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.

VOLUME 2 OF 3

Part 1 of 2

PART 2 OF 2

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.

	SYSTEM	TROUBLE SHOOTING ROADMAPS	FAULT SYMPTOM INDEXES	SUMMARY TROUBLE-SHOOTING PROCEDURES	SYSTEM SUPPORT DIAGRAMS
1	ENGINE	Figure 5-1	Table 6-1	Figure 9-1	
2	CLUTCH	Figure 5-2	Table 6-2	Figure 12-1	
3	FUEL	Figure 5-3	Table 6-3	Figure 15-1	Figure 16-1
4	EXHAUST	Figure 5-4	Table 6-4	Figure 20-1	Figure 21-1
5	COOLING	Figure 5-5	Table 6-5	Figure 73-1	
6	ELECTRICAL	Figure 5-6	Table 6-6	Figure 27-1	Figure 28-1
7	TRANSMISSION	Figure 5-7	Table 6-7		
8	TRANSFER	Figure 5-8	Table 6-8	Figure 34-1	Figure 35-1
9	PROPELLER SHAFT	Figure 5-9	Table 6-9	Figure 38-1	Figure 39-1
10	FRONT AXLE	Figure 5-10	Table 6-10	Figure 41-1	
11	REAR AXLE	Figure 5-11	Table 6-11	Figure 44-1	
12	BRAKE	Figure 5-12	Table 6-12	Figure 47-1	Figure 48-1
13	WHEEL	Figure 5-13	Table 6-13	Figure 52-1	
14	STEERING	Figure 5-14	Table 6-14	Figure 55-1	Figure 56-1
15	SPRING AND SHOCK ABSORBER	Figure 5-15	Table 6-15	Figure 59-1	
16	FRONT WINCH	Figure 5-16	Table 6-16	Figure 61-1	
17	DUMP BODY AND HOIST	Figure 5-17	Table 6-17	Figure 64-1	Figure 65-1
18	REAR WINCH	Figure 5-18	Table 6-18	Figure 69-1	Figure 70-1
19	M543A2 WRECKER	Figure 5-19	Table 6-19	Figure 73-1	Figure 74-1
20	ENGINE COOLANT HEATER	Figure 5-20	Table 6-20	Figure 78-1	
21	FUEL BURNING PERSONNEL HEATER	Figure 5-21	Table 6-21	Figure 82-1	
22	HOT WATER HEATER	Figure 5-22	Table 6-22	Figure 85-1	
23	NONELECTRICAL GAGES	Figure 5-23	Table 6-23	Figure 88-1	Figure 89-1

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Figure 3-1. Troubleshooting Index

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*	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
	*Alternate for AN/URM-105C		
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 TA 115503

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.

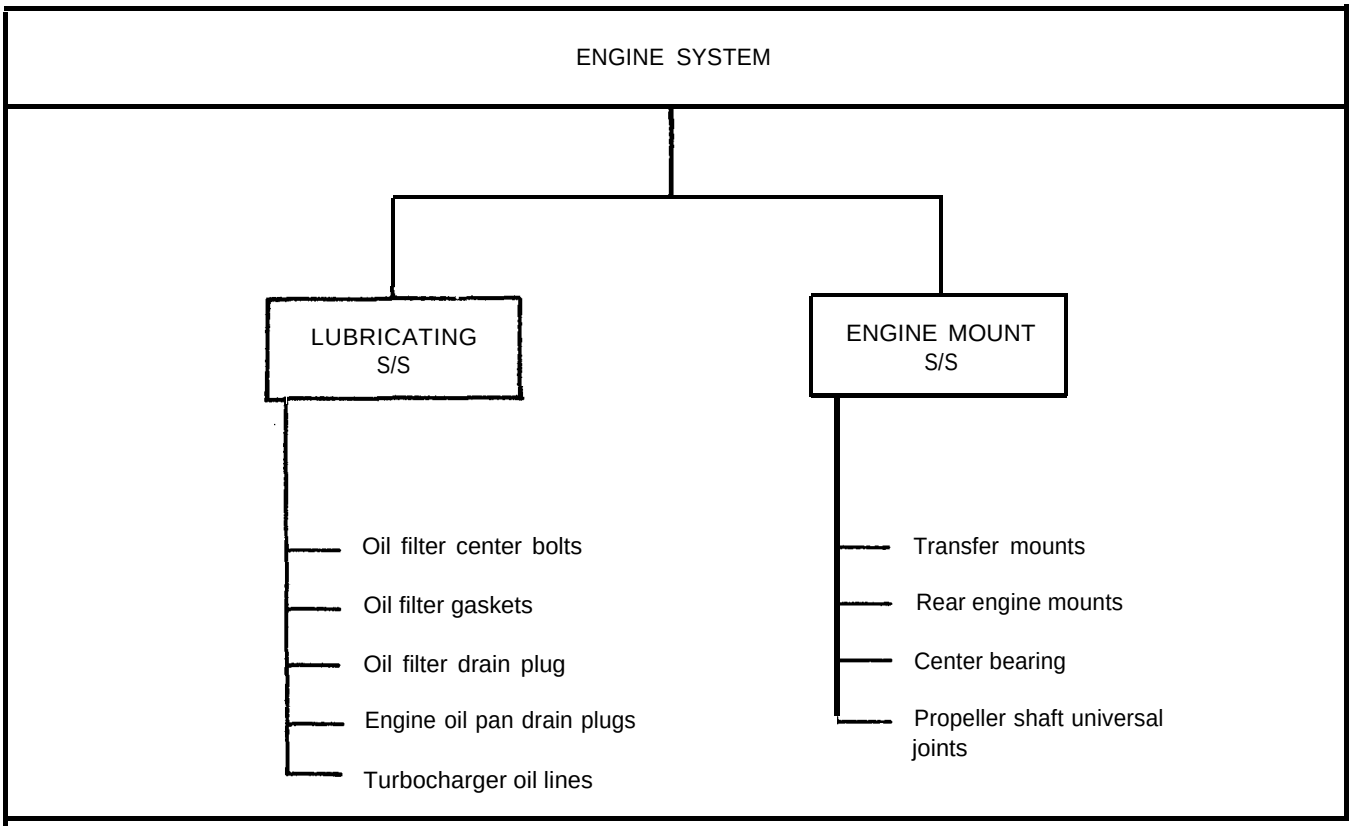

Figure 5-1. Troubleshooting Roadmaps, Engine System

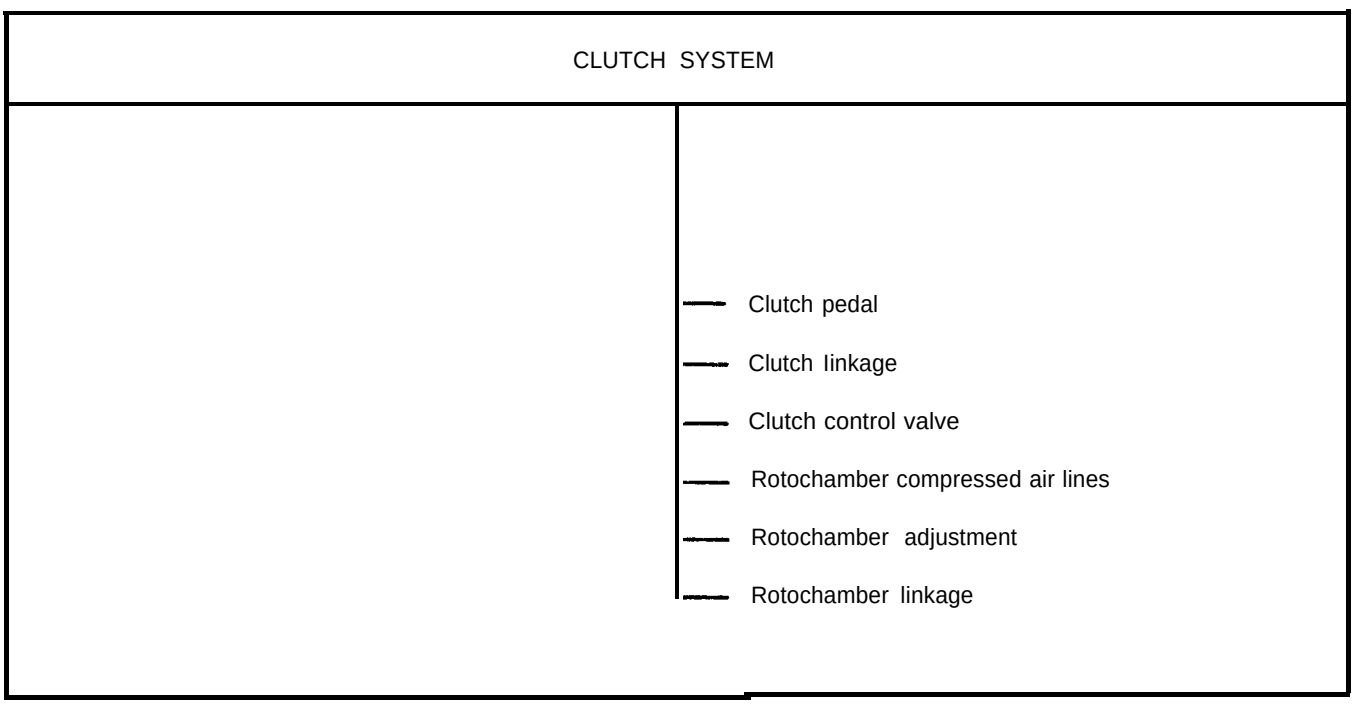

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Figure 5-2. Troubleshooting Roadmap, Clutch System

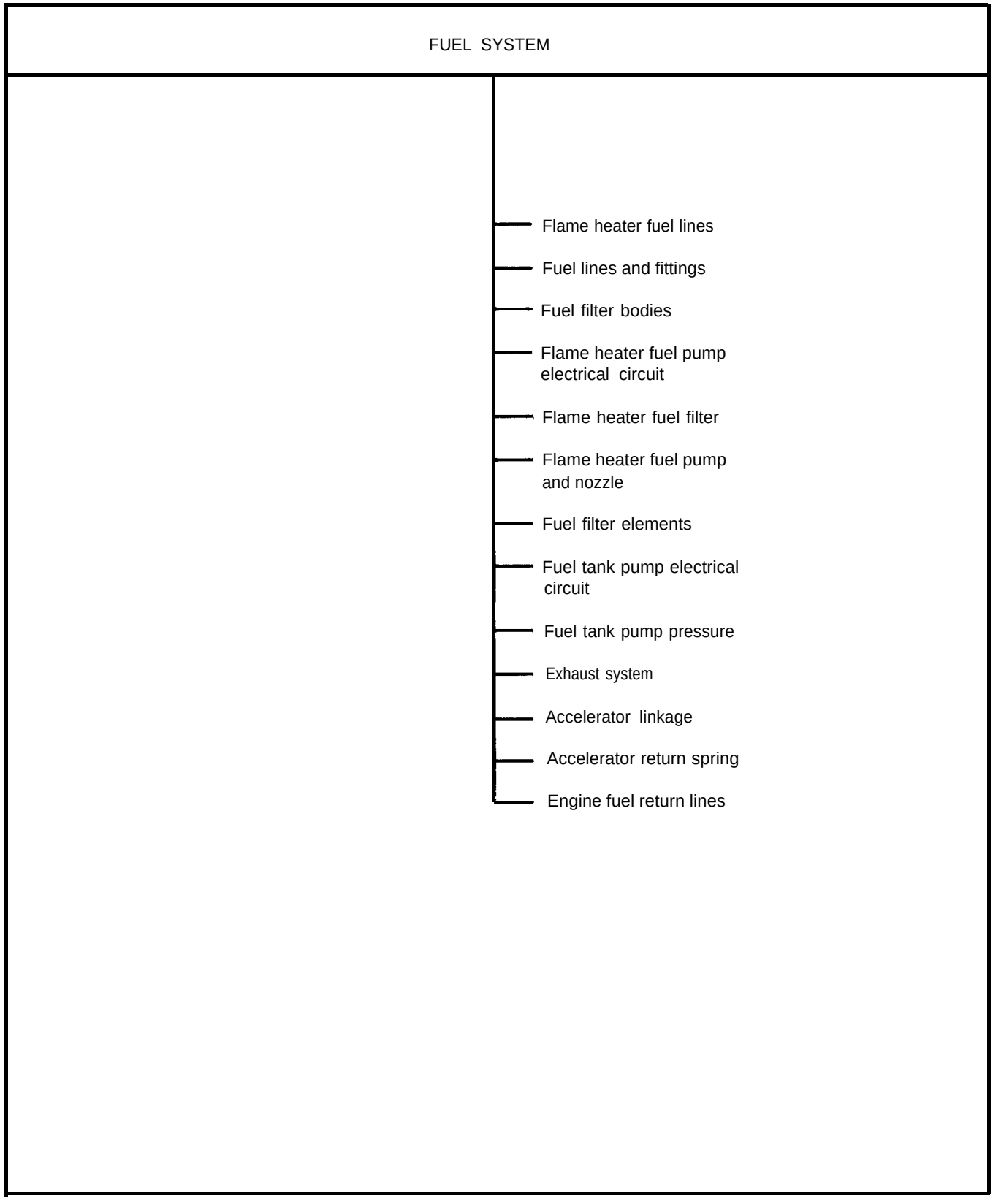

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Figure 5-3. Troubleshooting Roadmap, Fuel System

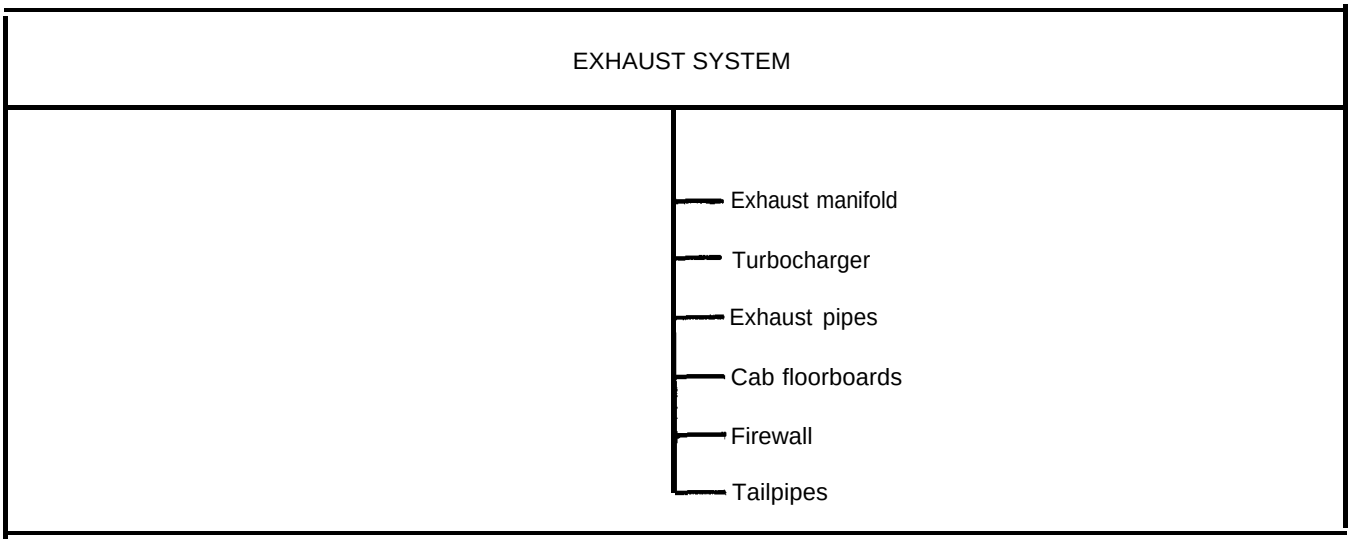

Figure 5-4. Troubleshooting Roadmap, Exhaust System

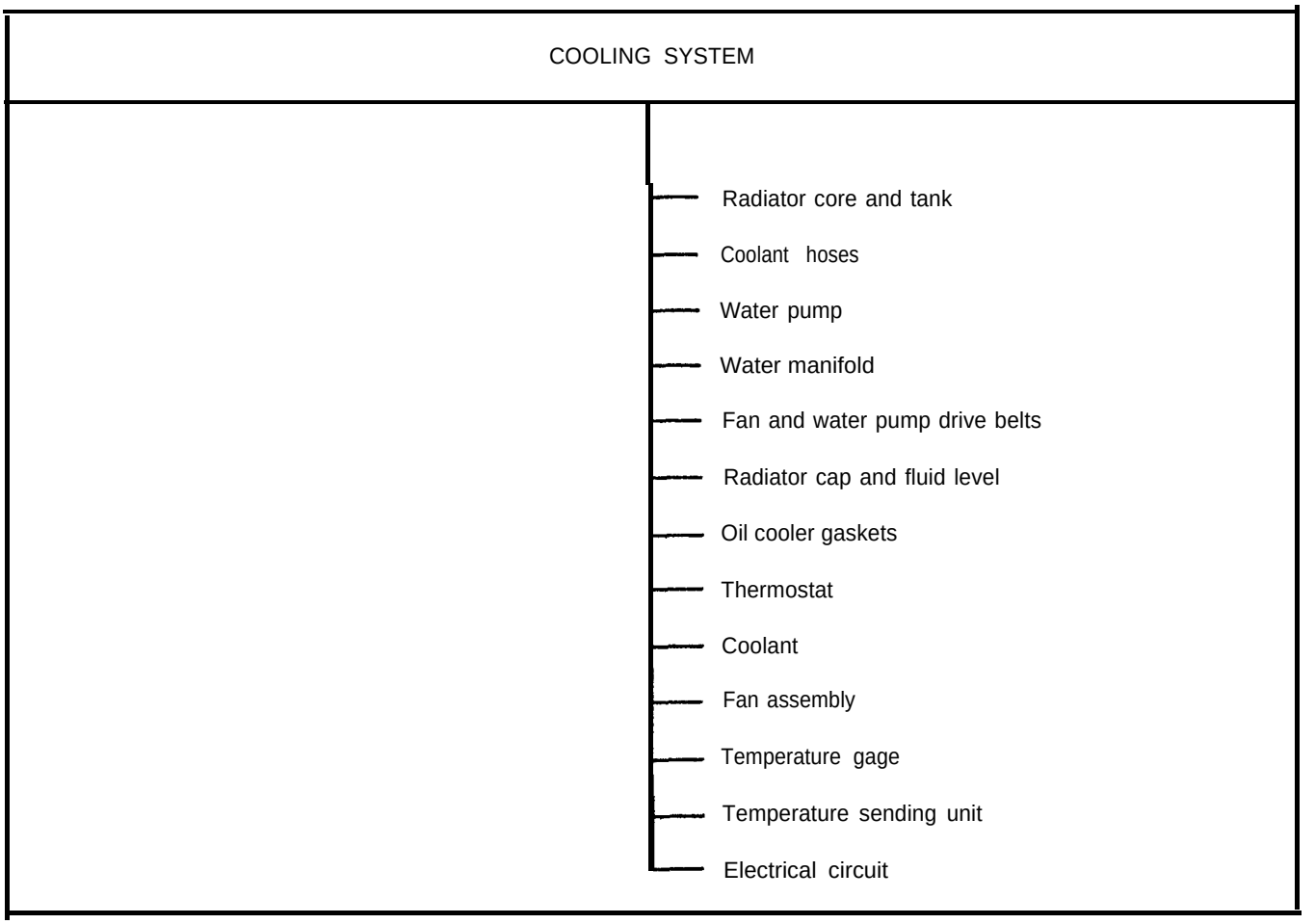

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Figure 5-5. Troubleshooting Roadmap, Cooling System

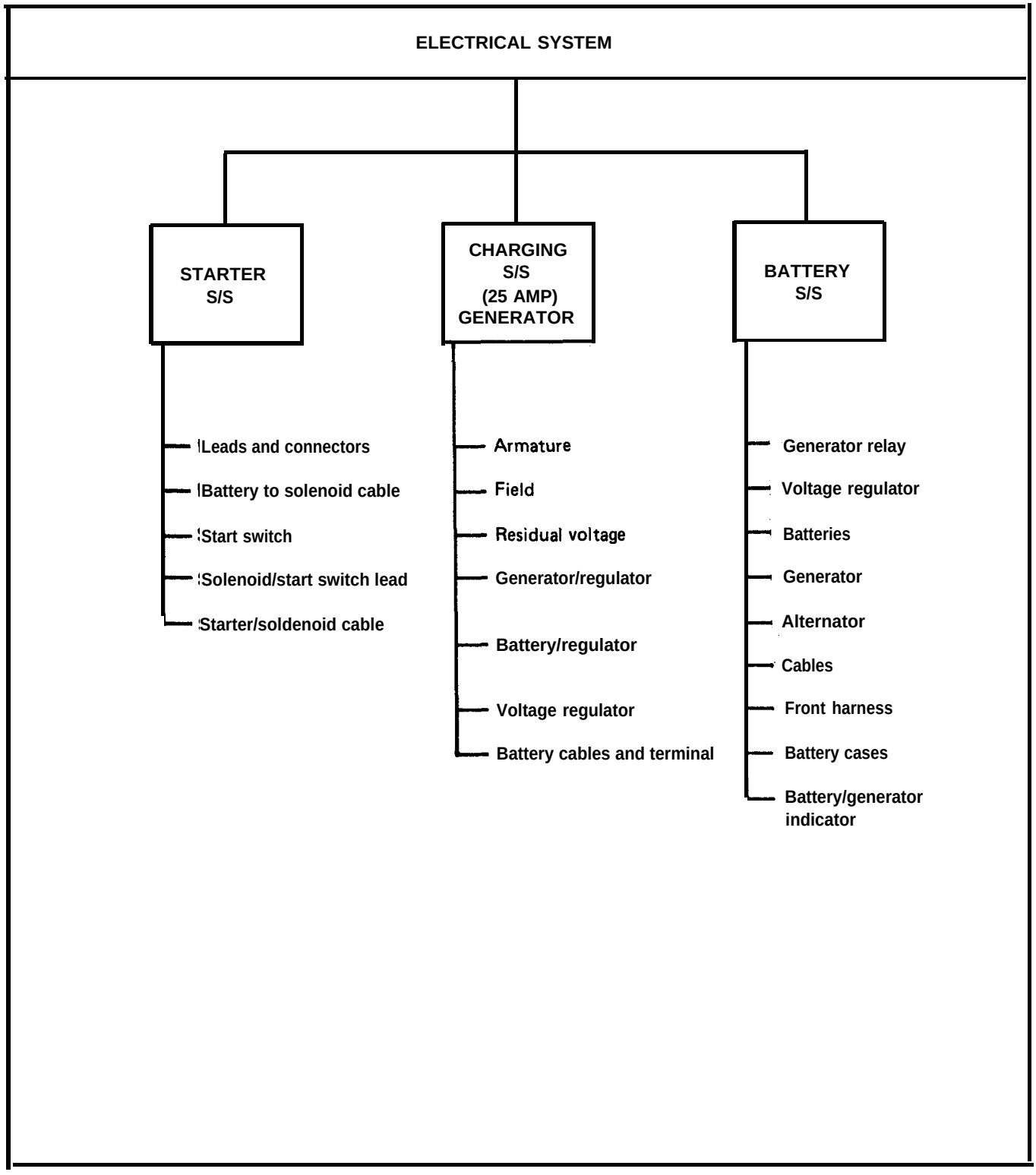

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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 1 of 5)

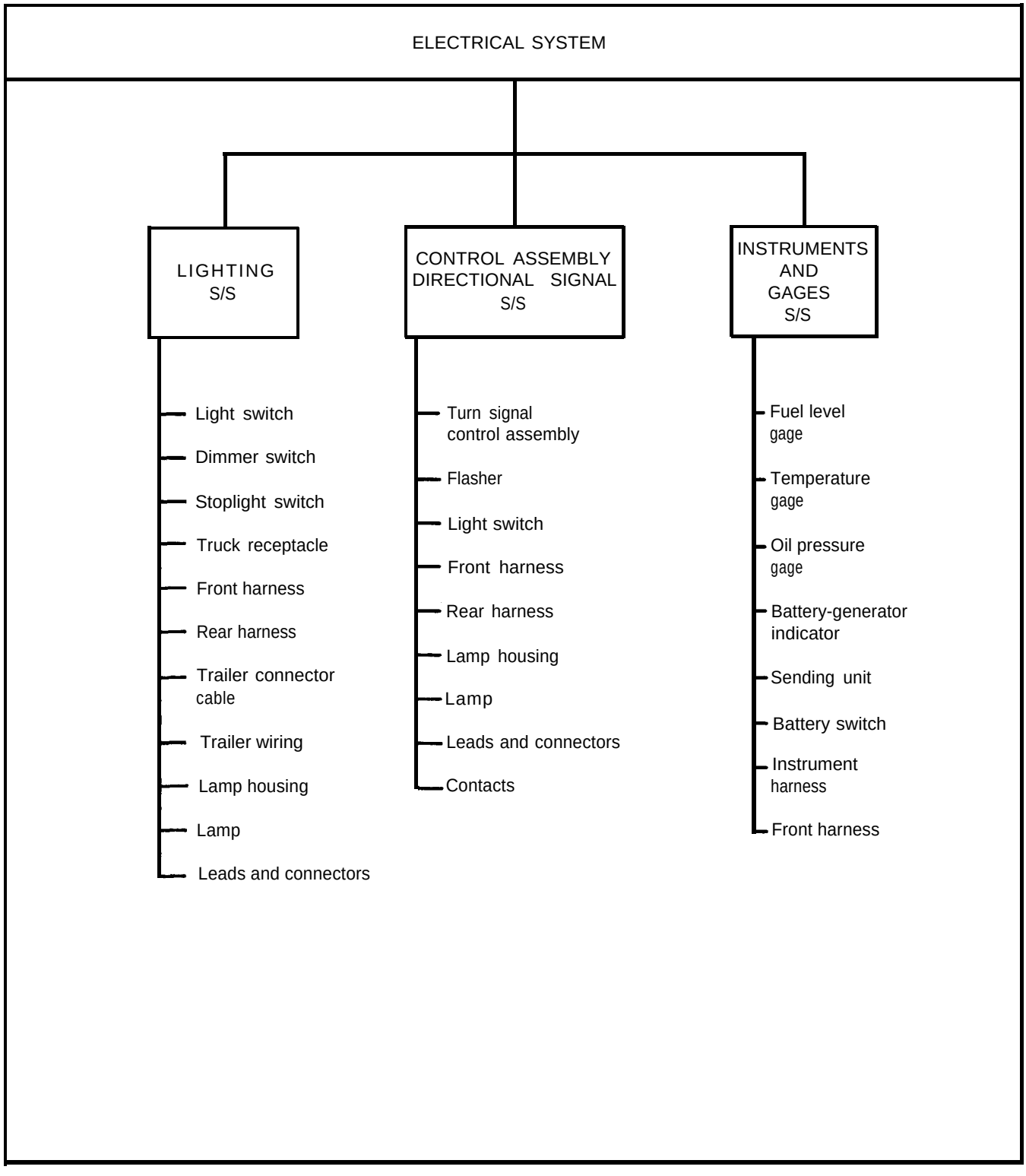

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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 2 of 5)

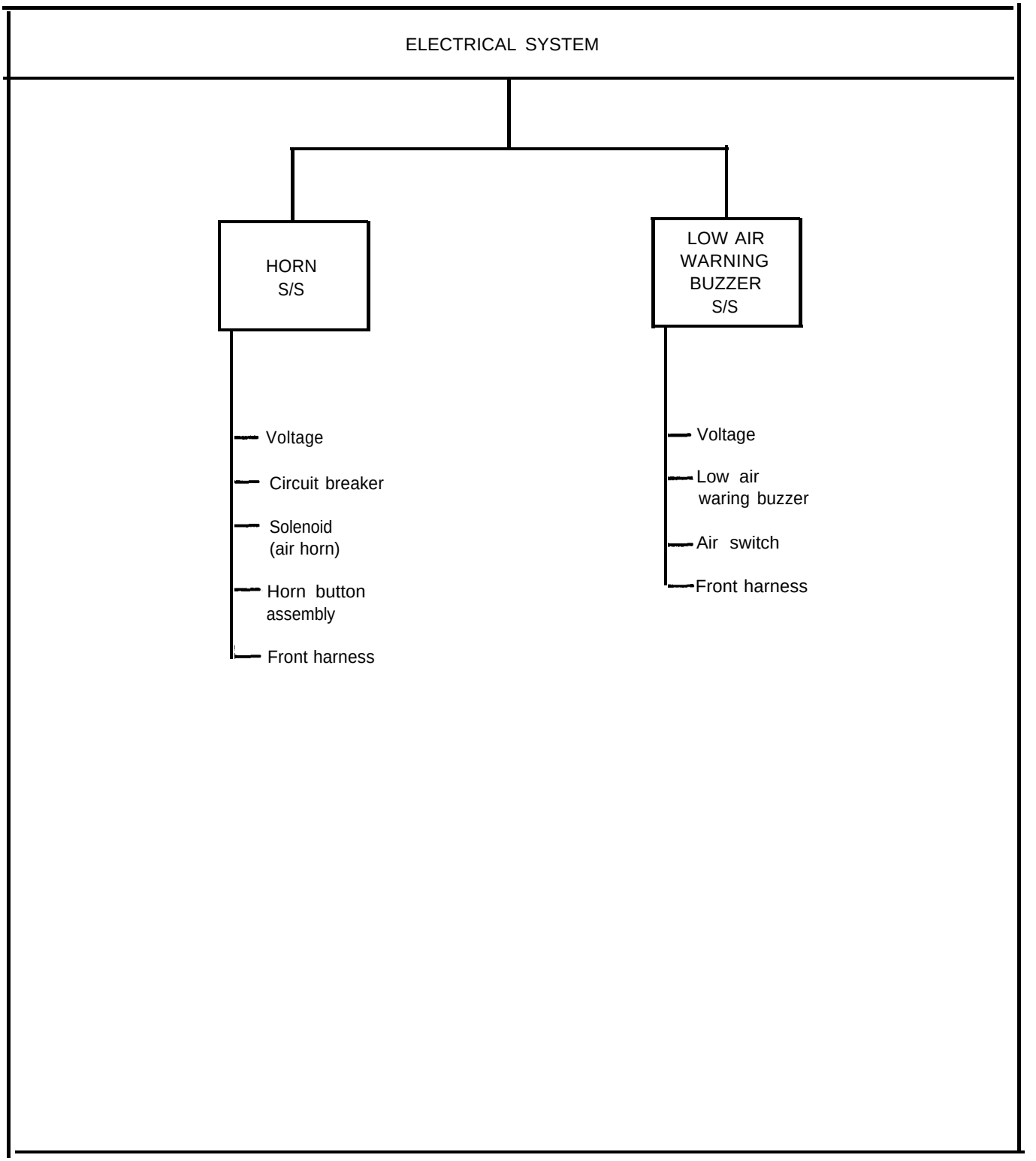

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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 3 of 5)

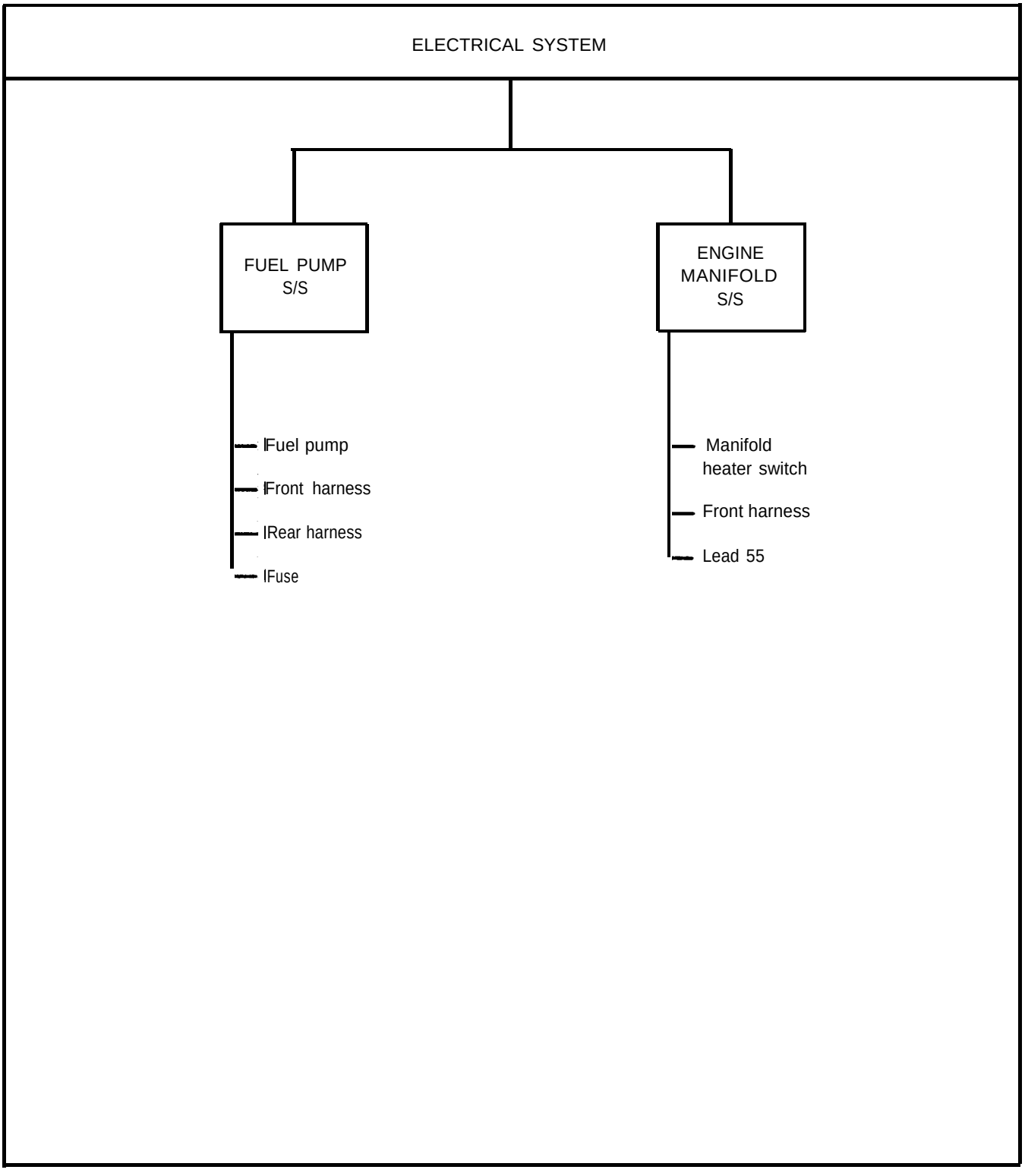

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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 4 of 5)

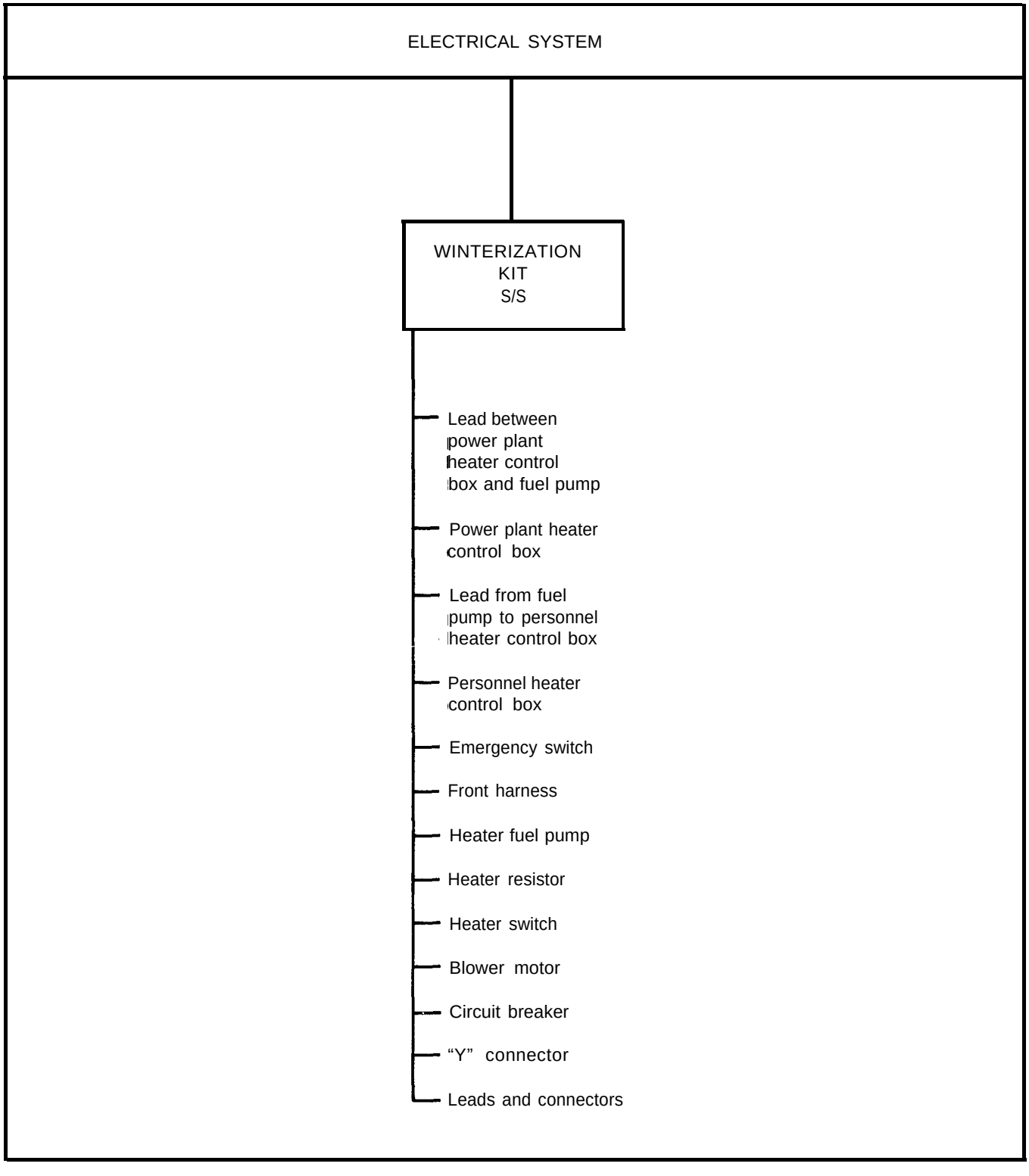

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Figure 5-6. Troubleshooting Roadmap, Electrical System (Sheet 5 of 5)

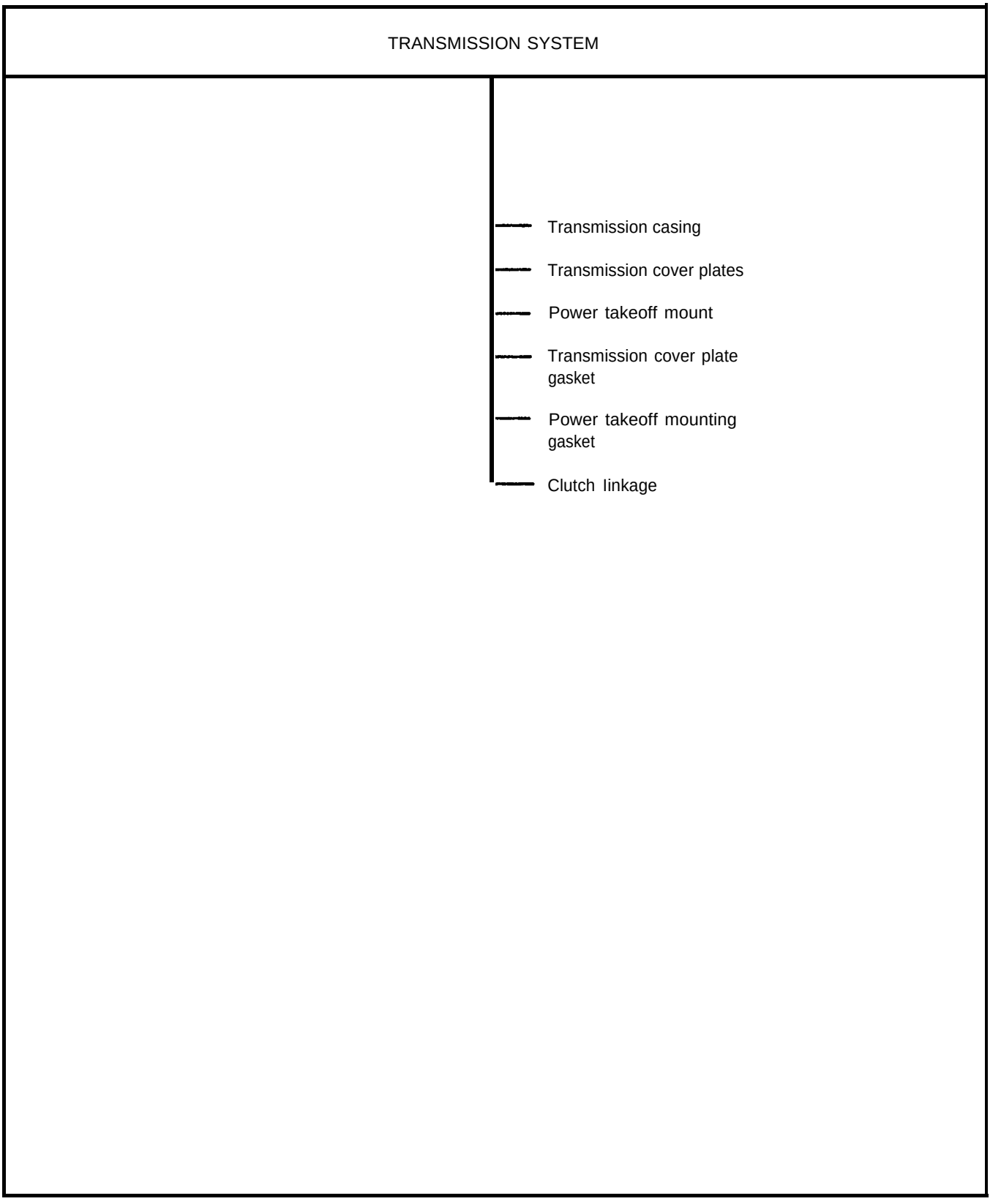

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Figure 5-7. Troubleshooting Roadmap, Transmission System

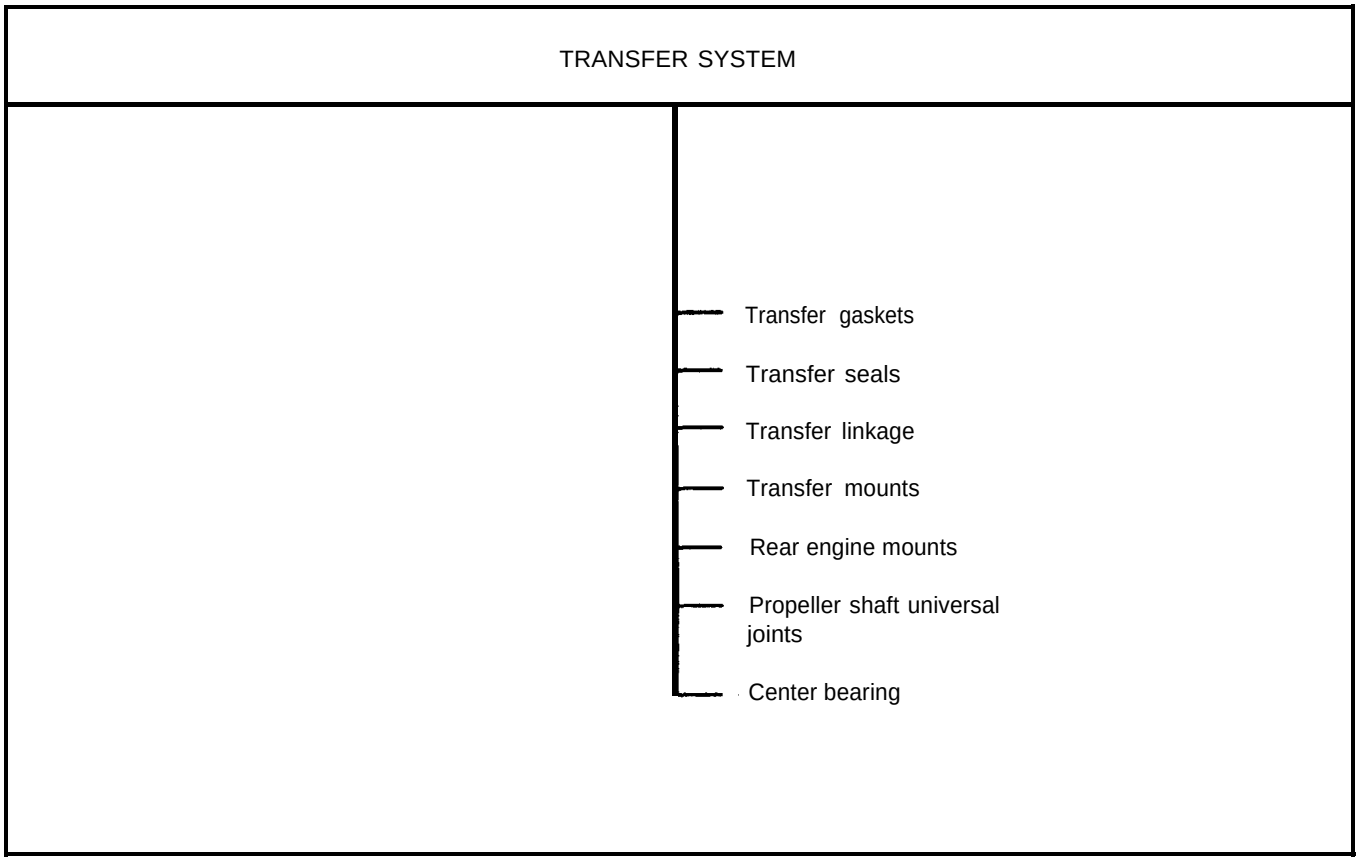

Figure 5-8. Troubleshooting Roadmap, Transfer System

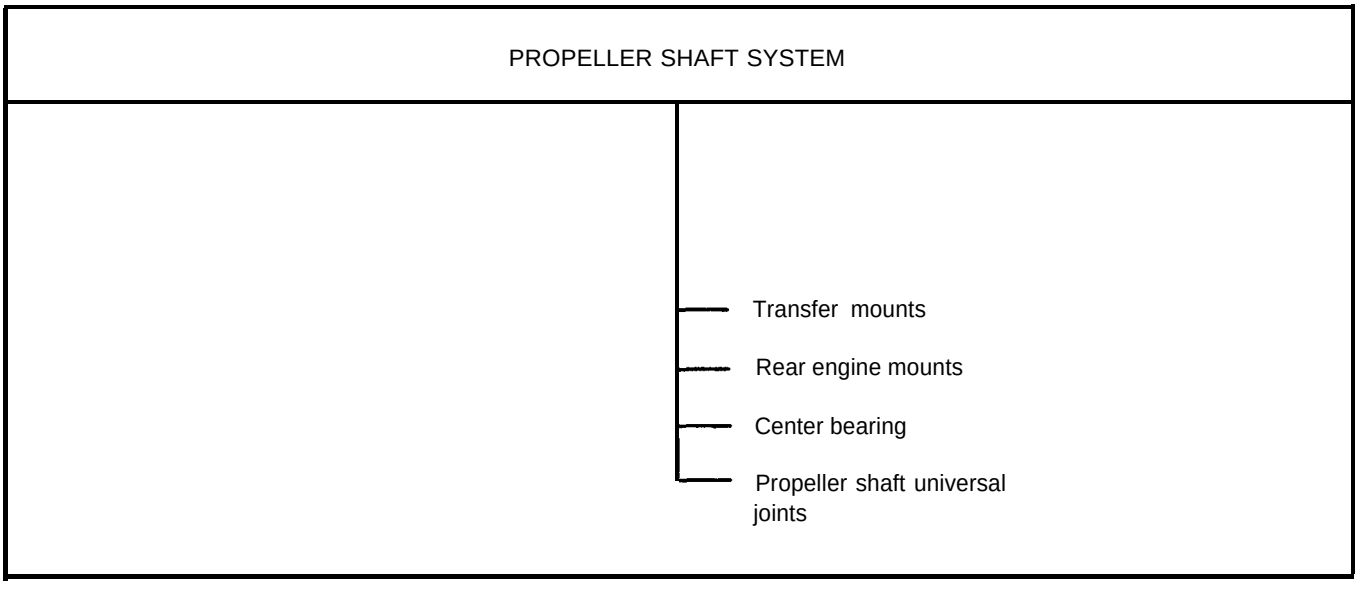

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Figure 5-9. Troubleshooting Roadmap, Propeller Shaft System

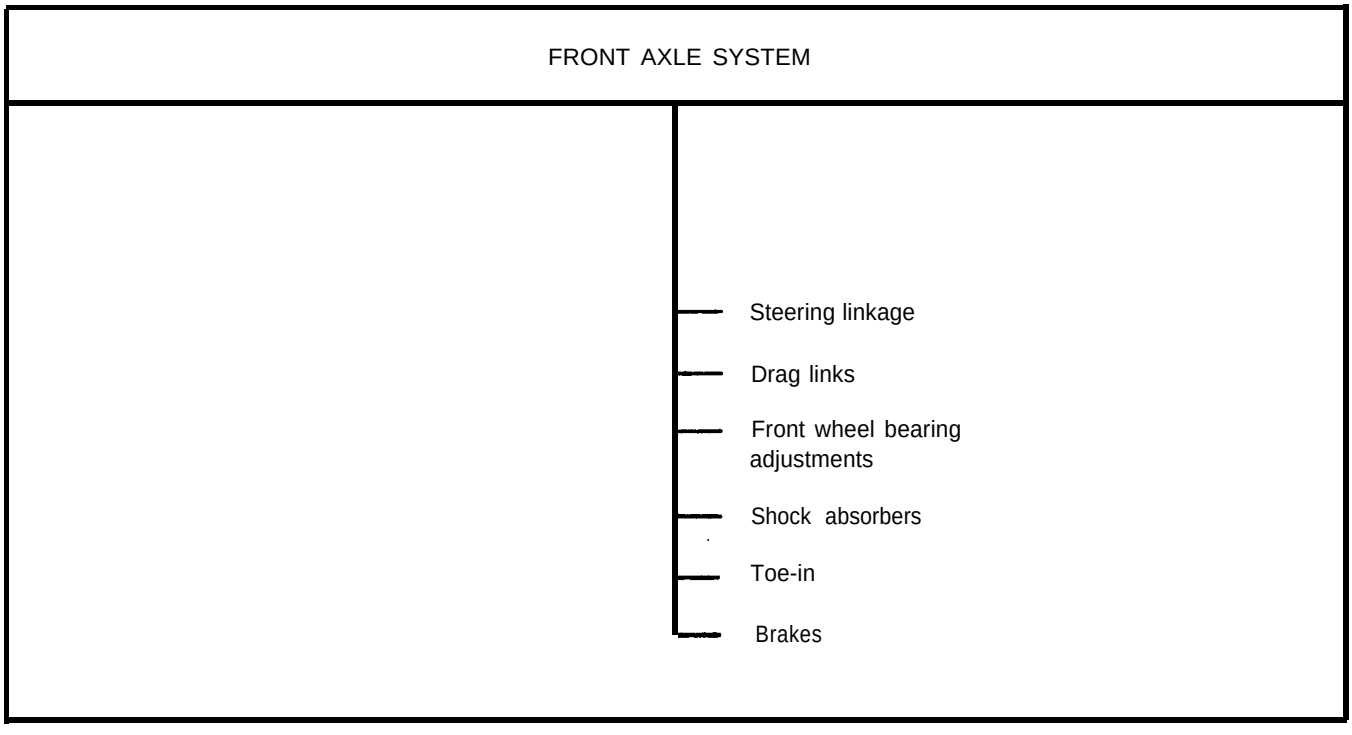

Figure 5-10. Troubleshooting, Front Axle System Roadmap

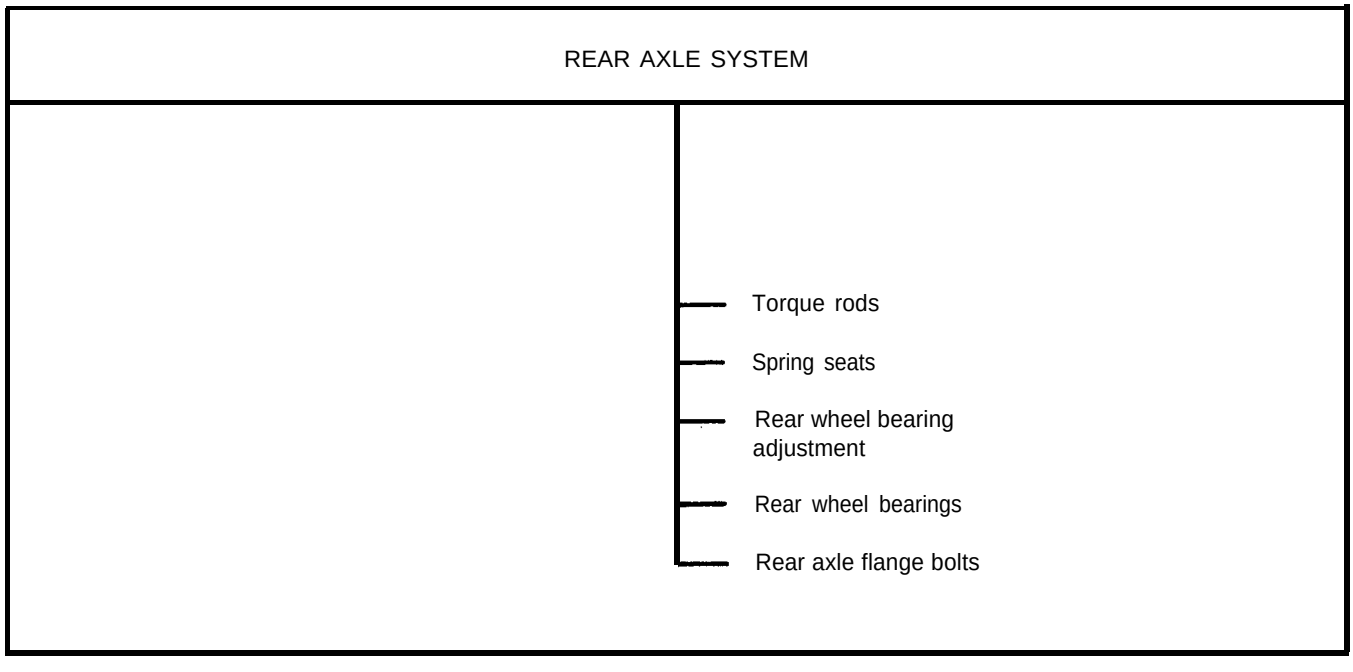

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Figure 5-11. Troubleshooting Roadmap, Rear Axle System

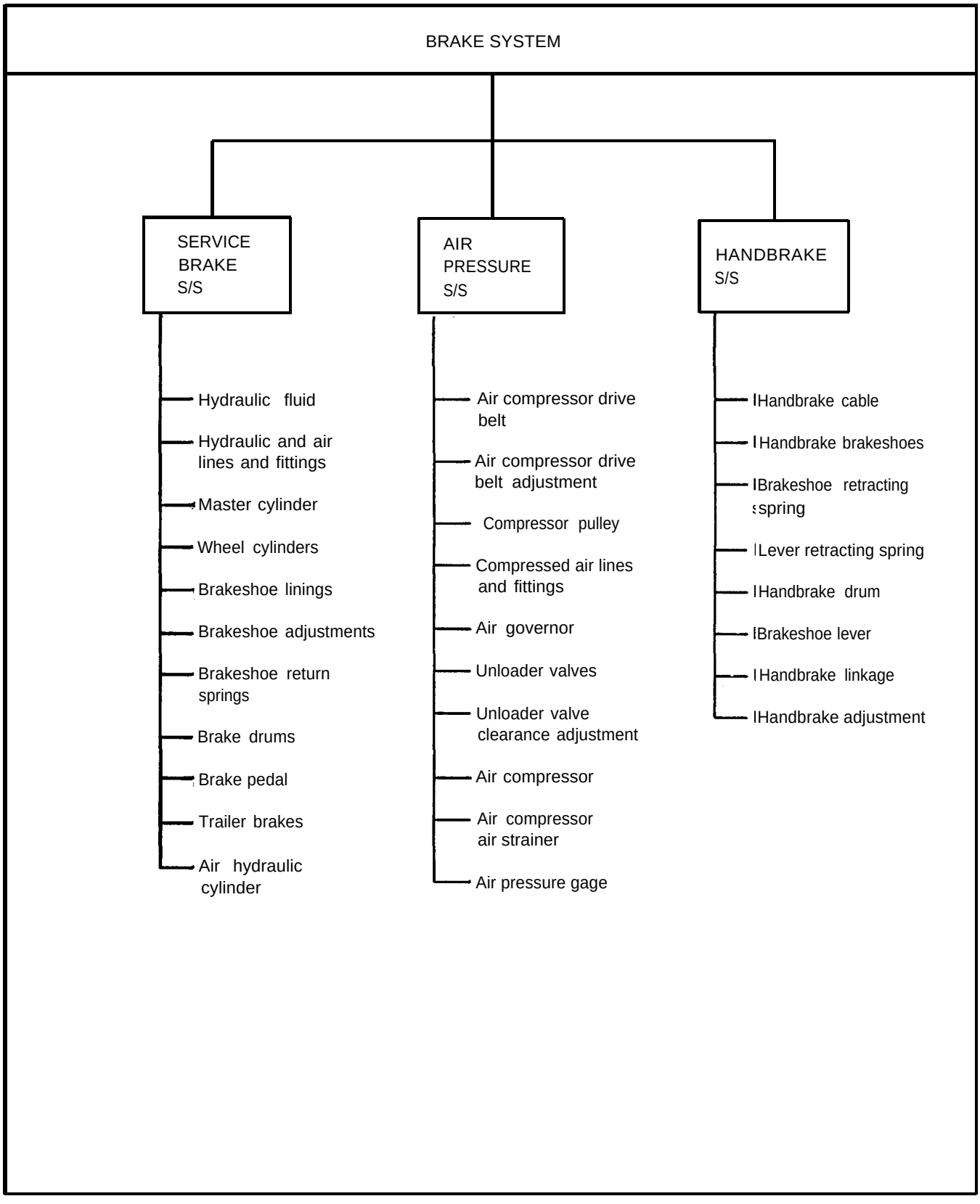

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Figure 5-12. Troubleshooting Roadmap, Brake System

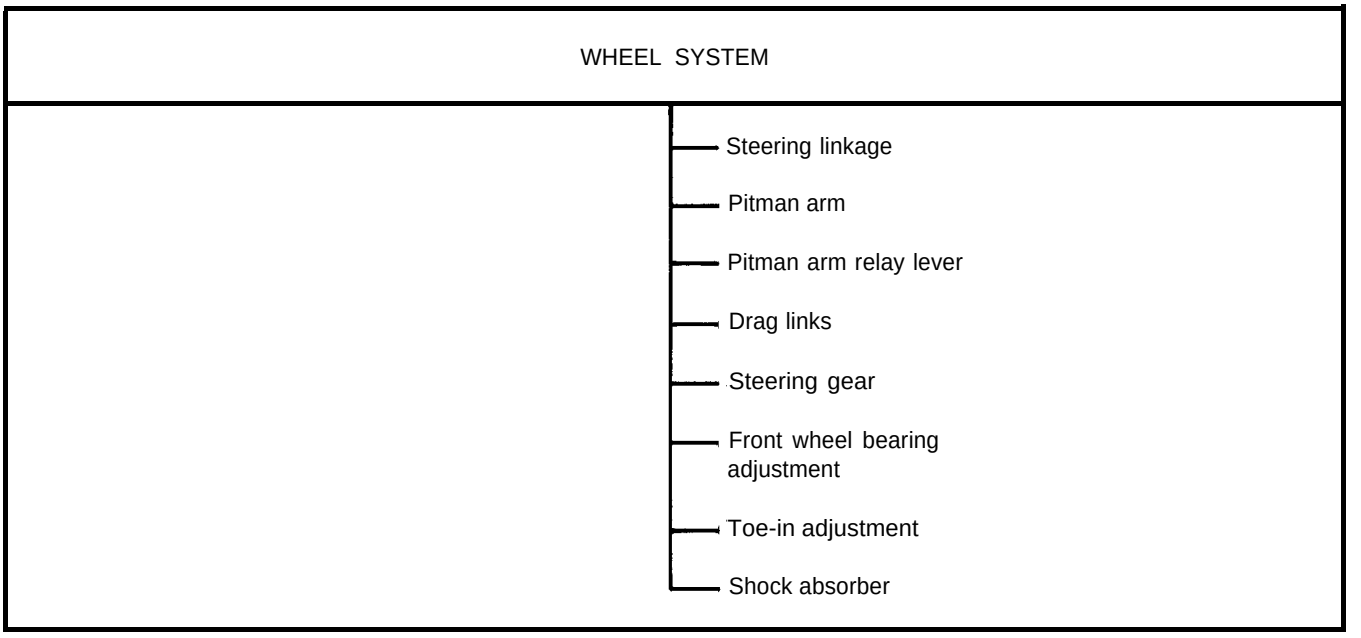

Figure 5-13. Troubleshooting Roadmap, Wheel System

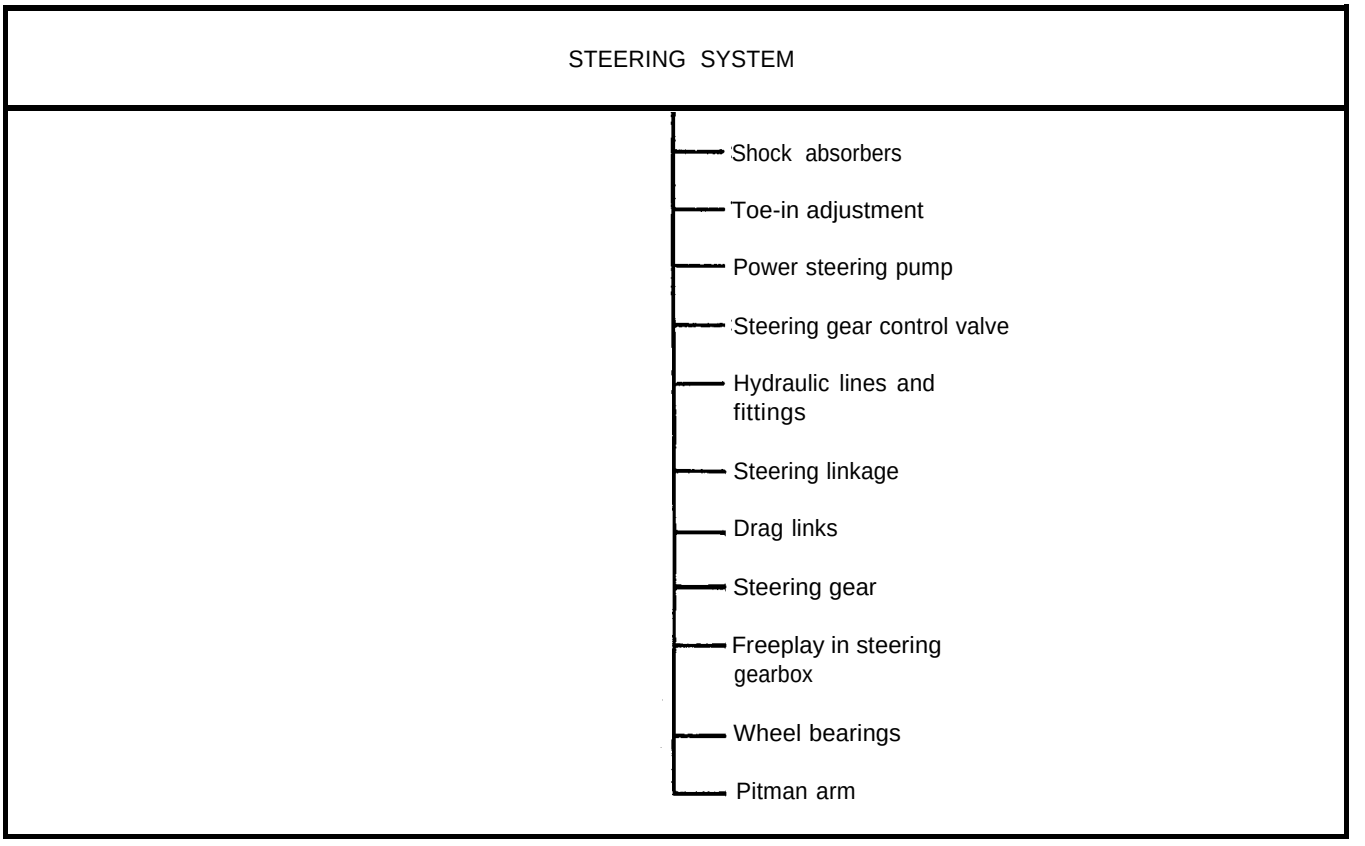

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Figure 5-14. Troubleshooting Roadmap, Steering System

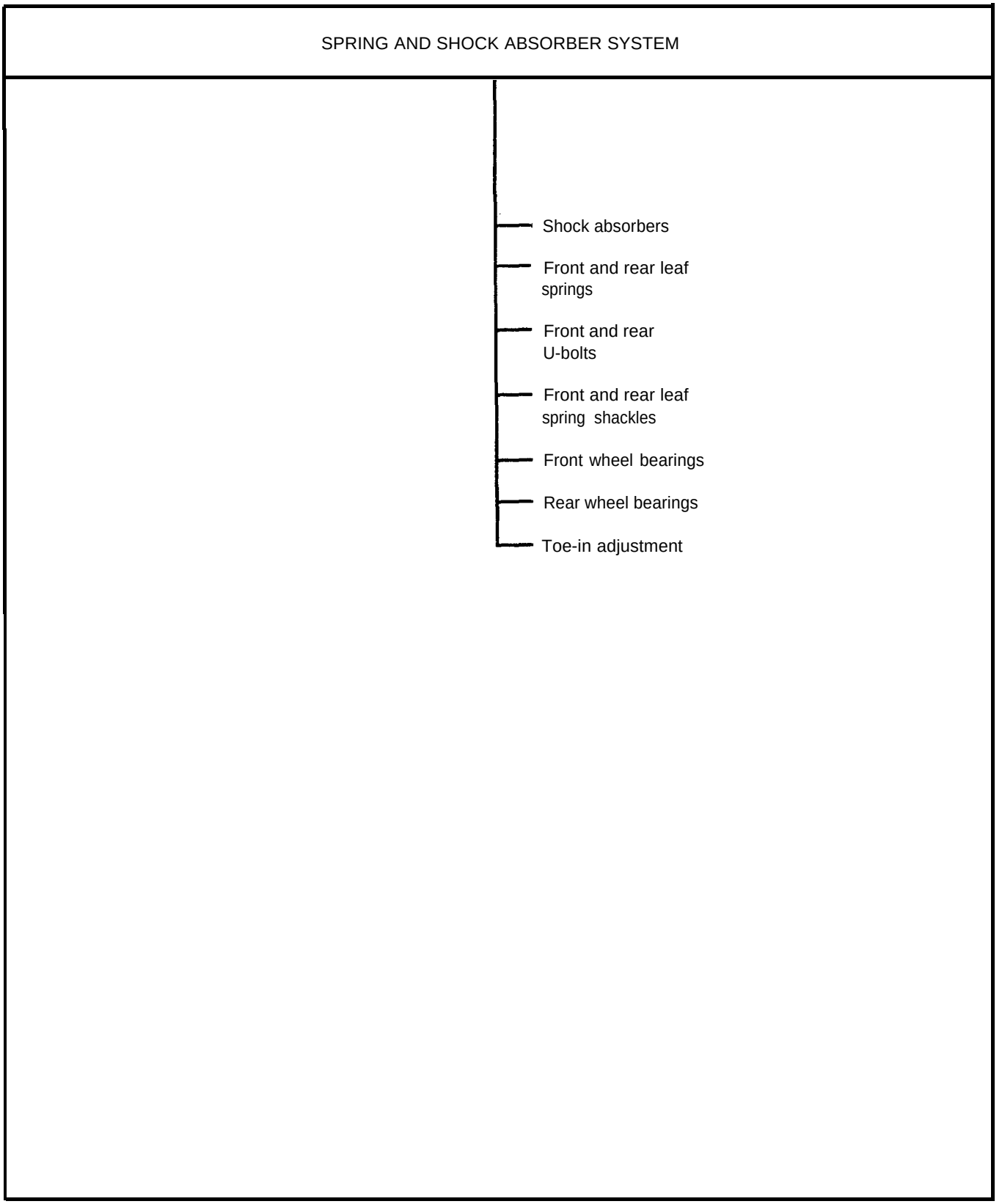

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Figure 5-15. Troubleshooting Roadmap, Spring and Shock Absorber System

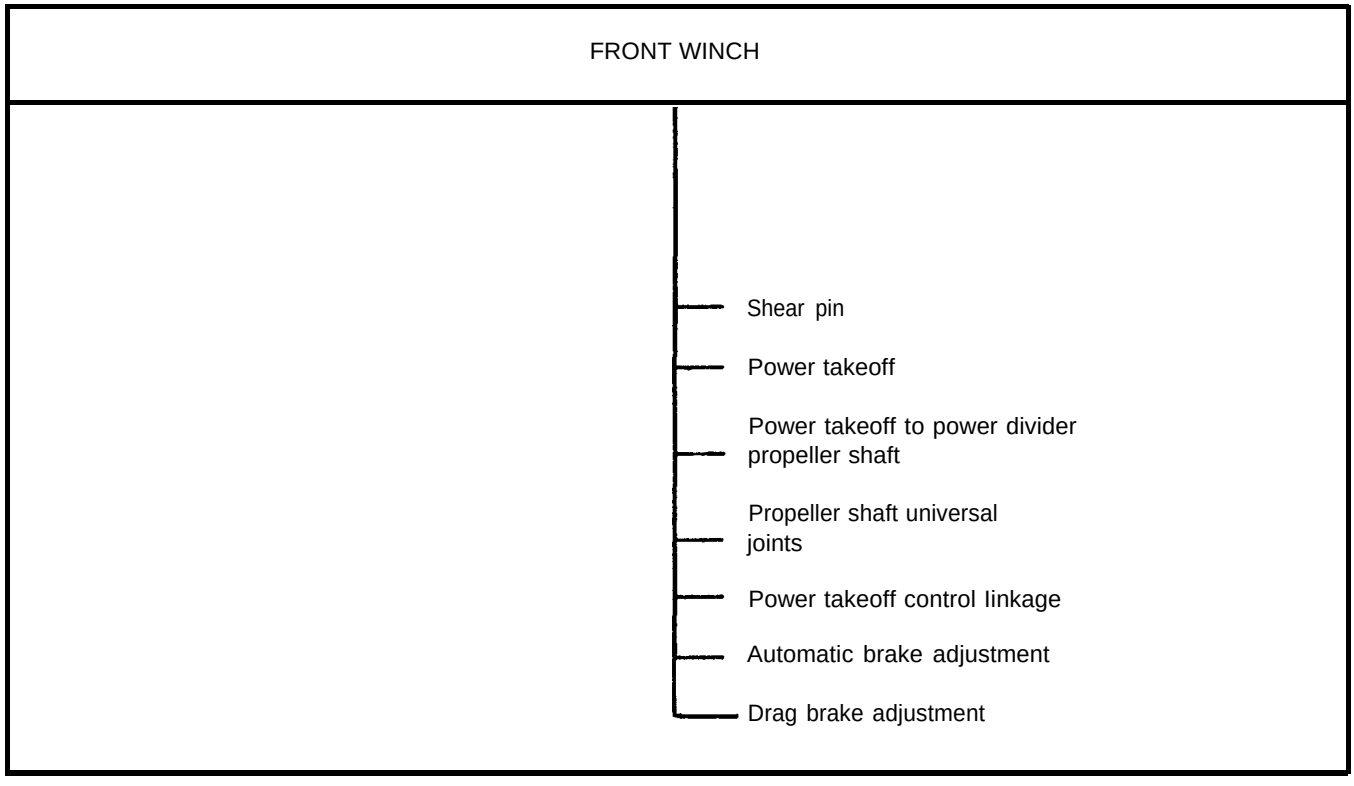

Figure 5-16. Troubleshooting Roadmap, Front Winch

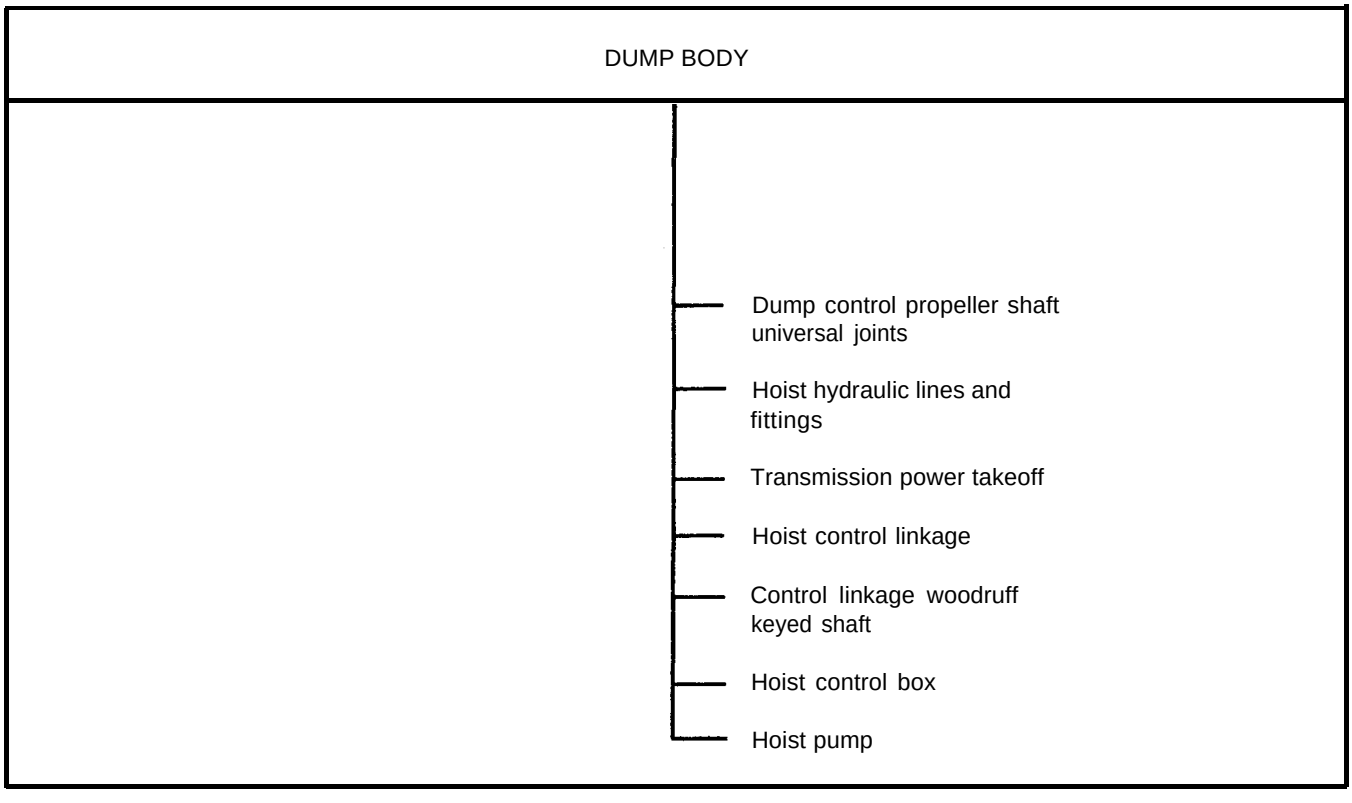

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Figure 5-17. Troubleshooting Roadmap, Dump Body and Hoist

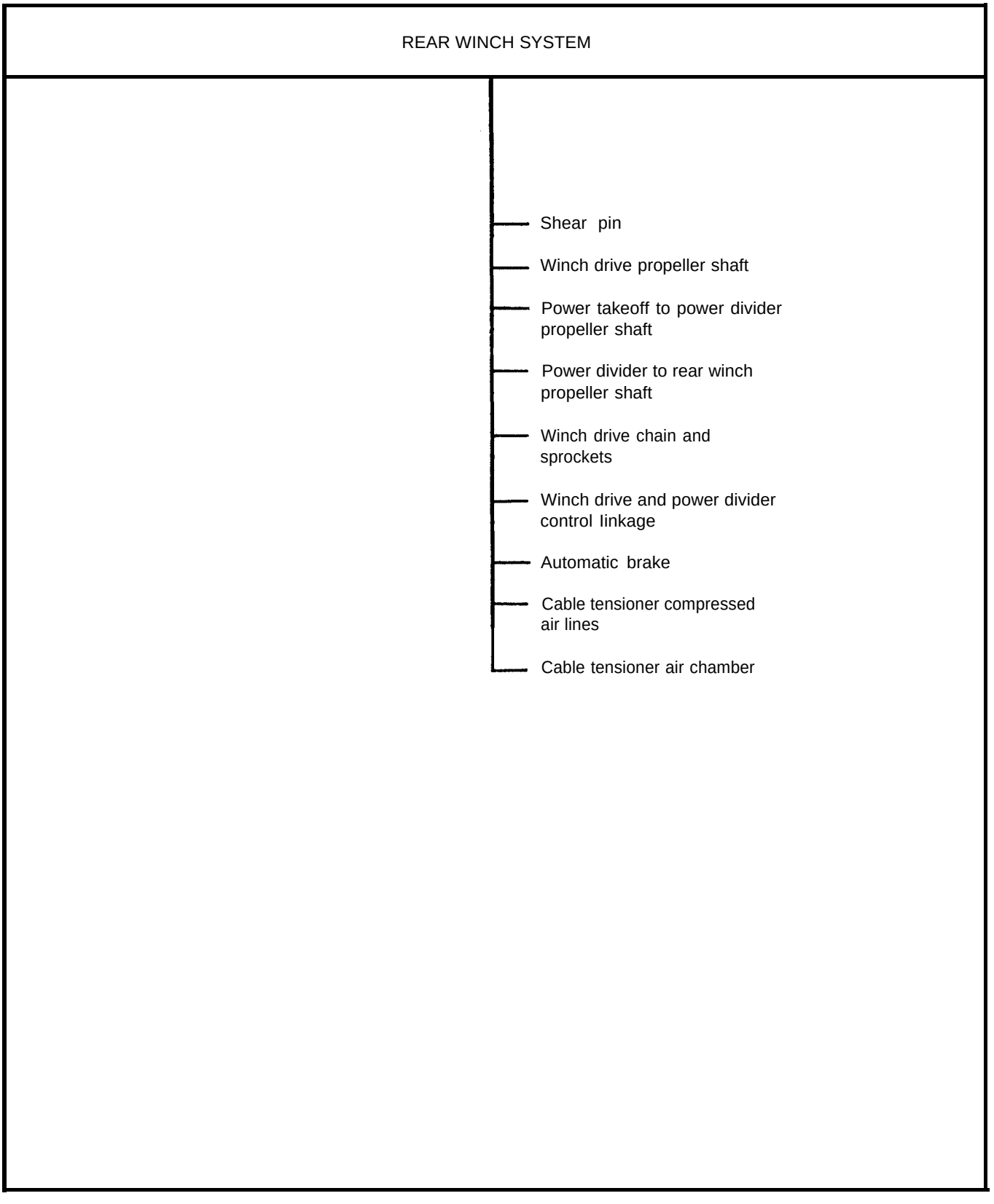

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Figure 5-18. Troubleshooting Roadmap, Rear Winch

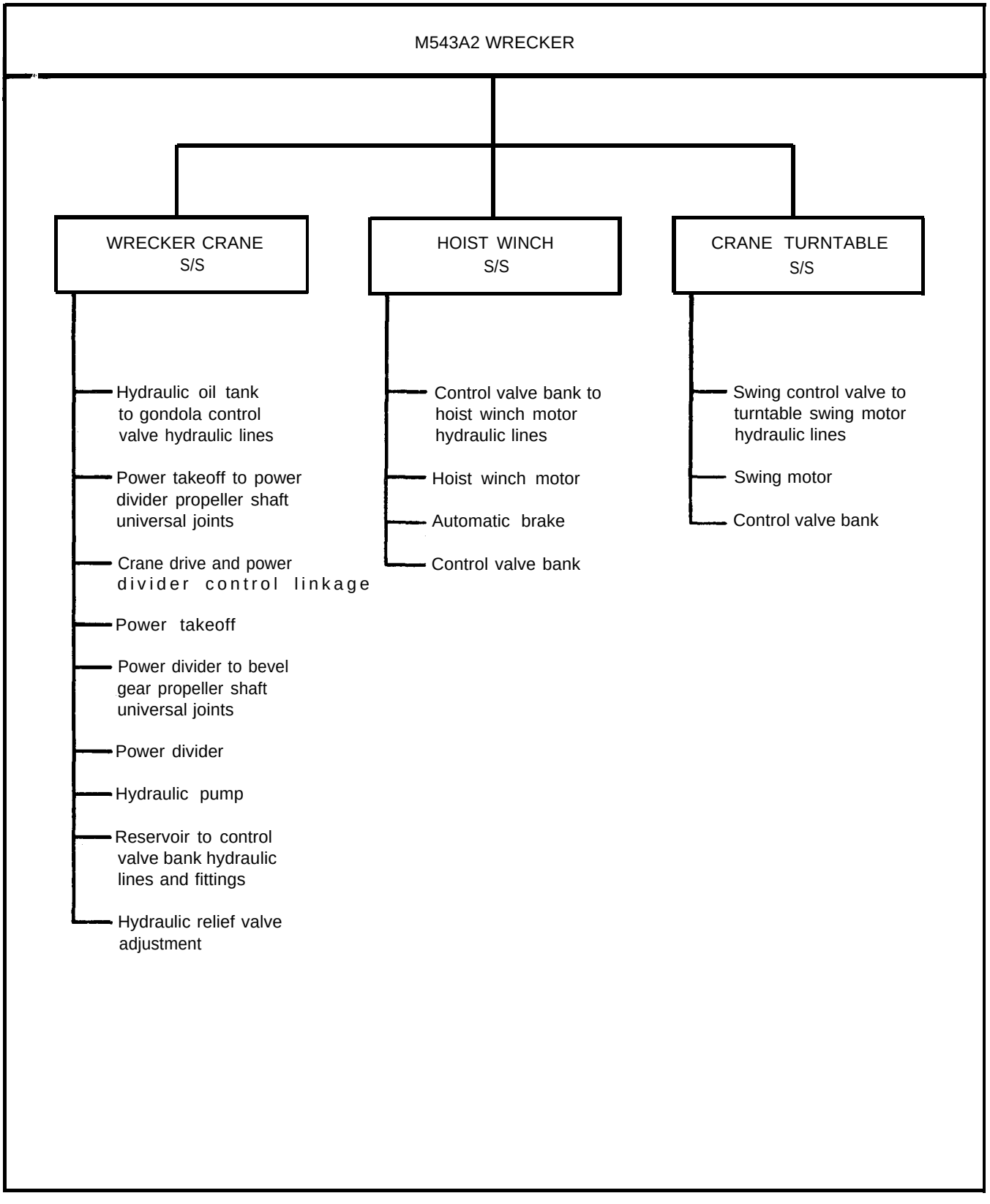

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Figure 5-19. Troubleshooting Roadmap, M543A2 Wrecker (Sheet 1 of 2)

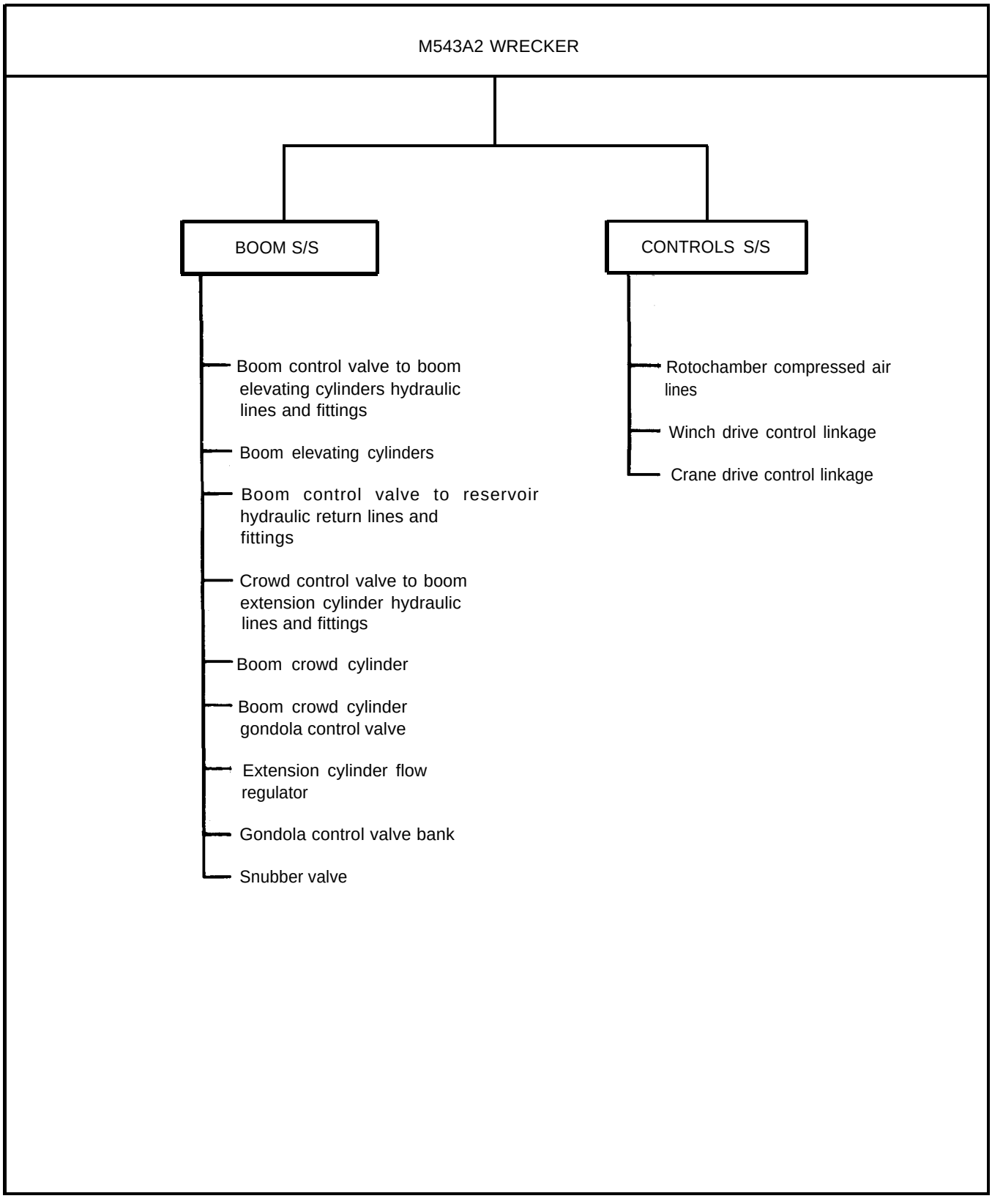

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Figure 5-19. Troubleshooting Roadmap, M543A2 Wrecker (Sheet 2 of 2)

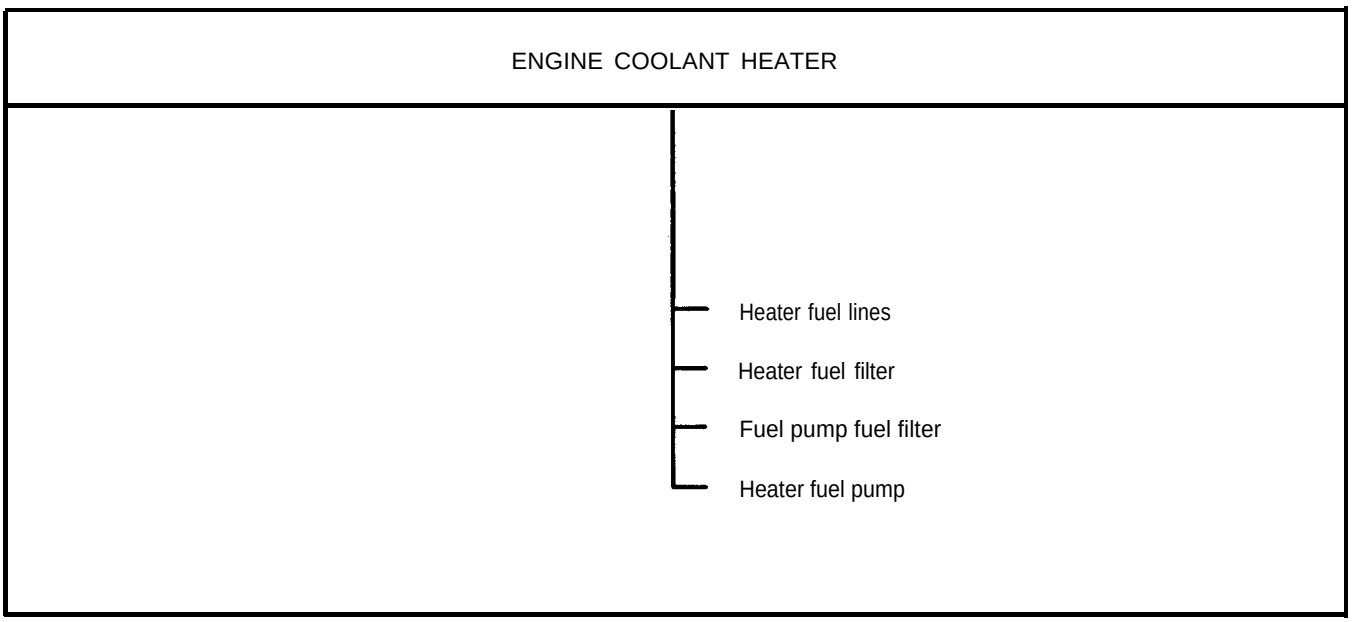

Figure 5-20. Troubleshooting Roadmap, Engine Coolant Heater

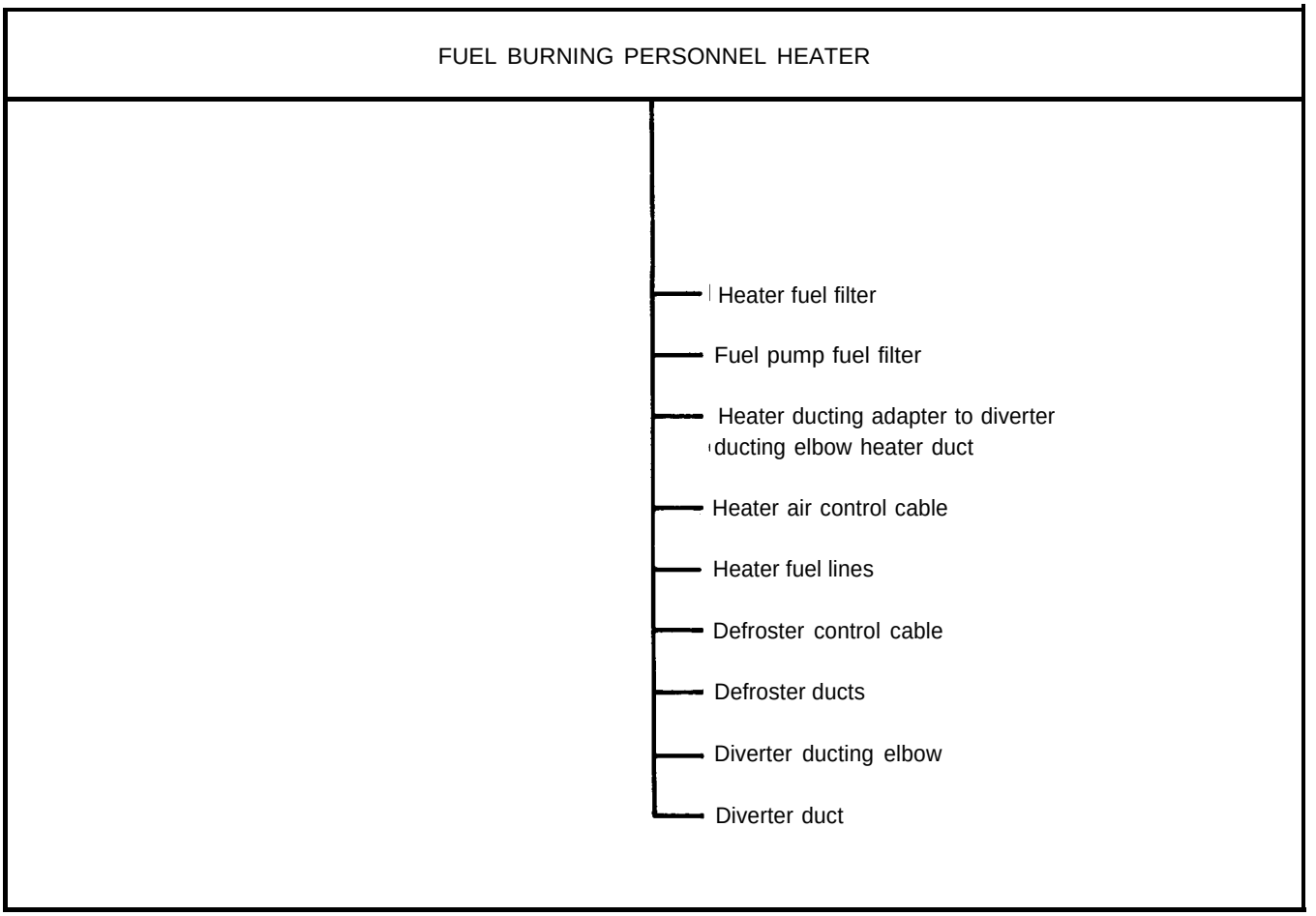

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Figure 5-21. Troubleshooting Roadmap, Fuel Burning Personnel Heater

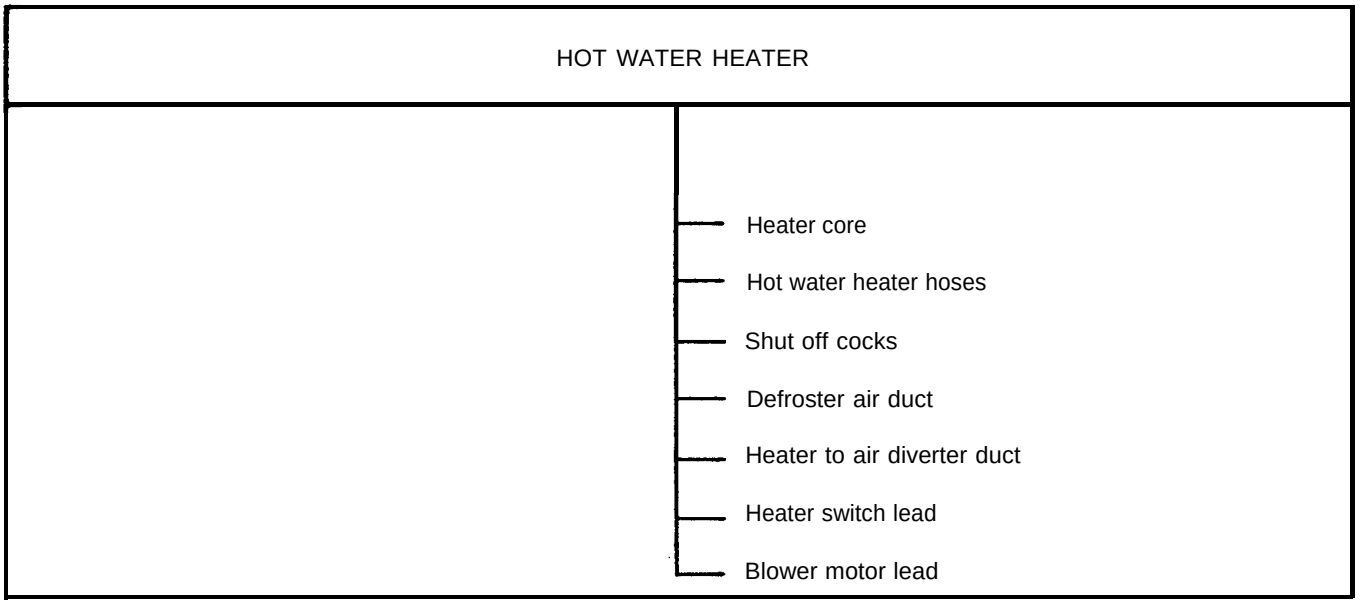

Figure 5-22. Troubleshooting Roadmap, Hot Water Heater

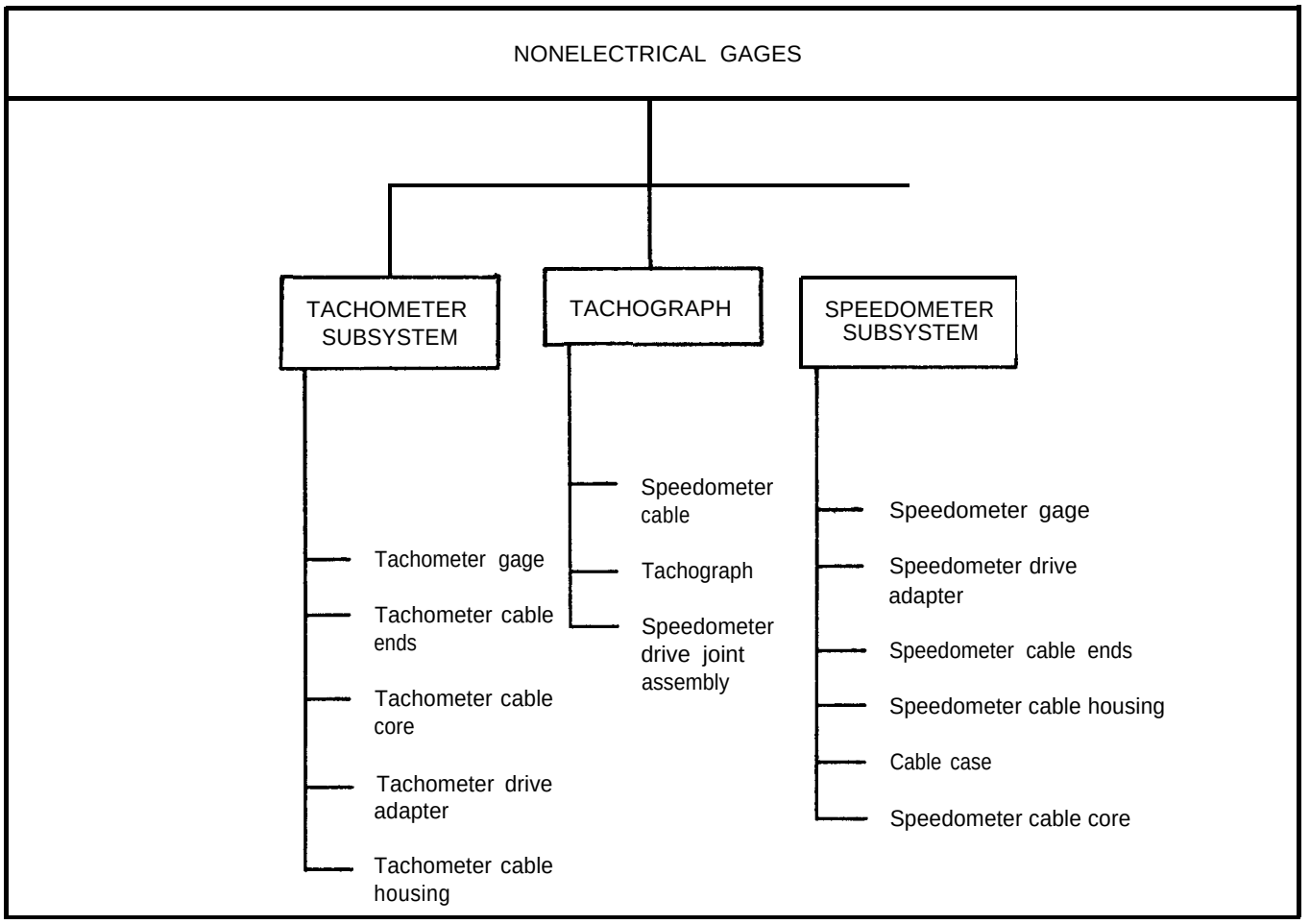

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Figure 5-23. Troubleshooting Roadmap, Nonelectrical Gages

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: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
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	—	•		

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TABLE 6-2. CLUTCH SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	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	—			

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TABLE 6-3. FUEL SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURES		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	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	—			

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TABLE 6-4. EXHAUST SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURES		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	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				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	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	—		•	

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TABLE 6-6. ELECTRICAL SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
					TEST EQUIPMENT				
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
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	•		•		

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TABLE 6-6. ELECTRICAL SYSTEM (Cont.)

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D						
					TEST EQUIPMENT					
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
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						
					TEST EQUIPMENT					
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
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	•		•		

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TABLE 6-6. ELECTRICAL SYSTEM (Cont.)

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
					TEST EQUIPMENT				
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
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 stop-lights.) All other truck running lights light	Figure 27-4	Figure 26-21	1	•		•		

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TABLE 6-6. ELECTRICAL SYSTEM (Cont.)

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
					TEST EQUIPMENT				
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
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					
					TEST EQUIPMENT				
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
	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	•		•		
WARNING	32. Horn does not work	Figure 27-7	Figure 26-32	1	•		•		
	33, Low air warning buzzer does not work	Figure 27-7	Figure 26-33	1	•		•		
FUEL PUMP/ MANIFOLD HEATER	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	•		•		

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TABLE 6-6. ELECTRICAL SYSTEM (Cont.)

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D					
					TEST EQUIPMENT				
		SUMMARY	DETAILED	PERSONS	MULTIMETER	HYDROMETER	STANDARD TOOLS	MATERIALS	TIME
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				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	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				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	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: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
—	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: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
—	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				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	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	—	•		

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TABLE 6-12. BRAKE SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	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				
					TEST EQUIPMENT			
		SUMMARY Fig. #	DETAILED Fig. #	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	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				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	1. Front tires do not wear evenly	Figure 55-1	Figure 54-1	1	Toe-i n 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	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
———	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		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
———	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	———			

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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	———			

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TABLE 6-19. M543A2 WRECKER SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
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	•		

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

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
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	•		

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

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
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	—			

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TABLE 6-20. ENGINE COOLANT HEATER SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	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				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	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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TABLE 6-22. HOT WATER HEATER

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
———	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	———			

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TABLE 6-23. NONELECTRICAL GAGES

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
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	—	●		

TA 115558

TABLE 6-23. NONELECTRICAL GAGES (Cont.)

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
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	—			

TA 115559

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 multimeter 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 (A). 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 (A) is (NO), then you do the corrective action given in box (B). If the answer is YES, follow the GO chains to box (C) and box (D) 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.

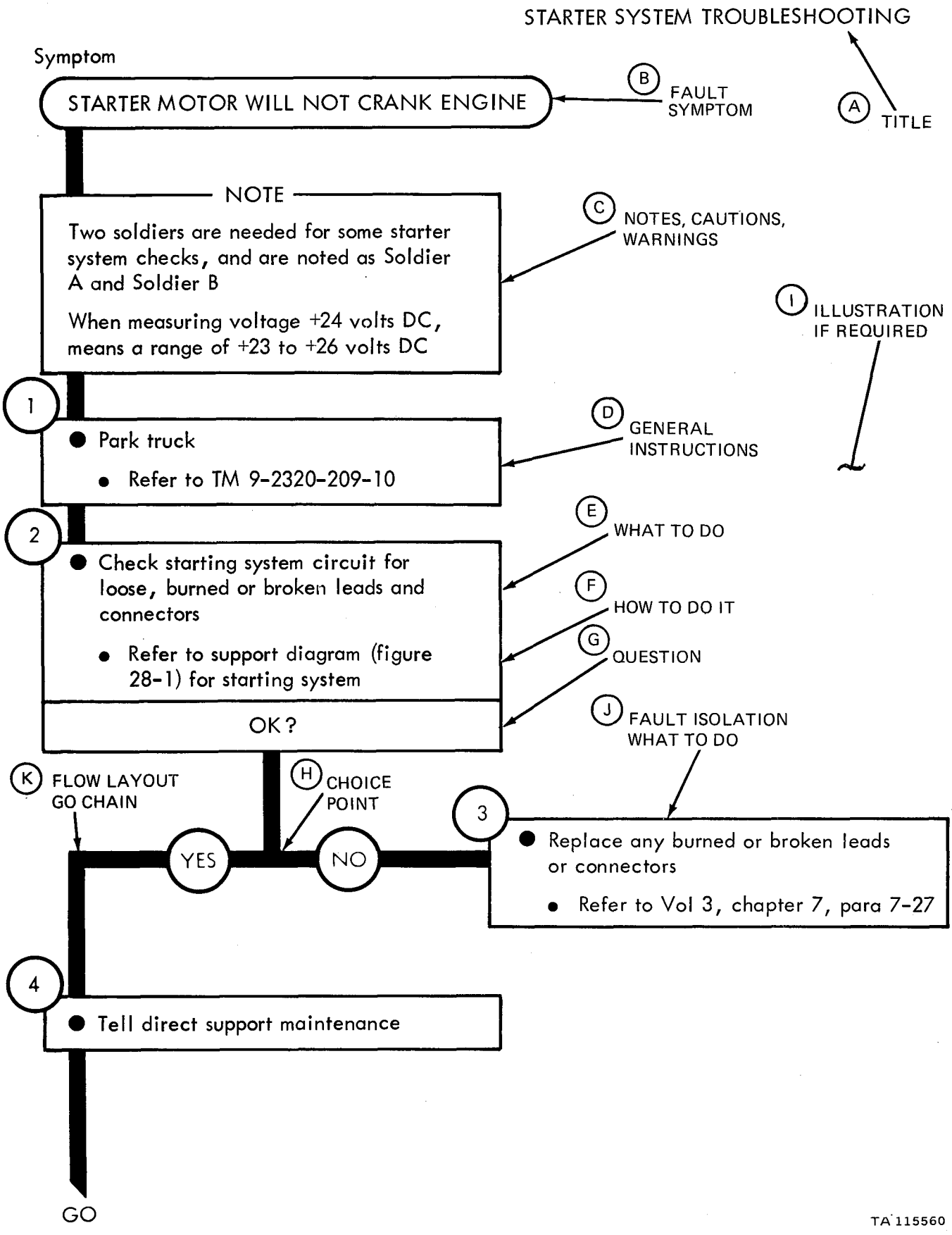

STARTER SYSTEM TROUBLESHOOTING
A TITLE
Symptom
STARTER MOTOR WILL NOT CRANK ENGINE
B FAULT SYMPTOM
NOTE
Two soldiers are needed for some starter system checks, and are noted as Soldier A and Soldier B
When measuring voltage +24 volts DC, means a range of +23 to +26 volts DC
C NOTES, CAUTIONS, WARNINGS
I ILLUSTRATION IF REQUIRED
1
Park truck
Refer to TM 9-2320-209-10
D GENERAL INSTRUCTIONS
2
Check starting system circuit for loose, burned or broken leads and connectors
Refer to support diagram (figure 28-1) for starting system
E WHAT TO DO
F HOW TO DO IT
G QUESTION
OK?
J FAULT ISOLATION WHAT TO DO
K FLOW LAYOUT GO CHAIN
H CHOICE POINT
YES
NO
3
Replace any burned or broken leads or connectors
Refer to Vol 3, chapter 7, para 7-27
4
Tell direct support maintenance
GO
TA 115560

Figure 7-1

1

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

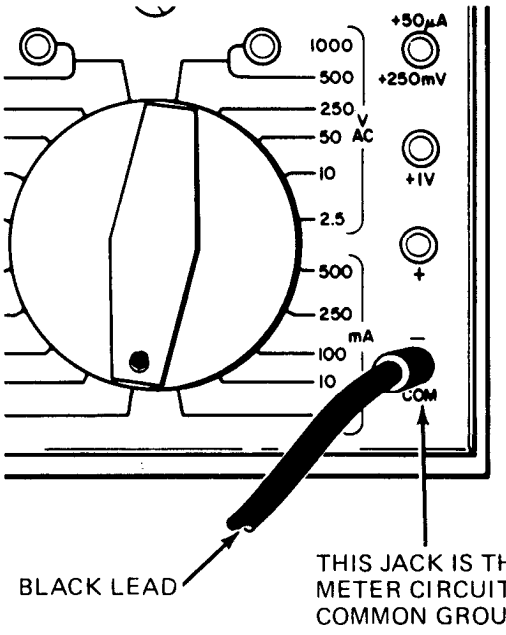
TEST EQUIPMENT PROCEDURE

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	+

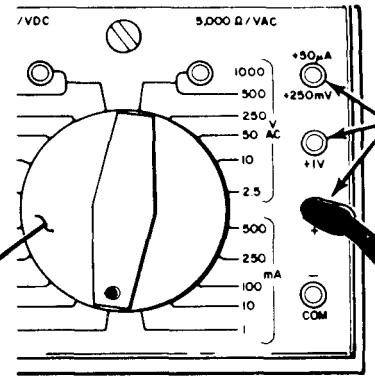
GO

TA 115275

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

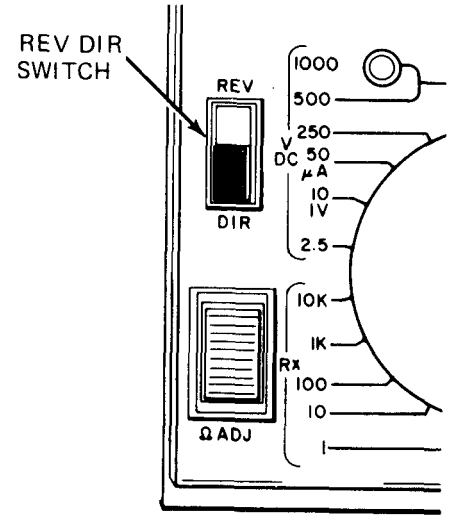
RED (+) TEST LEAD SHOWN IN + JACK

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.

MULTIMETER FUNCTION TABLE

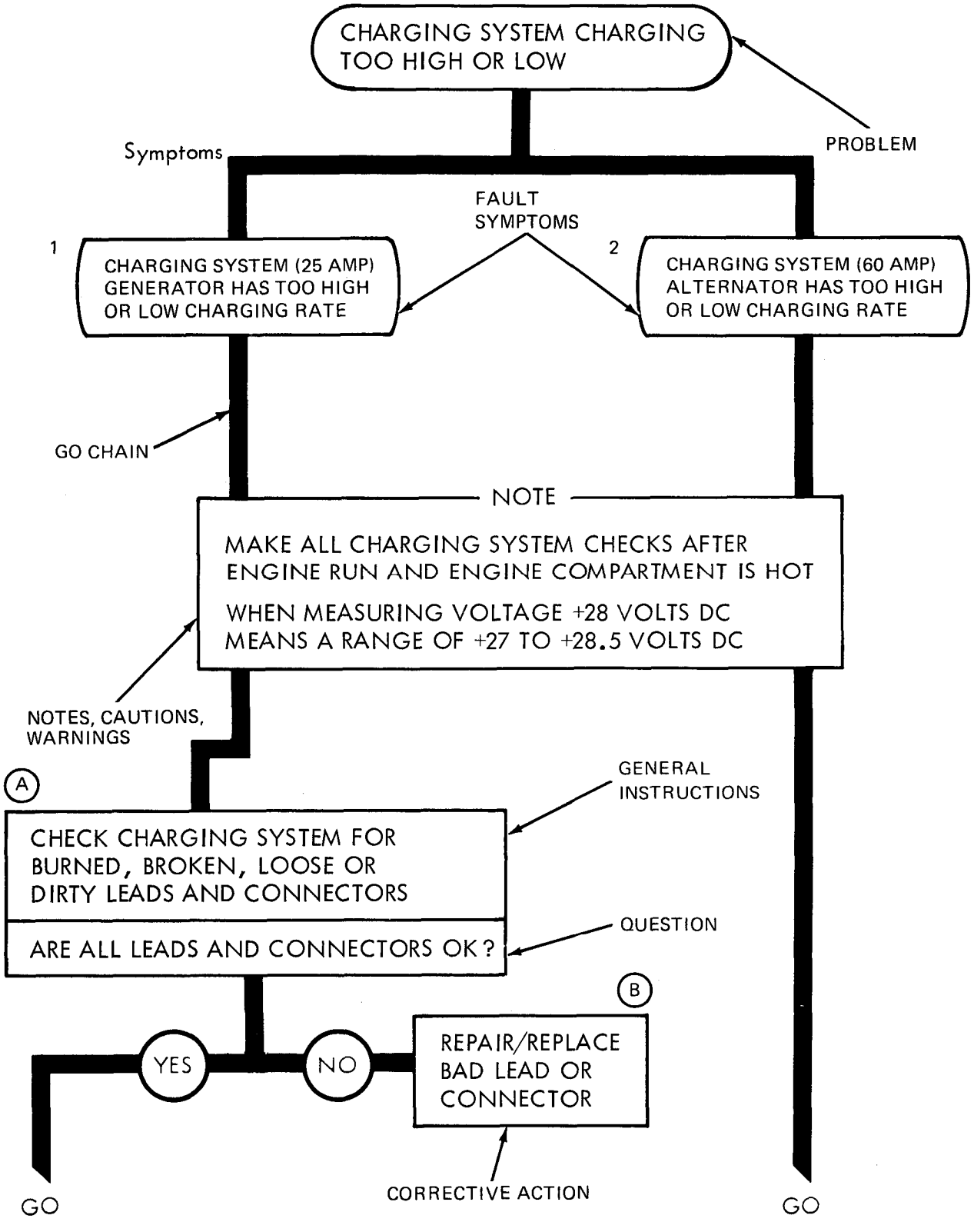
IF NORMAL VALUE OF VOLTAGE BEING MEASURED IN THIS:	SET FUNCTION/RANGE SWITCH TO:
0 TO 230 MILLIVOLTS	50 μA
230 MILLIVOLTS TO 0.8 VOLTS	10 1V
0.8 TO 2 VOLTS	2.5
2 TO 8 VOLTS	10 1V
8 TO 40 VOLTS	50 μA
UNKNOWN	50 μA

GO

TA 115276

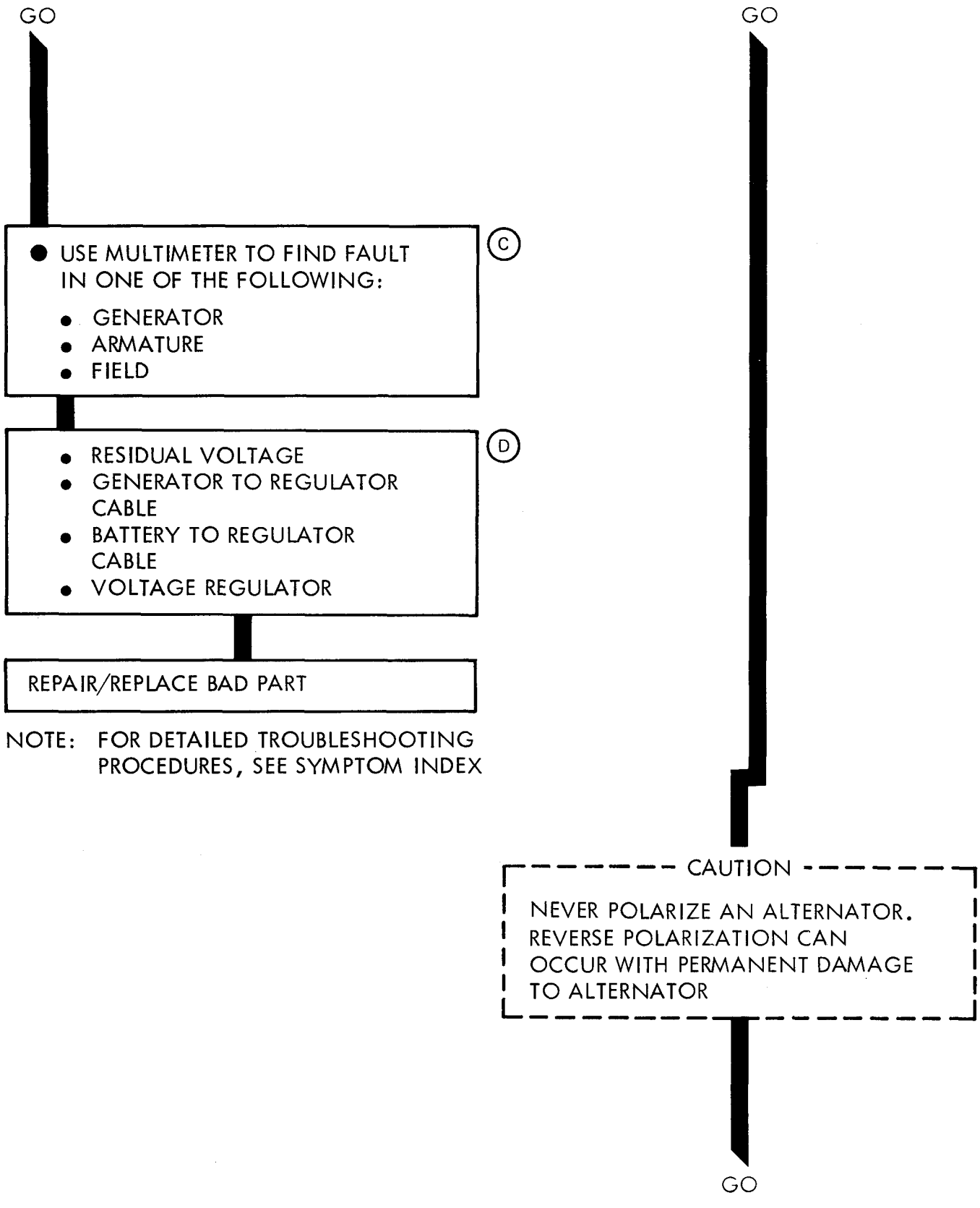
Figure 7-2 (Sheet 2 of 2)

ELECTRICAL SYSTEM SUMMARY TROUBLESHOOTING



TA 115277

Figure 7-3 (Sheet 1 of 2)



TA 115278

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

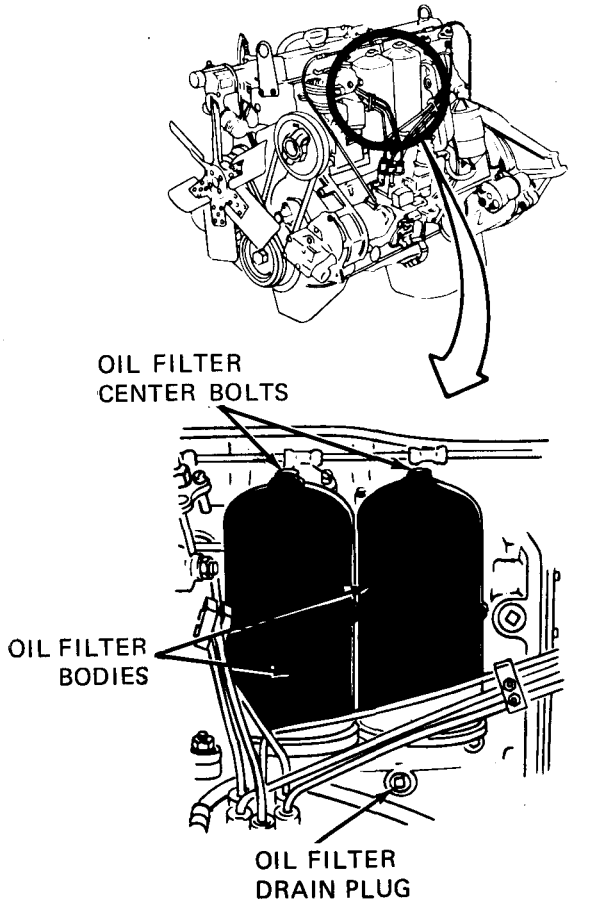
- Make truck ready for work on engine
  - Park truck. Refer to TM 9-2320-211-10
  - Chock wheels

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)

GO

YES

NO

3

- Tighten loose filter center bolt
  - Using 7/16-inch wrench tighten center bolt

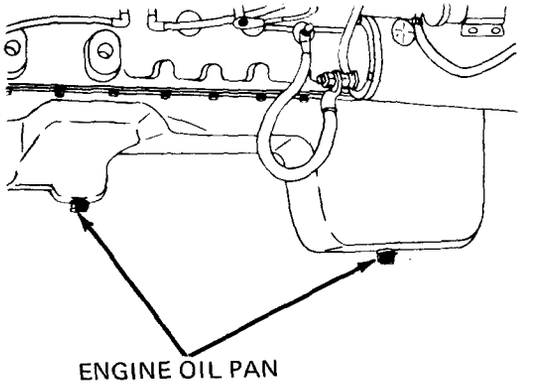
Note: If oil still leaks from the bottom of oil filter body replace oil filter gasket. **Refer to Vol 3, chapter 2 para 2-4**

- Tighten loose oil filter drain plug
  - Using 9/16-inch breaker bar tighten loose drain plug

4

- Check engine oil pan drain plugs
  - Look for signs of oil leaking from drain plugs
  - Feel for loose drain plugs

Are engine oil pan drain plugs OK?



ENGINE OIL PAN DRAIN PLUGS

TS 211-20-71

GO

TA 115564

Figure 8-1 (Sheet 2 of 4)

GO

YES

NO

5

- Tighten loose engine oil pan drain plugs
  - Tighten oil pan drain plugs

  Note: If oil leaks from drain plugs, the gaskets will be replaced
- Fill crankcase with oil
  - Refer to LO 9-2320-211-12

WARNING

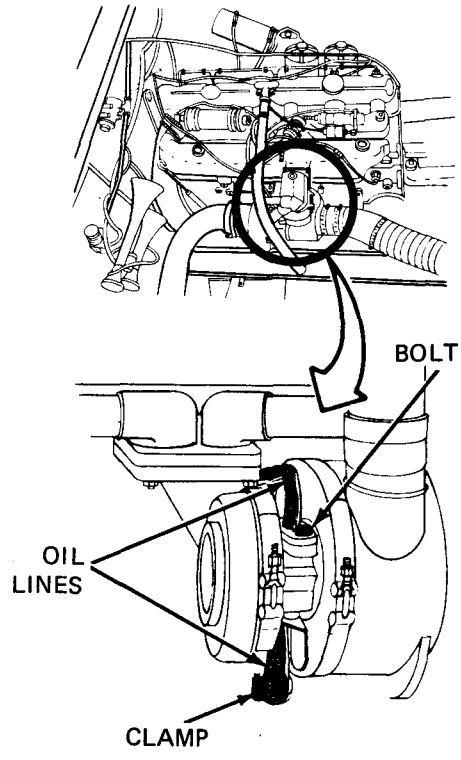
A bad burn can occur if turbocharger is touched. Wait until turbocharger and exhaust system have had time to cool down before doing any work

6

- Check turbocharger oil lines
  - Look for signs of oil leaking
  - Look for a broken oil line
  - Look for loose clamps and bolts

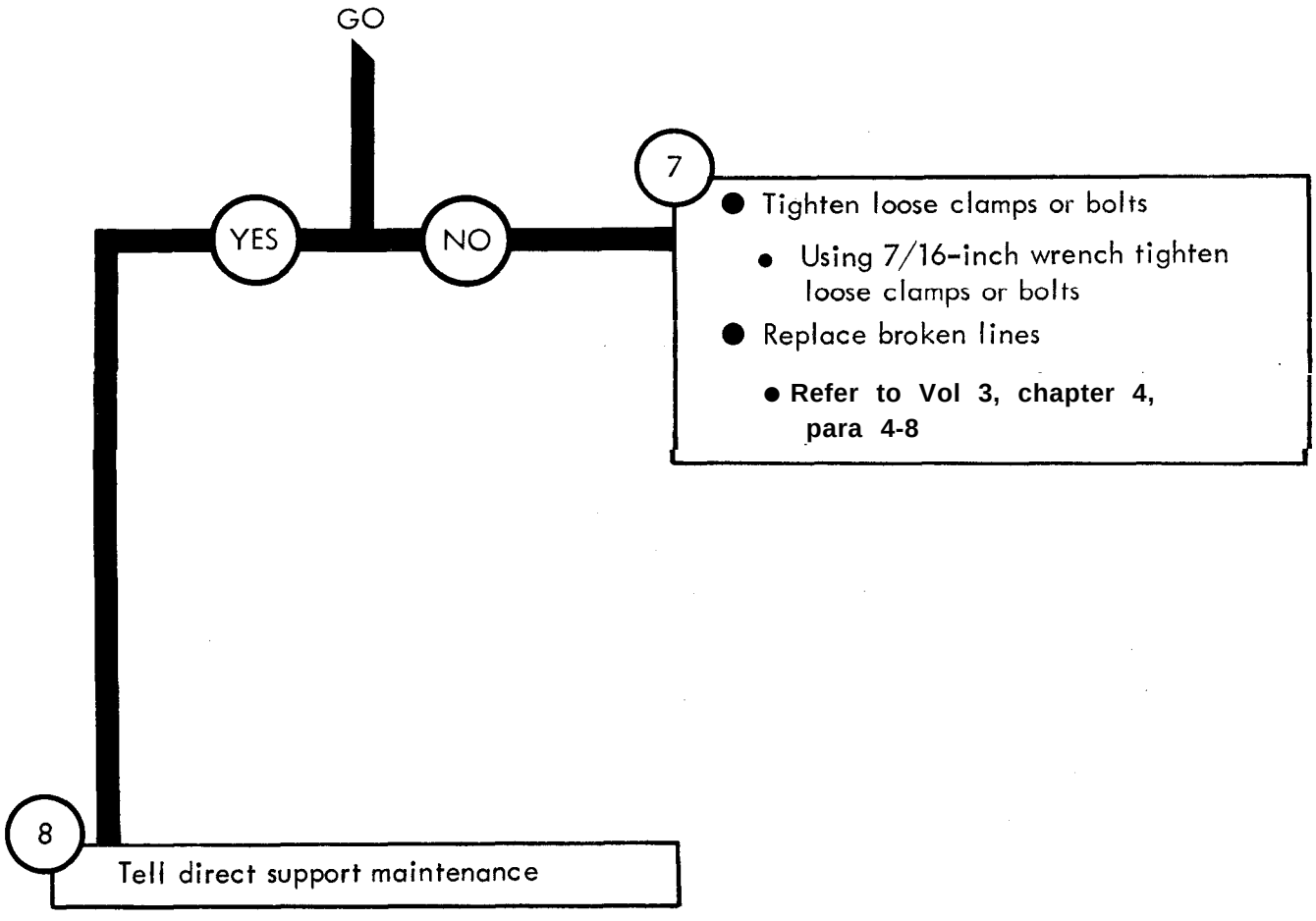
Are turbocharger oil lines OK?

GO



TA 115565

Figure 8-1 (Sheet 3 of 4)



TA 115566

Figure 8-1 (Sheet 4 of 4)

Symptom

2 ENGINE USES MORE OIL THAN NORMAL

1

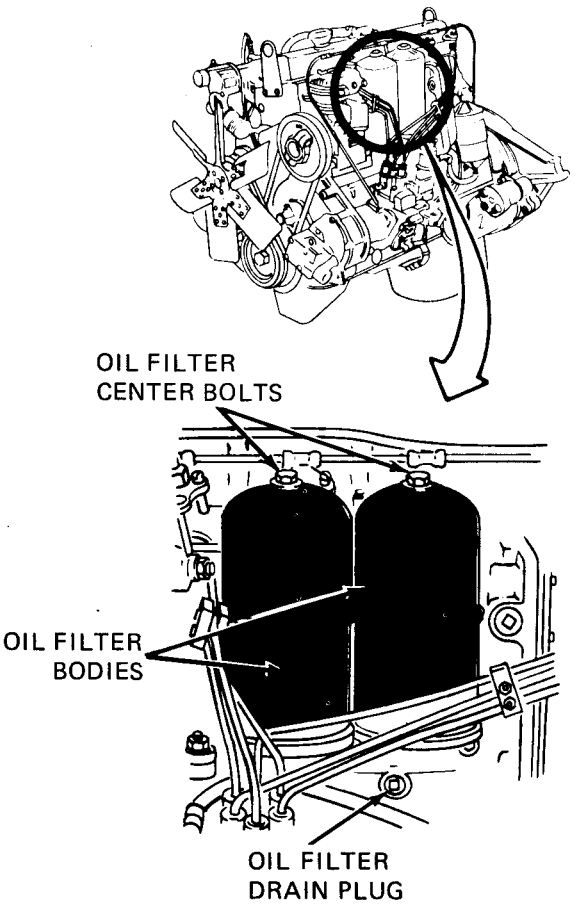
- Make truck ready for work on engine system
  - Park truck. Refer to TM 9-2320-211-10
  - Chock wheels

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



TA 115567

Figure 8-2 (Sheet 1 of 4)

GO

YES

NO

3

- Tighten loose oil filter center bolt
  - Using 7/16-inch wrench tighten center bolt

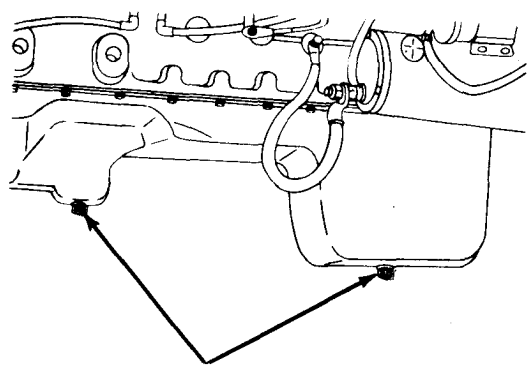
Note: If oil still leaks from the bottom of oil filter body replace oil filter gasket. Refer to Vol 3, chapter 2, para 2-4

- Tighten loose oil filter drain plug
  - Using 9/16-inch breaker bar tighten oil filter drain plug

4

- Check engine oil pan drain plugs
  - Look for signs of oil leaking from drain plugs
  - Feel for loose drain plugs

Are engine oil pan drain plugs OK?



ENGINE OIL PAN DRAIN PLUGS

GO

TA 115568

Figure 8-2 (Sheet 2 of 4)

GO

YES

NO

5

- Tighten loose engine oil pan drain plugs
  - Tighten oil pan drain plugs

  Note: If oil still leaks from drain plugs, the gasket will be replaced
- Fill crankcase with oil
  - Refer to LO 9-2320-211-12

WARNING

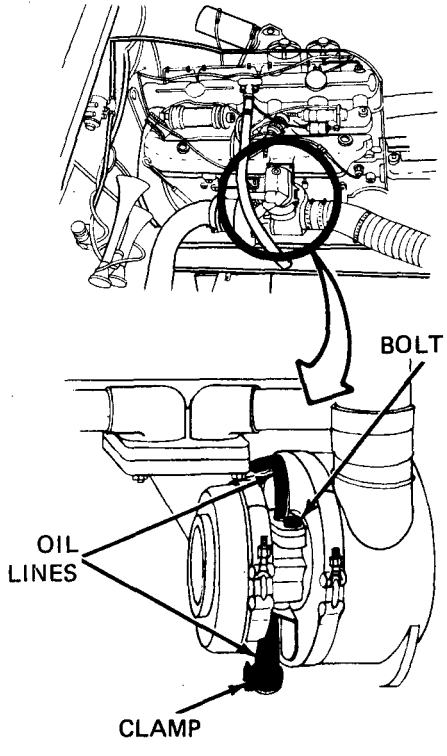
A bad burn can occur if turbocharger is touched. Wait until turbocharger and exhaust system have had time to cool down before doing any work

6

- Check turbocharger oil lines
  - Look for signs of oil leaking
  - Look for a broken oil line
  - Feel for loose clamps and bolts

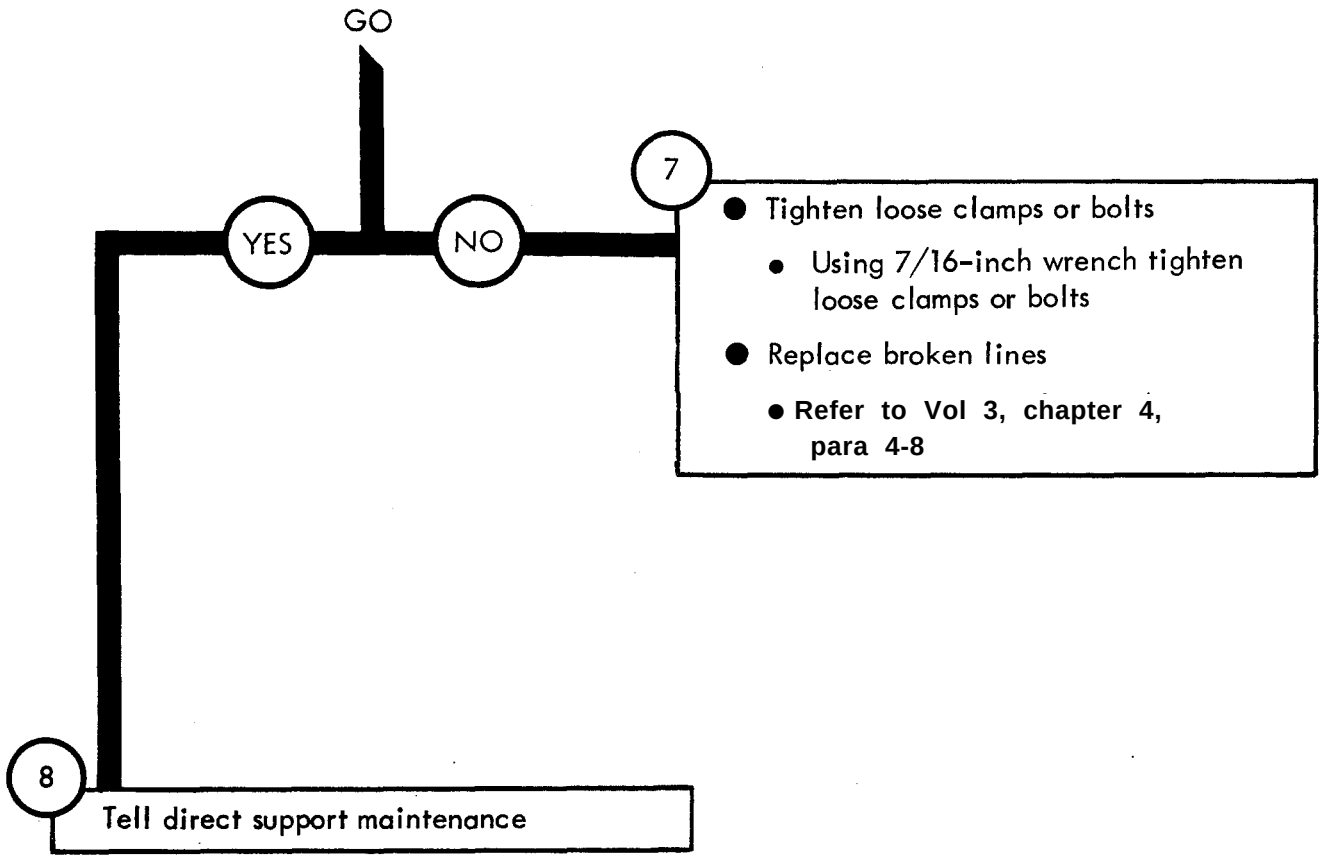
Are turbocharger oil lines OK?

