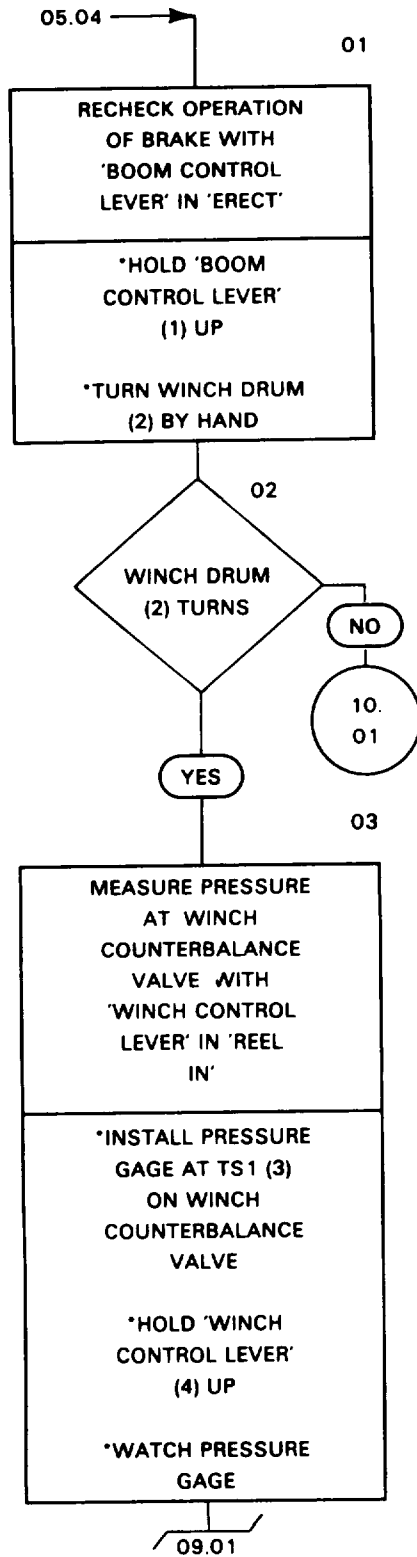
COUNTERBALANCE VALVES AND SHUTTLE VALVES

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 7 OF 27)**  
**30 a. Winch Cable Fails to Pay-Out (Continued)**

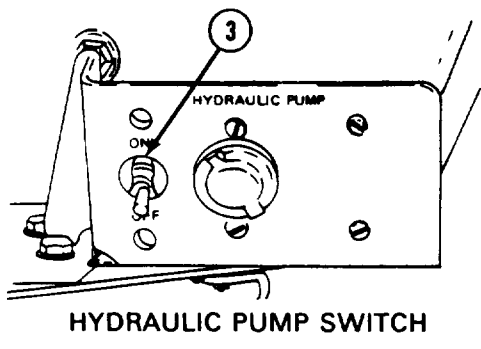
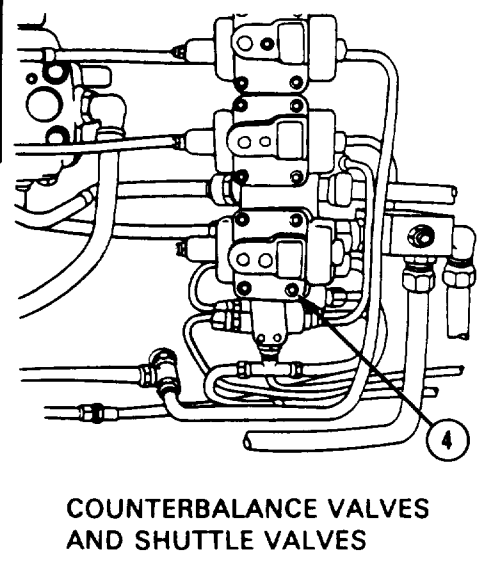
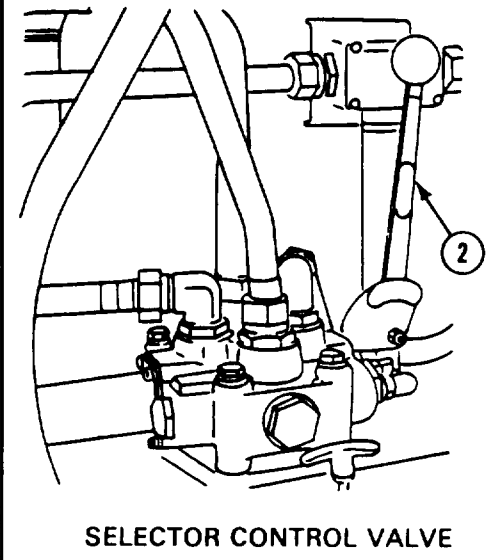
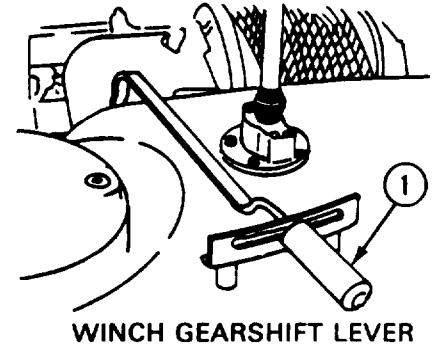
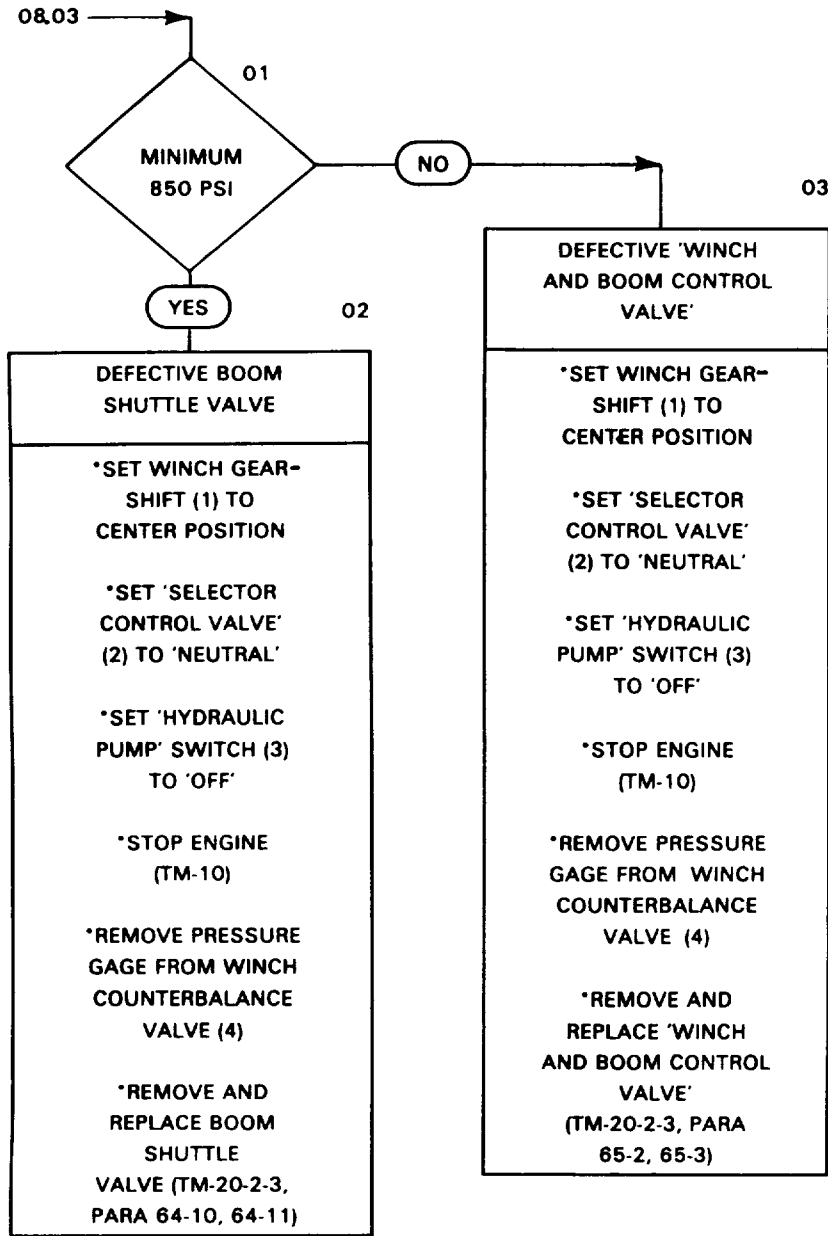


4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 8 OF 27)

30 a. Winch Cable Fails to Pay-Out (Continued)



**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 9 OF 27)**  
**30 a. Winch Cable Fails to Pay-Out (Continued)**



**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 10 OF 27)**  
**30 a. Winch Cable Fails to Pay-Out (Continued)**

08.02 → 01

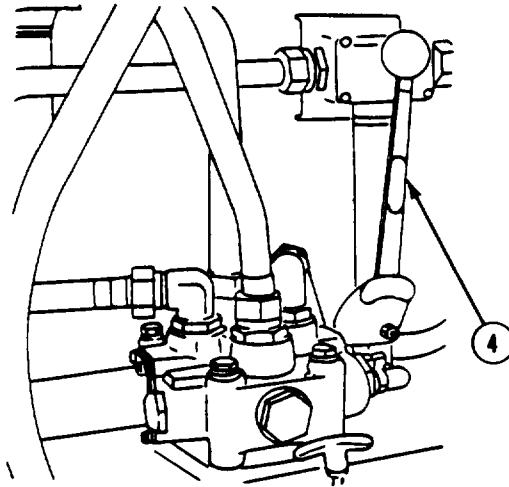
CHECK FOR PRESSURE AT BOOM CYLINDER BLEEDER PORT B WITH 'BOOM CONTROL LEVER' IN 'ERECT'

\*SET WINCH GEAR-SHIFT (1) TO CENTER POSITION

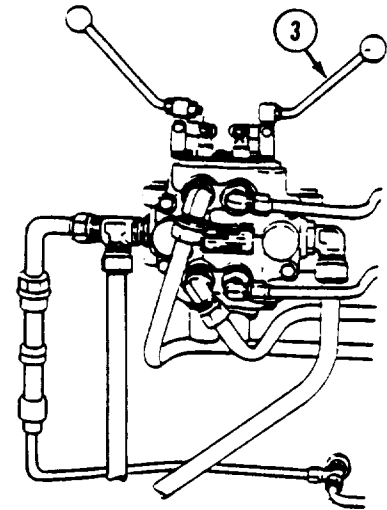
\*REMOVE SCREW FROM BLEEDER PORT B (2) ON BOOM CYLINDER

\*SLOWLY MOVE 'BOOM CONTROL LEVER' (3) UP

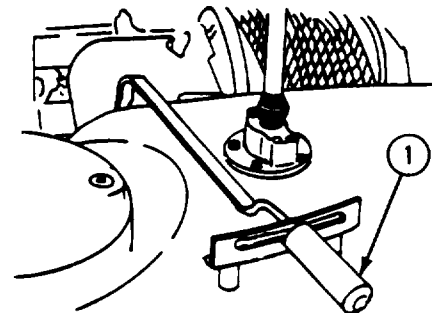
\*WATCH FOR OIL AT BLEEDER PORT B (2)



SELECTOR CONTROL VALVE



WINCH-BOOM CONTROL VALVE



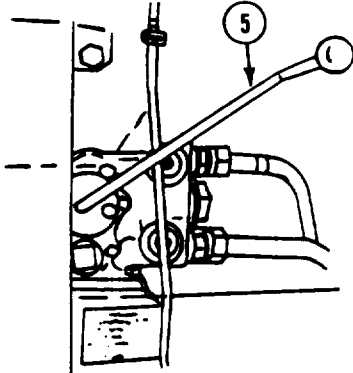
WINCH GEARSHIFT LEVER

02

OIL FLOWS FROM BLEEDER PORT B (2)

YES

11.01



MOLDBOARD DIRECTIONAL CONTROL VALVE

NO

03

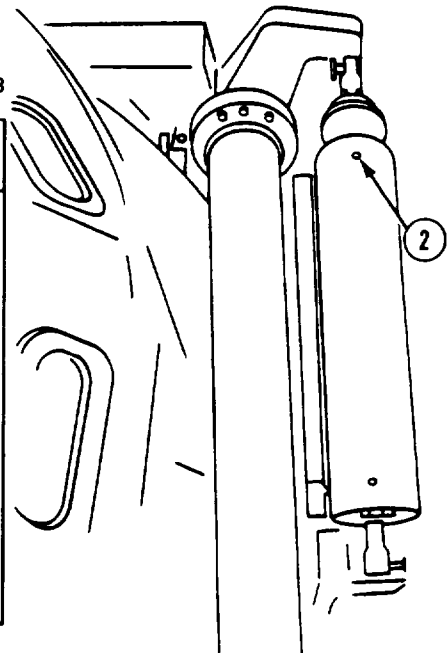
RAISE AND LOWER MOLDBOARD

\*REPLACE SCREW IN BLEEDER PORT B (2) ON BOOM CYLINDER

\*SET 'SELECTOR CONTROL VALVE' (4) TO 'HULL'

\*HOLD 'MOLDBOARD DIRECTIONAL CONTROL VALVE' (5) IN 'RAISE' THEN 'LOWER' POSITIONS

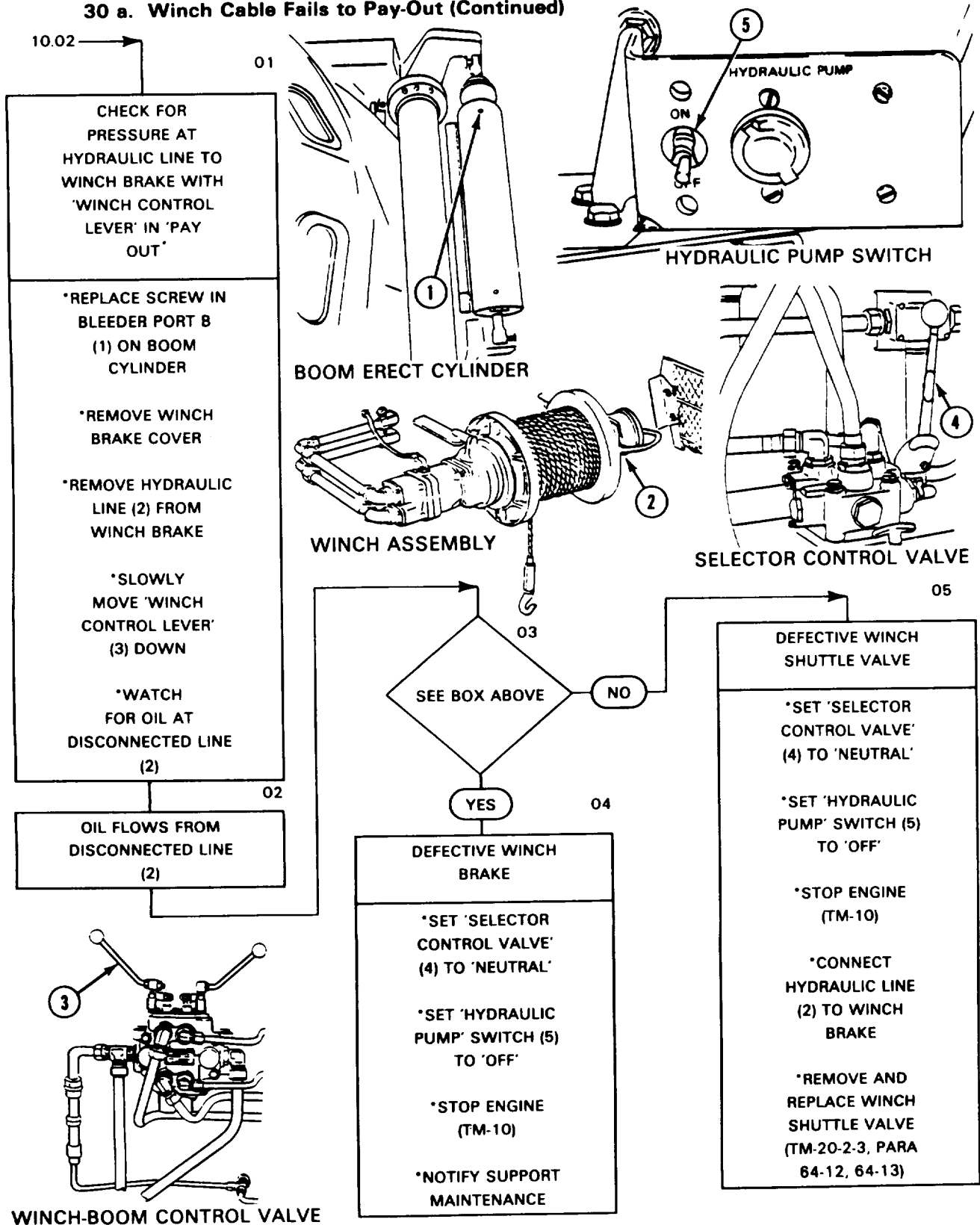
12.01



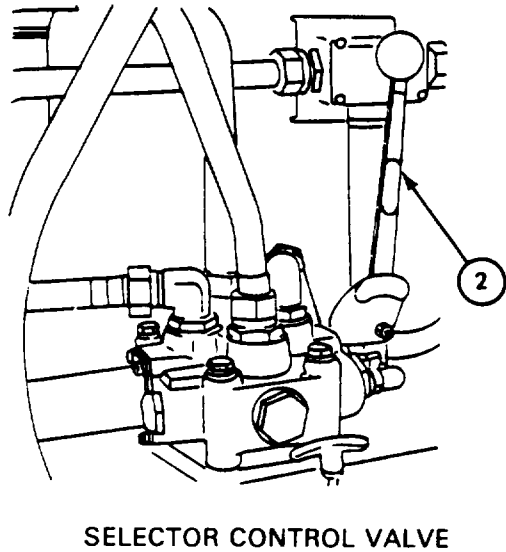
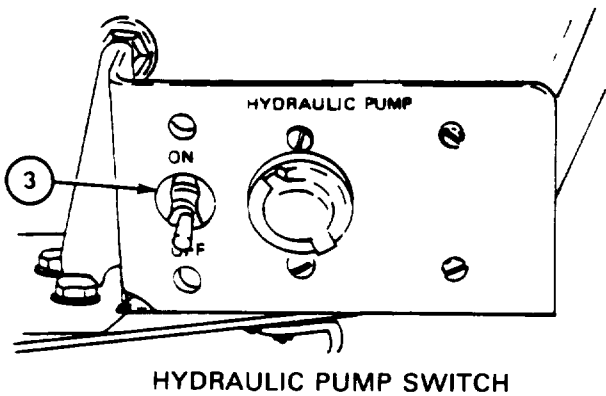
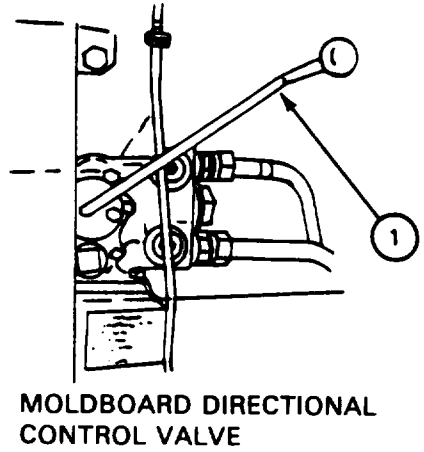
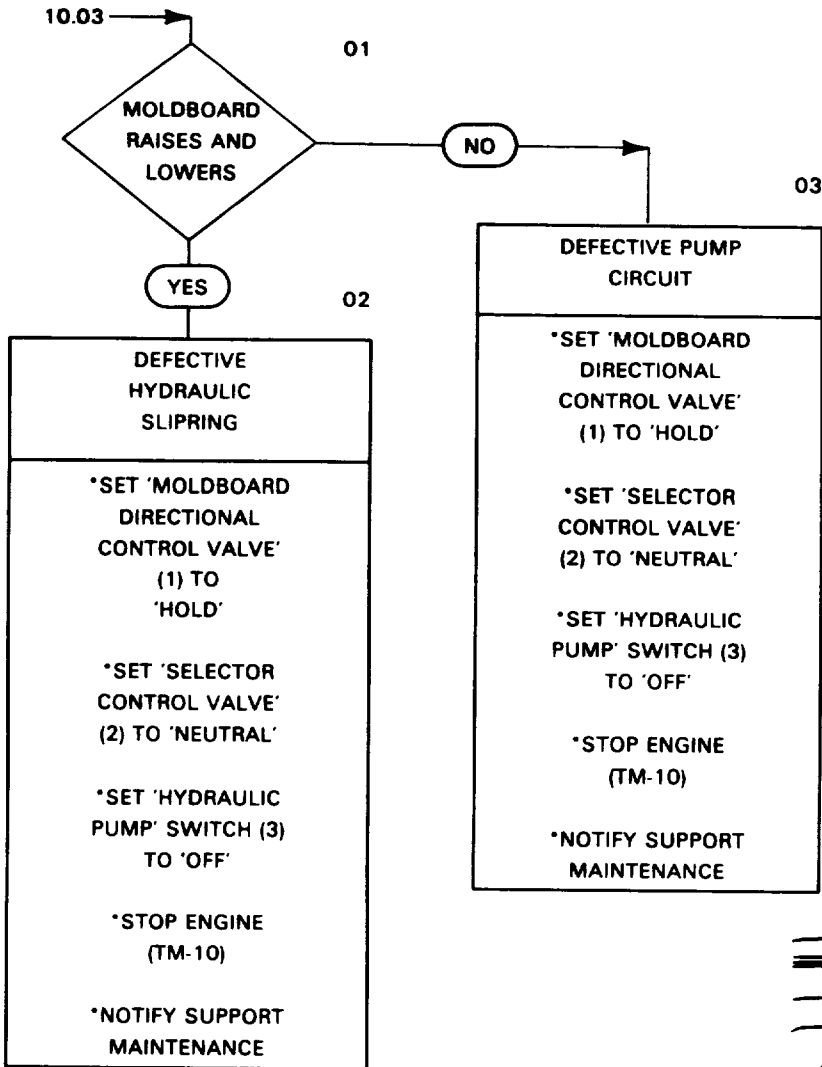
BOOM ERECT CYLINDER

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 11 OF 27)**

**30 a. Winch Cable Fails to Pay-Out (Continued)**

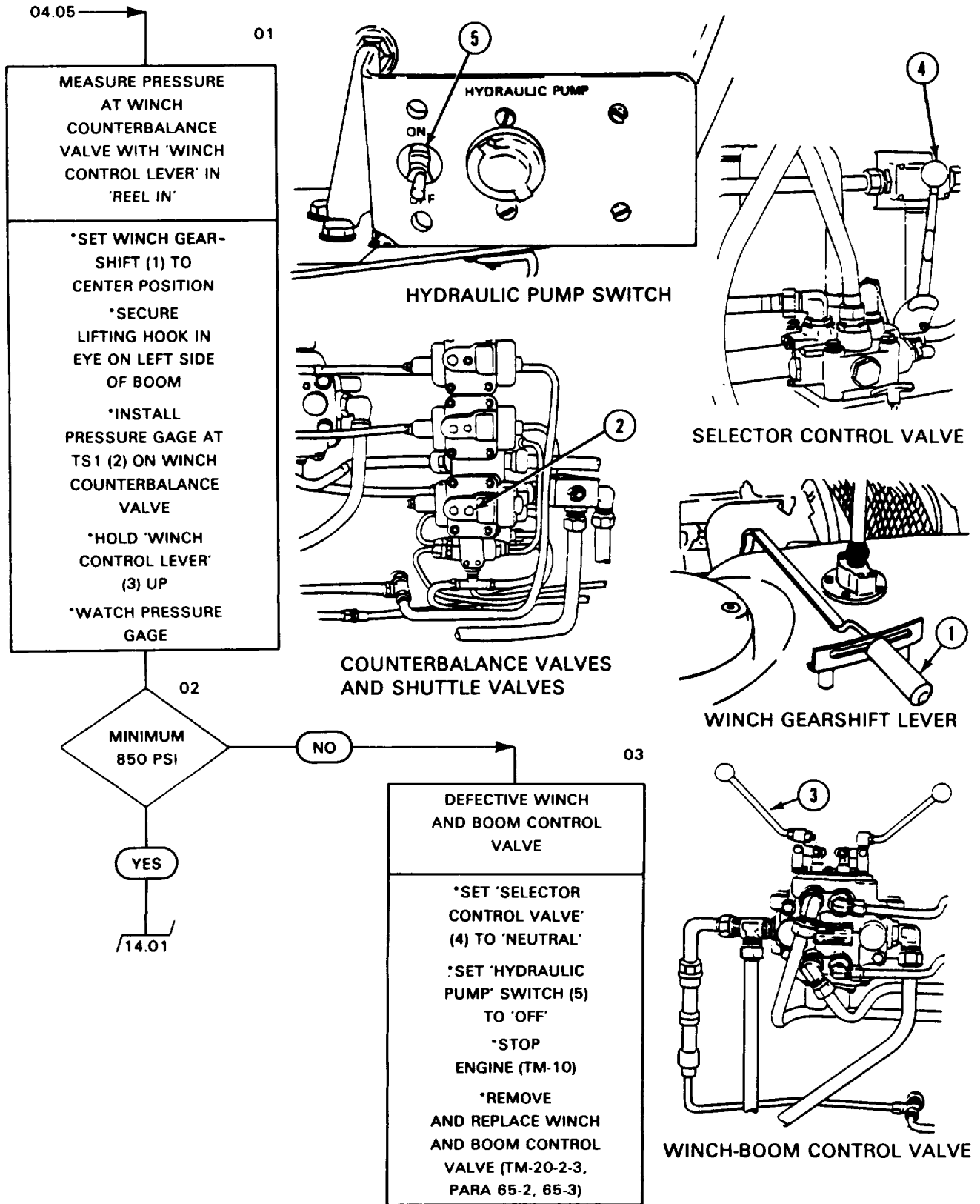


**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 12 OF 27)**  
**30 a. Winch Cable Fails to Pay-Out (Continued)**





**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 13 OF 27)**  
**30 b. Winch Cable Fails to Lift Load (Reel-In)**



**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 14 OF 27)**  
**30 b. Winch Cable Fails to Lift Load (Reel-In) (Continued)**

13.02 →

01

CHECK FOR PRESSURE AT HYDRAULIC LINE TO WINCH BRAKE WITH 'WINCH CONTROL LEVER' IN 'REEL-IN'

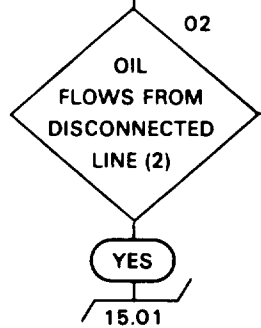
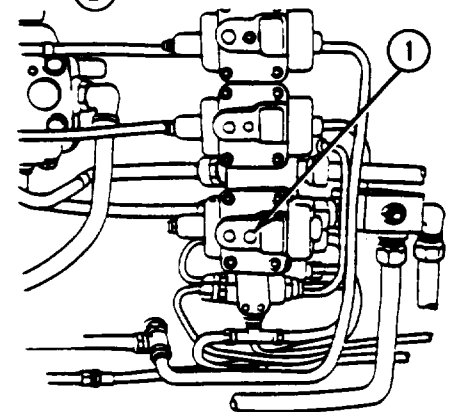
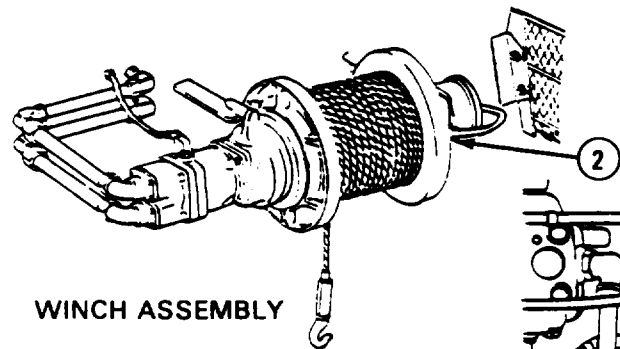
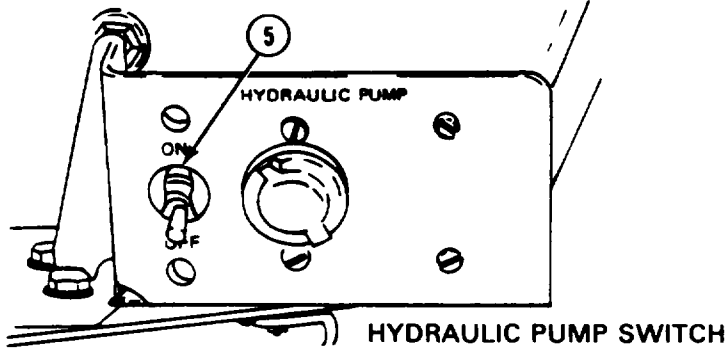
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\*REMOVE PRESSURE GAGE FROM WINCH COUNTERBALANCE VALVE (1)

\*REMOVE HYDRAULIC LINE (2) FROM WINCH BRAKE

\*SLOWLY MOVE 'WINCH CONTROL LEVER' (3) UP

\*WATCH FOR OIL AT DISCONNECTED LINE (2)



NO →

03

DEFECTIVE WINCH SHUTTLE VALVE

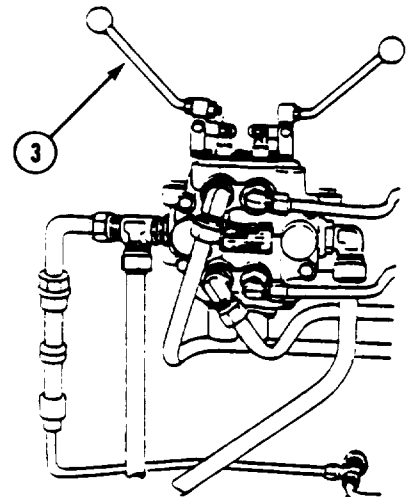
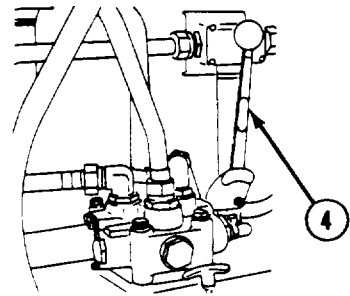
\*SET 'SELECTOR CONTROL VALVE' (4) TO 'NEUTRAL'

\*SET 'HYDRAULIC PUMP' SWITCH (5) TO 'OFF'

\*STOP ENGINE (TM-10)

\*CONNECT HYDRAULIC LINE (2) TO WINCH BRAKE

\*REMOVE AND REPLACE WINCH SHUTTLE VALVE (TM-20-2-3, PARA 64-12, 64-13)



SELECTOR CONTROL VALVE

WINCH-BOOM CONTROL VALVE

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 15 OF 27)**  
**30 b. Winch Cable Fails to Lift Load (Reel-In) (Continued)**

14.02 → 01

CHECK FOR PRESSURE AT INLET SIDE OF WINCH COUNTERBALANCE RELIEF VALVE WITH 'WINCH CONTROL LEVER' IN 'REEL-IN'

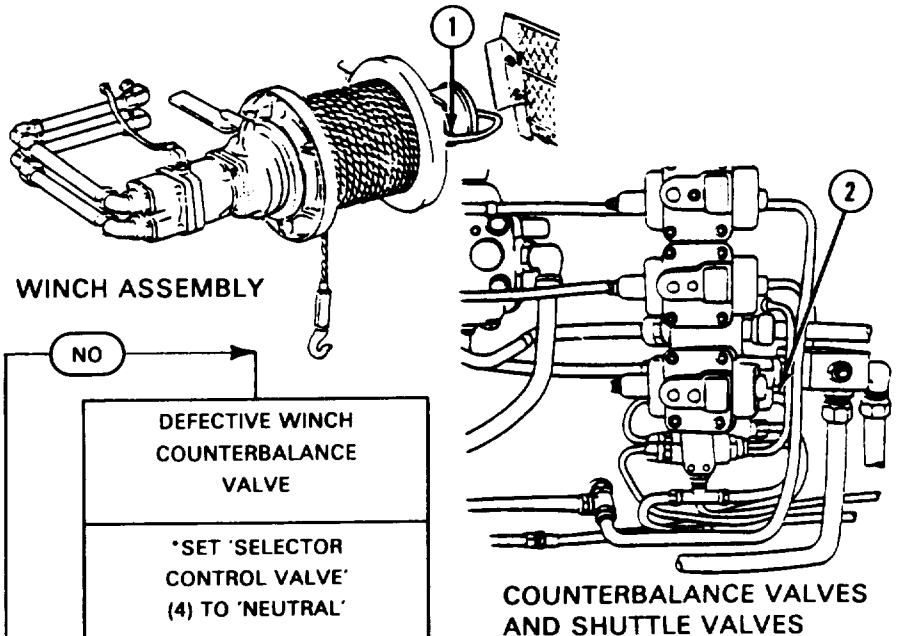
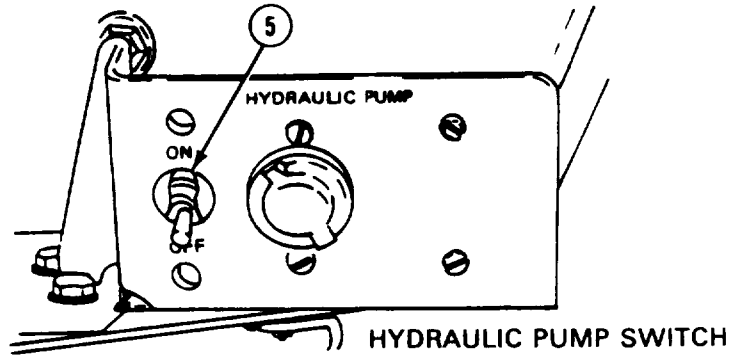
\*CONNECT HYDRAULIC LINE (1) TO WINCH BRAKE

\*INSTALL WINCH BRAKE COVER

\*DISCONNECT HYDRAULIC LINE (2) FROM INLET OF WINCH COUNTERBALANCE RELIEF VALVE

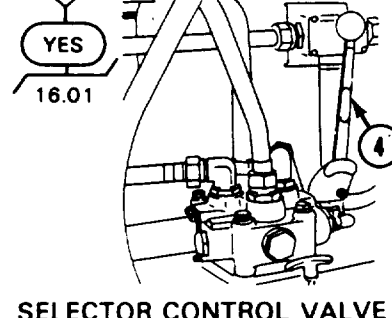
\*SLOWLY MOVE 'WINCH CONTROL LEVER' (3) UP

\*WATCH FOR OIL AT DISCONNECTED LINE (2)



02

OIL FLOWS FROM DISCONNECTED LINE (2)



NO →

DEFECTIVE WINCH COUNTERBALANCE VALVE

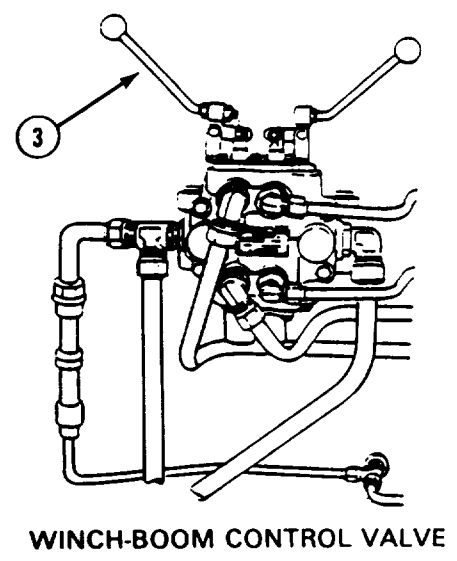
\*SET 'SELECTOR CONTROL VALVE' (4) TO 'NEUTRAL'

\*SET 'HYDRAULIC PUMP' SWITCH (5) TO 'OFF'

\*STOP ENGINE (TM-10)

\*CONNECT HYDRAULIC LINE (2) TO WINCH COUNTERBALANCE RELIEF VALVE

\*REMOVE AND REPLACE WINCH COUNTERBALANCE VALVE (TM-20-2-3, PARA 64-8, 64-9)



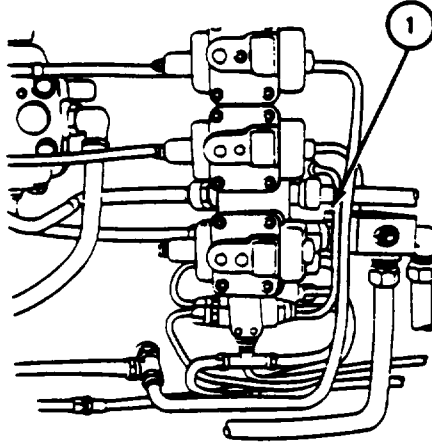
**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 16 OF 27)**  
**30 b. Winch Cable Fails to Lift Load (Reel-In) (Continued)**

15.02 → 01

**WINCH COUNTERBALANCE RELIEF VALVE MAY NEED ADJUSTMENT**

\*CONNECT HYDRAULIC LINE (1) TO WINCH COUNTERBALANCE RELIEF VALVE

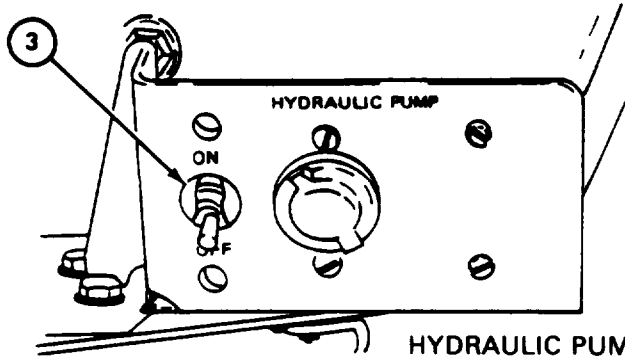
\*PERFORM WINCH COUNTERBALANCE RELIEF VALVE ADJUSTMENT (TM-20-2-3, PARA 64-16)



**COUNTERBALANCE VALVES AND SHUTTLE VALVES**

02

**WINCH COUNTERBALANCE RELIEF VALVE ADJUSTS PROPERLY**



**HYDRAULIC PUMP SWITCH**

03

SEE BOX ABOVE

NO

YES 04

**DEFECTIVE WINCH MOTOR**

\*SET 'SELECTOR CONTROL VALVE' (2) TO 'NEUTRAL'

\*SET 'HYDRAULIC PUMP' SWITCH (3) TO 'OFF'

\*STOP ENGINE (TM-10)

\*REMOVE AND REPLACE WINCH MOTOR (TM-20-2-3, PARA 63-2, 63-3)

05

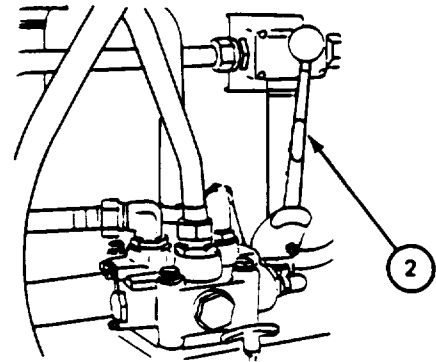
**DEFECTIVE WINCH COUNTERBALANCE RELIEF VALVE**

\*SET 'SELECTOR CONTROL VALVE' (2) TO 'NEUTRAL'

\*SET 'HYDRAULIC PUMP' SWITCH (3) TO 'OFF'

\*STOP ENGINE (TM-10)

\*REMOVE AND REPLACE WINCH COUNTERBALANCE RELIEF VALVE (TM-20-2-3, PARA 64-14, 64-15)



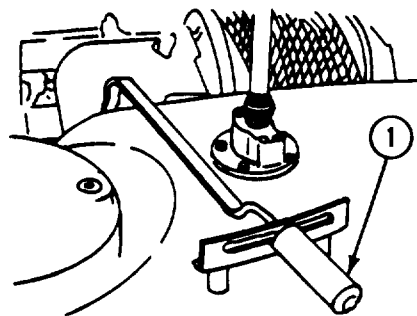
**SELECTOR CONTROL VALVE**

4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 17 OF 27)

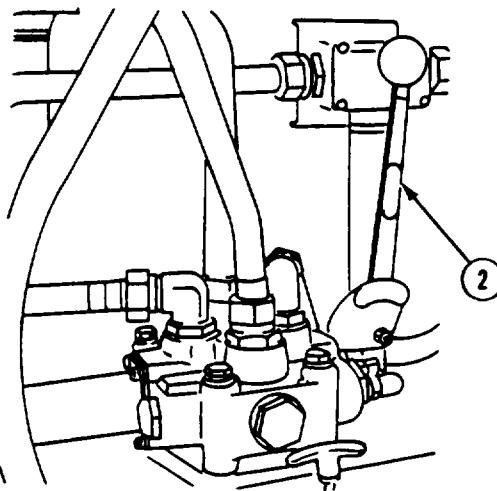
30 c. Winch Fails to Hold In Raised Position

04.05 → 01

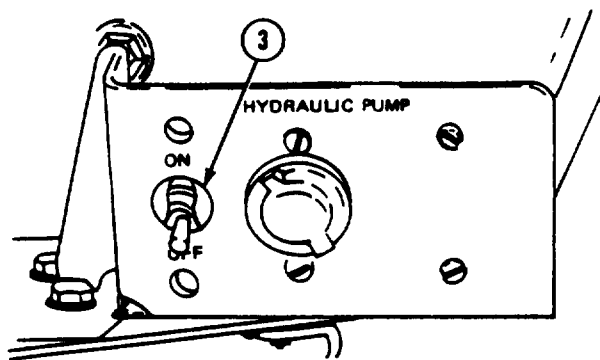
<b>DEFECTIVE WINCH BRAKE</b>
*REMOVE LIFTING HOOK FROM LOAD AND SECURE IN EYE ON LEFT SIDE OF BOOM
*SET WINCH GEARSHIFT (1) TO CENTER POSITION
*SET 'SELECTOR CONTROL VALVE' (2) TO 'NEUTRAL'
*SET 'HYDRAULIC PUMP' SWITCH (3) TO 'OFF'
*STOP ENGINE (TM-10)
*NOTIFY SUPPORT MAINTENANCE



WINCH GEARSHIFT LEVER



SELECTOR CONTROL VALVE



HYDRAULIC PUMP SWITCH

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 18 OF 27)**

**30 d. Winch Fails to Lower Load Slowly**

04.05

01

**DEFECTIVE WINCH  
COUNTERBALANCE  
VALVE**

\*REMOVE LIFTING  
HOOK FROM LOAD  
AND SECURE IN EYE  
ON LEFT SIDE OF  
BOOM

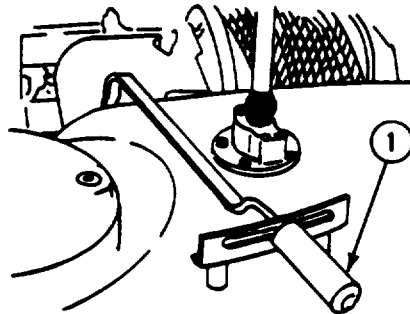
\*SET WINCH GEAR-  
SHIFT (1) TO  
CENTER POSITION

\*SET 'SELECTOR  
CONTROL VALVE' (2)  
TO 'NEUTRAL'

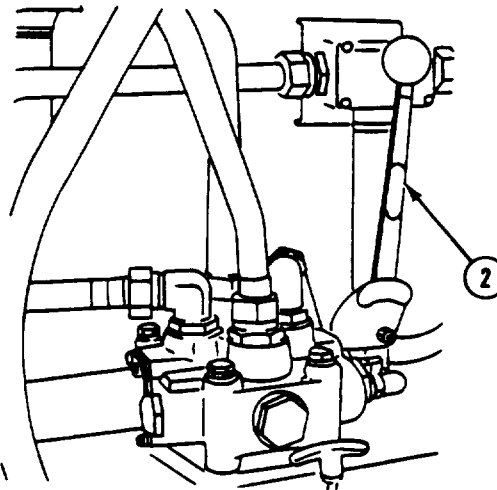
\*SET 'HYDRAULIC  
PUMP' SWITCH (3)  
TO 'OFF'

\*STOP ENGINE  
(TM-10)

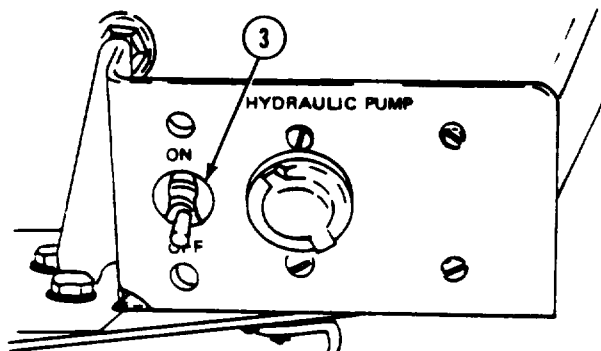
\*REMOVE  
AND REPLACE WINCH  
COUNTERBALANCE  
VALVE (TM-20-2-3,  
PARA 64-8, 64-9)



WINCH GEARSHIFT LEVER



SELECTOR CONTROL VALVE



HYDRAULIC PUMP SWITCH

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 19 OF 27)**  
**31 a. Boom Fails to Erect**

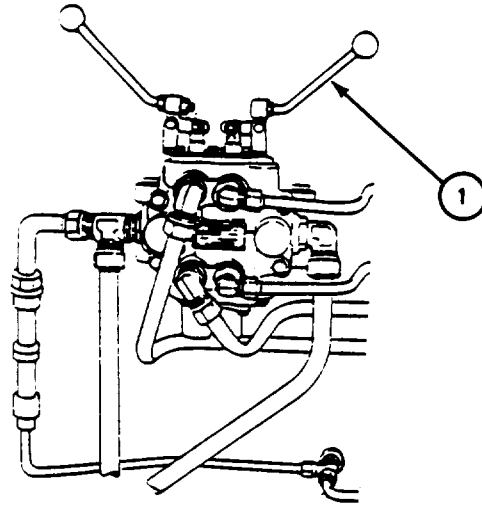
04.05 → 01

CHECK OPERATION OF WINCH BRAKE WITH 'BOOM CONTROL LEVER' IN 'ERECT'

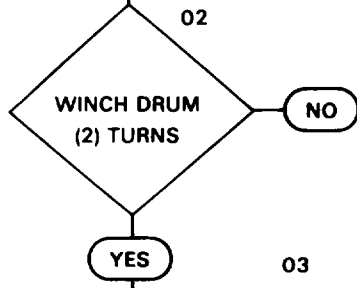
---

\*HOLD 'BOOM CONTROL LEVER' (1) UP

\*TURN WINCH DRUM (2) BY HAND



WINCH-BOOM CONTROL VALVE



CHECK FOR PRESSURE AT BOOM CYLINDER BLEEDER PORT A WITH 'BOOM CONTROL LEVER' IN 'ERECT'

---

\*SET WINCH GEAR-SHIFT (3) TO CENTER POSITION

\*REMOVE SCREW FROM BLEEDER PORT A (4) ON BOOM CYLINDER

\*SLOWLY MOVE 'BOOM CONTROL LEVER' (1) FORWARD AND UP

\*WATCH FOR OIL AT BLEEDER PORT A (4)

04

CHECK FOR PRESSURE AT BOOM CYLINDER BLEEDER PORT B WITH 'BOOM CONTROL LEVER' IN 'ERECT'

---

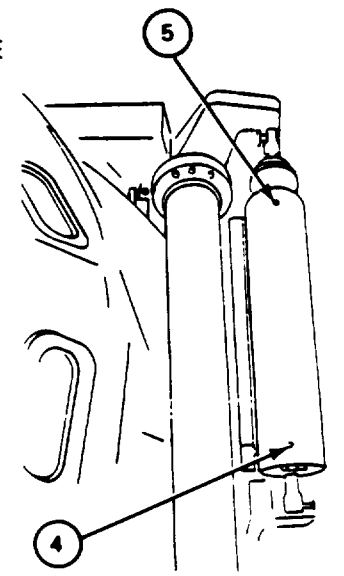
\*SECURE TWO BOOM TRAVEL LOCKS AND STAYLINES (TM-10)

\*SET WINCH GEAR-SHIFT (3) TO CENTER POSITION

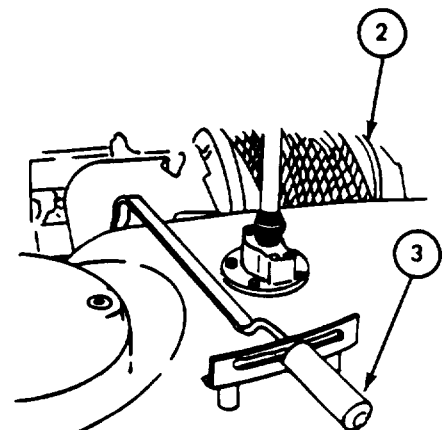
\*REMOVE SCREW FROM BLEEDER PORT B (5) ON BOOM CYLINDER

\*SLOWLY MOVE 'BOOM CONTROL LEVER' (1) UP

\*WATCH FOR OIL AT BLEEDER PORT B (5)



BOOM ERECT CYLINDER

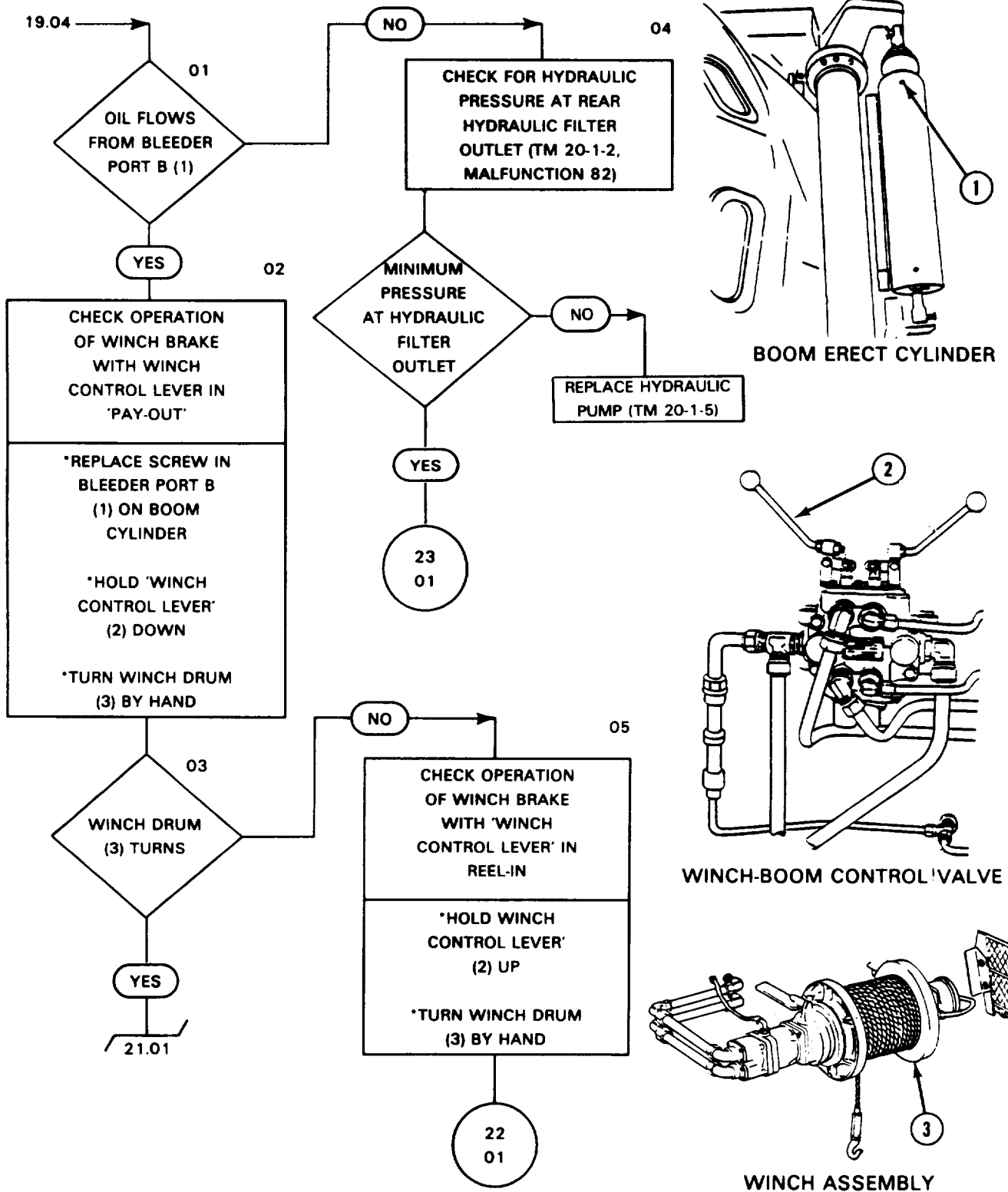


WINCH GEARSHIFT LEVER

24  
01

20.01

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 20 OF 27)**  
**31 a. Boom Fails to Erect (Continued)**





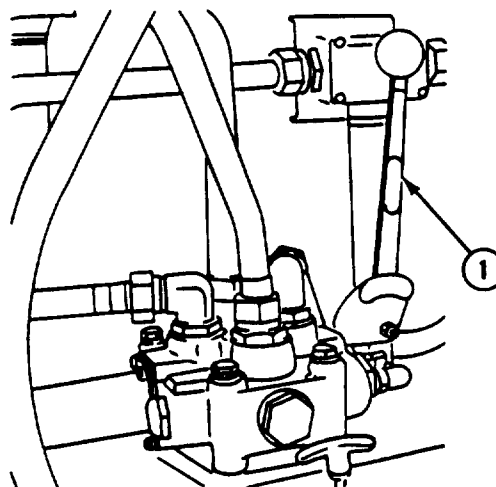
**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 21 OF 27)**

**31 a. Boom Fails to Erect (Continued)**

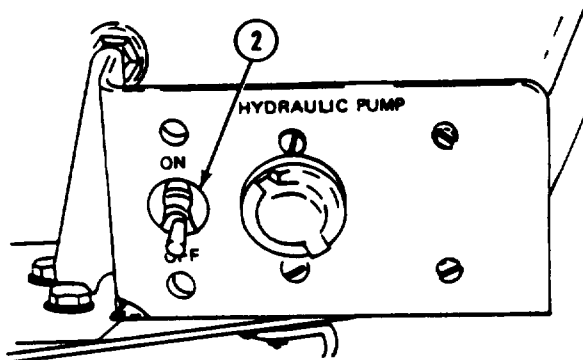
20.03 →

01

<b>DEFECTIVE BOOM SHUTTLE VALVE</b>
<p>*SET 'SELECTOR CONTROL VALVE' (1) TO 'NEUTRAL'</p> <p>*SET 'HYDRAULIC PUMP' SWITCH (2) TO 'OFF'</p> <p>*STOP ENGINE (TM-10)</p> <p>*REMOVE AND REPLACE BOOM SHUTTLE VALVE (TM-20-2-3, PARA 64-10, 64-11)</p>



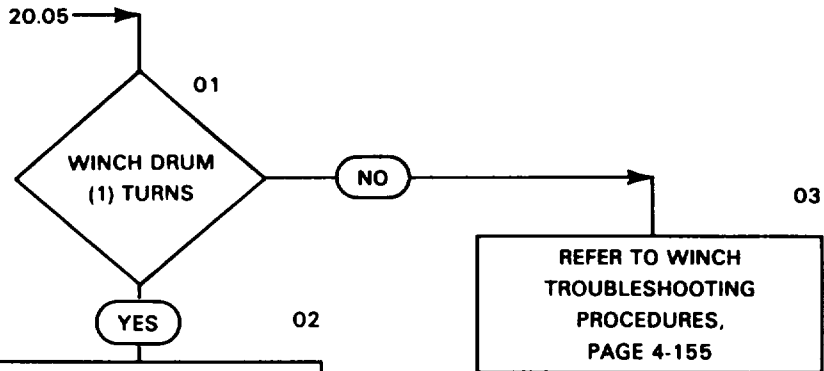
**SELECTOR CONTROL VALVE**



**HYDRAULIC PUMP SWITCH**

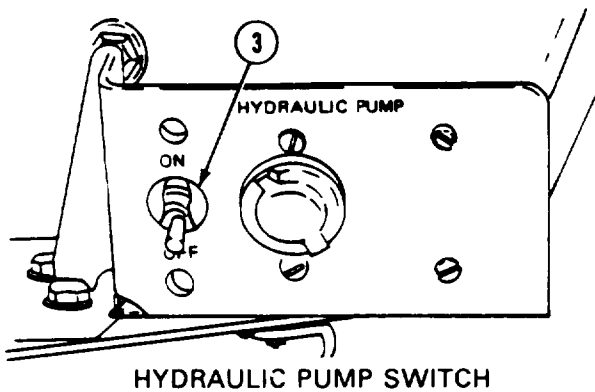
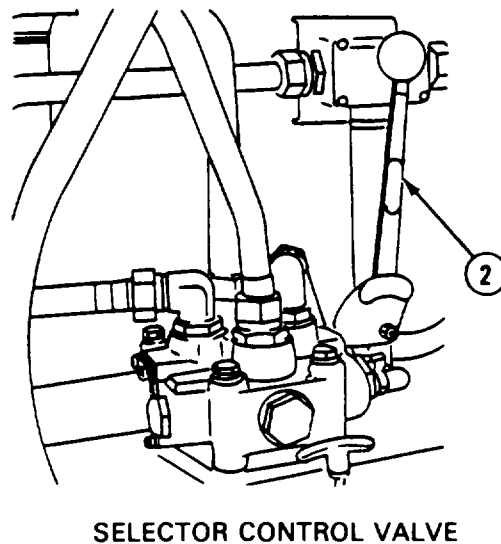
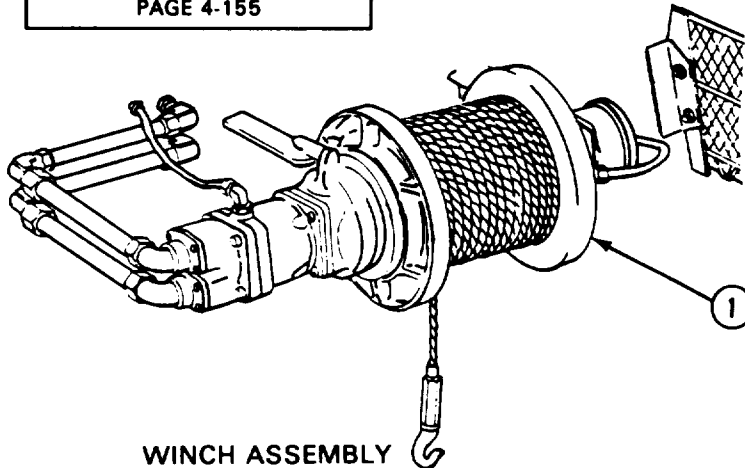
4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 22 OF 27)

31 a. Boom Fails to Erect (Continued)



**DEFECTIVE WINCH SHUTTLE VALVE**

- \*SET 'SELECTOR CONTROL VALVE' (2) TO 'NEUTRAL'
- \*SET 'HYDRAULIC PUMP' SWITCH (3) TO 'OFF'
- \*STOP ENGINE (TM-10)
- \*REMOVE AND REPLACE WINCH SHUTTLE VALVE (TM-20-2-3, PARA 64-12, 64-13)

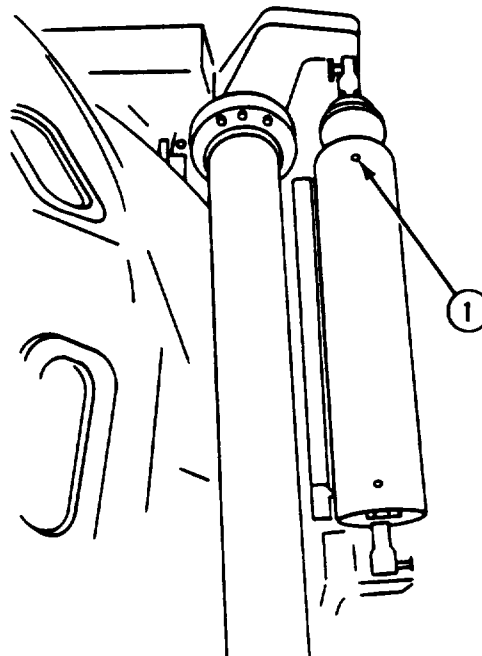


4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 23 OF 27)

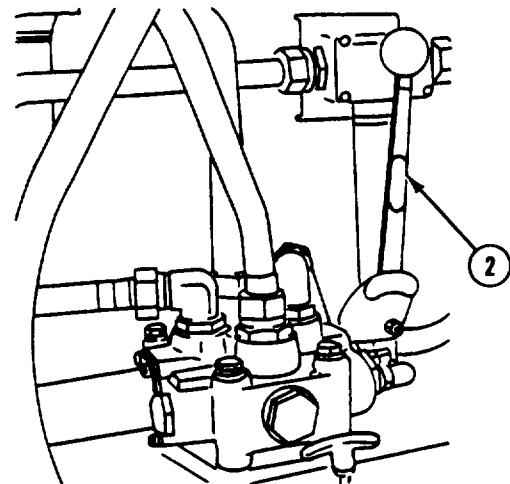
31 a. Boom Fails to Erect (Continued)

20.04 → 01

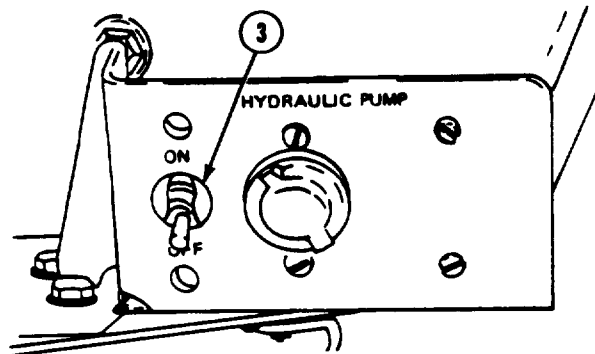
<p>DEFECTIVE WINCH AND BOOM CONTROL VALVE</p>
<p>*REPLACE SCREW IN BLEEDER PORT B (1) ON BOOM CYLINDER</p>
<p>*SET 'SELECTOR CONTROL VALVE' (2) TO 'NEUTRAL'</p>
<p>*SET 'HYDRAULIC PUMP' SWITCH (3) TO 'OFF'</p>
<p>*STOP ENGINE (TM-10)</p>
<p>*REMOVE AND REPLACE WINCH AND BOOM CONTROL VALVE (TM-20-2-3, PARA 65-2, 65-3)</p>



BOOM ERECT CYLINDER

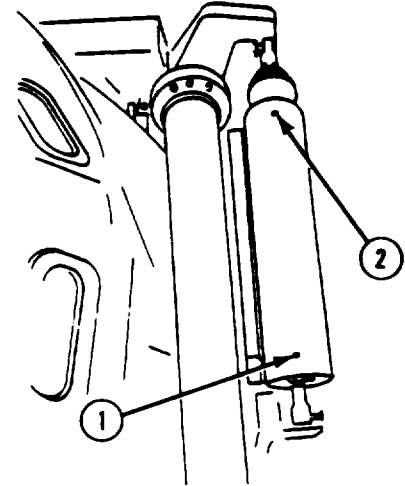
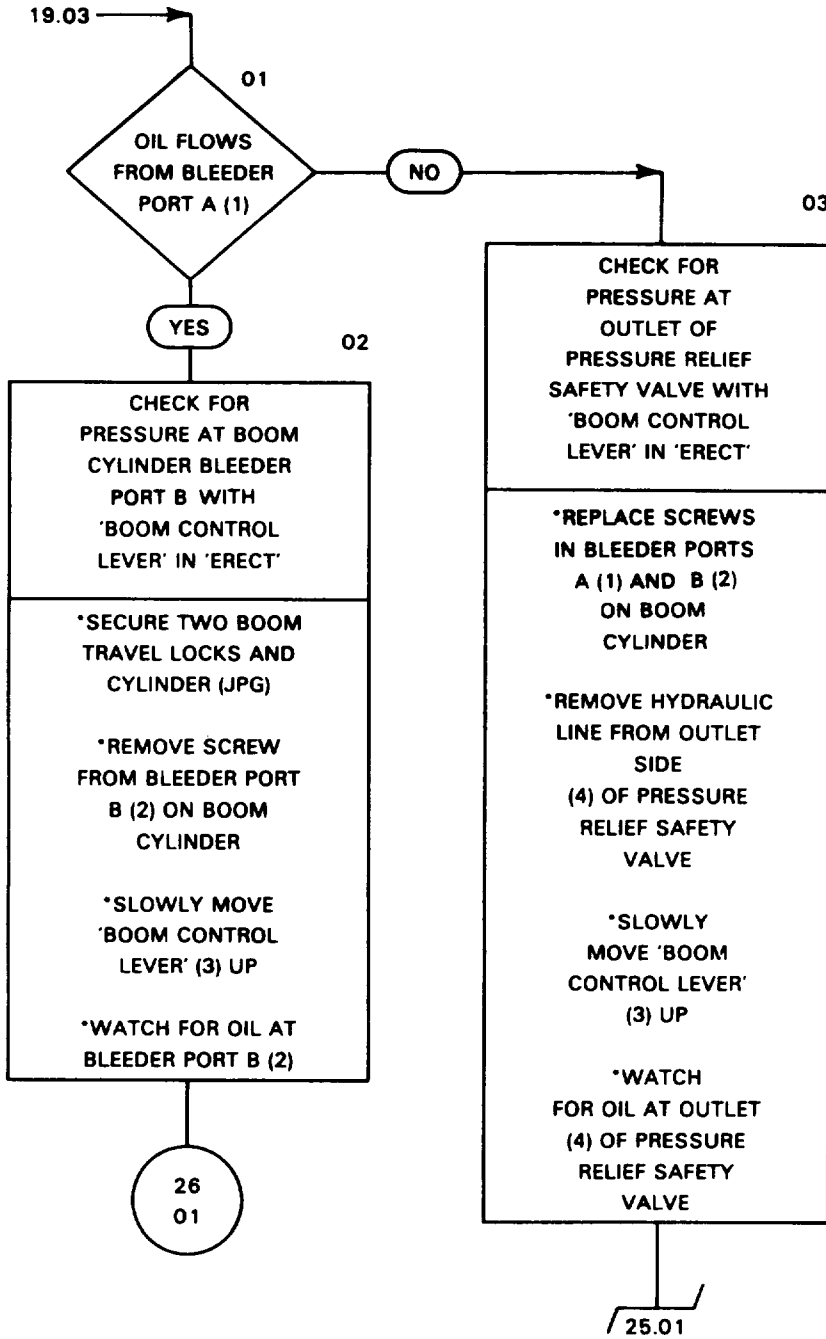


SELECTOR CONTROL VALVE

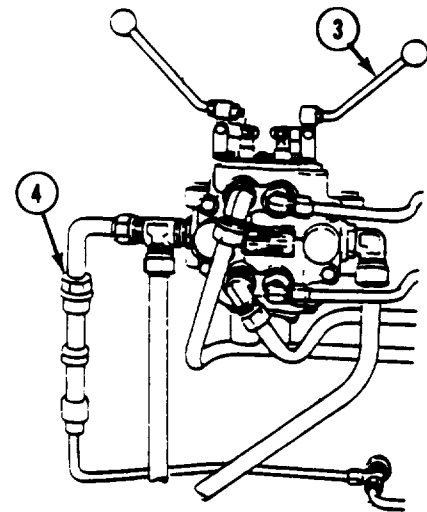


HYDRAULIC PUMP SWITCH

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 24 OF 27)**  
**31 a. Boom Fails to Erect (Continued)**

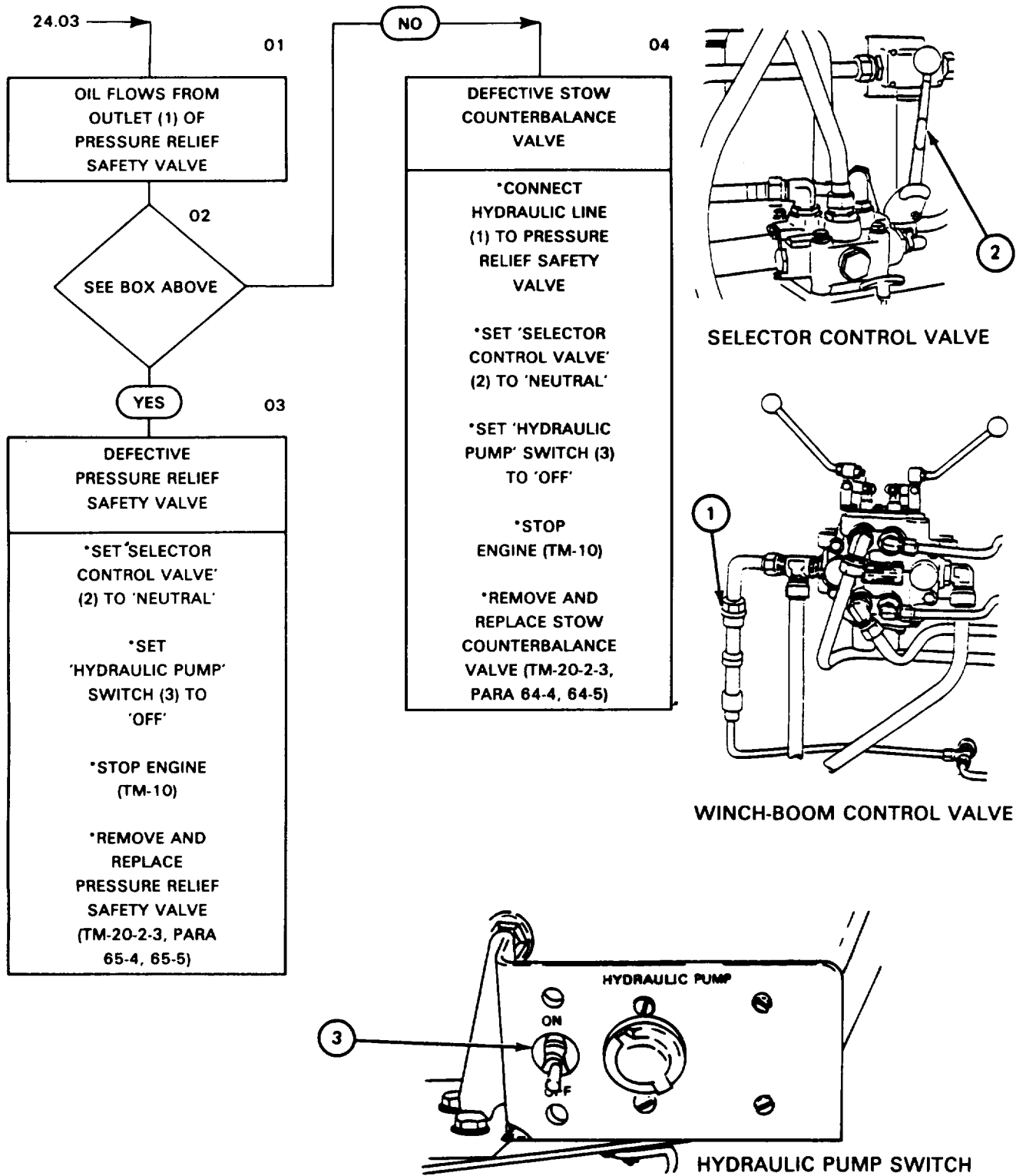


**BOOM ERECT CYLINDER**



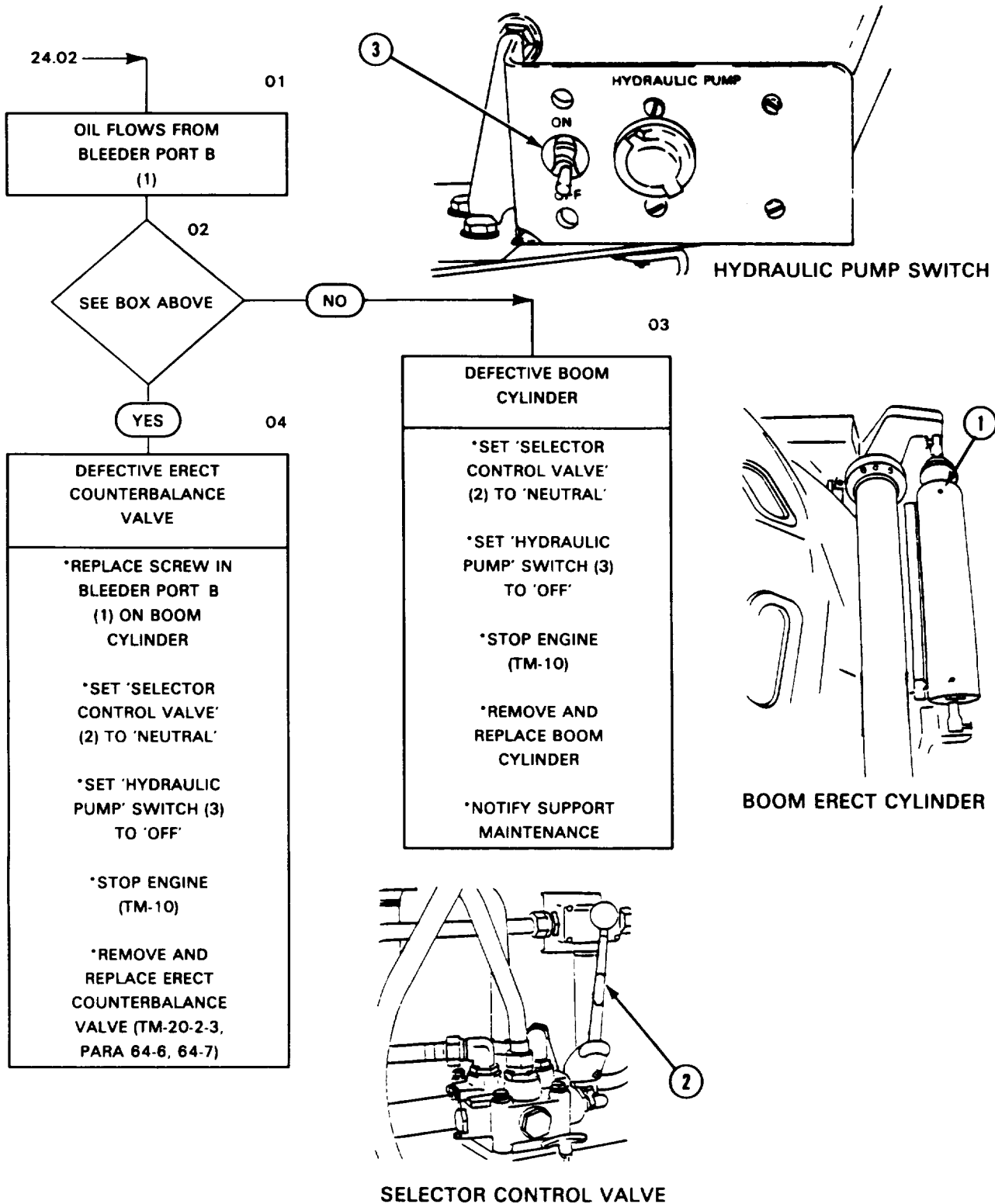
**WINCH-BOOM CONTROL VALVE**

**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 25 OF 27)**  
**31 a. Boom Fails to Erect (Continued)**



**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 26 OF 27)**

**31 a. Boom Fails to Erect (Continued)**

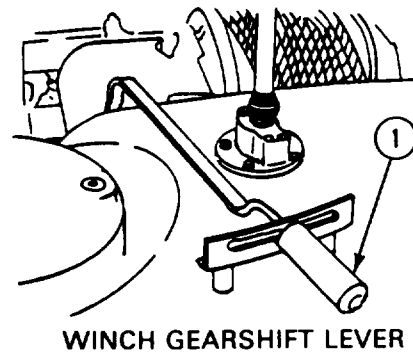


**4-3. WINCH OR BOOM TROUBLESHOOTING (SHEET 27 OF 27)**  
**31 b. Boom Fails to Stow**

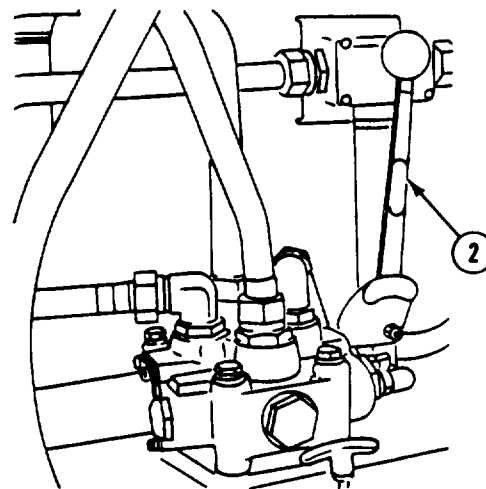
04.05 →

01

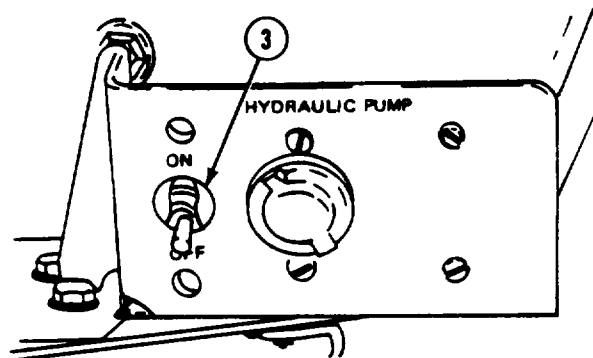
<p><b>DEFECTIVE STOW COUNTERBALANCE VALVE</b></p>
<p>*SET WINCH GEAR- SHIFT (1) TO CENTER POSITION</p>
<p>*SET 'SELECTOR CONTROL VALVE' (2) TO 'NEUTRAL'</p>
<p>*SET 'HYDRAULIC PUMP' SWITCH (3) TO 'OFF'</p>
<p>*STOP ENGINE (TM-10)</p>
<p>*REMOVE AND REPLACE STOW COUNTERBALANCE VALVE (TM-20-2-3, PARA 64-4, 64-5)</p>



WINCH GEARSHIFT LEVER



SELECTOR CONTROL VALVE



HYDRAULIC PUMP SWITCH





**4-4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING~(SHEET 1 OF 8)**

**SYMPTOM:** (24) Elevation and traverse power lamp fails to light

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:	Master Control Panel	FOLDOUT	CALLOUT
	Gunner's Control Box	4	4
	Turret Power and Searchlight	1	2
	Relay Box	1	9
	Turret Electrical Slipring	3	5

- REFERENCES:**
- (1) TM 9-2350-222-20-2-3 for removal and replacement of components
  - (2) ETM 643-091-9400R/JPG for procedures to:
    - Use multimeter
    - Disconnect electrical connectors
  - (3) TM 9-2350-222-10 for procedures to:
    - Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 2 OF 8)

**CAUTION** 01

TO PREVENT EQUIPMENT DAMAGE, BE SURE TO TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTORS, AND BEFORE MEASURING CONTINUITY OR RESISTANCE.

**NOTE** 02

FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, AND RESISTANCE, REFER TO JPG

03

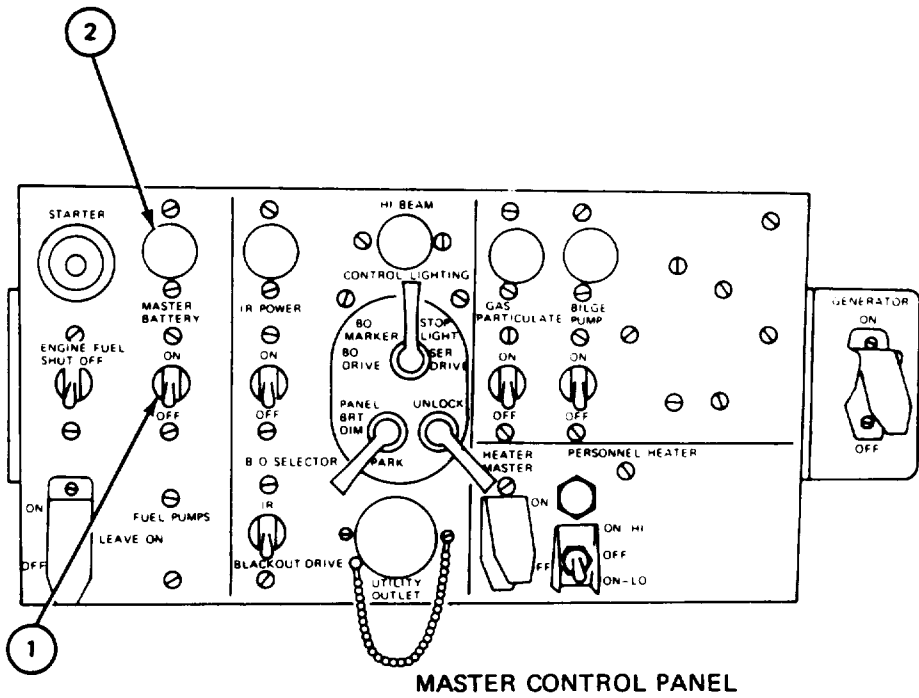
\*SET 'MASTER BATTERY' SWITCH (1) ON MASTER CONTROL PANEL TO 'ON'

04

'MASTER BATTERY' LAMP (2) LIGHTS

YES

3  
01



MASTER CONTROL PANEL

NO

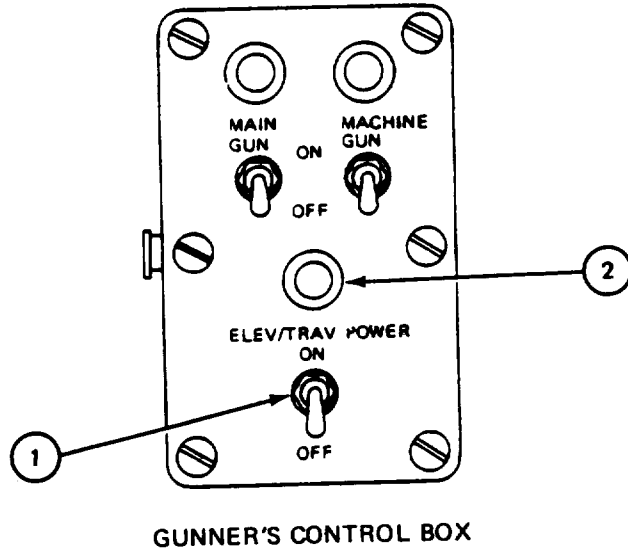
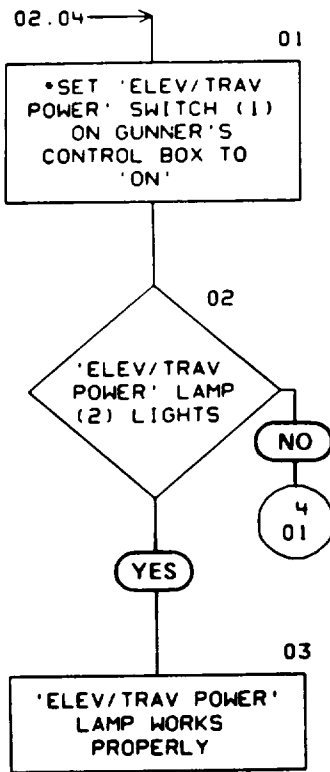
02.04\*

05

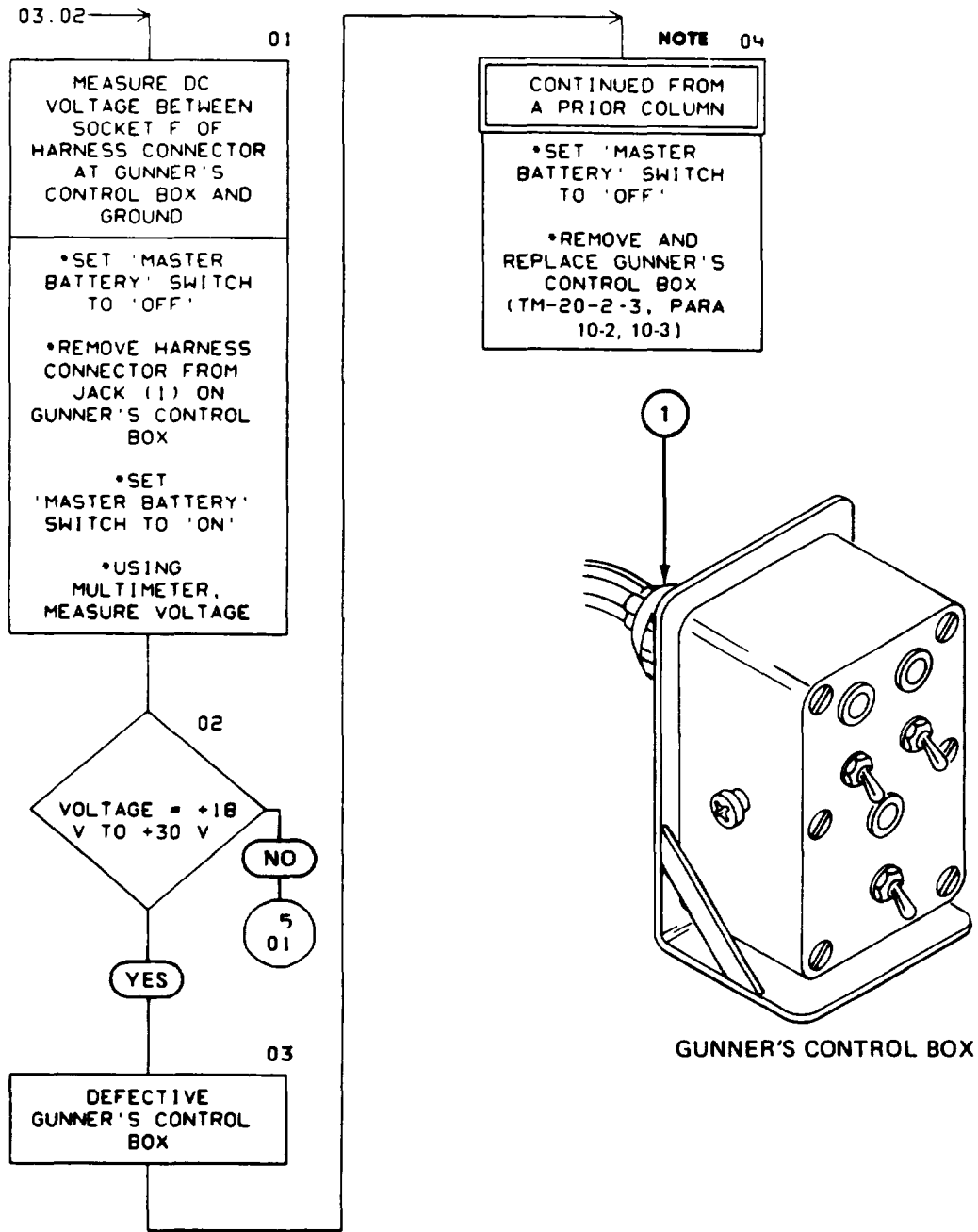
DEFECTIVE BATTERY CIRCUIT

\*NOTIFY HULL MAINTENANCE

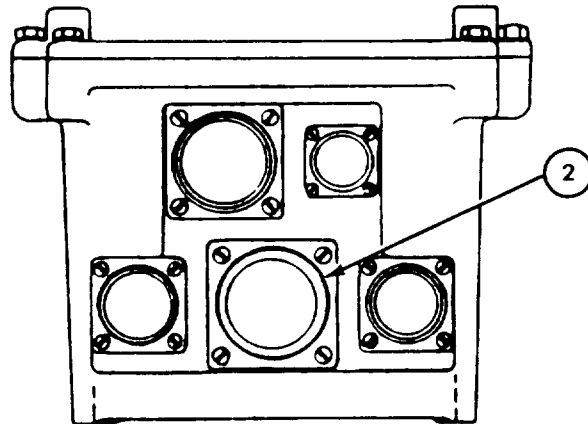
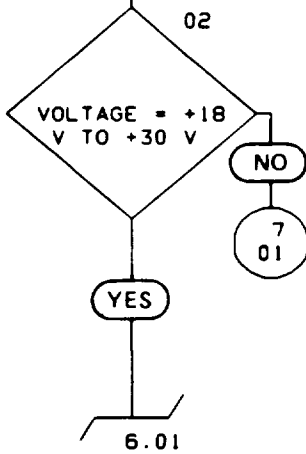
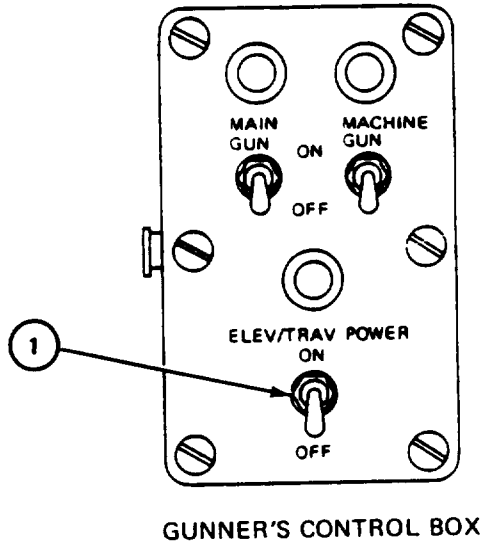
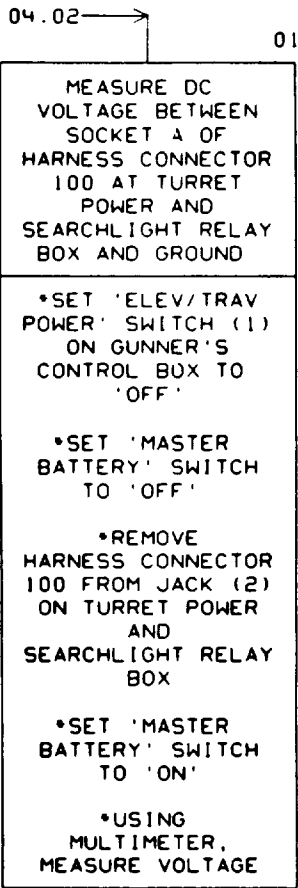
**4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 3 OF 8)**



**4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 4 OF 8)**



**4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 5 OF 8)**



**4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 6 OF 8)**

05.02 →

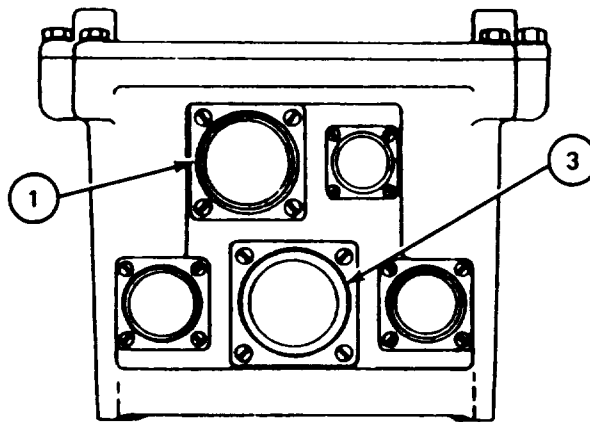
01

CHECK CONTINUITY BETWEEN SOCKET F OF HARNESS CONNECTOR AT GUNNER'S CONTROL BOX AND PIN B OF HARNESS CONNECTOR 625 AT TURRET POWER AND SEARCHLIGHT RELAY BOX

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE HARNESS CONNECTOR 625 FROM JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

06.03 →

**NOTE** 05

CONTINUED FROM A PRIOR COLUMN

•CONNECT HARNESS CONNECTOR TO JACK (2) ON GUNNER'S CONTROL BOX

•REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

02

RESISTANCE LESS THAN 2 OHMS

YES

03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

6.05

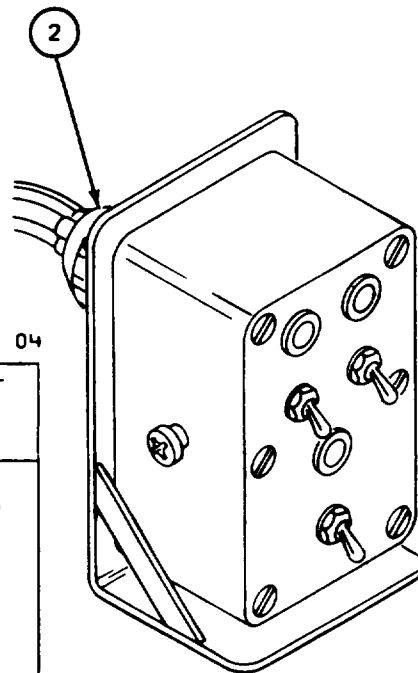
NO

04

DEFECTIVE TURRET CONTROL WIRING HARNESS

•CONNECT HARNESS CONNECTOR 100 TO JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•NOTIFY SUPPORT MAINTENANCE



GUNNER'S CONTROL BOX

**4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 7 OF 8)**

05.02 →

01

•CONNECT HARNESS CONNECTOR TO JACK (1) ON GUNNER'S CONTROL BOX

02

MEASURE DC VOLTAGE BETWEEN HARNESS CONNECTOR 47 AT TURRET ELECTRICAL SLIPRING AND GROUND

•TRAVERSE TURRET UNTIL MAIN GUN IS OVER REAR DECK (TM-10)

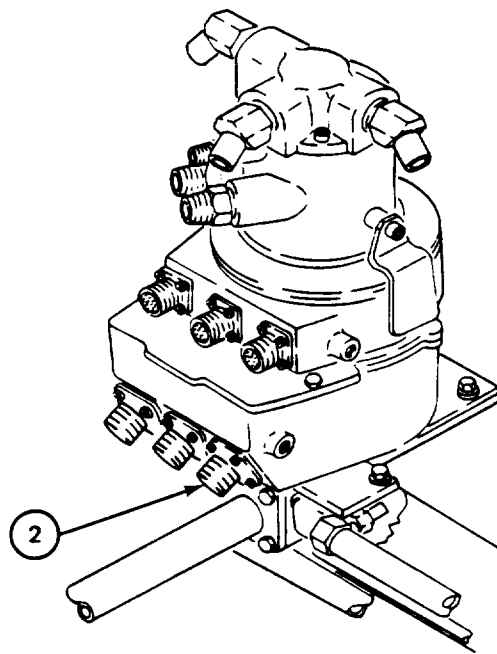
•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•OPEN BATTERY ACCESS DOOR

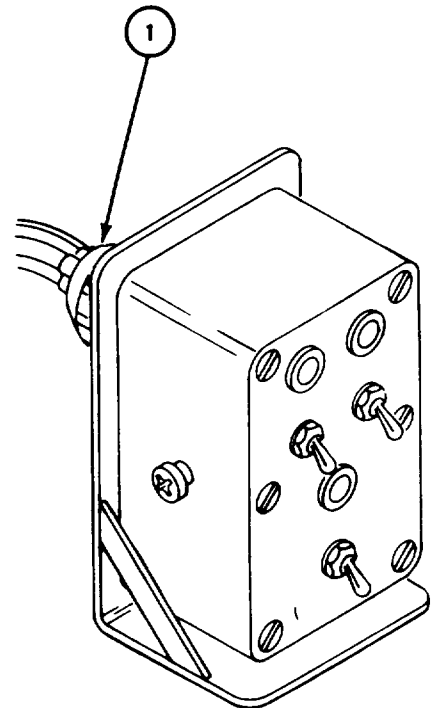
•REMOVE HARNESS CONNECTOR 47 FROM JACK (2) ON TURRET ELECTRICAL SLIPRING

•SET 'MASTER BATTERY' SWITCH TO 'ON'

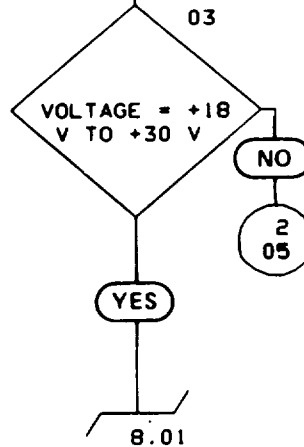
•USING MULTIMETER, MEASURE VOLTAGE



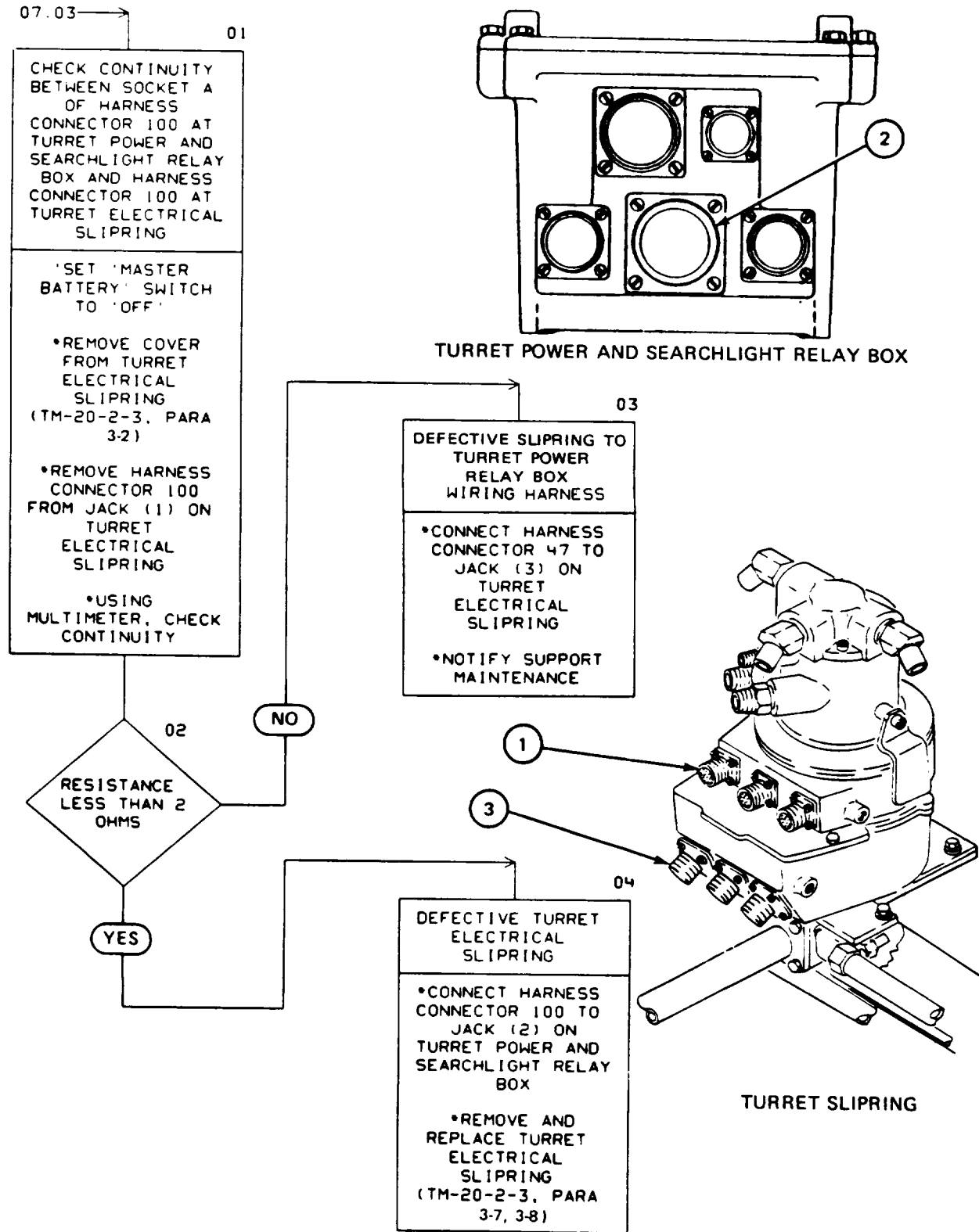
TURRET SLIPRING



GUNNER'S CONTROL BOX



**4.4. ELEVATION AND TRAVERSE POWER LAMP TROUBLESHOOTING (SHEET 8 OF 8)**





**4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 1 OF 13)**

**SYMPTOM:** (32) Deck clearance fails to operate  
 (33) Deck clearance fails to operate within proper limits

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Hydraulic Power Pack	1	10
Gunner's Control Box	1	2
Gunner's Control Handle	1	19
Gun Elevation Interference Switch	3	1
Turret Electrical Slipping	3	5

- REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 Adjustment of gun elevation interference and slipping interference switches  
 (2) ETM 643-091-9400R/JPG for procedures to:  
 Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedures to:  
 Release turret traversing lock  
 Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

### 4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 2 OF 13)

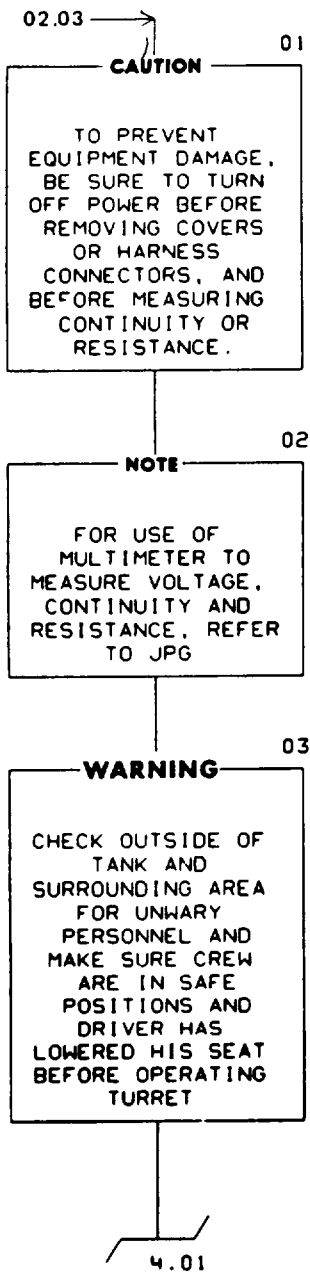
01  
**WARNING**  
DO NOT TRAVERSE  
TURRET OR ELEVATE  
GUN WITHOUT  
BENEFIT OF AN  
ASSISTANT TO WARN  
PERSONNEL IN AREA  
OF POTENTIAL  
SAFETY HAZARD.

02  
**CAUTION**  
BECAUSE OF  
EXTREME POWER  
DRAIN ON BATTERY  
DO NOT OPERATE  
ELECTRIC DRIVE  
MOTOR FOR LONG  
PERIODS OF TIME.

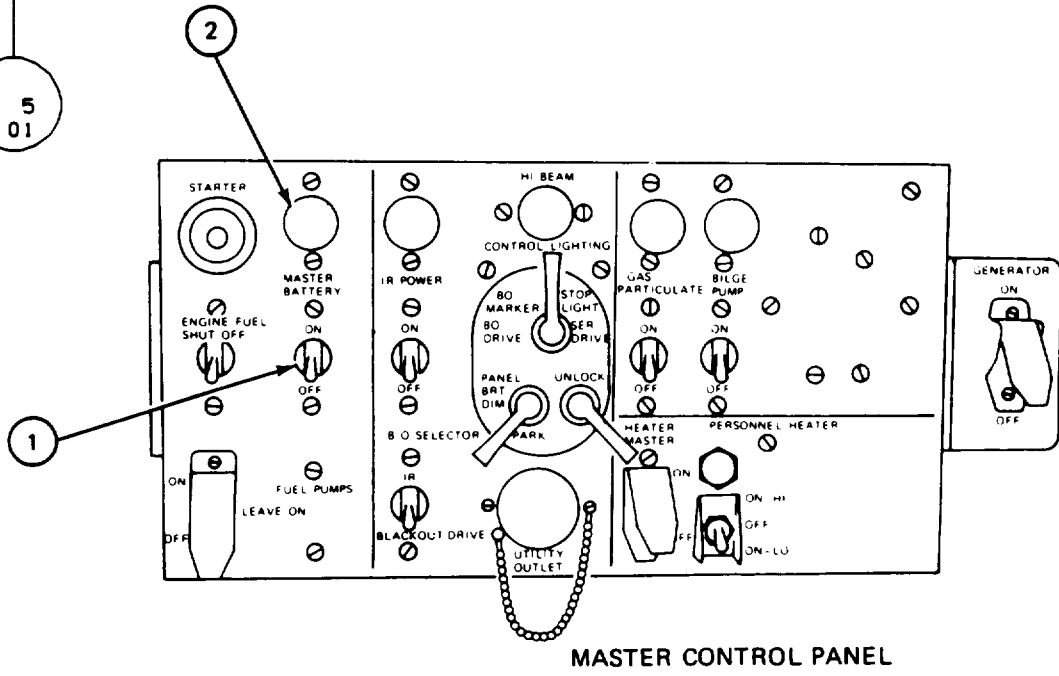
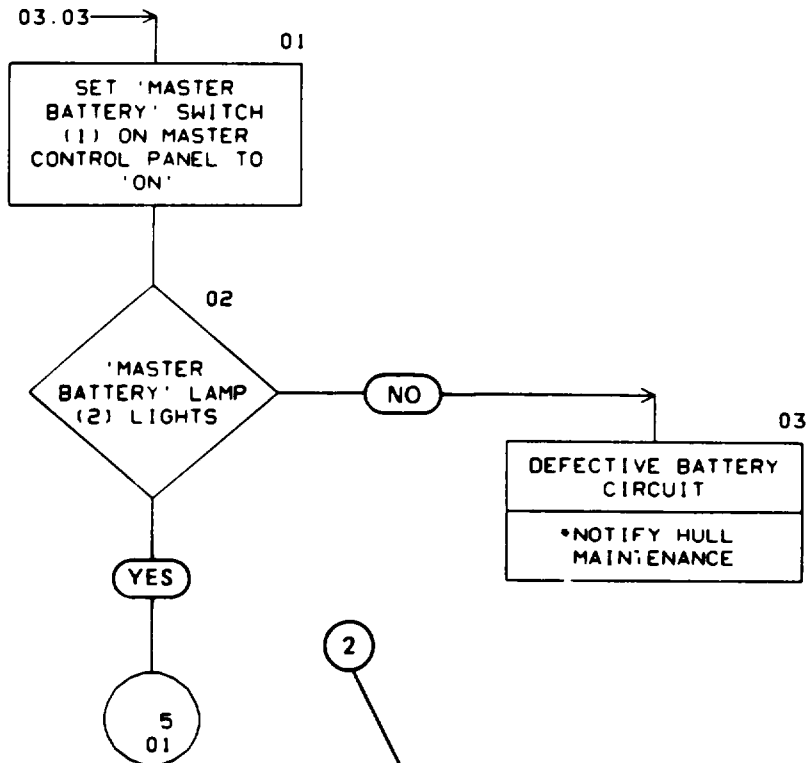
03  
**NOTE**  
MAKE SURE THAT  
HYDRAULIC SYSTEM  
IS INTACT WITH NO  
EVIDENCE OF OIL  
LEAKAGE.

