

TM 9-2320-211-20-2-1

T.O. 36A12-1C-422-1-2

TECHNICAL MANUAL
VOLUME 2 OF 3
PART 1 OF 2
TROUBLESHOOTING
ORGANIZATIONAL LEVEL

5-TON, 6X6, M39 SERIES TRUCKS
(MULTIFUEL)

TRUCK, CHASSIS: M40A2C,
M61A2, M63A2; TRUCK, CARGO:
M54A2, M54A2C, M55A2; TRUCK,
DUMP: M51A2; TRUCK, TRACTOR:
M52A2; TRUCK, WRECKER, MEDIUM: M543A2

NOTE:

THE STYLE OF THIS TM IS
EXPERIMENTAL. IT IS BEING TRIED
BY THE ARMY ONLY ON
A LIMITED BASIS

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
DECEMBER 1980

WARNING

EXHAUST GASES CAN BE DEADLY

Exposure to exhaust gases produced symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, and coma. Permanent brain damage or death can result from severe exposure.

Carbon monoxide occurs in the exhaust fumes of fuel burning heaters and internal combustion engines, and becomes dangerously concentrated under conditions of inadequate ventilation. The following precautions must be observed to insure the safety of personnel whenever fuel burning heater(s) or engine of any vehicle is operated for maintenance purposes or tactical use.

Do not operate heater of engine of vehicle in an enclosed area unless it is adequately ventilated.

Do not idle engine for long periods without maintaining adequate ventilation in personnel compartments.

Do not drive any vehicle with inspection plates or cover plates removed unless necessary for maintenance purposes.

Be alert at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, immediately ventilate personnel compartments. If symptoms persist, remove affected personnel from vehicle and treat as follows: expose to fresh air; keep warm; do not permit physical exercise; if necessary, administer artificial respiration.

If exposed, seek prompt medical attention for possible delayed onset of acute lung congestion. Administer oxygen if available.

The best defense against exhaust gas poisoning is adequate ventilation.

WARNING

Serious or fatal injury to personnel may result
if the following instructions are not complied with.

Use extreme care when removing radiator cap, especially when temperature gage shows above 180°F.

Always wear leather gloves when handling winch cable. Never allow cable to slip through hands. Do not operate winch with less than four turns of cable on drum.

Do not drive truck until the low air pressure warning buzzer is silent and the air pressure gage shows at least 65 PSI. This is the minimum pressure required for safe braking action.

Do not use hand throttle to drive the vehicle.

Do not park truck with front transmission gearshift lever in gear.

When used to carry flammables, explosives, or other hazardous material, equip truck with a fire extinguisher.

If your vehicle class number is greater than the bridge class number, your vehicle is too heavy for the bridge; DO-NOT CROSS.

**TECHNICAL MANUAL
NO. 9-2320-211-20-2-1
TECHNICAL ORDER
NO. 36A12-1C-422-1-2**

DEPARTMENTS OF THE ARMY
AND
THE AIR FORCE
WASHINGTON, DC, 10 December 1980

TECHNICAL MANUAL
VOLUME 2 OF 3
PART 1 OF 2
TROUBLESHOOTING
ORGANIZATIONAL LEVEL

**5-TON, 6X6, M39 SERIES TRUCKS
(MULTIFUEL)**

Model		NSN without Winch	NSN with Winch
Chassis	M40A2C	2320-00-969-4114	
	M61A2	2320-00-055-9264	2320-00-965-0321
	M63A2	2320-00-226-6251	2320-00-285-3757
Truck, Cargo	M54A2	2320-00-055-9266	2320-00-055-9265
	M54A2C	2320-00-926-0874	2320-00-926-0874
	M55A2	2320-00-073-8476	2320-00-055-9259
Truck, Dump	M51A2	2320-00-055-9262	2320-00-055-9263
Truck, Tractor	M52A2	2320-00-055-9260	2320-00-055-9261
Truck, Wrecker, Medium	M543A2		2320-00-055-9258

***This manual, together with TM 9-2320-211-20-1, 10 December 1980, TM 9-2320-211-20-2-2, 10 December 1980, TM 9-2320-211-20-3-1, 10 December 1980, and TM 9-2320-211-20-3-2, 10 December 1980, supersedes so much of TM 9-2320-211-20, 1 June 1973, as pertains to multifuel vehicles, including all changes.**

REPORTING OF 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 procedure, 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 direct to: Commander, U S Army Tank Automotive Materiel Readiness Command, ATTN: DRSTA-MB, Warren, Michigan 48090. A reply will be furnished to you.

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CHAPTER 1

GENERAL INFORMATION

1-1. SCOPE. This volume shows you how to do troubleshooting at the organizational level of maintenance. The amount of troubleshooting you can do is based on what the Maintenance Allocation Chart says you can fix. Because of this, the only trouble symptoms you will find here are those that could be caused by faulty things you can fix.

1-2. ORGANIZATION. When you do PMCS, or when you drive the truck and find that something is wrong, write down what is wrong. Then check the fault symptom index to see if the trouble (fault symptom) you noted is in the index. If it is, you can do troubleshooting to find the fault and fix it. If the symptom is not in the index tell direct support maintenance.

1-3. TROUBLESHOOTING APPROACH. In order to find out what is causing the problem in the truck, you must use a good approach. A good approach just means a way of doing troubleshooting so you can find the problem and not get confused or lost. The following chapter describes how you can use the materials in this volume to troubleshoot with a good approach.

CHAPTER 2

TROUBLESHOOTING APPROACH

2-1. GENERAL APPROACH. This chapter gives you instructions on how to use the troubleshooting material to help you find and fix the trouble. In every system of the truck there can be faults or problems which will cause certain symptoms.

Symptoms can be such things as unusual noise, vibration, or even complete failure of a system. This volume gives information for each system on which you can do troubleshooting to find faults and fix them. Before you troubleshoot a system, you should look at the troubleshooting indexes which will lead you to the information you need to help make your troubleshooting faster and easier. If you follow the instructions the right way, you will find those troubles you can fix. But, if you fix something and the trouble is still there, it means there is more than one trouble. If this happens, start all over again to find the other trouble.

2-2. TROUBLESHOOTING INDEX. The troubleshooting index, and instructions on how to use it are in chapter 3. Go to this index first because it tells you where to find troubleshooting roadmaps, fault symptom indexes, summary troubleshooting charts and support diagrams for each system.

2-3. TEST EQUIPMENT PROCEDURES INDEX. The test equipment procedures index, and instructions on how to use it are in chapter 4. This index tells you where to find electrical and mechanical tests which you can use to do your troubleshooting. It also tells you what equipment you will need to do the tests. If you have a STE/ICE (Simplified Test Equipment/Internal Combustion Engine) Set (NSN 4910-00-124-2554), you may use it, where applicable, to do your troubleshooting. Refer to TM 9-4910-571-12&P.

2-4. TROUBLESHOOTING ROADMAPS. Troubleshooting roadmaps for each system are in chapter 5. If the system is made up of subsystems, these subsystems are also on the roadmap. Under the subsystem is a list of things which are the most likely causes of a fault symptom in that subsystem. If you have enough skill, you can troubleshoot these things on the truck without using the detailed troubleshooting procedures. So if you know enough about the truck to work on your own, use the roadmap for the system with the problem before you check the fault symptom index.

2-5. FAULT SYMPTOM INDEX. Fault symptom indexes and instructions on how to use them are in chapter 6. For each system of the truck, there is an index which gives you a list of the fault symptoms for that system. The index also tells you where to find the detailed troubleshooting procedures and what resources (tools/people) you need to do each procedure.

2-6. SAMPLE TROUBLESHOOTING PROCEDURE. A sample troubleshooting procedure is in chapter 7. This sample procedure will help you see the way detailed troubleshooting procedures are to be used.

CHAPTER 3

TROUBLESHOOTING INDEX

3-1. GENERAL. This chapter has a troubleshooting index which covers every system of the truck on which you can do troubleshooting. The index tells you where to find all the other information you need to do your troubleshooting procedures.

3-2. INDEX. The troubleshooting index (fig. 3-1) is divided into five columns that list systems, troubleshooting roadmaps, fault symptoms, summary troubleshooting procedures, and system support diagrams. The following breakdown tells you what is in each column.

a. System Column. This column gives a list of systems on the truck for which troubleshooting can be done at the organizational maintenance level.

b. Troubleshooting Roadmaps Column. This column tells you where to find the troubleshooting roadmap for each listed system. These roadmaps are given in chapter 5.

c. Fault Symptom Index Column. This column tells you where to find the troubleshooting fault symptom index for each listed system. Fault symptom indexes are given in chapter 6.

d. Summary Troubleshooting Procedures Column. This column tells you where to find the summary troubleshooting procedure for each listed system. Some systems do not have summary troubleshooting procedures, so the column will be left blank for those systems.

e. System Support Diagrams Column. This column tells you where to find support diagrams for each listed system. Some systems do not have support diagrams, so the column will be left blank for those systems.

CHAPTER 4

TEST EQUIPMENT PROCEDURES INDEX

4-1. GENERAL. This chapter has a test equipment procedures index which tells you where to find the tests you need to do your troubleshooting.

4-2. INDEX. The test equipment procedures index is divided into three columns that list test equipment, tests, and figure numbers. The following breakdown tells you what is in each column.

a. Test Equipment Column. This column tells you what kind of equipment you need to do your troubleshooting test. For all electrical tests, a multimeter is used. The multimeter can be any one of three models fielded for your use. These models are given in the test equipment column. For mechanical tests, test equipment is also given, along with the part number of the equipment.

b. Tests Column. This column tells you what tests are given in this manual. Next to each piece of test equipment are listed the tests that you can do with that equipment. This column also gives troubleshooting tests which can be done without using test equipment.

c. Figure Column. This column tells you where you can find the test procedures in this manual. The first test given is the DC Voltage test.

TEST EQUIPMENT		TESTS	FIGURE
1	MULTIMETER AN/URM-105C SIMPSON 160* TS-352B/U* * Alternate for AN/URM-105C	1. General Instructions	29-1
		2. DC Voltage	29-2
		3. AC Voltage	29-3
		4. Resistance	29-4
		5. Continuity	29-5
		6. Short	29-6
2	GAGE—fuel system pressure. P/N 11600036	Fuel Tank Pressure	17-3
3	MISCELLANEOUS TESTS	Flame Heater Fuel Pump and Nozzle	17-1
		Fuel Filter Body	17-2
		Thermostat	24-1
		Master Cylinder	49-1
		Hoist Pump	66-1
		Hoist Control Box	66-2
		Hoist Control Linkage	
		Woodruff Keyed Shaft	66-3
		Boom Elevating Cylinder	75-1
		Swing Motor	75-2
		Hydraulic Pump	75-3
		Hoist Motor	75-4
		Boom Extension Cylinder Gondola	
		Control Valve Output	75-5
		Boom Extension Cylinder Input	75-6
		Heater Fuel Pump	71-2

Figure 4-1. Test Equipment Procedures Index

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CHAPTER 5

TROUBLESHOOTING ROADMAPS

5-1. GENERAL. This chapter gives troubleshooting roadmaps for every system of the truck for which you have detailed troubleshooting procedures. Figures 5-1 through 5-23 cover all the roadmaps for the detailed procedures.

5-2. ROADMAPS. Each roadmap gives a list of things which are most likely to cause a fault symptom in a system or subsystem. At least one of the items listed will be found to be bad when you do the detailed troubleshooting procedures for that system.

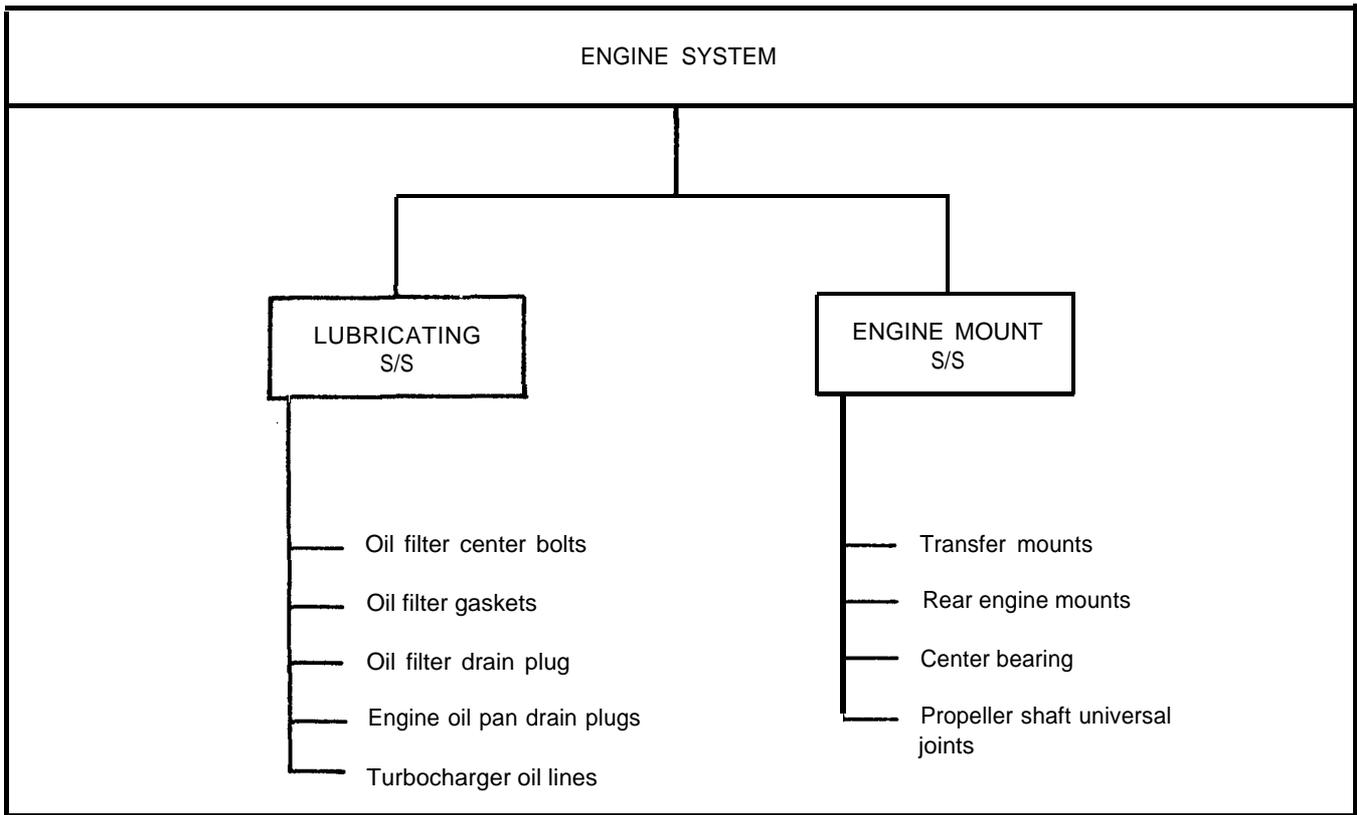


Figure 5-1. Troubleshooting Roadmaps, Engine System

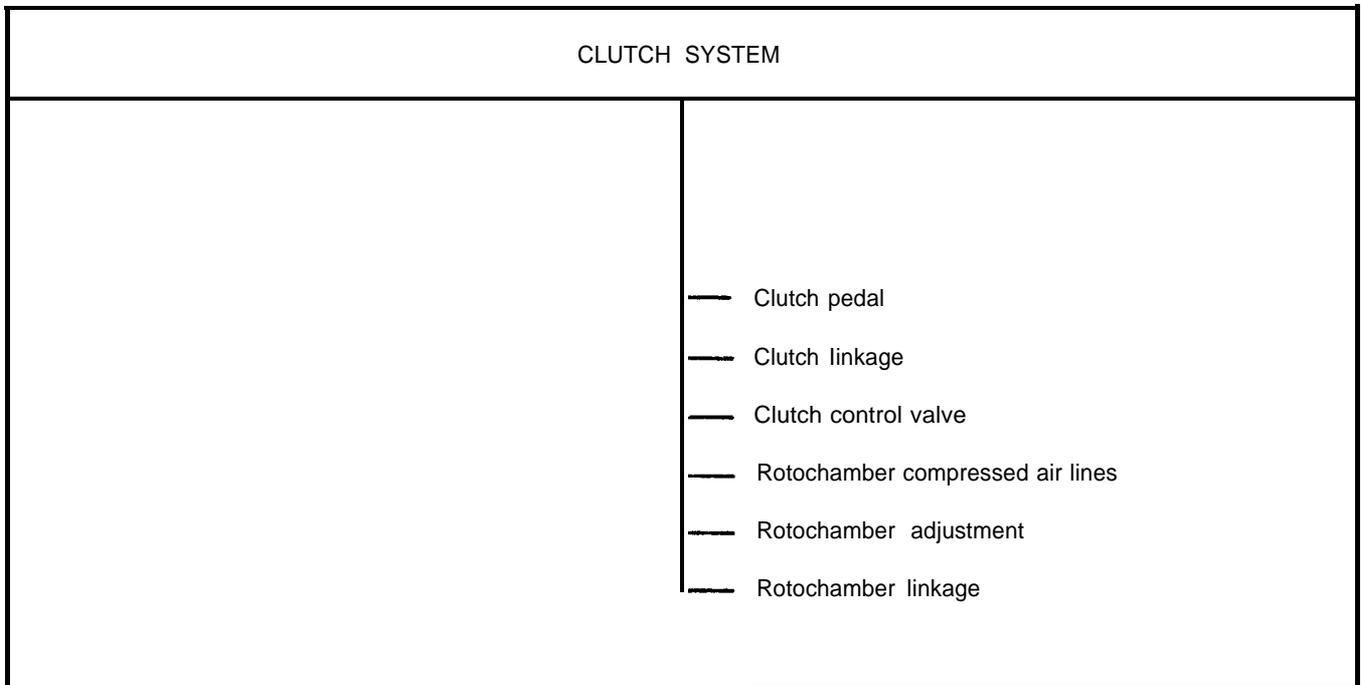


Figure 5-2. Troubleshooting Roadmap, Clutch System

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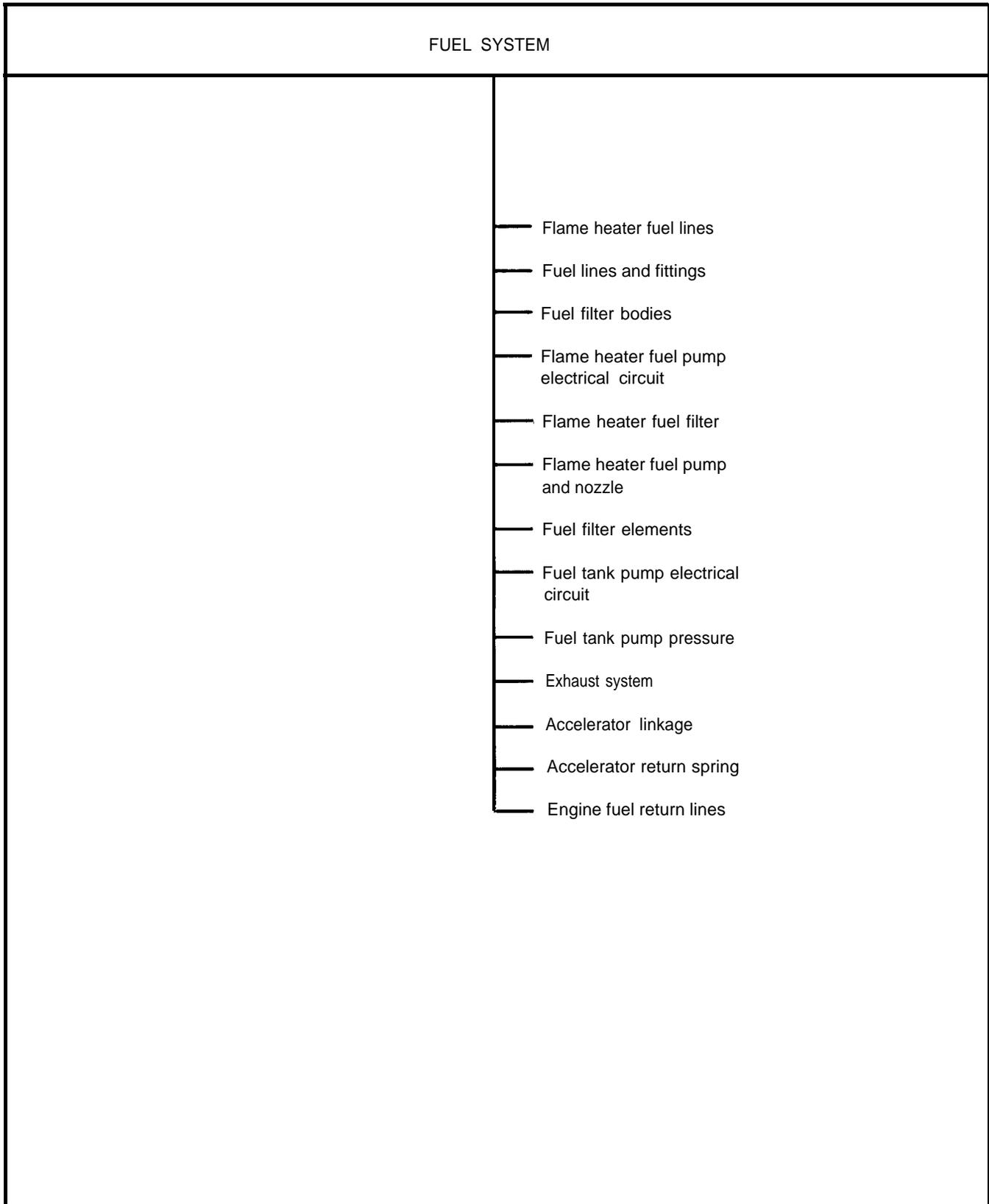


Figure 5-3. Troubleshooting Roadmap, Fuel System

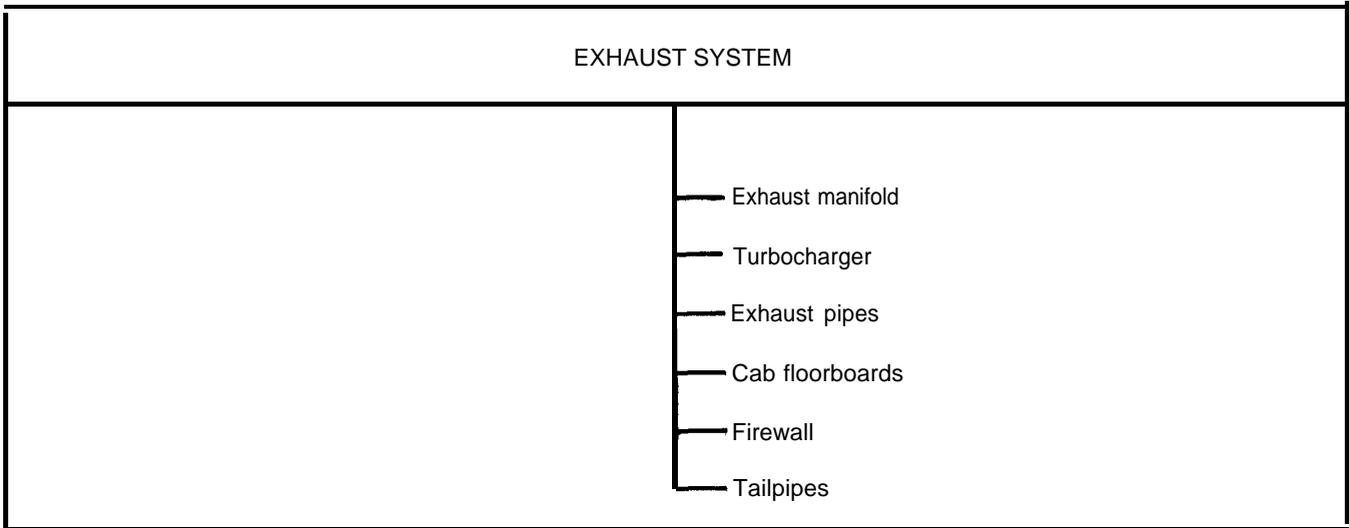


Figure 5-4. Troubleshooting Roadmap, Exhaust System

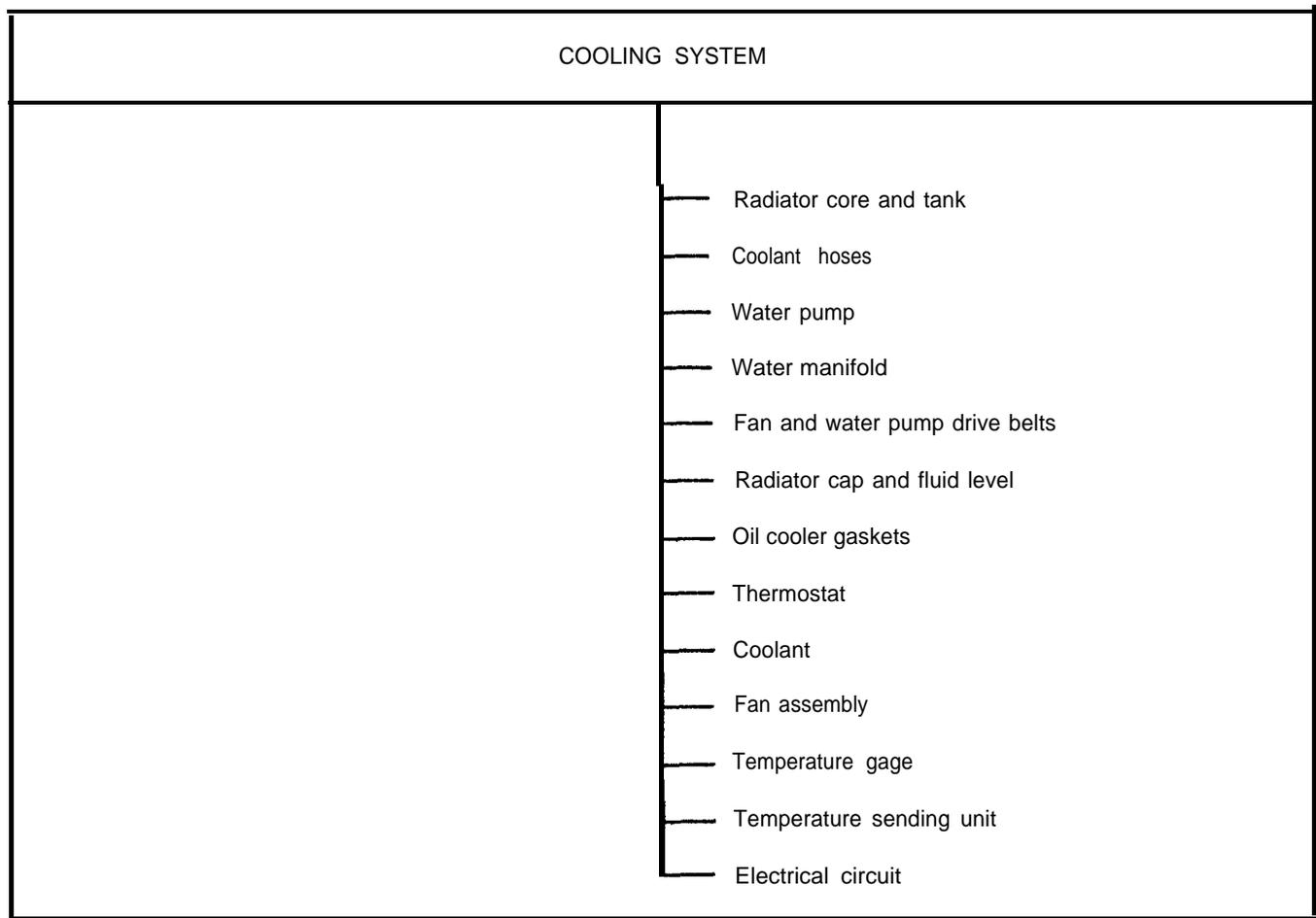
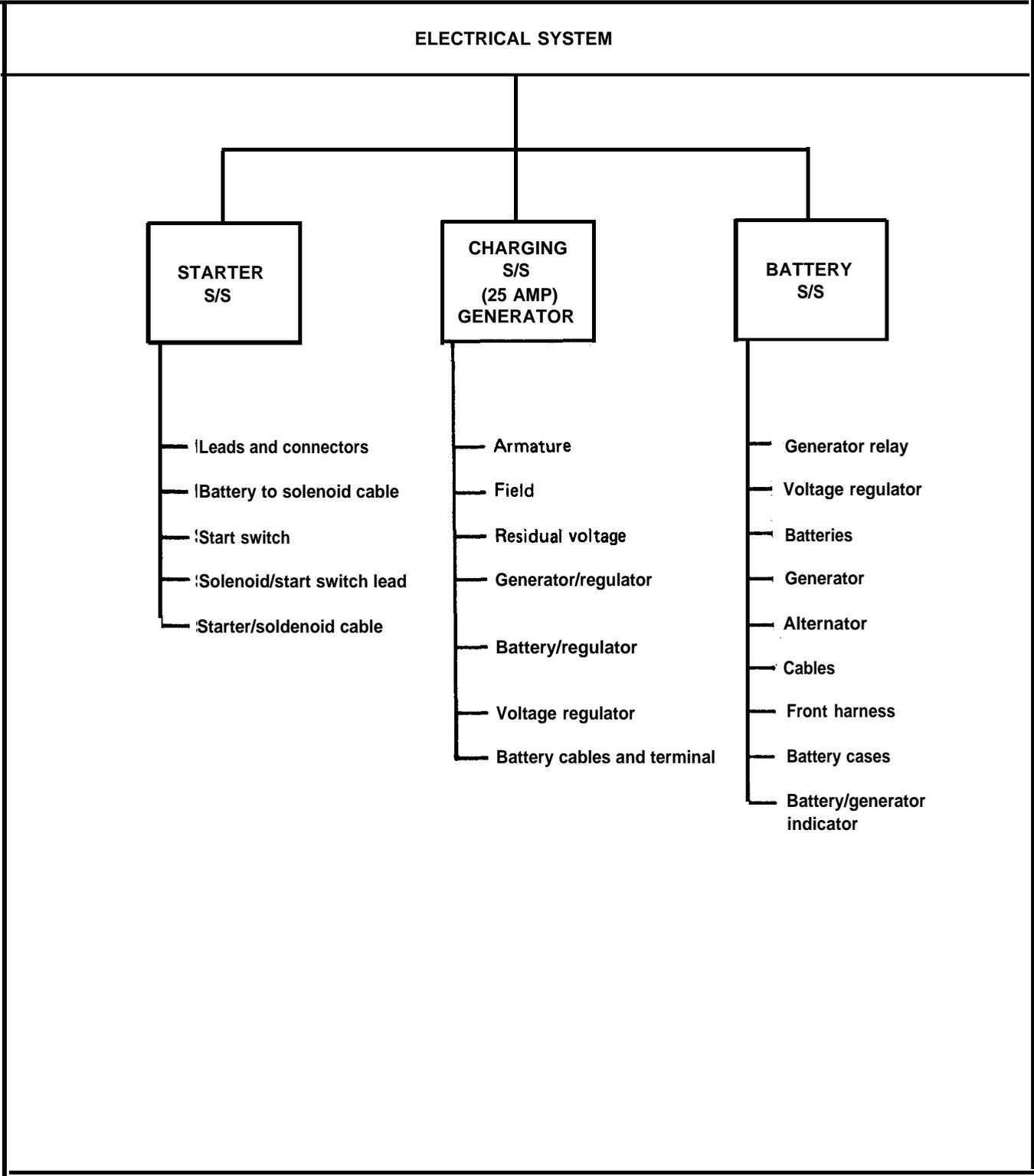


Figure 5-5. Troubleshooting Roadmap, Cooling System

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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 1 of 5)

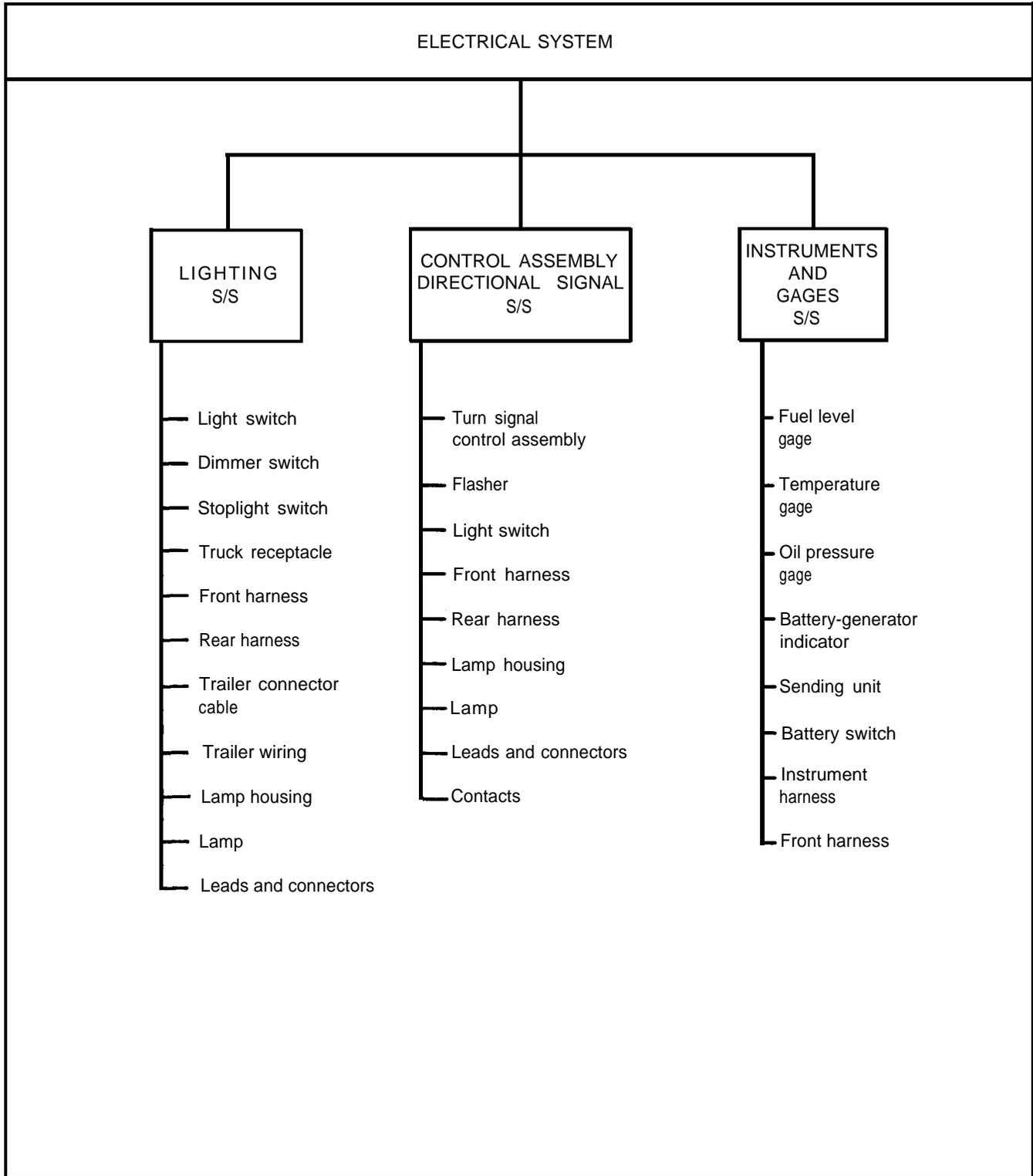
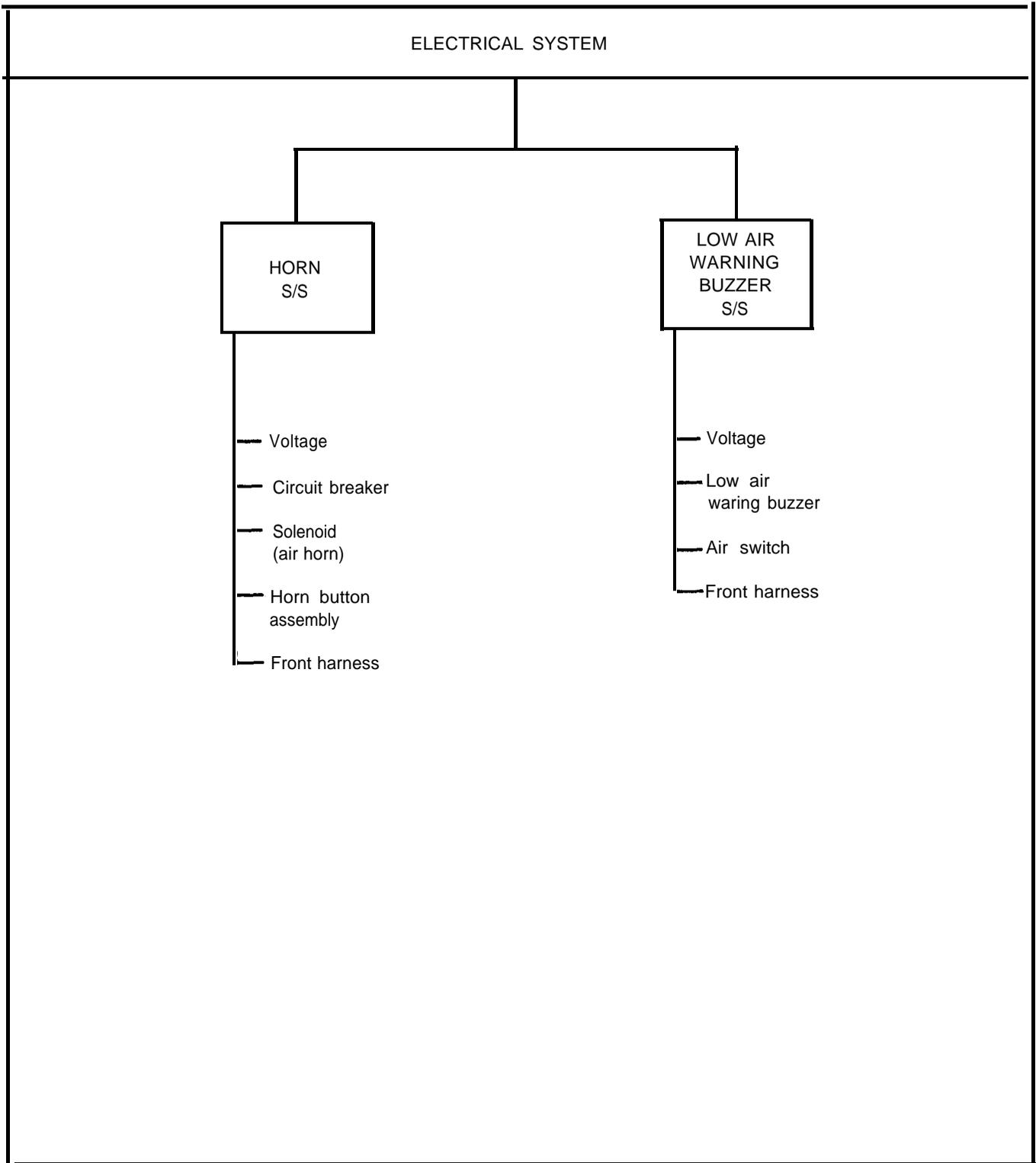


Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 2 of 5)



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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 3 of 5)

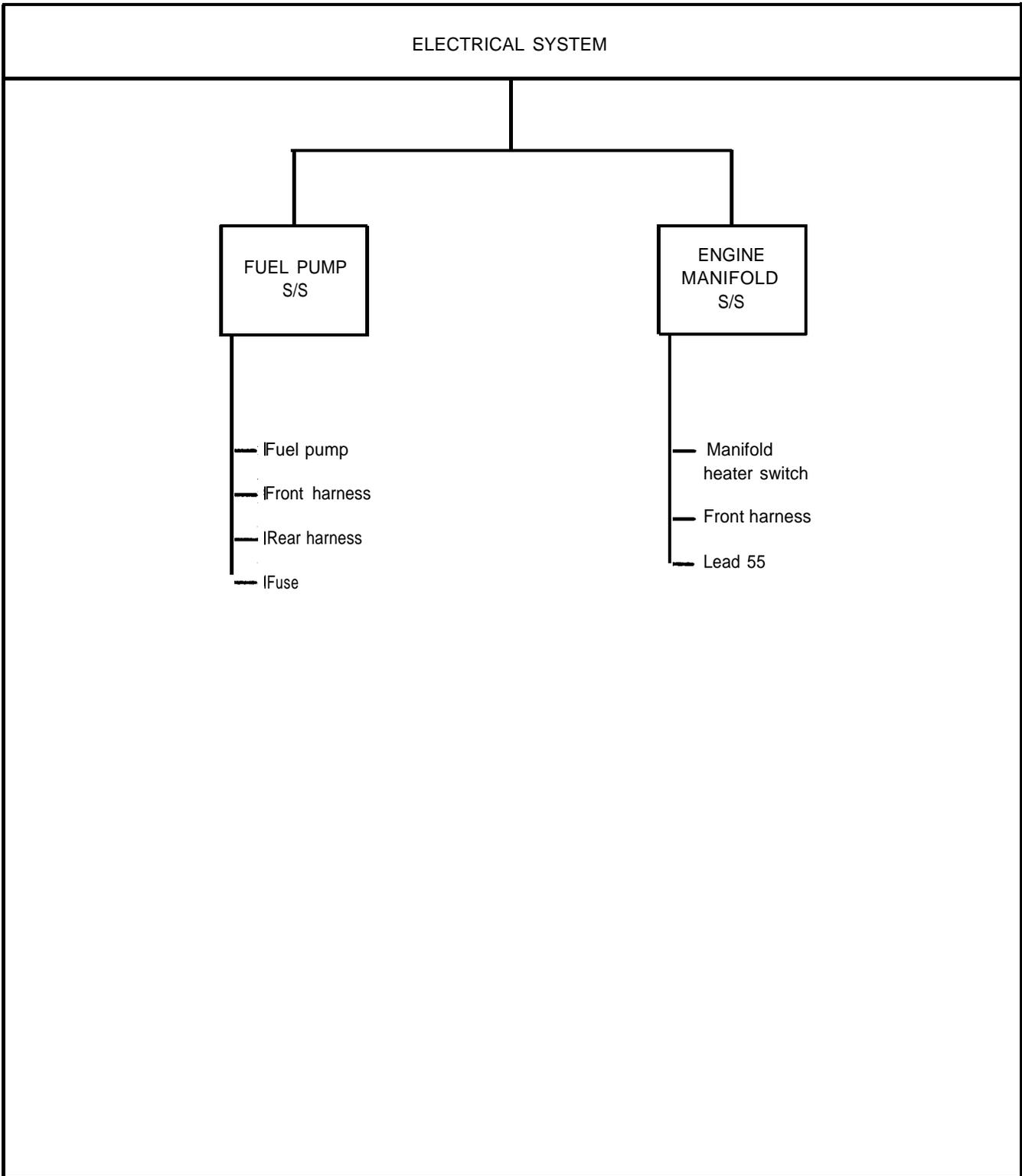
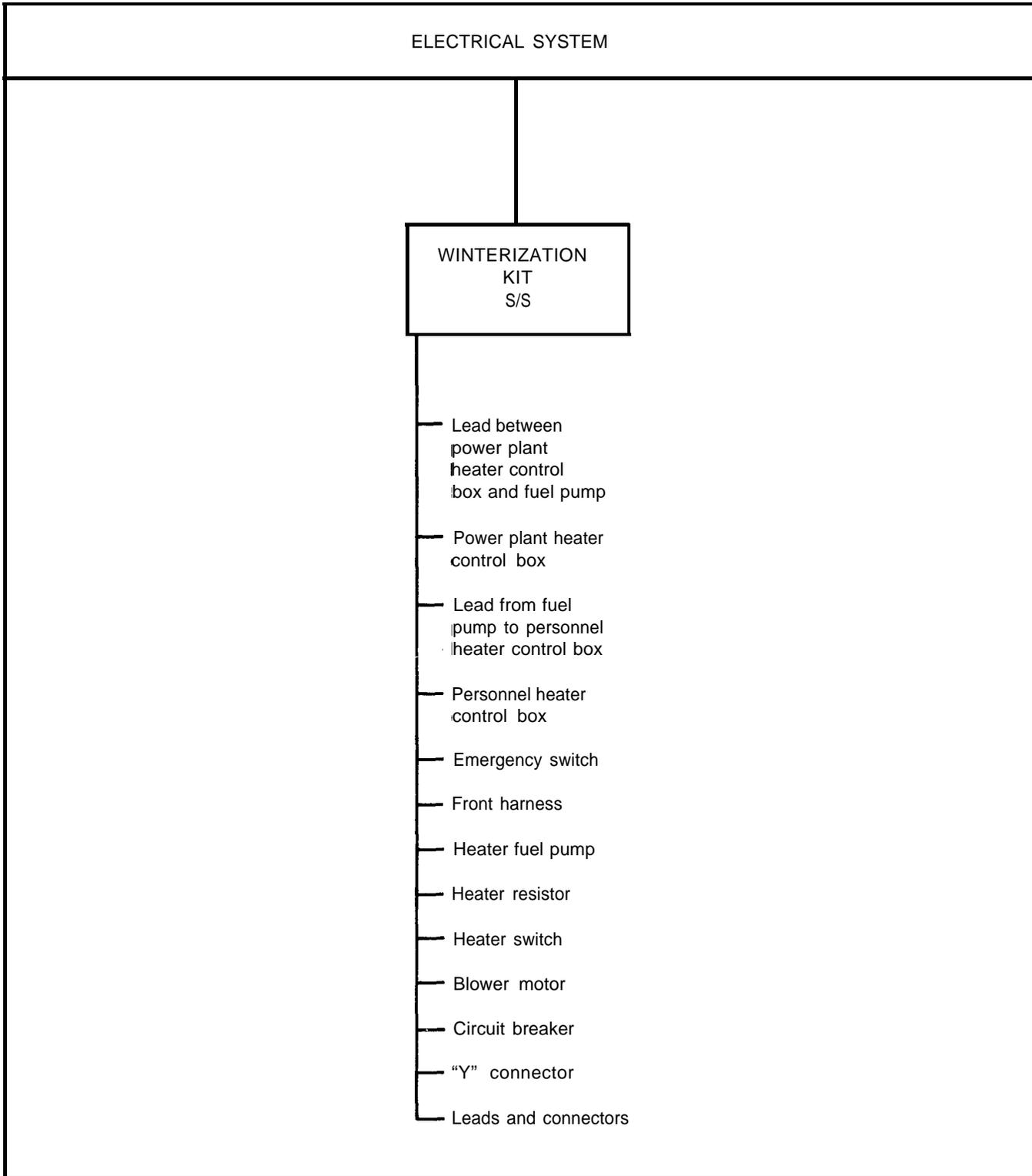


Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 4 of 5)



TA 115511

Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 5 of 5)

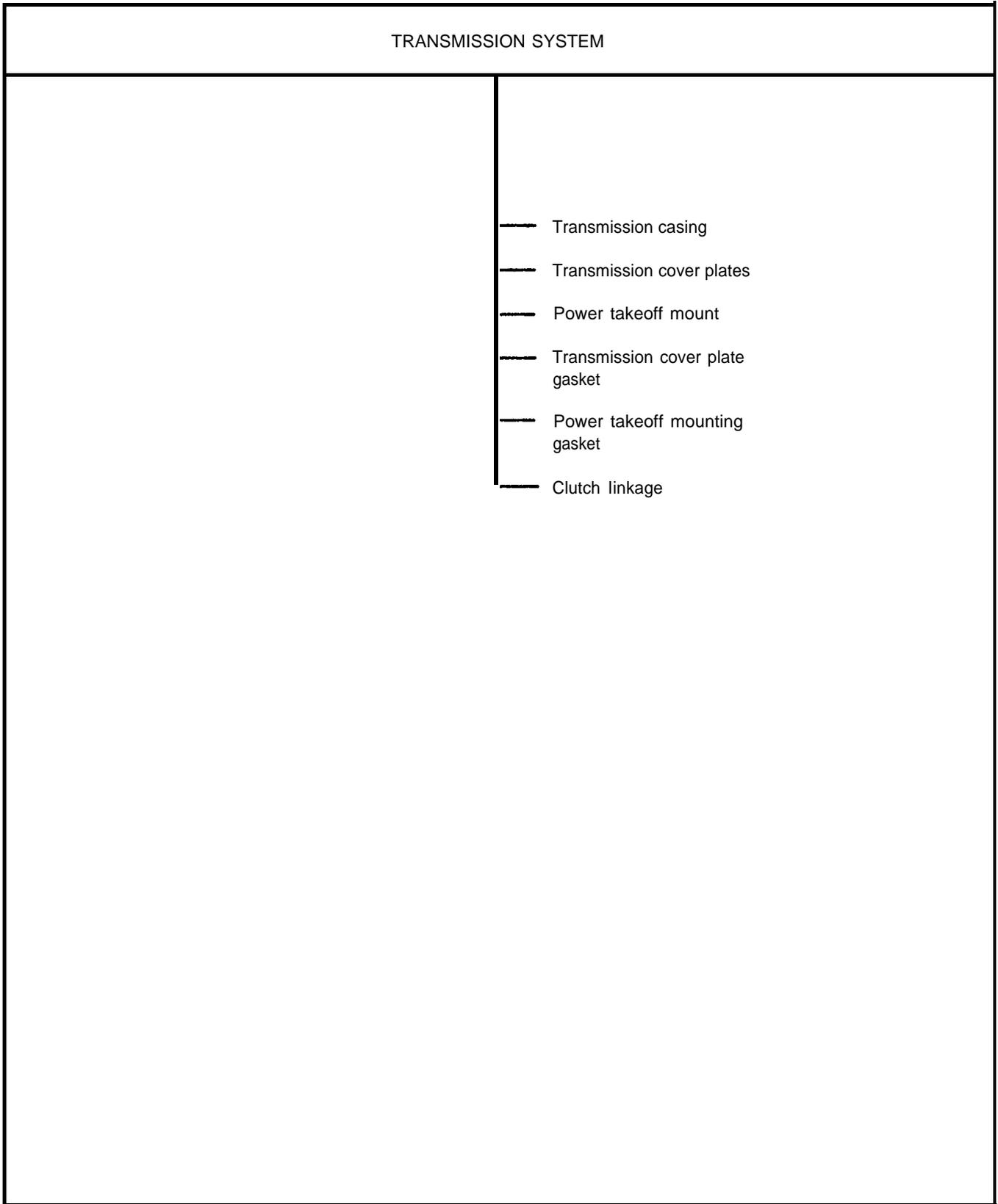


Figure 5-7. Troubleshooting Roadmap, Transmission System

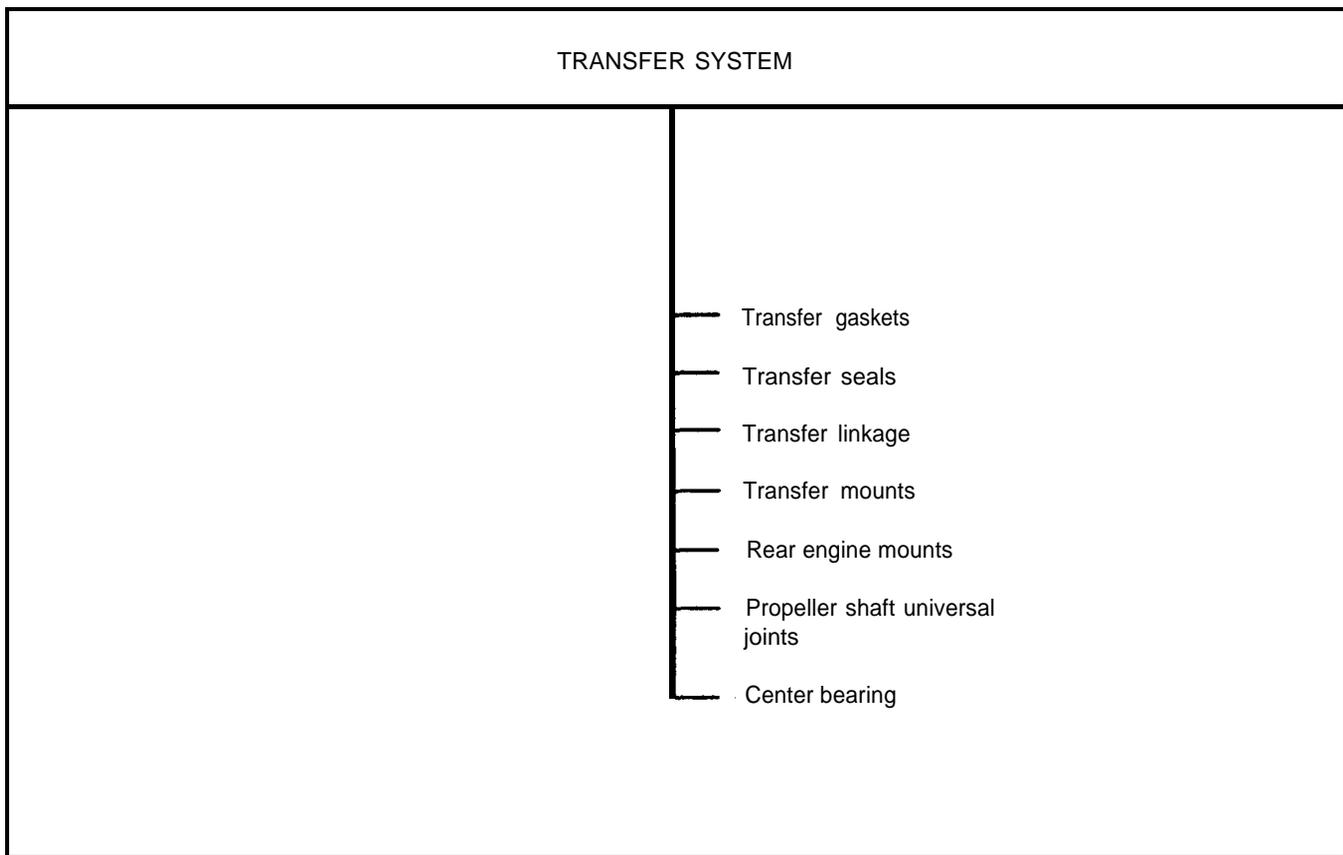


Figure 5-8. Troubleshooting Roadmap, Transfer System

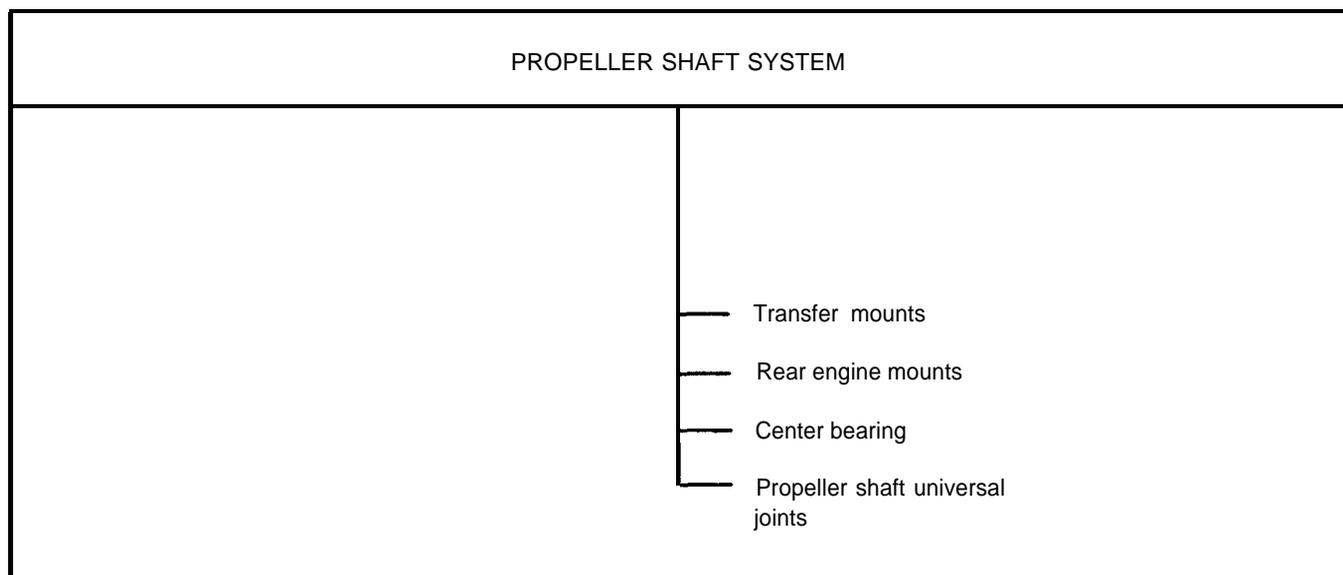


Figure 5-9. Troubleshooting Roadmap, Propeller Shaft System

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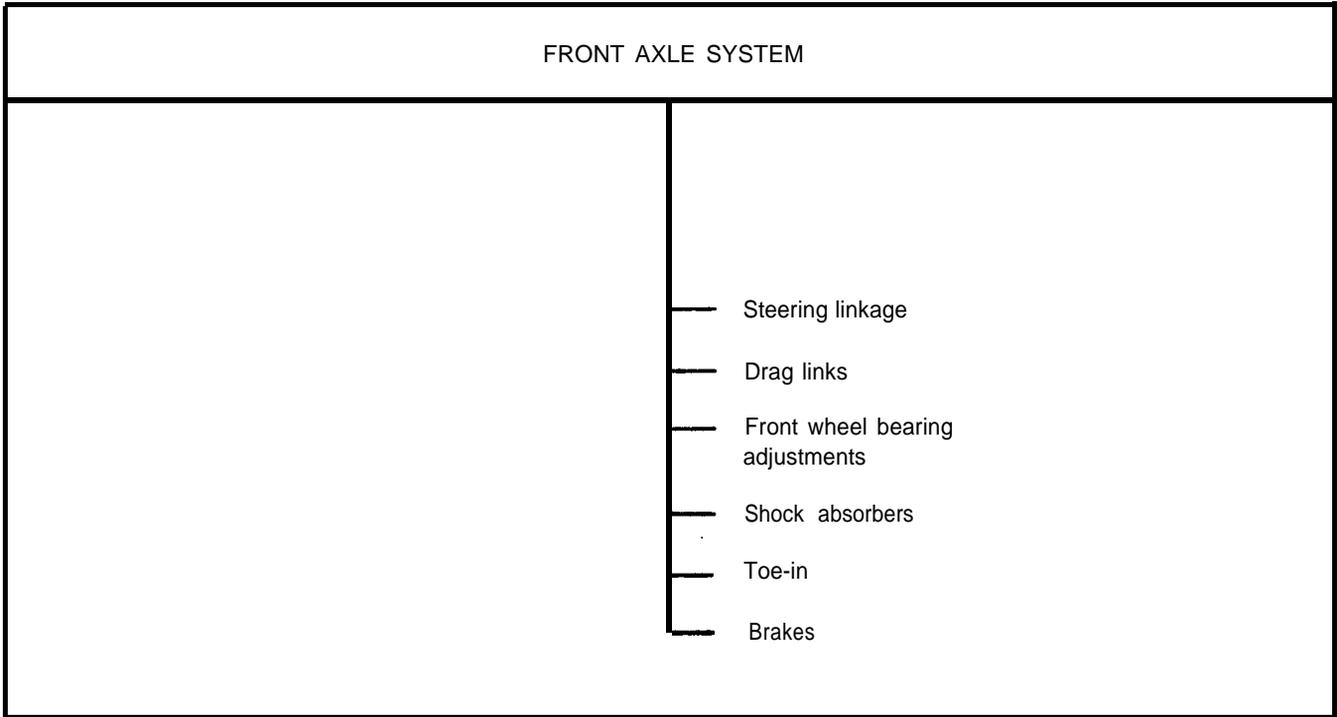


Figure 5-10. Troubleshooting, Front Axle System Roadmap

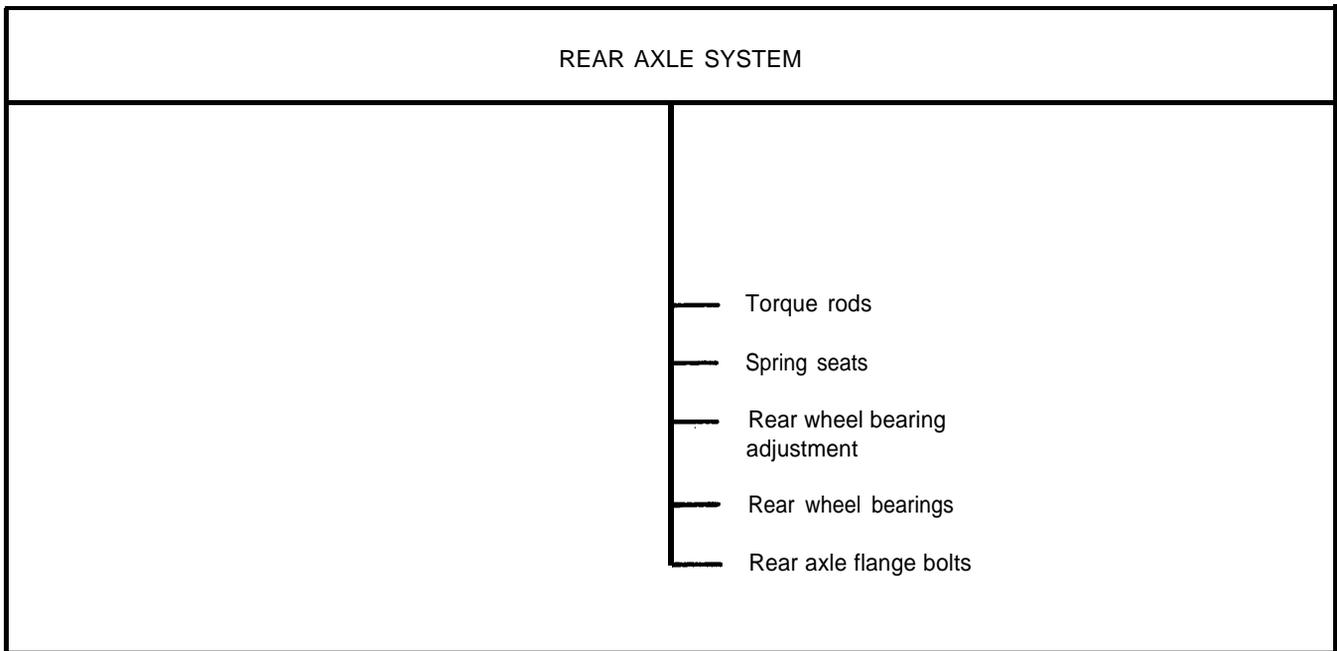


Figure 5-11. Troubleshooting Roadmap, Rear Axle System

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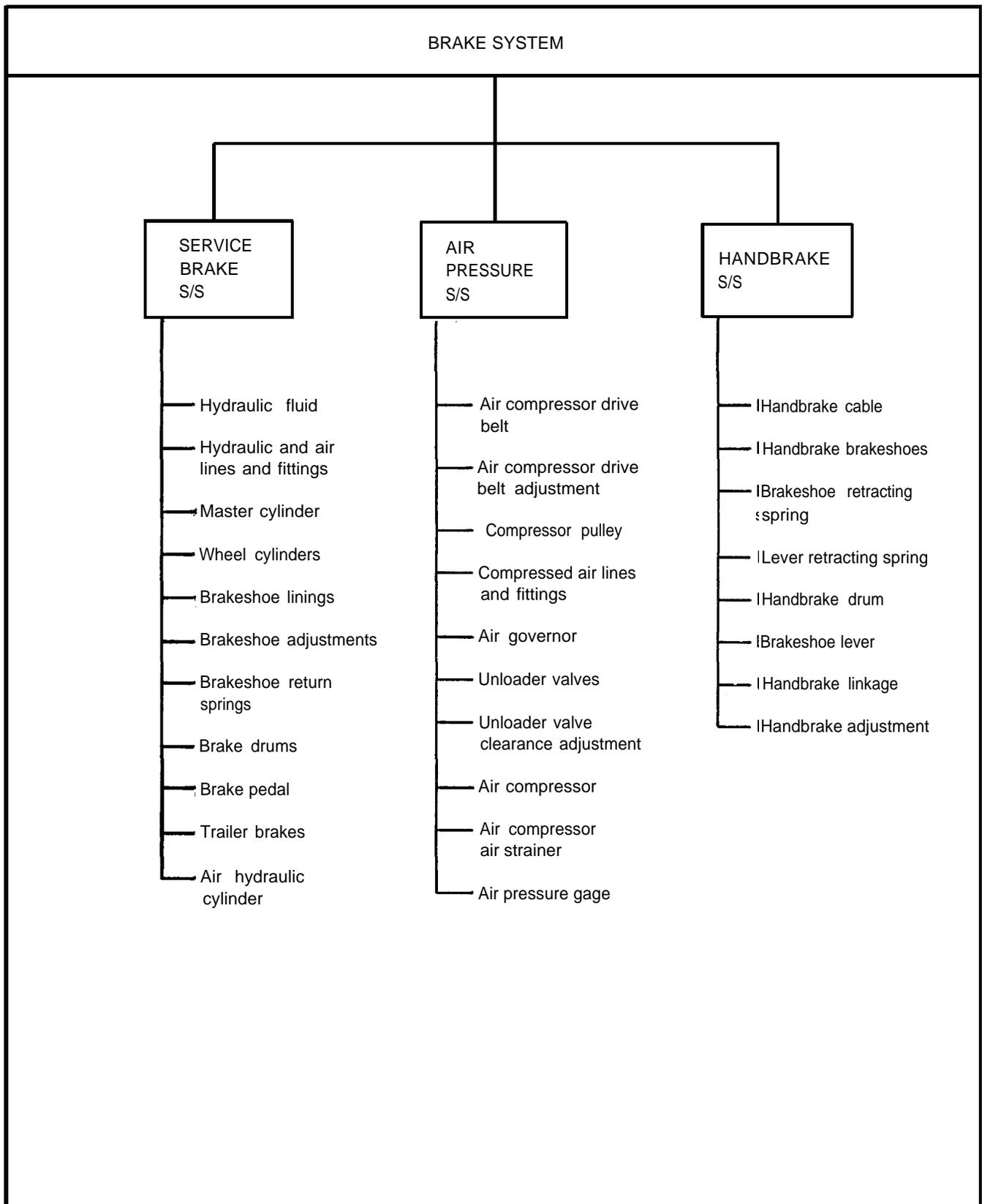


Figure 5-12. Troubleshooting Roadmap, Brake System

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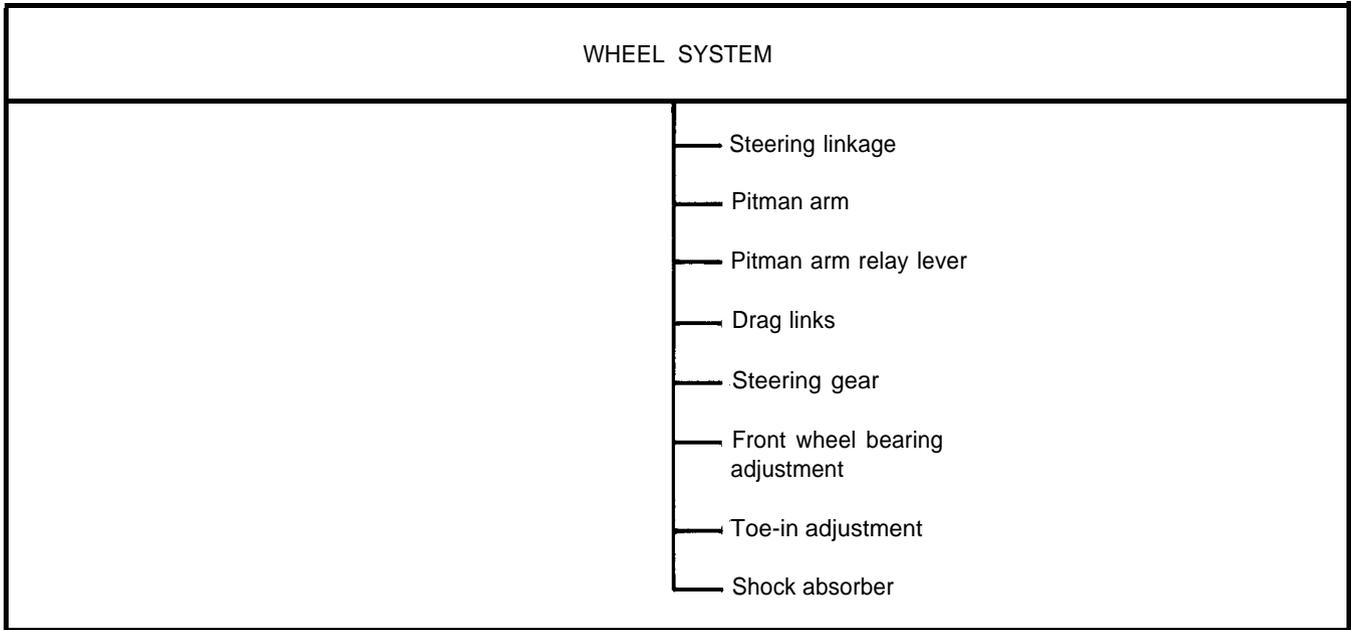


Figure 5-13. Troubleshooting Roadmap, Wheel System

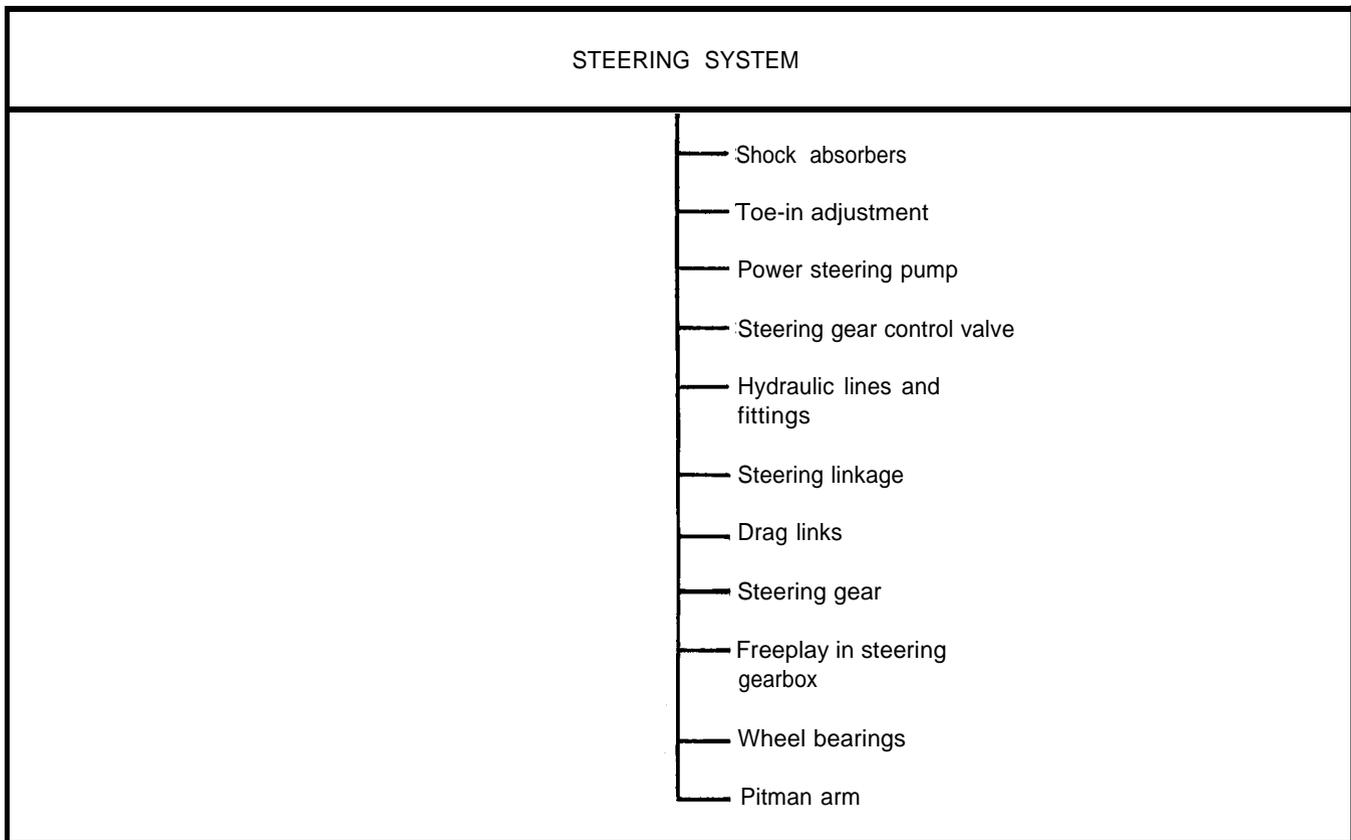
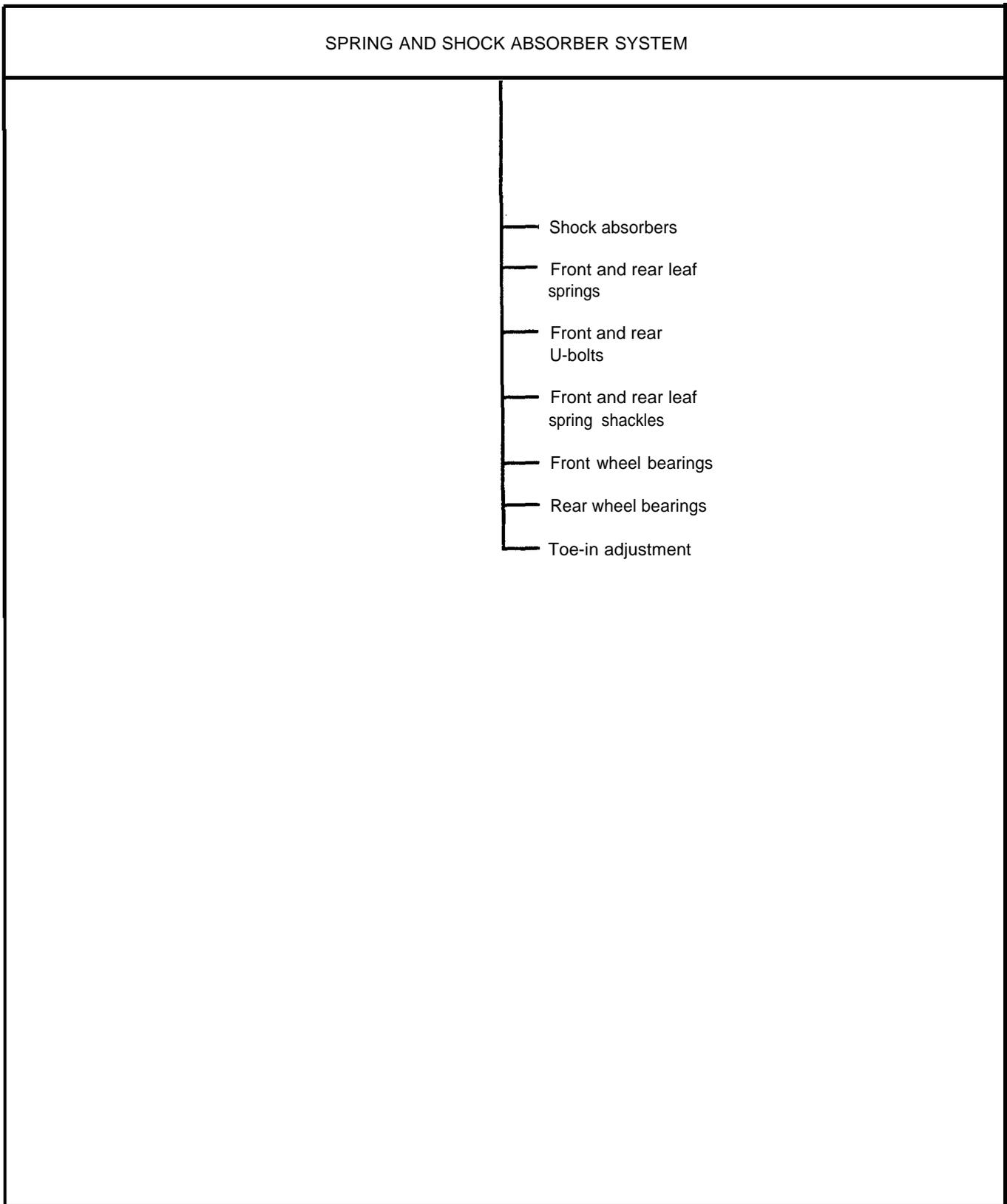


Figure 5-14. Troubleshooting Roadmap, Steering System

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Figure 5-15. Troubleshooting Roadmap, Spring and Shock Absorber System

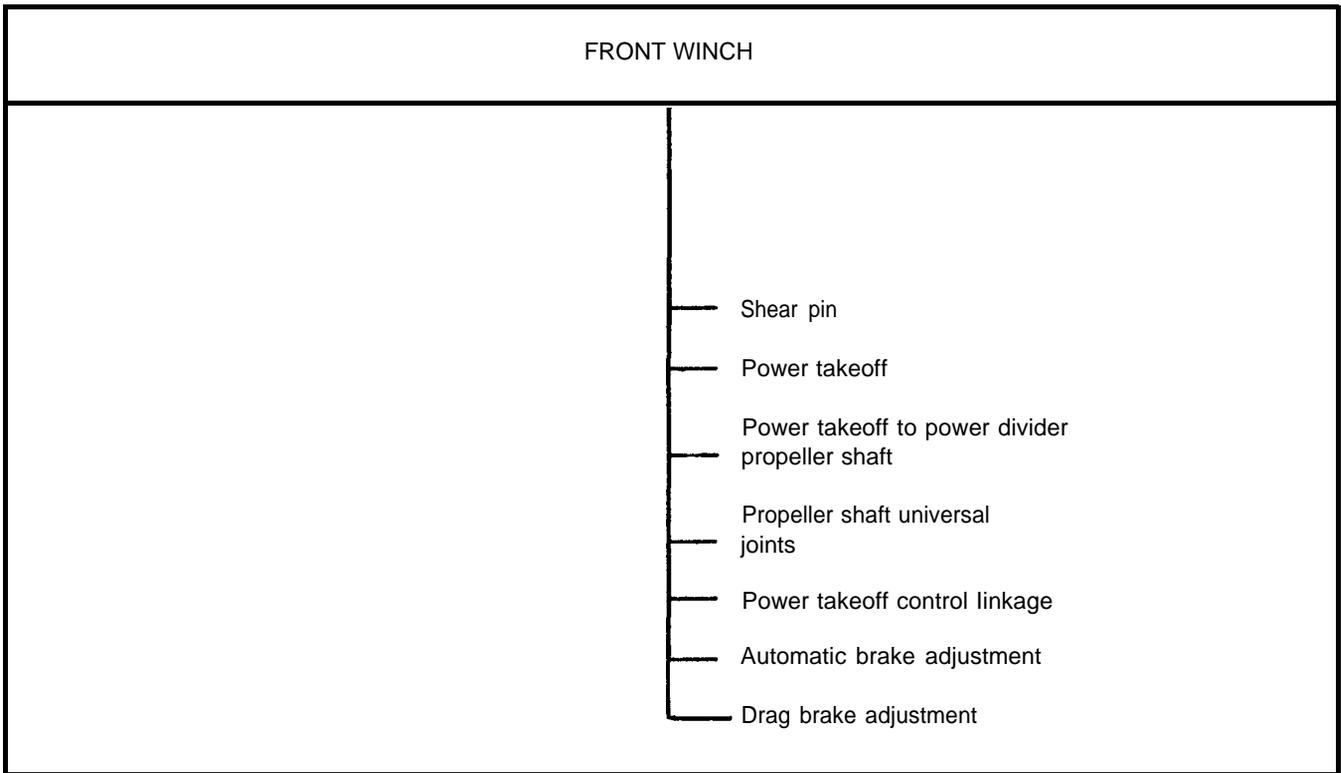


Figure 5-16. Troubleshooting Roadmap, Front Winch

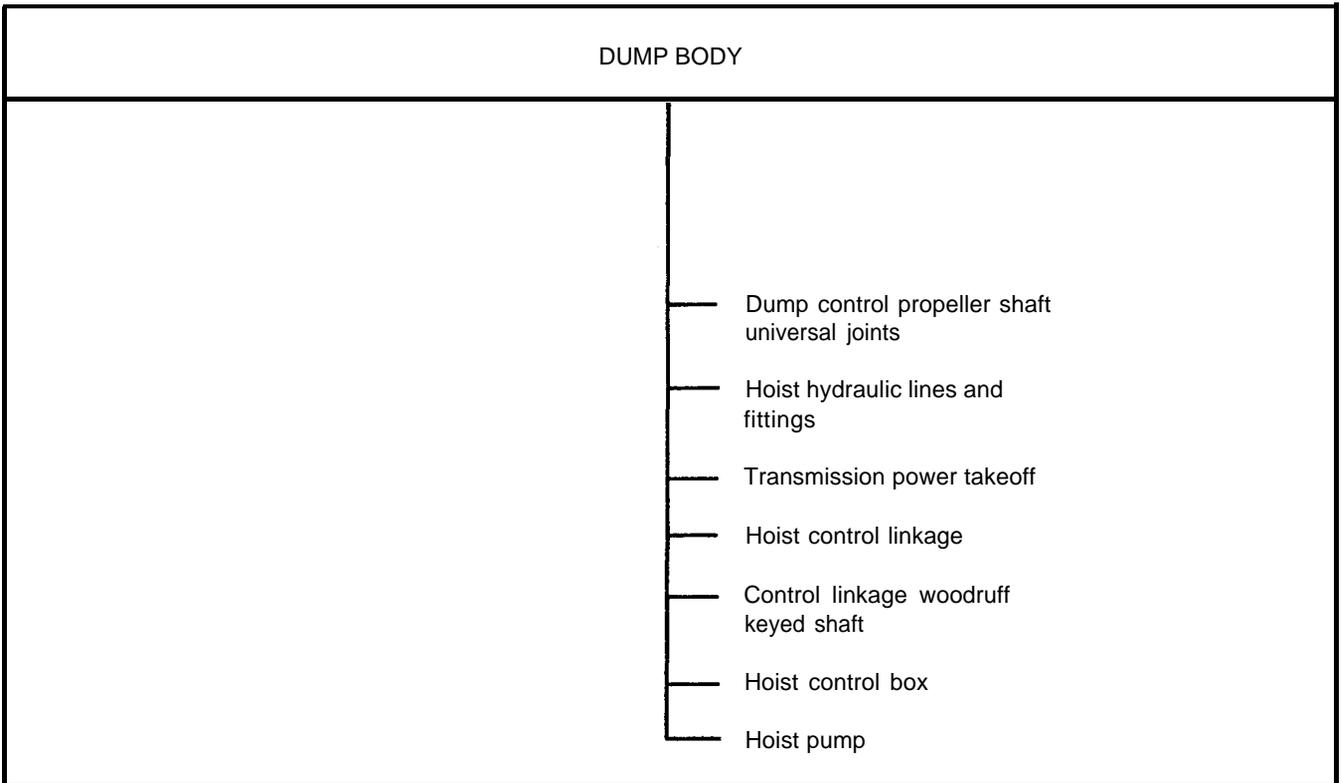
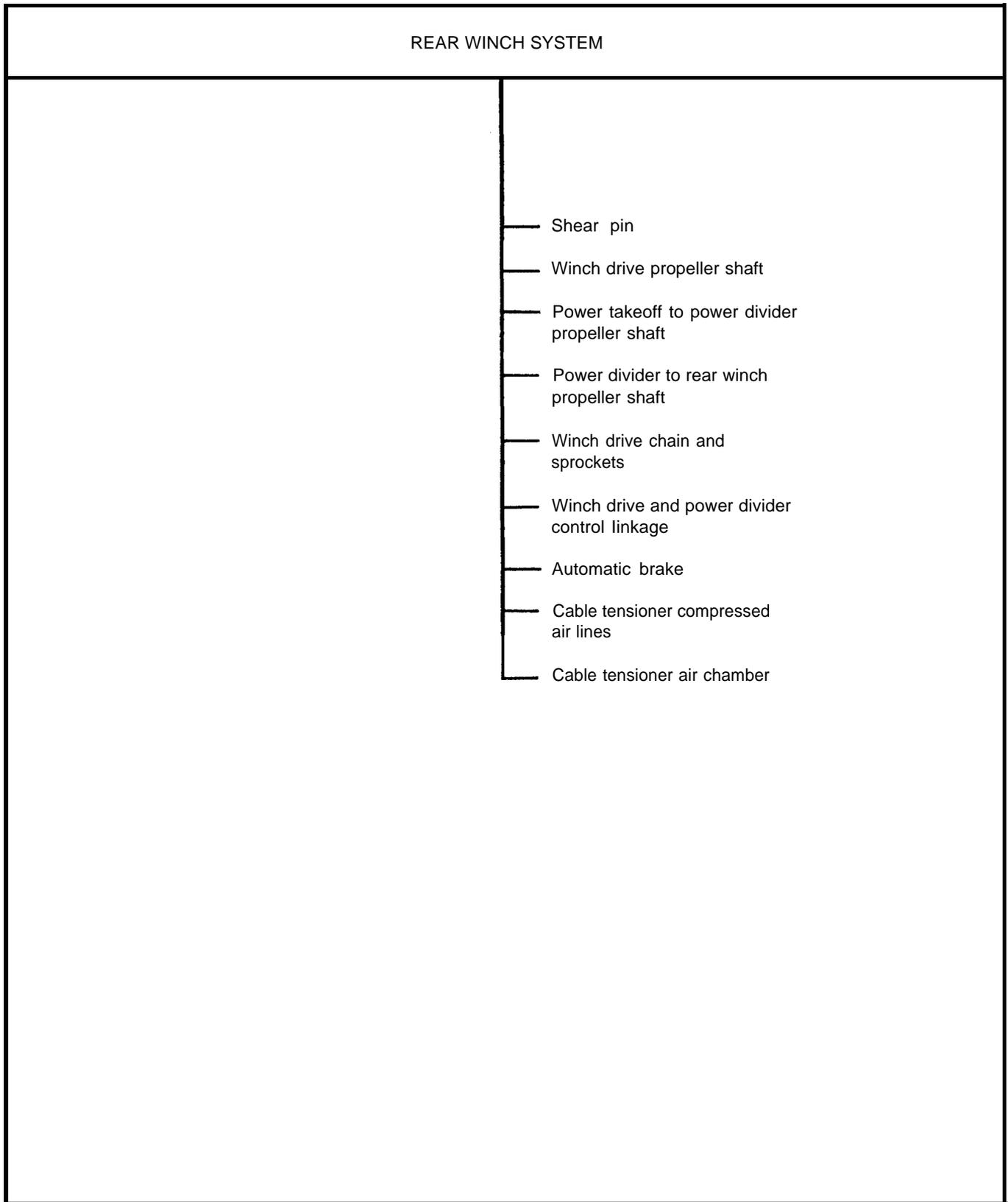


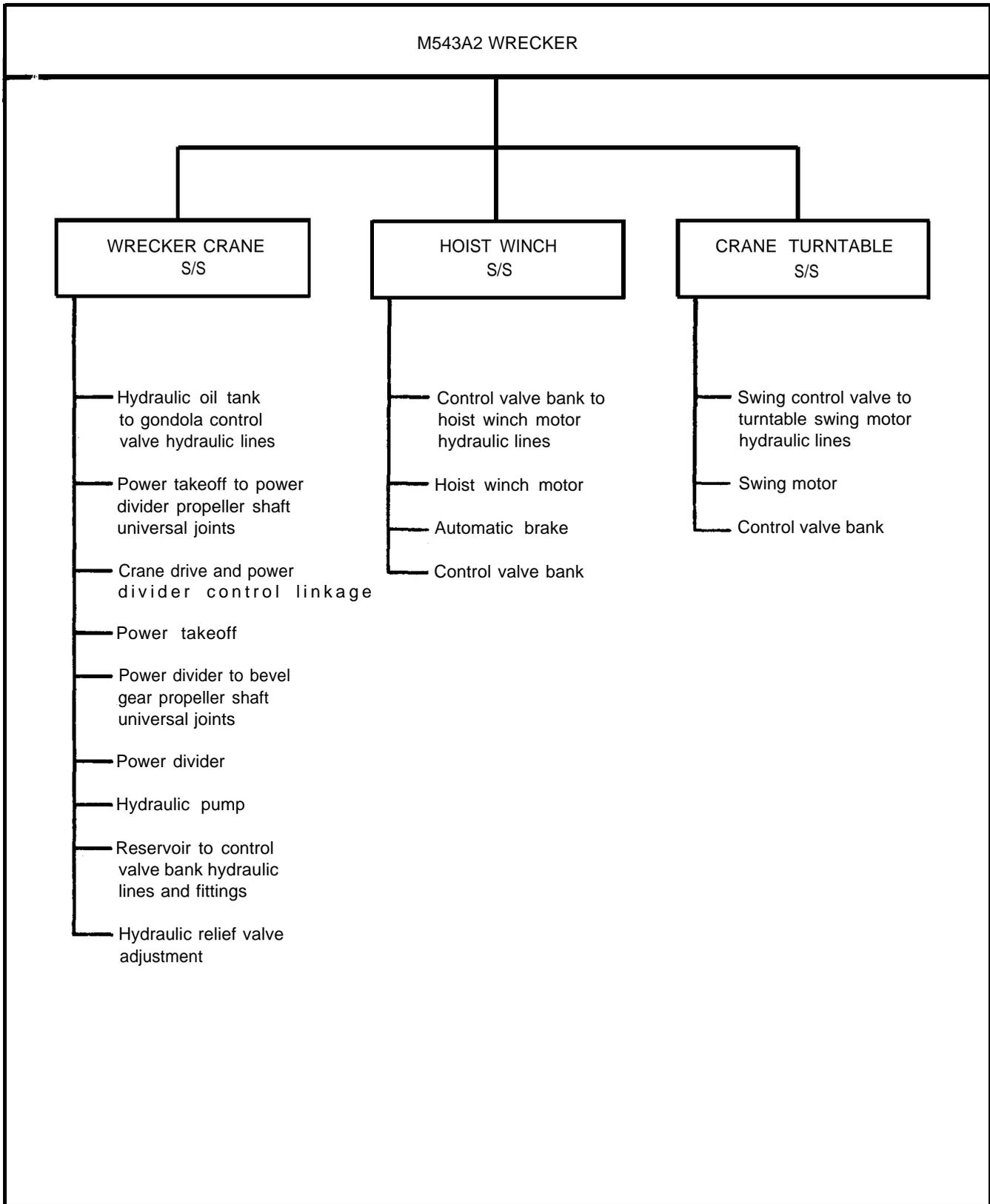
Figure 5-17. Troubleshooting Roadmap, Dump Body and Hoist

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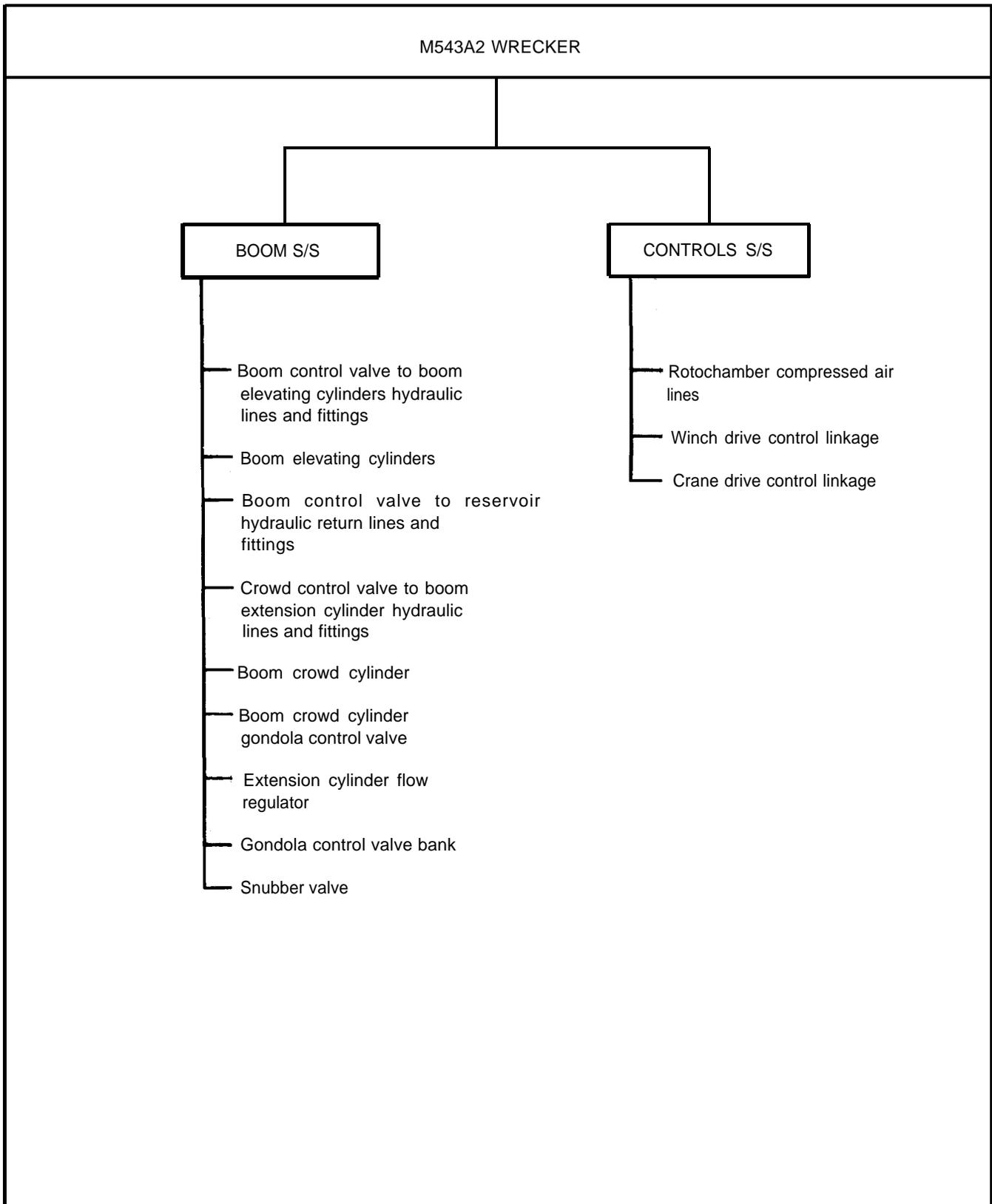
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Figure 5-18. Troubleshooting Roadmap, Rear Winch



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Figure 5-19. Troubleshooting Roadmap, M543A2 Wrecker (Sheet 1 of 2)



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Figure 5-19. Troubleshooting Roadmap, M543A2 Wrecker (Sheet 2 of 2)

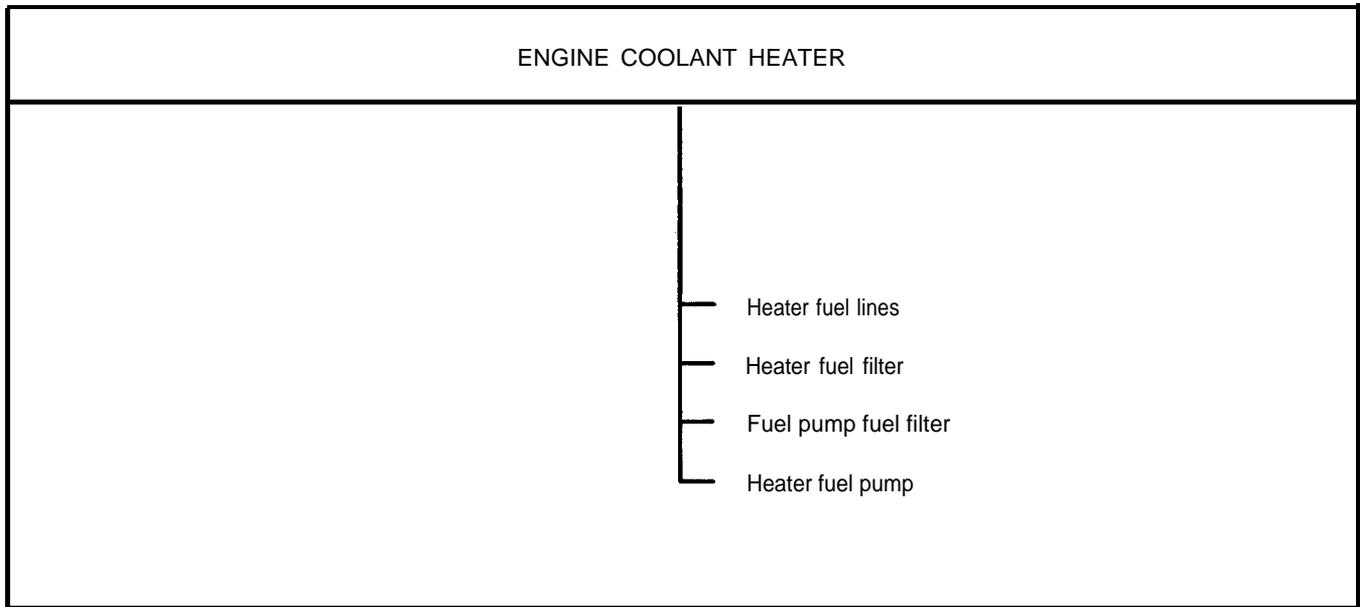


Figure 5-20. Troubleshooting Roadmap, Engine Coolant Heater

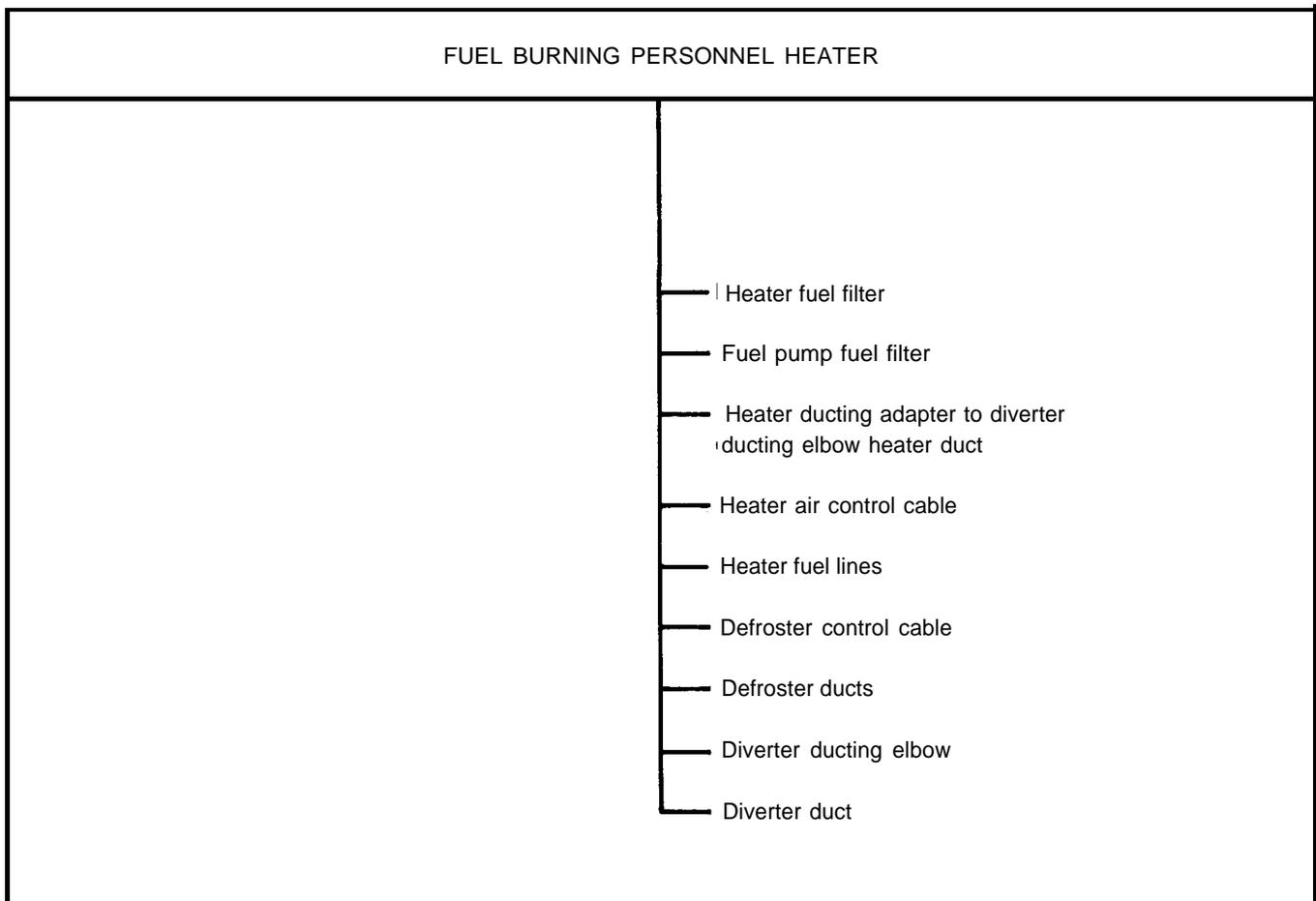


Figure 5-21. Troubleshooting Roadmap, Fuel Burning Personnel Heater

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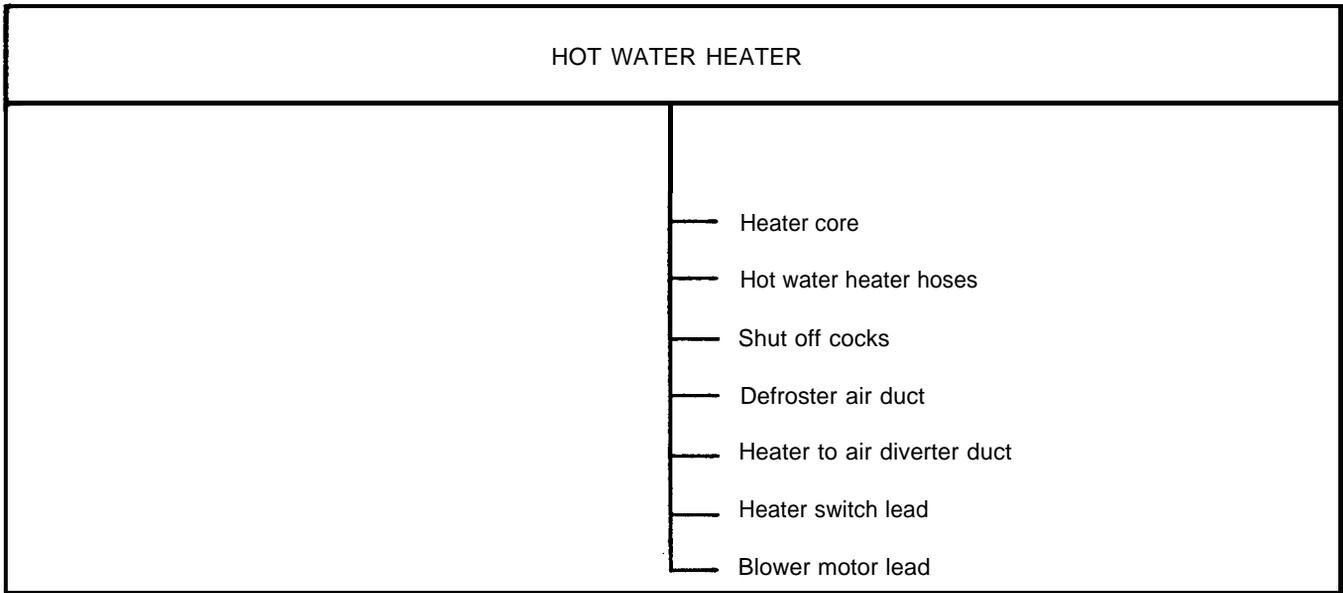


Figure 5-22. Troubleshooting Roadmap, Hot Water Heater

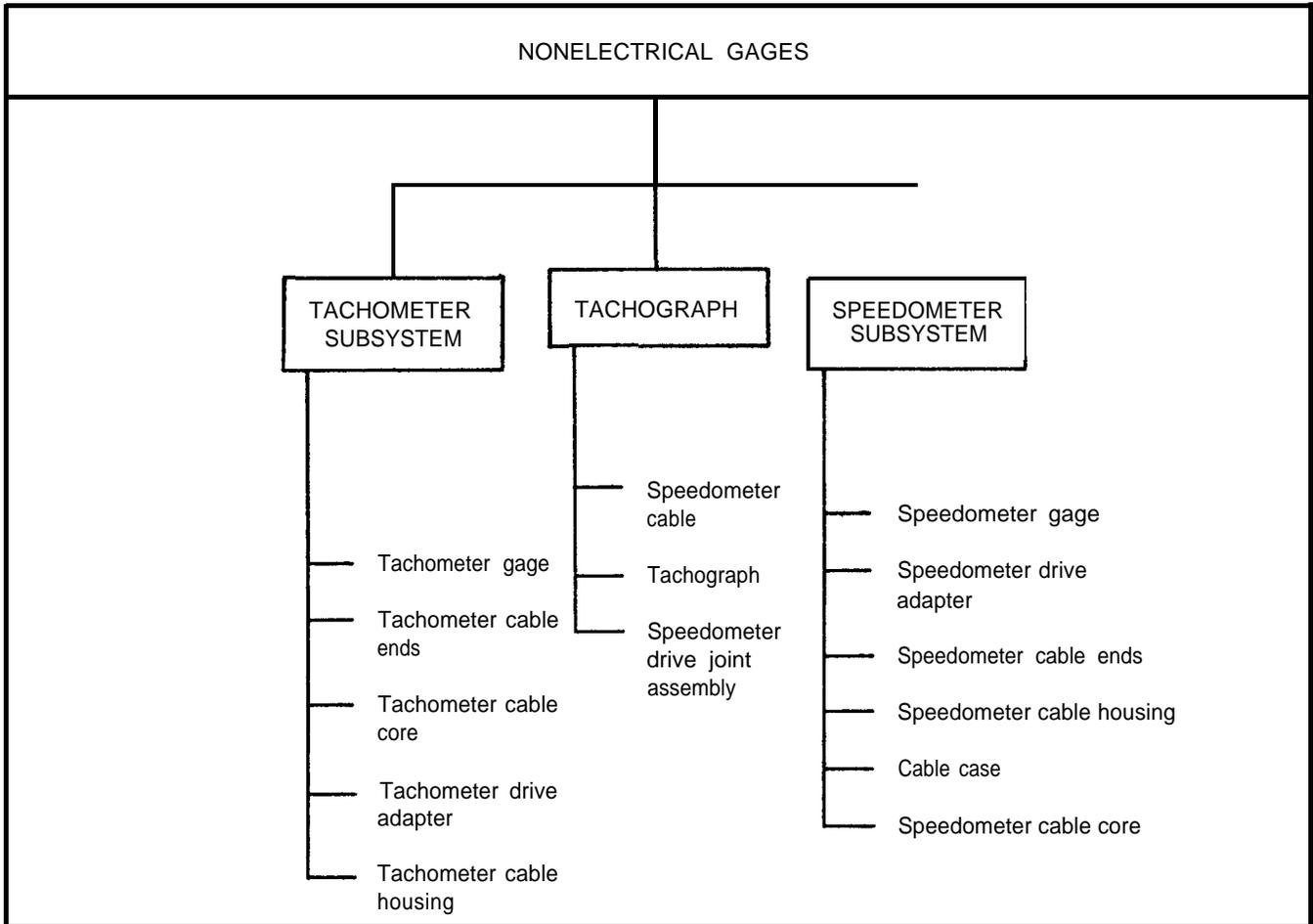


Figure 5-23. Troubleshooting Roadmap, Nonelectrical Gages

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CHAPTER 6

FAULT SYMPTOM INDEXES

6-1. GENERAL. This chapter gives troubleshooting fault symptom indexes for every system of the truck for which you have detailed troubleshooting procedures. These indexes are in table form (tables 6-1 through 6- 23) which gives you a quick way to check what material you have to use to do your troubleshooting.

6-2. INDEXES. Each index is divided into columns which give you information you need to help you do troubleshooting procedures. The following breakdown tells you what is in each column.

a. Subsystem Column. If the main system is divided into subsystems, the subsystems will be listed in this column.

b. Symptom Column. This column lists the symptoms, or problems for which detailed troubleshooting procedures are given.

c. Summary Column. This column tells you where to find the summary troubleshooting procedures for each symptom.

d. Detailed Column. This column tells you where to find the detailed troubleshooting procedure for each symptom.

e. Persons Column. This column tells you how many people are needed to do the troubleshooting procedure.

f. Special Tools Column. Any tools needed to do the troubleshooting procedure which are not included in your common tool kit are listed in this column.

g. Standard Tools Column. A dot in this column means that tools found in your common tool kit are needed to do the troubleshooting procedure.

h. Materials Column. This column tells you what materials are needed to do the troubleshooting procedure. These materials and how they will be issued will be decided by your maintenance officer.

i. Time Column. This column tells you how much time you will need to do the detailed troubleshooting procedure. The time will be decided by your maintenance officer.

TABLE 6-1. ENGINE SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
LUBRICATING	1. Low oil pressure	Figure 9-1	Figure 8-1	1	—			
	2. Engine uses more oil than normal	Figure 9-1	Figure 8-2	1	—			
ENGINE MOUNT	1. Clunking noise heard during acceleration on truck M55A2	Figure 9-2	Figure 10-1	1	—	•		
	2. Clunking noise heard during acceleration on all trucks except M55A2	Figure 9-2	Figure 10-2	1	—	•		

FAULT SYMPTOM INDEX

TABLE 6-2. CLUTCH SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
	1. Clutch drags, slips, or does not engage	Figure 12-1	Figure 11-1	1	—			
	2. Truck creeps when clutch pedal is pressed to floorboard	Figure 12-1	Figure 11-2	1	—			
	3. On M543A2 truck clutch slips during operation, clutch system works normally	Figure 12-1	Figure 11-3	1	—			
	4. Clutch does not engage when engine clutch control lever is pushed down on M543A2 truck, clutch system works normally using clutch pedal in cab	Figure 12-1	Figure 11-4	1	—			

FAULT SYMPTOM INDEX

TABLE 6-3. FUEL SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURES		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Engine is hard starting	Figure 15-1	Figure 14-1	1	—			
—	2. Engine does not start	Figure 15-1	Figure 14-2	1	—			
—	3. Engine stalls	Figure 15-1	Figure 14-3	1	—			
—	4. Engine runs rough	Figure 15-1	Figure 14-4	1	—			
—	5. Engine lacks power	Figure 15-1	Figure 14-5	1	—			
—	6. Poor fuel mileage	Figure 15-1	Figure 14-6	1	—			
—	7. Engine does not slow down when accelerator pedal is let go	Figure 15-1	Figure 14-7	1	—			
—	8. Engine runs after being shut off	Figure 15-1	Figure 14-8	1	—			

FAULT SYMPTOM INDEX

TABLE 6-4. EXHAUST SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURES		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
———	1. Exhaust system makes noise	Figure 20-1	Figure 19-1	1	—			
-----	2. Exhaust fumes enter cab	Figure 20-1	Figure 19-2	1	—			

TABLE 6-5. COOLING SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
———	1. Engine temperature reads above 195° while running	Figure 23-1	Figure 22-1	2	—		•	
———	2. Engine does not reach running temperature of 165°F to 195°F	Figure 23-1	Figure 22-2	1	—		•	
-----	3. Noise coming from engine other than that of normal running	Figure 23-1	Figure 22-3	1	—		•	

FAULT SYMPTOM INDEX

TABLE 6-6. ELECTRICAL SYSTEM									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
STARTER	1. Starter motor will not crank engine	Figure 27-1	Figure 26-1	2	•		•		
CHARGING	2. Charging system (25amp) generator has too high or low charging rate	Figure 27-2	Figure 26-2	1	•		•		
BATTERY	3. Batteries go dead when truck is parked over night or a period of days	Figure 27-3	Figure 26-3	1	•		•		
	4. Batteries do not fully charge or do not hold charge	Figure 27-3	Figure 26-4	1	•	•	•		
LIGHTING	5. One headlight does not light, other truck running lights light	Figure 27-4	Figure 26-5	1	•		•		
	6. Both headlights do not light, other truck running lights light	Figure 27-4	Figure 26-6	1	•		•		

FAULT SYMPTOM INDEX

TABLE 6-6. ELECTRICAL SYSTEM (Cont.)									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
LIGHTING	7. Blackout headlight does not light, other truck running lights light	Figure 27-4	Figure 26-7	1	•		•		
	8. One or both front blackout marker lamps do not light, other truck running lights light	Figure 27-4	Figure 26-8	1	•		•		
	9. One or both front parking lights do not light, other truck running lights light	Figure 27-4	Figure 26-9	1	•		•		
	10. One service stoplight does not light, other stoplight lights	Figure 27-4	Figure 26-10	2	•		•		
	11. Both service stoplights do not light, other truck running lights light	Figure 27-4	Figure 26-11	2	•		•		

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TABLE 6-6. ELECTRICAL SYSTEM (Cont.)									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
LIGHTING	12. One blackout stoplight does not light, other blackout stoplight lights	Figure 27-4	Figure 26-12	2	•		•		
	13. Both blackout stoplights do not light, other truck running lights light	Figure 27-4	Figure 26-13	1	•		•		
	14. One or both service taillight lamps do not light, other truck running lights light	Figure 27-4	Figure 26-14	1	•		•		
	15. One or both rear blackout marker lights do not light, other truck running lights light	Figure 27-4	Figure 26-15	1	•		•		
	16. One lamp dim, flickering or works sometimes	Figure 27-4	Figure 26-16	1	•		•		

TABLE 6-6. ELECTRICAL SYSTEM (Cont.)									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
LIGHTING	17. All or many truck running lights dim, flicker, or work sometimes	Figure 27-4	Figure 26-17	1	•		•		
	18. Lamps burn out too often	Figure 27-4	Figure 26-18	1	•		•		
	19. All or many truck running lights do not light	Figure 27-4	Figure 26-19	1	•		•		
	20. One or more trailer service or blackout stoplights do not light, all other truck lights light	Figure 27-4	Figure 26-20	1	•		•		
	21. One or more trailer lights do not light, (except service and blackout stoplights.) All other truck running lights light	Figure 27-4	Figure 26-21	1	•		•		

TABLE 6-6. ELECTRICAL SYSTEM (Cont.)									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
DIRECTIONAL SIGNAL	22. One control assembly directional signal lamp does not light	Figure 27-5	Figure 26-22	1	•		•		
	23. No control assembly directional signal lamps light, other truck lamps light	Figure 27-5	Figure 26-23	1	•		•		
	24. When emergency flasher or turn signal lamps are selected, lamps do not flash or flash at slow and uneven rate	Figure 27-5	Figure 26-24	1	•		•		
	25. Turn signal indicator lamp does not flash, rest of directional signal system works	Figure 27-5	Figure 26-25	1	•		•		
	26. Turn signal indicators do not work in one or more positions of signal lever, all other truck lights light	Figure 27-5	Figure 26-26	1	•		•		
INDICATOR	27. Fuel level gage does not work	Figure 27-6	Figure 26-27	1	•		•		

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TABLE 6-6. ELECTRICAL SYSTEM (Cont.)									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
WARNING	28. Temperature gage does not work	Figure 27-6	Figure 26-28	1	•		•		
	29. Oil pressure gage does not work	Figure 27-6	Figure 26-29	1	•		•		
	30. Battery-generator indicator does not work	Figure 27-6	Figure 26-30	1	•		•		
	31. All gages do not work	Figure 27-6	Figure 26-31	1	•		•		
	32. Horn does not work	Figure 27-7	Figure 26-32	1	•		•		
FUEL PUMP/ MANIFOLD HEATER	33. Low air warning buzzer does not work	Figure 27-7	Figure 26-33	1	•		•		
	34. Fuel pump does not work	Figure 27-8	Figure 26-34	1	•		•		
	35. Engine manifold heater does not work	Figure 27-8	Figure 26-35	1	•		•		

FAULT SYMPTOM INDEX

TABLE 6-6. ELECTRICAL SYSTEM (Cont.)									
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			MATERIALS	TIME
					MULTIMETER	HYDROMETER	STANDARD TOOLS		
HOT WATER HEATER	36. Hot water personnel heater defroster operates in "HI" position only	Figure 27-9	Figure 26-36	1	•		•		
	37. Hot water personnel heater defroster operates in "LO" position only	Figure 27-9	Figure 26-37	1	•		•		
	38. Hot water personnel heater defroster does not operate in either blower switch position	Figure 27-9	Figure 26-38	1	•		•		
	39. Hot water personnel heater defroster does not turn off when switch is in "OFF" position	Figure 27-9	Figure 26-39	1	•		•		
WINTER-IZATION	40. Only one control box will operate the heater fuel pump	Figure 27-10	Figure 26-40	1	•		•		
	41. Neither control box will operate the heater fuel pump	Figure 27-10	Figure 26-41	1	•		•		

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TABLE 6-7. TRANSMISSION SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Transmission leaks oil	—	Figure 32-1	1	—	•		
—	2. Transmission gears grind when shifting	—	Figure 32-2	1	—			

TABLE 6-8. TRANSFER SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURES		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Transfer leaks oil	Figure 34-1	Figure 33-1	1	—			
—	2. Transfer is hard to shift, or pops out of gear	Figure 34-1	Figure 33-2	2	—	•		
—	3. Clunking noise is heard during acceleration on trucks M55A2	Figure 34-1	Figure 33-3	1	—			
—	4. Clunking noise is heard during acceleration on all trucks except M55A2	Figure 34-1	Figure 33-4	1	—	•		

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TABLE 6-9. PROPELLER SHAFT SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Clunking noise heard during acceleration on truck M55A2	Figure 38-1	Figure 37-1	1	—	•		
—	2. Clunking noise heard during acceleration on all trucks except M55A2	Figure 38-1	Figure 37-2	1	—	•		

TABLE 6-10. FRONT AXLE SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Shimmy	Figure 41-1	Figure 40-1	1	—			
—	2. Front axle makes noise	Figure 41-1	Figure 40-2	1	—			
—	3. Front tires do not wear evenly	Figure 41-1	Figure 40-3	1	Toe-in gage	•		
—	4. Truck pulls to one side while in motion	Figure 41-1	Figure 40-4	1	Toe-in gage	•		

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TABLE 6-11. REAR AXLE SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Rear axle makes noise	Figure 44-1	Figure 43-1	1	—	•		
—	2. Too much backlash when driving	Figure 44-1	Figure 43-2	1	—	•		

TABLE 6-12. BRAKE SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Brake pedal is spongy	Figure 47-1	Figure 46-1	1	-----	●		
—	2. Brake pedal sinks close to floorboard, or weak braking action	Figure 47-1	Figure 46-2	1	-----	●		
—	3. Brakes drag	Figure 47-1	Figure 46-3	1	-----	●		
—	4. One brake drags or truck pulls to one side	Figure 47-1	Figure 46-4	1	-----	●		
—	5. No braking action	Figure 47-1	Figure 46-5	1	—			
—	6. Buzzer does not shut off and air pressure gage reads below 60 psi	Figure 47-1	Figure 46-6	1	Compressor pulley adjusting flange wrench	●		
—	7. Low or no reading on air pressure gage, and warning buzzer shuts off	Figure 47-1	Figure 46-7	1	-----	●		
—	8. Reading on air pressure gage is above normal	Figure 47-1	Figure 46-8	1	-----	●		
—	9. Trailer brakes do not work when pedal is pressed or hand control valve is used	Figure 47-1	Figure 46-9		—			
—	10. Handbrake does not hold parked truck	Figure 47-1	Figure 46-10	1	-----			
—	11. Handbrake assembly drags after handbrake lever is put down	Figure 47-1	Figure 46-11	1	—			

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TABLE 6-13. WHEEL SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURES		RESOURCES REQ'D				
		SUMMARY Fig. #	DETAILED Fig. #	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Truck pulls to one side	Figure 52-1	Figure 51-1	1	—	•		
—	2. Front axle makes noise	Figure 52-1	Figure 51-2	1	—	•		
—	3. Shimmy	Figure 52-1	Figure 51-3	1	—	•		
—	4. Front tires do not wear evenly	Figure 52-1	Figure 51-4	1	—	•		

TABLE 6-14. STEERING SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Front tires do not wear evenly	Figure 55-1	Figure 54-1	1	Toe-in gage	•		
—	2. Hard steering	Figure 55-1	Figure 54-2	1	—	•		
—	3. Shimmy	Figure 55-1	Figure 54-3	1	Toe-in gage	•		
—	4. Truck pulls to one side	Figure 55-1	Figure 54-4	1	—	•		

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TABLE 6-15. SPRING AND SHOCK ABSORBER SYSTEM								
SUBSYSTEM	SYMPTOM	SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT			TIME
					SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	
---	1. Front tires do not wear evenly	Figure 59-1	Figure 58-1	1	Toe-i n gage			
---	2. Truck leans to one side	Figure 59-1	Figure 58-2	1	---			

TABLE 6-16. FRONT WINCH SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		PERSONS	RESOURCES REQ'D			TIME
		SUMMARY	DETAILED		TEST EQUIPMENT		MATERIALS	
					SPECIAL TOOLS	STANDARD TOOLS		
---	1. Winch does not pull load	Figure 61-1	Figure 60-1	1	---			
---	2. Winch does not hold load	Figure 61-1	Figure 60-2	1	---			
---	3. Winch drum spins too fast when unwinding cable.	Figure 61-1	Figure 60-3	1	---			

TABLE 6-17. DUMP BODY AND HOIST SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Dump body does not rise	Figure 64-1	Figure 63-1	2	—	•		
—	2. Dump body rises slowly	Figure 64-1	Figure 63-2	2	Pressure gage	•		
—	3. Dump body will not hold in raised position	Figure 64-1	Figure 63-3	1	—	•		
—	4. Dump body will not lower	Figure 64-1	Figure 63-4	1	—	•		

TABLE 6-18. REAR WINCH SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Winch does not pull load	Figure 69-1	Figure 68-1	1	—			
—	2. Winch does not hold load	Figure 69-1	Figure 68-2	1	—	•		
—	3. Cable does not wind evenly on drum	Figure 69-1	Figure 68-3	1	—			

TABLE 6-19. M543A2 WRECKER SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
WRECKER CRANE	1. Wrecker crane does not work	Figure 73-1	Figure 72-1	1	Pressure gage	•		
	2. Wrecker crane works slowly during all hydraulically operated functions	Figure 73-1	Figure 72-2	1	Pressure gage	•		
HOIST WINCH	3. Hoist winch does not pull load	Figure 73-2	Figure 72-3	2	Pressure gage	•		
	4. Hoist winch pulls load slowly	Figure 73-2	Figure 72-4	2	Pressure gage	•		
	5. Hoist winch does not hold load	Figure 73-2	Figure 72-5	1				
	6. Jerky operation as hoist winch pulls load	Figure 73-2	Figure 72-6	2	Pressure gage	•		

FAULT SYMPTOM INDEX

TABLE 6-19. M543A2 WRECKER SYSTEM (Cont.)

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
CRANE TURNTABLE	7. Crane does not swing	Figure 73-3	Figure 72-7	2	Pressure gage	•		
	8. Crane swings slowly	Figure 73-3	Figure 72-8	2	Pressure gage	•		
	9. Jerky operation as crane swings	Figure 73-3	Figure 72-9	2	Pressure gage	•		
BOOM	10. Boom does not rise	Figure 73-4	Figure 72-10	2	Pressure gage	•		
	11. Boom rises slowly	Figure 73-4	Figure 72-11	2	Pressure gage	•		
	12. Boom comes down too fast	Figure 73-4	Figure 72-12	1	Pressure gage	•		
	13. Boom does not extend	Figure 73-4	Figure 72-13	2	Pressure gage	•		
	14. Boom extends or retracts slowly	Figure 73-4	Figure 72-14	2	Pressure gage	•		
	15. Jerky operation as boom extends or retracts	Figure 73-4	Figure 72-15	2	Pressure gage	•		

TABLE 6-19. M543A2 WRECKER SYSTEM (Cont.)								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
CONTROLS	16. Winch drive control lever does not go into gear or grinds when going into gear	Figure 73-5	Figure 72-16	1	—	•		
	17. Winch drive control lever does not stay in gear	Figure 73-5	Figure 72-17	1	—			
	18. Crane drive control lever does not go into gear or grinds when going into gear	Figure 73-5	Figure 72-18	1	—	•		
	19. Crane drive control lever does not stay in gear	Figure 73-5	Figure 72-19	1	—			

FAULT SYMPTOM INDEX

TABLE 6-20. ENGINE COOLANT HEATER SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Heater does not start when switch is turned on	Figure 78-1	Figure 77-1	1	—			
—	2. Heater works for several minutes then stops	Figure 78-1	Figure 77-2	2	—	•		
—	3. Heater has no or low heat output	Figure 78-1	Figure 77-3	2	—	•		

TABLE 6-21. FUEL BURNING PERSONNEL HEATER SYSTEM								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Heater does not start	Figure 82-1	Figure 81-1	1	—	•		
—	2. Heater and defroster do not work	Figure 82-1	Figure 81-2	1	—	•		
—	3. Heater does not work	Figure 82-1	Figure 81-3	1	—			
—	4. Defroster does not work	Figure 82-1	Figure 81-4	1	—			
—	5. Heater and defroster do not give off enough heat	Figure 82-1	Figure 81-5	1	—			
—	6. Defroster does not give off enough heat	Figure 82-1	Figure 81-6	1	—	•		
—	7. Heater does not give off enough heat	Figure 82-1	Figure 81-7	1	—			

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FAULT SYMPTOM INDEX

TABLE 6-22. HOT WATER HEATER								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
—	1. Cool or cold air at outlets after engine has reached operating temperature	Figure 85-1	Figure 84-1	1	—			
—	2. No air flow at defroster	Figure 85-1	Figure 84-2	1	—			
—	3. No air flow at heat outlet	Figure 85-1	Figure 84-3	1	—			
—	4. Blower operates in LO only	Figure 85-1	Figure 84-4	1	—			
—	5. Blower motor does not work	Figure 85-1	Figure 84-5	1	—			
—	6. Heat output too low	Figure 85-1	Figure 84-6	1	—			
—	7. Blower motor operates on HI only	Figure 85-1	Figure 84-7	1	—			

FAULT SYMPTOM INDEX

TABLE 6-23. NONELECTRICAL GAGES								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
TACHOMETER	1. Tachometer does not work	Figure 88-1	Figure 87-1	1	—	•		
	2. Tachometer fluctuates	Figure 88-1	Figure 87-2	1	—	•		
	3. Tachometer does not show correct reading	Figure 88-1	Figure 87-3	2	—	•		
	4. Tachometer is noisy	Figure 88-1	Figure 87-4	1	—	•		
SPEEDOMETER	5. Speedometer does not work	Figure 88-2	Figure 87-5	2	—	•		
	6. Speedometer does not show correct speed	Figure 88-2	Figure 87-6	1	—	•		
	7. Speedometer fluctuates	Figure 88-2	Figure 87-7	2	—	•		

FAULT SYMPTOM INDEX

TABLE 6-23. NONELECTRICAL GAGES (Cont.)								
SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT		MATERIALS	TIME
					SPECIAL TOOLS	STANDARD TOOLS		
TACHOGRAPH	8. Tachograph speedometer does not work, tachometer works	Figure 88-3	Figure 87-8	2	Variable speed drill	•		
	9. Tachograph speedometer does not show correct speed, tachometer works OK	Figure 88-3	Figure 87-9	1	—	•		
	10. Tachograph speedometer fluctuates, tachometer works OK	Figure 88-3	Figure 87-10	2	Variable speed drill	•		
	11. Tachograph tachometer does not work, speedometer works OK	Figure 88-3	Figure 87-11	1	—			
	12. Tachograph tachometer fluctuates, or does not show correct reading, speedometer works OK	Figure 88-3	Figure 87-12	1	—			

CHAPTER 7

SAMPLE TROUBLESHOOTING PROCEDURE

7-1. GENERAL. This chapter gives sample troubleshooting procedures. The purpose of the sample procedures is to help you see how detailed troubleshooting procedures test equipment procedures, and summary troubleshooting procedures are used to find faults in a system.

7-2. SAMPLE DETAILED PROCEDURE. The sample detailed procedure given is the fuel system troubleshooting procedure for the symptom, STARTER MOTOR WILL NOT CRANK ENGINE. This symptom is one you will have when you try to start your truck and certain parts on the truck are not working correctly. In each numbered box, instructions are given which tell you what to do, and how to do it. A large dot is placed next to the "what to do" instructions, and small dots next to the "how to do it" instructions.

a. Box number ① gives general instructions on getting the truck ready before you start to troubleshoot.

b. Box number ② gives fault isolation test instructions. In this case you are told to check the starting system circuit for loose, burned or broken leads and connectors. To help you find the leads and connectors that you must check, you are told to see figure 28-1, given in chapter 28. Figure 28-1 is a support diagram that gives you a detailed picture of the starter system circuit. Figure 28-1 also tells you what you must look for to decide if there is a problem in the starter system circuit. These support diagrams and tests, or checks, are often referred to in detailed troubleshooting procedures to help you find the problem and fix it. After you do the tests, you read the question at the bottom of box number ②. If the leads or connectors are burned or broken, the answer to the question is **NO**, so you go to the next box.

c. Box number ③ gives you a corrective action. In this case the fault is either burned or broken leads or connectors. The corrective action is what you do to fix the fault, which is to replace any burned or broken lead or connectors. If the starter motor still will not crank the engine, it could mean that there are other faults in the starter circuit system. When this happens, go back to the beginning of the procedure and do each step again until you find the other faults.

d. Sometimes the corrective actions given for a fault will tell you what to do to fix the fault, but will not give you detailed instructions on how to fix it. Instead, you will be told to refer to another volume in this manual for these instructions. Box number ③ is an example of this. If the answer to the, questions that all the fault isolation test instruction boxes ask is **YES**, it means that the symptom cannot be corrected at the organizational level of maintenance. When this happens you are given the instruction "Tell Direct Support Maintenance."

7-3. SAMPLE TEST EQUIPMENT PROCEDURE . The sample test equipment procedure given is the Simpson 160 multimeter DC VOLTAGE TEST. This procedure tells you how to use the multimeter to do the voltage tests you will need when you do electrical system troubleshooting.

a. The first box gives you the name of the test equipment procedure. It also tells you the kind of troubleshooting for which this procedure is used. In this case, the test equipment procedure is the DC VOLTAGE TEST. This test will be used to troubleshoot faults in the battery system, the charging system, and voltage drops in the electrical system.

b. Box ① gives you detailed test instructions. Next to the large dot are instructions telling you what to do. In this example you are told to set up the multi-meter test leads. Next to the small dots are instructions telling you how to set up the test leads.

c. The multimeter jack table tells you which jack to plug the red (+) test lead into.

d. The multimeter function table tells you how to set the function/range switch.

7-4. SAMPLE SUMMARY TROUBLESHOOTING PROCEDURE. The sample summary troubleshooting procedure given is the electrical system summary for the problem "CHARGING SYSTEM CHARGING TOO HIGH OR LOW."

a. The first box tells you what kinds of problems the summary covers. In this example, the summary covers charging system problems.

b. The charging system problems you will see on the truck are the fault symptoms "CHARGING SYSTEM (25 AMP) GENERATOR HAS TOO HIGH OR LOW CHARGING RATE", and "CHARGING SYSTEM (60 AMP) ALTERNATOR HAS TOO HIGH OR LOW CHARGING RATE."

c. To do the summary procedure for each fault symptom given, you follow the GO chains to each box. Any notes, cautions, or warnings that are given in the detailed troubleshooting procedures are also given in the summary.

d. General instructions telling you what to do are given in box ① . Detailed instructions on how to do checks or tests are not given in the summary. If the answer to the question at the bottom of box ① is NO , then you do the corrective action given in box ② . If the answer is YES , follow the GO chains to box ③ and box ④ and check the parts of the truck given in those boxes. You then repair or replace the parts that are bad.

e. The note given under the last box in the GO chain means that you should look at the electrical system fault symptom index. This index will tell you where you can find the detailed troubleshooting procedure for the symptom "CHARGING SYSTEM (25 AMP) GENERATOR HAS TOO HIGH OR LOW CHARGING RATE."

NOTE

All references to TM 9-2320-209-10
in this publication apply to the
TM 9-2320-209-10 series.

STARTER SYSTEM TROUBLESHOOTING

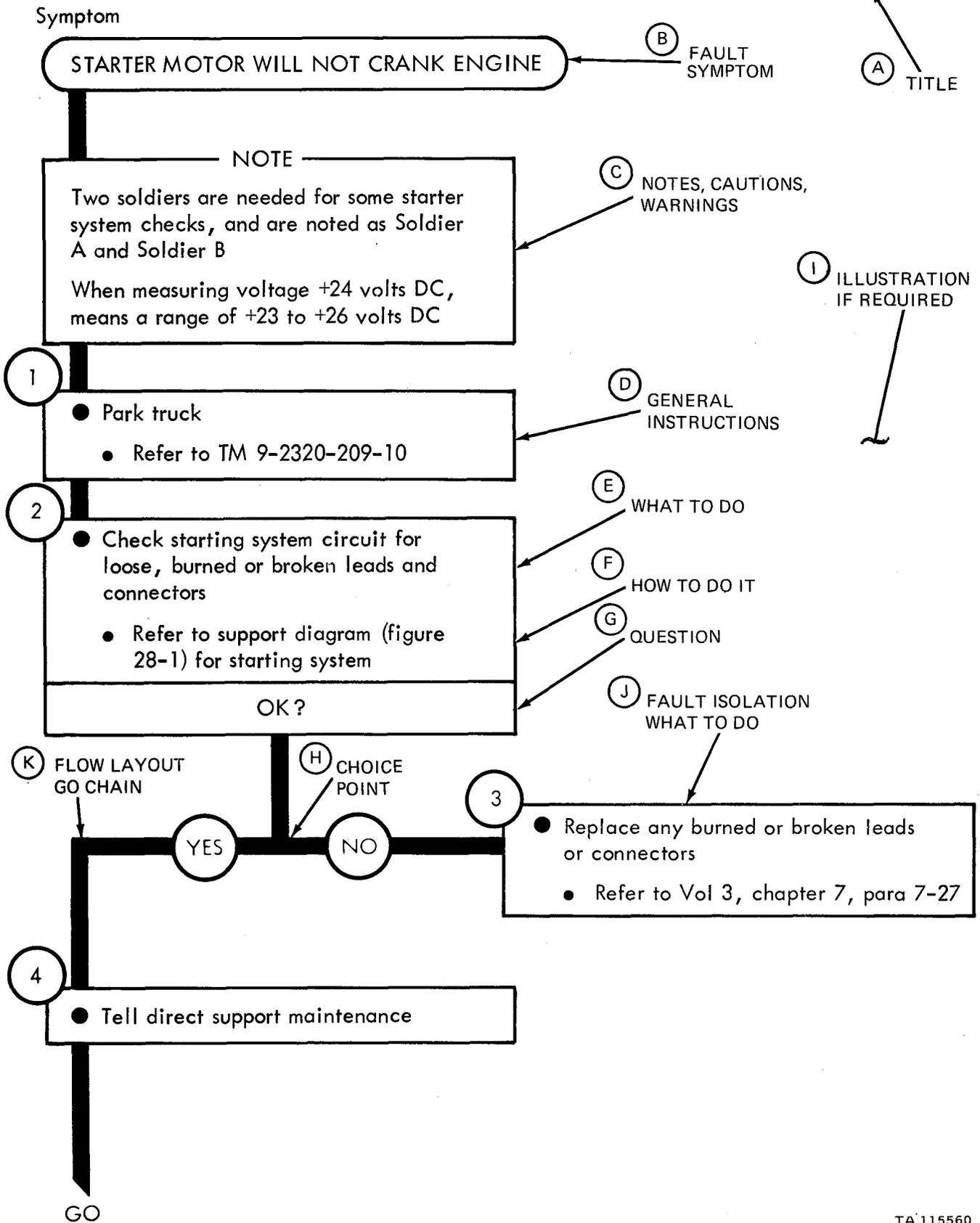


Figure 7-1

1 DC VOLTAGE TEST - To measure battery voltage, charging system output, and voltage drops at various test points

TEST EQUIPMENT PROCEDURE

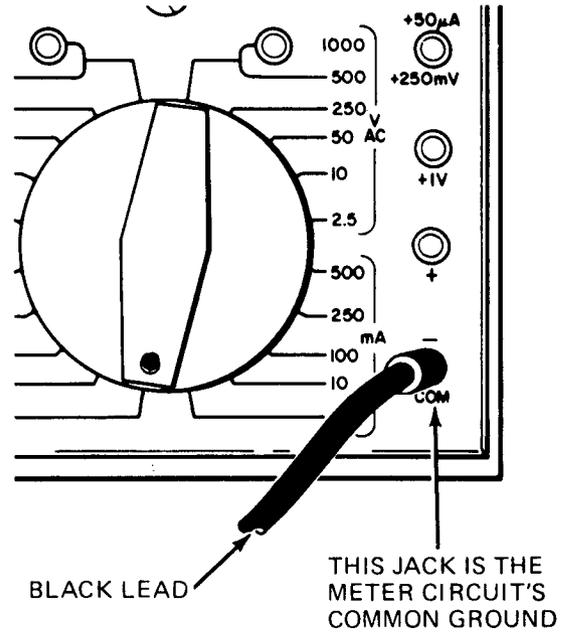
DETAILED TEST INSTRUCTIONS

1

- Set up multimeter test leads:
 - Put jack plug of black (-) test lead into COM - jack.

Note: The highest truck DC voltage that is measured is about 28 volts. Therefore, the multimeter red (+) lead is never put into the 1000 VDC jack.

 - See table to find out which jack to put red (+) lead into. Table shows which jack to use when normal value of measured voltage is known or unknown.



MULTIMETER JACK TABLE

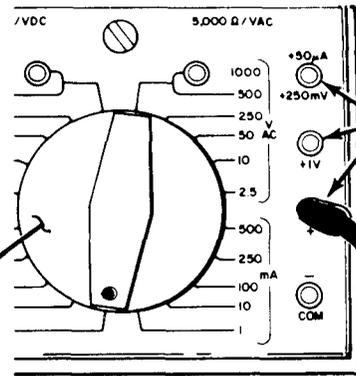
IF NORMAL VALUE OF VOLTAGE BEING MEASURED IS THIS:	PUT RED LEAD INTO THIS JACK ON RIGHT SIDE OF MULTIMETER:
0 TO 230 MILLIVOLTS	+50 µA +250mV
230 MILLIVOLTS TO 0.8 VOLTS	+1V
0.8 TO 2 VOLTS	+
2 TO 8 VOLTS	+
8 TO 40 VOLTS	+
UNKNOWN	+

GO

Figure 7-2 (Sheet 1 of 2)

GO

- Put jack plug of red (+) test lead into jack receptacle you picked on right side of multimeter.



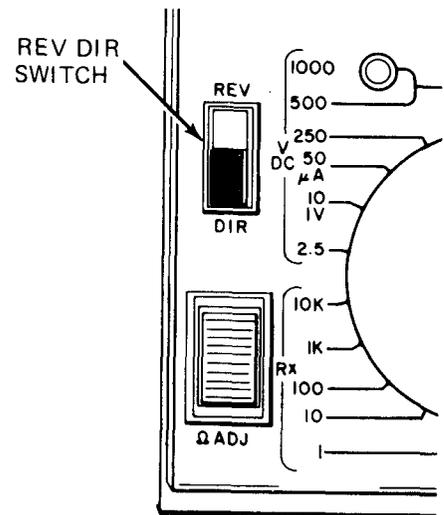
RED (+) TEST LEAD MAY BE PUT INTO ONE OF THESE THREE JACKS

FUNCTION/RANGE SWITCH

RED (+) TEST LEAD SHOWN IN + JACK

2

- Set up multimeter switches:
 - Note: The Ω ADJ knob is not used for DC voltage tests.
 - Set REV DIR switch to DIR.



- See table to find out setting of function/range switch. Table shows switch setting when normal value of measured voltage is known or unknown.

IF NORMAL VALUE OF VOLTAGE BEING MEASURED IN THIS:	SET FUNCTION/RANGE SWITCH TO:
0 TO 230 MILLIVOLTS	50 μ A
230 MILLIVOLTS TO 0.8 VOLTS	10 1V
0.8 TO 2 VOLTS	2.5
2 TO 8 VOLTS	10 1V
8 TO 40 VOLTS	50 μ A
UNKNOWN	50 μ A

MULTIMETER FUNCTION TABLE

GO

Figure 7-2 (Sheet 2 of 2)

ELECTRICAL SYSTEM SUMMARY TROUBLESHOOTING

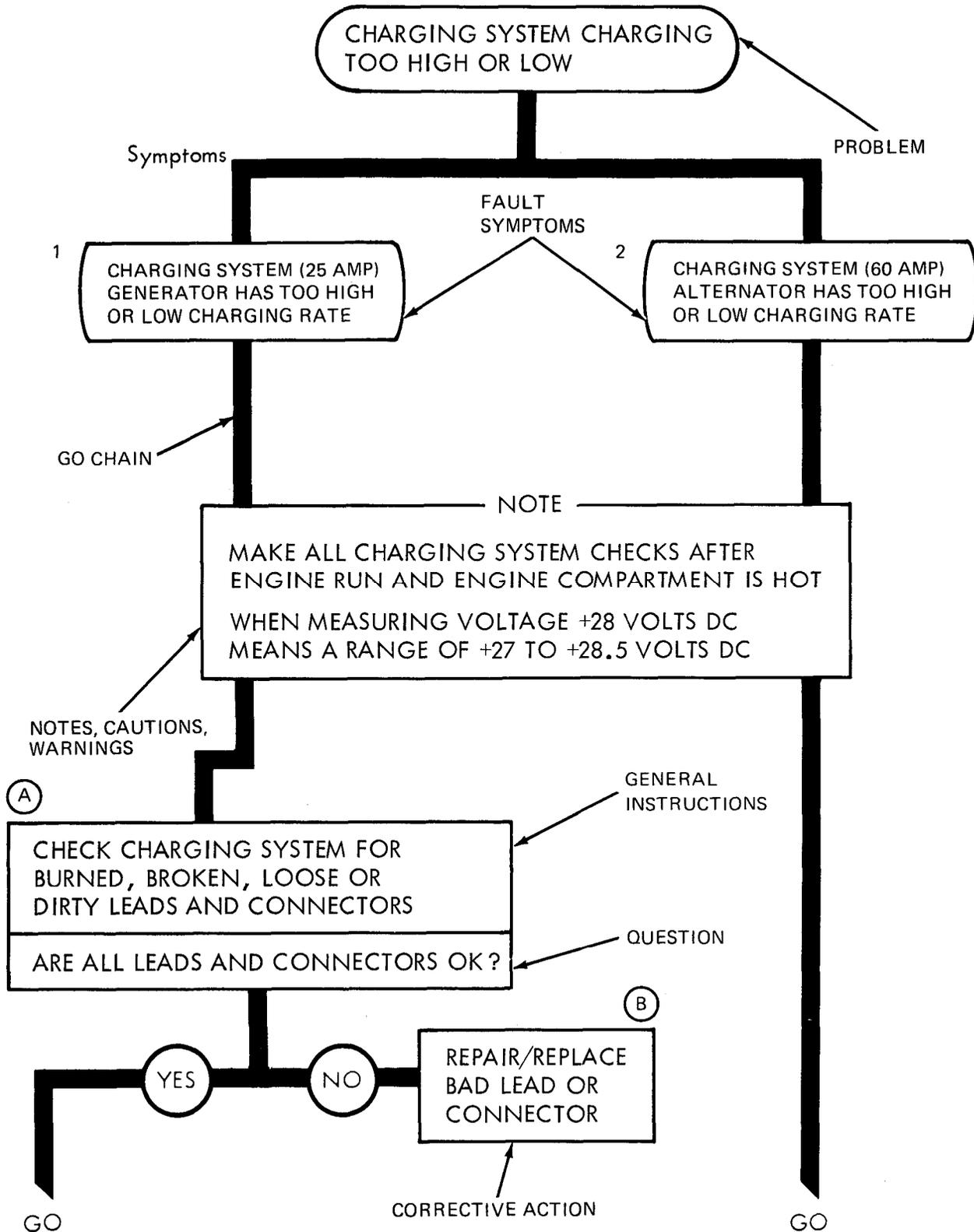


Figure 7-3 (Sheet 1 of 2)

TA 115277

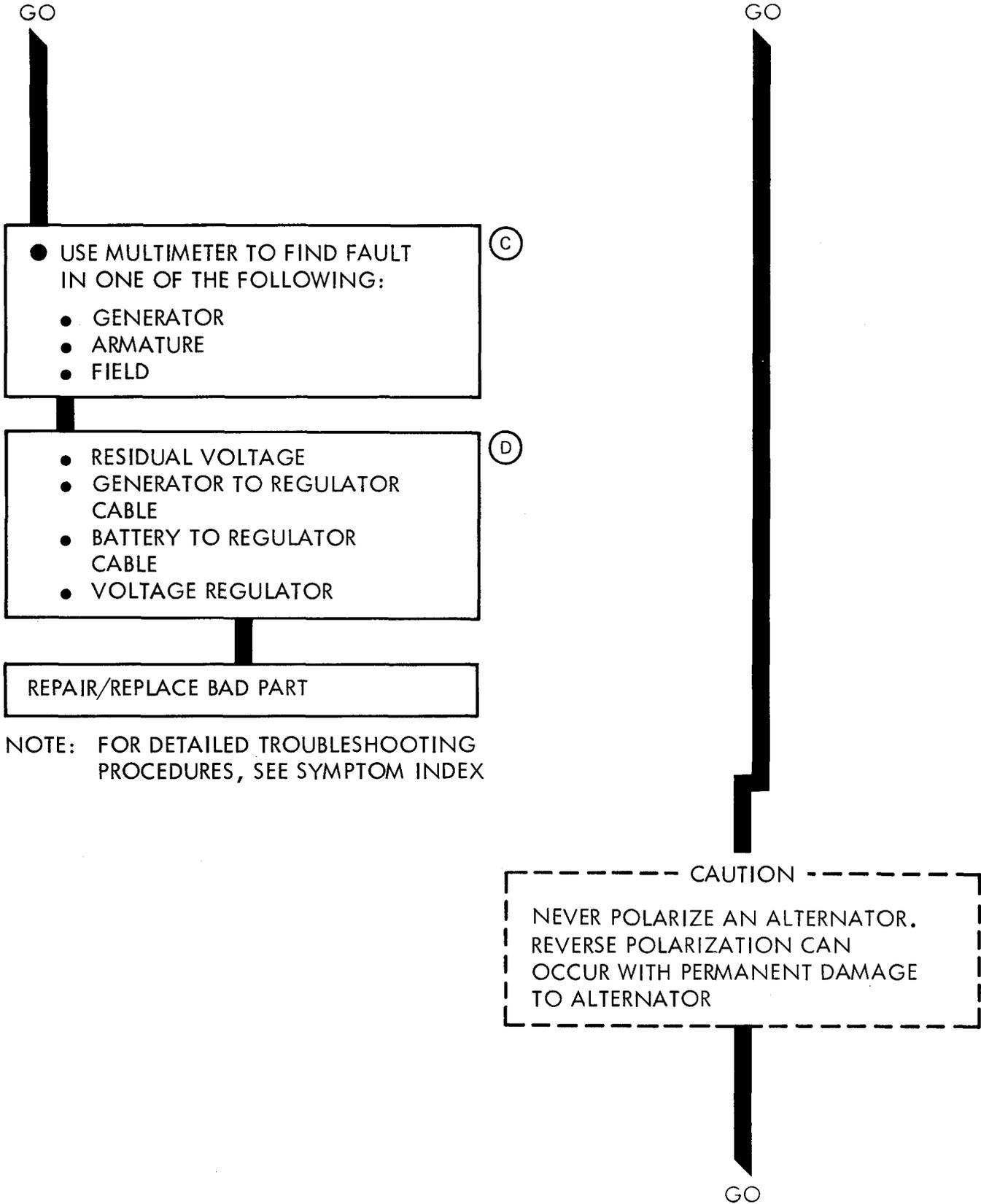


Figure 7-3 (Sheet 2 of 2)

CHAPTER 8

ENGINE SYSTEM TROUBLESHOOTING

8-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the engine system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

8-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

NOTE

All references to TM 9-2320-211-10 in this publication apply to the TM 9-2320-211-10 series.

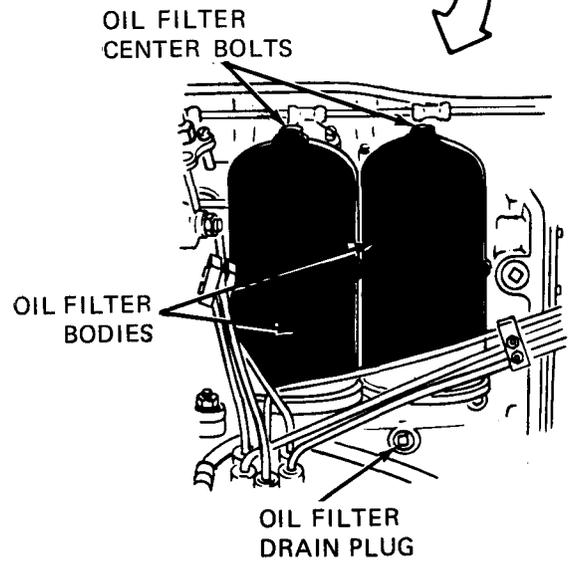
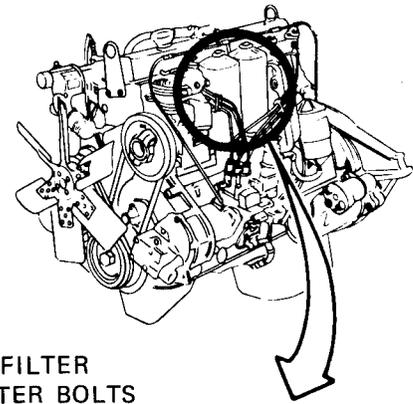
Symptom

1 LOW OIL PRESSURE

- 1
- Make truck ready for work on engine
 - Park truck. Refer to TM 9-2320-211-10
 - Chock wheels

- 2
- Check oil filter gaskets
 - Look for signs of oil leaks at bottom of oil filter bodies
 - Feel for loose center bolt on filter
 - Check oil filter drain plug
 - Look for signs of oil leaking from drain plug
 - Feel for a loose plug
- Are oil filter gaskets and oil filter drain plug OK?

GO



TA 115563

Figure 8-1 (Sheet 1 of 4)

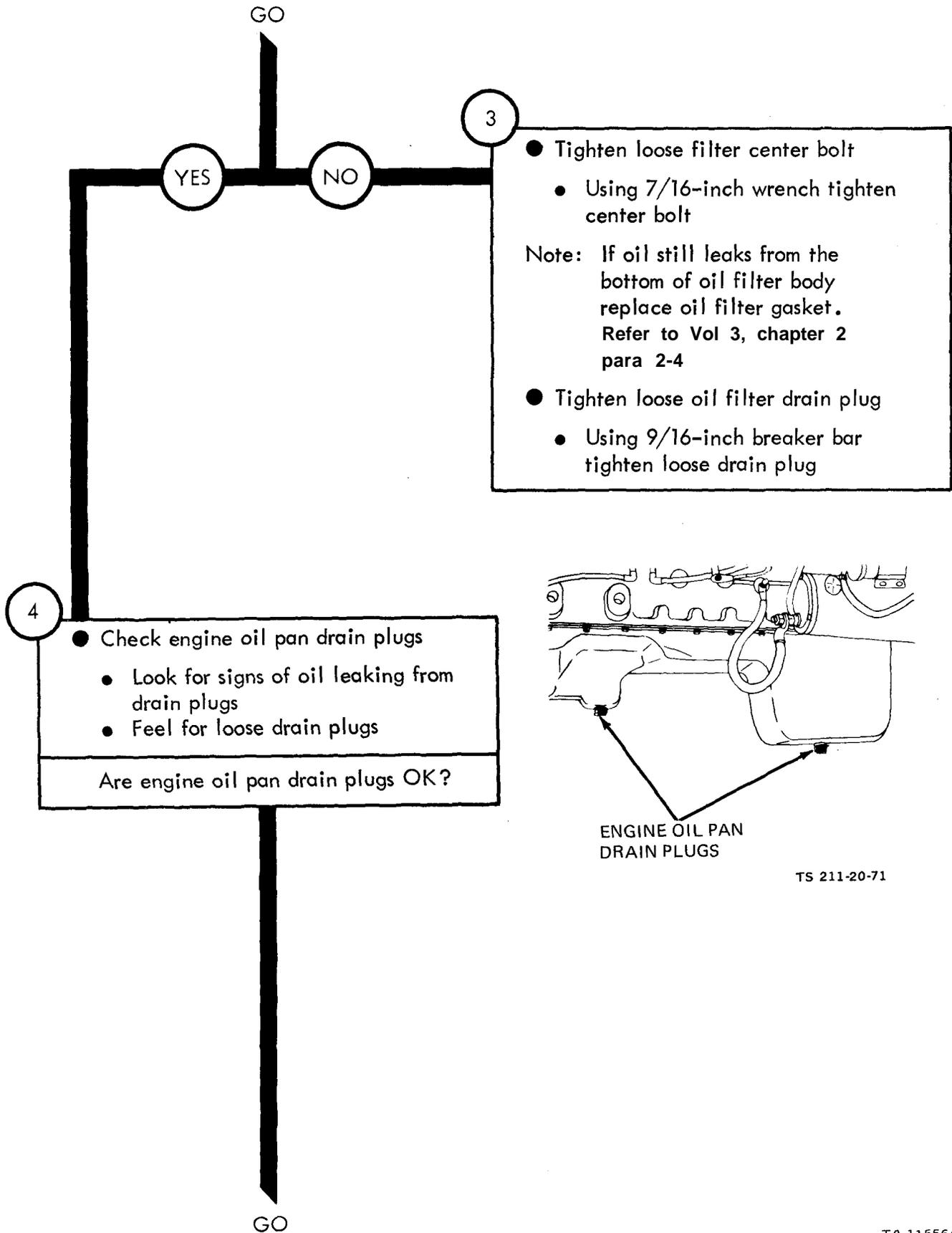
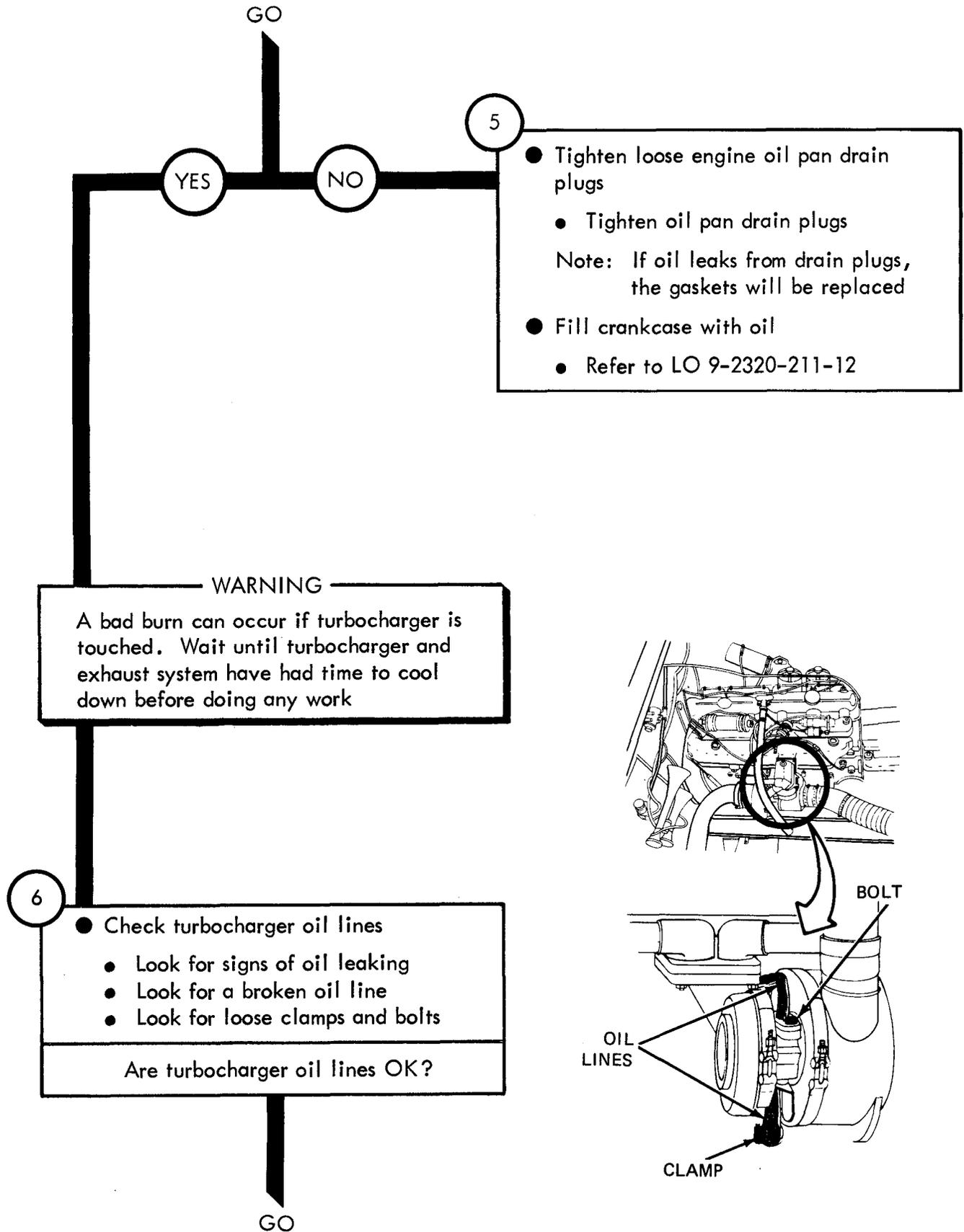


Figure 8-1 (Sheet 2 of 4)



TA 115565

Figure 8-1 (Sheet 3 of 4)

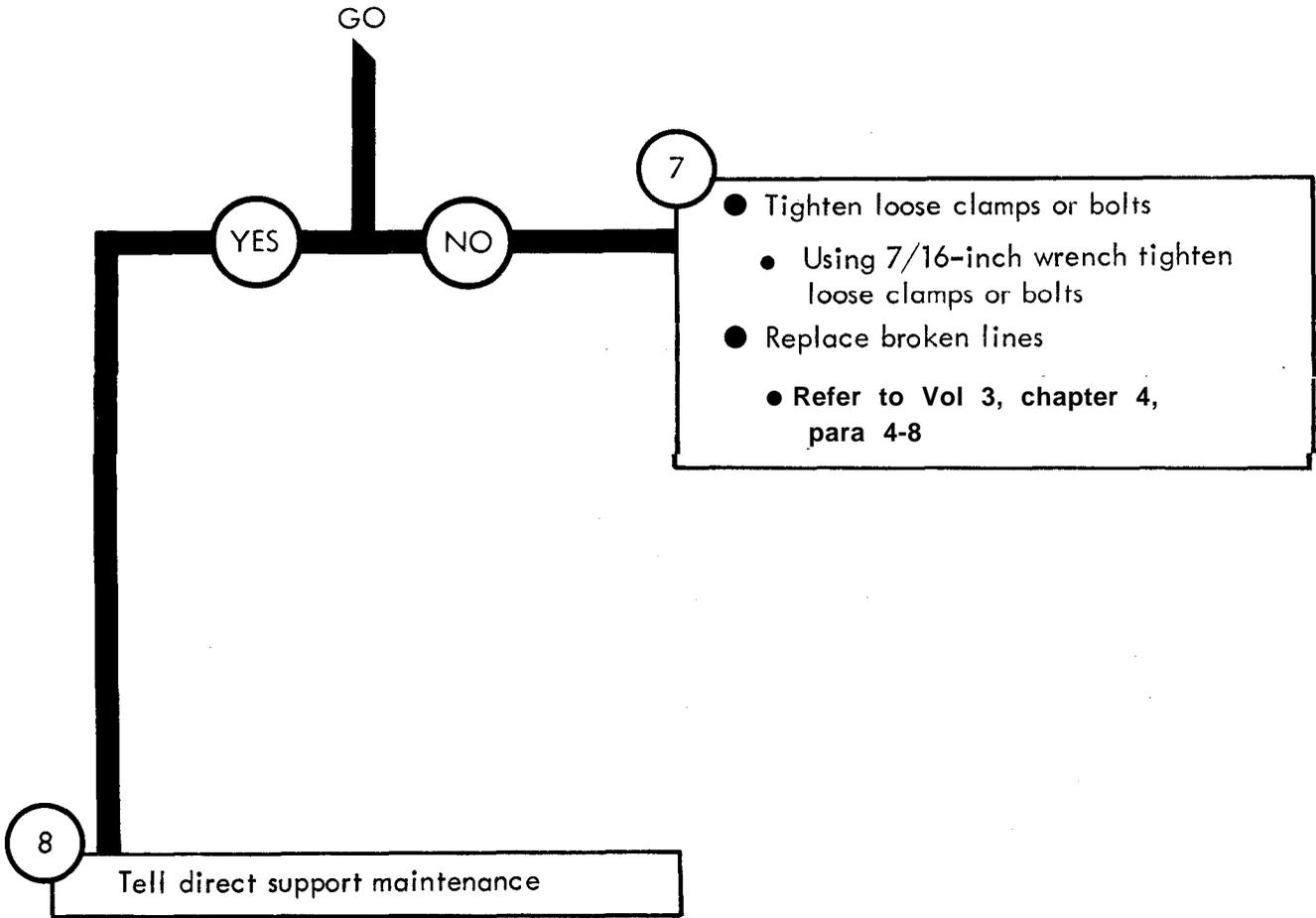


Figure 8-1 (Sheet 4 of 4)

Symptom

2

ENGINE USES MORE OIL THAN NORMAL

1

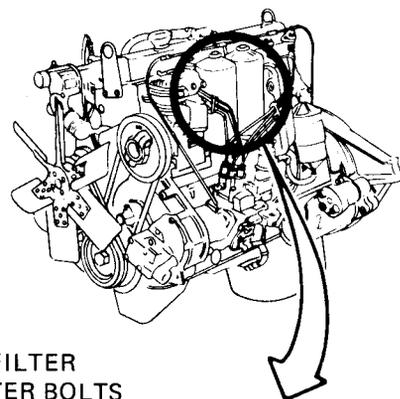
- Make truck ready for work on engine system
 - Park truck. Refer to TM 9-2320-211-10
 - Chock wheels

2

- Check oil filter gaskets
 - Look for signs of oil leaks at bottom of oil filter bodies
 - Feel for loose center bolt
- Check oil filter drain plug
 - Look for signs of oil leaking from drain plug
 - Feel for a loose plug

Are oil filter gaskets and oil filter drain plug OK?

GO



OIL FILTER CENTER BOLTS

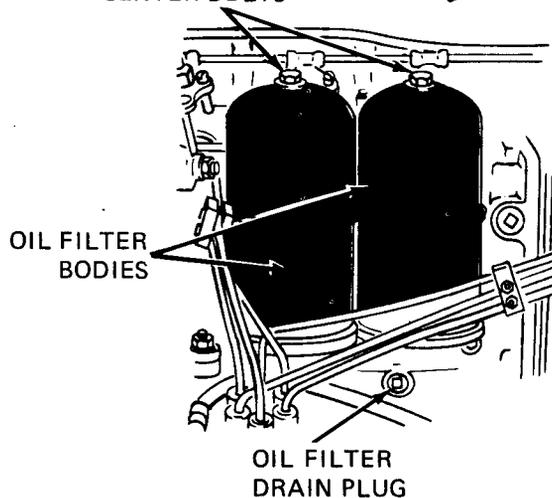


Figure 8-2 (Sheet 1 of 4)

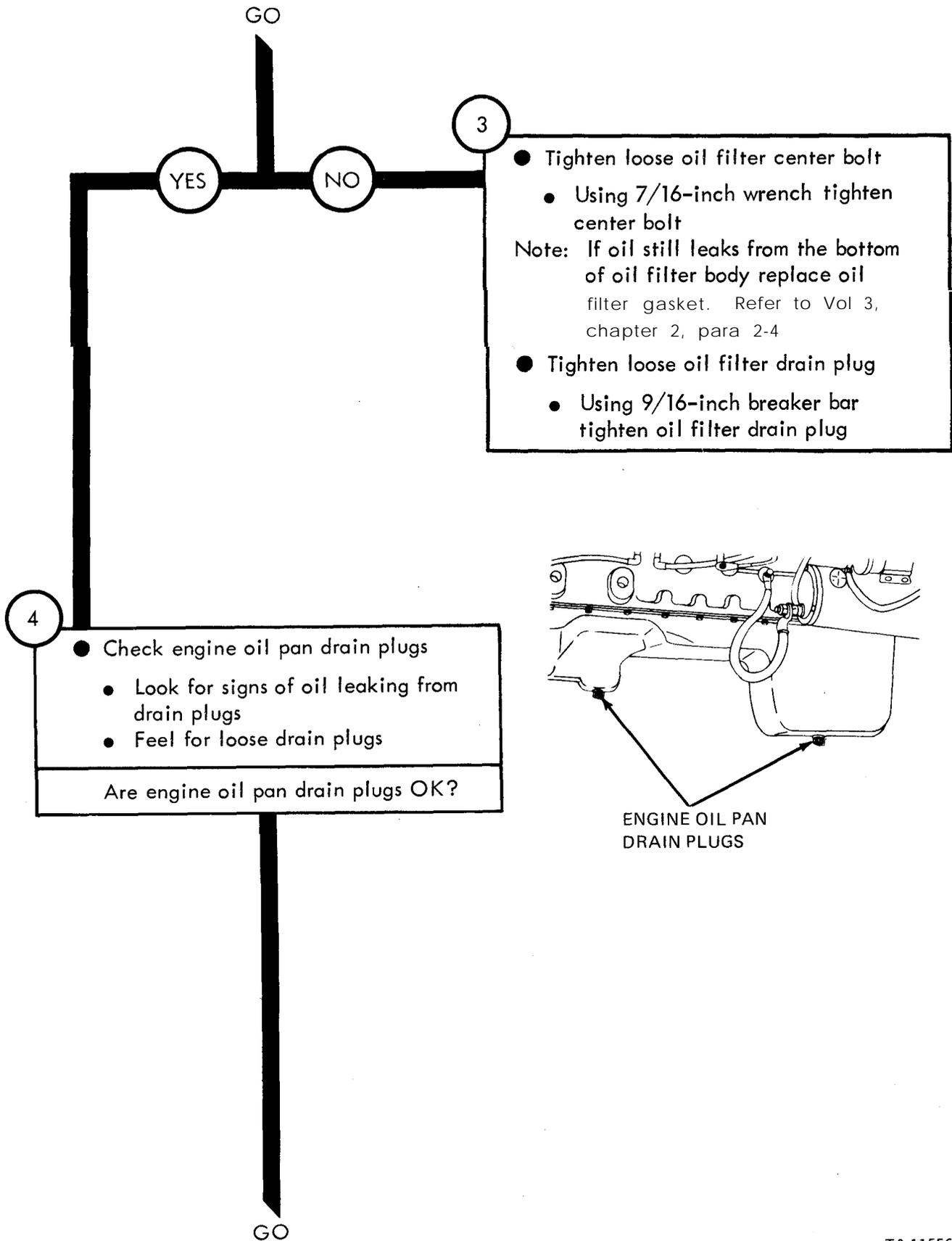
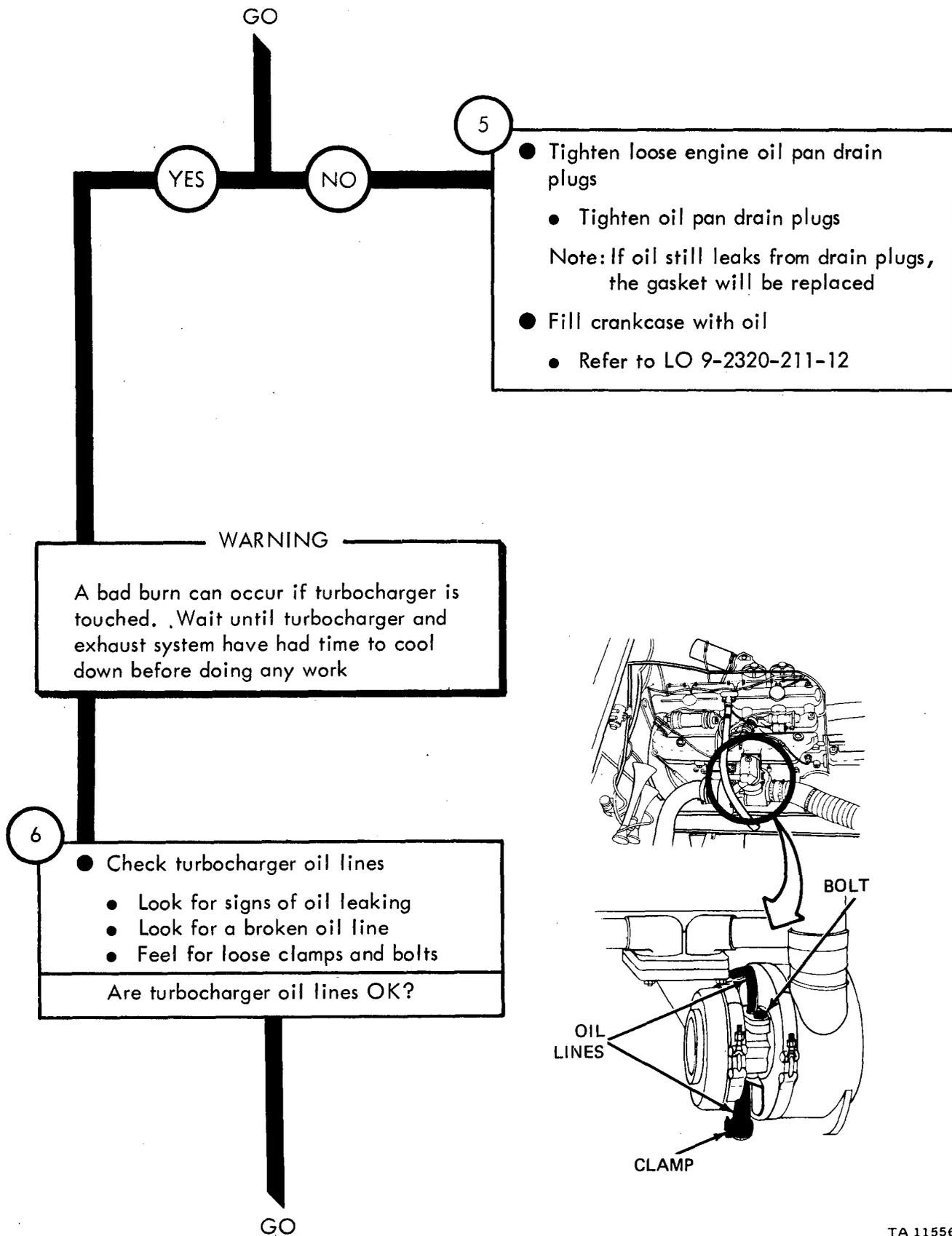


Figure 8-2 (Sheet 2 of 4)



TA 115569

Figure 8-2 (Sheet 3 of 4)

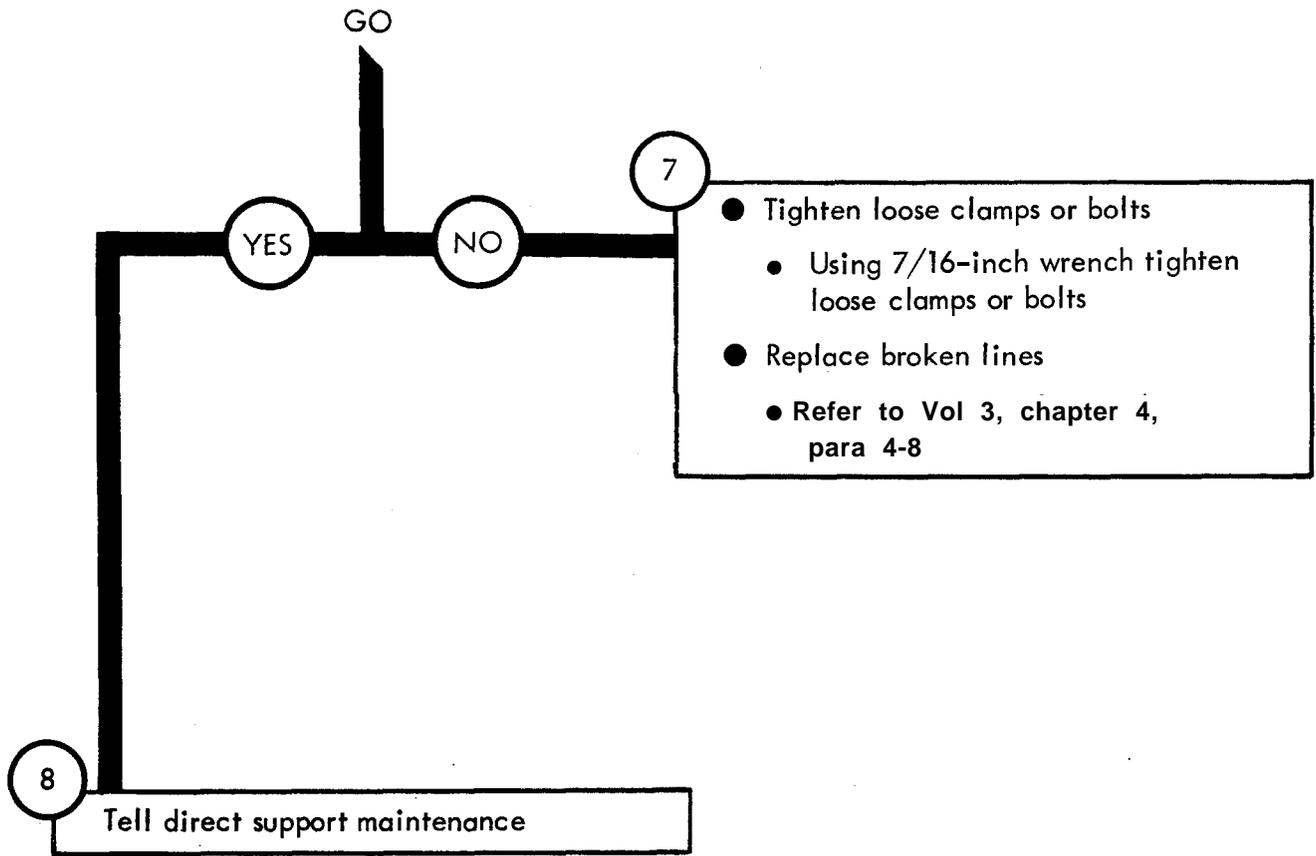


Figure 8-2 (Sheet 4 of 4)

CHAPTER 9

ENGINE SYSTEM TROUBLESHOOTING SUMMARY

9-1. GENERAL. This chapter gives a summary of troubleshooting procedures given in chapter 8, for the Engine System.

9-2. PROCEDURES. The summary in this chapter covers all fault symptoms found in the detailed troubleshooting procedures. Chapter 7 outlines a sample troubleshooting procedure. The summary procedures are based on the "what-to-do" portions of the detailed procedures and do not include the "How-to-do-it" instructions. Warnings, cautions, and notes are given where needed.

ENGINE SYSTEM - LUBRICATING SUBSYSTEM TROUBLESHOOTING SUMMARY

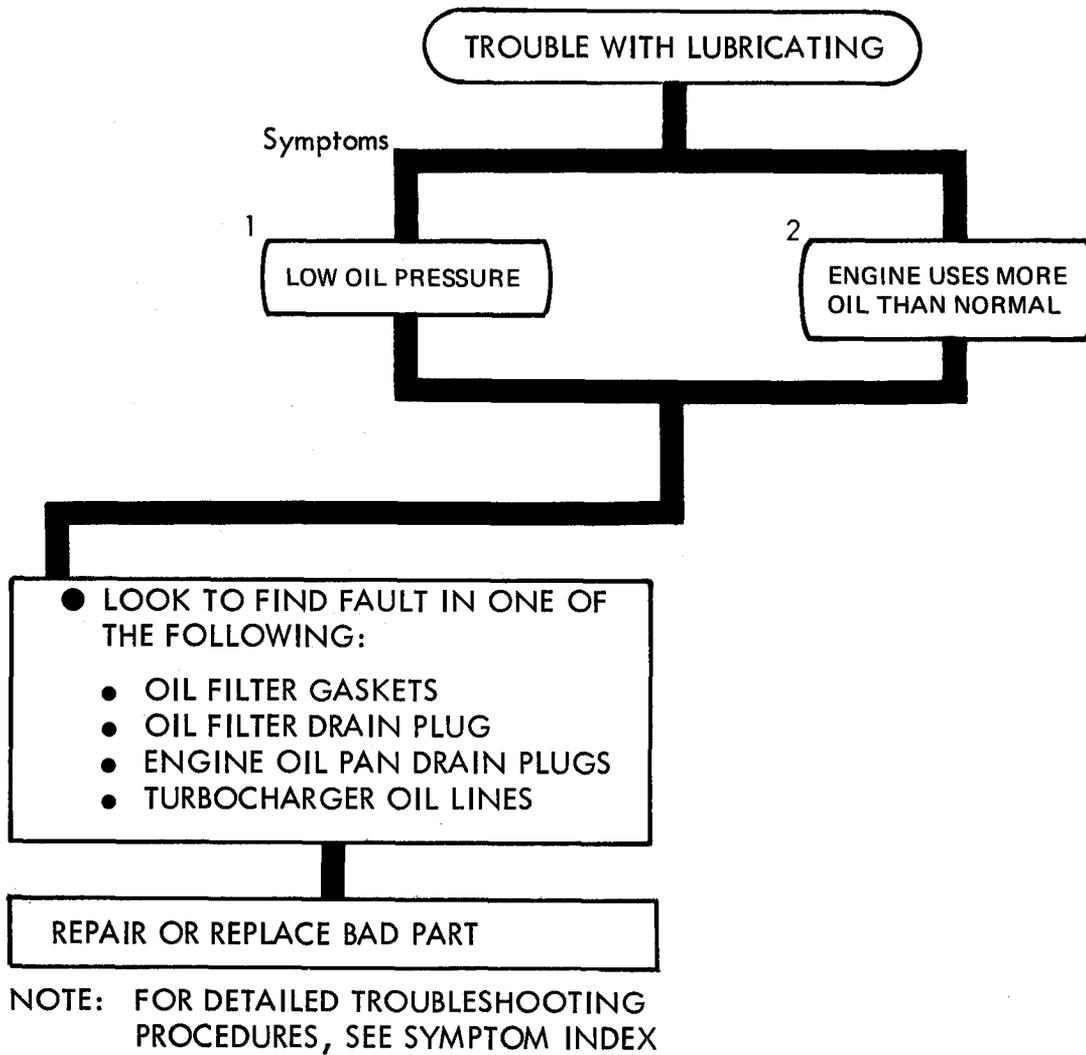


Figure 9-1

ENGINE SYSTEM - ENGINE MOUNT SUBSYSTEM TROUBLESHOOTING SUMMARY

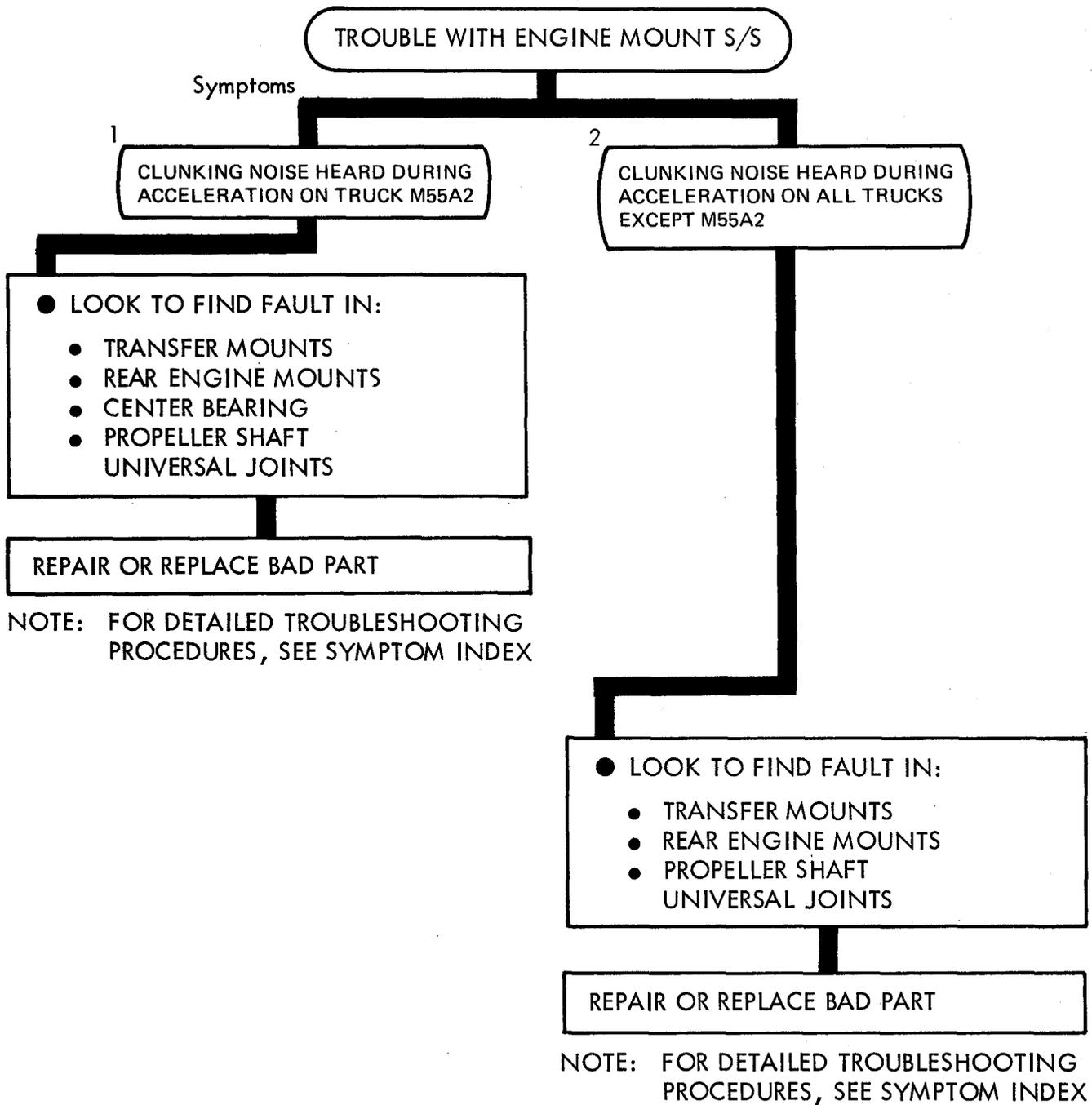


Figure 9-2

TA 120651

CHAPTER 10

ENGINE DRIVELINE SUBSYSTEM TROUBLESHOOTING

10-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the engine mount subsystem, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

10-2. EQUIPMENT ITEMS NOT COVERED . All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

Symptom

1 CLUNKING NOISE HEARD DURING ACCELERATION ON TRUCK M55A2

- 1
- Make truck ready for work on propeller shafts
 - Park truck. Refer to TM 9-2320-211-10
 - Chock wheels

NOTE

Transfer mounts are not part of the engine system. However the transfer mounts should be checked as a cause of the clunking noise

- 2
- Check transfer mounts
 - Crawl under truck
 - Look for a broken transfer mount. See figure 35-1
 - Look for missing transfer mount nuts or bolts
 - Using two 9/16-inch wrenches feel if transfer mount nuts are loose
 - Using two 9/16-inch wrenches feel if transfer mount nuts and bolts are loose
- Are transfer mounts OK?

GO

Figure 10-1 (Sheet 1 of 4)

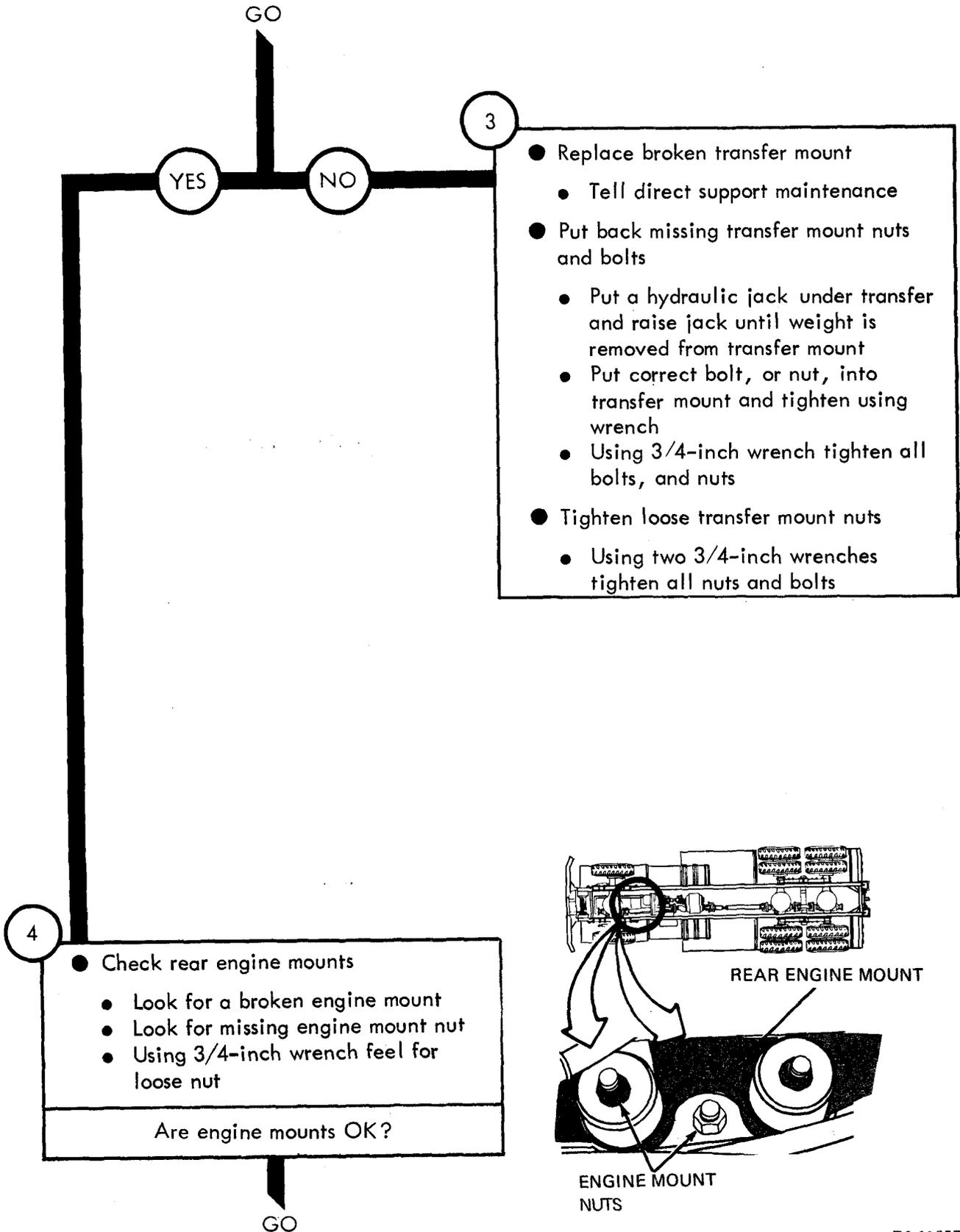
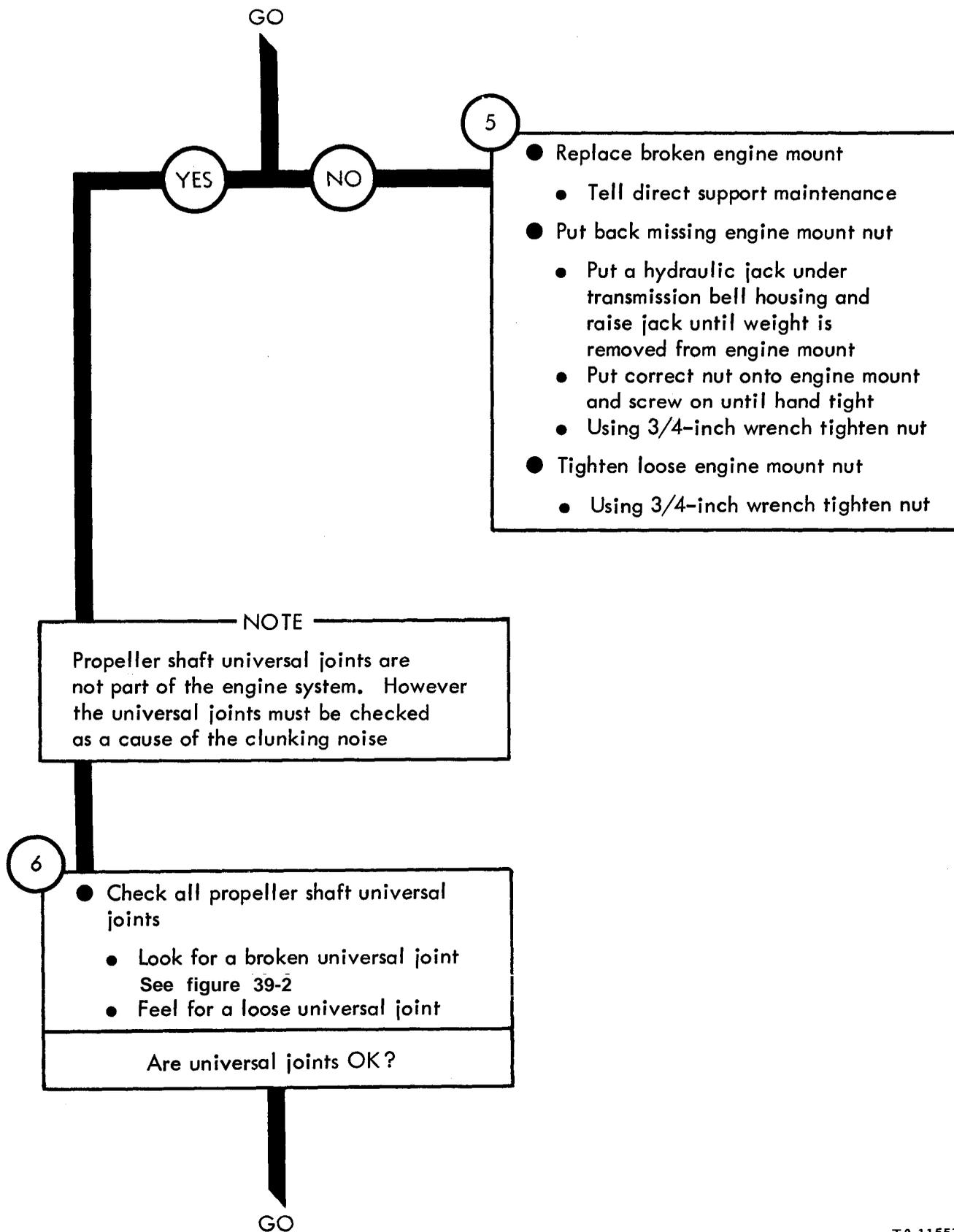


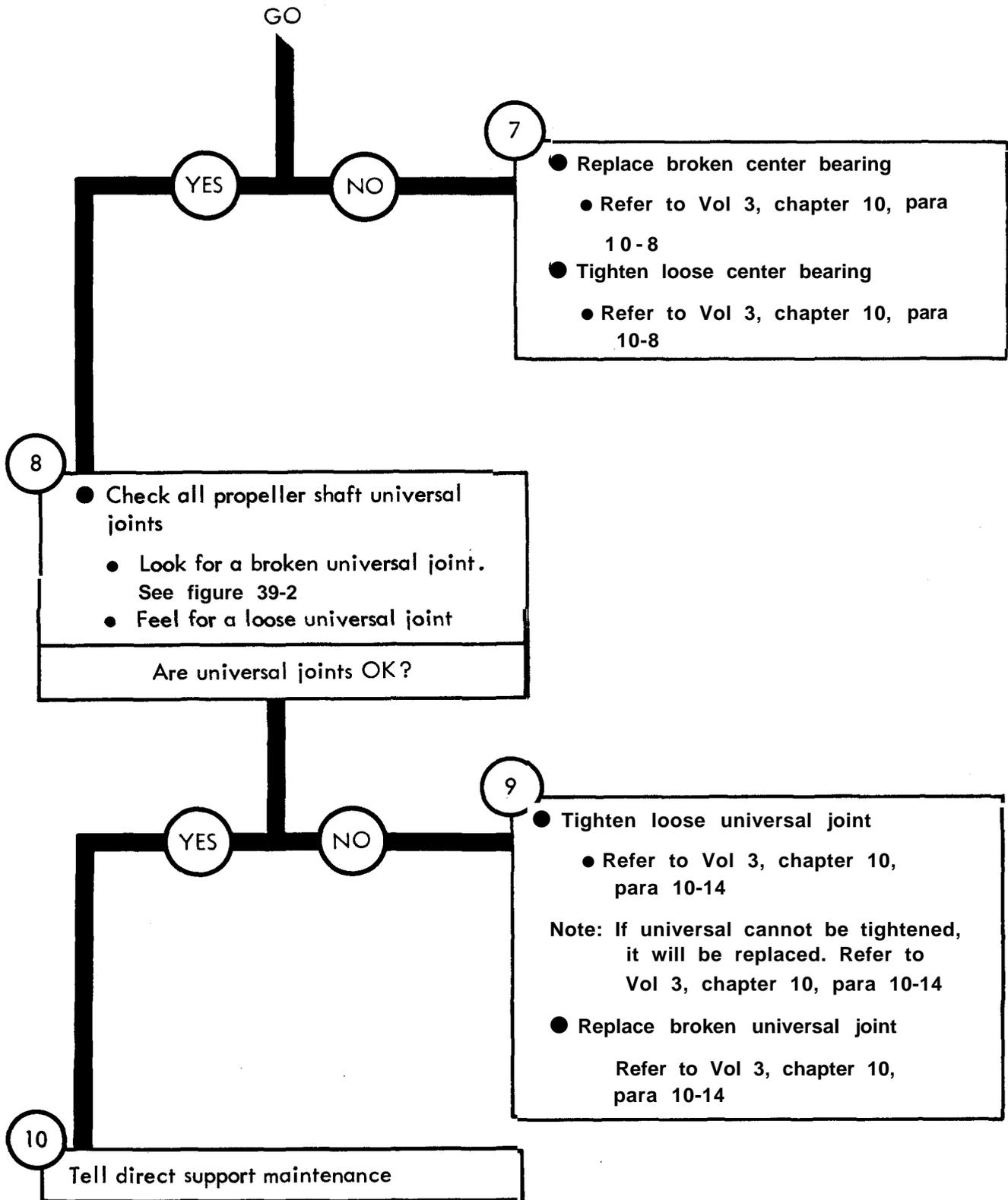
Figure 10-1 (Sheet 2 of 4)

TA 115573



TA 115574

Figure 10-1 (Sheet 3 of 4)



TA 115575

Figure 10-1 (Sheet 4 of 4)

Symptom

2 CLUNKING NOISE HEARD DURING ACCELERATION ON ALL TRUCKS EXCEPT M55A2

- 1
- Make truck ready for work on propeller shafts
 - Park truck. Refer to procedures given in TM 9-2320-211-10
 - Chock wheels

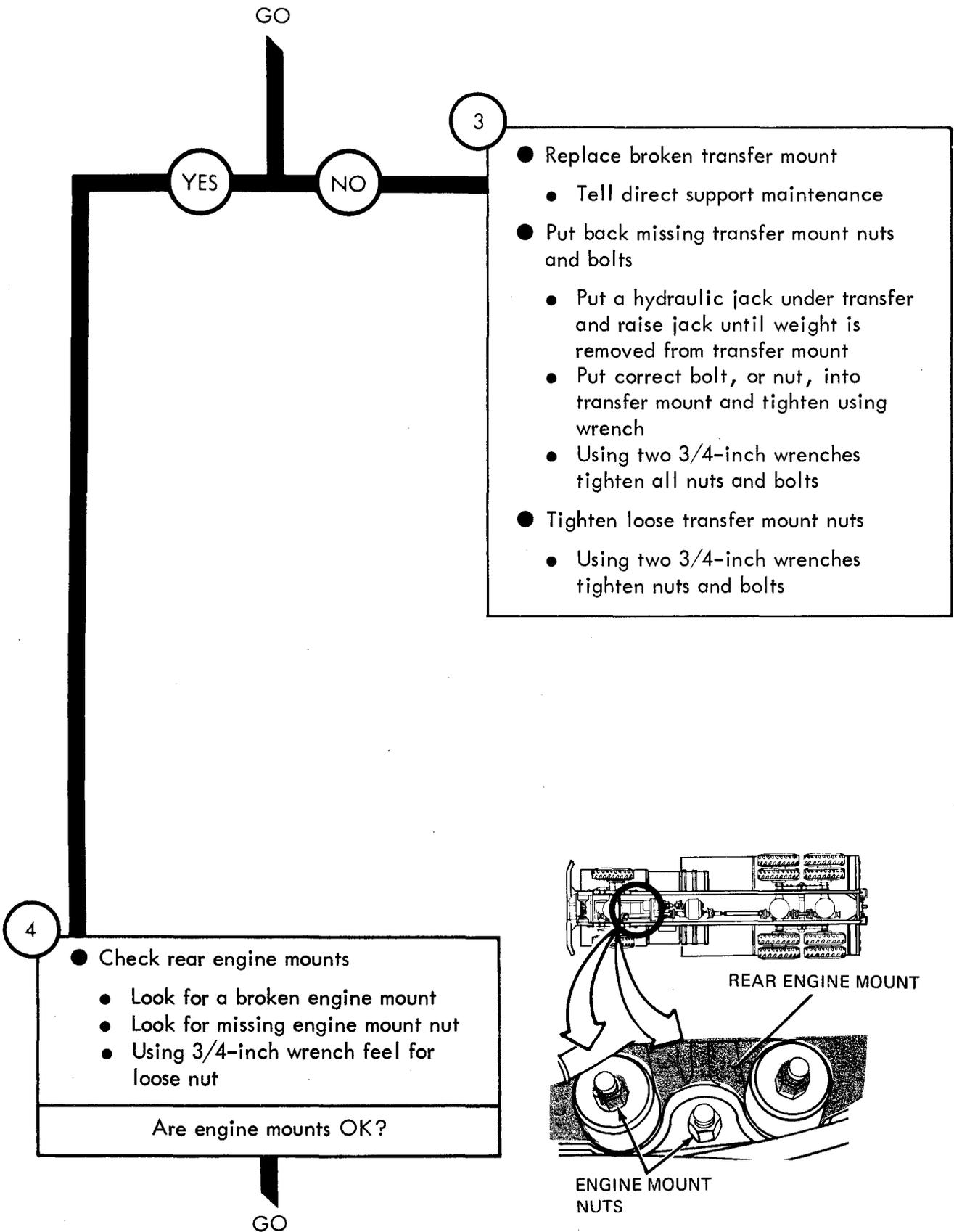
NOTE

Transfer mounts are not part of the engine system. However the transfer mounts must be checked as a cause of the clunking noise

- 2
- Check transfer mounts
 - Crawl under truck
 - Look for a broken transfer mount. See figure 35-1
 - Look for missing transfer mount nuts or bolts
 - Using two 9/16-inch wrenches feel if transfer mount nuts and bolts are loose
- Are transfer mounts OK?