GO



TA 115569

Figure 8-2 (Sheet 3 of 4)



TA 115570

Figure 8-2 (Sheet 4 of 4)

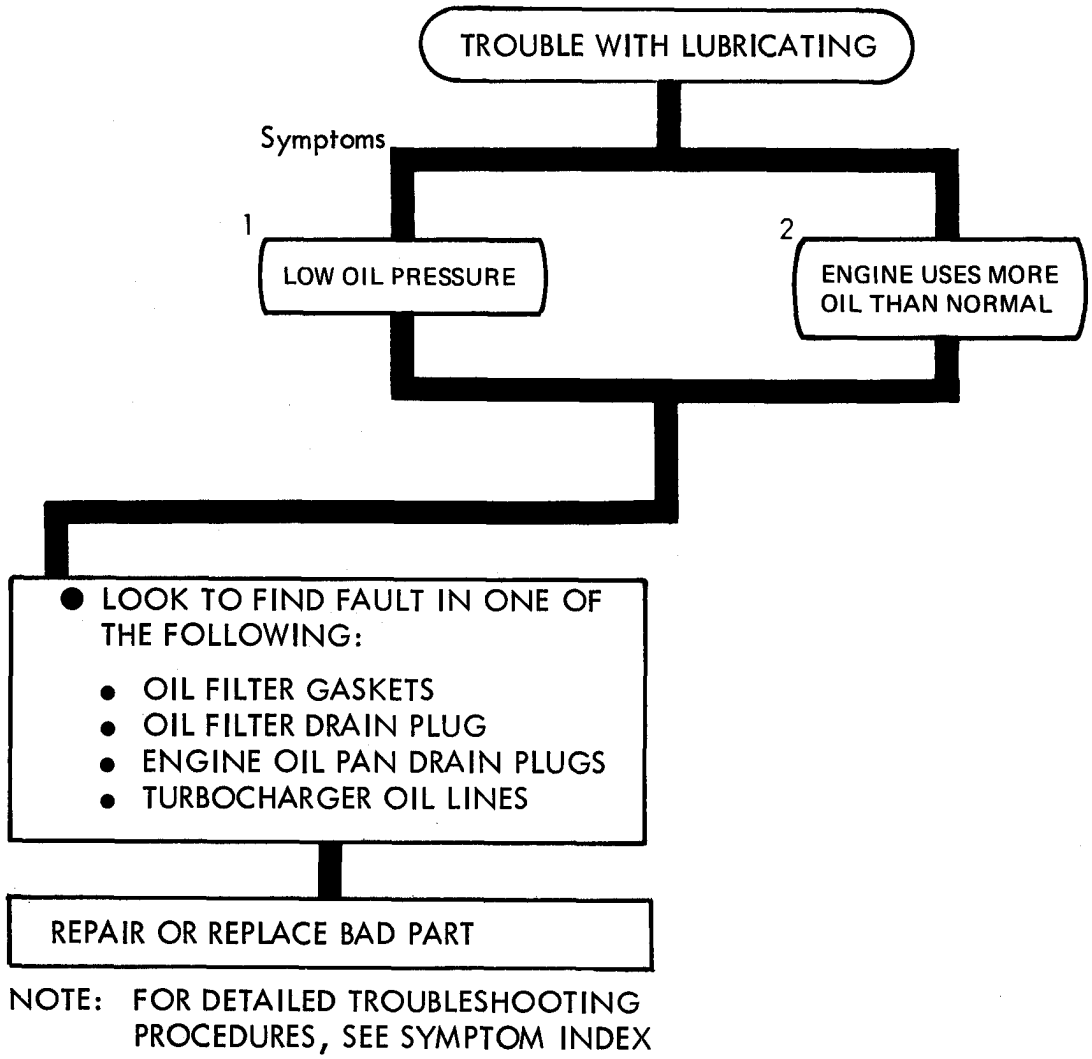
CHAPTER 9

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.

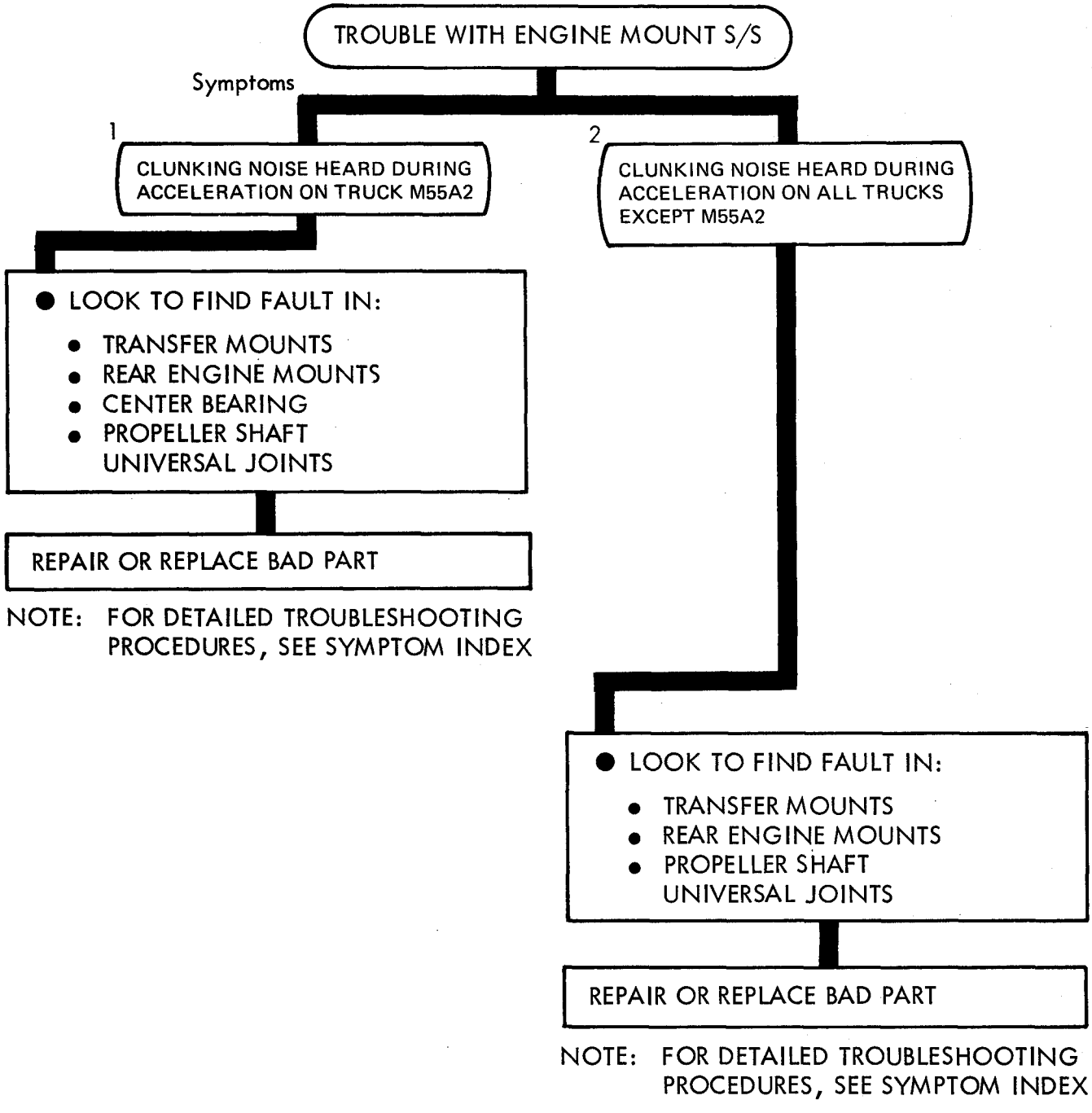
ENGINE SYSTEM - LUBRICATING SUBSYSTEM TROUBLESHOOTING SUMMARY



TA 115571

Figure 9-1

ENGINE SYSTEM - ENGINE MOUNT SUBSYSTEM TROUBLESHOOTING SUMMARY



TA 120651

Figure 9-2

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.

ENGINE MOUNT SUBSYSTEM TROUBLESHOOTING

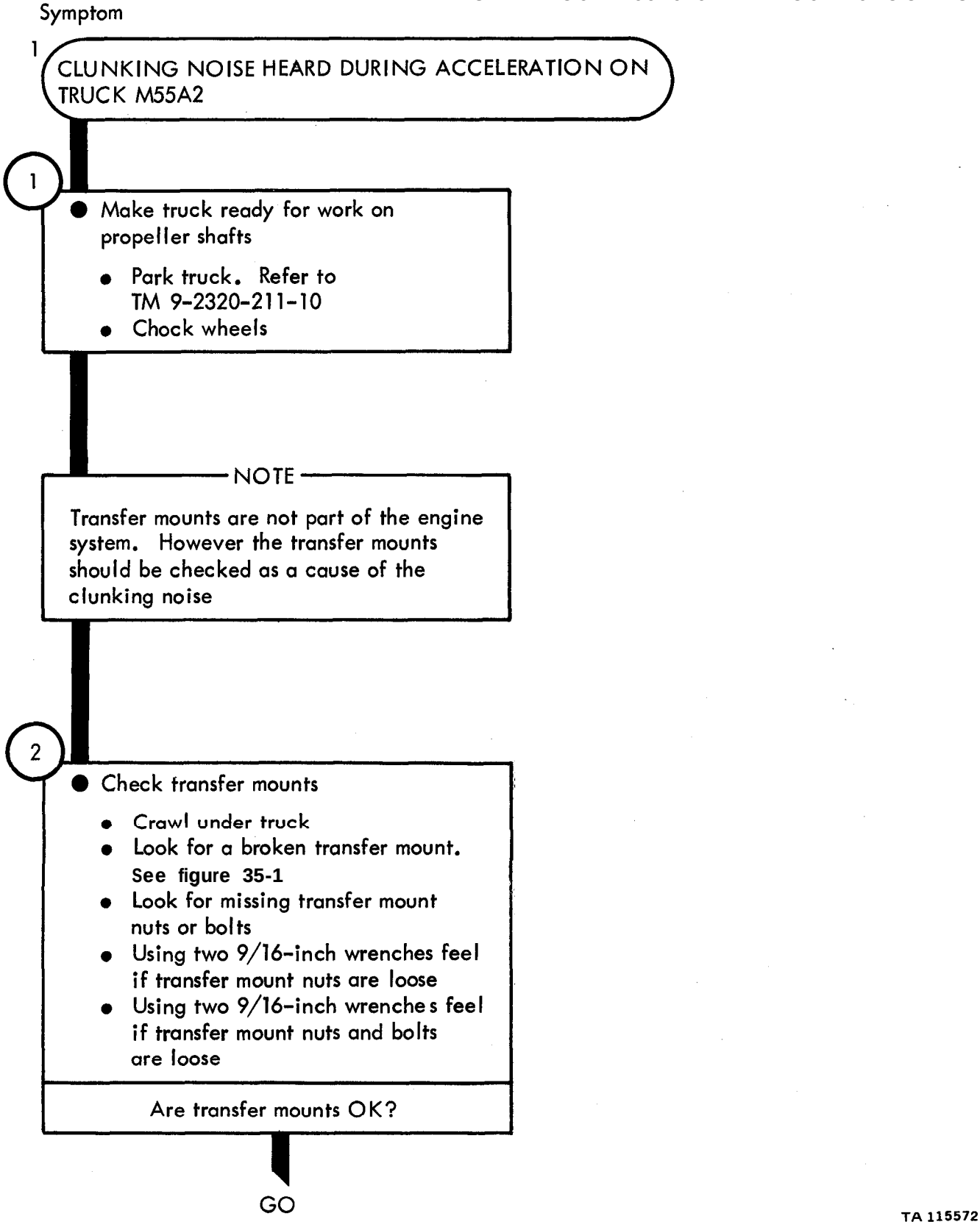


Figure 10-1 (Sheet 1 of 4)

GO

YES

NO

3

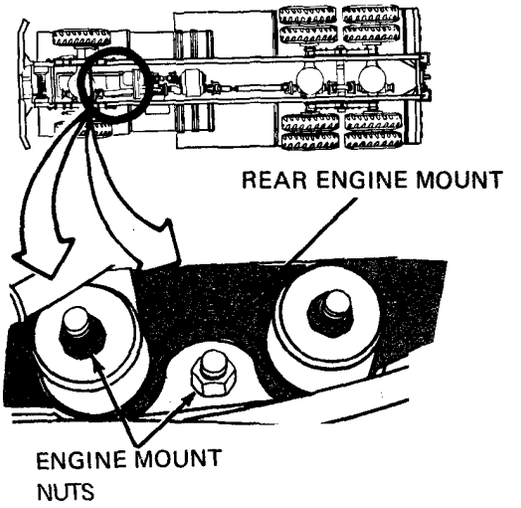
- Replace broken transfer mount
  - Tell direct support maintenance
- Put back missing transfer mount nuts and bolts
  - Put a hydraulic jack under transfer and raise jack until weight is removed from transfer mount
  - Put correct bolt, or nut, into transfer mount and tighten using wrench
  - Using 3/4-inch wrench tighten all bolts, and nuts
- Tighten loose transfer mount nuts
  - Using two 3/4-inch wrenches tighten all nuts and bolts

4

- Check rear engine mounts
  - Look for a broken engine mount
  - Look for missing engine mount nut
  - Using 3/4-inch wrench feel for loose nut

Are engine mounts OK?

GO



TA 115573

Figure 10-1 (Sheet 2 of 4)

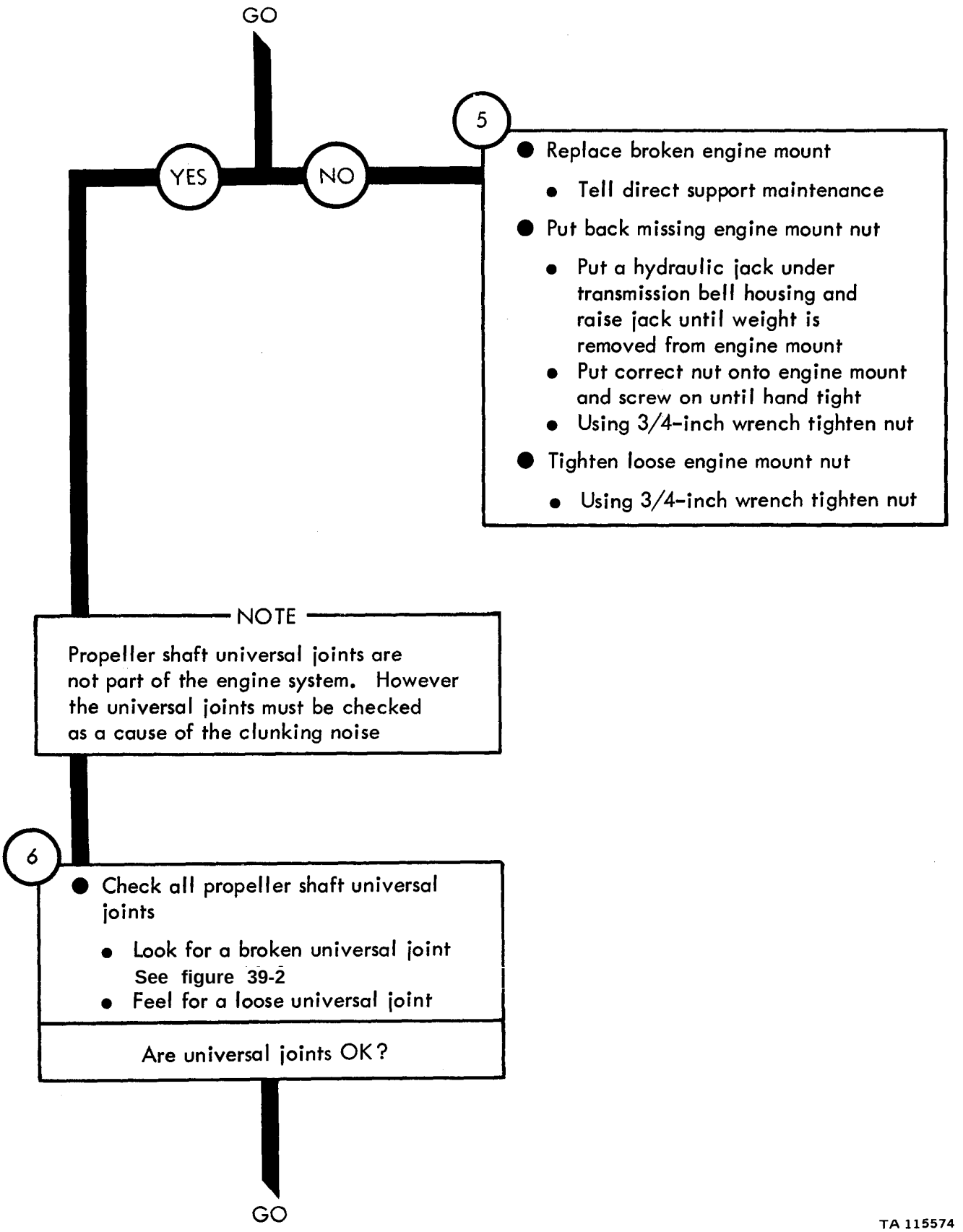
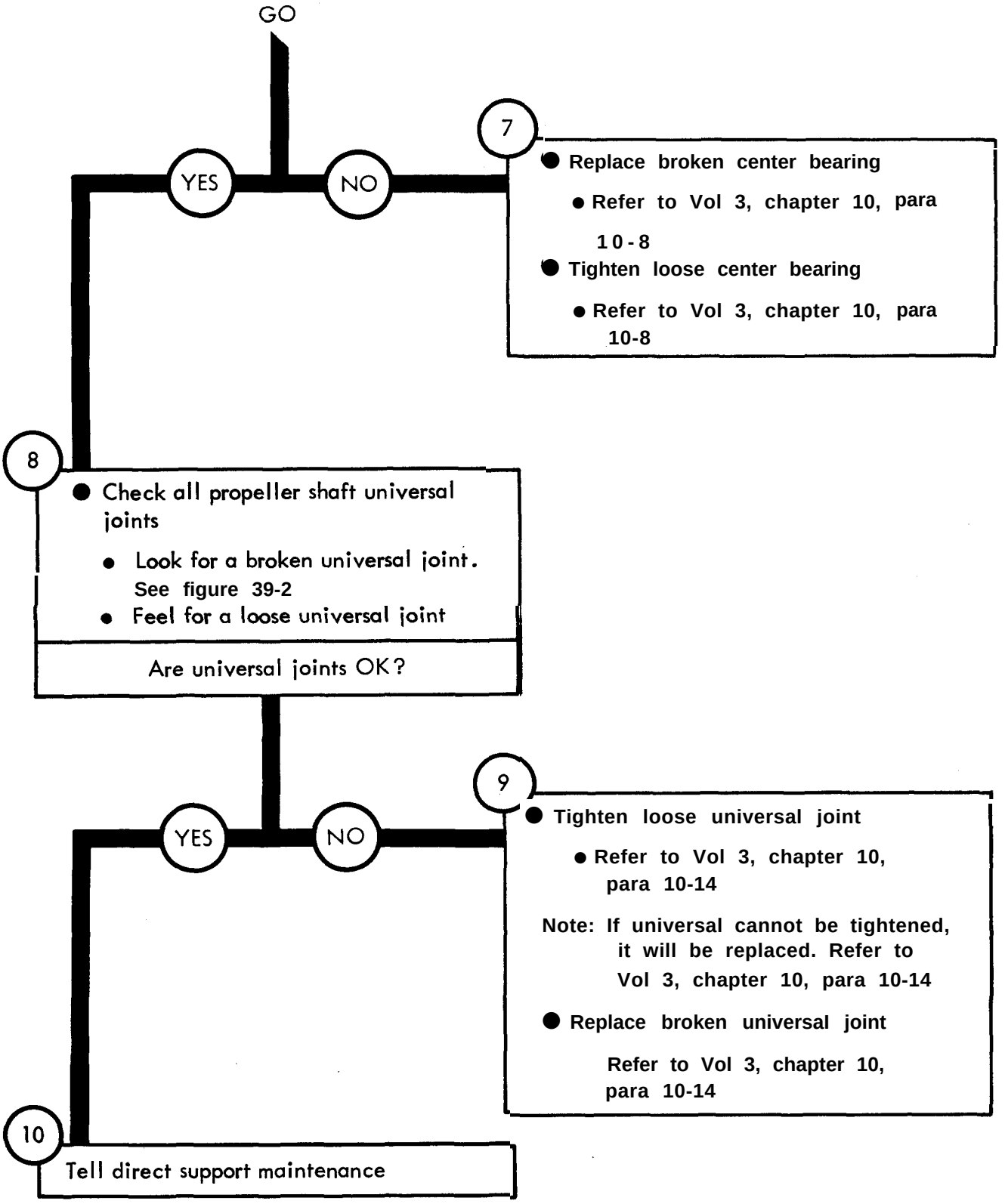
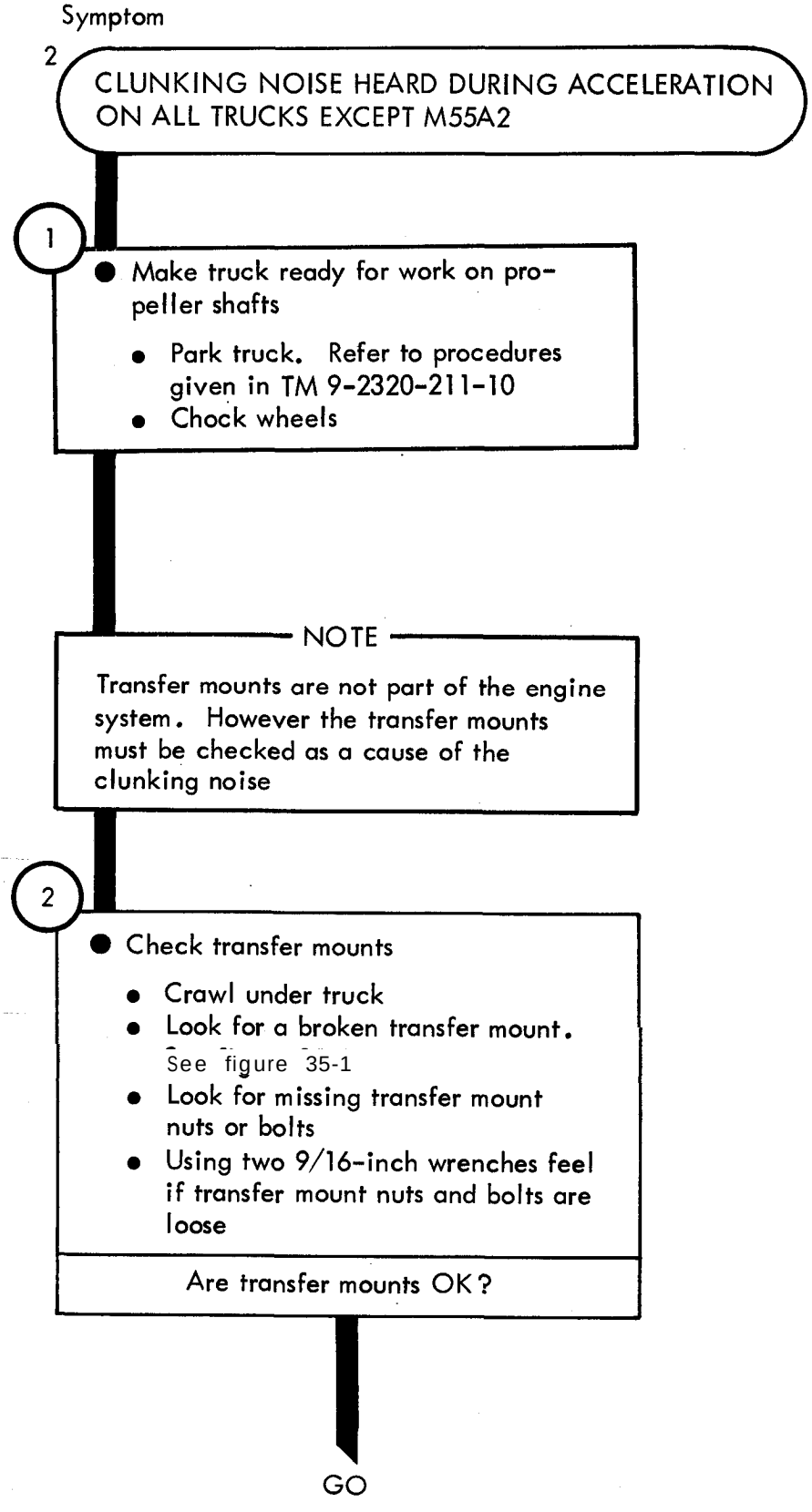


Figure 10-1 (Sheet 3 of 4)



TA 115575

Figure 10-1 (Sheet 4 of 4)



TA 115576

Figure 10-2 (Sheet 1 of 4)

GO

YES

NO

3

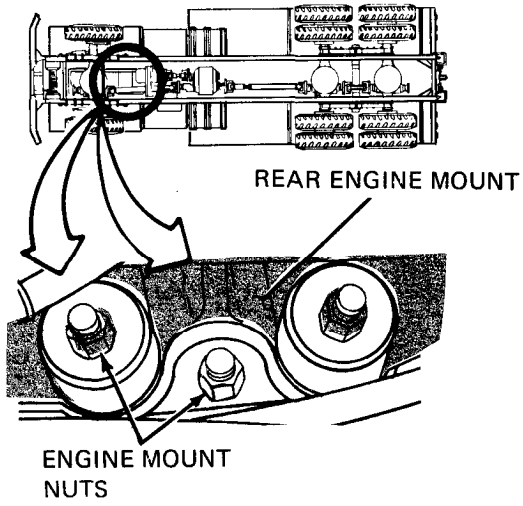
- Replace broken transfer mount
  - Tell direct support maintenance
- Put back missing transfer mount nuts and bolts
  - Put a hydraulic jack under transfer and raise jack until weight is removed from transfer mount
  - Put correct bolt, or nut, into transfer mount and tighten using wrench
  - Using two 3/4-inch wrenches tighten all nuts and bolts
- Tighten loose transfer mount nuts
  - Using two 3/4-inch wrenches tighten nuts and bolts

4

- Check rear engine mounts
  - Look for a broken engine mount
  - Look for missing engine mount nut
  - Using 3/4-inch wrench feel for loose nut

Are engine mounts OK?

GO



TA 115577

Figure 10-2 (Sheet 2 of 4)

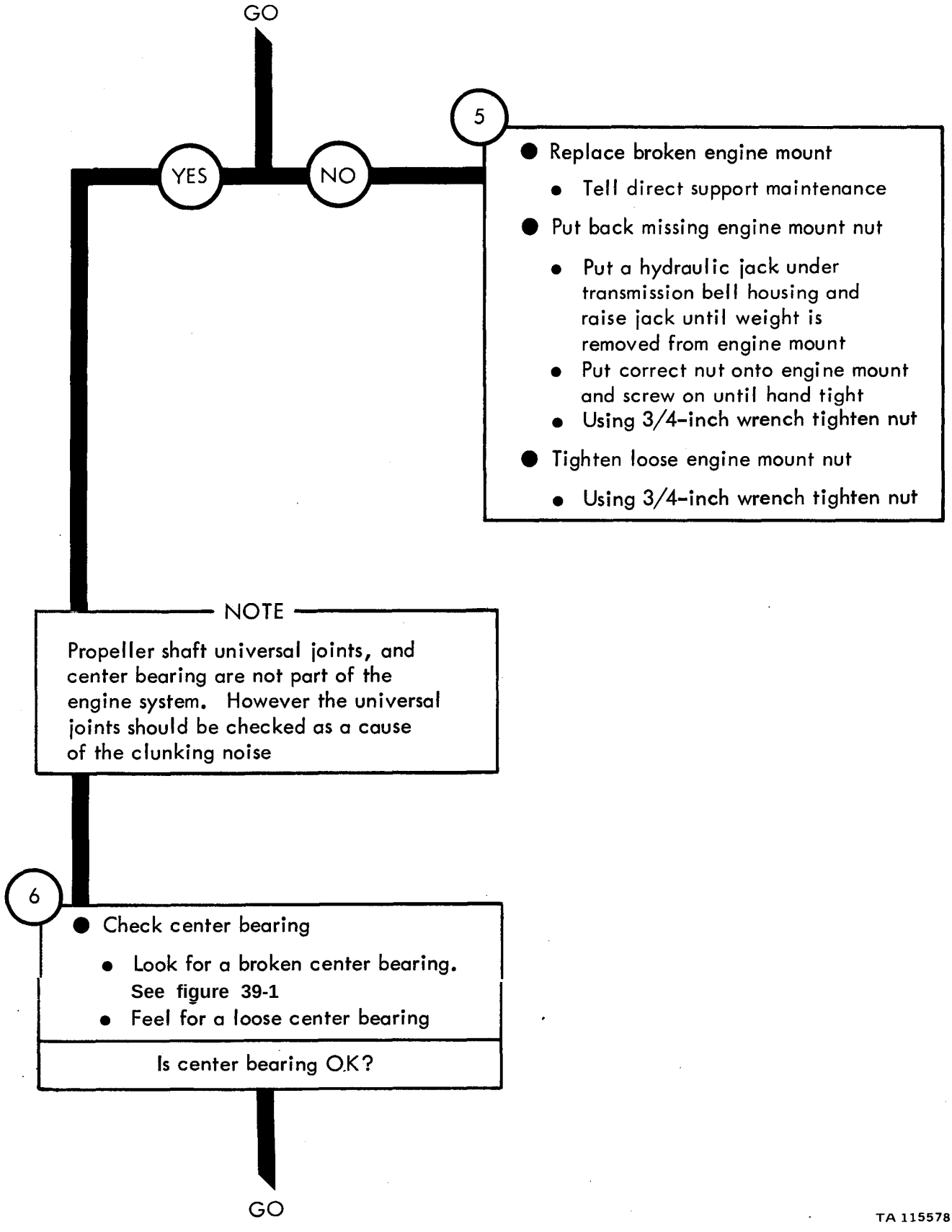
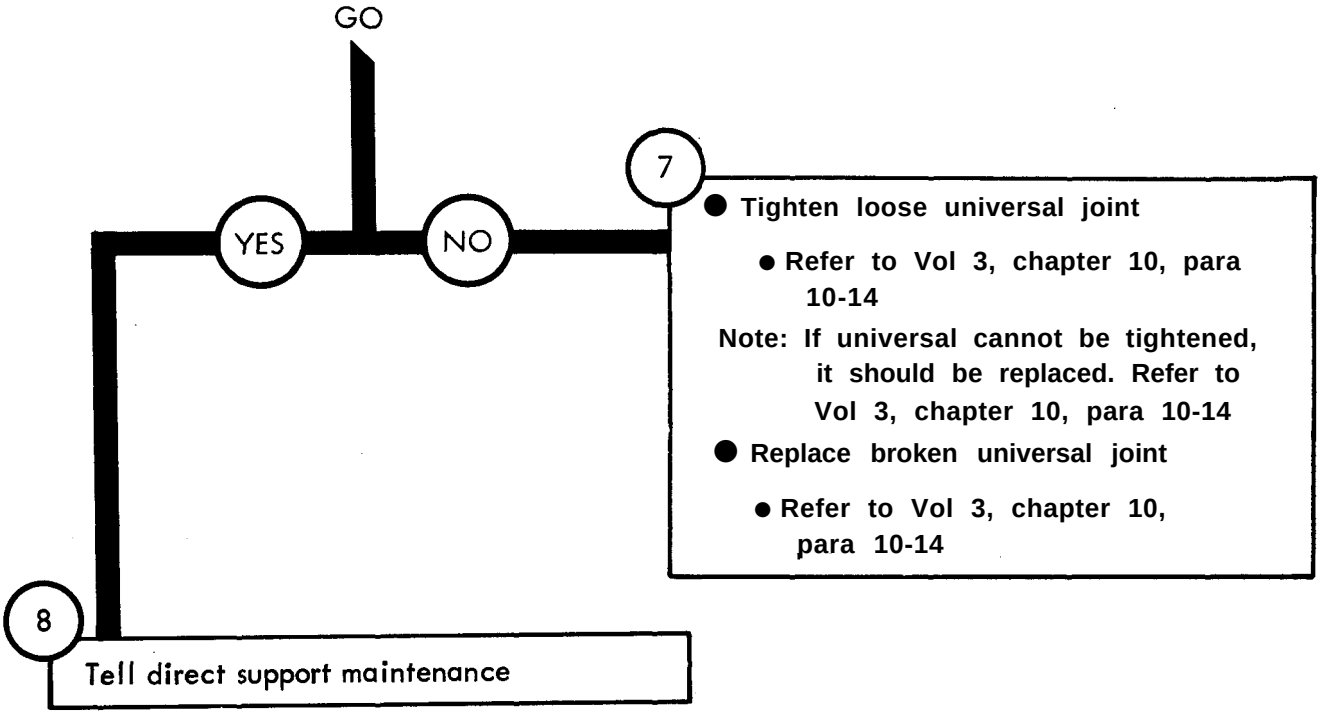


Figure 10-2 (Sheet 3 of 4)



TA 115579

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.

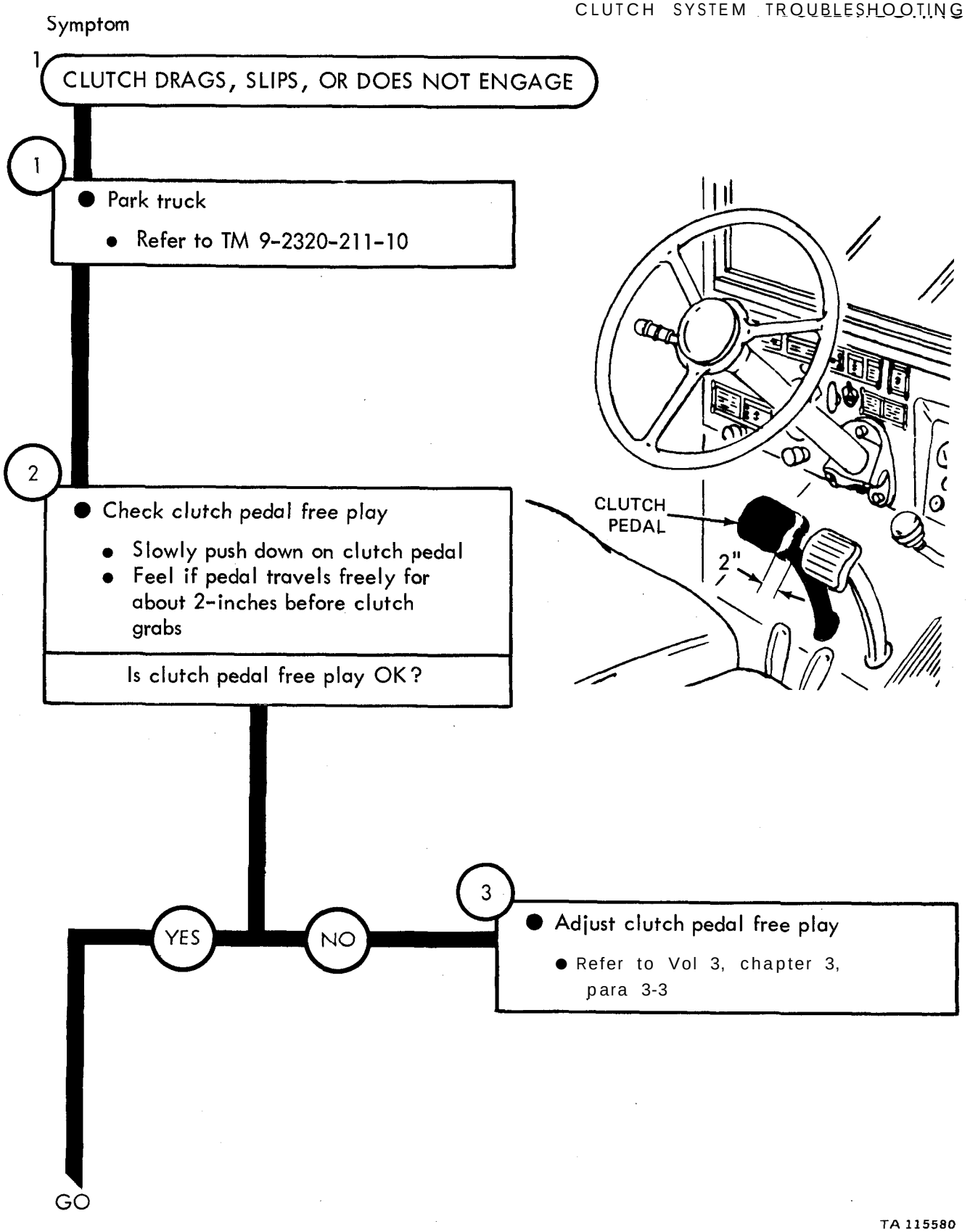


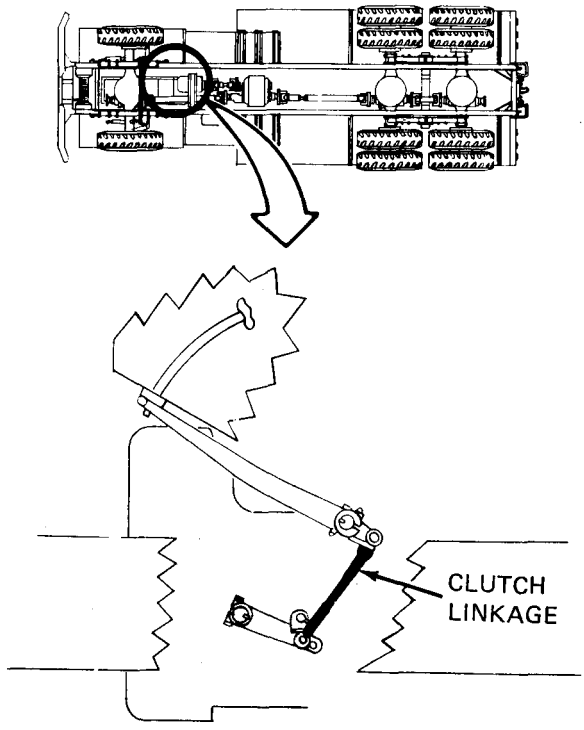
Figure 11-1 (Sheet 1 of 2)

GO

4

- Check clutch linkage
  - Crawl under truck
  - Move clutch linkage to feel if it is binding
  - Look for bent linkage

Is clutch linkage OK?



YES

NO

5

- Lubricate binding clutch linkage
  - Refer to LO 9-2320-211-12
- Replace bent linkage
  - Refer to Vol 3, chapter 3, para 3-4

6

Tell direct support maintenance

TA 115581

Figure 11-1 (Sheet 2 of 2)

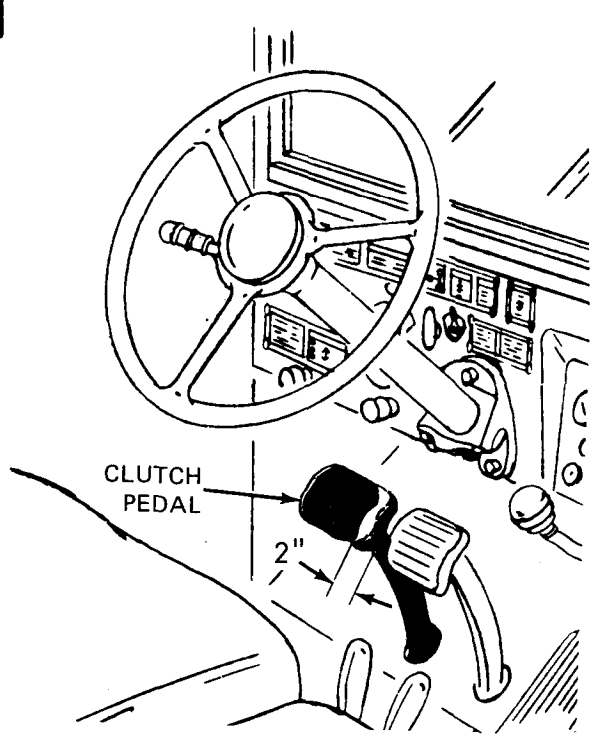
Symptom

2 TRUCK CREEPS WHEN CLUTCH PEDAL IS PRESSED TO FLOORBOARD

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

2
- Check clutch pedal free play
  - Slowly push down on clutch pedal
  - Feel if pedal travels freely for about 2 inches before clutch grabs

Is clutch pedal free play OK?



YES

NO

3
- Adjust clutch pedal free play
  - Refer to Vol 3, chapter 3, para 3-3

4
Tell direct support maintenance

TA 115582

Figure 11-2

Symptom 3

ON M543A2 TRUCK, CLUTCH SLIPS DURING OPERATION, CLUTCH SYSTEM WORKS NORMALLY

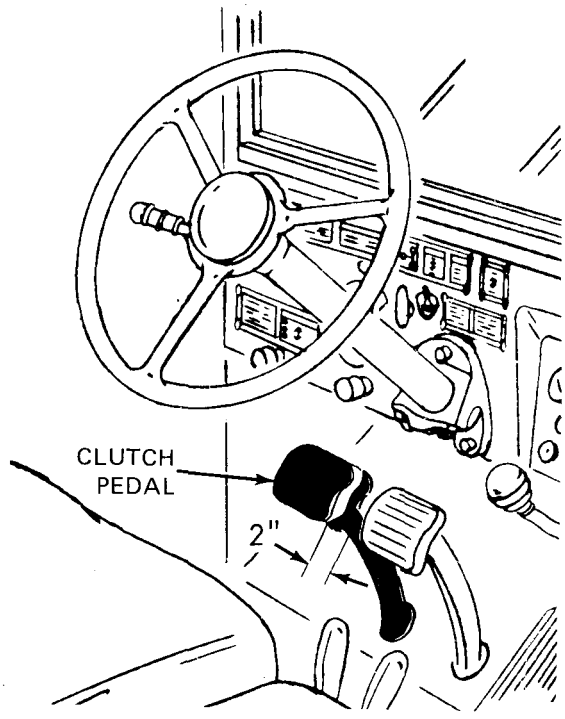
1

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

2

- Check clutch pedal free play
  - Slowly push down on clutch pedal
  - Feel if pedal travels freely for about 2 inches before clutch grabs

Is clutch pedal free play OK?



YES

NO

3

- Adjust clutch pedal free play
  - Refer to Vol 3, chapter 3, para 3-3

GO

TA 115583

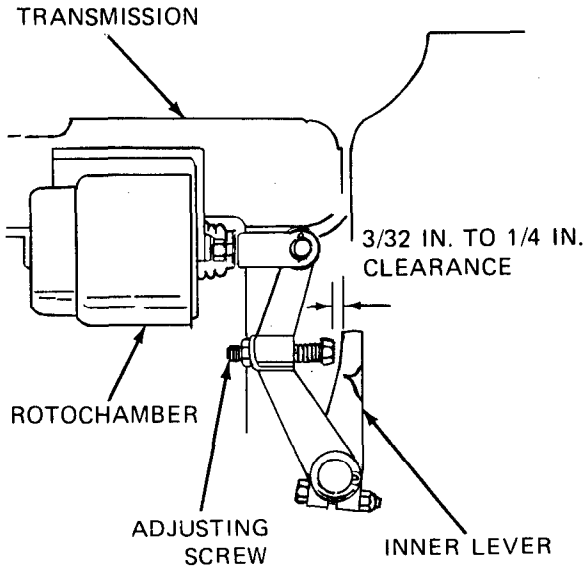
Figure 11-3 (Sheet 1 of 4)

GO

4

- Check rotochamber adjustment
  - Crawl under truck
  - Using a ruler that measures to 1/32-inch, check for 3/32 to 1/4-inch, of clearance between inner lever and adjusting screw

Is rotochamber adjustment OK?



YES

NO

5

- Adjust rotochamber
  - Refer to Vol 3, chapter 18, para 18-28

  Note: If rotochamber cannot be adjusted, it should be replaced. Tell direct support maintenance

GO

TA 119060

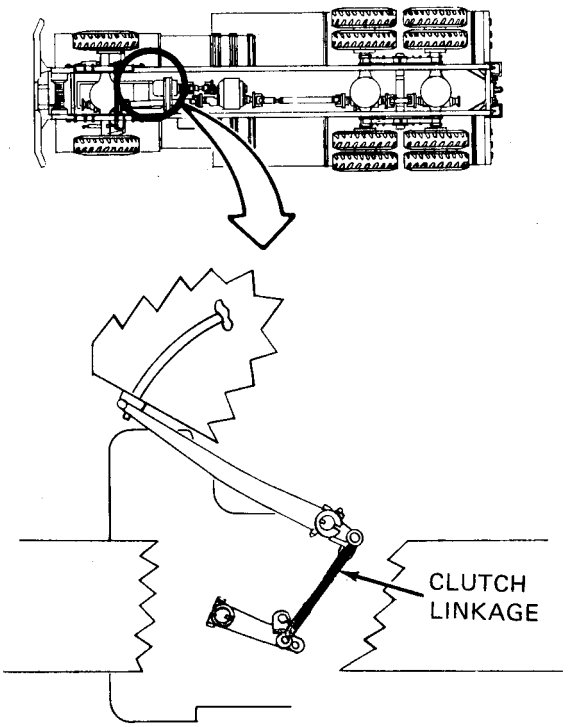
Figure 11-3 (Sheet 2 of 4)

GO

6

- Check clutch linkage
  - Move clutch linkage to feel if it is binding
  - Look for bent linkage

Is clutch linkage OK?



YES

NO

7

- Lubricate binding clutch linkage
  - Refer to LO 9-2320-211-12
- Replace bent linkage
  - Refer to Vol 3, chapter 3, para 3-4

GO

TA 119061

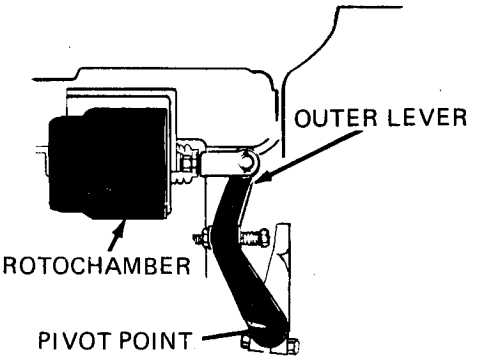
Figure 11-3 (Sheet 3 of 4)

GO

8

- Check rotochamber linkage
  - Move outer lever connected to rotochamber
  - Feel for signs of binding at pivot point

Is rotochamber linkage OK?



YES

NO

9

- Lubricate binding linkage
  - Using oil can lubricate pivot point on outer lever

10

Tell direct support maintenance

TA 119062

Figure 11-3 (Sheet 4 of 4)

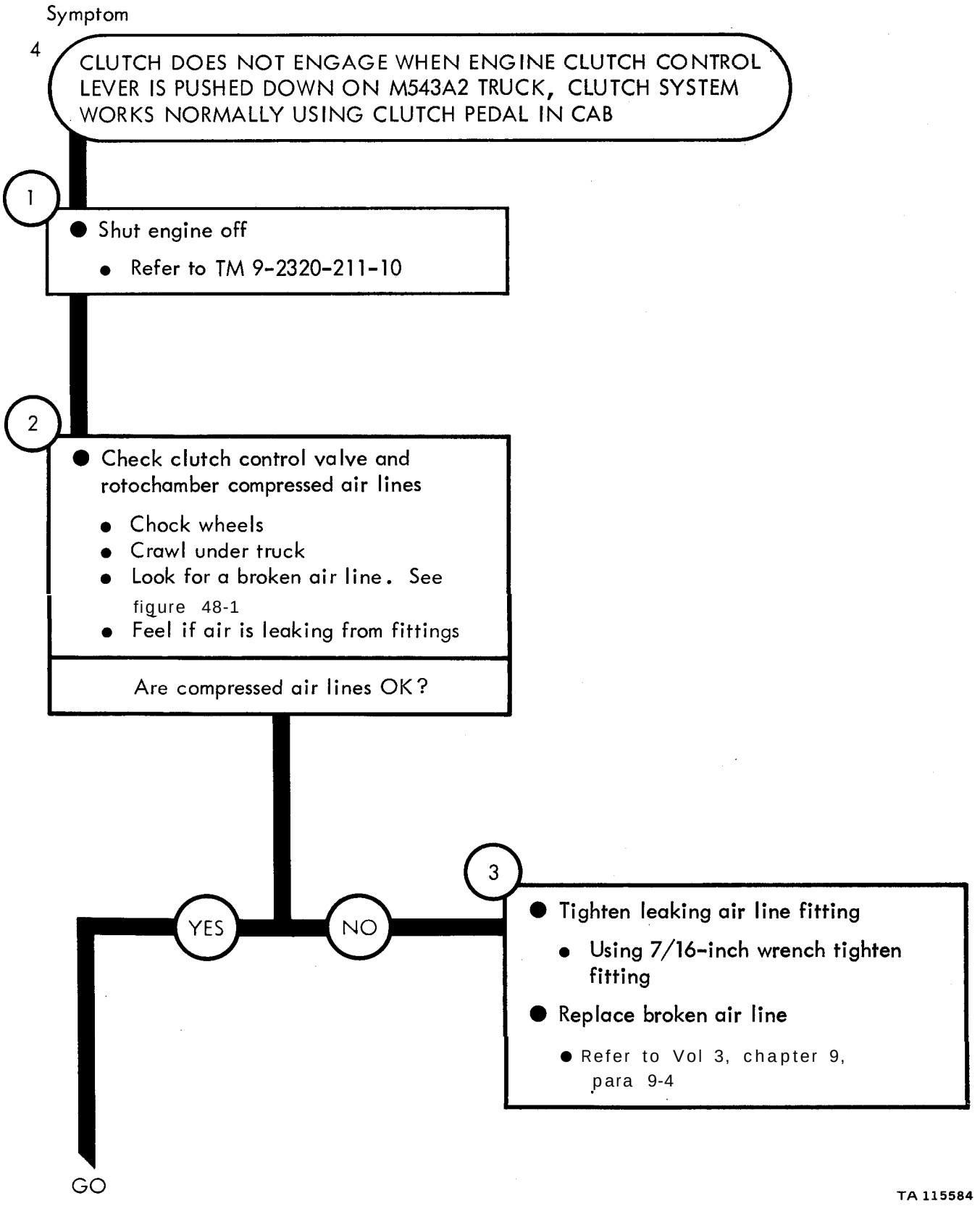


Figure 11-4 (Sheet 1 of 3)

GO

4

- Check rotochamber adjustment
  - Crawl under truck
  - Using a ruler that measures to 1/32 inch, check for 3/32 to 1/4 inch, of clearance between inner lever and adjusting screw

Is rotochamber adjustment OK?

YES

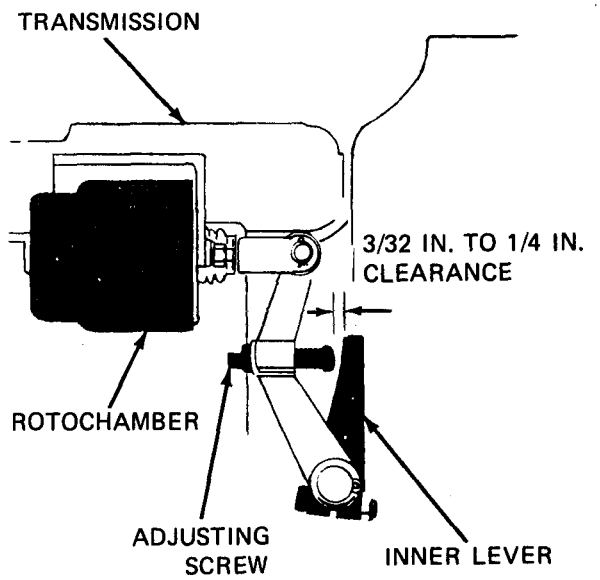
NO

5

- Adjust rotochamber
  - **Refer to Vol 3, chapter 18, para 18-28**

Note: If rotochamber can not be adjusted, it should be replaced. Tell direct support maintenance

GO



TA 115585

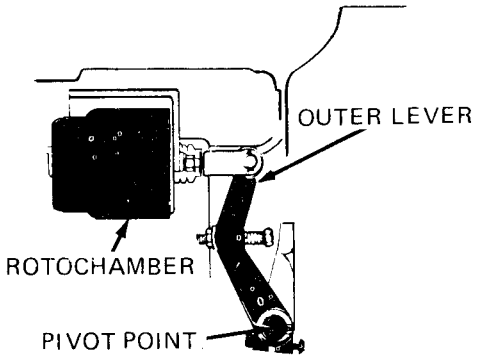
Figure 11-4 (Sheet 2 of 3)

GO

6

- Check rotochamber linkage
  - Move outer lever connected to rotochamber
  - Feel for signs of binding at pivot point

Is rotochamber linkage OK?



YES

NO

7

- Lubricate binding linkage
  - Using oil can lubricate pivot point on outer lever

8

Tell direct support maintenance

TA 115586

Figure 11-4 (Sheet 3 of 3)

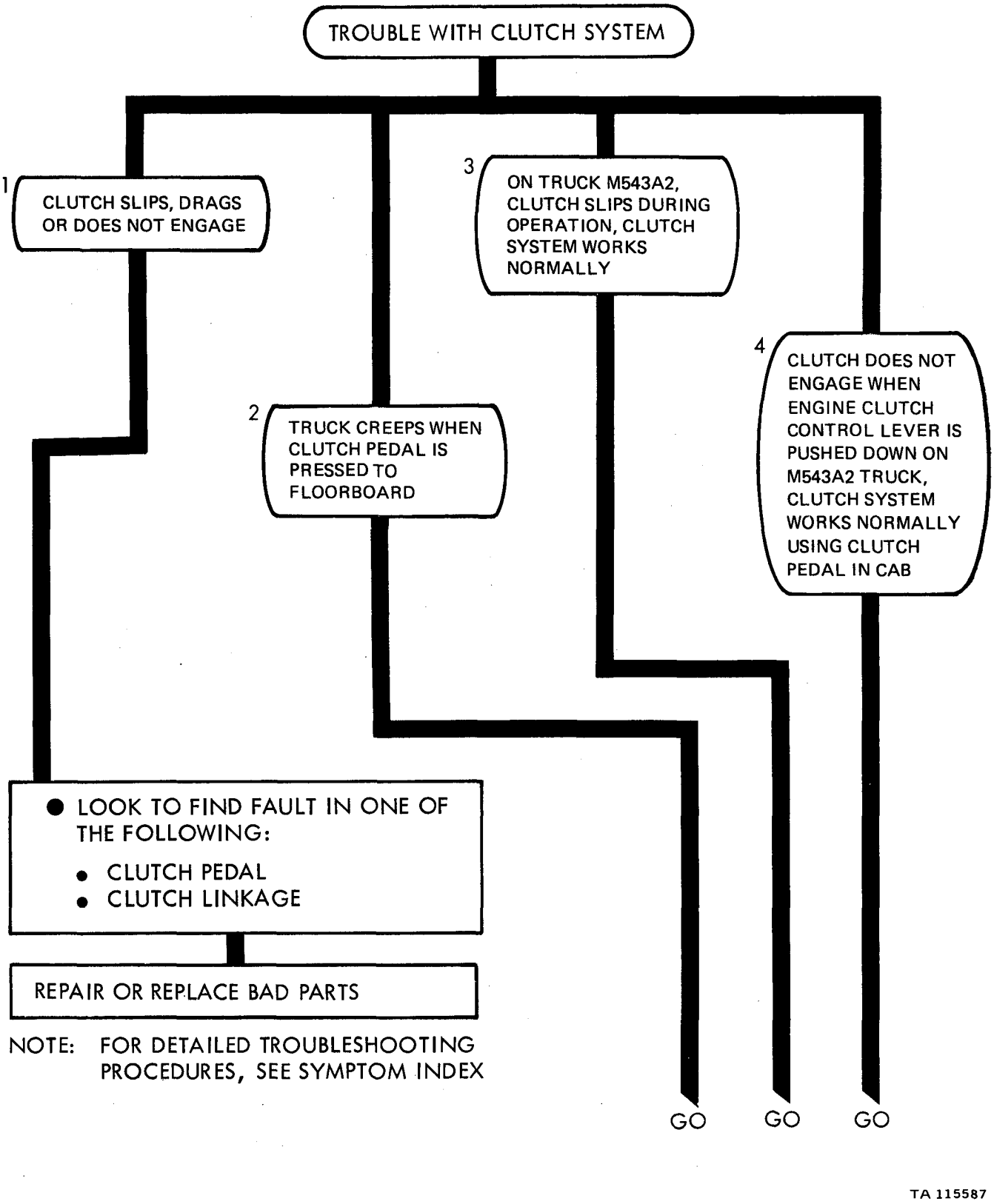
CHAPTER 12

CLUTCH SYSTEM TROUBLESHOOTING SUMMARY

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

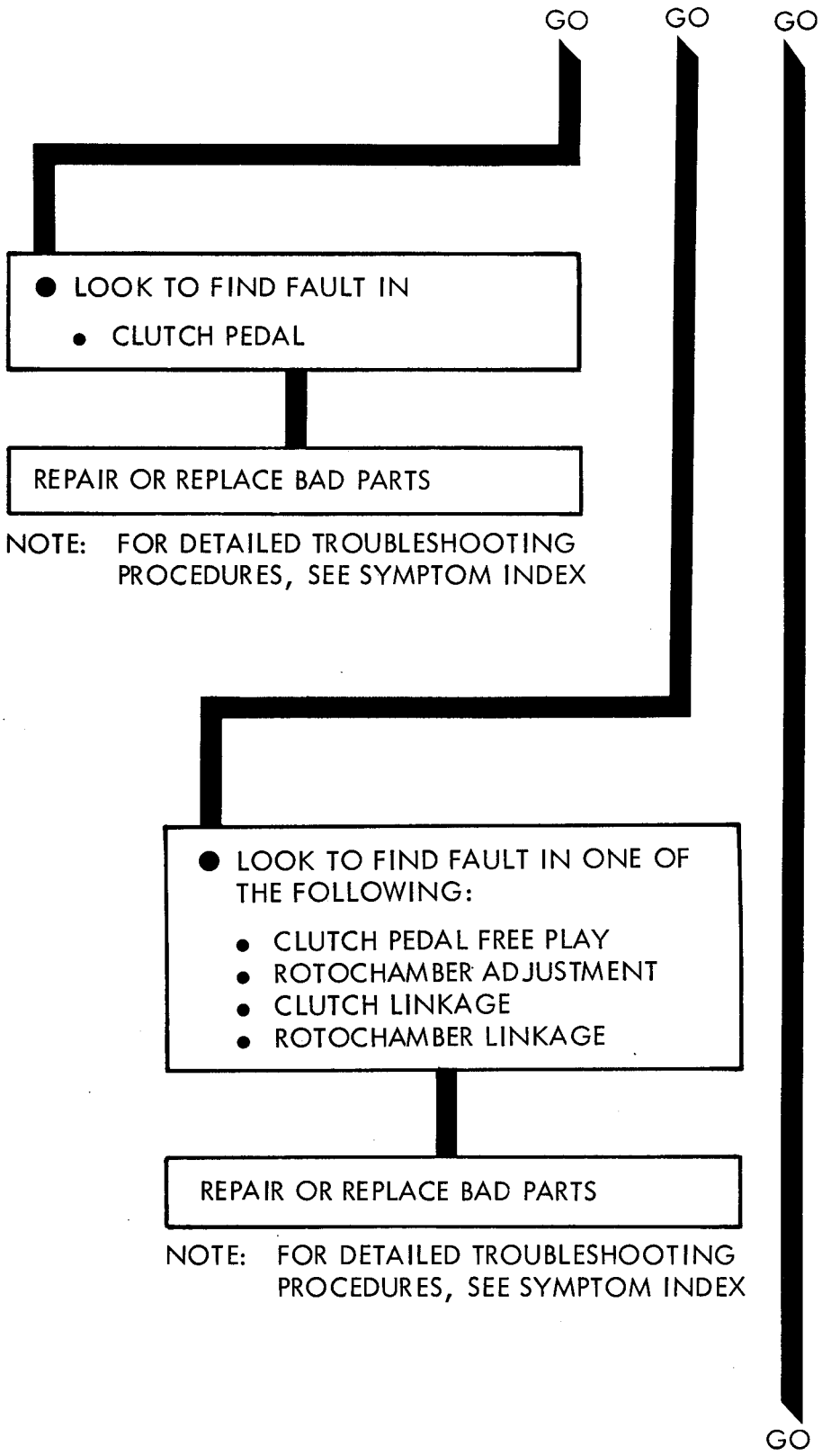
12-2. PROCEDURES. The summary in this chapter covers all fault symptoms found in the detailed troubleshooting procedures. Chapter 7 outlines a sample trouble-shooting procedure. The summary procedures are based on the "what-to-do" portions of the detailed procedures and do not include the "How-to-do-it"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

CLUTCH SYSTEM TROUBLESHOOTING SUMMARY



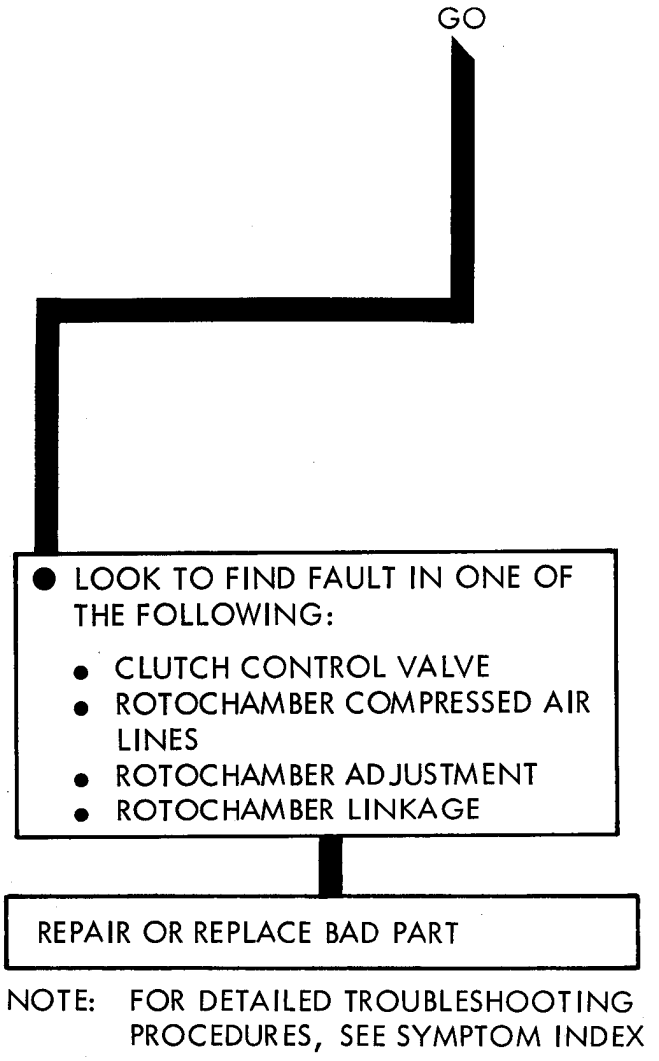
TA 115587

Figure 12-1 (Sheet 1 of 3)



TA 115589

Figure 12-1 (Sheet 2 of 3)



TA 115590

Figure 12-1 (Sheet 3 of 3)

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.

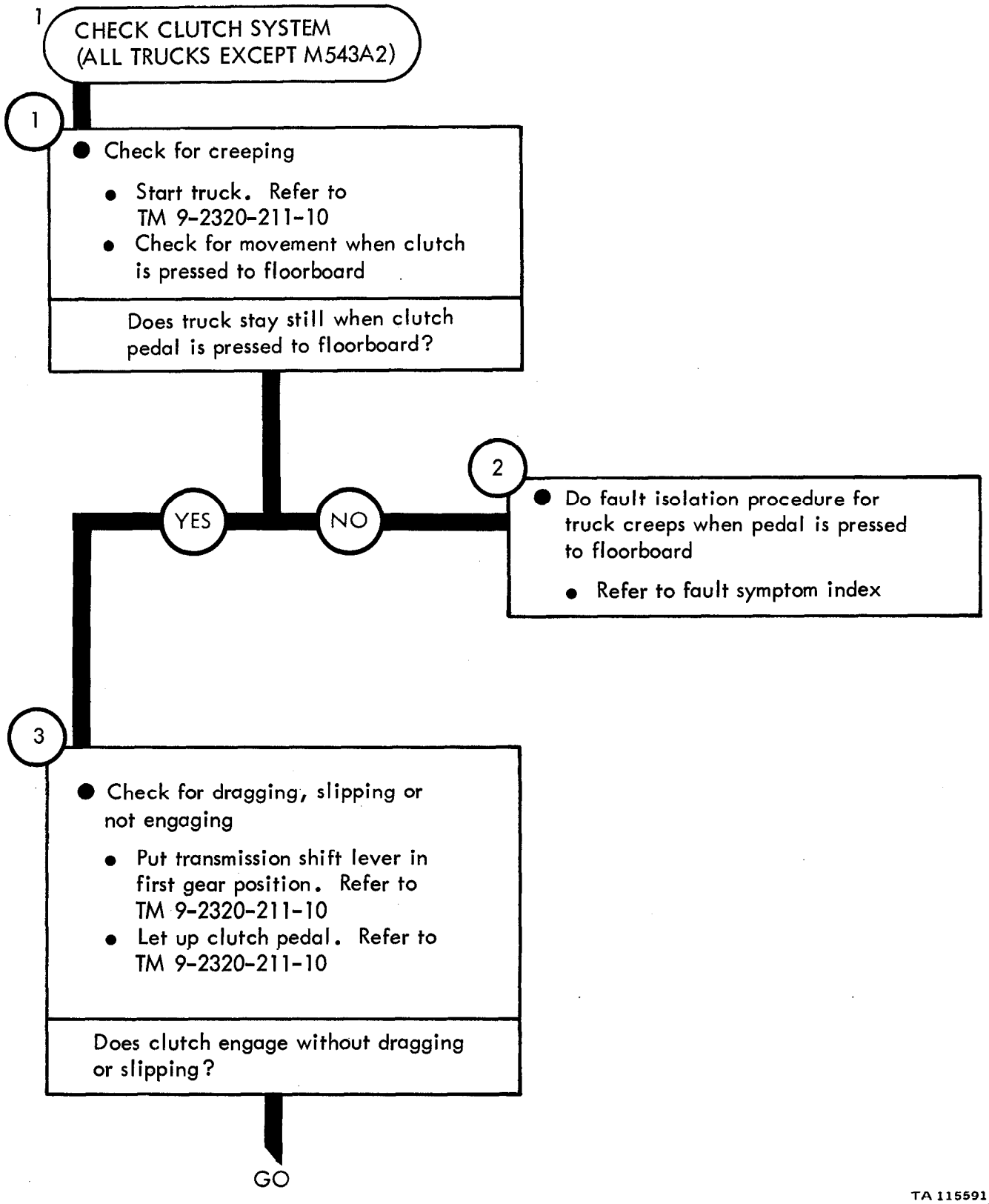
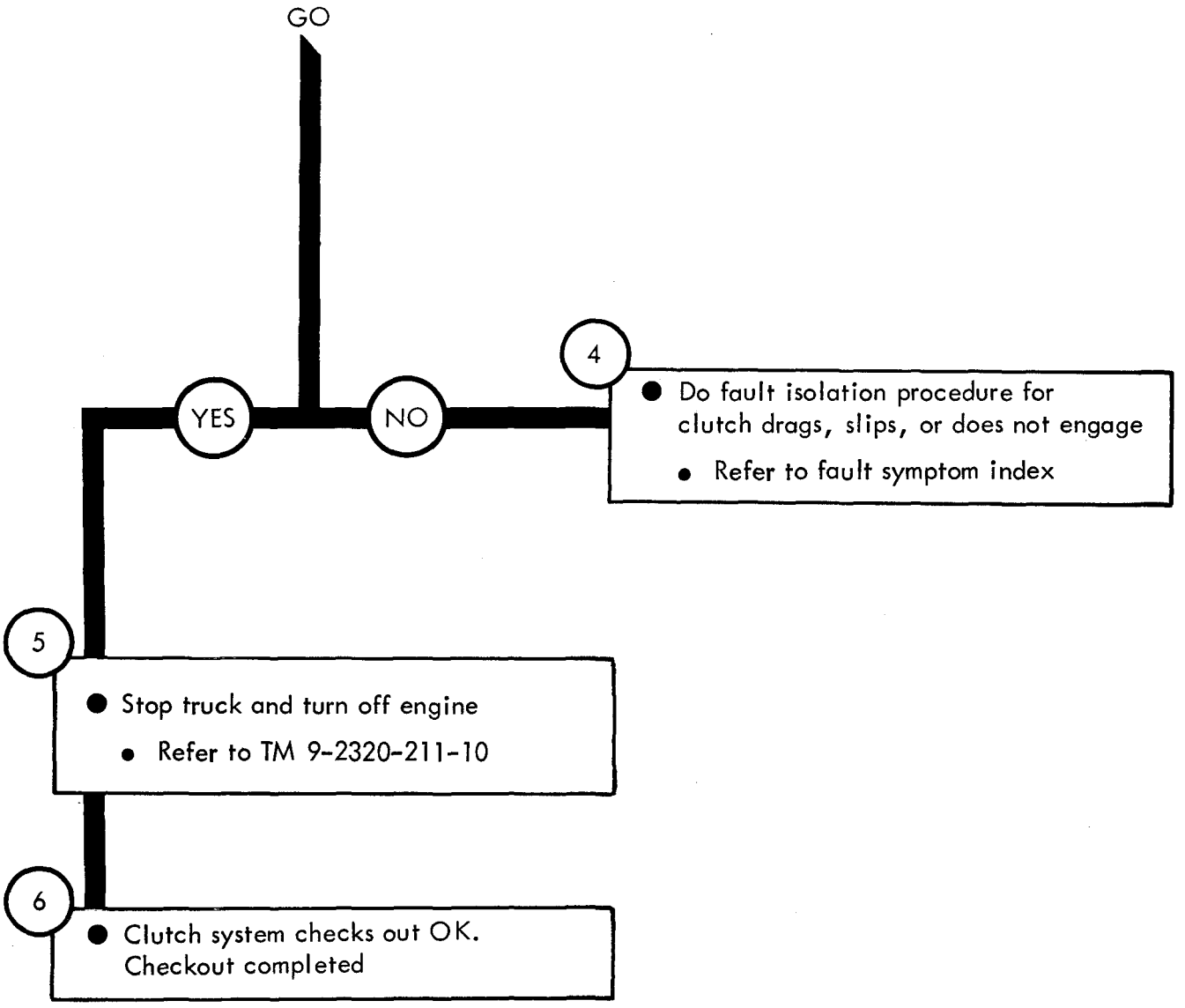


Figure 13-1 (Sheet 1 of 5)



TA 115592

Figure 13-1 (Sheet 2 of 5)

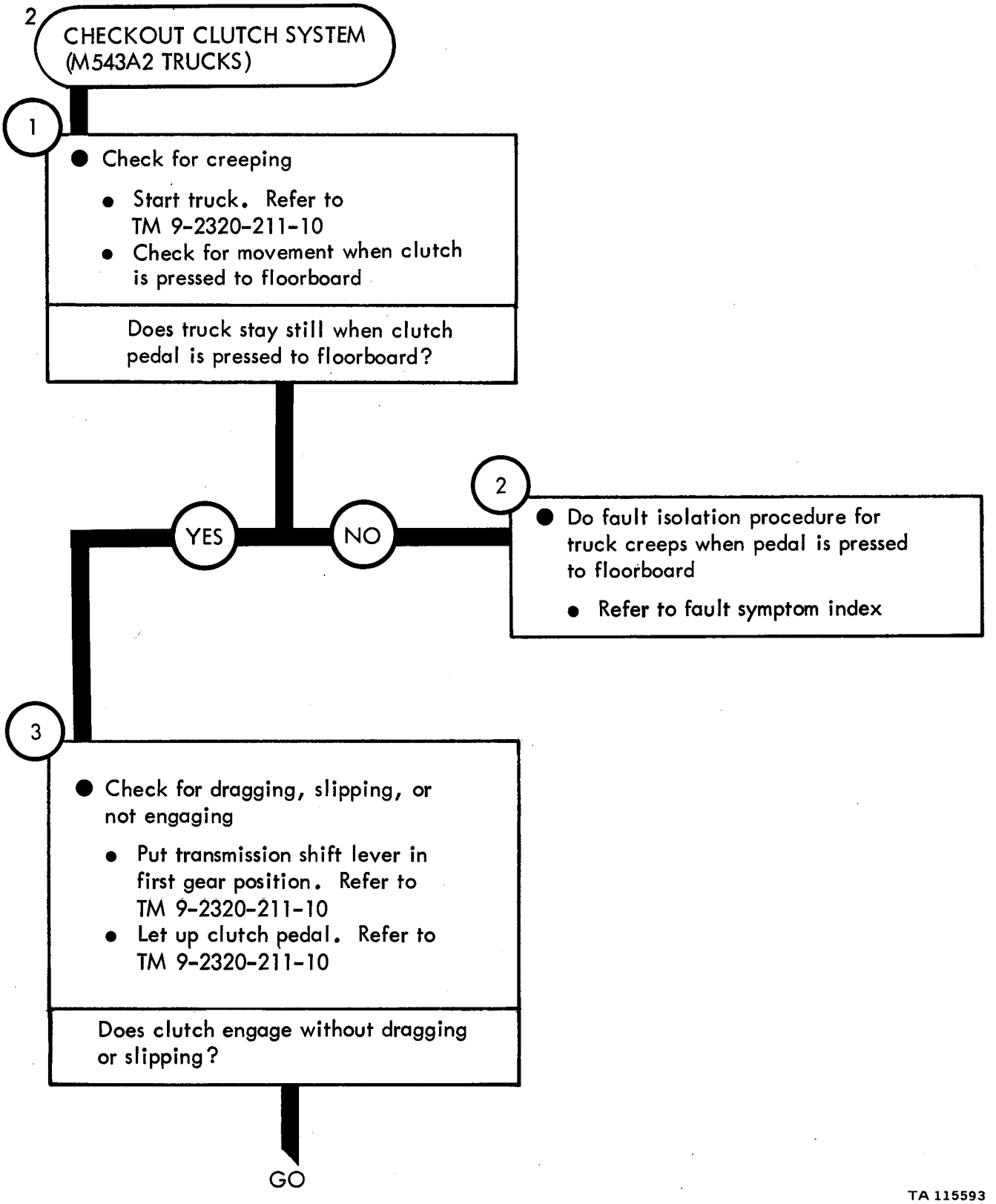
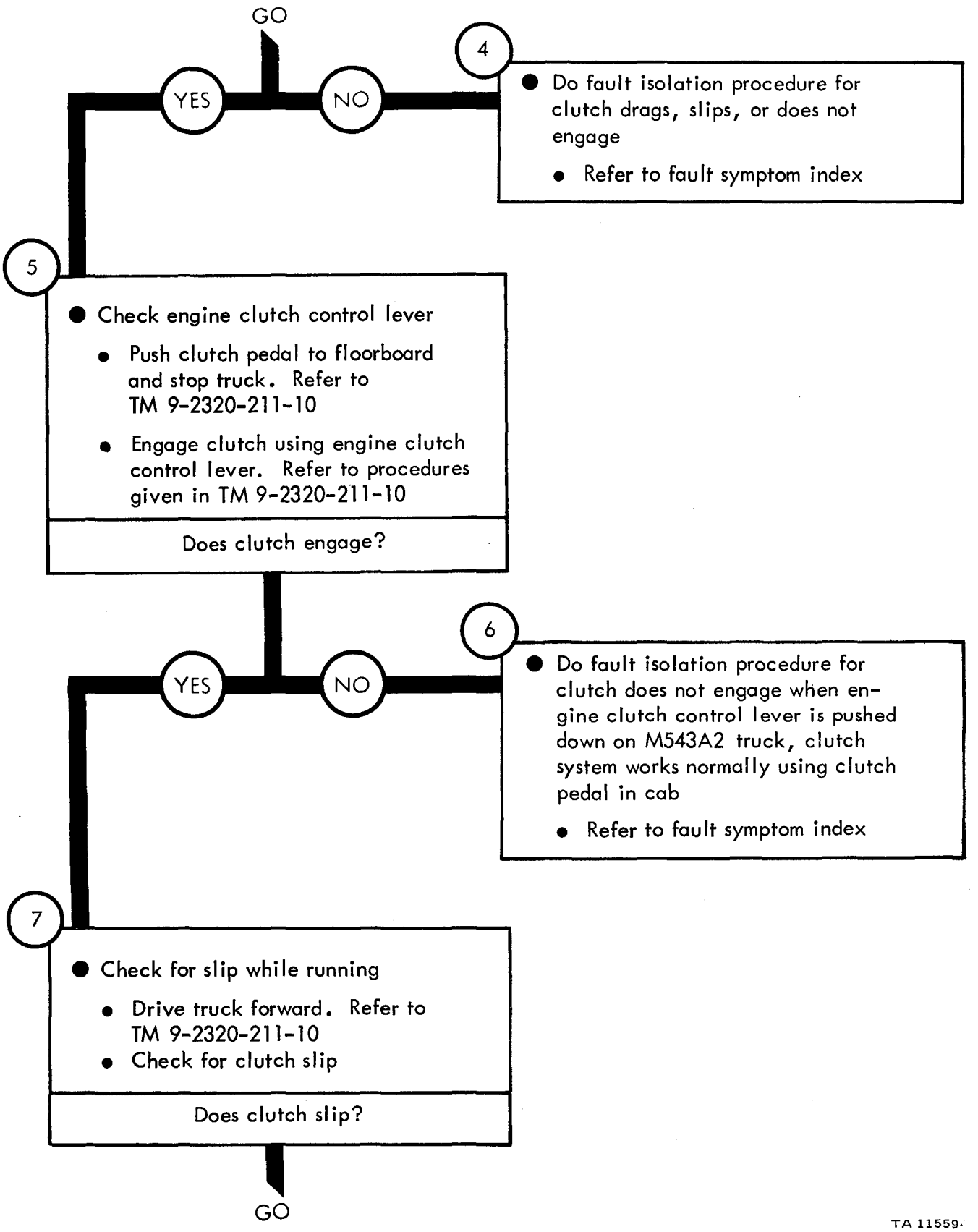
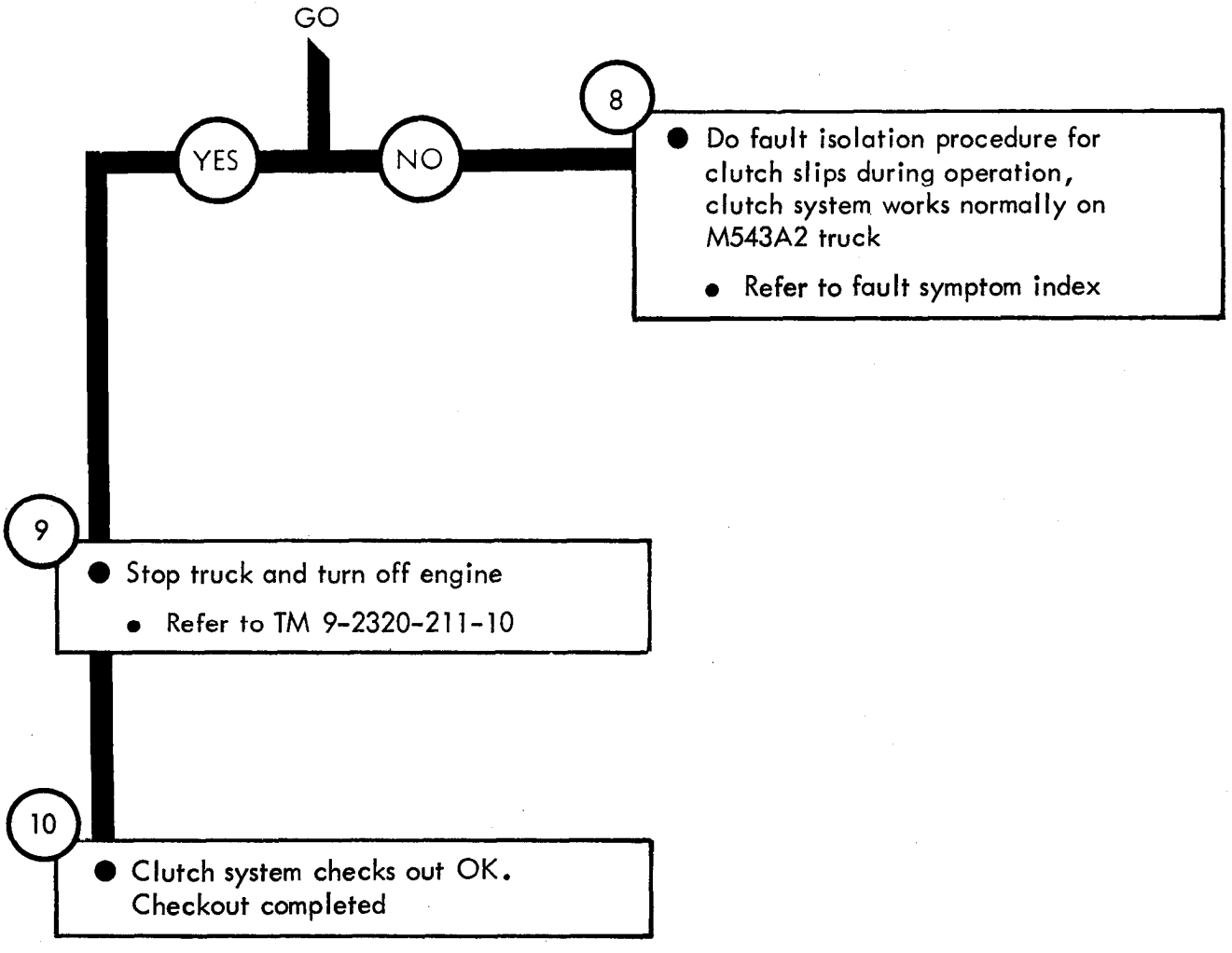


Figure 13-1 (Sheet 3 of 5)



TA 11559

Figure 13-1 (Sheet 4 of 5)



TA 115595

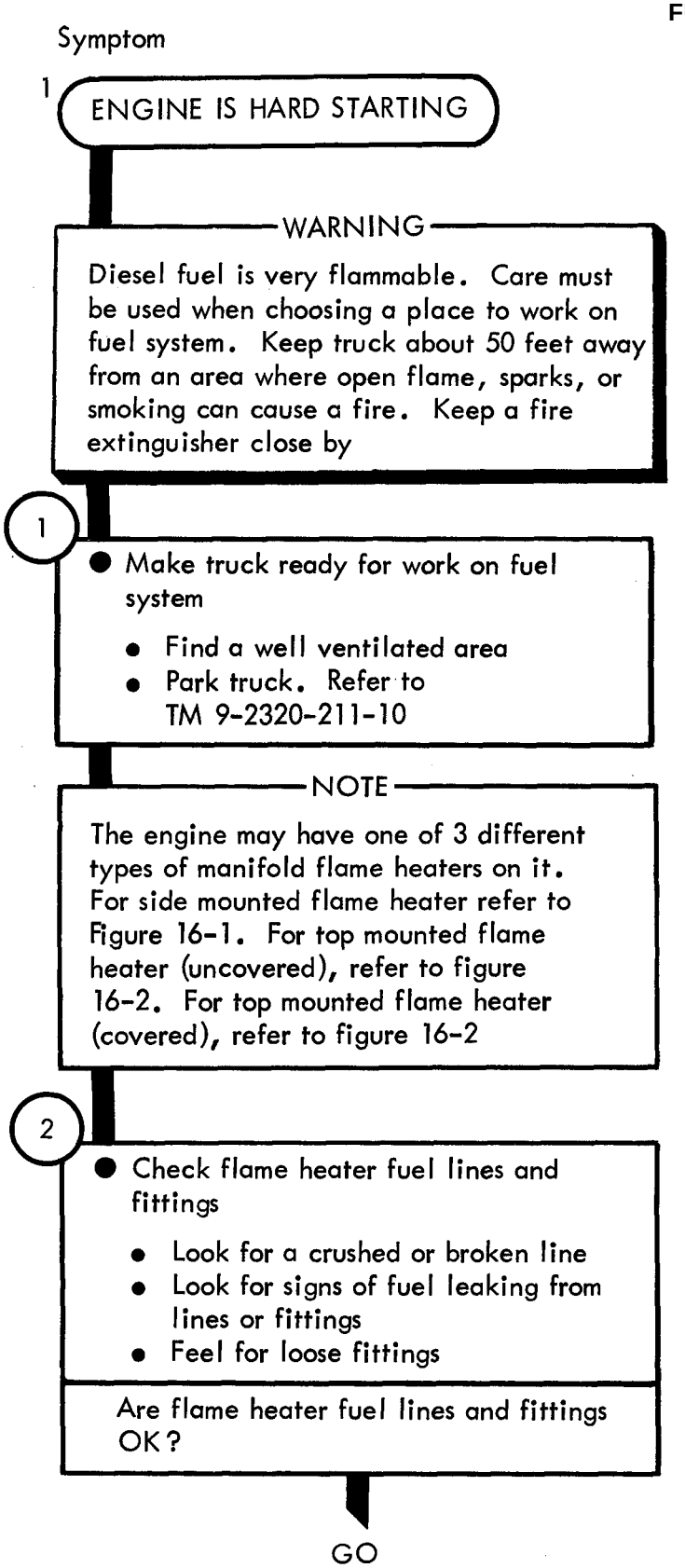
Figure 13-1 (Sheet 5 of 5)

CHAPTER 14

FUEL SYSTEM TROUBLESHOOTING

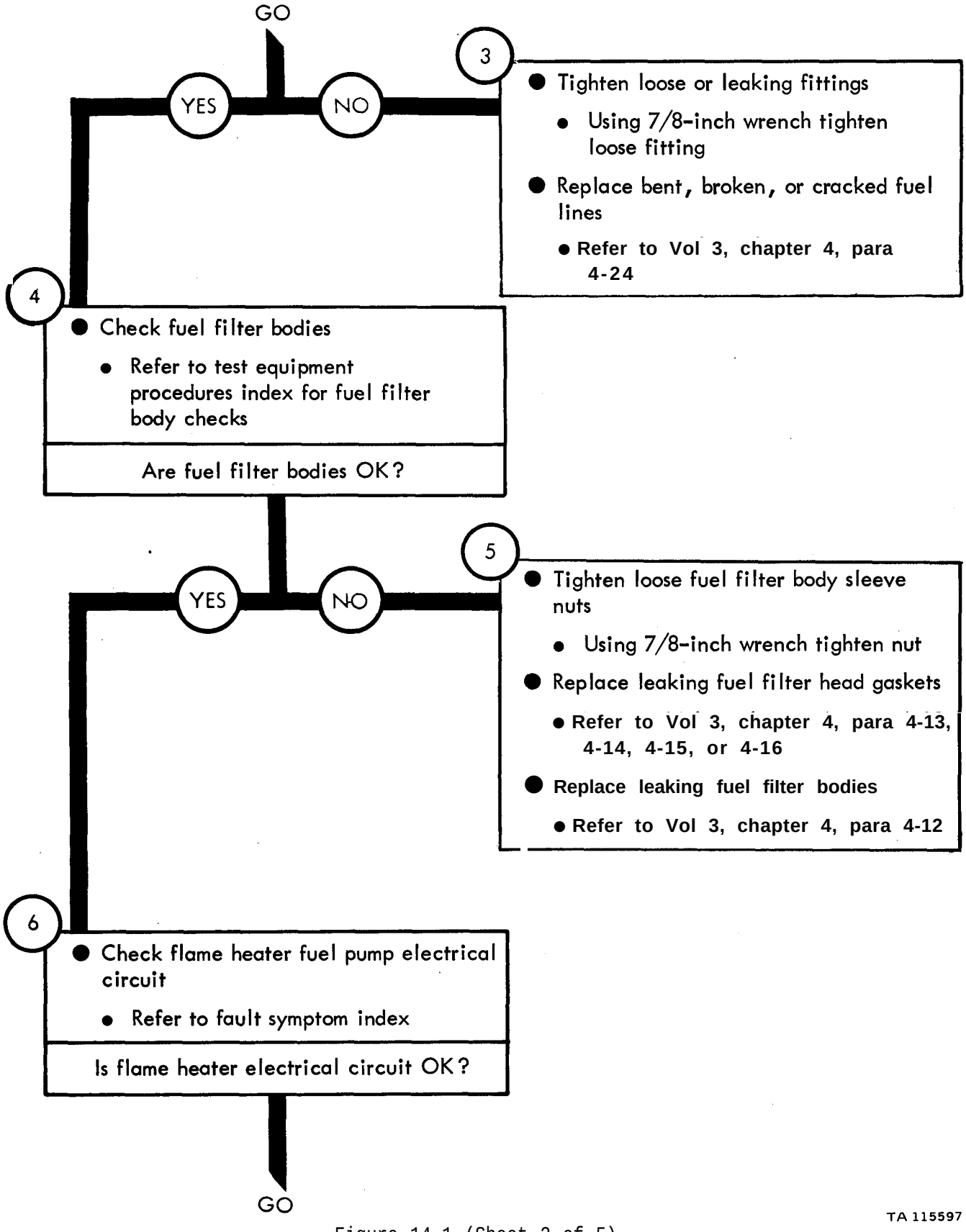
14-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the fuel system, for which there are authorized corrective maintenance tasks at the organizational maintenance level.

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.



TA 115596

Figure 14-1 (Sheet 1 of 5)



TA 115597

Figure 14-1 (Sheet 2 of 5)

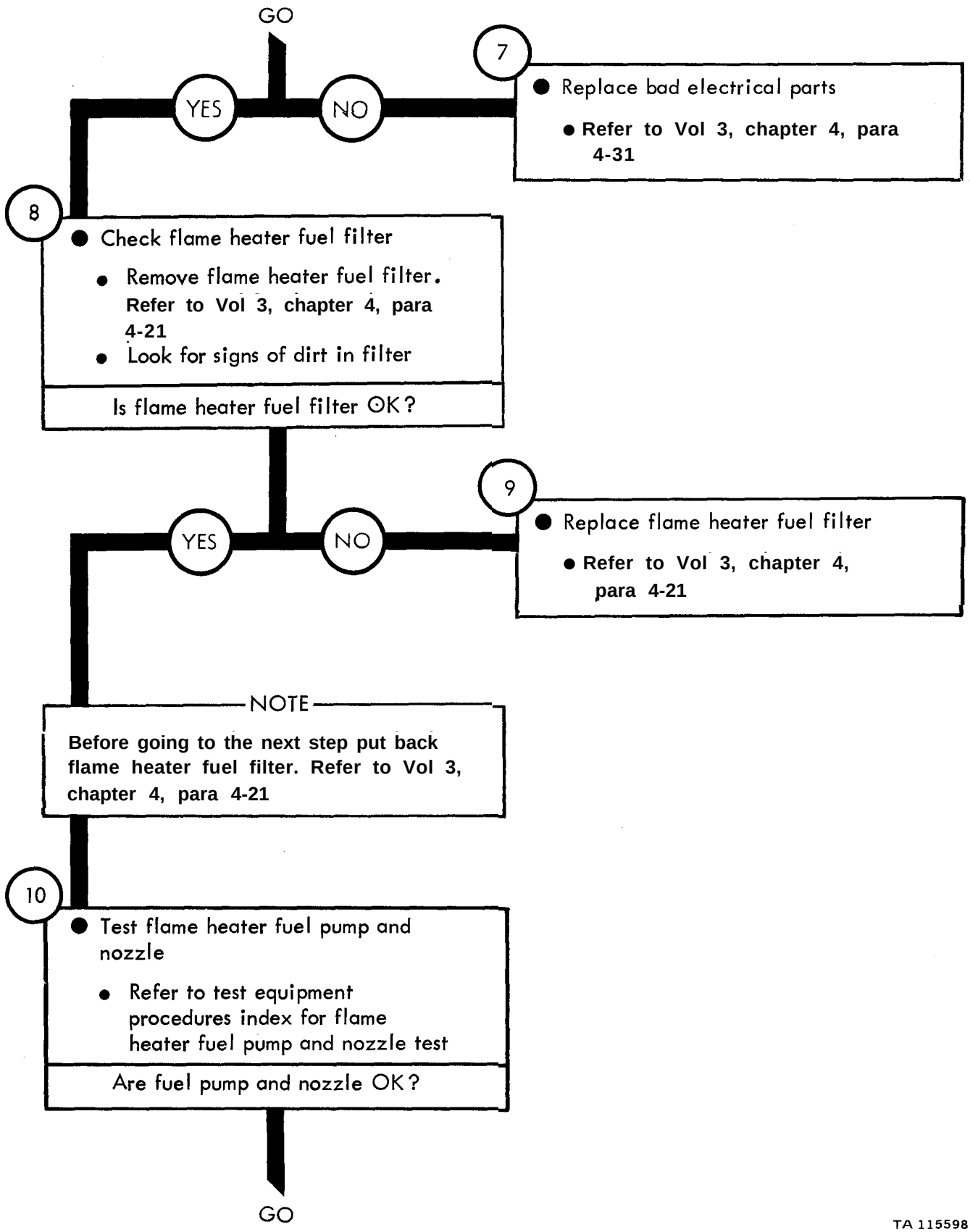
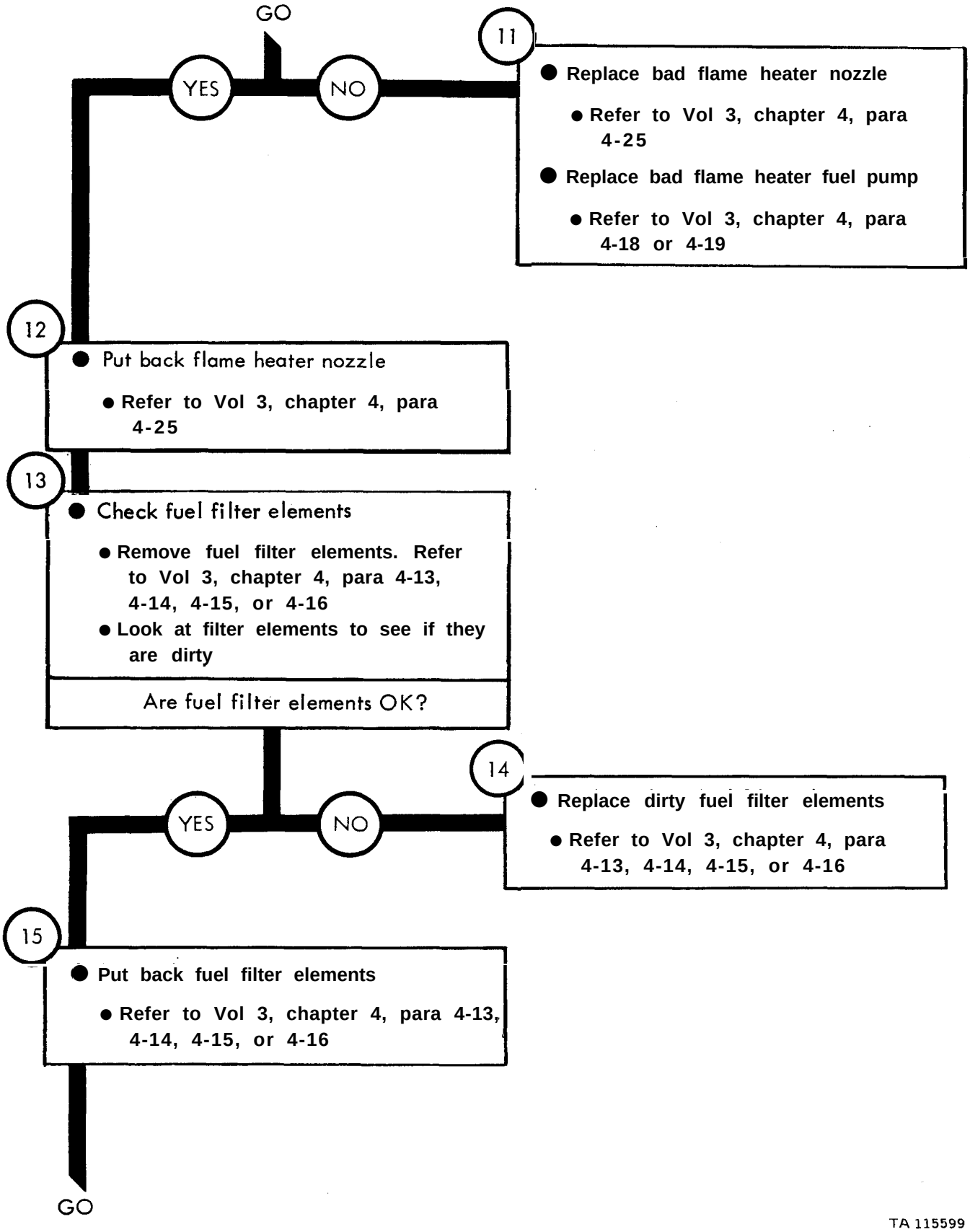


Figure 14-1 (Sheet 3 of 5)



TA 115599

Figure 14-1 (Sheet 4 of 5)

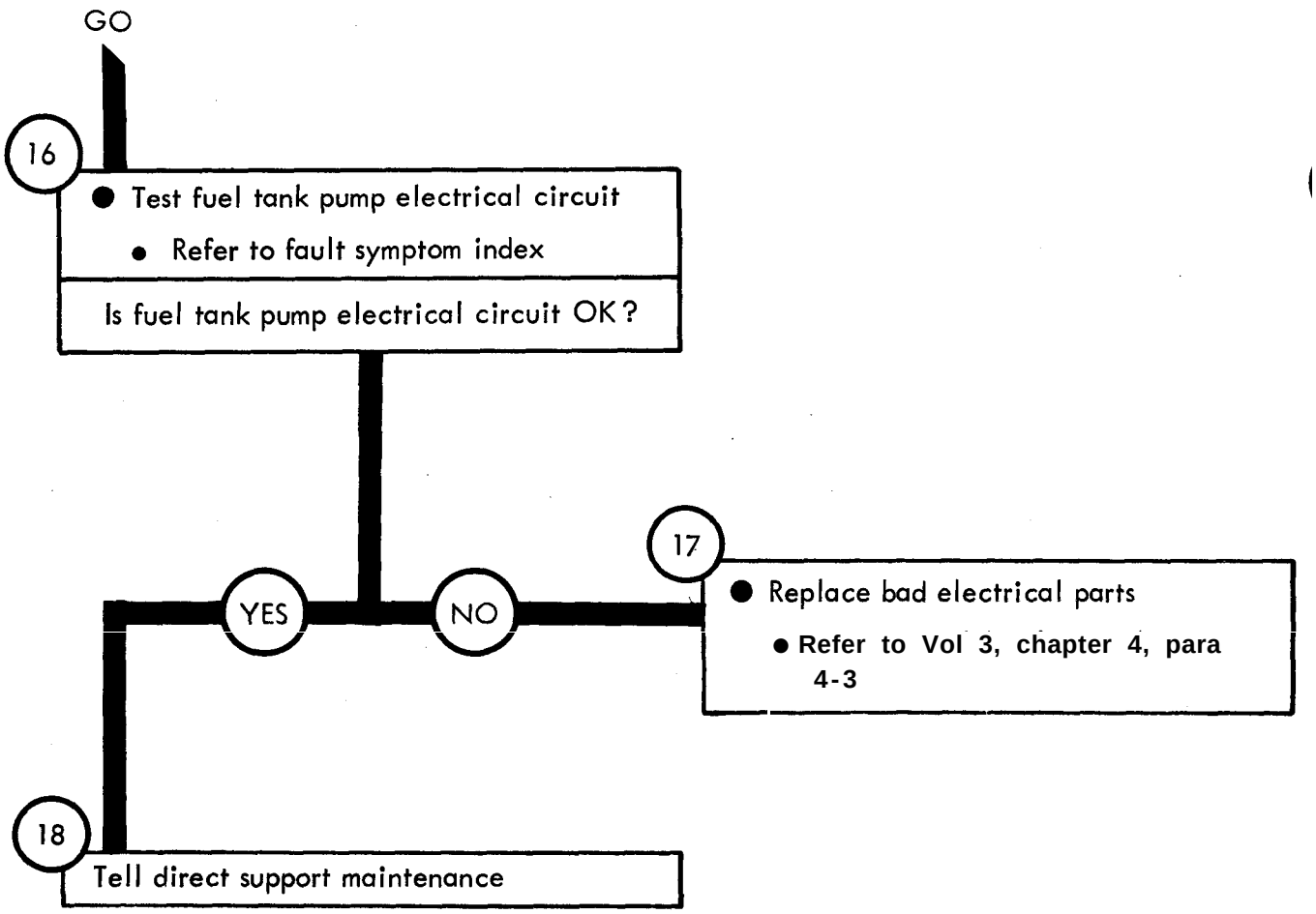


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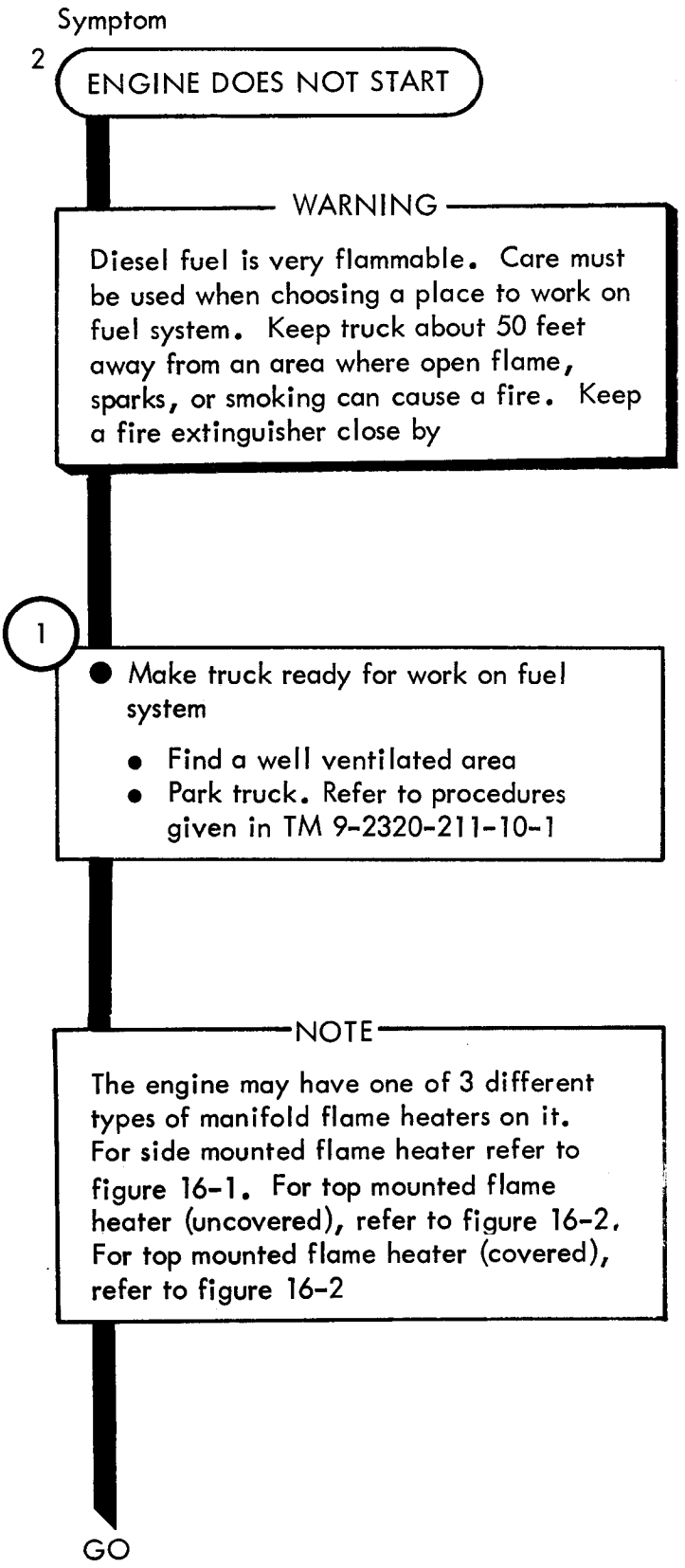
Figure 14-1 (Sheet 5 of 5)



TA 115601

Figure 14-2 (Sheet 1 of 6)

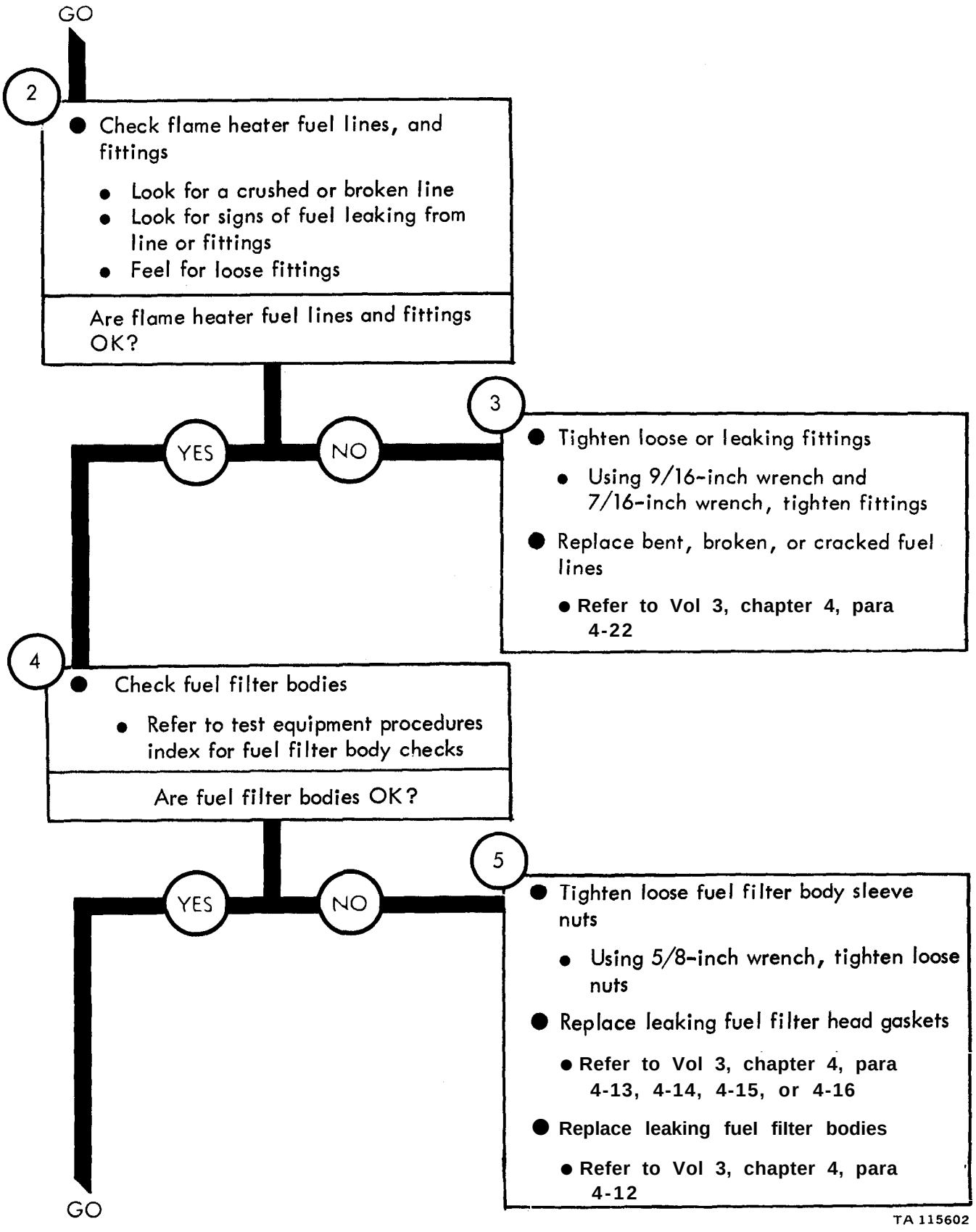


Figure 14-2 (Sheet 2 of 6)

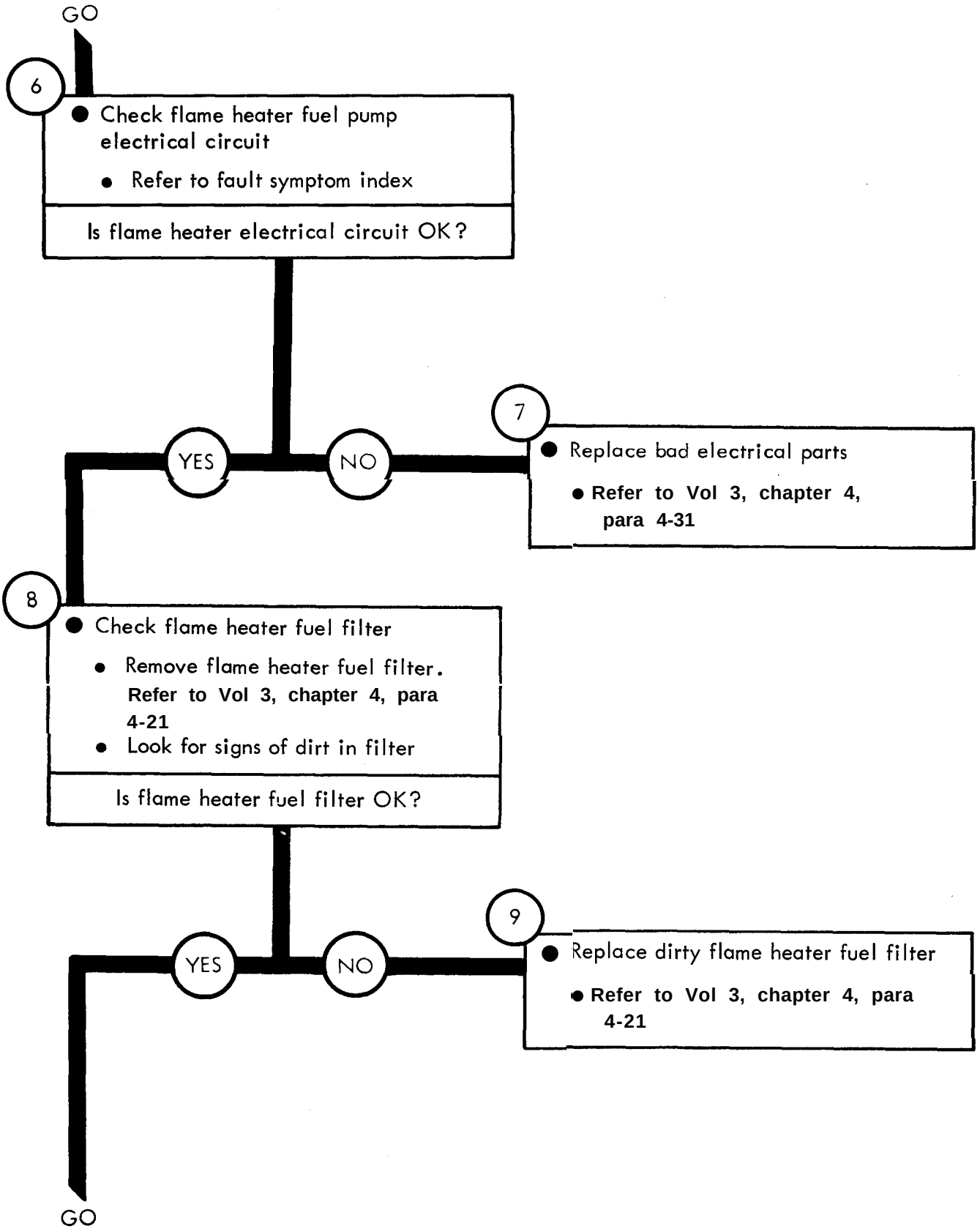


Figure 14-2 (Sheet 3 of 6)

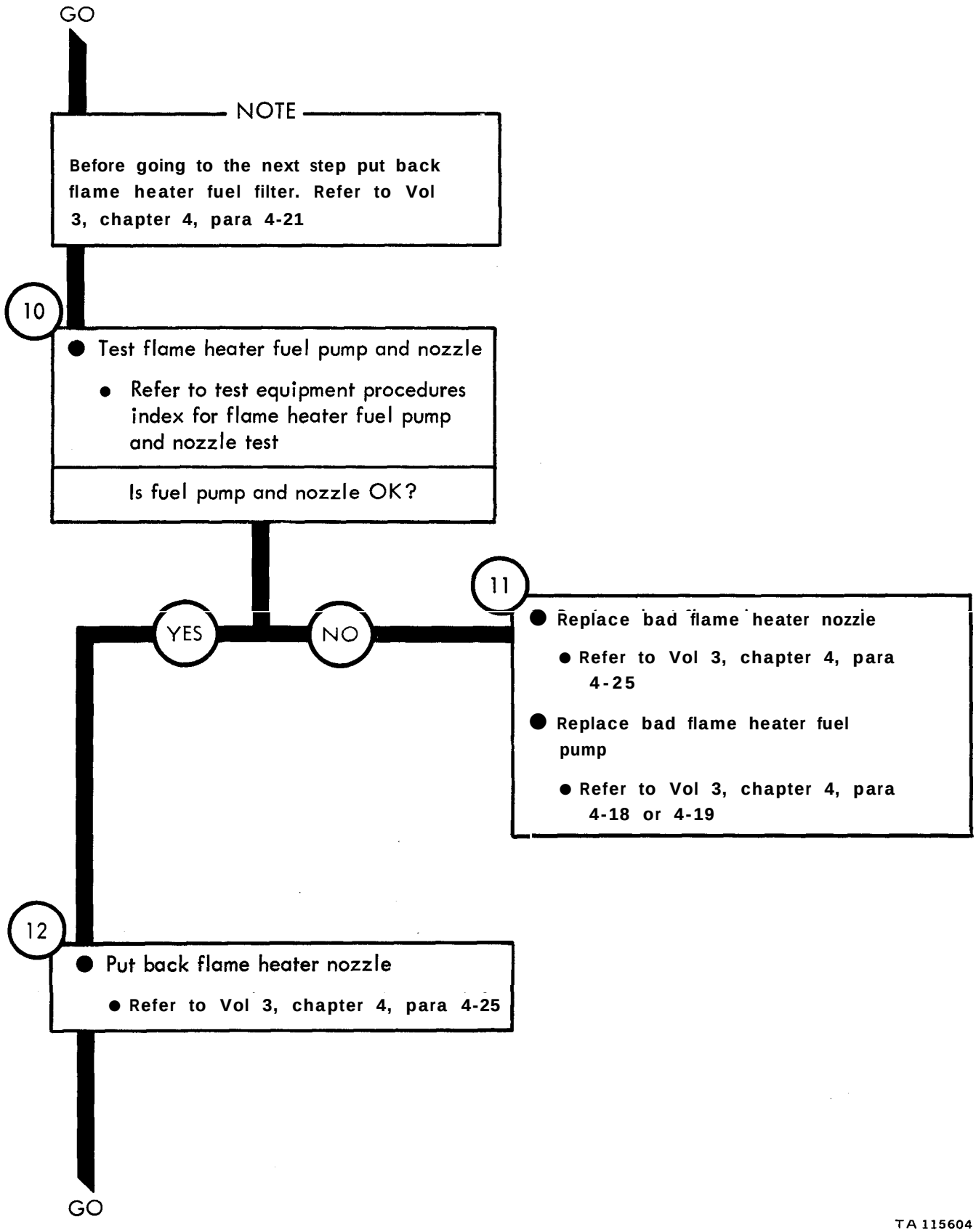
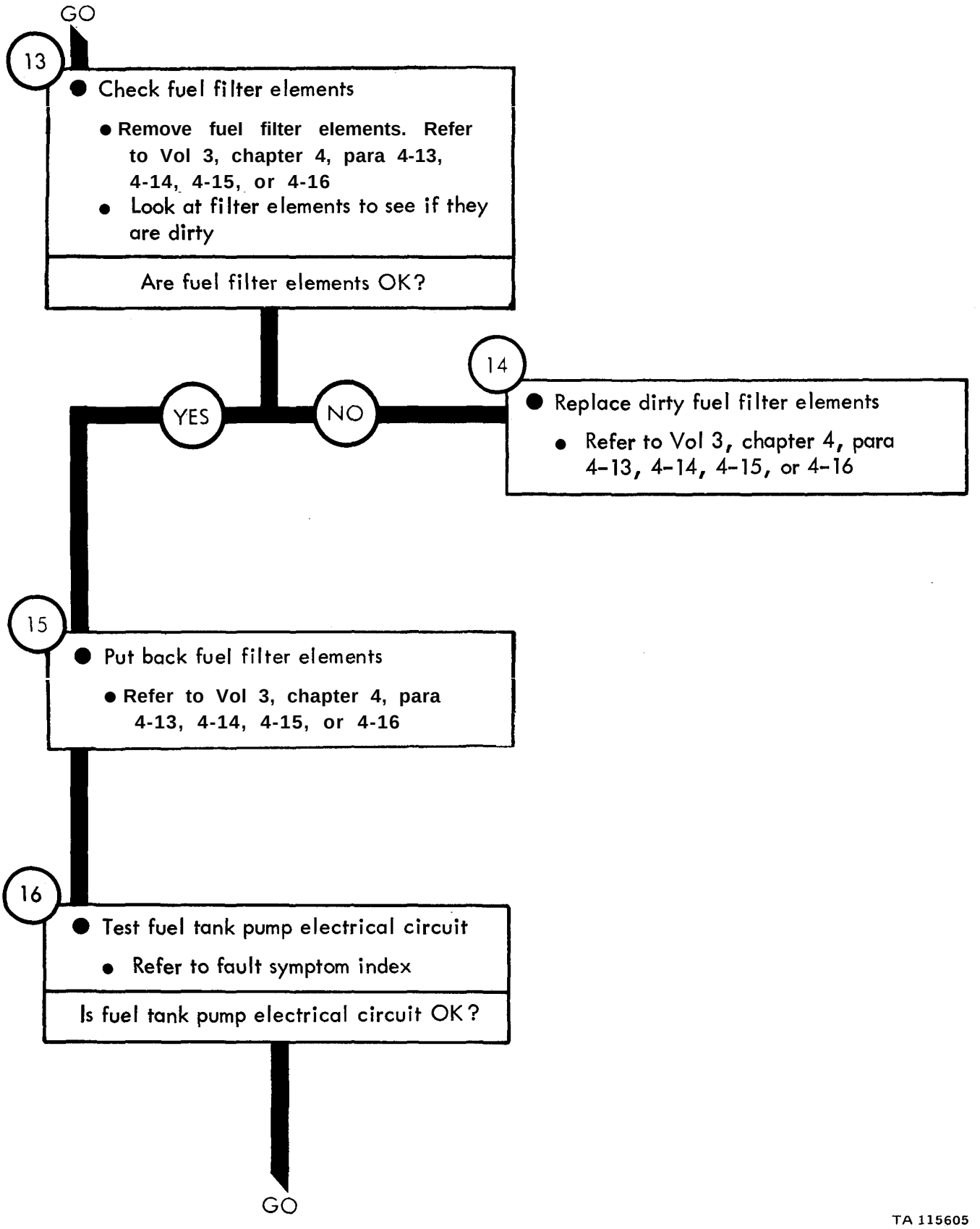
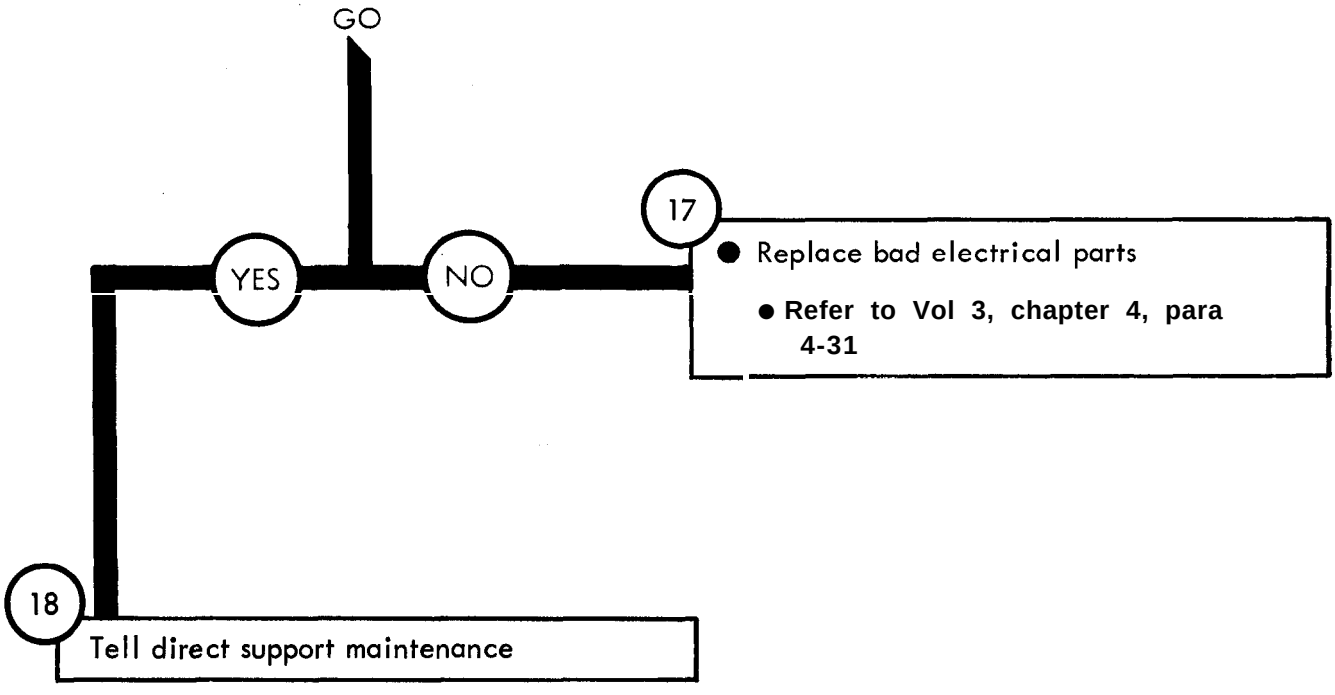


Figure 14-2 (Sheet 4 of 6)



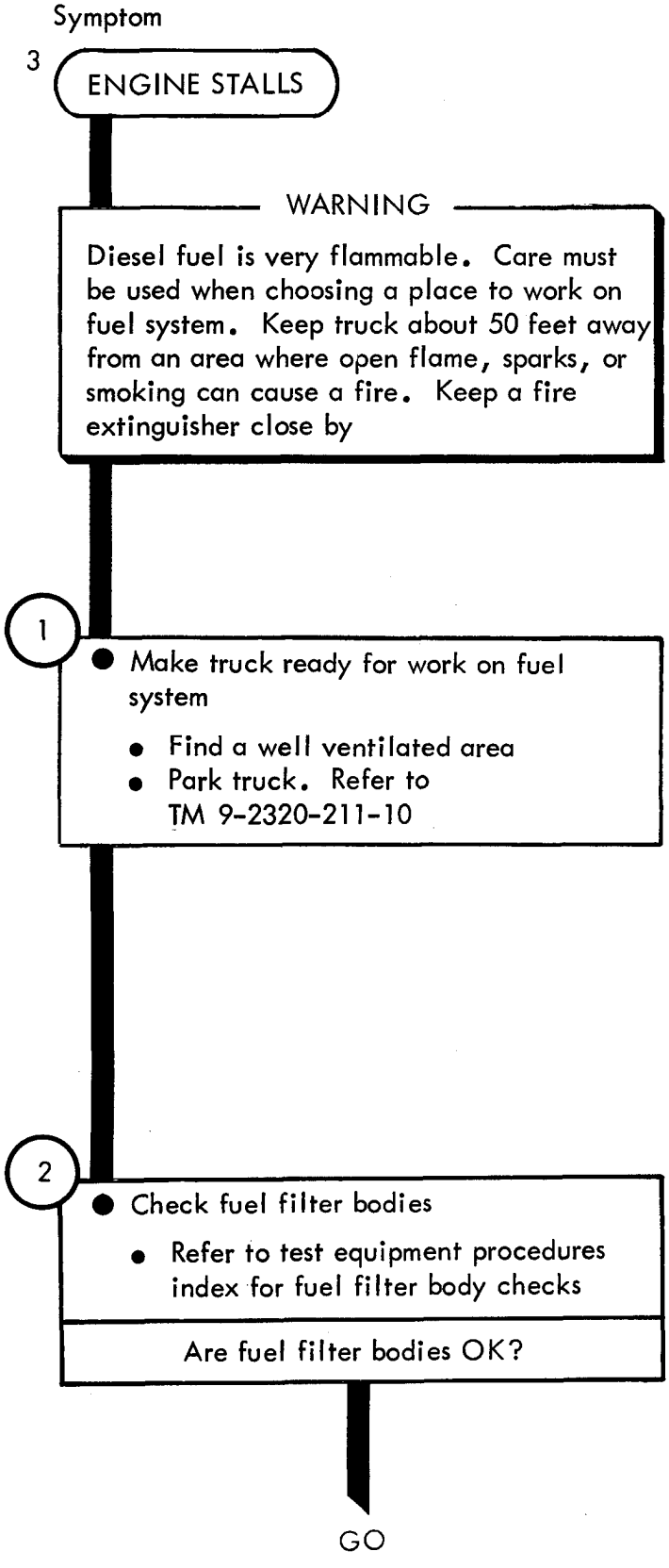
TA 115605

Figure 14-2 (Sheet 5 of 6)



TA 115606

Figure 14-2 (Sheet 6 of 6)



TA 115607

Figure 14-3 (Sheet 1 of 4)

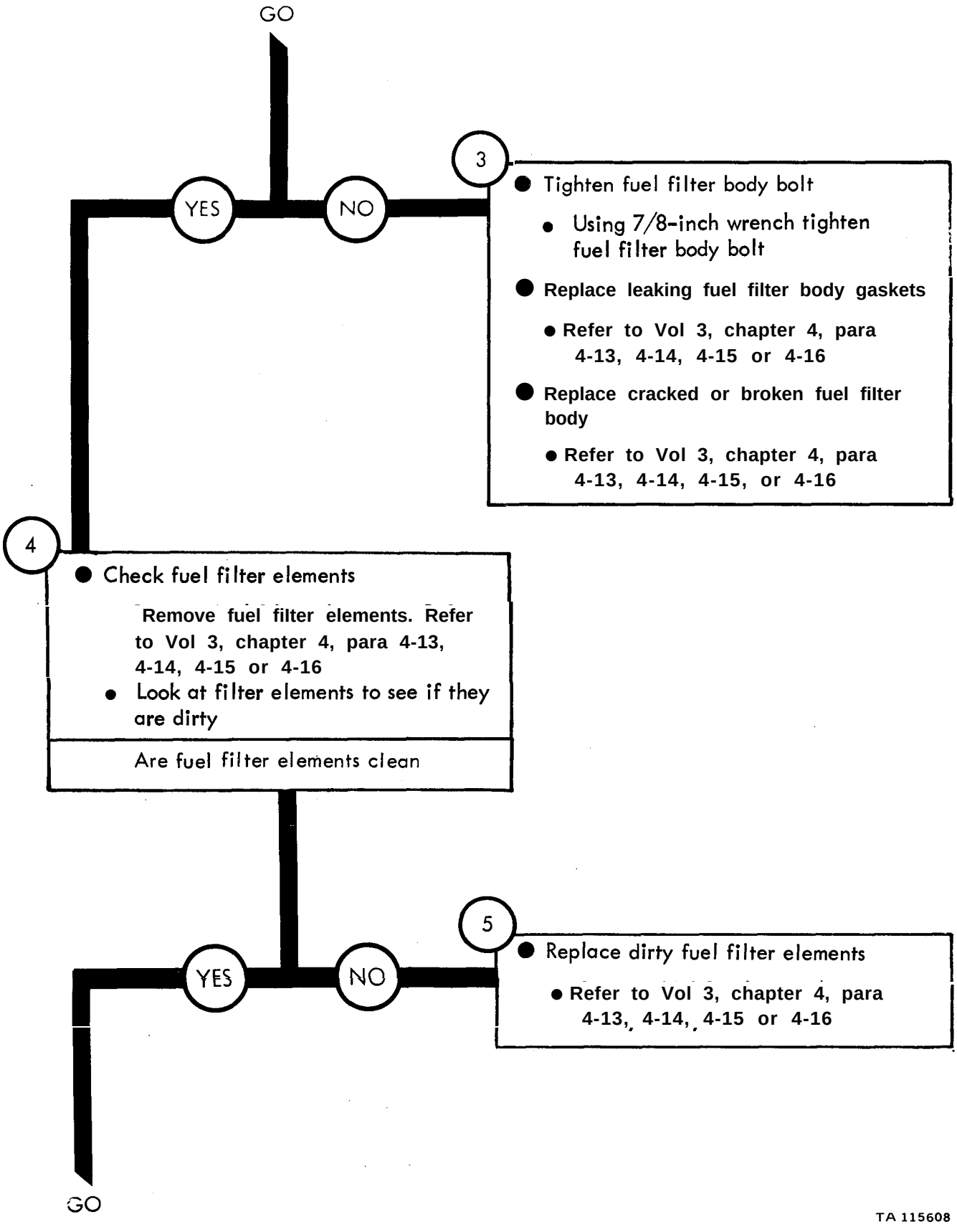


Figure 14-3 (Sheet 2 of 4)