3.01

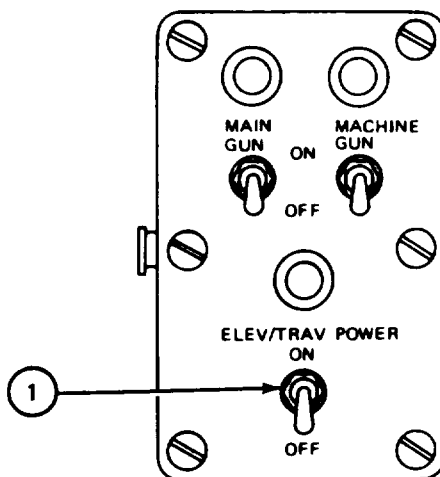
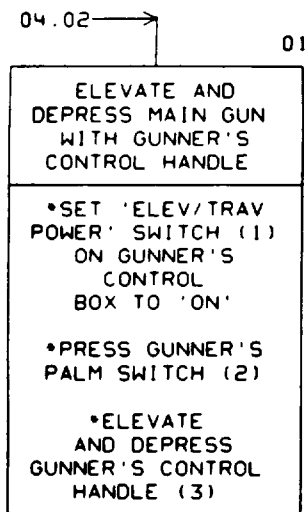
**4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 3 OF 13)**



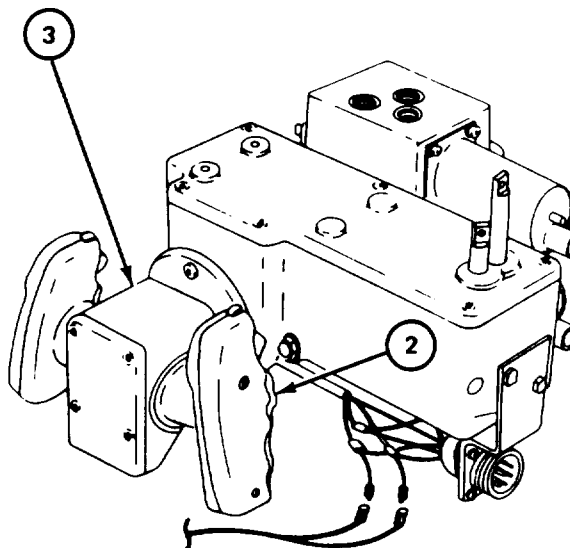
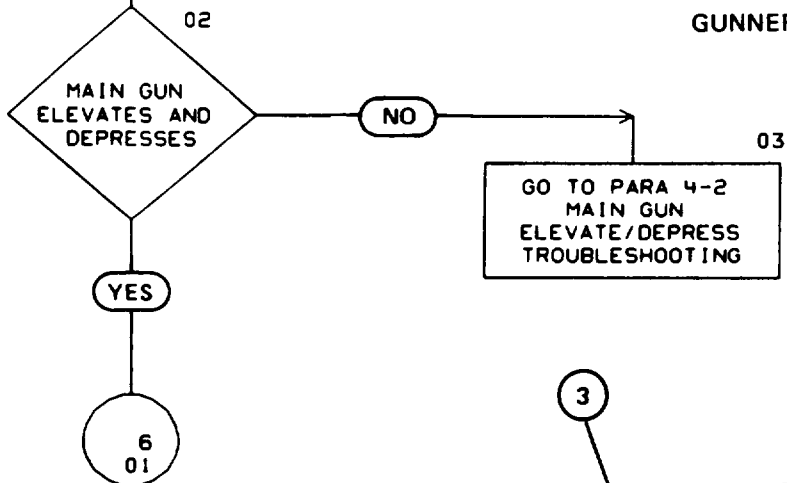
4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 4 OF 13)



4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 5 OF 13)

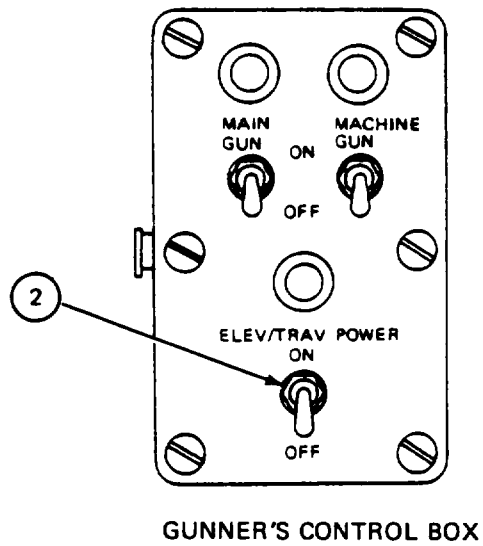
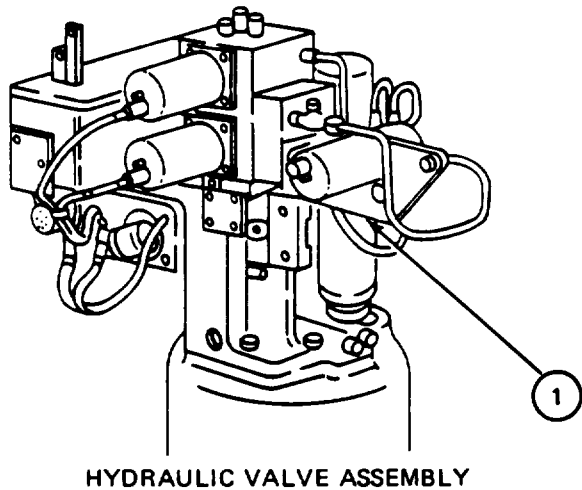
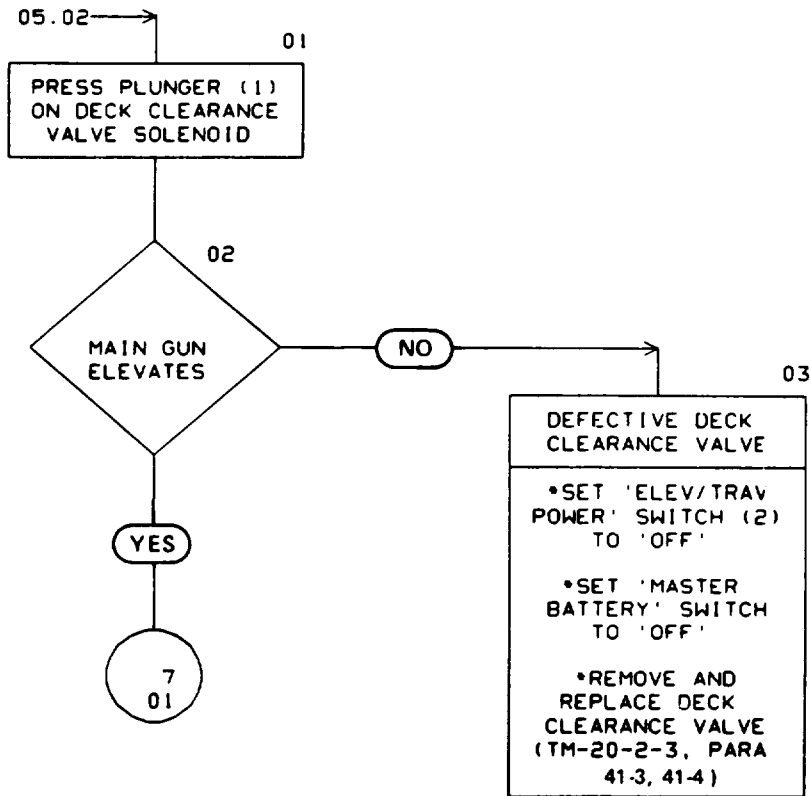


GUNNER'S CONTROL BOX



GUNNER'S CONTROL ASSEMBLY

**4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 6 OF 13)**



**4.5. DECK CLEARANCE TROUBLESHOOTING (SHEET 7 OF 13)**

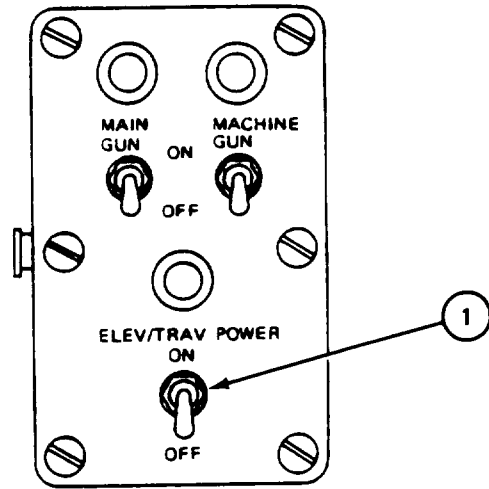
06.02 →

01

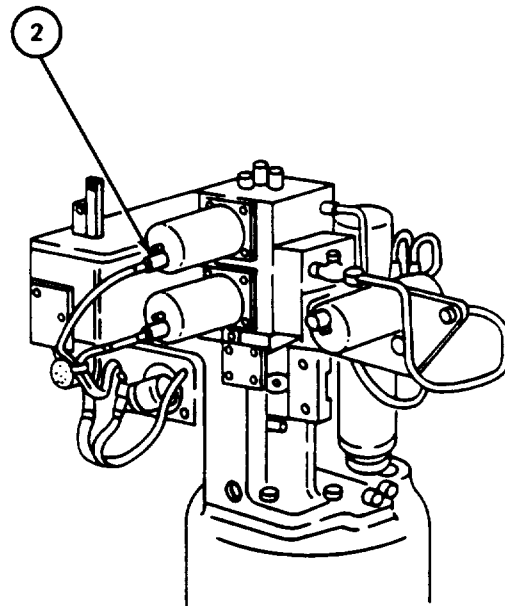
CHECK OPERATION OF DECK CLEARANCE VALVE SOLENOID

- TRAVERSE TURRET UNTIL MAIN GUN IS OVER REAR DECK (TM-10)
- SET 'ELEV/TRAV POWER' SWITCH (1) ON GUNNER'S CONTROL BOX TO 'OFF'
- REMOVE HARNESS CONNECTOR FROM JACK (2) ON POWER SOLENOID
- SET 'ELEV/TRAV POWER' SWITCH (1) TO 'ON'
- PRESS GUN ELEVATION INTERFERENCE SWITCH (3)

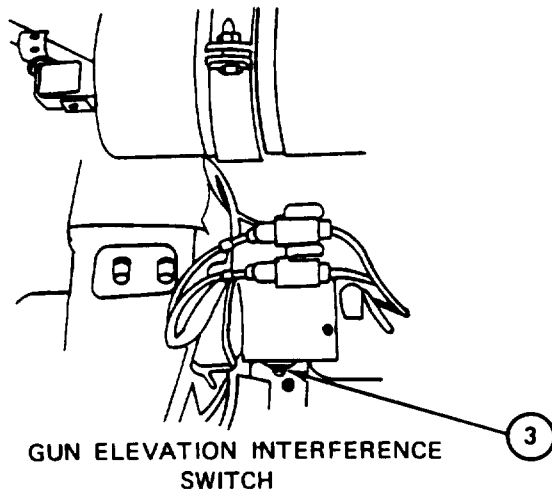
8.01



GUNNER'S CONTROL BOX



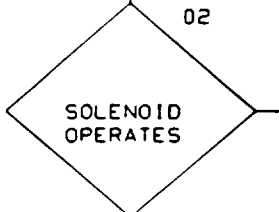
HYDRAULIC VALVE ASSEMBLY



GUN ELEVATION INTERFERENCE SWITCH

**4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 8 OF 13)**

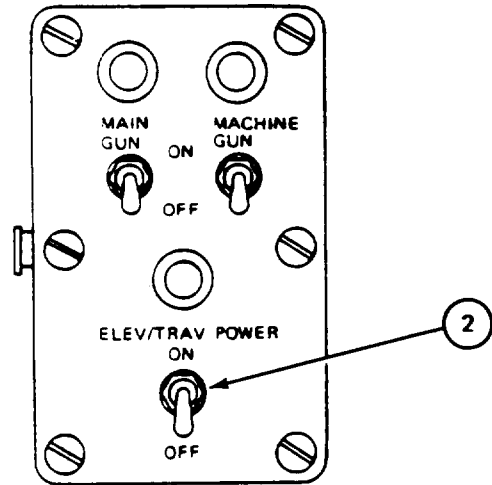
07.01 →  
01  
CHECK IF DECK  
CLEARANCE VALVE  
SOLENOID OPERATES



YES

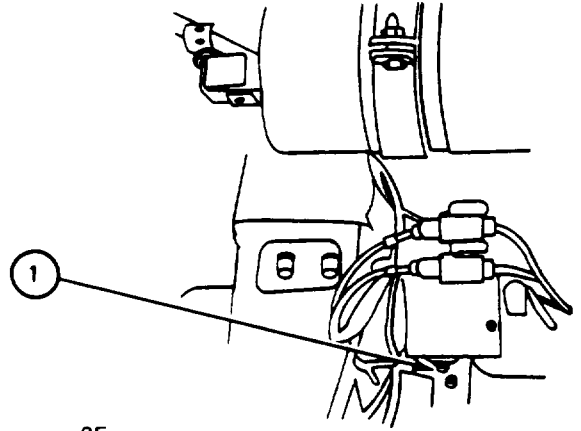
03  
RELEASE GUN  
ELEVATION  
INTERFERENCE  
SWITCH (1)

04  
PERFORM SLIPRING  
INTERFERENCE AND  
GUN ELEVATION  
INTERFERENCE  
SWITCH  
ADJUSTMENTS  
(TM-20-2-3, PARA  
3-6, 2-100)



GUNNER'S CONTROL BOX

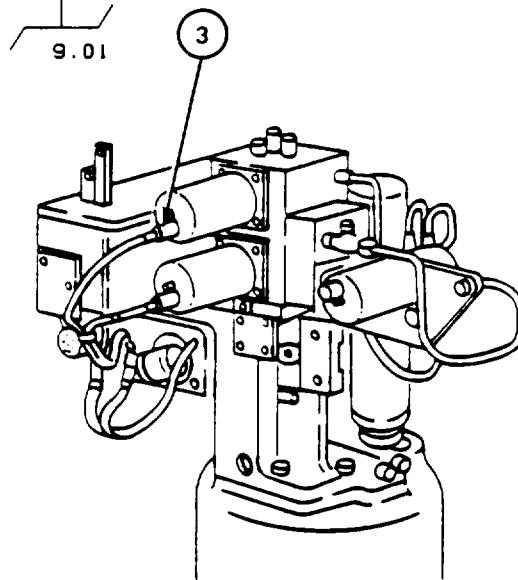
Para 4-5 (Sheet 8 of 13)  
4-198



GUN ELEVATION INTERFERENCE SWITCH

05  
CONNECT HARNESS  
CONNECTOR TO  
POWER SOLENOID

- \*SET 'ELEV/TRAV POWER' SWITCH (2) ON GUNNER'S CONTROL BOX TO 'OFF'
- \*CONNECT HARNESS CONNECTOR TO JACK (3) ON POWER SOLENOID
- \*SET 'ELEV/TRAV POWER' SWITCH (2) TO 'ON'



HYDRAULIC VALVE ASSEMBLY



**4.5. DECK CLEARANCE TROUBLESHOOTING (SHEET 9 OF 13)**

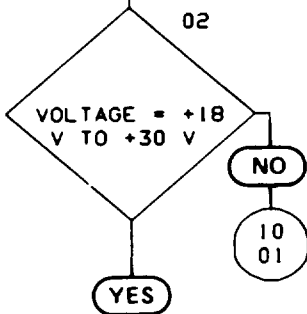
08.05 → 01

MEASURE DC VOLTAGE BETWEEN HARNESS CONNECTOR AT DECK CLEARANCE VALVE SOLENOID AND GROUND WITH GUN ELEVATION INTERFERENCE SWITCH DEPRESSED

• REMOVE HARNESS CONNECTOR FROM JACK (1) ON DECK CLEARANCE VALVE SOLENOID

• PRESS AND HOLD GUN ELEVATION INTERFERENCE SWITCH (2)

• USING MULTIMETER, MEASURE VOLTAGE



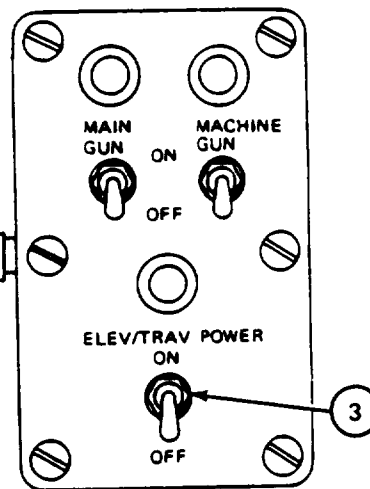
03

DEFECTIVE DECK CLEARANCE VALVE SOLENOID

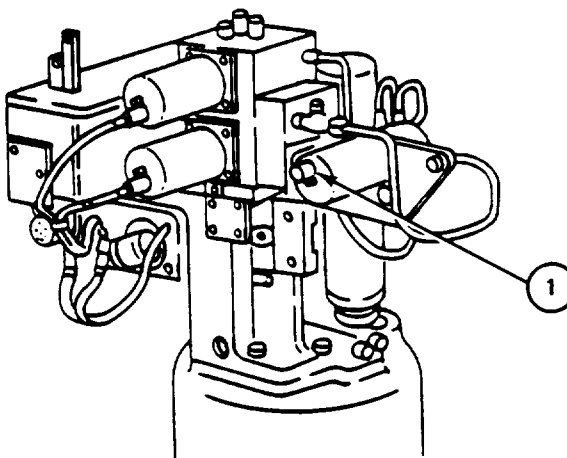
• SET 'ELEV/TRAV POWER' SWITCH (3) TO 'OFF'

• SET 'MASTER BATTERY' SWITCH TO 'OFF'

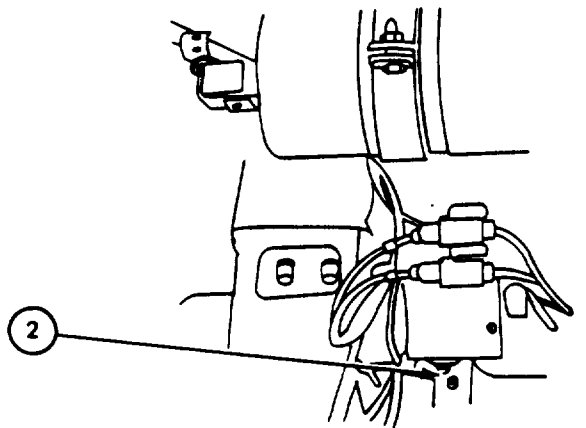
• REMOVE AND REPLACE DECK CLEARANCE VALVE SOLENOID (TM-20-2-3, PARA 41-7, 41-8)



GUNNER'S CONTROL BOX

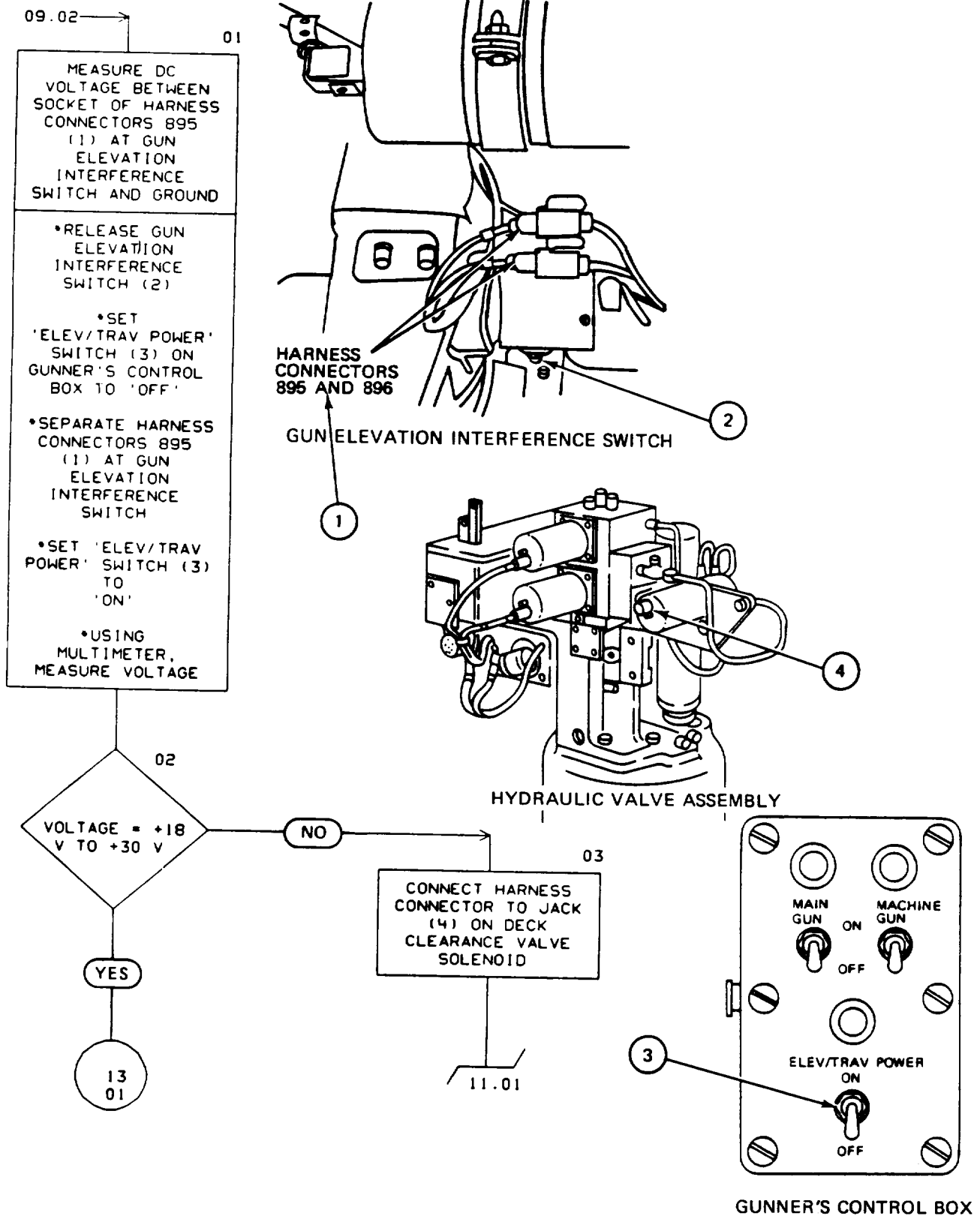


HYDRAULIC VALVE ASSEMBLY



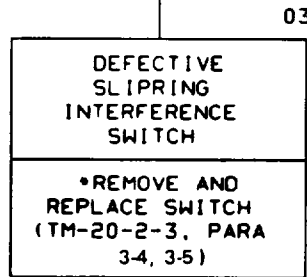
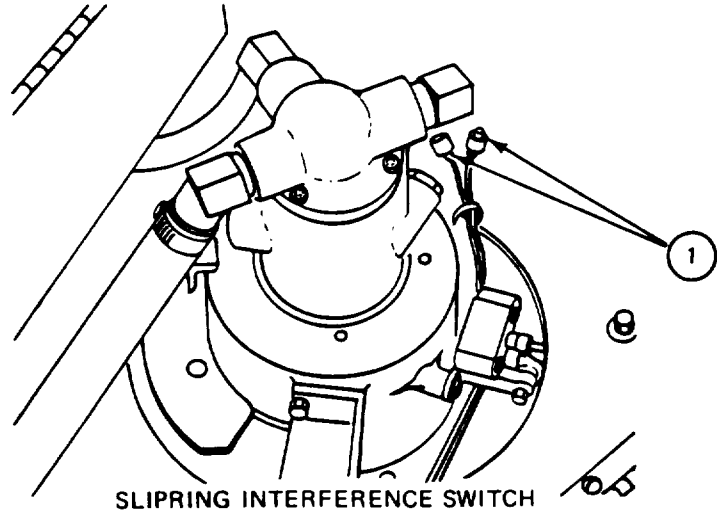
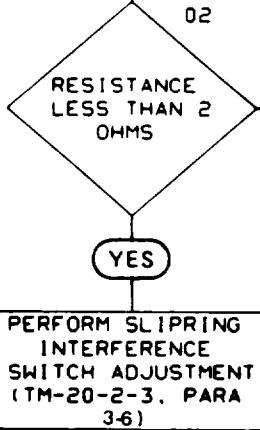
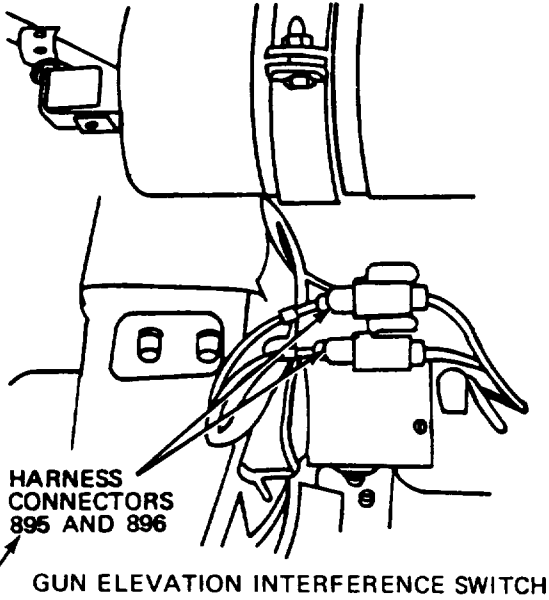
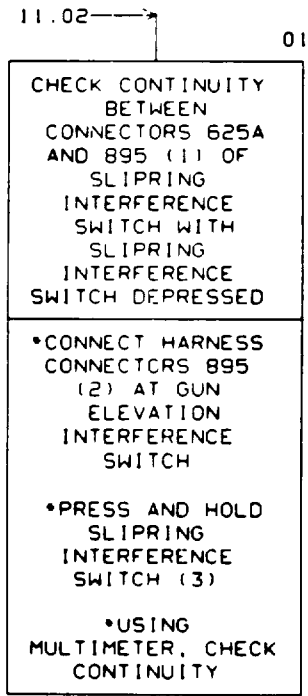
GUN ELEVATION INTERFERENCE SWITCH

### 4.5. DECK CLEARANCE TROUBLESHOOTING (SHEET 10 OF 13)





4.5. DECK CLEARANCE TROUBLESHOOTING (SHEET 12 OF 13)



**4-5. DECK CLEARANCE TROUBLESHOOTING (SHEET 13 OF 13)**

10.02 → 01

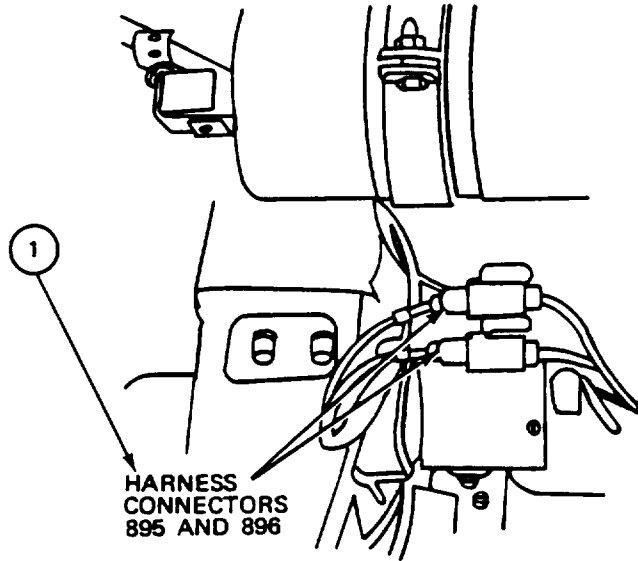
CHECK CONTINUITY BETWEEN HARNESS CONNECTOR AT DECK CLEARANCE VALVE SOLENOID AND SOCKET OF HARNESS CONNECTOR 896 (1) AT GUN ELEVATION INTERFERENCE SWITCH

- SET 'ELEV/TRAV POWER' SWITCH (2) ON GUNNER'S CONTROL BOX TO 'OFF'

- SET 'MASTER BATTERY' SWITCH TO 'OFF'

- SEPARATE HARNESS CONNECTORS 896 (1) AT GUN ELEVATION INTERFERENCE SWITCH

- USING MULTIMETER, CHECK CONTINUITY

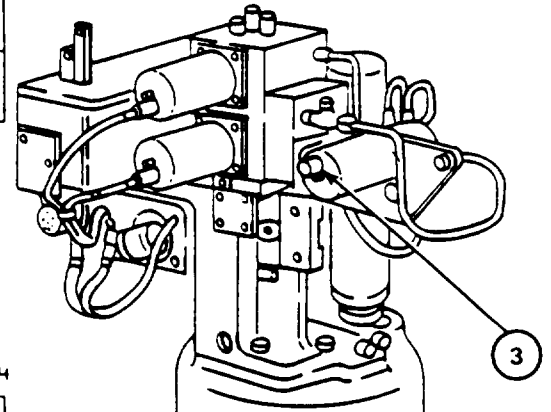


GUN ELEVATION INTERFERENCE SWITCH

03

DEFECTIVE TURRET CONTROL WIRING HARNESS

- NOTIFY SUPPORT MAINTENANCE



HYDRAULIC VALVE ASSEMBLY

04

DEFECTIVE GUN ELEVATION INTERFERENCE SWITCH

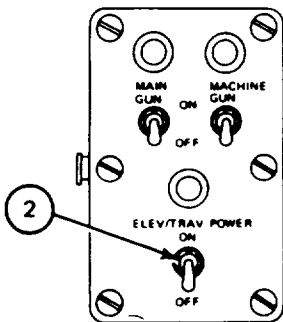
- CONNECT HARNESS CONNECTOR TO JACK (3) ON DECK CLEARANCE VALVE SOLENOID
- REMOVE AND REPLACE GUN ELEVATION INTERFERENCE SWITCH (TM-20-2-3, PARA 2-101, 2-102)

02

RESISTANCE LESS THAN 2 OHMS

YES

NO



GUNNER'S CONTROL BOX



**CHAPTER 5****FIRE CONTROL FAULT ISOLATION DIAGRAMS****5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 1 OF 10)**

**SYMPTOM:** (34) Azimuth Indicator lamps fail to light (M28E2)  
 (35) Azimuth Indicator lamps fail to dim (M28E2)

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

<b>UNIT LOCATION:</b>	<b>FOLDOUT</b>	<b>CALLOUT</b>
Master Control Panel	4	4
Azimuth Indicator M28E2	1	5
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipping	3	5
Gunner's Dome Light	1	1

**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to:  
 Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedures to:  
 Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 2 OF 10)

**CAUTION** 01

TO PREVENT EQUIPMENT DAMAGE, TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTORS AND BEFORE MEASURING CONTINUITY OR RESISTANCE. AFTER MEASUREMENT, TURN POWER BACK ON

**NOTE** 02

FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, OR RESISTANCE, REFER TO JPG

03

\*ON MASTER CONTROL PANEL, SET 'MASTER BATTERY' SWITCH (1) TO 'ON'

04

'MASTER BATTERY' LAMP (2) LIGHTS

YES

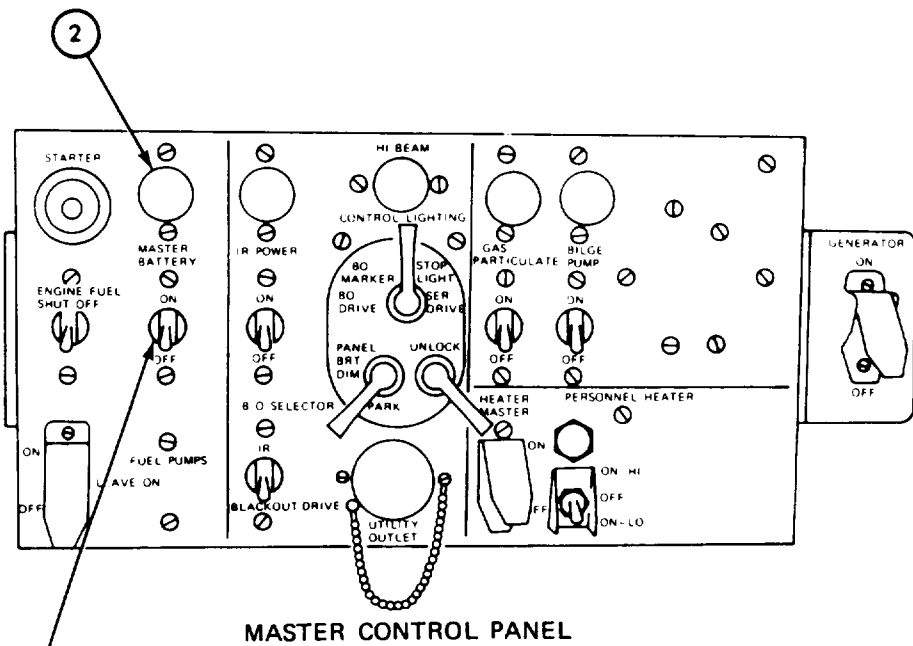
3  
01

NO

05

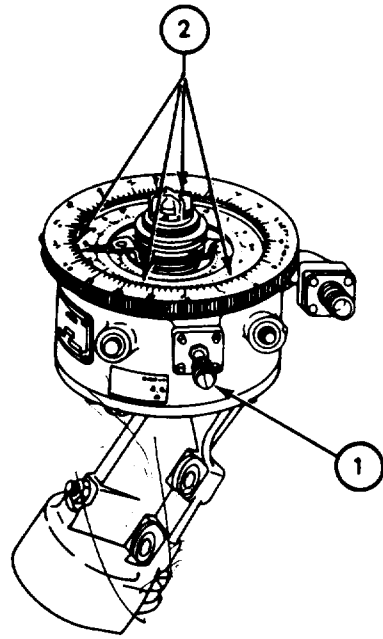
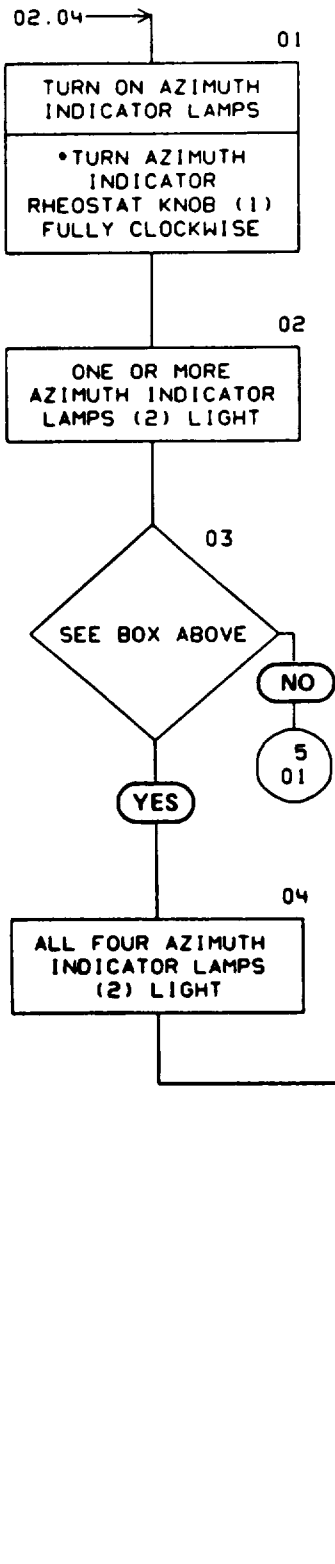
DEFECTIVE BATTERY CIRCUIT

\*NOTIFY HULL MAINTENANCE



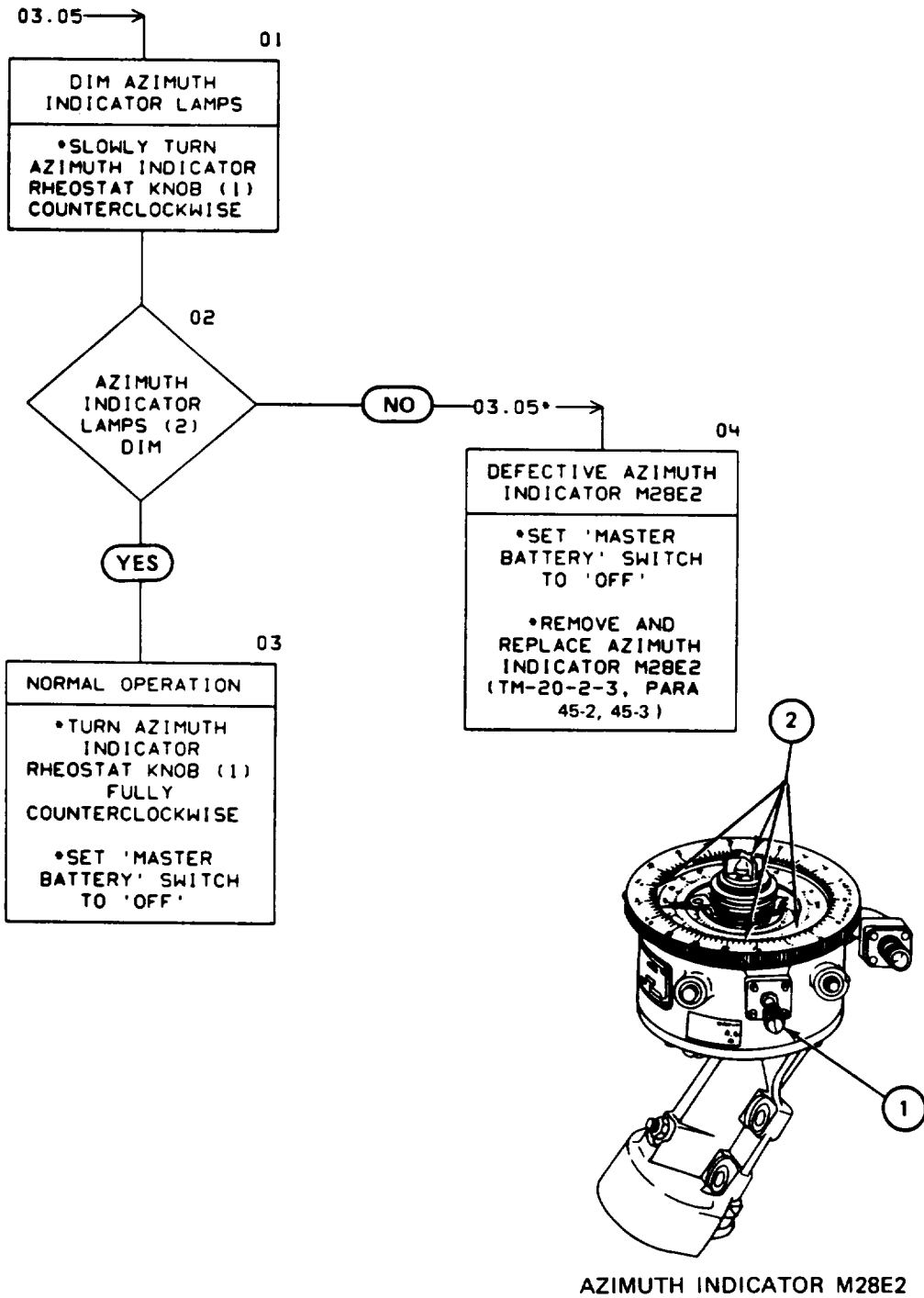


5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 3 OF 10)

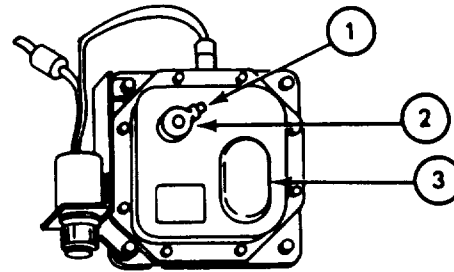
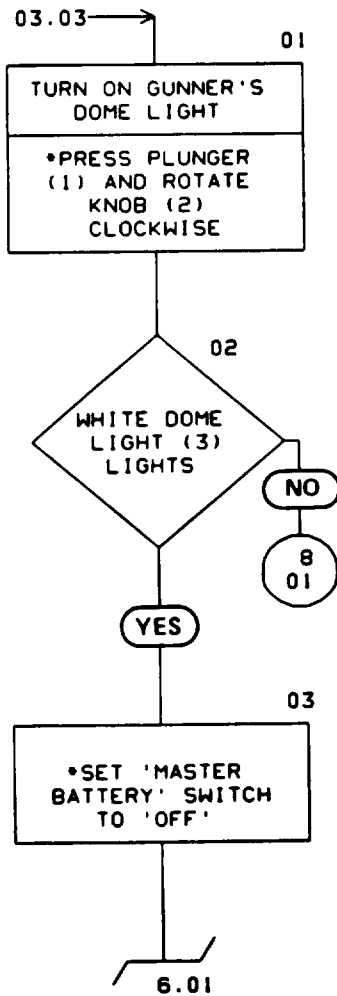


AZIMUTH INDICATOR M28E2

5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 4 OF 10)

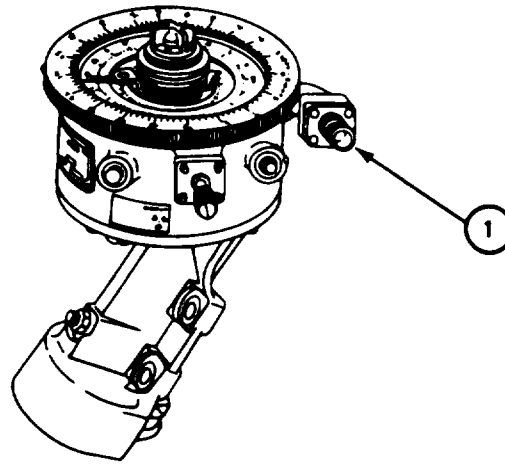
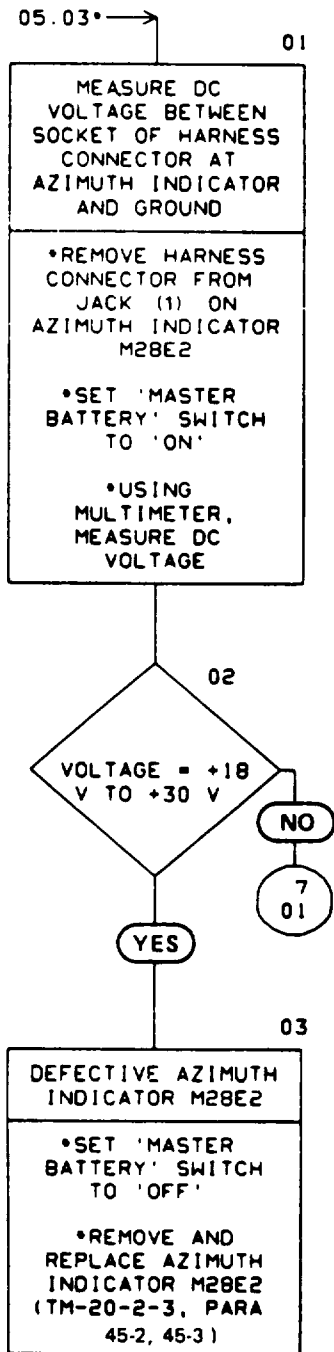


5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 5 OF 10)



DOME LIGHT AND DIMMER SWITCH

5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 6 OF 10)



AZIMUTH INDICATOR M28E2

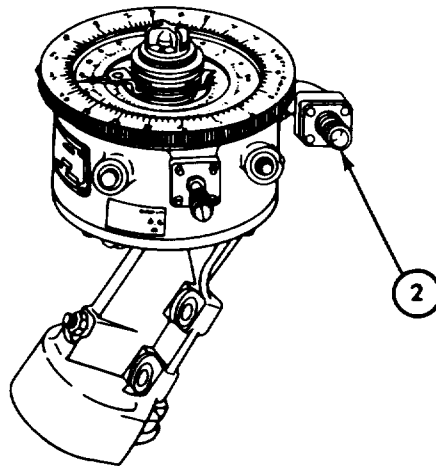
5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 7 OF 10)

06.02 →

01

CHECK CONTINUITY BETWEEN SOCKET OF HARNESS CONNECTOR AT AZIMUTH INDICATOR AND PIN D OF HARNESS CONNECTOR AT TURRET POWER AND SEARCHLIGHT RELAY BOX

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE HARNESS CONNECTOR FROM JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- USING MULTIMETER, CHECK CONTINUITY



AZIMUTH INDICATOR M28E2

07.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

AZIMUTH INDICATOR M28E2

- REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

02

RESISTANCE LESS THAN 2 OHMS

NO

YES

04

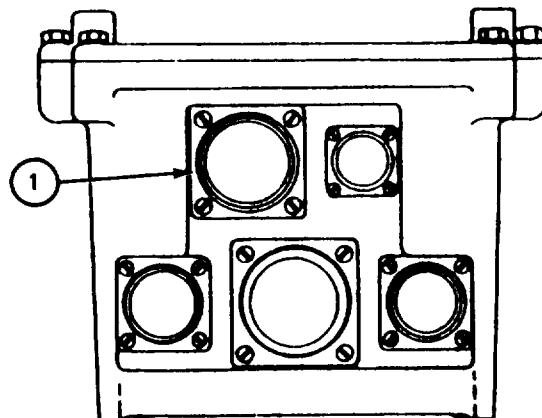
DEFECTIVE TURRET CONTROL WIRING HARNESS

- NOTIFY SUPPORT MAINTENANCE

03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

- CONNECT HARNESS CONNECTOR TO JACK (2) ON



TURRET POWER AND SEARCHLIGHT RELAY BOX

7.05

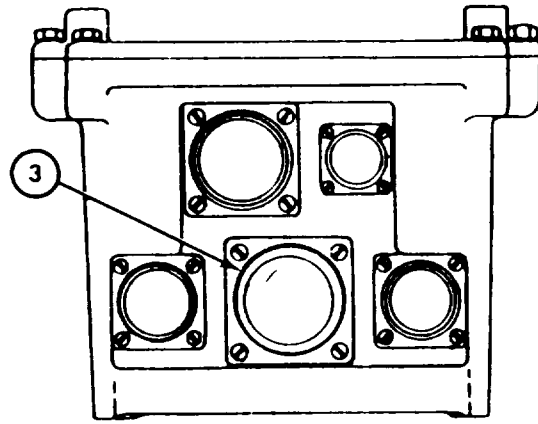
5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 8 OF 10)

05.02 →

01

TURN OFF GUNNER'S DOME LIGHT

•PRESS PLUNGER (1) AND ROTATE KNOB (2) COUNTERCLOCKWISE



TURRET POWER AND SEARCHLIGHT RELAY BOX

02

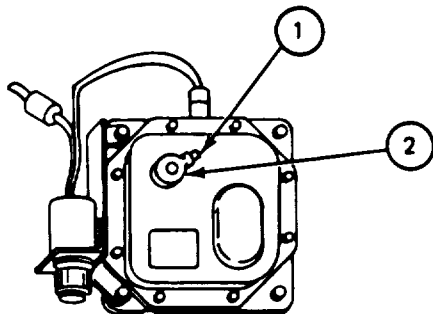
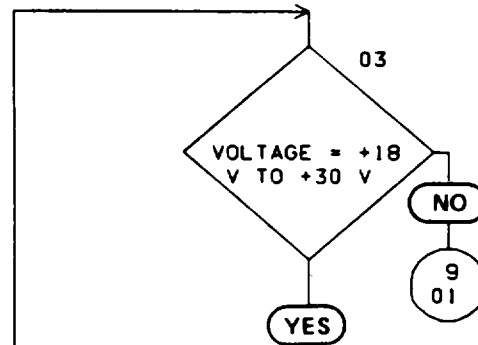
MEASURE DC VOLTAGE BETWEEN SOCKET A OF HARNESS CONNECTOR 100 ON TURRET POWER AND SEARCHLIGHT RELAY BOX AND GROUND

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE HARNESS CONNECTOR 100 FROM JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•SET 'MASTER BATTERY' SWITCH TO 'ON'

•USING MULTIMETER, MEASURE DC VOLTAGE

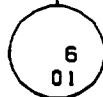


DOME LIGHT AND DIMMER SWITCH

04

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•CONNECT HARNESS CONNECTOR 100 TO JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX



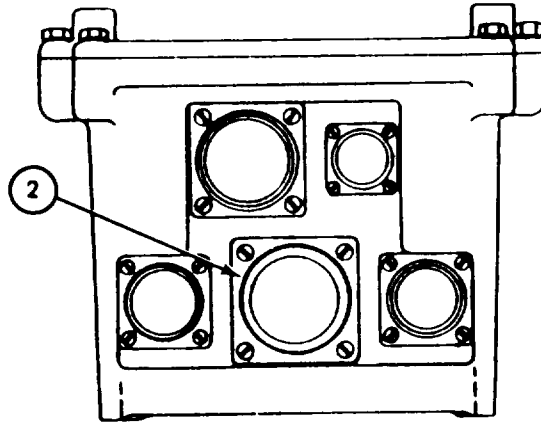
5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 9 OF 10)

08.03 →

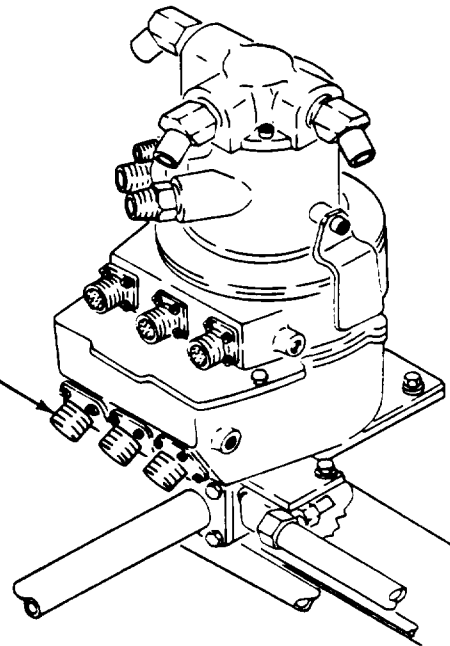
01

MEASURE DC VOLTAGE BETWEEN SOCKET OF HARNESS CONNECTOR 47 AT TURRET ELECTRICAL SLIPRING AND GROUND

- TRAVERSE TURRET UNTIL MAIN GUN IS OVER REAR DECK (TM-10)
- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- GRASP RING AND PULL BATTERY ACCESS DOOR OPEN
- REMOVE HARNESS CONNECTOR 47 FROM JACK (1) ON TURRET ELECTRICAL SLIPRING
- SET 'MASTER BATTERY' SWITCH TO 'ON'
- USING MULTIMETER, MEASURE DC VOLTAGE



TURRET POWER AND SEARCHLIGHT RELAY BOX



TURRET SLIPRING

02

VOLTAGE = +18 V TO +30 V

NO

YES

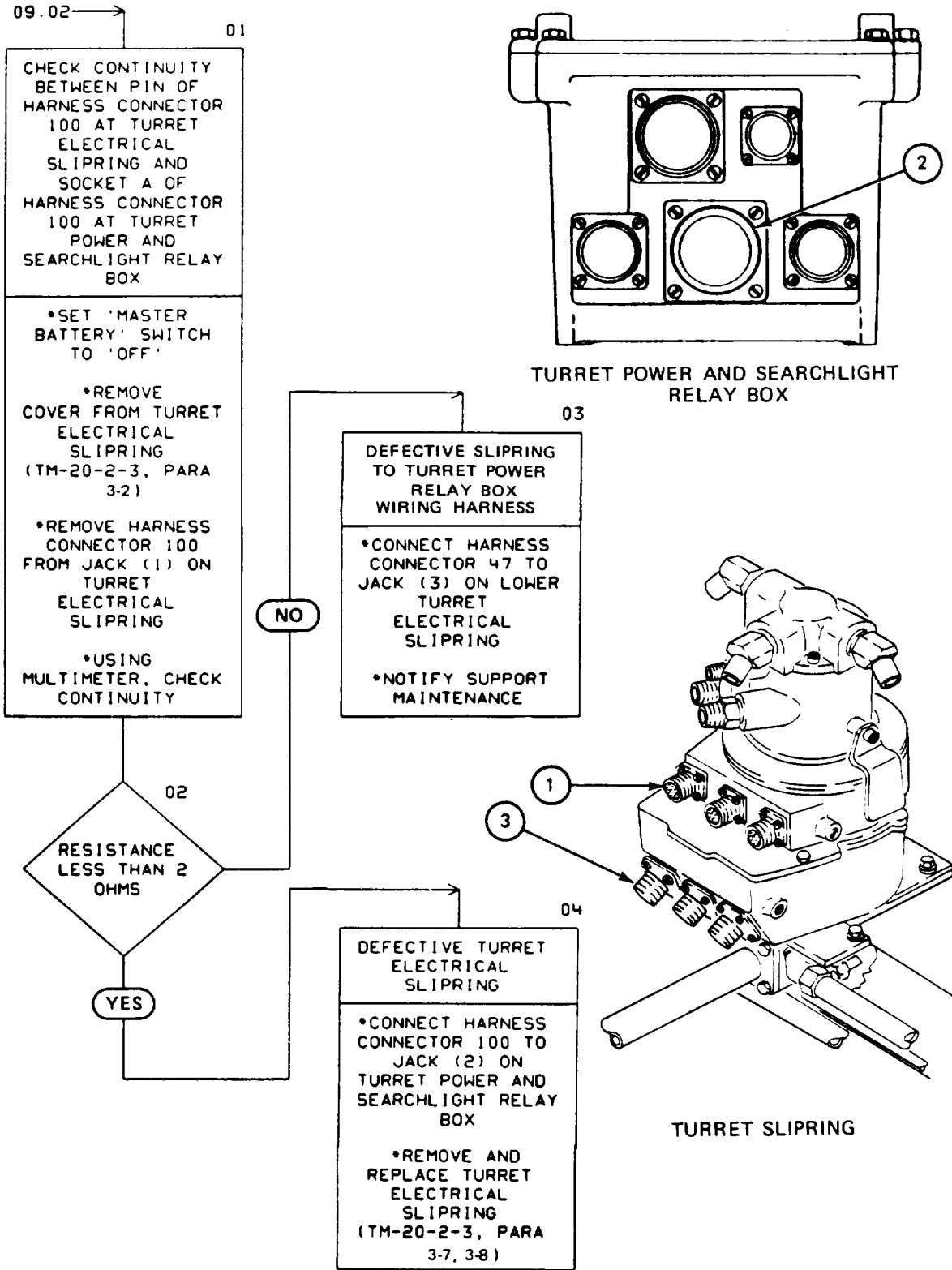
10  
01

03

NO POWER TO TURRET ELECTRICAL SLIPRING

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- CONNECT HARNESS CONNECTOR 100 TO JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- NOTIFY HULL MAINTENANCE

5-1. AZIMUTH INDICATOR TROUBLESHOOTING (SHEET 10 OF 10)





**5-2. ELEVATION QUADRANT LIGHT SOURCE  
TROUBLESHOOTING (SHEET 1 OF 15)**

**SYMPTOM:** (36) Elevation Quadrant light source fails to light  
 (37) Elevation Quadrant light source fails to dim  
 (38) Telescope Light Source Control fails to light  
 (39) Telescope Light Source Control fails to dim

**TEST EQUIPMENT:** Multimeter

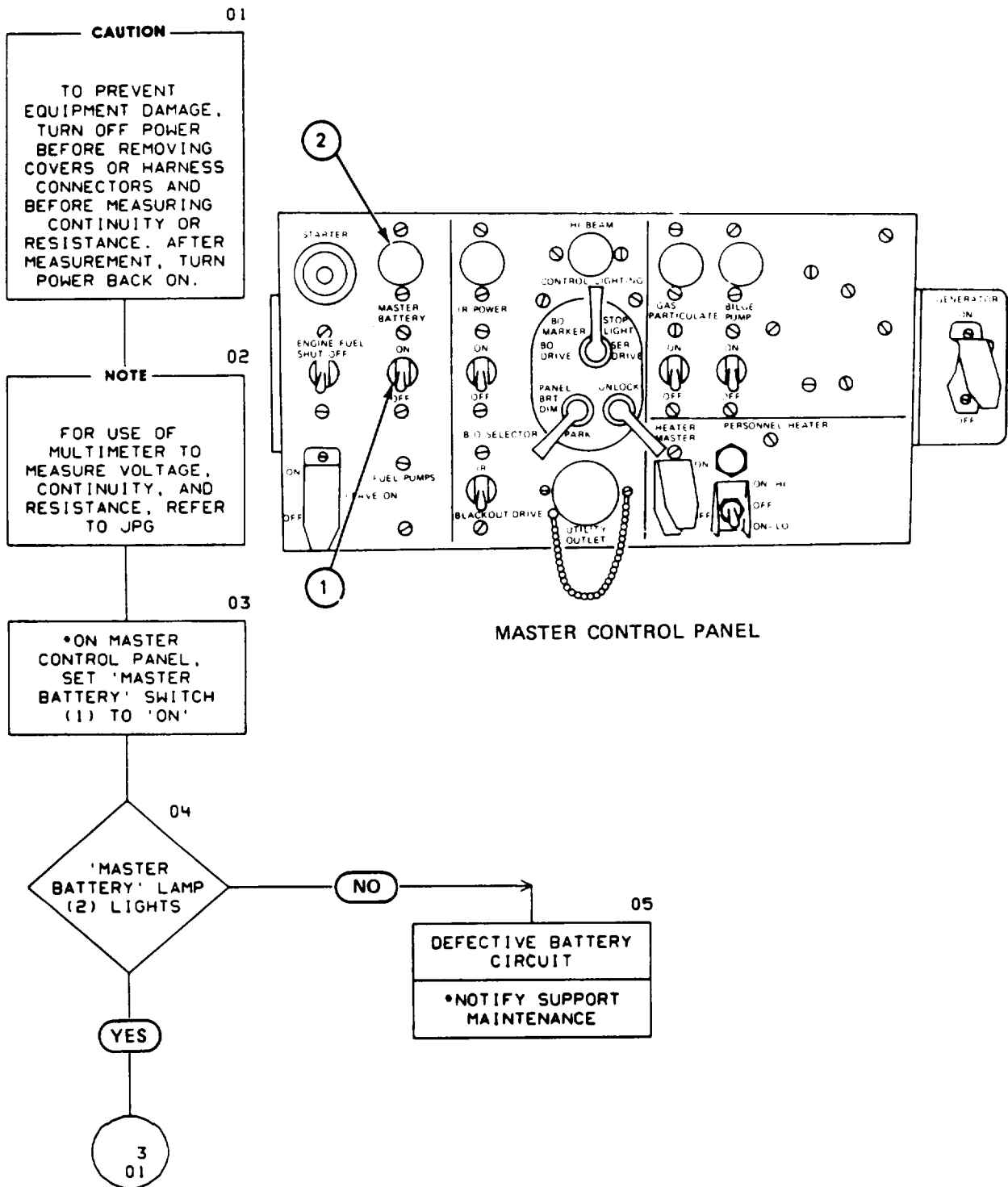
**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Elevation Quadrant	1	14
Telescope Light Source Control	1	17
Gunner's Dome Light	1	1
Turret Power and Searchlight	1	9
Relay Box		
Turret Electrical Slipping	3	5
Gun Quick Disconnect	1	20
'Y' Connector	1	16

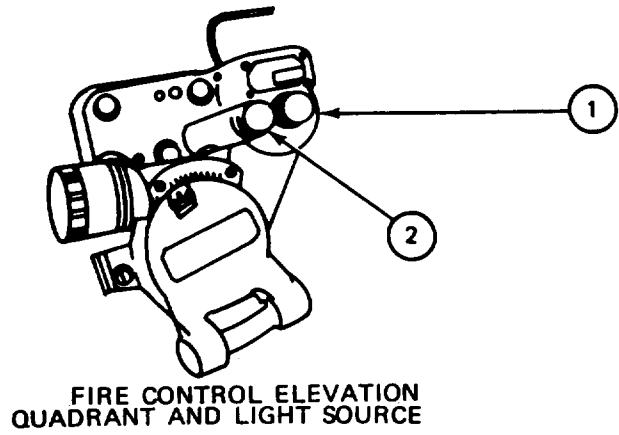
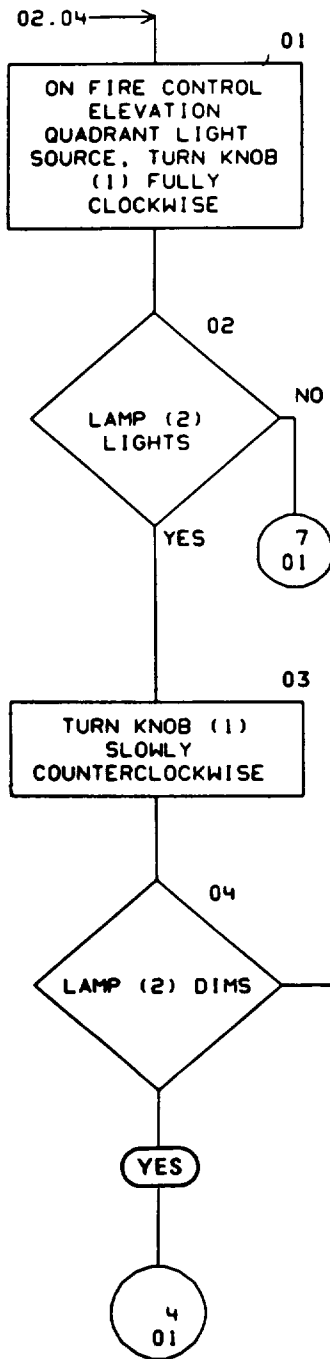
**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to:  
 Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedure to:  
 Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 2 OF 15)



5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 3 OF 15)



5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 4 OF 15)

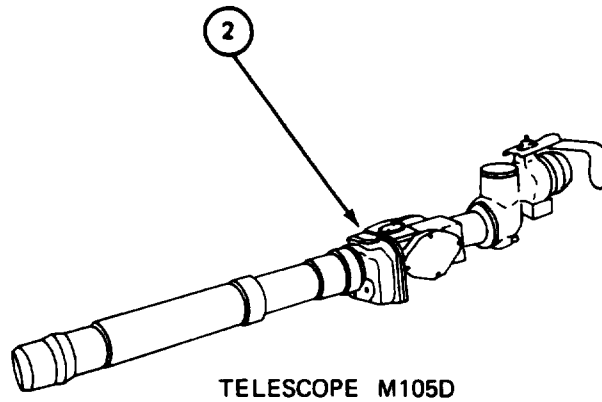
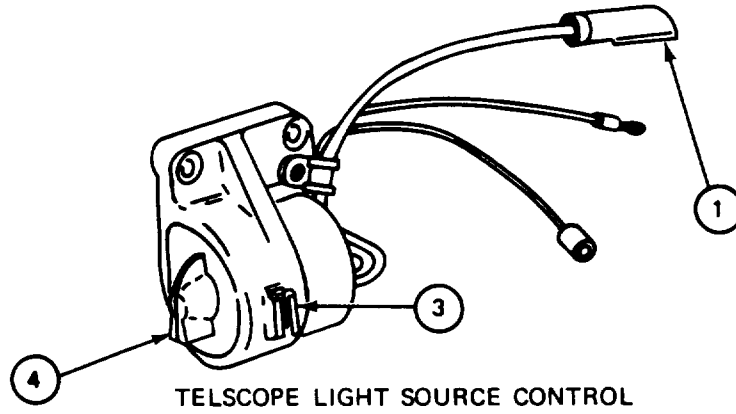
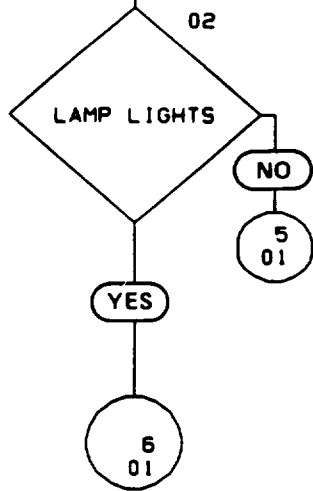
03.04 →

01

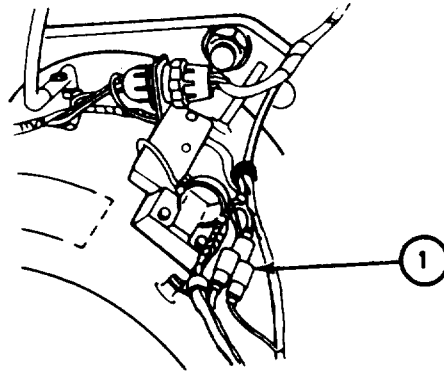
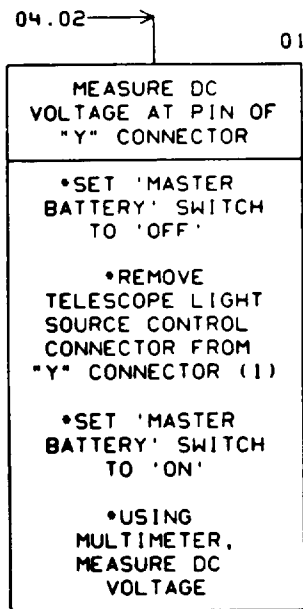
• REMOVE LAMP HOUSING (1) FROM DOVETAIL SLOT ON TELESCOPE (2) OR TELESCOPE LIGHT SOURCE CONTROL (3)

• ON TELESCOPE LIGHT SOURCE CONTROL, TURN KNOB (4) FULLY CLOCKWISE

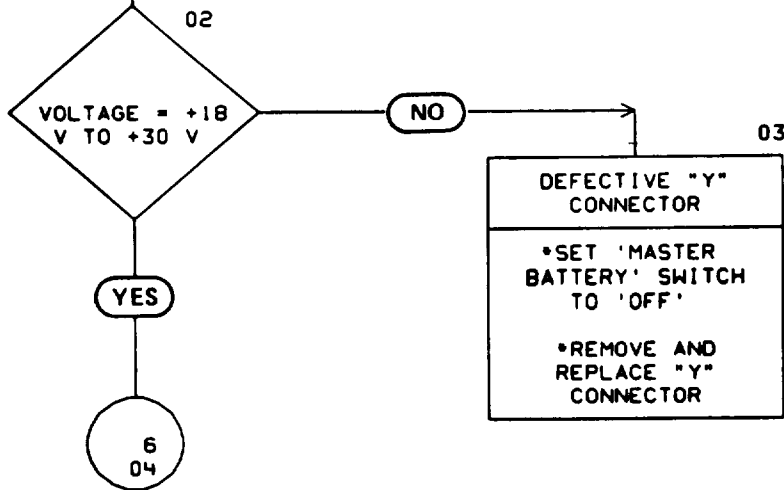
• OBSERVE LAMP IN LAMP HOUSING (1)



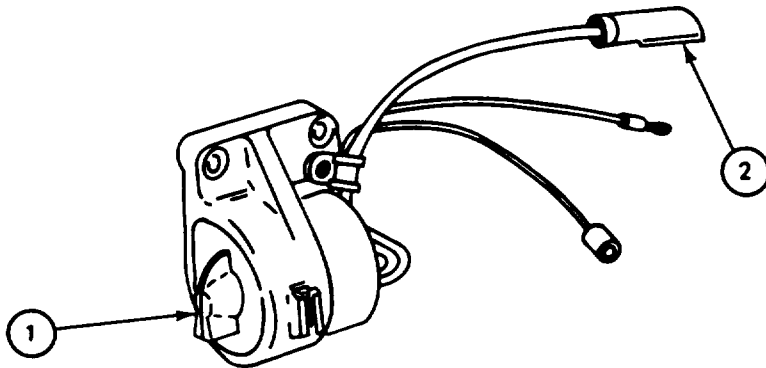
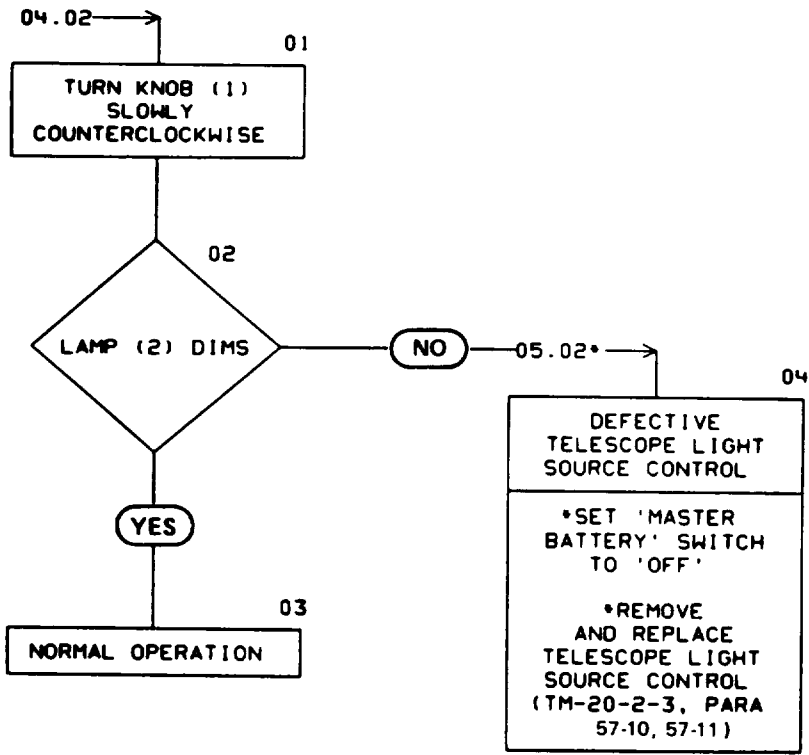
5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 5 OF 15)



"Y" CONNECTOR

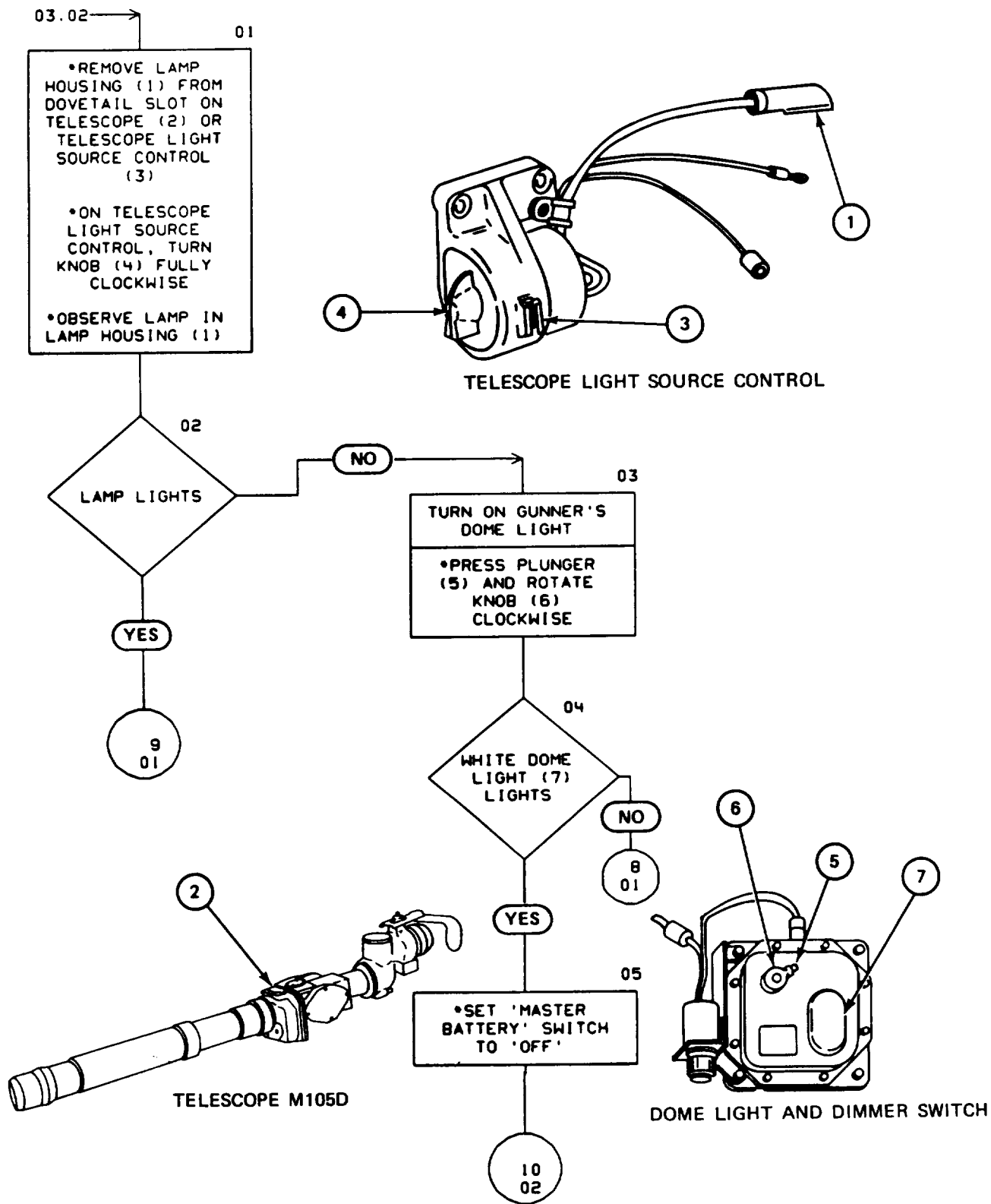


### 5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 6 OF 15)

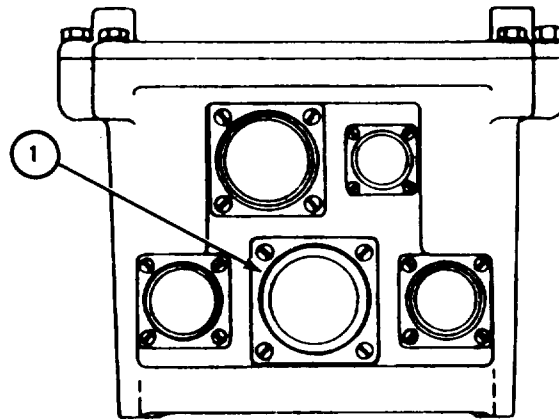
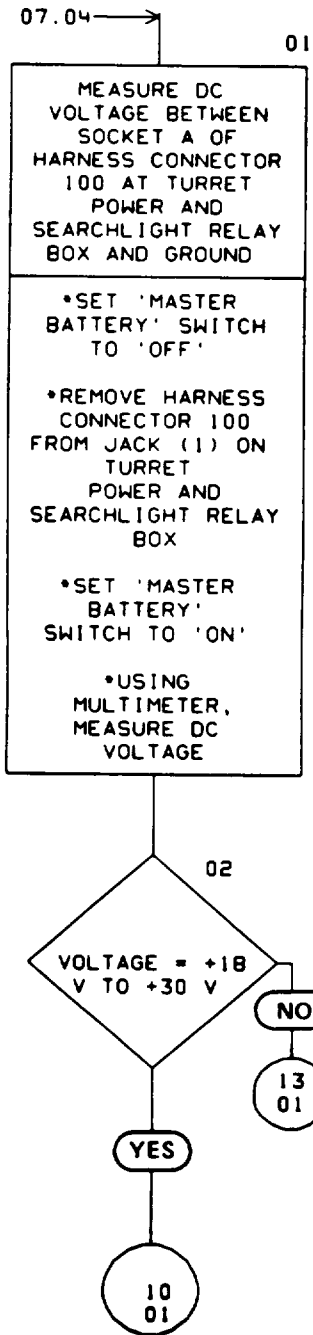


TELESCOPE LIGHT SOURCE CONTROL

5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 7 OF 15)



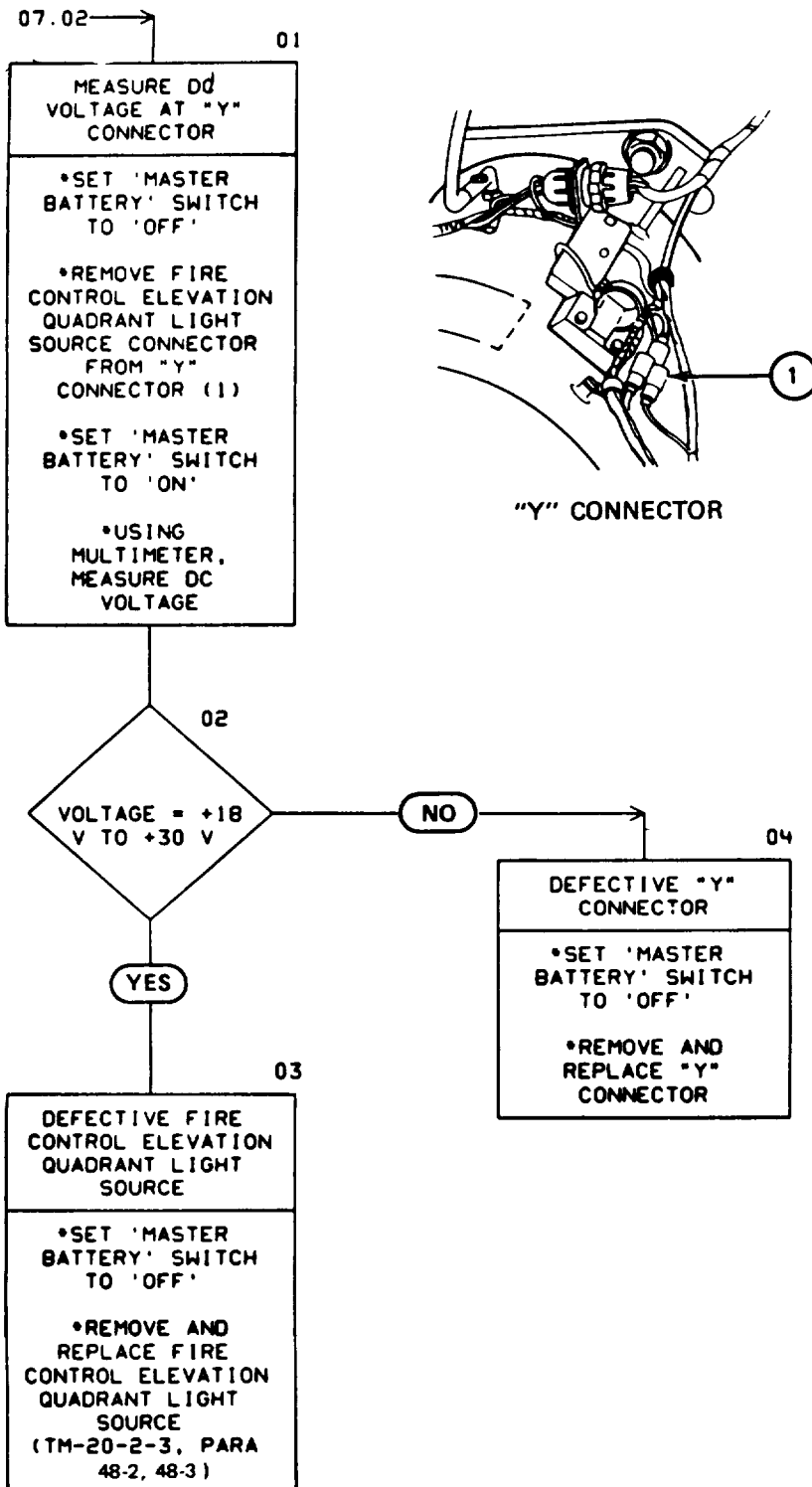
5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 8 OF 15)



TURRET POWER AND SEARCHLIGHT RELAY BOX



5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 9 OF 15)



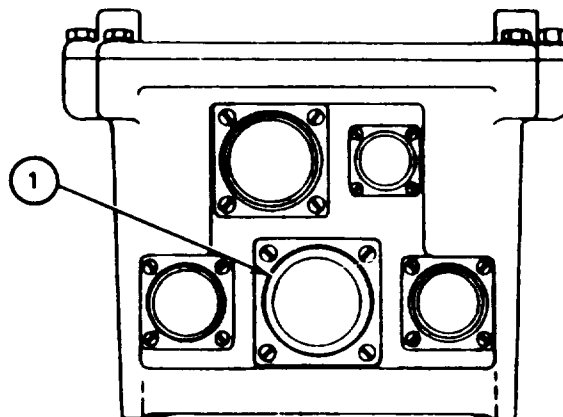
5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 10 OF 15)

08.02 →

01

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•CONNECT HARNESS CONNECTOR 100 TO JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX



TURRET POWER AND SEARCHLIGHT RELAY BOX

07.05 →

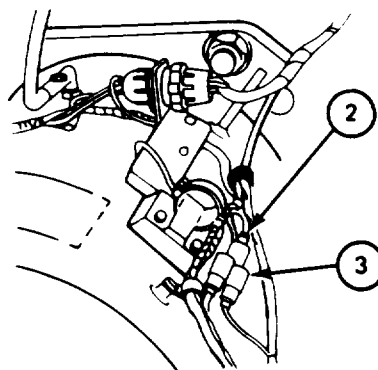
02

MEASURE DC VOLTAGE AT SOCKET OF HARNESS CONNECTOR AT "Y" CONNECTOR

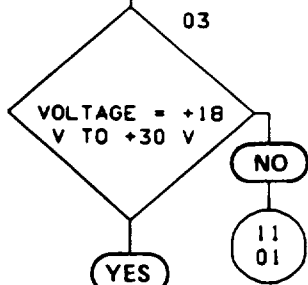
•REMOVE HARNESS CONNECTOR (2) FROM "Y" CONNECTOR (3)

•SET 'MASTER BATTERY' SWITCH TO 'ON'

•USING MULTIMETER, MEASURE DC VOLTAGE



"Y" CONNECTOR



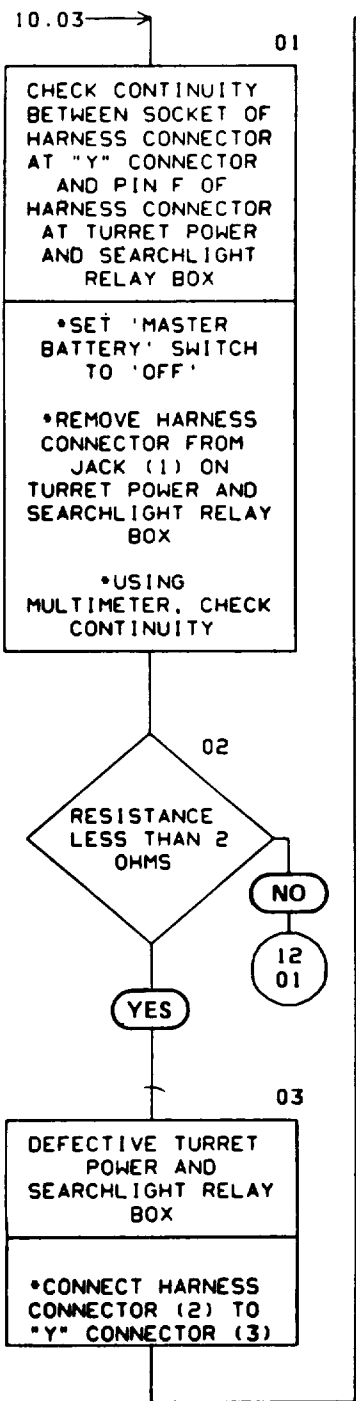
04

DEFECTIVE "Y" CONNECTOR

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE AND REPLACE "Y" CONNECTOR

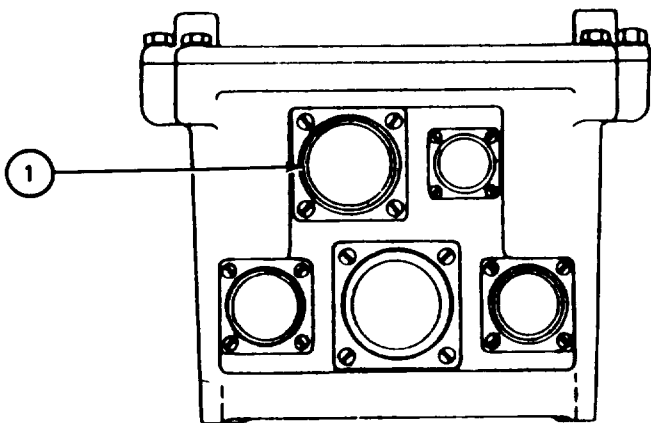
5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 11 OF 15)



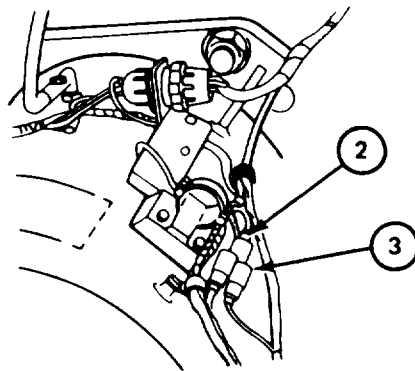
NOTE 04

CONTINUED FROM A PRIOR COLUMN

•REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

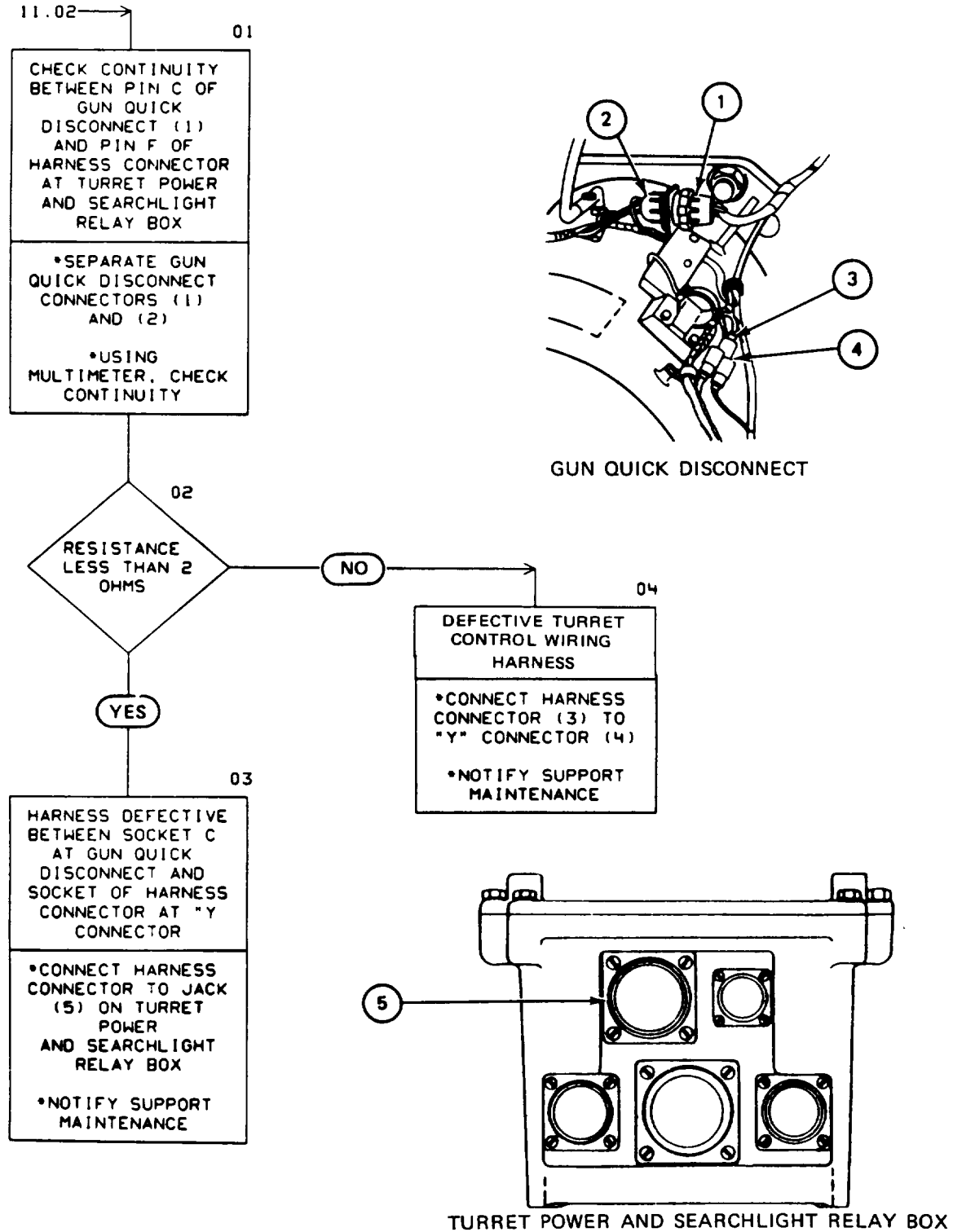


TURRET POWER AND SEARCHLIGHT RELAY BOX



"Y" CONNECTOR

5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 12 OF 15)



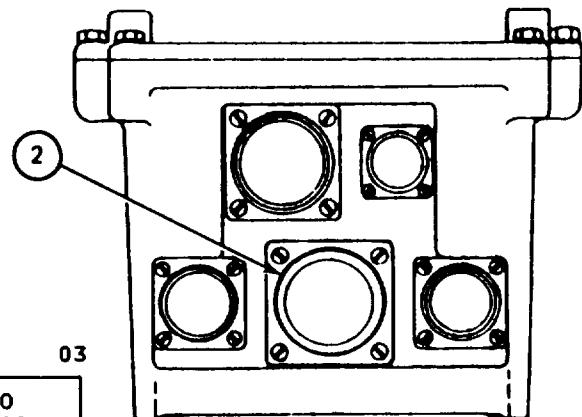
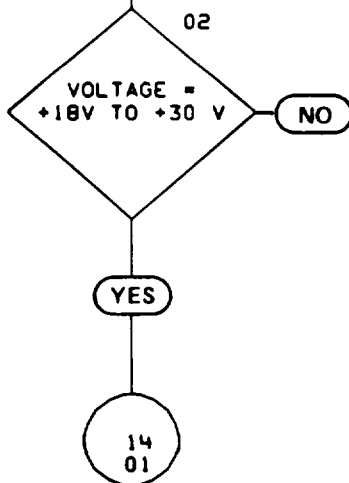
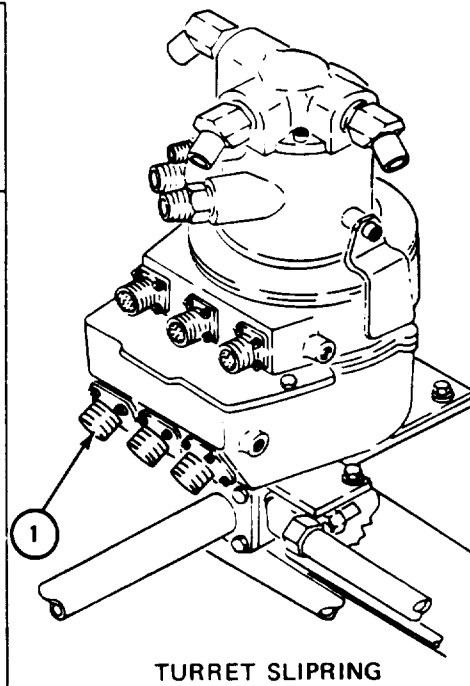
5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 13 OF 15)

08.02 →

01

MEASURE DC VOLTAGE BETWEEN SOCKET OF HARNESS CONNECTOR 47 AT TURRET ELECTRICAL SLIPRING AND GROUND

- TRAVERSE GUN OVER REAR DECK (TM-10)
- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- GRASP RING AND PULL OPEN BATTERY ACCESS DOOR
- REMOVE HARNESS CONNECTOR 47 FROM JACK (1) ON TURRET ELECTRICAL SLIPRING
- SET 'MASTER BATTERY' SWITCH TO 'ON'
- USING MULTIMETER, MEASURE DC VOLTAGE

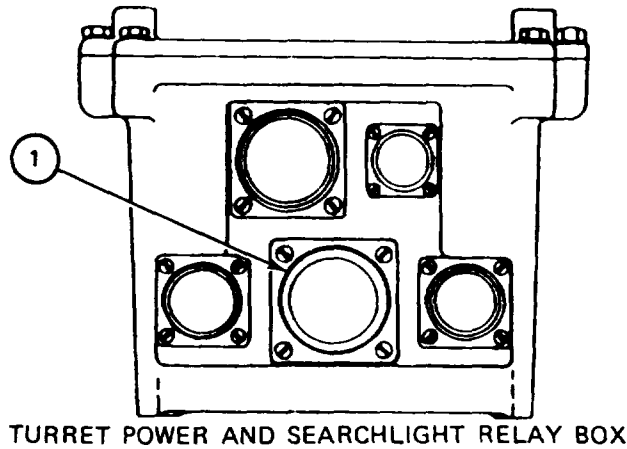
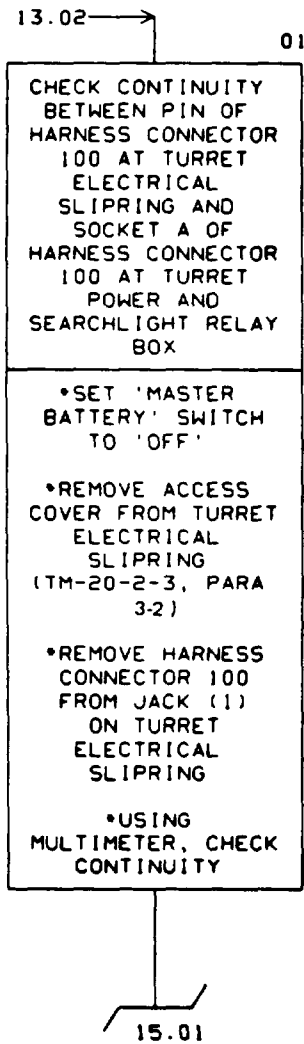


03

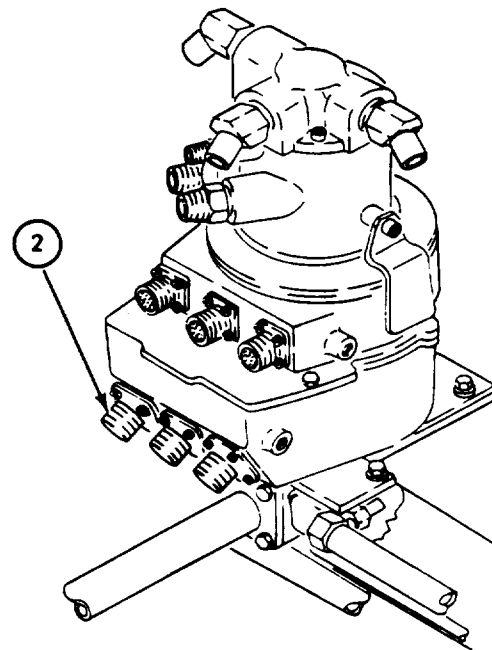
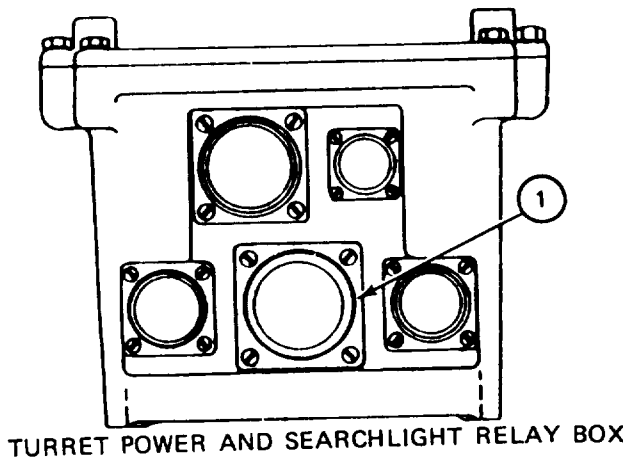
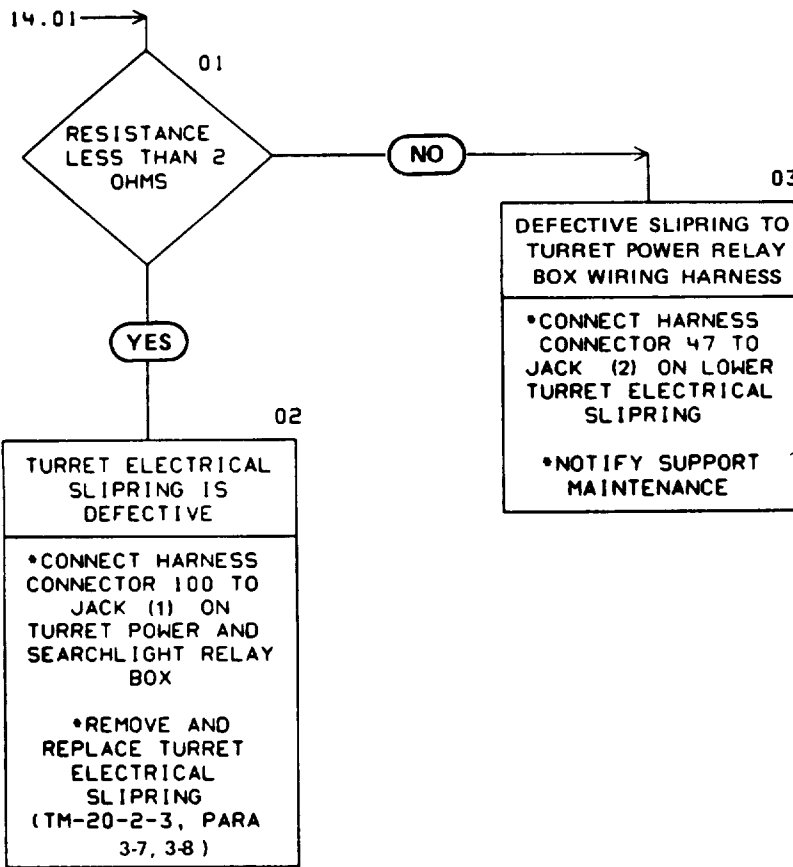
NO POWER TO TURRET ELECTRICAL SLIPRING

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- CONNECT HARNESS CONNECTOR 100 TO JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- NOTIFY HULL MAINTENANCE

5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 14 OF 15)



5-2. ELEVATION QUADRANT LIGHT SOURCE TROUBLESHOOTING (SHEET 15 OF 15)



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 1 OF 31)

SYMPTOM: (40) Daylight reticle fails to light  
 (41) IR reticle fails to light  
 (42) No IR image

TEST EQUIPMENT: Multimeter

PERSONNEL: Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Cupola Power Switch	2	1
Light Source Control	2	13
Cupola Power Relay	2	1
Resistor Assembly	2	1
Gunner's Dome Light	1	1
Cupola Interconnecting Box	2	6
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipping	3	5

REFERENCES: (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to: Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedure to: Traverse turret

EQUIPMENT CONDITION: Vehicle parked, power off.