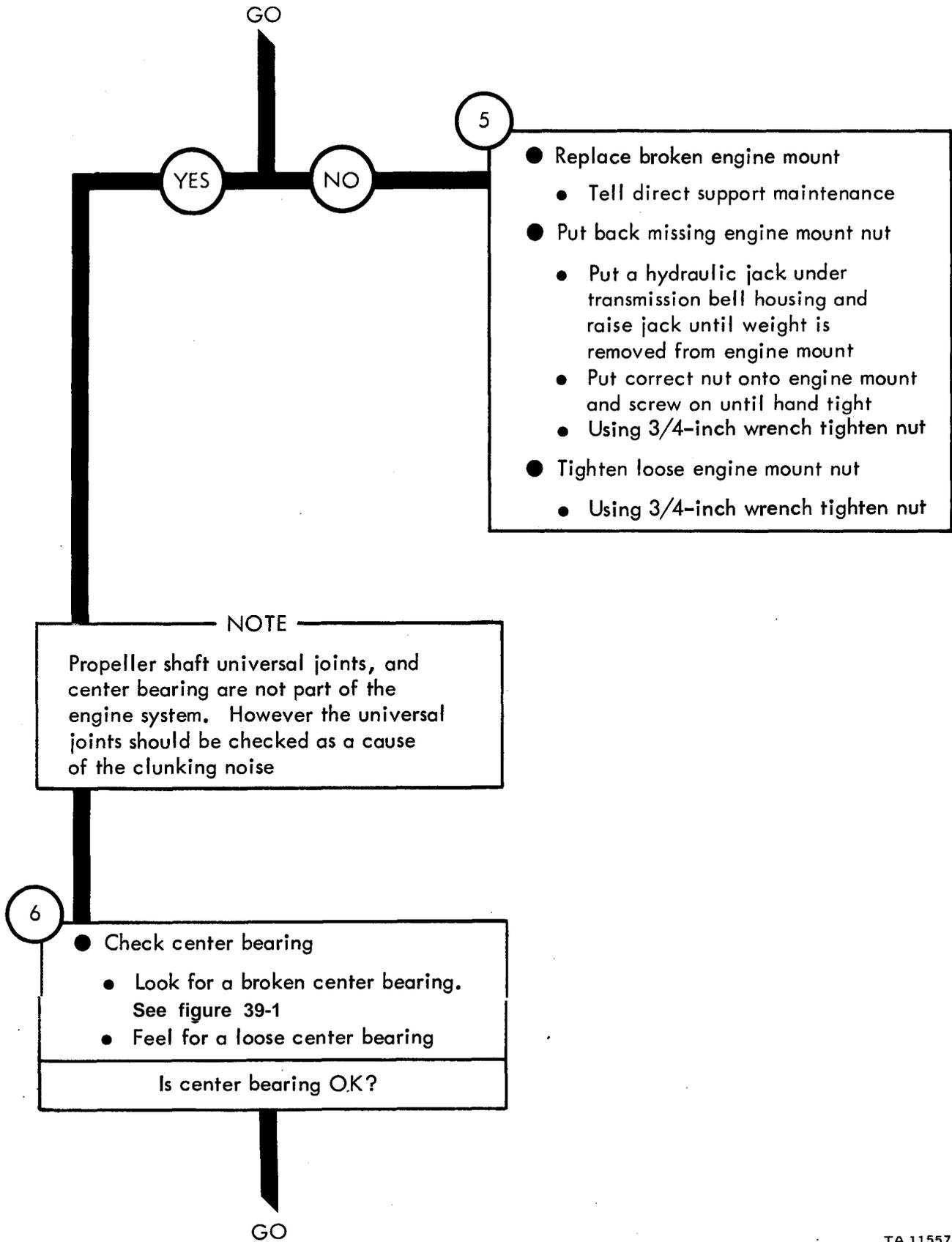
GO

Figure 10-2 (Sheet 1 of 4)



TA 115577

Figure 10-2 (Sheet 2 of 4)



TA 115578

Figure 10-2 (Sheet 3 of 4)

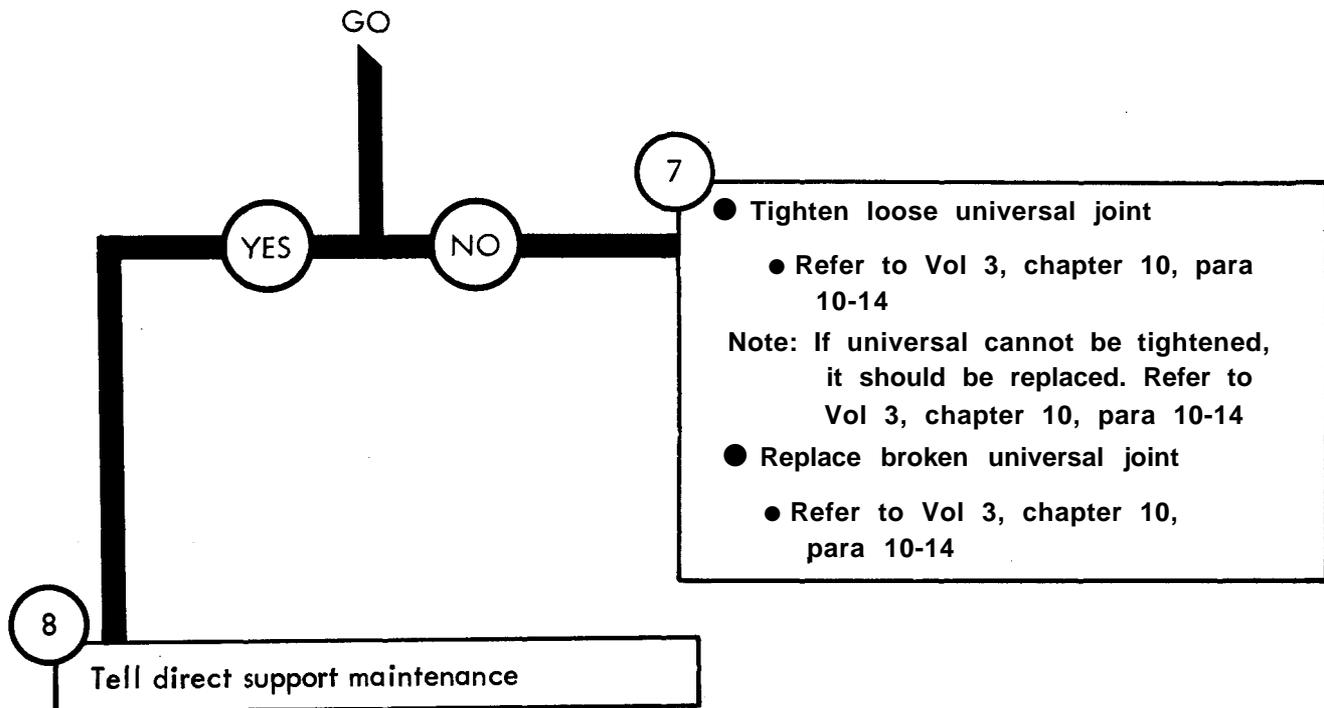


Figure 10-2 (Sheet 4 of 4)

CHAPTER 11

CLUTCH SYSTEM TROUBLESHOOTING

11-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the clutch system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

11-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

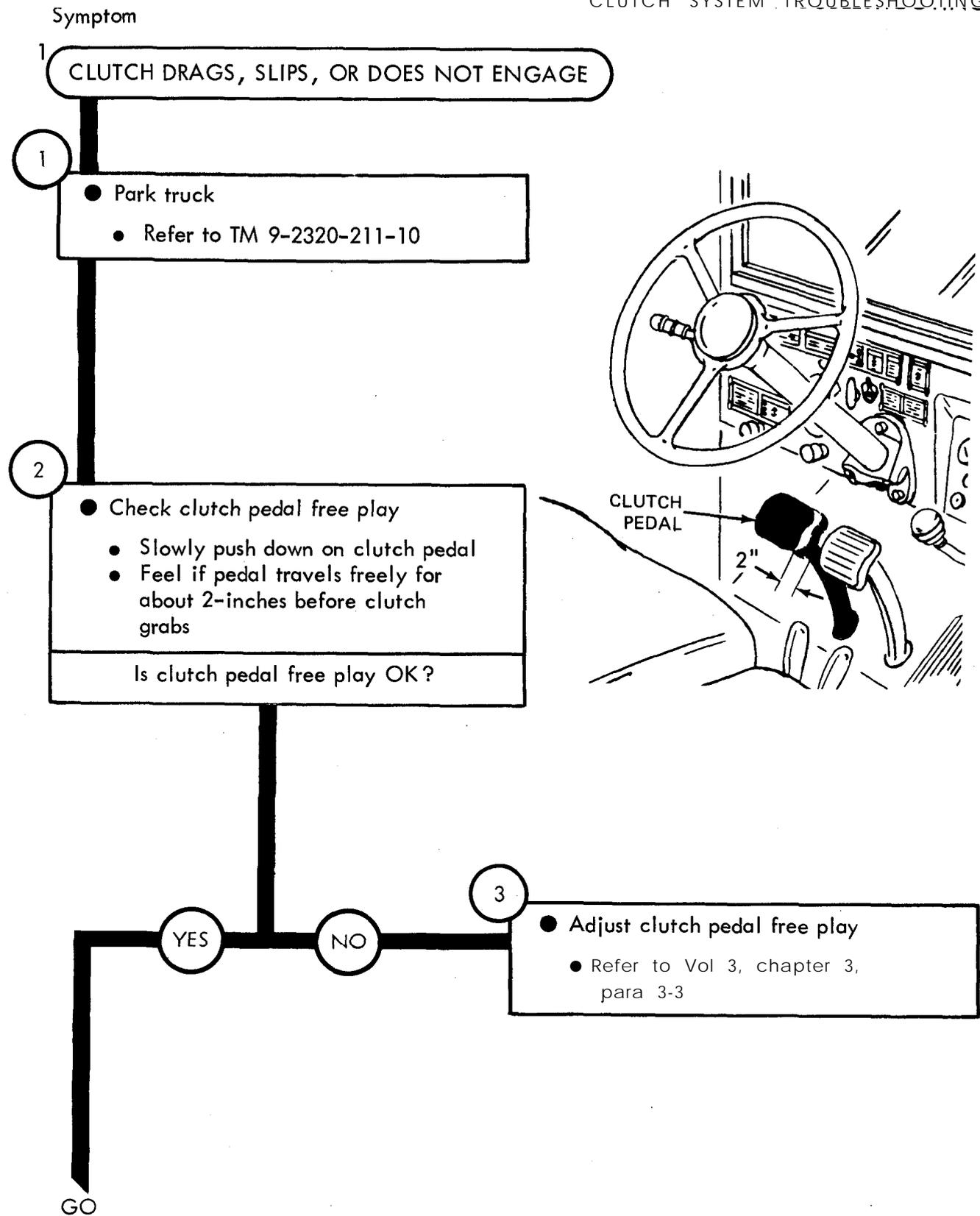


Figure 11-1 (Sheet 1 of 2)

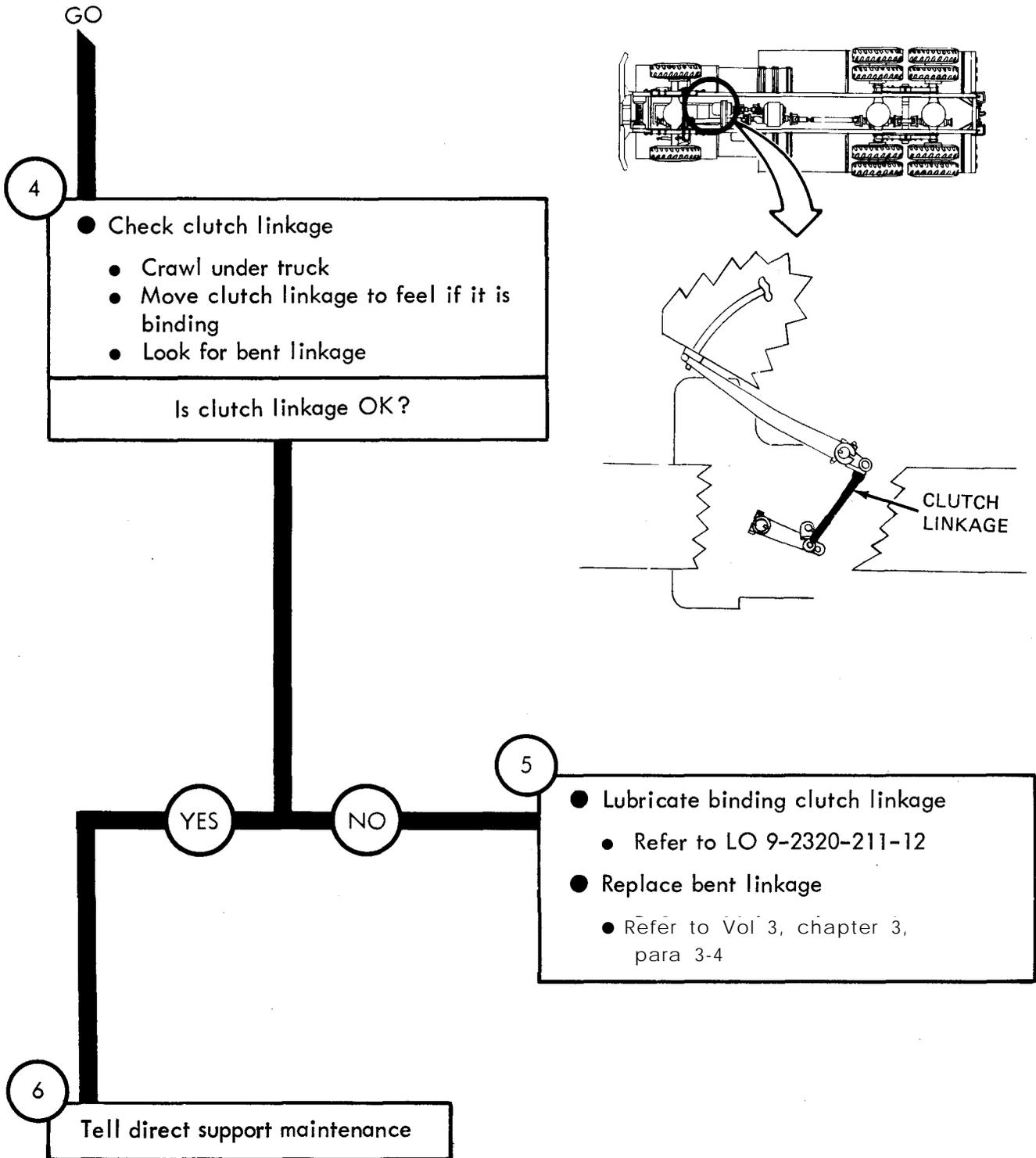
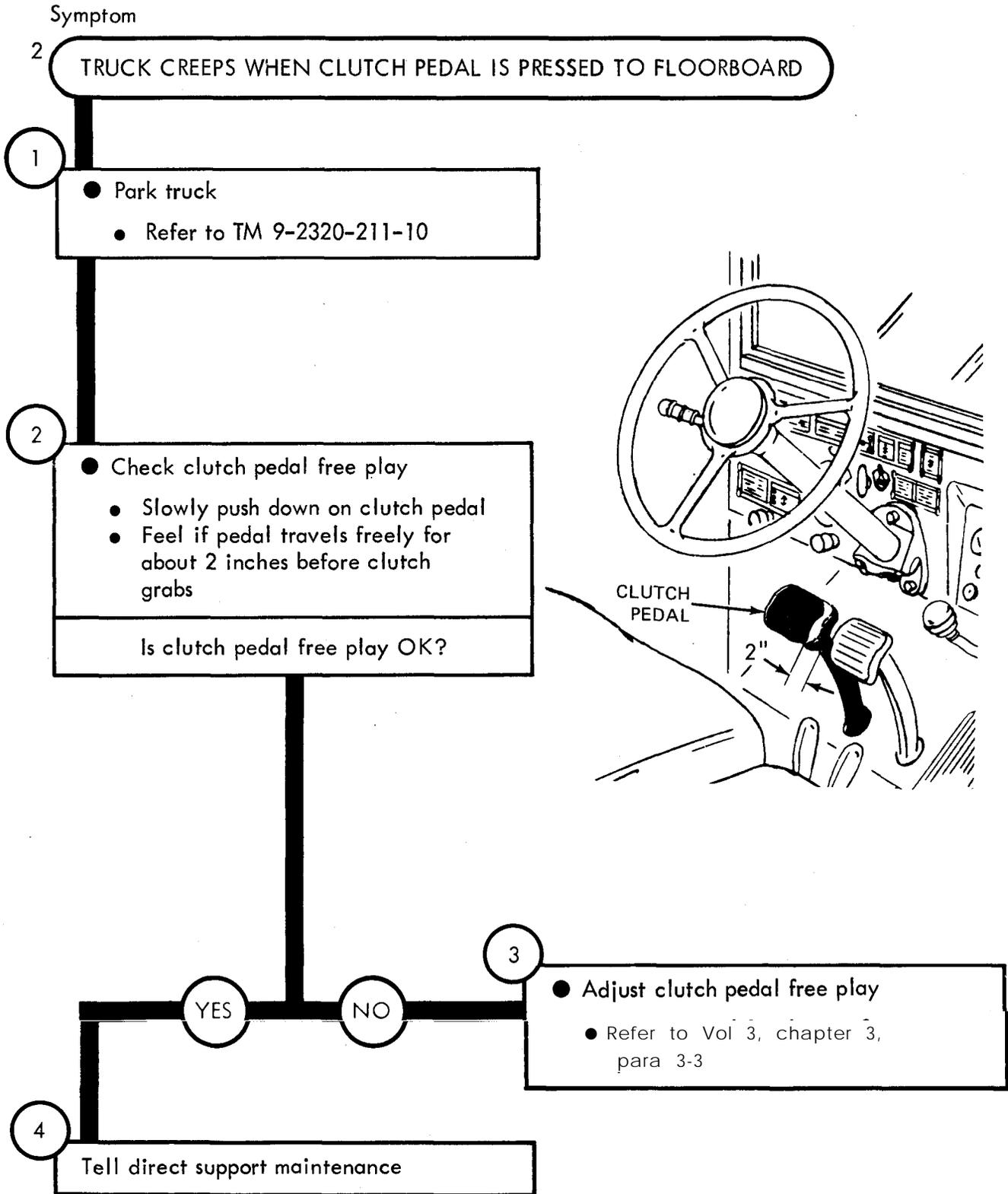
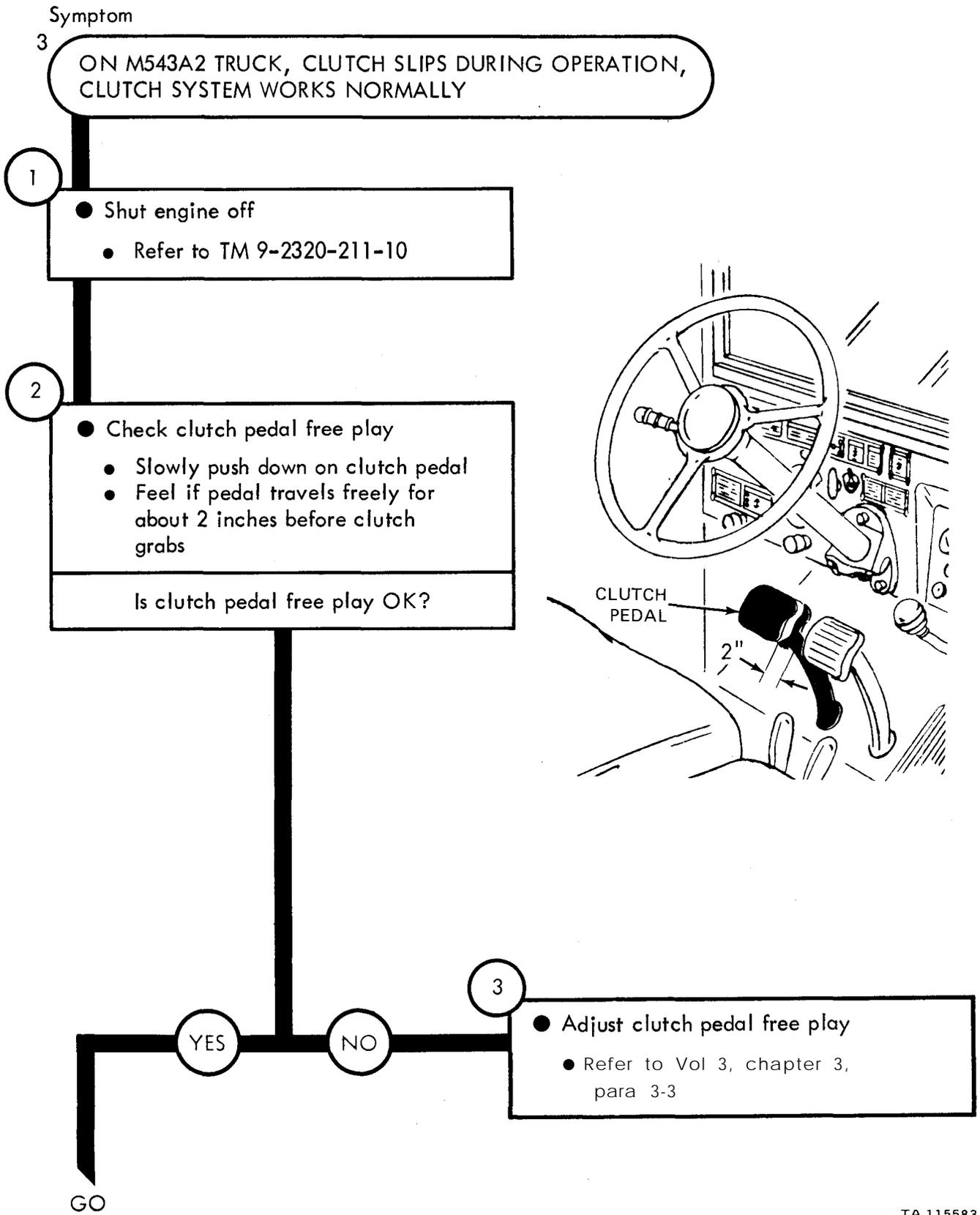


Figure 11-1 (Sheet 2 of 2)



TA 115582

Figure 11-2



TA 115583

Figure 11-3 (Sheet 1 of 4)

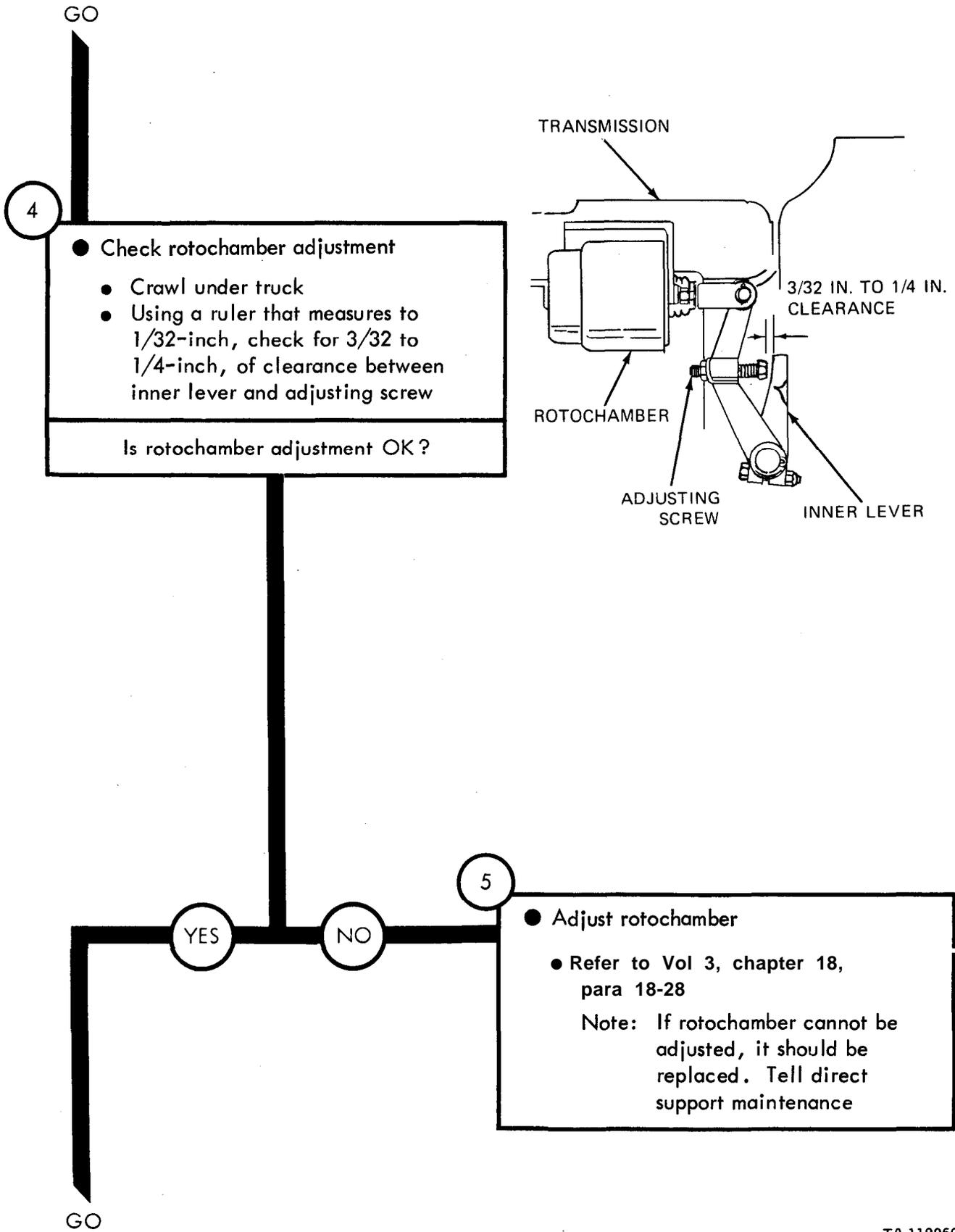


Figure 11-3 (Sheet 2 of 4)

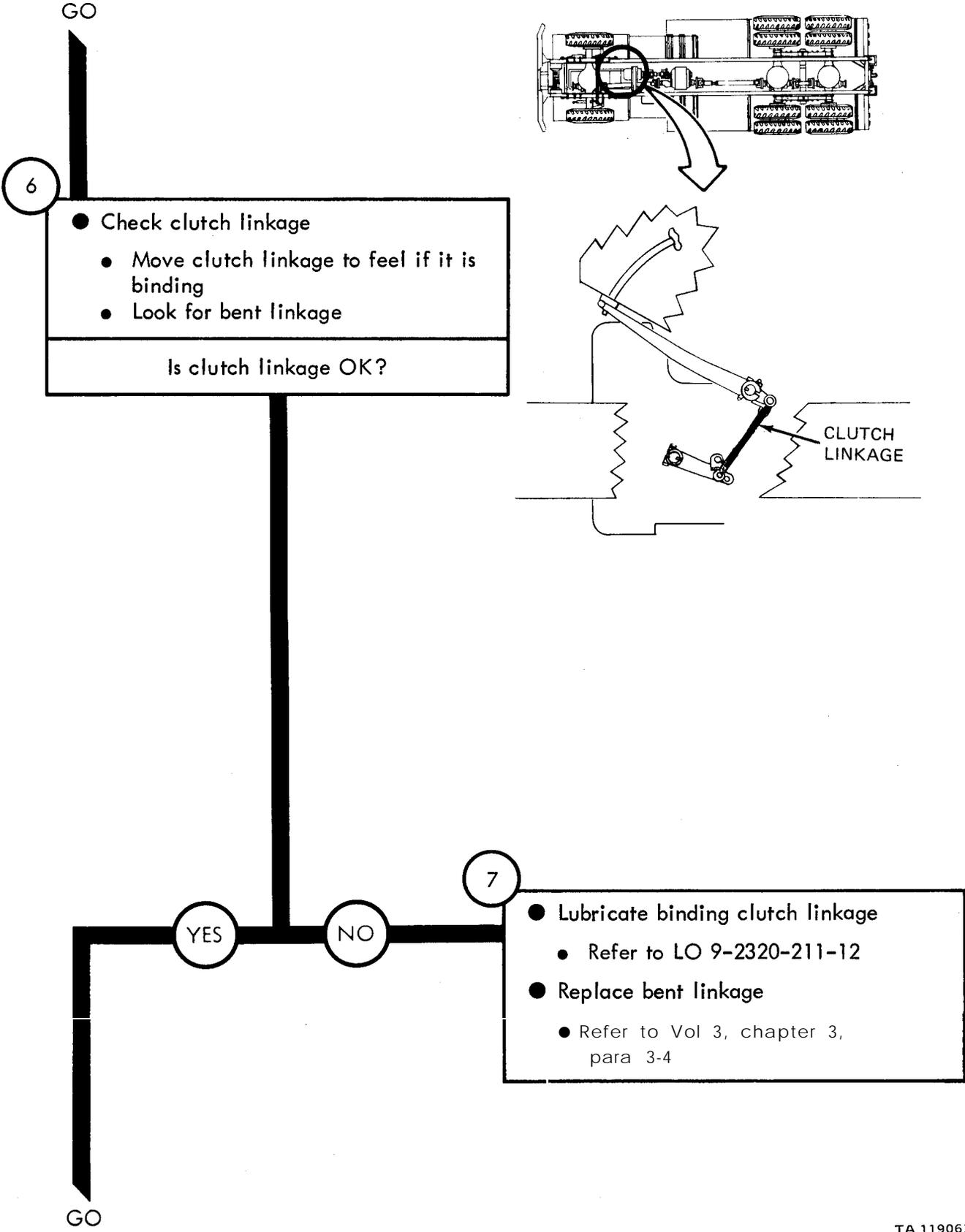


Figure 11-3 (Sheet 3 of 4)

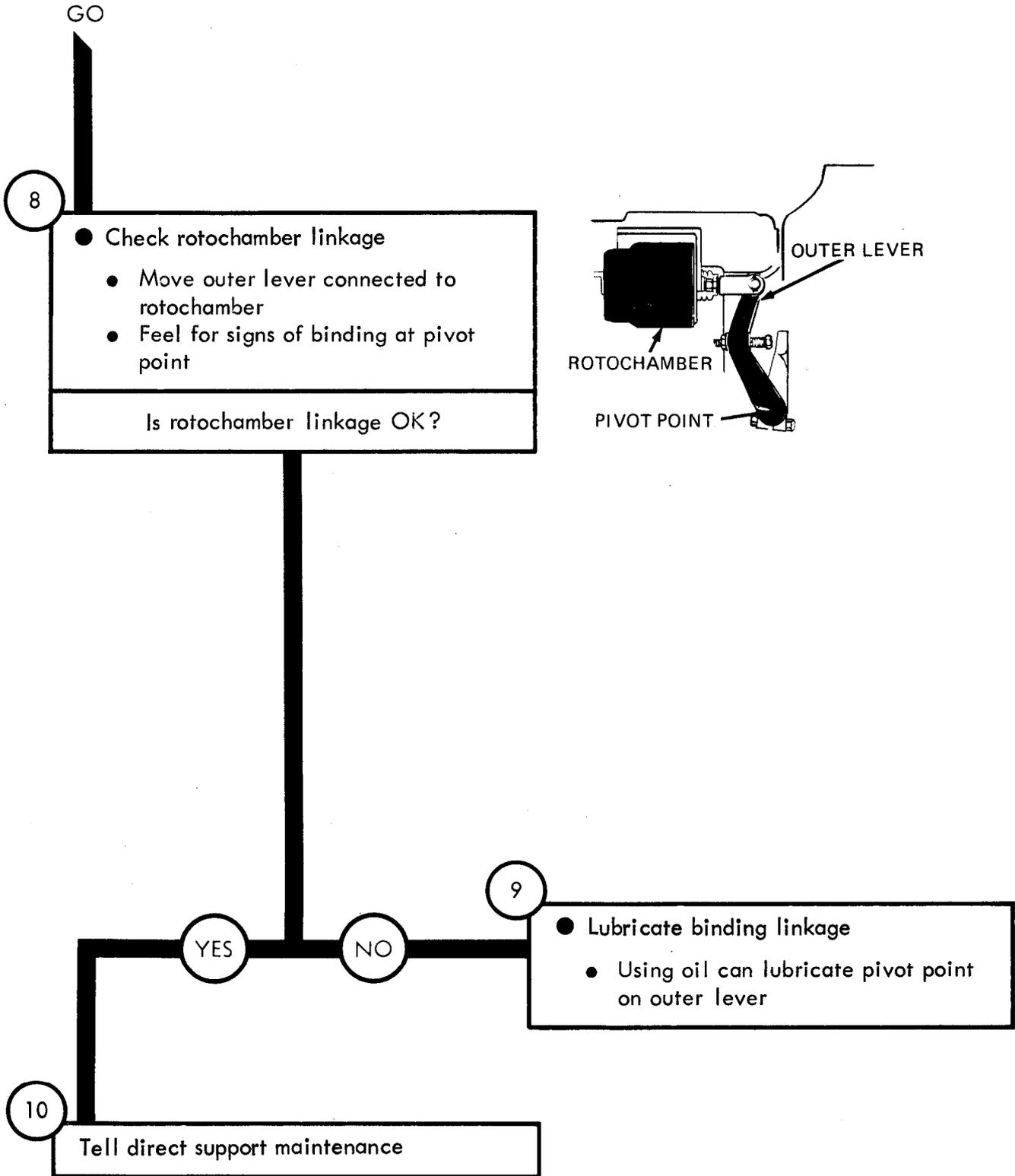


Figure 11-3 (Sheet 4 of 4)

Symptom

4

CLUTCH DOES NOT ENGAGE WHEN ENGINE CLUTCH CONTROL LEVER IS PUSHED DOWN ON M543A2 TRUCK, CLUTCH SYSTEM WORKS NORMALLY USING CLUTCH PEDAL IN CAB

1

- Shut engine off
 - Refer to TM 9-2320-211-10

2

- Check clutch control valve and rotochamber compressed air lines
 - Chock wheels
 - Crawl under truck
 - Look for a broken air line. See figure 48-1
 - Feel if air is leaking from fittings

Are compressed air lines OK?

YES

NO

3

- Tighten leaking air line fitting
 - Using 7/16-inch wrench tighten fitting
- Replace broken air line
 - Refer to Vol 3, chapter 9, para 9-4

GO

TA 115584

Figure 11-4 (Sheet 1 of 3)

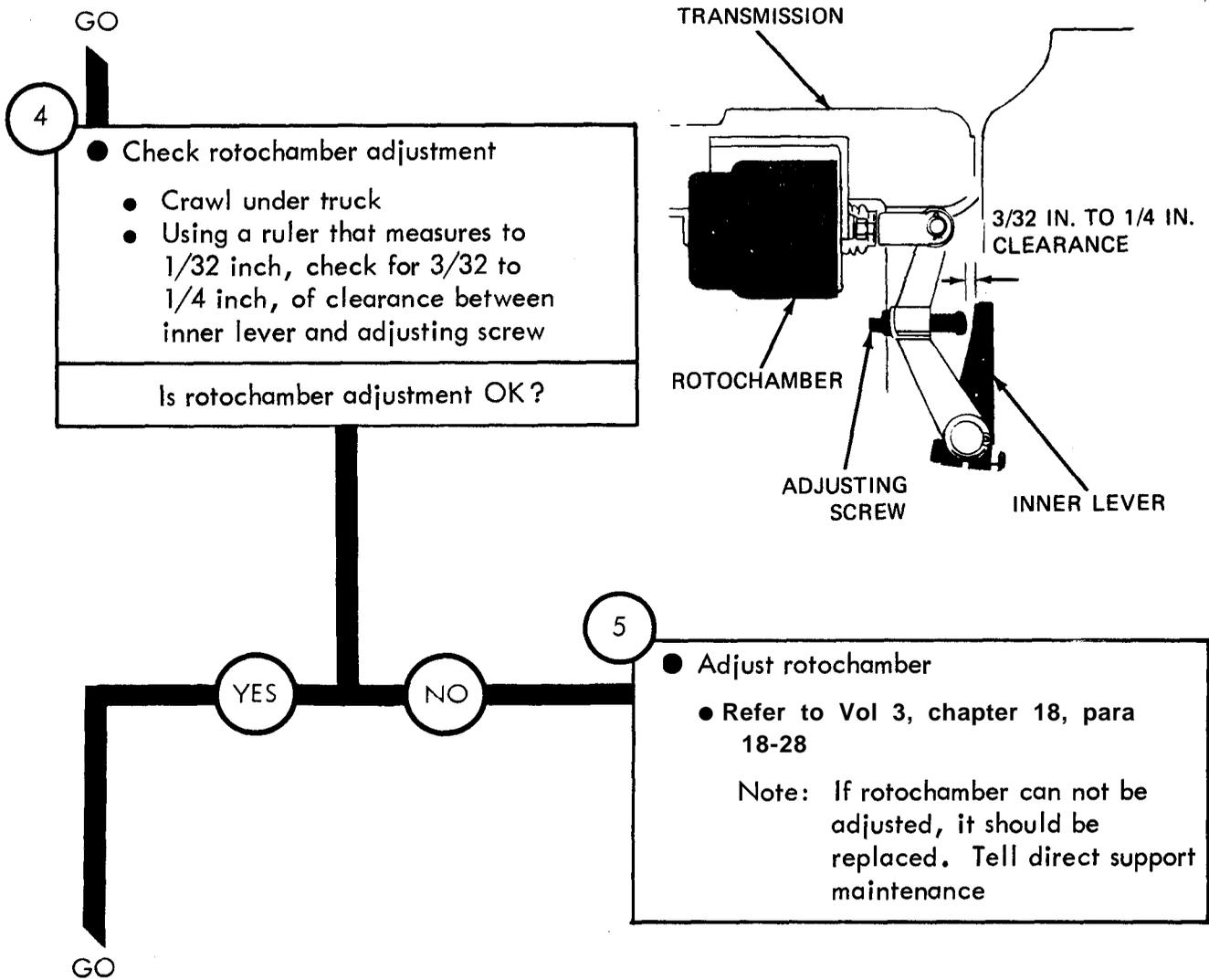


Figure 11-4 (Sheet 2 of 3)

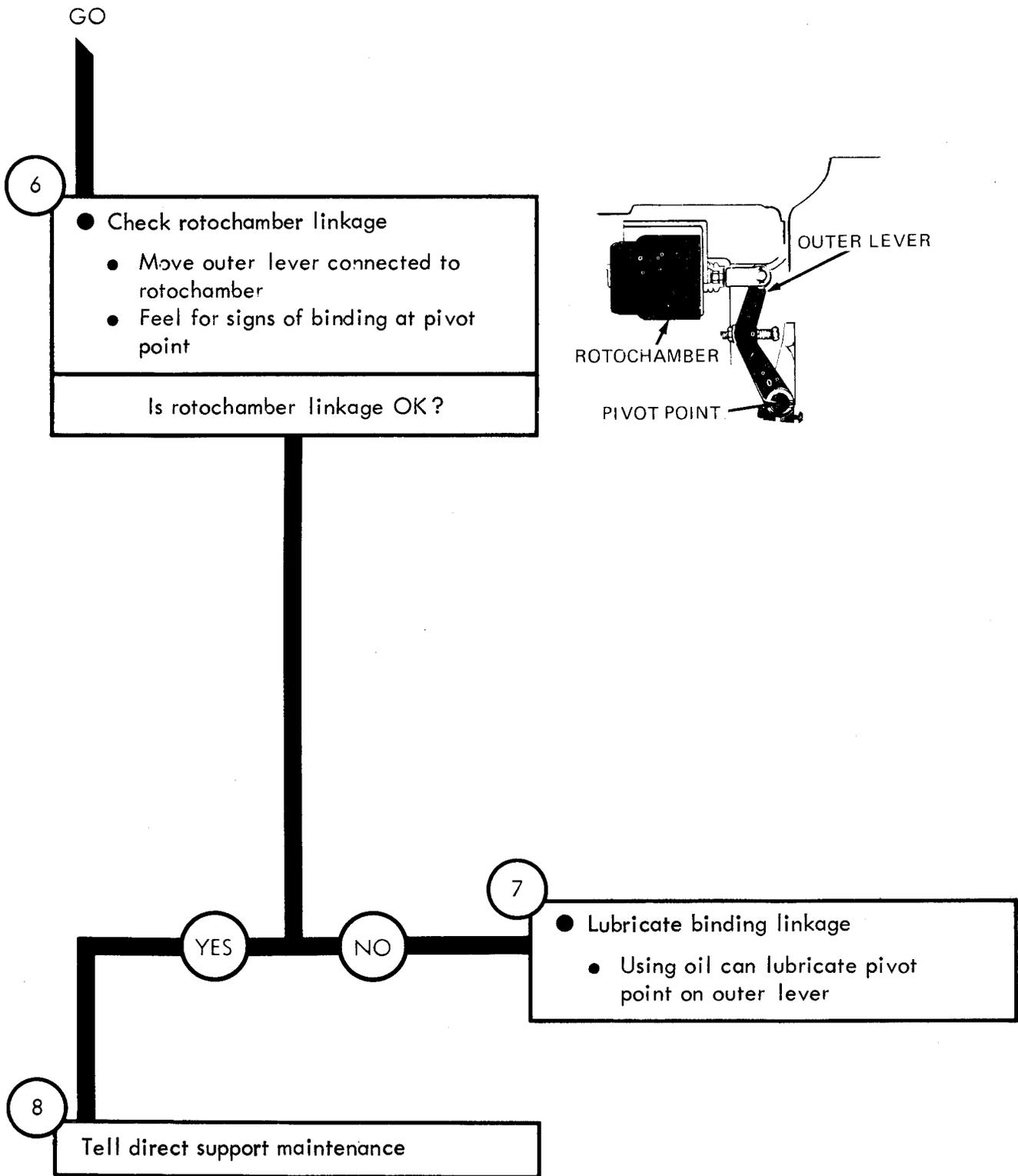


Figure 11-4 (Sheet 3 of 3)

TA 115586

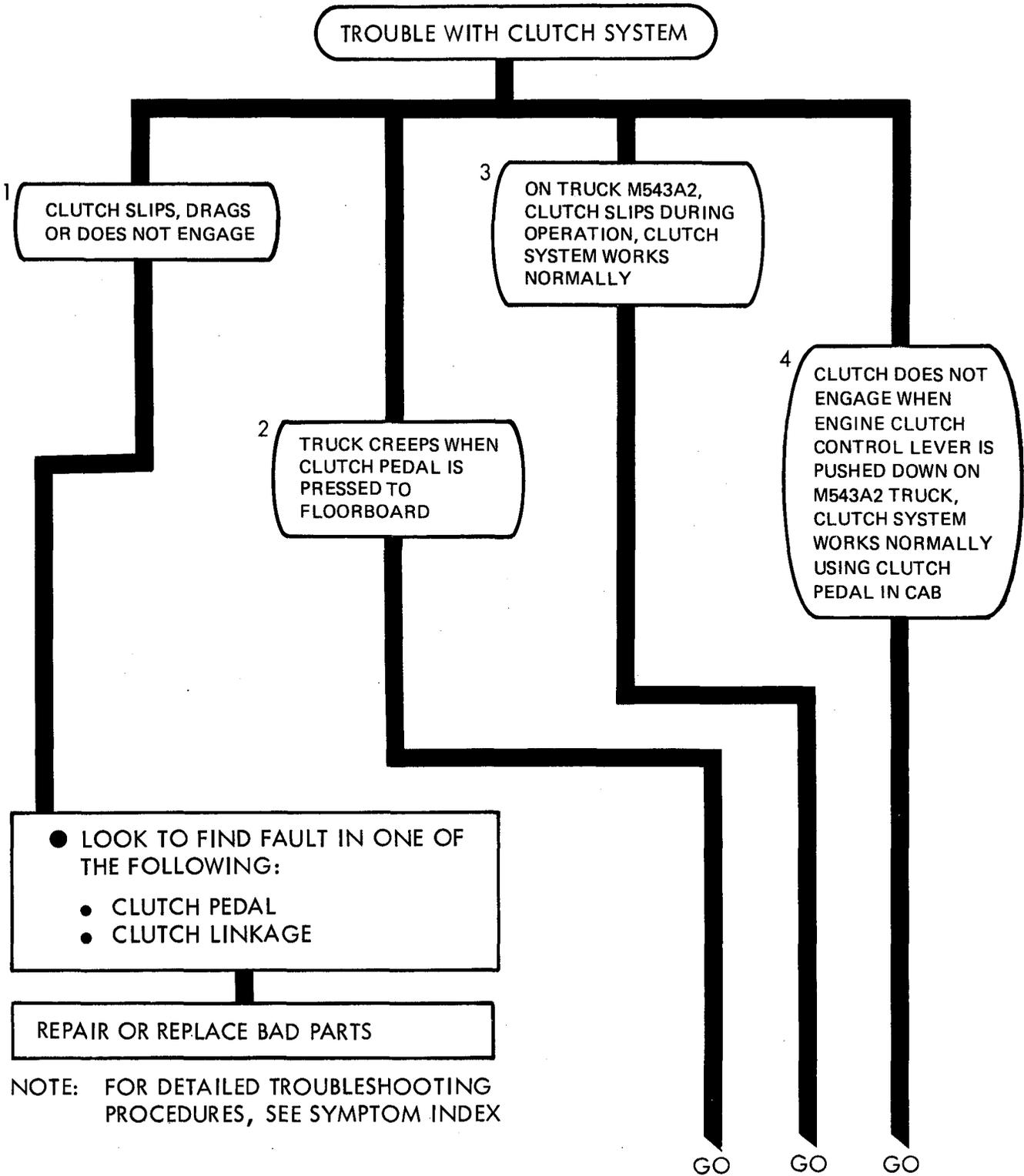
CHAPTER 12

CLUTCH SYSTEM TROUBLESHOOTING SUMMARY

12-1. GENERAL. This chapter gives a summary of troubleshooting procedures given in chapter 11, for the Clutch System.

12-2. PROCEDURES. The summary in this chapter covers all fault symptoms found in the detailed troubleshooting procedures. Chapter 7 outlines a sample troubleshooting procedure. The summary procedures are based on the "what-to-do" portions of the detailed procedures and do not include the "How-to-do-it" instructions. Warnings, cautions, and notes are given where needed.

CLUTCH SYSTEM TROUBLESHOOTING SUMMARY



TA 115587

Figure 12-1 (Sheet 1 of 3)

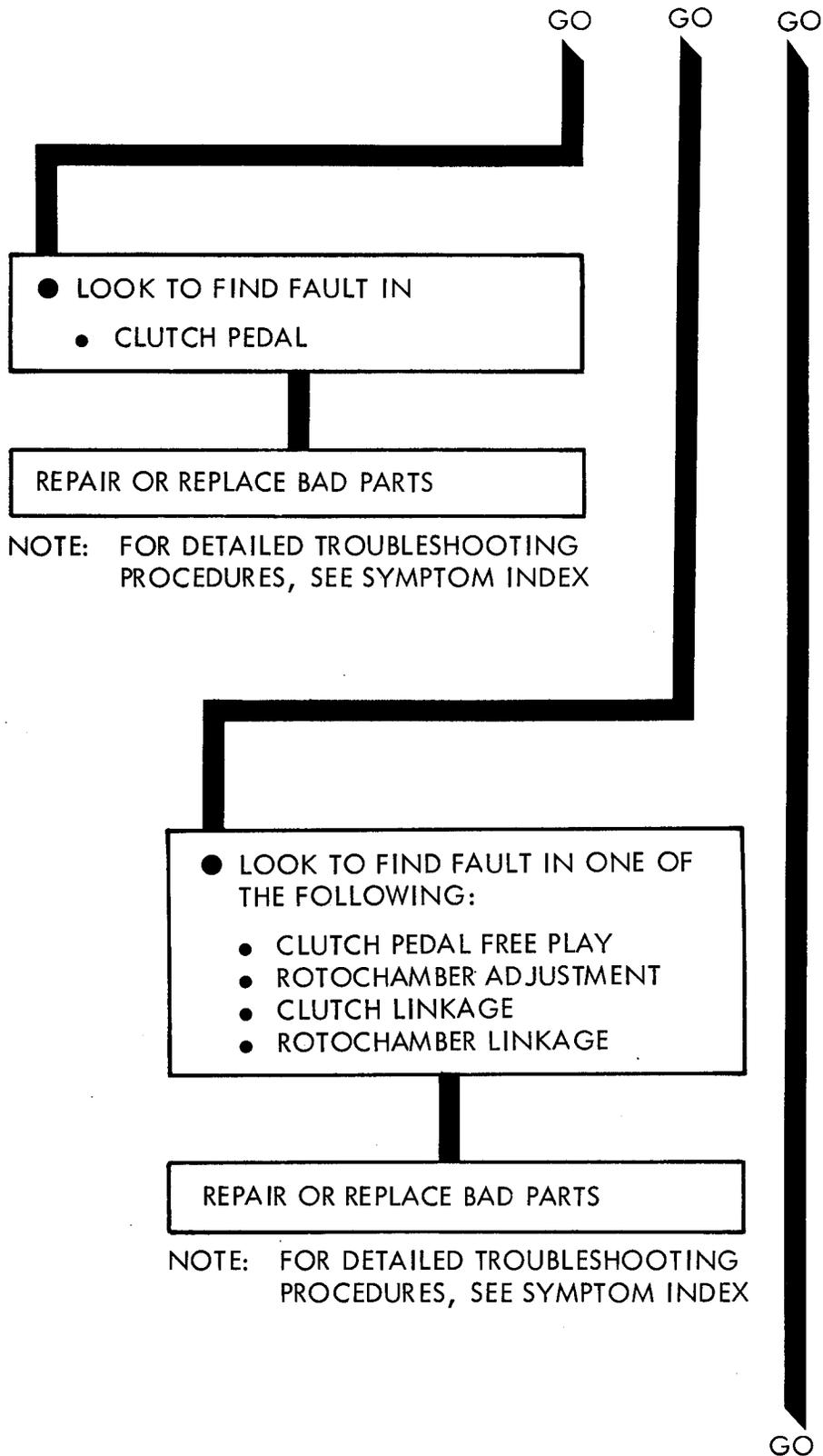


Figure 12-1 (Sheet 2 of 3)

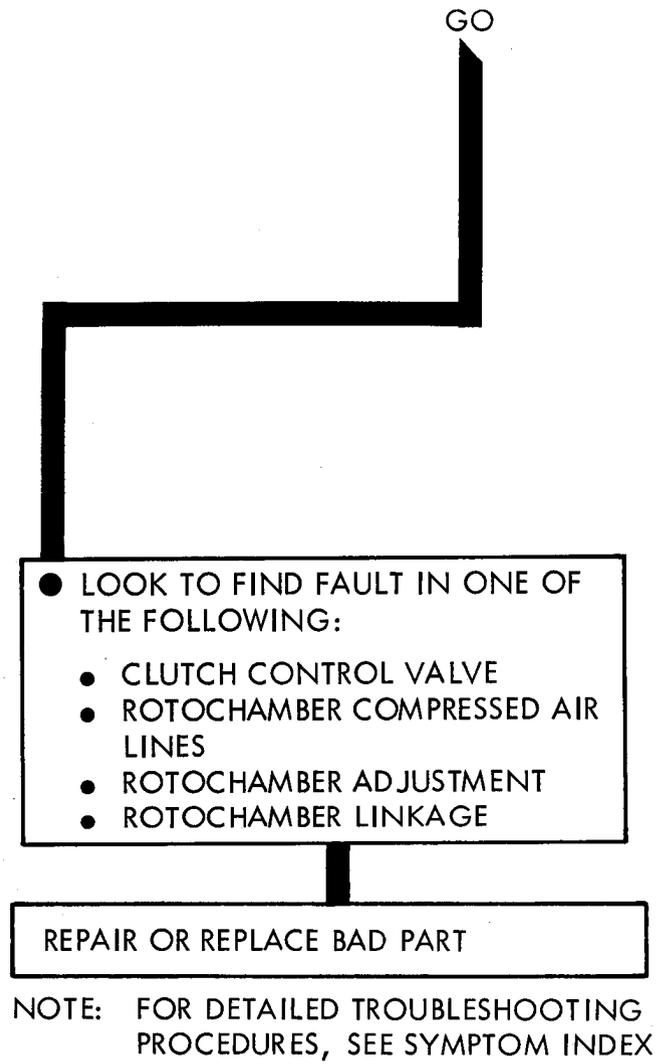


Figure 12-1 (Sheet 3 of 3)

TA 115590

CHAPTER 13

CLUTCH SYSTEM CHECKOUT PROCEDURES

13-1. GENERAL. This chapter gives procedures for checking out the system after troubleshooting and repair have been done. Procedures are set up in flow chart form showing the checkout steps in order and referring to the fault symptom index when the system does not checkout.

CLUTCH SYSTEM CHECKOUT

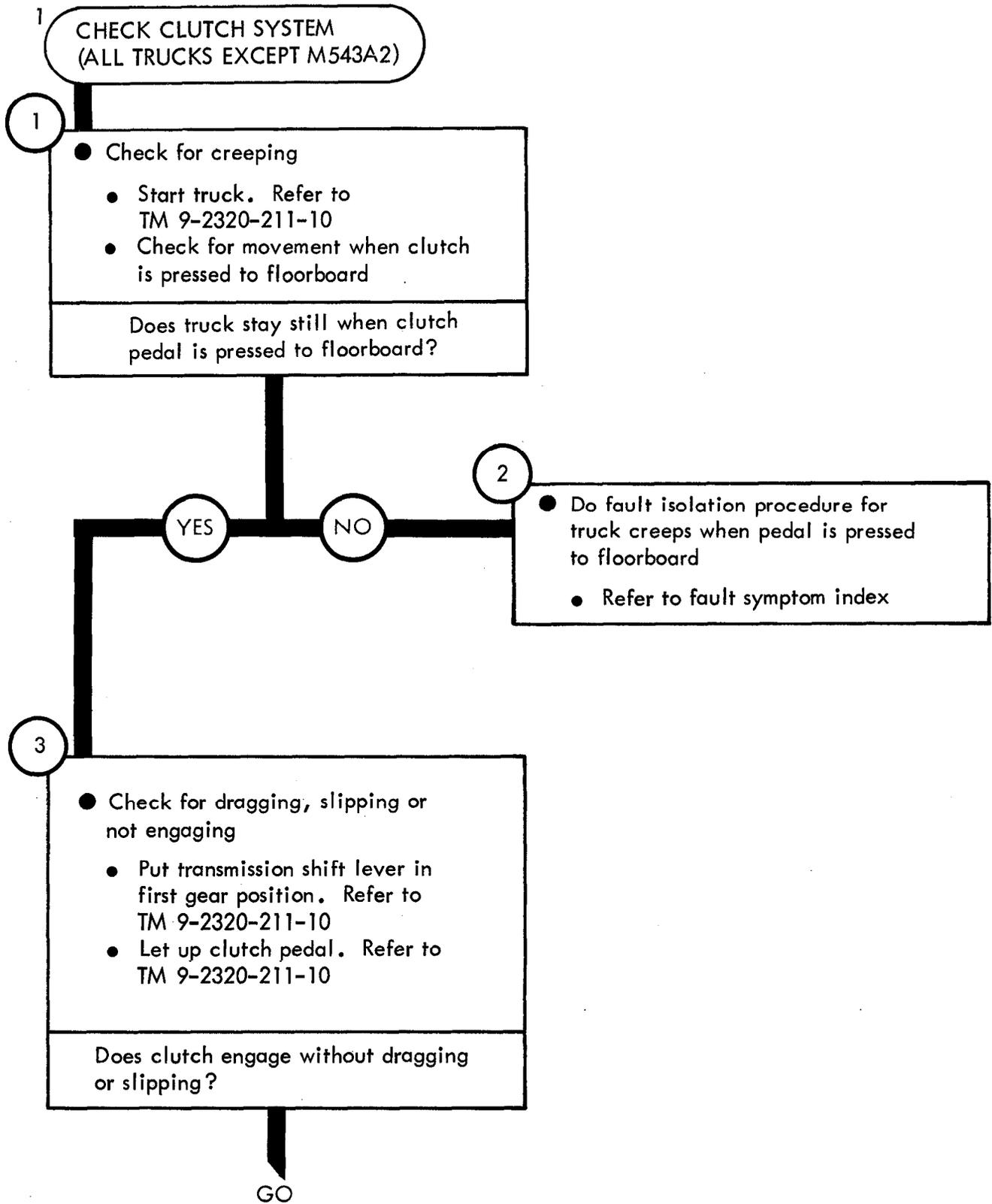


Figure 13-1 (Sheet 1 of 5)

TA 115591

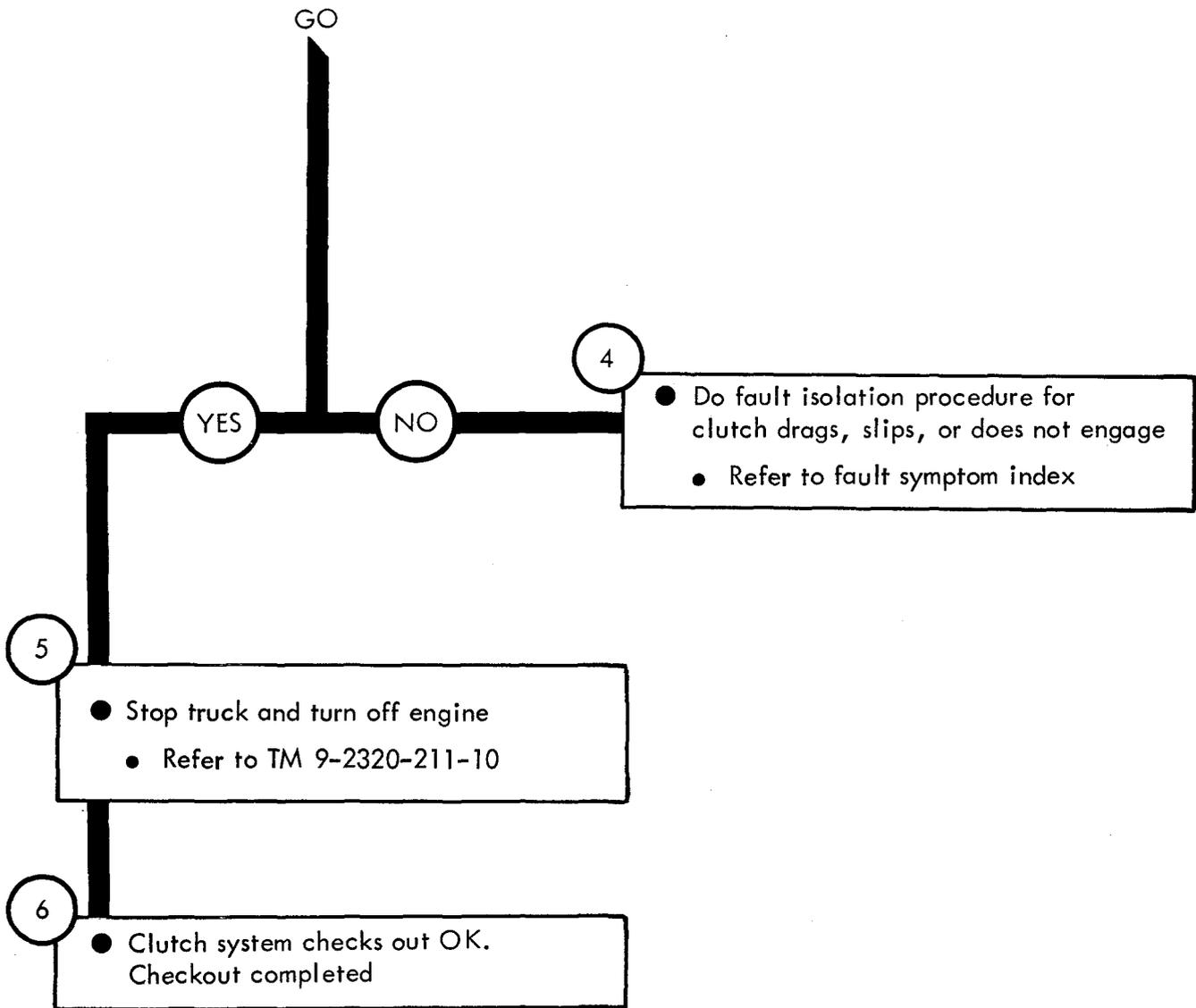


Figure 13-1 (Sheet 2 of 5)

CLUTCH SYSTEM CHECKOUT

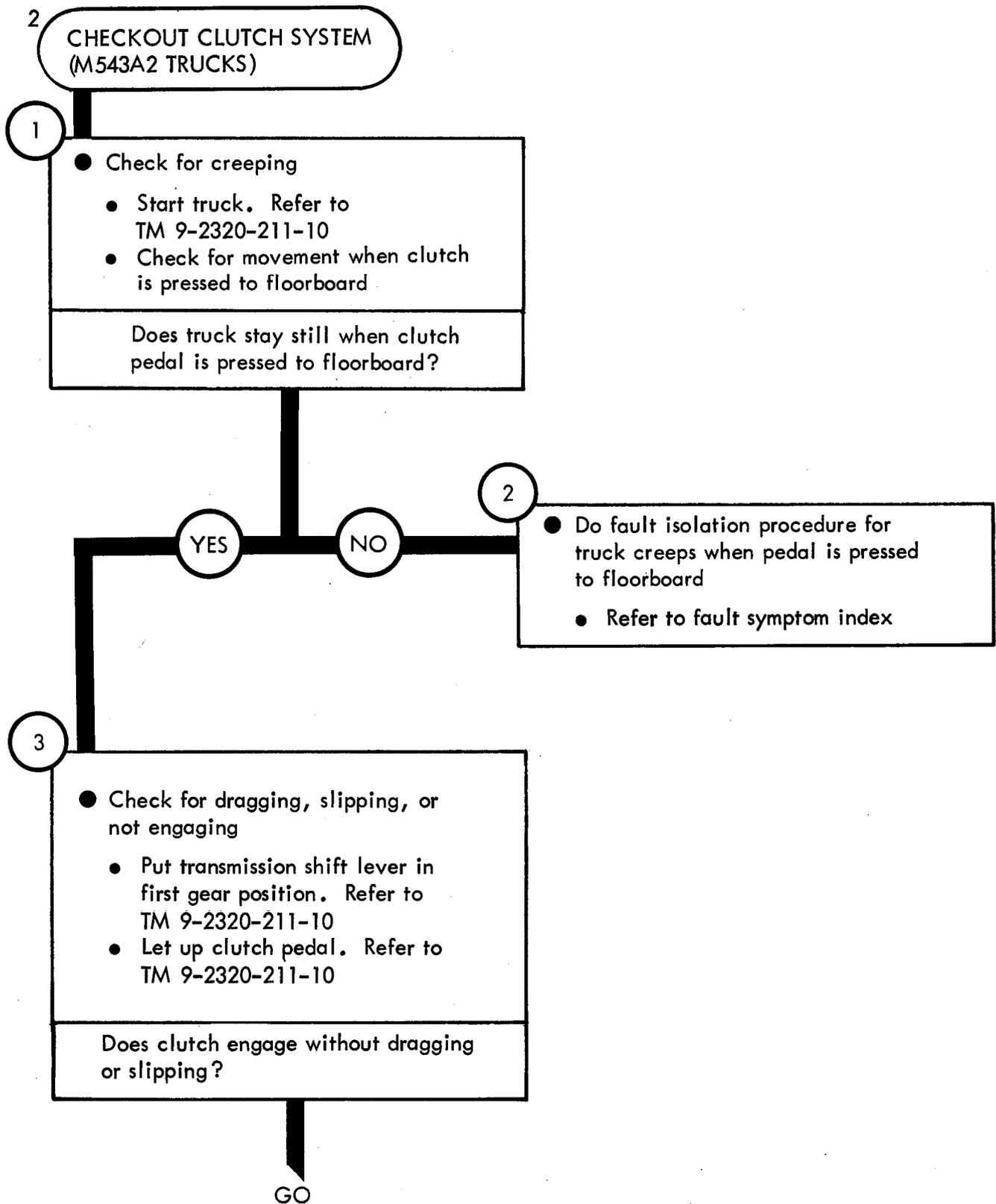


Figure 13-1 (Sheet 3 of 5)

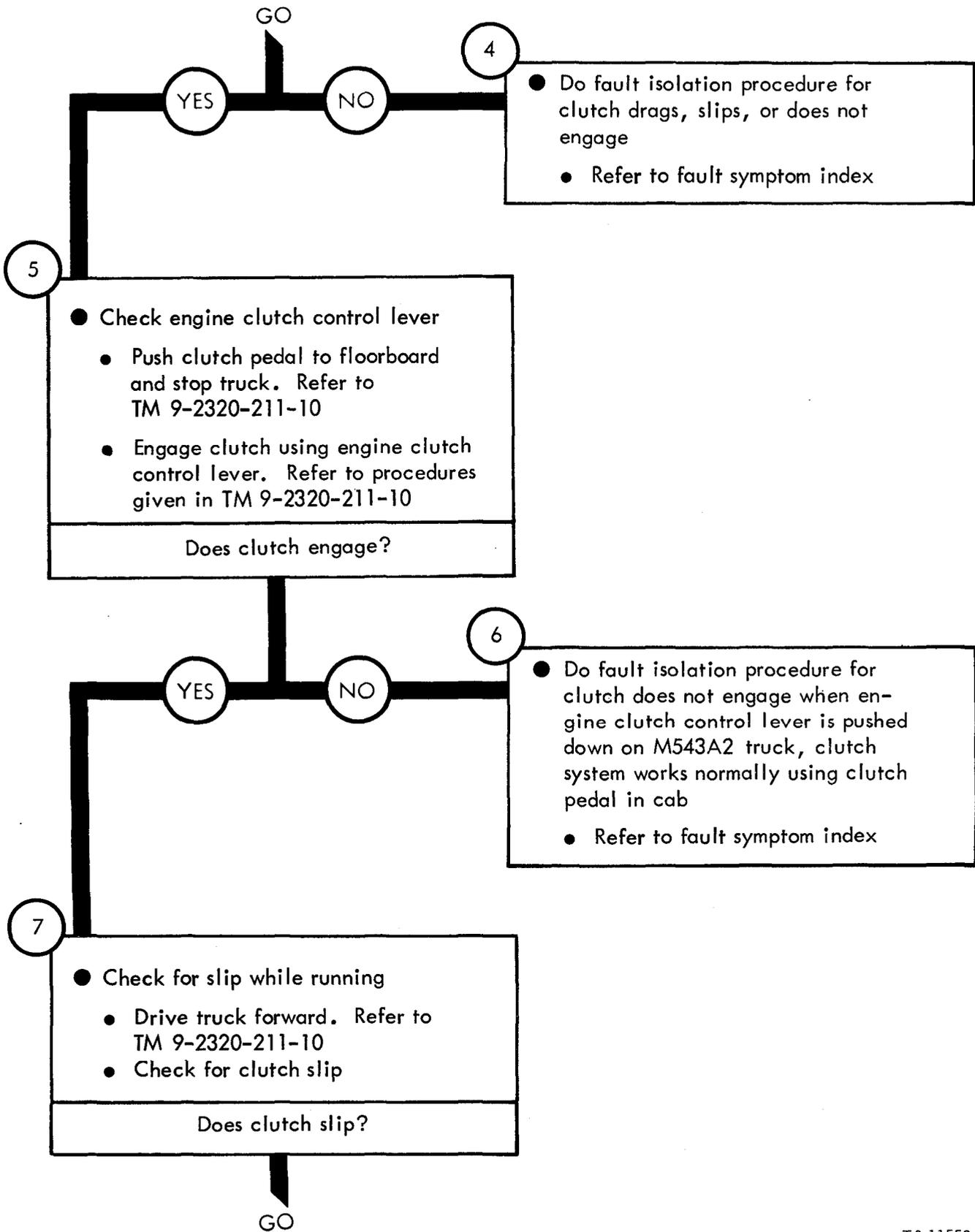


Figure 13-1 (Sheet 4 of 5)

TA 11559

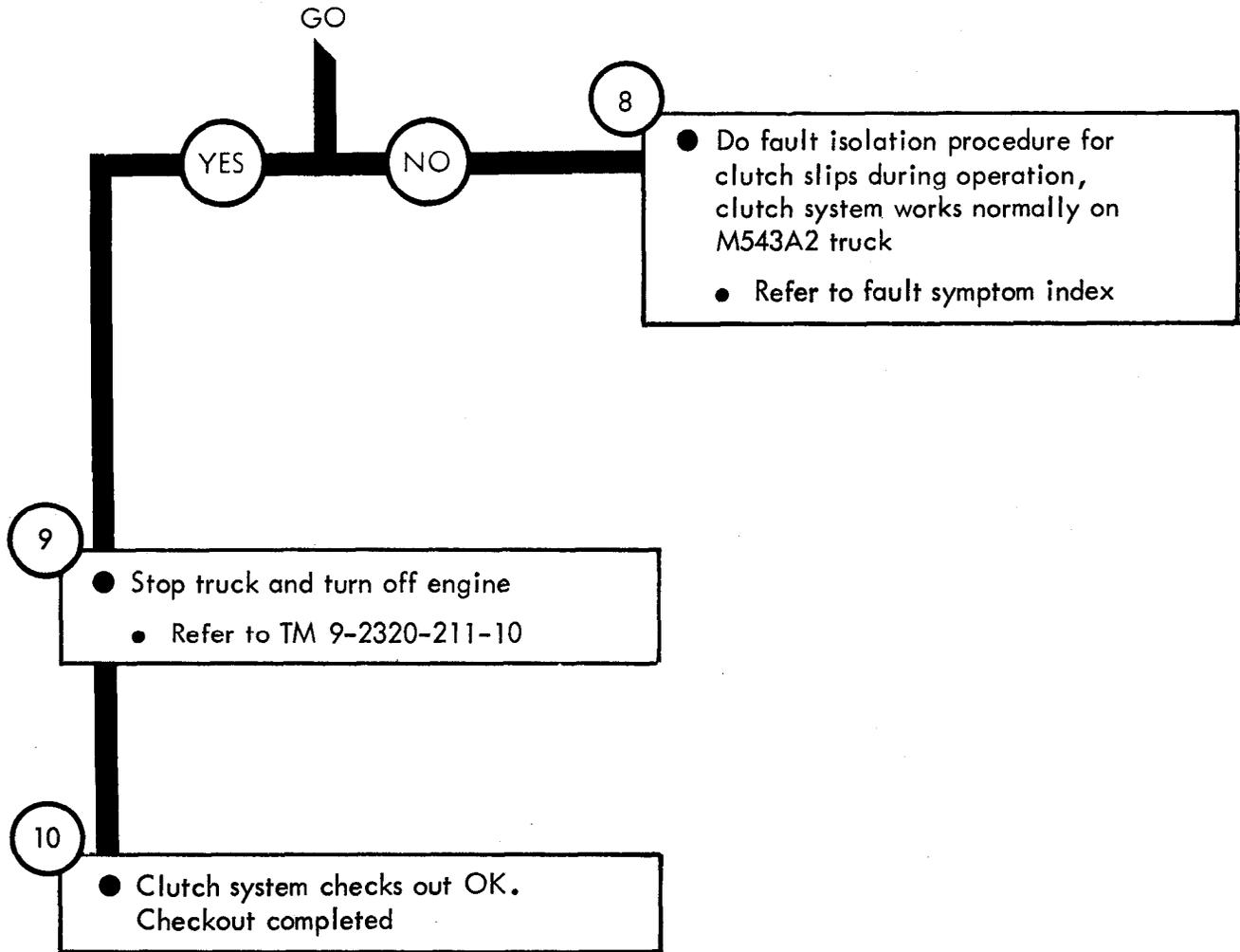


Figure 13-1 (Sheet 5 of 5)

CHAPTER 14

FUEL SYSTEM TROUBLESHOOTING

14-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the fuel system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

14-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

FUEL SYSTEM TROUBLESHOOTING

Symptom

1 ENGINE IS HARD STARTING

WARNING

Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks, or smoking can cause a fire. Keep a fire extinguisher close by

1

- Make truck ready for work on fuel system
 - Find a well ventilated area
 - Park truck. Refer to TM 9-2320-211-10

NOTE

The engine may have one of 3 different types of manifold flame heaters on it. For side mounted flame heater refer to Figure 16-1. For top mounted flame heater (uncovered), refer to figure 16-2. For top mounted flame heater (covered), refer to figure 16-2

2

- Check flame heater fuel lines and fittings
 - Look for a crushed or broken line
 - Look for signs of fuel leaking from lines or fittings
 - Feel for loose fittings

Are flame heater fuel lines and fittings OK?

GO

Figure 14-1 (Sheet 1 of 5)

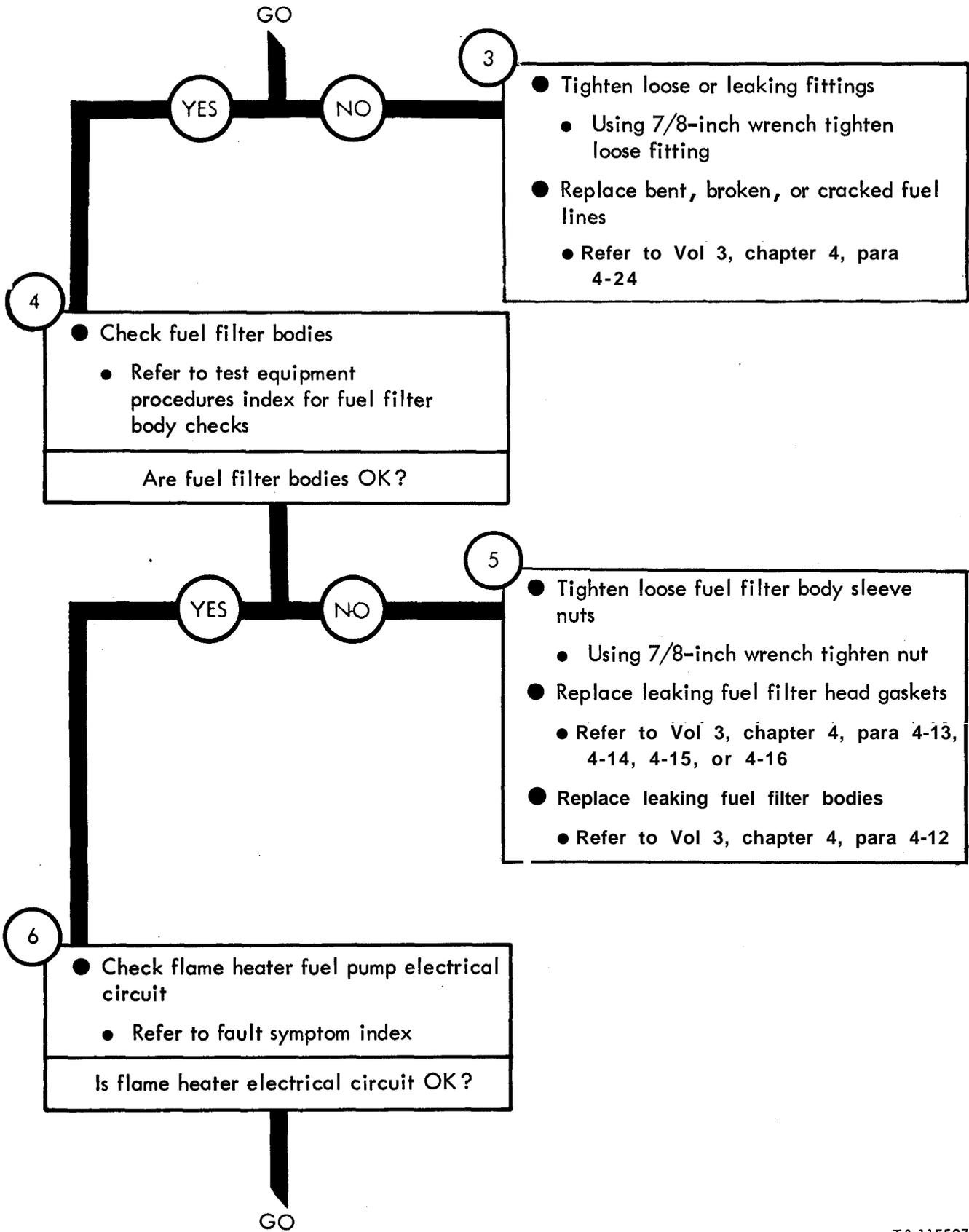


Figure 14-1 (Sheet 2 of 5)

TA 115597

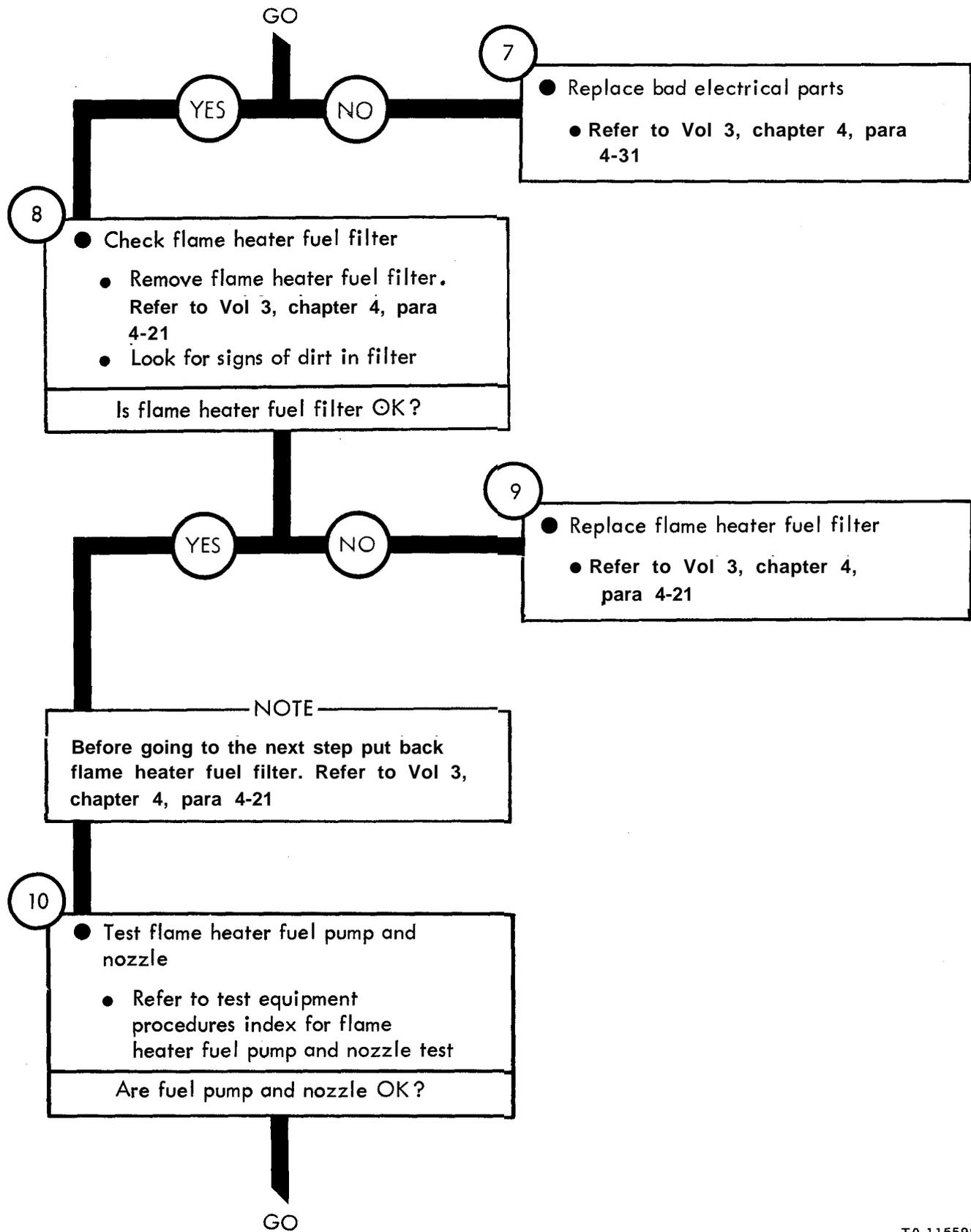


Figure 14-1 (Sheet 3 of 5)

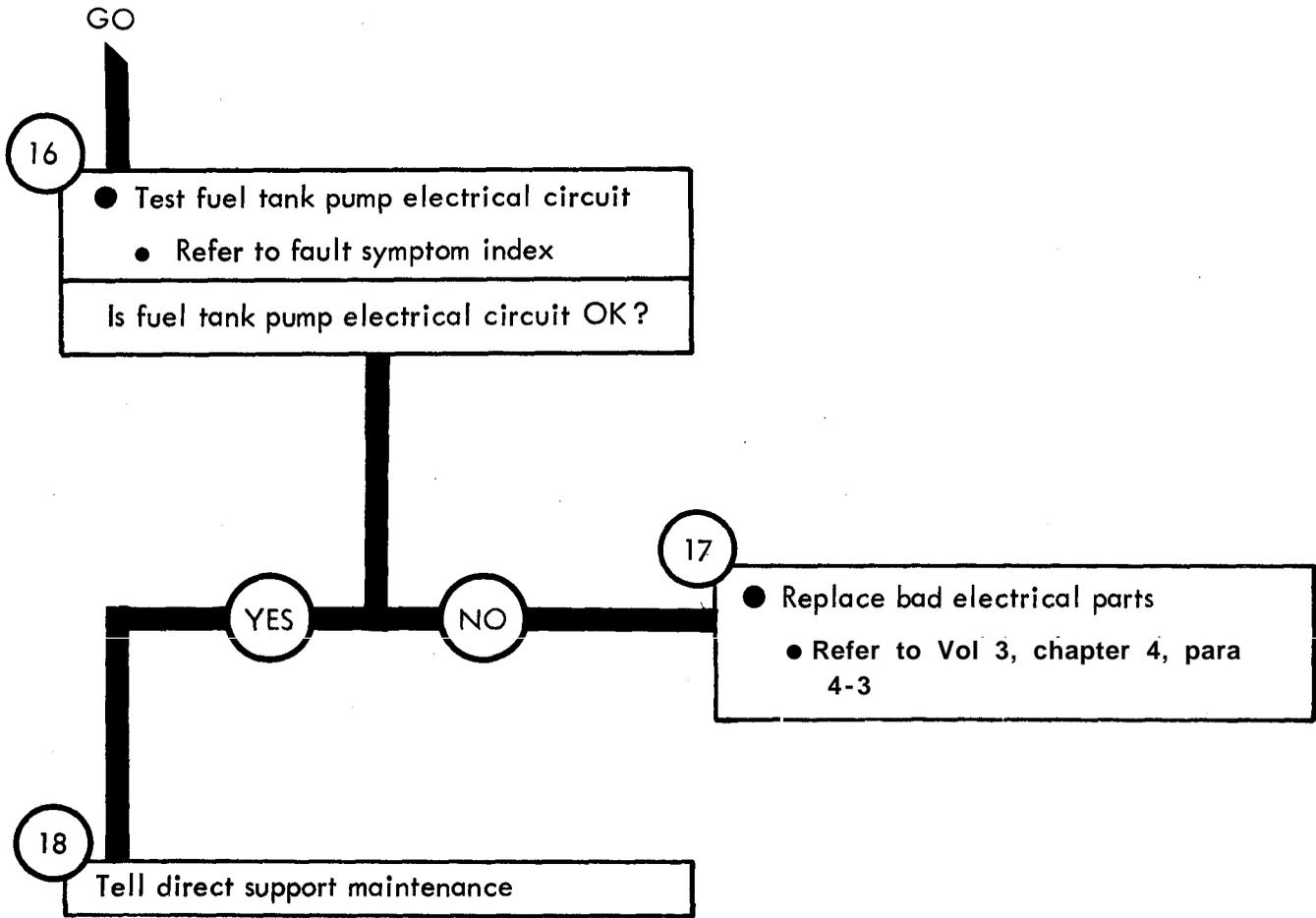


Figure 14-1 (Sheet 5 of 5)

Symptom

2

ENGINE DOES NOT START

WARNING

Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks, or smoking can cause a fire. Keep a fire extinguisher close by

1

- Make truck ready for work on fuel system
 - Find a well ventilated area
 - Park truck. Refer to procedures given in TM 9-2320-211-10-1

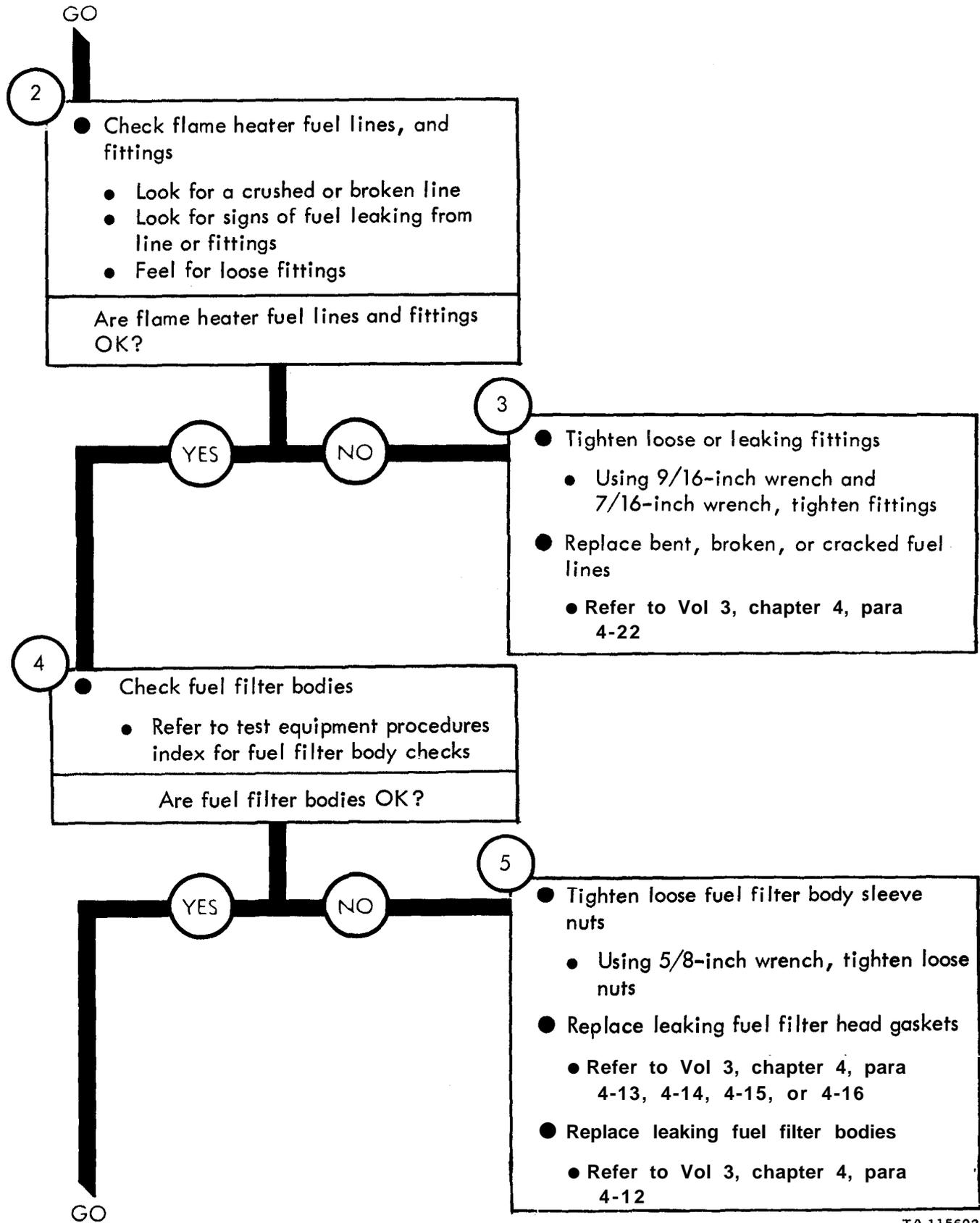
NOTE

The engine may have one of 3 different types of manifold flame heaters on it. For side mounted flame heater refer to figure 16-1. For top mounted flame heater (uncovered), refer to figure 16-2. For top mounted flame heater (covered), refer to figure 16-2

GO

TA 115601

Figure 14-2 (Sheet 1 of 6)



TA 115602

Figure 14-2 (Sheet 2 of 6)

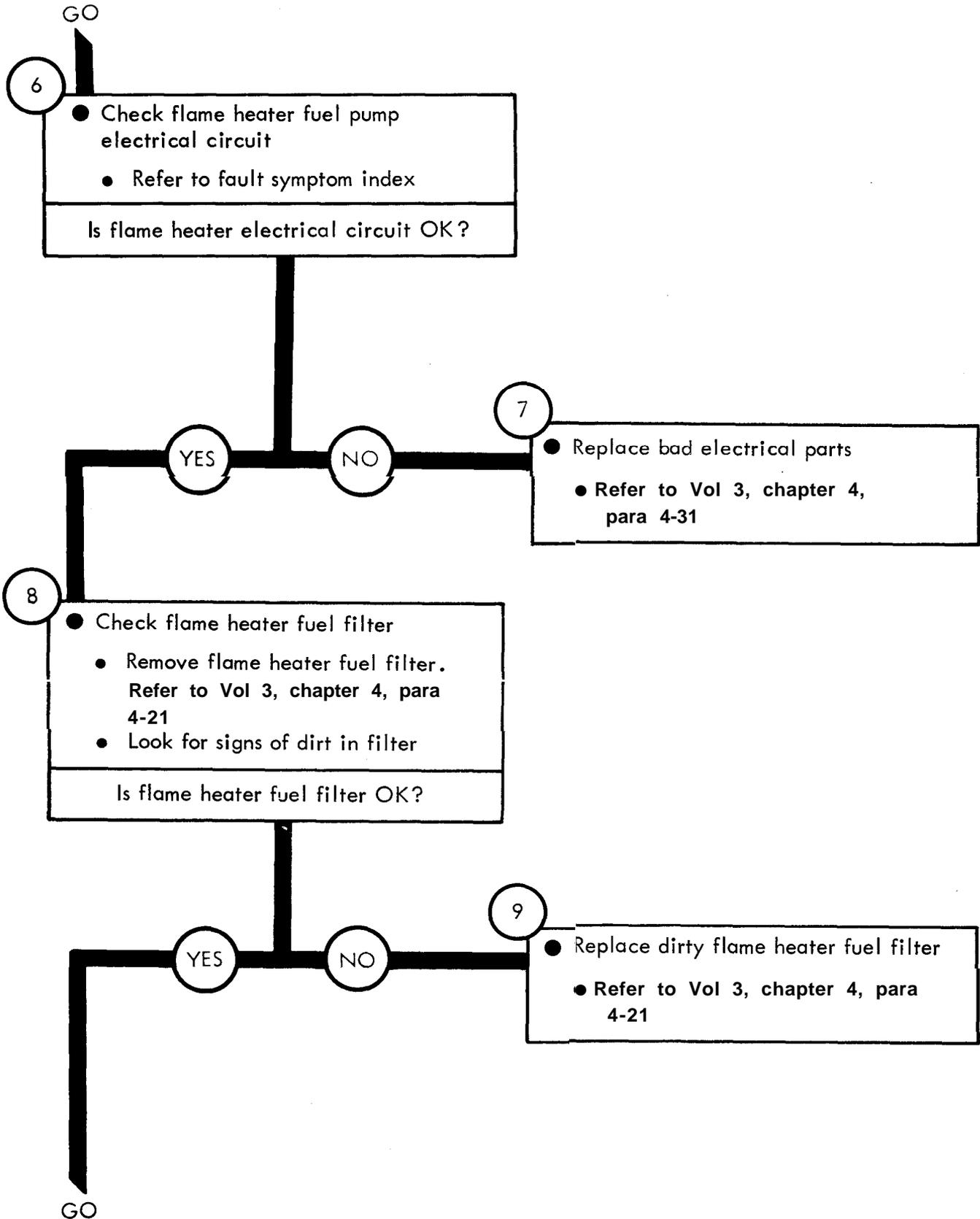


Figure 14-2 (Sheet 3 of 6)

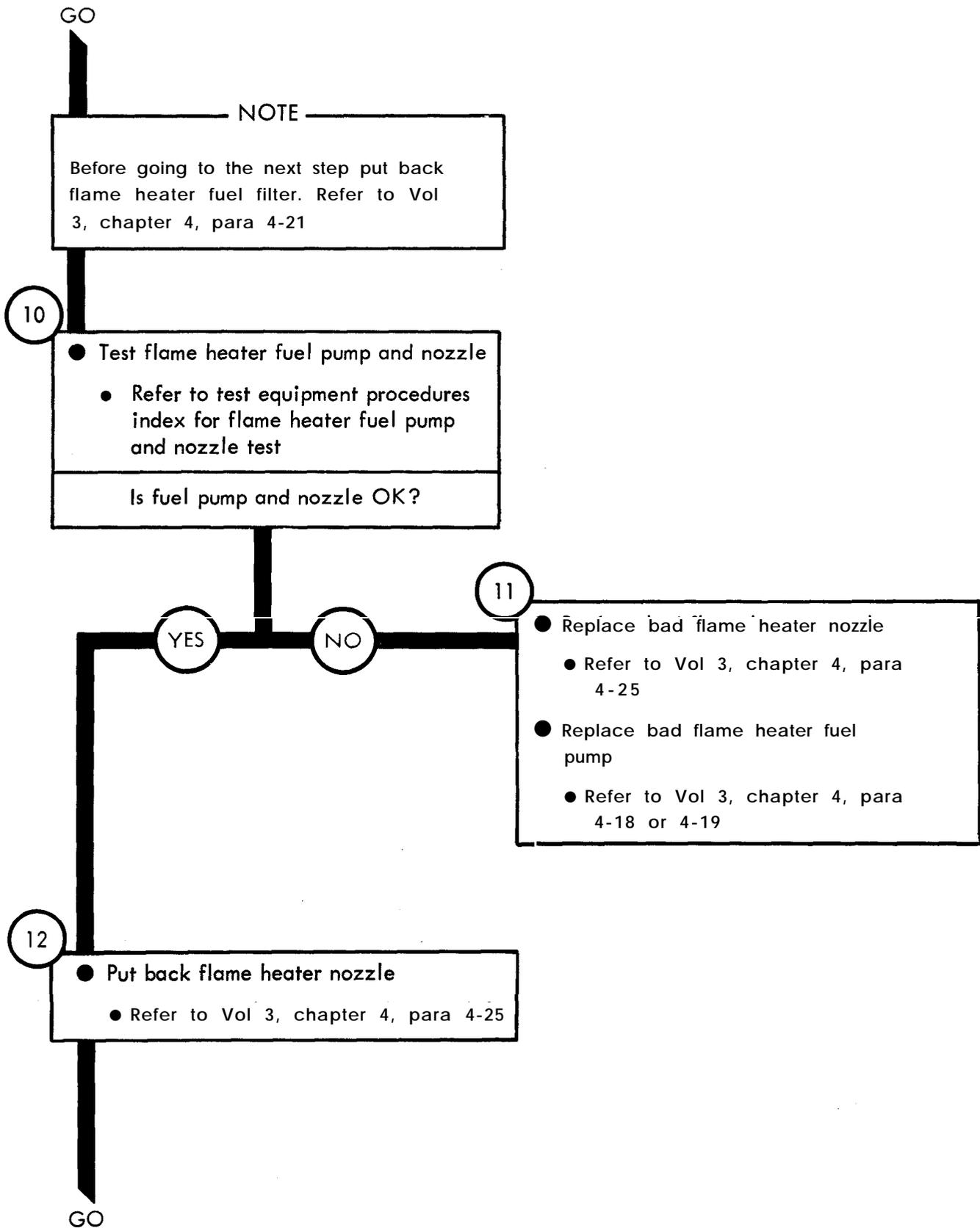


Figure 14-2 (Sheet 4 of 6)

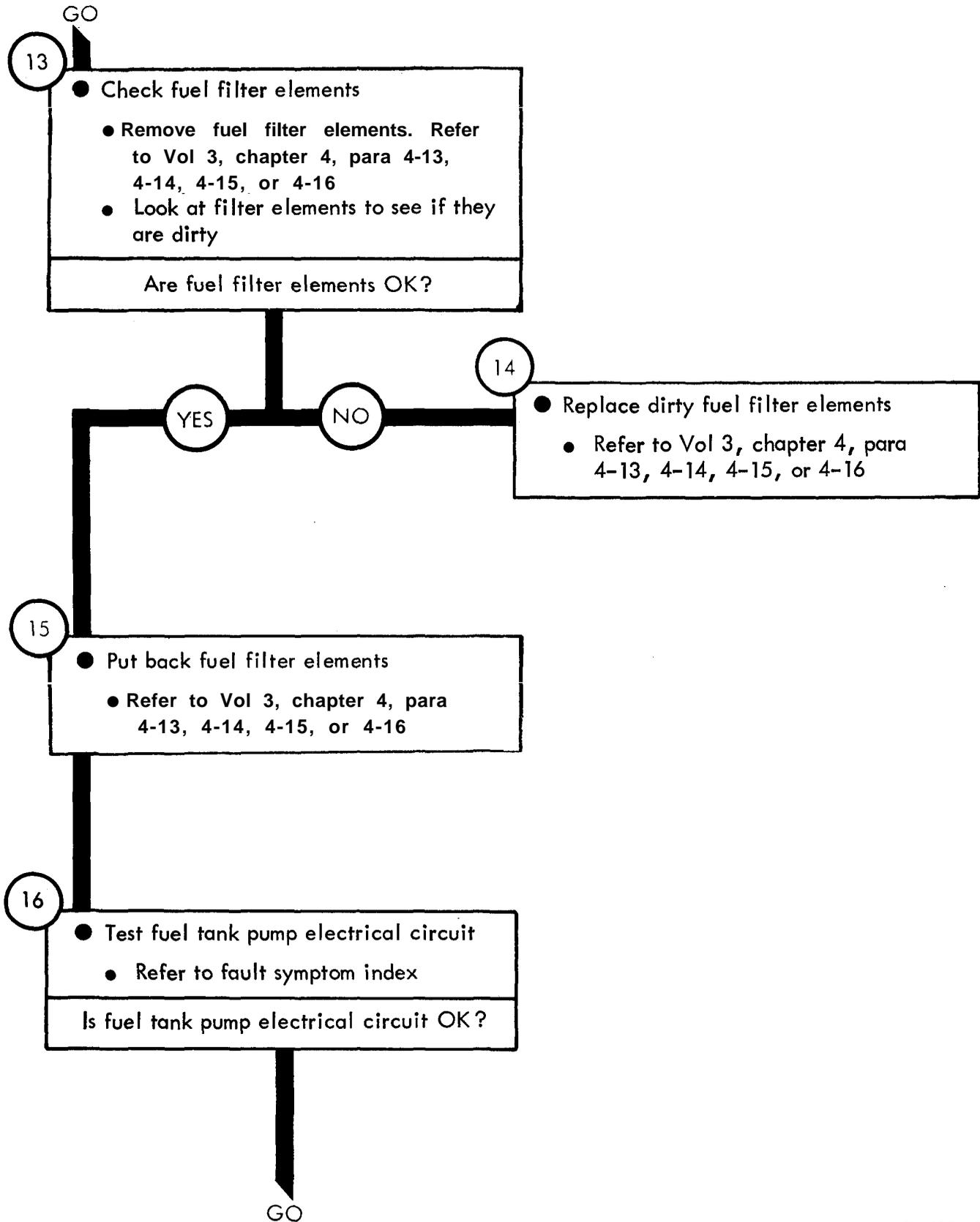


Figure 14-2 (Sheet 5 of 6)

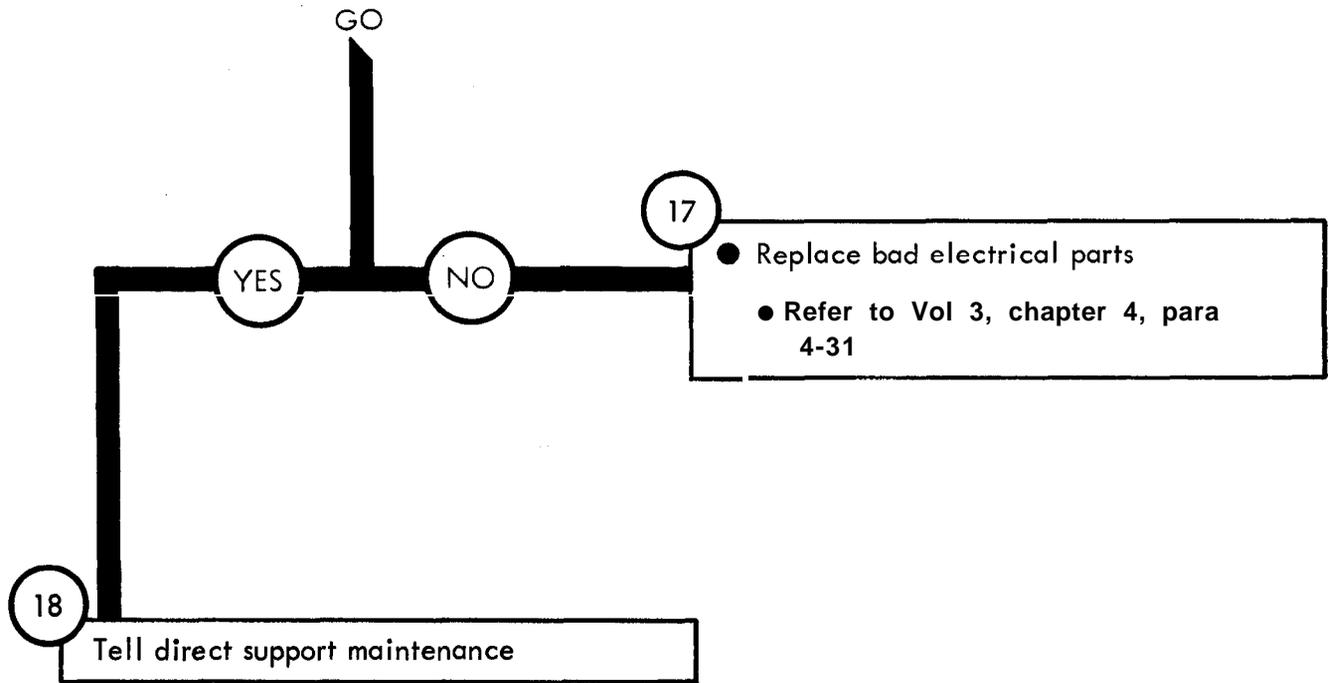


Figure 14-2 (Sheet 6 of 6)

Symptom

3

ENGINE STALLS

WARNING

Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks, or smoking can cause a fire. Keep a fire extinguisher close by

1

- Make truck ready for work on fuel system
 - Find a well ventilated area
 - Park truck. Refer to TM 9-2320-211-10

2

- Check fuel filter bodies
 - Refer to test equipment procedures index for fuel filter body checks

Are fuel filter bodies OK?

GO

Figure 14-3 (Sheet 1 of 4)

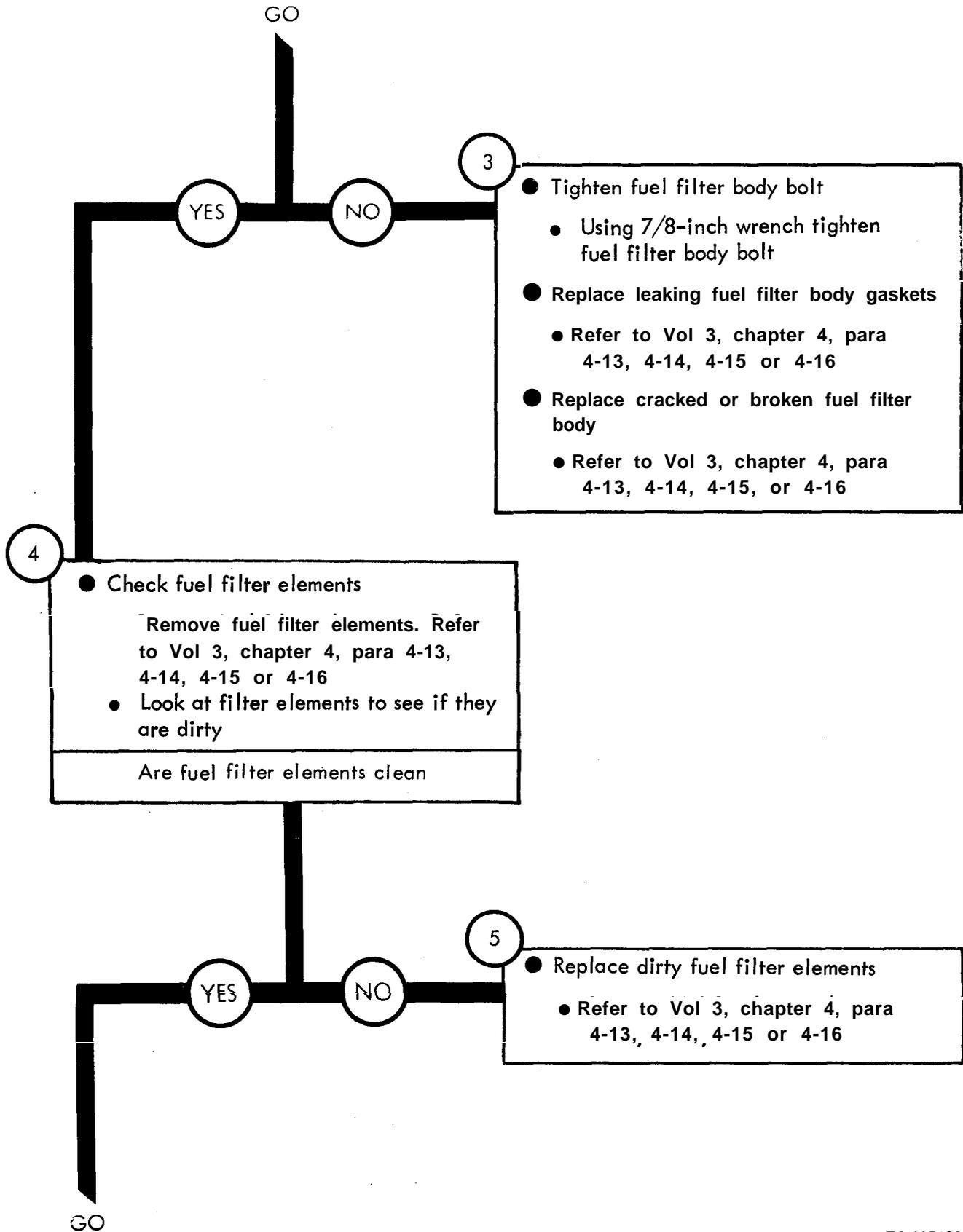


Figure 14-3 (Sheet 2 of 4)

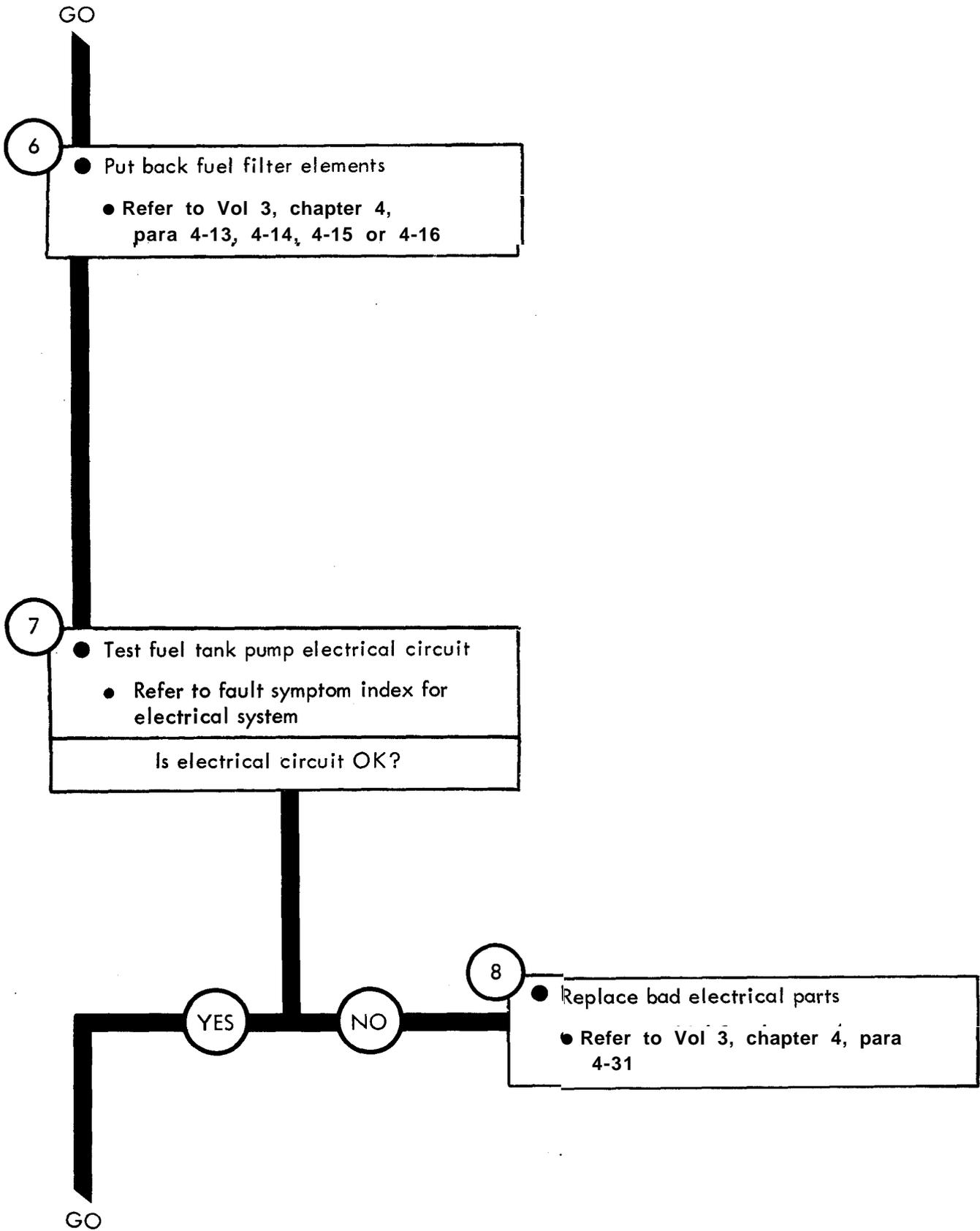


Figure 14-3 (Sheet 3 of 4)

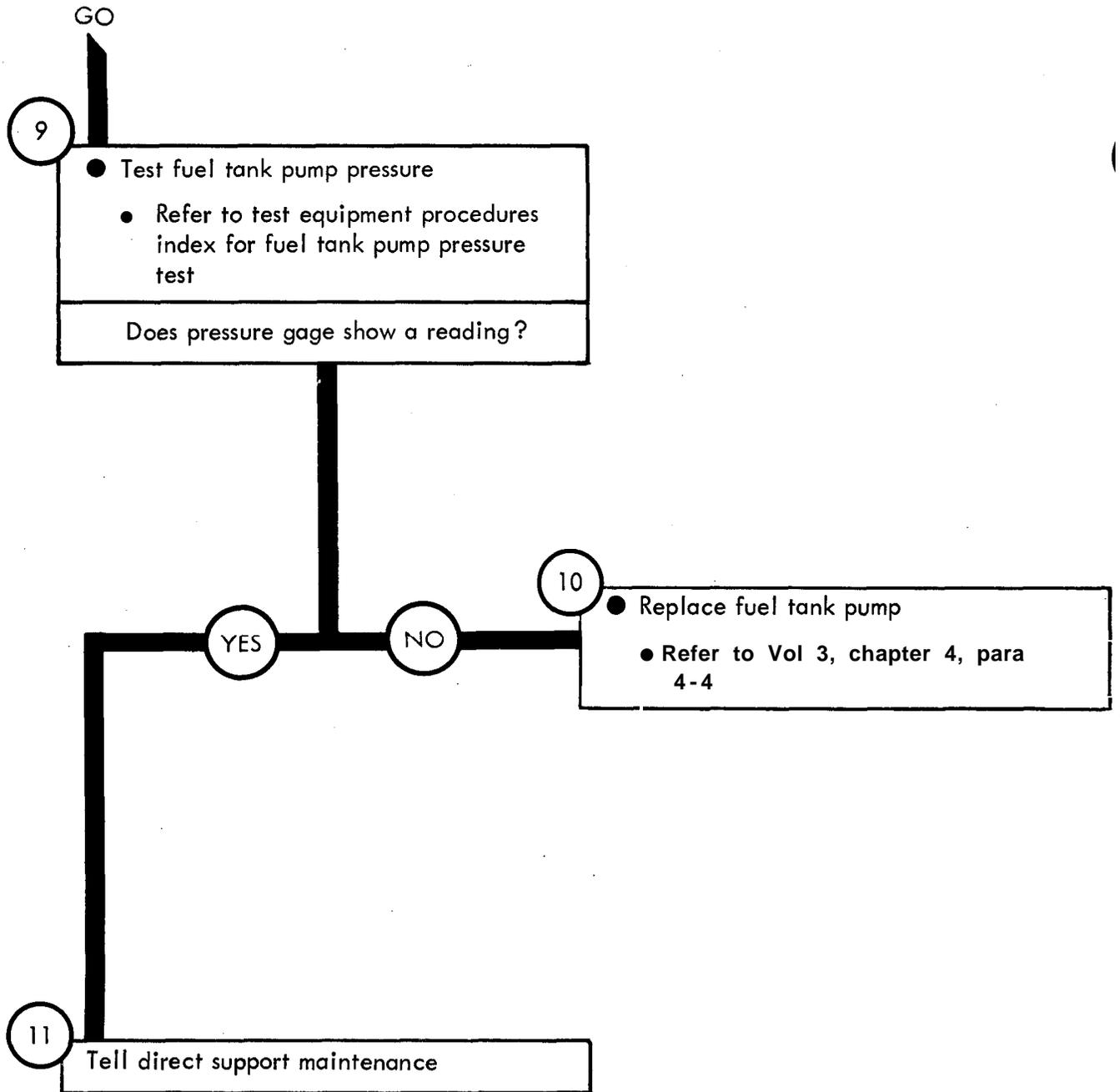


Figure 14-3 (Sheet 4 of 4)

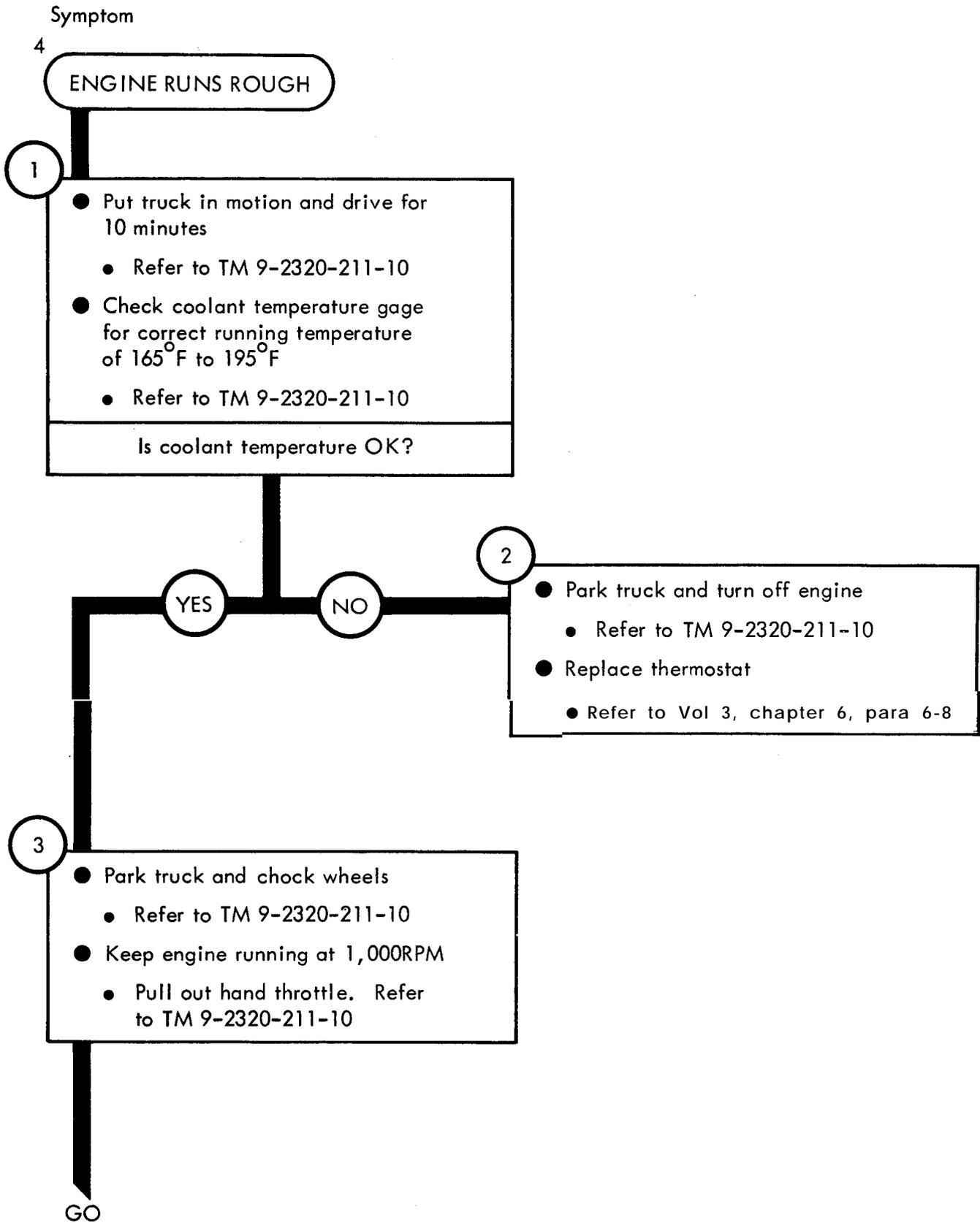


Figure 14-4 (Sheet 1 of 3)

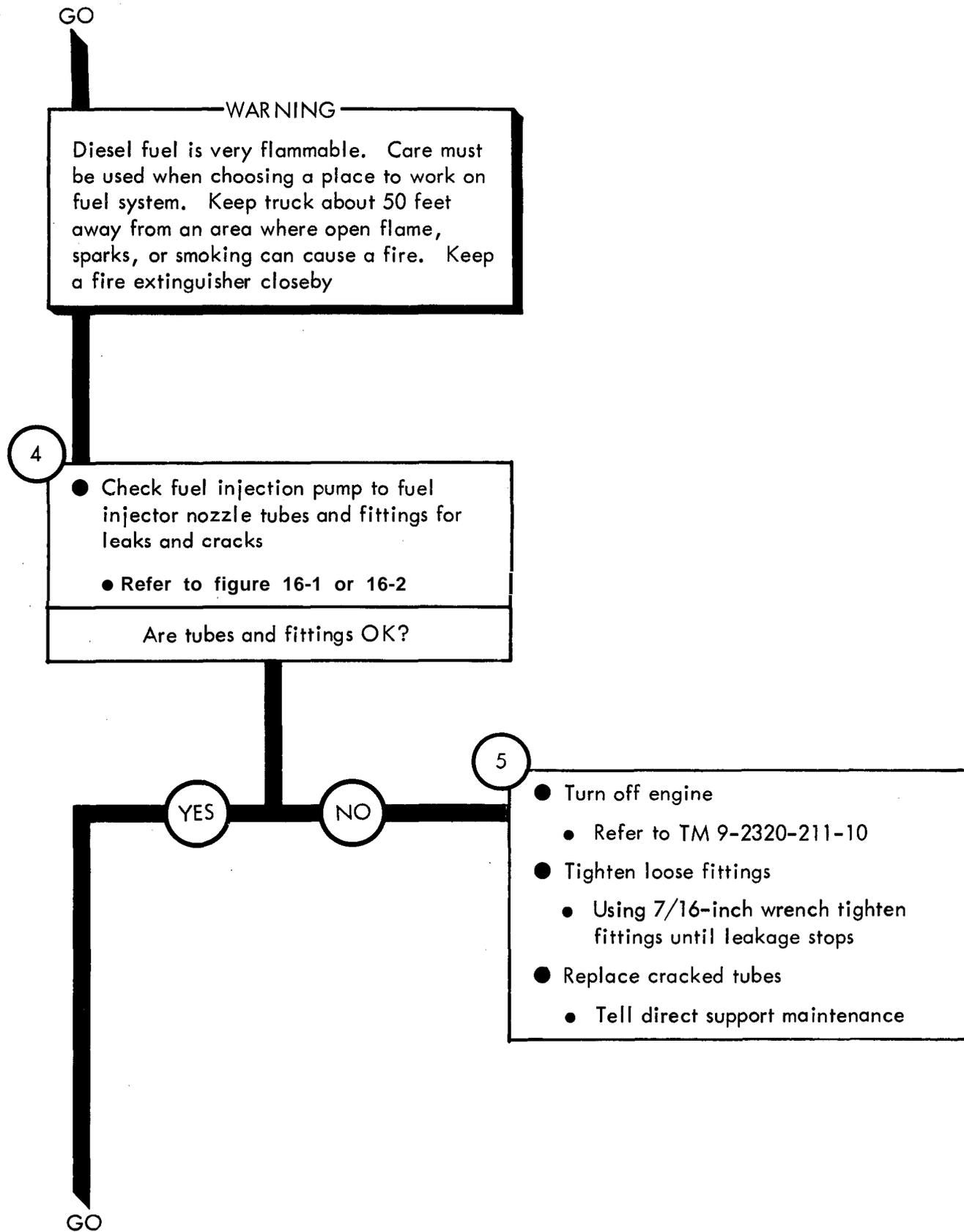


Figure 14-4 (Sheet 2 of 3)

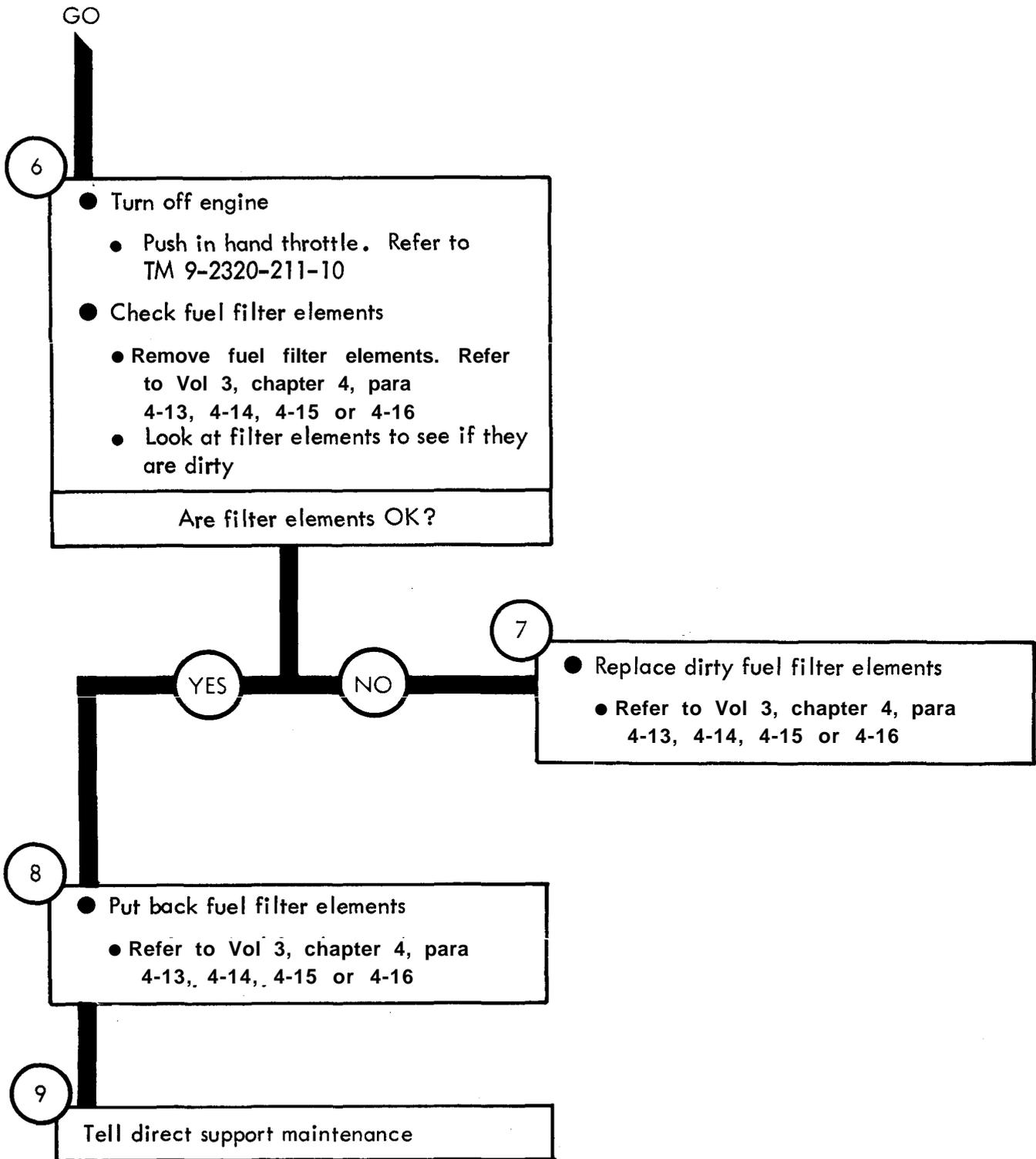


Figure 14-4 (Sheet 3 of 3)

Symptom

5

ENGINE LACKS POWER

WARNING

Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks or smoking can cause a fire. Keep a fire extinguisher close by

1

- Make truck ready for work on fuel system
 - Find a well ventilated area
 - Park truck. Refer to procedures given in TM 9-2320-211-10

2

- Check accelerator linkage
 - Crawl under truck
 - Look for bent accelerator rod
 - Look for bent accelerator linkage bracket

Is accelerator linkage OK?

GO

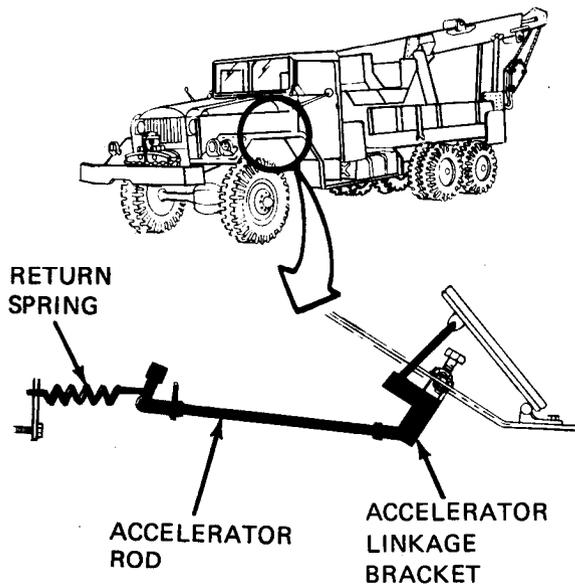


Figure 14-5 (Sheet 1 of 4)

TA 115614

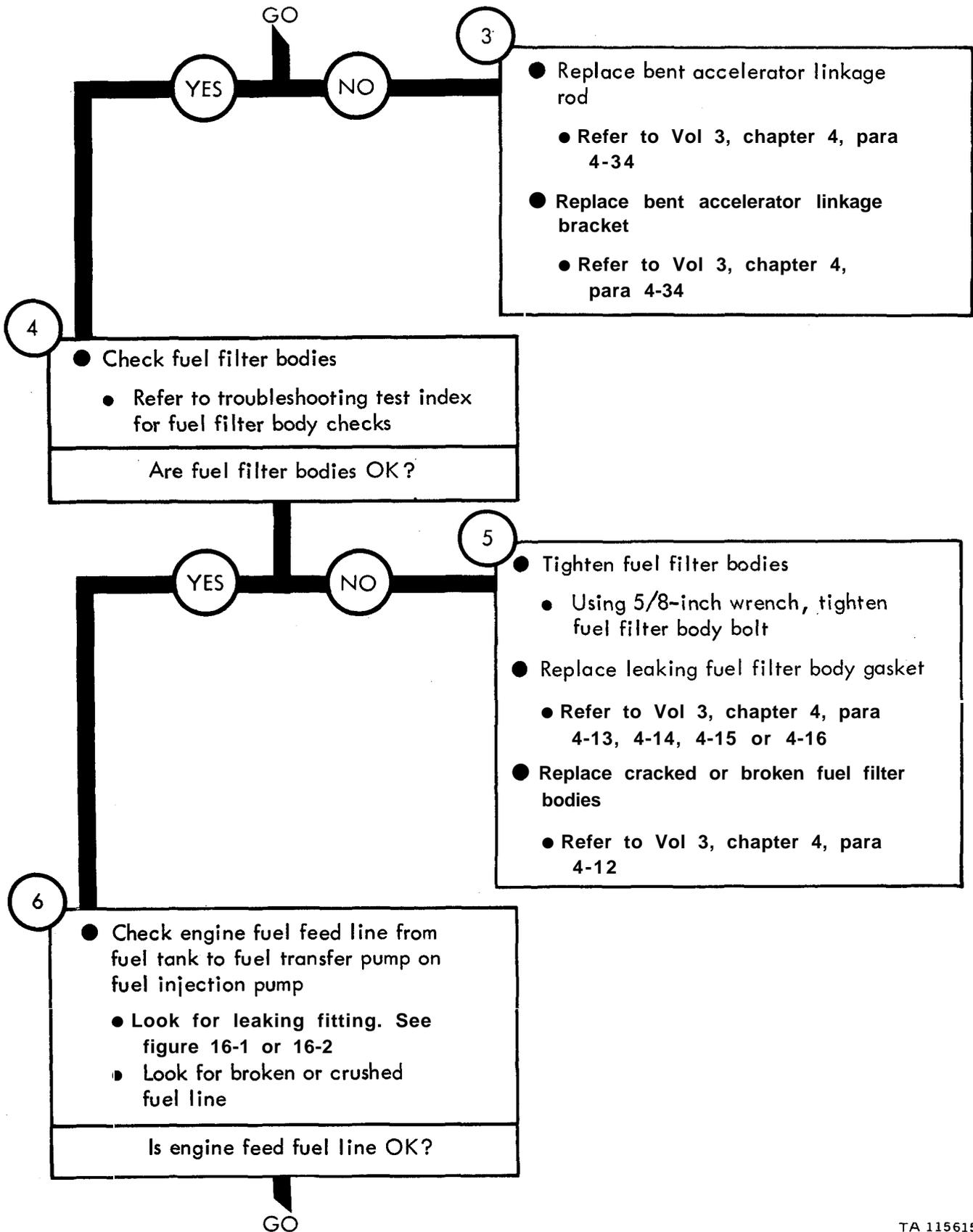


Figure 14-5 (Sheet 2 of 4)

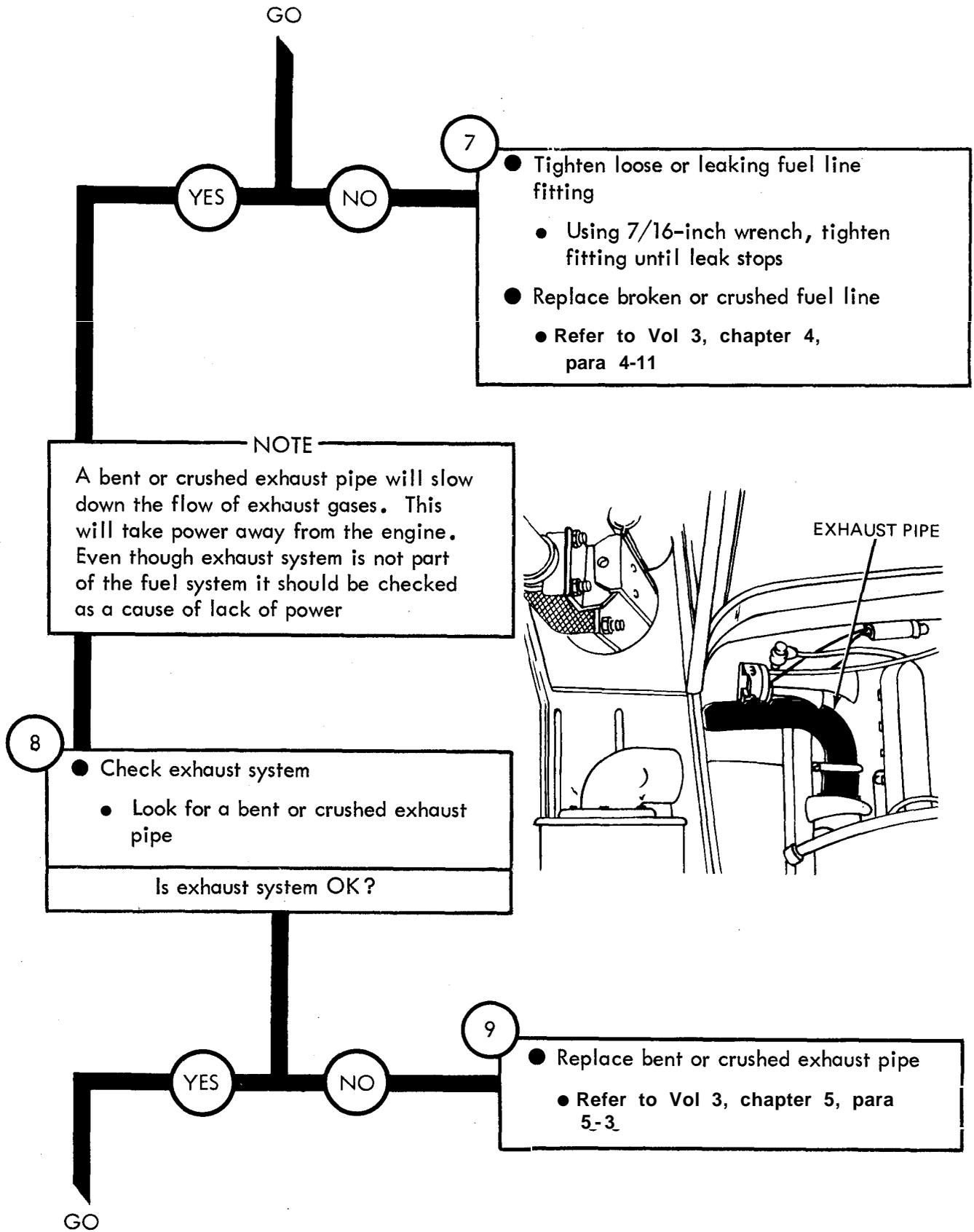


Figure 14-5 (Sheet 3 of 4)

TA 115616

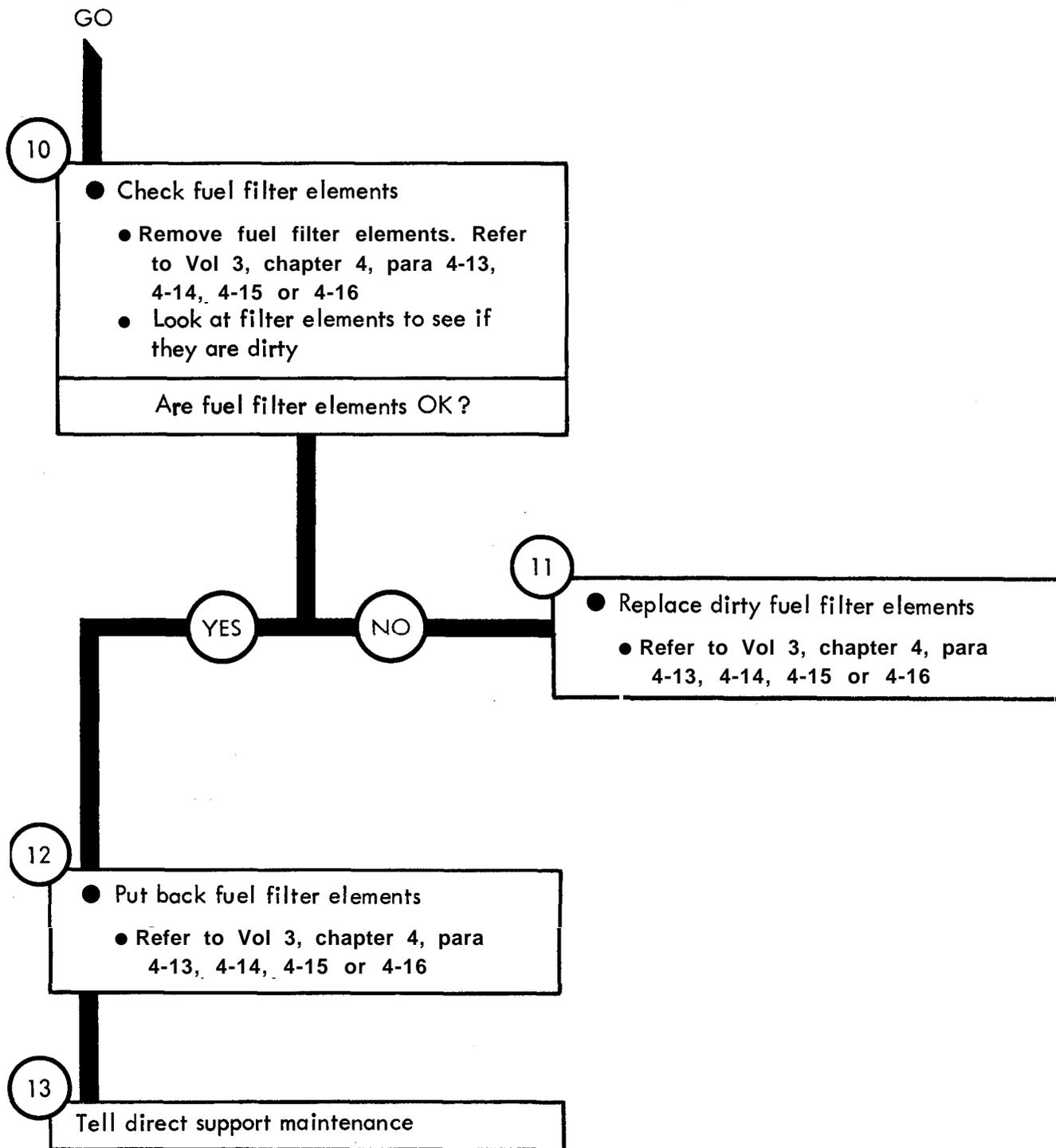


Figure 14-5 (Sheet 4 of 4)

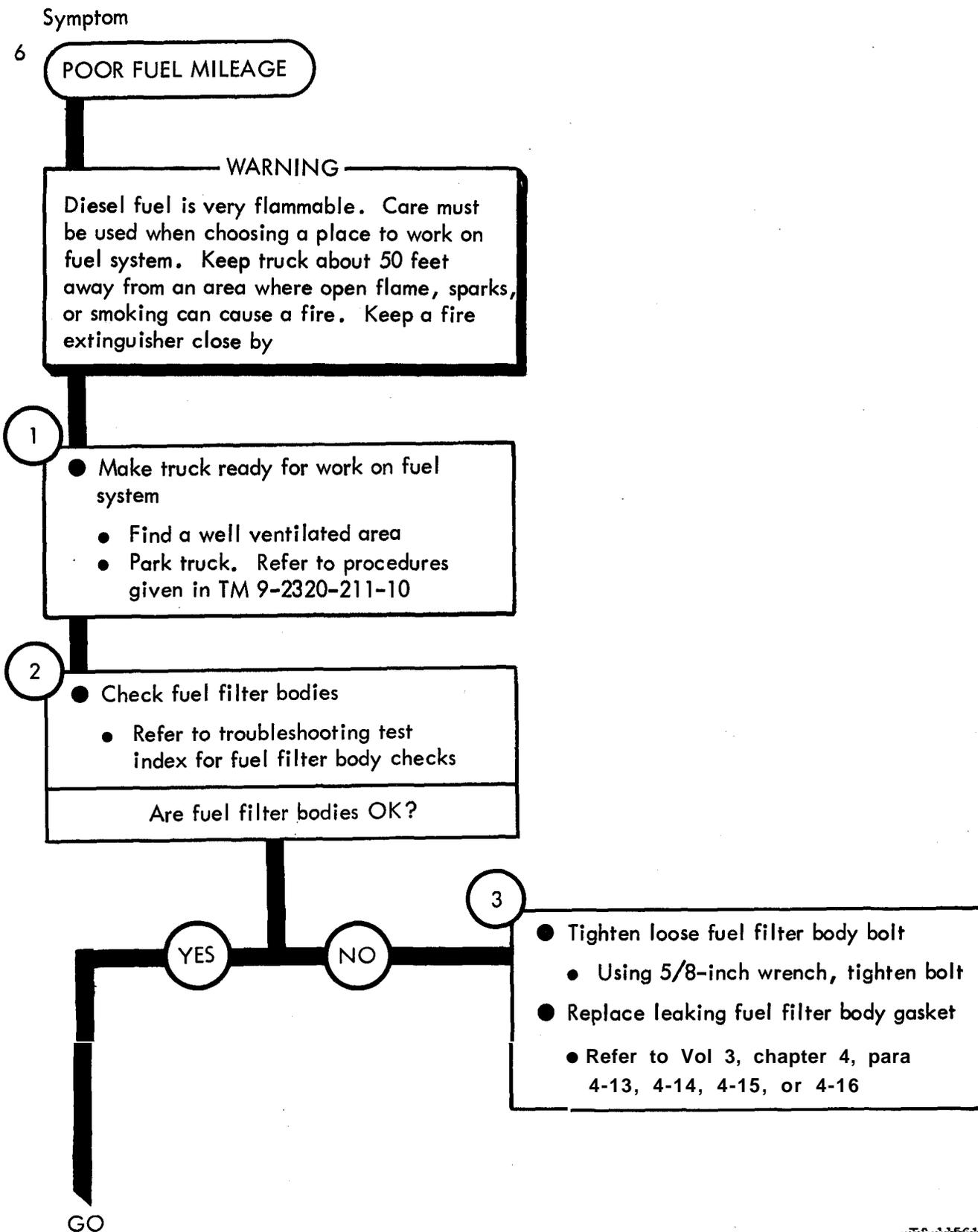


Figure 14-6 (Sheet 1 of 2)

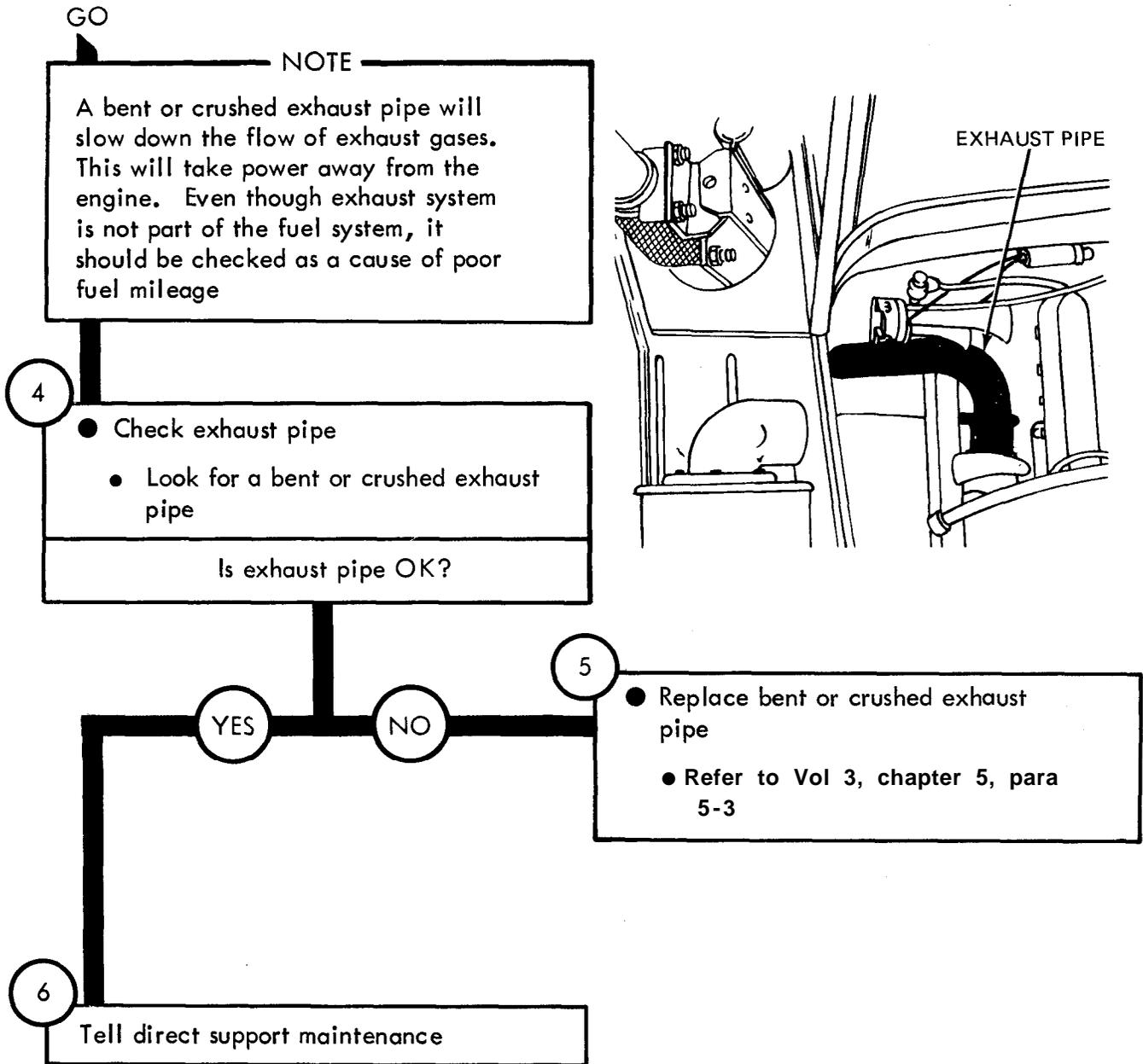


Figure 14-6 (Sheet 2 of 2)

Symptom

7

ENGINE DOES NOT SLOW DOWN WHEN ACCELERATOR PEDAL IS LET GO

WARNING

Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks, or smoking can cause a fire. Keep a fire extinguisher close by

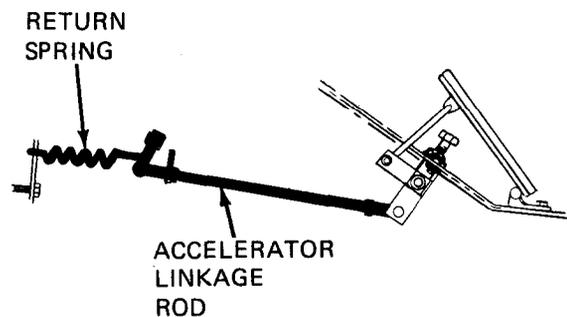
1

- Make truck ready for work on fuel system
 - Find a well ventilated area
 - Park truck. Refer to procedures given in TM 9-2320-211-10

2

- Check accelerator return spring
 - See if both ends of return spring are attached
 - See if return spring is broken

Is accelerator return spring OK?



GO

Figure 14-7 (Sheet 1 of 3)

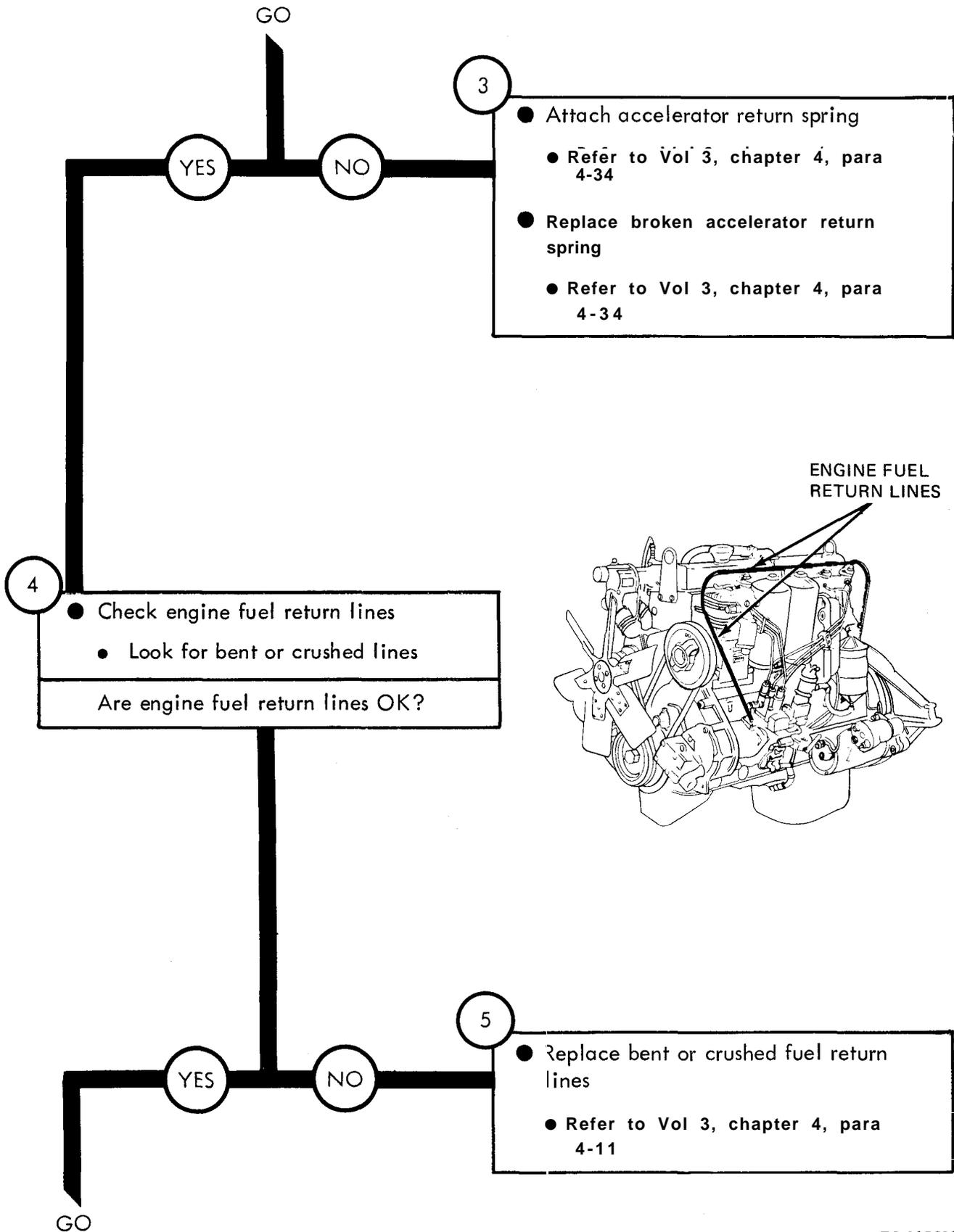


Figure 14-7 (Sheet 2 of 3)

TA 115621

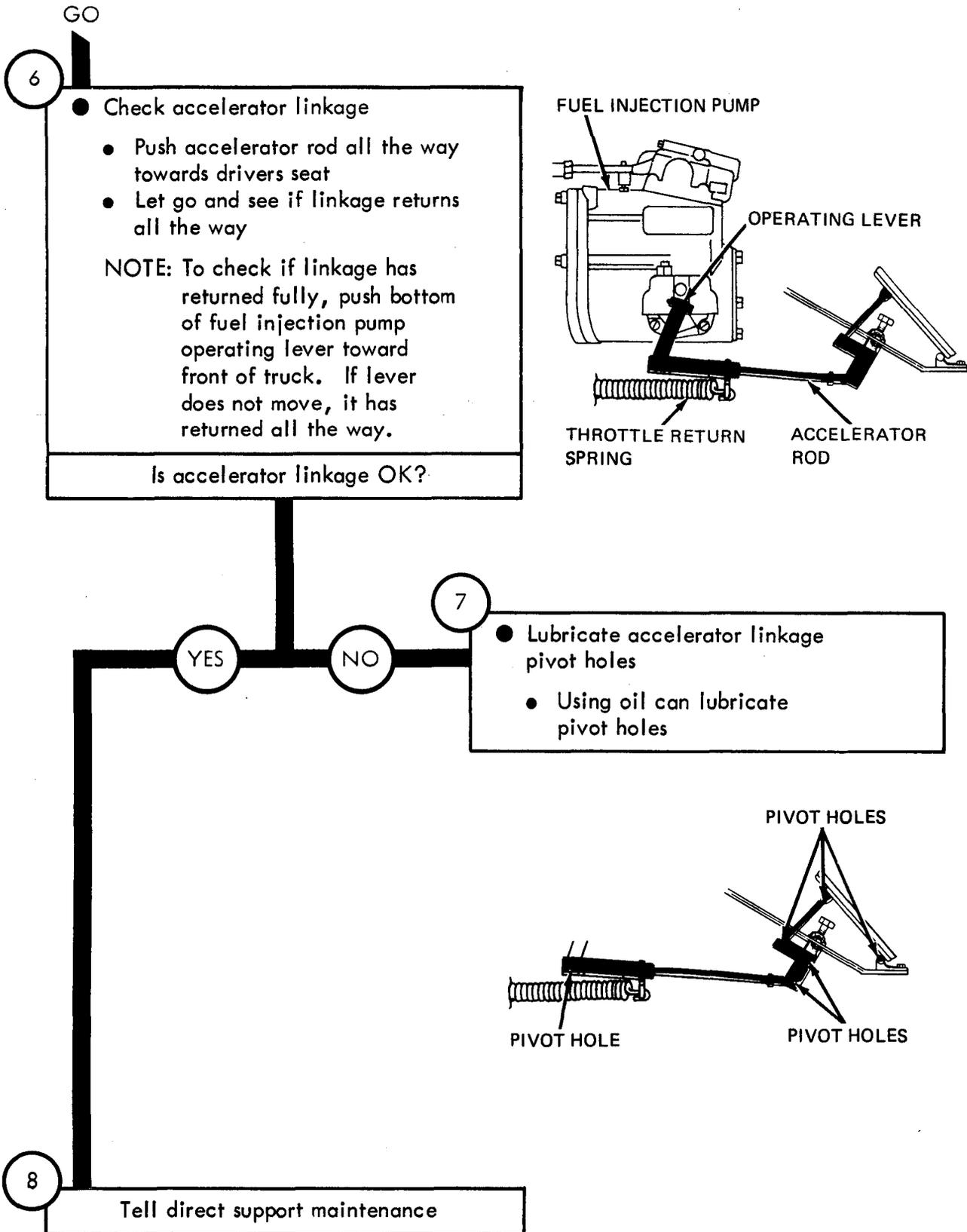


Figure 14-7 (Sheet 3 of 3)

TA 115622

Symptom

8

ENGINE RUNS AFTER BEING SHUT OFF**WARNING**

Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks, or smoking can cause a fire. Keep a fire extinguisher close by

1

- Make truck ready for work on fuel system
 - Find a well ventilated area
 - Park truck. Refer to procedures given in TM 9-2320-211-10-1

GO

Figure 14-8 (Sheet 1 of 3)

TA 115623

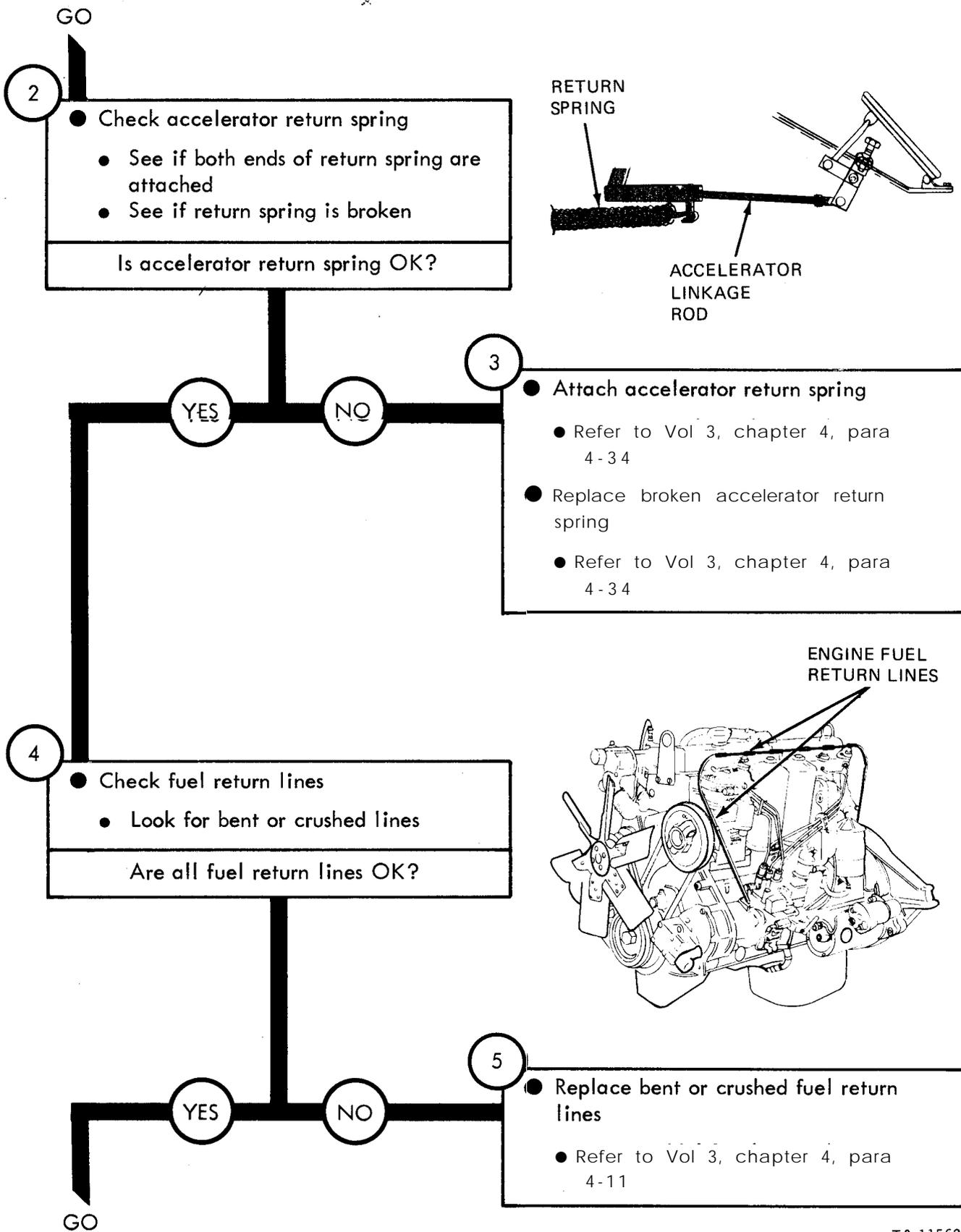


Figure 14-8 (Sheet 2 of 3)

TA 115624

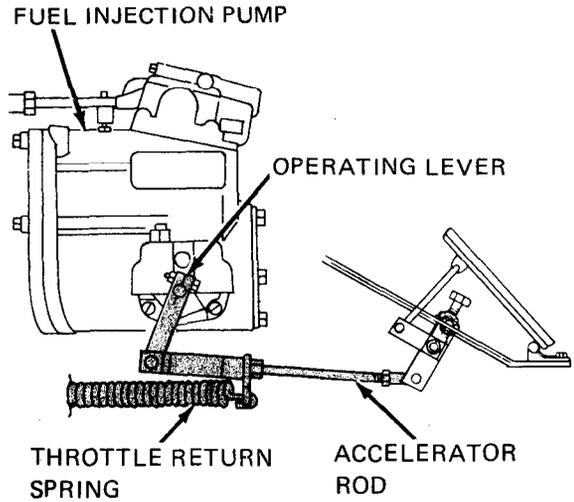
GO

6

- Check accelerator linkage
 - Push accelerator rod all the way towards drivers seat
 - Let go and see if linkage returns all the way

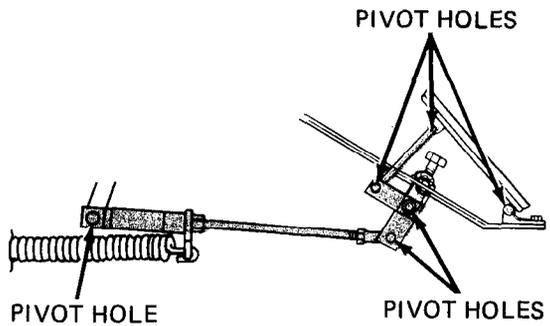
Note: To check if linkage has returned fully push bottom of fuel injection pump operating lever toward front of truck. If lever does not move it has returned all the way

Is accelerator linkage OK?



7

- Lubricate accelerator linkage pivot holes
 - Using oil can, lubricate pivot holes



YES

NO

8

Tell direct support maintenance

Figure 14-8 (Sheet 3 of 3)

TA 115625

CHAPTER 15

FUEL SYSTEM TROUBLESHOOTING SUMMARY

15-1. GENERAL. This chapter gives a summary of troubleshooting procedures given in chapter 14, for the Fuel System.

15-2. PROCEDURES . The summary in this chapter covers all fault symptoms found in the detailed troubleshooting procedures. Chapter 7 outlines a sample troubleshooting procedure. The summary procedures are based on the "what-to-to" portions of the detailed procedures and do not include the "How-to'do-it" instructions. Warnings, cautions, and notes are given where needed.

FUEL SYSTEM TROUBLESHOOTING SUMMARY

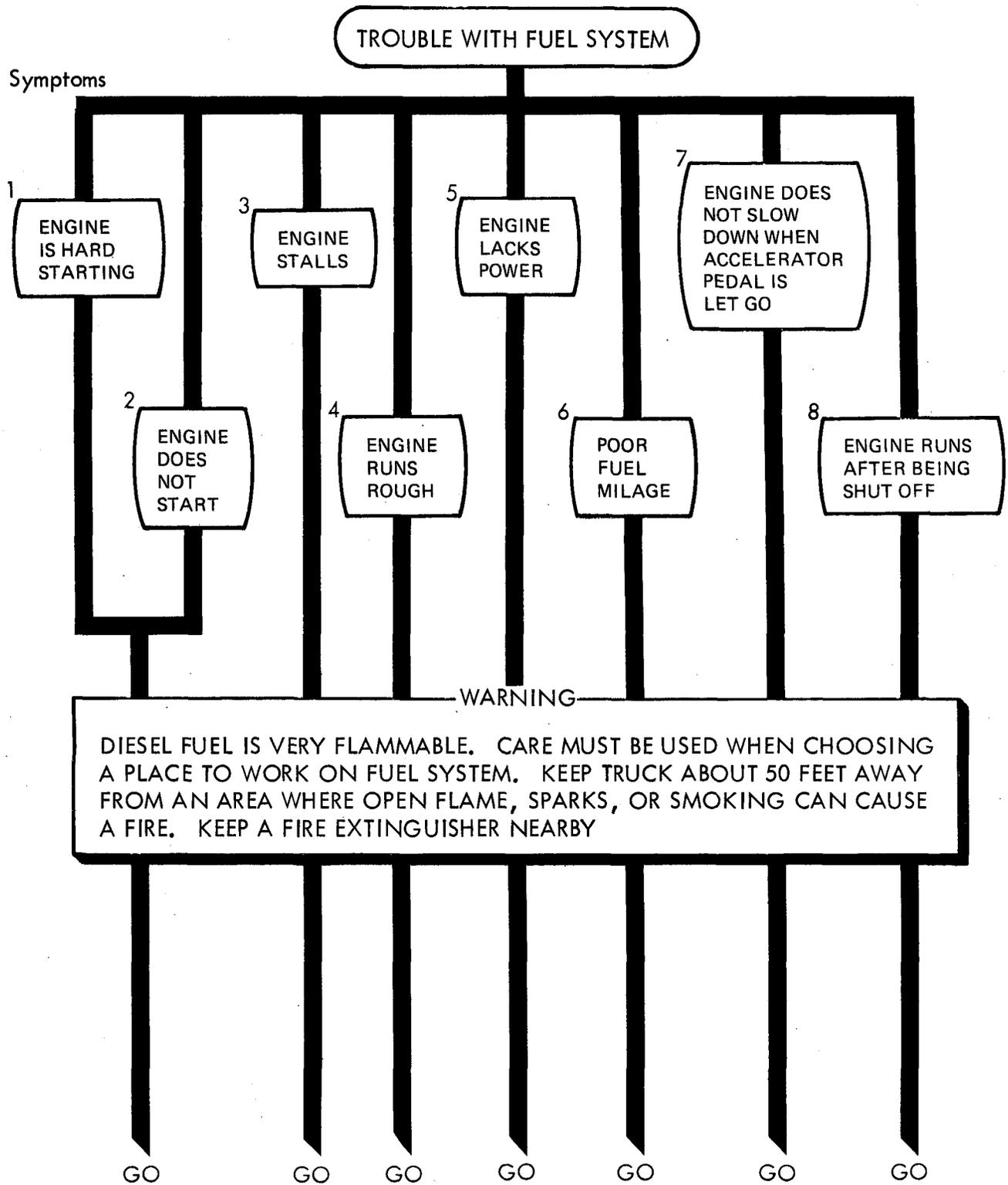


Figure 15-1 (Sheet 1 of 9)

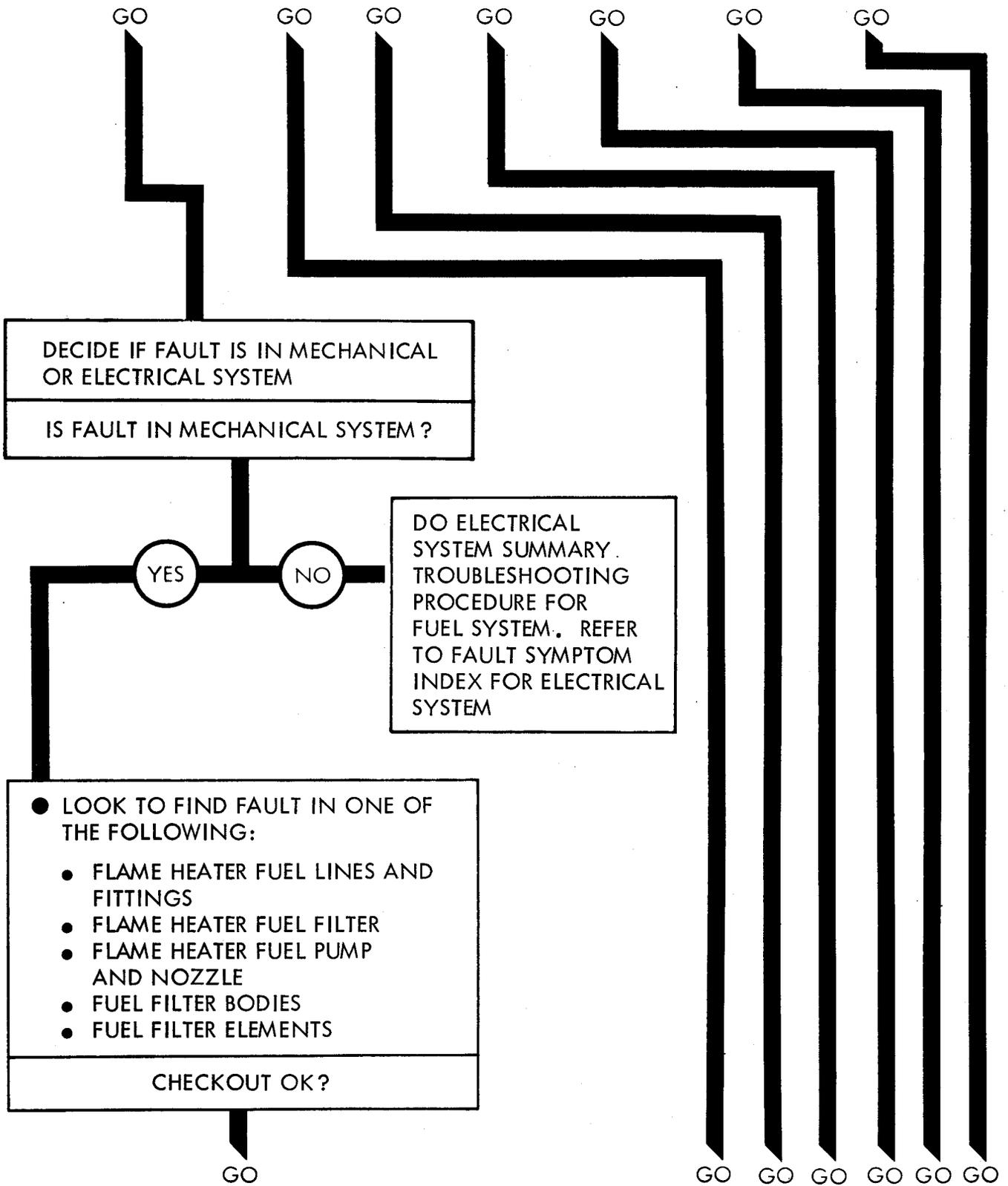
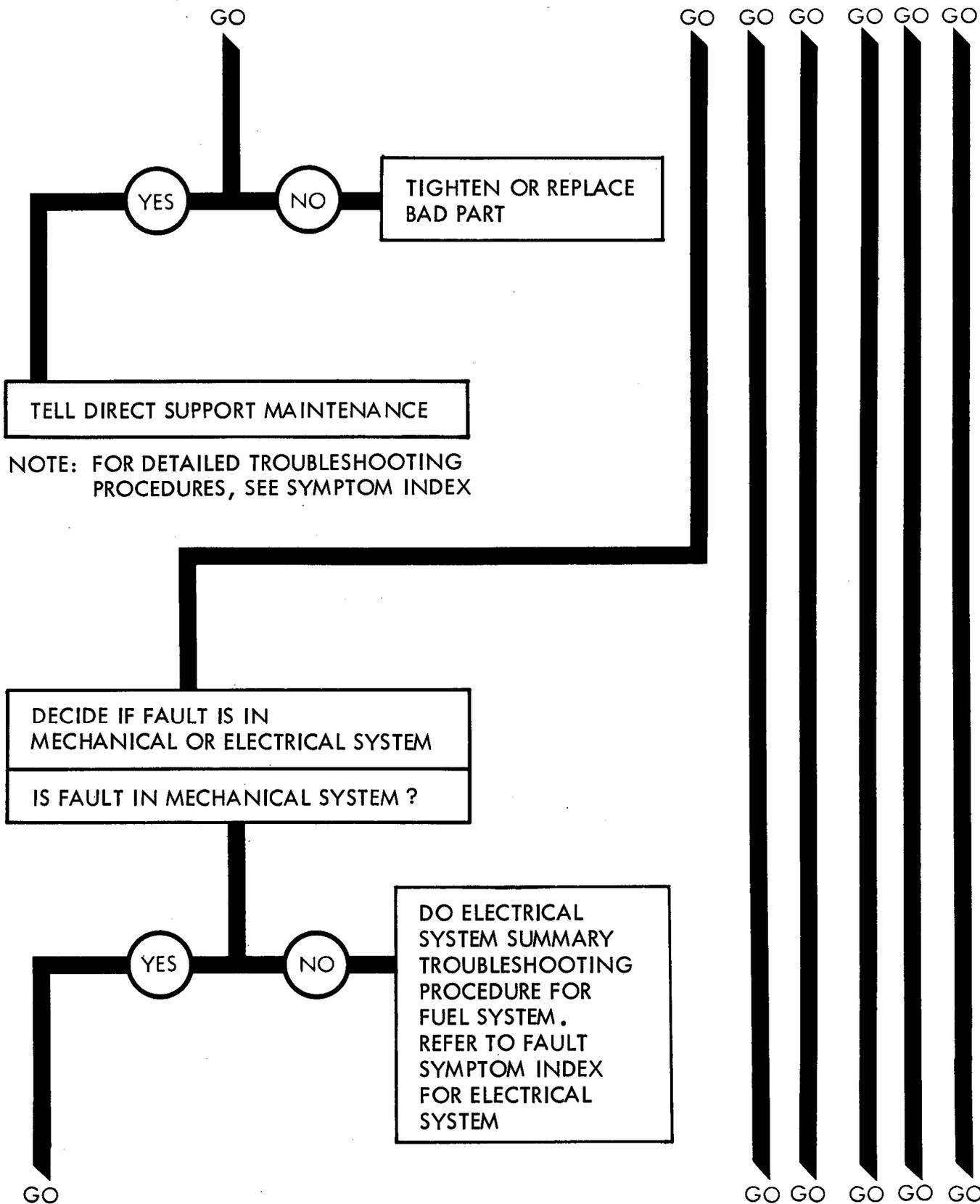


Figure 15-1 (Sheet 2 of 9)



NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

TA 115628

Figure 15-1 (Sheet 3 of 9)

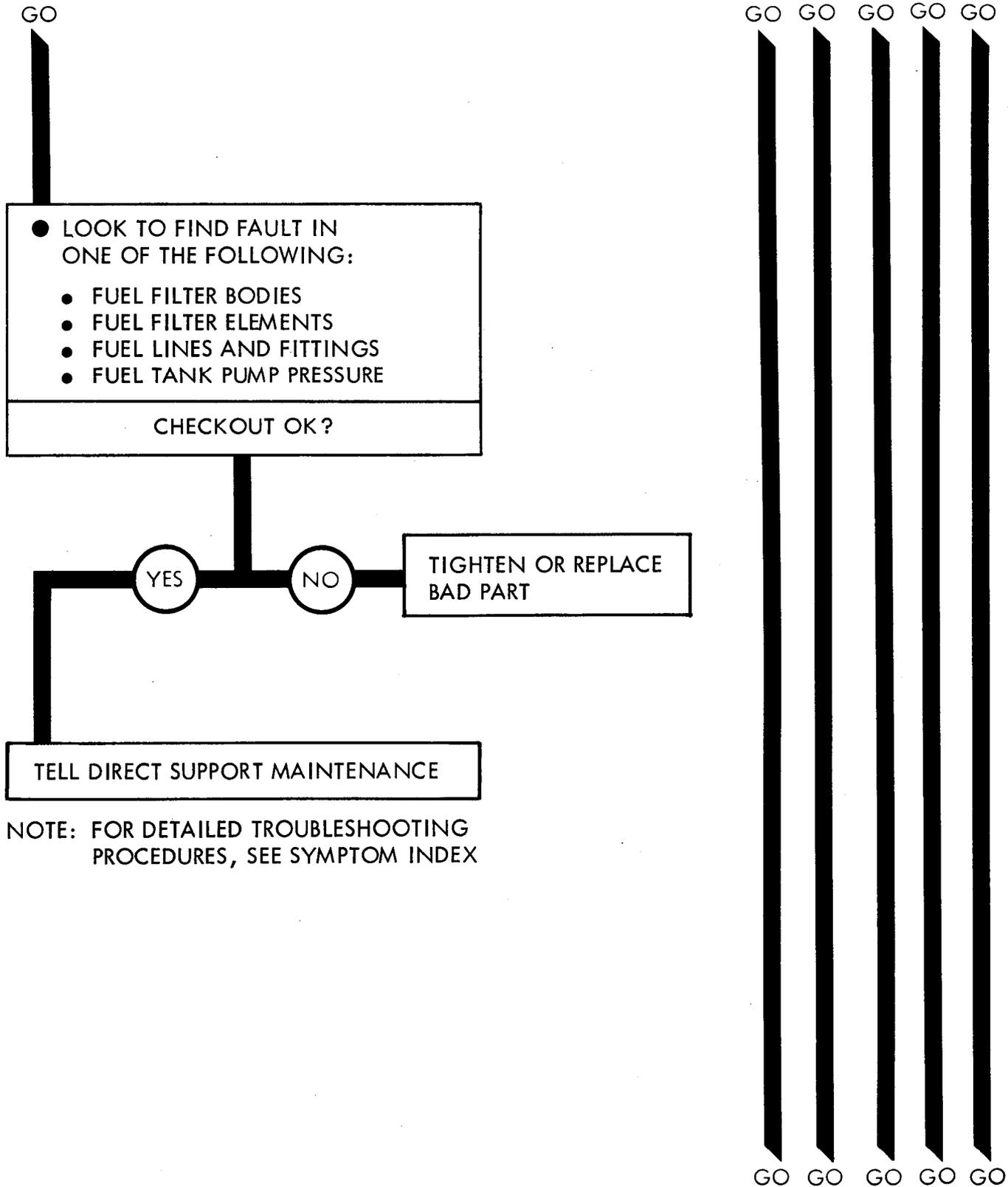


Figure 15-1 (Sheet 4 of 9)

TA 115629

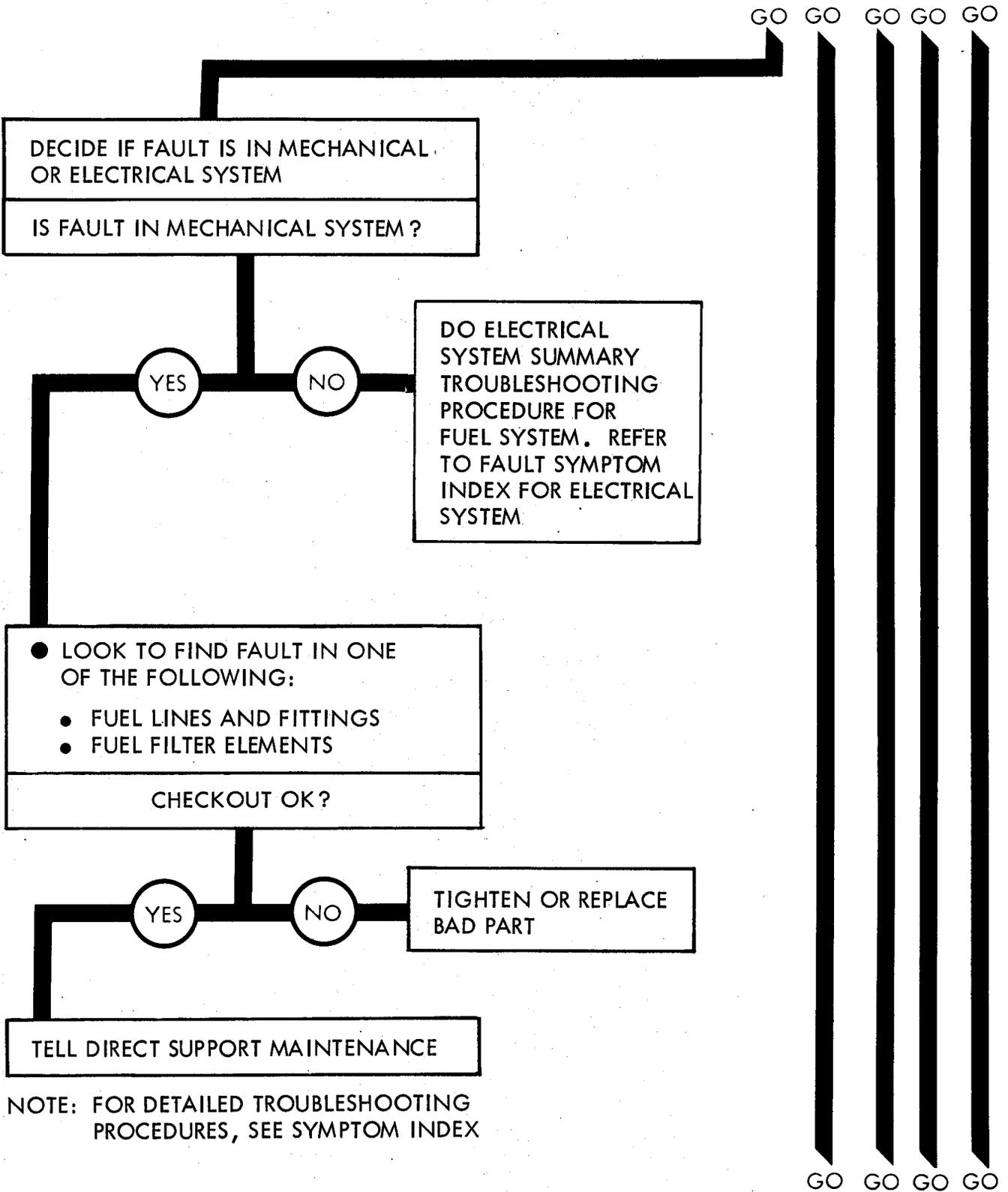
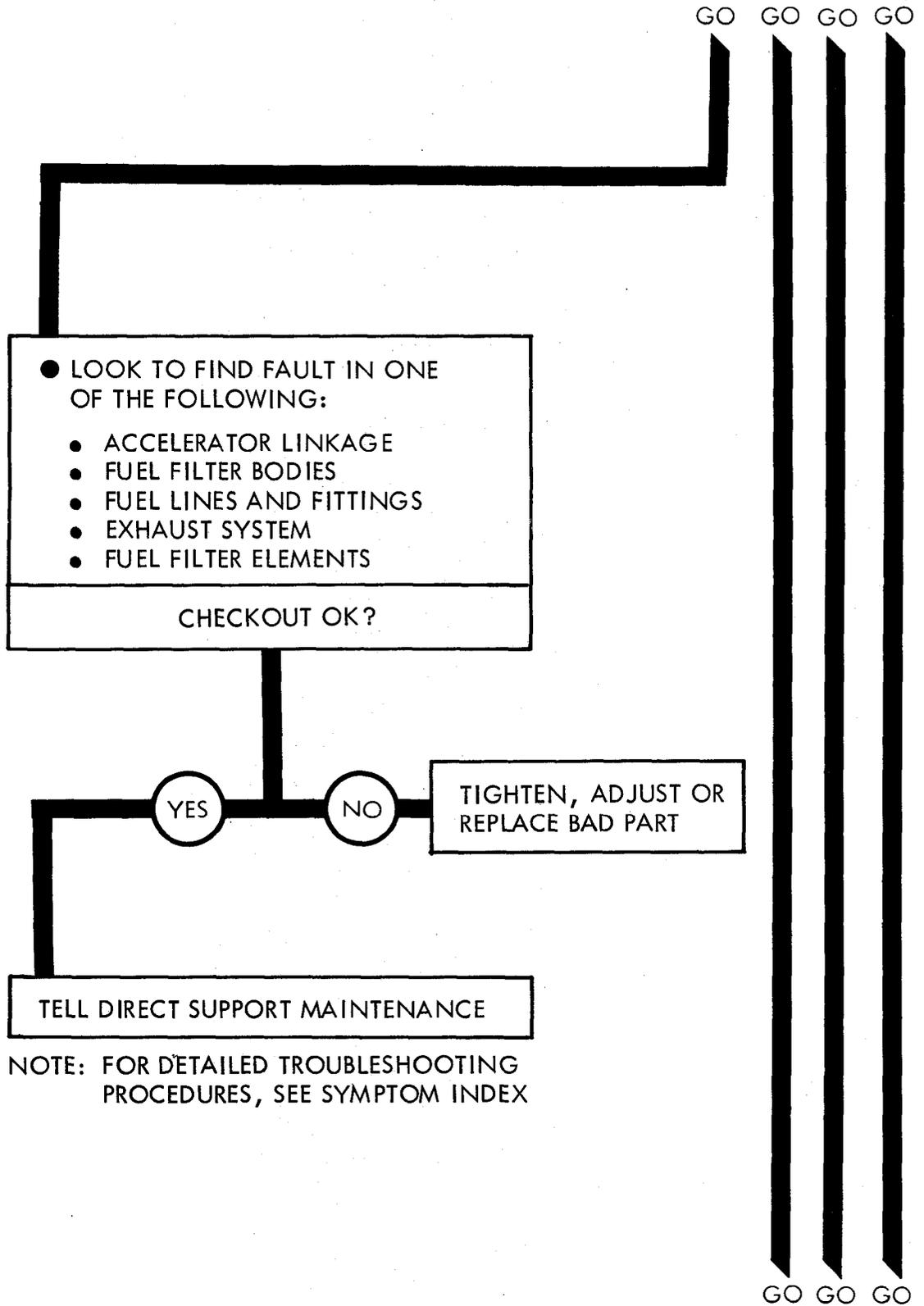


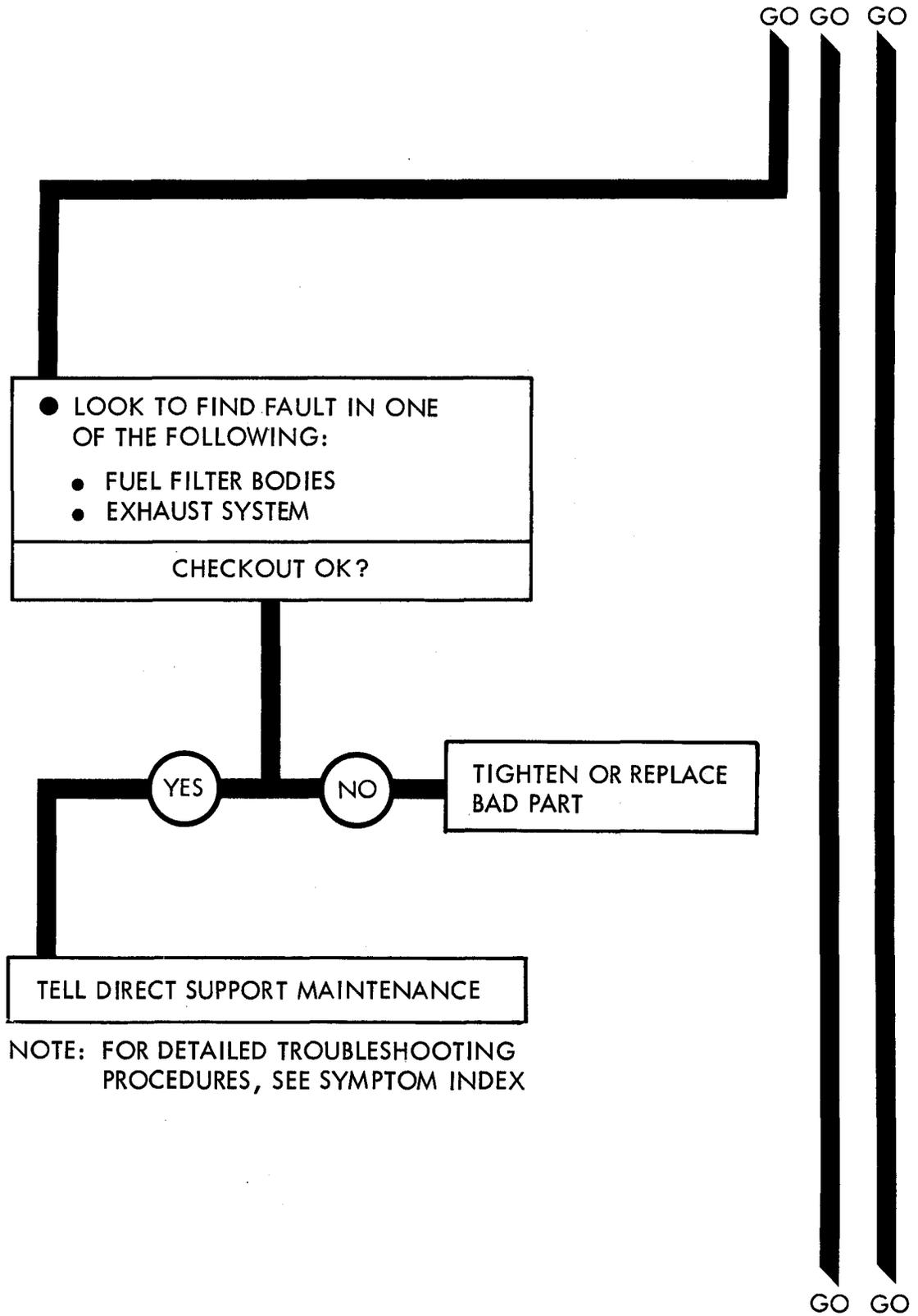
Figure 15-1 (Sheet 5 of 9)



NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

Figure 15-1 (Sheet 6 of 9)

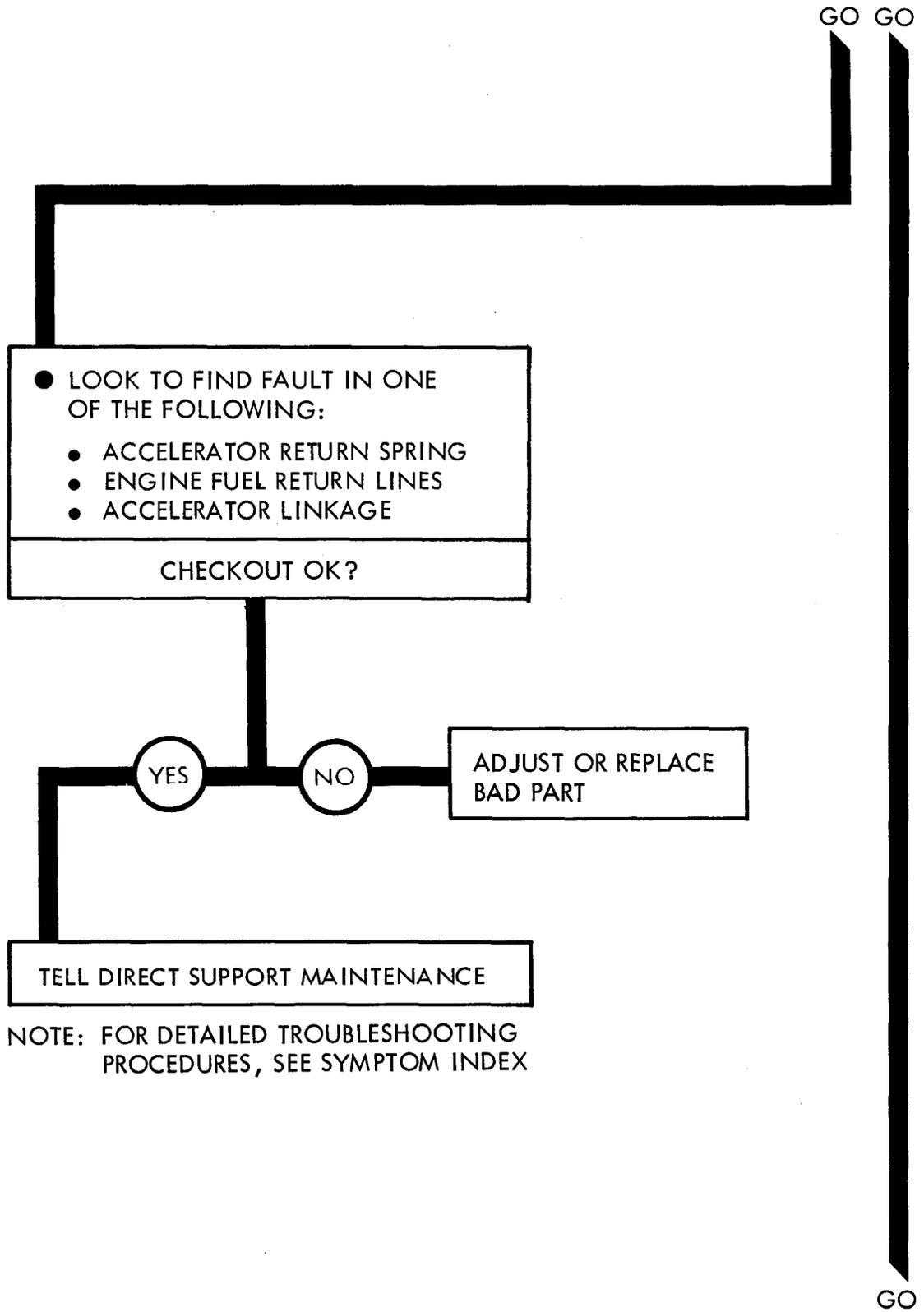
TA 115631



NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

Figure 15-1. (Sheet 7 of 9)

TA 115632



NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

Figure 15-1 (Sheet 8 of 9)

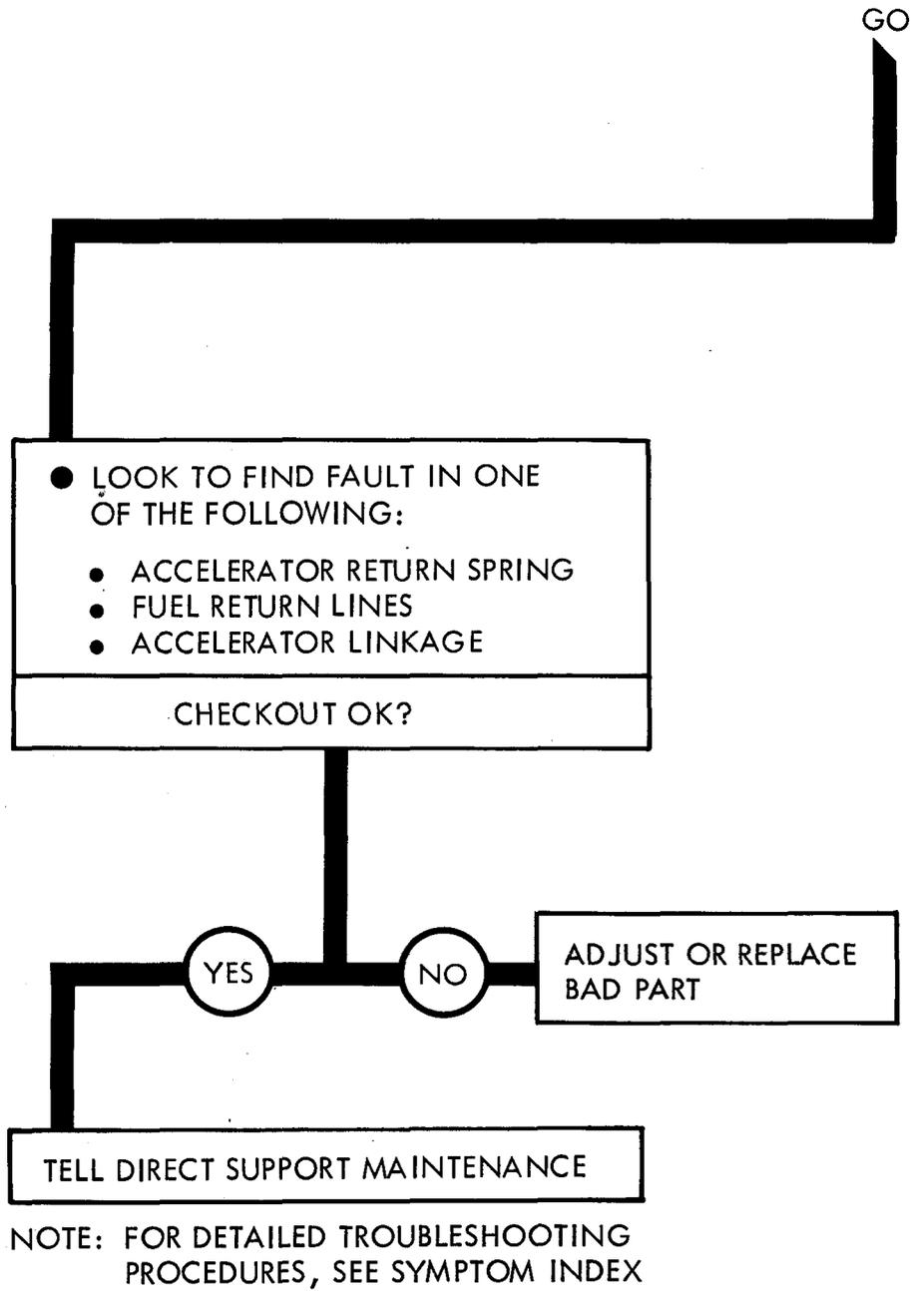
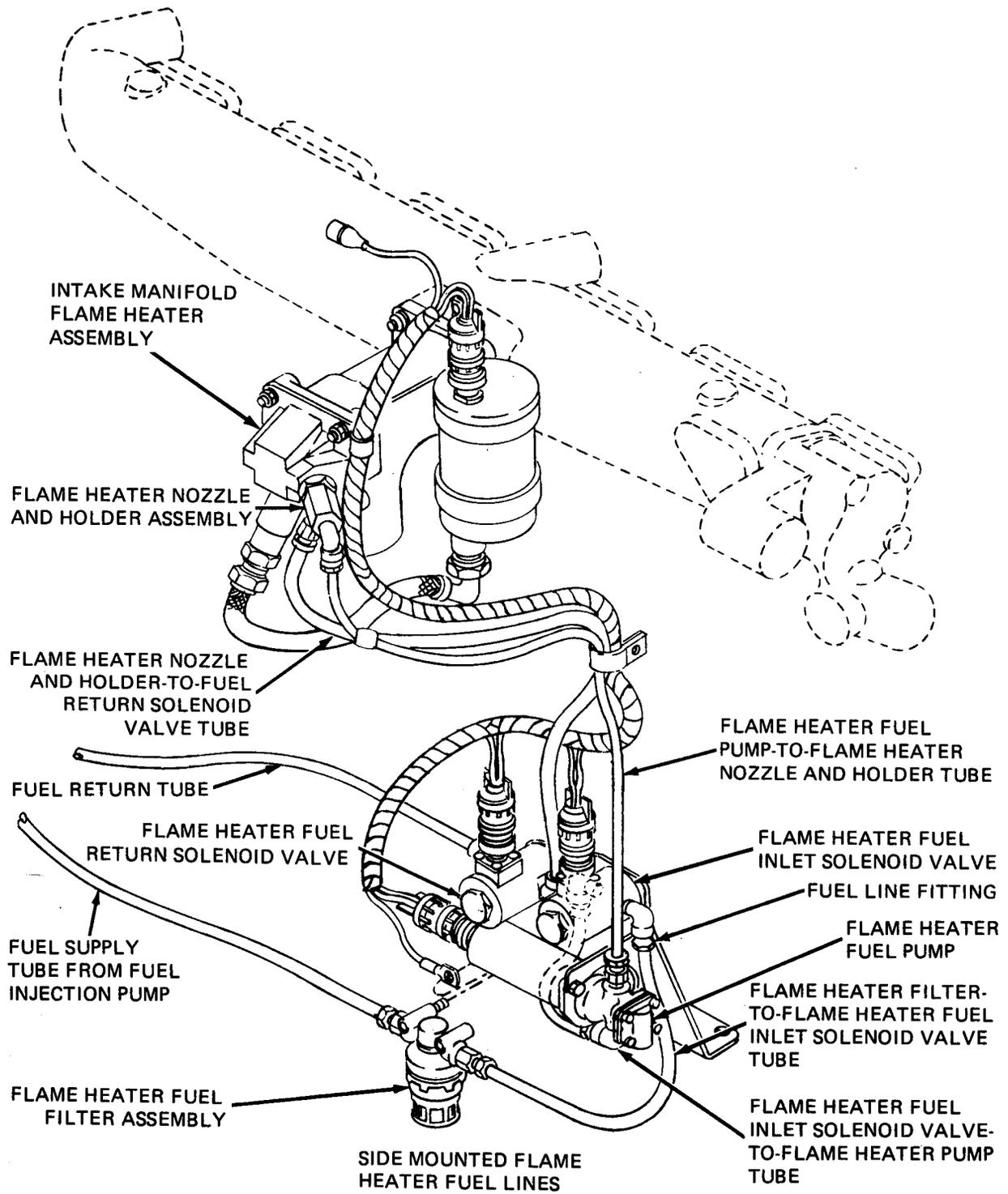


Figure 15-1 (Sheet 9 of 9)

CHAPTER 16

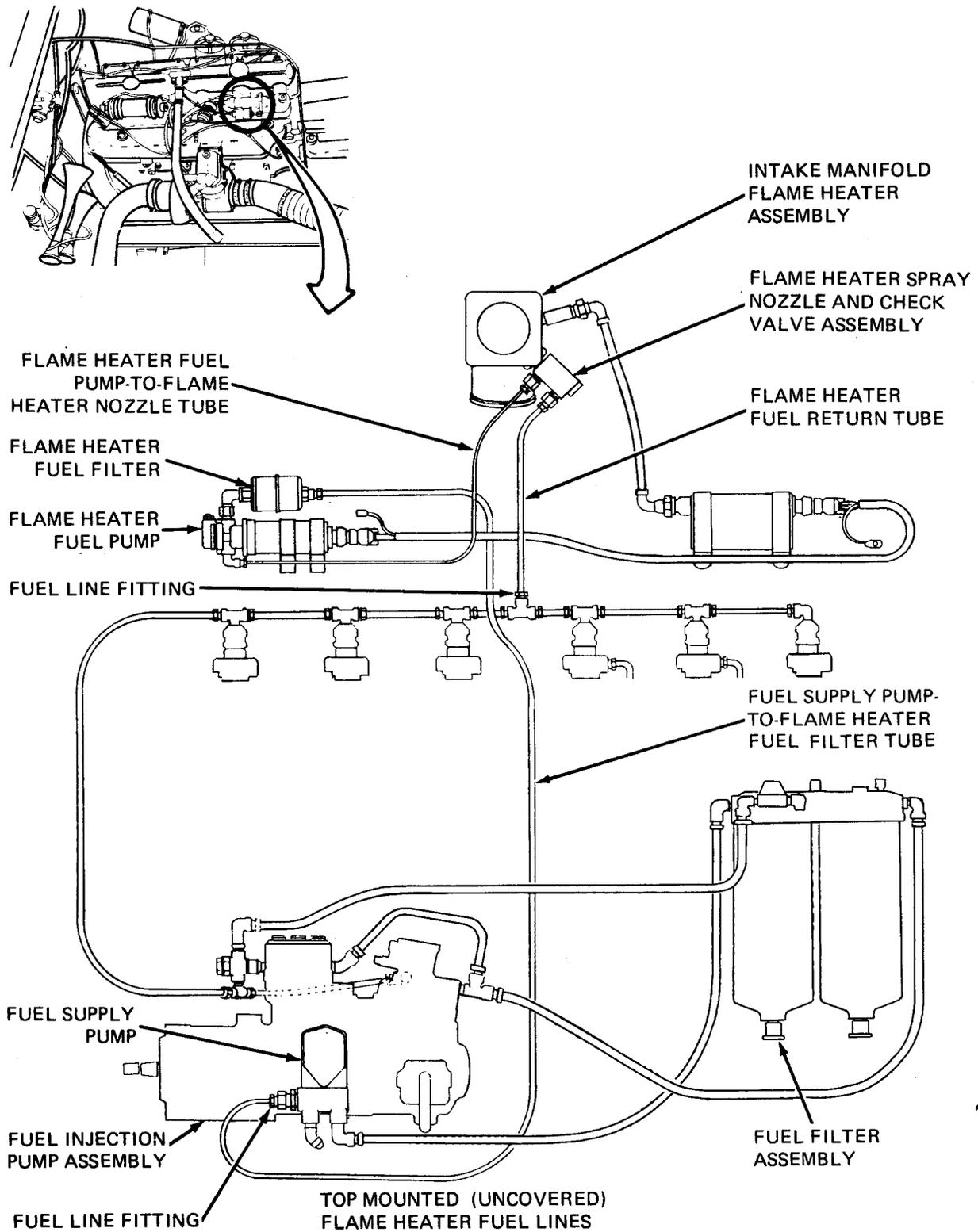
FUEL SYSTEM SUPPORT DIAGRAMS

16-1. GENERAL. This chapter gives the diagrams you need when doing troubleshooting procedures in chapter 14. Table 3-1 is a complete listing of all support diagrams used in this manual.