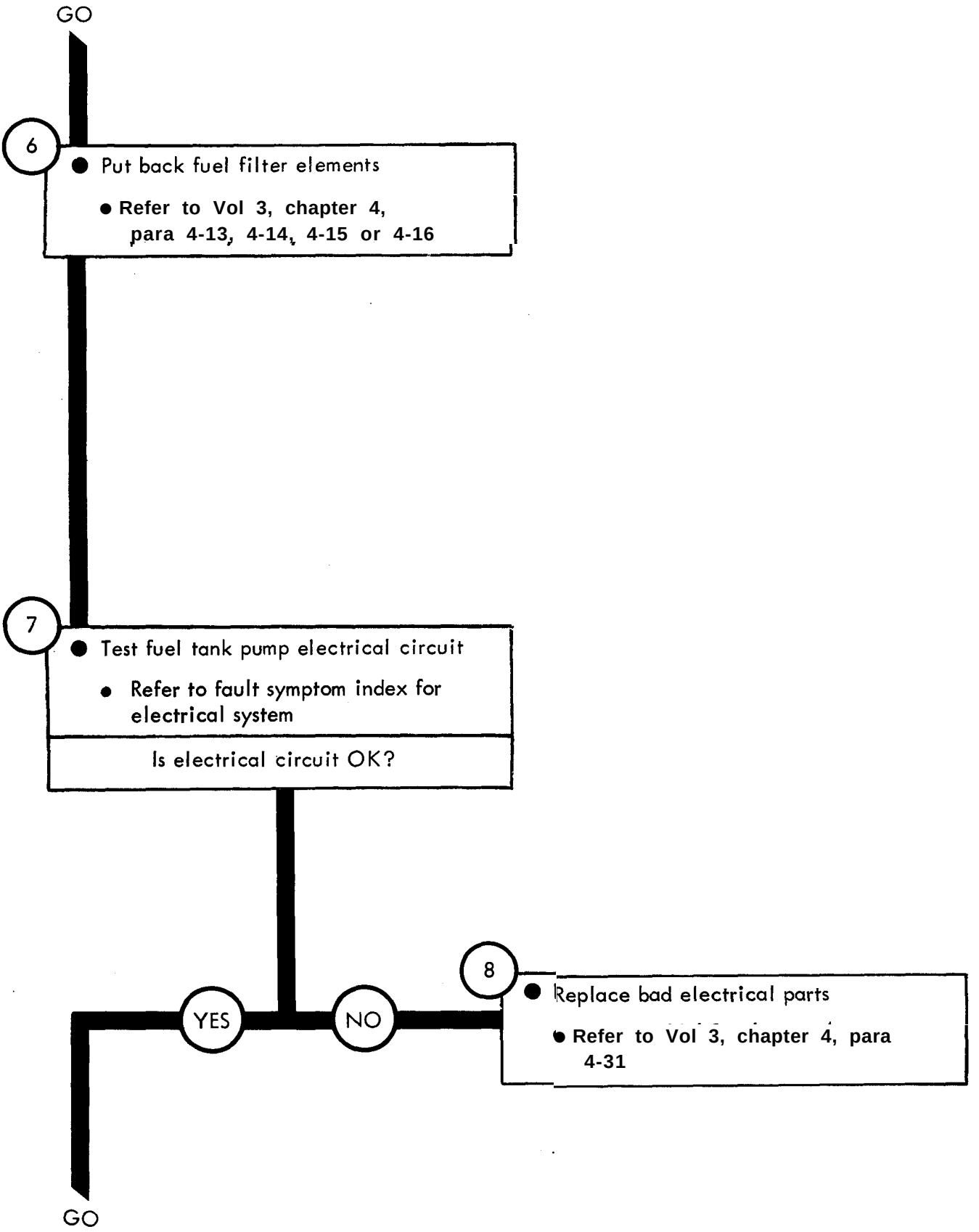
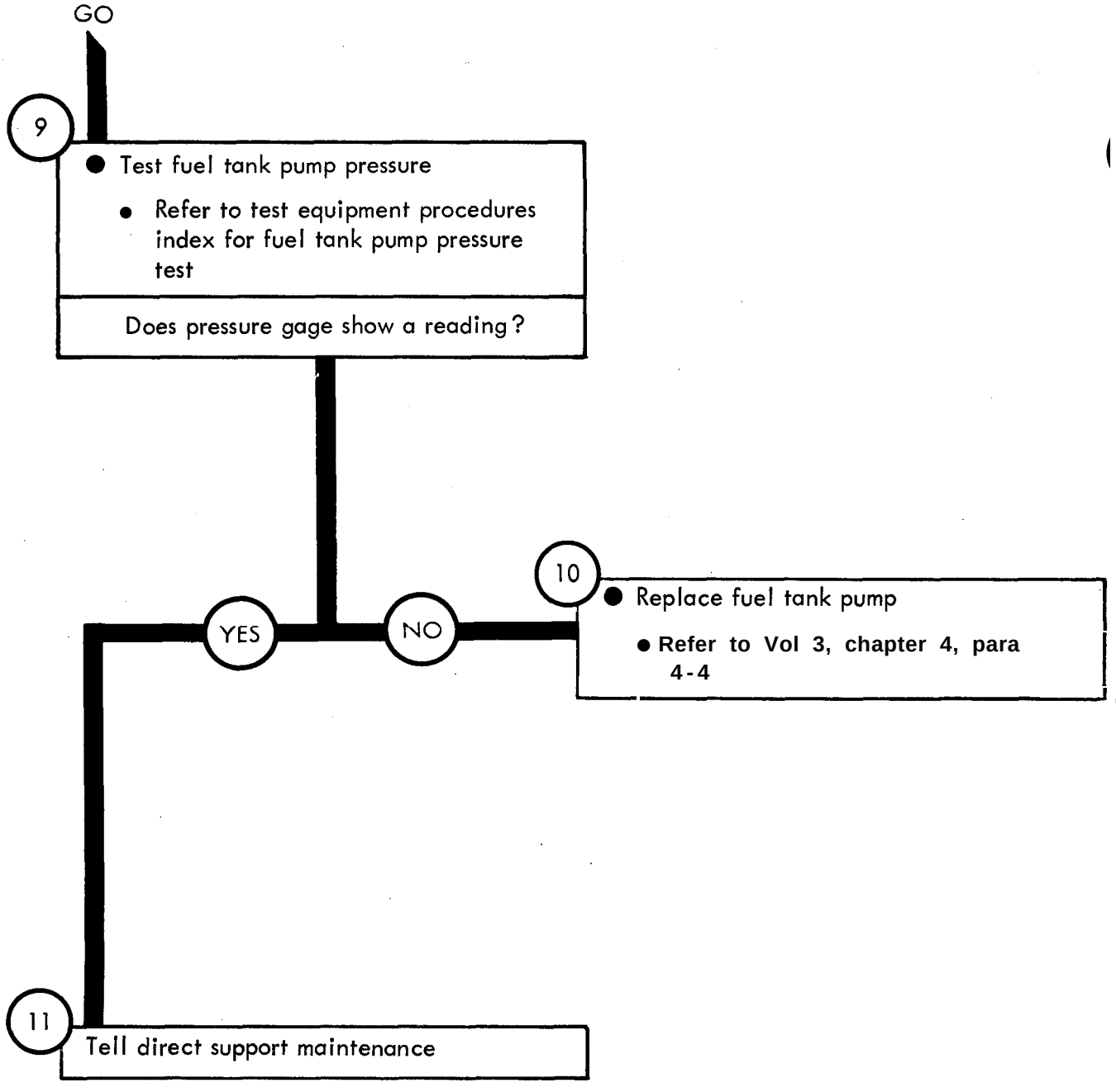
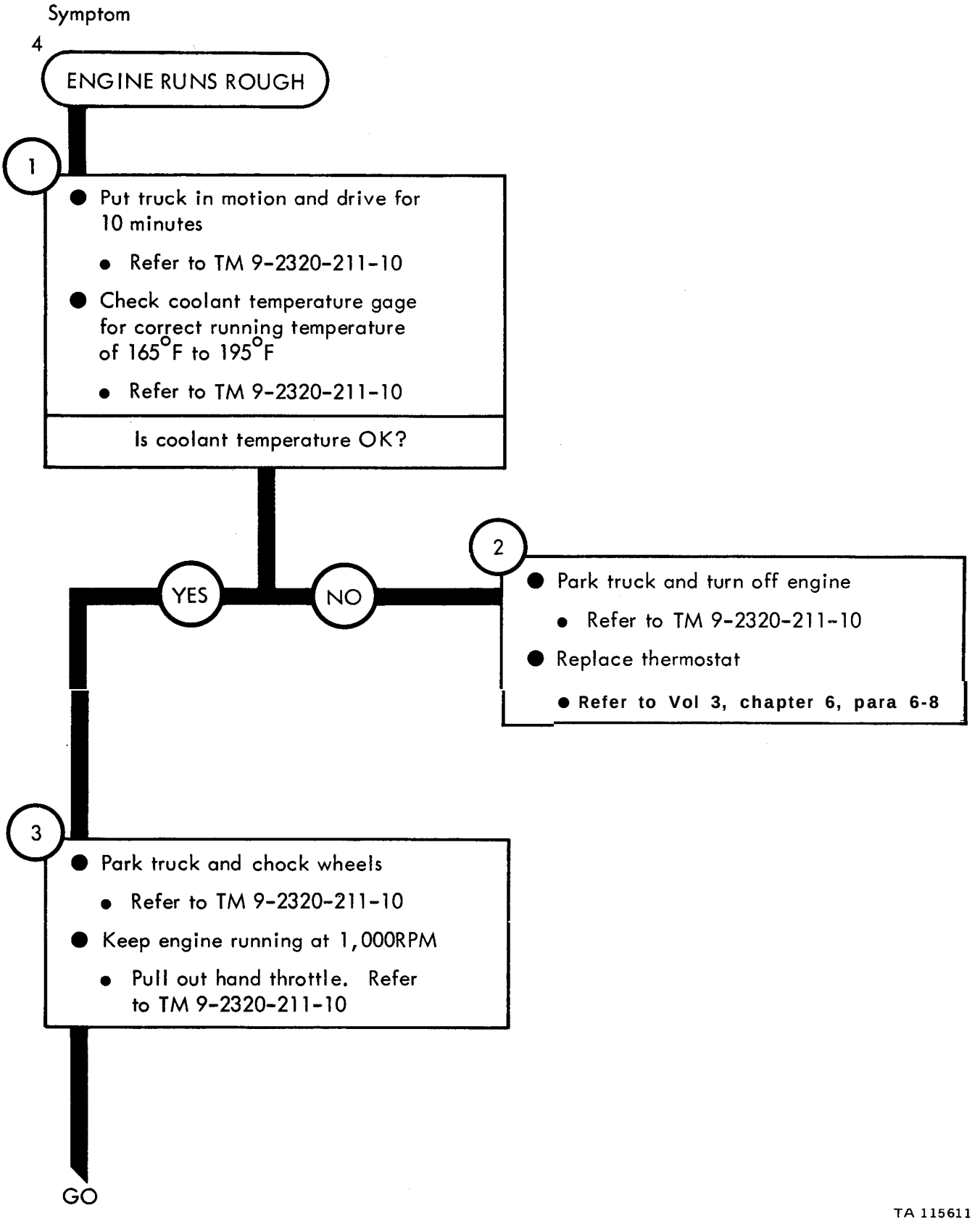


Figure 14-3 (Sheet 3 of 4)



TA 115610

Figure 14-3 (Sheet 4 of 4)



TA 115611

Figure 14-4 (Sheet 1 of 3)

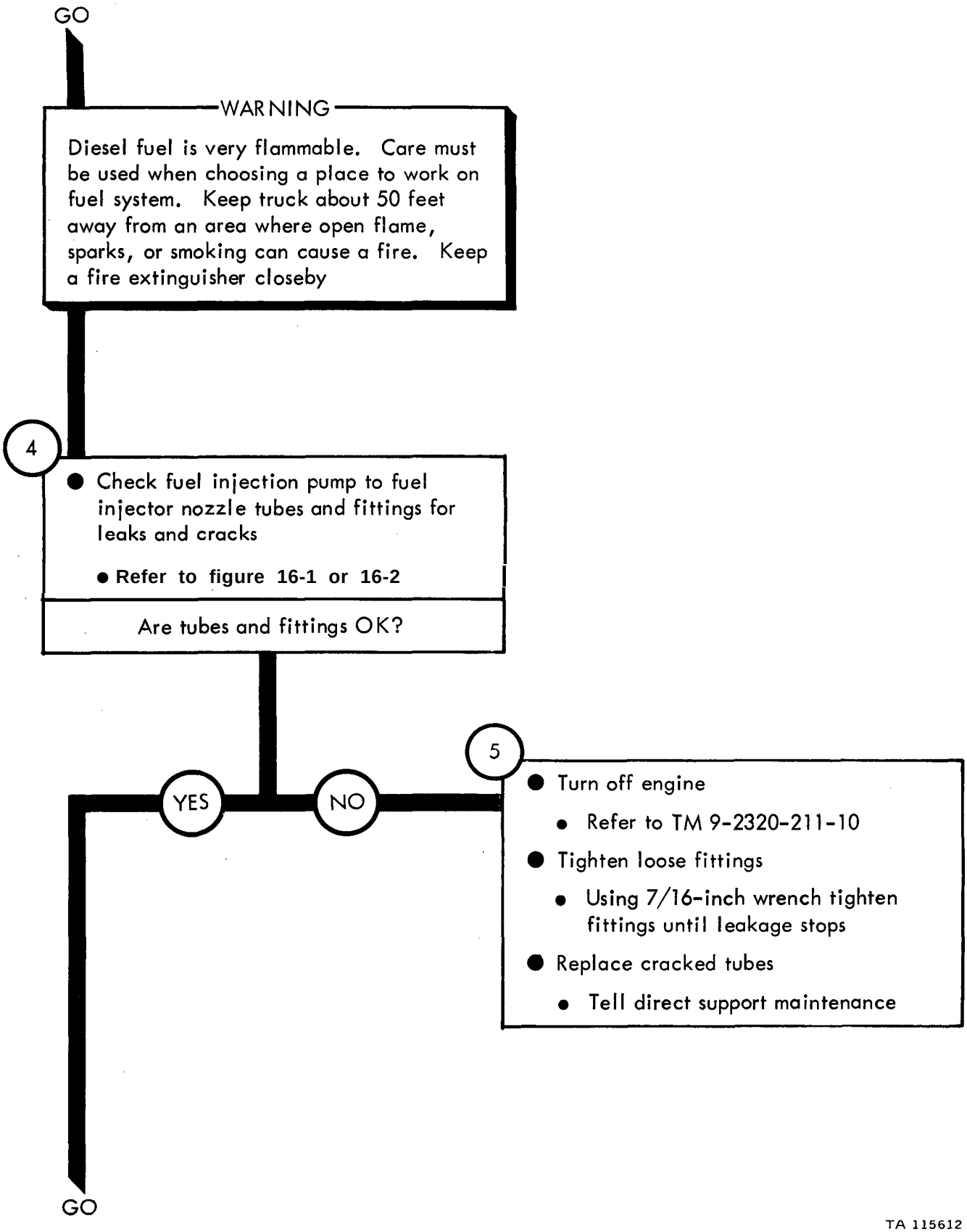
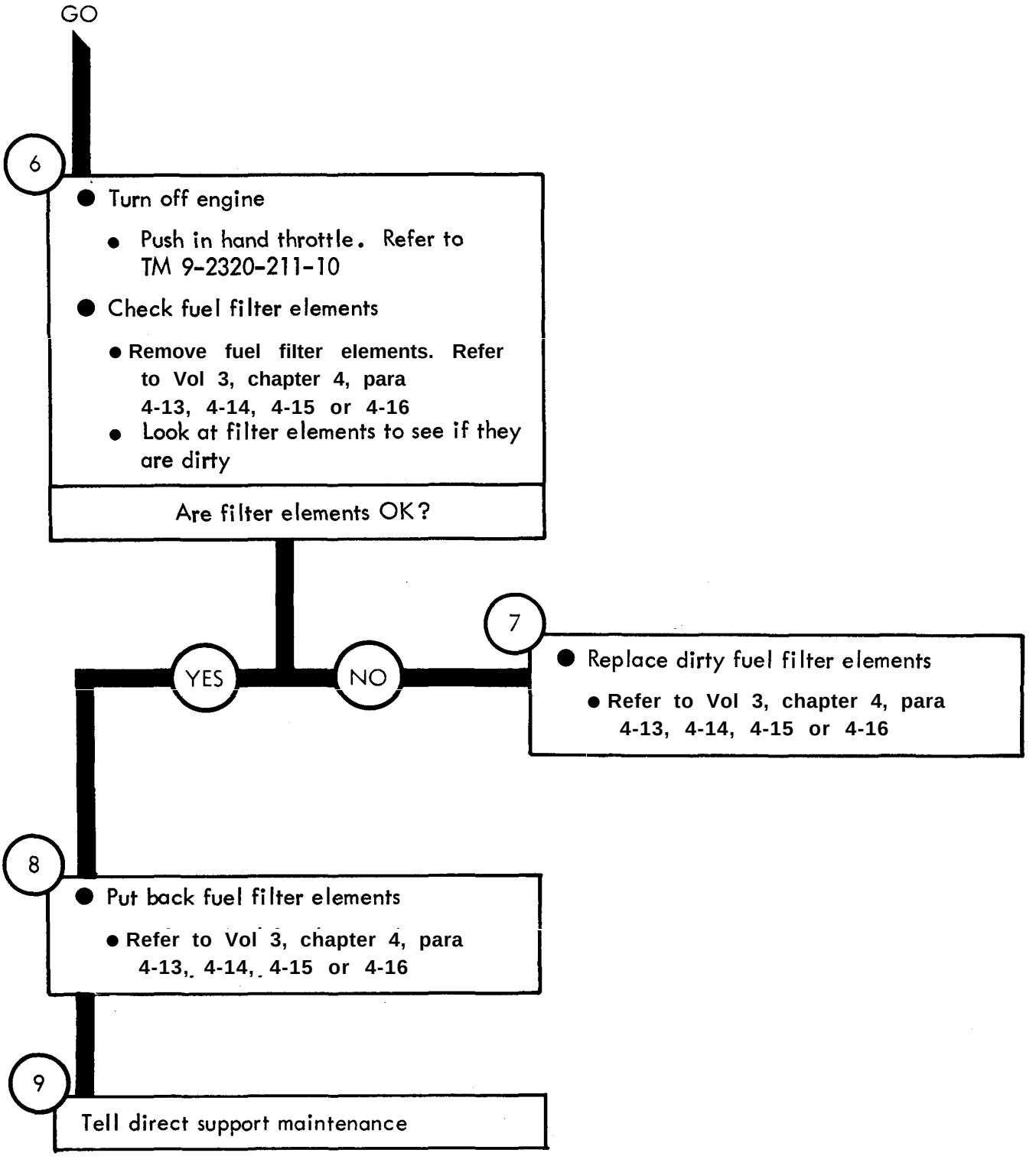


Figure 14-4 (Sheet 2 of 3)



TA 115613

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

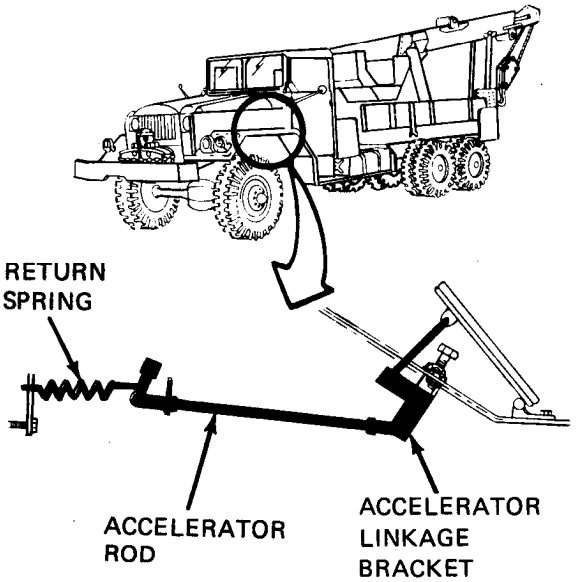
- Make truck ready for work on fuel system
  - Find a well ventilated area
  - Park truck. Refer to procedures given in TM 9-2320-211-10

2

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

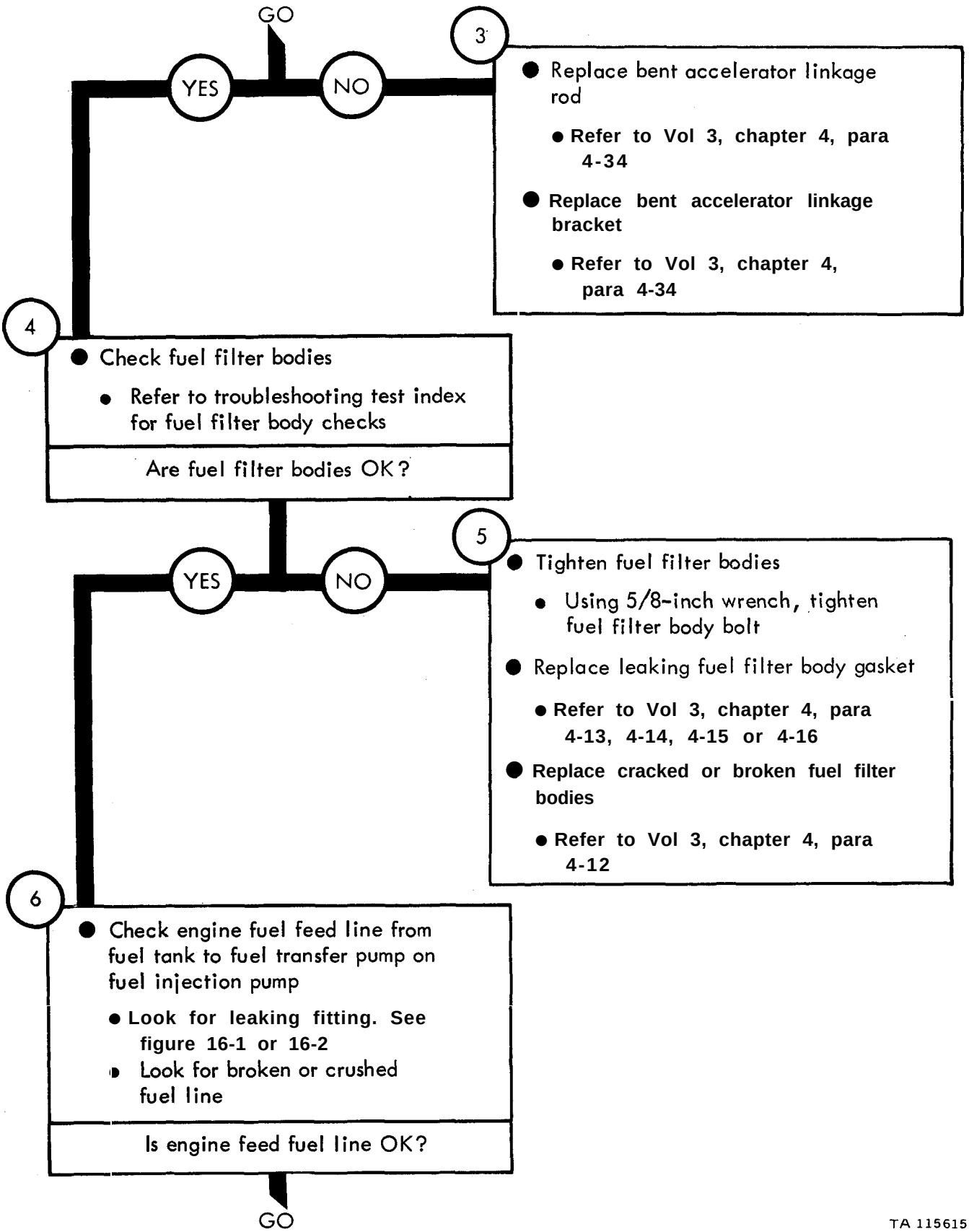
Is accelerator linkage OK?

GO



TA 115614

Figure 14-5 (Sheet 1 of 4)



TA 115615

Figure 14-5 (Sheet 2 of 4)

GO

YES

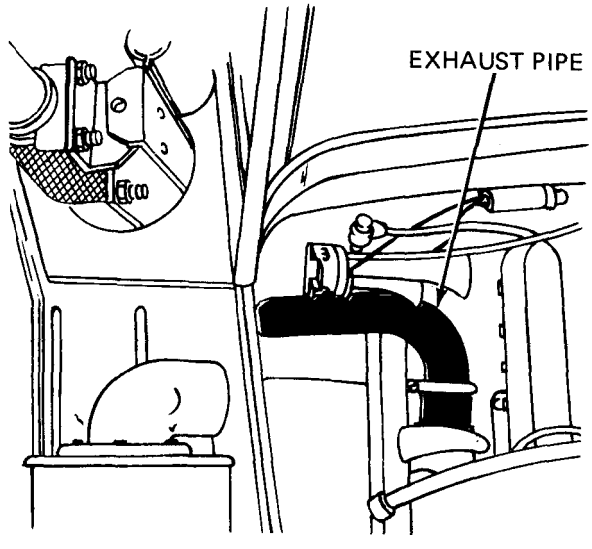
NO

7

- Tighten loose or leaking fuel line fitting
  - Using 7/16-inch wrench, tighten fitting until leak stops
- Replace broken or crushed fuel line
  - **Refer to Vol 3, chapter 4, para 4-11**

NOTE

A bent or crushed exhaust pipe will slow down the flow of exhaust gases. This will take power away from the engine. Even though exhaust system is not part of the fuel system it should be checked as a cause of lack of power



8

- Check exhaust system
  - Look for a bent or crushed exhaust pipe

Is exhaust system OK?

YES

NO

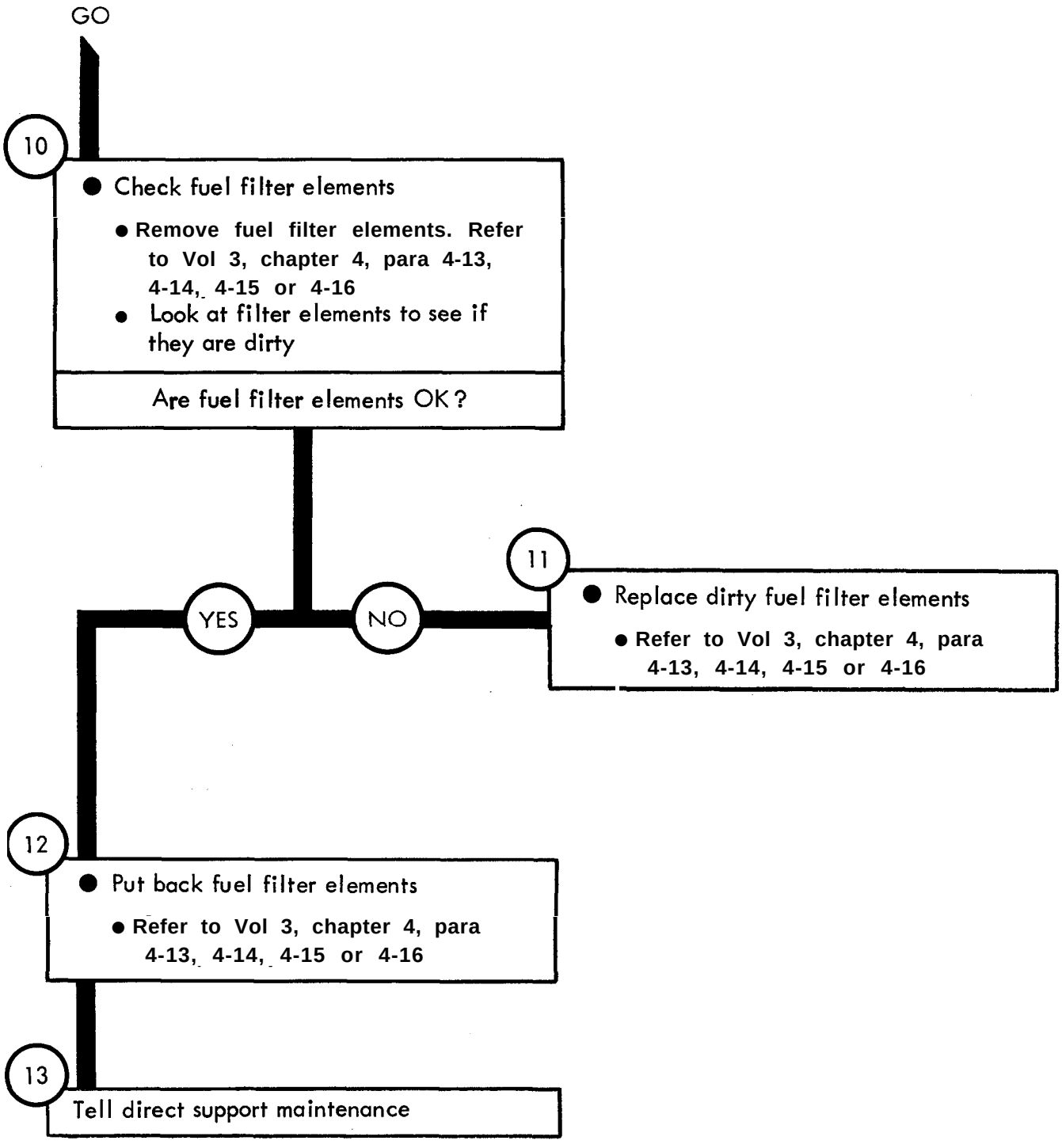
9

- Replace bent or crushed exhaust pipe
  - **Refer to Vol 3, chapter 5, para 5-3**

GO

TA 115616

Figure 14-5 (Sheet 3 of 4)



TA 115617

Figure 14-5 (Sheet 4 of 4)

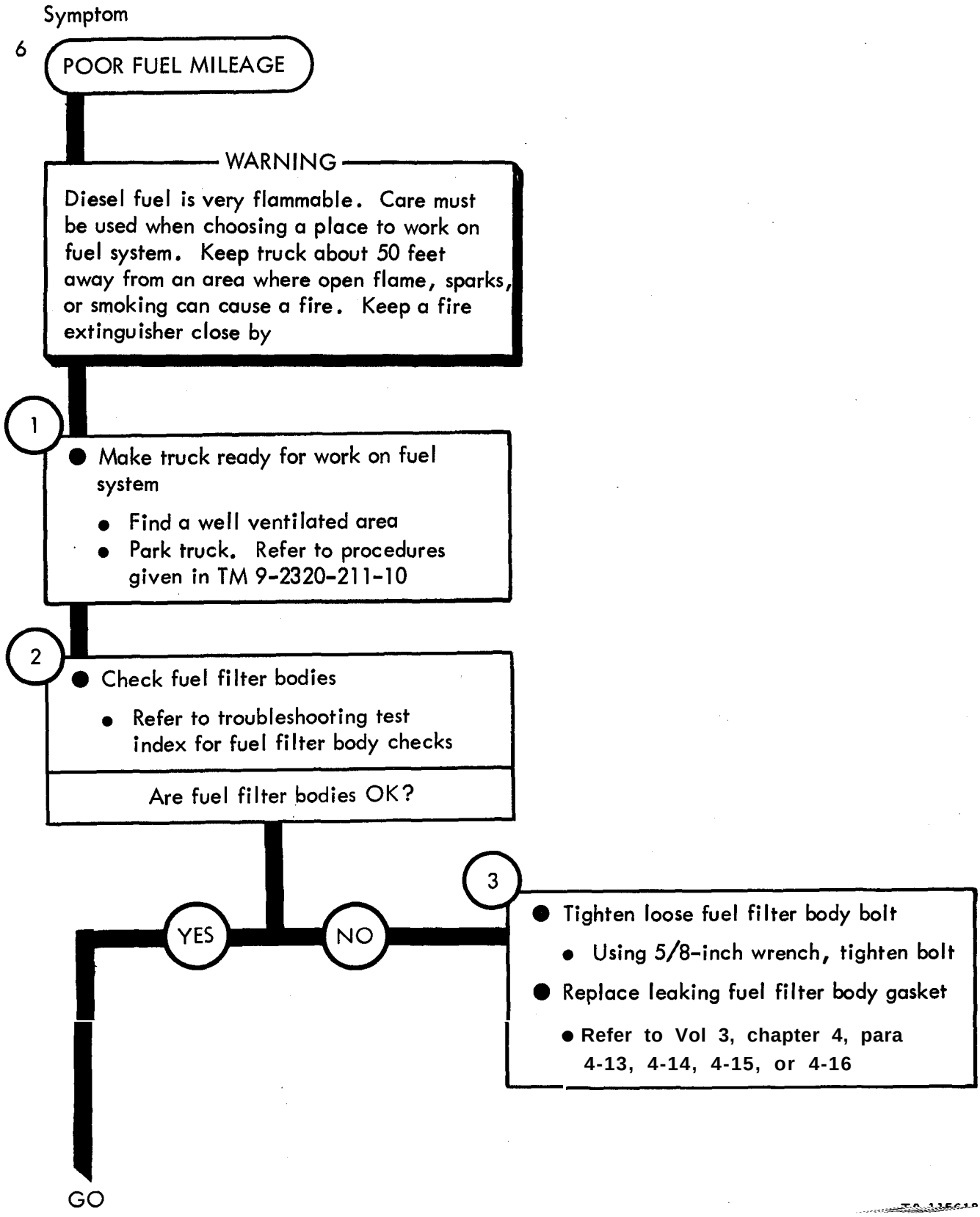


Figure 14-6 (Sheet 1 of 2)

GO

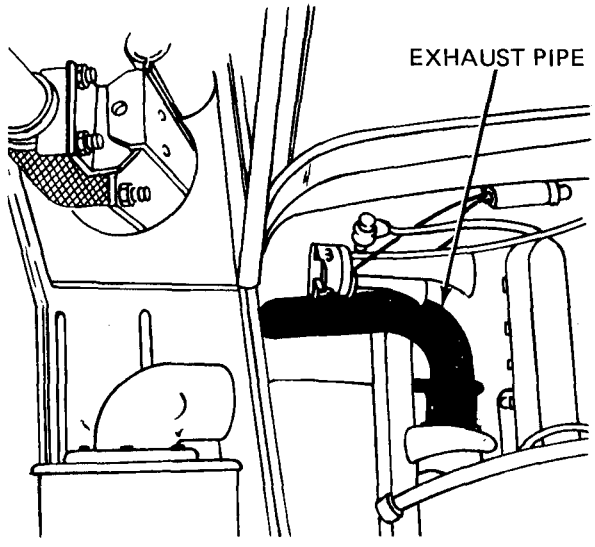
NOTE

A bent or crushed exhaust pipe will slow down the flow of exhaust gases. This will take power away from the engine. Even though exhaust system is not part of the fuel system, it should be checked as a cause of poor fuel mileage

4

- Check exhaust pipe
  - Look for a bent or crushed exhaust pipe

Is exhaust pipe OK?



YES

NO

5

- Replace bent or crushed exhaust pipe
  - **Refer to Vol 3, chapter 5, para 5-3**

6

Tell direct support maintenance

TA 115619

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

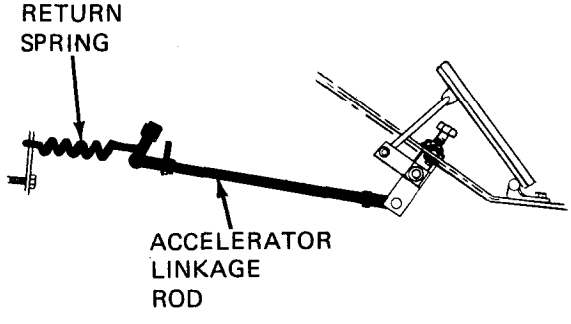
- Make truck ready for work on fuel system
  - Find a well ventilated area
  - Park truck. Refer to procedures given in TM 9-2320-211-10

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



TA 115620

Figure 14-7 (Sheet 1 of 3)

GO

YES

NO

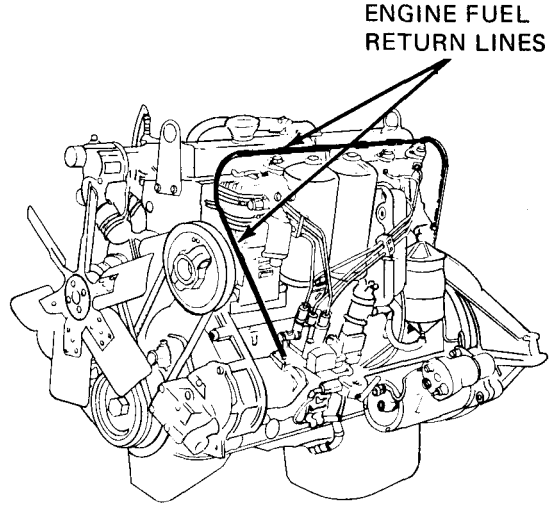
3

- Attach accelerator return spring
  - Refer to Vol 3, chapter 4, para 4-34
- Replace broken accelerator return spring
  - Refer to Vol 3, chapter 4, para 4-34

4

- Check engine fuel return lines
  - Look for bent or crushed lines

Are engine fuel return lines OK?



YES

NO

5

- Replace bent or crushed fuel return lines
  - Refer to Vol 3, chapter 4, para 4-11

GO

TA 115621

Figure 14-7 (Sheet 2 of 3)

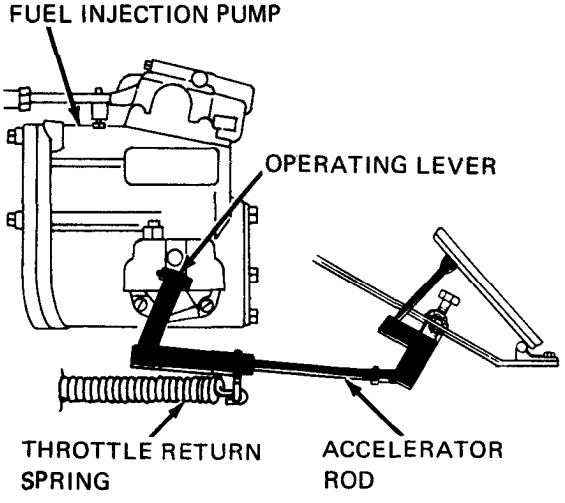
GO

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?

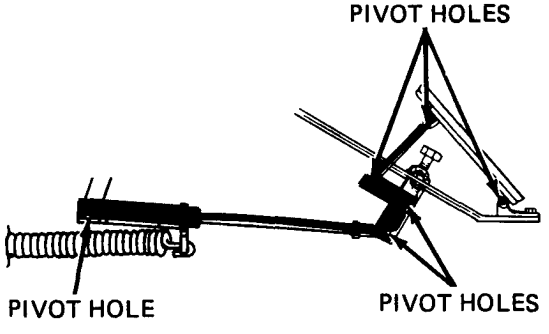


YES

NO

7

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

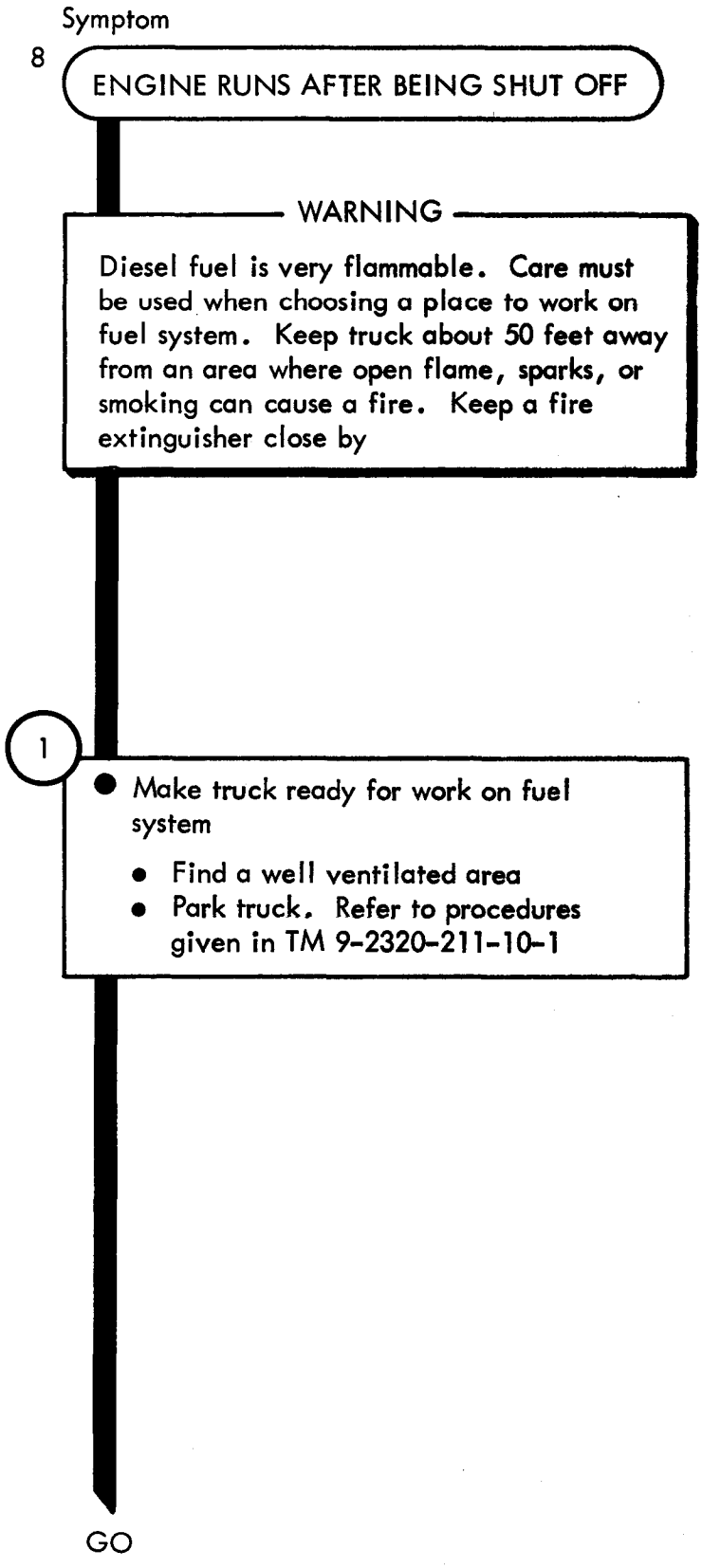


8

Tell direct support maintenance

TA 115622

Figure 14-7 (Sheet 3 of 3)



TA 115623

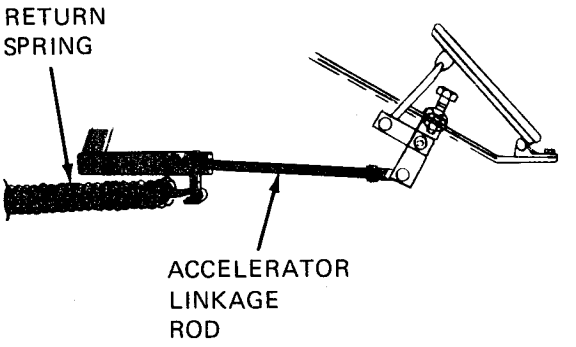
Figure 14-8 (Sheet 1 of 3)

GO

2

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

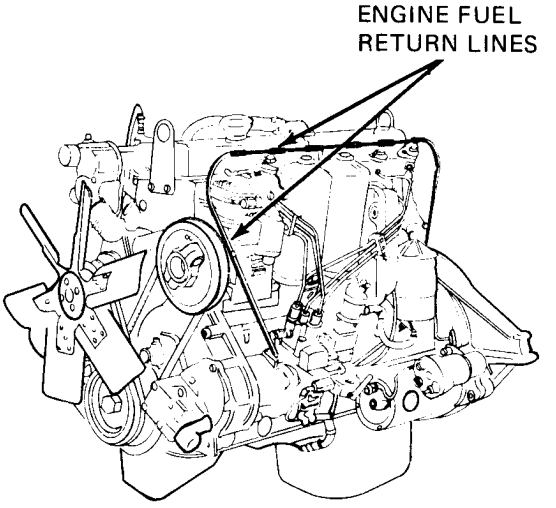
Is accelerator return spring OK?



YES / NO

3

- Attach accelerator return spring
  - Refer to Vol 3, chapter 4, para 4-34
- Replace broken accelerator return spring
  - Refer to Vol 3, chapter 4, para 4-34



4

- Check fuel return lines
  - Look for bent or crushed lines

Are all fuel return lines OK?

YES / NO

5

- Replace bent or crushed fuel return lines
  - Refer to Vol 3, chapter 4, para 4-11

GO

TA 115624

Figure 14-8 (Sheet 2 of 3)

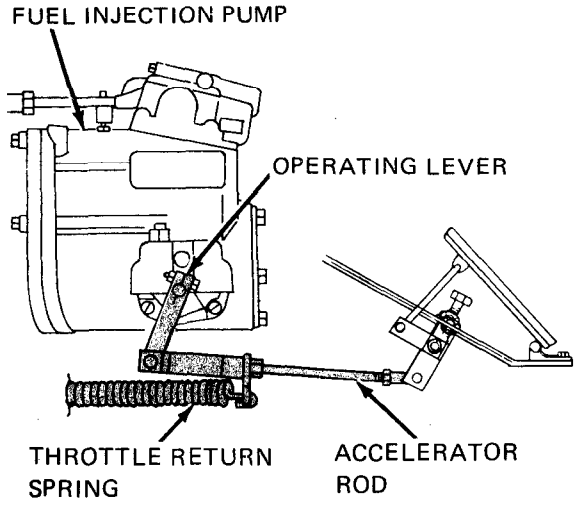
GO

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?

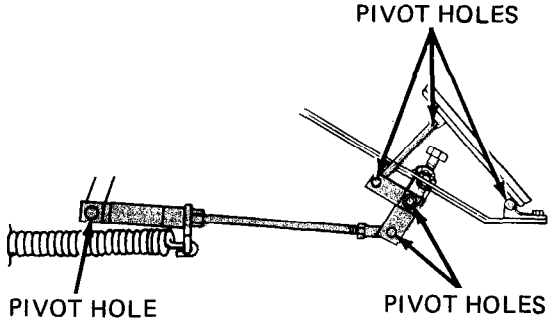


YES

NO

7

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



8

Tell direct support maintenance

TA 115625

Figure 14-8 (Sheet 3 of 3)

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

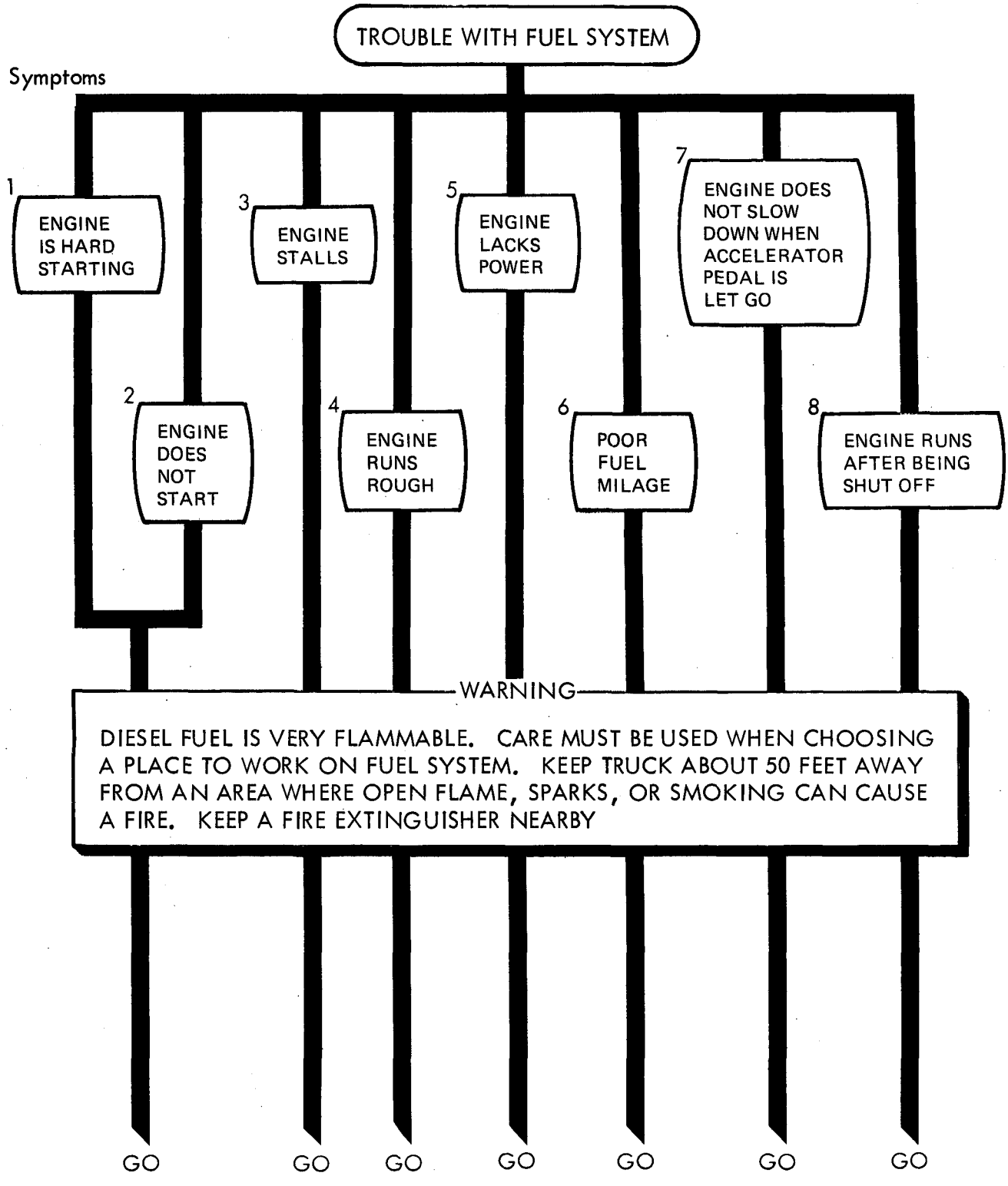


Figure 15-1 (Sheet 1 of 9)

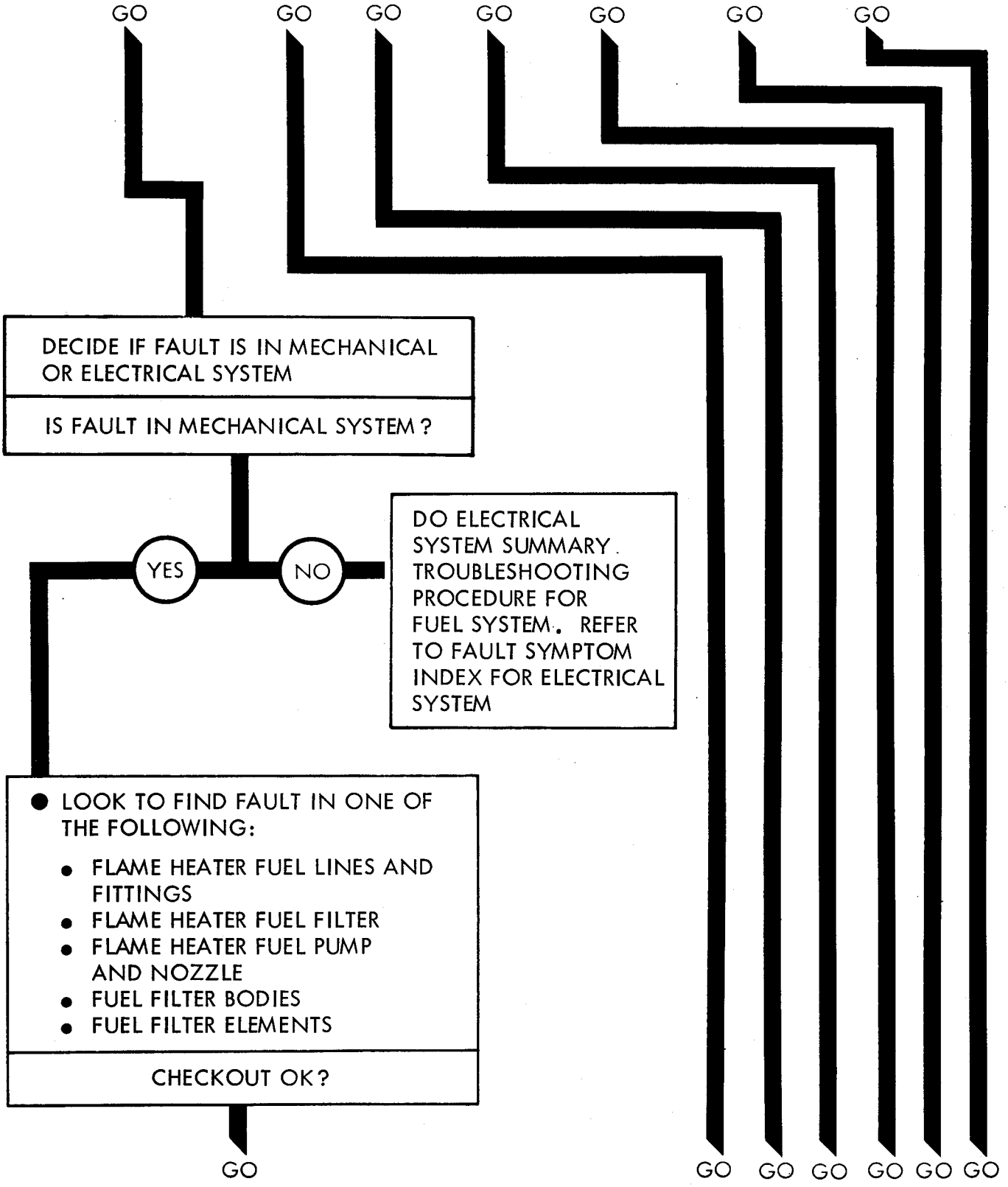


Figure 15-1 (Sheet 2 of 9)

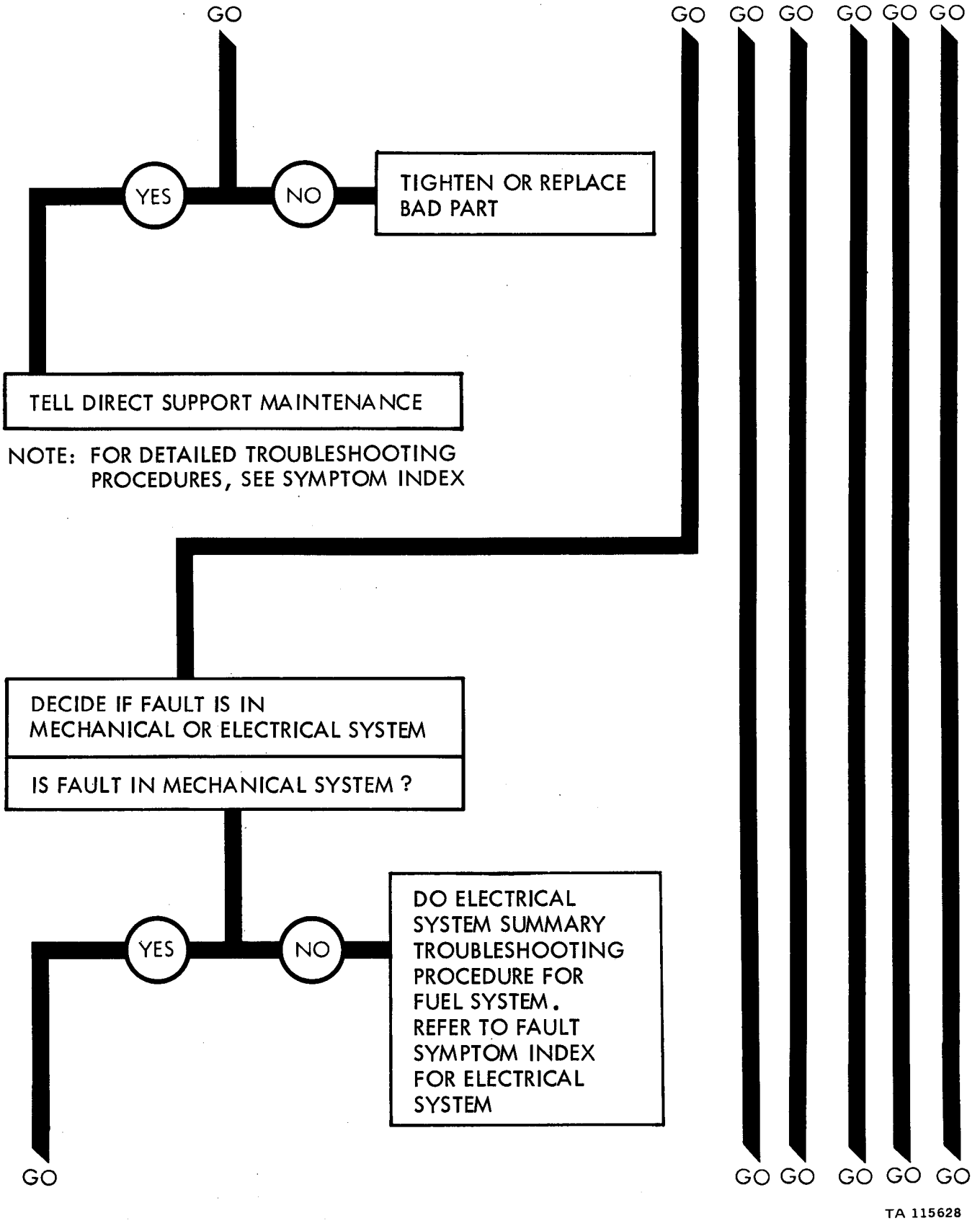


Figure 15-1 (Sheet 3 of 9)

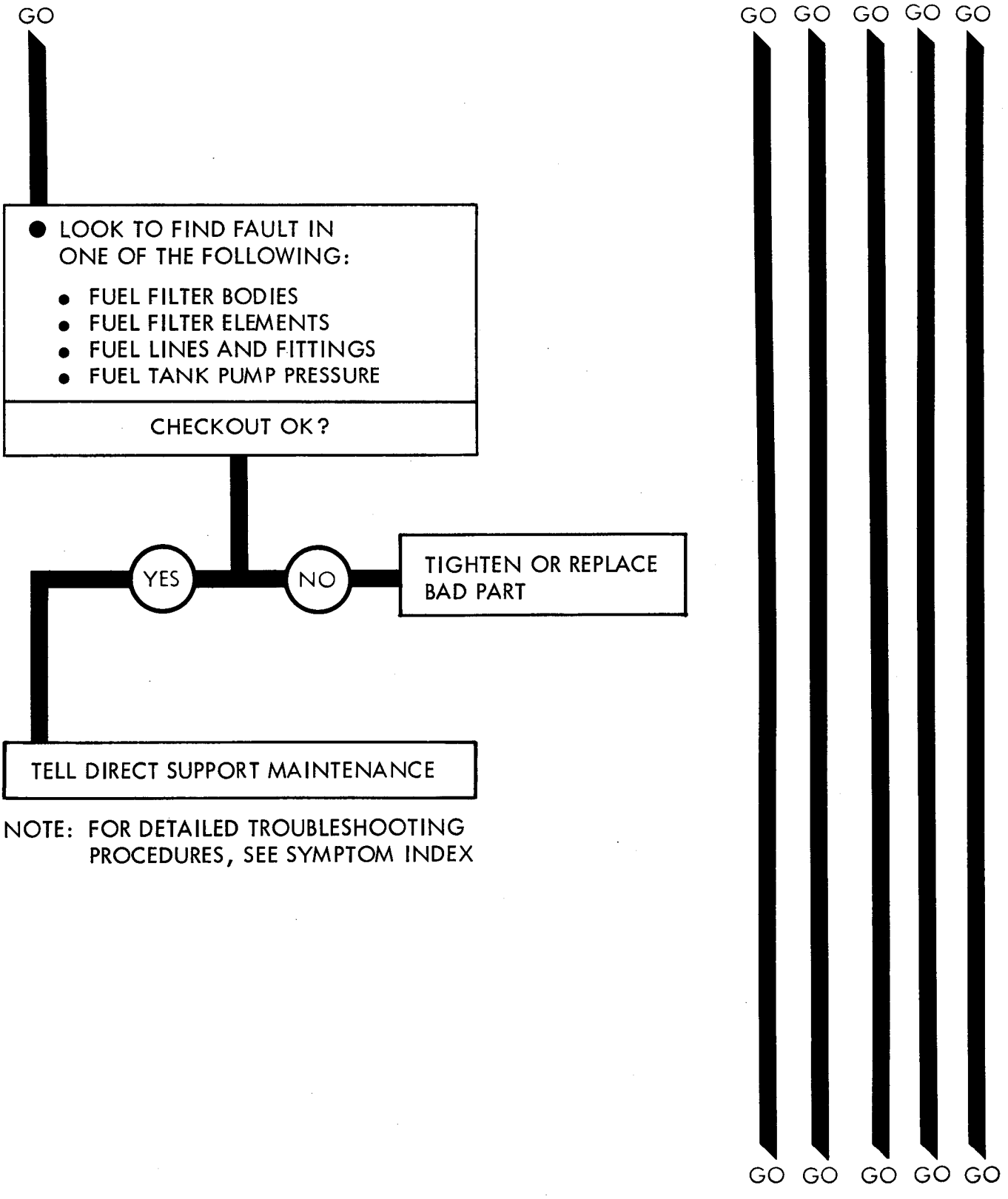


Figure 15-1 (Sheet 4 of 9)

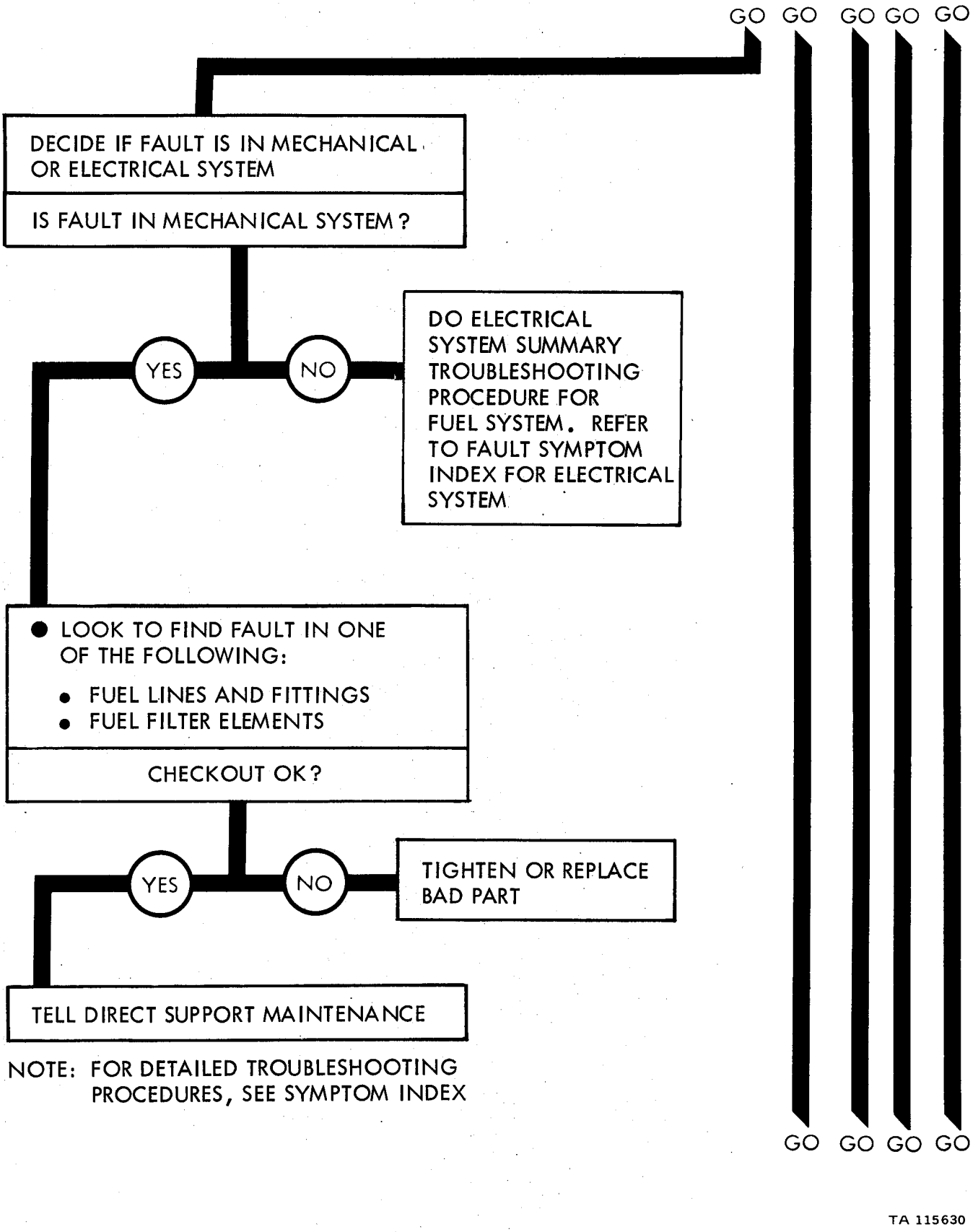


Figure 15-1 (Sheet 5 of 9)

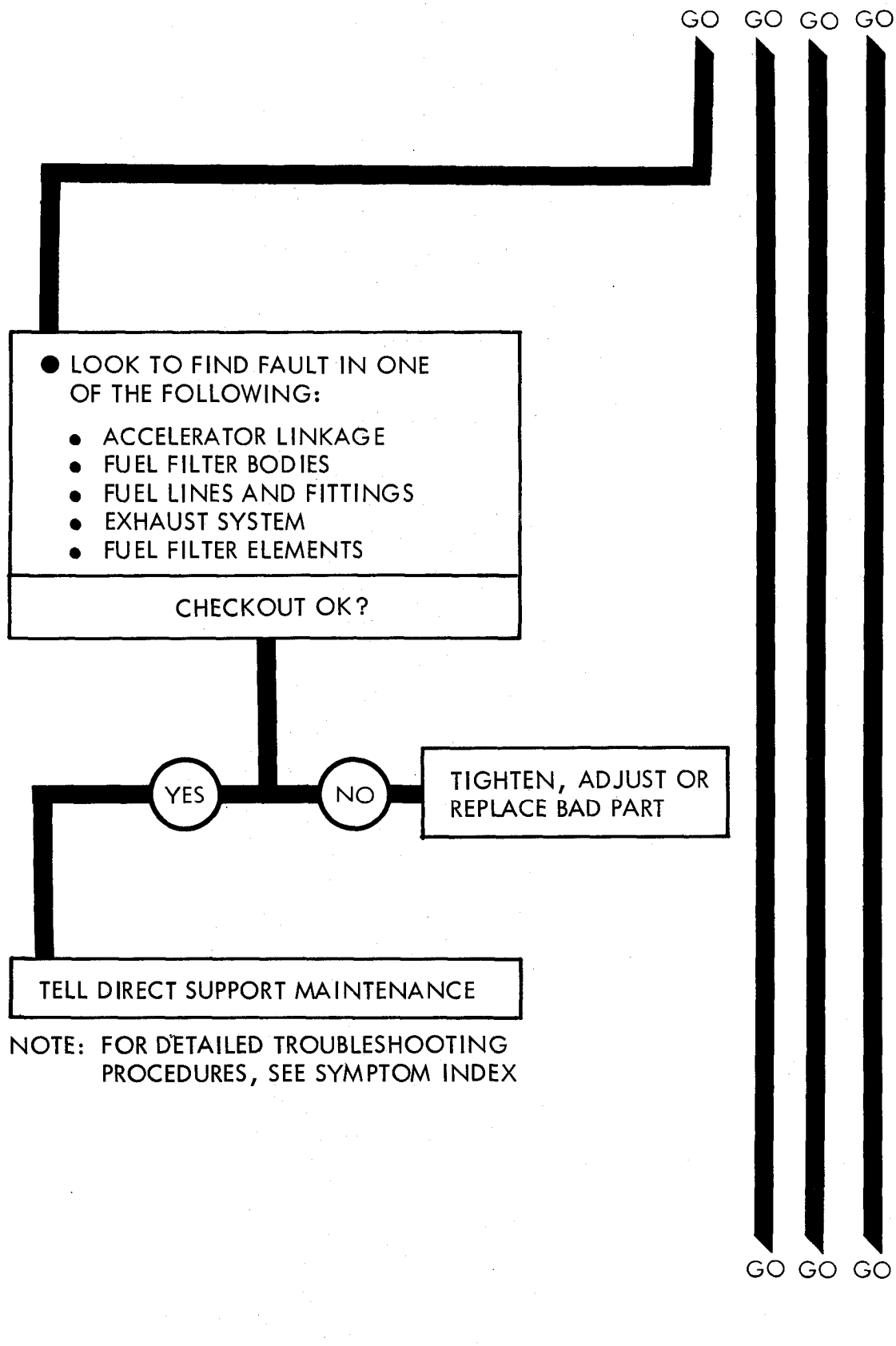


Figure 15-1 (Sheet 6 of 9)

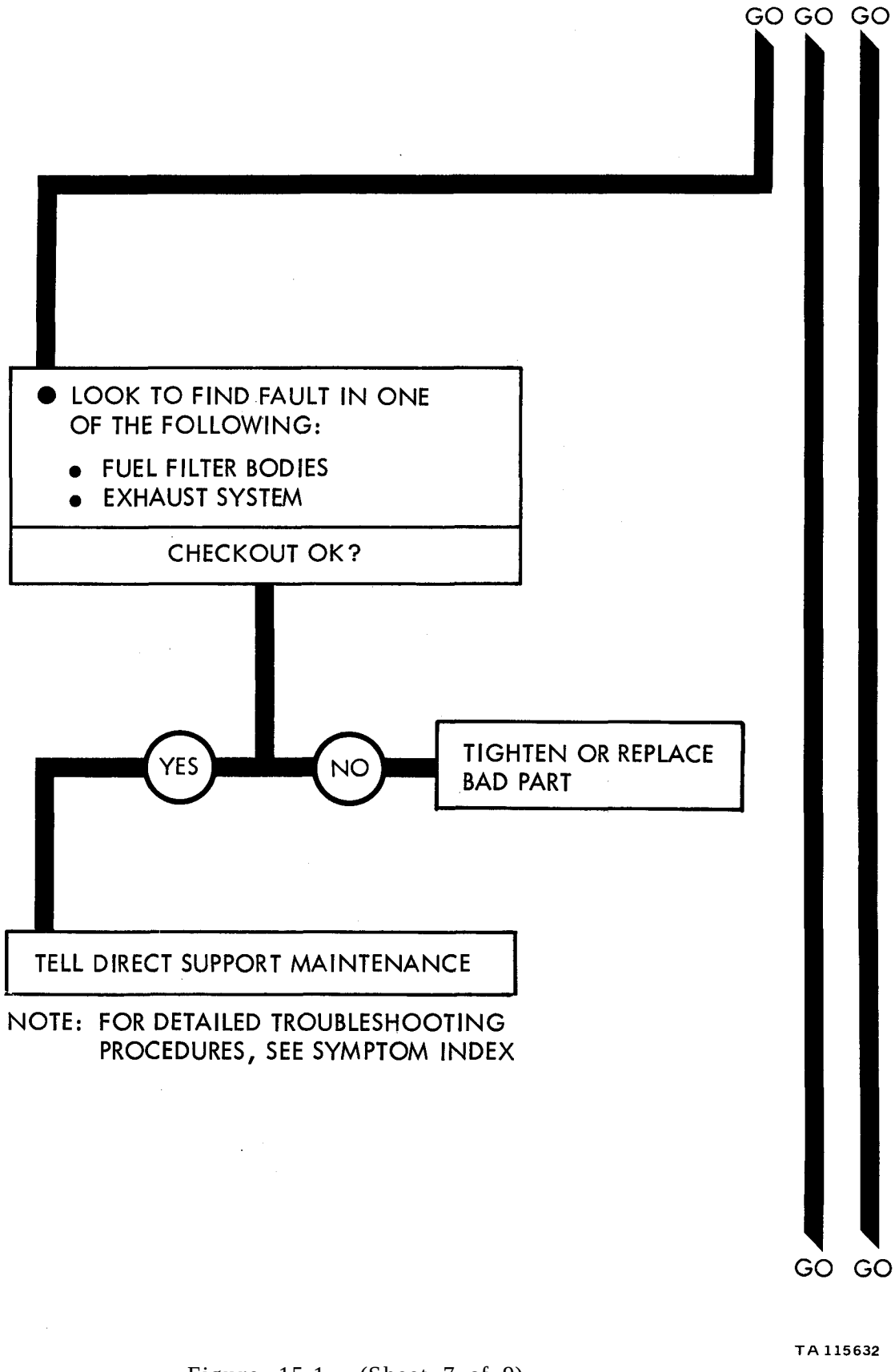
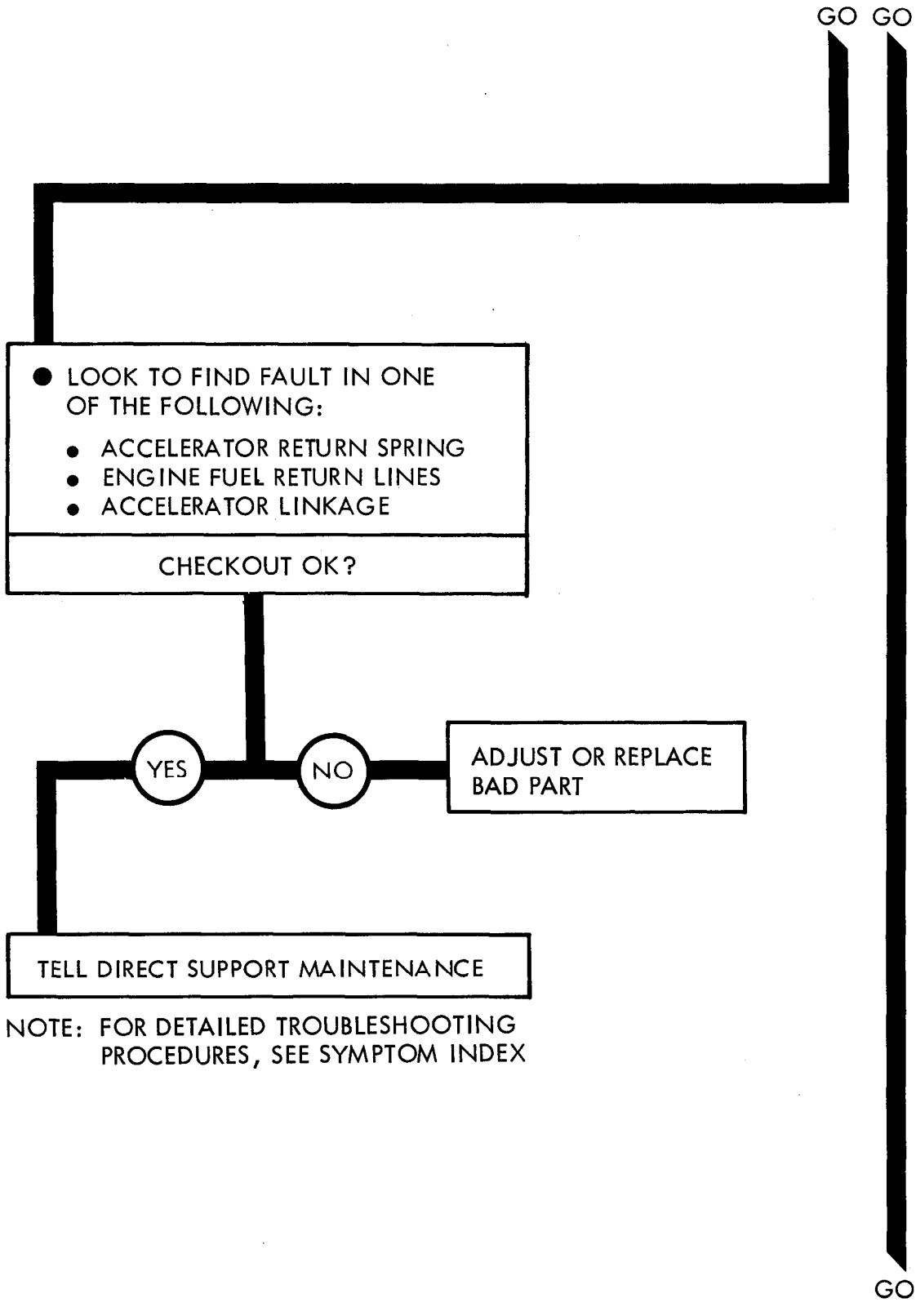


Figure 15-1. (Sheet 7 of 9)



TA 115633

Figure 15-1 (Sheet 8 of 9)

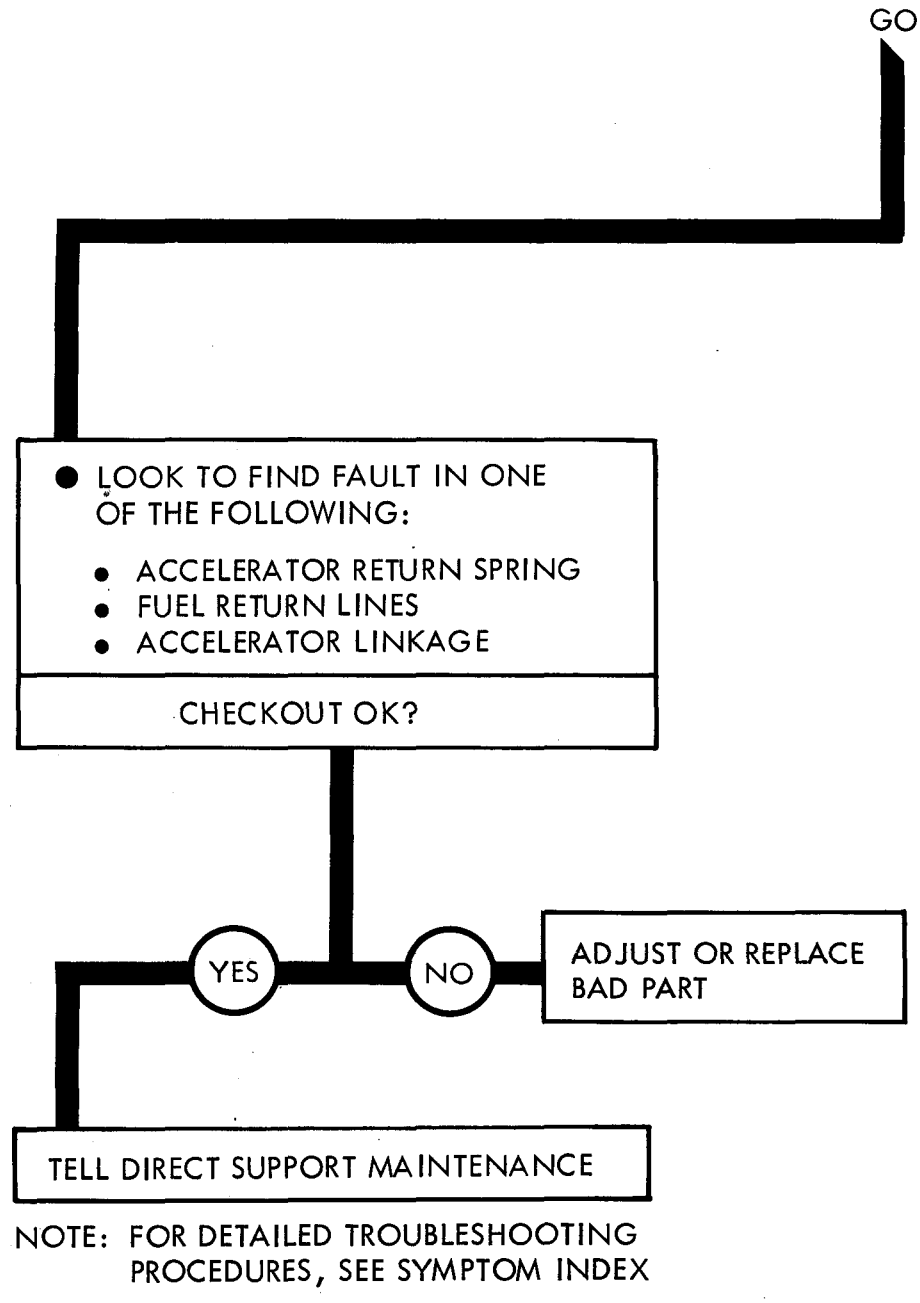


Figure 15-1 (Sheet 9 of 9)

CHAPTER 16

FUEL SYSTEM SUPPORT DIAGRAMS

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

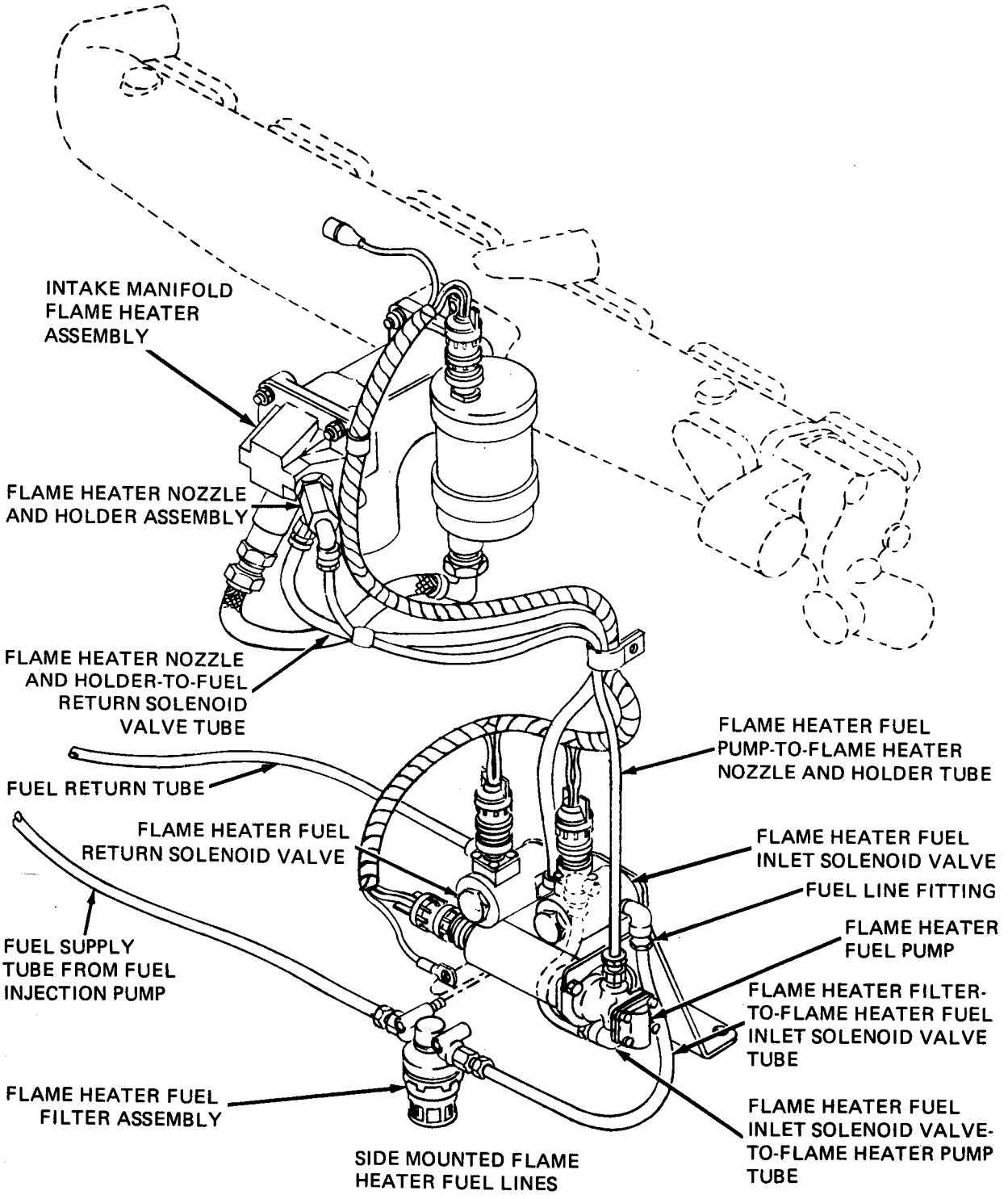

INTAKE MANIFOLD FLAME HEATER ASSEMBLY
FLAME HEATER NOZZLE AND HOLDER ASSEMBLY
FLAME HEATER NOZZLE AND HOLDER-TO-FUEL RETURN SOLENOID VALVE TUBE
FUEL RETURN TUBE
FLAME HEATER FUEL RETURN SOLENOID VALVE
FUEL SUPPLY TUBE FROM FUEL INJECTION PUMP
FLAME HEATER FUEL FILTER ASSEMBLY
SIDE MOUNTED FLAME HEATER FUEL LINES
FLAME HEATER FUEL PUMP-TO-FLAME HEATER NOZZLE AND HOLDER TUBE
FLAME HEATER FUEL INLET SOLENOID VALVE
FUEL LINE FITTING
FLAME HEATER FUEL PUMP
FLAME HEATER FILTER-TO-FLAME HEATER FUEL INLET SOLENOID VALVE TUBE
FLAME HEATER FUEL INLET SOLENOID VALVE-TO-FLAME HEATER PUMP TUBE
TA 115635

Figure 16-1

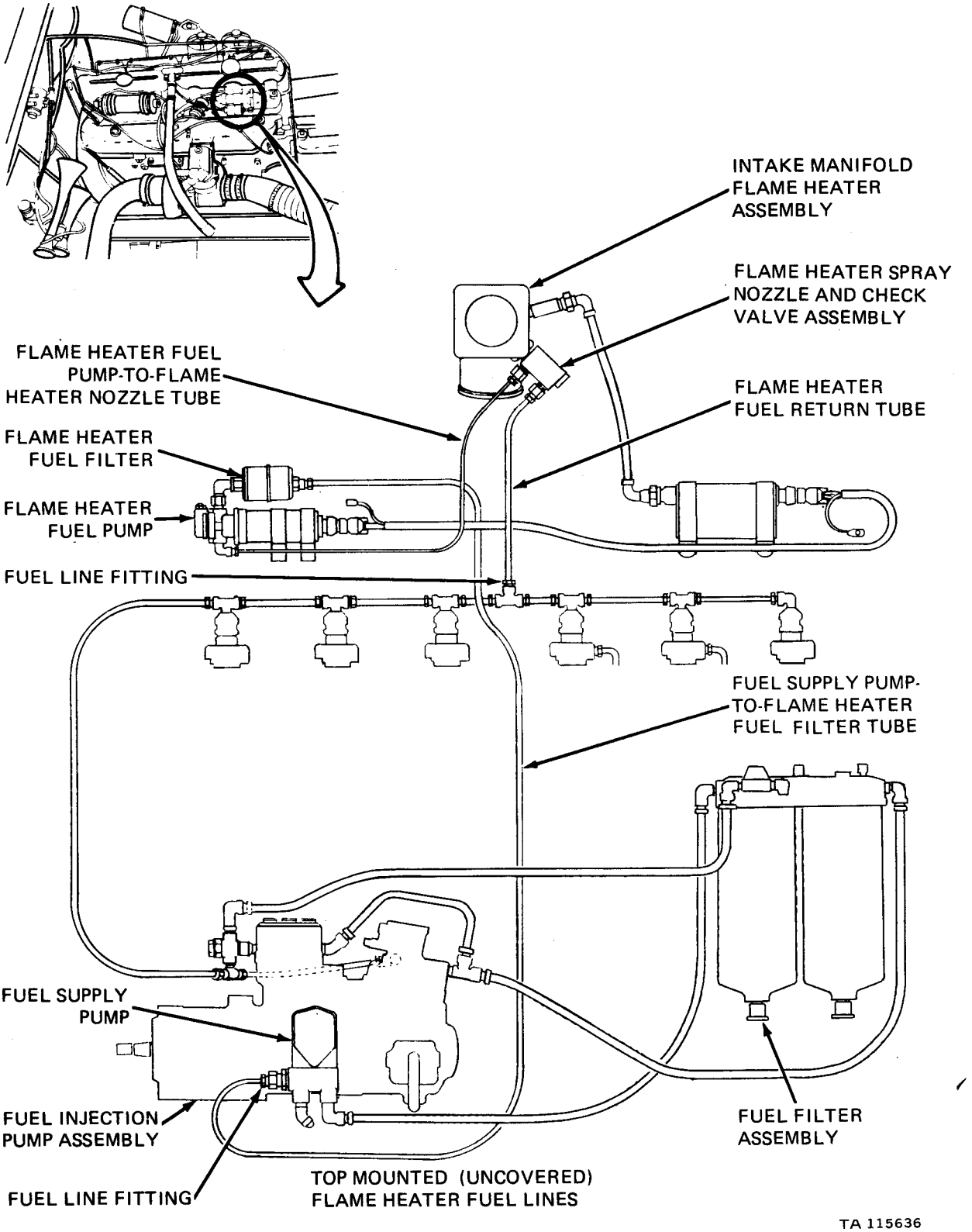
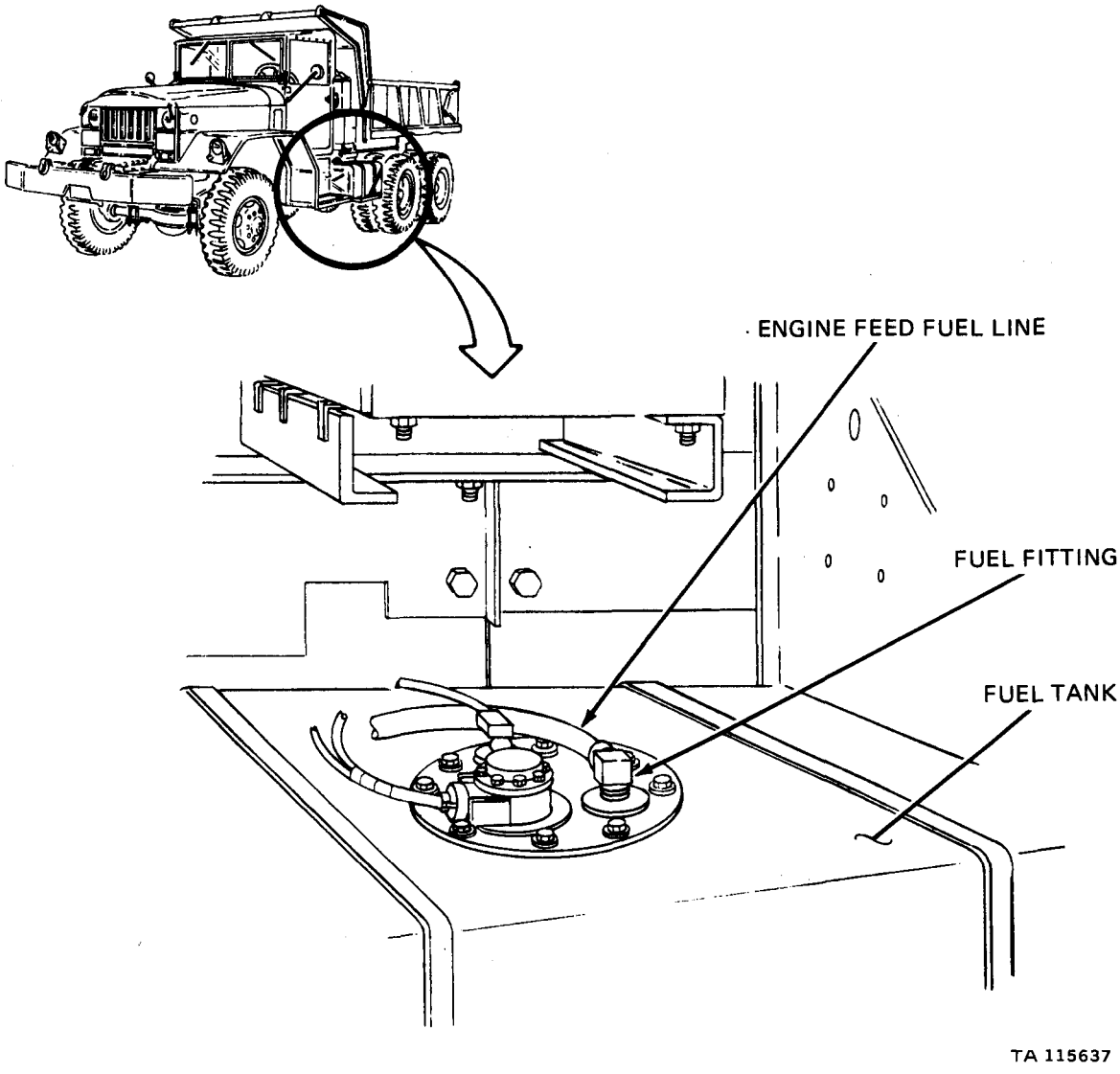

INTAKE MANIFOLD FLAME HEATER ASSEMBLY
FLAME HEATER SPRAY NOZZLE AND CHECK VALVE ASSEMBLY
FLAME HEATER FUEL PUMP-TO-FLAME HEATER NOZZLE TUBE
FLAME HEATER FUEL RETURN TUBE
FLAME HEATER FUEL FILTER
FLAME HEATER FUEL PUMP
FUEL LINE FITTING
FUEL SUPPLY PUMP-TO-FLAME HEATER FUEL FILTER TUBE
FUEL SUPPLY PUMP
FUEL INJECTION PUMP ASSEMBLY
FUEL FILTER ASSEMBLY
FUEL LINE FITTING
TOP MOUNTED (UNCOVERED) FLAME HEATER FUEL LINES
TA 115636

Figure 16-2



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

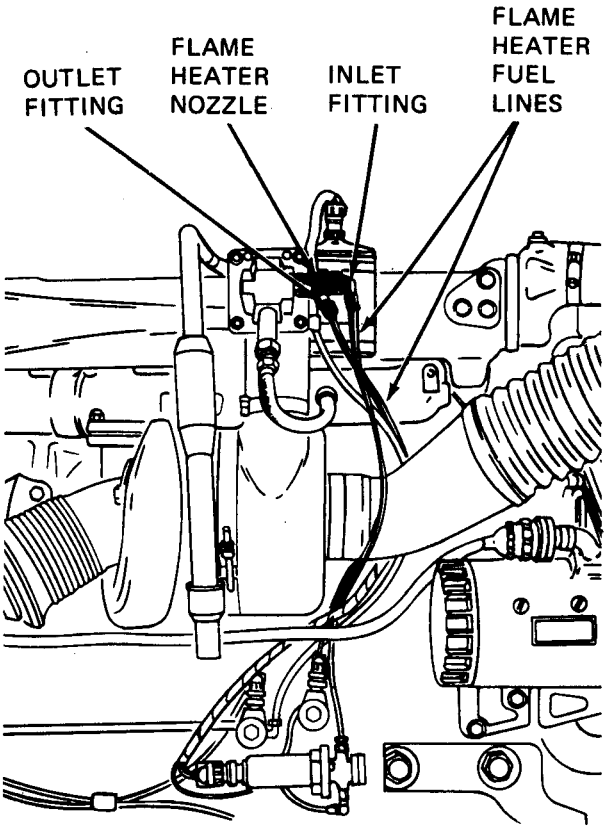
NOTE

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



TA 115638

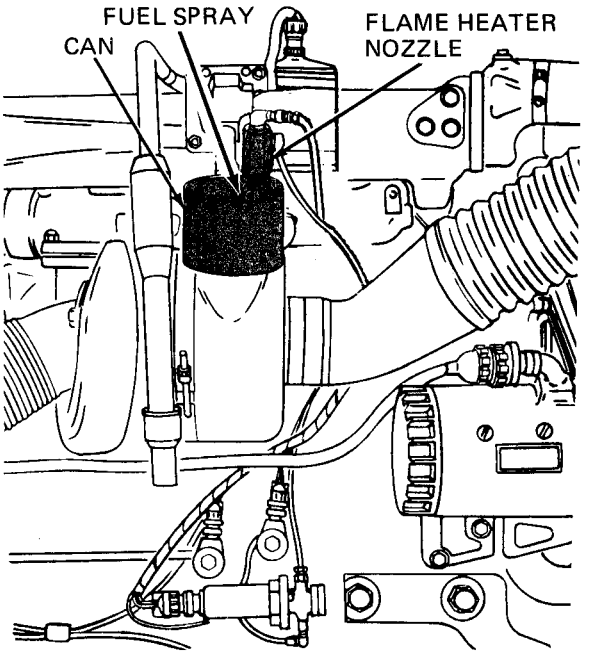
Figure 17-1 (Sheet 1 of 3)

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

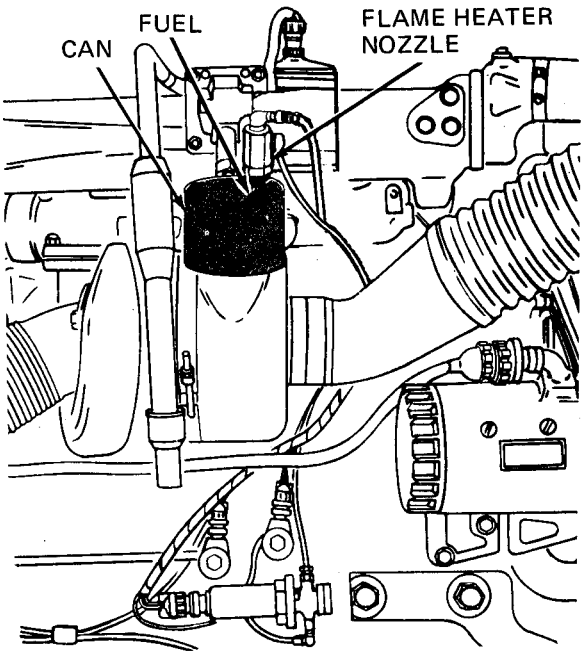
Soldier B
- Turn on flame heater for 10 seconds then turn it off. Refer to TM9-2320-211-10

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

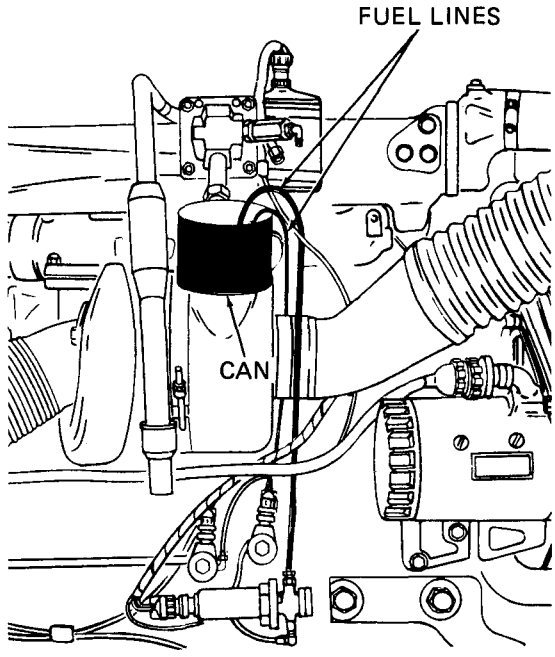
- Test flame heater fuel pump

  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

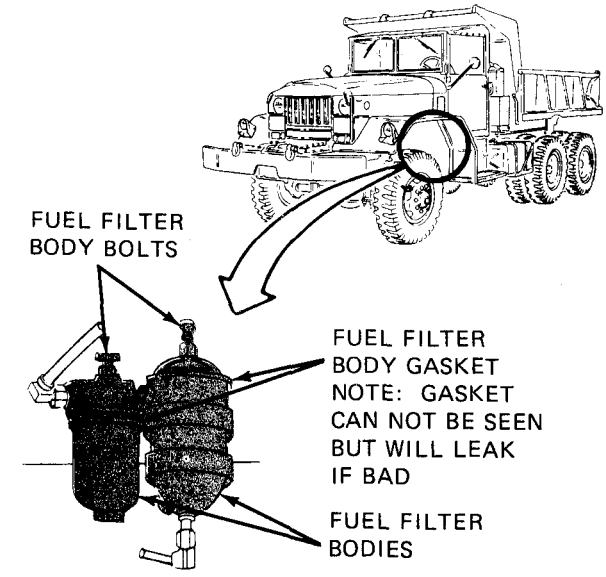


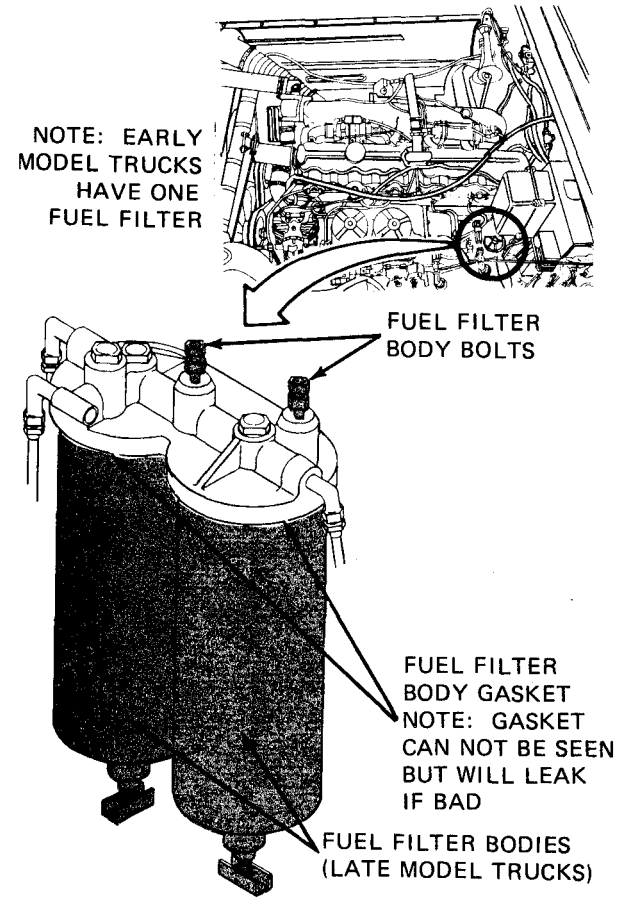
TA 115640

Figure 17-1 (Sheet 3 of 3)

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



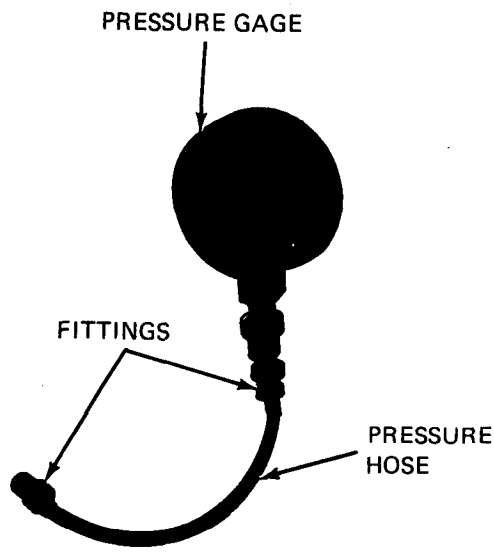


TA 115641

Figure 17-2

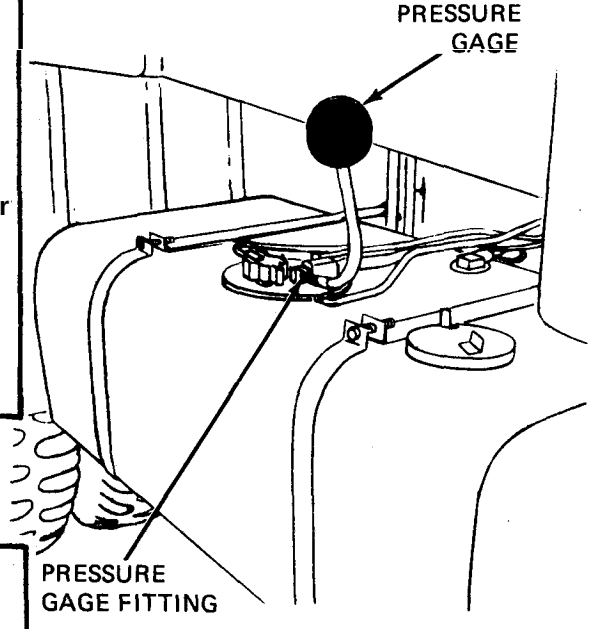
GENERAL INSTRUCTIONS

- 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

TA 115642

Figure 17-3

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.

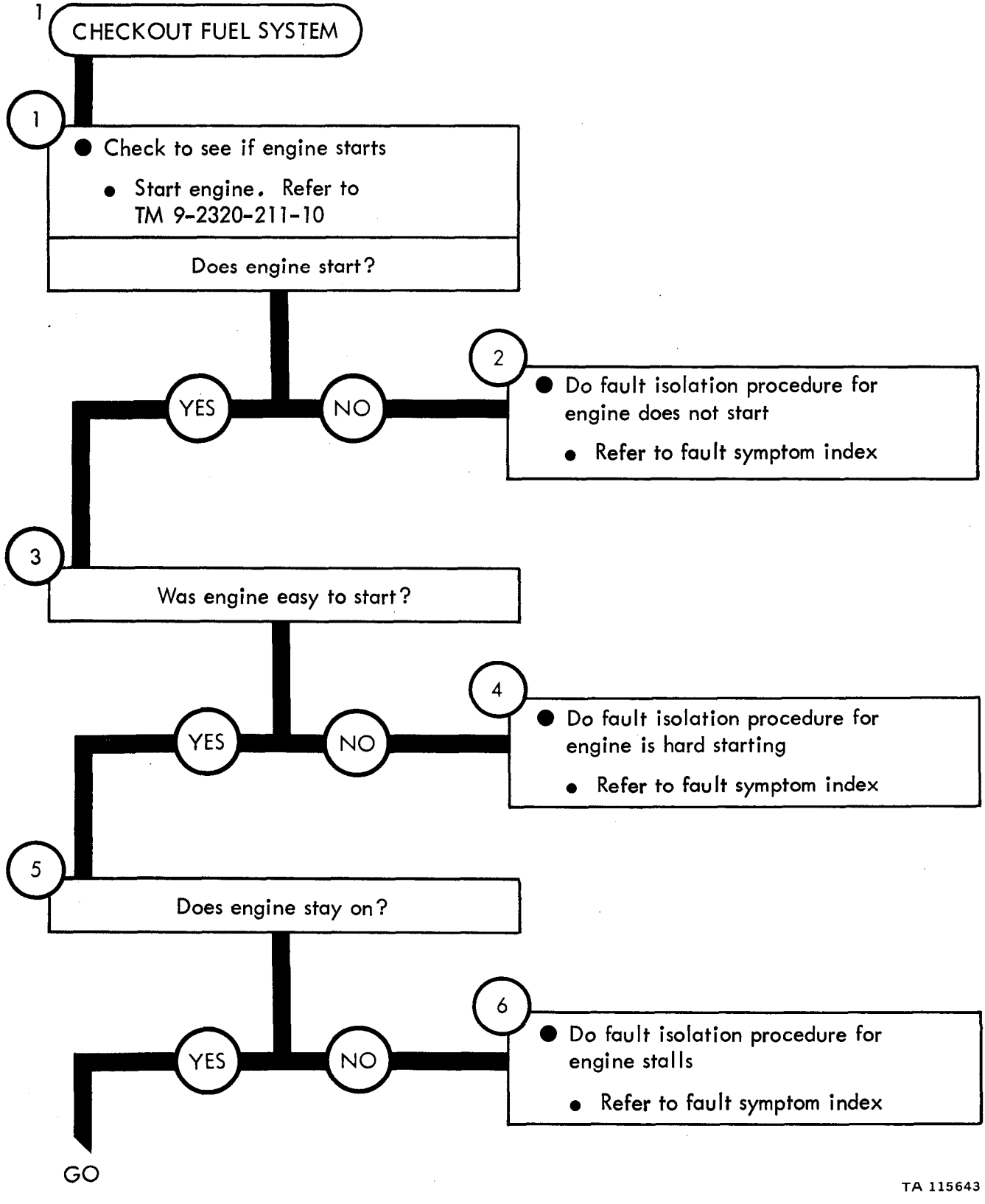
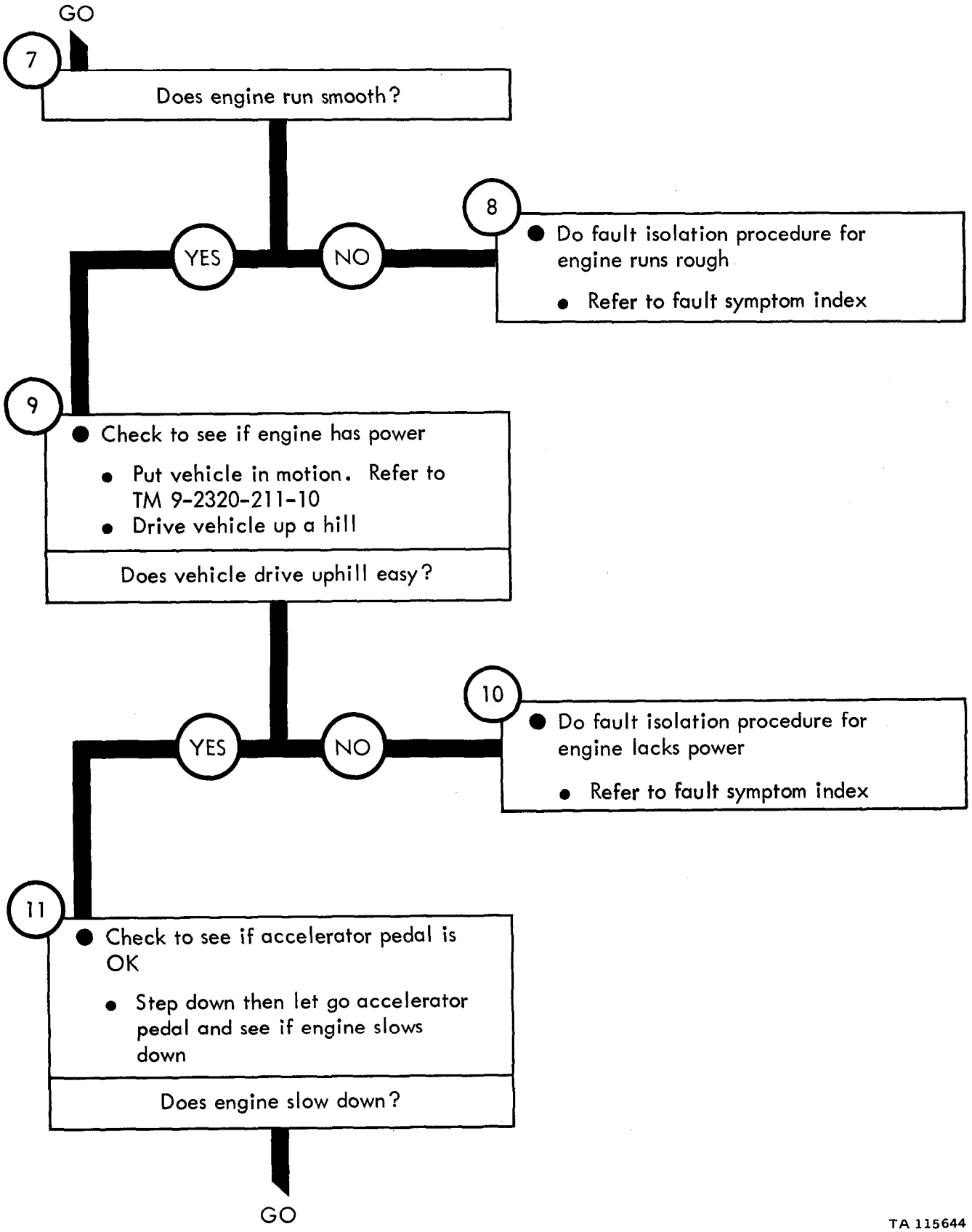
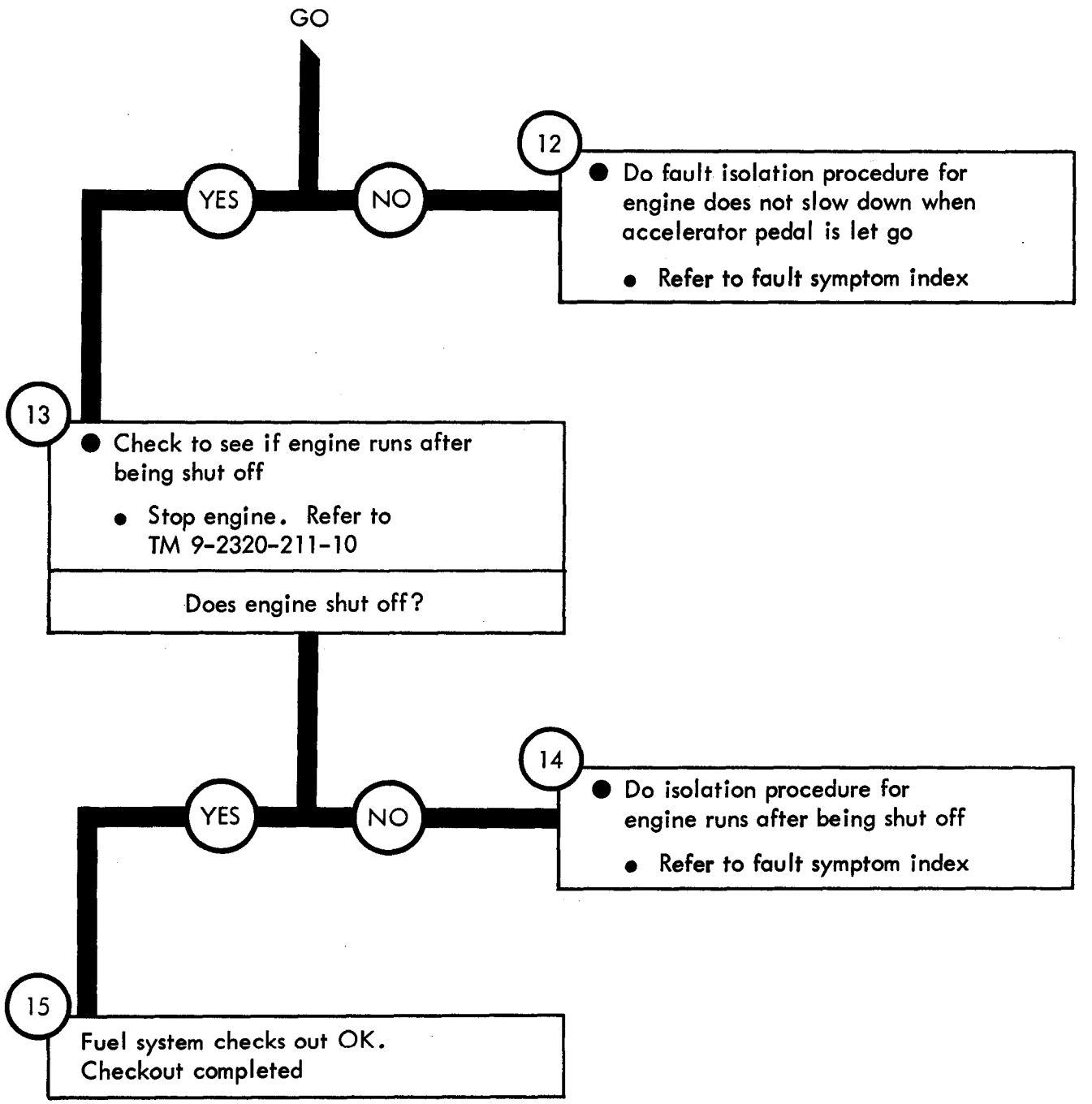


Figure 18-1 (Sheet 1 of 3)



TA 115644

Figure 18-1 (Sheet 2 of 3)



TA 115645

Figure 18-1 (Sheet 3 of 3)

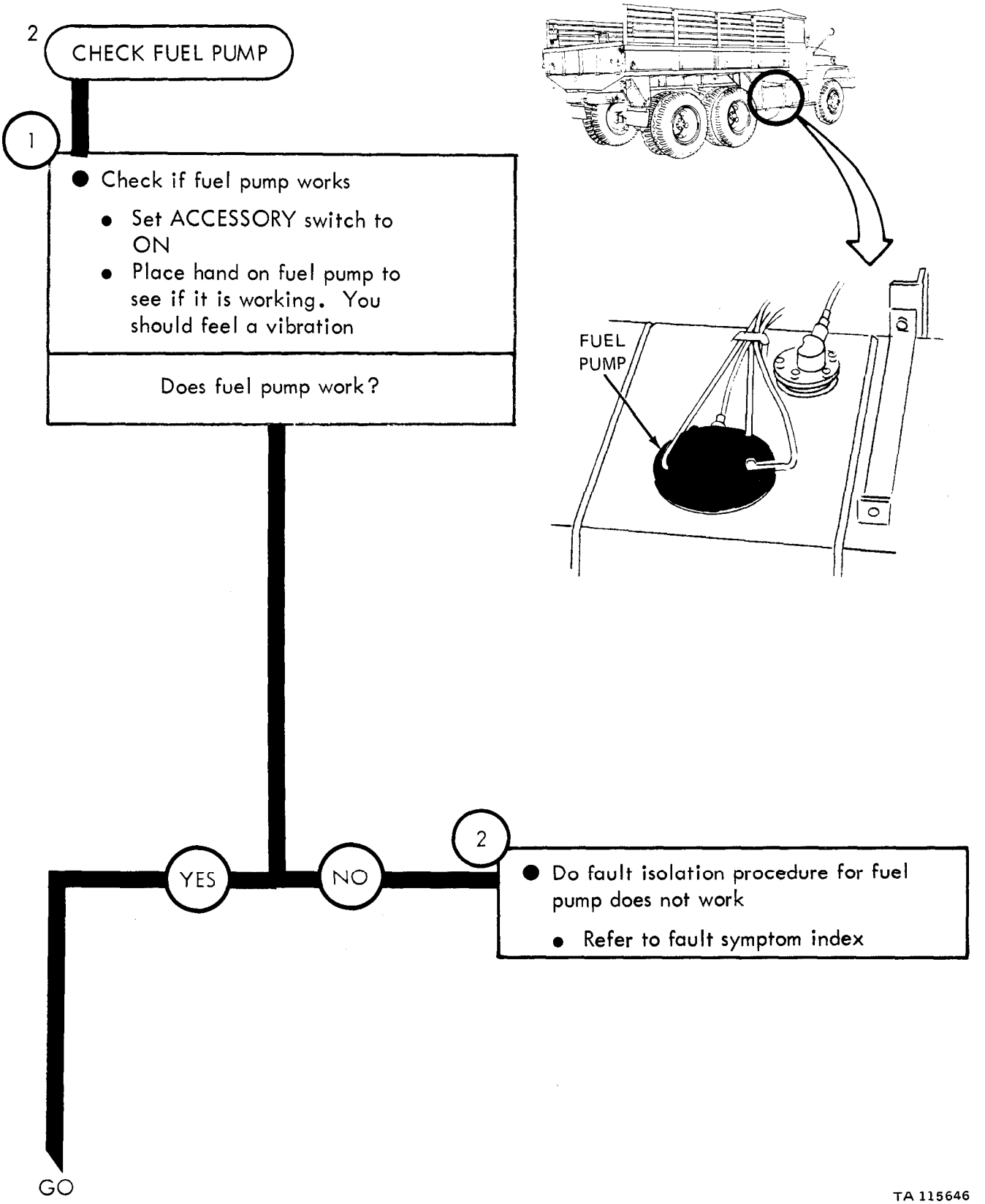


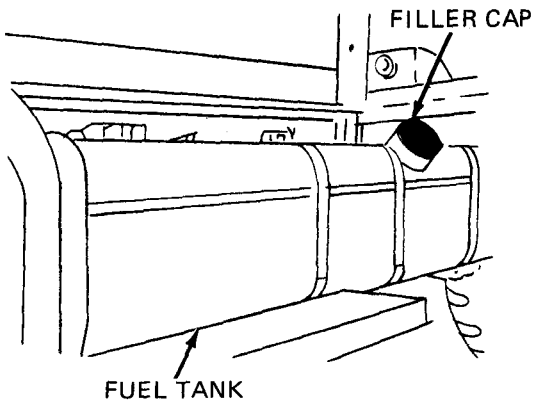
Figure 18-2 (Sheet 1 of 2)

GO

3

- Check if fuel tank has fuel
  - Unscrew and take off fuel tank filler cap
  - See if fuel tank has fuel

Does fuel tank have fuel?



YES

NO

4

- Fill fuel tank
  - Refer to TM 9-2320-211-10

5

- Do fault isolation procedure for engine does not start
  - Refer to fault symptom index

TA 115647

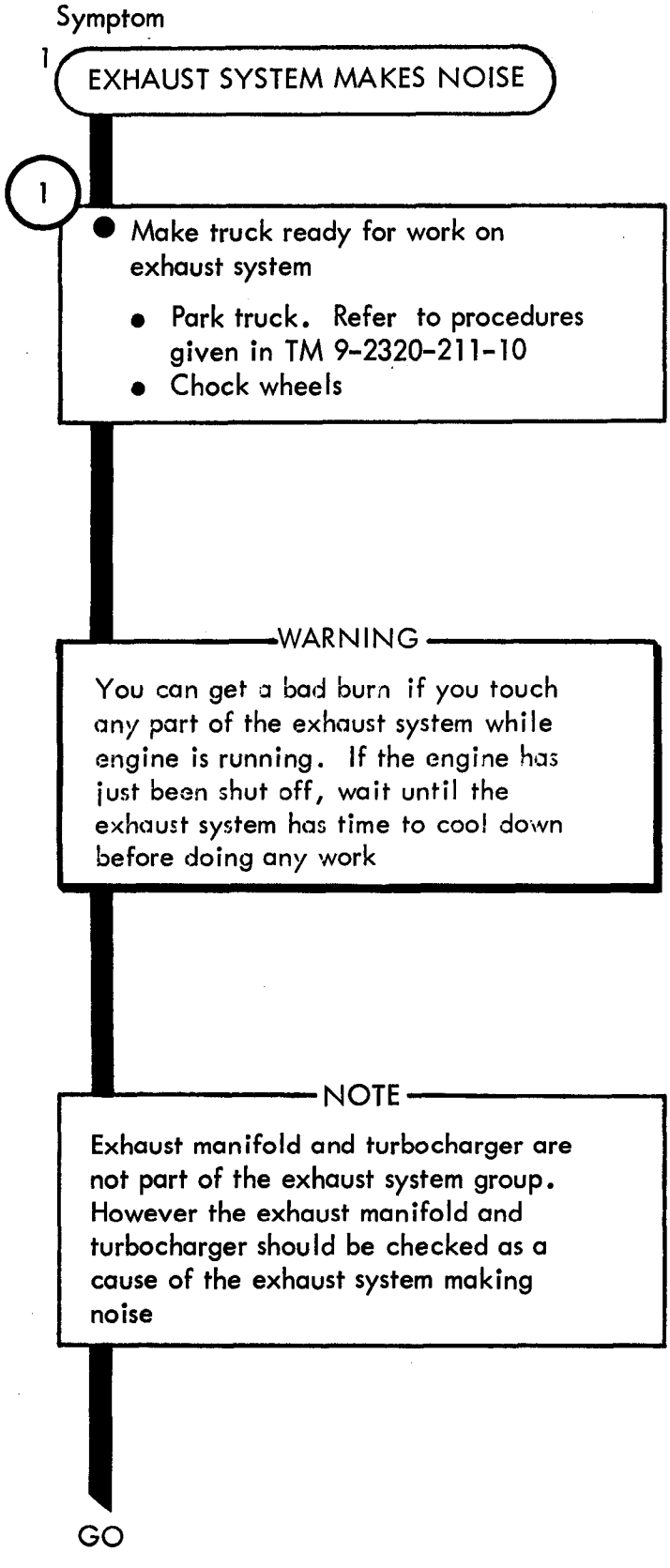
Figure 18-2 (Sheet 2 of 2)

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.



TA 115649

Figure 19-1 (Sheet 1 of 3)

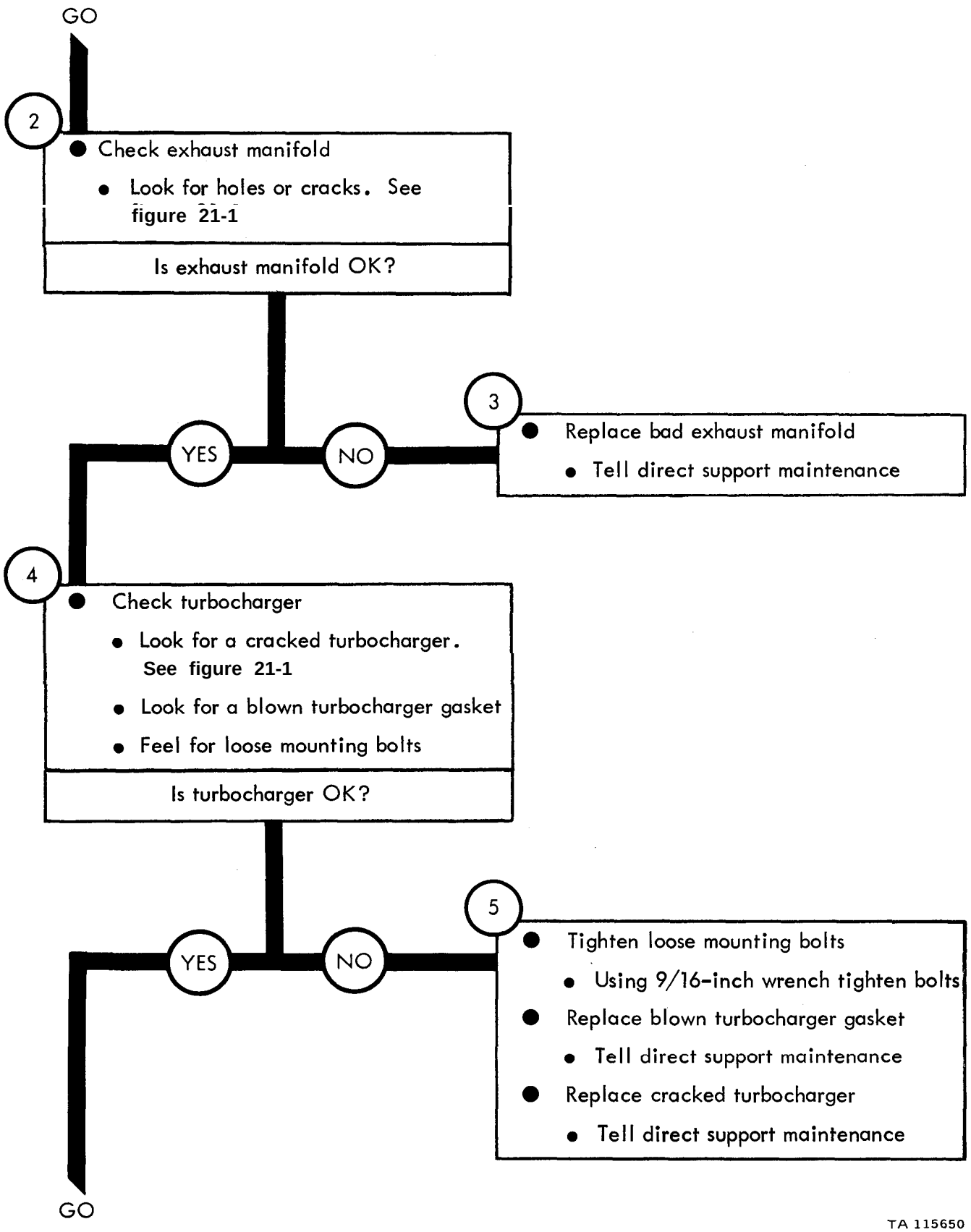


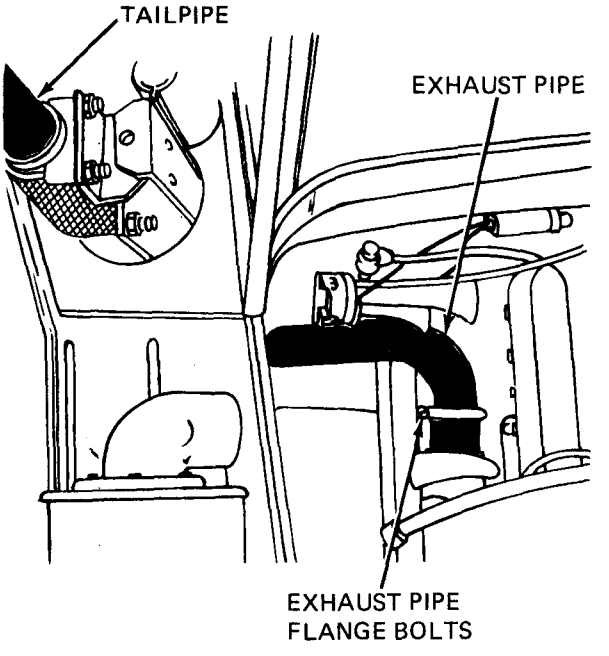
Figure 19-1 (Sheet 2 of 3)

GO

6

- Check exhaust pipes
  - Look for holes or cracks
  - Feel for loose flange bolts

Are exhaust pipes OK?



YES

NO

7

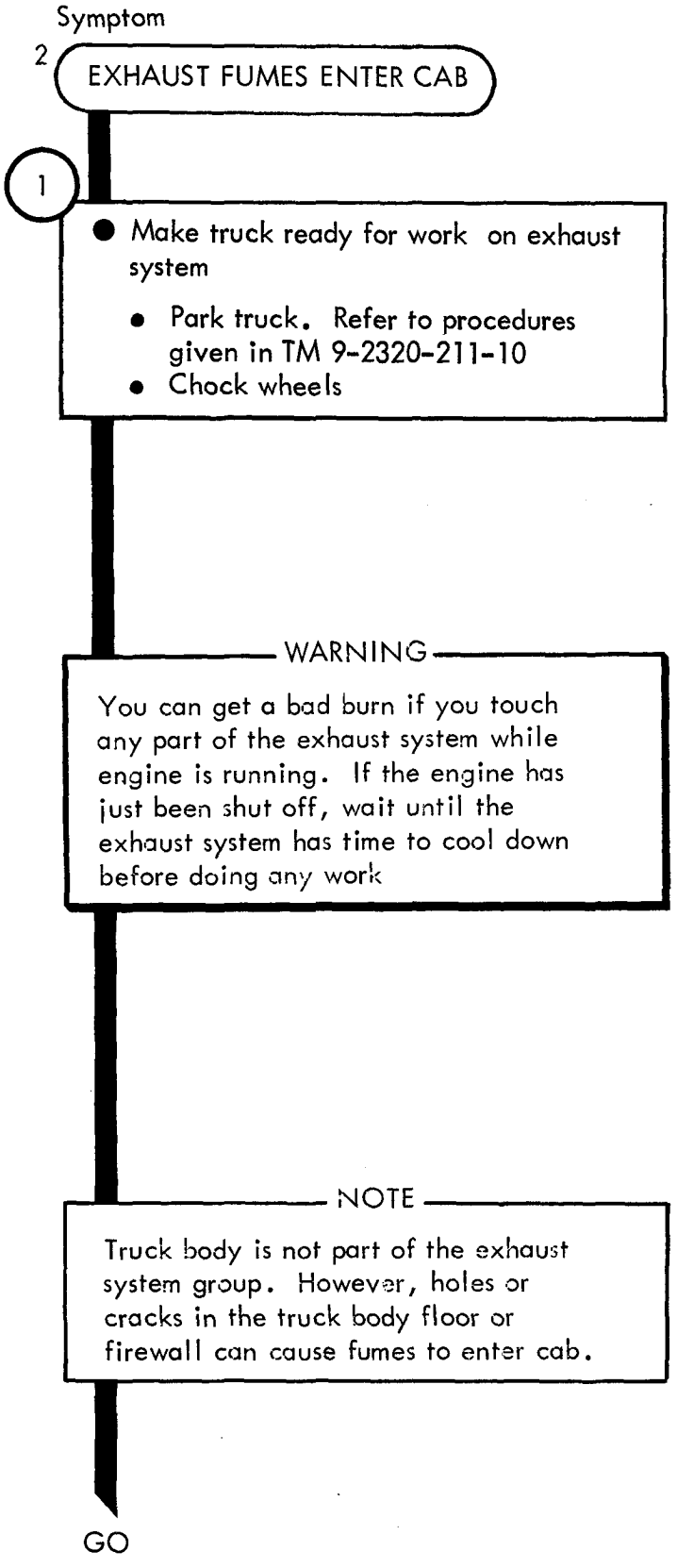
- Tighten loose flange bolts
  - Using 9/16-inch wrench tighten loose bolts
- Replace bad exhaust pipes
  - **Refer to Vol 3, chapter 5, para 5-3**

8

- Replace tailpipe
  - **Refer to Vol 3, chapter 5, para 5-3**

TA 115651

Figure 19-1 (Sheet 3 of 3)



TA 115652

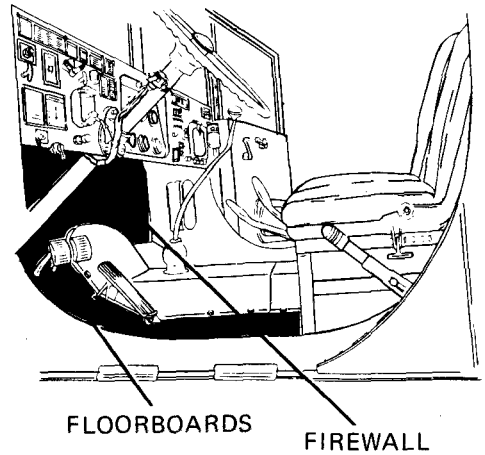
Figure 19-2 (Sheet 1 of 4)

GO

2

- Check cab floorboards and firewall
  - Look for holes or cracks

Are floorboards and firewall OK?



YES

NO

3

- Repair holes and cracks in floorboards and firewall
  - Refer to TM 9-237 for welding procedures

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 exhaust entering cab

4

- Check exhaust manifold
  - Look for holes or cracks. See figure 21-1

Is exhaust manifold OK?