### 5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 2 OF 31)

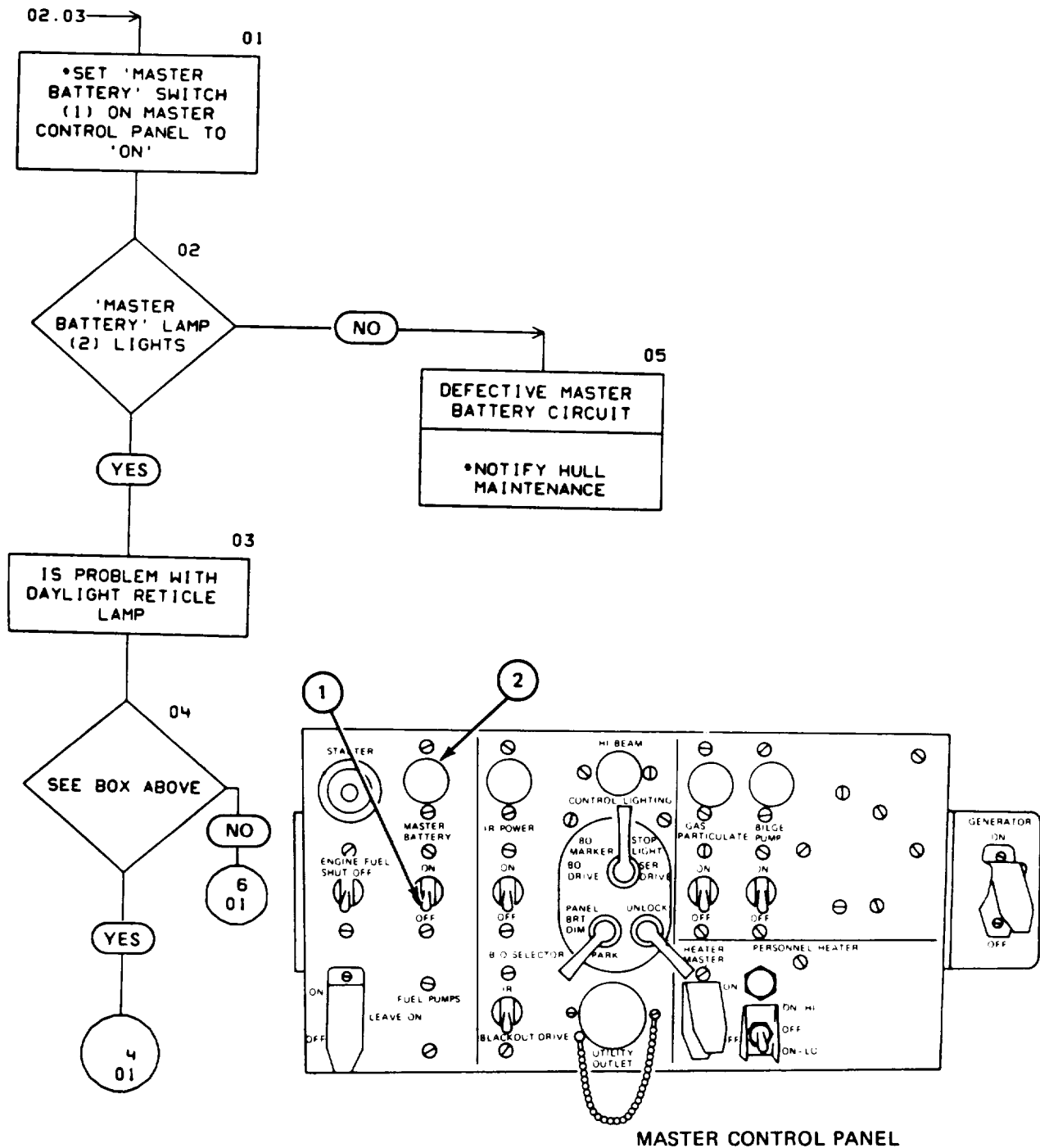
01  
**WARNING**  
TO PREVENT INJURY  
TO PERSONNEL,  
REMOVE ALL  
AMMUNITION FROM  
WEAPONS BEFORE  
START OF  
TROUBLESHOOTING  
(TM-10)

02  
**CAUTION**  
TO PREVENT  
EQUIPMENT DAMAGE  
TURN OFF POWER  
BEFORE REMOVING  
COVERS OR HARNESS  
CONNECTORS AND  
BEFORE MEASURING  
RESISTANCE OR  
CONTINUITY

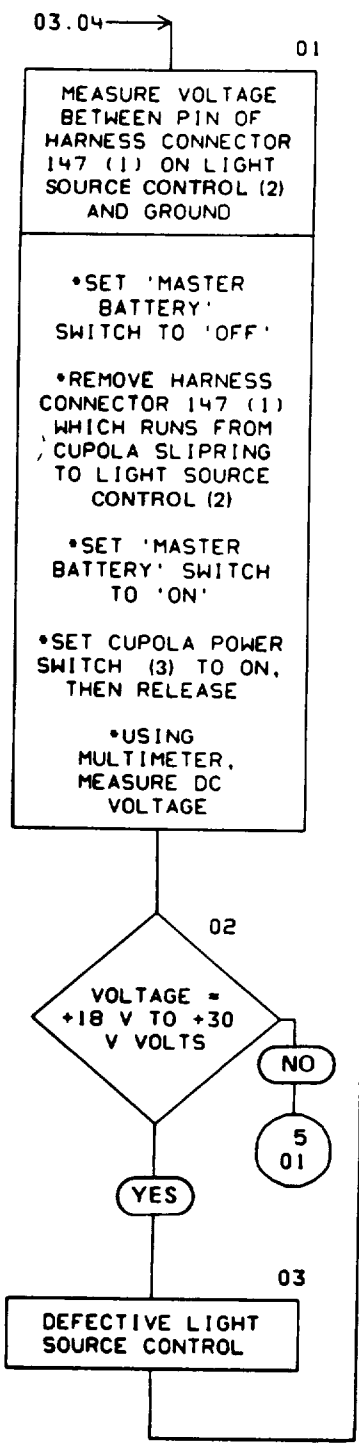
03  
**NOTE**  
FOR USE OF  
MULTIMETER TO  
MEASURE VOLTAGE,  
CONTINUITY OR  
RESISTANCE REFER  
TO JPG

3.01

5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 3 OF 31)



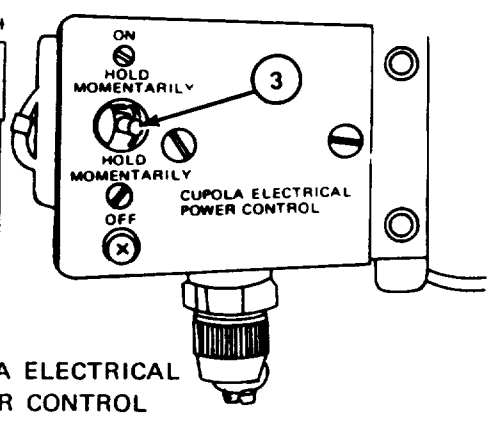
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 4 OF 31)



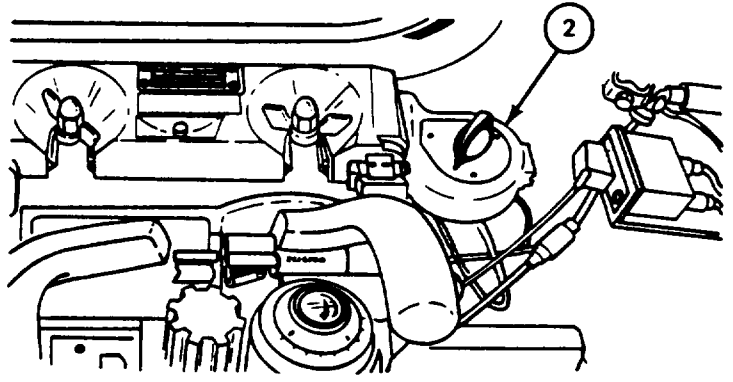
NOTE 04

CONTINUED FROM A PRIOR COLUMN

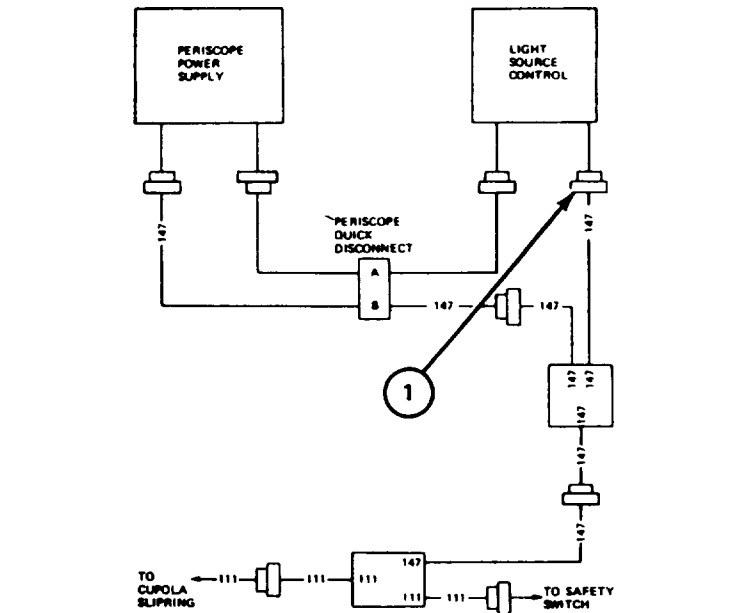
•REMOVE AND REPLACE LIGHT SOURCE CONTROL (TM-20-2-3, PARA 53-2, 53-3)



CUPOLA ELECTRICAL POWER CONTROL

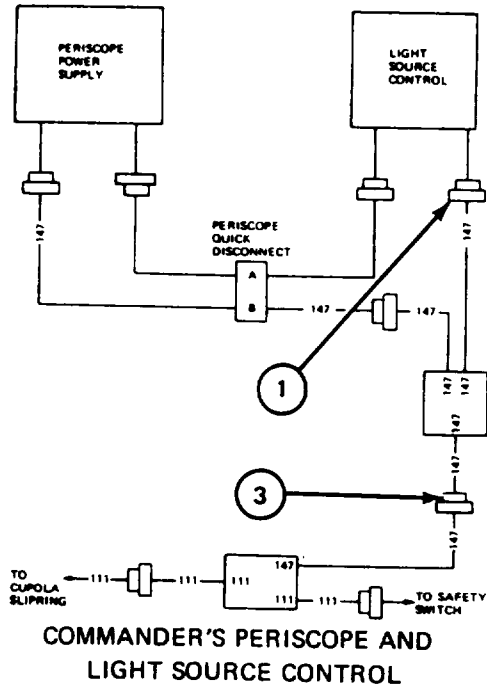
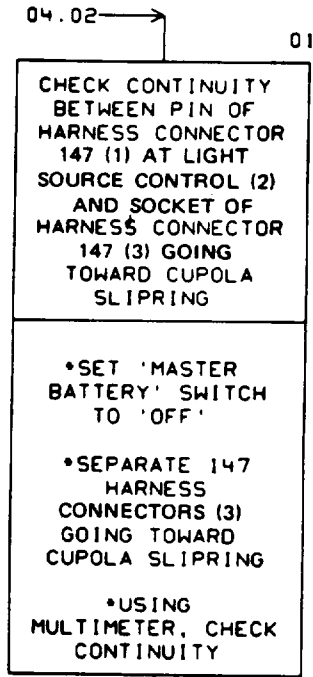


LIGHT SOURCE CONTROL, COMMANDER'S

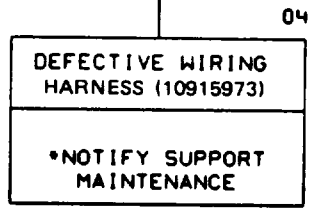


COMMANDER'S PERISCOPE AND LIGHT SOURCE CONTROL

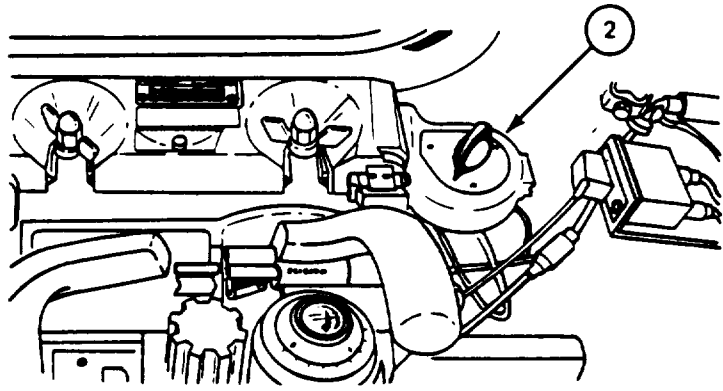
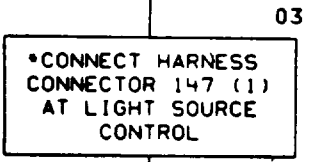
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 5 OF 31)



NO

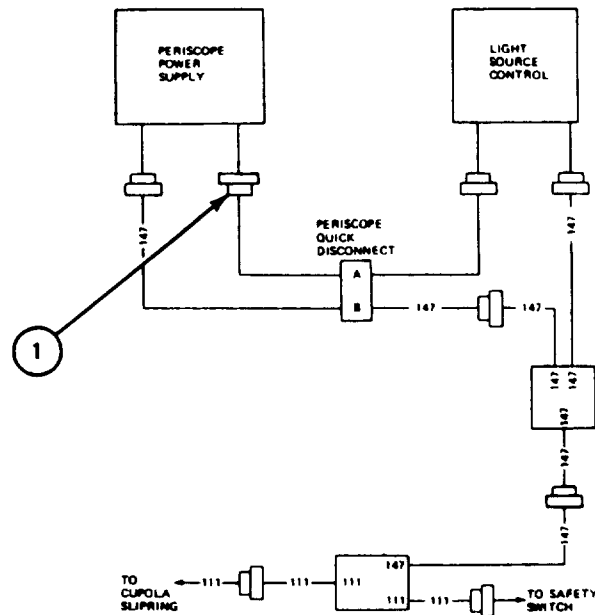
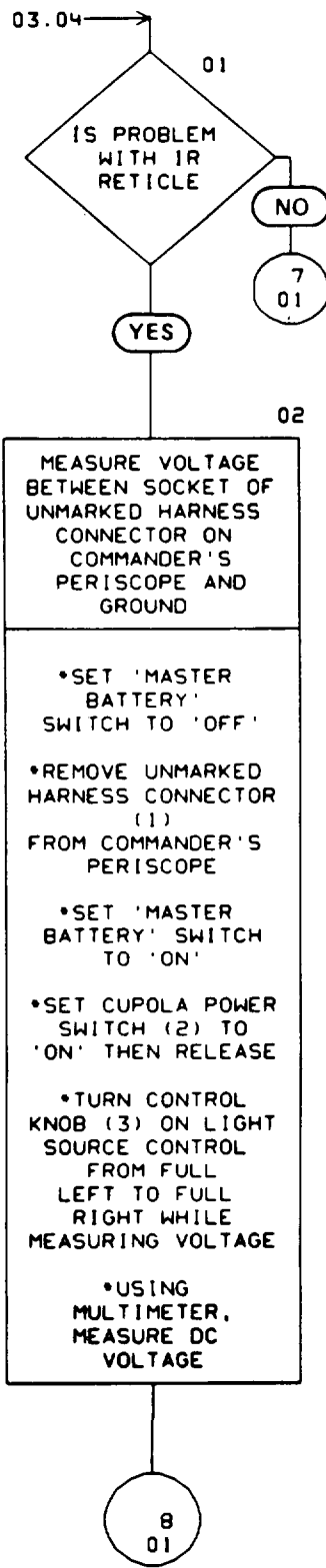


YES

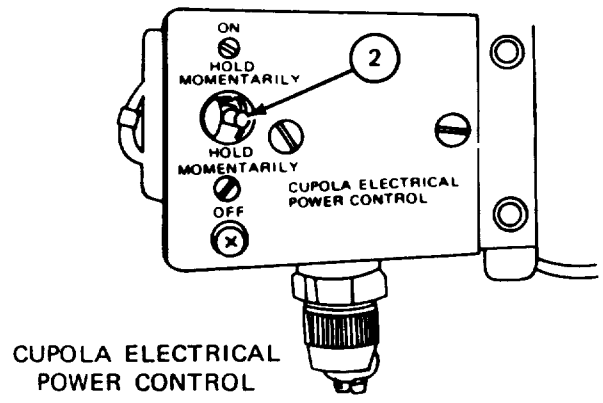
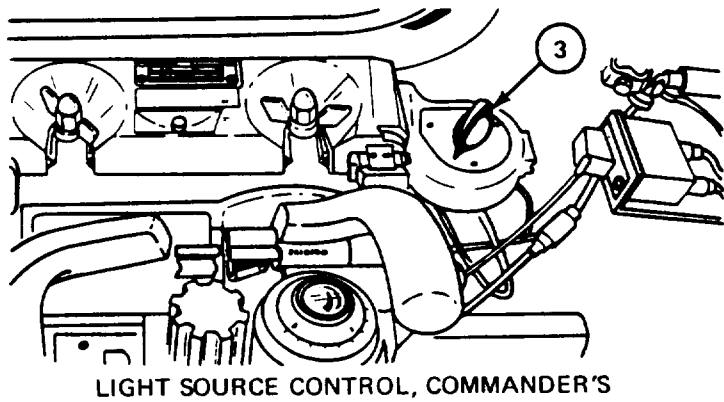


LIGHT SOURCE CONTROL, COMMANDER'S

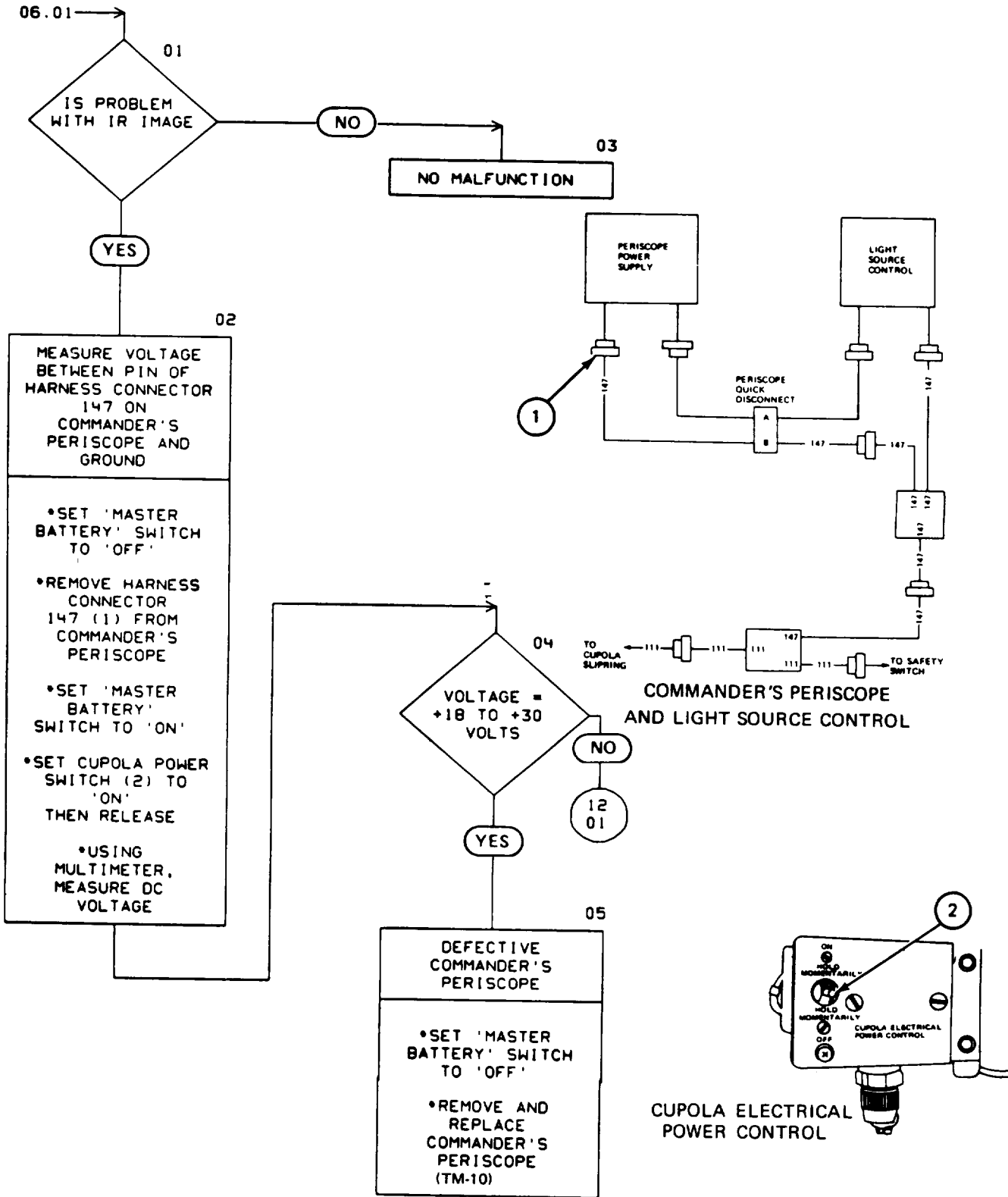
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 6 OF 31)



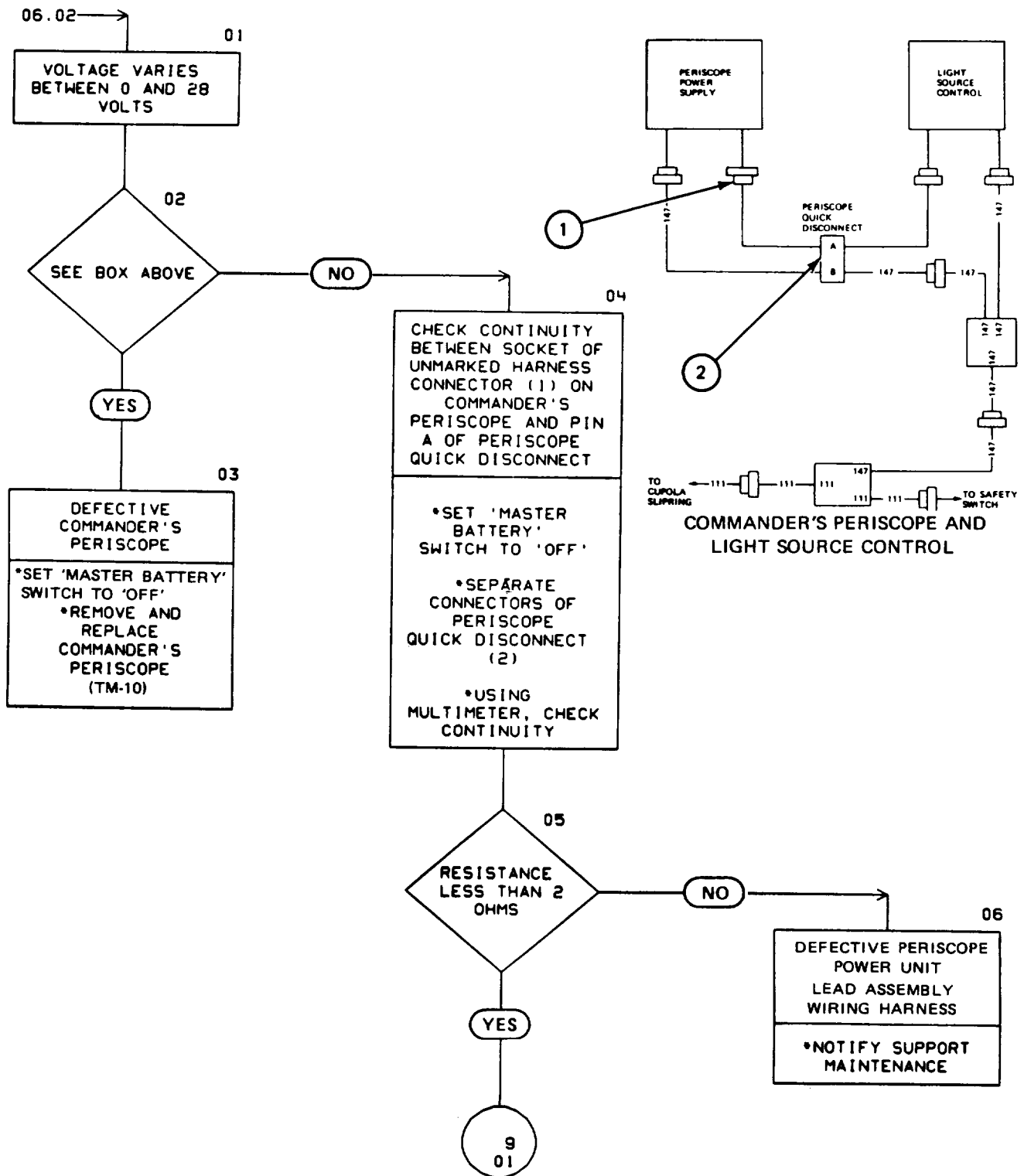
COMMANDER'S PERISCOPE AND LIGHT SOURCE CONTROL



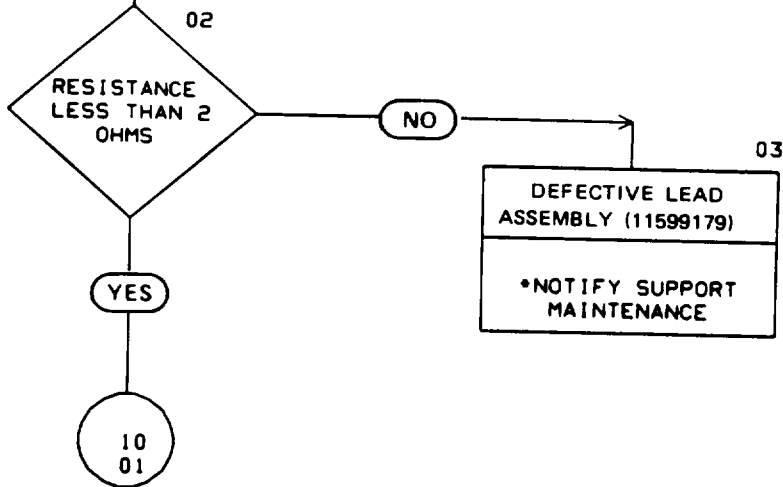
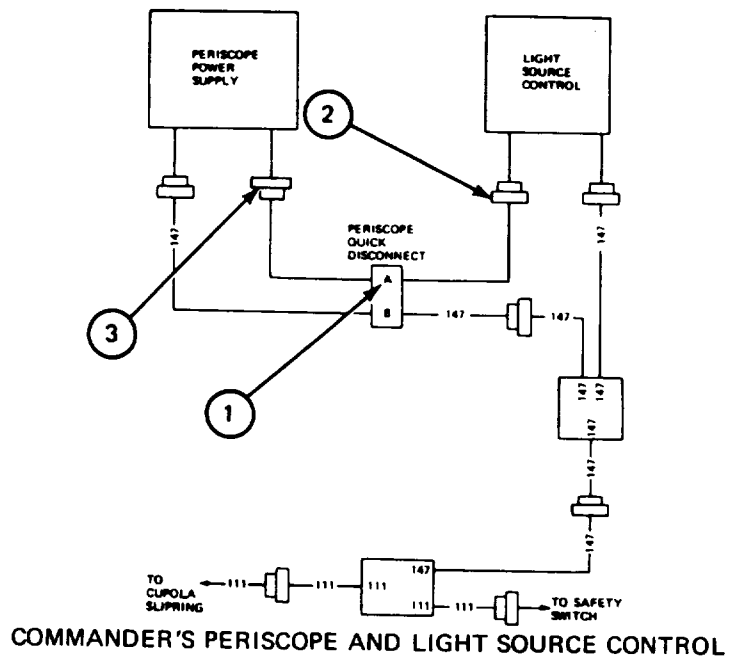
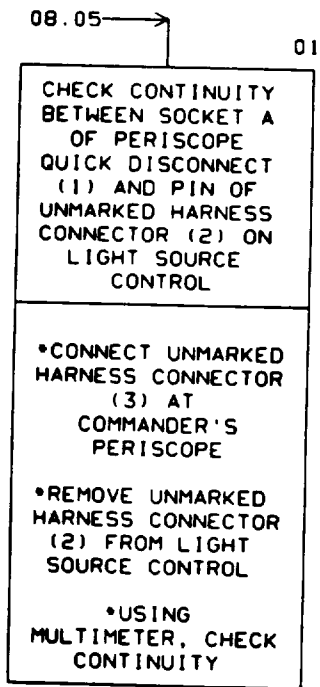
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 7 OF 31)



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 8 OF 31)



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 9 OF 31)









5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 12 OF 31)

07.04 →

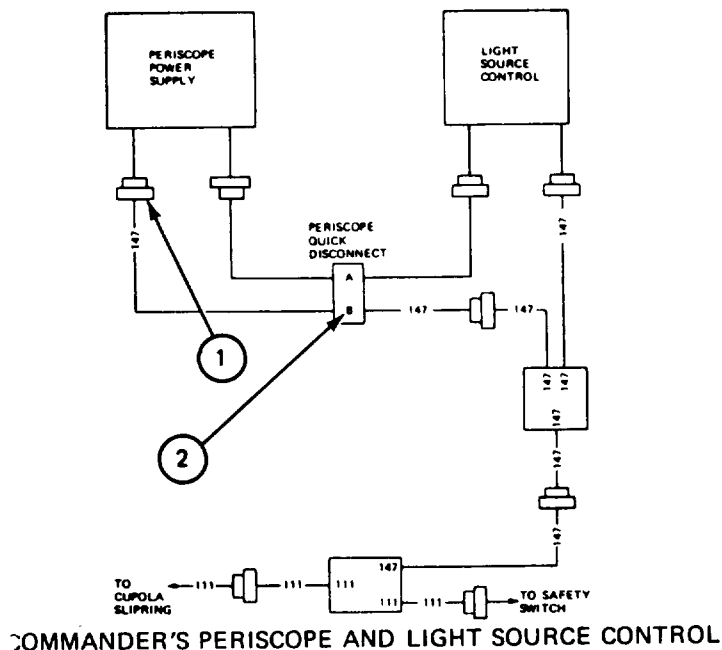
01

CHECK CONTINUITY BETWEEN PIN OF HARNESS CONNECTOR 147 (1) AT COMMANDER'S PERISCOPE AND PIN B OF PERISCOPE QUICK DISCONNECT (2)

\*SET 'MASTER BATTERY' SWITCH TO 'OFF'

\*SEPARATE CONNECTORS OF PERISCOPE QUICK DISCONNECT (2)

\*USING MULTIMETER, CHECK CONTINUITY



02

REISTANCE  
LESS THAN 2  
OHMS

NO

03

DEFECTIVE PERISCOPE POWER UNIT LEAD ASSEMBLY

\*NOTIFY SUPPORT MAINTENANCE

YES

13  
01

5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 13 OF 31)

12.02 →

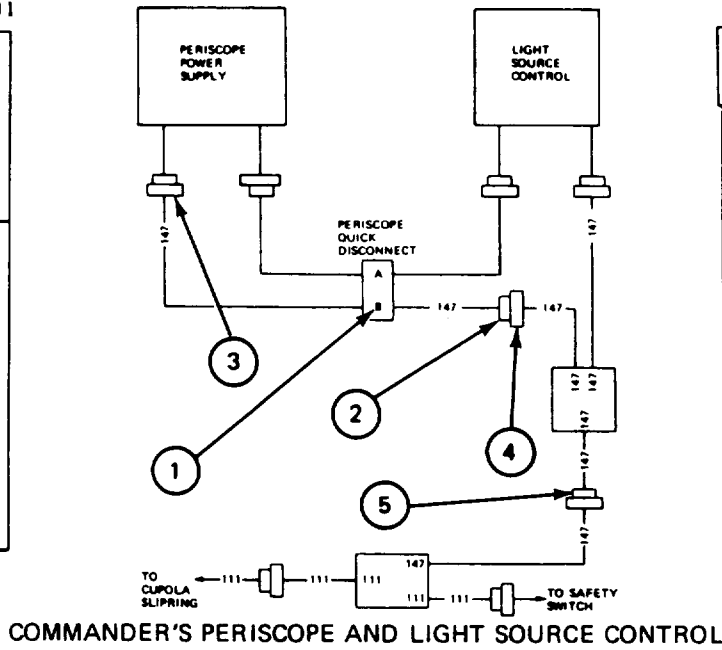
01

CHECK CONTINUITY BETWEEN SOCKET B OF PERISCOPE QUICK DISCONNECT (1) AND SOCKET OF HARNESS CONNECTOR 147 (2)

\*CONNECT 147 HARNESS CONNECTORS (3) AT COMMANDER'S PERISCOPE

\*SEPARATE 147 HARNESS CONNECTORS (2)

\*USING MULTIMETER, CHECK CONTINUITY



13.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

\*SEPARATE 147 HARNESS CONNECTORS (5)

\*USING MULTIMETER, CHECK CONTINUITY

14 01

02

RESISTANCE LESS THAN 2 OHMS

NO →

04

DEFECTIVE LEAD ASSEMBLY (11599179)

\*NOTIFY SUPPORT MAINTENANCE

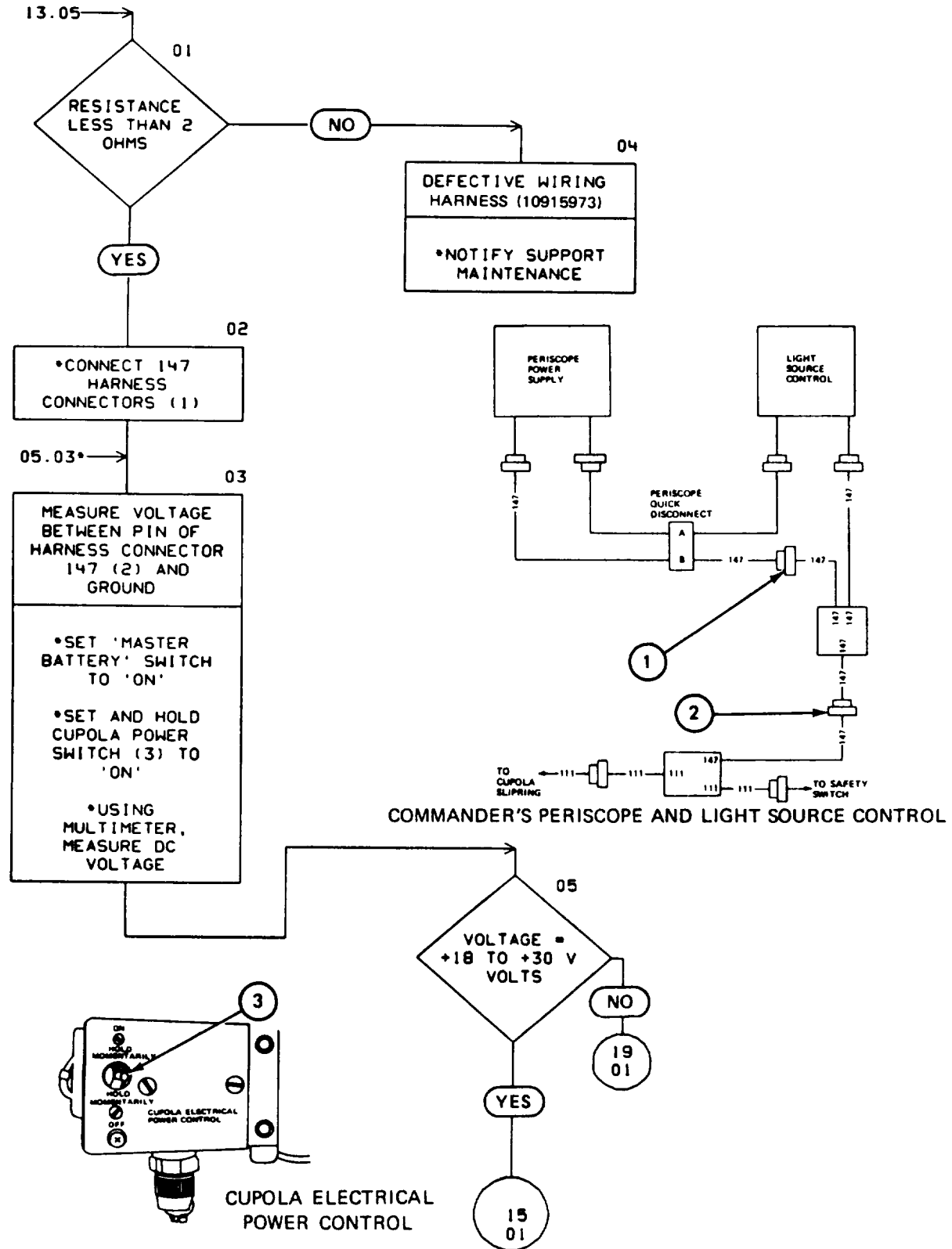
03

CHECK CONTINUITY BETWEEN PIN OF HARNESS CONNECTOR 147 (4) AND SOCKET OF HARNESS CONNECTOR 147 (5)

\*CONNECT PERISCOPE QUICK DISCONNECT CONNECTORS (1)

13 05

5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 14 OF 31)



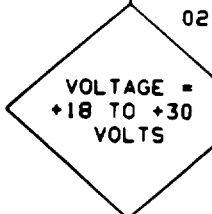
**5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 15 OF 31)**

14.05 →

01

MEASURE VOLTAGE BETWEEN SOCKET A OF HARNESS CONNECTOR (1) ON CUPOLA POWER RELAY AND GROUND

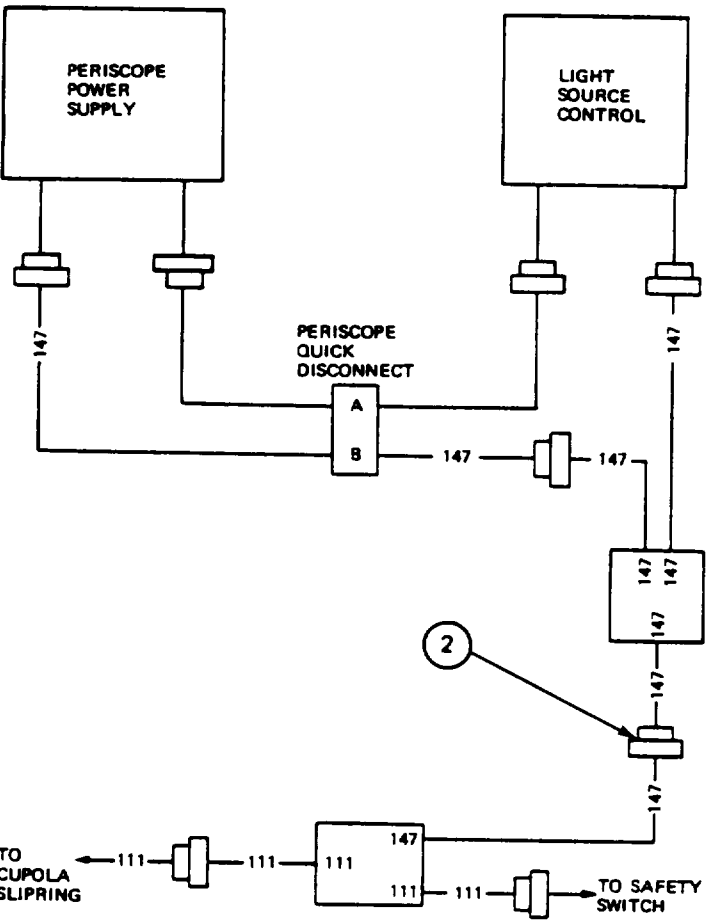
- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- RECONNECT HARNESS CONNECTOR 147 (2)
- REMOVE HARNESS CONNECTOR (1) FROM JACK ON CUPOLA POWER RELAY
- SET 'MASTER BATTERY' SWITCH TO 'ON'
- SET AND HOLD CUPOLA POWER SWITCH (3) TO 'ON'
- USING MULTIMETER, MEASURE DC VOLTAGE



YES

16  
01

NO

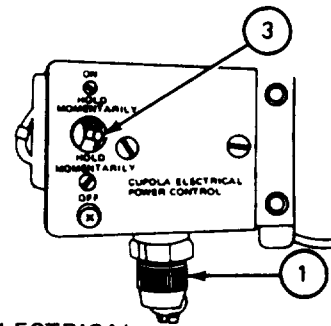


COMMANDER'S PERISCOPE AND LIGHT SOURCE CONTROL

03

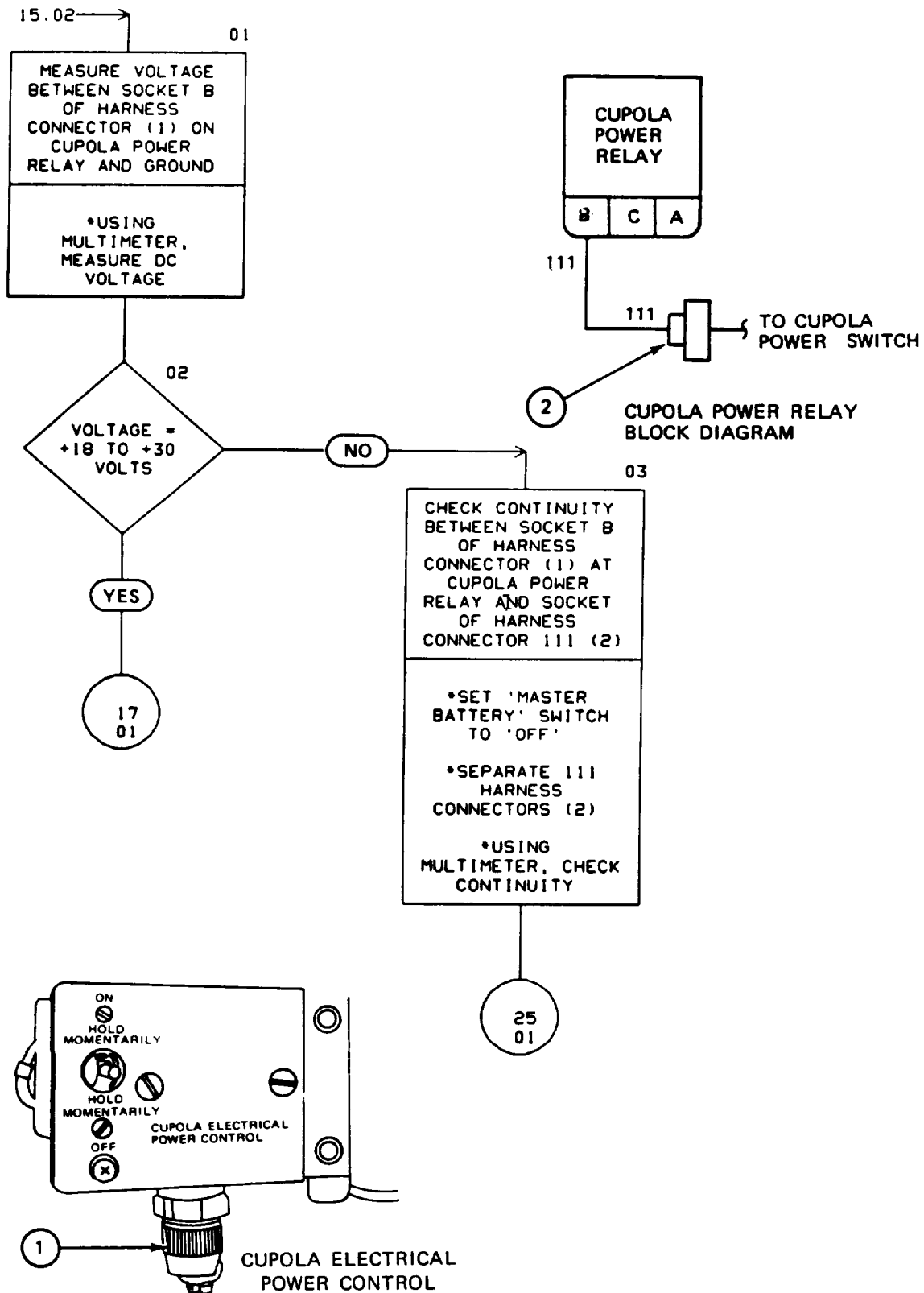
DEFECTIVE BRANCHED WIRING HARNESS (10905869) BETWEEN SOCKET A OF HARNESS CONNECTOR ON CUPOLA POWER RELAY AND HARNESS CONNECTOR 1118 ON CUPOLA POWER SWITCH

•NOTIFY SUPPORT MAINTENANCE

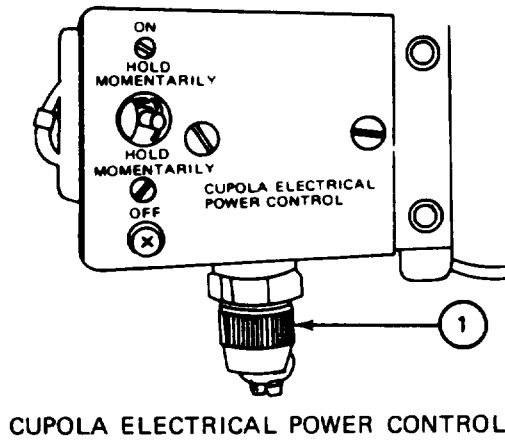
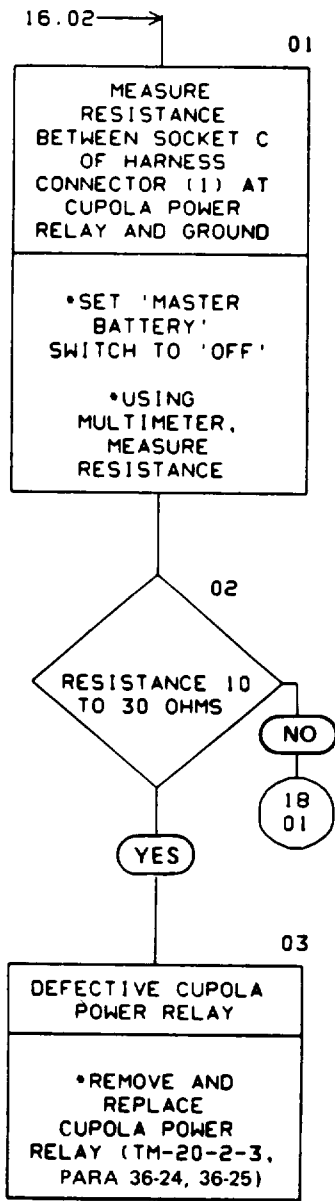


CUPOLA ELECTRICAL POWER CONTROL

5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 16 OF 31)

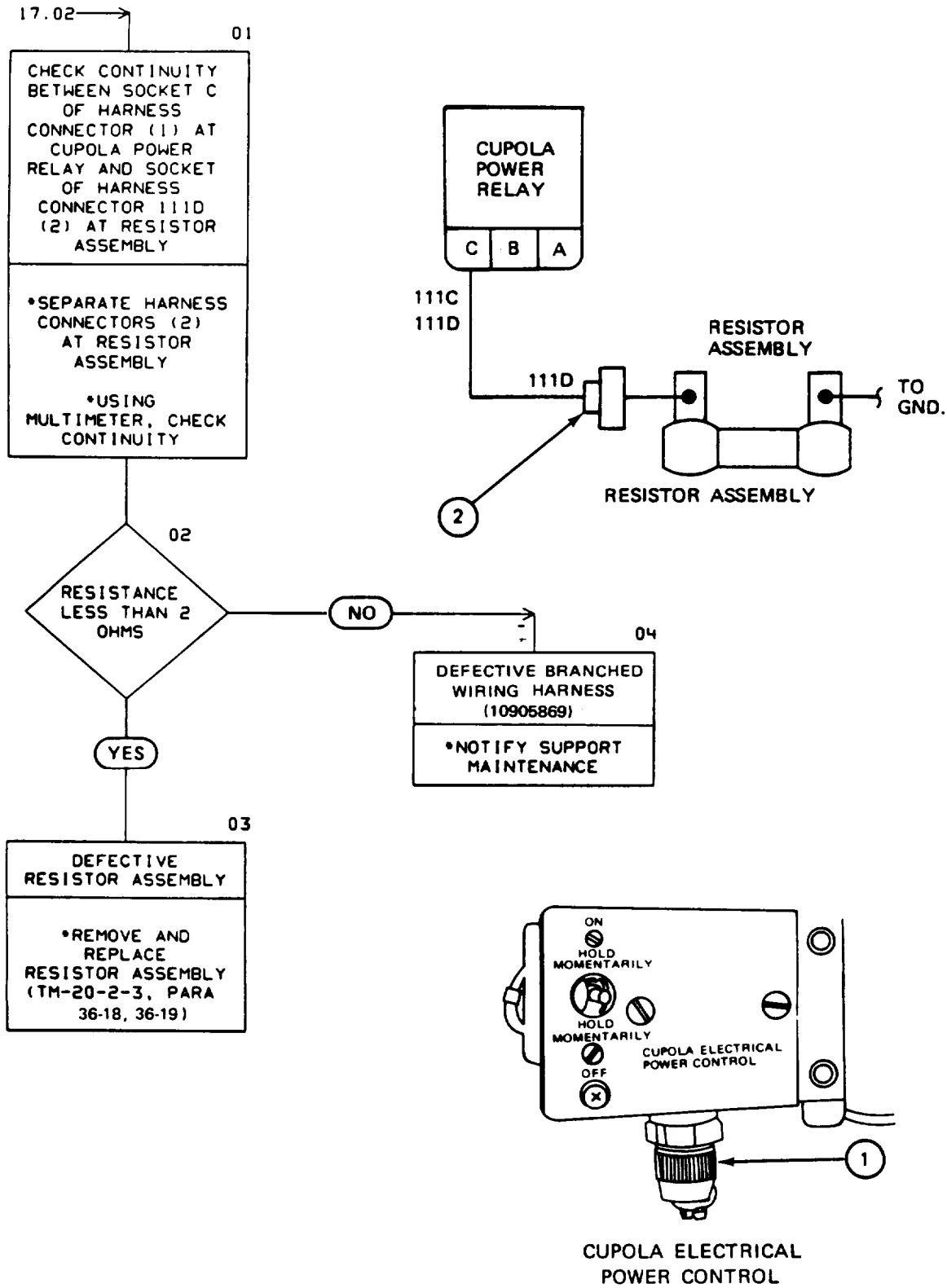


5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 17 OF 31)





5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 18 OF 31)



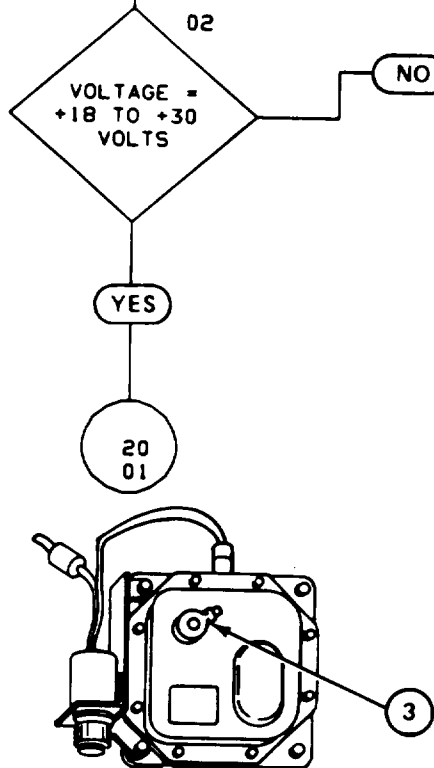
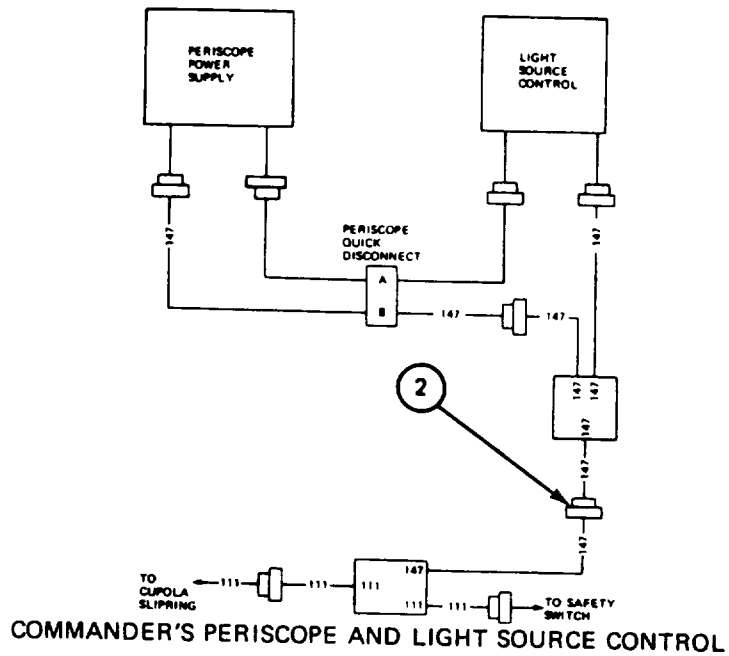
### 5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 19 OF 31)

14.05 →

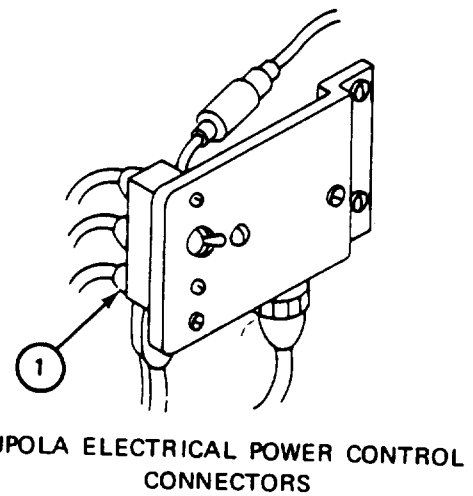
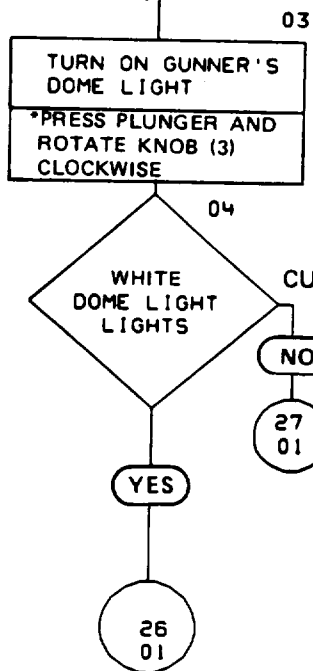
01

MEASURE VOLTAGE BETWEEN SOCKET OF HARNESS CONNECTOR 111 (1) ON CUPOLA POWER SWITCH AND GROUND

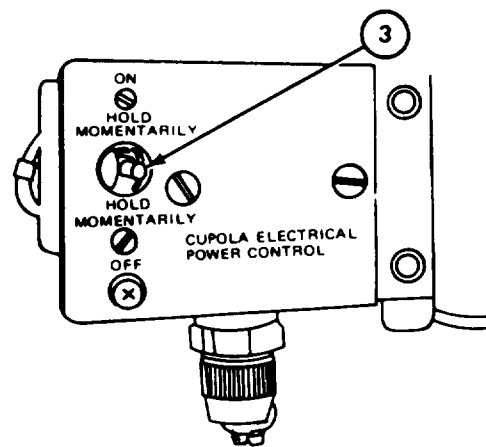
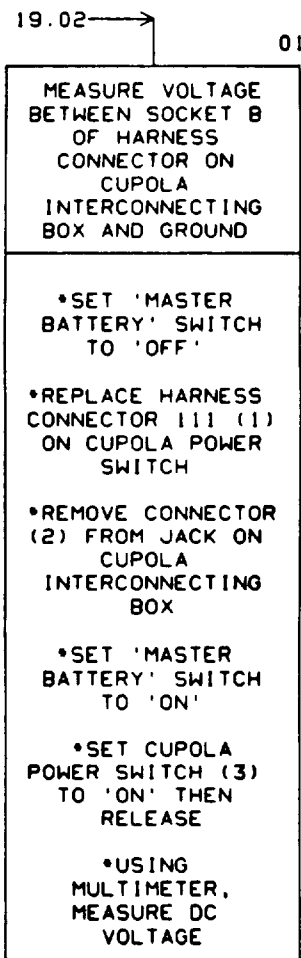
- \*SET 'MASTER BATTERY' SWITCH TO 'OFF'
- \*RECONNECT HARNESS CONNECTOR 147 (2)
- \*REMOVE HARNESS CONNECTOR 111 (1) FROM CUPOLA POWER SWITCH
- \*SET 'MASTER BATTERY' SWITCH TO 'ON'
- \*USING MULTIMETER, MEASURE DC VOLTAGE



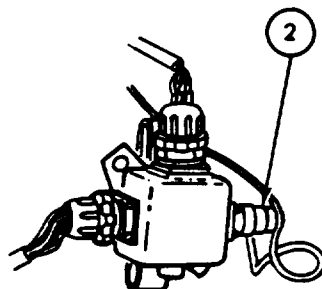
DOMELIGHT AND DIMMER SWITCH



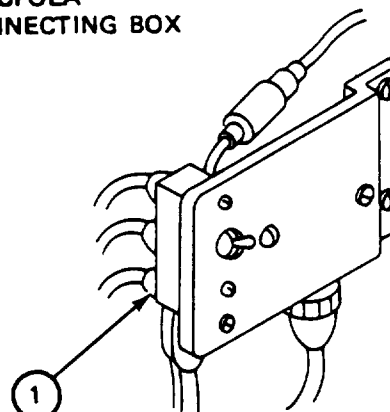
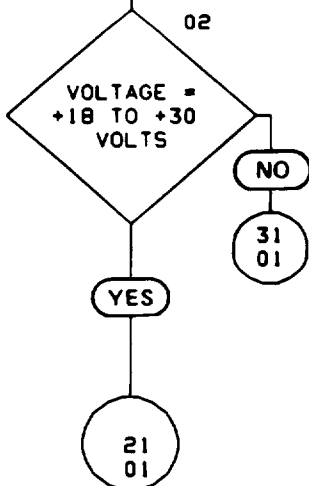
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 20 OF 31)



CUPOLA ELECTRICAL POWER CONTROL



CUPOLA INTERCONNECTING BOX



CUPOLA ELECTRICAL POWER CONTROL CONNECTORS



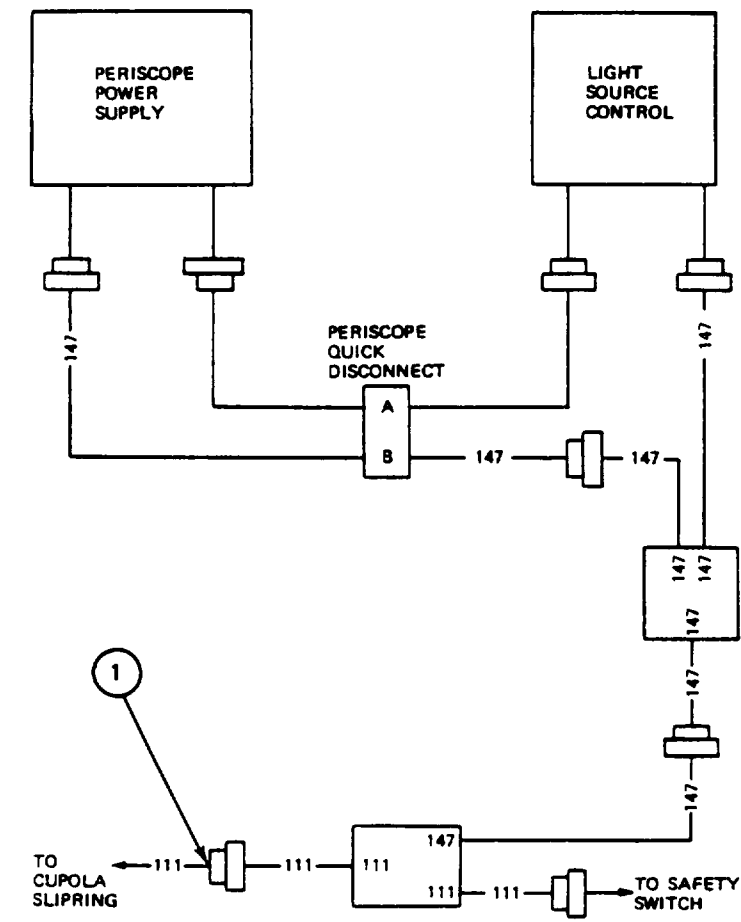
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 22 OF 31)

21.02 → 01

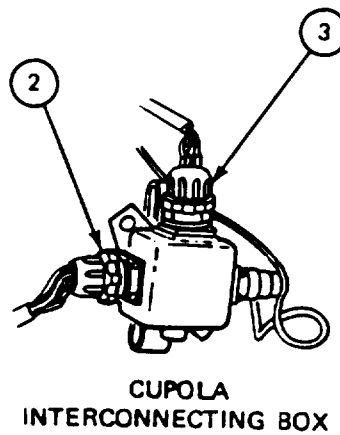
CHECK CONTINUITY BETWEEN SOCKET OF HARNESS CONNECTOR 111 (1) AT QUICK DISCONNECT AND PIN B OF HARNESS CONNECTORS (2) AND (3) ON CUPOLA INTERCONNECTING BOX

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE HARNESS CONNECTORS (2) AND (3) FROM JACKS ON CUPOLA INTERCONNECTING BOX
- USING MULTIMETER, CHECK CONTINUITY WHILE ROTATING CUPOLA (TM-10) UNTIL READING IS RECEIVED OR UNTIL CUPOLA HAS ROTATED FULL CIRCLE

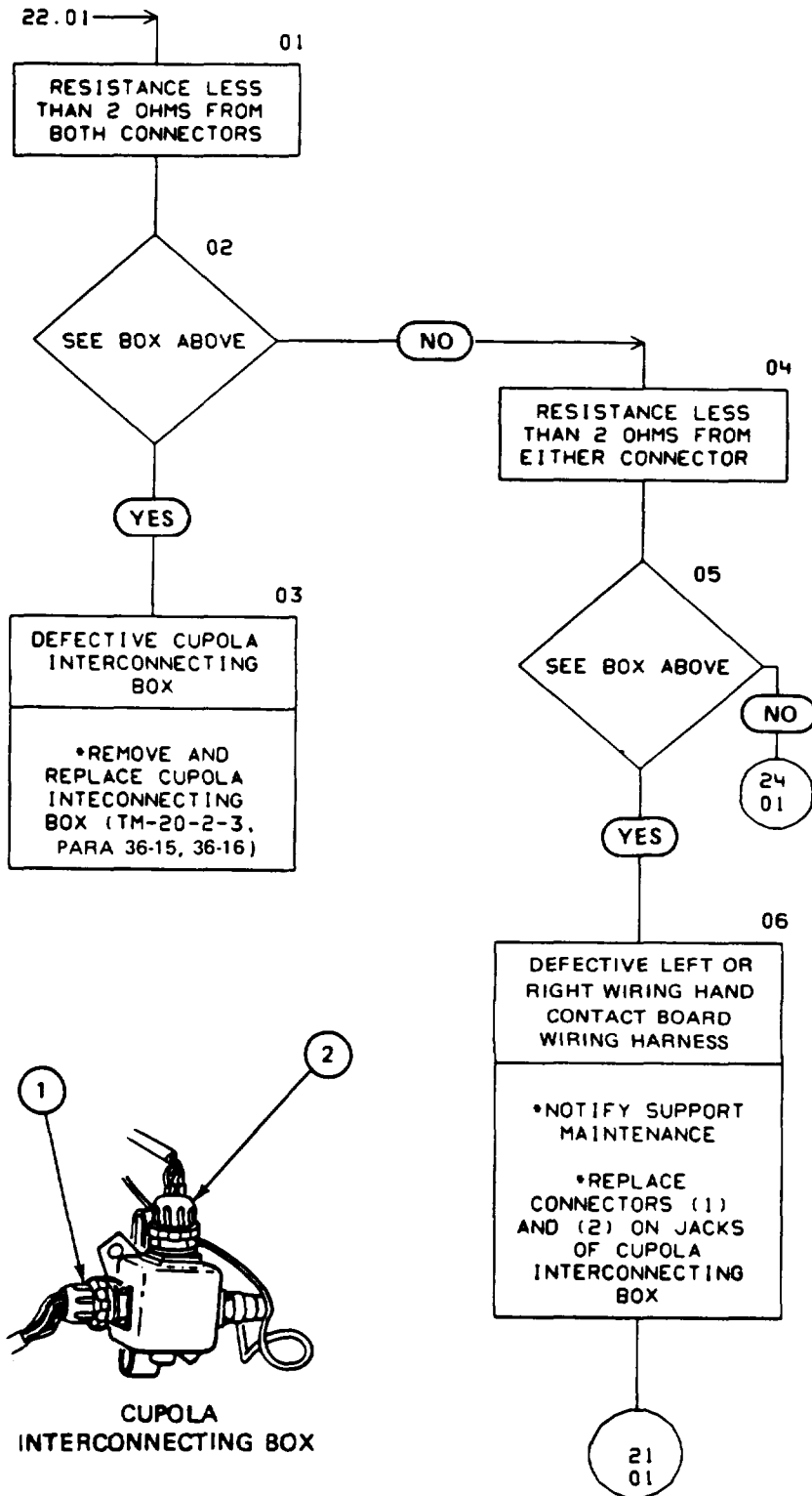
23  
01



COMMANDER'S PERISCOPE AND LIGHT SOURCE CONTROL



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 23 OF 31)



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 24 OF 31)

23.05 →

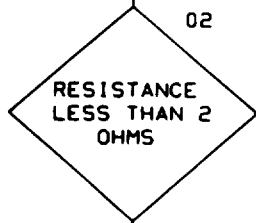
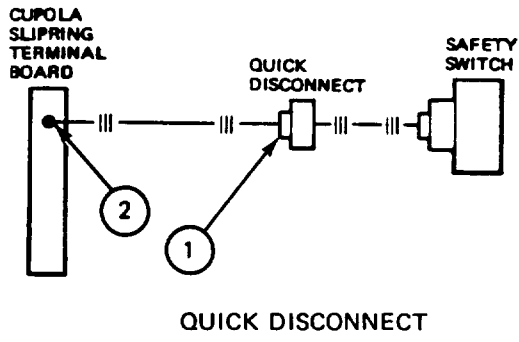
01

CHECK CONTINUITY BETWEEN SOCKET OF QUICK DISCONNECT HARNESS CONNECTOR 111 (1) AND CONTACT 2 (2) OF TERMINAL BOARD ON CUPOLA SLIPRING

\*REPLACE HARNESS CONNECTORS (3) AND (4) ON JACKS OF CUPOLA INTERCONNECTING BOX

\*ROTATE CUPOLA (TM-10) UNTIL SLOT (5) BY AZIMUTH LOCK IS ALIGNED WITH TERMINAL BOARD

\*USING MULTIMETER, CHECK CONTINUITY



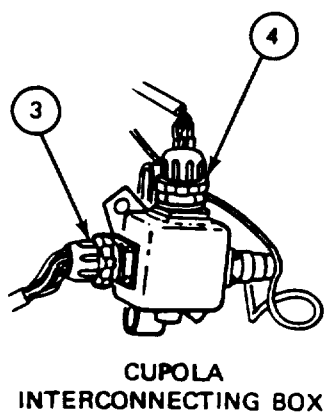
YES

NO

04

DEFECTIVE WIRING HARNESS (10873581)

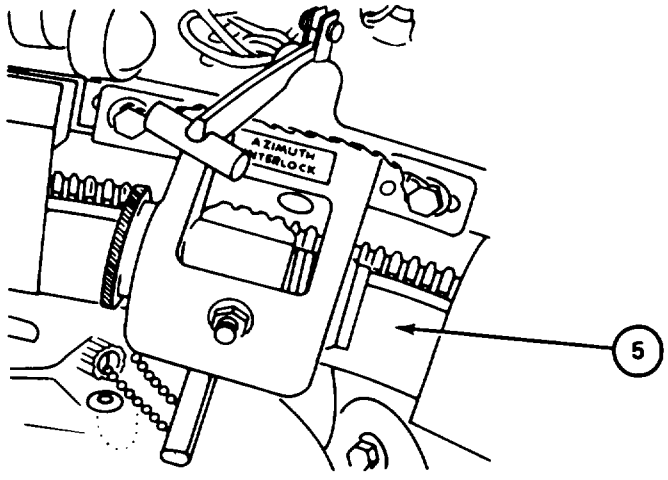
\*NOTIFY SUPPORT MAINTENANCE



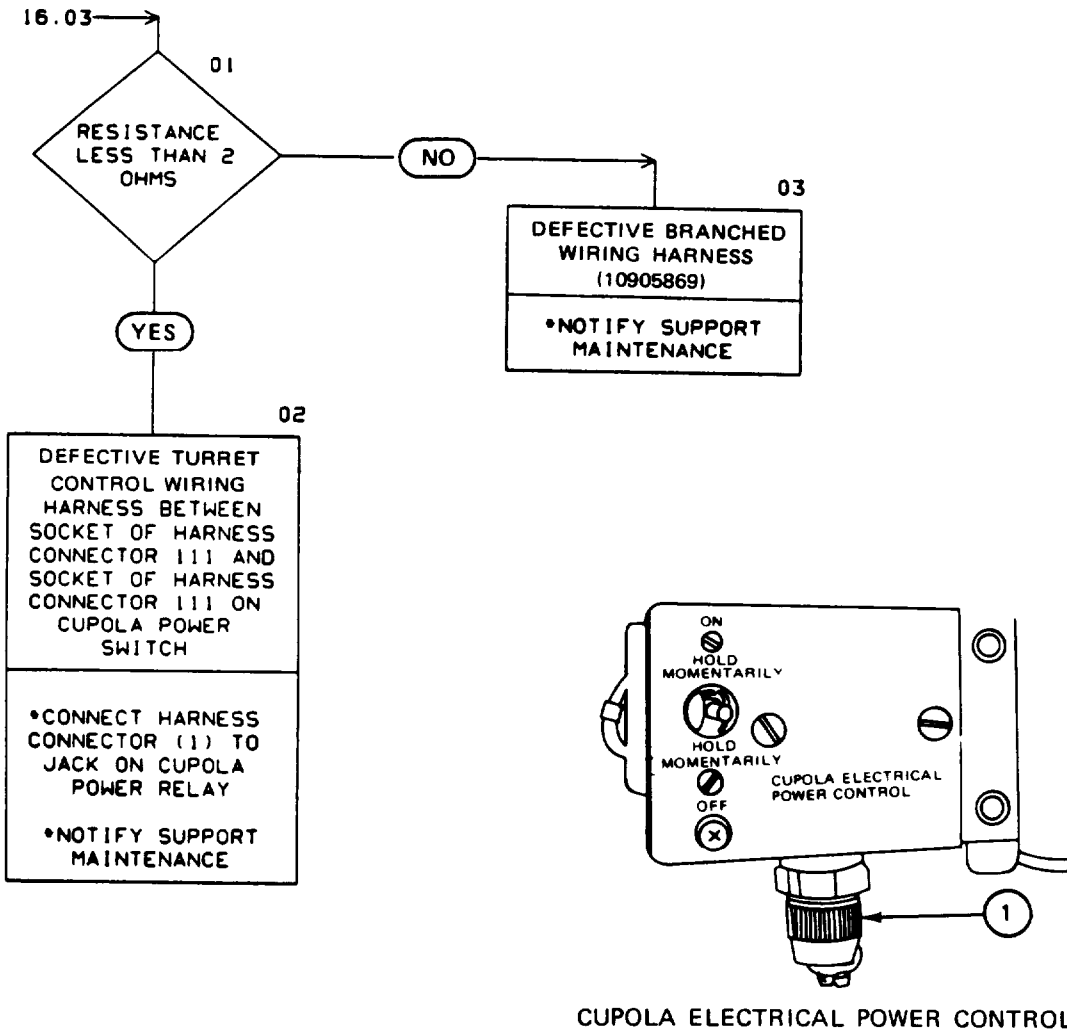
03

DEFECTIVE CUPOLA TERMINAL BOARD AND PAD ASSEMBLY

\*NOTIFY SUPPORT MAINTENANCE



### 5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 25 OF 31)





5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 26 OF 31)

19.04 →

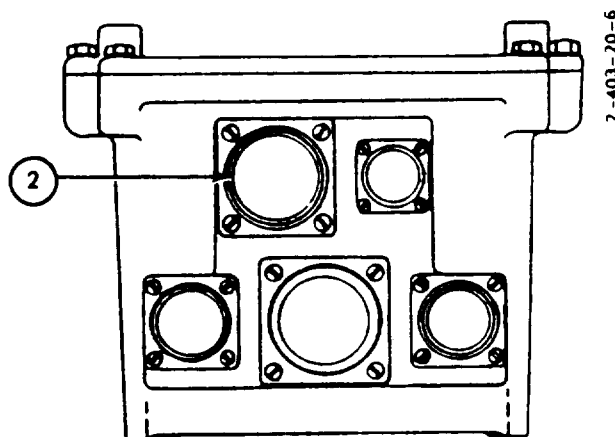
01

CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 111 (1) AT CUPOLA POWER SWITCH AND PIN A CIRCUIT 111, OF HARNESS CONNECTOR ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE HARNESS CONNECTOR FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

26.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

•REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

02

RESISTANCE LESS THAN 2 OHMS

YES

03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

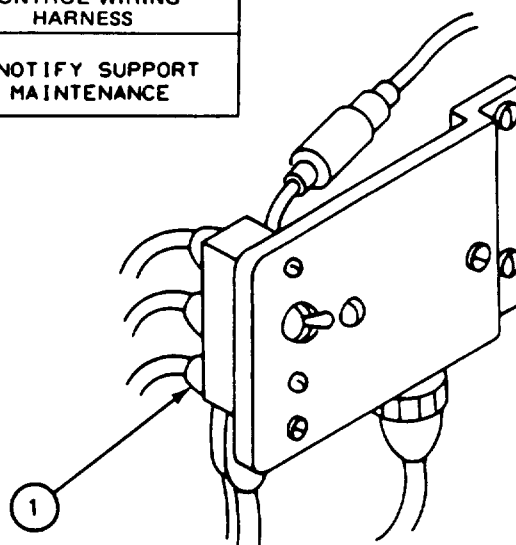
26.05

NO

04

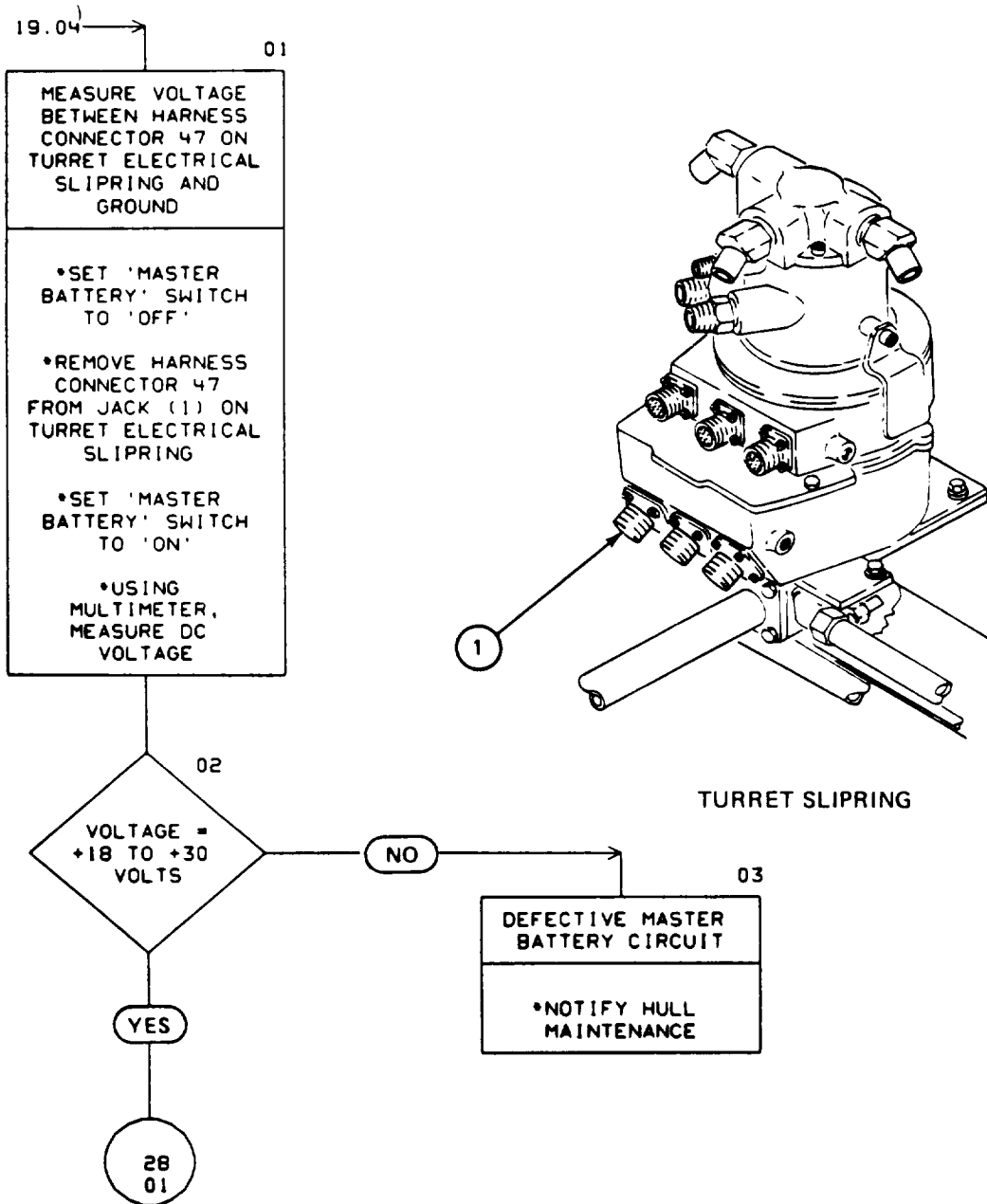
DEFECTIVE TURRET CONTROL WIRING HARNESS

•NOTIFY SUPPORT MAINTENANCE

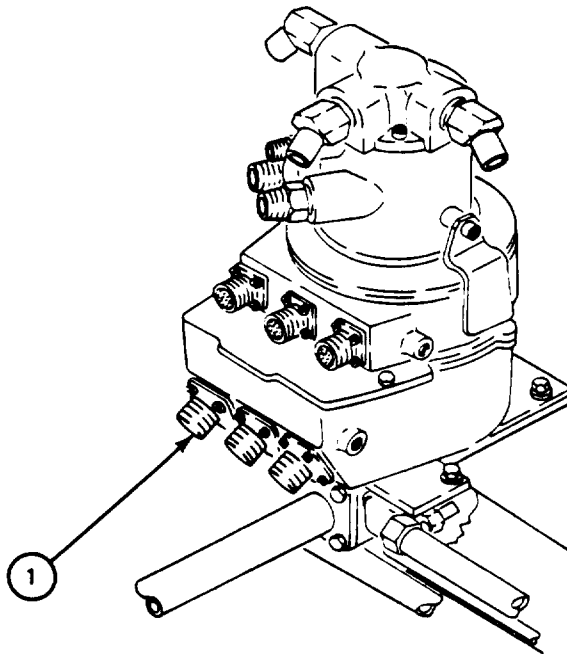
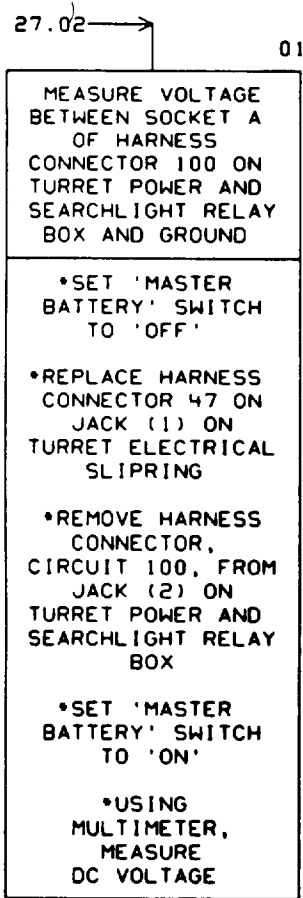


CUPOLA ELECTRICAL POWER CONTROL CONNECTORS

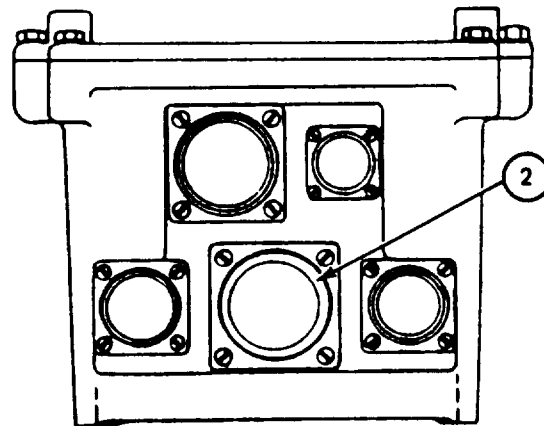
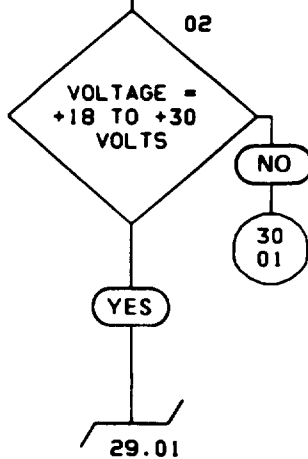
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 27 OF 31)



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 28 OF 31)

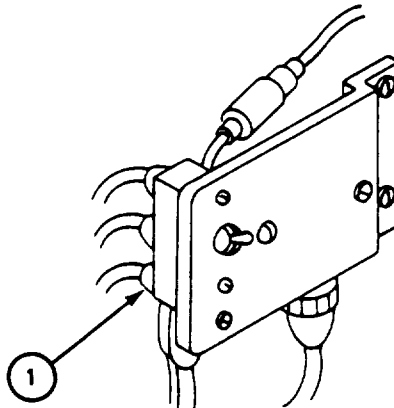
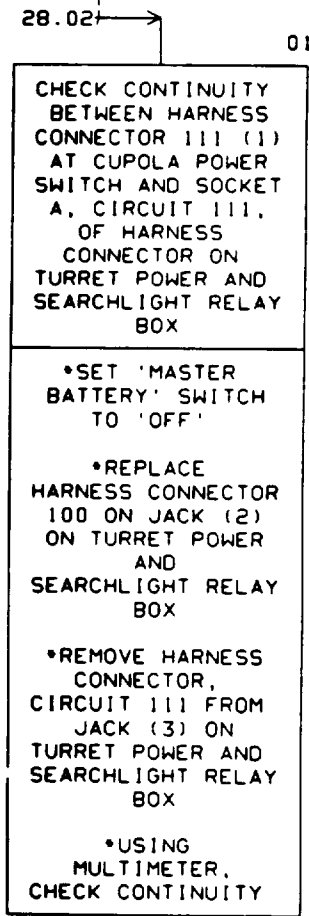


TURRET SLIPRING

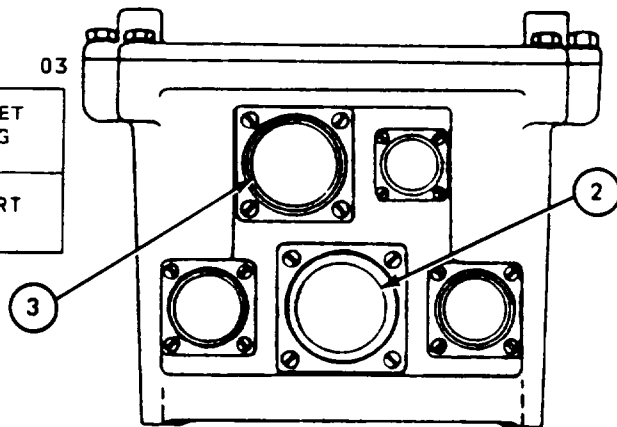
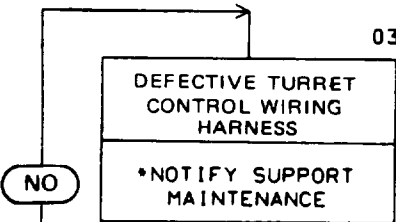
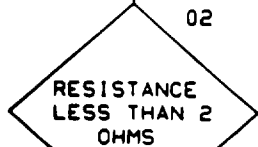


TURRET POWER AND SEARCHLIGHT RELAY BOX

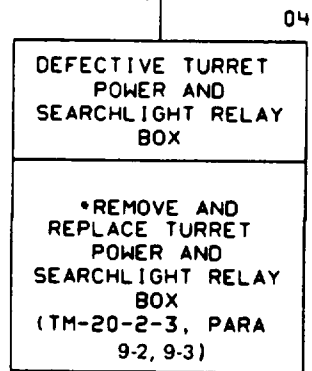
**5.3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 29 OF 31)**



CUPOLA ELECTRICAL POWER CONTROL CONNECTORS



TURRET POWER AND SEARCHLIGHT RELAY BOX



5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 30 OF 31)

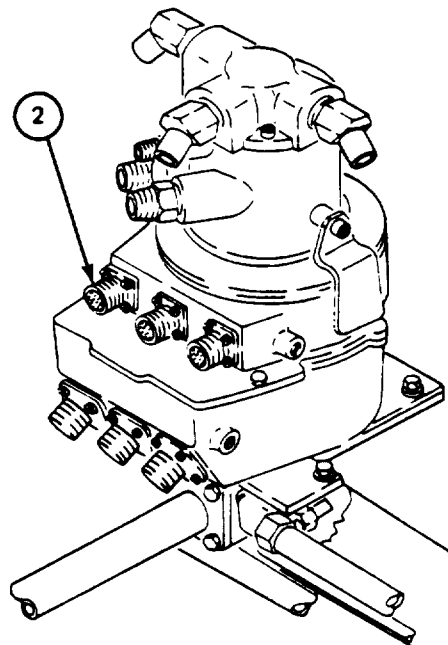
28.02 → 01

CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 100 ON TURRET ELECTRICAL SLIPRING AND SOCKET A OF HARNESS CONNECTOR 100 AT JACK (1) OF TURRET POWER AND SEARCHLIGHT RELAY BOX

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE HARNESS CONNECTOR 100 FROM JACK (2) ON TURRET ELECTRICAL SLIPRING

•USING MULTIMETER, CHECK CONTINUITY



TURRET SLIPRING



NO

04

DEFECTIVE SLIPRING TO TURRET POWER RELAY BOX WIRING HARNESS

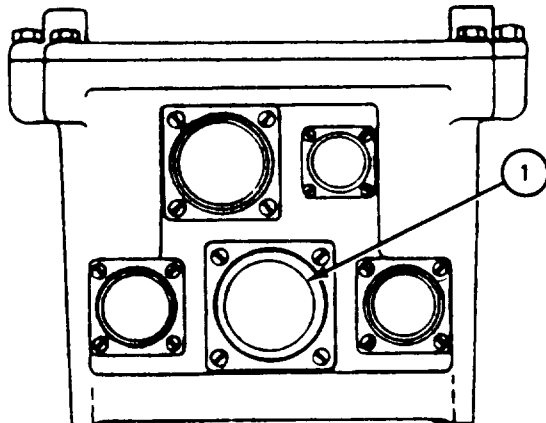
•NOTIFY SUPPORT MAINTENANCE

YES

03

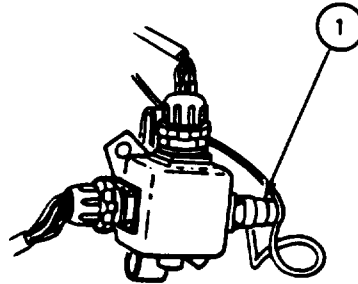
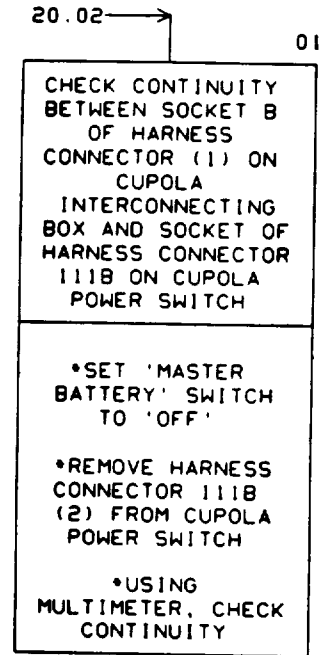
DEFECTIVE TURRET ELECTRICAL SLIPRING

•REMOVE AND REPLACE TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-7, 3-8)

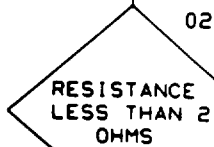


TURRET POWER AND SEARCHLIGHT RELAY BOX

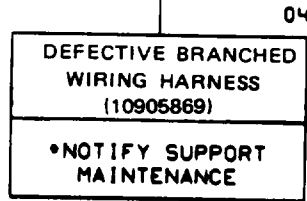
5-3. COMMANDER'S PERISCOPE TROUBLESHOOTING (SHEET 31 OF 31)



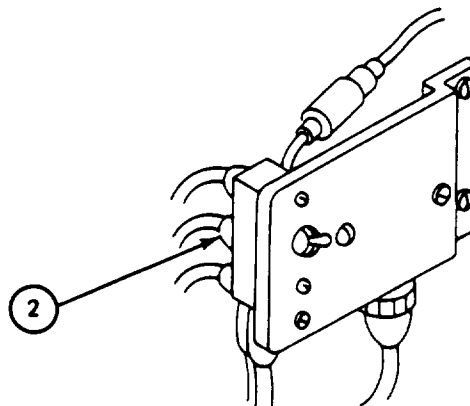
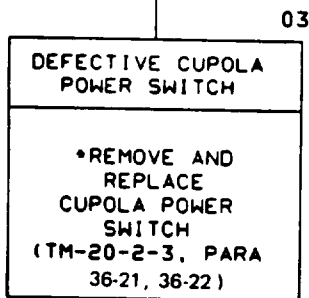
CUPOLA INTERCONNECTING BOX



NO



YES



CUPOLA ELECTRICAL POWER CONTROL CONNECTORS

**5.4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 1 OF 9)**

- SYMPTOM:**
- (46) Daylight reticle fails to light
  - (47) Infinity Sight reticle fails to light
  - (48) IR/Passive reticle fails to light
  - (49) No IR/Passive image

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:		FOLDOUT	CALLOUT
Master Control Panel		4	4
Infinity Sight		1	23
Turret Power and Searchlight		1	9
Relay Box			
Turret Electrical Slipping		3	5

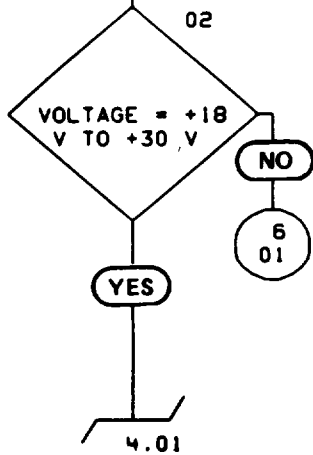
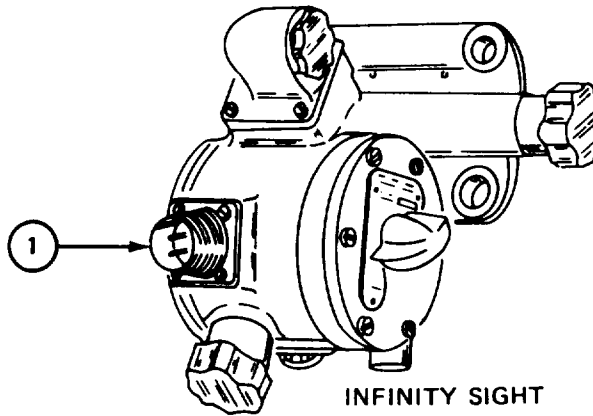
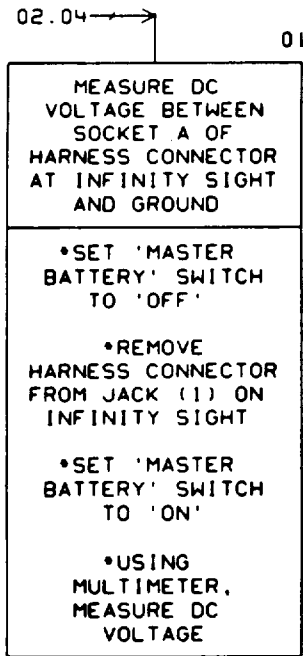
- REFERENCES:**
- (1) TM 9-2350-222-20-2-3 for removal and replacement of components
  - (2) ETM 643-091-9400R/JPG for procedures to:  
Use multimeter  
Disconnect electrical connectors
  - (3) TM 9-2350-222-10 for procedure to:  
Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

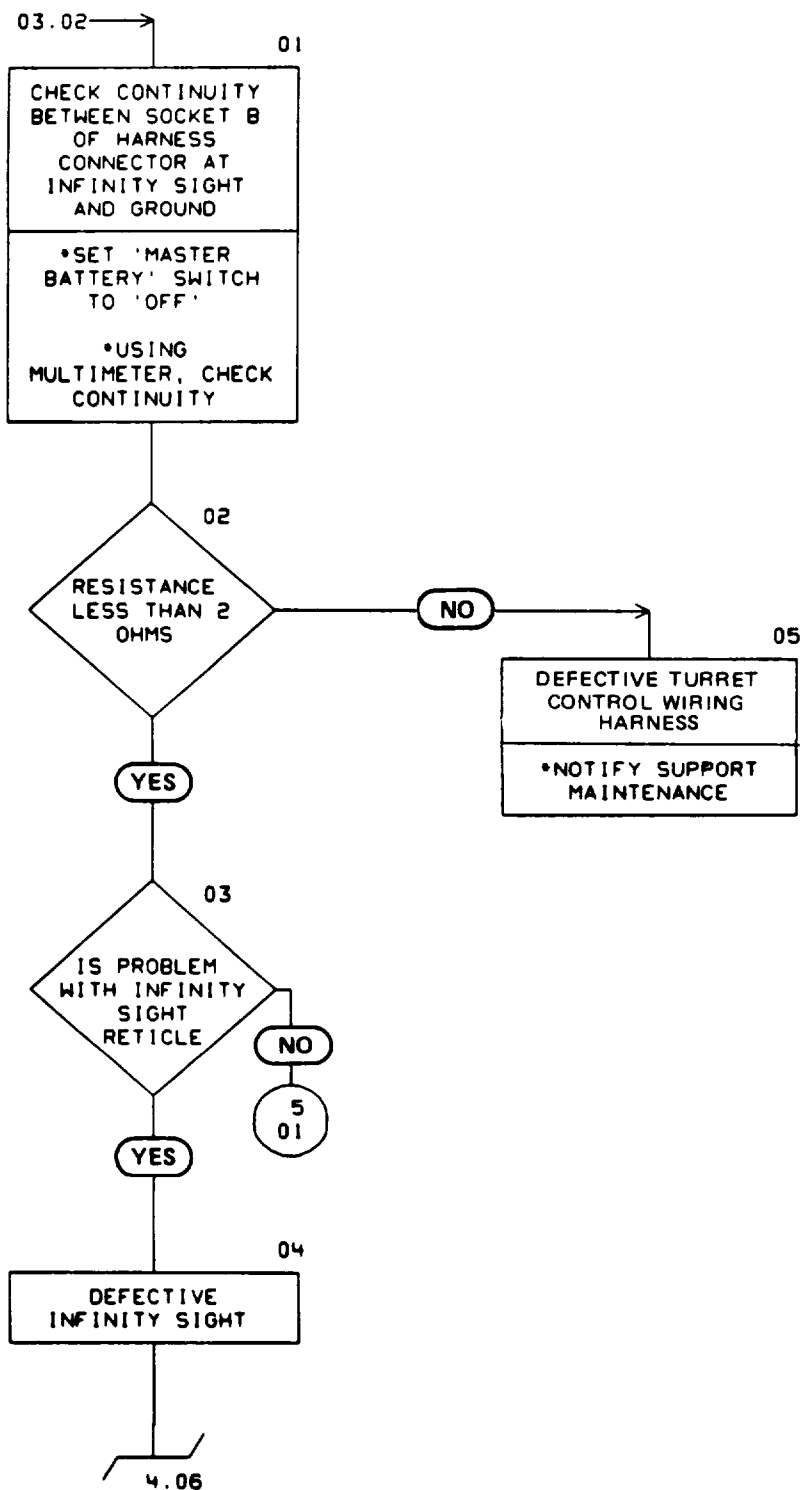




5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 3 OF 9)



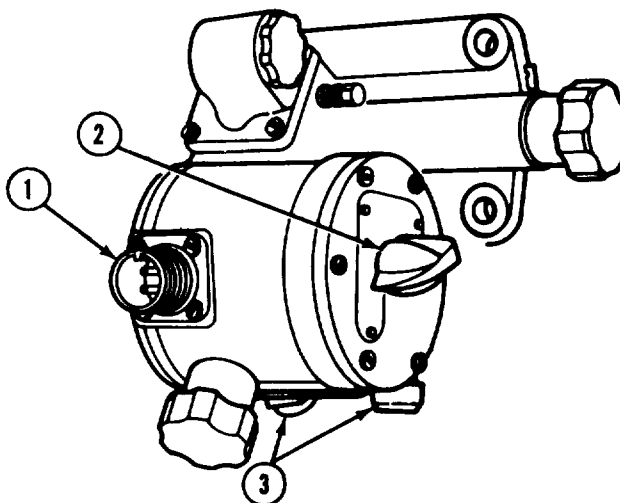
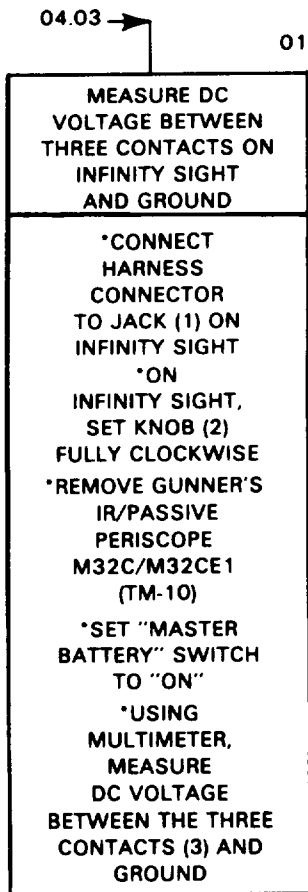
5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 4 OF 9)



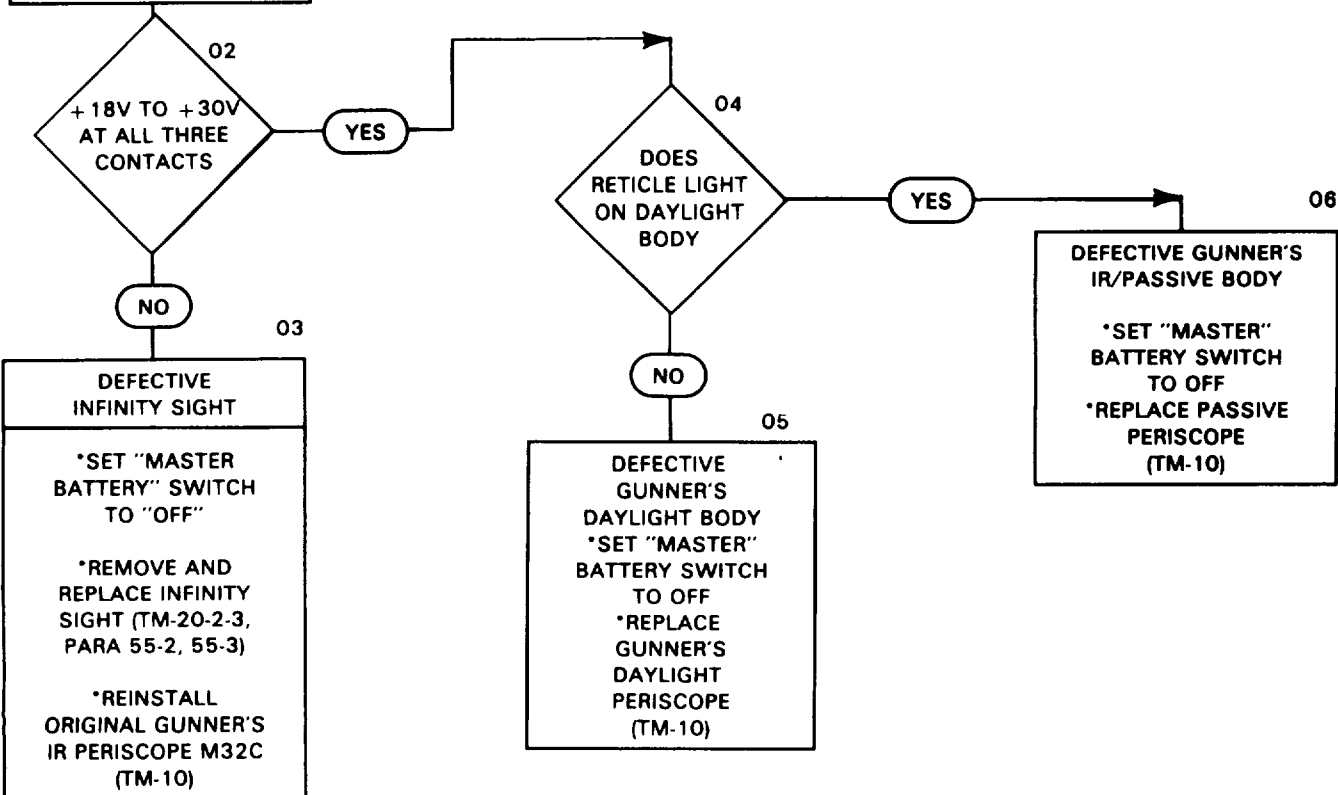
04.04 → **NOTE 06**

CONTINUED FROM A PRIOR COLUMN
*SET 'MASTER BATTERY' SWITCH TO 'OFF'
*REMOVE AND REPLACE INFINITY SIGHT (TM-20-2-3, PARA 55-2, 55-3)

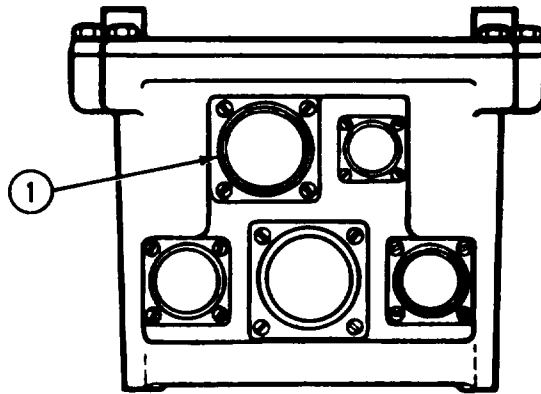
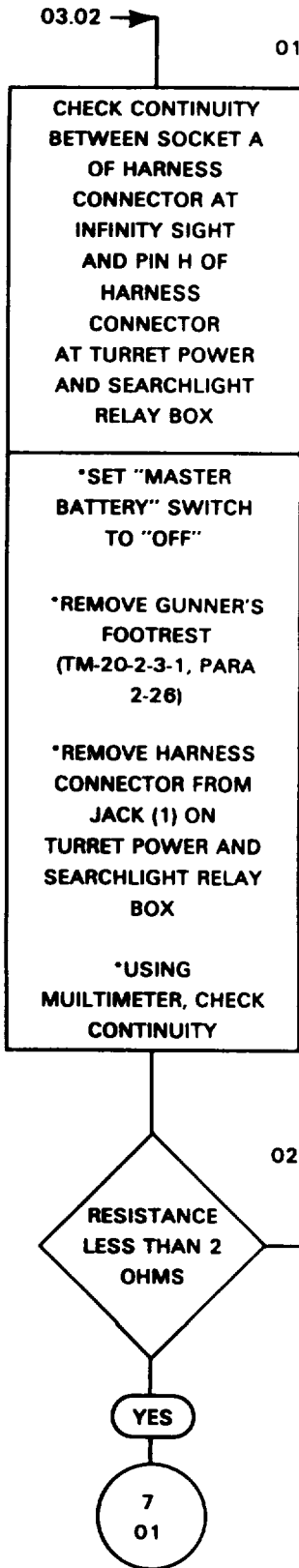
5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 5 OF 9)



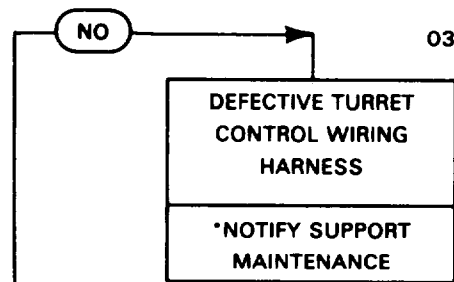
INFINITY SIGHT



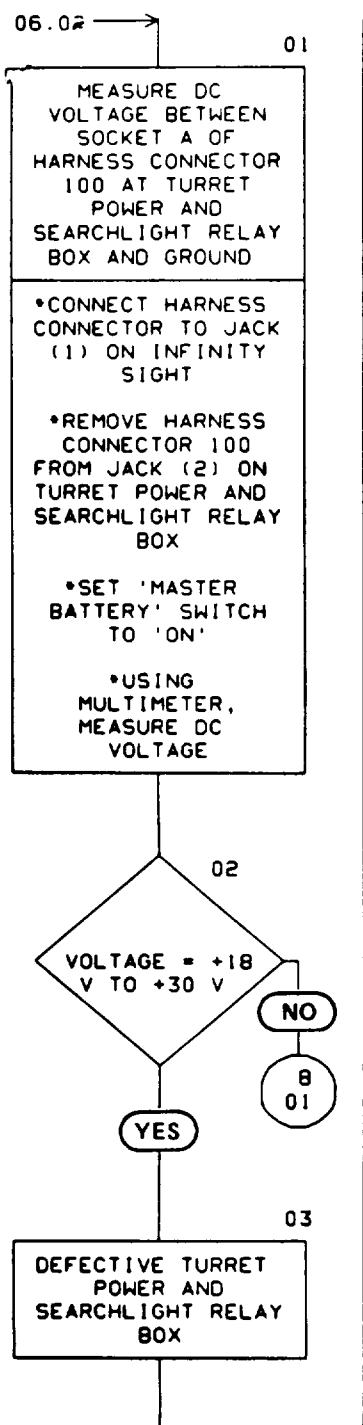
5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 6 OF 9)



TURRET POWER AND SEARCHLIGHT RELAY BOX



5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 7 OF 9)

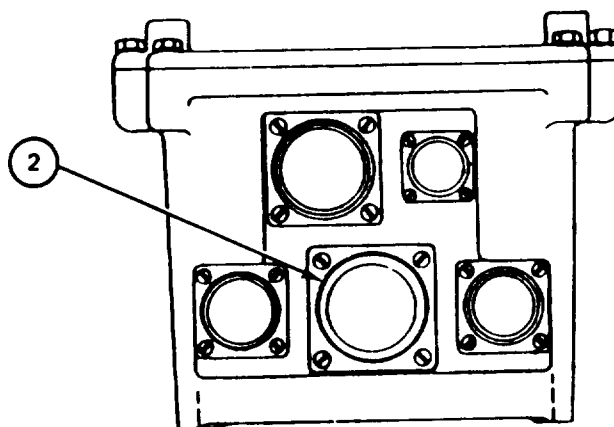
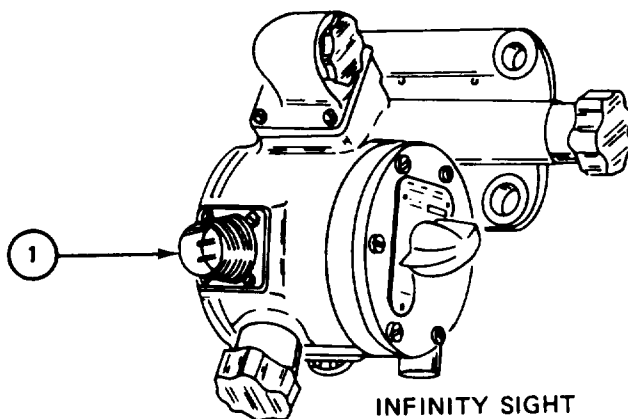


NOTE 04

CONTINUED FROM A PRIOR COLUMN

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)