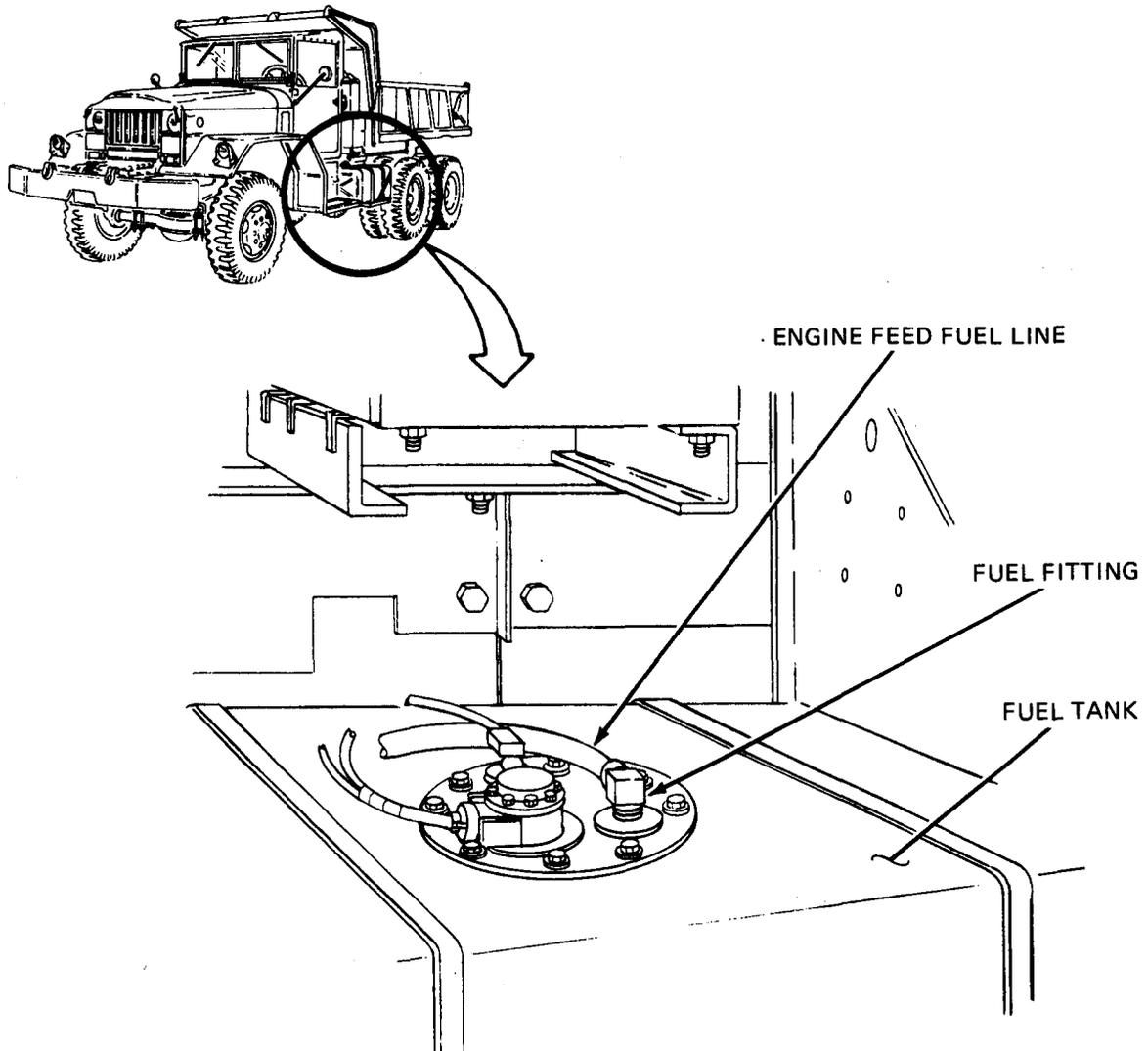
TA 115635

Figure 16-1



TA 115636

Figure 16-2



TA 115637

FUEL SYSTEM SUPPORT DIAGRAM – M51A2 FUEL TANK

Figure 16-3

CHAPTER 17

FUEL SYSTEM TEST PROCEDURES

17-1. GENERAL. This chapter gives test procedures for the tests given in chapter 14, for the Fuel System.

17-2. TEST SET-UP. Instructions for setup of test equipment and parts to be tested are given before the test procedures. Illustrations are used, when needed, to show you how to hook up the test equipment to the part to be tested.

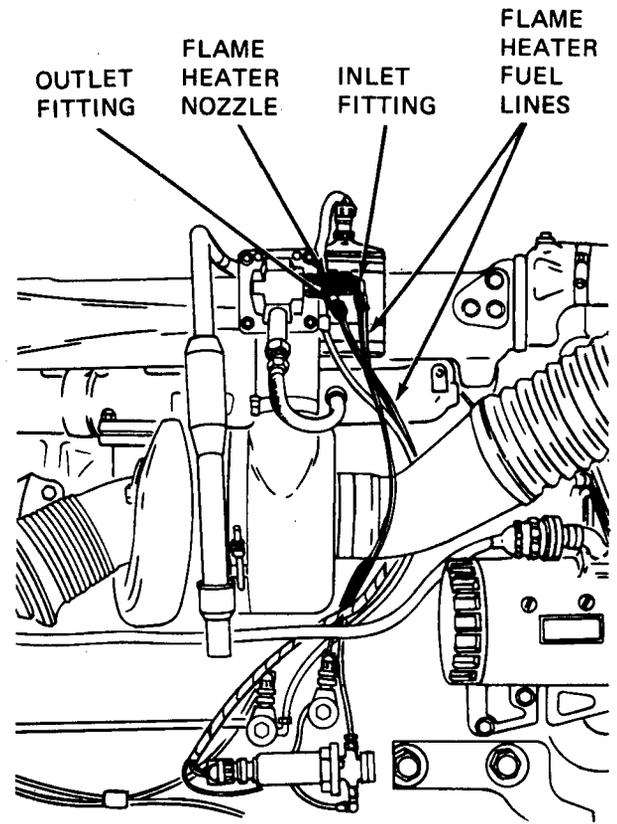
17-3. TEST PROCEDURE. Detailed step-by-step instructions, in flow chart form, are given for each test. The procedure calls out the type of test and the condition of the truck system for each part of testing. The step-by-step test will lead you to the bad component or to a fault symptom within a related system. Reference is made to the fault symptom index, chapter 6, if the test shows a fault in another system.

1 FLAME HEATER FUEL PUMP AND NOZZLE TEST

WARNING
 Diesel fuel is very flammable. Care must be used when choosing a place to work on fuel system. Keep truck about 50 feet away from an area where open flame, sparks, or smoking can cause a fire. Keep a fire extinguisher close by

NOTE
 This test will need two soldiers. The lead soldier will be called soldier A. The helper will be called soldier B

- Test flame heater nozzle
 - Soldier A ● Using 9/16-inch wrench and 7/16-inch wrench unscrew and take off inlet fitting from nozzle
 - Using 7/16-inch wrench and 3/8-inch wrench unscrew and take off outlet fitting
 - Using 1-inch wrench unscrew and take out flame heater nozzle
 - Screw inlet fitting back on nozzle and tighten using 9/16-inch wrench and 7/16-inch wrench



GO

Figure 17-1 (Sheet 1 of 3)

TA 115638

GO

- Screw outlet fitting back on flame heater nozzle and tighten using 7/16-inch wrench and 3/8-inch wrench
- Point nozzle into a can that has at least a 4-inch opening

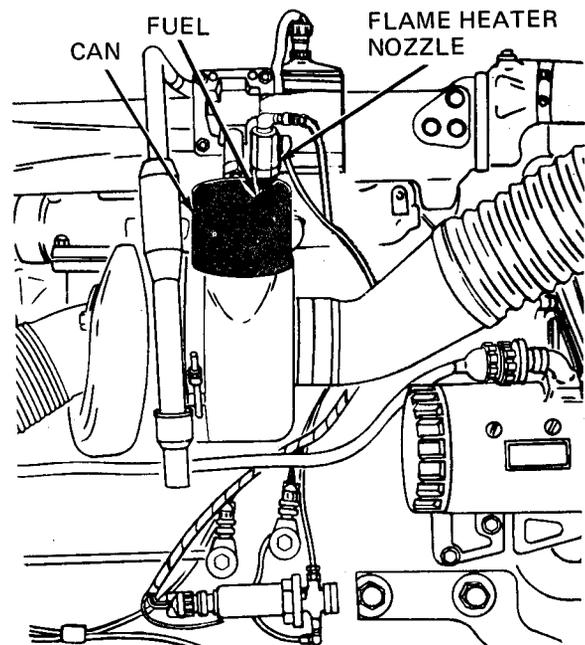
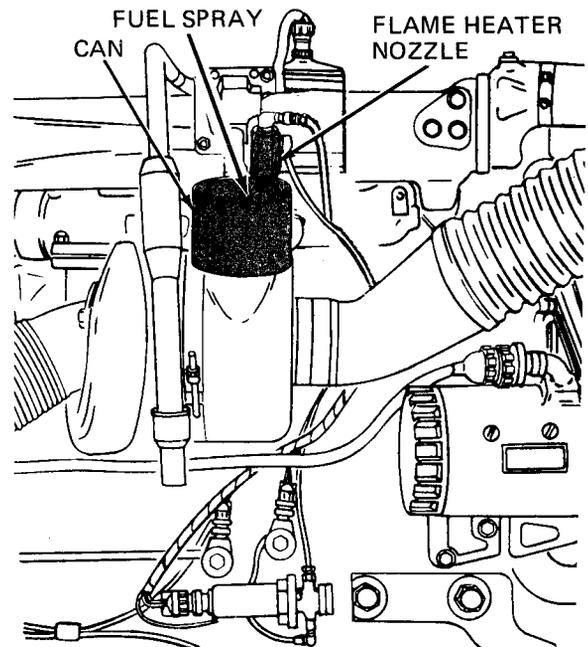
Soldier B ● Turn on flame heater for 10 seconds then turn it off. Refer to TM9-2320-211-10

Soldier A ● See if a cone shaped fuel spray comes from flame heater nozzle

NOTE

If fuel spray pattern is correct, nozzle and flame heater fuel pump are ok. If fuel comes from nozzle in solid stream, nozzle is bad. If no fuel comes from nozzle, go to next step to see if fuel pump is bad

GO



TA 115639

Figure 17-1 (Sheet 2 of 3)

GO

- Test flame heater fuel pump
- Soldier A ● Using 9/16-inch wrench and 7/16-inch wrench unscrew and take off inlet fitting from nozzle
- Using 7/16-inch wrench and 3/8-inch wrench unscrew and take off outlet fitting
 - Put fuel line fitting ends into can
- SOLDIER B ● Turn on flame heater for 10 seconds then turn it off. Refer to TM9-2320-211-10

- Soldier A ● See if steady stream of fuel comes from flame heater fuel pump
- NOTE: A solid, steady stream of fuel means pump is ok

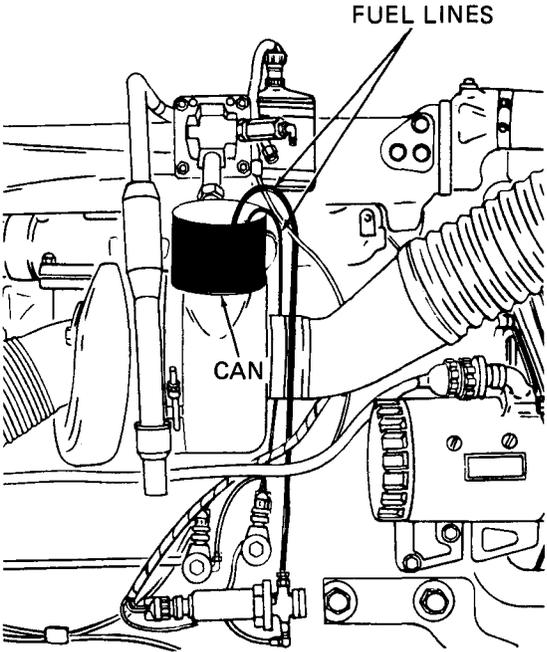


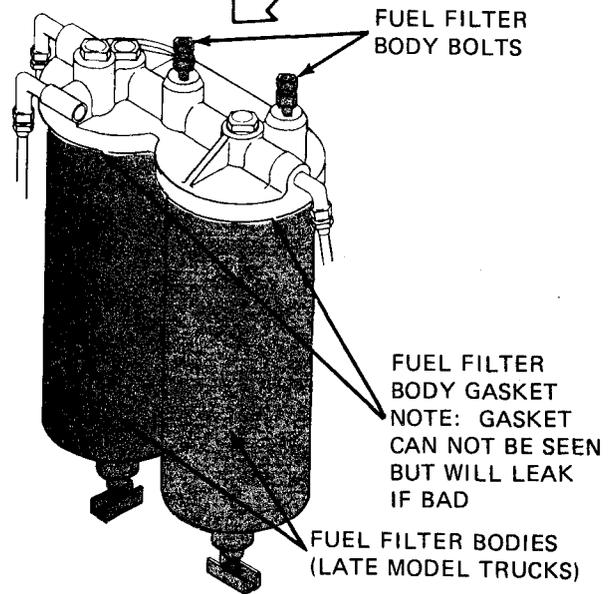
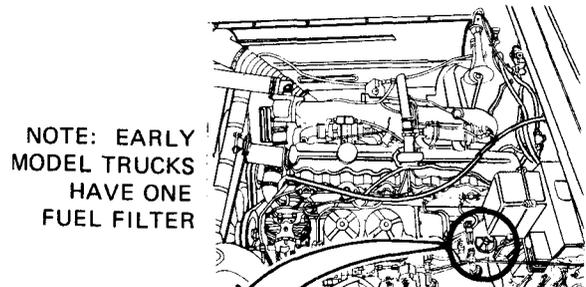
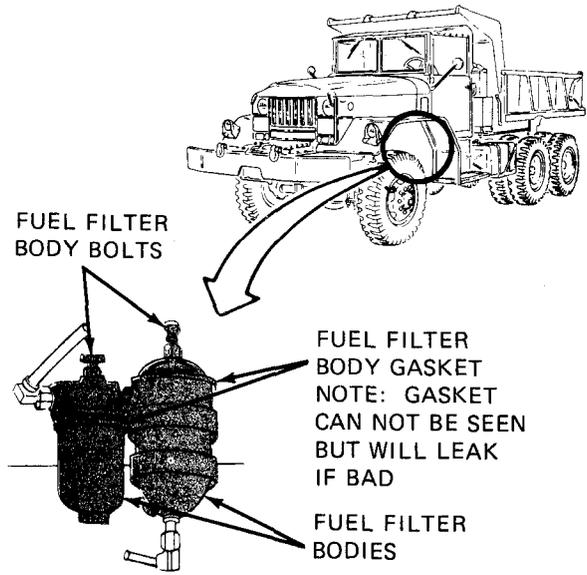
Figure 17-1 (Sheet 3 of 3)

FUEL SYSTEM TROUBLESHOOTING TESTS

2

FUEL FILTER BODY CHECKS

- Check primary, secondary and final fuel filter bodies
- Look for fuel leaking from fuel filter bodies
- Look for signs of fuel leaking from fuel filters head gasket
- Feel for loose fuel filter head bolt



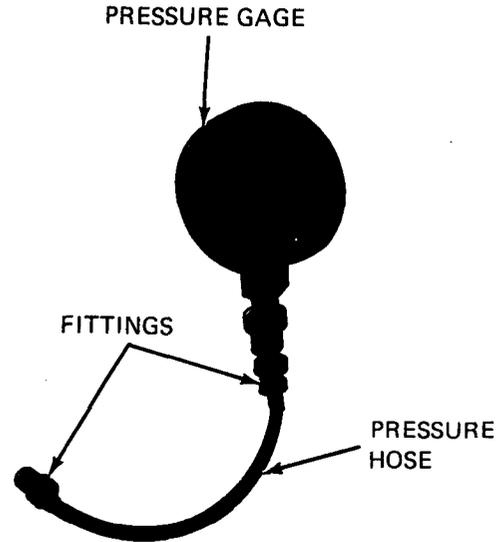
TA 115641

Figure 17-2

FUEL SYSTEM TROUBLESHOOTING TESTS

GENERAL INSTRUCTIONS

- Check pressure gage before using
 - Gage - look to see that the glass and needle are not broken
 - Pressure hose - look to see that there are no holes, cracks, or kinks
 - Fittings - feel if fittings are tight on both ends. Look to see that the input end is dirt free



3 FUEL TANK PUMP PRESSURE TEST

- Test fuel pump pressure
 - Remove fuel pump output line from elbow. See figure 16-3
 - Put pressure gage fitting in elbow and tighten using 5/8-inch wrench
 - Turn on battery switch to "ON". Refer to TM 9-2320-211-10
 - See if gage reading is between 5 and 7 psi
 - Turn off battery switch. Refer to TM 9-2320-211-10

- Using 5/8-inch wrench unscrew and take out pressure gage fitting
- Put back fuel line. See figure 16-3

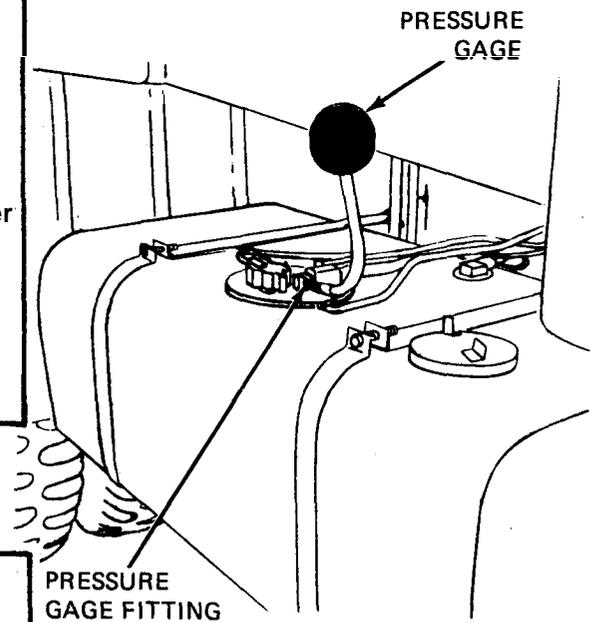


Figure 17-3

TA 115642

CHAPTER 18

FUEL SYSTEM CHECKOUT PROCEDURES

18-1. GENERAL. This chapter gives procedures for checking out the system after troubleshooting and repair have been done. Procedures are set up in flow chart form showing the checkout steps in order and referring to the fault symptom index when the system does not checkout.

FUEL SYSTEM CHECKOUT

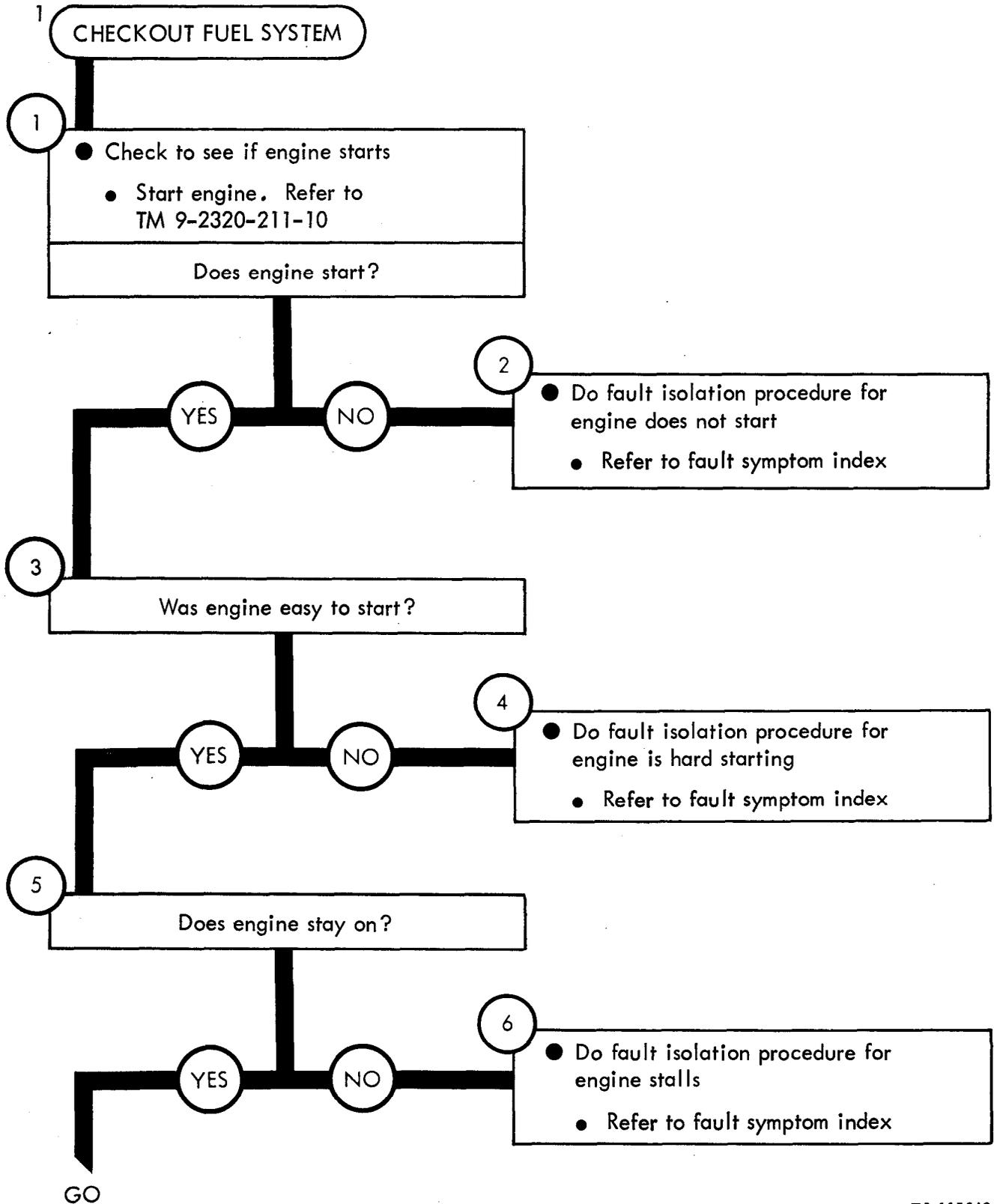


Figure 18-1 (Sheet 1 of 3)

TA 115643

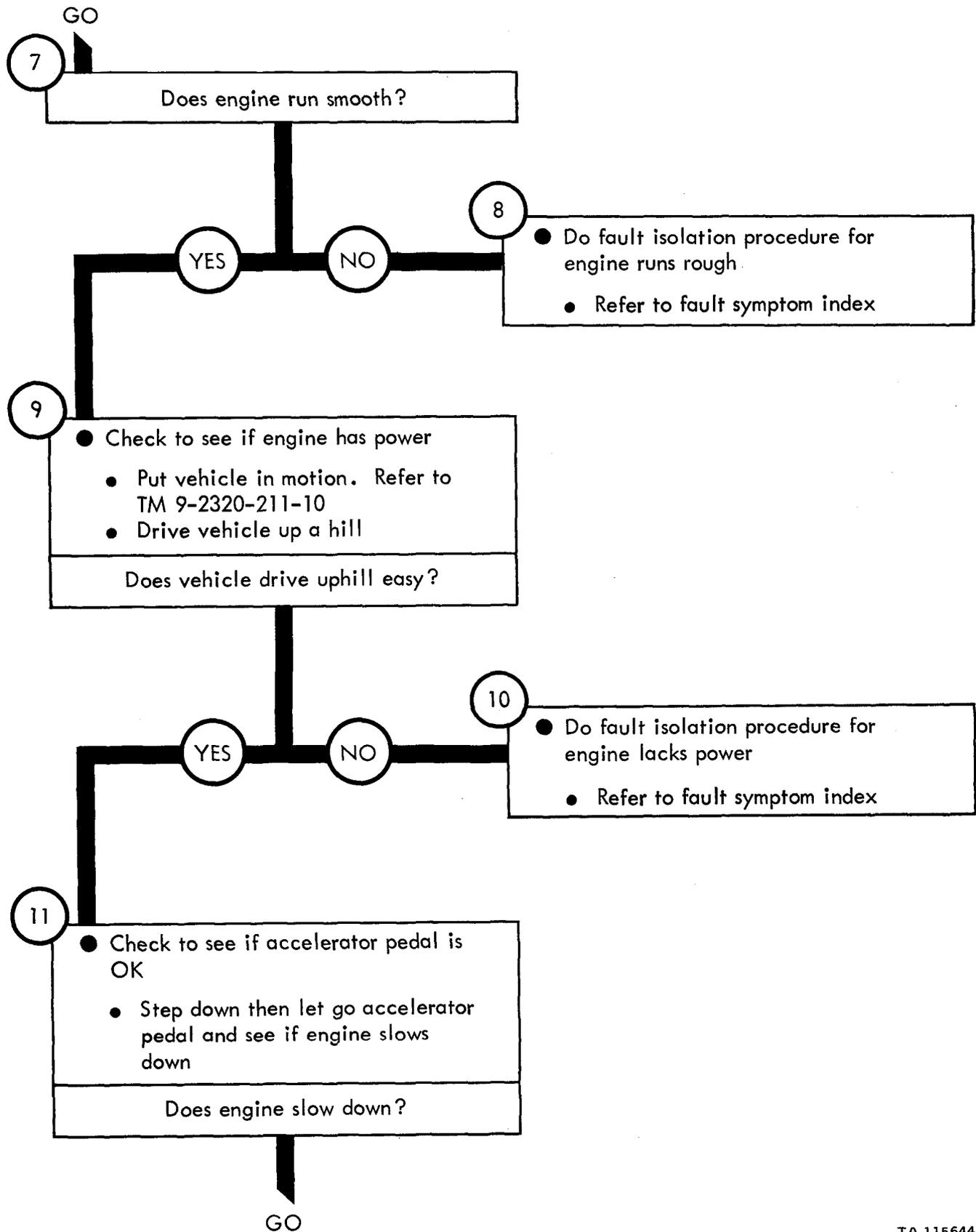


Figure 18-1 (Sheet 2 of 3)

TA 115644

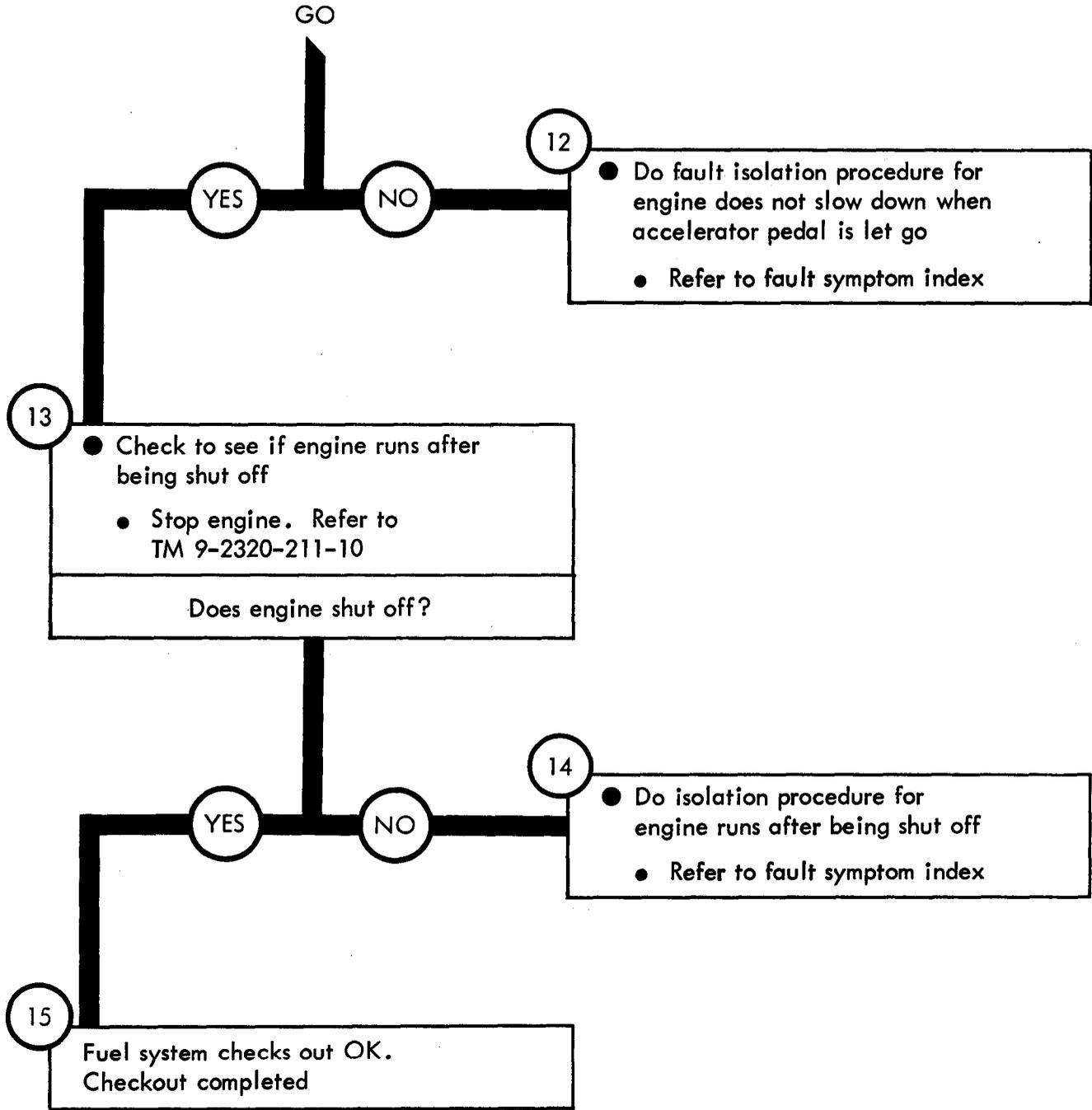


Figure 18-1 (Sheet 3 of 3)

FUEL PUMP CHECKOUT

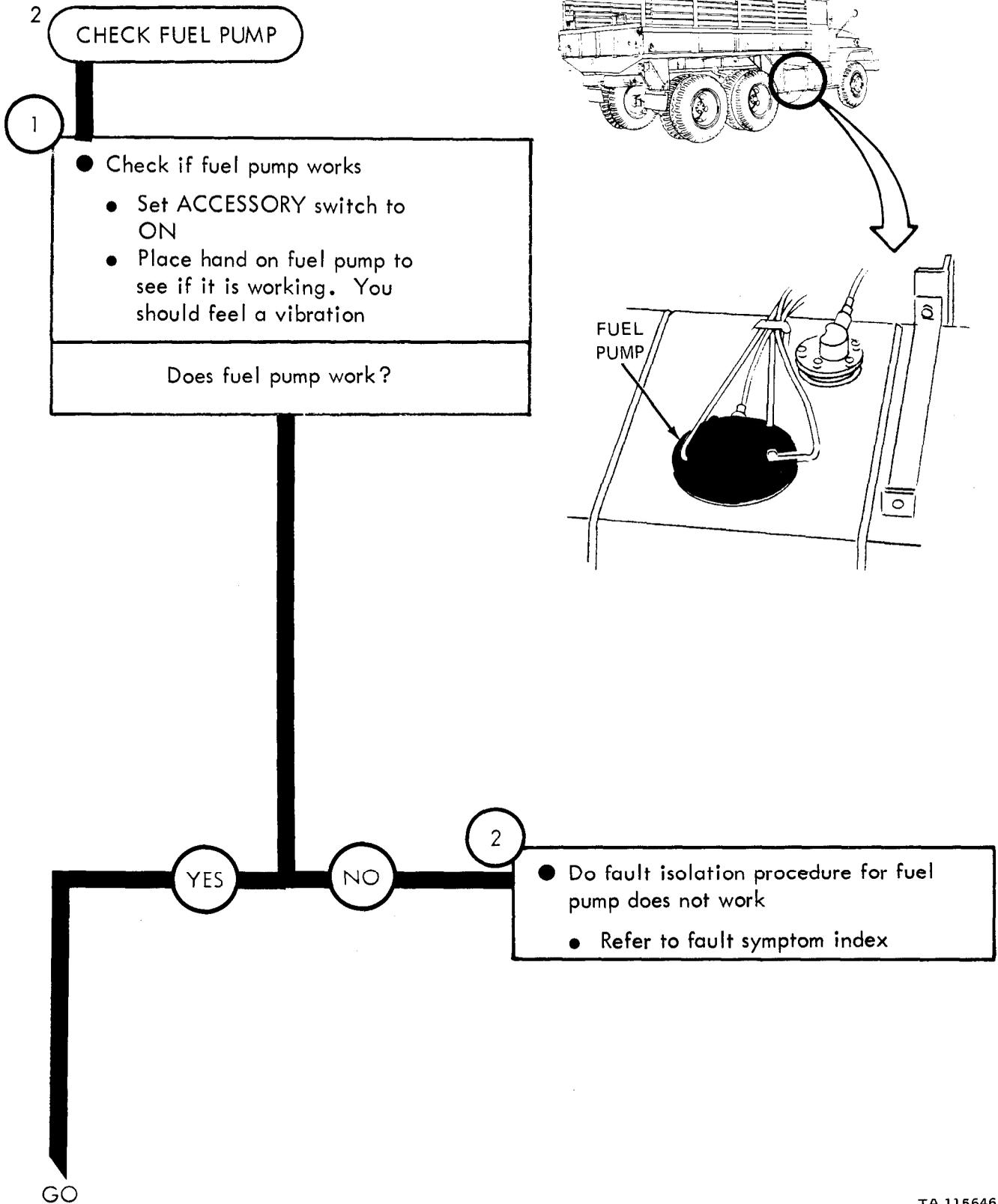


Figure 18-2 (Sheet 1 of 2)

TA 115646

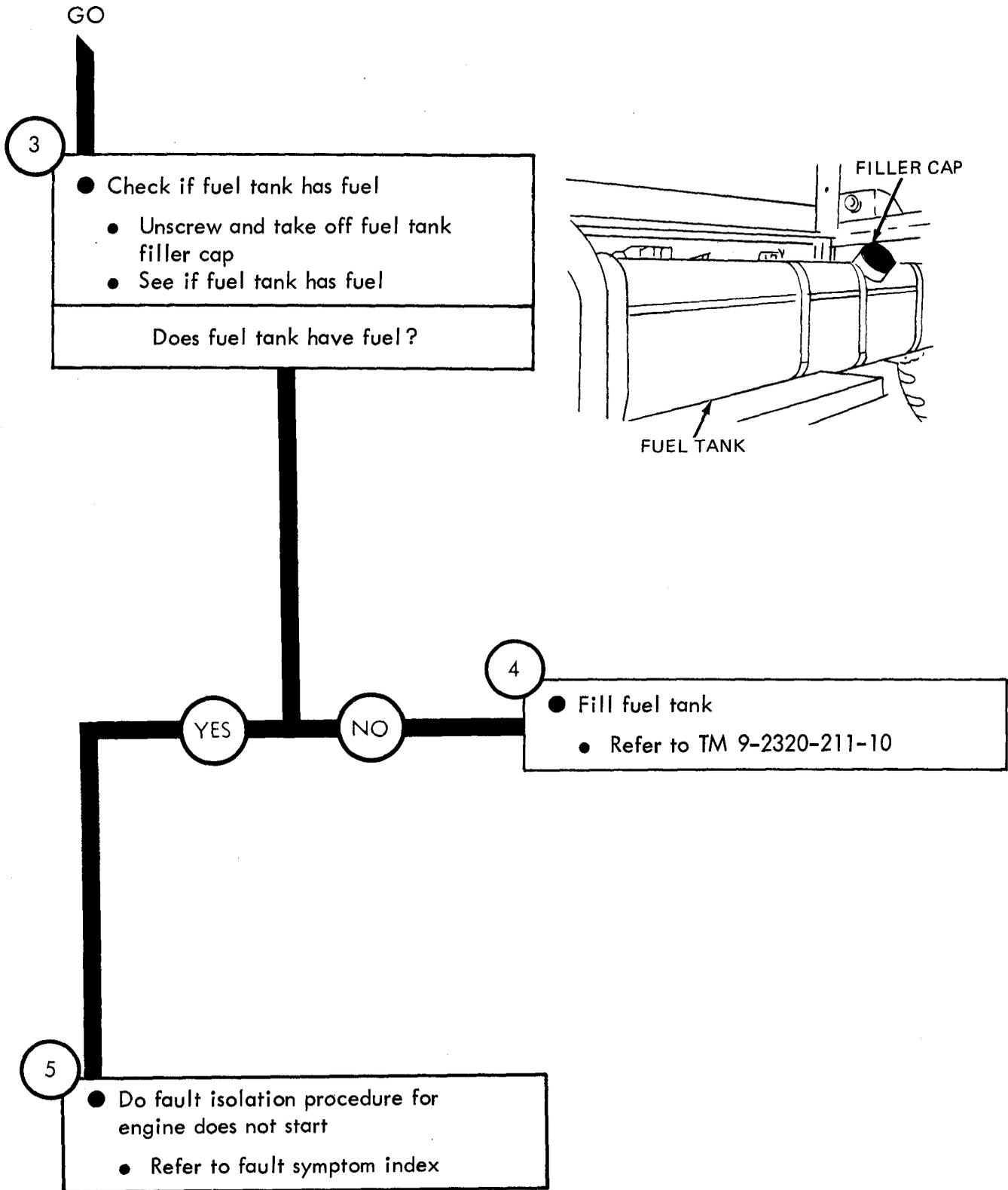


Figure 18-2 (Sheet 2 of 2)

CHAPTER 19

EXHAUST SYSTEM TROUBLESHOOTING

19-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the exhaust system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

19-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

EXHAUST SYSTEM TROUBLESHOOTING

Symptom

1 EXHAUST SYSTEM MAKES NOISE

1

- Make truck ready for work on exhaust system
 - Park truck. Refer to procedures given in TM 9-2320-211-10
 - Chock wheels

WARNING

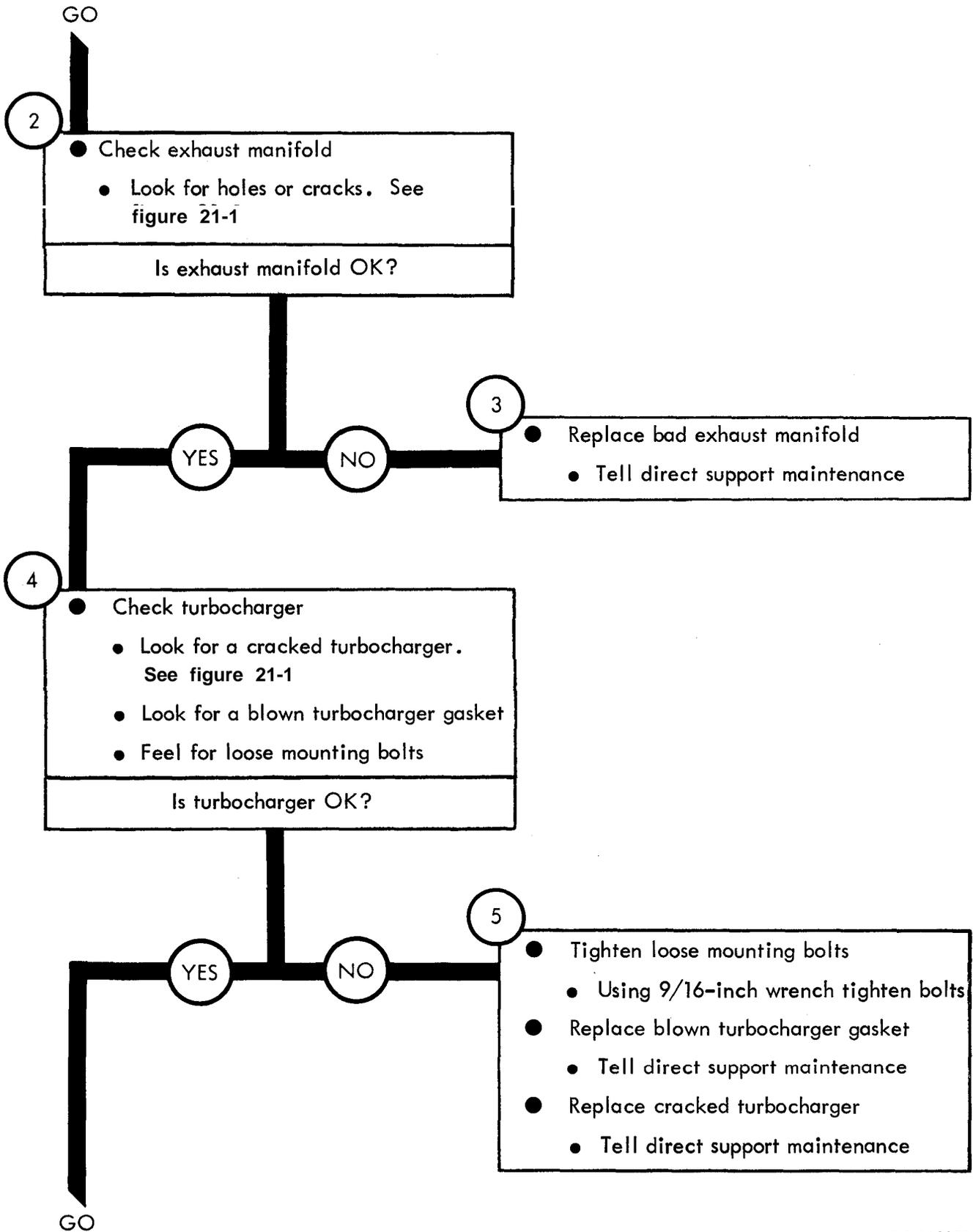
You can get a bad burn if you touch any part of the exhaust system while engine is running. If the engine has just been shut off, wait until the exhaust system has time to cool down before doing any work

NOTE

Exhaust manifold and turbocharger are not part of the exhaust system group. However the exhaust manifold and turbocharger should be checked as a cause of the exhaust system making noise

GO

Figure 19-1 (Sheet 1 of 3)



TA 115650

Figure 19-1 (Sheet 2 of 3)

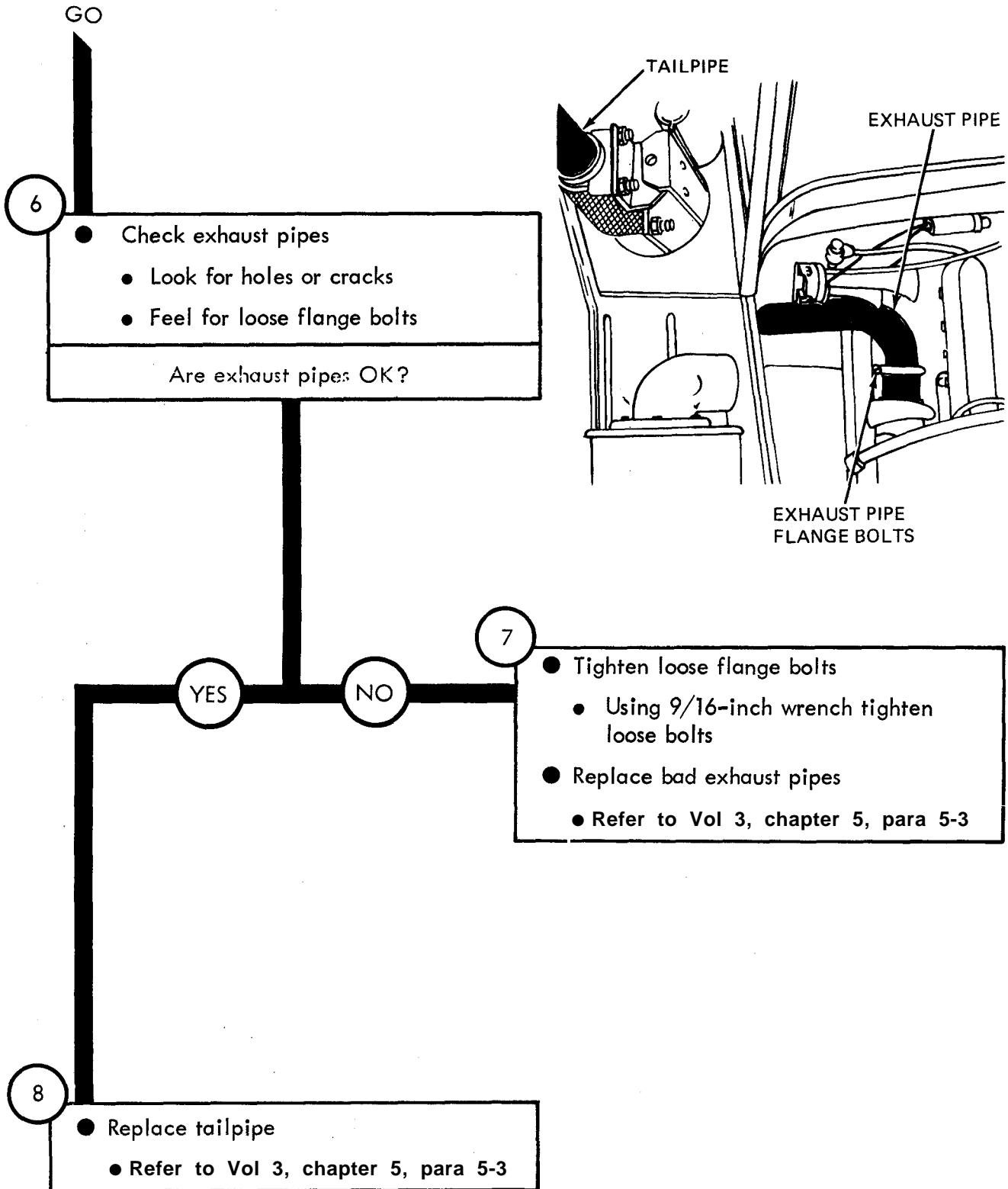
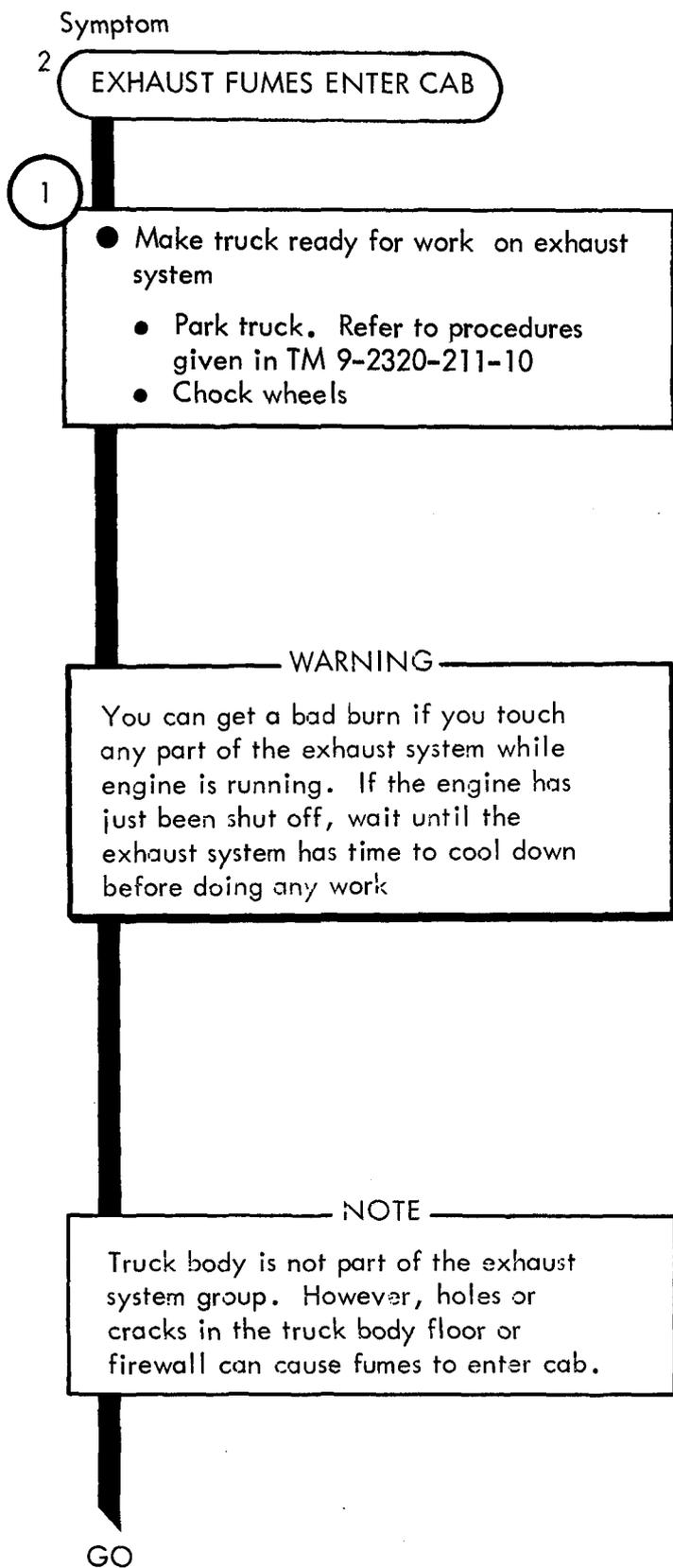


Figure 19-1 (Sheet 3 of 3)



TA 115652

Figure 19-2 (Sheet 1 of 4)

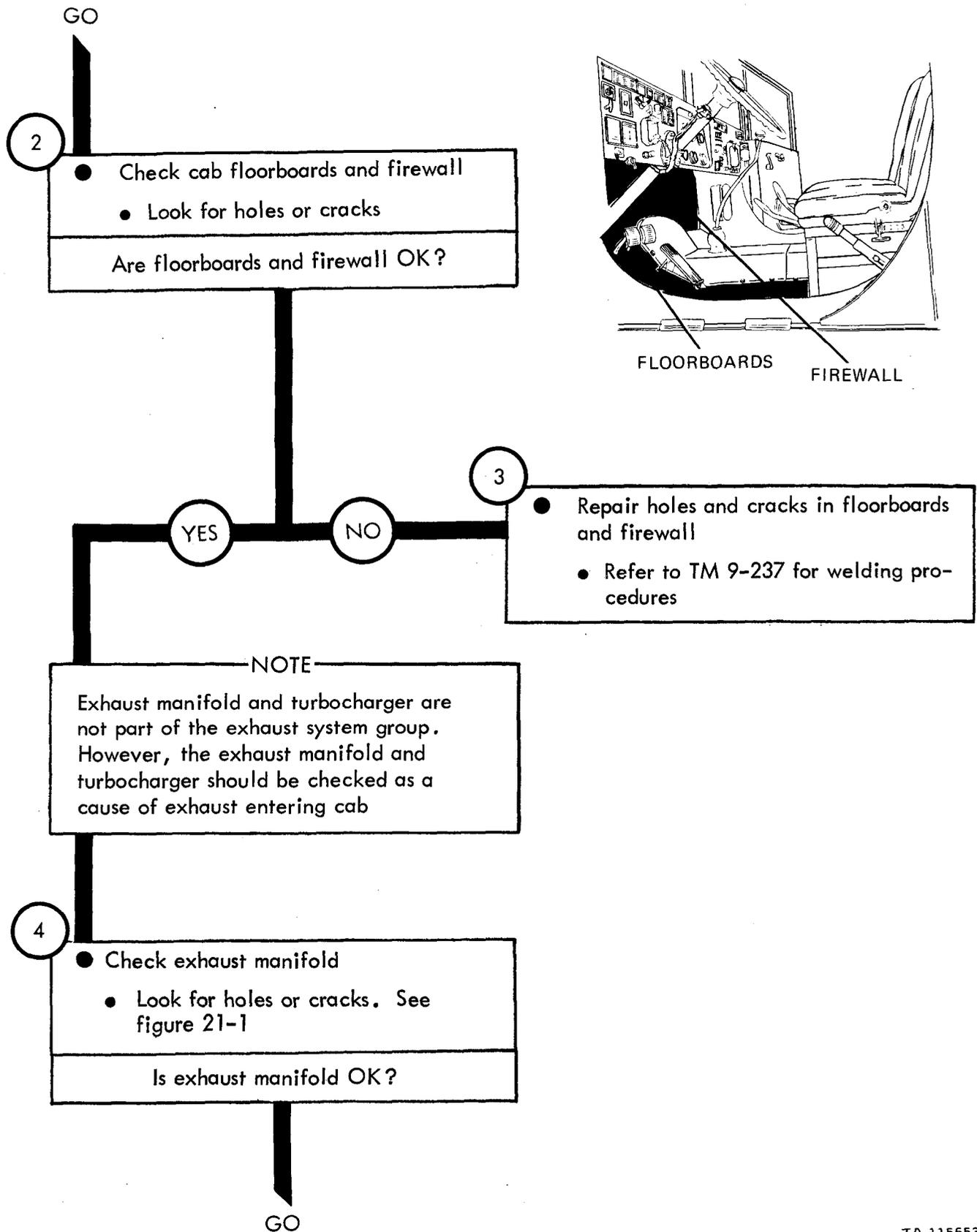


Figure 19-2 (Sheet 2 of 4)

TA 115653

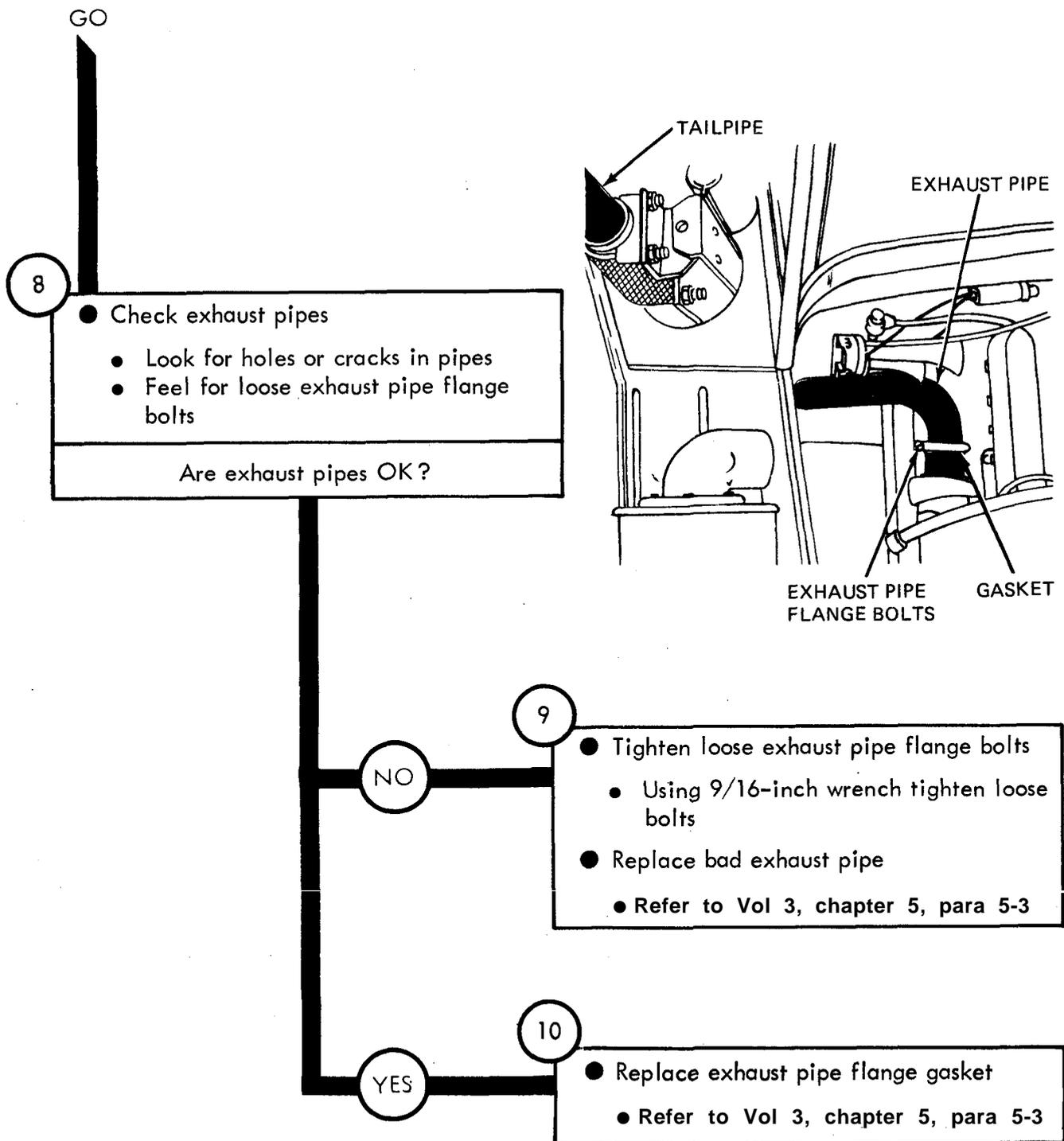


Figure 19-2 (Sheet 4 of 4)

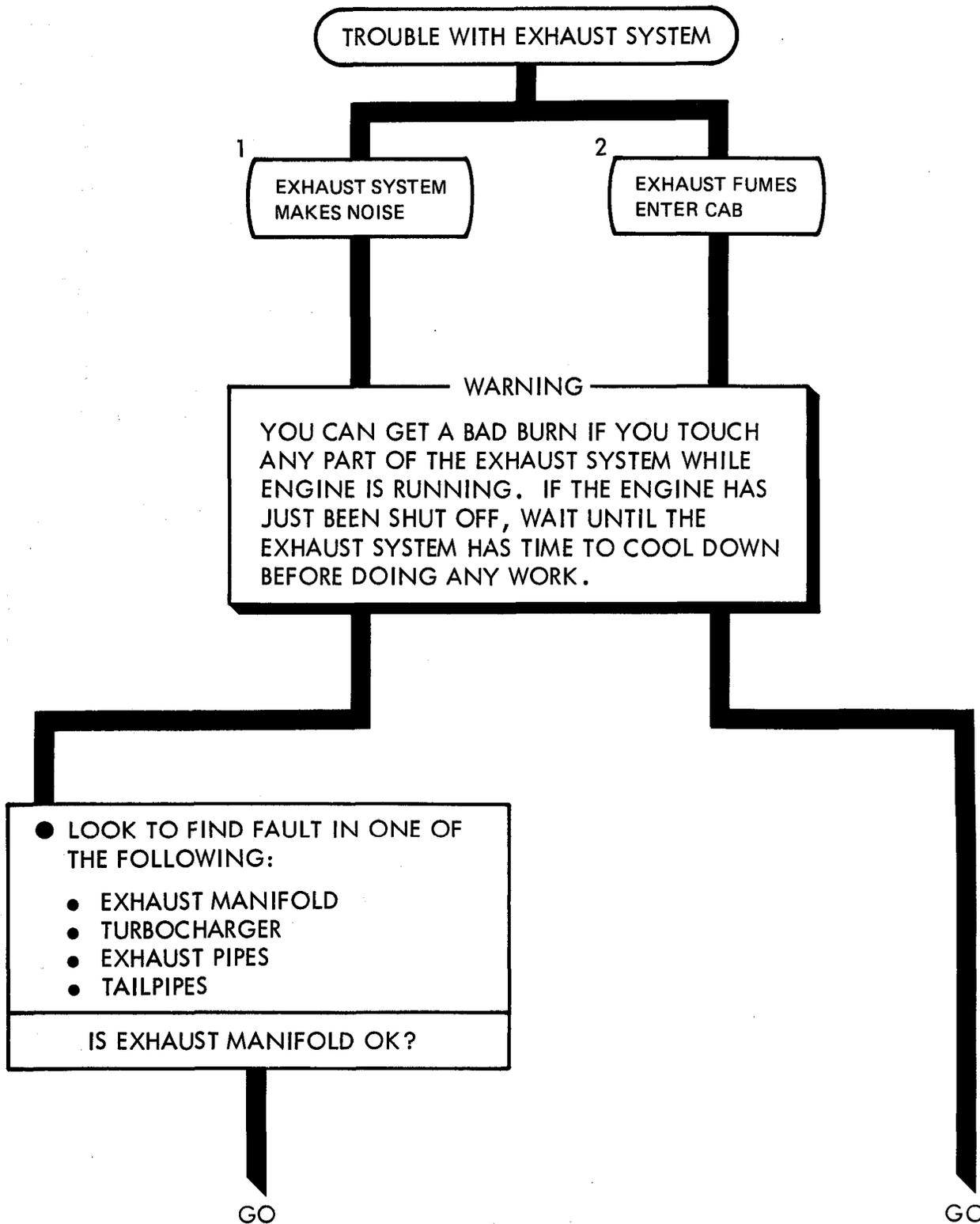
CHAPTER 20

EXHAUST SYSTEM TROUBLESHOOTING SUMMARY

20-1. GENERAL. This chapter gives a summary of troubleshooting procedures given in chapter 19, for the Exhaust System.

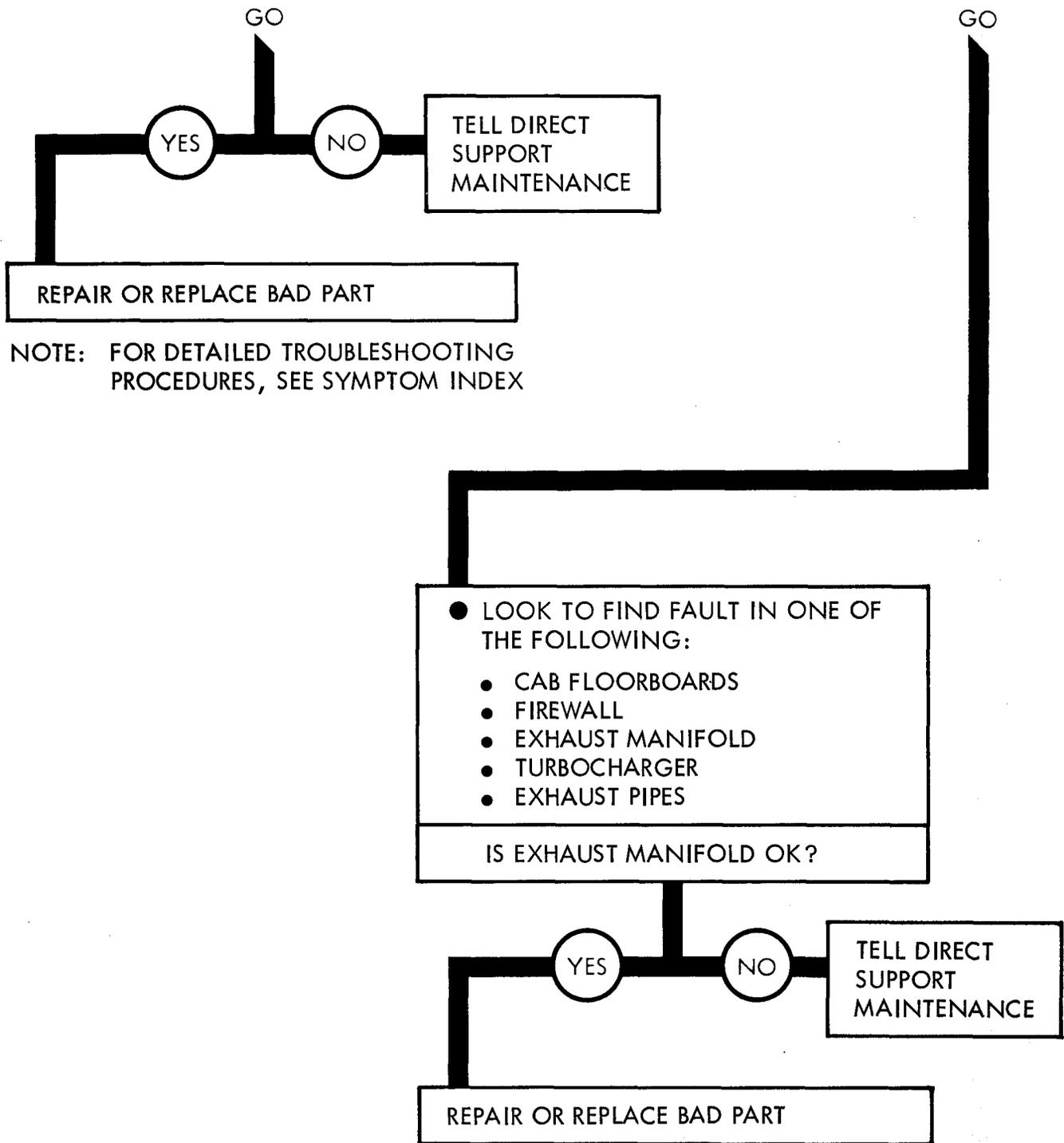
20-2. PROCEDURES. The summary in this chapter covers all fault symptoms found in the detailed troubleshooting procedures. Chapter 7 outlines a sample troubleshooting procedure. The summary procedures are based on the "what-to-do" portions of the detailed procedures and do not include the "How-to-do-it" instructions. Warnings, cautions, and notes are given where needed.

EXHAUST SYSTEM TROUBLESHOOTING SUMMARY



TA 115656

Figure 20-1 (Sheet 1 of 2)



NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

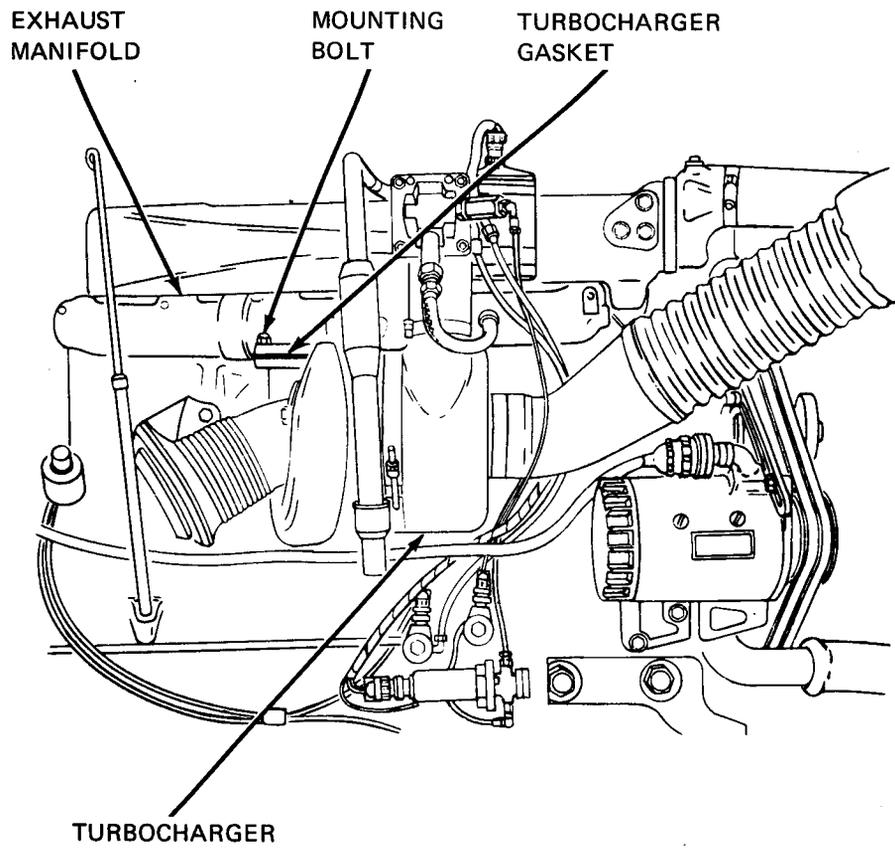
TA 115657

Figure 20-1 (Sheet 2 of 2)

CHAPTER 21

EXHAUST SYSTEM SUPPORT DIAGRAMS

21-1. GENERAL. This chapter gives the diagrams you need when doing troubleshooting procedures in chapter 19. Table 3-1 is a complete listing of all support diagrams used in this manual.



TA 115658

Figure 21-1

CHAPTER 22

COOLING SYSTEM TROUBLESHOOTING

22-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the cooling system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

22-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

Symptom

1 ENGINE TEMPERATURE READS ABOVE 195°F WHILE RUNNING

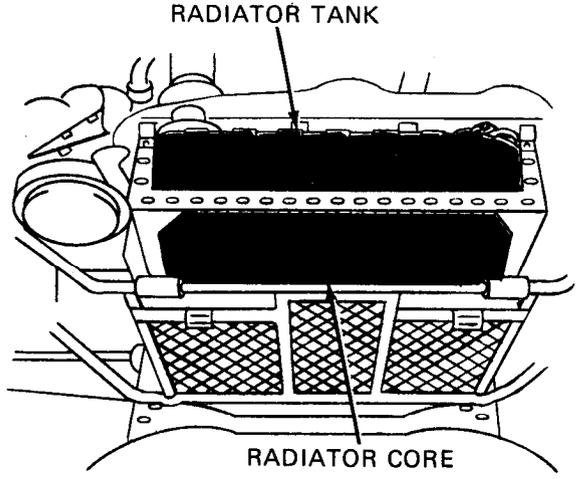
1

- Park truck
- Refer to procedures given in TM 9-2320-211-10

2

- Check radiator core and tank
- Look for any leaks
- Look for a crushed or damaged core

Is radiator OK?



YES

NO

3

- Replace radiator
- Refer to Vol 3, chapter 6, para 6-3

GO

Figure 22-1 (Sheet 1 of 10)

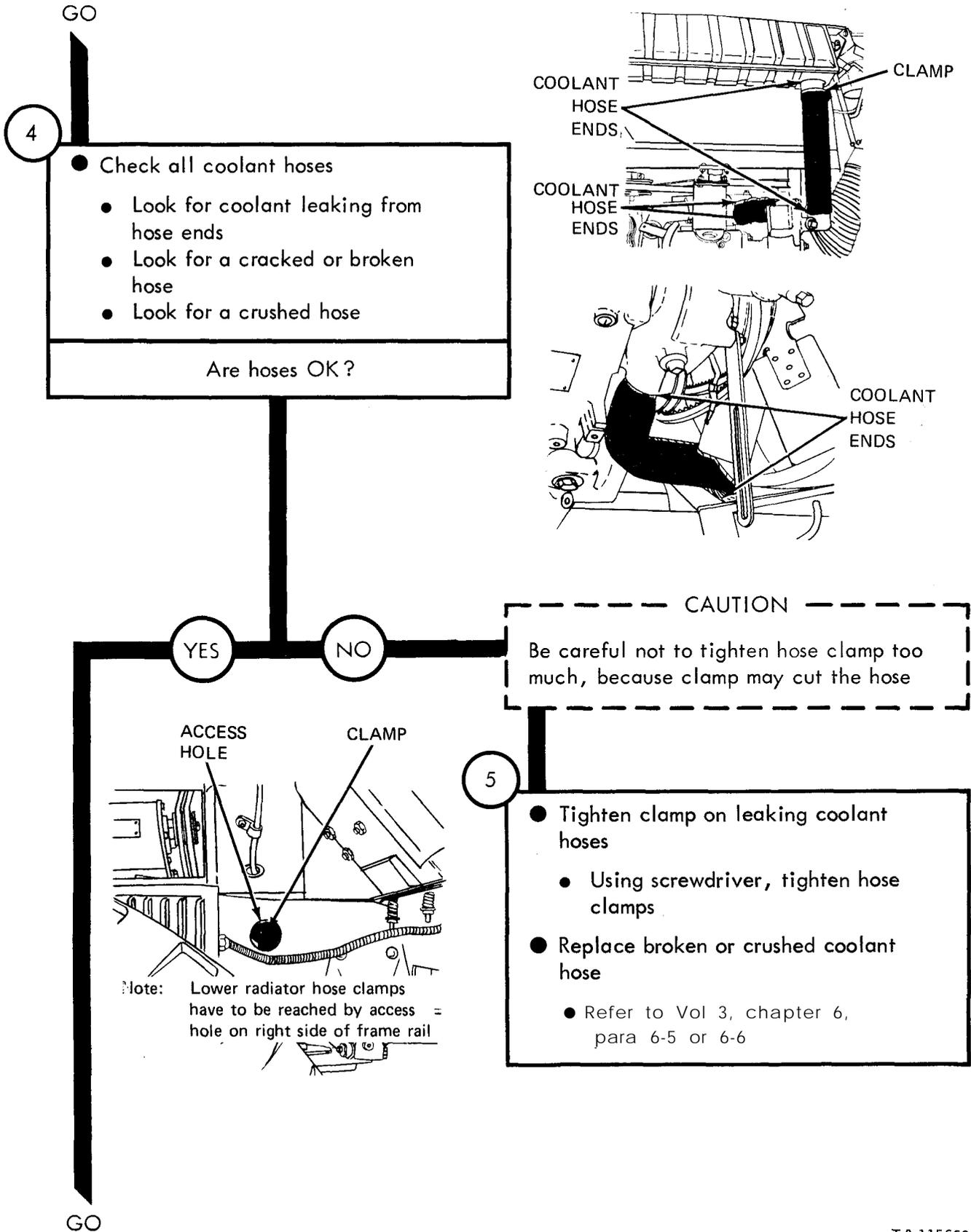


Figure 22-1 (Sheet 2 of 10)

GO

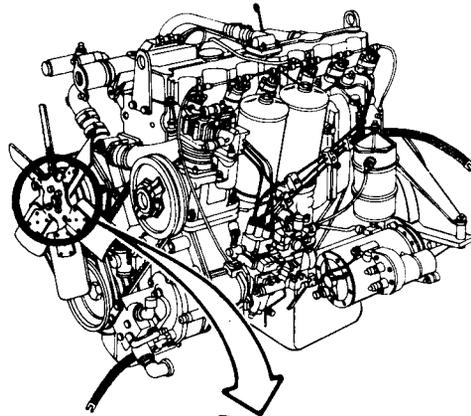
NOTE

The next step will need the use of two soldiers. The lead soldier will be called Soldier A, and the helper will be called Soldier B

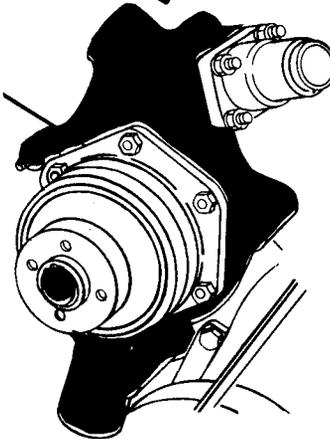
6

● Check water pump

- SOLDIER B ● Go to driver's seat and wait for instructions from Soldier A
- SOLDIER A ● Look at water pump and tell Soldier B to start engine
- SOLDIER B ● Start engine. Refer to TM 9-2320-211-10



WATER PUMP



- SOLDIER A ● See if water pump leaks
- Tell Soldier B to stop engine
- SOLDIER B ● Stop engine. Refer to TM 9-2320-211-10

Is water pump OK?

YES

NO

7

● Replace water pump

- Refer to Vol 3, chapter 6, para 6-9

GO

Figure 22-1 (Sheet 3 of 10)

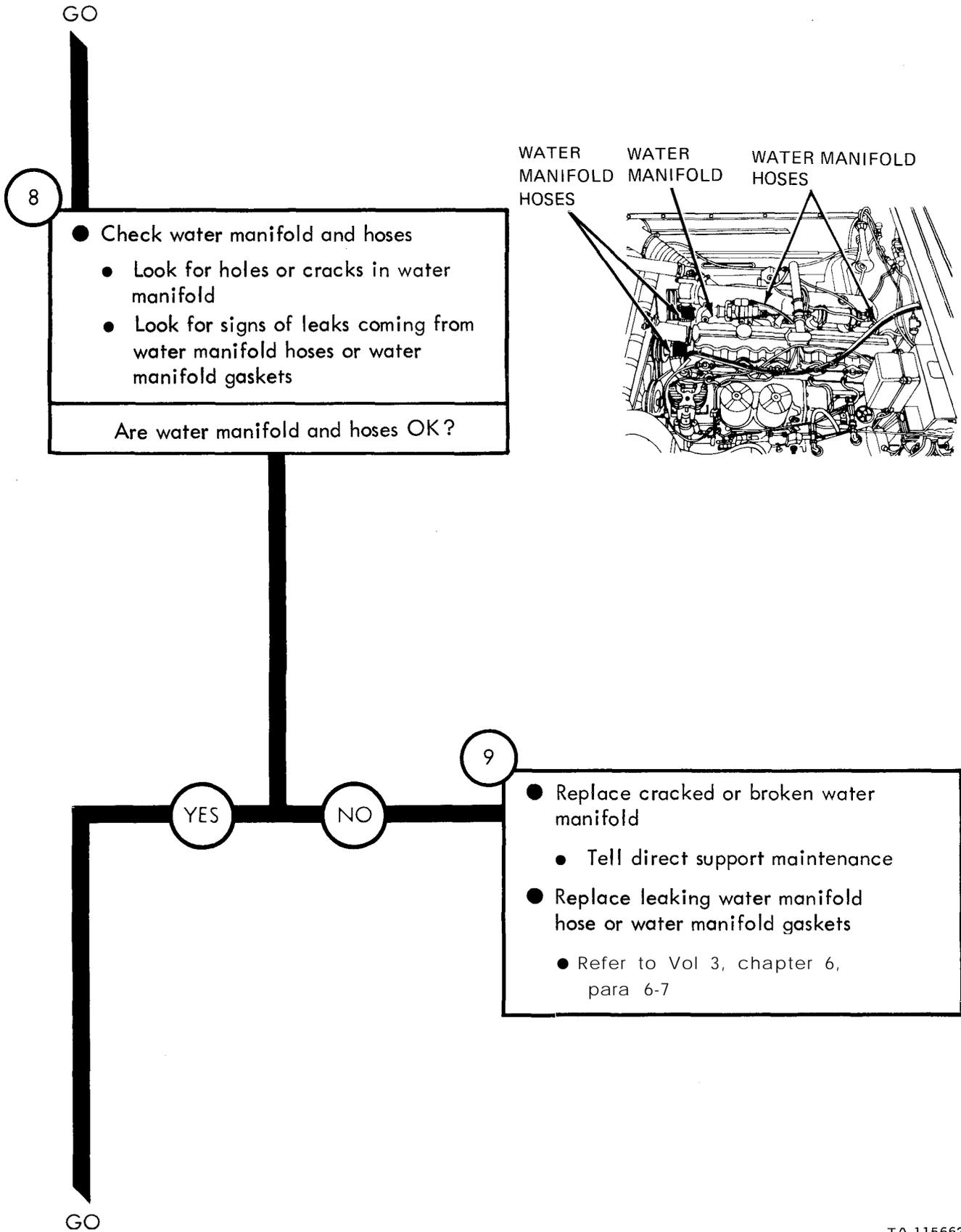


Figure 22-1 (Sheet 4 of 10)

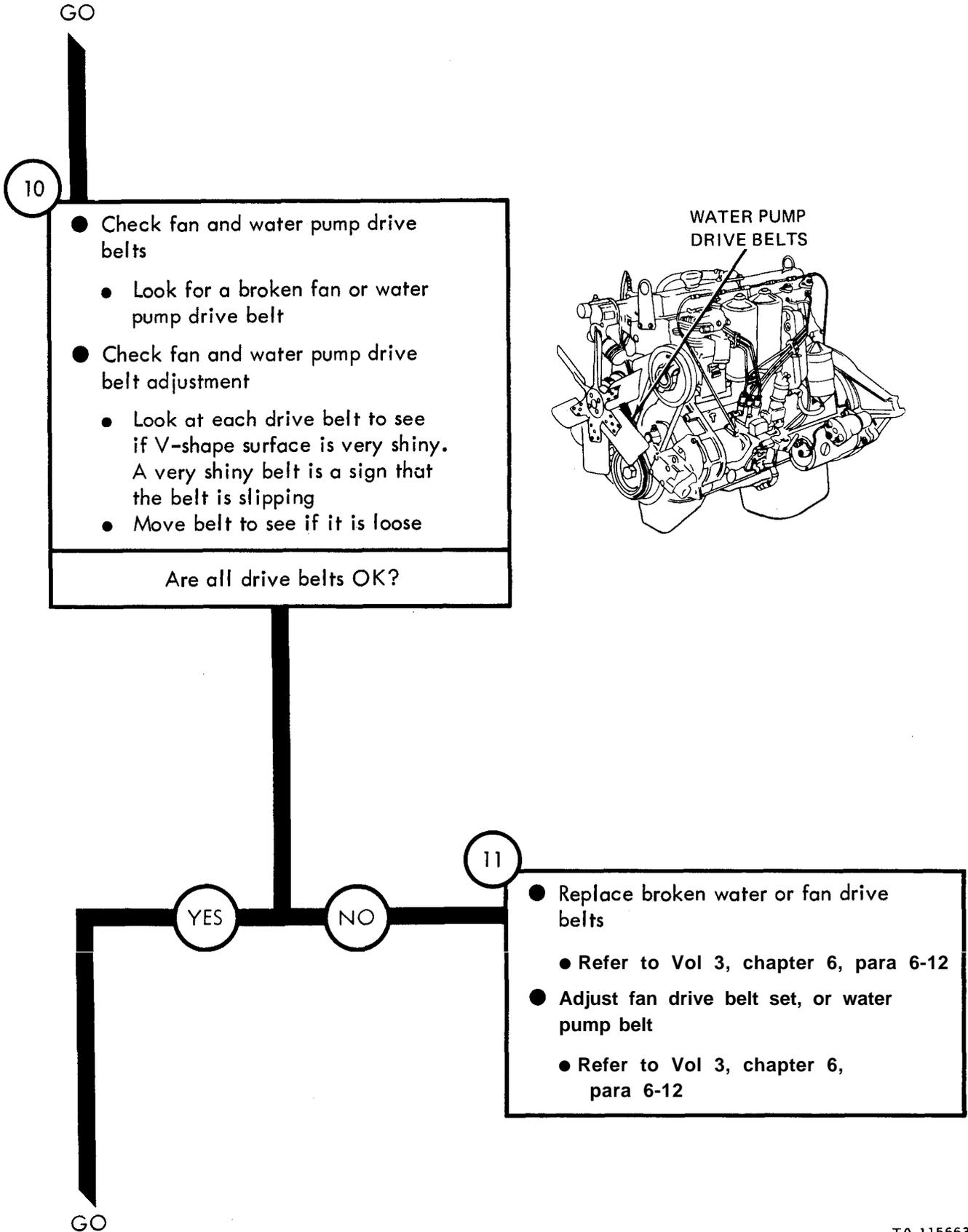


Figure 22-1 (Sheet 5 of 10)

GO

WARNING

Engine cooling system runs under pressure, and at a temperature of 165°F to 195°F. If radiator cap is taken off before pressure is set free scalding coolant will blow out. Due to high temperatures of coolant, bad burns can occur if contact is made with skin

12

- Check radiator cap and fluid level in radiator
 - Using rag, grab radiator cap and turn to the left until it reaches stop
 - Wait about 30 seconds, or until all pressure has been set free
 - Using rag, push down on cap, turn to left and take off cap

- Look at radiator cap rubber sealing gasket for signs of wear or damage
- Look at tension spring for signs of rust, or damage
- Look inside radiator and check that tank is about 3/4-full

Is fluid level and radiator cap OK?

GO

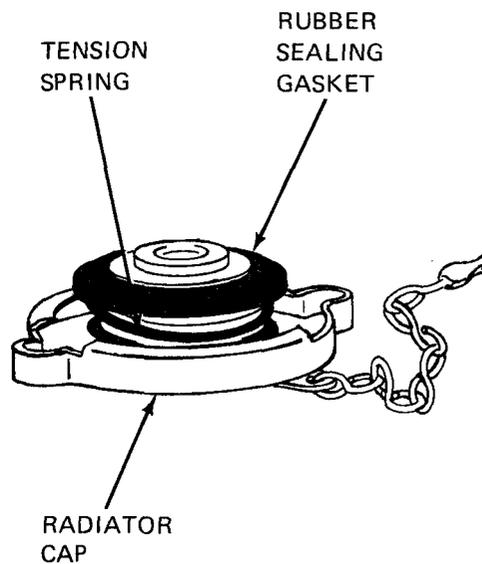
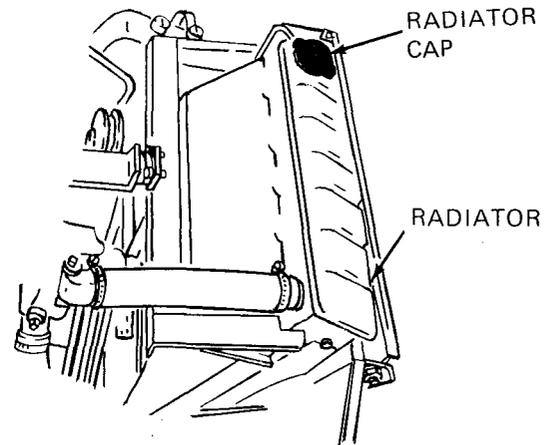


Figure 22-1 (Sheet 6 of 10)

TA 115664

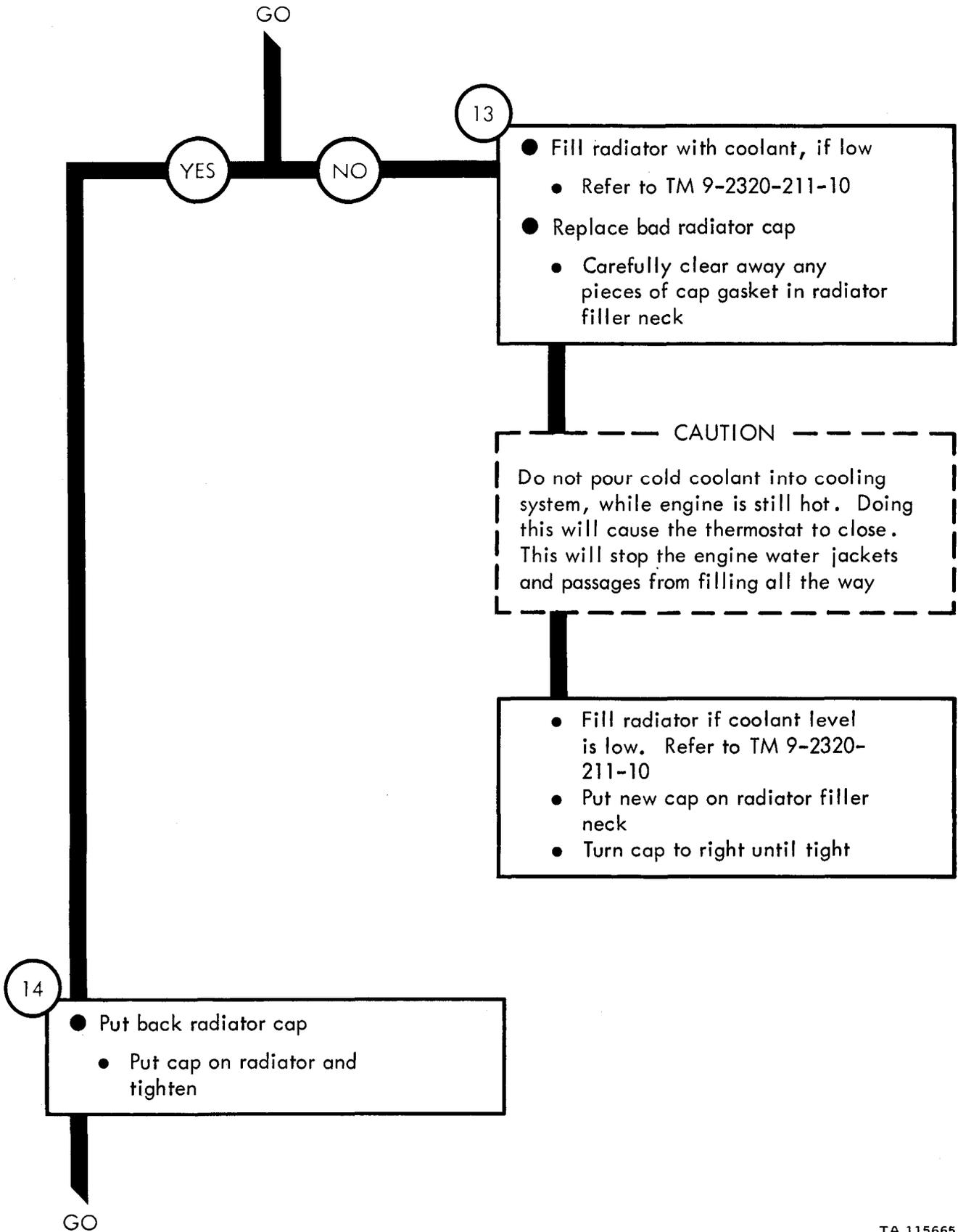


Figure 22-1 (Sheet 7 of 10)

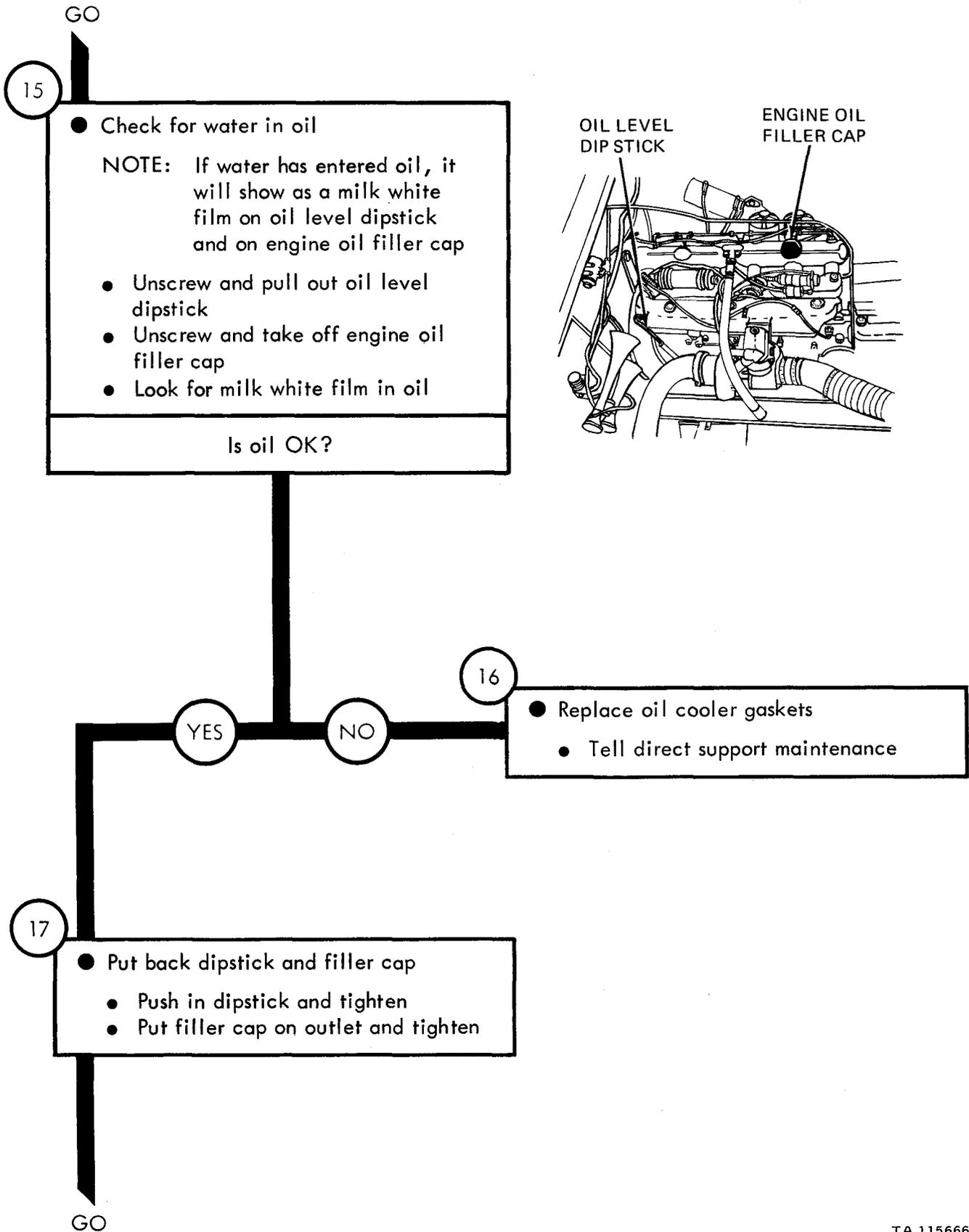


Figure 22-1 (Sheet 8 of 10)

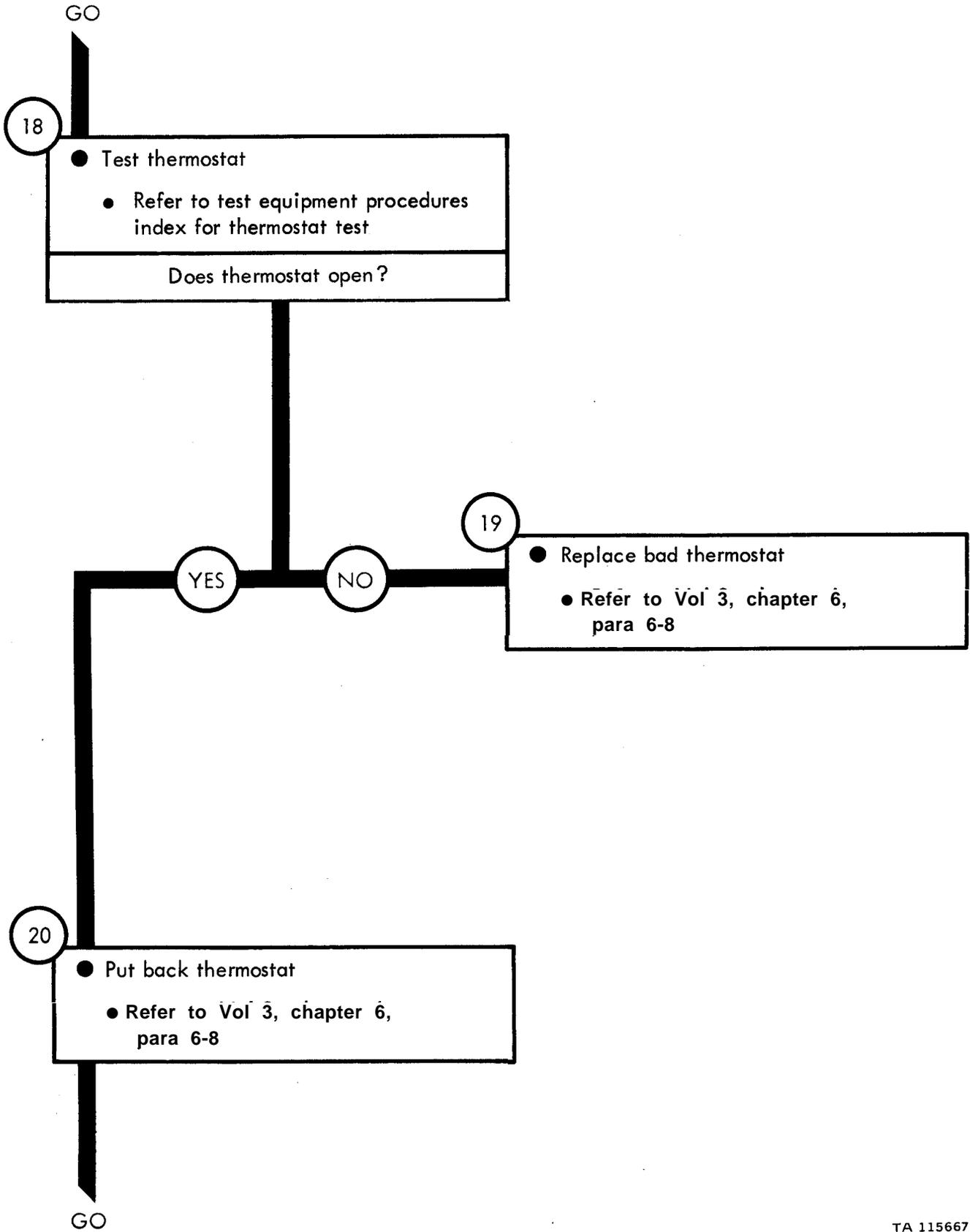


Figure 22-1 (Sheet 9 of 10)

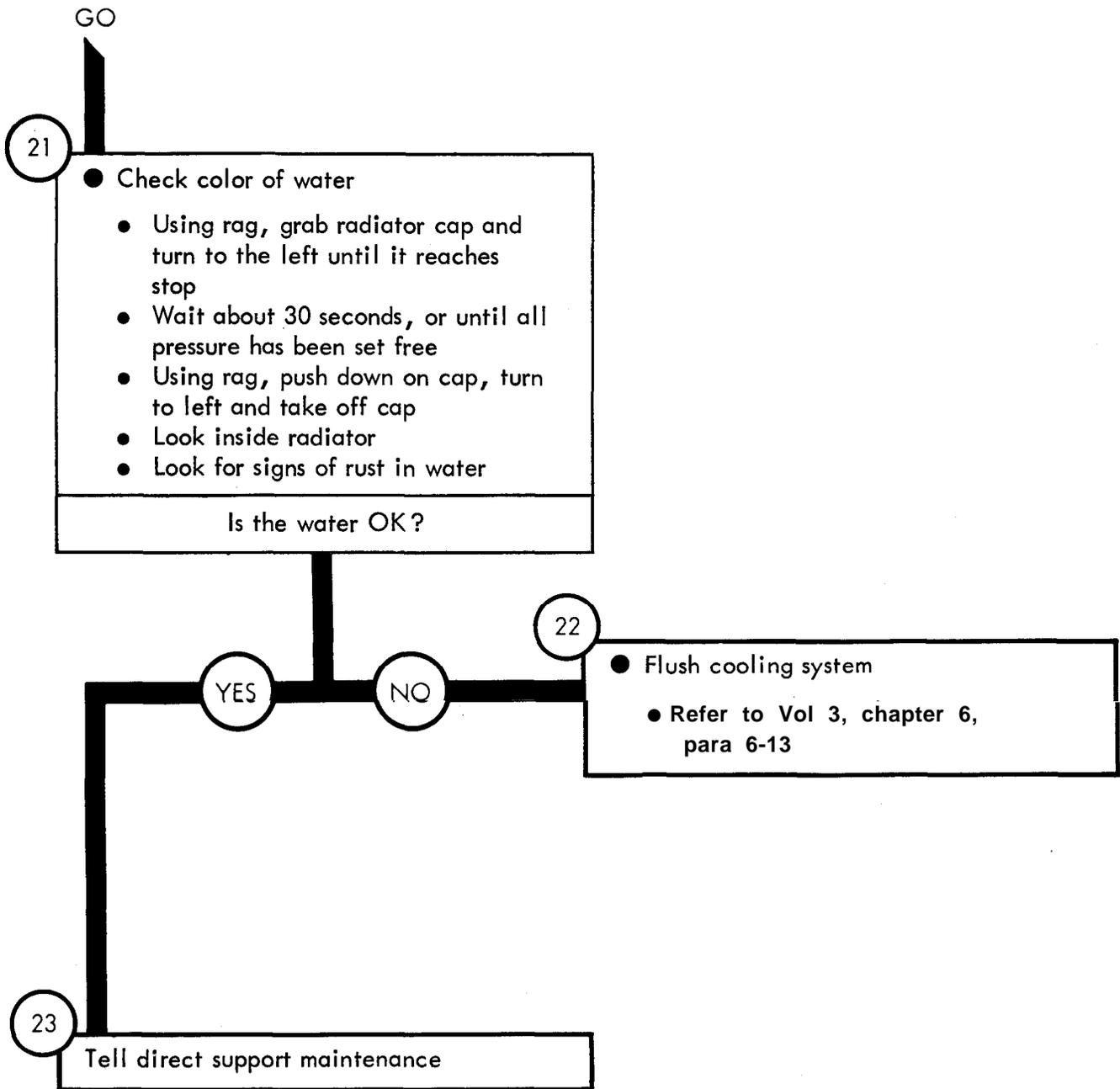


Figure 22-1 (Sheet 10 of 10)

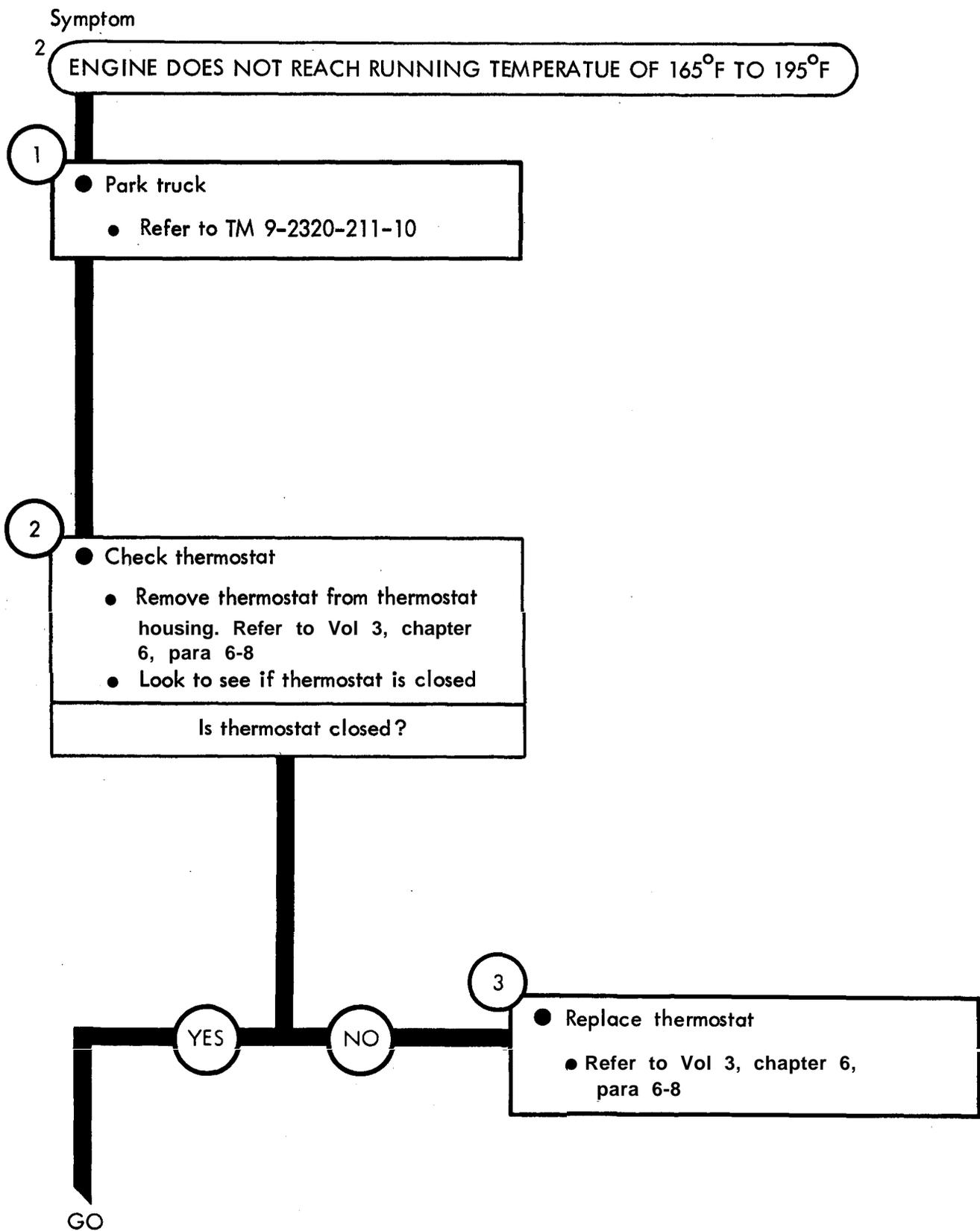


Figure 22-2 (Sheet 1 of 2)

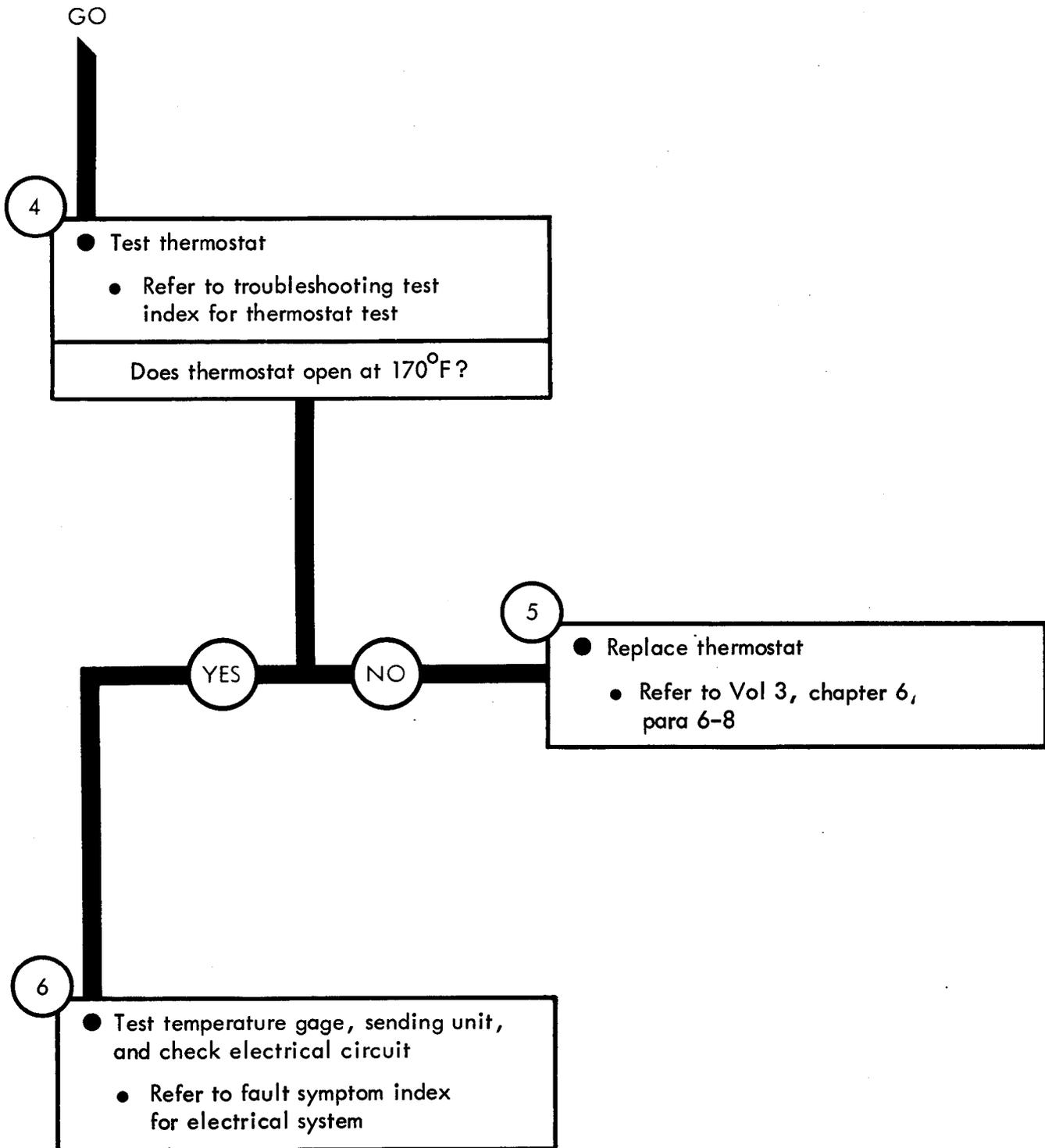


Figure 22-2 (Sheet 2 of 2)

Symptom

3 NOISE COMING FROM ENGINE OTHER THAN THAT OF NORMAL RUNNING

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Check engine cooling fan assembly
- Look for any bent blades

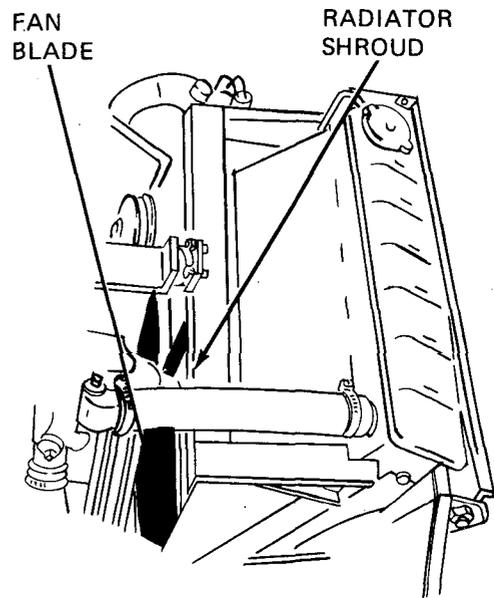
WARNING

Before working near or touching fan assembly take off battery ground cable. Refer to Vol 3, chapter 7, para 7-42 This will make sure that truck is not started by accident. Working room around fan area is tight. Be careful not to cut hands on the sharp edges of the radiator shroud, and fan blades

- Feel if fan assembly is loose

Is fan assembly OK?

GO



TA 115671

Figure 22-3 (Sheet 1 of 2)

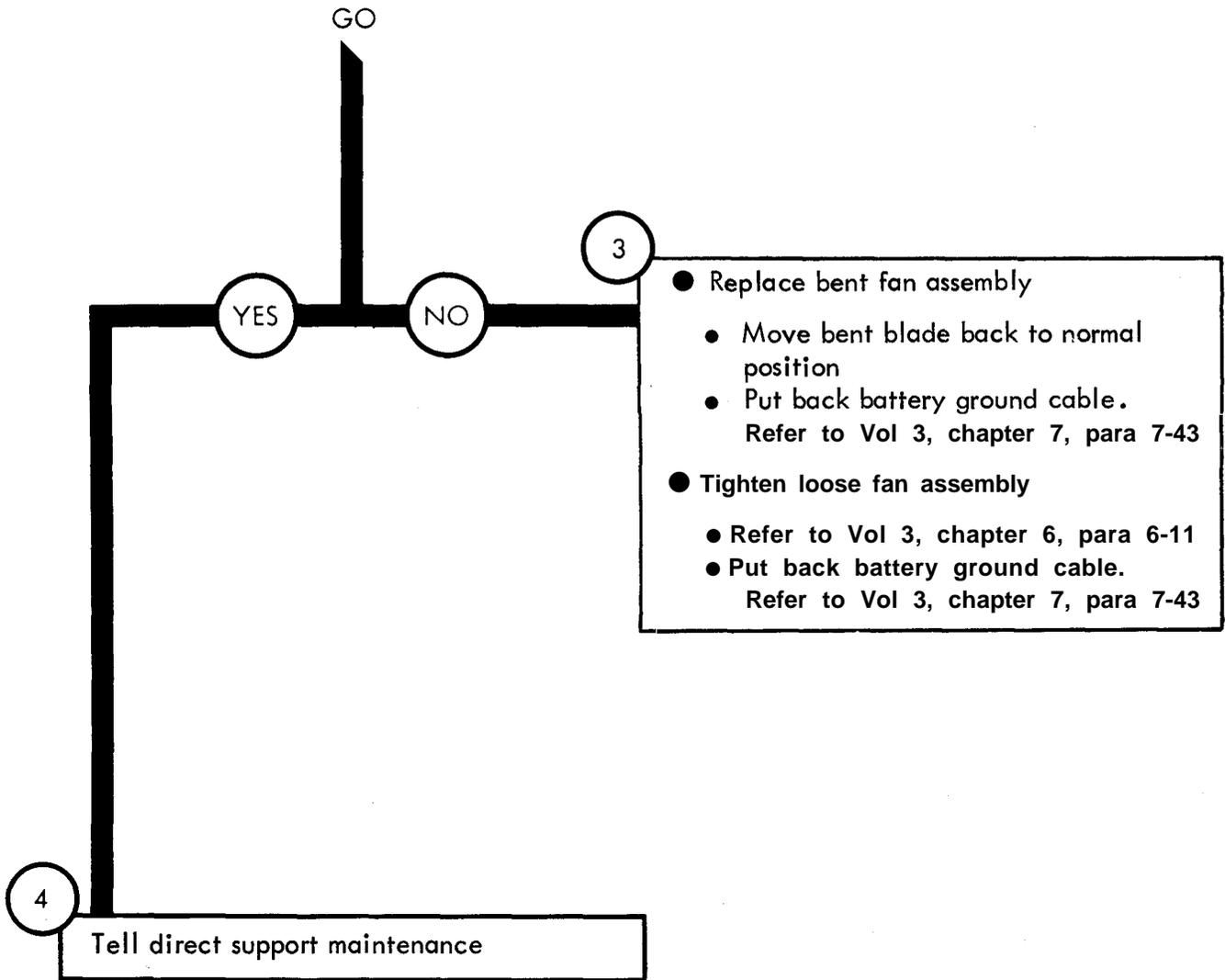


Figure 22-3 (Sheet 2 of 2)

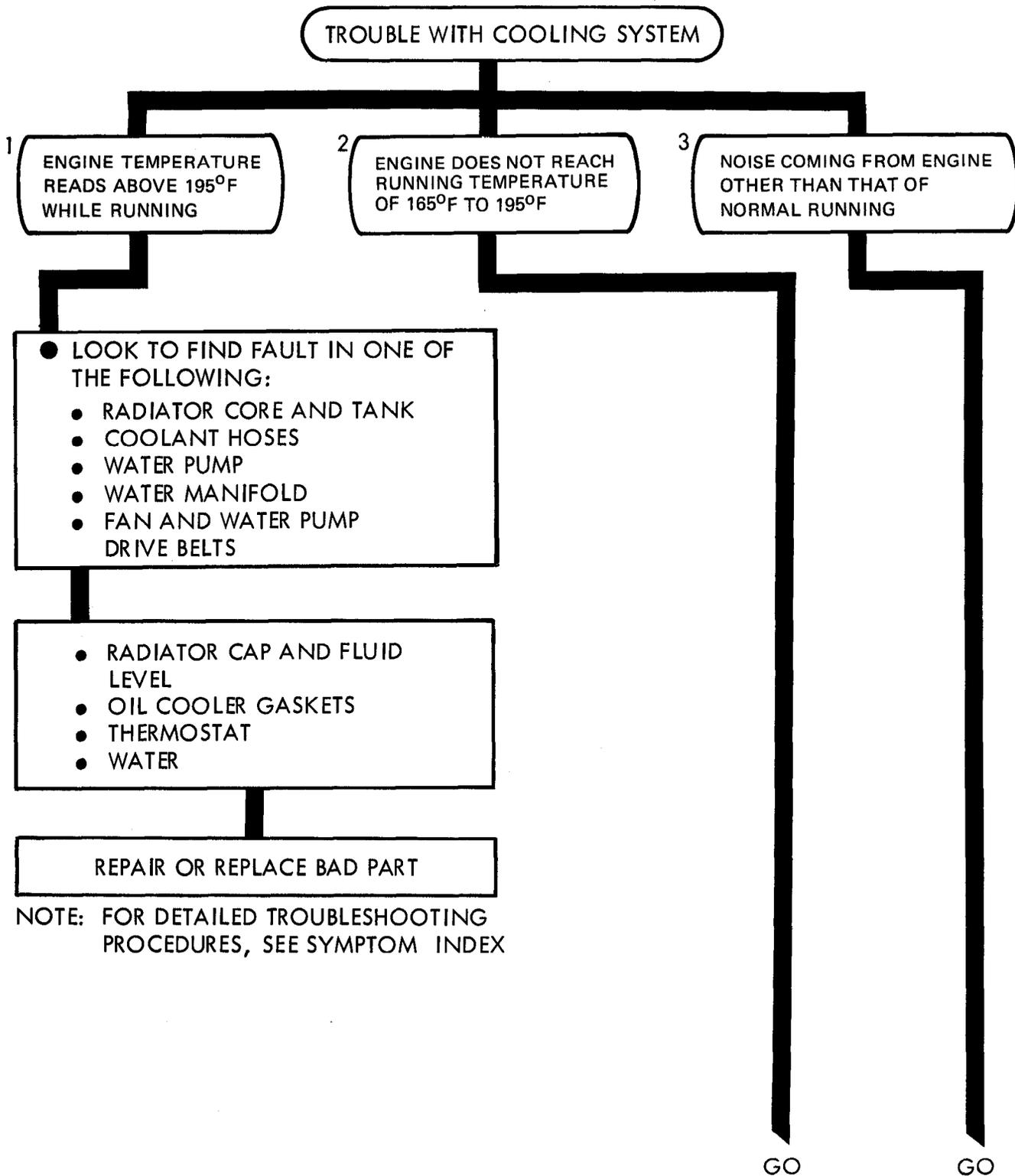
CHAPTER 23

COOLING SYSTEM TROUBLESHOOTING SUMMARY

23-1. GENERAL. This chapter gives a summary of troubleshooting procedures given in chapter 22, for the Cooling System.

23-2. PROCEDURES. The summary in this chapter covers all fault symptoms found in the detailed troubleshooting procedures. Chapter 7 outlines a sample troubleshooting procedure. The summary procedures are based on the "what-to-do" portions of the detailed procedures and do not include the "How-to-do-it" instructions. Warnings, cautions, and notes are given where needed.

COOLING SYSTEM TROUBLESHOOTING SUMMARY



NOTE: FOR DETAILED TROUBLESHOOTING PROCEDURES, SEE SYMPTOM INDEX

Figure 23-1 (Sheet 1 of 2)

TA 115673

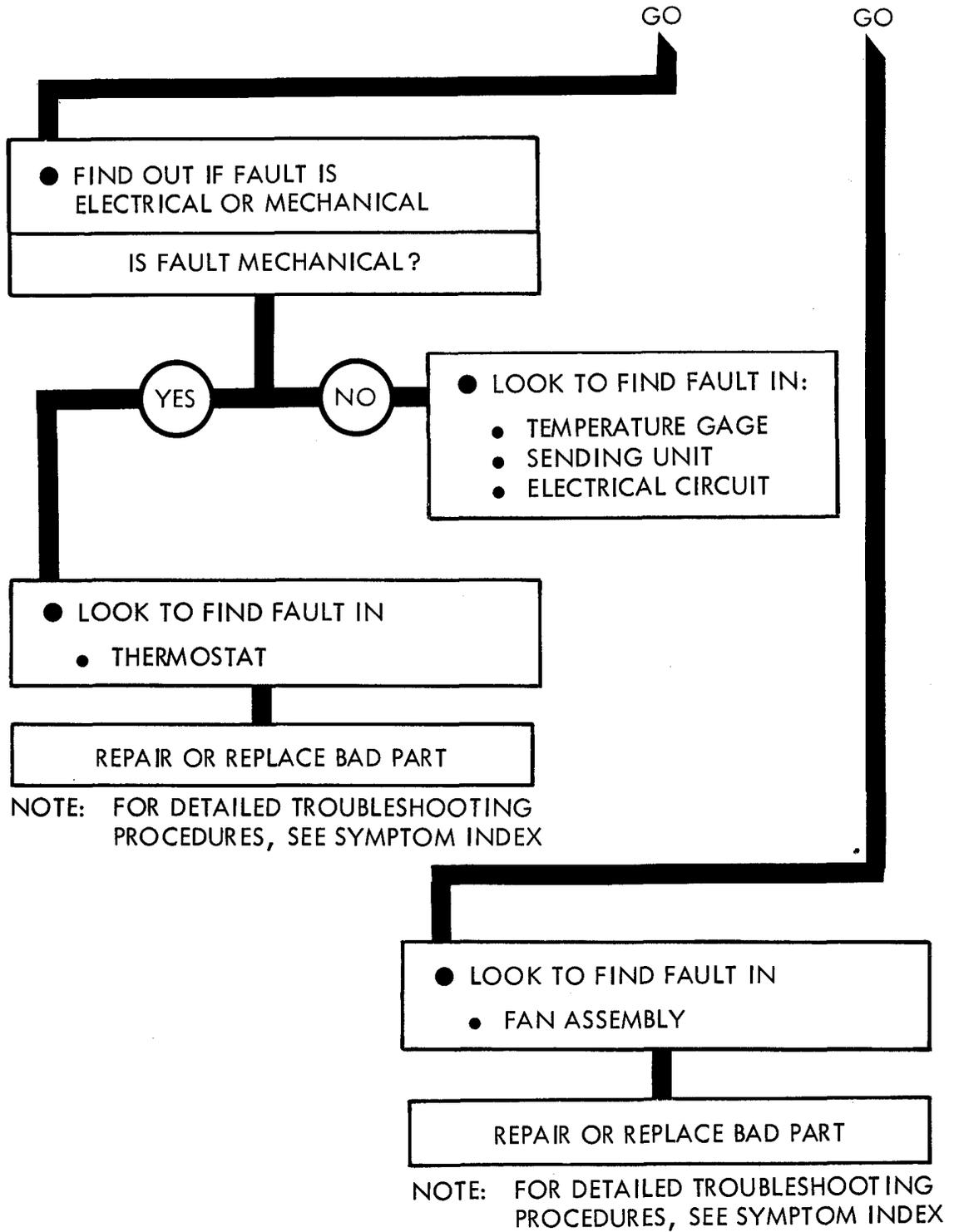


Figure 23-1 (Sheet 2 of 2)

TA 115674

CHAPTER 24

COOLING SYSTEM TEST PROCEDURES

24-1. GENERAL. This chapter gives test procedures for the tests given in chapter 22, for the Cooling System.

24-2. TEST SET-UP. Instructions for setup of test equipment and parts to be tested are given before the test procedures. Illustrations are used, when needed, to show you how to hook up the test equipment to the part to be tested.

24-3. TEST PROCEDURE. Detailed step-by-step instructions, in flow chart form, are given for each test. The procedure calls out the type of test and the condition of the truck system for each part of testing. The step-by-step test will lead you to the bad component or to a fault symptom within a related system. Reference is made to the fault symptom index, chapter 6, if the test shows a fault in another system.

THERMOSTAT TEST

- **Test thermostat**
 - Remove thermostat. Refer to Vol 3, chapter 6, para 6-8
 - Place thermometer in a can of water
 - Hang thermostat in water. Do not let thermostat touch the bottom of the can
 - Heat water to 170°F and see if thermostat starts to open
 - Heat water to 195°F and see if thermostat fully opens

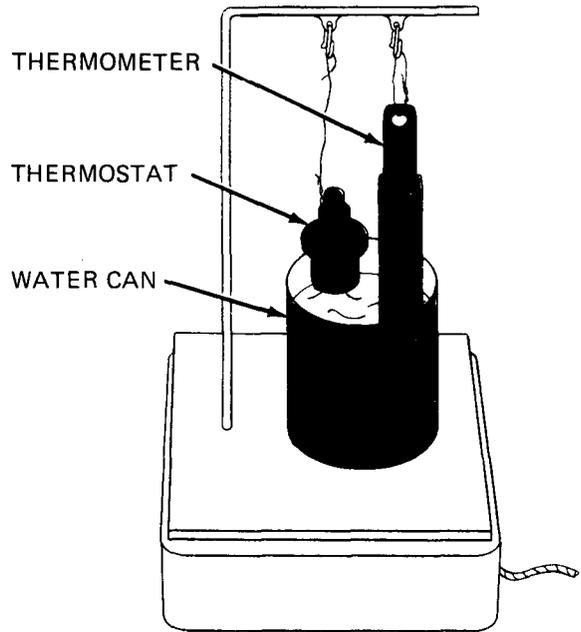


Figure 24-1 (Sheet 1 of 1)

TA 115675

CHAPTER 25

COOLING SYSTEM CHECKOUT PROCEDURES

25-1. GENERAL. This chapter gives procedures for checking out the cooling system after troubleshooting and repair have been done. Procedures are set up in flow chart form showing the checkout steps in order and referring to the fault symptom index when the system does not checkout.

COOLING SYSTEM CHECKOUT

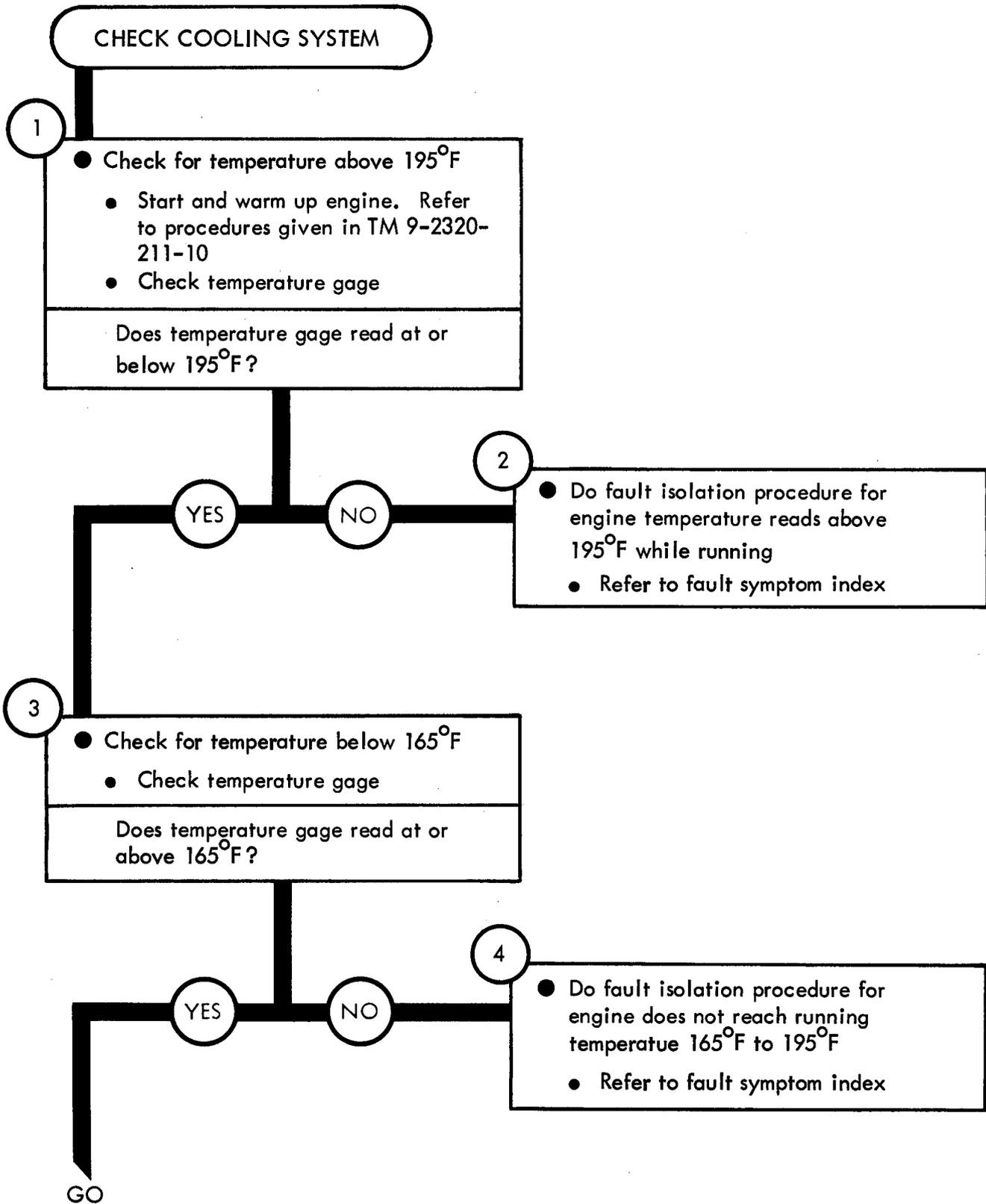


Figure 25-1 (Sheet 1 of 2)

TA 115676

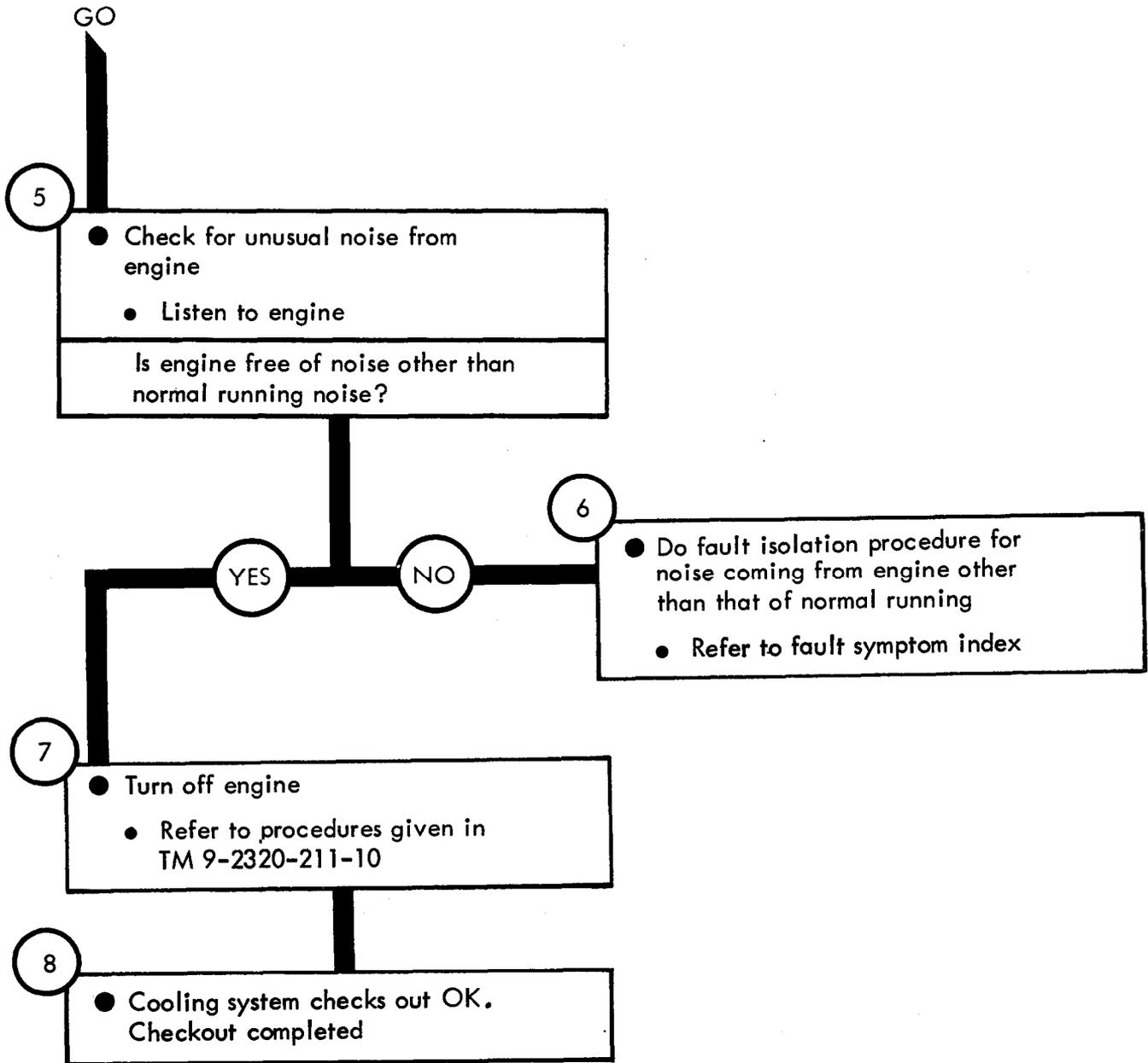


Figure 25-1 (Sheet 2 of 2)

TA 115677

CHAPTER 26

ELECTRICAL SYSTEM TROUBLESHOOTING

26-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the electrical system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

26-2. EQUIPMENT ITEMS NOT COVERED . All equipment items for which corrective maintenance is authorized at the organizational maintenance level are covered in this chapter.

Symptom

1

STARTER MOTOR WILL NOT
CRANK ENGINE

NOTE

Two soldiers will be needed for some starter system checks, and are noted as Soldier A and Soldier B. When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC. Batteries must be fully charged before doing any starter system checks.

1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-1 (Sheet 1 of 11)

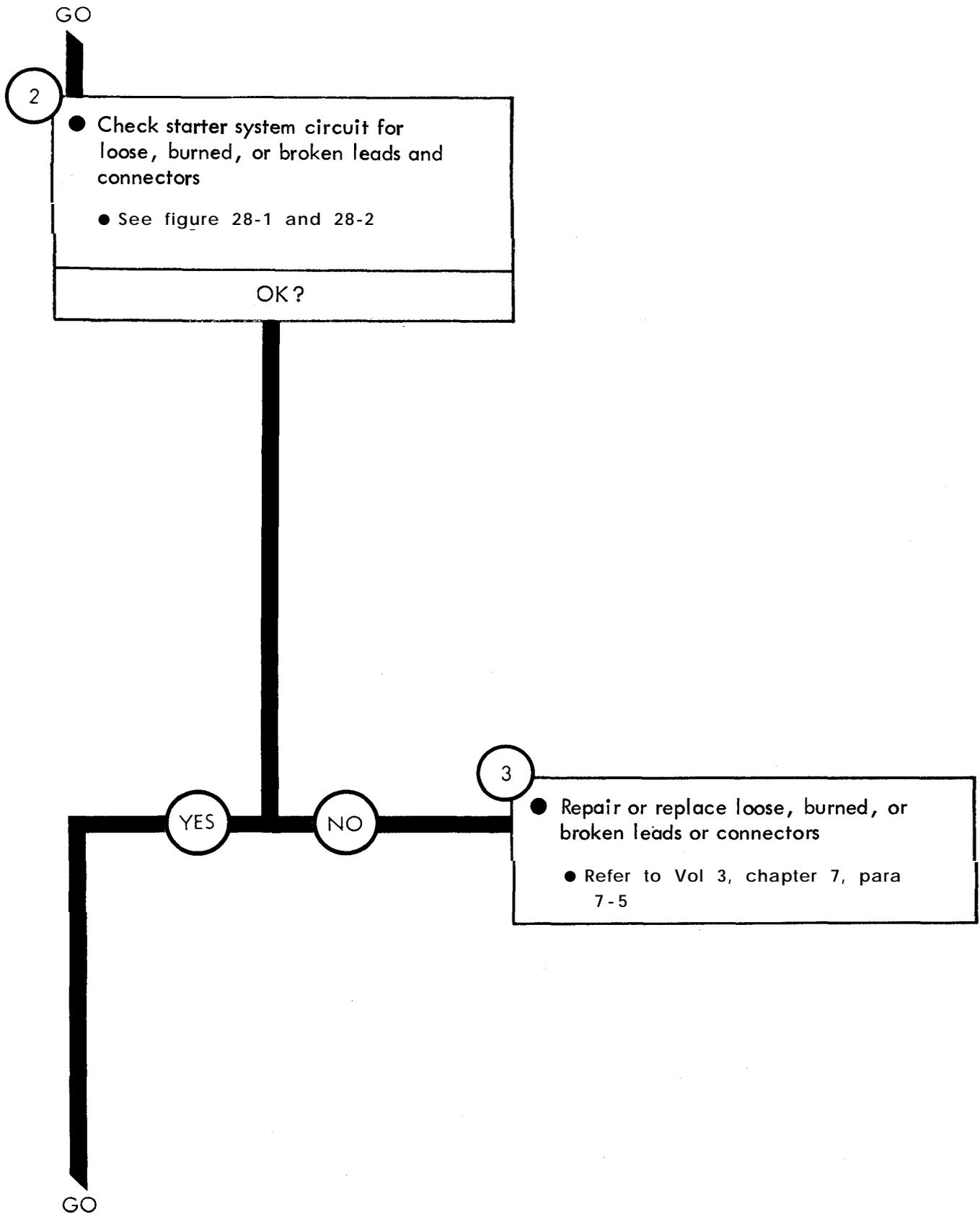


Figure 26-1 (Sheet 2 of 11)

GO

4

- Check for +24 volts DC from batteries to starter solenoid switch
 - Set multimeter to measure +24 volts DC. Refer to multimeter test procedures
 - Put multimeter + lead on stud of solenoid battery cable
 - Put multimeter - lead on a good ground
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO

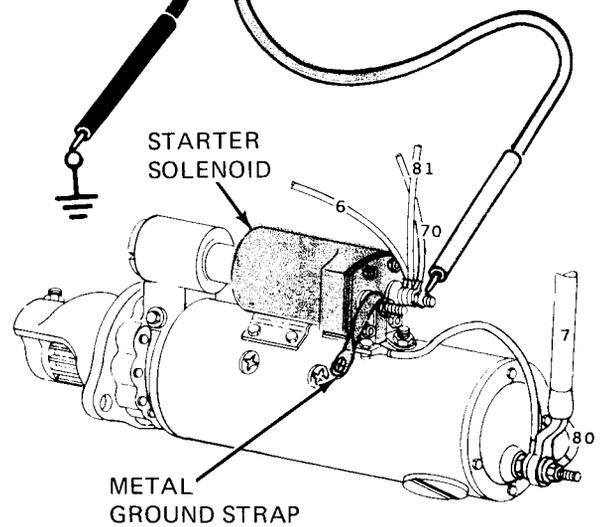
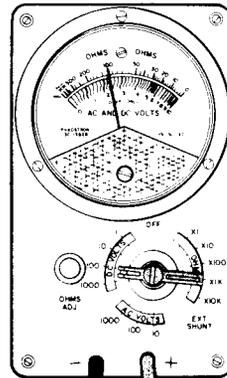
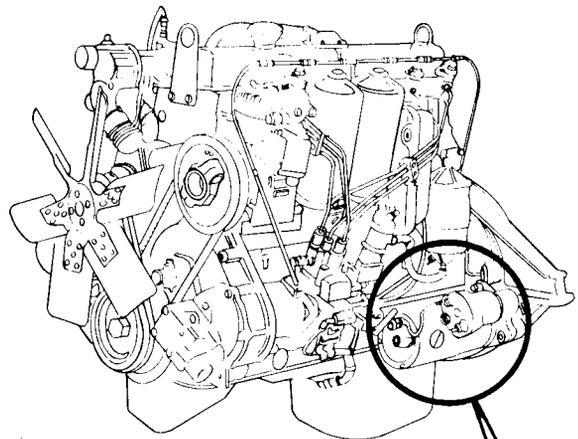


Figure 26-1 (Sheet 3 of 11)

TA 115680

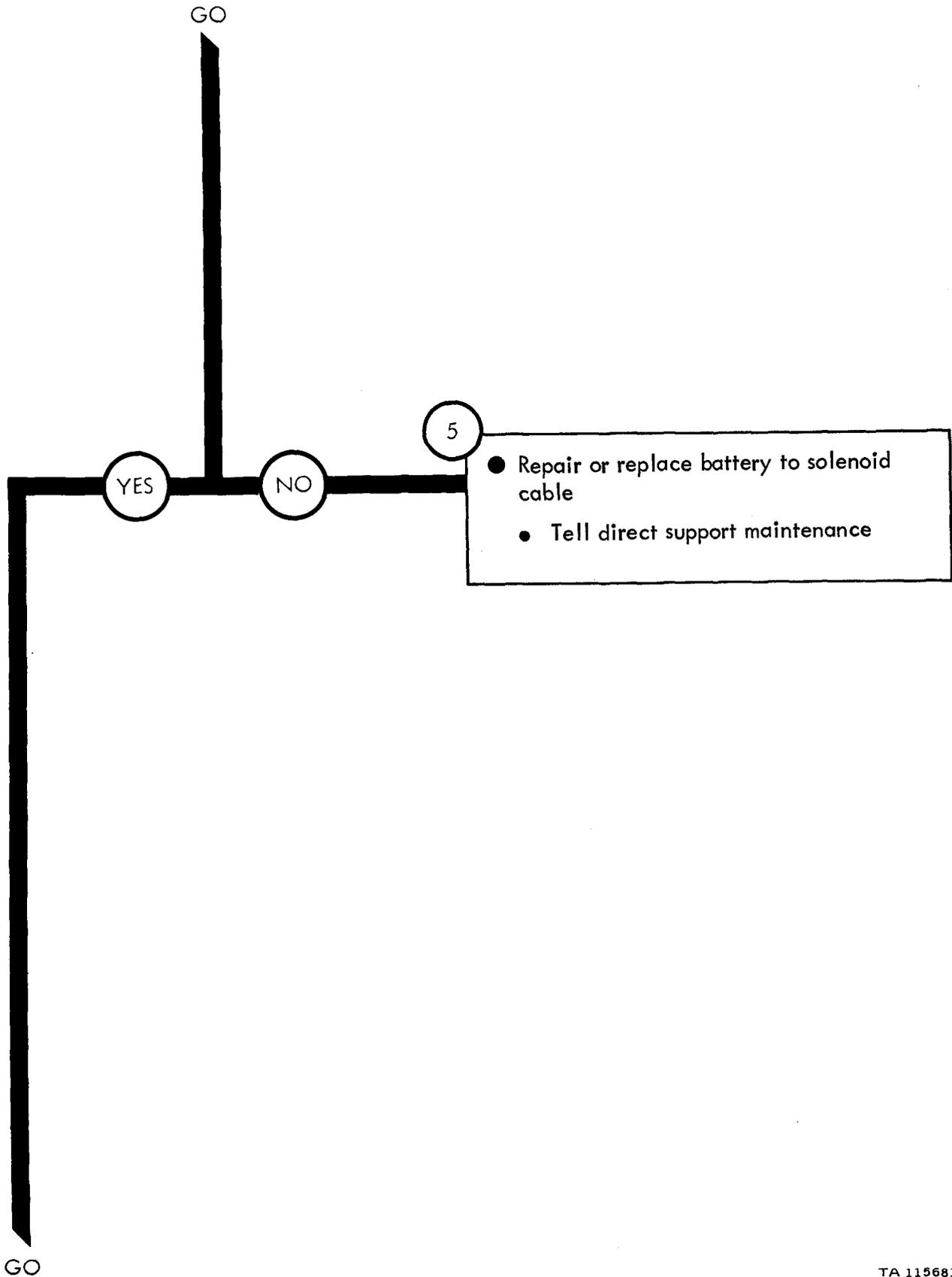


Figure 26-1 (Sheet 4 of 11)

TA 115681

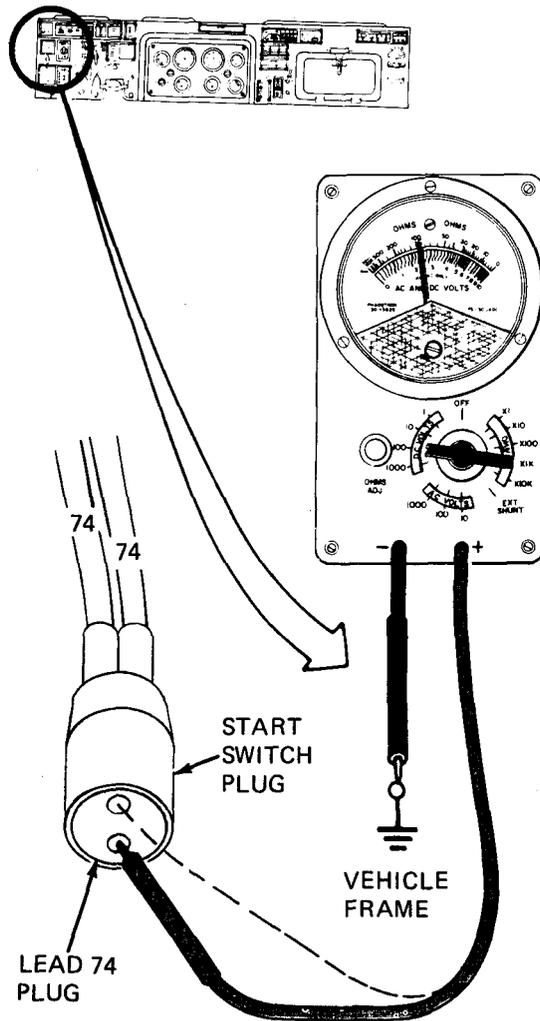
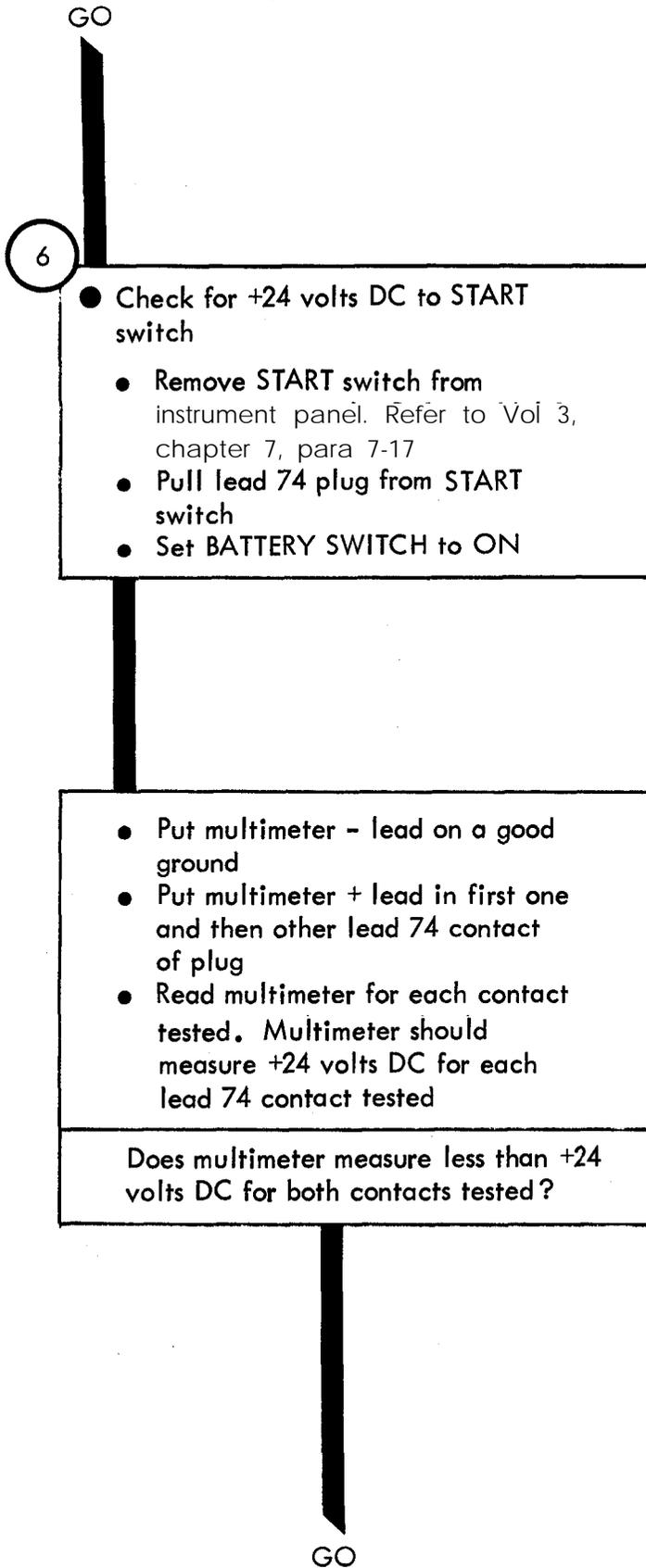


Figure 26-1 (Sheet 5 of 11)

TA 115682

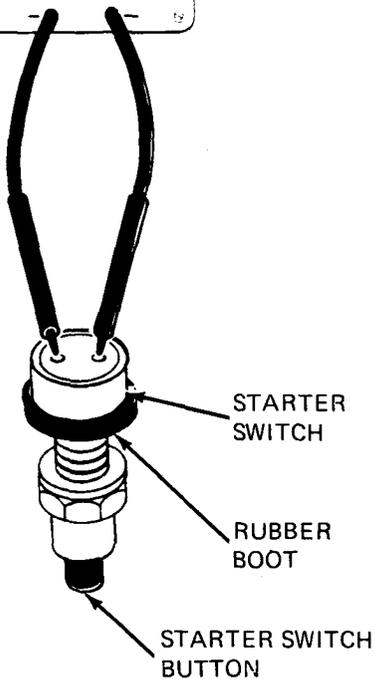
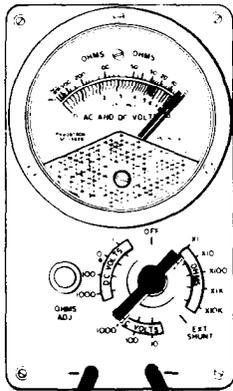
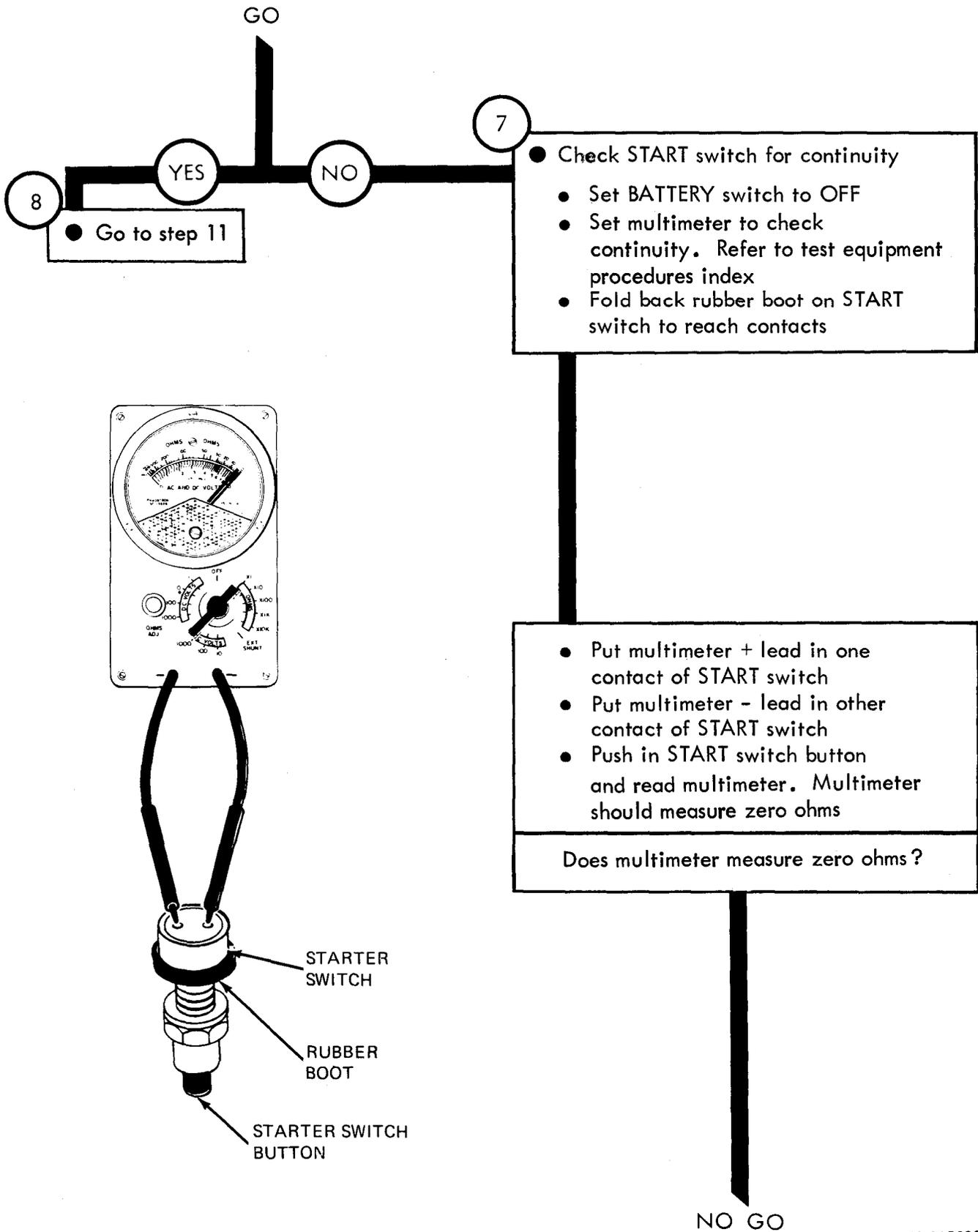


Figure 26-1 (Sheet 6 of 11)

TA 115683

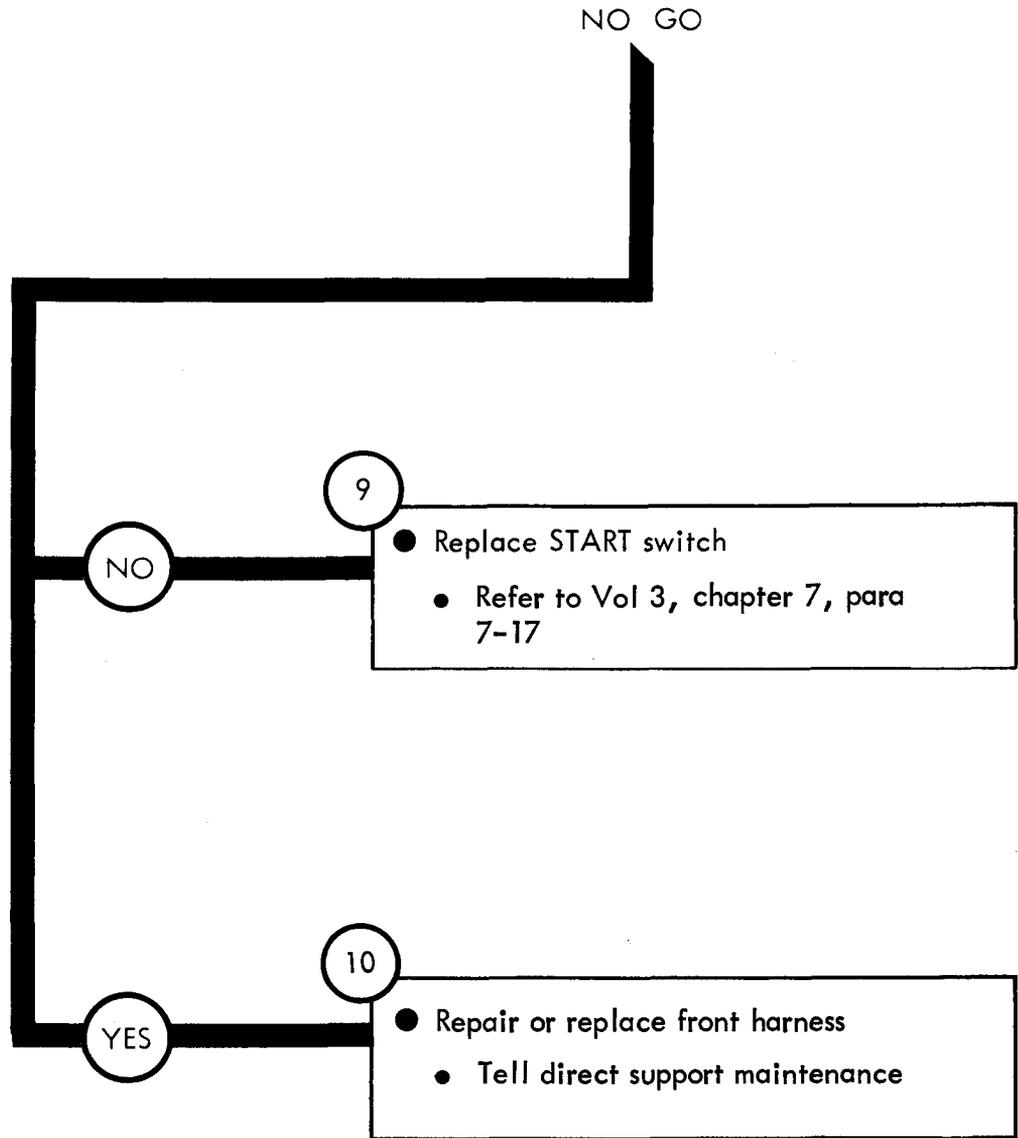


Figure 26-1 (Sheet 7 of 11)

TA 115684

From step 8

11

- Check for +24 volts DC through lead from solenoid to START switch
- SOLDIER A ● Put lead 74 plug back on START switch
- SOLDIER B ● Put multimeter + lead post on lead at solenoid
- Put multimeter - lead on a good ground
- SOLDIER A ● Press and hold START switch button
- SOLDIER B ● Read multimeter while Soldier A presses START switch button. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO

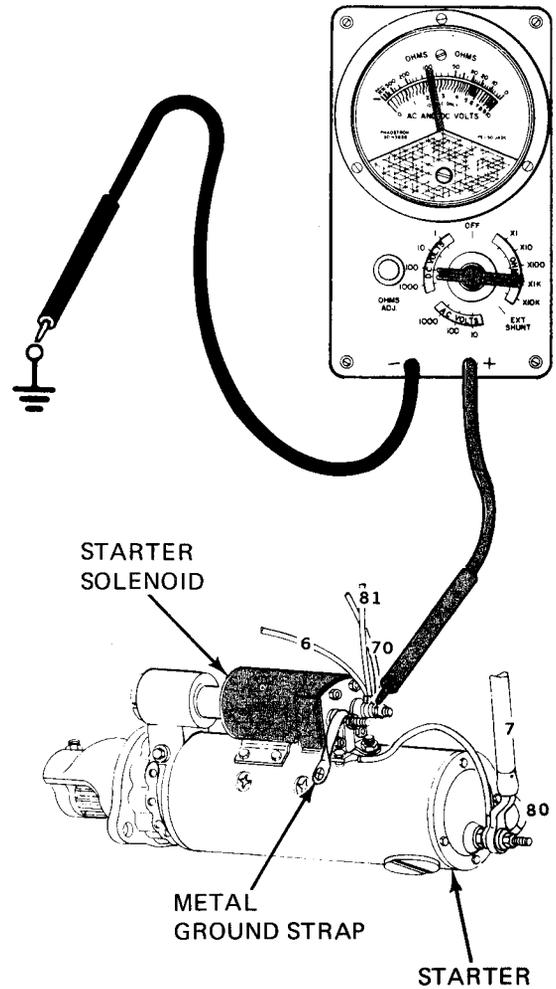


Figure 26-1 (Sheet 8 of 11)

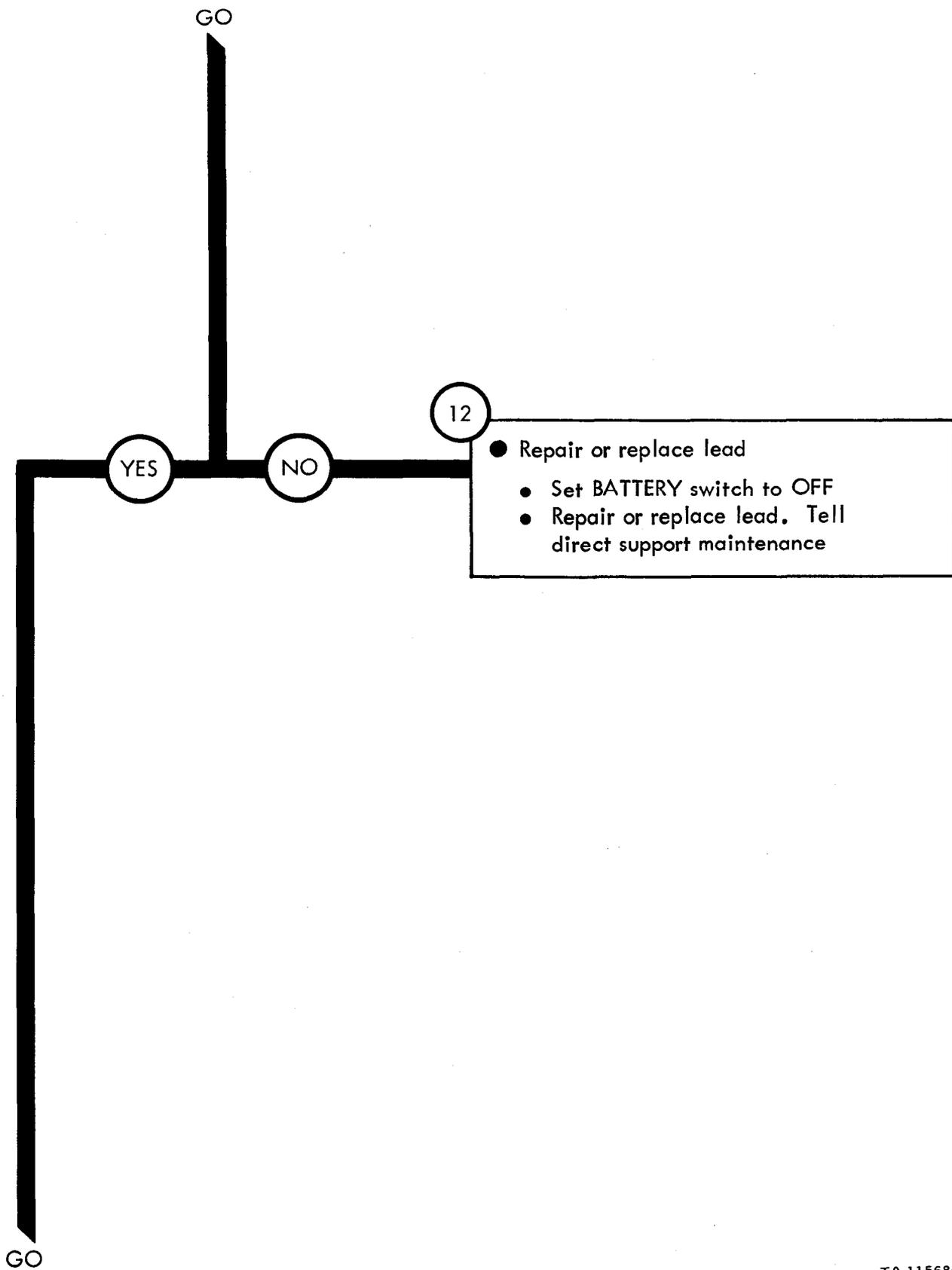


Figure 26-1 (Sheet 9 of 11)

GO

13

- Check cable from starter solenoid to starter motor for +24 volts DC
- SOLDIER B ● Put multimeter + lead on cable contact at starter motor
- Put multimeter - lead on a good ground
- SOLDIER A ● Press and hold START switch button
- SOLDIER B ● Read multimeter while Soldier A presses START switch button. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO

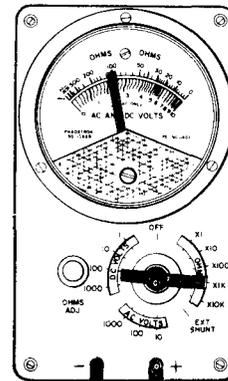
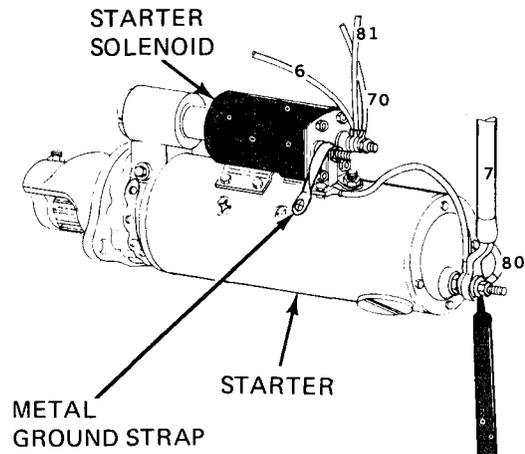


Figure 26-1 (Sheet 10 of 11)

TA 115687

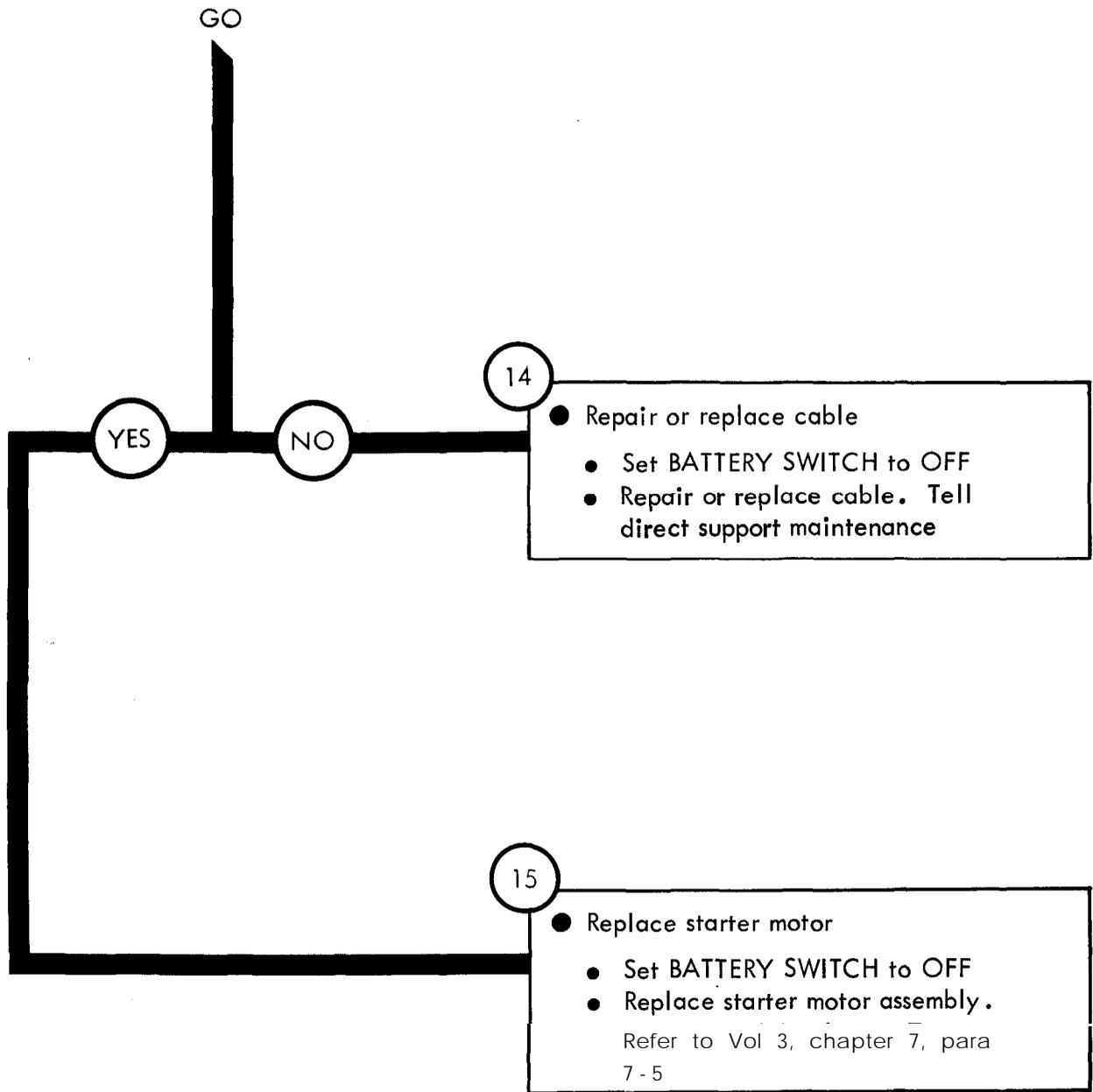


Figure 26-1 (Sheet 11 of 11)

Symptom

2 CHARGING SYSTEM (25 AMP, GENERATOR) HAS TOO HIGH OR LOW CHARGING RATE

NOTE
Make all charging system checks after engine run and engine compartment is hot
When measuring voltage, +24 volts means a range of +23 to +26 volts

1 ● Park truck
● Refer to TM 9-2320-211-10

GO

Figure 26-2 (Sheet 1 of 13)

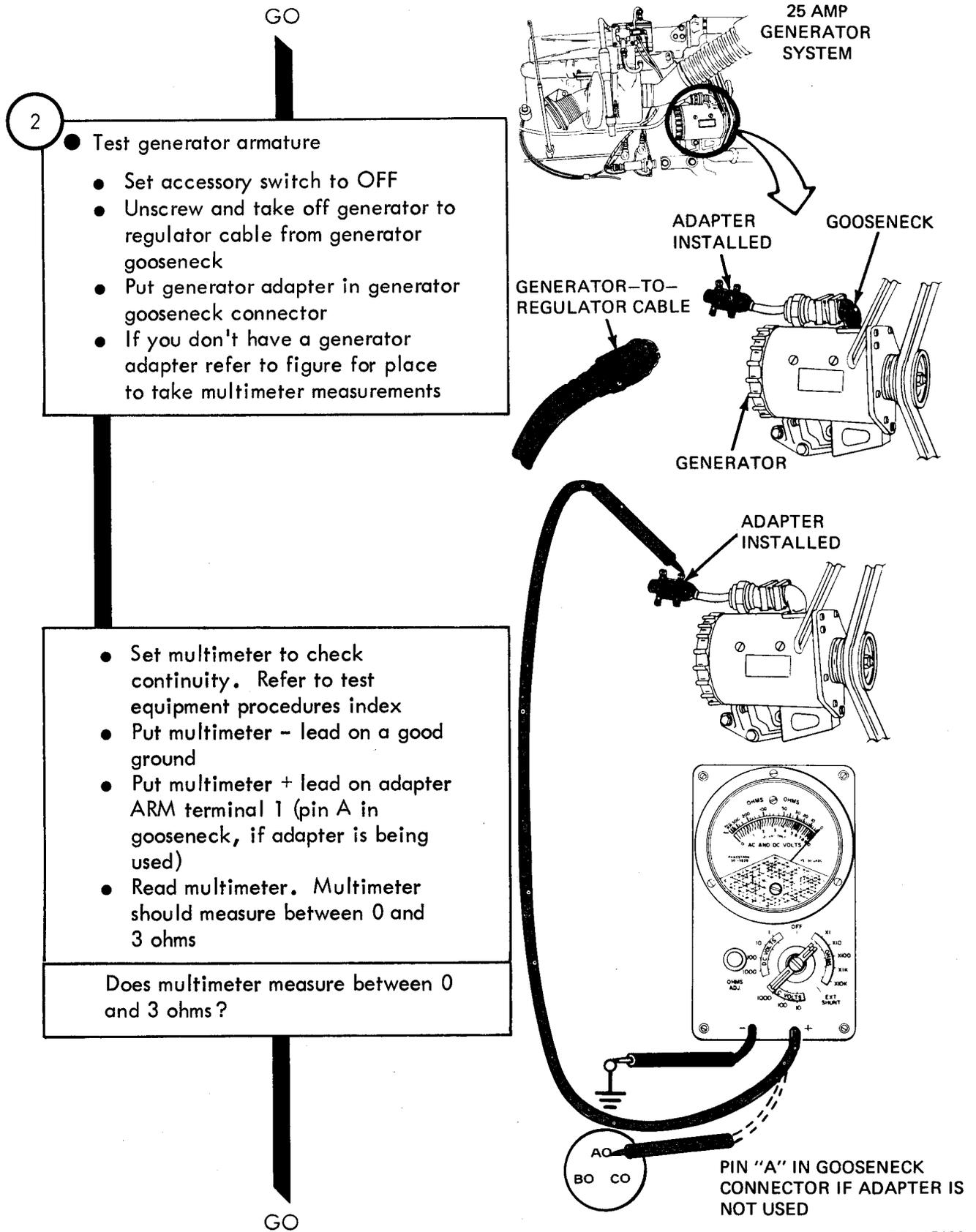


Figure 26-2 (Sheet 2 of 13)

TA 115690

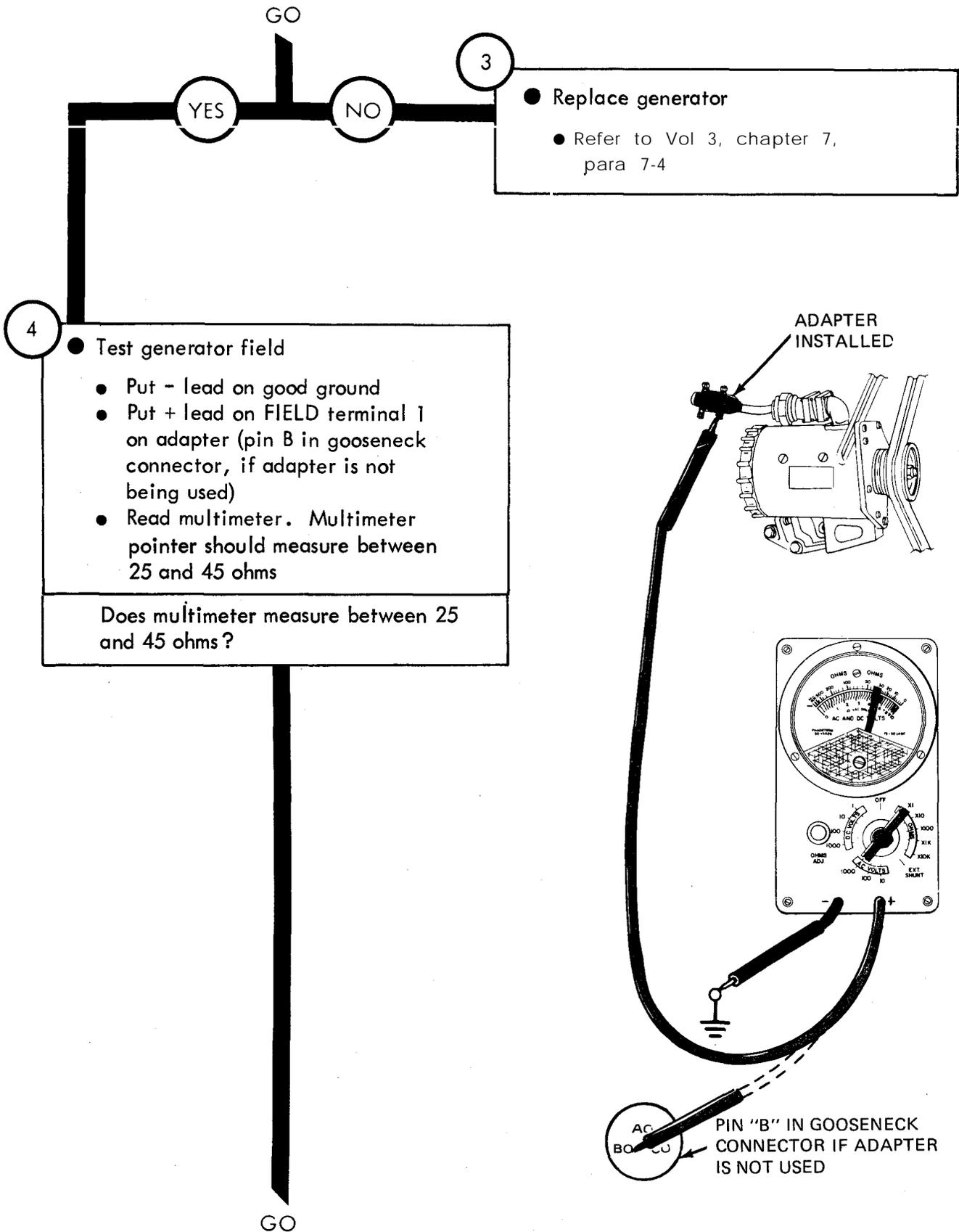


Figure 26-2 (Sheet 3 of 13)

TA 115691

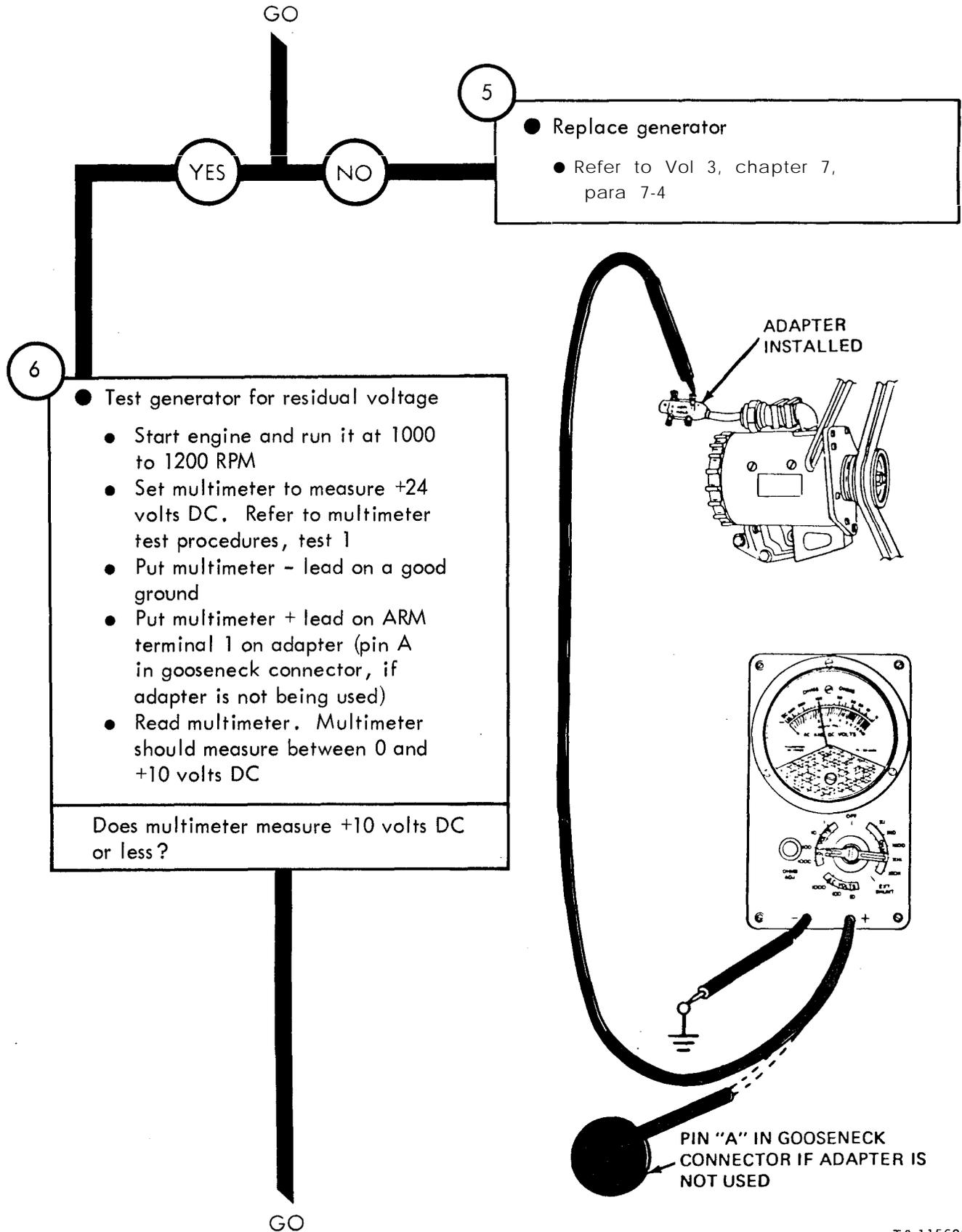
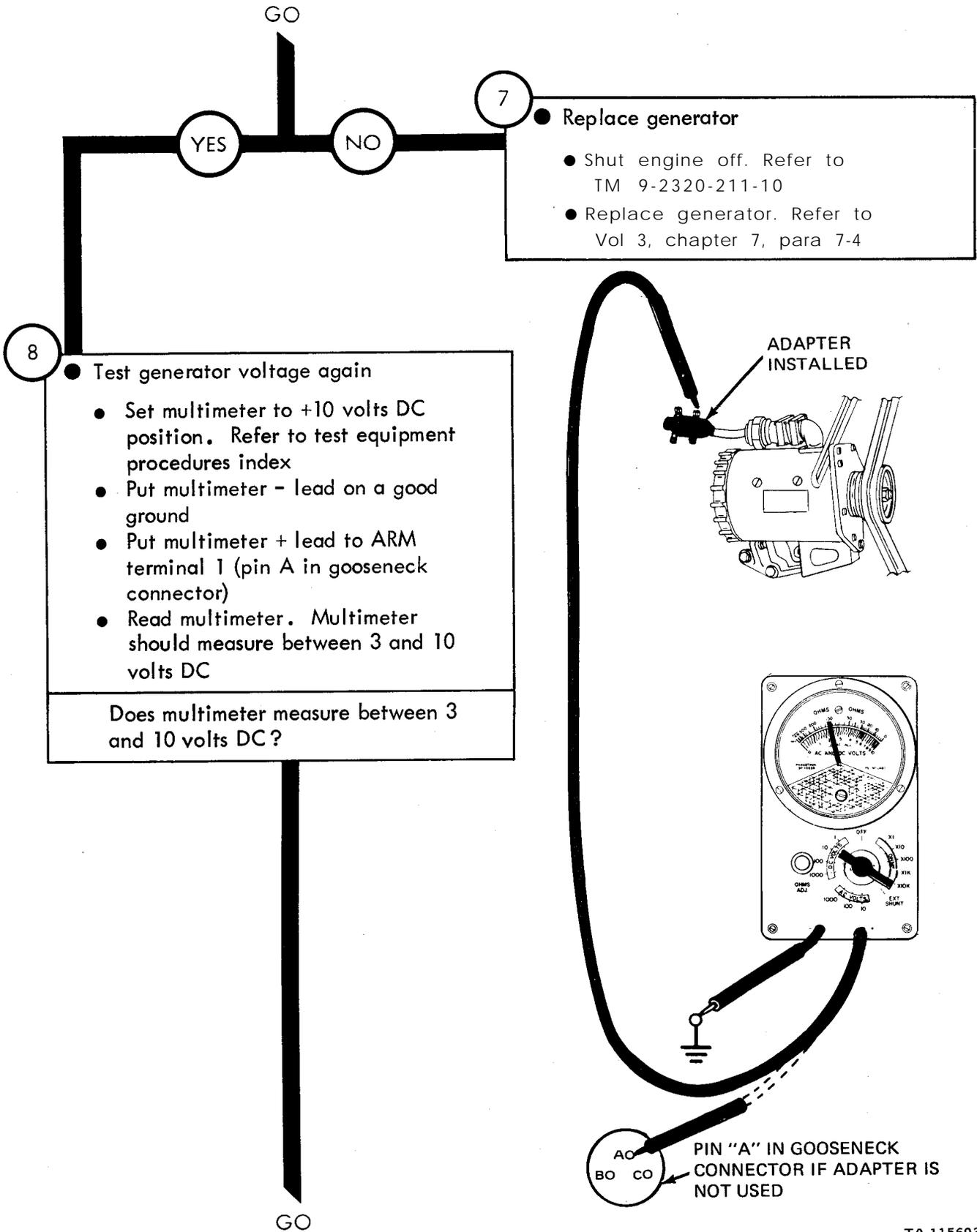


Figure 26-2 (Sheet 4 of 13)

TA 115692



TA 115693

Figure 26-2 (Sheet 5 of 13)

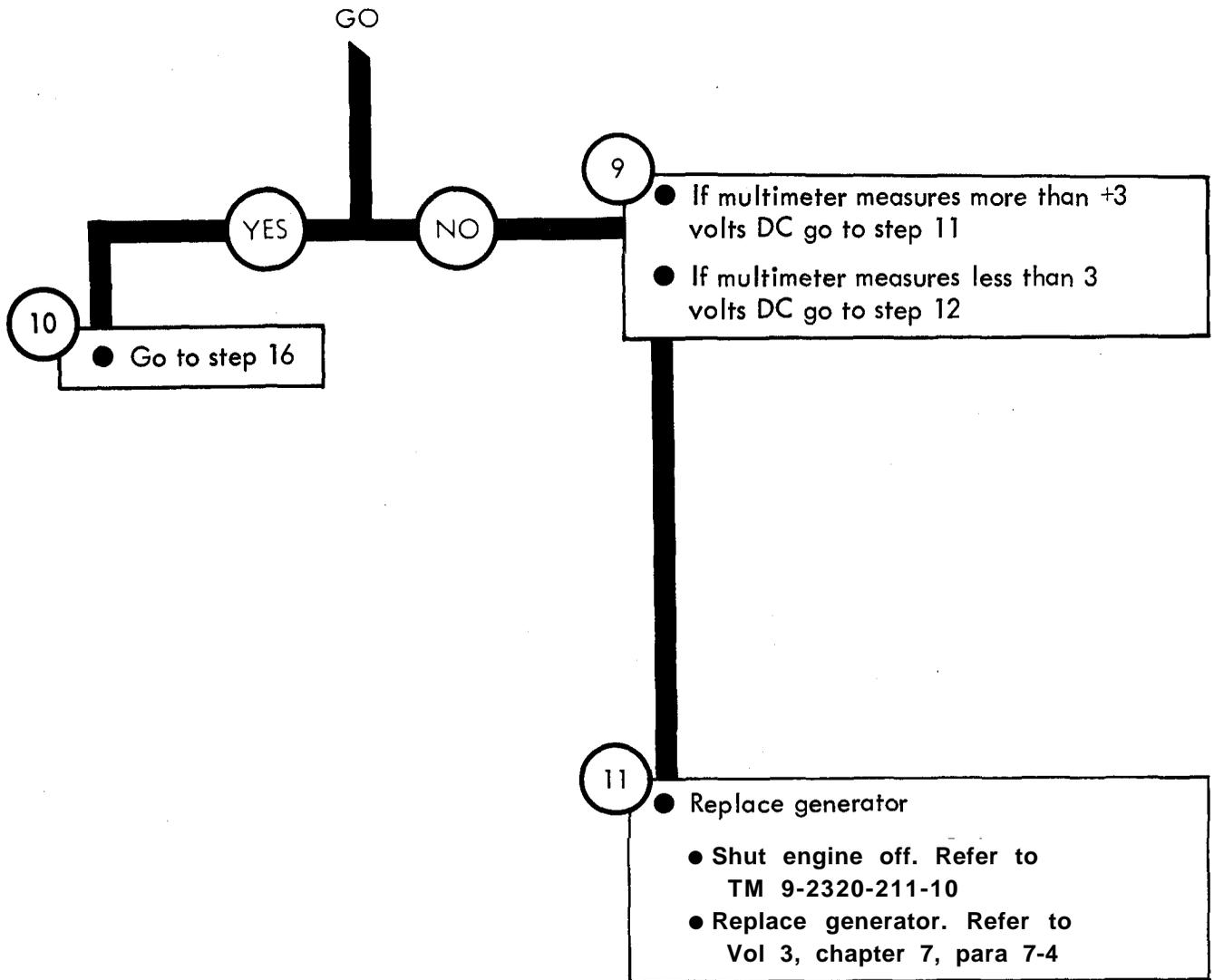
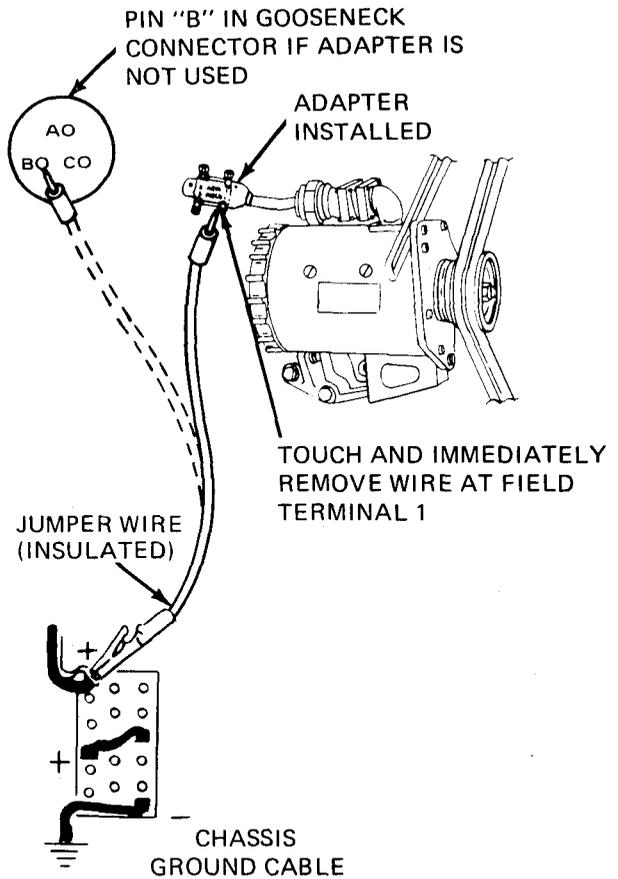


Figure 26-2 (Sheet 6 of 13)

From step 9

12

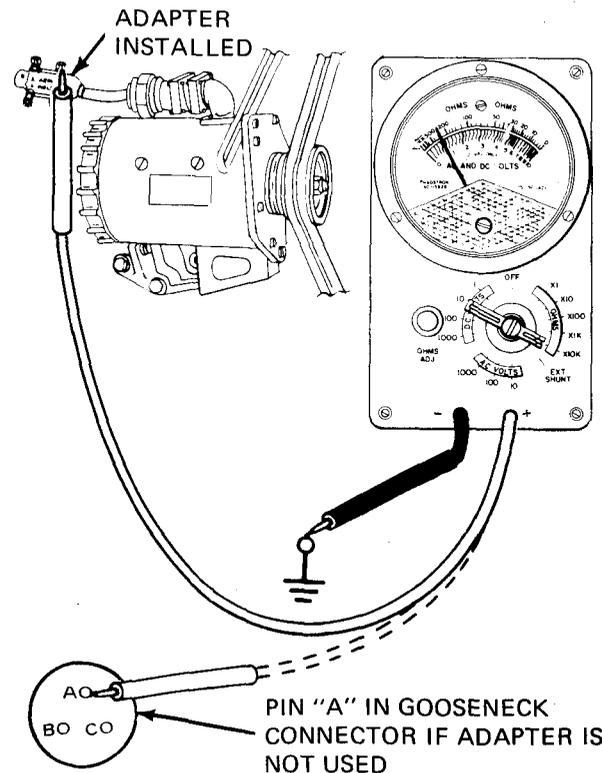
- Check generator field terminal
 - Shut engine off. Refer to TM 9-2320-211-10
 - Put one end of an insulated jumper wire on middle + terminal of batteries
 - Touch and quickly take away other end of jumper wire from field terminal 1 (pin B in gooseneck connector)
 - Take insulated jumper wire off + battery terminal



13

- Test generator for 3 to 10 volts DC again
 - Start engine and run at 1000 to 1200 RPM. Refer to TM 9-2320-211-10
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on ARM terminal 1 (pin A in generator gooseneck)
 - Read multimeter

Does multimeter measure between 3 and 10 volts DC?



GO

Figure 26-2 (Sheet 7 of 13)

TA 115695

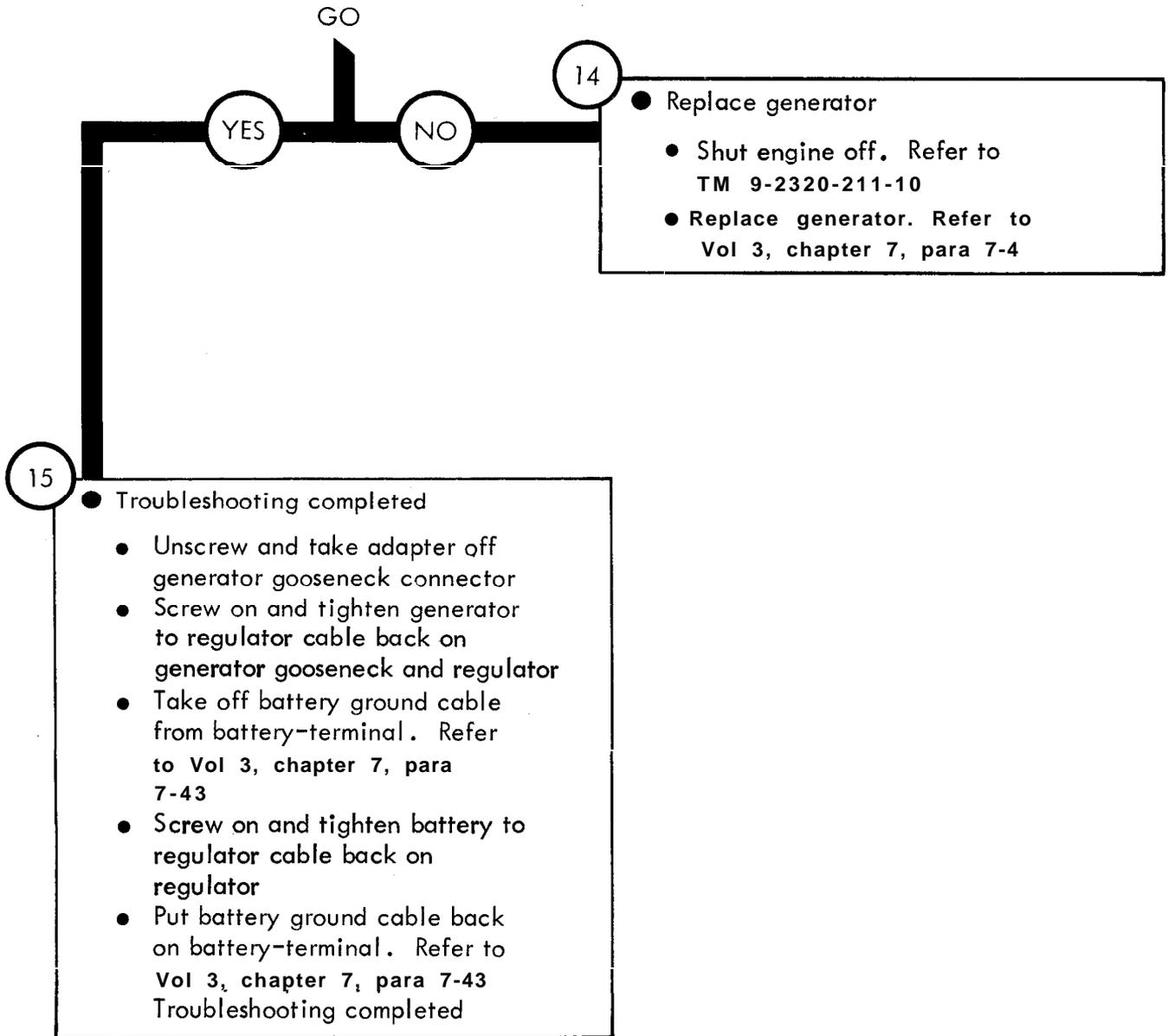


Figure 26-2 (Sheet 8 of 13)

From step 10

16

- Check generator to regulator cable for continuity
 - Shut engine off. Refer to TM 9-2320-211-10
 - Unscrew and take generator to regulator cable off at regulator
 - Set multimeter to measure continuity. Refer to test equipment procedures index

- Put multimeter - lead on pin A of cable
- Put multimeter + lead on other pin A of cable. Read multimeter
- Put multimeter - lead on pin B of cable
- Put multimeter + lead on other pin B of cable. Read multimeter

Does multimeter measure 0 ohms for both tests?