GO

TA 115653

Figure 19-2 (Sheet 2 of 4)

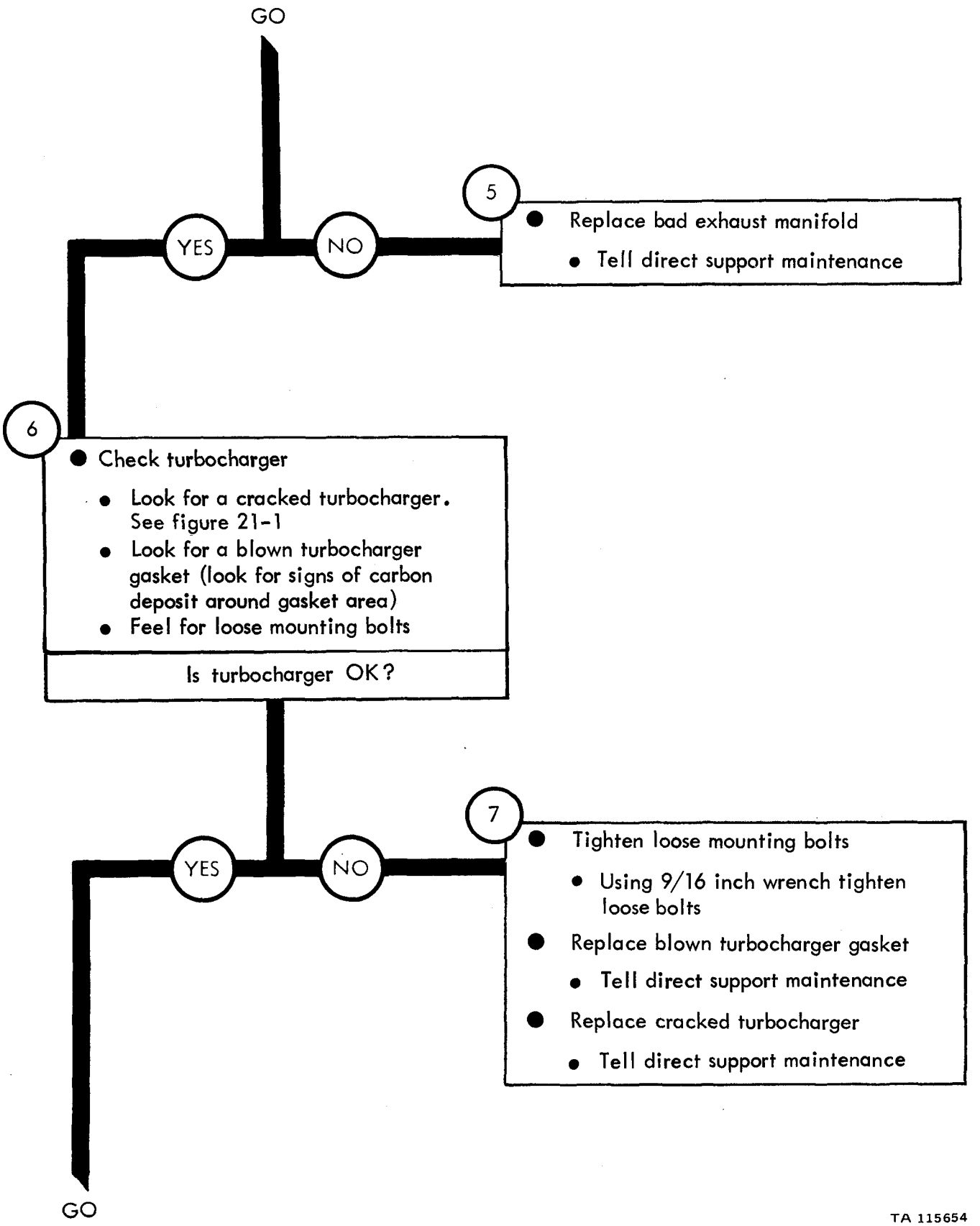


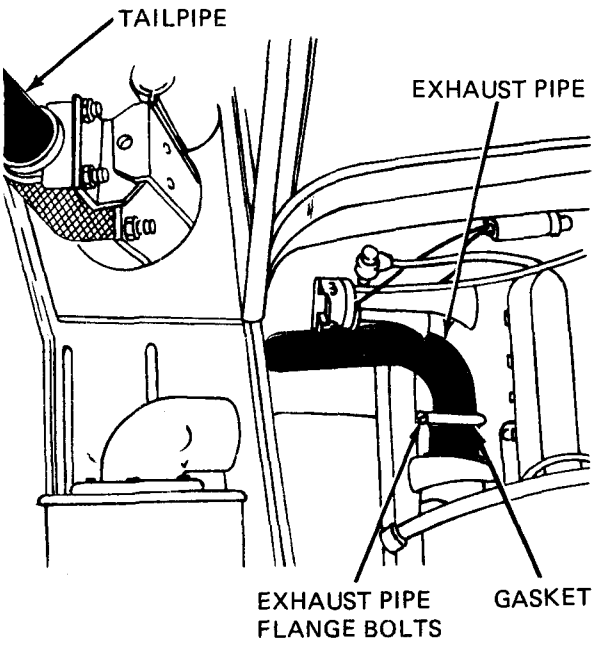
Figure 19-2 (Sheet 3 of 4)

GO

8

- Check exhaust pipes
  - Look for holes or cracks in pipes
  - Feel for loose exhaust pipe flange bolts

Are exhaust pipes OK?



NO

9

- Tighten loose exhaust pipe flange bolts
  - Using 9/16-inch wrench tighten loose bolts
- Replace bad exhaust pipe
  - **Refer to Vol 3, chapter 5, para 5-3**

YES

10

- Replace exhaust pipe flange gasket
  - **Refer to Vol 3, chapter 5, para 5-3**

TA 115655

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

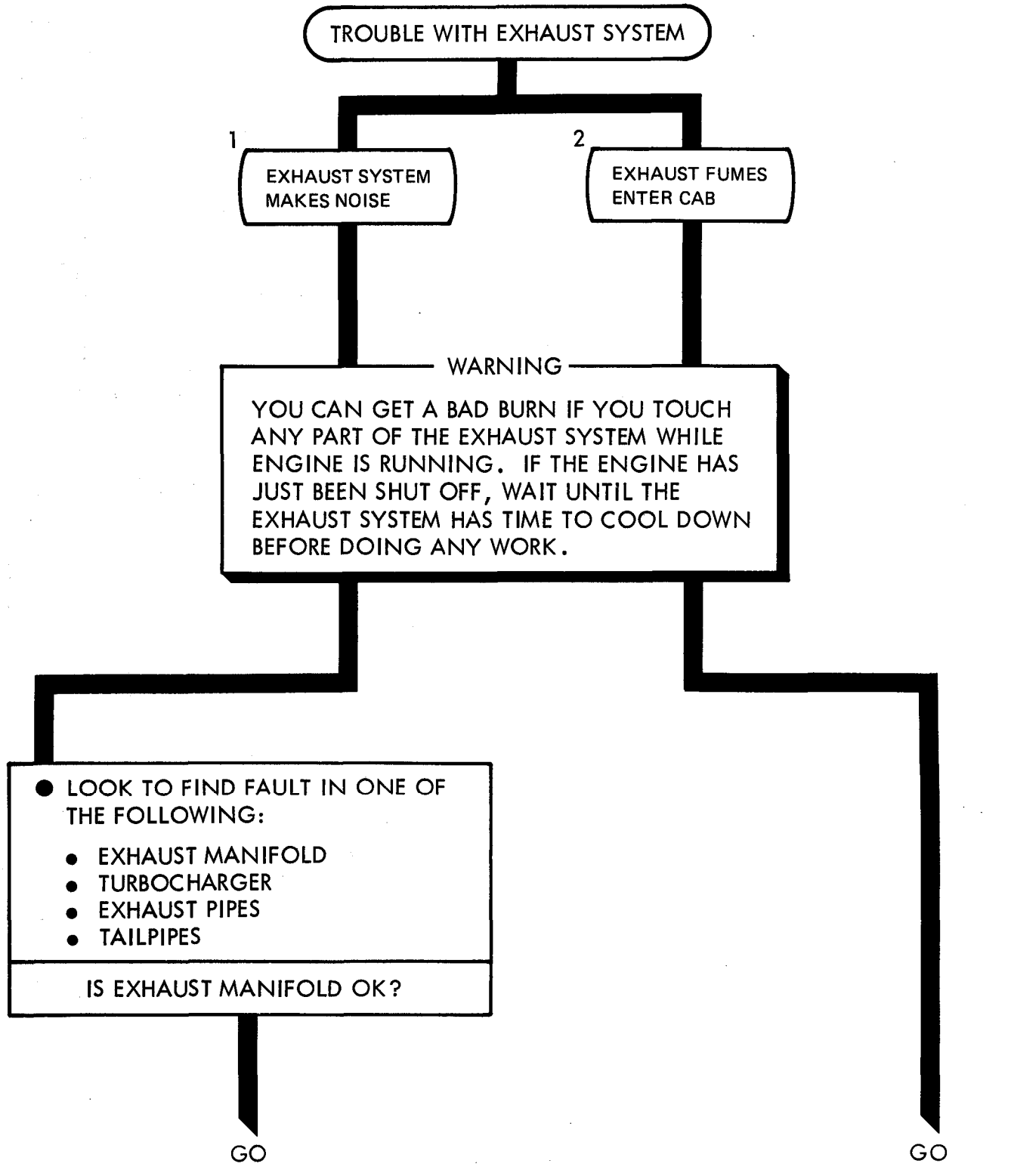
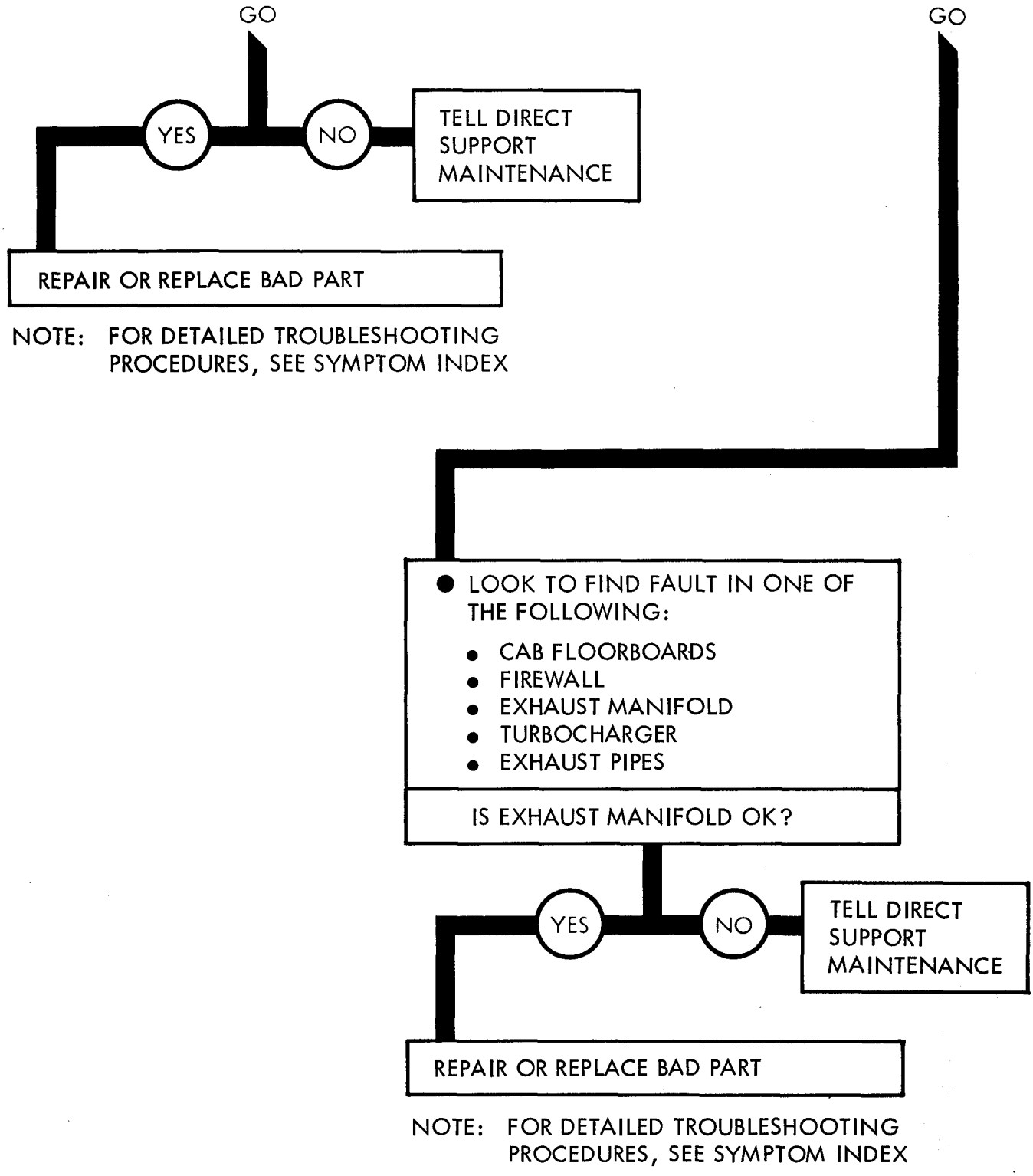


Figure 20-1 (Sheet 1 of 2)



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 trouble-shooting procedures in chapter 19. Table 3-1 is a complete listing of all support diagrams used in this manual.

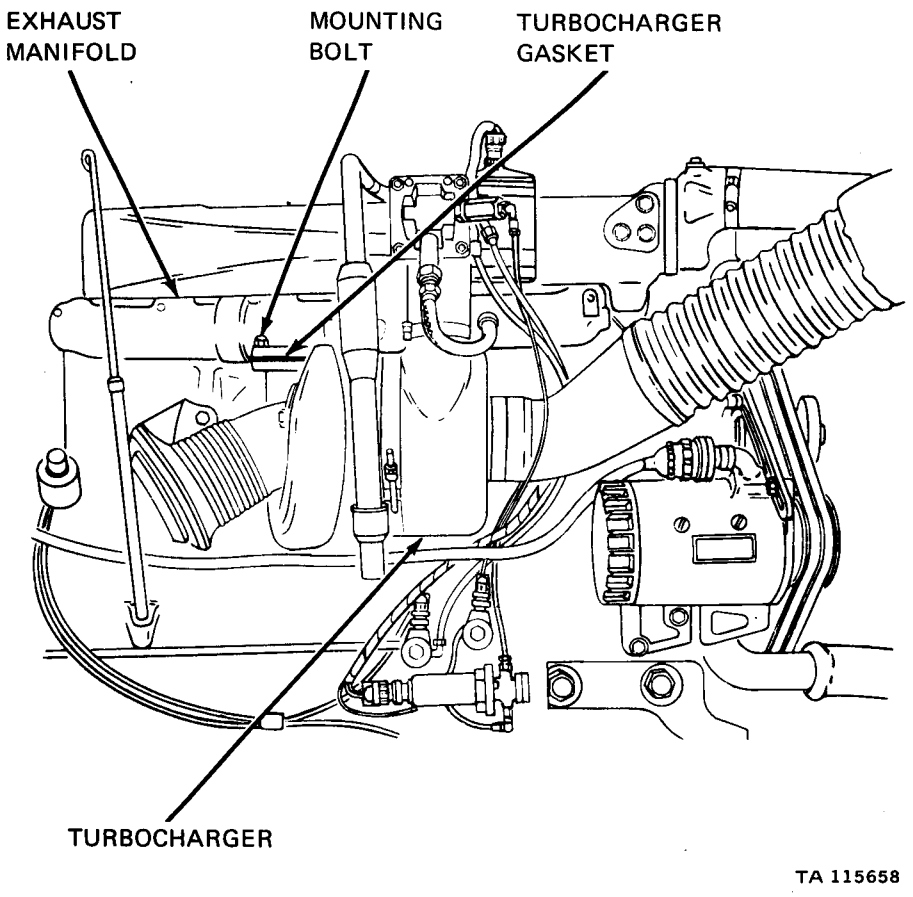

EXHAUST MANIFOLD
MOUNTING BOLT
TURBOCHARGER GASKET
TURBOCHARGER
TA 115658

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

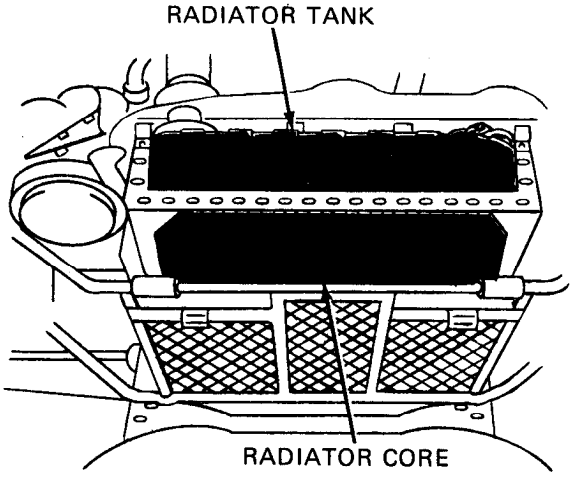
1

- 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

TA 115659

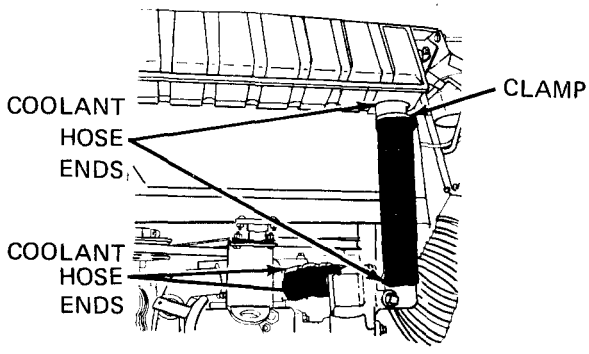
Figure 22-1 (Sheet 1 of 10)

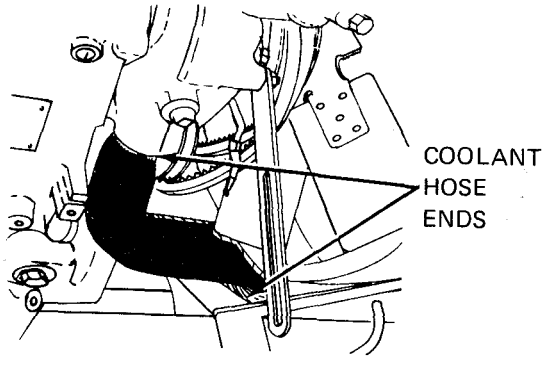
GO

4

- Check all coolant hoses
  - Look for coolant leaking from hose ends
  - Look for a cracked or broken hose
  - Look for a crushed hose

Are hoses OK?



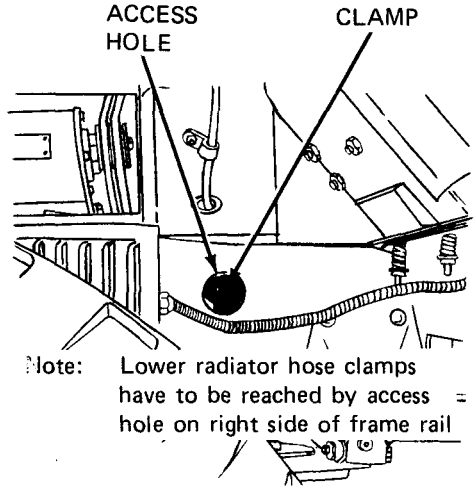


YES

NO

CAUTION

Be careful not to tighten hose clamp too much, because clamp may cut the hose



Note: Lower radiator hose clamps have to be reached by access hole on right side of frame rail

5

- Tighten clamp on leaking coolant hoses
  - Using screwdriver, tighten hose clamps
- Replace broken or crushed coolant hose
  - Refer to Vol 3, chapter 6, para 6-5 or 6-6

GO

TA 115660

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

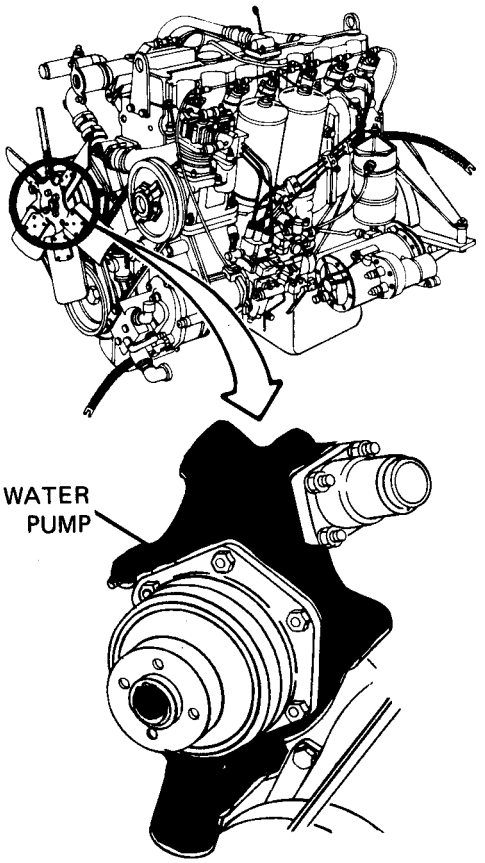
6

- 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



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

TA 115661

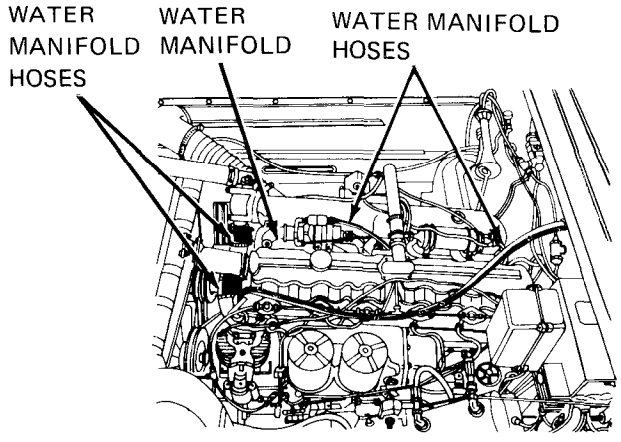
Figure 22-1 (Sheet 3 of 10)

GO

8

- Check water manifold and hoses
  - Look for holes or cracks in water manifold
  - Look for signs of leaks coming from water manifold hoses or water manifold gaskets

Are water manifold and hoses OK?



YES

NO

9

- Replace cracked or broken water manifold
  - Tell direct support maintenance
- Replace leaking water manifold hose or water manifold gaskets
  - Refer to Vol 3, chapter 6, para 6-7

GO

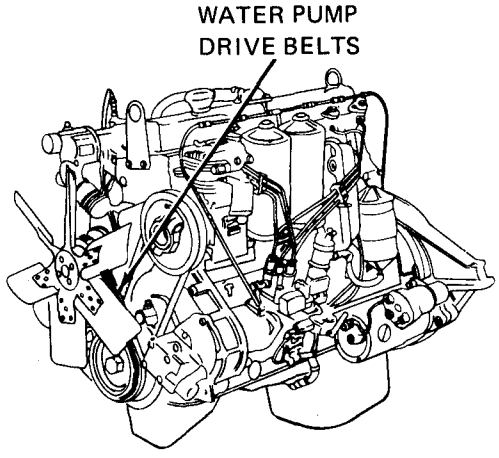
TA 115662

Figure 22-1 (Sheet 4 of 10)

GO

10

- Check fan and water pump drive belts
  - Look for a broken fan or water pump drive belt
- Check fan and water pump drive belt adjustment
  - Look at each drive belt to see if V-shape surface is very shiny. A very shiny belt is a sign that the belt is slipping
  - Move belt to see if it is loose



Are all drive belts OK?

YES

NO

11

- Replace broken water or fan drive belts
  - **Refer to Vol 3, chapter 6, para 6-12**
- **Adjust fan drive belt set, or water pump belt**
  - **Refer to Vol 3, chapter 6, para 6-12**

GO

TA 115663

Figure 22-1 (Sheet 5 of 10)

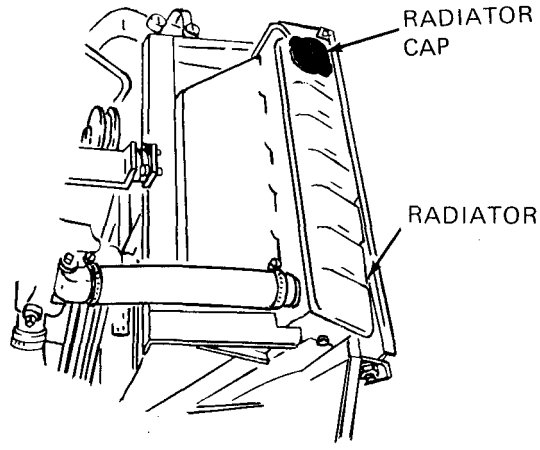
GO

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

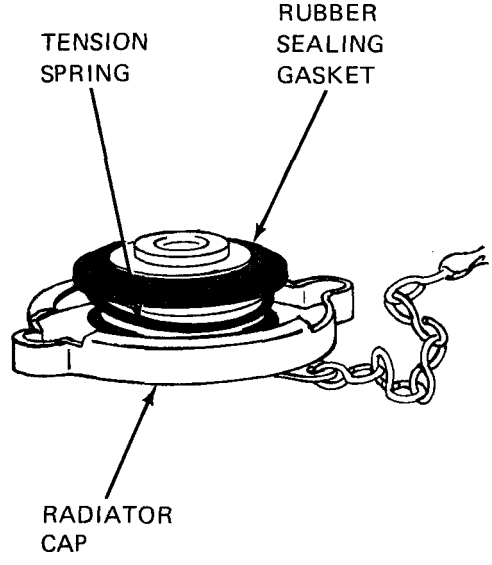
12

- 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

TA 115664

Figure 22-1 (Sheet 6 of 10)

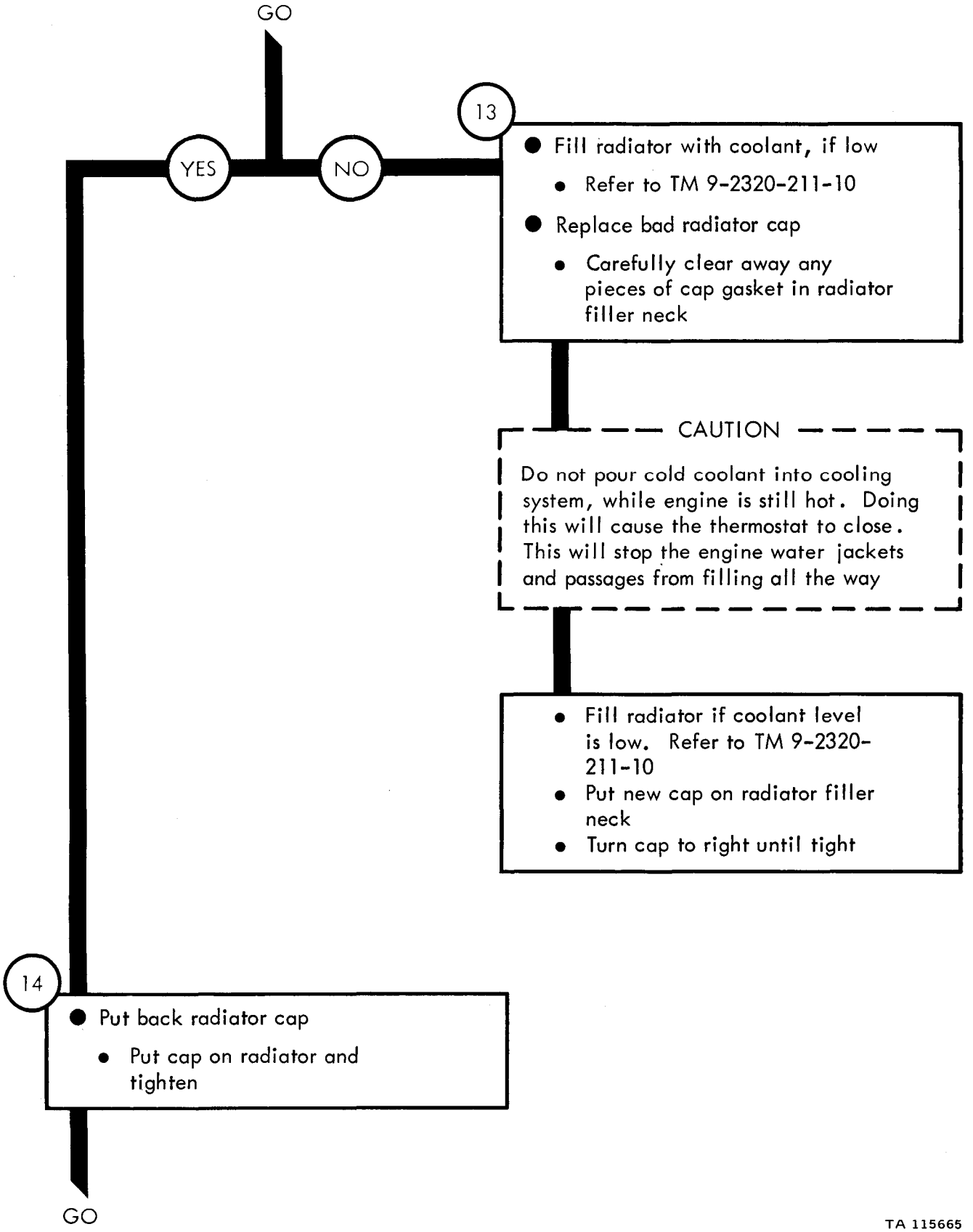


Figure 22-1 (Sheet 7 of 10)

GO

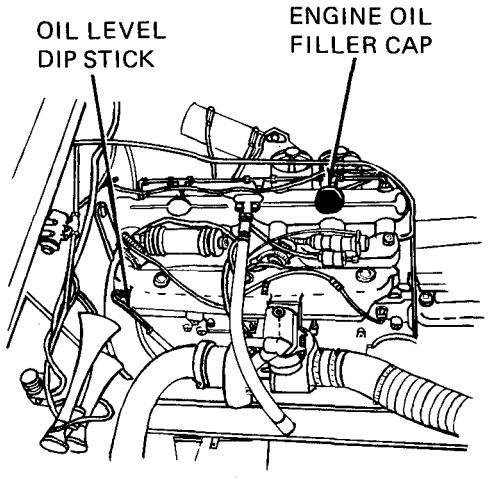
15

- Check for water in oil

  NOTE: If water has entered oil, it will show as a milk white film on oil level dipstick and on engine oil filler cap

  - Unscrew and pull out oil level dipstick
  - Unscrew and take off engine oil filler cap
  - Look for milk white film in oil

Is oil OK?



YES

NO

16

- Replace oil cooler gaskets
  - Tell direct support maintenance

17

- Put back dipstick and filler cap
  - Push in dipstick and tighten
  - Put filler cap on outlet and tighten

GO

TA 115666

Figure 22-1 (Sheet 8 of 10)

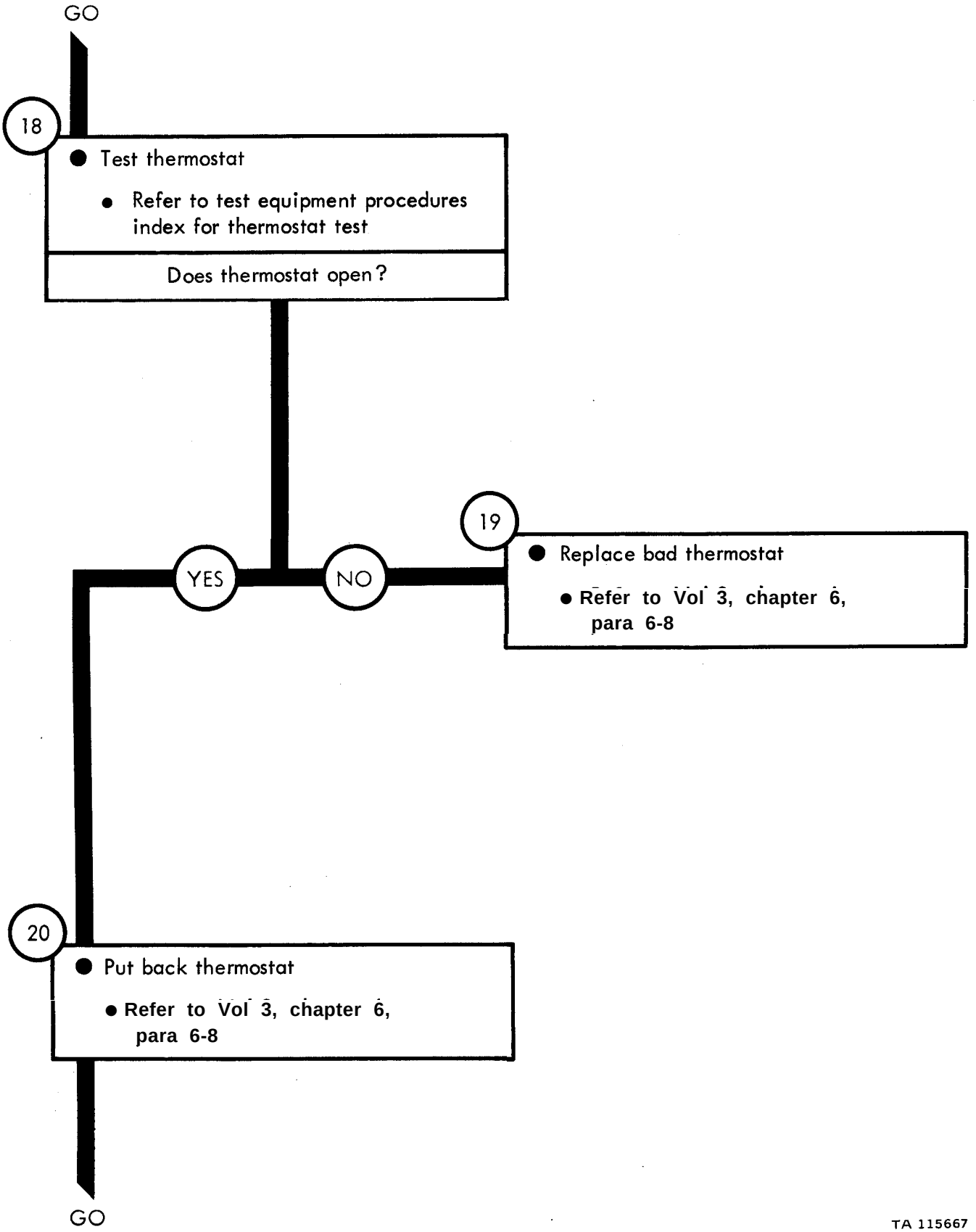
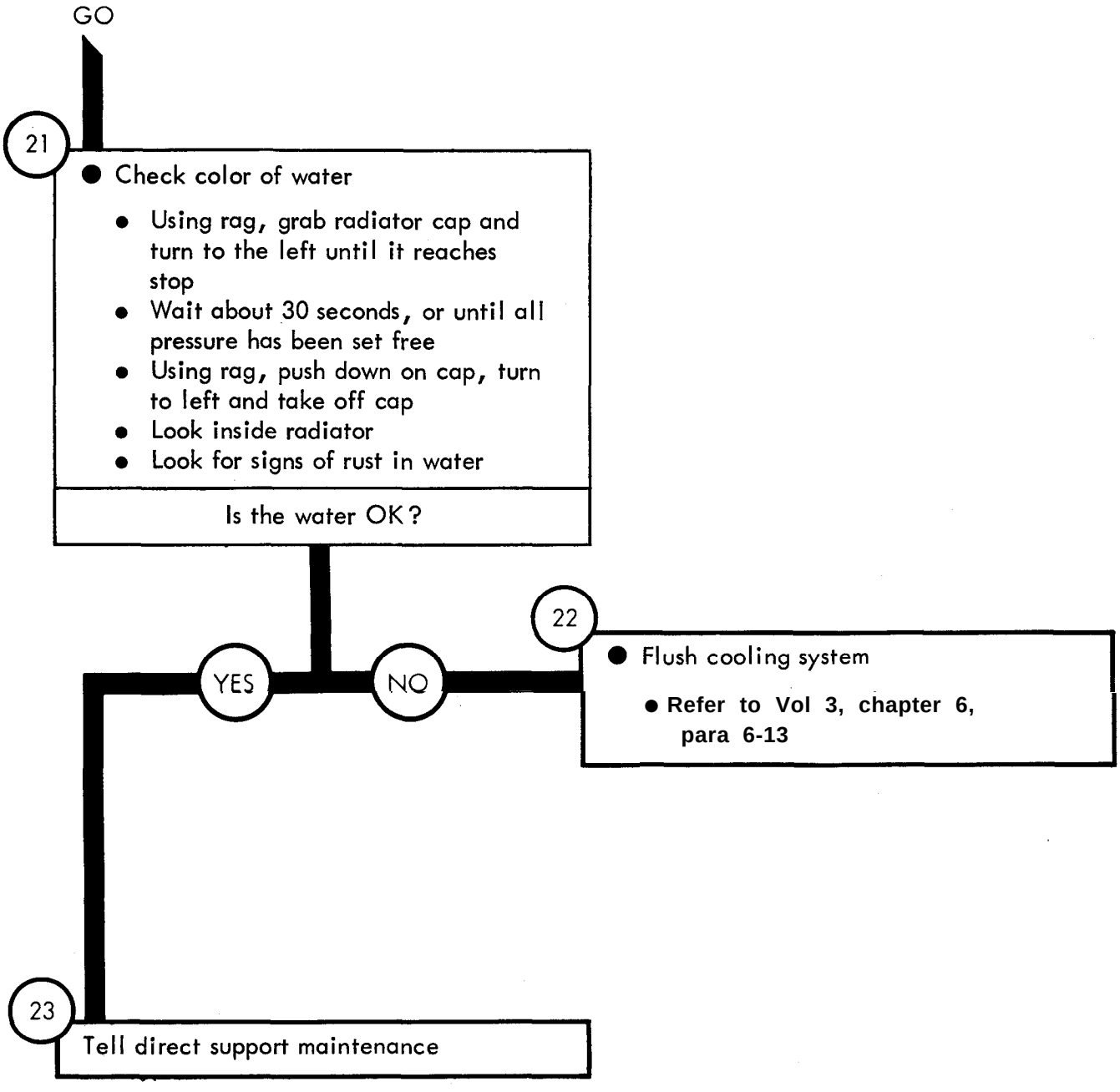


Figure 22-1 (Sheet 9 of 10)



TA 115668

Figure 22-1 (Sheet 10 of 10)

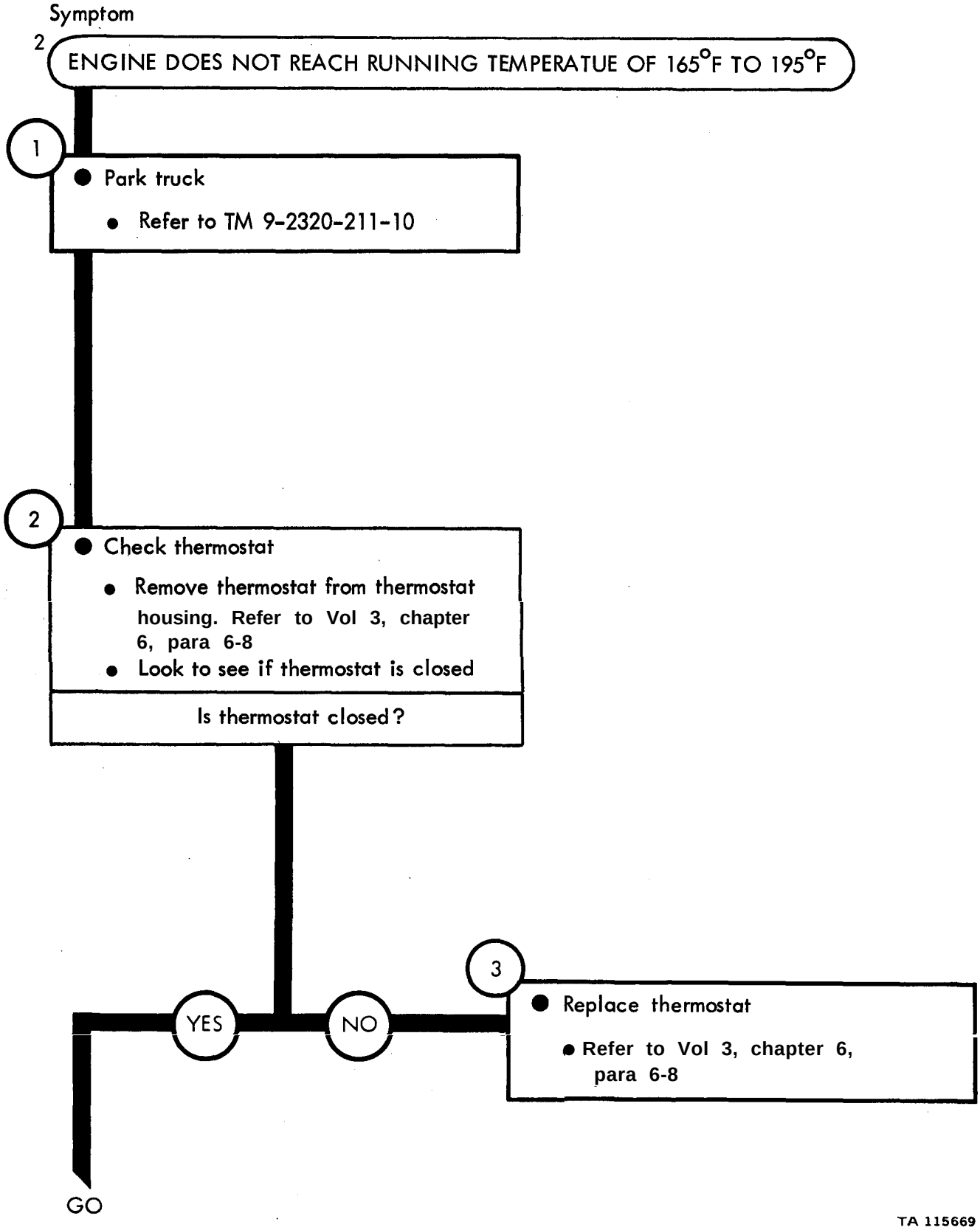
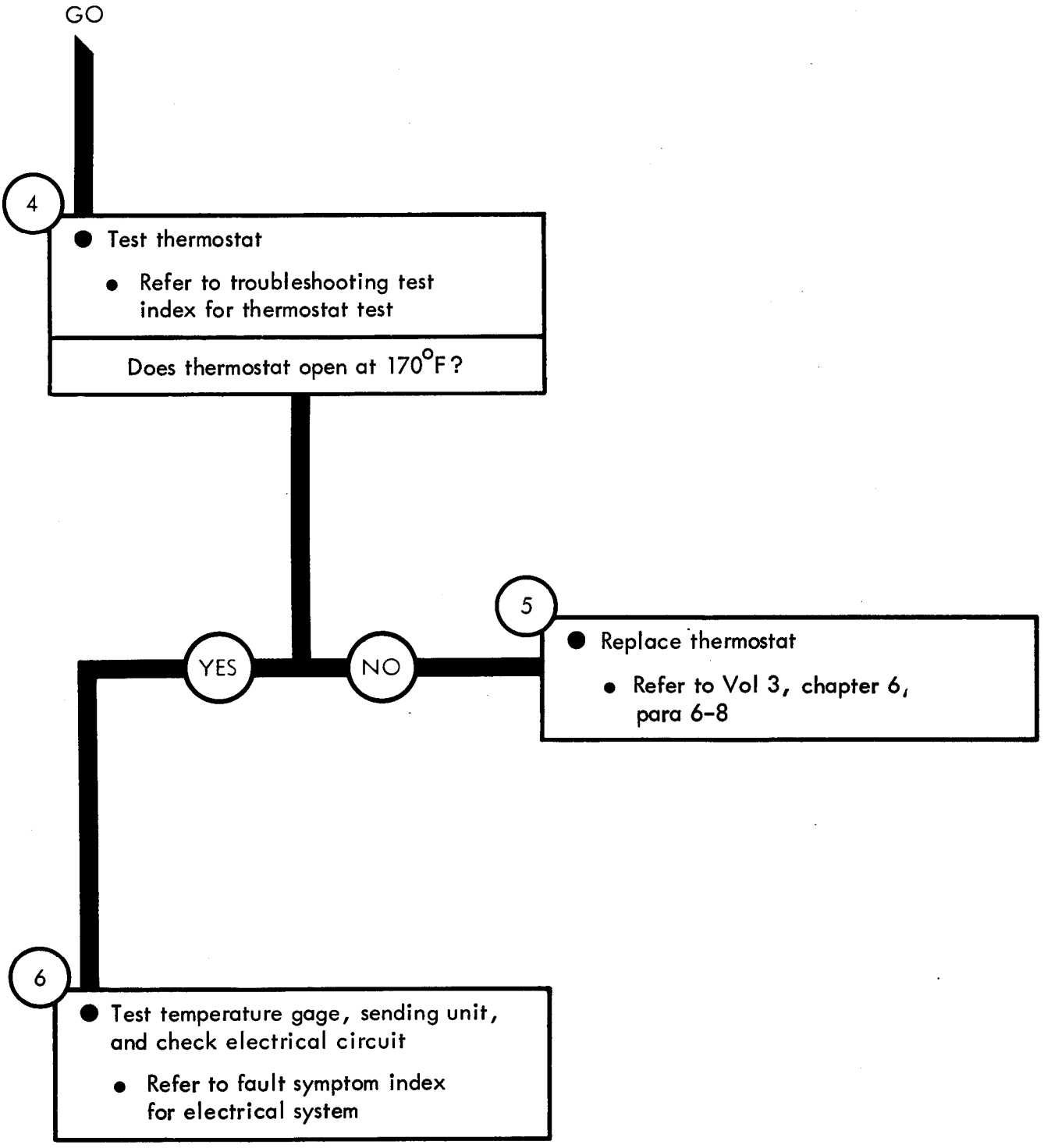


Figure 22-2 (Sheet 1 of 2)



TA 115670

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

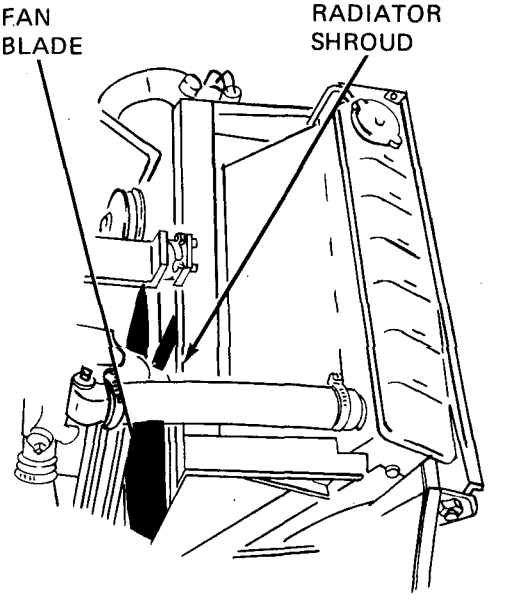
WARNING

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

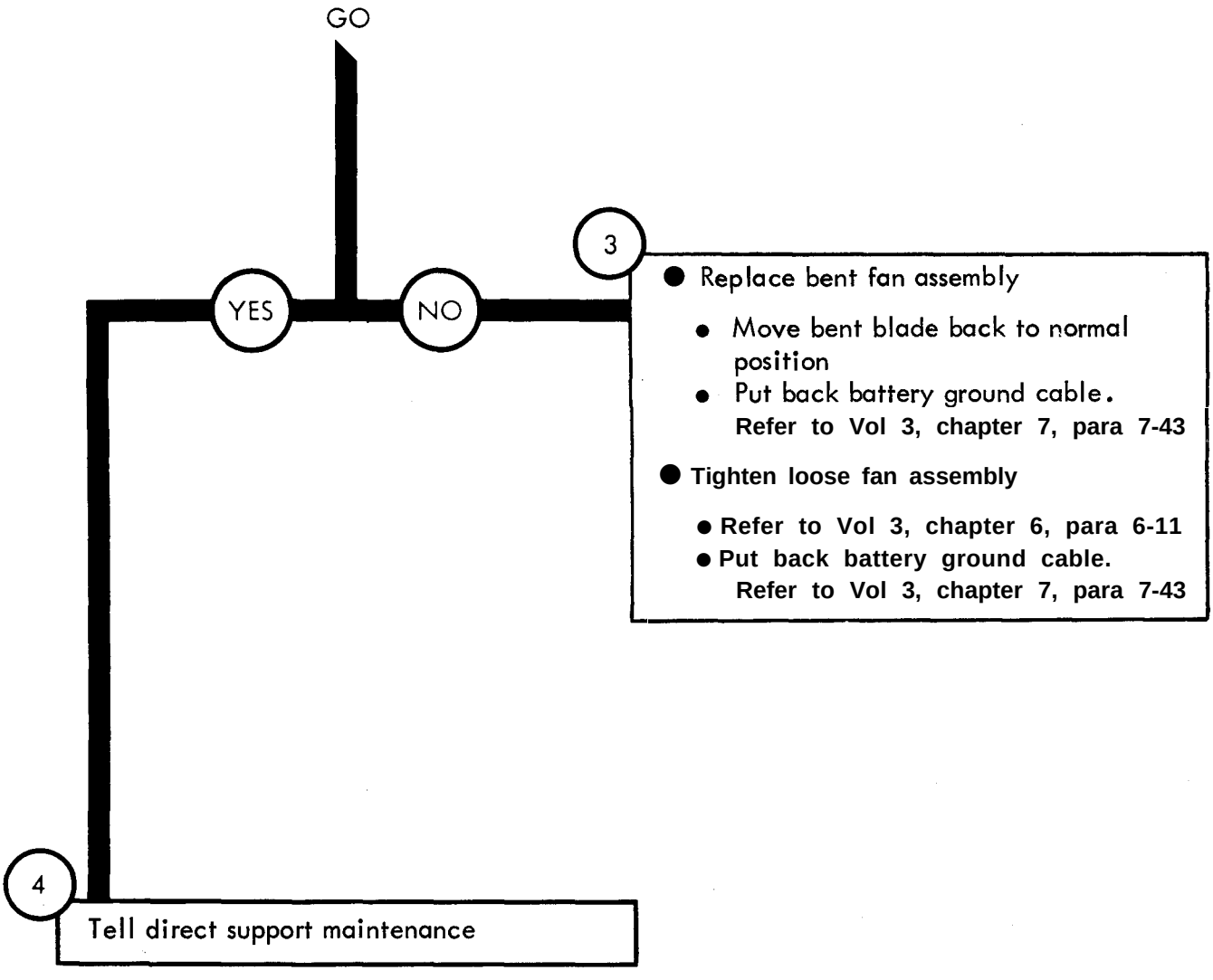
Is fan assembly OK?

GO



TA 115671

Figure 22-3 (Sheet 1 of 2)



TA 115672

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

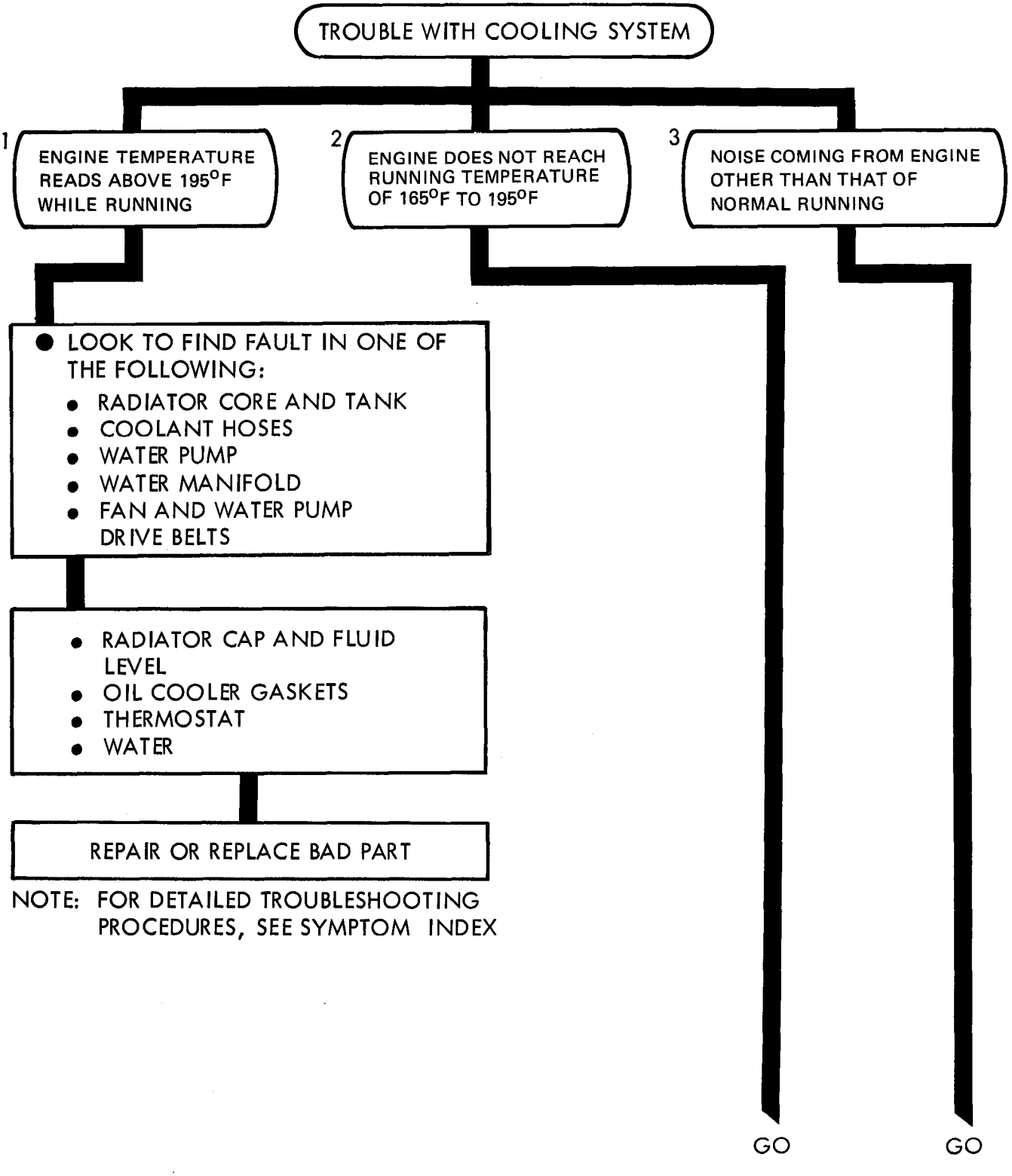
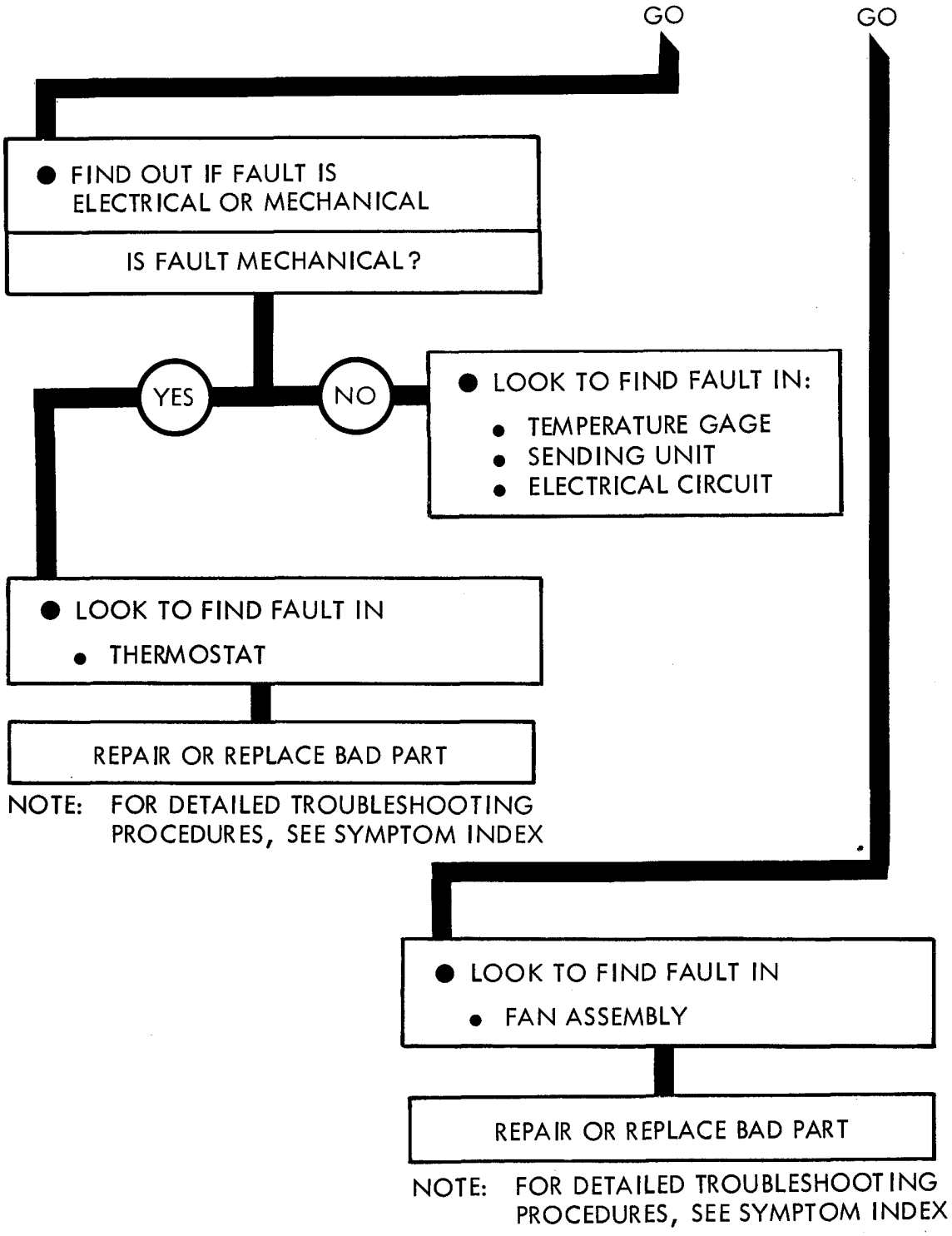


Figure 23-1 (Sheet 1 of 2)



TA 115674

Figure 23-1 (Sheet 2 of 2)

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.

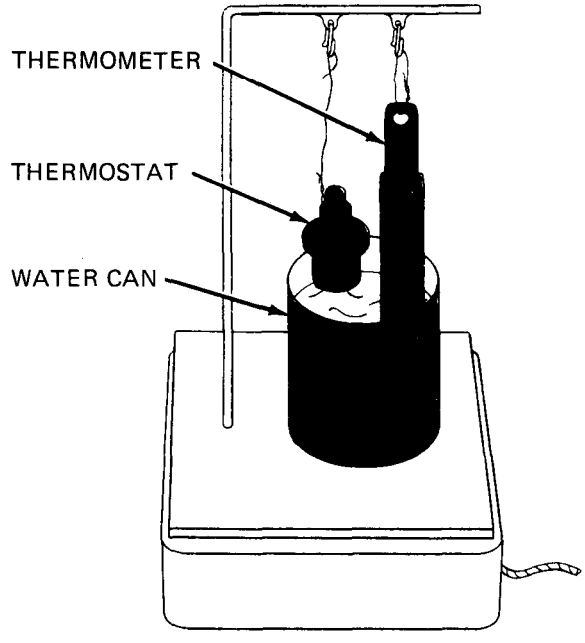
24-3. TEST PROCEDURE. Detailed step-by-step instructions, in flow chart form, are given for each test. The procedure calls out the type of test and the condition of the truck system for each part of testing. The step-by-step test will lead you to the bad component or to a fault symptom within a related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



TA 115675

Figure 24-1 (Sheet 1 of 1)

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.

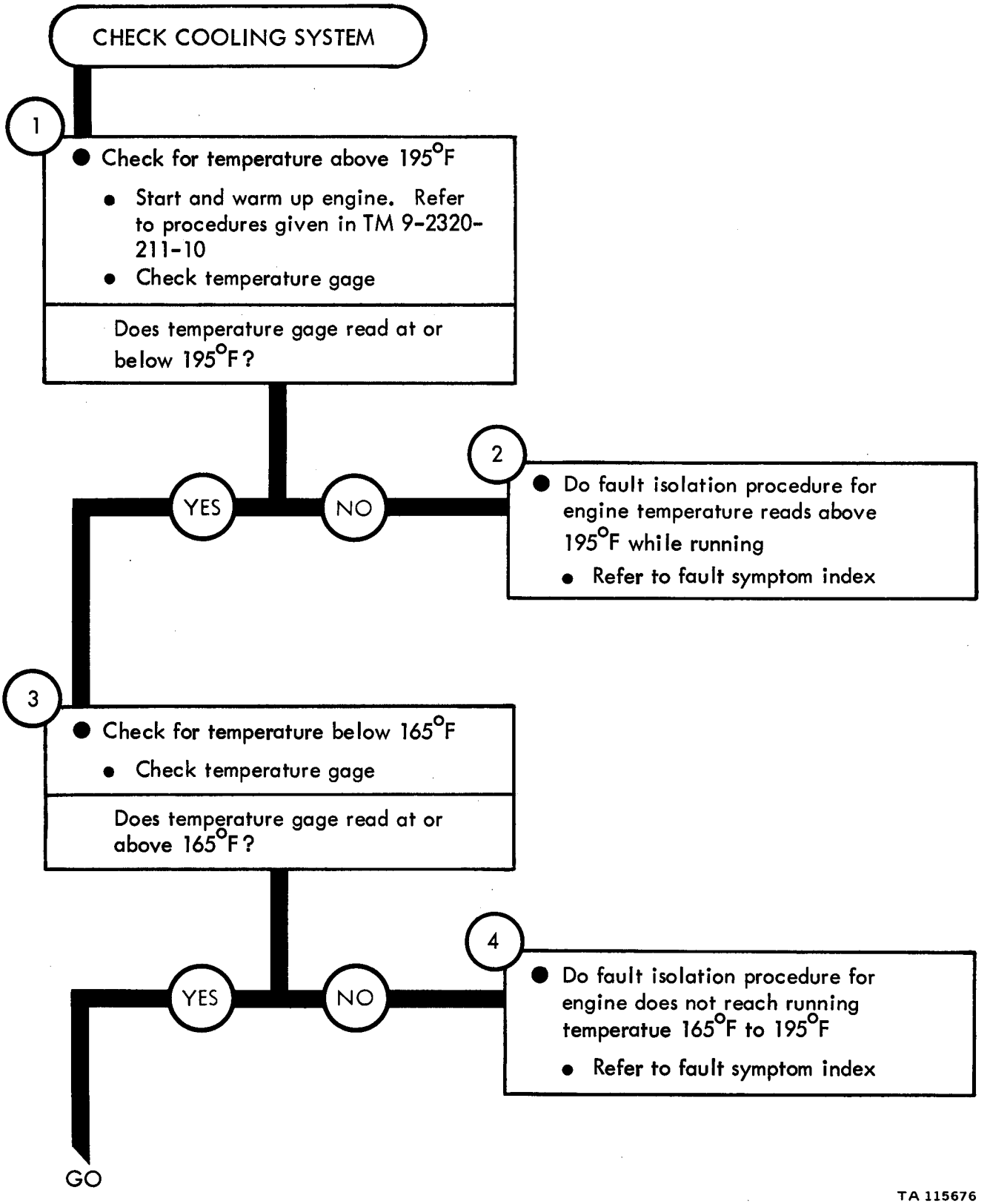
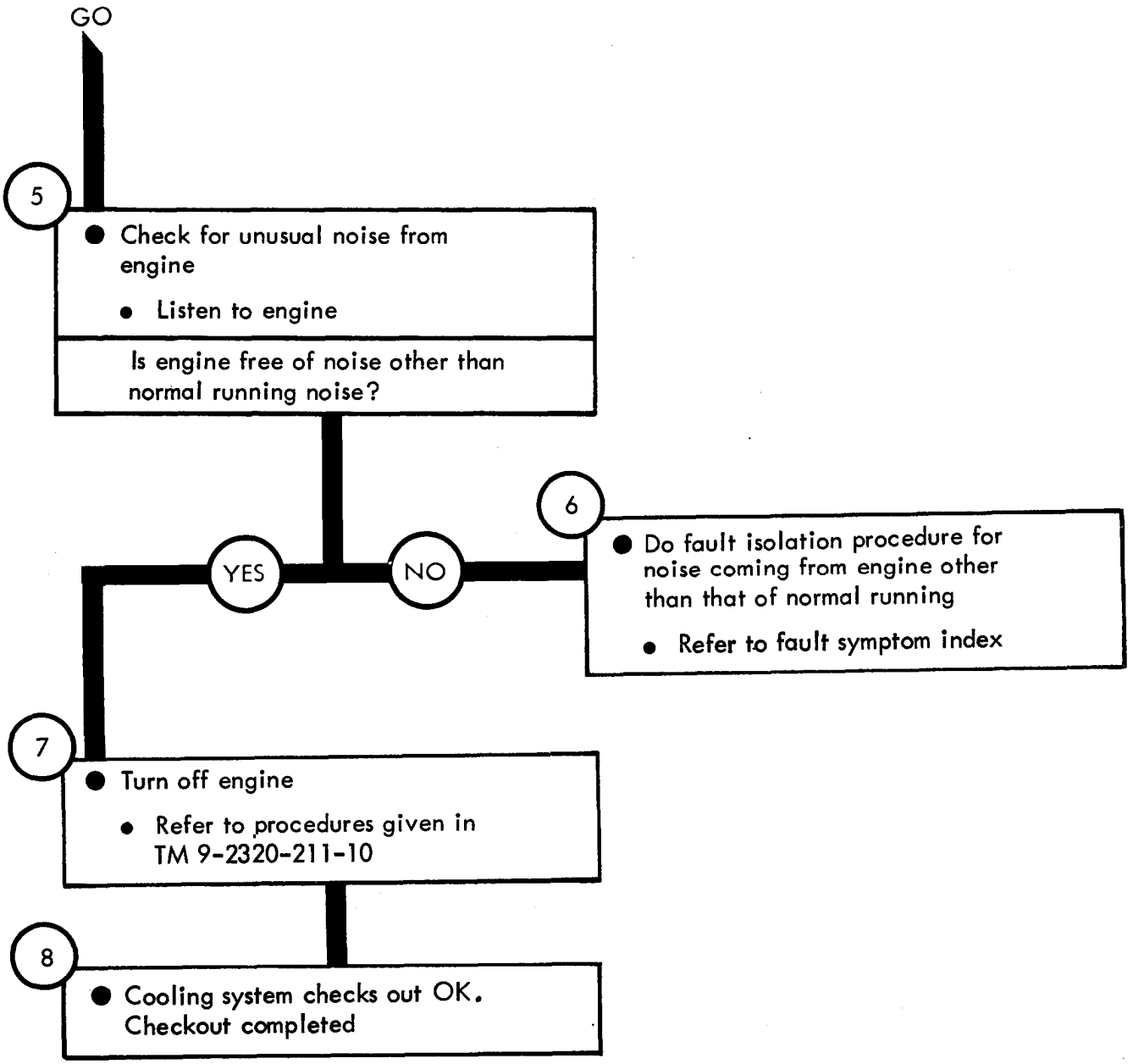


Figure 25-1 (Sheet 1 of 2)



TA 115677

Figure 25-1 (Sheet 2 of 2)

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.

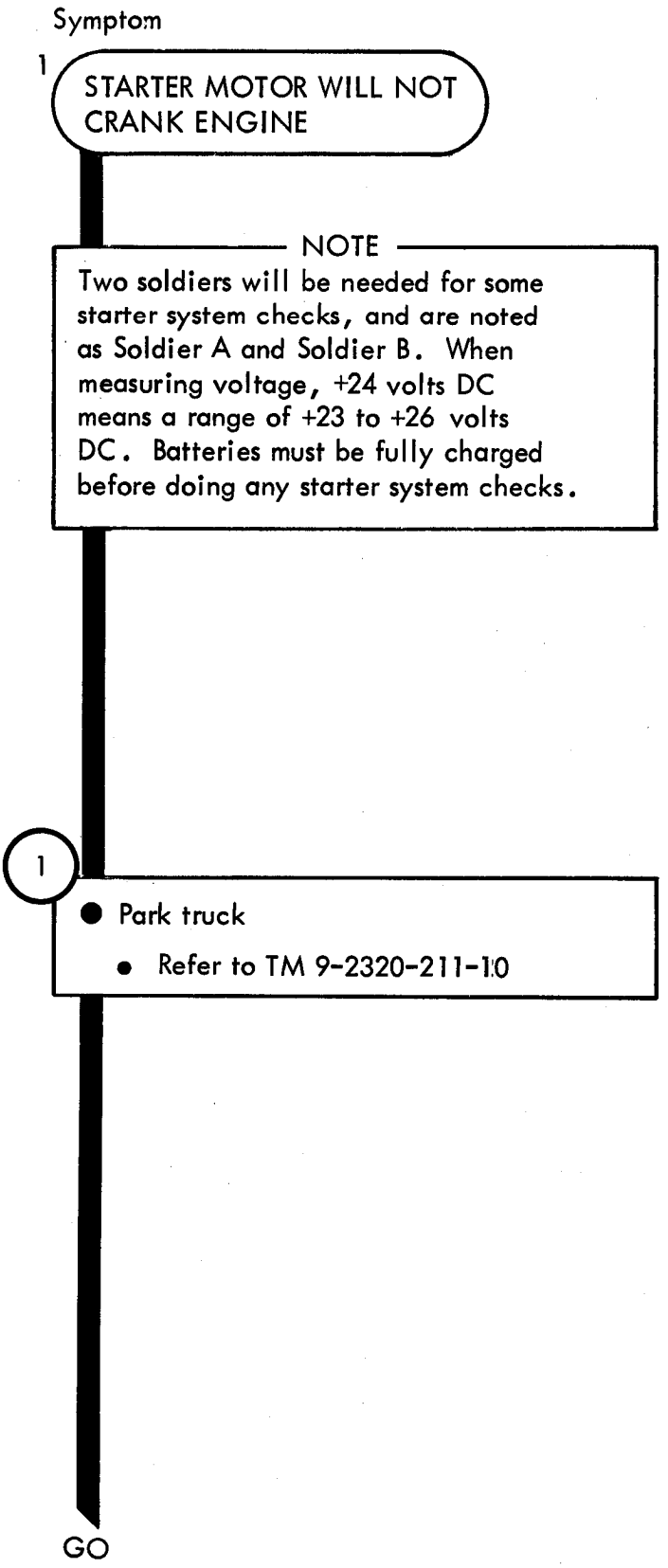


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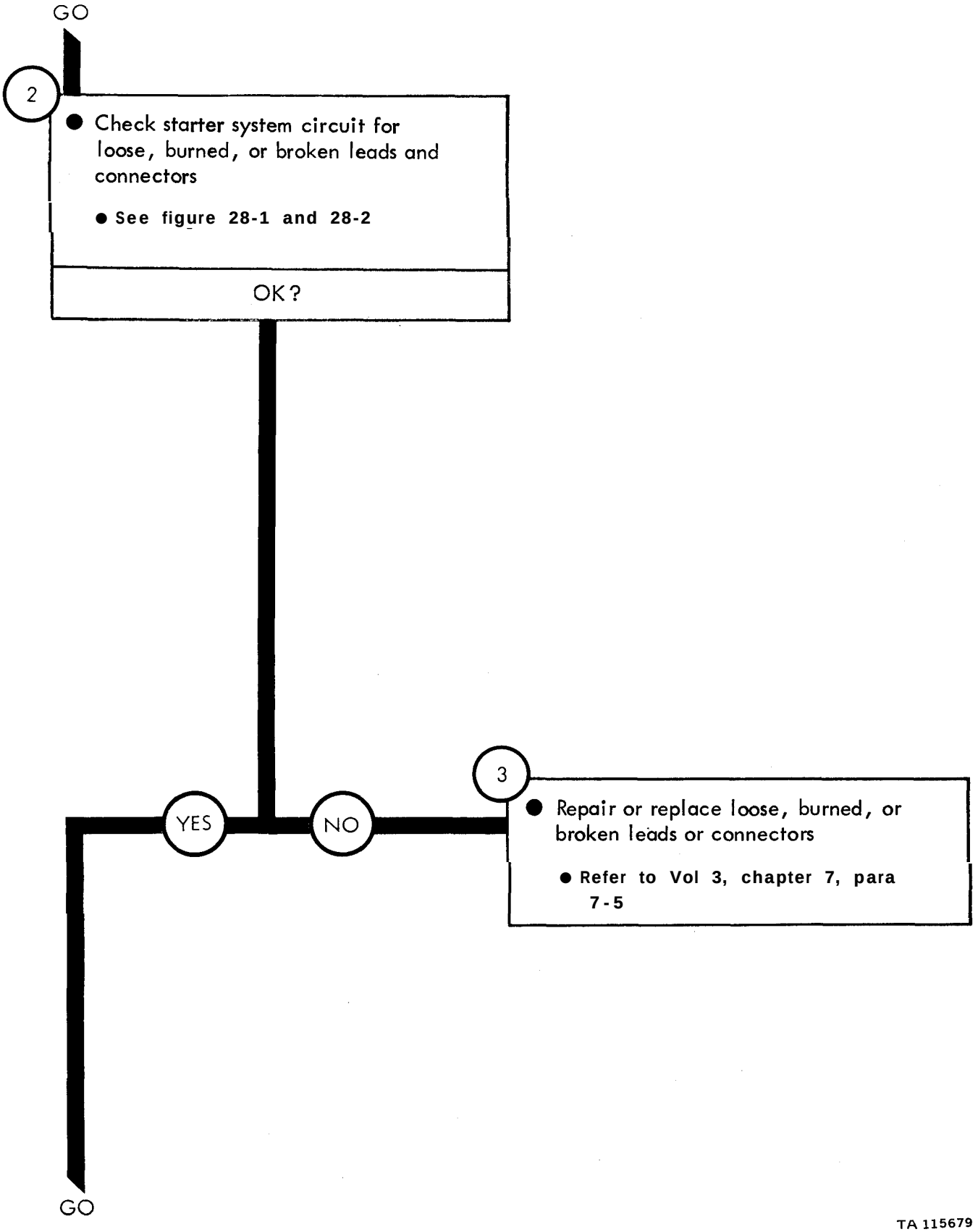
Figure 26-1 (Sheet 1 of 11)



TA 115679

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

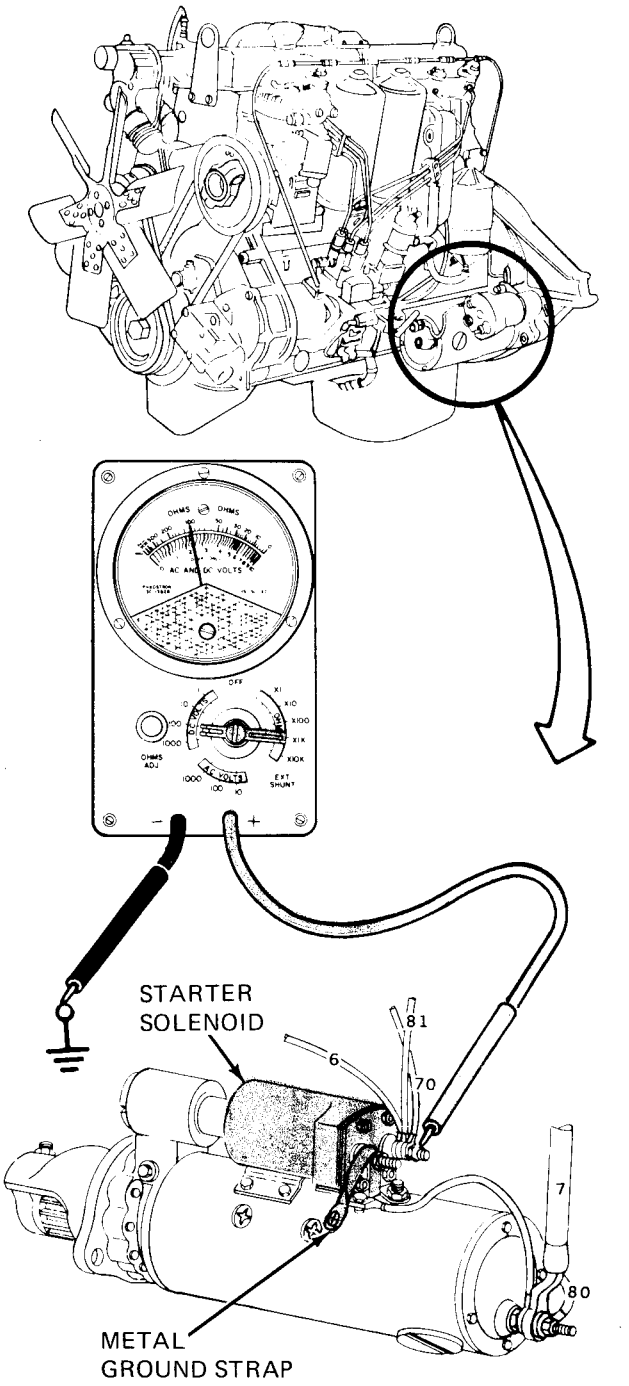


Figure 26-1 (Sheet 3 of 11)

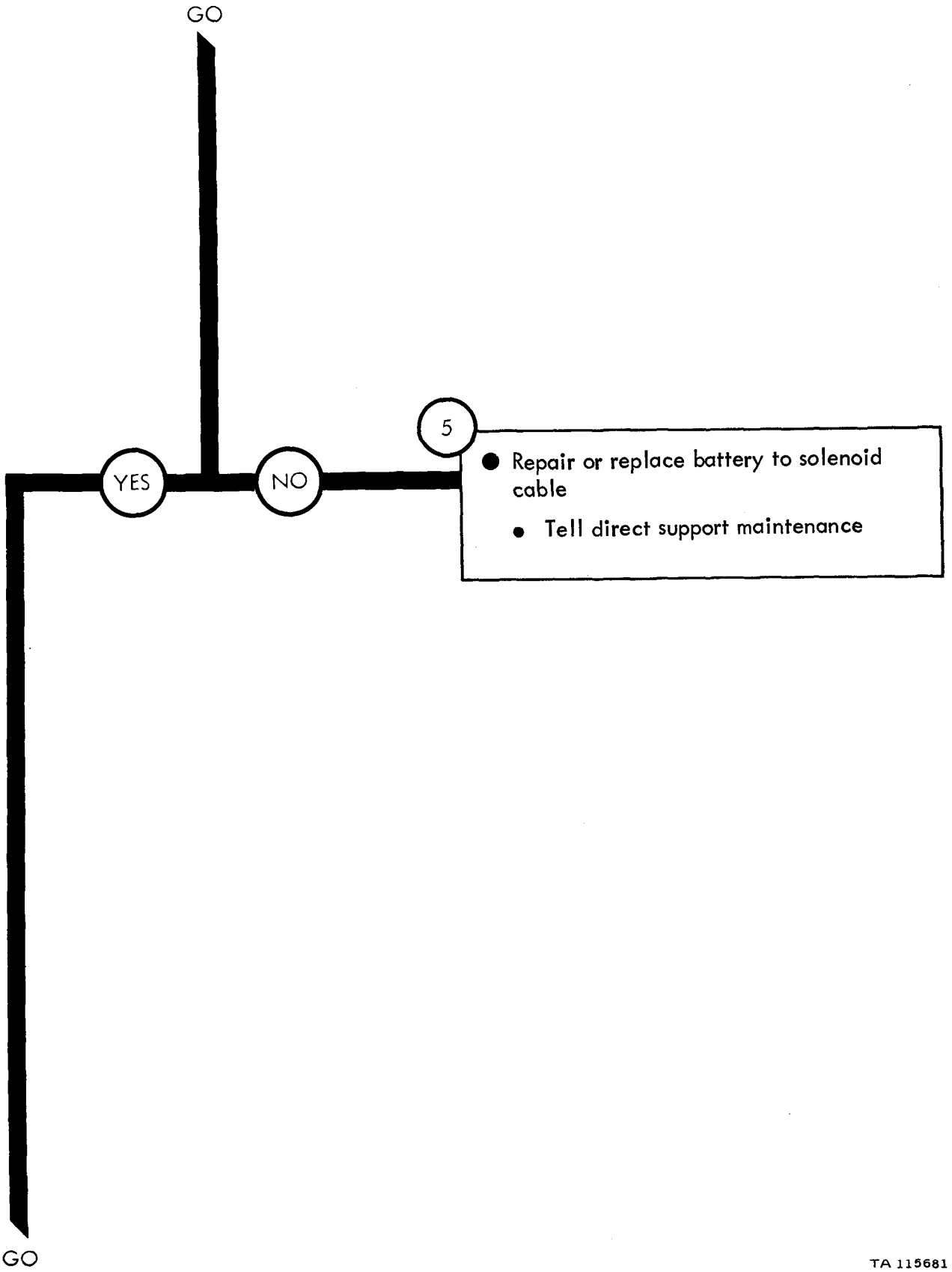


Figure 26-1 (Sheet 4 of 11)

GO

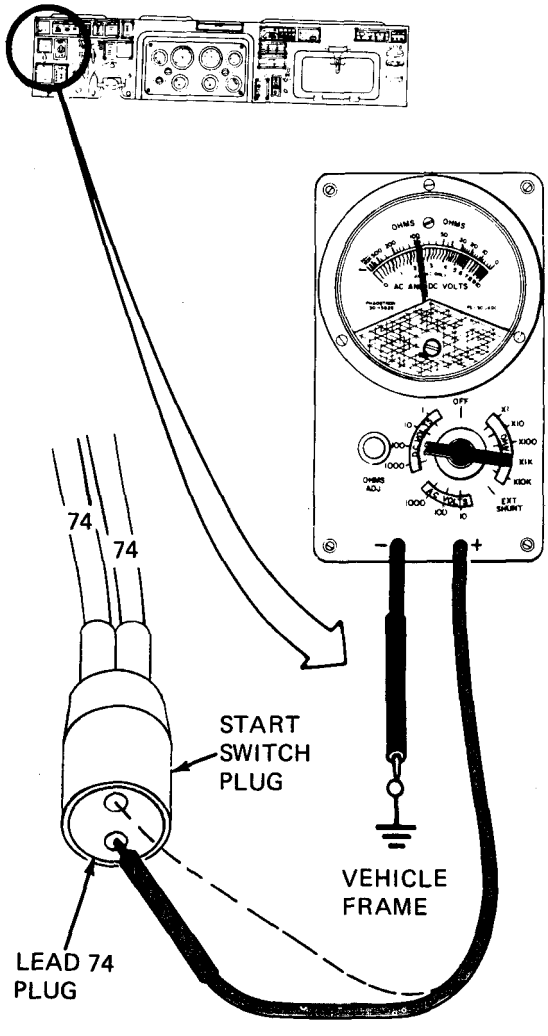
6

- Check for +24 volts DC to START switch
  - Remove START switch from instrument panel. Refer to Vol 3, chapter 7, para 7-17
  - Pull lead 74 plug from START switch
  - Set BATTERY SWITCH to ON

- Put multimeter - lead on a good ground
- Put multimeter + lead in first one and then other lead 74 contact of plug
- Read multimeter for each contact tested. Multimeter should measure +24 volts DC for each lead 74 contact tested

Does multimeter measure less than +24 volts DC for both contacts tested?

GO



TA 115682

Figure 26-1 (Sheet 5 of 11)

GO

7

- Check START switch for continuity
  - Set BATTERY switch to OFF
  - Set multimeter to check continuity. Refer to test equipment procedures index
  - Fold back rubber boot on START switch to reach contacts

- Put multimeter + lead in one contact of START switch
- Put multimeter - lead in other contact of START switch
- Push in START switch button and read multimeter. Multimeter should measure zero ohms

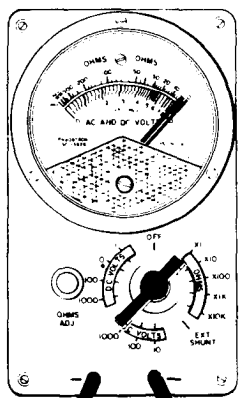
Does multimeter measure zero ohms?

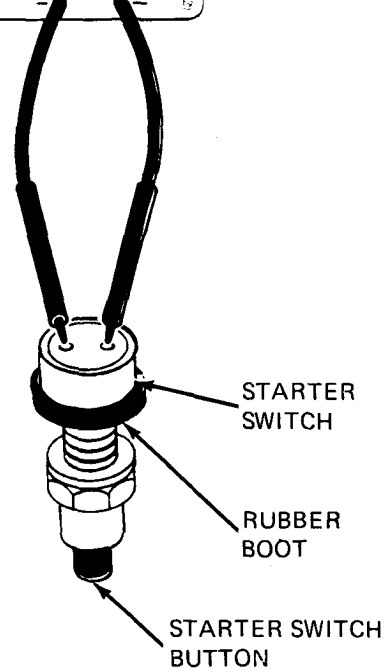
YES

NO

8

- Go to step 11

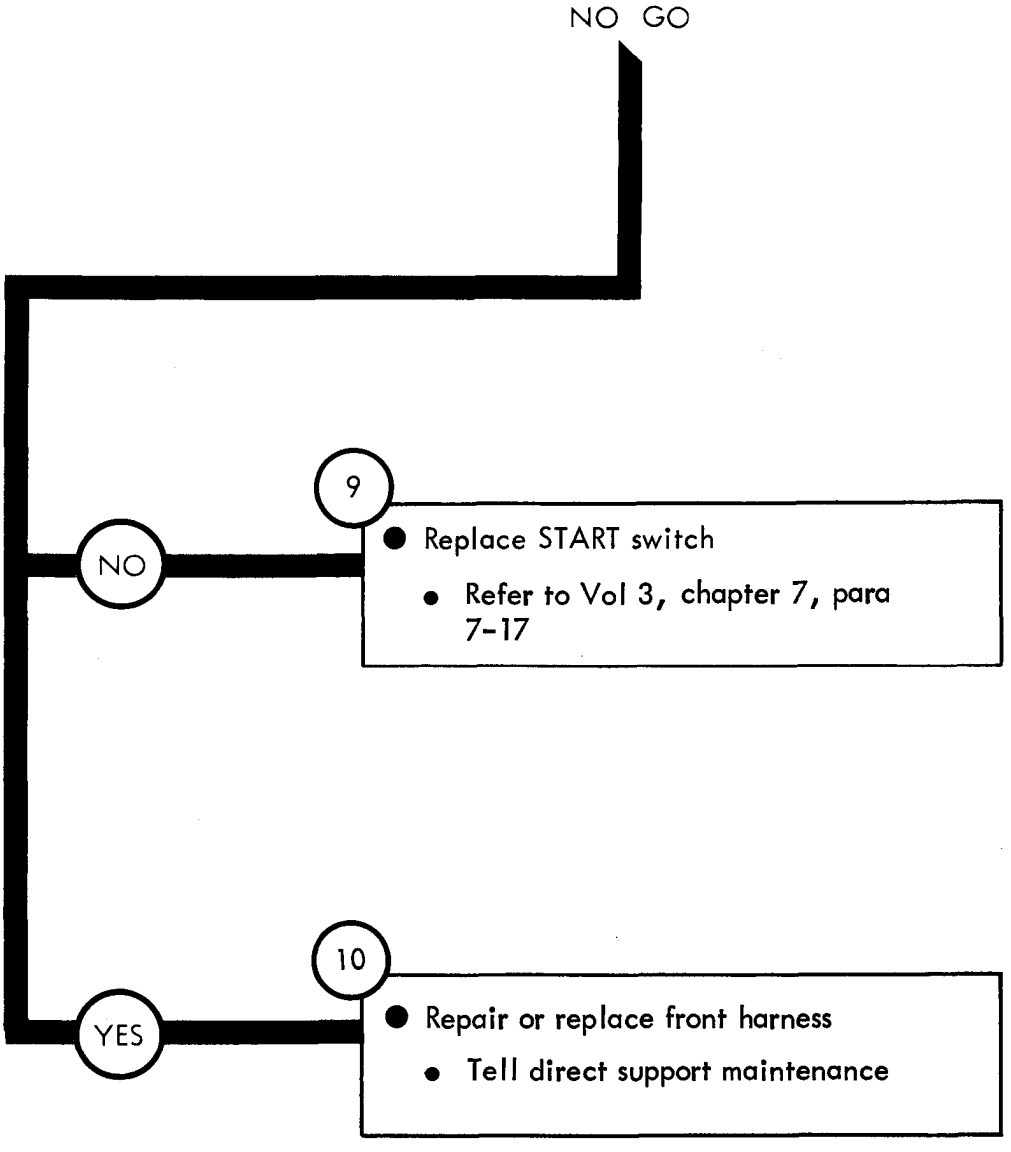




NO GO

TA 115683

Figure 26-1 (Sheet 6 of 11)



TA 115684

Figure 26-1 (Sheet 7 of 11)

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

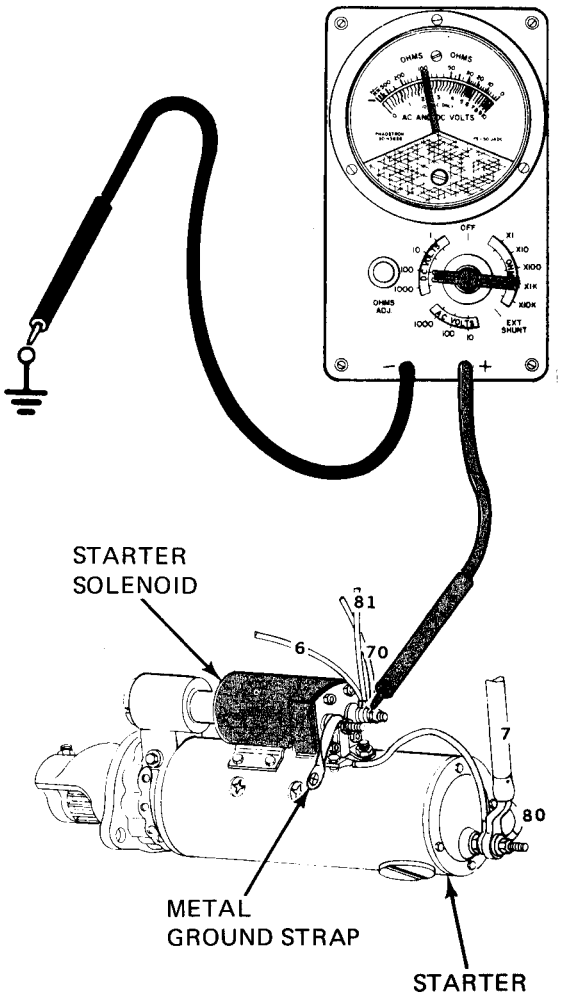
• Put multimeter – lead on a good ground

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



TA 115685

Figure 26-1 (Sheet 8 of 11)

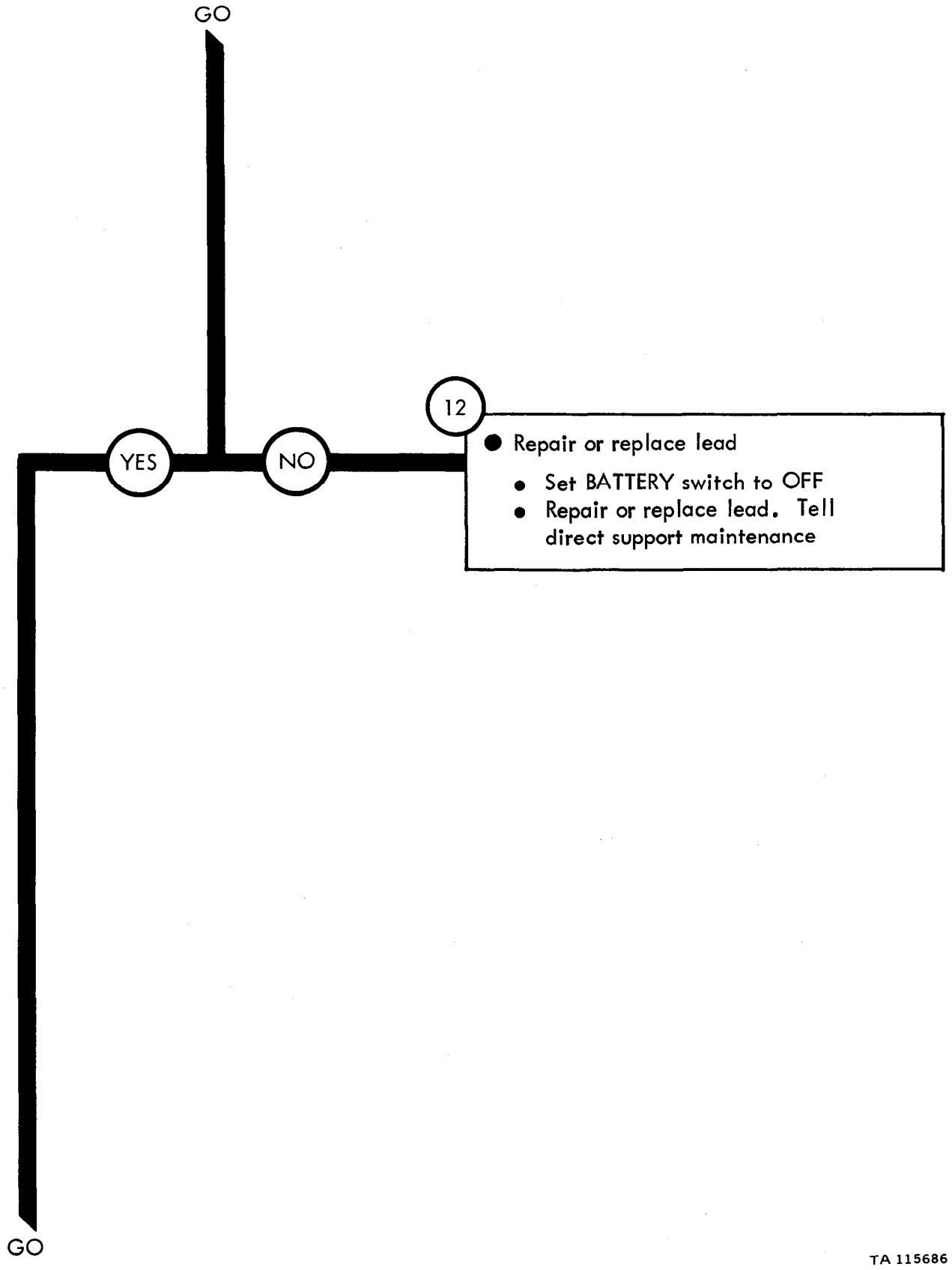


Figure 26-1 (Sheet 9 of 11)

GO

13

- Check cable from starter solenoid to starter motor for +24 volts DC

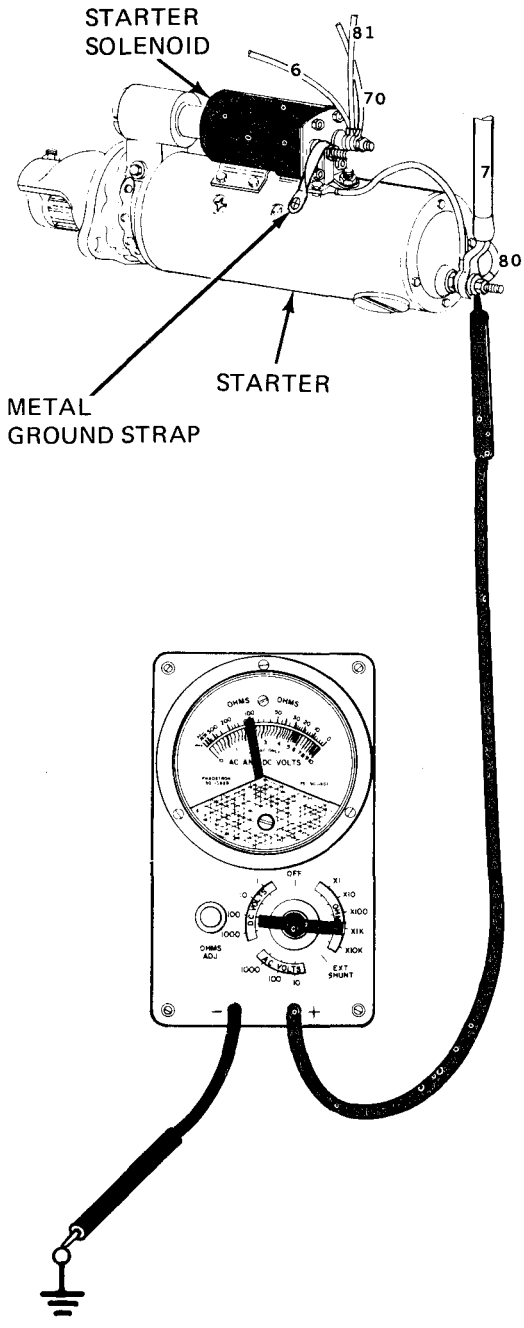
SOLDIER B
- Put multimeter + lead on cable contact at starter motor
- Put multimeter - lead on a good ground

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

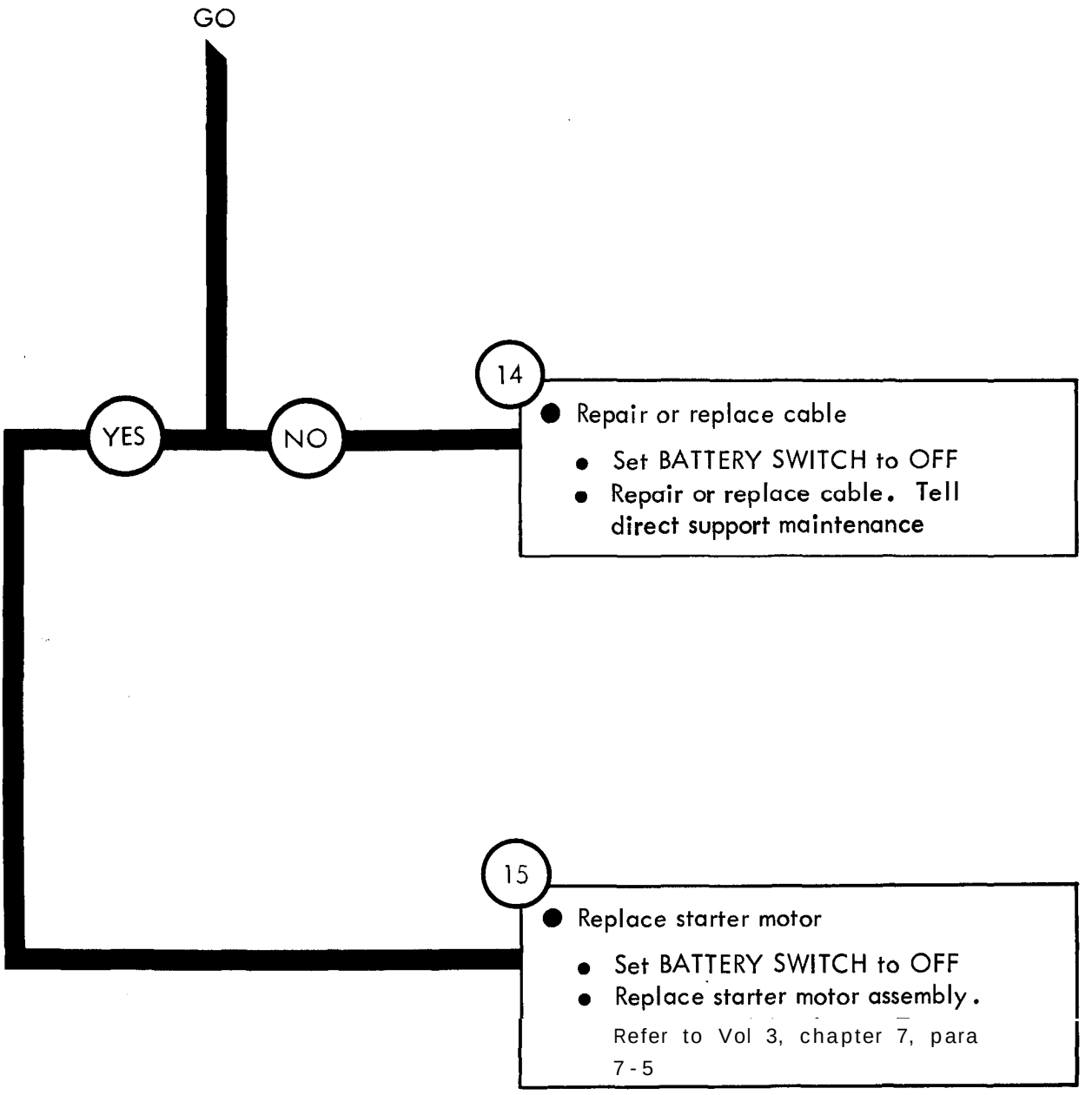
Does multimeter measure +24 volts DC?

GO



TA 115687

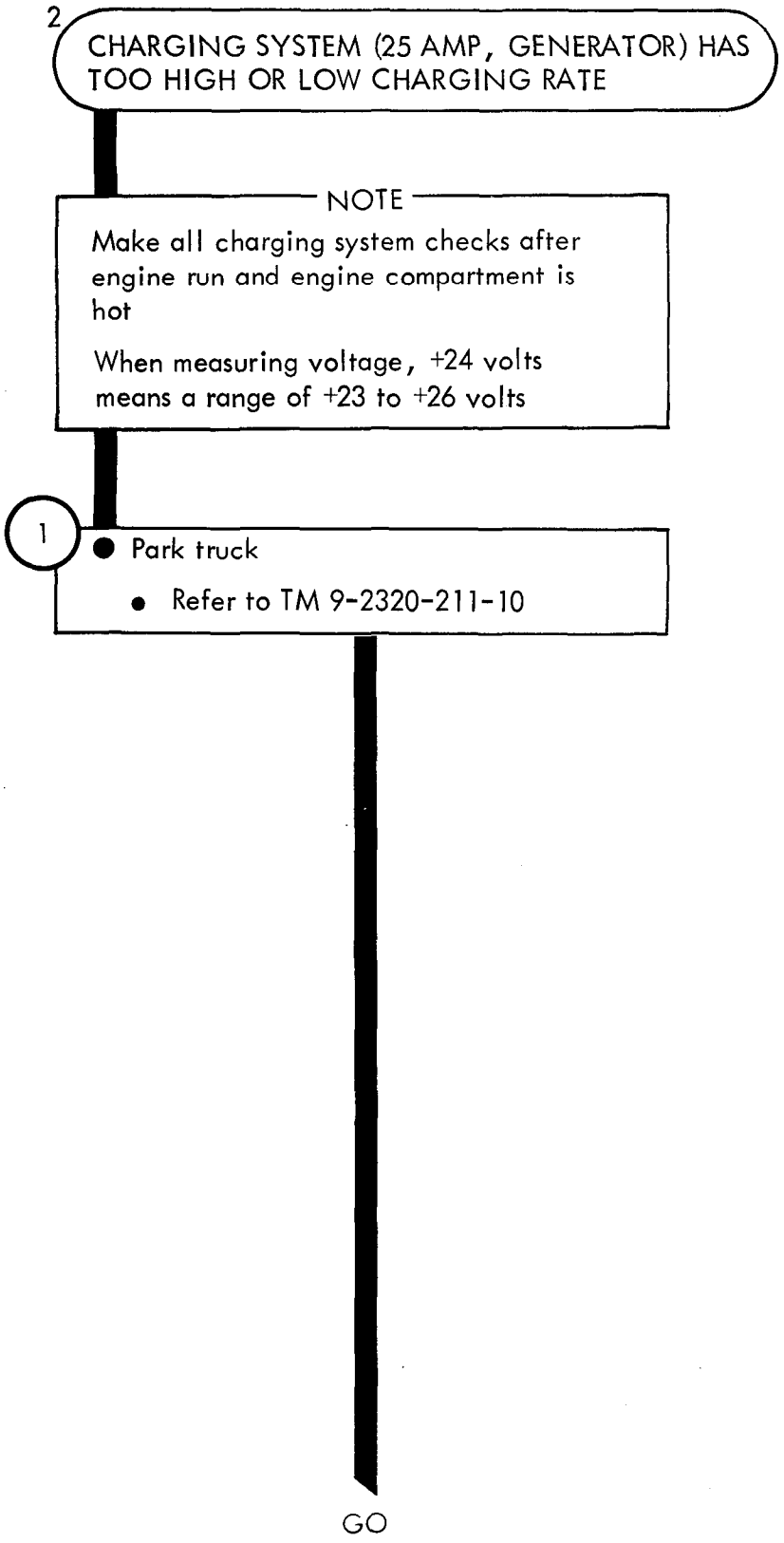
Figure 26-1 (Sheet 10 of 11)



TA 115688

Figure 26-1 (Sheet 11 of 11)

Symptom



TA 115689

Figure 26-2 (Sheet 1 of 13)

GO

2

- Test generator armature
  - Set accessory switch to OFF
  - Unscrew and take off generator to regulator cable from generator gooseneck
  - Put generator adapter in generator gooseneck connector
  - If you don't have a generator adapter refer to figure for place to take multimeter measurements

- Set multimeter to check continuity. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on adapter ARM terminal 1 (pin A in gooseneck, if adapter is being used)
- Read multimeter. Multimeter should measure between 0 and 3 ohms

Does multimeter measure between 0 and 3 ohms?

GO

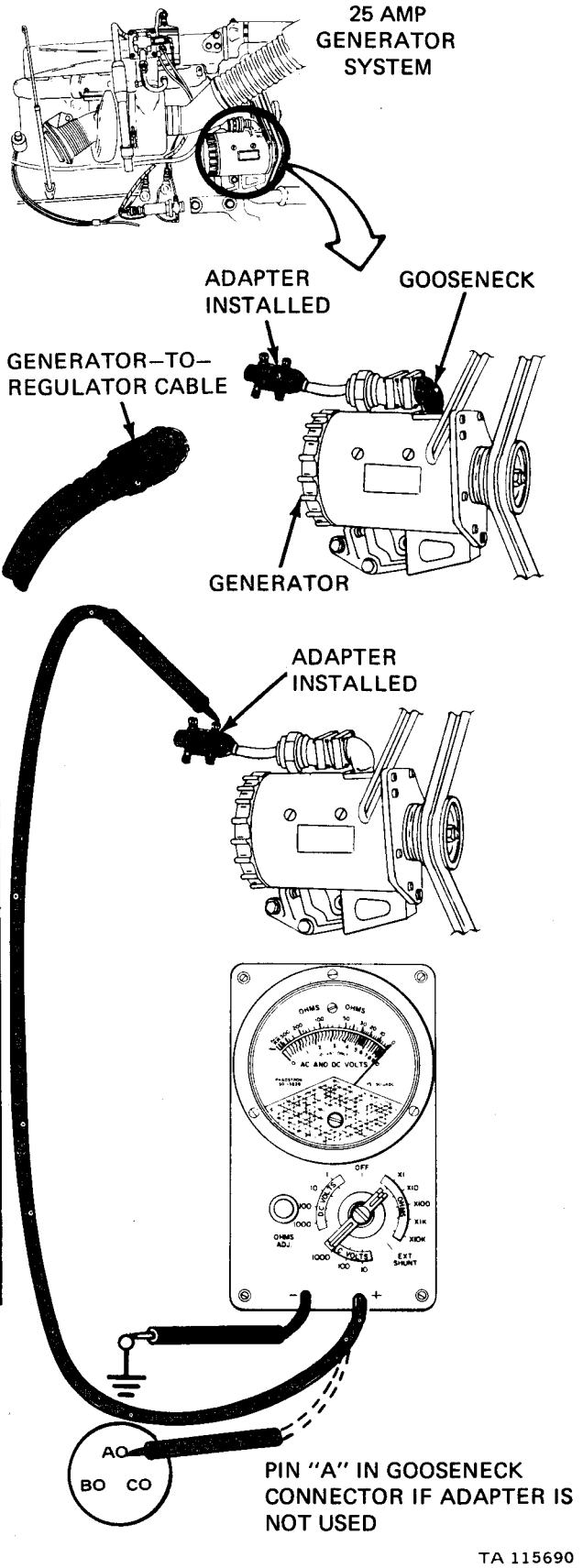


Figure 26-2 (Sheet 2 of 13)

GO

YES

NO

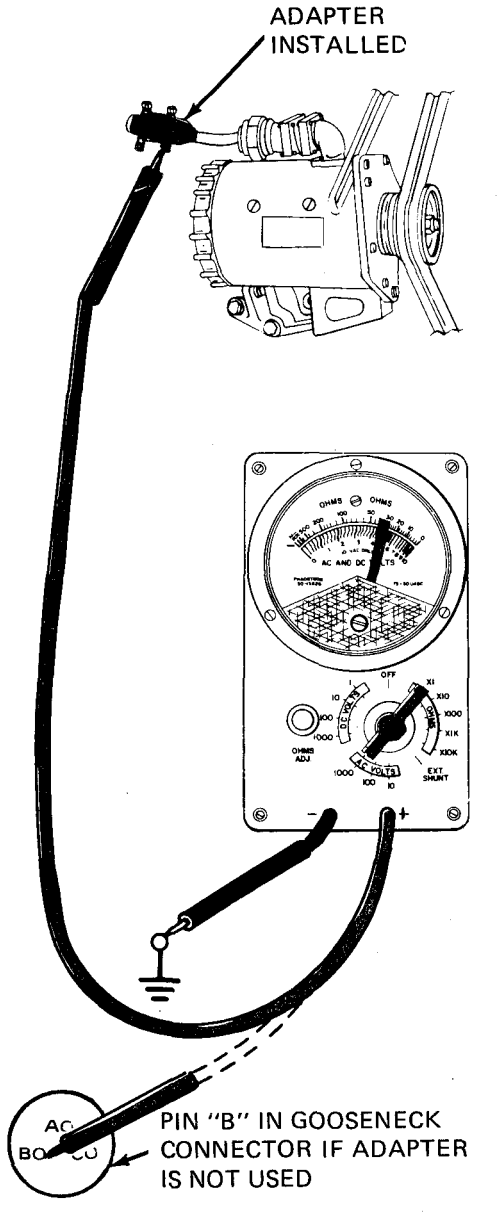
3

- Replace generator
  - Refer to Vol 3, chapter 7, para 7-4

4

- Test generator field
  - Put - lead on good ground
  - Put + lead on FIELD terminal 1 on adapter (pin B in gooseneck connector, if adapter is not being used)
  - Read multimeter. Multimeter pointer should measure between 25 and 45 ohms

Does multimeter measure between 25 and 45 ohms?



GO

TA 115691

Figure 26-2 (Sheet 3 of 13)

GO

YES

NO

5

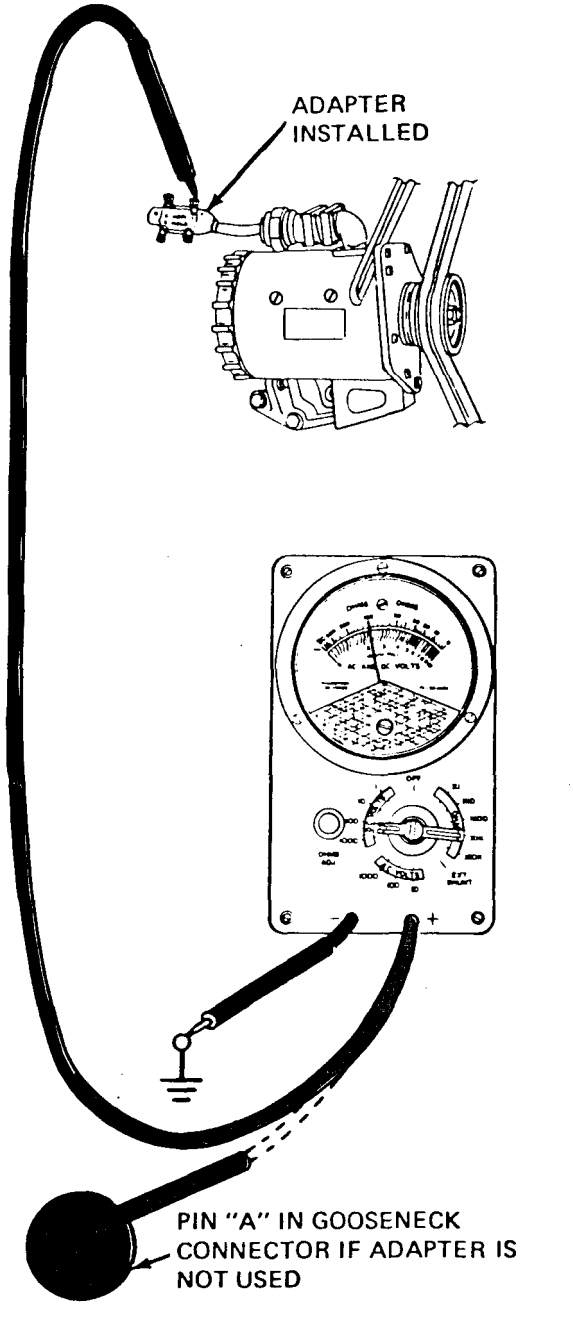
- Replace generator
  - Refer to Vol 3, chapter 7, para 7-4

6

- Test generator for residual voltage
  - Start engine and run it at 1000 to 1200 RPM
  - Set multimeter to measure +24 volts DC. Refer to multimeter test procedures, test 1
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on ARM terminal 1 on adapter (pin A in gooseneck connector, if adapter is not being used)
  - Read multimeter. Multimeter should measure between 0 and +10 volts DC

Does multimeter measure +10 volts DC or less?

GO



TA 115692

Figure 26-2 (Sheet 4 of 13)

GO

YES

NO

7

● Replace generator

- Shut engine off. Refer to TM 9-2320-211-10
- Replace generator. Refer to Vol 3, chapter 7, para 7-4

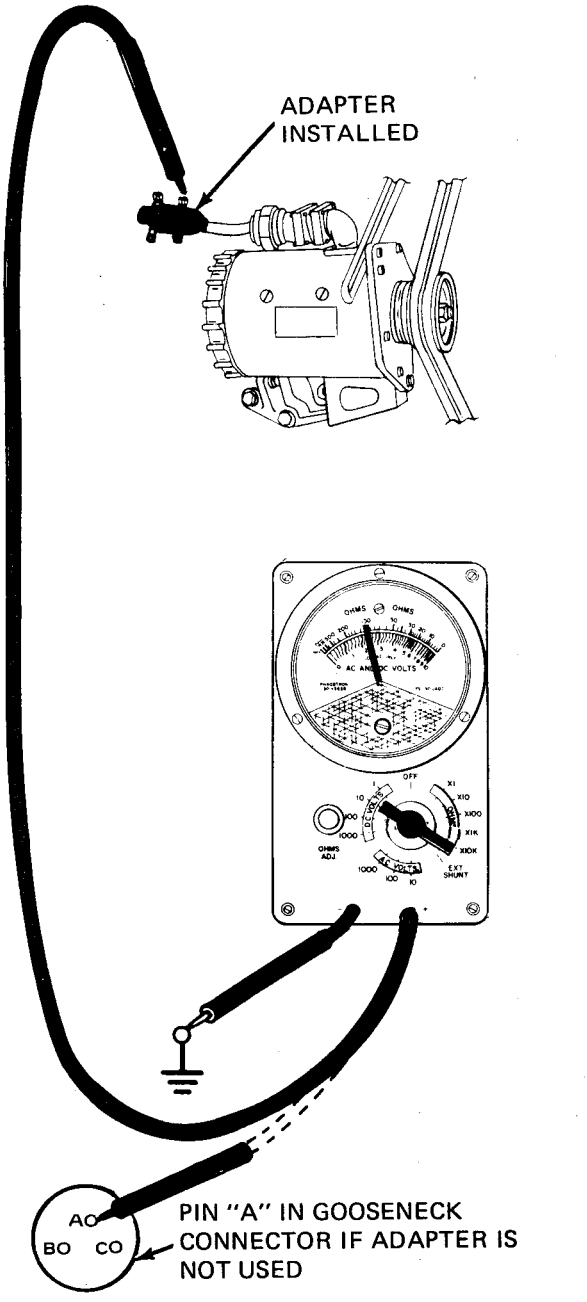
8

● Test generator voltage again

- Set multimeter to +10 volts DC position. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead to ARM terminal 1 (pin A in gooseneck connector)
- Read multimeter. Multimeter should measure between 3 and 10 volts DC

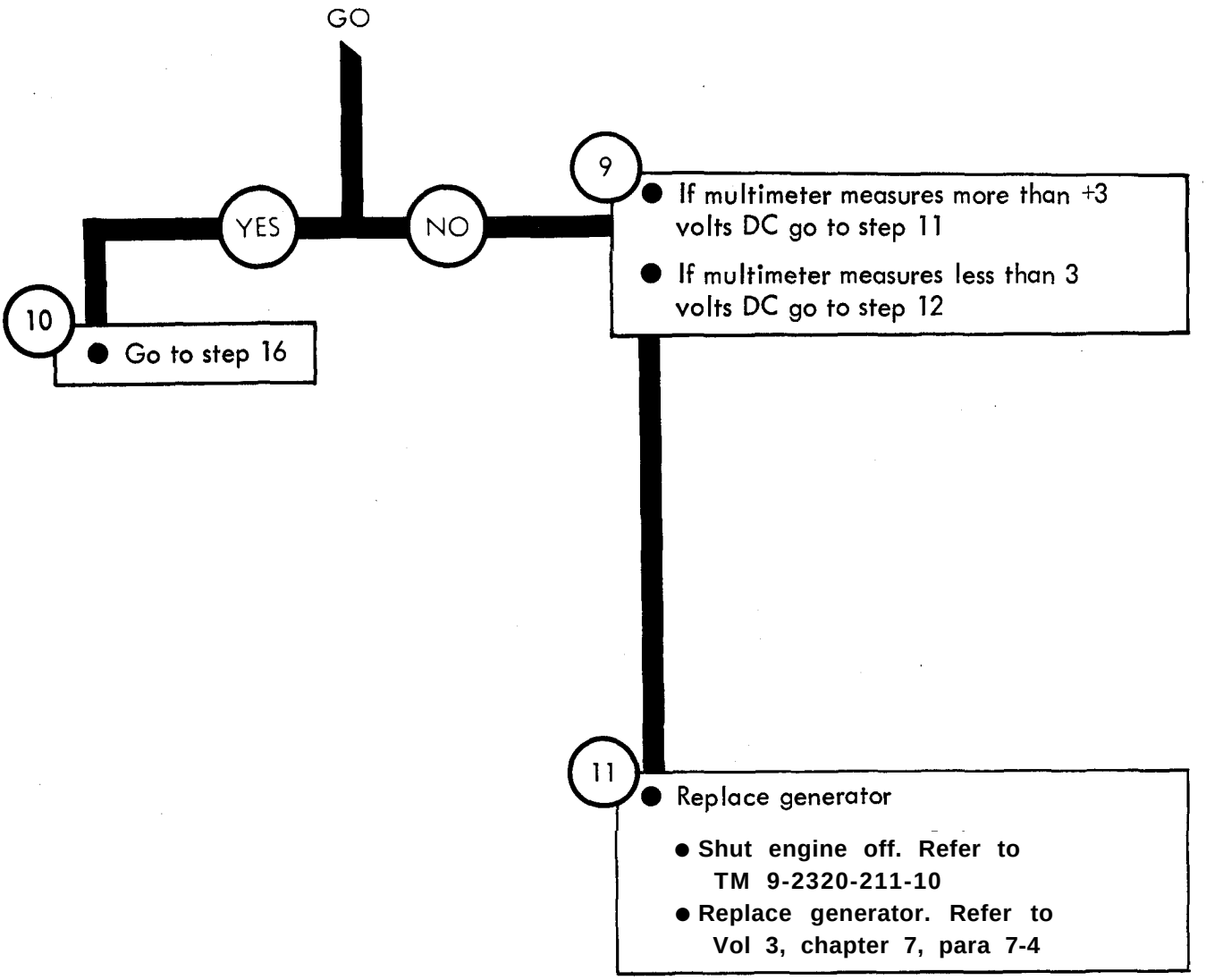
Does multimeter measure between 3 and 10 volts DC?

GO



TA 115693

Figure 26-2 (Sheet 5 of 13)



TA 115694

Figure 26-2 (Sheet 6 of 13)

From step 9

12

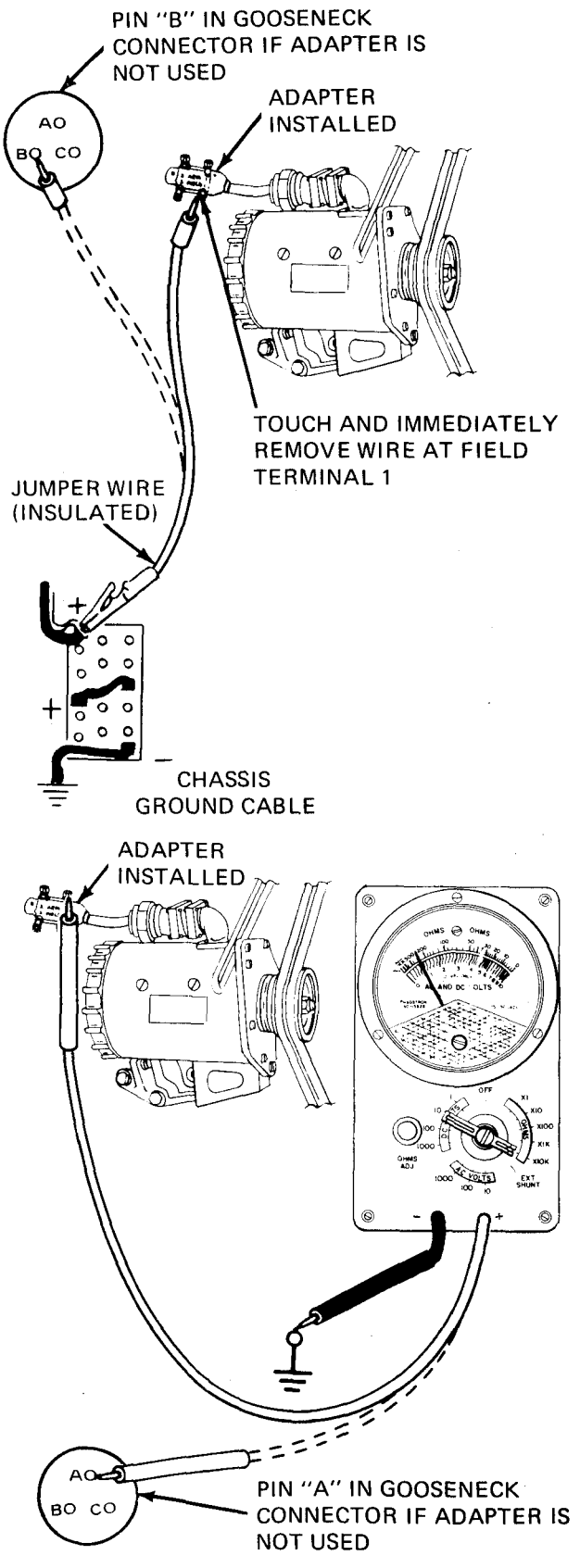
- Check generator field terminal
  - Shut engine off. Refer to TM 9-2320-211-10
  - Put one end of an insulated jumper wire on middle + terminal of batteries
  - Touch and quickly take away other end of jumper wire from field terminal 1 (pin B in gooseneck connector)
  - Take insulated jumper wire off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



TA 115695

Figure 26-2 (Sheet 7 of 13)

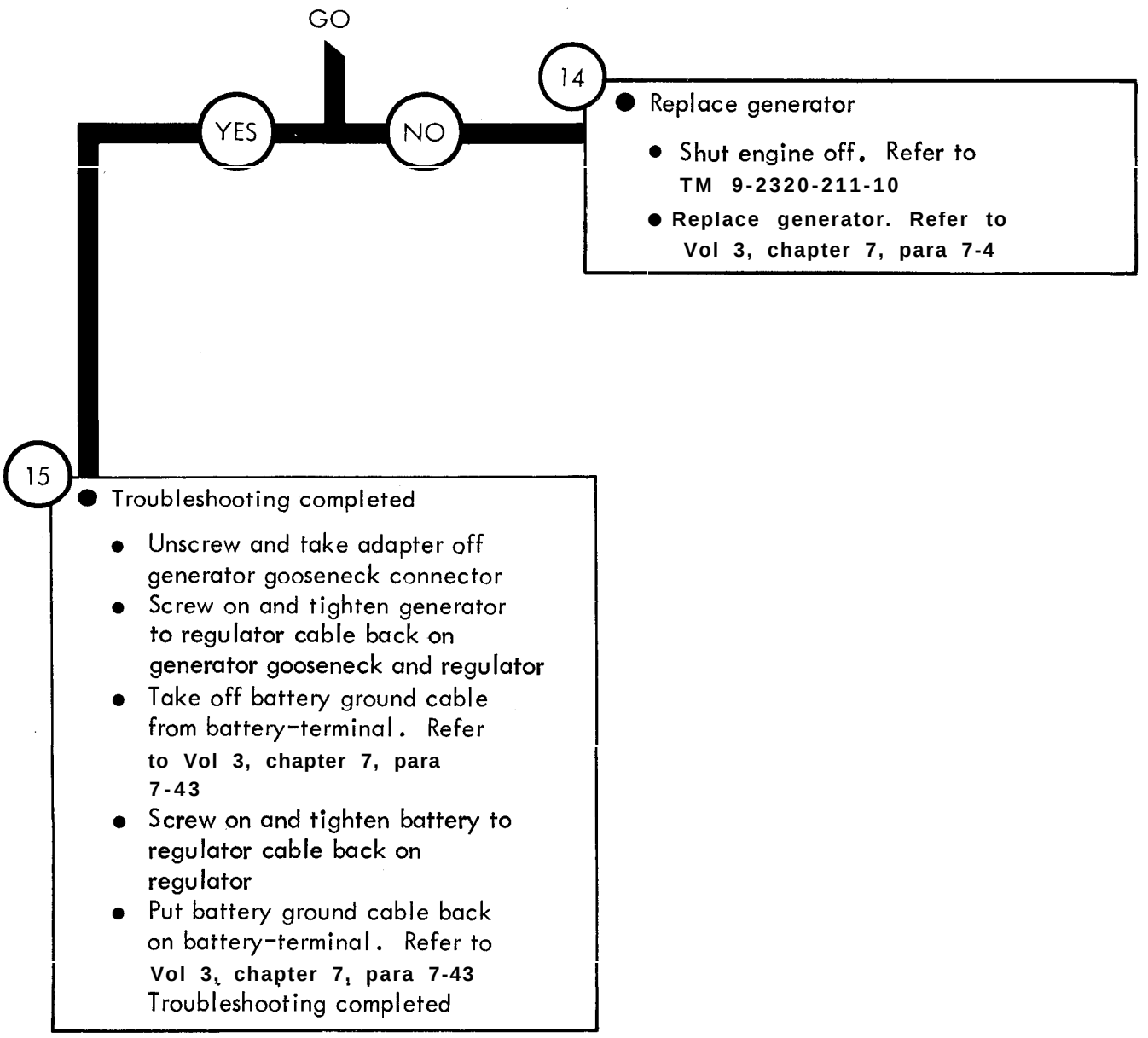
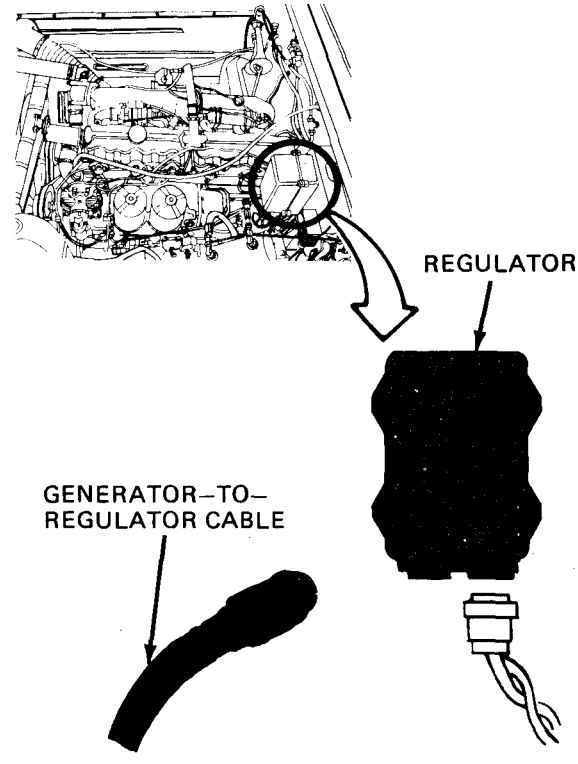


Figure 26-2 (Sheet 8 of 13)

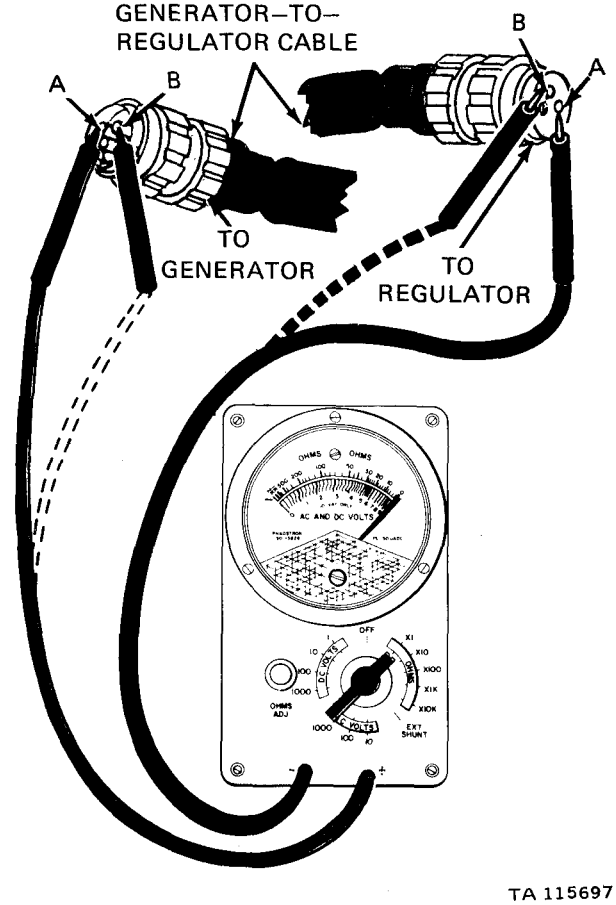
From step 10

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

TA 115697

Figure 26-2 (Sheet 9 of 13)

GO

YES

NO

17

- Replace generator to regulator cable
- Tell direct support maintenance

18

- Test generator to regulator cable for shorts
  - Refer to test equipment procedures index
  - Put multimeter + lead on one end of cable not on a contact
  - Put multimeter - lead on contact A on other side of cable. Read multimeter
  - Put multimeter - lead on contact B. Read multimeter. Multimeter pointer should not move in either test

- Put multimeter + lead on contact A on one end of cable
- Put multimeter - lead on contact B other end of cable. Read multimeter
- Put multimeter + lead on pin B one end of cable
- Put multimeter - cable in pin A other end of cable. Read multimeter. Multimeter pointer should not move in either test

Did pointer stay still in both test?