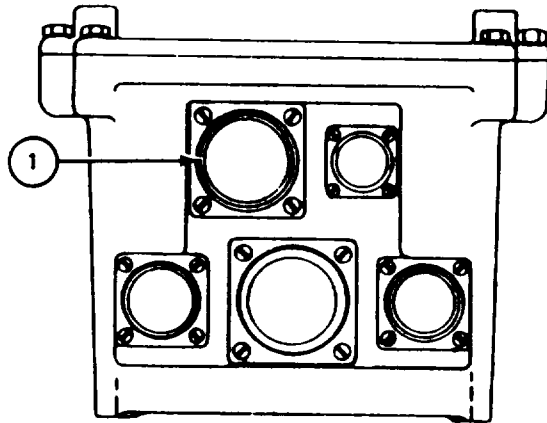
5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 8 OF 9)

07.02 →

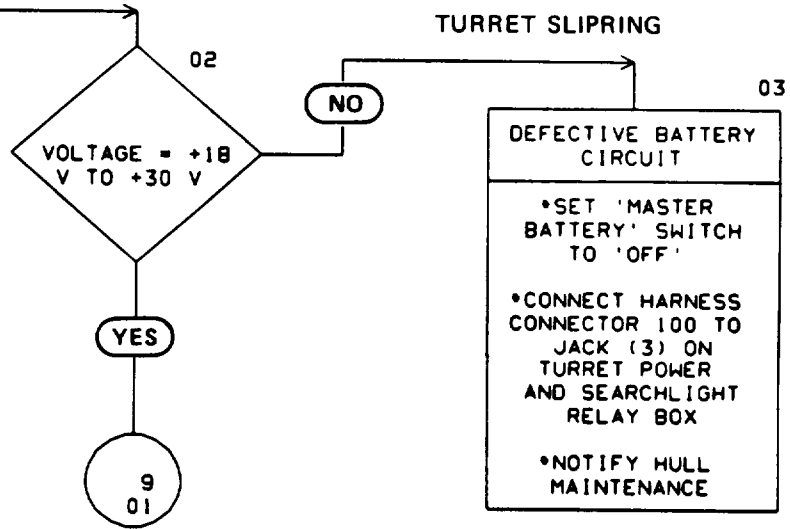
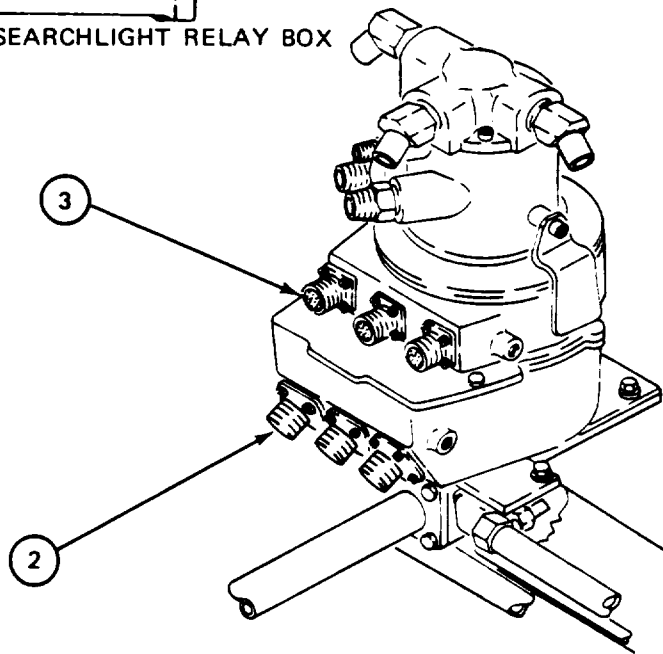
01

MEASURE DC VOLTAGE BETWEEN SOCKET OF HARNESS CONNECTOR 47 AT TURRET ELECTRICAL SLIPRING AND GROUND

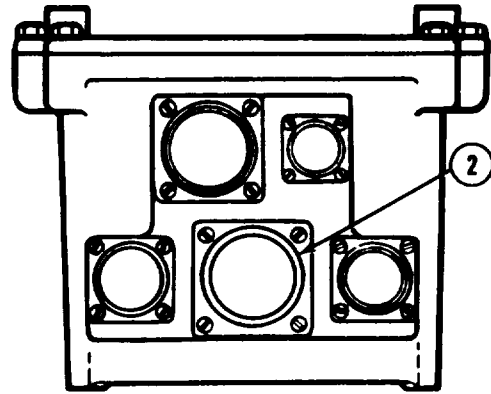
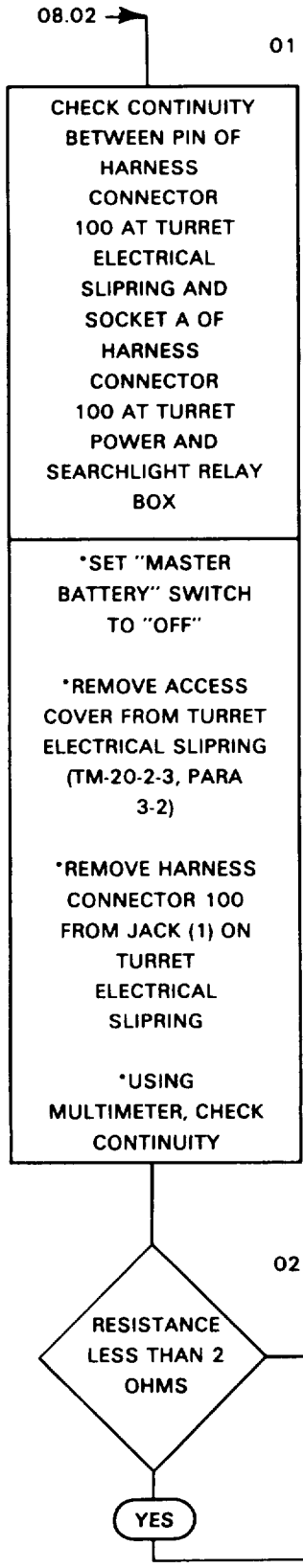
- TRAVERSE GUN OVER REAR DECK (TM-10)
- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- CONNECT HARNESS CONNECTOR TO JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- GRASP RING AND PULL BATTERY ACCESS DOOR OPEN
- REMOVE HARNESS CONNECTOR 47 FROM JACK (2) ON TURRET ELECTRICAL SLIPRING
- SET 'MASTER BATTERY' SWITCH TO 'ON'
- USING MULTIMETER, MEASURE DC VOLTAGE



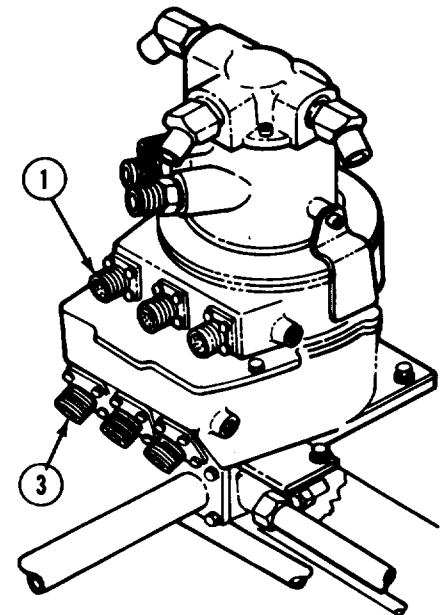
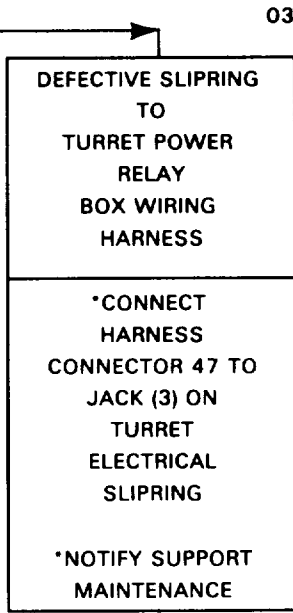
TURRET POWER AND SEARCHLIGHT RELAY BOX



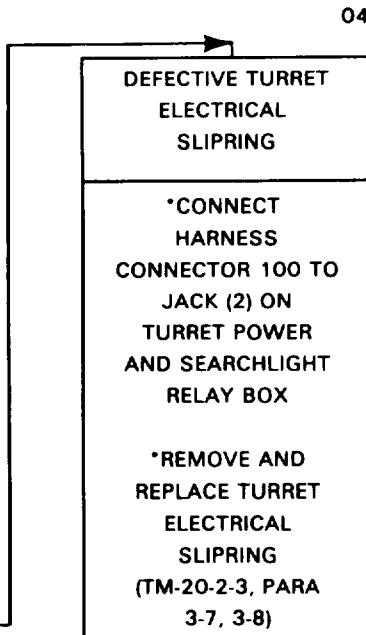
5-4. GUNNER'S PERISCOPE TROUBLESHOOTING (SHEET 9 OF 9)



TURRET POWER AND SEARCHLIGHT RELAY BOX



TURRET SLIPRING



5-5. **COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 1 OF 35)**

**SYMPTOM:** (43) Daylight reticle fails to light  
(44) IR/Passive reticle fails to light  
(45) No IR/Passive image

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:		FOLDOUT	CALLOUT
	Master Control Panel	4	4
	Cupola Power Switch	2	1
	Light Source Control	2	13
	Cupola Power Relay	2	1
	Resistor Assembly	2	1
	Gunner's Dome Light	1	1
	Cupola Interconnecting Box	2	6
	Turret Power and Searchlight Relay Box	1	9
	Turret Slipring	3	5
	Commander's Control Panel	2	15

**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
(2) ETM 643-091-9400R/JPG for procedures to:  
Use multimeter  
Disconnect electrical connectors

**EQUIPMENT CONDITION:** Vehicle parked, power off.



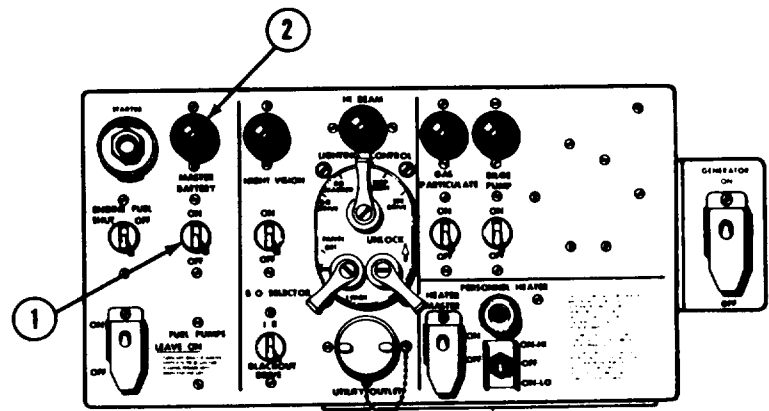
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 2 OF 35)

01  
**WARNING**  
 TO PREVENT INJURY TO PERSONNEL, REMOVE ALL AMMUNITION FROM WEAPONS BEFORE START OF TROUBLESHOOTING (TM-10)

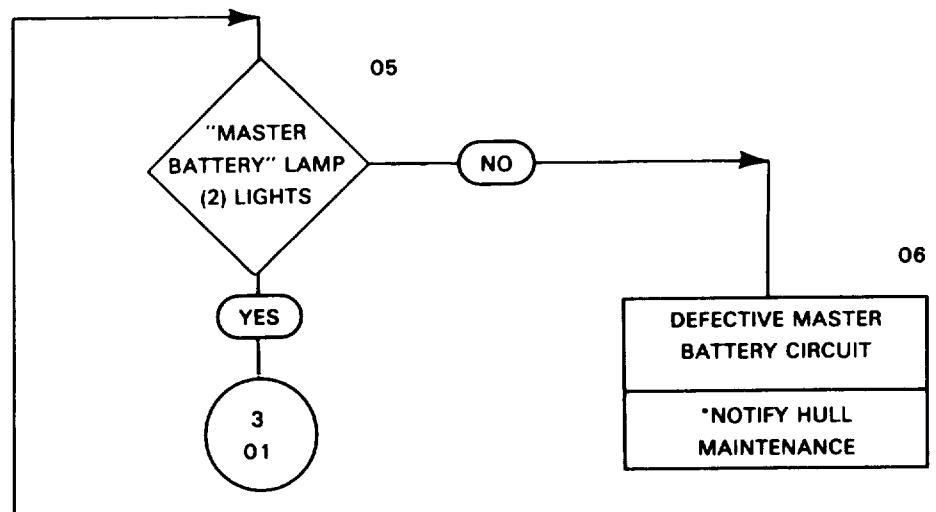
02  
**CAUTION**  
 TO PREVENT EQUIPMENT DAMAGE, TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTORS AND BEFORE MEASURING RESISTANCE OR CONTINUITY

03  
**NOTE**  
 FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY OR RESISTANCE, REFER TO JPG

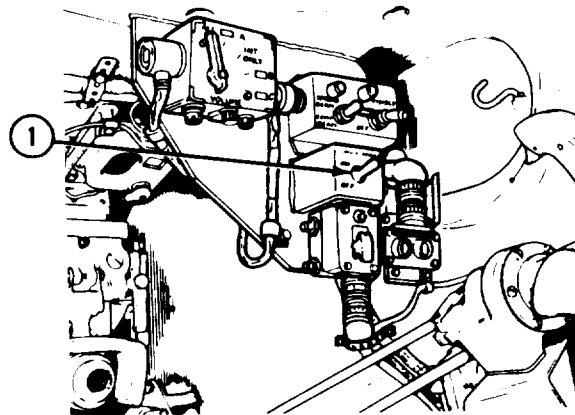
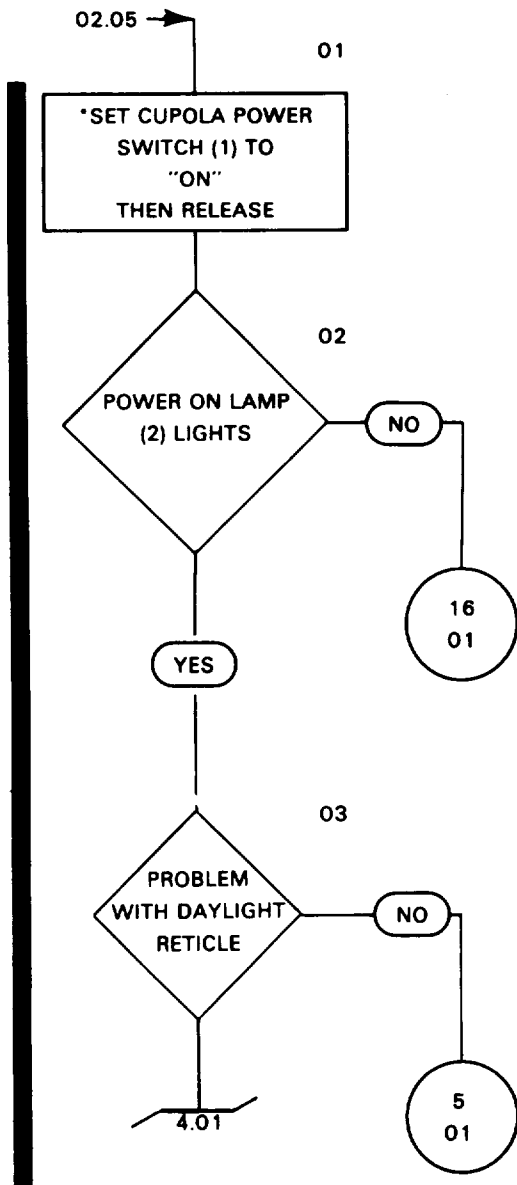
04  
 \*SET "MASTER BATTERY" SWITCH (1) ON MASTER CONTROL PANEL TO "ON"



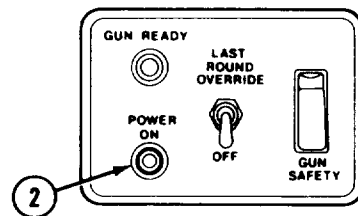
MASTER CONTROL PANEL



5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 3 OF 35)

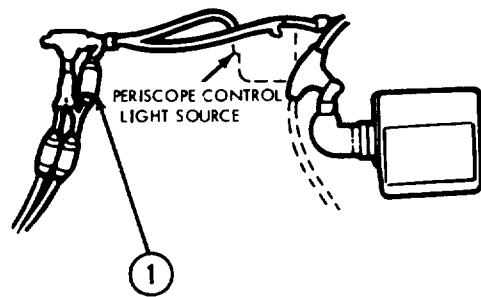
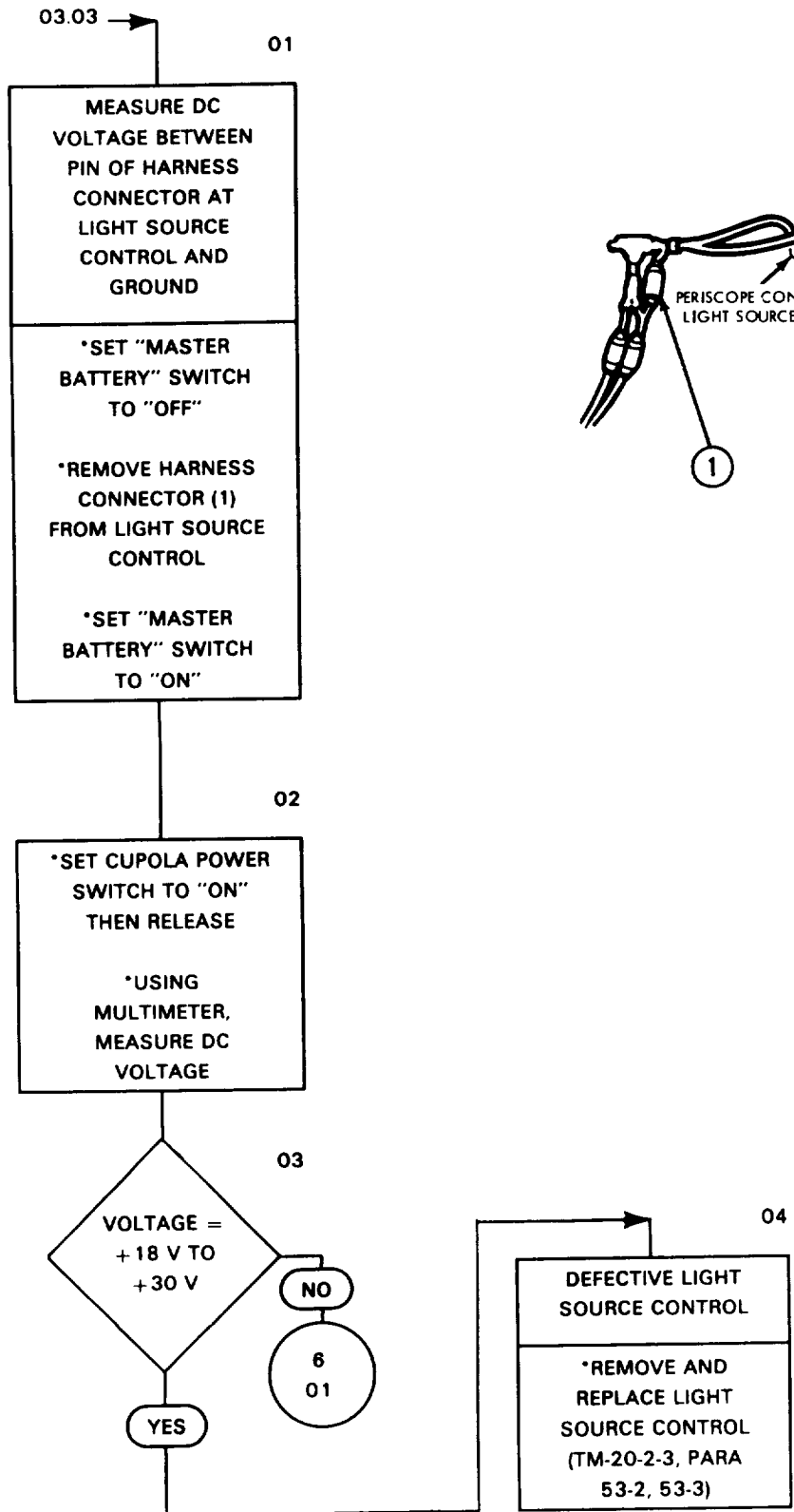


CUPOLA ELECTRICAL POWER CONTROL

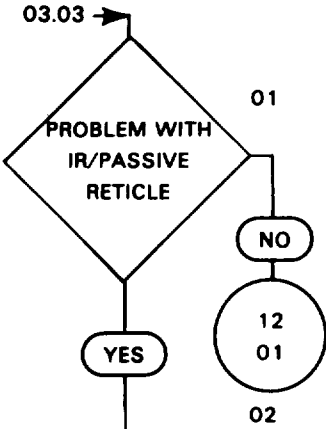


COMMANDER'S PANEL

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 4 OF 35)



5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 5 OF 35)



**MEASURE DC VOLTAGE BETWEEN SOCKET OF UNMARKED HARNESS CONNECTOR ON COMMANDER'S PERISCOPE AND GROUND**

\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REMOVE UNMARKED HARNESS CONNECTOR (1) FROM COMMANDER'S PERISCOPE

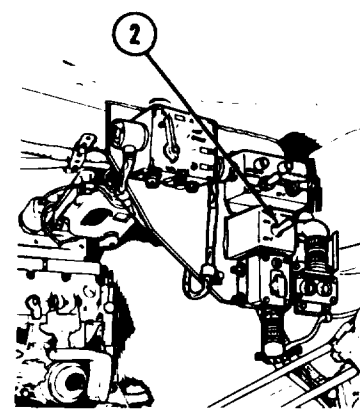
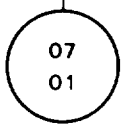
\*SET "MASTER BATTERY" SWITCH TO "ON"

\*SET CUPOLA POWER SWITCH (2) TO "ON" THEN RELEASE

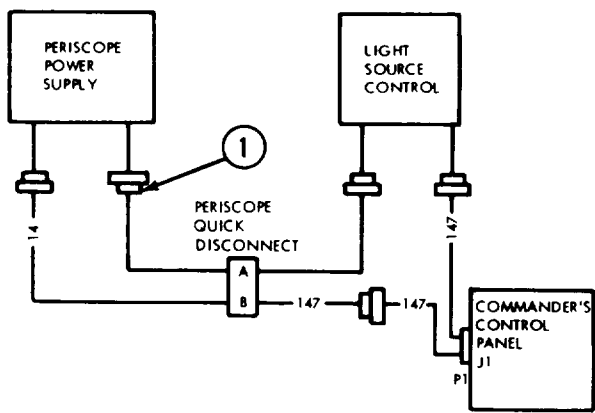
\*TURN CONTROL KNOB (3) ON LIGHT SOURCE CONTROL FROM FULL LEFT TO FULL RIGHT WHILE MEASURING VOLTAGE

**NOTE**  
CONTINUED FROM A PRIOR COLUMN

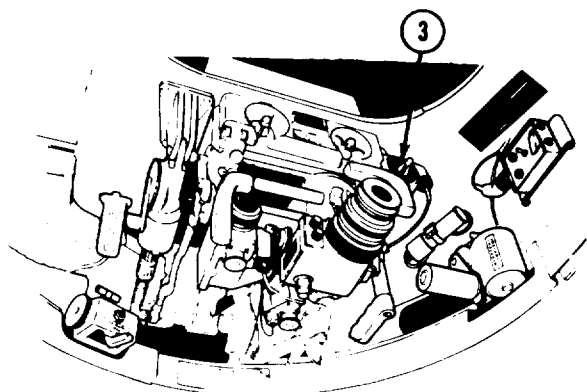
\*USING MULTIMETER, MEASURE DC VOLTAGE



CUPOLA ELECTRICAL POWER CONTROL

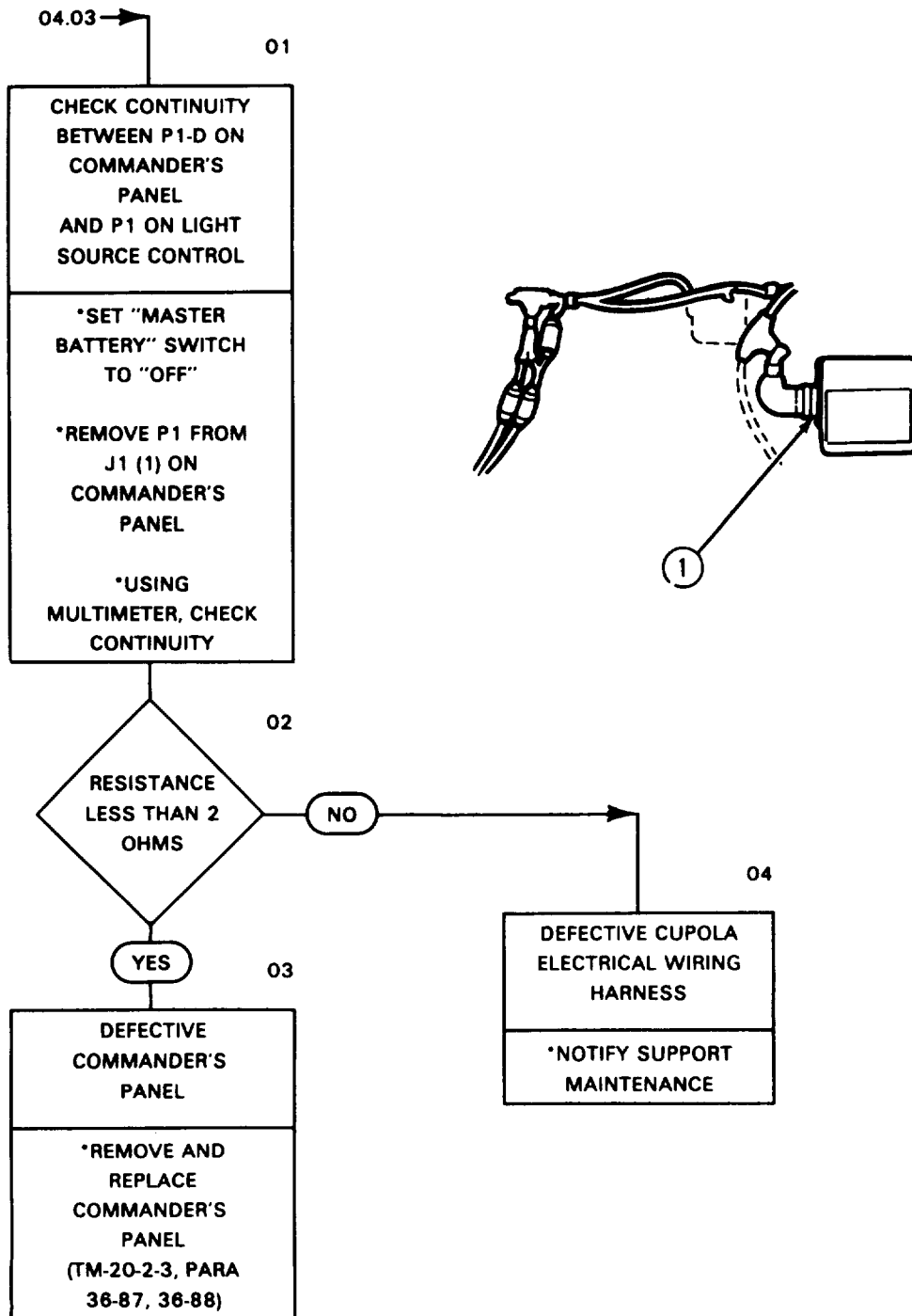


CUPOLA WIRING DIAGRAM

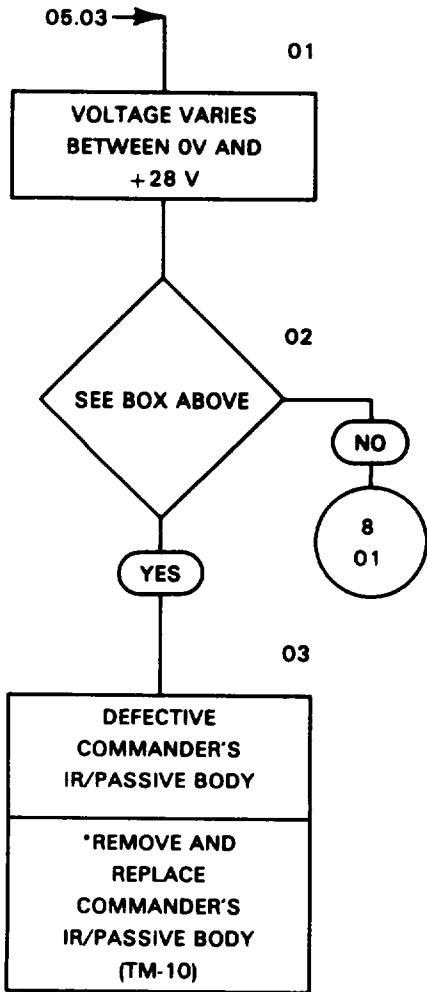


COMMANDER'S CUPOLA

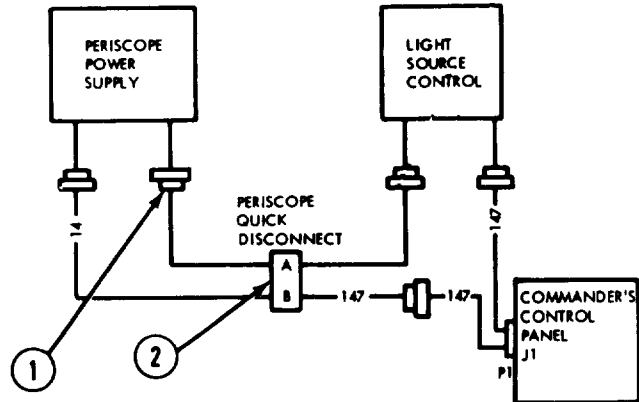
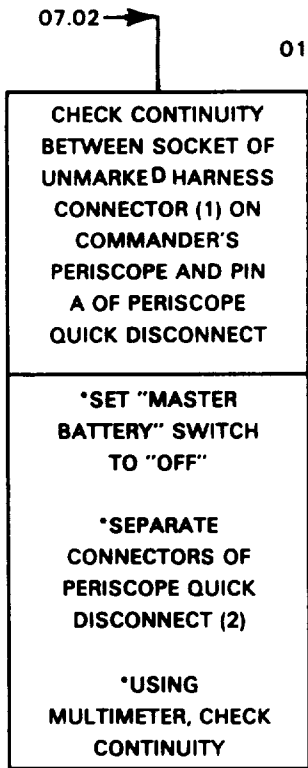
**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 6 OF 35)**



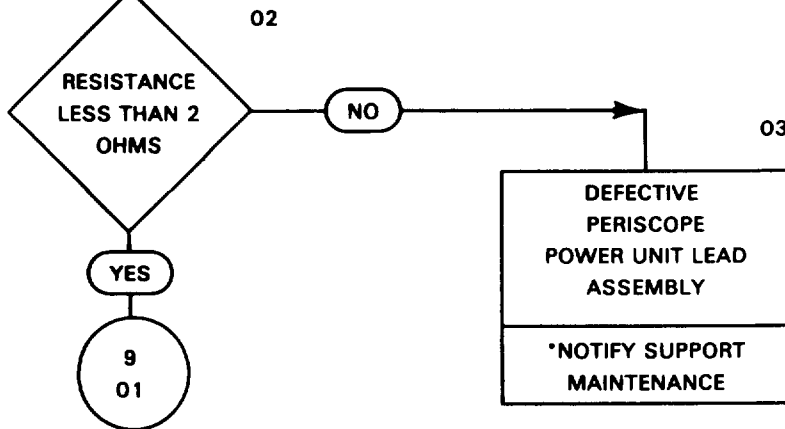
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 7 OF 35)



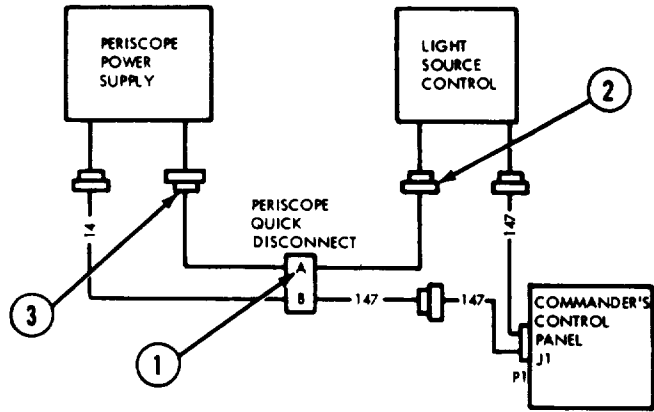
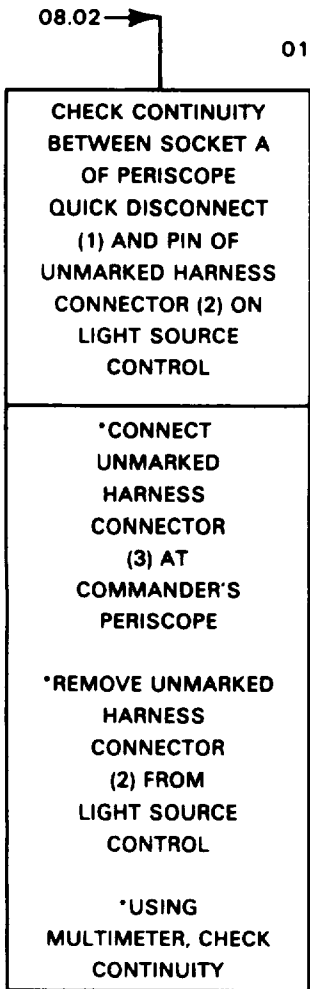
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 8 OF 35)



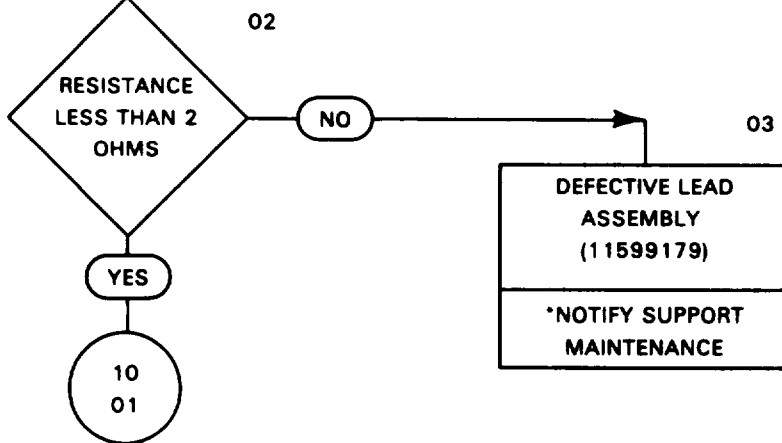
CUPOLA WIRING DIAGRAM



**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 9 OF 35)**

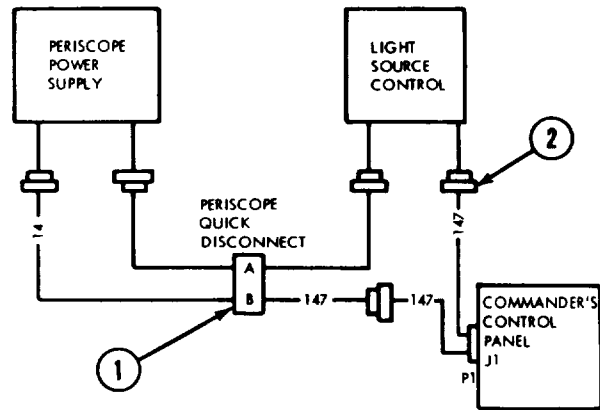
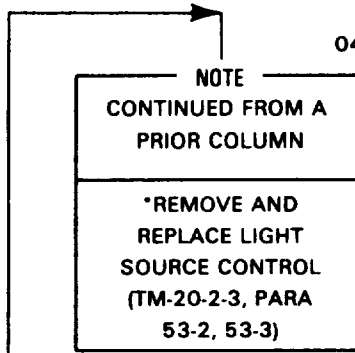
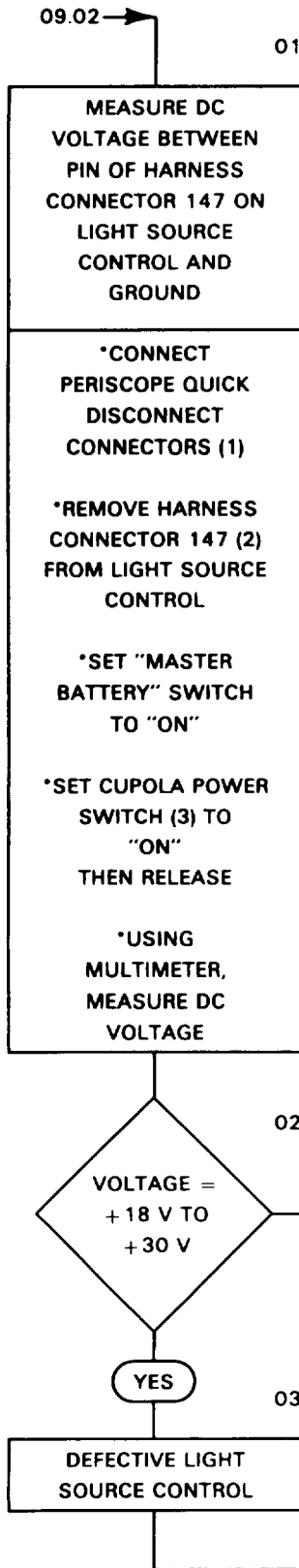


**CUPOLA WIRING DIAGRAM**

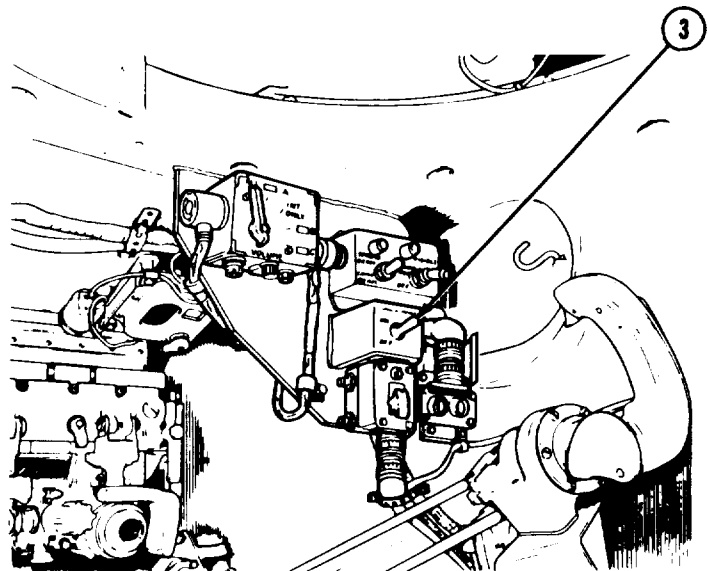




**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 10 OF 35)**

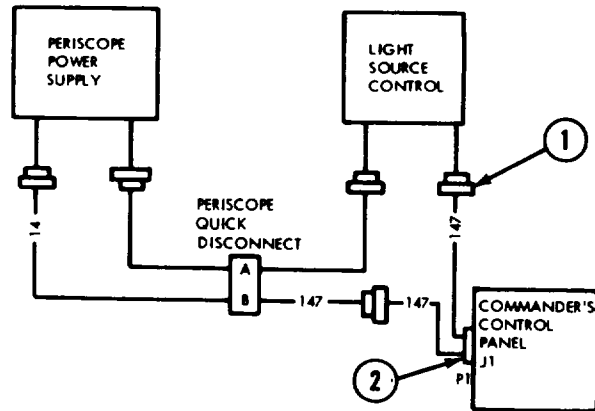
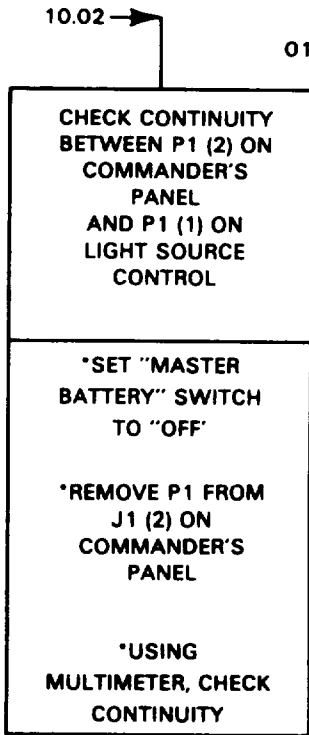


CUPOLA WIRING DIAGRAM

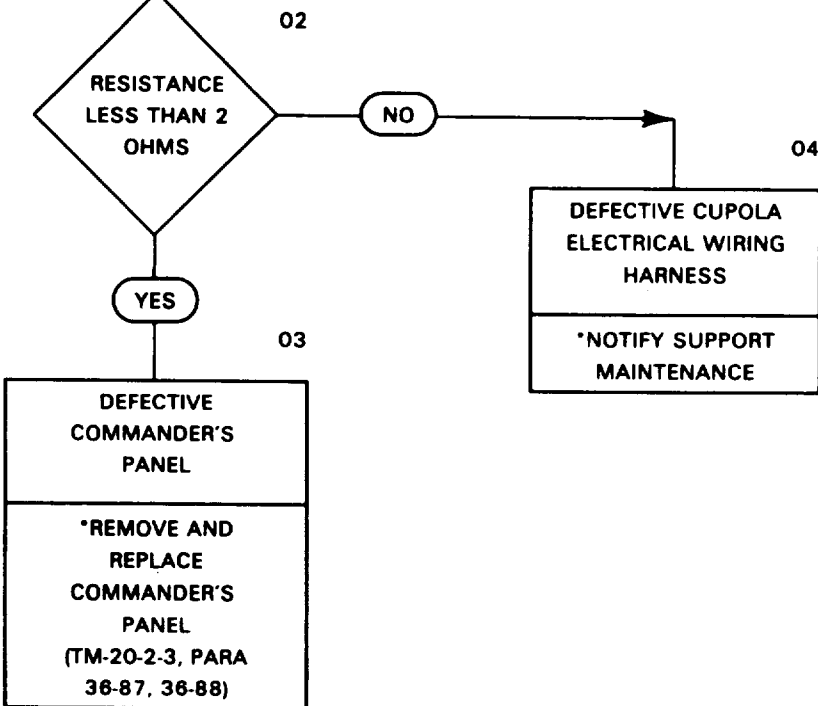


CUPOLA ELECTRICAL POWER CONTROL

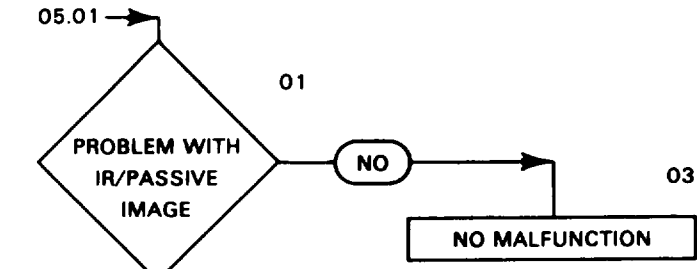
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 11 OF 35)



CUPOLA WIRING DIAGRAM



**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 12 OF 35)**



**02**

MEASURE DC VOLTAGE BETWEEN PIN OF HARNESS CONNECTOR 147 ON COMMANDER'S PERISCOPE AND GROUND

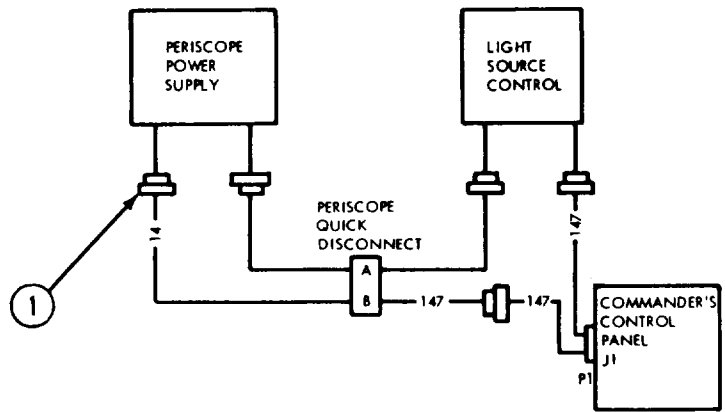
\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REMOVE HARNESS CONNECTOR 147 (1) FROM COMMANDER'S PERISCOPE

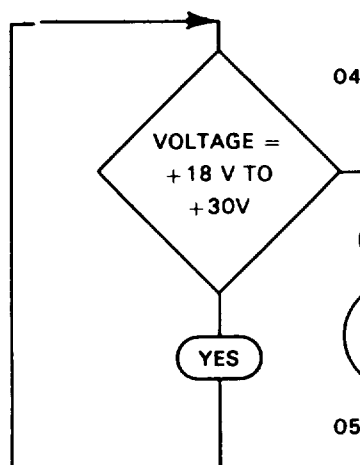
\*SET "MASTER BATTERY" SWITCH TO "ON"

\*SET CUPOLA POWER SWITCH (2) TO "ON" THEN RELEASE

\*USING MULTIMETER, MEASURE DC VOLTAGE



CUPOLA WIRING DIAGRAM

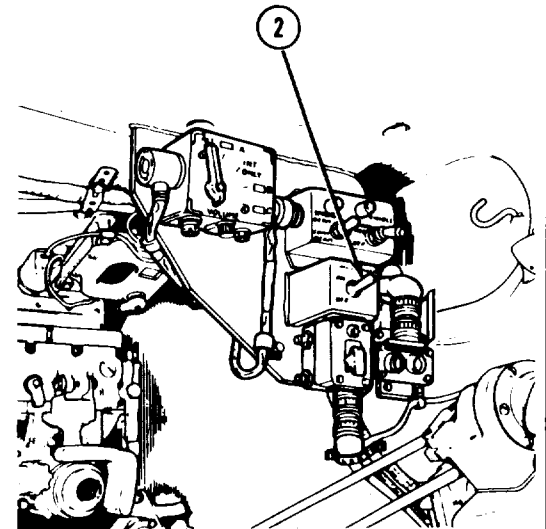


**05**

DEFECTIVE COMMANDER'S PERISCOPE

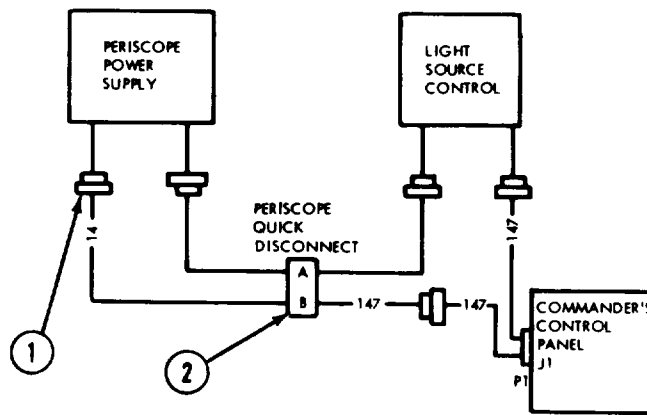
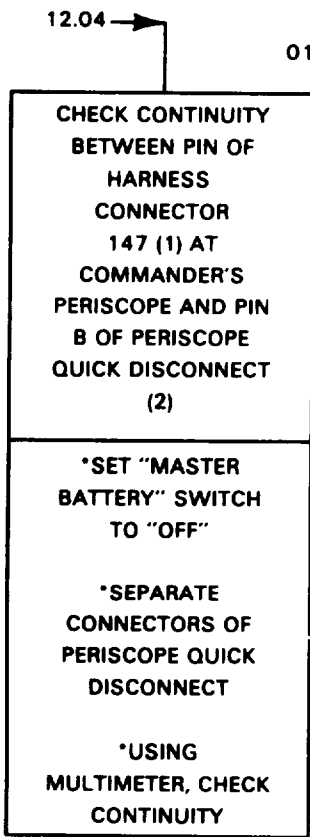
\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REMOVE AND REPLACE COMMANDER'S PERISCOPE (TM-10)

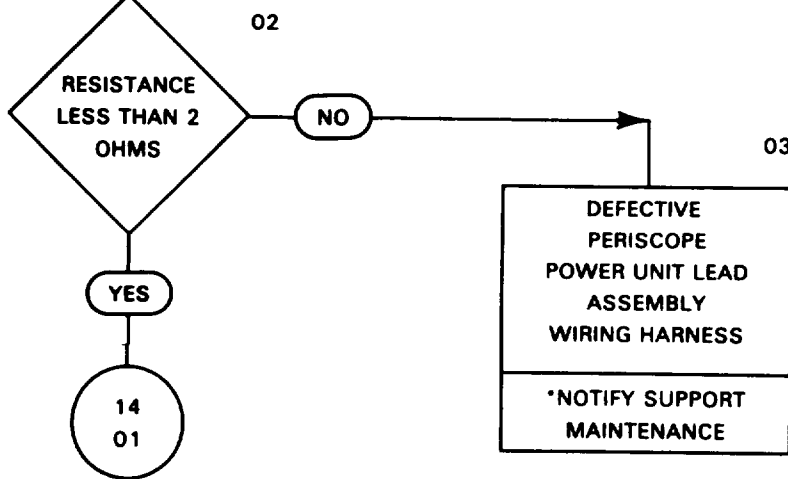


CUPOLA ELECTRICAL POWER CONTROL

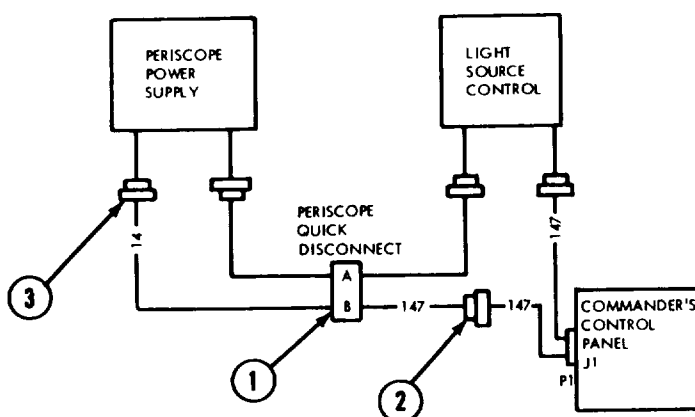
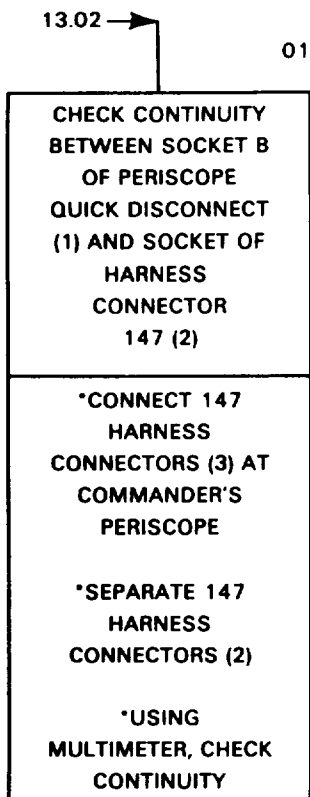
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 13 OF 35)



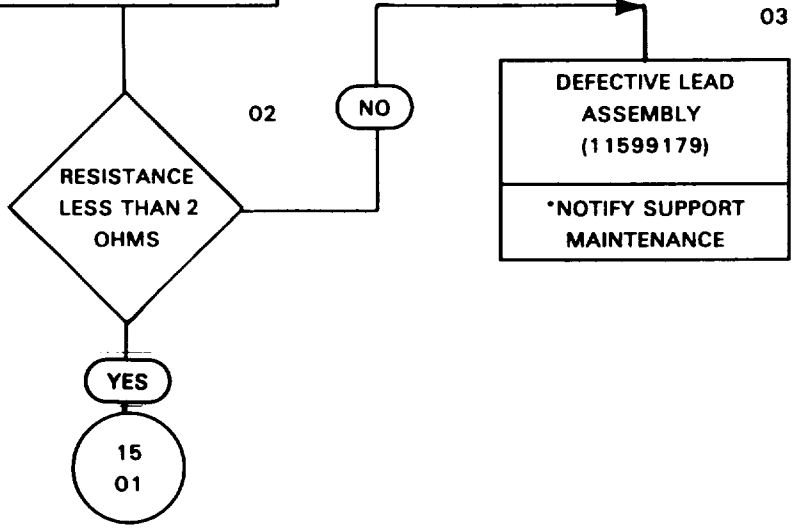
CUPOLA WIRING DIAGRAM



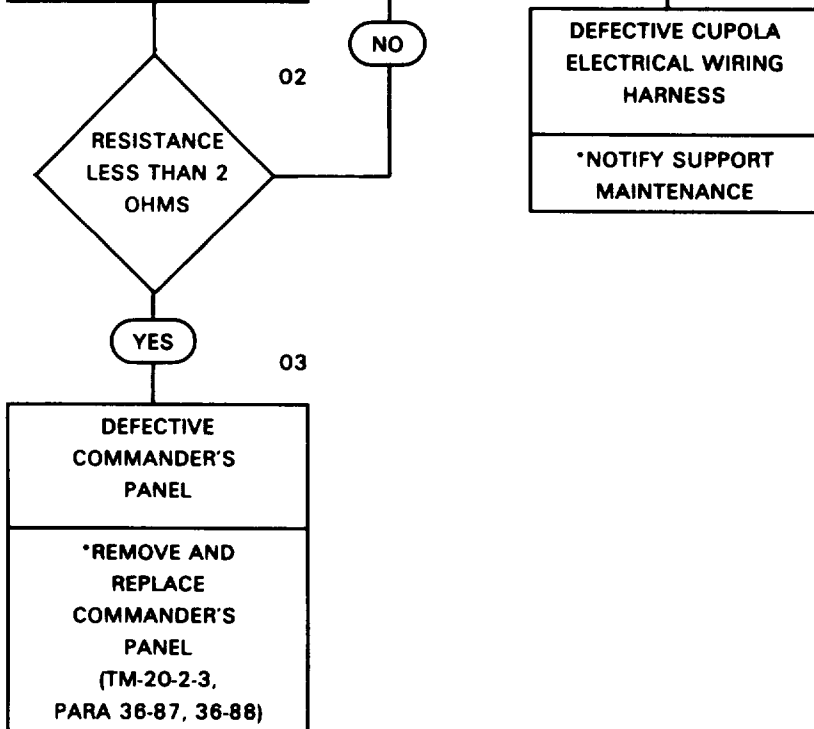
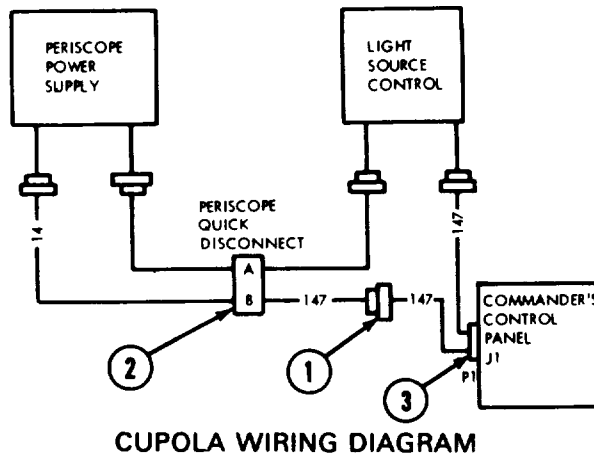
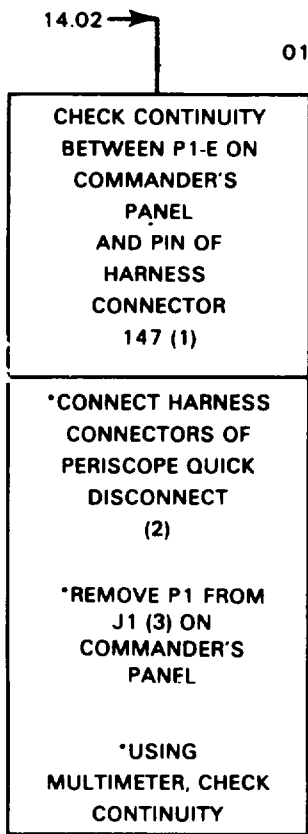
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 14 OF 35)



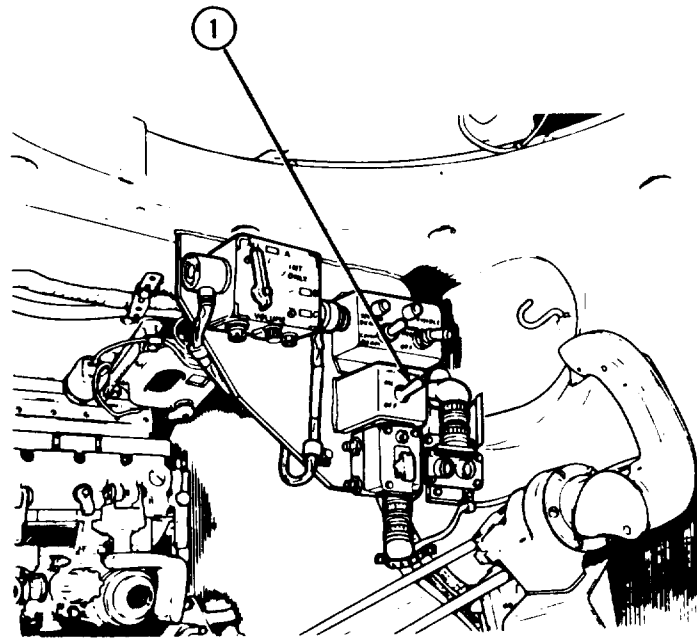
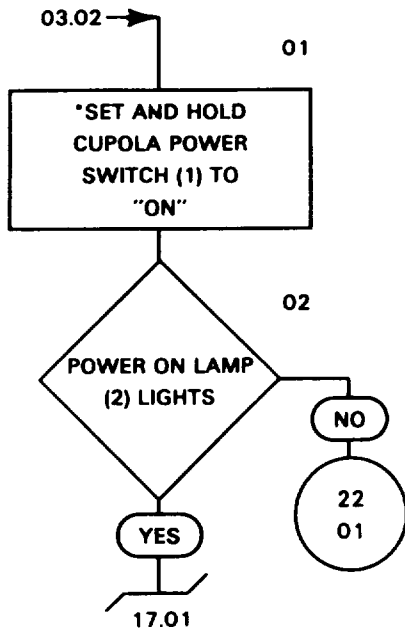
CUPOLA WIRING DIAGRAM



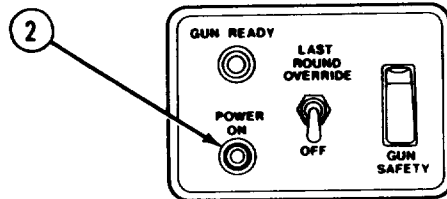
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 15 OF 35)



5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 16 OF 35)

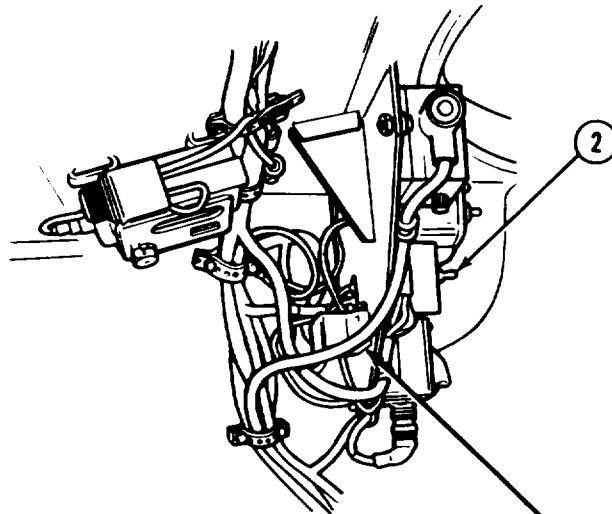
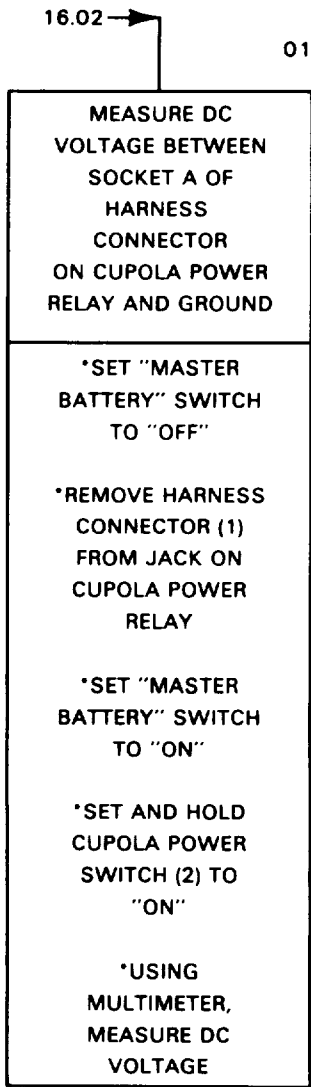


CUPOLA ELECTRICAL POWER CONTROL



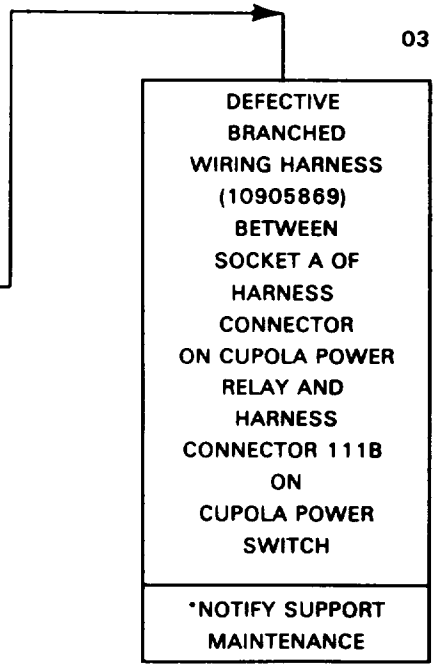
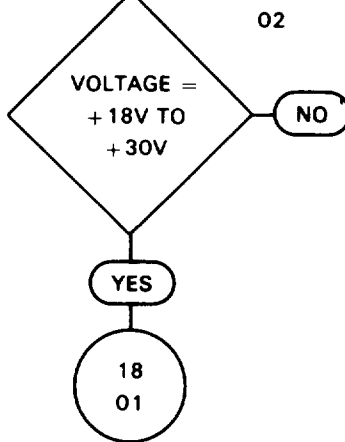
COMMANDER'S PANEL

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 17 OF 35)



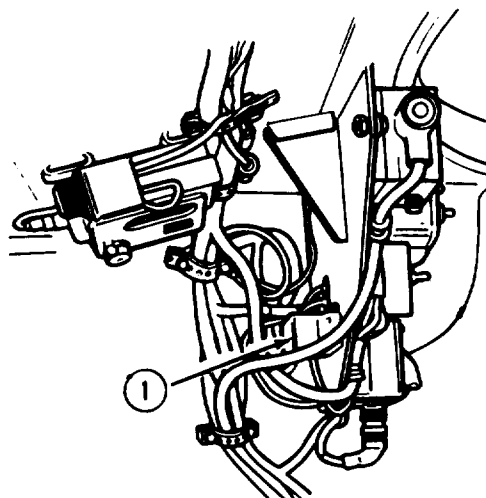
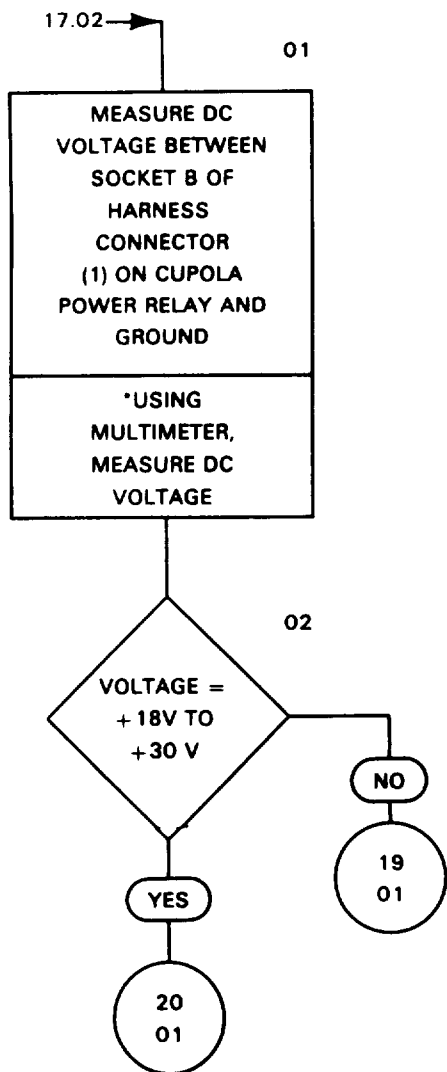
CUPOLA ELECTRICAL POWER CONTROL

HARNESS CONNECTOR (HIDDEN)



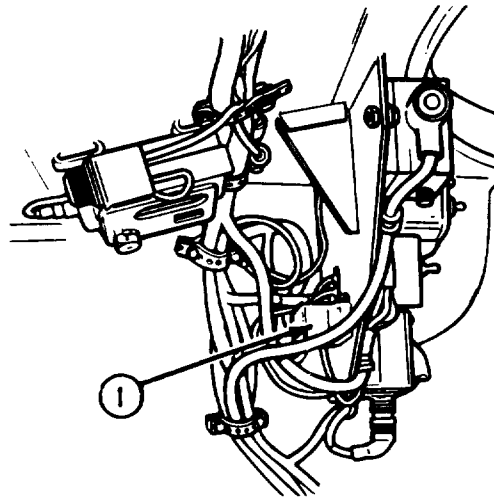
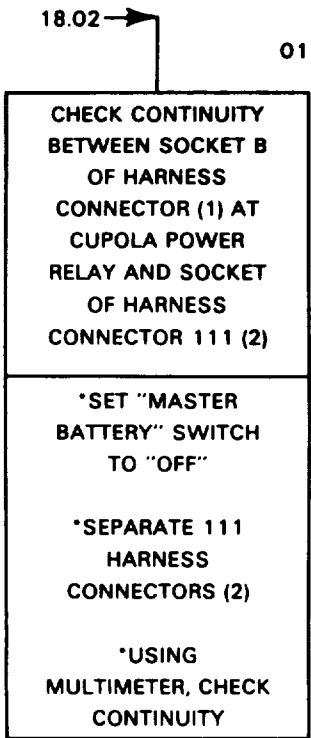


5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 18 OF 35)



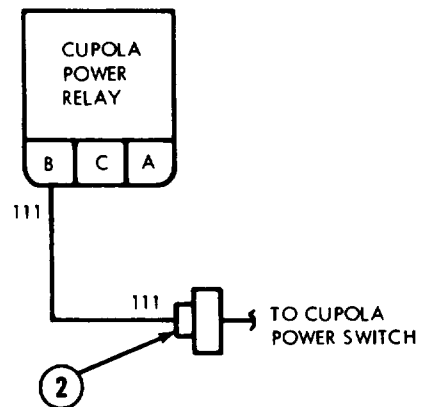
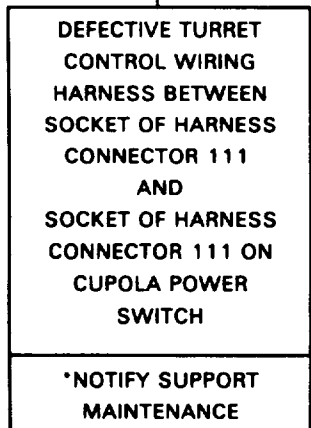
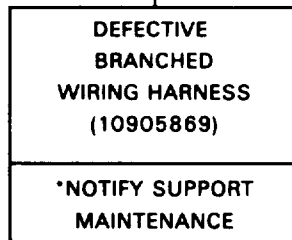
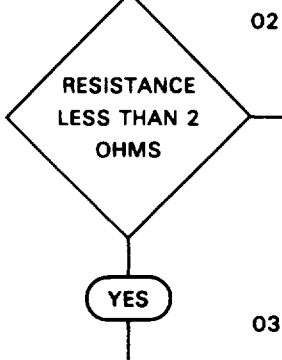
CUPOLA ELECTRICAL POWER CONTROL HARNESS CONNECTOR (HIDDEN)

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 19 OF 35)



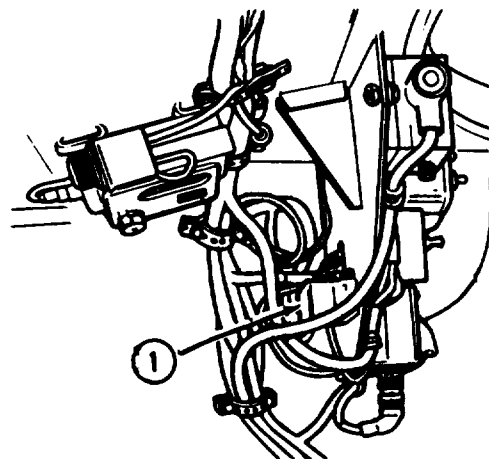
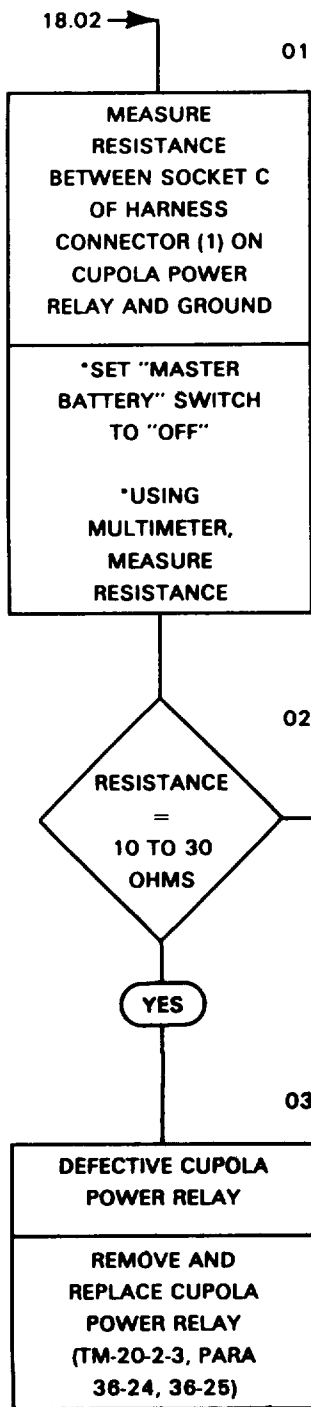
CUPOLA ELECTRICAL POWER CONTROL

HARNESS CONNECTOR (HIDDEN)



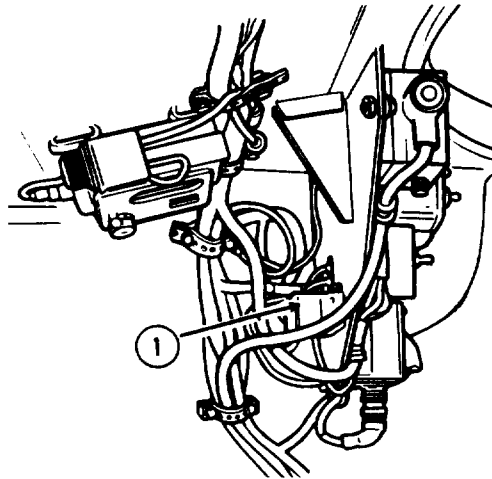
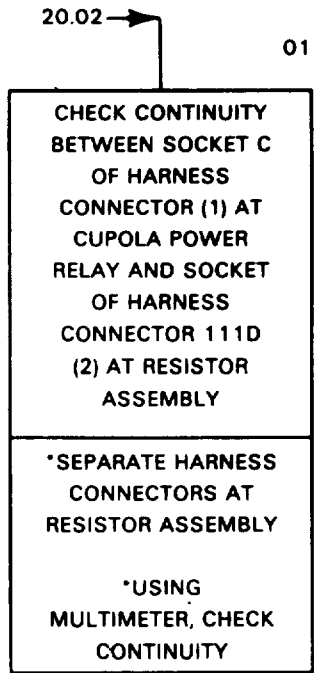
CUPOLA POWER RELAY BLOCK DIAGRAM

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 20 OF 35)

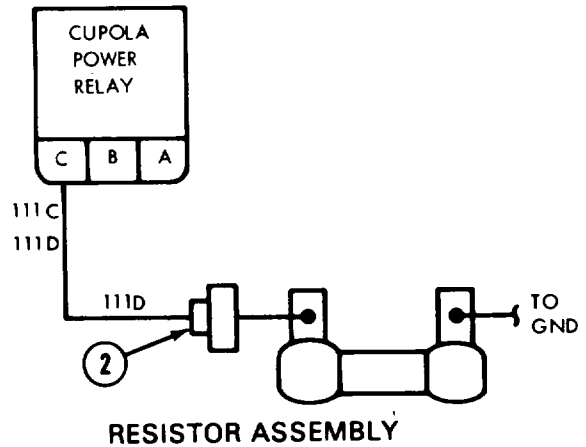
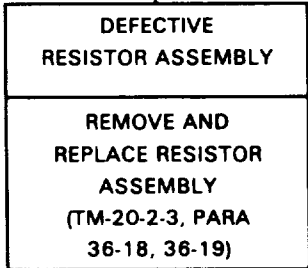
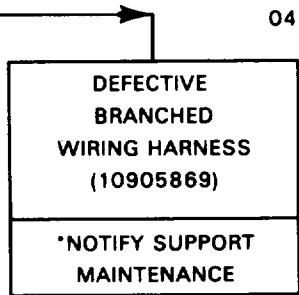
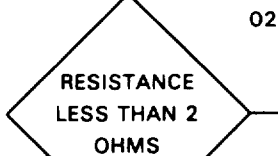


CUPOLA ELECTRICAL POWER CONTROL HARNESS CONNECTOR (HIDDEN)

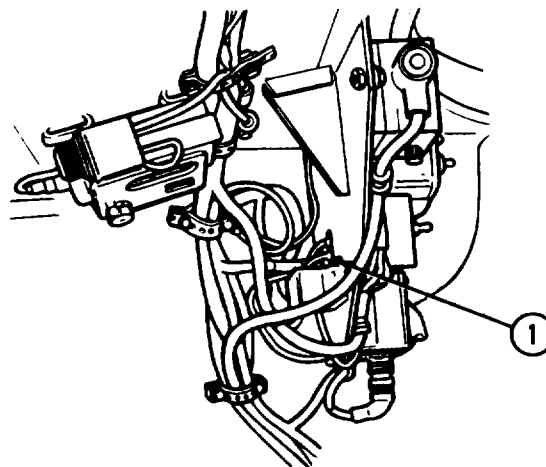
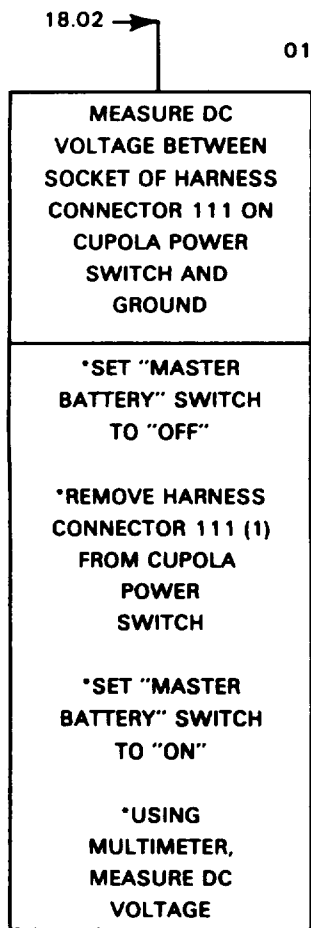
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 21 OF 35)



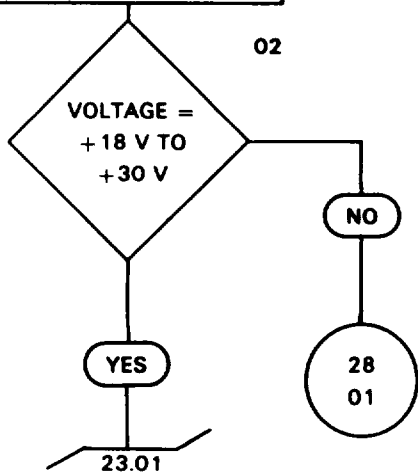
CUPOLA ELECTRICAL POWER CONTROL



5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 22 OF 35)



CUPOLA ELECTRICAL POWER CONTROL AND CONNECTORS



5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 23 OF 35)

22.02 →

01

MEASURE DC VOLTAGE BETWEEN SOCKET B OF HARNESS CONNECTOR ON CUPOLA INTER-CONNECTING BOX AND GROUND

\*SET "MASTER BATTERY" SWITCH TO "OFF"

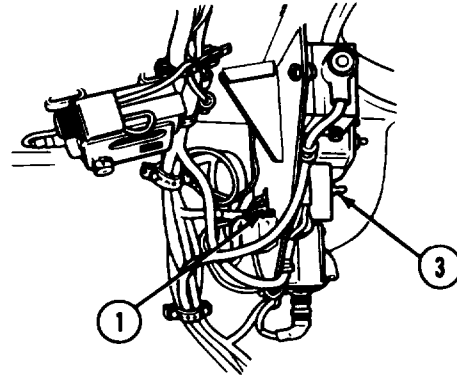
\*REPLACE HARNESS CONNECTOR 111 (1) ON CUPOLA POWER SWITCH

\*REMOVE CONNECTOR (2) FROM JACK ON CUPOLA INTER-CONNECTING BOX

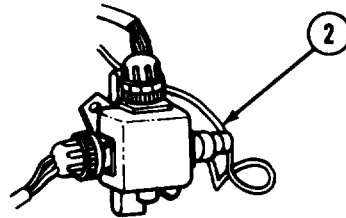
\*SET "MASTER BATTERY" SWITCH TO "ON"

\*SET CUPOLA POWER SWITCH (3) TO "ON" THEN RELEASE

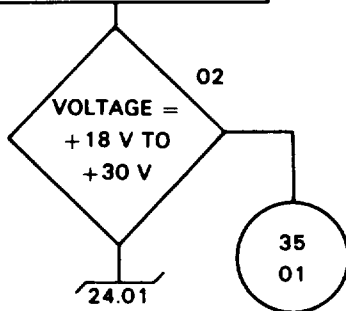
\*USING MULTIMETER, MEASURE DC VOLTAGE



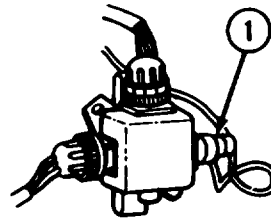
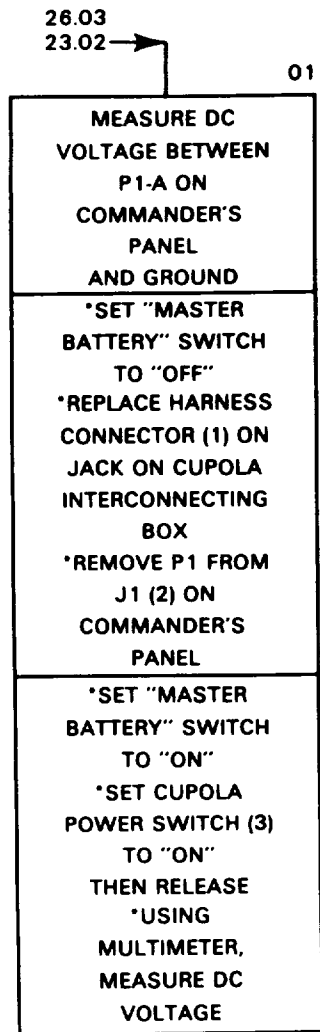
CUPOLA ELECTRICAL POWER CONTROL AND CONNECTORS



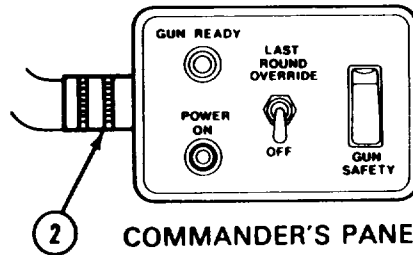
CUPOLA INTERCONNECTING BOX



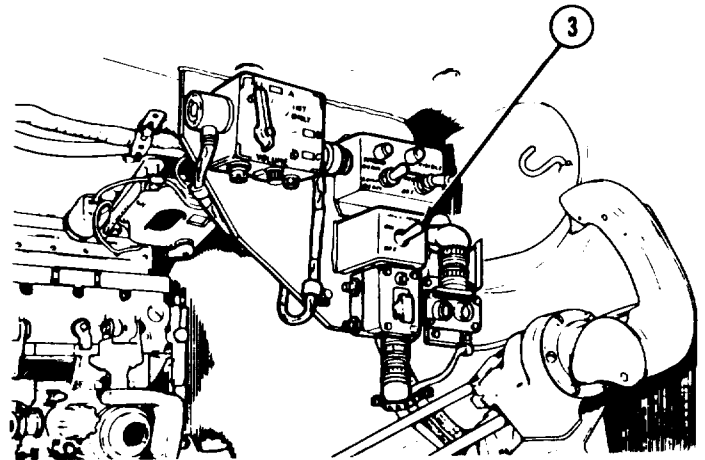
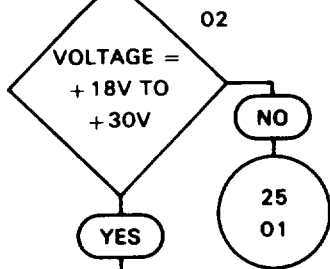
**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 24 OF 35)**



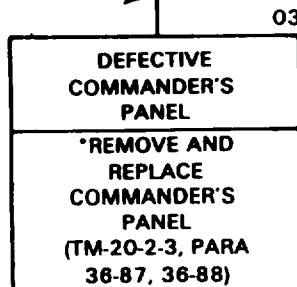
**CUPOLA INTERCONNECTING BOX**



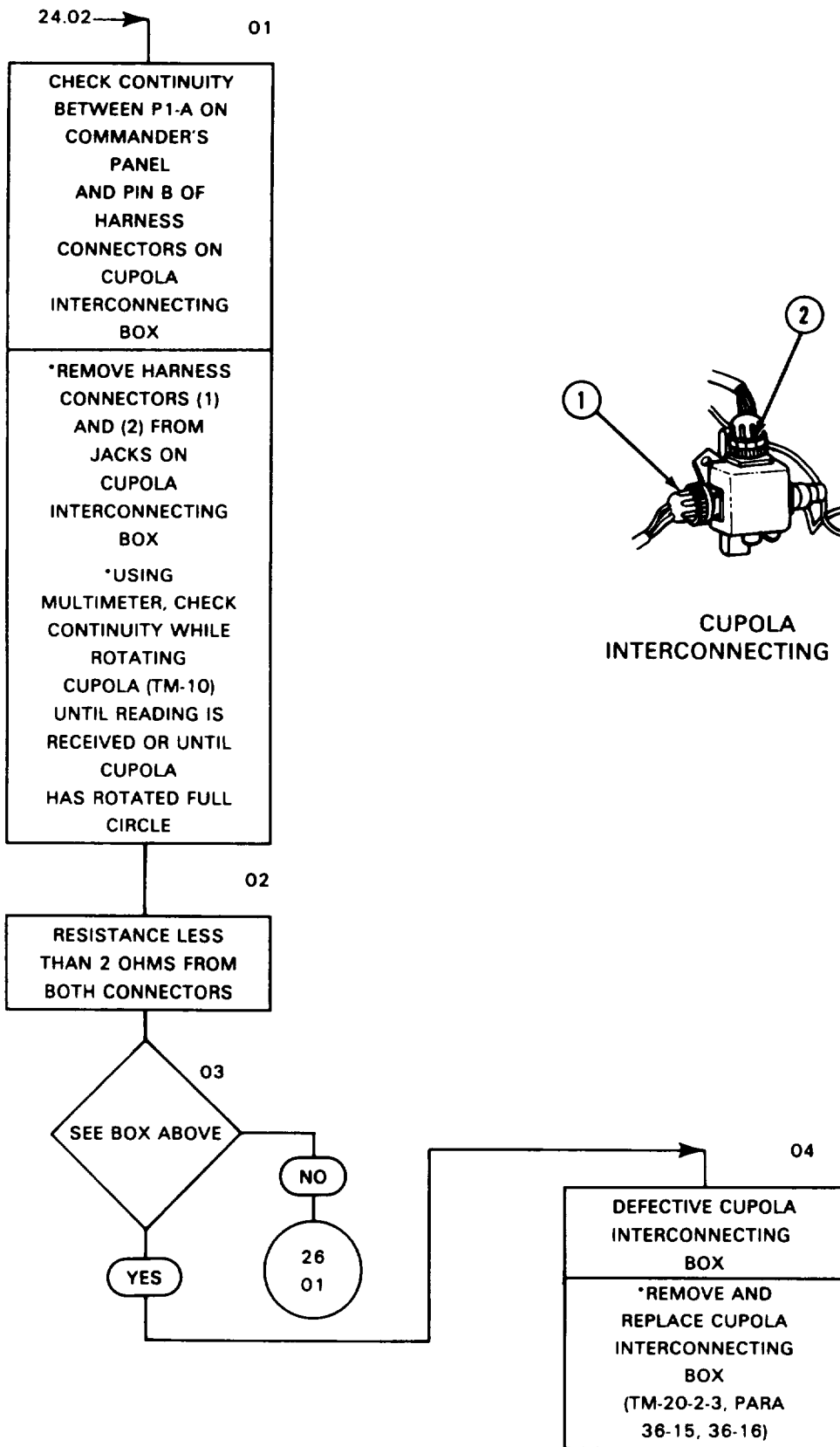
**COMMANDER'S PANEL**



**CUPOLA ELECTRICAL POWER CONTROL**

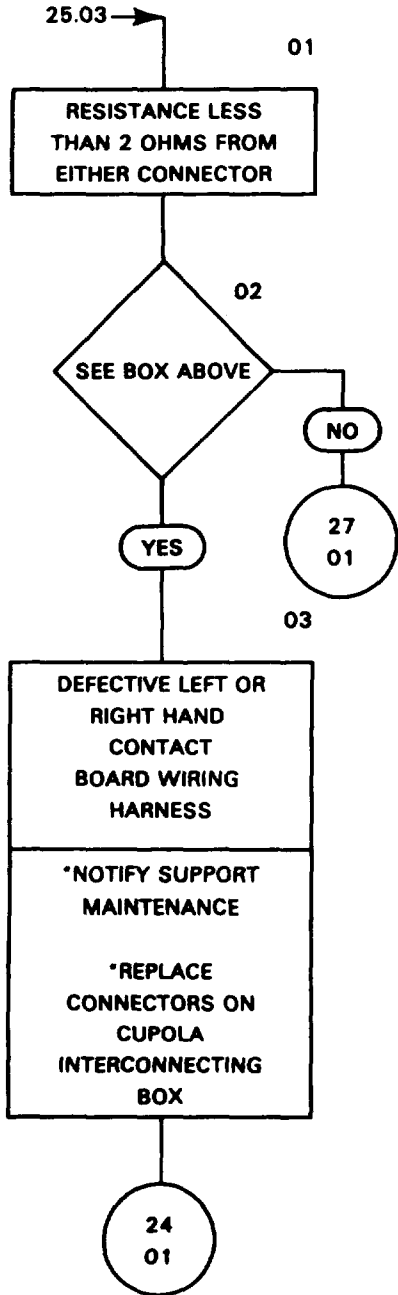


5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 25 OF 35)

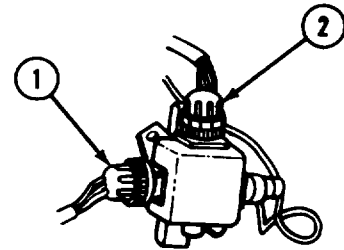
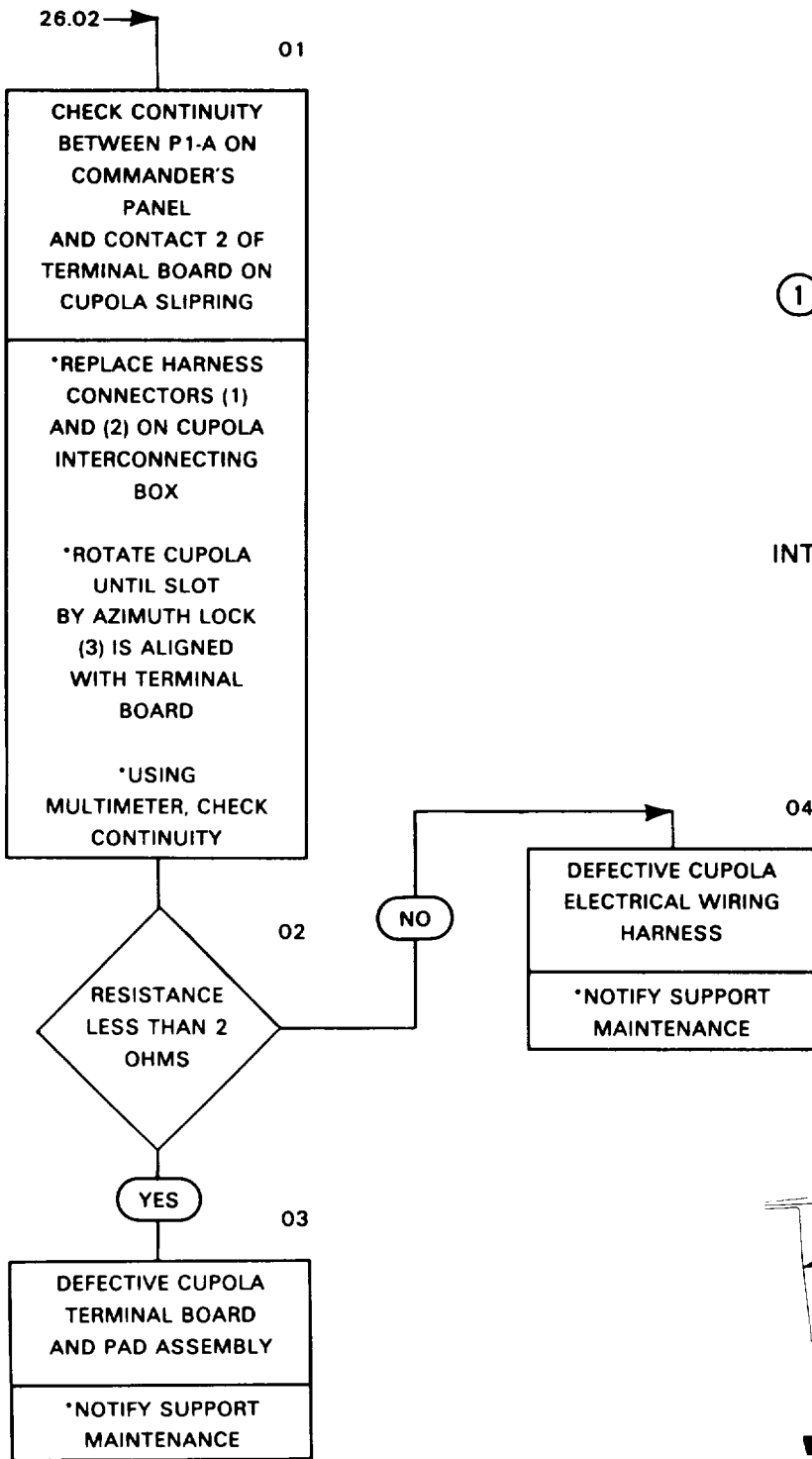




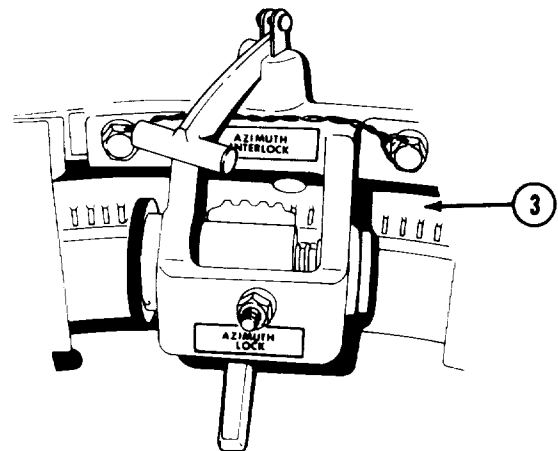
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 26 OF 35)



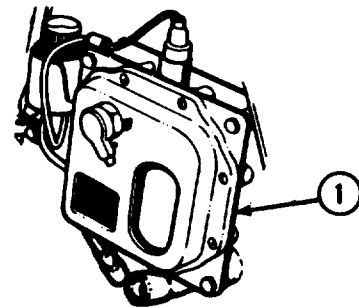
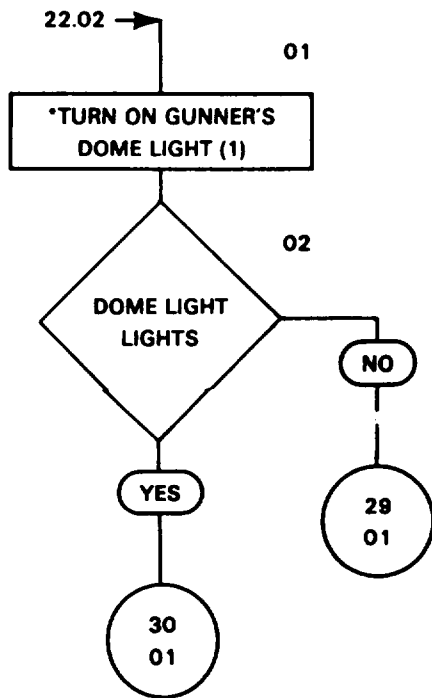
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 27 OF 35)



CUPOLA INTERCONNECTING BOX

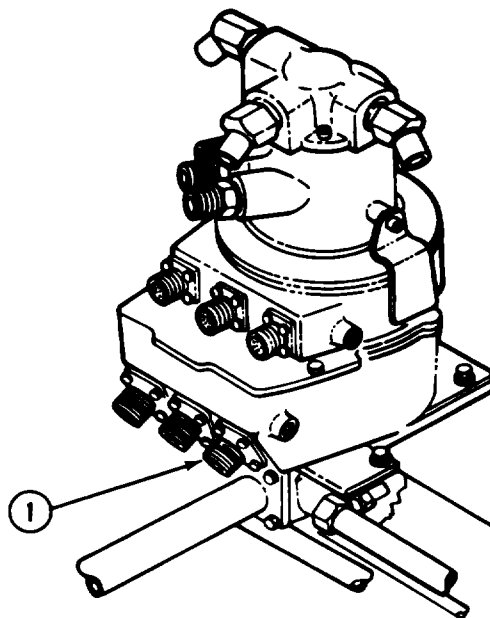
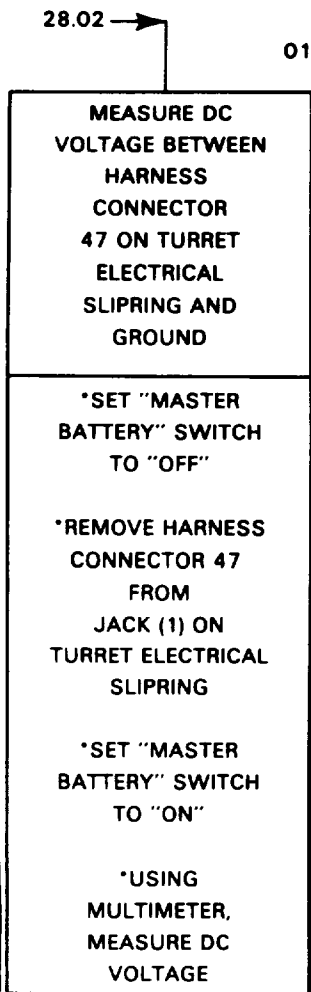


**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 28 OF 35)**

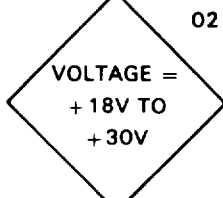


**DOME LIGHT AND DIMMER SWITCH**

**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 29 OF 35)**

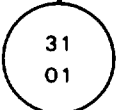


TURRET SLIPRING

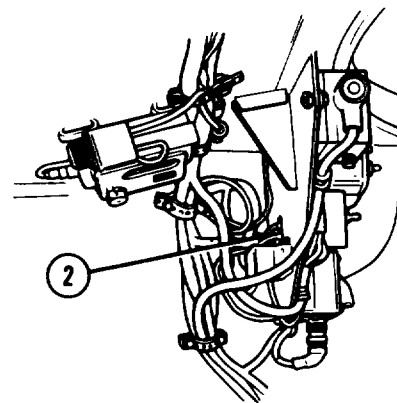
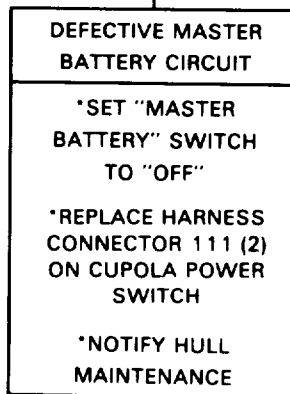


NO

YES



03



CUPOLA ELECTRICAL POWER CONTROL CONNECTORS

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 30 OF 35)

28.02 →

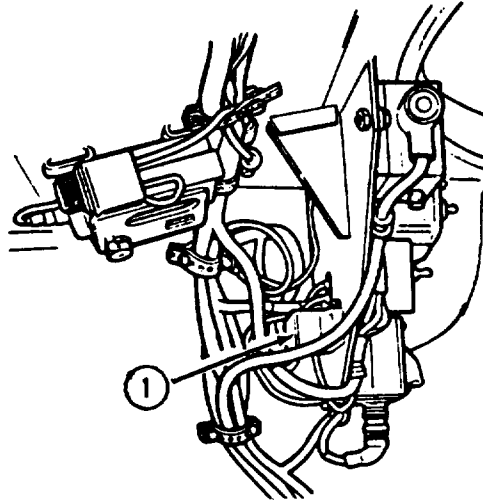
01

CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 111 (1) AT CUPOLA POWER SWITCH AND SOCKET A, CIRCUIT 111, OF HARNESS CONNECTOR ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REMOVE HARNESS CONNECTOR FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*USING MULTIMETER, CHECK CONTINUITY



CUPOLA ELECTRICAL POWER CONTROL HARNESS CONNECTOR (HIDDEN)

30.03 →

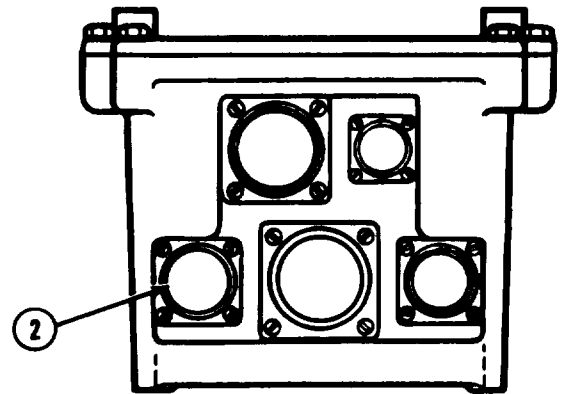
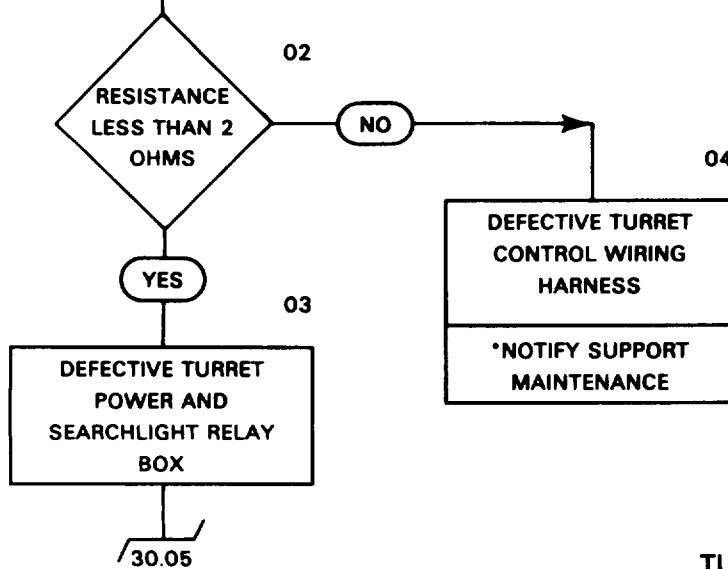
05

NOTE

CONTINUED FROM A PRIOR COLUMN

\*REPLACE HARNESS CONNECTOR 111 (1) ON JACK ON CUPOLA POWER SWITCH

\*REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)



TURRET POWER AND SEARCHLIGHT RELAY BOX

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 31 OF 35)

29.02 →

01

MEASURE DC VOLTAGE BETWEEN SOCKET A OF HARNESS CONNECTOR 100 ON TURRET POWER AND SEARCHLIGHT RELAY BOX AND GROUND

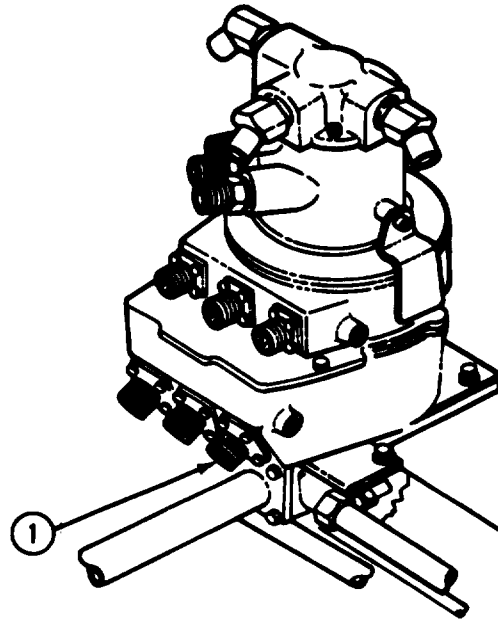
\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REPLACE HARNESS CONNECTOR 47 ON JACK (1) ON TURRET ELECTRICAL SLIPRING

\*REMOVE HARNESS CONNECTOR, CIRCUIT 100, FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

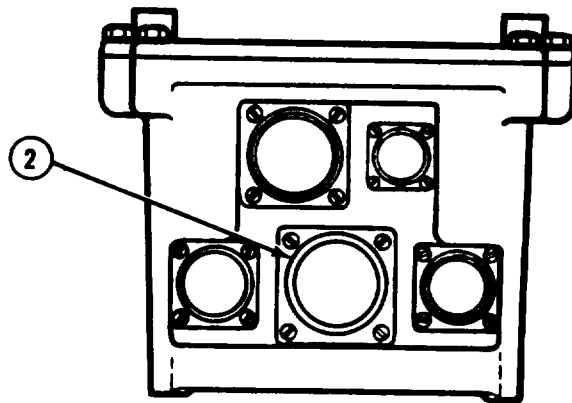
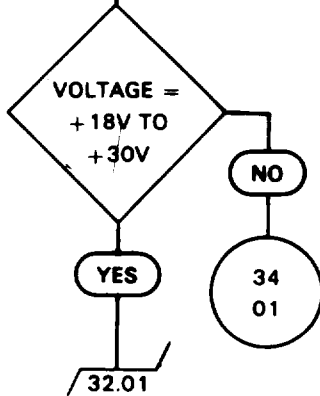
\*SET "MASTER BATTERY" SWITCH TO "ON"

\*USING MULTIMETER, MEASURE DC VOLTAGE



TURRET SLIPRING

02



TURRET POWER AND SEARCHLIGHT RELAY BOX

**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 32 OF 35)**

31.02 →

01

CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 111 (1) AT CUPOLA POWER SWITCH AND SOCKET A, CIRCUIT 111, OF HARNESS CONNECTOR ON TURRET POWER AND SEARCHLIGHT RELAY BOX

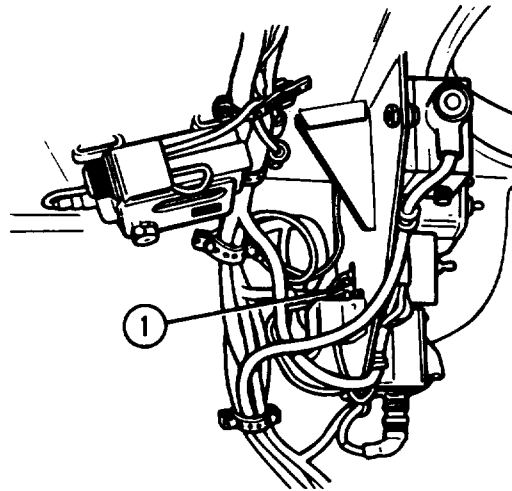
\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REPLACE HARNESS CONNECTOR 100 ON JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

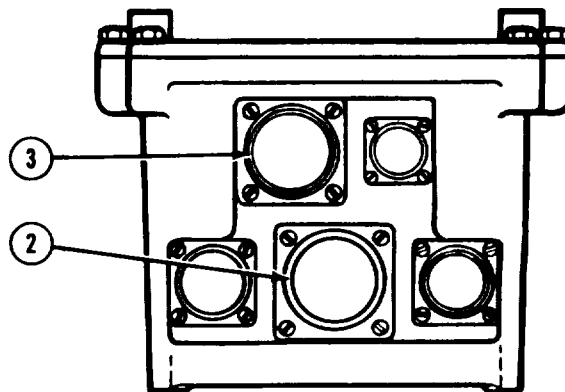
\*REMOVE HARNESS CONNECTOR, CIRCUIT 111, FROM JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*USING MULTIMETER, CHECK CONTINUITY

33.01

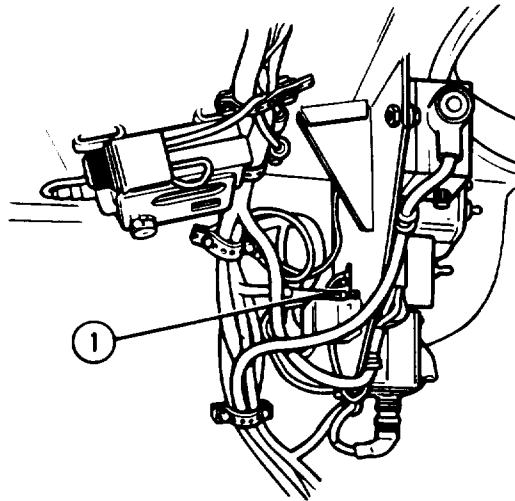
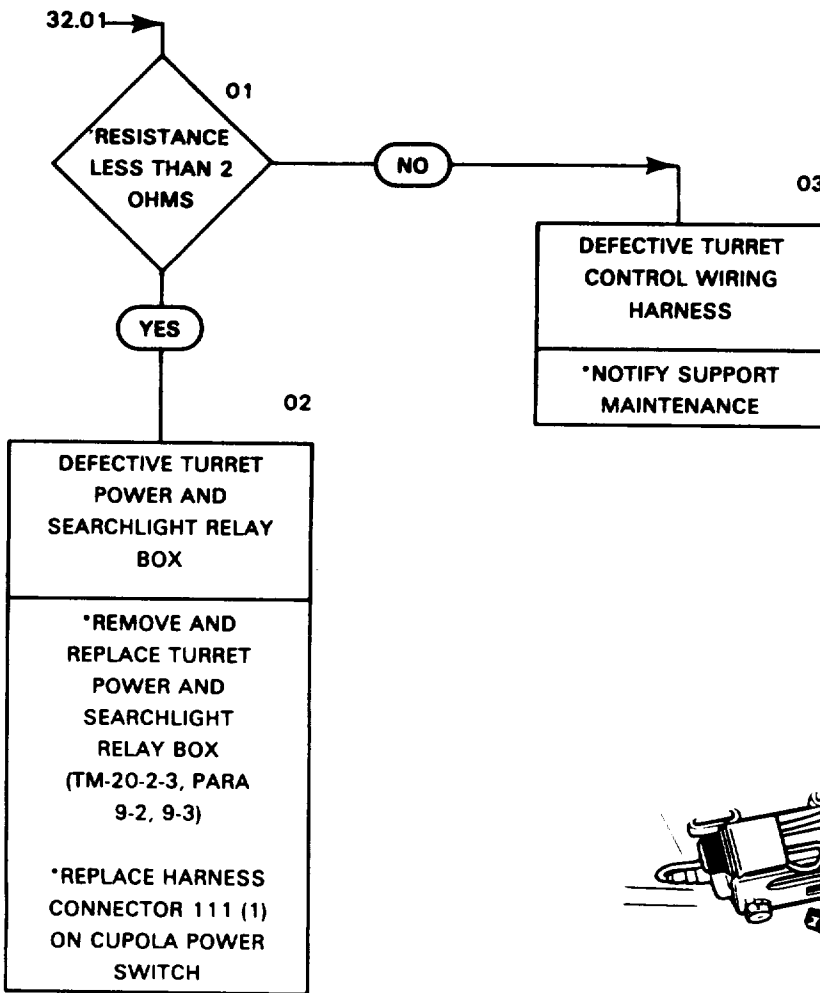


CUPOLA ELECTRICAL POWER CONTROL CONNECTORS



TURRET POWER AND SEARCHLIGHT RELAY BOX

5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 33 OF 35)



CUPOLA ELECTRICAL POWER CONTROL CONNECTORS



**5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 34 OF 35)**

31.02 →

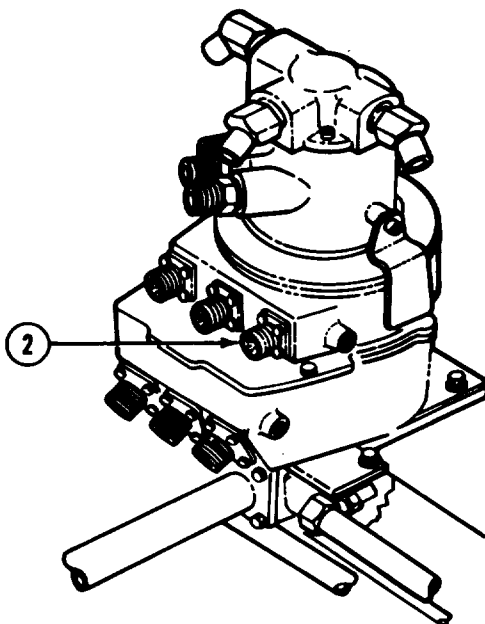
01

CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 100 ON TURRET ELECTRICAL SLIPRING AND SOCKET A OF HARNESS CONNECTOR 100 ON JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REMOVE HARNESS CONNECTOR 100 FROM JACK (2) ON TURRET ELECTRICAL SLIPRING

\*USING MULTIMETER, CHECK CONTINUITY



TURRET SLIPRING

34.03 →

NOTE

05

CONTINUED FROM A PRIOR COLUMN

AND SEARCHLIGHT RELAY BOX

\*REMOVE AND REPLACE TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-7, 3-8)

02

RESISTANCE LESS THAN 2 OHMS

03

YES

DEFECTIVE TURRET ELECTRICAL SLIPRING

\*REPLACE HARNESS CONNECTOR 100 ON JACK (1) ON TURRET POWER

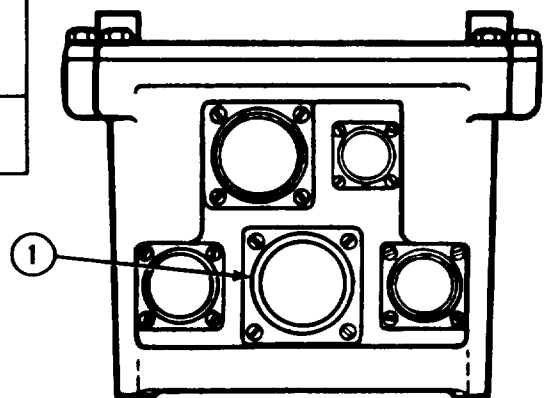
34.05

NO

04

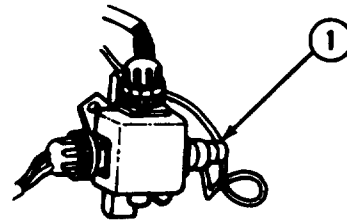
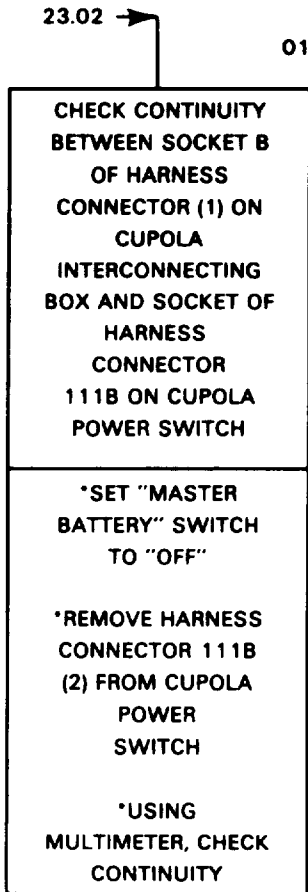
DEFECTIVE SLIPRING TO TURRET POWER RELAY BOX WIRING HARNESS

\*NOTIFY SUPPORT MAINTENANCE

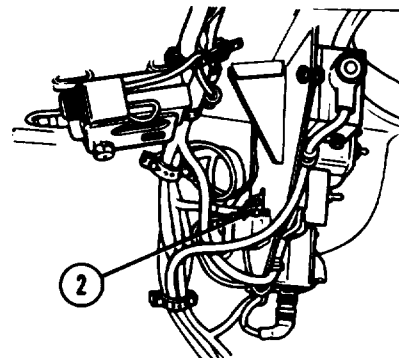


TURRET POWER AND SEARCHLIGHT RELAY BOX

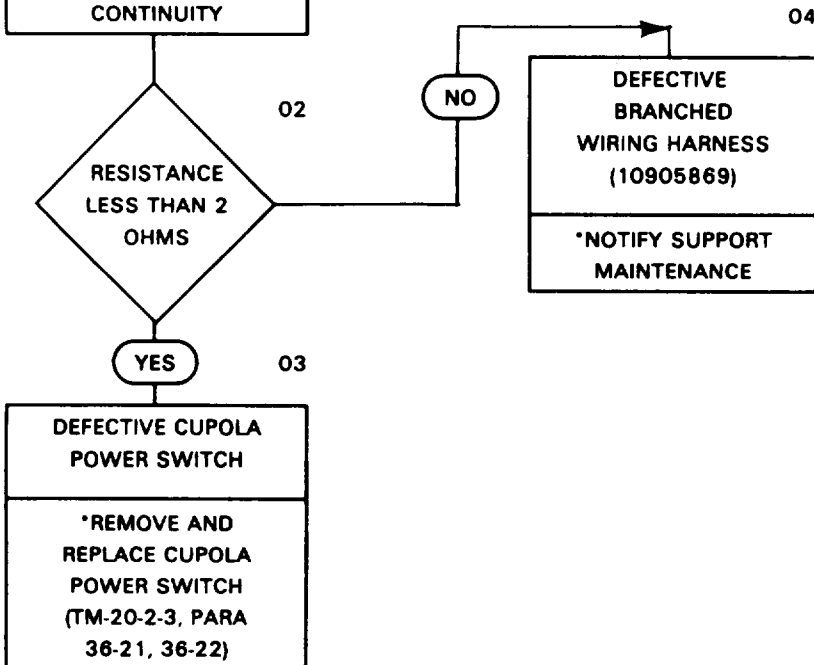
5-5. COMMANDER'S PERISCOPE TROUBLESHOOTING (COMMANDER'S CONTROL PANEL 11673913 INSTALLED) (SHEET 35 OF 35)



CUPOLA INTERCONNECTING BOX



CUPOLA ELECTRICAL POWER CONTROL HARNESS CONNECTOR (HIDDEN)



**CHAPTER 6**

**CBR FAULT ISOLATION DIAGAMS**

**6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 1 OF 8)**

**SYMPTOM:** (50) Commander's air filter heater fails to operate

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Commander's Air Filter Heater	2	8
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipping	3	5

**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components

- (2) ETM 643-091-9400R/JPG for procedures to:  
Use multimeter  
Disconnect electrical connectors
- (3) TM 9-2350-222-10 for procedure to:  
Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 2 OF 8)

**CAUTION** 01

TO PREVENT EQUIPMENT DAMAGE, BE SURE TO TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTOR AND BEFORE MEASURING CONTINUITY OR RESISTANCE.