GO

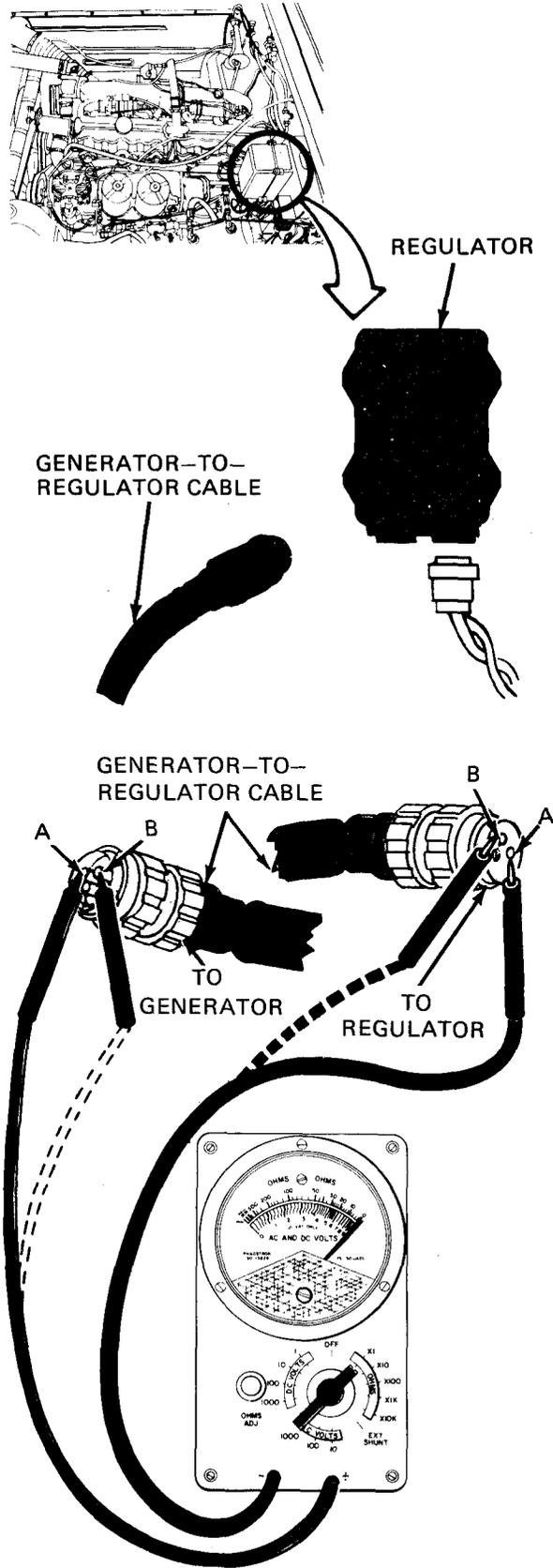


Figure 26-2 (Sheet 9 of 13)

TA 115697

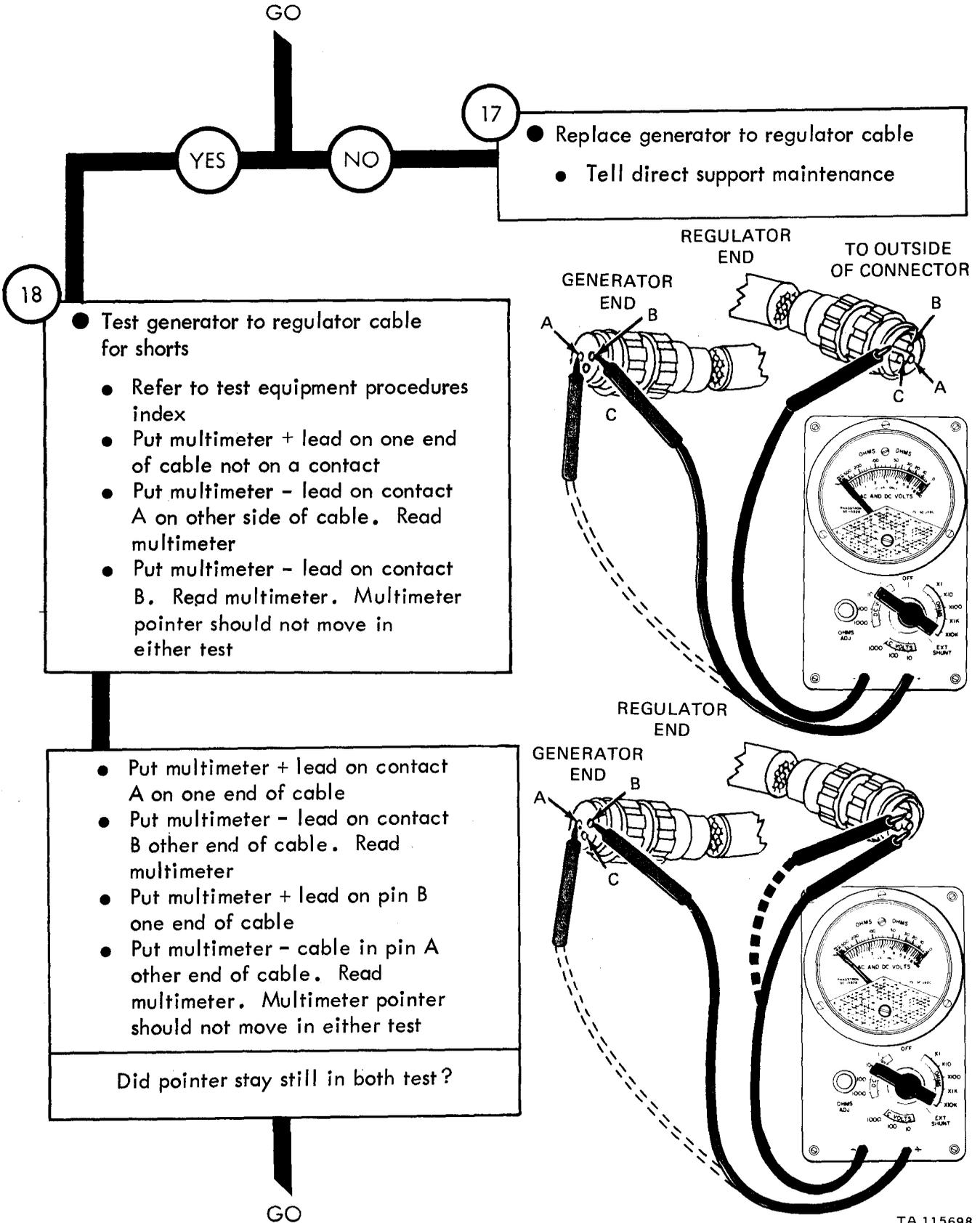


Figure 26-2 (Sheet 10 of 13)

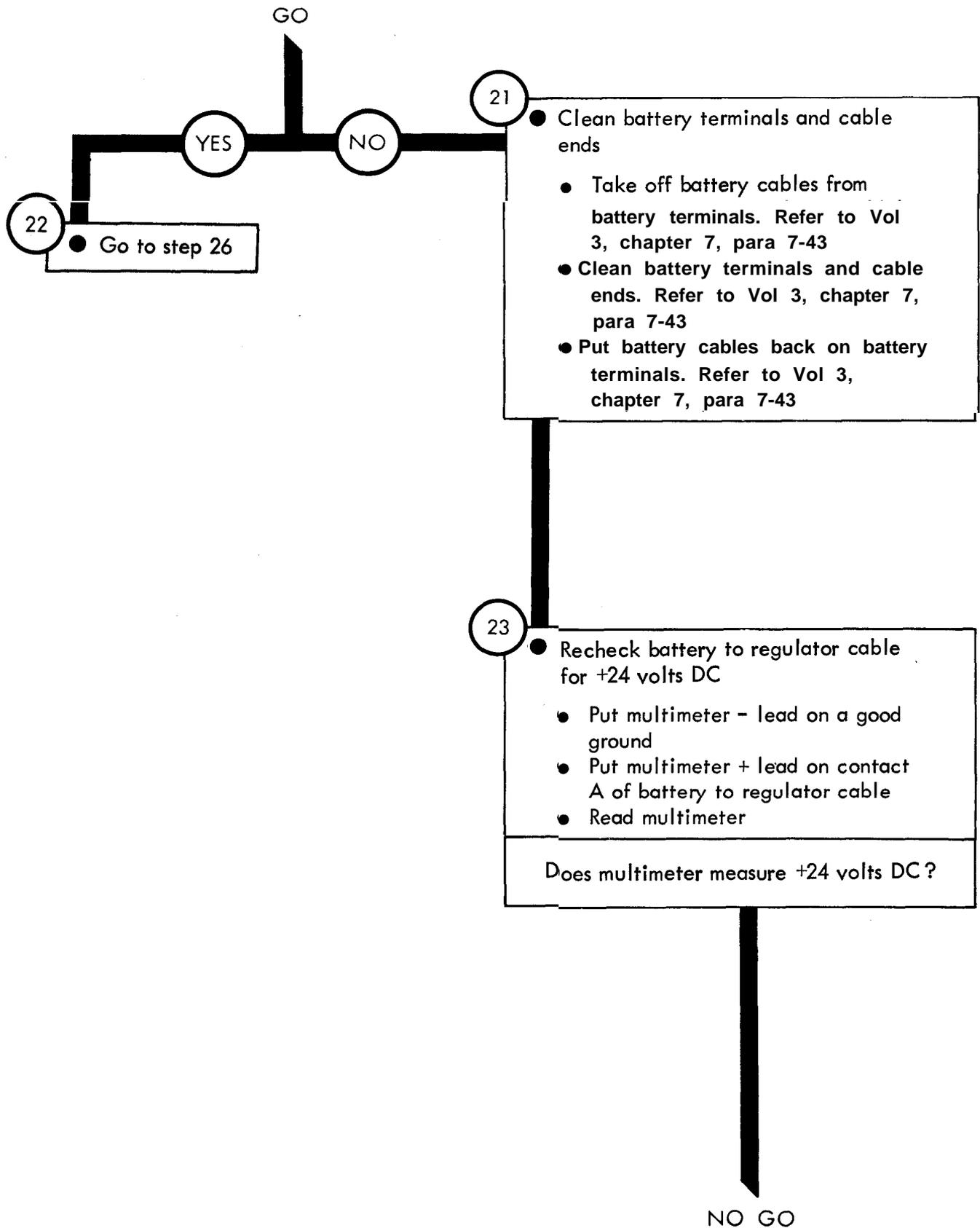


Figure 26-2 (Sheet 12 of 13)

From step 22

NO GO

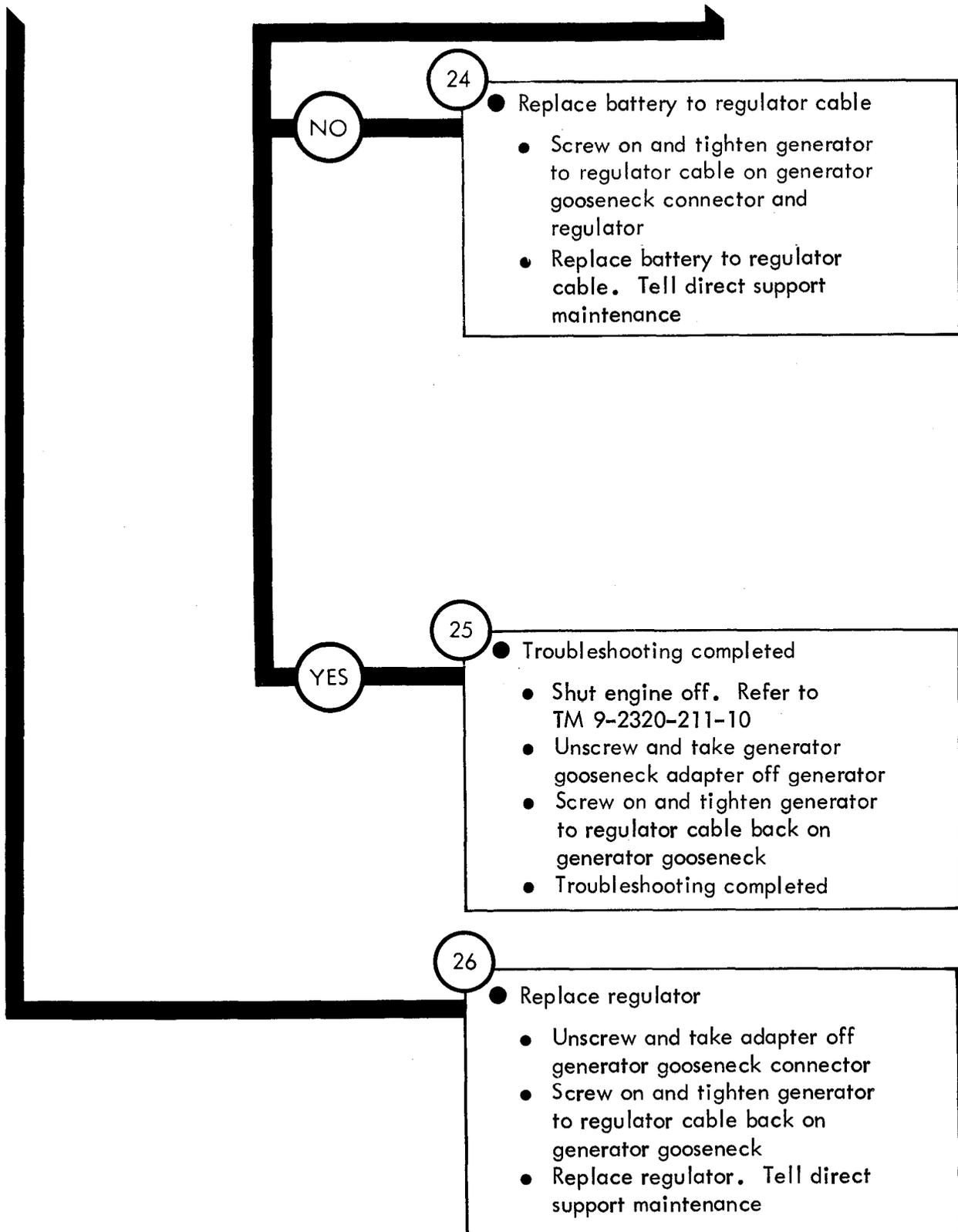


Figure 26-2 (Sheet 13 of 13)

TA 115702

Symptom

3

BATTERIES GO DEAD WHEN TRUCK IS PARKED OVERNIGHT OR A PERIOD OF DAYS

NOTE

First check that BATTERY switch, lights, etc were not left on.
Recharge or replace batteries before making any test. Refer to Vol 3, chapter 7, para 7-43

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Start engine and run at 1000 to 1200 RPM until warm
- Refer to TM 9-2320-211-10

GO

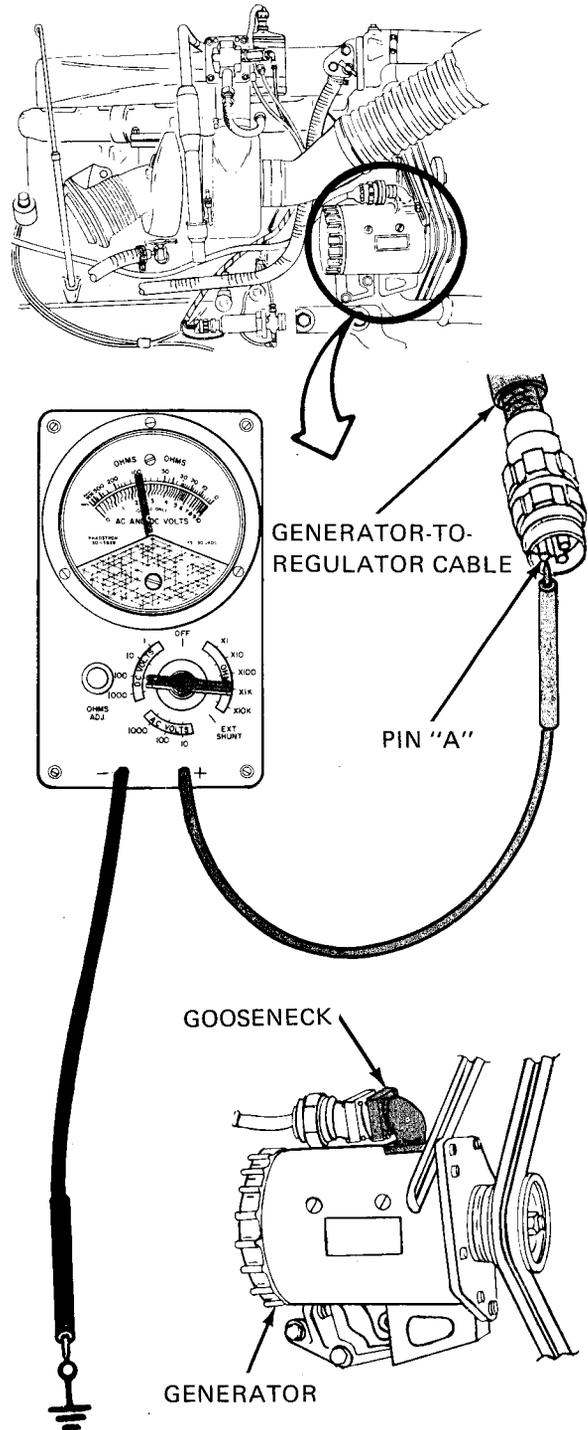
Figure 26-3 (Sheet 1 of 3)

GO

3

- Test generator cut out (reverse current) relay in the voltage regulator
- Shut engine off. Refer to TM 9-2320-211-10
- Unscrew and take off generator to regulator cable at generator gooseneck
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on pin A of generator to regulator cable. Read multimeter

Does multimeter measure +24 volts DC?



GO

Figure 26-3 (Sheet 2 of 3)

TA 115704

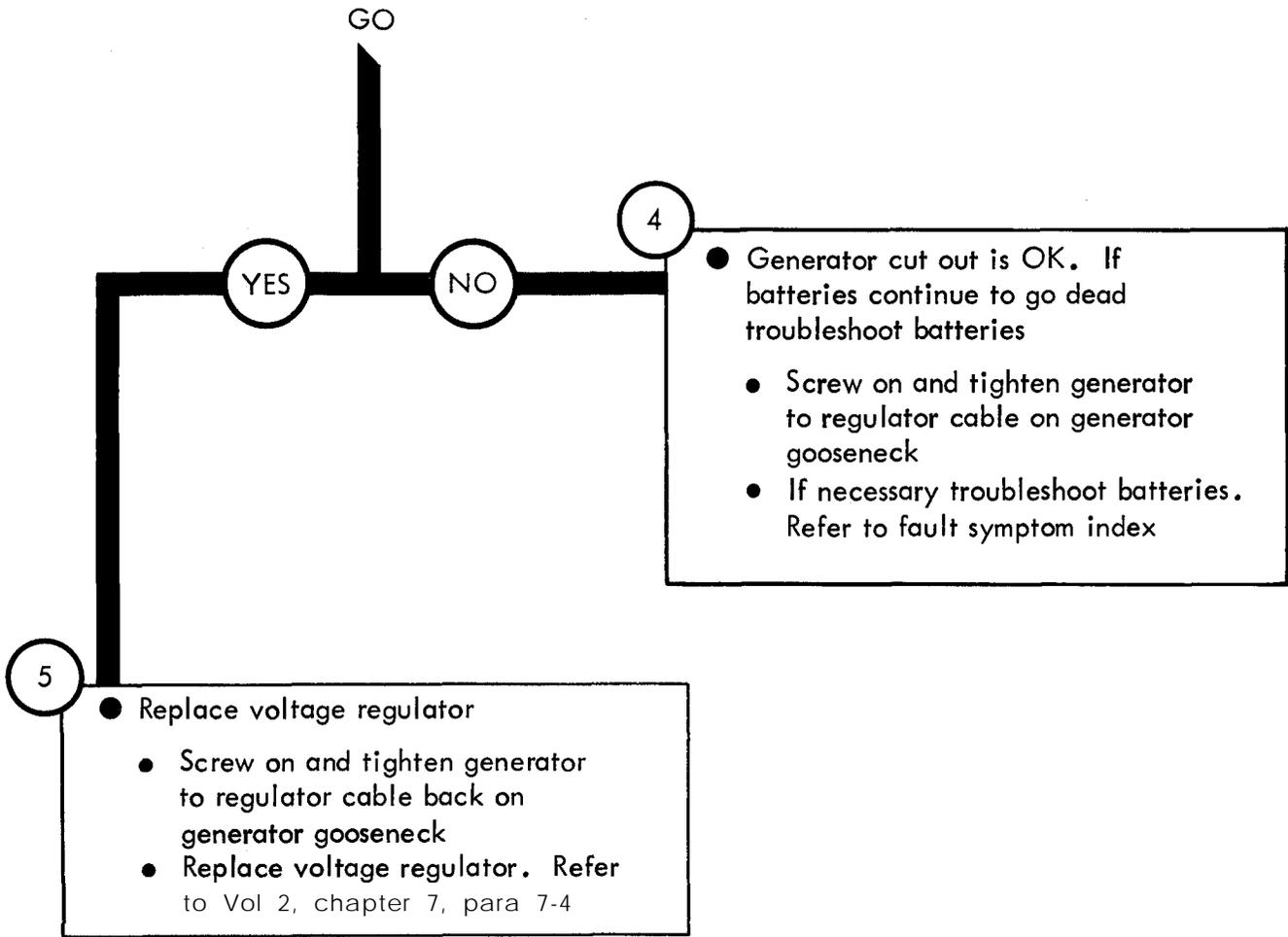


Figure 26-3 (Sheet 3 of 3)

Symptom

4

BATTERIES DO NOT FULLY CHARGE,
OR DO NOT HOLD CHARGE

WARNING

Because of their higher power 24 volt systems are more dangerous than 6 or 12 volt systems. Do not let a "hot" wire touch metal parts of the truck at anytime. "Flash" testing by striking a hot wire against a ground will cause an arc that can destroy the lead connector and possibly the lead itself. Accidental contact of metal tools between positive (+) battery or starter terminals will cause a direct short circuit which can cause burns on the hands, damage tools, truck electrical components and batteries. The battery can explode spraying acid and sharp fragments that can cause serious or fatal injuries

1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-4 (Sheet 1 of 10)

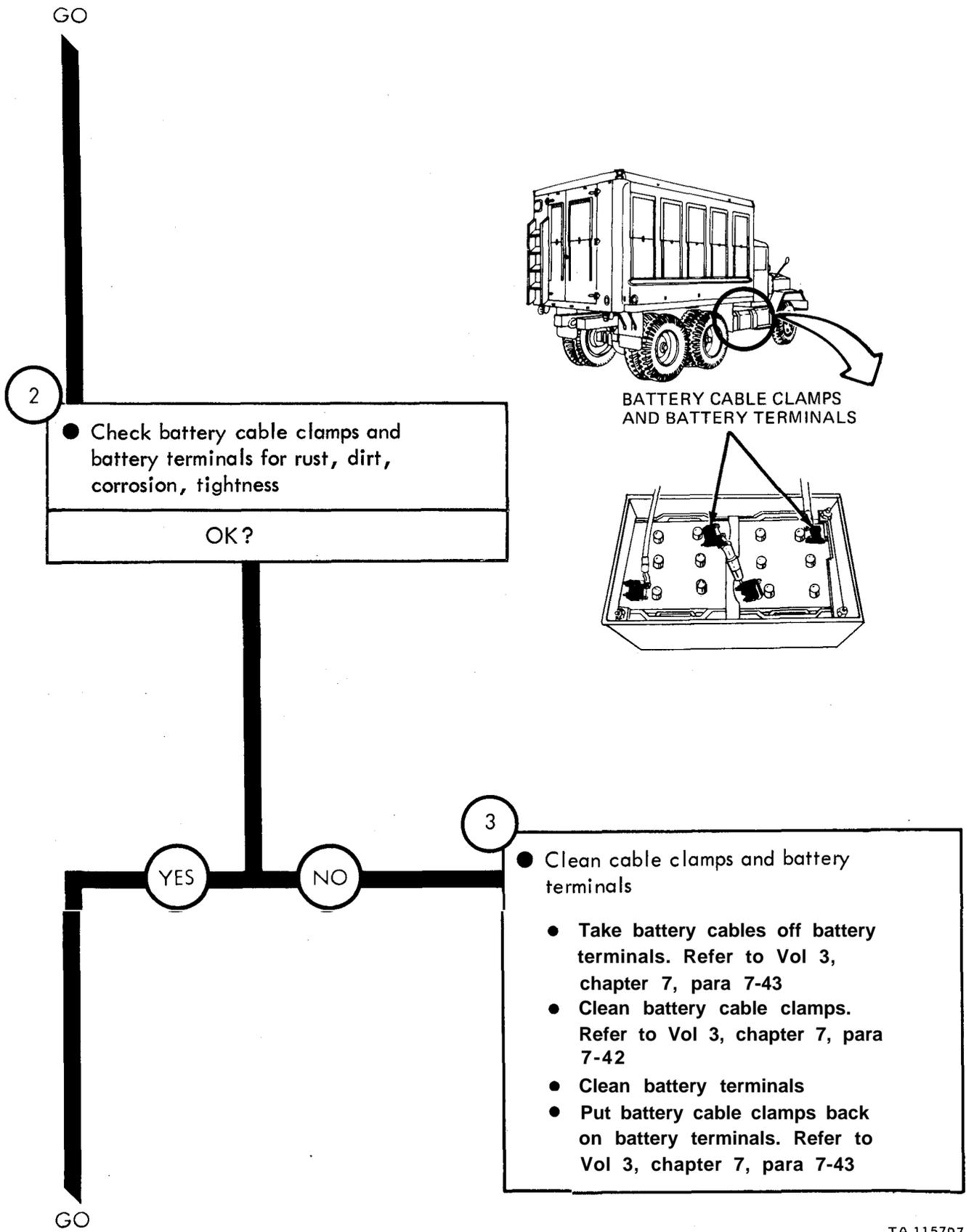


Figure 26-4 (Sheet 2 of 10)

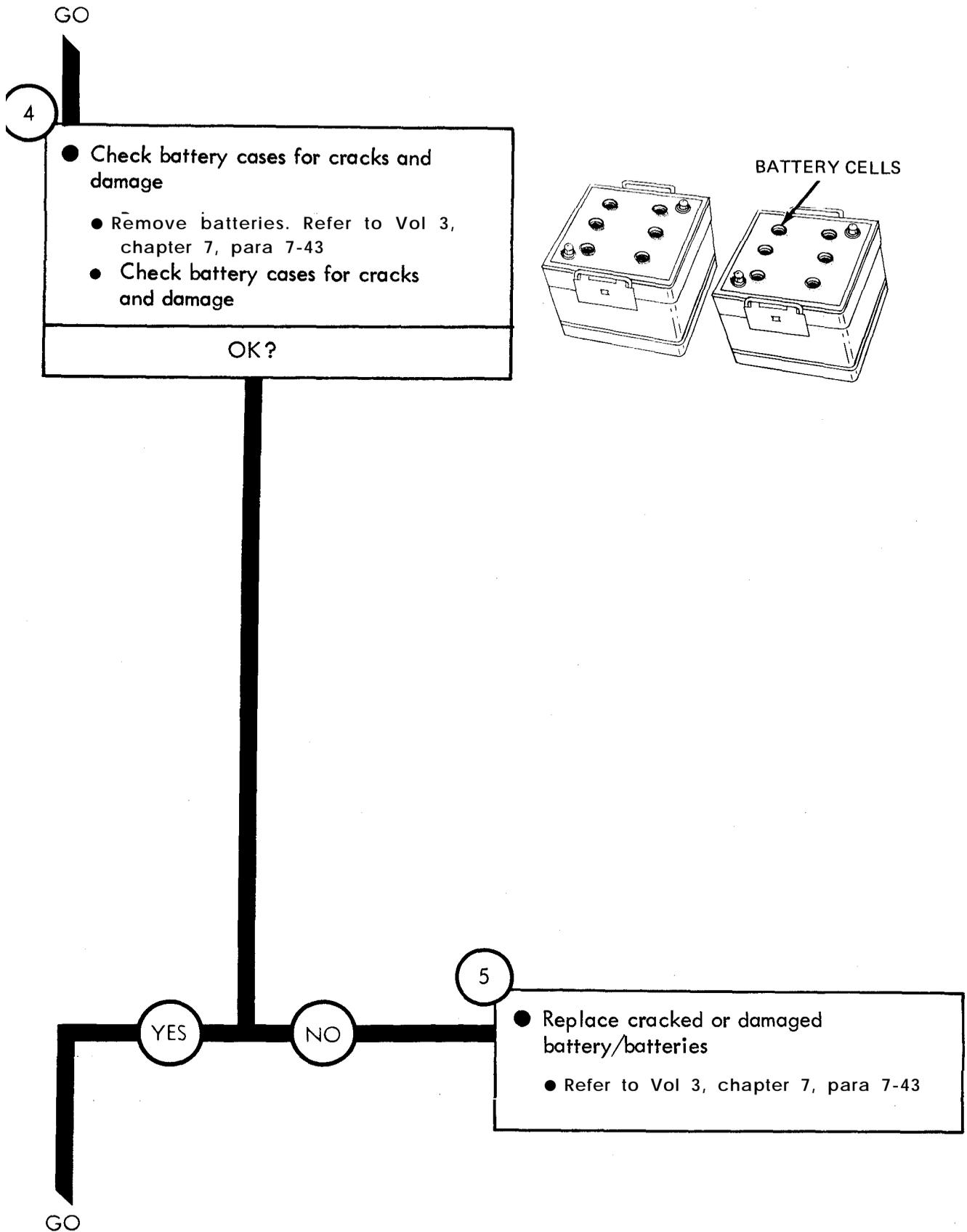


Figure 26-4 (Sheet 3 of 10)

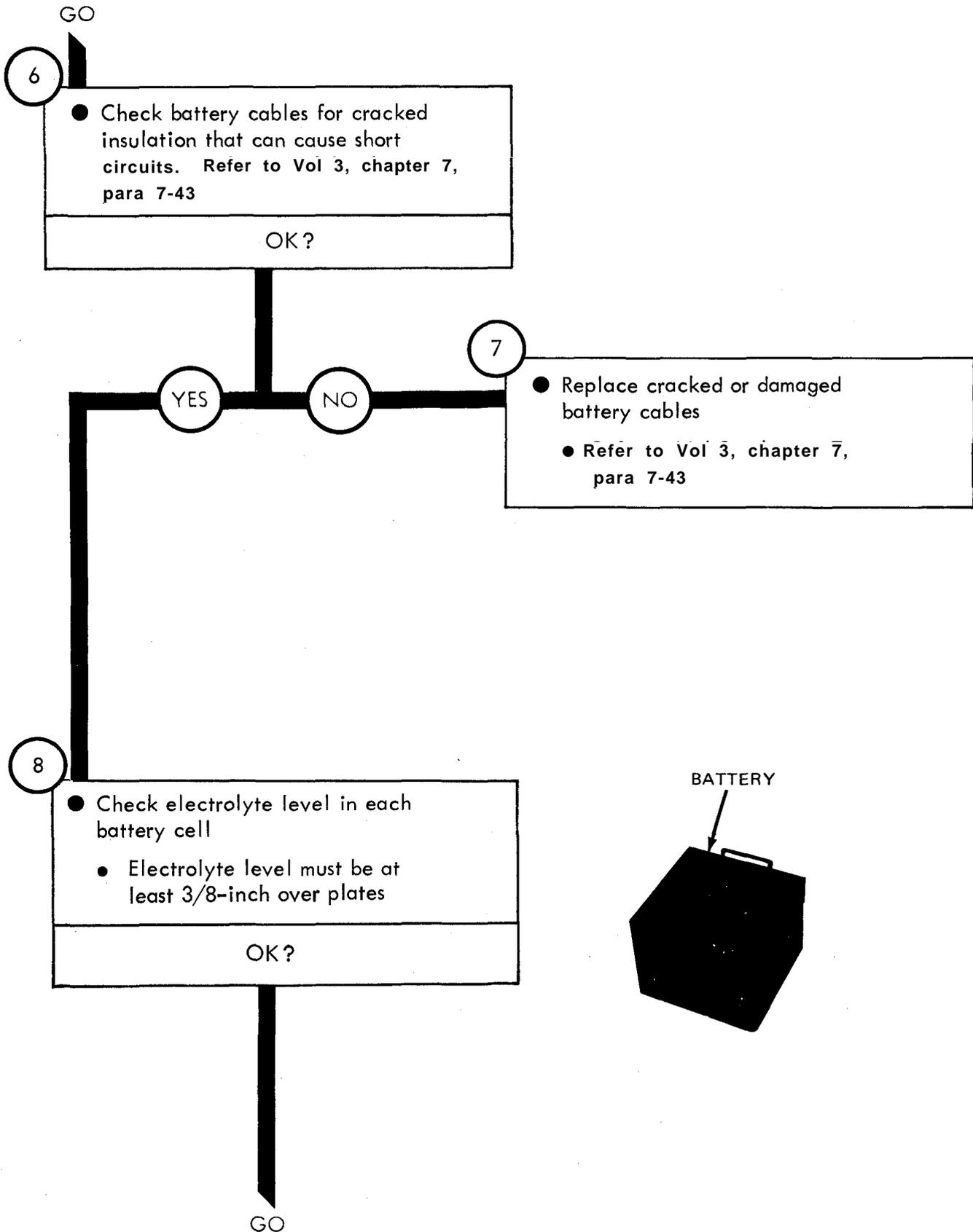


Figure 26-4 (Sheet 4 of 10)

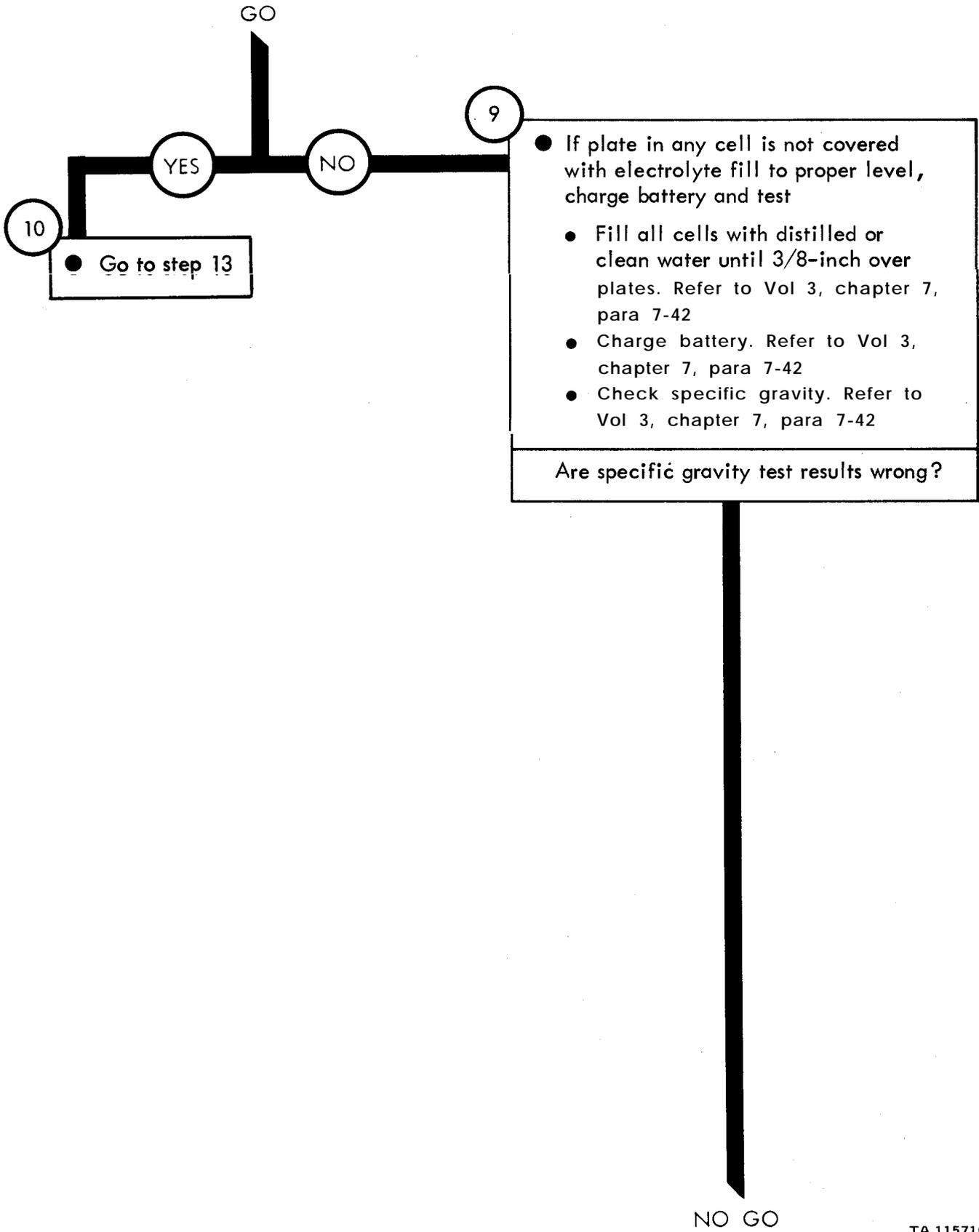


Figure 26-4 (Sheet 5 of 10)

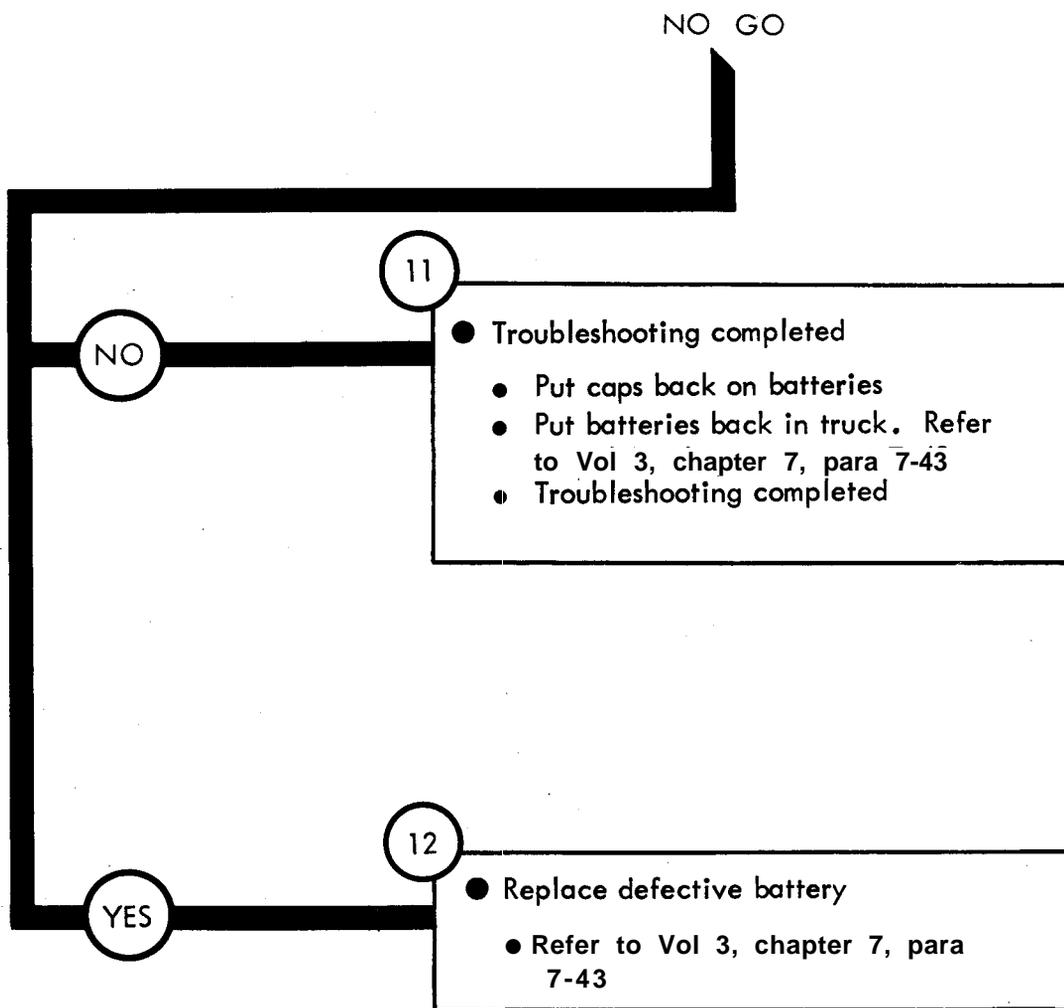


Figure 26-4 (Sheet 6 of 10)

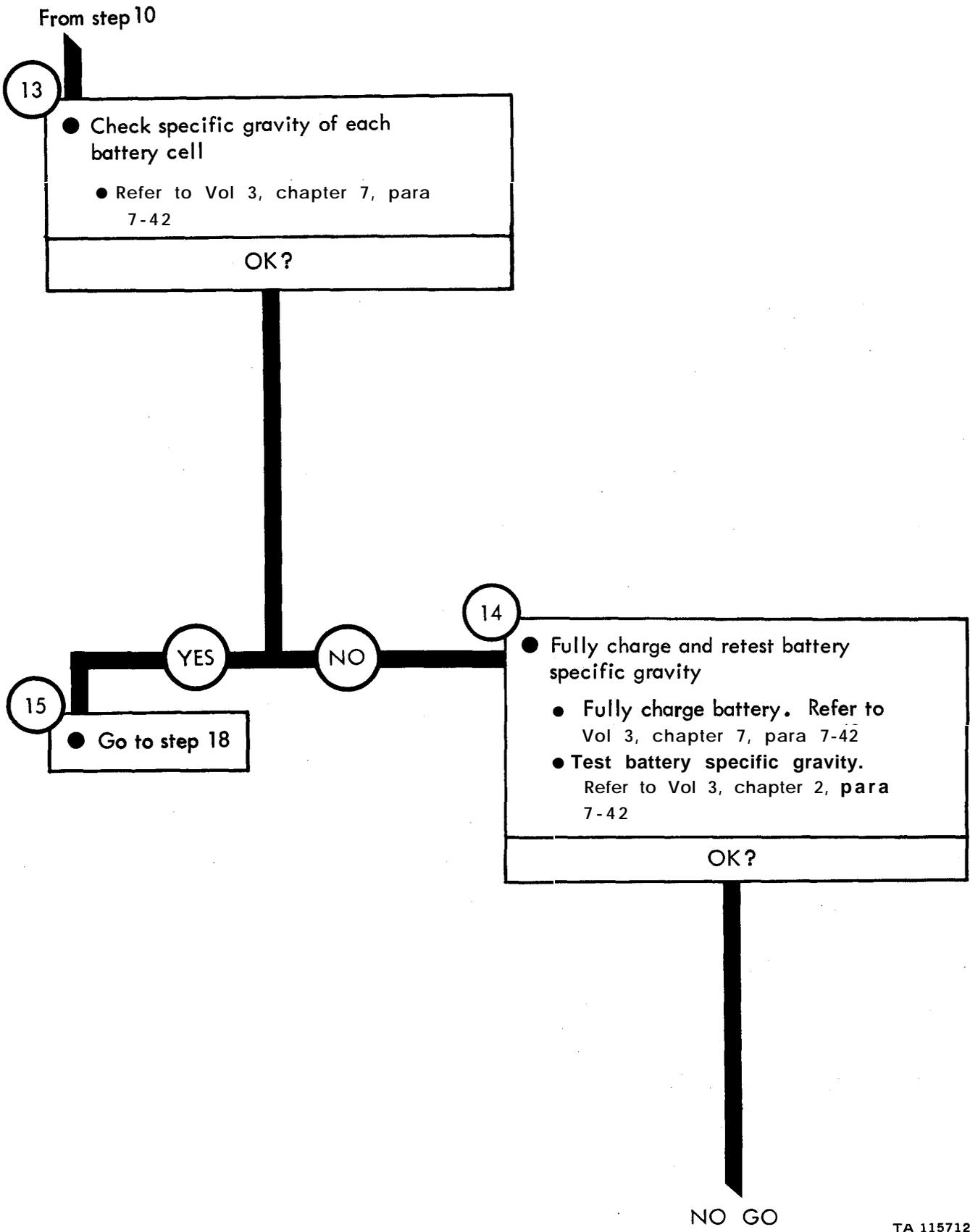


Figure 26-4 (Sheet 7 of 10)

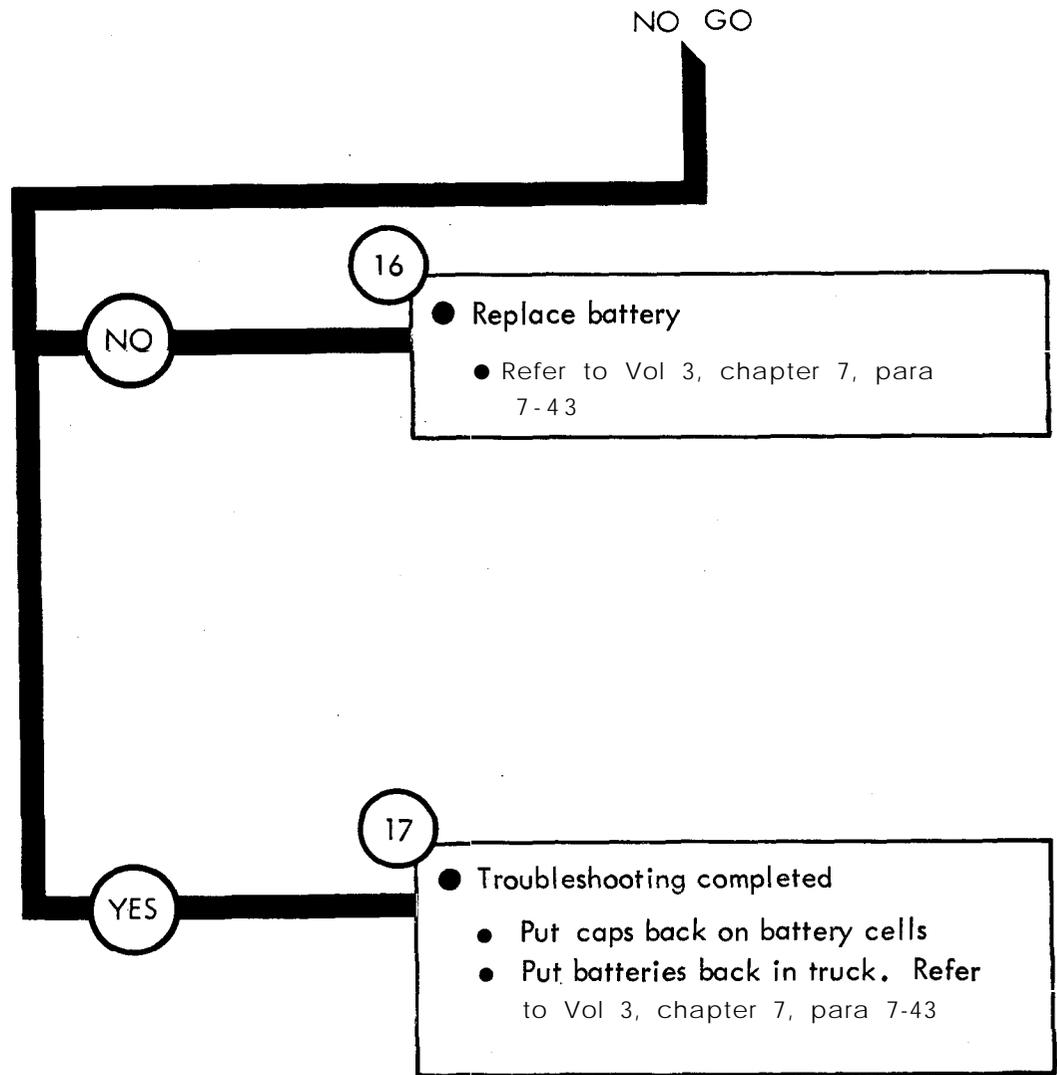


Figure 26-4 (Sheet 8 of 10)

From step 15

18

- Test voltage rise at batteries
 - Put batteries back in truck. Refer to Vol 3, chapter 7, para 7-43
 - Set ACCESSORY switch to ON
 - Start engine and run at 1000 to 1200 RPM

- Set multimeter to measure +28 volts DC
- Put multimeter - lead to battery ground terminal
- Put multimeter + lead to battery + terminal
- Read multimeter. Multimeter should measure 28.5 volts DC

Does multimeter read 28.5 volts DC?

GO

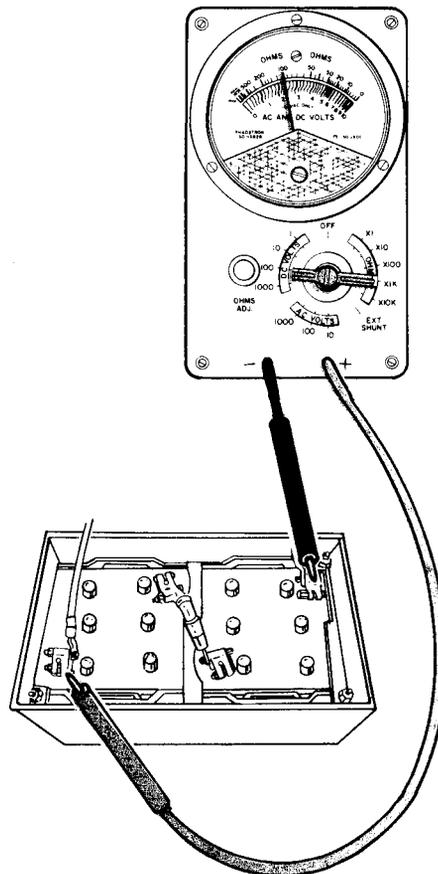


Figure 26-4 (Sheet 9 of 10)

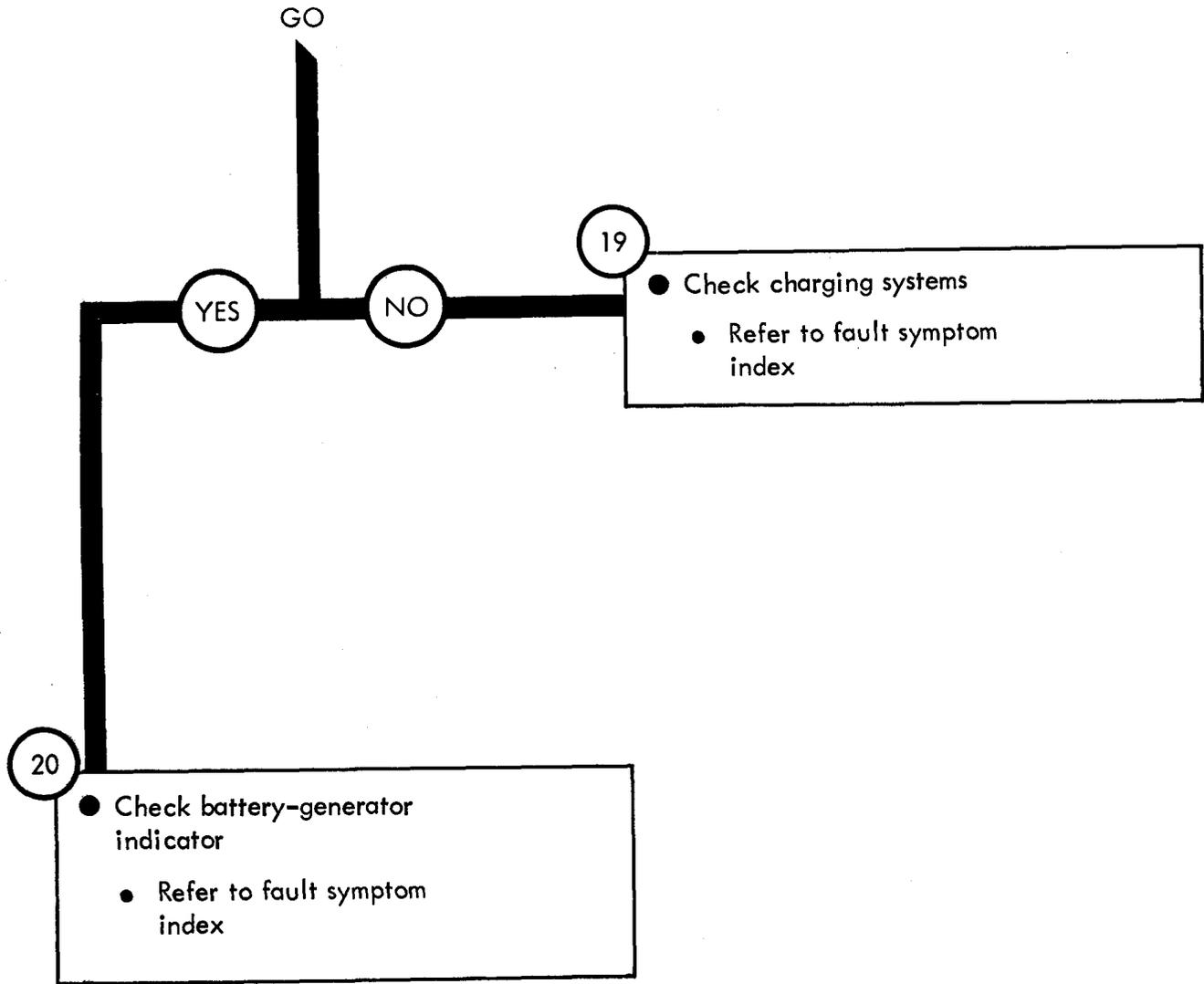


Figure 26-4 (Sheet 10 of 10)

Symptom

5

ONE HEADLIGHT DOES NOT LIGHT,
OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

When checking voltage, +24 volts DC
means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

TA 115716

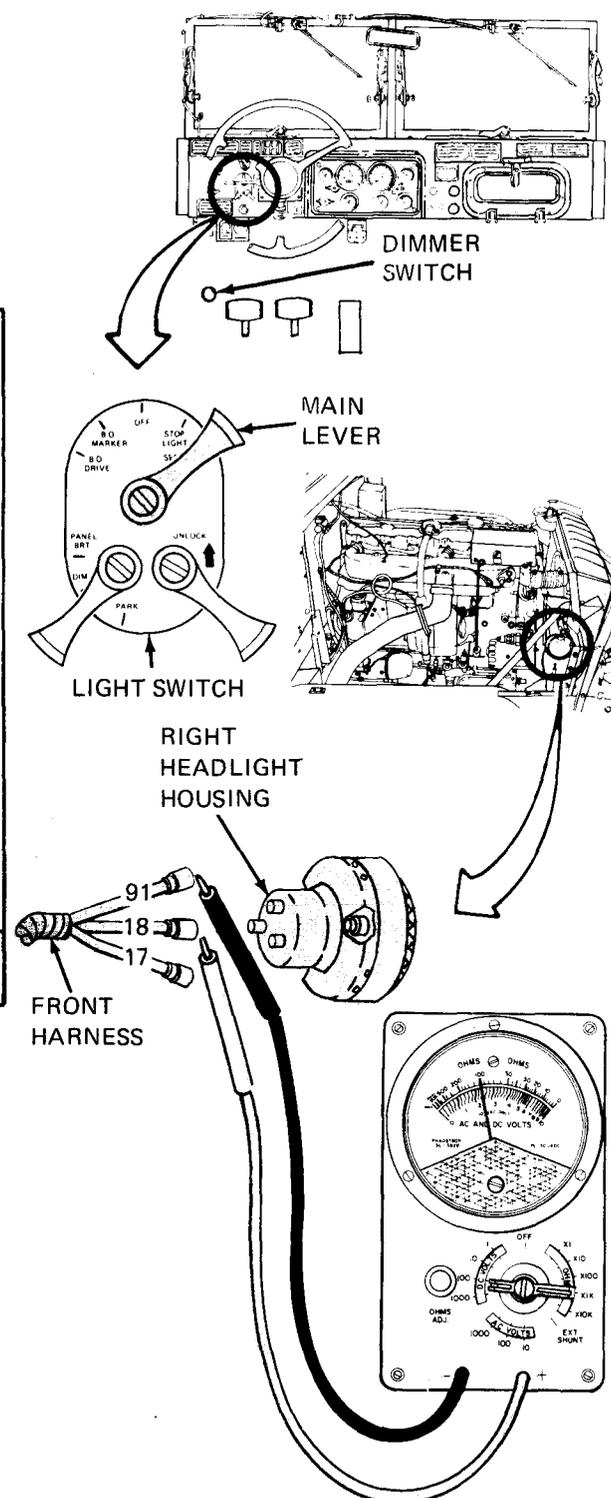
Figure 26-5 (Sheet 1 of 5)

GO

2

- Check for +24 volts DC at low beam input of bad headlight
- Take off leads 17, 18, and 91 from headlight housing
- Set multimeter to measure +24 volts DC. Refer to multimeter test procedures, test 1
- Set light switch main lever to SERVICE DRIVE
- Put multimeter + lead on lead 18 and - lead on lead 91 contacts
- Read multimeter. Multimeter should read +24 volts DC. If not push dimmer switch and read multimeter again

Does multimeter measure +24 volts DC?



GO

Figure 26-5 (Sheet 2 of 5)

TA 115717

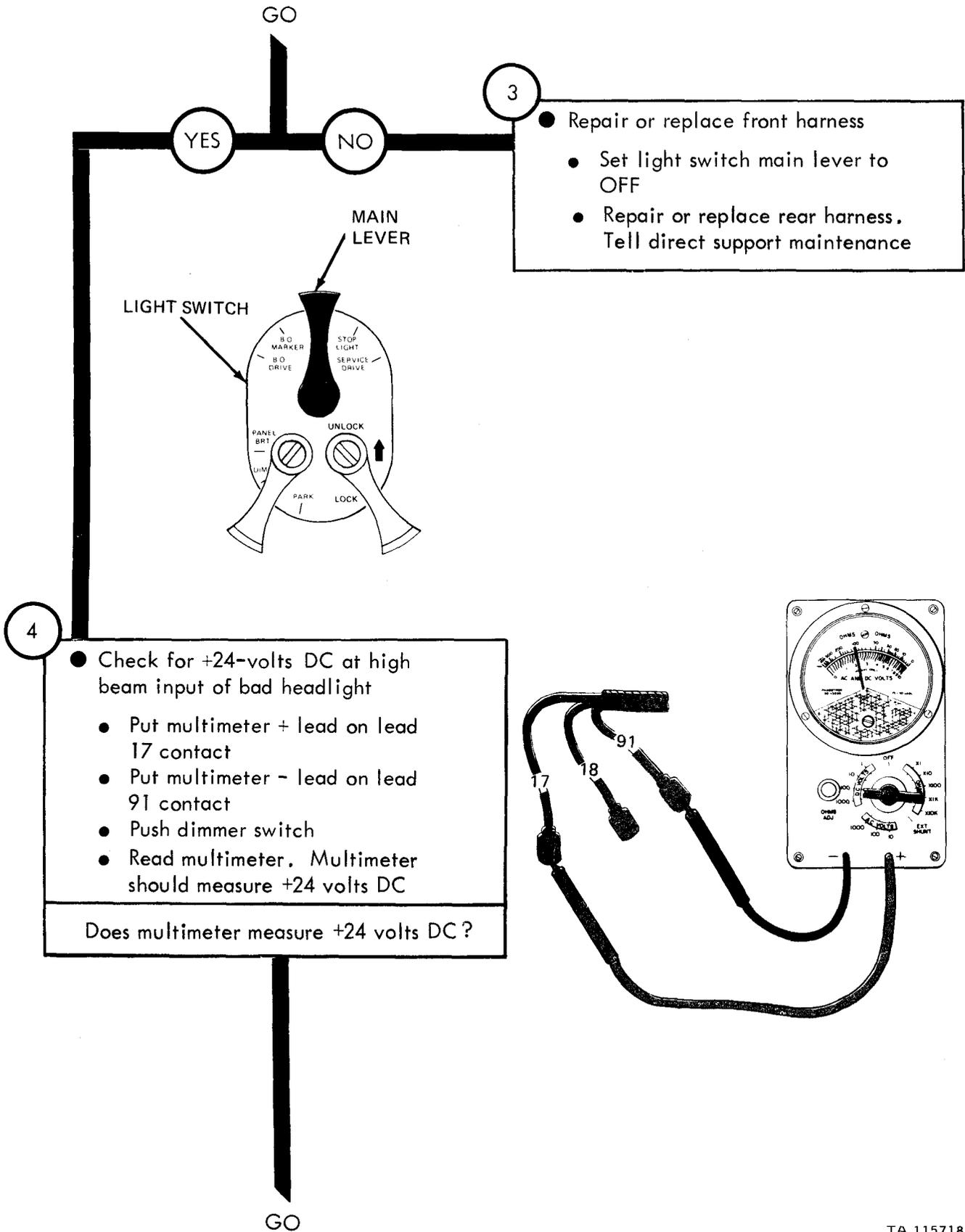


Figure 26-5 (Sheet 3 of 5)

TA 115718

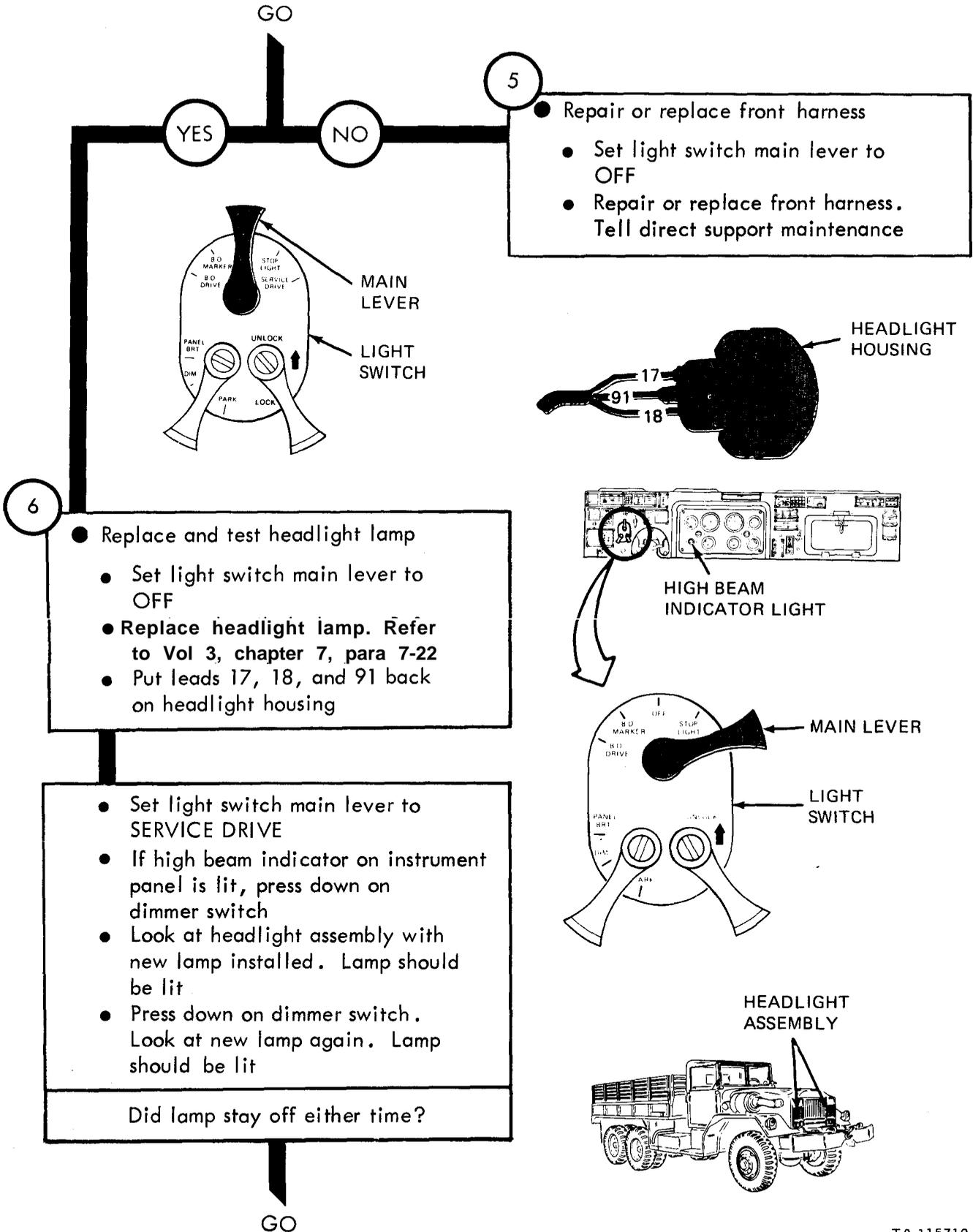


Figure 26-5 (Sheet 4 of 5)

TA 115719

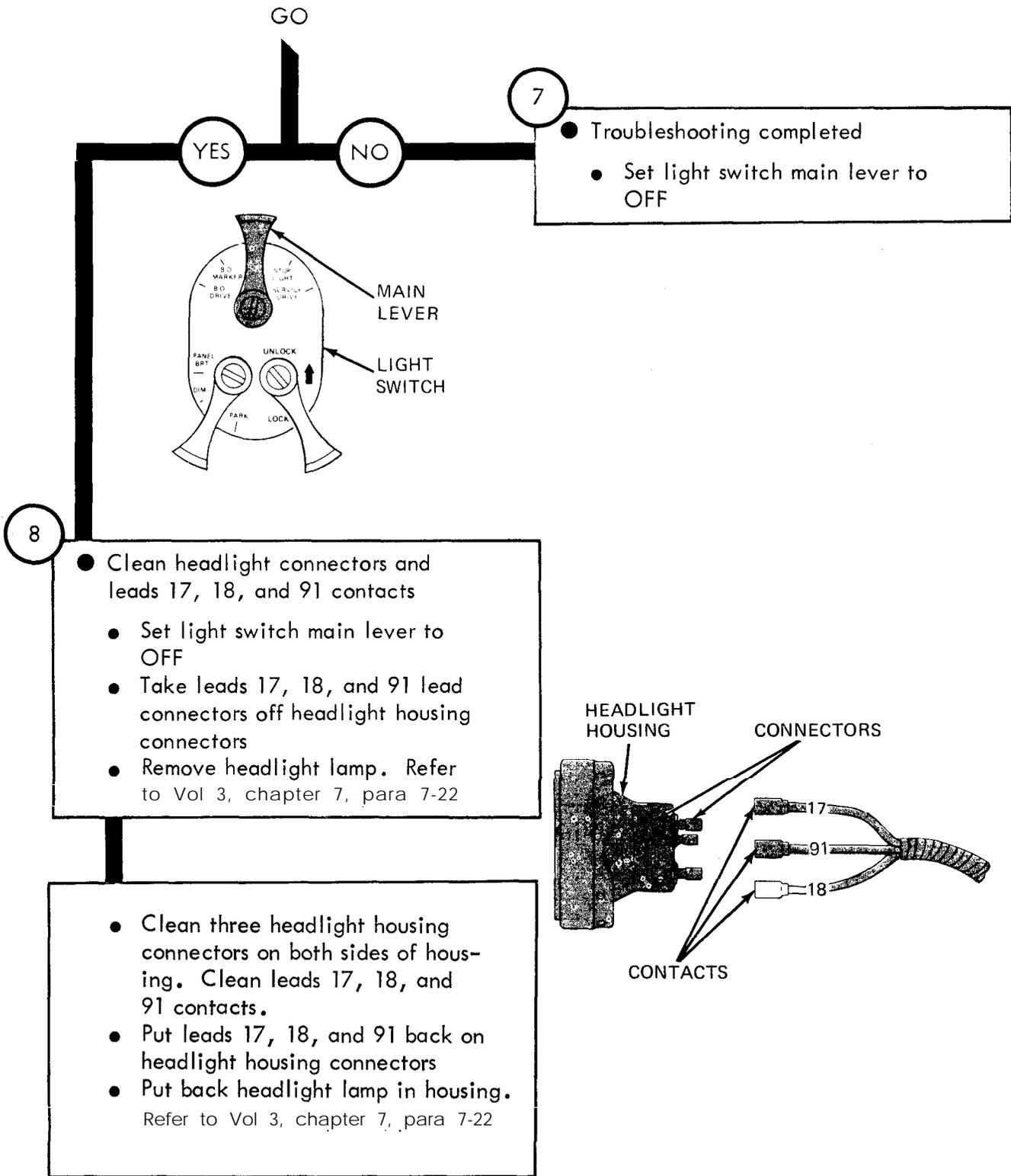


Figure 26-5 (Sheet 5 of 5)

Symptom

6 BOTH HEADLIGHTS DO NOT LIGHT,
OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

When checking voltage +24 volts DC means a range of +23 to +26 volts DC

1

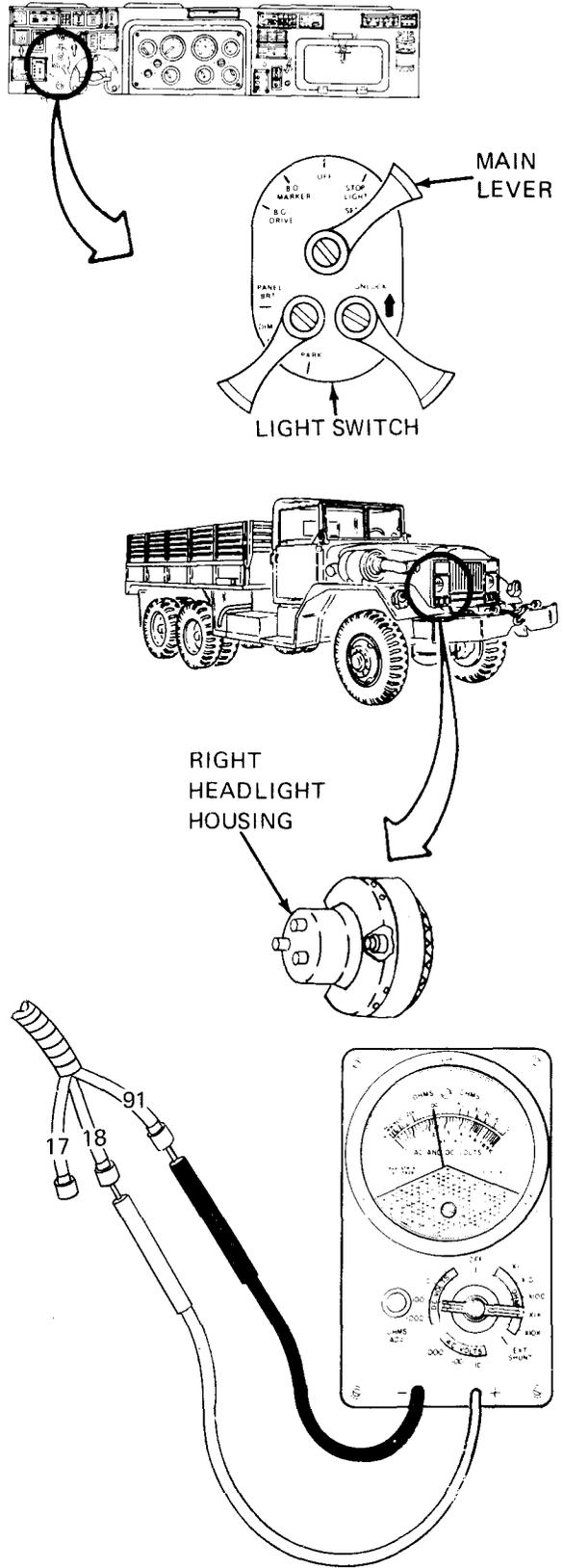
- Park truck
- Refer to TM 9-2320-211-10

2

- Check for +24 volts DC at right headlight low beam input
 - Take off leads 17, (high beam), 18 (low beam), and 91 (ground) from right headlight housing
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Set light switch main lever to SERVICE DRIVE
 - Put multimeter - lead on lead 91 contact. Put multimeter + lead on lead 18 contact
 - Read multimeter. Multimeter should read +24 volts DC. If not, push foot dimmer switch and read multimeter again

Does multimeter read +24 volts DC?

GO



TA 115721

Figure 26-6 (Sheet 1 of 15)

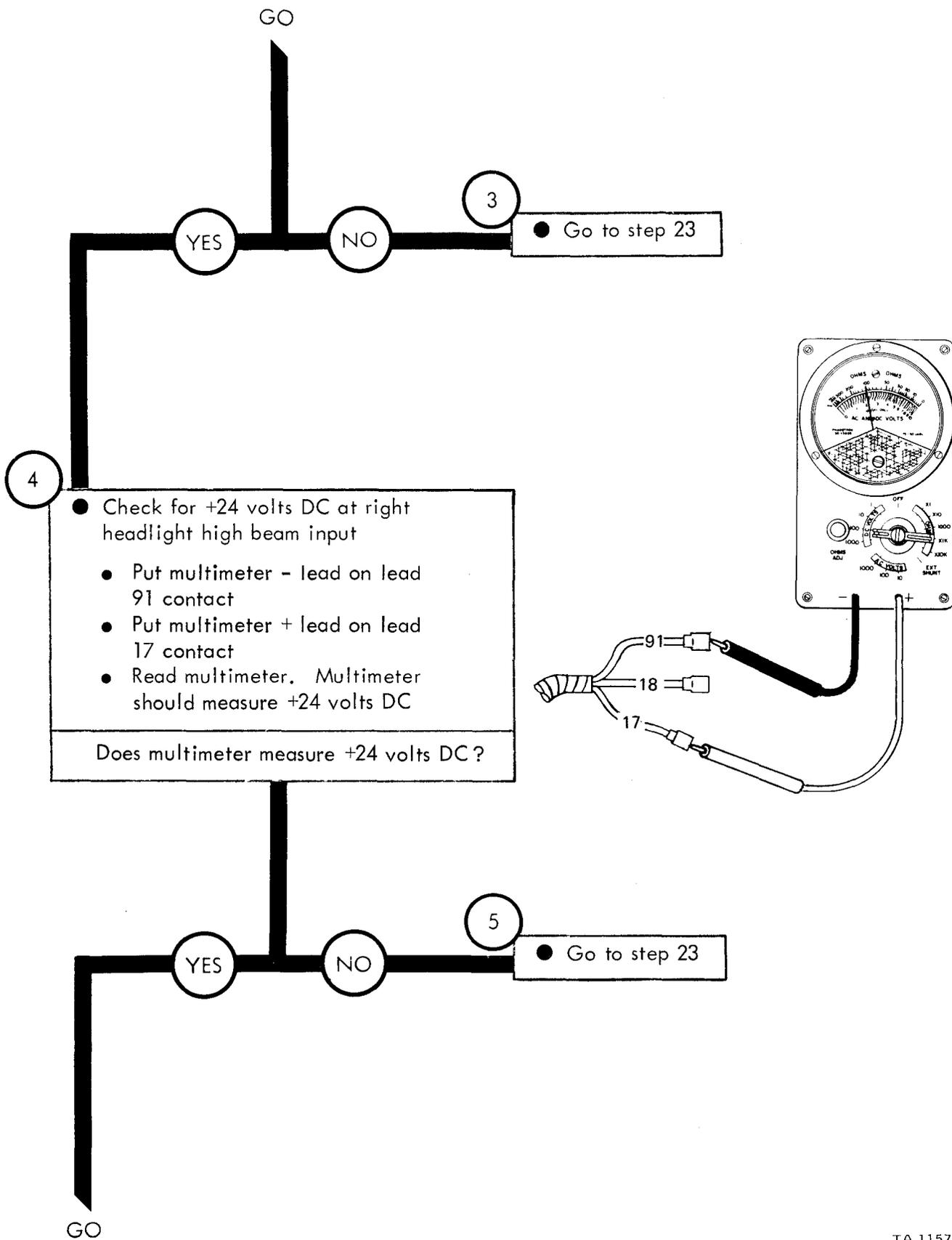
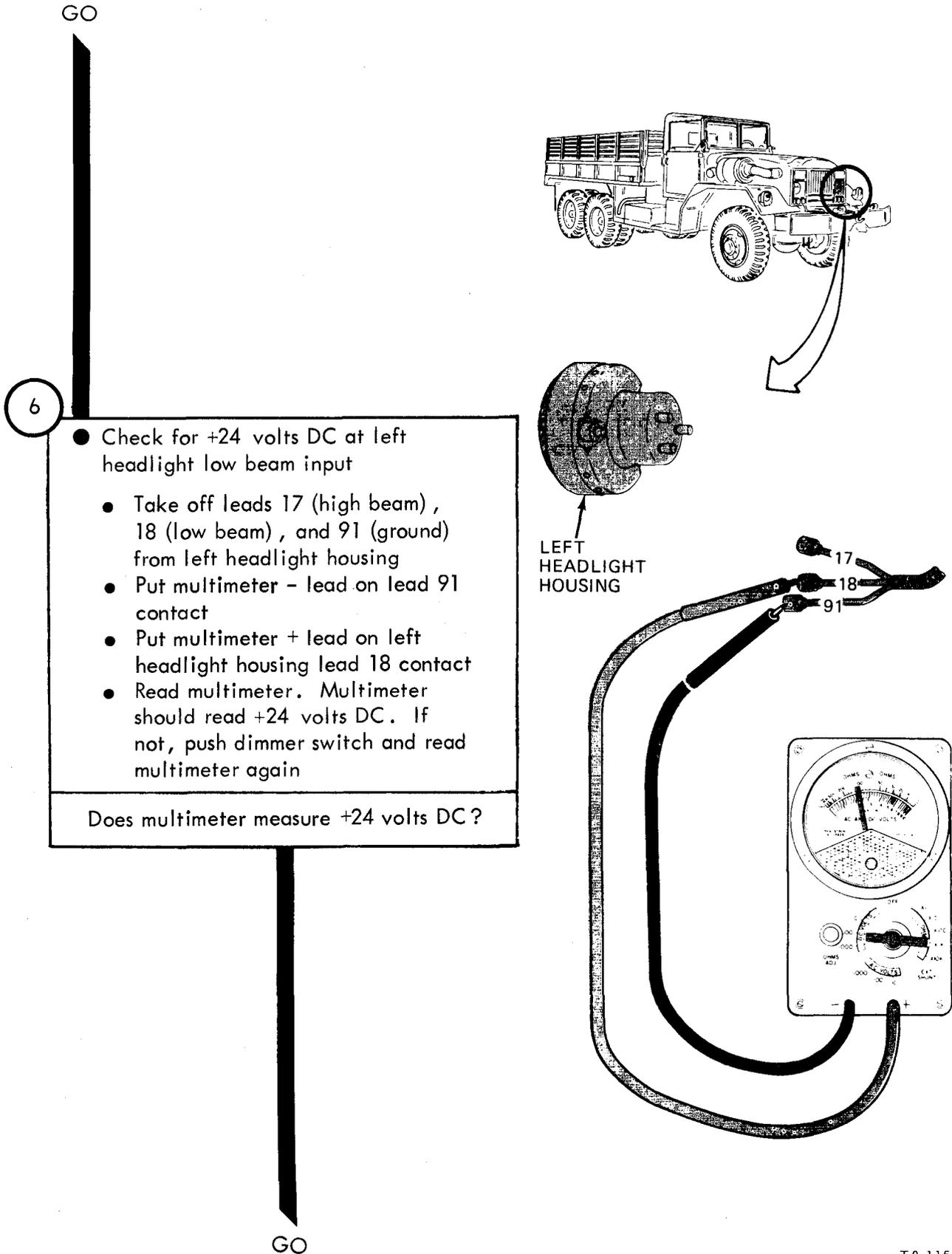


Figure 26-6 (Sheet 2 of 15)

TA 115722



TA 115723

Figure 26-6 (Sheet 3 of 15)

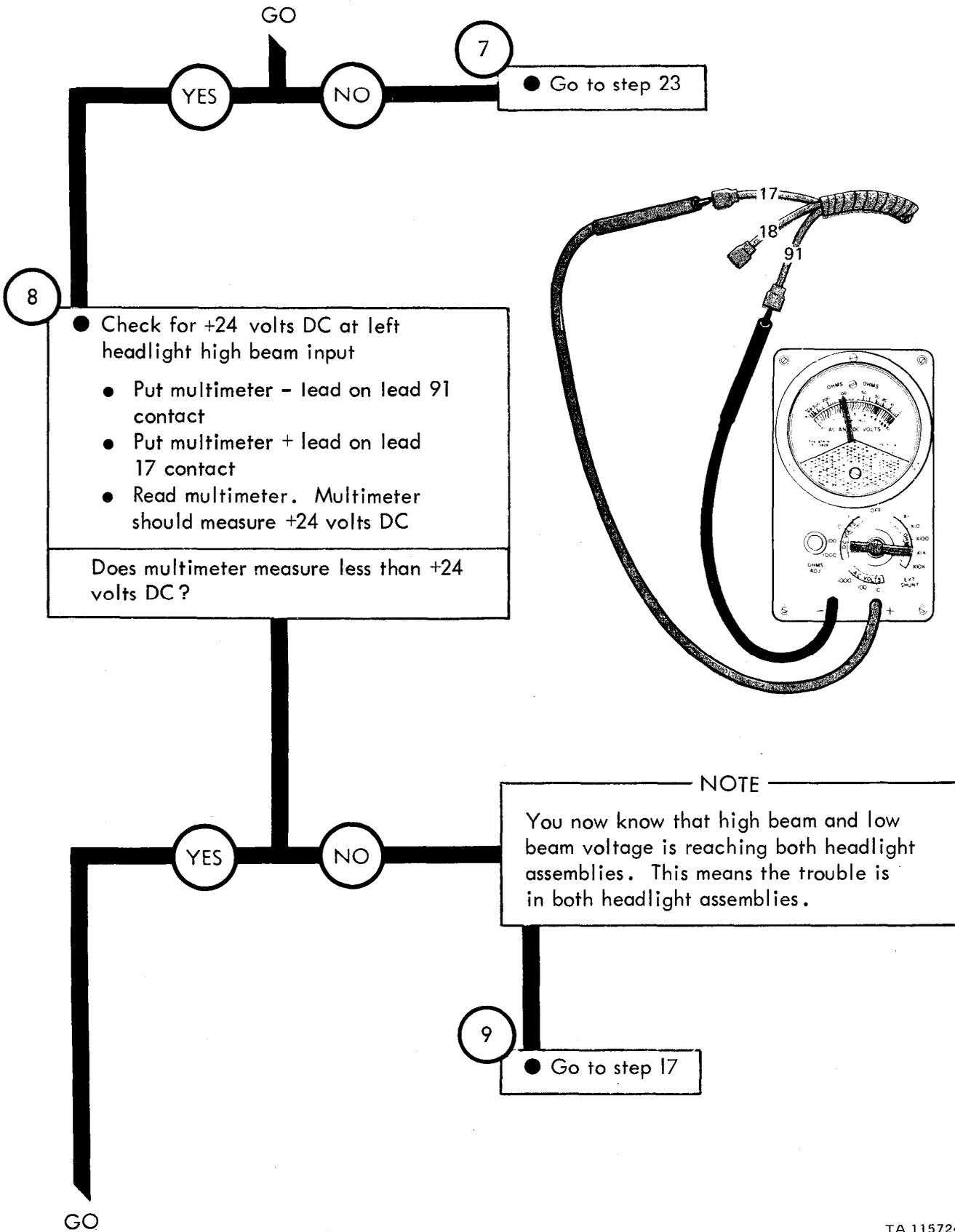


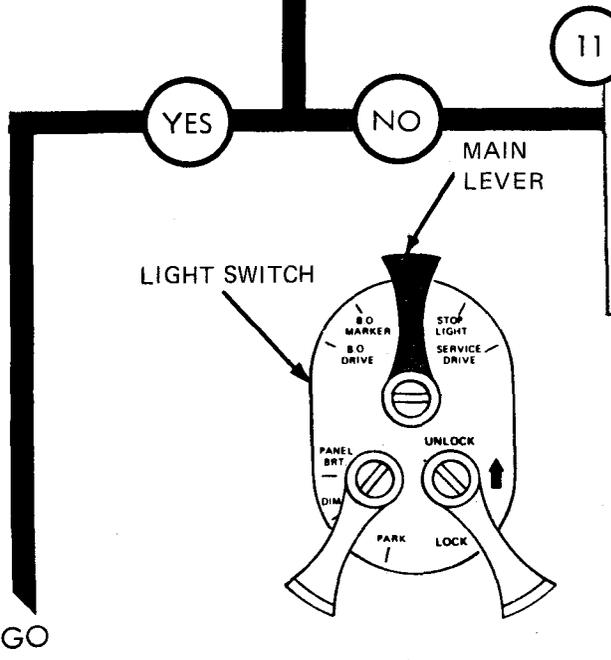
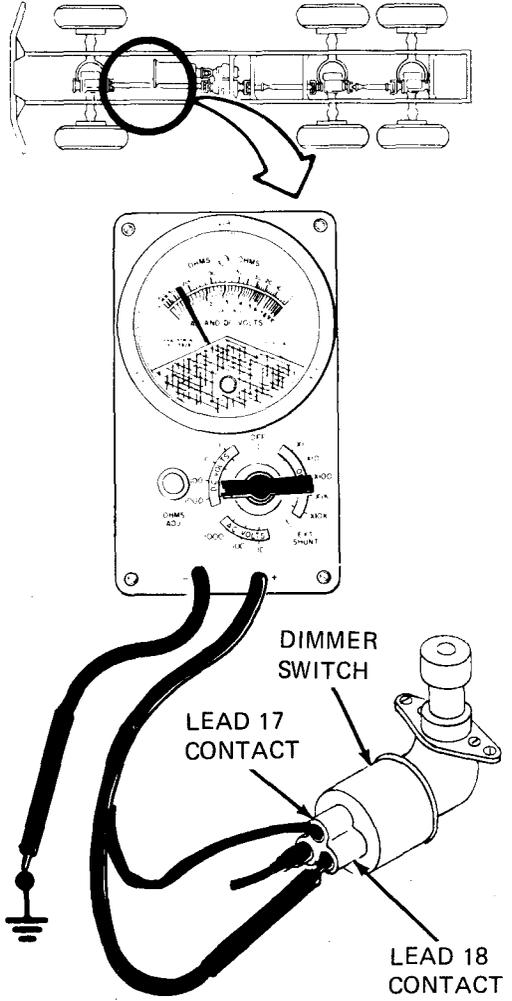
Figure 26-6 (Sheet 4 of 15)

GO

10

- Check wiring harness between headlight and dimmer switch
 - Take off leads 17 and 18 contacts from dimmer switch
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on lead 18 contact of dimmer switch
 - Read multimeter. Multimeter should measure +24 volts DC. If not, press down on dimmer switch and read multimeter again
 - Put multimeter + lead on lead 17 contact and read multimeter again

Does multimeter measure less than +24 volts DC at either or both lead 17 and 18 contacts?



- Repair or replace front harness
 - Set light switch main lever to OFF
 - Repair or replace front harness. Tell direct support maintenance

GO

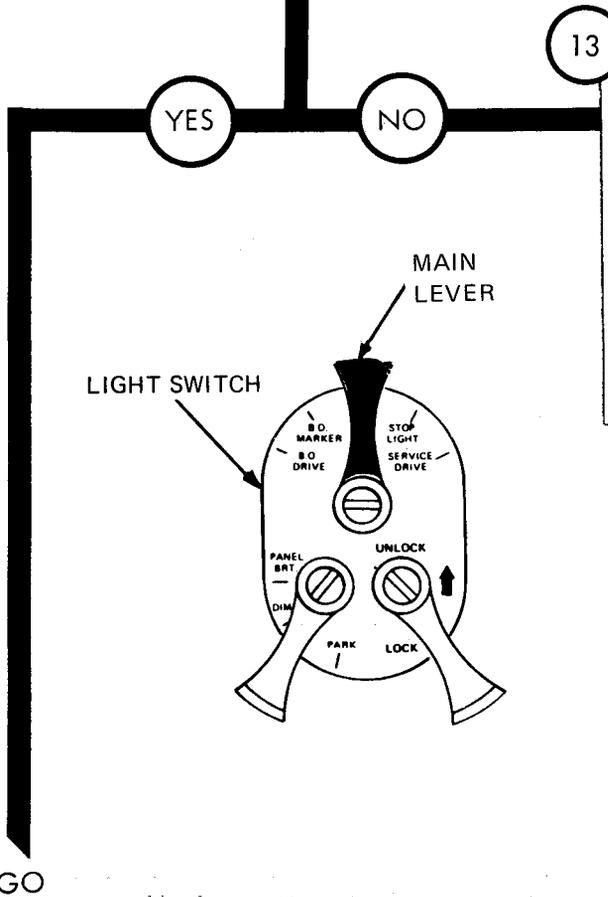
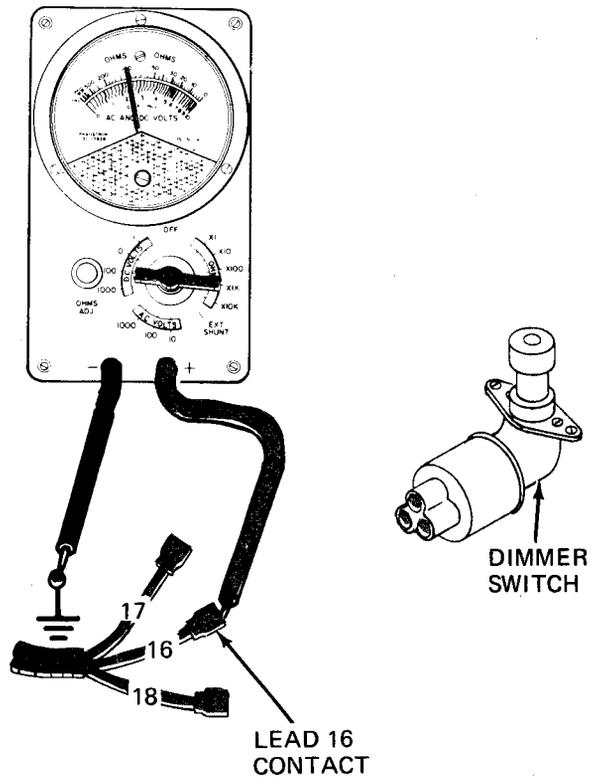
Figure 26-6 (Sheet 5 of 15)

GO

12

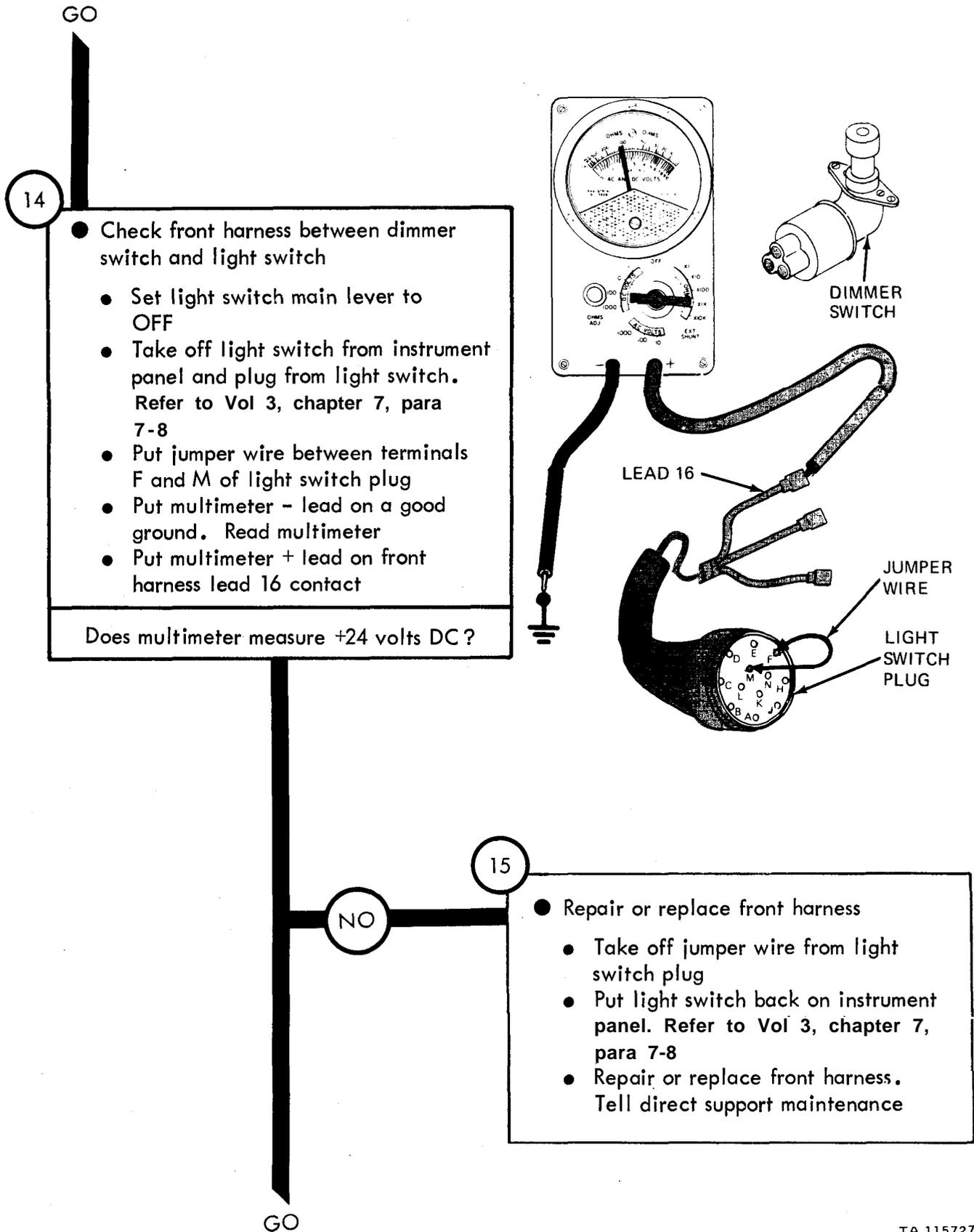
- Check dimmer switch
 - Take off lead 16 from dimmer switch
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on lead 16 contact (do not put it on dimmer switch contact)
 - Read multimeter. Multimeter should read +24 volts DC

Does multimeter read less than +24 volts DC?



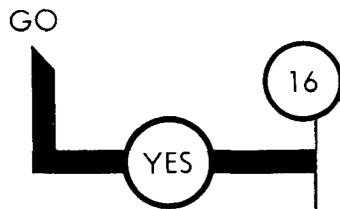
- Replace dimmer switch
 - Set light switch main lever to OFF
 - At right and left headlight housing put back leads 17, 18 and 91
 - Replace dimmer switch. Refer to Vol 3, chapter 7, para 7-52

Figure 26-6 (Sheet 6 of 15)



TA 115727

Figure 26-6 (Sheet 7 of 15)

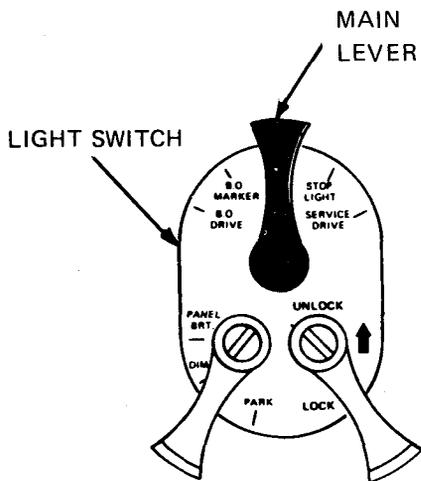


- 16
- Replace light switch
 - Take off jumper wire from light switch plug
 - Put leads 16, 17, and 18 back on dimmer switch
 - Put leads 17, 18, and 91 back on both headlight housings
 - Replace light switch. Refer to Vol 3, chapter 7, para 7-8

From step 9



- 17
- Replace and test right headlight assembly lamp
 - Set light switch main lever to OFF
 - Replace right headlight assembly lamp. Refer to Vol 3, chapter 7, para 7-22
 - Put leads 17, 18, and 91 back on right headlight housing



- Set light switch main switch lever to SERVICE DRIVE. If high beam indicator light on instrument panel is lit, press down on dimmer switch
- Look at right headlight lamp. Lamp should be lit
- Press down on dimmer switch
- Look at right headlight lamp. Lamp should be lit

Was lamp lit both times?

NO GO

TA 115728

Figure 26-6 (Sheet 8 of 15)

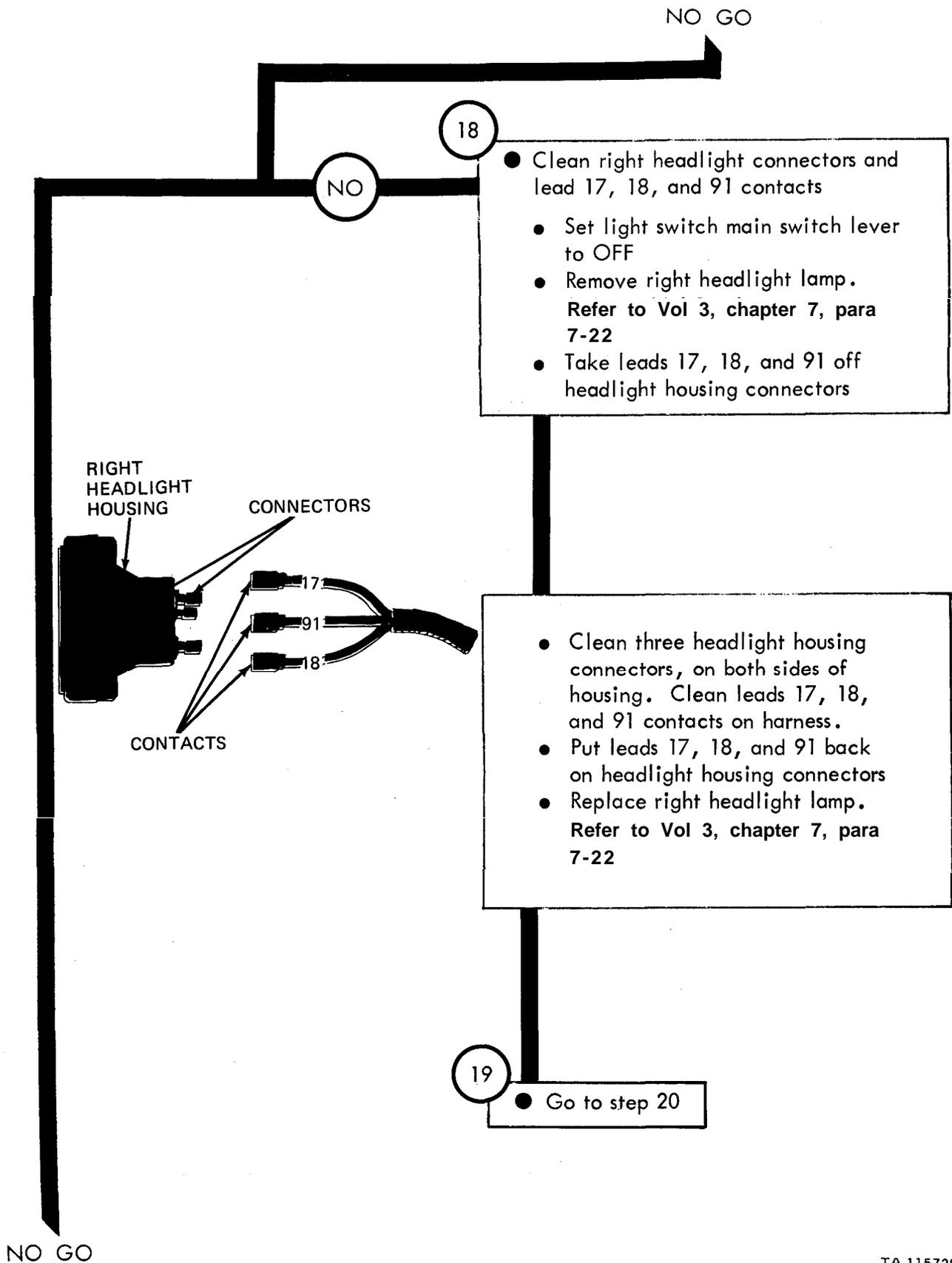
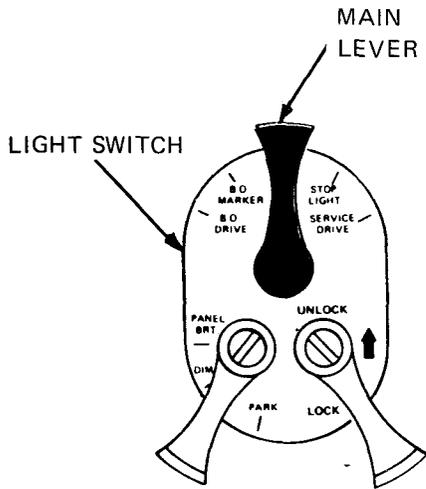


Figure 26-6 (Sheet 9 of 15)

NO GO



- Replace and test left headlight lamp
 - Set light switch main lever to OFF
 - Replace left headlight lamp. Refer to Vol 3, chapter 7, para 7-22
 - Put leads 17, 18, and 91 back on headlight housing
 - Set light switch main lever to SERVICE DRIVE. If high beam indicator light on instrument panel is lit, press down on dimmer switch



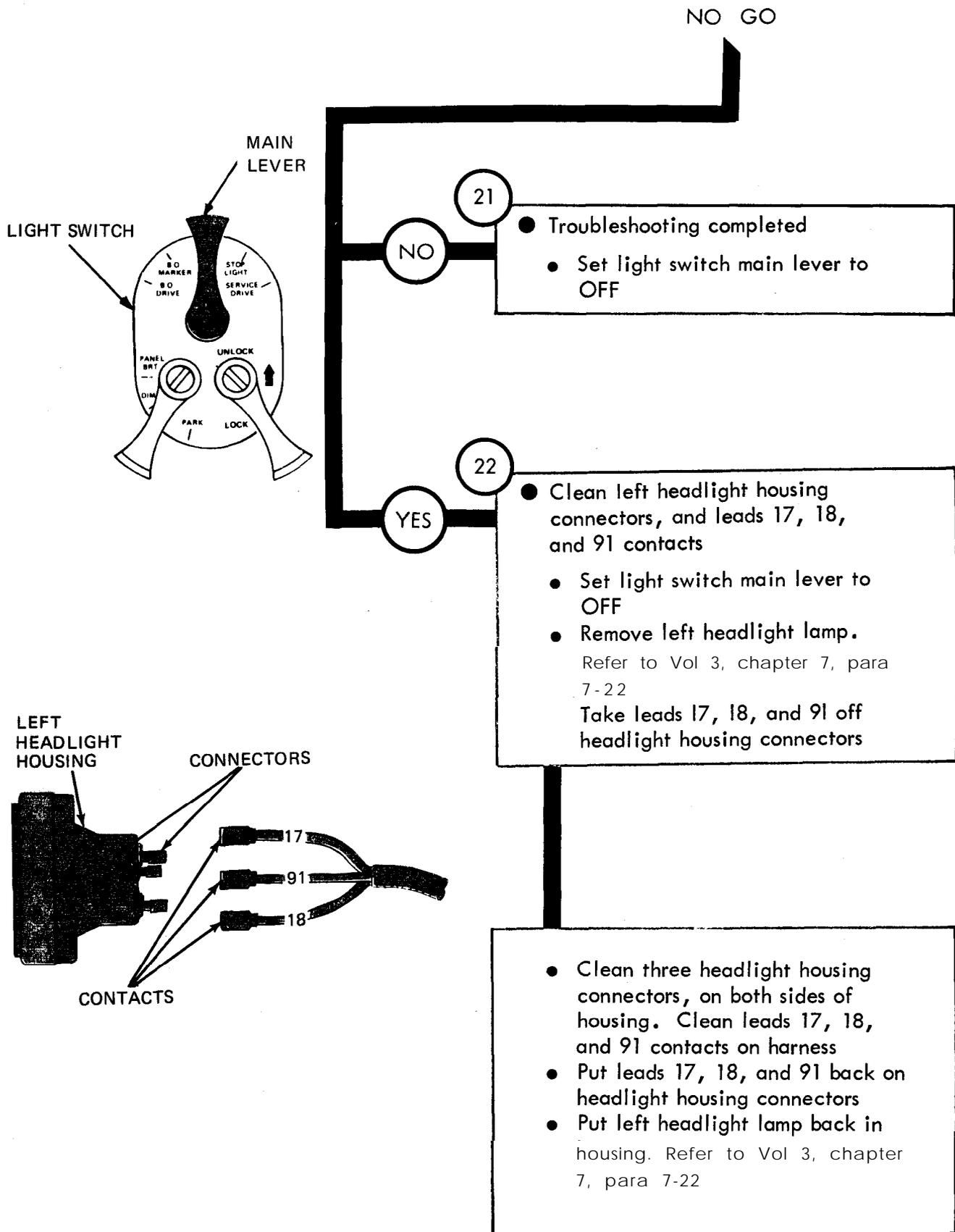
- Look at left headlight housing. Lamp should be lit
- Press down on dimmer switch
- Look at left headlight housing. Lamp should be lit

Did lamp stay off either time?

NO GO

TA 115730

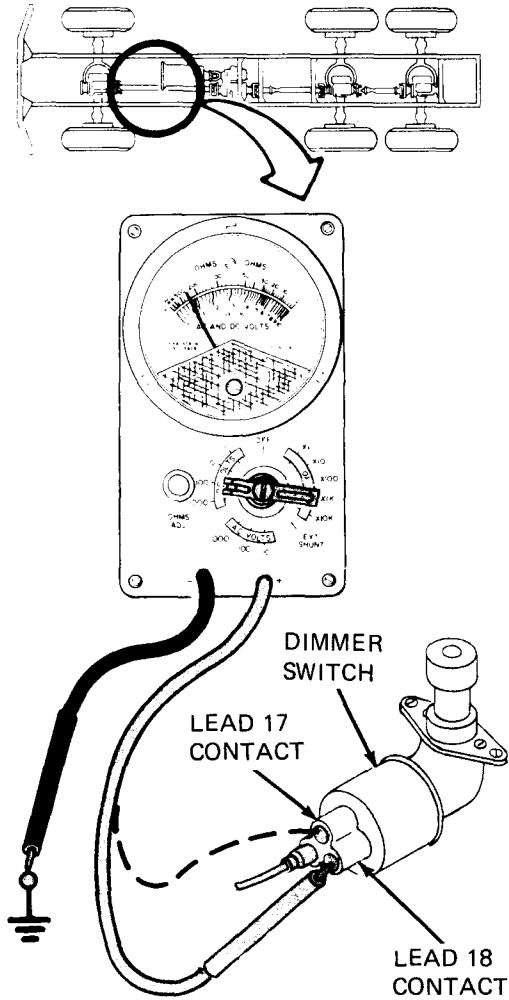
Figure 26-6 (Sheet 10 of 15)



TA 115731

Figure 26-6 (Sheet 11 of 15)

From steps 3, 5, and 7



23

- Check wiring harness between headlight and dimmer switch
 - Take off leads 17 and 18 contacts from dimmer switch
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on lead 18 contact of dimmer switch
 - Read multimeter. Multimeter should measure +24 volts DC. If not, press down on dimmer switch and read multimeter again
 - Put multimeter + lead on lead 17 contact and read multimeter again

Does multimeter measure less than +24 volts DC at either or both lead 17 and 18 contacts?

NO GO

TA 115732

Figure 26-6 (Sheet 12 of 15)

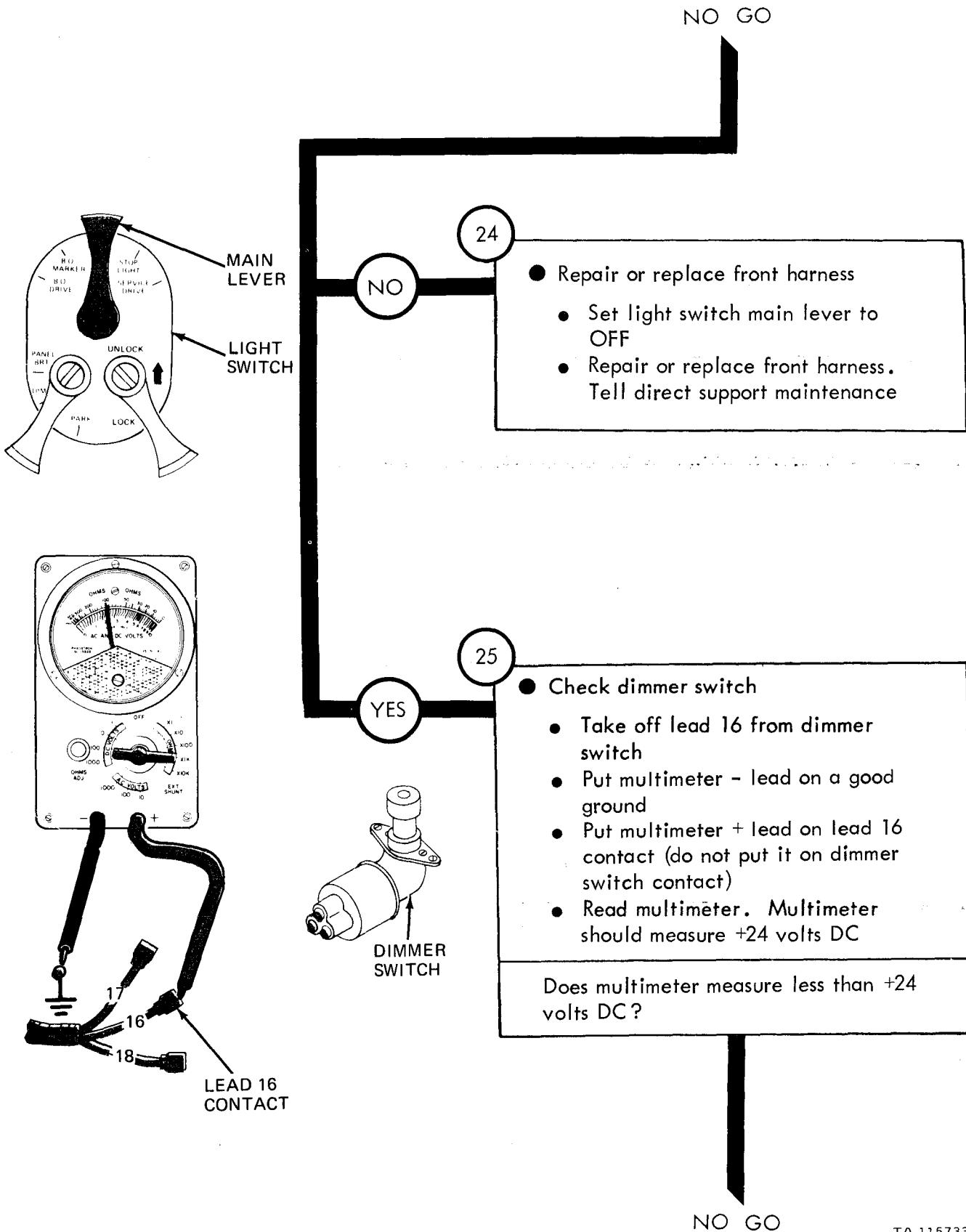
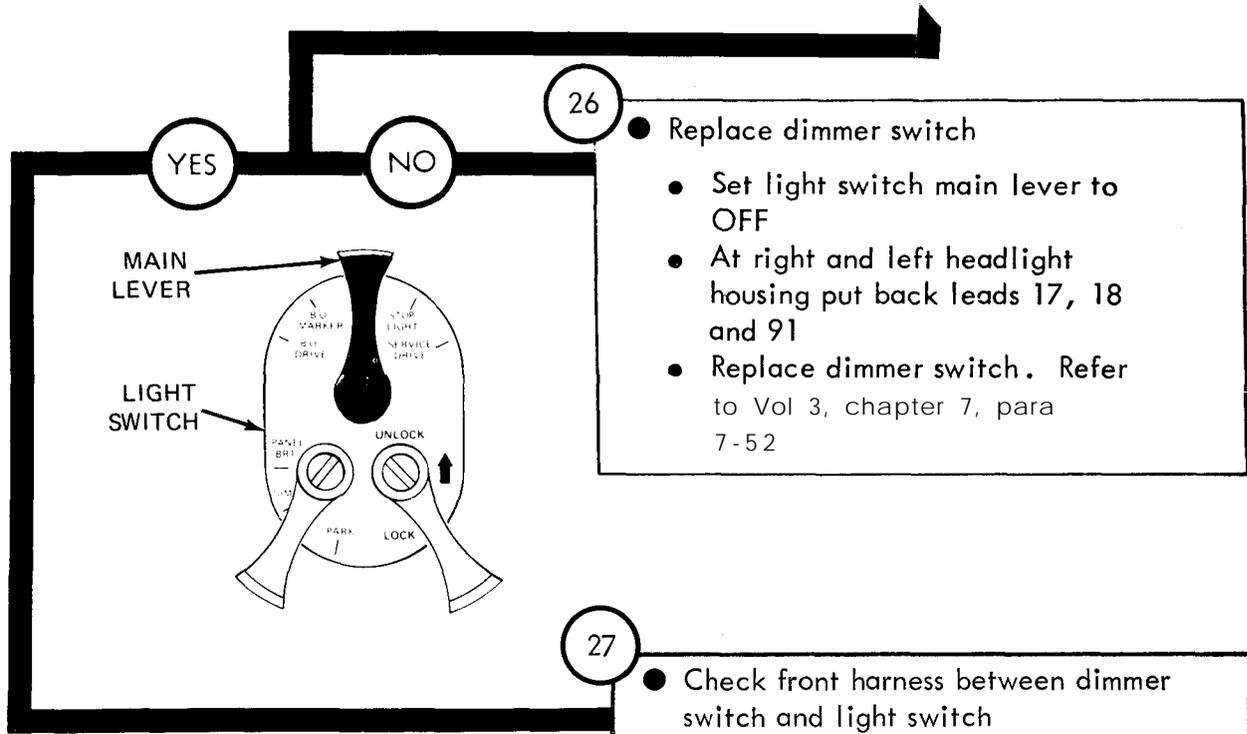


Figure 26-6 (Sheet 13 of 15)

NO GO



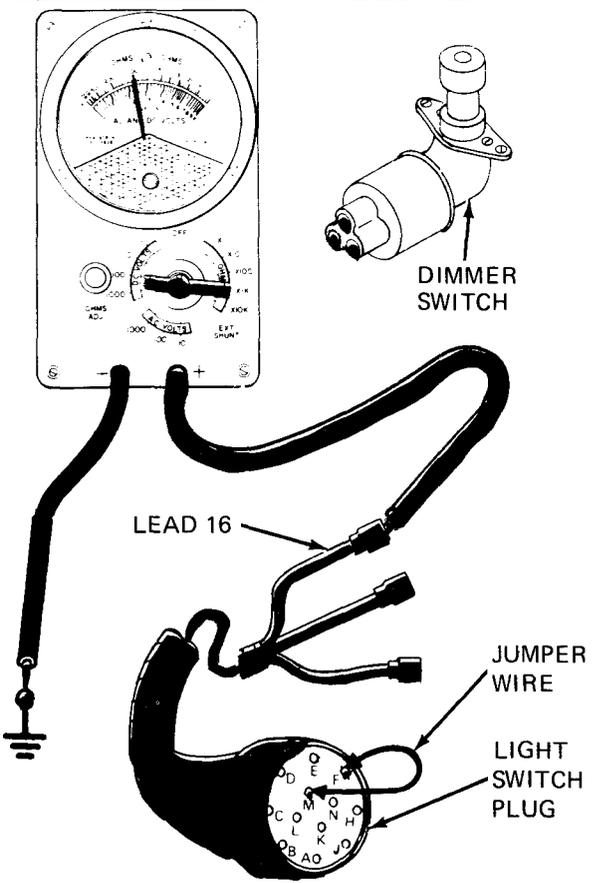
26

- Replace dimmer switch
 - Set light switch main lever to OFF
 - At right and left headlight housing put back leads 17, 18 and 91
 - Replace dimmer switch. Refer to Vol 3, chapter 7, para 7-52

27

- Check front harness between dimmer switch and light switch
 - Set light switch main lever to OFF
 - Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Put jumper wire between terminals F and M of light switch plug
 - Put multimeter - lead on a good ground. Read multimeter
 - Put multimeter + lead on front harness lead 16 contact

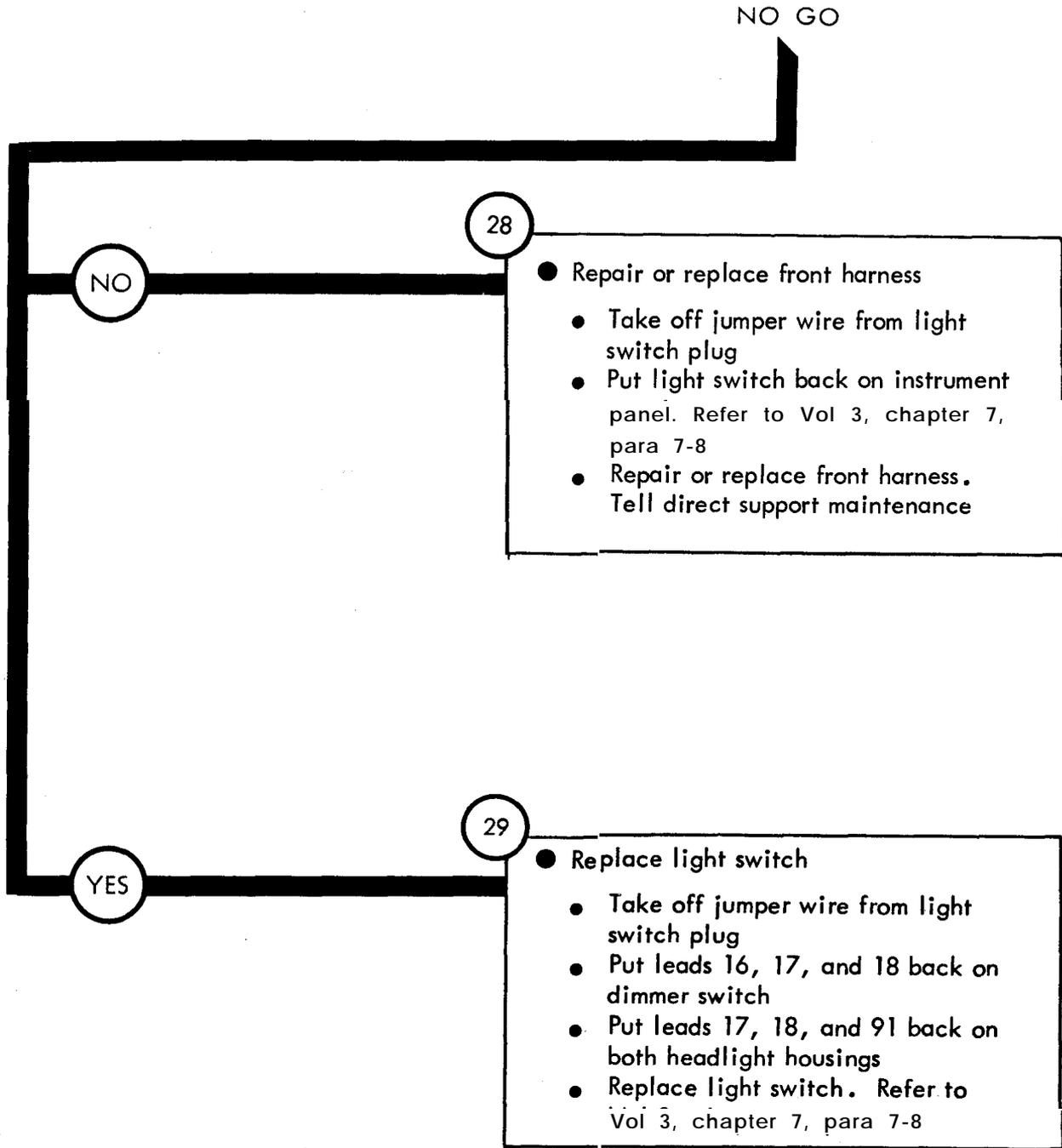
Does multimeter measure +24 volts DC?



NO GO

TA 115734

Figure 26-6 (Sheet 14 of 15)



TA 115735

Figure 26-6 (Sheet 15 of 15)

Symptom

7 BLACKOUT HEADLIGHT DOES NOT LIGHT,
OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE
When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

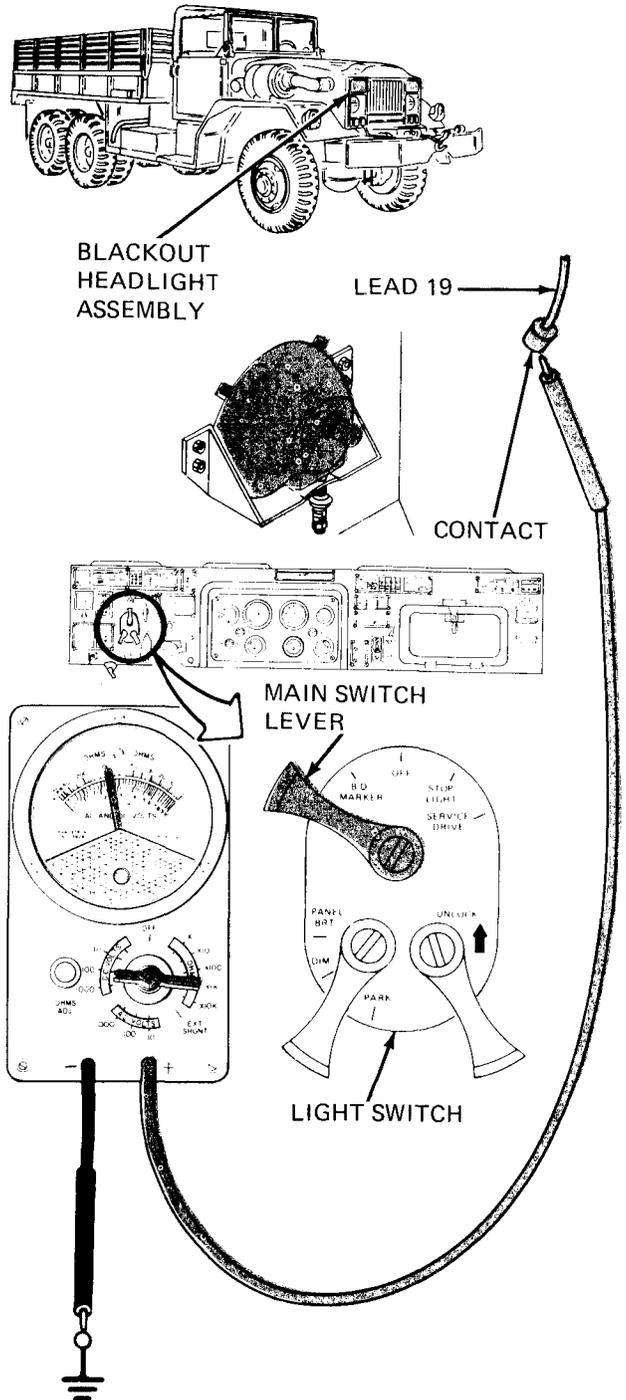
1 ● Park truck
● Refer to TM 9-2320-211-10

2 ● Check for +24 volts DC at blackout headlight assembly

- Take off lead 19 at rear of blackout headlight housing
- Set multimeter to measure +24 volts DC. Refer to multimeter test procedures, test 1
- Set light switch main lever to B.O. DRIVE
- Put multimeter + lead on lead 19 contact and - lead on a good ground
- Read multimeter. Multimeter should measure +24 volts DC

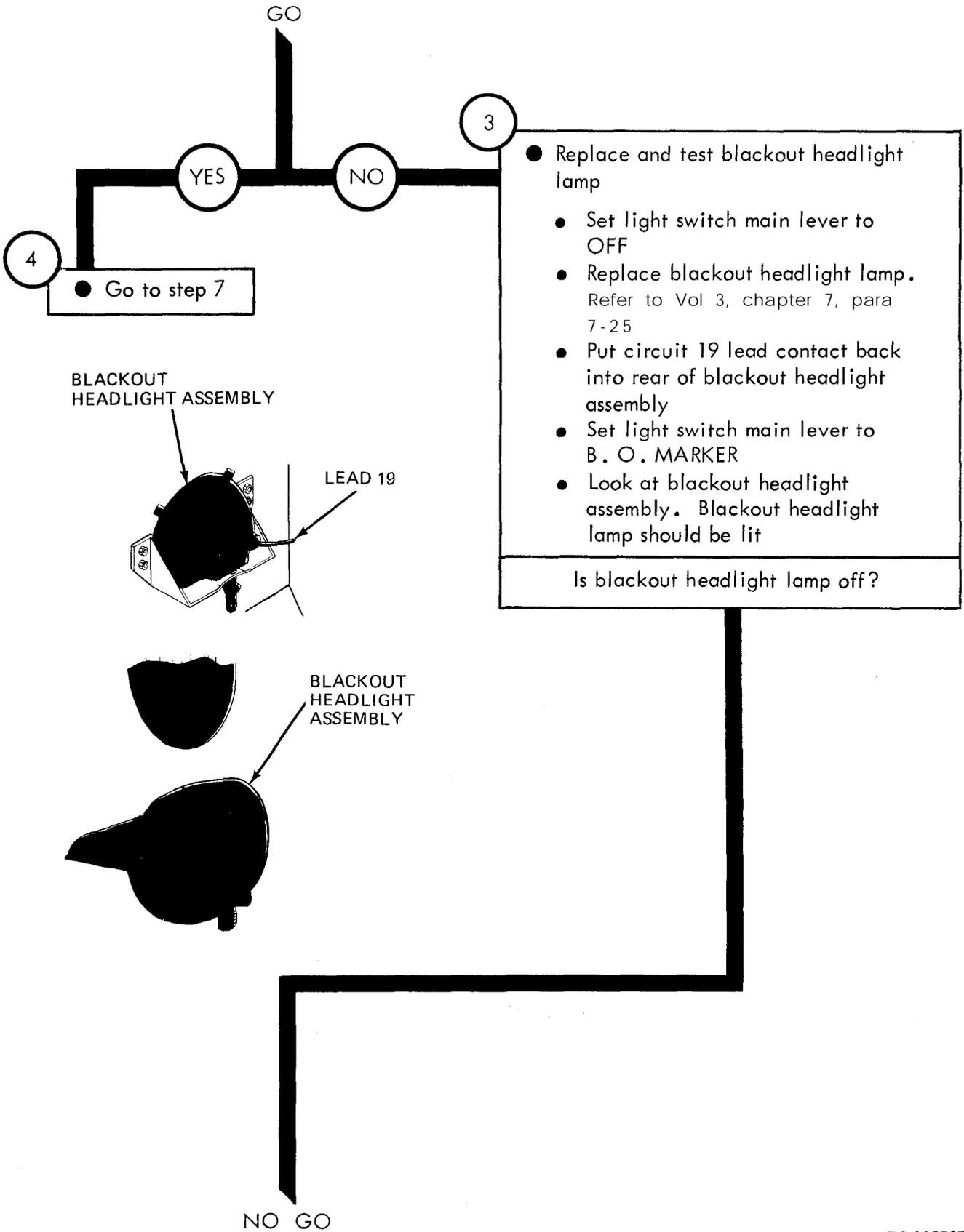
Does multimeter measure less than +24 volts DC?

GO



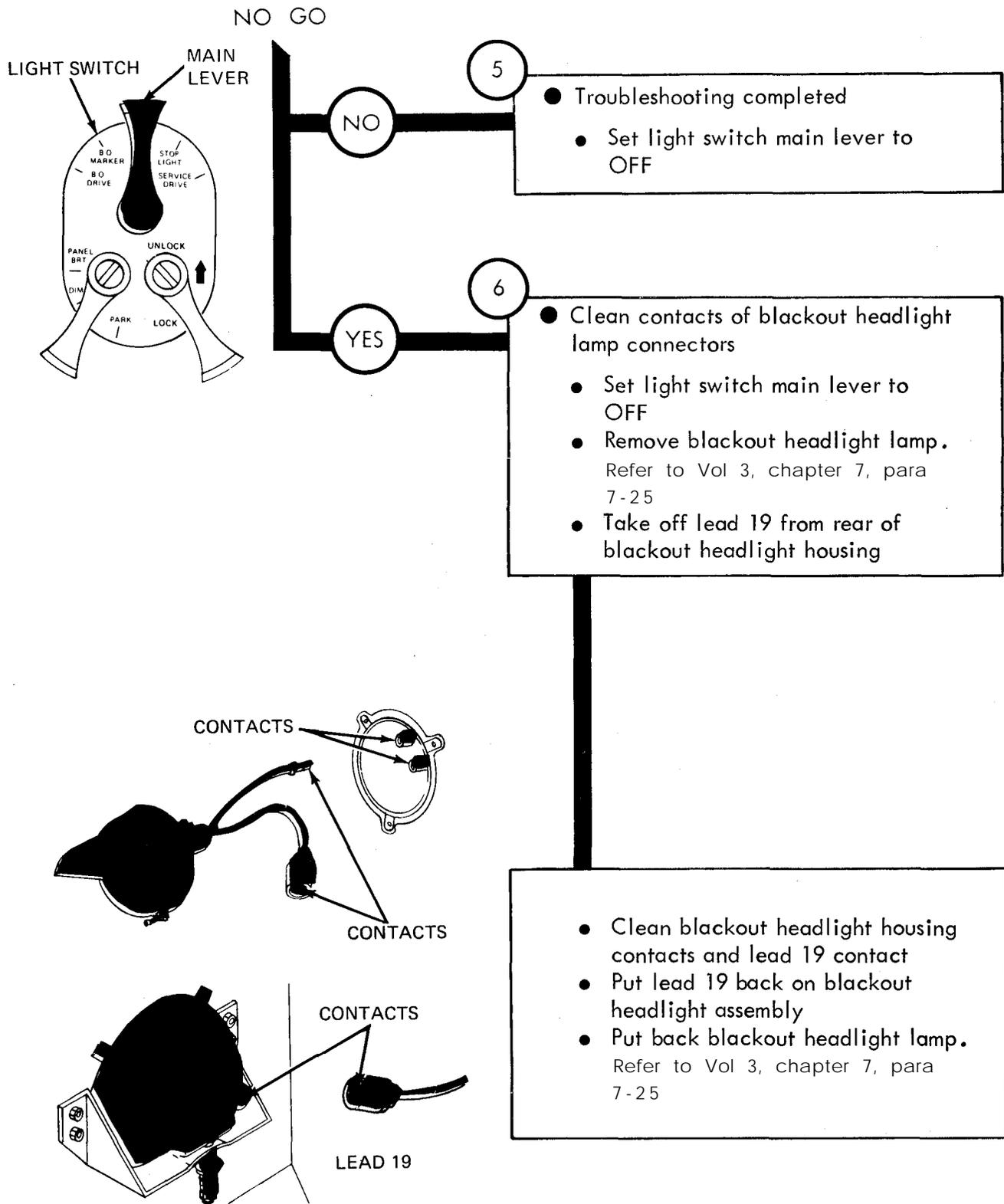
TA 115736

Figure 26-7 (Sheet 1 of 5)



TA 115737

Figure 26-7 (Sheet 2 of 5)



TA 115738

Figure 26-7 (Sheet 3 of 5)

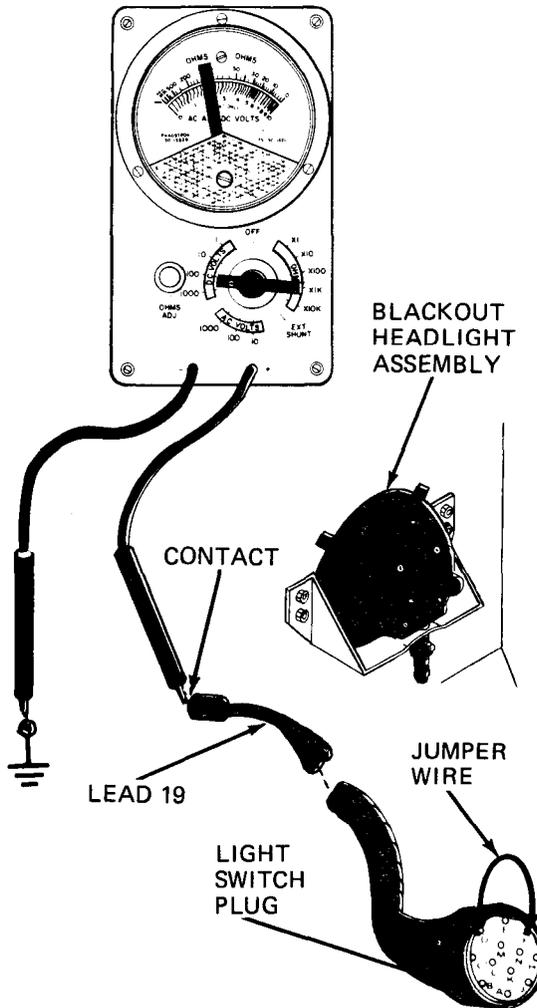
From step 4

7

- Check front harness between light switch and blackout headlight assembly
 - Set light switch main lever to OFF
 - Take light switch off instrument panel and plug off light switch. Refer to Vol 3, chapter 7, para 7-8
 - Put jumper wire between contact F and D of light switch plug on front harness

- Put multimeter + lead on front harness lead 19 contact
- Put multimeter - lead on a good ground
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



NO

8

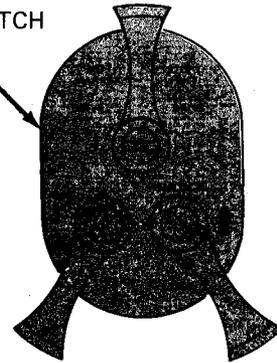
- Repair or replace front harness
 - Set light switch main lever to OFF
 - Put light switch back on instrument panel. Refer to Vol 3, chapter 7, para 7-8
 - Repair or replace front harness. Tell direct support maintenance

GO

Figure 26-7 (Sheet 4 of 5)

GO

LIGHT SWITCH



YES

9

- Replace light switch
 - Take jumper wire off light switch plug
 - Put lead 19 contact back on rear of blackout headlight housing
 - Replace light switch. Refer to Vol 3, chapter 7, para 7-8

Symptom

8 ONE OR BOTH FRONT BLACKOUT MARKER LIGHTS DO NOT LIGHT, OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

Do this procedure for each blackout marker lamp that does not light
 When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

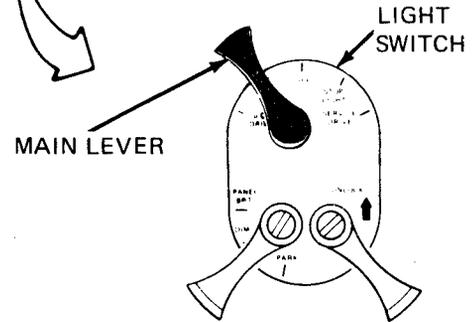
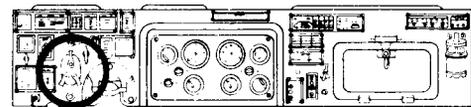
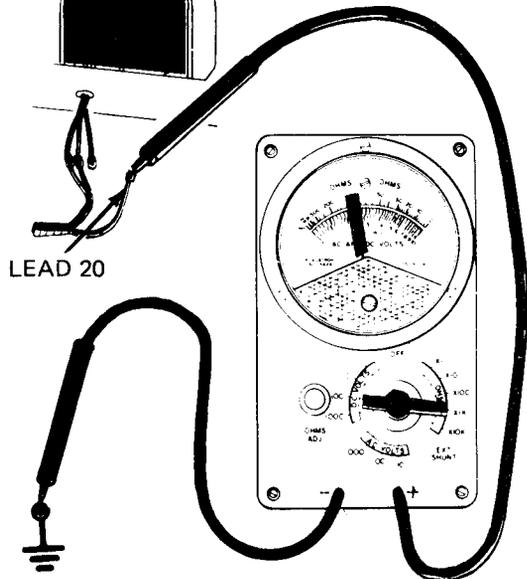
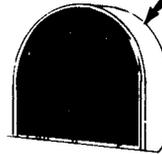
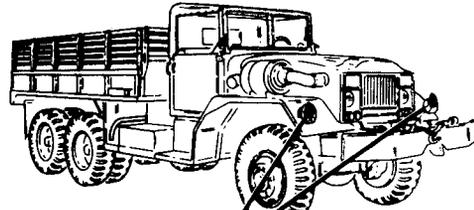
- Park truck
 - Refer to TM 9-2320-211-10

2

- Check for +24 volts DC at front blackout marker lamp
 - Take off lead 20 at rear of front composite marker light assembly
 - Set light switch main lever to B.O. MARKER
 - Set multimeter to measure +24 volts DC. Refer to multimeter test procedures, test 1
 - Put multimeter + lead on lead 20 contact and - lead on a good ground
 - Read multimeter. Multimeter should measure +24 volts DC

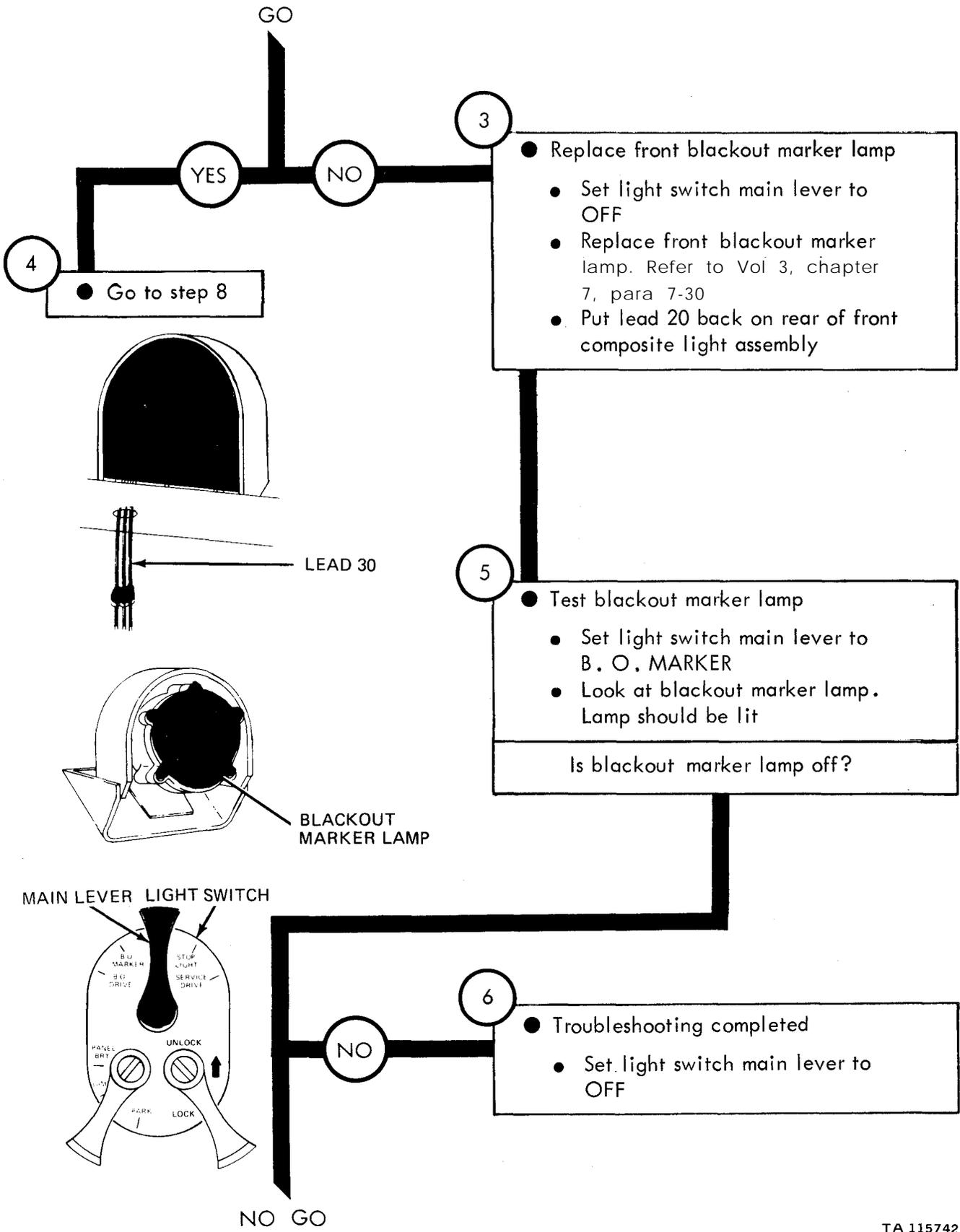
Does multimeter measure less than +24 volts DC?

GO



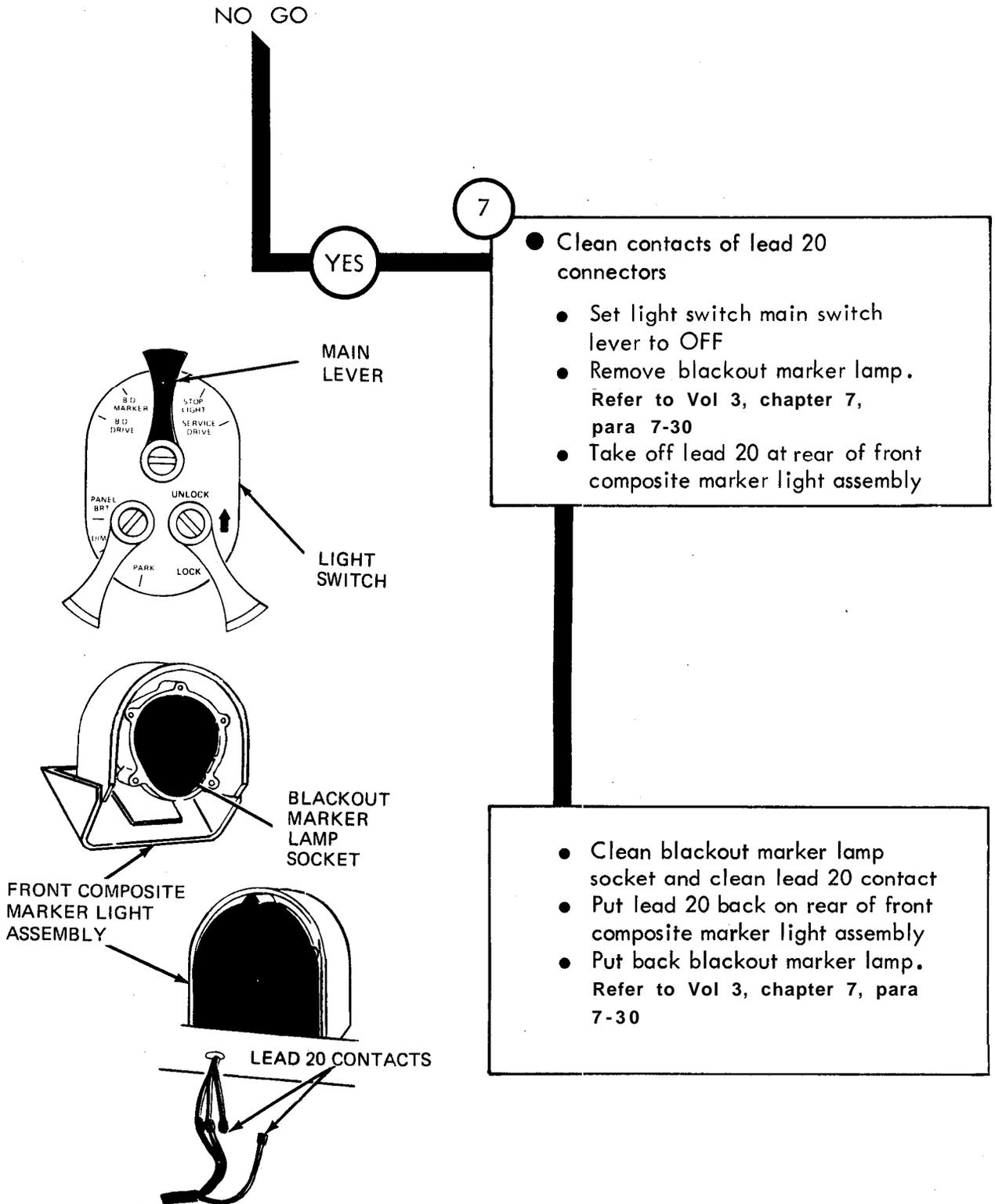
TA 115741

Figure 26-8 (Sheet 1 of 5)



TA 115742

Figure 26-8 (Sheet 2 of 5)



TA 115743

Figure 26-8 (Sheet 3 of 5)

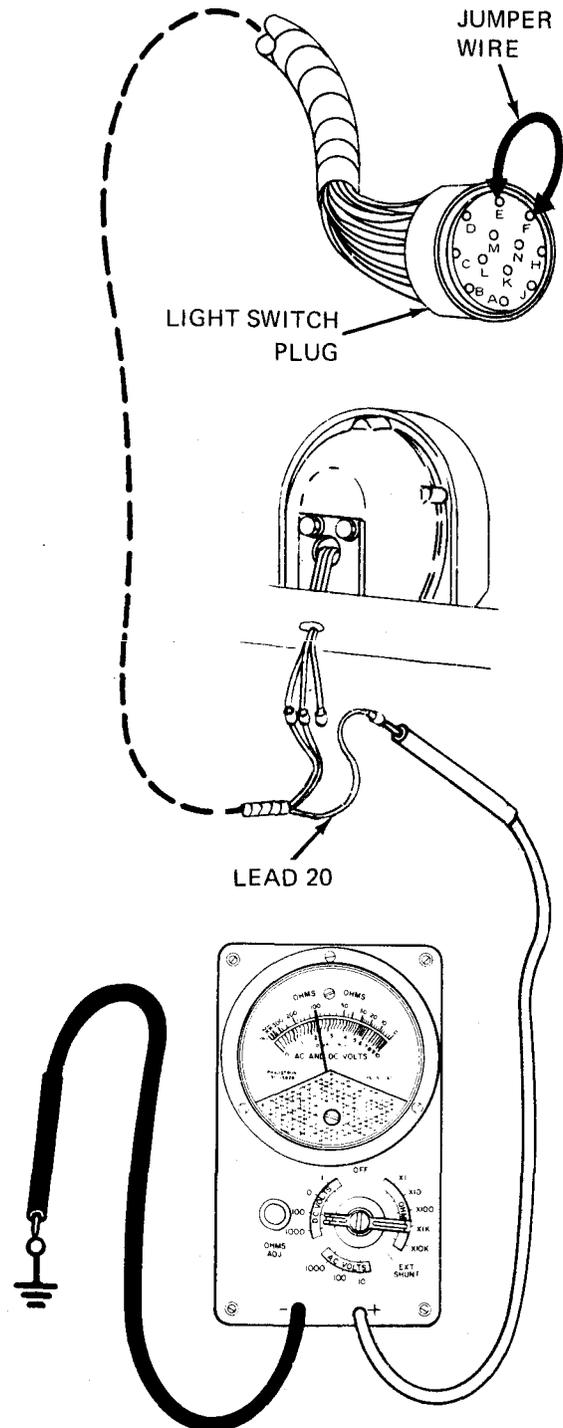
From step 4

8

- Check wiring harness between blackout marker lamp and light switch
- Set light switch main lever to OFF
- Take off light switch from instrument panel and light switch plug from light switch. Refer to Vol 3, chapter 7, para 7-8
- Put jumper wire between terminals F and E of light switch plug on front harness
- Put multimeter + lead on front harness lead 20 contact and - lead on a good ground
- Read multimeter. Multimeter should measure +24 volts DC

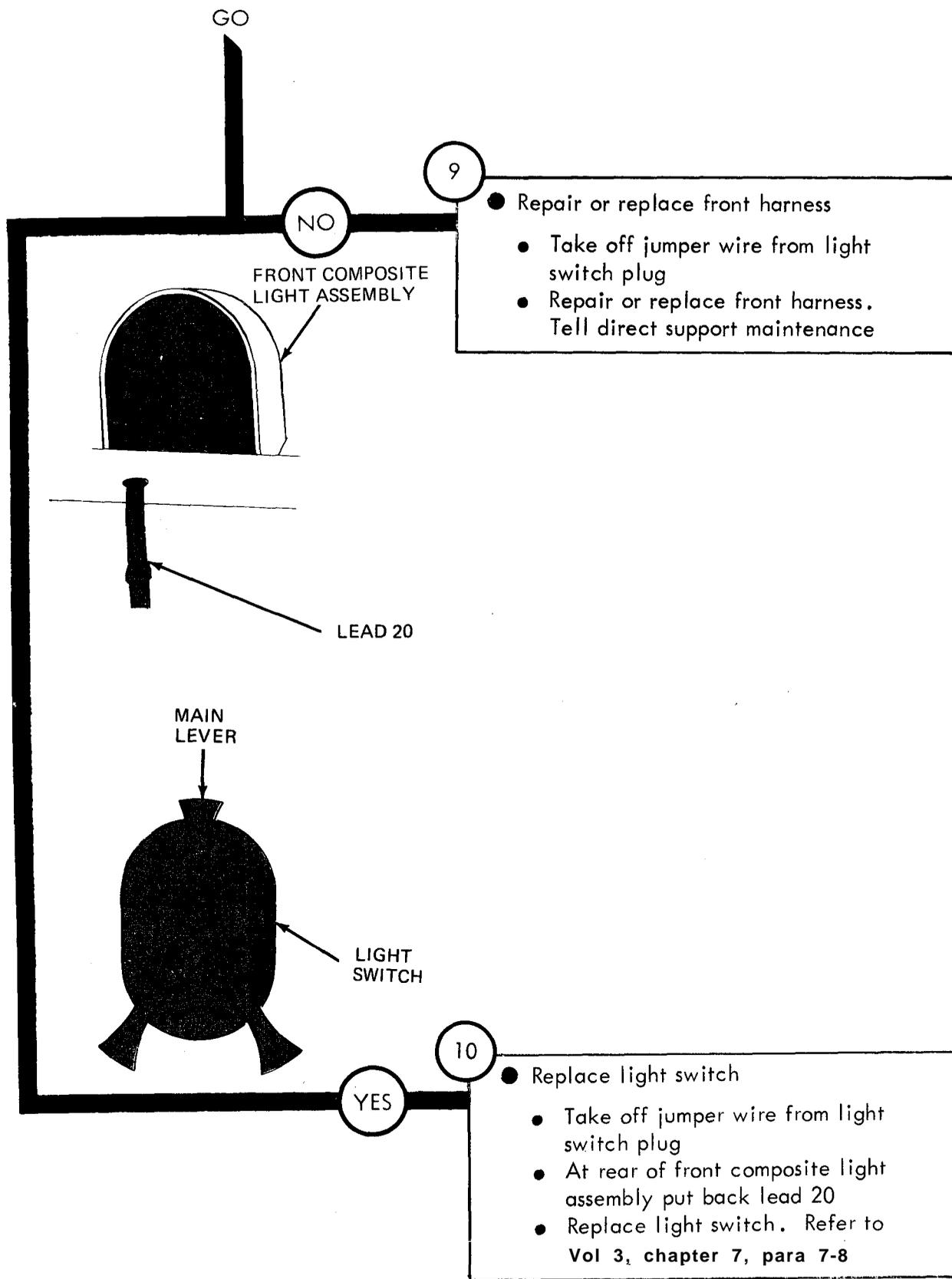
Does multimeter measure less than +24 volts DC?

GO



TA 115744

Figure 26-8 (Sheet 4 of 5)



TA 115745

Figure 26-8 (Sheet 5 of 5)

Symptom

9

ONE OR BOTH FRONT PARKING LIGHTS DO NOT LIGHT,
OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

Do this procedure for each front parking
light that does not light
When checking voltage, +24 volts DC
means a range of +23 to +26 volts DC

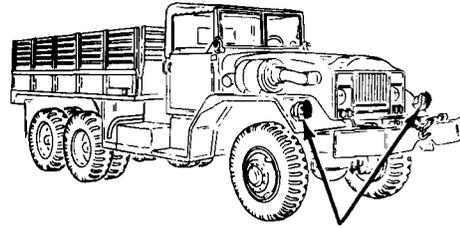
1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-9 (Sheet 1 of 6)

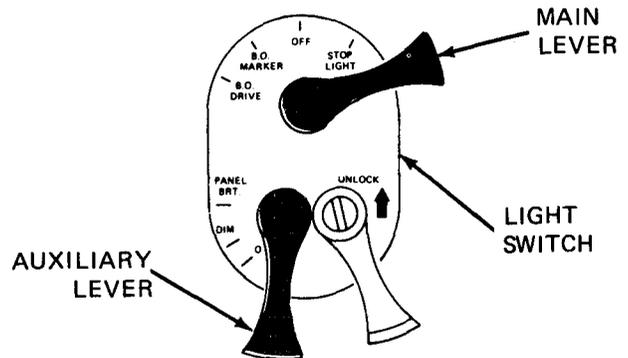
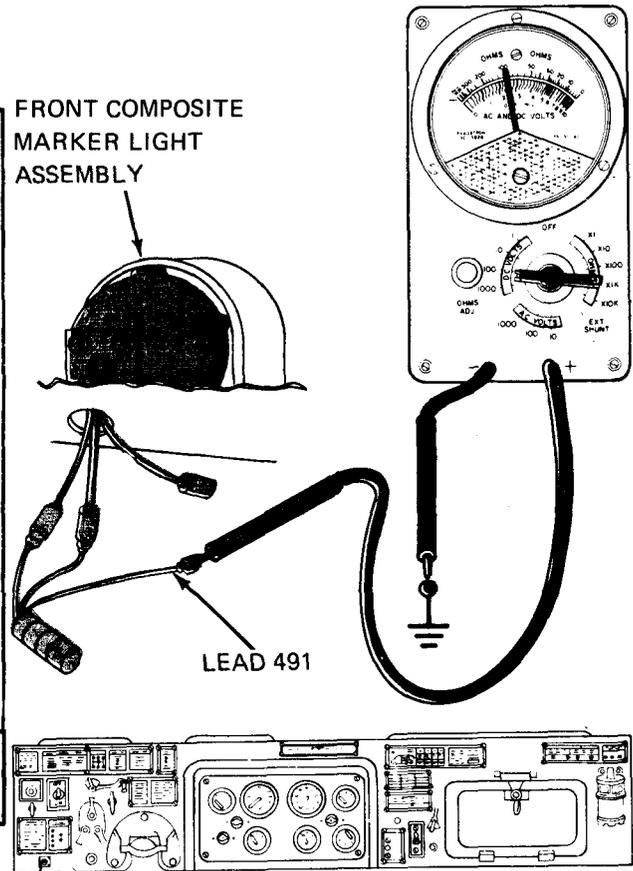
GO



COMPOSITE MARKER LIGHT ASSEMBLIES CONTAINING PARKING LIGHTS

2

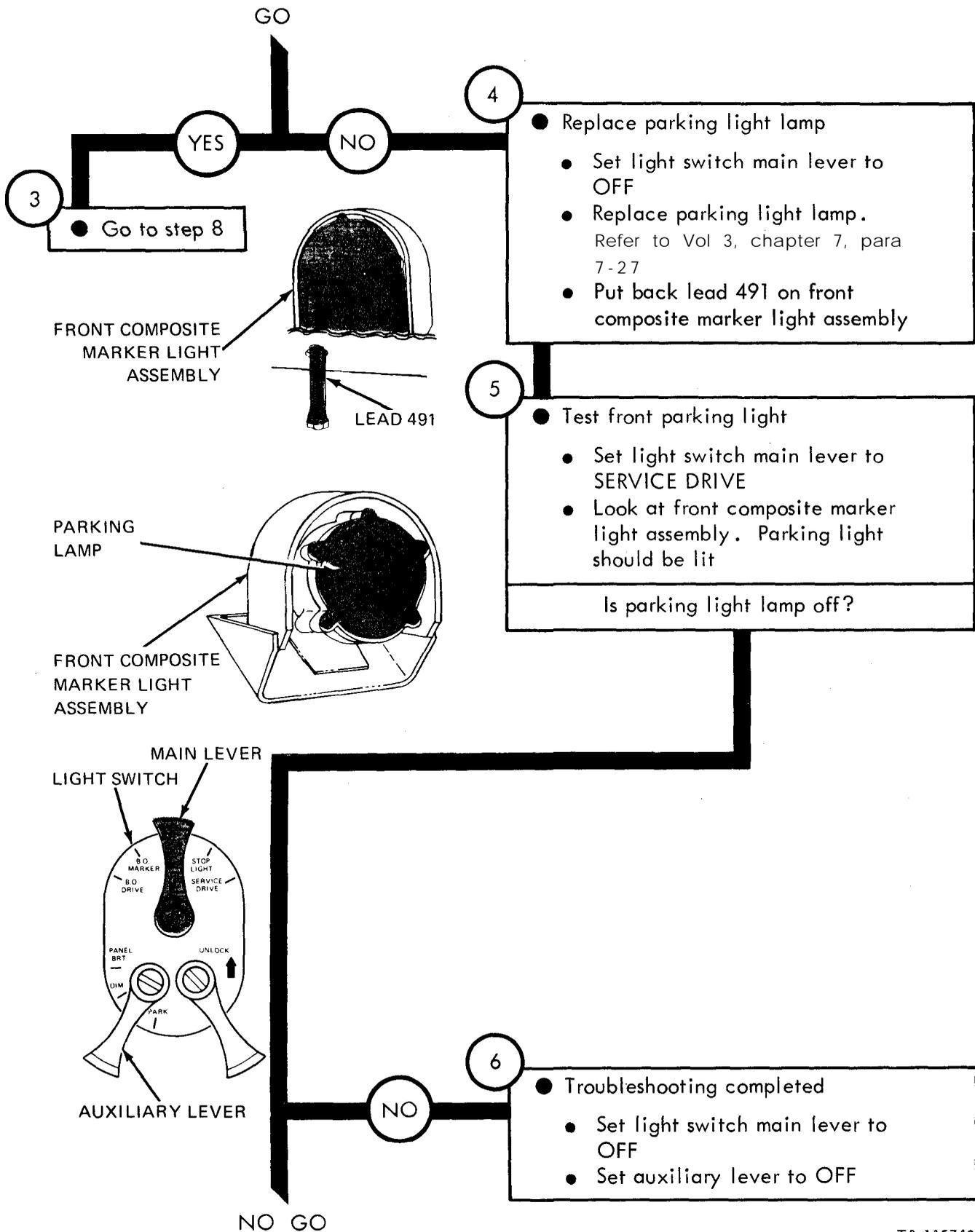
- Check for +24 volts DC at front parking light
 - Take off lead 491 at front composite marker light assembly
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Set light switch main lever to SERVICE DRIVE and auxiliary lever to PARK
 - Put multimeter + lead on lead 491 and - lead on a good ground
 - Read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure less than +24 volts DC?



GO

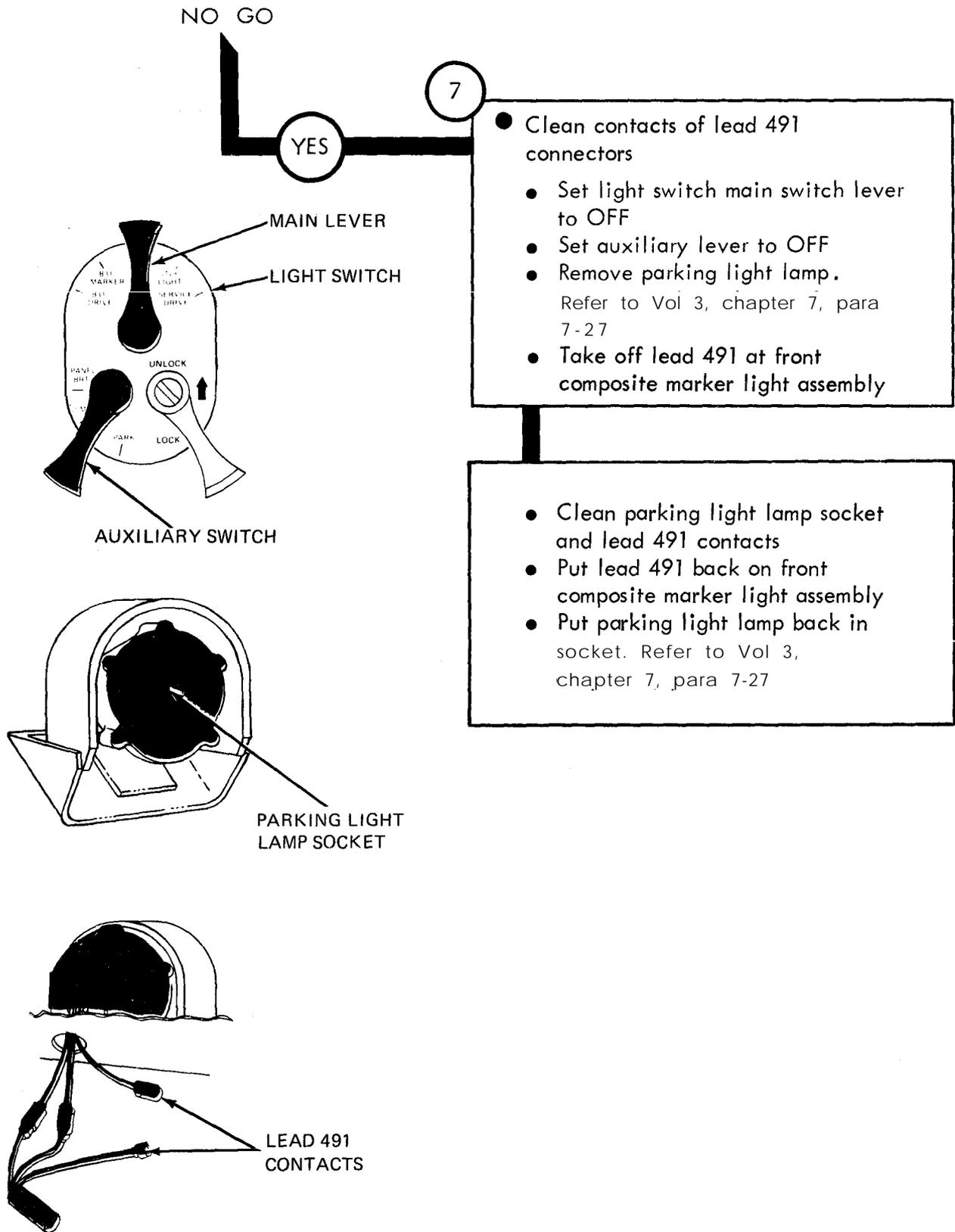
TA 115747

Figure 26-9 (Sheet 2 of 6)



TA 115748

Figure 26-9 (Sheet 3 of 6)



TA 115749

Figure 26-9 (Sheet 4 of 6)

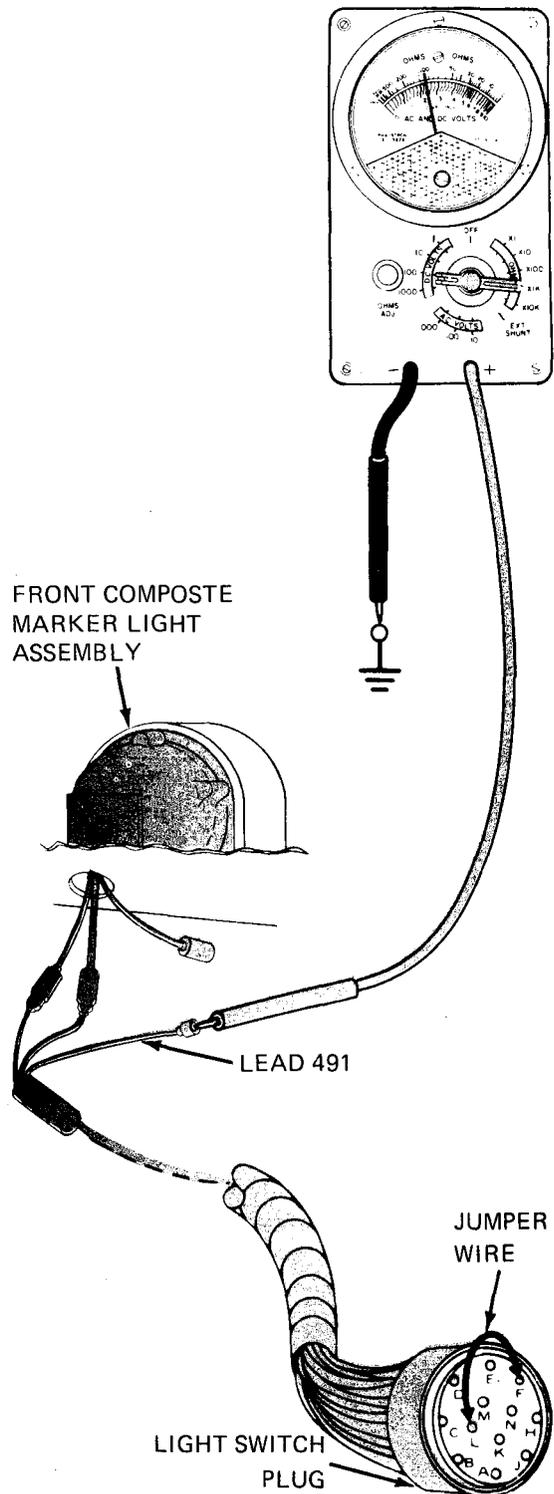
From step 3

8

- Check wiring harness between parking light lamp and light switch
 - Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Put jumper wire between contacts F and L of light switch plug
 - Put multimeter + lead on lead 491 contact
 - Put multimeter - lead on a good ground
 - Read multimeter. Multimeter should measure +24 volts DC

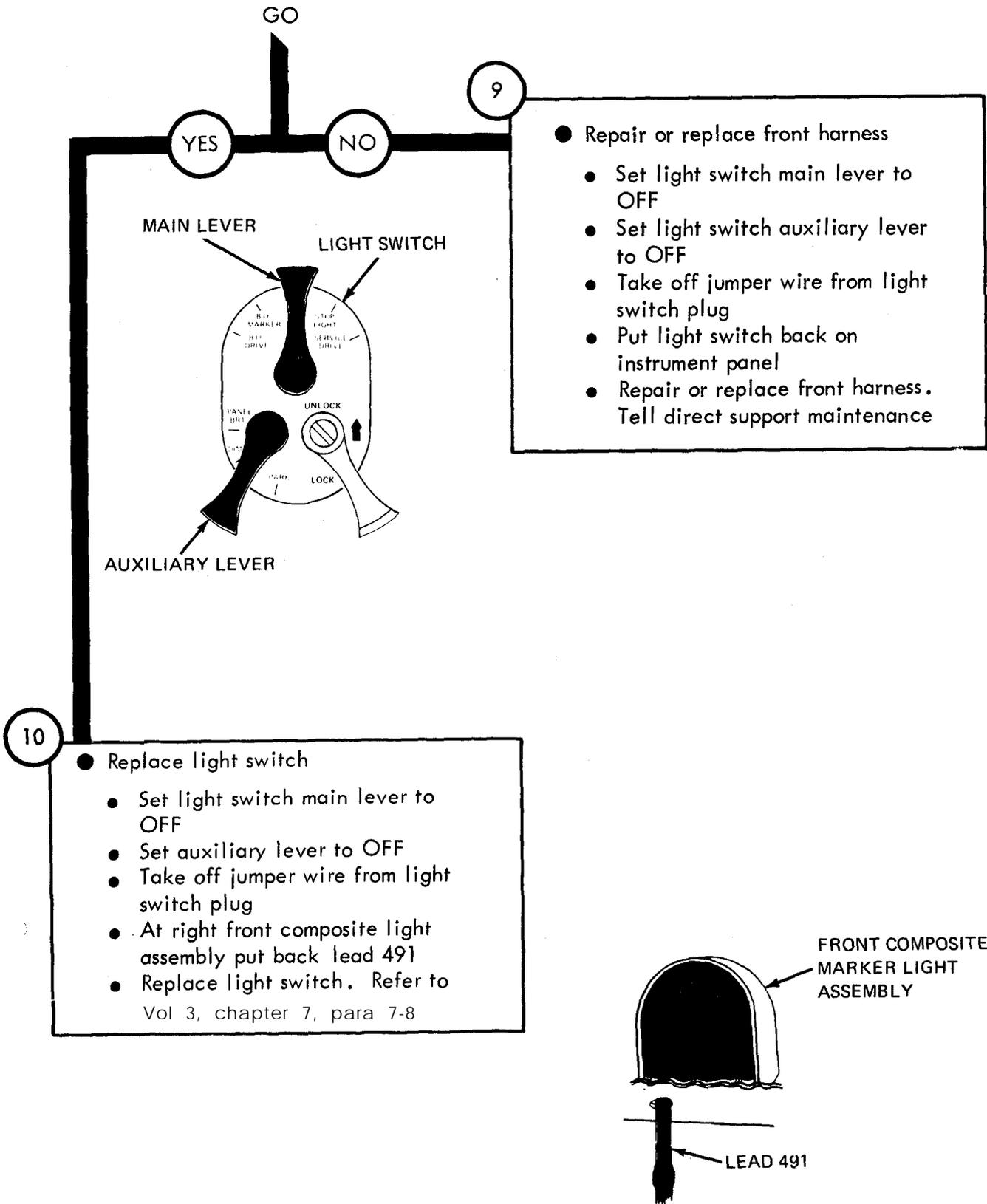
Does multimeter measure +24 volts DC?

GO



TA 115750

Figure 26-9 (Sheet 5 of 6)



TA 115751

Figure 26-9 (Sheet 6 of 6)

Symptom

10

ONE SERVICE STOPLIGHT DOES NOT LIGHT, OTHER STOPLIGHT LIGHTS

NOTE

Two soldiers are needed to troubleshoot a stoplight. Soldier A sits in the cab and operates controls. Soldier B makes voltage checks with the multimeter. When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

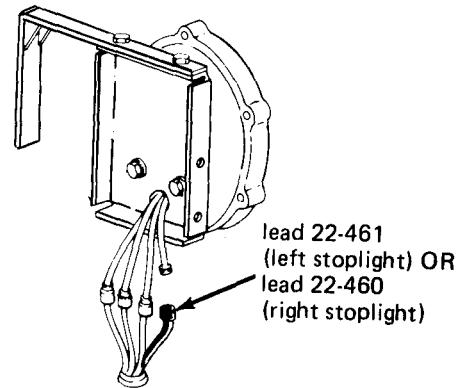
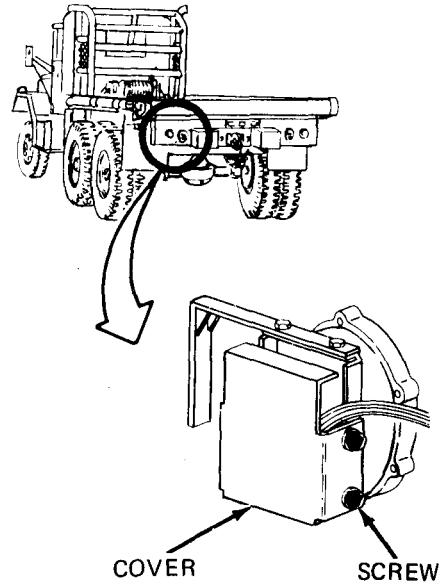
TA 115752

Figure 26-10 (Sheet 1 of 11)

GO

2

- Check for +24 volts DC at stoplight
- SOLDIER B
- Using 7/16-inch wrench, unscrew and take off four screws with washers from rear composite marker assembly
 - Take off cover
 - Take off lead 22-460 (right service) or lead 22-461 (left service) stoplight
- SOLDIER A
- Set light switch main lever to STOPLIGHT
 - Make sure turn signal control assembly lever is in neutral position



GO

TA 115753

Figure 26-10 (Sheet 2 of 11)

GO

<p>SOLDIER B ● Set multimeter to measure +24 volts DC. Refer to test equipment procedures index</p> <ul style="list-style-type: none">● Put multimeter + lead on stoplight lead 22-461 or 22-460● Put multimeter - lead on a good ground <p>SOLDIER A ● Press down on brake pedal and hold it down</p> <p>SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC</p>
<p>Does multimeter measure less than +24 volts DC</p>

GO

Figure 26-10 (Sheet 3 of 11)

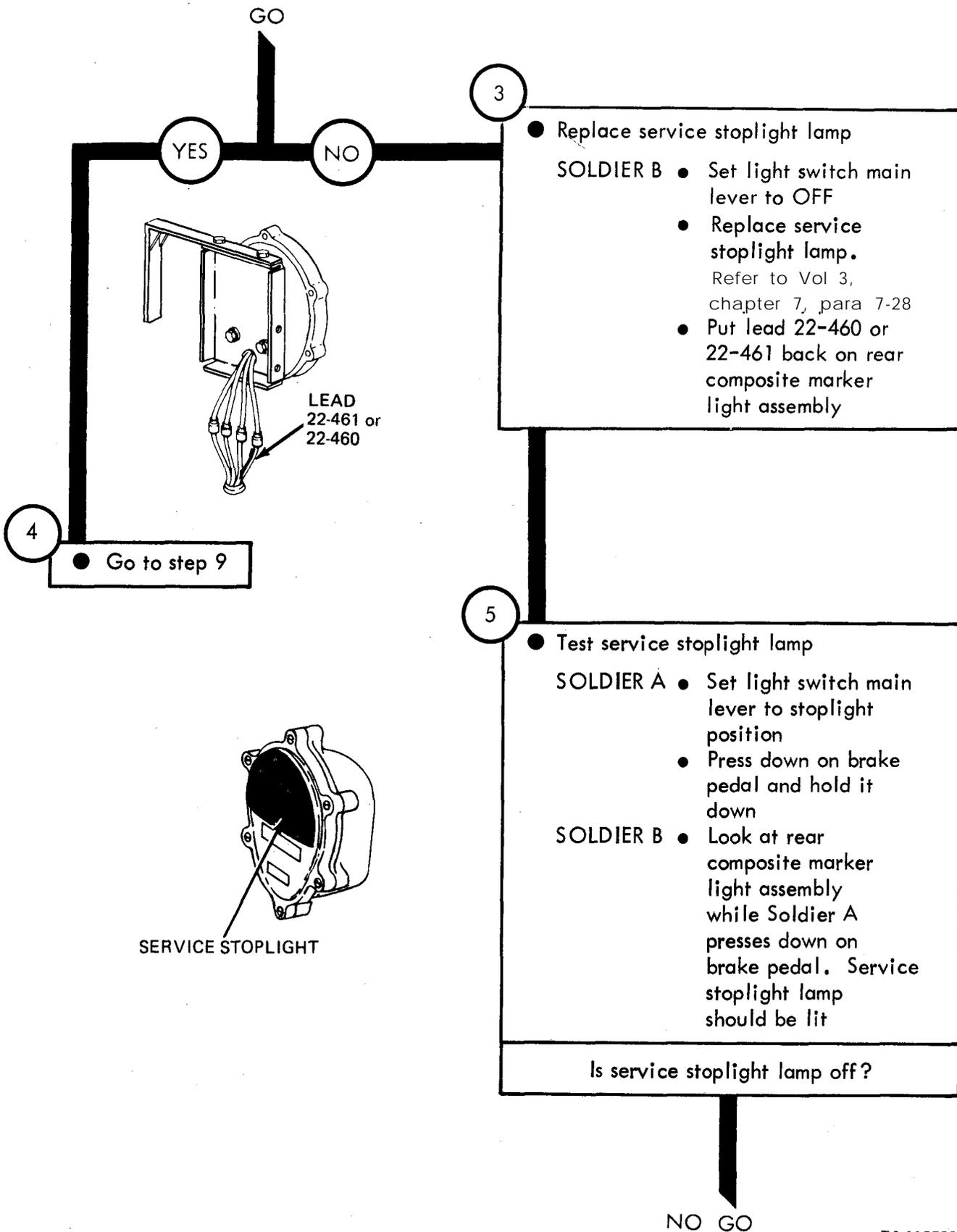


Figure 26-10 (Sheet 4 of 11)

NO GO

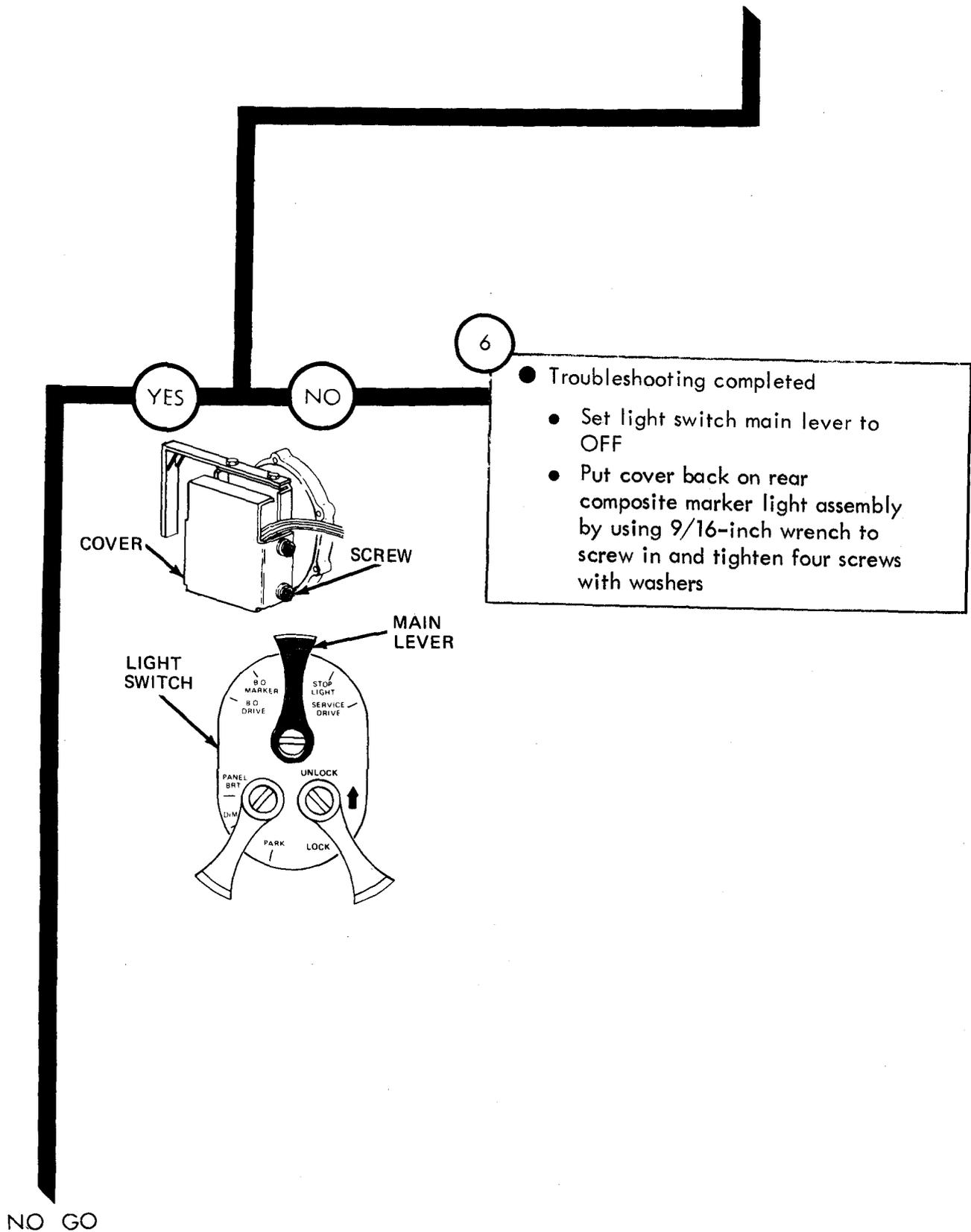
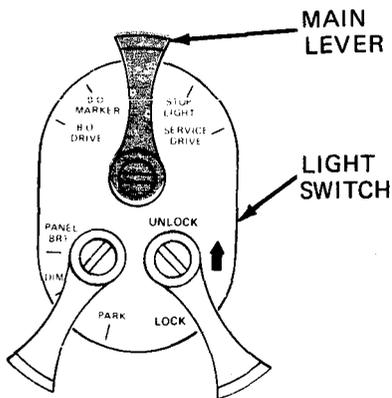


Figure 26-10 (Sheet 5 of 11)

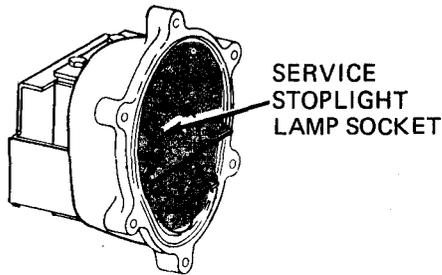
TA 115756

NO GO

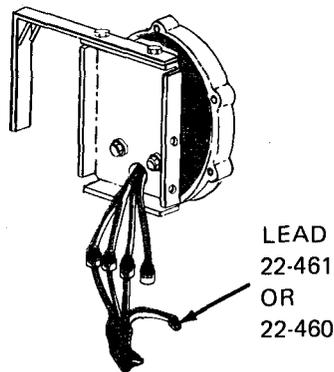
7



- Clean contacts of service stoplight lamp socket
- Set light switch main lever to OFF
- Remove service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28
- Clean service stoplight lamp socket
- Put back service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28



8



- Clean contacts of stoplight lamp connectors
- Take off lead 22-460 or 22-461
- Clean lead 22-460 or 22-461 contacts
- Push lead 22-460 or 22-461 into connector
- Put cover back on rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers

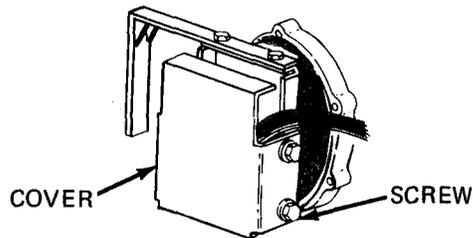


Figure 26-10 (Sheet 6 of 11)

From step 4

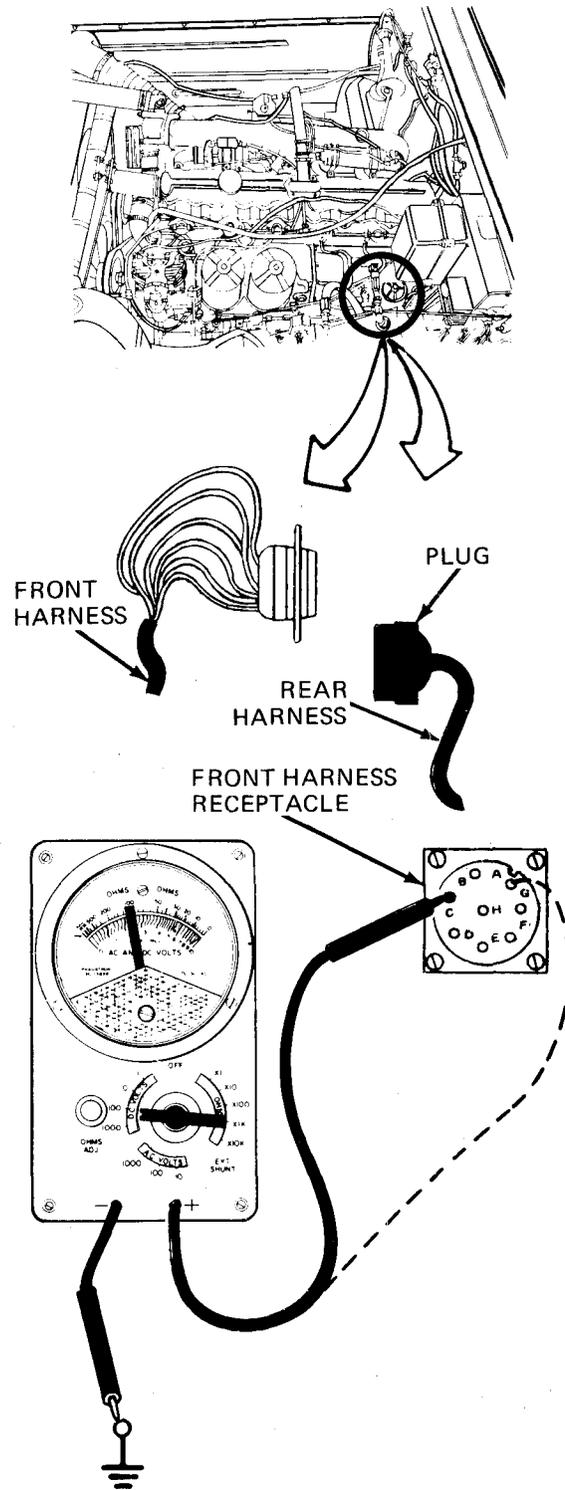
9

- Check rear harness between service stoplight lamp and rear harness connector
- SOLDIER A ● Set light switch main lever to OFF
- SOLDIER B ● Unscrew and take off rear harness plug from front harness receptacle
- SOLDIER A ● Set light switch main lever to stoplight
- SOLDIER B ● Put multimeter - lead on a good ground

- SOLDIER B ● For left service stoplight put multimeter + lead on contact C in front harness receptacle. For right hand service stoplight put multimeter + lead on contact G in front harness receptacle
- SOLDIER A ● Press down on brake pedal and hold it down
- SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO



TA 115758

Figure 26-10 (Sheet 7 of 11)

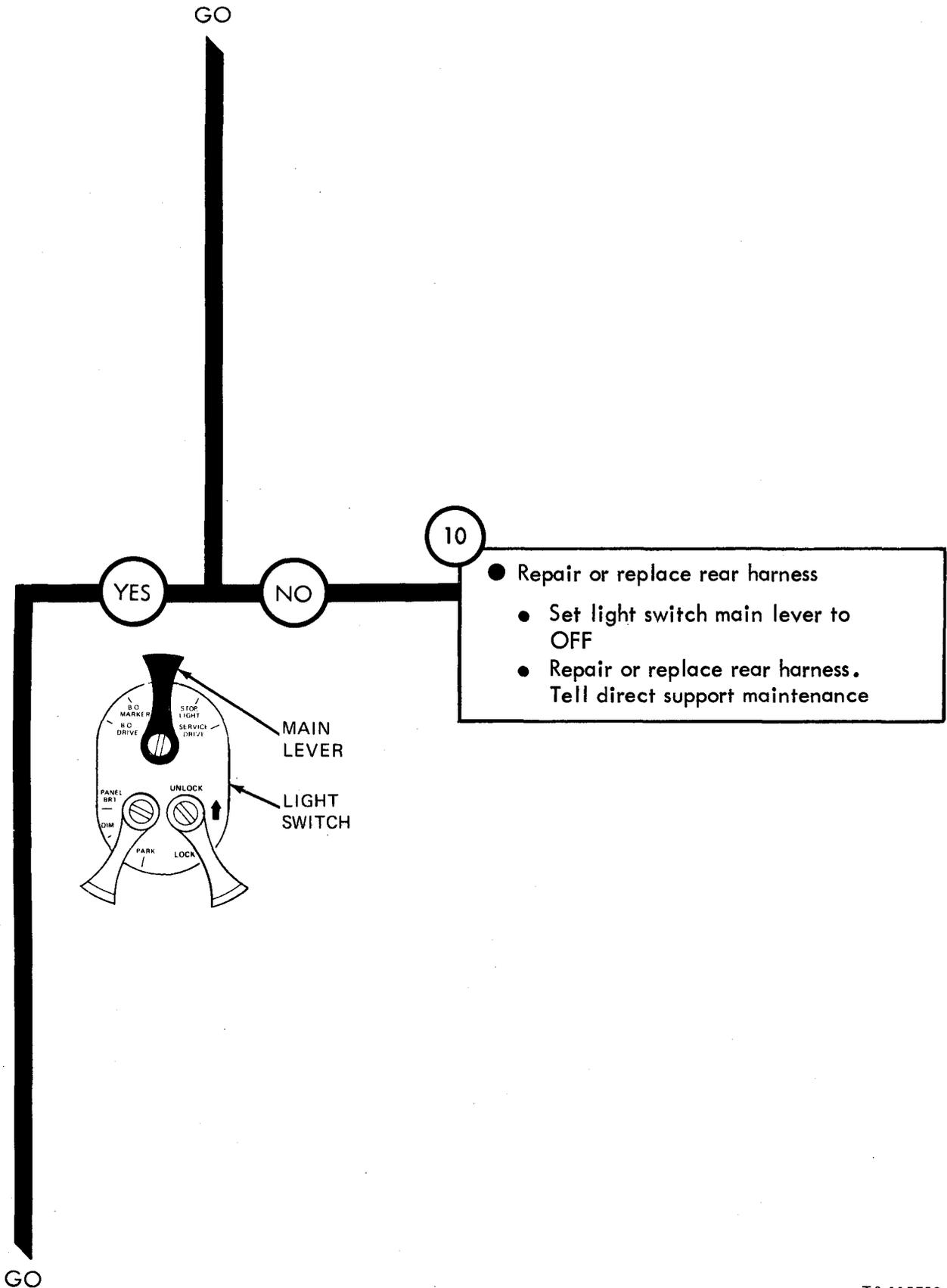


Figure 26-10 (Sheet 8 of 11)

GO
11

- Check front harness between control assembly directional signal and front harness receptacle
- SOLDIER A ● Set light switch main lever to OFF
- SOLDIER B ● Unscrew and take off front harness plug from turn signal control assembly
 - Put jumper wire between contacts D and C for left service stoplight in front harness plug
 - Put another jumper between contacts D and E for right service stoplight in front harness plug
- SOLDIER A ● Set light switch main lever to STOPLIGHT

- SOLDIER B ● Put multimeter - lead on a good ground
- For left service stoplight put multimeter + lead on contact C of front harness receptacle
- For right service stoplight put multimeter + lead on contact G of front harness receptacle
- SOLDIER A ● Press down on brake pedal and hold it down
- SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO

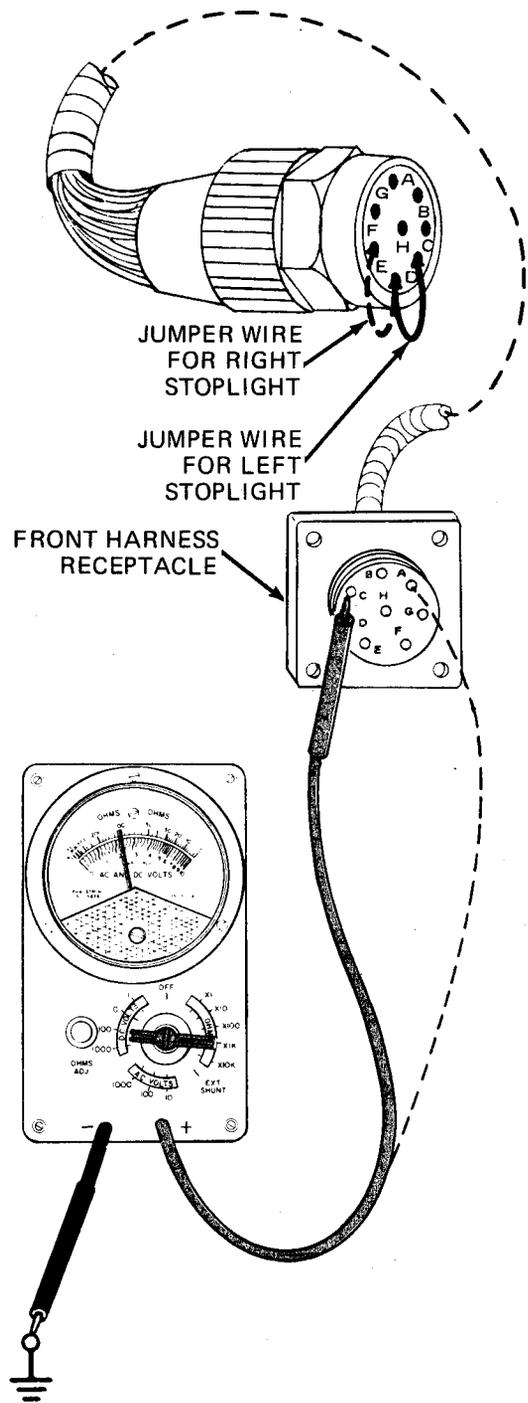


Figure 26-10 (Sheet 9 of 11)

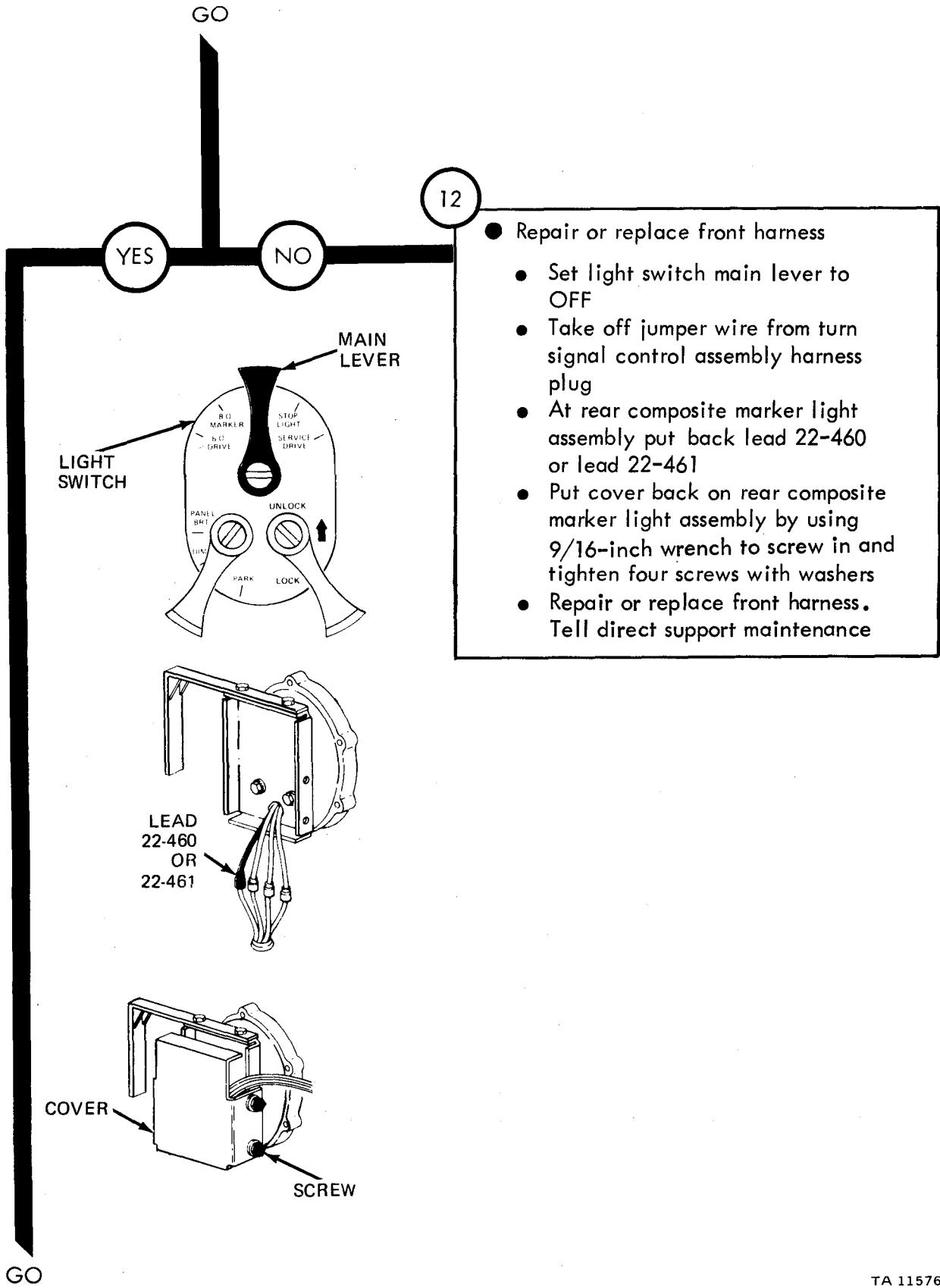
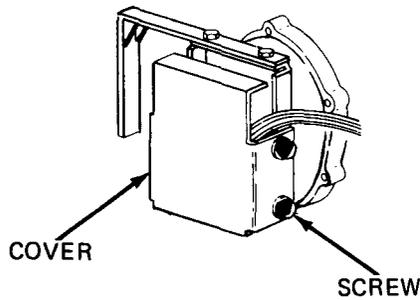
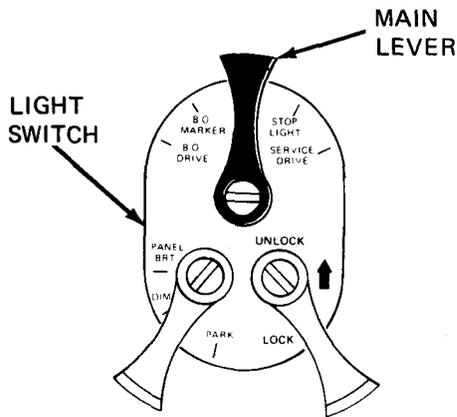


Figure 26-10 (Sheet 10 of 11)

GO



13

- Replace control assembly directional signal
 - Set light switch main switch lever to OFF
 - Take off jumper wire from turn signal control assembly harness plug
 - Put rear harness plug back on front harness receptacle

- At rear composite marker light assembly put back lead 22-460 or 22-461
- Put cover back on rear composite marker light assembly by using 9/16-inch wrench to screw on and tighten four screws and washers
- Replace turn signal control assembly. Refer to Vol 3, chapter 7, para 7-48

Figure 26-10 (Sheet 11 of 11)

Symptom

11 BOTH SERVICE STOPLIGHTS DO NOT LIGHT, OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

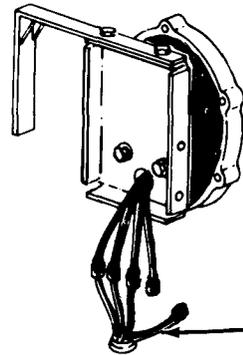
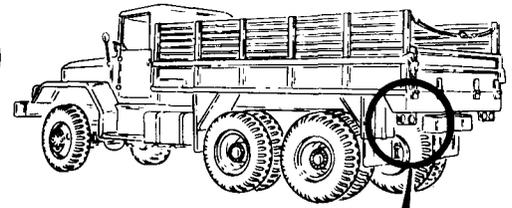
Two soldiers are needed to troubleshoot the rear service stoplights. Soldier A sits in the cab and operates the controls. Soldier B makes voltage checks with the multimeter

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

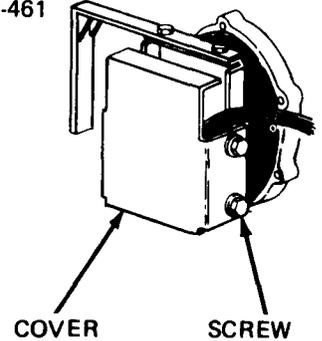
- 1
- Park truck
 - Refer to TM 9-2320-211-10

- 2
- Check for +24 volts DC at left service stoplight
- SOLDIER B
- Using 9/16-inch wrench, unscrew and take off four screws with washers from left rear composite marker assembly
 - Take off cover
 - Take off lead 22-461
- SOLDIER A
- Set light switch main lever to STOPLIGHT position
 - Make sure turn signal control lever is in neutral position

GO

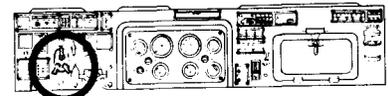


LEAD 22-461

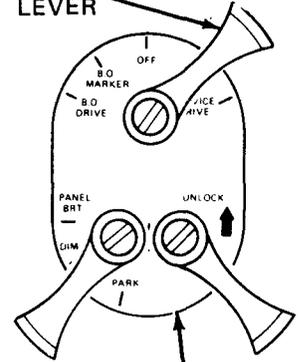


COVER

SCREW



MAIN LEVER



LIGHT SWITCH

TA 121122

Figure 26-11 (Sheet 1 of 27)

GO

SOLDIER B

- Set multimeter to measure +24 volts DC
- Refer to multimeter test procedures, test 1
- Put multimeter + lead on lead 22-461

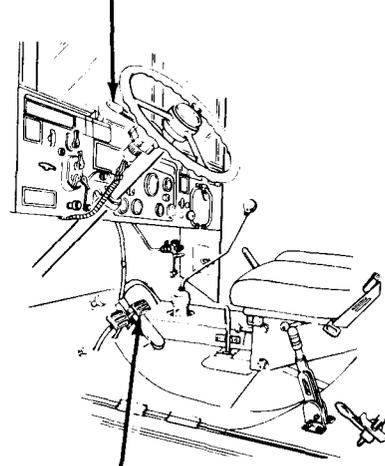
SOLDIER A

- Press down on brake pedal and hold it down
- Read multimeter while Soldier A presses down on brake pedal
- Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO

TURN SIGNAL CONTROL HANDLE



BRAKE PEDAL

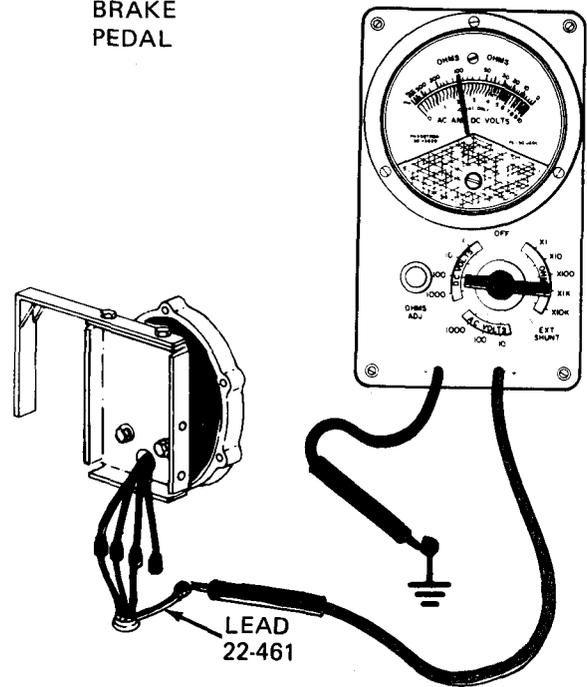


Figure 26-11 (Sheet 2 of 27)

TA 115763

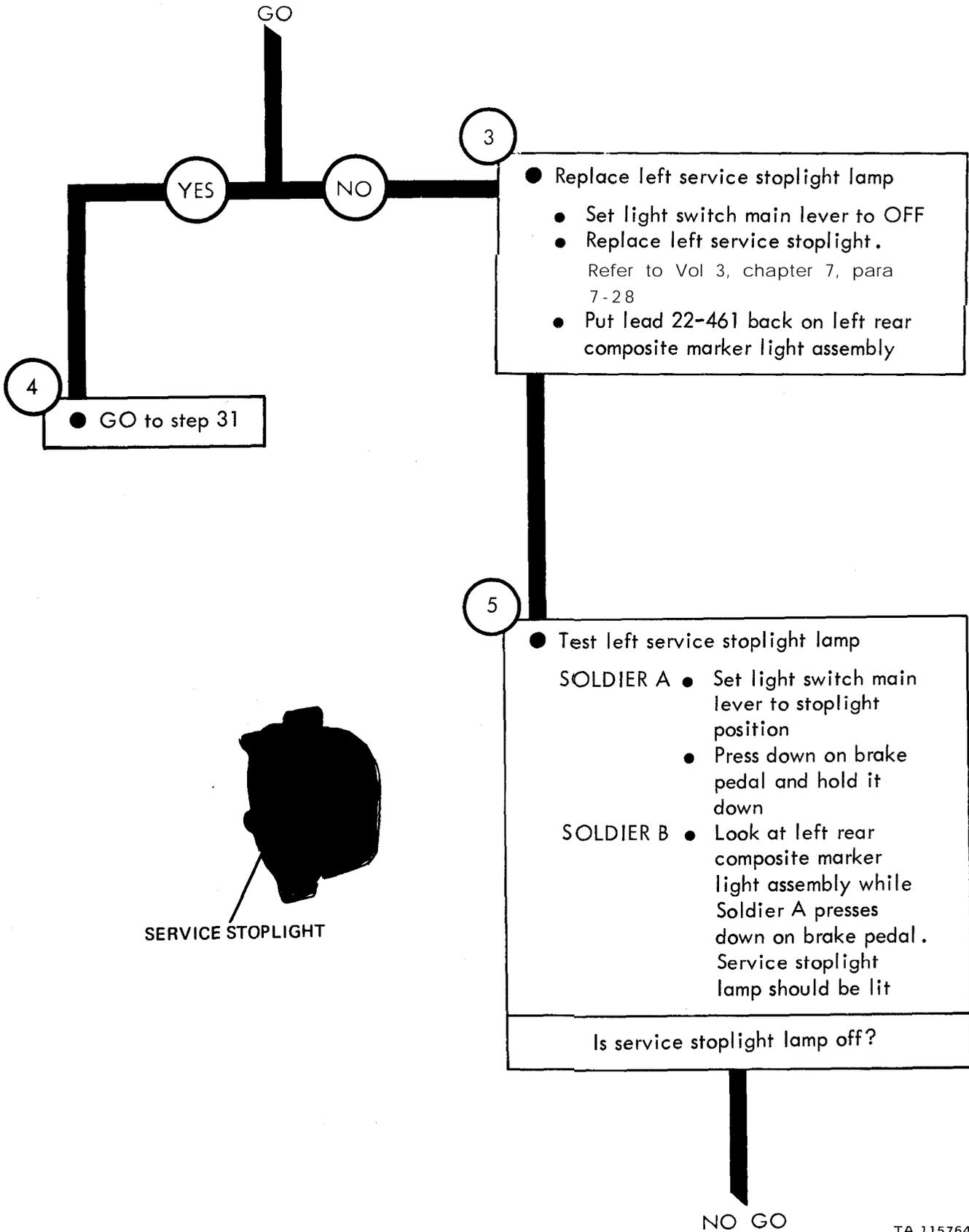
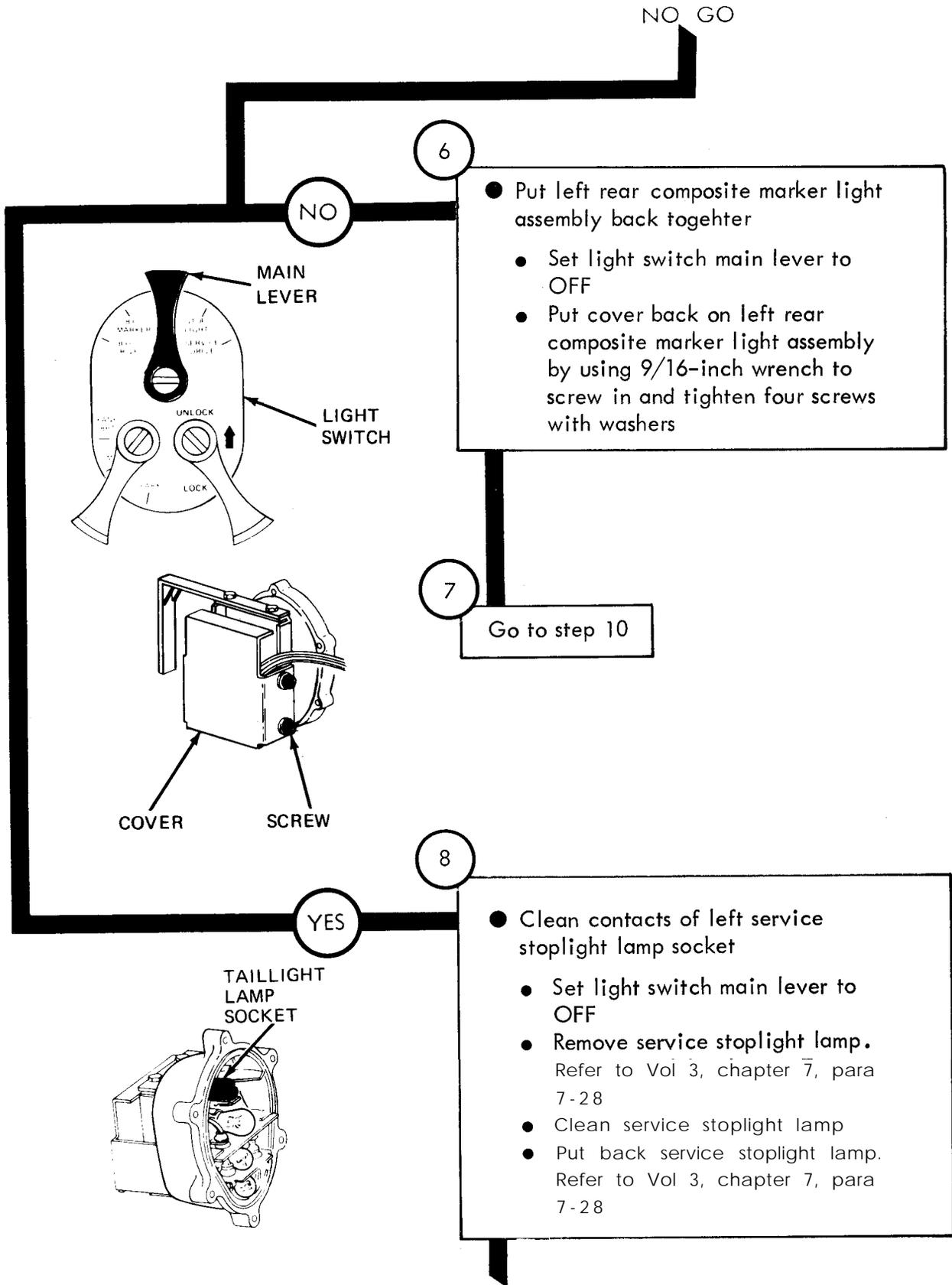


Figure 26-11 (Sheet 3 of 27)

TA 115764



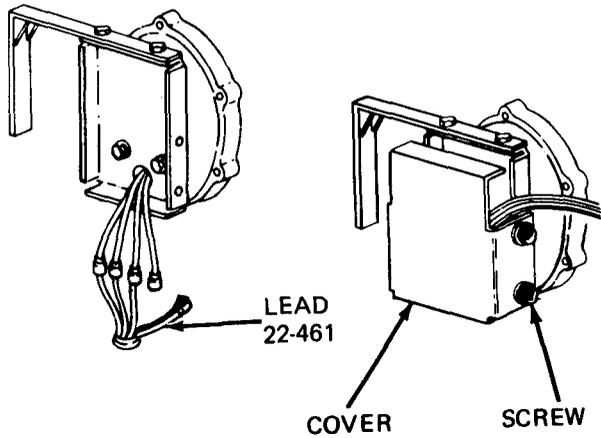
NO GO

TA 115765

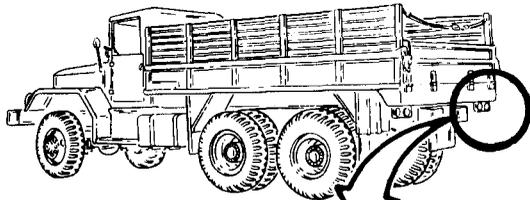
Figure 26-11 (Sheet 4 of 27)

NO GO

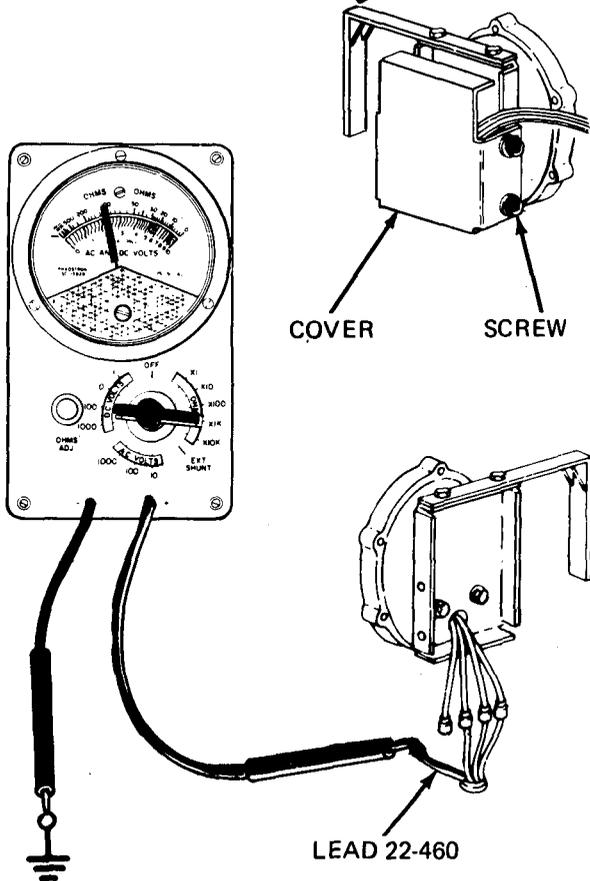
9



- Clean contacts of left service stoplight lamp connectors
 - Take off lead 22-461
 - Clean lead 22-461 contacts
 - Push lead 22-461 into connector
 - Put cover back into left rear composite marker assembly by using 9/16-inch wrench to screw in and tighten four screws with washers



10



- Check for +24 volts DC at right service stoplight
 - SOLDIER B ● Using 9/16-inch wrench, unscrew and take off four screws with washers from right rear composite marker assembly
 - Take off cover
 - Take off lead 22-460
 - SOLDIER A ● Set light switch main lever to STOPLIGHT

NO GO

TA 115766

Figure 26-11 (Sheet 5 of 27)

NO GO

SOLDIER B

- Put multimeter + lead on lead 22-460
- Press down on brake pedal and hold
- Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

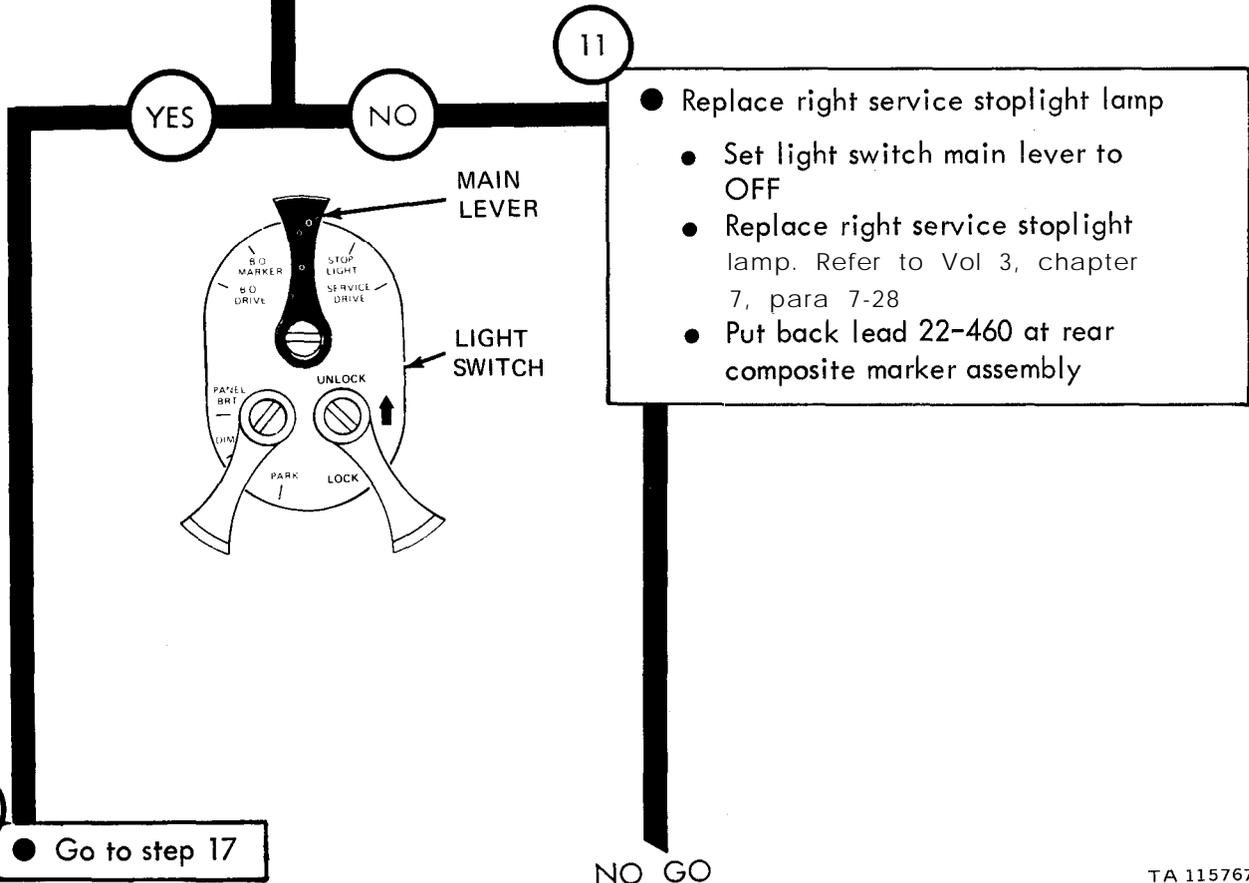


Figure 26-11 (Sheet 6 of 27)

TA 115767

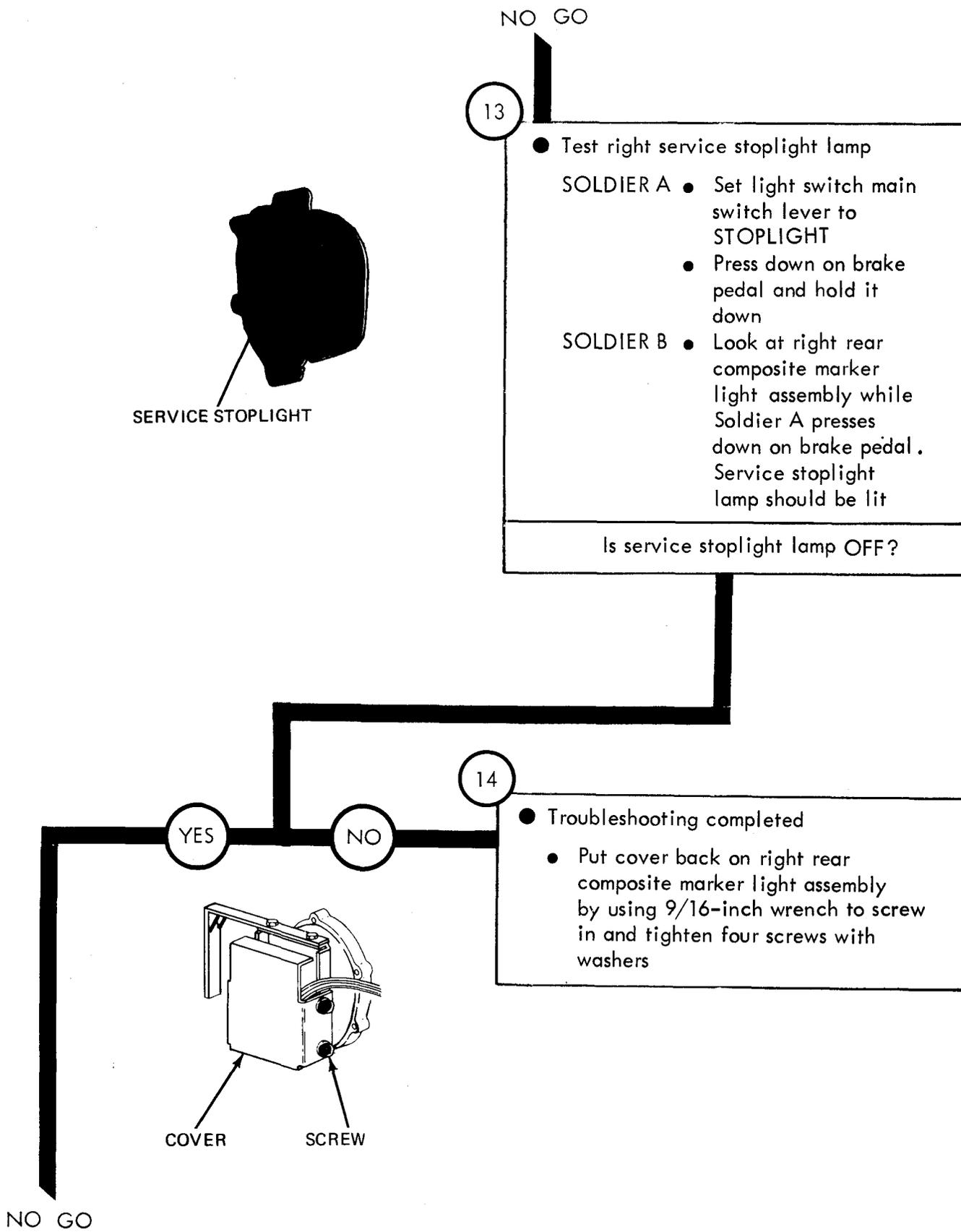
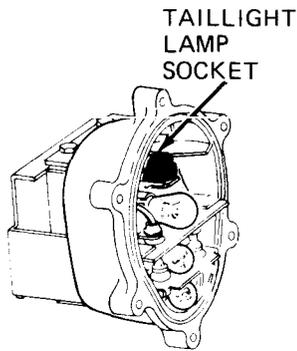


Figure 26-11 (Sheet 7 of 27)

TA 115768

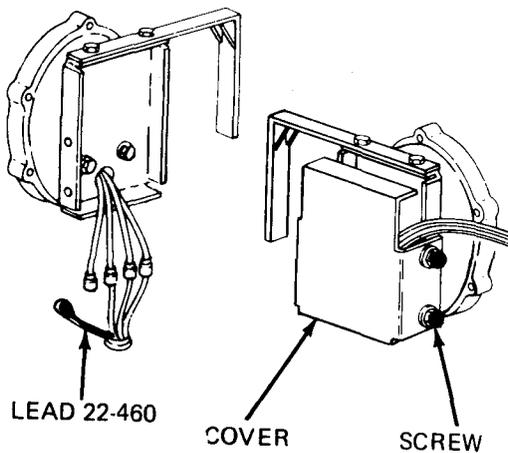
NO GO



15

- Clean contacts of right service stoplight socket
- Set light switch main lever to OFF
- Remove service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28
- Clean service stoplight lamp socket
- Put back service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28

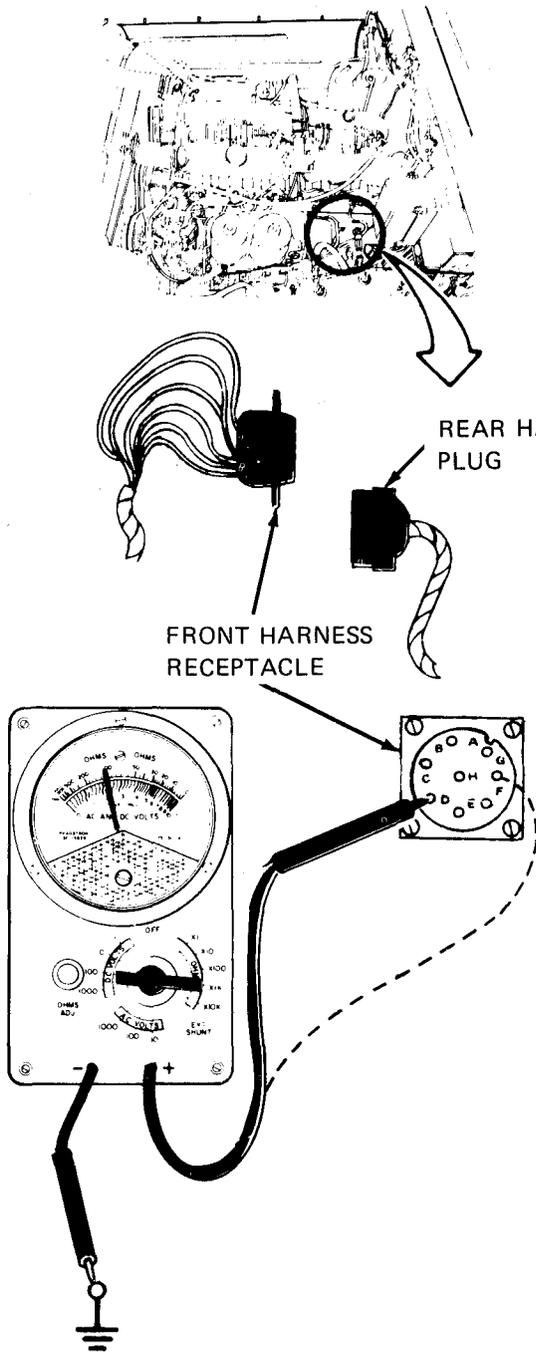
16



- Clean contacts of right service stoplight lamp connectors
- Take off lead 22-460
- Clean lead 22-460 contacts
- Push lead 22-460 back into connector
- Put cover back on right rear composite marker assembly by using 9/16-inch wrench to screw in and tighten four screws with washers

Figure 26-11 (Sheet 8 of 27)

From step 13



17

- Check voltage to front harness receptacle
- SOLDIER B ● Unscrew and take off rear harness plug from front harness receptacle
- Put multimeter - lead on a good ground
- Put multimeter + lead on contacts C and then G of front harness receptacle
- SOLDIER A ● Step on brake pedal and hold it down
- SOLDIER B ● Read multimeter for +24 volts DC at both contacts C then D while Soldier A presses down on brake pedal

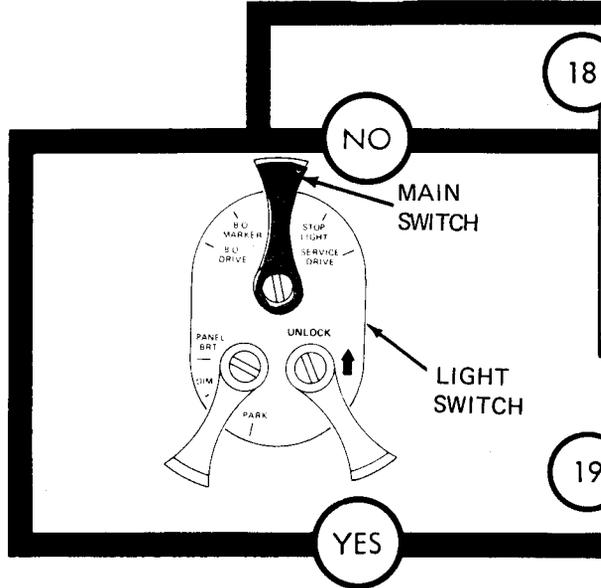
Does multimeter read less than +24 volts DC for both test?