GO

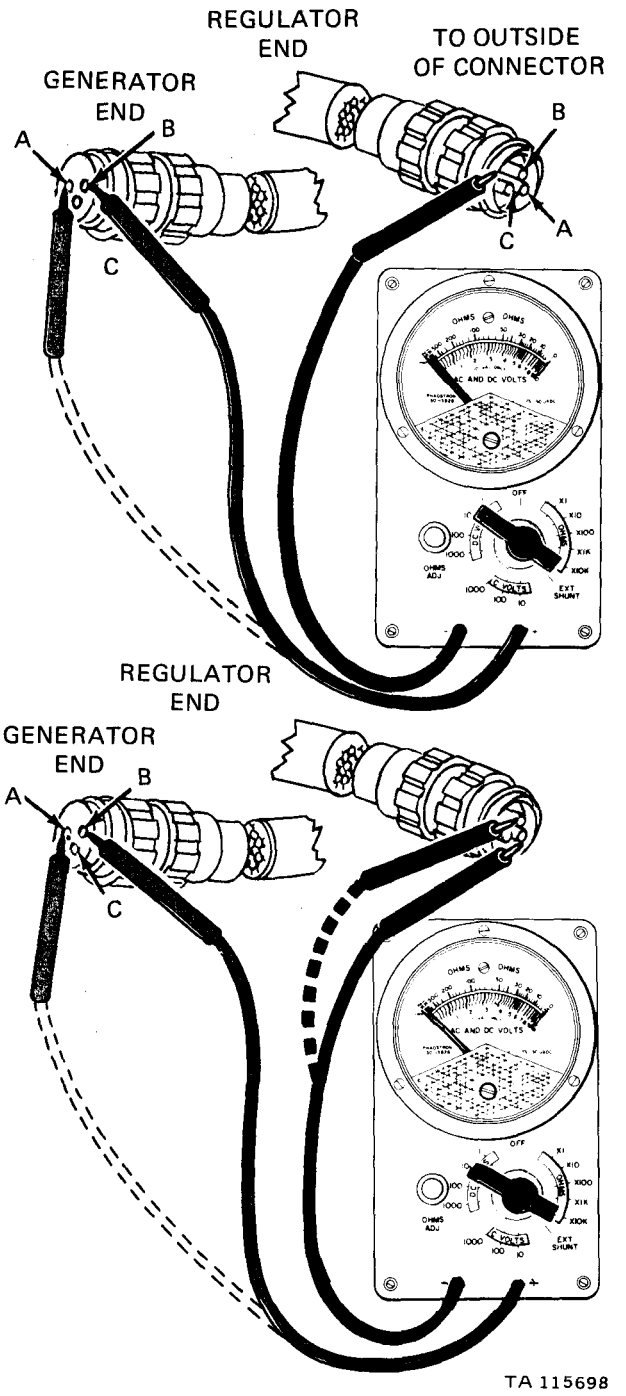


Figure 26-2 (Sheet 10 of 13)

GO

YES

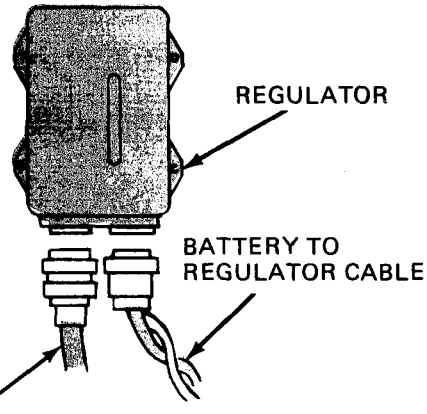
NO

19

- Replace generator to regulator cable
  - Tell direct support maintenance

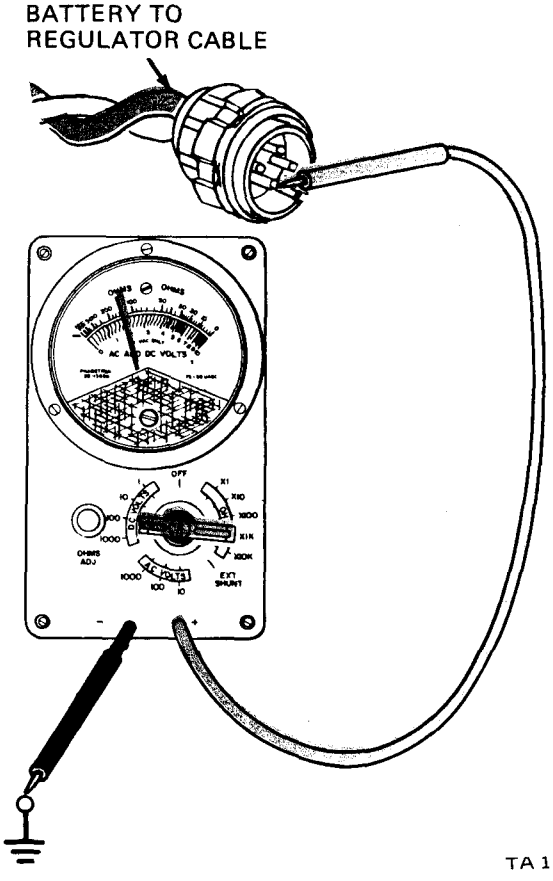
CAUTION

In the following test do not let any connector pins touch any metal in engine compartment
A short circuit will occur with possible damage to cable or batteries



20

- Test battery to voltage regulator cable for +24 volts DC
  - Unscrew and take off battery ground cable from battery - terminal
  - Take off battery to regulator cable from regulator
  - Put battery ground cable back on battery - 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 pin A in battery to regulator cable connector
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO

TA 115699

Figure 26-2 (Sheet 11 of 13)

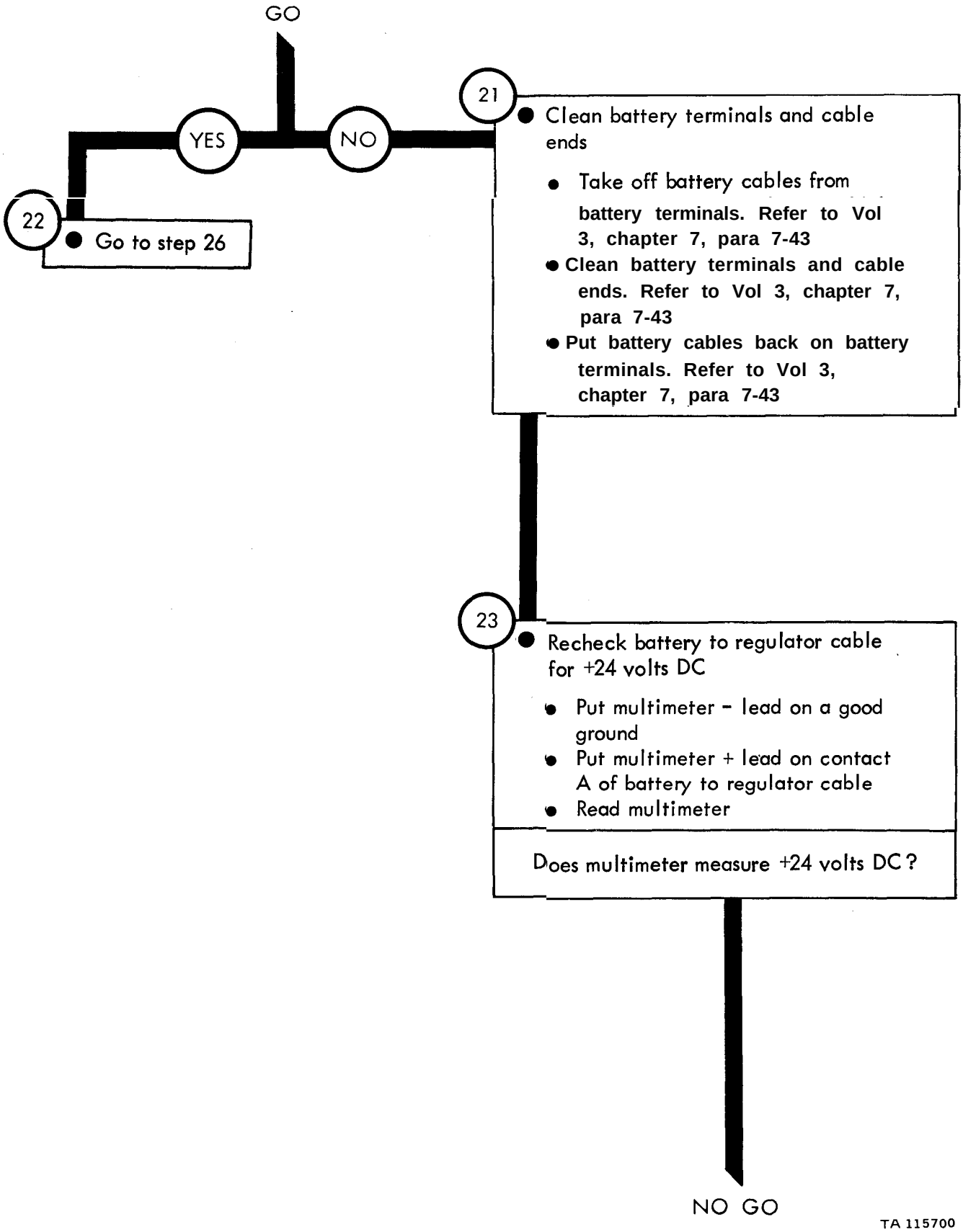


Figure 26-2 (Sheet 12 of 13)

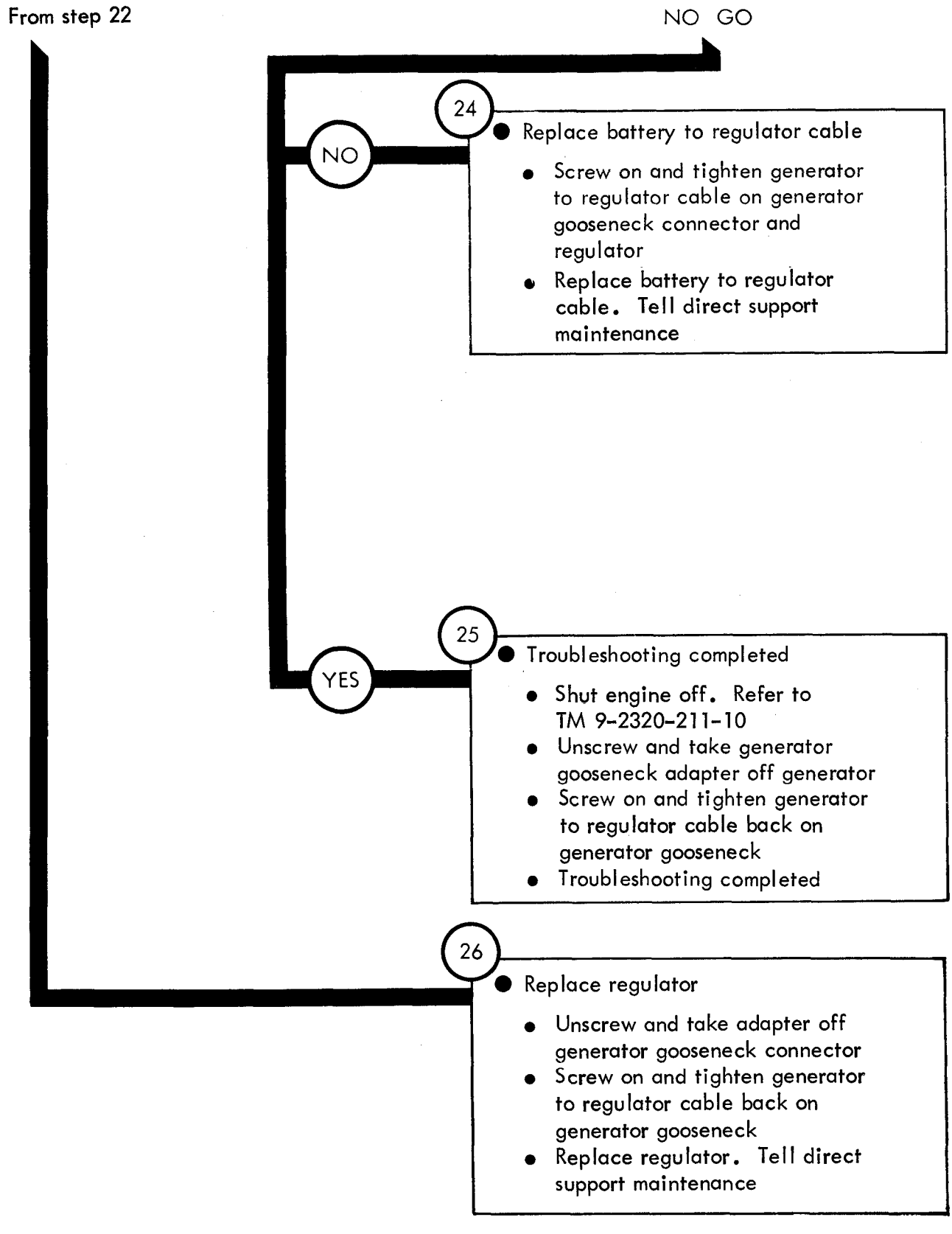
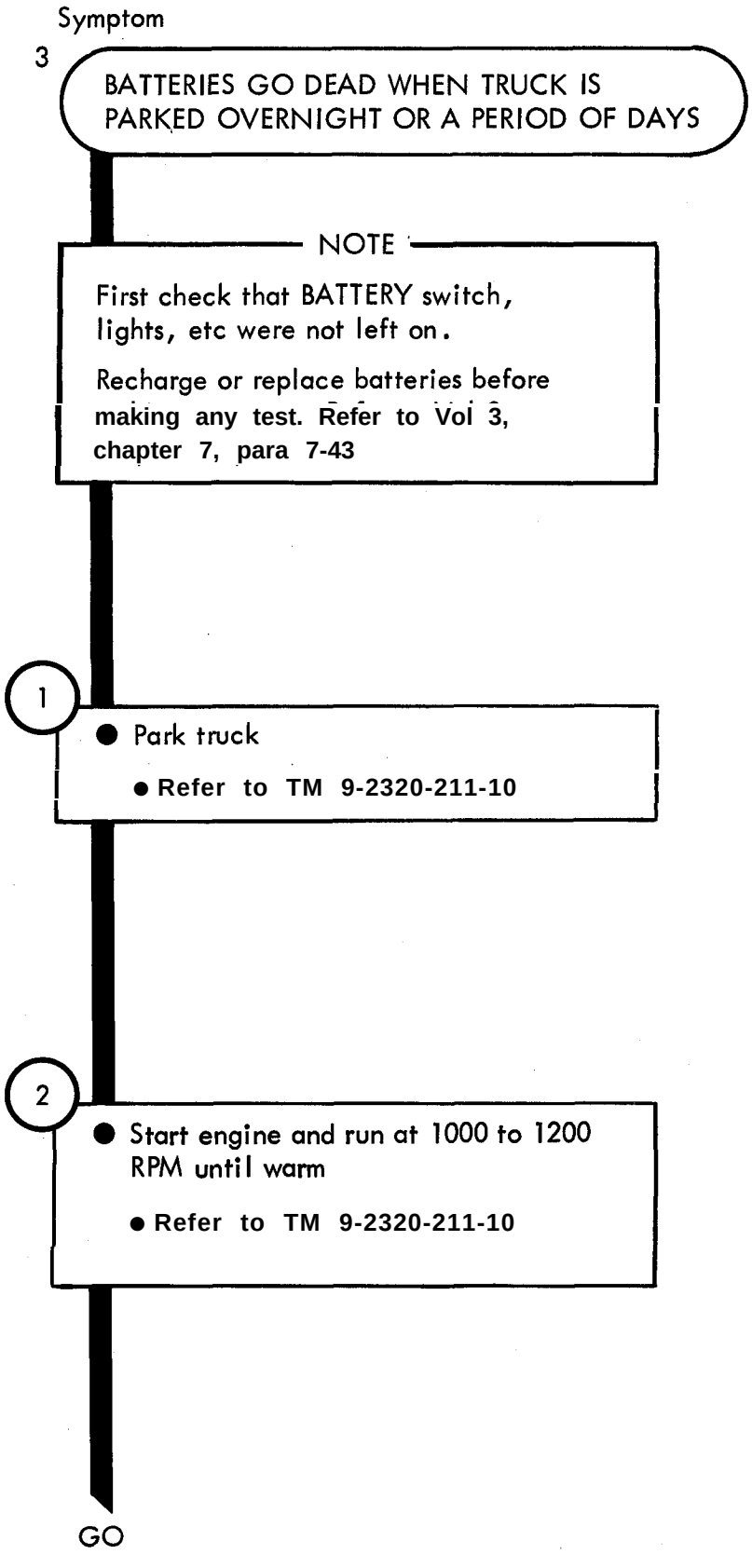


Figure 26-2 (Sheet 13 of 13)



TA 115703

Figure 26-3 (Sheet 1 of 3)

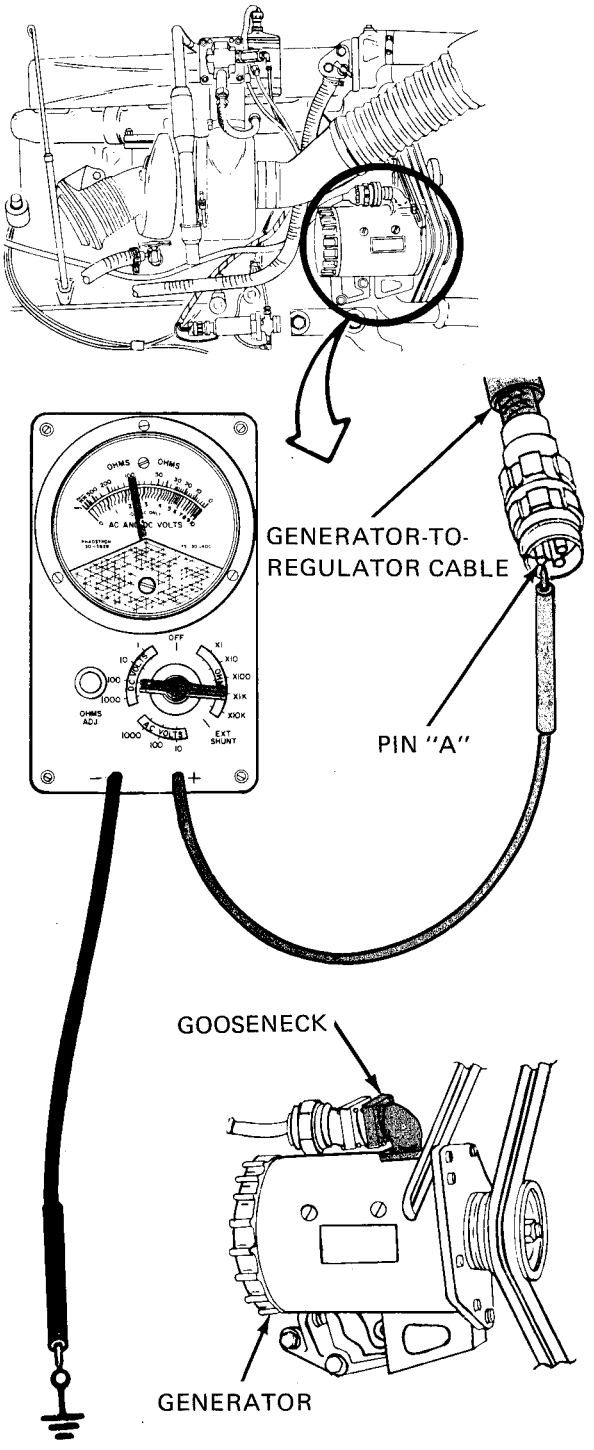
GO

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

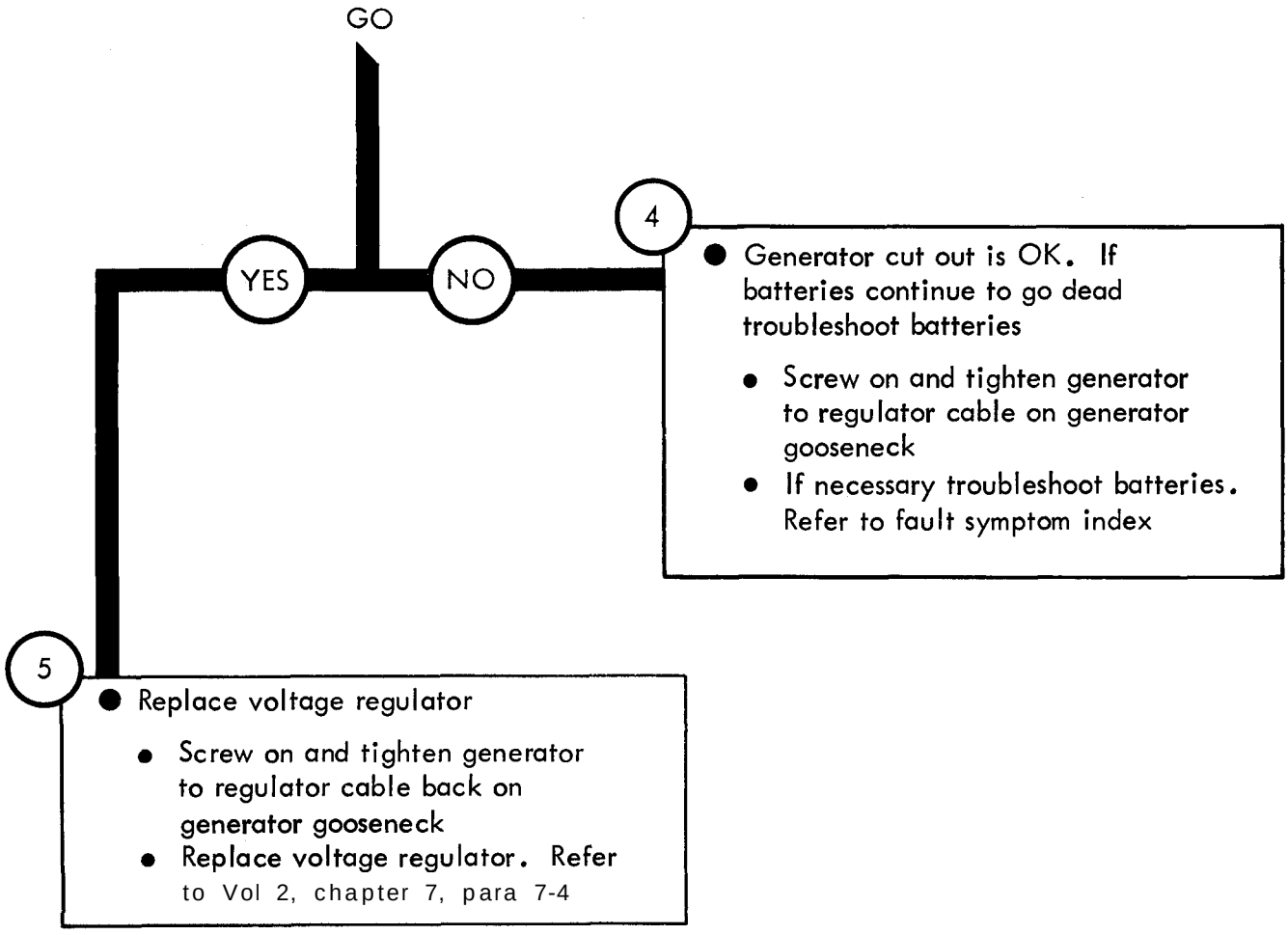
Does multimeter measure +24 volts DC?

GO



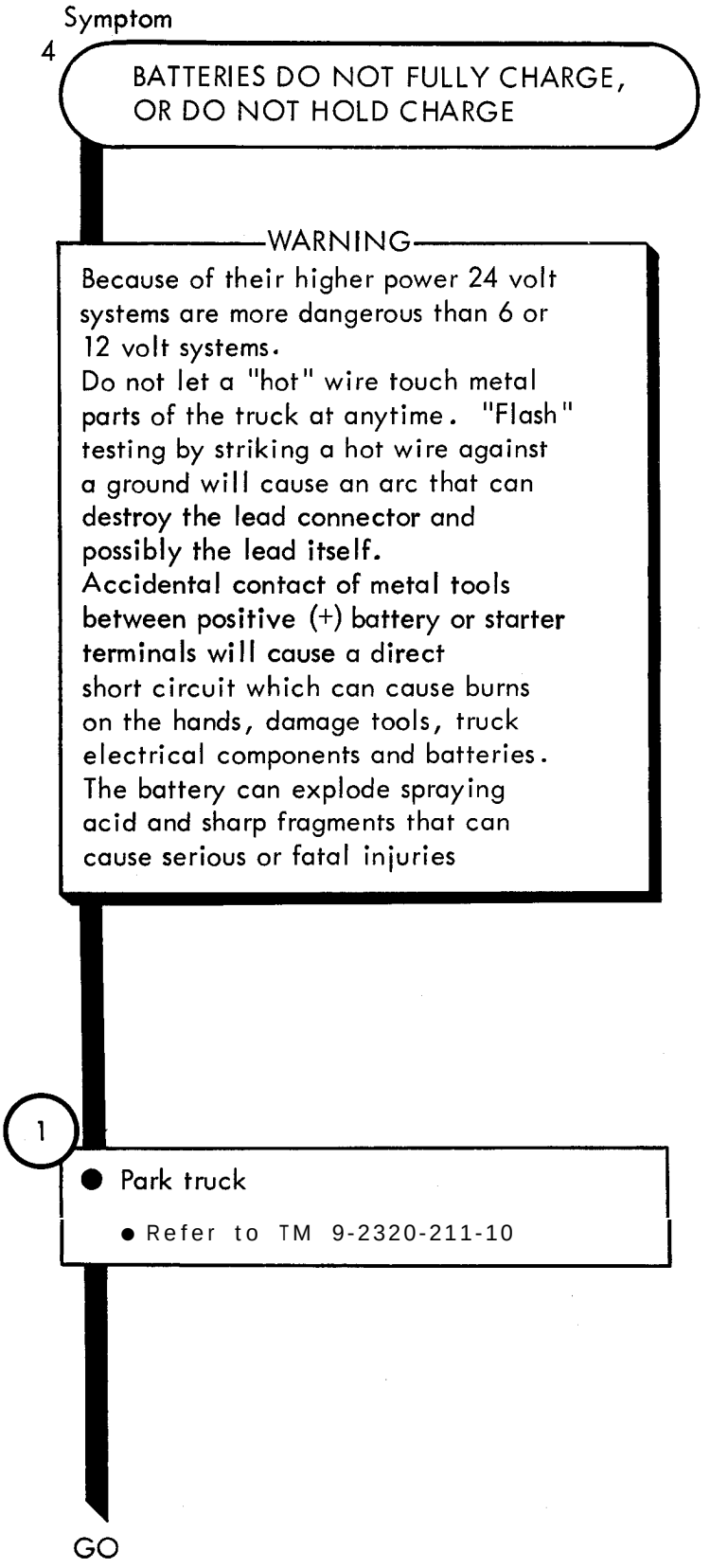
TA 115704

Figure 26-3 (Sheet 2 of 3)



TA 115705

Figure 26-3 (Sheet 3 of 3)



TA 115706

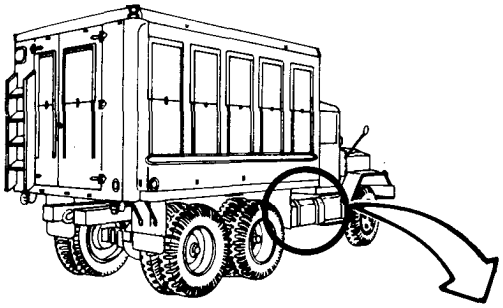
Figure 26-4 (Sheet 1 of 10)

GO

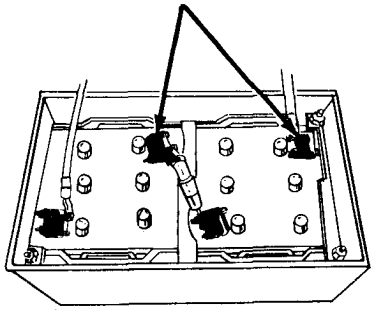
2

- Check battery cable clamps and battery terminals for rust, dirt, corrosion, tightness

OK?



BATTERY CABLE CLAMPS AND BATTERY TERMINALS



YES

NO

3

- Clean cable clamps and battery terminals
  - **Take battery cables off battery terminals. Refer to Vol 3, chapter 7, para 7-43**
  - **Clean battery cable clamps. Refer to Vol 3, chapter 7, para 7-42**
  - **Clean battery terminals**
  - **Put battery cable clamps back on battery terminals. Refer to Vol 3, chapter 7, para 7-43**

GO

TA 115707

Figure 26-4 (Sheet 2 of 10)

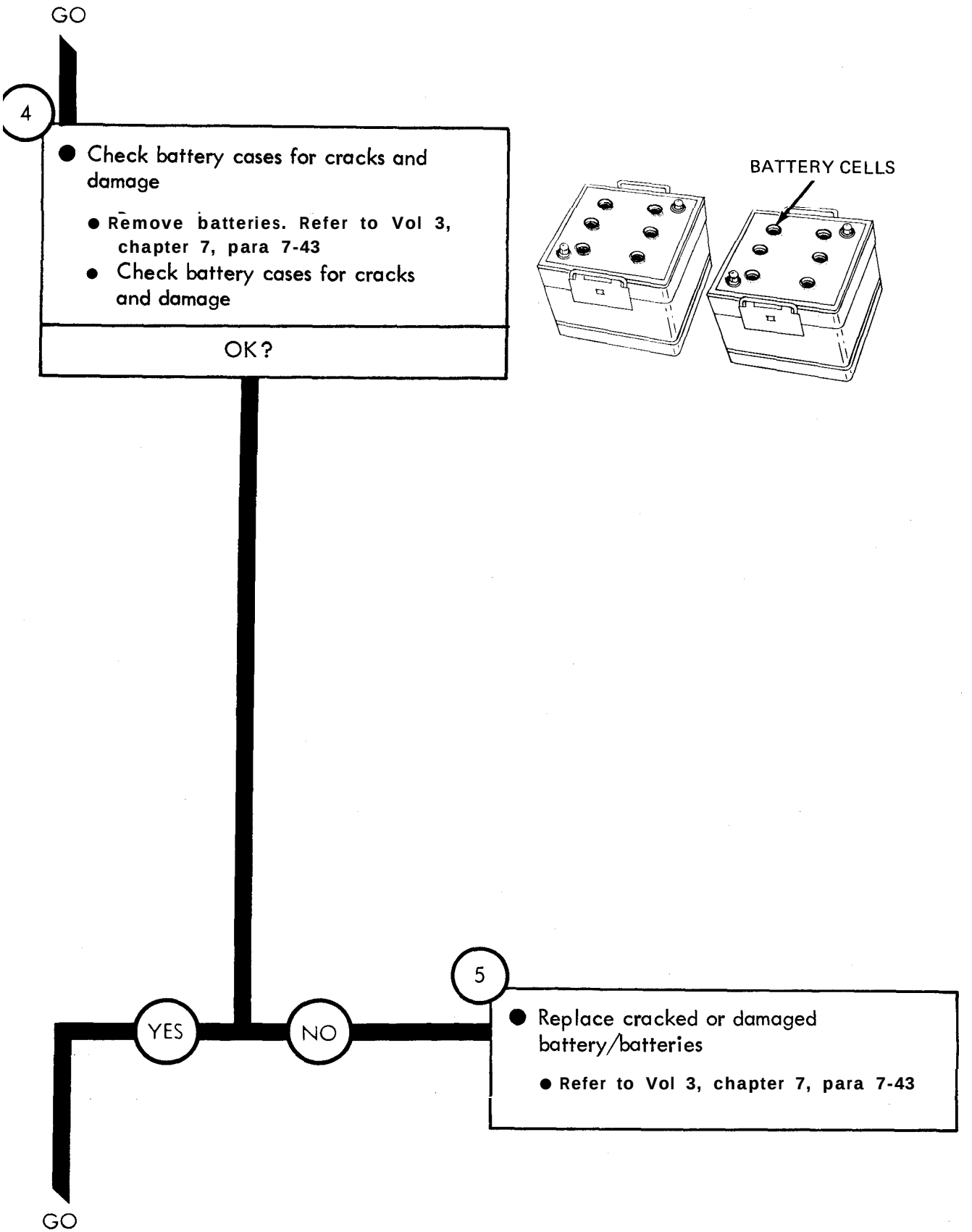


Figure 26-4 (Sheet 3 of 10)

GO

6

- Check battery cables for cracked insulation that can cause short circuits. **Refer to Vol 3, chapter 7, para 7-43**

OK?

YES

NO

7

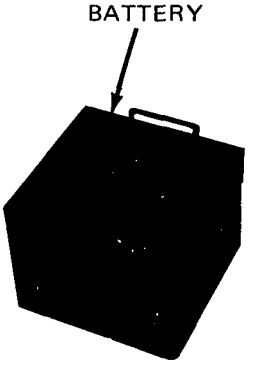
- Replace cracked or damaged battery cables
  - **Refer to Vol 3, chapter 7, para 7-43**

8

- Check electrolyte level in each battery cell
  - Electrolyte level must be at least 3/8-inch over plates

OK?

GO



TA 115709

Figure 26-4 (Sheet 4 of 10)

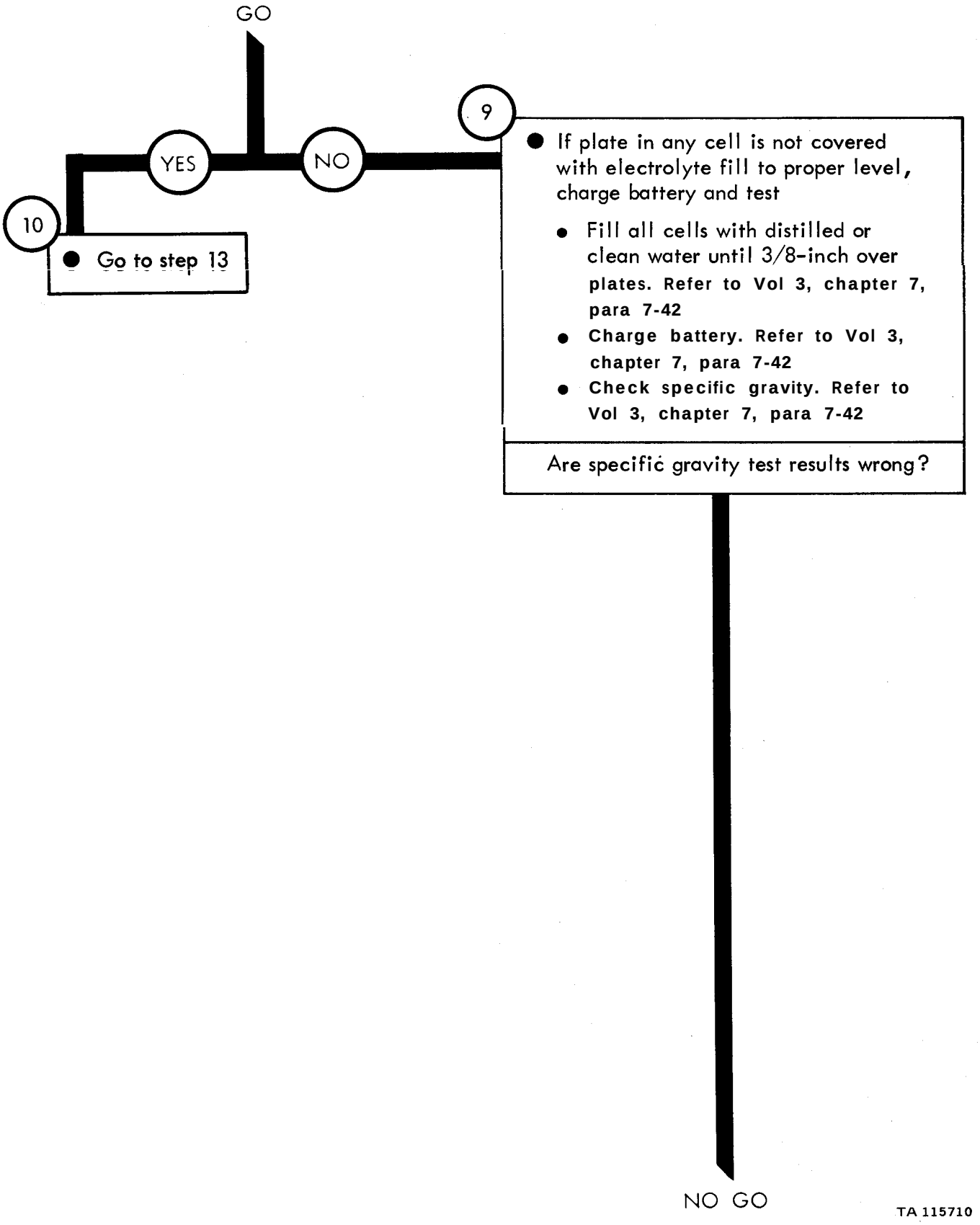
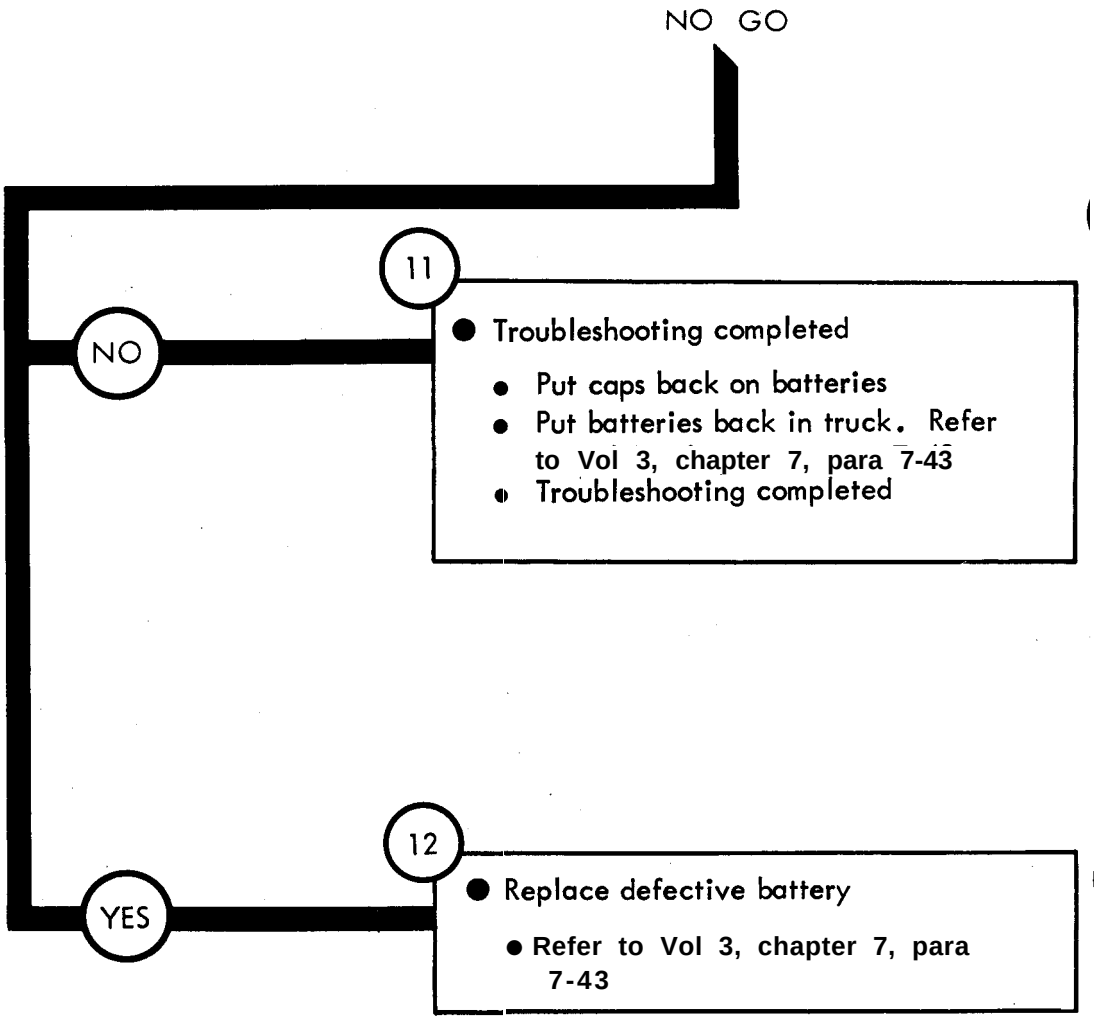


Figure 26-4 (Sheet 5 of 10)



TA 115711

Figure 26-4 (Sheet 6 of 10)

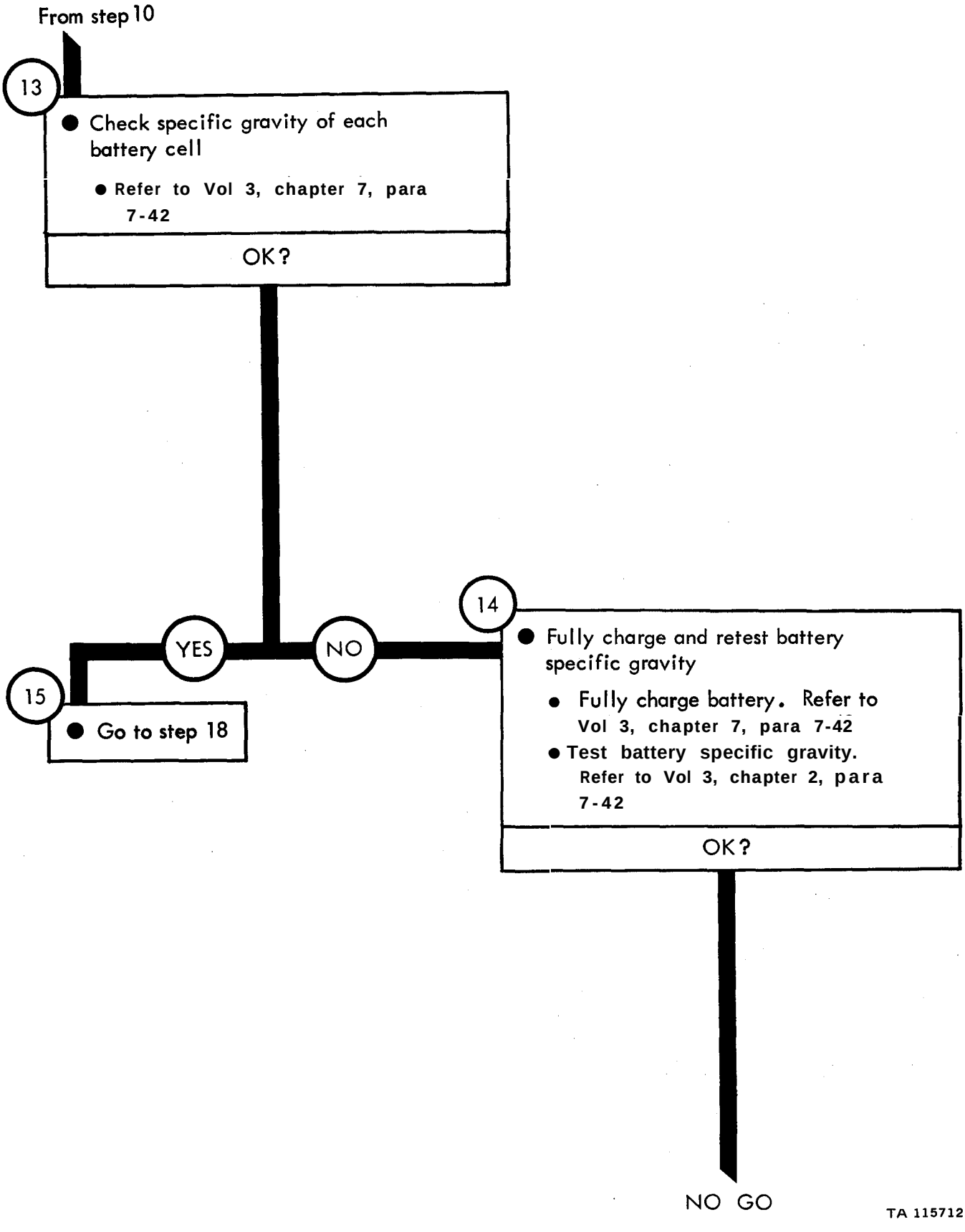
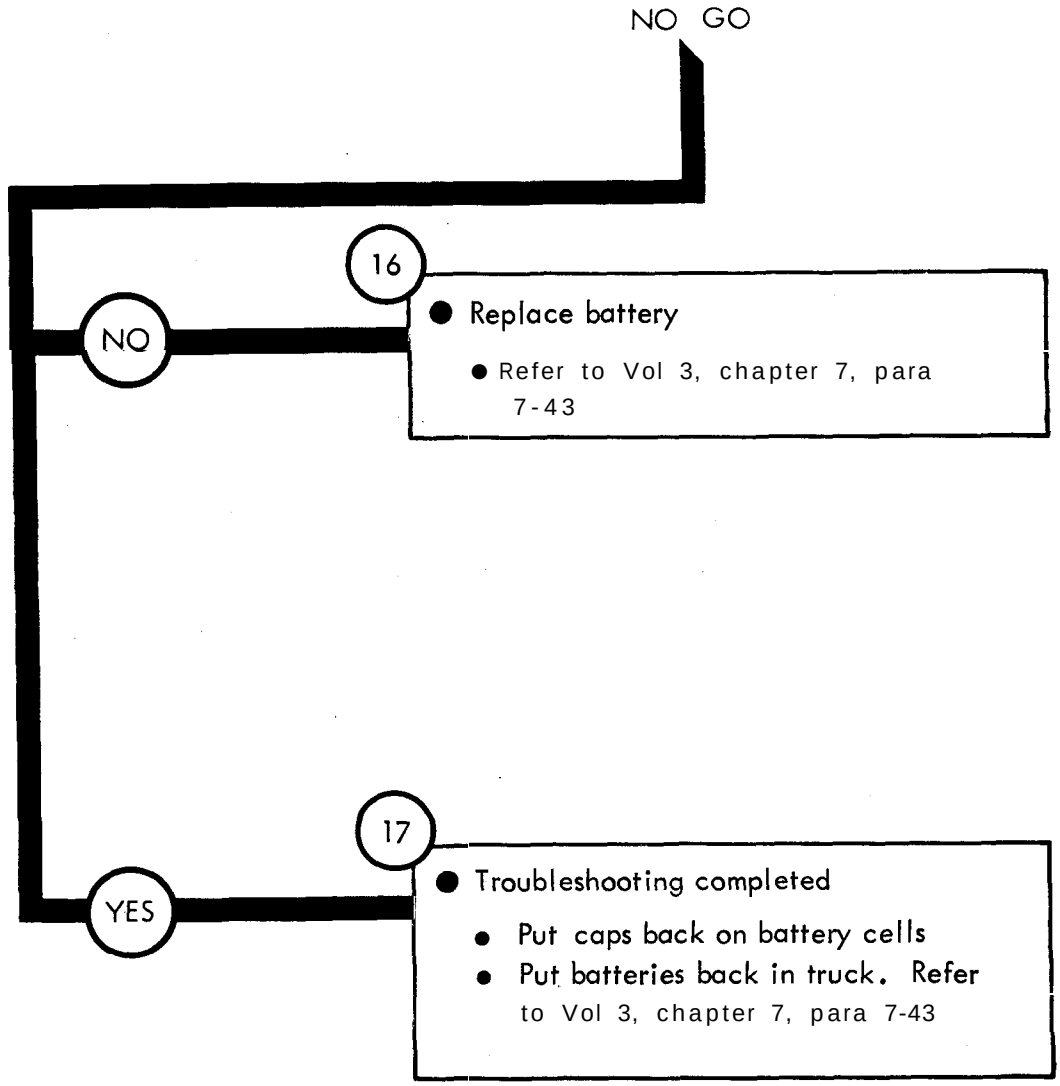


Figure 26-4 (Sheet 7 of 10)



TA 115713

Figure 26-4 (Sheet 8 of 10)

From step 15

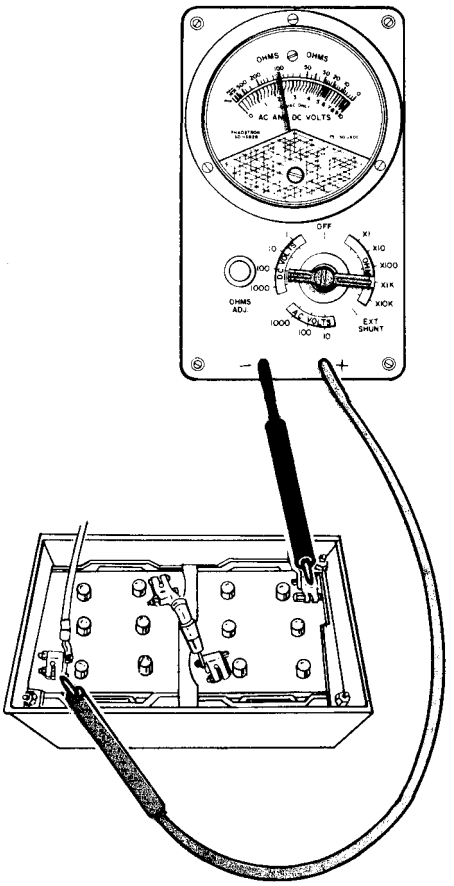
18

- 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

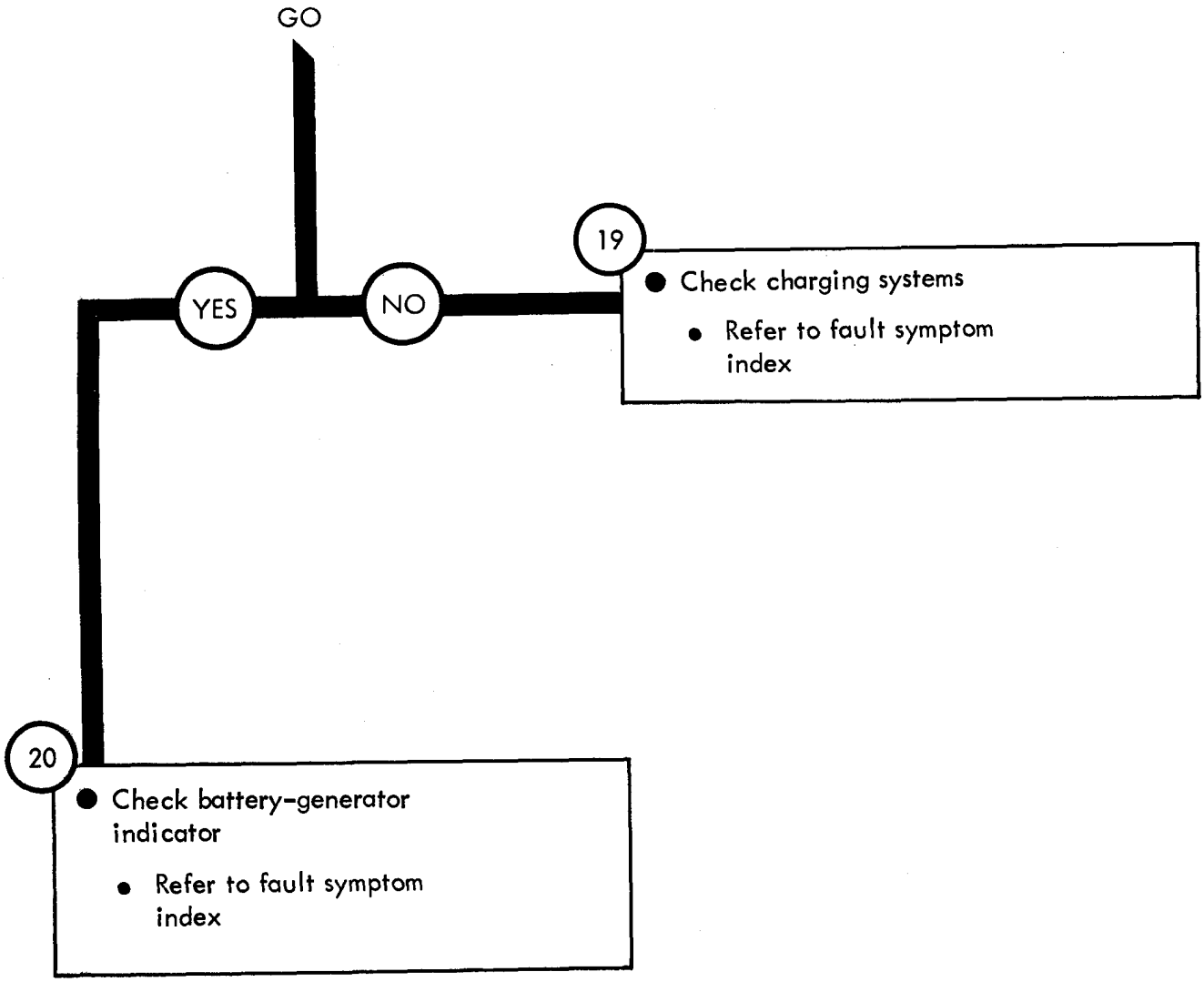
Does multimeter read 28.5 volts DC?

GO



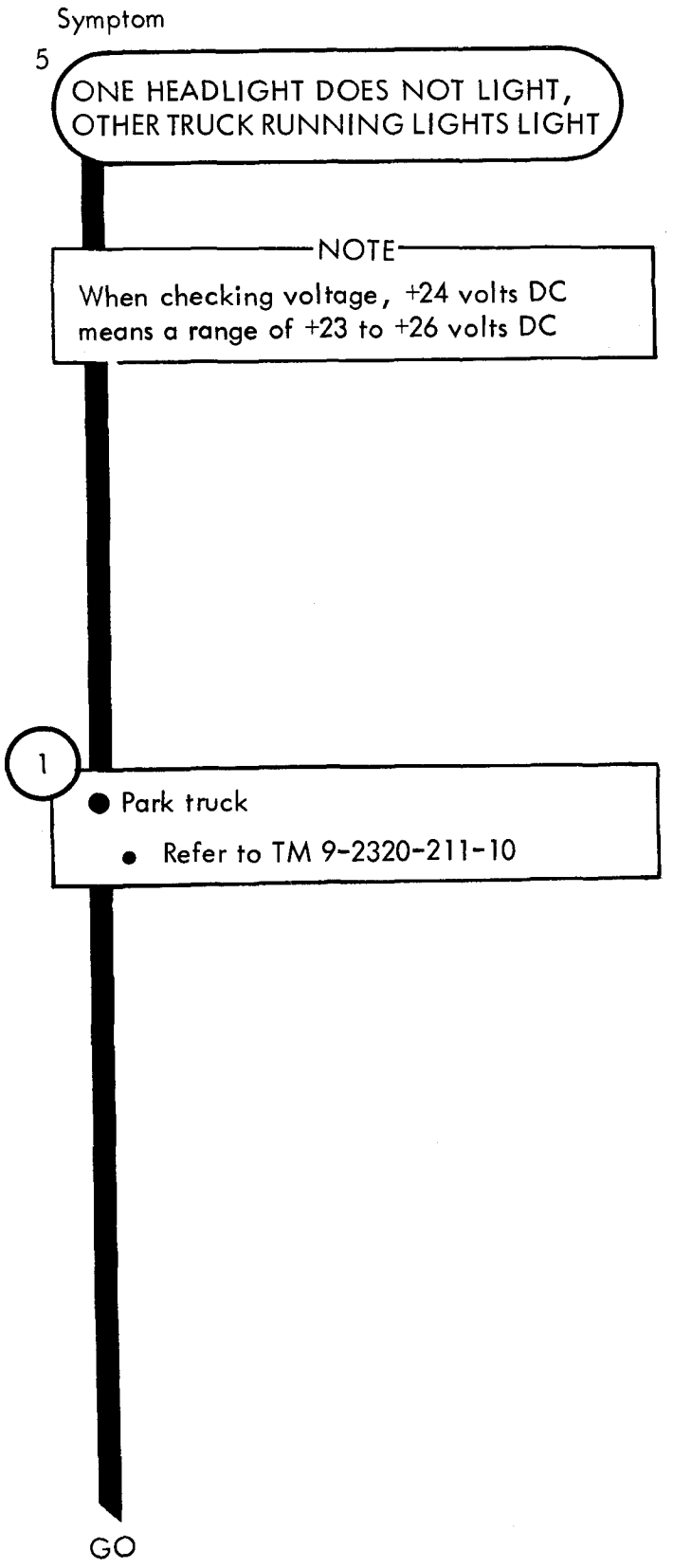
TA 115714

Figure 26-4 (Sheet 9 of 10)



TA 115715

Figure 26-4 (Sheet 10 of 10)



TA 115716

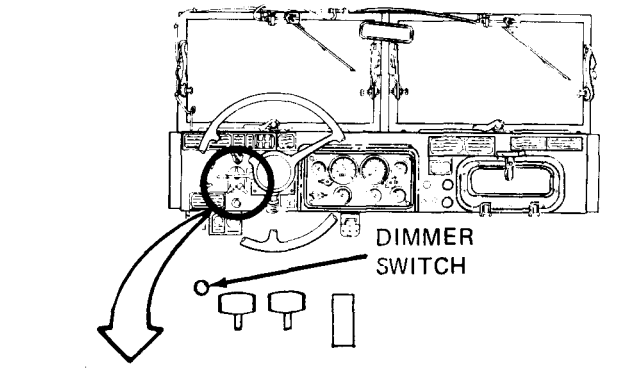
Figure 26-5 (Sheet 1 of 5)

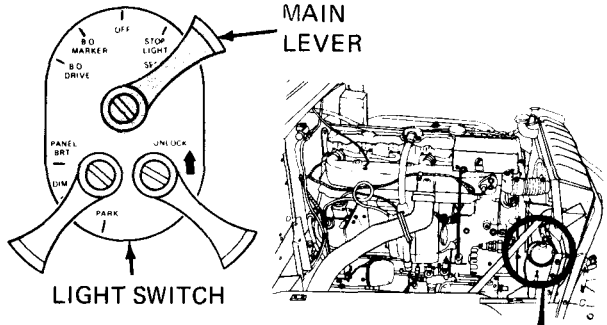
GO

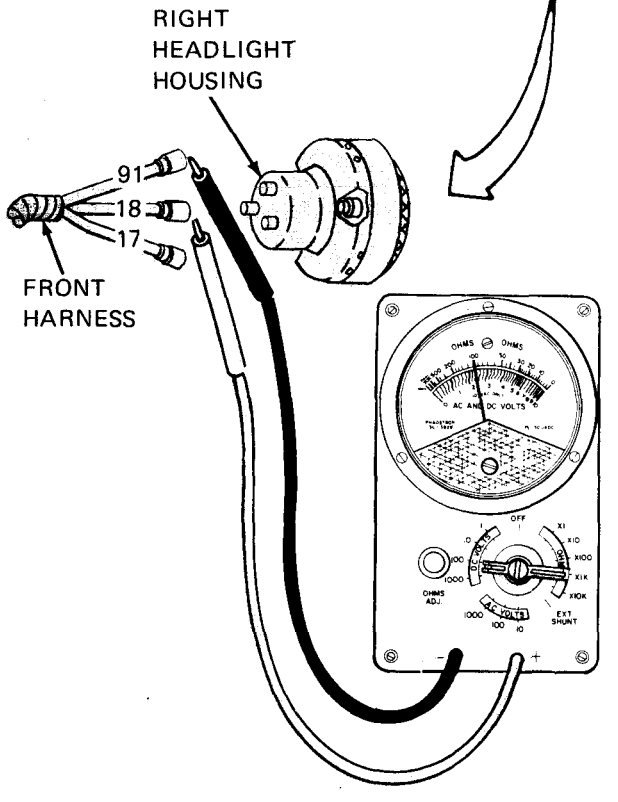
2

- 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

TA 115717

Figure 26-5 (Sheet 2 of 5)

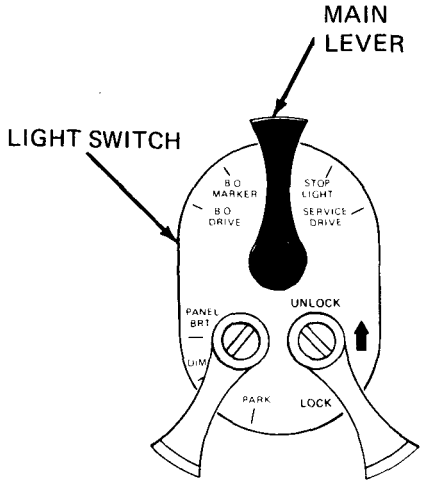
GO

YES

NO

3

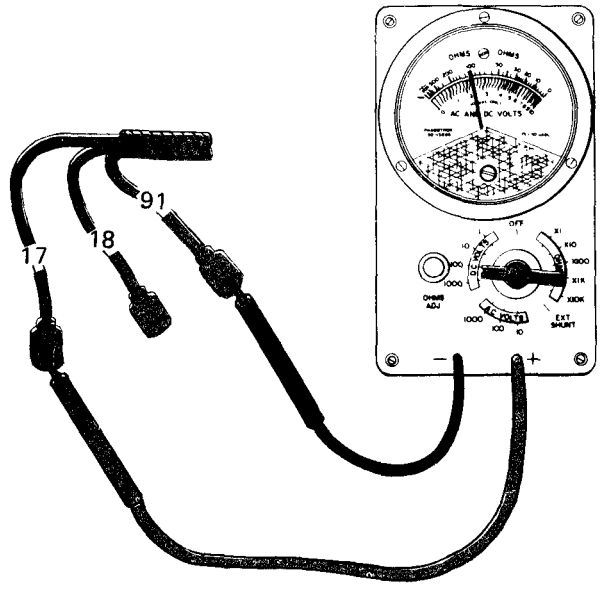
- Repair or replace front harness
  - Set light switch main lever to OFF
  - Repair or replace rear harness. Tell direct support maintenance



4

- Check for +24-volts DC at high beam input of bad headlight
  - Put multimeter + lead on lead 17 contact
  - Put multimeter - lead on lead 91 contact
  - Push dimmer switch
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



GO

TA 115718

Figure 26-5 (Sheet 3 of 5)

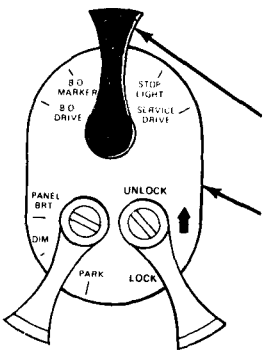
GO

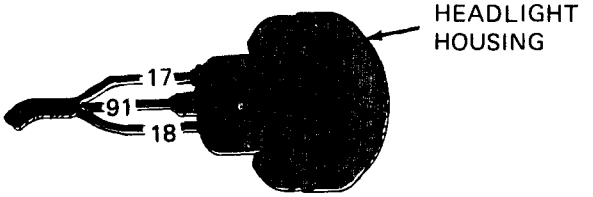
YES

NO

5

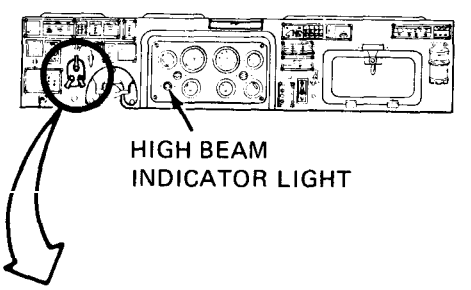
- Repair or replace front harness
  - Set light switch main lever to OFF
  - Repair or replace front harness. Tell direct support maintenance



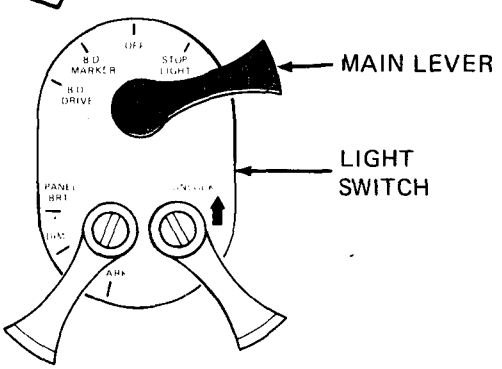


6

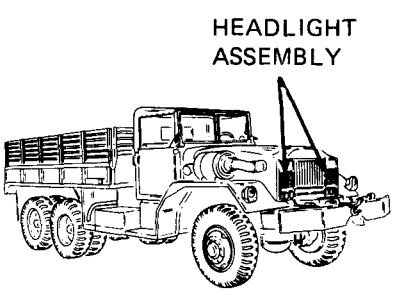
- Replace and test headlight lamp
  - Set light switch main lever to OFF
  - **Replace headlight lamp. Refer to Vol 3, chapter 7, para 7-22**
  - Put leads 17, 18, and 91 back on headlight housing



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



Did lamp stay off either time?



GO

TA 115719

Figure 26-5 (Sheet 4 of 5)

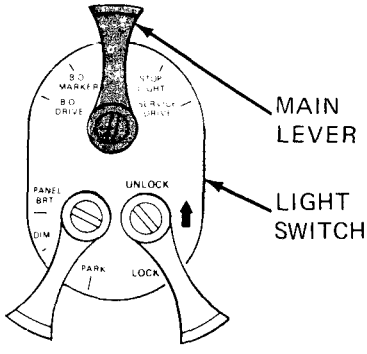
GO

YES

NO

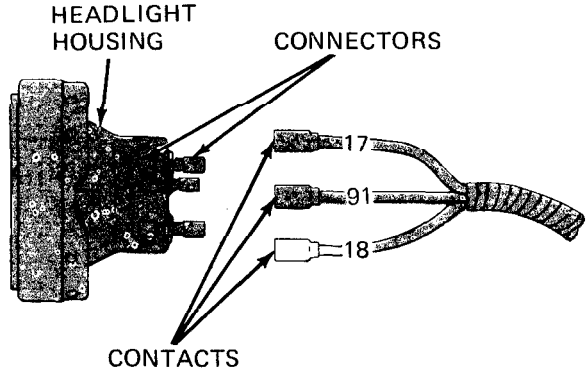
7

- Troubleshooting completed
  - Set light switch main lever to OFF



8

- Clean headlight connectors and leads 17, 18, and 91 contacts
  - Set light switch main lever to OFF
  - Take leads 17, 18, and 91 lead connectors off headlight housing connectors
  - Remove headlight lamp. Refer to Vol 3, chapter 7, para 7-22



- Clean three headlight housing connectors on both sides of housing. Clean leads 17, 18, and 91 contacts.
- Put leads 17, 18, and 91 back on headlight housing connectors
- Put back headlight lamp in housing. Refer to Vol 3, chapter 7, para 7-22

TA 115720

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

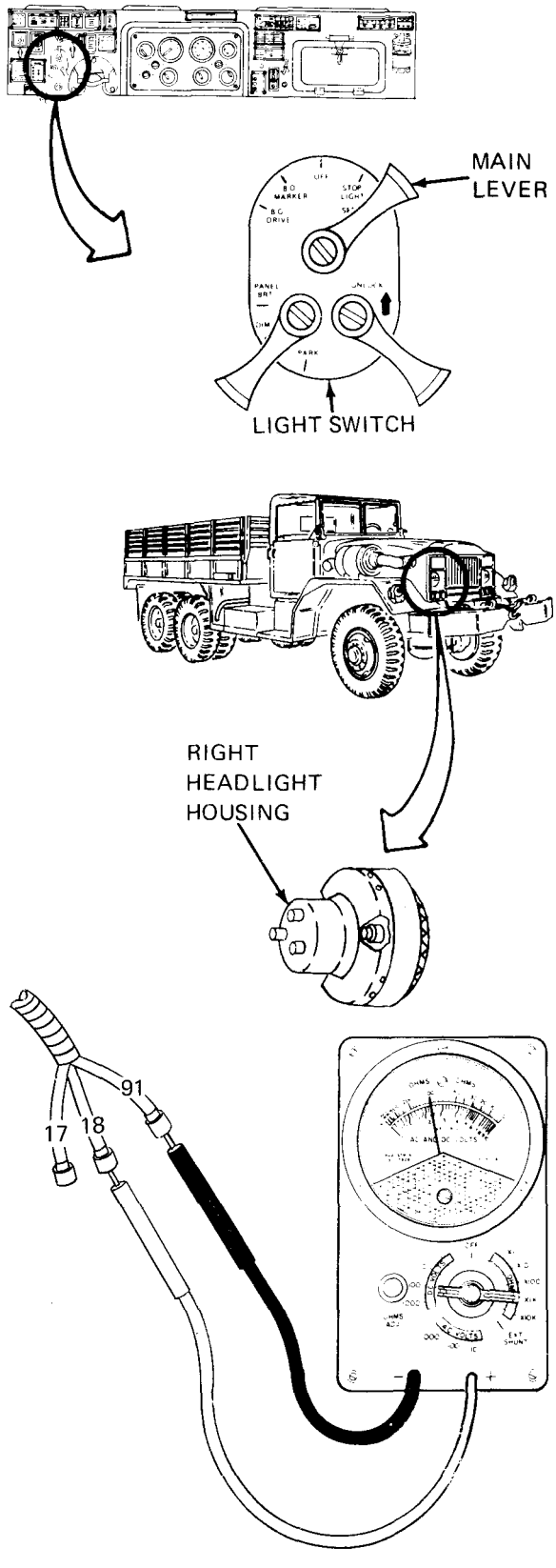


Figure 26-6 (Sheet 1 of 15)

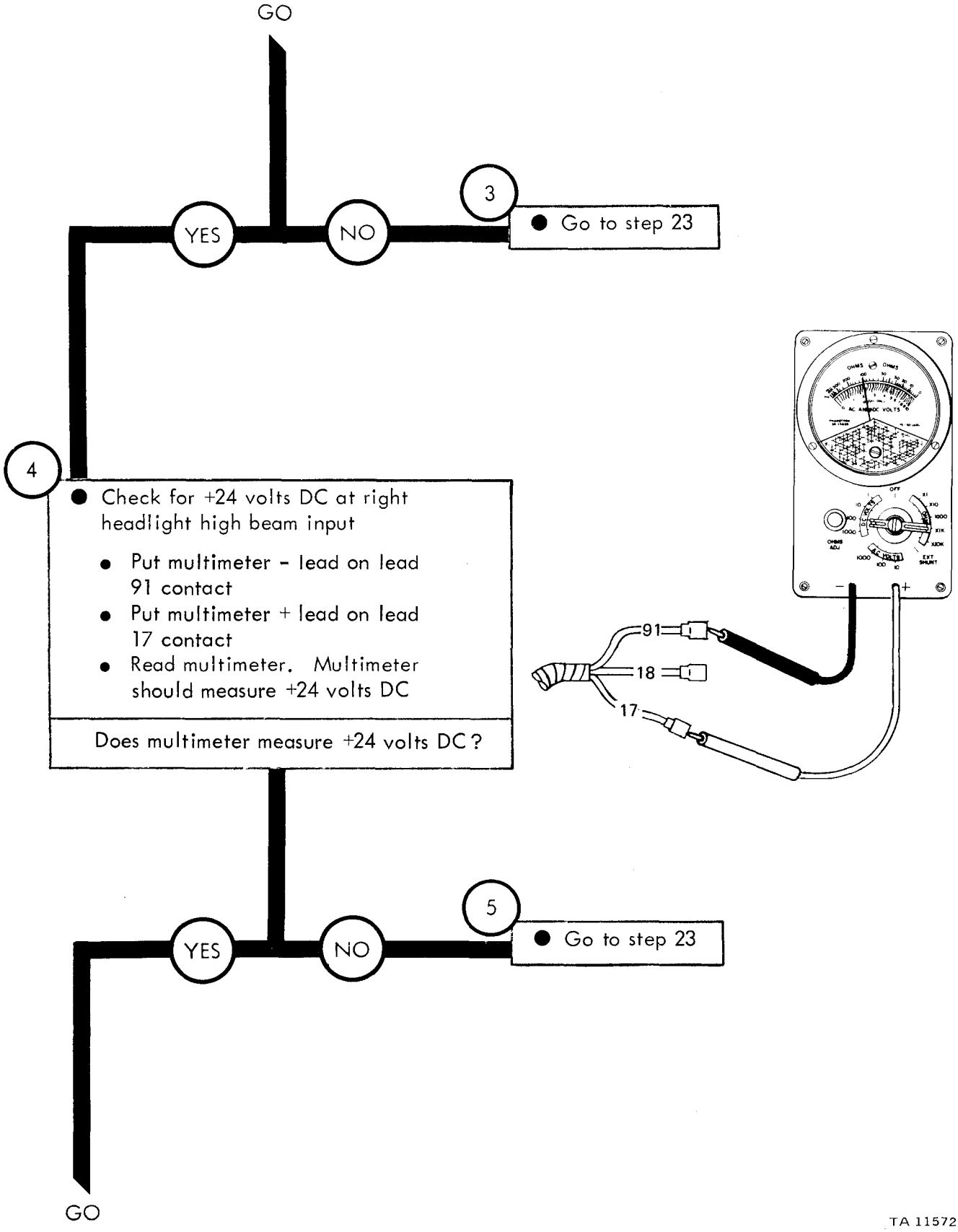


Figure 26-6 (Sheet 2 of 15)

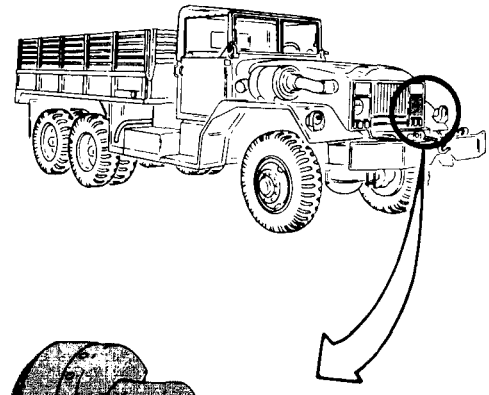
GO

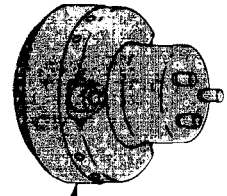
6

- Check for +24 volts DC at left headlight low beam input
  - Take off leads 17 (high beam), 18 (low beam), and 91 (ground) from left headlight housing
  - Put multimeter - lead on lead 91 contact
  - Put multimeter + lead on left headlight housing lead 18 contact
  - Read multimeter. Multimeter should read +24 volts DC. If not, push dimmer switch and read multimeter again

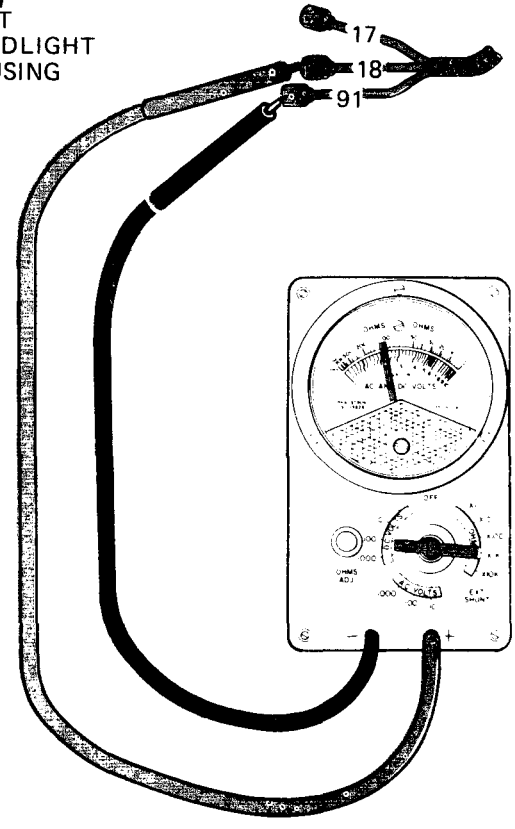
Does multimeter measure +24 volts DC?

GO





LEFT HEADLIGHT HOUSING



TA 115723

Figure 26-6 (Sheet 3 of 15)

GO

7

YES

NO

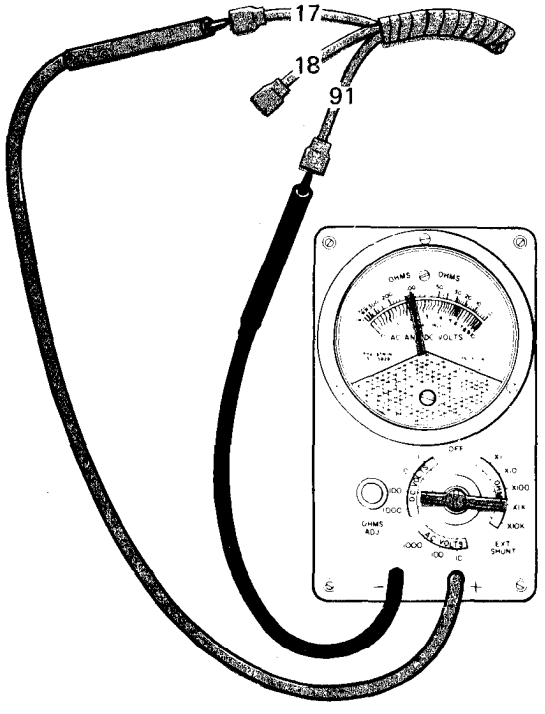
● Go to step 23

8

● Check for +24 volts DC at left headlight high beam input

- Put multimeter - lead on lead 91 contact
- Put multimeter + lead on lead 17 contact
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

NOTE

You now know that high beam and low beam voltage is reaching both headlight assemblies. This means the trouble is in both headlight assemblies.

9

● Go to step 17

GO

TA 115724

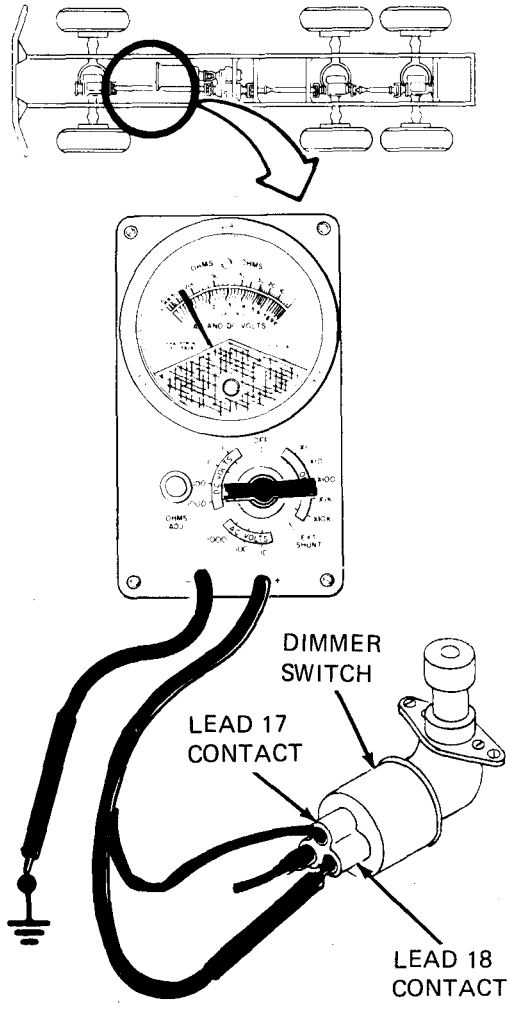
Figure 26-6 (Sheet 4 of 15)

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?

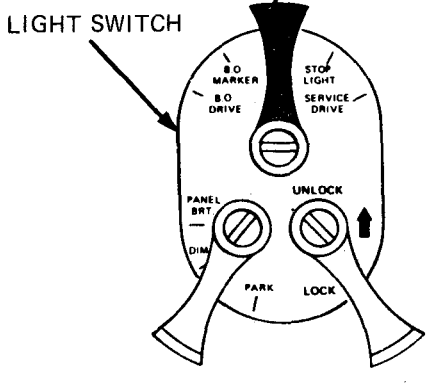


YES

NO

11

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



GO

TA 115725

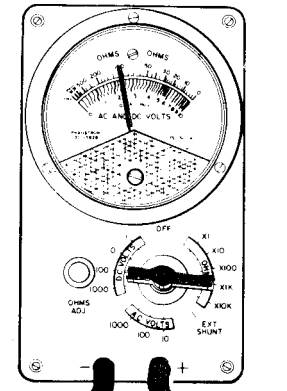
Figure 26-6 (Sheet 5 of 15)

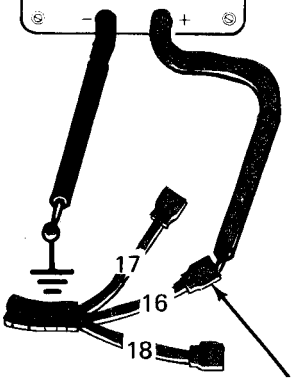
GO

12

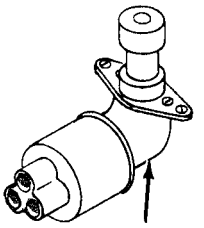
- Check dimmer switch
  - Take off lead 16 from dimmer switch
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on lead 16 contact (do not put it on dimmer switch contact)
  - Read multimeter. Multimeter should read +24 volts DC

Does multimeter read less than +24 volts DC?





LEAD 16 CONTACT



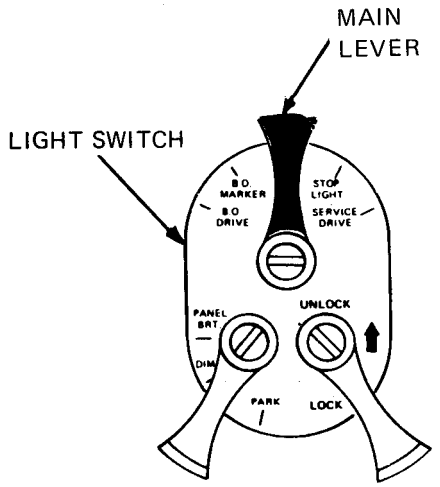
DIMMER SWITCH

YES

NO

13

- 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



GO

TA 115726

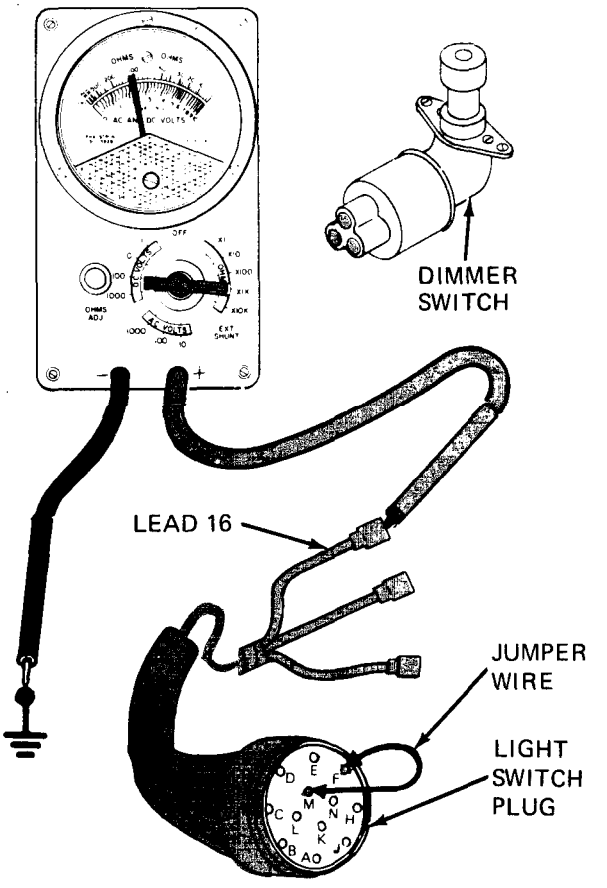
Figure 26-6 (Sheet 6 of 15)

GO

14

- 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

15

- Repair or replace front harness
  - Take off jumper wire from light switch plug
  - 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

TA 115727

Figure 26-6 (Sheet 7 of 15)

GO

YES

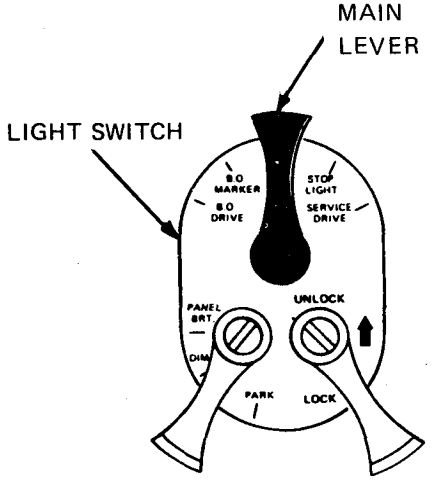
16

- 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)

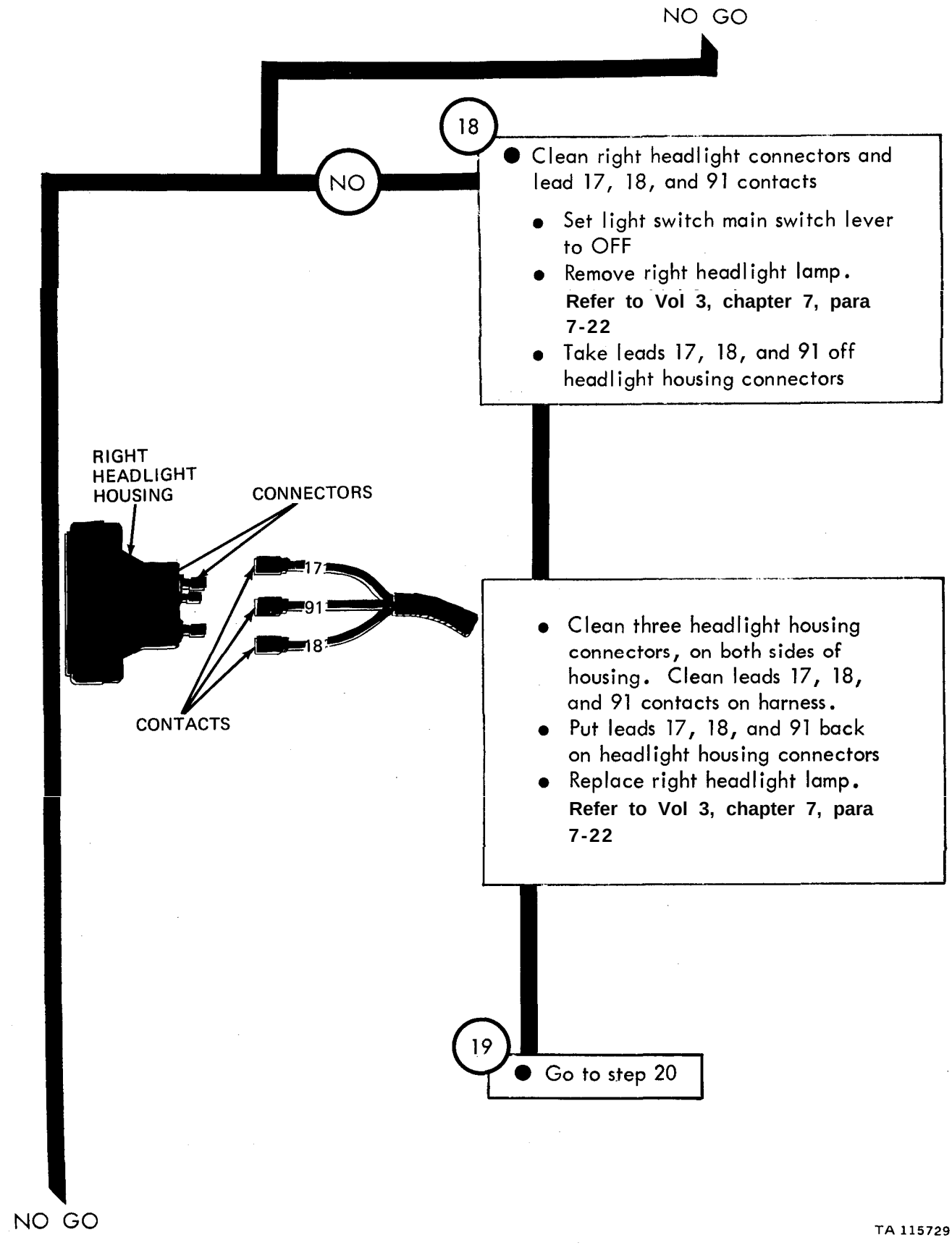


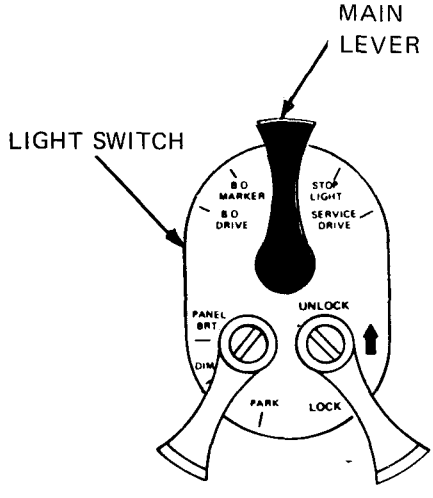
Figure 26-6 (Sheet 9 of 15)

NO GO

YES

20

- 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

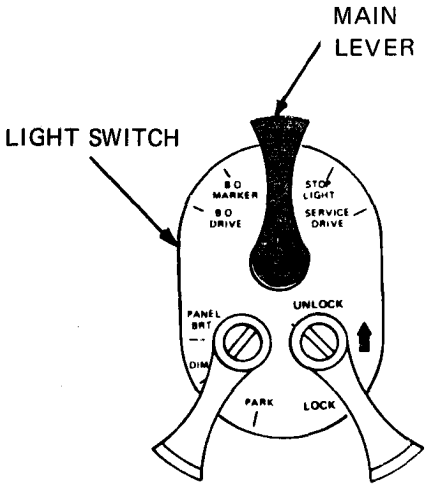
Did lamp stay off either time?

NO GO

TA 115730

Figure 26-6 (Sheet 10 of 15)

NO GO



NO

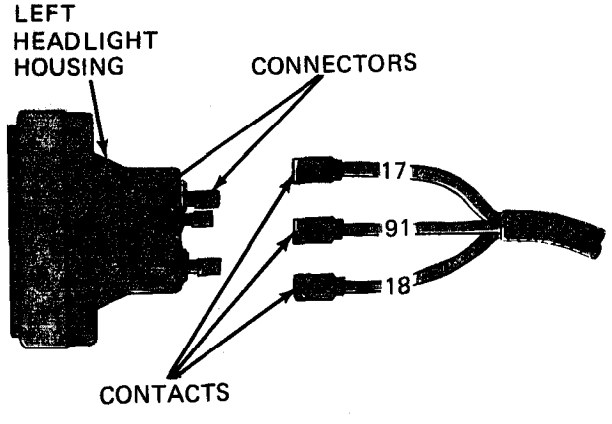
21

- Troubleshooting completed
  - Set light switch main lever to OFF

YES

22

- Clean left headlight housing connectors, and leads 17, 18, and 91 contacts
  - Set light switch main lever to OFF
  - Remove left headlight lamp. Refer to Vol 3, chapter 7, para 7-22
    Take leads 17, 18, and 91 off headlight housing connectors

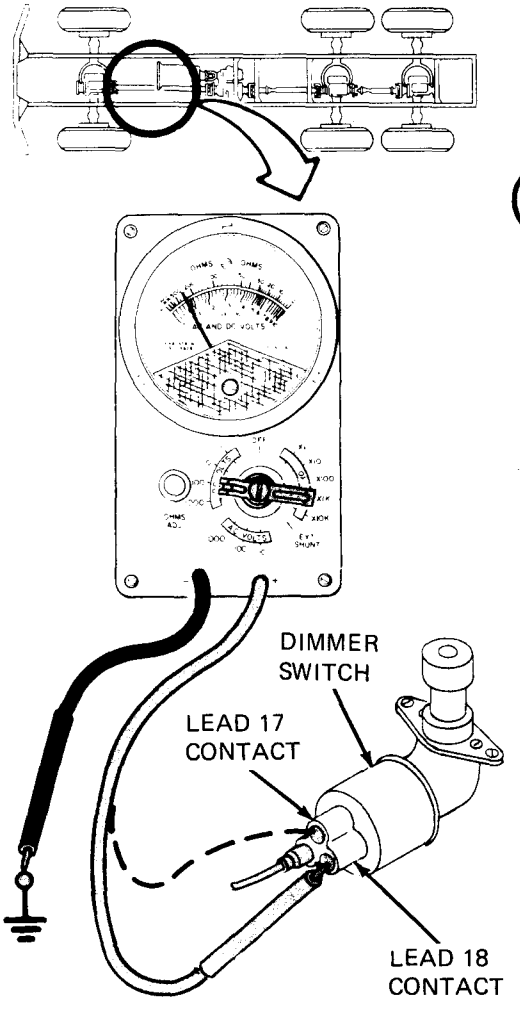


- Clean three headlight housing connectors, on both sides of housing. Clean leads 17, 18, and 91 contacts on harness
- Put leads 17, 18, and 91 back on headlight housing connectors
- Put left headlight lamp back in housing. Refer to Vol 3, chapter 7, para 7-22

TA 115731

Figure 26-6 (Sheet 11 of 15)

From steps 3, 5, and 7



23

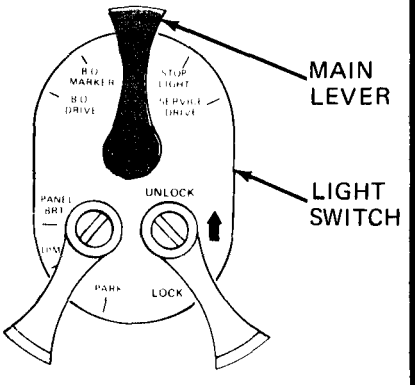
- Check wiring harness between headlight and dimmer switch
  - Take off leads 17 and 18 contacts from dimmer switch
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on lead 18 contact of dimmer switch
  - Read multimeter. Multimeter should measure +24 volts DC. If not, press down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

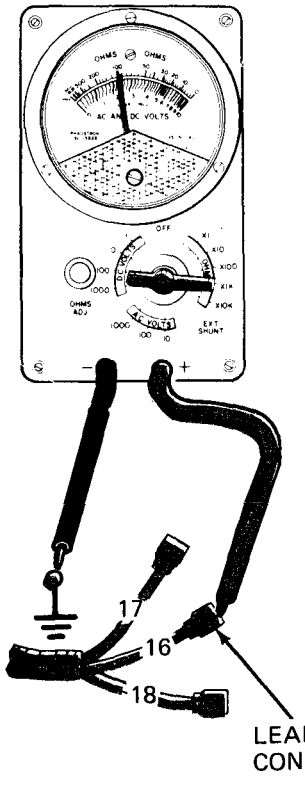
Does multimeter measure less than +24 volts DC at either or both lead 17 and 18 contacts?

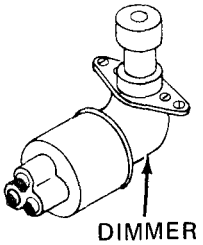
NO GO

TA 115732

Figure 26-6 (Sheet 12 of 15)







NO GO

NO

24

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

YES

25

- 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 measure +24 volts DC

Does multimeter measure less than +24 volts DC?

NO GO

TA 115733

Figure 26-6 (Sheet 13 of 15)

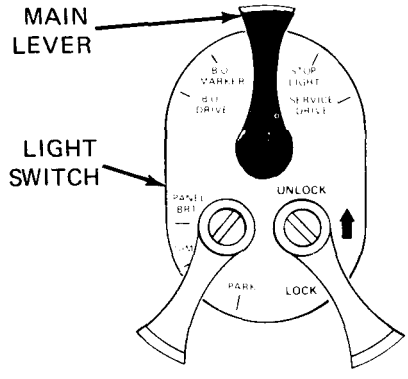
NO GO

YES

NO

26

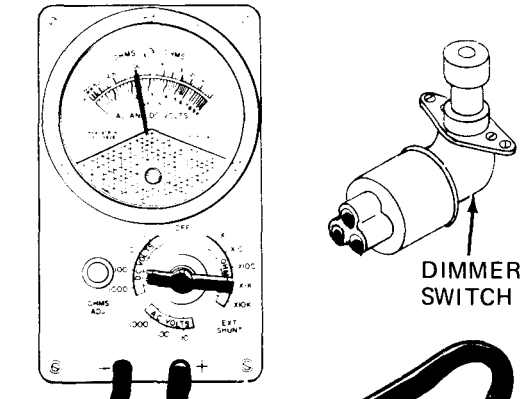
- Replace dimmer switch
  - Set light switch main lever to OFF
  - At right and left headlight housing put back leads 17, 18 and 91
  - Replace dimmer switch. Refer to Vol 3, chapter 7, para 7-52

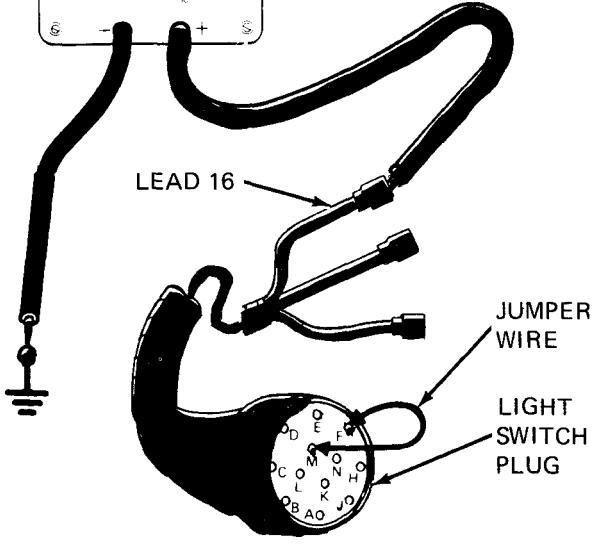


27

- 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?

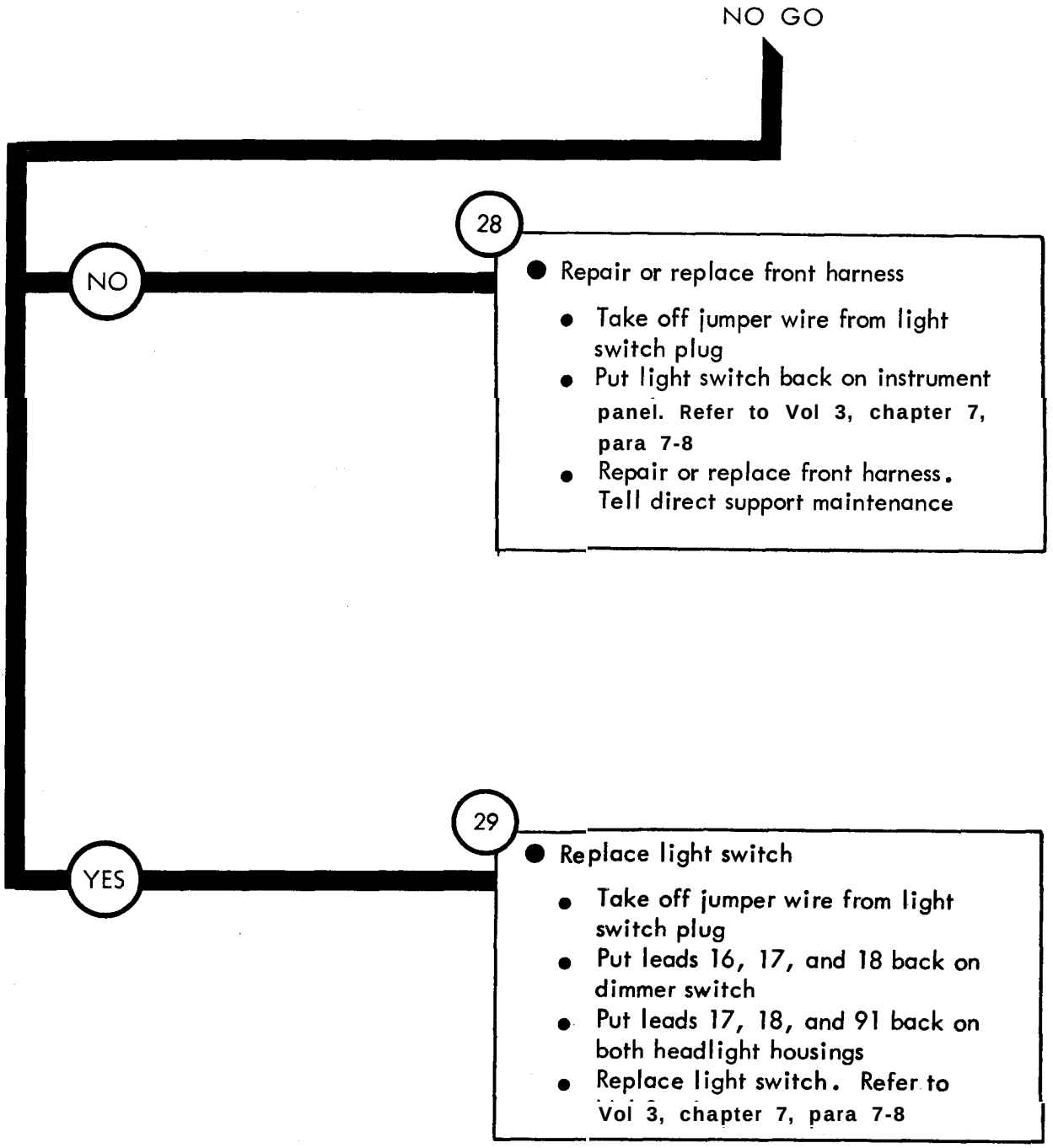




NO GO

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

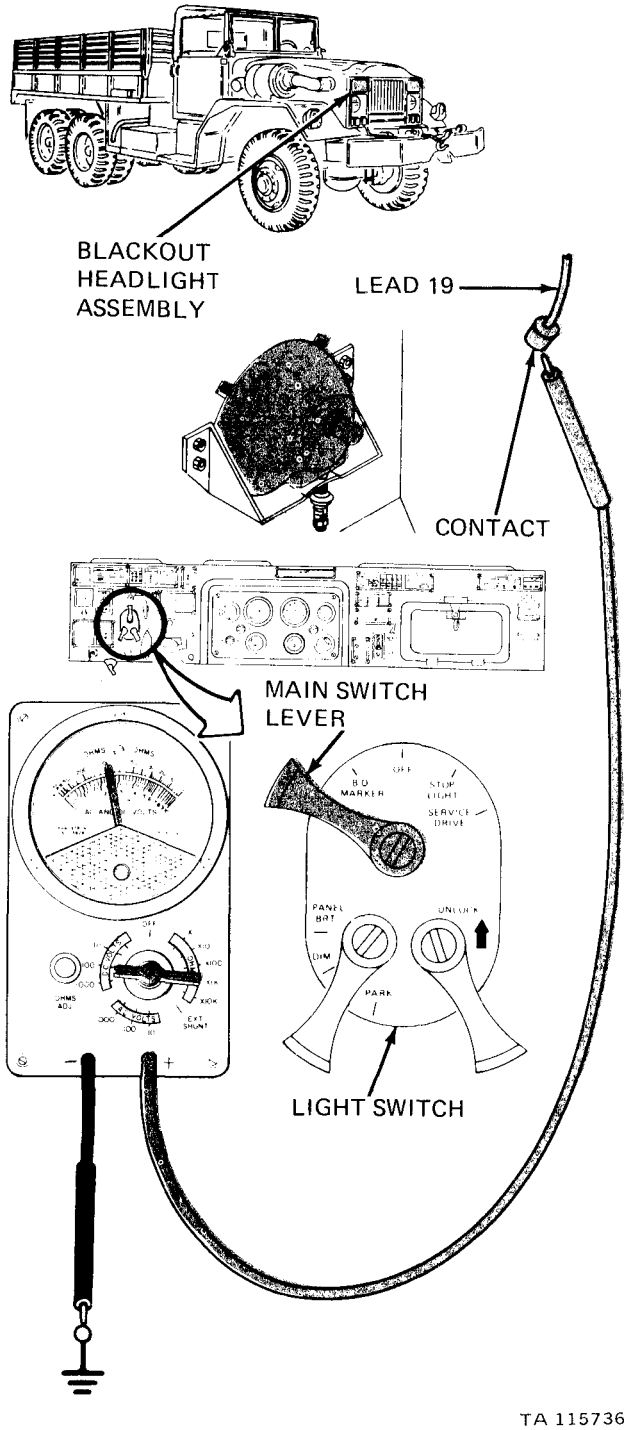


Figure 26-7 (Sheet 1 of 5)

GO

YES

NO

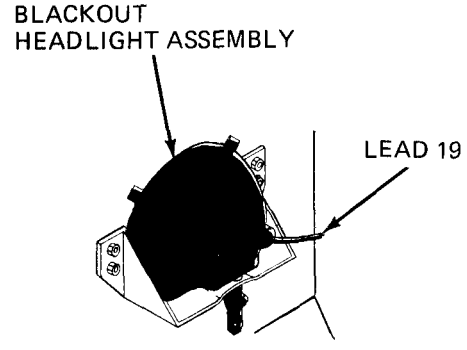
3

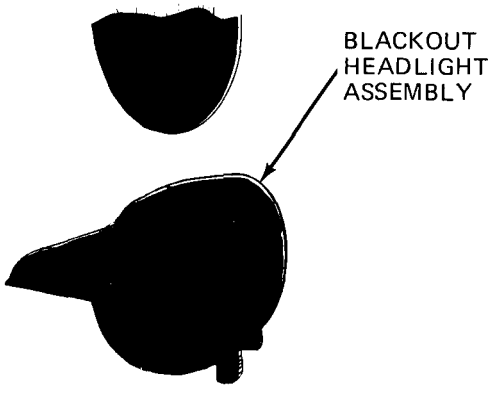
- Replace and test blackout headlight lamp
  - Set light switch main lever to OFF
  - Replace blackout headlight lamp. Refer to Vol 3, chapter 7, para 7-25
  - Put circuit 19 lead contact back into rear of blackout headlight assembly
  - Set light switch main lever to B. O. MARKER
  - Look at blackout headlight assembly. Blackout headlight lamp should be lit

Is blackout headlight lamp off?

4

- Go to step 7



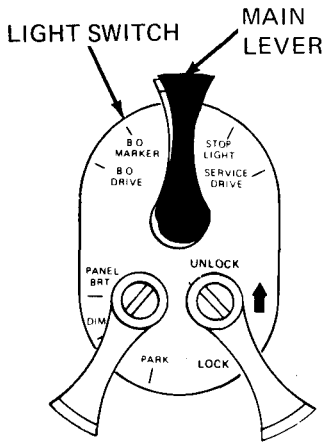


NO GO

TA 115737

Figure 26-7 (Sheet 2 of 5)

NO GO



NO

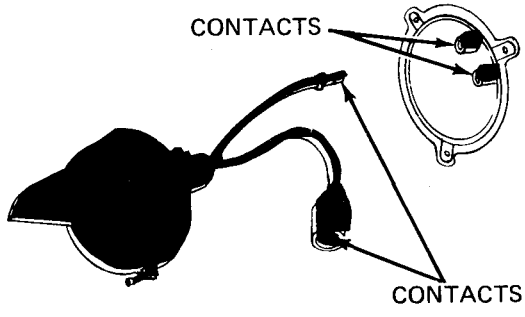
5

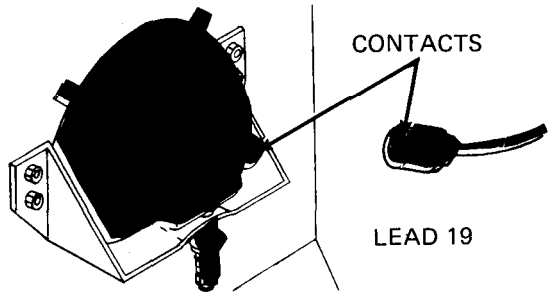
- Troubleshooting completed
  - Set light switch main lever to OFF

YES

6

- Clean contacts of blackout headlight lamp connectors
  - Set light switch main lever to OFF
  - Remove blackout headlight lamp. Refer to Vol 3, chapter 7, para 7-25
  - Take off lead 19 from rear of blackout headlight housing





- Clean blackout headlight housing contacts and lead 19 contact
- Put lead 19 back on blackout headlight assembly
- Put back blackout headlight lamp. Refer to Vol 3, chapter 7, para 7-25

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

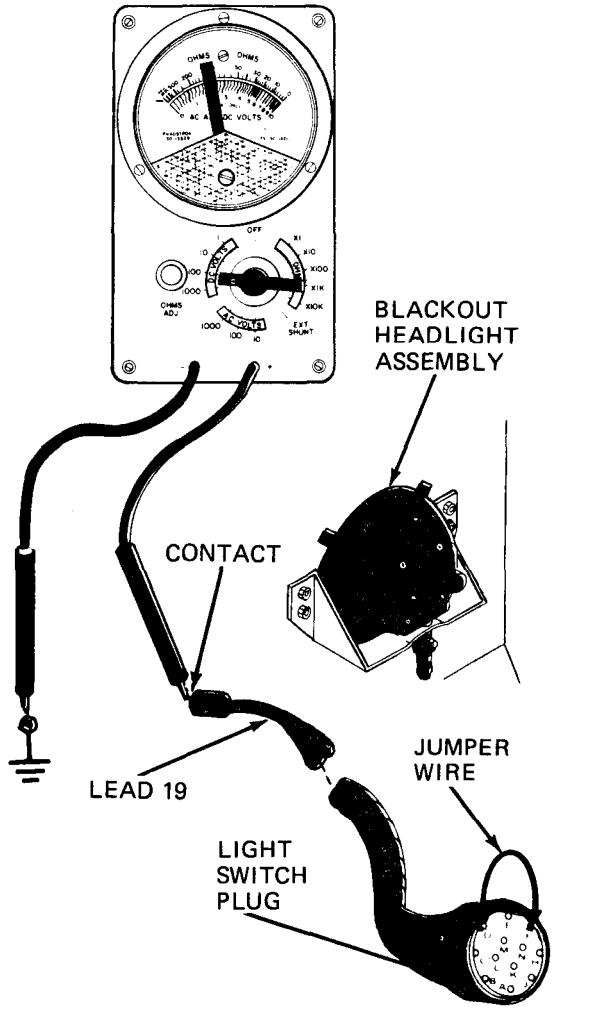
Does multimeter measure +24 volts DC?

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

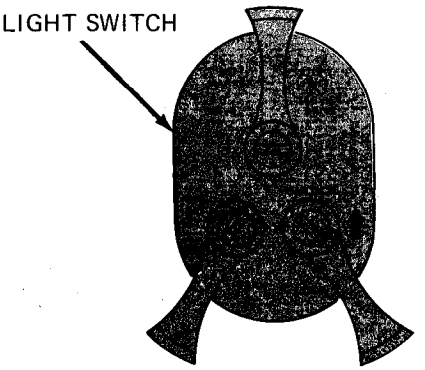
GO



TA 115739

Figure 26-7 (Sheet 4 of 5)

GO



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

TA 115740

Figure 26-7 (Sheet 5 of 5)

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

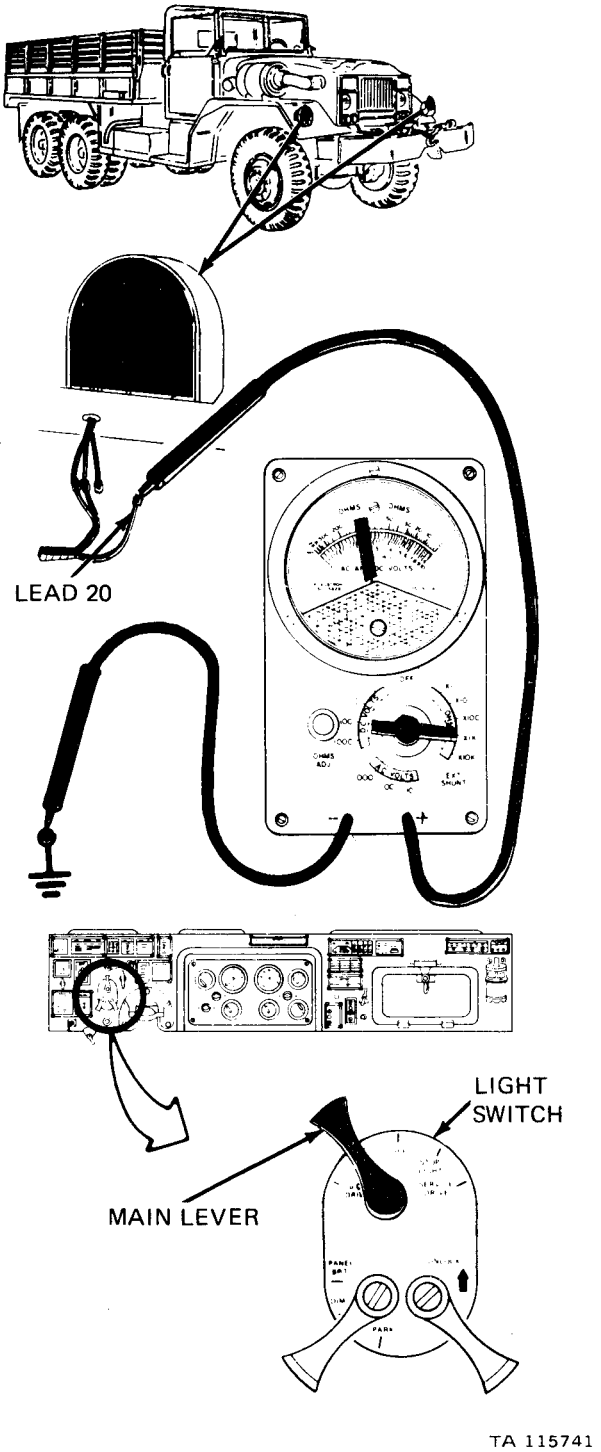


Figure 26-8 (Sheet 1 of 5)

GO

YES

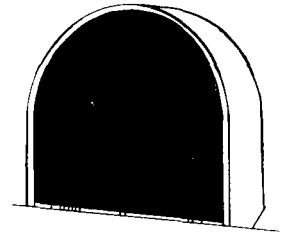
NO

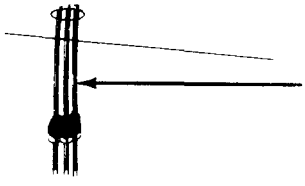
3

- Replace front blackout marker lamp
  - Set light switch main lever to OFF
  - Replace front blackout marker lamp. Refer to Vol 3, chapter 7, para 7-30
  - Put lead 20 back on rear of front composite light assembly

4

- Go to step 8

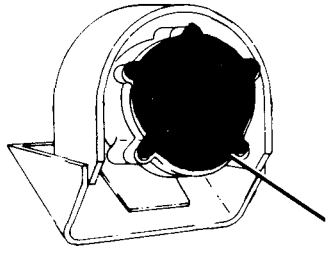


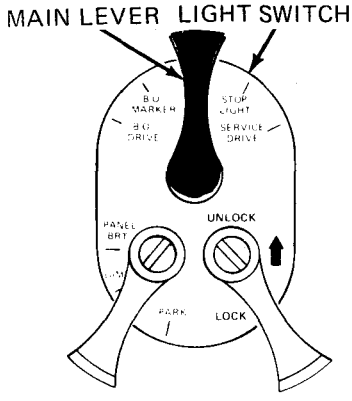


5

- Test blackout marker lamp
  - Set light switch main lever to B. O. MARKER
  - Look at blackout marker lamp. Lamp should be lit

Is blackout marker lamp off?





NO

6

- Troubleshooting completed
  - Set light switch main lever to OFF

NO GO

TA 115742

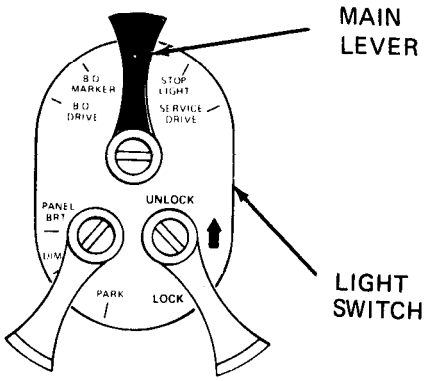
Figure 26-8 (Sheet 2 of 5)

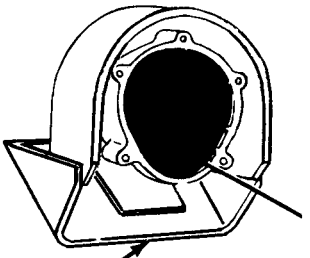
NO GO

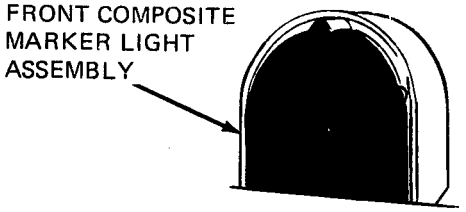
YES

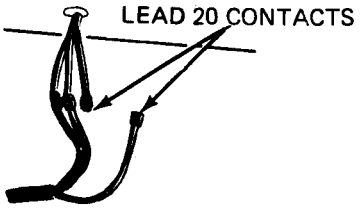
7

- Clean contacts of lead 20 connectors
  - Set light switch main switch lever to OFF
  - Remove blackout marker lamp. **Refer to Vol 3, chapter 7, para 7-30**
  - Take off lead 20 at rear of front composite marker light assembly









- Clean blackout marker lamp socket and clean lead 20 contact
- Put lead 20 back on rear of front composite marker light assembly
- Put back blackout marker lamp. **Refer to Vol 3, chapter 7, para 7-30**

TA 115743

Figure 26-8 (Sheet 3 of 5)

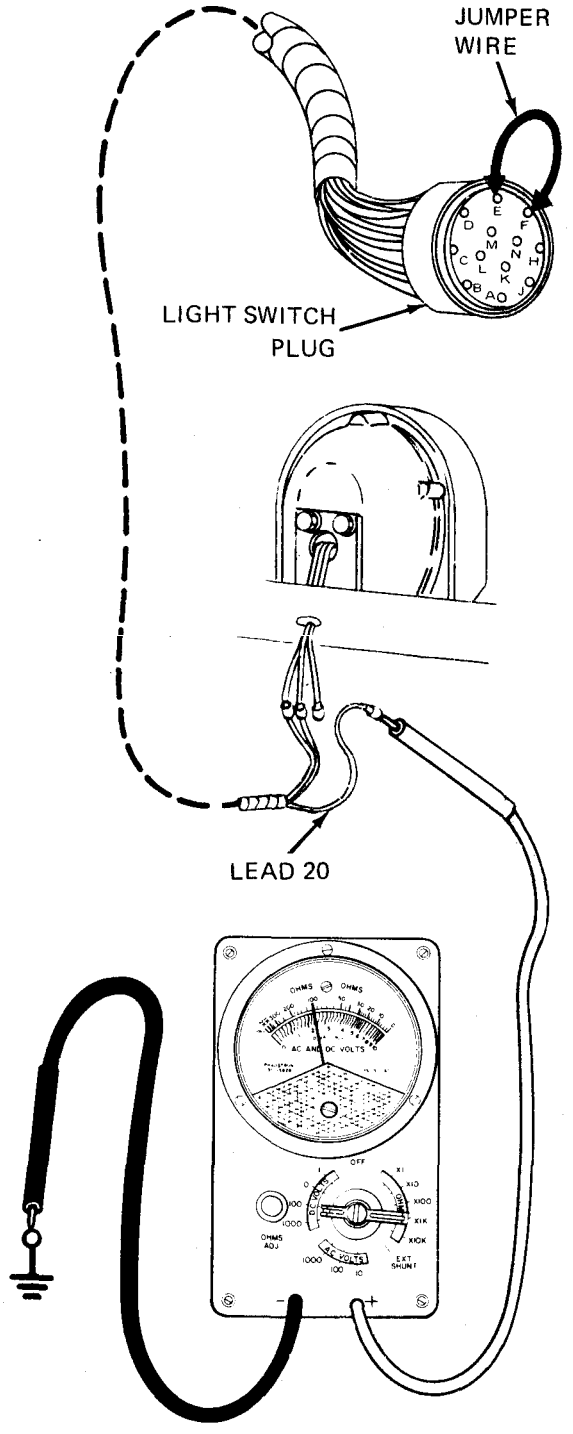
From step 4

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)

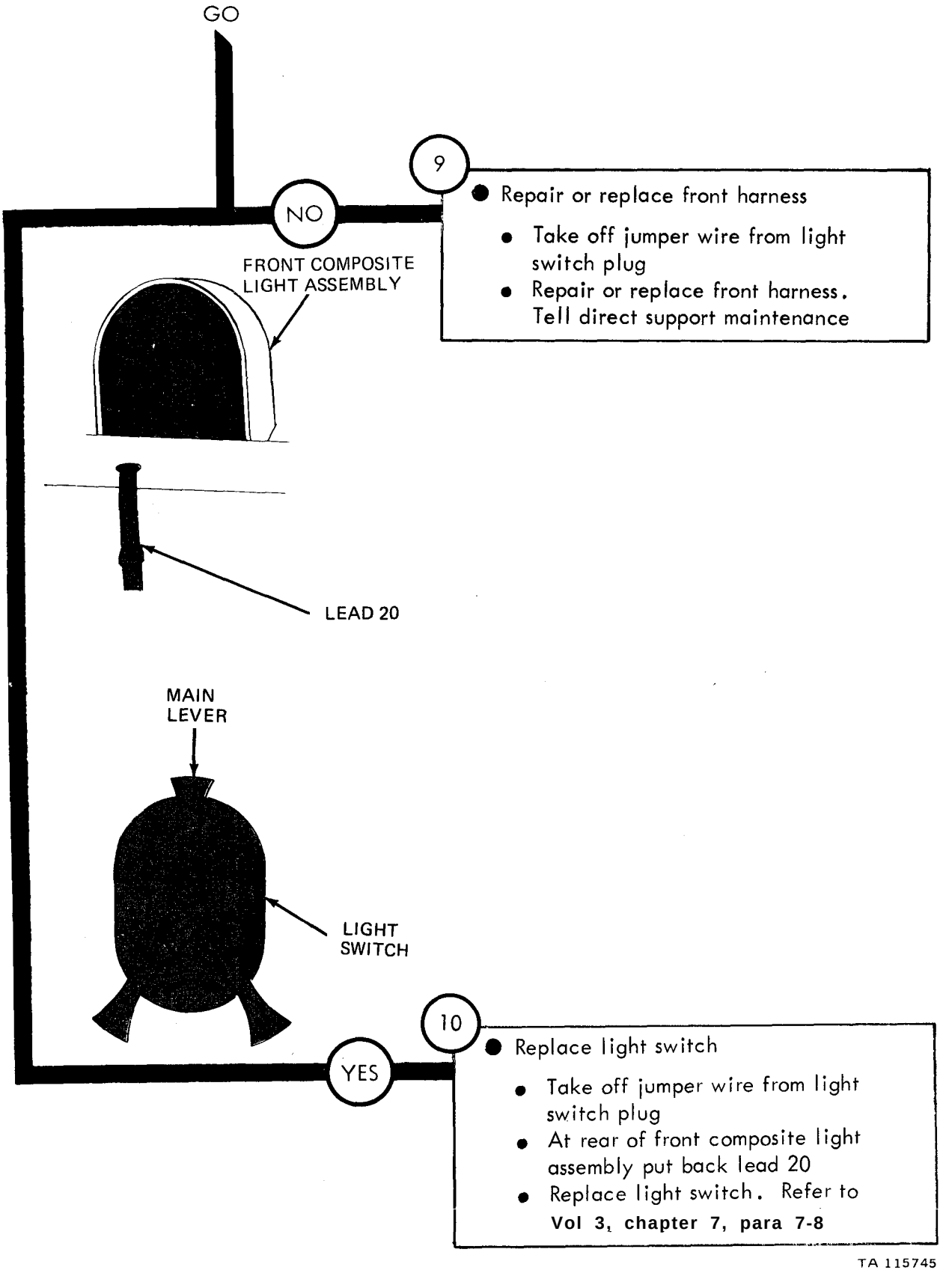
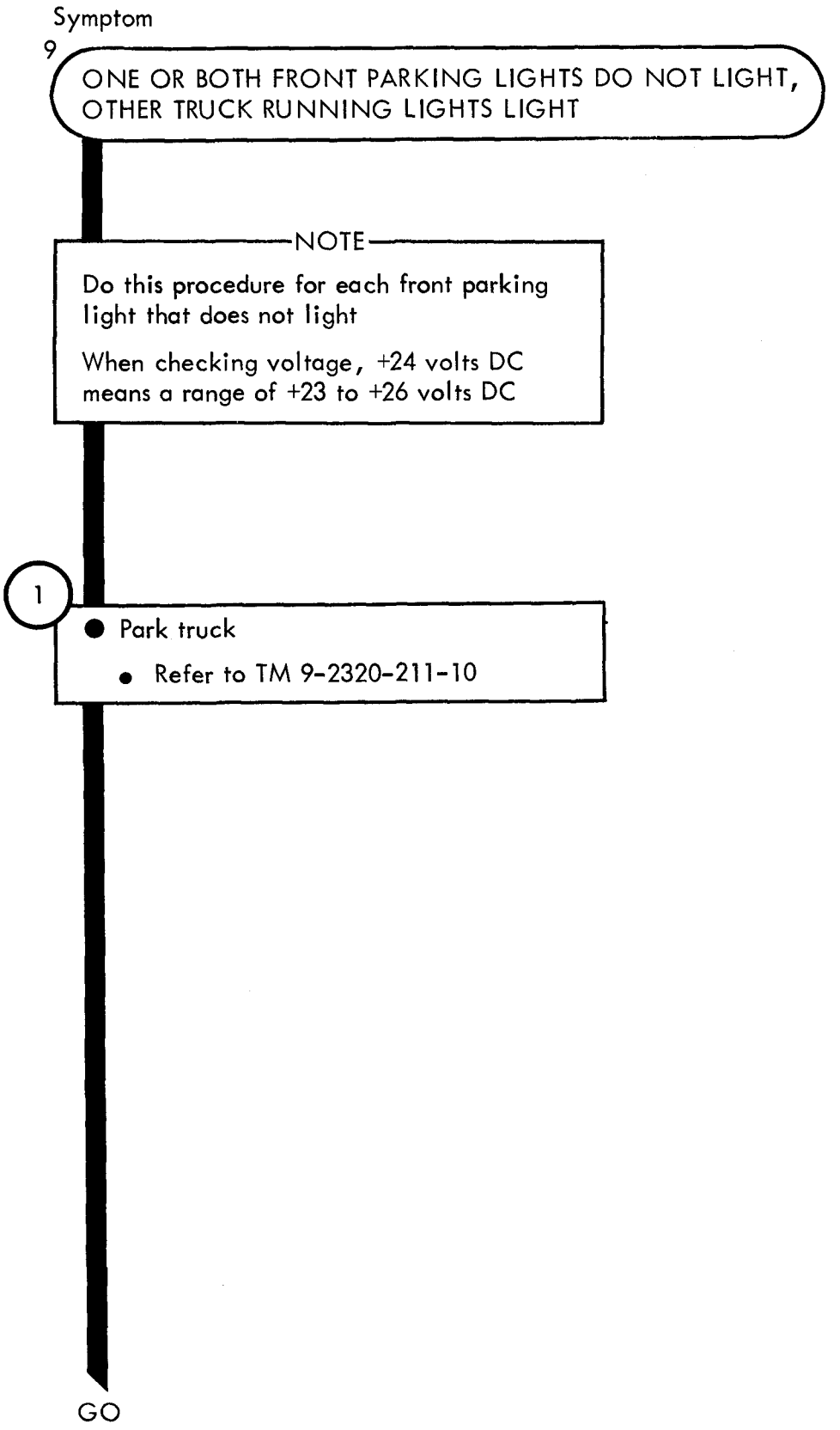


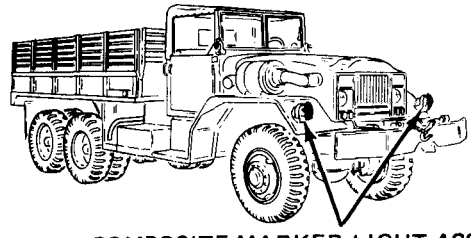
Figure 26-8 (Sheet 5 of 5)



TA 115746

Figure 26-9 (Sheet 1 of 6)

GO

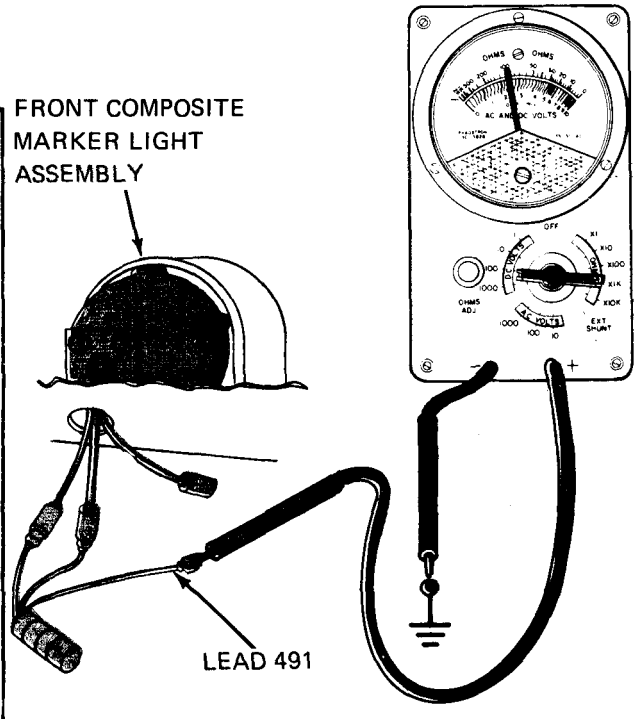


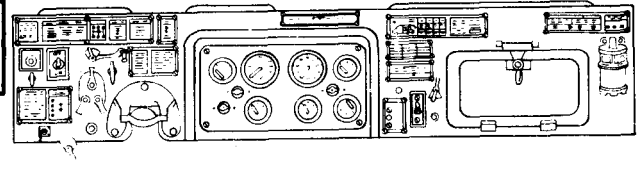
COMPOSITE MARKER LIGHT ASSEMBLIES CONTAINING PARKING LIGHTS

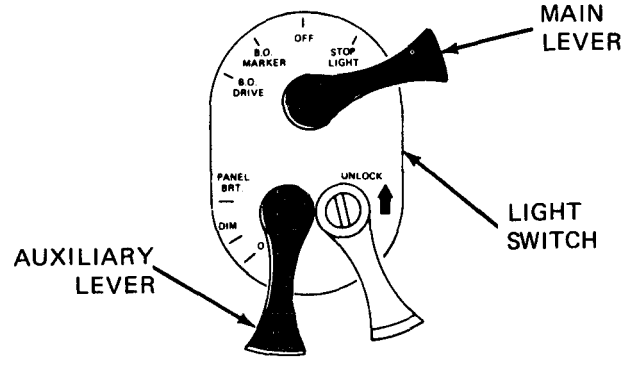
2

- 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)

GO

YES

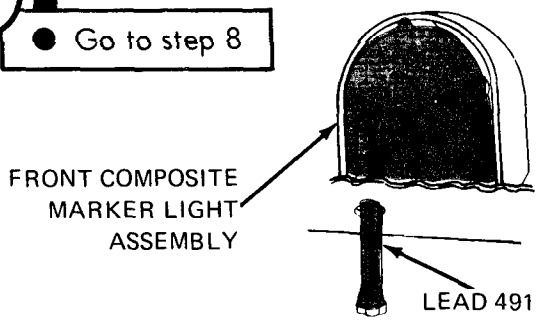
NO

3

- Go to step 8

4

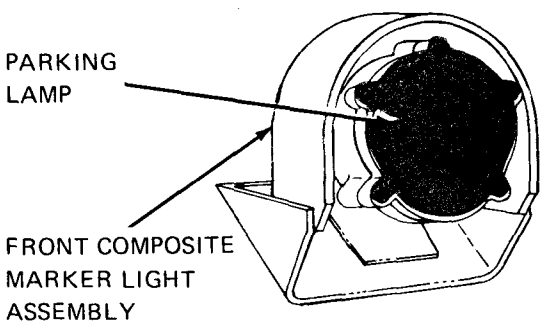
- Replace parking light lamp
  - Set light switch main lever to OFF
  - Replace parking light lamp. Refer to Vol 3, chapter 7, para 7-27
  - Put back lead 491 on front composite marker light assembly

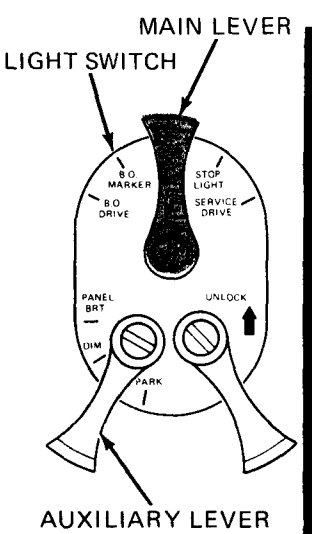


5

- Test front parking light
  - Set light switch main lever to SERVICE DRIVE
  - Look at front composite marker light assembly. Parking light should be lit

Is parking light lamp off?