**NOTE** 02

FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, AND RESISTANCE, REFER TO JPG

03

SET 'MASTER BATTERY' SWITCH (1) ON MASTER CONTROL PANEL TO 'ON'

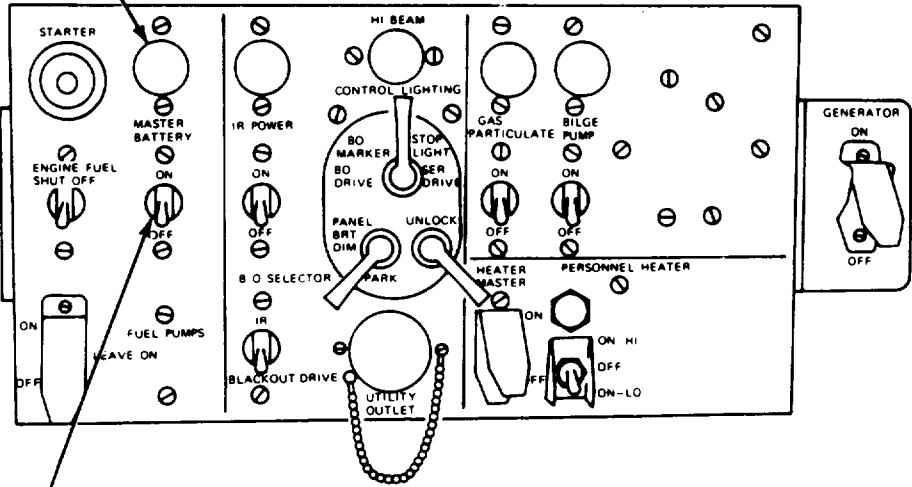
04

'MASTER BATTERY' LAMP (2) LIGHTS

YES

3  
01

2



MASTER CONTROL PANEL

1

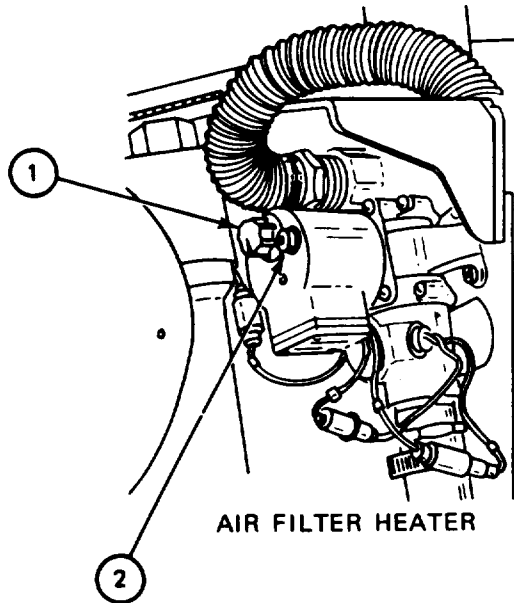
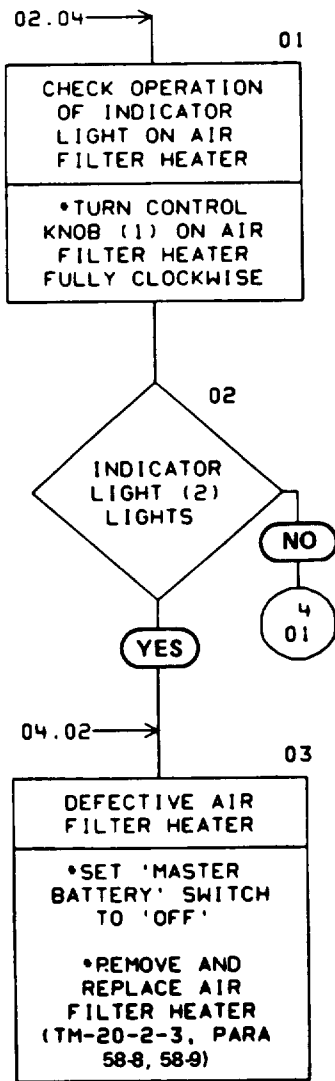
NO

05

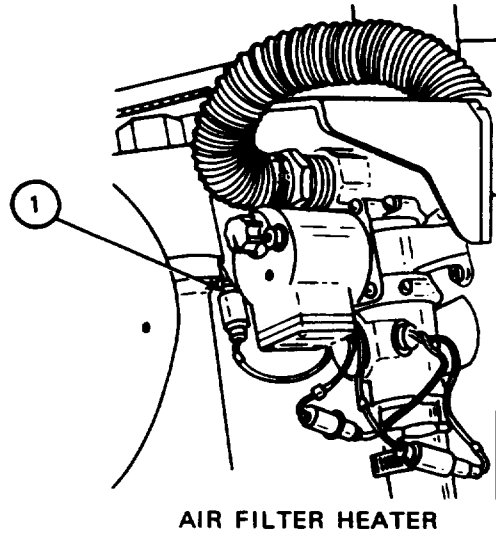
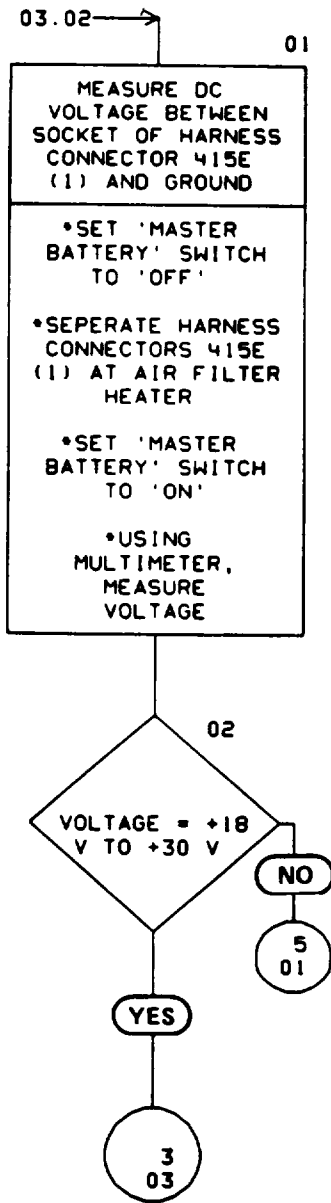
DEFECTIVE BATTERY CIRCUIT

\*NOTIFY HULL MAINTENANCE

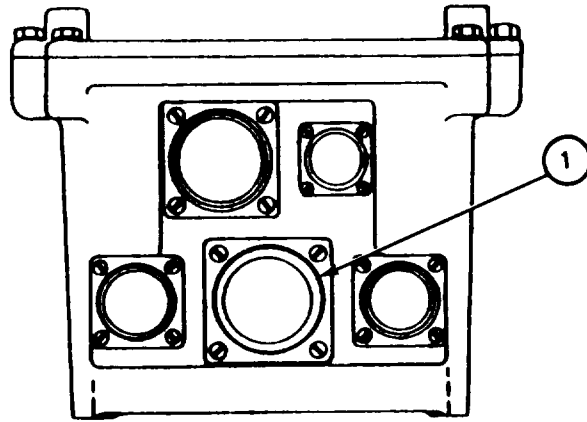
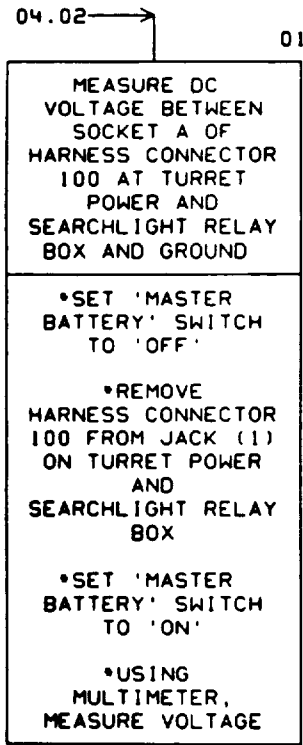
6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 3 OF 8)



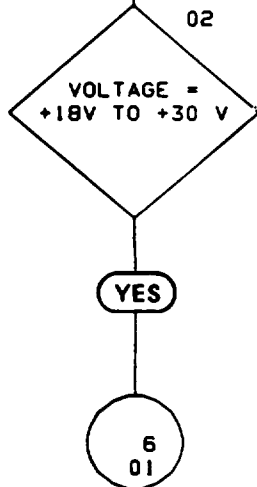
### 6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 4 OF 8)



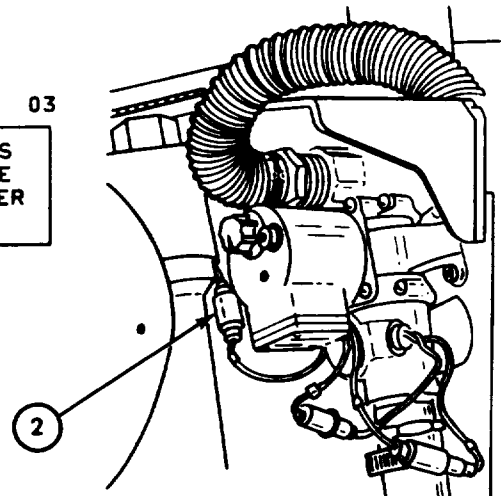
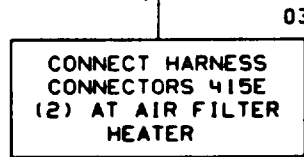
6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 5 OF 8)



TURRET POWER AND SEARCHLIGHT RELAY BOX



NO



AIR FILTER HEATER

6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 6 OF 8)

05.02 →

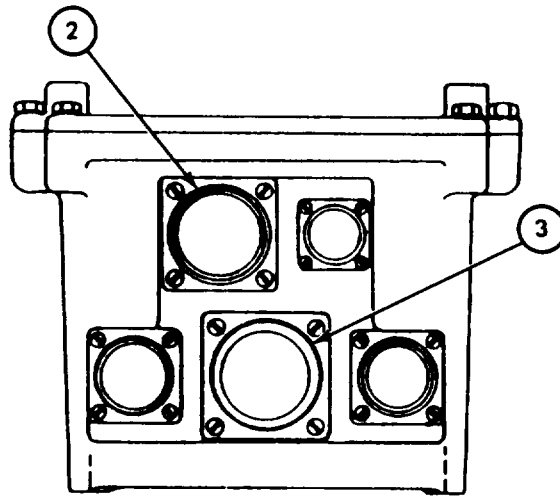
01

CHECK CONTINUITY BETWEEN PIN M OF HARNESS CONNECTOR 415E AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND SOCKET OF HARNESS CONNECTOR 415E (1)

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE HARNESS CONNECTOR 415E FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

06.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

•REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

02

RESISTANCE LESS THAN 2 OHMS

YES

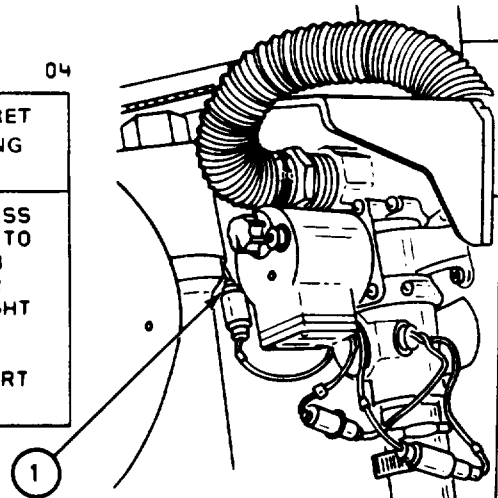
NO

04

DEFECTIVE TURRET CONTROL WIRING HARNESS

•CONNECT HARNESS CONNECTOR 100 TO JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•NOTIFY SUPPORT MAINTENANCE



AIR FILTER HEATER

03

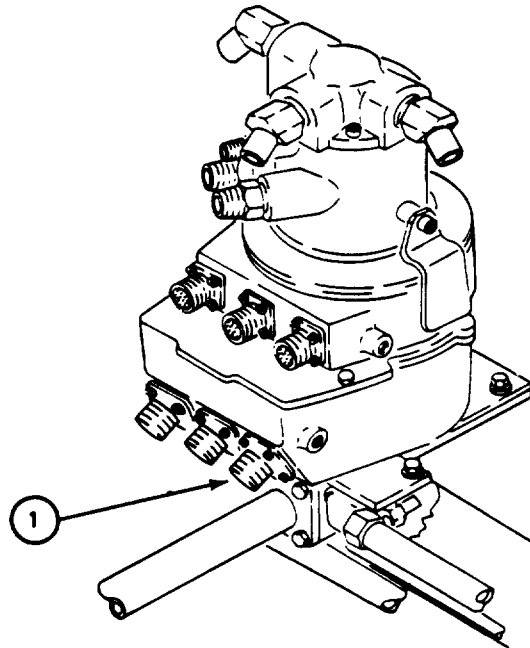
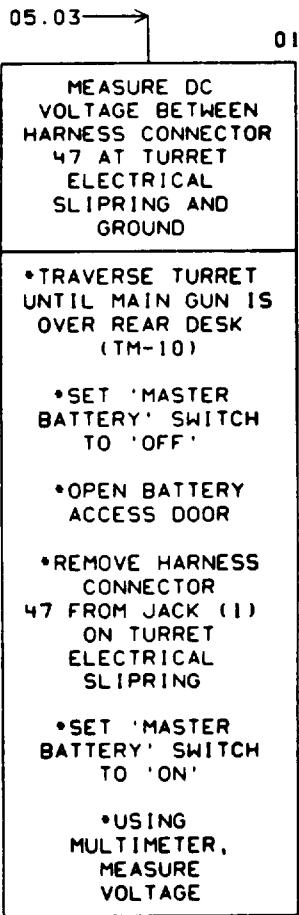
DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

•CONNECT HARNESS CONNECTORS 415E (1) AT AIR FILTER HEATER

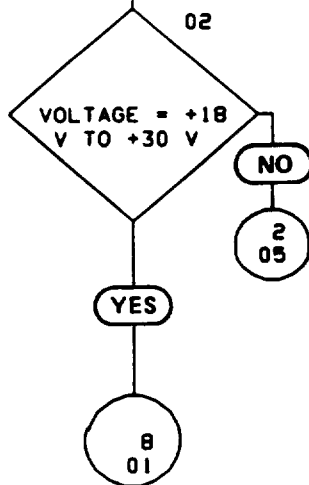
6.05



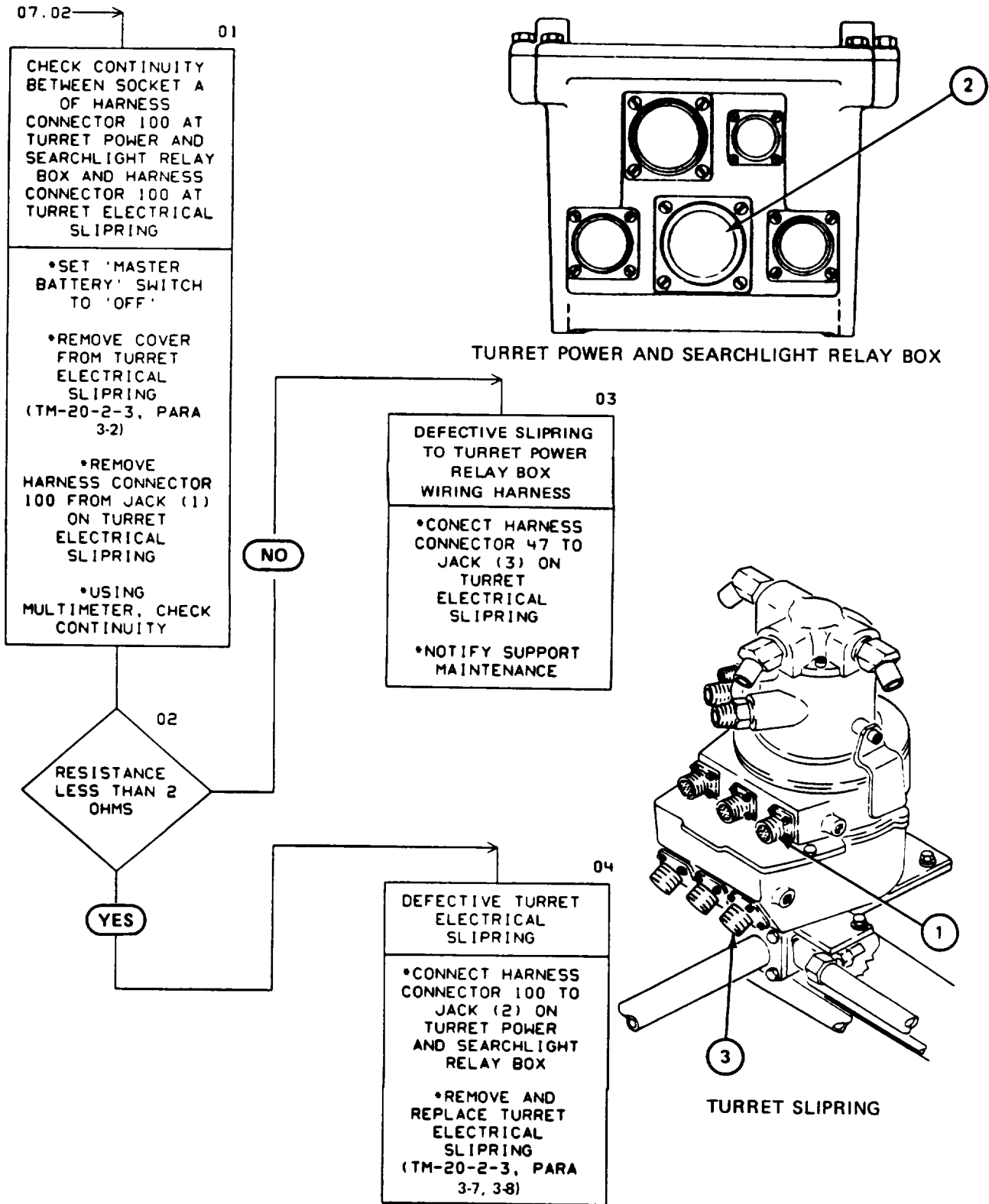
6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 7 OF 8)



TURRET SLIPRING



6-1. COMMANDER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 8 OF 8)



## 6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 1 OF 8)

**SYMPTOM:** (51) Loader's air filter heater fails to operate  
(52) Gunner's air filter heater fails to operate

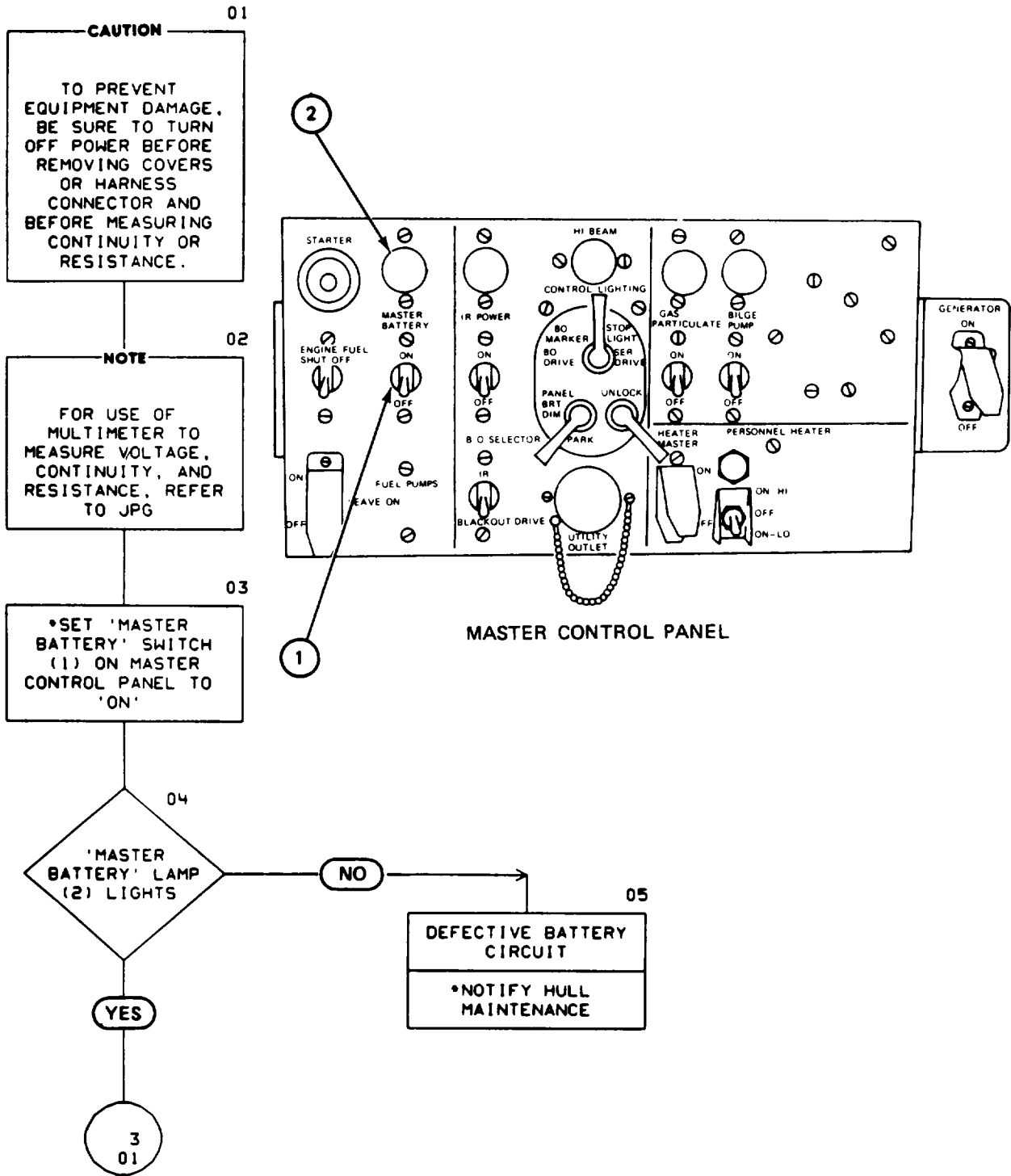
**TEST EQUIPMENT:** Multimeter

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Loader's Air Filter Heater	3	7
Gunner's Air Filter Heater	1	4
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipping	3	5

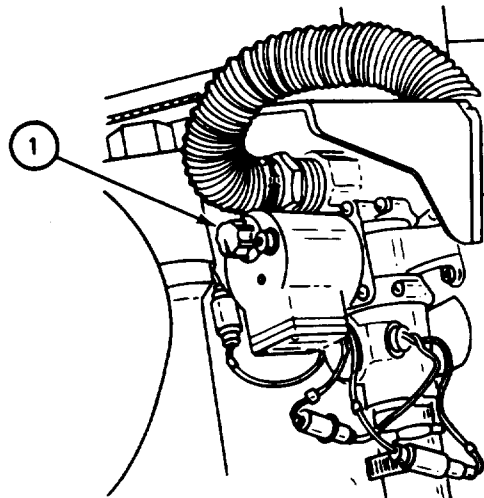
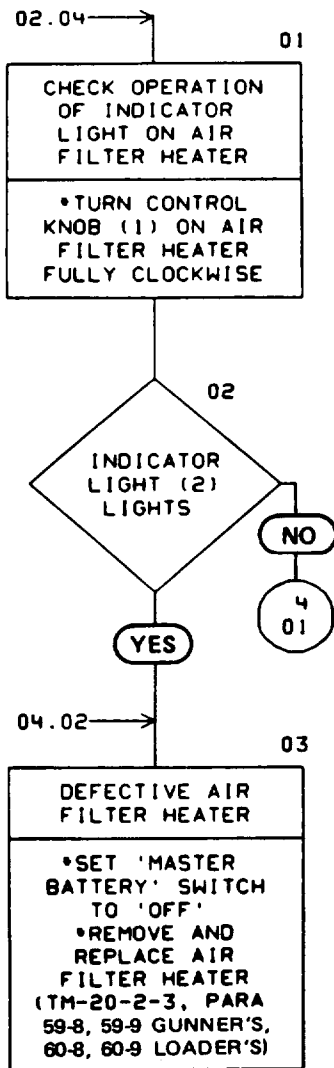
**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
(2) ETM 643-091-9400R/JPG for procedures to:  
Use multimeter  
Disconnect electrical connectors  
(3) TM 9-2350-222-10 for procedure to:  
Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 2 OF 8)

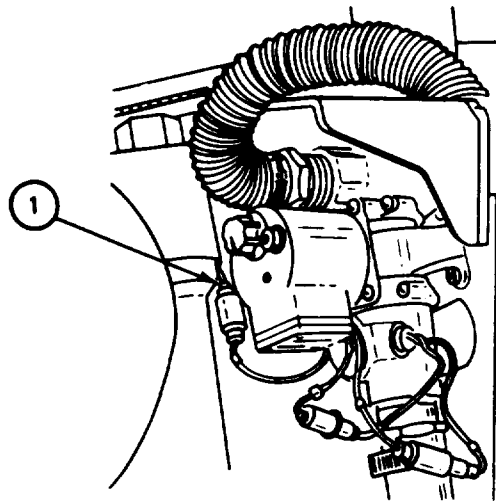
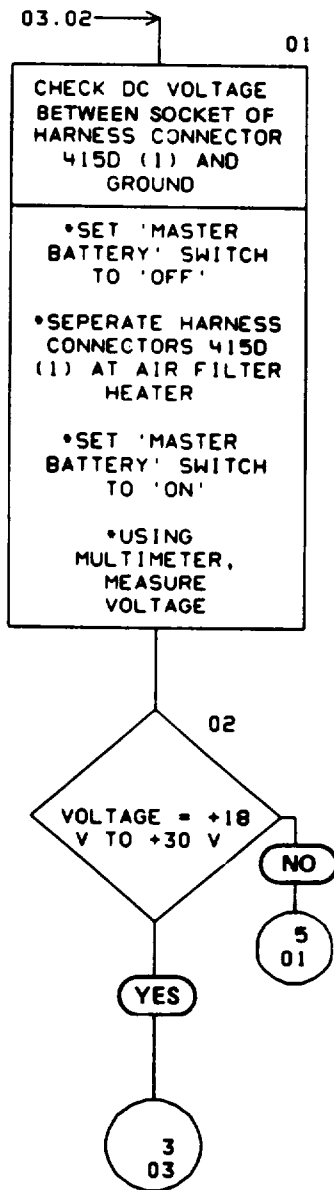


6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 3 OF 8)



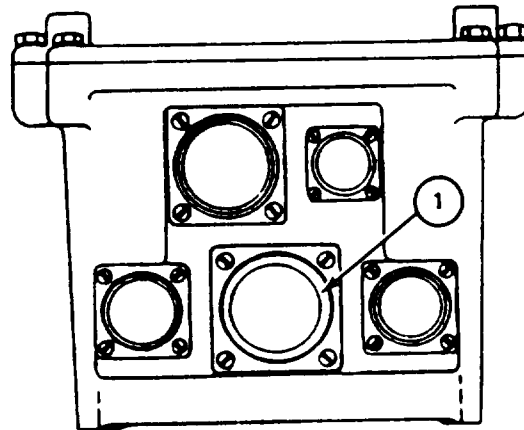
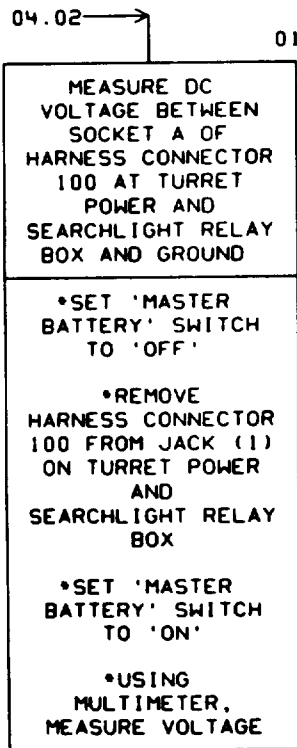
AIR FILTER HEATER

6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 4 OF 8)

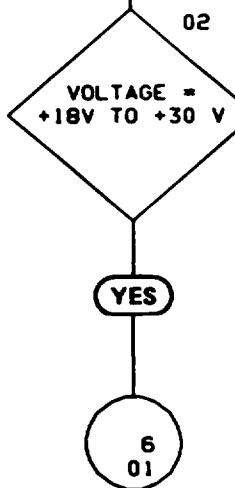


AIR FILTER HEATER

6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 5 OF 8)



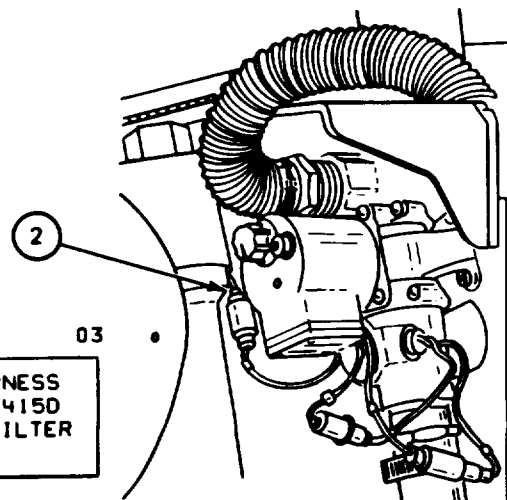
TURRET POWER AND SEARCHLIGHT RELAY BOX



NO

CONNECT HARNESS CONNECTORS 4150 (2) AT AIR FILTER HEATER

7  
01



AIR FILTER HEATER

6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 6 OF 8)

05.02 →

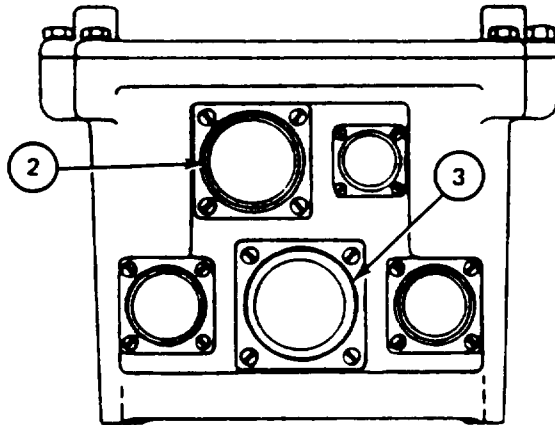
01

CHECK CONTINUITY BETWEEN PIN L OF HARNESS CONNECTOR 4150 AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND SOCKET OF HARNESS CONNECTOR 4150 (1)

•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•REMOVE HARNESS CONNECTOR 4150 FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•USING MULTIMETER, CHECK CONTINUITY



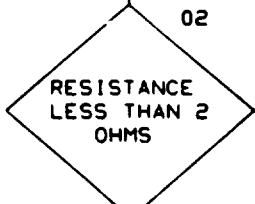
TURRET POWER AND SEARCHLIGHT RELAY BOX

06.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

•REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)



YES

NO

03

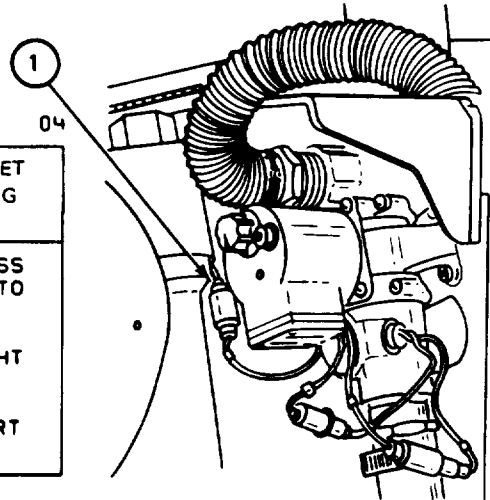
DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

•CONNECT HARNESS CONNECTORS 4150 (1) AT AIR FILTER HEATER

DEFECTIVE TURRET CONTROL WIRING HARNESS

•CONNECT HARNESS CONNECTOR 100 TO JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•NOTIFY SUPPORT MAINTENANCE

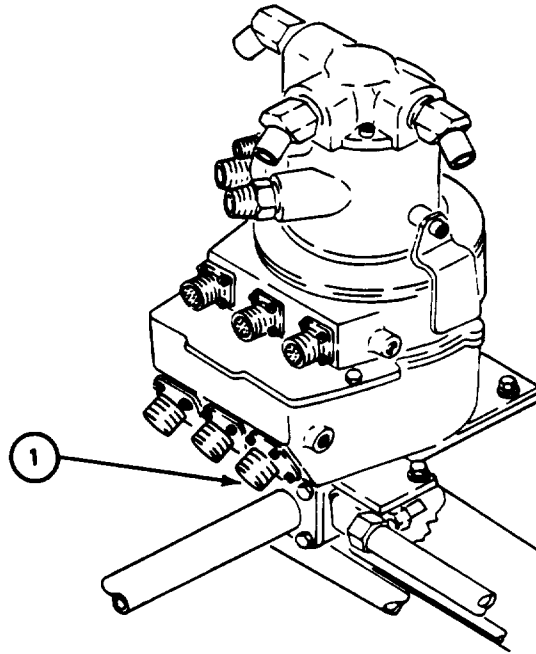
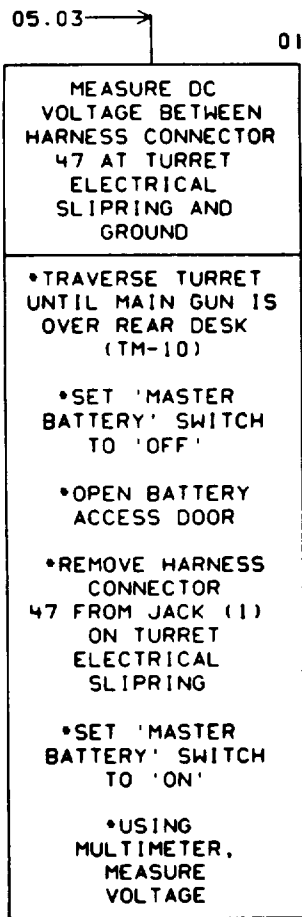


AIR FILTER HEATER

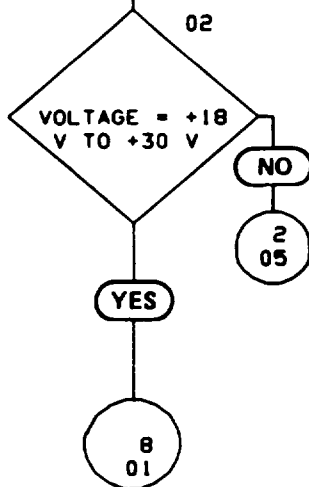
6.05



6-2. 'LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 7 OF 8)



TURRET SLIPRING



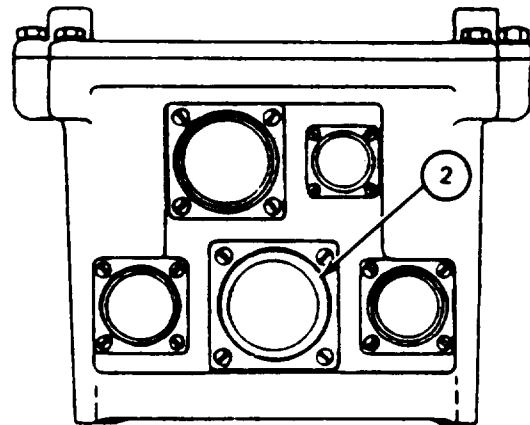
6-2. LOADER'S OR GUNNER'S AIR FILTER HEATER TROUBLESHOOTING (SHEET 8 OF 8)

07.02 →

01

CHECK CONTINUITY BETWEEN SOCKET A OF HARNESS CONNECTOR 100 AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND HARNESS CONNECTOR 100 AT TURRET ELECTRICAL SLIPRING

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE COVER FROM TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-2)
- REMOVE HARNESS CONNECTOR 100 FROM JACK (1) ON TURRET ELECTRICAL SLIPRING
- USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

02

RESISTANCE LESS THAN 2 OHMS

YES

NO

03

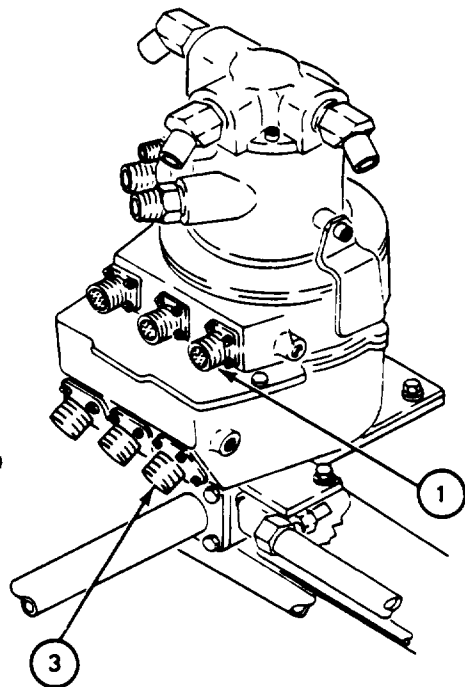
DEFECTIVE SLIPRING TO TURRET POWER RELAY BOX WIRING HARNESS

- CONNECT HARNESS CONNECTOR 47 TO JACK (3) ON TURRET ELECTRICAL SLIPRING
- NOTIFY SUPPORT MAINTENANCE

04

DEFECTIVE TURRET ELECTRICAL SLIPRING

- CONNECT HARNESS CONNECTOR 100 TO JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- REMOVE AND REPLACE TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-7, 3-8)



TURRET SLIPRING

**6-3. VENT BLOWER TROUBLESHOOTING (SHEET 1 OF 11)**

**SYMPTOM:** (53) Vent Blower fails to operate  
 (54) Utility Outlet fails to operate

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Accessories Control Box	4	6
Turret Vent Blower	2	7
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipring	3	5

**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to:  
 Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedure to:  
 Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

6-3. VENT BLOWER TROUBLESHOOTING (SHEET 2 OF 11)

**CAUTION** 01

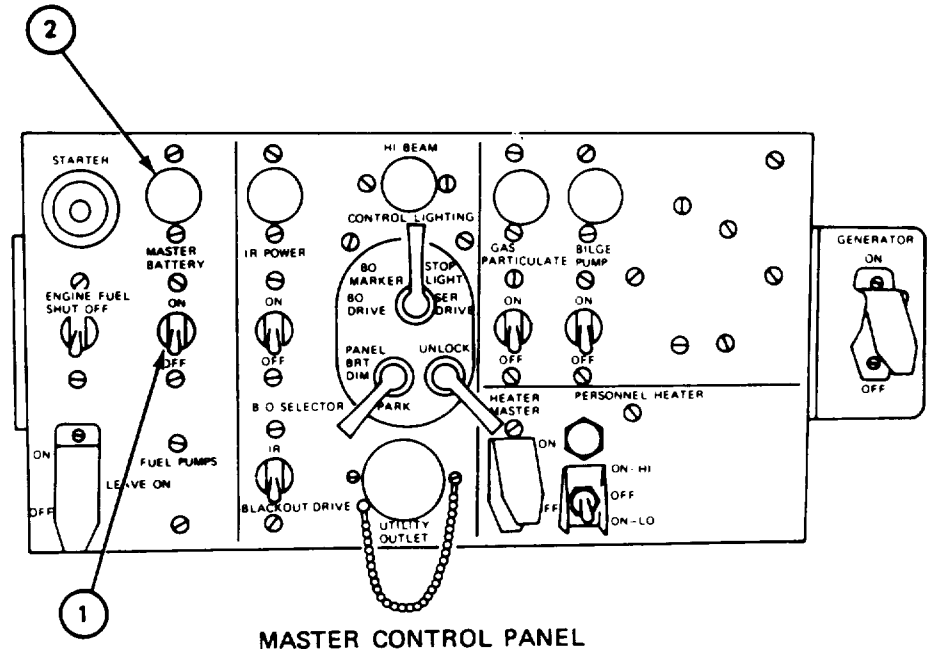
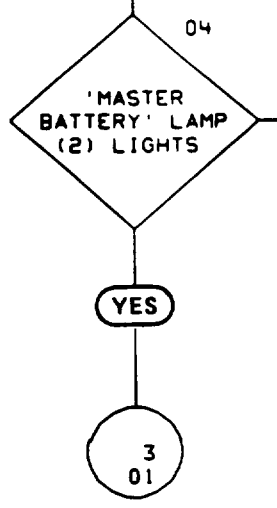
TO PREVENT EQUIPMENT DAMAGE, BE SURE TO TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTORS AND BEFORE MEASURING CONTINUITY OR RESISTANCE.

**NOTE** 02

FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, AND RESISTANCE, REFER TO JPG

03

•SET 'MASTER BATTERY' SWITCH (1) ON MASTER CONTROL PANEL TO 'ON'

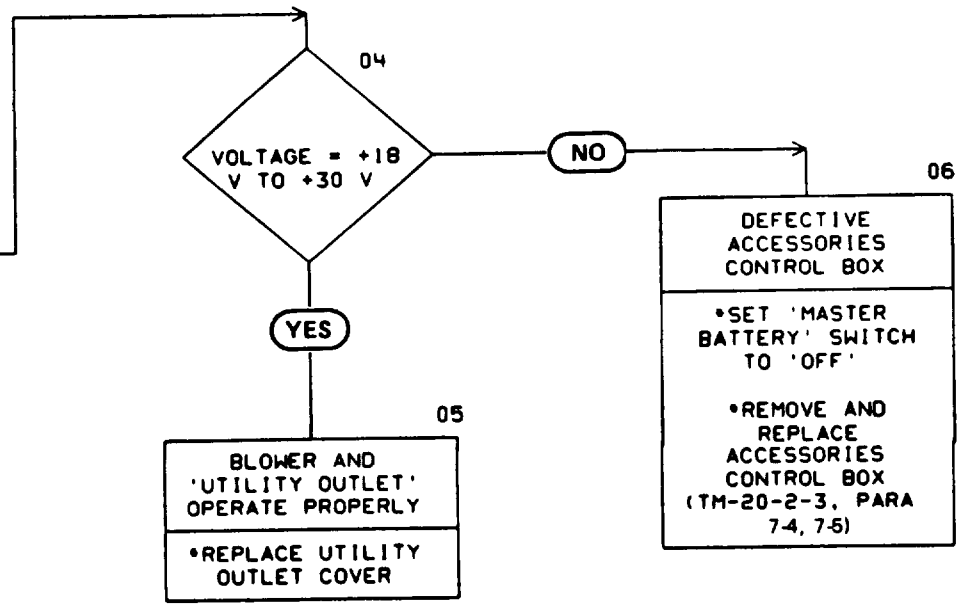
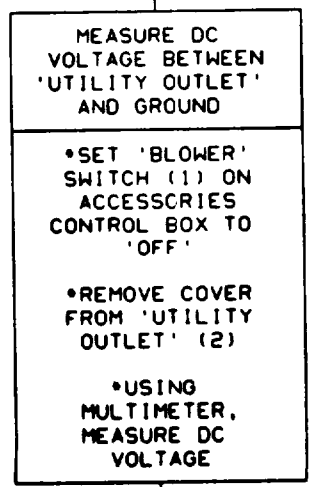
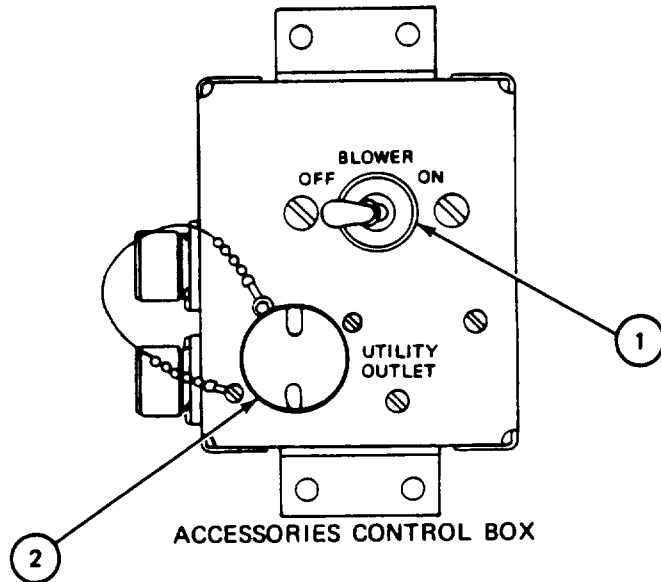
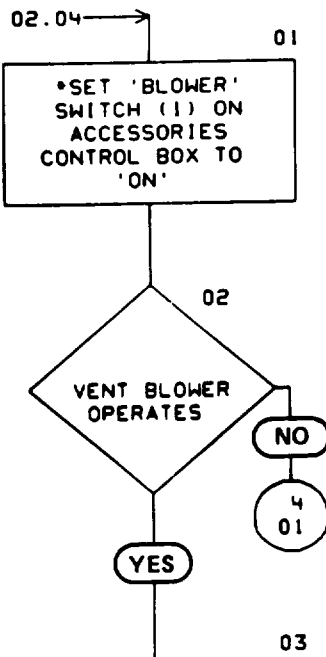


05

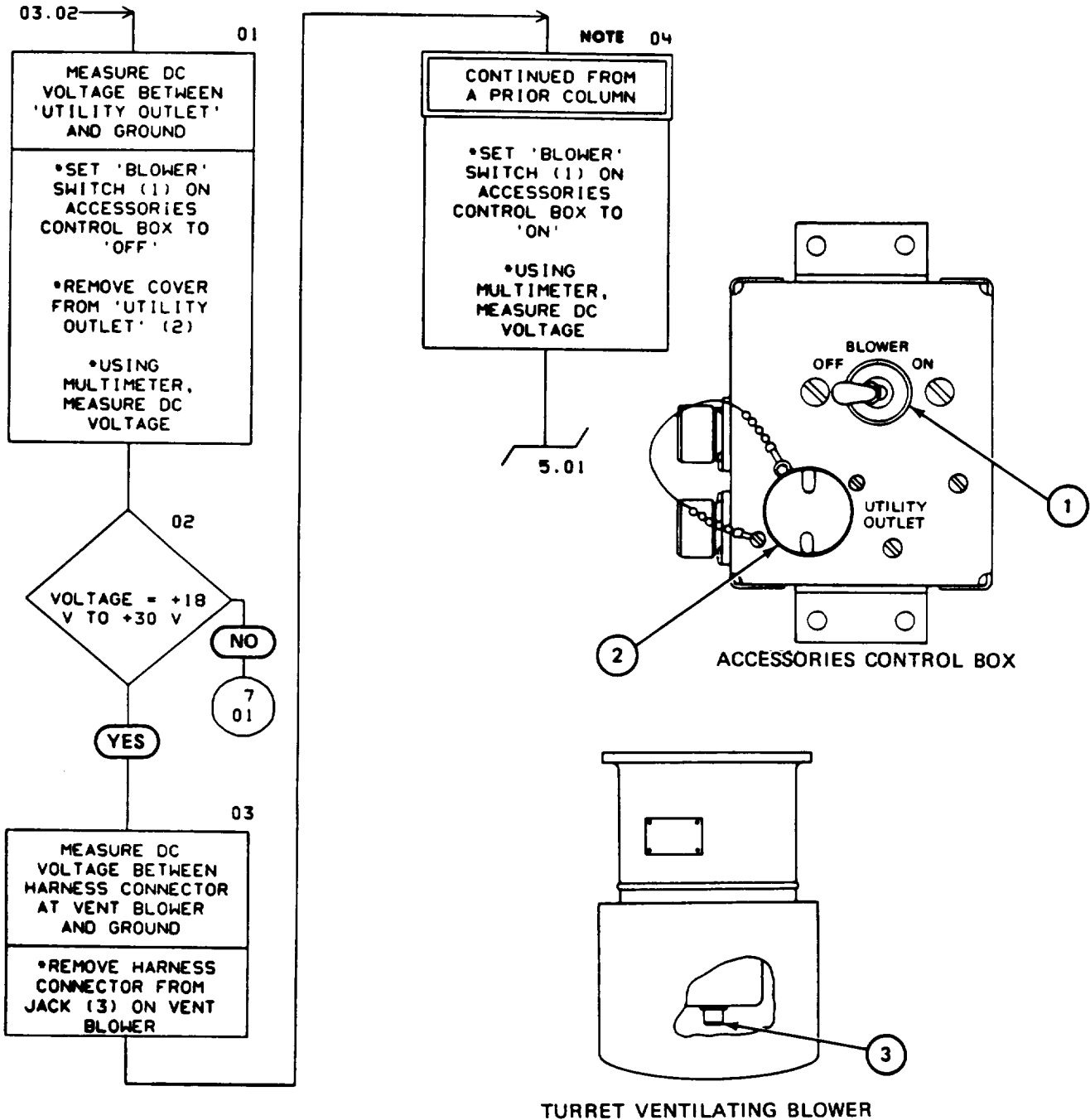
DEFECTIVE BATTERY CIRCUIT

•NOTIFY HULL MAINTENANCE

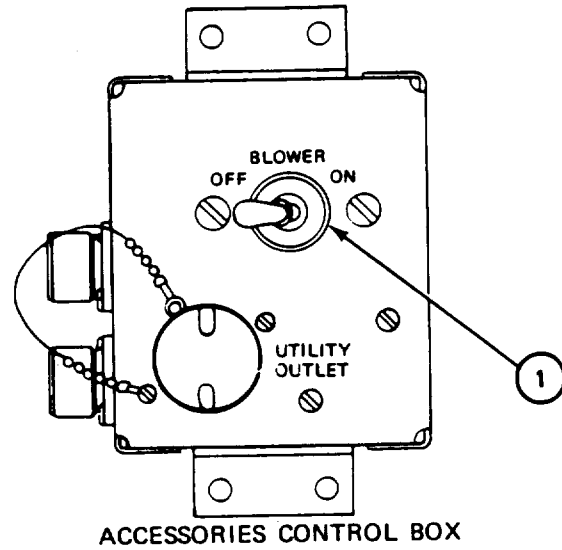
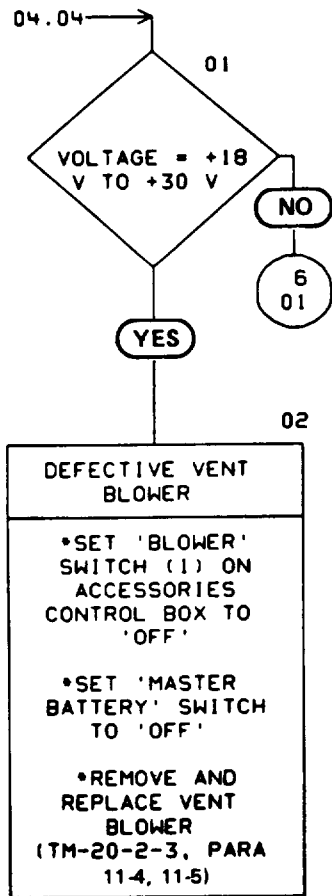
6-3. VENT BLOWER TROUBLESHOOTING (SHEET 3 OF 11)



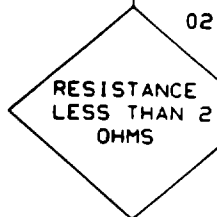
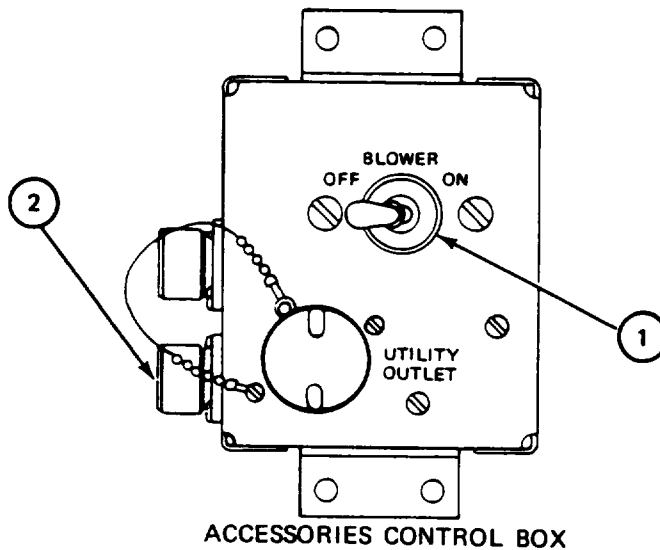
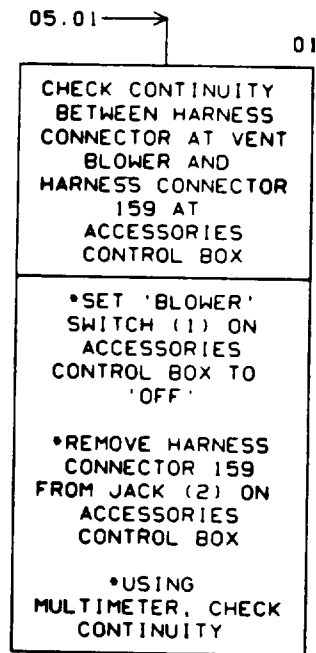
6-3. VENT BLOWER TROUBLESHOOTING (SHEET 4 OF 11)



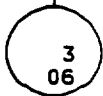
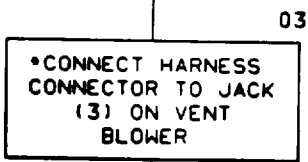
6-3. VENT BLOWER TROUBLESHOOTING (SHEET 5 OF 11)



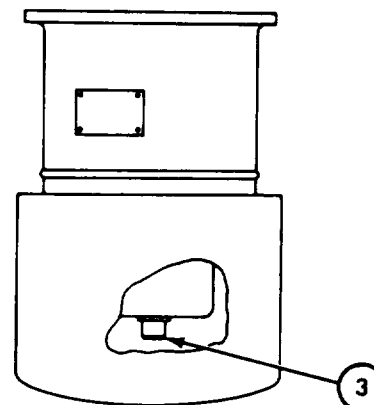
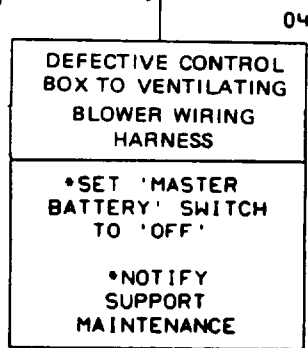
6-3. VENT BLOWER TROUBLESHOOTING (SHEET 6 OF 11)



YES

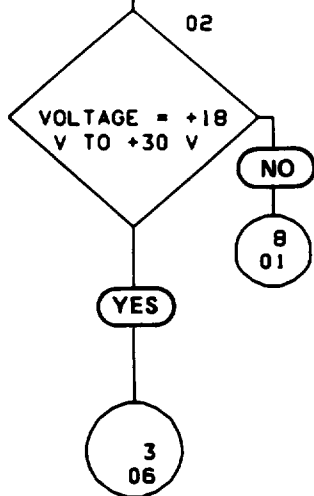
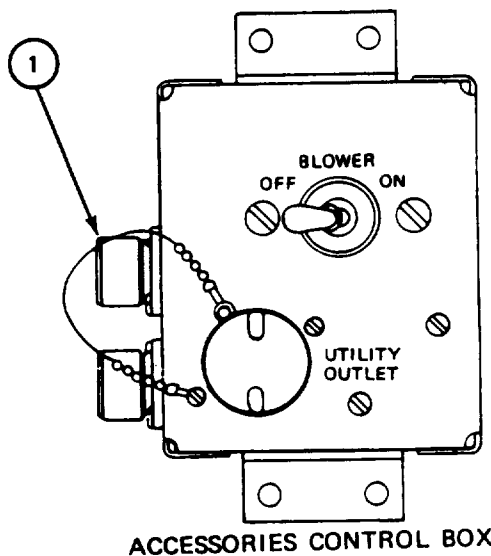
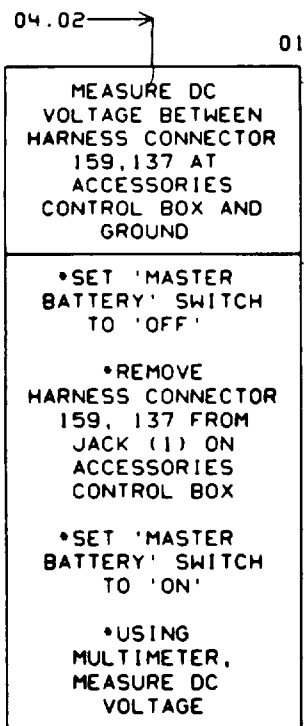


NO

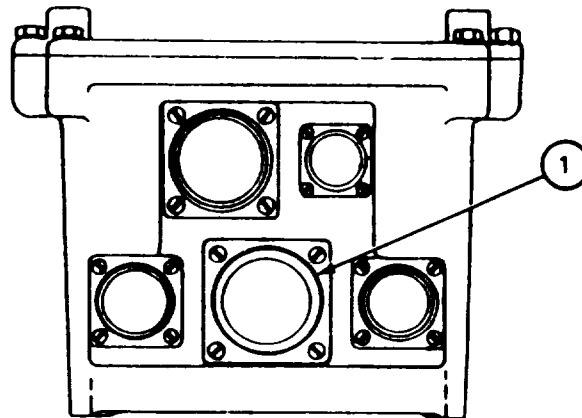
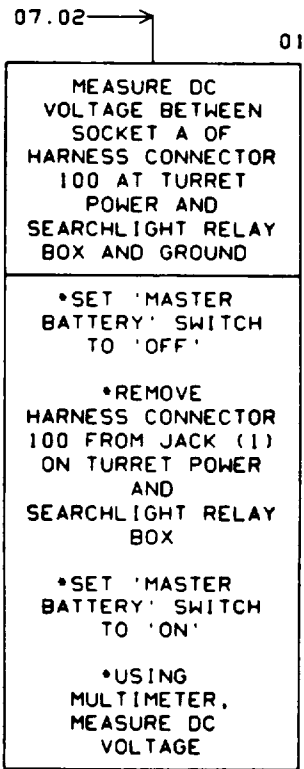




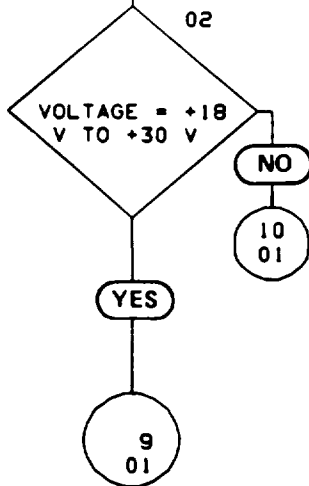
6-3. VENT BLOWER TROUBLESHOOTING (SHEET 7 OF 11)



6-3. VENT BLOWER TROUBLESHOOTING (SHEET 8 OF 11)



TURRET POWER AND SEARCHLIGHT RELAY BOX



6.3. VENT BLOWER TROUBLESHOOTING (SHEET 9 OF 11)

08.02 →

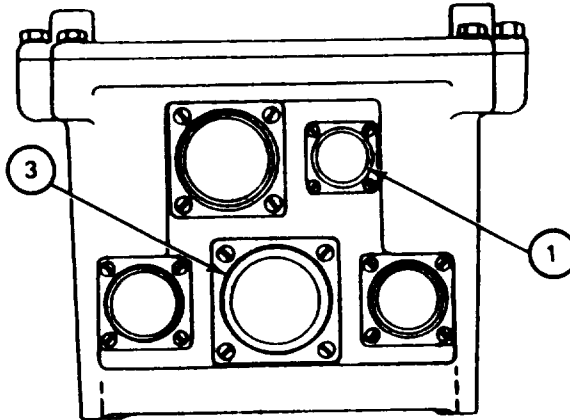
01

CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 159, 137 AT ACCESSORIES CONTROL BOX AND HARNESS CONNECTOR 159, 137 AT TURRET POWER AND SEARCHLIGHT RELAY BOX

\*SET 'MASTER BATTERY' SWITCH TO 'OFF'

\*REMOVE HARNESS CONNECTOR 159, 137 FROM JACK (1) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

09.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

\*CONNECT HARNESS CONNECTOR TO JACK (2) ON ACCESSORIES CONTROL BOX

\*REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)



03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

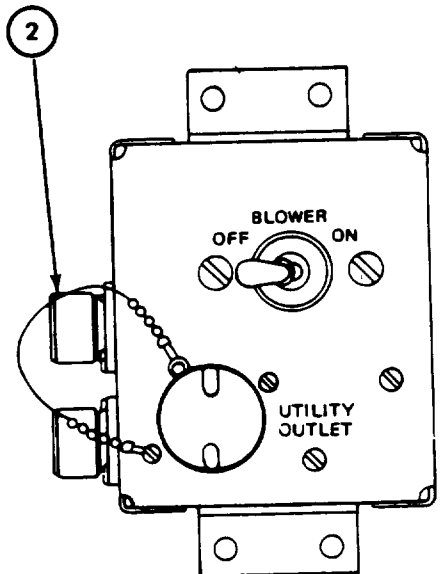
9.05

04

DEFECTIVE TURRET POWER RELAY BOX TO BLOWER CONTROL BOX WIRING HARNESS

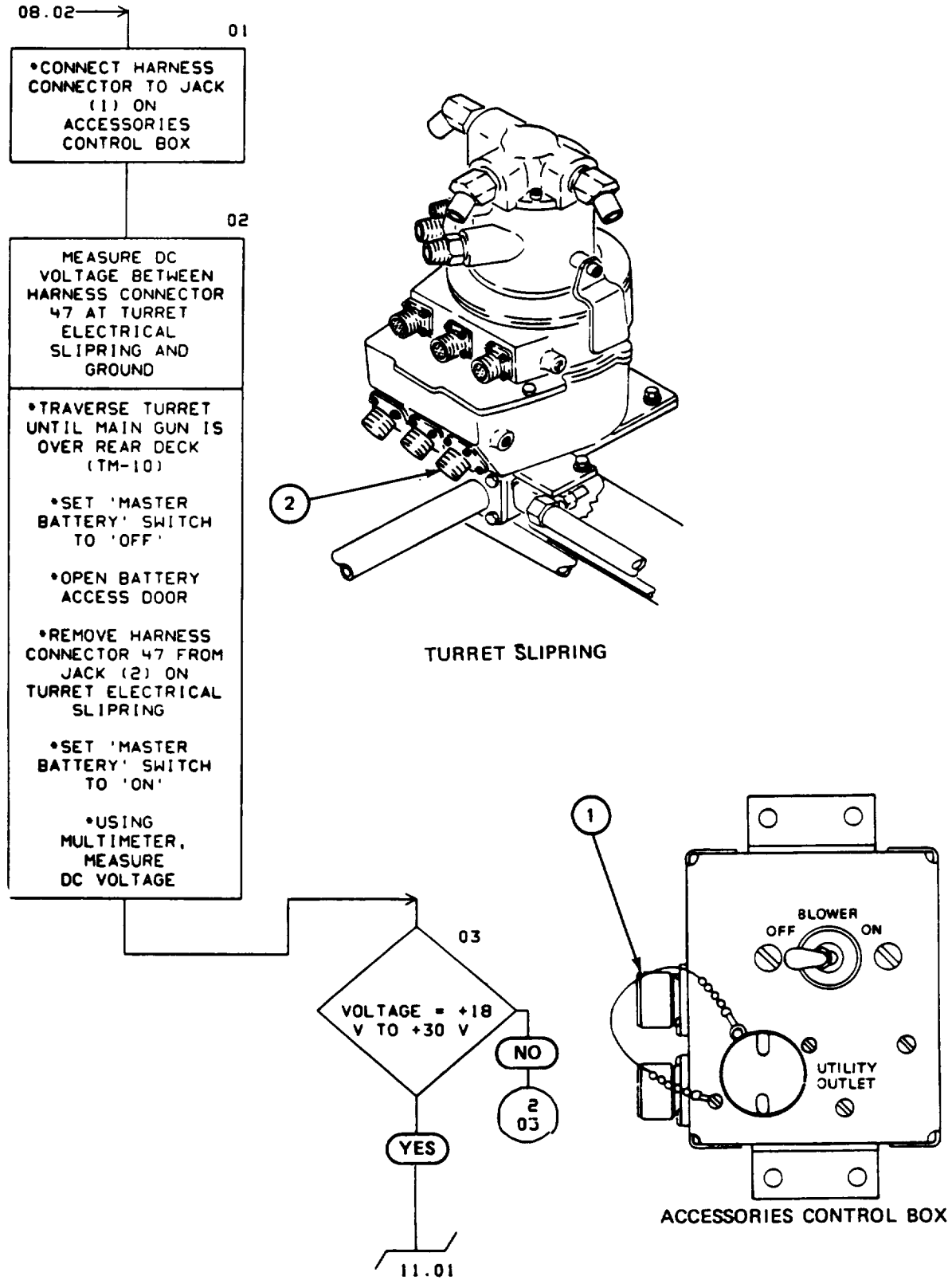
\*CONNECT HARNESS CONNECTOR 100 TO JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*NOTIFY SUPPORT MAINTENANCE



ACCESSORIES CONTROL BOX

6-3. VENT BLOWER TROUBLESHOOTING (SHEET 10 OF 11)



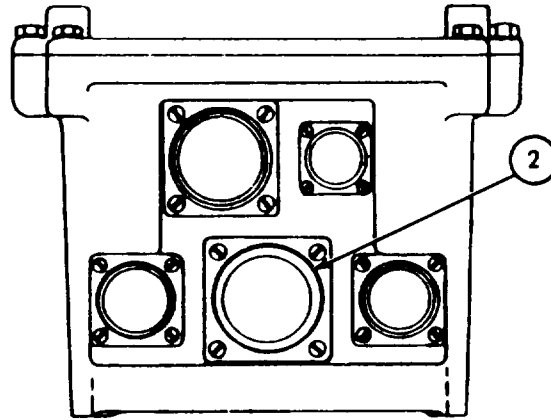
6-3. VENT BLOWER TROUBLESHOOTING (SHEET 11 OF 11)

10.03 →

01

CHECK CONTINUITY BETWEEN SOCKET A OF HARNESS CONNECTOR 100 AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND HARNESS CONNECTOR 100 AT TURRET ELECTRICAL SLIPRING

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE COVER FROM TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-2)
- REMOVE HARNESS CONNECTOR 100 FROM JACK (1) ON TURRET ELECTRICAL SLIPRING
- USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

11.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

- CONNECT HARNESS CONNECTOR 100 TO JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- REMOVE AND REPLACE TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-7, 3-8)

02

RESISTANCE LESS THAN 2 OHMS

YES

03

DEFECTIVE TURRET ELECTRICAL SLIPRING

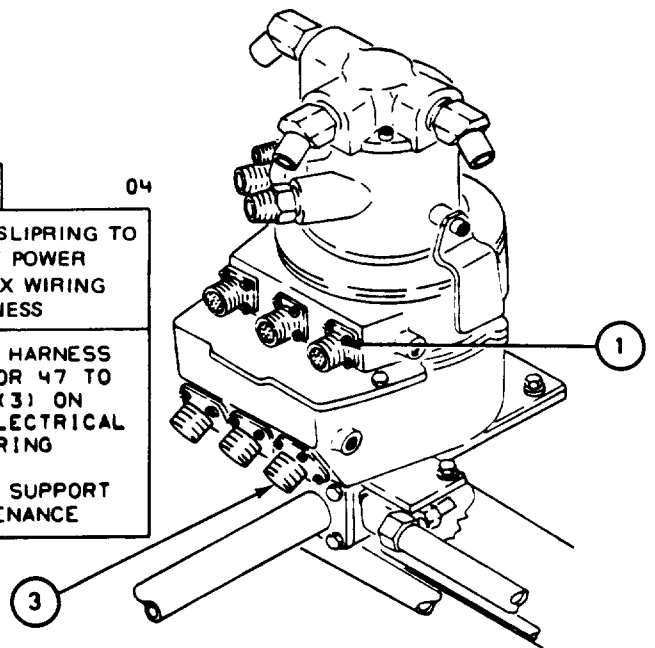
11.05

NO

04

DEFECTIVE SLIPRING TO TURRET POWER RELAY BOX WIRING HARNESS

- CONNECT HARNESS CONNECTOR 47 TO JACK (3) ON TURRET ELECTRICAL SLIPRING
- NOTIFY SUPPORT MAINTENANCE



TURRET SLIPRING



**CHAPTER 7**

**LIGHTING FAULT ISOLATION DIAGRAMS**

**7-1. DOME LIGHT TROUBLESHOOTING (SHEET 1 OF 11)**

**SYMPTOM:** (55) Red Dome Light fails to light  
 (56) White Dome Light fails to light  
 (57) Red or White Dome Light fails to dim

**TEST EQUIPMENT:** Multimeter

**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Gunner's Dome Light	1	1
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipring	3	5
Loader's Dome Light	3	2
Commander's Dome Light	4	7

**REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to:  
 Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedure to:  
 Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

7-1. DOMELIGHT TROUBLESHOOTING (SHEET 2 OF 11)

**CAUTION** 01

TO PREVENT EQUIPMENT DAMAGE, BE SURE TO TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTORS AND BEFORE MEASURING CONTINUITY OR RESISTANCE.

**NOTE** 02

FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, OR RESISTANCE, REFER TO TO JPG

03

\*SET 'MASTER BATTERY' SWITCH (1) ON MASTER CONTROL PANEL TO 'ON'

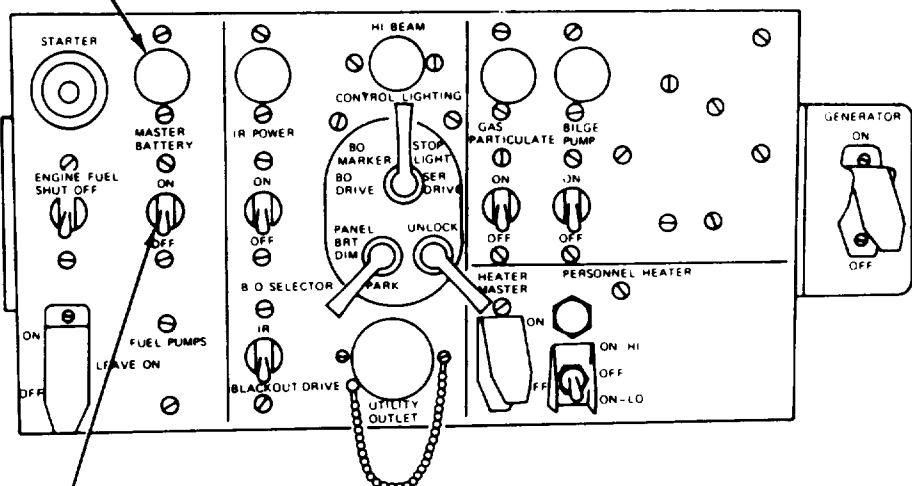
04

'MASTER BATTERY' LAMP (2) LIGHTS

YES

3  
01

2



MASTER CONTROL PANEL

NO

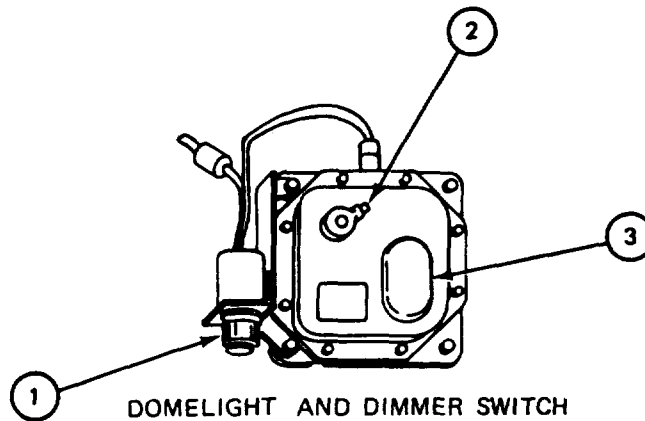
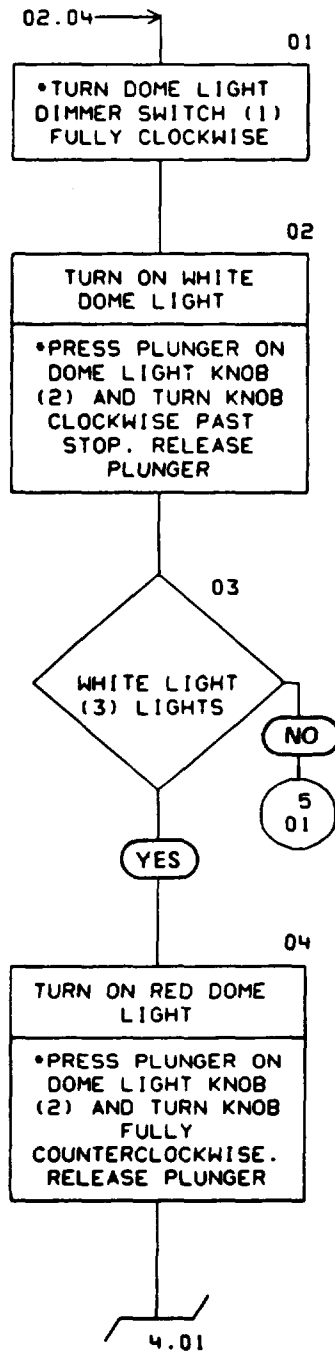
05

DEFECTIVE BATTERY CIRCUIT

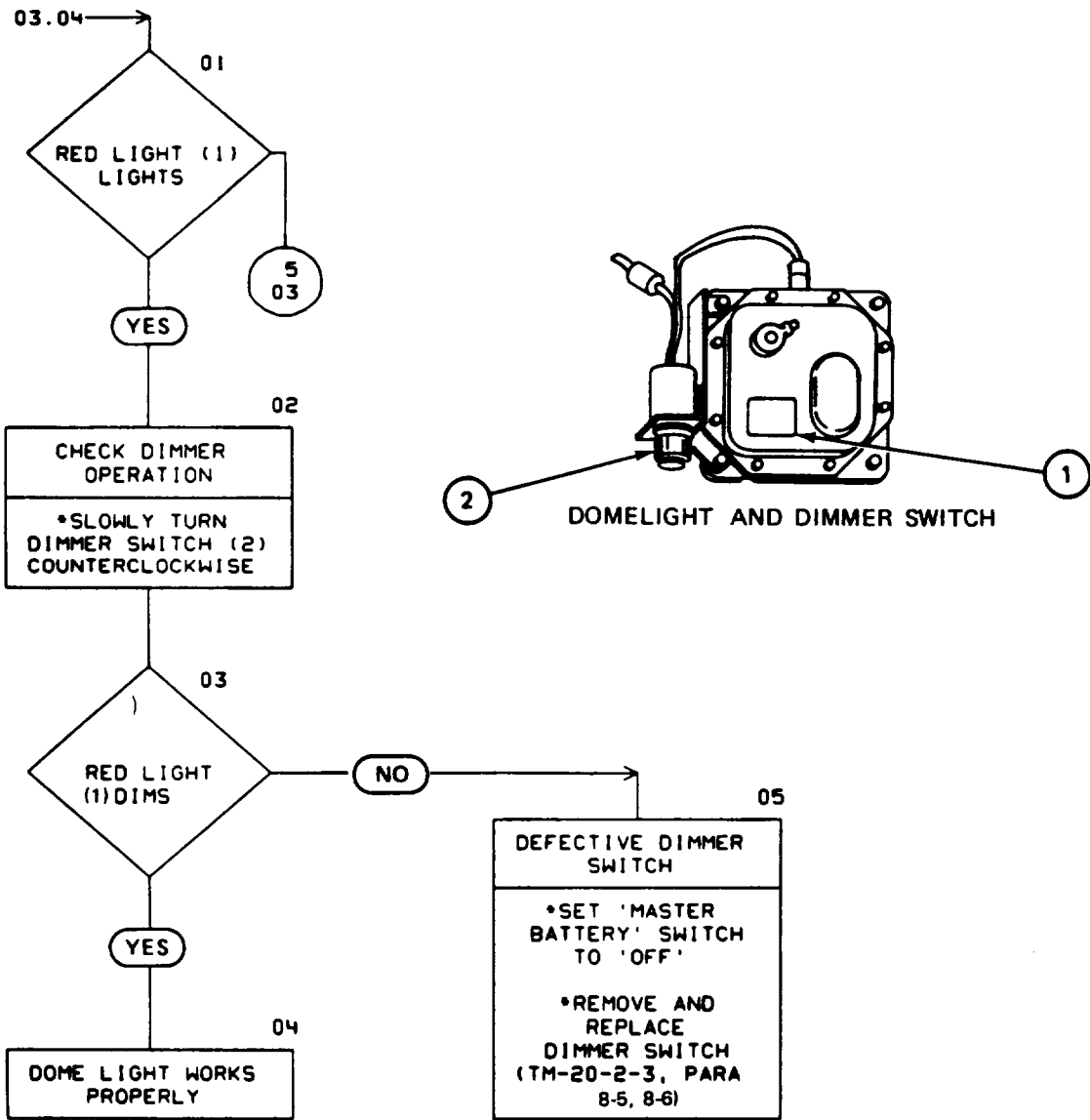
\*NOTIFY HULL MAINTENANCE



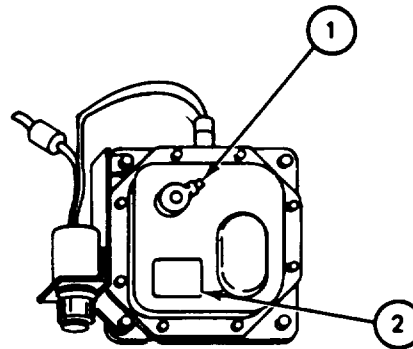
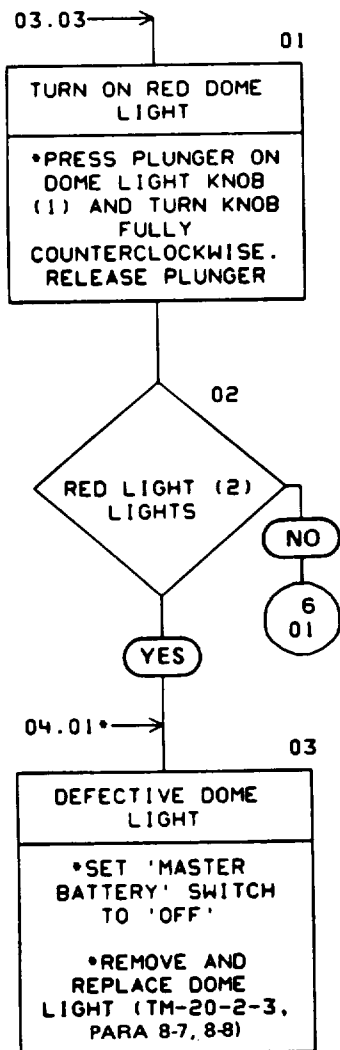
7-1. DOMELIGHT TROUBLESHOOTING (SHEET 3 OF 11)



7-1. DOMELIGHT TROUBLESHOOTING (SHEET 4 OF 11)

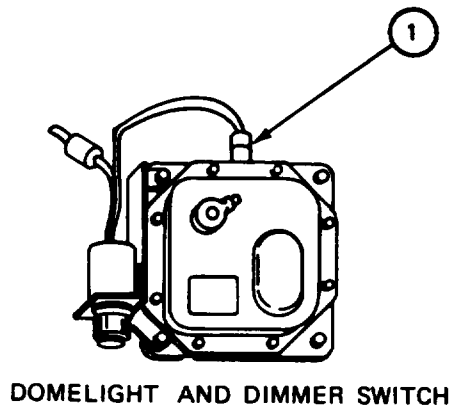
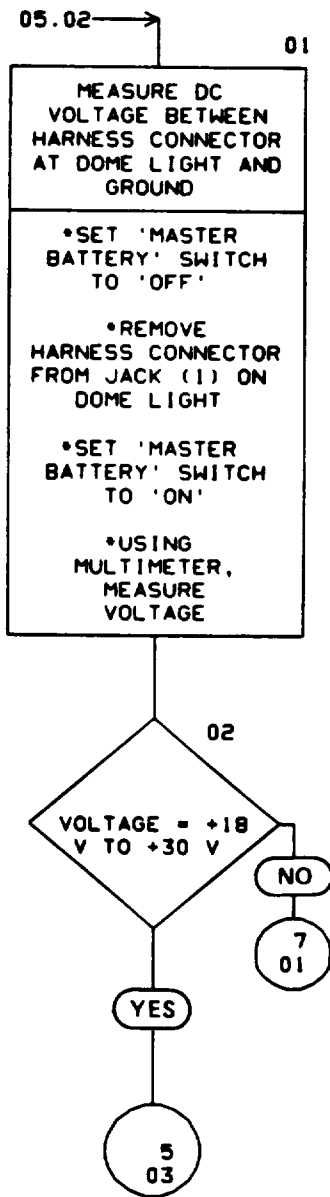


7-1. DOMELIGHT TROUBLESHOOTING (SHEET 5 OF 11)

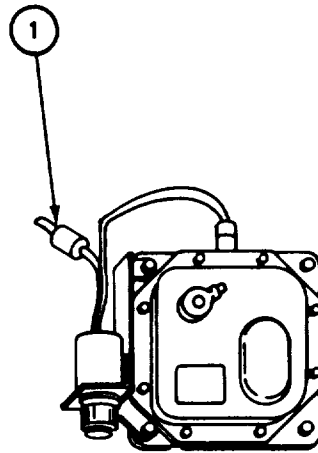
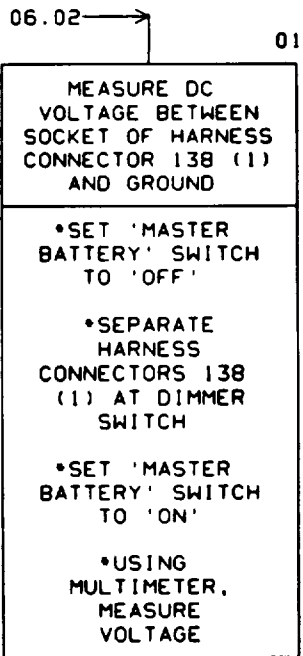


DOMELIGHT AND DIMMER SWITCH

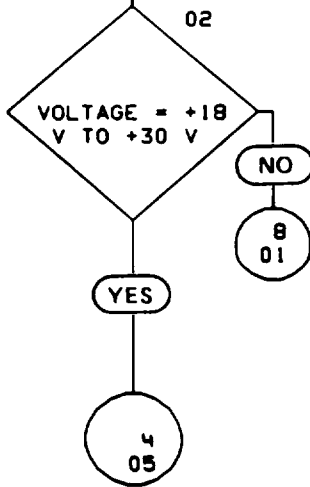
7-1. DOMELIGHT TROUBLESHOOTING (SHEET 6 OF 11)



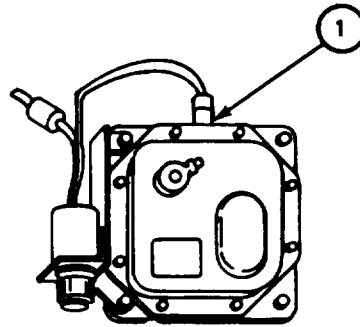
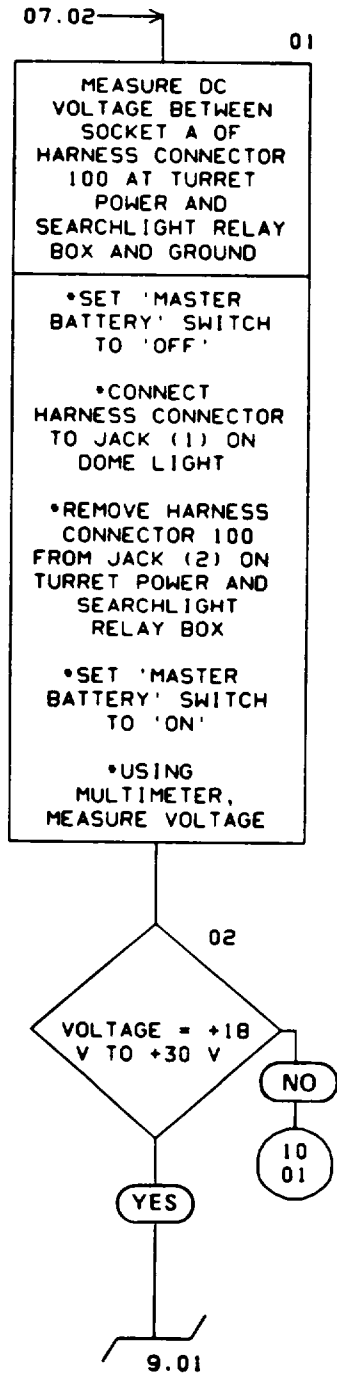
7-1. DOMELIGHT TROUBLESHOOTING (SHEET 7 OF 11)



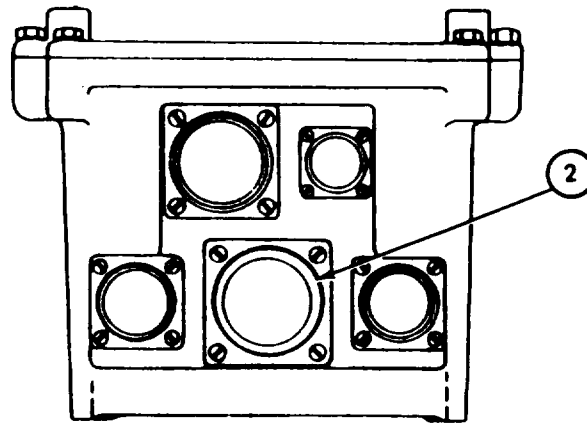
DOMELIGHT AND DIMMER SWITCH



### 7-1. DOMELIGHT TROUBLESHOOTING (SHEET 8 OF 11)



DOMELIGHT AND DIMMER SWITCH



TURRET POWER AND SEARCHLIGHT RELAY BOX

7-1. DOMELIGHT TROUBLESHOOTING (SHEET 9 OF 11)

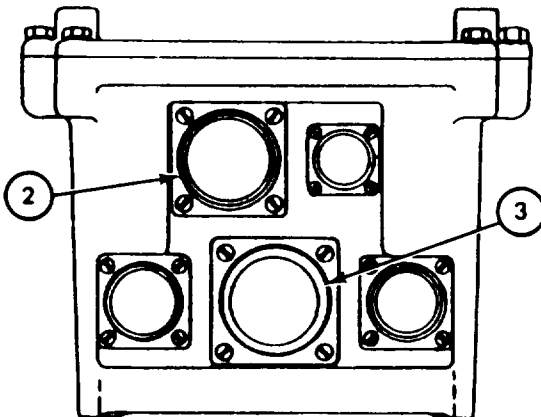
08.02 → 01

CHECK CONTINUITY BETWEEN PIN D OF HARNESS CONNECTOR 138 AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND SOCKET OF HARNESS CONNECTOR 138 (1)

\*SET 'MASTER BATTERY' SWITCH TO 'OFF'

\*REMOVE HARNESS CONNECTOR 138 FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*USING MULTIMETER, CHECK CONTINUITY



TURRET POWER AND SEARCHLIGHT RELAY BOX

09.03 → NOTE 05

CONTINUED FROM A PRIOR COLUMN

\*REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

02

RESISTANCE LESS THAN 2 OHMS

YES

03

DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX

\*CONNECT HARNESS CONNECTORS 138 (1) AT DIMMER SWITCH

9.05

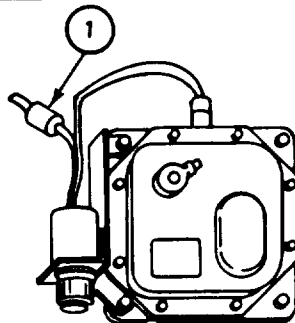
NO

04

DEFECTIVE TURRET CONTROL WIRING HARNESS

\*CONNECT HARNESS CONNECTOR 100 TO JACK (3) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

\*NOTIFY SUPPORT MAINTENANCE



DOMELIGHT AND DIMMER SWITCH

7-1. DOMELIGHT TROUBLESHOOTING (SHEET 10 OF 11)

08.02 →

01

•CONNECT HARNESS CONNECTORS 138 (1) AT DIMMER SWITCH

02

MEASURE DC VOLTAGE BETWEEN HARNESS CONNECTOR 47 AT TURRET ELECTRICAL SLIPRING AND GROUND

•TRAVERSE TURRET UNTIL MAIN GUN IS OVER REAR DECK (TM-10)

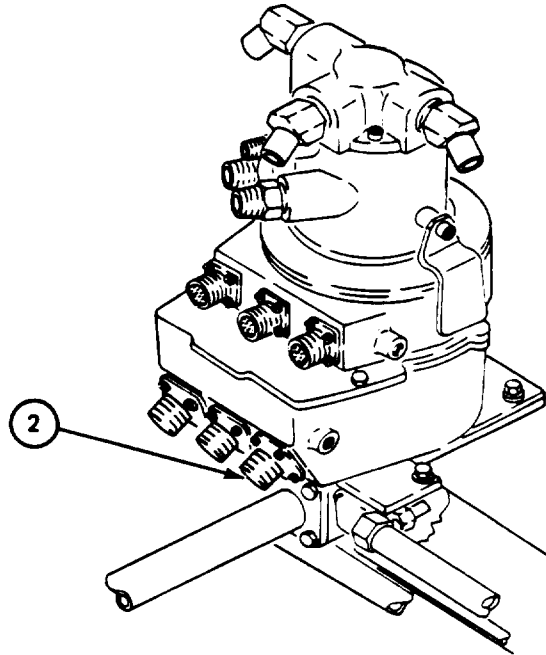
•SET 'MASTER BATTERY' SWITCH TO 'OFF'

•OPEN BATTERY ACCESS DOOR

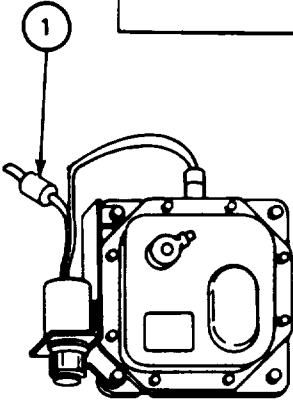
•REMOVE HARNESS CONNECTOR 47 FROM JACK (2) ON TURRET ELECTRICAL SLIPRING

•SET 'MASTER BATTERY' SWITCH TO 'ON'

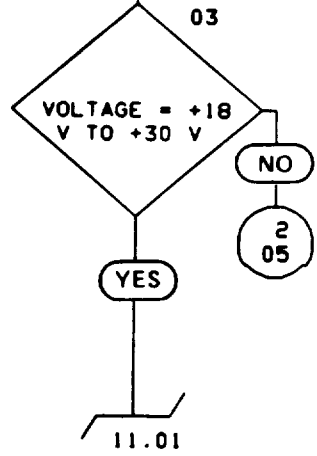
•USING MULTIMETER, MEASURE VOLTAGE



TURRET SLIPRING



DOMELIGHT AND DIMMER SWITCH





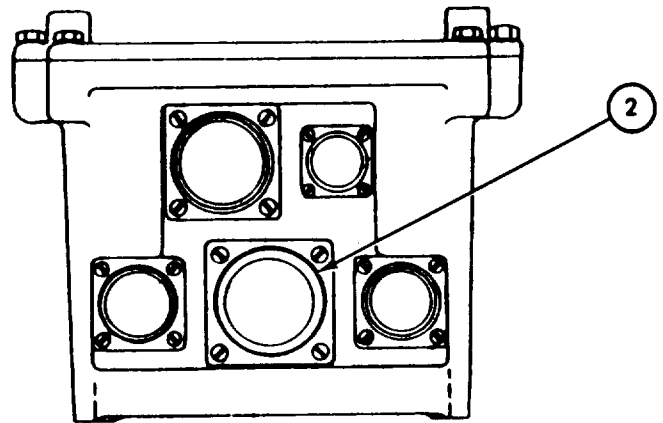
7-1. DOMELIGHT TROUBLESHOOTING (SHEET 11 OF 11)

10.03 →

01

CHECK CONTINUITY BETWEEN SOCKET A OF HARNESS CONNECTOR 100 AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND HARNESS CONNECTOR 100 AT TURRET ELECTRICAL SLIPRING

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE COVER FROM TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-2)
- REMOVE HARNESS CONNECTOR 100 FROM JACK (1) ON TURRET ELECTRICAL SLIPRING
- USING MULTIMETER, CHECK CONTINUITY

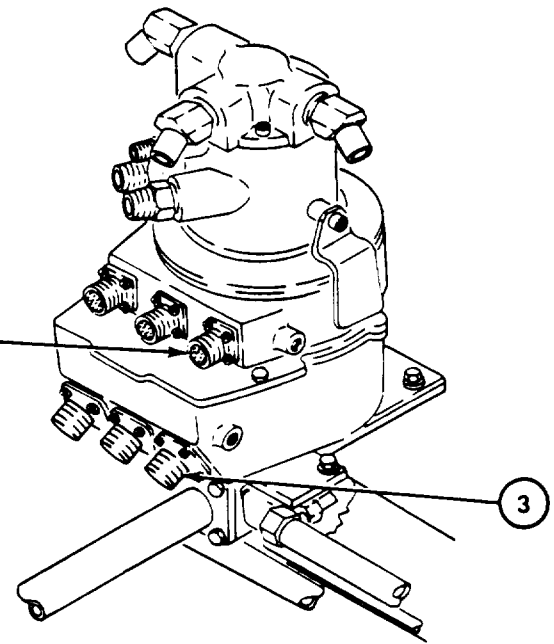


TURRET POWER AND SEARCHLIGHT RELAY BOX

03

DEFECTIVE SLIPRING TO TURRET POWER RELAY BOX WIRING HARNESS

- CONNECT HARNESS CONNECTOR 47 TO JACK (3) ON TURRET ELECTRICAL SLIPRING
- NOTIFY SUPPORT MAINTENANCE



TURRET SLIPRING

02

RESISTANCE LESS THAN 2 OHMS

YES

NO

04

DEFECTIVE TURRET ELECTRICAL SLIPRING

- CONNECT HARNESS CONNECTOR 100 TO JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- REMOVE AND REPLACE TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-7, 3-8)

**7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 1 OF 37)**

- SYMPTOM:** (58) Xenon lamp fails to light  
 (59) Indicator lamp fails to light  
 (60) Beam width does not change  
 (61) IR filter fails to operate (mode of operation does not change)  
 (62) Searchlight shutter fails to operate  
 (63) Overdrive fails to operate  
 (64) Blower motor fails to run

**TEST EQUIPMENT:** Multimeter  
 Jumper wire

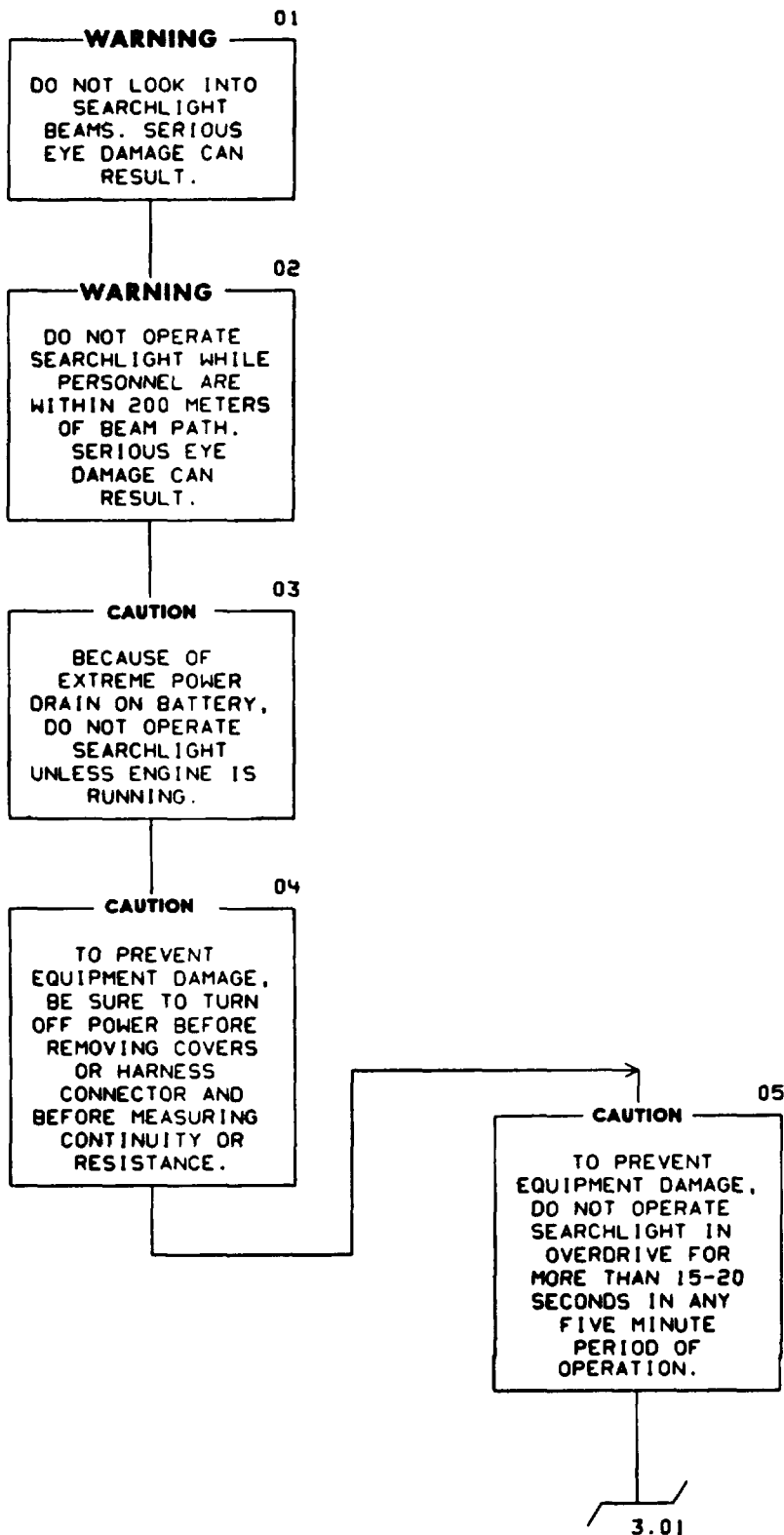
**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Searchlight Control Box	2	4
Searchlight	5	1
Searchlight Connector	5	6
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipping	3	5

- REFERENCES:** (1) TM 9-2350-222-20-2-3 for removal and replacement of components  
 (2) ETM 643-091-9400R/JPG for procedures to:  
 Use multimeter  
 Disconnect electrical connectors  
 (3) TM 9-2350-222-10 for procedure to:  
 Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 2 OF 37)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 3 OF 37)

02.05 →

**NOTE** 01

WHEN MAKING CONTINUITY CHECKS BETWEEN SEARCHLIGHT CABLE AND SEARCHLIGHT CONTROL BOX, IT WILL BE NECESSARY TO DISCONNECT CABLE AT SEARCHLIGHT AND BRING CABLE PLUG THROUGH COMMANDER'S OR LOADER'S HATCH.