NO GO

TA 115770

Figure 26-11 (Sheet 9 of 27)

NO GO

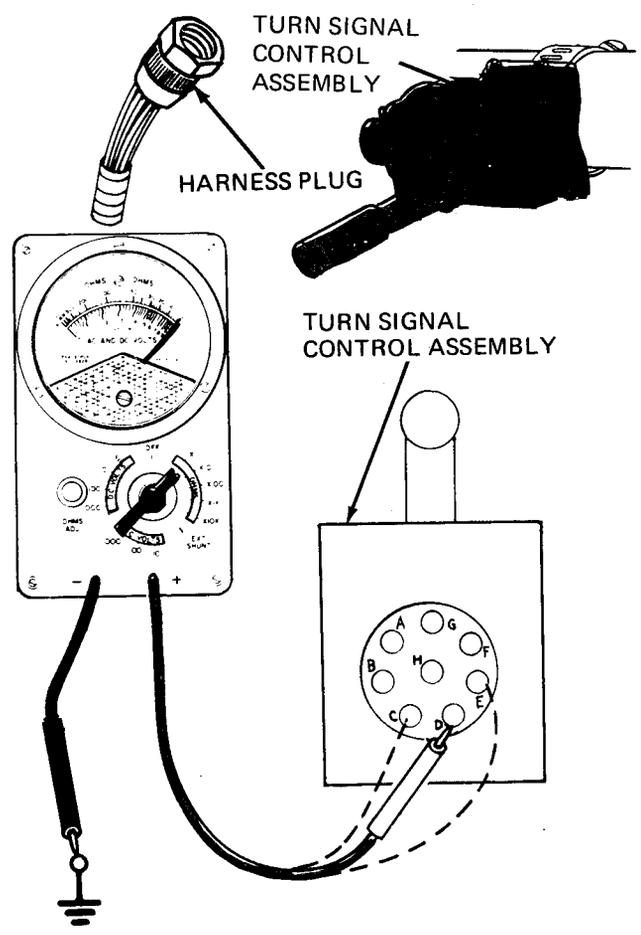


18

- Repair or replace rear harness
 - Set light switch main lever to OFF
 - Repair or replace rear harness. Tell direct support maintenance

19

- Check for continuity through control assembly directional signal
 - Make sure turn signal control lever is in neutral position
 - Unscrew and take off harness plug from turn signal control assembly
 - Set multimeter to measure continuity. Refer to test equipment procedures index



- Put multimeter - lead on a good ground
- Put multimeter + lead on contacts D, then E, then C of turn signal control assembly. Read multimeter. Multimeter pointer should measure zero ohms
- Put multimeter + lead on contacts B, A, H, E, and then G. Read multimeter. Multimeter pointer should not move

Did multimeter reading check out OK for all tests?

NO GO

Figure 26-11 (Sheet 10 of 27)

TA 115771

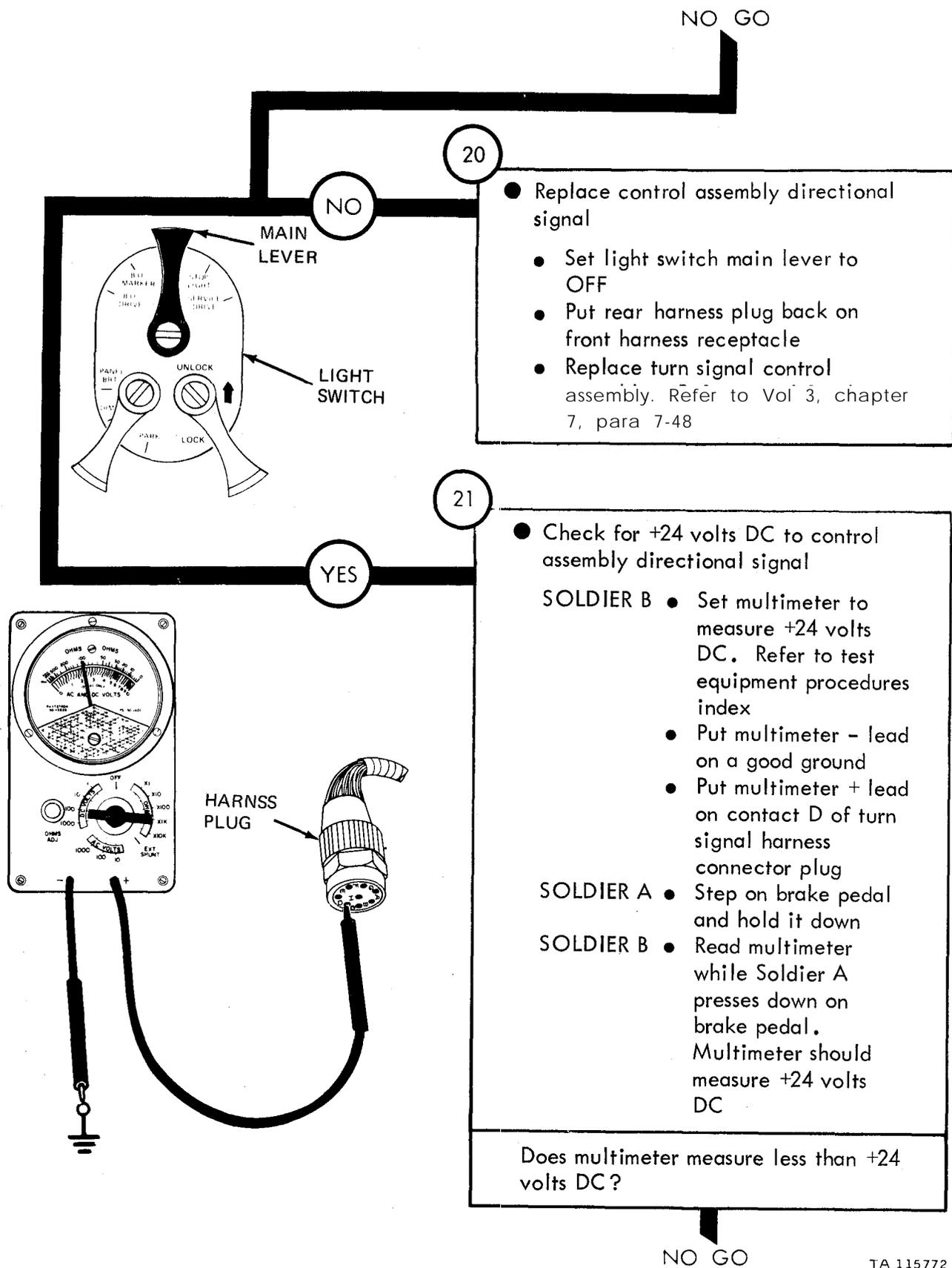


Figure 26-11 (Sheet 11 of 27)

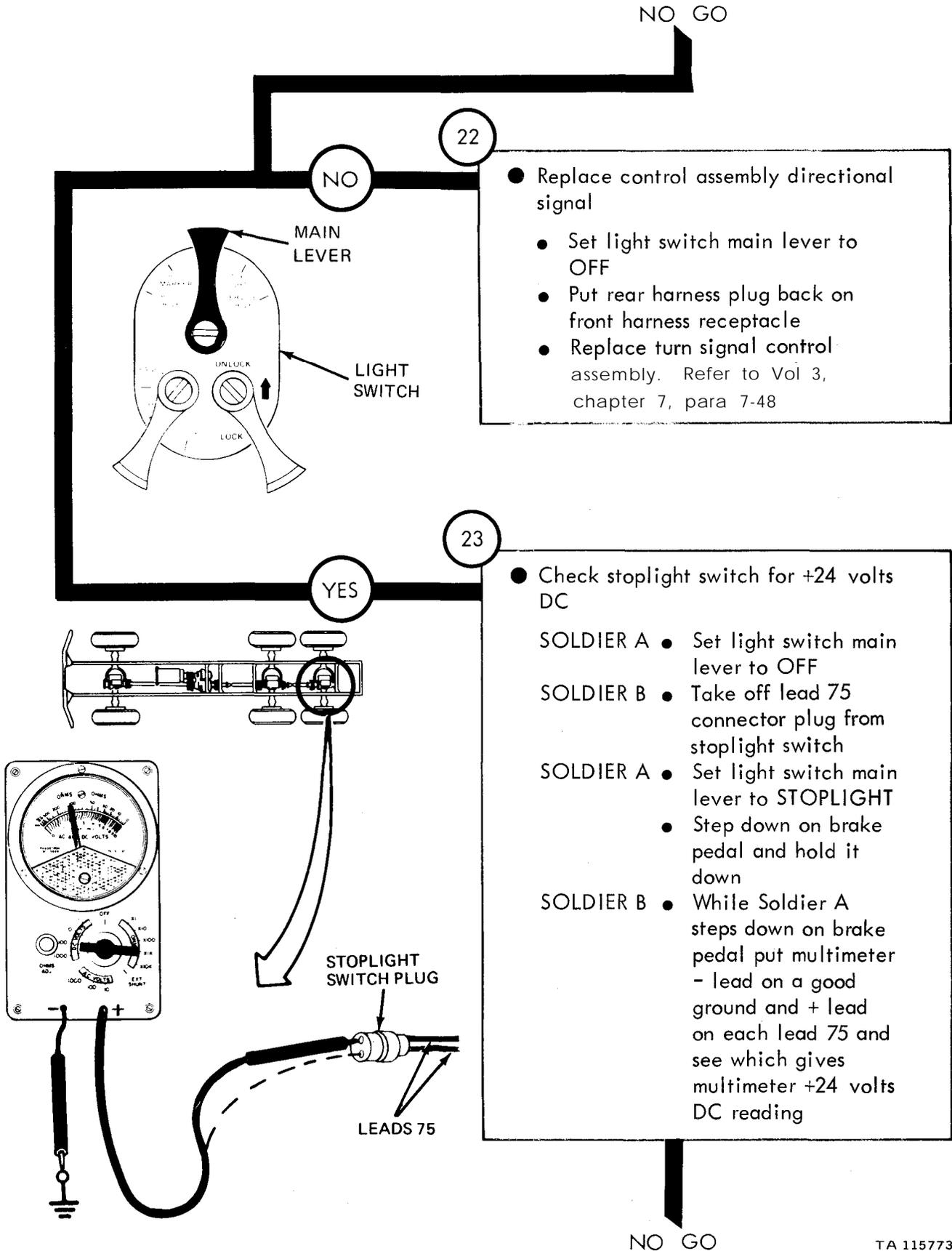
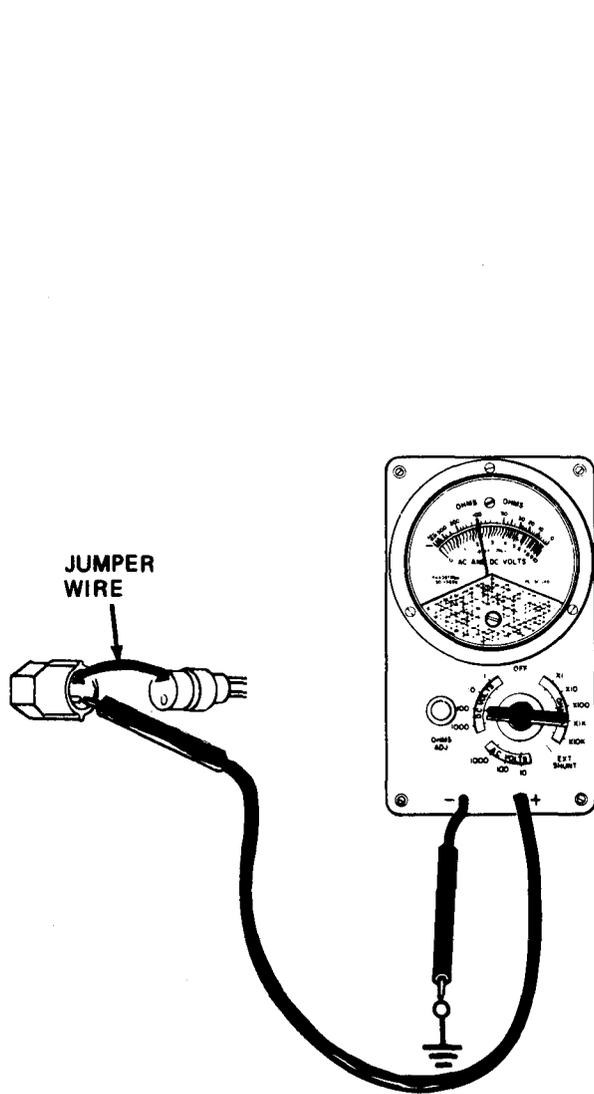


Figure 26-11 (Sheet 12 of 27)

TA 115773



NO GO

- SOLDIER B**
- Put jumper wire from lead 75 that gave +24-volt DC reading to either stoplight switch contact
 - Put multimeter + lead on other contact of stoplight switch
 - Put multimeter - lead on a good ground
 - With Soldier A still pressing down on brake pedal read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

NO GO

Figure 26-11 (Sheet 13 of 27)

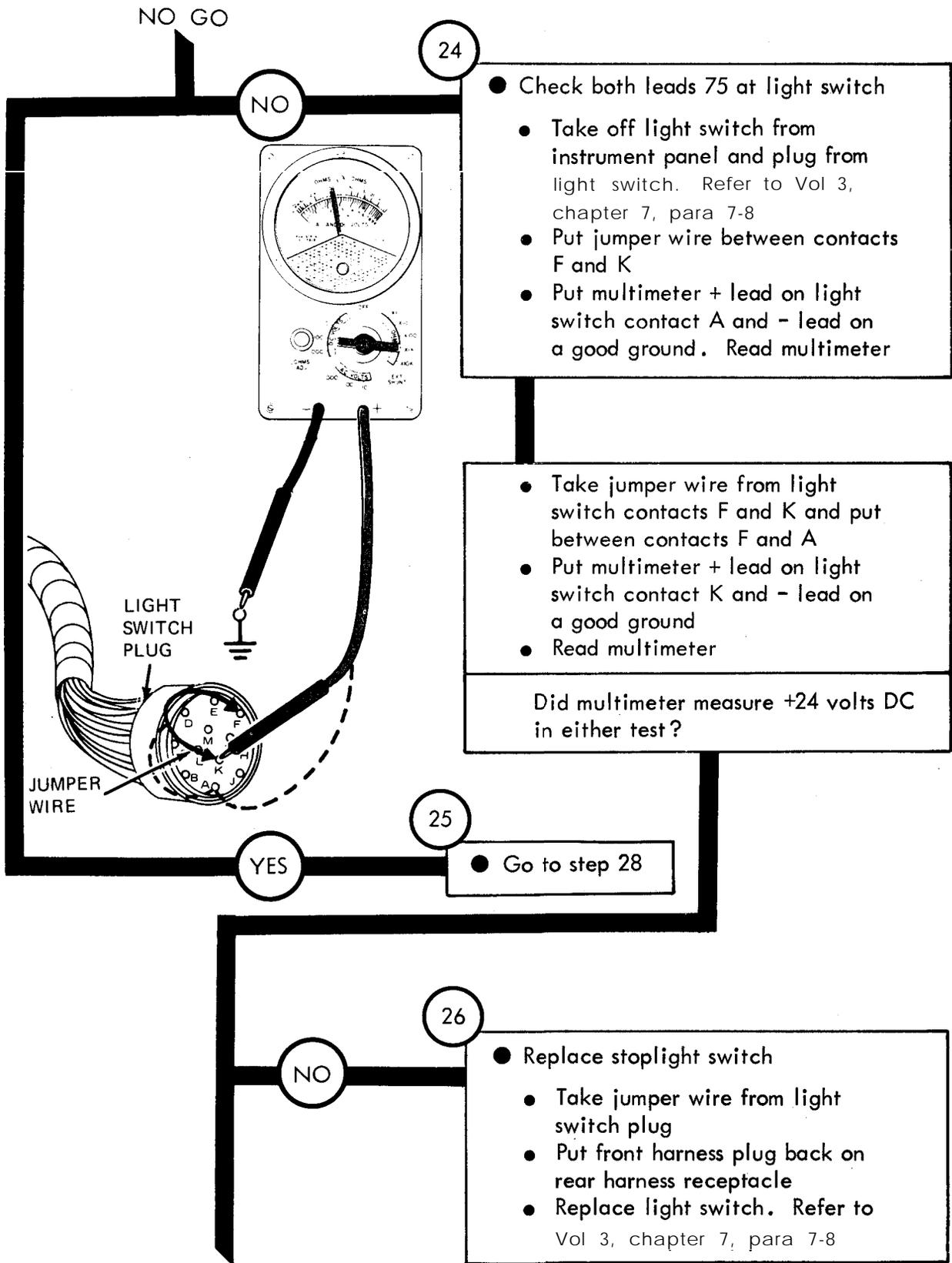


Figure 26-11 (Sheet 14 of 27)

TA 115775

NO GO

YES

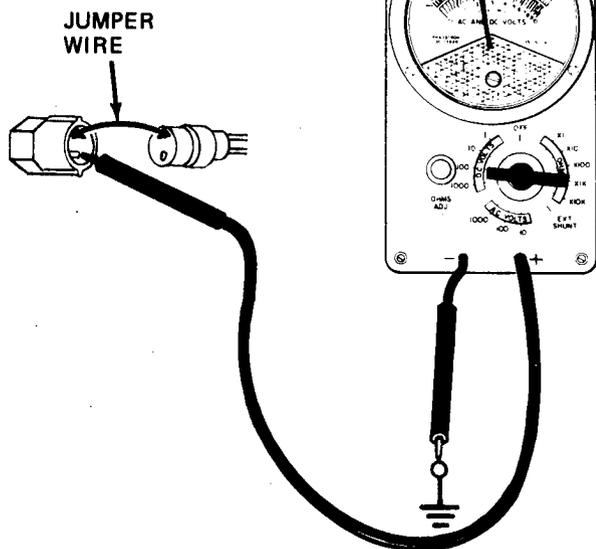
27

- Repair or replace front harness
 - Take jumper wire from light switch plug
 - Put light switch plug back on light switch and light switch back on instrument panel.

Refer to Vol 3, chapter 7, para 7-8

- Repair or replace front harness. Tell direct support maintenance

From step 25



28

- Check for +24 volts DC through stoplight switch
 - Put jumper wire from lead 75 that gave +24 volts DC reading to either stoplight switch contact
 - Put multimeter + lead to other stoplight switch contact and to a good ground
 - With Soldier A still pressing down on brake pedal read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure +24 volts DC ?

NO GO

Figure 26-11 (Sheet 15 of 27)

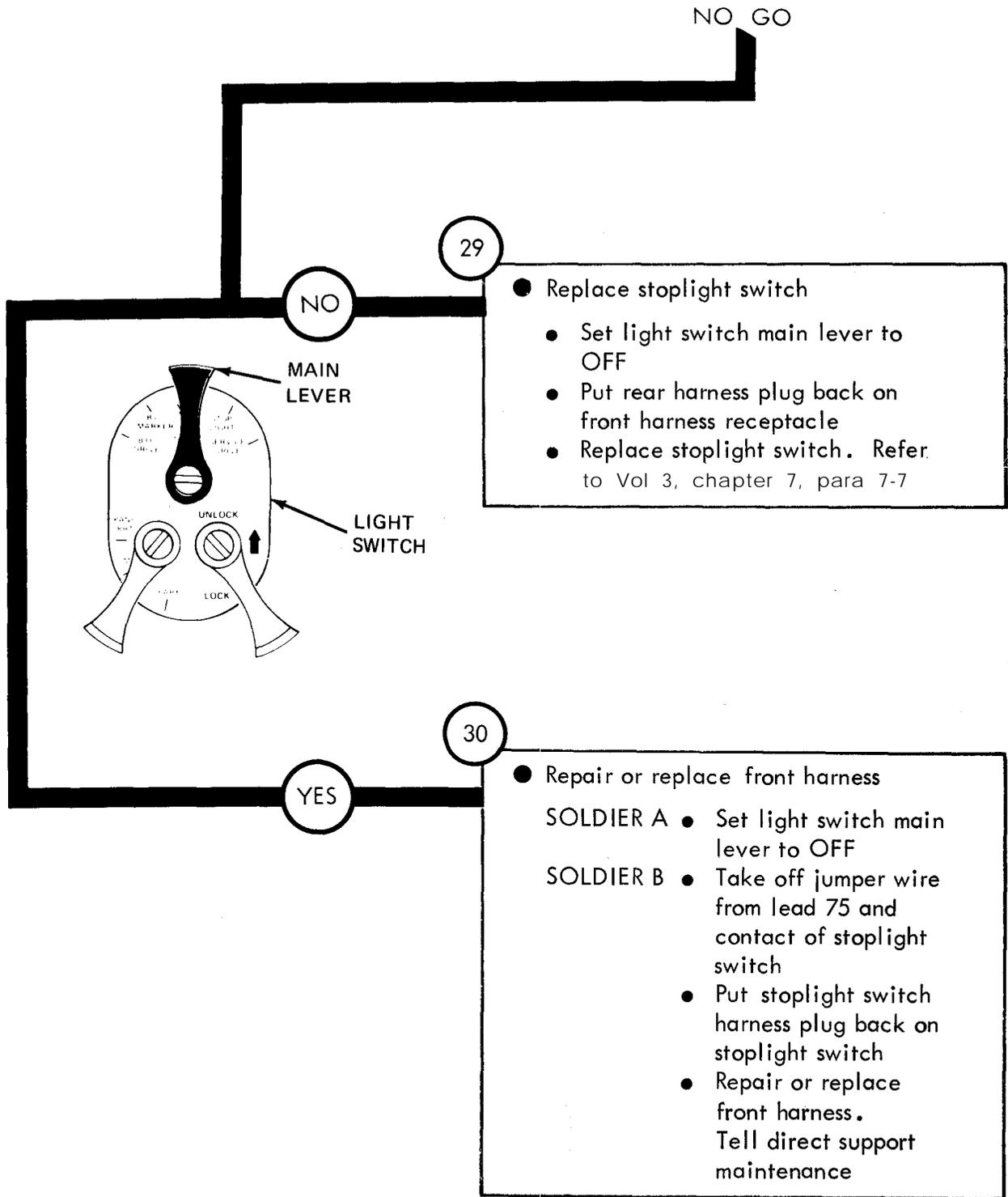


Figure 26-11 (Sheet 16 of 27)

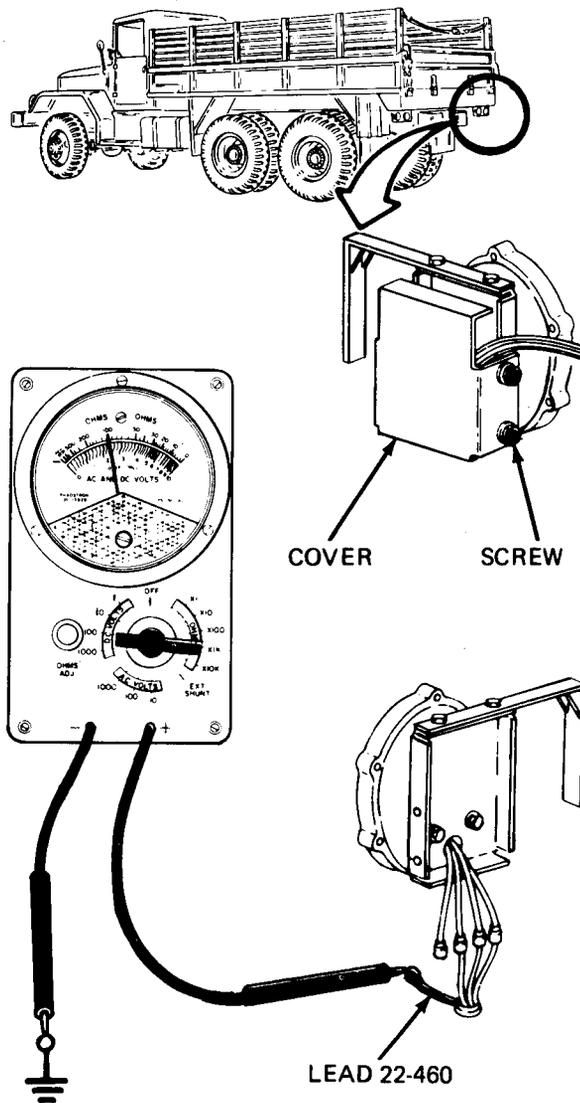
From step 4

31

- Check for +24 volts DC at right service stoplight
- SOLDIER B ● Using 9/16-inch wrench, unscrew and take off four screws with washers from right rear composite marker assembly
- Take off cover
 - Take off lead 22-460
- SOLDIER A ● Set light switch main lever to STOPLIGHT

- SOLDIER B ● Put multimeter + lead on lead 22-460
- Press down on brake pedal and hold
 - Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

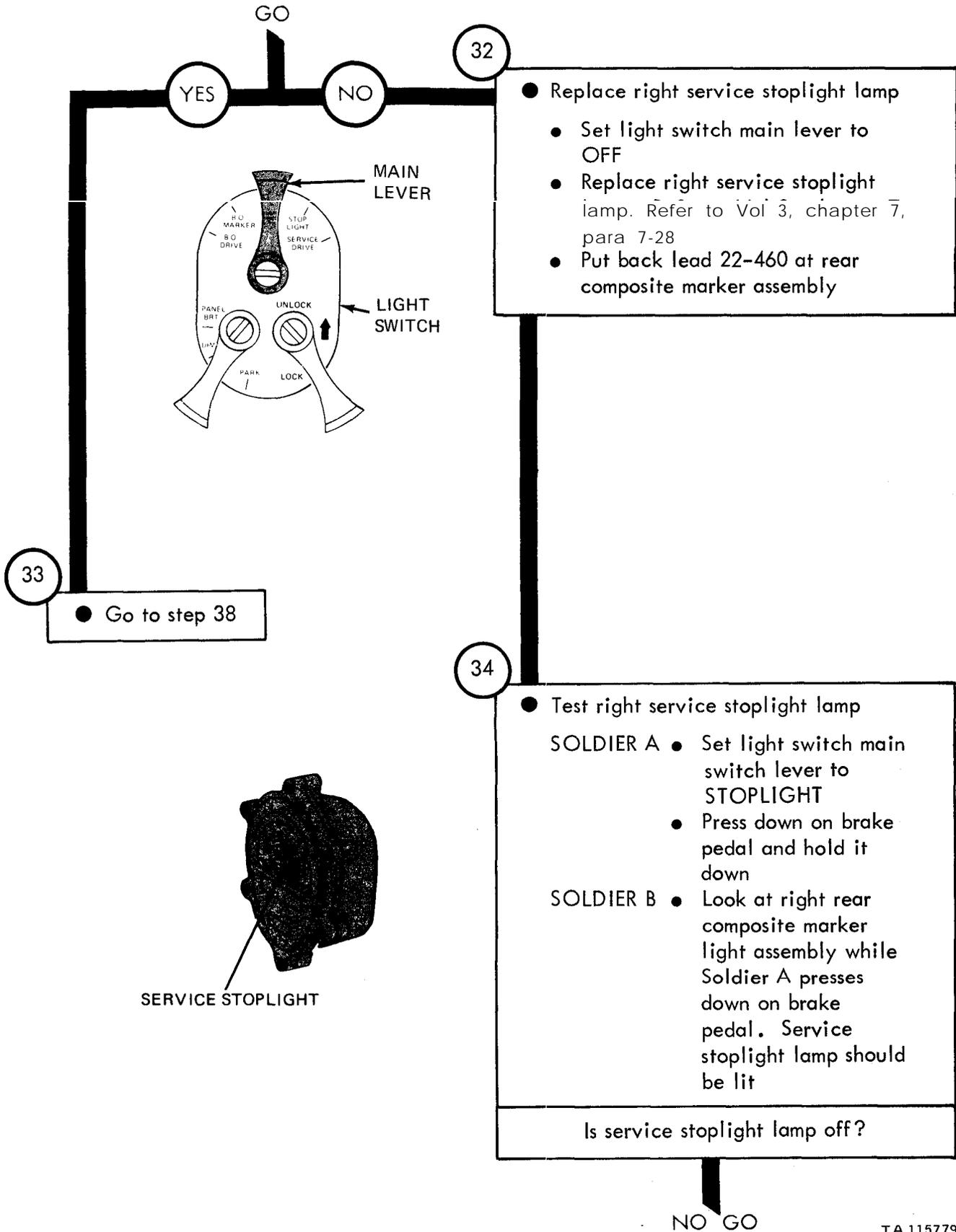
Does multimeter measure less than +24 volts DC?



GO

Figure 26-11 (Sheet 17 of 27)

TA 115778



- Replace right service stoplight lamp
 - Set light switch main lever to OFF
 - Replace right service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28
 - Put back lead 22-460 at rear composite marker assembly

● Go to step 38

- Test right service stoplight lamp
 - SOLDIER A
 - Set light switch main switch lever to STOPLIGHT
 - Press down on brake pedal and hold it down
 - SOLDIER B
 - Look at right rear composite marker light assembly while Soldier A presses down on brake pedal. Service stoplight lamp should be lit

Is service stoplight lamp off?

NO GO

Figure 26-11 (Sheet 18 of 27)

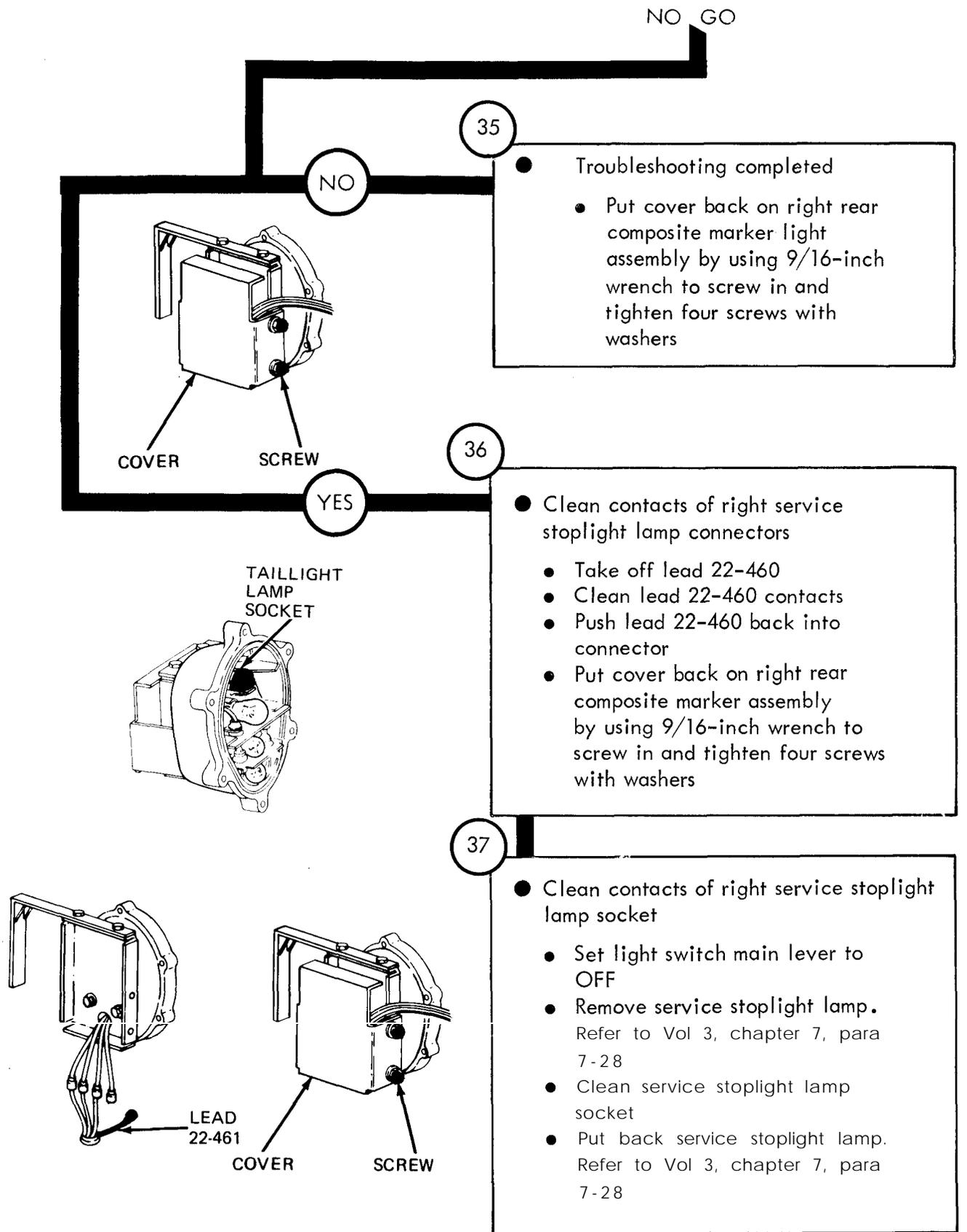


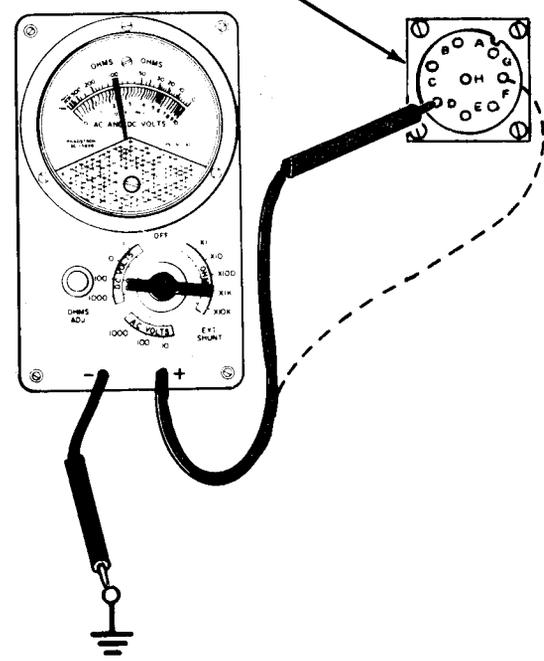
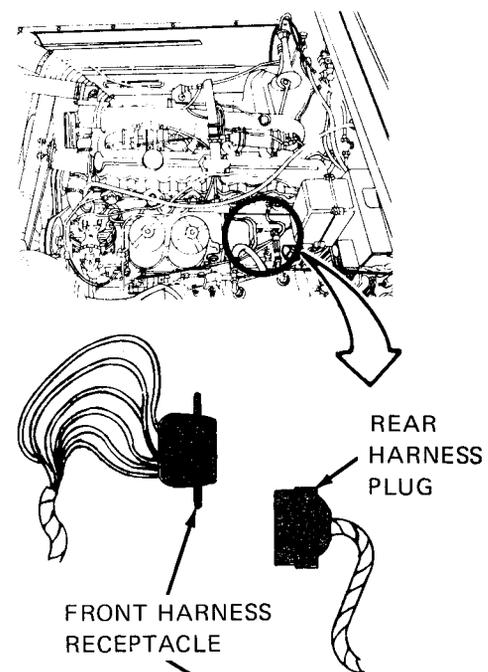
Figure 26-11 (Sheet 19 of 27)

TA 115780

From step 33

38

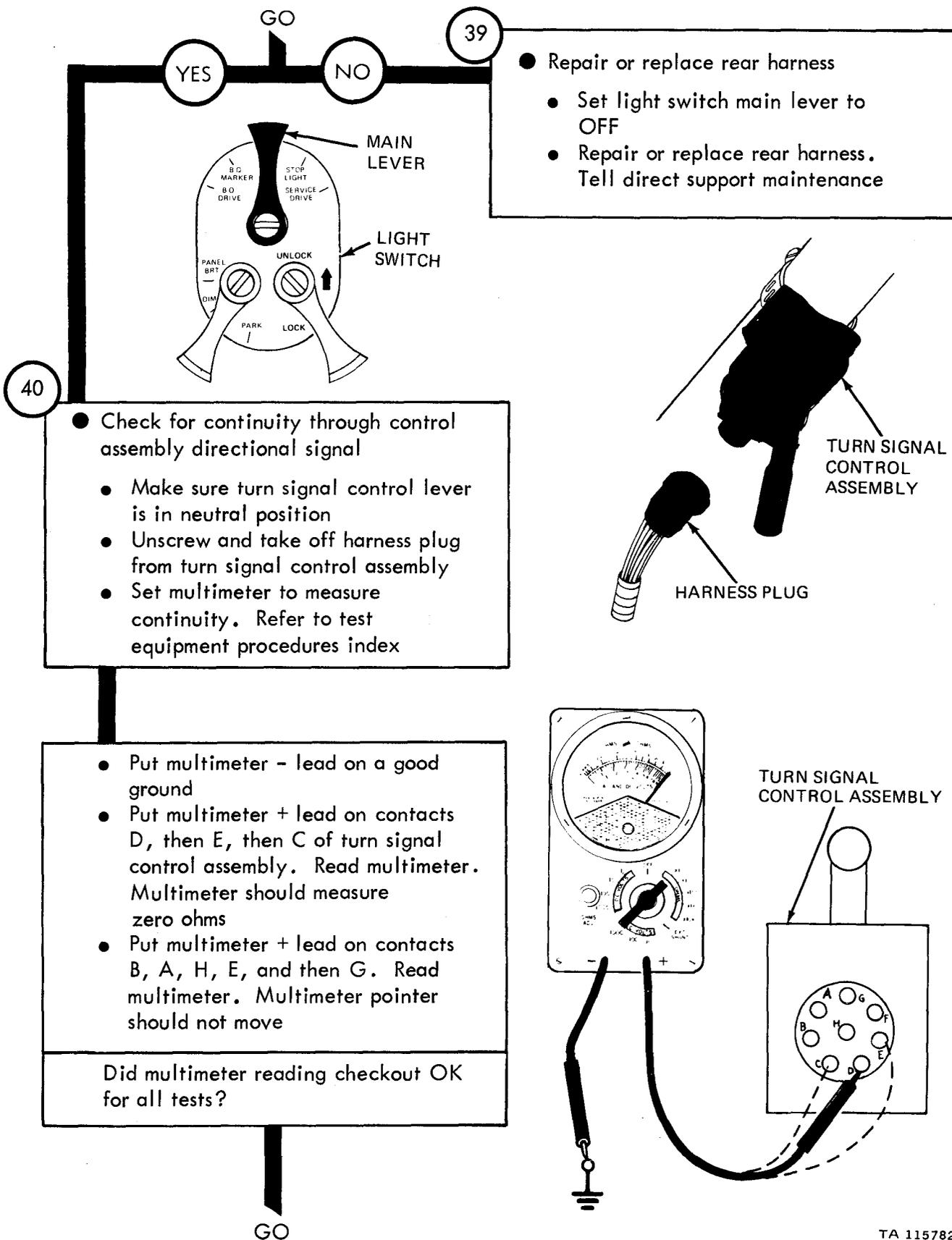
- Check voltage to front harness receptacle
- SOLDIER B ● Unscrew and take off rear harness plug from front harness receptacle
- Put multimeter - lead on a good ground
 - Put multimeter + lead on contacts C and then G of front harness receptacle
- SOLDIER A ● Step on brake pedal and hold it down
- SOLDIER B ● Read multimeter for +24 volts DC at both contacts C then D while Soldier A presses down on brake pedal
-
- Does multimeter measure less than +24 volts DC for both tests?



GO

Figure 26-11 (Sheet 20 of 27)

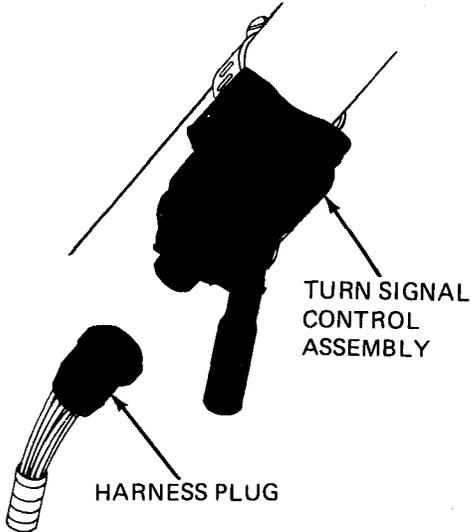
TA 115781



- Repair or replace rear harness
- Set light switch main lever to OFF
- Repair or replace rear harness. Tell direct support maintenance

40

- Check for continuity through control assembly directional signal
 - Make sure turn signal control lever is in neutral position
 - Unscrew and take off harness plug from turn signal control assembly
 - Set multimeter to measure continuity. Refer to test equipment procedures index



- Put multimeter - lead on a good ground
- Put multimeter + lead on contacts D, then E, then C of turn signal control assembly. Read multimeter. Multimeter should measure zero ohms
- Put multimeter + lead on contacts B, A, H, E, and then G. Read multimeter. Multimeter pointer should not move

Did multimeter reading checkout OK for all tests?

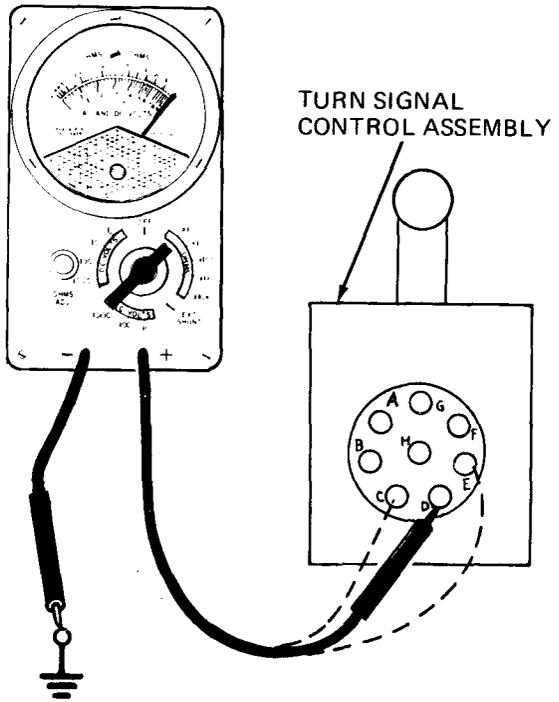
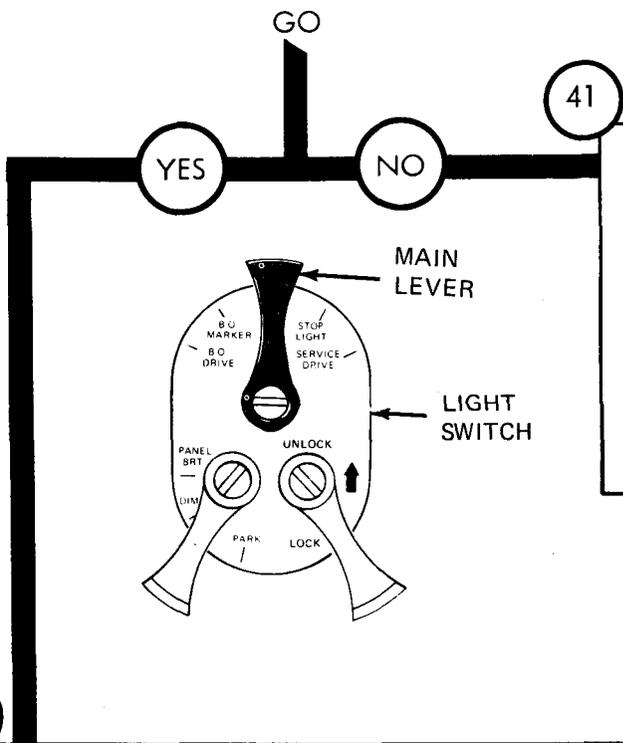


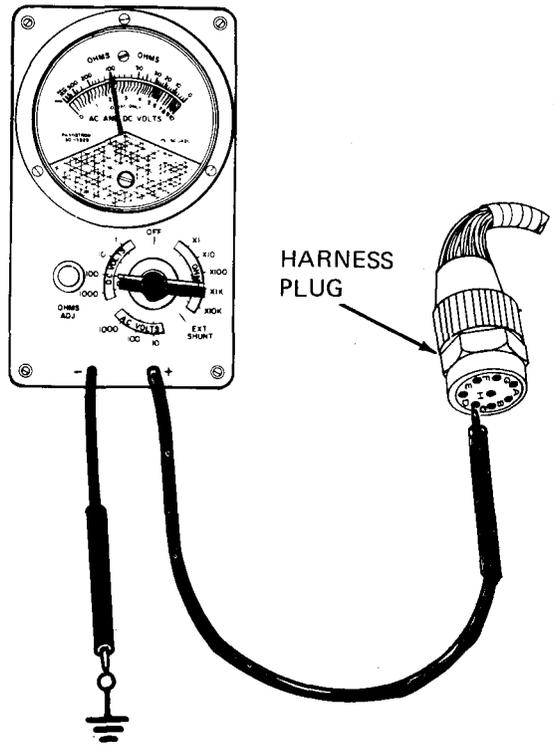
Figure 26-11 (Sheet 21 of 27)

TA 115782



- Replace control assembly directional signal
 - Set light switch main lever to OFF
 - Put rear harness plug back on front harness receptacle
 - Replace turn signal control assembly. Refer to Vol 3, chapter 7, para 7-48

- 42
- Check for +24 volts DC to control assembly directional signal
- SOLDIER B ● Set multimeter to measure +24 volts DC. Refer to multimeter test equipment procedures index
- Put multimeter - lead on a good ground
 - Put multimeter + lead on contact D of turn signal harness connector plug
- SOLDIER A ● Step on brake pedal and hold it down
- SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC
- Does multimeter measure less than +24 volts DC?



GO

Figure 26-11 (Sheet 22 of 27)

TA 115783

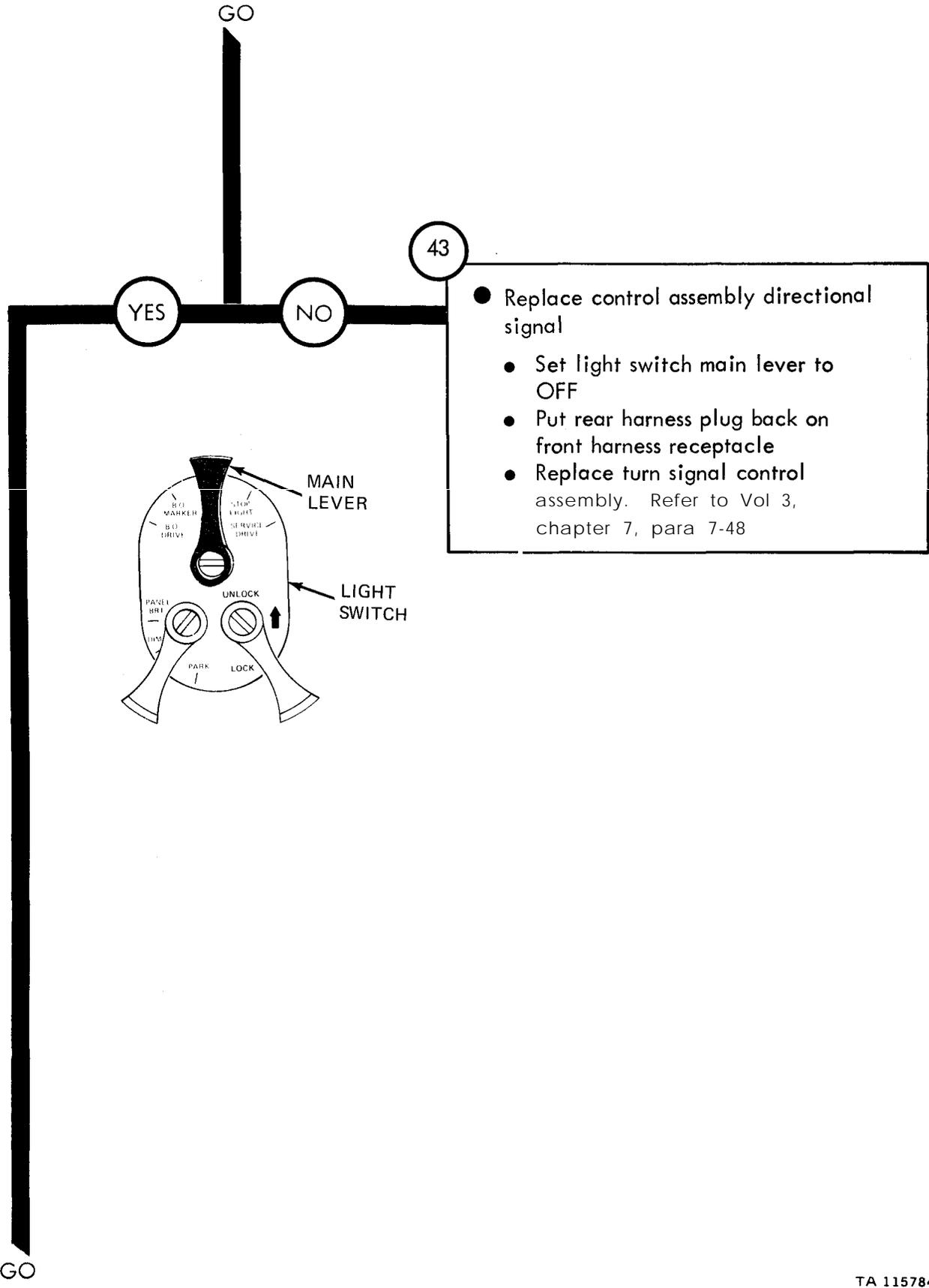


Figure 26-11 (Sheet 23 of 27)

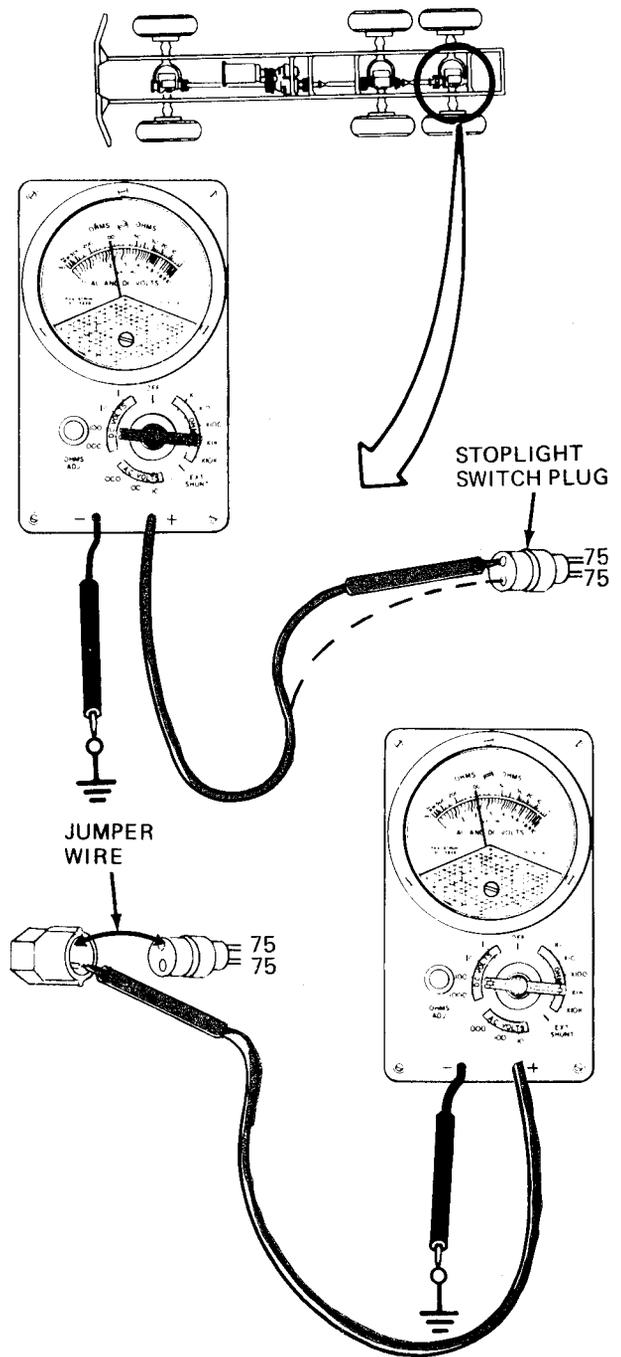
TA 115784

44 **GO**

- Check stoplight switch for +24 volts DC
- SOLDIER A ● Set light switch main lever to OFF
- SOLDIER B ● Take off lead 75 connector plug from stoplight switch
- SOLDIER A ● Set light switch main lever to STOPLIGHT
 - Step down on brake pedal and hold it down
- SOLDIER B ● While Soldier A steps down on brake pedal, put multimeter - lead on a good ground and + lead on each lead 75 and see which gives multimeter +24 volts DC reading

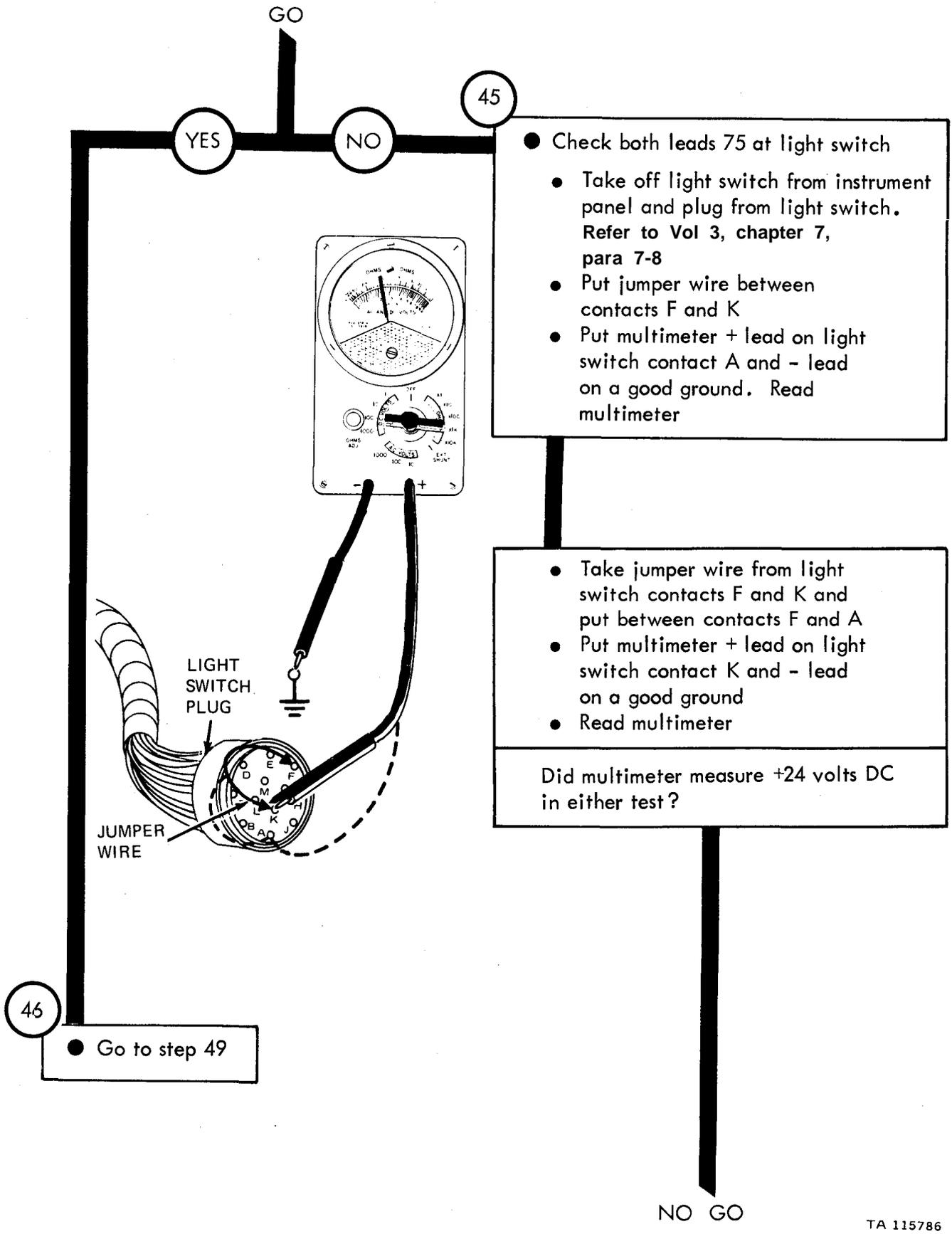
- SOLDIER B ● Put jumper wire from lead 75 that gave +24 volt DC reading to either stoplight switch contact
- Put multimeter + lead on other contact of stoplight switch
- Put multimeter - lead on a good ground
- With Soldier A still pressing down on brake pedal, read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



GO

Figure 26-11 (Sheet 24 of 27)



- 45
- Check both leads 75 at light switch
 - Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Put jumper wire between contacts F and K
 - Put multimeter + lead on light switch contact A and - lead on a good ground. Read multimeter

- Take jumper wire from light switch contacts F and K and put between contacts F and A
- Put multimeter + lead on light switch contact K and - lead on a good ground
- Read multimeter

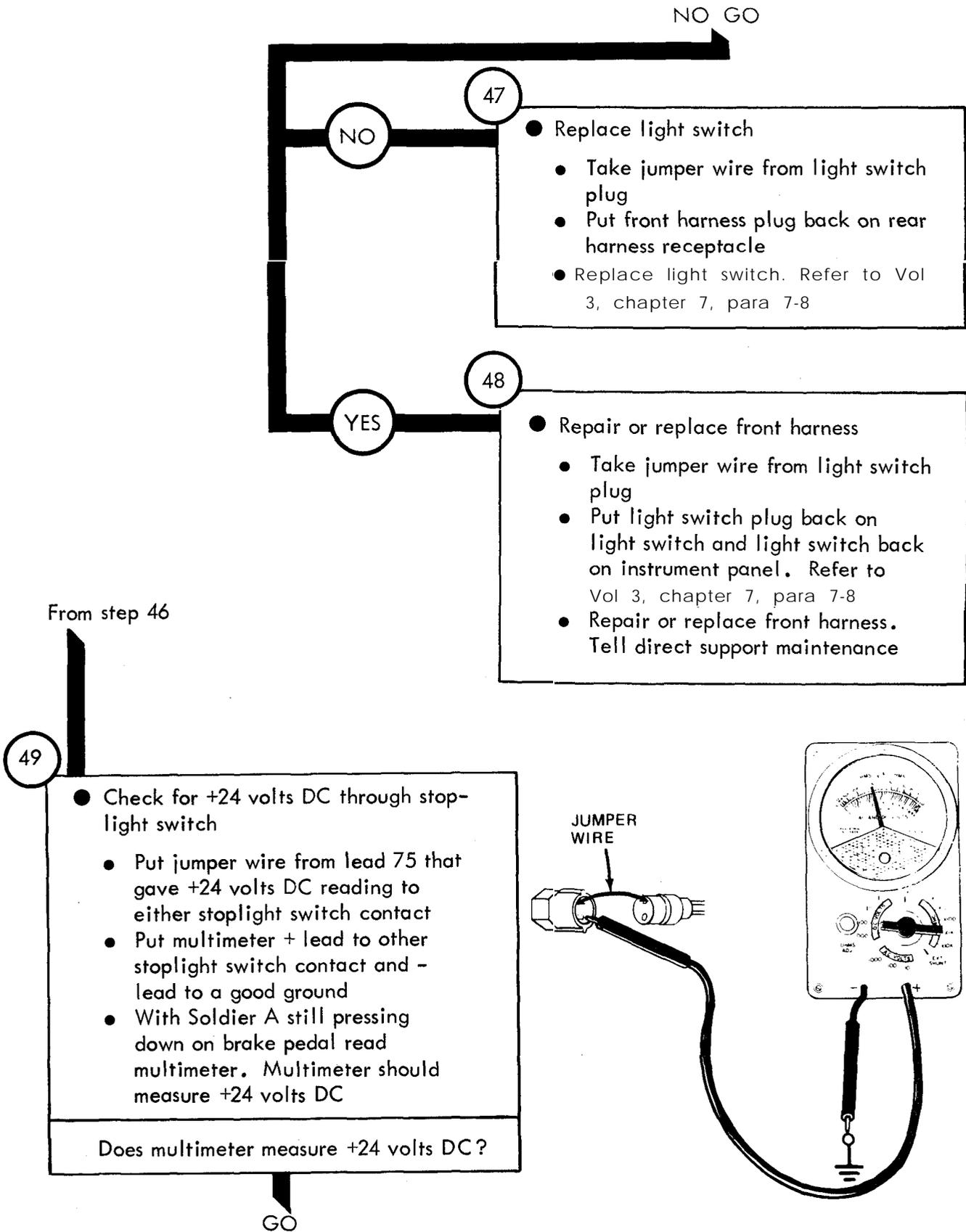
Did multimeter measure +24 volts DC in either test?

46

- Go to step 49

NO GO

Figure 26-11 (Sheet 25 of 27)



TA 115787

Figure 26-11 (Sheet 26 of 27)

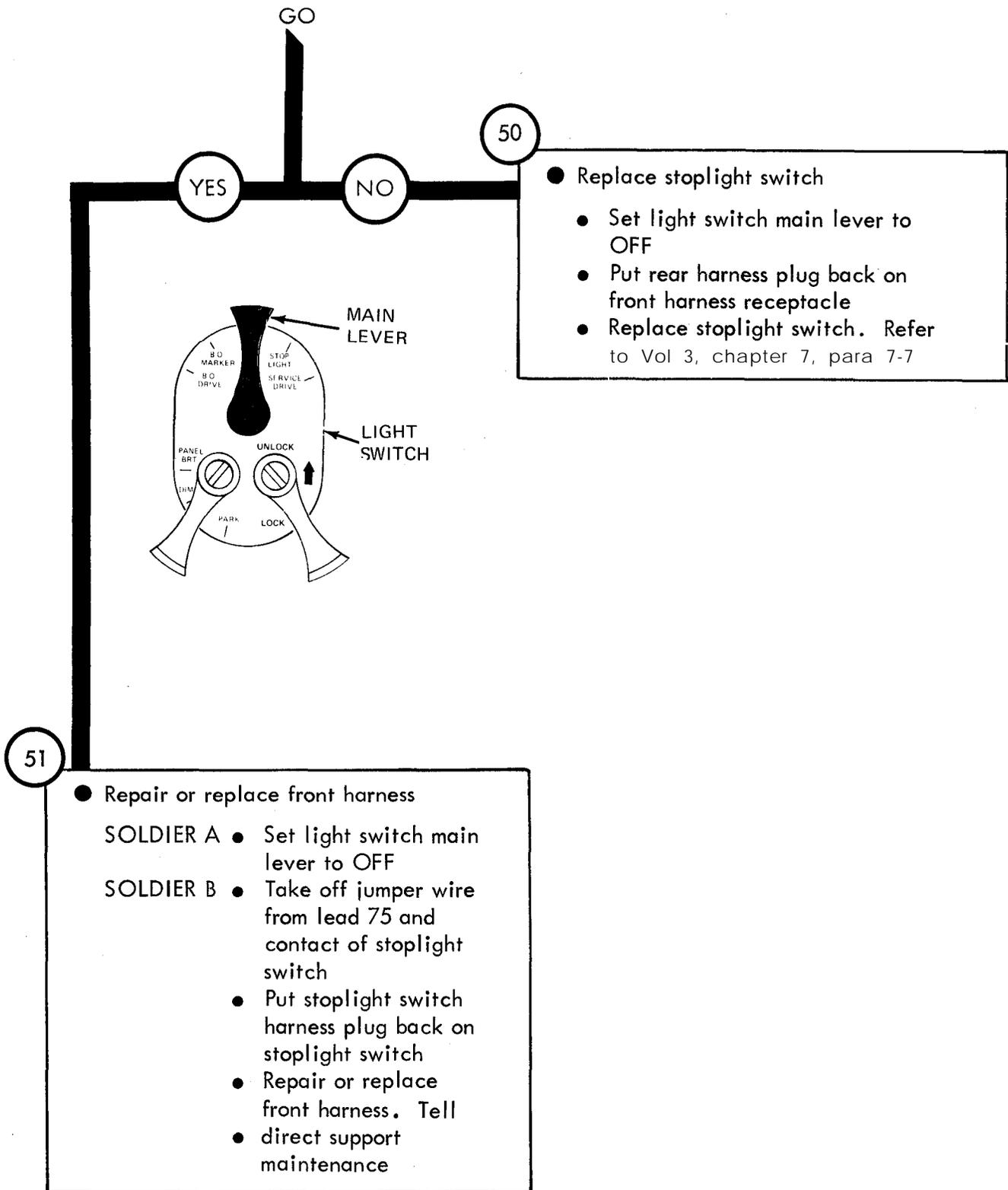


Figure 26-11 (Sheet 27 of 27)

Symptom

12

ONE BLACKOUT STOPLIGHT DOES NOT LIGHT,
OTHER BLACKOUT STOPLIGHT LIGHTS

NOTE

Two soldiers are needed to troubleshoot a blackout stoplight. Soldier A sits in the cab and operates the controls. Soldier B makes voltage checks with the multimeter

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-12 (Sheet 1 of 7)

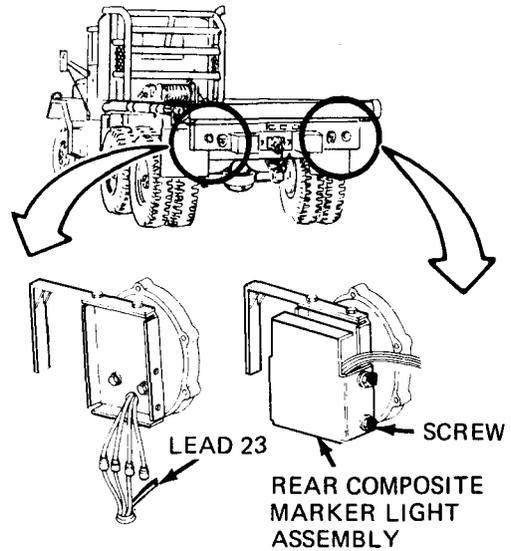
TA 115789

26-113

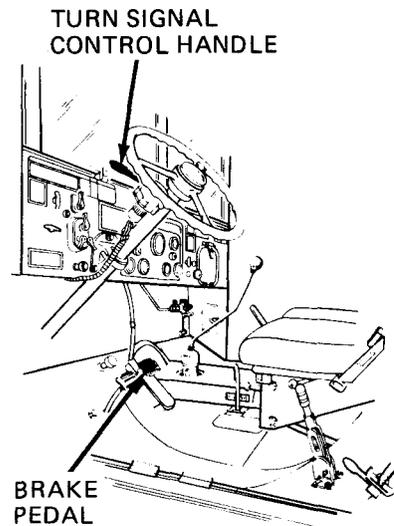
GO

2

- Check for +24 volts at blackout stoplight
- SOLDIER B ● Using 7/16-inch wrench, unscrew and take off four screws with washers from blackout light assembly
- Take off cover
- Take off lead 23
- SOLDIER A ● Set light switch main lever to B. O. MARKER
- Make sure turn signal control handle is in neutral position



- SOLDIER B ● Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- SOLDIER A ● Put multimeter + lead on lead 23 and - lead on a good ground
- SOLDIER A ● Press down on brake pedal and hold it down
- SOLDIER B ● Read multimeter while Soldier A presses down an brake pedal. Multimeter should measure +24 volts DC



Does multimeter measure less than +24 volts DC?

GO

Figure 26-12 (Sheet 2 of 7)

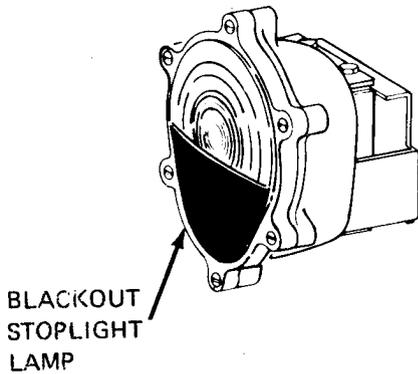
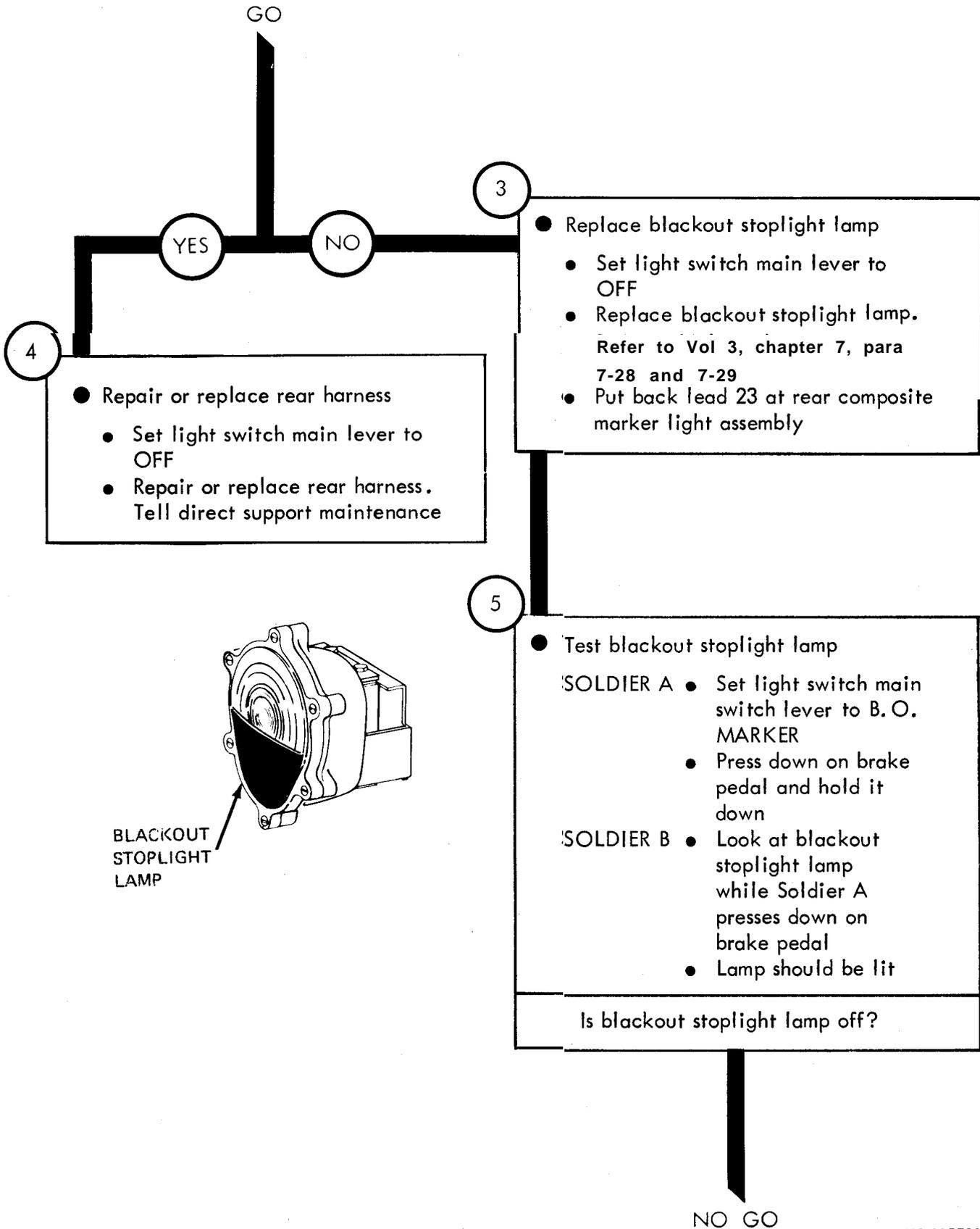
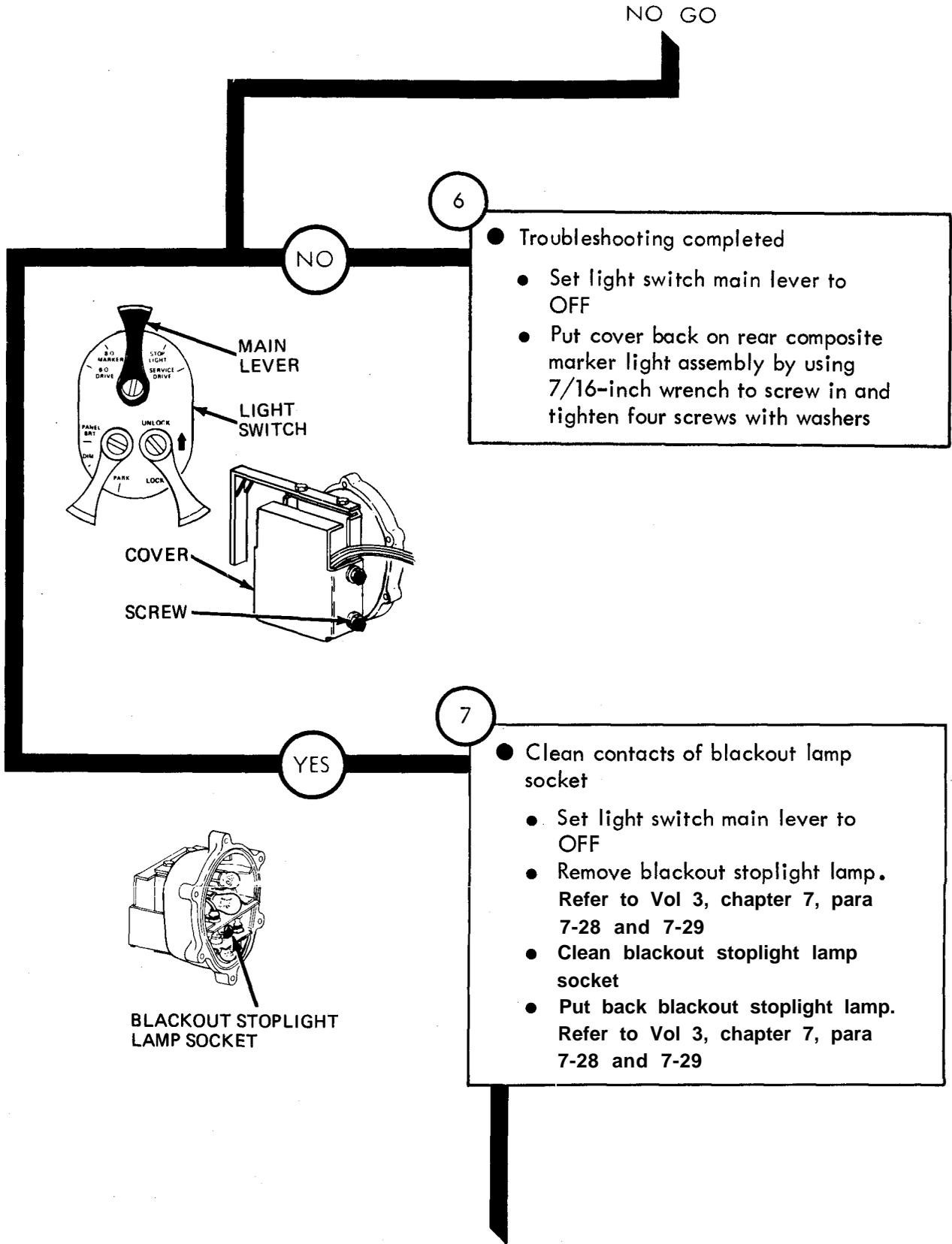


Figure 26-12 (Sheet 3 of 7)

TA 115791

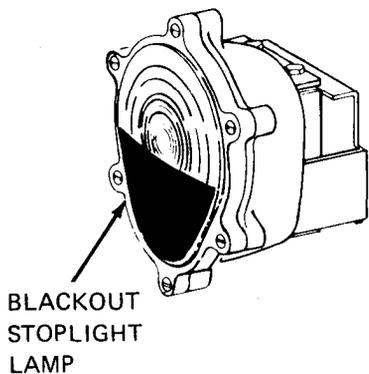
NO GO



NO GO

Figure 26-12 (Sheet 4 of 7)

TA 115792



NO GO

8

- Test blackout stoplight lamp

SOLDIER A

- Set light switch main switch lever to B.O. MARKER
- Press down on brake pedal and hold it down

SOLDIER B

- Look at blackout stoplight lamp while Soldier A presses down on brake pedal
- Lamp should be lit

Is blackout stoplight lamp off?

9

- Troubleshooting completed

- Set light switch main lever to OFF
- Put cover back on rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers

YES

NO

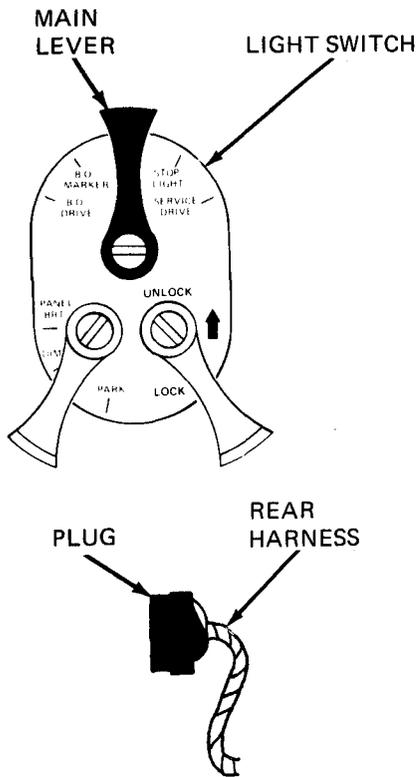
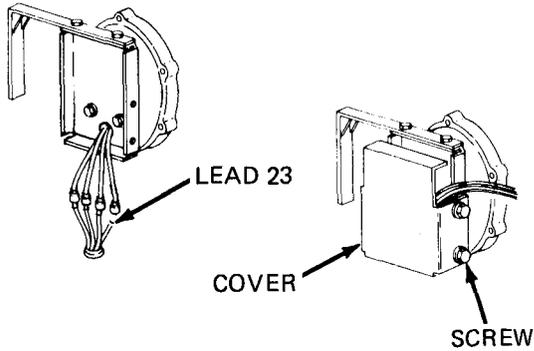
NO GO

Figure 26-12 (Sheet 5 of 7)

NO GO

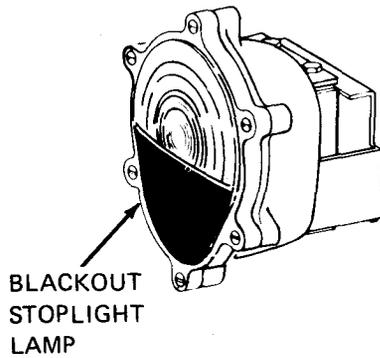
10

- Clean contacts of blackout stoplight lamp connectors
- Take off lead 23 from rear of rear composite marker assembly
- Clean lead 23 contacts
- Put lead 23 back in rear of rear composite marker assembly
- Put cover back on rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers



NO GO

Figure 26-12 (Sheet 6 of 7)



NO GO

11

- Test blackout stoplight lamp

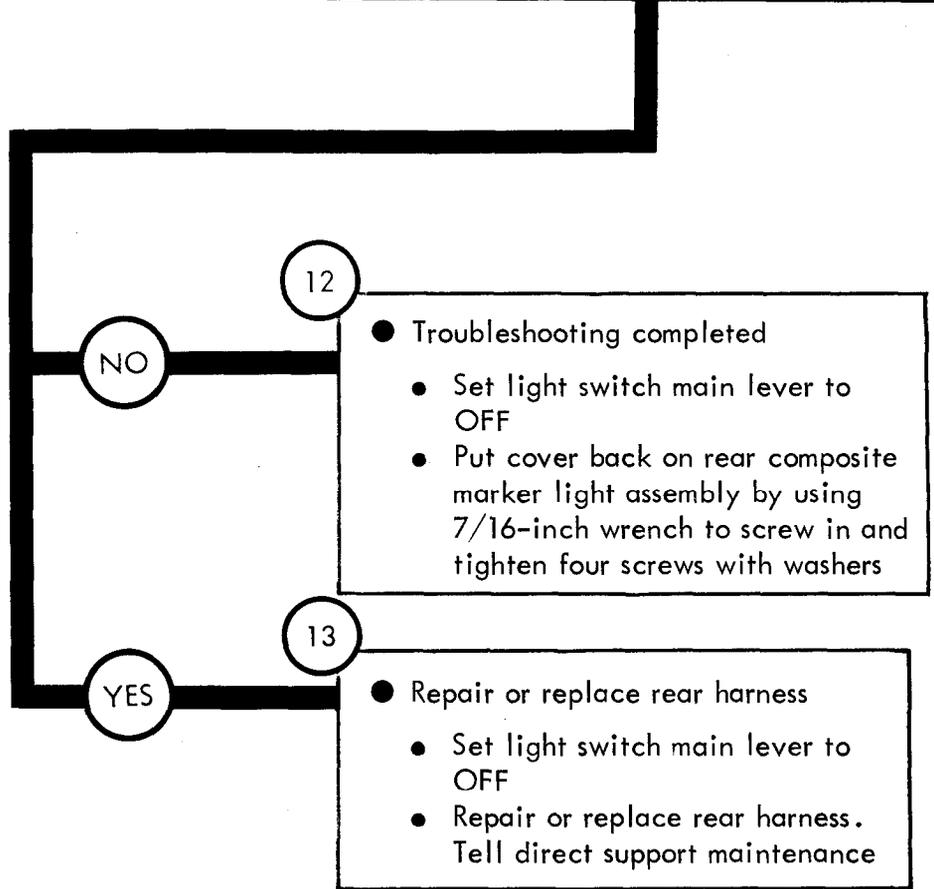
SOLDIER A

- Set light switch main switch lever to B.O. MARKER
- Press down on brake pedal and hold it down

SOLDIER B

- Look at blackout stoplight lamp while Soldier A presses down on brake pedal
- Lamp should be lit

Is blackout stoplight lamp off?



TA 115795

Figure 26-12 (Sheet 7 of 7)

Symptom

13

BOTH BLACKOUT STOPLIGHTS DO NOT LIGHT,
OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

Two soldiers are needed to troubleshoot the blackout stoplights. Soldier A sits in the cab and operates the controls. Soldier B makes voltage checks with the multimeter

When checking voltage +24 volts DC means a range of +23 to +26 volts DC

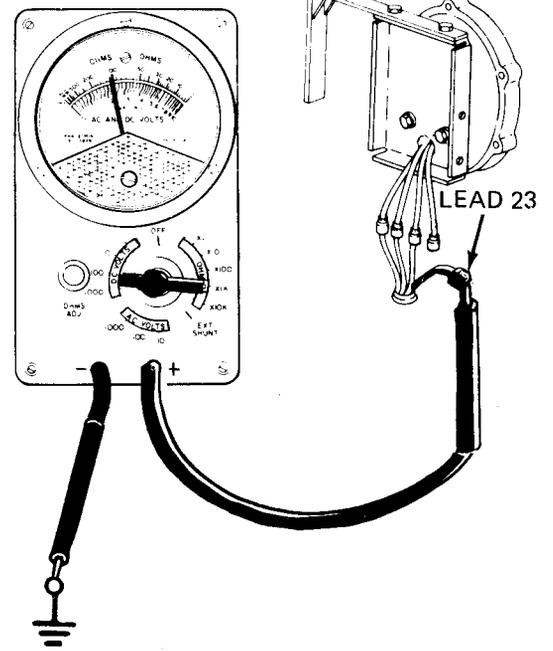
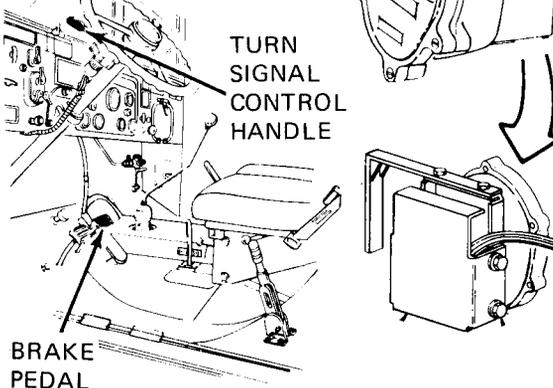
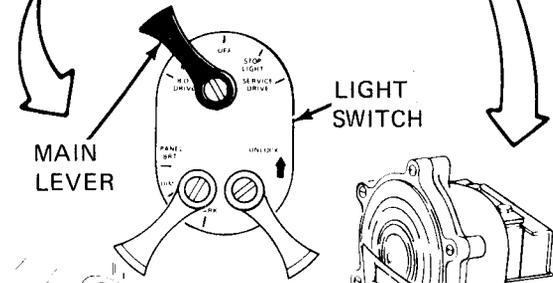
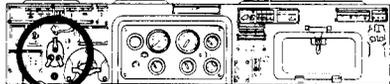
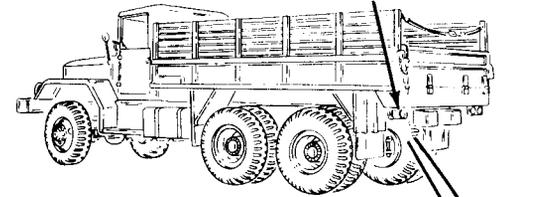
1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-13 (Sheet 1 of 30)

LEFT REAR COMPOSITE MARKER LIGHT ASSEMBLY



GO

2

- Check for +24 volts DC at left blackout stoplight
- SOLDIER B ● Using 7/16-inch wrench, unscrew and take off four screws with washers from left composite marker light assembly
 - Take off cover
 - Take off lead 23 from rear of left rear composite marker light assembly
- SOLDIER A ● Make sure turn signal control handle is in neutral position
 - Set light switch main lever to BLACKOUT MARKER

- SOLDIER B ● Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter + lead on lead 23 and - lead on a good ground
- SOLDIER A ● Press down on brake pedal and hold it down
- SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO

Figure 26-13 (Sheet 2 of 30)

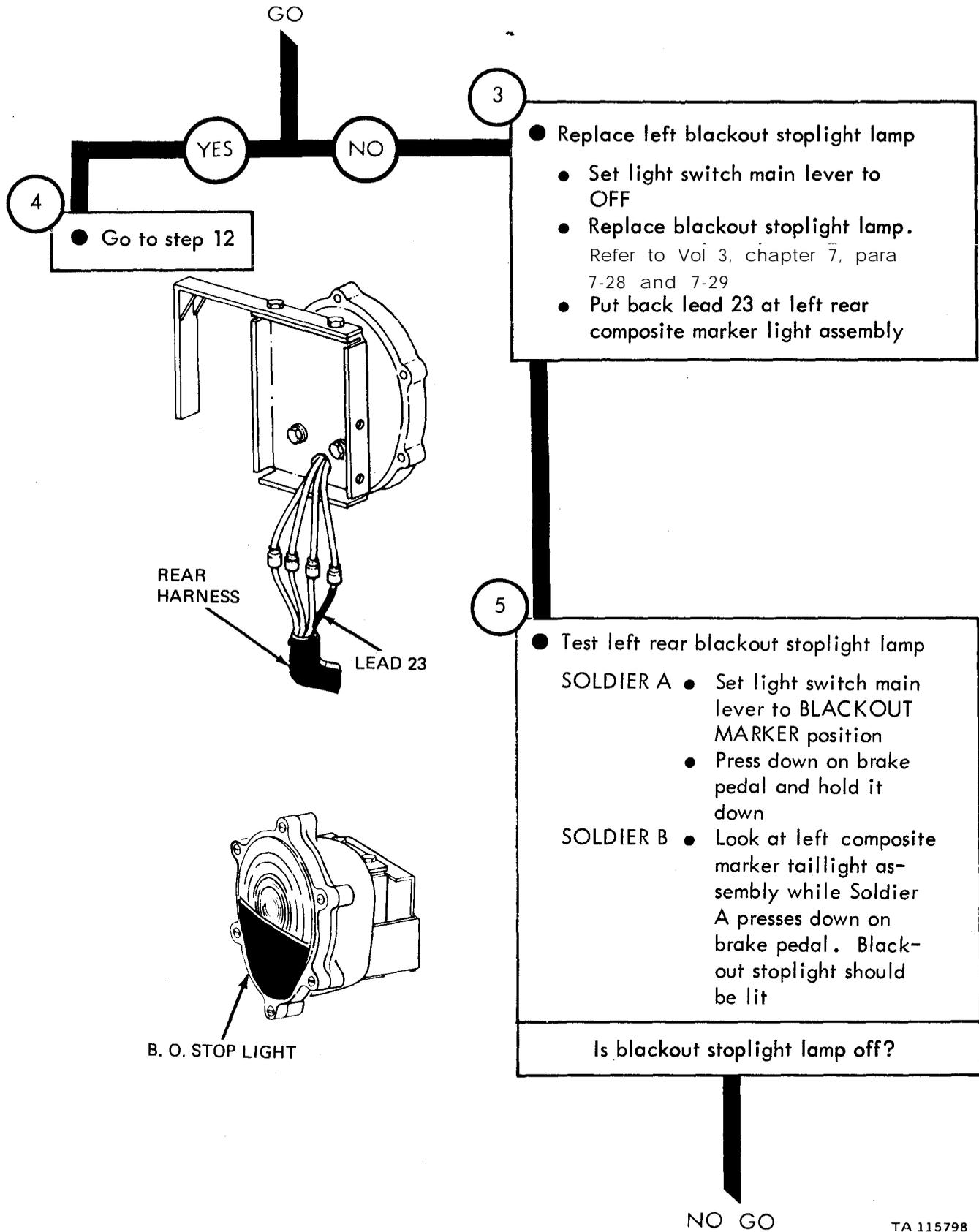


Figure 26-13 (Sheet 3 of 30)

TA 115798

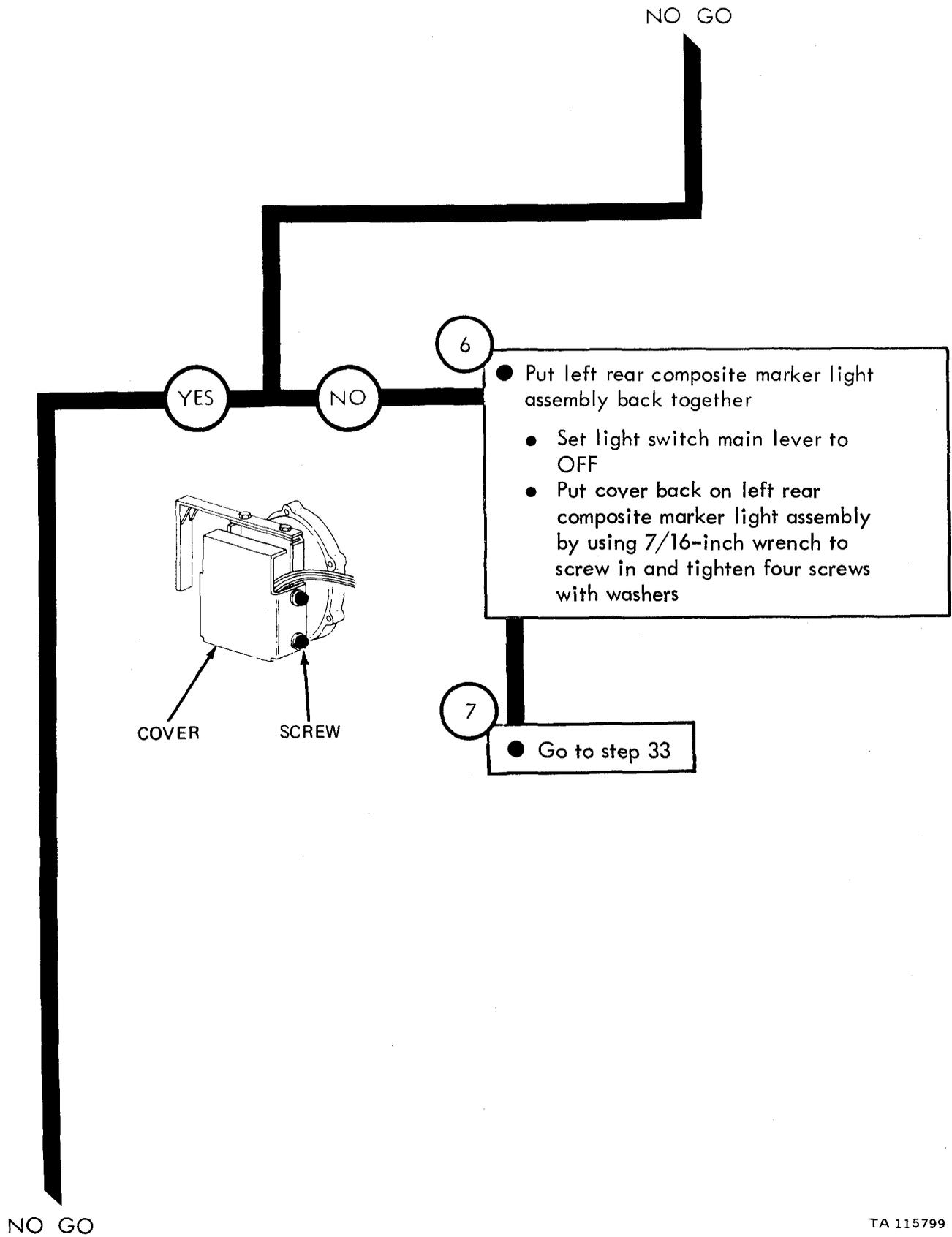
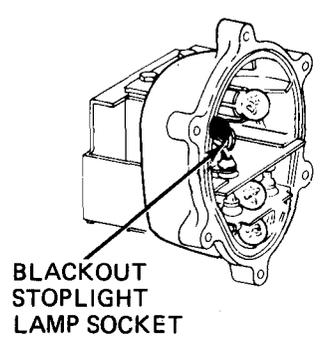


Figure 26-13 (Sheet 4 of 30)

NO GO

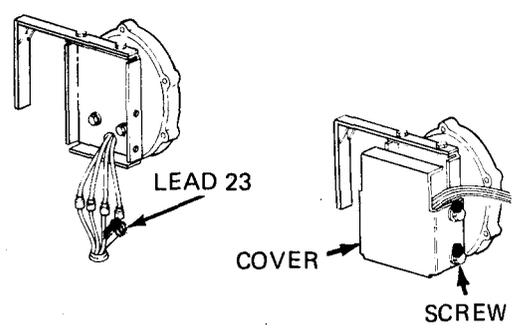
8

- Clean contacts of left blackout stoplight lamp socket
- Remove blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
- Clean blackout stoplight lamp socket
- Replace blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29



9

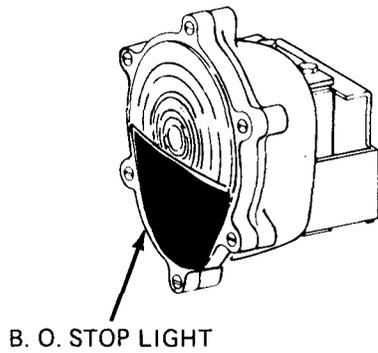
- Clean contacts of left blackout stoplight lamp connectors
- Take off lead 23 from rear of left composite marker light assembly
- Clean lead 23 contacts
- Put lead 23 back into rear of left rear composite marker assembly
- Put cover back on left rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers



NO GO

Figure 26-13 (Sheet 5 of 30)

NO GO

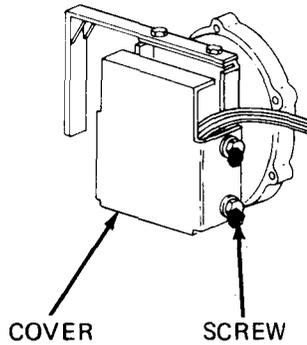


10

- Test left rear blackout stoplight lamp
- SOLDIER A ● Set light switch main lever to BLACKOUT MARKER position
 - Press down on brake pedal and hold it down
- SOLDIER B ● Look at left composite marker taillight assembly while Soldier A presses down on brake pedal. Blackout stoplight should be lit

Is blackout stoplight lamp off?

NO



11

- Put left rear composite marker light assembly back together
 - Set light switch main lever to OFF
 - Put cover back on left rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers

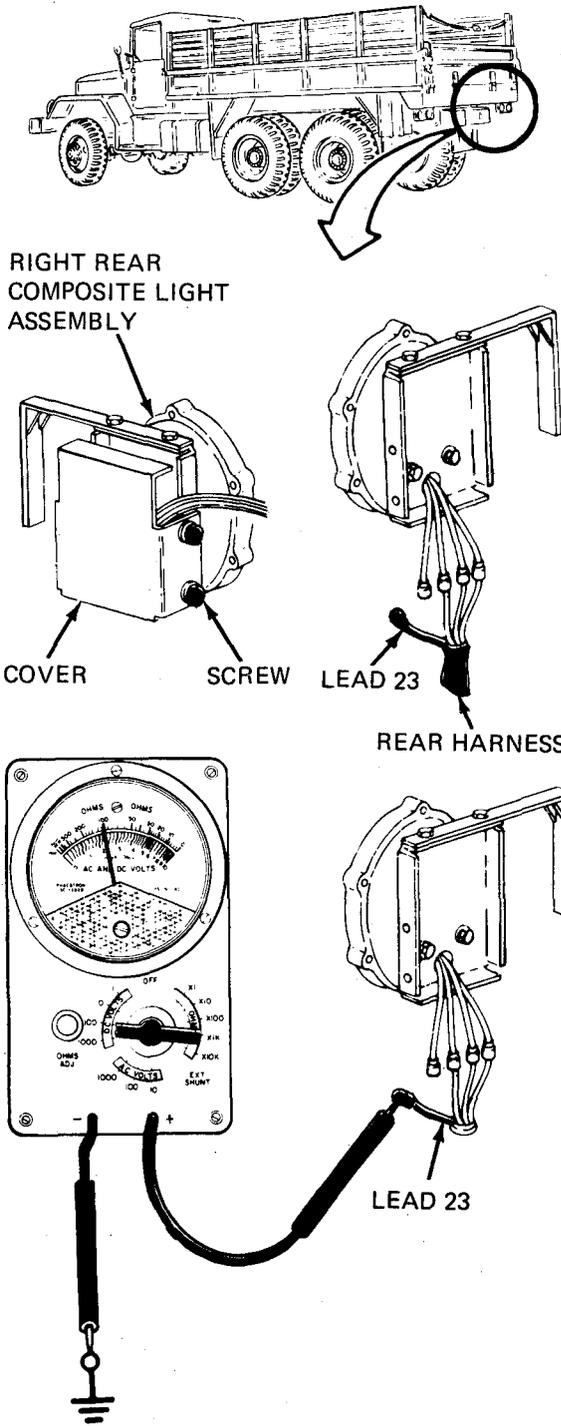
NO GO

Figure 26-13 (Sheet 6 of 30)

NO GO

YES

12



- Check for +24 volts DC at right blackout stoplight

- SOLDIER B ● Using 7/16-inch wrench unscrew and take off four screws with washers from right rear composite marker light assembly
- Take off cover
 - Take off lead 23 from rear composite marker light assembly

- SOLDIER A ● Set light switch main lever to BLACKOUT MARKER position

- SOLDIER B ● Put multimeter + lead on lead 23 and - lead on a good ground

- SOLDIER A ● Press down on brake pedal and hold it down

- SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

NO GO

TA 115802

Figure 26-13 (Sheet 7 of 30)

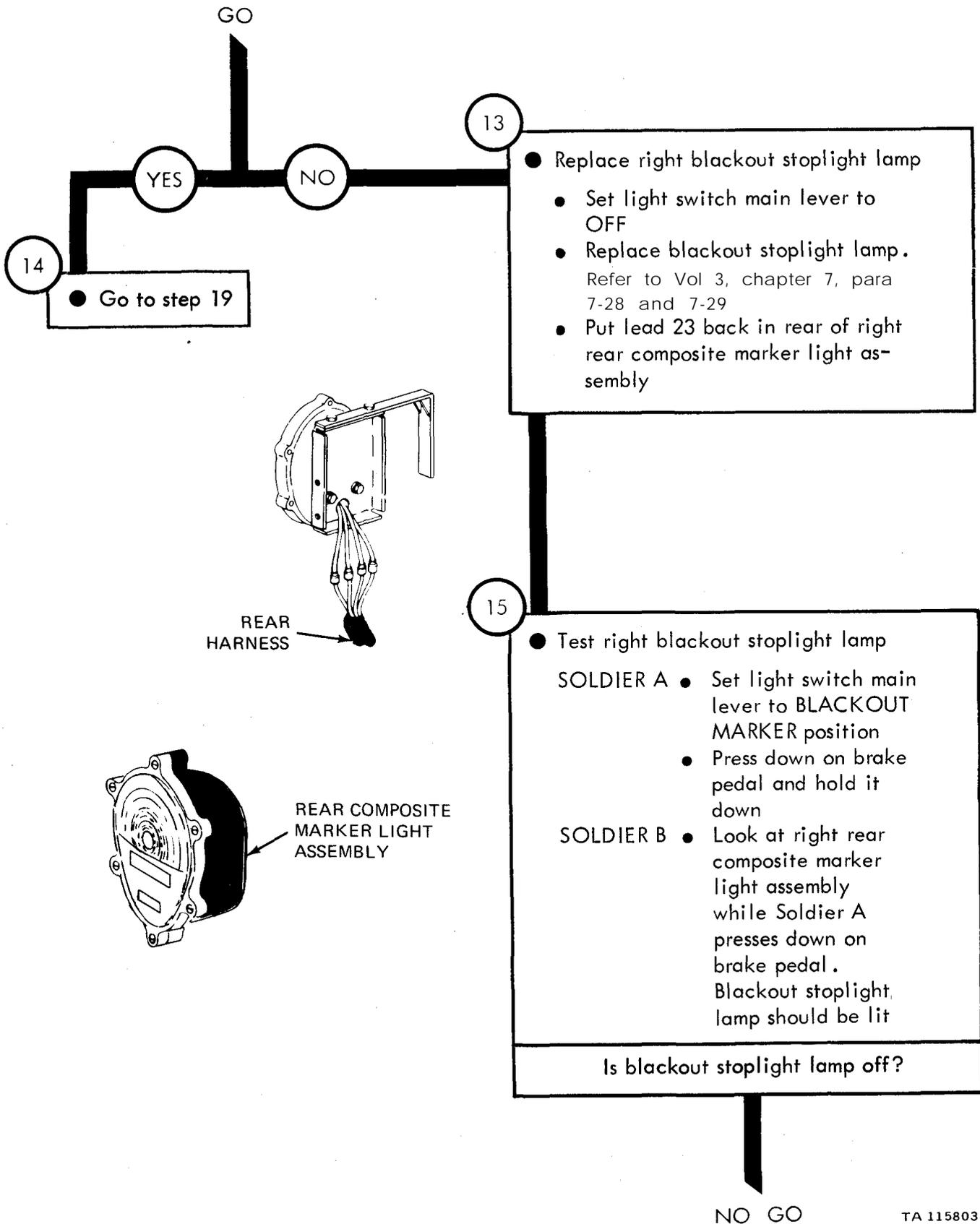
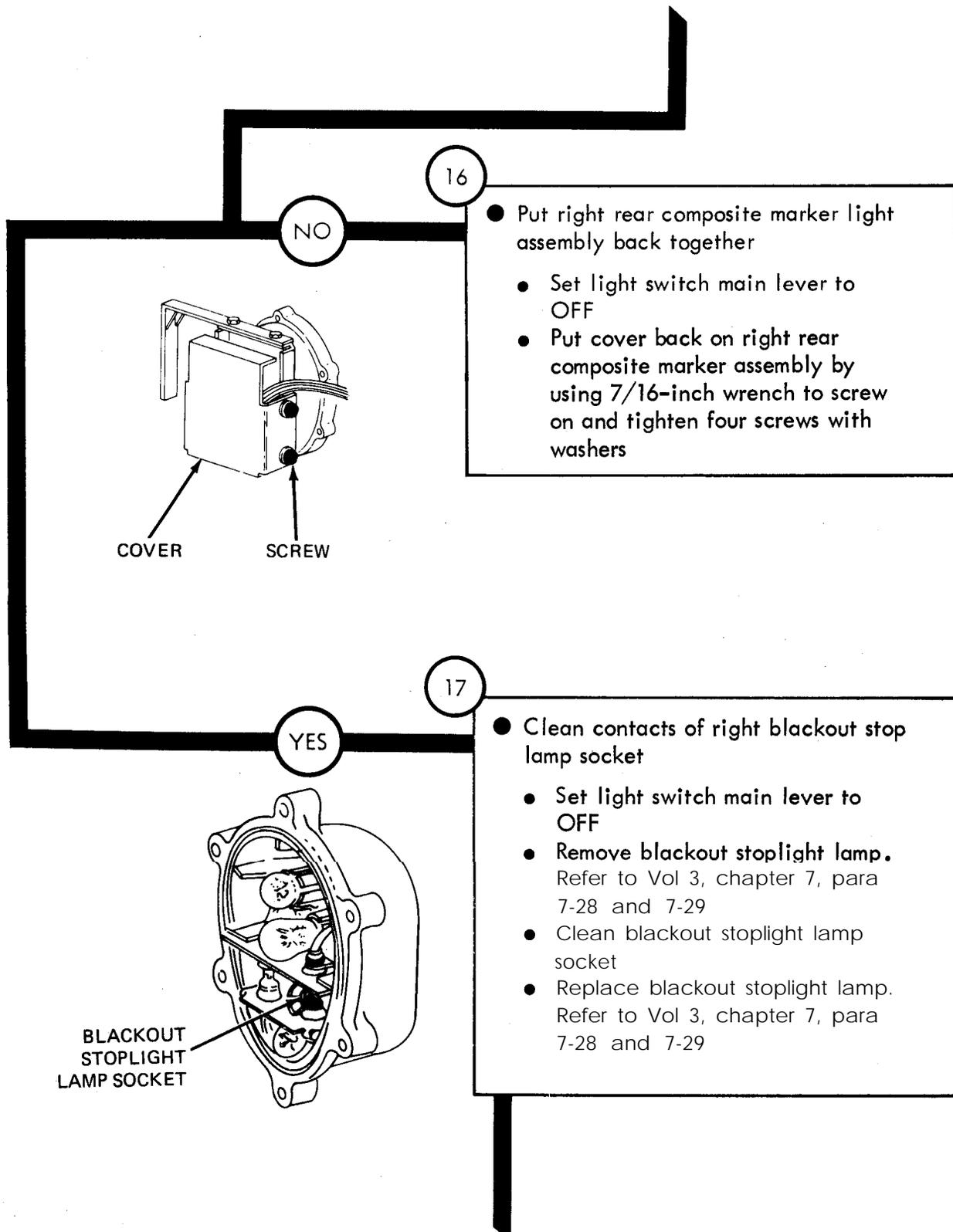


Figure 26-13 (Sheet 8 of 30)

TA 115803

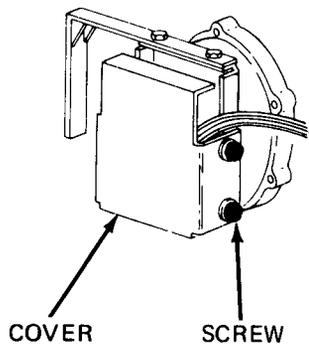
NO GO



16

NO

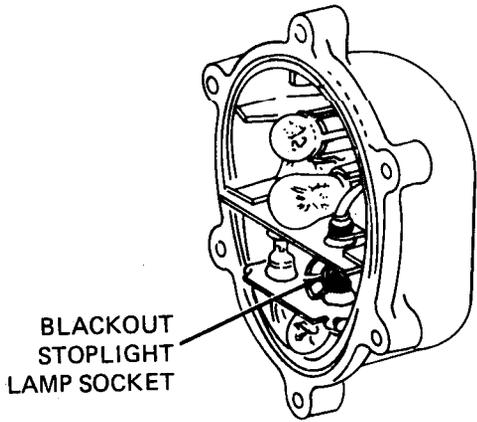
- Put right rear composite marker light assembly back together
- Set light switch main lever to OFF
- Put cover back on right rear composite marker assembly by using 7/16-inch wrench to screw on and tighten four screws with washers



17

YES

- Clean contacts of right blackout stop lamp socket
- Set light switch main lever to OFF
- Remove blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
- Clean blackout stoplight lamp socket
- Replace blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29



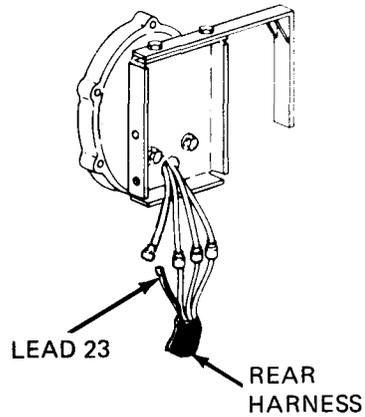
NO GO

TA 115804

Figure 26-13 (Sheet 9 of 30)

NO GO

18



- Clean contacts of right blackout stoplight lamp connectors
- Take off lead 23 from right rear composite marker light assembly
- Clean lead 23 contacts
- Put lead 23 back into right rear composite marker light assembly
- Put cover back on right rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers

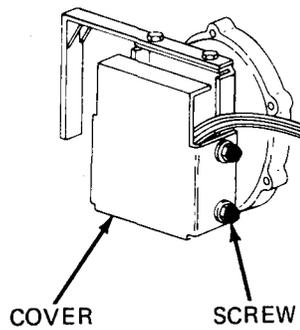


Figure 26-13 (Sheet 10 of 30)

TA 115805

26-129

From step 14

19

- Check voltage to front harness receptacle
- SOLDIER B ● Unscrew and take rear harness plug from dash harness receptacle
- SOLDIER A ● Step on brake pedal and hold it down
- SOLDIER B ● Put multimeter + lead on contact C of front harness receptacle
- Put multimeter - lead on a good ground
- Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC ?

GO

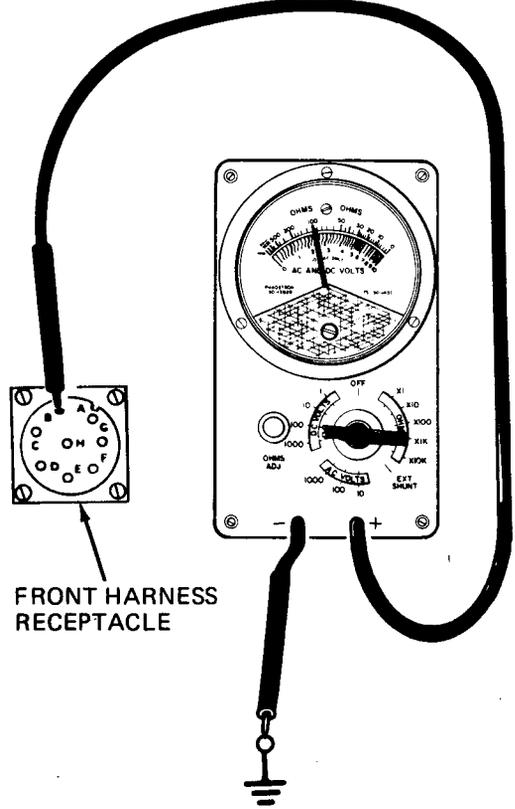
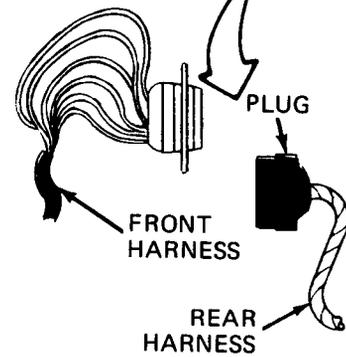
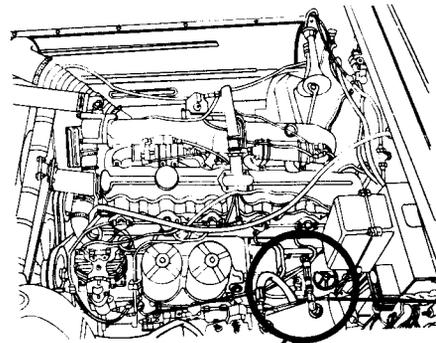
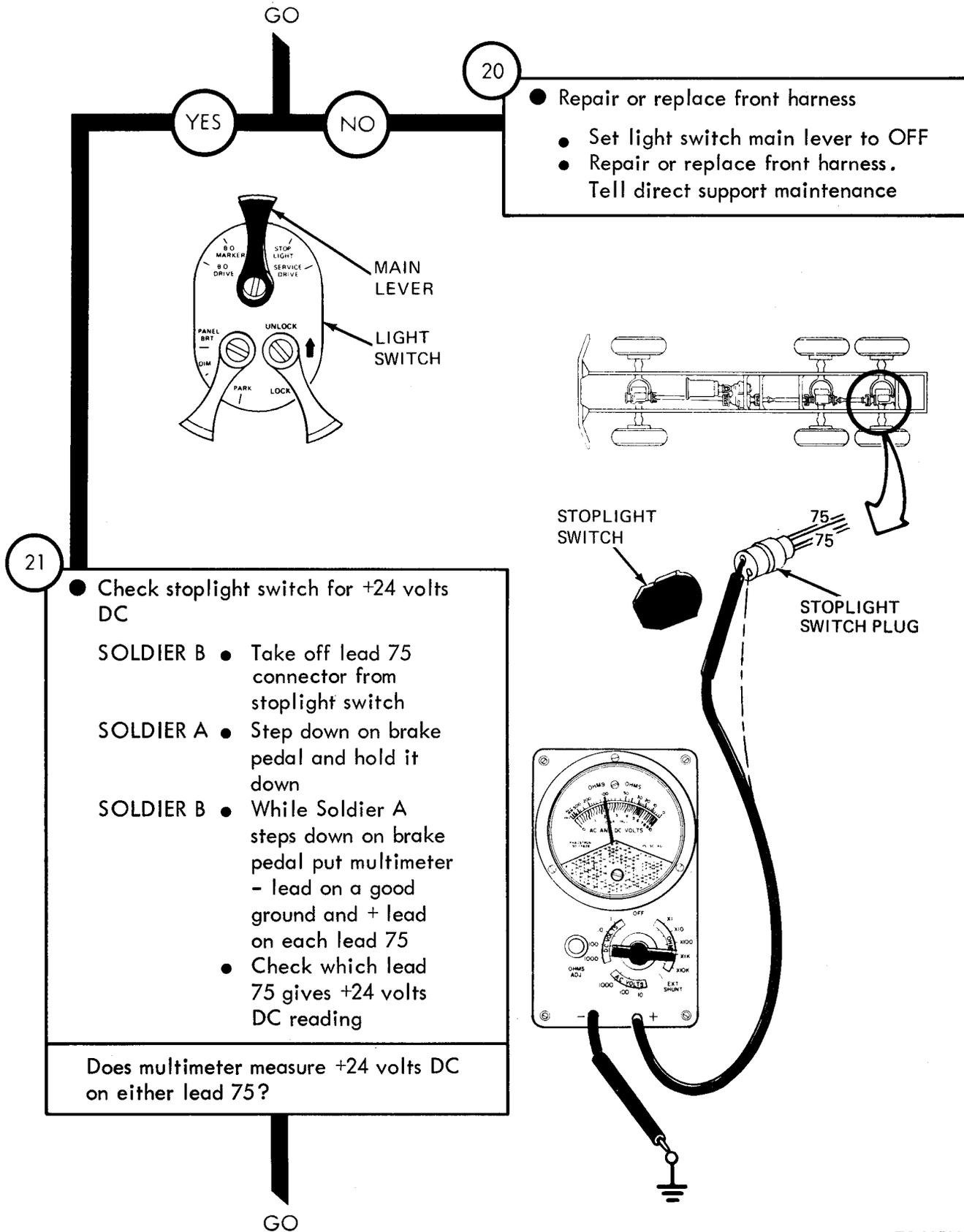


Figure 26-30 (Sheet 11 of 30)



TA 115807

Figure 26-13 (Sheet 12 of 30)

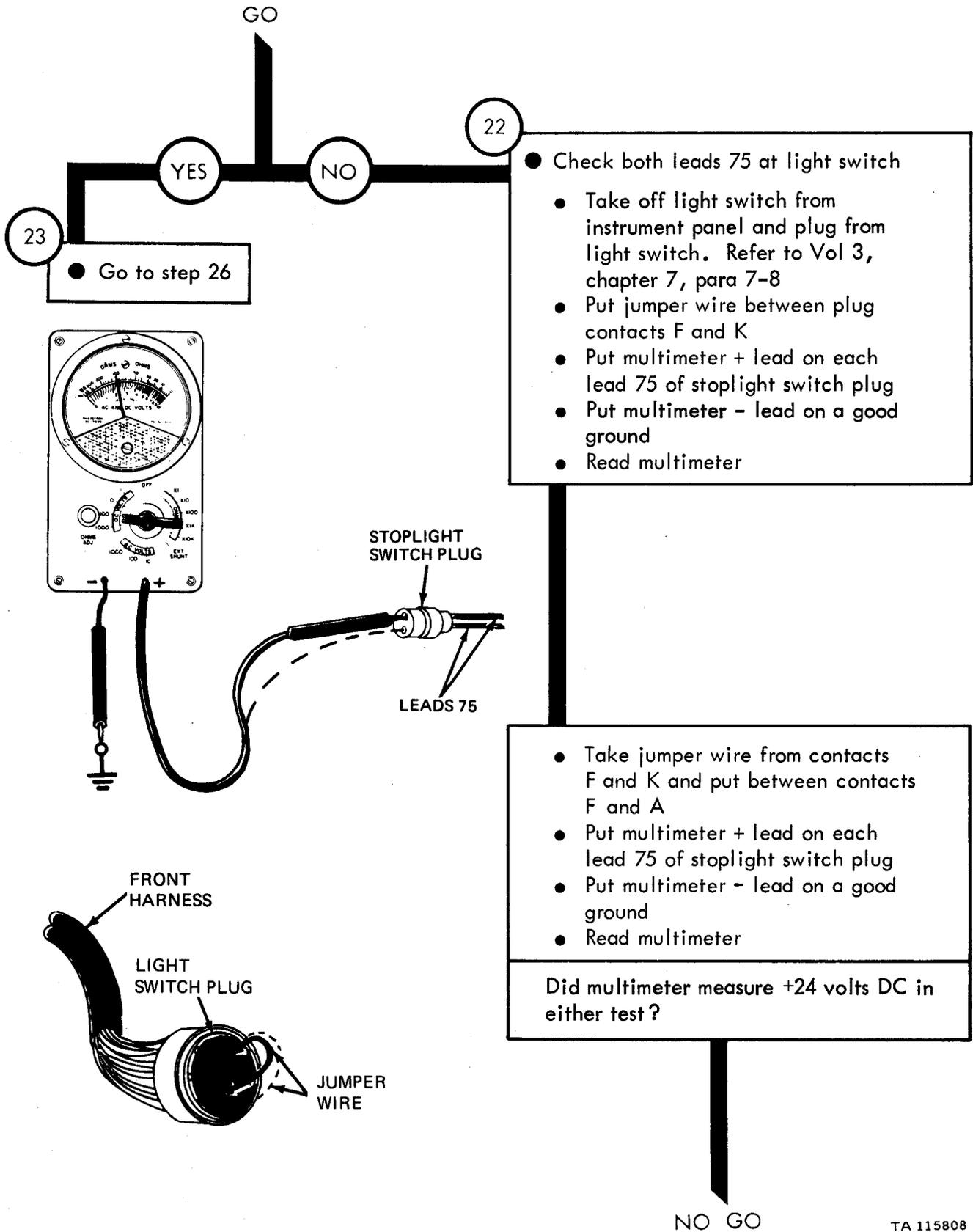


Figure 26-13 (Sheet 13 of 30)

TA 115808

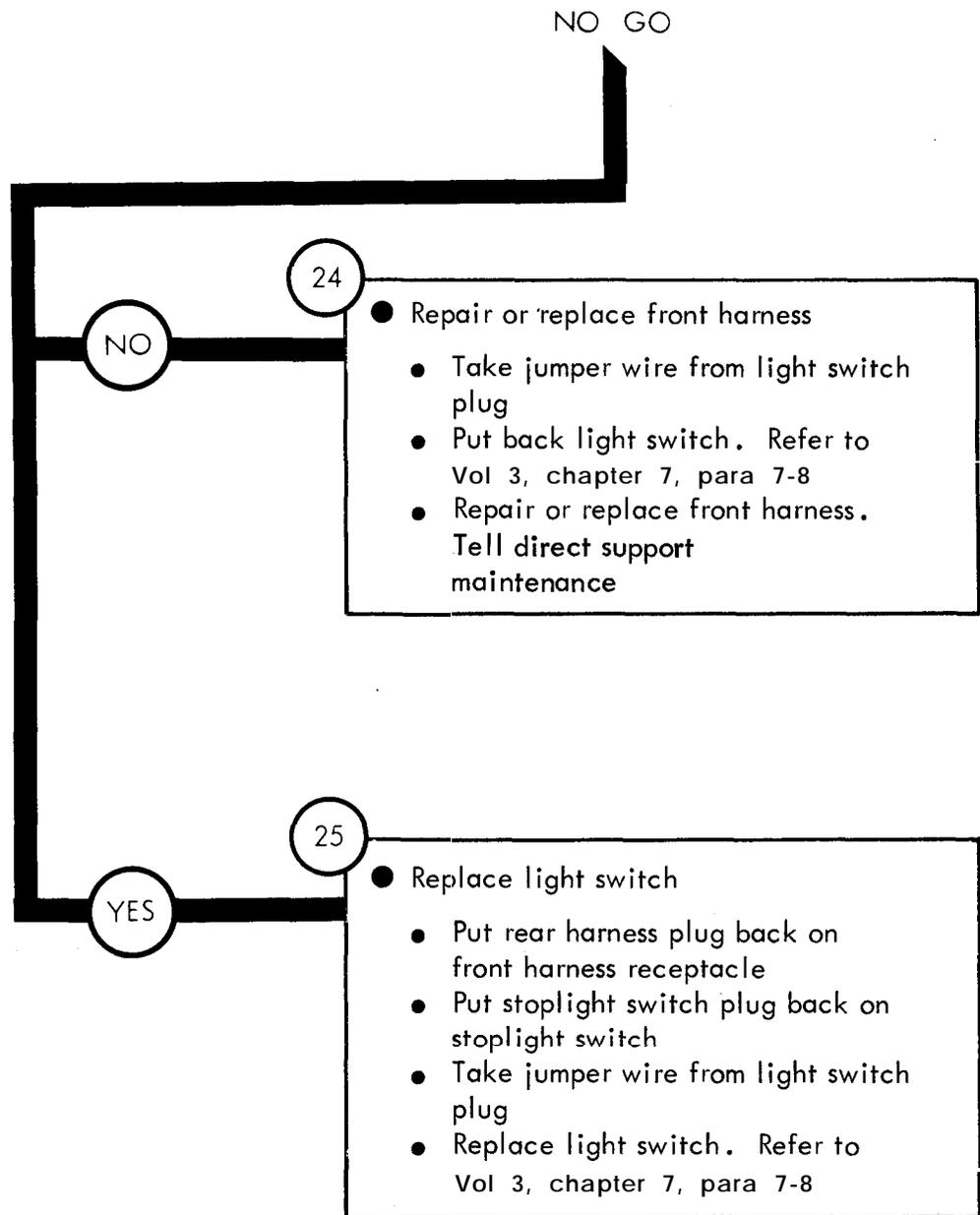
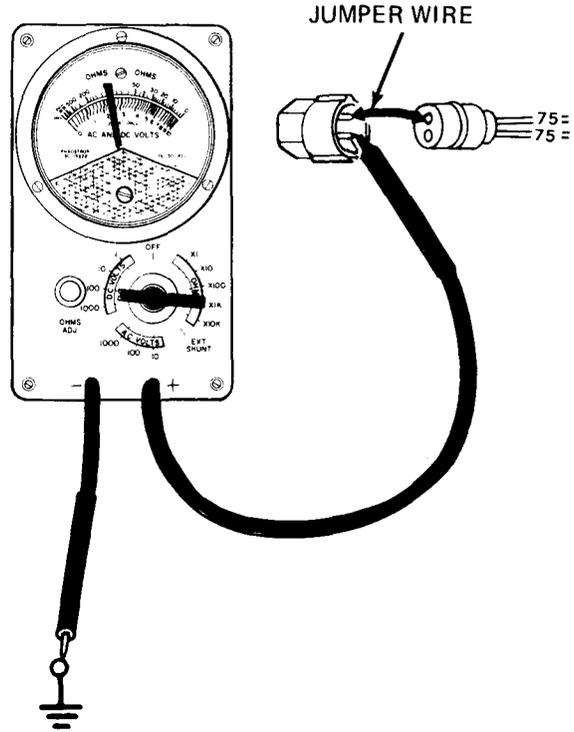


Figure 26-13 (Sheet 14 of 30)

From step 23

26

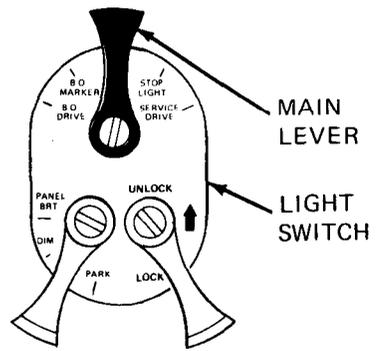
- Check for +24 volts DC through stoplight switch
 - Put jumper wire from lead 75 that gave +24 volts DC reading to either stoplight switch connector
 - Put multimeter + lead on other connector of brake switch and - lead on a good ground
 - With Soldier A still pressing down on brake pedal, read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure +24 volts DC?



YES NO

27

- Replace stoplight switch
 - Put rear harness plug back on front harness receptacle
 - Set light switch main lever to OFF
 - Replace stoplight switch. Refer to Vol 3, chapter 7, para 7-7



GO

Figure 26-13 (Sheet 15 of 30)

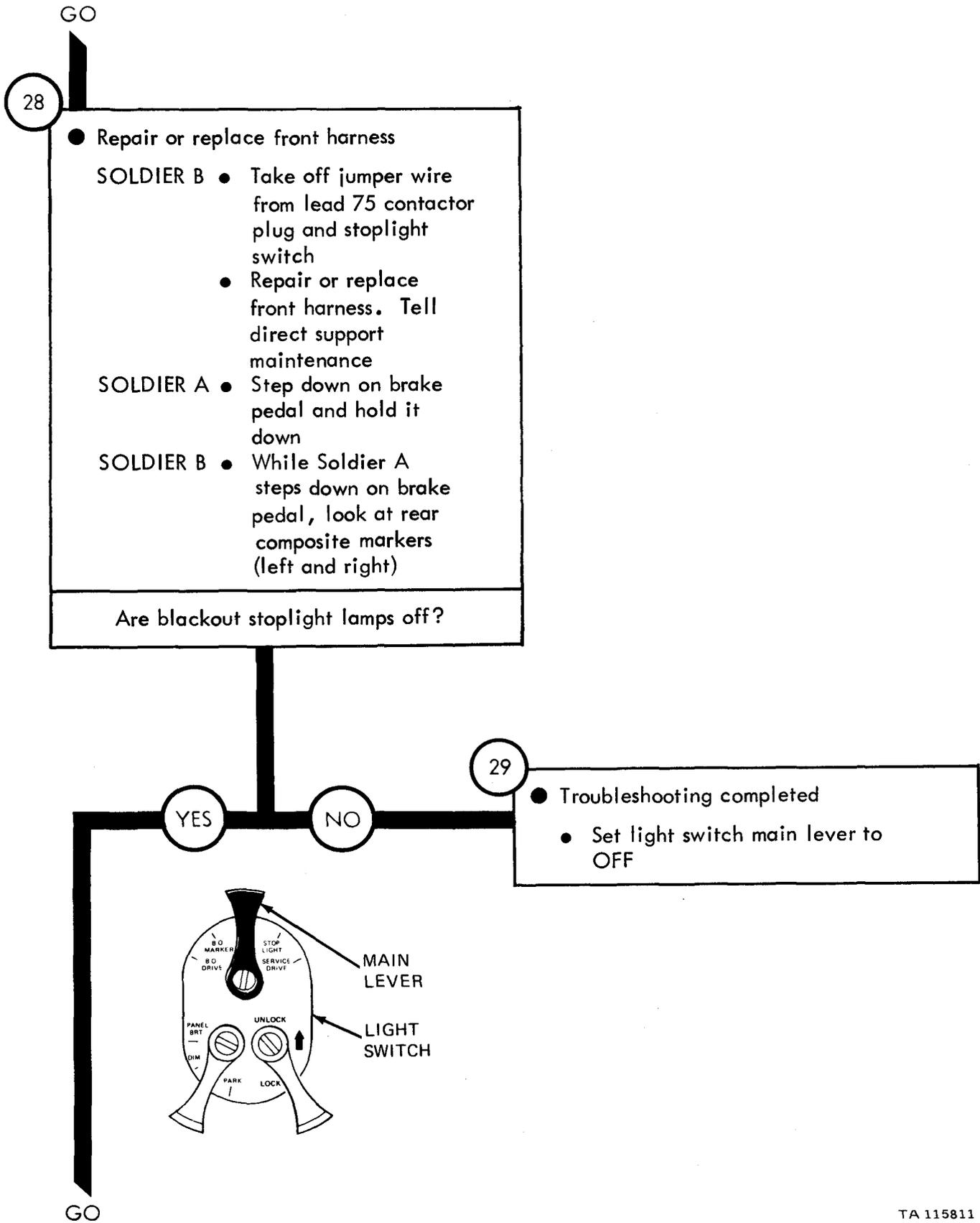


Figure 26-13 (Sheet 16 of 30)

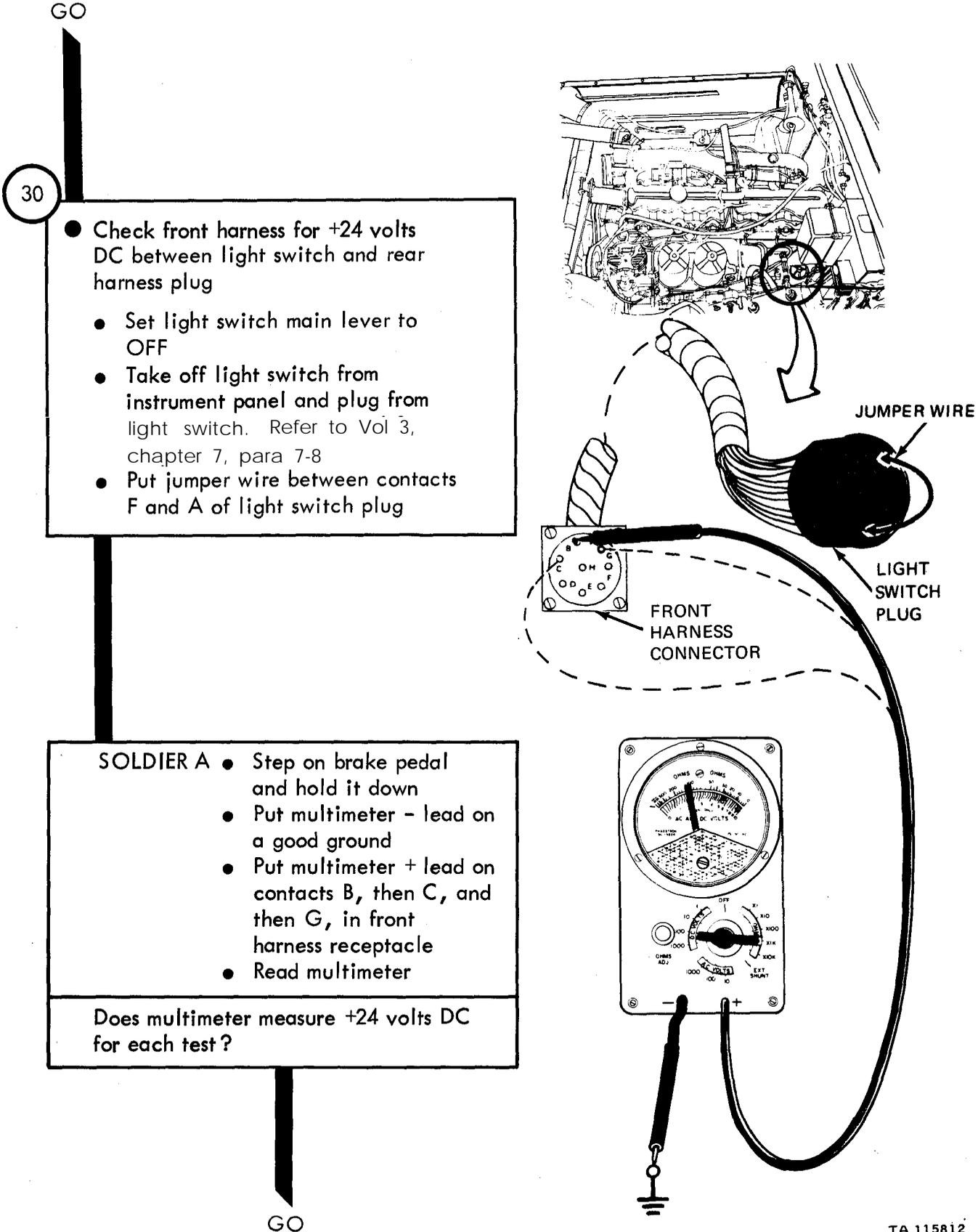


Figure 26-13 (Sheet 17 of 30)

TA 115812

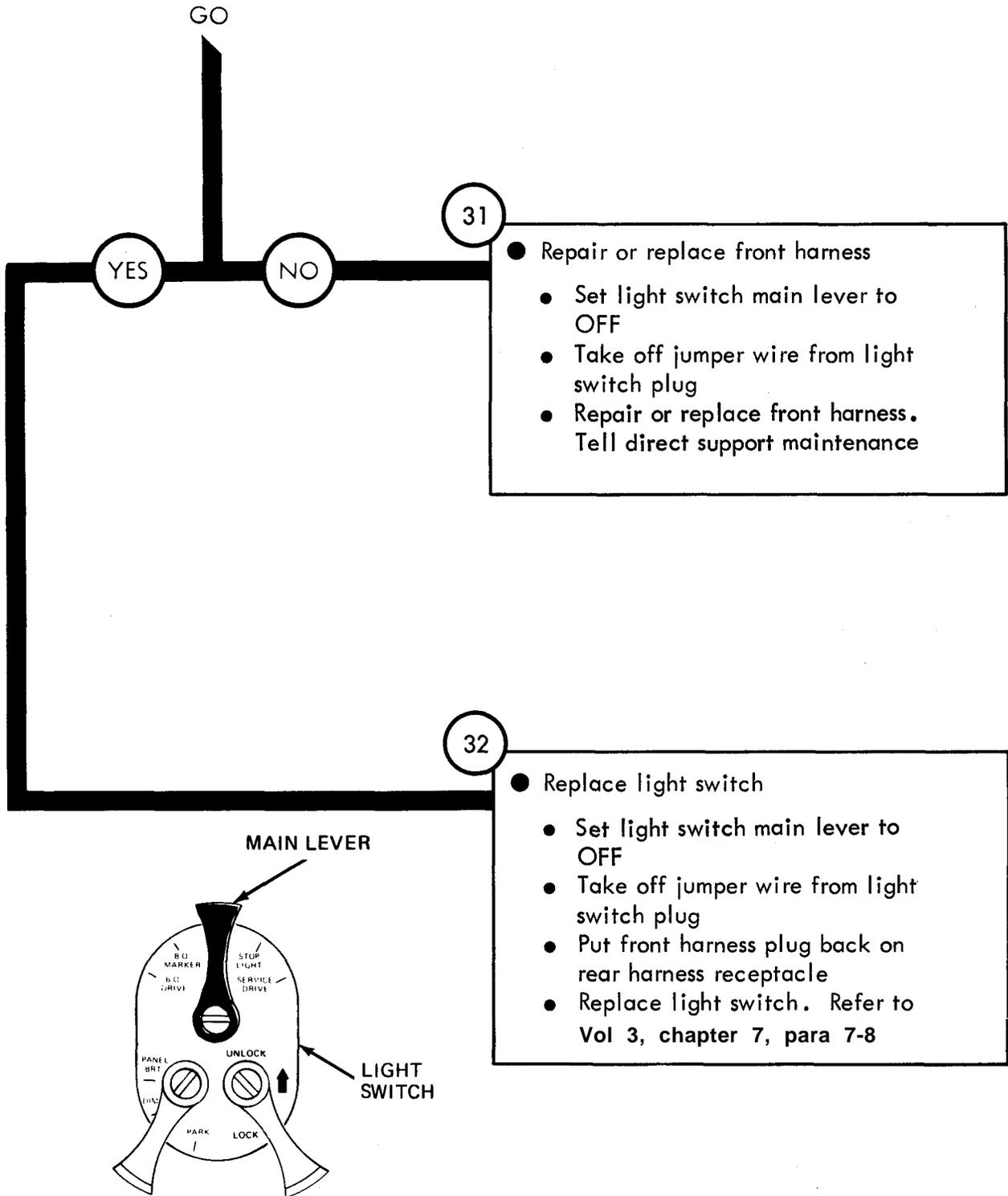
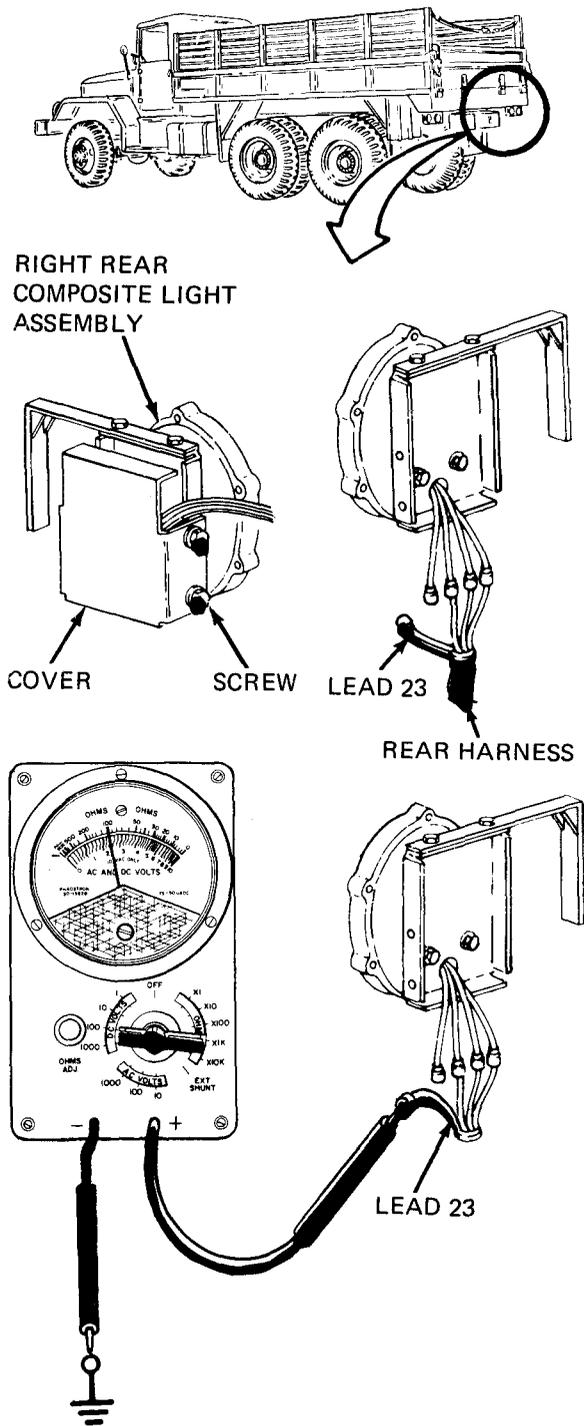


Figure 26-13 (Sheet 18 of 30)

TA 115813

From step 7



33

- Check for +24 volts DC at right blackout stoplight
- SOLDIER B ● Using 7/16-inch wrench unscrew and take off four screws with washers from right rear composite marker light assembly
- Take off cover
 - Take off lead 23 from rear composite marker light assembly

- SOLDIER A ● Set light switch main lever to BLACKOUT MARKER position
- SOLDIER B ● Put multimeter + lead on lead 23 and - lead on a good ground
- SOLDIER A ● Press down on brake pedal and hold it down
- SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

NOGO

Figure 26-13 (Sheet 19 of 30)

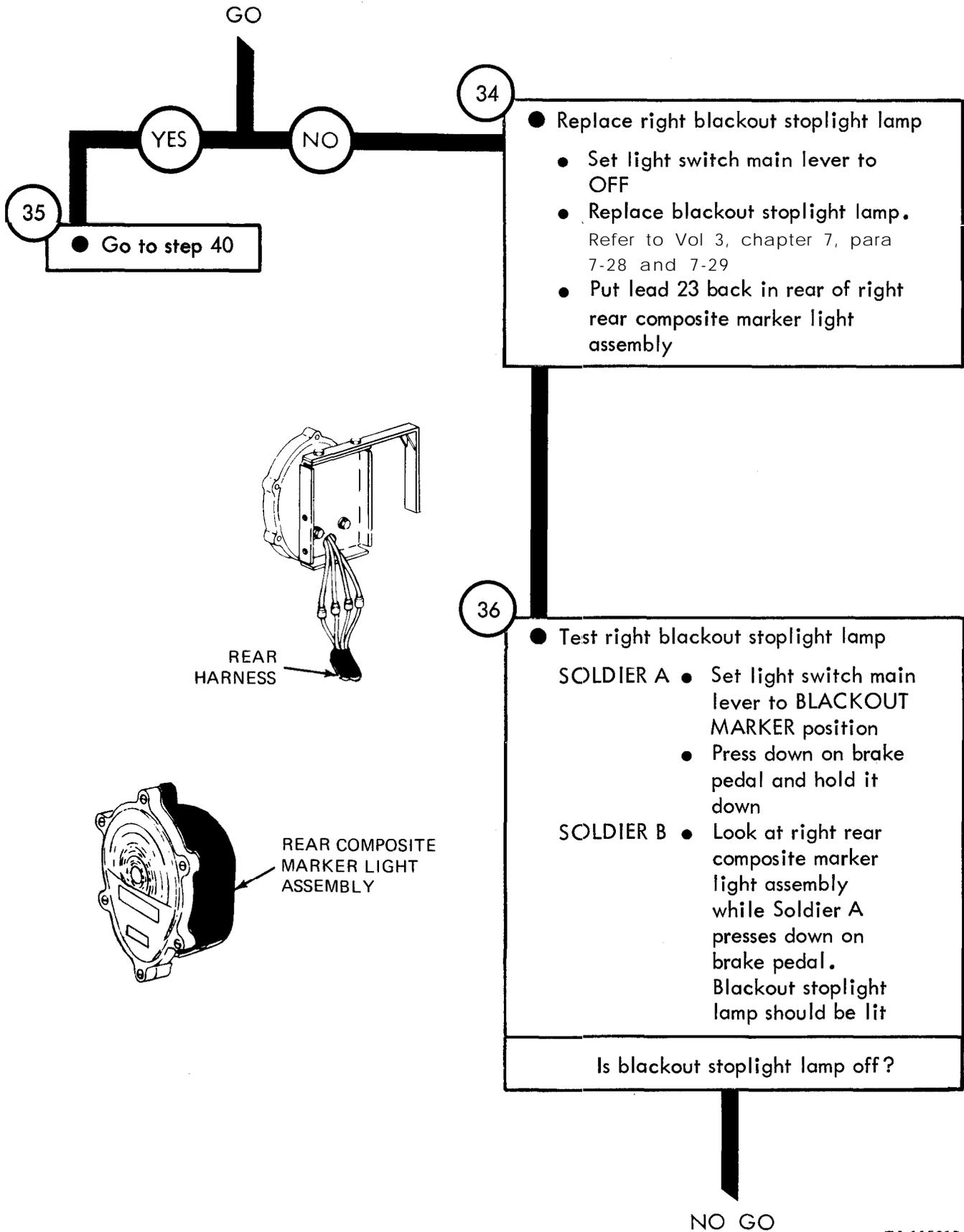
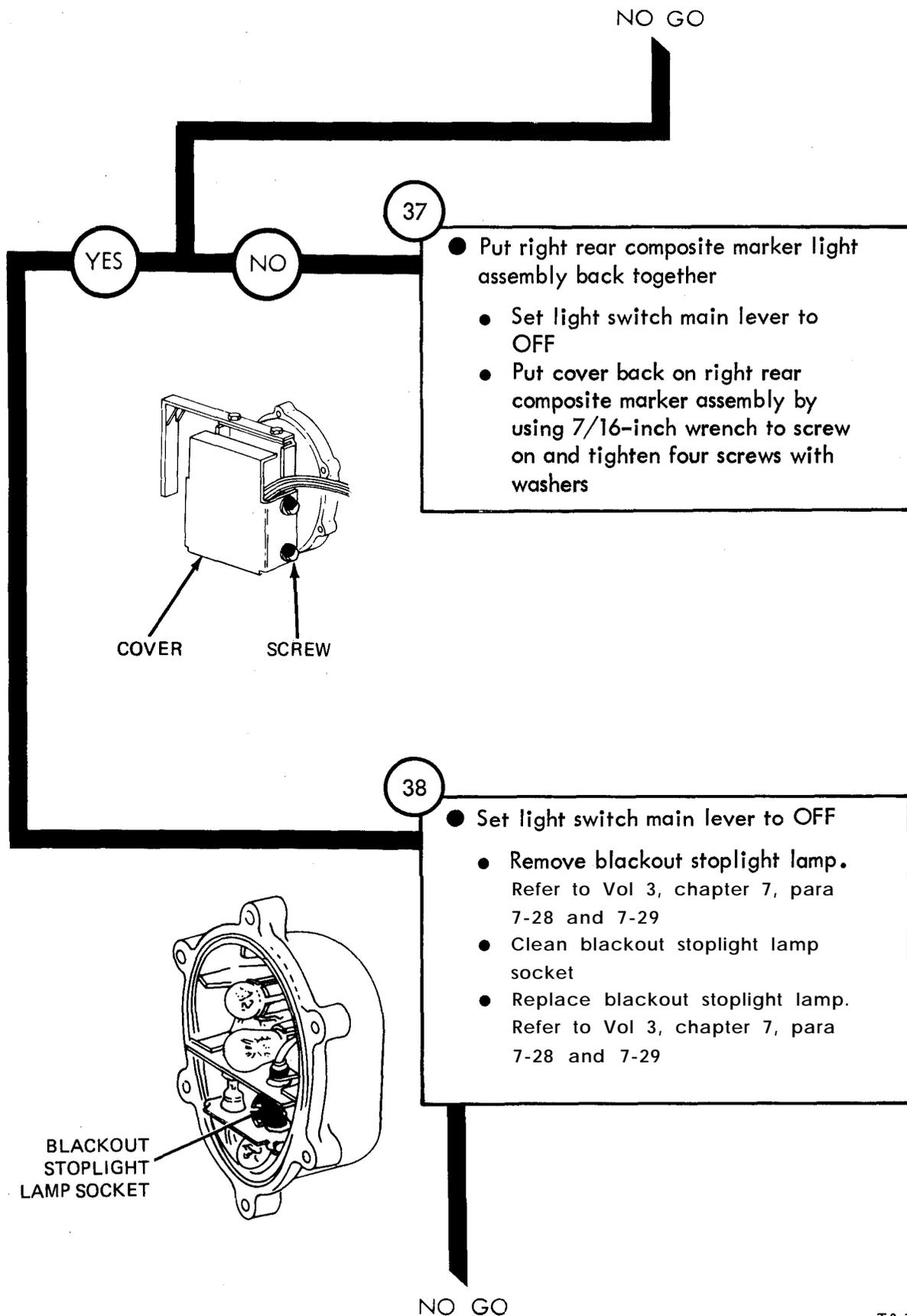


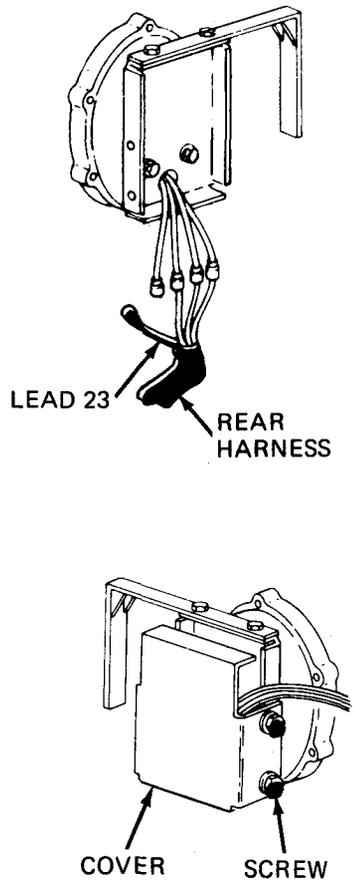
Figure 26-13 (Sheet 20 of 30)



TA 115816

Figure 26-13 (Sheet 21 of 30)

NO GO



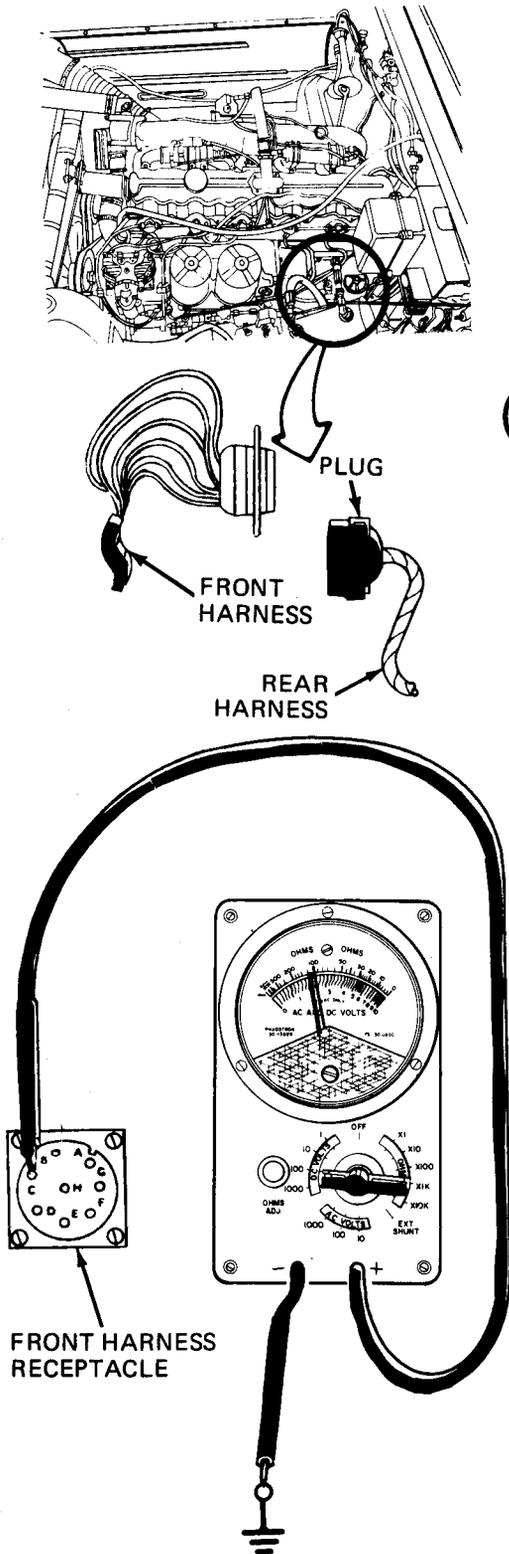
39

- Clean contacts of right blackout stoplight lamp connectors
 - Take off lead 23 from right rear composite marker light assembly
 - Clean lead 23 contacts
 - Put lead 23 back into right rear composite marker light assembly
 - Put cover back on right rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers

TA 115817

Figure 26-13 (Sheet 22 of 30)

From step 35



40

- Check voltage to front harness receptacle
- SOLDIER B ● Unscrew and take rear harness plug from dash harness receptacle
- SOLDIER A ● Step on brake pedal and hold it down
- SOLDIER B ● Put multimeter + lead on contact C of front harness receptacle
- Put multimeter - lead on a good ground
- Read multimeter for +24 volts DC while Soldier A presses down on brake pedal

Does multimeter measure +24 volts DC ?

NO GO

TS 211-20-524

Figure 26-13 (Sheet 23 of 30)

TA 115818

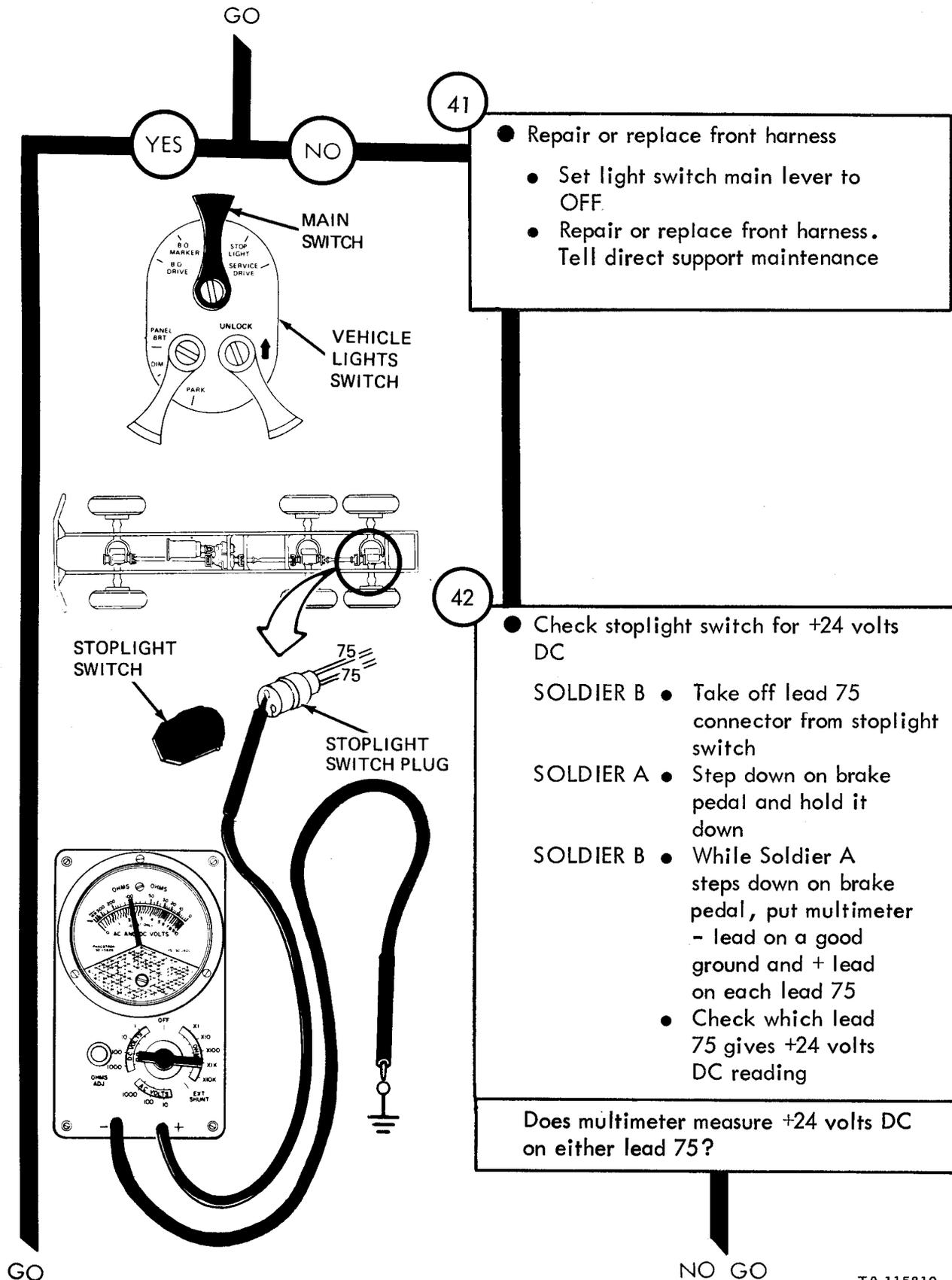


Figure 26-13 (Sheet 24 of 30)

TA 115819

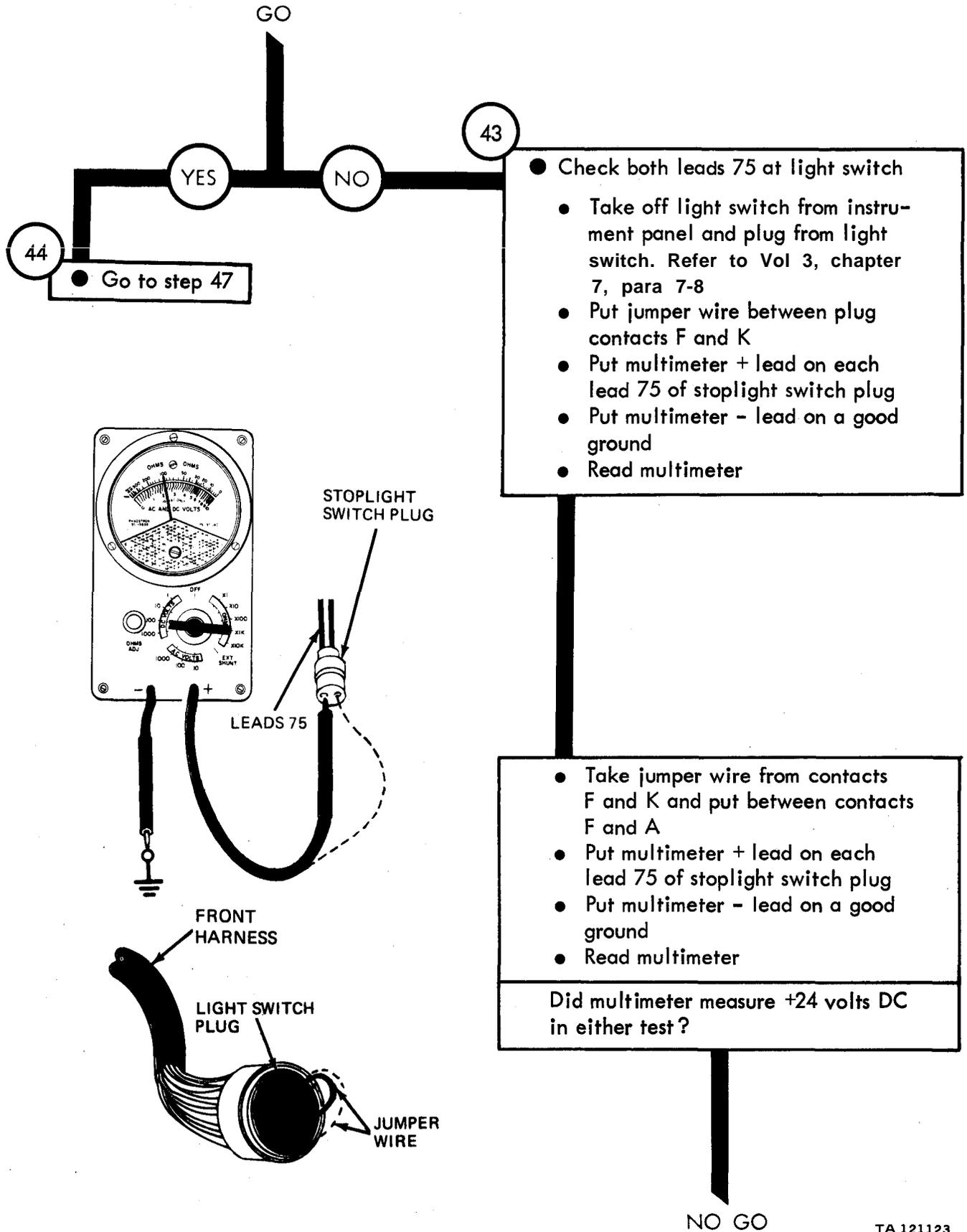


Figure 26-13 (Sheet 25 of 30)

TA 121123

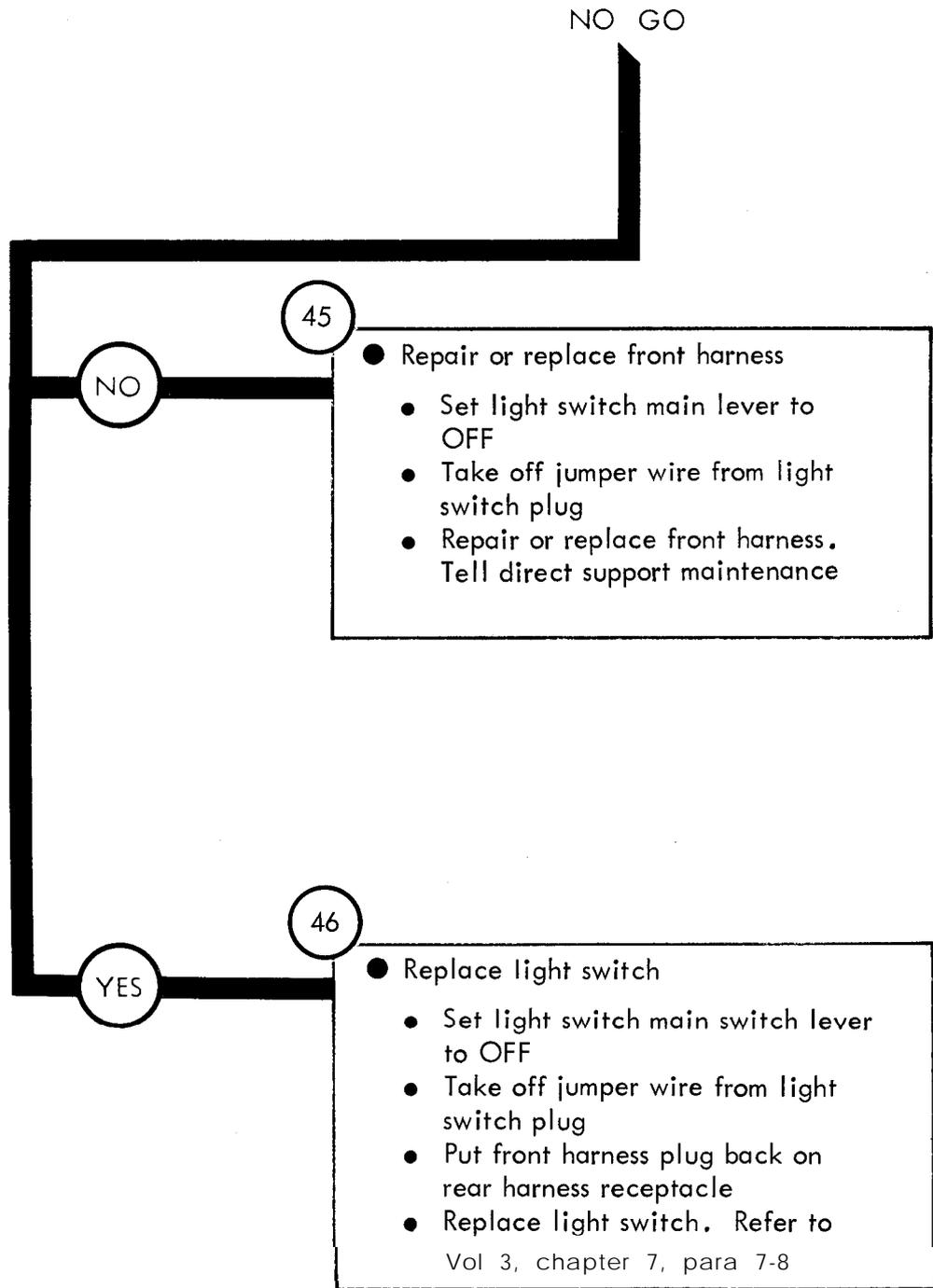
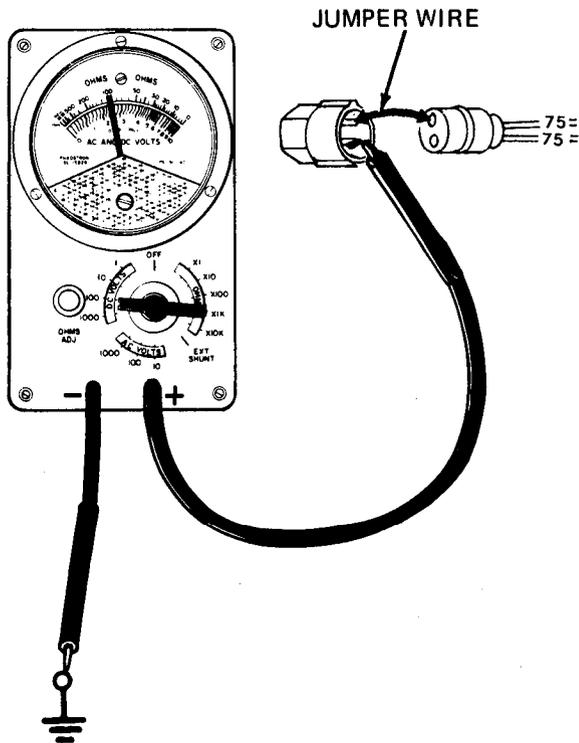


Figure 26-13 (Sheet 26 of 30)

TA 115820

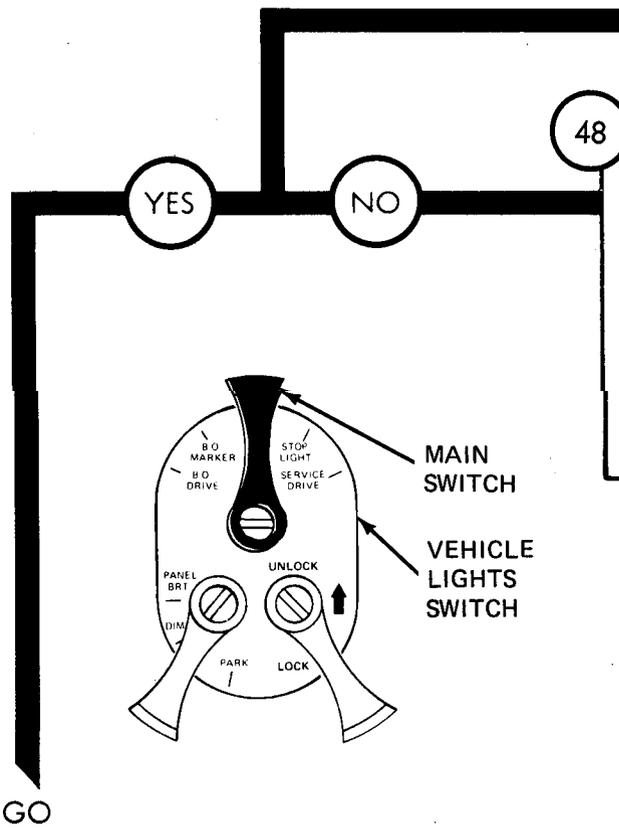
From step 44



47

- Check for +24 volts DC through stoplight switch
 - Put jumper wire from lead 75 that gave +24 volts DC reading to either stoplight switch connector
 - Put multimeter + lead on other connector of brake switch and - lead to a good ground
 - With Soldier A still pressing down on brake pedal read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



48

- Replace stoplight switch
 - Put rear harness plug back on front harness receptacle
 - Set light switch main lever to OFF
 - Replace stoplight switch. Refer to Vol 3, chapter 7, para 7-7

GO

Figure 26-13 (Sheet 27 of 30)

GO

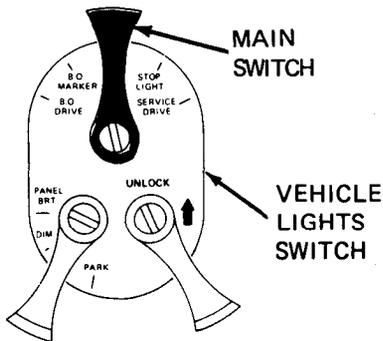
49

- Repair or replace front harness
- SOLDIER B ● Take off jumper wire from lead 75 contact plug and stoplight switch
- Repair or replace front harness. Tell direct support maintenance
- SOLDIER A ● Step down on brake pedal and hold it down
- SOLDIER B ● While Soldier A steps down on brake pedal look at rear composite markers (left and right)
- Are blackout stoplight lamps off?

50

- Troubleshooting completed
- Set light switch main lever to OFF

YES NO



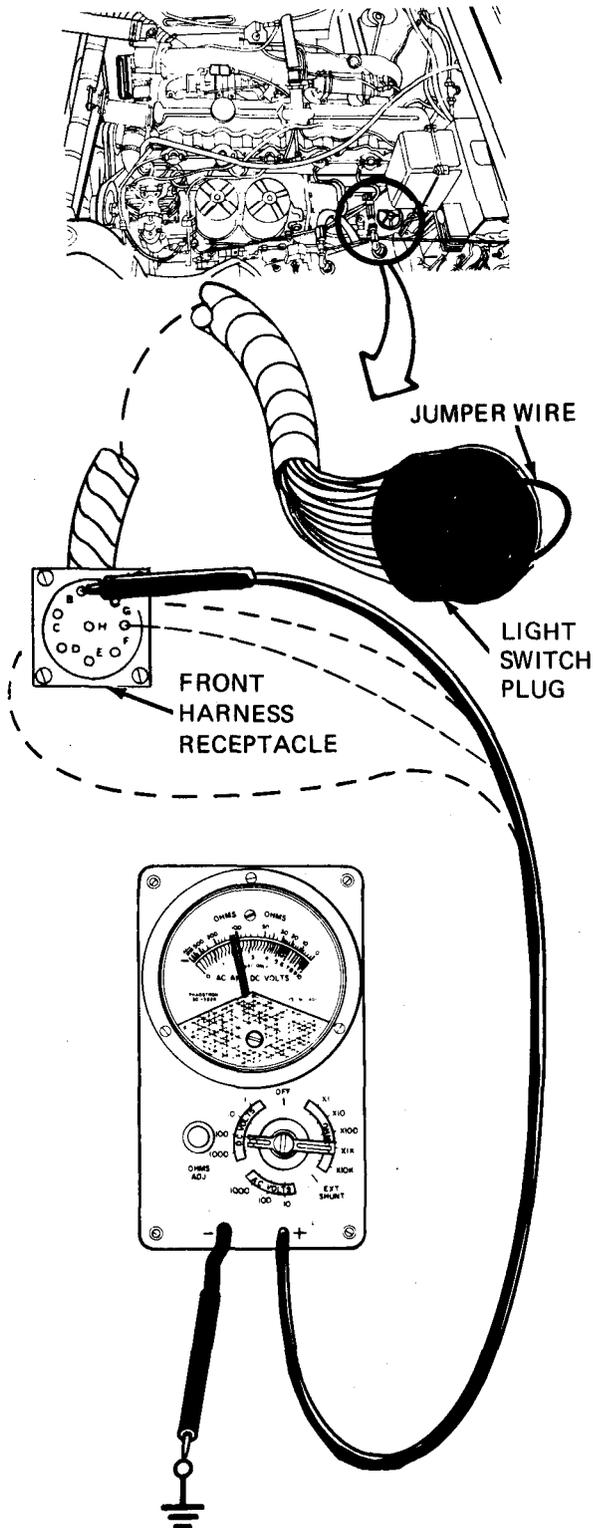
GO

TA 115822

Figure 26-13 (Sheet 28 of 30)

GO

51



- Check front harness for +24 volts DC between light switch and rear harness plug
- Set light switch main lever to OFF
- Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
- Put jumper wire between contacts F and A of light switch plug

- SOLDIER A**
- Step on brake pedal and hold it down
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on contacts B, then C, and then G, in front harness receptacle
 - Read multimeter

Does multimeter measure +24 volts DC for each test?

NO GO

TA 115823

Figure 26-13 (Sheet 29 of 30)

NO GO

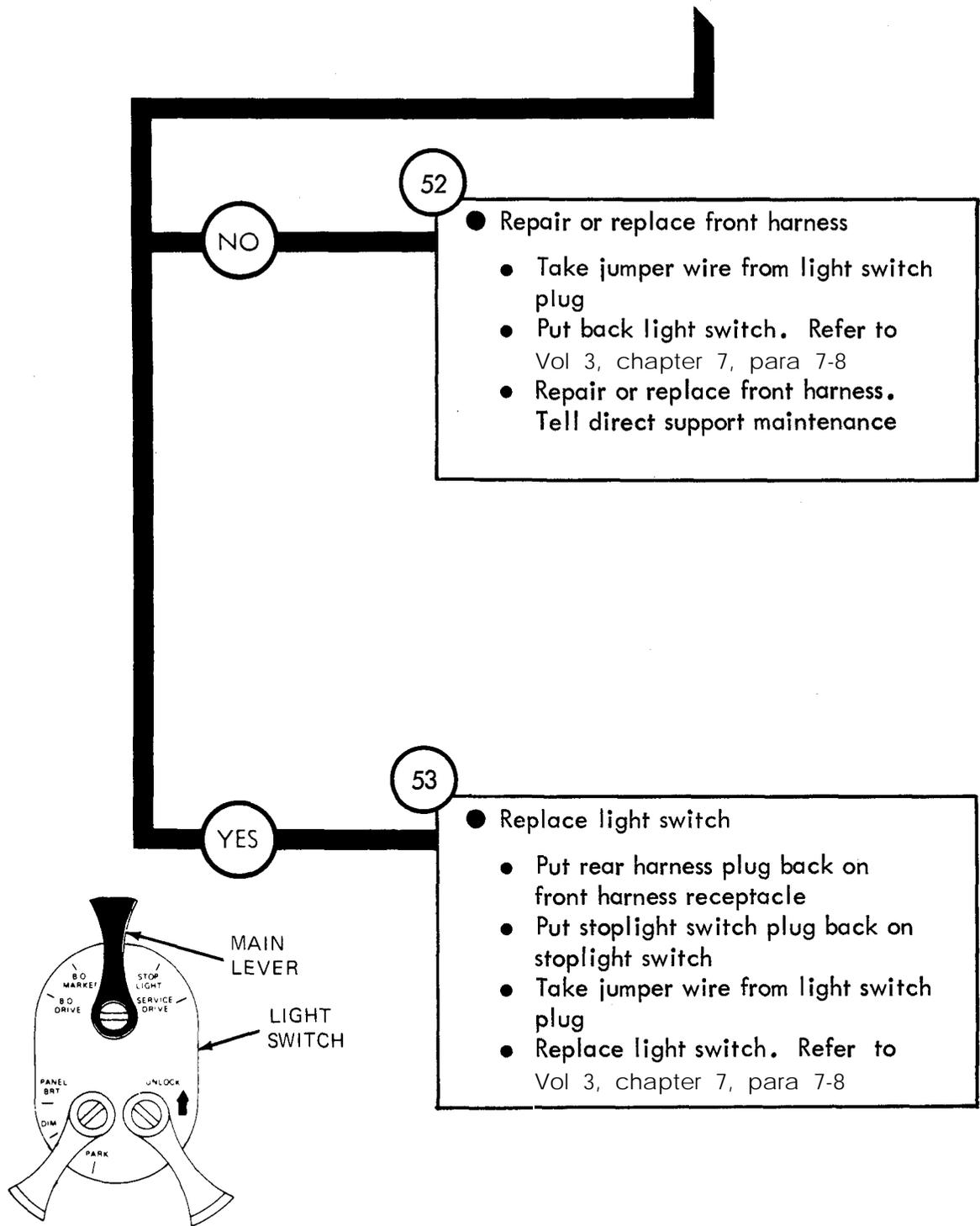


Figure 26-13 (Sheet 30 of 30)

TA 115824

14 Symptom

ONE OR BOTH SERVICE TAILLIGHT LAMPS DO NOT LIGHT, OTHER TRUCK RUNNING LIGHTS LIGHT.