NO

6

- Troubleshooting completed
  - Set light switch main lever to OFF
  - Set auxiliary lever to OFF

NO GO

TA 115748

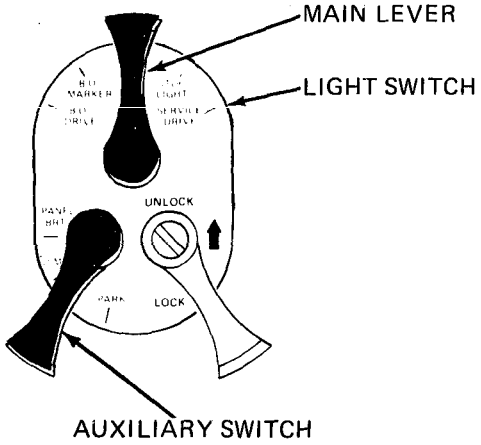
Figure 26-9 (Sheet 3 of 6)

NO GO

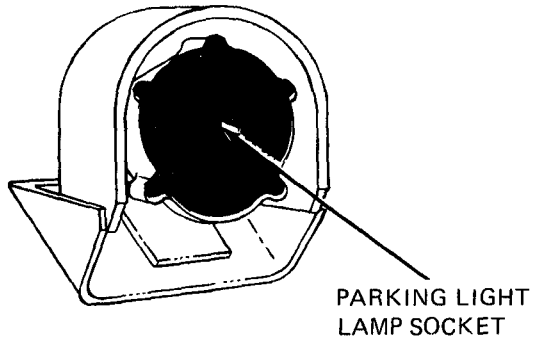
YES

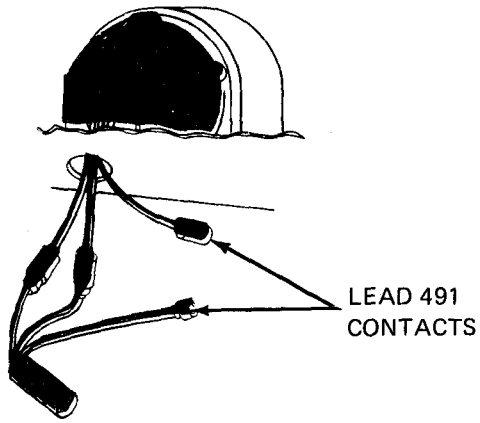
7

- Clean contacts of lead 491 connectors
  - Set light switch main switch lever to OFF
  - Set auxiliary lever to OFF
  - Remove parking light lamp. Refer to Vol 3, chapter 7, para 7-27
  - Take off lead 491 at front composite marker light assembly



- Clean parking light lamp socket and lead 491 contacts
- Put lead 491 back on front composite marker light assembly
- Put parking light lamp back in socket. Refer to Vol 3, chapter 7, para 7-27





TA 115749

Figure 26-9 (Sheet 4 of 6)

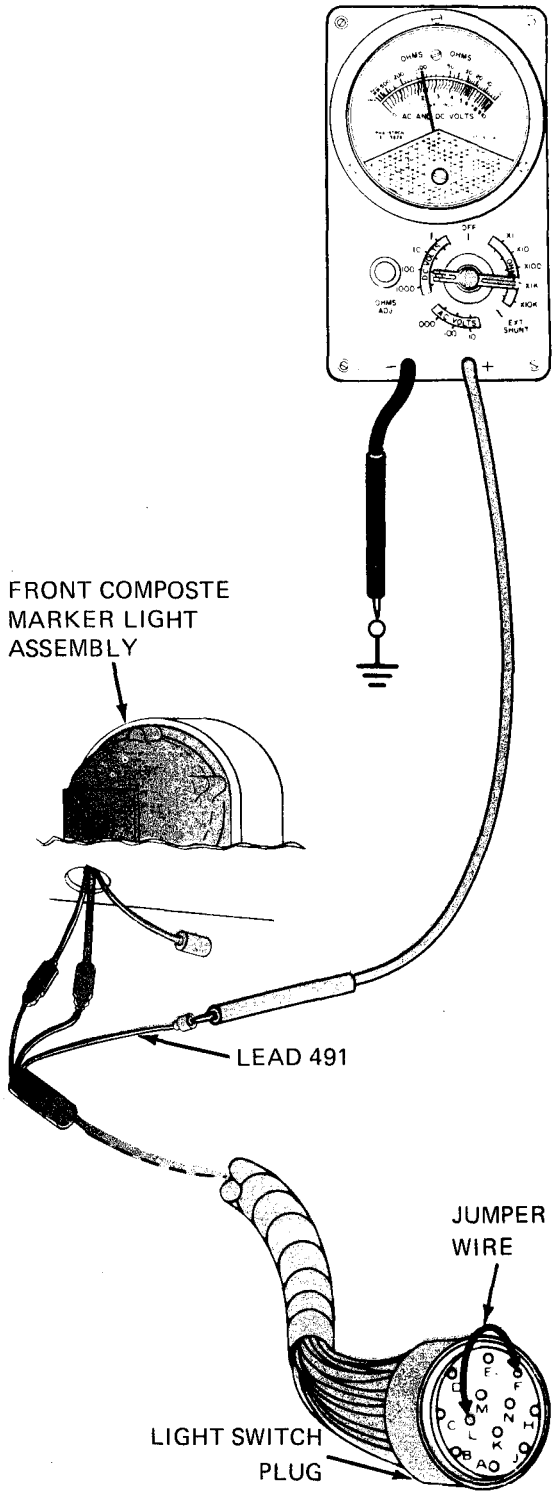
From step 3

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)

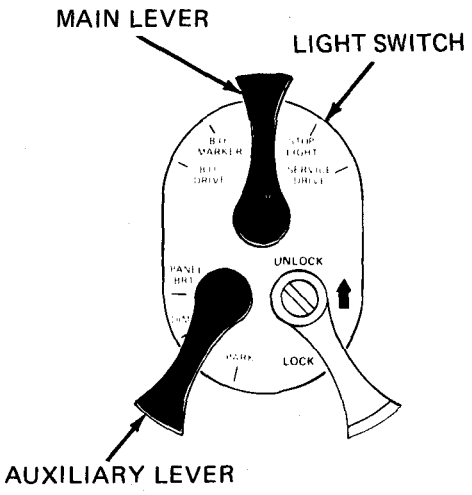
GO

YES

NO

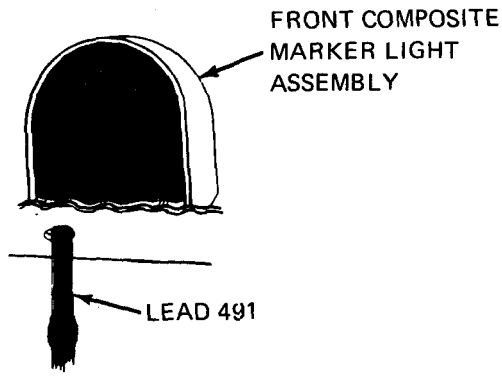
9

- Repair or replace front harness
  - Set light switch main lever to OFF
  - Set light switch auxiliary lever to OFF
  - Take off jumper wire from light switch plug
  - Put light switch back on instrument panel
  - Repair or replace front harness. Tell direct support maintenance



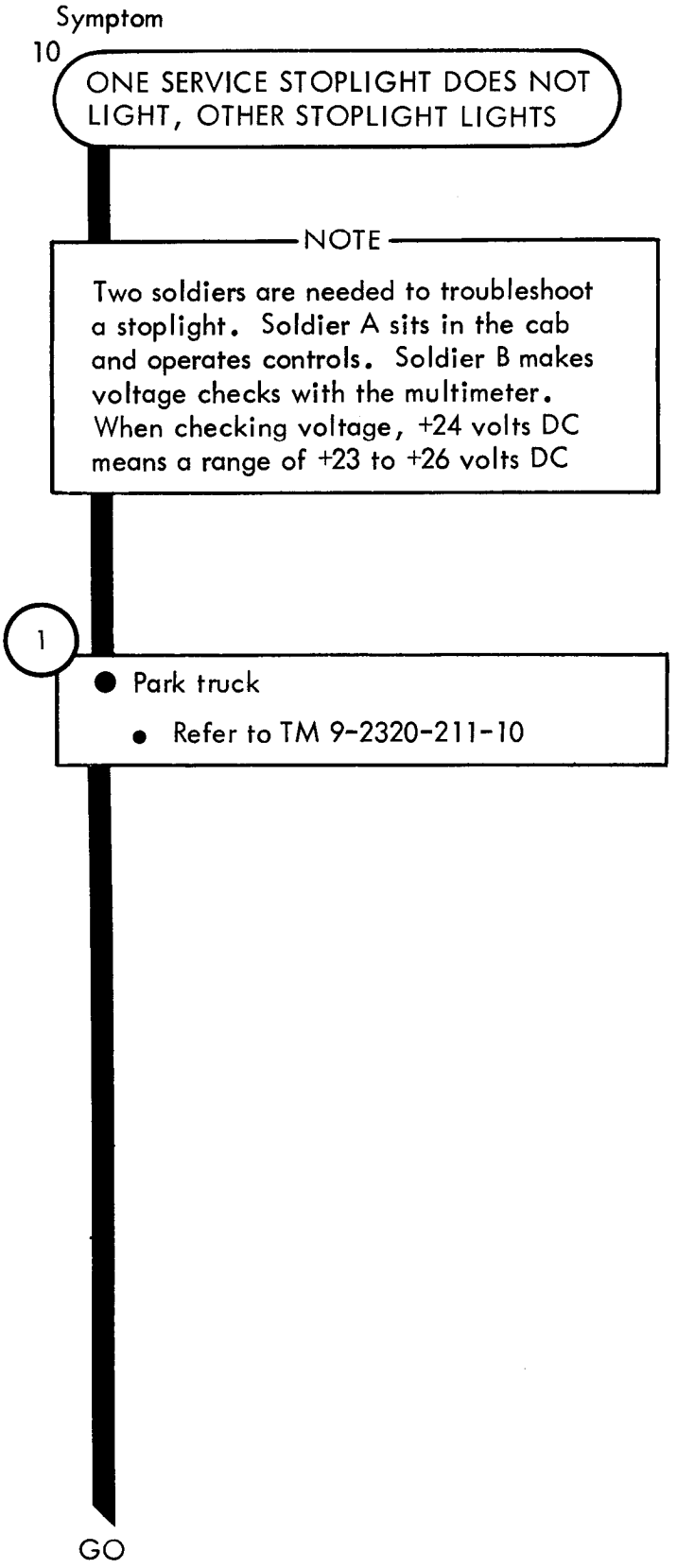
10

- Replace light switch
  - Set light switch main lever to OFF
  - Set auxiliary lever to OFF
  - Take off jumper wire from light switch plug
  - At right front composite light assembly put back lead 491
  - Replace light switch. Refer to Vol 3, chapter 7, para 7-8



TA 115751

Figure 26-9 (Sheet 6 of 6)



TA 115752

Figure 26-10 (Sheet 1 of 11)

GO

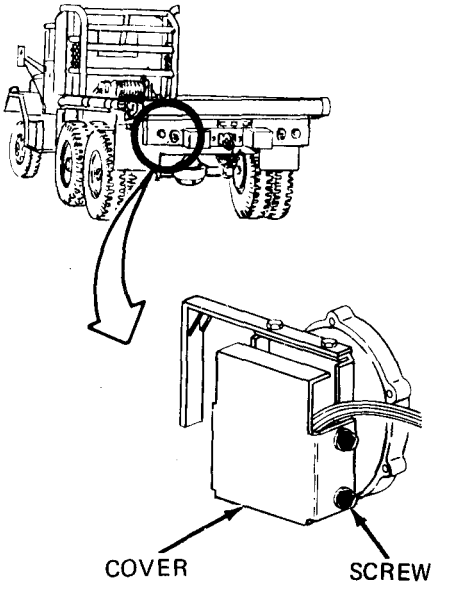
2

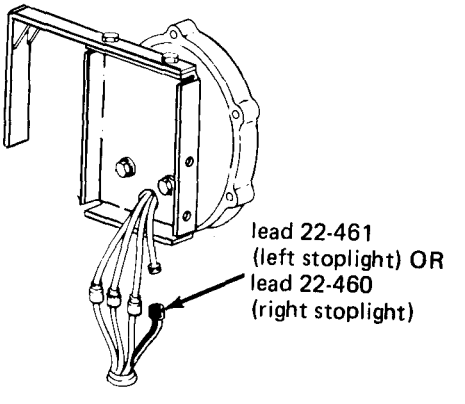
- Check for +24 volts DC at stoplight

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

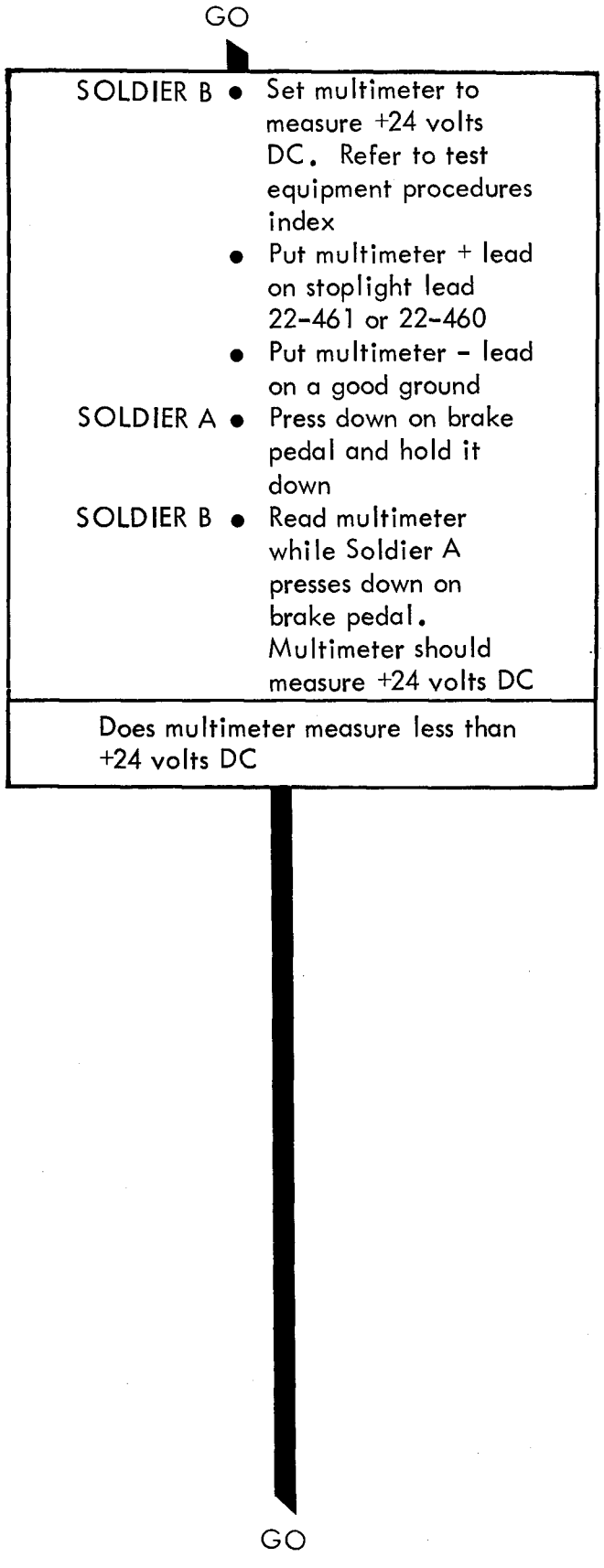
GO





TA 115753

Figure 26-10 (Sheet 2 of 11)



TA 115754

Figure 26-10 (Sheet 3 of 11)

GO

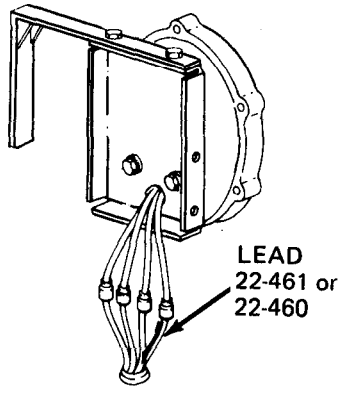
YES

NO

3

● Replace service stoplight lamp

SOLDIER B
- Set light switch main lever to OFF
- Replace service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28
- Put lead 22-460 or 22-461 back on rear composite marker light assembly



4

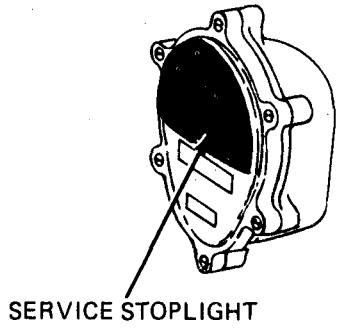
● Go to step 9

5

● Test service stoplight lamp

SOLDIER A
- Set light switch main lever to stoplight position
- Press down on brake pedal and hold it down

SOLDIER B
- Look at 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

TA 115755

Figure 26-10 (Sheet 4 of 11)

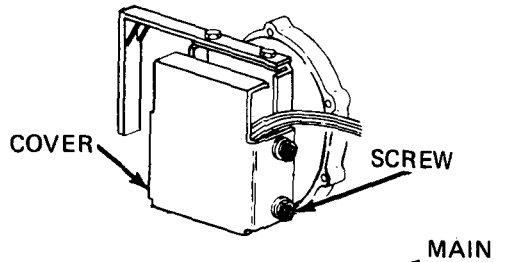
NO GO

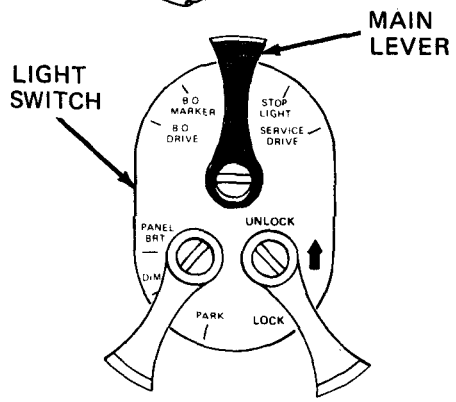
YES

NO

6

- Troubleshooting completed
  - Set light switch main lever to OFF
  - Put cover back on rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers





NO GO

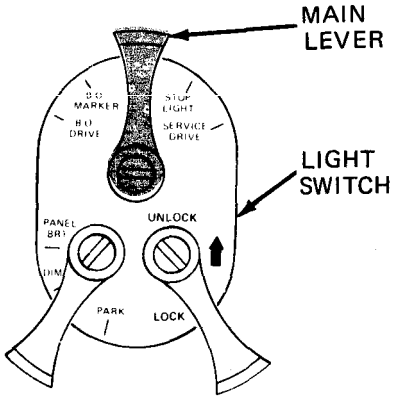
TA 115756

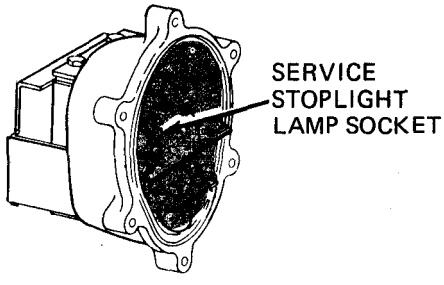
Figure 26-10 (Sheet 5 of 11)

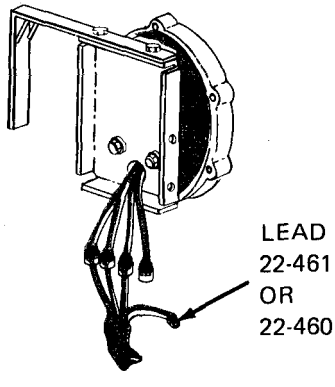
NO GO

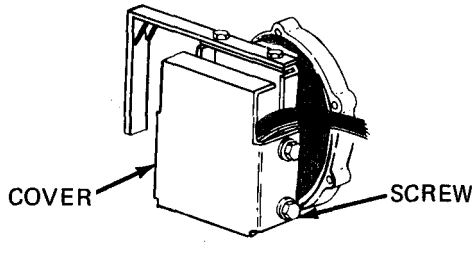
7

- 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

TA 115757

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

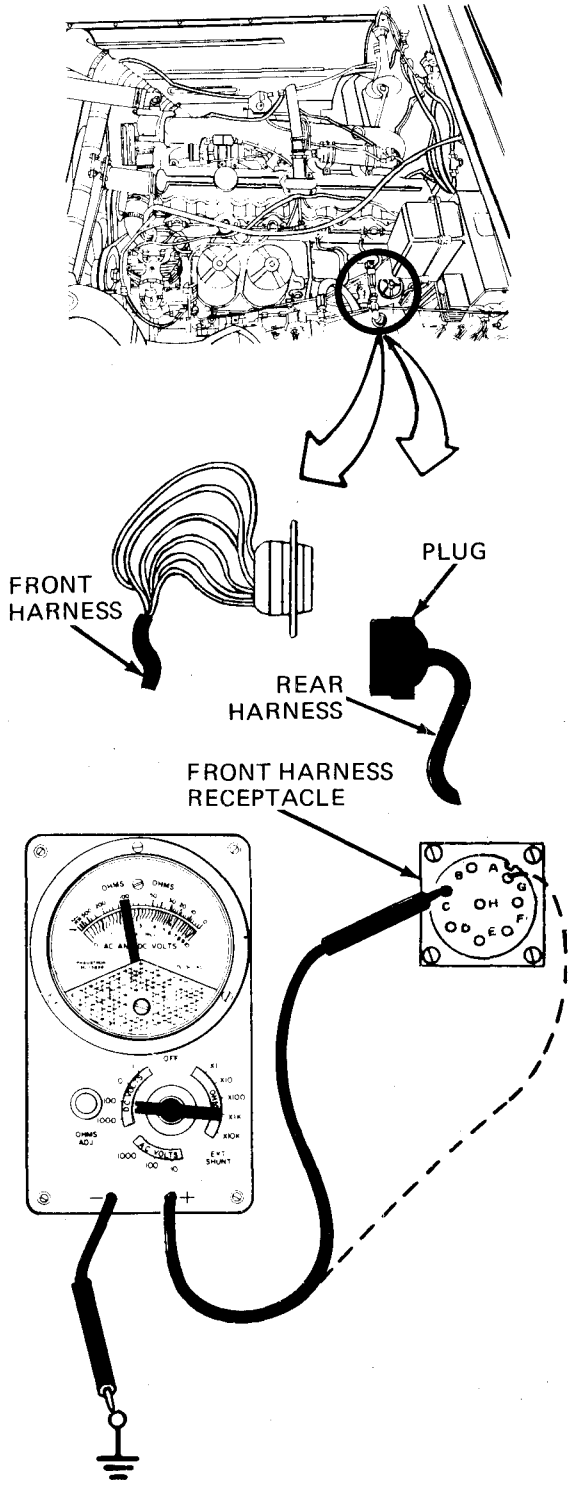
SOLDIER B • For left service stoplight put multimeter + lead on contact C in front harness receptacle. For right hand service stoplight put multimeter + lead on contact G in front harness receptacle

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)

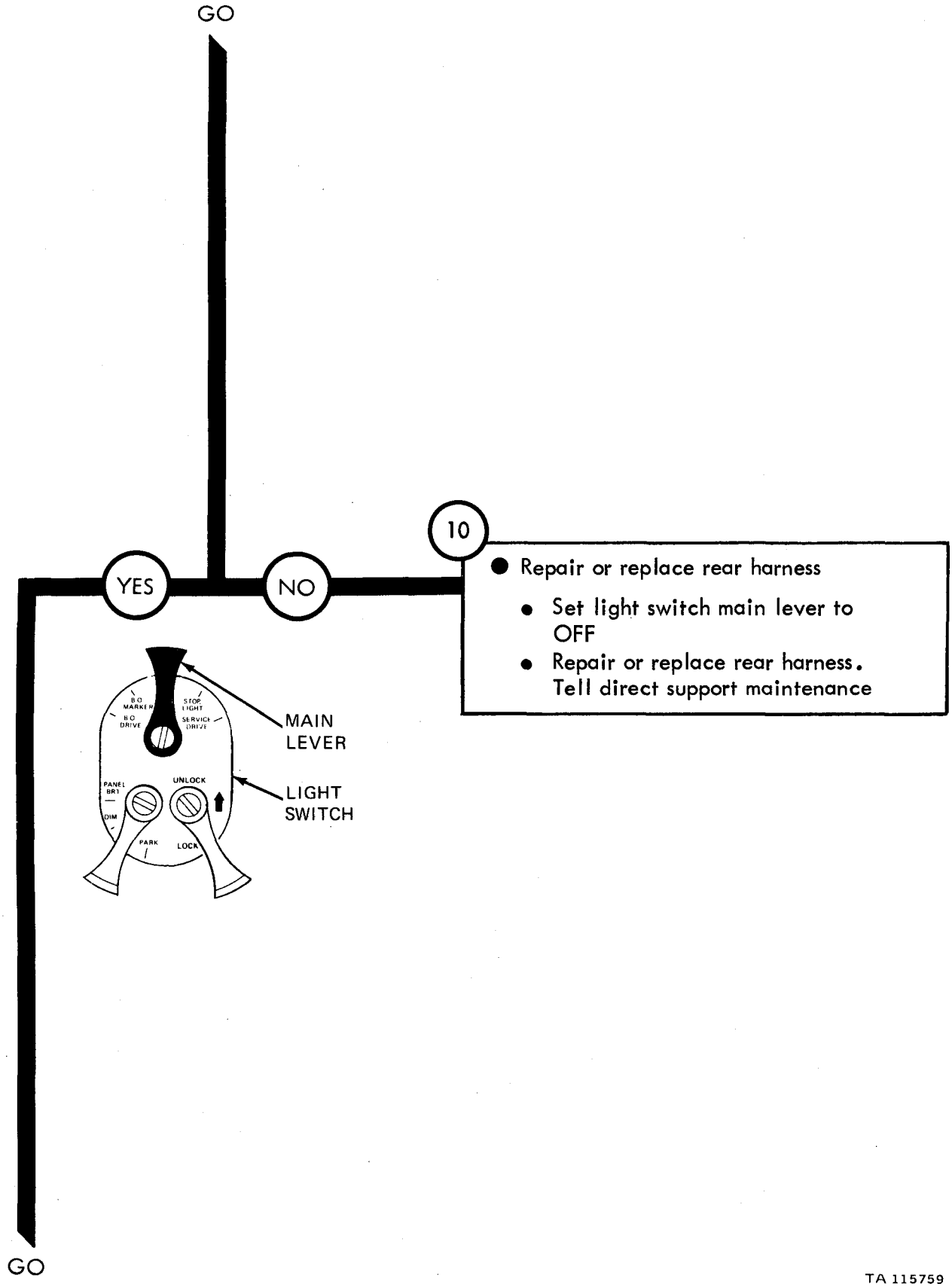


Figure 26-10 (Sheet 8 of 11)

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

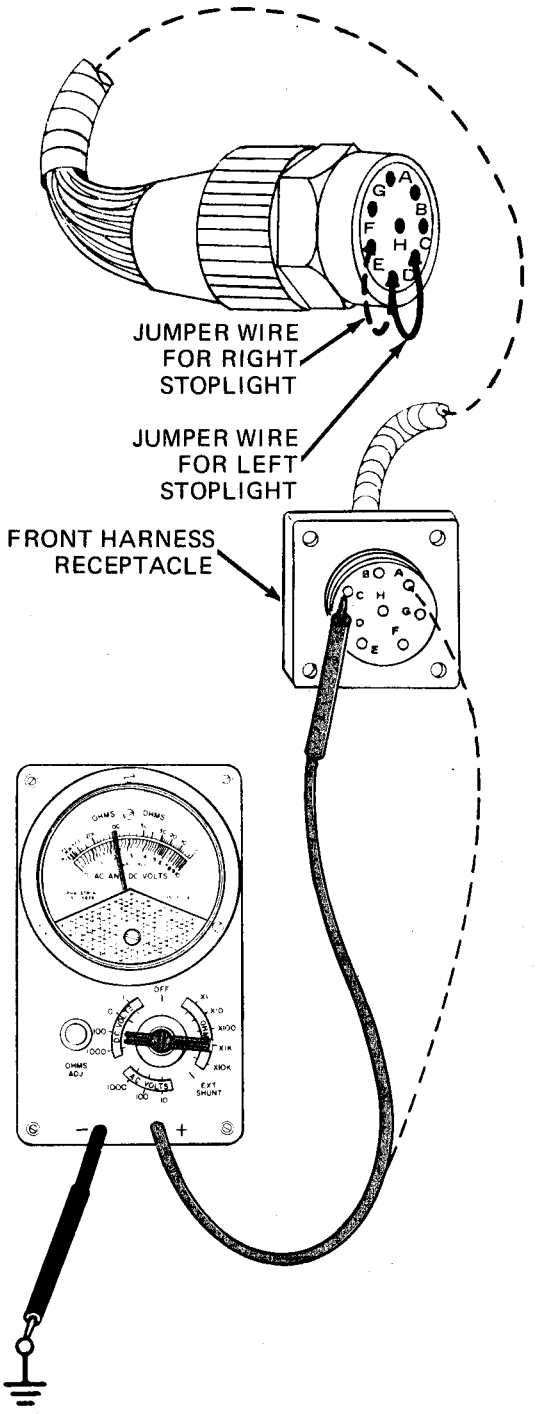
SOLDIER B
- Put multimeter - lead on a good ground
- For left service stoplight put multimeter + lead on contact C of front harness receptacle
- For right service stoplight put multimeter + lead on contact G of front harness receptacle

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



TA 115760

Figure 26-10 (Sheet 9 of 11)

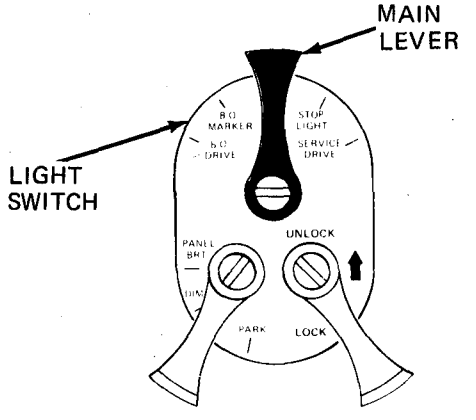
GO

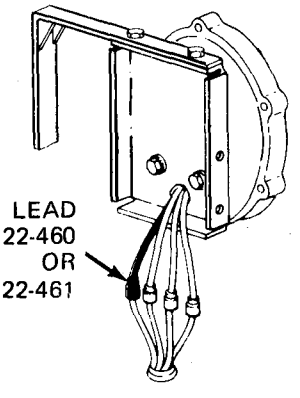
YES

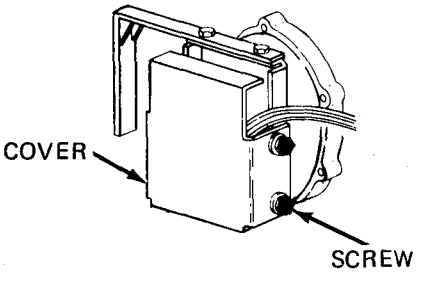
NO

12

- Repair or replace front harness
  - Set light switch main lever to OFF
  - Take off jumper wire from turn signal control assembly harness plug
  - At rear composite marker light assembly put back lead 22-460 or lead 22-461
  - Put cover back on rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers
  - Repair or replace front harness. Tell direct support maintenance







GO

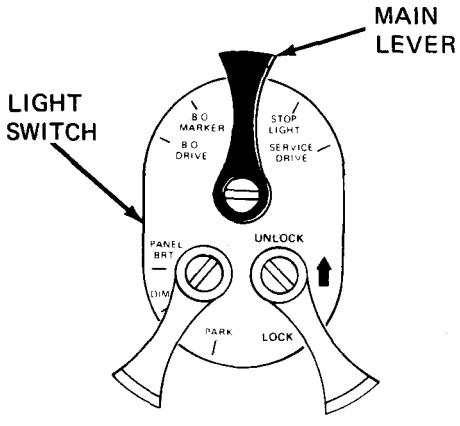
TA 115761

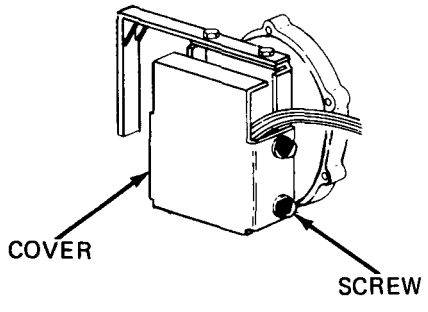
Figure 26-10 (Sheet 10 of 11)

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**

TA 115762

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

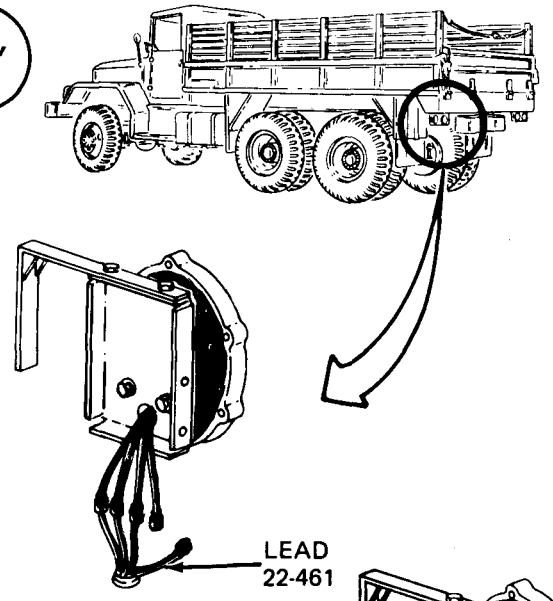
2

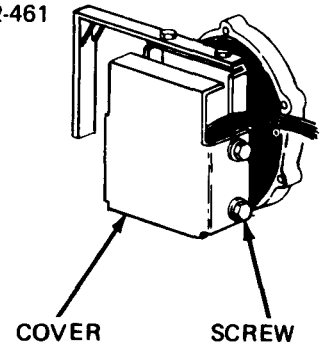
- Check for +24 volts DC at left service stoplight

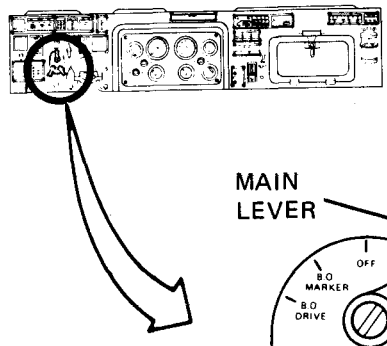
SOLDIER B
- Using 9/16-inch wrench, unscrew and take off four screws with washers from left rear composite marker assembly
- Take off cover
- Take off lead 22-461

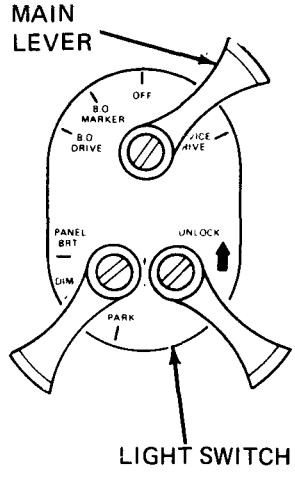
SOLDIER A
- Set light switch main lever to STOPLIGHT position
- Make sure turn signal control lever is in neutral position

GO









TA 121122

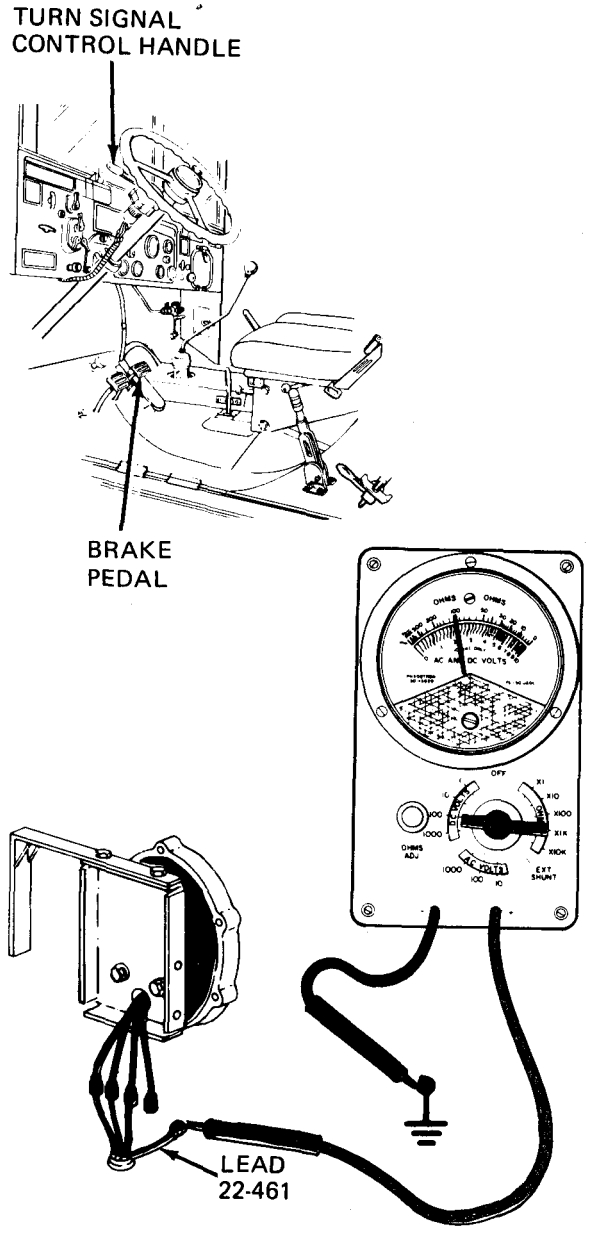
Figure 26-11 (Sheet 1 of 27)

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

TA 115763

Figure 26-11 (Sheet 2 of 27)

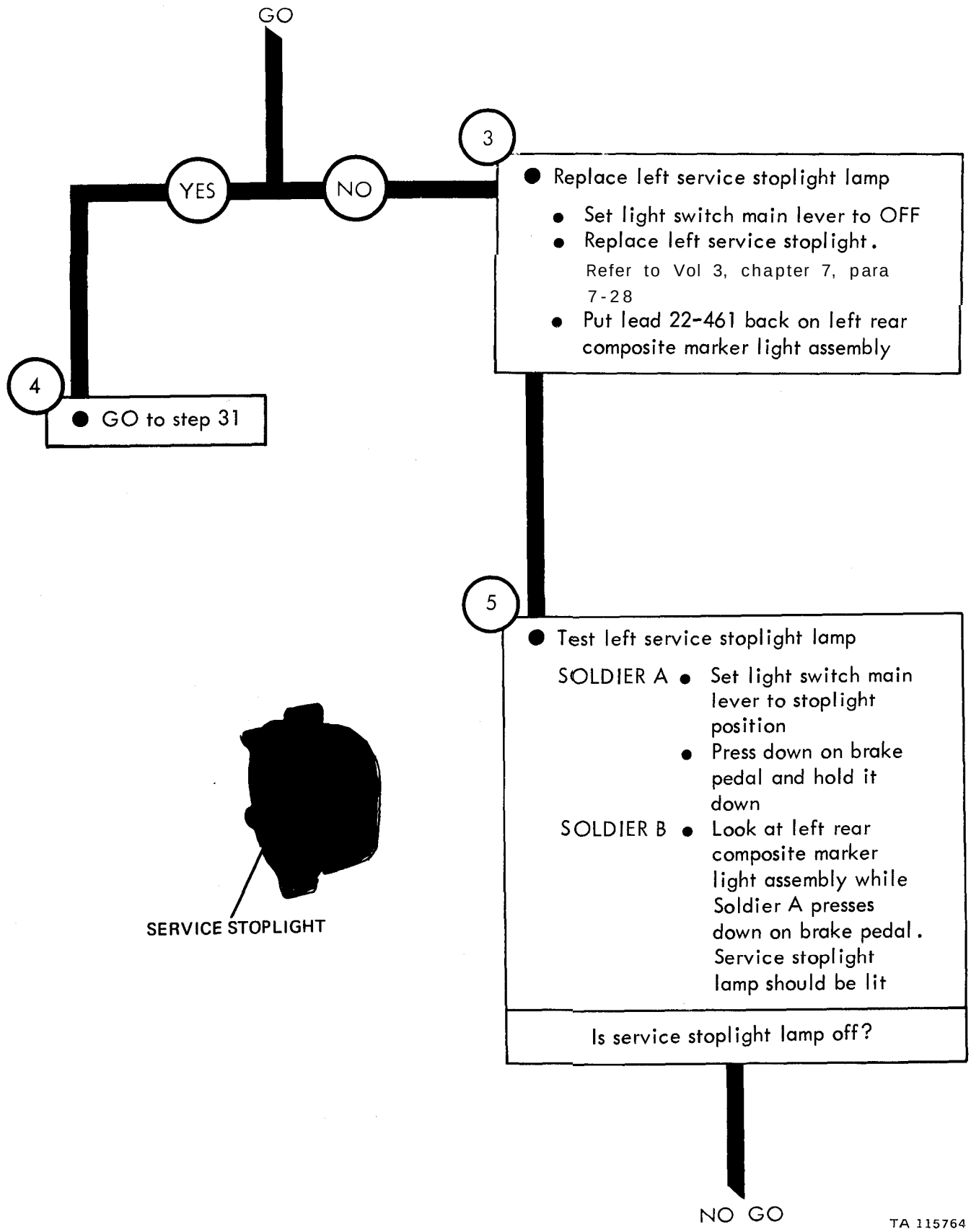


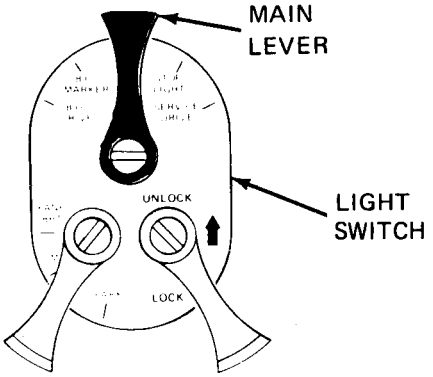
Figure 26-11 (Sheet 3 of 27)

NO GO

6

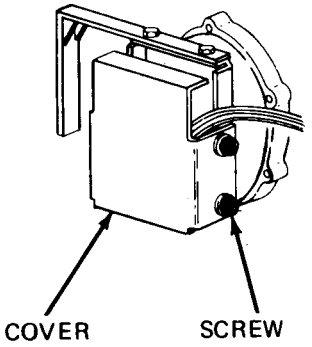
NO

- Put left rear composite marker light assembly back togehter
  - Set light switch main lever to OFF
  - Put cover back on left rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers



7

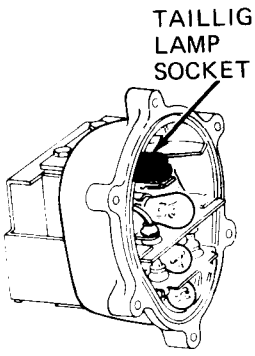
Go to step 10



8

YES

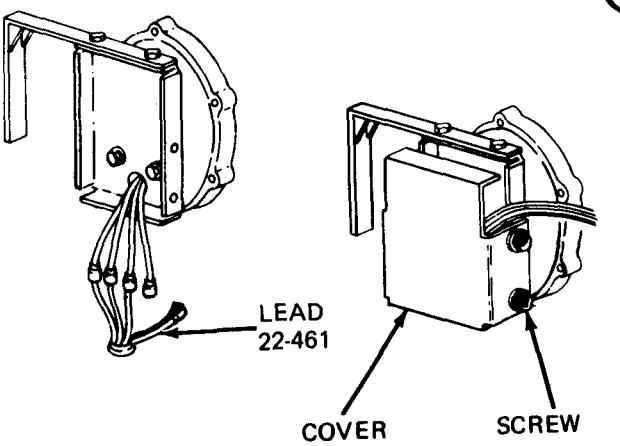
- Clean contacts of left service stoplight lamp socket
  - Set light switch main lever to OFF
  - Remove service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28
  - Clean service stoplight lamp
  - Put back service stoplight lamp. Refer to Vol 3, chapter 7, para 7-28



NO GO

TA 115765

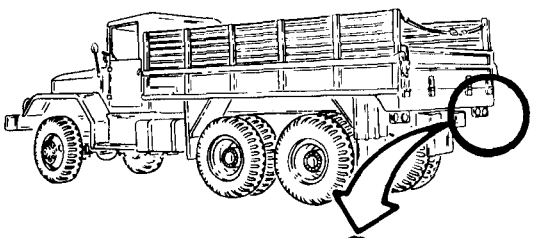
Figure 26-11 (Sheet 4 of 27)

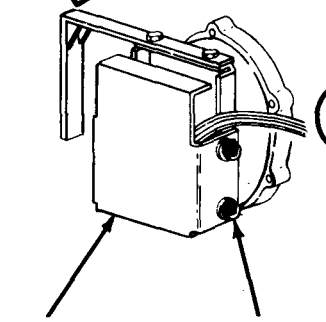


NO GO

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



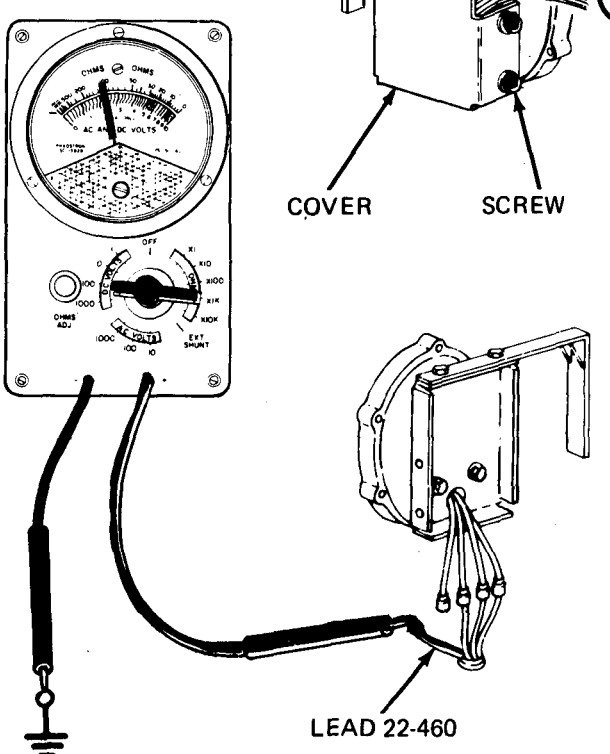


10

- 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

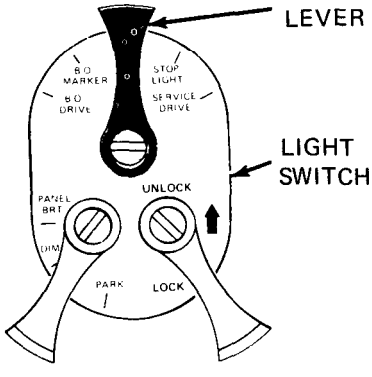
Does multimeter measure less than +24 volts DC?

YES

NO

11

- 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



12

- Go to step 17

NO GO

TA 115767

Figure 26-11 (Sheet 6 of 27)

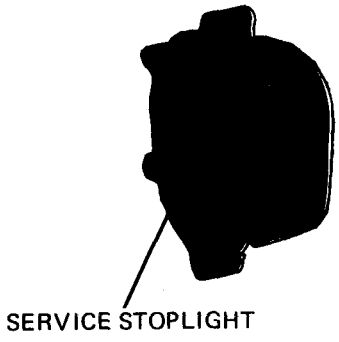
NO GO

13

- 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



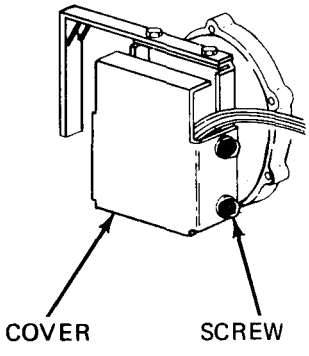
Is service stoplight lamp OFF?

YES

NO

14

- Troubleshooting completed
  - Put cover back on right rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers



NO GO

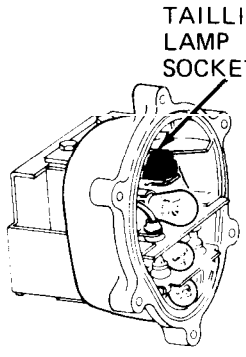
TA 115768

Figure 26-11 (Sheet 7 of 27)

NO GO

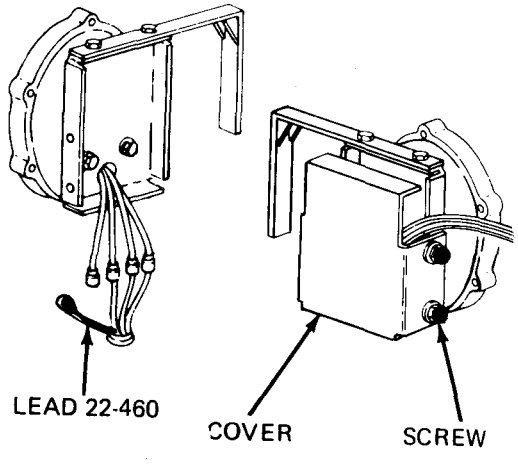
15

- 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



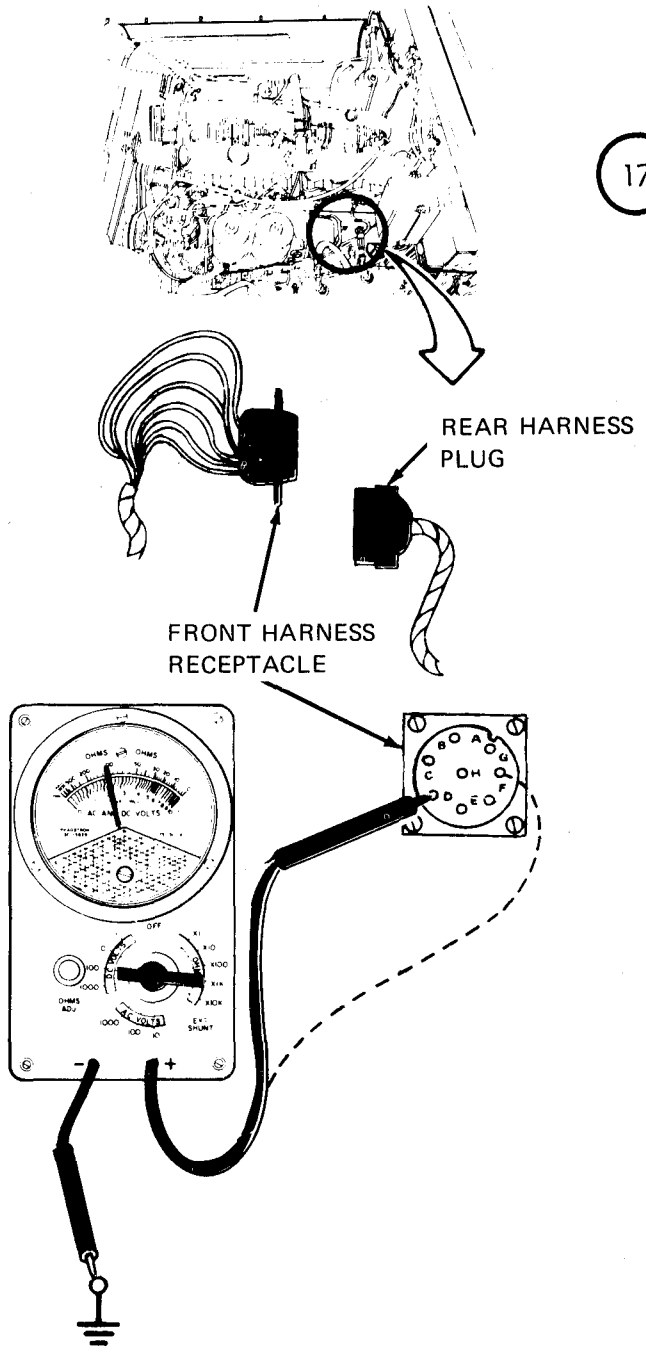
16

- 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



TA 115769

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

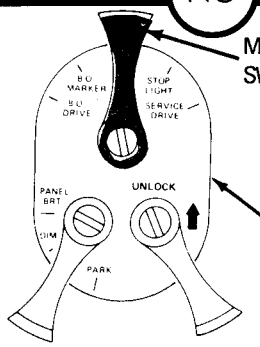
Figure 26-11 (Sheet 9 of 27)

NO GO

18

NO

MAIN SWITCH



LIGHT SWITCH

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

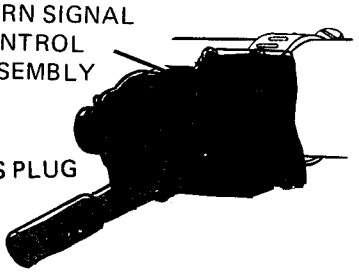
19

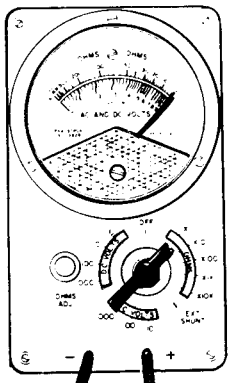
YES

- 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

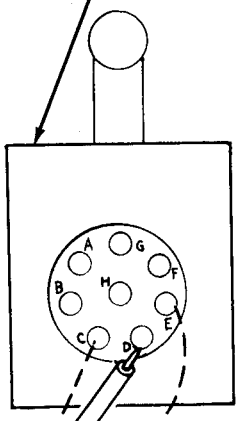
TURN SIGNAL CONTROL ASSEMBLY

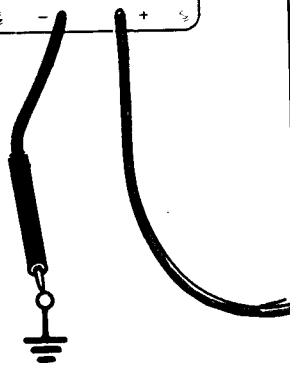
HARNESS PLUG





TURN SIGNAL CONTROL ASSEMBLY





- 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

TA 115771

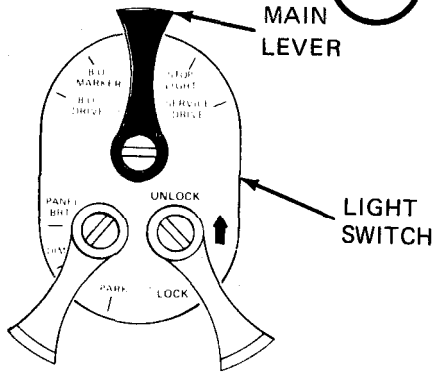
Figure 26-11 (Sheet 10 of 27)

NO GO

20

NO

- 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



21

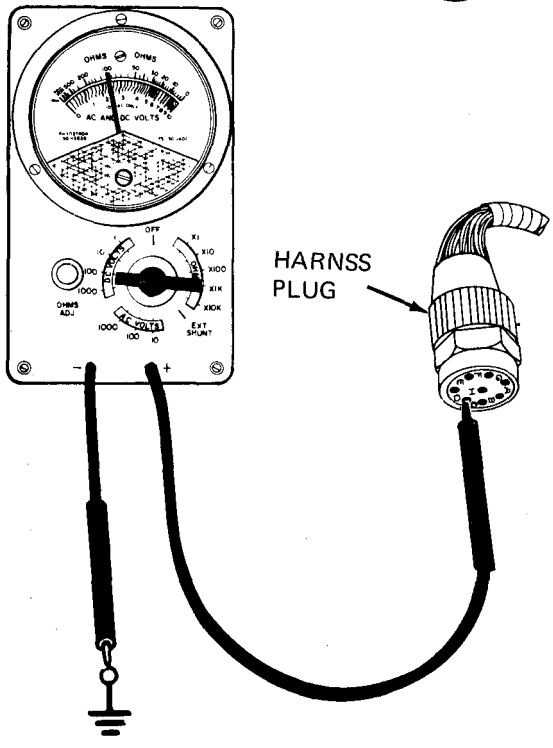
YES

- Check for +24 volts DC to control assembly directional signal

SOLDIER B
- Set multimeter to measure +24 volts DC. Refer to 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?

NO GO

TA 115772

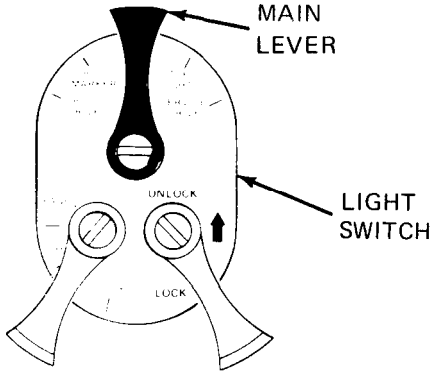
Figure 26-11 (Sheet 11 of 27)

NO GO

22

NO

- 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



23

YES

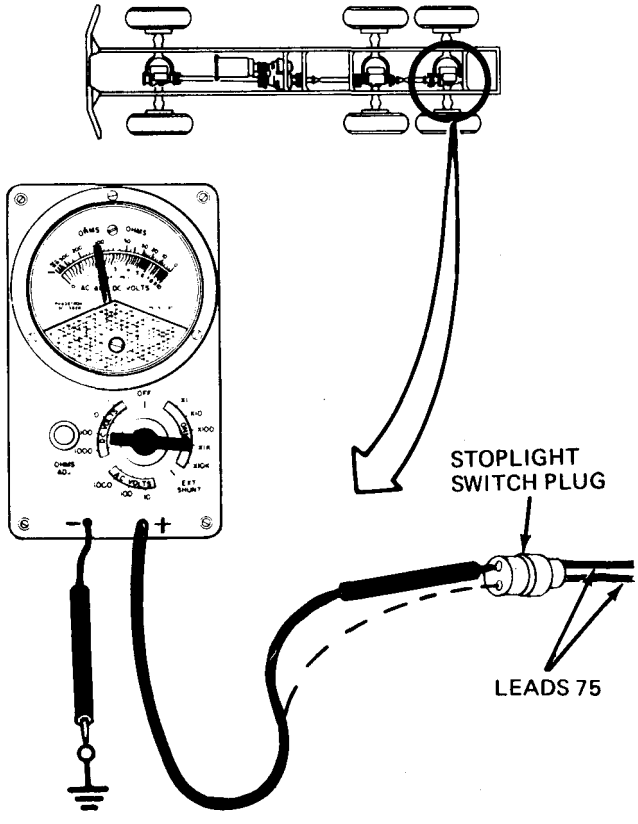
- Check stoplight switch for +24 volts DC

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

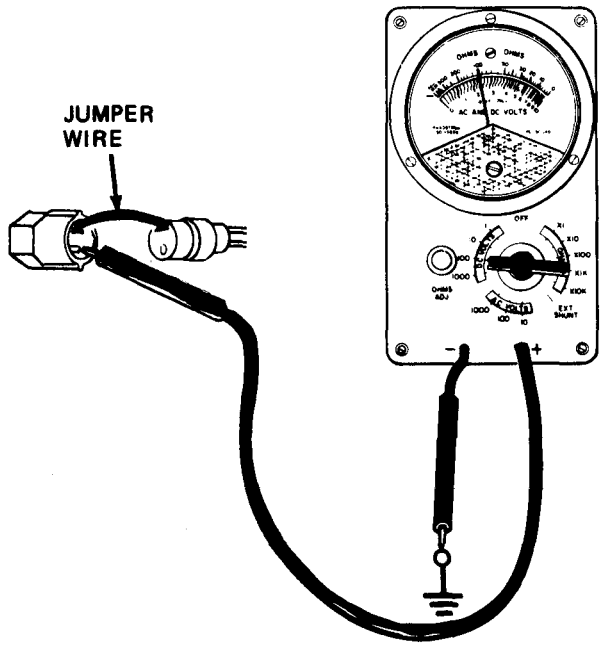
SOLDIER B • While Soldier A steps down on brake pedal put multimeter - lead on a good ground and + lead on each lead 75 and see which gives multimeter +24 volts DC reading



NO GO

TA 115773

Figure 26-11 (Sheet 12 of 27)



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

TA 115774

Figure 26-11 (Sheet 13 of 27)

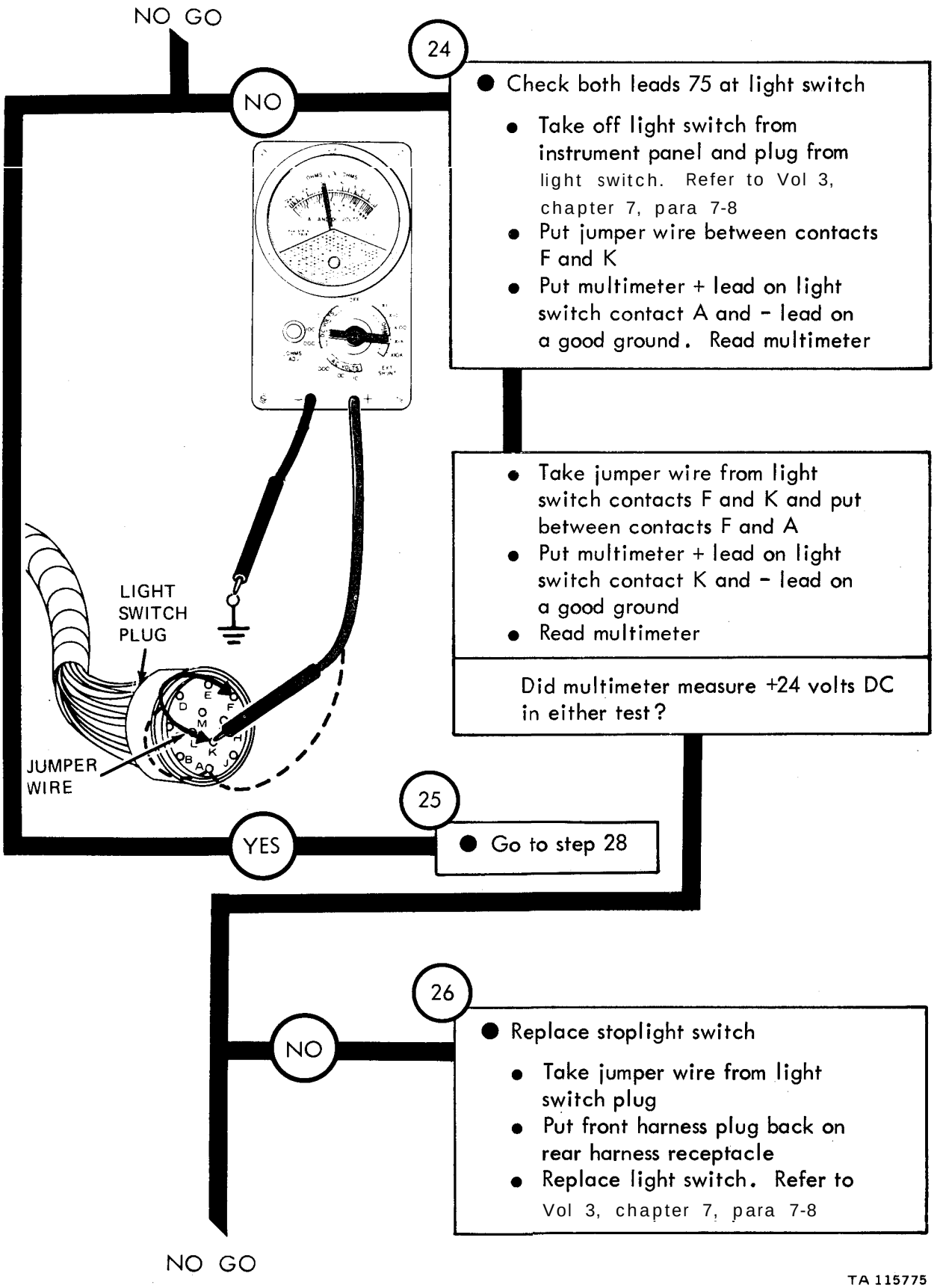


Figure 26-11 (Sheet 14 of 27)

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

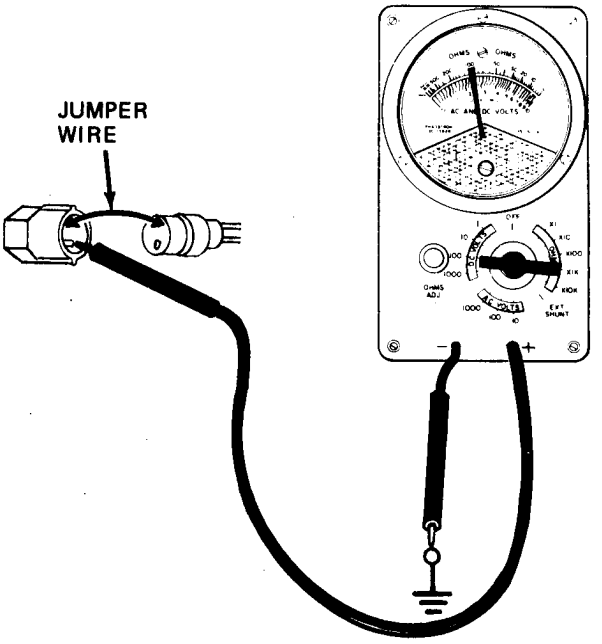
From step 25

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



TA 115776

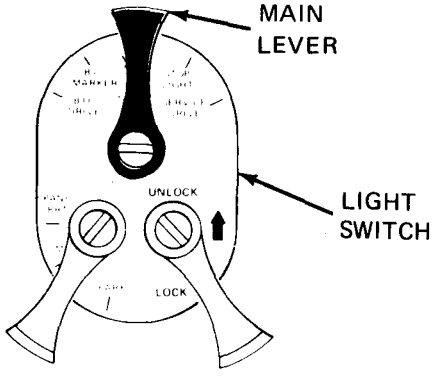
Figure 26-11 (Sheet 15 of 27)

NO GO

NO

29

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



YES

30

- Repair or replace front harness

SOLDIER A
- Set light switch main lever to OFF

SOLDIER B
- Take off jumper wire from lead 75 and contact of stoplight switch
- Put stoplight switch harness plug back on stoplight switch
- Repair or replace front harness. Tell direct support maintenance

TA 115777

Figure 26-11 (Sheet 16 of 27)

From step 4

31

- Check for +24 volts DC at right service stoplight

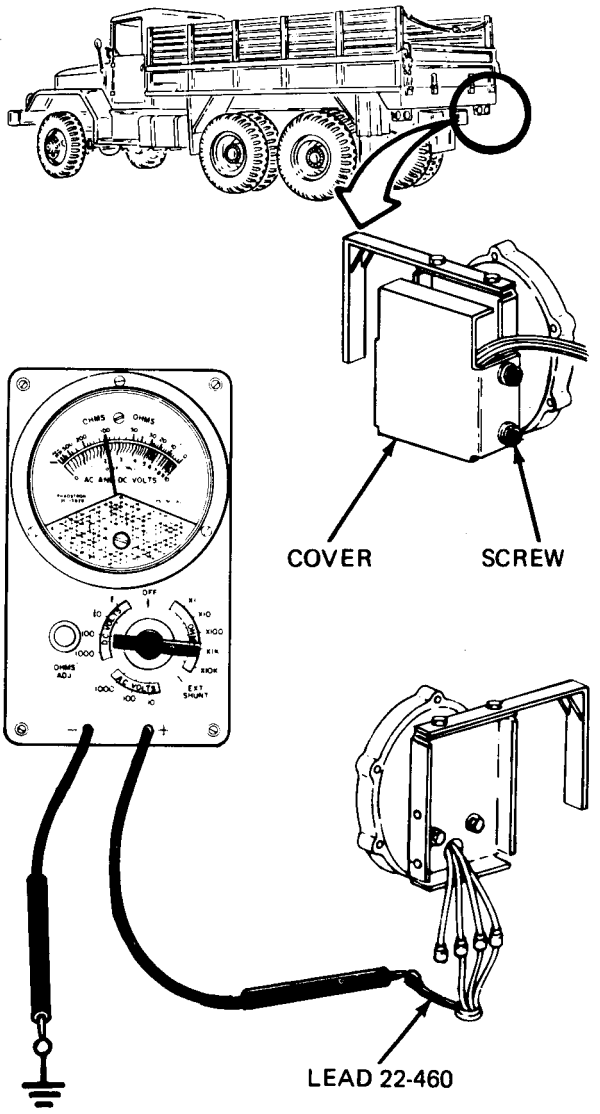
SOLDIER B
- Using 9/16-inch wrench, unscrew and take off four screws with washers from right rear composite marker assembly
- Take off cover
- Take off lead 22-460

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



TA 115778

Figure 26-11 (Sheet 17 of 27)

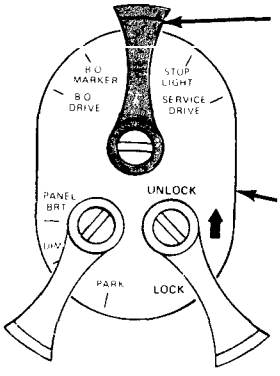
GO

YES

NO

32

- 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



33

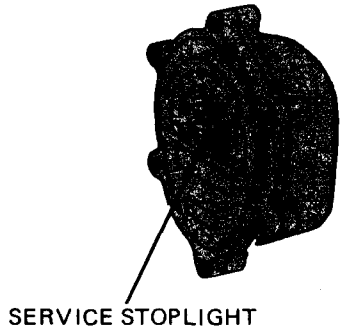
- Go to step 38

34

- 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

TA 115779

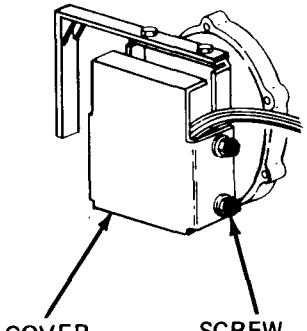
Figure 26-11 (Sheet 18 of 27)

NO GO

NO

35

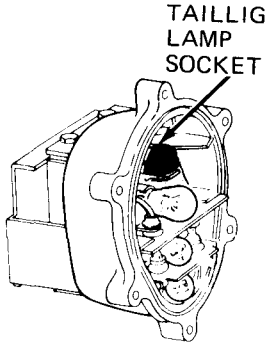
- Troubleshooting completed
  - Put cover back on right rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers



36

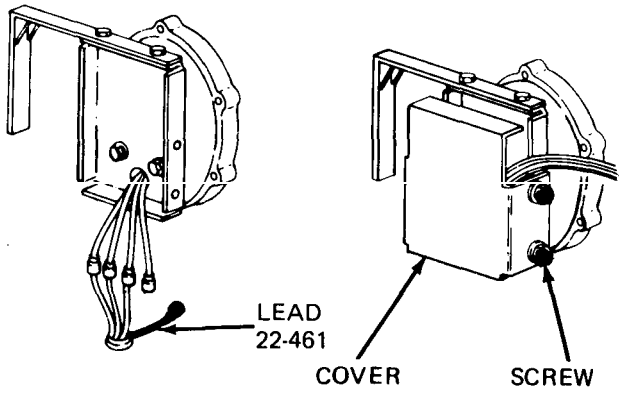
YES

- 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



37

- Clean contacts of right 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



TA 115780

Figure 26-11 (Sheet 19 of 27)

From step 33

38

- Check voltage to front harness receptacle

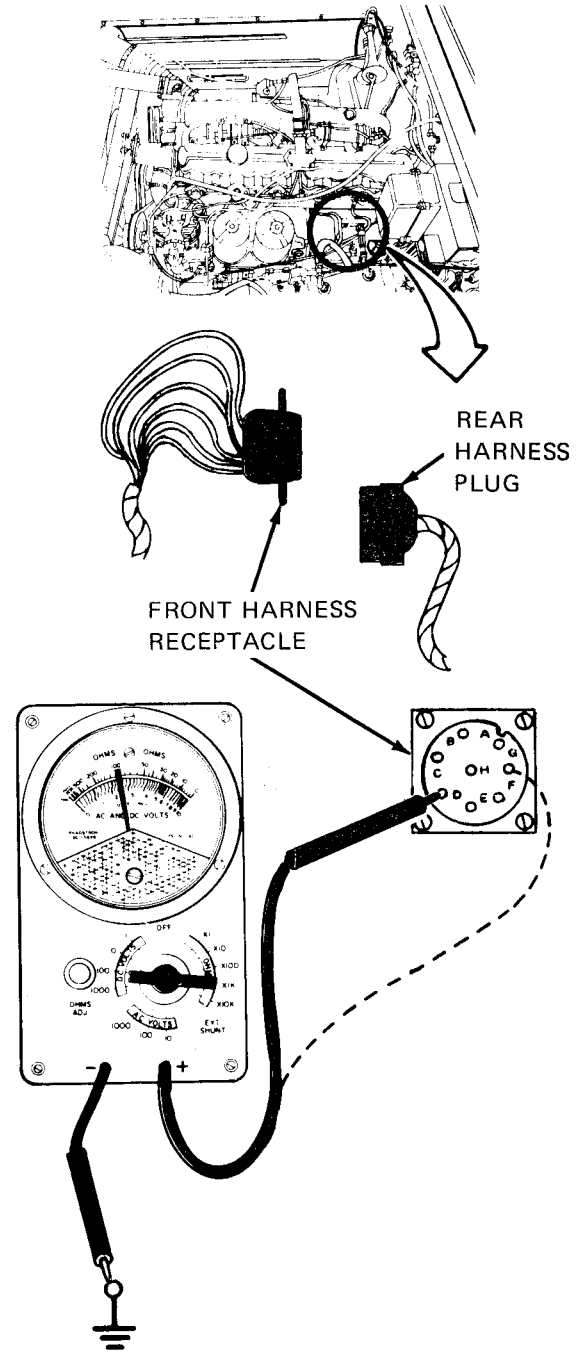
SOLDIER B
- Unscrew and take off rear harness plug from front harness receptacle
- Put multimeter – lead on a good ground
- Put multimeter + lead on contacts C and then G of front harness receptacle

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



TA 115781

Figure 26-11 (Sheet 20 of 27)

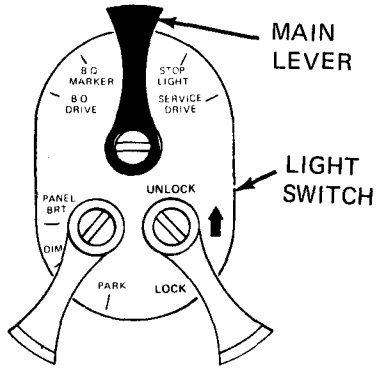
GO

YES

NO

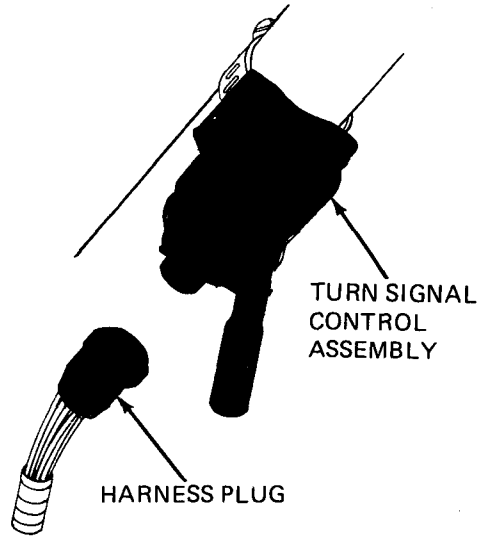
39

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

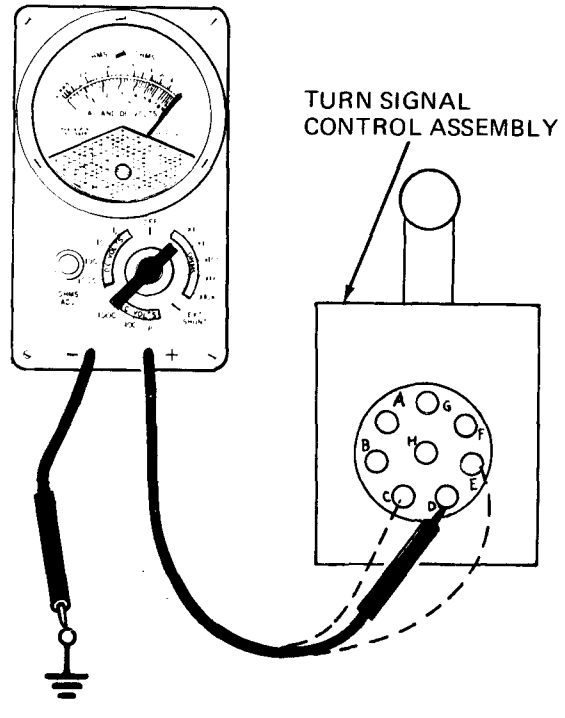


40

- 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?

GO

TA 115782

Figure 26-11 (Sheet 21 of 27)

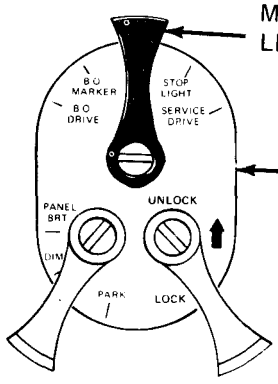
GO

YES

NO

41

- 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



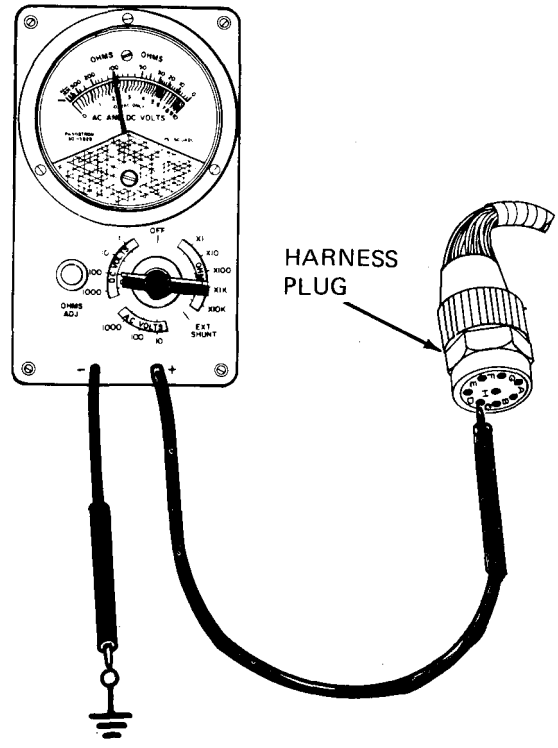
42

- 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

TA 115783

Figure 26-11 (Sheet 22 of 27)

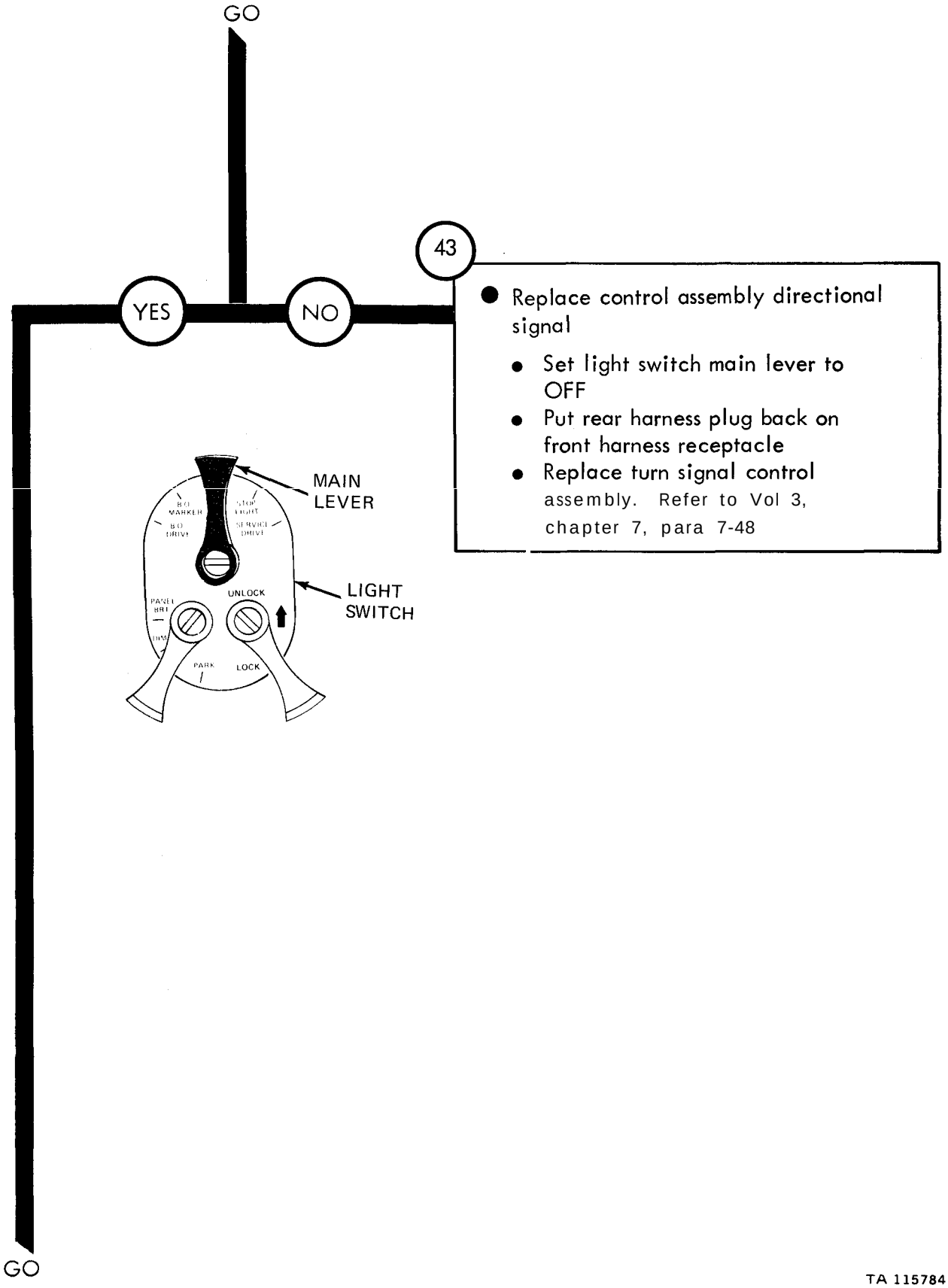


Figure 26-11 (Sheet 23 of 27)

GO

44

- 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

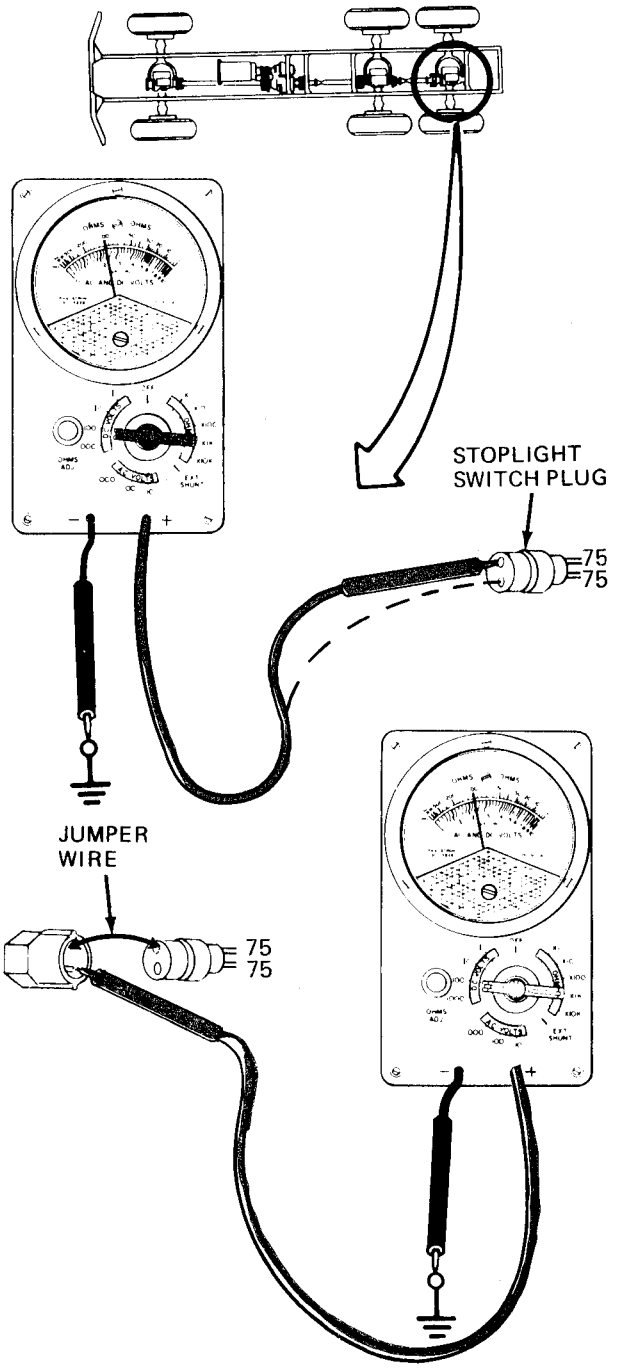
SOLDIER A
- Set light switch main lever to STOPLIGHT
- Step down on brake pedal and hold it down

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



TA 115785

Figure 26-11 (Sheet 24 of 27)

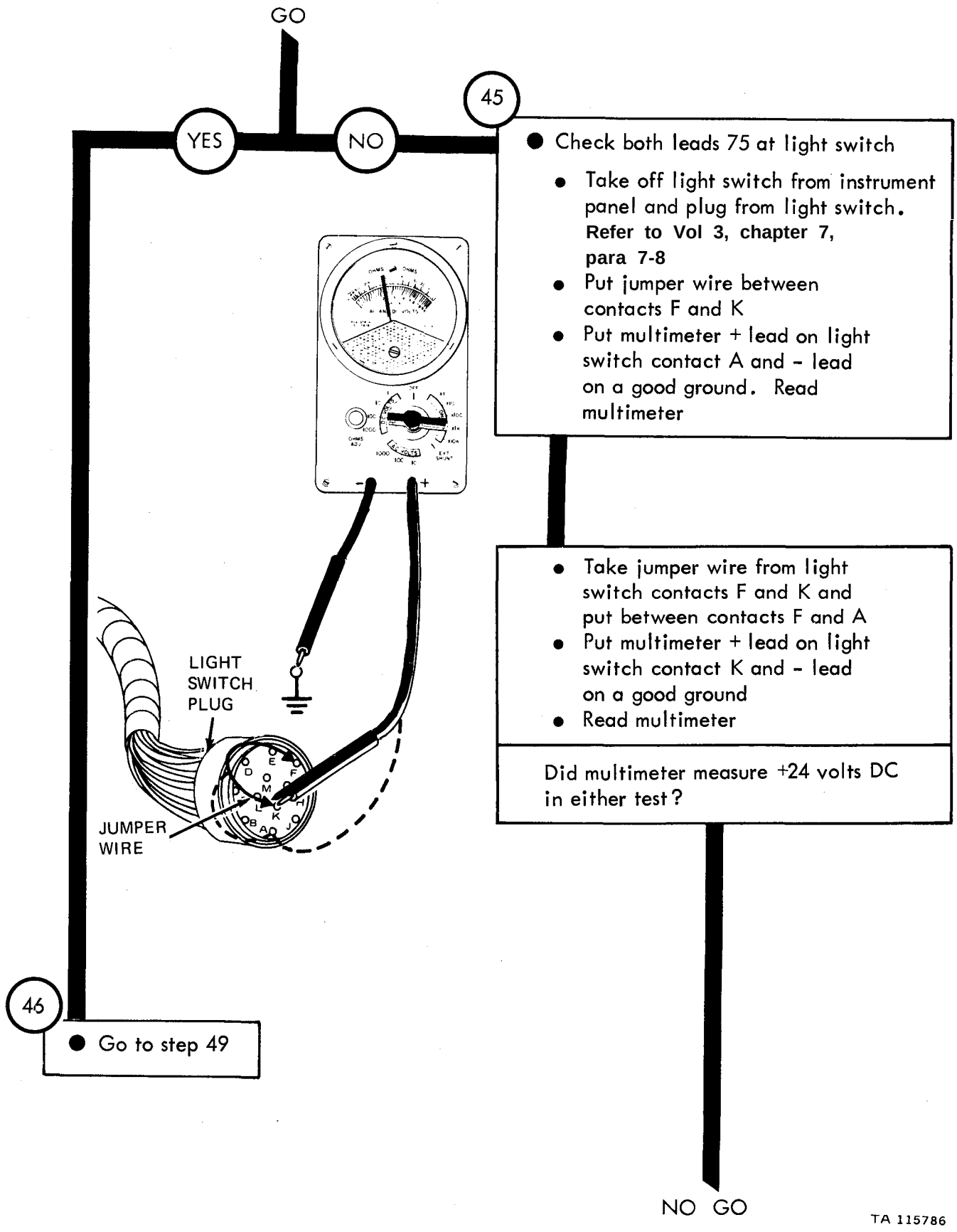


Figure 26-11 (Sheet 25 of 27)

NO GO

NO

47

- Replace light switch
  - Take jumper wire from light switch plug
  - Put front harness plug back on rear harness receptacle
  - Replace light switch. Refer to Vol 3, chapter 7, para 7-8

YES

48

- 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

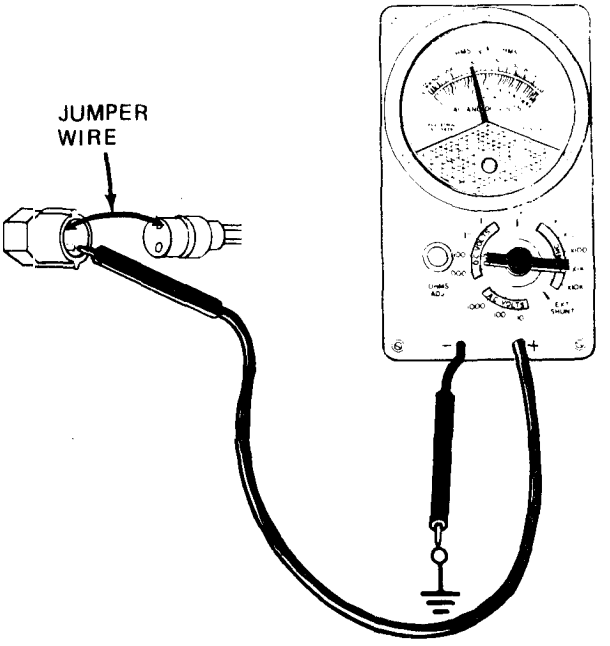
From step 46

49

- 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 - 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?

GO



TA 115787

Figure 26-11 (Sheet 26 of 27)

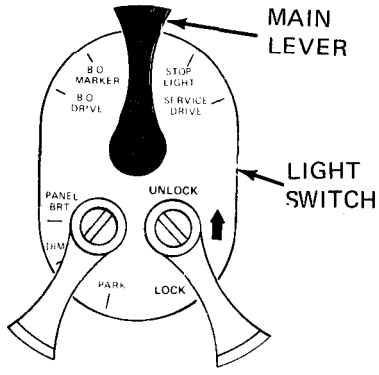
GO

YES

NO

50

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



51

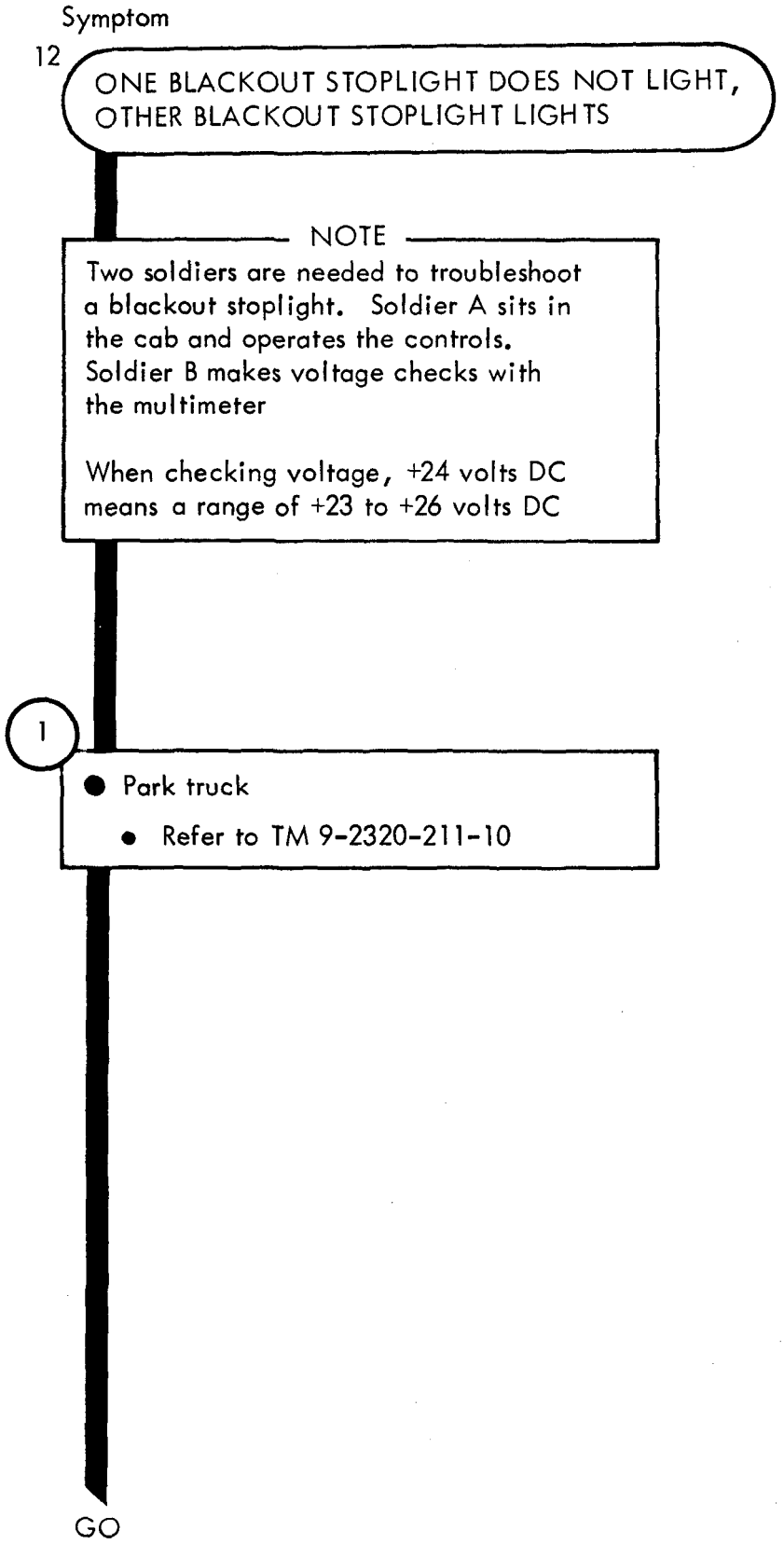
- Repair or replace front harness

SOLDIER A
- Set light switch main lever to OFF

SOLDIER B
- Take off jumper wire from lead 75 and contact of stoplight switch
- Put stoplight switch harness plug back on stoplight switch
- Repair or replace front harness. Tell
- direct support maintenance

TA 115788

Figure 26-11 (Sheet 27 of 27)



TA 115789

Figure 26-12 (Sheet 1 of 7)

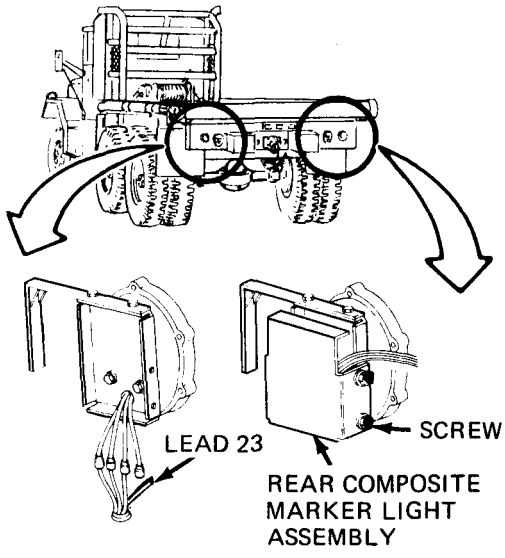
GO

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

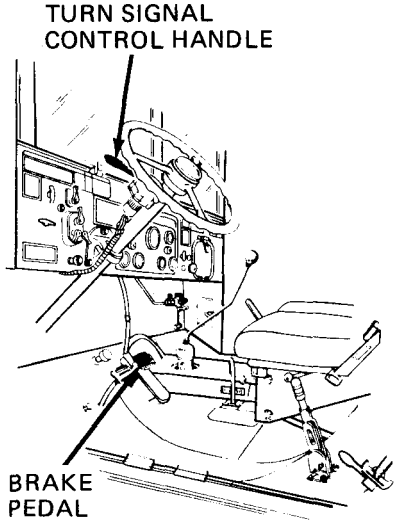


SOLDIER B
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index

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

TA 115790

Figure 26-12 (Sheet 2 of 7)

GO

YES

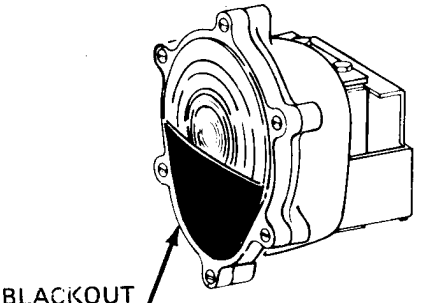
NO

3

- Replace blackout stoplight lamp
  - Set light switch main lever to OFF
  - Replace blackout stoplight lamp. **Refer to Vol 3, chapter 7, para 7-28 and 7-29**
  - Put back lead 23 at rear composite marker light assembly

4

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



5

- 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?

NO GO

TA 115791

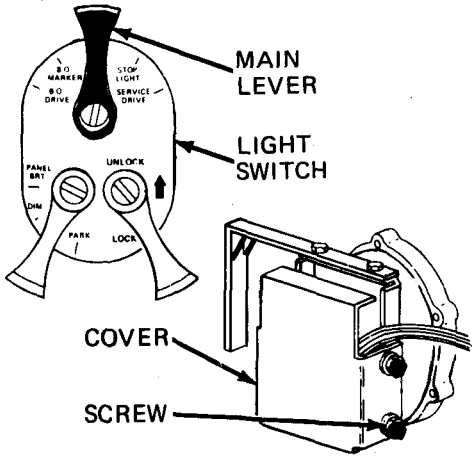
Figure 26-12 (Sheet 3 of 7)

NO GO

6

- 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

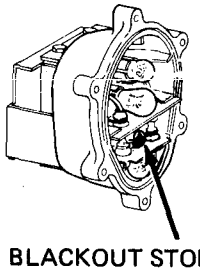
NO



7

- Clean contacts of blackout 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**
  - **Put back blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29**

YES



NO GO

TA 115792

Figure 26-12 (Sheet 4 of 7)

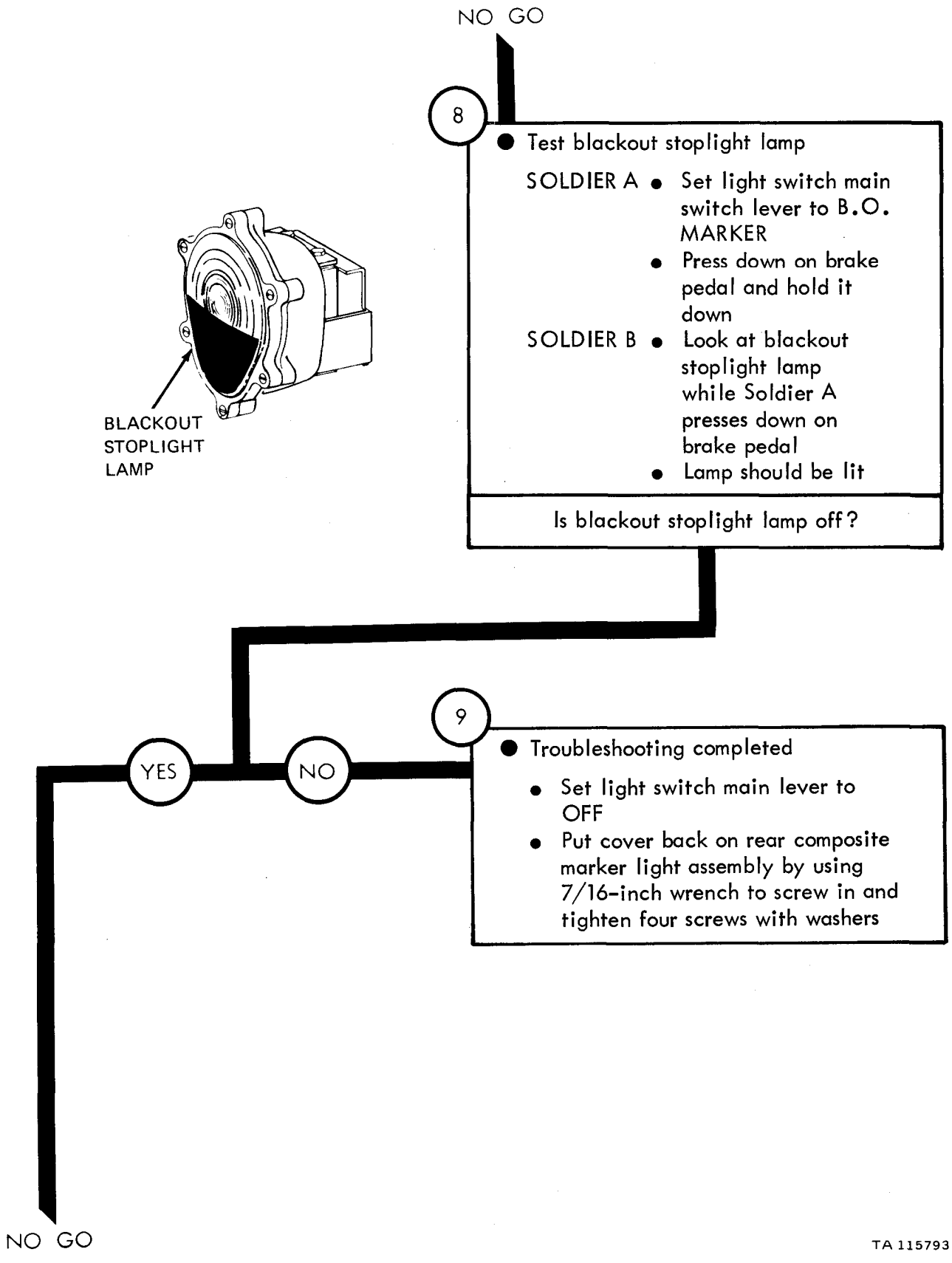
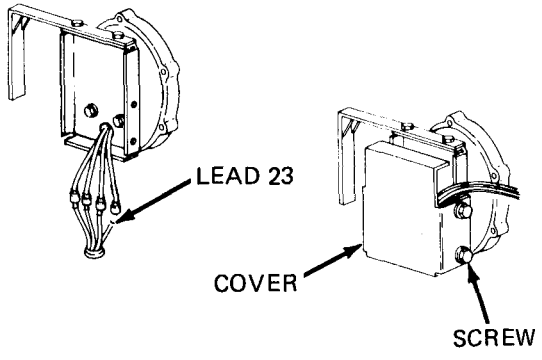


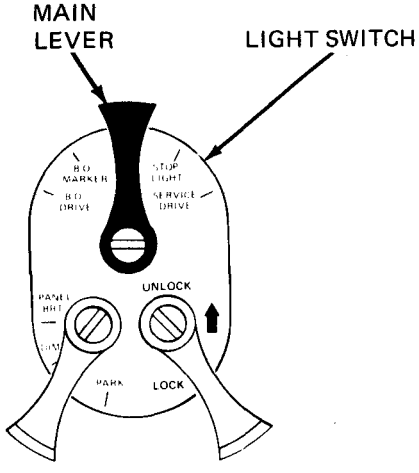
Figure 26-12 (Sheet 5 of 7)

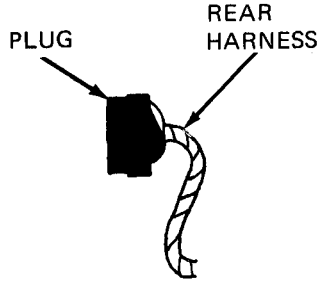
NO GO

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



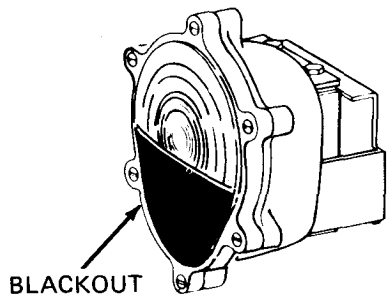




NO GO

TA 115794

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?

NO

12

- 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

13

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

TA 115795

Figure 26-12 (Sheet 7 of 7)

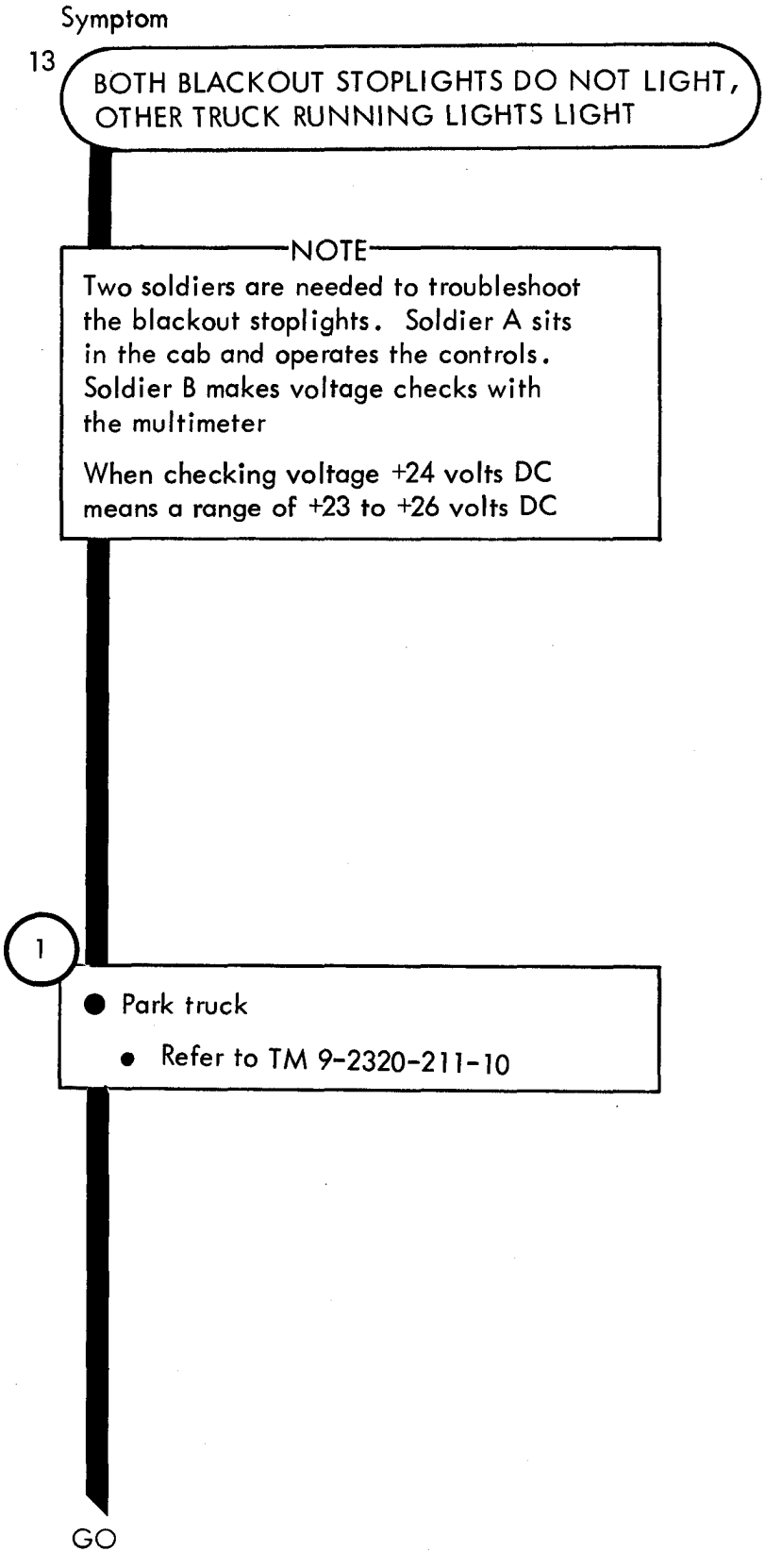


Figure 26-13 (Sheet 1 of 30)

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

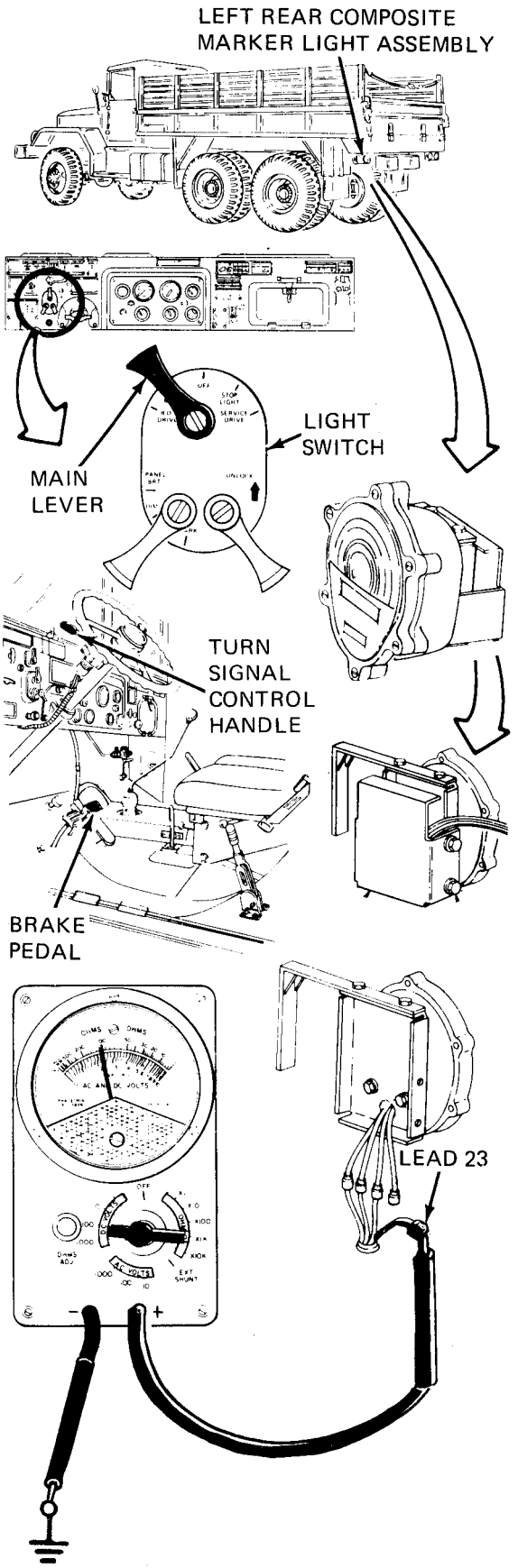
SOLDIER B
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter + lead on lead 23 and - lead on a good ground

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



TA 115797

Figure 26-13 (Sheet 2 of 30)

GO

YES

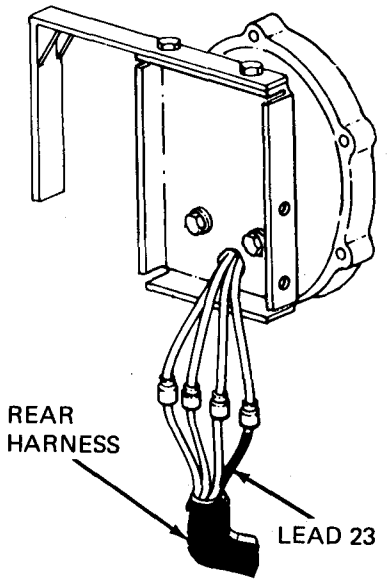
NO

3

- Replace left blackout stoplight lamp
  - Set light switch main lever to OFF
  - Replace blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Put back lead 23 at left rear composite marker light assembly

4

- Go to step 12

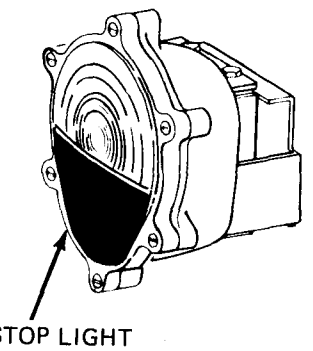


5

- 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 GO

TA 115798

Figure 26-13 (Sheet 3 of 30)

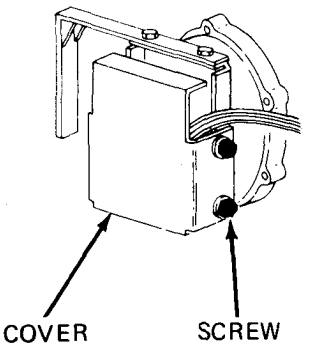
NO GO

YES

NO

6

- 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



7

- Go to step 33

NO GO

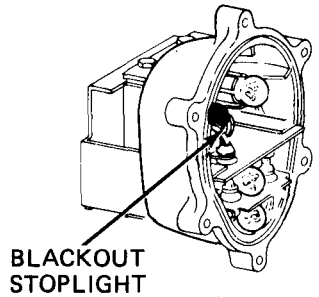
TA 115799

Figure 26-13 (Sheet 4 of 30)

NO GO

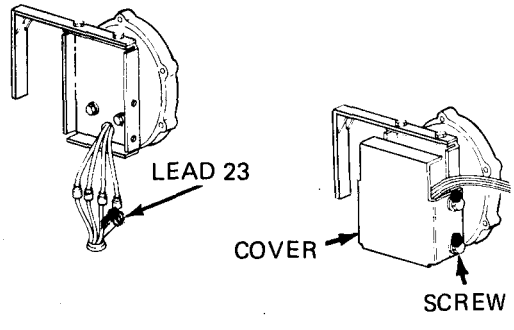
8

- 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

TA 115800

Figure 26-13 (Sheet 5 of 30)

NO GO

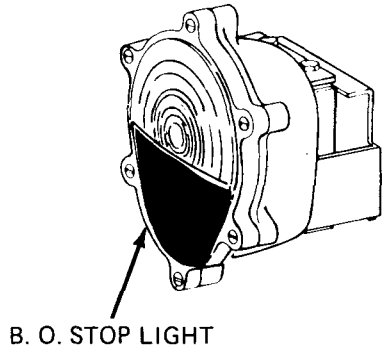
10

- 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

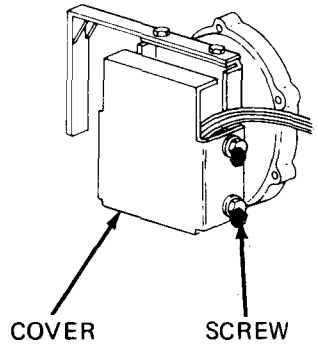
Is blackout stoplight lamp off?



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

TA 115801

Figure 26-13 (Sheet 6 of 30)

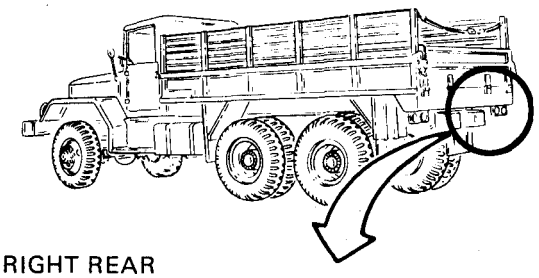
NO GO

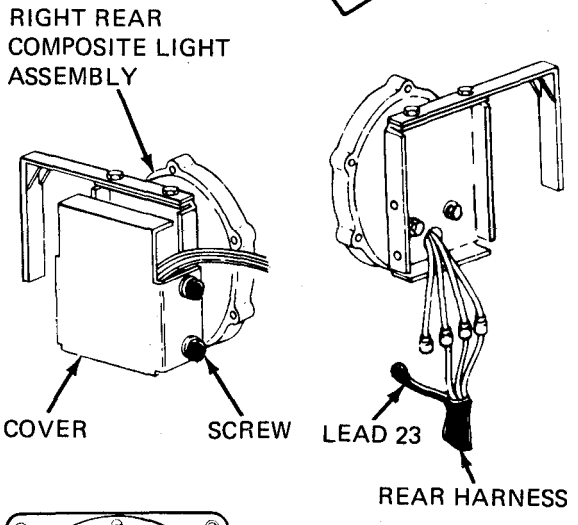
YES

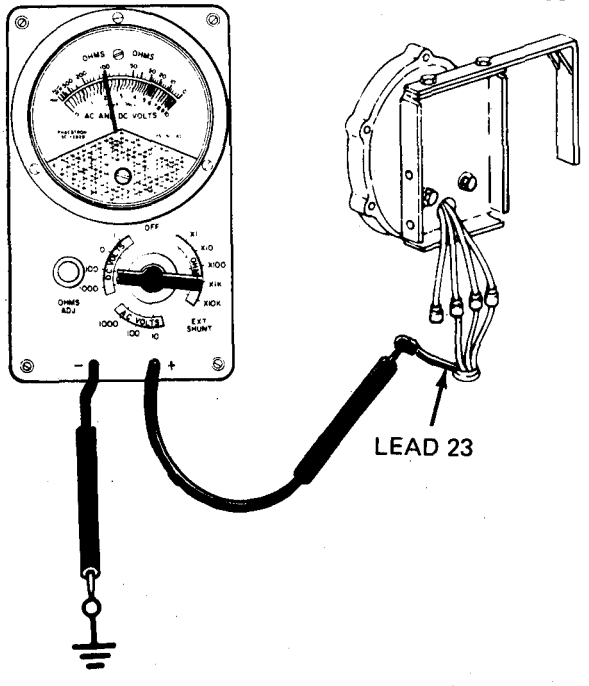
12

- 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)

GO

YES

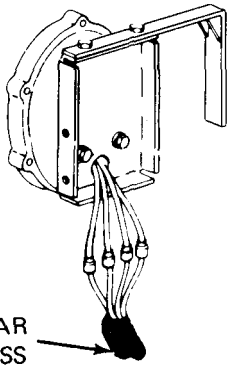
NO

14

- Go to step 19

13

- Replace right blackout stoplight lamp
  - Set light switch main lever to OFF
  - Replace blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Put lead 23 back in rear of right rear composite marker light assembly

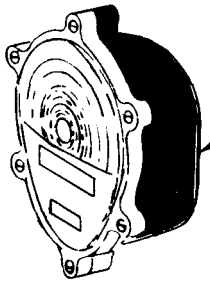


15

- Test right 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 right rear composite marker light assembly while Soldier A presses down on brake pedal. Blackout stoplight lamp should be lit



Is blackout stoplight lamp off?

NO GO

TA 115803

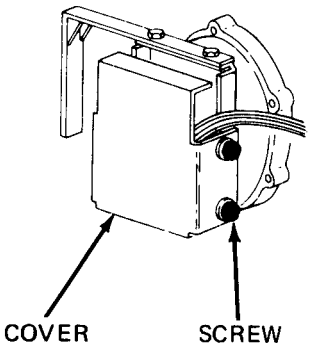
Figure 26-13 (Sheet 8 of 30)

NO GO

16

NO

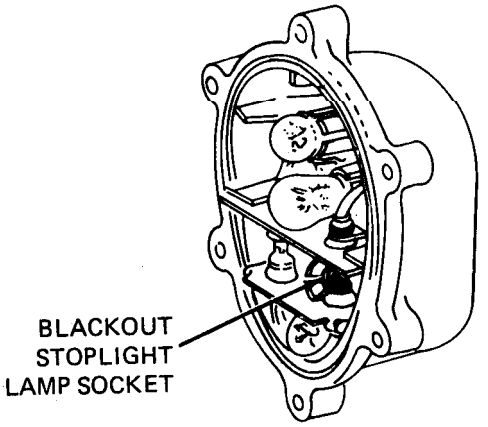
- Put right rear composite marker light assembly back together
  - Set light switch main lever to OFF
  - Put cover back on right rear composite marker assembly by using 7/16-inch wrench to screw on and tighten four screws with washers



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

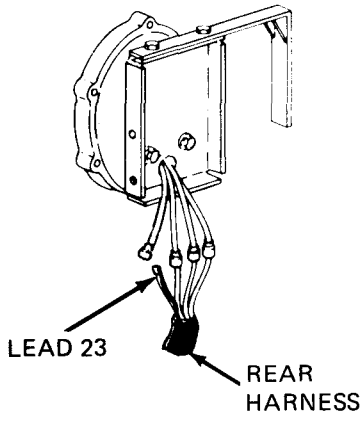
TA 115804

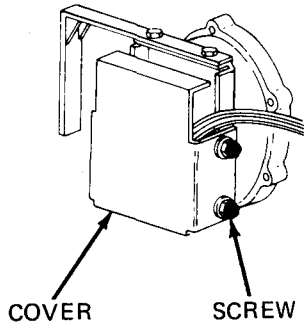
Figure 26-13 (Sheet 9 of 30)

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





TA 115805

Figure 26-13 (Sheet 10 of 30)

From step 14

19

- Check voltage to front harness receptacle

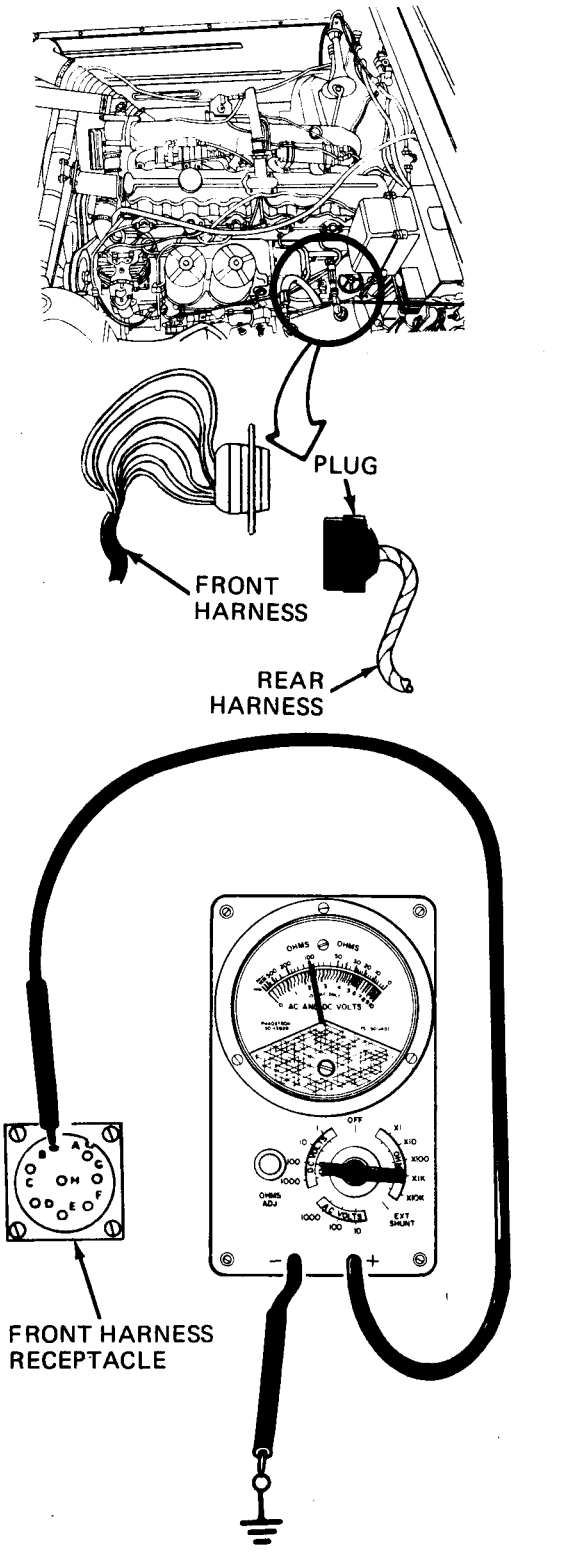
SOLDIER B
- Unscrew and take rear harness plug from dash harness receptacle

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



TA 115806

Figure 26-30 (Sheet 11 of 30)

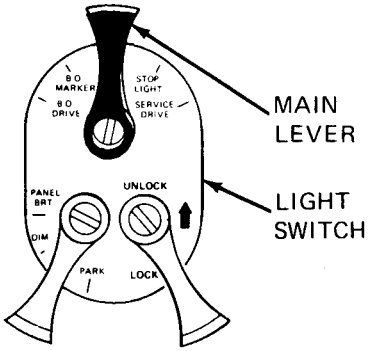
GO

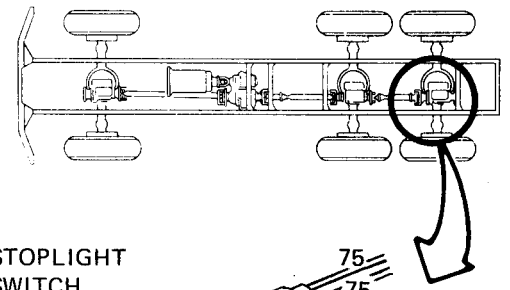
YES

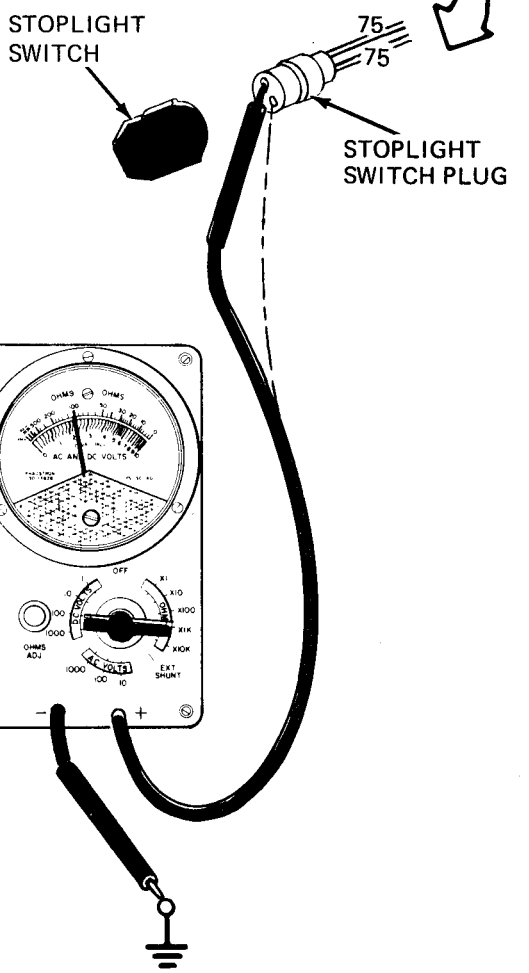
NO

20

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







21

- Check stoplight switch for +24 volts DC

SOLDIER B • Take off lead 75 connector from stoplight switch

SOLDIER A • 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
- Check which lead 75 gives +24 volts DC reading

Does multimeter measure +24 volts DC on either lead 75?

GO

TA 115807

Figure 26-13 (Sheet 12 of 30)

GO

YES

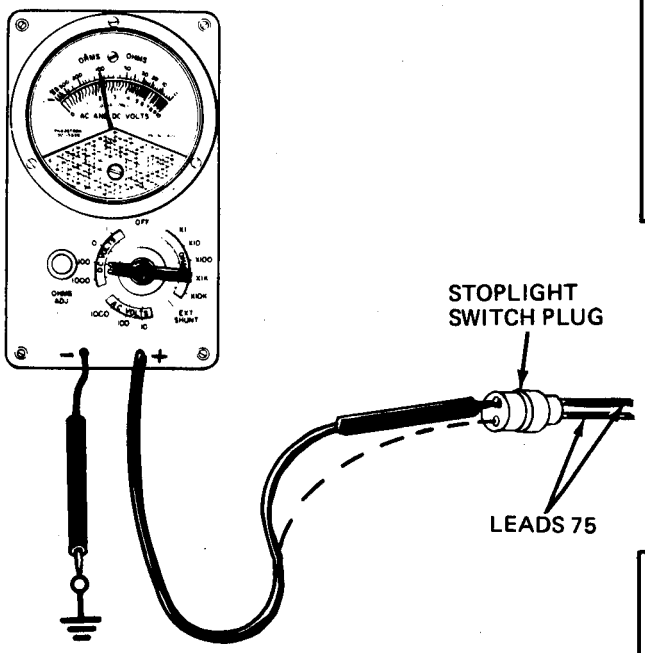
NO

23

- Go to step 26

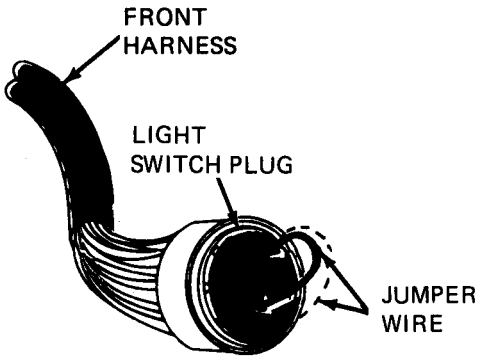
22

- 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 plug contacts F and K
  - Put multimeter + lead on each lead 75 of stoplight switch plug
  - Put multimeter - lead on a good ground
  - Read multimeter



- Take jumper wire from contacts F and K and put between contacts F and A
- Put multimeter + lead on each lead 75 of stoplight switch plug
- Put multimeter - lead on a good ground
- Read multimeter

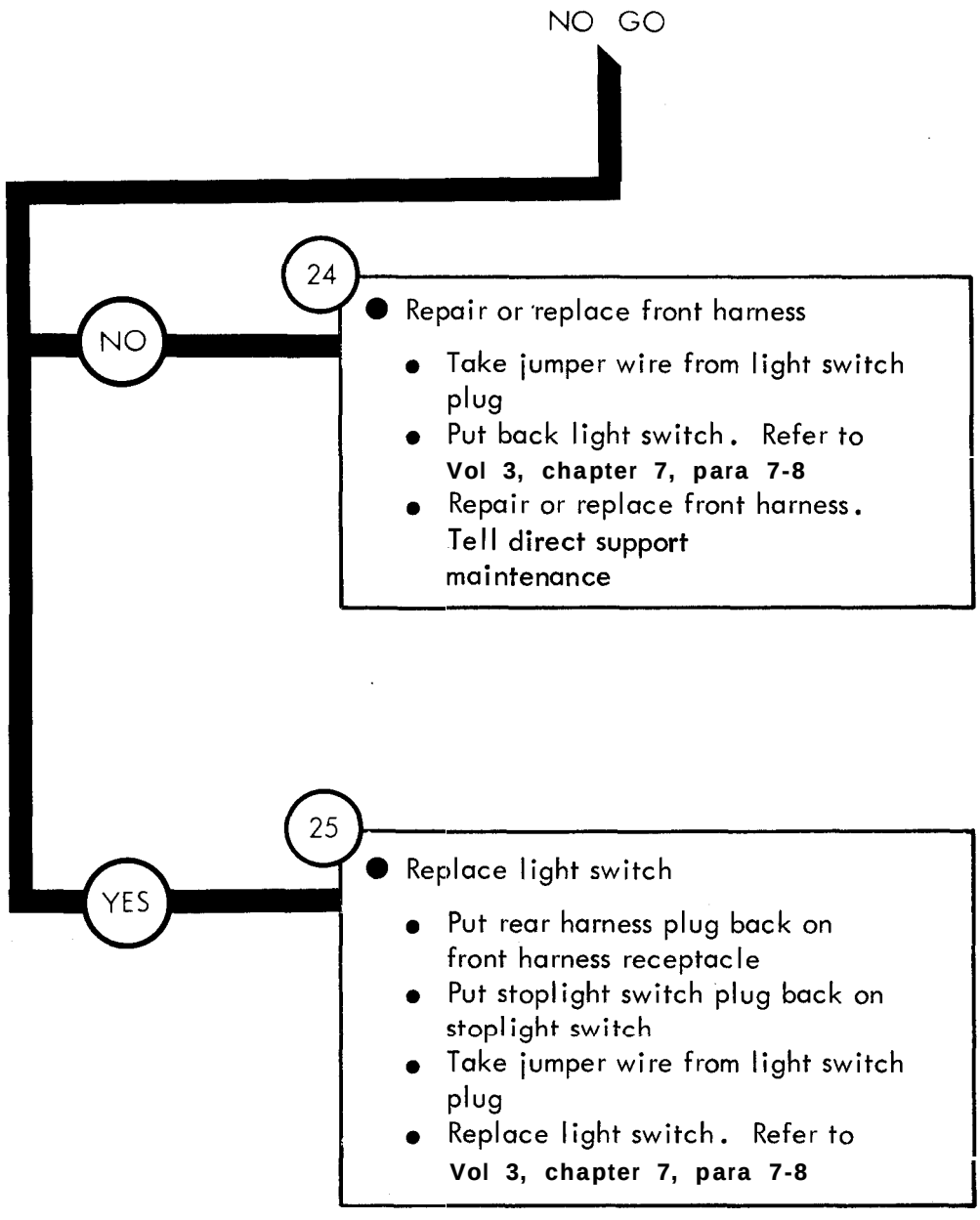
Did multimeter measure +24 volts DC in either test?



NO GO

TA 115808

Figure 26-13 (Sheet 13 of 30)



TA 115809

Figure 26-13 (Sheet 14 of 30)

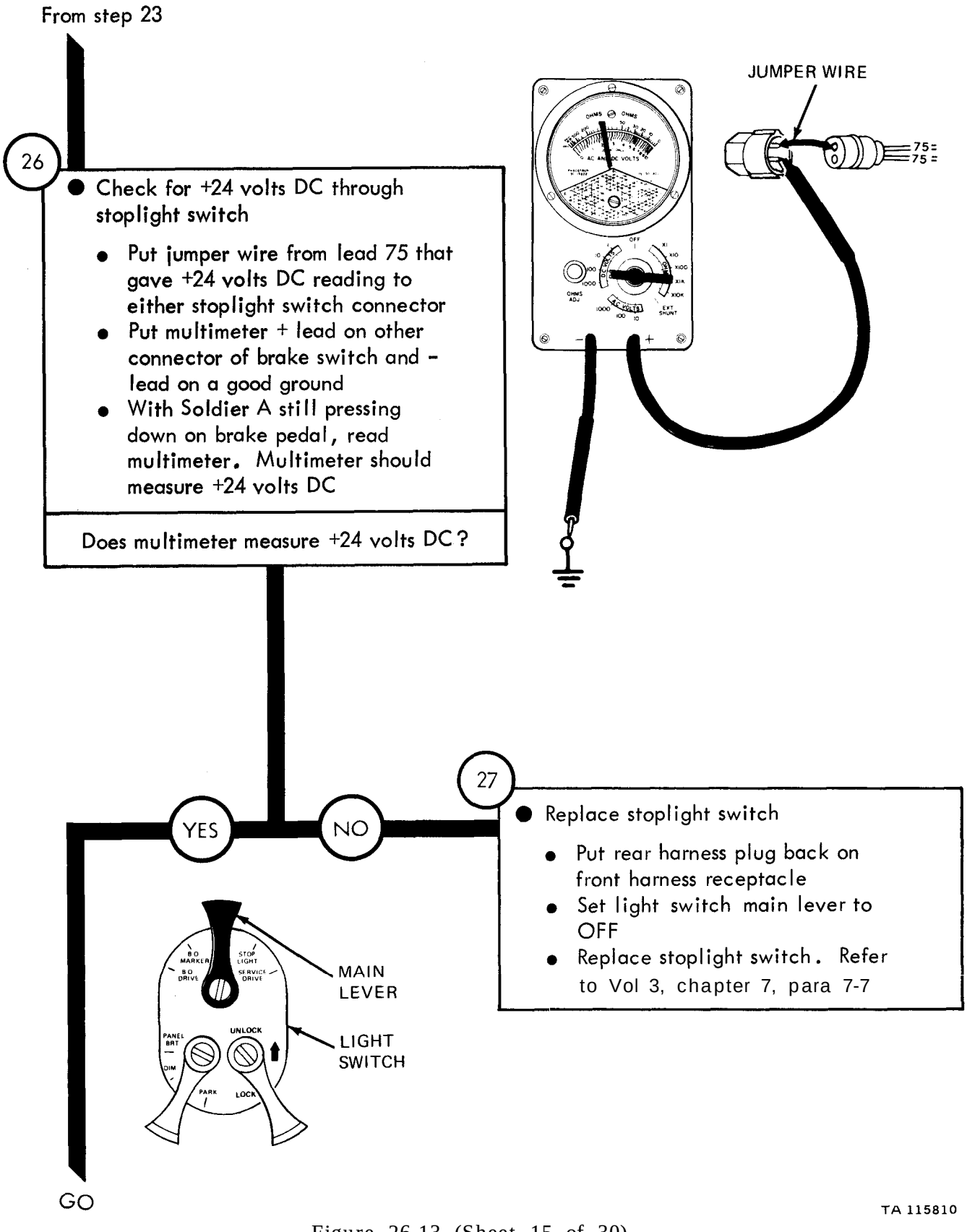


Figure 26-13 (Sheet 15 of 30)

GO

28

- Repair or replace front harness

SOLDIER B
- Take off jumper wire from lead 75 contactor 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)

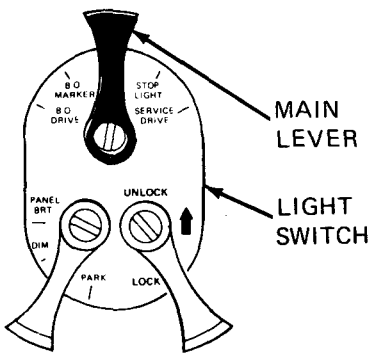
Are blackout stoplight lamps off?