**NOTE** 02

FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, AND RESISTANCE, REFER TO JPG

03

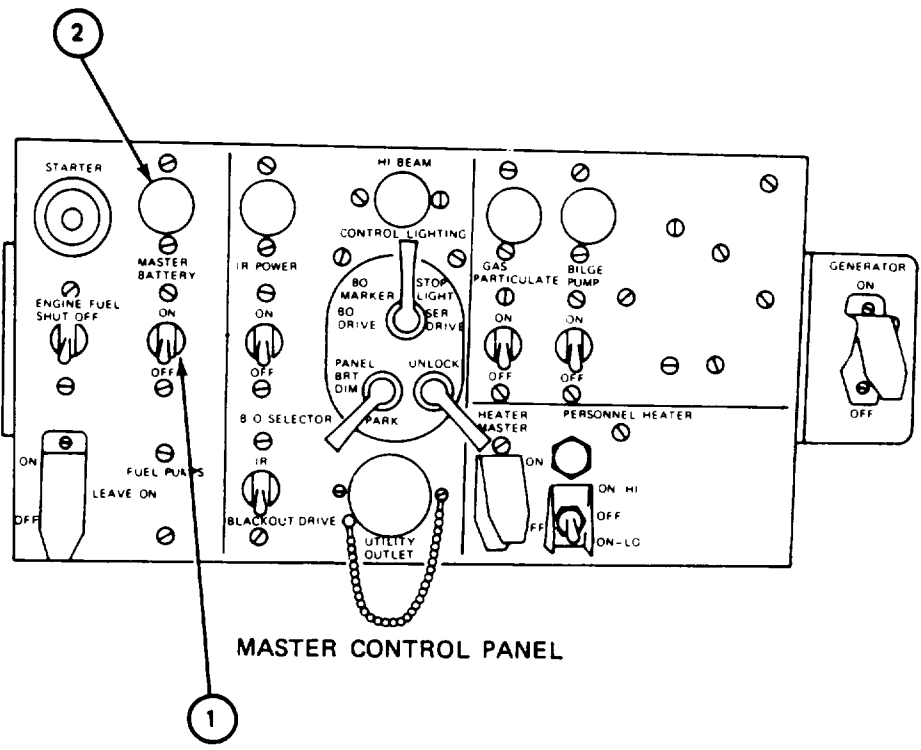
SET 'MASTER BATTERY' SWITCH (1) ON MASTER CONTROL PANEL TO 'ON'

04

'MASTER BATTERY' LAMP (2) LIGHTS

YES

4  
01



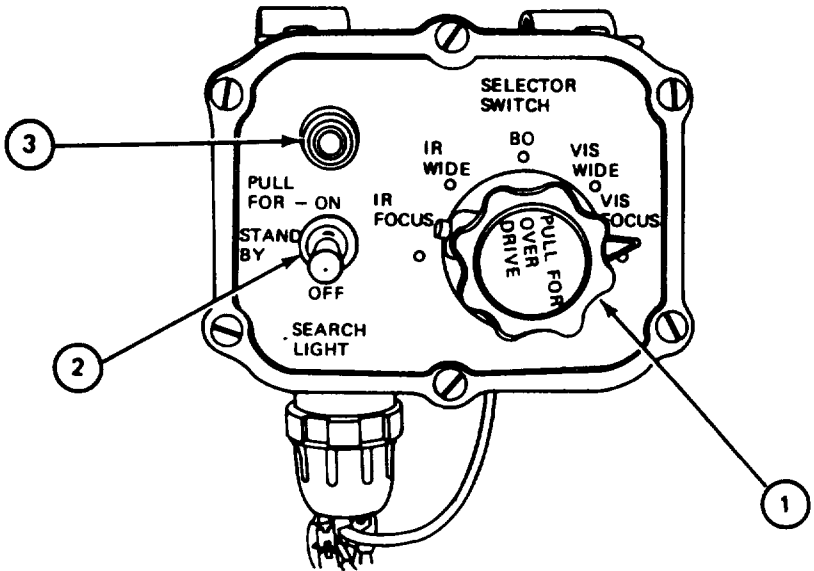
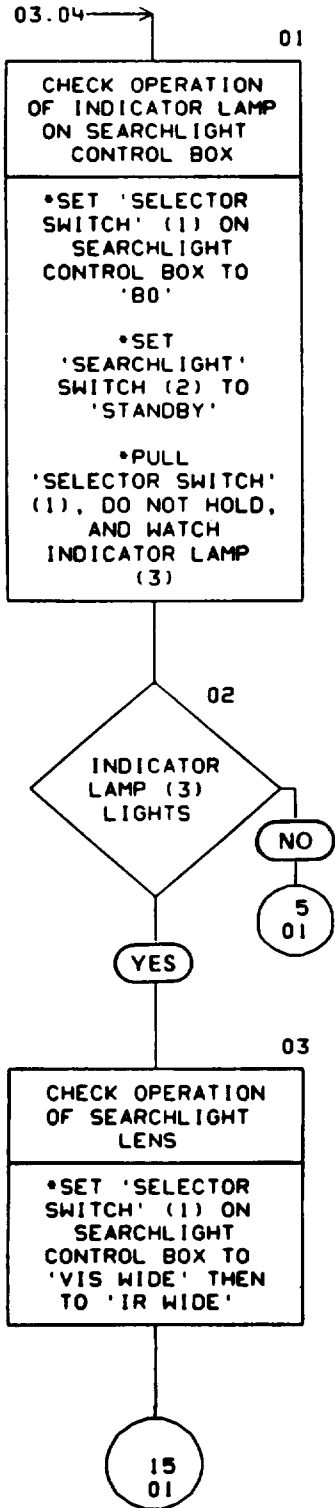
NO

05

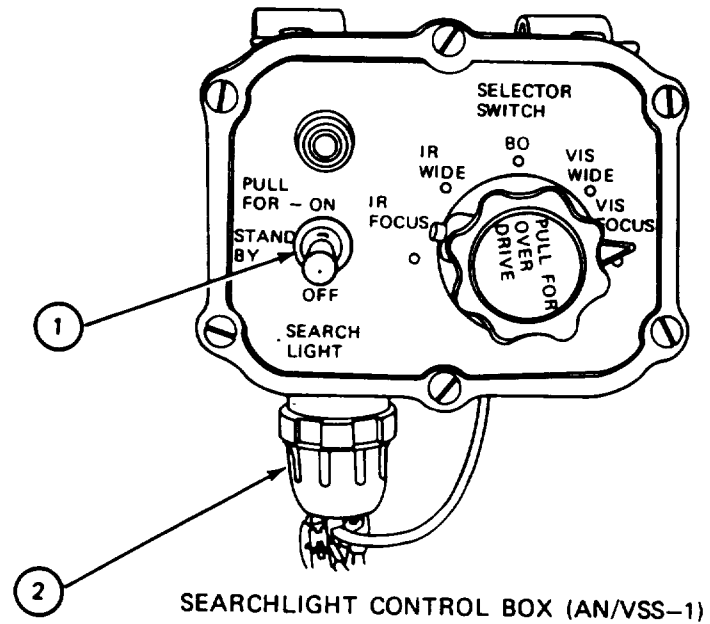
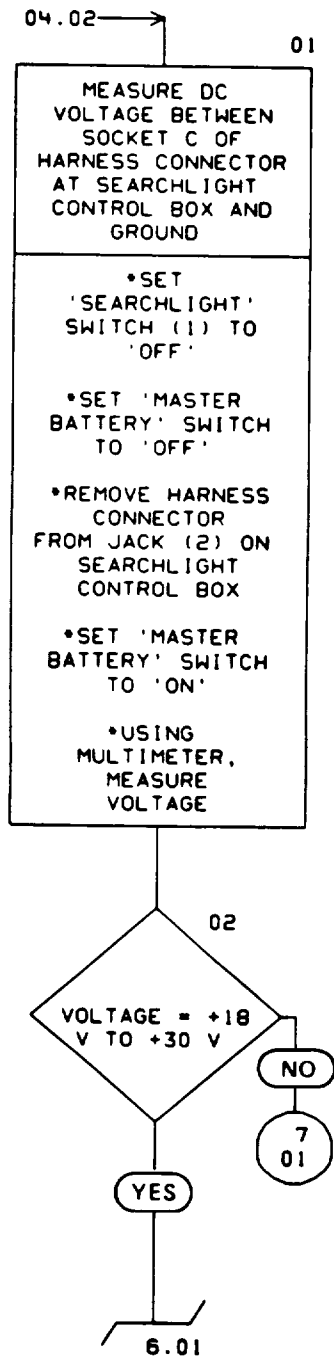
DEFECTIVE BATTERY CIRCUIT

\*NOTIFY HULL MAINTENANCE

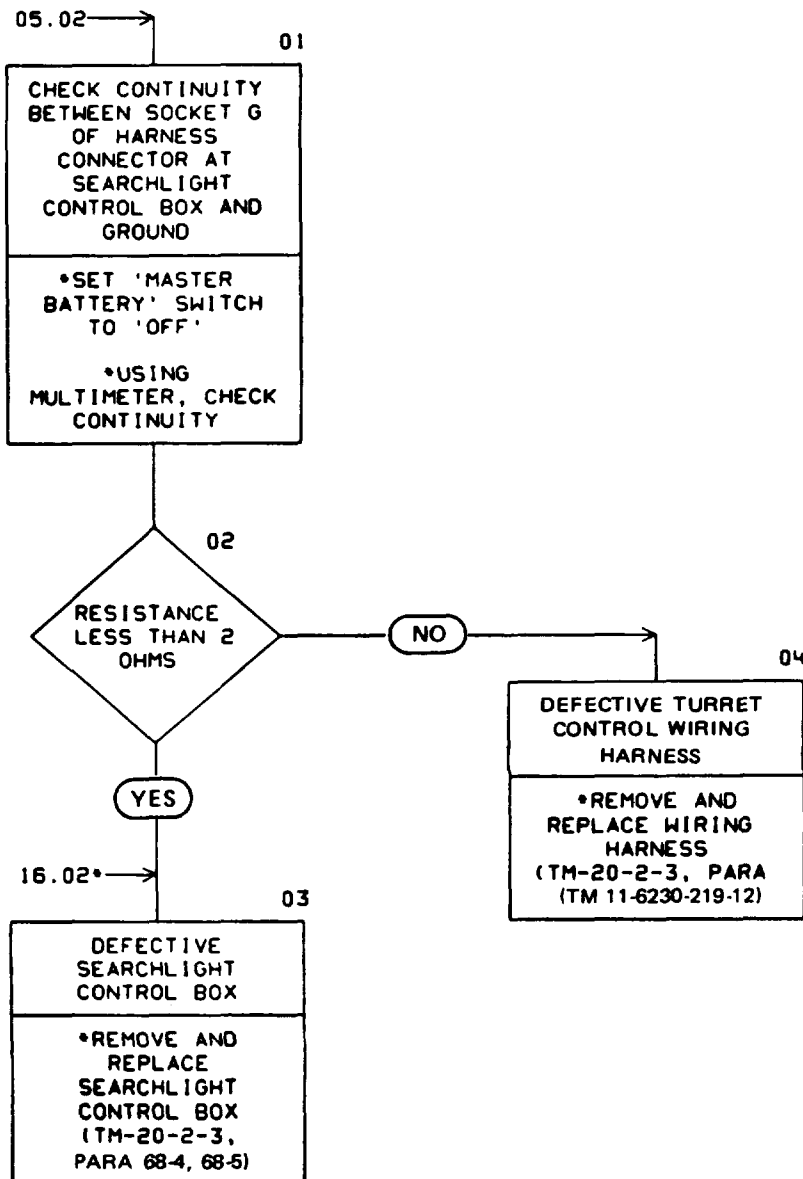
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 4 OF 37)



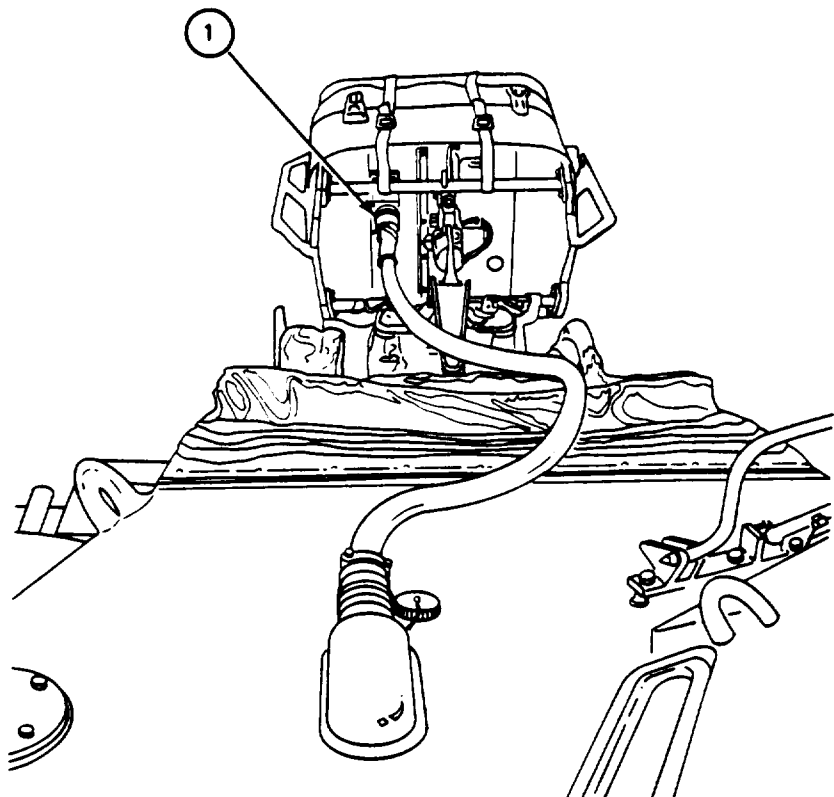
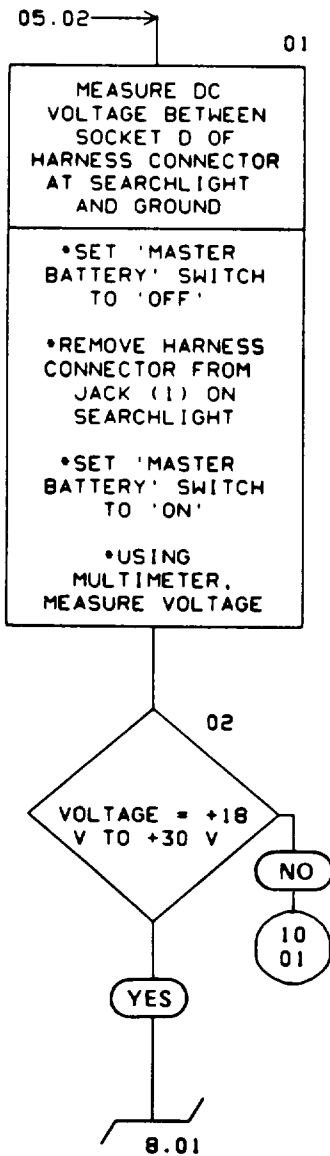
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 5 OF 37)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 6 OF 37)



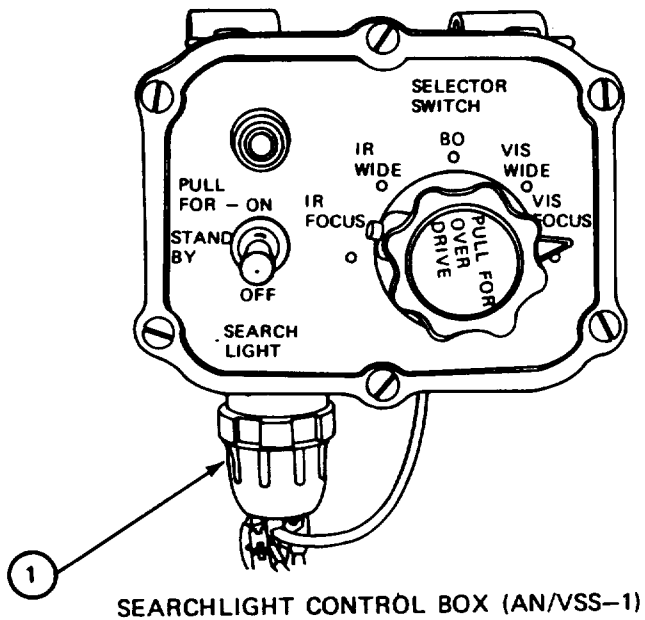
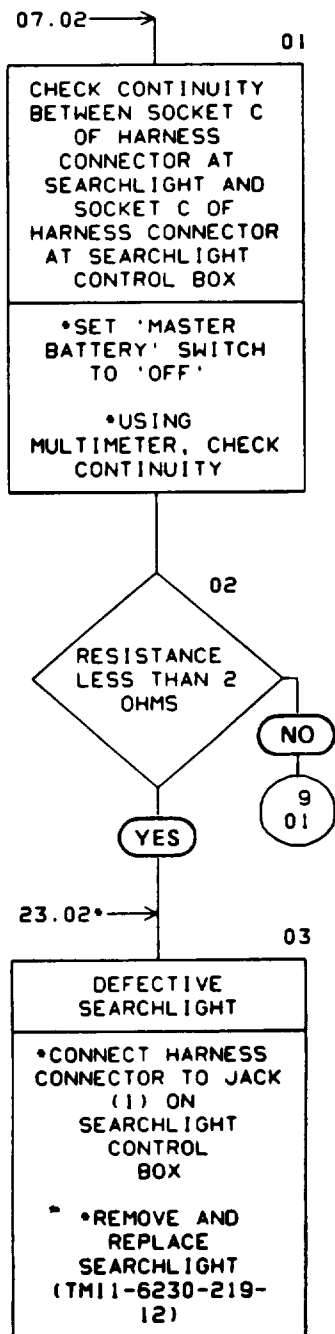
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 7 OF 37)



SEARCHLIGHT AND SEARCHLIGHT CONNECTOR (AN/VSS-1)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 8 OF 37)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 9 OF 37)

08.02 →

01

CHECK CONTINUITY BETWEEN SOCKET C OF HARNESS CONNECTOR AT SEARCHLIGHT AND SOCKET C OF HARNESS CONNECTOR AT SEARCHLIGHT CONNECTOR (1)

• REMOVE HARNESS CONNECTOR FROM SEARCHLIGHT CONNECTOR

• USING MULTIMETER, CHECK CONTINUITY

02

RESISTANCE LESS THAN 2 OHMS

YES

14.02\* →

03

DEFECTIVE TURRET CONTROL WIRING HARNESS BETWEEN SEARCHLIGHT CONTROL BOX AND SEARCHLIGHT CONNECTOR

• CONNECT HARNESS CONNECTOR TO JACK (3) ON SEARCHLIGHT

• NOTIFY SUPPORT MAINTENANCE

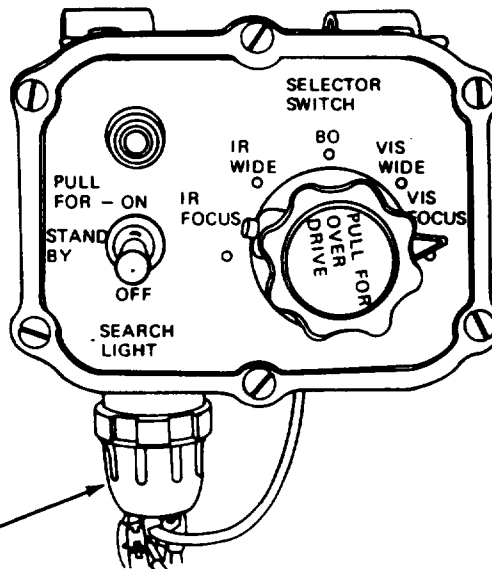
NO

04

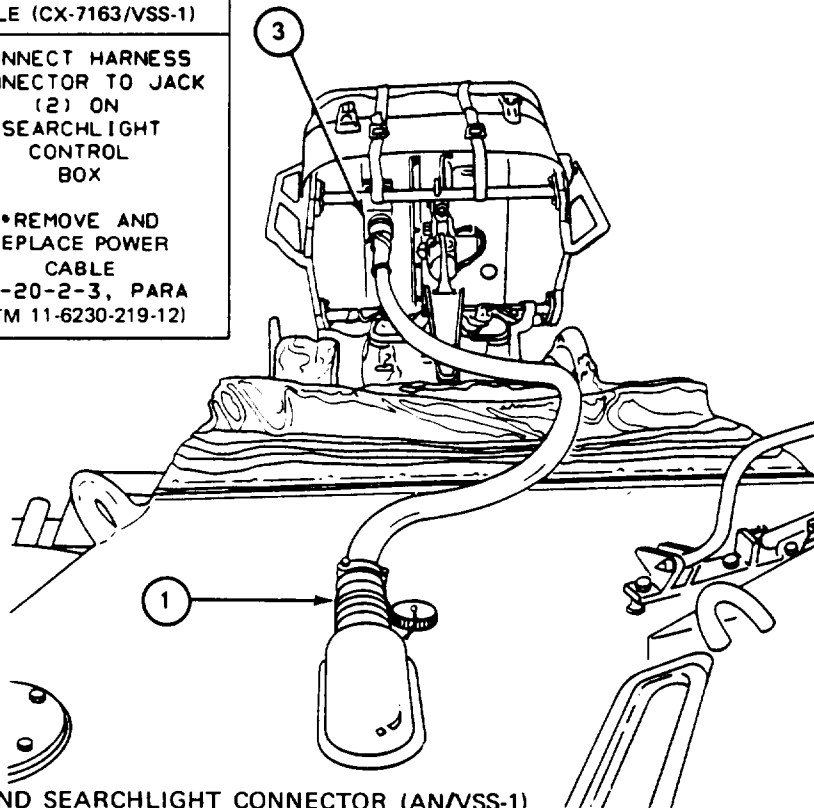
DEFECTIVE POWER CABLE (CX-7163/VSS-1)

• CONNECT HARNESS CONNECTOR TO JACK (2) ON SEARCHLIGHT CONTROL BOX

• REMOVE AND REPLACE POWER CABLE (TM-20-2-3, PARA (TM 11-6230-219-12)

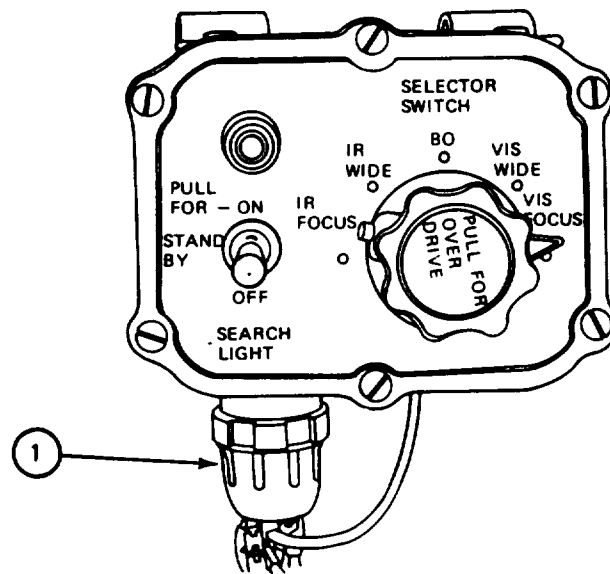
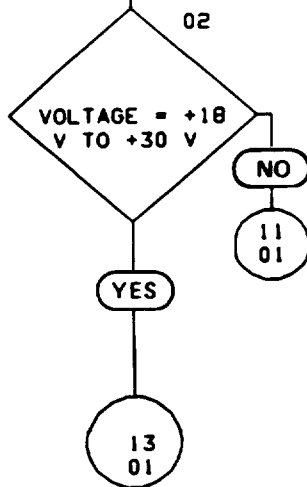
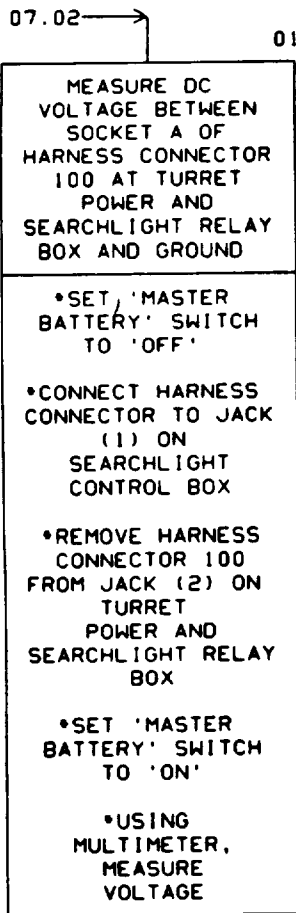


SEARCHLIGHT CONTROL BOX (AN/VSS-1)

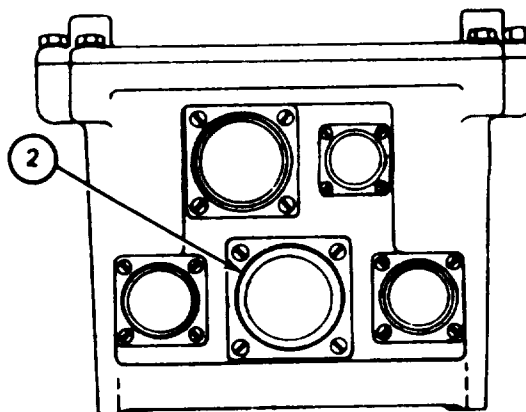


SEARCHLIGHT AND SEARCHLIGHT CONNECTOR (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 10 OF 37)

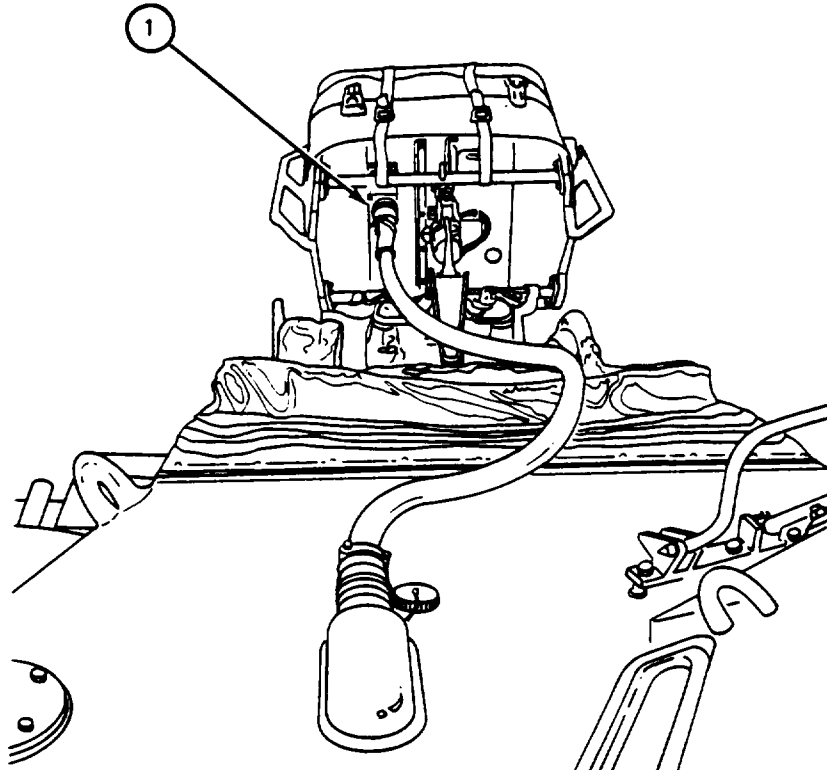
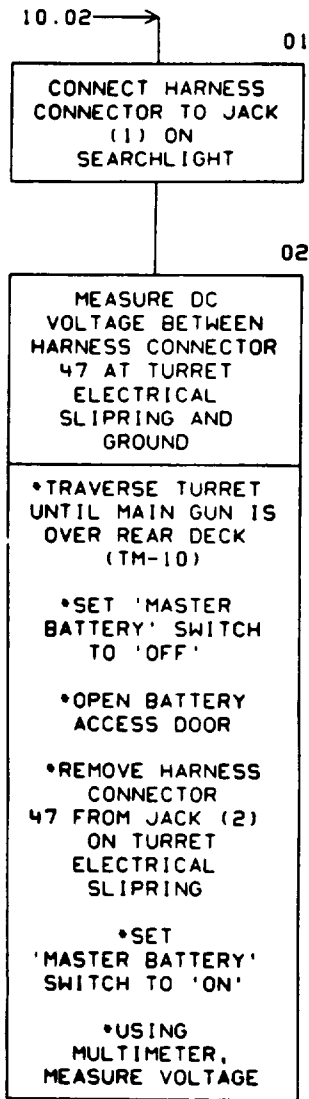


SEARCHLIGHT CONTROL BOX (AN/VSS-1)

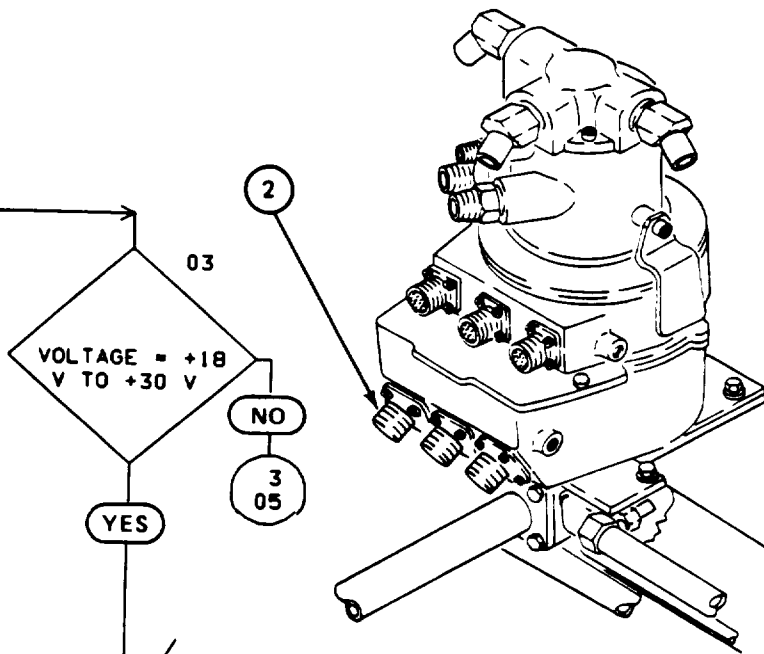


TURRET POWER AND SEARCHLIGHT RELAY BOX

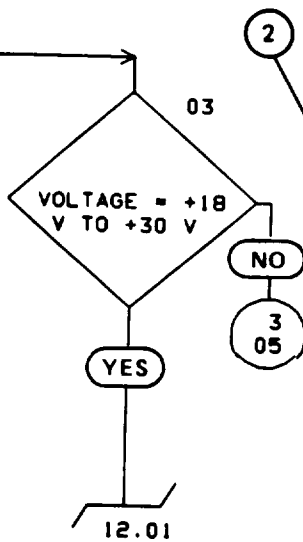
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 11 OF 37)



SEARCHLIGHT AND SEARCHLIGHT CONNECTOR (AN/VSS-1)



TURRET SLIPRING



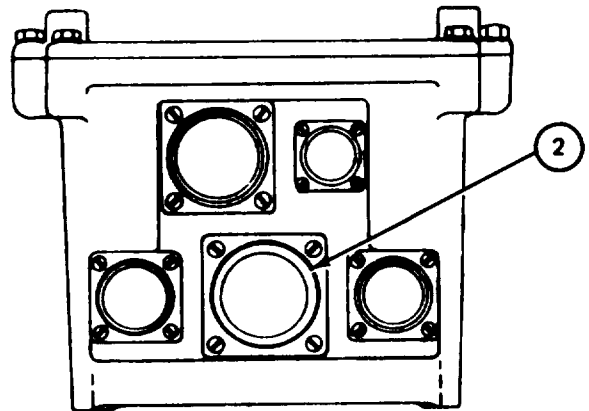
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 12 OF 37)

11.03 →

01

CHECK CONTINUITY BETWEEN SOCKET A OF HARNESS CONNECTOR 100 AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND HARNESS CONNECTOR 100 AT TURRET ELECTRICAL SLIPRING

- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE COVER FROM TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-2)
- REMOVE HARNESS CONNECTOR 100 FROM JACK (1) ON TURRET ELECTRICAL SLIPRING
- USING MULTIMETER, CHECK CONTINUITY

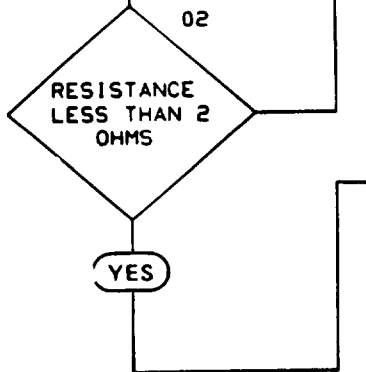


TURRET POWER AND SEARCHLIGHT RELAY BOX

03

DEFECTIVE SLIPRING TO TURRET POWER RELAY BOX WIRING HARNESS SEARCHLIGHT RELAY BOX AND TURRET ELECTRICAL SLIPRING

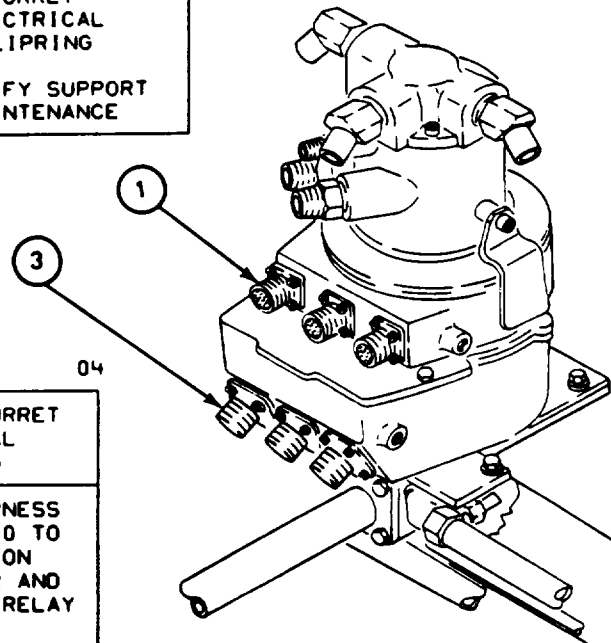
- CONNECT HARNESS CONNECTOR 47 TO JACK (3) ON TURRET ELECTRICAL SLIPRING
- NOTIFY SUPPORT MAINTENANCE



04

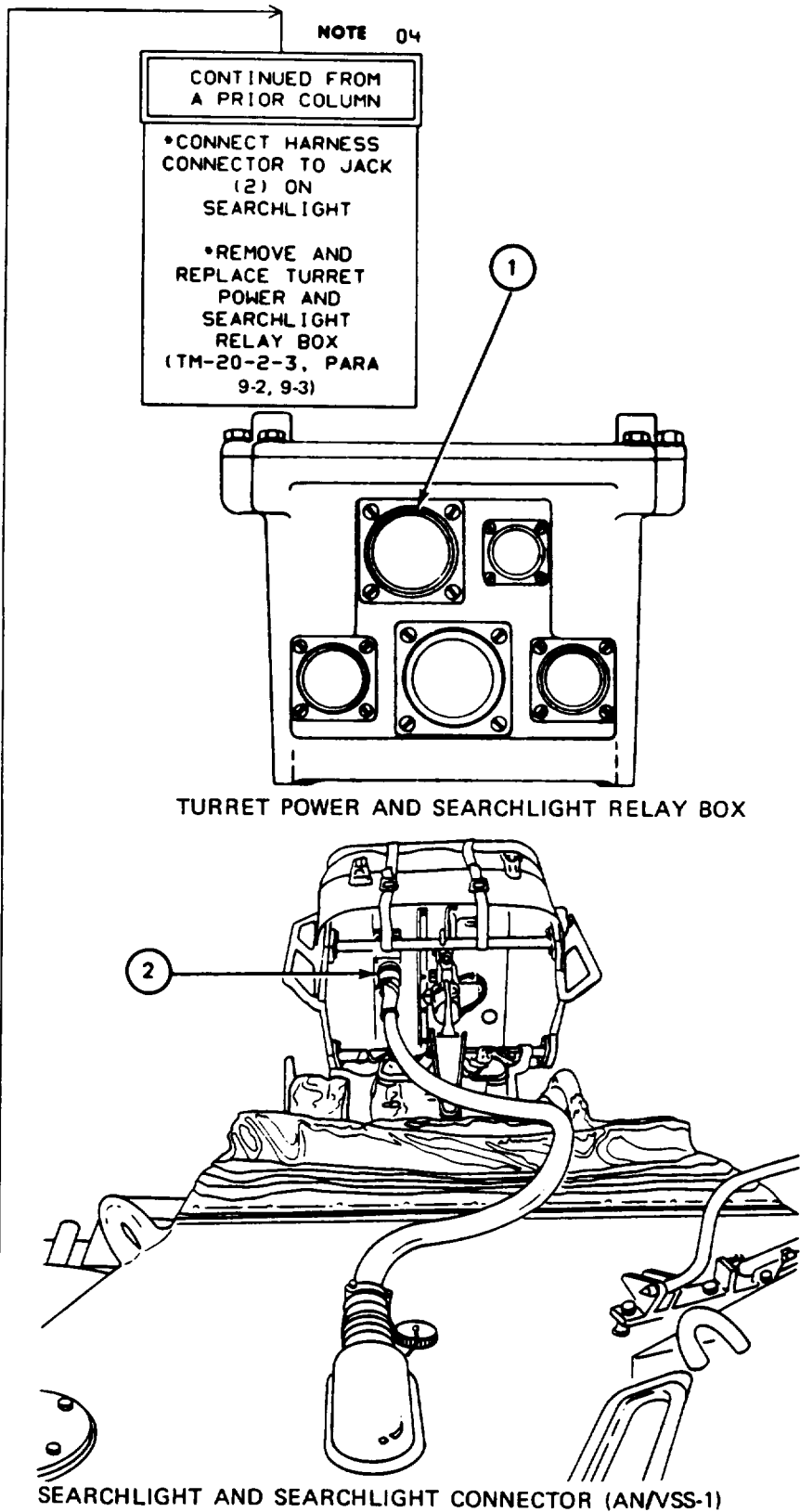
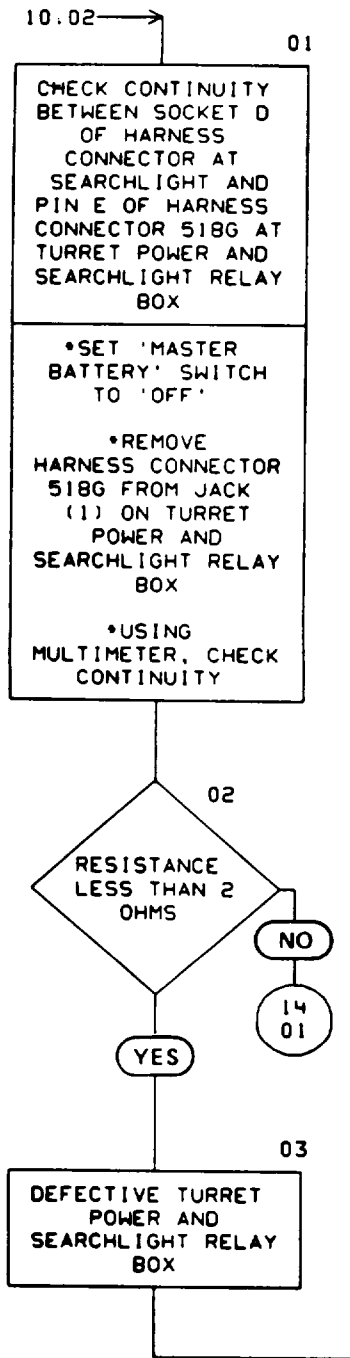
DEFECTIVE TURRET ELECTRICAL SLIPRING

- CONNECT HARNESS CONNECTOR 100 TO JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX
- REMOVE AND REPLACE TURRET ELECTRICAL SLIPRING (TM-20-2-3, PARA 3-7, 3-8)

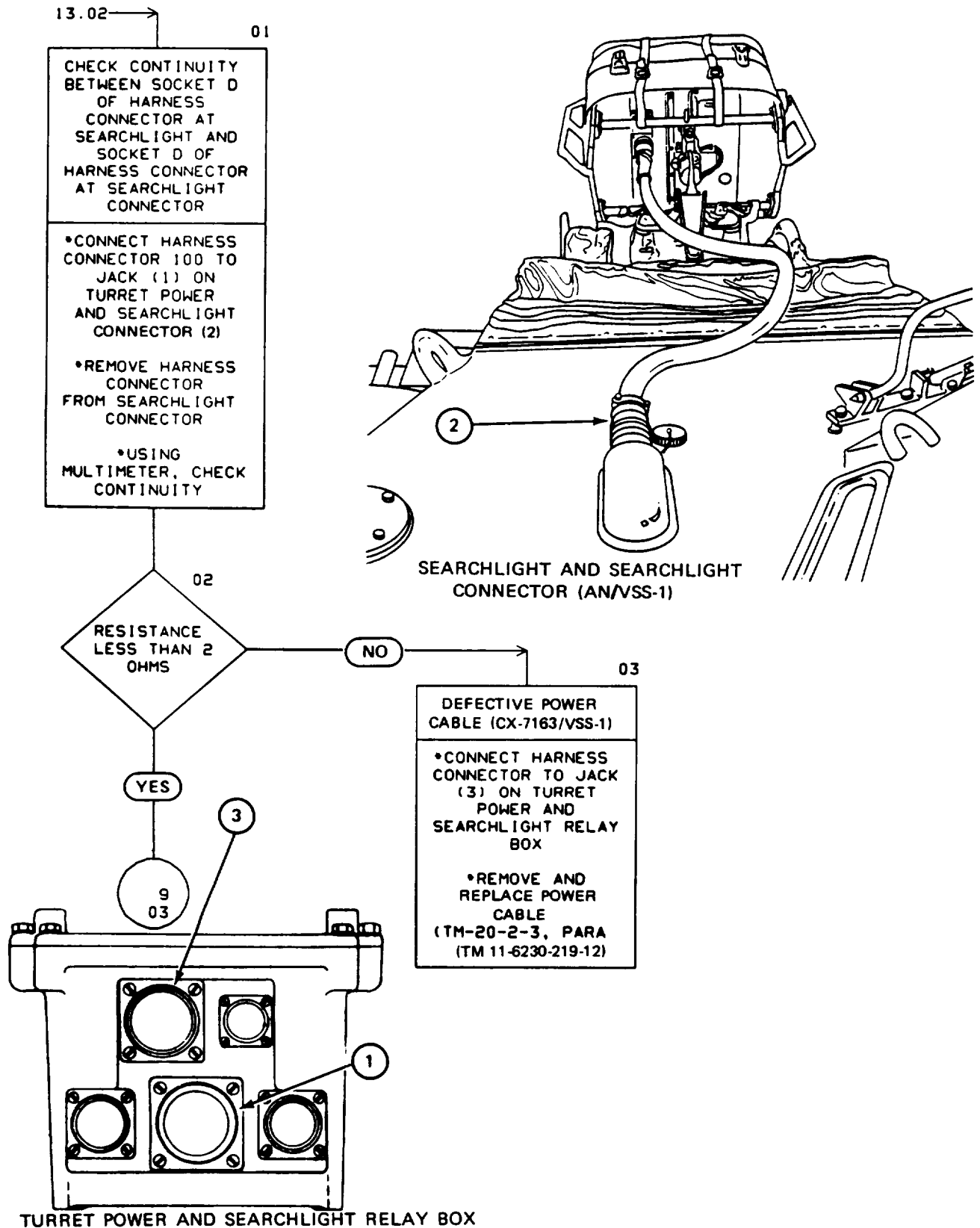


TURRET SLIPRING

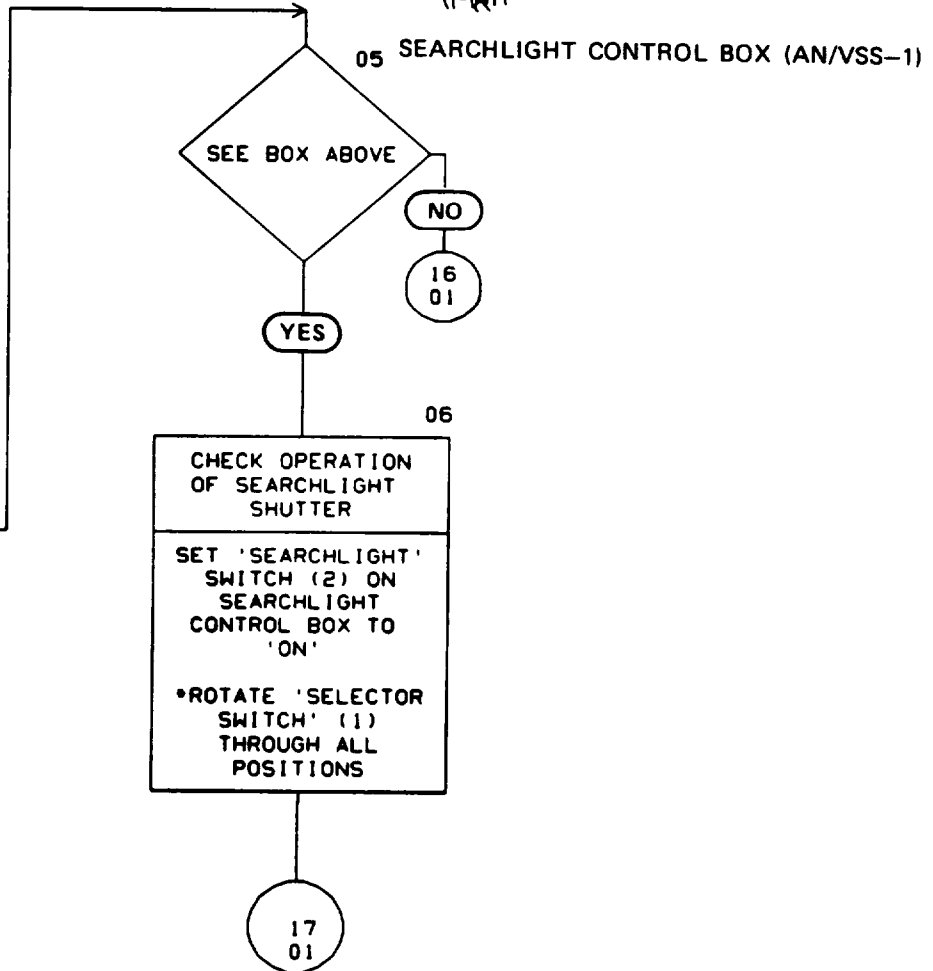
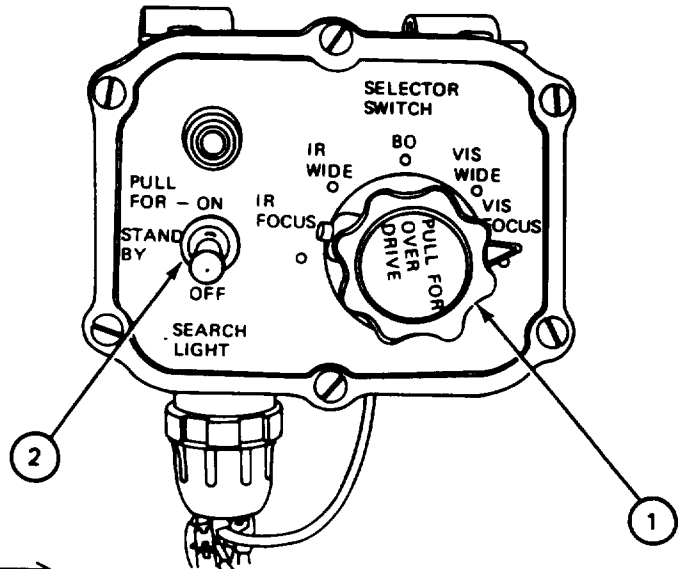
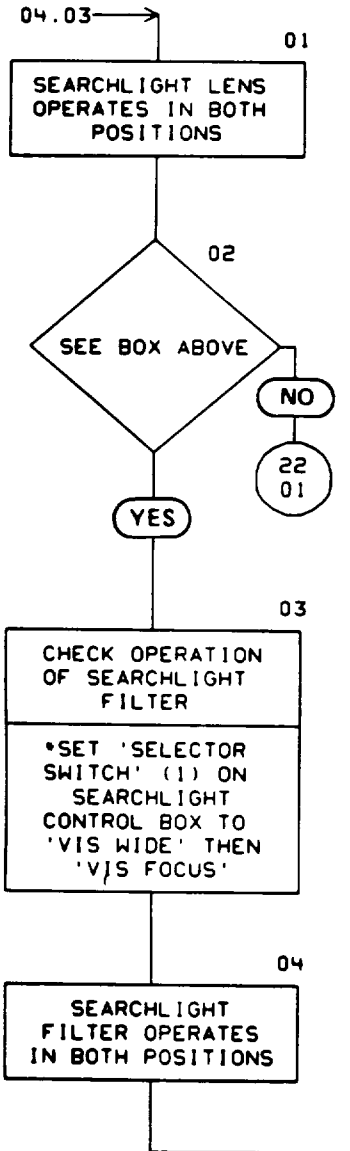
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 13 OF 37)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 14 OF 37)

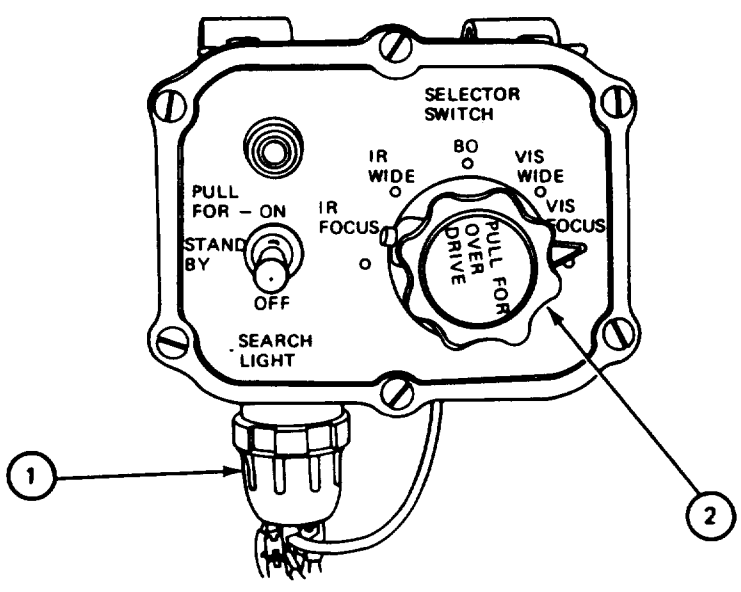
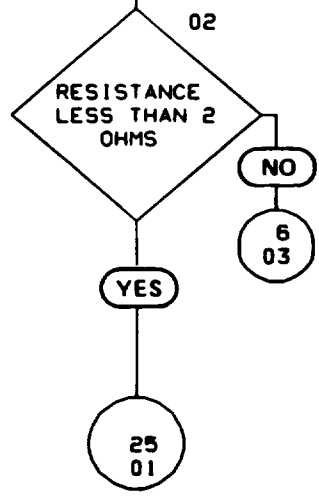
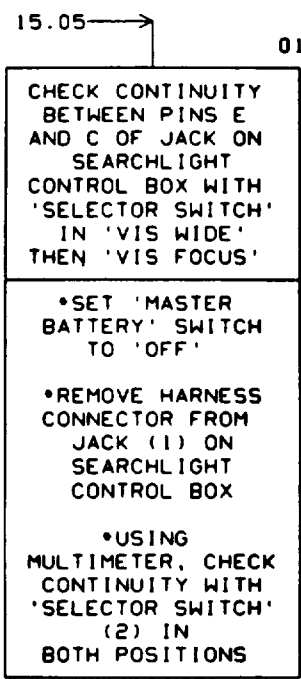


7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 15 OF 37)



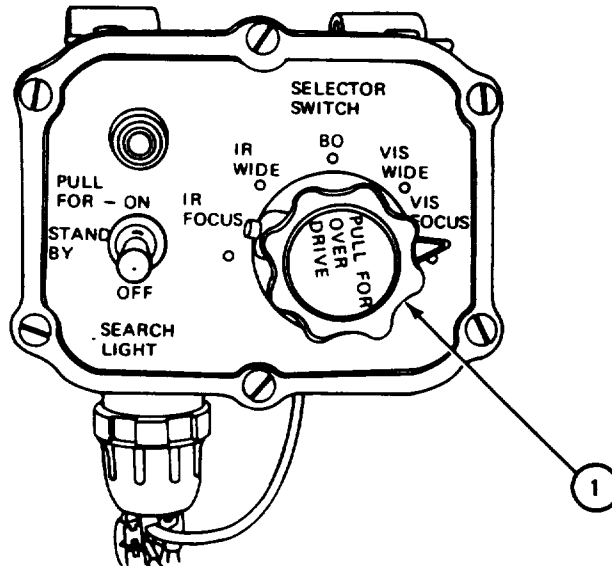
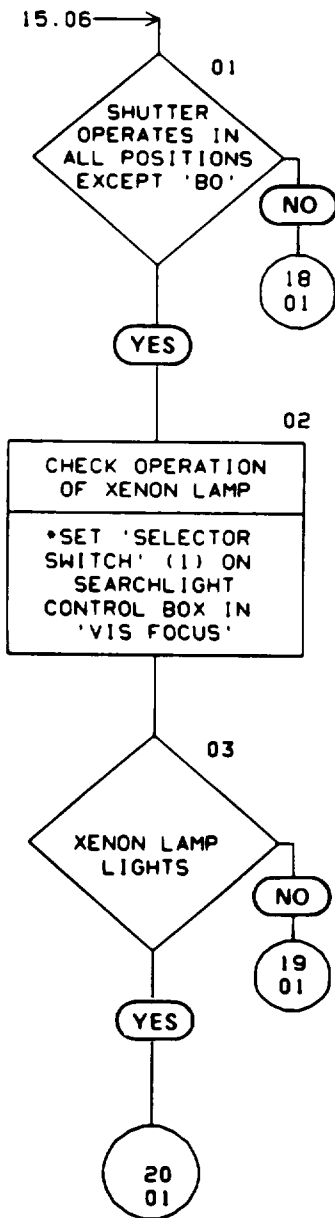


7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 16 OF 37)



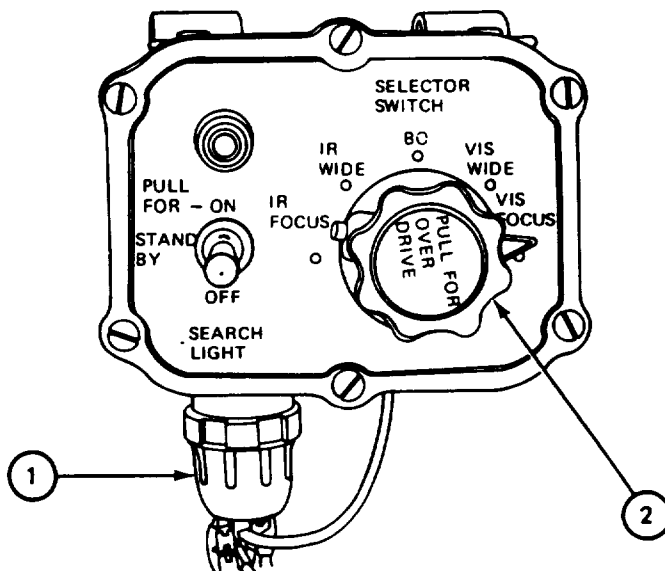
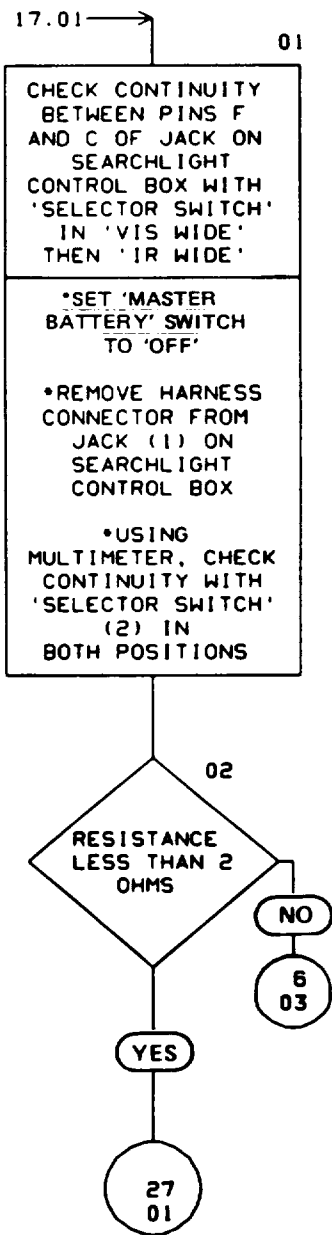
SEARCHLIGHT CONTROL BOX (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 17 OF 37)



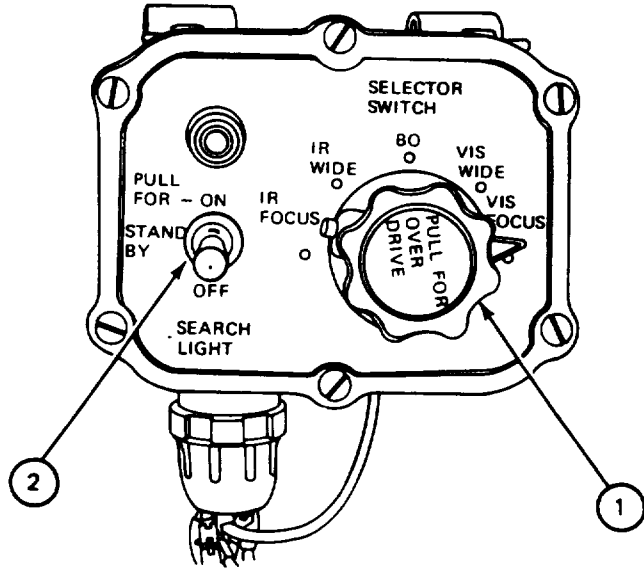
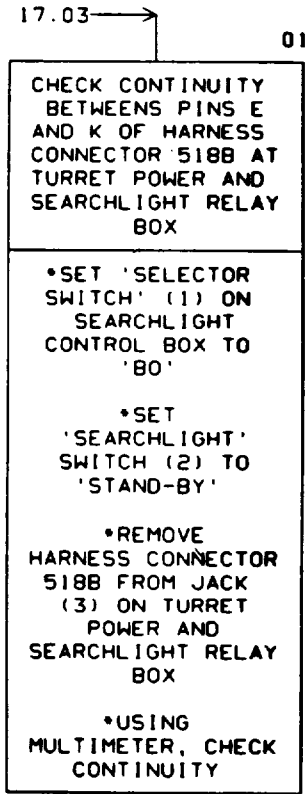
SEARCHLIGHT CONTROL BOX (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 18 OF 37)

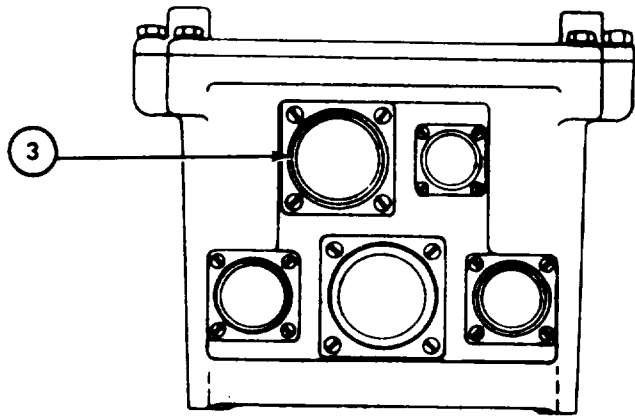
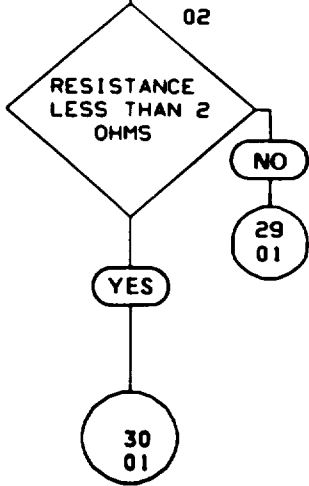


SEARCHLIGHT CONTROL BOX (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 19 OF 37)

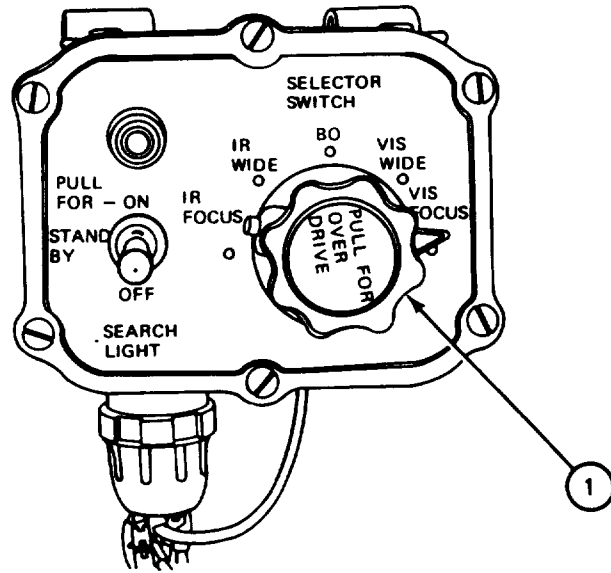
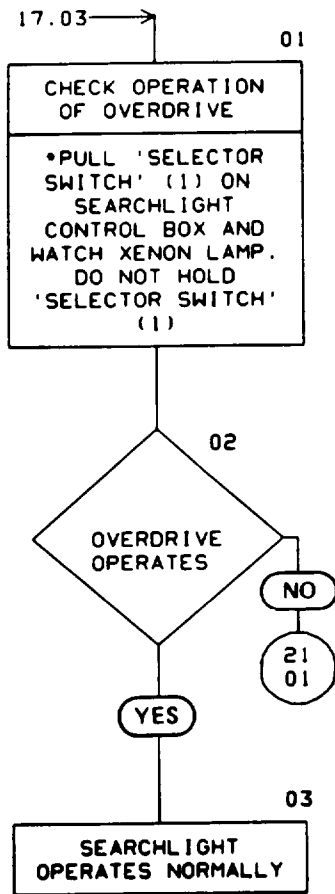


SEARCHLIGHT CONTROL BOX (AN/VSS-1)



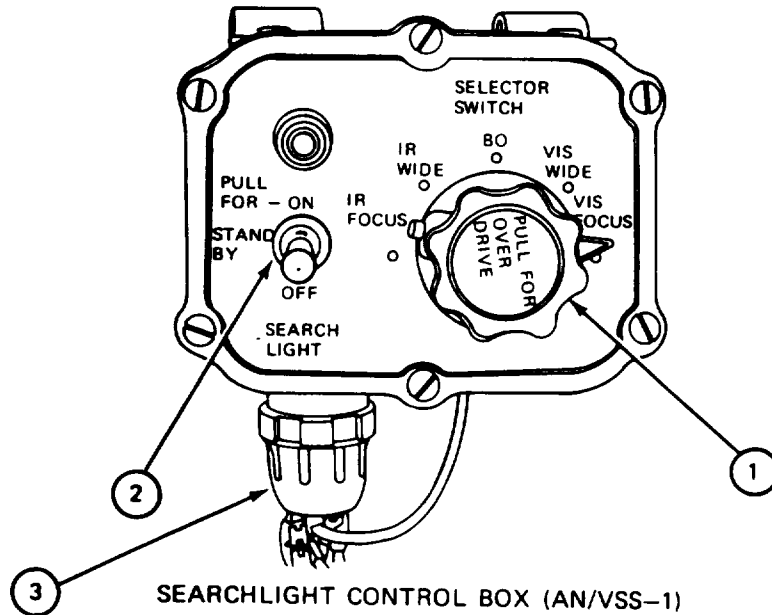
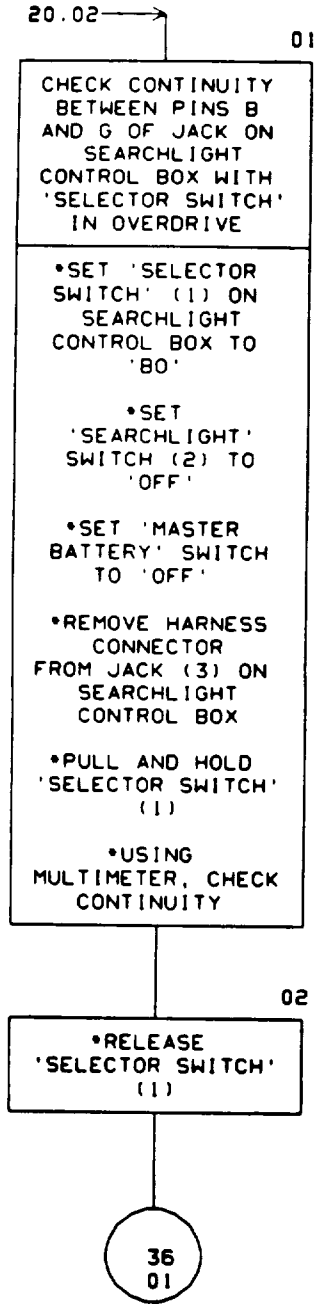
TURRET POWER AND SEARCHLIGHT RELAY BOX

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 20 OF 37)

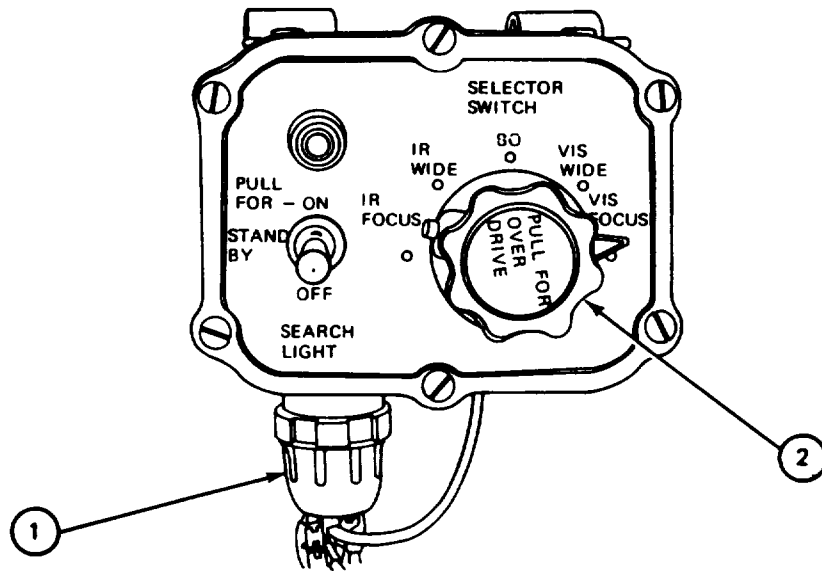
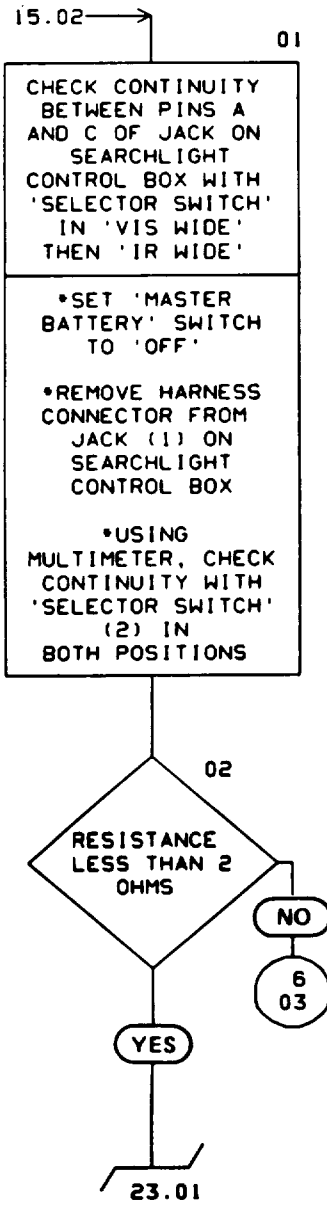


SEARCHLIGHT CONTROL BOX (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 21 OF 37)

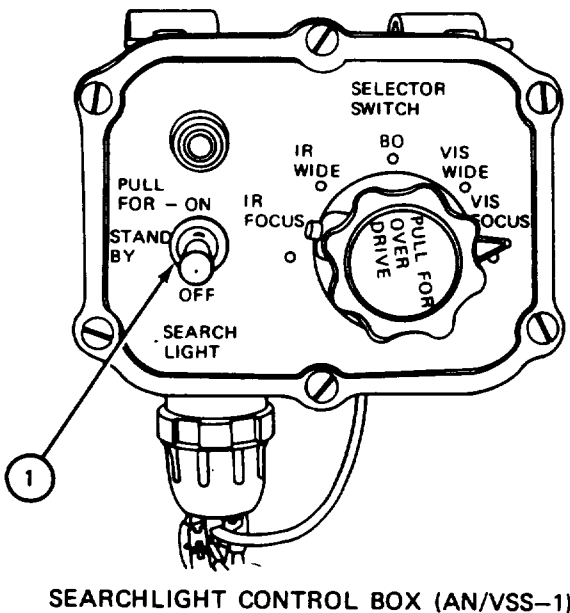
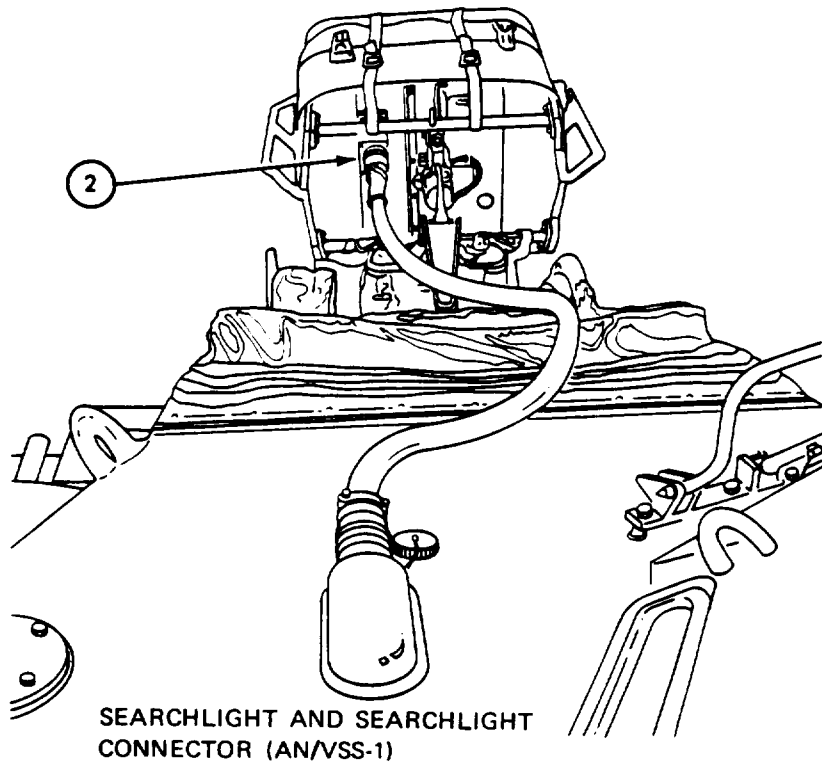
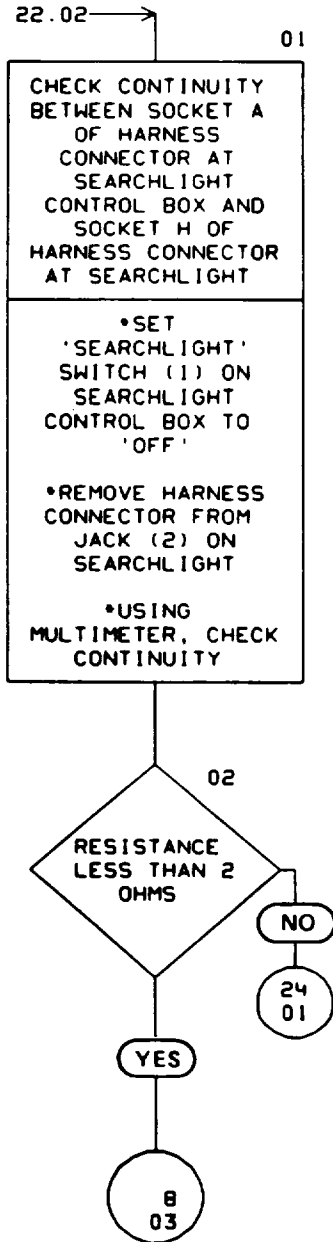


7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 22 OF 37)



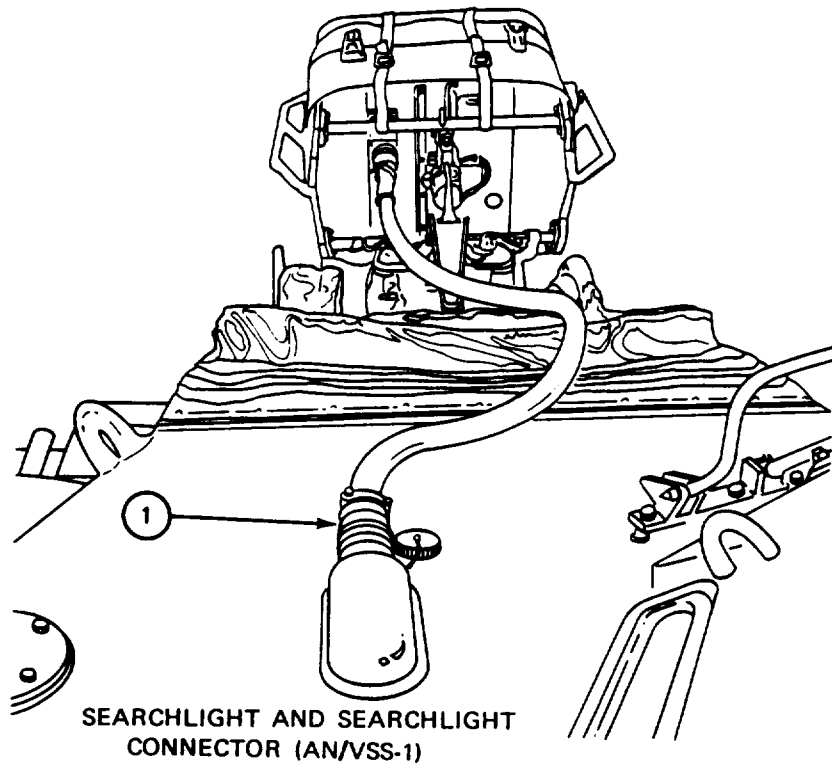
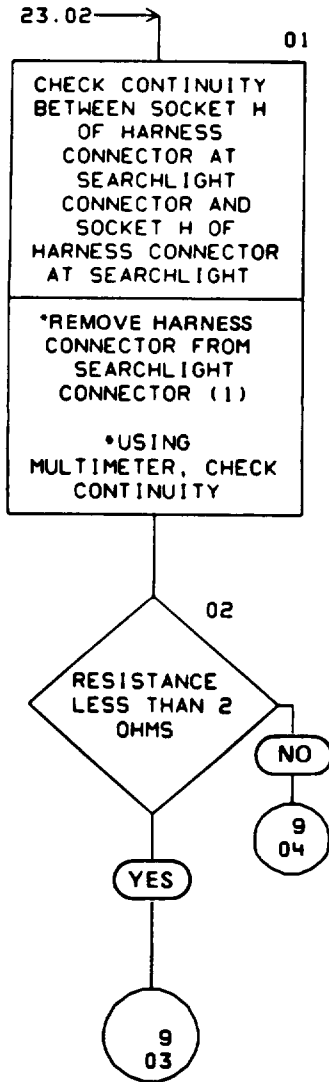
SEARCHLIGHT CONTROL BOX (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 23 OF 37)

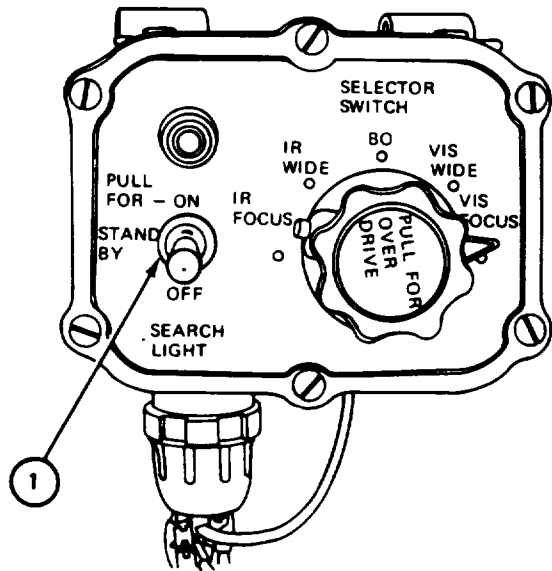
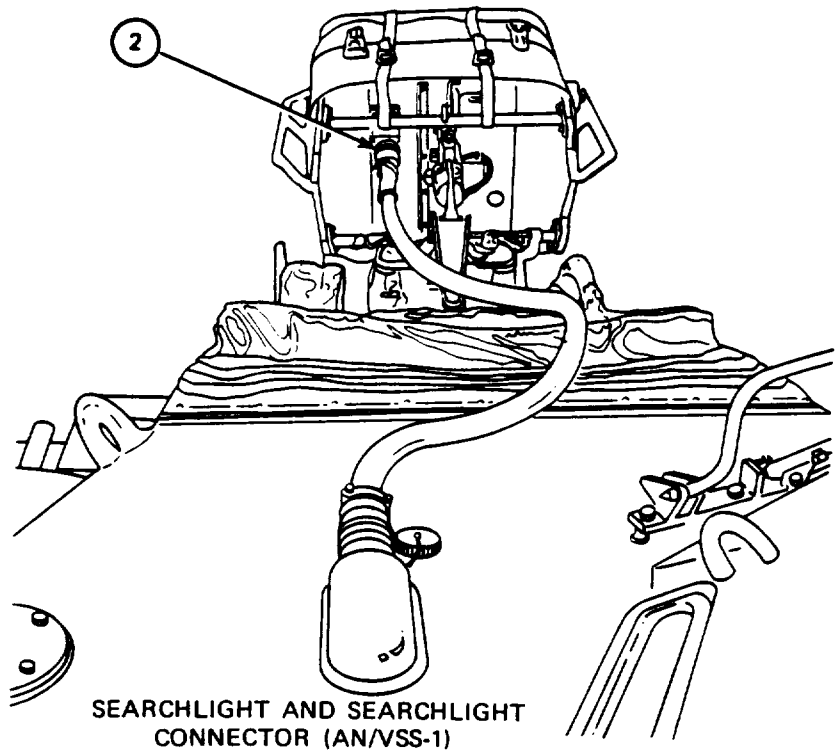
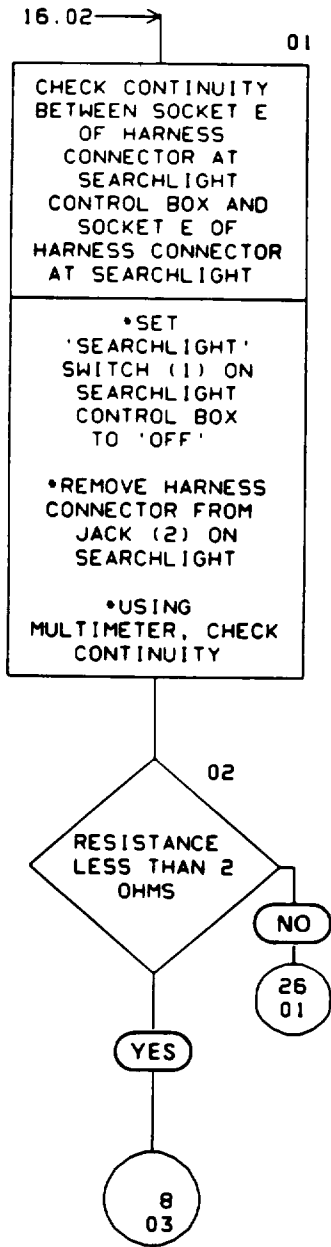




7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 24 OF 37)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 25 OF 37)



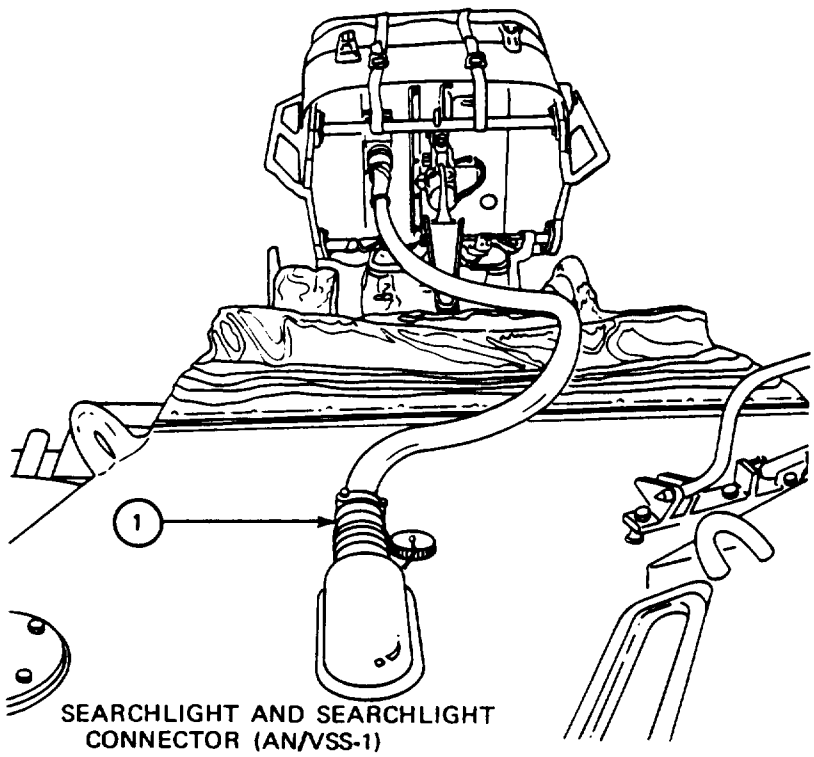
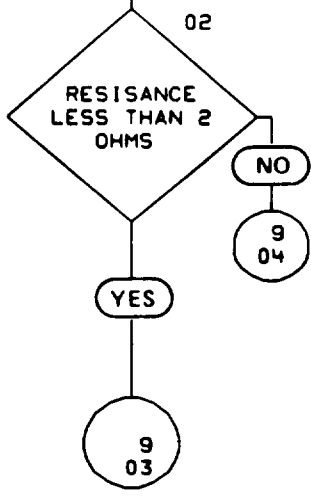
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 26 OF 37)

25.02 → 01

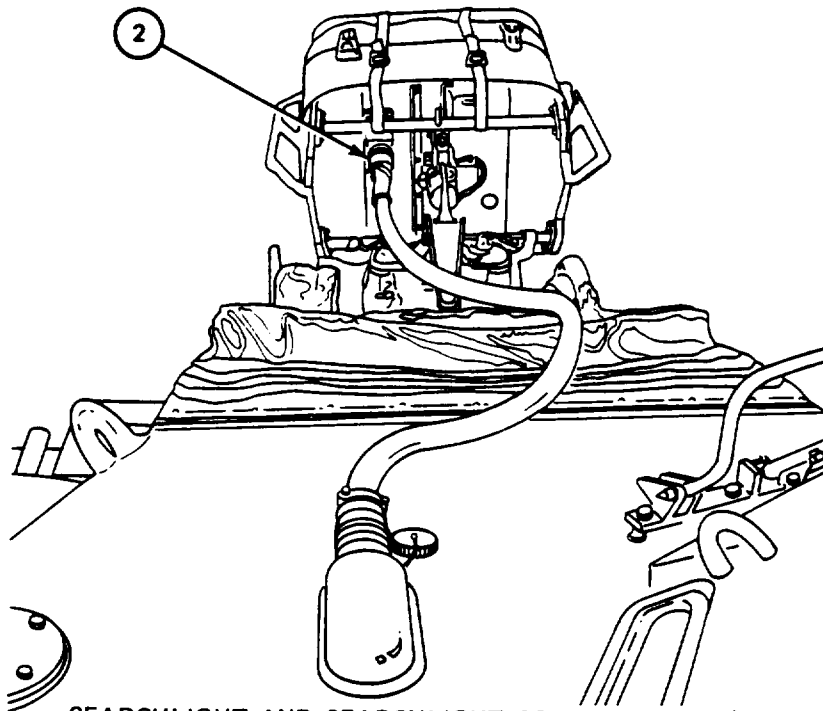
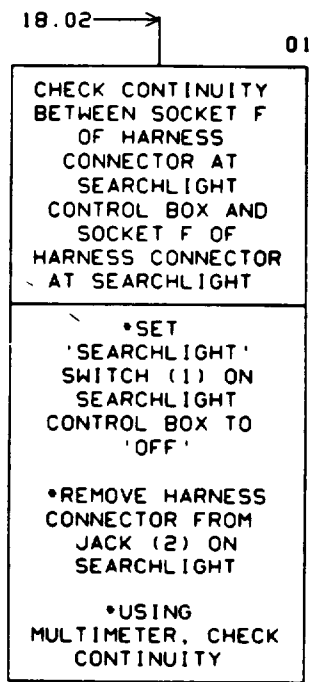
CHECK CONTINUITY BETWEEN SOCKET E OF HARNESS CONNECTOR AT SEARCHLIGHT AND SOCKET E OF HARNESS CONNECTOR AT SEARCHLIGHT CONNECTOR

\*REMOVE HARNESS CONNECTOR FROM SEARCHLIGHT CONNECTOR (1)

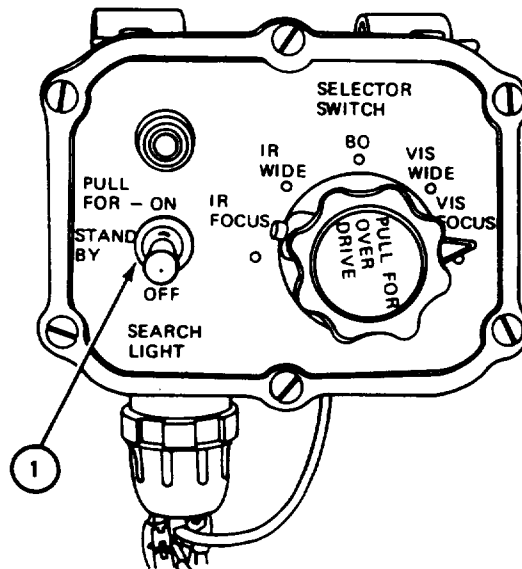
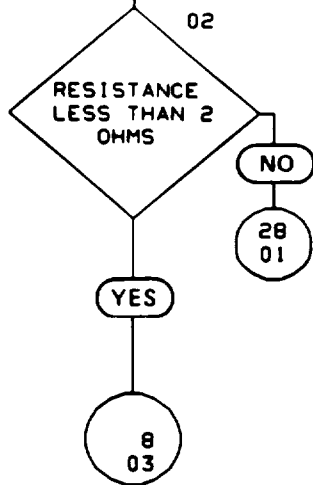
\*USING MULTIMETER, CHECK CONTINUITY



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 27 OF 37)

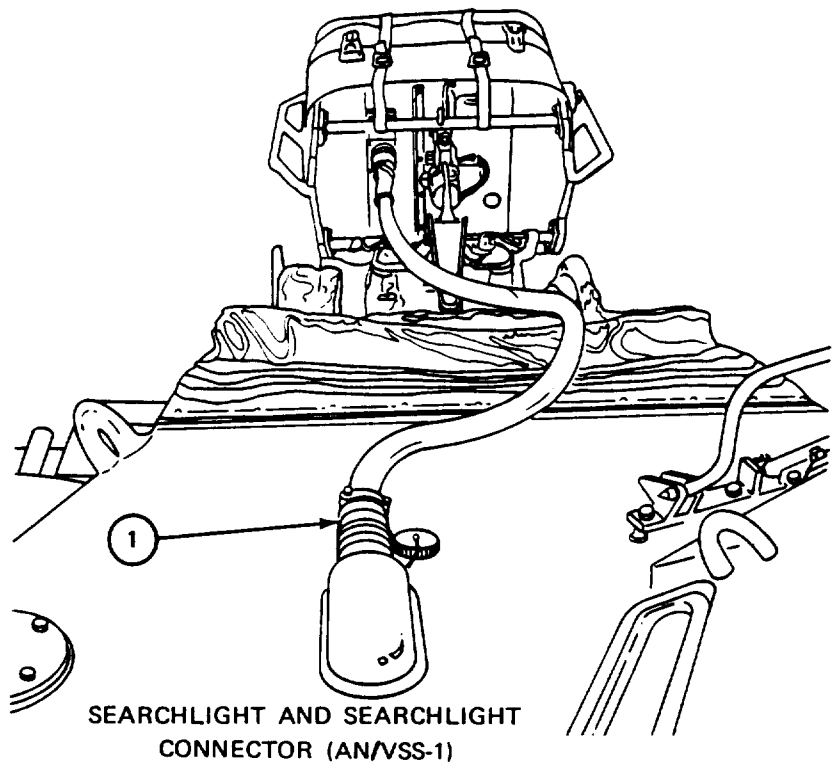
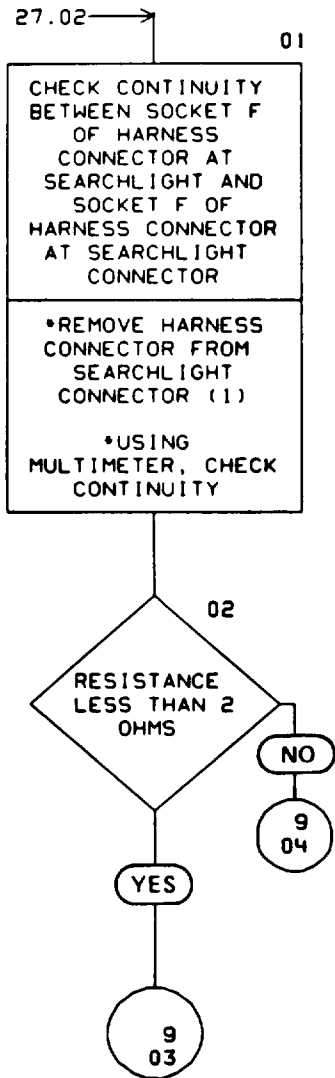


SEARCHLIGHT AND SEARCHLIGHT CONNECTOR, (AN/VSS-1)

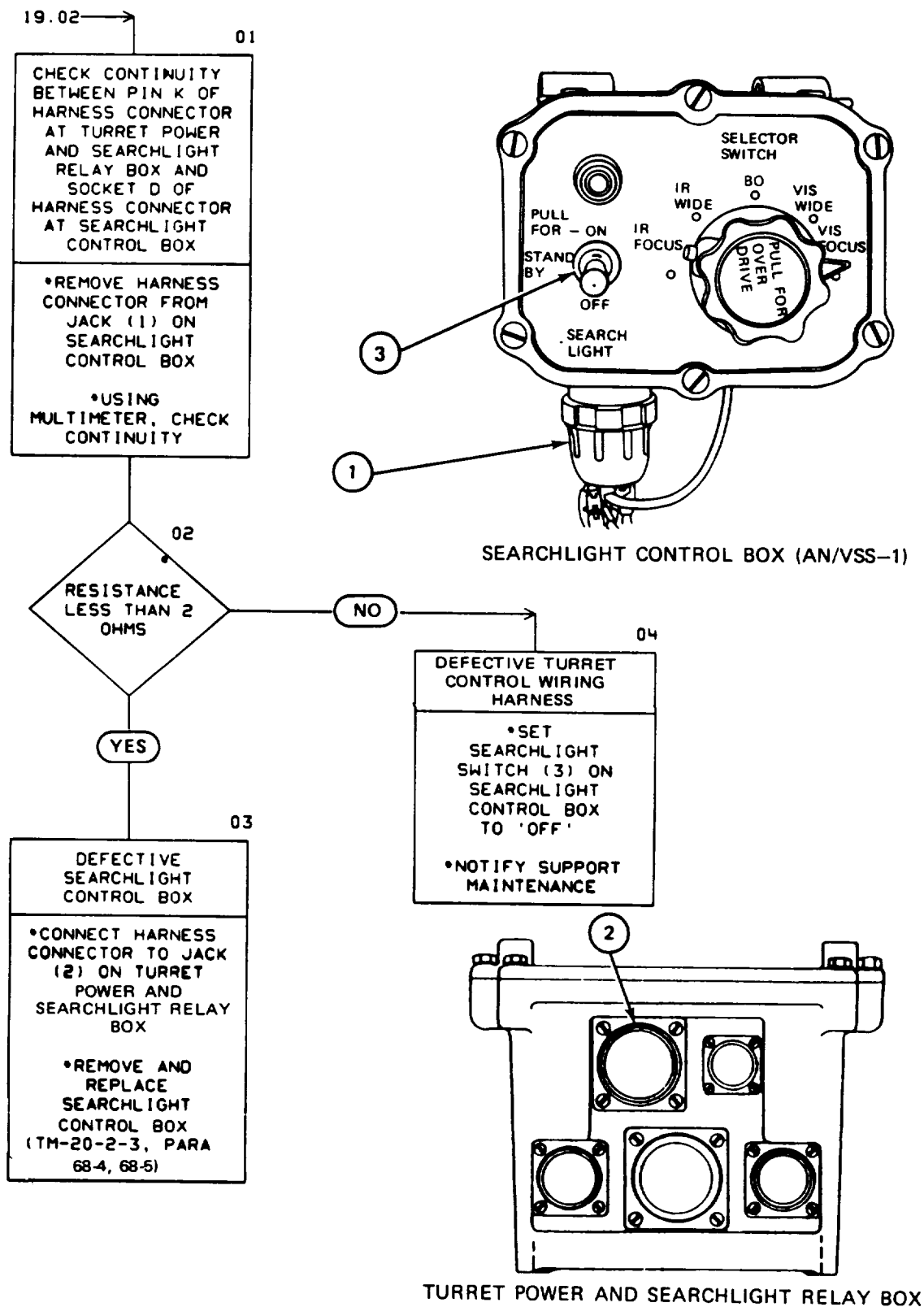


SEARCHLIGHT CONTROL BOX (AN/VSS-1)

7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 28 OF 37)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 29 OF 37)



7.2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 30 OF 37)

19.02 →

01

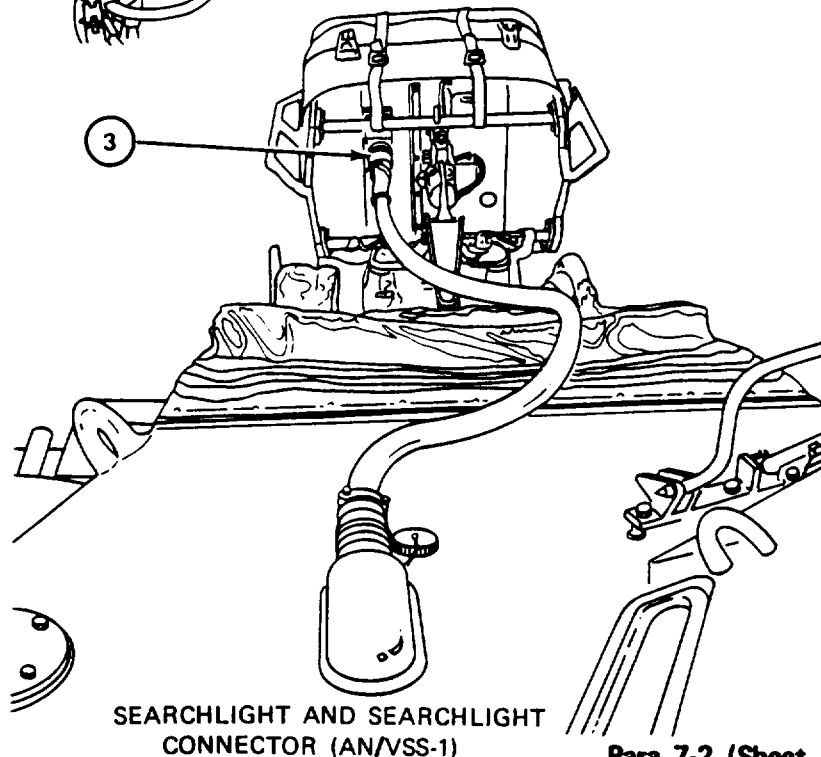
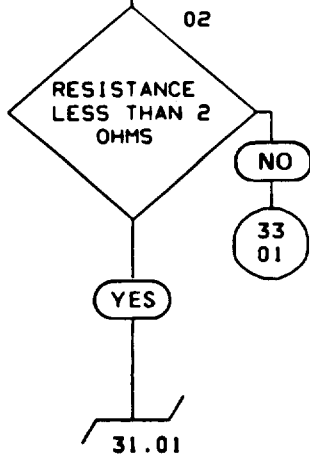
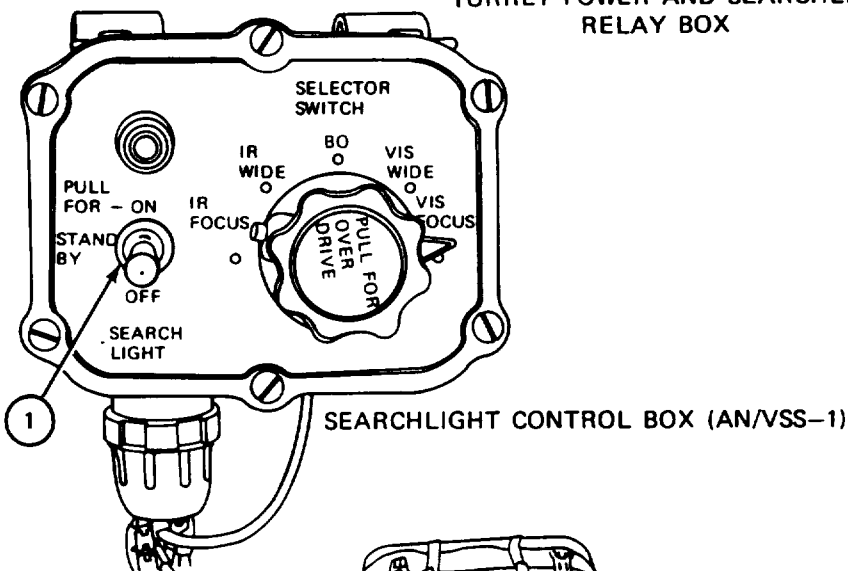
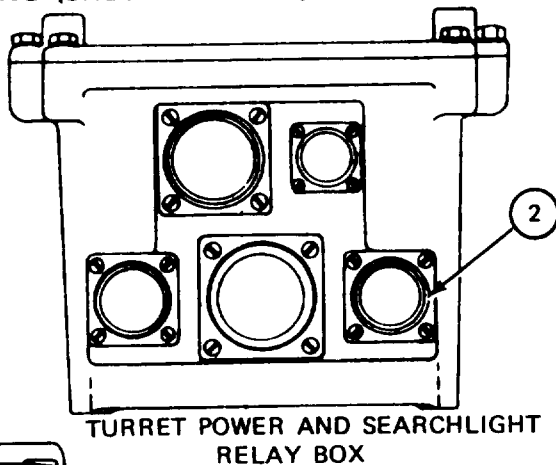
CHECK CONTINUITY BETWEEN HARNESS CONNECTOR 518A AT TURRET POWER AND SEARCHLIGHT RELAY BOX AND SOCKET A OF HARNESS CONNECTOR AT SEARCHLIGHT