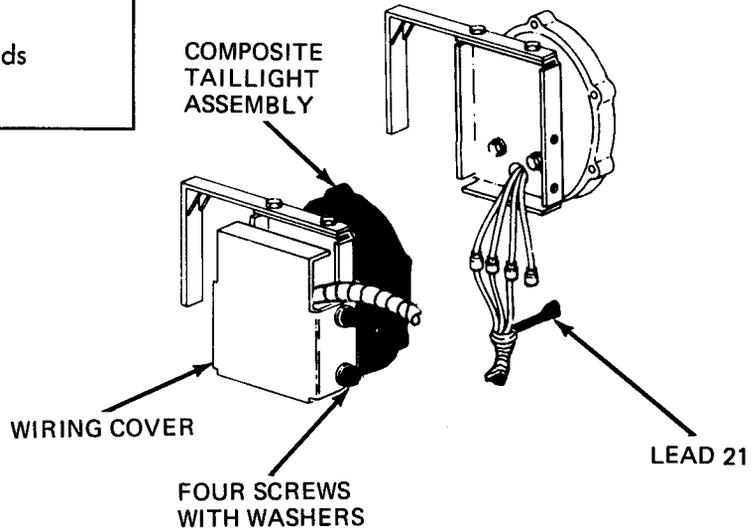
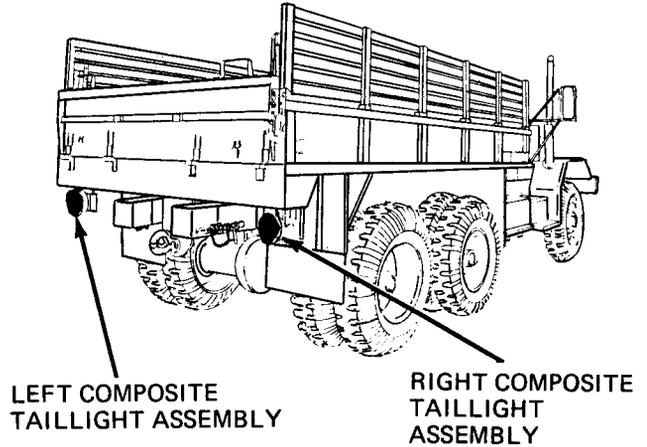
NOTE

Do this procedure for each taillight lamp that does not light

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

- 1
- Park Truck
 - Refer to TM 9-2320-211-10

- 2
- Check for +24 Volts DC at Taillight Lamp
 - At composite taillight assembly, using wrench, unscrew and take off four screws with washers
 - Take off wiring cover
 - Pull out four electrical leads
 - Take off lead 21



GO

TA 115825

Figure 26-14 (Sheet 1 of 8)

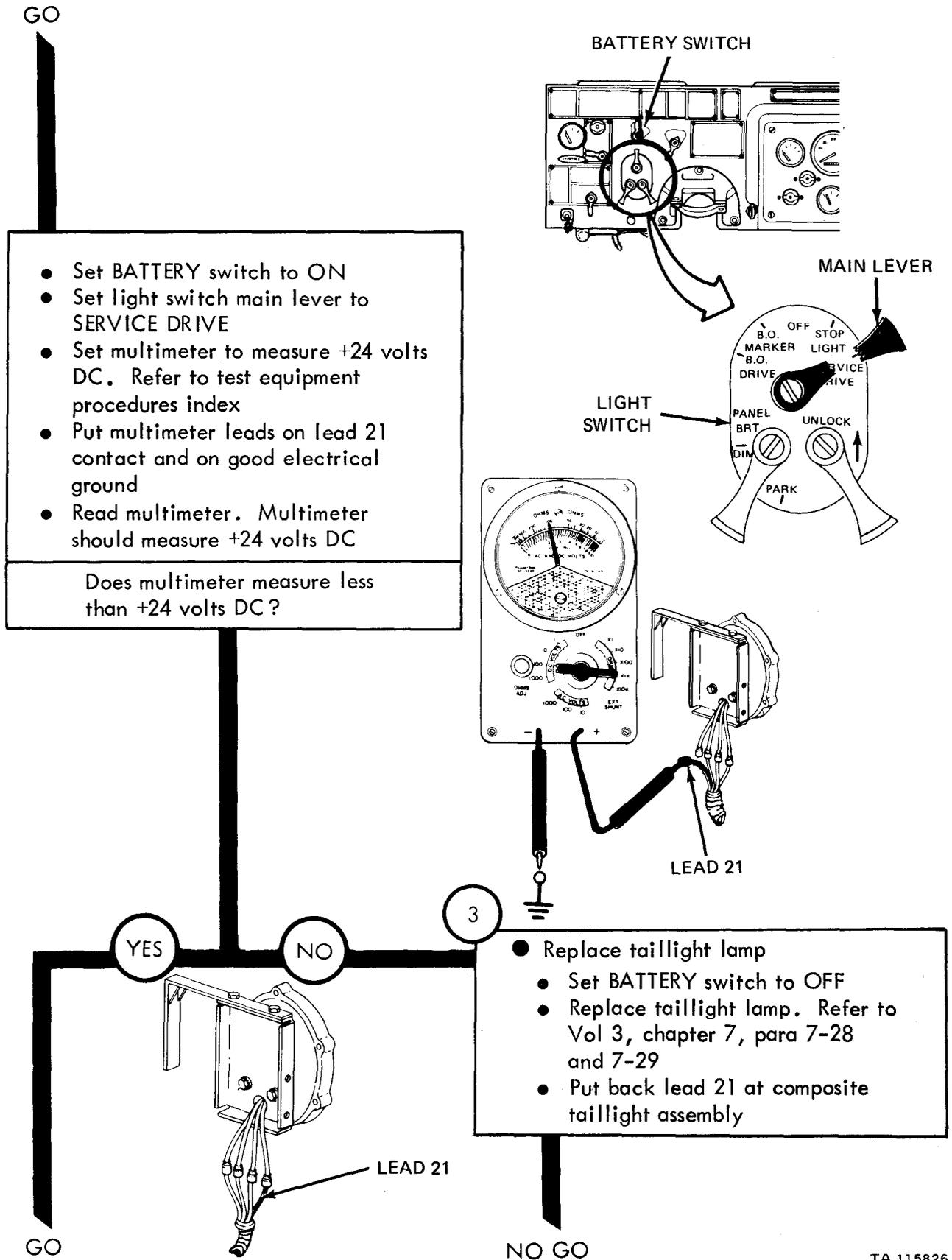


Figure 26-14 (Sheet 2 of 8)

TA 115826

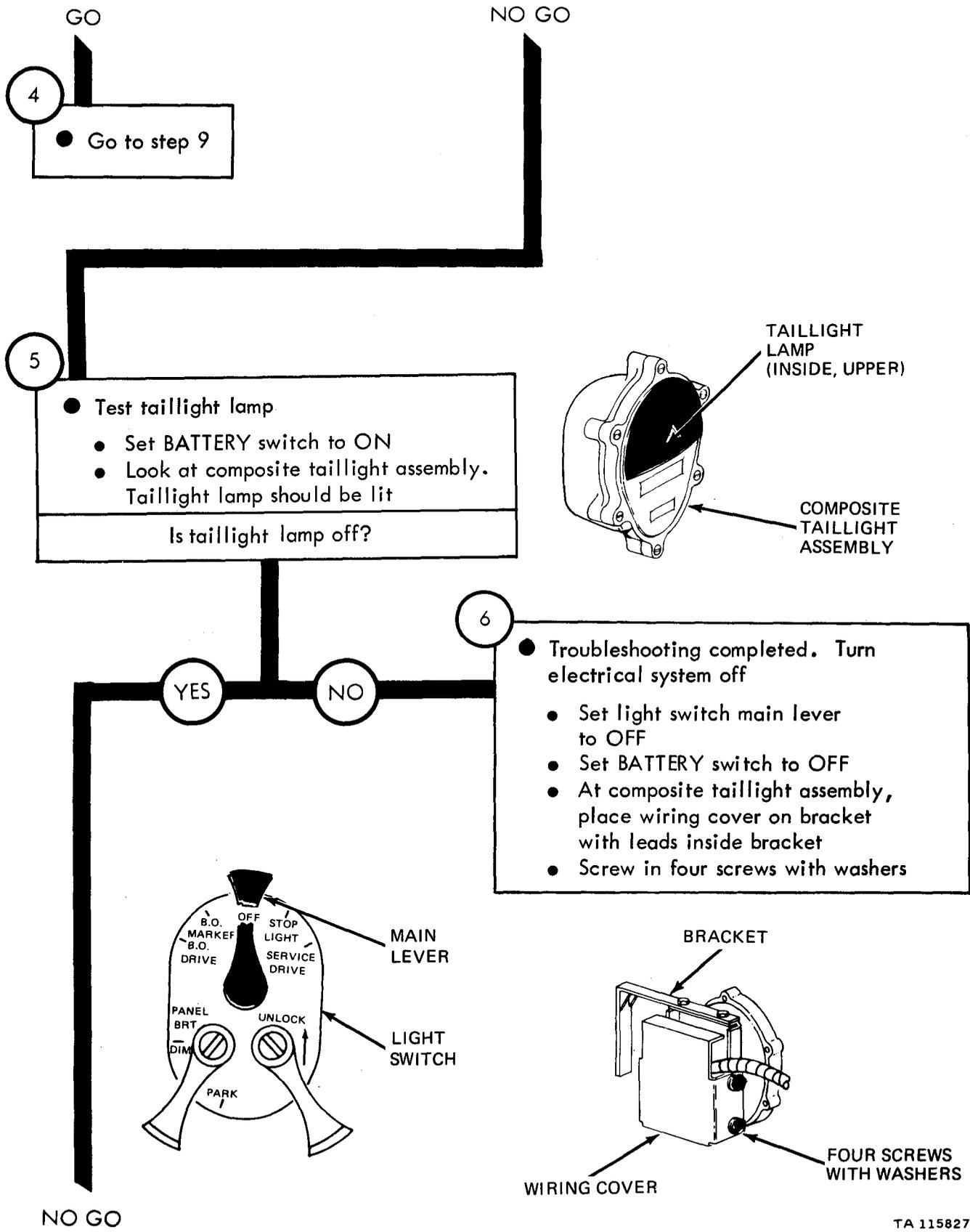
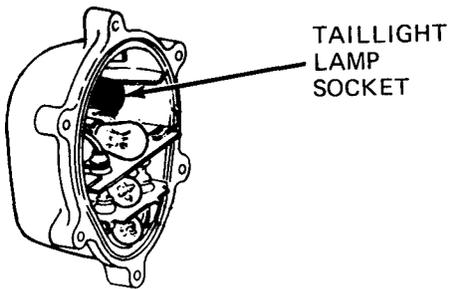
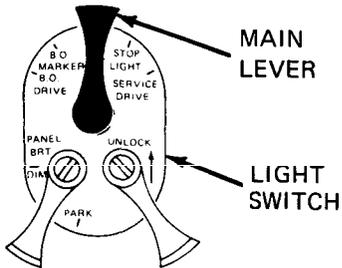


Figure 26-14 (Sheet 3 of 8)

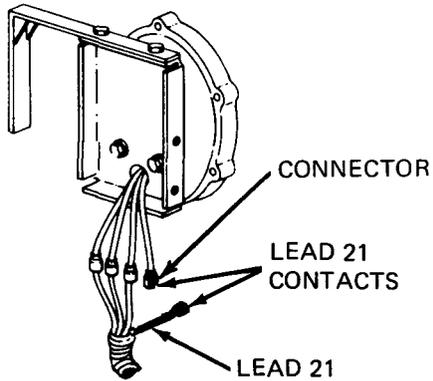
TA 115827

NO GO

7

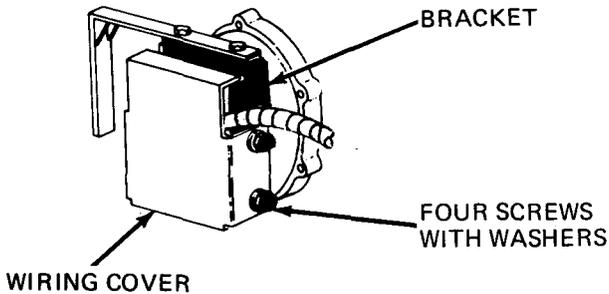


- Clean contacts of taillight lamp socket
- Set light switch main lever to OFF
- Set BATTERY switch to OFF
- Remove taillight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
- Clean taillight lamp socket. Refer to Vol 3, chapter 7, para 7-28 and 7-29
- Replace taillight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29



8

- Clean contacts of taillight connectors
- Take off lead 21
- Clean lead 21 contacts. Refer to Vol 3, chapter 7, para 7-28 and 7-29
- Push lead 21 into connector
- Place wiring cover on bracket with leads inside bracket
- Screw in four screws with washers



NO GO

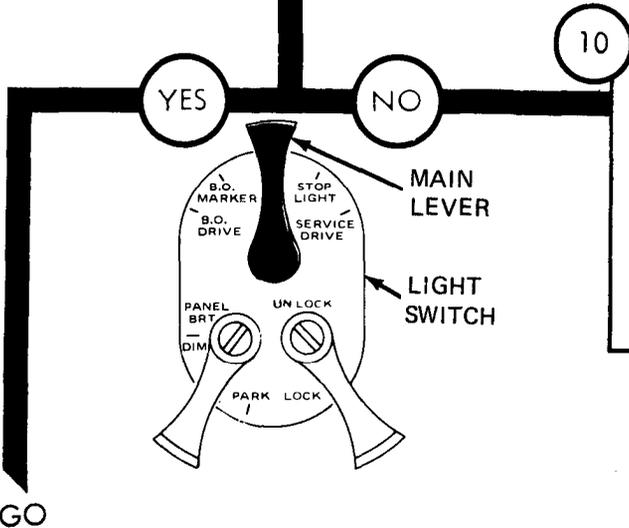
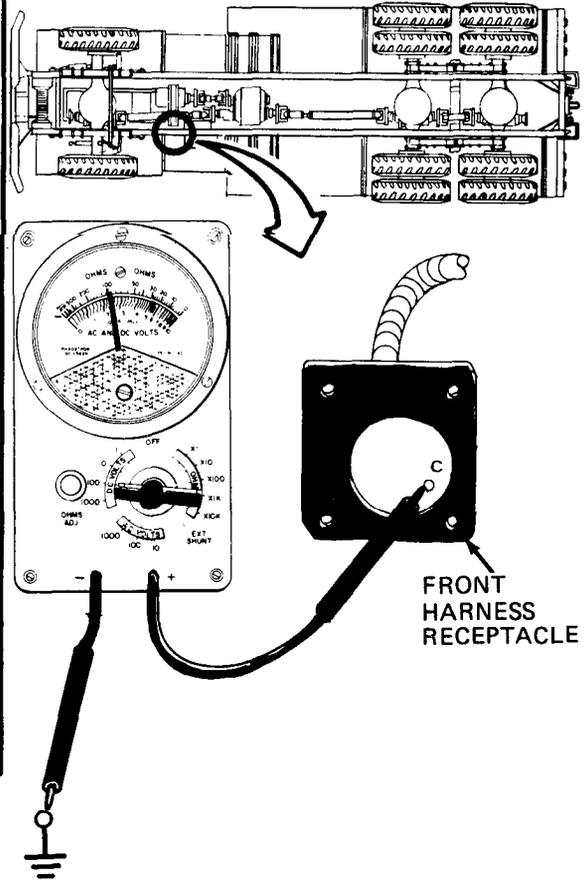
Figure 26-14 (Sheet 4 of 8)

From step 4

9

- Check front harness between light switch and front harness receptacle
 - Set BATTERY switch to OFF
 - Take off light switch from instrument panel. Refer to Vol 3, chapter 7, para 7-8
Take off light switch plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Put jumper wire between contacts F and H of light switch plug
 - Set BATTERY switch to ON
 - Put multimeter - lead on good electrical ground. Put multimeter + lead on contact C in front harness receptacle. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



10

- Repair or replace rear harness
 - Set light switch main lever to OFF
 - Set BATTERY switch to OFF
 - Repair or replace rear harness. Tell direct support maintenance

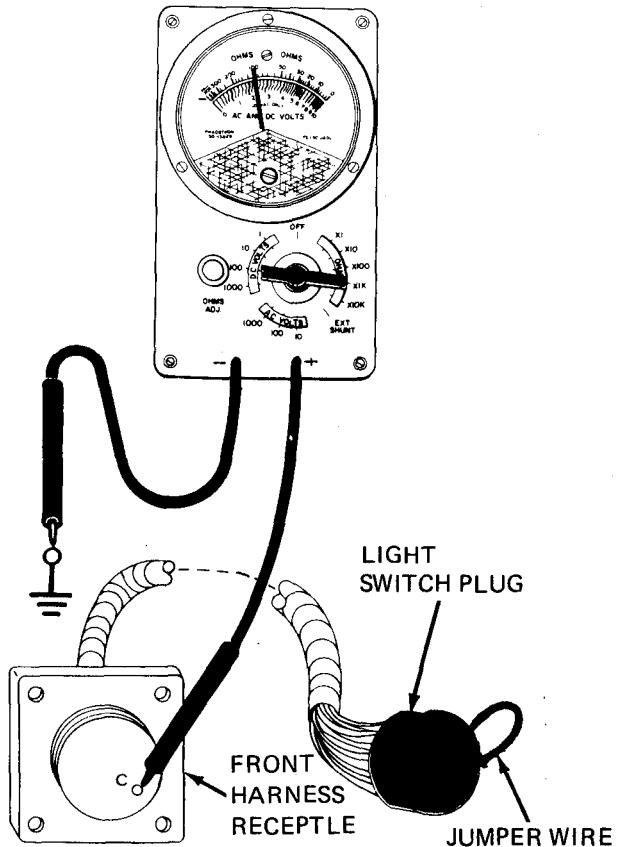
Figure 26-14 (Sheet 5 of 8)

GO

11

- Check front harness between light switch and front harness receptacle
 - Set BATTERY switch to OFF
 - Take off light switch from instrument panel. Take off light switch plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Put jumper wire between contacts F and H of light switch plug
 - Set BATTERY switch to ON
 - Put multimeter - lead on good electrical ground. Put multimeter + lead on contact C in front harness receptacle. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



NO

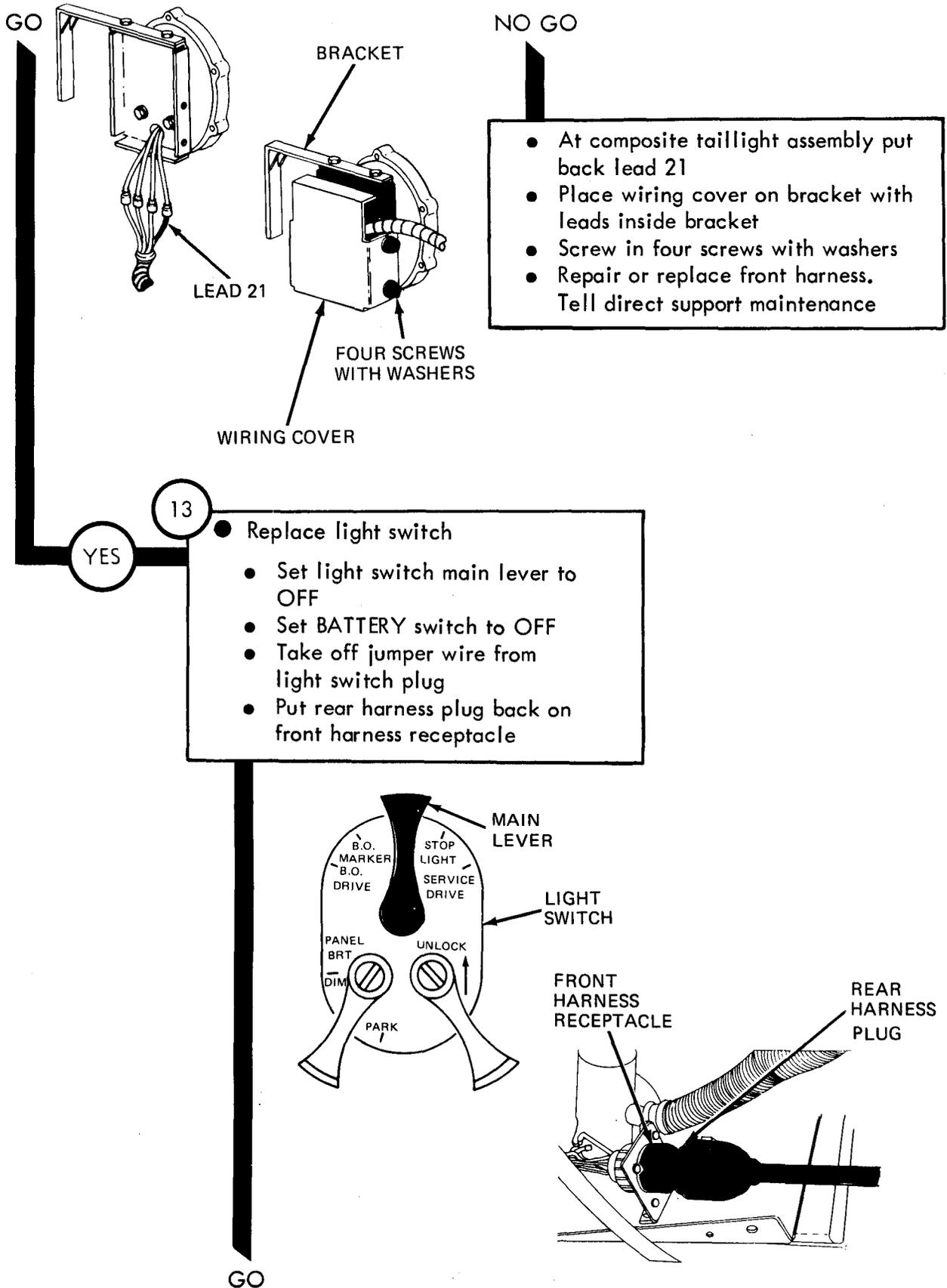
12

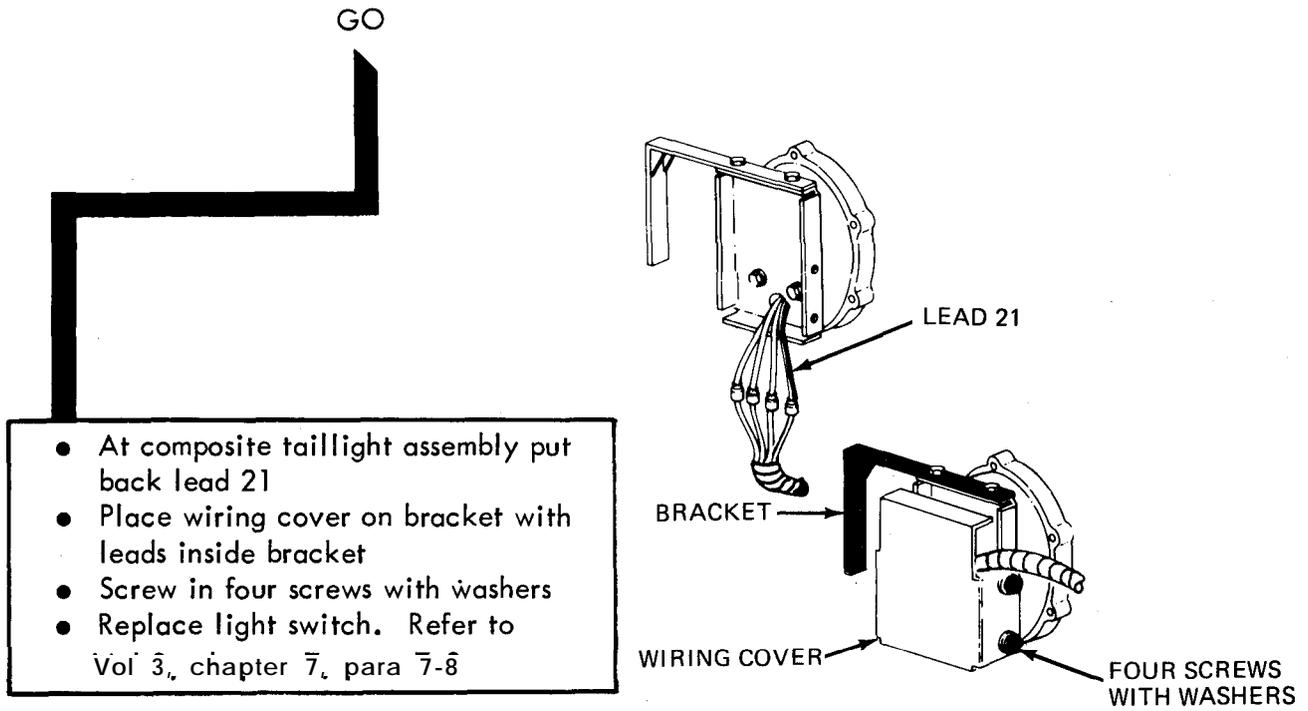
- Repair or replace front harness
 - Set light switch main lever to OFF
 - Set BATTERY switch to OFF
 - Take off jumper wire from light switch plug
 - Put light switch back on instrument panel. Refer to Vol 3, chapter 7, para 7-8

GO

NO GO

Figure 26-14 (Sheet 6 of 8)





Symptom

15

ONE OR BOTH REAR BLACKOUT MARKER LIGHTS DO NOT LIGHT, OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

Do this procedure for each blackout marker light that does not light
When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

GO

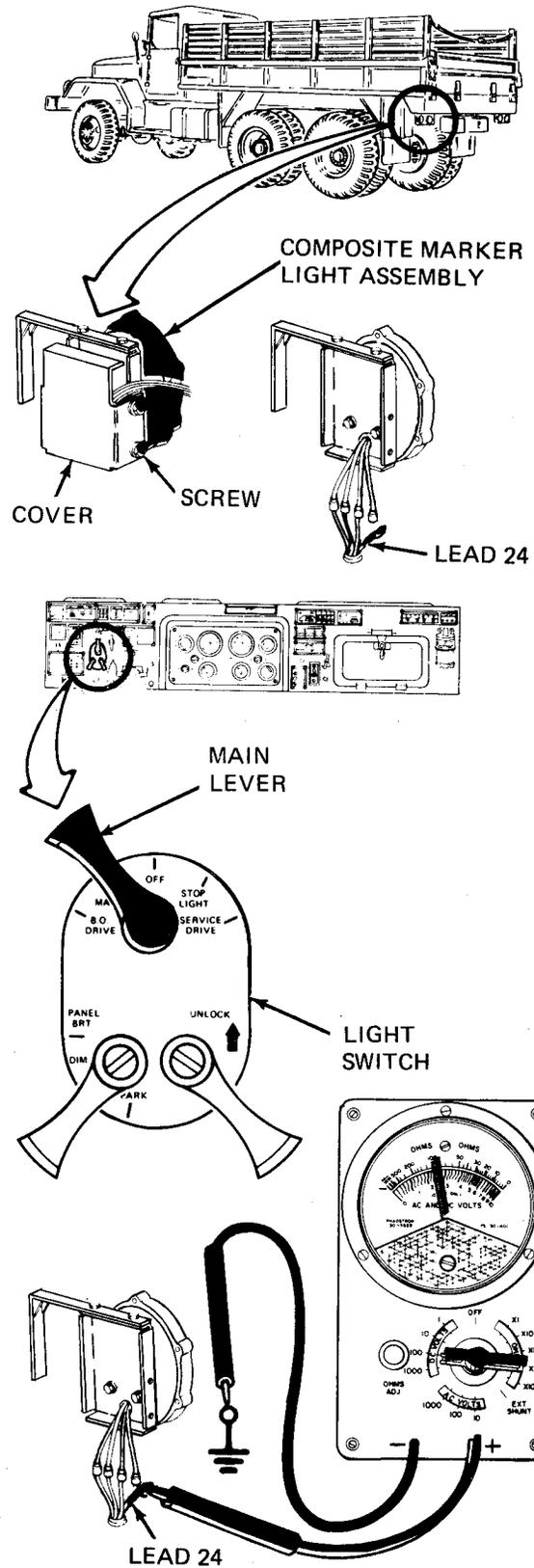
2

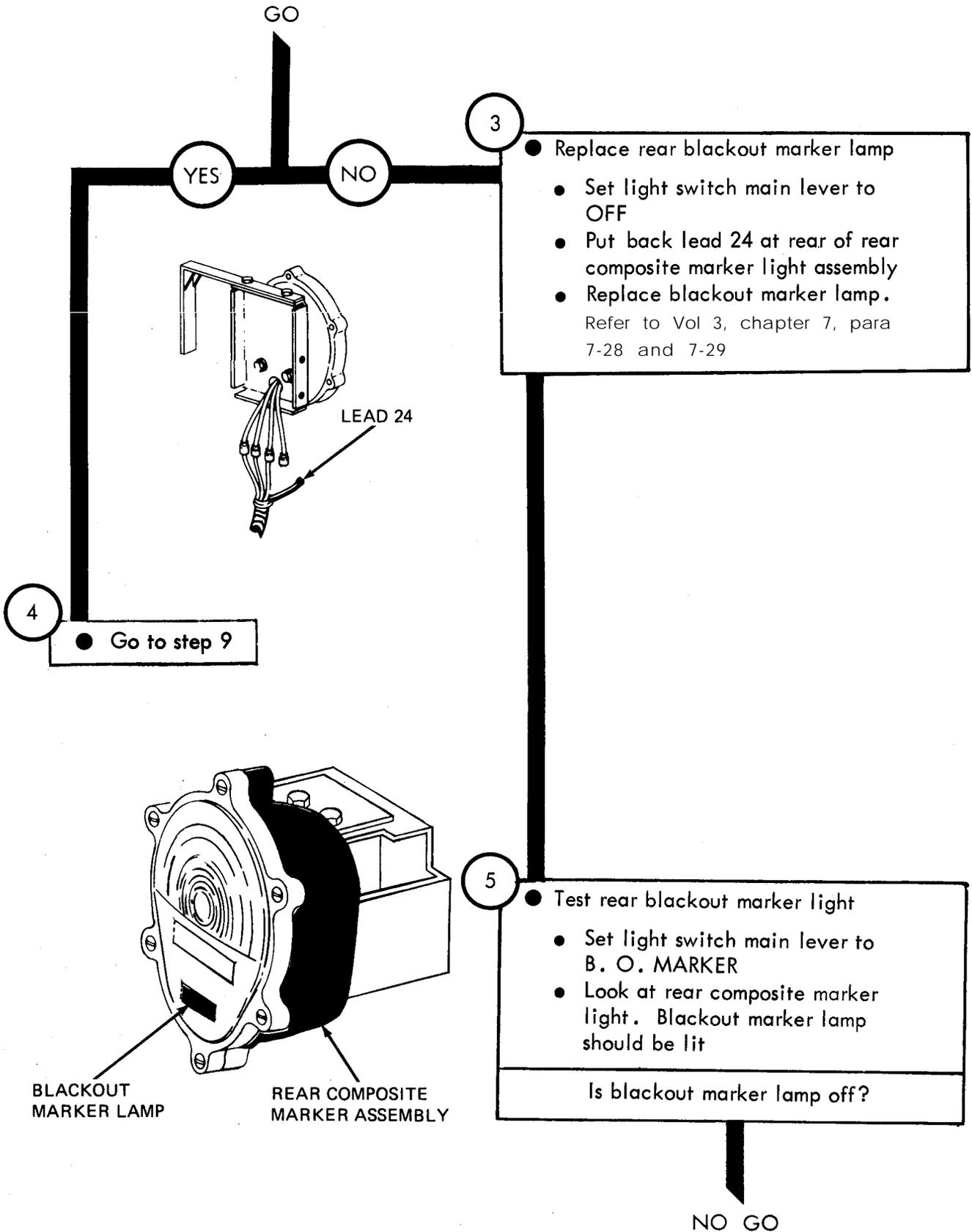
- Check for +24 volts DC at rear blackout marker
- Using 7/16-inch wrench, unscrew and take off four screws with washers from rear composite marker light assembly
- Take off cover
- Take off lead 24 from rear of rear composite marker light assembly
- Set light switch main lever to B.O. MARKER

- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter + lead on lead 24
- Put multimeter - lead on a good ground
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO





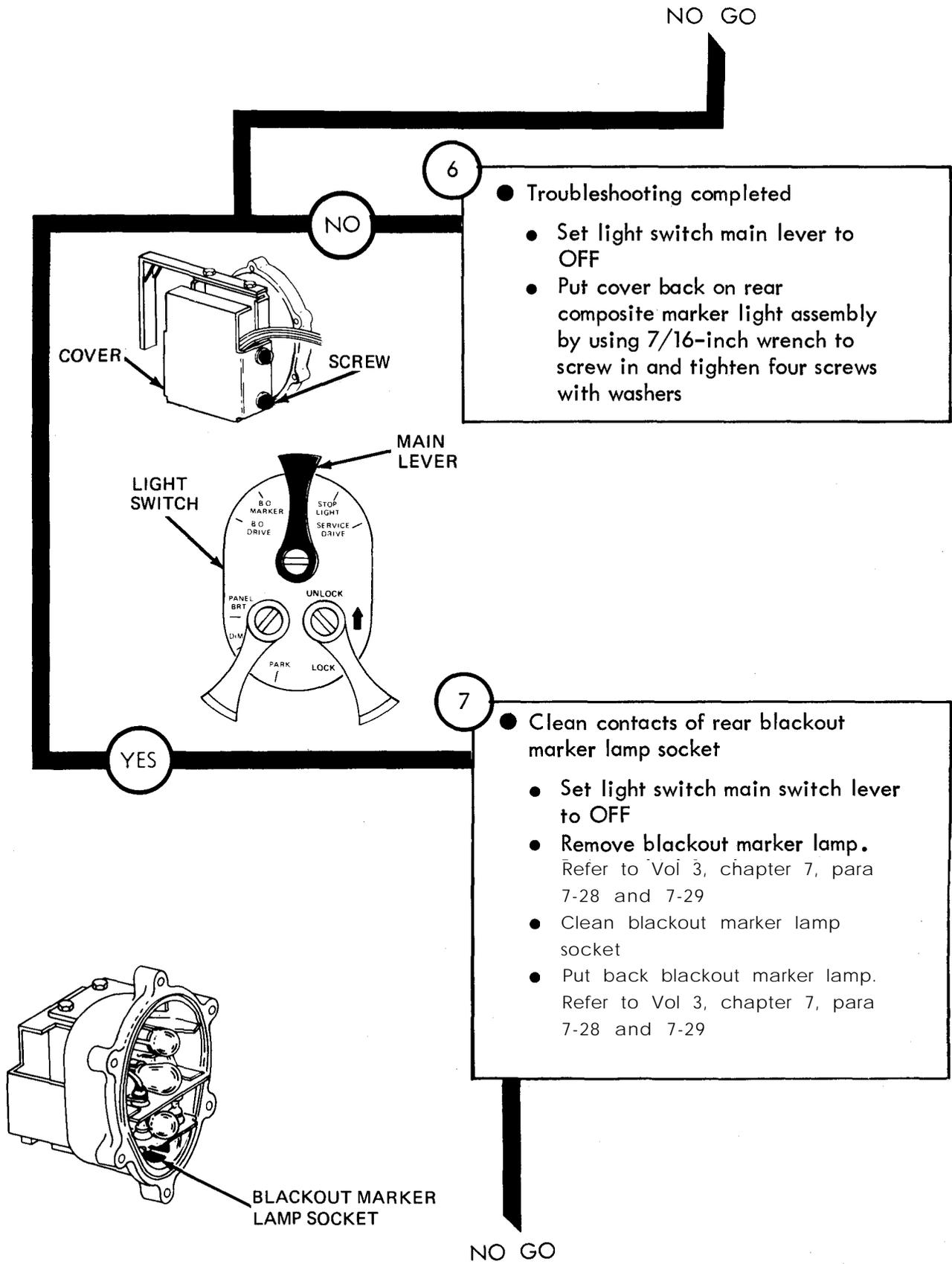
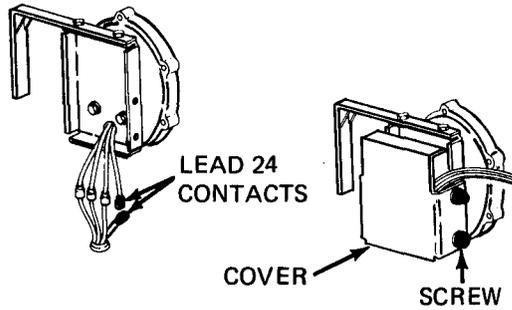


Figure 26-15 (Sheet 4 of 8)

NO GO

8



- Clean contacts of rear blackout marker light connectors
- Take off lead 24 from rear of rear composite marker light assembly
- Clean lead 24 contacts
- Put lead 24 back into rear of rear composite marker light assembly
- Put cover back on rear composite light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers

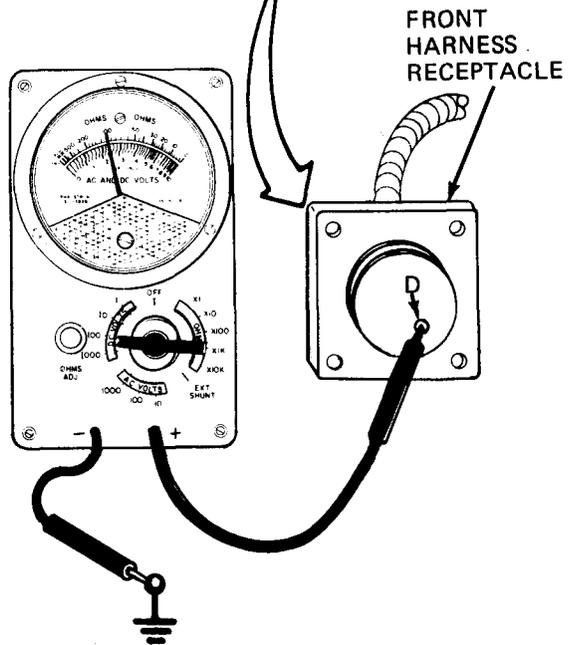
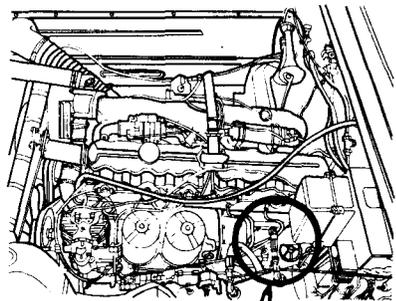
From step 4

9

- Check harness between rear blackout marker lamp and front harness receptacle
- Set light switch main lever to OFF
- Take rear harness plug off front harness receptacle
- Set light switch main lever to B. O. MARKER
- Put multimeter + lead in contact D of front harness receptacle and - lead on a good ground
- Read multimeter. Multimeter should measure +24 volts DC

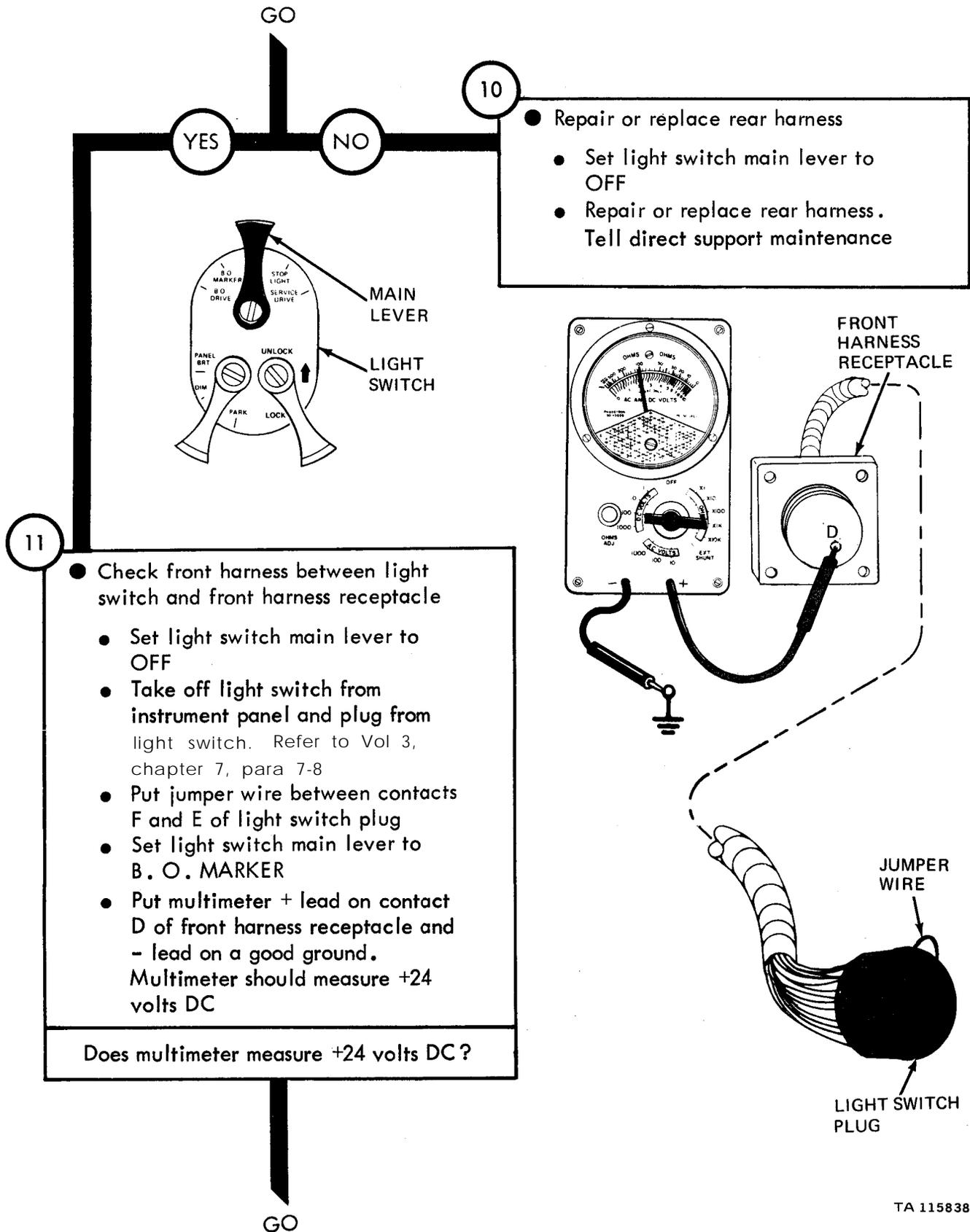
Does multimeter measure less than +24 volts DC?

GO



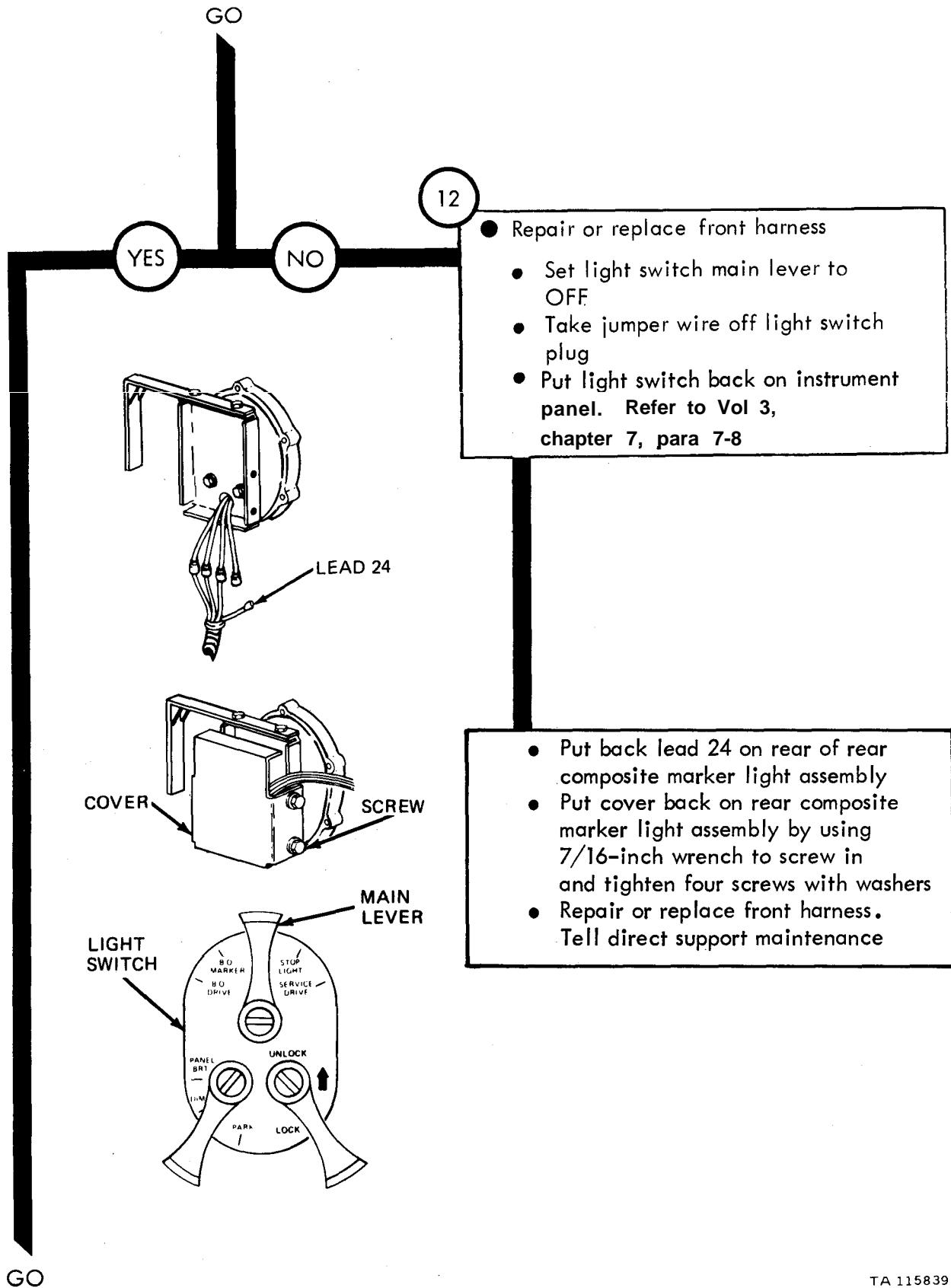
TA 115837

Figure 26-15 (Sheet 5 of 8)



TA 115838

Figure 26-15 (Sheet 6 of 8)



- Repair or replace front harness
- Set light switch main lever to OFF
- Take jumper wire off light switch plug
- Put light switch back on instrument panel. Refer to Vol 3, chapter 7, para 7-8

- Put back lead 24 on rear of rear composite marker light assembly
- Put cover back on rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers
- Repair or replace front harness. Tell direct support maintenance

Figure 26-15 (Sheet 7 of 8)

GO

13

- Replace light switch
 - Set light switch main lever to OFF
 - Take off jumper wire from light switch plug
 - Put rear harness plug back on dash harness receptacle and screw on tight
 - Put cover back on rear composite marker light assembly by using 7/16-inch wrench to screw in and tighten four screws with washers

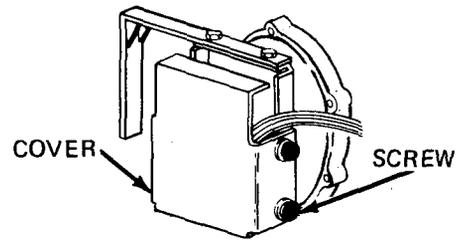
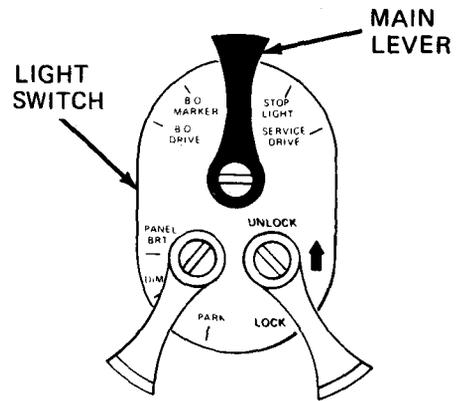


Figure 26-15 (Sheet 8 of 8)

Symptom

16

ONE LAMP DIM, FLICKERING,
OR WORKS SOMETIMES

NOTE

Lamps that are dim, flickering, or only work sometimes are caused by loose connections, poor ground connections, dirt, paint, and corrosion buildup. Fault isolation and correction consists of checking electrical connections for defects, and cleaning and tightening as necessary. A typical lamp, the blackout drive lamp is used as an example. Other truck lamps can be done the same way

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Remove blackout headlight lamp and lead 19
- Take lead 19 from blackout headlight lamp housing connector
- Remove blackout headlight lamp from lamp housing. Refer to Vol 3, chapter 7, para 7-25

GO

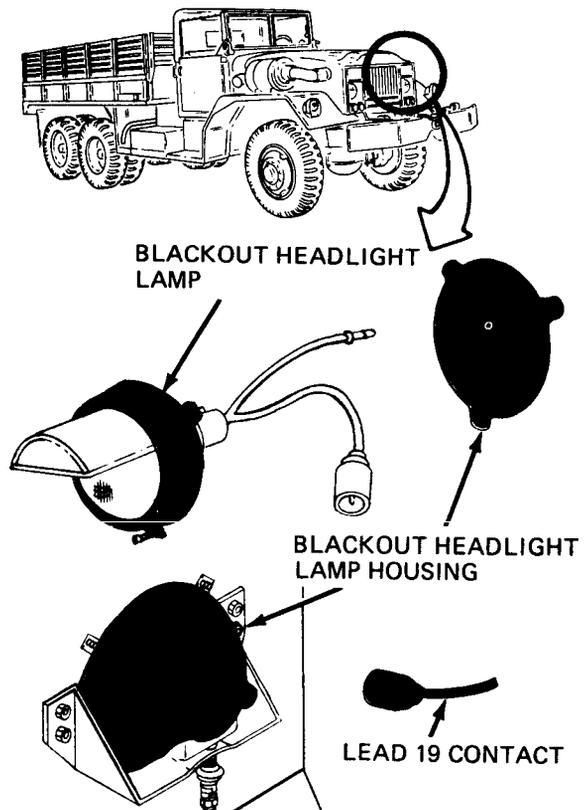
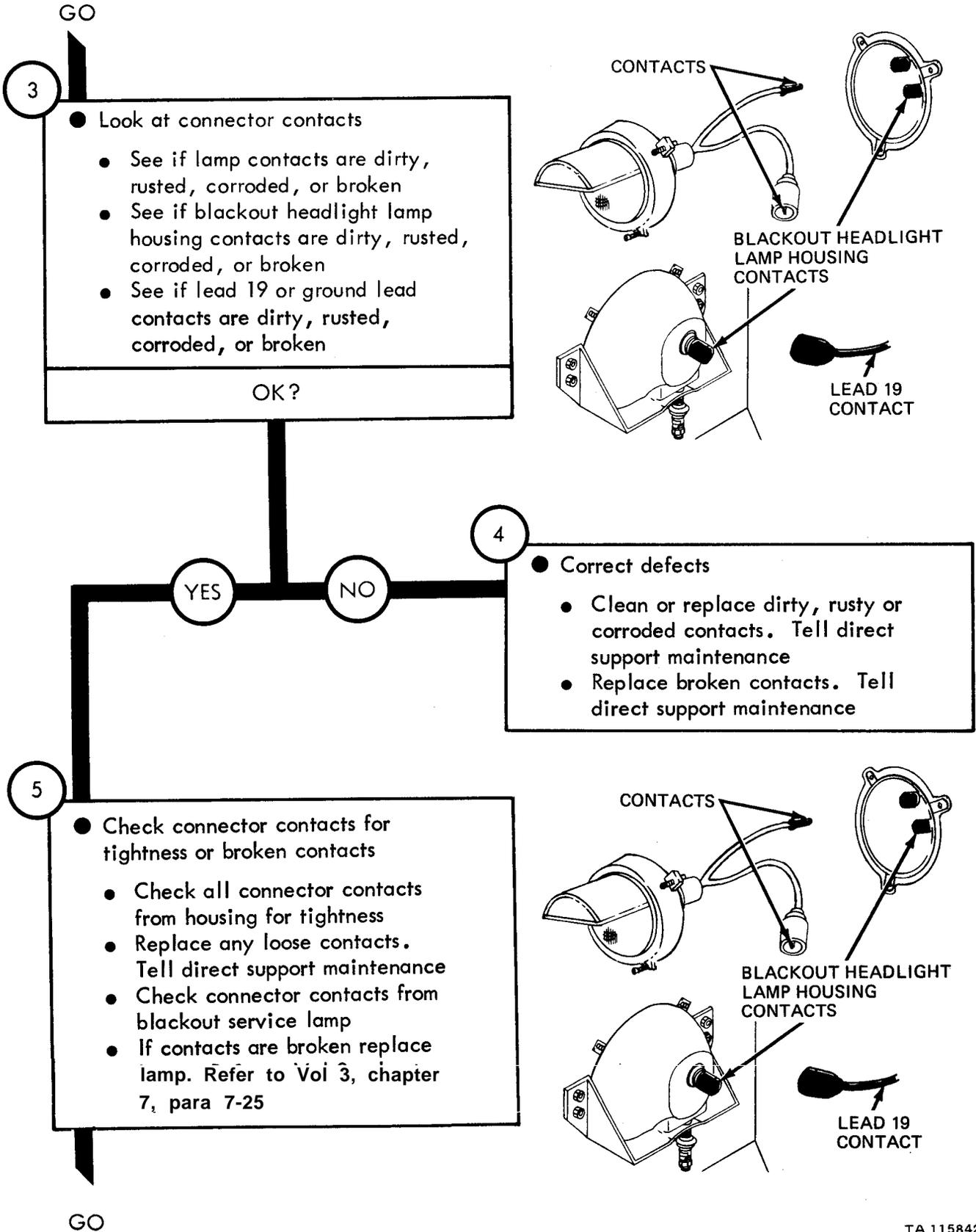


Figure 26-16 (Sheet 1 of 4)

TA 115841



TA 115842

Figure 26-16 (Sheet 2 of 4)

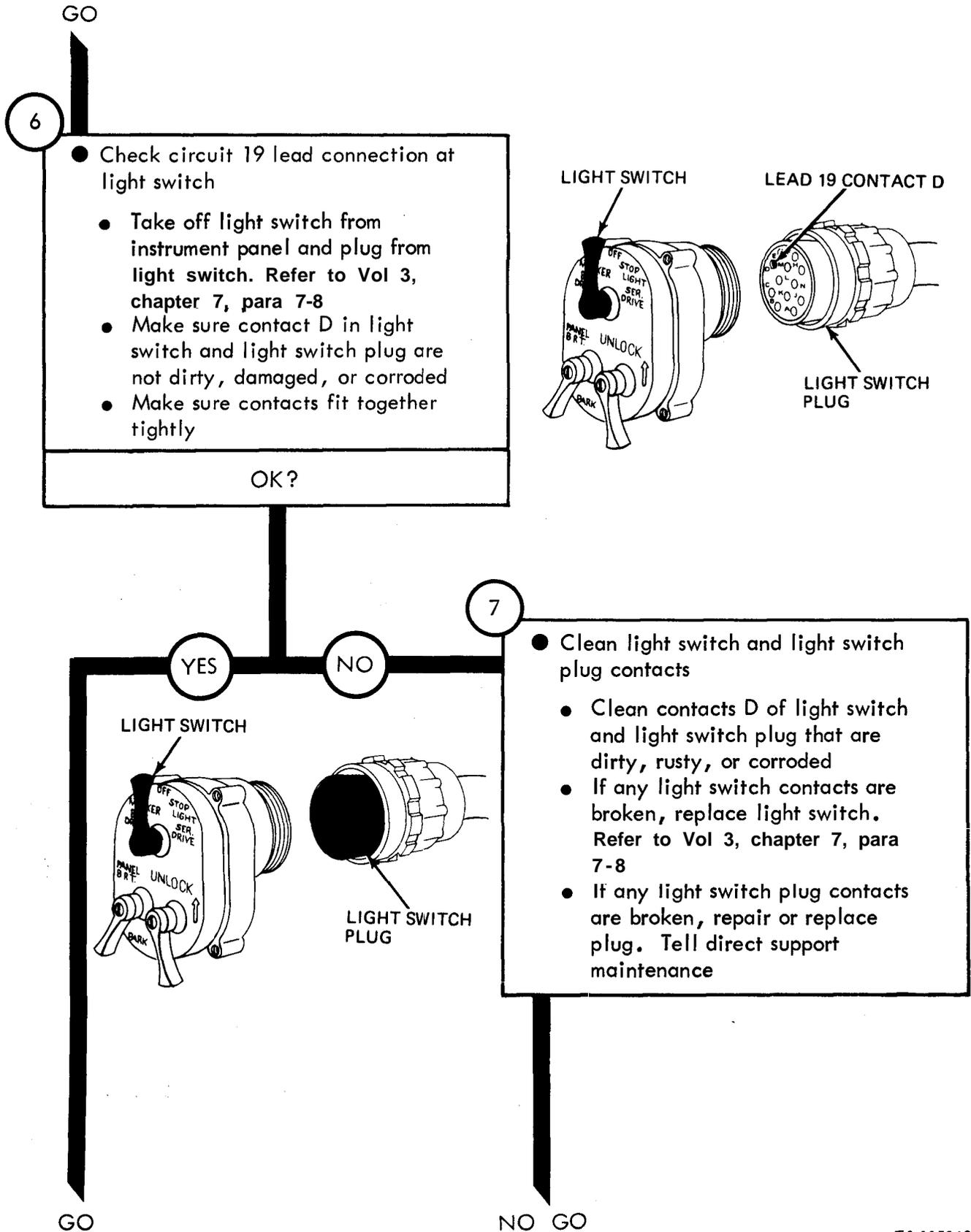


Figure 26-16 (Sheet 3 of 4)

GO

NO GO

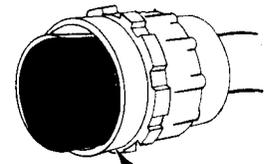
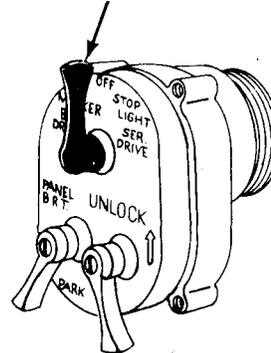
8

- Put back light switch plug and light switch
 - Put light switch plug back on light switch and light switch back on instrument panel. Refer to Vol 3, chapter 7, para 7-8
 - Put lead 19 back in blackout headlight lamp housing connector
 - Put blackout headlight lamp back in housing. Refer to Vol 3, chapter 7, para 7-30

9

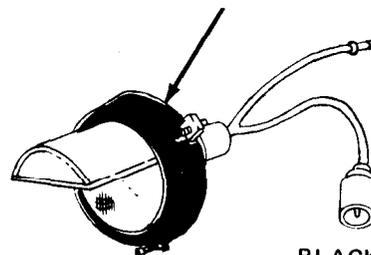
- Put back light switch plug and light switch
 - Put light switch plug back on light switch and light switch back on instrument panel. Refer to Vol 3, chapter 7, para 7-8
 - Put lead 19 back in blackout headlight lamp housing connector
 - Put blackout headlight lamp back in housing. Refer to Vol 3, chapter 7, para 7-30

LIGHT SWITCH

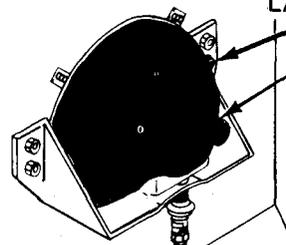


LIGHT SWITCH PLUG

BLACKOUT HEADLIGHT LAMP



BLACKOUT HEADLIGHT LAMP HOUSING



CONNECTOR



LEAD 19 CONTACT

Figure 26-16 (Sheet 4 of 4)

TA 115844

Symptom

17 ALL OR MANY TRUCK RUNNING LIGHTS DIM, FLICKER OR WORK SOMETIMES

NOTE

When many lamps are dim, flickering, or only work sometimes the cause is probably loose, broken, dirty, rusty, or corroded circuit or ground connections. The fault can be found between the battery system and light switch.

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Check battery system
- Refer to fault symptom index

Is battery system OK?

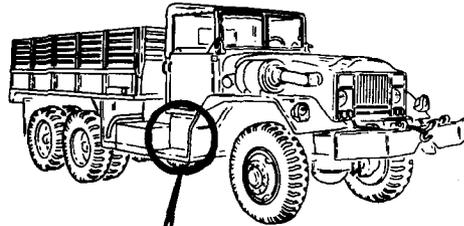
YES

NO

3

- Troubleshoot battery system
- Refer to fault symptom index

GO



BATTERIES

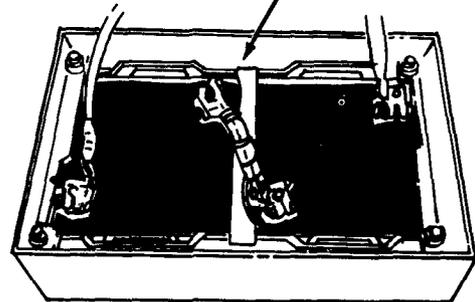


Figure 26-17 (Sheet 1 of 7)

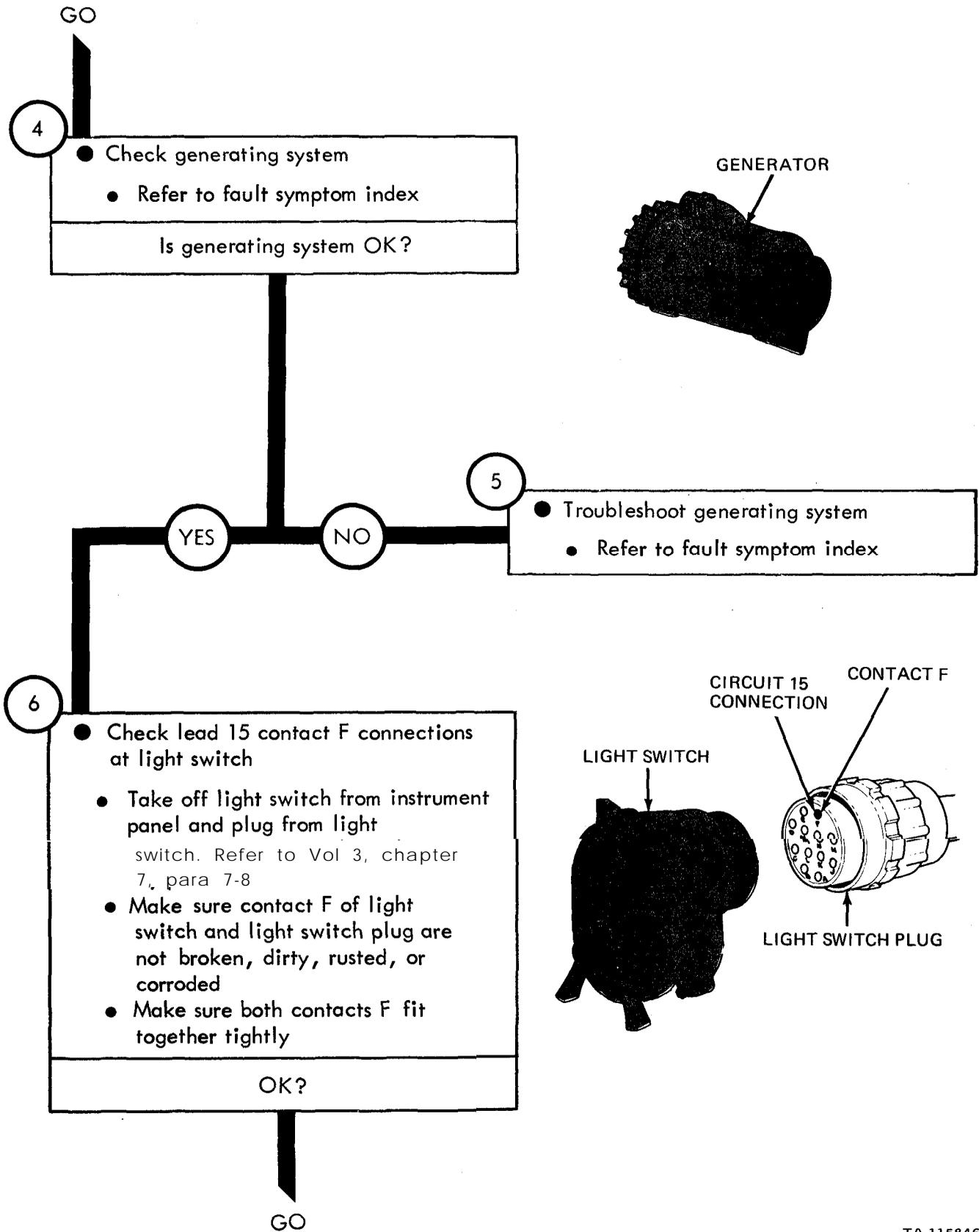
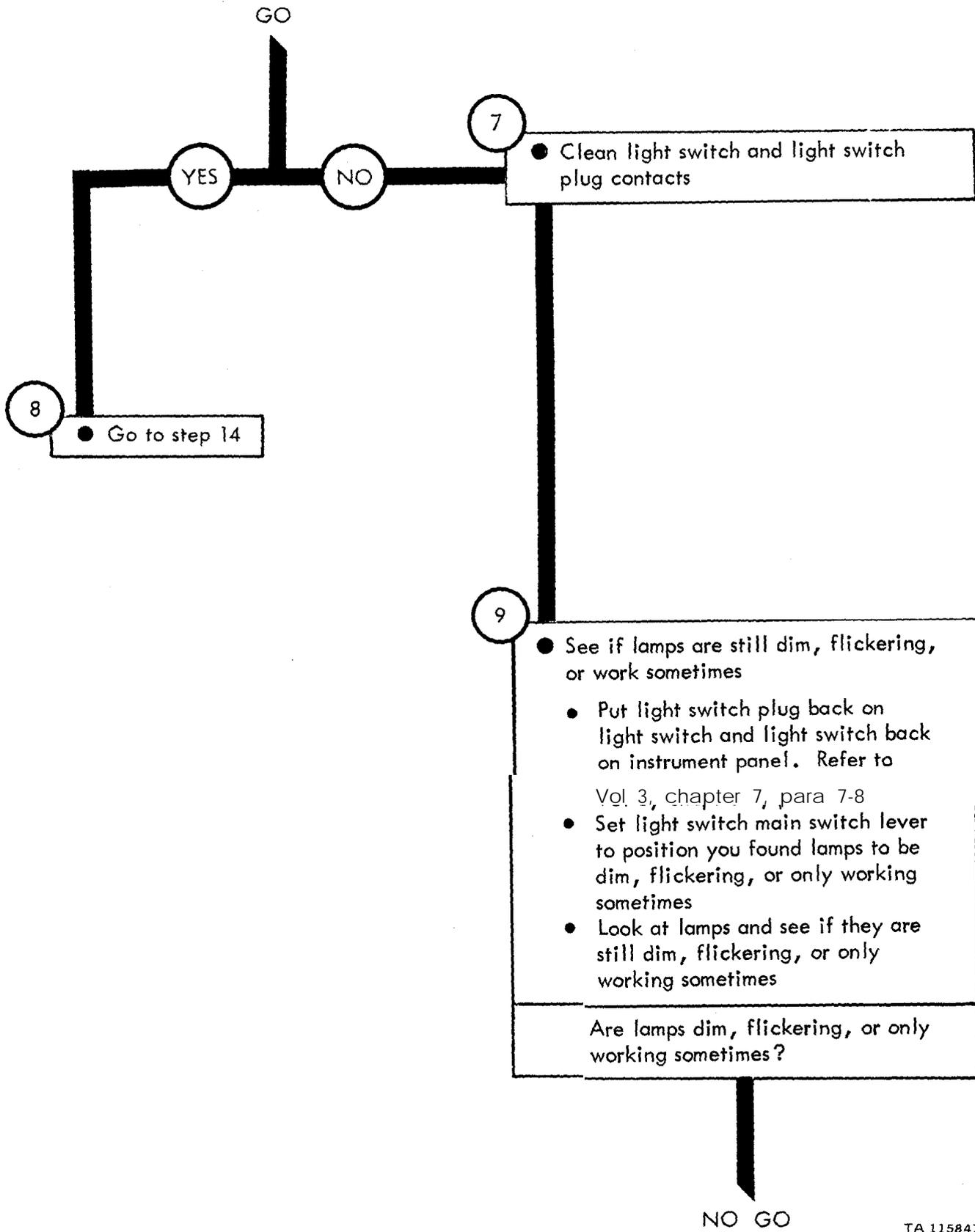


Figure 26-17 (Sheet 2 of 7)



TA 115847

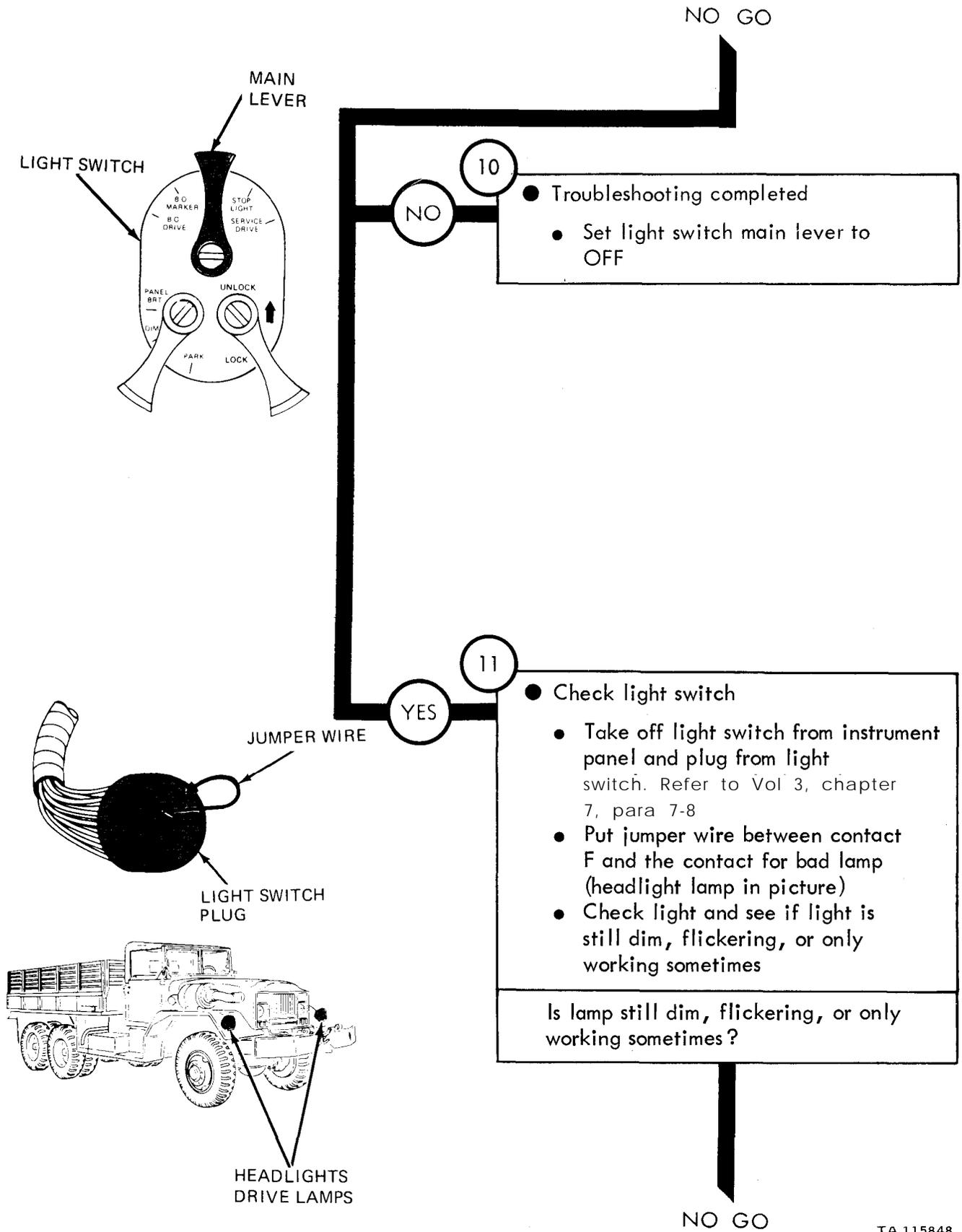


Figure 26-17 (Sheet 4 of 7)

TA 115848

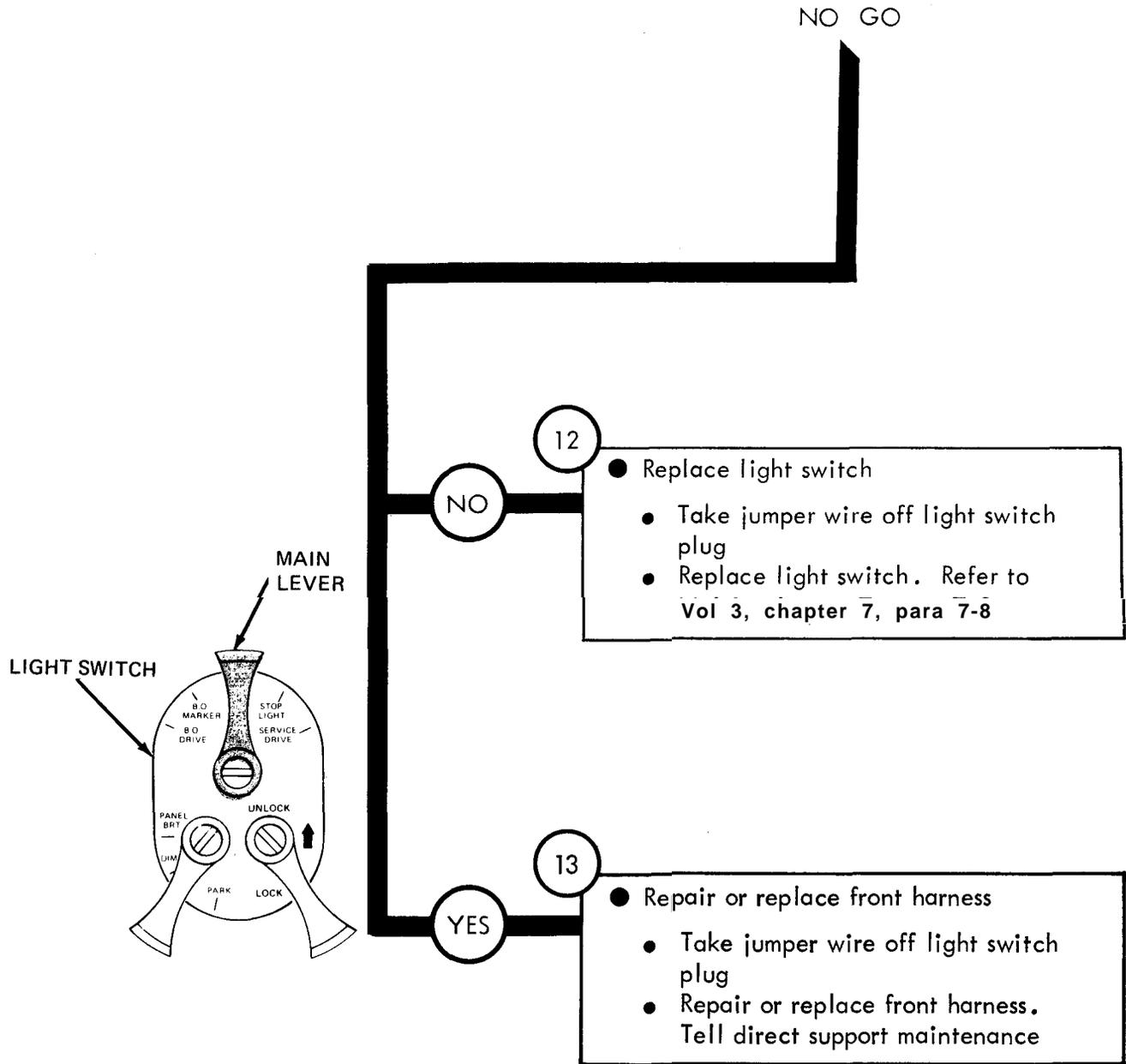


Figure 26-17 (Sheet 5 of 7)

From step 8

14

- See if lamps are still dim, flickering, or only working sometimes
- Put light switch plug back on light switch and light switch back on instrument panel. Refer to Vol 3, chapter 7, para 7-8
- Set light switch main lever to position you found lamps dim, flickering, or only working sometimes
- Look at lamps and see if they are still dim, flickering, or only working sometimes

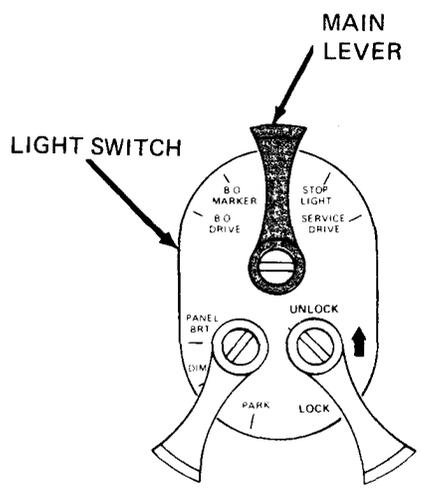
Are lamps dim, flickering, or only working sometimes?

YES

NO

15

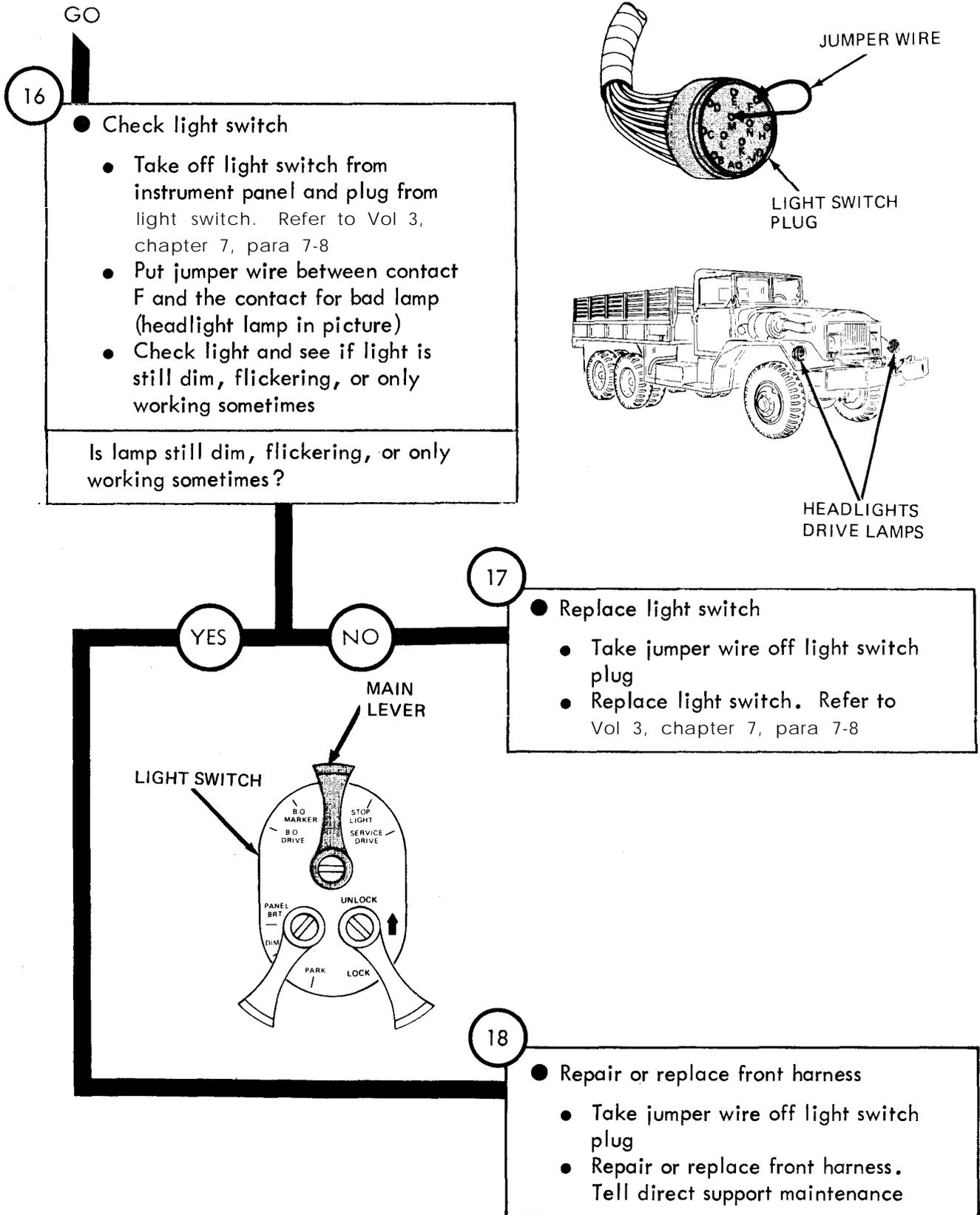
- Troubleshooting completed
- Set light switch main lever to OFF



GO

Figure 26-17 (Sheet 6 of 7)

TA 115850



TA 115851

Figure 26-17 (Sheet 7 of 7)

Symptom

18

LAMPS BURN OUT TOO OFTEN

NOTE

Short lamp life is caused by generating voltage that is too high, or by loose lamp housing or mountings which vibrate and break lamp filaments.

When measuring voltage, +28 volts DC means a range of +27 to +28.5 volts DC

1

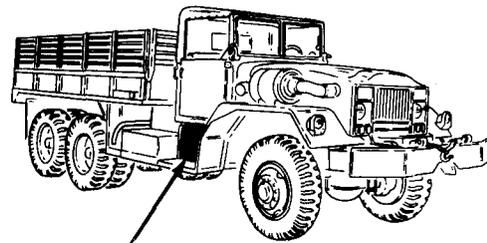
- Park truck
- Refer to TM 9-2320-211-10

2

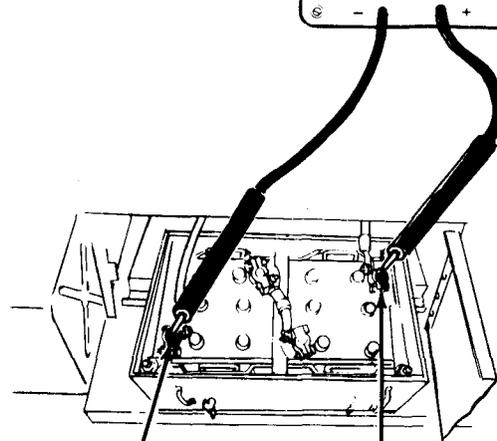
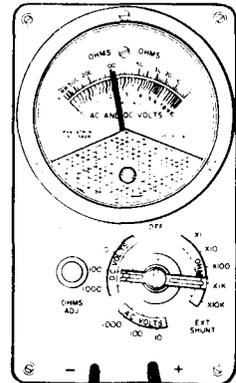
- Check generating subsystem for +28 volts DC output
 - Set multimeter to measure +28 volts DC. Refer to test equipment procedures index
 - Start engine. Refer to TM 9-2320-211-10
 - Pull out battery box. Refer to TM 9-2320-211-10

- Put multimeter + lead on battery + terminal
- Put multimeter - lead on battery - terminal
- Read multimeter. Multimeter should measure +28 volts DC

Does multimeter measure +28 volts DC?



BATTERY BOX



BATTERY - TERMINAL

BATTERY + TERMINAL

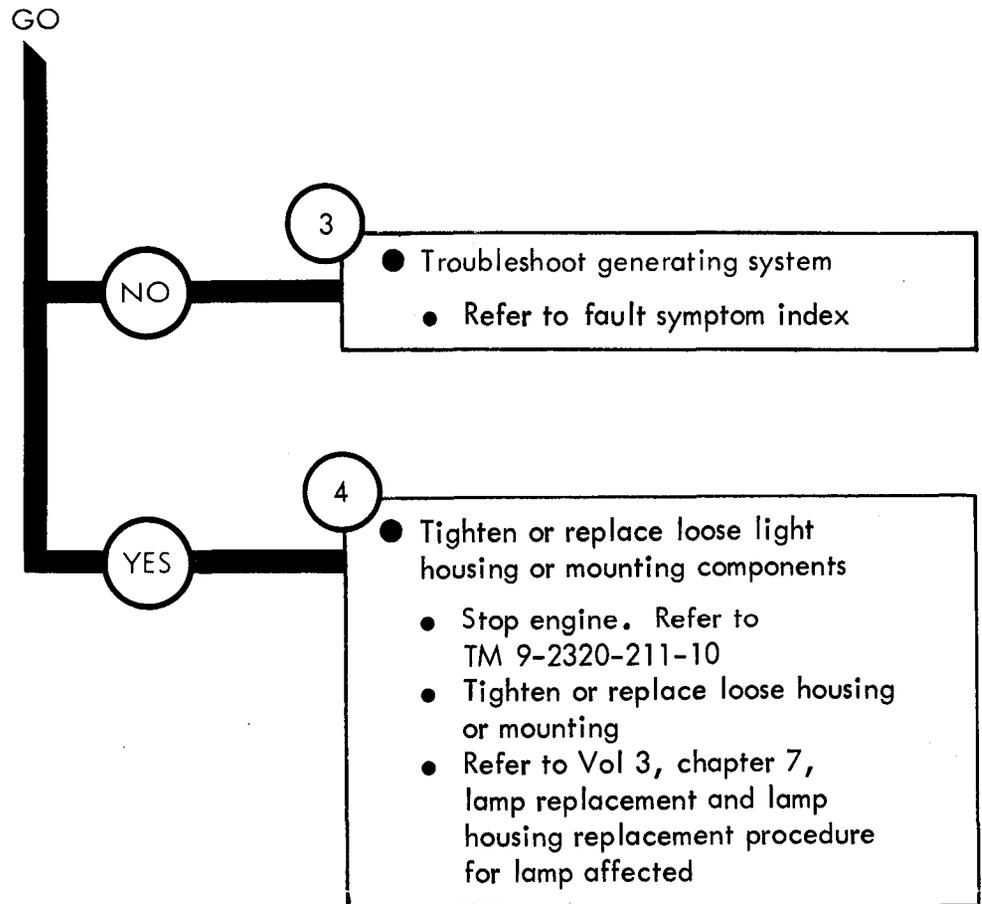


Figure 26-18 (Sheet 2 of 2)

Symptom
19

ALL OR MANY TRUCK RUNNING LIGHTS DO NOT LIGHT

NOTE

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

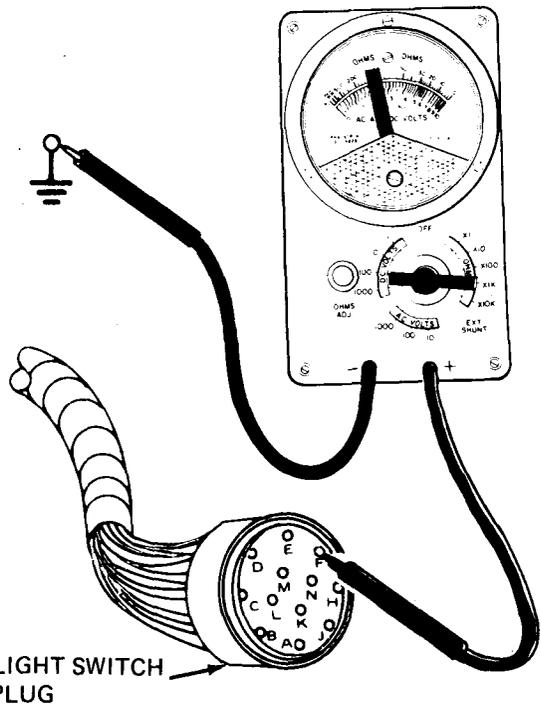
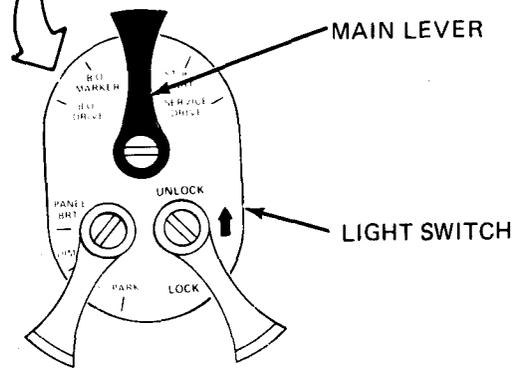
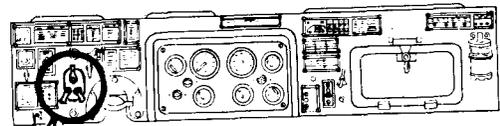
GO

Figure 26-19 (Sheet 1 of 5)

GO

2

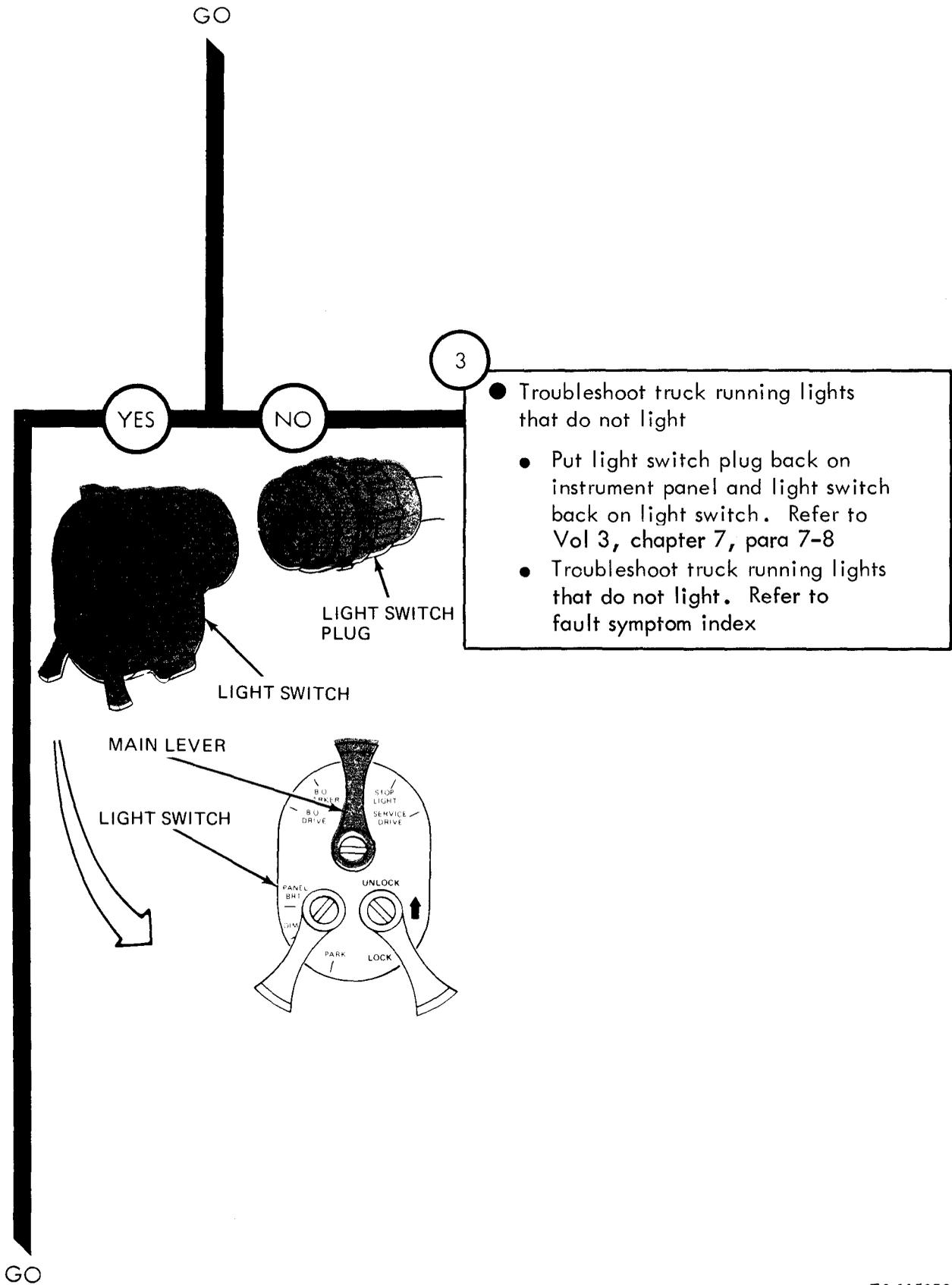
- Check light switch input voltage
 - Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Set multimeter to measure +24 volts DC. Refer to multimeter test equipment procedures index
 - Put multimeter + lead on contact F of light switch plug
 - Put multimeter - lead on a good ground
 - Read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure less than +24 volts DC?



GO

TA 115855

Figure 26-19 (Sheet 2 of 5)



TA 115856

Figure 26-19 (Sheet 3 of 5)

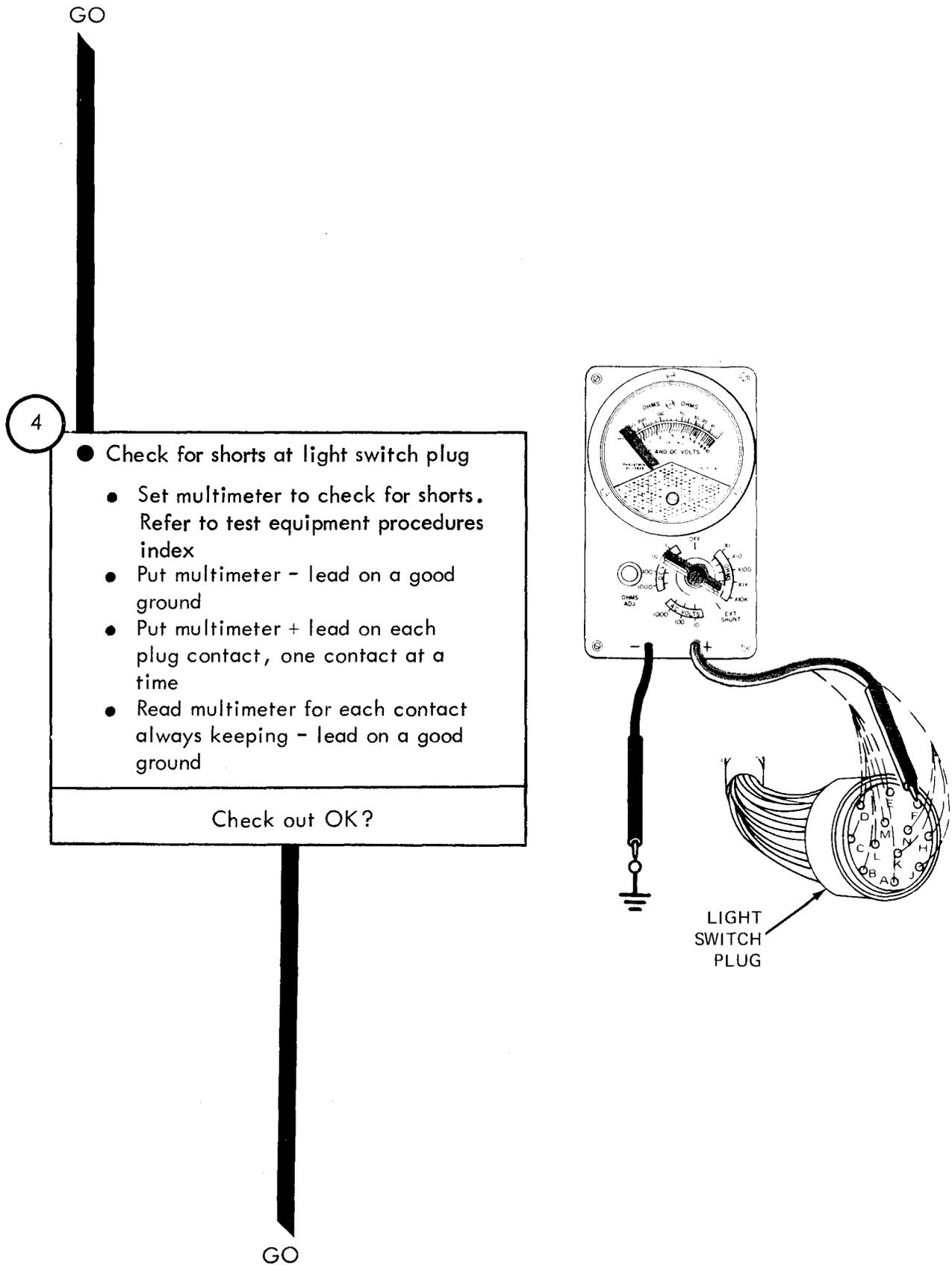


Figure 26-19 (Sheet 4 of 5)

TA 115857

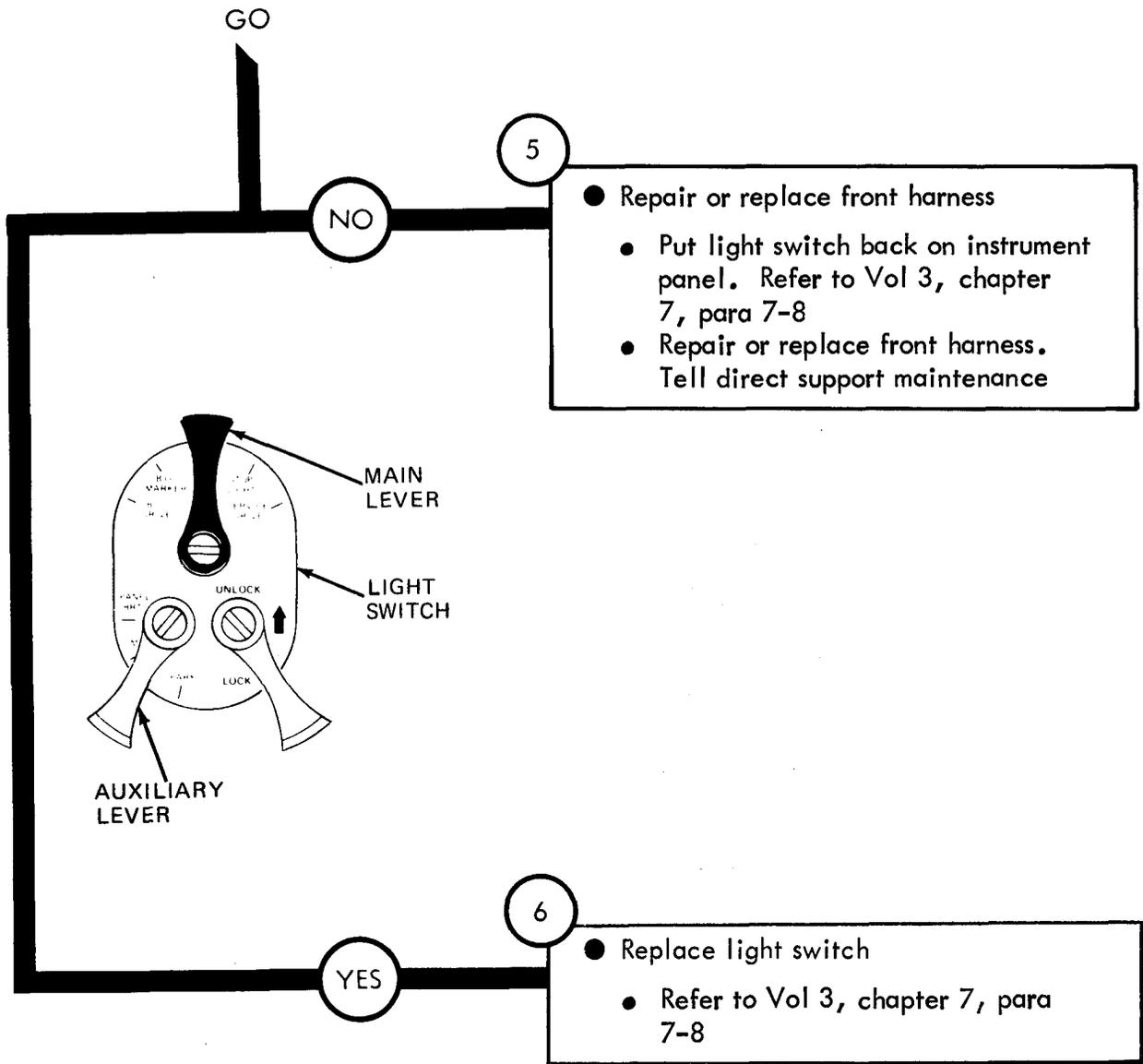


Figure 26-19 (Sheet 5 of 5)

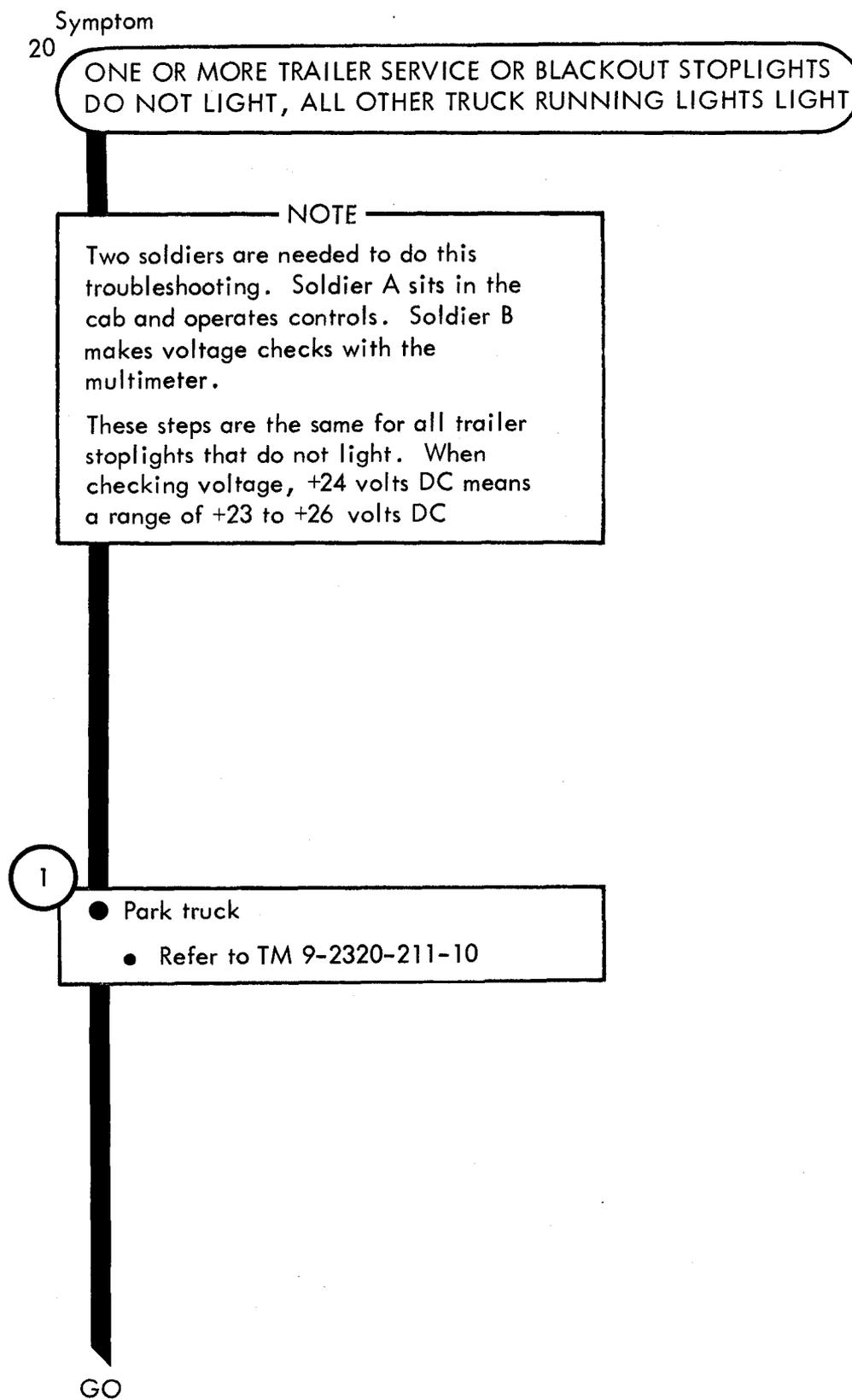


Figure 26-20 (Sheet 1 of 6)

GO

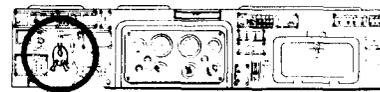
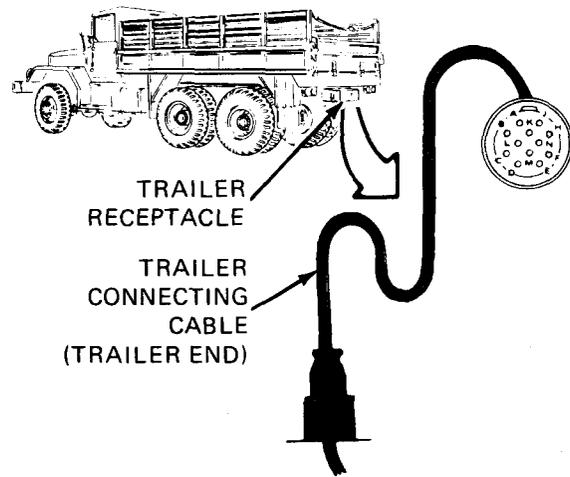
2

- Check for voltage to trailer service or blackout stoplight that does not light

SOLDIER B ● Take off trailer connecting cable from trailer

SOLDIER A ● Set light switch main switch lever to position for trailer stoplight that does not light

SOLDIER B ● Set multimeter to measure +24 volts DC. Refer to test equipment procedures index



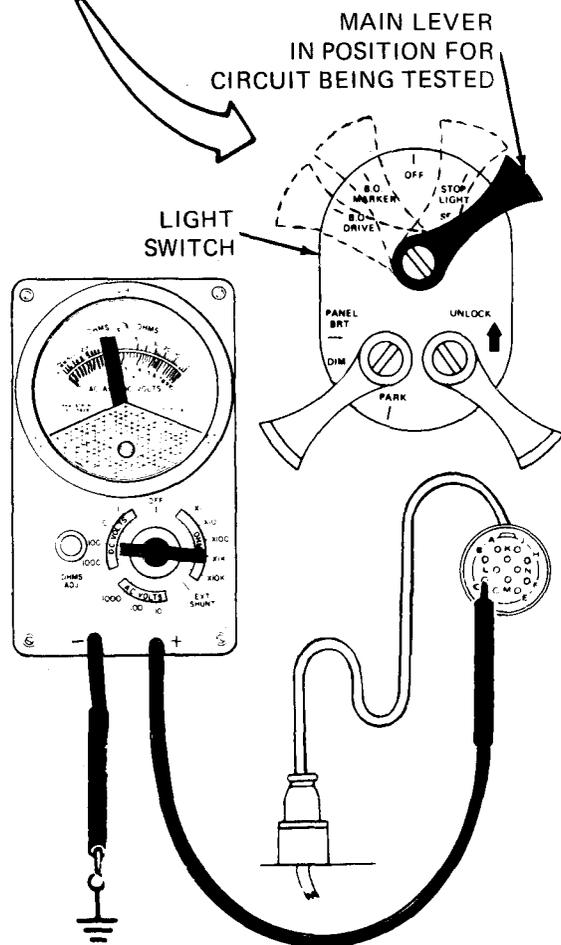
SOLDIER B ● Put multimeter + lead on contact on trailer end of cable for light that does not light. Service stoplight (RH) = contact J. Service stoplight (LH) = contact B. Blackout stoplight = contact F

● Put multimeter - lead on a good ground

SOLDIER A ● Step on brake pedal and hold it down

SOLDIER B ● Read multimeter while Soldier A presses down on brake pedal. Multimeter should measure +24 volts DC

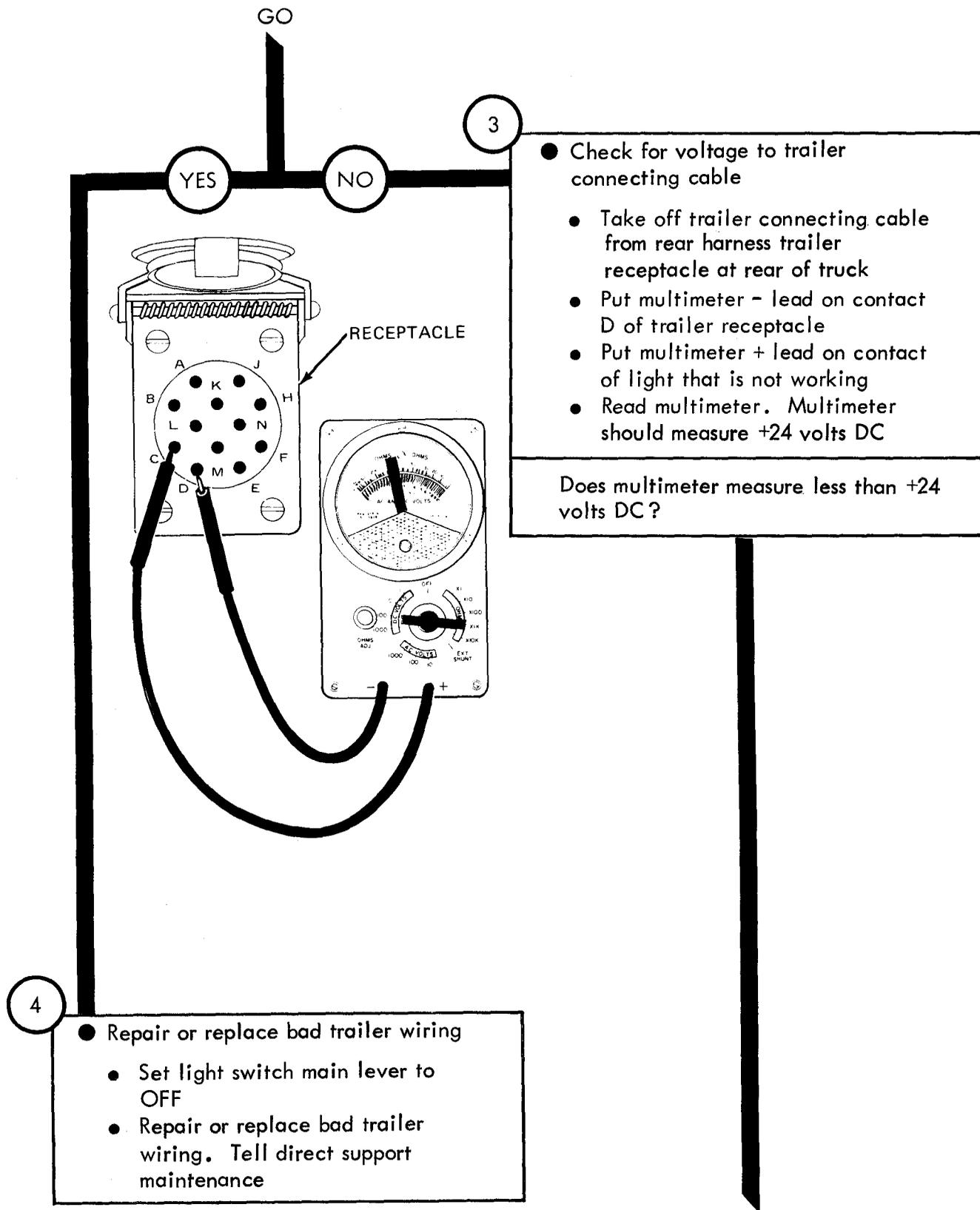
Does multimeter measure +24 volts DC?



GO

Figure 26-20 (Sheet 2 of 6)

TA 115860



3

- Check for voltage to trailer connecting cable
- Take off trailer connecting cable from rear harness trailer receptacle at rear of truck
- Put multimeter - lead on contact D of trailer receptacle
- Put multimeter + lead on contact of light that is not working
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

4

- Repair or replace bad trailer wiring
 - Set light switch main lever to OFF
 - Repair or replace bad trailer wiring. Tell direct support maintenance

NO GO

Figure 26-20 (Sheet 3 of 6)

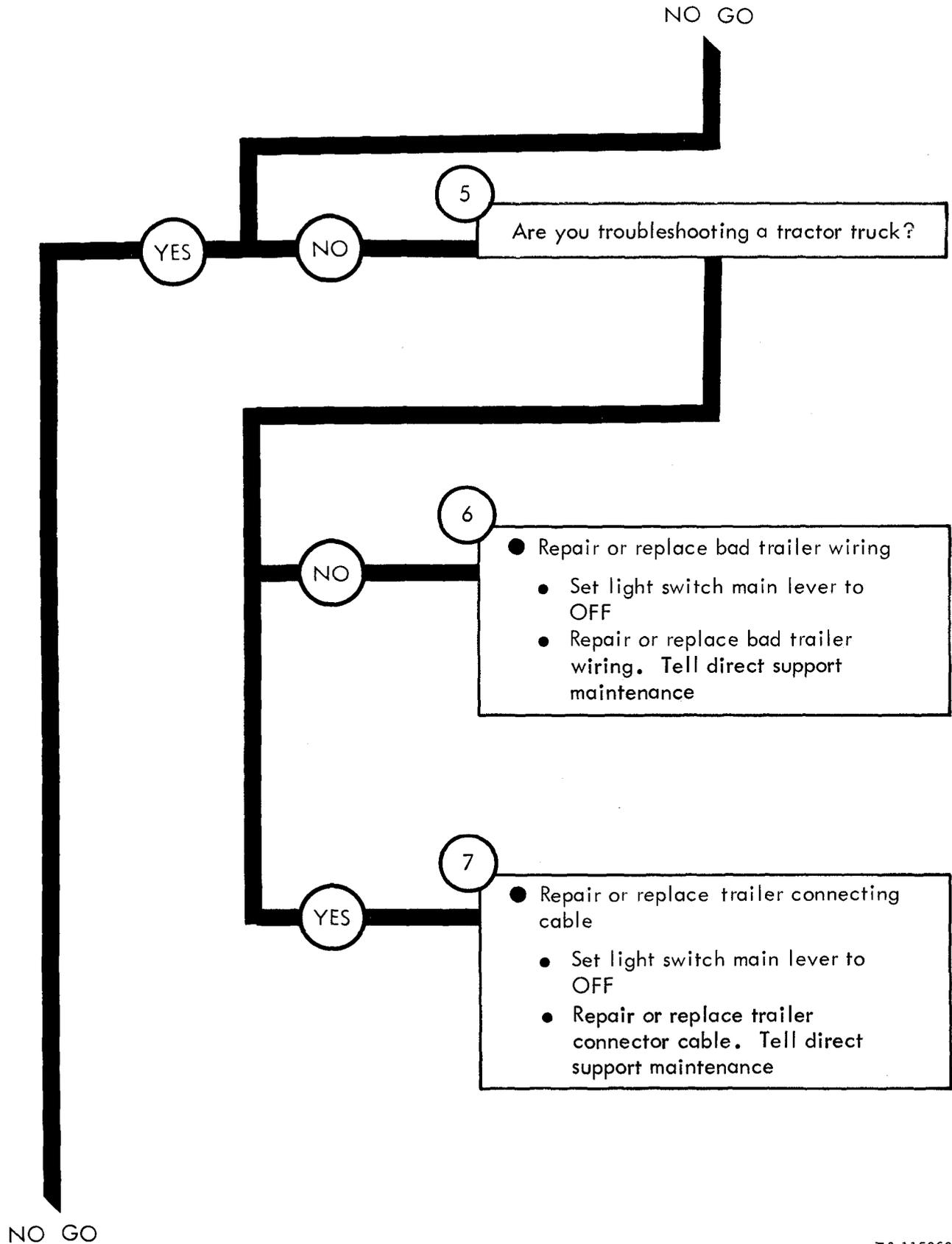
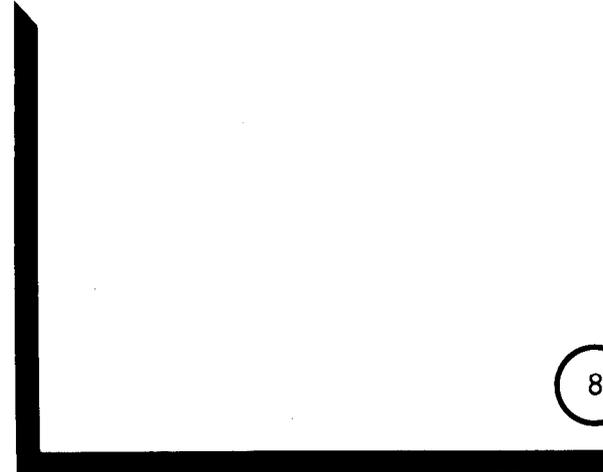


Figure 26-20 (Sheet 4 of 6)

NO GO

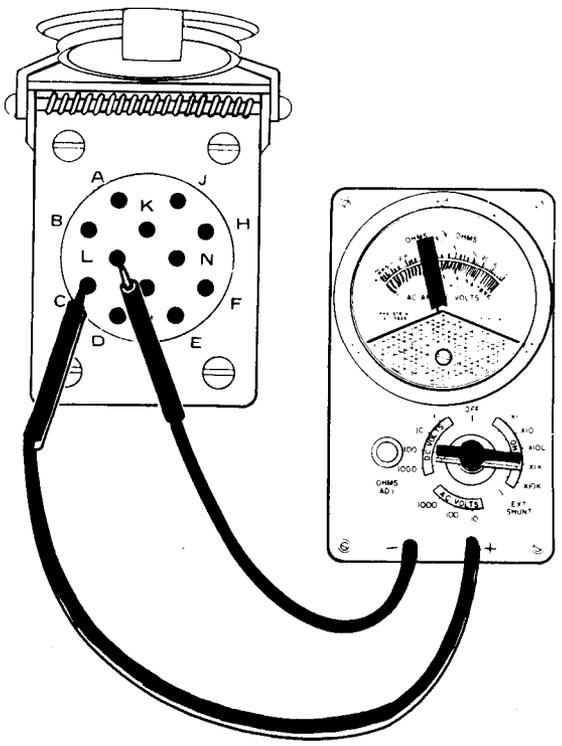


8

- Check for voltage using a different ground
- Leave multimeter + lead on contact of light being tested
- Move multimeter from contact D to a good ground
- Read multimeter

PIN	WIRE NO.	CIRCUIT
A	24A	REAR B. O. MARKER (LH)
B	22-461	SERVICE STOPLIGHT (LH)
C	24B	REAR B. O. MARKER (RH)
D	90	GROUND TO FRAME
E	21	SERVICE REAR
F	23	B. O. STOPLIGHT
H	490	B. O. MARKER LIGHTS
J	22-460	SERVICE STOPLIGHT (RH)
K	37	AUXILIARY 24 VOLT POWER
L	NONE	NOT USED
M	NONE	NOT USED
N	NONE	NOT USED

Does multimeter measure less than +24 volts DC?



NO GO

Figure 26-20 (Sheet 5 of 6)

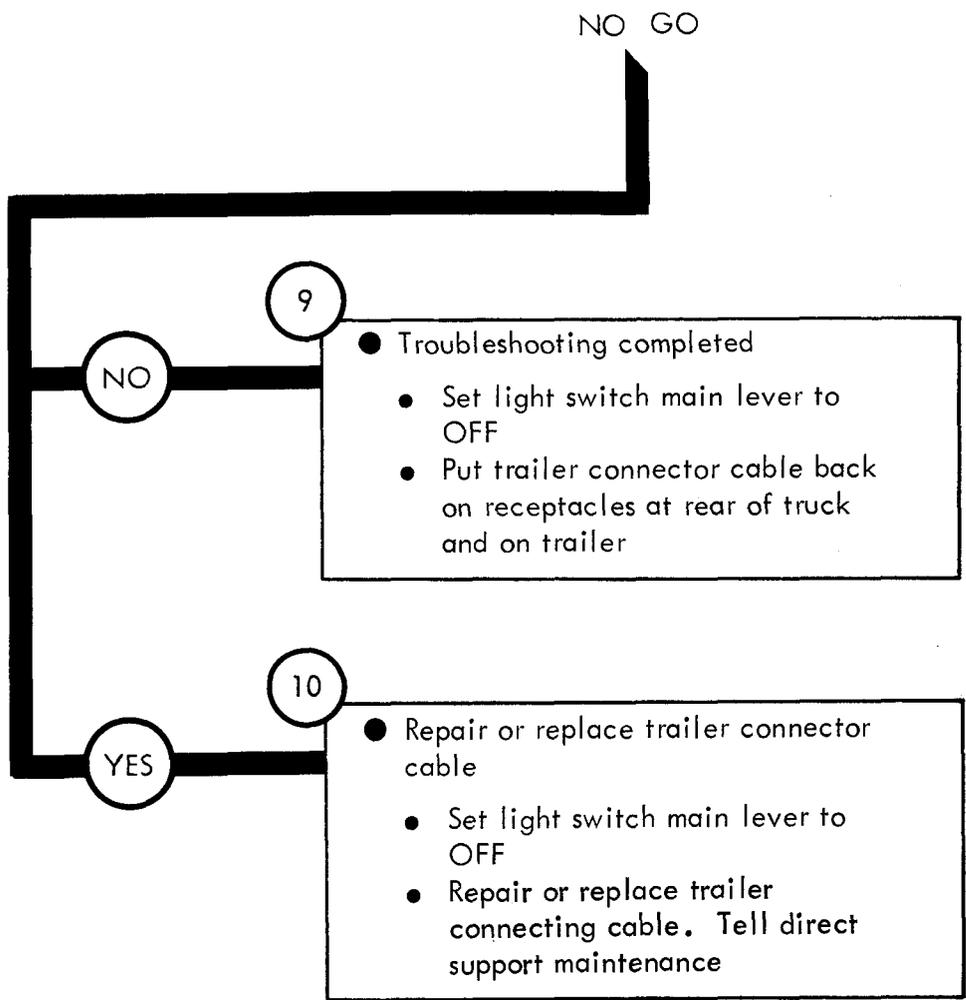


Figure 26-20 (Sheet 6 of 6)

Symptom

21

ONE OR MORE TRAILER LIGHTS DO NOT LIGHT
(EXCEPT SERVICE AND BLACKOUT STOPLIGHTS),
ALL OTHER TRUCK RUNNING LIGHTS LIGHT

NOTE

Two soldiers are needed to do this troubleshooting. Soldier A sits in the cab and operates controls. Soldier B makes voltage checks with the multimeter.

Do these steps for each trailer light that does not light.

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

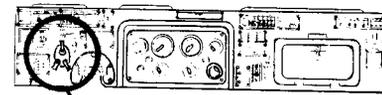
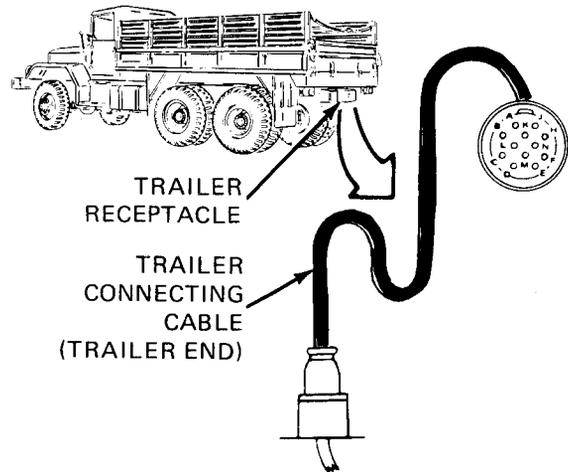
GO

Figure 26-21 (Sheet 1 of 6)

GO

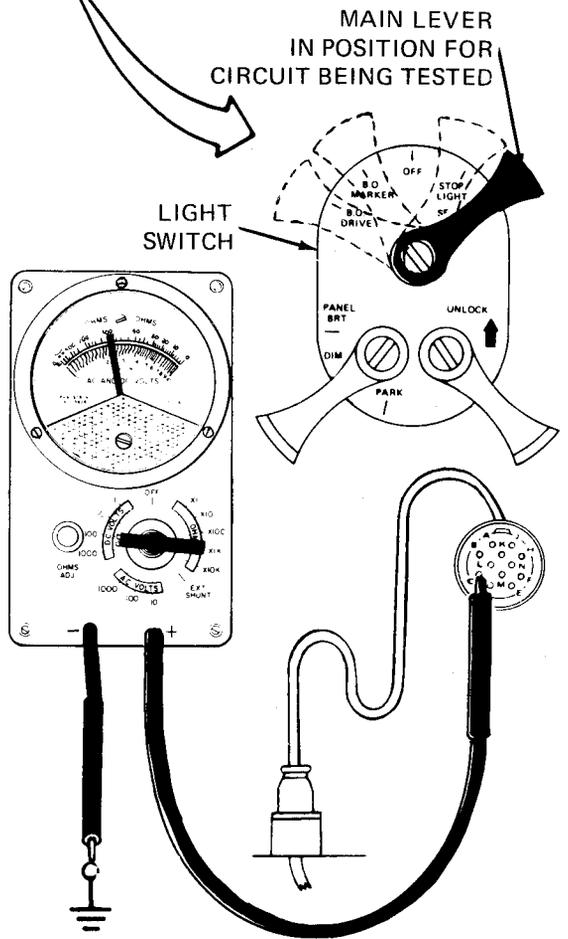
2

- Check for voltage at trailer lamp that is not working
- SOLDIER B ● Take off trailer connector cable from trailer
- SOLDIER A ● Set light switch main lever to position for trailer light that does not light
- SOLDIER B ● Set multimeter to measure +24 volts DC. Refer to test equipment procedures index



- SOLDIER B ● Put multimeter + lead on contact of cable for light that does not light. Rear B.O. marker (LH) = contact A. Rear B.O. marker (RH) = contact C. Service lights = contact H
- Put multimeter - lead on a good ground
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter read +24-volts DC?



GO

TA 115866

Figure 26-21 (Sheet 2 of 6)

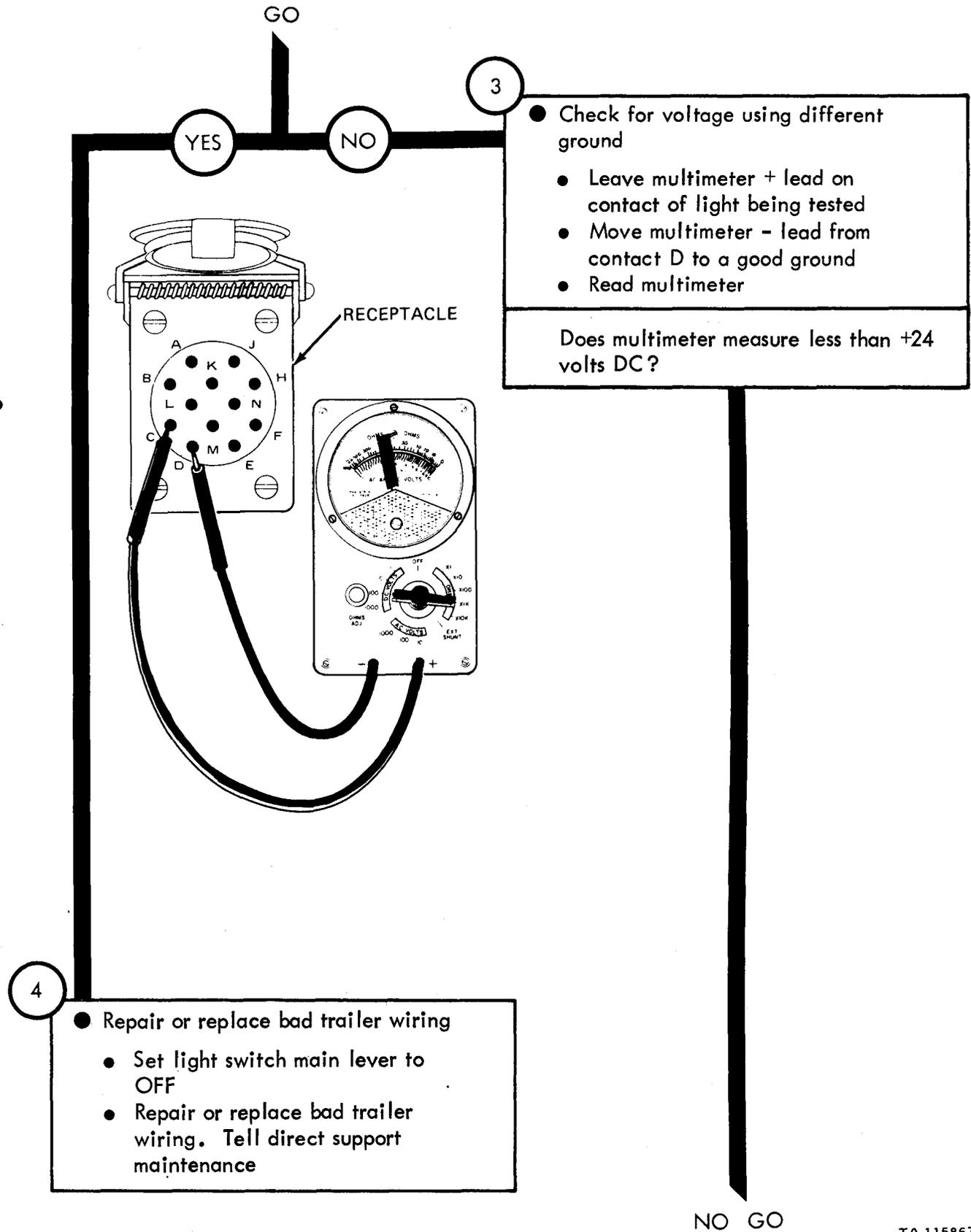


Figure 26-21 (Sheet 3 of 6)

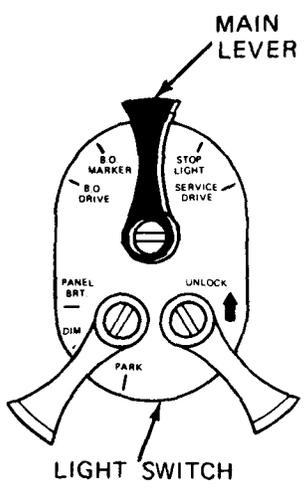
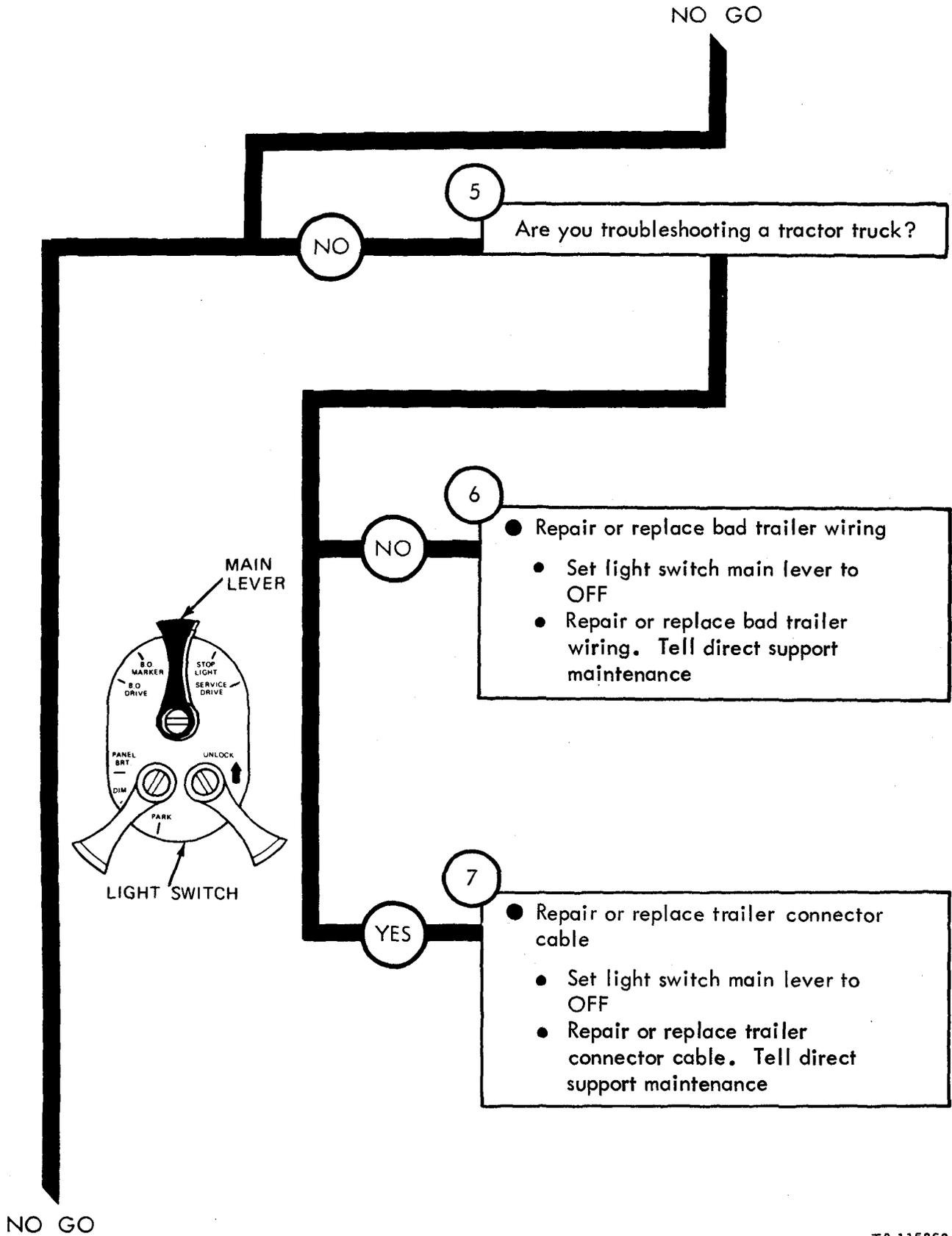
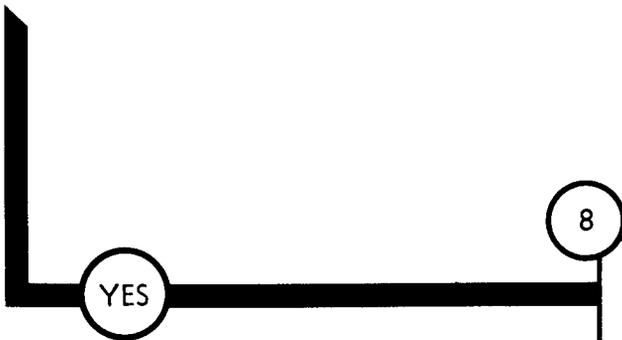


Figure 26-21 (Sheet 4 of 6)

TA 115868

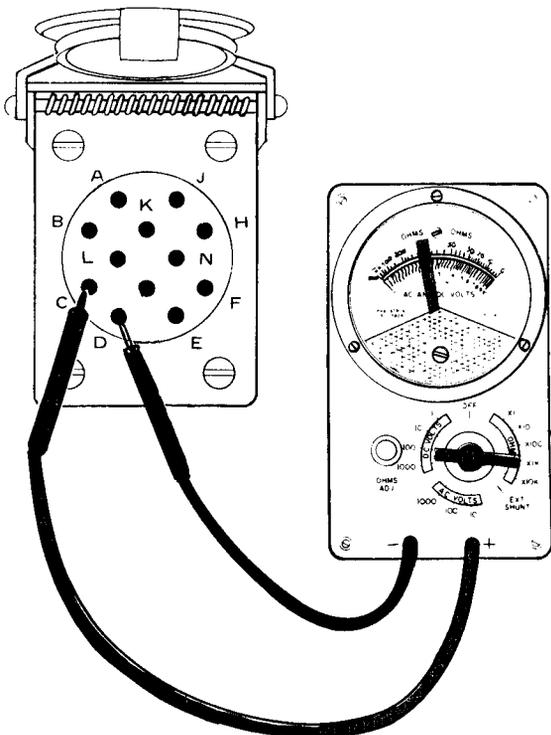
NO GO



PIN	WIRE NO.	CIRCUIT
A	24A	REAR B. O. MARKER (LH)
B	22-461	SERVICE STOPLIGHT (LH)
C	24B	REAR B. O. MARKER (RH)
D	90	GROUND TO FRAME
E	21	SERVICE REAR
F	23	B. O. STOPLIGHT
H	490	B. O. MARKER LIGHTS
J	22-460	SERVICE STOPLIGHT (RH)
K	37	AUXILIARY 24 VOLT POWER
L	NONE	NOT USED
M	NONE	NOT USED
N	NONE	NOT USED

- Check for voltage to trailer connector cable
- Take off trailer connector cable from trailer receptacle at rear of truck
- Put multimeter + lead on contact of trailer receptacle for light that does not light
- Put multimeter - lead on contact D of trailer receptacle
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



TS 209-20-486

NO GO

Figure 26-21 (Sheet 5 of 6)

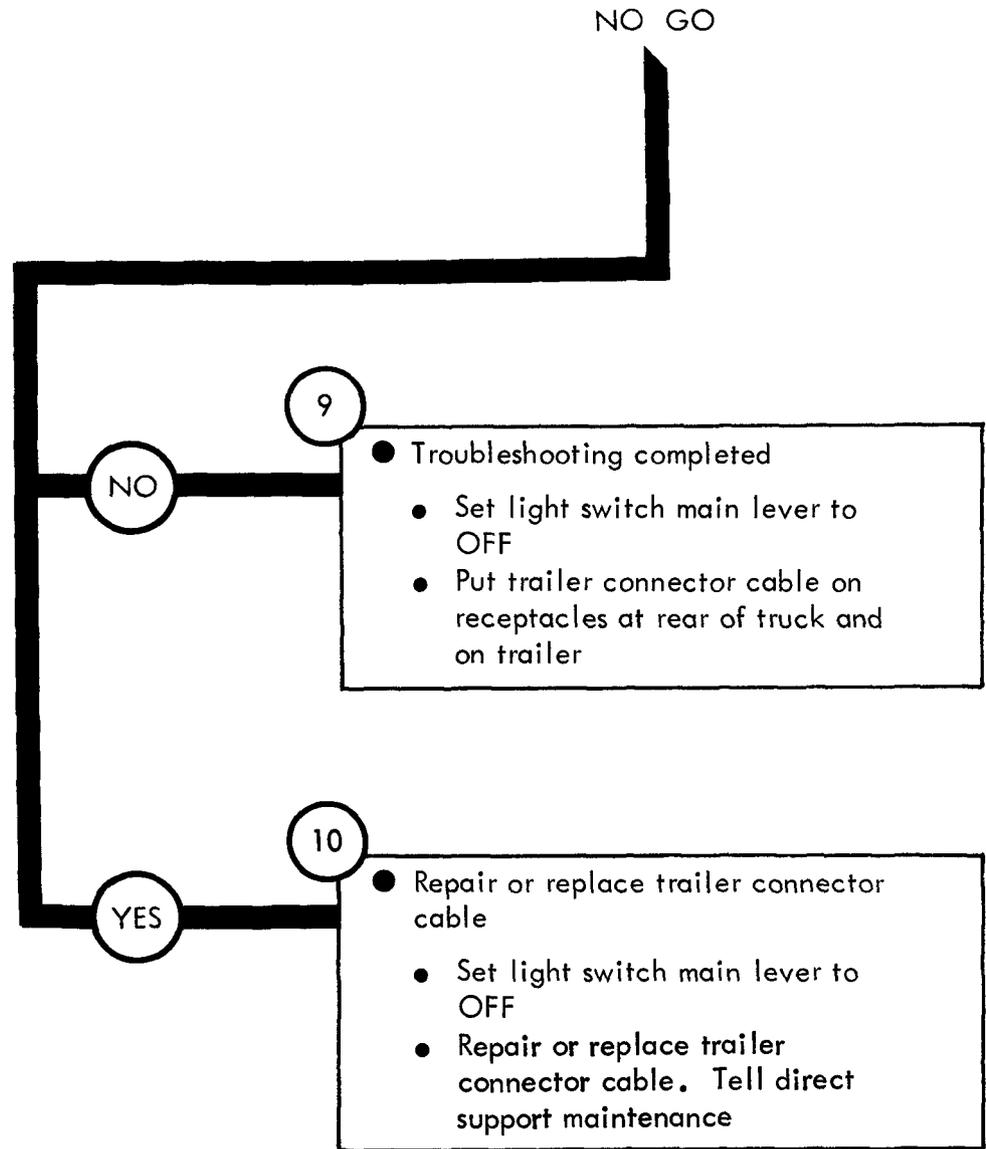


Figure 26-21 (Sheet 6 of 6)

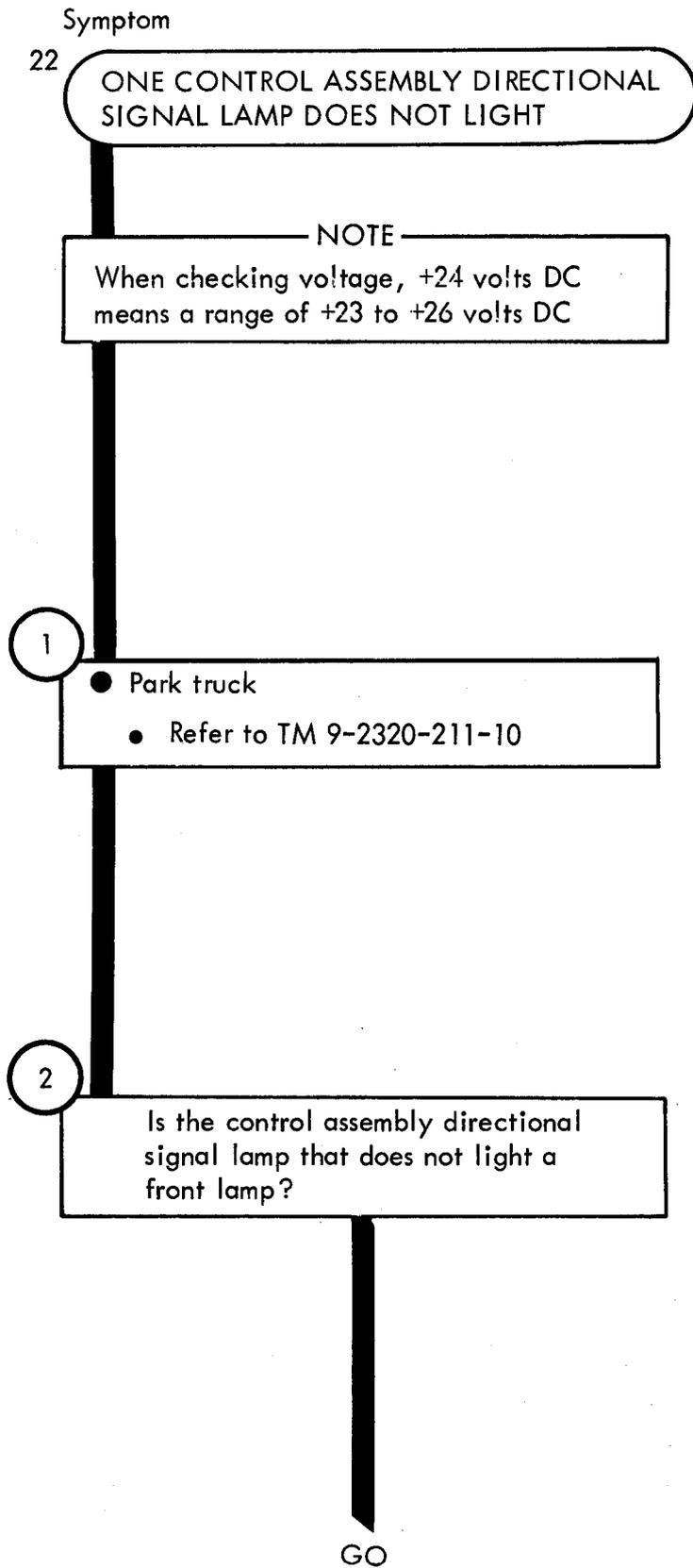


Figure 26-22 (Sheet 1 of 18)

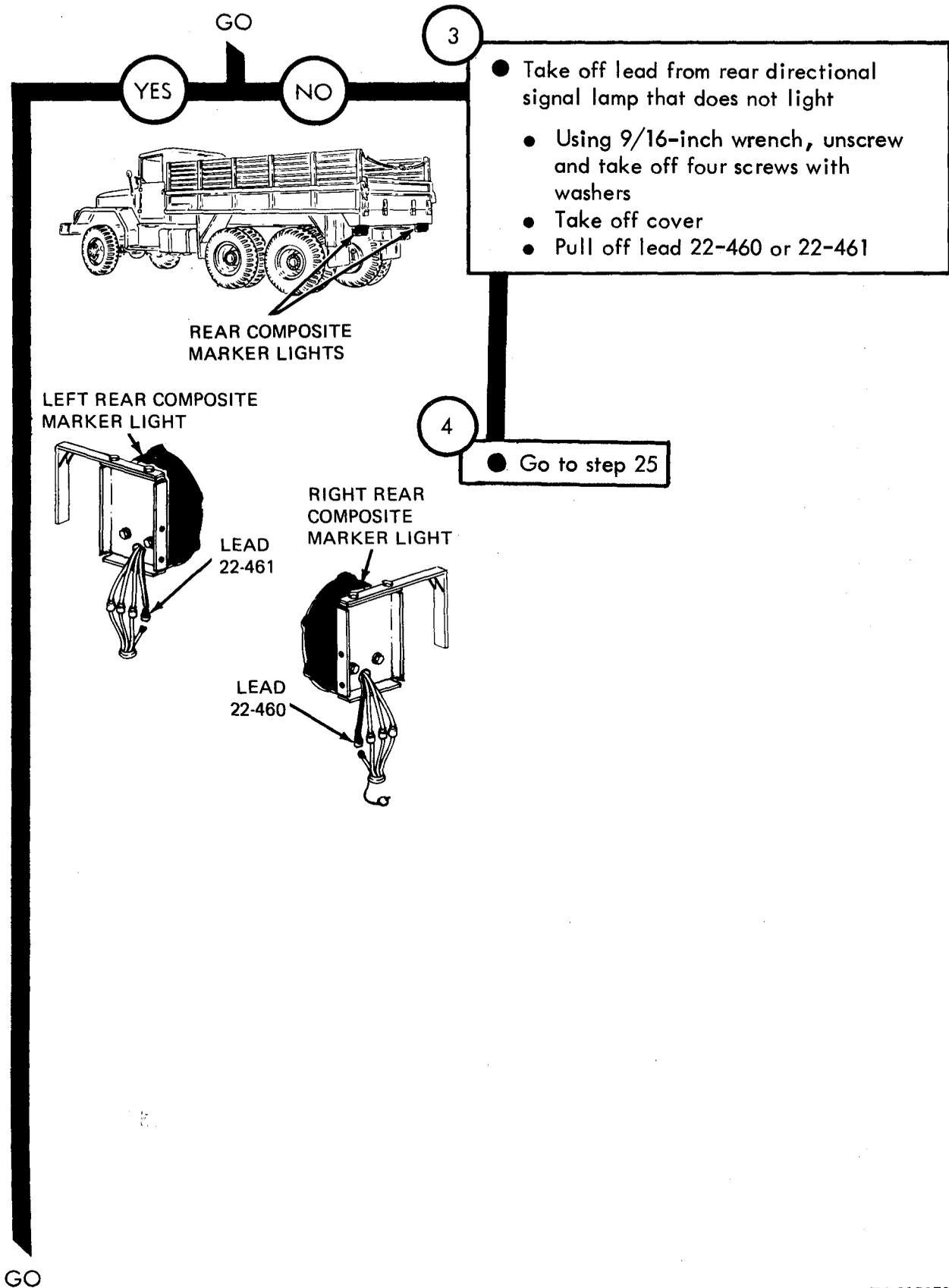
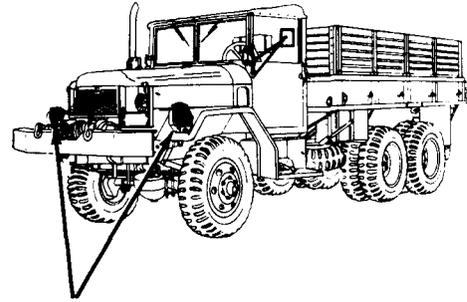
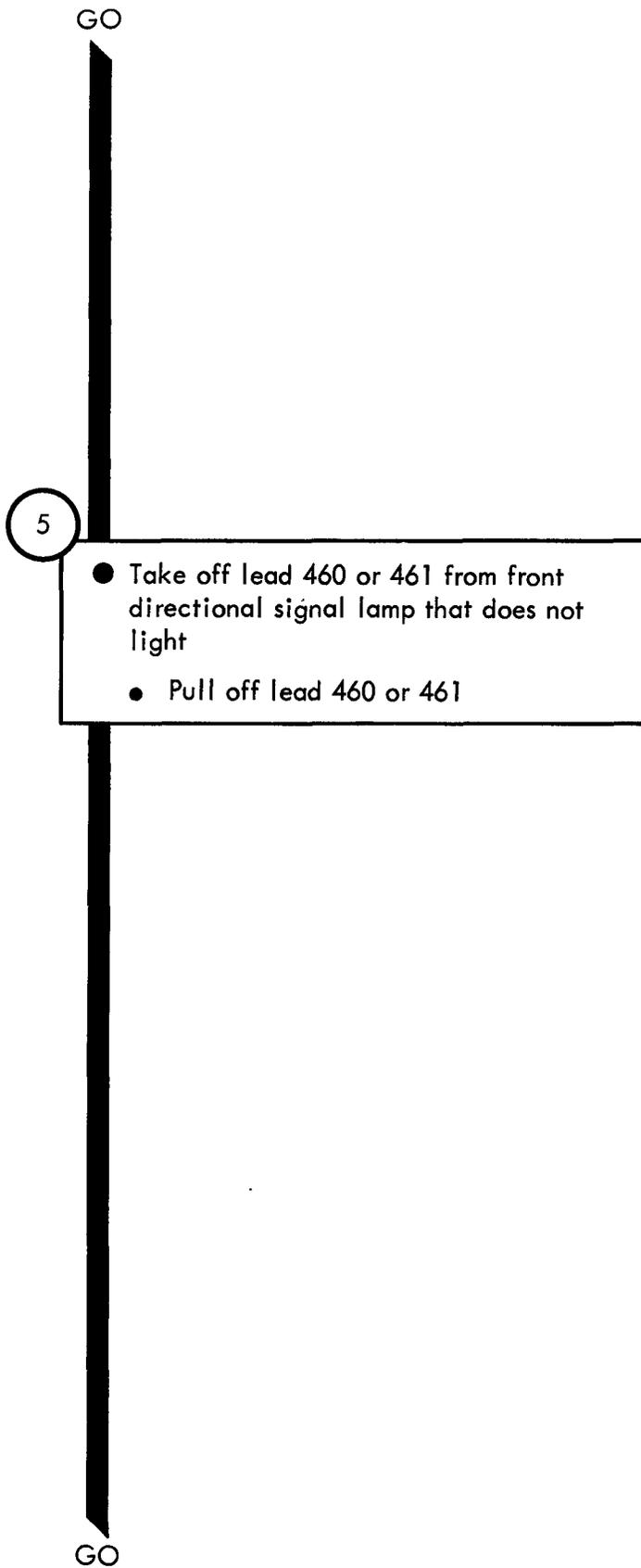


Figure 26-22 (Sheet 2 of 18)



FRONT COMPOSITE MARKER LIGHTS

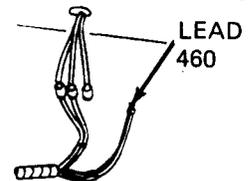
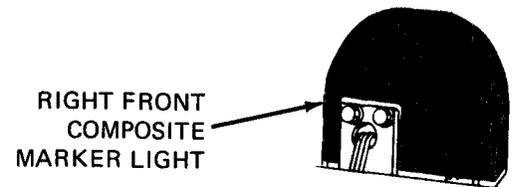
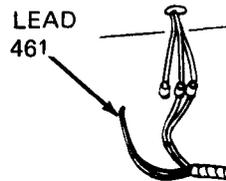
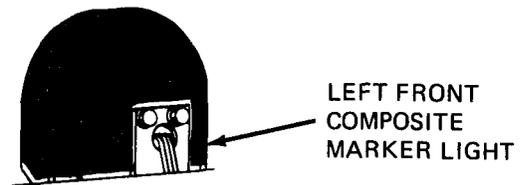


Figure 26-22 (Sheet 3 of 18)

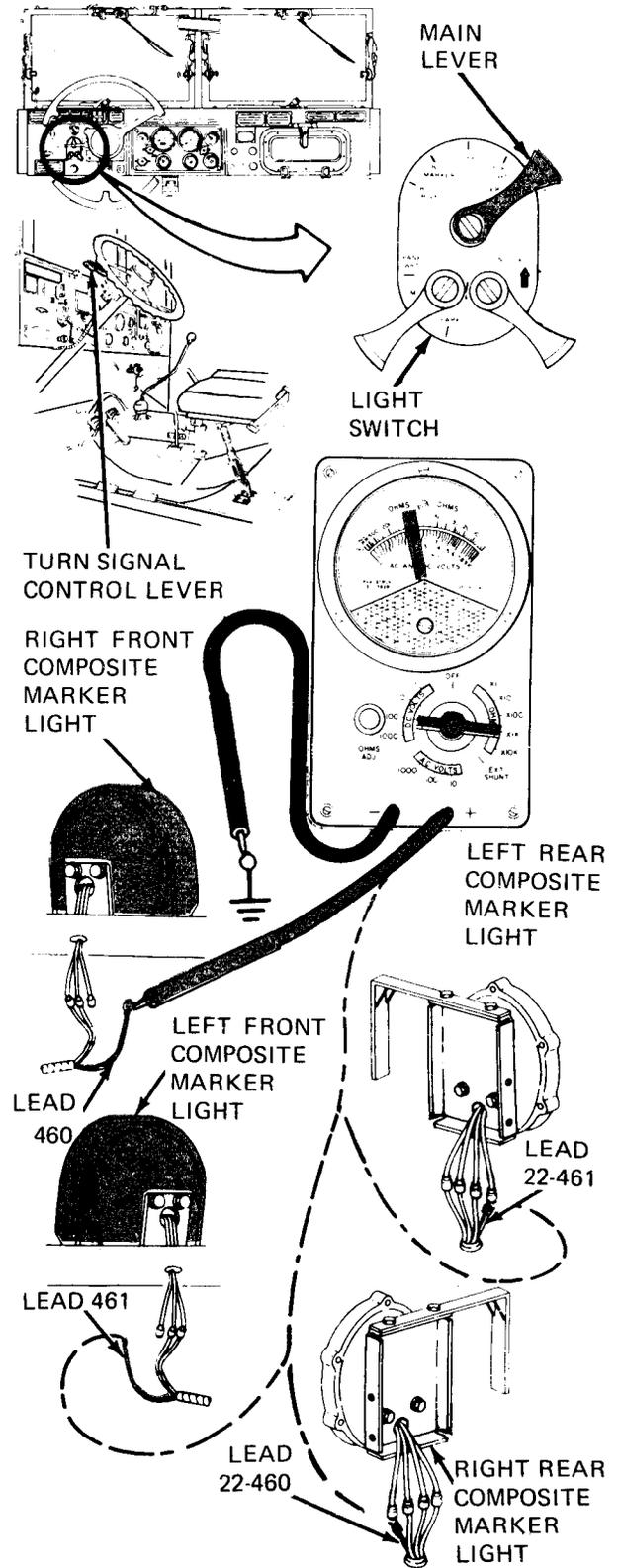
TA 115873

GO

6

- Check for voltage at directional signal lamp that does not light
 - Set light switch main lever to SERVICE DRIVE
 - Set turn signal control lever to emergency flasher position
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter + lead on lead 22-460, 22-461, 460, or 461 and - lead on a good ground
 - Read multimeter. Multimeter pointer should move up and down scale at rate of 1 to 2 times per second

Is multimeter reading wrong?



GO

Figure 26-22 (Sheet 4 of 18)

TA 115874

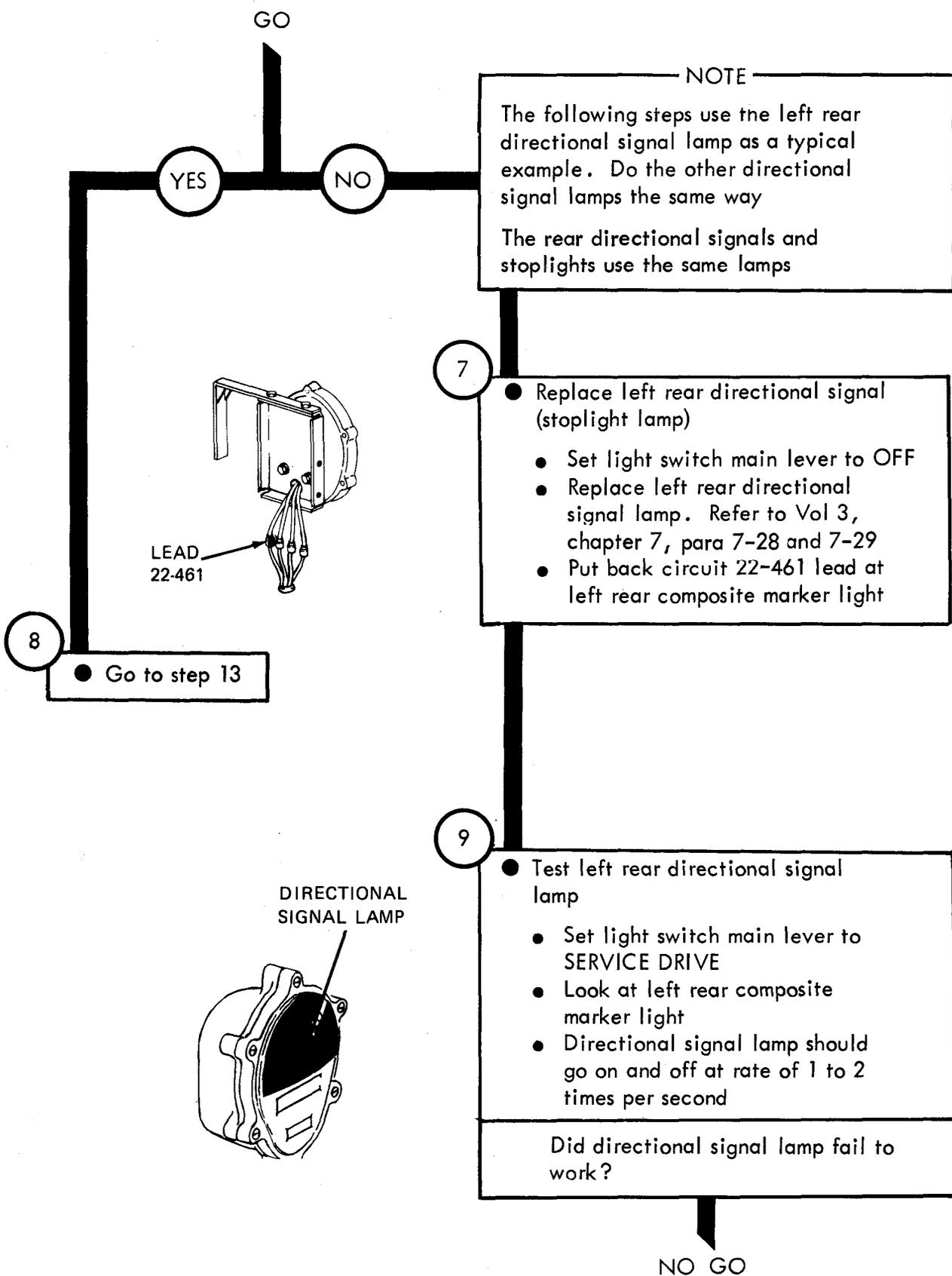
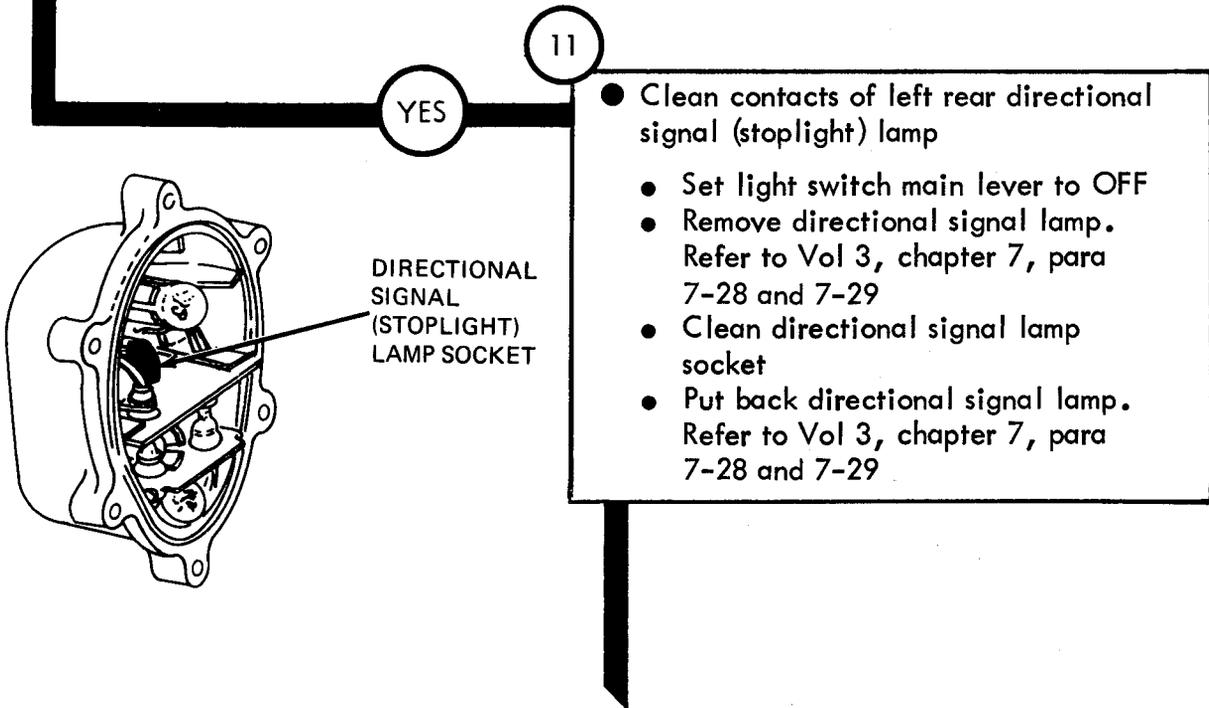
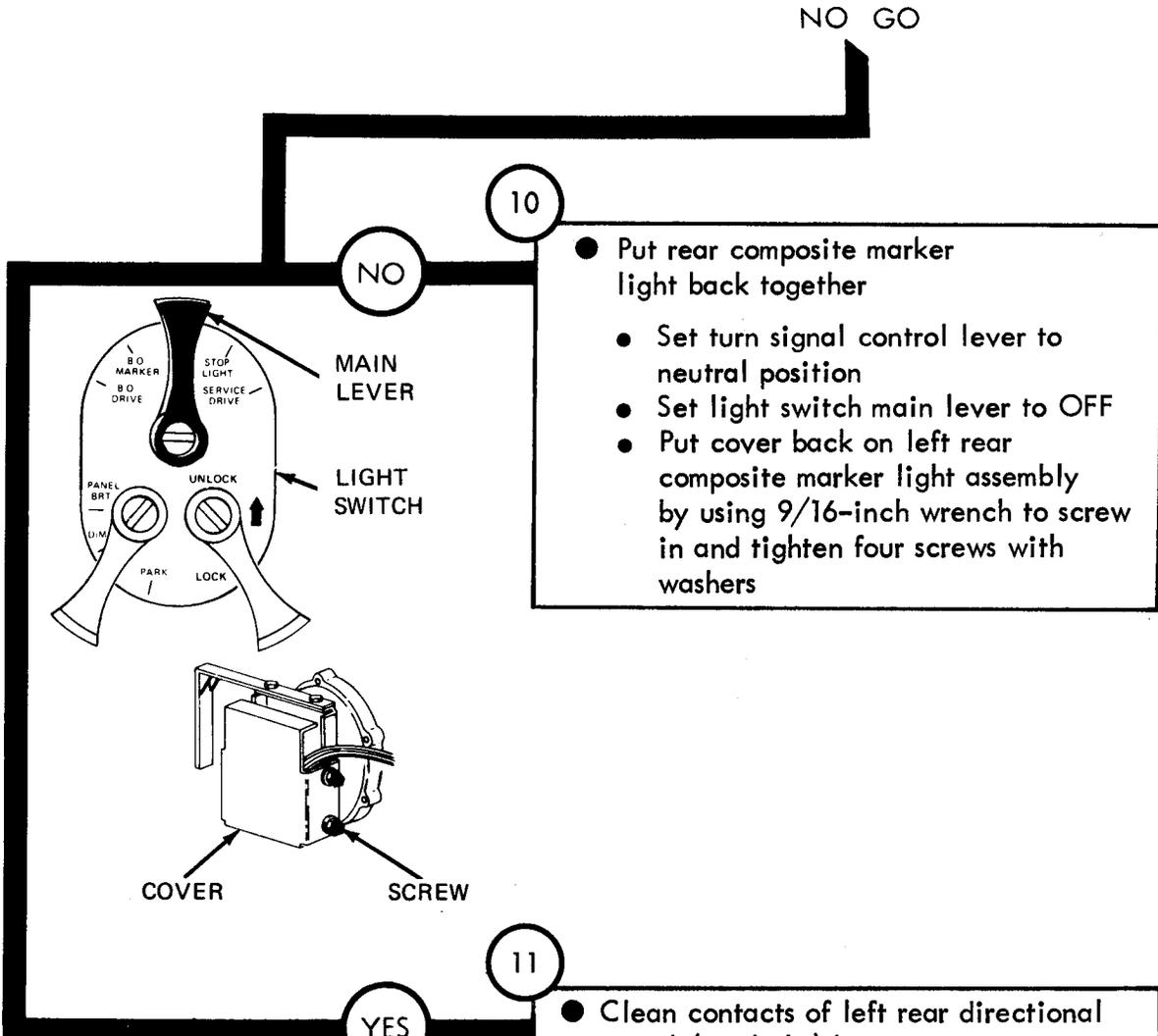


Figure 26-22 (Sheet 5 of 18)

NO GO

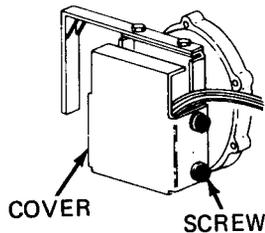
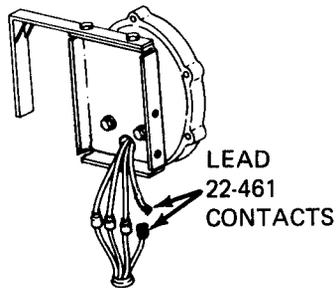


NO GO

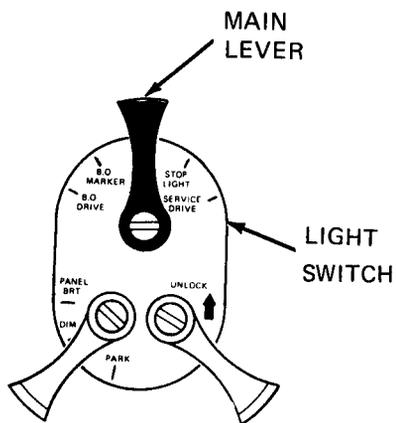
Figure 26-22 (Sheet 6 of 18)

TA 115876

NO GO



- Clean left rear directional signal (stoplight) lamp connector contacts
 - Take off lead 22-461
 - Clean lead 22-461
 - Push lead 22-461 into connector
 - Put cover back on rear composite marker assembly by using 9/16-inch wrench to screw in and tighten four screws with washers



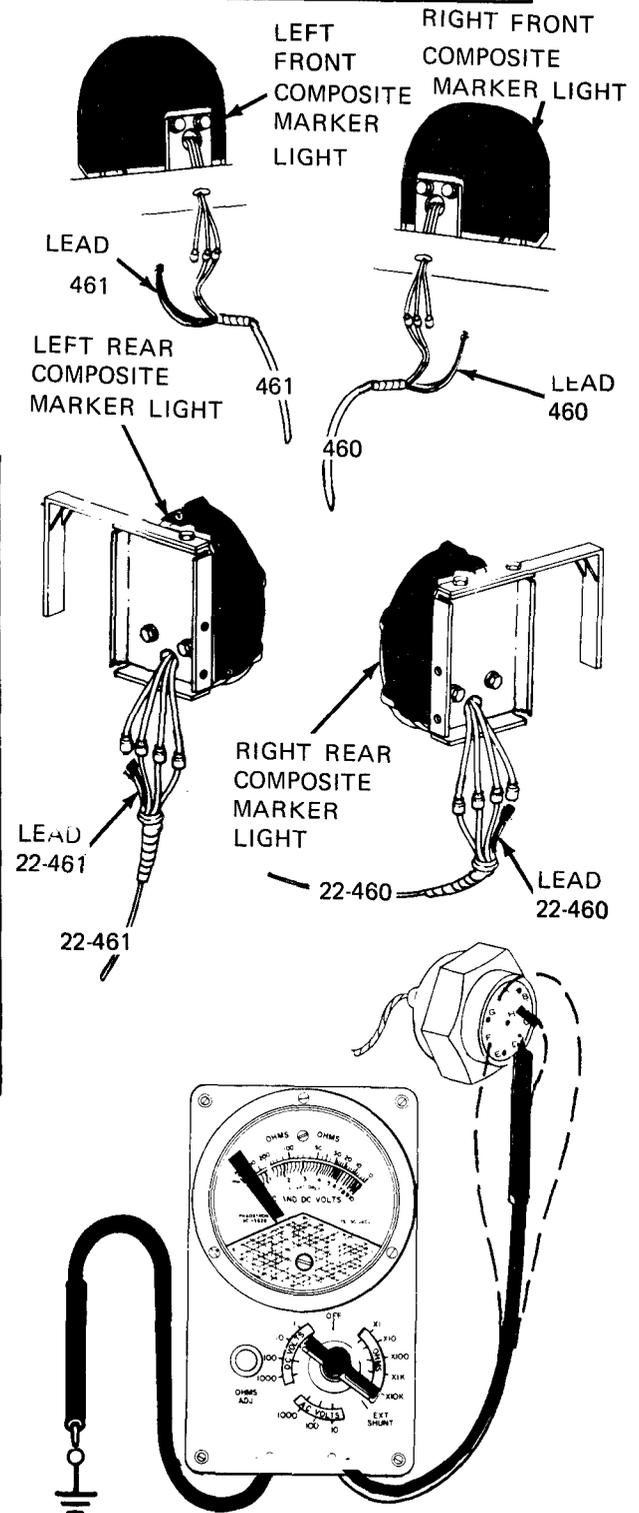
12

- Troubleshooting completed. Set turn signal control lever to neutral position
- Set light switch main lever to OFF

Figure 26-22 (Sheet 7 of 18)

From step 8

LAMP CIRCUIT:	PLUG CONTACT:
RIGHT FRONT	A
LEFT FRONT	B
RIGHT REAR	E
LEFT REAR	C



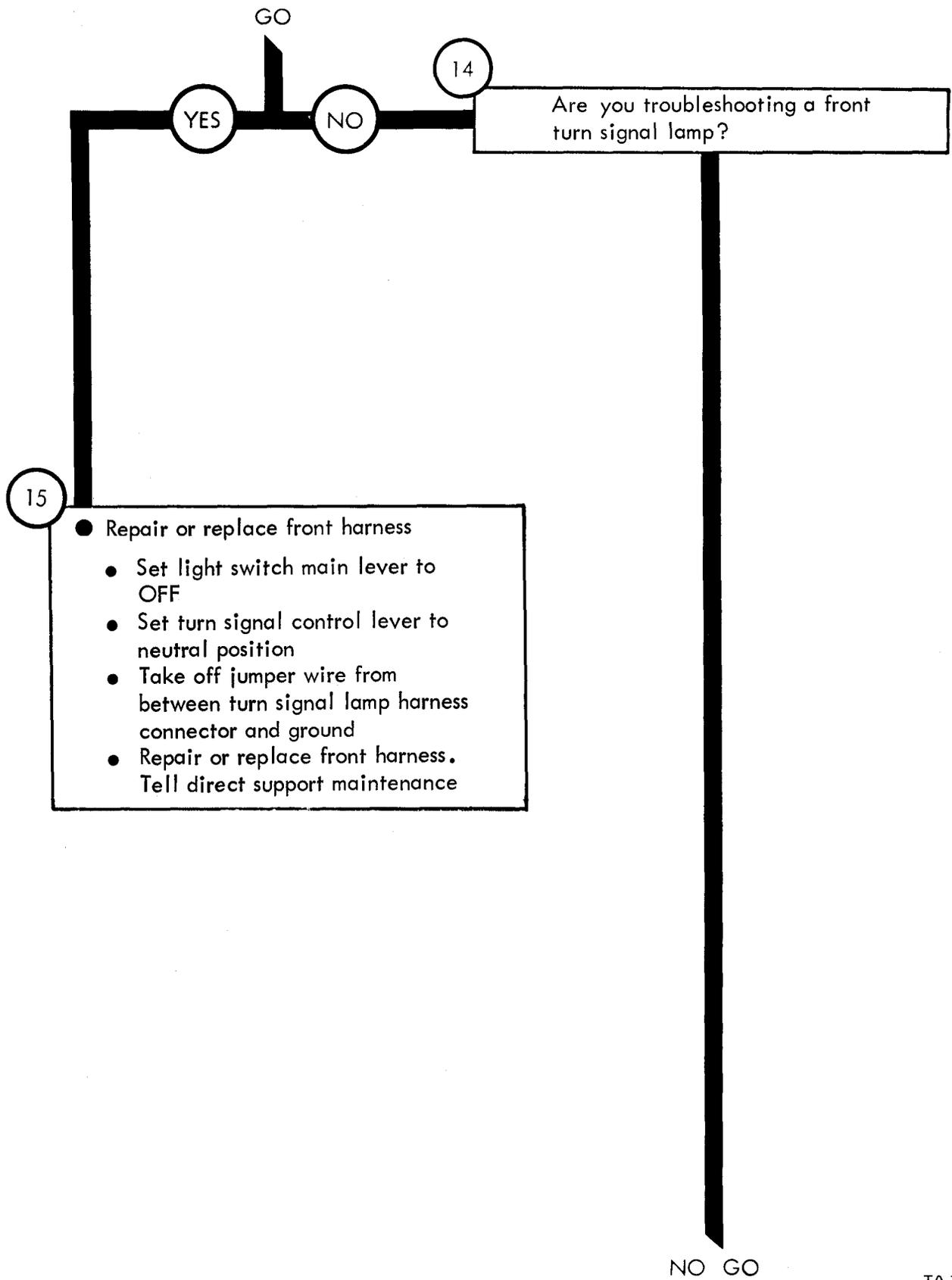
13

- See if directional signal lamp circuit is shorted to ground
- Set light switch main lever to OFF
- Unscrew and take off turn signal control harness plug from turn signal control assembly
- Set multimeter to check for short circuit. Refer to test equipment procedures index
- Put multimeters - lead on a good ground and + lead on turn signal control harness plug connector for circuit being tested
- Read multimeter. Multimeter pointer should not move

Check out OK?

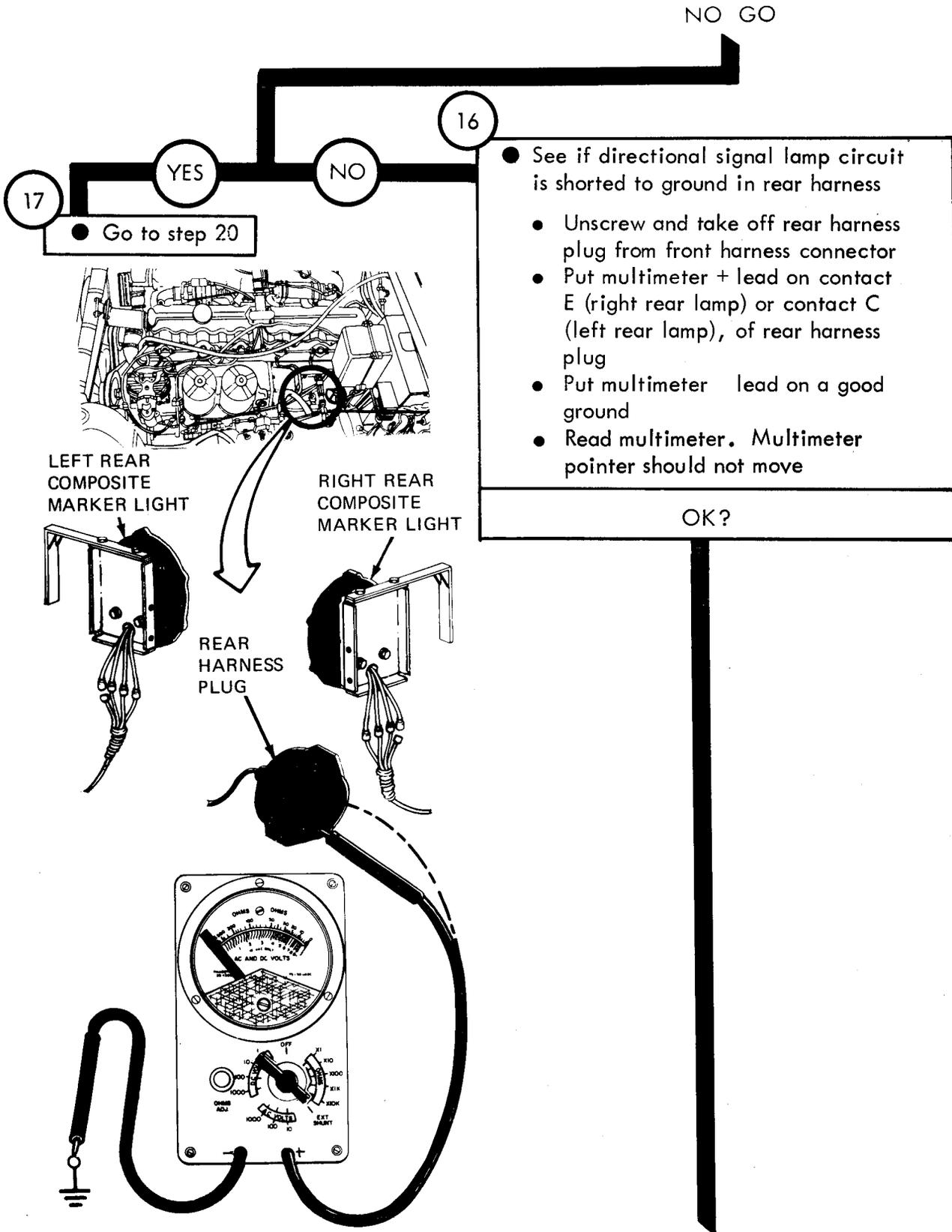
GO

Figure 26-22 (Sheet 8 of 18)



TA 115879

Figure 26-22 (Sheet 9 of 18)



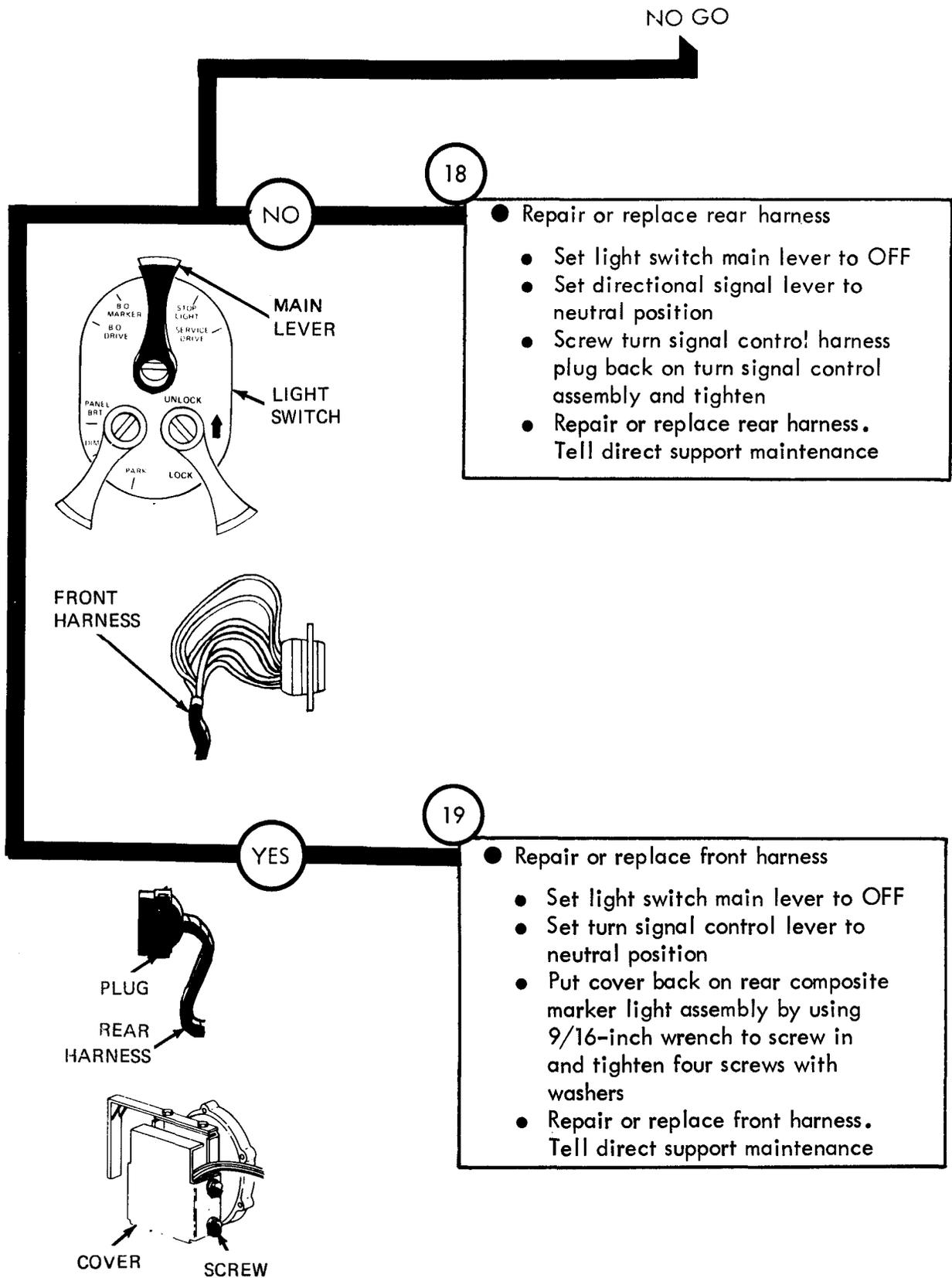
- See if directional signal lamp circuit is shorted to ground in rear harness
 - Unscrew and take off rear harness plug from front harness connector
 - Put multimeter + lead on contact E (right rear lamp) or contact C (left rear lamp), of rear harness plug
 - Put multimeter lead on a good ground
 - Read multimeter. Multimeter pointer should not move

OK?

NO GO

Figure 26-22 (Sheet 10 of 18)

TA 115880



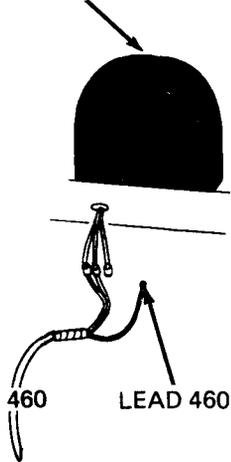
TA 115881

Figure 26-22 (Sheet 11 of 18)

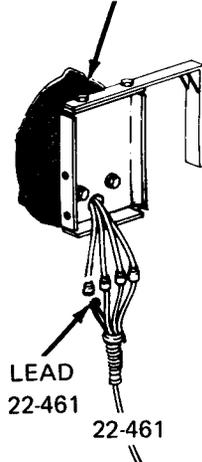
From step 17

LAMP CIRCUIT:	PLUG CONTACT:
RIGHT FRONT	A
LEFT FRONT	B
RIGHT REAR	E
LEFT REAR	C

RIGHT FRONT COMPOSITE MARKER LIGHT



LEFT REAR COMPOSITE MARKER LIGHT



20

- Check for continuity in directional signal lamp circuit
 - Put jumper wire between turn signal lamp harness connector and a good ground
 - Set multimeter to check continuity. Refer to test equipment procedures index

NO GO

Figure 26-22 (Sheet 12 of 18)

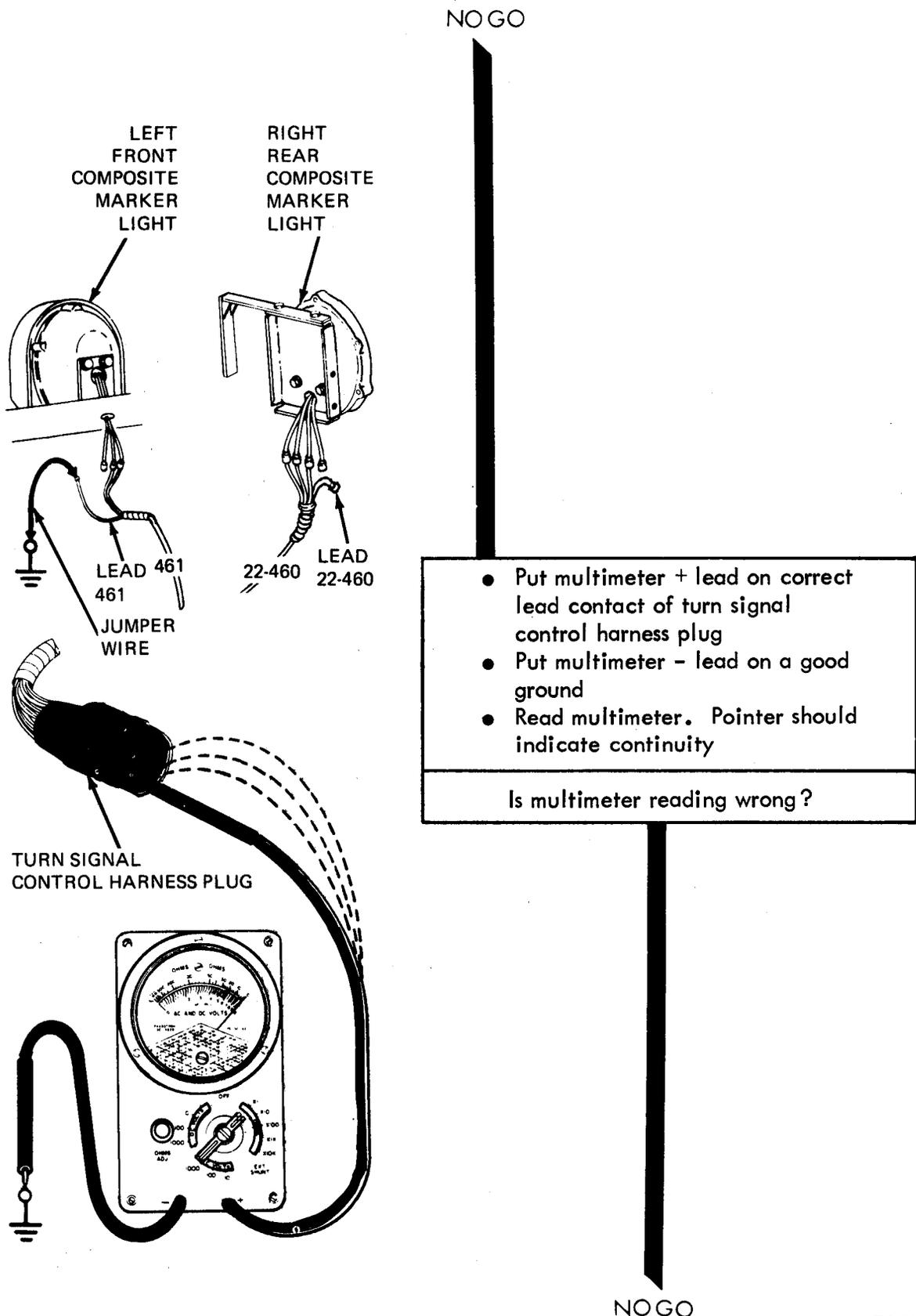


Figure 26-22 (Sheet 13 of 18)

TA 115883

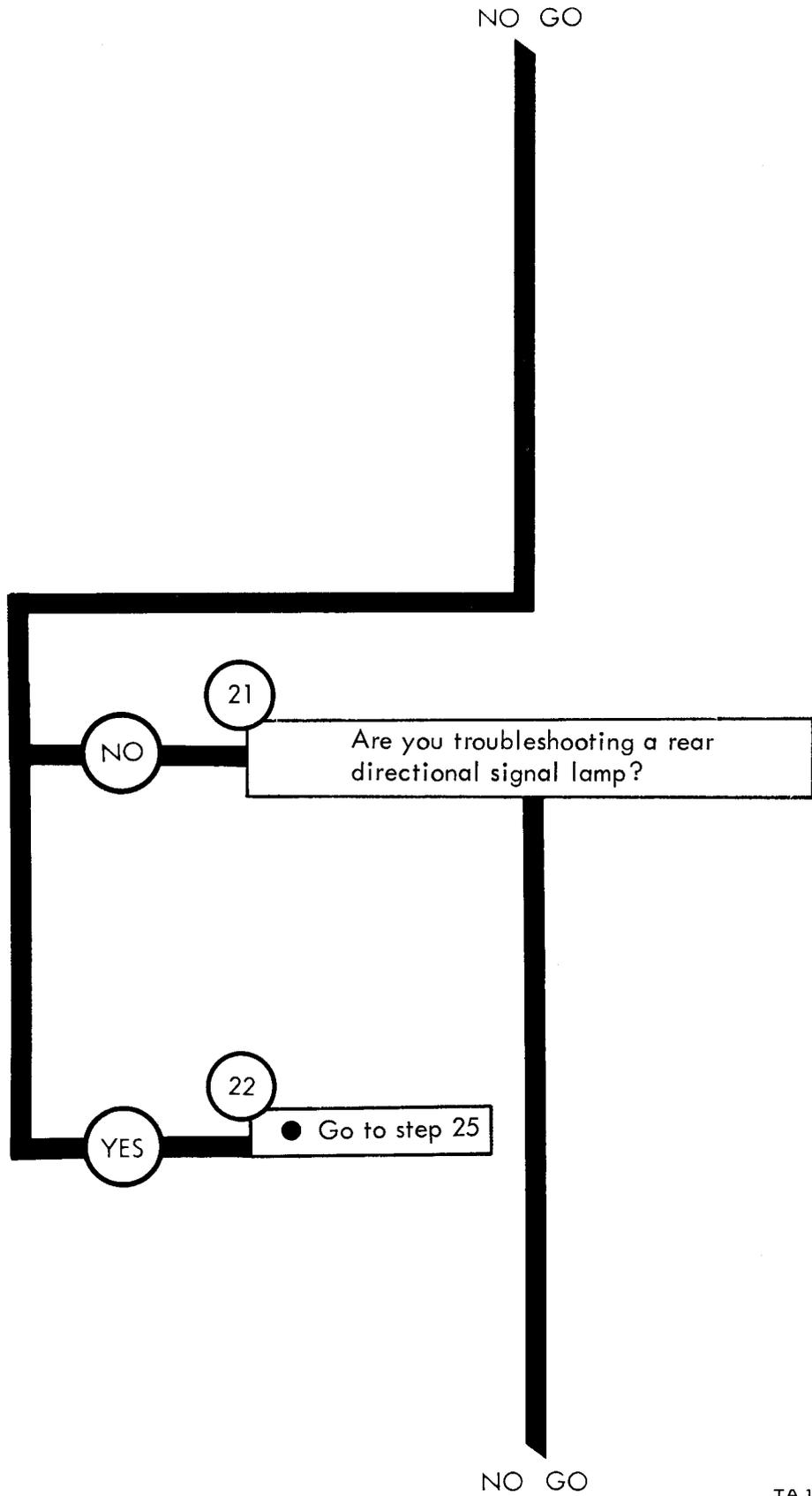


Figure 26-22 (Sheet 14 of 18)

TA 115884

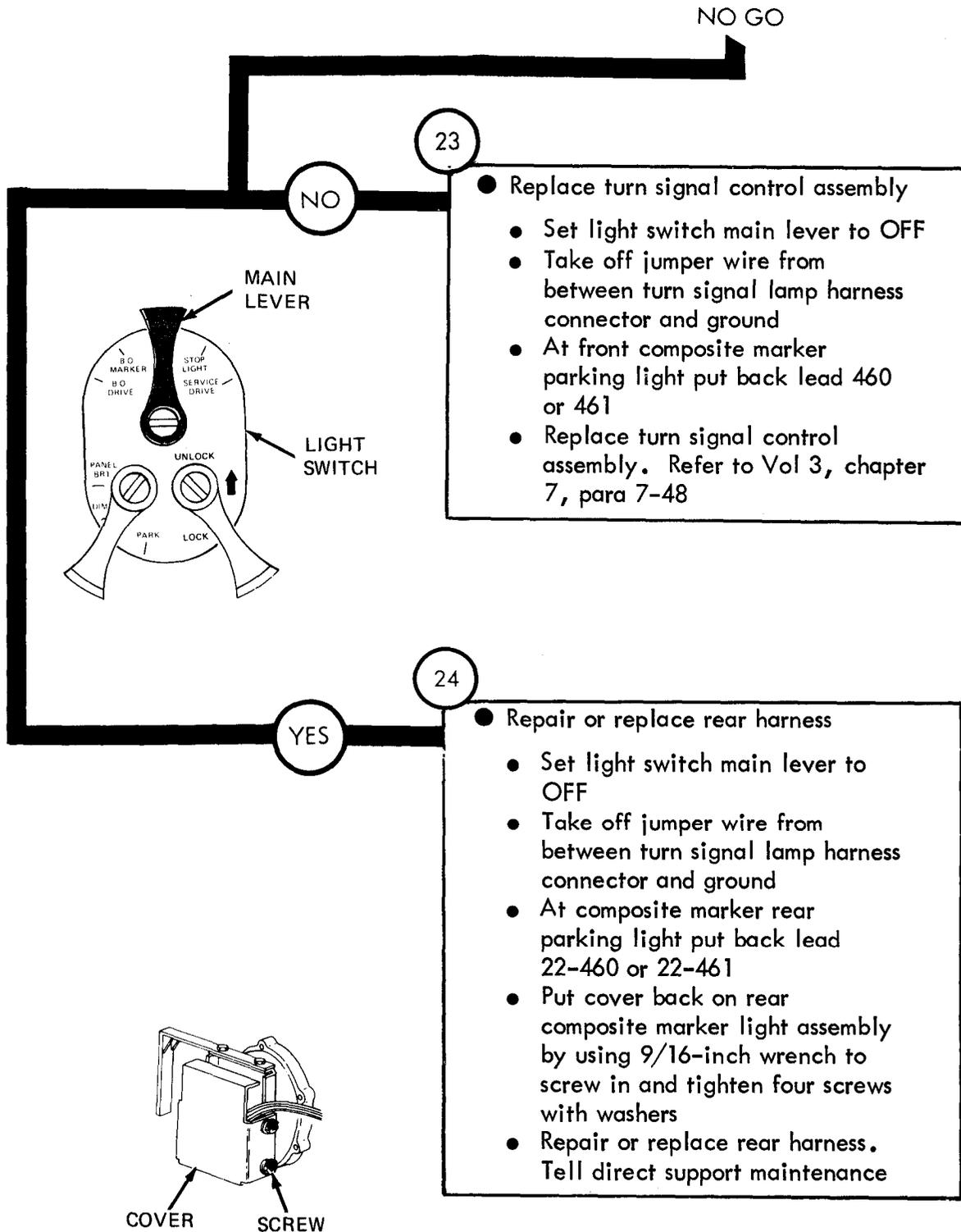


Figure 26-22 (Sheet 15 of 18)

From step 22

25

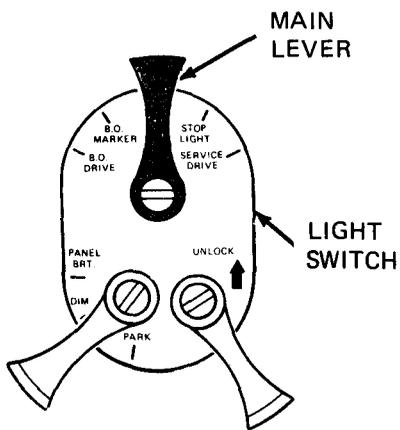
Are you troubleshooting a rear turn signal lamp?

YES

NO

26

- Repair or replace front harness
 - Set turn signal control lever to neutral position
 - Set light switch main lever to OFF
 - Take off jumper wire from between turn signal lamp harness connector and ground
 - Repair or replace front harness. Tell direct support maintenance

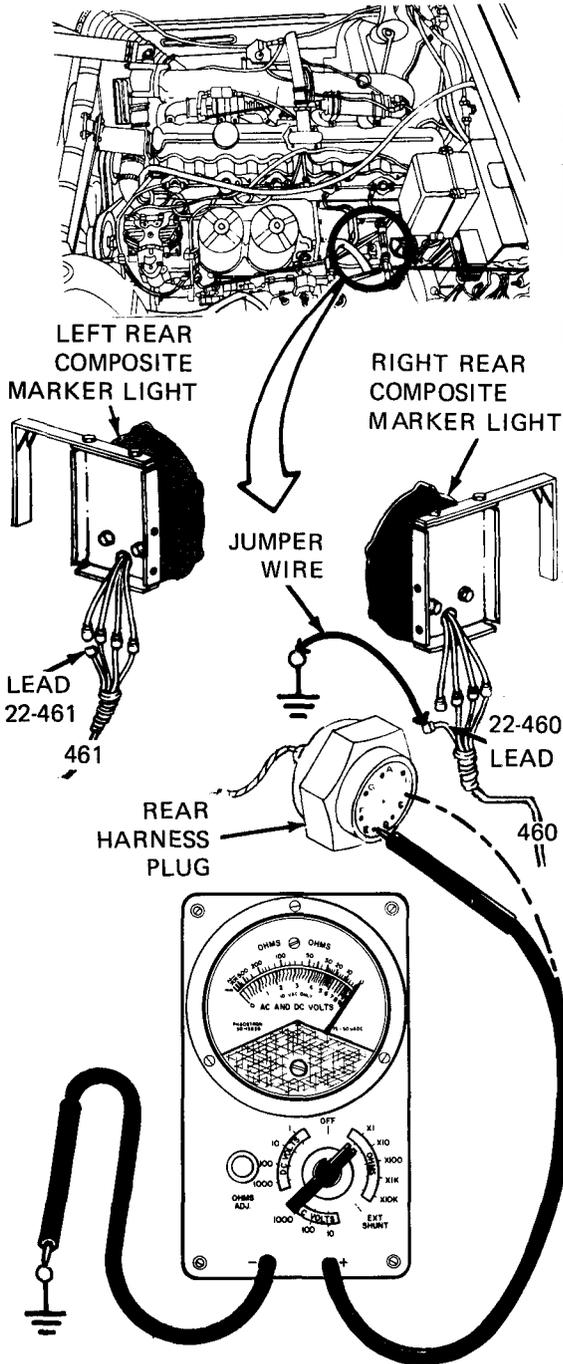


NO GO

Figure 26-22 (Sheet 16 of 18)

NO GO

27

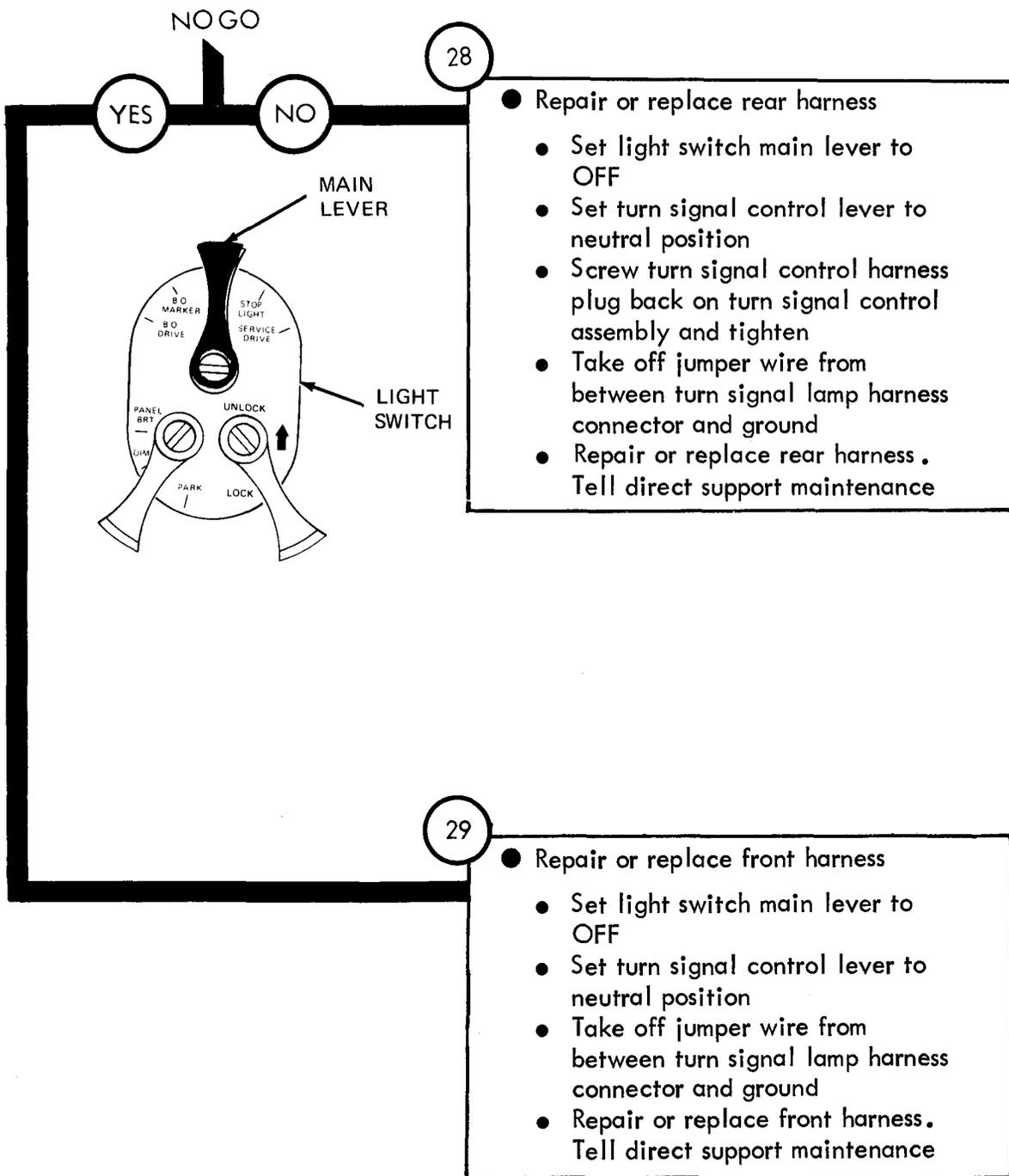


- Check for continuity in directional signal lamp rear harness circuit
 - Take off rear harness plug from front harness receptacle
 - Put a jumper wire between turn signal lamp harness connector and a good ground
 - With multimeter still set to measure continuity put + lead on contact E (right rear lamp) or contact C (left rear lamp) of rear harness plug
 - Put multimeter - lead on a good ground
 - Read multimeter. Multimeter should measure zero ohms

Does multimeter measure zero ohms?

NO GO

Figure 26-22 (Sheet 17 of 18)



22

TA 115888

Figure 26-22 (Sheet 18 of 18)

Symptom

23

NO CONTROL ASSEMBLY DIRECTIONAL SIGNAL LAMPS LIGHT, OTHER TRUCK LAMPS LIGHT

NOTE

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

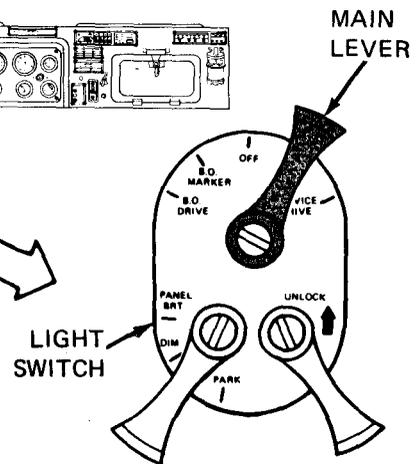
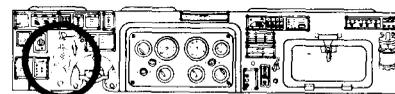
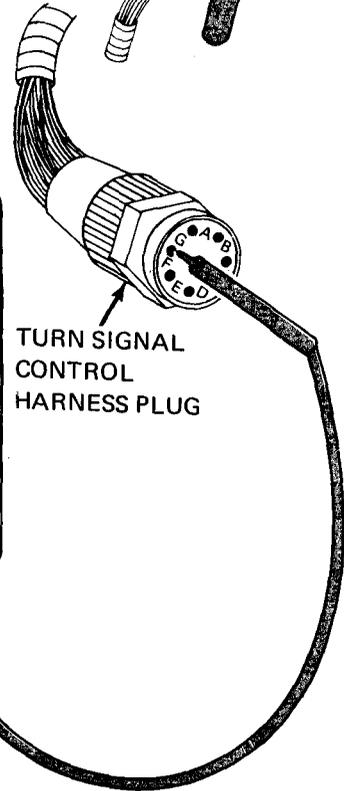
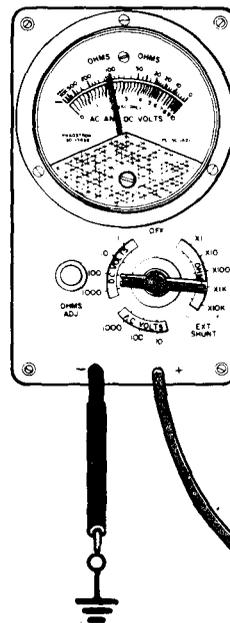
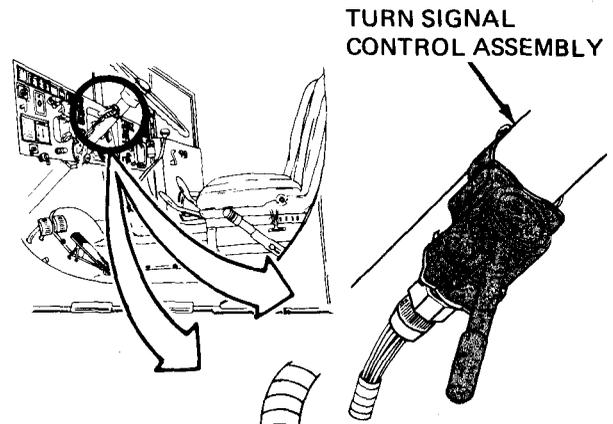
Figure 26-23 (Sheet 1 of 7)

GO

2

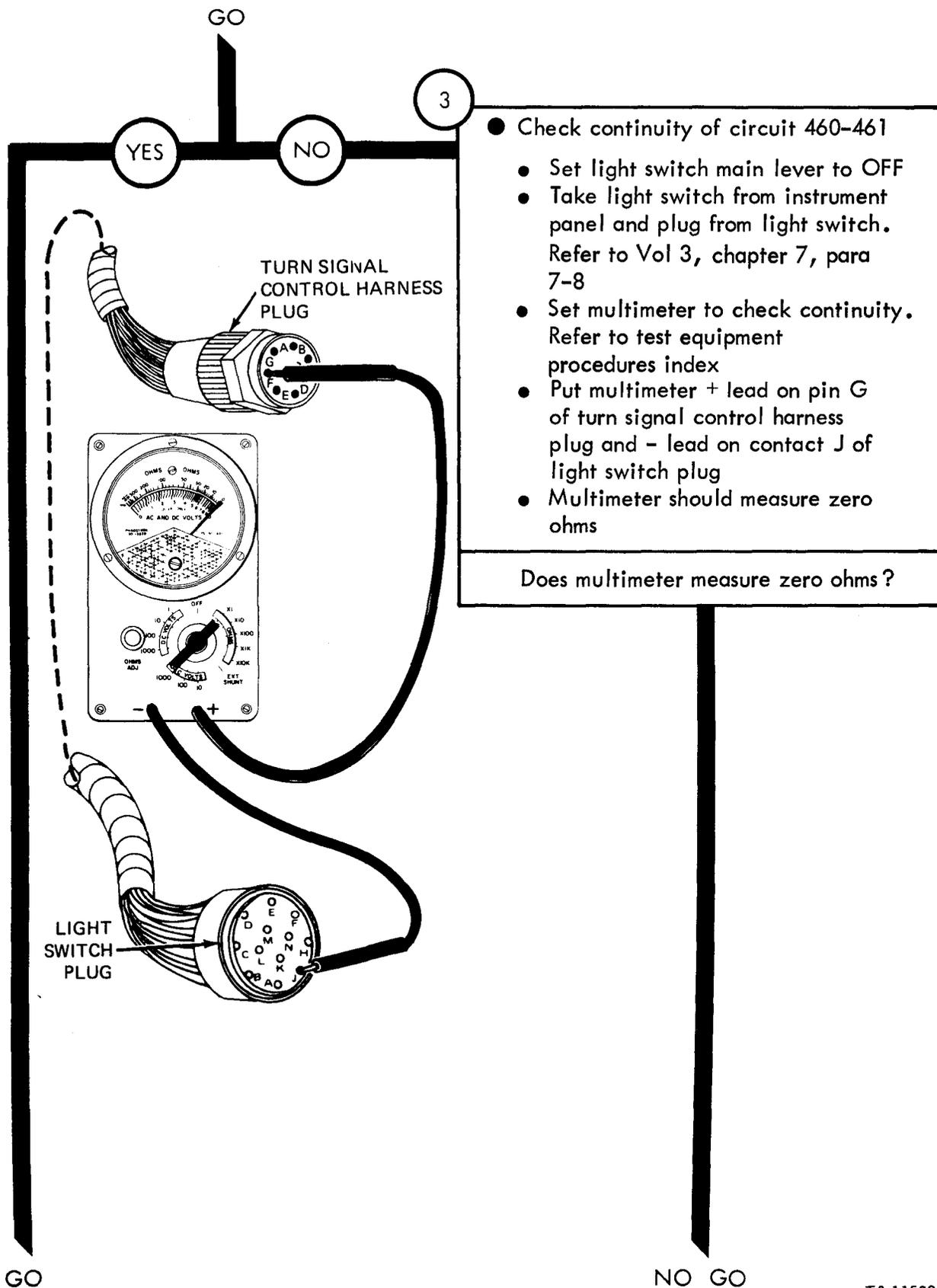
- Check that +24 volts DC is getting to turn signal control
 - Unscrew and take off control harness plug from turn signal control assembly
 - Set light switch main lever to STOPLIGHT
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter + lead on contact G of harness plug and - lead on a good ground
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



GO

Figure 26-23 (Sheet 2 of 7)



- Check continuity of circuit 460-461
 - Set light switch main lever to OFF
 - Take light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
 - Set multimeter to check continuity. Refer to test equipment procedures index
 - Put multimeter + lead on pin G of turn signal control harness plug and - lead on contact J of light switch plug
 - Multimeter should measure zero ohms

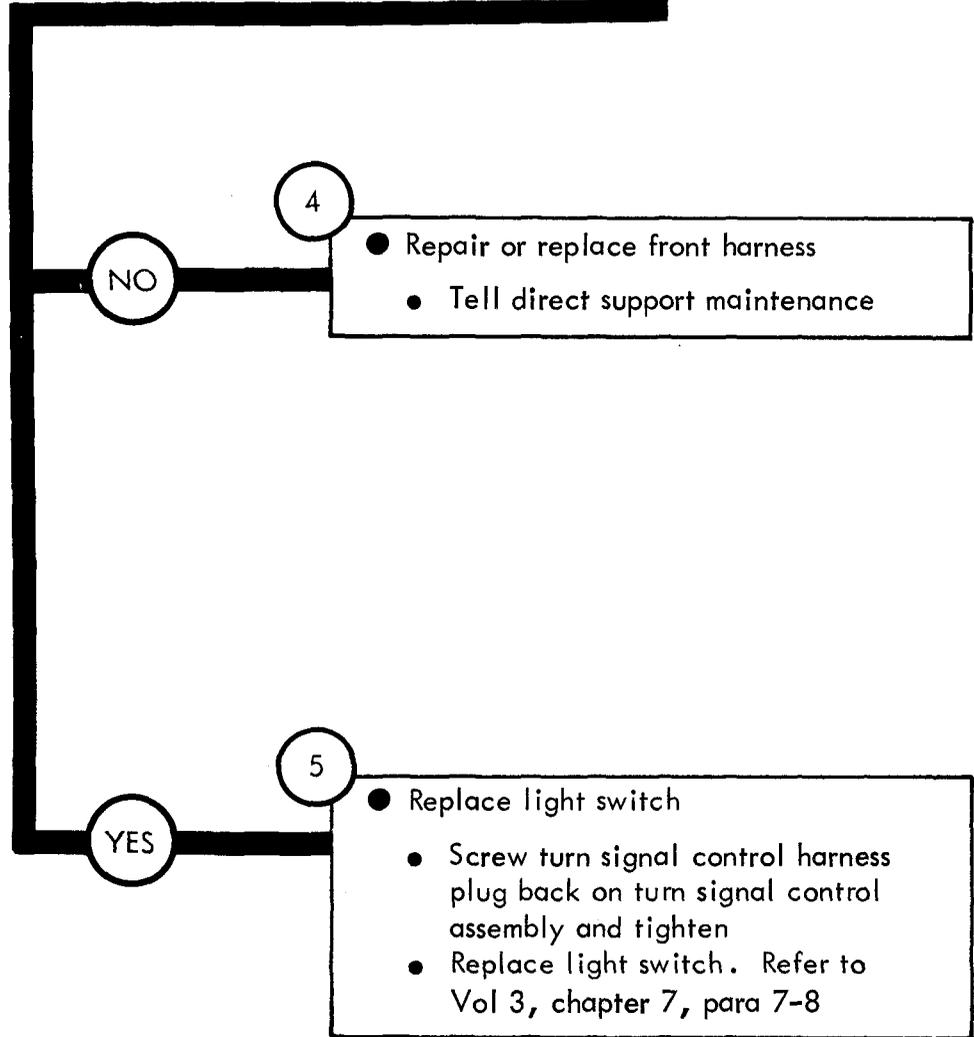
Figure 26-23 (Sheet 3 of 7)

TA 115891

GO

GO

NO GO



TA 115892

Figure 26-23 (Sheet 4 of 7)

GO

6

- Check harness between turn signal control lever and flasher for continuity
 - Unscrew and take off flasher harness plug from turn signal flasher
 - Set multimeter to measure continuity. Refer to test equipment procedures index
 - Put multimeter + lead on contact B of flasher harness plug and - lead on contact F of turn signal harness plug. Read multimeter
 - Put multimeter + lead on contact A of flasher harness plug and - lead on contact H of turn signal harness plug. Read multimeter
 - Put multimeter + lead on contact C of flasher harness plug and - lead on a good ground. Read multimeter

Did multimeter measure zero ohms for each test?