YES

NO

29

- Troubleshooting completed
- Set light switch main lever to OFF



GO

TA 115811

Figure 26-13 (Sheet 16 of 30)

GO

30

- 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?

GO

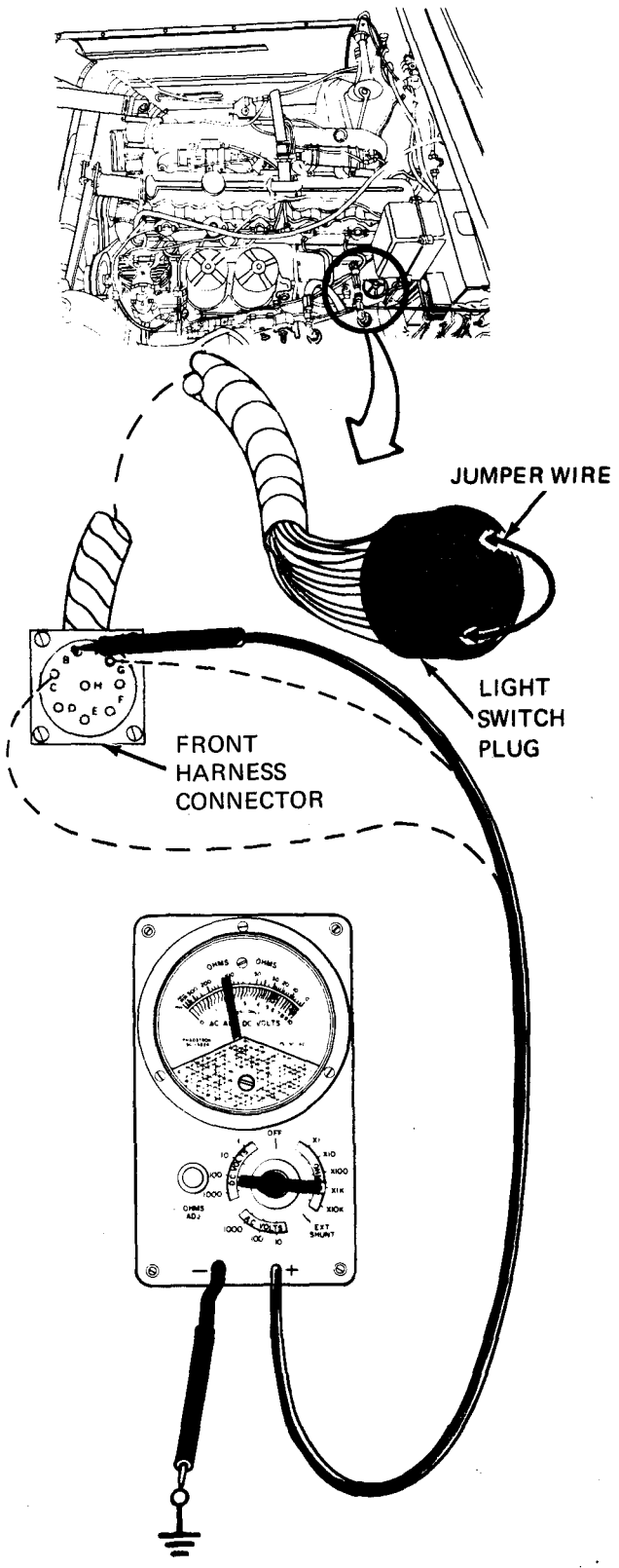


Figure 26-13 (Sheet 17 of 30)

GO

YES

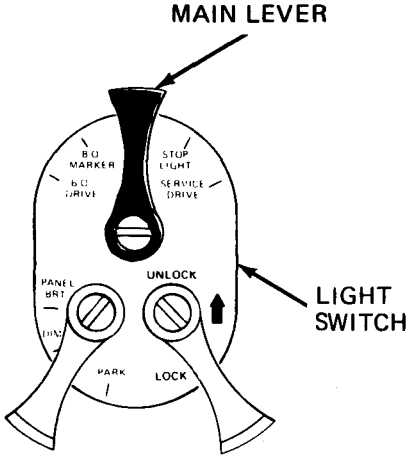
NO

31

- Repair or replace front harness
  - Set light switch main lever to OFF
  - Take off jumper wire from light switch plug
  - Repair or replace front harness. Tell direct support maintenance

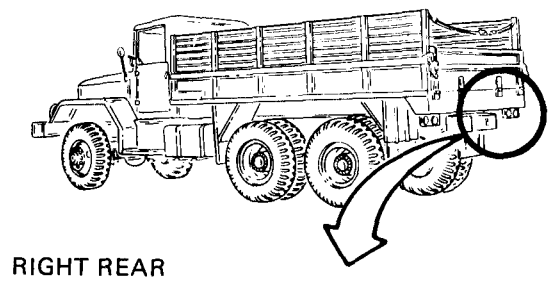
32

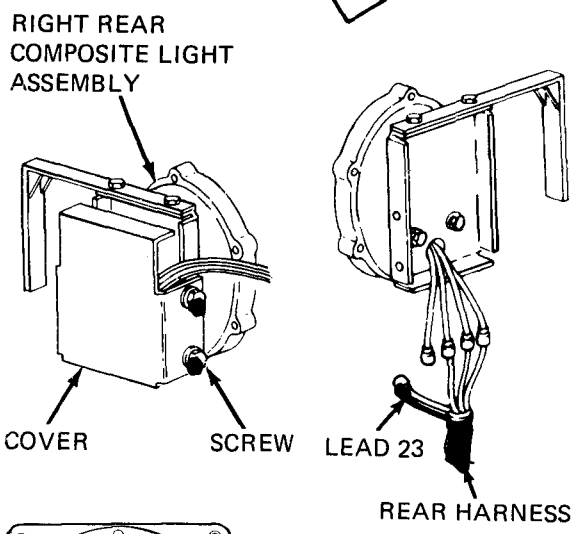
- Replace light switch
  - Set light switch main lever to OFF
  - Take off jumper wire from light switch plug
  - Put front harness plug back on rear harness receptacle
  - Replace light switch. Refer to **Vol 3, chapter 7, para 7-8**

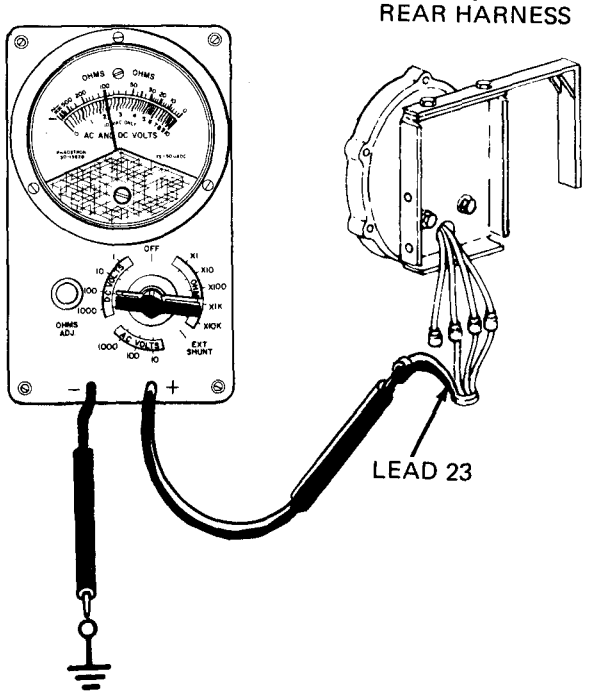


TA 115813

Figure 26-13 (Sheet 18 of 30)







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?

NO GO

TA 115814

Figure 26-13 (Sheet 19 of 30)

GO

YES

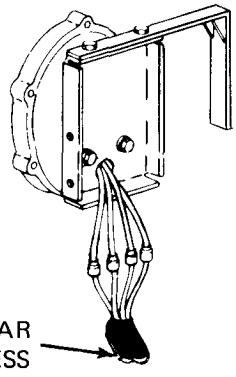
NO

35

● Go to step 40

34

● Replace right blackout stoplight lamp
- Set light switch main lever to OFF
- Replace blackout stoplight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
- Put lead 23 back in rear of right rear composite marker light assembly

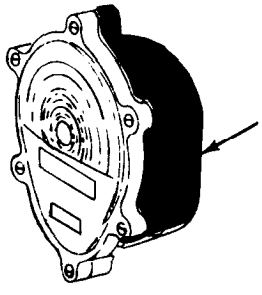


36

● Test right 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 right rear composite marker light assembly while Soldier A presses down on brake pedal. Blackout stoplight lamp should be lit



Is blackout stoplight lamp off?

NO GO

TA 115815

Figure 26-13 (Sheet 20 of 30)

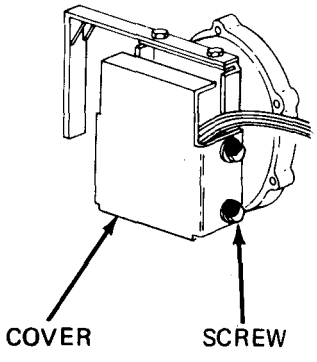
NO GO

YES

NO

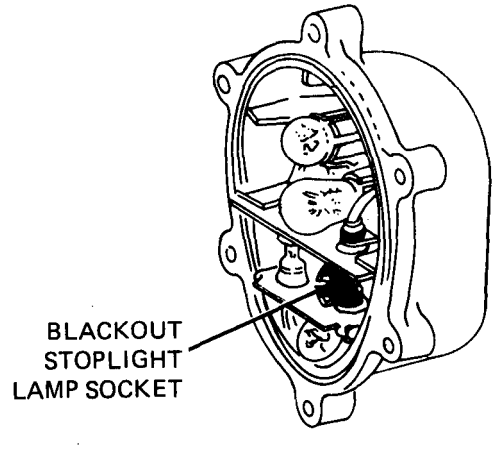
37

- 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



38

- 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**

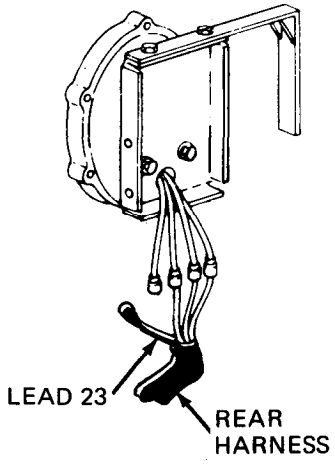


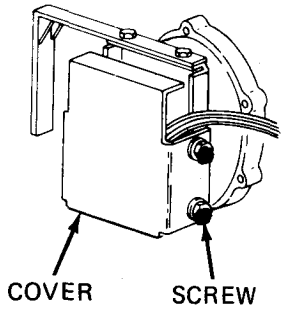
NO GO

TA 115816

Figure 26-13 (Sheet 21 of 30)

NO GO





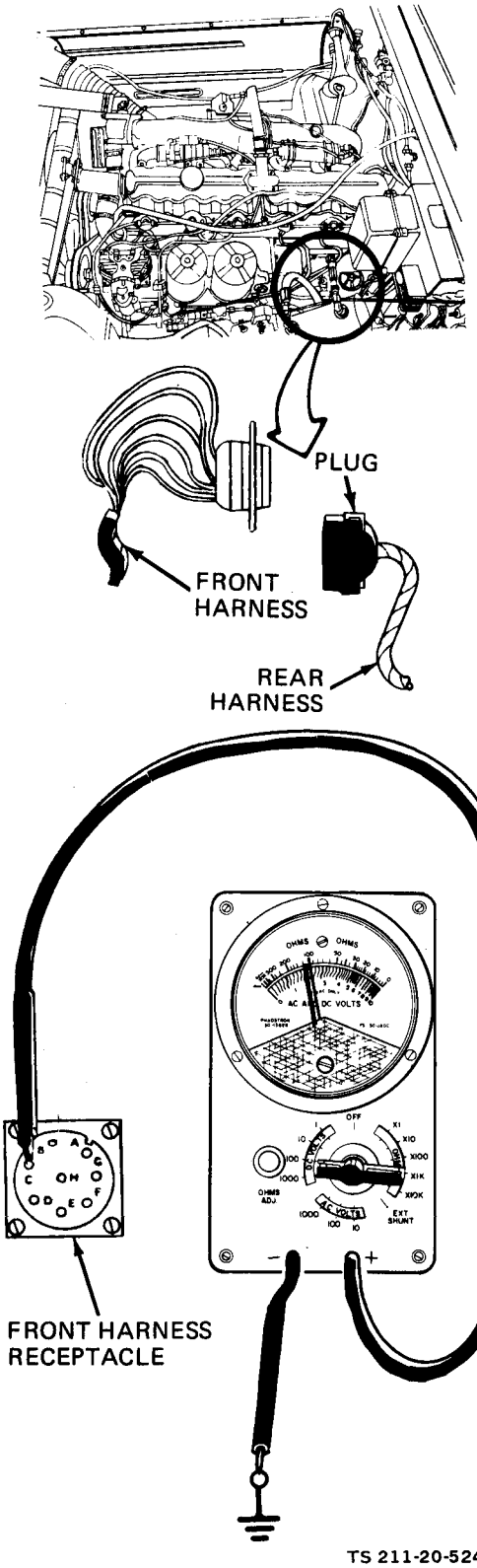
39

- 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

TA 115818

Figure 26-13 (Sheet 23 of 30)

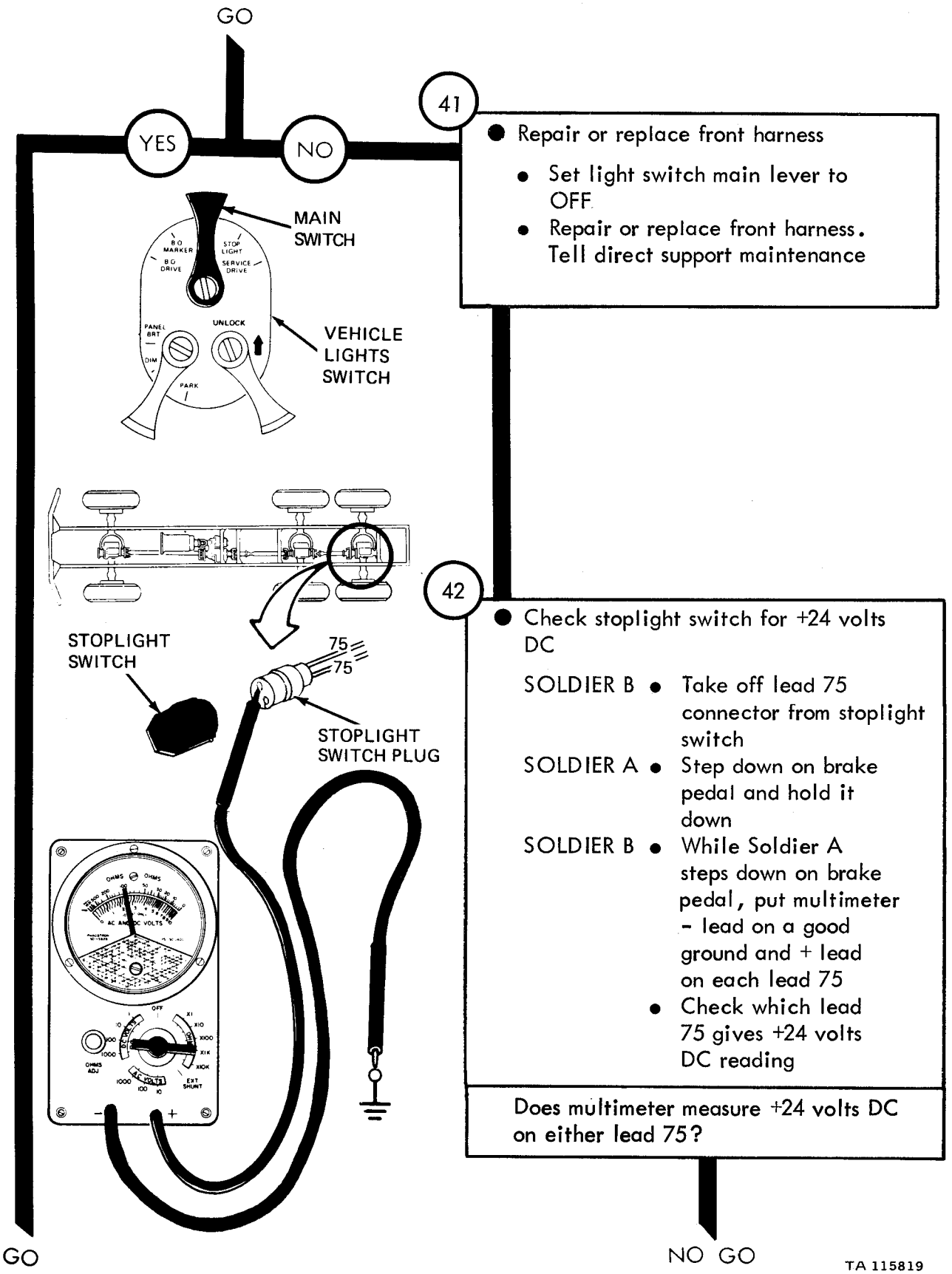


Figure 26-13 (Sheet 24 of 30)

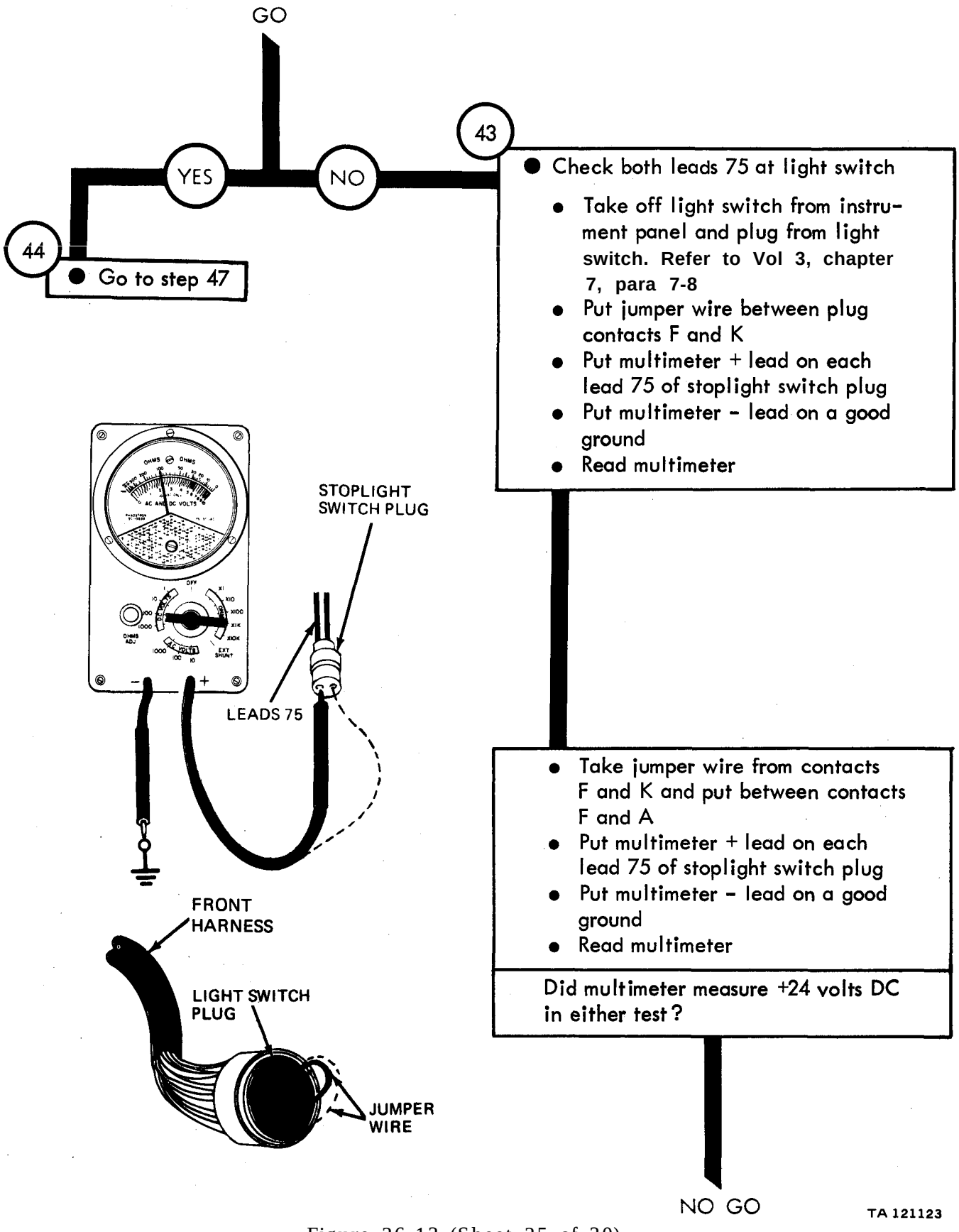
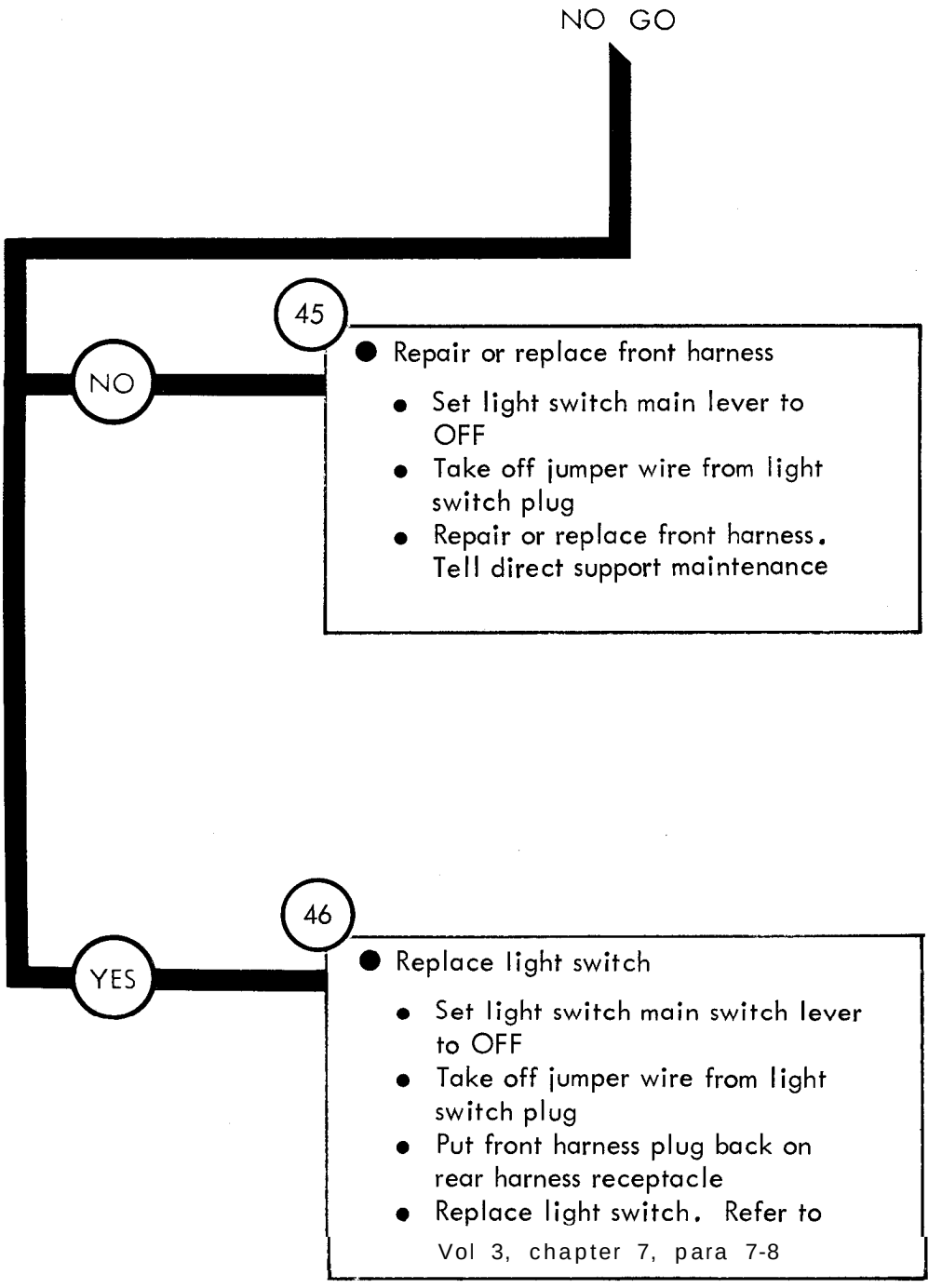


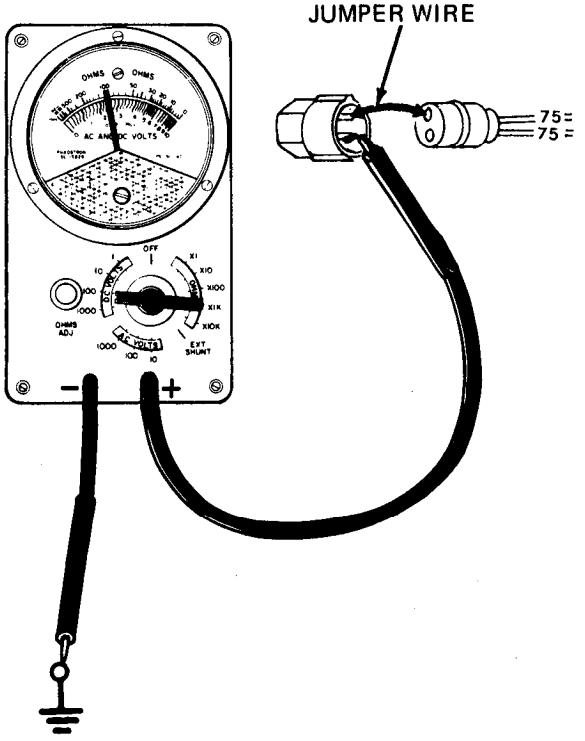
Figure 26-13 (Sheet 25 of 30)



TA 115820

Figure 26-13 (Sheet 26 of 30)

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

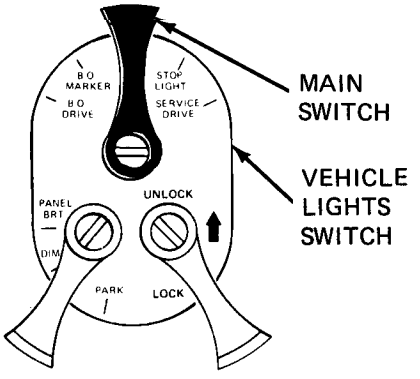
Does multimeter measure +24 volts DC?

YES

NO

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

TA 115821

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)

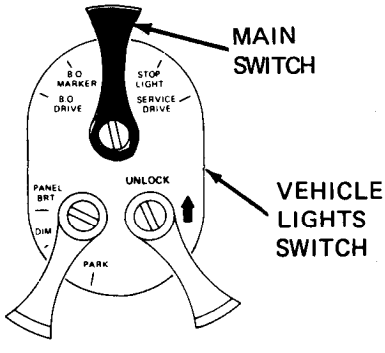
Are blackout stoplight lamps off?

YES

NO

50

- Troubleshooting completed
  - Set light switch main lever to OFF



GO

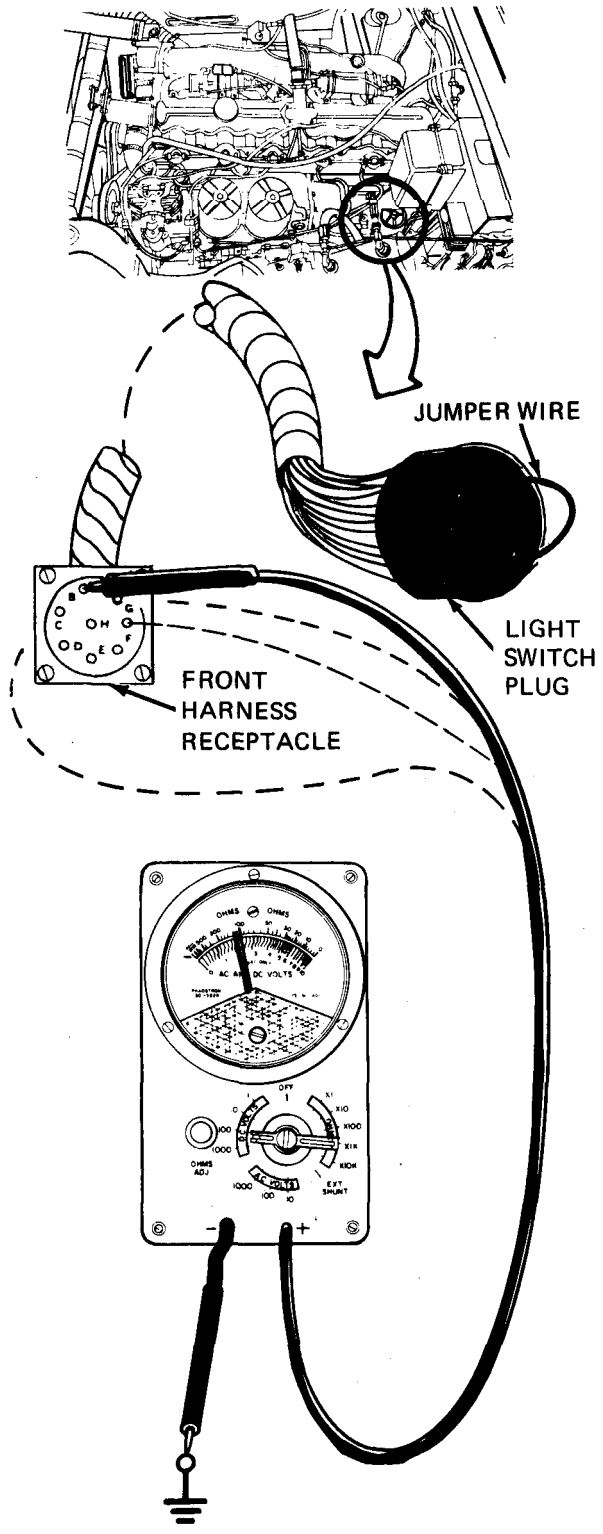
TA 115822

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

NO

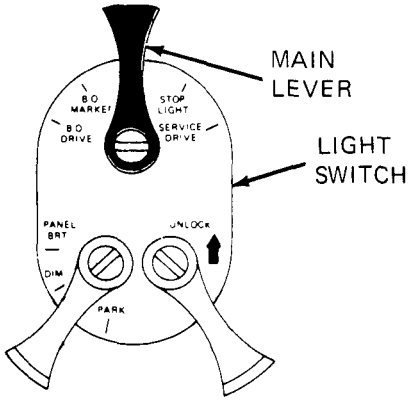
52

- Repair or replace front harness
  - Take jumper wire from light switch plug
  - Put back light switch. Refer to Vol 3, chapter 7, para 7-8
  - Repair or replace front harness. Tell direct support maintenance

YES

53

- Replace light switch
  - Put rear harness plug back on front harness receptacle
  - Put stoplight switch plug back on stoplight switch
  - Take jumper wire from light switch plug
  - Replace light switch. Refer to Vol 3, chapter 7, para 7-8



TA 115824

Figure 26-13 (Sheet 30 of 30)

Symptom 14

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

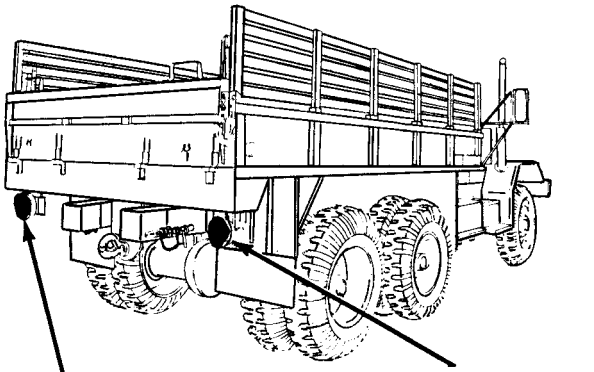
1

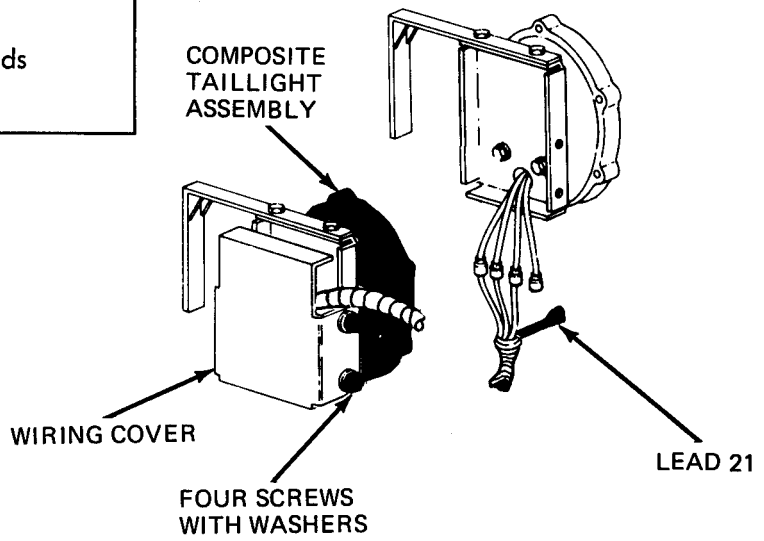
- Park Truck
  - Refer to TM 9-2320-211-10

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)

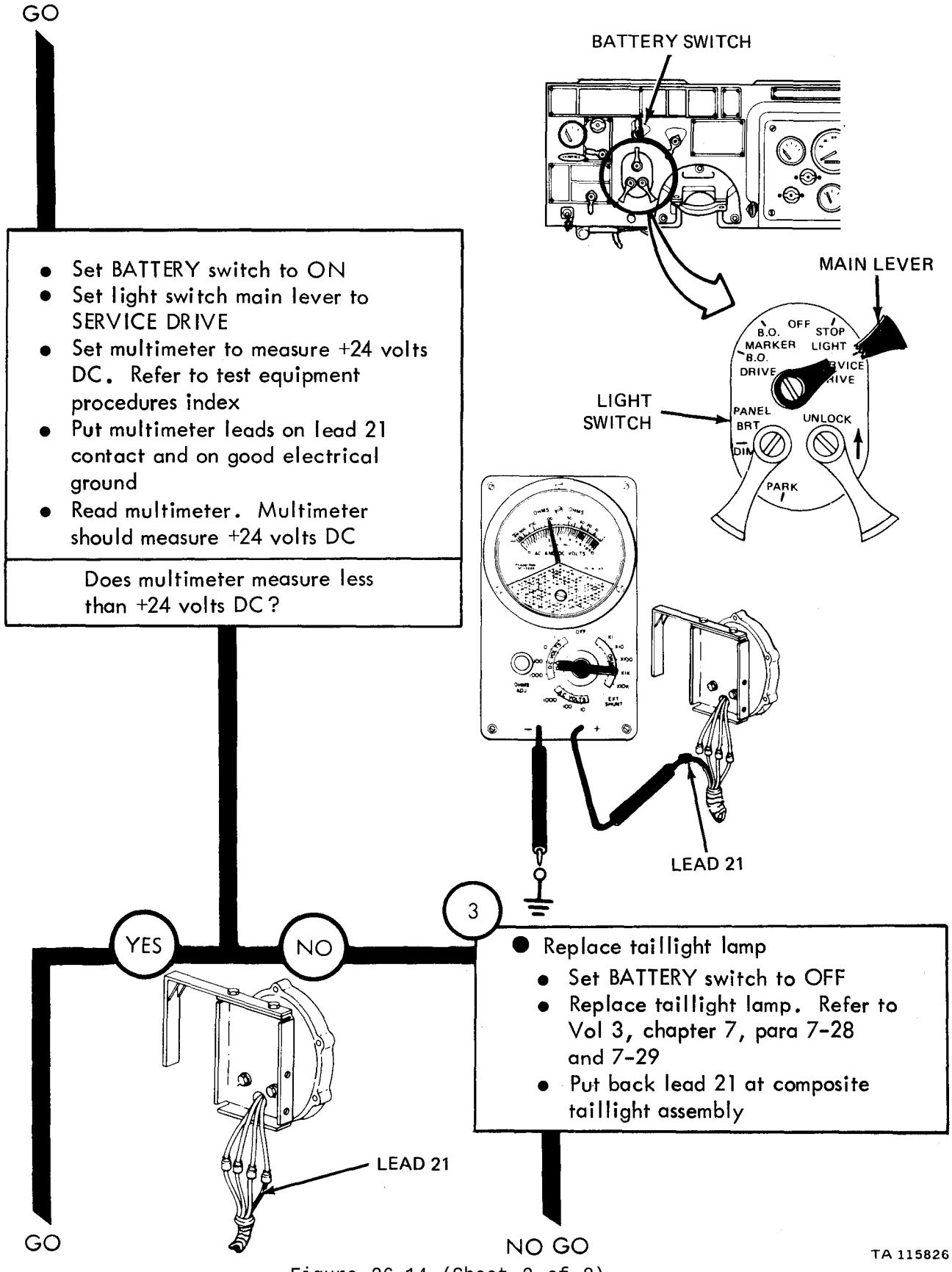


Figure 26-14 (Sheet 2 of 8)

GO

NO GO

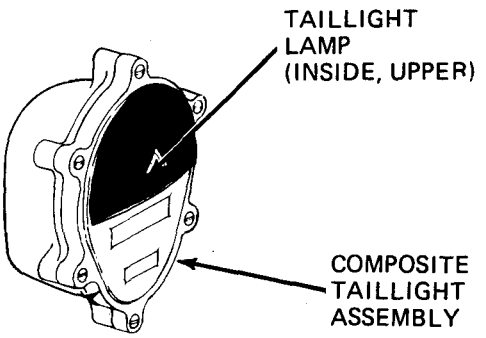
4

- Go to step 9

5

- Test taillight lamp
  - Set BATTERY switch to ON
  - Look at composite taillight assembly. Taillight lamp should be lit

Is taillight lamp off?

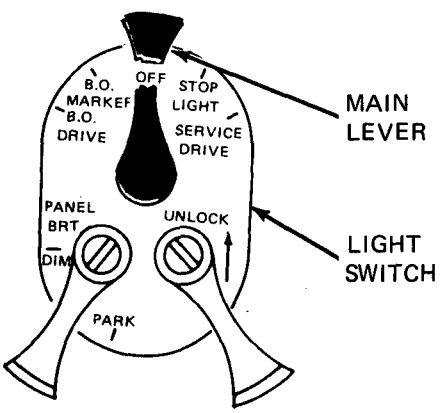


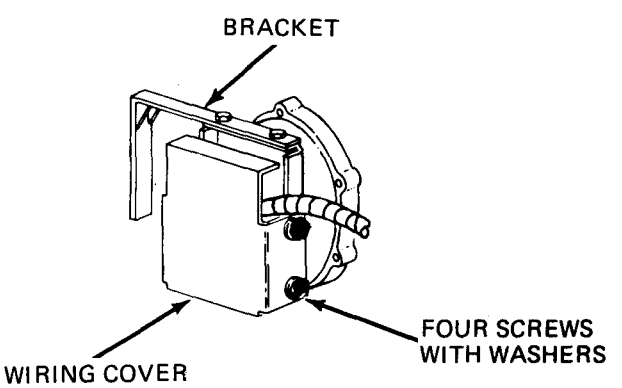
YES

NO

6

- Troubleshooting completed. Turn electrical system off
  - Set light switch main lever to OFF
  - Set BATTERY switch to OFF
  - At composite taillight assembly, place wiring cover on bracket with leads inside bracket
  - Screw in four screws with washers





NO GO

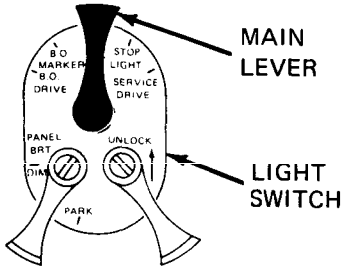
TA 115827

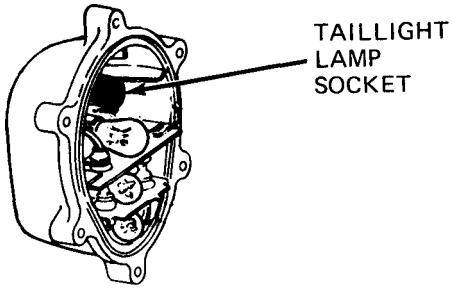
Figure 26-14 (Sheet 3 of 8)

NO GO

7

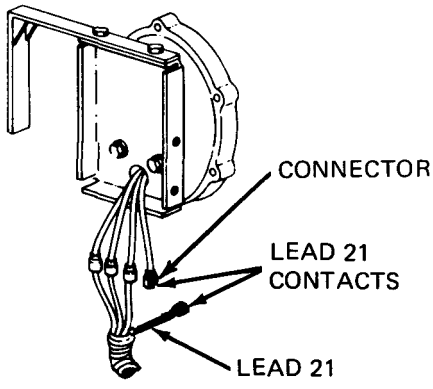
- Clean contacts of taillight lamp socket
  - Set light switch main lever to OFF
  - Set BATTERY switch to OFF
  - Remove taillight lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Clean taillight lamp socket. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Replace taillight lamp. Refer to Vol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

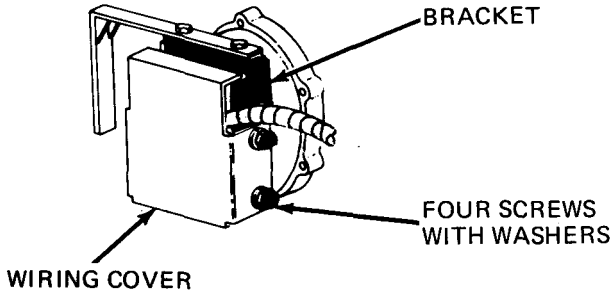




8

- 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

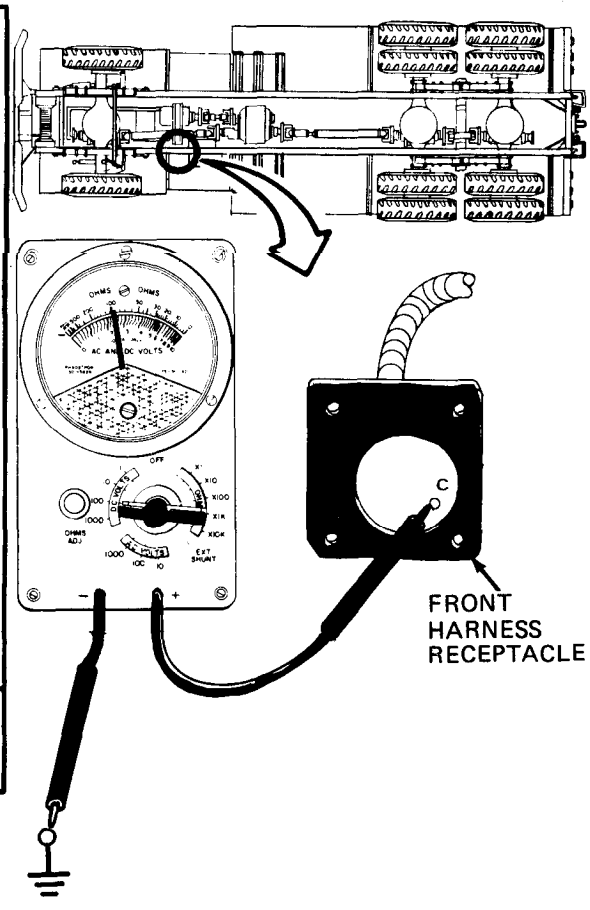
TA 115828

Figure 26-14 (Sheet 4 of 8)

From step 4

9

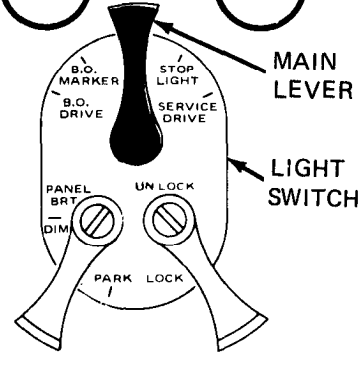
- Check front harness between light switch and front harness receptacle
  - Set BATTERY switch to OFF
  - Take off light switch from instrument panel. Refer to Vol 3, chapter 7, para 7-8
  - Take off light switch plug from light switch. Refer to Vol 3, chapter 7, para 7-8
  - Put jumper wire between 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?

YES

NO



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

GO

TA 115829

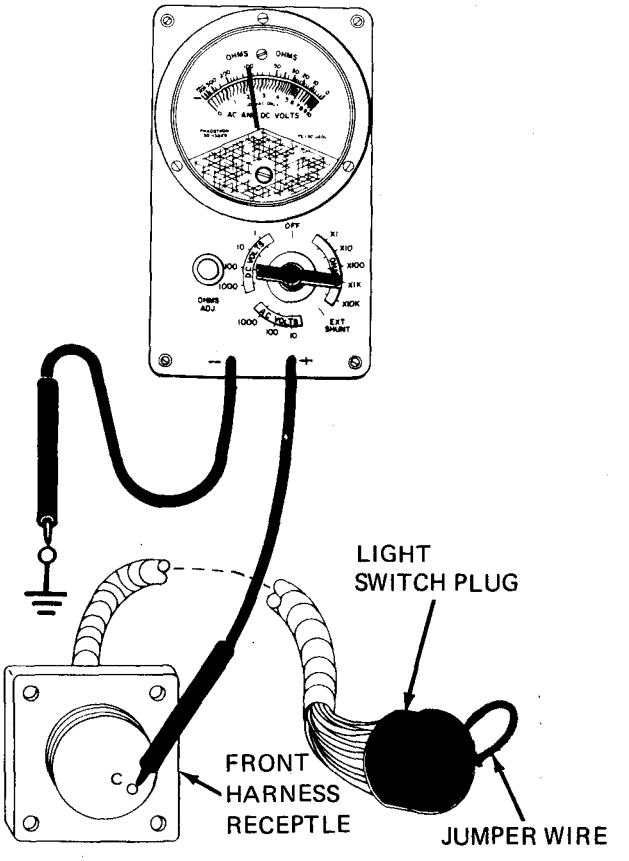
Figure 26-14 (Sheet 5 of 8)

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

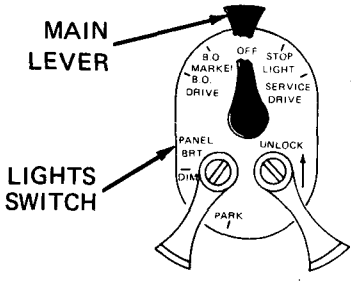
Does multimeter measure +24 volts DC?



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

TA 115830

Figure 26-14 (Sheet 6 of 8)

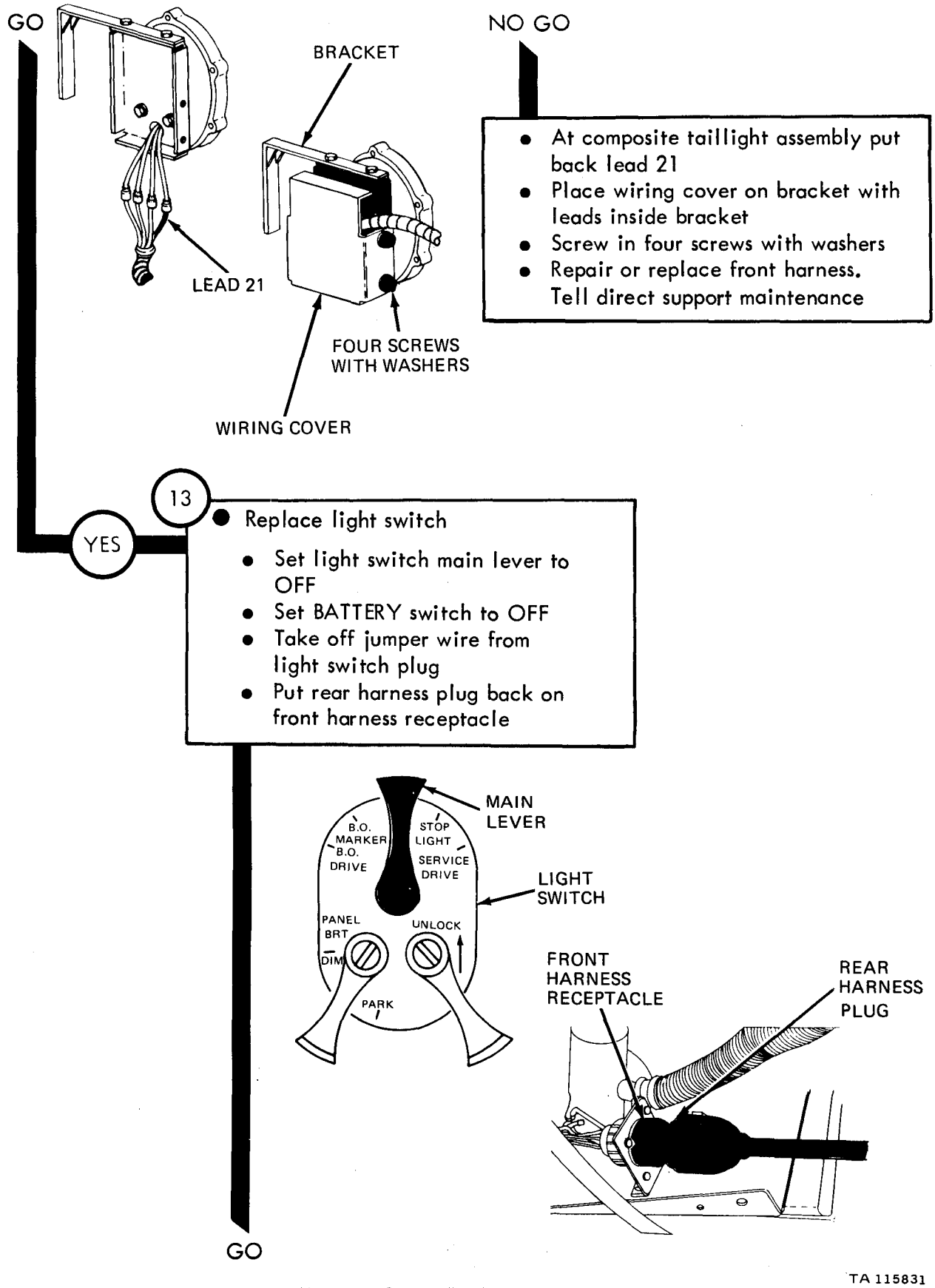
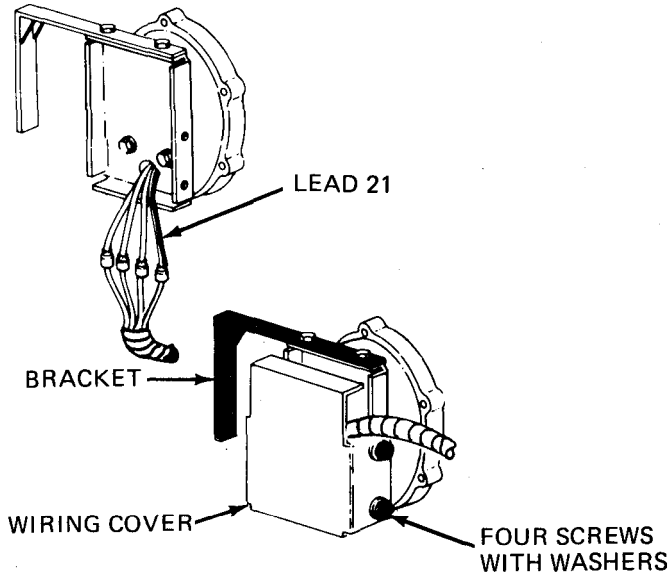


Figure 26-14 (Sheet 7 of 8)

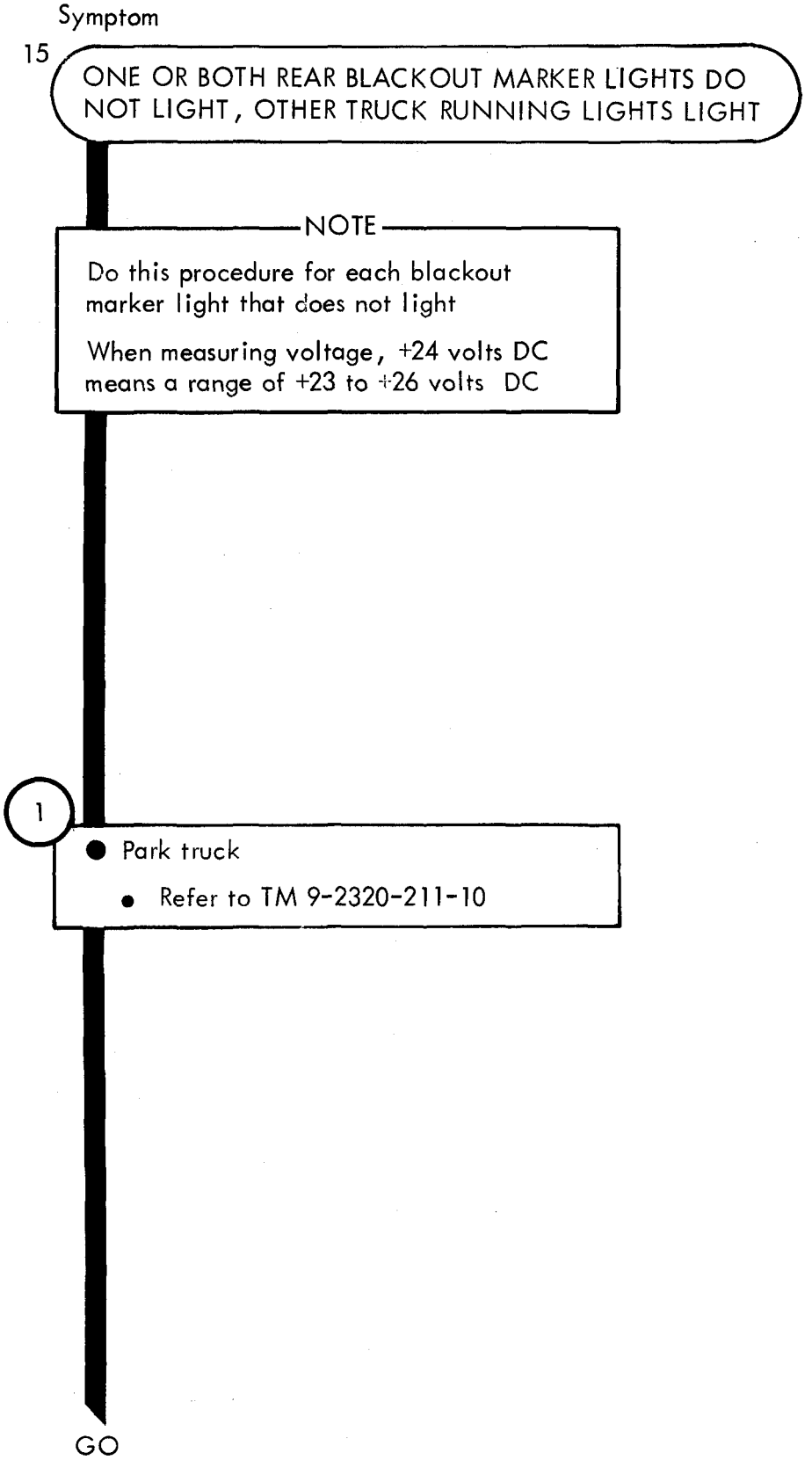
GO

- At composite taillight assembly put back lead 21
- Place wiring cover on bracket with leads inside bracket
- Screw in four screws with washers
- Replace light switch. Refer to Vol 3, chapter 7, para 7-8



TA 115832

Figure 26-14 (Sheet 8 of 8)



TA 115833

Figure 26-15 (Sheet 1 of 8)

GO

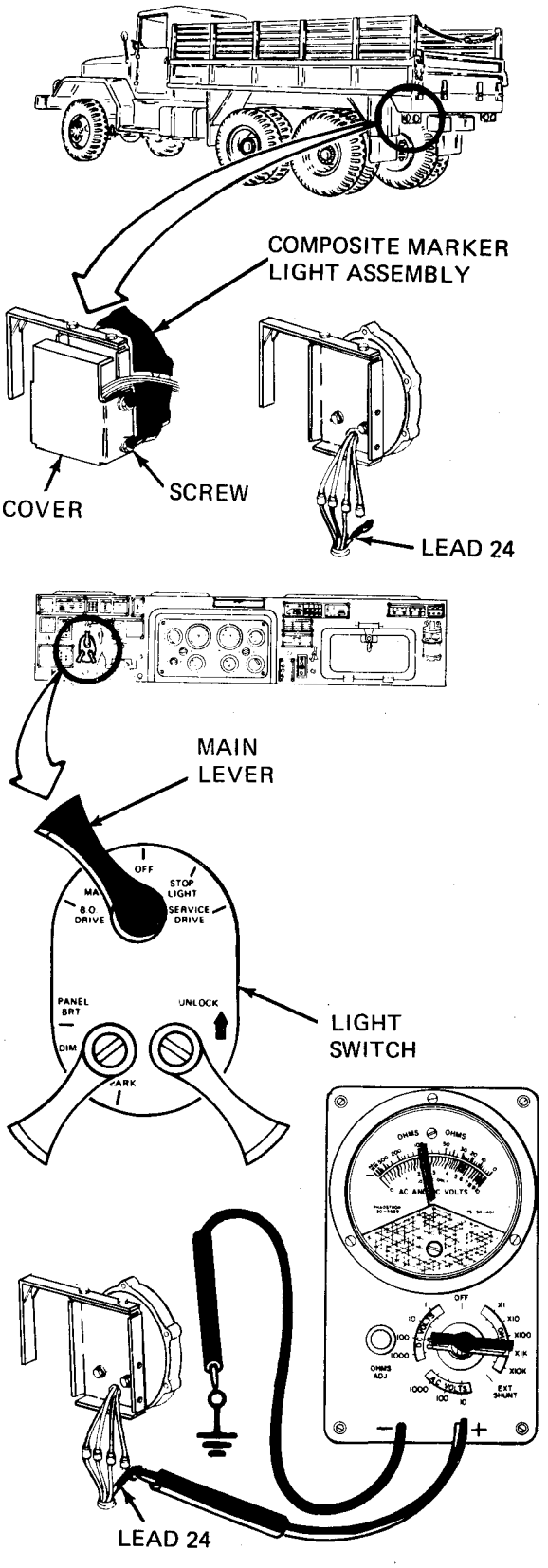
2

- 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



TA 115834

Figure 26-15 (Sheet 2 of 8)

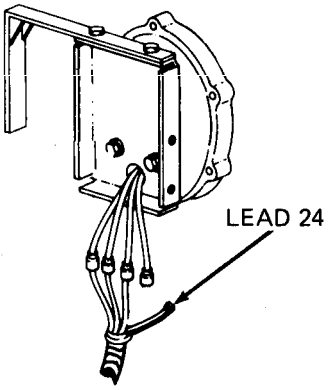
GO

YES

NO

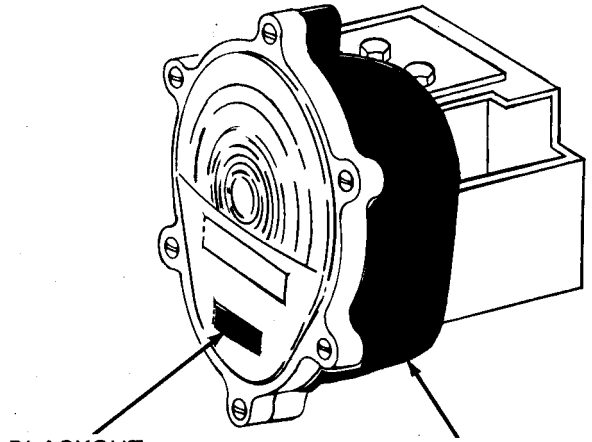
3

- Replace rear blackout marker lamp
  - Set light switch main lever to OFF
  - Put back lead 24 at rear of rear composite marker light assembly
  - Replace blackout marker lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29



4

- Go to step 9



5

- Test rear blackout marker light
  - Set light switch main lever to B. O. MARKER
  - Look at rear composite marker light. Blackout marker lamp should be lit

Is blackout marker lamp off?

NO GO

TA 115835

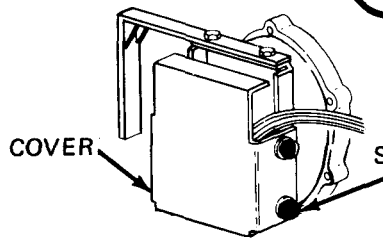
Figure 26-15 (Sheet 3 of 8)

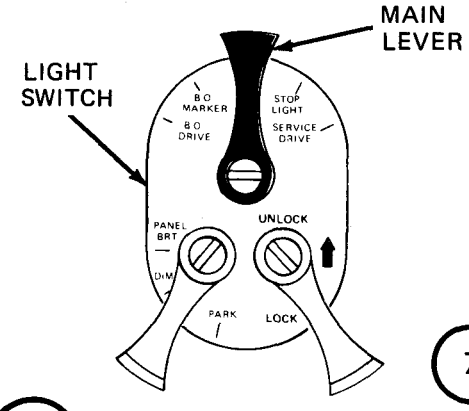
NO GO

6

- 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

NO

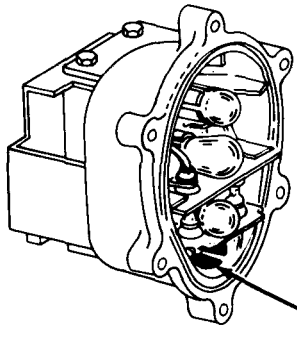




7

- Clean contacts of rear blackout marker lamp socket
  - Set light switch main switch lever to OFF
  - Remove blackout marker lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Clean blackout marker lamp socket
  - Put back blackout marker lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29

YES



NO GO

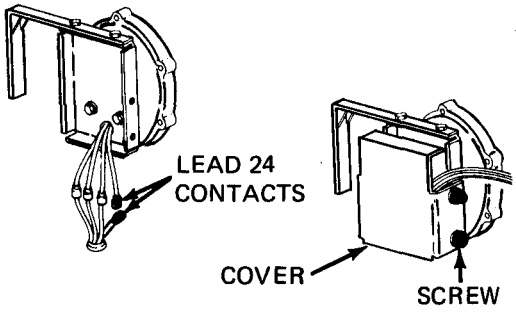
TA 115836

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



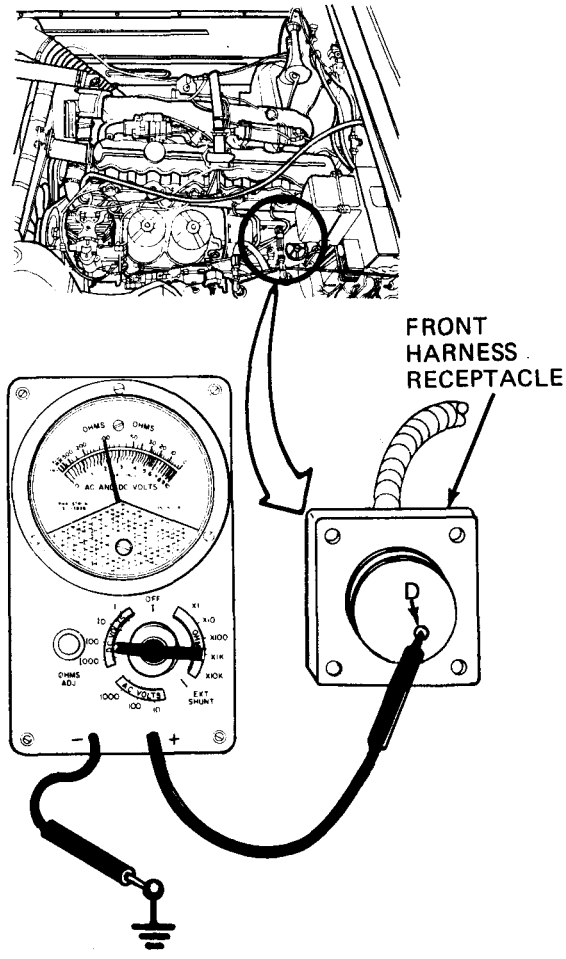
From step 4

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)

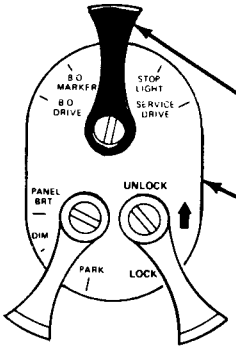
GO

YES

NO

10

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



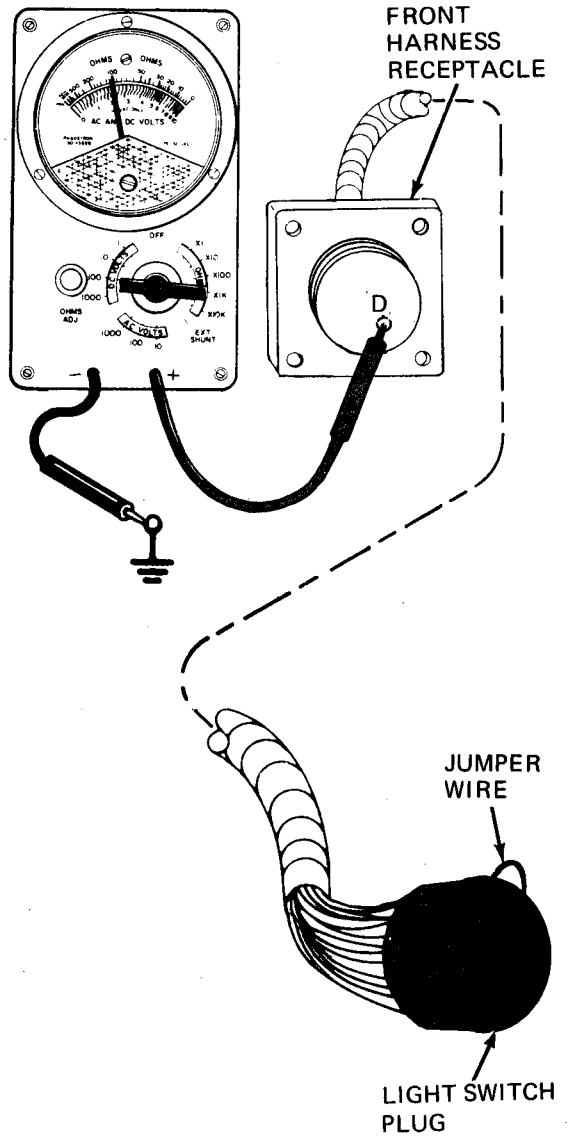
MAIN LEVER

LIGHT SWITCH

11

- Check front harness between light switch and front harness receptacle
  - 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 E of light switch plug
  - Set light switch main lever to B. O. MARKER
  - Put multimeter + lead on contact D of front harness receptacle and - lead on a good ground. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?



GO

TA 115838

Figure 26-15 (Sheet 6 of 8)

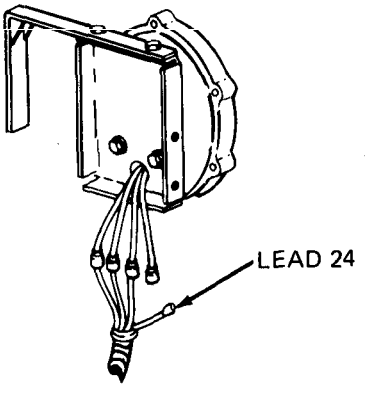
GO

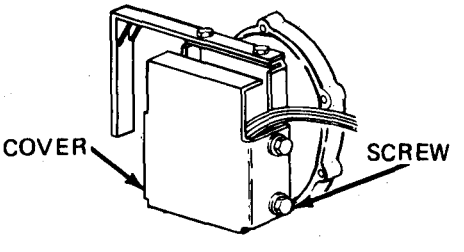
YES

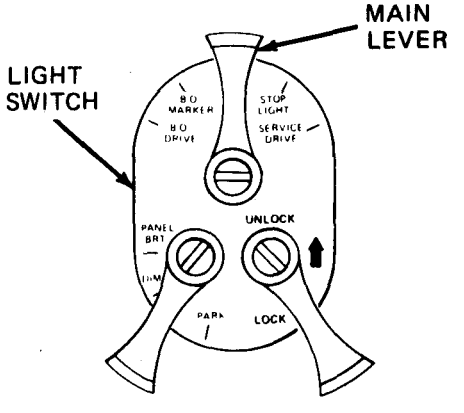
NO

12

- 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

GO

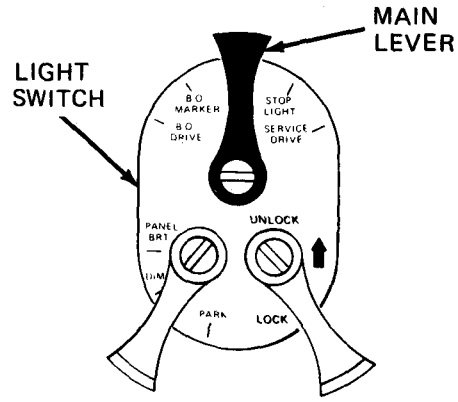
TA 115839

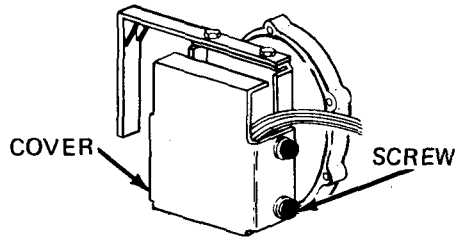
Figure 26-15 (Sheet 7 of 8)

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





TA 115840

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

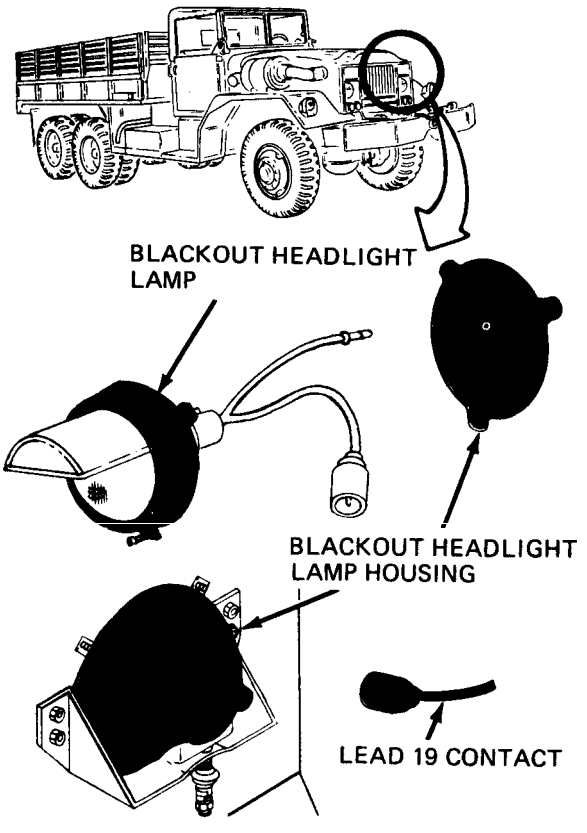
1

- 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



TA 115841

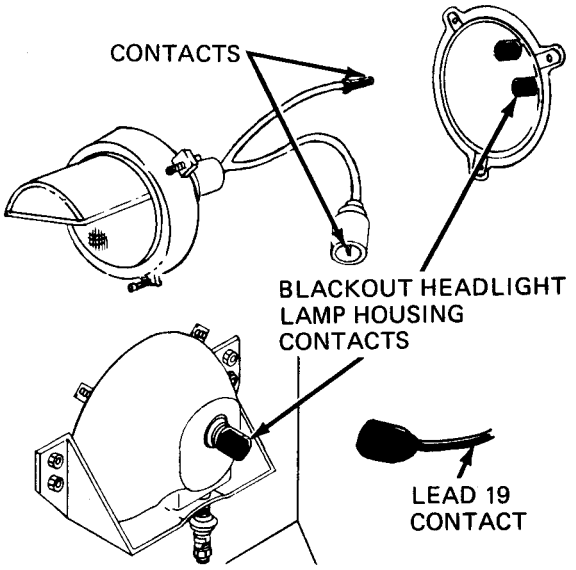
Figure 26-16 (Sheet 1 of 4)

GO

3

- Look at connector contacts
  - See if lamp contacts are dirty, rusted, corroded, or broken
  - See if blackout headlight lamp housing contacts are dirty, rusted, corroded, or broken
  - See if lead 19 or ground lead contacts are dirty, rusted, corroded, or broken

OK?



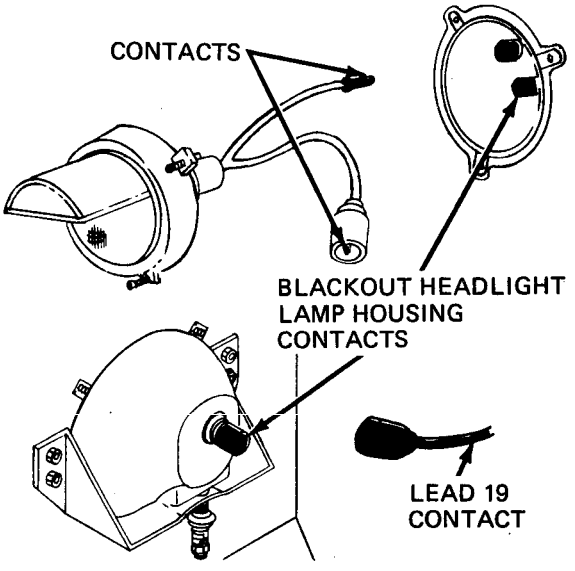
YES — NO

4

- Correct defects
  - Clean or replace dirty, rusty or corroded contacts. Tell direct support maintenance
  - Replace broken contacts. Tell direct support maintenance

5

- Check connector contacts for tightness or broken contacts
  - Check all connector contacts from housing for tightness
  - Replace any loose contacts. Tell direct support maintenance
  - Check connector contacts from blackout service lamp
  - If contacts are broken replace lamp. Refer to Vol 3, chapter 7, para 7-25



GO

TA 115842

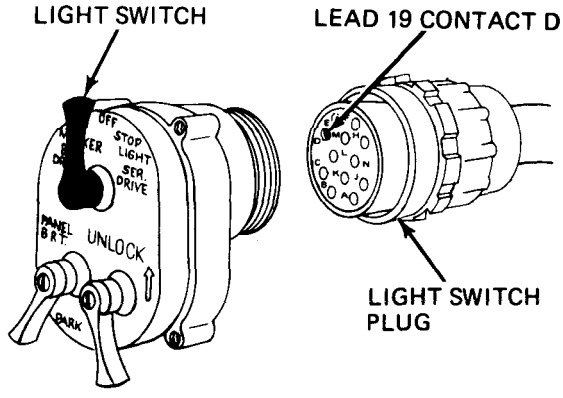
Figure 26-16 (Sheet 2 of 4)

GO

6

- Check circuit 19 lead connection at light switch
  - Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
  - Make sure contact D in light switch and light switch plug are not dirty, damaged, or corroded
  - Make sure contacts fit together tightly

OK?

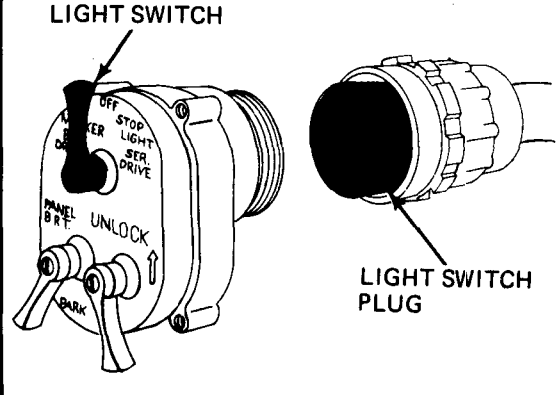


YES

NO

7

- Clean light switch and light switch plug contacts
  - Clean contacts D of light switch and light switch plug that are dirty, rusty, or corroded
  - If any light switch contacts are broken, replace light switch. Refer to Vol 3, chapter 7, para 7-8
  - If any light switch plug contacts are broken, repair or replace plug. Tell direct support maintenance



GO

NO GO

TA 115843

Figure 26-16 (Sheet 3 of 4)

GO

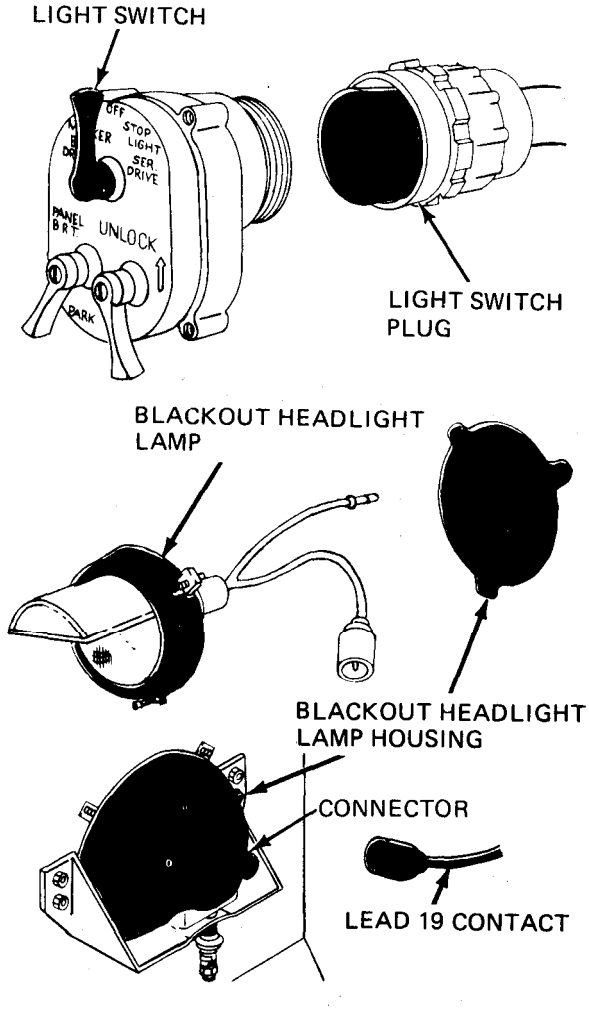
NO GO

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**



TA 115844

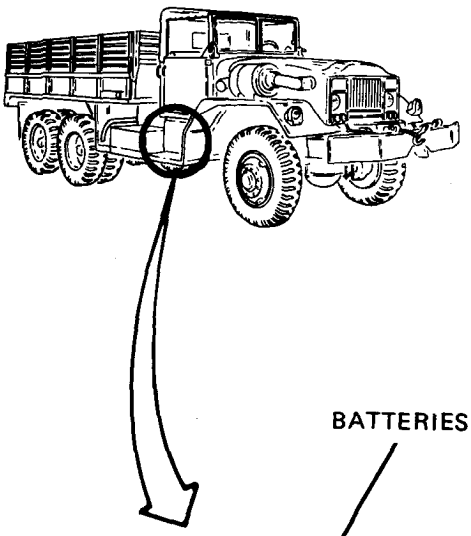
Figure 26-16 (Sheet 4 of 4)

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

TA 115845

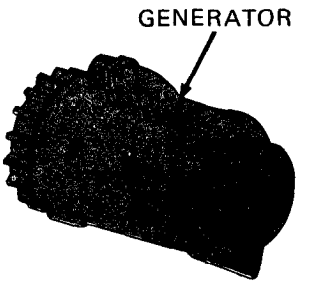
Figure 26-17 (Sheet 1 of 7)

GO

4

- Check generating system
  - Refer to fault symptom index

Is generating system OK?



YES

NO

5

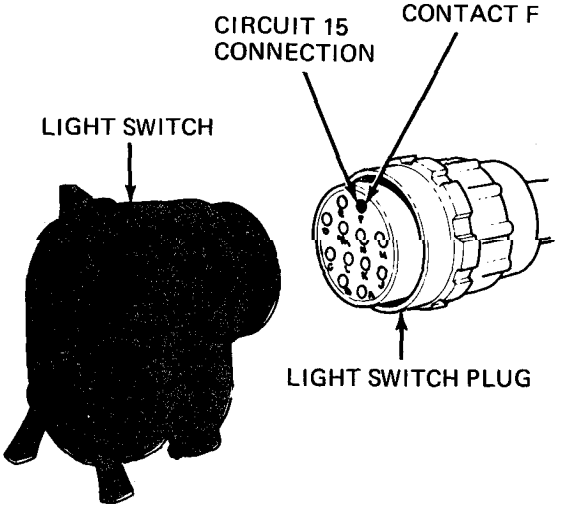
- Troubleshoot generating system
  - Refer to fault symptom index

6

- Check lead 15 contact F connections at light switch
  - Take off light switch from instrument panel and plug from light switch. Refer to Vol 3, chapter 7, para 7-8
  - Make sure contact F of light switch and light switch plug are not broken, dirty, rusted, or corroded
  - Make sure both contacts F fit together tightly

OK?

GO



TA 115846

Figure 26-17 (Sheet 2 of 7)

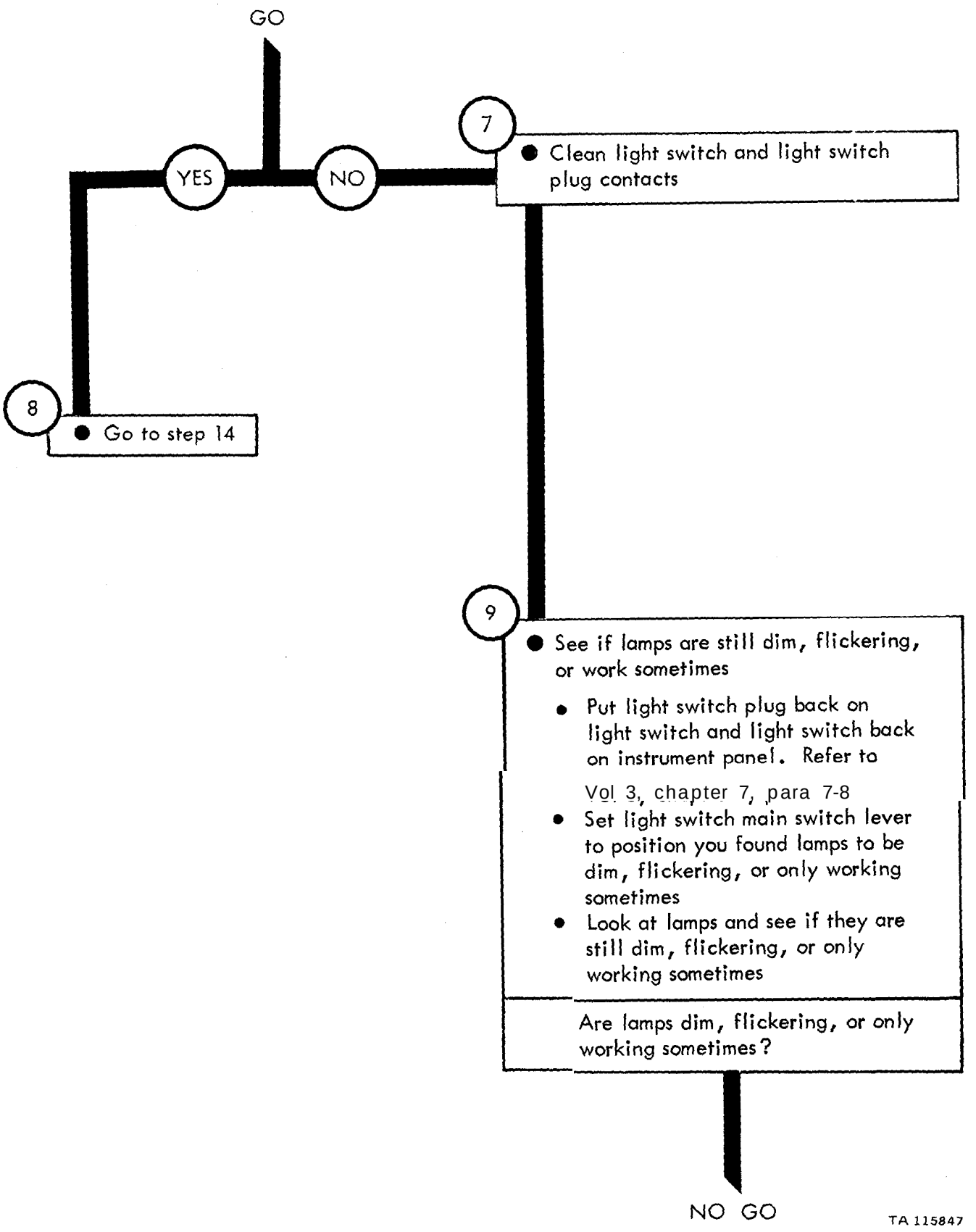
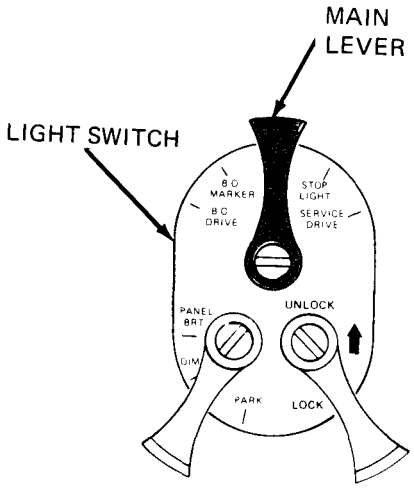


Figure 26-17 (Sheet 3 of 7)

NO GO



10

NO

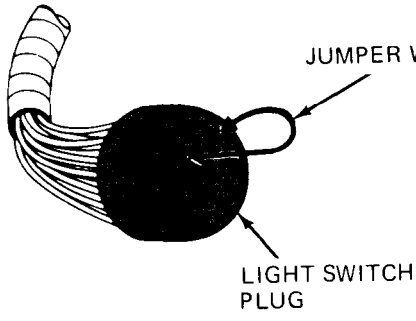
- Troubleshooting completed
  - Set light switch main lever to OFF

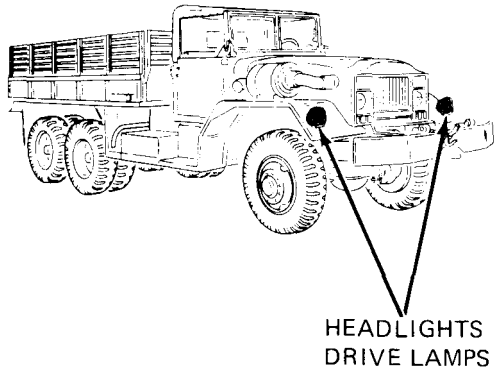
11

YES

- Check 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 contact F and the contact for bad lamp (headlight lamp in picture)
  - Check light and see if light is still dim, flickering, or only working sometimes

Is lamp still dim, flickering, or only working sometimes?





NO GO

TA 115848

Figure 26-17 (Sheet 4 of 7)

NO GO

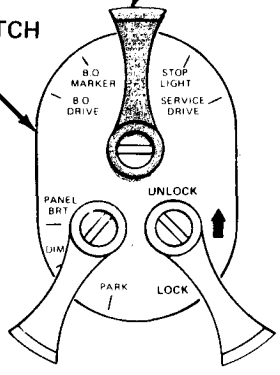
NO

12

- Replace light switch
  - Take jumper wire off light switch plug
  - Replace light switch. Refer to Vol 3, chapter 7, para 7-8

MAIN LEVER

LIGHT SWITCH



YES

13

- Repair or replace front harness
  - Take jumper wire off light switch plug
  - Repair or replace front harness. Tell direct support maintenance

TA 115849

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

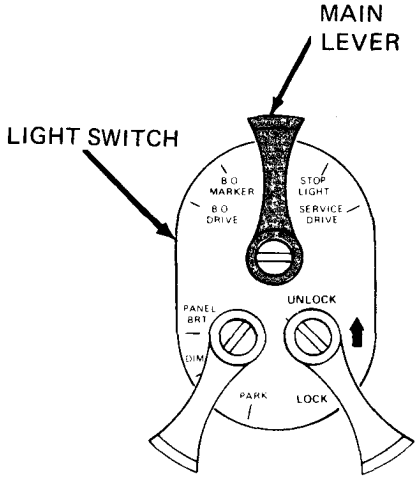
Are lamps dim, flickering, or only working sometimes?

YES

NO

15

- Troubleshooting completed
  - Set light switch main lever to OFF



GO

TA 115850

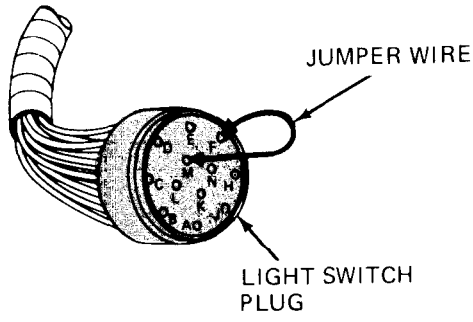
Figure 26-17 (Sheet 6 of 7)

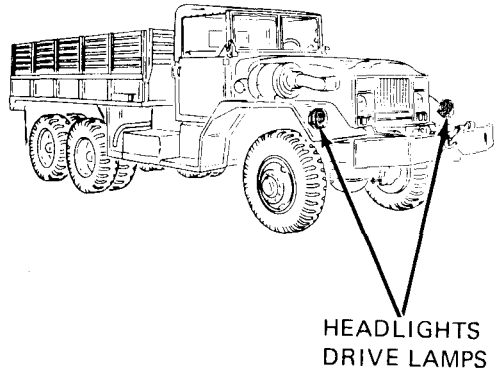
GO

16

- Check 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 contact F and the contact for bad lamp (headlight lamp in picture)
  - Check light and see if light is still dim, flickering, or only working sometimes

Is lamp still dim, flickering, or only working sometimes?



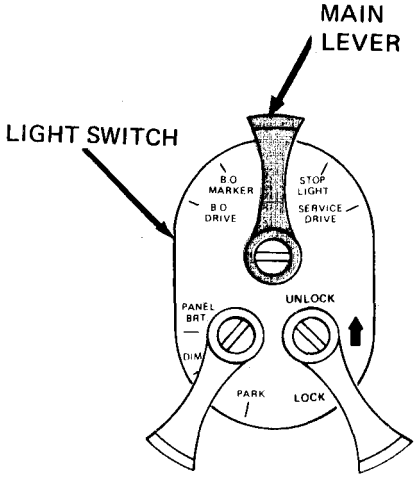


YES

NO

17

- Replace light switch
  - Take jumper wire off light switch plug
  - Replace light switch. Refer to Vol 3, chapter 7, para 7-8



18

- Repair or replace front harness
  - Take jumper wire off light switch plug
  - Repair or replace front harness. Tell direct support maintenance

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

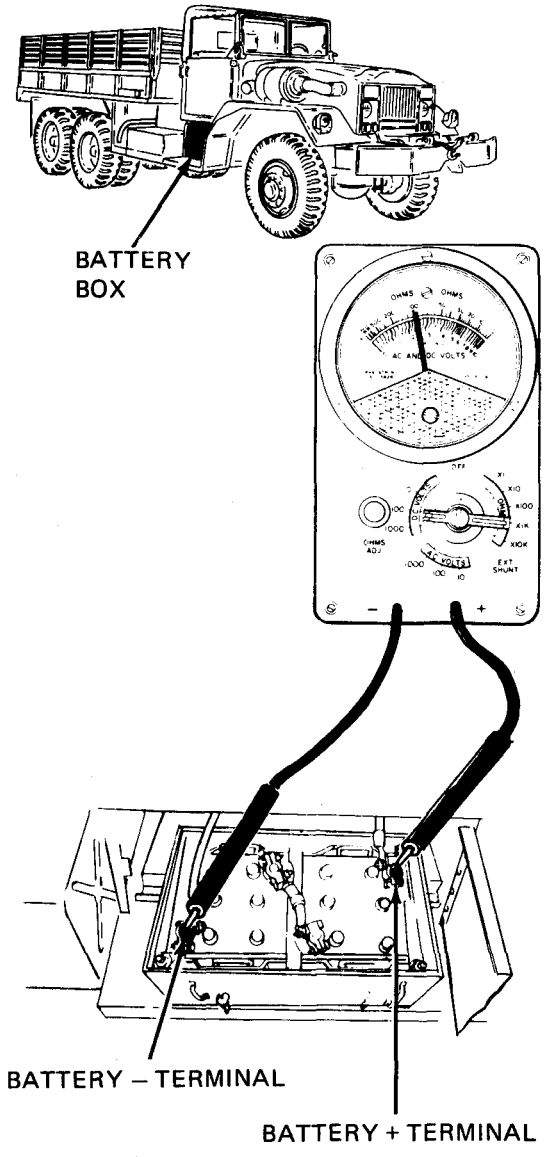
- Park truck
  - Refer to TM 9-2320-211-10

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

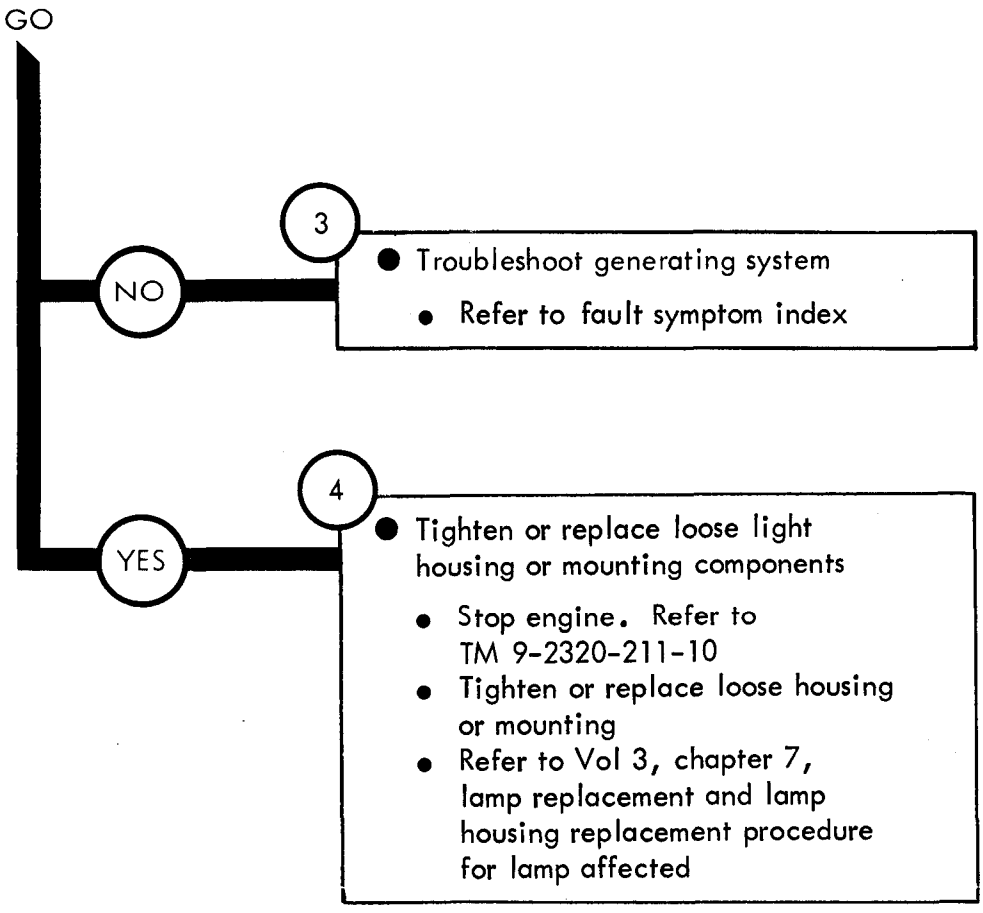
- Put multimeter + lead on battery + terminal
- Put multimeter - lead on battery - terminal
- Read multimeter. Multimeter should measure +28 volts DC

Does multimeter measure +28 volts DC?



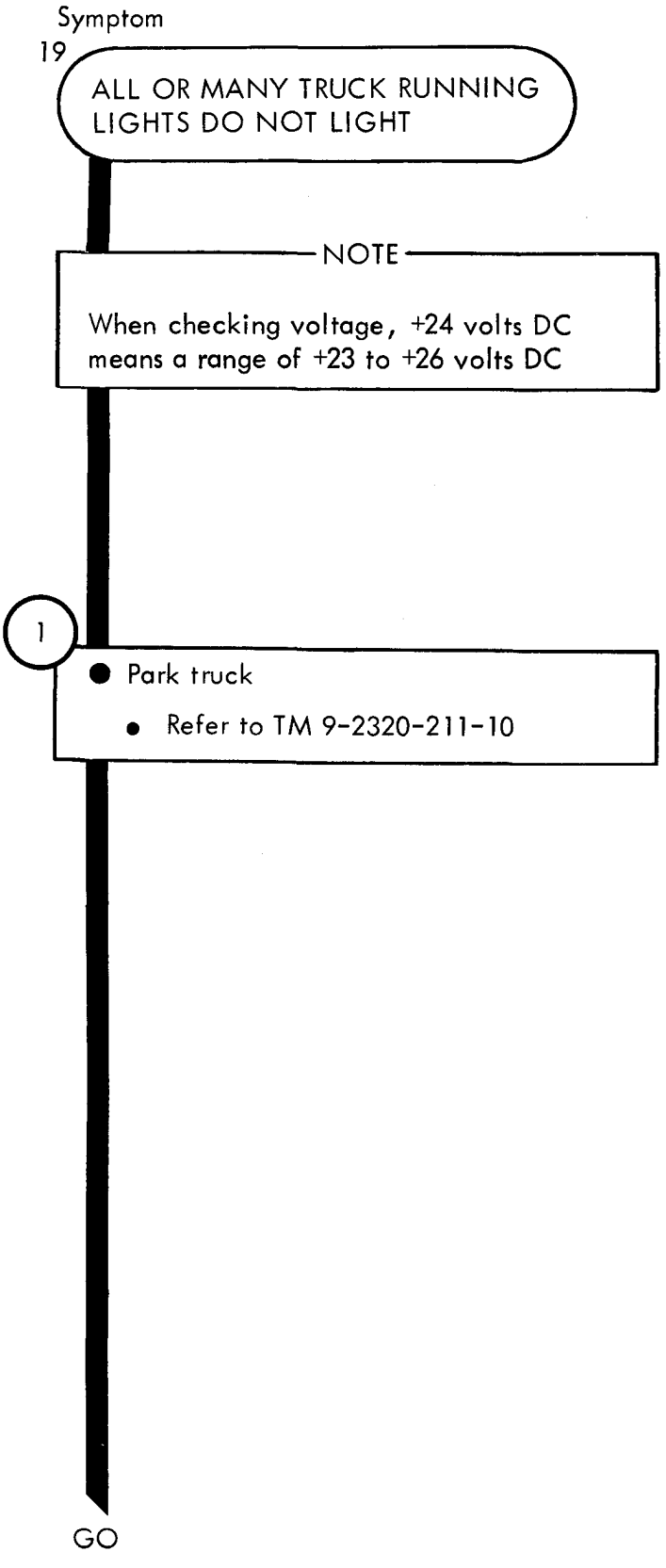
TA 115852

Figure 26-18 (Sheet 1 of 2)



TA 115853

Figure 26-18 (Sheet 2 of 2)



TA 115854

Figure 26-19 (Sheet 1 of 5)

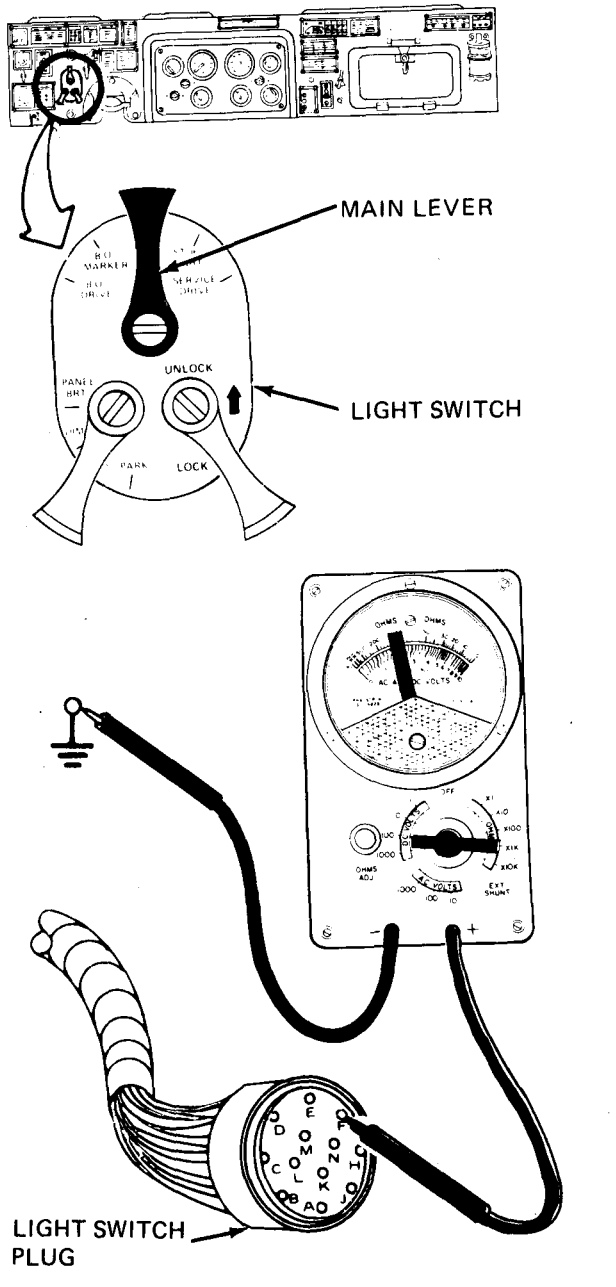
GO

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)

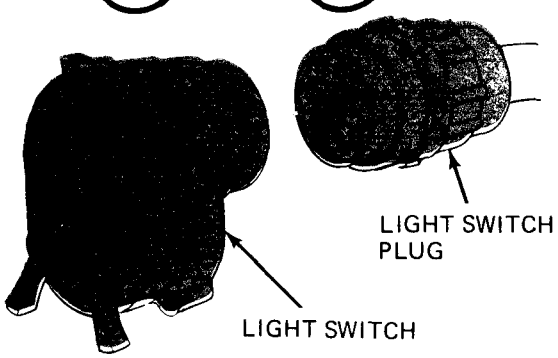
GO

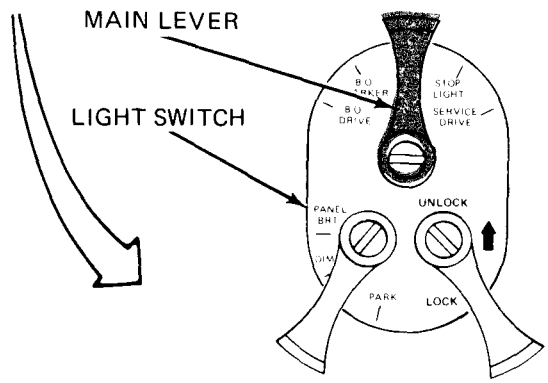
YES

NO

3

- Troubleshoot truck running lights that do not light
  - Put light switch plug back on instrument panel and light switch back on light switch. Refer to Vol 3, chapter 7, para 7-8
  - Troubleshoot truck running lights that do not light. Refer to fault symptom index





GO

TA 115856

Figure 26-19 (Sheet 3 of 5)

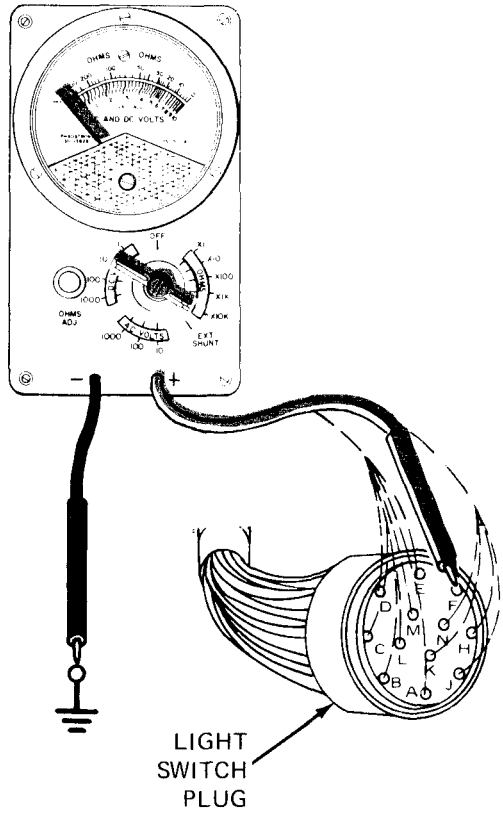
GO

4

- Check for shorts at light switch plug
  - Set multimeter to check for shorts. Refer to test equipment procedures index
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on each plug contact, one contact at a time
  - Read multimeter for each contact always keeping - lead on a good ground

Check out OK?

GO



TA 115857

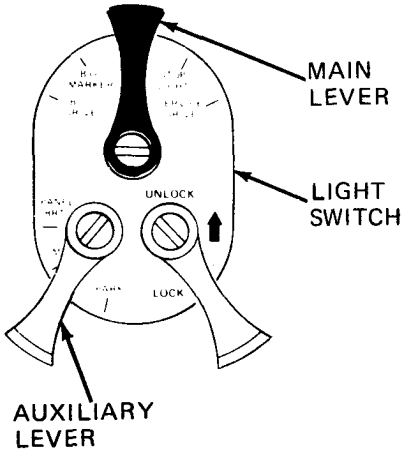
Figure 26-19 (Sheet 4 of 5)

GO

NO

5

- Repair or replace front harness
  - 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



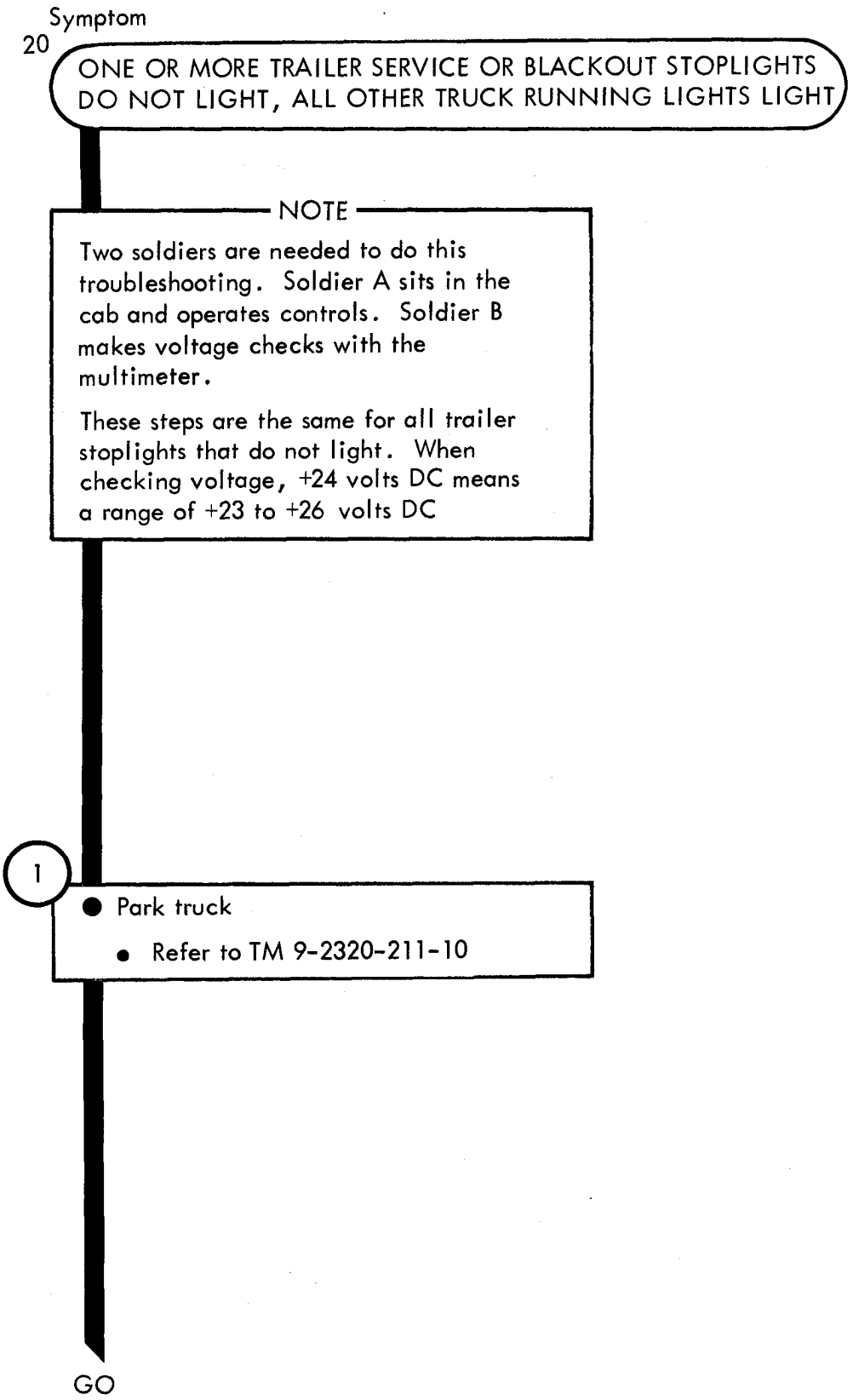
YES

6

- Replace light switch
  - Refer to Vol 3, chapter 7, para 7-8

TA 115858

Figure 26-19 (Sheet 5 of 5)



TA 115859

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

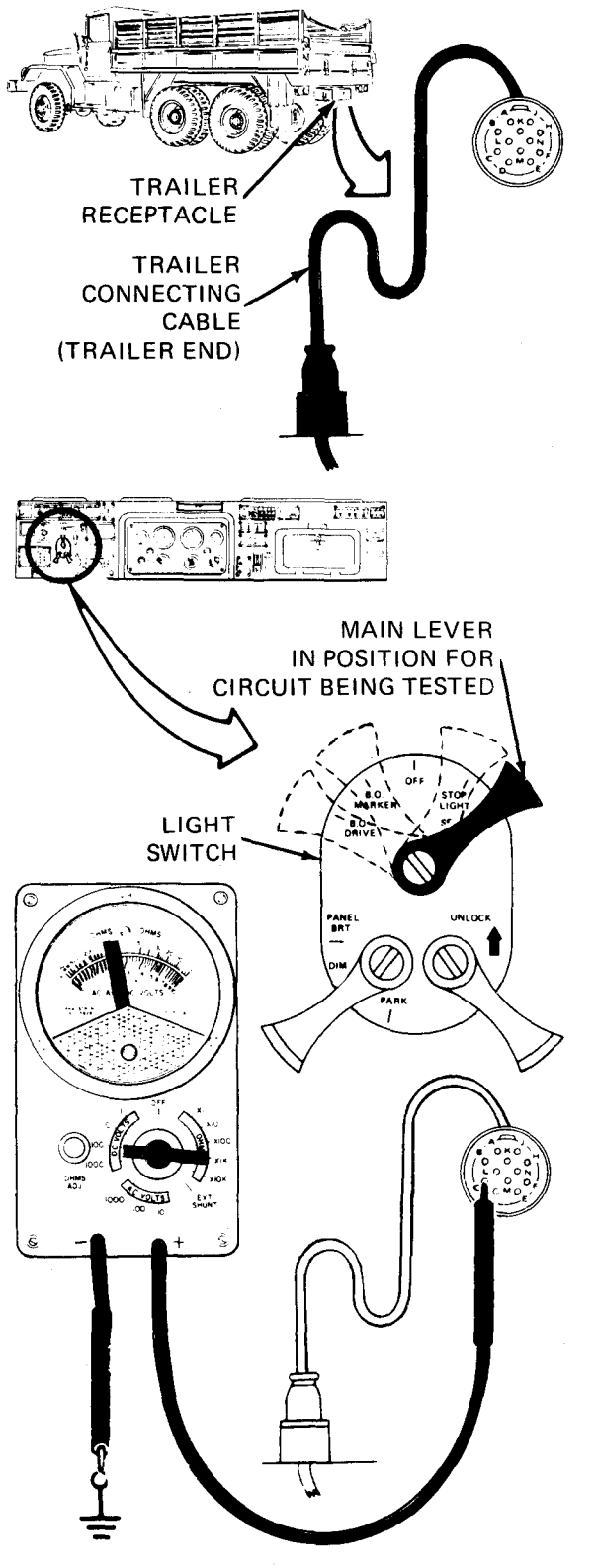
• Put multimeter - lead on a good ground

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



TA 115860

Figure 26-20 (Sheet 2 of 6)

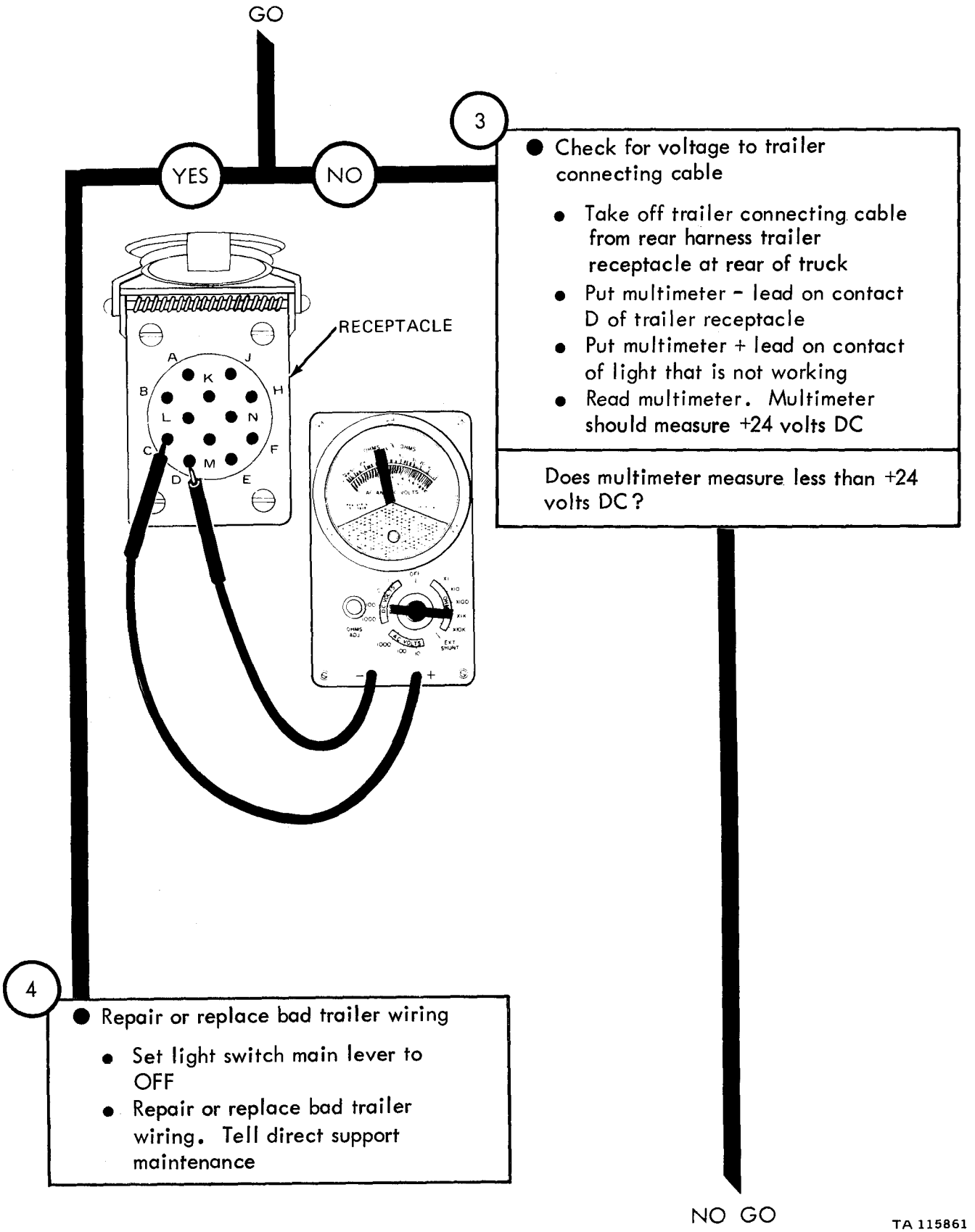


Figure 26-20 (Sheet 3 of 6)

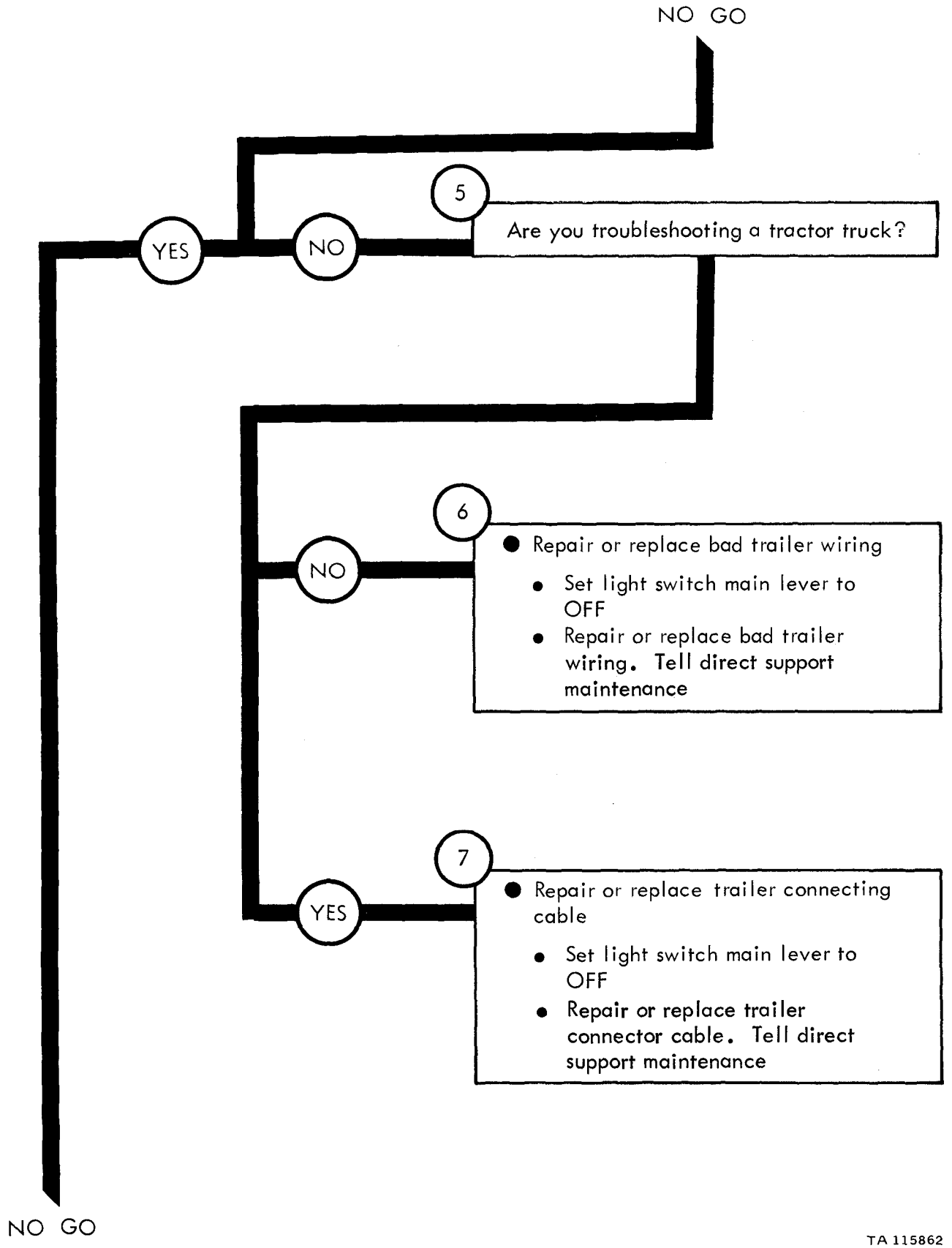


Figure 26-20 (Sheet 4 of 6)

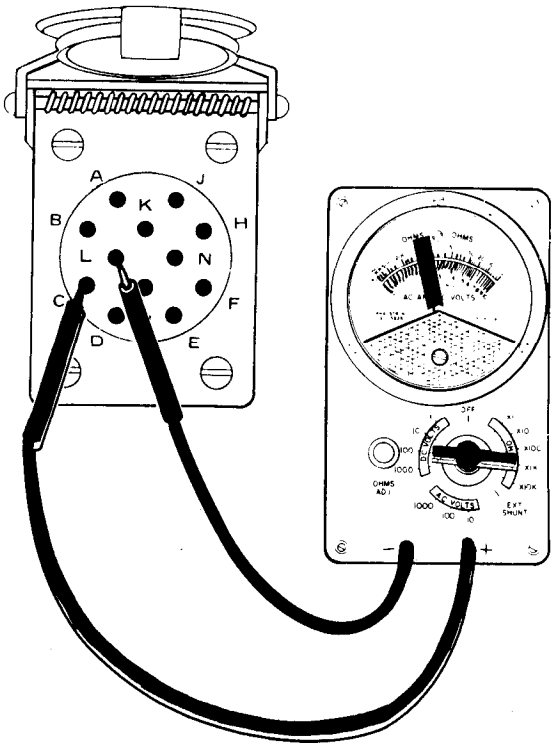
NO GO

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

Does multimeter measure less than +24 volts DC?

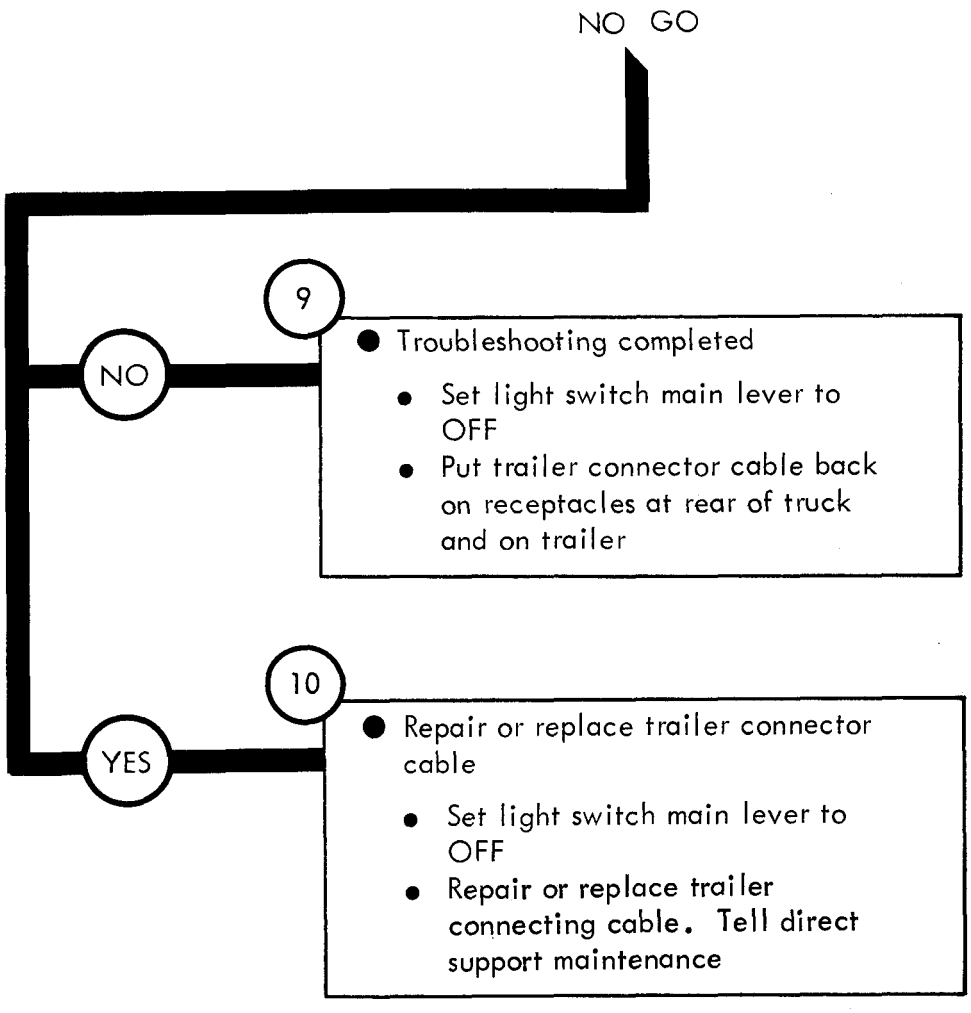
PIN	WIRE NO.	CIRCUIT
A	24A	REAR B. O. MARKER (LH)
B	22-461	SERVICE STOPLIGHT (LH)
C	24B	REAR B. O. MARKER (RH)
D	90	GROUND TO FRAME
E	21	SERVICE REAR
F	23	B. O. STOPLIGHT
H	490	B. O. MARKER LIGHTS
J	22-460	SERVICE STOPLIGHT (RH)
K	37	AUXILIARY 24 VOLT POWER
L	NONE	NOT USED
M	NONE	NOT USED
N	NONE	NOT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



NO GO

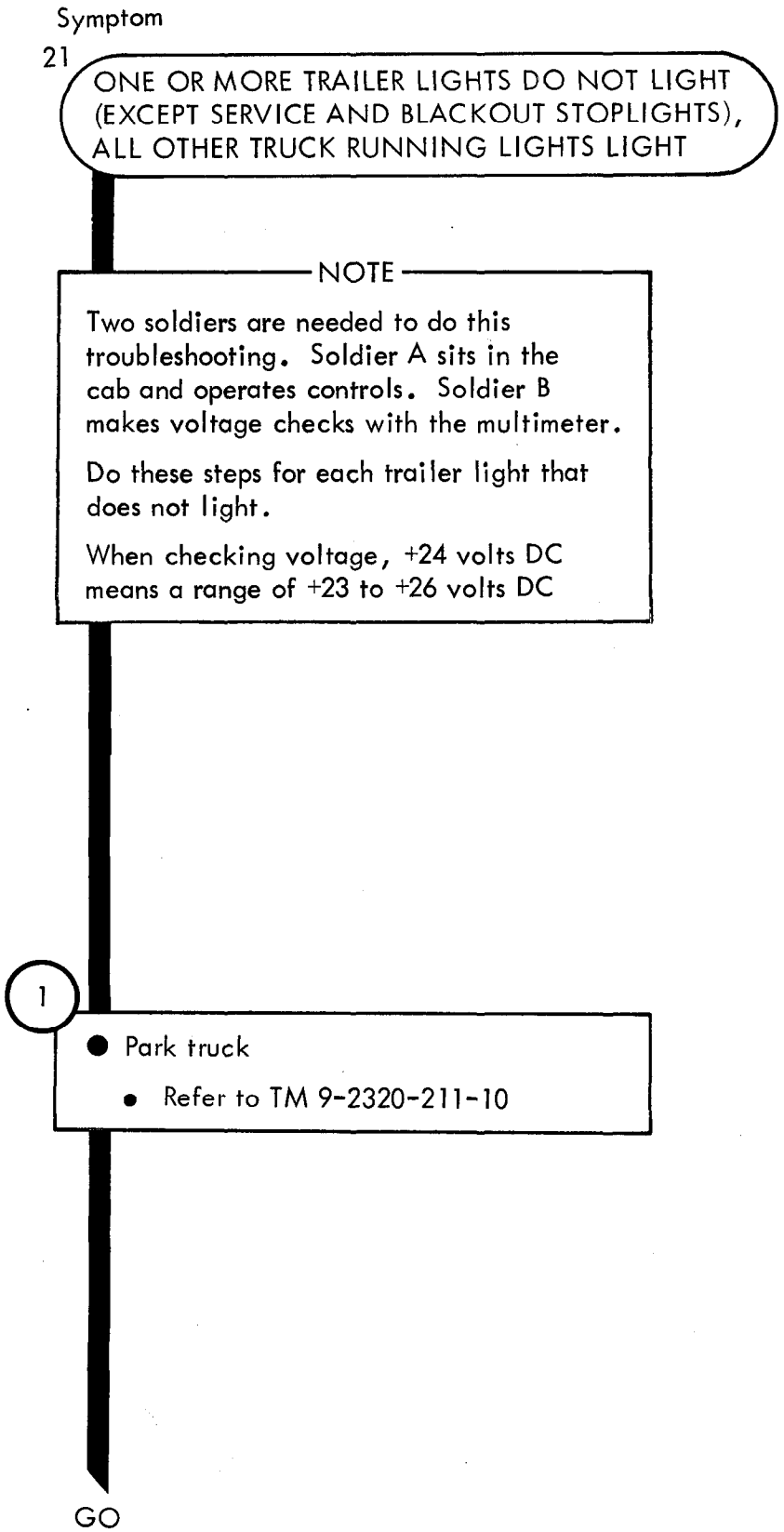
TA 115863

Figure 26-20 (Sheet 5 of 6)



TA 115864

Figure 26-20 (Sheet 6 of 6)



TA 115865

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

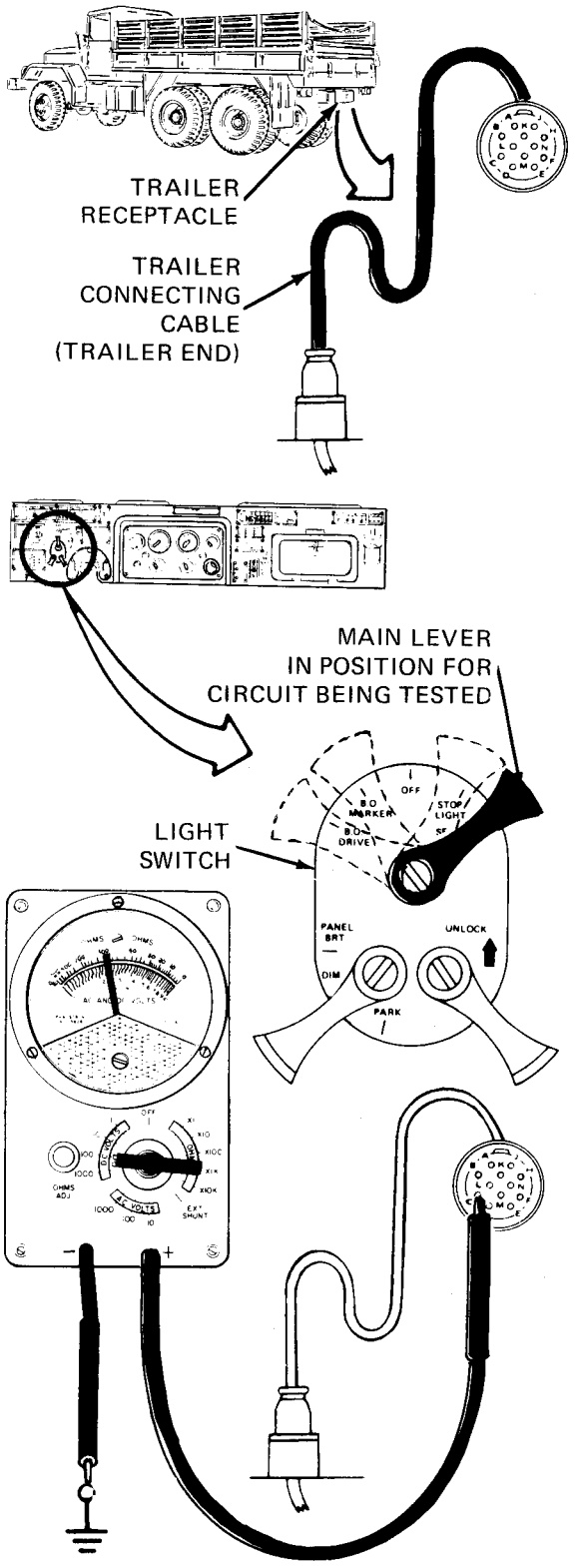
SOLDIER B • Set multimeter to measure +24 volts DC. Refer to test equipment procedures index

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)

GO

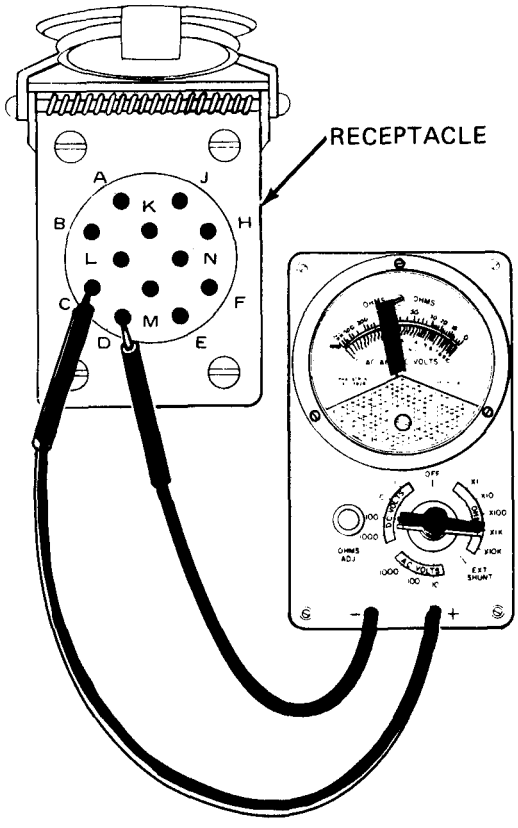
YES

NO

3

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

Does multimeter measure less than +24 volts DC?