•SET 'SEARCHLIGHT' SWITCH (1) ON SEARCHLIGHT CONTROL BOX TO 'OFF'

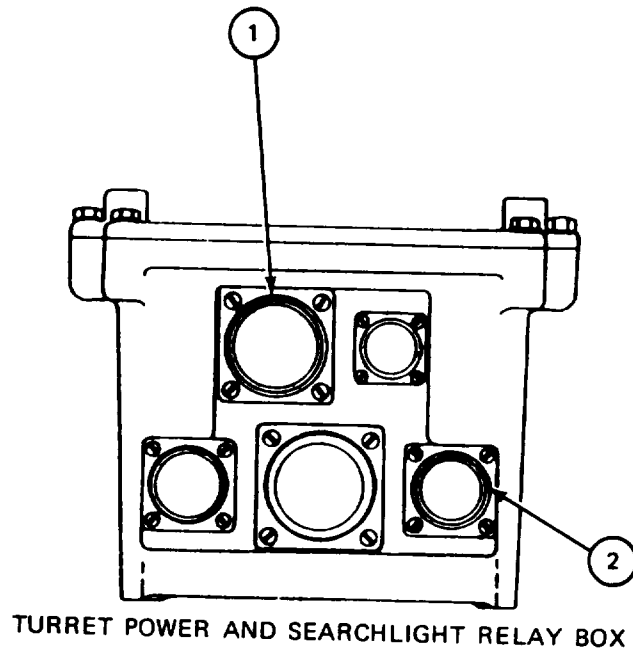
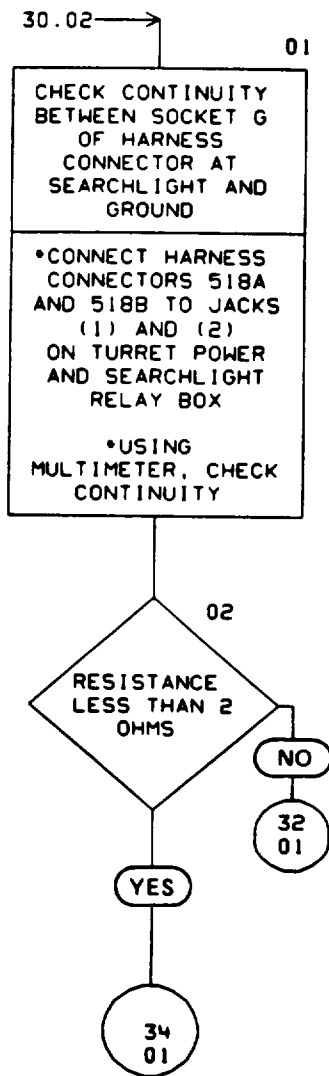
•REMOVE HARNESS CONNECTOR 518A FROM JACK (2) ON TURRET POWER AND SEARCHLIGHT RELAY BOX

•REMOVE HARNESS CONNECTOR FROM JACK (3) ON SEARCHLIGHT

•USING MULTIMETER, CHECK CONTINUITY



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 31 OF 37)





7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 32 OF 37)

31.02 → 01

CHECK CONTINUITY BETWEEN SOCKET G OF HARNESS CONNECTOR AT SEARCHLIGHT CONNECTOR AND SOCKET G OF HARNESS CONNECTOR AT SEARCHLIGHT

• REMOVE HARNESS CONNECTOR FROM SEARCHLIGHT CONNECTOR (1)

• USING MULTIMETER, CHECK CONTINUITY

02

RESISTANCE LESS THAN 2 OHMS

YES

03

DEFECTIVE SEARCHLIGHT GROUND LEAD

• CONNECT HARNESS CONNECTOR TO JACK (2) ON SEARCHLIGHT

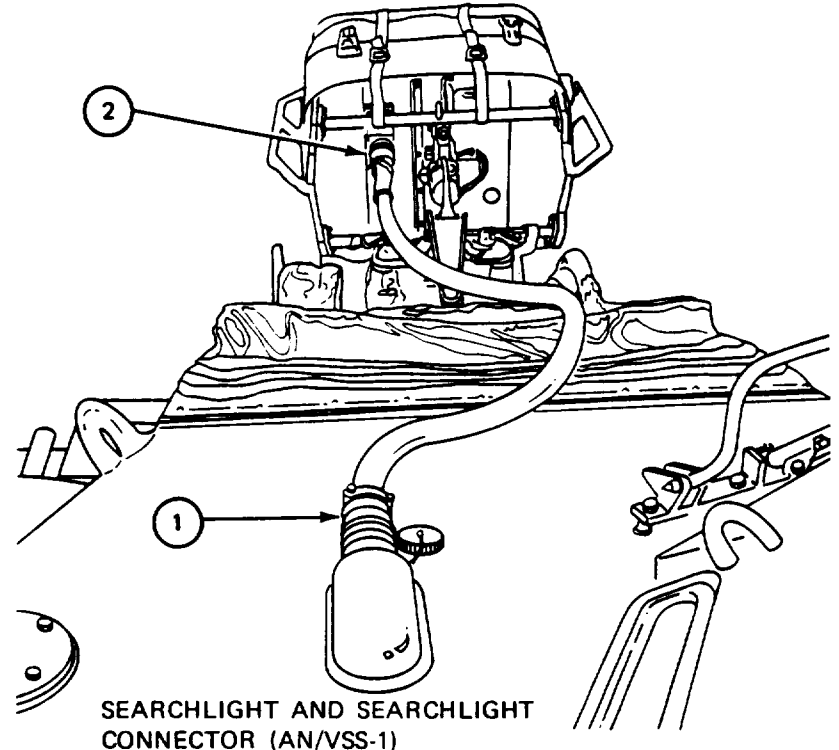
• REMOVE AND REPLACE GROUND LEAD (TM-20-2-3, PARA 68-2, 68-3)

NO

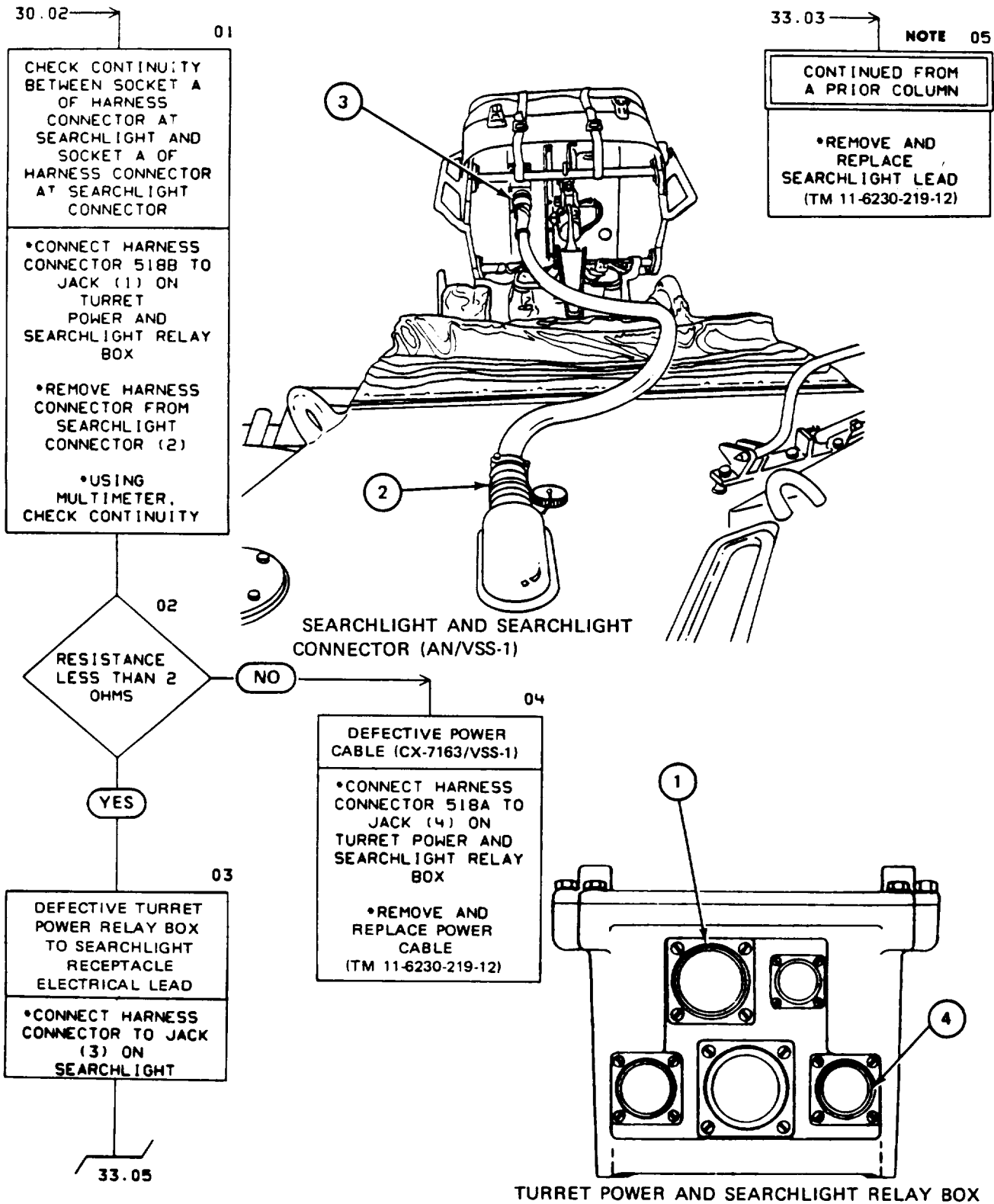
04

DEFECTIVE POWER CABLE (CX-7163/VSS-1)

• REMOVE AND REPLACE POWER CABLE (TM 11-2630-219-12)



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 33 OF 37)

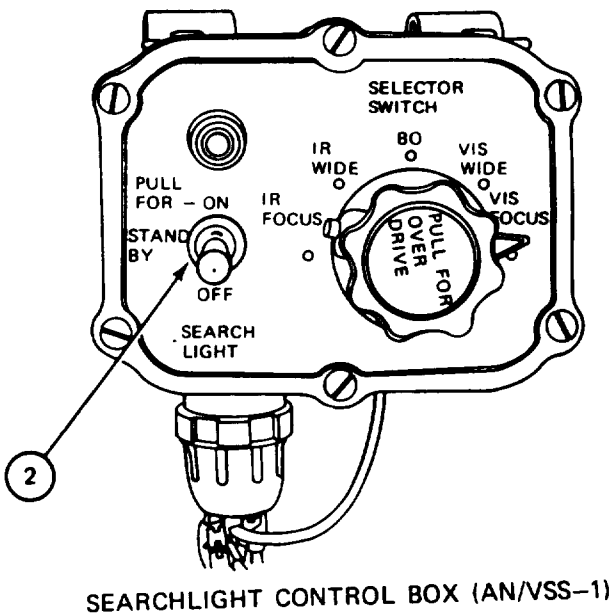
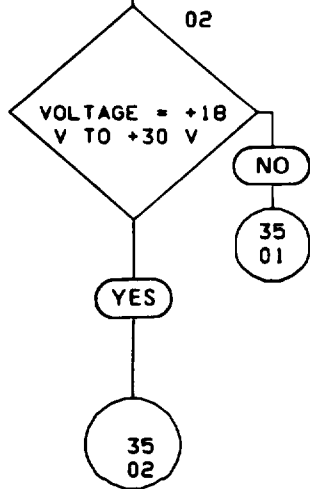
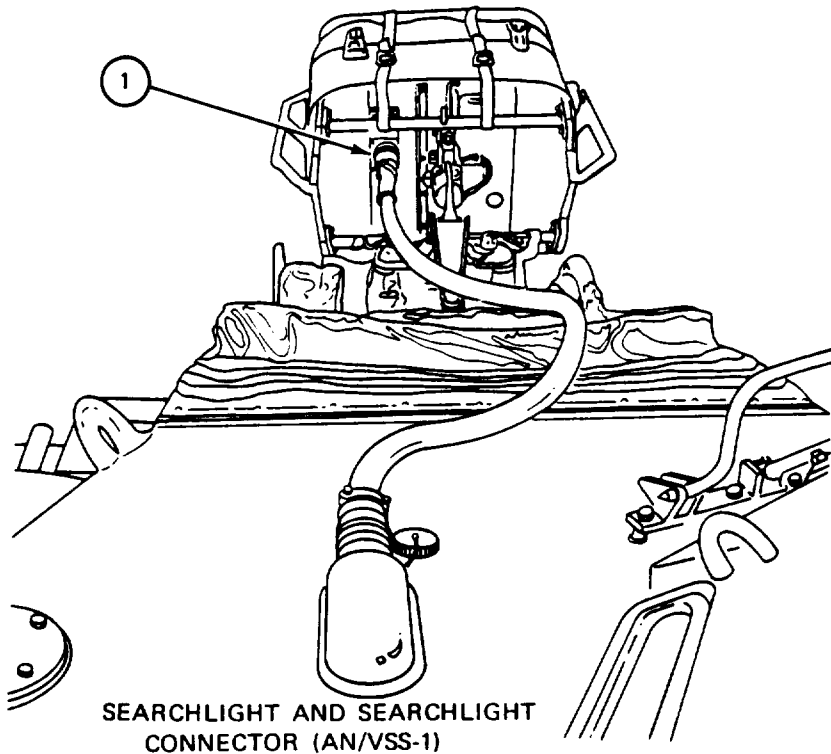


7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 34 OF 37)

31.02 → 01

MEASURE DC VOLTAGE BETWEEN SOCKET A OF HARNESS CONNECTOR AT SEARCHLIGHT AND GROUND WITH JUMPER WIRE CONNECTED BETWEEN SOCKETS D AND C OF HARNESS CONNECTOR

- CONNECT JUMPER WIRE BETWEEN SOCKETS D AND C OF HARNESS CONNECTOR (1) AT SEARCHLIGHT
- SET 'MASTER BATTERY' SWITCH TO 'ON'
- SET 'SEARCHLIGHT' SWITCH (2) ON SEARCHLIGHT CONTROL BOX TO 'STAND-BY'
- USING MULTIMETER, MEASURE VOLTAGE



7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 35 OF 37)

34.02 → 01

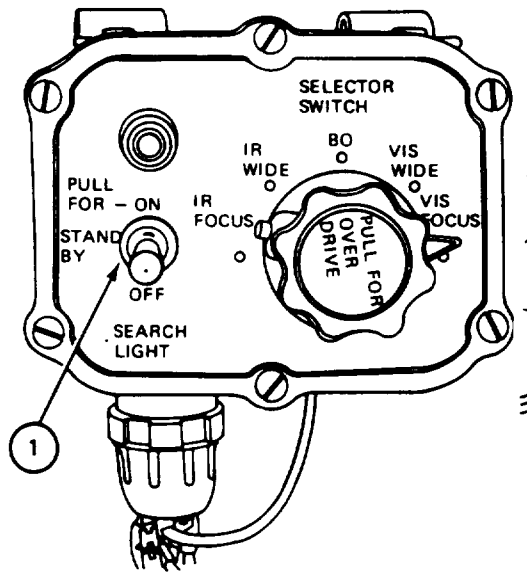
**DEFECTIVE TURRET POWER AND SEARCHLIGHT RELAY BOX**

- SET 'SEARCHLIGHT' SWITCH (1) ON SEARCHLIGHT CONTROL BOX TO 'OFF'
- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE JUMPER WIRE
- CONNECT HARNESS CONNECTOR TO JACK (2) ON SEARCHLIGHT
- REMOVE AND REPLACE TURRET POWER AND SEARCHLIGHT RELAY BOX (TM-20-2-3, PARA 9-2, 9-3)

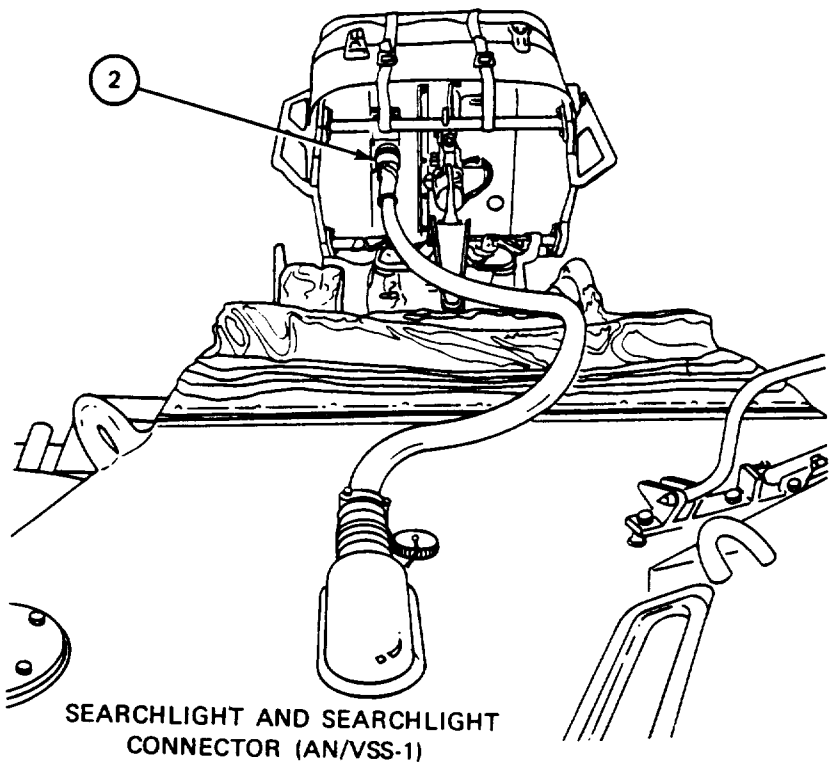
34.02 → 02

**DEFECTIVE SEARCHLIGHT**

- SET 'SEARCHLIGHT' SWITCH (1) ON SEARCHLIGHT CONTROL BOX TO 'OFF'
- SET 'MASTER BATTERY' SWITCH TO 'OFF'
- REMOVE JUMPER WIRE
- REMOVE AND REPLACE SEARCHLIGHT (TM11-6230-219-12)

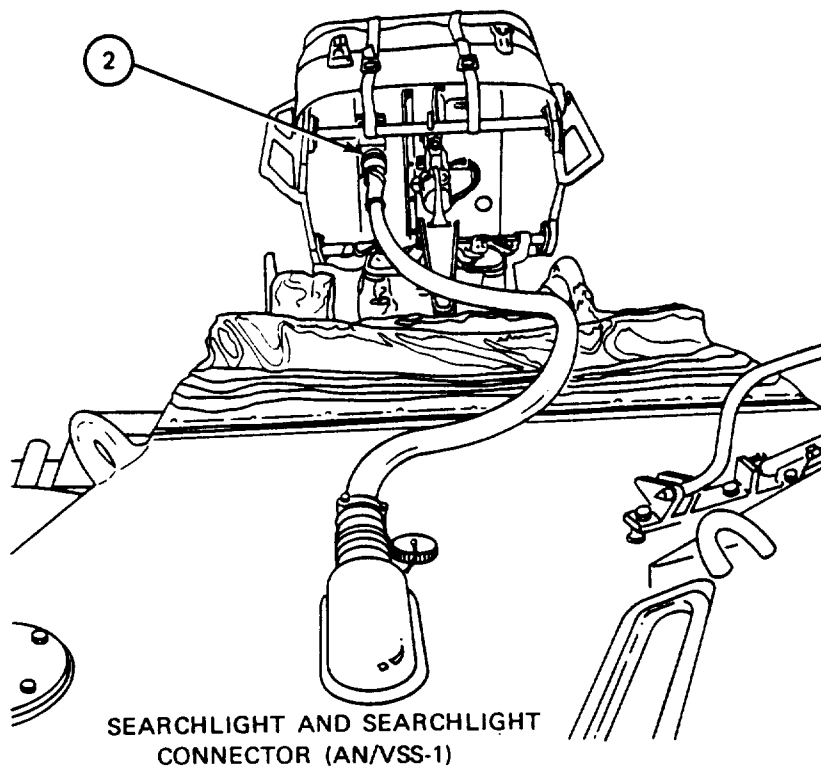
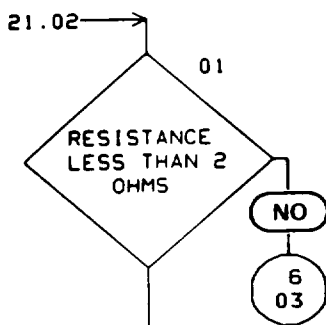


SEARCHLIGHT CONTROL BOX (AN/VSS-1)



SEARCHLIGHT AND SEARCHLIGHT CONNECTOR (AN/VSS-1)

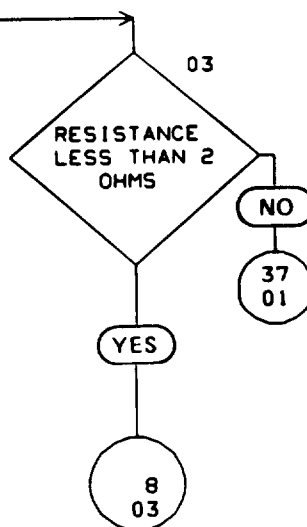
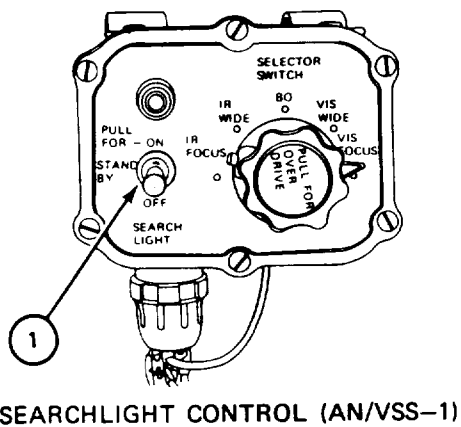
7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 36 OF 37)



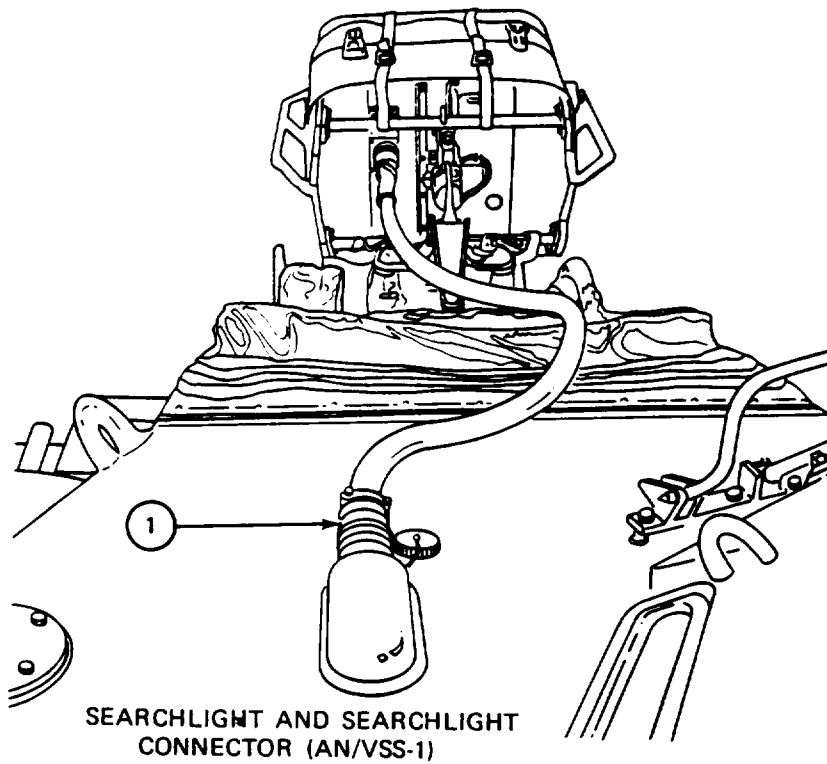
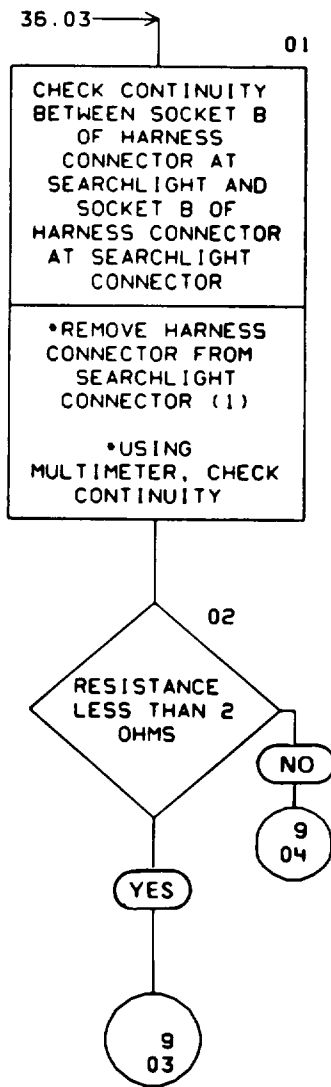
02

CHECK CONTINUITY BETWEEN SOCKET B OF HARNESS CONNECTOR AT SEARCHLIGHT CONTROL BOX AND SOCKET B OF HARNESS CONNECTOR AT SEARCHLIGHT

- SET 'SEARCHLIGHT' SWITCH (1) ON SEARCHLIGHT CONTROL BOX TO 'OFF'
- REMOVE HARNESS CONNECTOR FROM JACK (2) ON SEARCHLIGHT
- USING MULTIMETER, CHECK CONTINUITY



### 7-2. SEARCHLIGHT (AN/VSS-1) TROUBLESHOOTING (SHEET 37 OF 37)



**7-3. SEARCHLIGHT (AN/VSS-3A) TROUBLESHOOTING (SHEET 1 OF 7)**

**SYMPTOM:** (65) Xenon lamp fails to light

**TEST EQUIPMENT:** Multimeter  
Jumper wire

**PERSONNEL:** Two

UNIT LOCATION:	FOLDOUT	CALLOUT
Master Control Panel	4	4
Searchlight Control Box	2	4
Searchlight	5	1
Searchlight Connector	5	6
Turret Power and Searchlight Relay Box	1	9
Turret Electrical Slipping	3	5

- REFERENCES:**
- (1) TM 9-2350-222-20-2-3 for removal and replacement of components
  - (2) ETM 643-091-9400R/JPG for procedures to:  
Use multimeter  
Disconnect electrical connectors
  - (3) TM 9-2350-222-10 for procedure to:  
Traverse turret

**EQUIPMENT CONDITION:** Vehicle parked, power off.

7-3. SEARCHLIGHT (AN/VSS-3A) TROUBLESHOOTING (SHEET 2 OF 7)

01

**WARNING**  
DO NOT LOOK INTO  
SEARCHLIGHT  
BEAMS. SERIOUS  
EYE DAMAGE CAN  
RESULT.

02

**WARNING**  
DO NOT OPERATE  
SEARCHLIGHT WHILE  
PERSONNEL ARE  
WITHIN 200 METERS  
OF BEAM PATH.  
SERIOUS EYE  
DAMAGE CAN  
RESULT.

03

**CAUTION**  
BECAUSE OF  
EXTREME POWER  
DRAIN ON BATTERY,  
DO NOT OPERATE  
SEARCHLIGHT  
UNLESS ENGINE IS  
RUNNING.

04

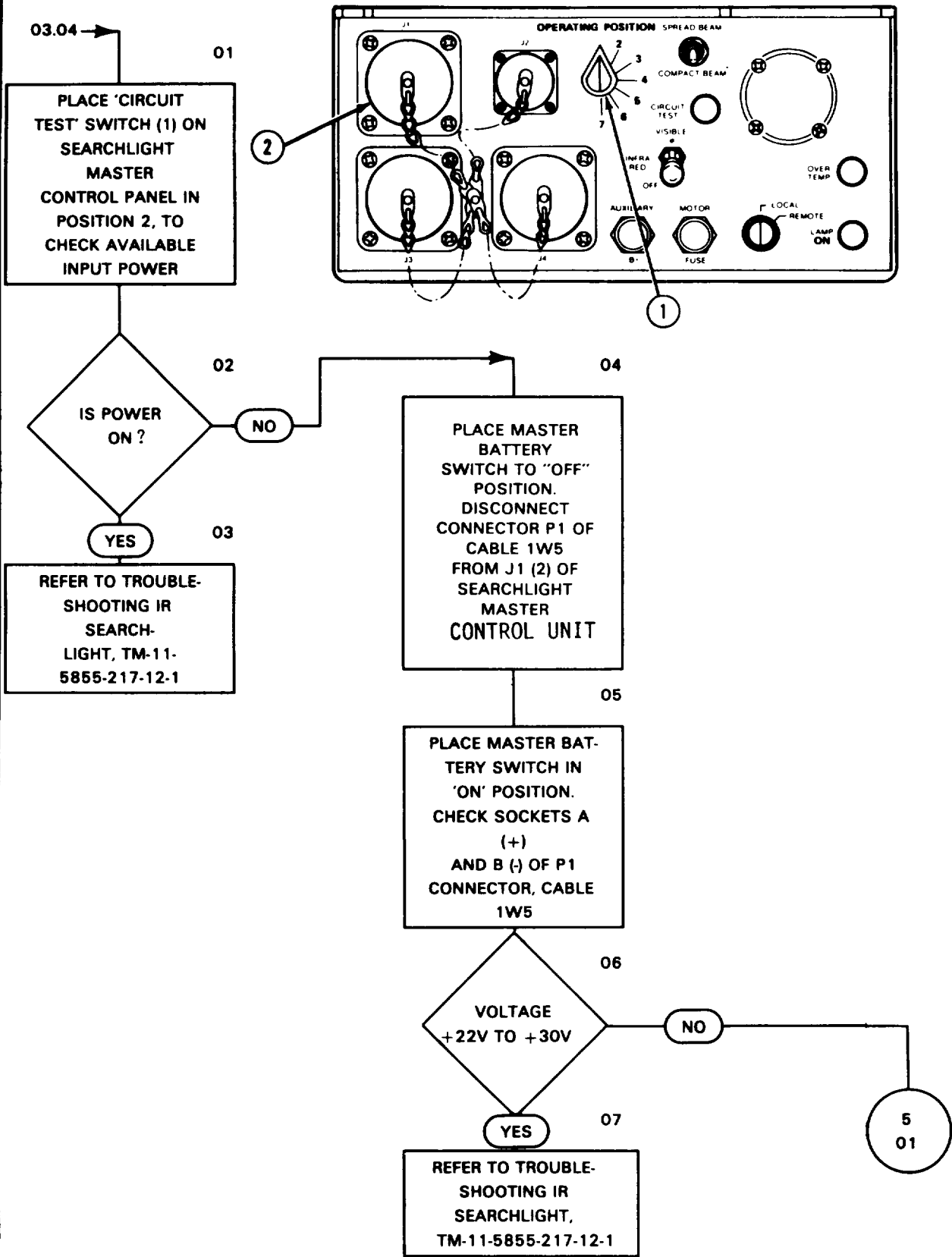
**CAUTION**  
TO PREVENT  
EQUIPMENT DAMAGE,  
BE SURE TO TURN  
OFF POWER BEFORE  
REMOVING COVERS  
OR HARNESS  
CONNECTOR AND  
BEFORE MEASURING  
CONTINUITY OR  
RESISTANCE.

3.01

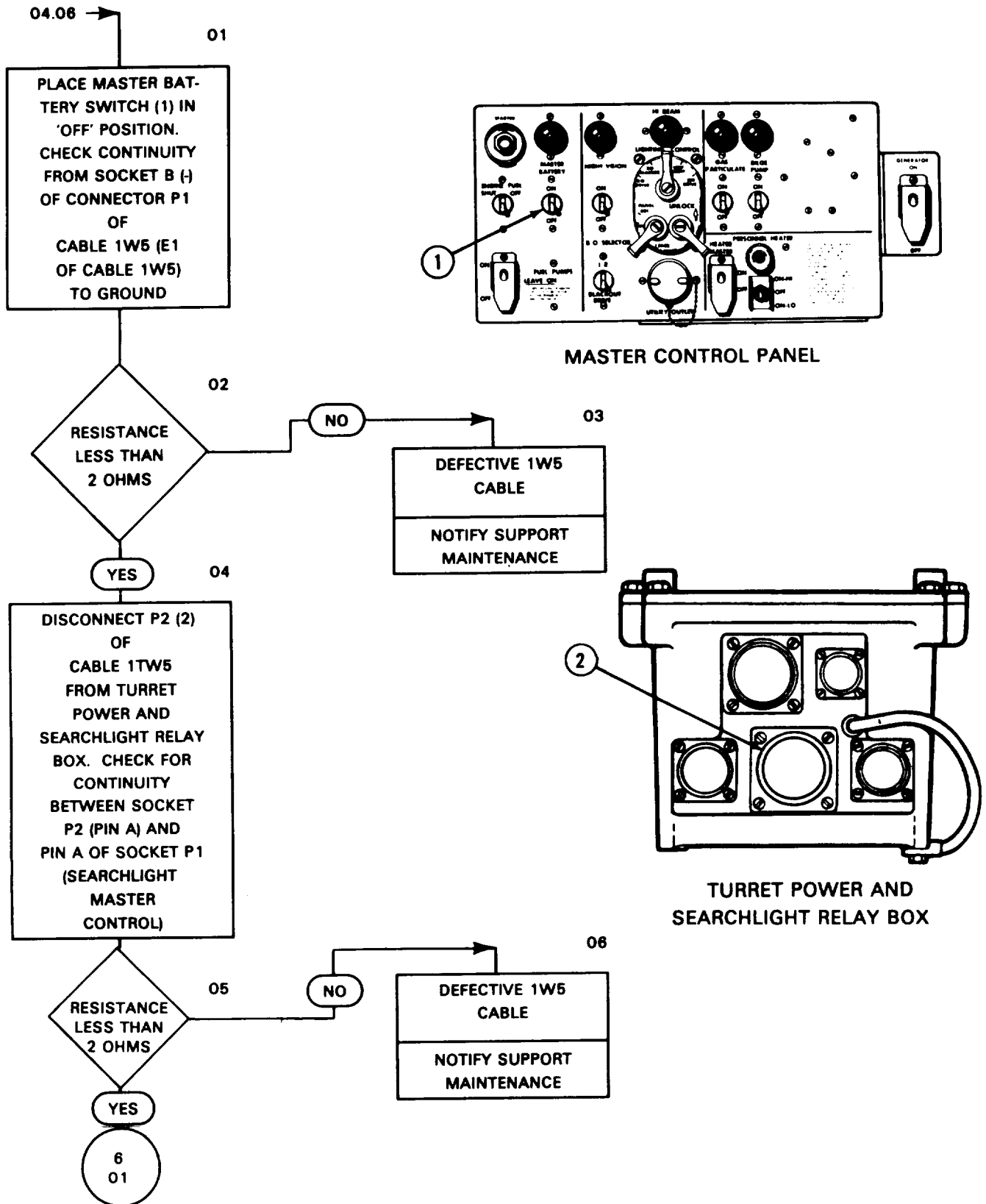




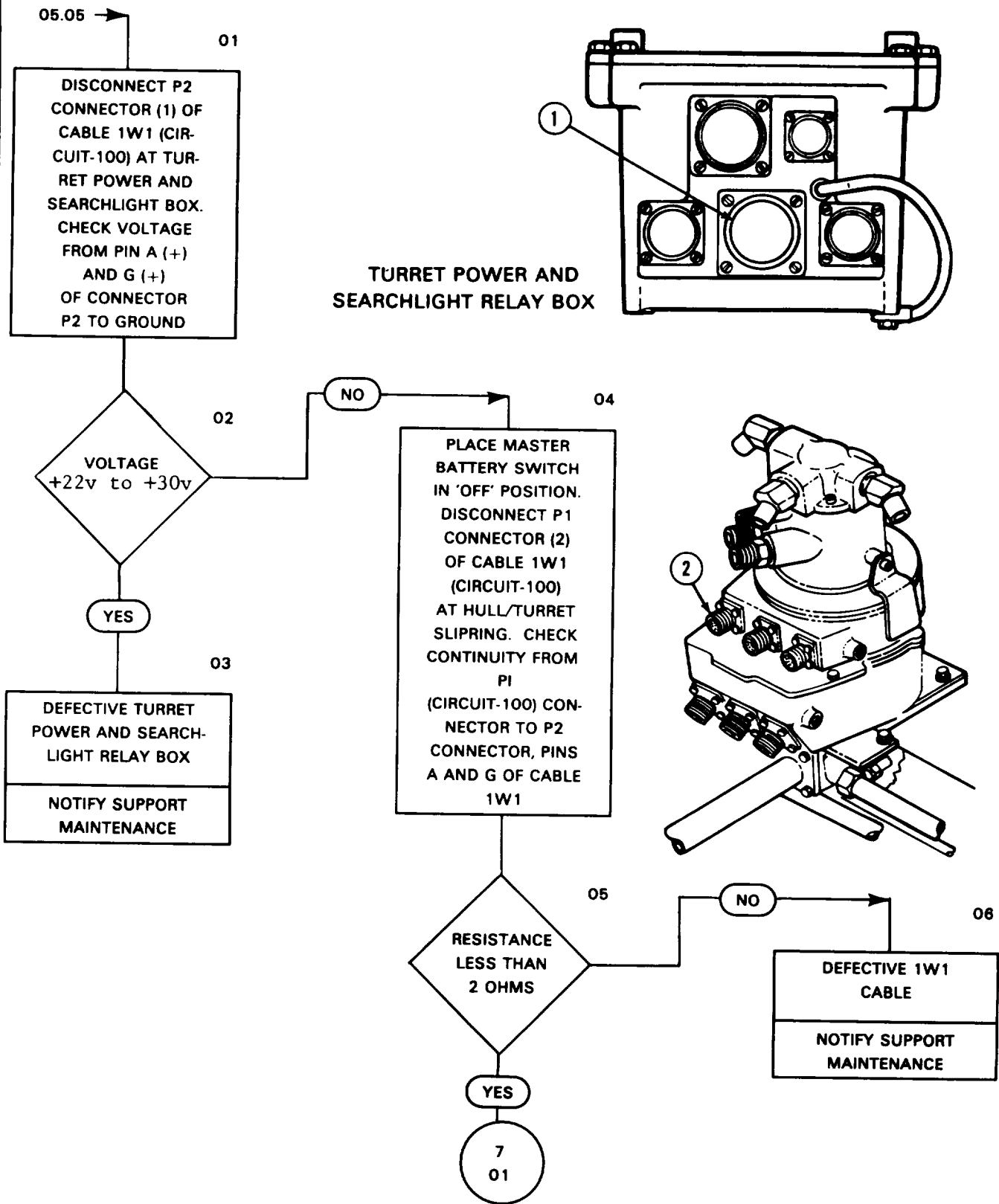
7-3. SEARCHLIGHT (AN/VSS-3A) TROUBLESHOOTING (SHEET 4 OF 7)



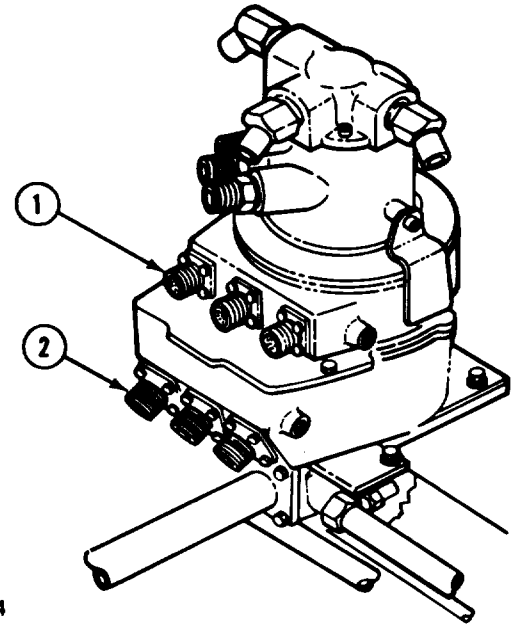
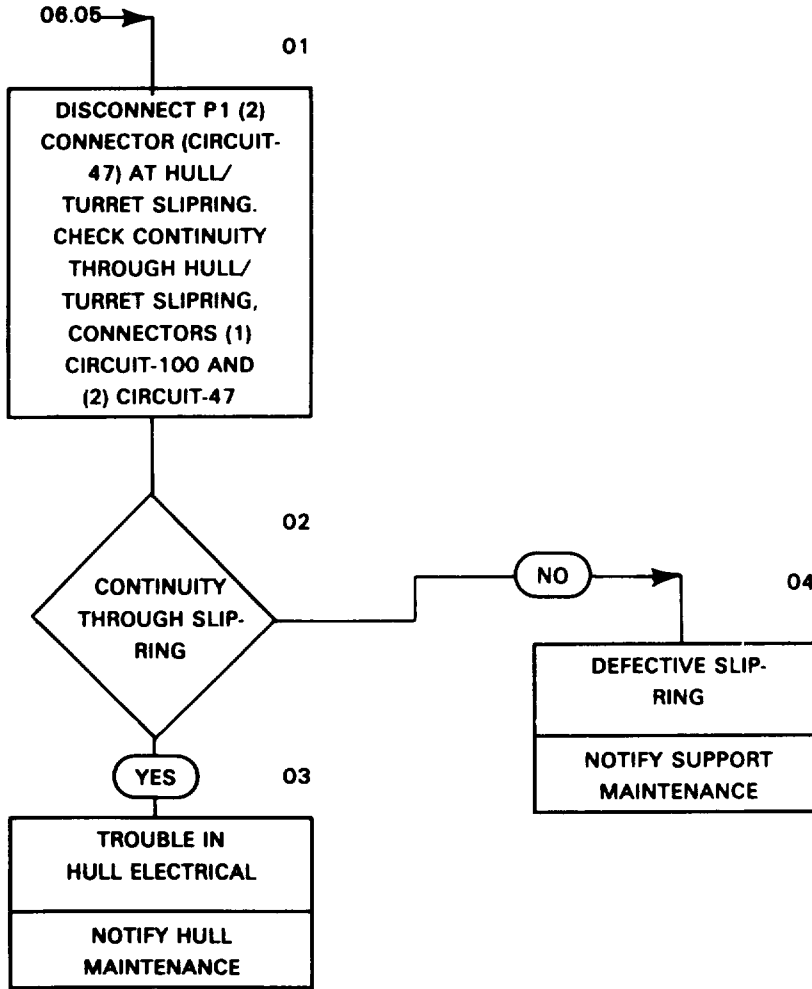
7-3. SEARCHLIGHT (AN/VSS-3A) TROUBLESHOOTING (SHEET 5 OF 7)



7-3. SEARCHLIGHT (AN/VSS-3A) TROUBLESHOOTING (SHEET 6 OF 7)



7-3. SEARCHLIGHT (AN/VSS-3A) TROUBLESHOOTING (SHEET 7 OF 7)



TURRET SLIPRING

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 1 of 31)

SYMPTOM: Grenade launcher fails to fire  
Grenade POWER lamp fails to light

TEST EQUIPMENT: Multimeter

PERSONNEL: Two

UNIT LOCATION		FOLDOUT	CALLOUT
	Master Control Panel	4	4
	Grenade Power Control Box	2	20
	Commander's Dome Light	4	7
	Turret Power and Searchlight	1	9
	Relay Box		
	Turret Electrical Slipping	3	5

REFERENCES: (1)TM 9-2350-222-20-2-3 for removal and replacement of components  
(2)ETM 643-091-9400R/JPG for procedures to:  
Use multimeter  
Disconnect electrical connectors  
  
(3)TM 9-2350-222-10 for procedures to:  
Remove ammunition  
Traverse turret

EQUIPMENT CONDITION: Tank parked, power off, gun in travel lock

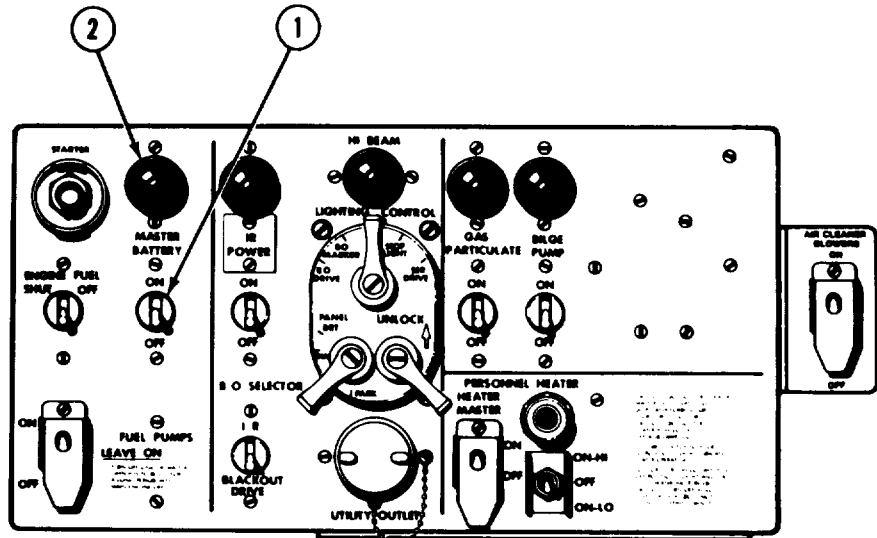
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 2 of 31)

01  
**WARNING**  
 TO PREVENT INJURY TO PERSONNEL, REMOVE ALL LIVE AMMUNITION FROM WEAPONS BEFORE START OF TROUBLESHOOTING (TM-10).

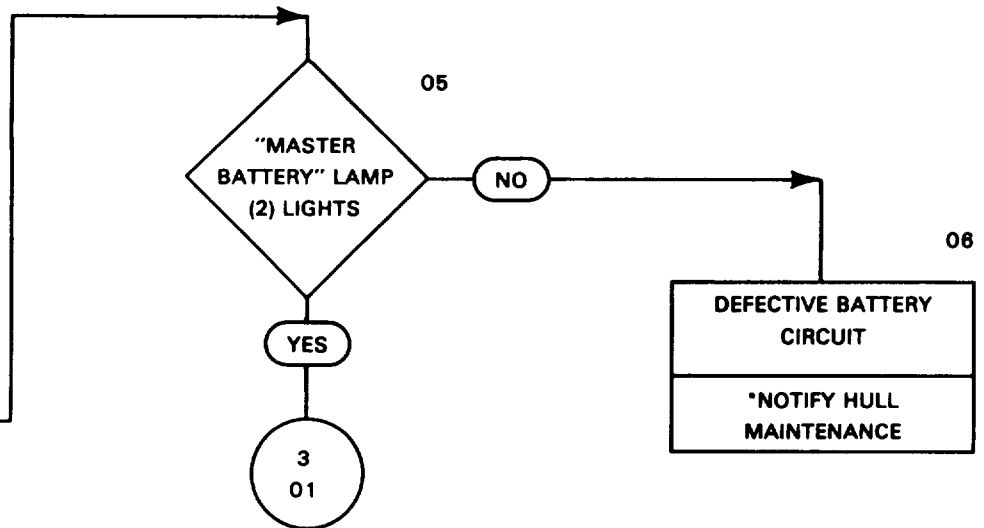
02  
**CAUTION**  
 TO PREVENT EQUIPMENT DAMAGE, TURN OFF POWER BEFORE REMOVING COVERS OR HARNESS CONNECTORS AND BEFORE MEASURING CONTINUITY OR RESISTANCE.

03  
**NOTE**  
 FOR USE OF MULTIMETER TO MEASURE VOLTAGE, CONTINUITY, OR RESISTANCE, REFER TO JPG.

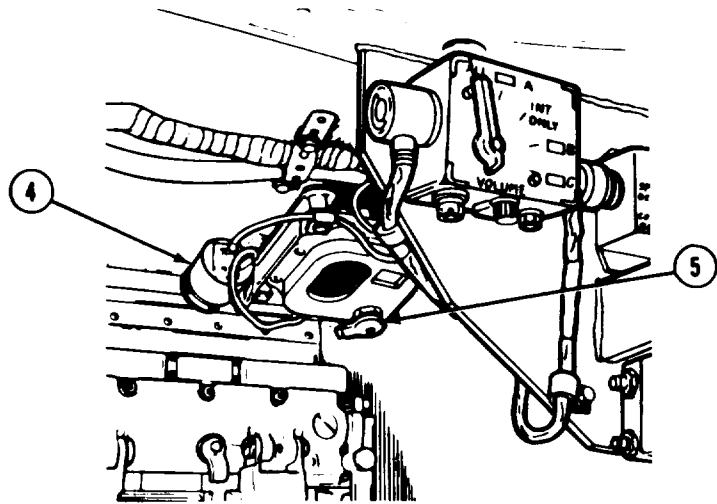
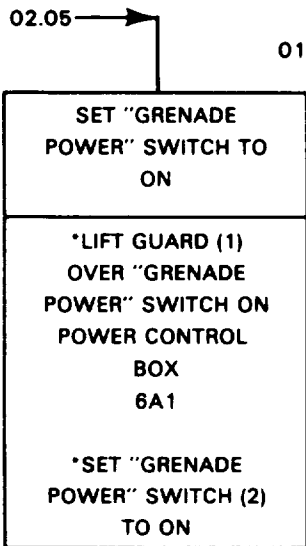
04  
 \*ON MASTER CONTROL PANEL, SET "MASTER BATTERY" SWITCH (1) TO "ON"



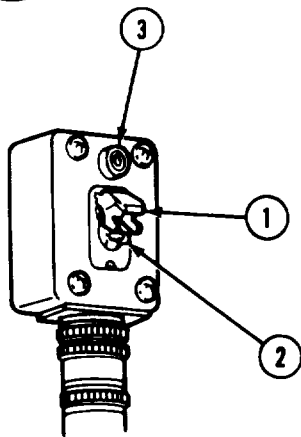
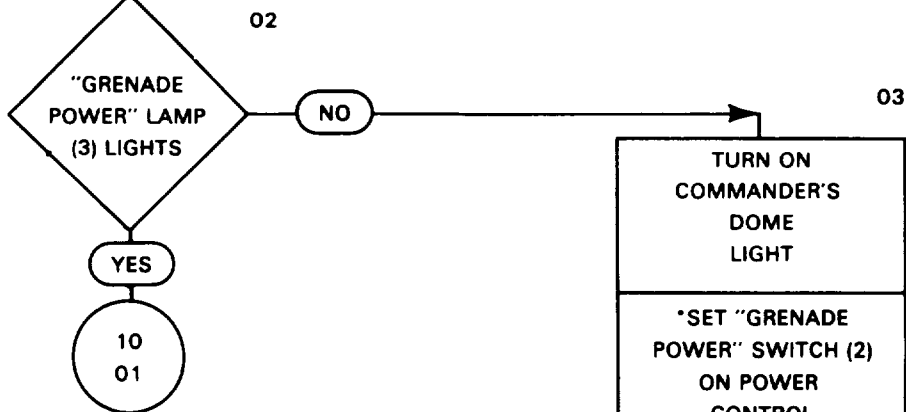
MASTER CONTROL PANEL



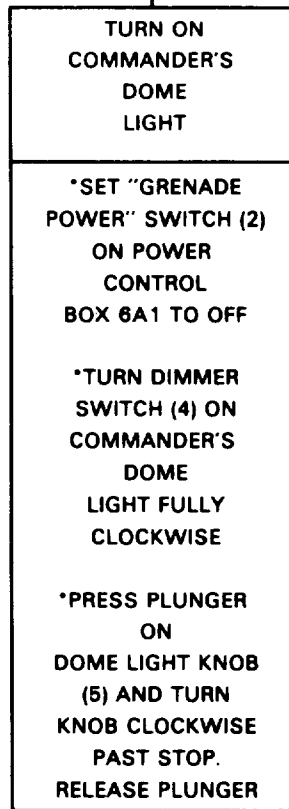
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 3 of 31)



DOME LIGHT AND DIMMER SWITCH



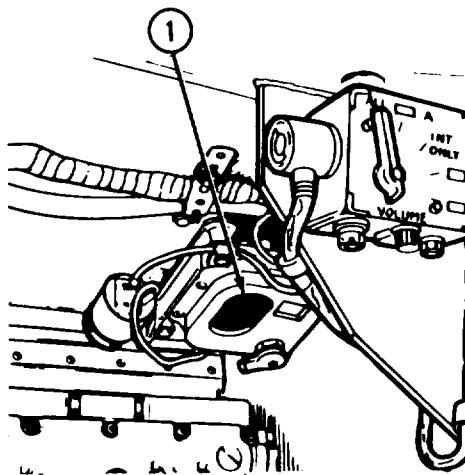
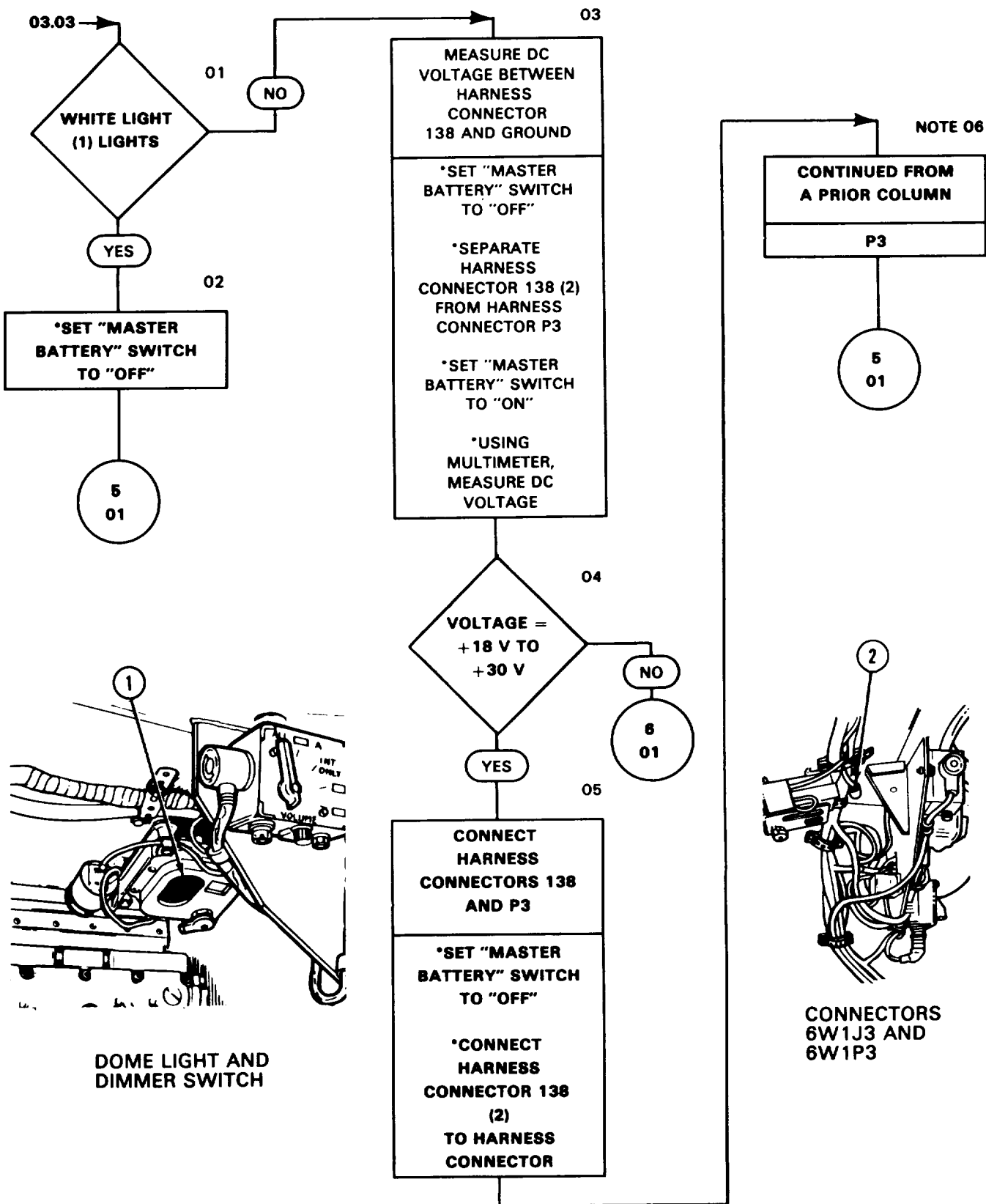
POWER CONTROL BOX 6A1



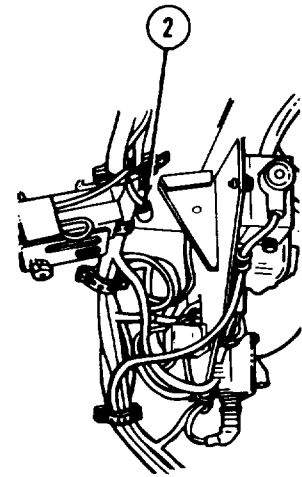
4.01



7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 4 of 31)

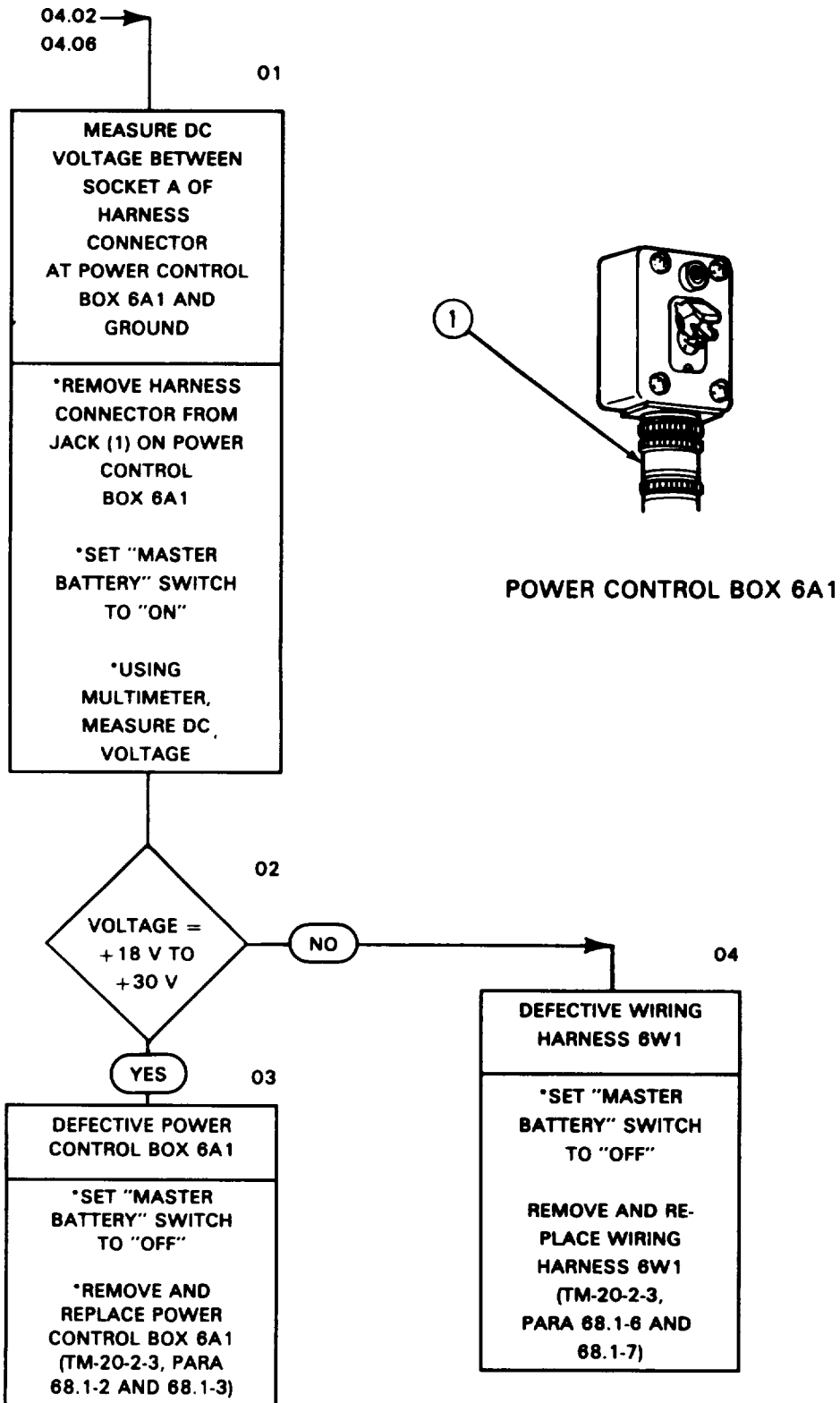


DOME LIGHT AND DIMMER SWITCH

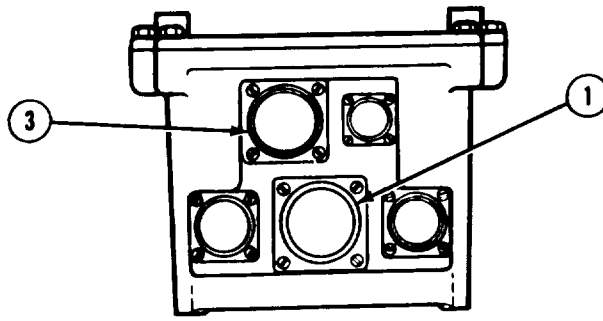
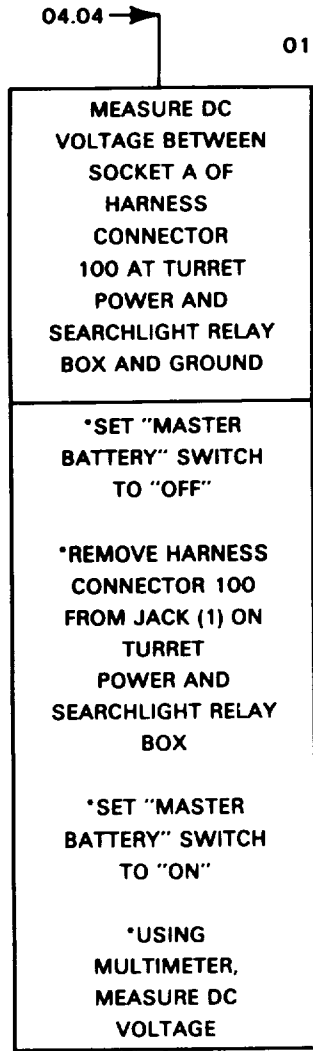


CONNECTORS 6W1J3 AND 6W1P3

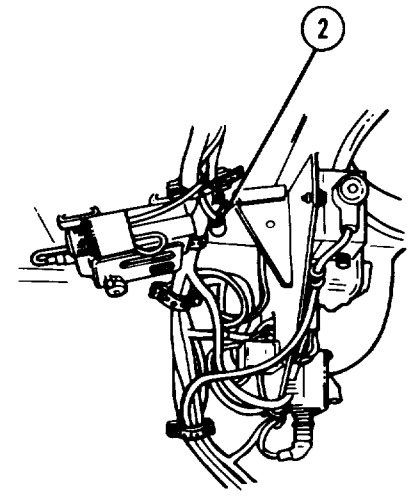
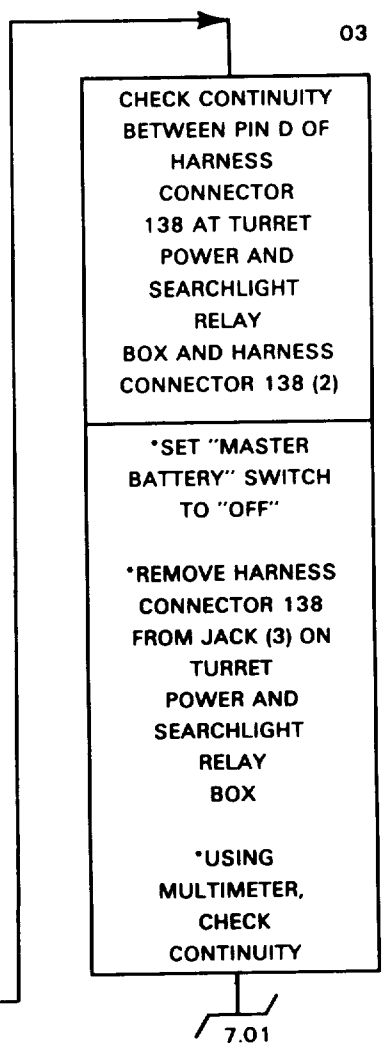
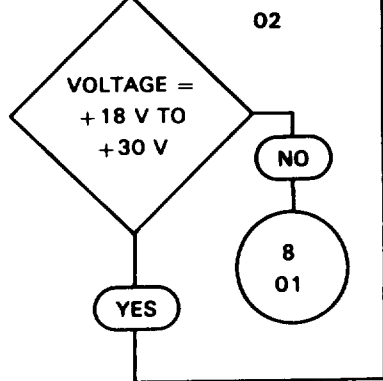
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 5 of 31)



7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 6 of 31)

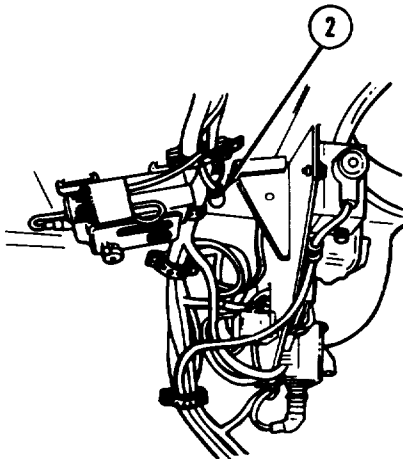
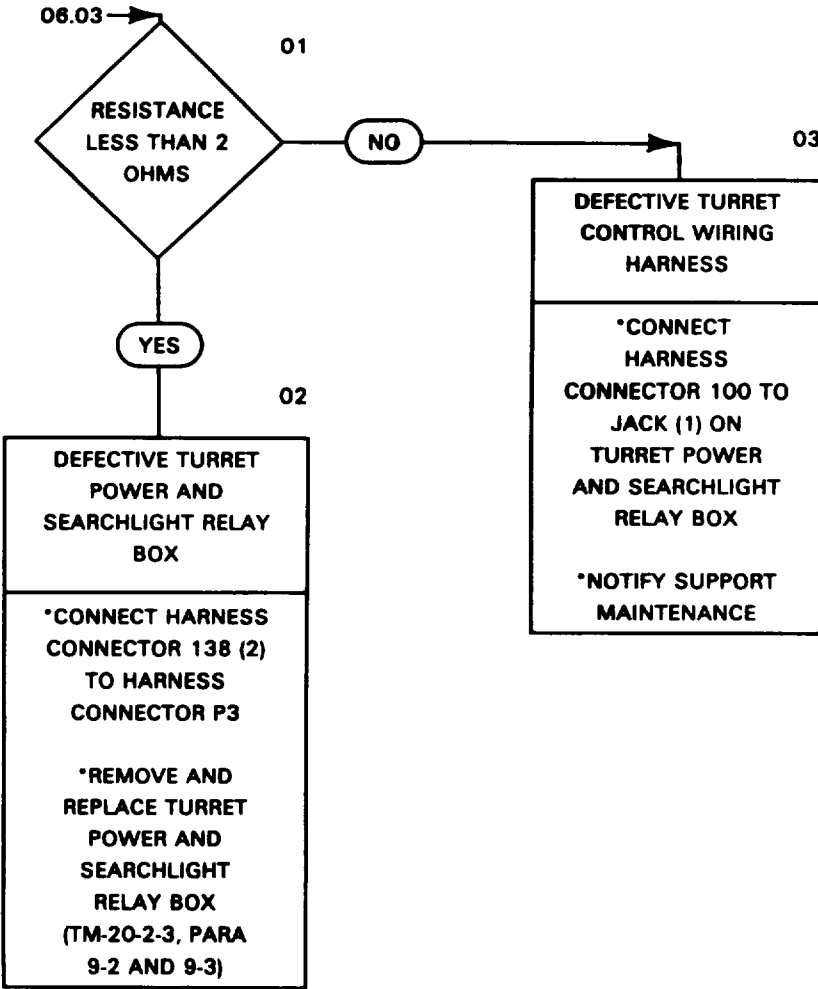


TURRET POWER AND SEARCHLIGHT RELAY BOX

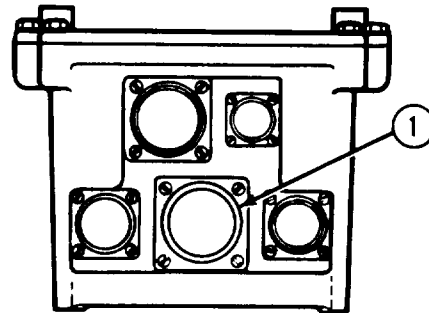


CONNECTORS 6W1J3 AND 6W1P3

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 7 of 31)



CONNECTORS 6W1J3 AND 6W1P3



TURRET POWER AND SEARCHLIGHT RELAY BOX

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 8 of 31)

06.02 →

01

\*CONNECT HARNESS CONNECTOR 138 (1) TO HARNESS CONNECTOR P3

02

MEASURE DC VOLTAGE BETWEEN HARNESS CONNECTOR 47 AT TURRET ELECTRICAL SLIPRING AND GROUND

\*TRAVERSE TURRET UNTIL MAIN GUN IS OVER REAR DECK (TM-10)

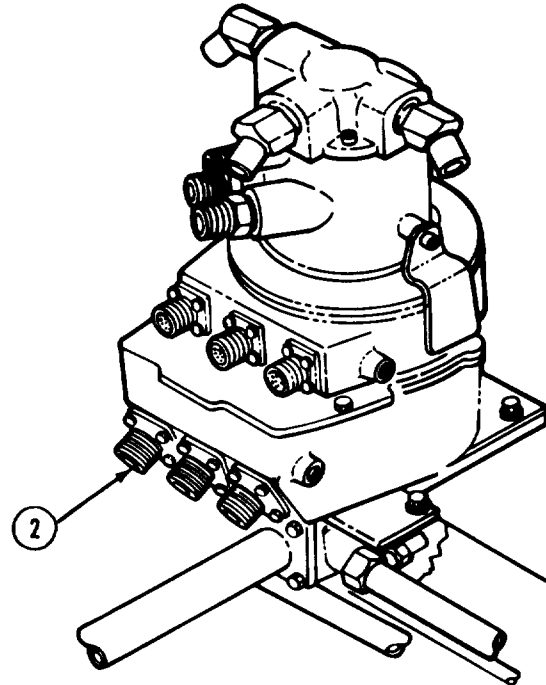
\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*OPEN BATTERY ACCESS DOOR

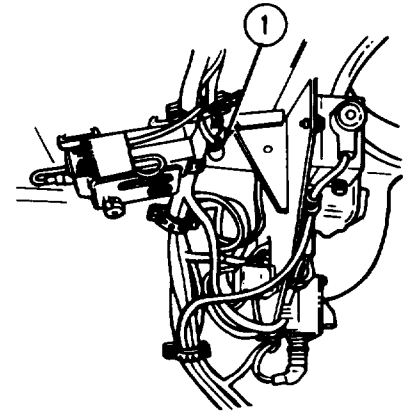
\*REMOVE HARNESS CONNECTOR 47 FROM JACK (2) ON TURRET ELECTRICAL SLIPRING

\*SET "MASTER BATTERY" SWITCH TO "ON"

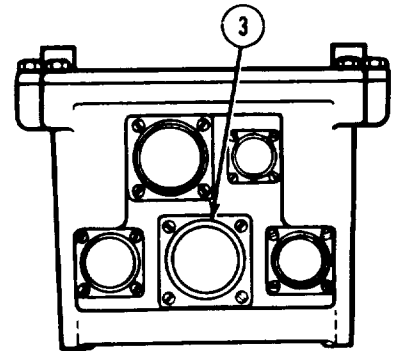
\*USING MULTIMETER, MEASURE DC VOLTAGE



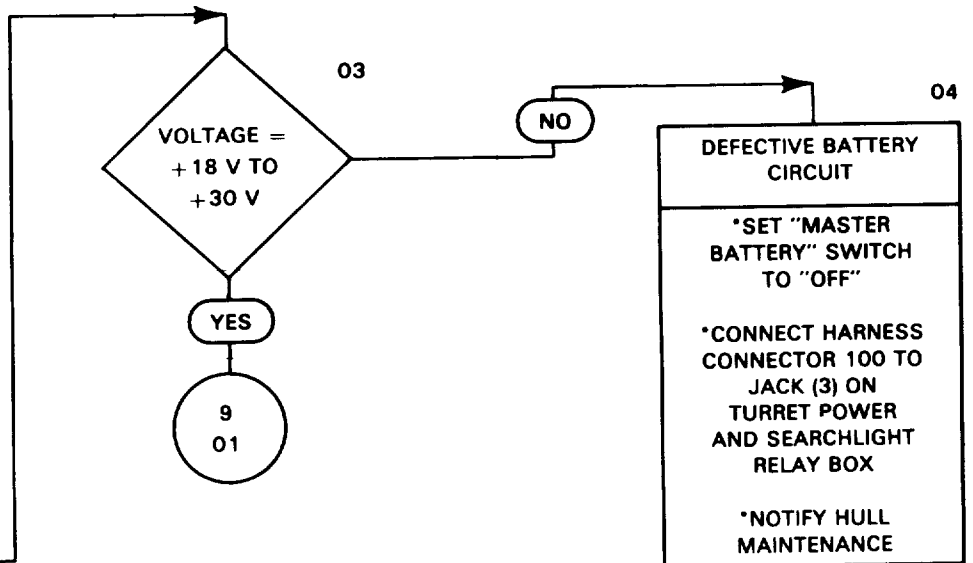
TURRET SLIPRING



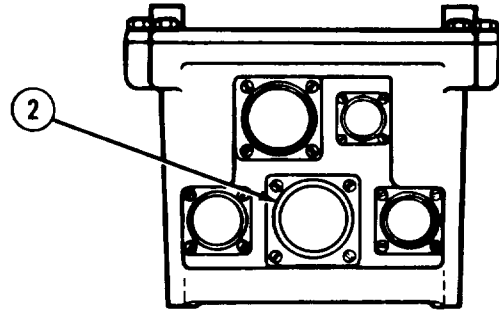
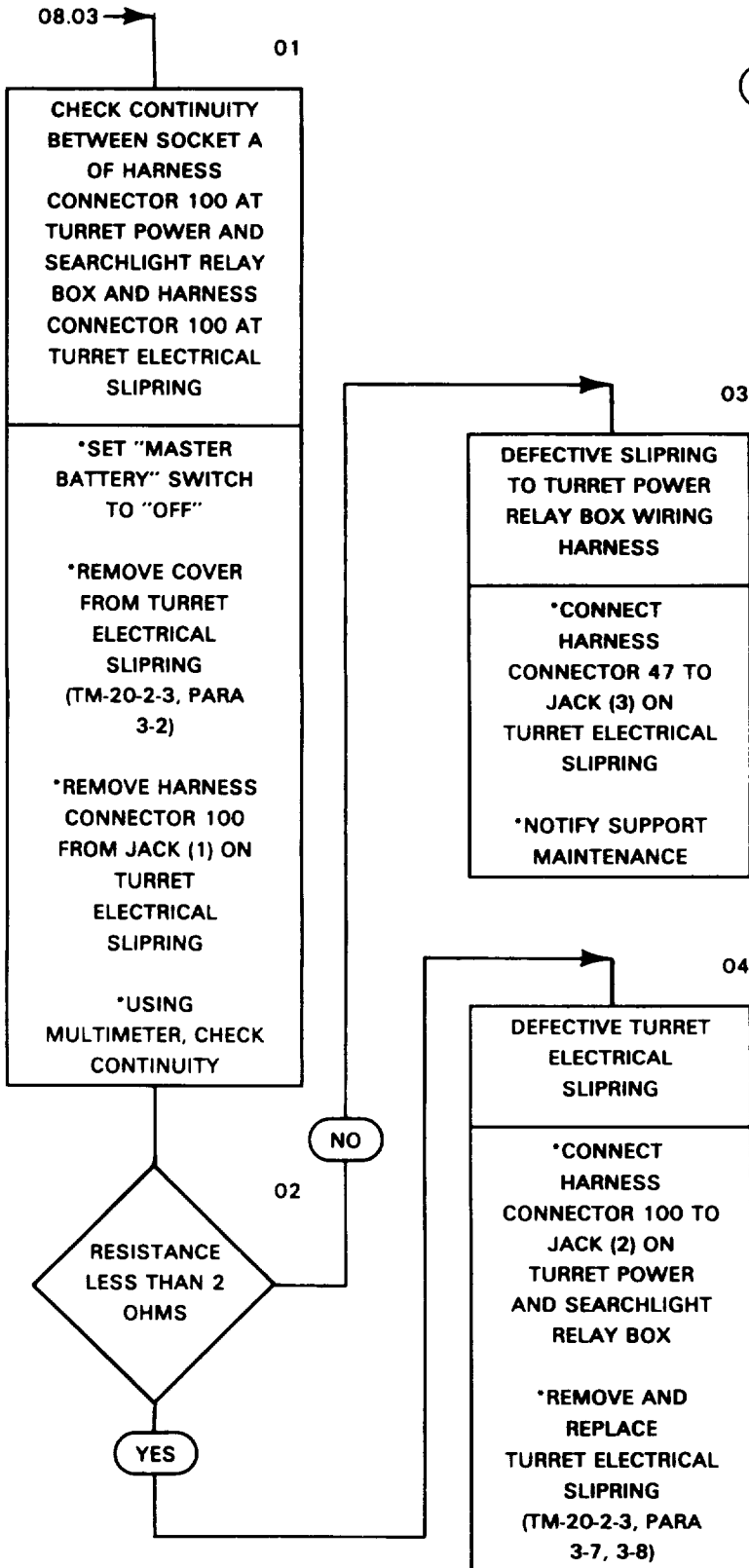
CONNECTORS 6W1J3 AND 6W1P3



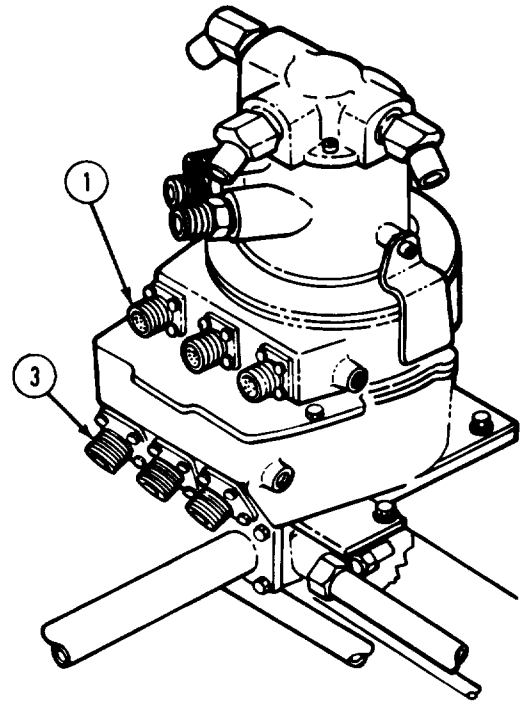
TURRET POWER AND SEARCHLIGHT RELAY BOX



7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 9 of 31)

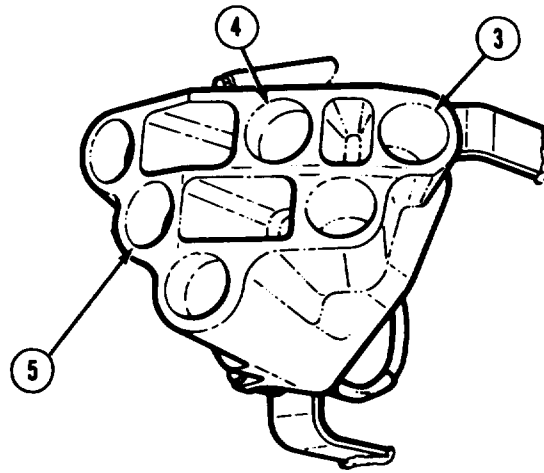
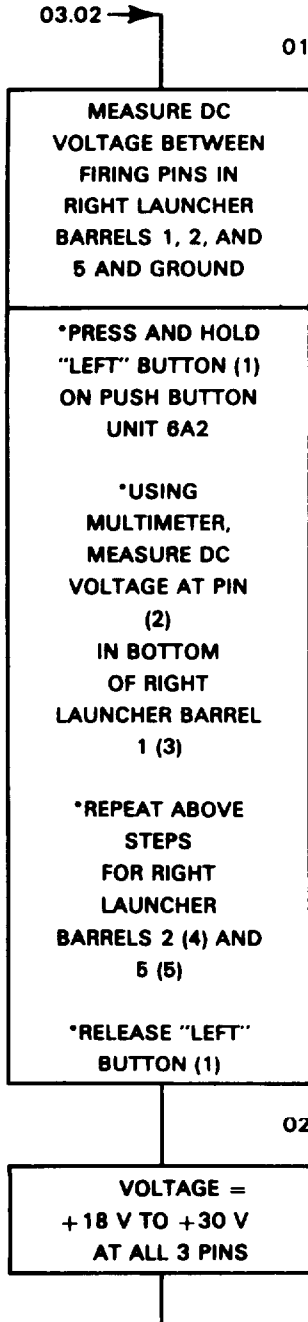


TURRET POWER AND SEARCHLIGHT RELAY BOX

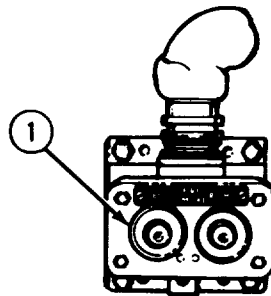


TURRET SLIPRING

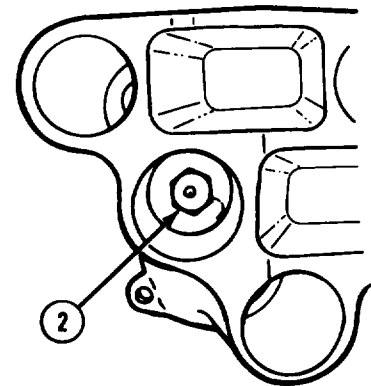
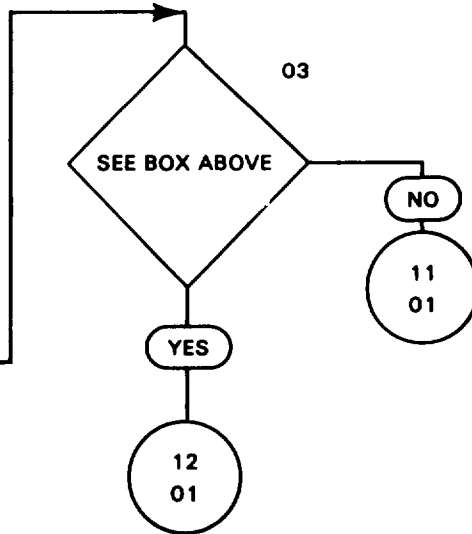
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 10 of 31)



RIGHT LAUNCHER 6A3

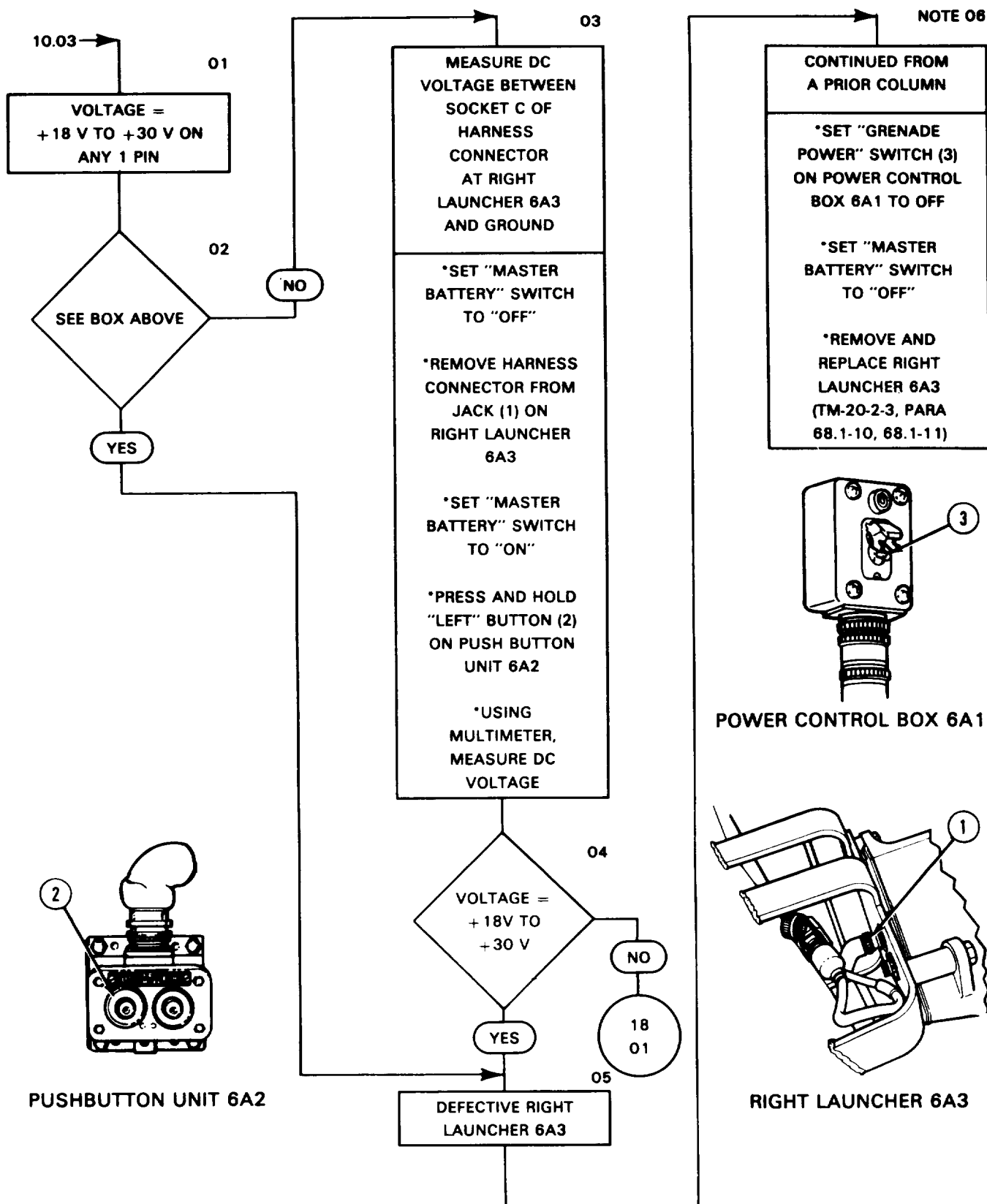


PUSH BUTTON UNIT 6A2



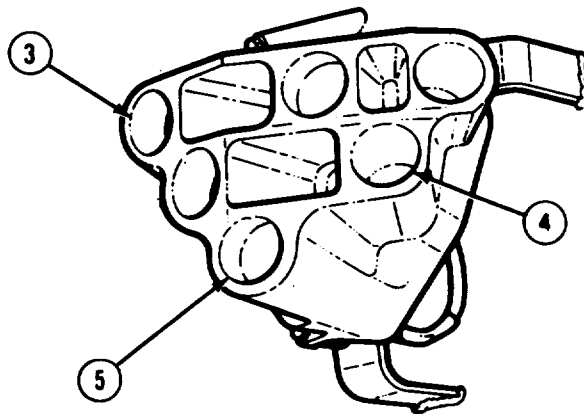
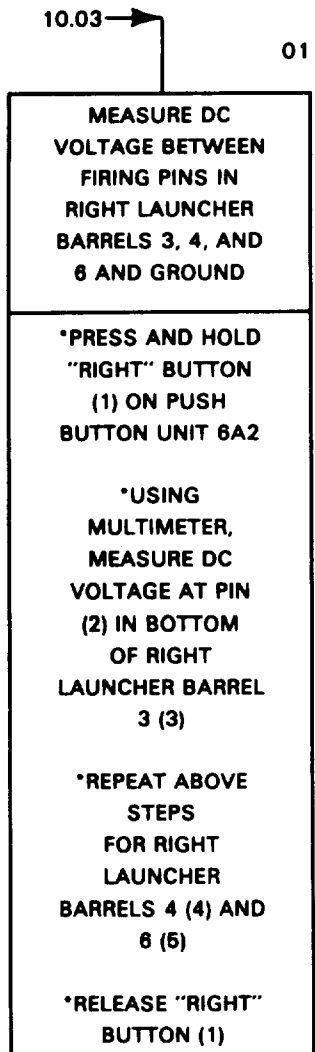
GRENADE FIRING PIN (TYPICAL)

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 11 of 31)

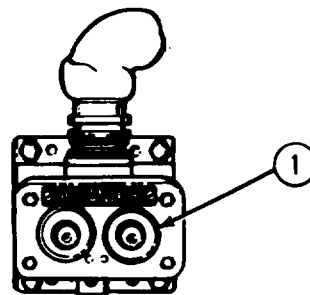




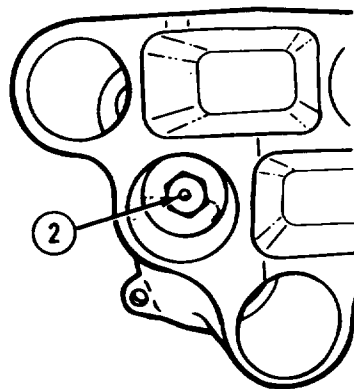
7.4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 12 of 31)



RIGHT LAUNCHER 6A3

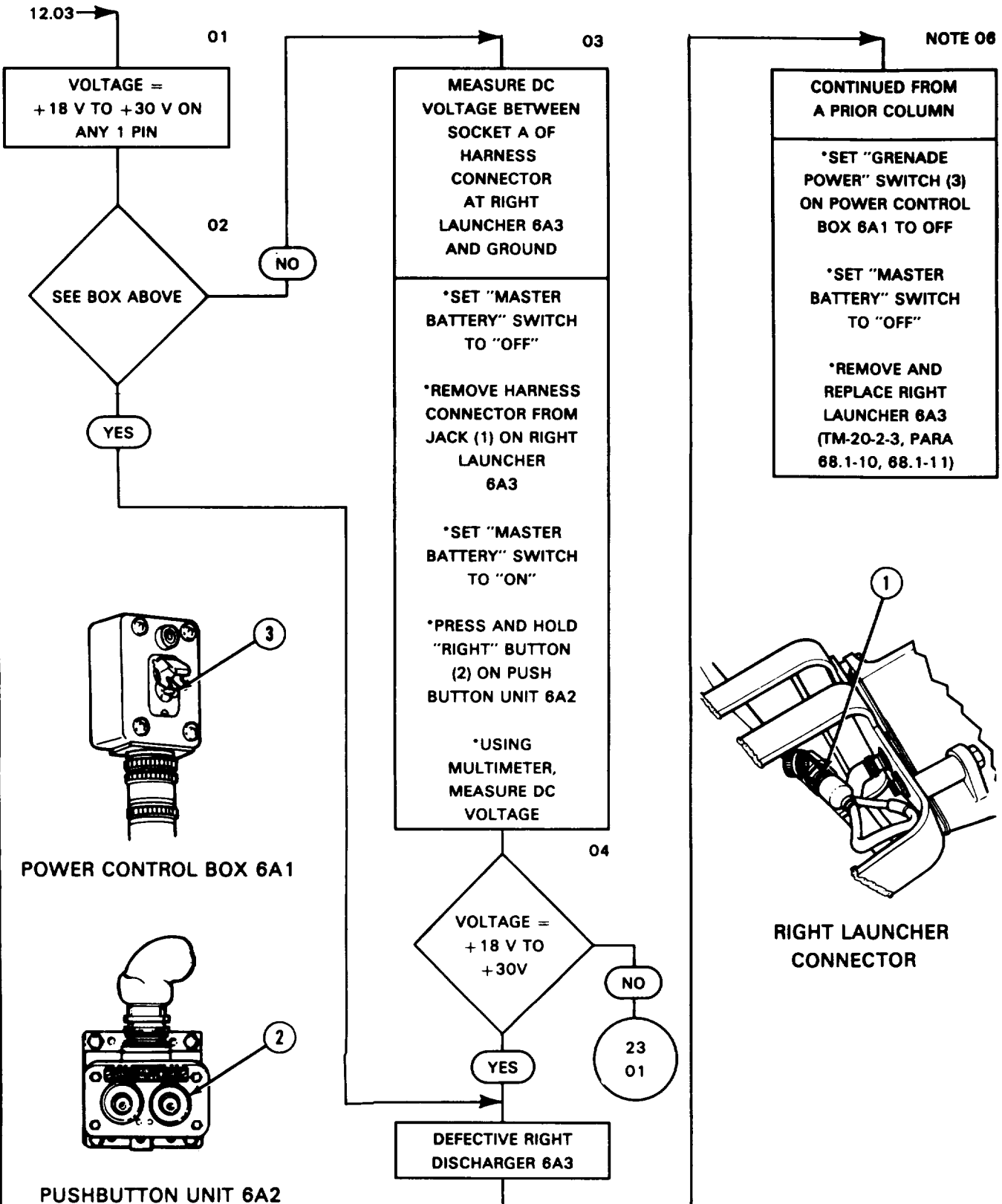


PUSHBUTTON UNIT 6A2

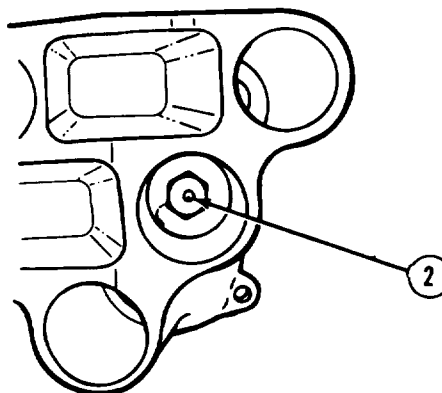
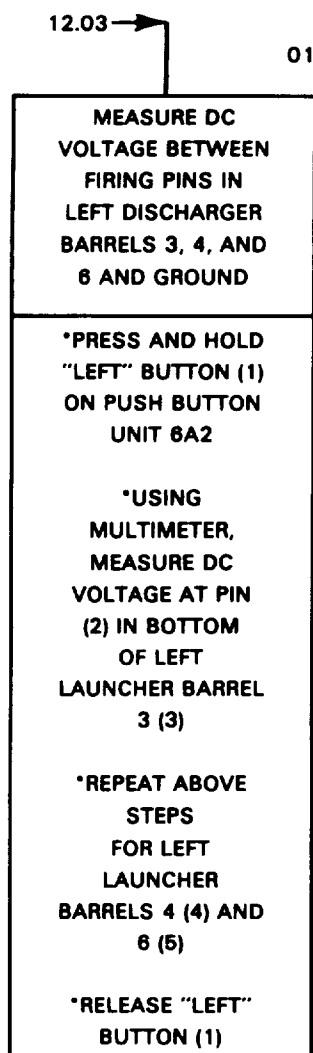


GRENADE FIRING PIN (TYPICAL)

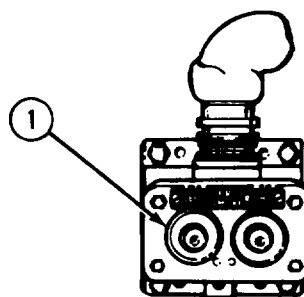
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 13 of 31)



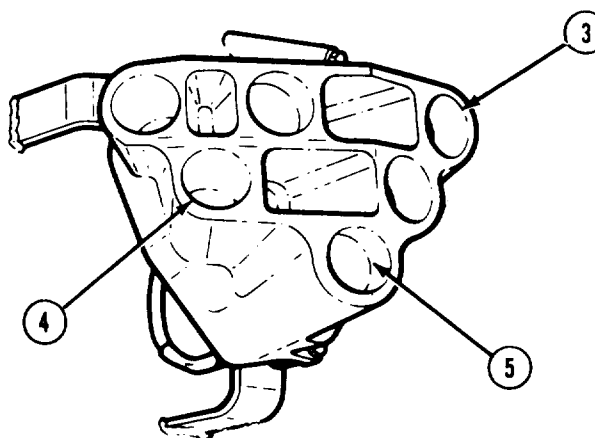
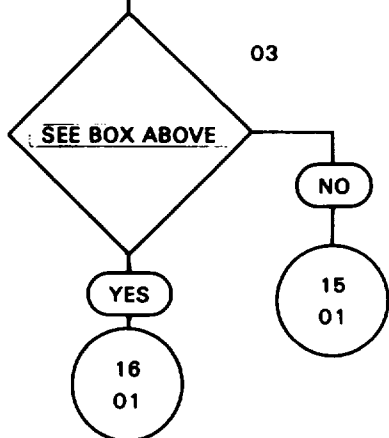
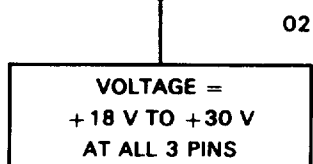
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 14 of 31)



GRENADE FIRING PIN (TYPICAL)

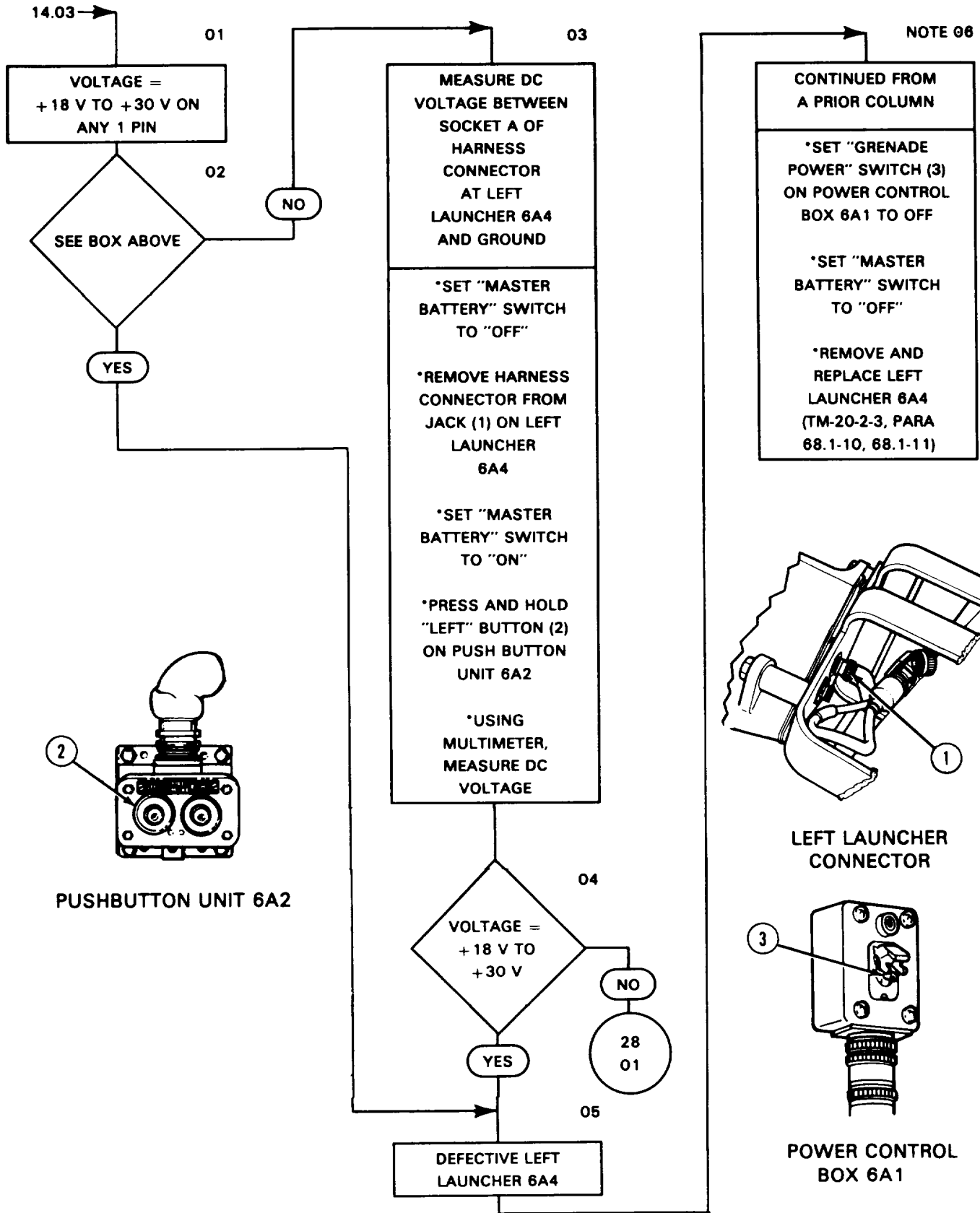


PUSHBUTTON UNIT 6A2

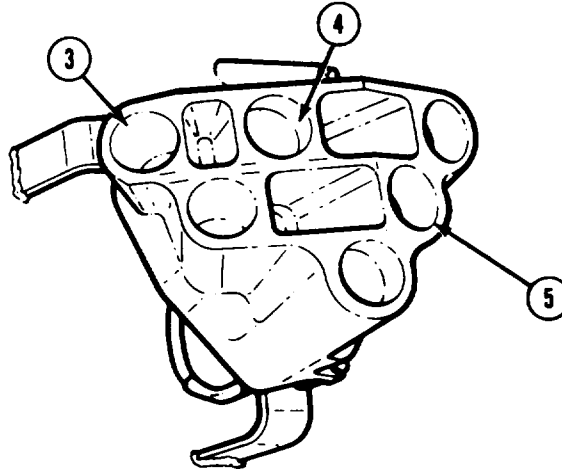
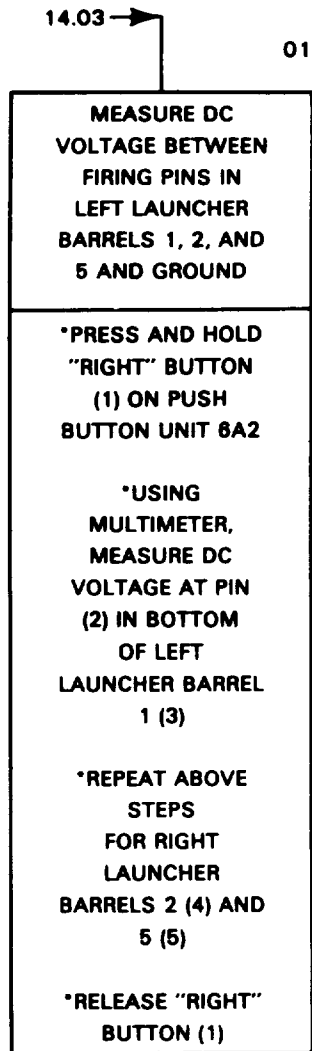


LEFT LAUNCHER 6A4

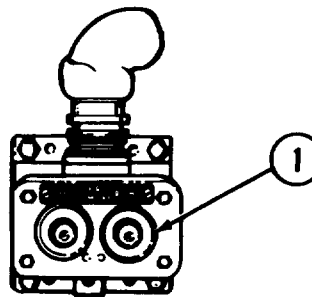
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 15 of 31)



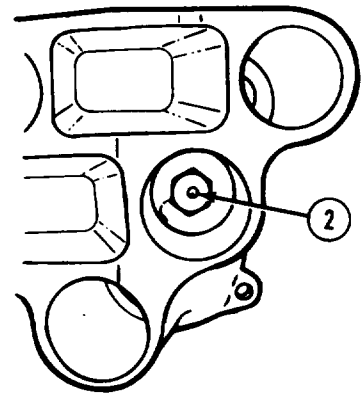
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 16 of 31)