GO

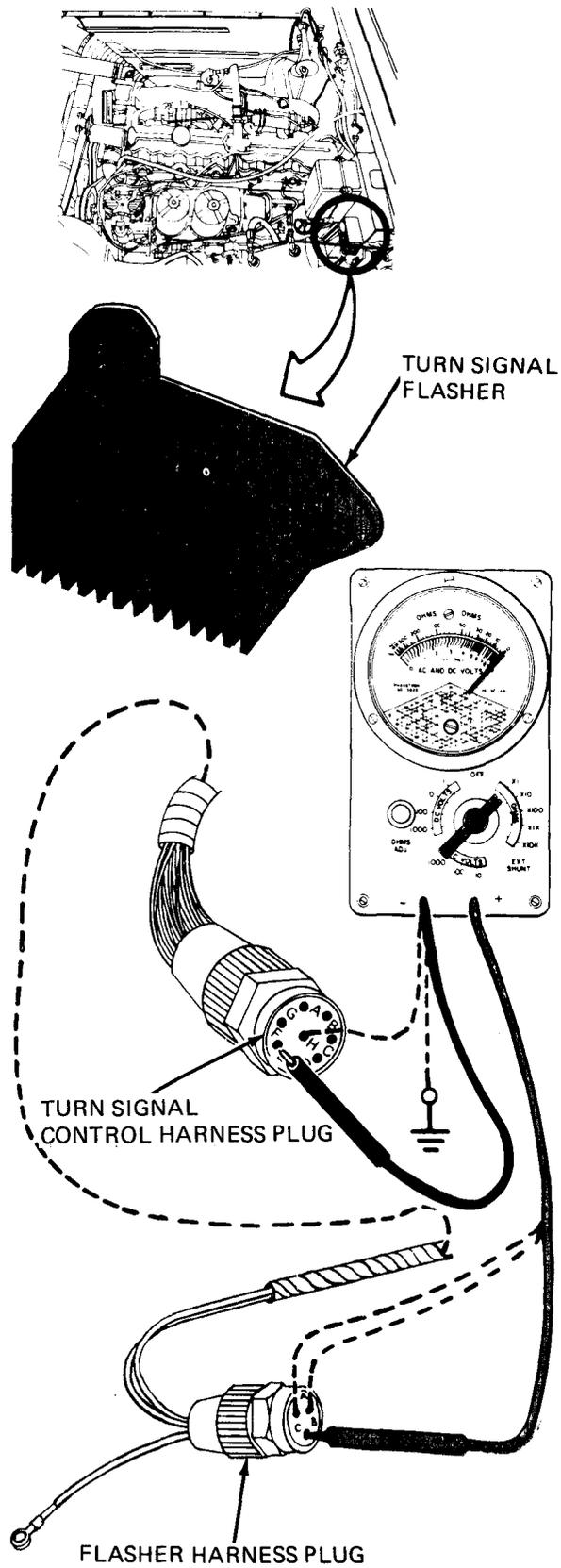


Figure 26-23 (Sheet 5 of 7)

TA 115893

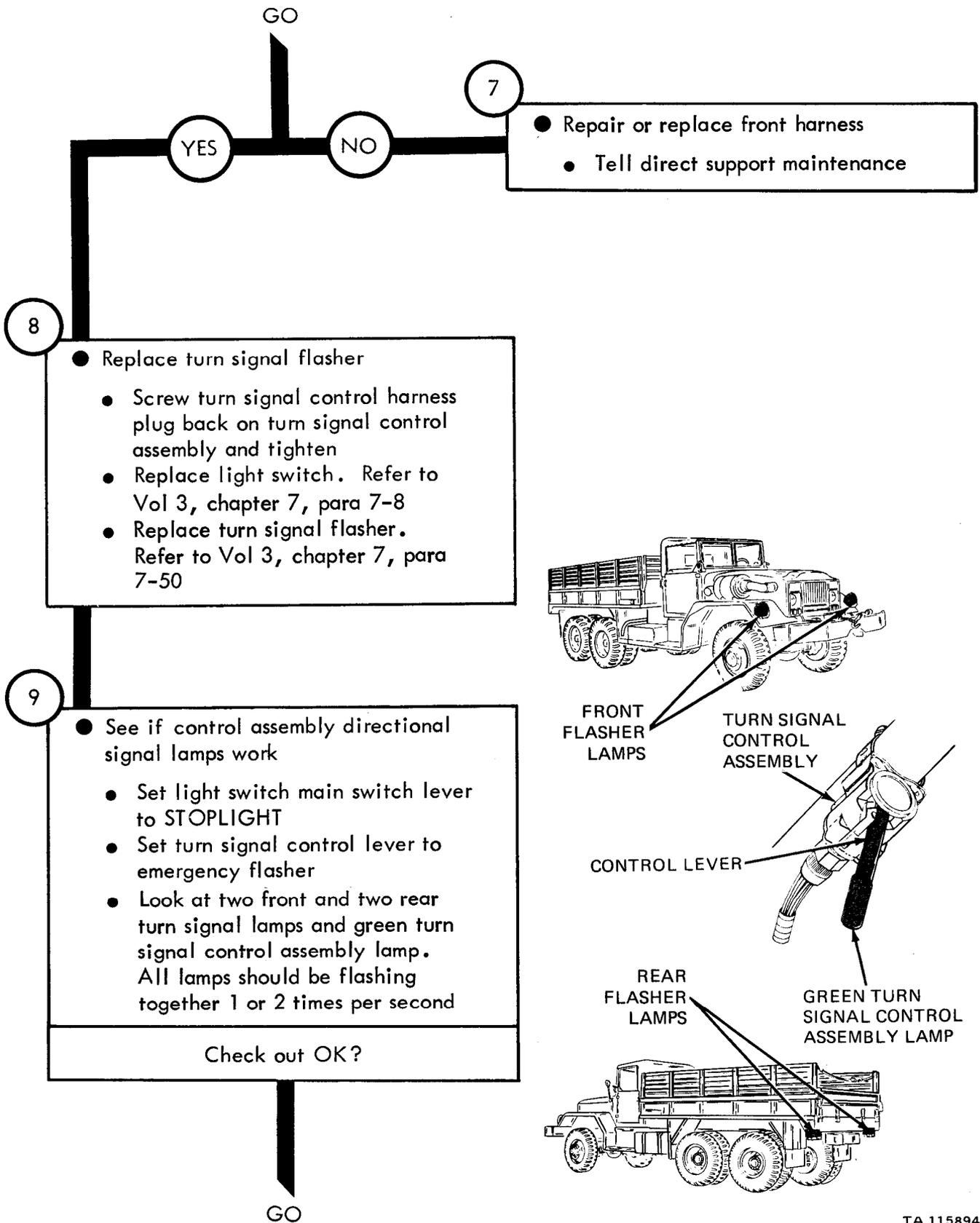


Figure 26-23 (Sheet 6 of 7)

TA 115894

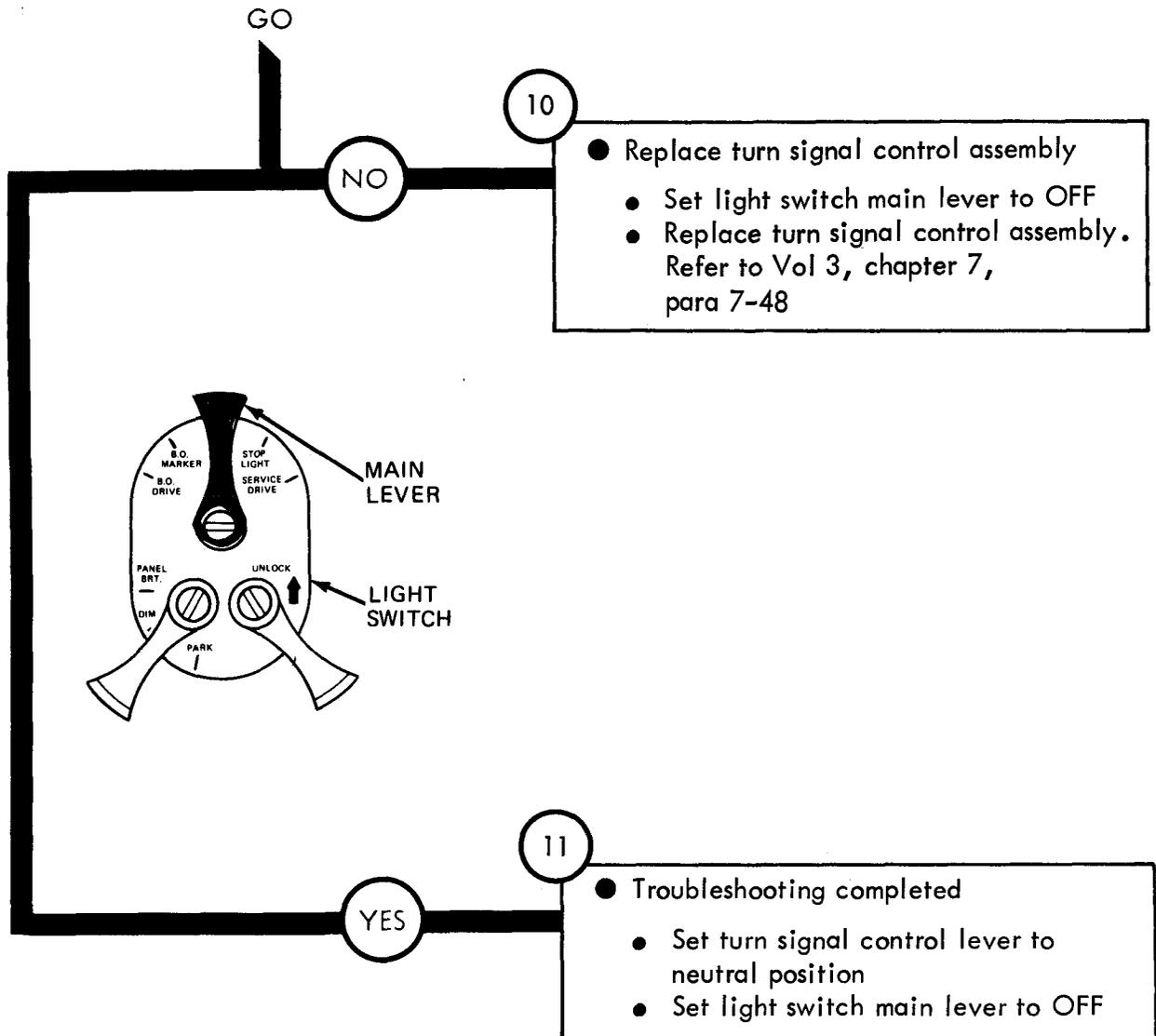


Figure 26-23 (Sheet 7 of 7)

Symptom

24

WHEN EMERGENCY FLASHER OR TURN SIGNAL LAMPS ARE SELECTED, LAMPS DO NOT FLASH OR FLASH AT SLOW AND UNEVEN RATE

NOTE

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-24 (Sheet 1 of 3)

GO

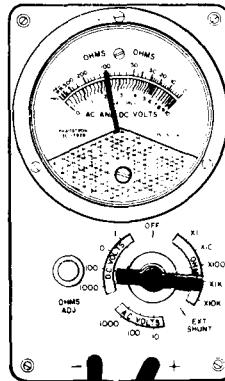
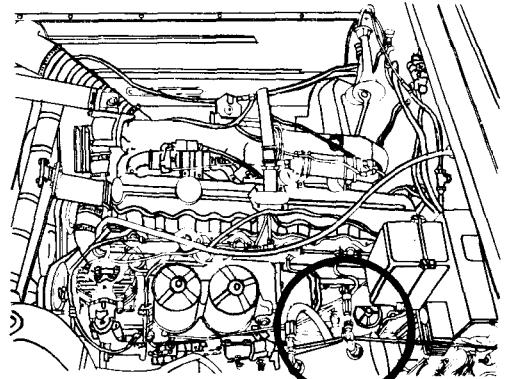
2

- Check turn signal flasher unit for +24 volts DC
 - Open battery box and pull out batteries. Refer to TM 9-2320-211-10
 - Unscrew and take off flasher harness plug from turn signal flasher
 - Put a jumper wire from contact C of flasher to a good ground
 - Put a jumper wire from + terminal of battery to contact B of flasher

- Set multimeter to measure + 24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on contact C of flasher
- Put multimeter + lead on contact C of flasher. Multimeter should measure 0 to 24 volts DC at flasher rate, 1 to 2 times per second

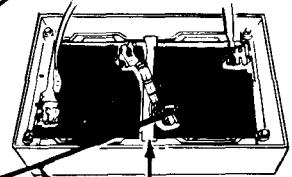
OK?

GO



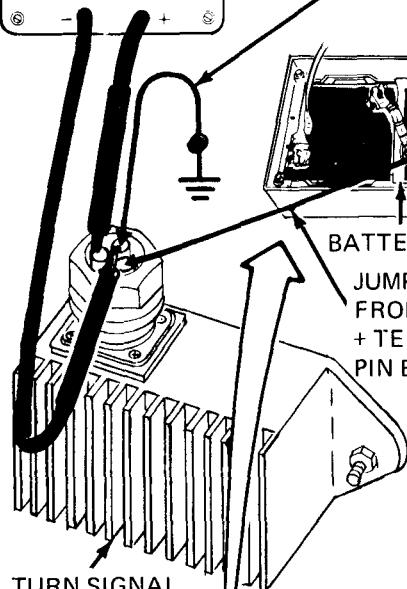
TURN SIGNAL
FLASHER WIRING
HARNESS

JUMPER WIRE FROM
PIN C TO GROUND



BATTERIES

JUMPER WIRE
FROM BATTERY
+ TERMINAL TO
PIN B



TURN SIGNAL
FLASHER UNIT

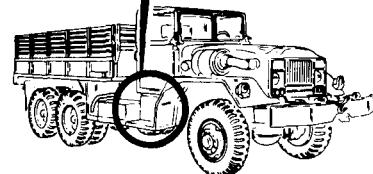
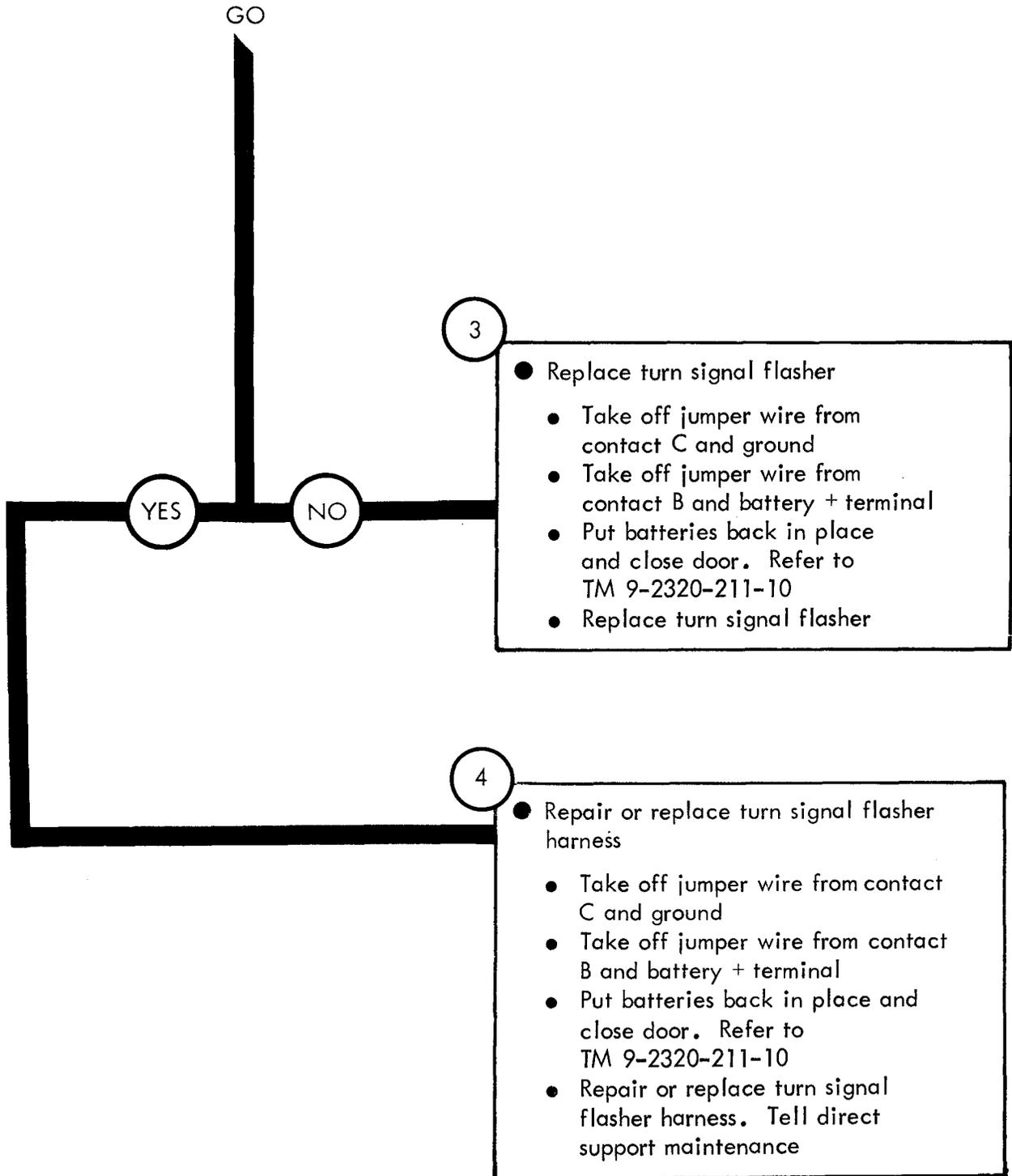
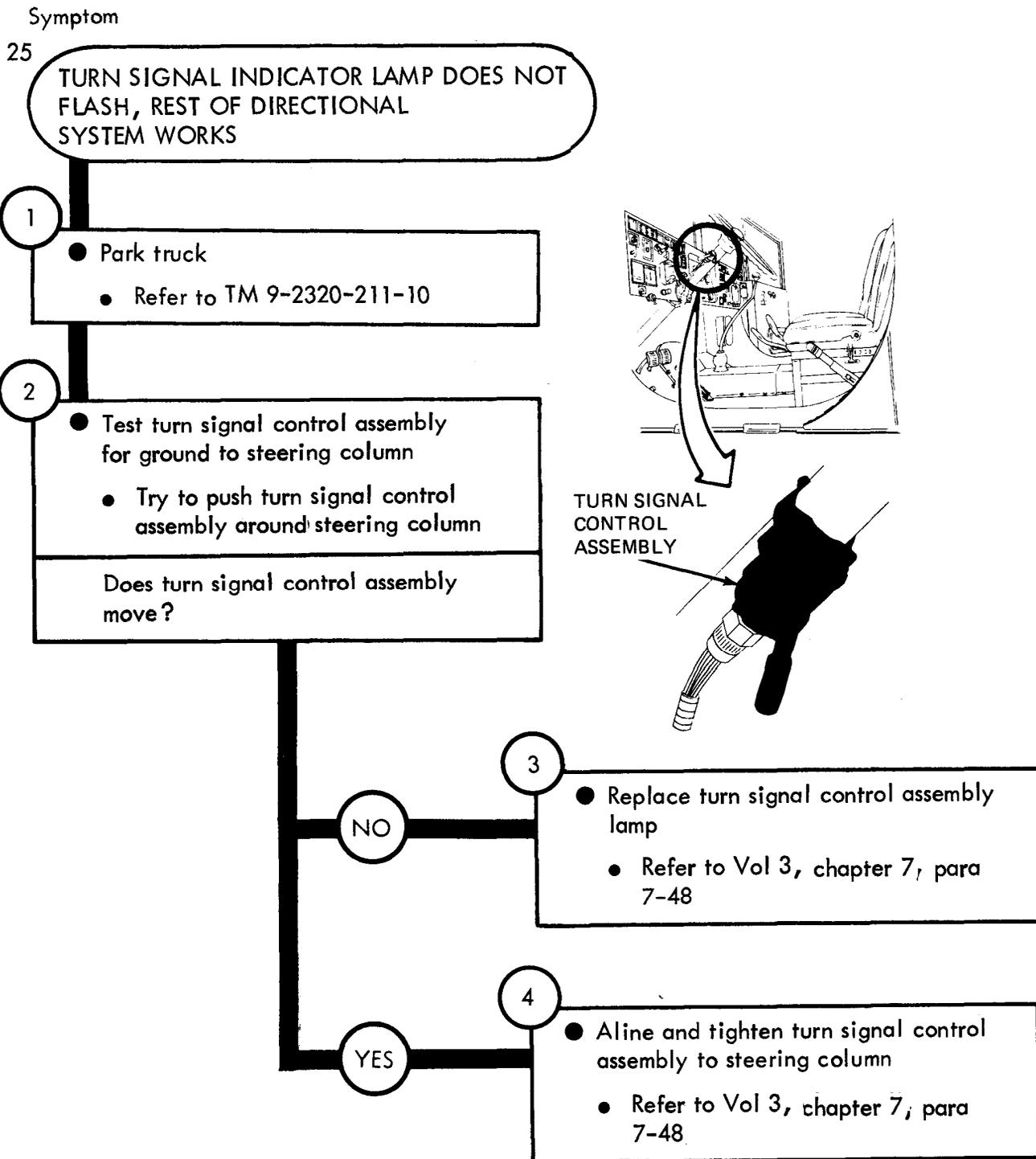


Figure 26-24 (Sheet 2 of 3)



TA 115898

Figure 26-24 (Sheet 3 of 3)



TA 115899

Figure 26-25

Symptom

26

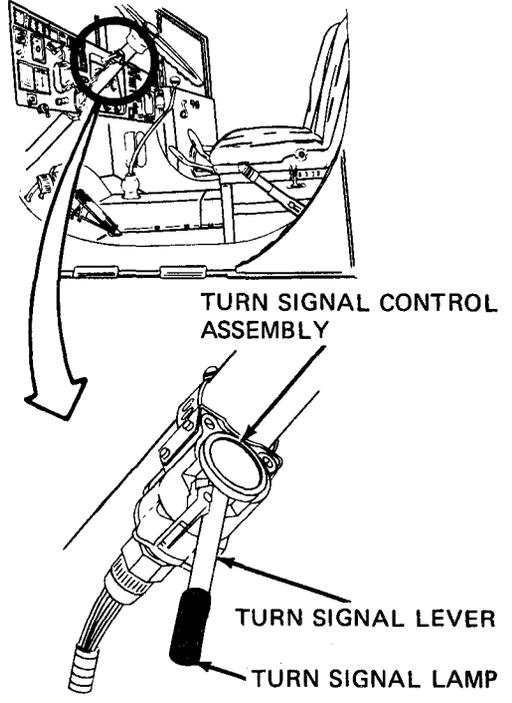
TURN SIGNAL INDICATORS DO NOT WORK IN ONE OR MORE POSITIONS OF SIGNAL LEVER, ALL OTHER TRUCK LIGHTS LIGHT

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Take control assembly directional signal off steering column
- Take turn signal control assembly lamp out of turn signal lever. Refer to Vol 3, chapter 7, para 7-48
- Take off turn signal control assembly from steering column. Refer to Vol 3, chapter 7, para 7-48



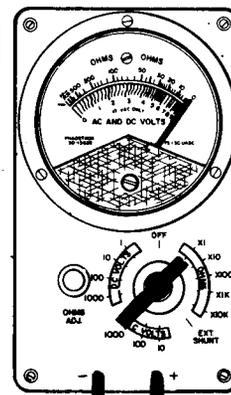
GO

Figure 26-26 (Sheet 1 of 6)

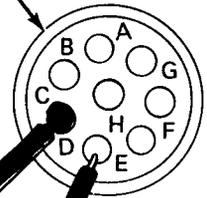
3 **GO**

- Check continuity of turn signal control assembly with turn signal control lever in neutral position
- Put turn signal control lever in neutral position
- Set multimeter to measure continuity. Refer to test equipment procedures index
- Check for continuity between turn signal control assembly contacts. Multimeter pointer will go to zero if contacts have continuity

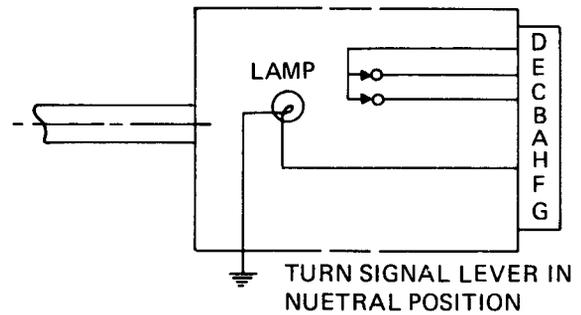
Check out OK?



PLUG CONNECTOR AT BOTTOM OF TURN SIGNAL CONTROL ASSEMBLY



SCHMATIC DIAGRAM



+ LEAD FROM CONTACT	- LEAD TO CONTACT	INDICATION
H	B	OPEN (NO NEEDLE MOVEMENT)
H	C	OPEN (NO NEEDLE MOVEMENT)
H	A	OPEN (NO NEEDLE MOVEMENT)
H	E	OPEN (NO NEEDLE MOVEMENT)
F	G	OPEN (NO NEEDLE MOVEMENT)
D	E	NEEDLE MOVES TO ZERO
D	C	NEEDLE MOVES TO ZERO

GO

Figure 26-26 (Sheet 2 of 6)

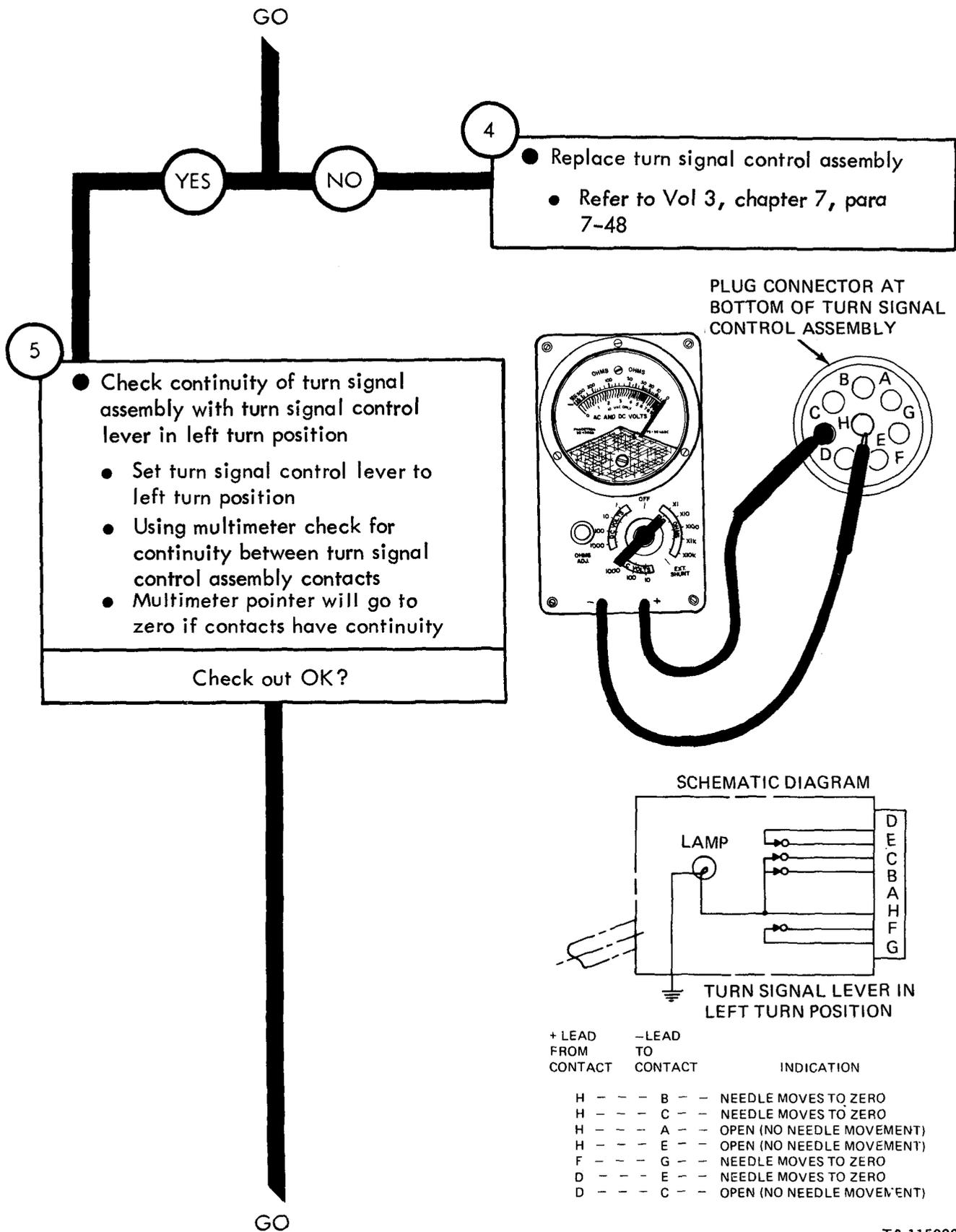


Figure 26-26 (Sheet 3 of 6)

TA 115902

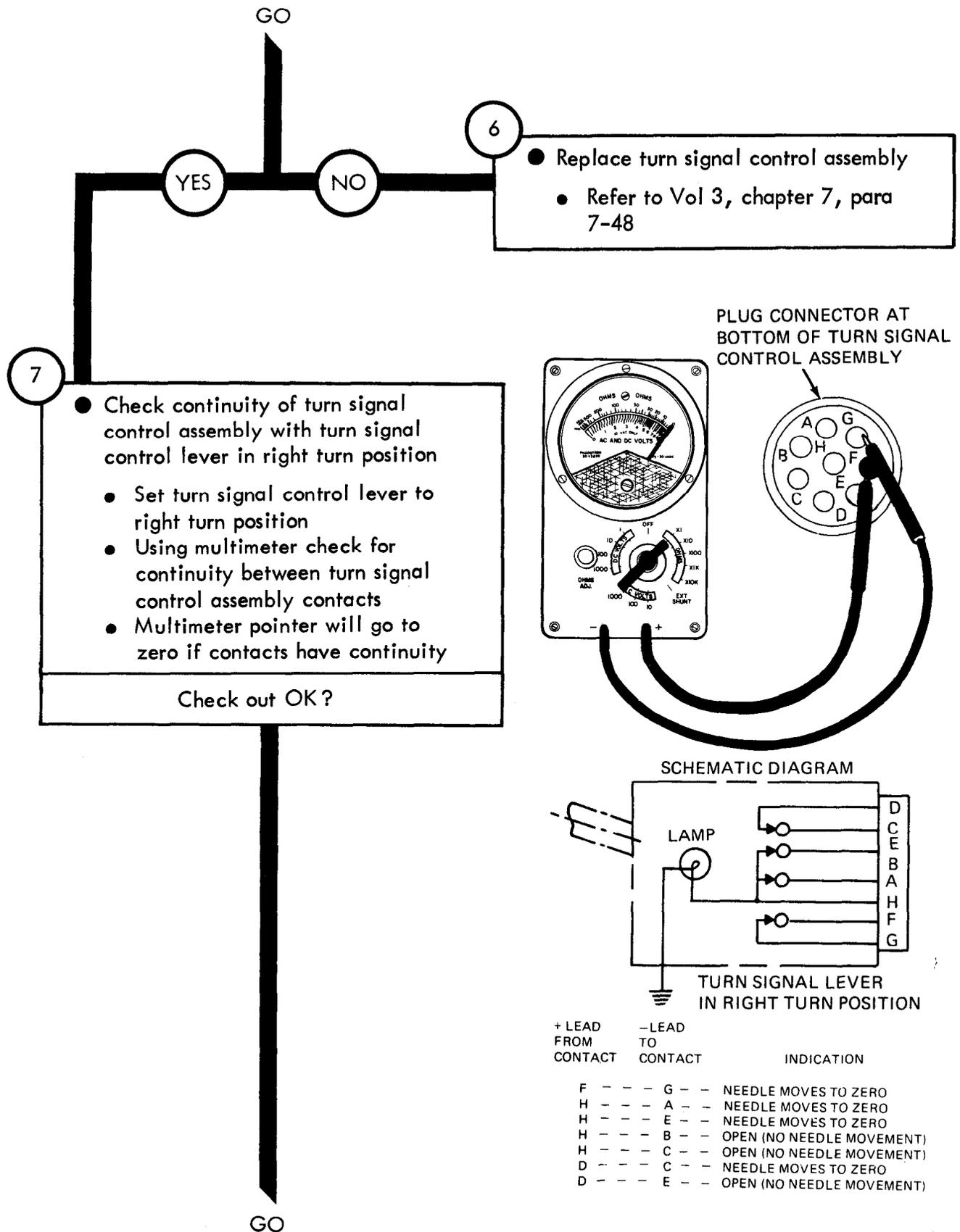
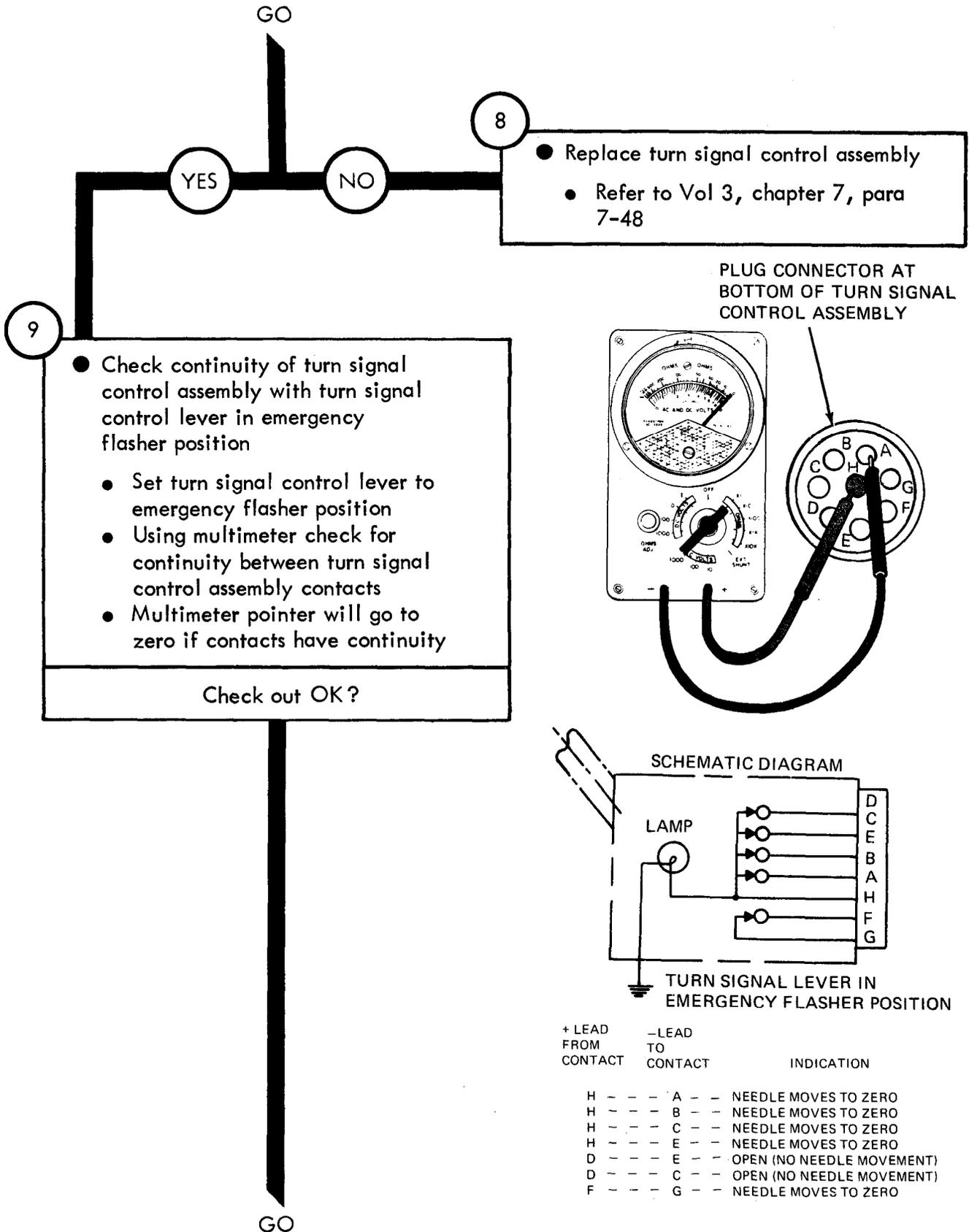


Figure 26-26 (Sheet 4 of 6)

TA 115903



TA 115904

Figure 26-26 (Sheet 5 of 6)

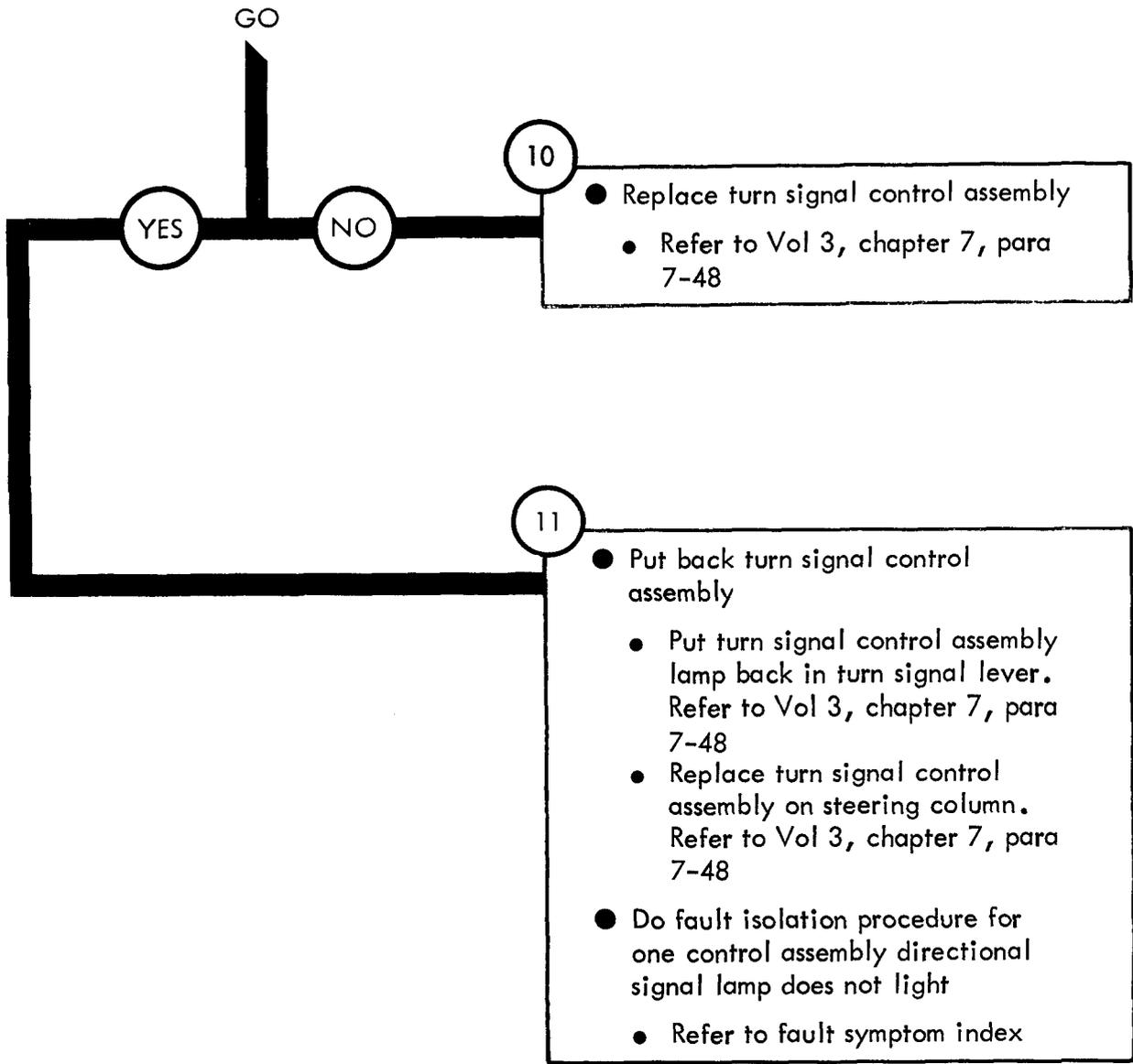


Figure 26-26 (Sheet 6 of 6)

Symptom

27

FUEL LEVEL GAGE DOES NOT WORK

NOTE

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-27 (Sheet 1 of 10)

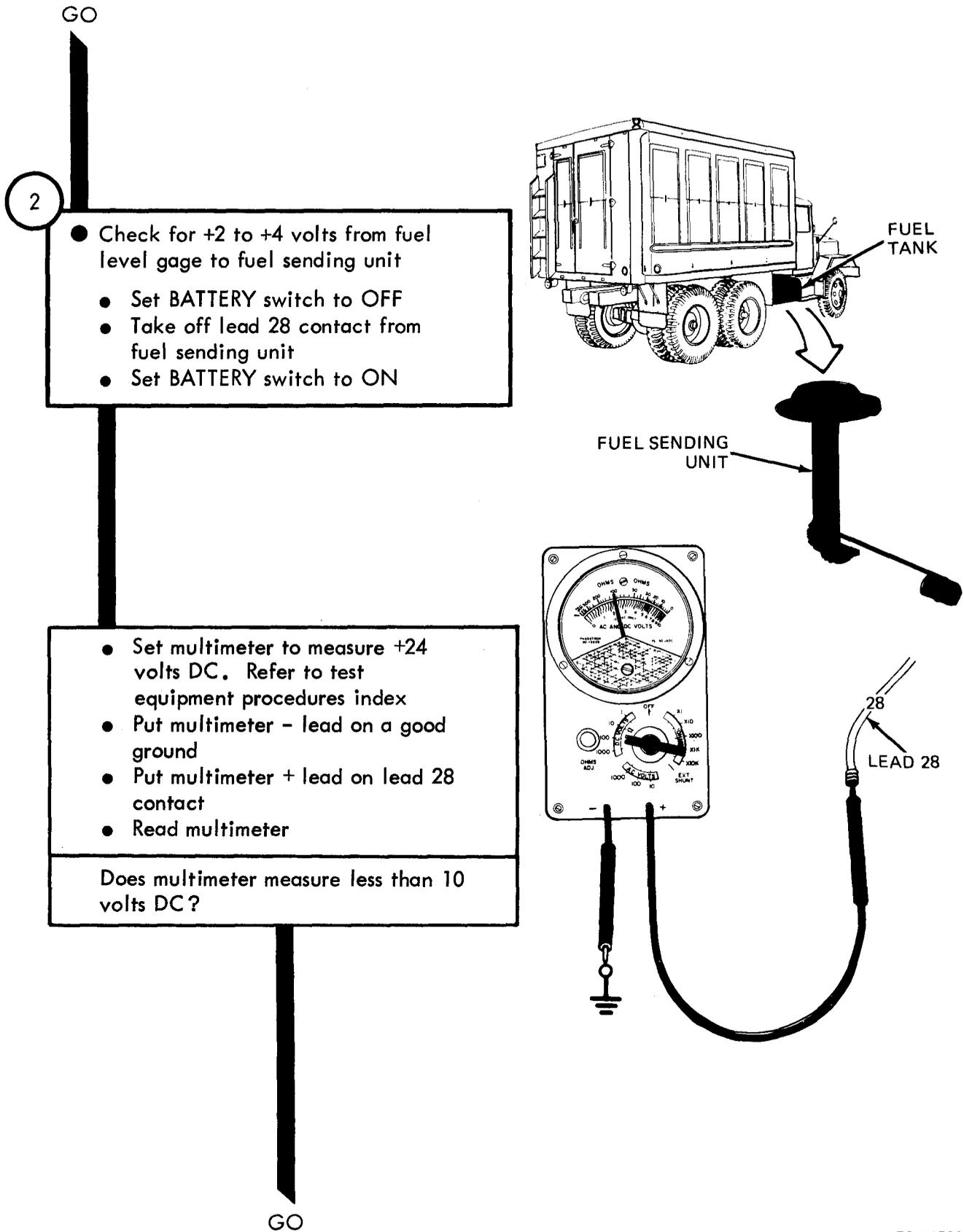


Figure 26-27 (Sheet 2 of 10)

TA 115907

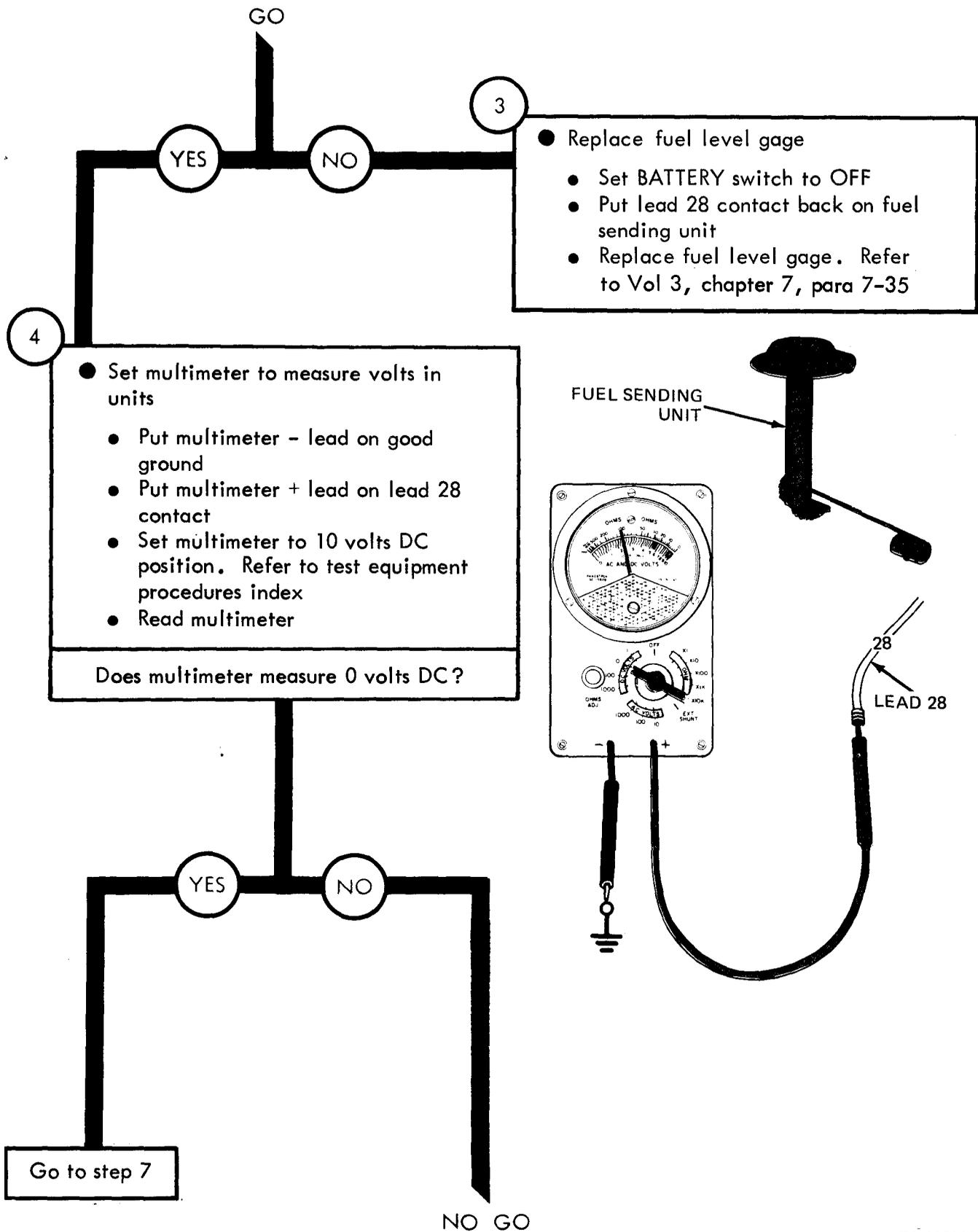


Figure 26-27 (Sheet 3 of 10)

TA 115908

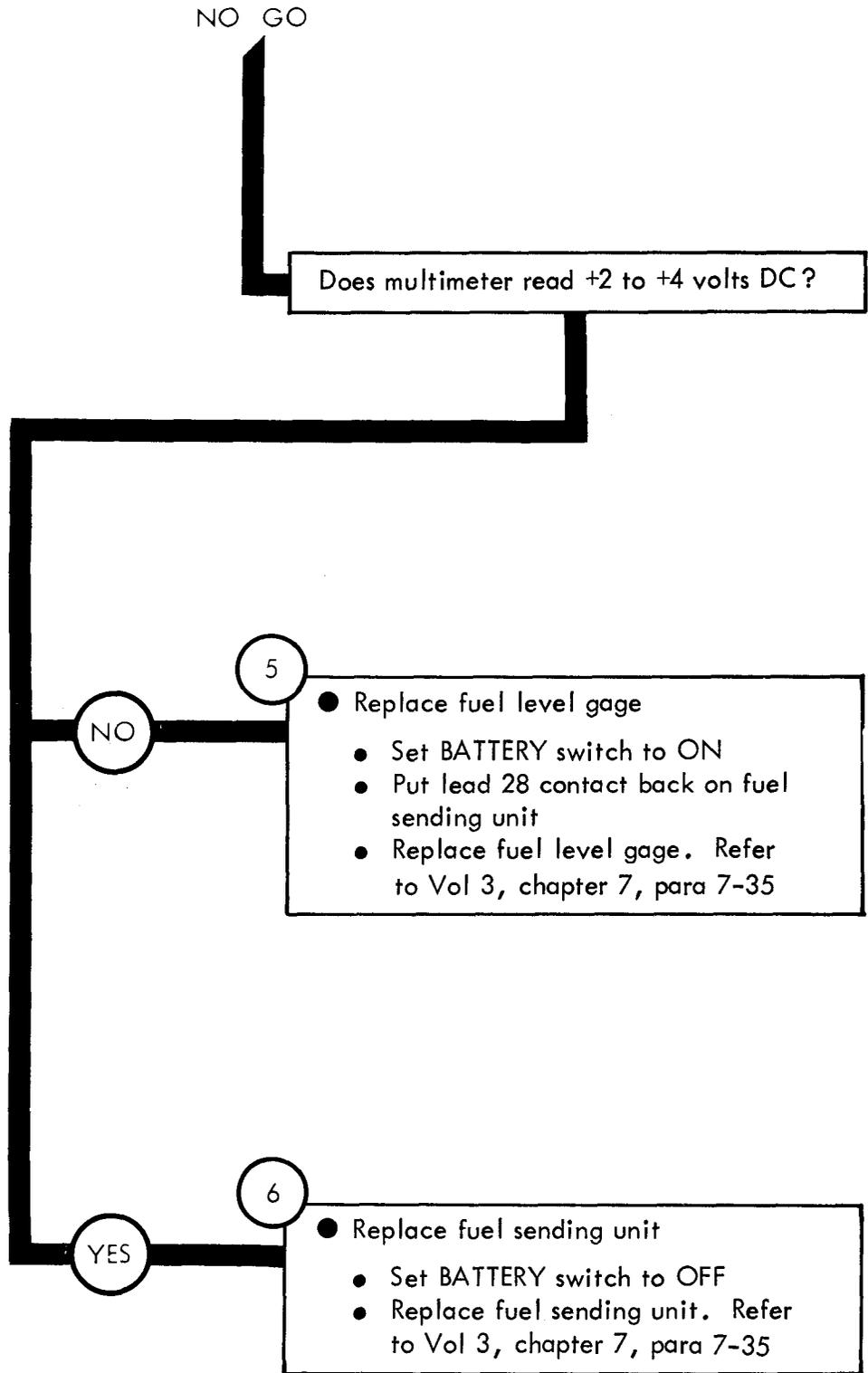


Figure 26-27 (Sheet 4 of 10)

From Step 4

7

- Check for voltage to fuel level gage
 - Set BATTERY switch to OFF
 - Take off instrument cluster from instrument panel. Refer to Vol 3, chapter 7, para 7-15 or 7-16
 - Put jumper wire from instrument cluster to a good ground
 - Take off lead 28 from fuel level gage

- Set BATTERY switch to ON
- Check that multimeter is still in 10-volts DC position
- Place multimeter - lead on a good ground
- Place multimeter + lead on lead 28 contact. Read multimeter
- Multimeter should measure +2 to +4 volts DC

Does multimeter measure less than +2 volts ?

YES

NO

8

- Go to step 12

NO GO

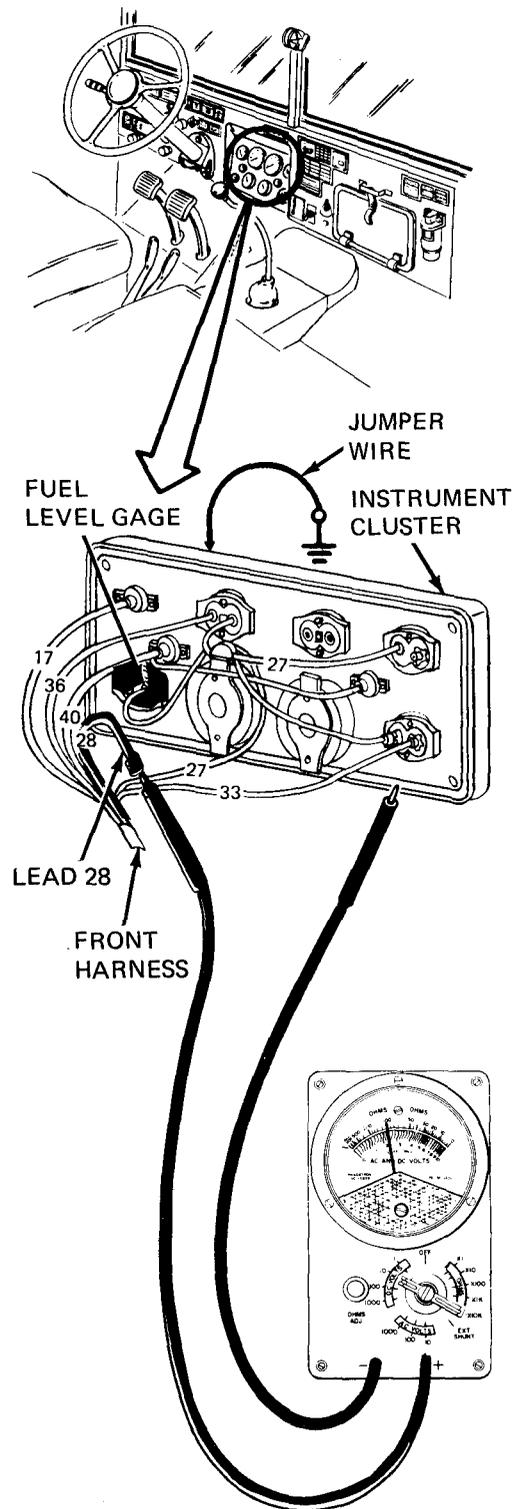
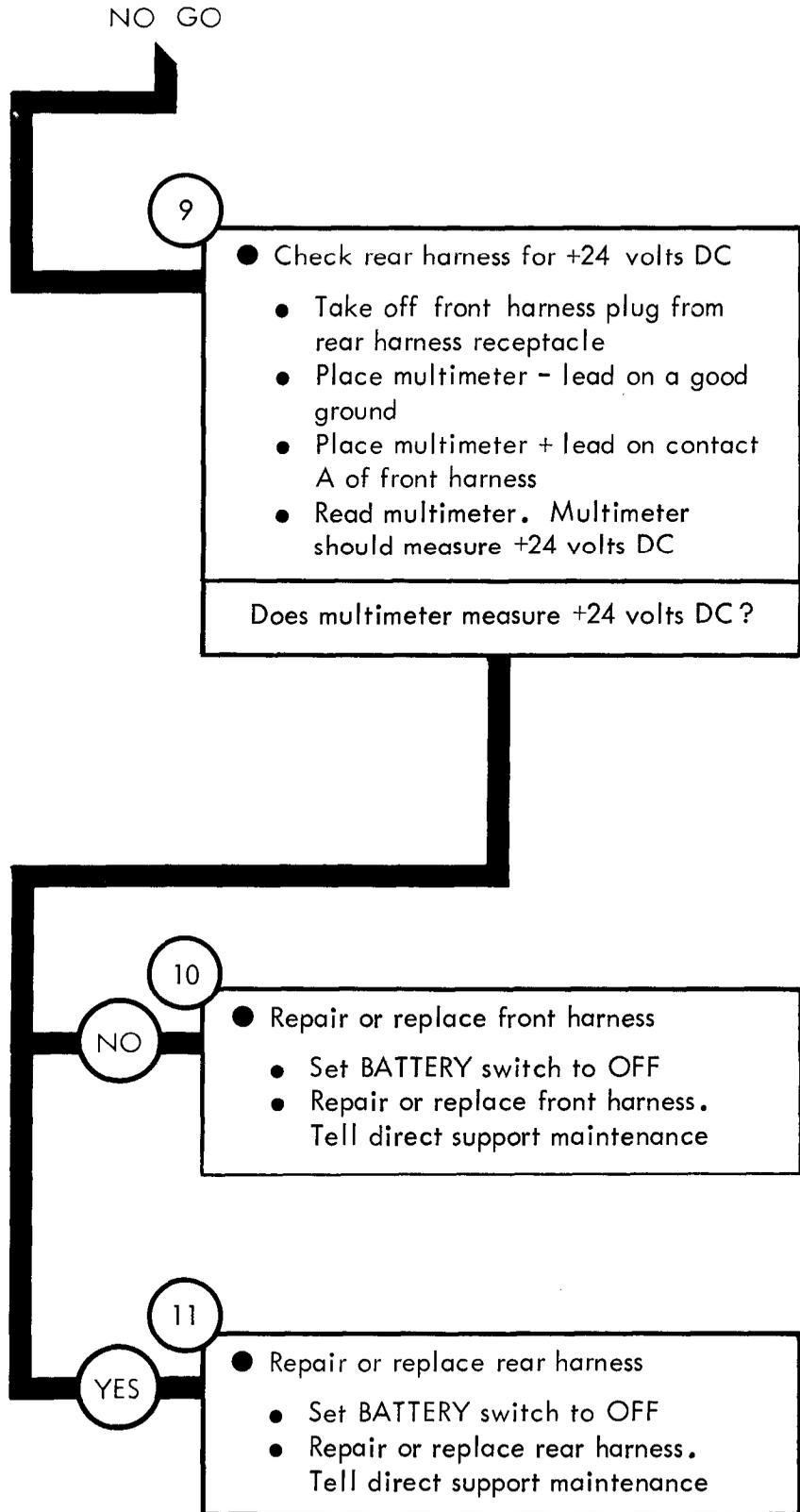


Figure 26-27 (Sheet 5 of 10)



TA 115911

Figure 26-27 (Sheet 6 of 10)

From Step 9

12

- Check for voltage from batteries to instrument cluster
- Set BATTERY switch to OFF
- Take off lead 27 from instrument harness assembly
- Set ACCESSORY switch to ON

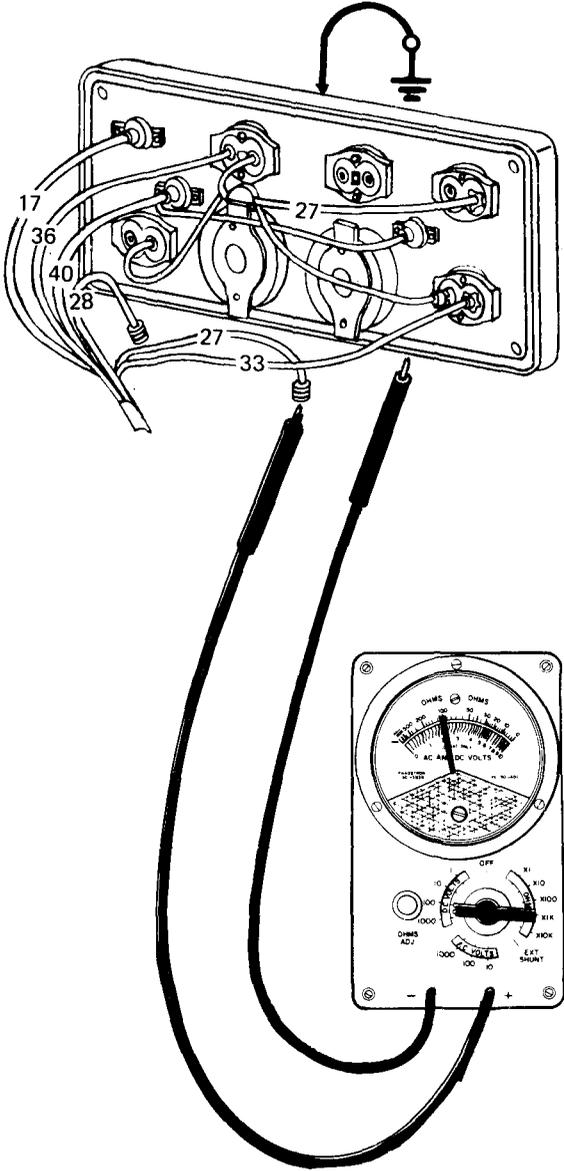
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on lead 27 contact
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

YES NO

13

- Replace instrument harness assembly
 - Set BATTERY switch to OFF
 - Replace instrument harness assembly. Tell direct support maintenance



GO

TA 115912

Figure 26-27 (Sheet 7 of 10)

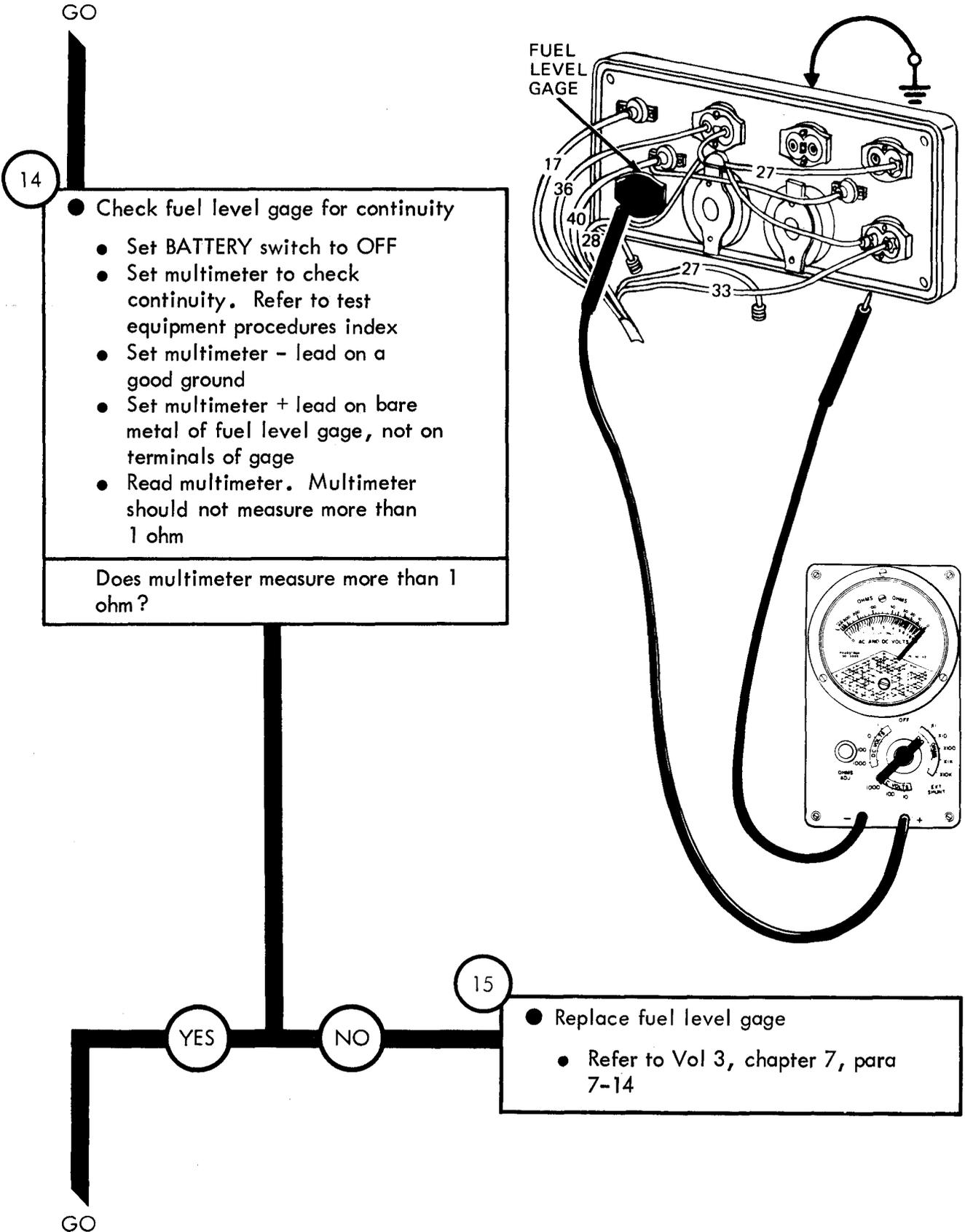


Figure 26-27 (Sheet 8 of 10)

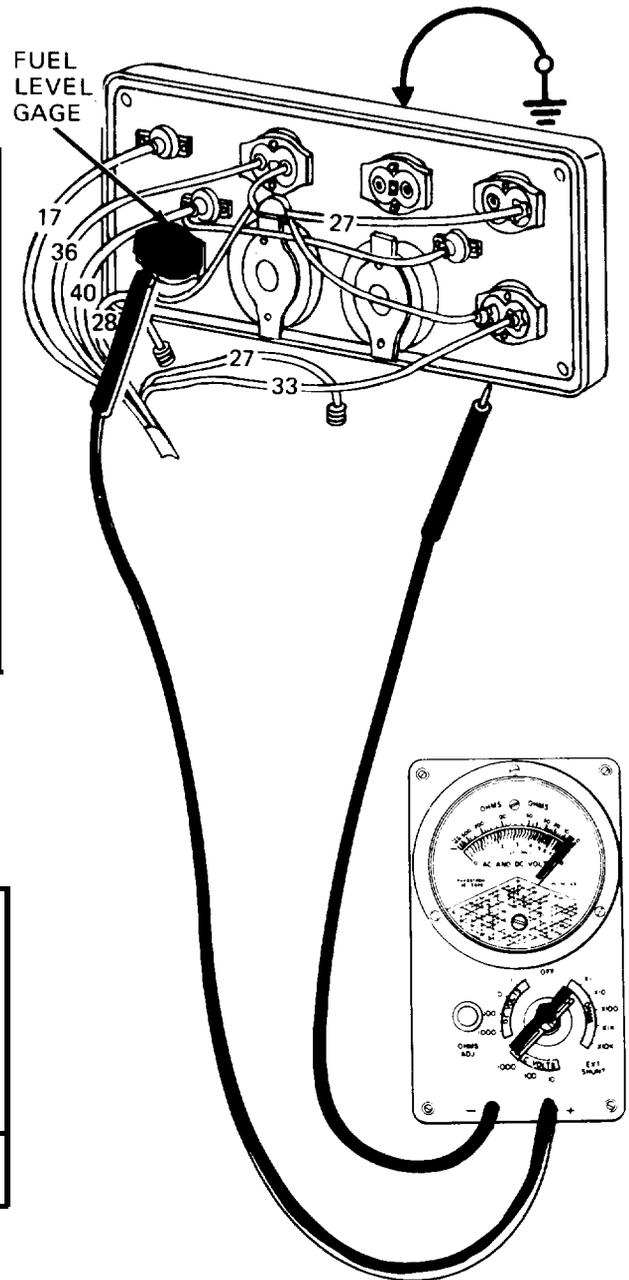
GO

16

- Clean surfaces where fuel level gage and instrument cluster contact, and recheck continuity
- Take off fuel level gage from instrument cluster. Refer to Vol 3, chapter 7, para 7-14
- Clean surfaces where fuel level gage and instrument cluster contact
- Put fuel level gage back on instrument cluster. Refer to Vol 3, chapter 7, para 7-14

- Put multimeter - lead on a good ground
- Put multimeter + lead on fuel level gage terminal 28
- Read multimeter. Multimeter should measure less than 1 ohm

Does multimeter measure less than 1 ohm?



GO

Figure 26-27 (Sheet 9 of 10)

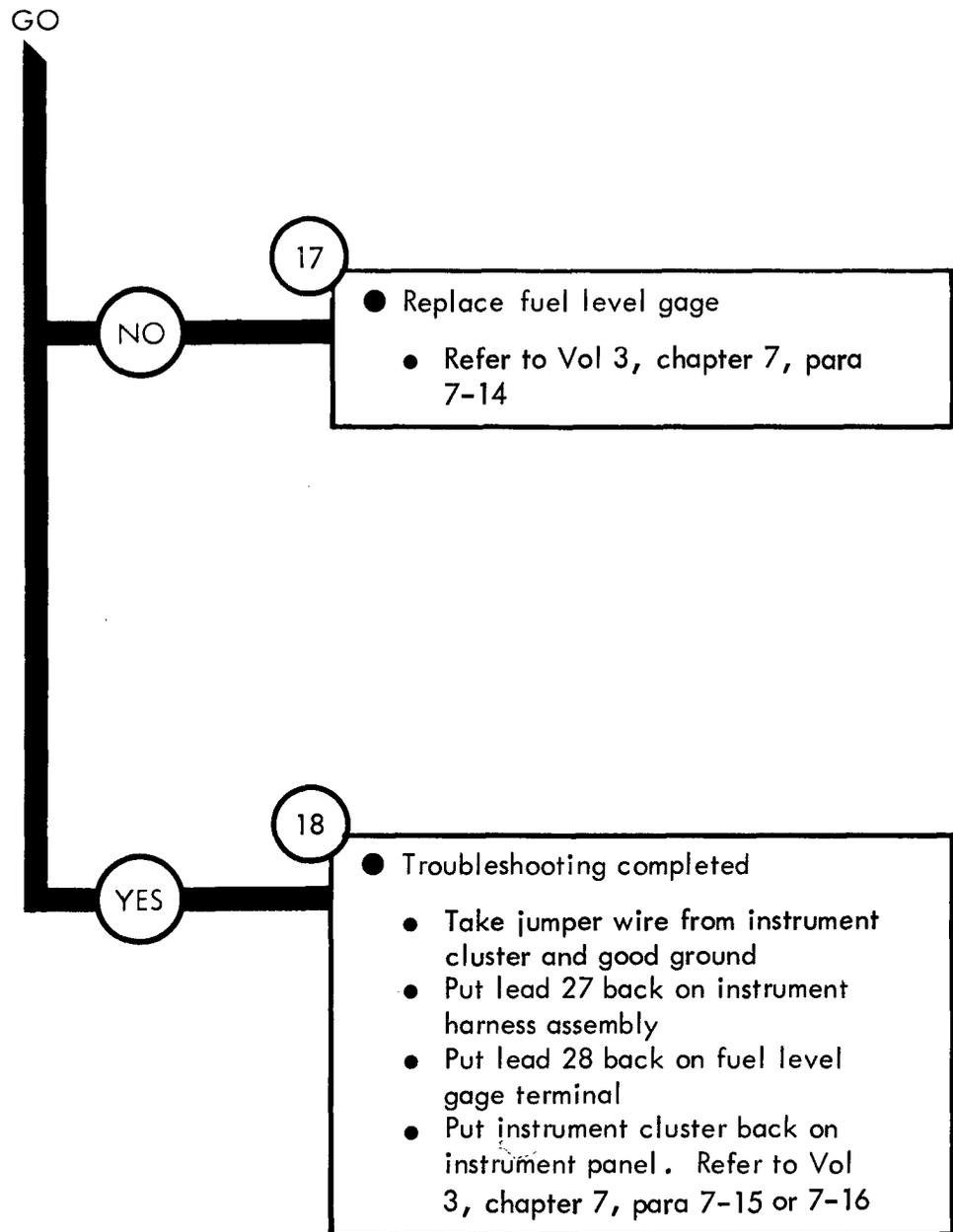


Figure 26-27 (Sheet 10 of 10)

Symptom

28

TEMPERATURE GAGE DOES NOT WORK

NOTE

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
 - Refer to TM 9-2320-211-10

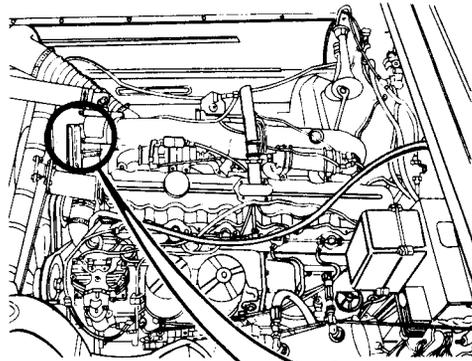
2

- Check for +24 volts from temperature gage to sending unit
 - Set BATTERY switch to OFF
 - Take off lead 33 contact from temperature sending unit
 - Set BATTERY switch to ON

- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on lead 33 contact
- Read multimeter. Multimeter should measure +24 volts DC

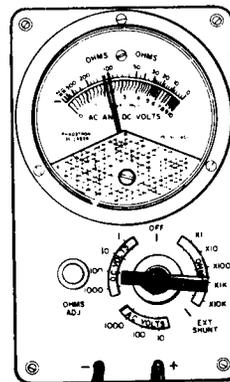
Does multimeter measure less than +24 volts DC?

GO



TEMPERATURE SENDING UNIT

LEAD 33



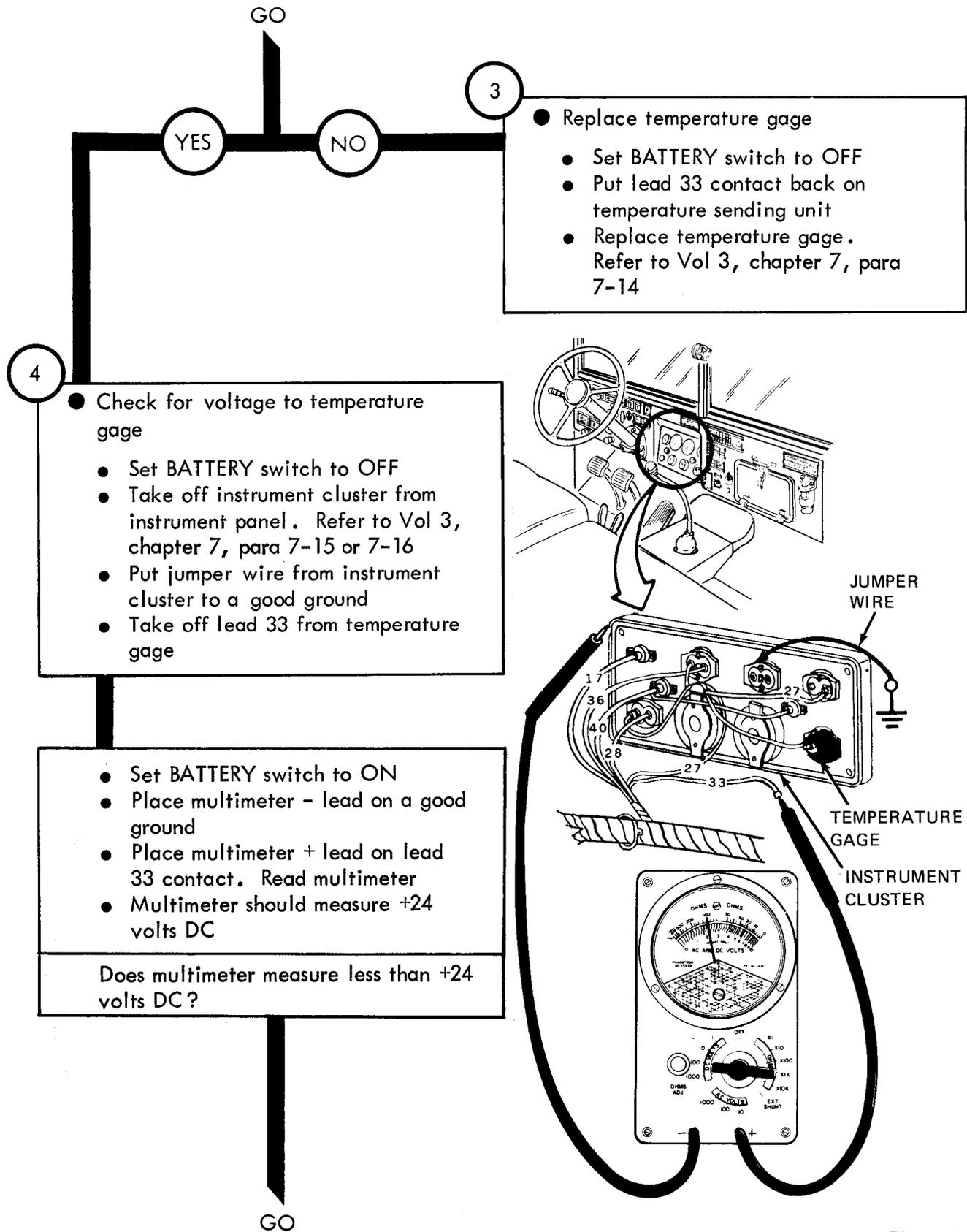
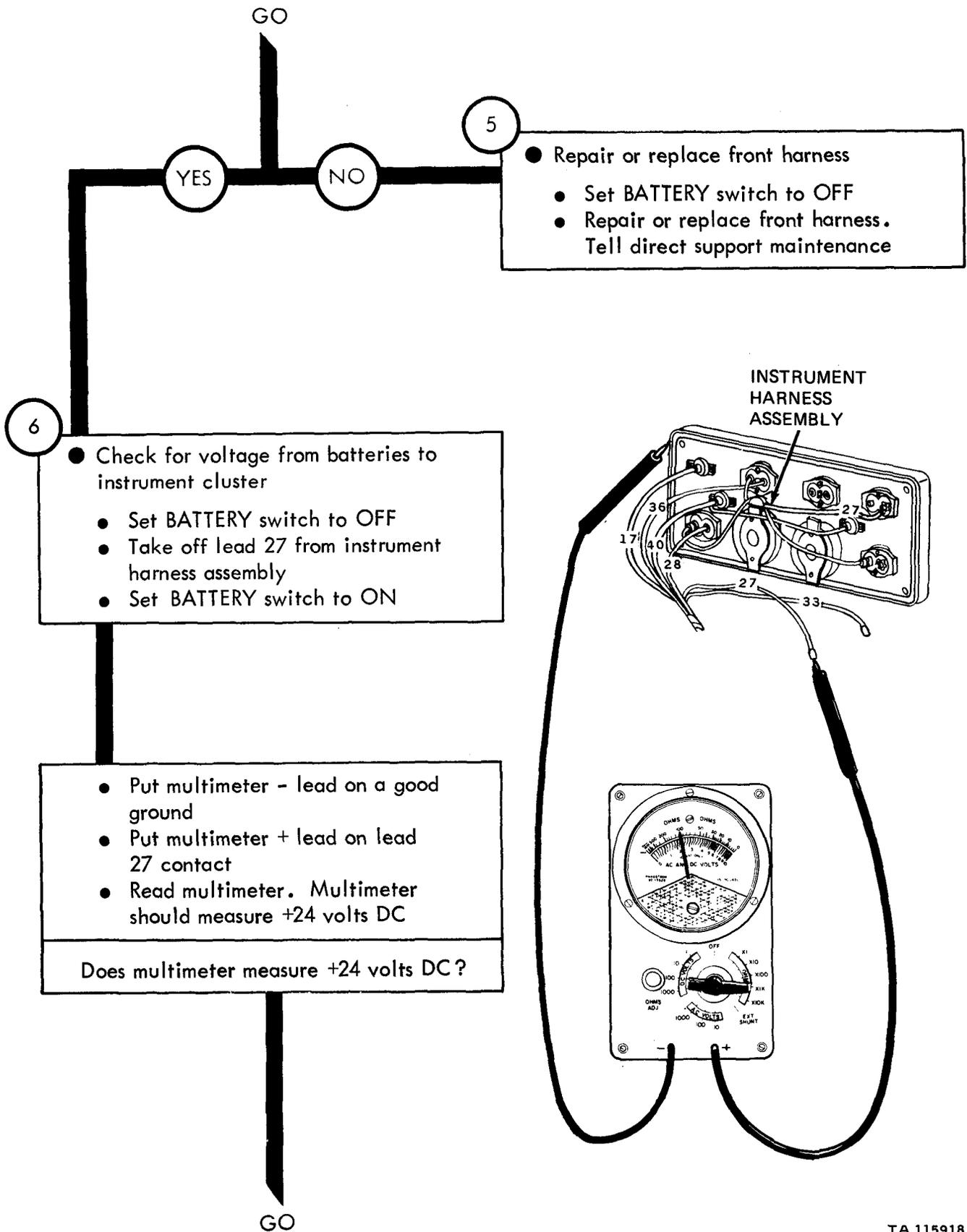


Figure 26-28 (Sheet 2 of 6)

TA 115917



TA 115918

Figure 26-28 (Sheet 3 of 6)

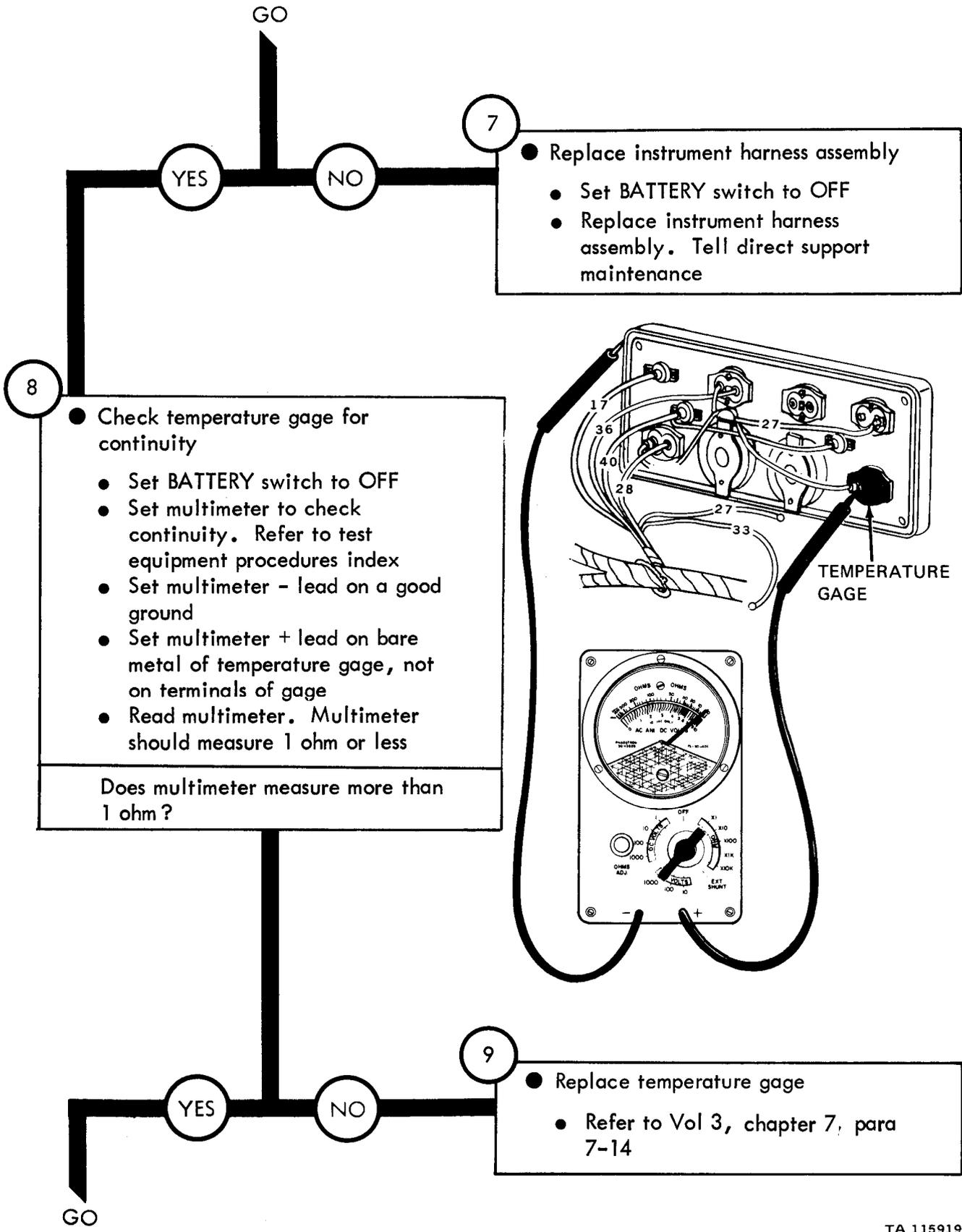


Figure 26-28 (Sheet 4 of 6)

TA 115919

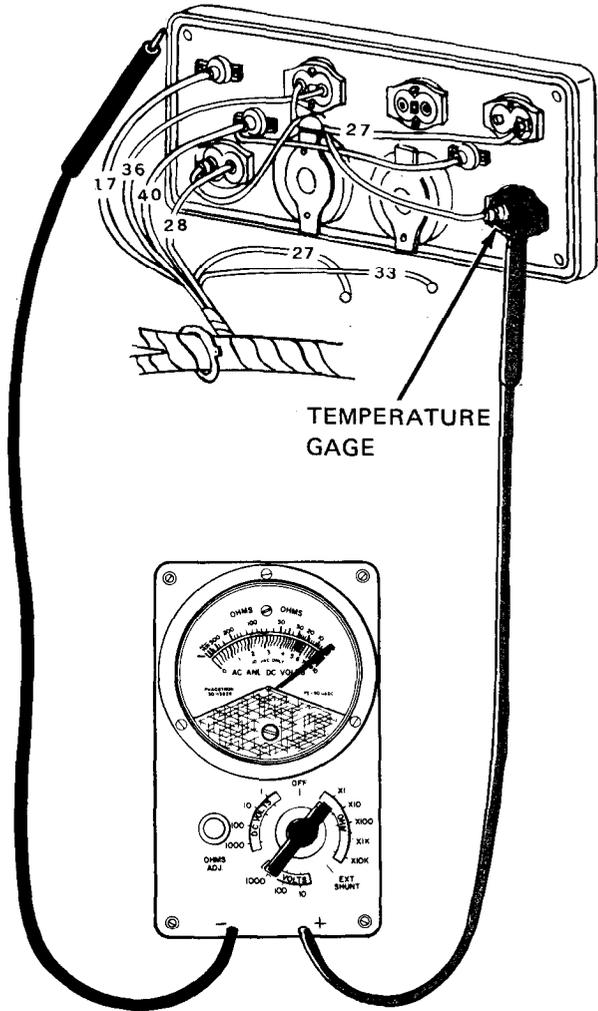
GO

10

- Clean surfaces where temperature gage and instrument cluster contact, and recheck continuity
- Take off temperature gage from instrument cluster. Refer to Vol 3, chapter 7, para 7-14
- Clean surfaces where temperature gage and instrument cluster contact
- Put temperature gage back on instrument cluster. Refer to Vol 3, chapter 7, para 7-14

- Put multimeter - lead on a good ground
- Put multimeter + lead on temperature gage lead 33 terminal
- Read multimeter. Multimeter should measure 1 ohm or less

Does multimeter measure 1 ohm or less?



NO

11

- Replace temperature gage
- Refer to Vol 3, chapter 7, para 7-14

GO

Figure 26-28 (Sheet 5 of 6)

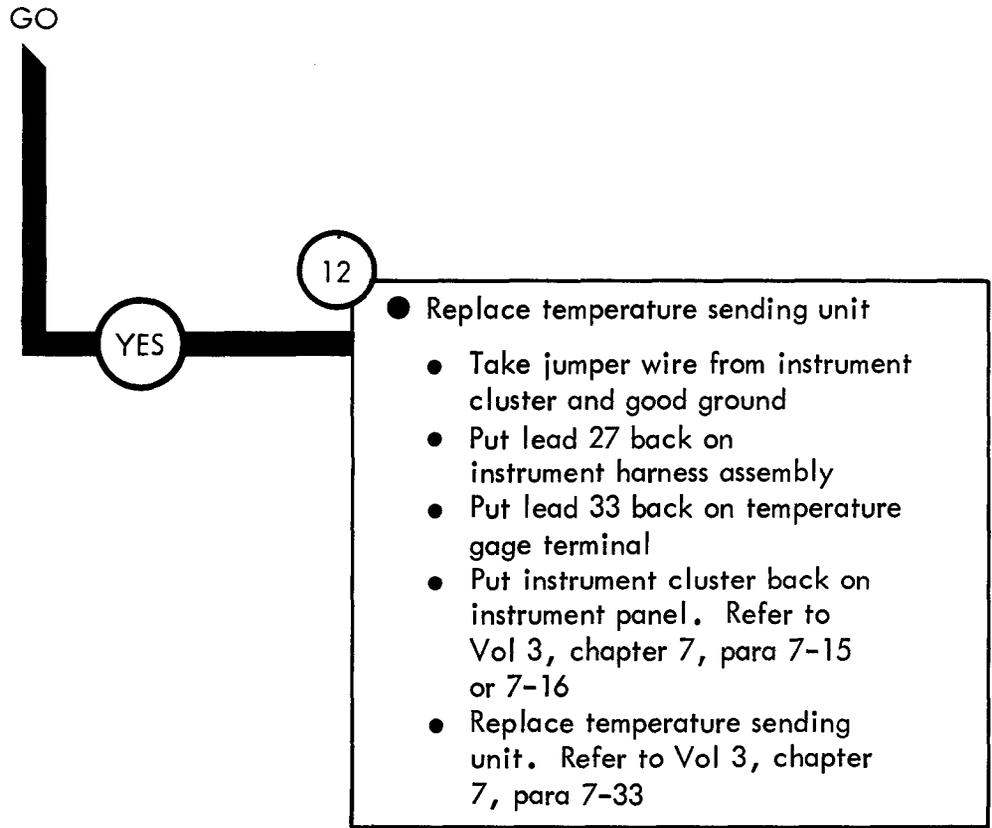


Figure 26-28 (Sheet 6 of 6)

Symptom

29

OIL PRESSURE GAGE DOES NOT WORK

NOTE

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Check for +24 volts DC from oil pressure gage to oil sending unit
 - Set BATTERY switch to OFF
 - Take off lead 36 lead contact from oil pressure sending unit
 - Set BATTERY switch to ON

- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on lead 36 contact
- Read multimeter. Multimeter should measure more than 10 volts DC

Does multimeter measure less than 10 volts DC?

GO

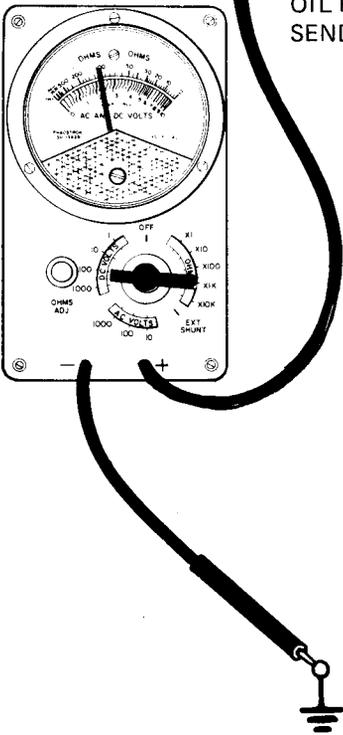
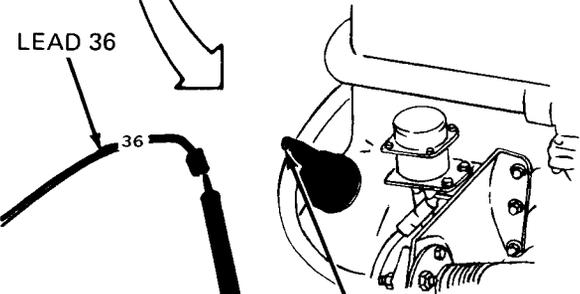
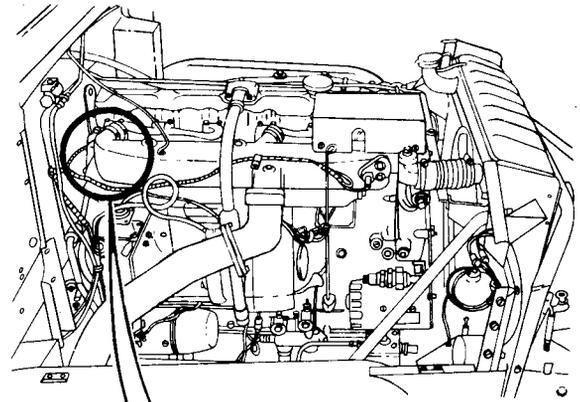


Figure 26-29 (Sheet 1 of 7)

TA 115922

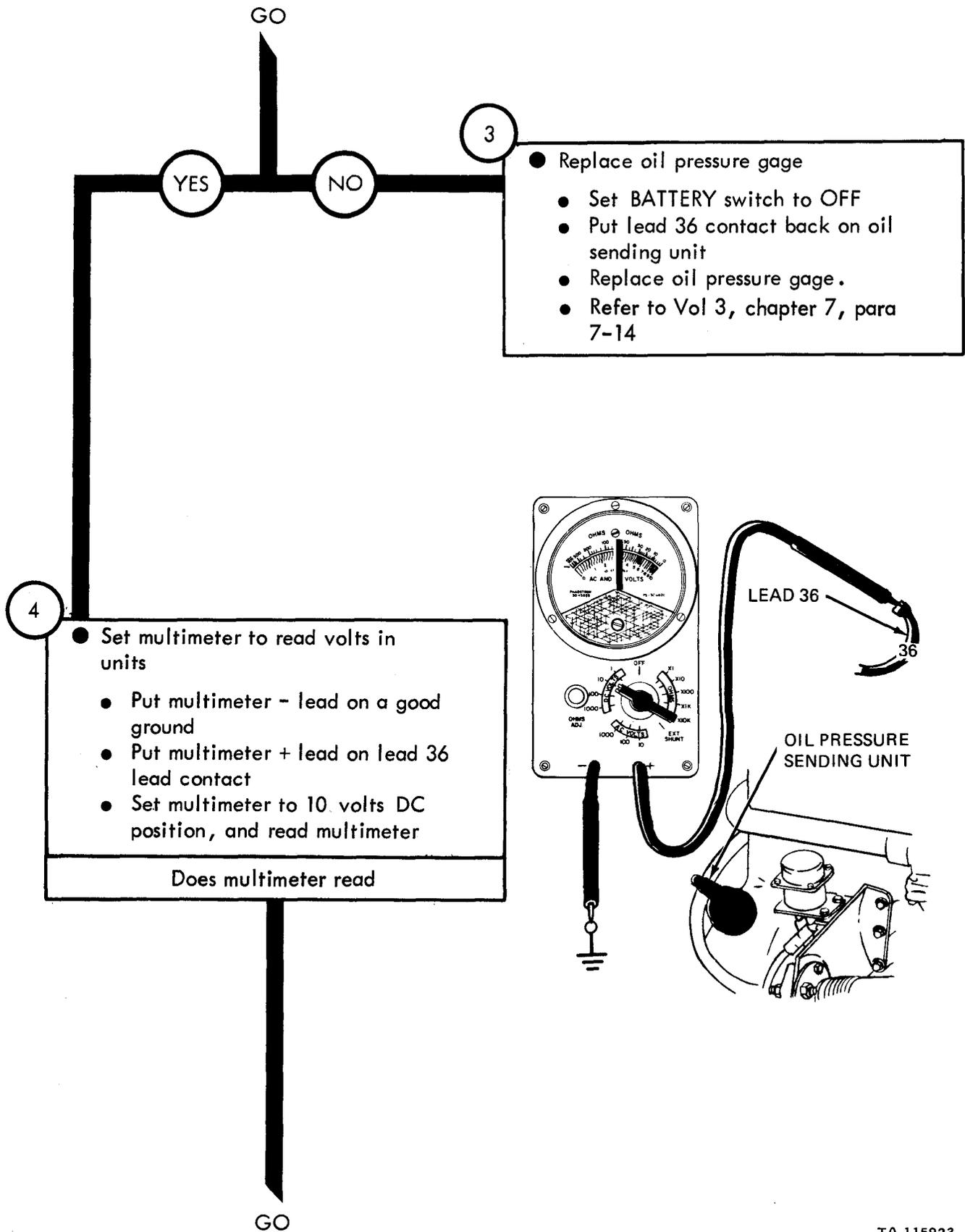


Figure 26-29 (Sheet 2 of 7)

TA 115923

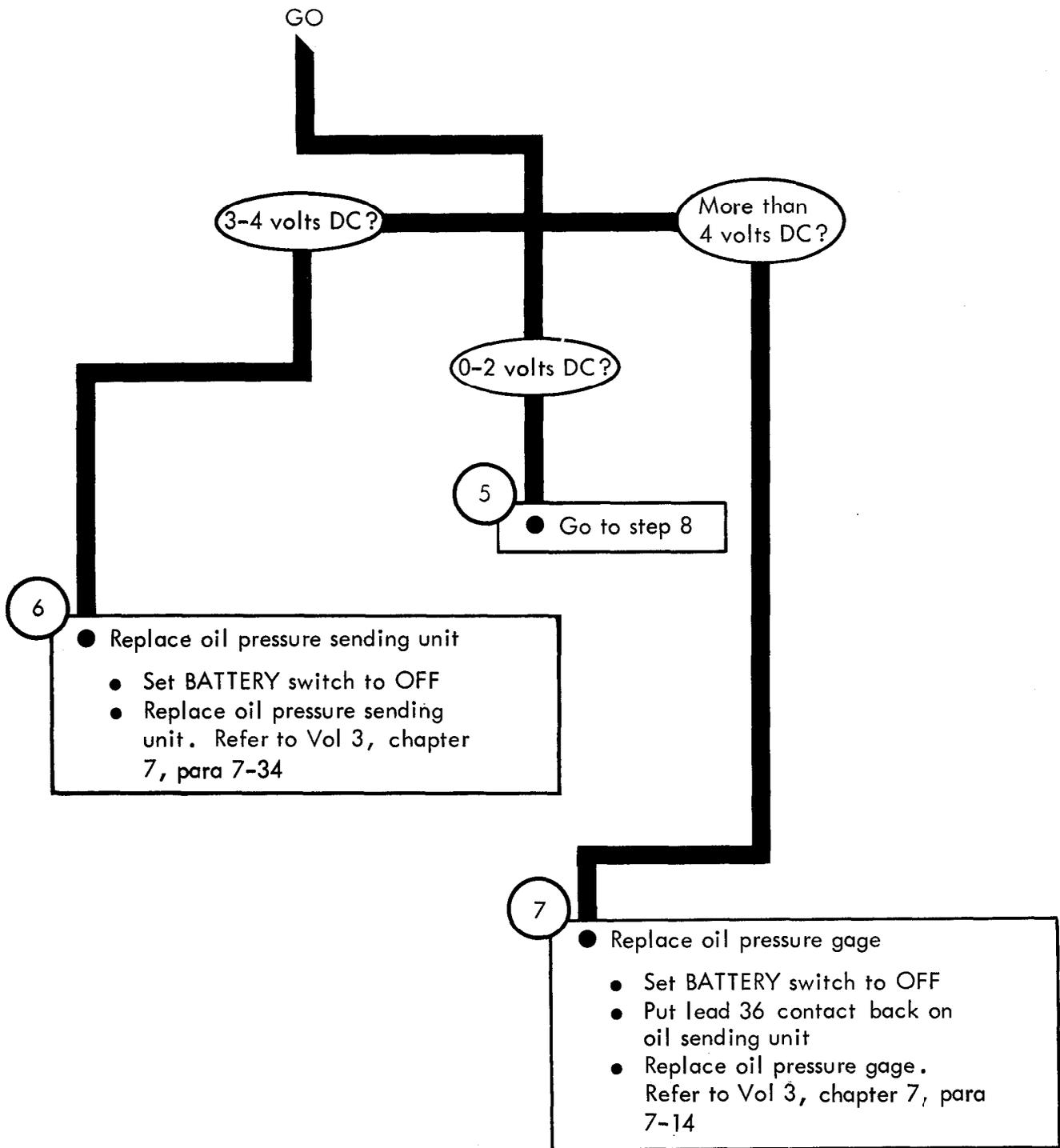
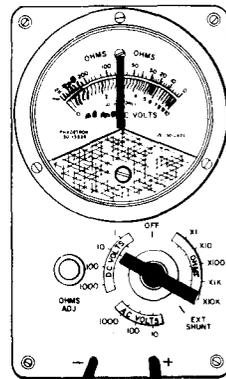
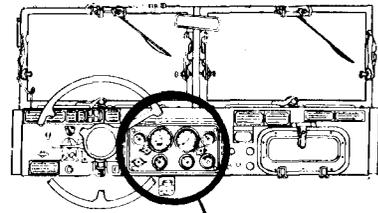


Figure 26-29 (Sheet 3 of 7)

From step 5

8

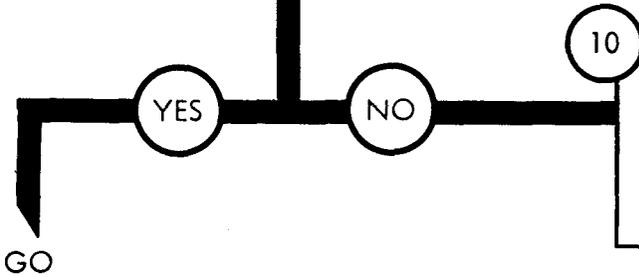
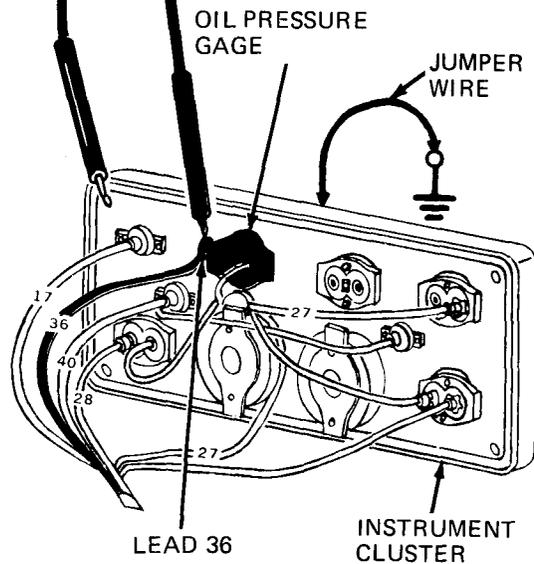
- Check for voltage through oil pressure gage
 - Set BATTERY switch to OFF
 - Take off instrument cluster from instrument panel. Refer to Vol 3, chapter 2, para 7-15 or 7-16
 - Put jumper wire from instrument cluster to a good ground
 - Take off lead 36 from oil pressure gage



9

- Set BATTERY switch to ON
 - Place multimeter - lead on a good ground
 - Place multimeter + lead on lead 36 contact. Read multimeter
 - Multimeter should measure +2 to +4 volts DC

Does multimeter measure less than 2 volts DC?



10

- Repair or replace front harness
 - Set BATTERY switch to OFF
 - Repair or replace front harness. Tell direct support maintenance

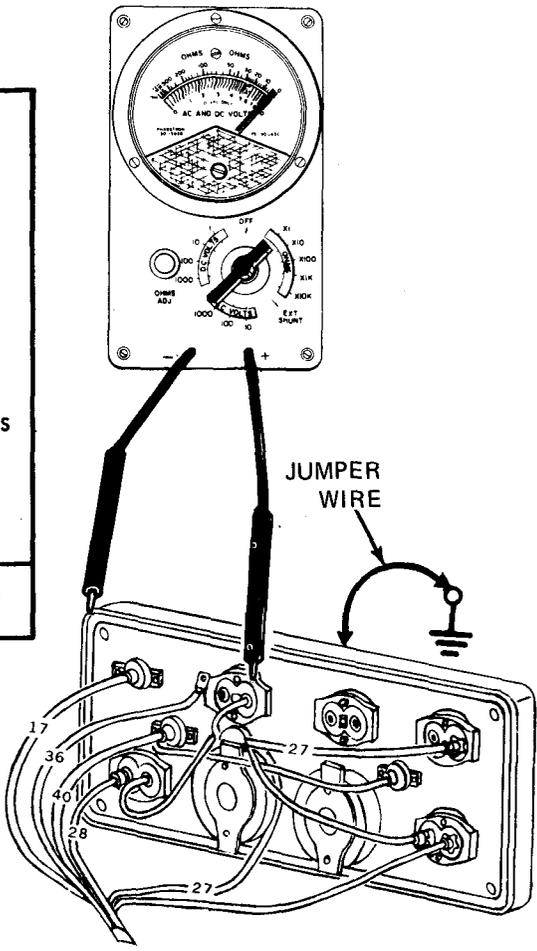
Figure 26-29 (Sheet 4 of 7)

GO

11

- Check oil pressure gage for continuity
 - Set BATTERY switch to OFF
 - Set multimeter to check continuity. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on bare metal of oil pressure gage, not on terminals of gage
 - Read multimeter. Multimeter should measure less than 1 ohm

Does multimeter measure more than 1 ohm ?



YES

NO

12

- Replace oil pressure gage
 - Refer to Vol 3, chapter 7, para 7-14

GO

Figure 26-29 (Sheet 5 of 7)

GO

13

- Clean surfaces where oil pressure gage and instrument cluster contact, and recheck continuity
- Take off oil pressure gage from instrument cluster. Refer to Vol 3, chapter 7, para 7-14
- Clean surfaces where oil pressure gage and instrument cluster contact
- Put oil pressure gage back on instrument cluster. Refer to Vol 3, chapter 7, para 7-14

- Put multimeter - lead on a good ground
- Put multimeter + lead on oil pressure gage lead 36 terminal
- Read multimeter. Multimeter should measure less than 1 ohm

Does multimeter measure less than 1 ohm?

GO

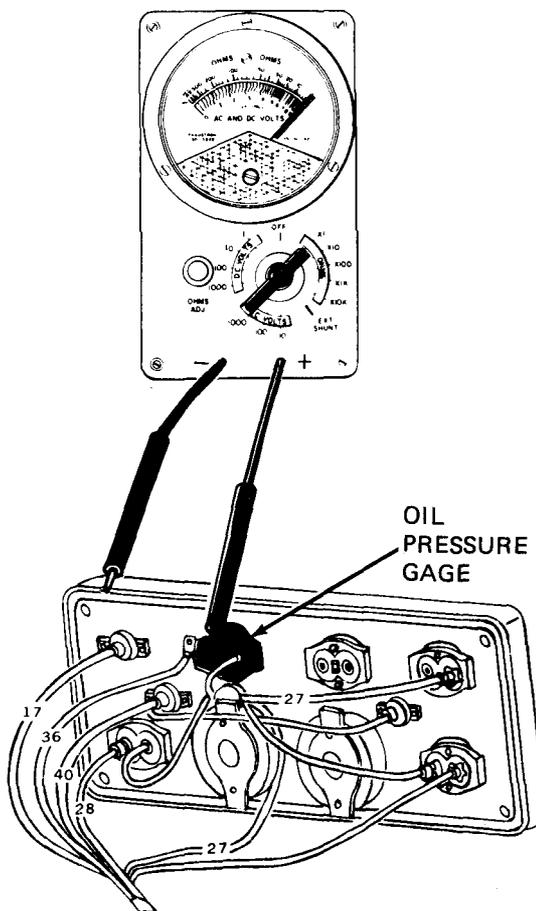


Figure 26-29 (Sheet 6 of 7)

TA 115927

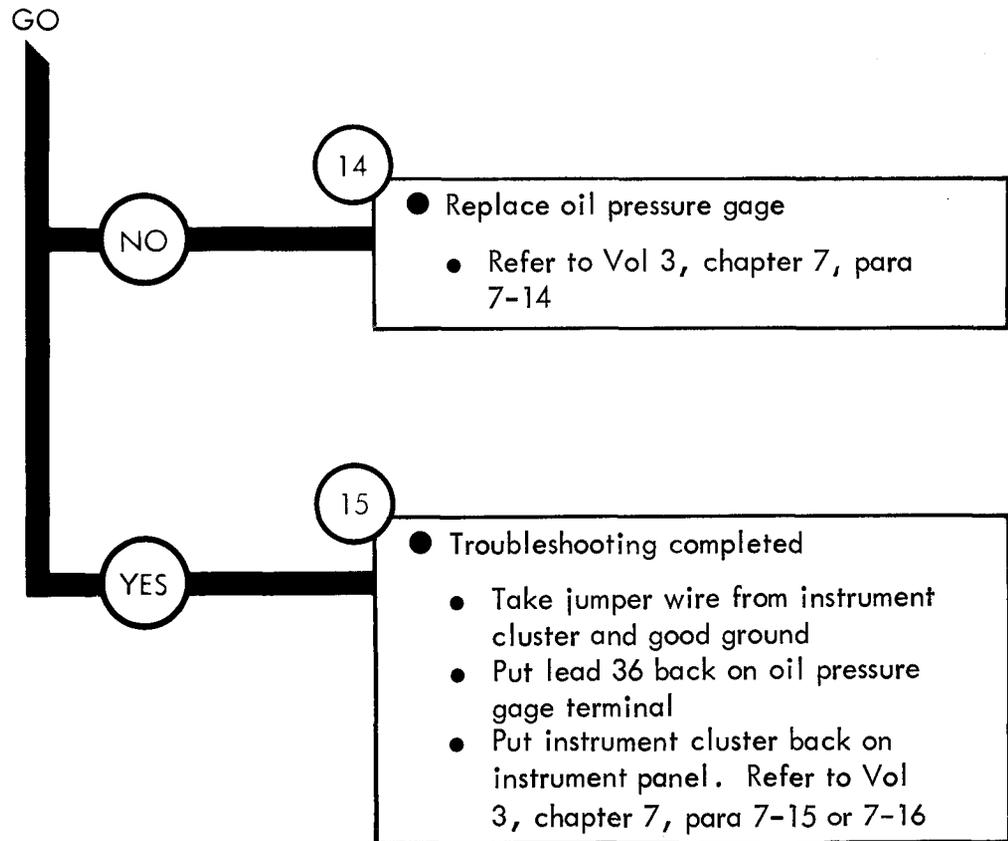


Figure 26-29 (Sheet 7 of 7)

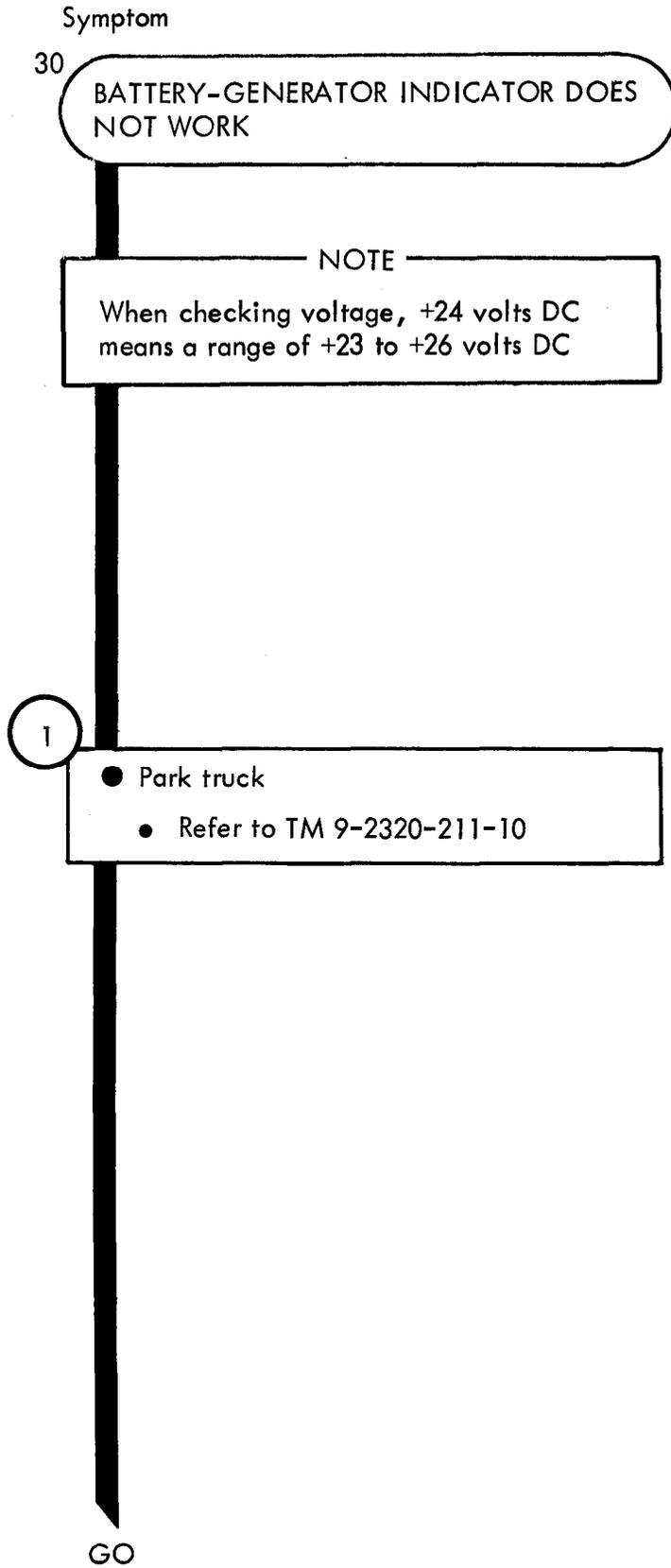
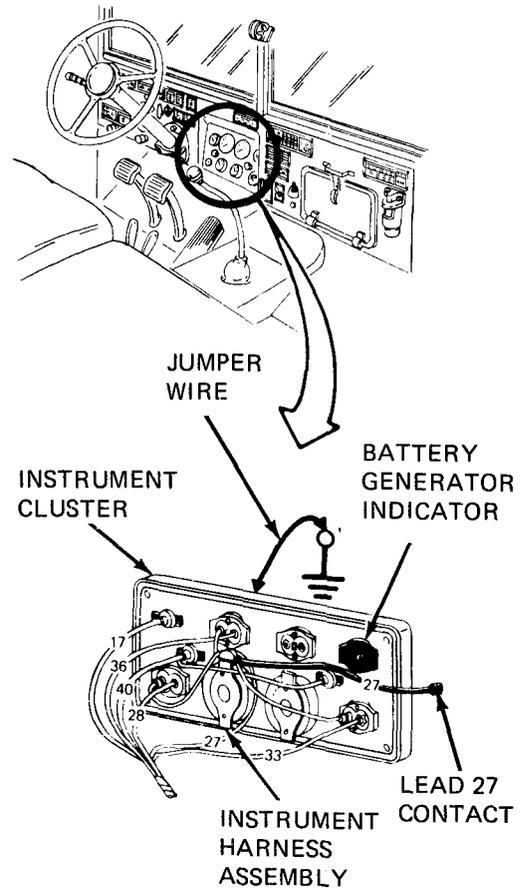


Figure 26-30 (Sheet 1 of 5)

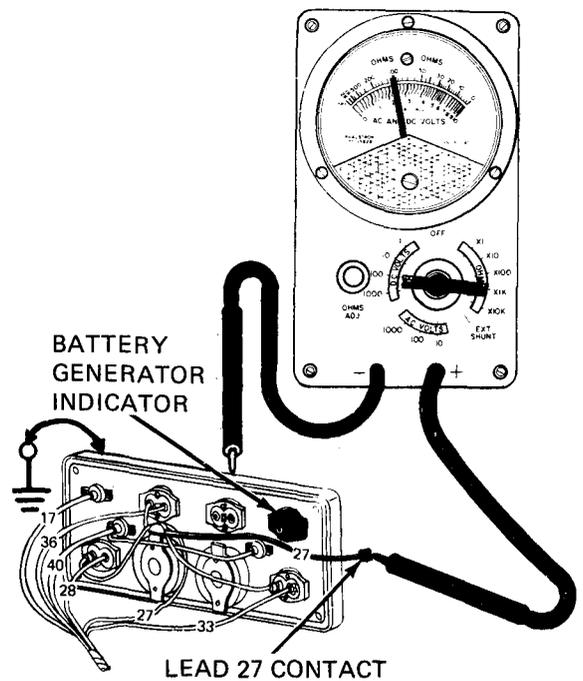
GO

2

- Check for +24 volts DC to battery-generator indicator gage
 - Set BATTERY switch to OFF
 - Take off instrument cluster from instrument panel. Refer to Vol 3, chapter 7, para 7-15 or 7-16
 - Put jumper wire between instrument cluster and a good ground
 - Take off lead 27 contact from battery indicator terminal
 - Set BATTERY switch to ON



- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on lead 27 contact
 - Read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure +24 volts DC?



GO

Figure 26-30 (Sheet 2 of 5)

TA 115930

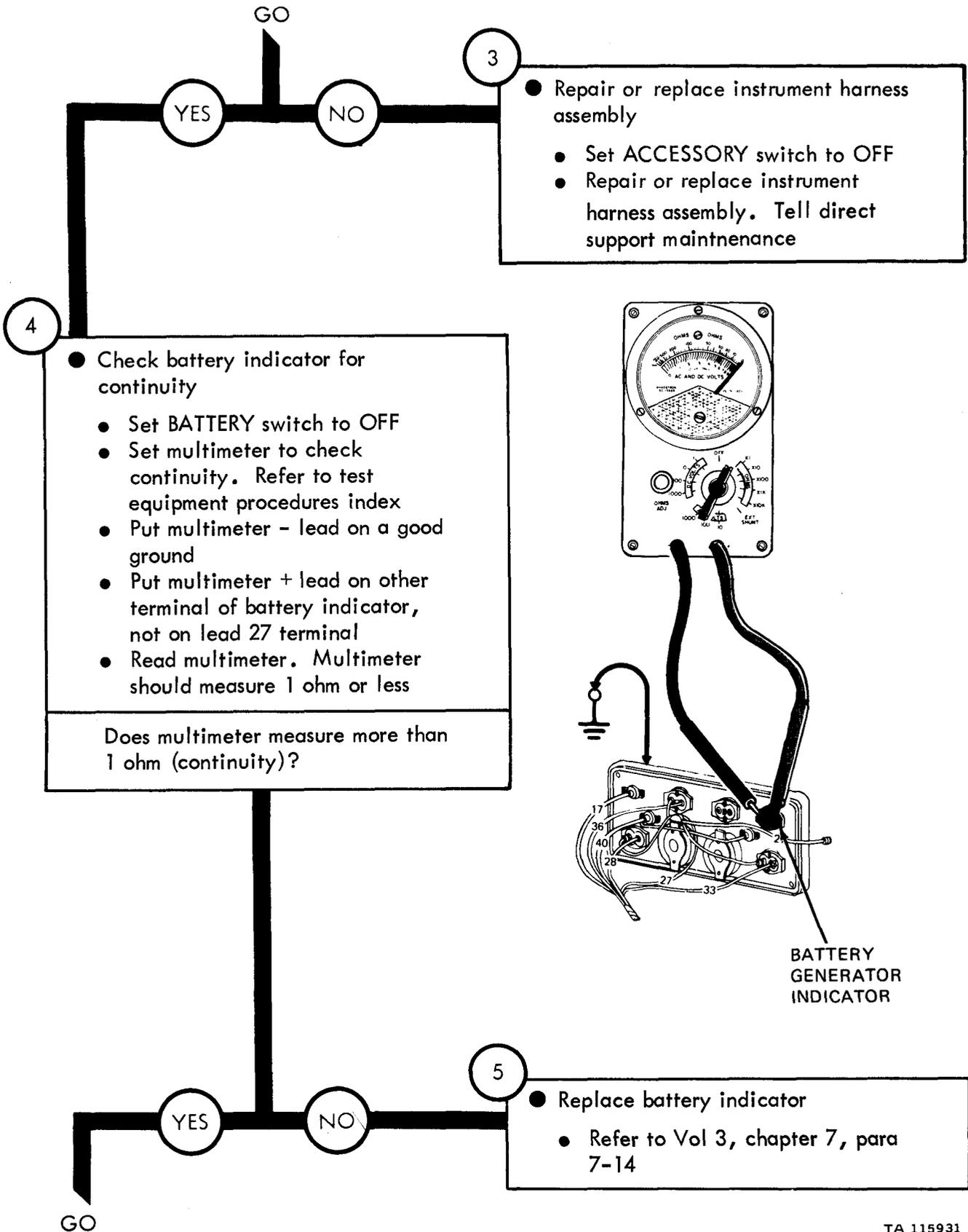


Figure 26-30 (Sheet 3 of 5)

TA 115931

GO

6

- Clean surfaces where battery indicator and instrument cluster contact, and recheck continuity
- Take off battery indicator from instrument cluster. Refer to Vol 3, chapter 7, para 7-14
- Clean surfaces where battery indicator and instrument cluster contact
- Put battery indicator back on instrument cluster. Refer to Vol 3, chapter 7, para 7-14

- Put multimeter - lead on a good ground
- Put multimeter + lead on battery indicator lead 27 contact terminal
- Read multimeter. Multimeter should measure 1 ohm or less

Does multimeter measure 1 ohm or less?

GO

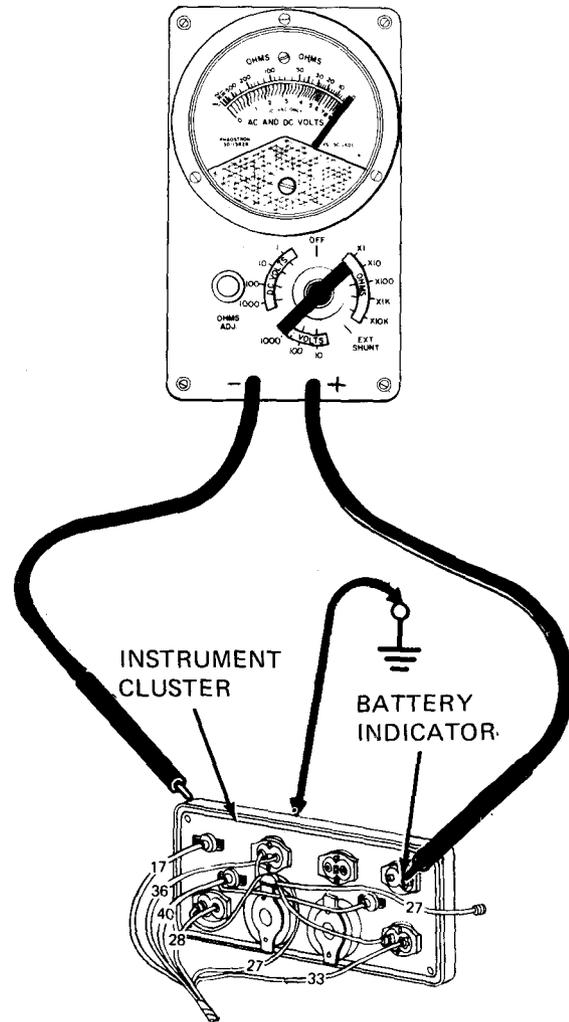


Figure 26-30 (Sheet 4 of 5)

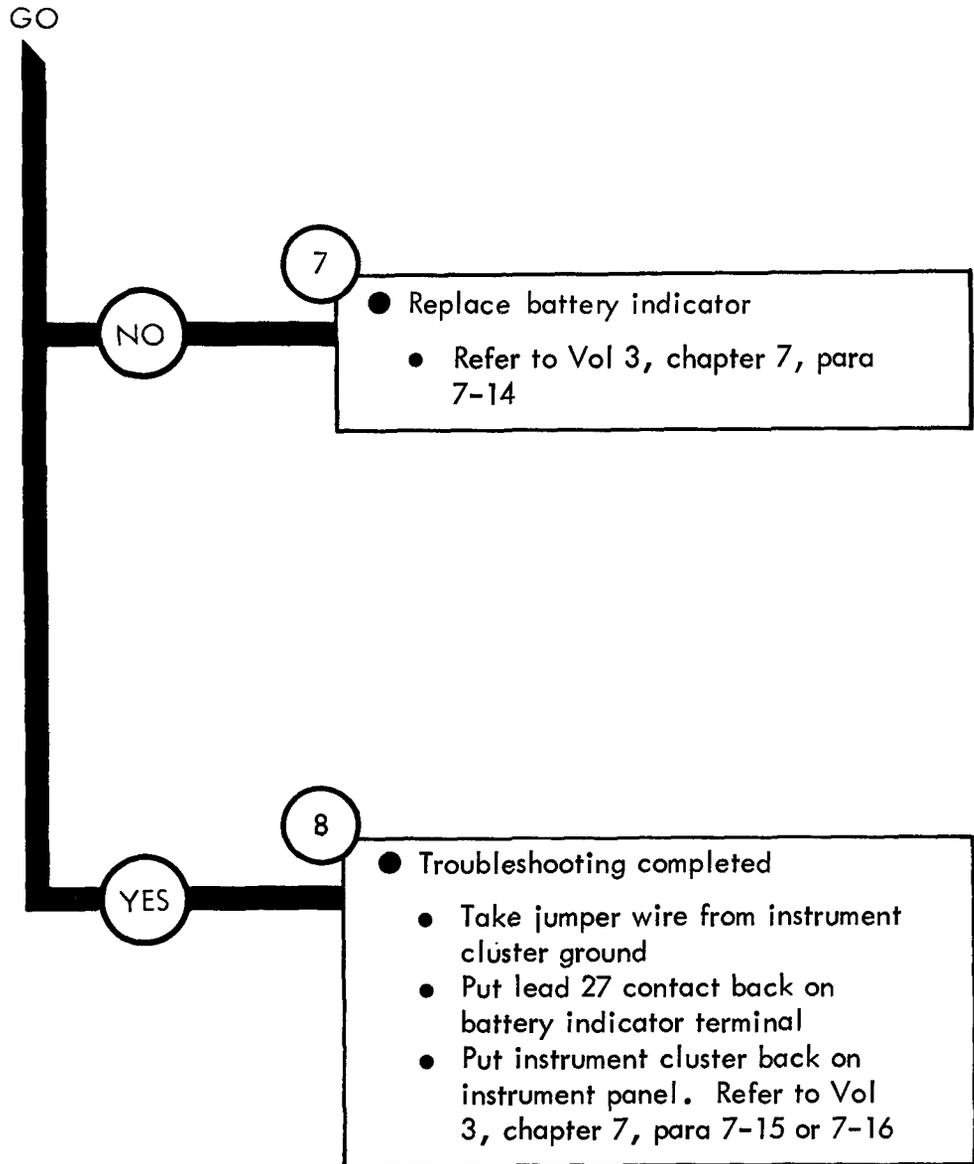


Figure 26-30 (Sheet 5 of 5)

TA 115933

Symptom

31

ALL GAGES DO NOT WORK

NOTE

The speedometer and tachometer cables and air pressure gage air hose must be removed to take off the instrument cluster from the instrument panel. A jumper wire must be placed from the instrument panel to a good ground for the gages to work

When checking voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

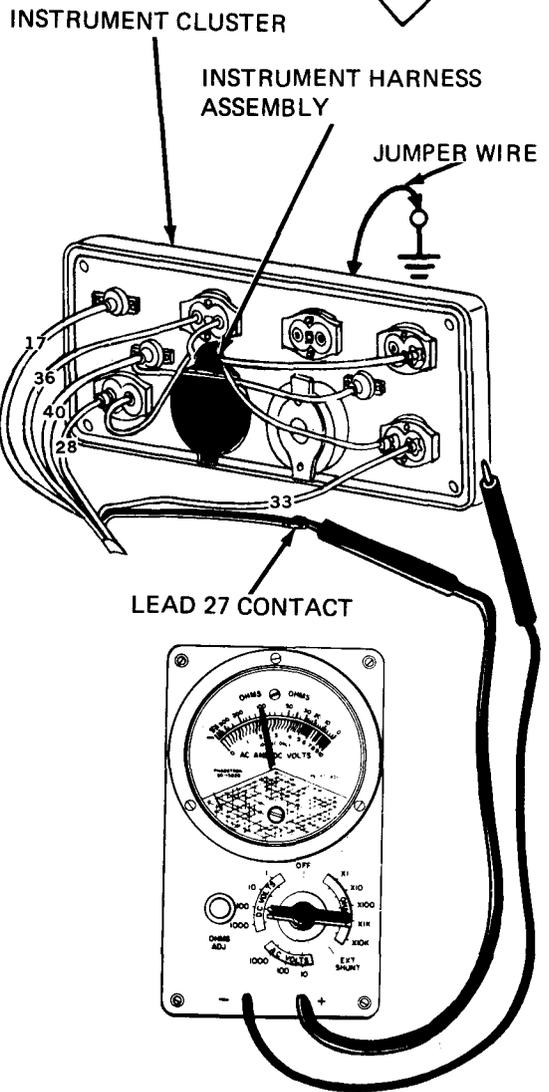
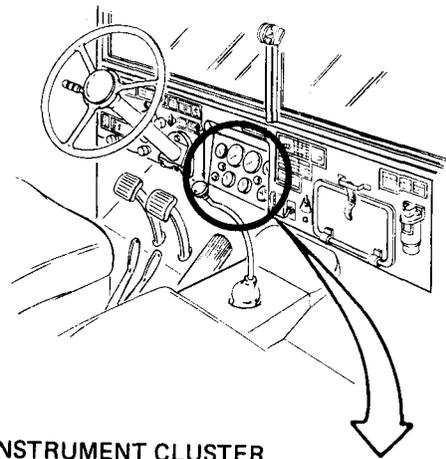
GO

Figure 26-31 (Sheet 1 of 7)

GO

2

- Check for voltage from batteries to instrument cluster
 - Set BATTERY switch to OFF
 - Take off instrument cluster from instrument panel. Refer to Vol 3, chapter 7, para 7-15 or 7-16
 - Put jumper wire between instrument cluster and a good ground
 - Take off lead 27 at instrument harness assembly
 - Set BATTERY switch to ON



- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on lead 27
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO

Figure 26-31 (Sheet 2 of 7)

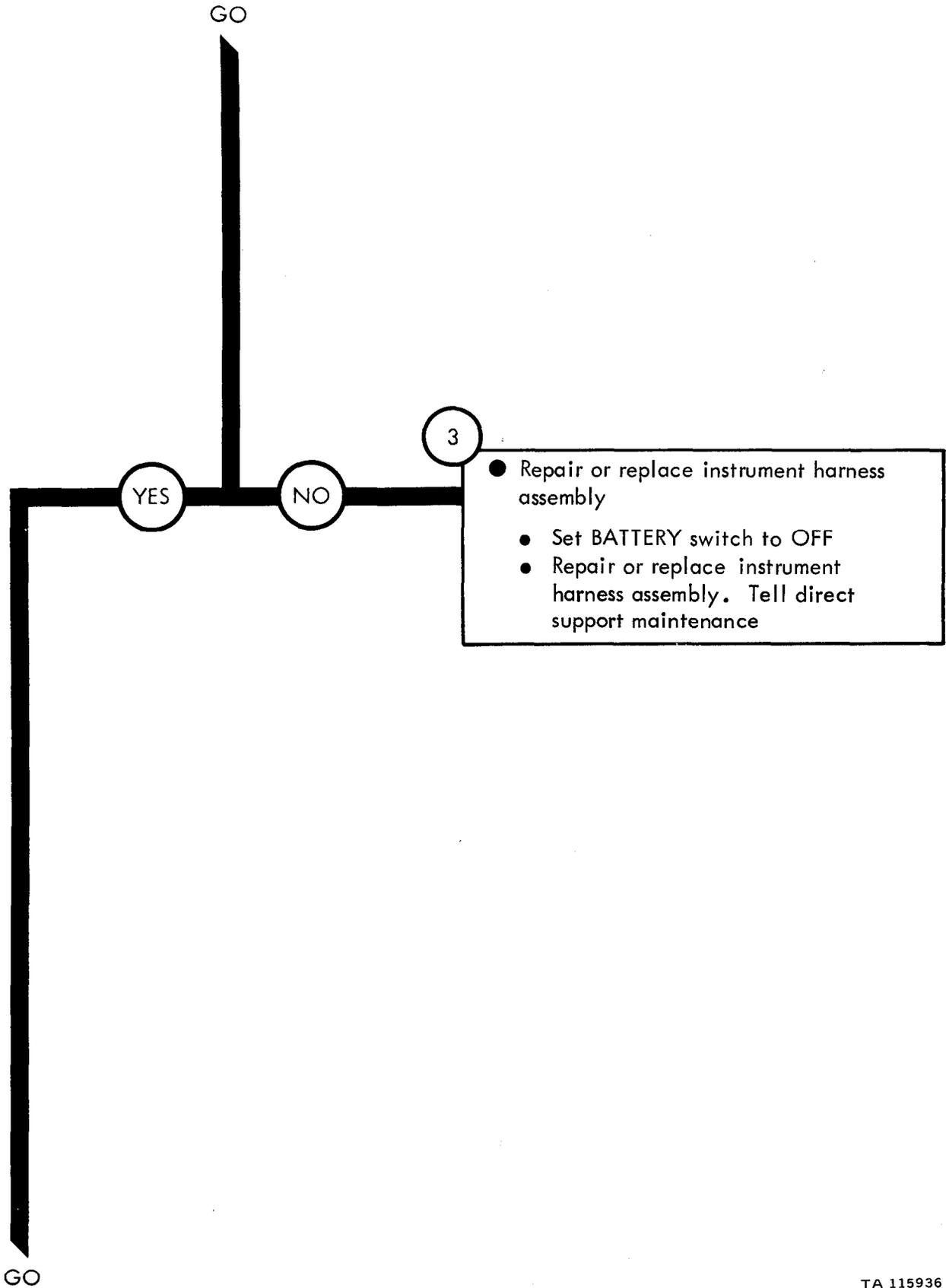


Figure 26-31 (Sheet 3 of 7)

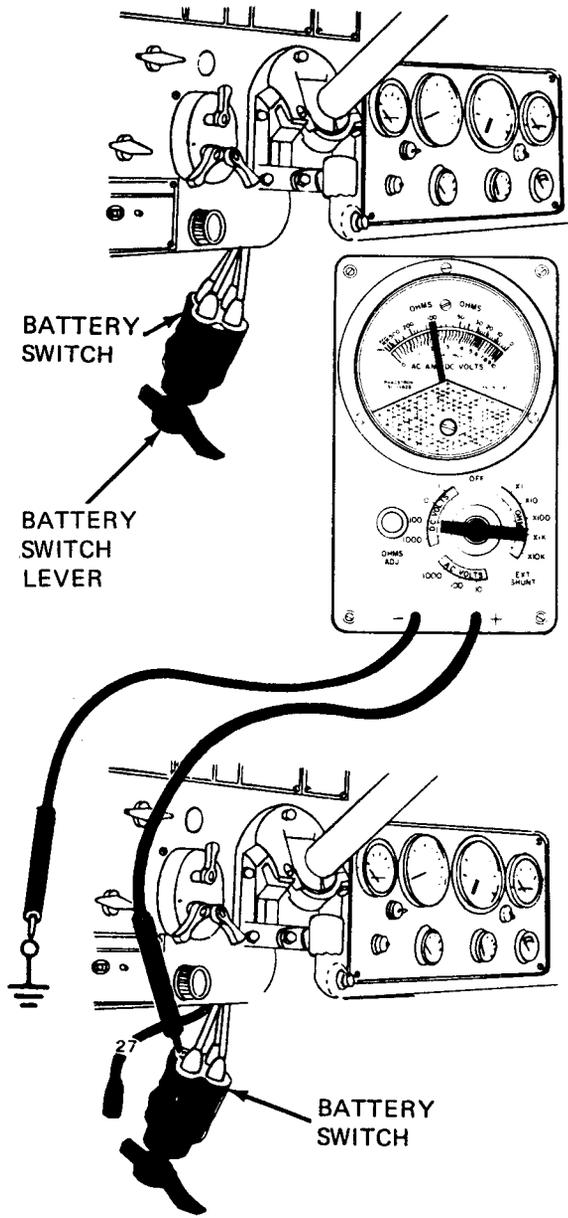
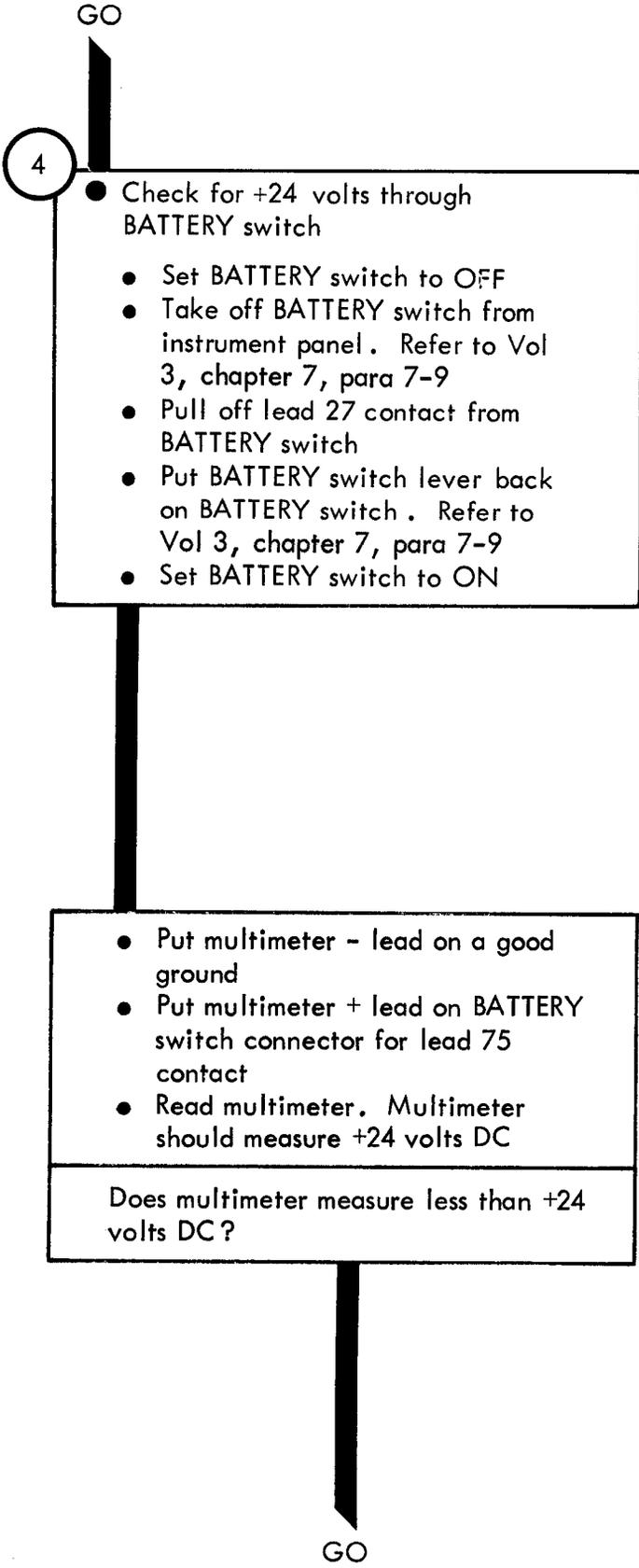


Figure 26-31 (Sheet 4 of 7)

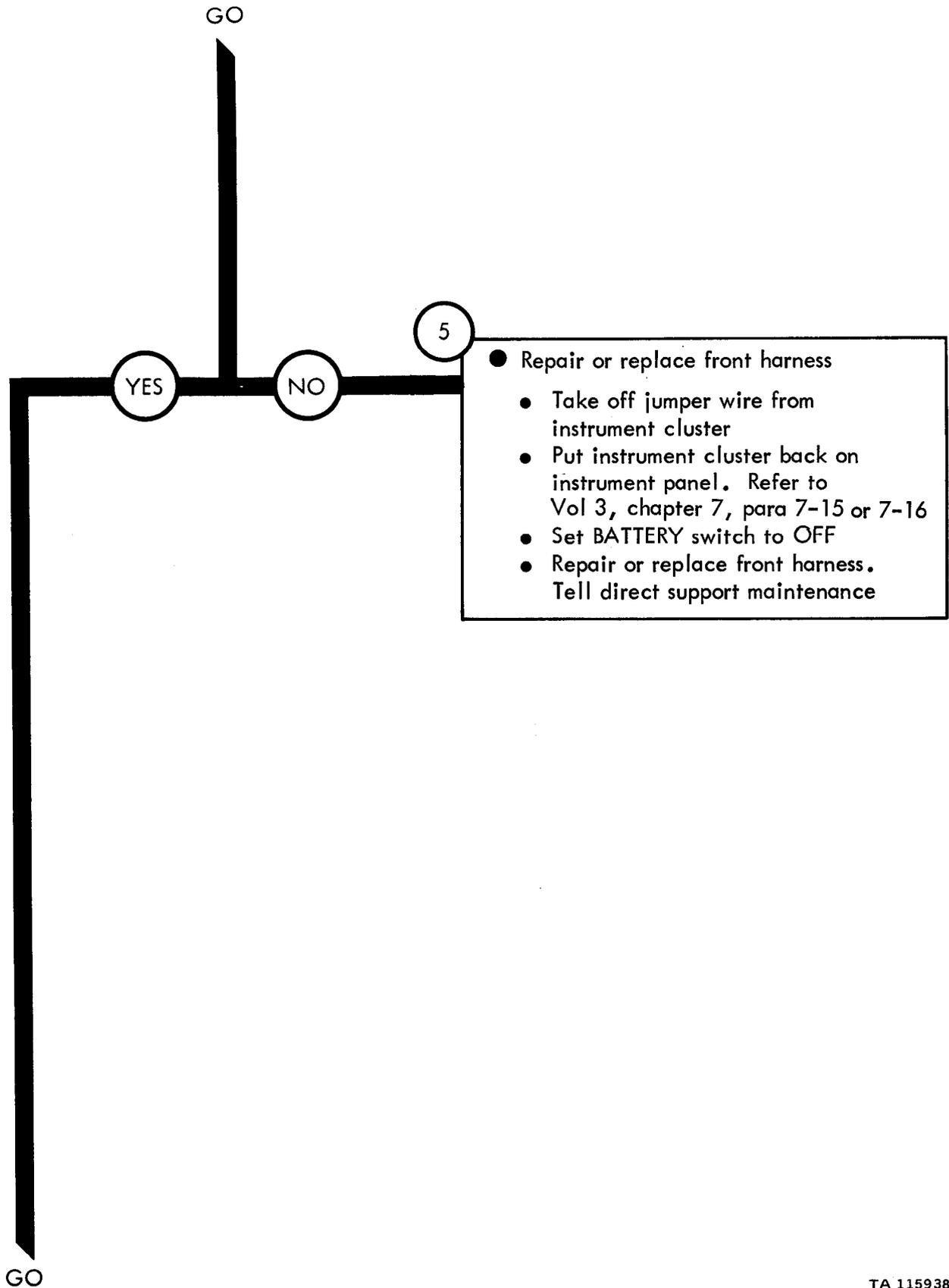
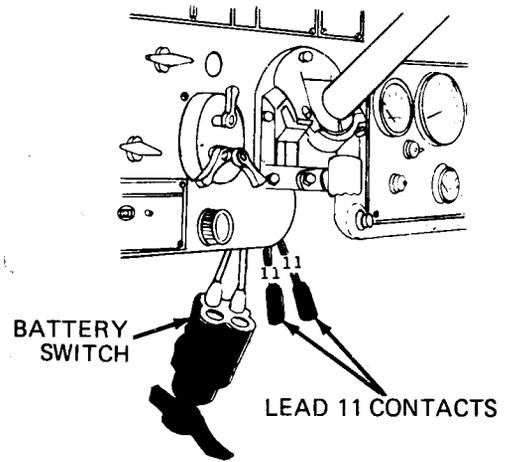


Figure 26-31 (Sheet 5 of 7)

GO

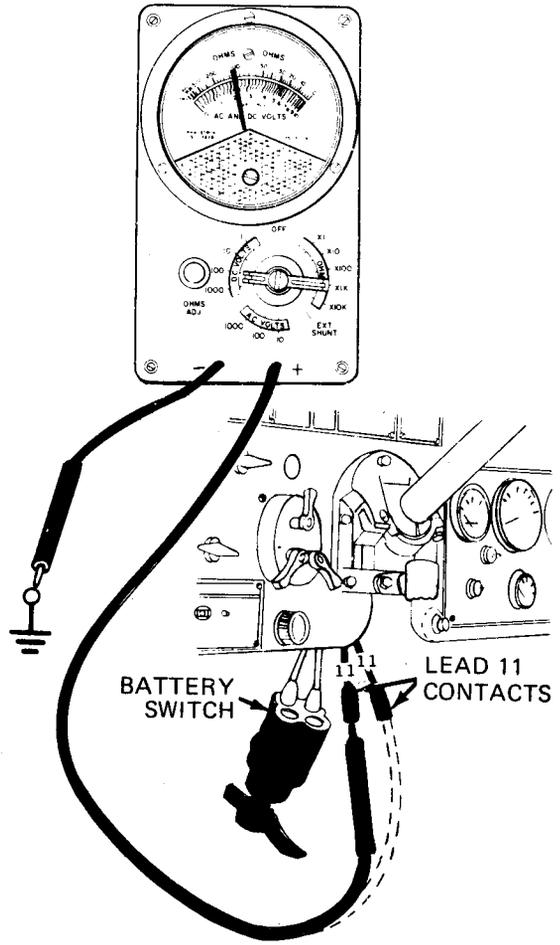
6

- Check for +24 volts DC to BATTERY switch
 - Set BATTERY switch to OFF
 - Put lead 27 lead contact back into BATTERY switch lead 27 connector
 - Pull out both lead 11 contacts from BATTERY switch lead 11 connectors



- Put multimeter - lead on a good ground
- Put multimeter + lead on one lead 11 contact. Read multimeter
- Put multimeter + lead on other lead 11 contact. Read multimeter. Multimeter should measure +24 volts DC for both tests

Does multimeter measure +24 volts DC for both tests?



GO

Figure 26-31 (Sheet 6 of 7)

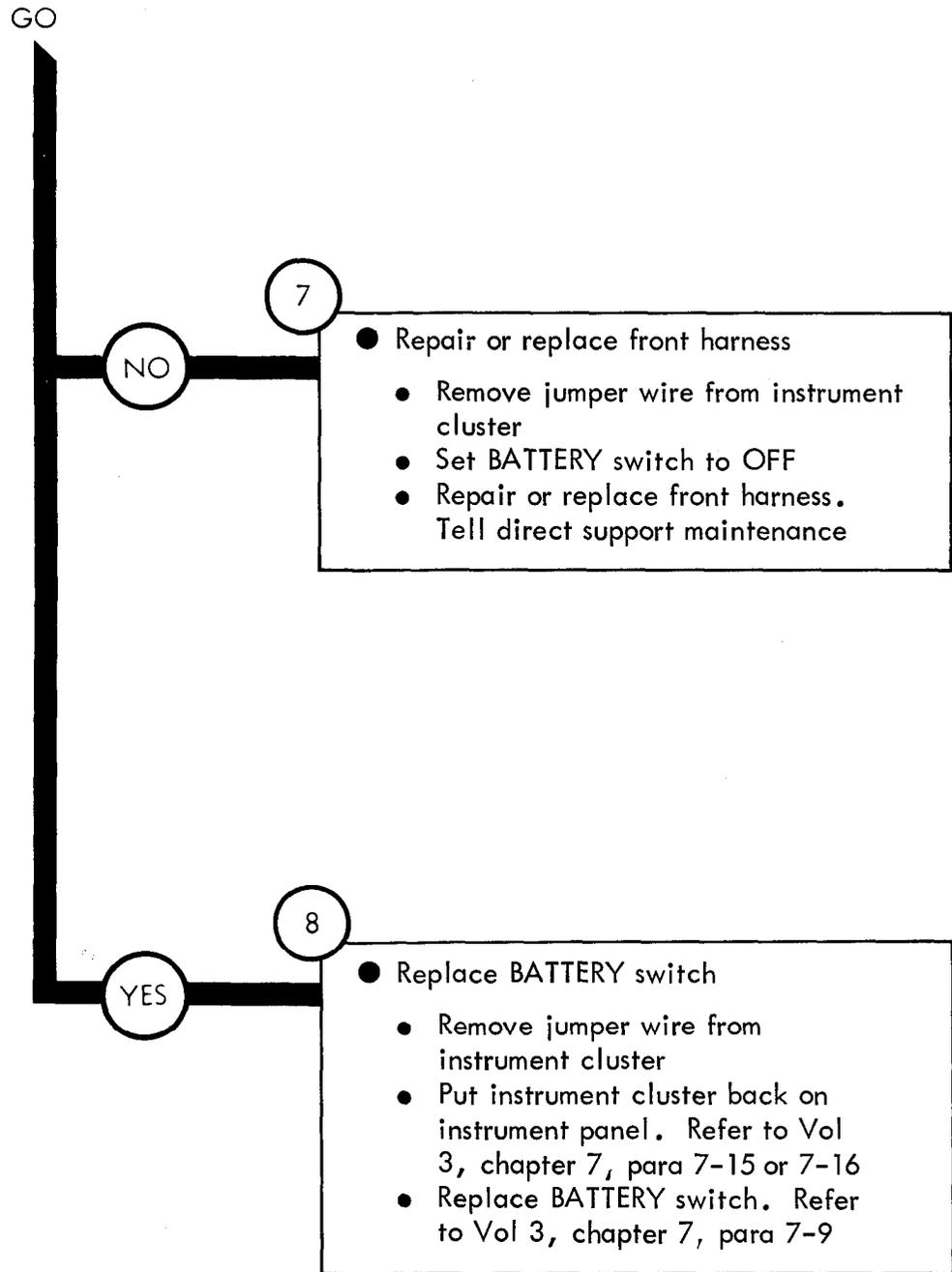


Figure 26-31 (Sheet 7 of 7)

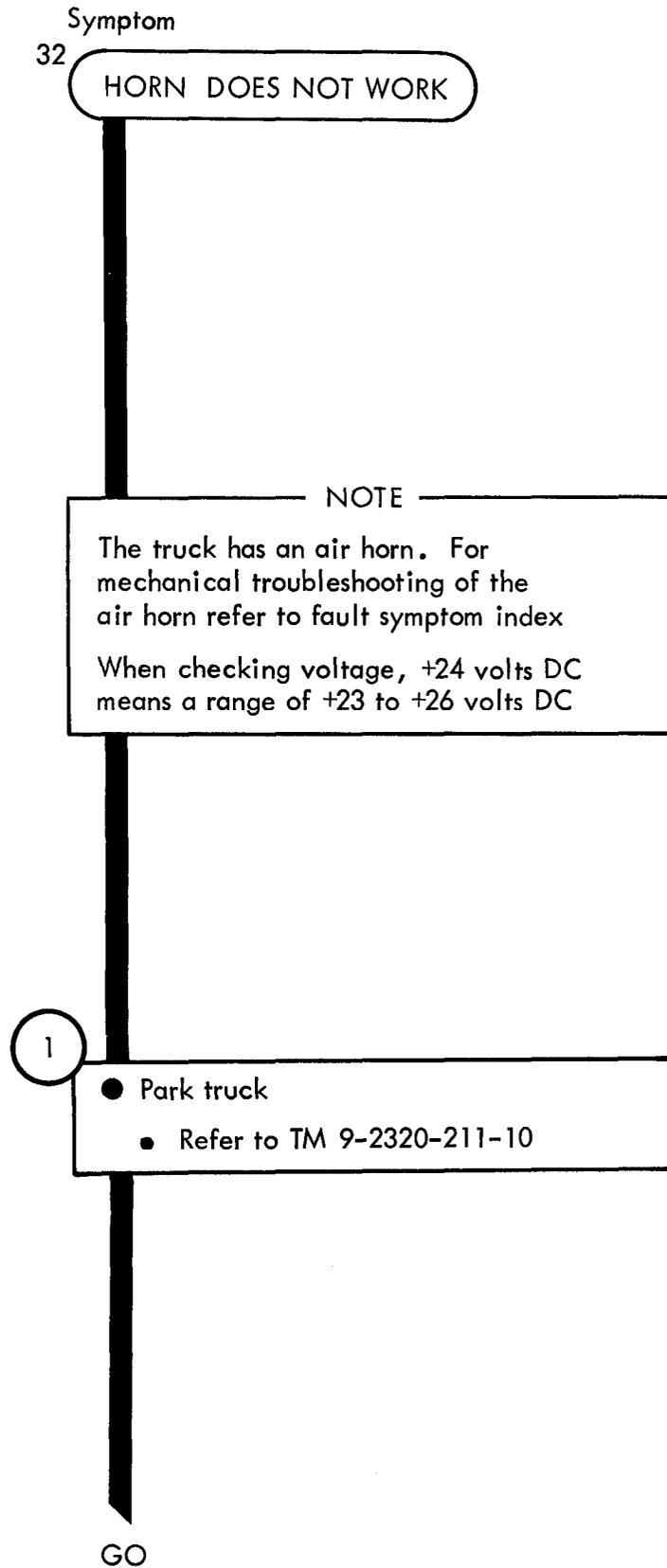


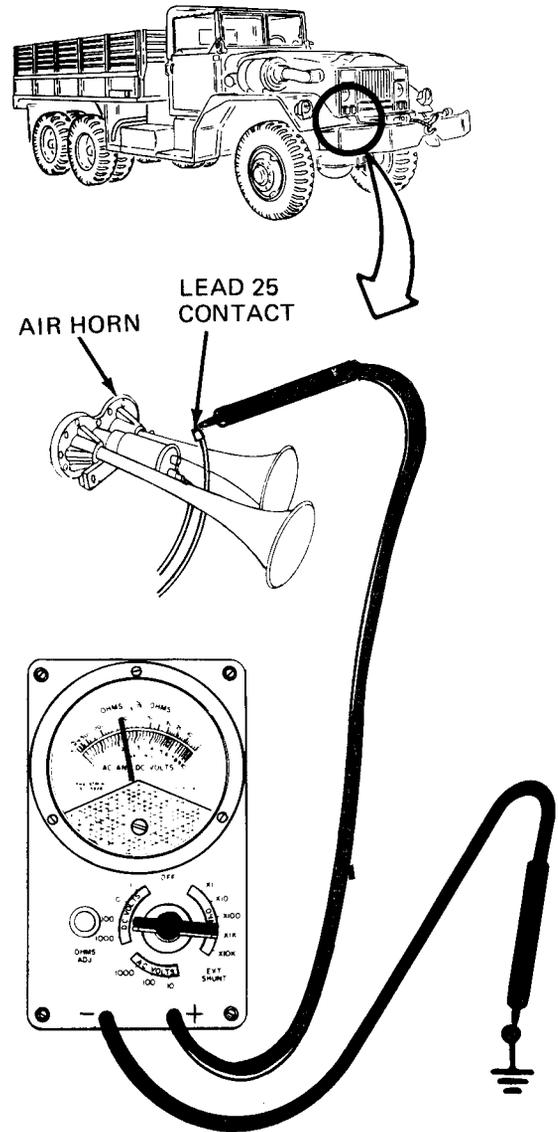
Figure 26-32 (Sheet 1 of 10)

GO

2

- Check lead 25 from circuit breaker to horn for +24 volts DC
 - Remove top lead 25 from horn terminal
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on lead 25 contact. Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



GO

TA 115942

Figure 26-32 (Sheet 2 of 10)

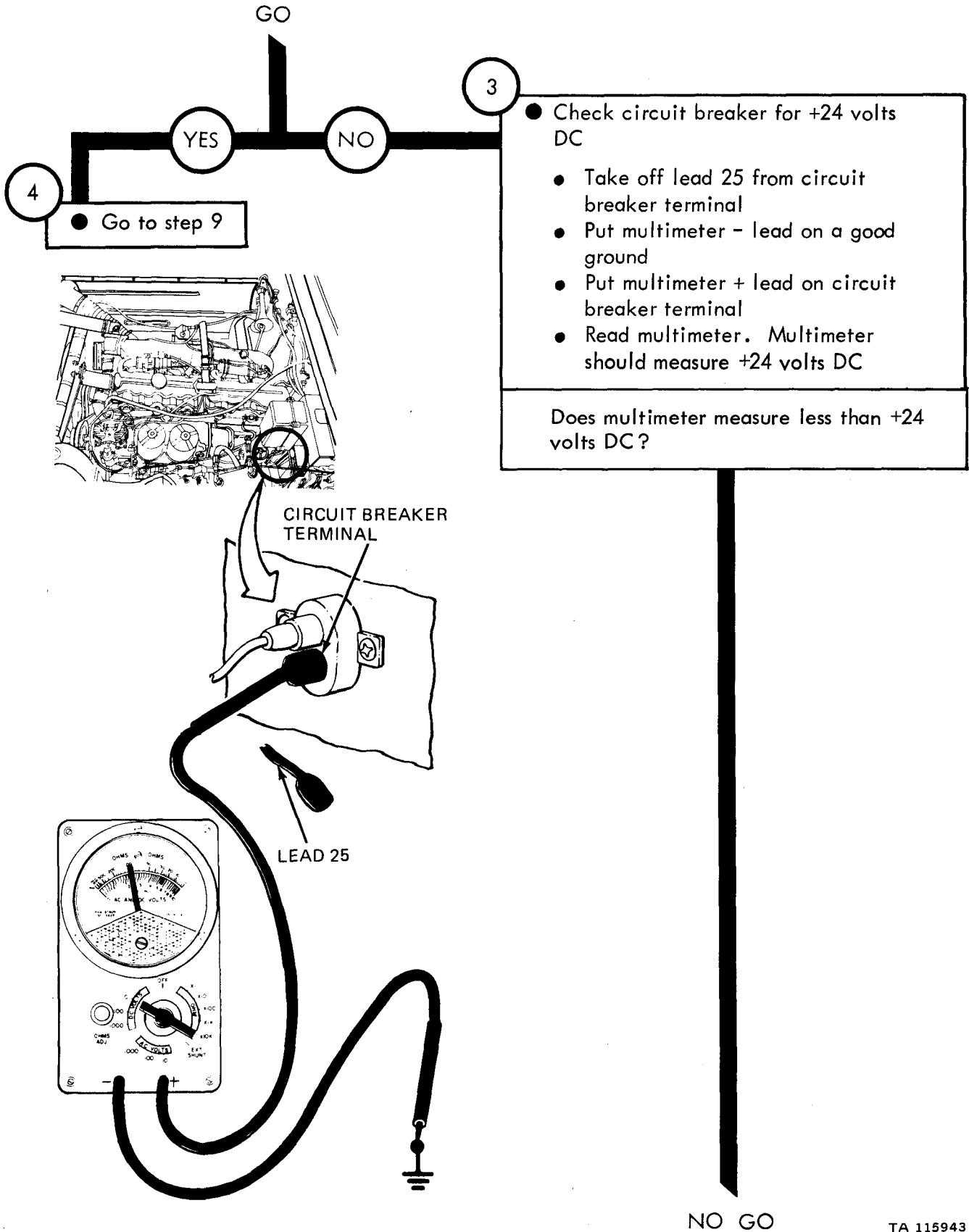


Figure 26-32 (Sheet 3 of 10)

TA 115943

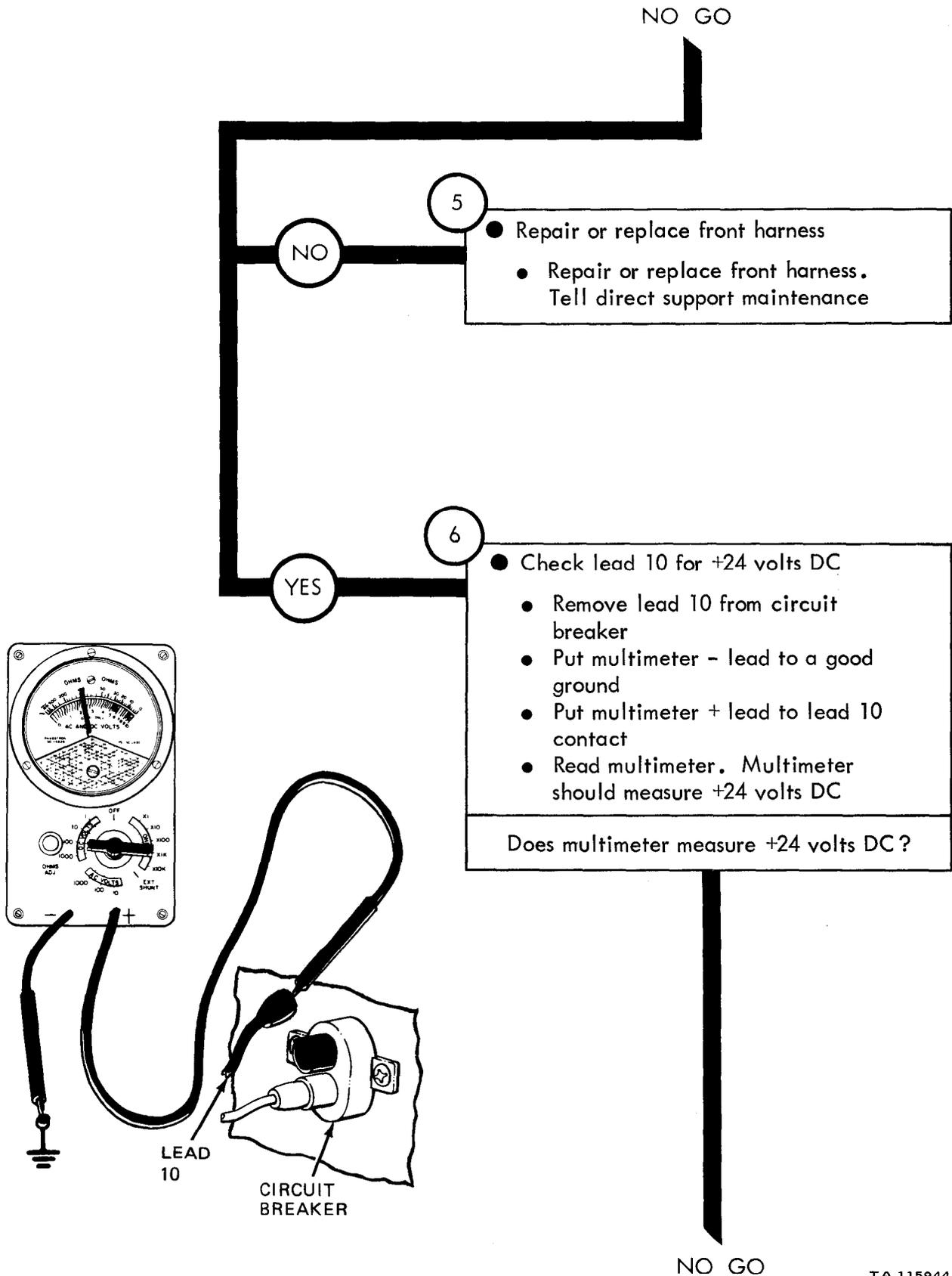


Figure 26-32 (Sheet 4 of 10)

TA 115944

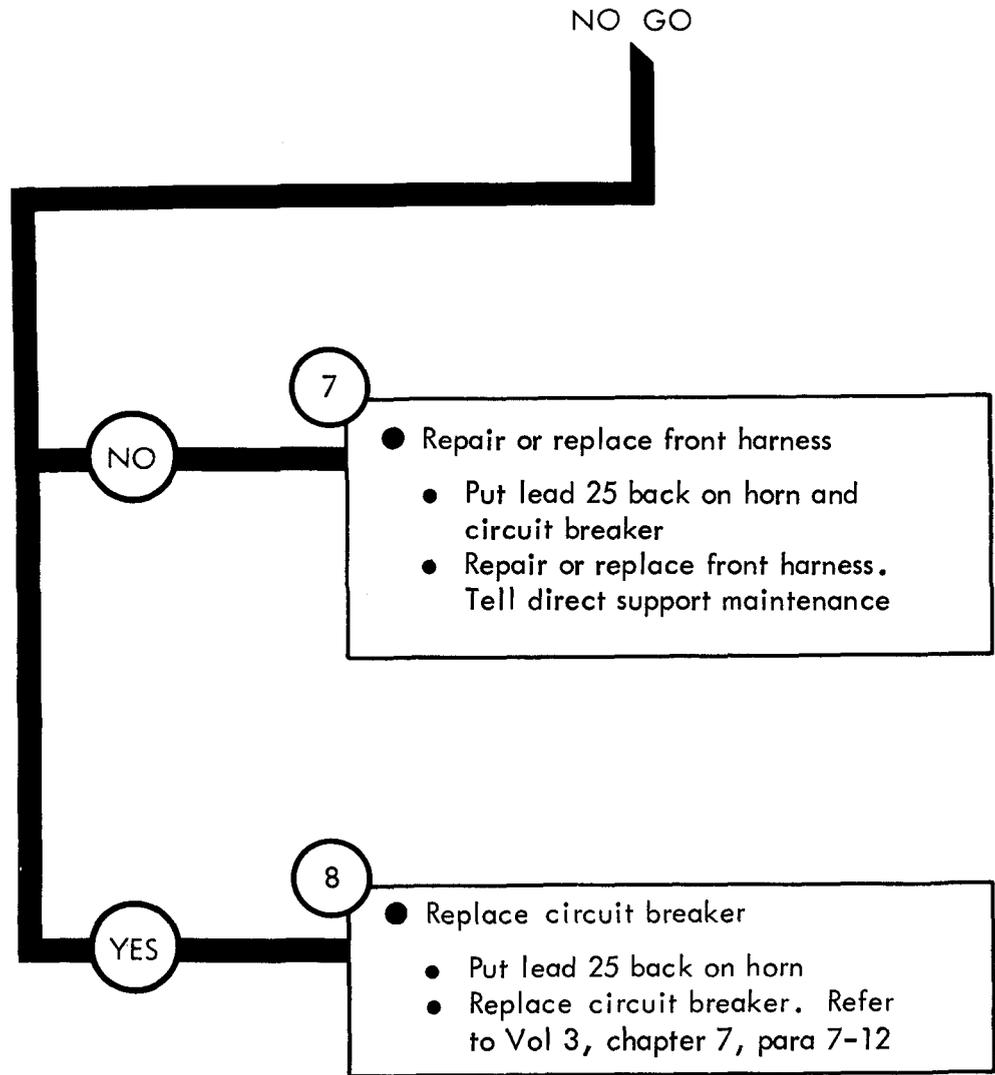


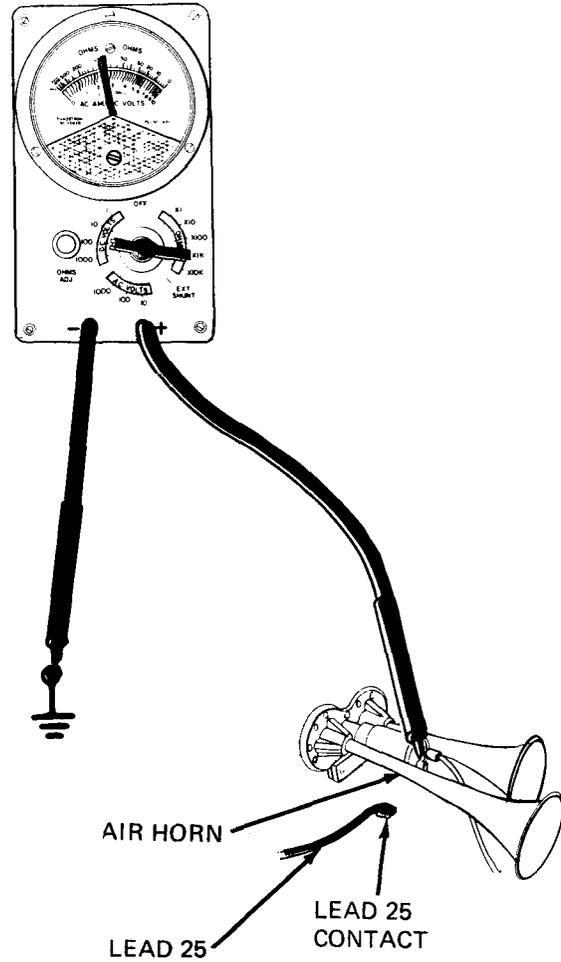
Figure 26-32 (Sheet 5 of 10)

TA 115945

From step 4

9

- Check horn for +24 volts DC
 - Put lead 25 back on horn terminal
 - Take off other circuit 25 lead from other horn terminal
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on horn terminal
 - Read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure +24 volts DC?



YES

NO

10

- Replace air horn solenoid
 - Replace air horn solenoid. Refer to Vol 3, chapter 7, para 7-39 or 7-40

GO

Figure 26-32 (Sheet 6 of 10)

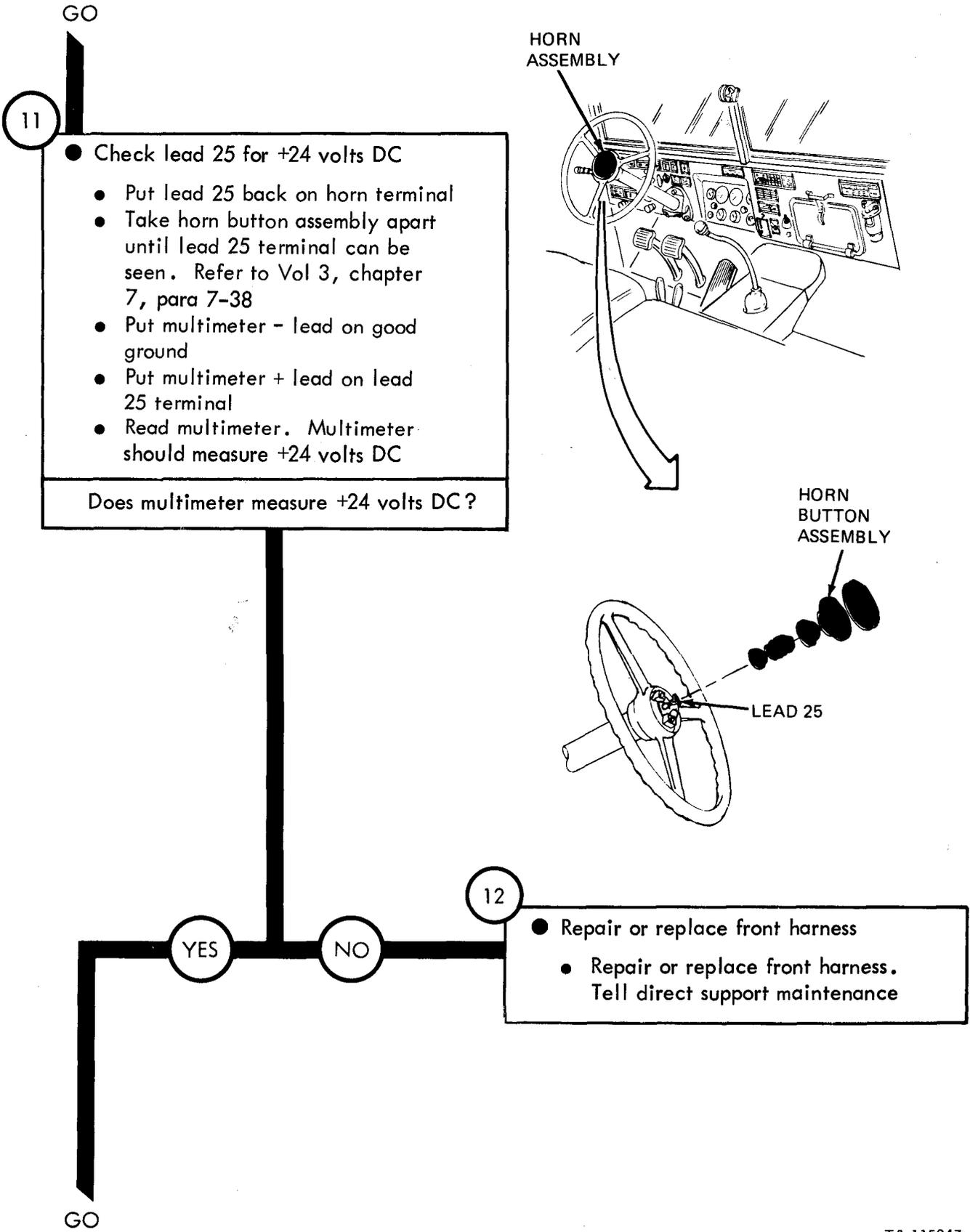


Figure 26-32 (Sheet 7 of 10)

TA 115947

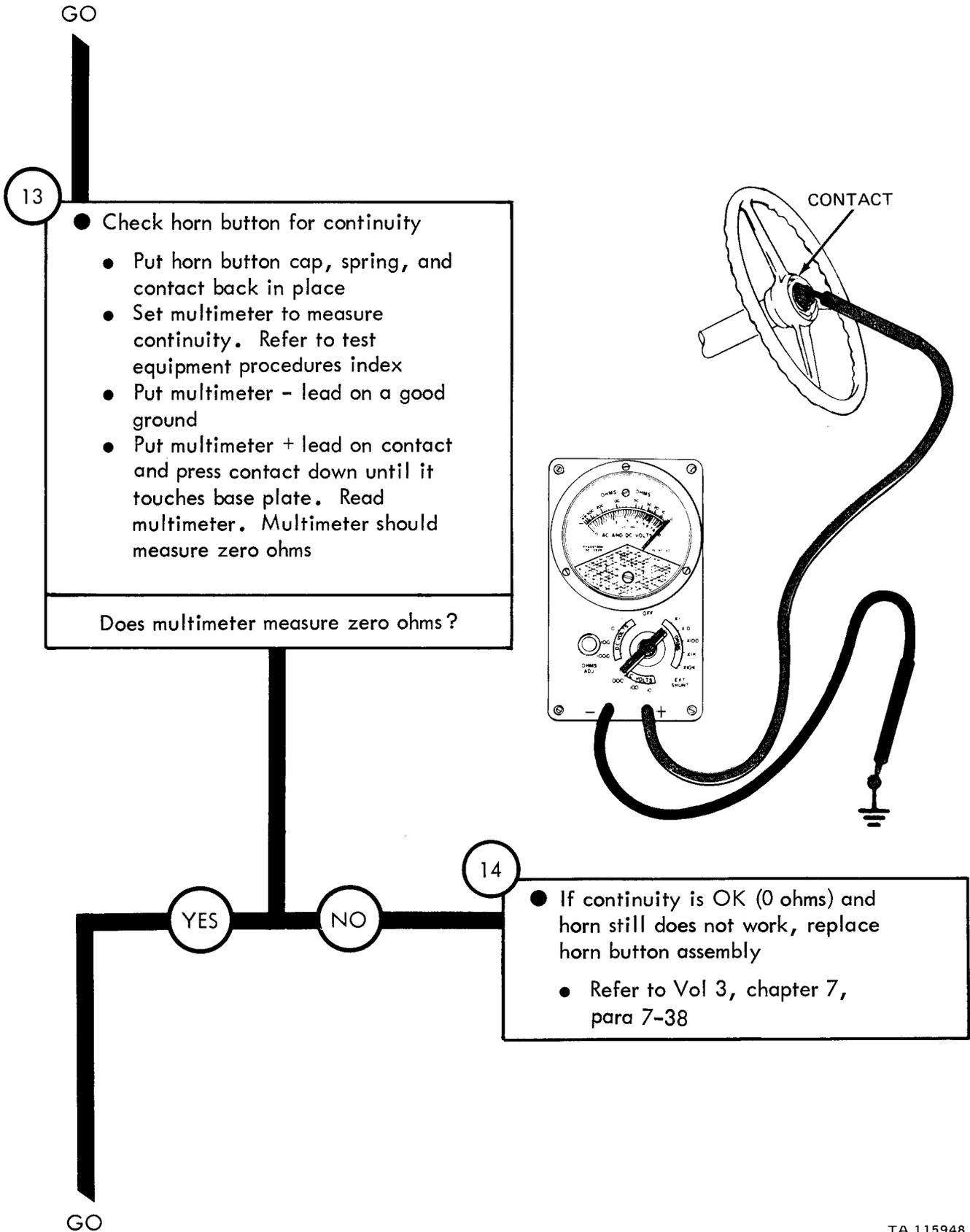
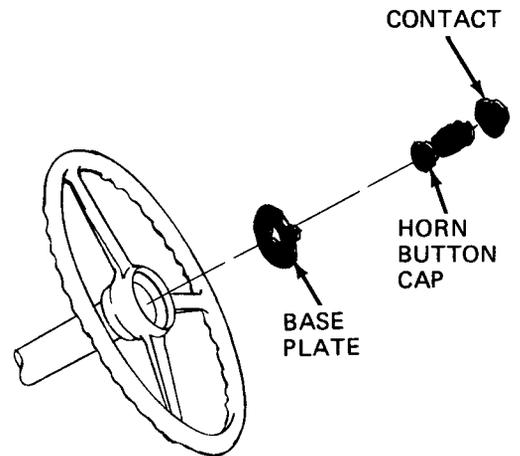


Figure 26-32 (Sheet 8 of 10)

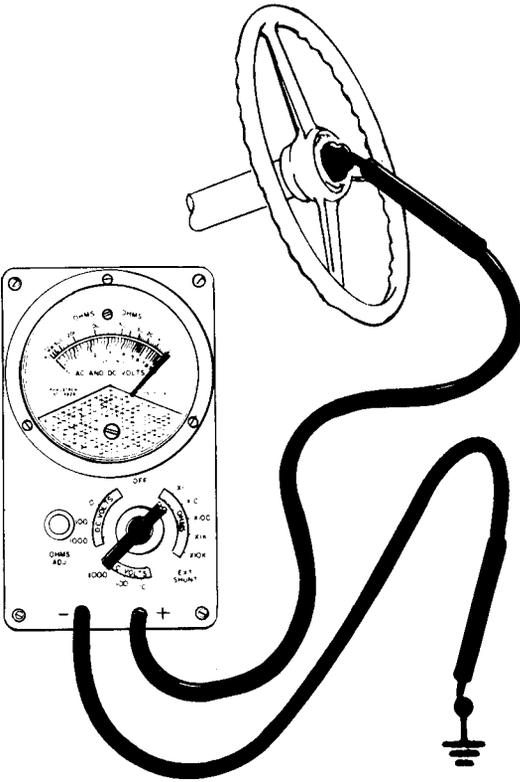
GO

15

- Clean horn button contacts
 - Take off horn button cap, spring, and contact
 - Take off base plate from steering column. Refer to Vol 3, chapter 7, para 7-38
 - Clean steering column where base plate makes contact. Clean both sides of base plate
 - Clean contact and cap



- Put base plate, horn button cap, spring and contact back in place. Refer to Vol 3, chapter 7, para 7-38
- Put multimeter - lead on a good ground
- Put multimeter + lead on contact and press contact down until it touches base plate
- Read multimeter. Multimeter should measure zero ohms



Does multimeter measure zero ohms?

GO

TA 115949

Figure 26-32 (Sheet 9 of 10)

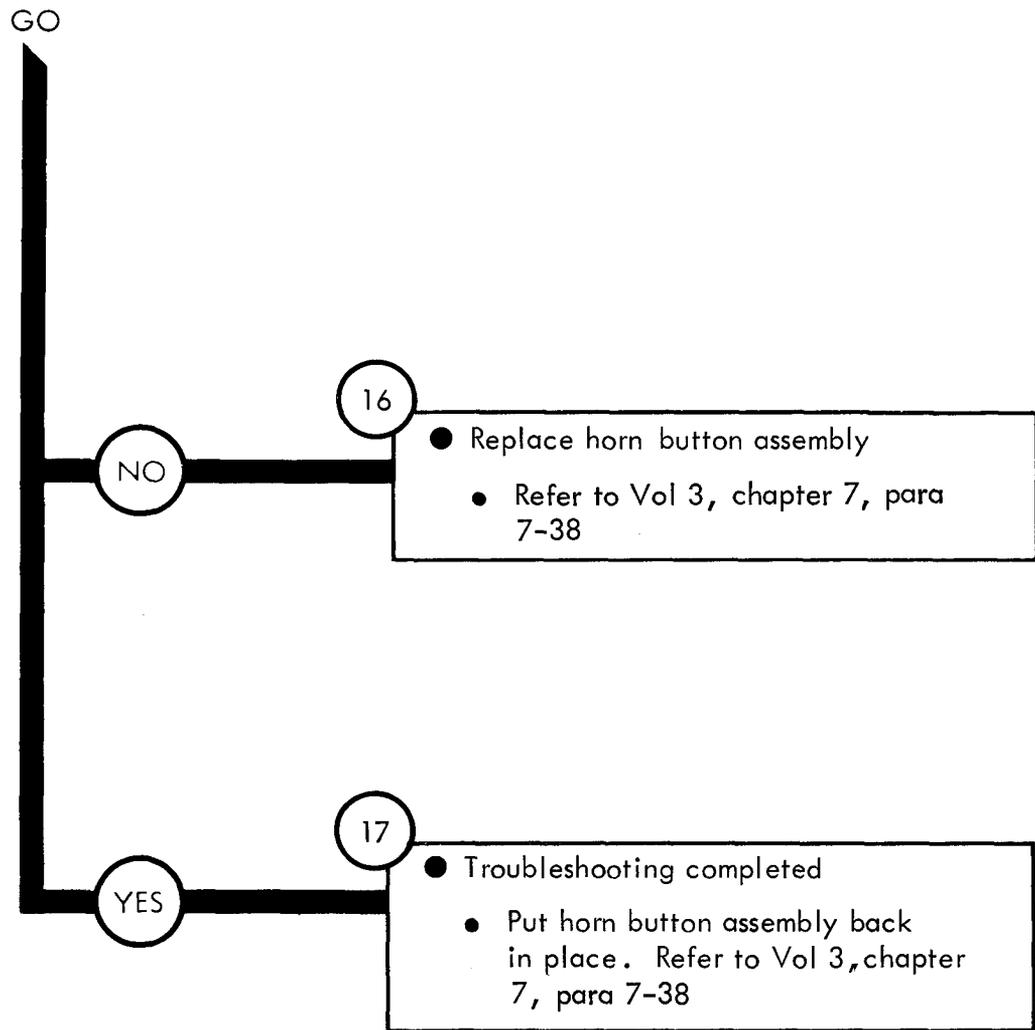


Figure 26-32 (Sheet 10 of 10)

Symptom

33

LOW AIR WARNING BUZZER DOES NOT WORK

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Check for +24 volts DC at input to low air warning buzzer
 - Set BATTERY switch to OFF
 - Take off lead 85 from buzzer
 - Turn air reservoir drain cocks to left and drain air reservoirs to 60 psi
 - Set BATTERY switch to ON

- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put - lead on a good ground
- Put + lead on lead 85 contact
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO

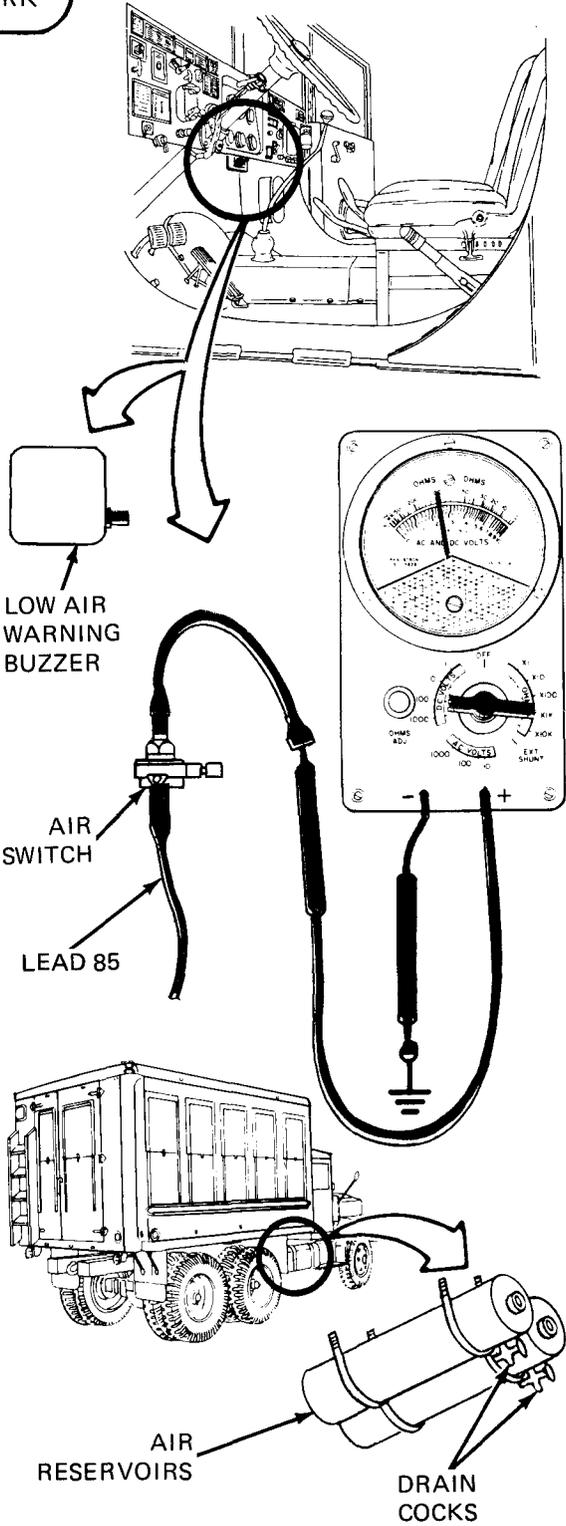


Figure 26-33 (Sheet 1 of 4)

TA 115951

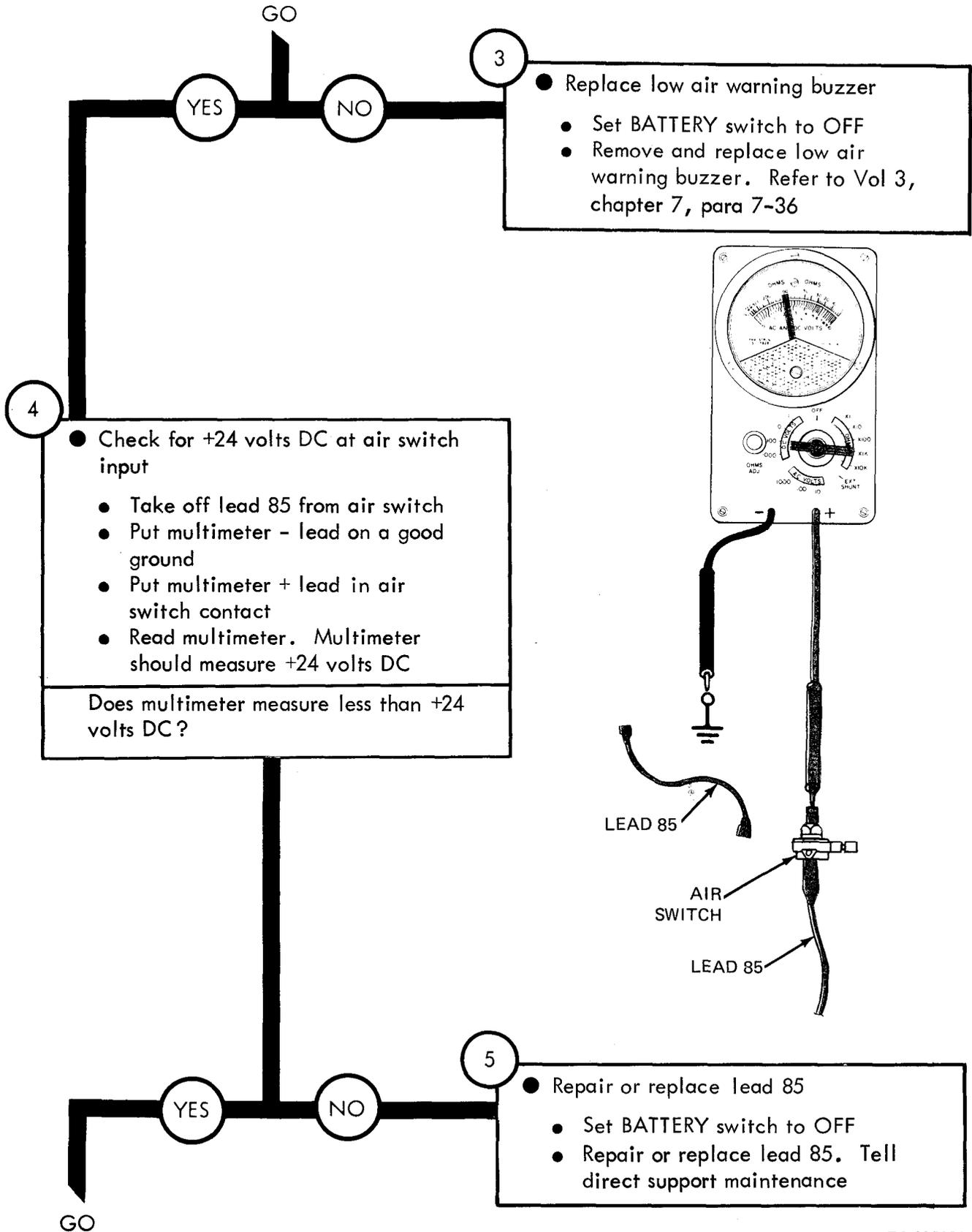


Figure 26-33 (Sheet 2 of 4)

TA 115952

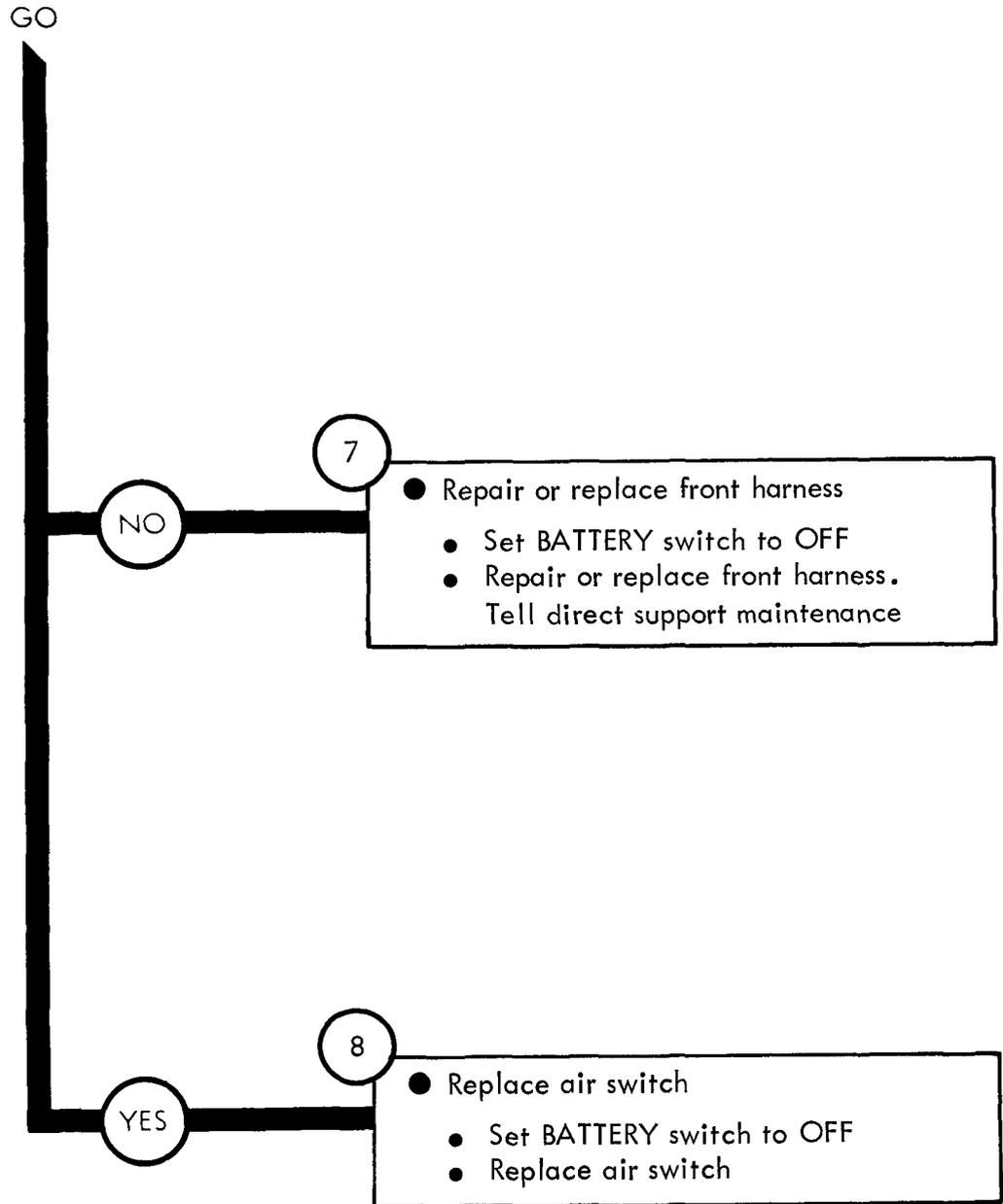


Figure 26-33 (Sheet 4 of 4)

Symptom

34

FUEL PUMP DOES NOT WORK

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

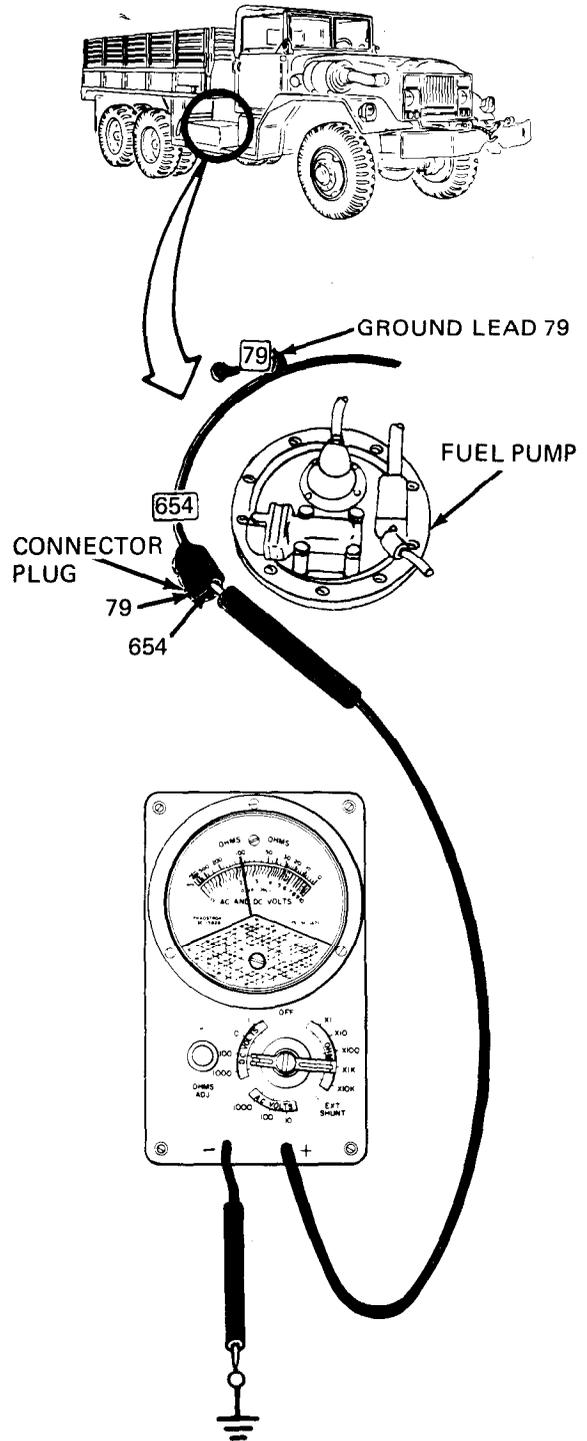
- Park truck
- Refer to TM 9-2320-211-10

2

- Check that +24 volts DC is getting to fuel pump
 - Pull off lead 654 plug from fuel pump fuse holder
 - Set BATTERY switch to ON
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on circuit 654 contact in plug. Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO



TA 115955

Figure 26-34 (Sheet 1 of 5)

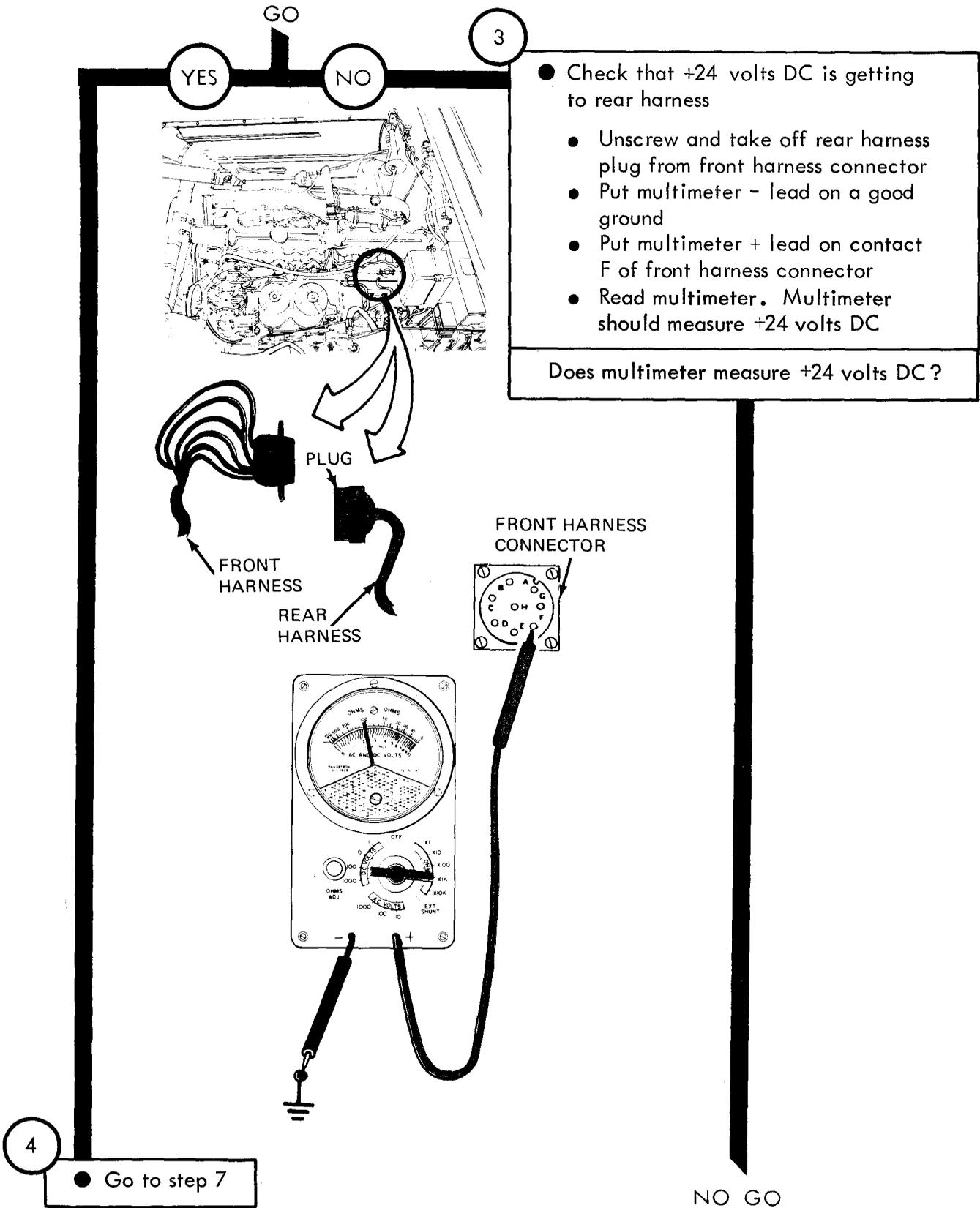


Figure 26-34 (Sheet 2 of 5)

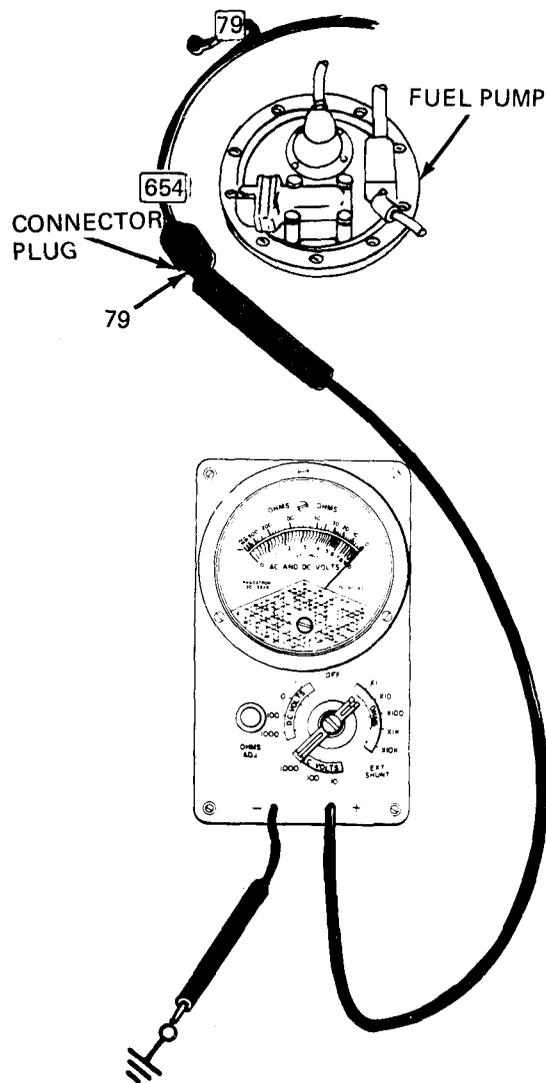
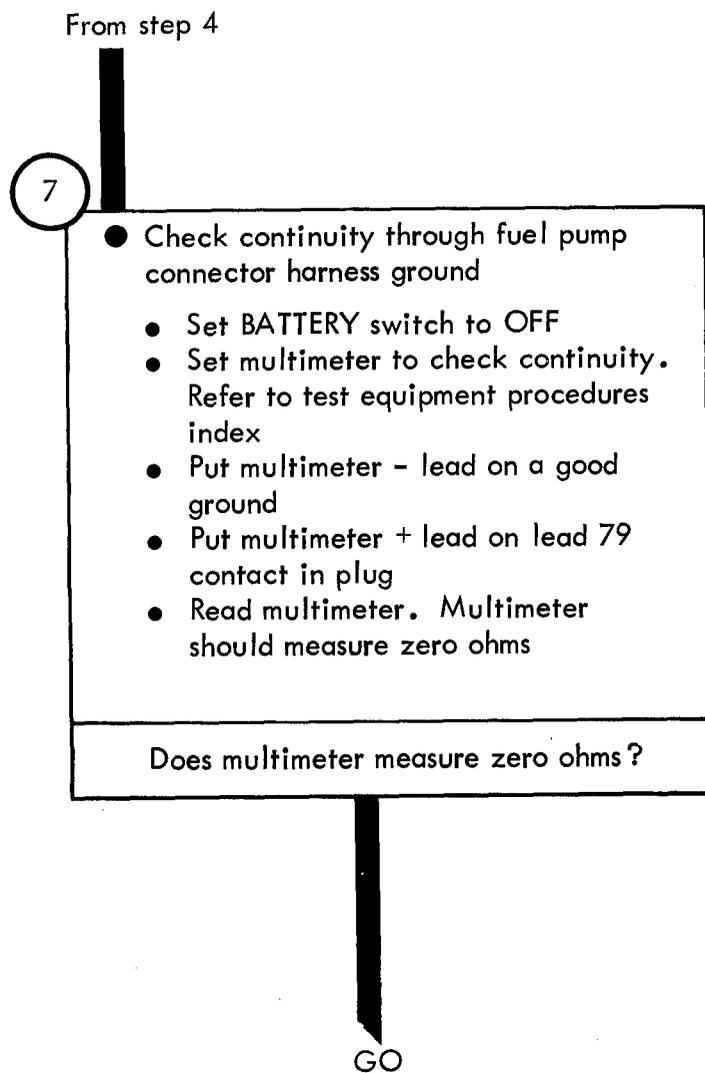
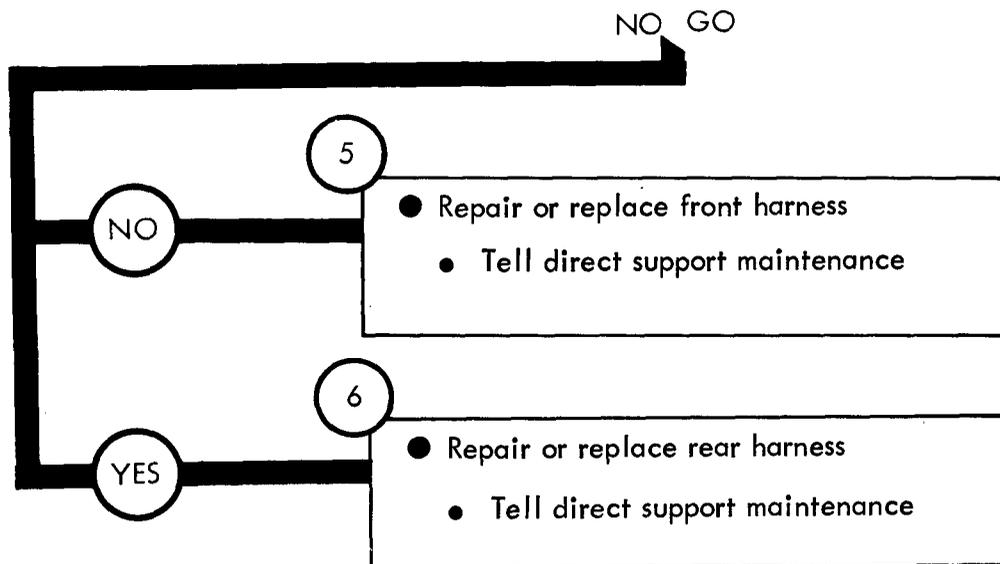


Figure 26-34 (Sheet 3 of 5)

TA 115957

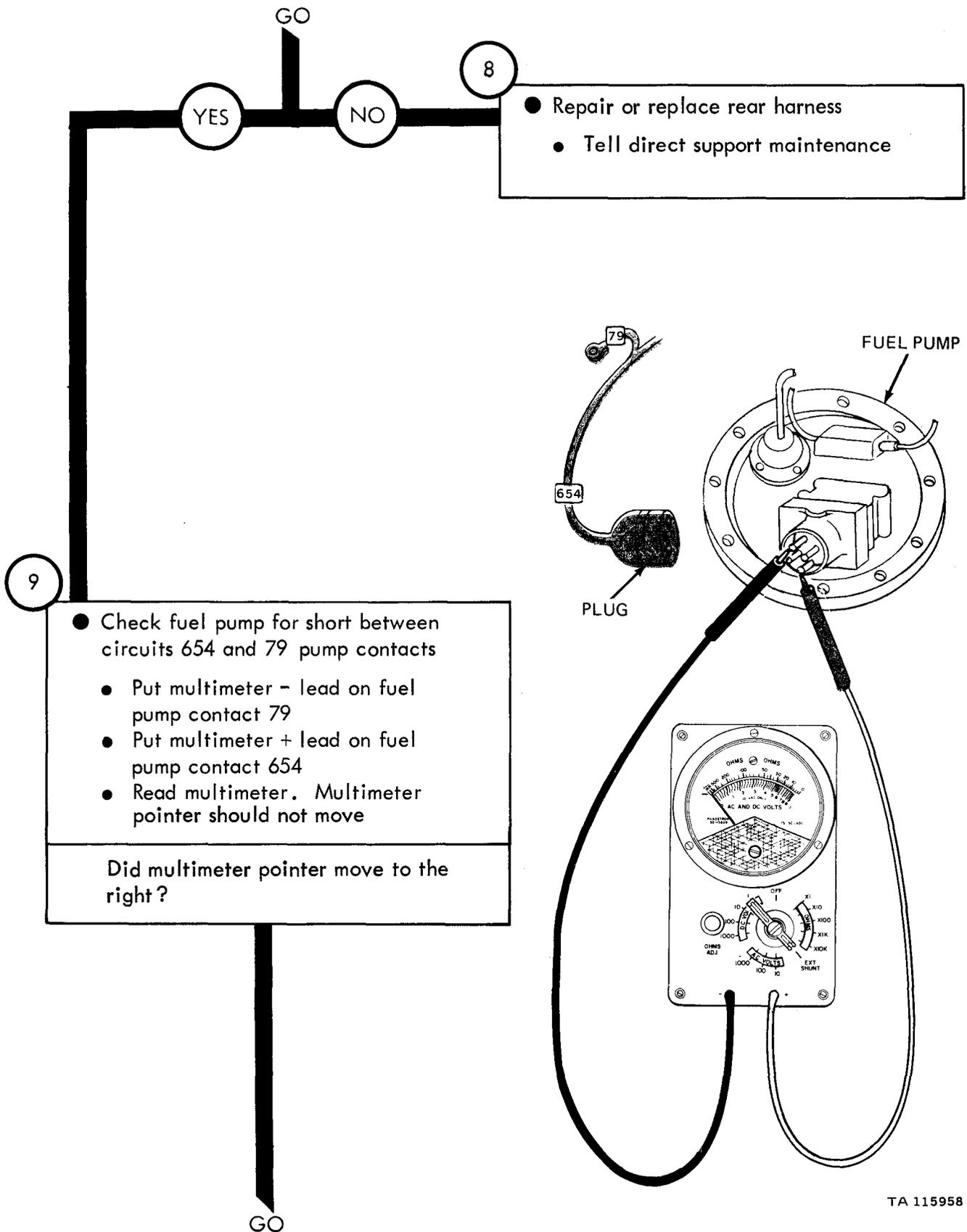


Figure 26-34 (Sheet 4 of 5)

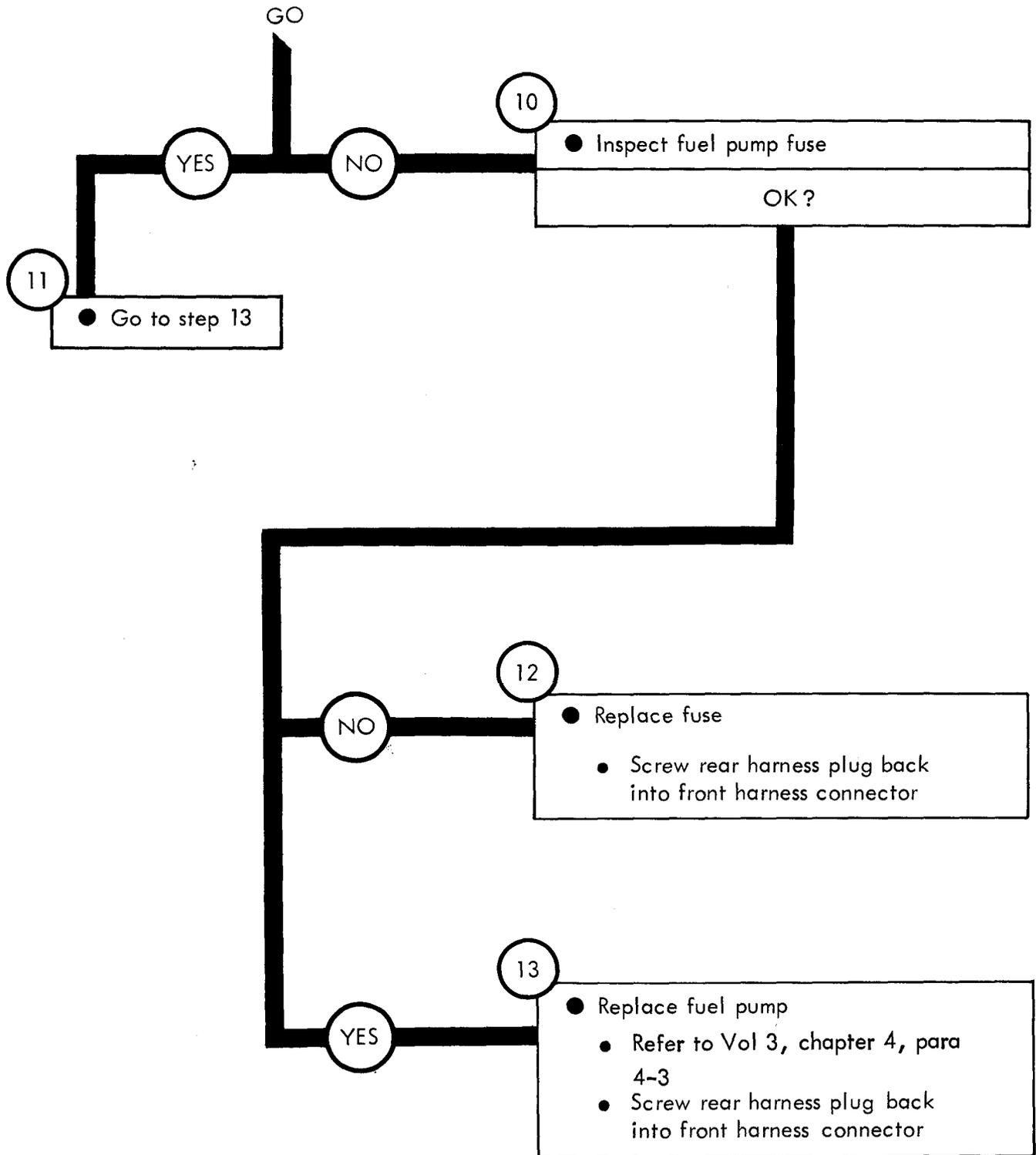


Figure 26-34 (Sheet 5 of 5)

Symptom

35

ENGINE MANIFOLD HEATER DOES NOT WORK

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

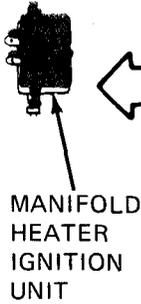
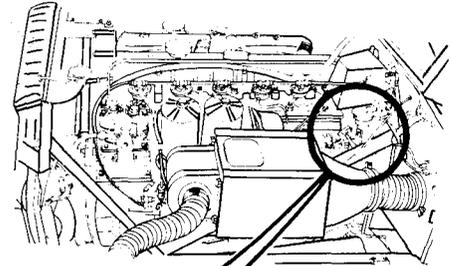
2

- Check engine manifold heater ignition circuit for +24 volts DC
 - Take off lead 55 at manifold heater ignition unit
 - Set MANIFOLD HEATER switch to ON
 - Set BATTERY switch to ON

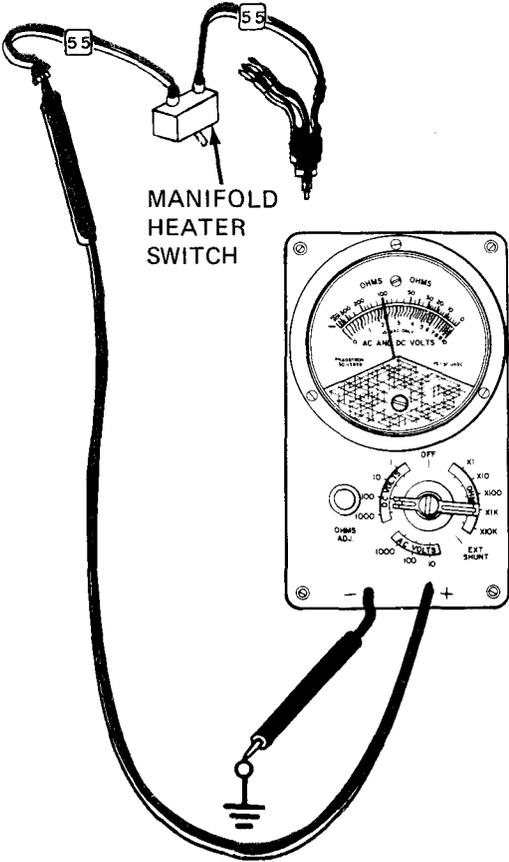
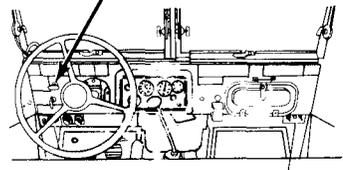
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on lead 55 contact
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO



BATTERY SWITCH



TA 115960

Figure 26-35 (Sheet 1 of 6)

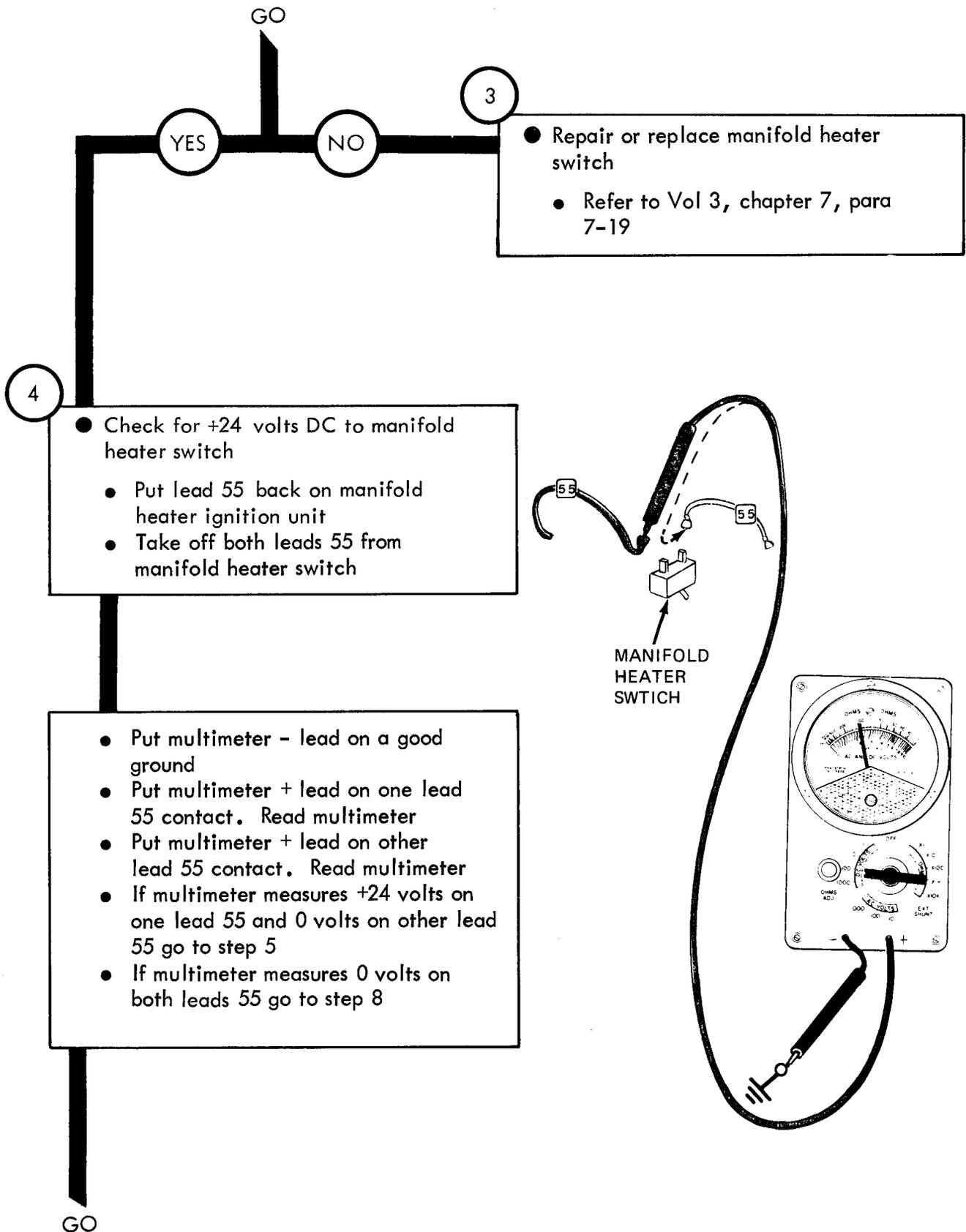


Figure 26-35 (Sheet 2 of 6)

TA 115961

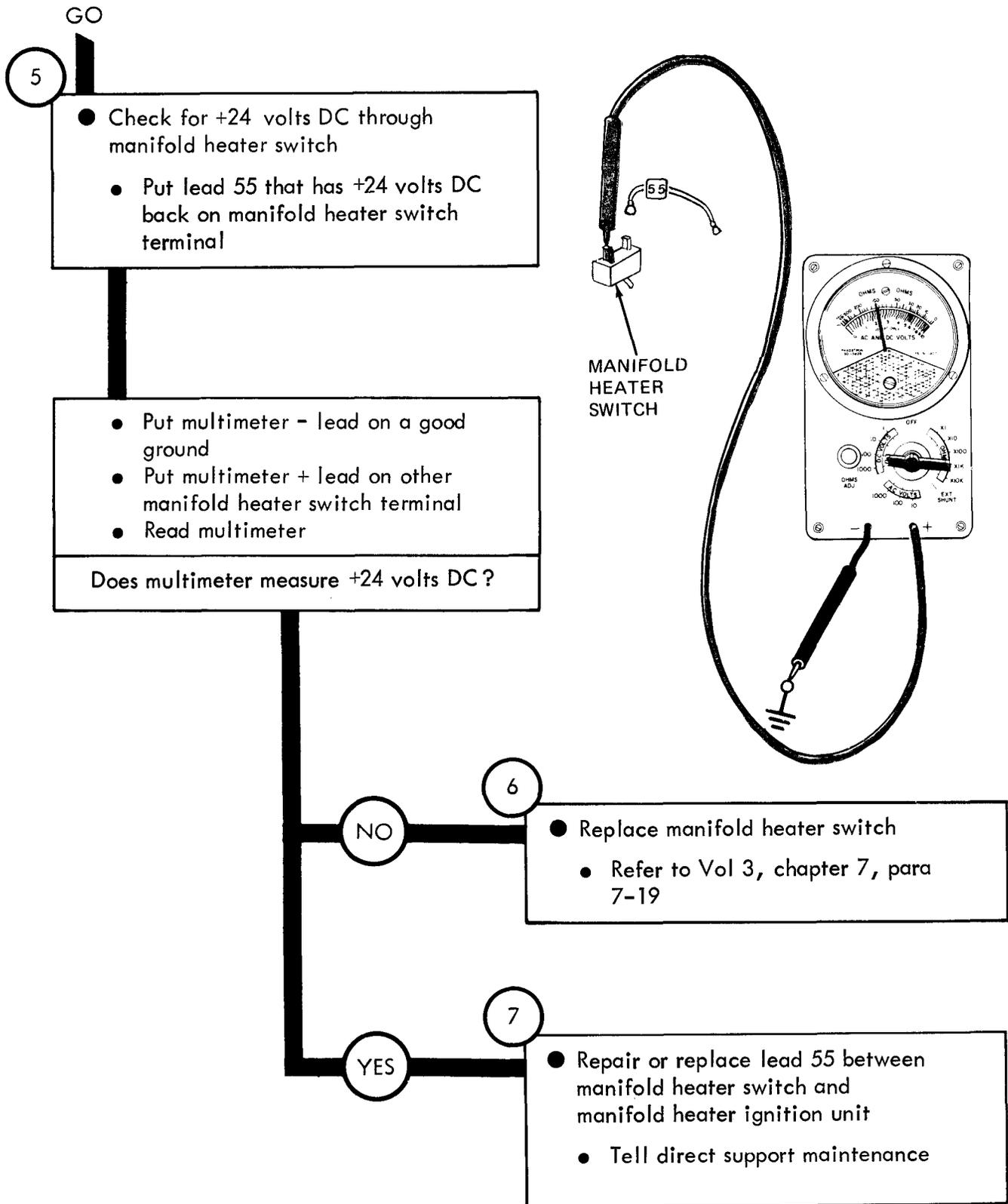


Figure 26-35 (Sheet 3 of 6)

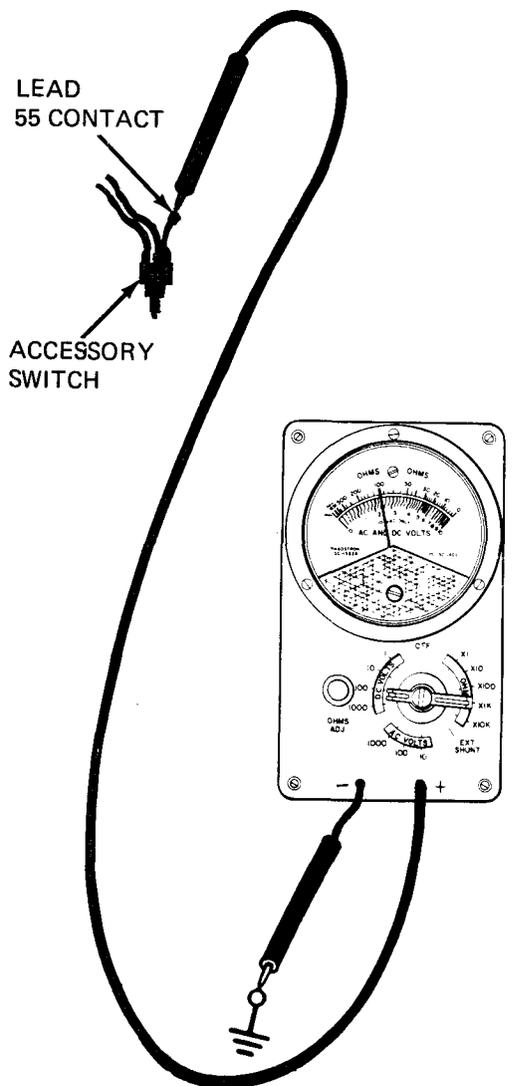
From step 4

8

- Check ACCESSORY switch for +24 volts DC
 - Take off BATTERY switch from instrument panel. Refer to Vol 3, chapter 7, para 7-9
 - Take off lead 55 from BATTERY switch
 - Put lever back on ACCESSORY switch

- Put multimeter - lead on a good ground
- Put multimeter + lead on one lead 11 contact. Read multimeter
- Put multimeter + lead on other lead 11 contact. Read multimeter

Does multimeter measure +24 volts DC on both lead 11 contacts?



YES

NO

9

- Repair or replace front harness
 - Tell direct support maintenance

GO

Figure 26-35 (Sheet 4 of 6)

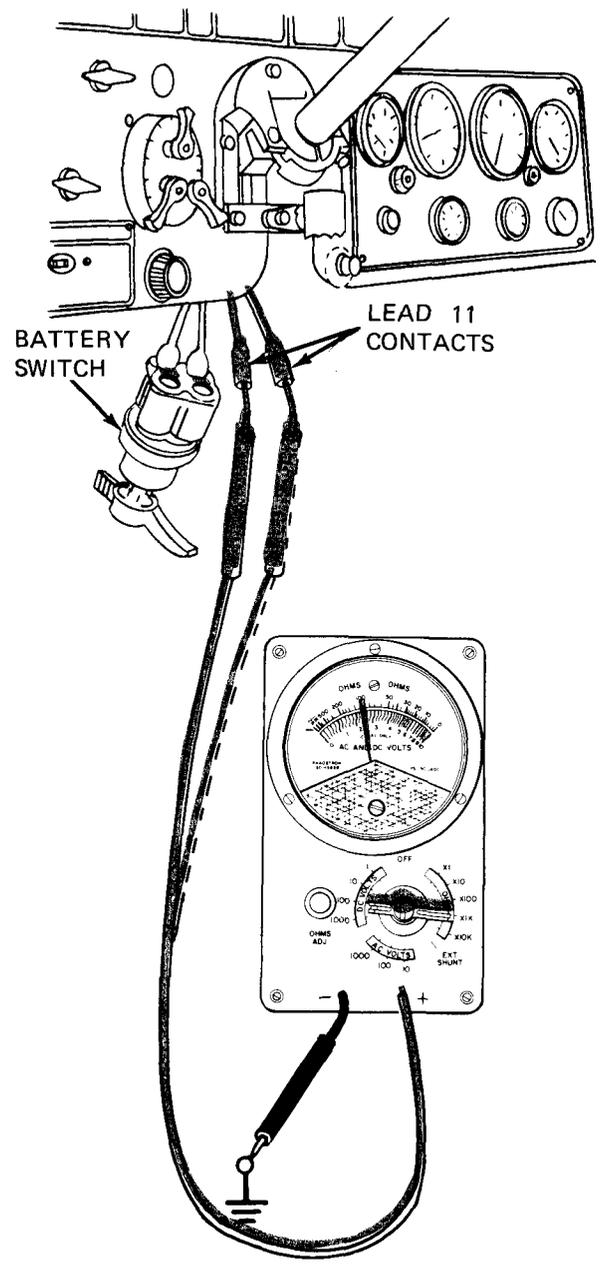
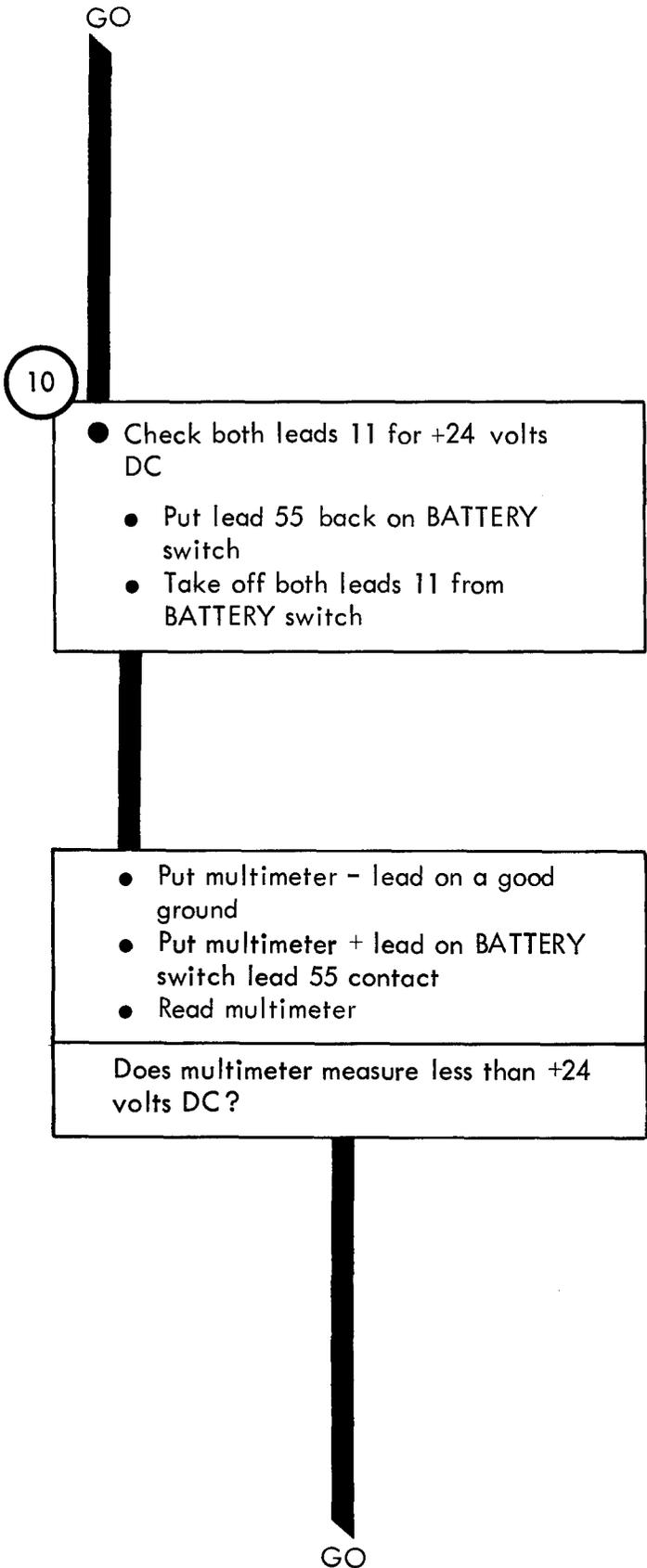


Figure 26-35 (Sheet 5 of 6)

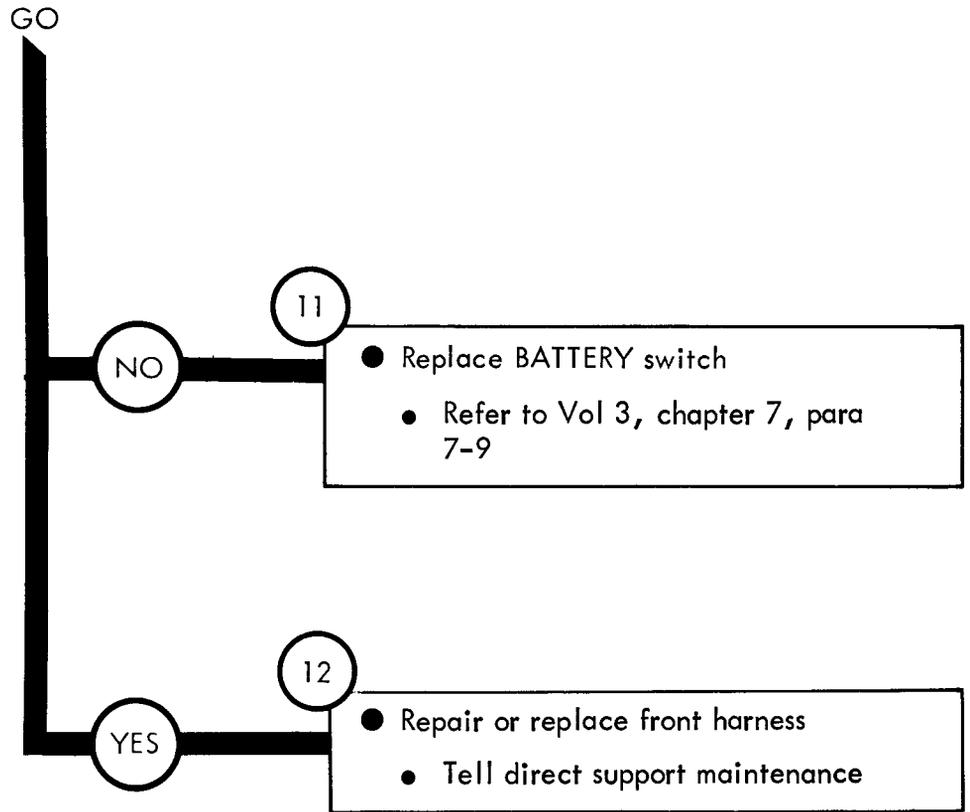


Figure 26-35 (Sheet 6 of 6)

Symptom

36

HOT WATER PERSONNEL HEATER DEFROSTER
OPERATES IN "HI" POSITION ONLY

NOTE

When measuring voltage, +24 volts DC
means a range of +23 to +26 volts DC

1

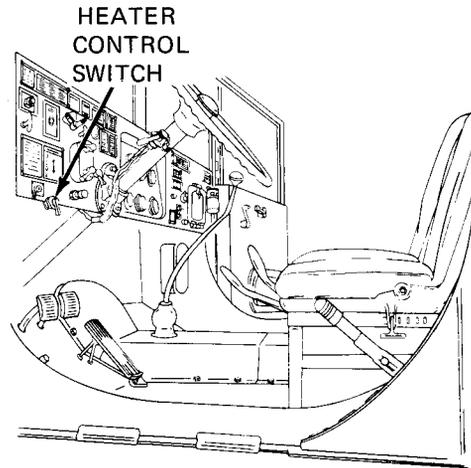
- Park Truck
- Refer to TM 9-2320-211-10

GO

Figure 26-36 (Sheet 1 of 14)

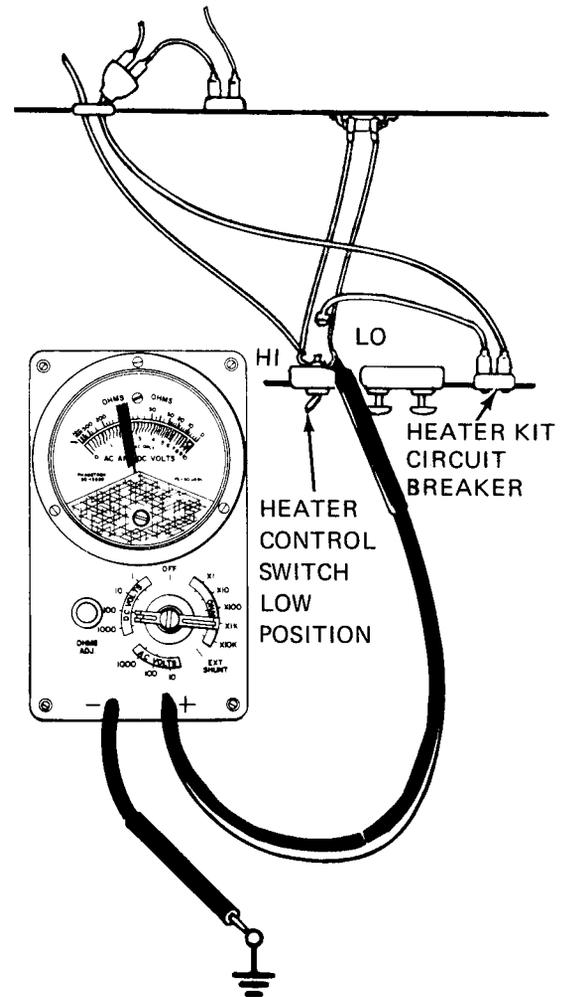
TA 115966

GO



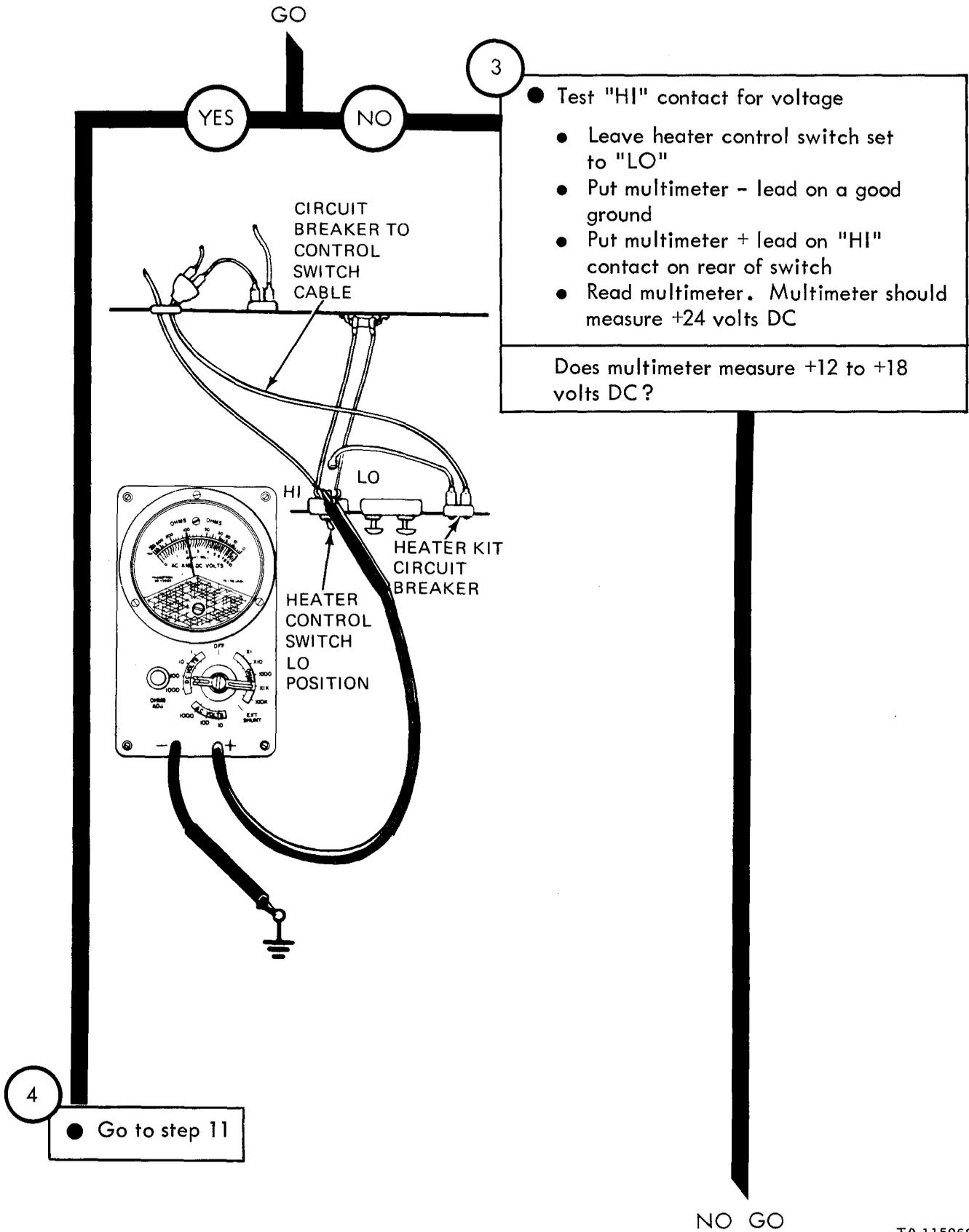
2

- Test heater blower system
 - Set heater switch in "LO" position
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on "LO" contact on rear of switch
 - Read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure less than +24 volts DC?



GO

Figure 26-36 (Sheet 2 of 14)



- Test "HI" contact for voltage
 - Leave heater control switch set to "LO"
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on "HI" contact on rear of switch
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +12 to +18 volts DC?

● Go to step 11

NO GO

Figure 26-36 (Sheet 3 of 14)

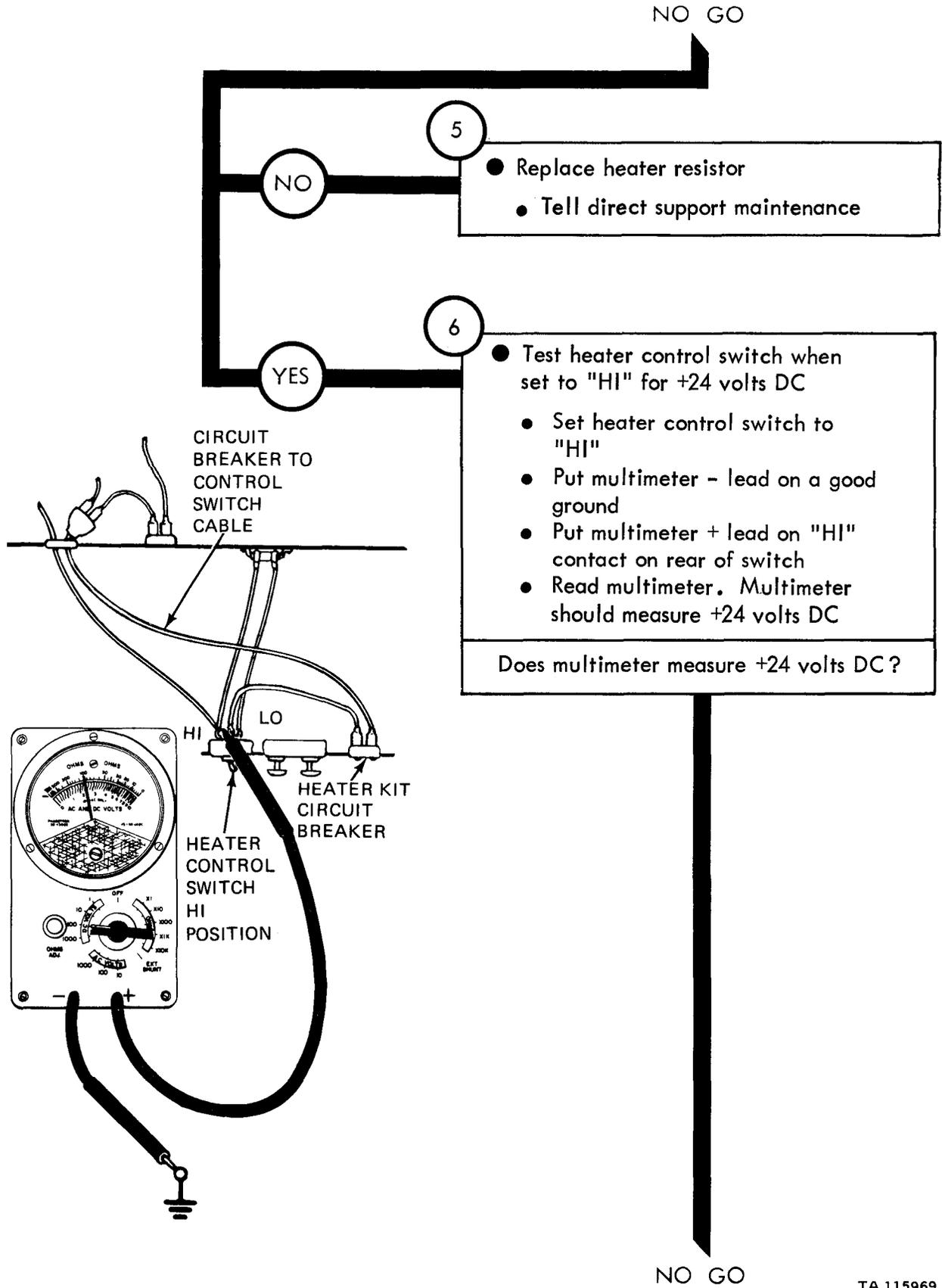


Figure 26-36 (Sheet 4 of 14)

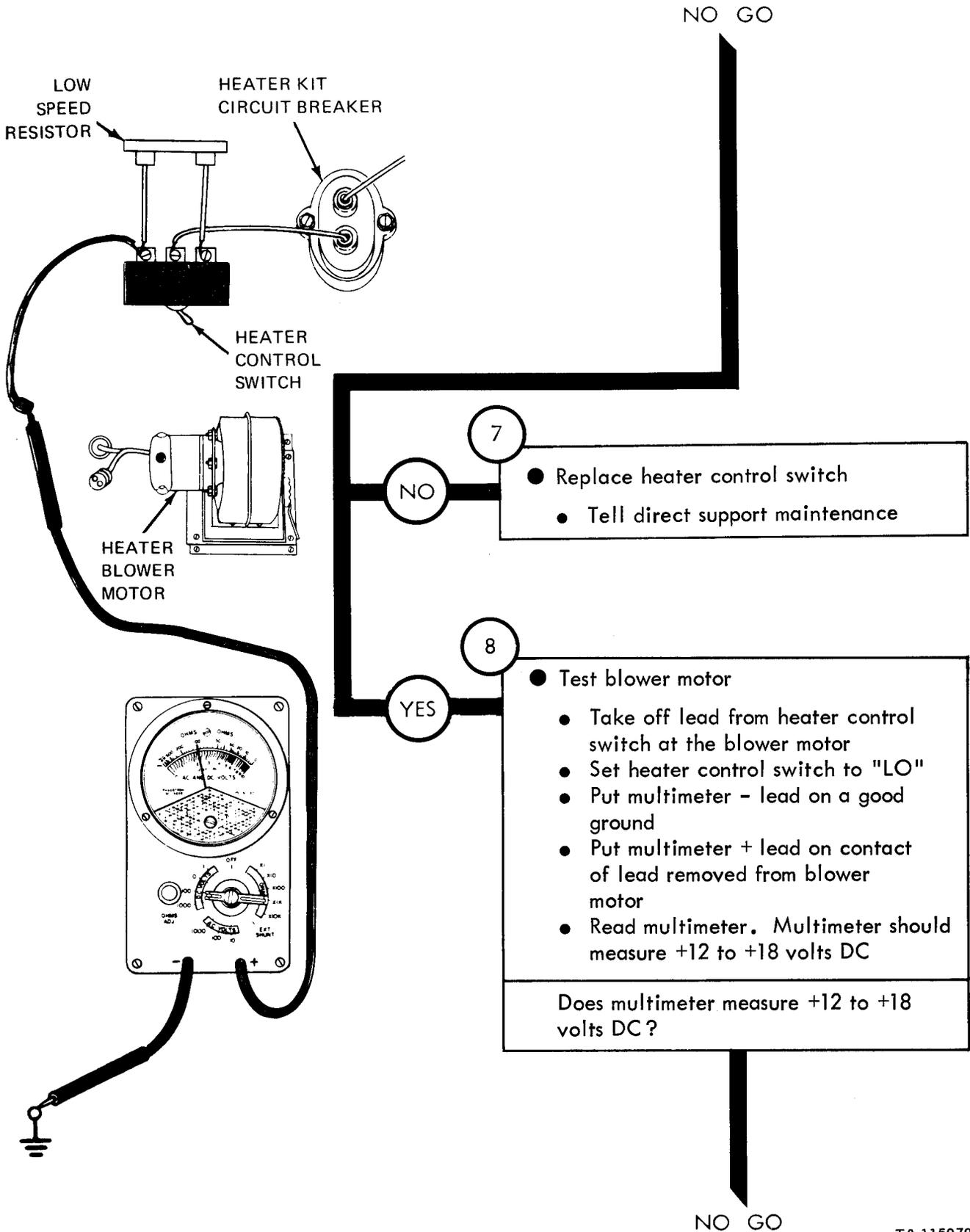


Figure 26-36 (Sheet 5 of 14)

TA 115970

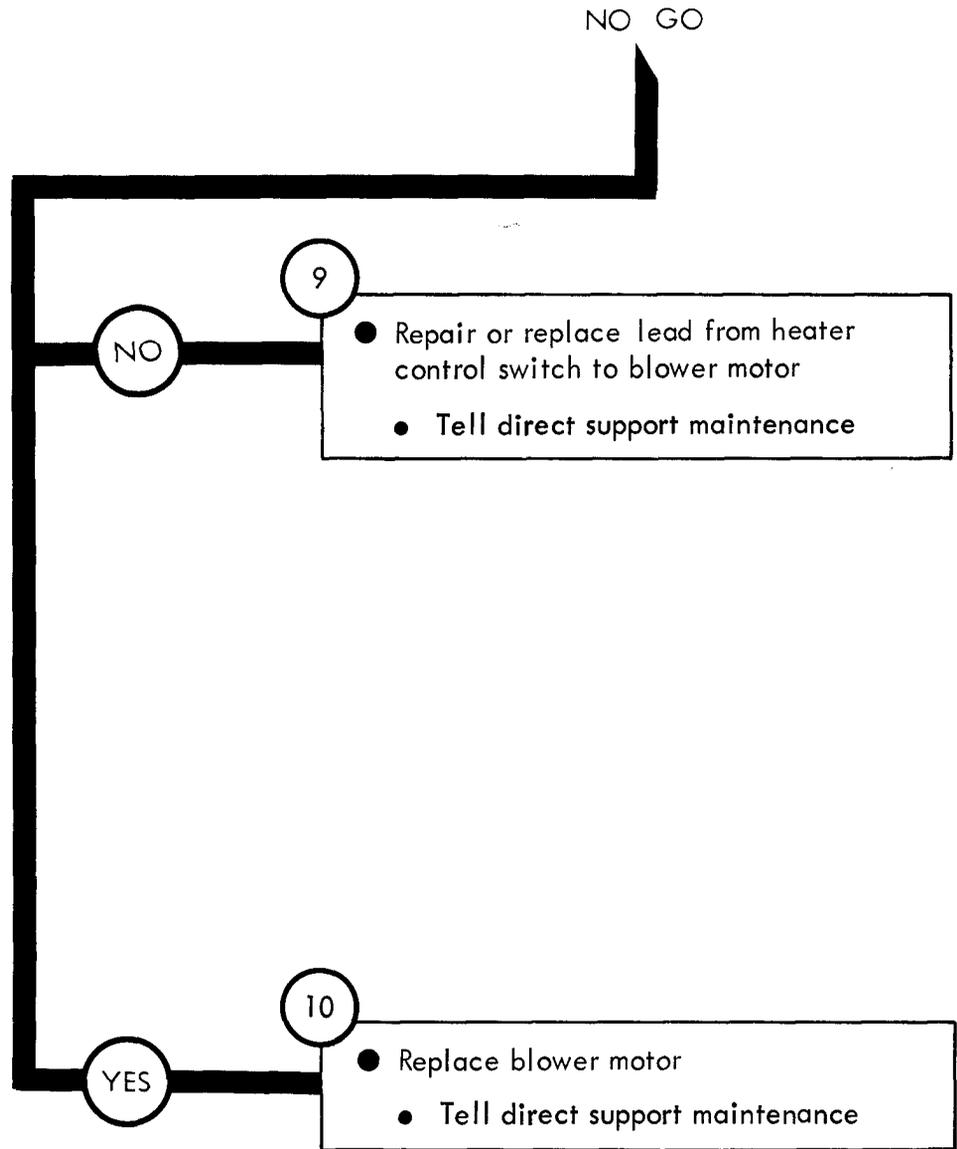


Figure 26-36 (Sheet 6 of 14)

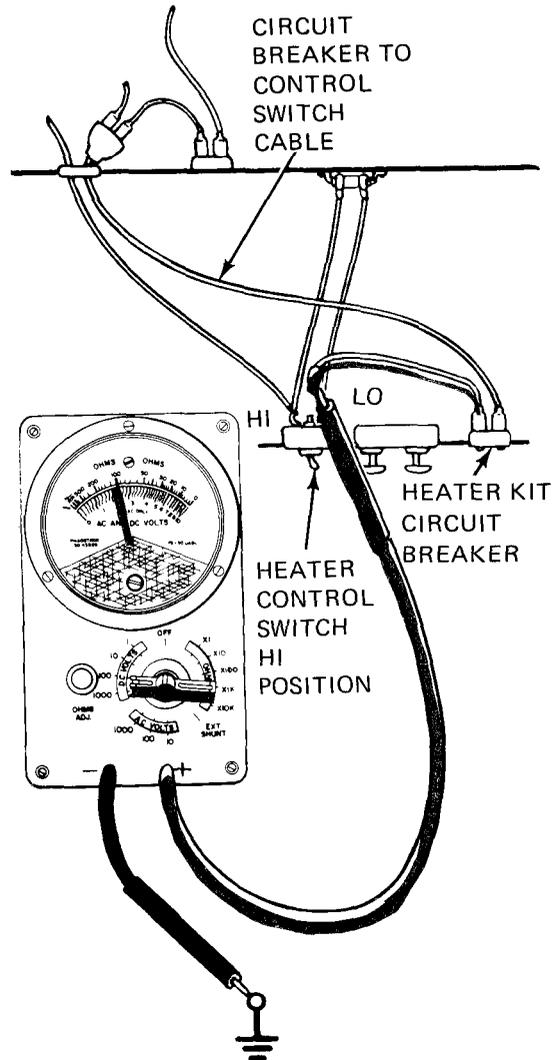
TA 115971

From step 4

11

- Check for voltage from batteries to heater control switch
- Take off circuit breaker to control switch cable from center contact of heater control switch
- Put multimeter - lead on a good ground
- Put multimeter + lead in contact of cable
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



GO

Figure 26-36 (Sheet 7 of 14)

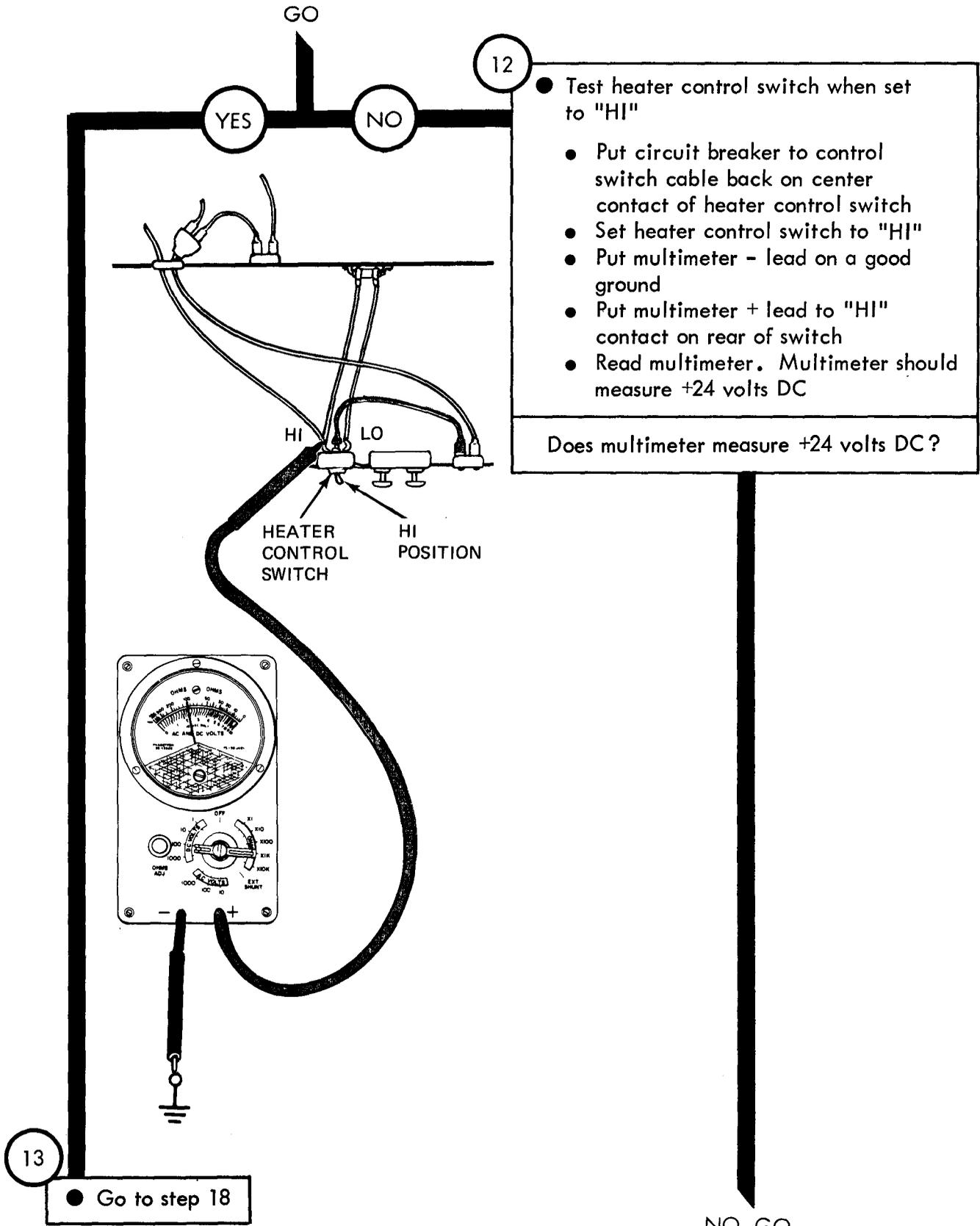


Figure 26-36 (Sheet 8 of 14)

TA 115973

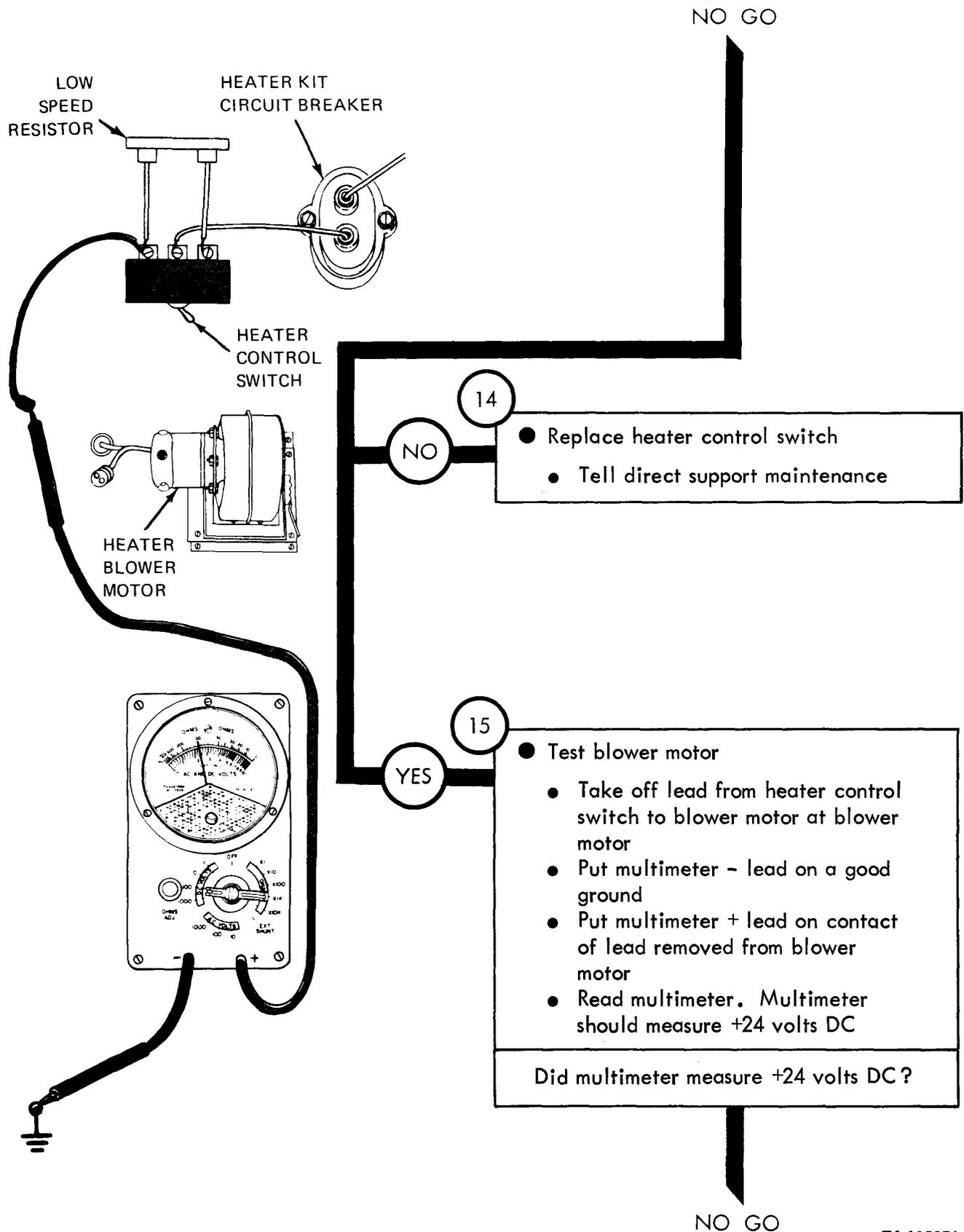


Figure 26-36 (Sheet 9 of 14)

TA 115974

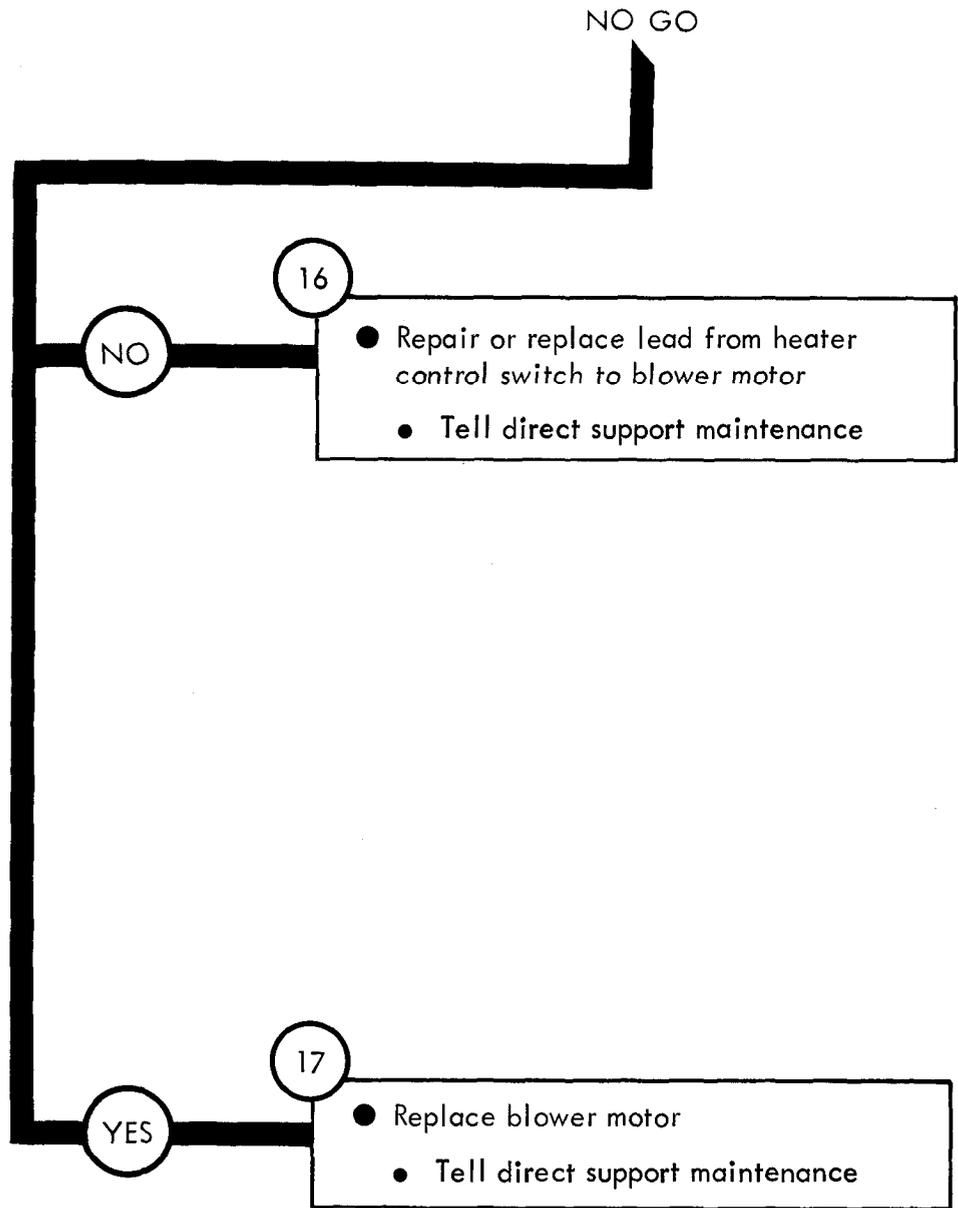


Figure 26-36 (Sheet 10 of 14)

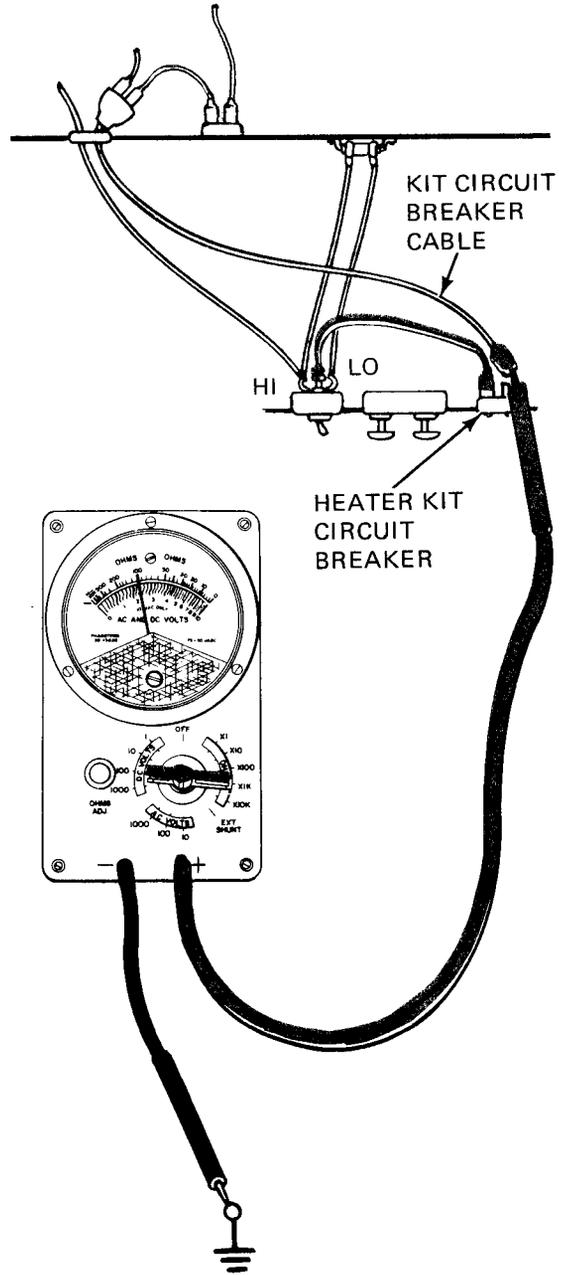
TA 115975

From step 13

18

- Check for +24 volts DC to heater kit circuit breaker
 - Put circuit breaker to control switch cable back on center terminal of heater control switch
 - Take off lead from "Y" connector to heater kit circuit breaker at heater kit circuit breaker
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on contact of lead to circuit breaker
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

19

- Replace heater kit circuit breaker
- Tell direct support maintenance

GO

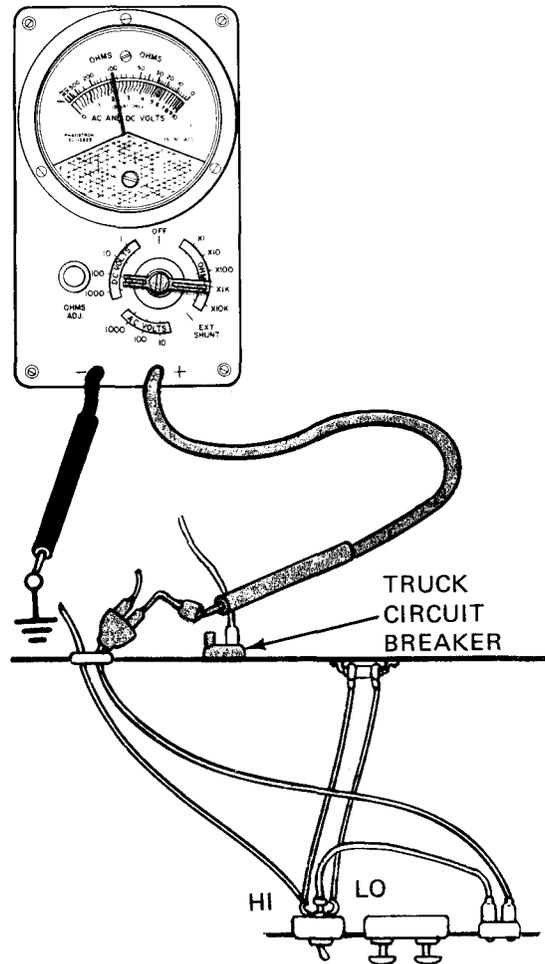
Figure 26-36 (Sheet 11 of 14)

GO

22

- Check lead from truck circuit breaker to "Y" connector
- Put "Y" connector lead back on contact of heater kit circuit breaker
- Take off truck circuit breaker to "Y" connector lead at truck circuit breaker
- Put multimeter - lead on a good ground
- Put multimeter + lead on contact of truck circuit breaker
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

23

- Repair or replace lead from truck circuit breaker to "Y" connector
- Tell direct support maintenance

GO

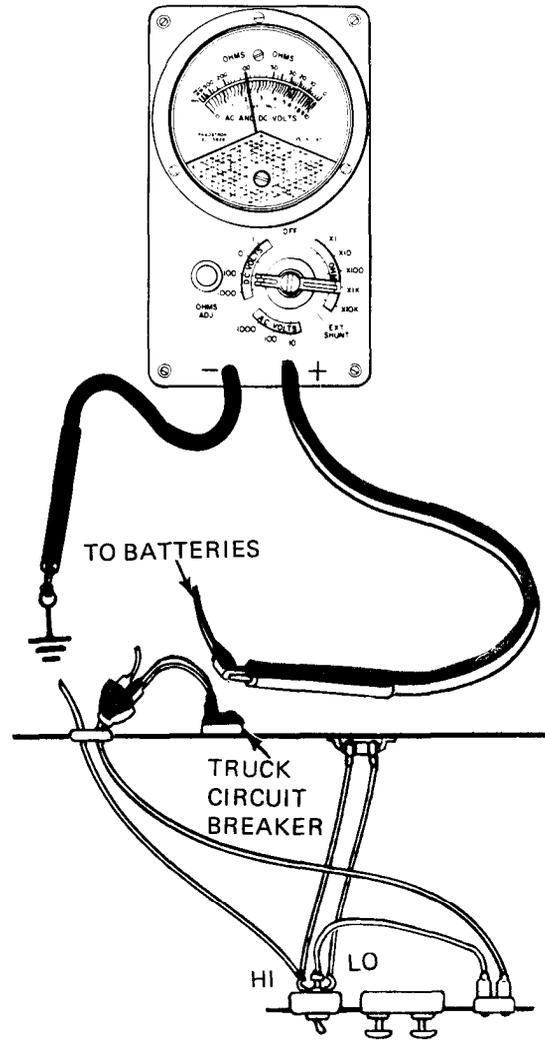
Figure 26-36 (Sheet 13 of 14)

GO

24

- Check lead from front harness to circuit breaker
- Put lead from truck circuit breaker to "Y" connector back on truck circuit breaker and "Y" connector
- Take off front harness lead from other terminal of truck circuit breaker
- Put multimeter - lead on a good ground
- Put multimeter + lead on front harness lead contact
- Read multimeter. Multimeter should measure +24 volts DC

Did multimeter measure +24 volts DC?



NO

25

- Repair or replace front harness from batteries to vehicle circuit breaker
- Tell direct support maintenance

YES

26

- Replace truck circuit breaker
- Tell direct support maintenance

Figure 26-36 (Sheet 14 of 14)

Symptom

37 HOT WATER PERSONNEL HEATER DEFROSTER OPERATES IN "LO" POSITION ONLY

NOTE
When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

2

- Check for +24 volts to heater switch
 - Set heater switch to "HI"
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on "HI" contact on rear of heater switch
 - Read multimeter. Multimeter should measure +24 volts DC

Did multimeter measure +24 volts DC?

GO

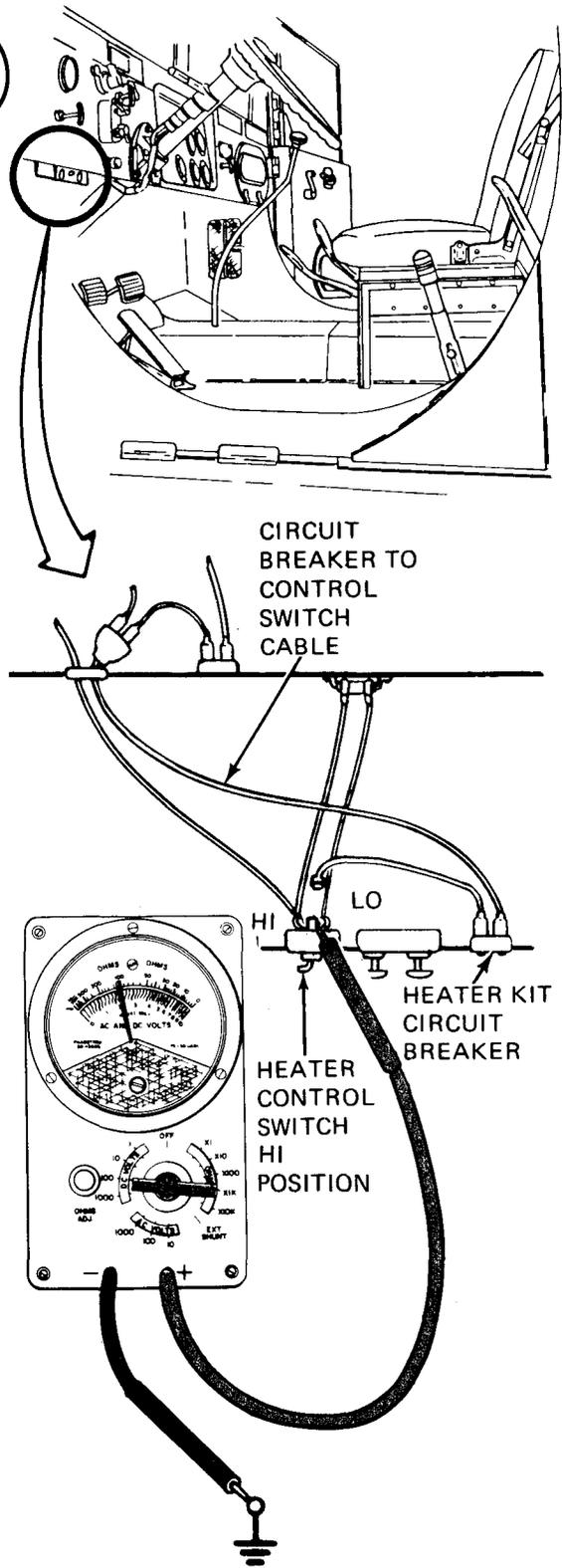


Figure 26-37 (Sheet 1 of 10)

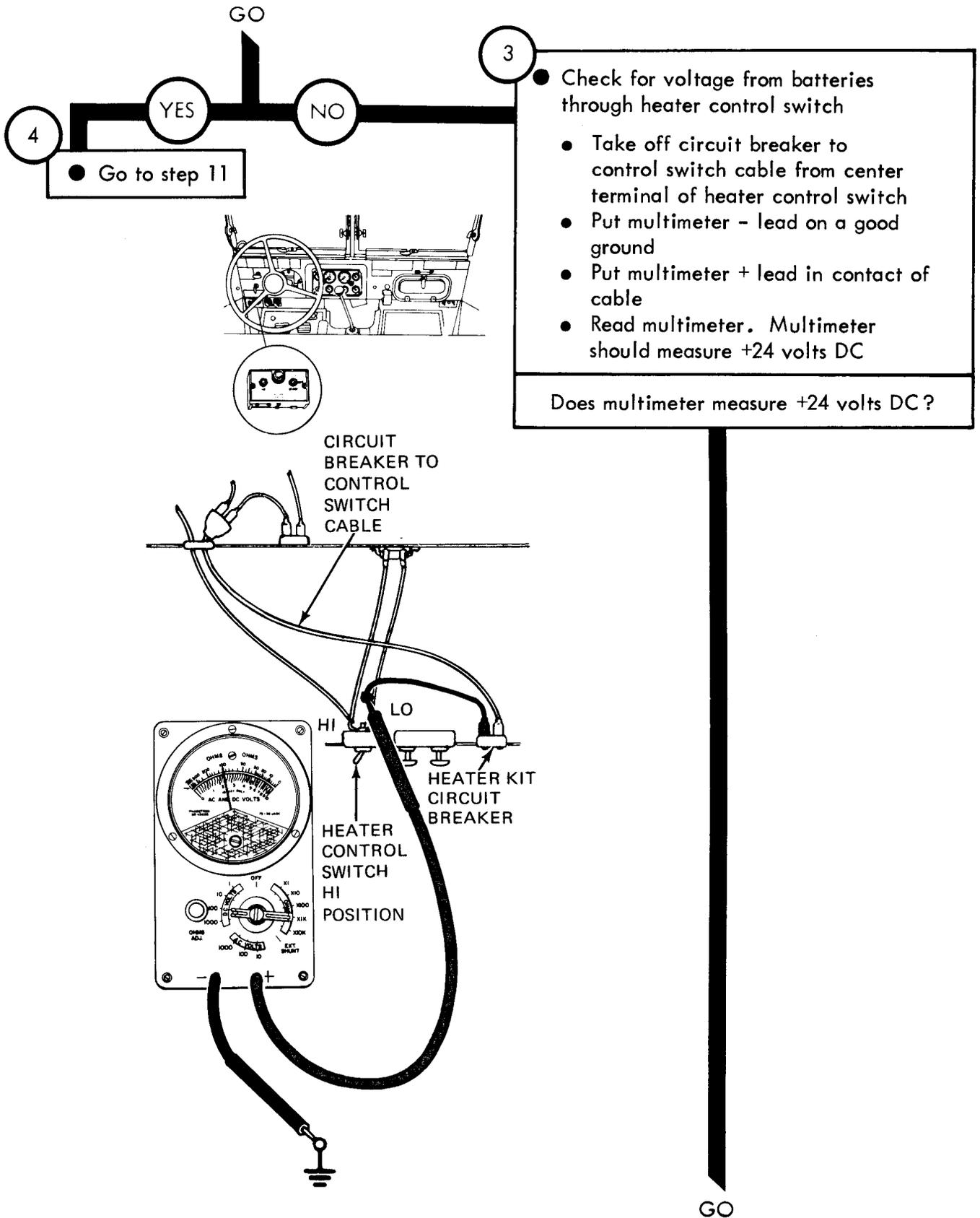


Figure 26-37 (Sheet 2 of 10)

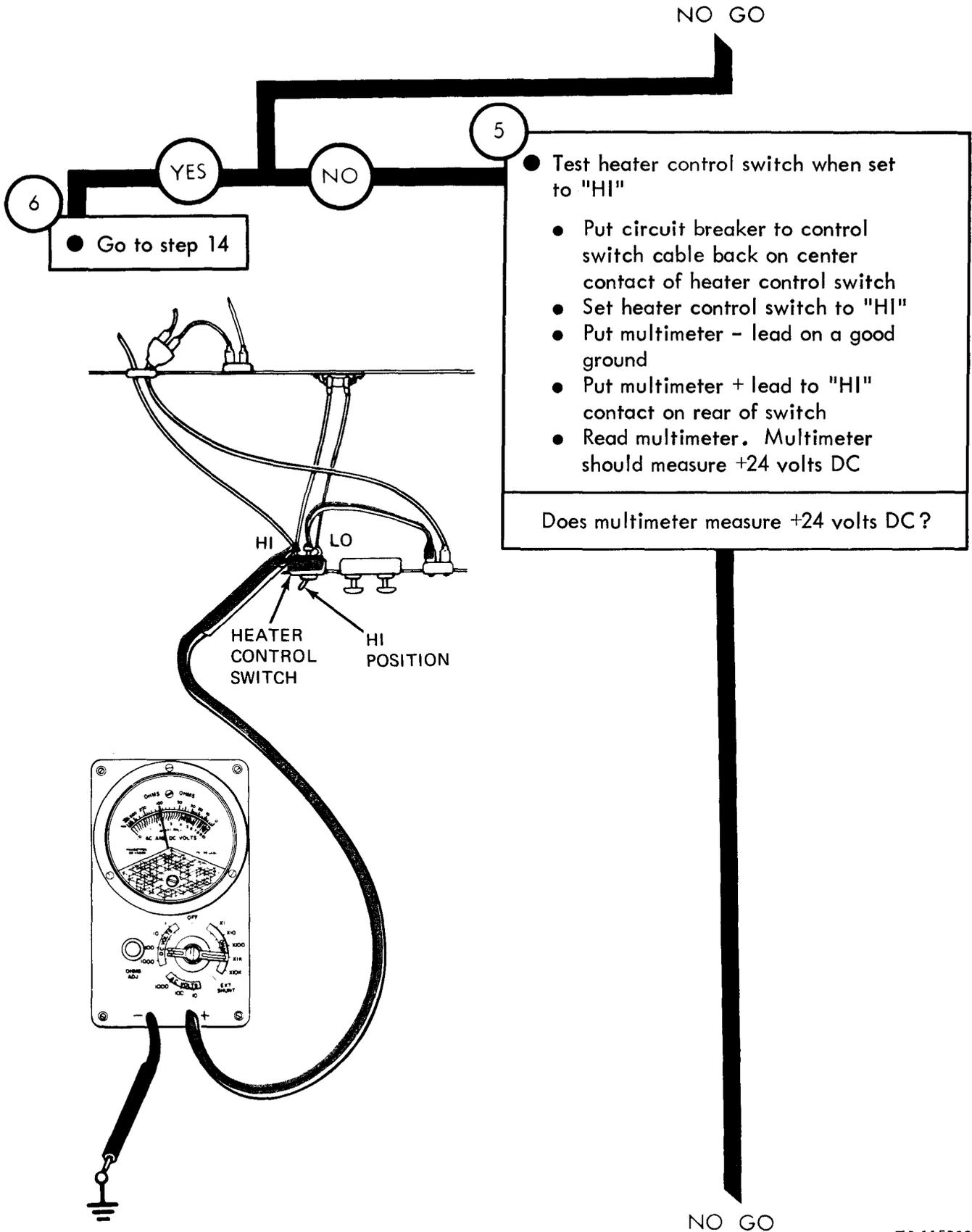


Figure 26-37 (Sheet 3 of 10)

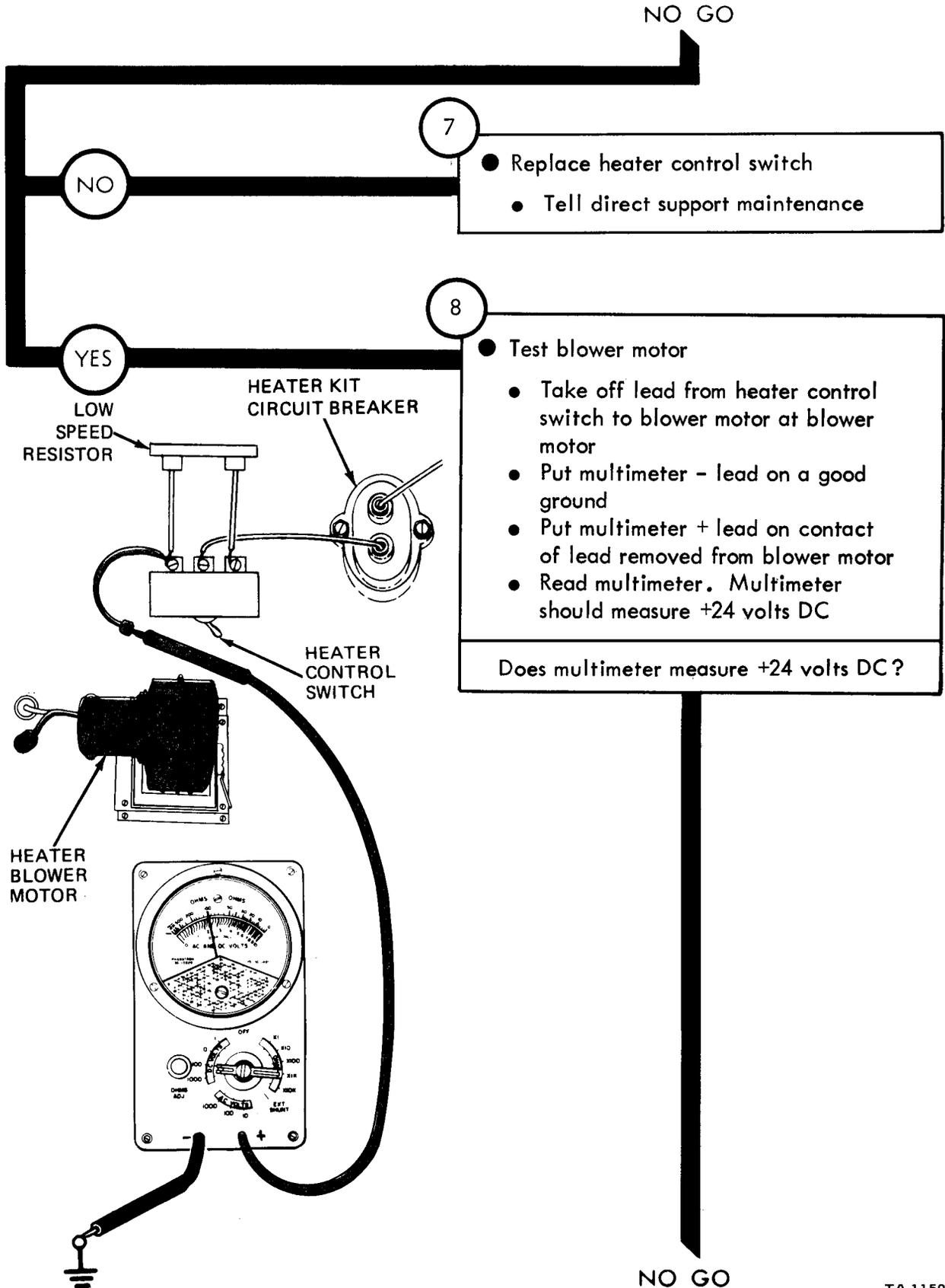


Figure 26-37 (Sheet 4 of 10)

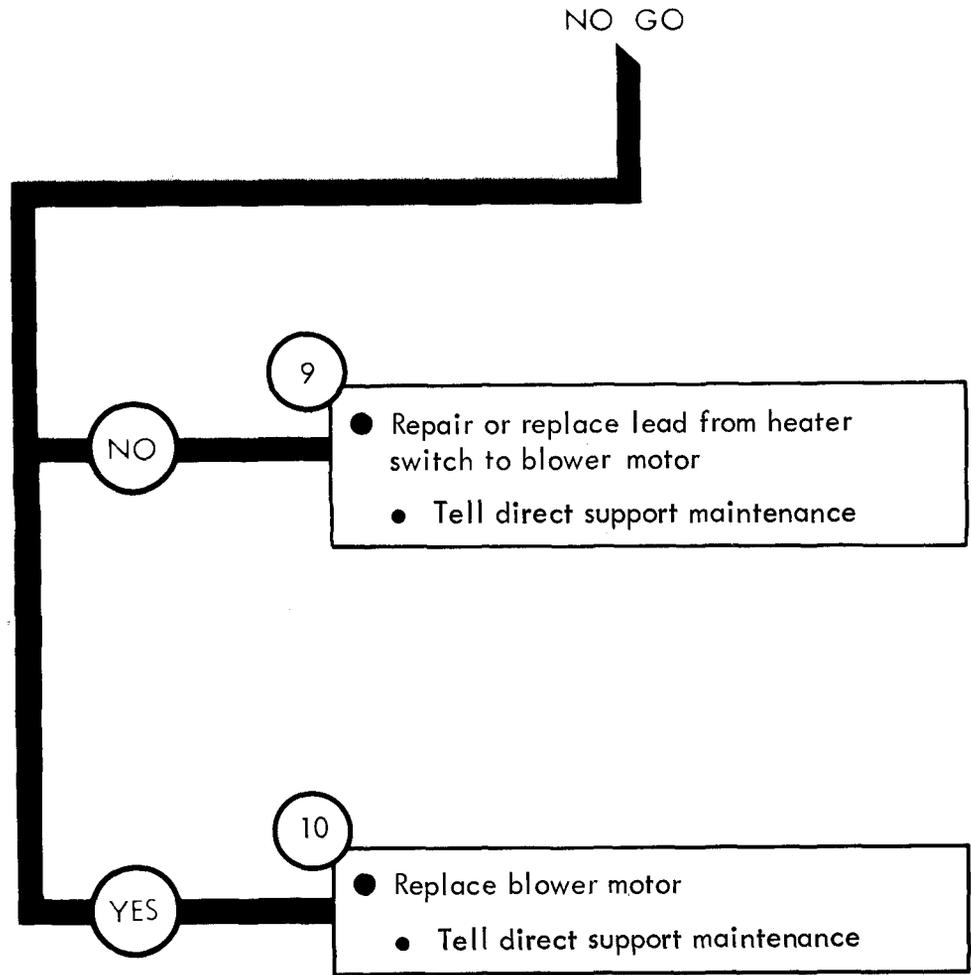


Figure 26-37 (Sheet 5 of 10)

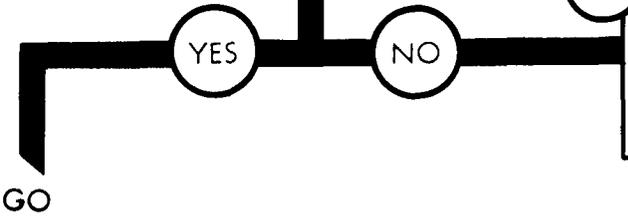
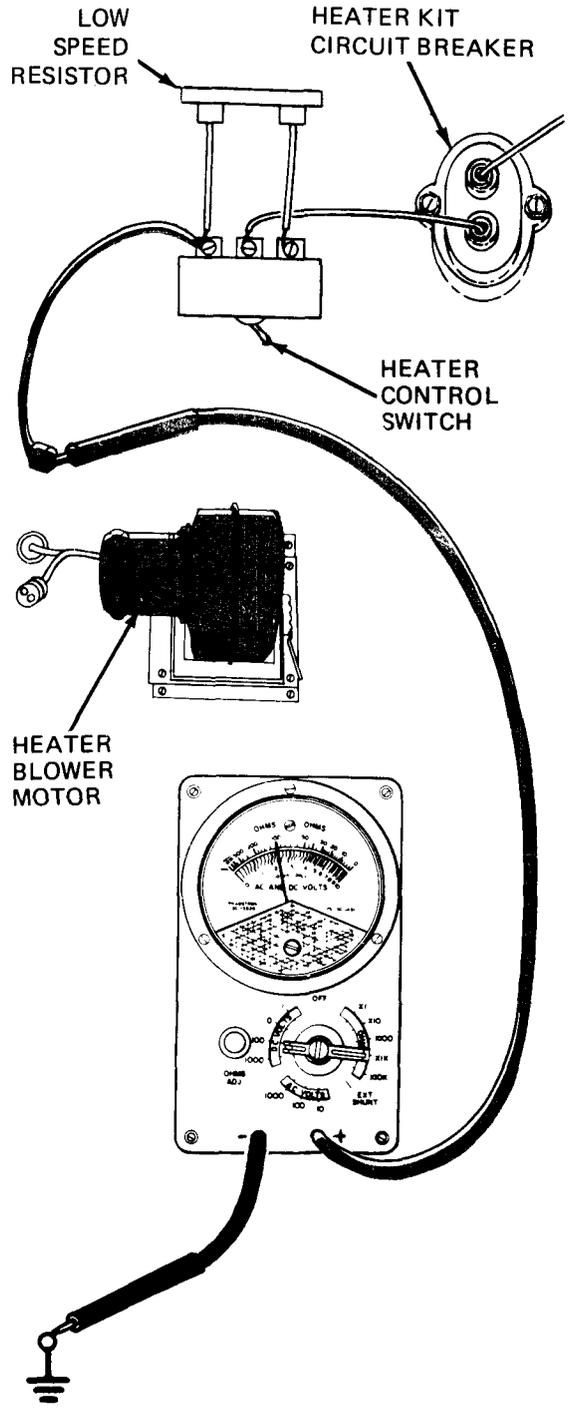
From step 4

11

● Test blower motor

- Take off lead from heater control switch to blower motor at blower motor
- Put multimeter - lead on a good ground
- Put multimeter + lead on contact of lead removed from blower motor
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



12

● Repair or replace lead from heater control switch to blower motor

- Tell direct support maintenance

Figure 26-37 (Sheet 6 of 10)

From step 6

GO

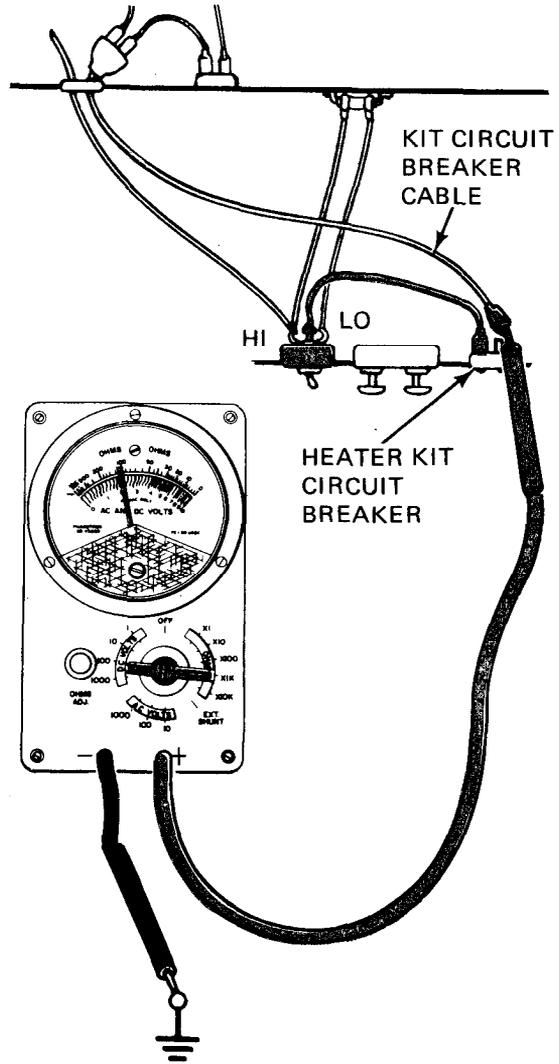
13

- Replace blower motor
- Tell direct support maintenance

14

- Check for +24 volts DC to heater kit circuit breaker
- Put circuit breaker to control switch cable back on center contact of heater control switch
- Take off lead from "Y" connector to heater kit circuit breaker at heater kit circuit breaker
- Put multimeter - lead on a good ground
- Put multimeter + lead on contact of lead to circuit breaker
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

- Replace heater kit circuit breaker
- Tell direct support maintenance

GO

Figure 26-37 (Sheet 7 of 10)

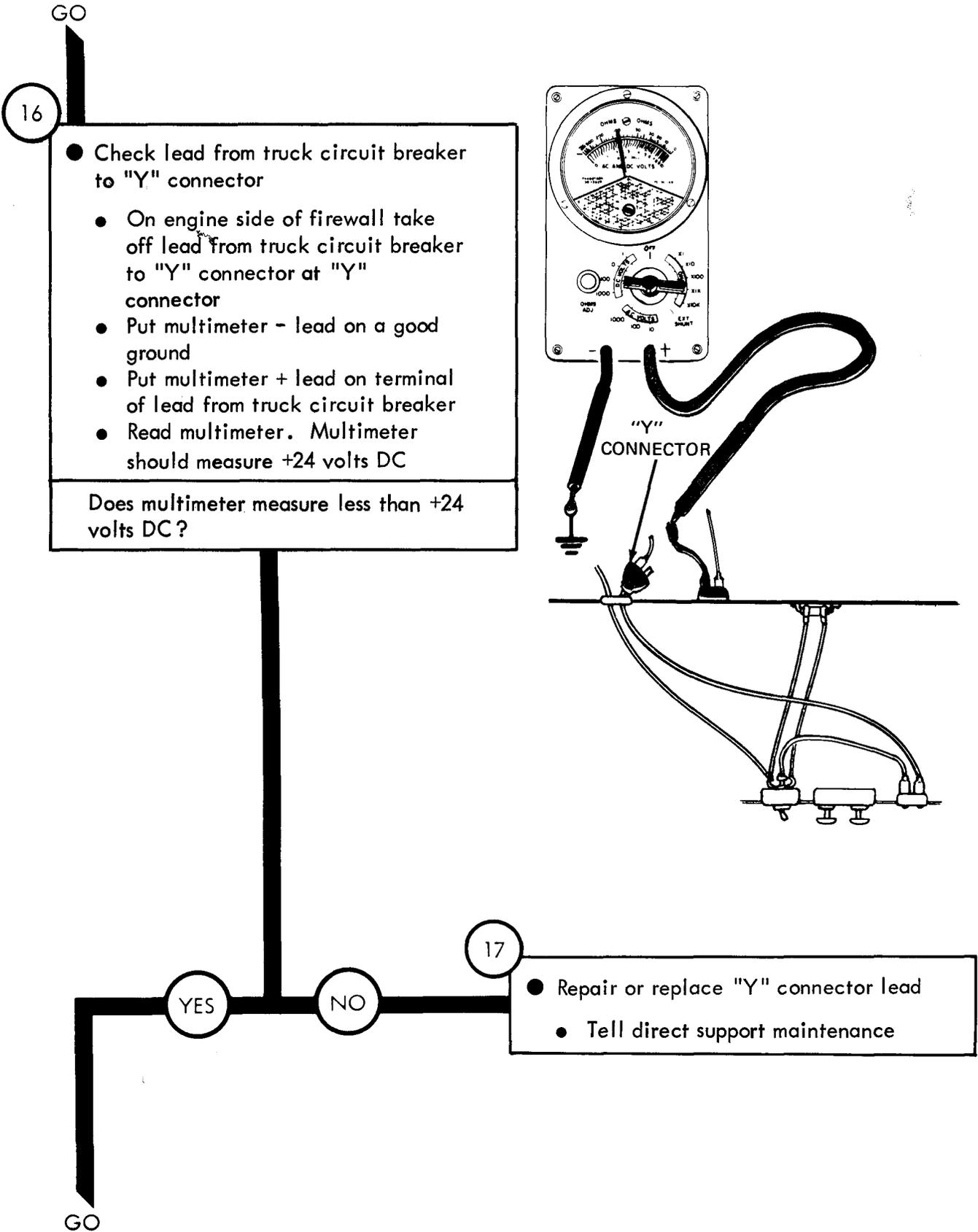


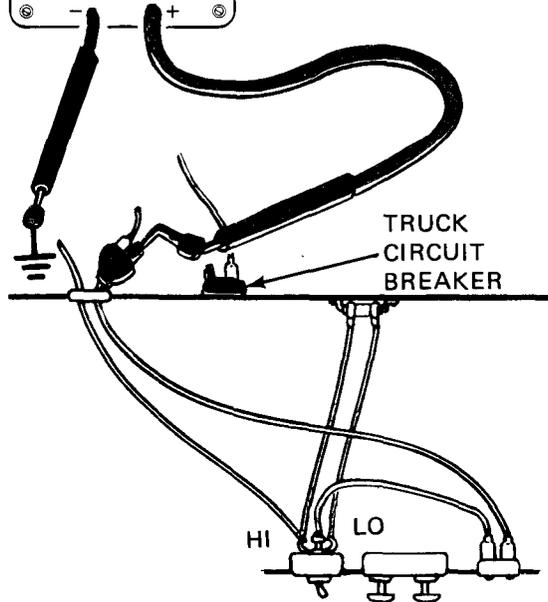
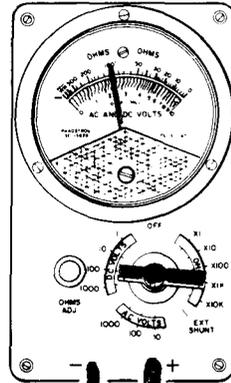
Figure 26-37 (Sheet 8 of 10)

GO

18

- Check lead from truck circuit breaker to "Y" connector
 - Put "Y" connector lead back on terminal of heater kit circuit breaker
 - Take off truck circuit breaker to "Y" connector lead at truck circuit breaker
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on terminal of truck circuit breaker
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

19

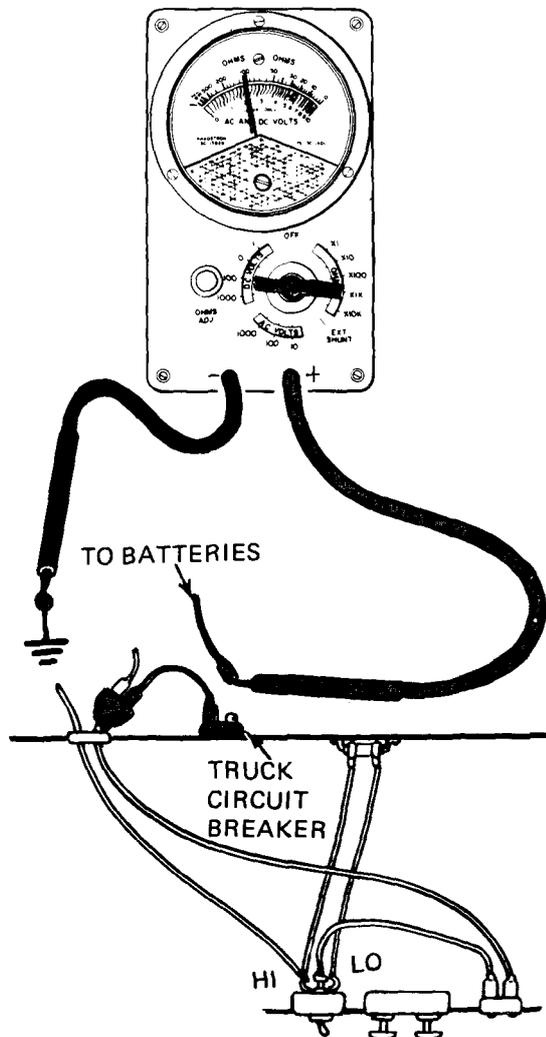
- Repair or replace lead from truck circuit breaker to "Y" connector
 - Tell direct support maintenance

GO

GO

20

- Check lead from front harness to circuit breaker
 - Put lead from truck circuit breaker to "Y" connector back on truck circuit breaker and "Y" connector
 - Take off front harness lead from other contact of truck circuit breaker
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on front harness lead contact
 - Read multimeter. Multimeter should measure +24 volts DC
- Did multimeter measure +24 volts DC ?



NO

21

- Repair or replace front harness from batteries to vehicle circuit breaker
- Tell direct support maintenance

YES

22

- Replace vehicle circuit breaker
- Tell direct support maintenance

TA 115989

Figure 26-37 (Sheet 10 of 10)

Symptom

38

HOT WATER PERSONNEL HEATER DEFROSTER DOES NOT OPERATE IN EITHER BLOWER SWITCH POSITION

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

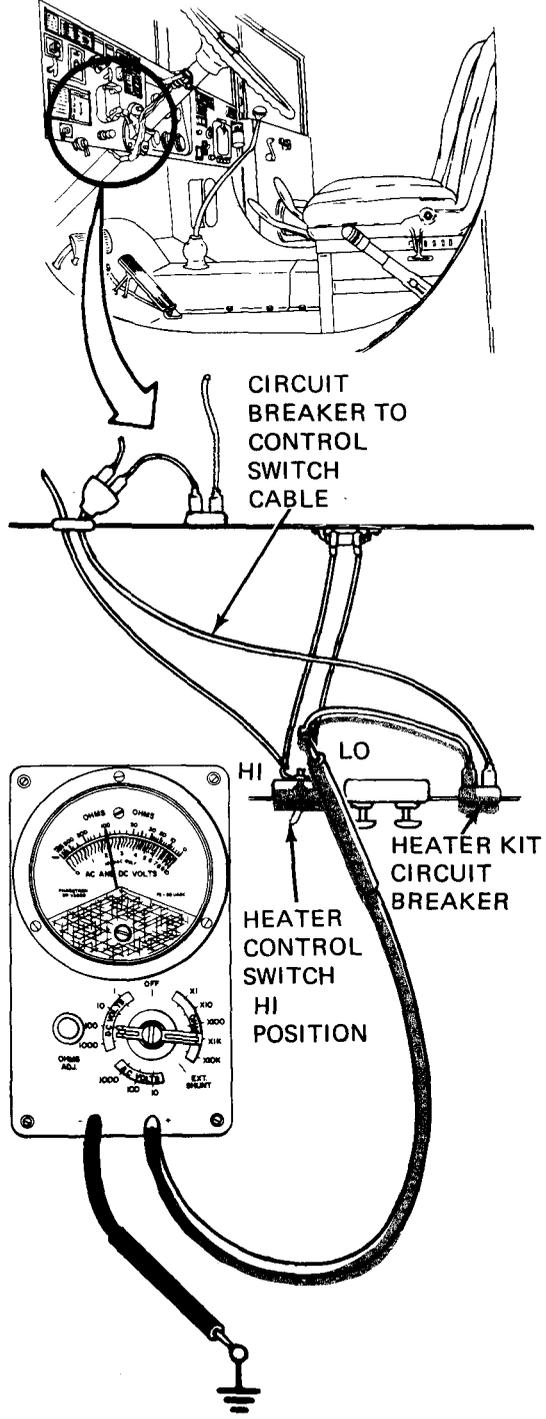
- Park truck
- Refer to TM 9-2320-211-10

2

- Check for voltage from batteries through heater control switch
- Take off circuit breaker to control switch cable from center terminal of heater control switch
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead in contact of cable
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO



TA 115990

Figure 26-38 (Sheet 1 of 7)

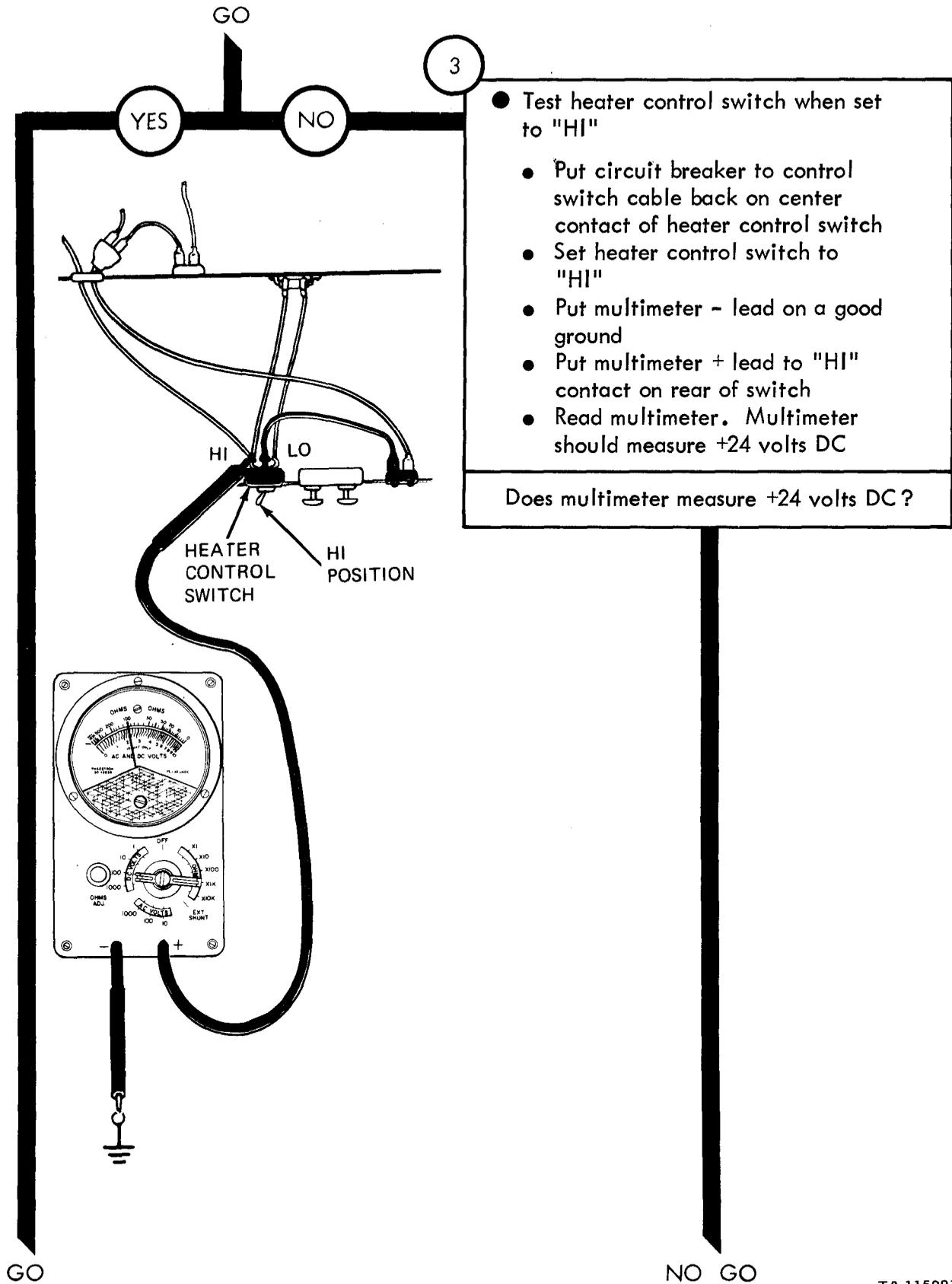


Figure 26-38 (Sheet 2 of 7)

TA 115991

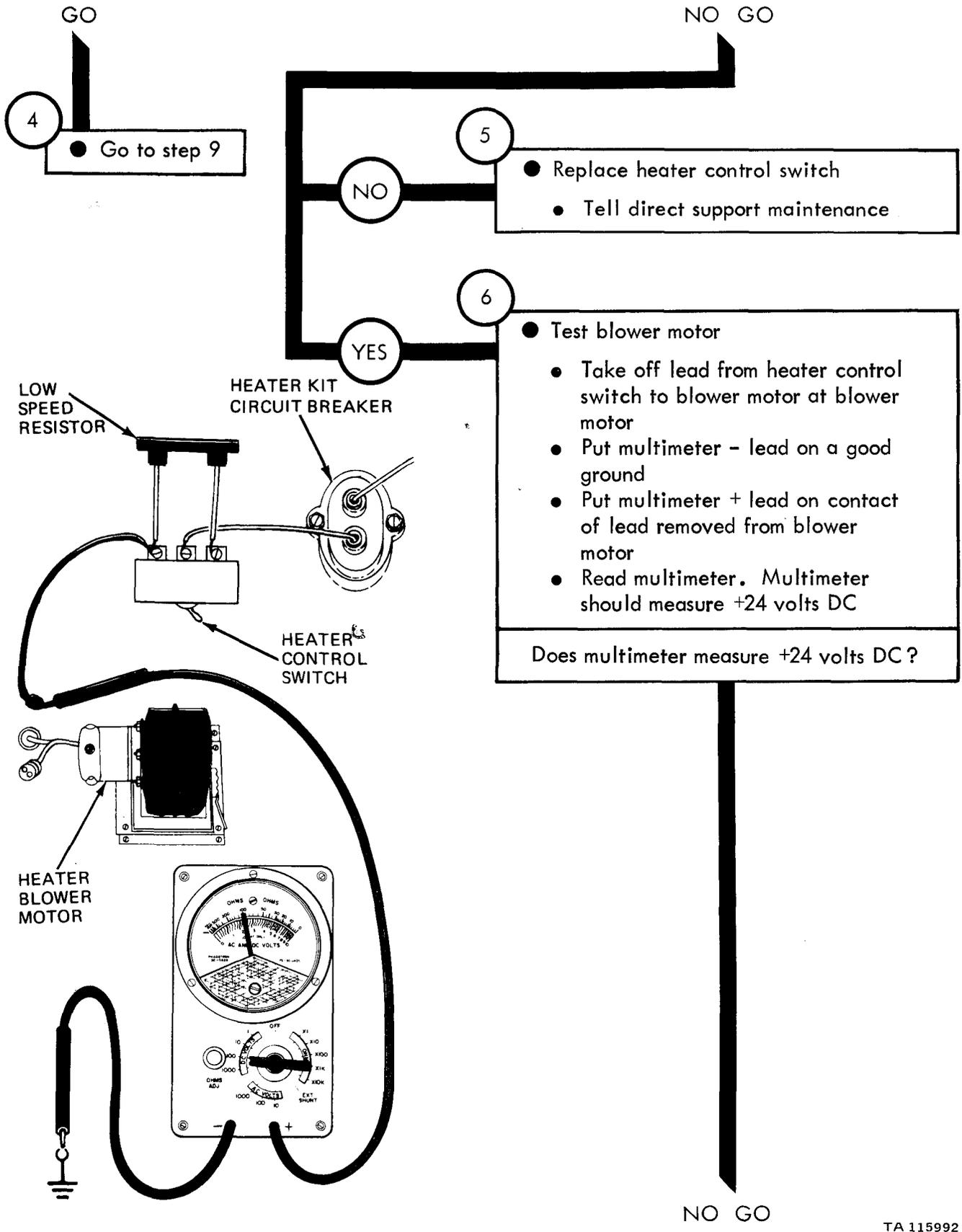
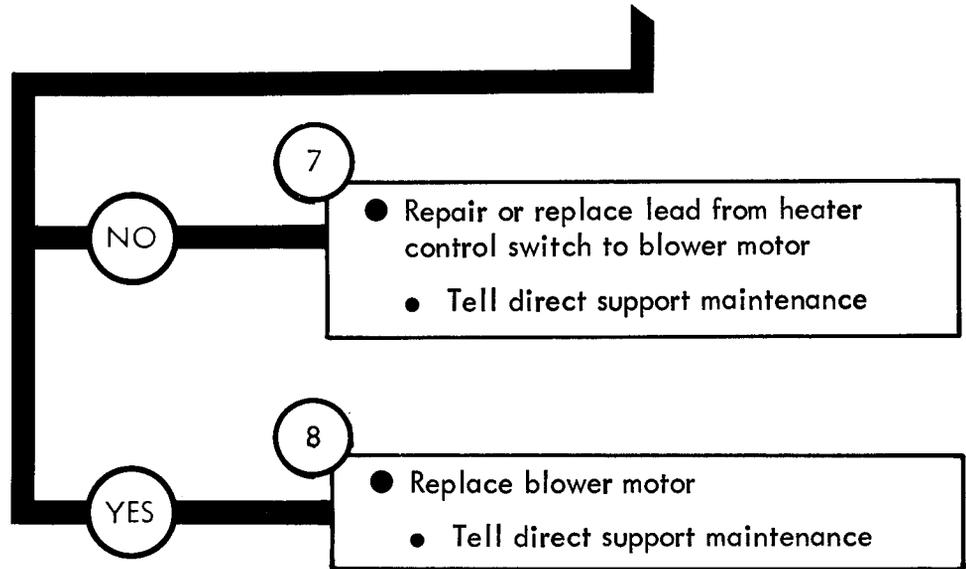


Figure 26-38 (Sheet 3 of 7)

TA 115992

NO GO



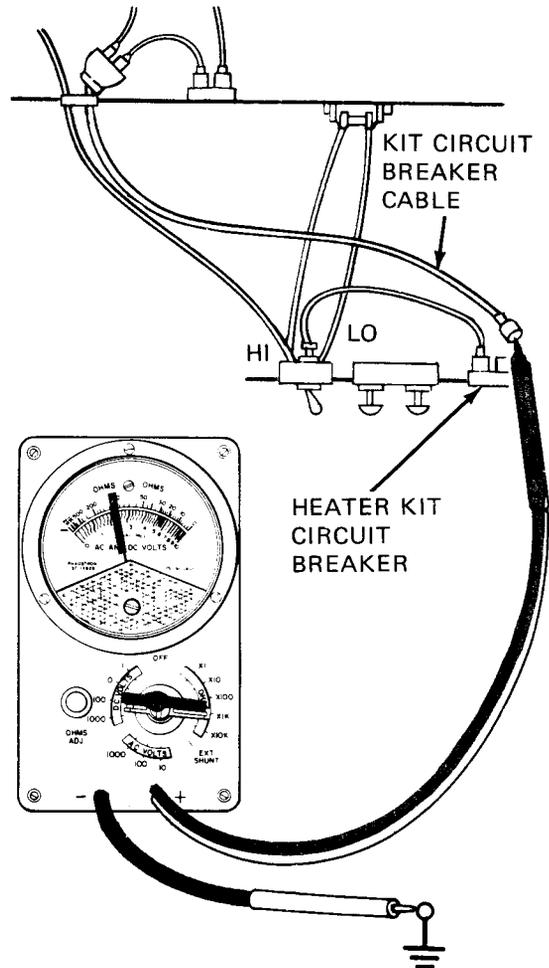
From step 4

9

- Check for +24 volts DC to heater kit circuit breaker
 - Put circuit breaker to control switch cable back on center terminal of heater control switch
 - Take off lead from "Y" connector to heater kit circuit breaker
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on contact of lead to circuit breaker
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO



TA 115993

Figure 26-38 (Sheet 4 of 7)

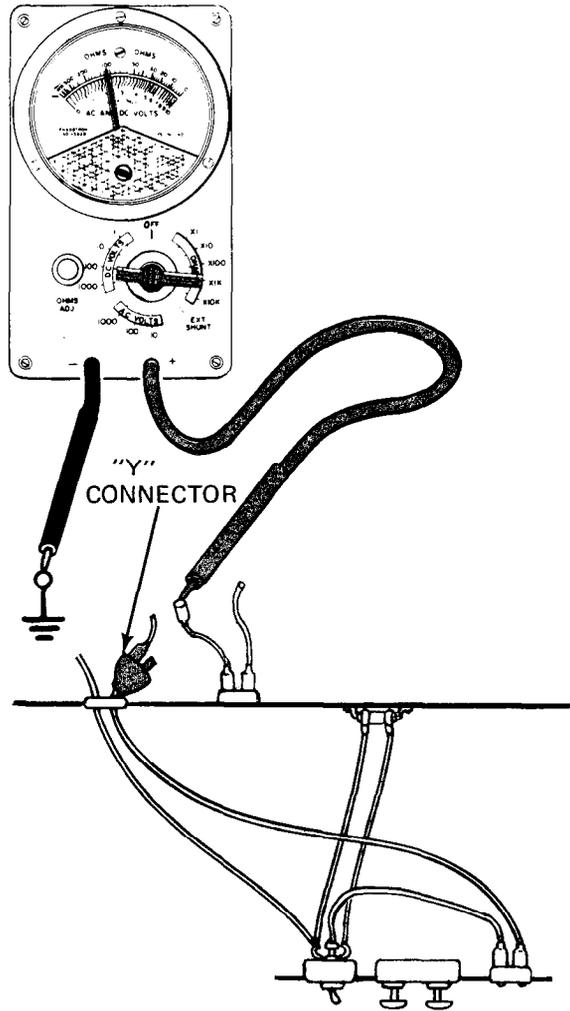
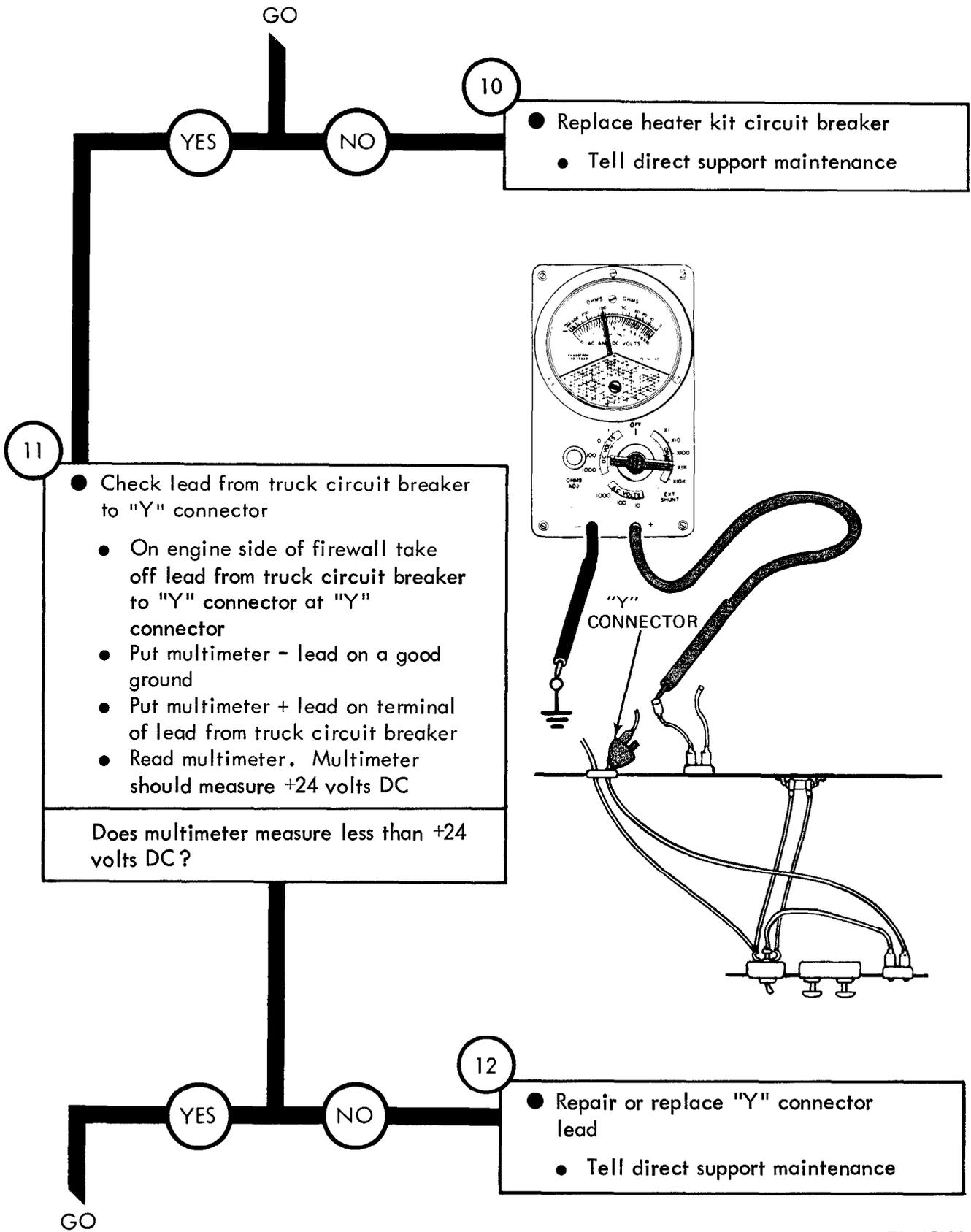
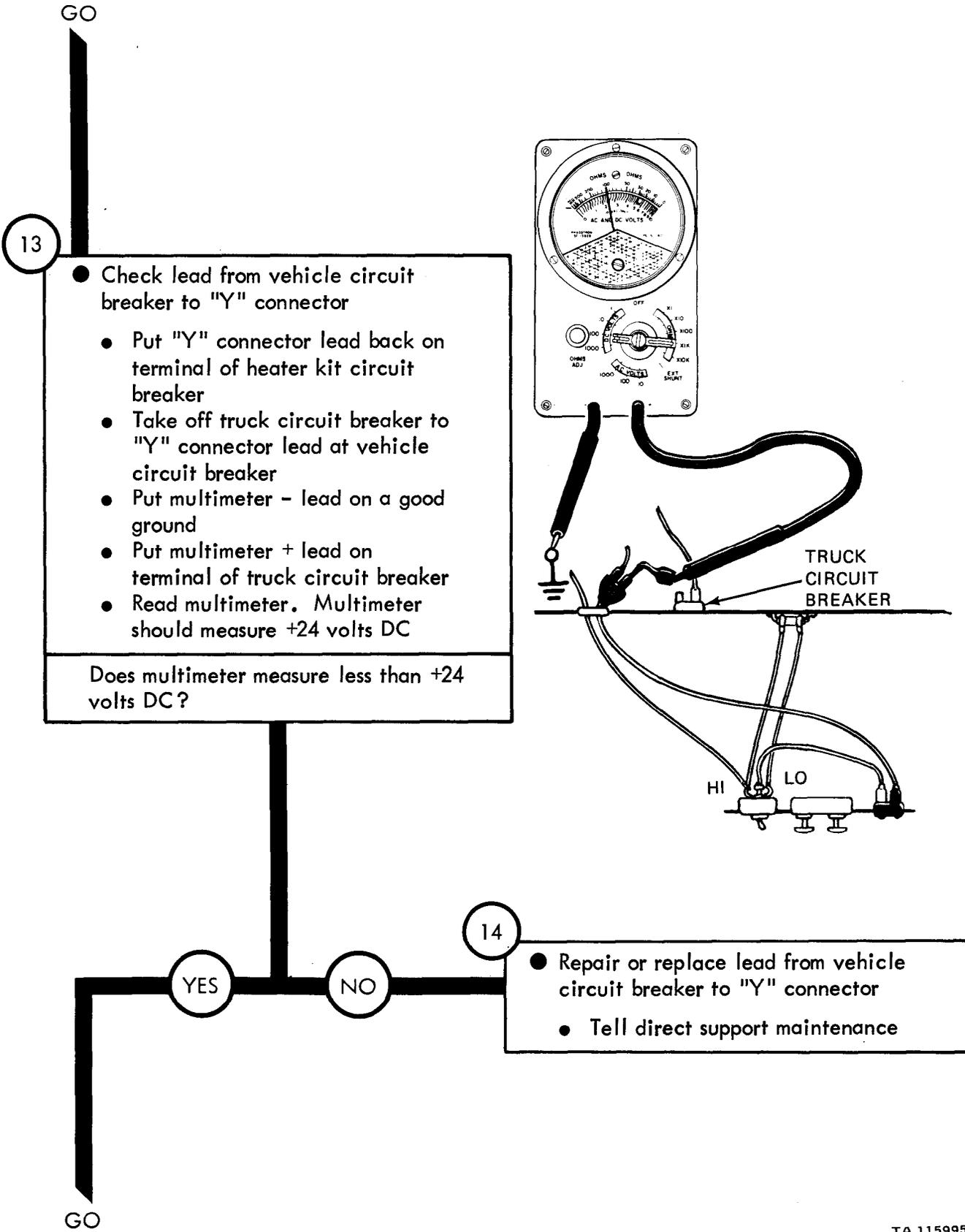


Figure 26-38 (Sheet 5 of 7)



TA 115995

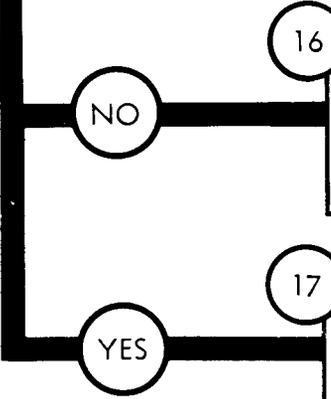
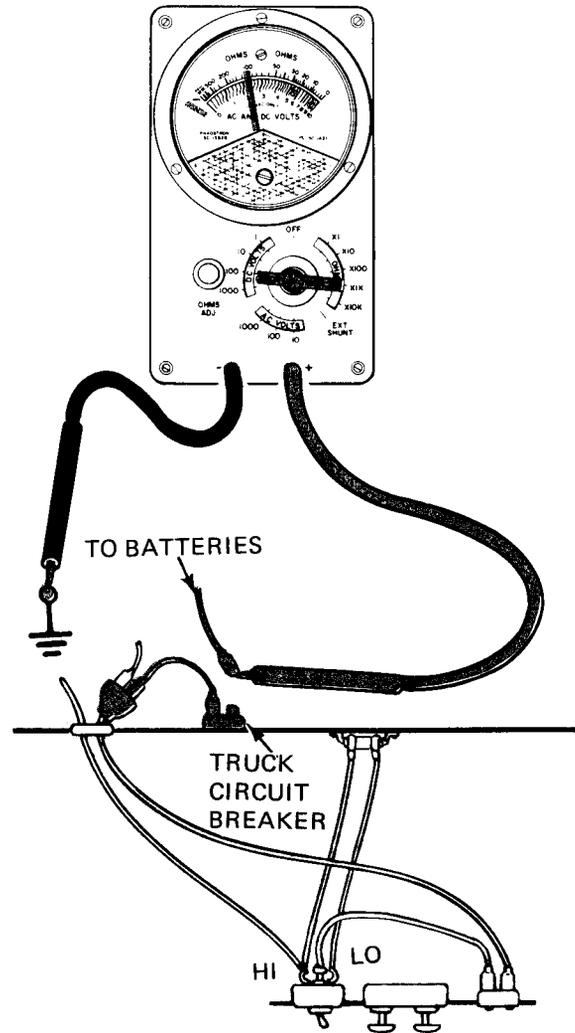
Figure 26-38 (Sheet 6 of 7)

GO

15

- Check lead from front harness to circuit breaker
- Put lead from truck circuit breaker to "Y" connector back on vehicle circuit breaker and "Y" connector
- Take off front harness lead from other terminal of truck circuit breaker
- Put multimeter - lead on a good ground
- Put multimeter + lead on front harness lead contact
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



16

- Repair or replace front harness from batteries to truck circuit breaker
- Tell direct support maintenance

17

- Replace truck circuit breaker
- Tell direct support maintenance

Figure 26-38 (Sheet 7 of 7)

Symptom

39

HOT WATER PERSONNEL HEATER DEFROSTER DOES NOT TURN OFF WHEN SWITCH IS IN "OFF" POSITION

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

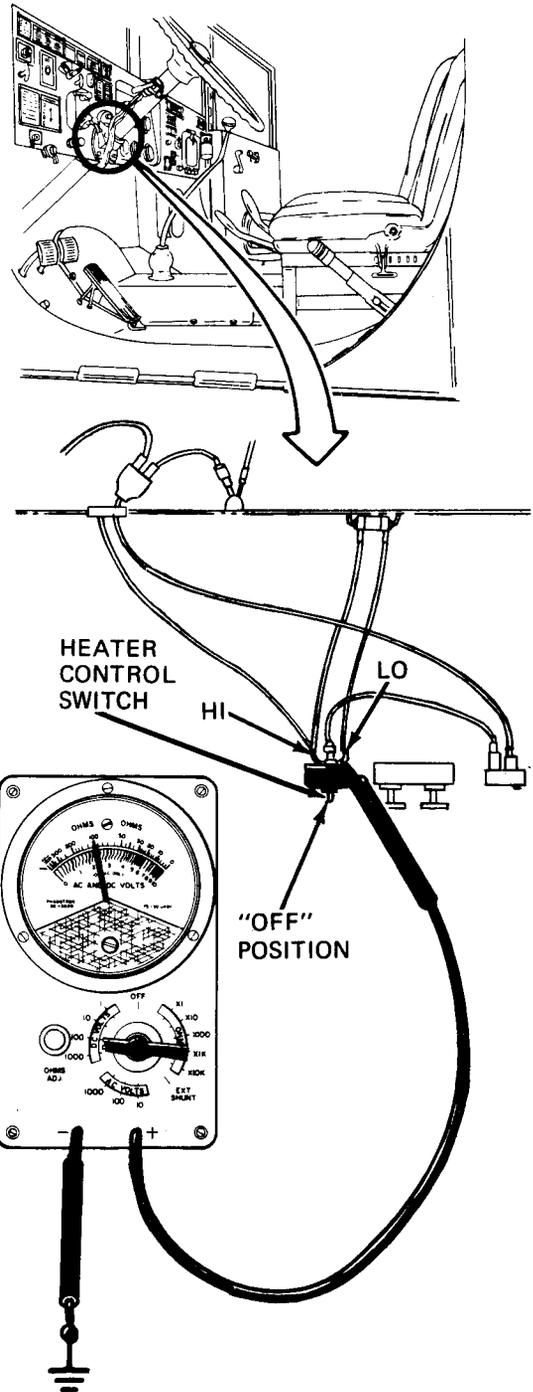
- Park truck
- Refer to TM 9-2320-211-10

2

- Check for bad heater control switch or shorted leads
 - Set heater control switch to "OFF"
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on "LO" contact of heater switch. Read multimeter
 - Put multimeter + lead on "HI" contact of heater switch. Read multimeter

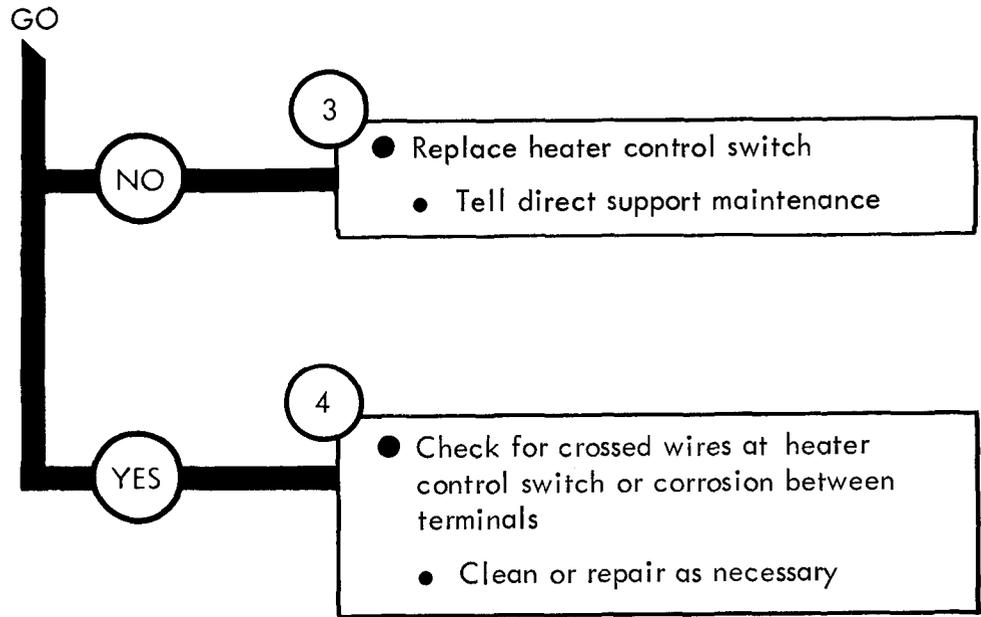
Did multimeter measure +24 volts DC on either contact?

GO



TA 115997

Figure 26-39 (Sheet 1 of 2)



Symptom

40

ONLY ONE CONTROL BOX WILL OPERATE THE HEATER FUEL PUMP

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

- Park truck
- Refer to TM 9-2320-211-10

GO

Figure 26-40 (Sheet 1 of 9)

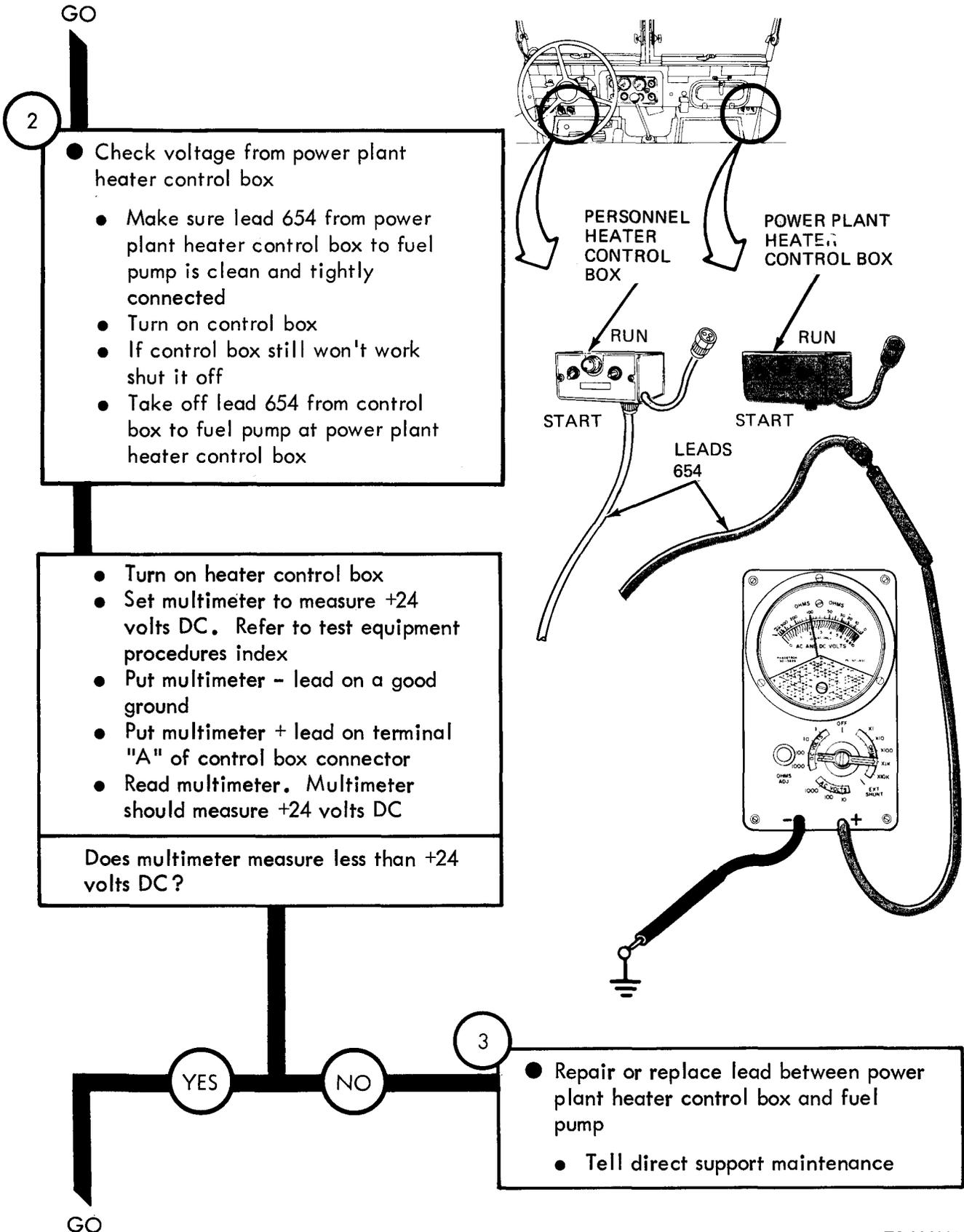
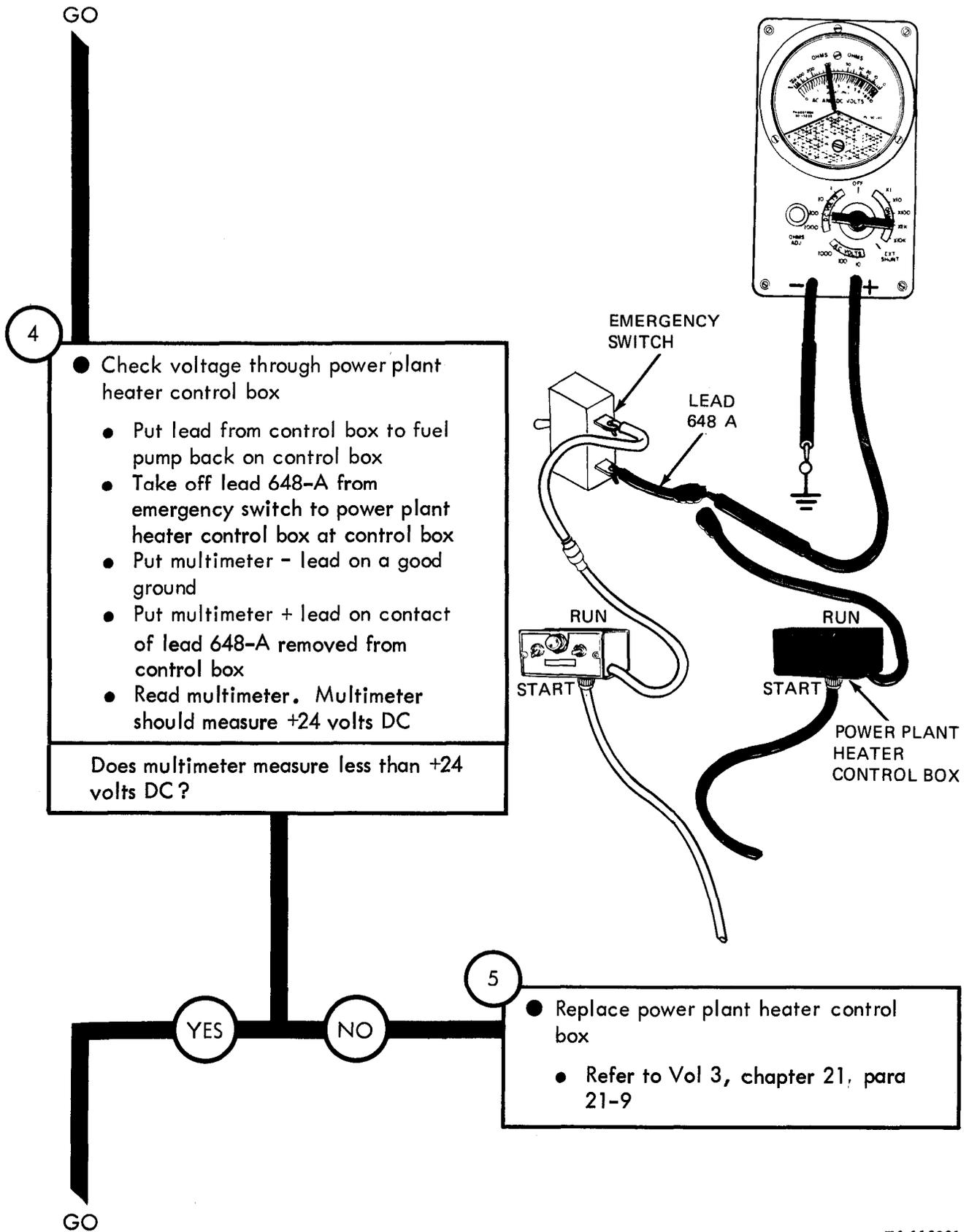


Figure 26-40 (Sheet 2 of 9)



TA 116001

Figure 26-40 (Sheet 3 of 9)

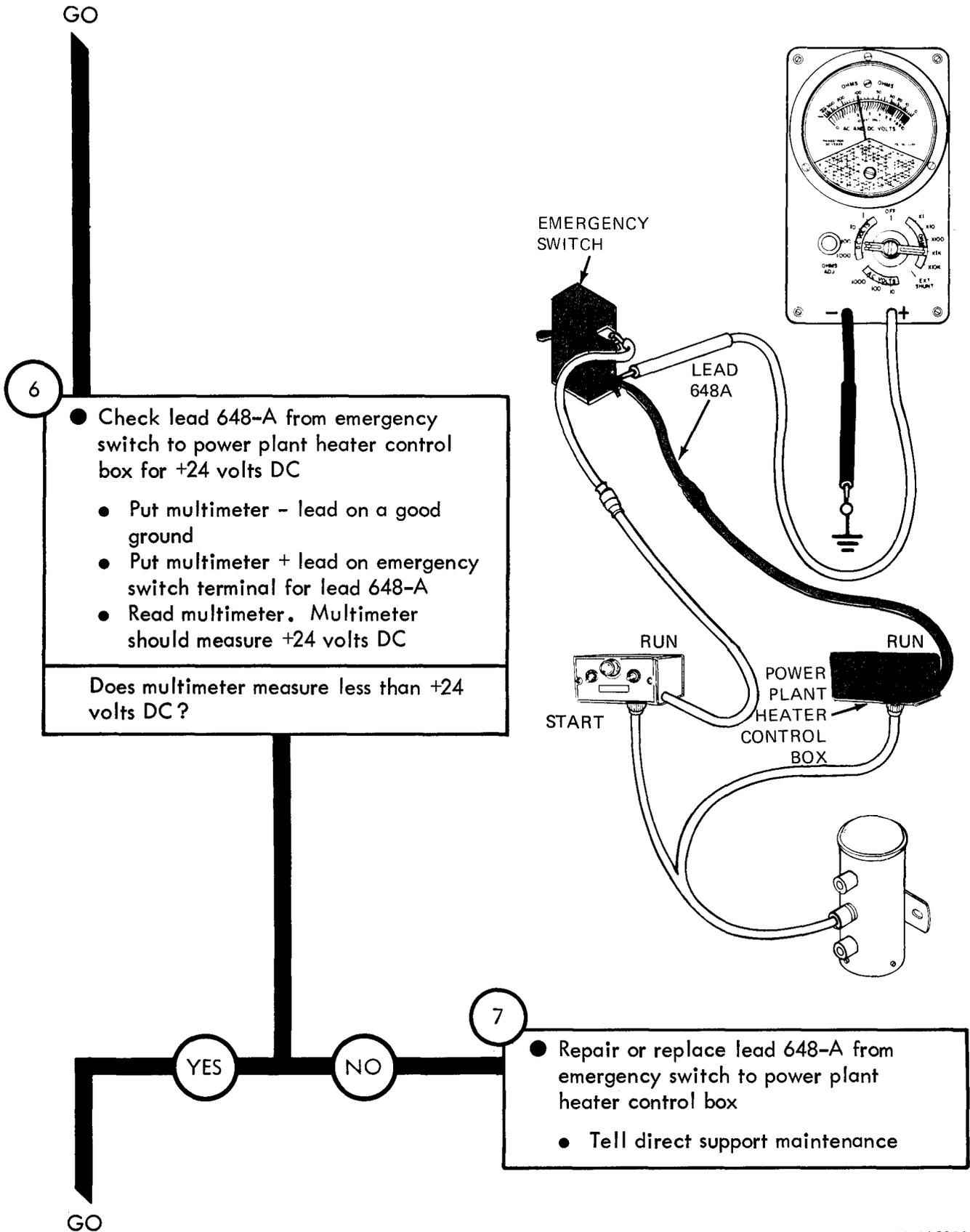
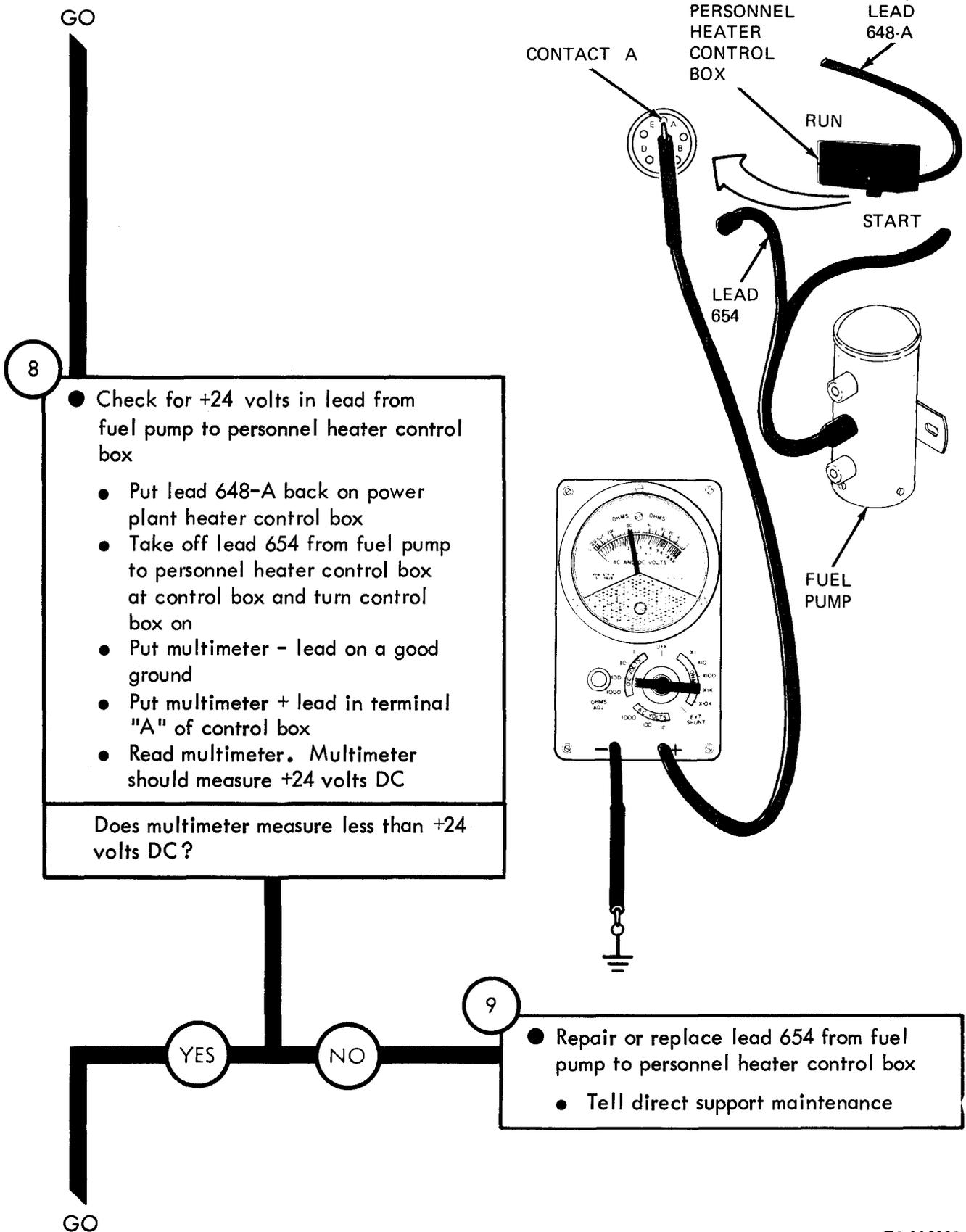


Figure 26-40 (Sheet 4 of 9)



8

- Check for +24 volts in lead from fuel pump to personnel heater control box
 - Put lead 648-A back on power plant heater control box
 - Take off lead 654 from fuel pump to personnel heater control box at control box and turn control box on
 - Put multimeter - lead on a good ground
 - Put multimeter + lead in terminal "A" of control box
 - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

9

- Repair or replace lead 654 from fuel pump to personnel heater control box
 - Tell direct support maintenance

GO

Figure 26-40 (Sheet 5 of 9)

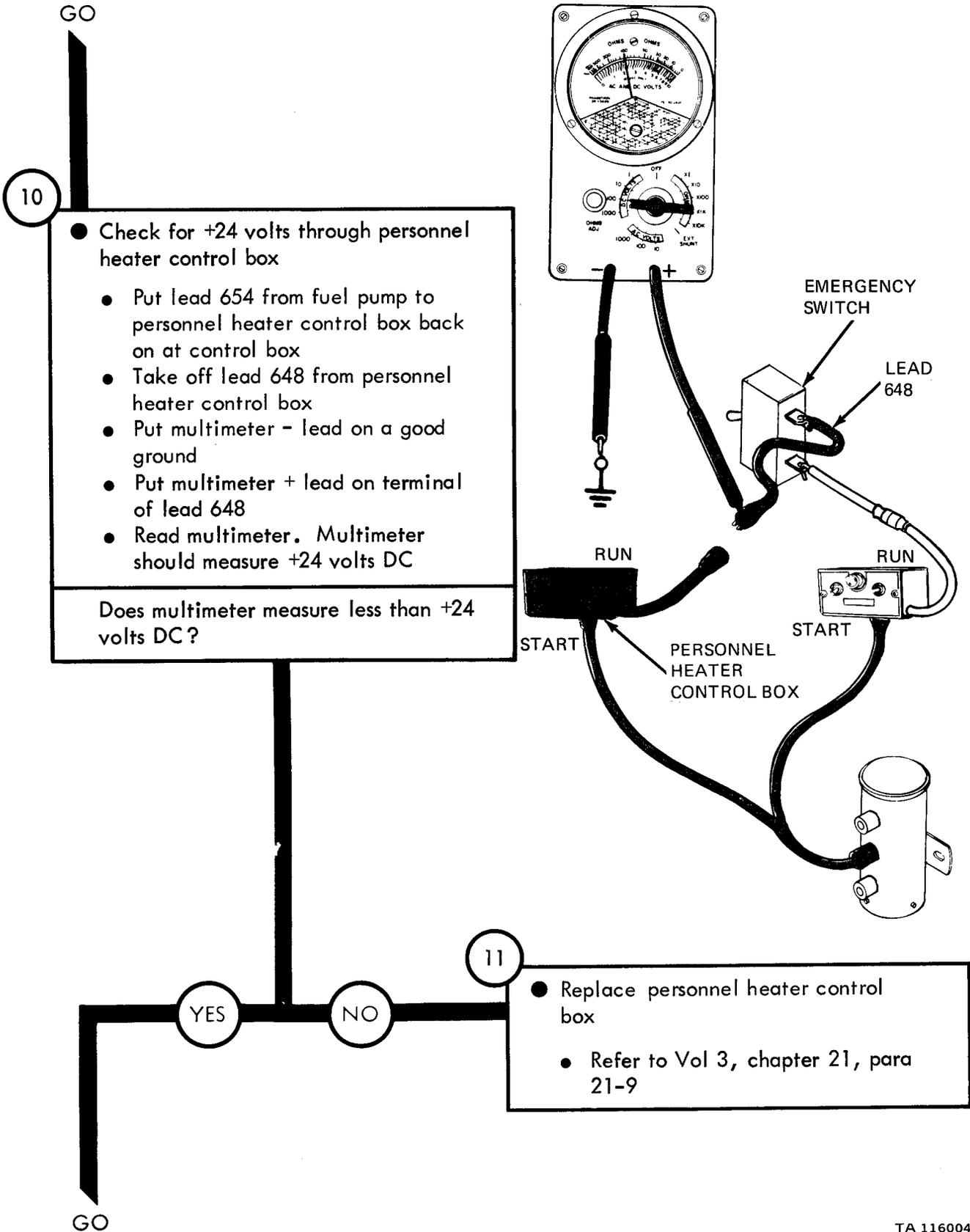
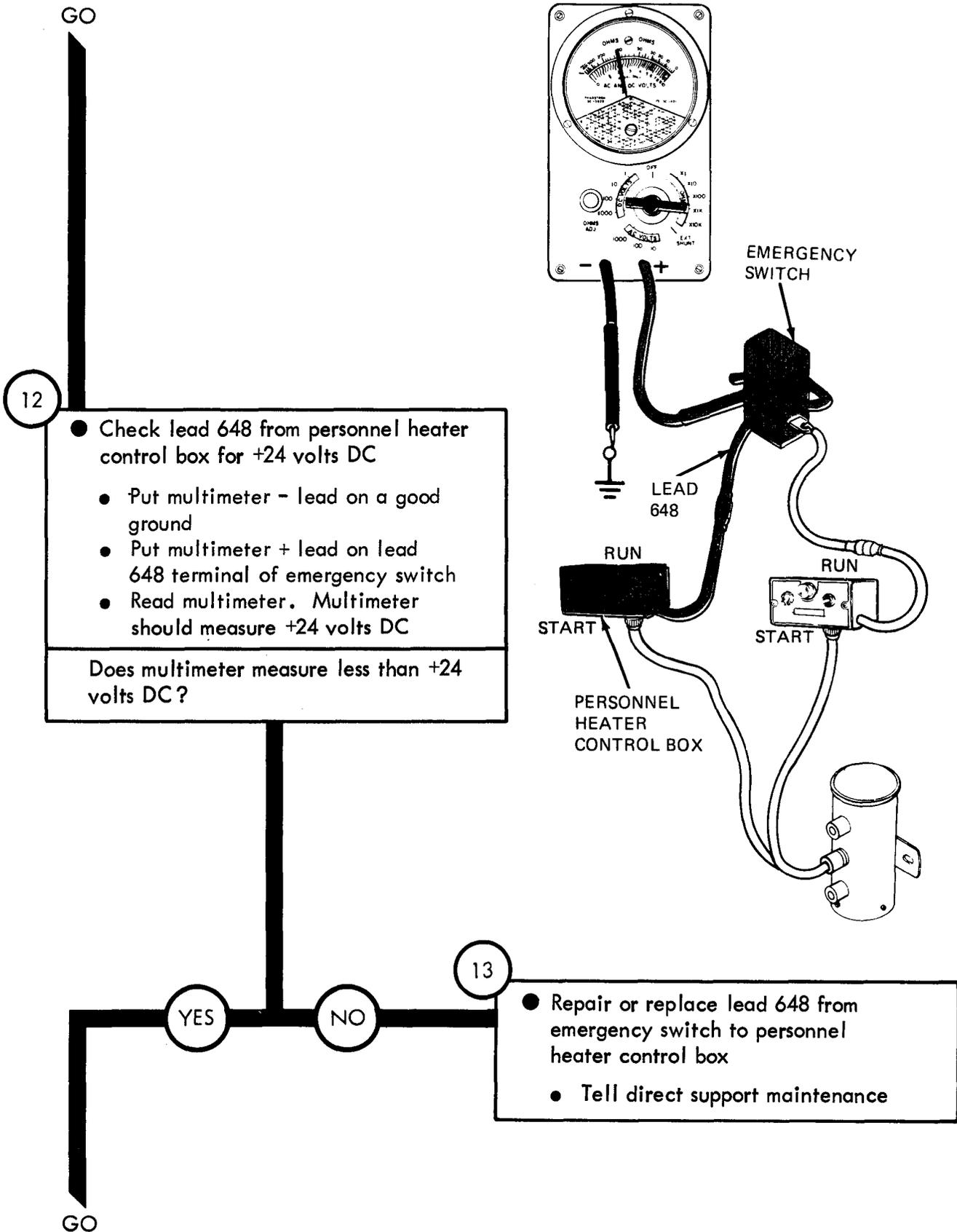
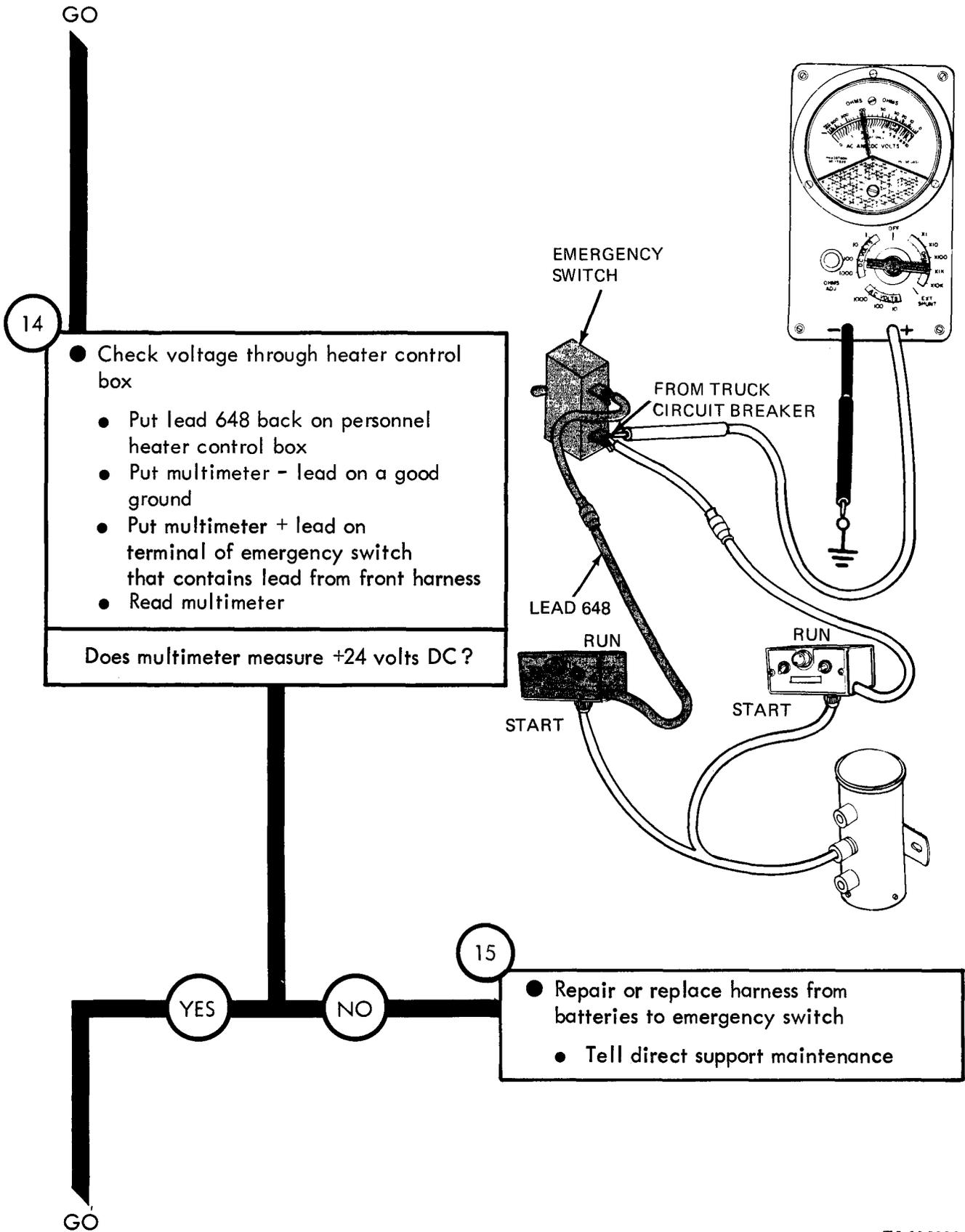


Figure 26-40 (Sheet 6 of 9)



TA 116005

Figure 26-40 (Sheet 7 of 9)



TA 116006

Figure 26-40 (Sheet 8 of 9)

GO



16

- Replace emergency switch
- Refer to Vol 3, chapter 21, para 21-6

Symptom

41

NEITHER CONTROL BOX WILL OPERATE THE HEATER FUEL PUMP

NOTE

When measuring voltage, +24 volts DC means a range of +23 to +26 volts DC

1

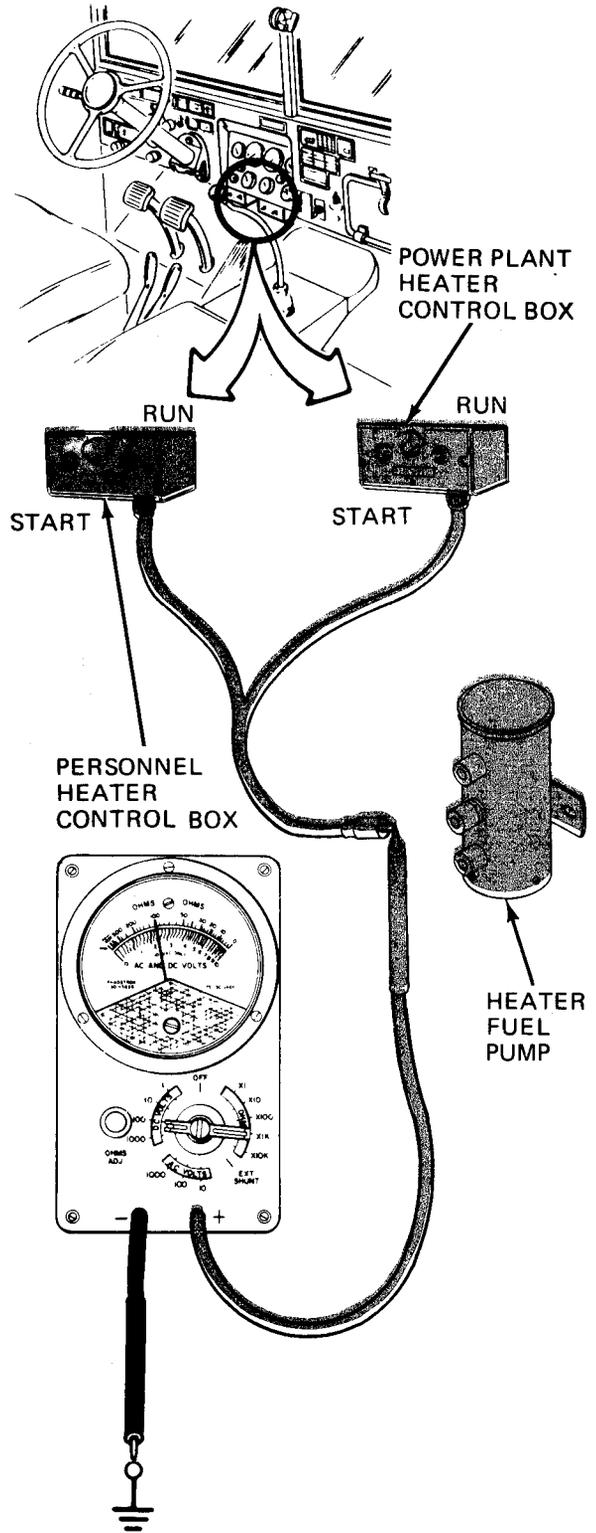
- Park truck
- Refer to TM 9-2320-211-10

2

- Check for +24 volts DC at heater fuel pump
 - Take off lead from both control boxes to heater fuel pump at the fuel pump
 - Set control boxes to ON
 - Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on lead contact
 - Read multimeter. Multimeter should measure +24 volts DC

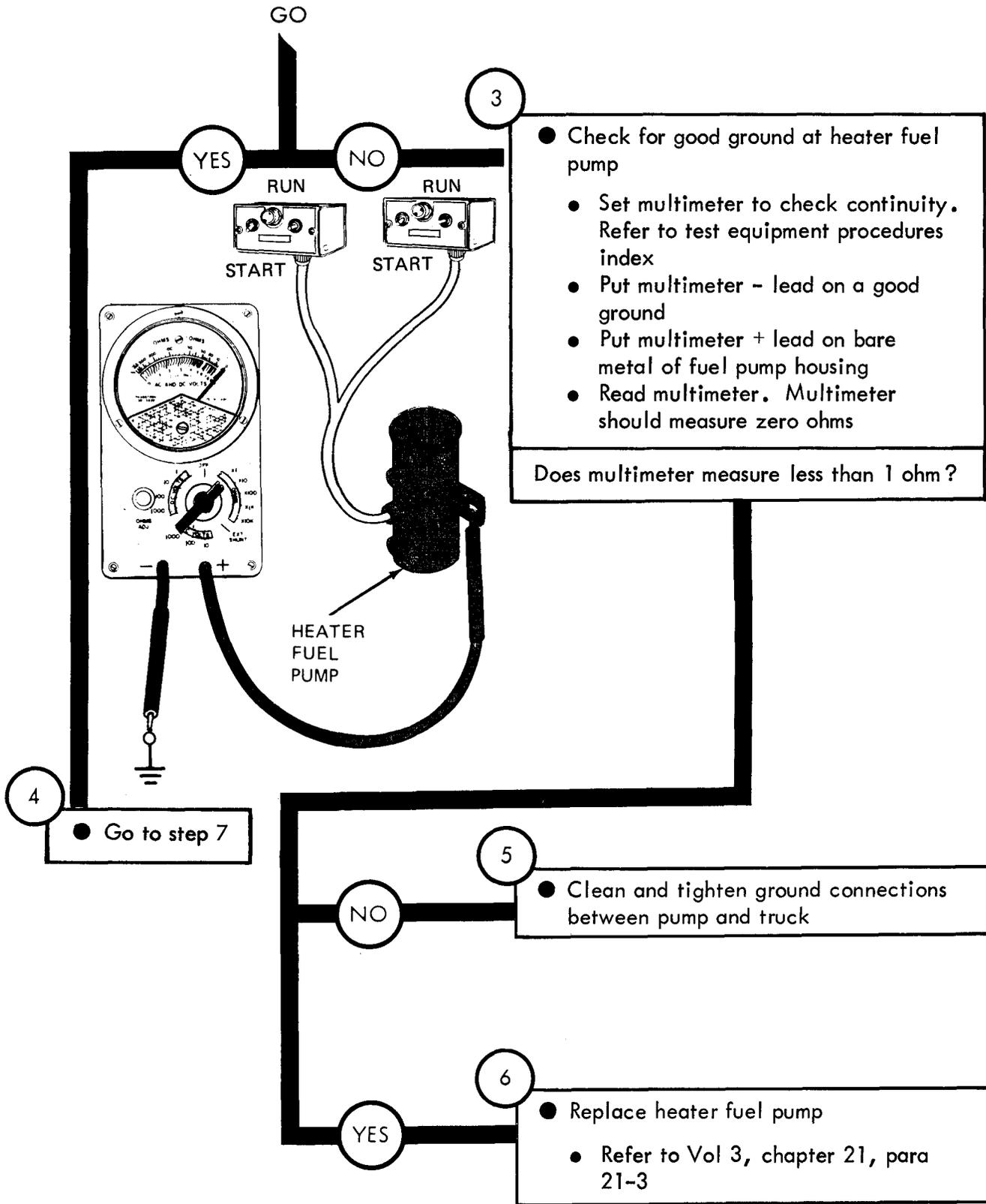
Does multimeter measure +24 volts DC?

GO



TA 116010

Figure 26-41 (Sheet 1 of 9)



TA 116011

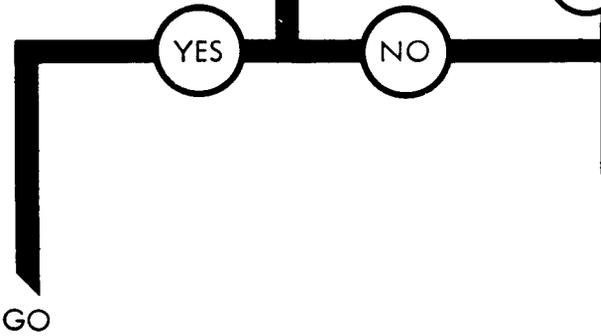
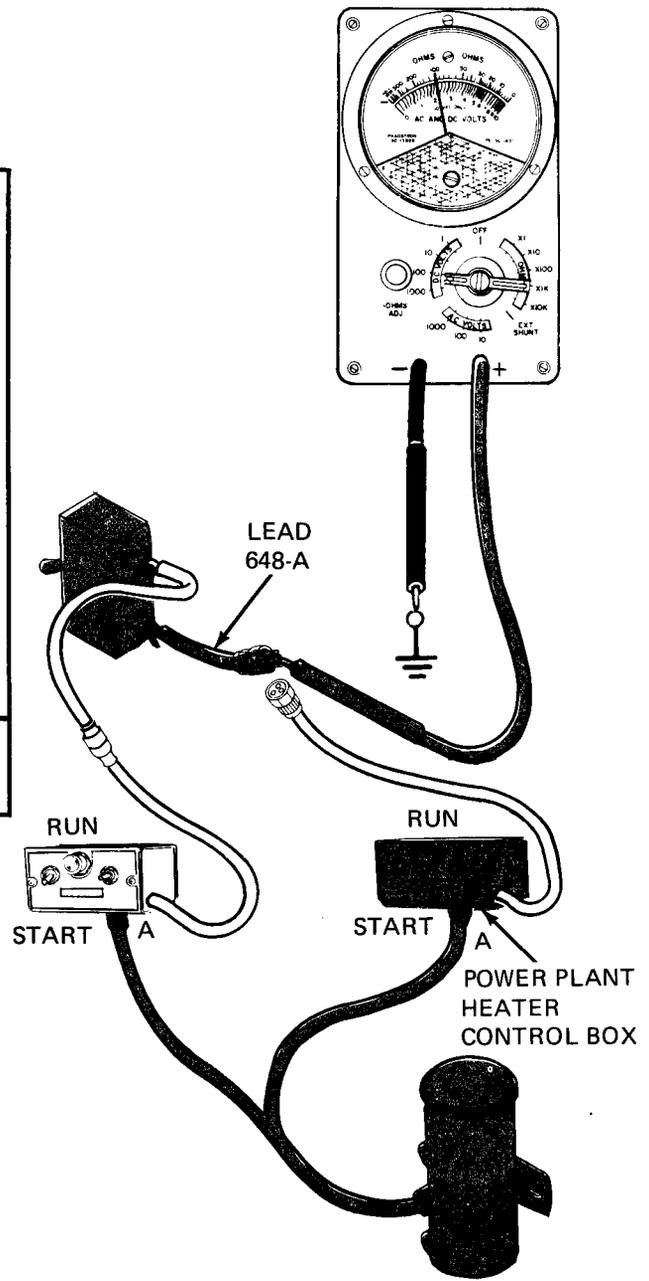
Figure 26-41 (Sheet 2 of 9)

From step 4

7

- Check voltage through power plant heater control box
 - Put lead from control box to fuel pump back on control box
 - Take off lead 648-A from emergency switch to power plant heater control box at control box
 - Put multimeter - lead on a good ground
 - Put multimeter + lead on contact of lead 648-A removed from control box
 - Read multimeter. Multimeter should measure +24 volts DC

Did multimeter measure less than +24 volts DC?



8

- Replace power plant heater control box
 - Refer to Vol 3, chapter 21, para 21-9

GO

TA 116012

Figure 26-41 (Sheet 3 of 9)

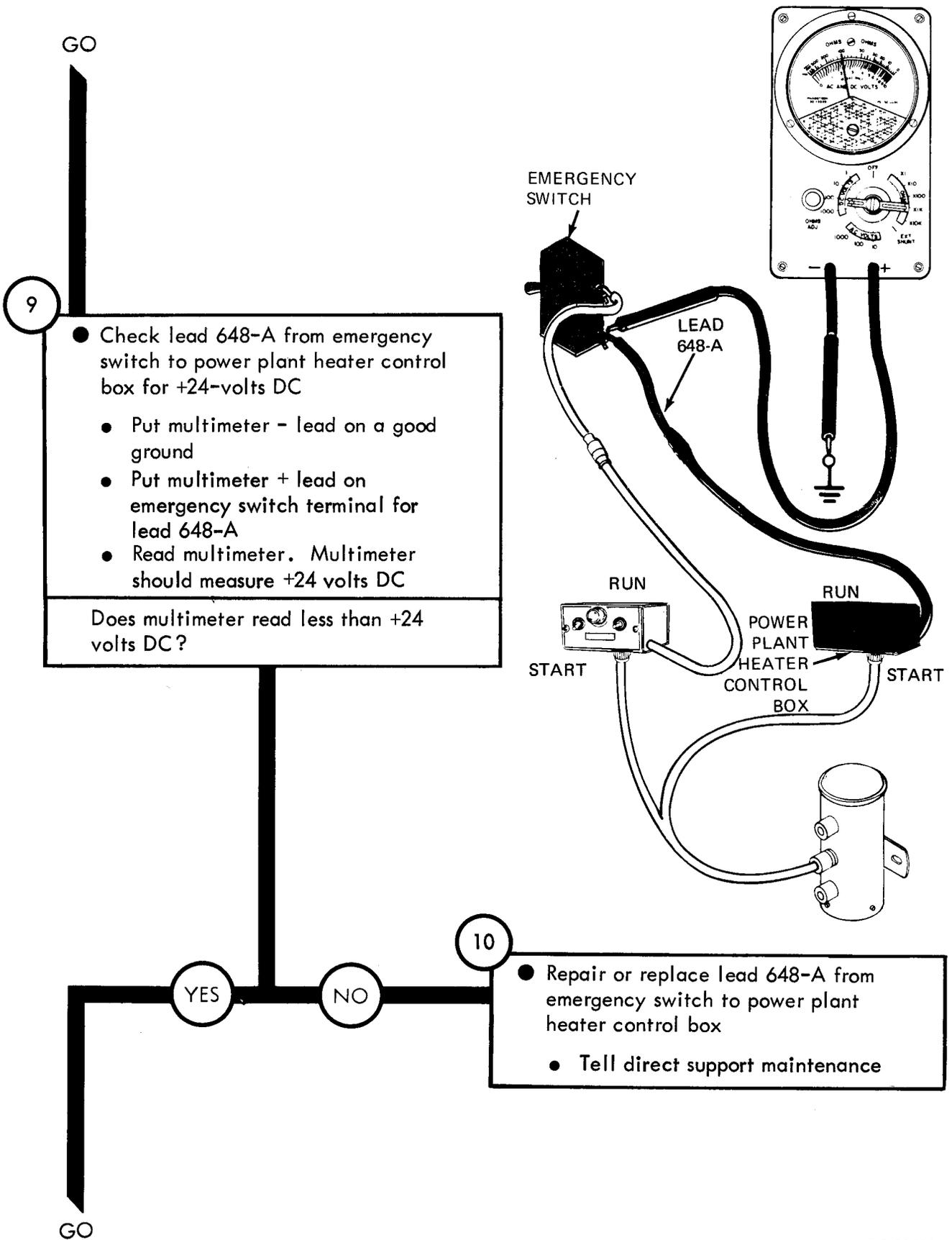


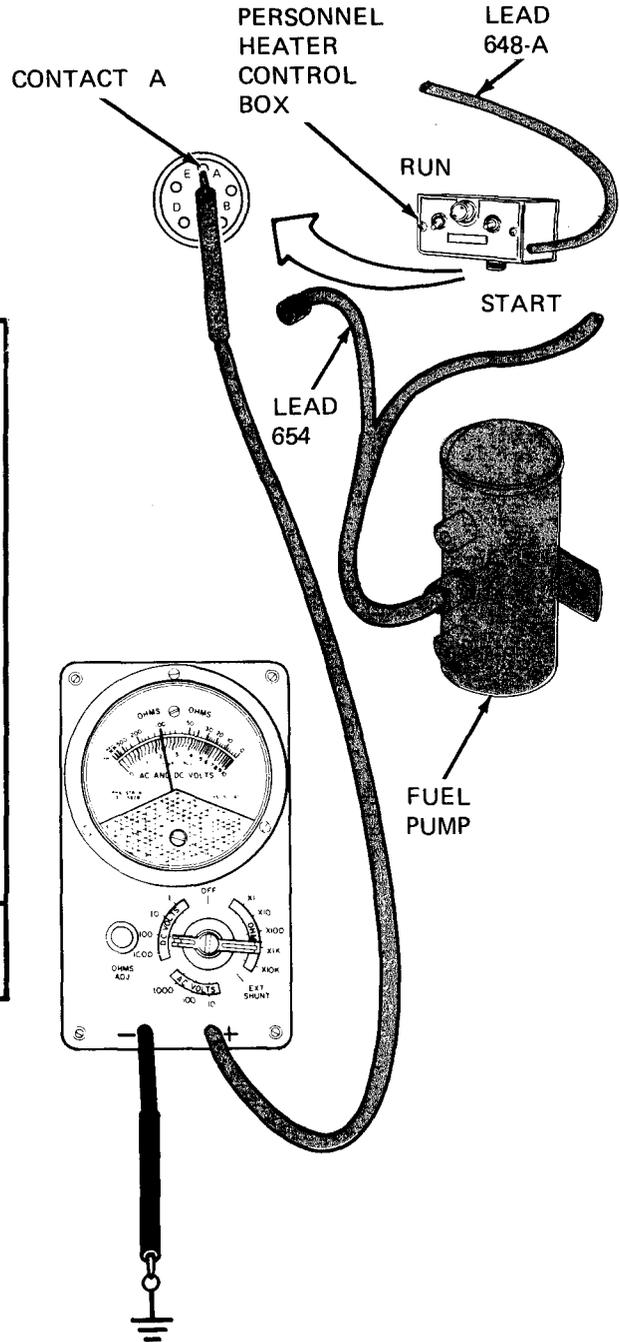
Figure 26-41 (Sheet 4 of 9)

TA 116013

GO

11

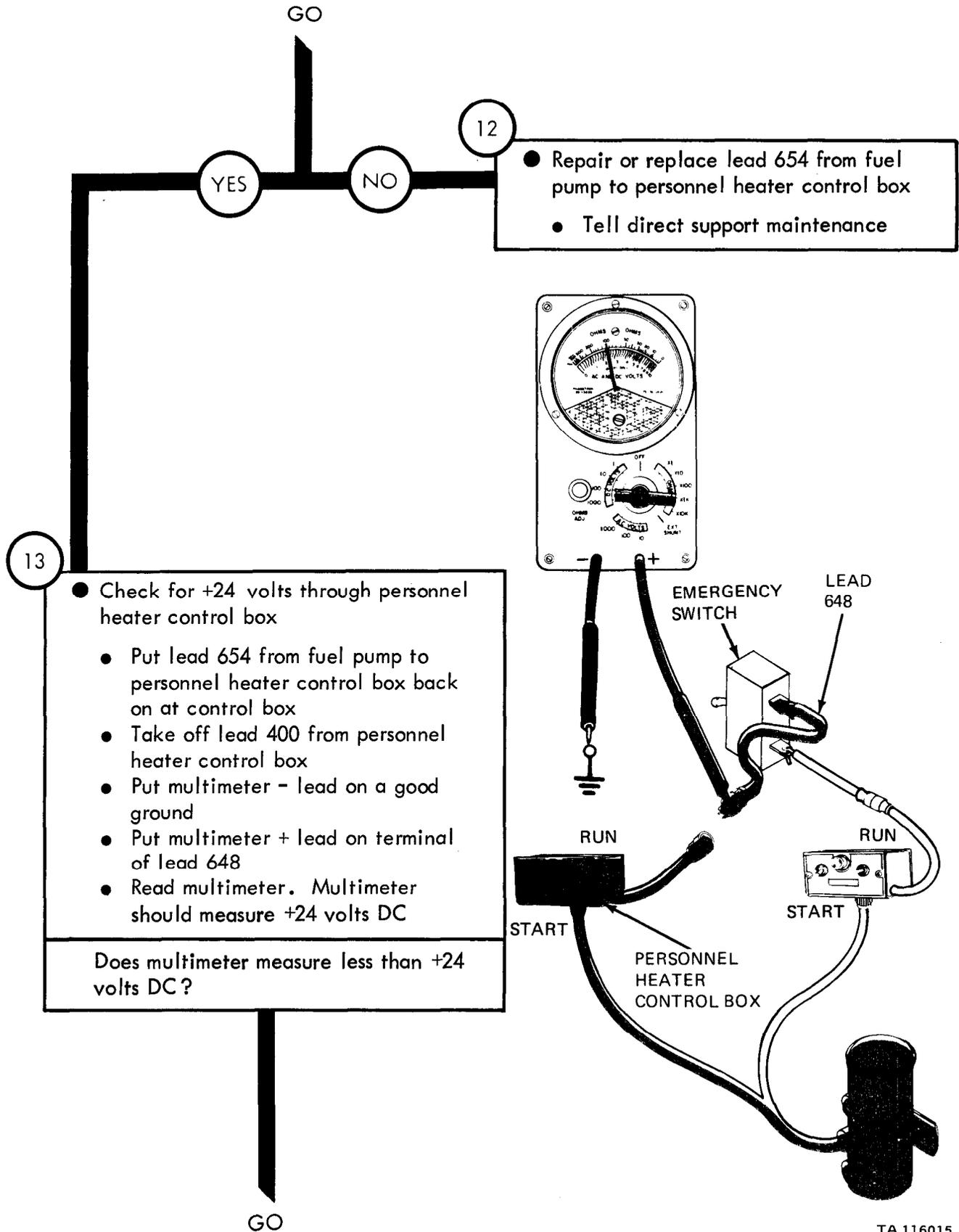
- Check for +24 volts in lead 654 from fuel pump to personnel heater control box
 - Put lead 648-A back on power plant heater control box
 - Take off lead 654 from fuel pump to personnel heater control box at control box and turn control box on
 - Put multimeter - lead on a good ground
 - Put multimeter + lead in terminal "A" of control box
 - Read multimeter. Multimeter should measure +24 volts DC
- Does multimeter measure less than +24 volts DC?



GO

TA 116014

Figure 26-41 (Sheet 5 of 9)



TA 116015

Figure 26-41 (Sheet 6 of 9)

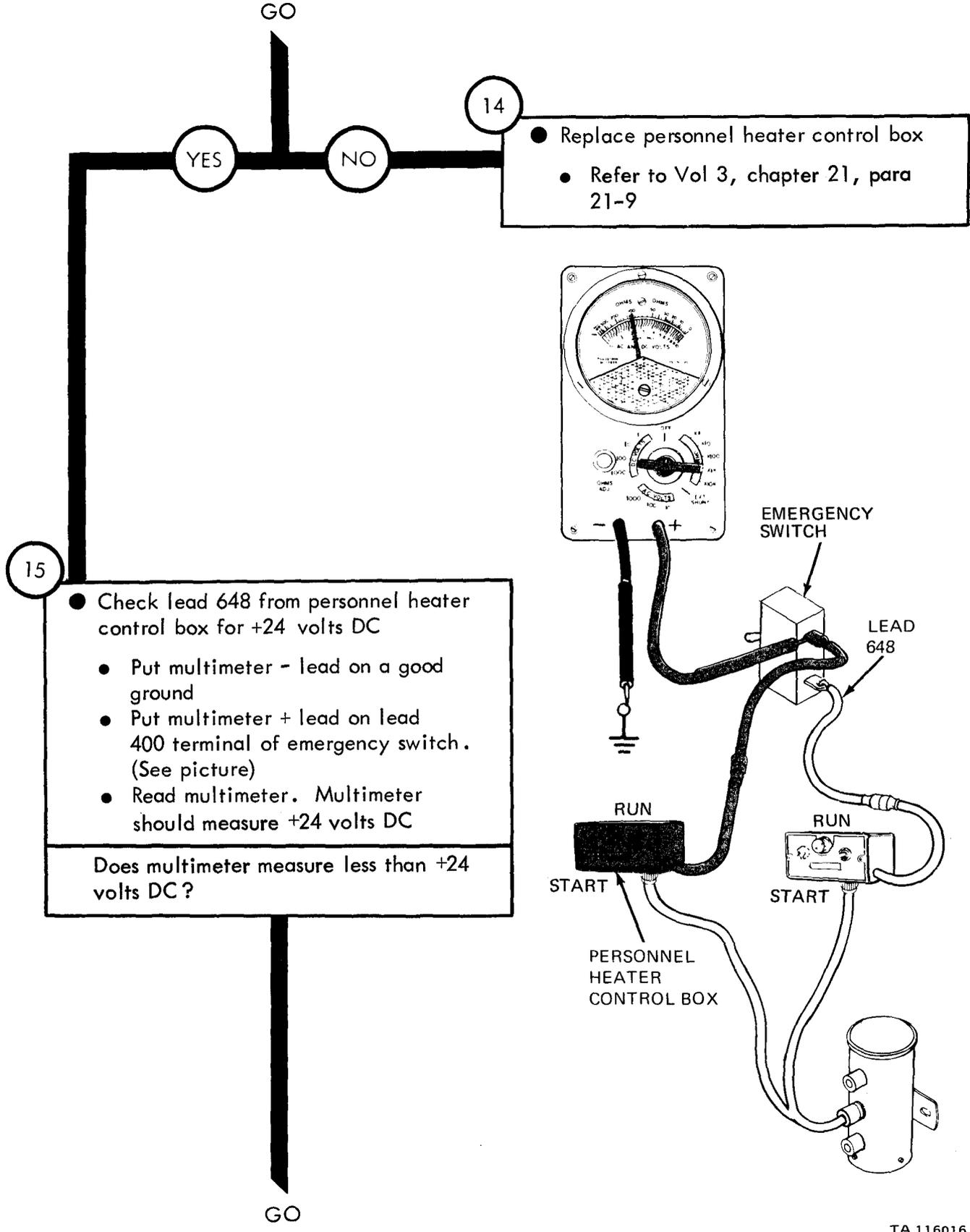


Figure 26-41 (Sheet 7 of 9)

TA 116016

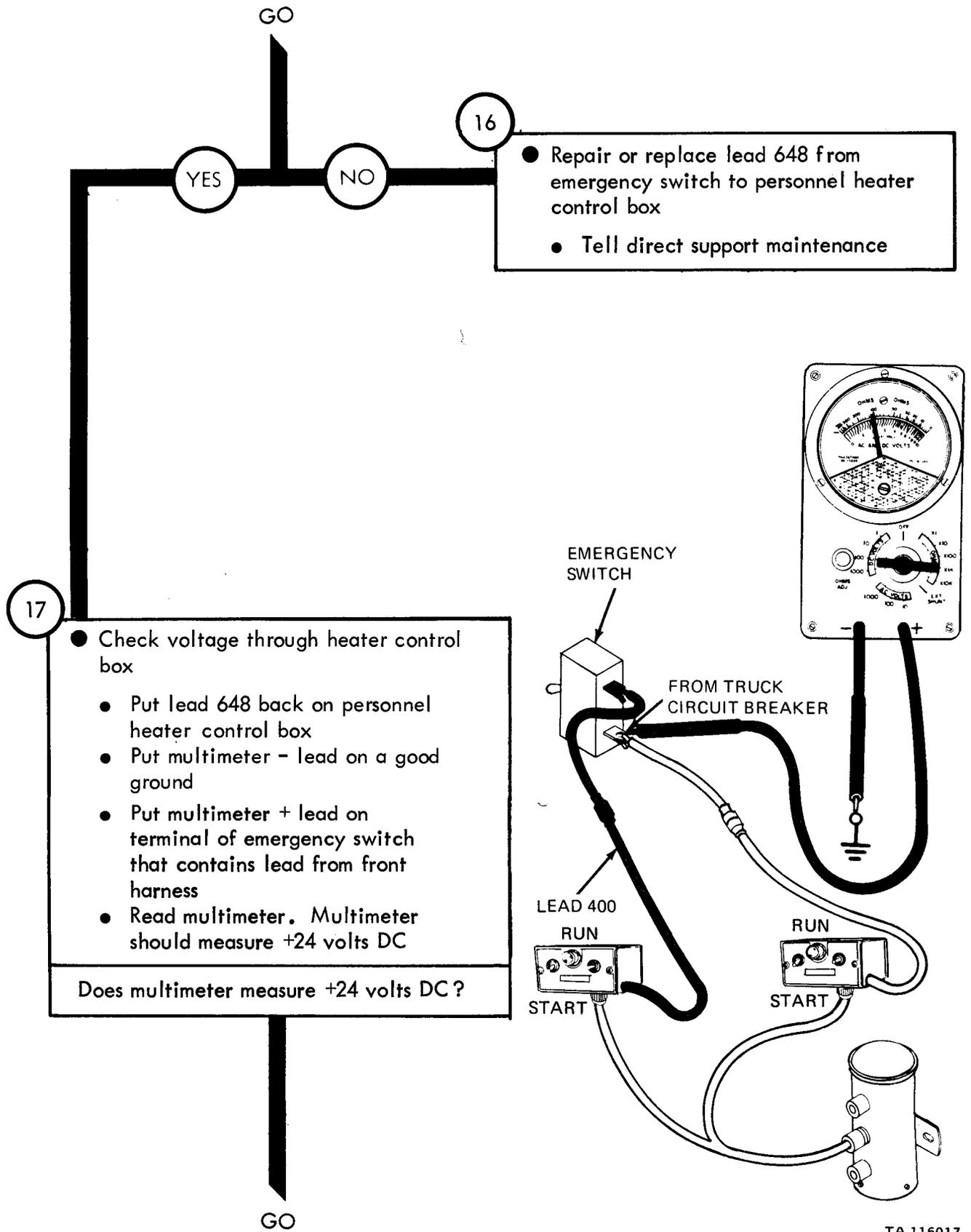
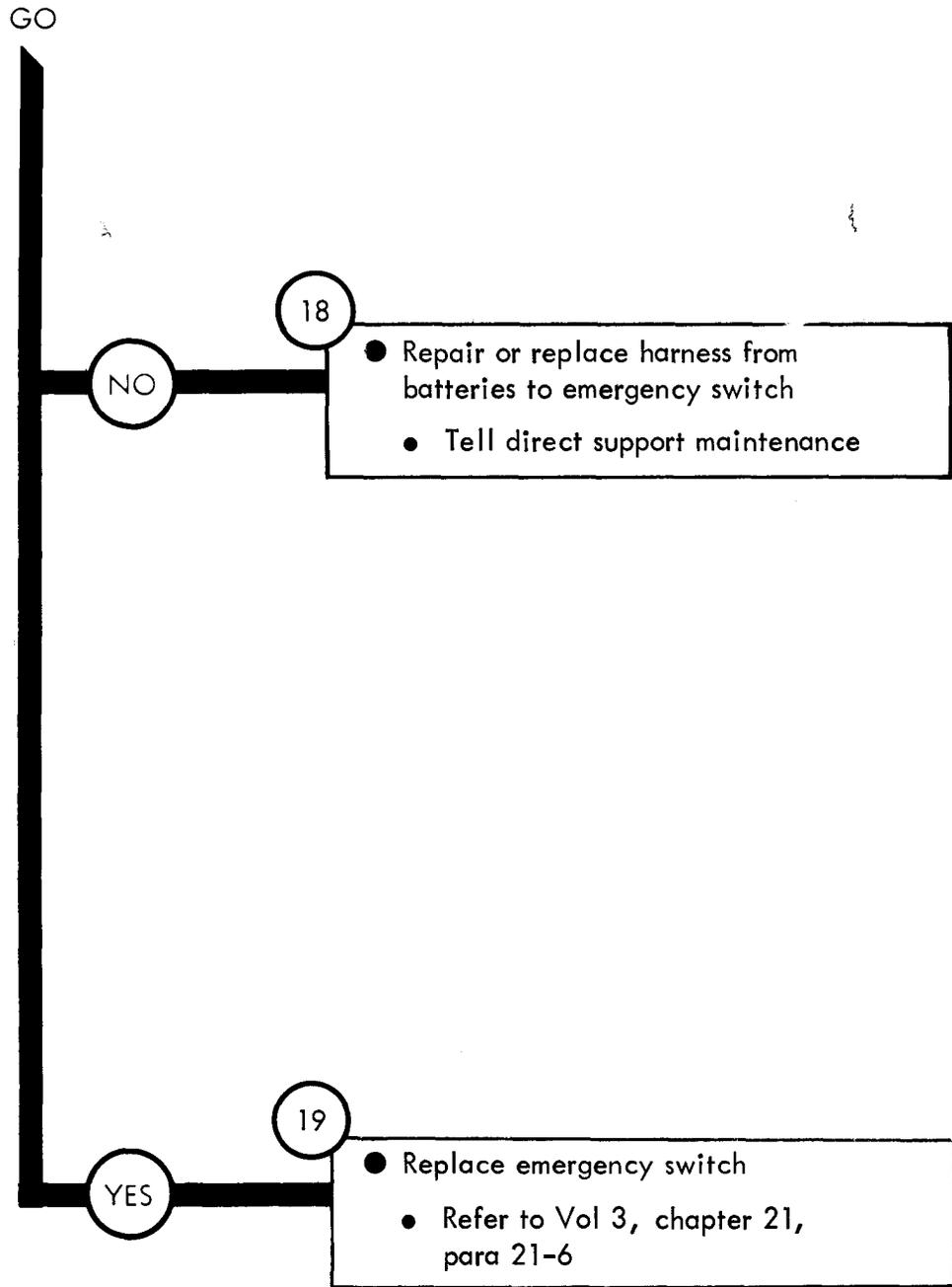


Figure 26-41 (Sheet 8 of 9)



TA 116018

Figure 26-41 (Sheet 9 of 9)

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6-24			6-22
14-22		14-5 (Sheet 3 of 4)	
26-222		26-24 (Sheet 2 of 3)	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

HOT WATER HEATER, symptom 4, summary refers to fig. 85-4. Should refer to fig. 85-1.

Box ⑦, third sentence reads "Replace broken fuel line." Should read "Replace broken or crushed fuel line."

Change illustration callouts.
Reason: callouts for JUMPER WIRE FROM PIN C TO GROUND and JUMPER WIRE FROM BATTERY & TERMINAL TO PIN B are reversed.

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Jane Idone

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TEAR ALONG PERFORATED LINE

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

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

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

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

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212^o Fahrenheit is equivalent to 100^o Celsius
 90^o Fahrenheit is equivalent to 32.2^o Celsius
 32^o Fahrenheit is equivalent to 0^o Celsius
 $9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$

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