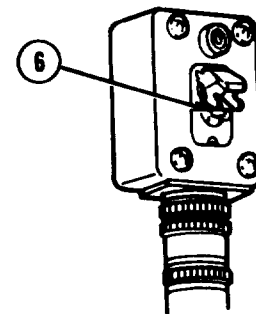
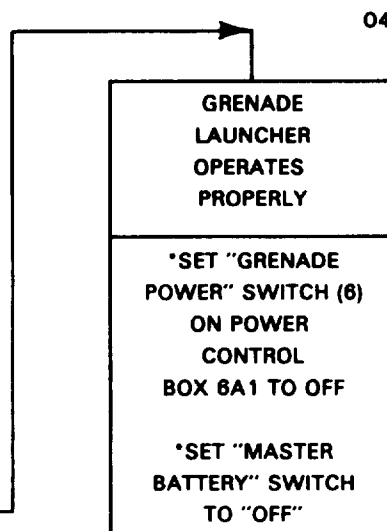
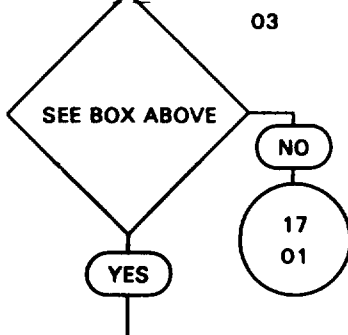
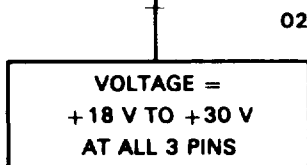
LEFT LAUNCHER 6A4



PUSHBUTTON UNIT 6A2

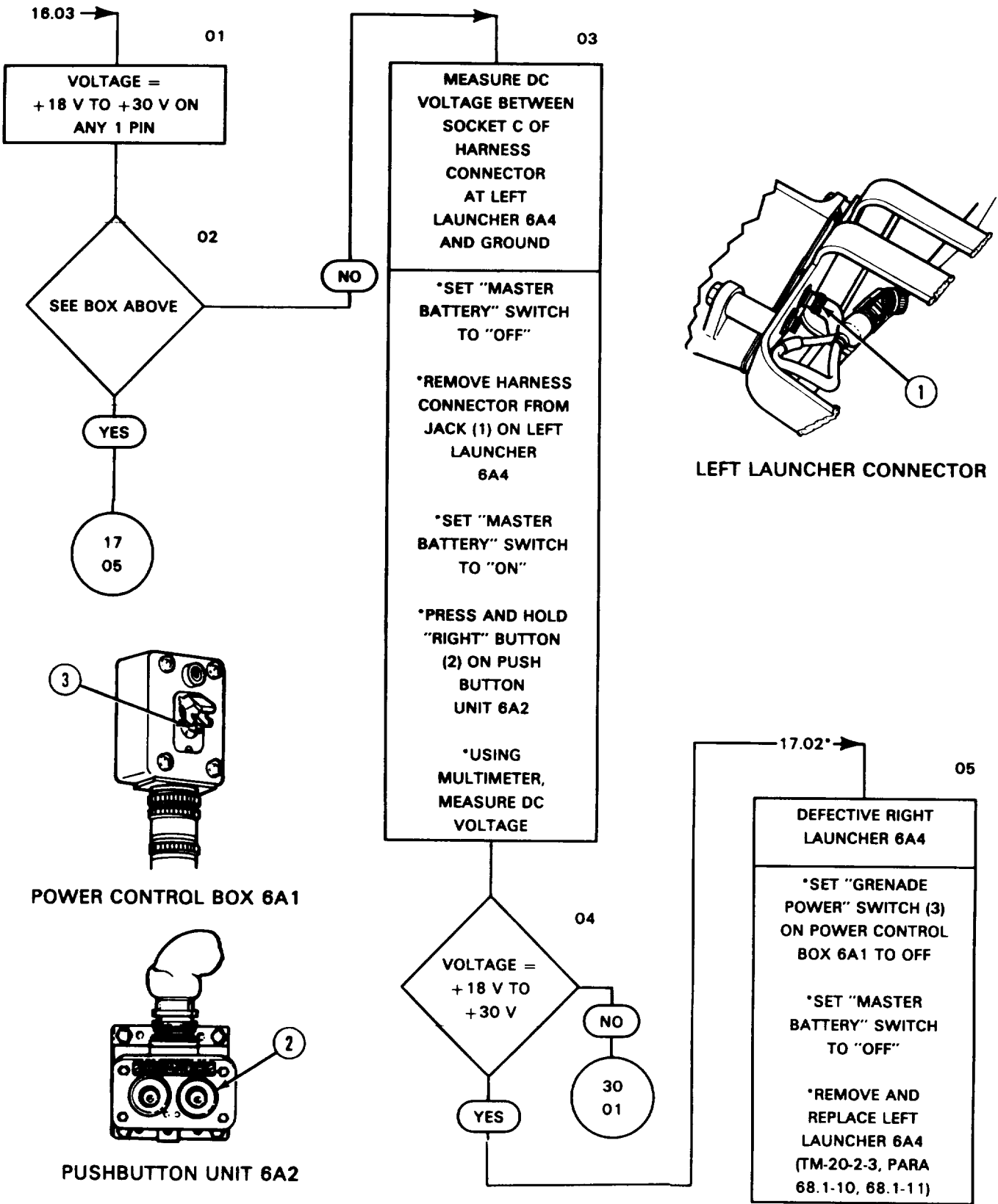


GRENADE FIRING PIN (TYPICAL)

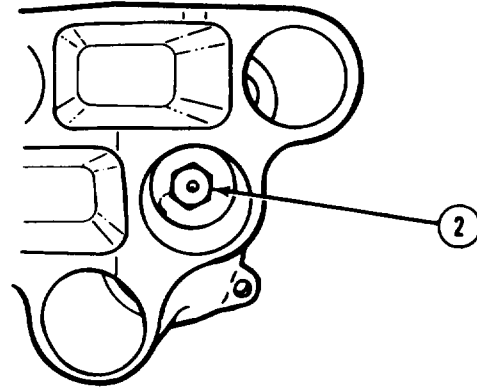
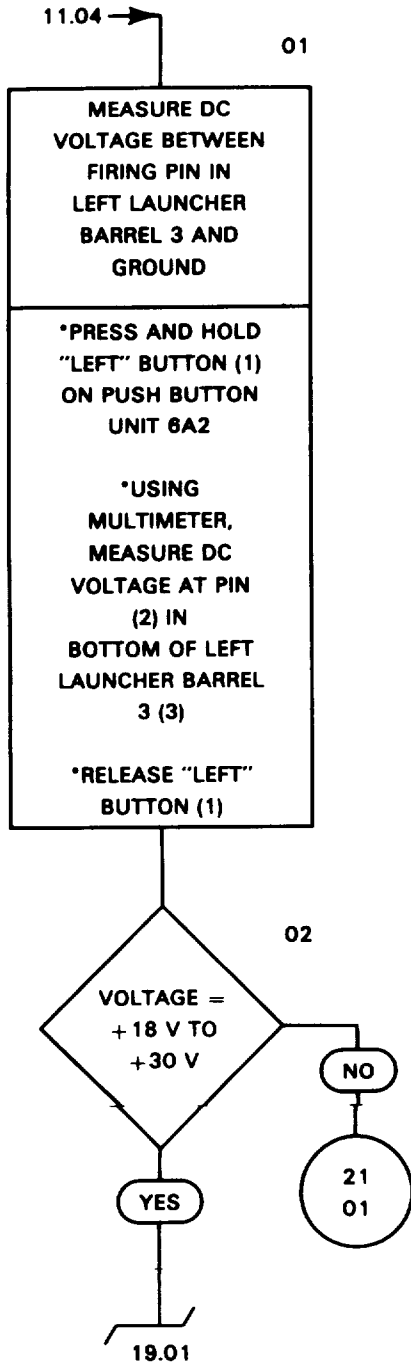


POWER CONTROL BOX 6A1

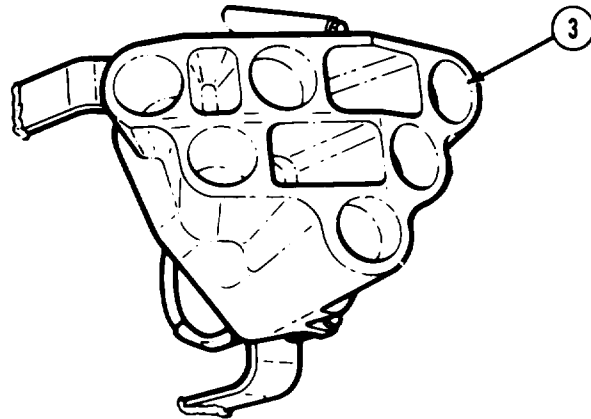
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 17 of 31)



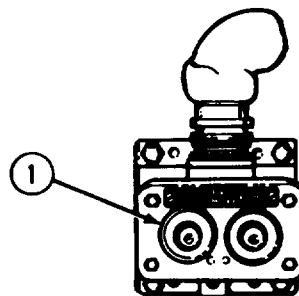
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 18 of 31)



GRENADE FIRING PIN (TYPICAL)

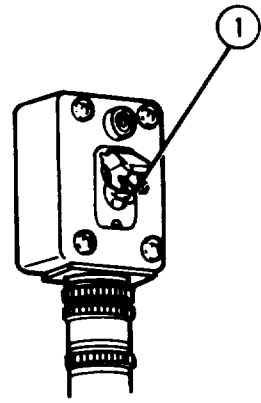
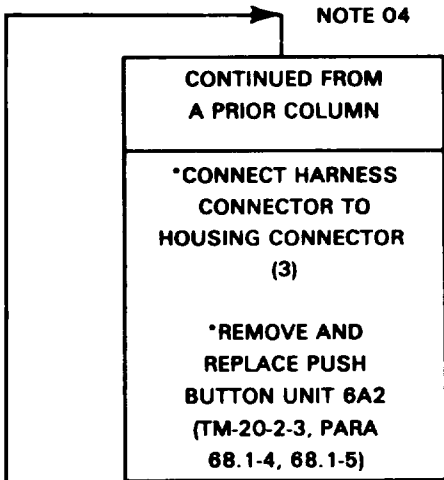
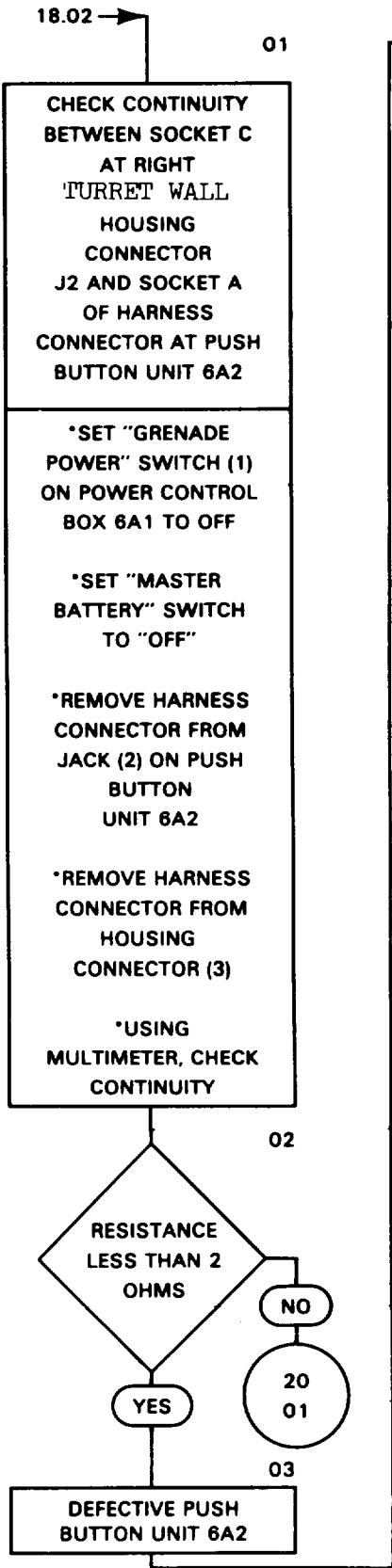


LEFT LAUNCHER 6A4

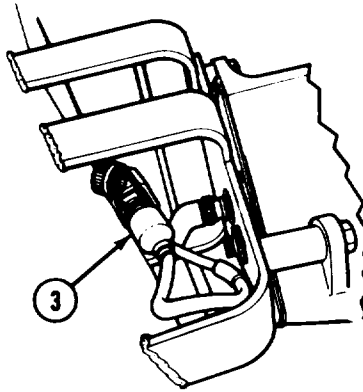


PUSHBUTTON UNIT 6A2

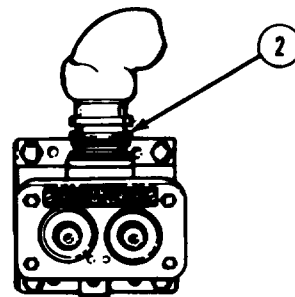
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 19 of 31)



POWER CONTROL BOX 6A1



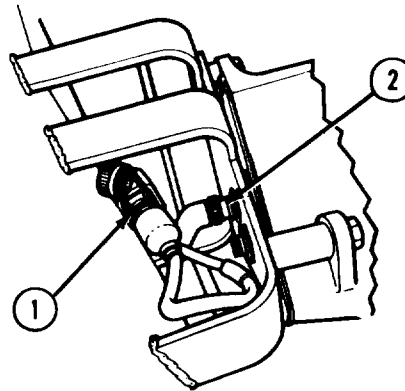
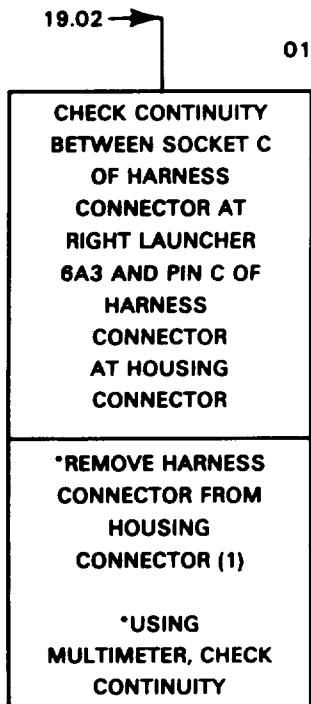
RIGHT LAUNCHER CONNECTOR



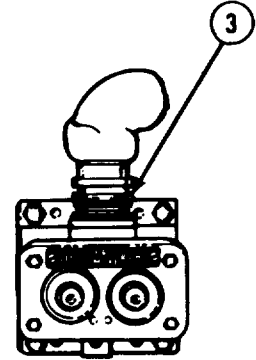
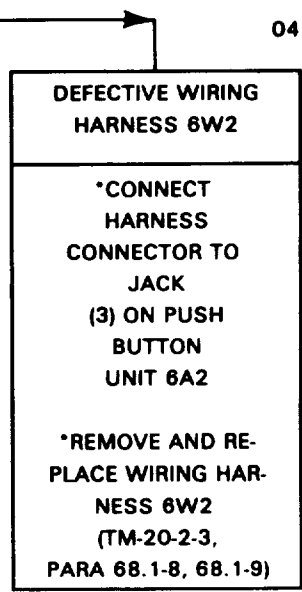
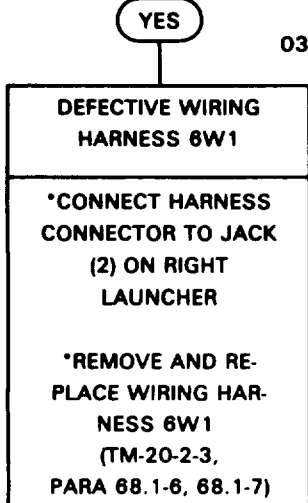
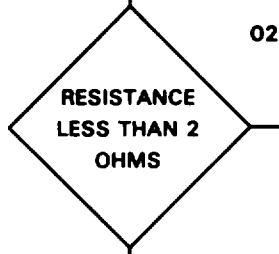
PUSHBUTTON UNIT 6A2



7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 20 of 31)

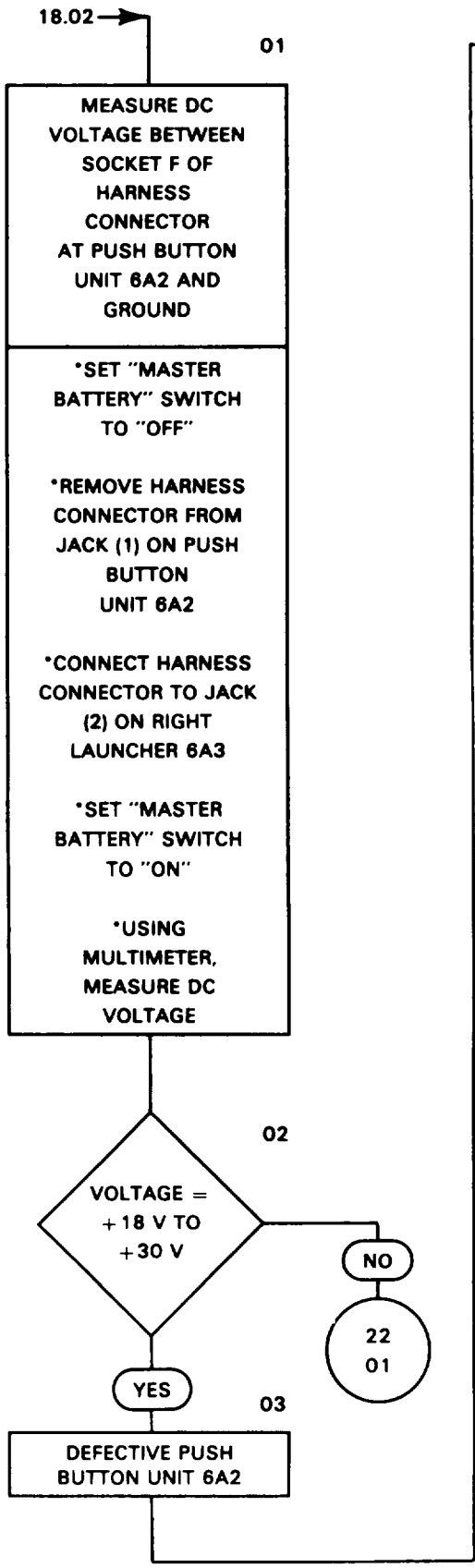


RIGHT LAUNCHER CONNECTOR



PUSHBUTTON UNIT 6A2

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 21 of 31)



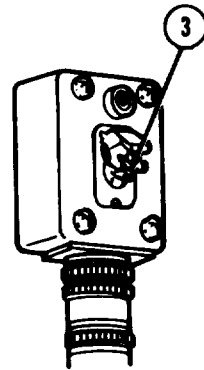
NOTE 04

CONTINUED FROM A PRIOR COLUMN

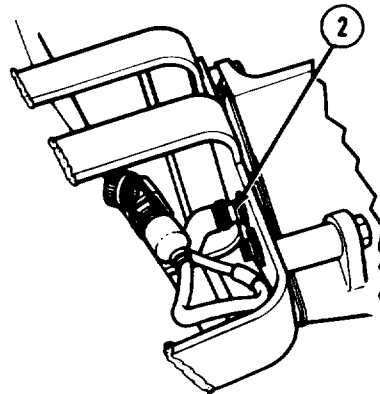
\*SET "GRENADE POWER" SWITCH (3) ON POWER CONTROL BOX 6A1 TO OFF

\*SET "MASTER BATTERY" SWITCH TO "OFF"

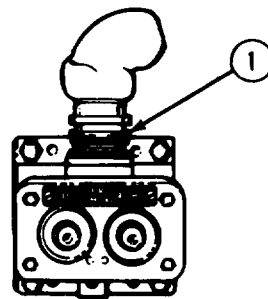
\*REMOVE AND REPLACE PUSH BUTTON UNIT 6A2 (TM-20-2-3, PARA 68.1-4, 68.1-5)



POWER CONTROL BOX 6A1



RIGHT LAUNCHER CONNECTOR



PUSHBUTTON UNIT 6A2

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 22 of 31)

21.02 →

01

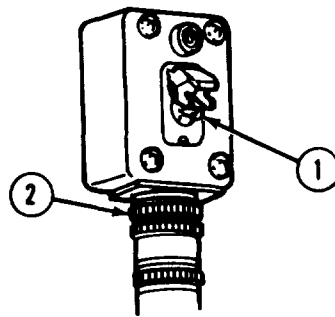
CHECK CONTINUITY BETWEEN SOCKET F OF HARNESS CONNECTOR AT PUSH BUTTON UNIT 6A2 AND SOCKET D OF HARNESS CONNECTOR AT POWER CONTROL BOX 6A1

\*SET "GRENADE POWER" SWITCH (1) ON POWER CONTROL BOX 6A1 TO OFF

\*SET "MASTER BATTERY" SWITCH TO "OFF"

\*REMOVE HARNESS CONNECTOR FROM JACK (2) ON POWER CONTROL BOX 6A1

\*USING MULTIMETER, CHECK CONTINUITY



POWER CONTROL BOX 6A1

22.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

\*CONNECT HARNESS CONNECTOR TO JACK (3) ON PUSH BUTTON UNIT 6A2

\*REMOVE AND REPLACE POWER CONTROL BOX 6A1 (TM-20-2-3, PARA 68.1-2, 68.1-3)

02

LESS THAN 2 OHMS RESISTANCE

NO

03

YES

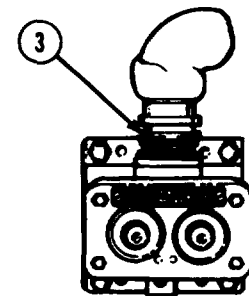
DEFECTIVE POWER CONTROL BOX 6A1

22.05

04

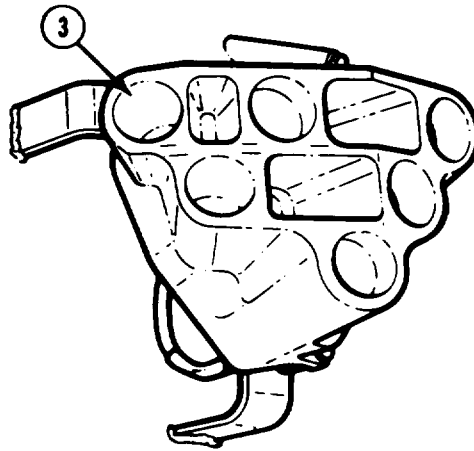
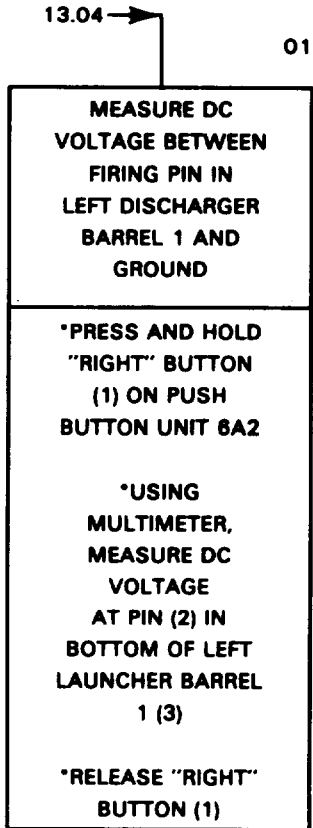
DEFECTIVE WIRING HARNESS 6W1

\*REMOVE AND REPLACE WIRING HARNESS 6W1 (TM-20-2-3, PARA 68.1-6, 68.1-7)

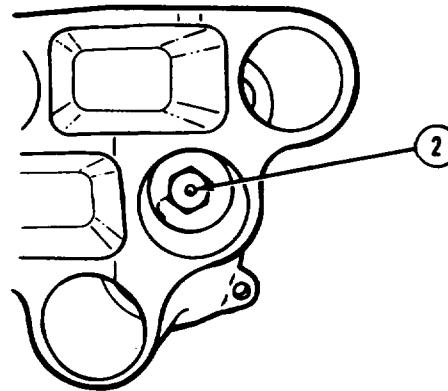


PUSHBUTTON UNIT 6A2

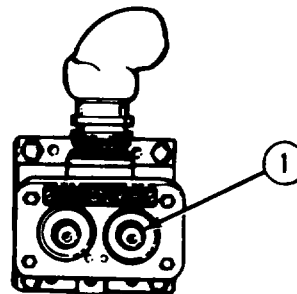
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 23 of 31)



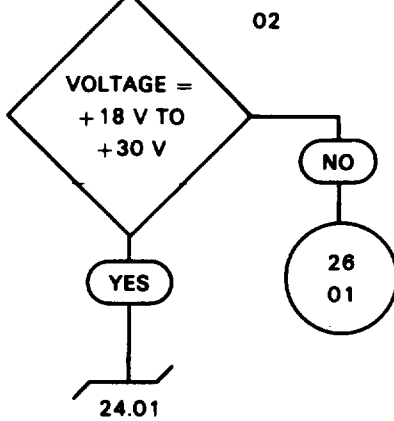
LEFT LAUNCHER 6A4



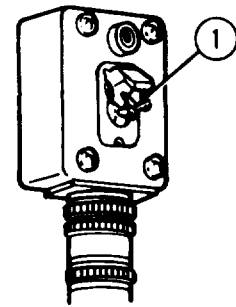
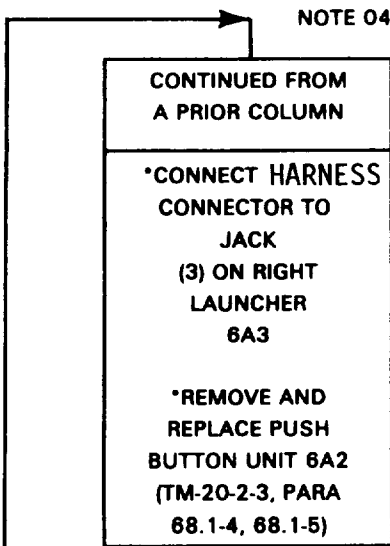
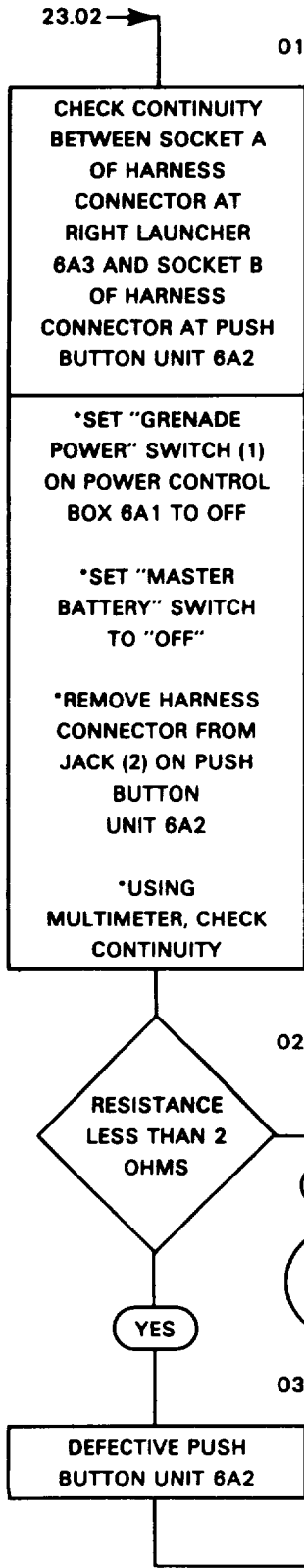
GRENADE FIRING PIN (TYPICAL)



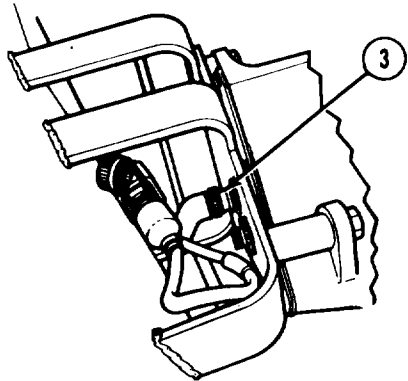
PUSHBUTTON UNIT 6A2



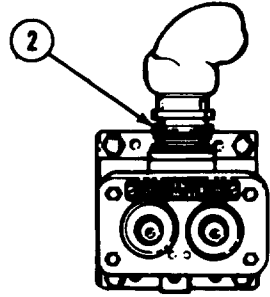
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 24 of 31)



POWER CONTROL BOX 6A1



RIGHT LAUNCHER CONNECTOR



PUSHBUTTON UNIT 6A2

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 25 of 31)

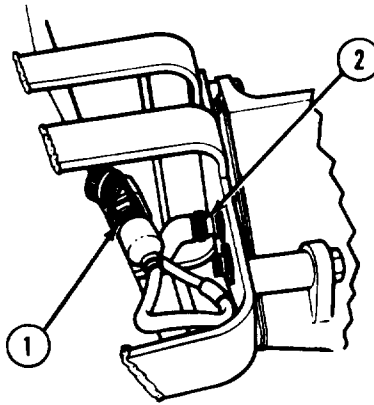
24.02 →

01

CHECK CONTINUITY BETWEEN SOCKET C OF HARNESS CONNECTOR AT RIGHT LAUNCHER 6A3 AND PIN C OF HARNESS CONNECTOR AT HOUSING CONNECTOR

\*REMOVE HARNESS CONNECTOR FROM HOUSING CONNECTOR (1)

\*USING MULTIMETER, CHECK CONTINUITY



25.03 →

NOTE 05

CONTINUED FROM A PRIOR COLUMN

6A3

\*REMOVE AND REPLACE WIRING HARNESS 6W1 (TM-20-2-3, PARA 68.1-6, 68.1-7)

02

RESISTANCE LESS THAN 2 OHMS

NO

04

YES

03

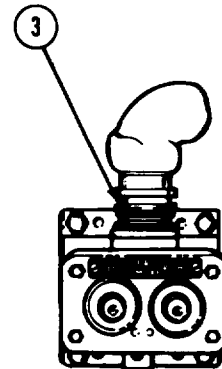
DEFECTIVE WIRING HARNESS 6W1

\*CONNECT HARNESS CONNECTOR TO JACK (2) ON RIGHT LAUNCHER

DEFECTIVE WIRING HARNESS 6W2

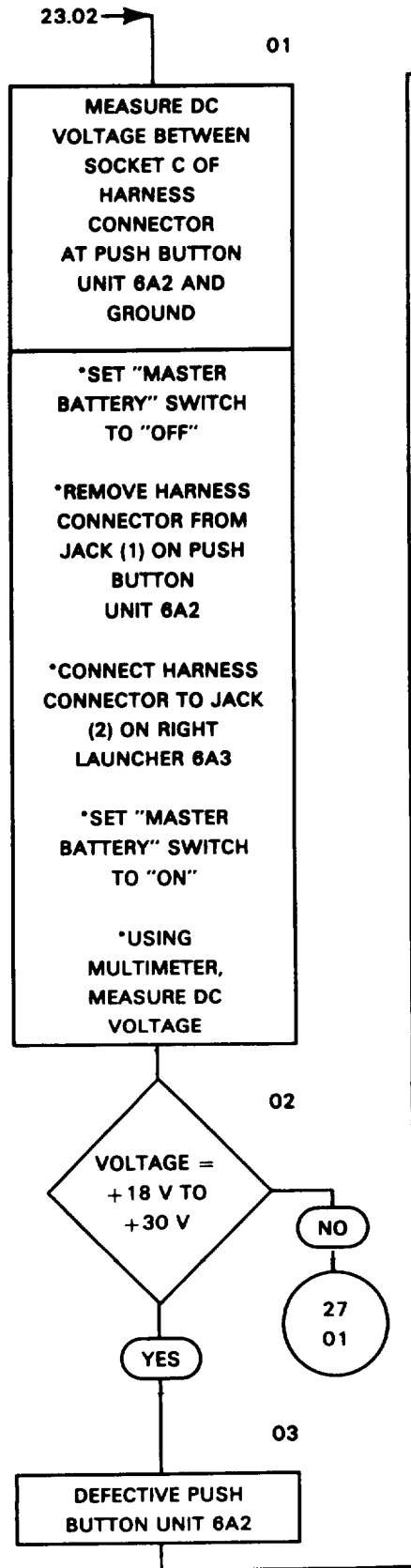
\*CONNECT HARNESS CONNECTOR TO JACK (3) ON PUSH BUTTON UNIT 6A2

\*REMOVE AND REPLACE WIRING HARNESS 6W2 (TM-20-2-3, PARA 68.1-8, 68.1-9)



25.05

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 26 of 31)



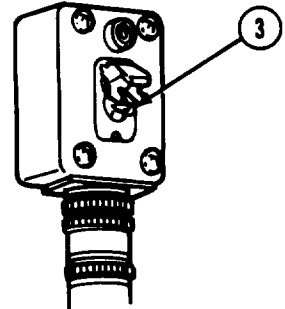
NOTE 04

CONTINUED FROM A PRIOR COLUMN

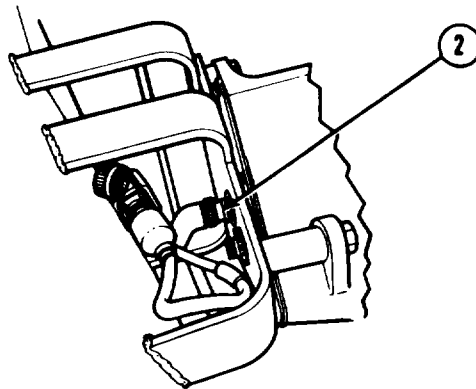
\*SET "GRENADE POWER" SWITCH (3) ON POWER CONTROL BOX 6A1 TO OFF

\*SET "MASTER BATTERY" SWITCH TO "OFF"

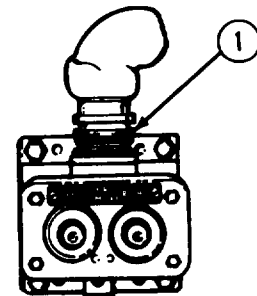
\*REMOVE AND REPLACE PUSH BUTTON UNIT 6A2 (TM-20-2-3, PARA 68.1-4, 68.1-5)



POWER CONTROL BOX 6A1

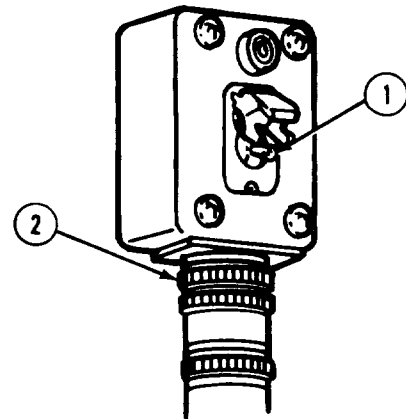
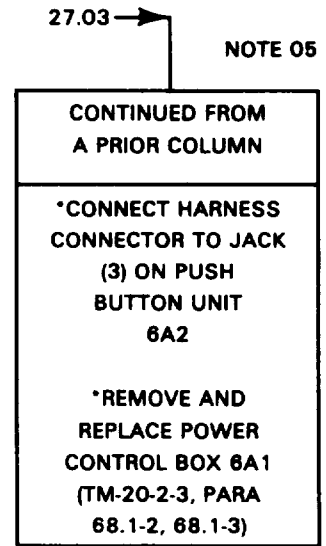
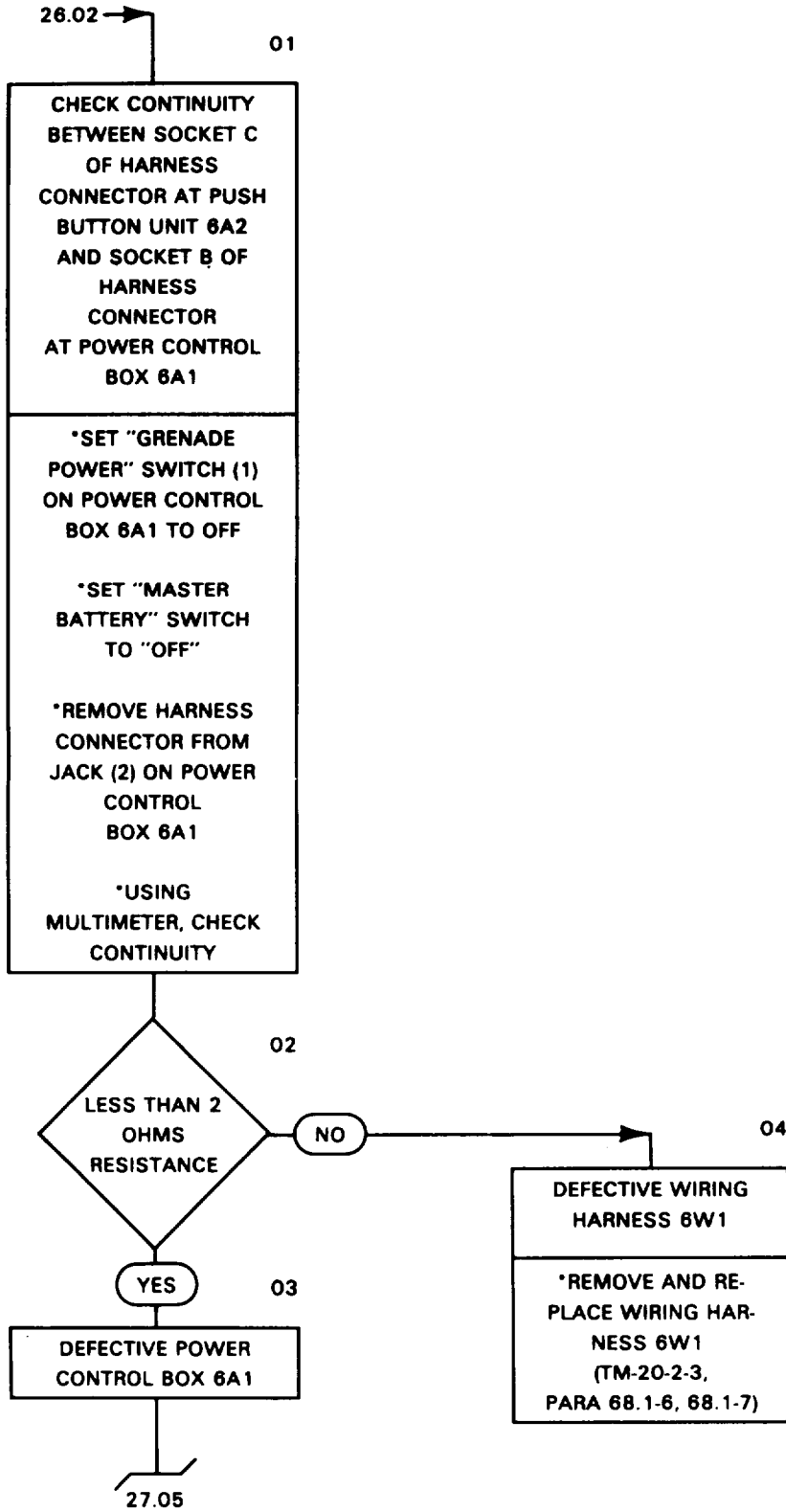


RIGHT LAUNCHER CONNECTOR

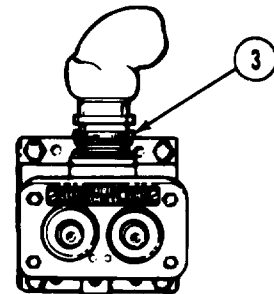


PUSHBUTTON UNIT 6A2

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 27 of 31)



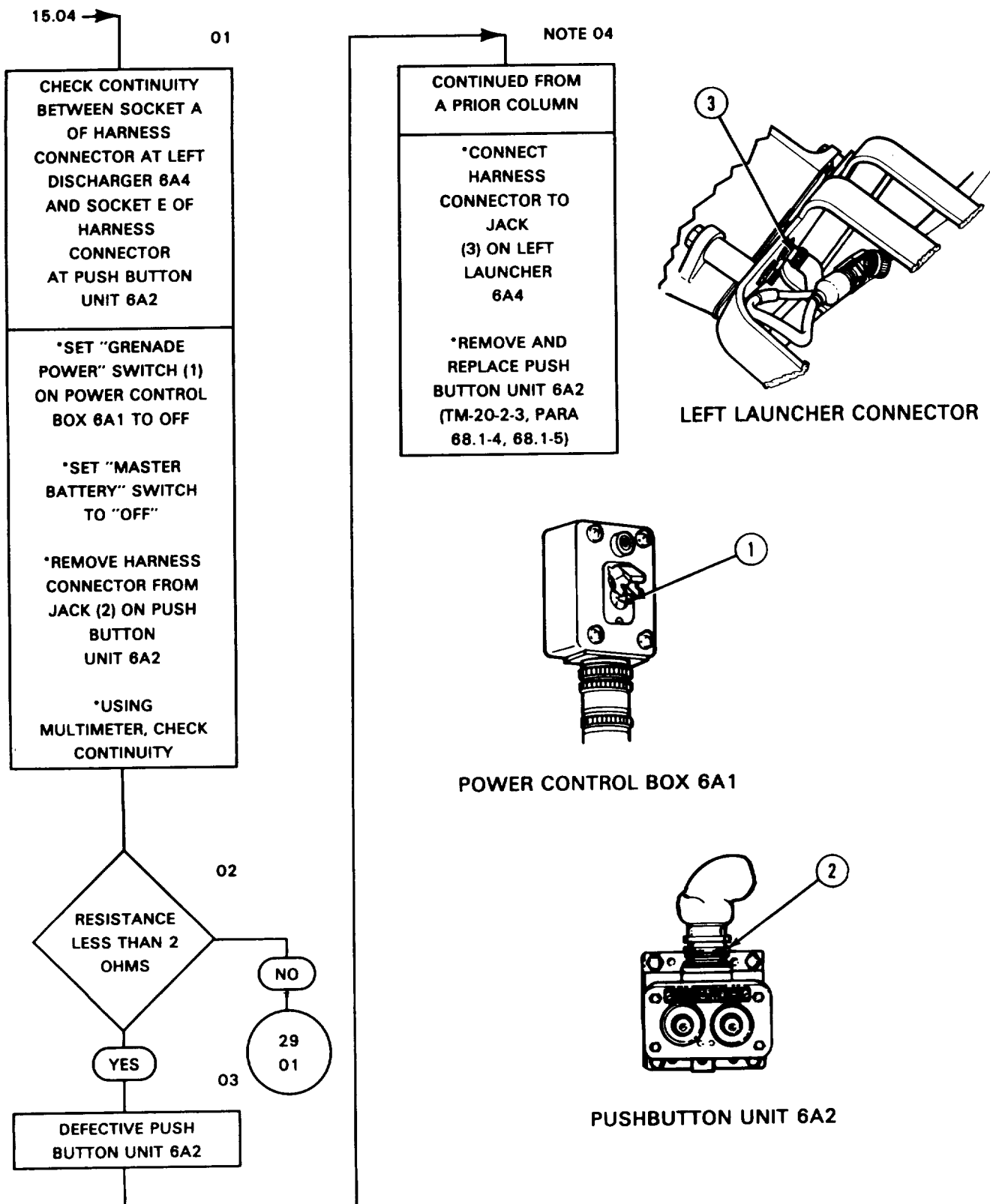
POWER CONTROL BOX 6A1



PUSHBUTTON UNIT 6A2



7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 28 of 31)



7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 29 of 31)

28.02 →

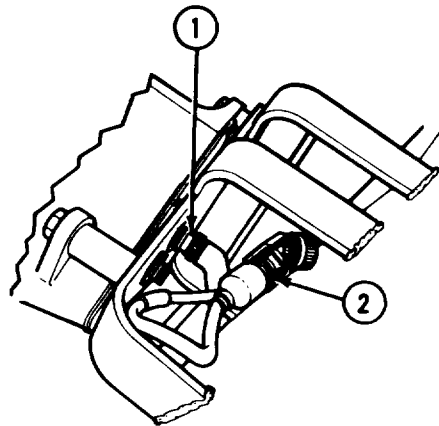
01

CHECK CONTINUITY BETWEEN SOCKET A OF HARNESS CONNECTOR OF LEFT DISCHARGER 6A4 (1) AND PIN A OF HARNESS CONNECTOR AT HOUSING CONNECTOR (2)

REMOVE HARNESS CONNECTOR FROM JACK (1) ON LEFT DISCHARGER 6A4

\*REMOVE HARNESS CONNECTOR FROM JACK P1 (2) ON HOUSING CONNECTOR

\*USING MULTIMETER, CHECK CONTINUITY



LEFT LAUNCHER CONNECTOR

02

RESISTANCE LESS THAN 2 OHMS

NO

YES

03

DEFECTIVE WIRING HARNESS 6W1

\*CONNECT HARNESS CONNECTOR TO JACK (1) ON LEFT LAUNCHER 6A4

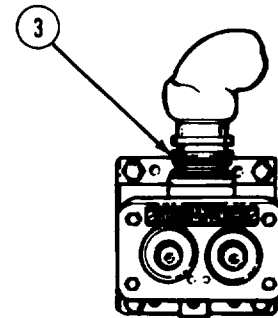
\*REMOVE AND REPLACE WIRING HARNESS 6W1 (TM-20-2-3, PARA 68.1-6, 68.1-7)

04

DEFECTIVE WIRING HARNESS 6W3

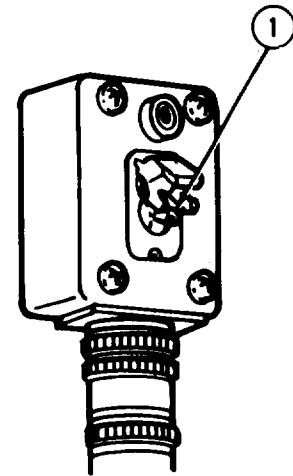
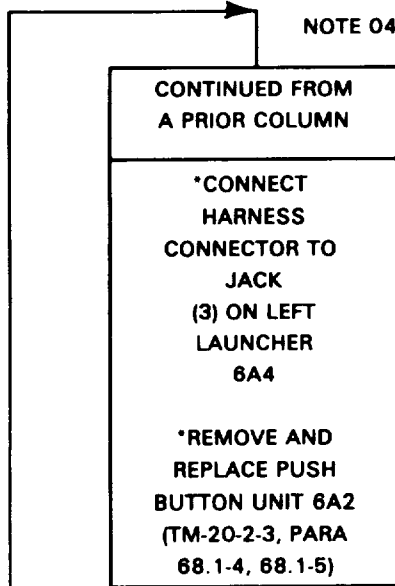
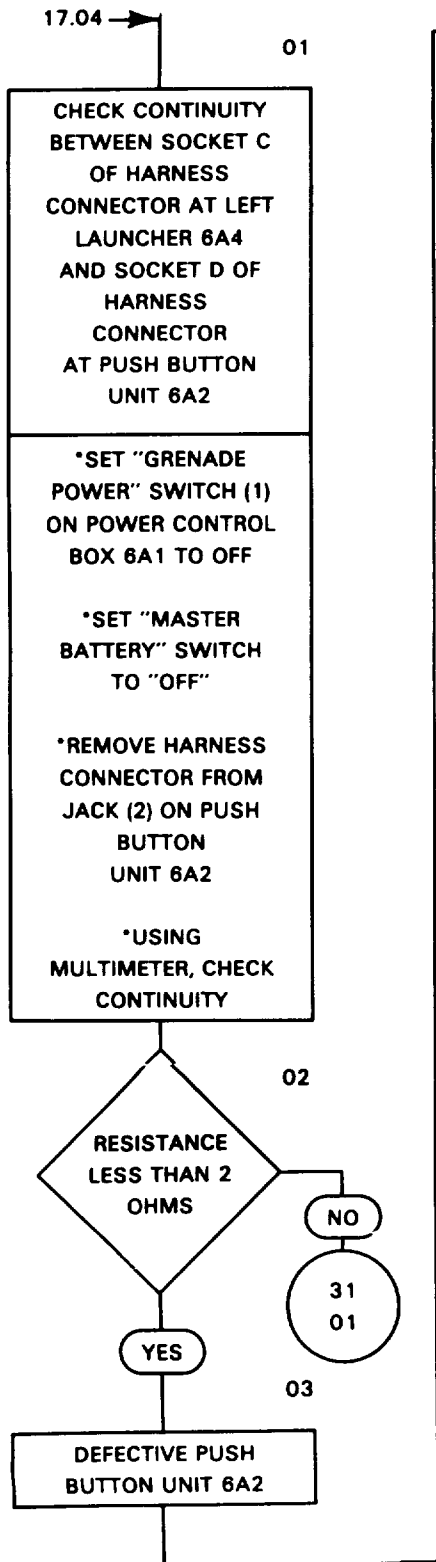
\*CONNECT HARNESS CONNECTOR TO JACK (3) ON PUSH BUTTON UNIT 6A2

\*REMOVE AND REPLACE WIRING HARNESS 6W3 (TM-20-2-3, PARA 68.1-8, 68.1-9)

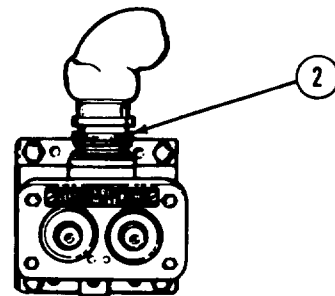


PUSHBUTTON UNIT 6A2

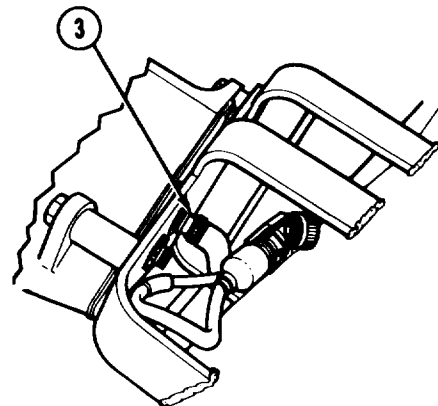
7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 30 of 31)



POWER CONTROL BOX 6A1



PUSHBUTTON UNIT 6A2



LEFT LAUNCHER CONNECTOR

7-4. GRENADE LAUNCHER TROUBLESHOOTING (Sheet 31 of 31)

30.02 →

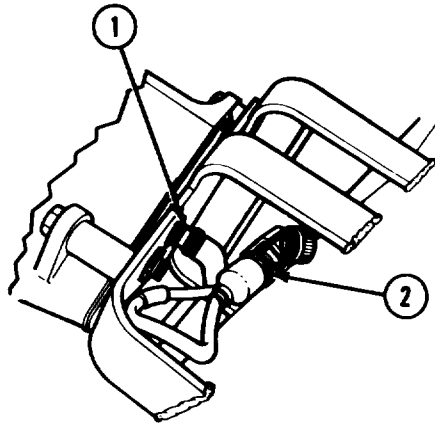
01

CHECK CONTINUITY BETWEEN SOCKET C OF HARNESS CONNECTOR OF LEFT LAUNCHER 6A4 AND PIN C OF HARNESS CONNECTOR AT HOUSING CONNECTOR

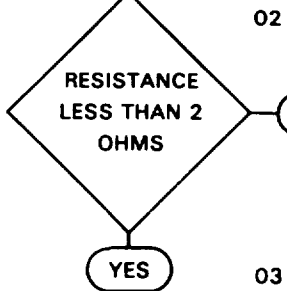
REMOVE HARNESS CONNECTOR 6W3 FROM JACK (1) ON LEFT LAUNCHER 6A4

\*REMOVE HARNESS CONNECTOR FROM JACK (2) ON HOUSING CONNECTOR

\*USING MULTIMETER, CHECK CONTINUITY



LEFT LAUNCHER CONNECTOR



DEFECTIVE WIRING HARNESS 6W1

\*CONNECT HARNESS CONNECTOR TO JACK (2) ON LEFT LAUNCHER 6A4

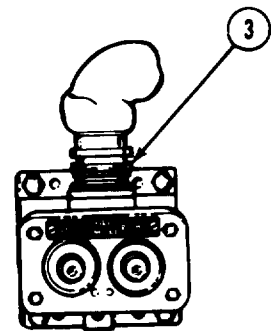
\*REMOVE AND REPLACE WIRING HARNESS 6W1 (TM-20-2-3, PARA 68.1-6, 68.1-7)

04

DEFECTIVE WIRING HARNESS 6W3

\*CONNECT HARNESS CONNECTOR TO JACK (3) ON PUSH BUTTON UNIT 6A2

\*REMOVE AND REPLACE WIRING HARNESS 6W3 (TM-20-2-3, PARA 68.1-8, 68.1-9)



PUSHBUTTON UNIT 6A2

By Order of the Secretary of the Army:

E. C. MEYER  
*General, United States Army*  
*Chief of Staff*

Official:

J. C. PENNINGTON  
*Major General, United States Army*  
*The Adjutant General*

DISTRIBUTION:

To be distributed in accordance with DA Form 12-37 (Qty req block no. 1041) requirements for M728 Combat Engineer Vehicle.





# SOMETHING WRONG WITH THIS MANUAL?

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

FROM: (YOUR UNIT'S COMPLETE ADDRESS)

Your mailing address.

DATE Date you fill out this form.

PUBLICATION NUMBER

TM 9-XXXX-XXX-XX

DATE

Date of TM

TITLE

Title of TM

BE EXACT... PIN-POINT WHERE IT IS

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.
3		2	
109		51	
2-8			2-1
12	1-6a		

Item 10. Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.

Item 3. The NSN and P/N are not listed on the AMDF nor the MCRL. Request correct NSN and P/N be furnished.

2-1 Preventive Maintenance Checks and Services. Item 7 under "Items to be inspected" should be changed to read as follows: Firing linkage and firing mechanism pawl.

Since there are both 20- and 30- round magazines for this rifle, data on both should be listed.

# SAMPLE

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

TEAR ALONG DOTTED LINE





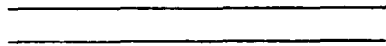


FILL IN YOUR  
UNIT'S ADDRESS



FOLD BACK

DEPARTMENT OF THE ARMY



OFFICIAL BUSINESS

Commander  
US Army Armament Materiel Readiness Command  
ATTN: DRSAR-MAS  
Rock Island, IL 61299

TEAR ALONG DOTTED LINE

FOLD BACK



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DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander  
US Army Armament Materiel Readiness Command  
ATTN: DRSAR-MAS  
Rock Island, IL 61299

TEAR ALONG DOTTED LINE

FOLD BACK



FILL IN YOUR  
UNIT'S ADDRESS

FOLD BACK

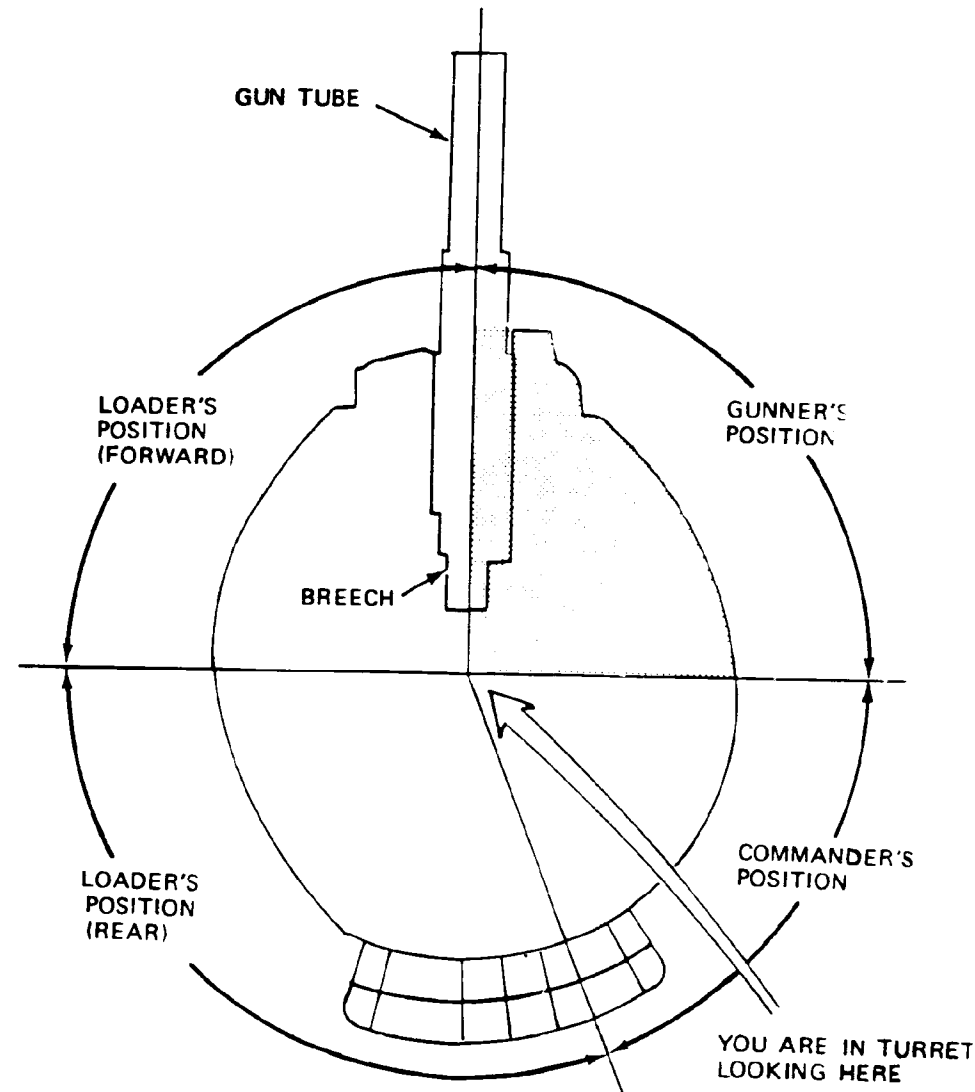
DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander  
US Army Armament Materiel Readiness Command  
ATTN: DRSAR-MAS  
Rock Island, IL 61299

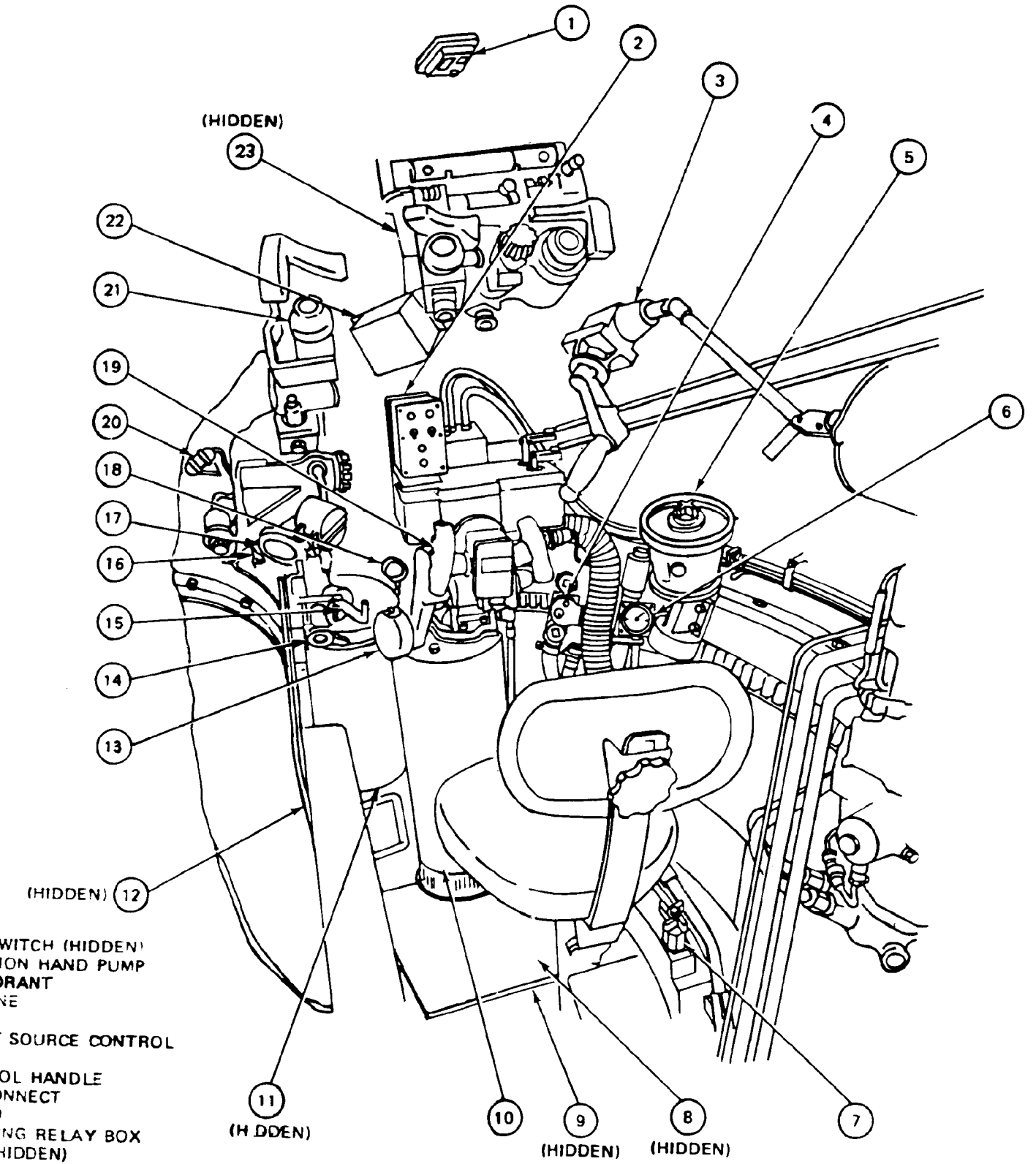
TEAR ALONG DOTTED LINE

FOLD BACK



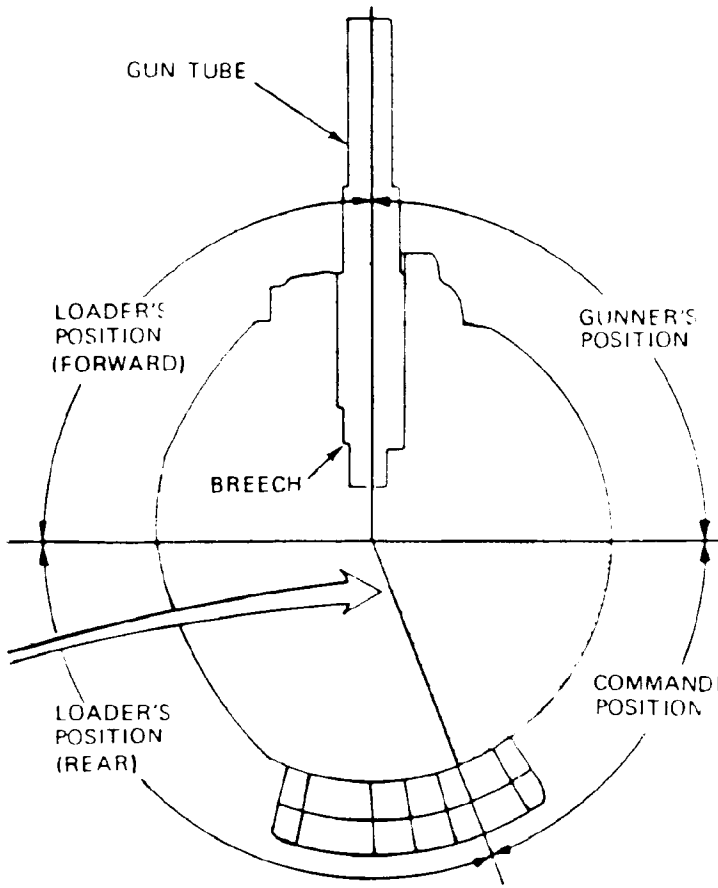
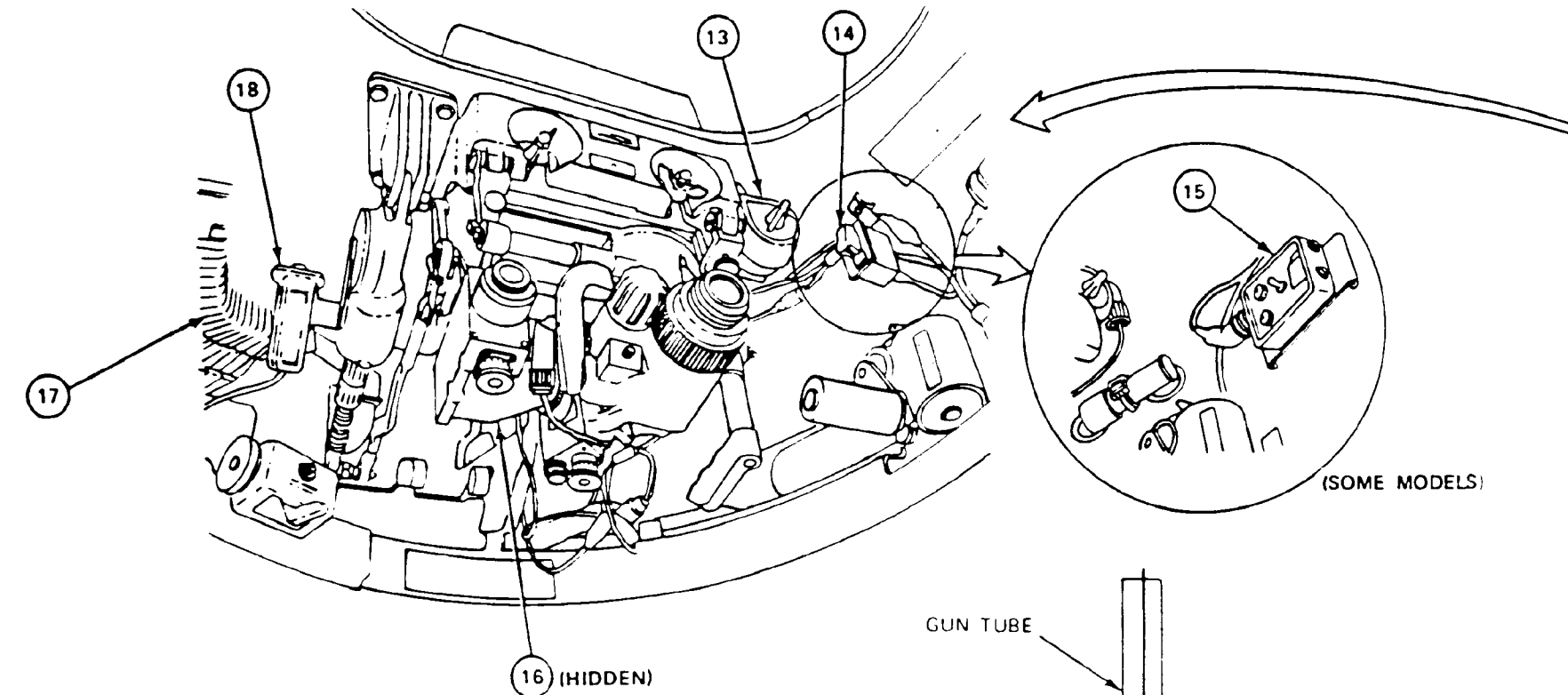
LEGEND:

- 1. GUNNER'S DOMELIGHT
- 2. GUNNER'S CONTROL BOX
- 3. HAND TRAVERSE DRIVE
- 4. GUNNER'S AIR FILTER HEATER
- 5. AZIMUTH INDICATOR
- 6. EQUILIBRATOR PRESSURE GAGE
- 7. EQUILIBRATOR CHARGING ASSEMBLY
- 8. POWER PACK BLOWER (HIDDEN)
- 9. TURRET POWER AND SEARCHLIGHT RELAY BOX (HIDDEN)
- 10. HYDRAULIC POWER PACK
- 11. PRESSURE SWITCH (HIDDEN)

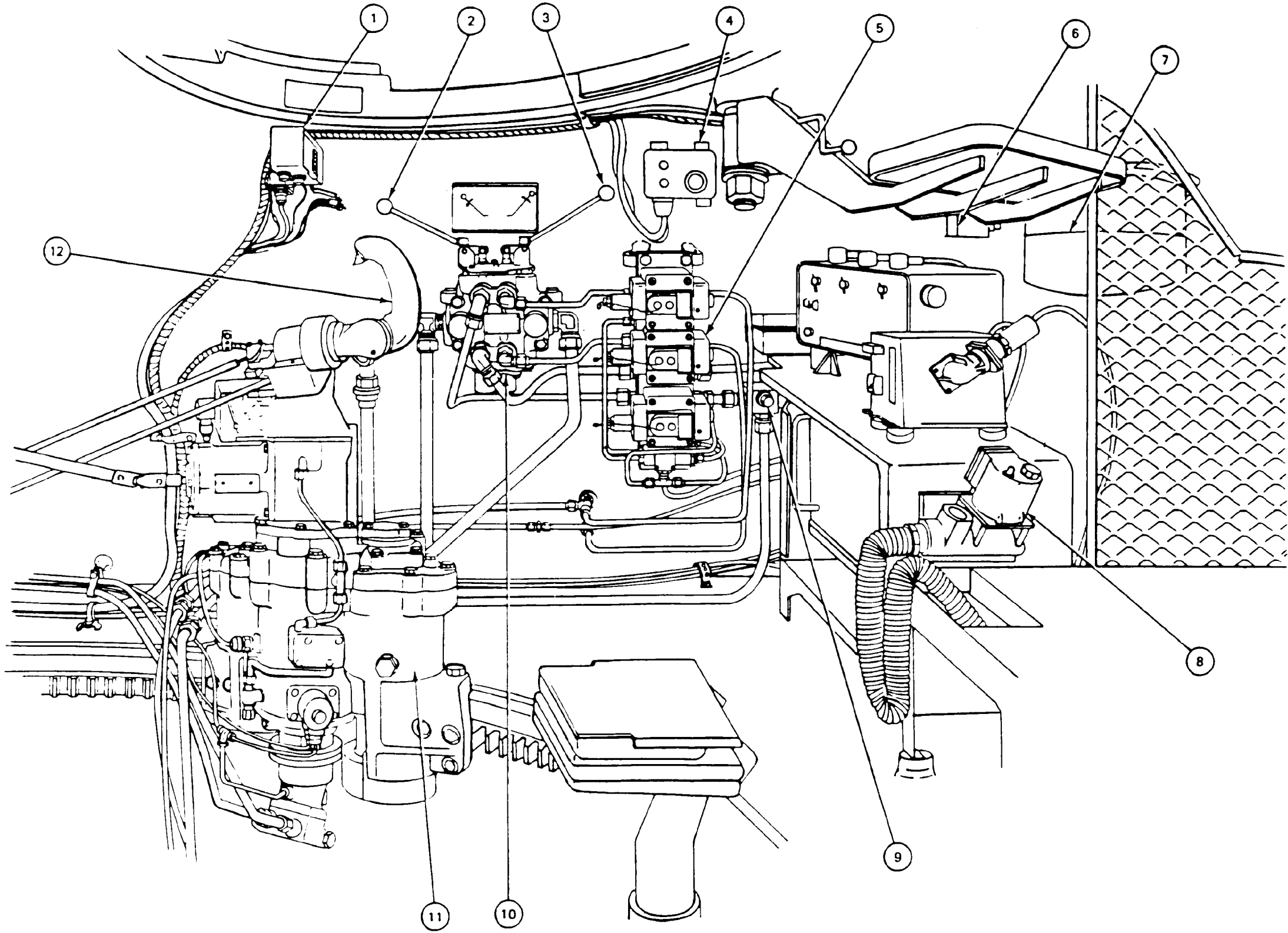


- 12. SAFETY RELAY SWITCH (HIDDEN)
- 13. MANUAL ELEVATION HAND PUMP
- 14. ELEVATION QUADRANT
- 15. BLASTING MACHINE
- 16. "Y" CONNECTOR
- 17. TELESCOPE LIGHT SOURCE CONTROL
- 18. PRESSURE GAGE
- 19. GUNNER'S CONTROL HANDLE
- 20. GUN QUICK DISCONNECT
- 21. TELESCOPE M1050
- 22. TURRET GUN FIRING RELAY BOX
- 23. INFINITY SIGHT (HIDDEN)

FO-1. EQUIPMENT LOCATION INFORMATION - GUNNER'S POSITION

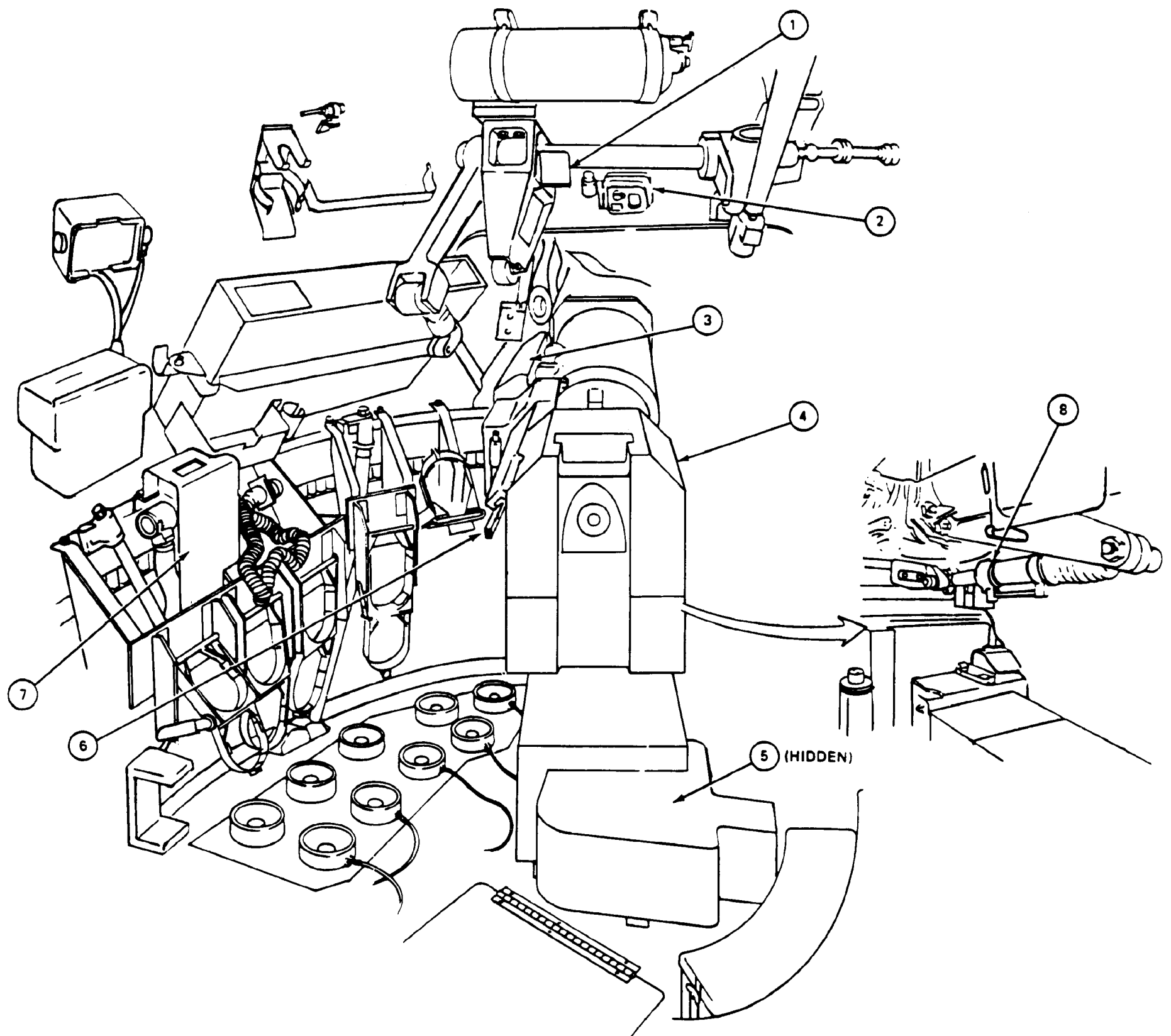
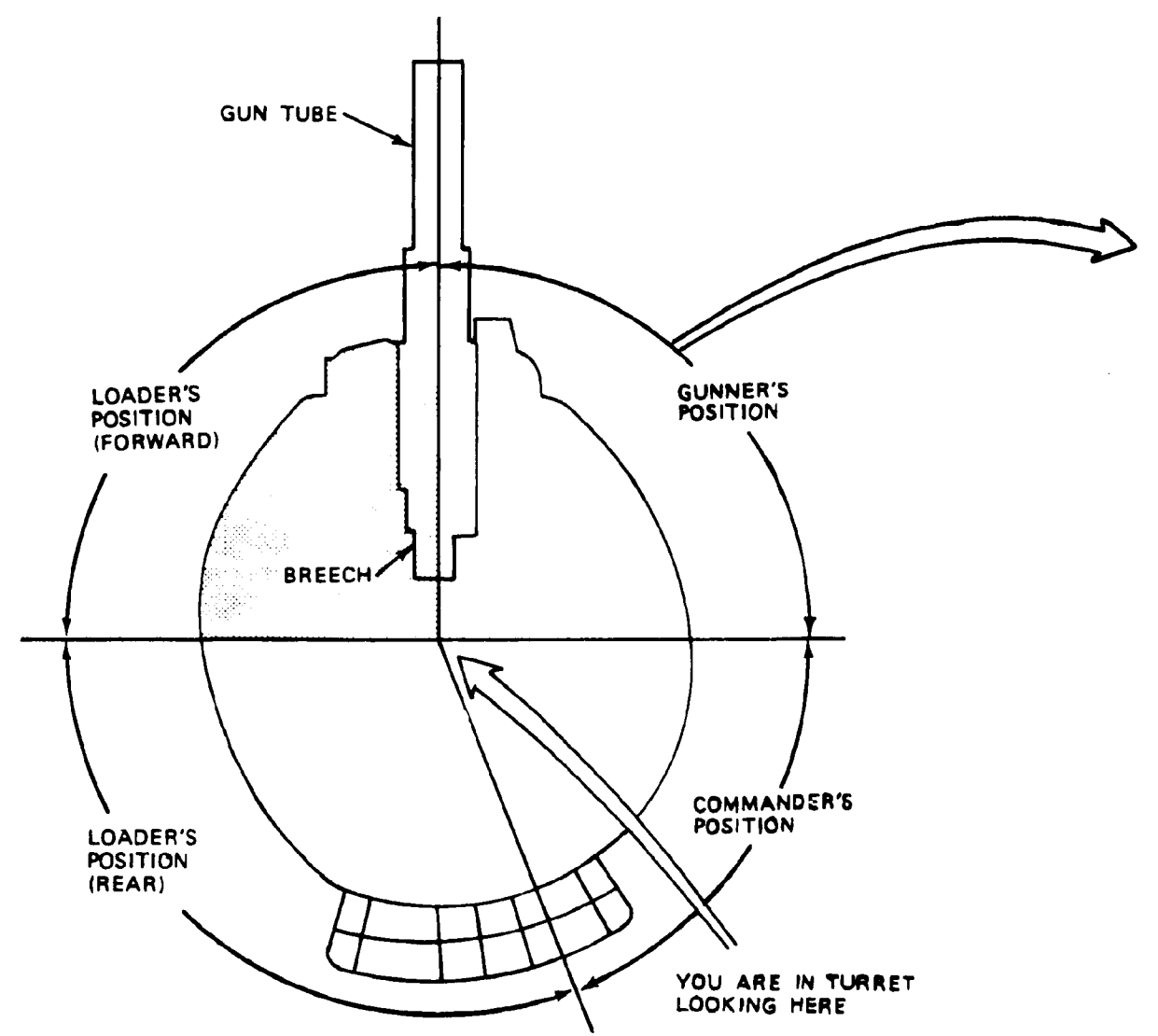


- LEGEND:
1. CUPOLA POWER SWITCH RELAY, AND RESISTOR ASSEMBLY
  2. WINCH CONTROL LEVER
  3. BOOM CONTROL LEVER
  4. SEARCHLIGHT CONTROL BOX (AN/VSS-1)
  5. COUNTERBALANCE AND SHUTTLE VALVES
  6. CUPOLA INTERCONNECTING BOX
  7. TURRET VENT BLOWER
  8. COMMANDER'S AIR FILTER HEATER
  9. WINCH COUNTERBALANCE RELIEF VALVE
  10. WINCH-BOOM CONTROL VALVE
  11. TURRET TRAVERSE MECHANISM
  12. COMMANDER'S CONTROL HANDLE
  13. COMMANDER'S PERISCOPE AND LIGHT SOURCE CONTROL
  14. CUPOLA SAFETY SWITCH
  15. COMMANDER'S CONTROL PANEL
  16. CALIBER 0.50 MACHINE GUN (HIDDEN)
  17. CALIBER 0.50 AMMO FEED CHUTE
  18. ELEVATING HANDLE



FO-2. EQUIPMENT LOCATION INFORMATION - COMMANDER'S POSITION

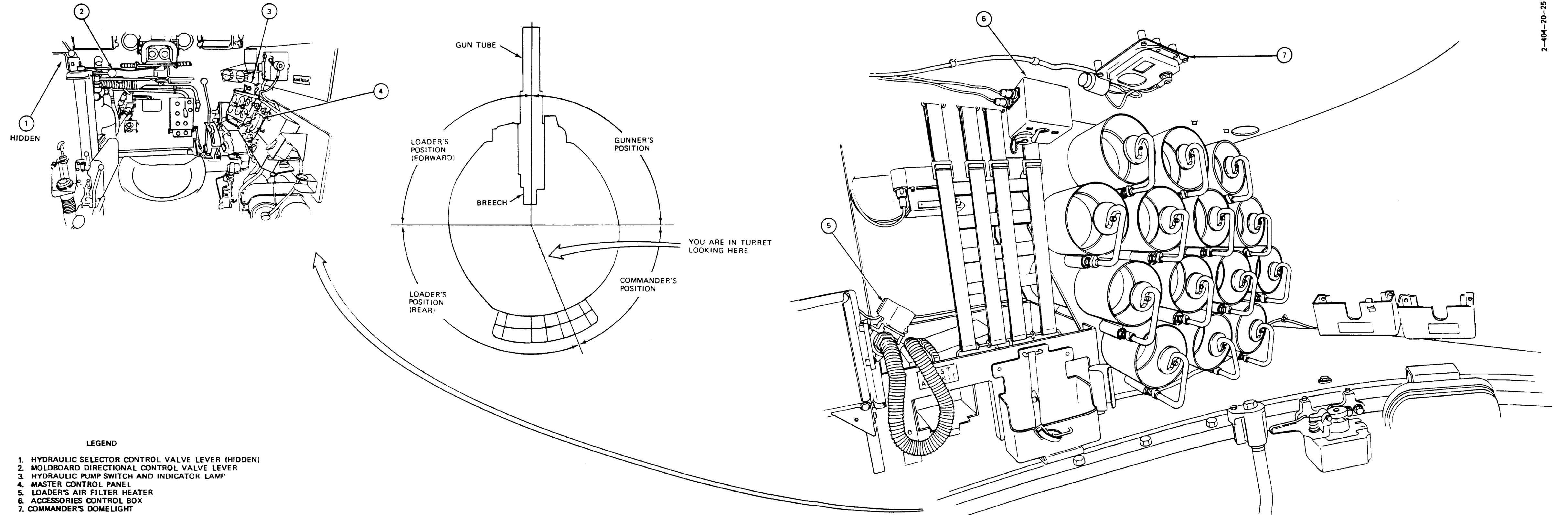




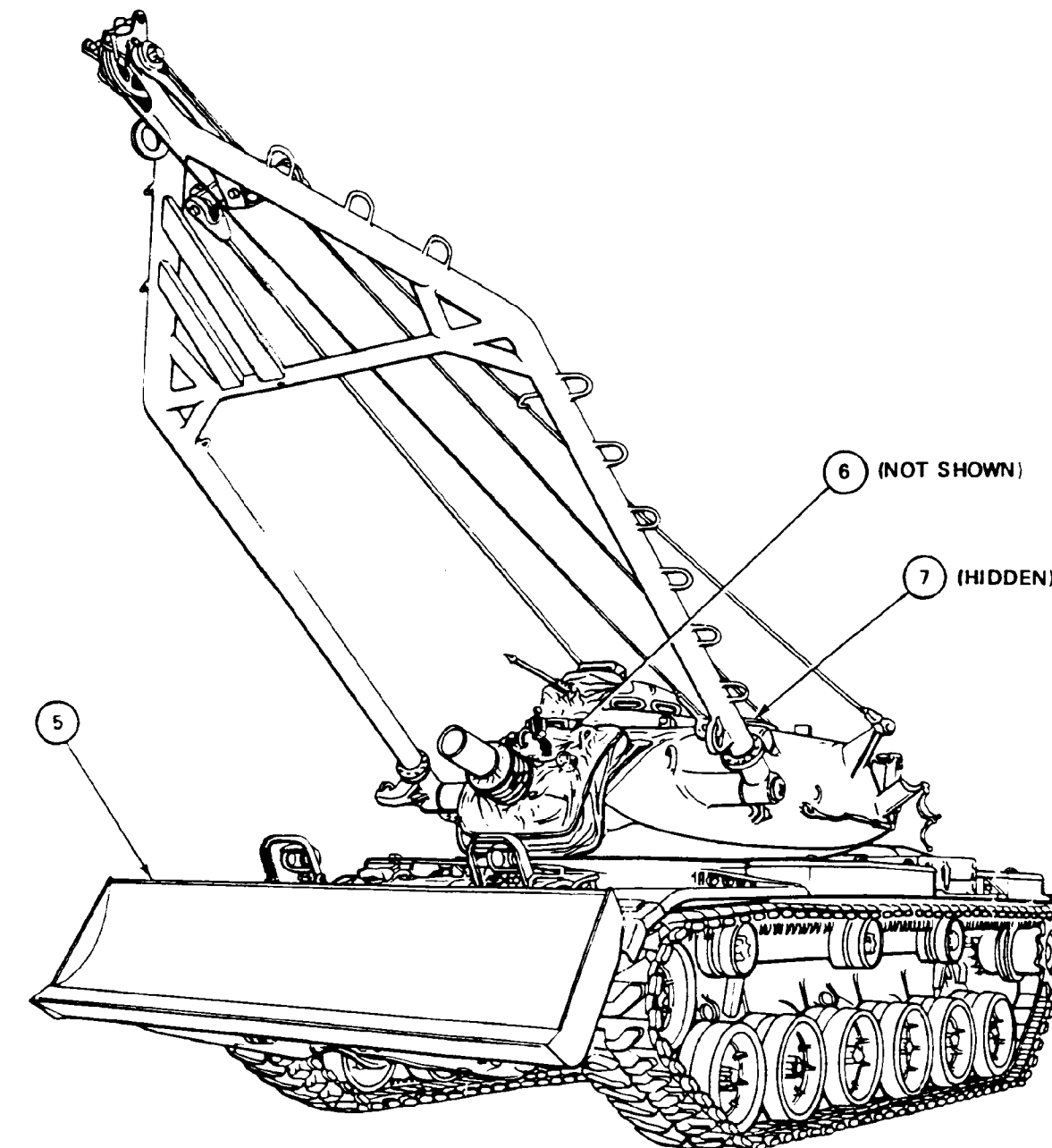
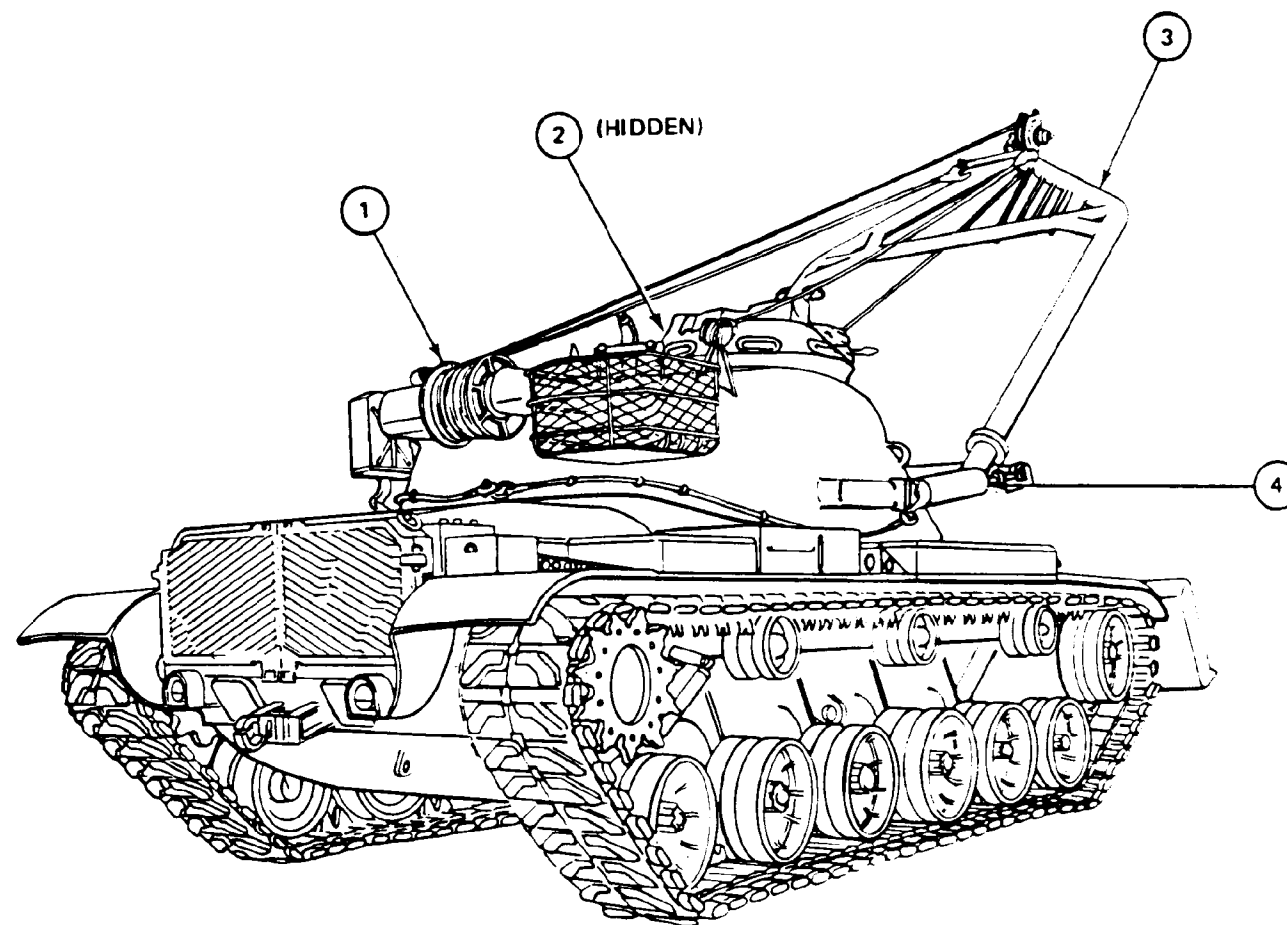
LEGEND

- 1. GUN ELEVATION INTERFERENCE SWITCH
- 2. LOADER'S DOMELIGHT
- 3. 7.62 MM COAX MACHINE GUN
- 4. BREECH RING
- 5. TURRET ELECTRICAL SLIPRING (HIDDEN)
- 6. LOADER'S SAFETY SWITCH
- 7. LOADER'S AIR FILTER HEATER (HIDDEN)
- 8. ELEVATING MECHANISM

FO-3. EQUIPMENT LOCATION INFORMATION - LOADER'S POSITION (FORWARD)



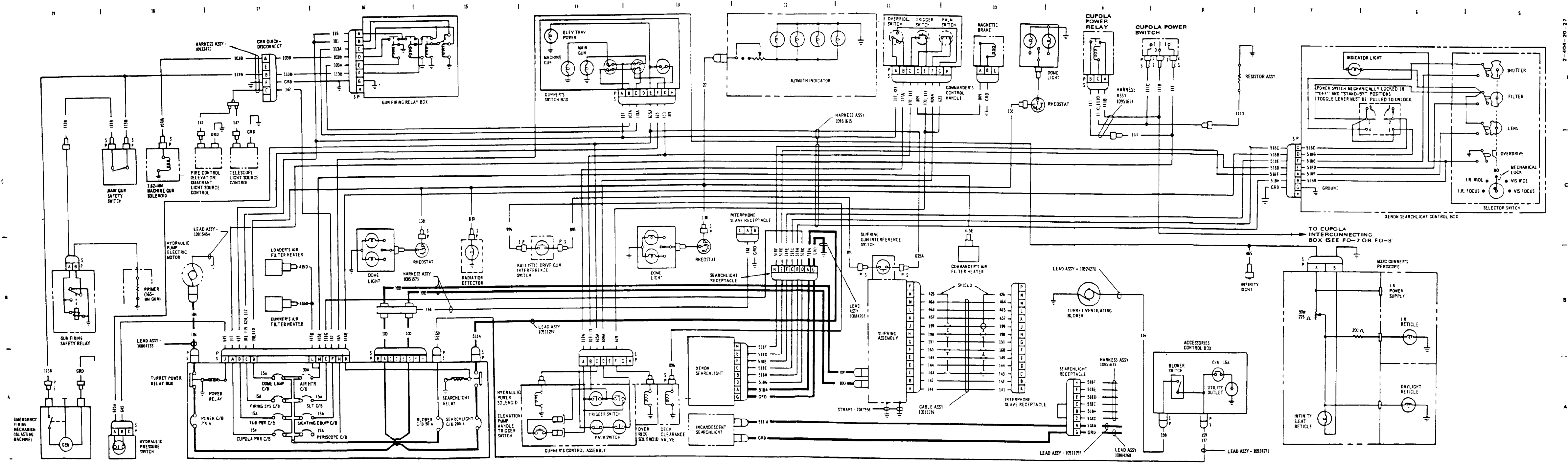
FO-4. EQUIPMENT LOCATION INFORMATION - LOADER'S POSITION (REAR)



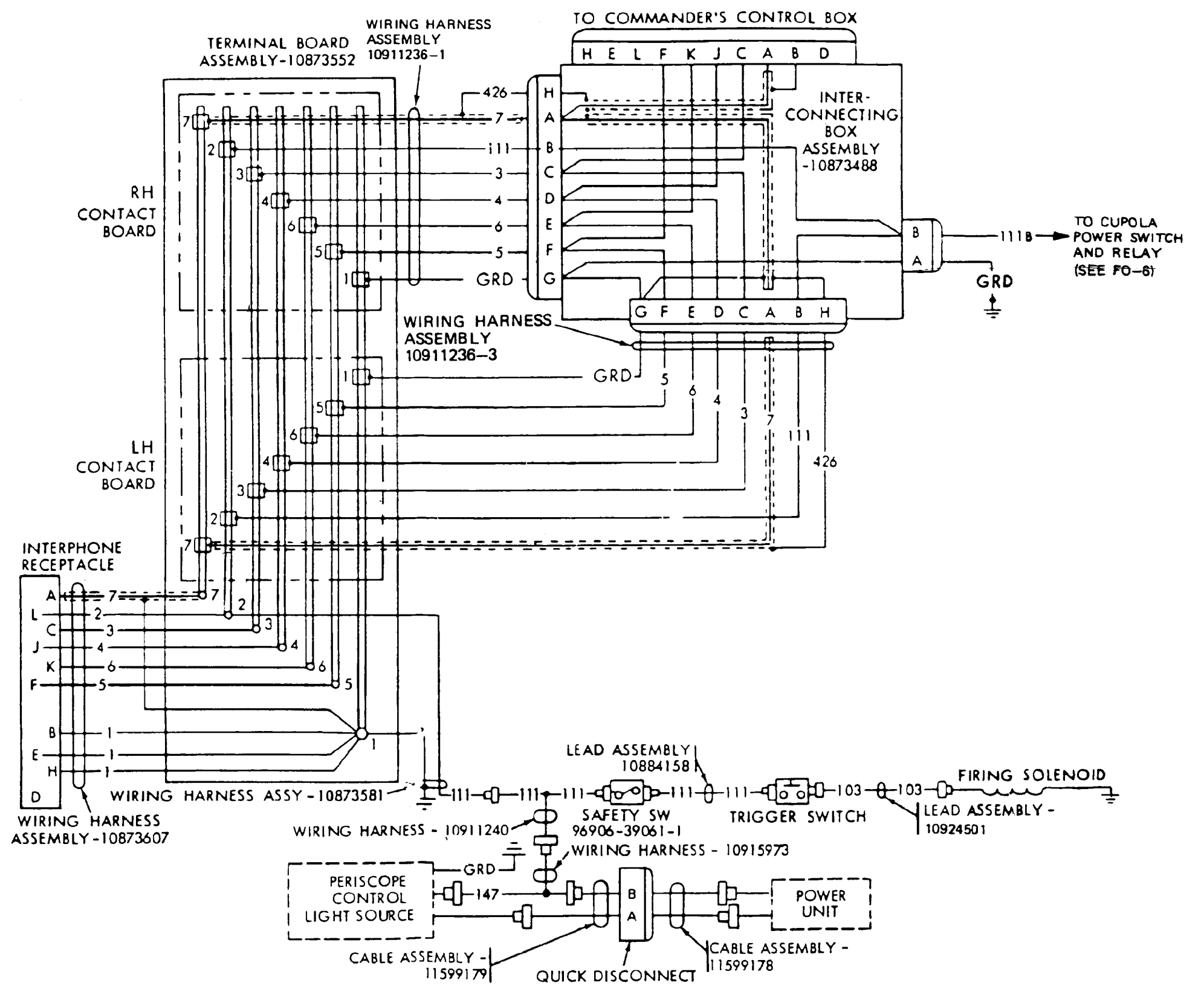
LEGEND

- 1. WINCH
- 2. WINCH GEARSHIFT LEVER (HIDDEN)
- 3. BOOM
- 4. BOOM ERECT CYLINDER
- 5. MOLDBOARD
- 6. SEARCHLIGHT (NOT SHOWN)
- 7. SEARCHLIGHT CONNECTOR (HIDDEN)

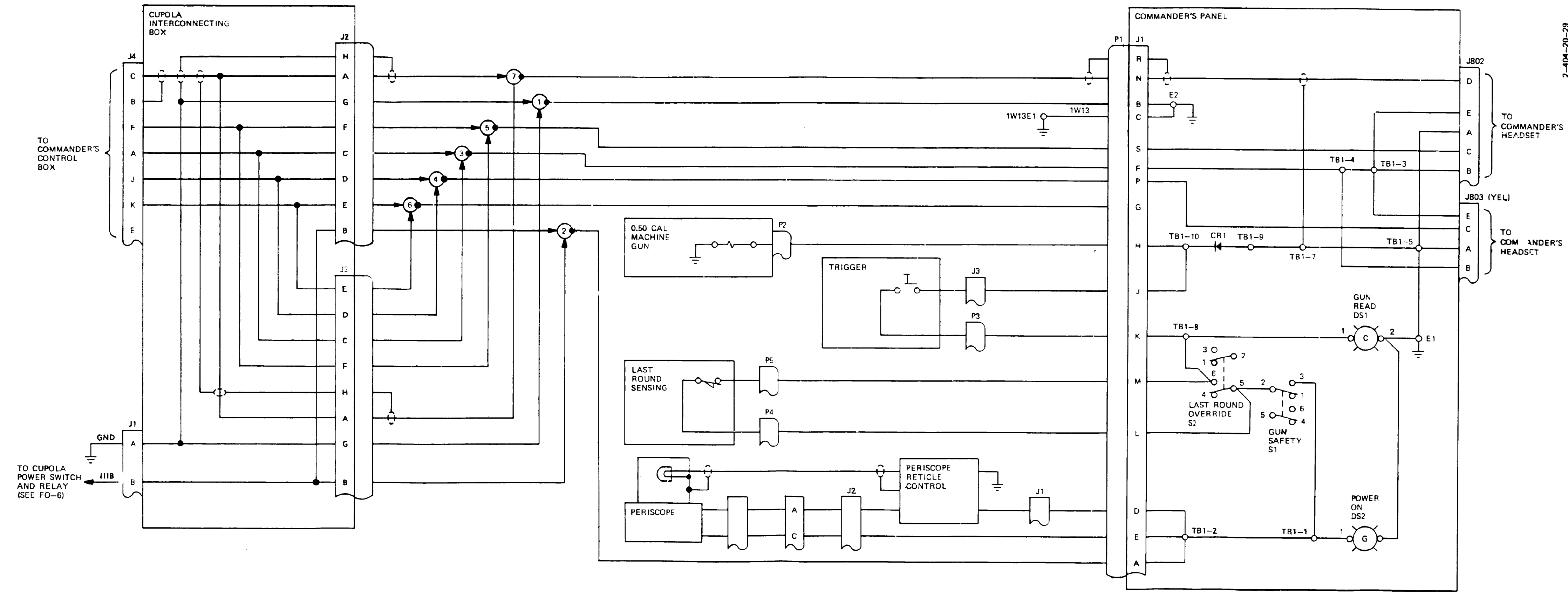
FO-5. EQUIPMENT LOCATION INFORMATION - OUTSIDE TANK



FO-6. TURRET ELECTRICAL SCHEMATIC DIAGRAM



FO-7 CUPOLA ELECTRICAL SCHEMATIC DIAGRAM



FO 8. CUPOLA ELECTRICAL SCHEMATIC DIAGRAM - LAST ROUND STOP INSTALLED

**THE METRIC SYSTEM AND EQUIVALENTS**

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches  
 1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet  
 1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches  
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

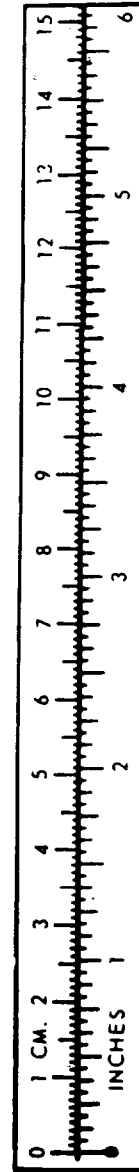
TEMPERATURE

$5/9 (^{\circ}F - 32) = ^{\circ}C$   
 212<sup>o</sup> Fahrenheit is equivalent to 100<sup>o</sup> Celsius  
 90<sup>o</sup> Fahrenheit is equivalent to 32.2<sup>o</sup> Celsius  
 32<sup>o</sup> Fahrenheit is equivalent to 0<sup>o</sup> Celsius  
 $9/5 C^{\circ} + 32 = F^{\circ}$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Inches . . . . .	Centimeters . . . . .	2.540
Feet . . . . .	Meters . . . . .	0.305
Yards . . . . .	Meters . . . . .	0.914
Miles . . . . .	Kilometers . . . . .	1.609
Square Inches . . . . .	Square Centimeters . . . . .	6.451
Square Feet . . . . .	Square Meters . . . . .	0.093
Square Yards . . . . .	Square Meters . . . . .	0.836
Square Miles . . . . .	Square Kilometers . . . . .	2.590
Acres . . . . .	Square Hectometers . . . . .	0.405
Cubic Feet . . . . .	Cubic Meters . . . . .	0.028
Cubic Yards . . . . .	Cubic Meters . . . . .	0.765
Fluid Ounces . . . . .	Milliliters . . . . .	29.573
Pints . . . . .	Liters . . . . .	0.473
Quarts . . . . .	Liters . . . . .	0.946
Gallons . . . . .	Liters . . . . .	3.785
Ounces . . . . .	Grams . . . . .	28.349
Pounds . . . . .	Kilograms . . . . .	0.454
Short Tons . . . . .	Metric Tons . . . . .	0.907
Pound-Feet . . . . .	Newton-Meters . . . . .	1.356
Pounds per Square Inch . . . . .	Kilopascals . . . . .	6.895
Miles per Gallon . . . . .	Kilometers per Liter . . . . .	0.425
Miles per Hour . . . . .	Kilometers per Hour . . . . .	1.609

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Centimeters . . . . .	Inches . . . . .	0.394
Meters . . . . .	Feet . . . . .	3.280
Meters . . . . .	Yards . . . . .	1.094
Kilometers . . . . .	Miles . . . . .	0.621
Square Centimeters . . . . .	Square Inches . . . . .	0.155
Square Meters . . . . .	Square Feet . . . . .	10.764
Square Meters . . . . .	Square Yards . . . . .	1.196
Square Kilometers . . . . .	Square Miles . . . . .	0.386
Square Hectometers . . . . .	Acres . . . . .	2.471
Cubic Meters . . . . .	Cubic Feet . . . . .	35.315
Cubic Meters . . . . .	Cubic Yards . . . . .	1.308
Milliliters . . . . .	Fluid Ounces . . . . .	0.034
Liters . . . . .	Pints . . . . .	2.113
Liters . . . . .	Quarts . . . . .	1.057
Liters . . . . .	Gallons . . . . .	0.264
Grams . . . . .	Ounces . . . . .	0.035
Kilograms . . . . .	Pounds . . . . .	2.205
Metric Tons . . . . .	Short Tons . . . . .	1.102
Newton-Meters . . . . .	Pound-Feet . . . . .	0.738
Kilopascals . . . . .	Pounds per Square Inch . . . . .	0.145
Kilometers per Liter . . . . .	Miles per Gallon . . . . .	2.354
Kilometers per Hour . . . . .	Miles per Hour . . . . .	0.621



TA089991