NO GO

4

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

TA 115867

Figure 26-21 (Sheet 3 of 6)

NO GO

5

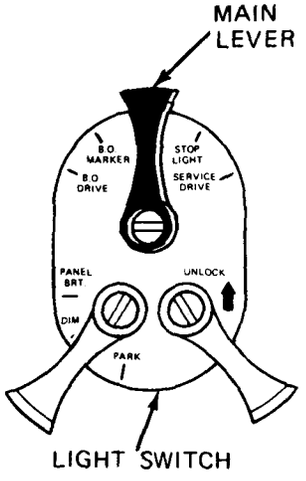
Are you troubleshooting a tractor truck?

NO

NO

6

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



YES

7

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

NO GO

TA 115868

Figure 26-21 (Sheet 4 of 6)

NO GO

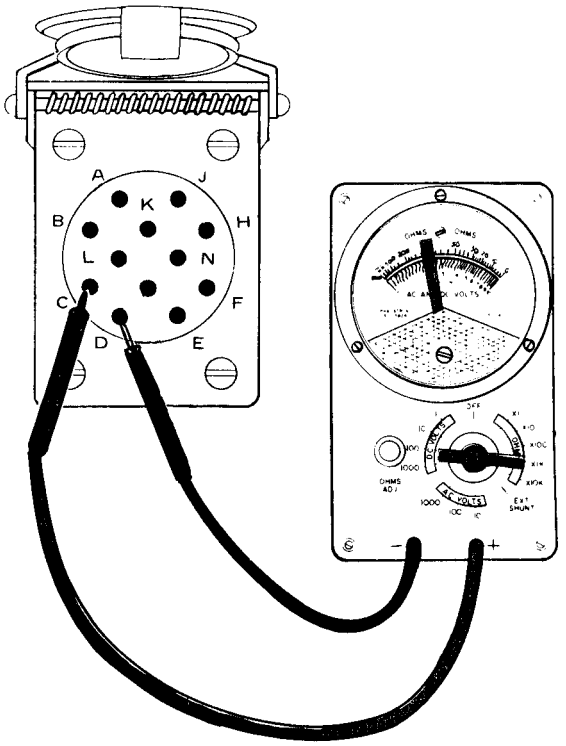
YES

8

- 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?

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

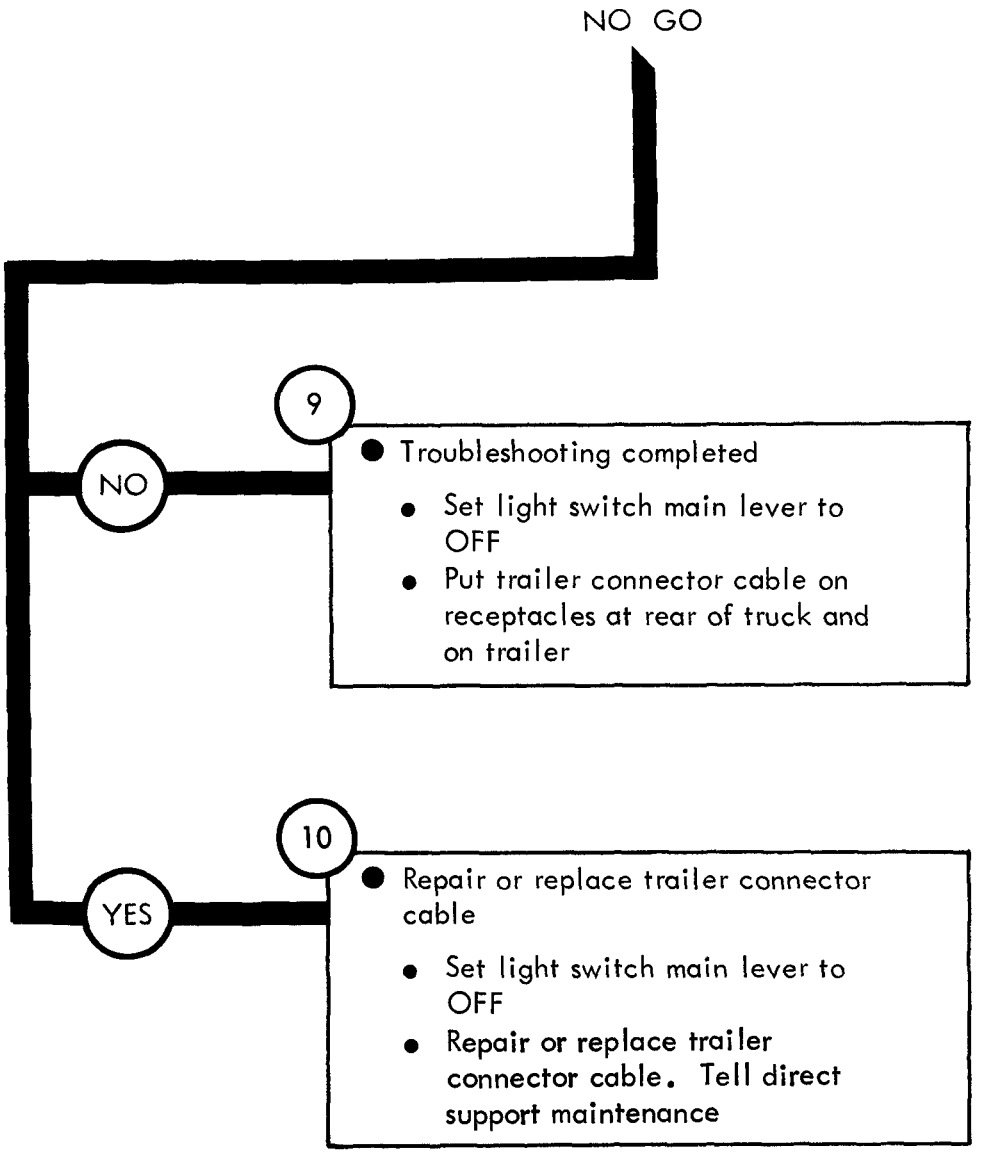


TS 209-20-486

NO GO

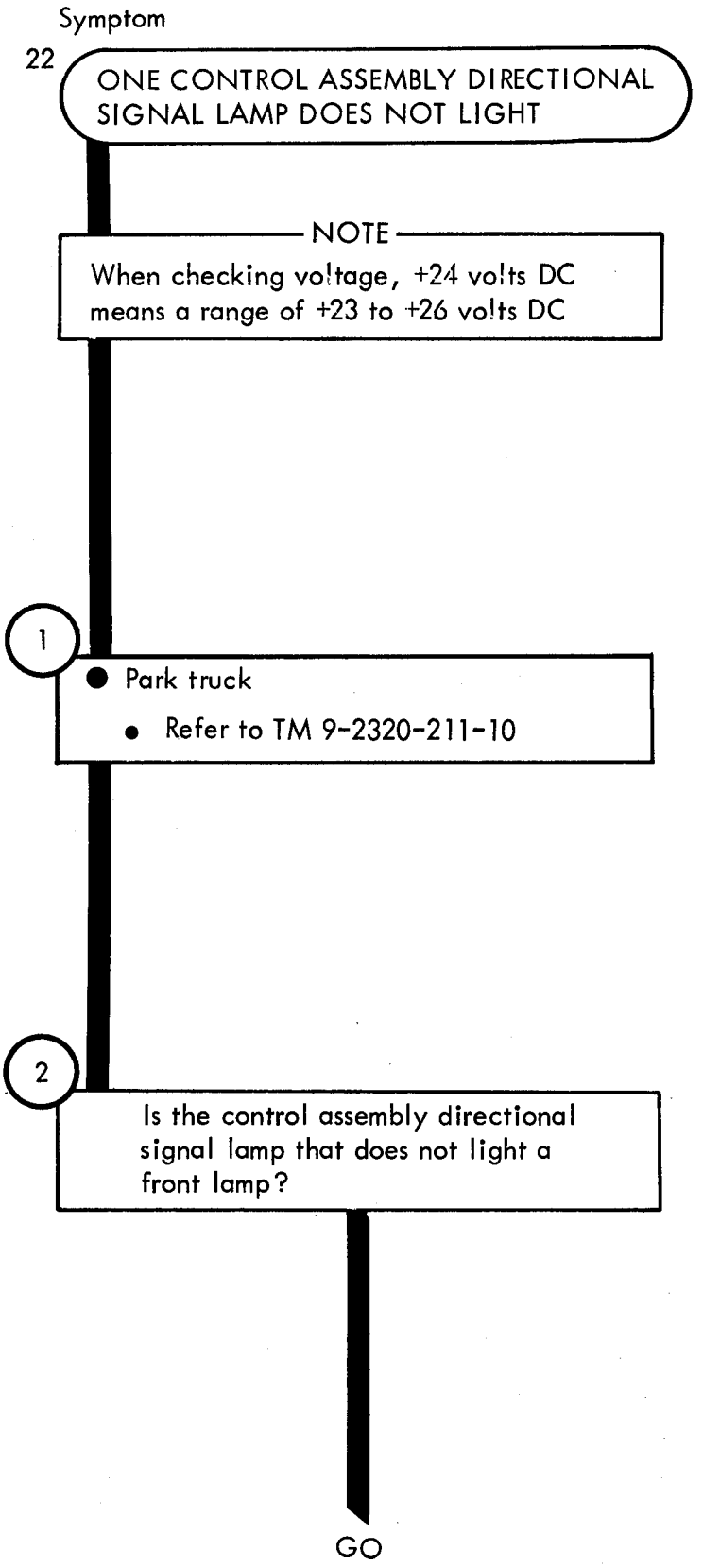
TA 115869

Figure 26-21 (Sheet 5 of 6)



TA 115870

Figure 26-21 (Sheet 6 of 6)



TA 115871

Figure 26-22 (Sheet 1 of 18)

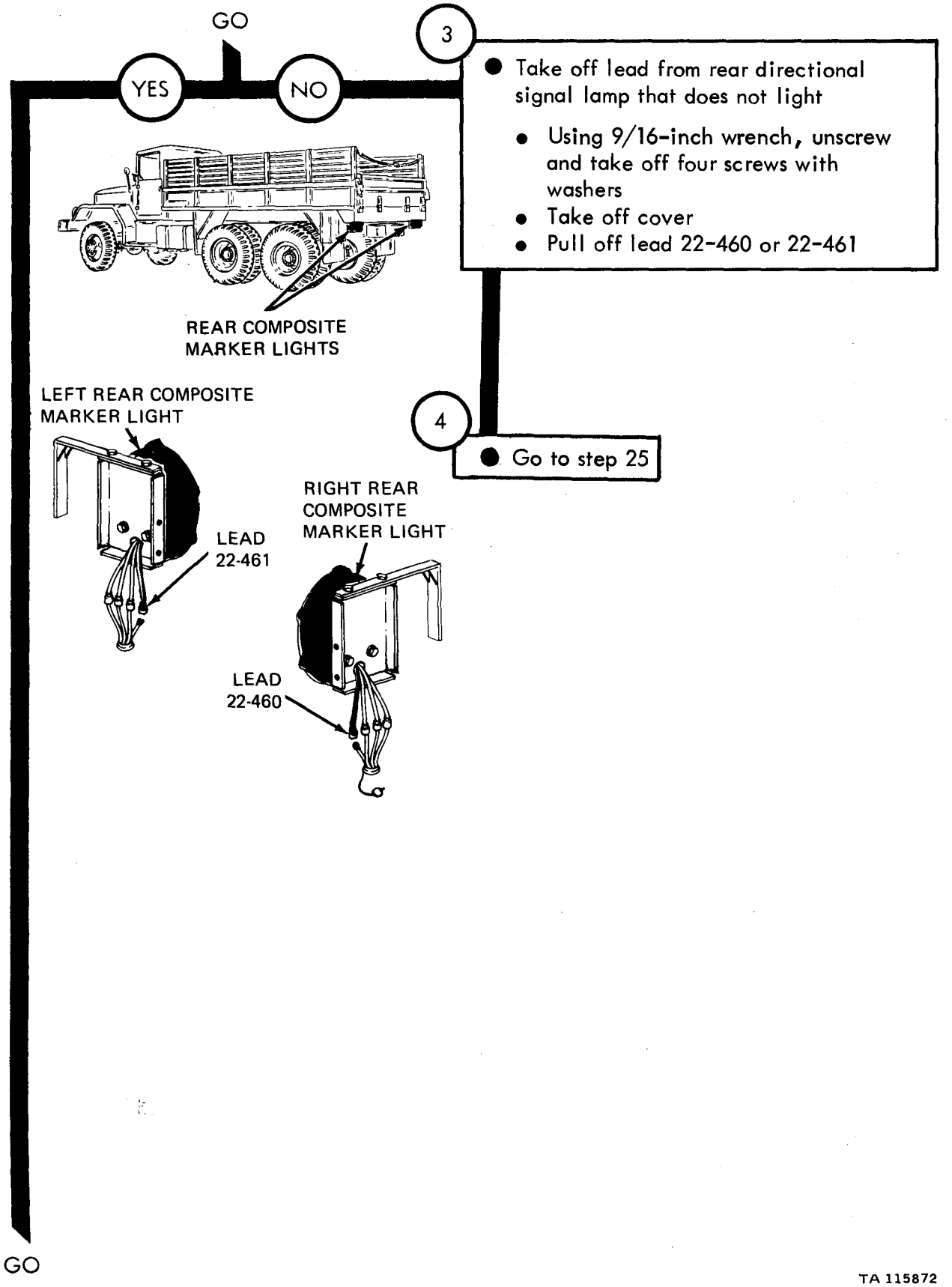
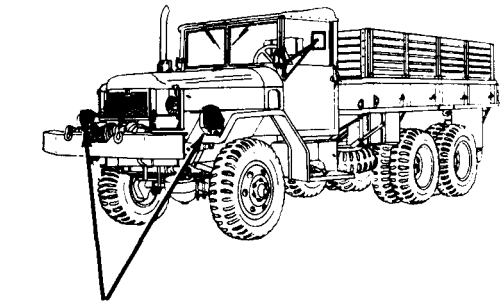


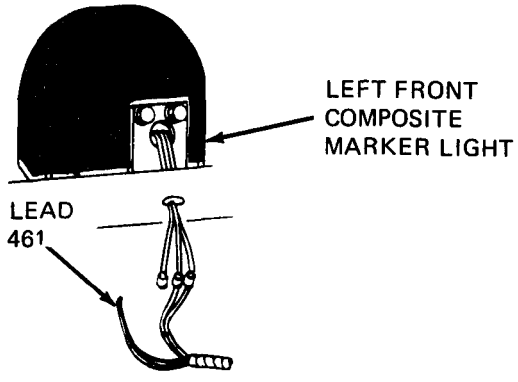
Figure 26-22 (Sheet 2 of 18)

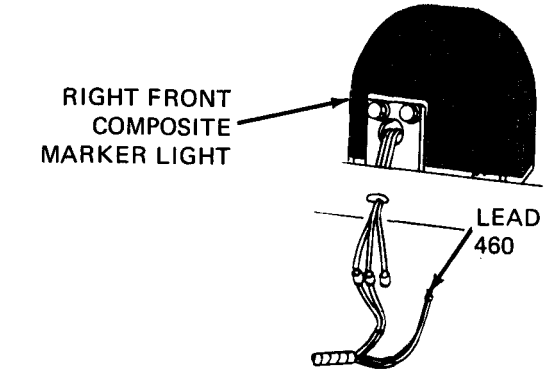
GO

5

- Take off lead 460 or 461 from front directional signal lamp that does not light
  - Pull off lead 460 or 461







GO

TA 115873

Figure 26-22 (Sheet 3 of 18)

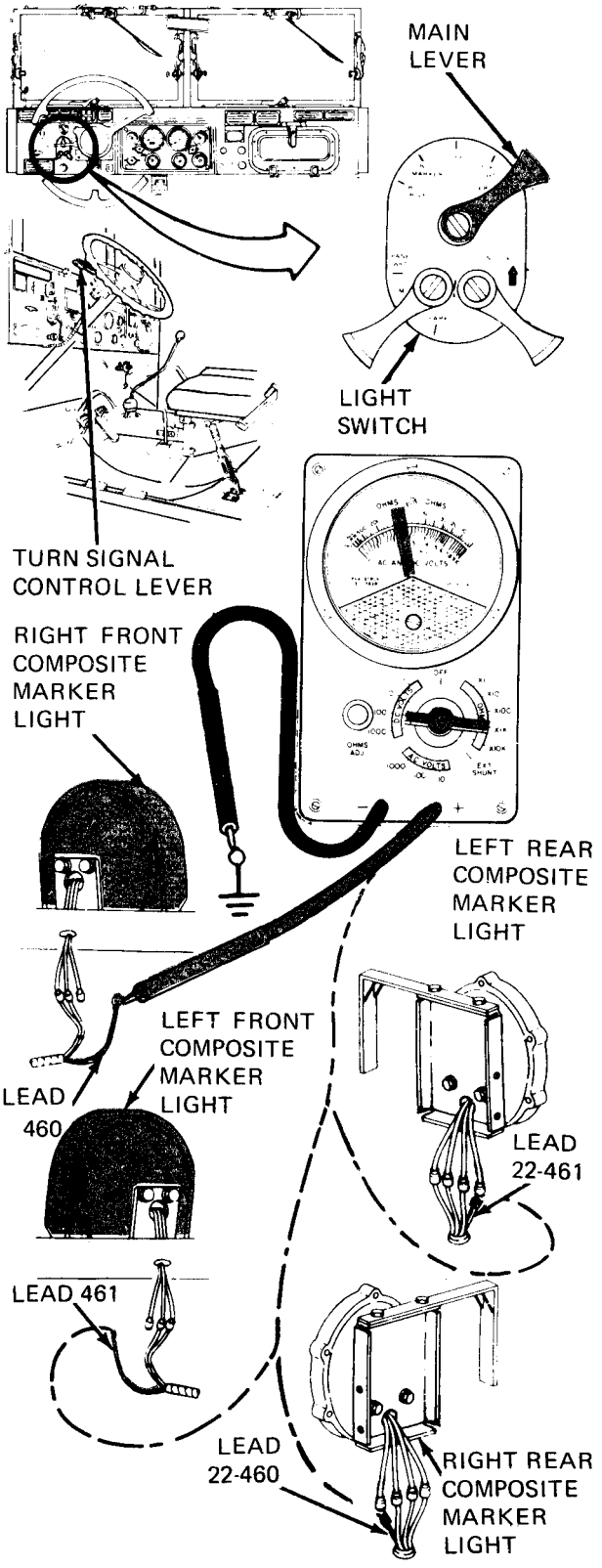
GO

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



TA 115874

Figure 26-22 (Sheet 4 of 18)

GO

YES

NO

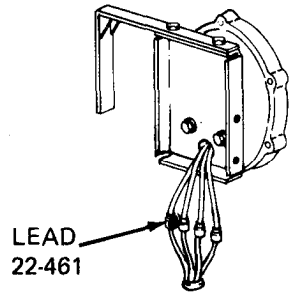
NOTE

The following steps use the left rear directional signal lamp as a typical example. Do the other directional signal lamps the same way

The rear directional signals and stoplights use the same lamps

7

- Replace left rear directional signal (stoplight lamp)
  - Set light switch main lever to OFF
  - Replace left rear directional signal lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Put back circuit 22-461 lead at left rear composite marker light

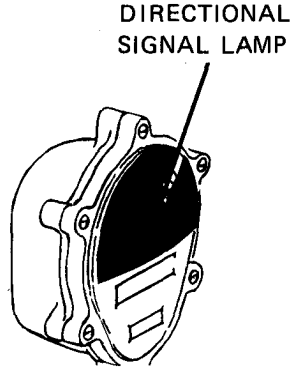


8

- Go to step 13

9

- Test left rear directional signal lamp
  - Set light switch main lever to SERVICE DRIVE
  - Look at left rear composite marker light
  - Directional signal lamp should go on and off at rate of 1 to 2 times per second



Did directional signal lamp fail to work?

NO GO

TA 115875

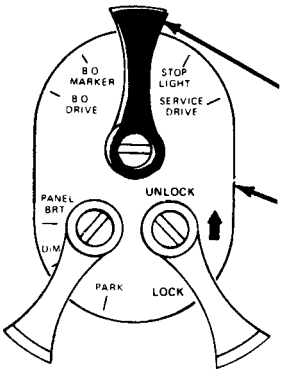
Figure 26-22 (Sheet 5 of 18)

NO GO

10

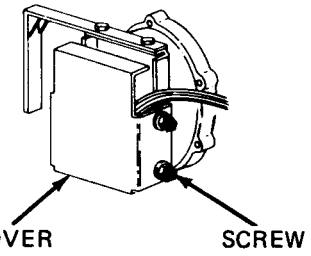
NO

- Put rear composite marker light back together
  - Set turn signal control lever to neutral position
  - Set light switch main lever to OFF
  - Put cover back on left rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers



MAIN LEVER

LIGHT SWITCH



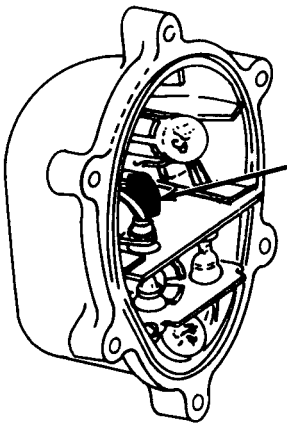
COVER

SCREW

11

YES

- Clean contacts of left rear directional signal (stoplight) lamp
  - Set light switch main lever to OFF
  - Remove directional signal lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29
  - Clean directional signal lamp socket
  - Put back directional signal lamp. Refer to Vol 3, chapter 7, para 7-28 and 7-29



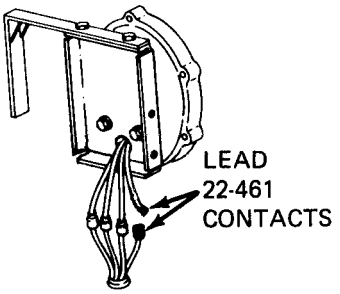
DIRECTIONAL SIGNAL (STOPLIGHT) LAMP SOCKET

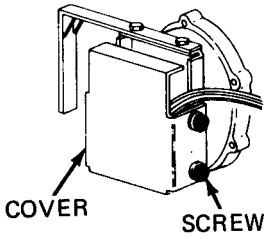
NO GO

TA 115876

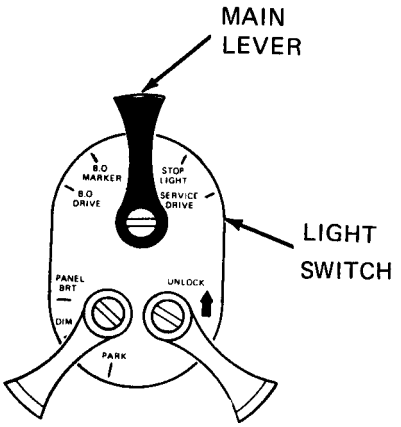
Figure 26-22 (Sheet 6 of 18)

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

TA 115877

Figure 26-22 (Sheet 7 of 18)

From step 8

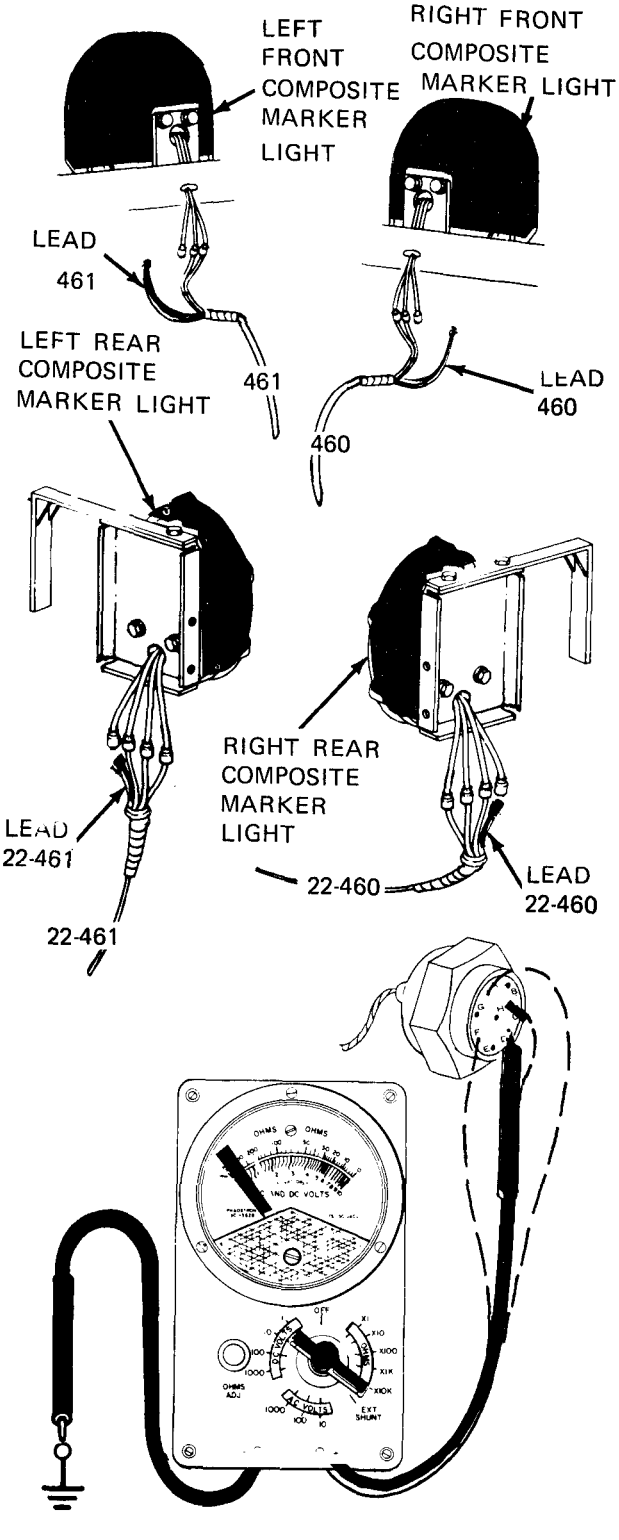
13

- 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

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



TA 115878

Figure 26-22 (Sheet 8 of 18)

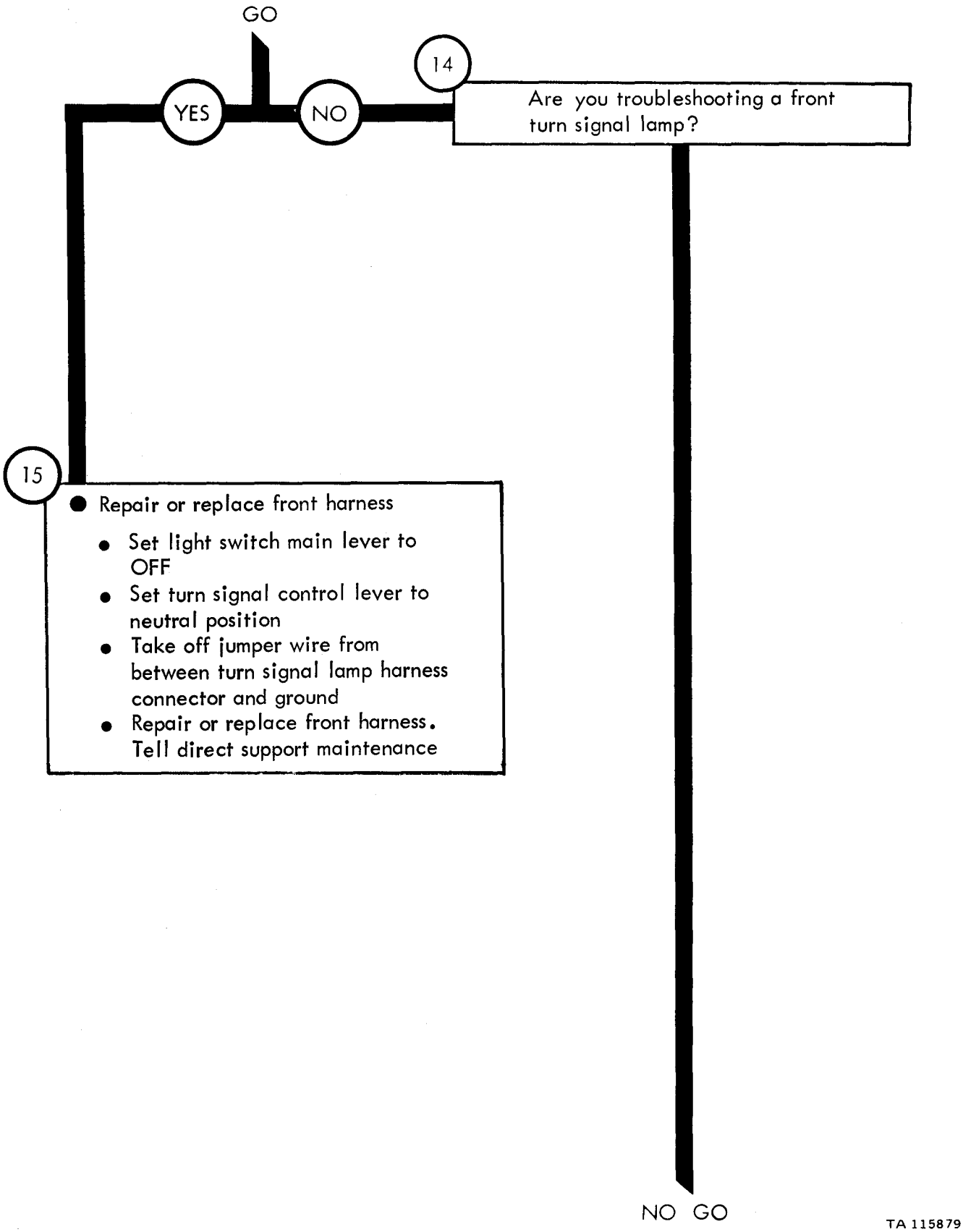


Figure 26-22 (Sheet 9 of 18)

NO GO

16

- 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

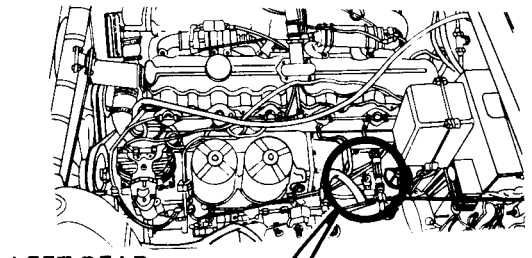
OK?

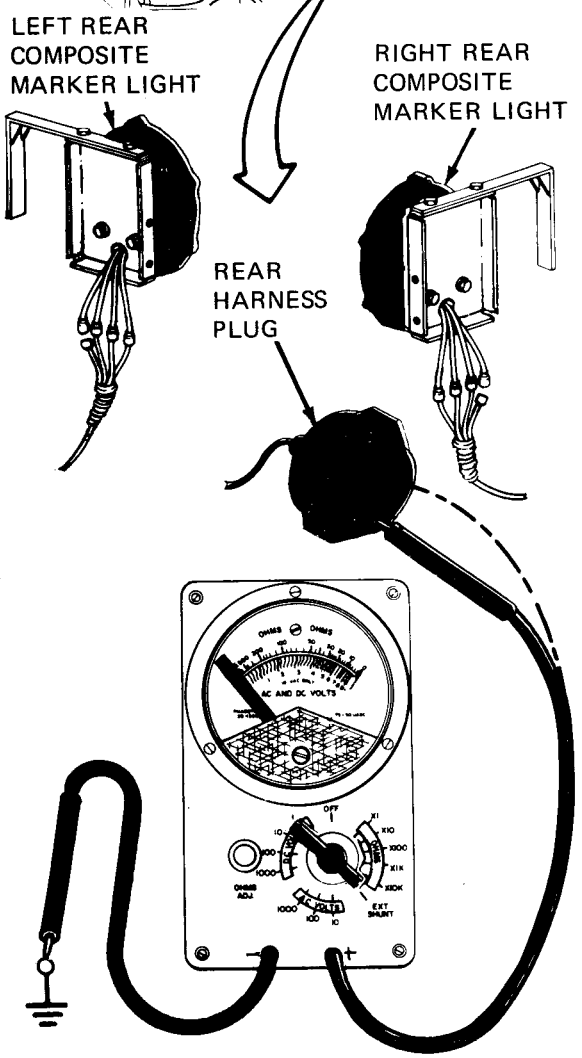
YES

NO

17

- Go to step 20





NO GO

TA 115880

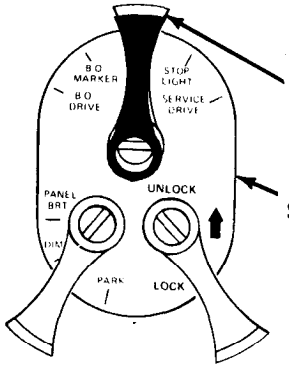
Figure 26-22 (Sheet 10 of 18)

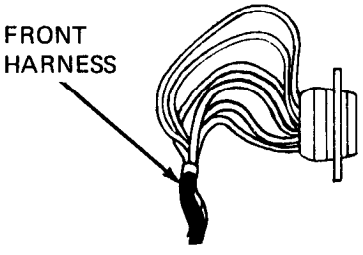
NO GO

NO

18

- Repair or replace rear harness
  - Set light switch main lever to OFF
  - Set directional signal lever to neutral position
  - Screw turn signal control harness plug back on turn signal control assembly and tighten
  - Repair or replace rear harness. Tell direct support maintenance

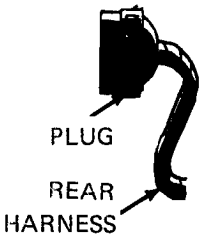


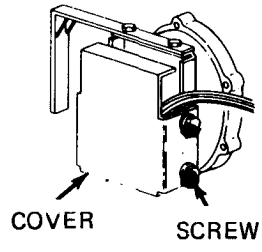


YES

19

- Repair or replace front harness
  - Set light switch main lever to OFF
  - Set turn signal control lever to neutral position
  - Put cover back on rear composite marker light assembly by using 9/16-inch wrench to screw in and tighten four screws with washers
  - Repair or replace front harness. Tell direct support maintenance



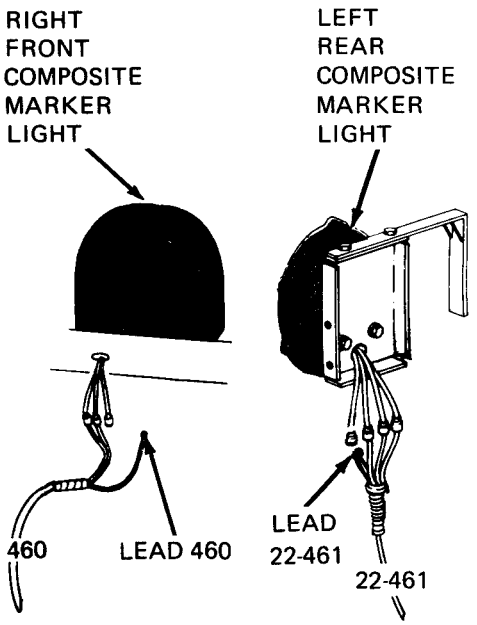


TA 115881

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



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

TA 115882

Figure 26-22 (Sheet 12 of 18)

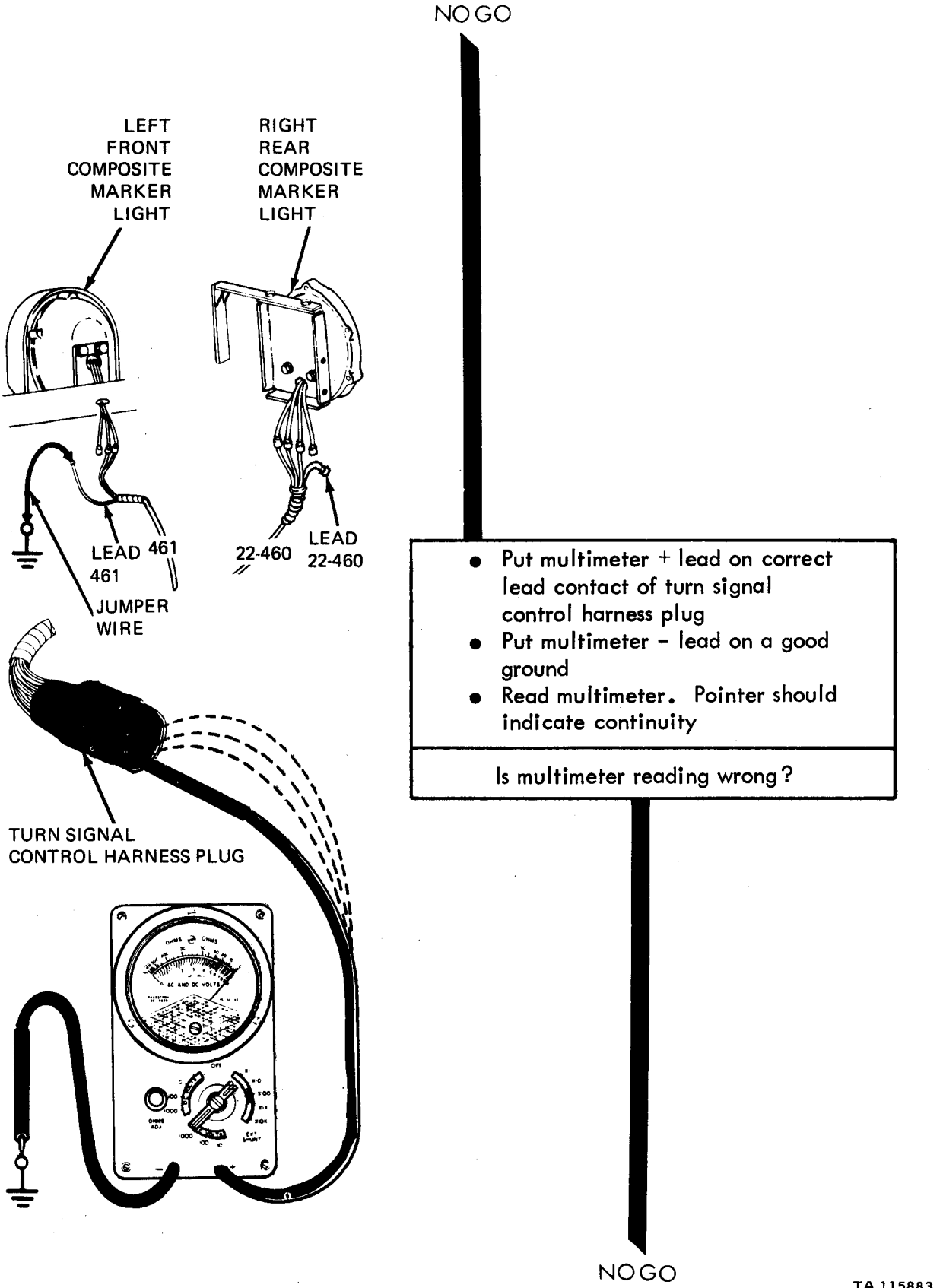


Figure 26-22 (Sheet 13 of 18)

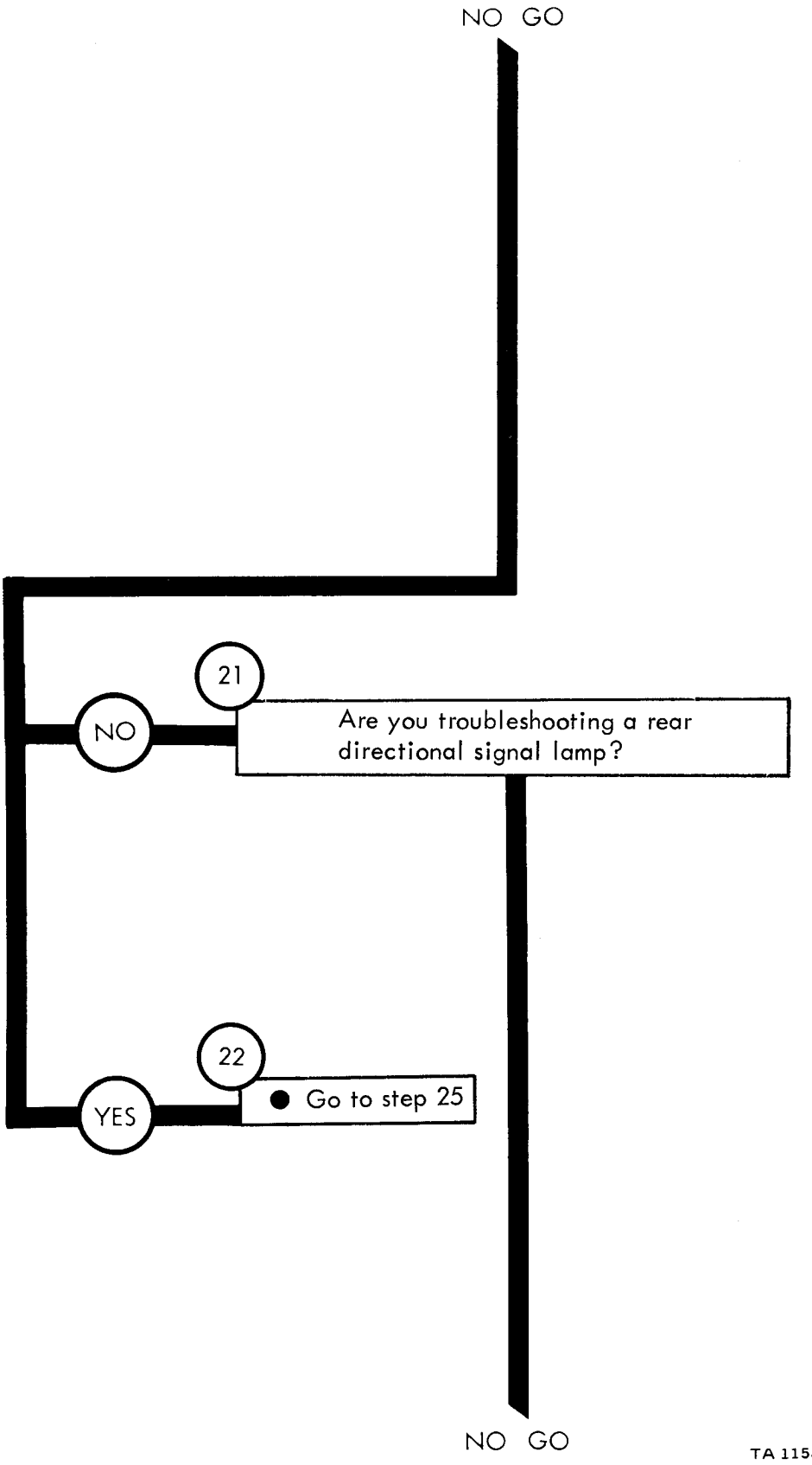


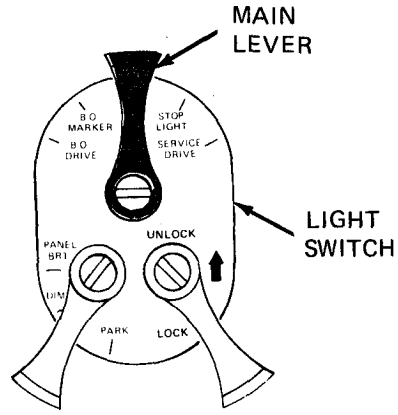
Figure 26-22 (Sheet 14 of 18)

NO GO

NO

23

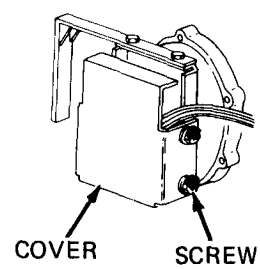
- Replace turn signal control assembly
  - Set light switch main lever to OFF
  - Take off jumper wire from between turn signal lamp harness connector and ground
  - At front composite marker parking light put back lead 460 or 461
  - Replace turn signal control assembly. Refer to Vol 3, chapter 7, para 7-48



YES

24

- Repair or replace rear harness
  - Set light switch main lever to OFF
  - Take off jumper wire from between turn signal lamp harness connector and ground
  - At composite marker rear parking light 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 in and tighten four screws with washers
  - Repair or replace rear harness. Tell direct support maintenance



TA 115885

Figure 26-22 (Sheet 15 of 18)

From step 22

25

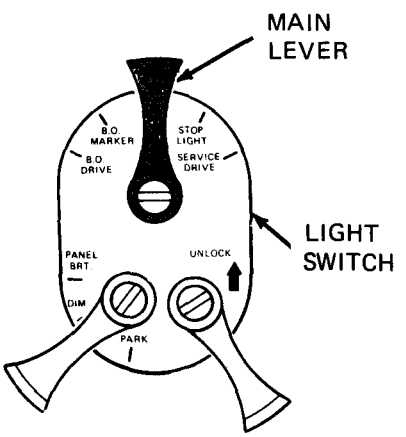
Are you troubleshooting a rear turn signal lamp?

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

TA 115886

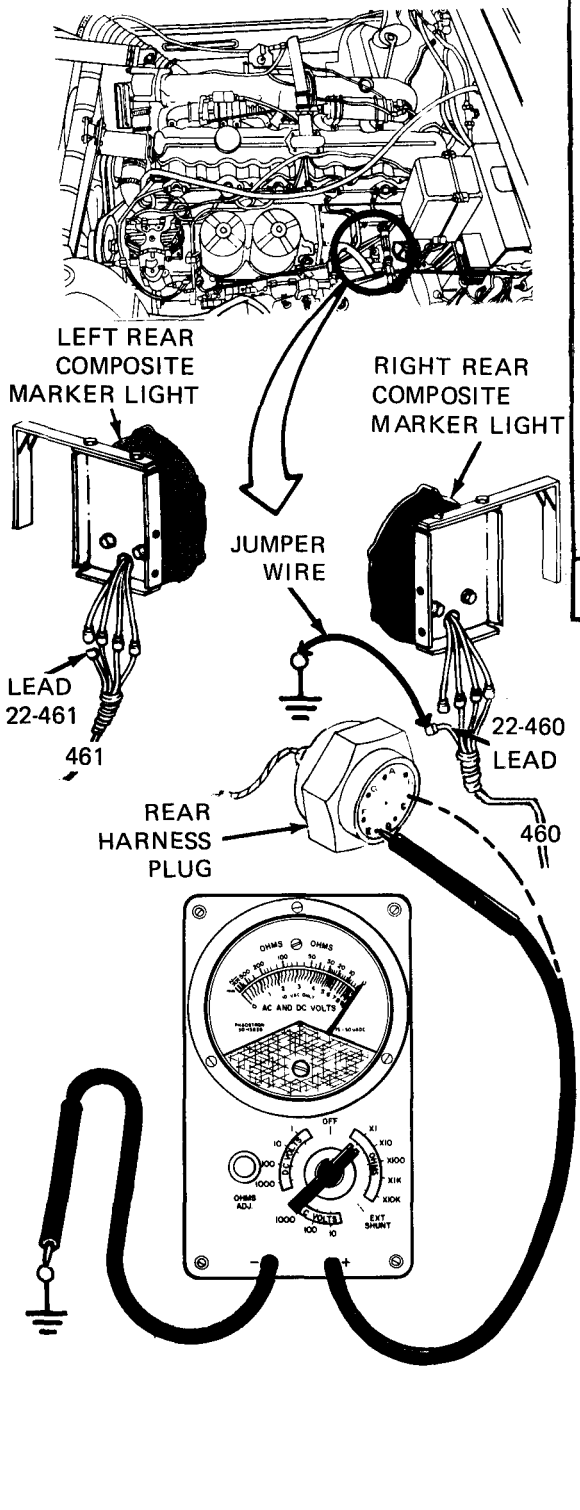
Figure 26-22 (Sheet 16 of 18)

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

TA 115887

Figure 26-22 (Sheet 17 of 18)

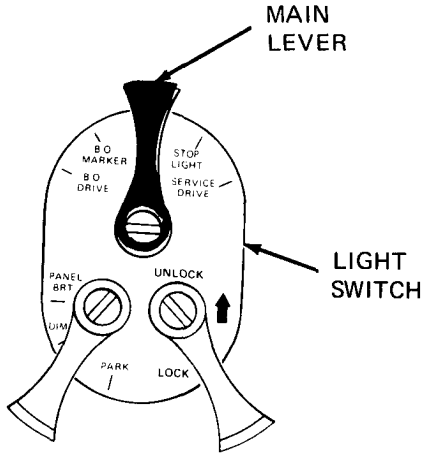
NO GO

YES

NO

28

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

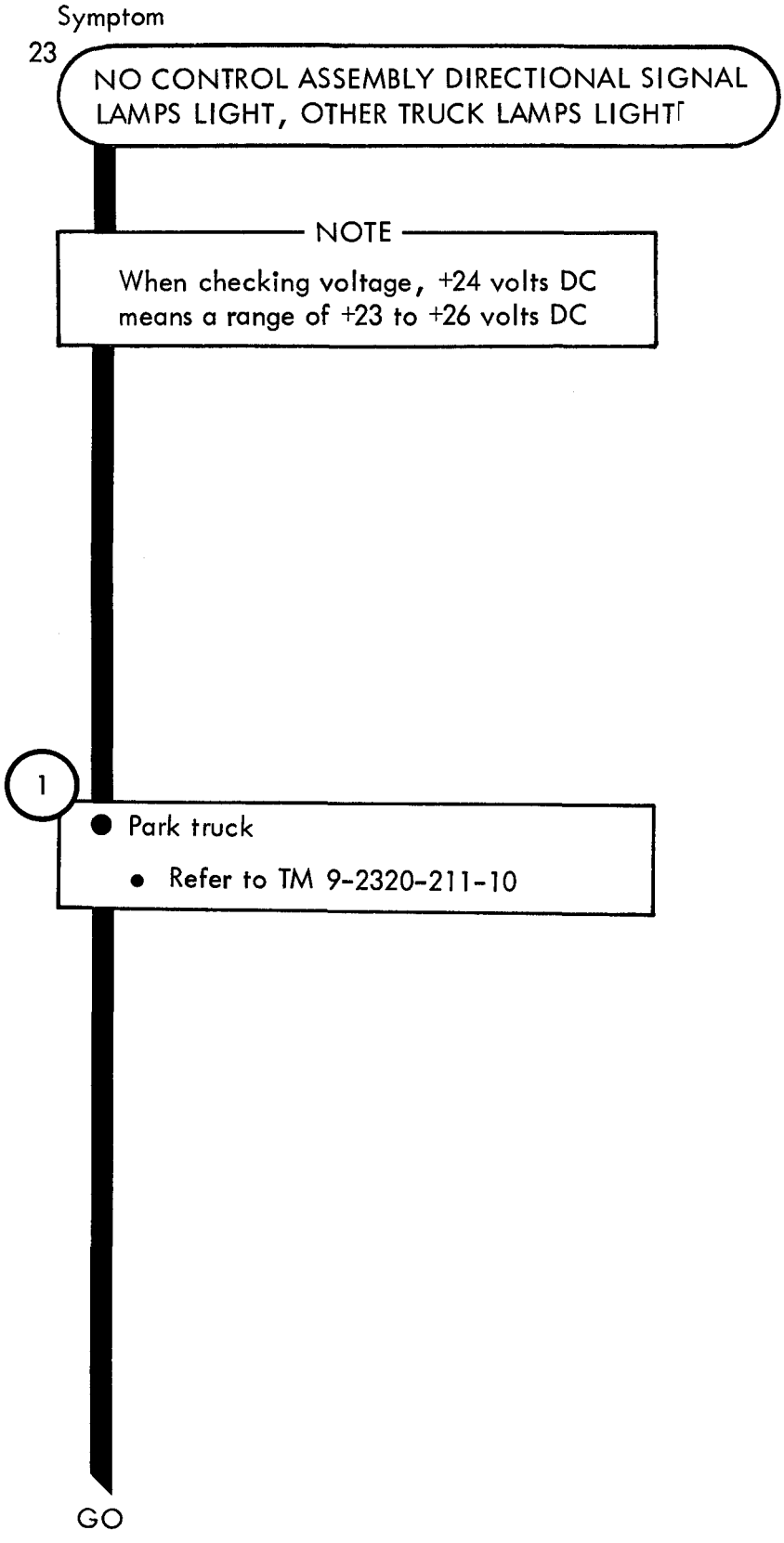


29

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

TA 115888

Figure 26-22 (Sheet 18 of 18)



TA 115889

Figure 26-23 (Sheet 1 of 7)

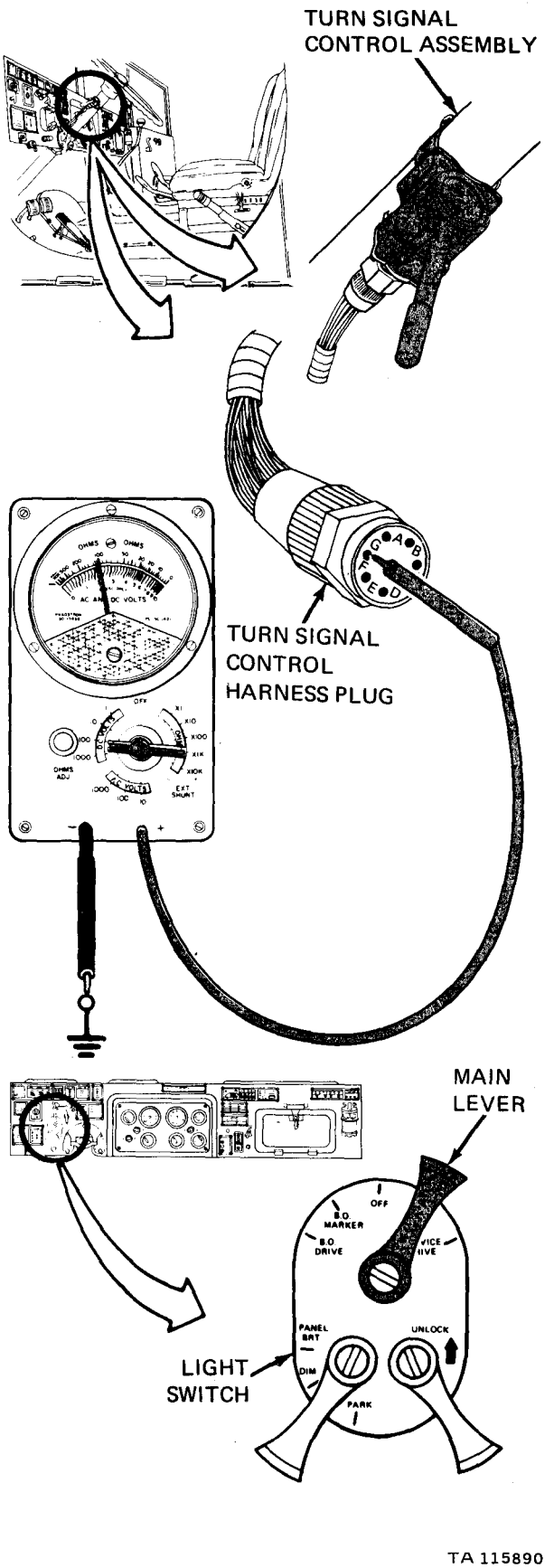
GO

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



TA 115890

Figure 26-23 (Sheet 2 of 7)

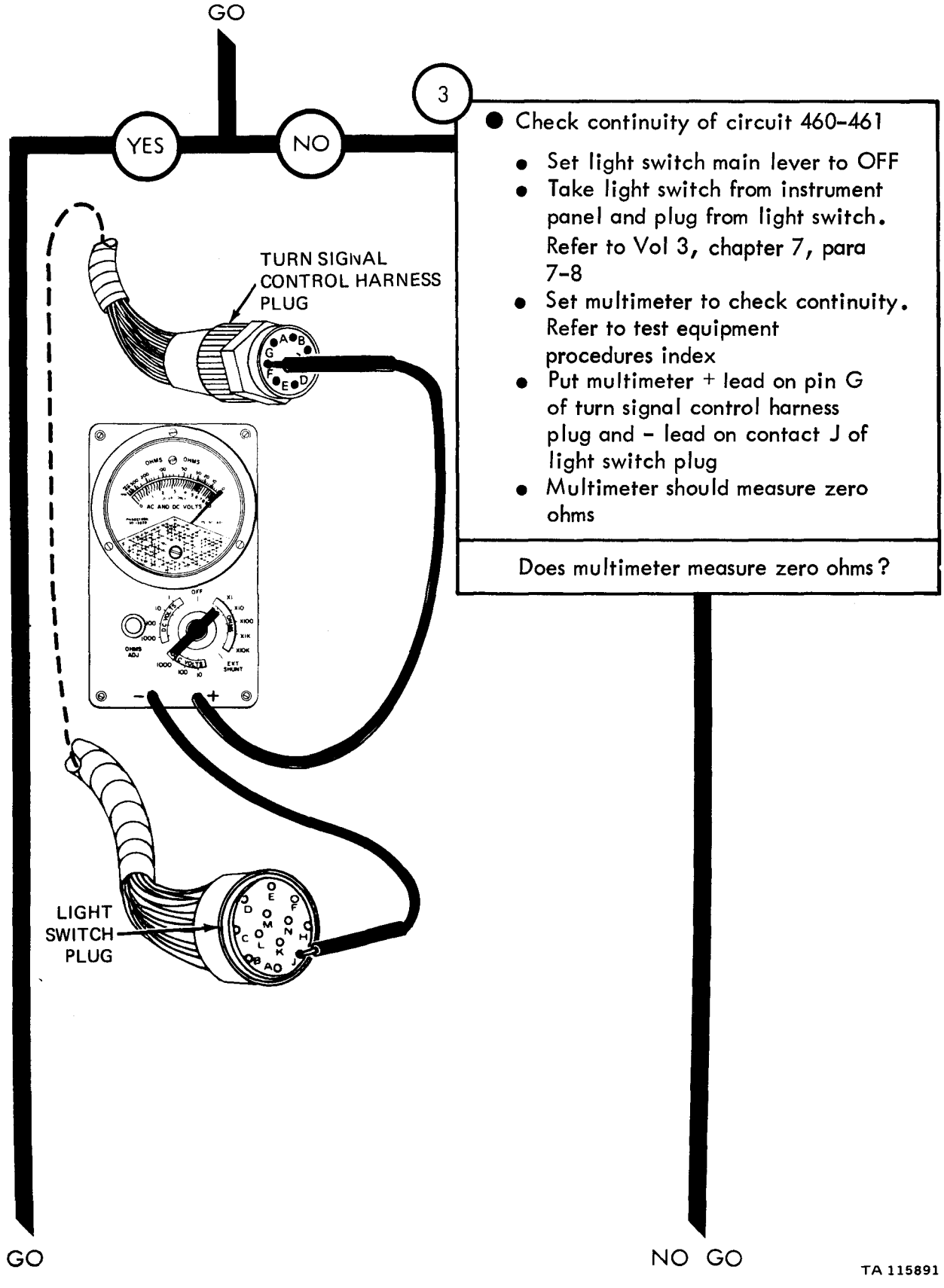


Figure 26-23 (Sheet 3 of 7)

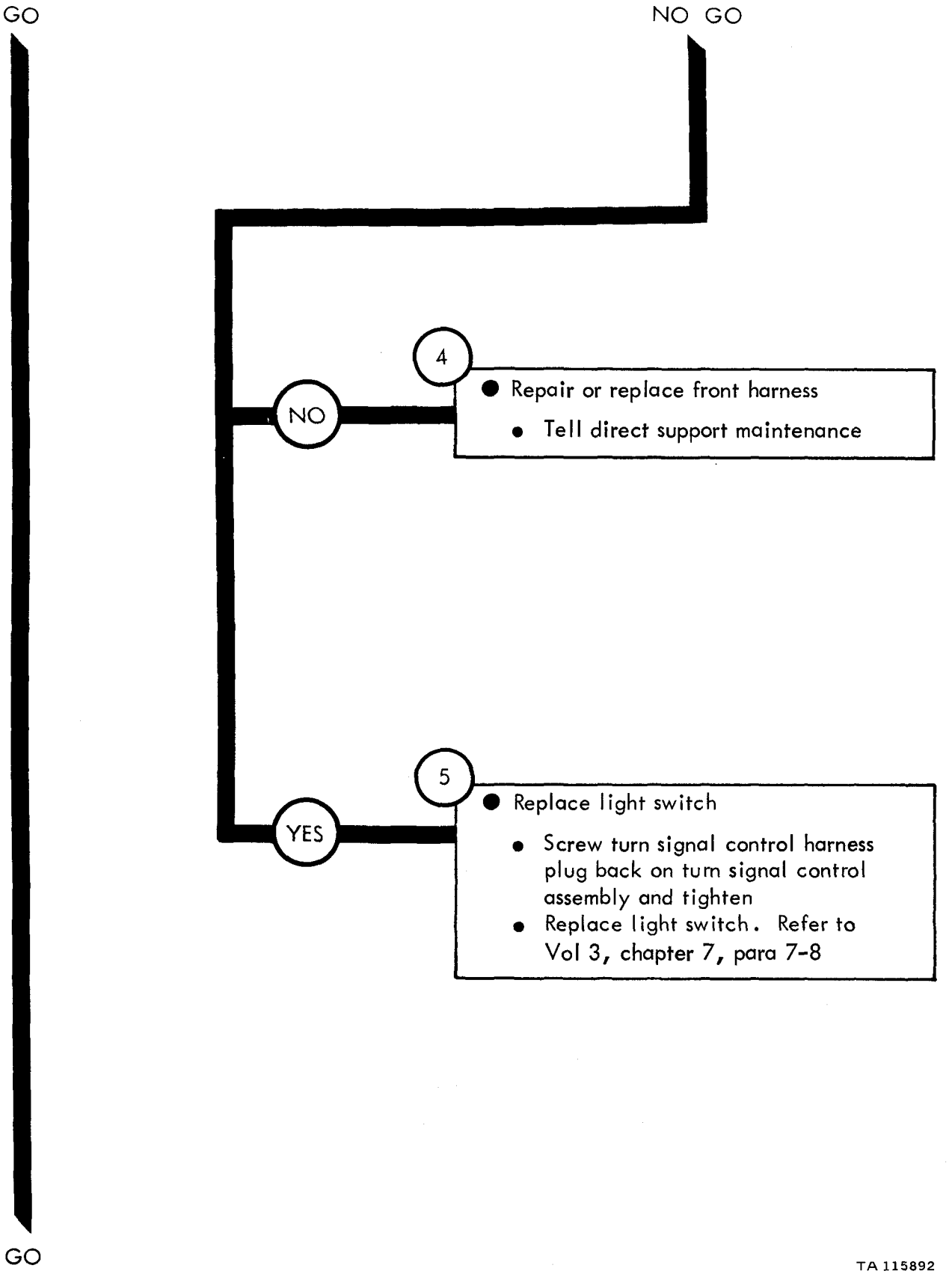


Figure 26-23 (Sheet 4 of 7)

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

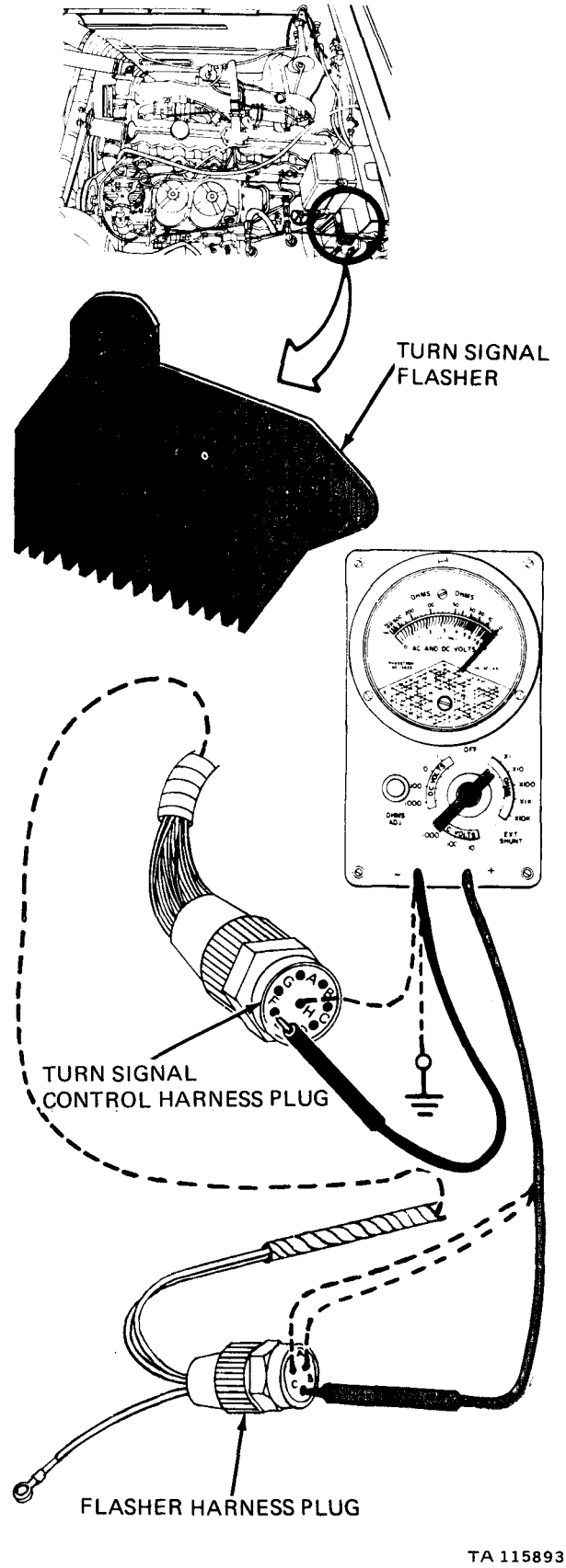


Figure 26-23 (Sheet 5 of 7)

GO

YES

NO

7

- Repair or replace front harness
  - Tell direct support maintenance

8

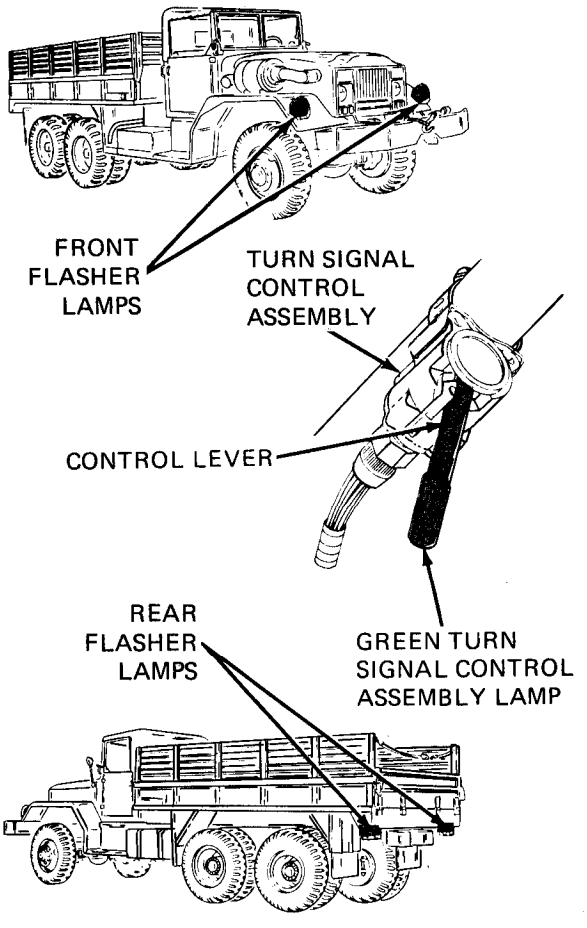
- Replace turn signal flasher
  - Screw turn signal control harness plug back on turn signal control assembly and tighten
  - Replace light switch. Refer to Vol 3, chapter 7, para 7-8
  - Replace turn signal flasher. Refer to Vol 3, chapter 7, para 7-50

9

- See if control assembly directional signal lamps work
  - Set light switch main switch lever to STOPLIGHT
  - Set turn signal control lever to emergency flasher
  - Look at two front and two rear turn signal lamps and green turn signal control assembly lamp. All lamps should be flashing together 1 or 2 times per second

Check out OK?

GO



TA 115894

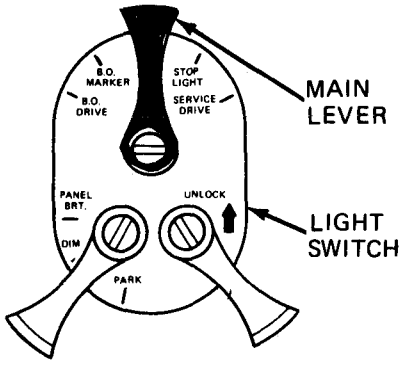
Figure 26-23 (Sheet 6 of 7)

GO

NO

10

- Replace turn signal control assembly
  - Set light switch main lever to OFF
  - Replace turn signal control assembly. Refer to Vol 3, chapter 7, para 7-48



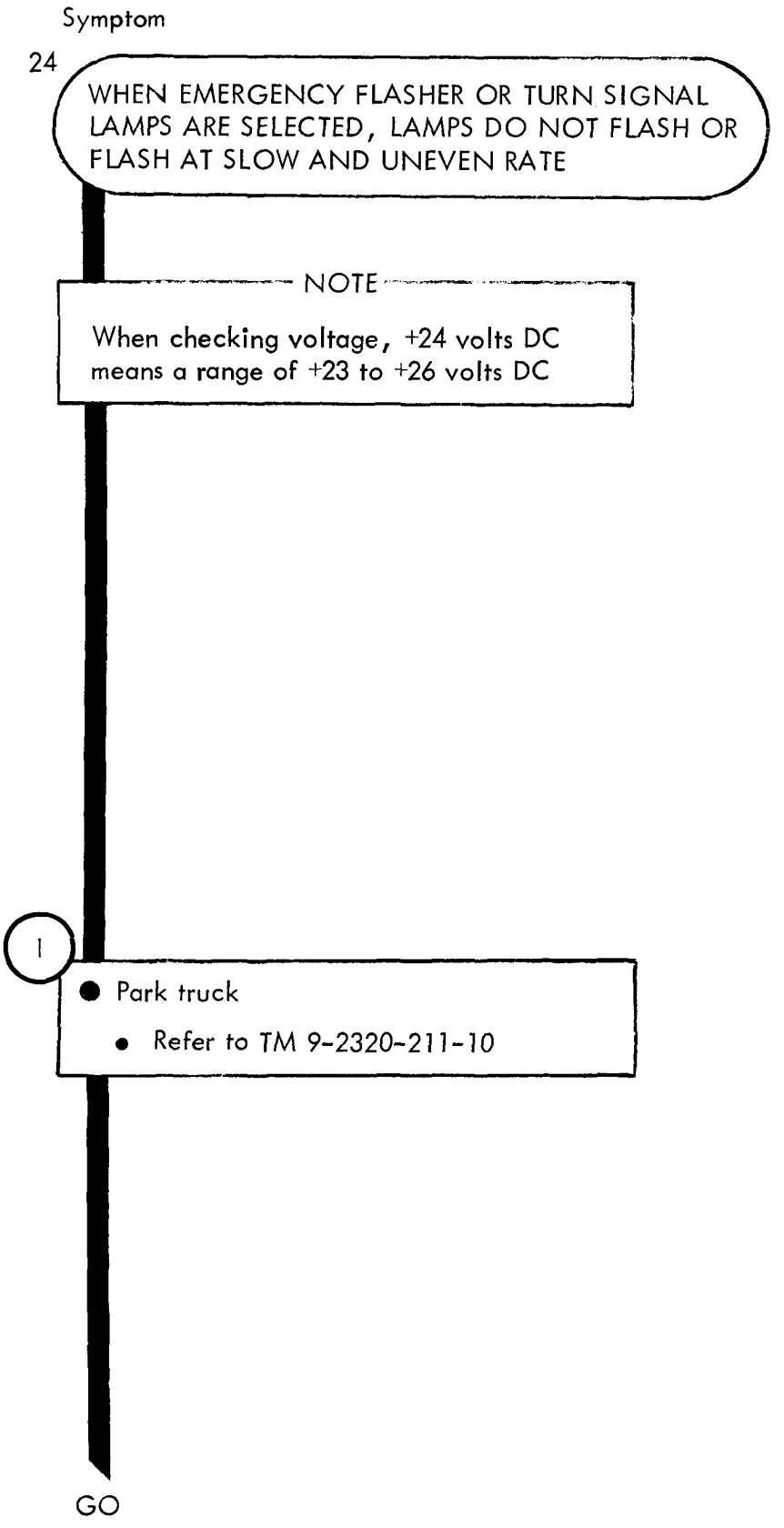
YES

11

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

TA 115895

Figure 26-23 (Sheet 7 of 7)



TA 115896

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

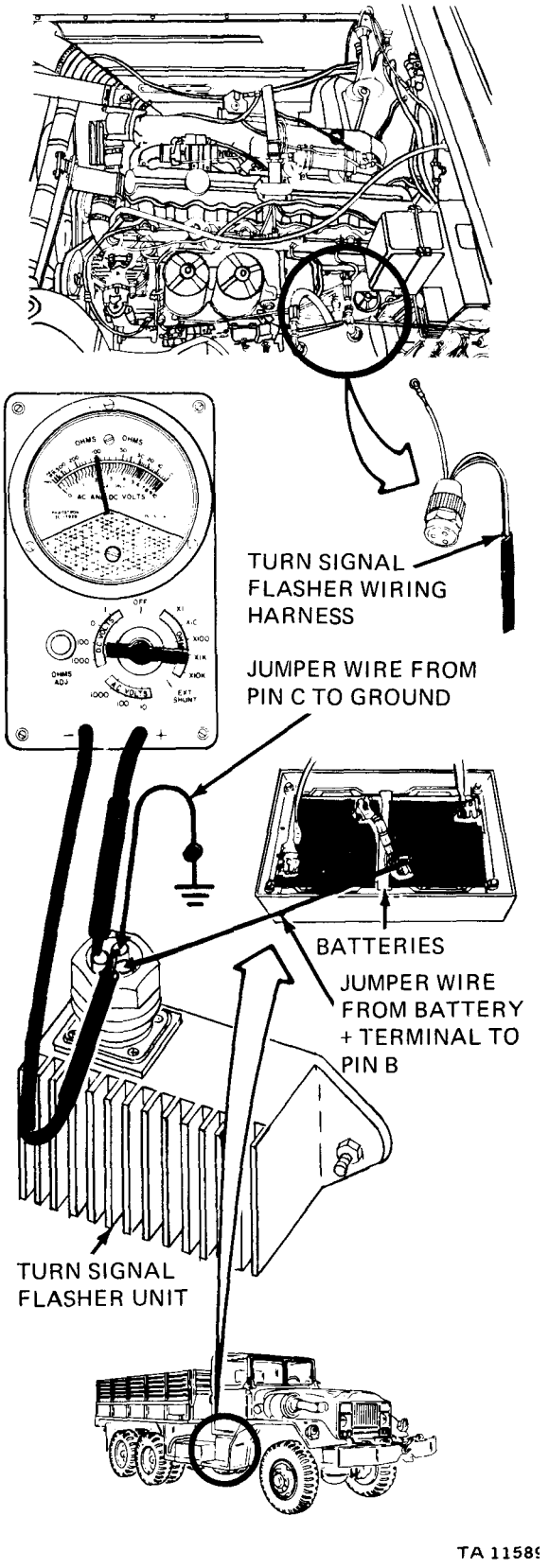
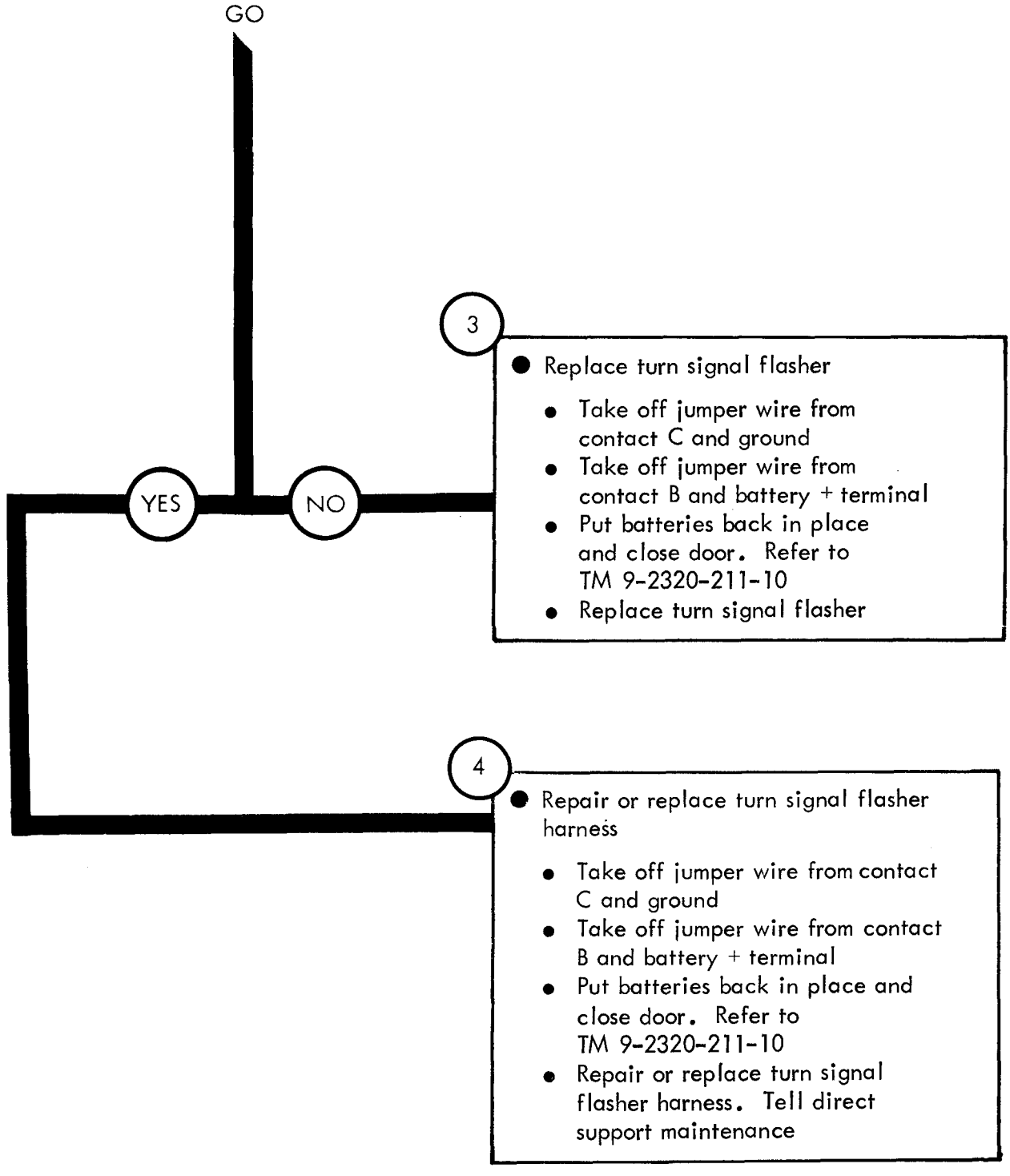


Figure 26-24 (Sheet 2 of 3)



TA 115898

Figure 26-24 (Sheet 3 of 3)

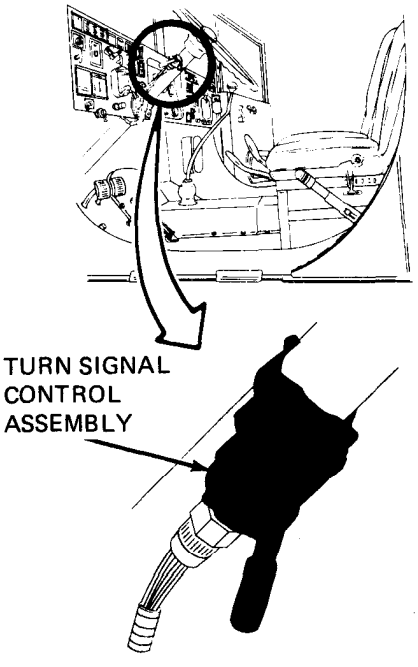
Symptom 25

TURN SIGNAL INDICATOR LAMP DOES NOT FLASH, REST OF DIRECTIONAL SYSTEM WORKS

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

2
- Test turn signal control assembly for ground to steering column
  - Try to push turn signal control assembly around steering column

Does turn signal control assembly move?



NO

3
- Replace turn signal control assembly lamp
  - Refer to Vol 3, chapter 7, para 7-48

YES

4
- Aline and tighten turn signal control assembly to steering column
  - Refer to Vol 3, chapter 7, para 7-48

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

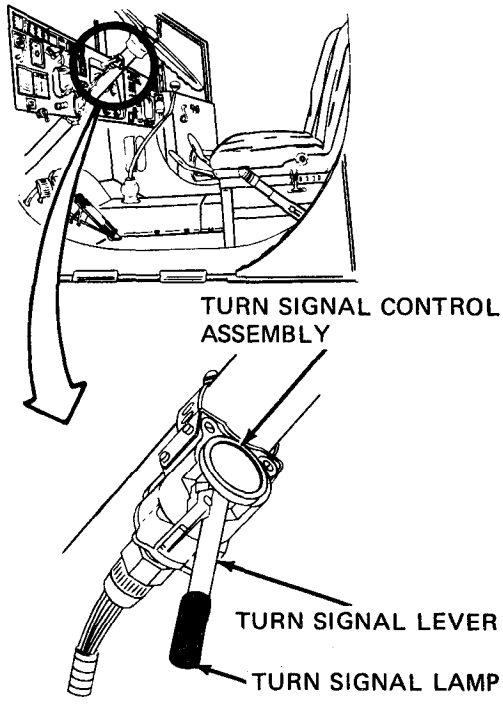
1

- 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



TA 115900

Figure 26-26 (Sheet 1 of 6)

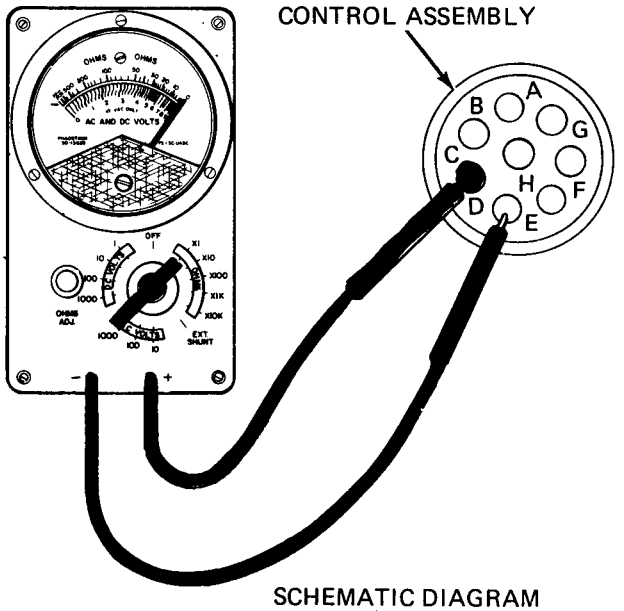
GO

3

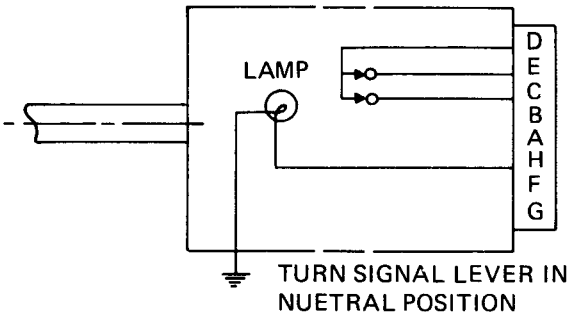
- Check continuity of turn signal control assembly with turn signal control lever in neutral position
  - Put turn signal control lever in neutral position
  - Set multimeter to measure continuity. Refer to test equipment procedures index
  - Check for continuity between turn signal control assembly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

Check out OK?

GO



SCHEMATIC DIAGRAM



TURN SIGNAL LEVER IN NUETRAL POSITION

+ 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

TA 115901

Figure 26-26 (Sheet 2 of 6)

GO

YES

NO

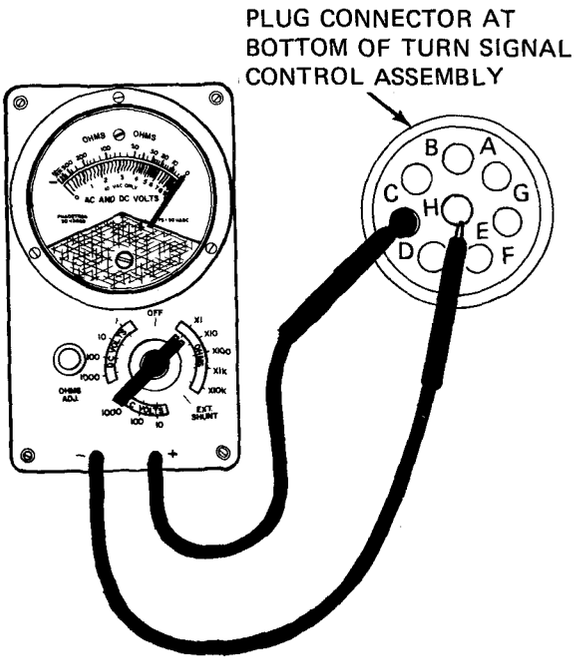
4

- Replace turn signal control assembly
  - Refer to Vol 3, chapter 7, para 7-48

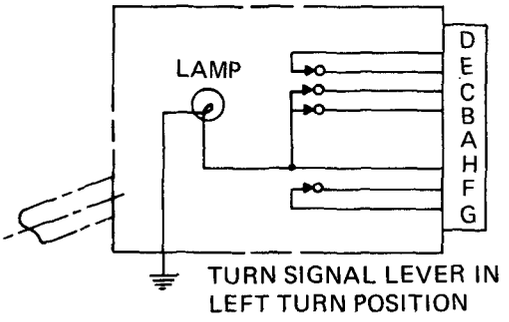
5

- Check continuity of turn signal assembly with turn signal control lever in left turn position
  - Set turn signal control lever to left turn position
  - Using multimeter check for continuity between turn signal control assembly contacts
  - Multimeter pointer will go to zero if contacts have continuity

Check out OK?



SCHEMATIC DIAGRAM



TURN SIGNAL LEVER IN LEFT TURN POSITION

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

GO

TA 115902

Figure 26-26 (Sheet 3 of 6)

GO

YES

NO

6

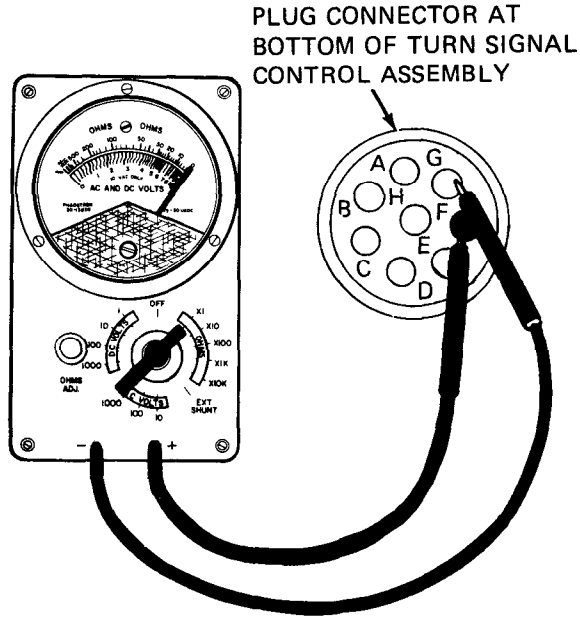
- Replace turn signal control assembly
  - Refer to Vol 3, chapter 7, para 7-48

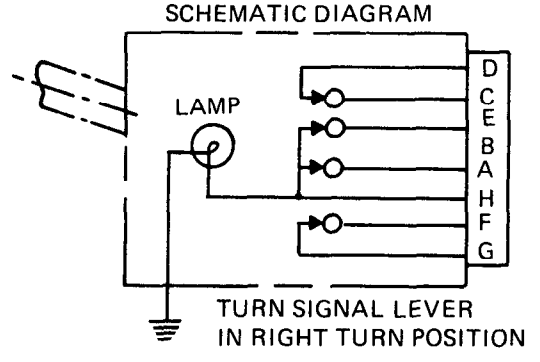
7

- Check continuity of turn signal control assembly with turn signal control lever in right turn position
  - Set turn signal control lever to right turn position
  - Using multimeter check for continuity between turn signal control assembly contacts
  - Multimeter pointer will go to zero if contacts have continuity

Check out OK?

GO





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

TA 115903

Figure 26-26 (Sheet 4 of 6)

GO

YES

NO

8

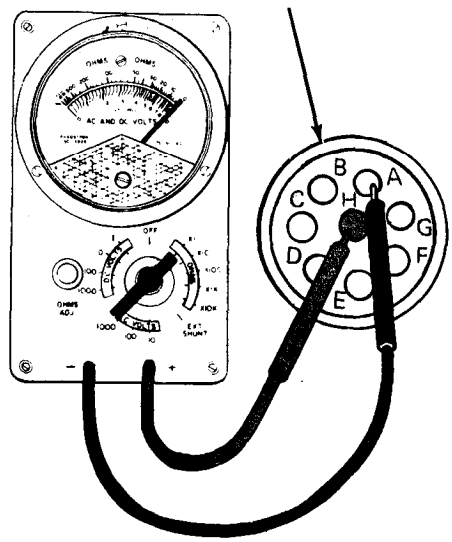
- Replace turn signal control assembly
  - Refer to Vol 3, chapter 7, para 7-48

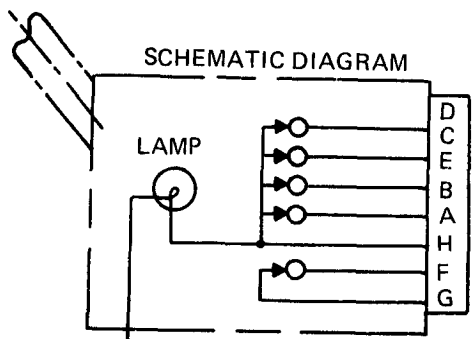
9

- Check continuity of turn signal control assembly with turn signal control lever in emergency flasher position
  - Set turn signal control lever to emergency flasher position
  - Using multimeter check for continuity between turn signal control assembly contacts
  - Multimeter pointer will go to zero if contacts have continuity

Check out OK?

GO

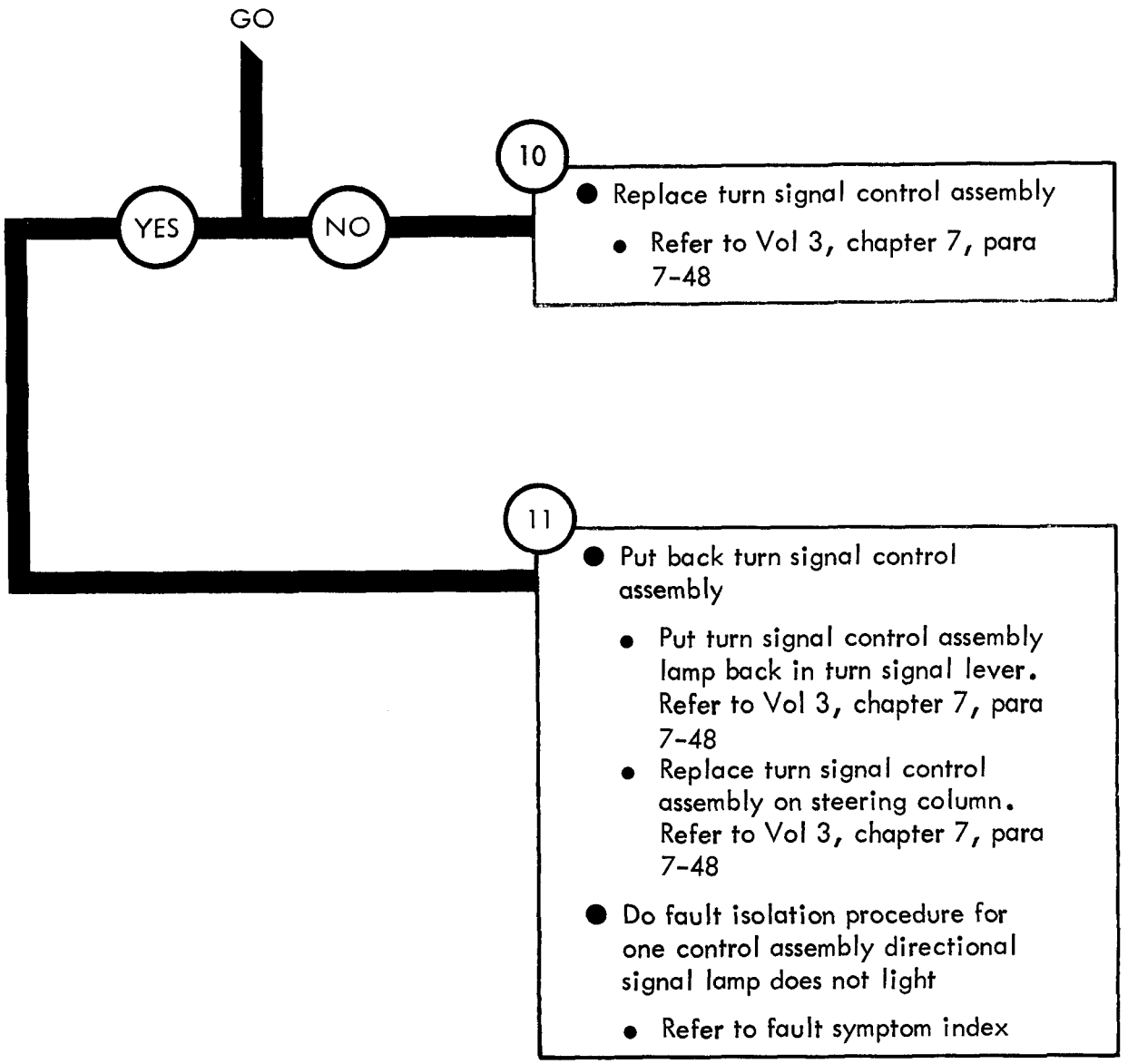




+ LEAD FROM CONTACT	– LEAD TO CONTACT	INDICATION
H	A	NEEDLE MOVES TO ZERO
H	B	NEEDLE MOVES TO ZERO
H	C	NEEDLE MOVES TO ZERO
H	E	NEEDLE MOVES TO ZERO
D	E	OPEN (NO NEEDLE MOVEMENT)
D	C	OPEN (NO NEEDLE MOVEMENT)
F	G	NEEDLE MOVES TO ZERO

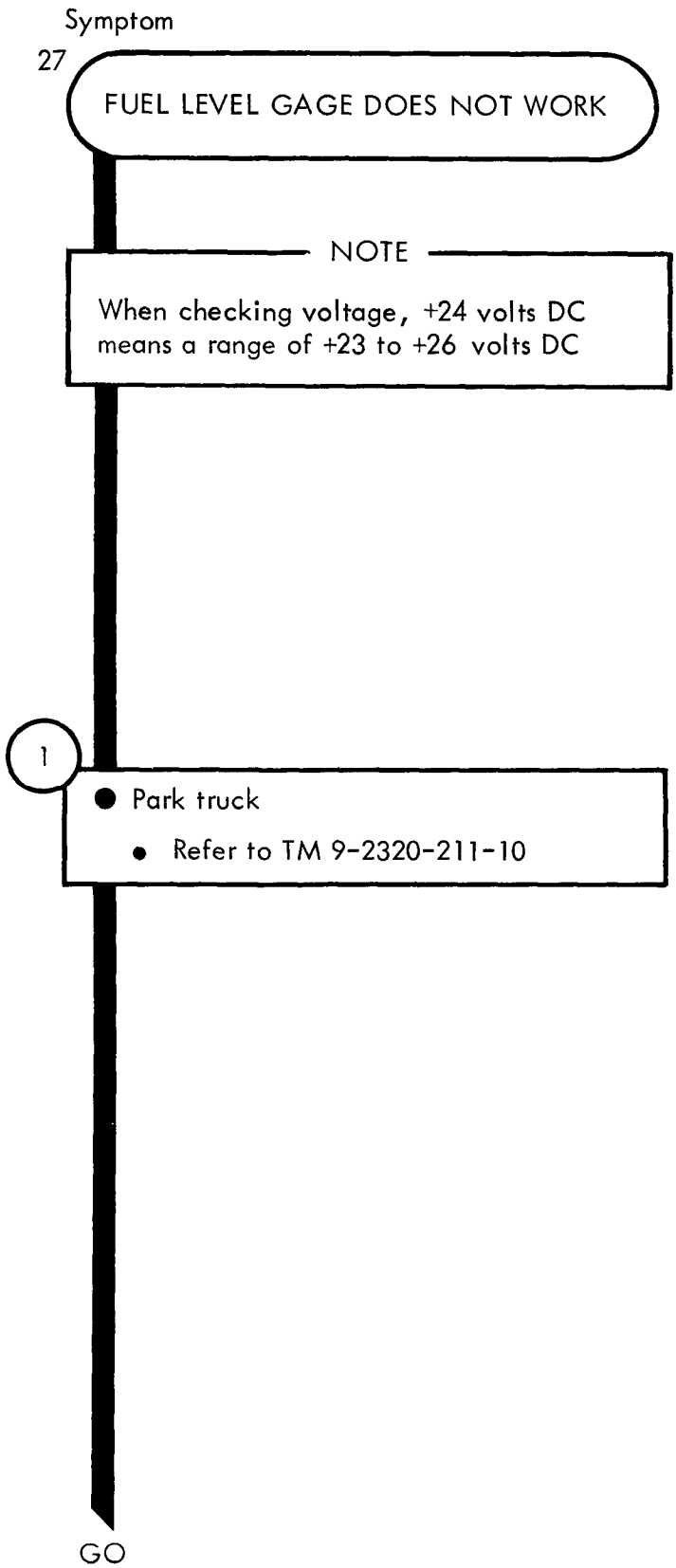
TA 115904

Figure 26-26 (Sheet 5 of 6)



TA 115905

Figure 26-26 (Sheet 6 of 6)



TA 115906

Figure 26-27 (Sheet 1 of 10)

GO

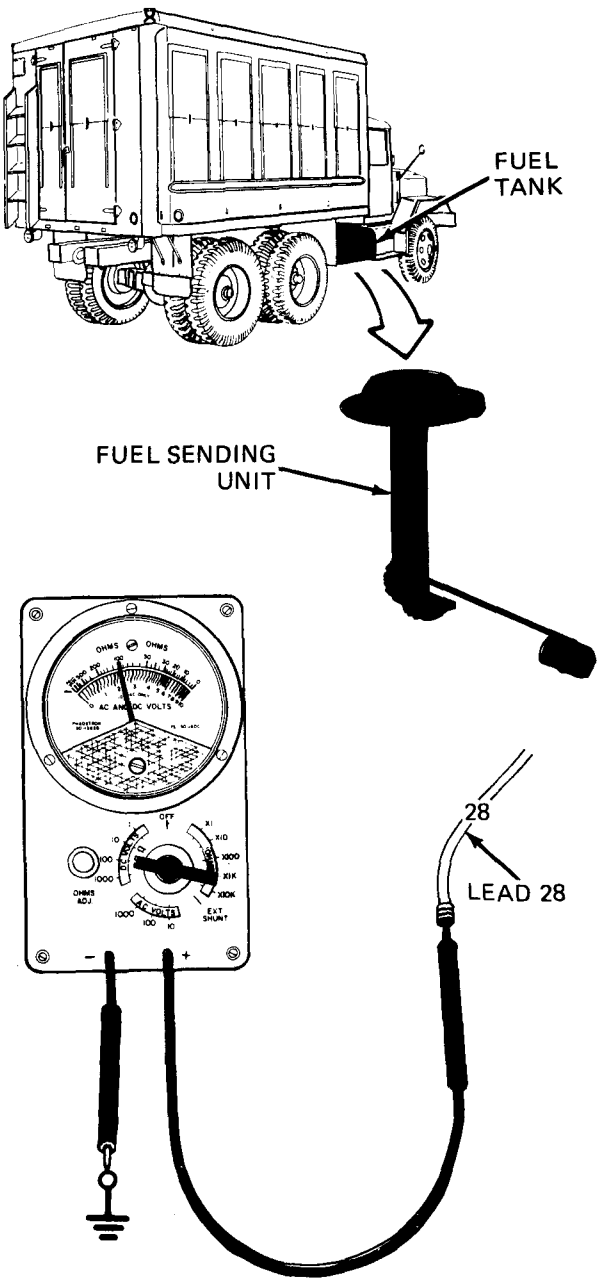
2

- Check for +2 to +4 volts from fuel level gage to fuel sending unit
  - Set BATTERY switch to OFF
  - Take off lead 28 contact from fuel 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 28 contact
- Read multimeter

Does multimeter measure less than 10 volts DC?

GO



TA 115907

Figure 26-27 (Sheet 2 of 10)

GO

YES

NO

3

- Replace fuel level gage
  - Set BATTERY switch to OFF
  - Put lead 28 contact back on fuel sending unit
  - Replace fuel level gage. Refer to Vol 3, chapter 7, para 7-35

4

- Set multimeter to measure volts in units
  - Put multimeter - lead on good ground
  - Put multimeter + lead on lead 28 contact
  - Set multimeter to 10 volts DC position. Refer to test equipment procedures index
  - Read multimeter

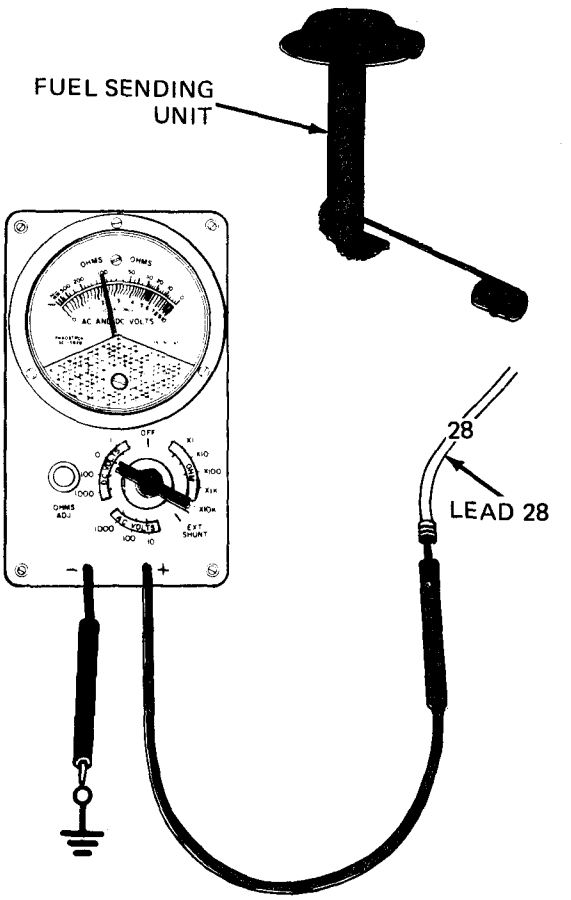
Does multimeter measure 0 volts DC?

YES

NO

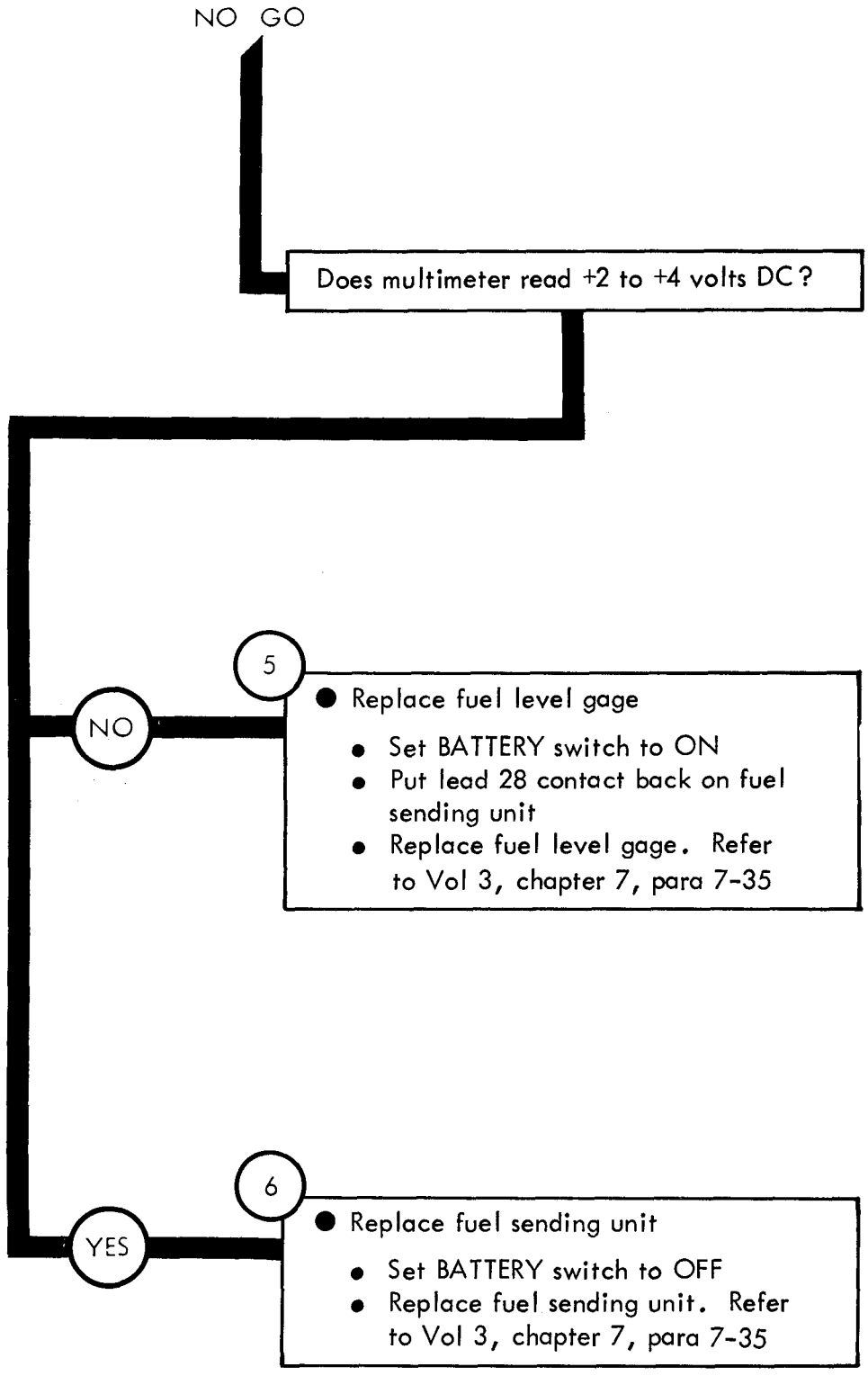
Go to step 7

NO GO



TA 115908

Figure 26-27 (Sheet 3 of 10)



TA 115909

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 ?

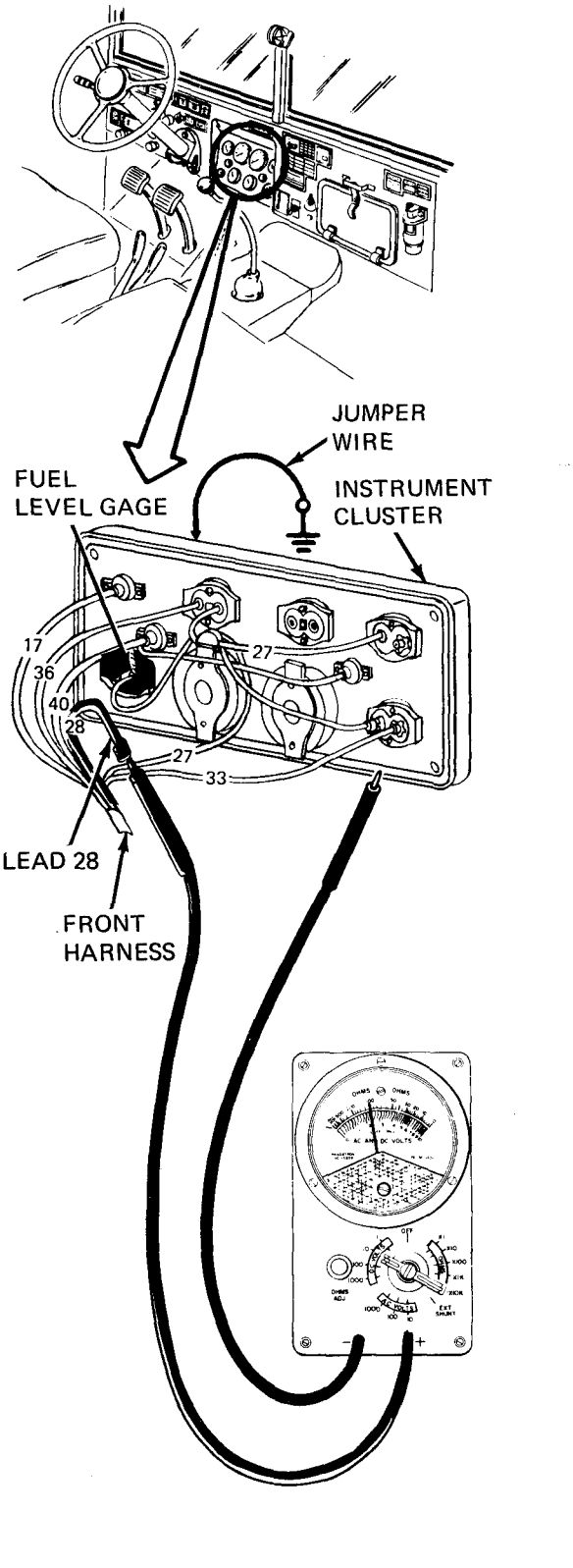
YES

8

- Go to step 12

NO

NO GO



TA 115910

Figure 26-27 (Sheet 5 of 10)

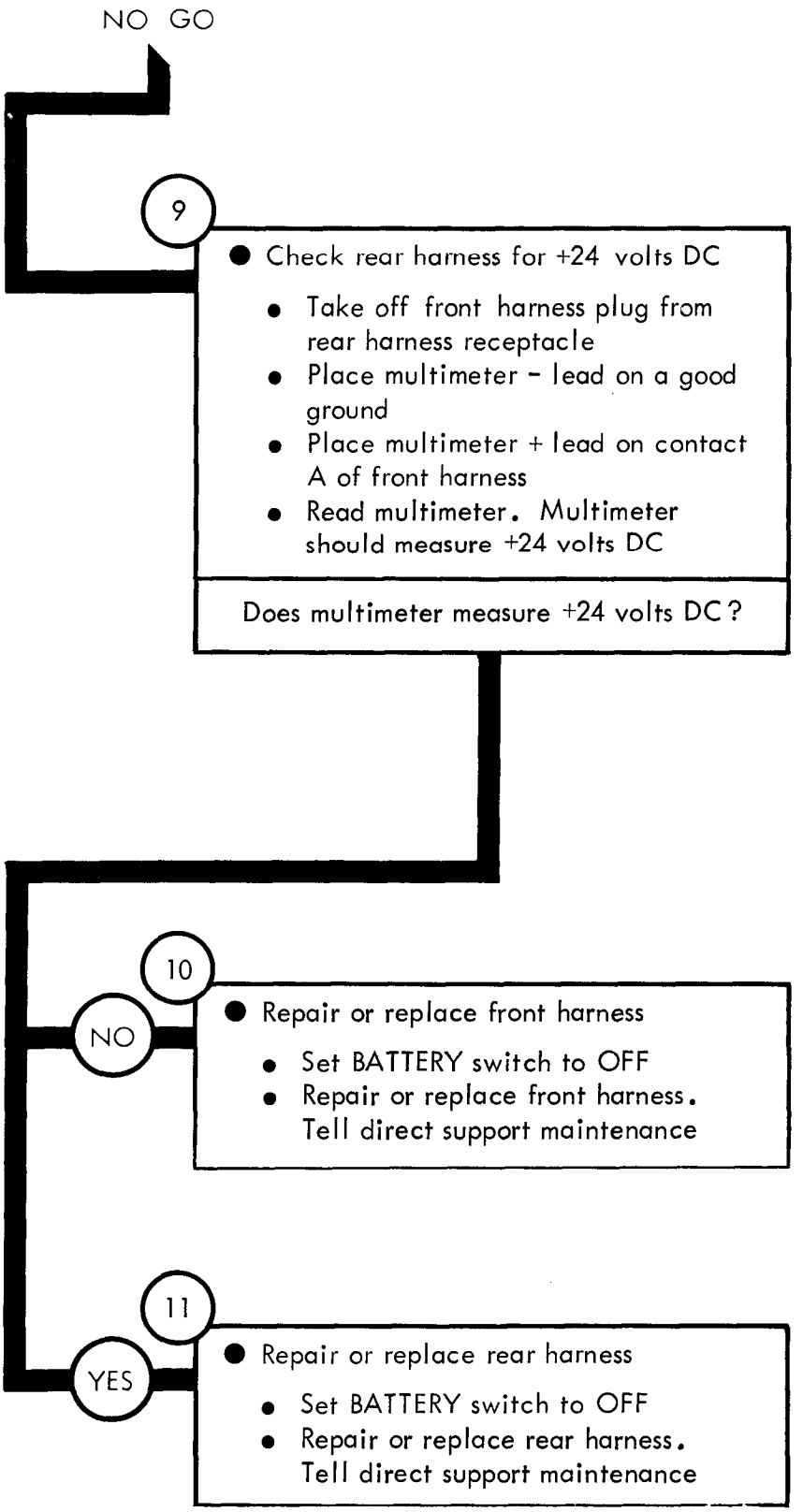
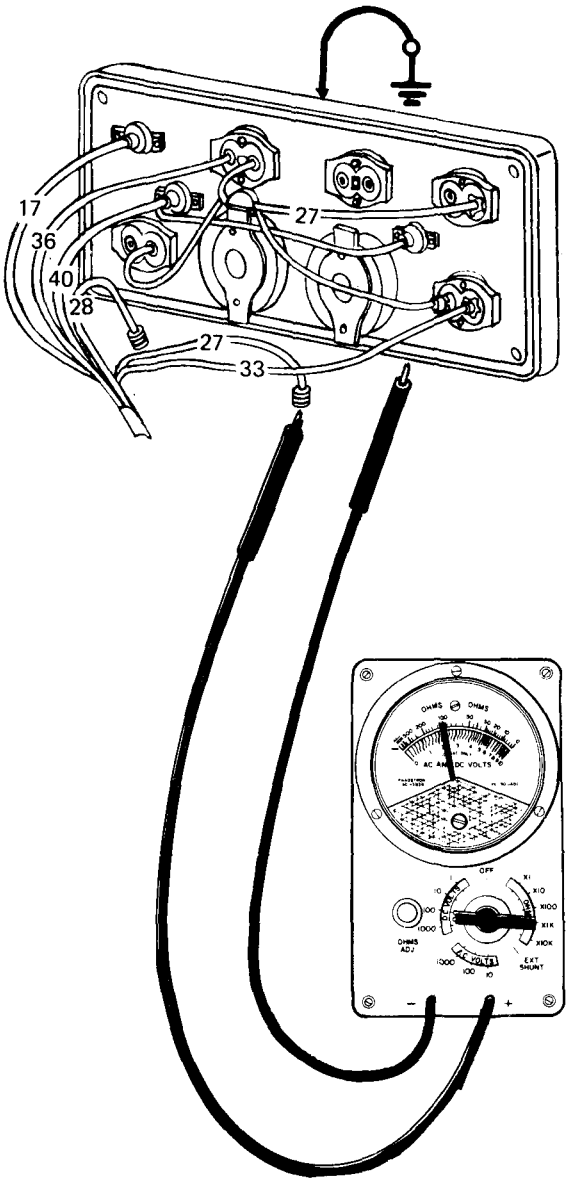


Figure 26-27 (Sheet 6 of 10)

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)

GO

14

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

Does multimeter measure more than 1 ohm?

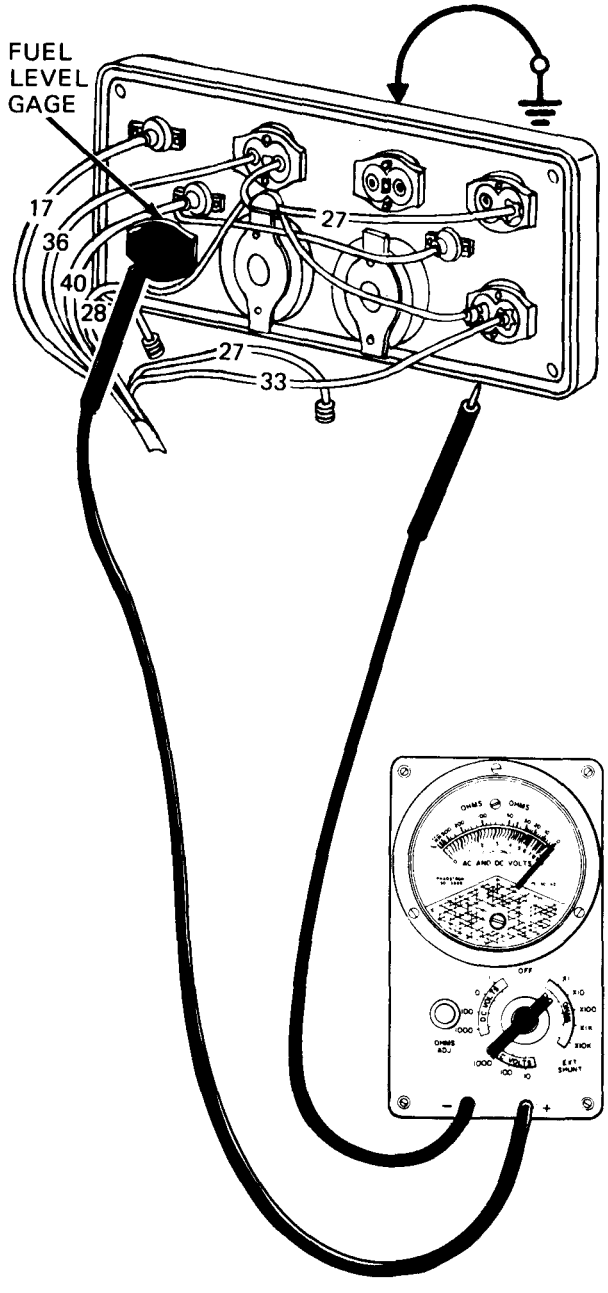
YES

NO

15

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

GO



TA 115913

Figure 26-27 (Sheet 8 of 10)

GO

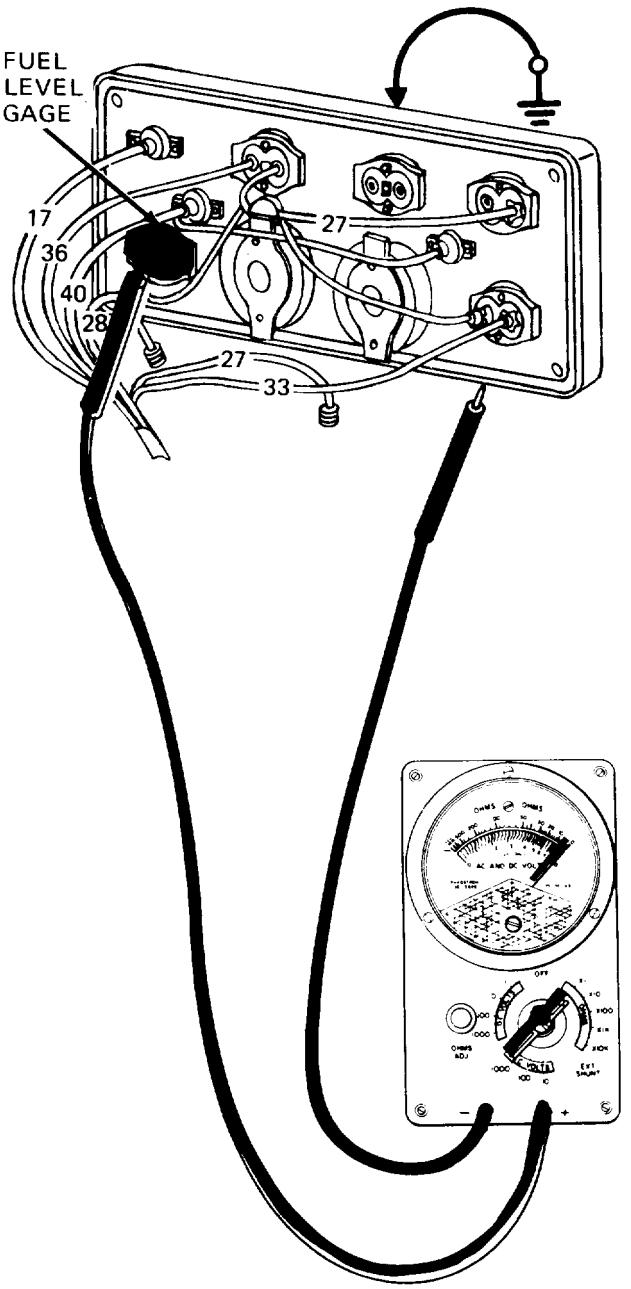
16

- 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

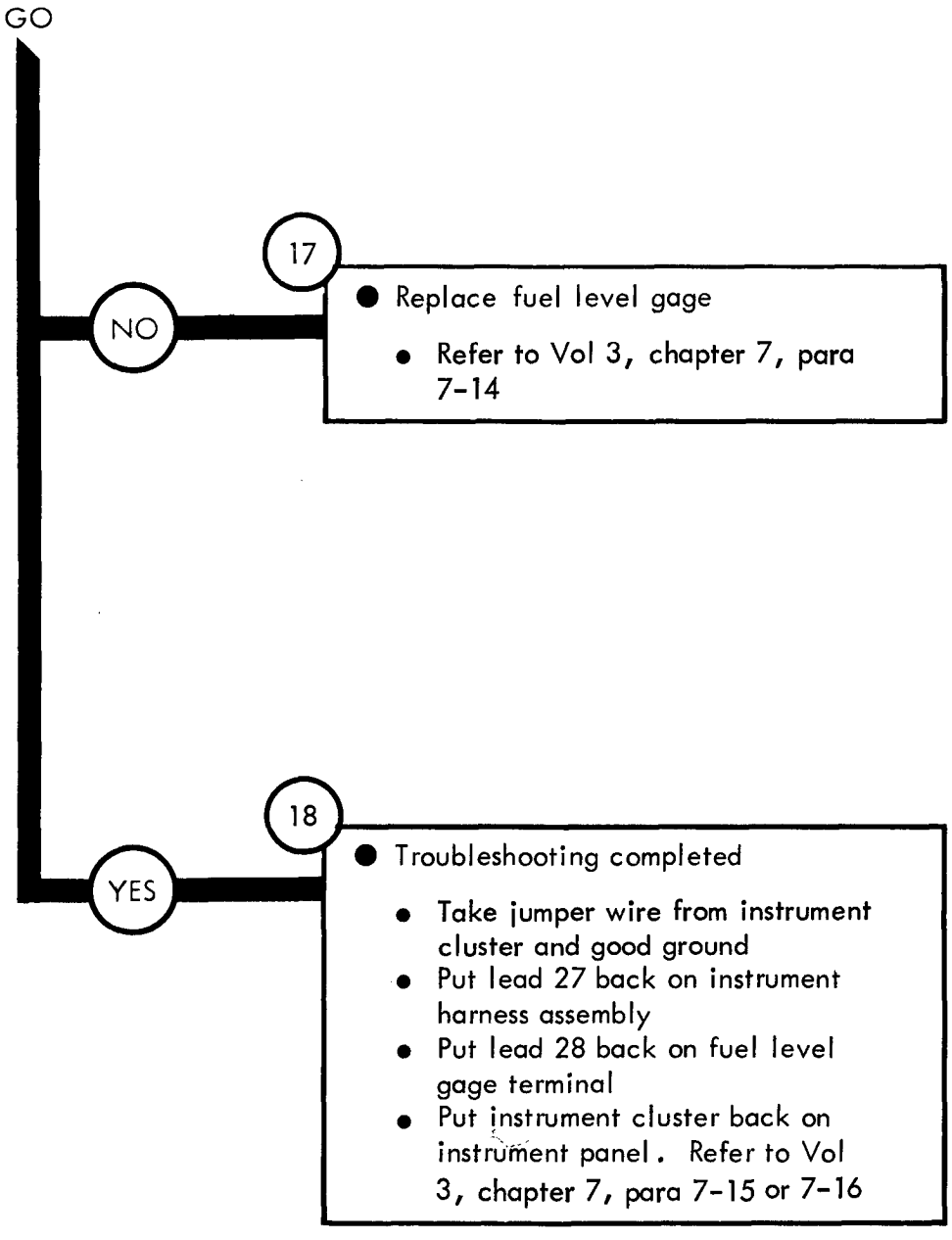
Does multimeter measure less than 1 ohm?

GO



TA 115914

Figure 26-27 (Sheet 9 of 10)



TA 115915

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

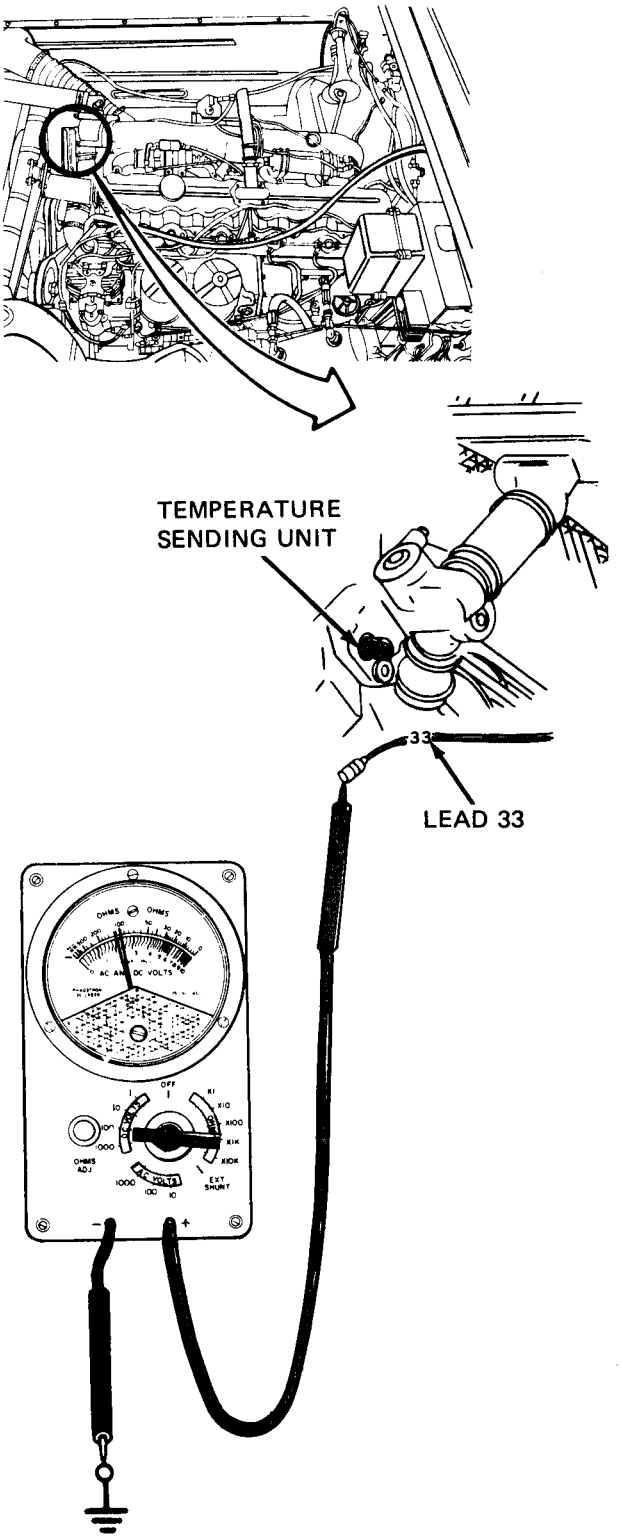
2

- 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



TA 115916

Figure 26-28 (Sheet 1 of 6)

GO

YES

NO

3

- Replace temperature gage
  - Set BATTERY switch to OFF
  - Put lead 33 contact back on temperature sending unit
  - Replace temperature gage. Refer to Vol 3, chapter 7, para 7-14

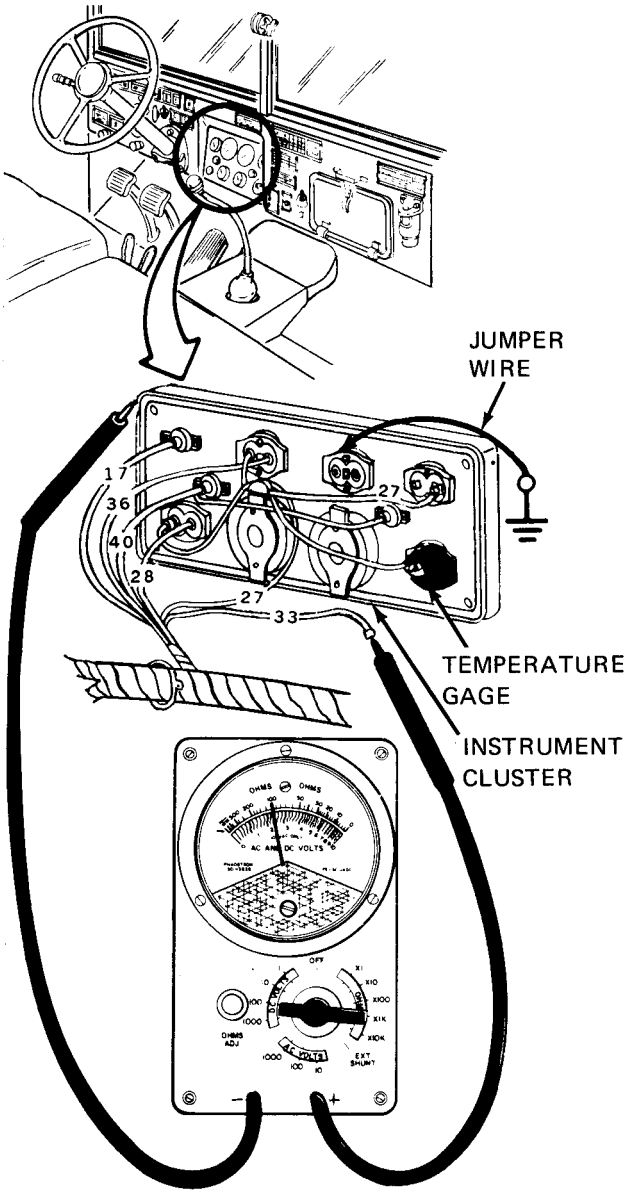
4

- Check for voltage to temperature 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 33 from temperature gage

- Set BATTERY switch to ON
- Place multimeter - lead on a good ground
- Place multimeter + lead on lead 33 contact. Read multimeter
- Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO



TA 115917

Figure 26-28 (Sheet 2 of 6)

GO

5

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

YES

NO

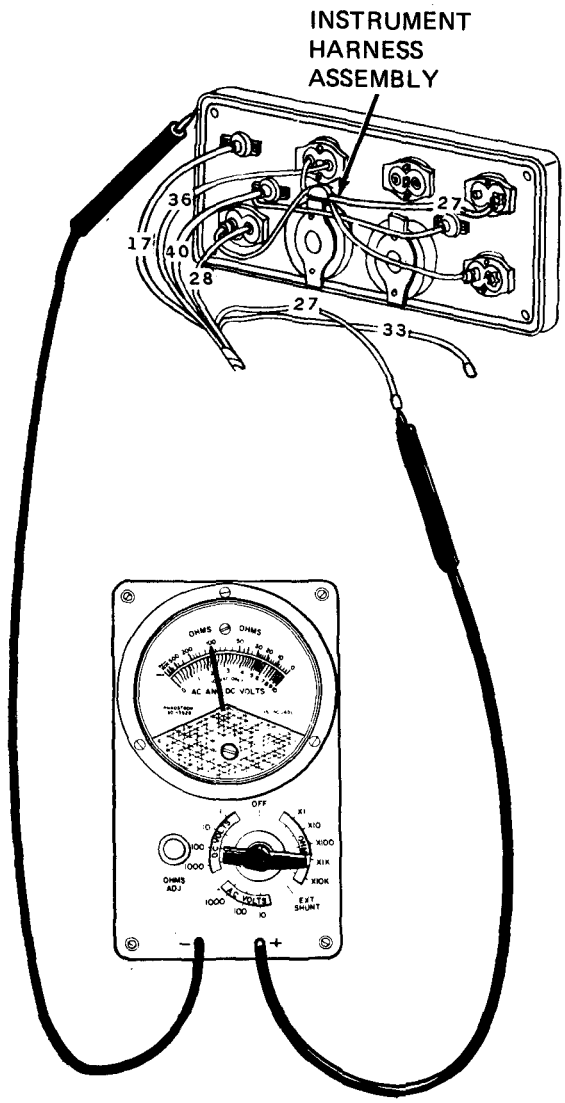
6

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

- 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



TA 115918

Figure 26-28 (Sheet 3 of 6)

GO

YES

NO

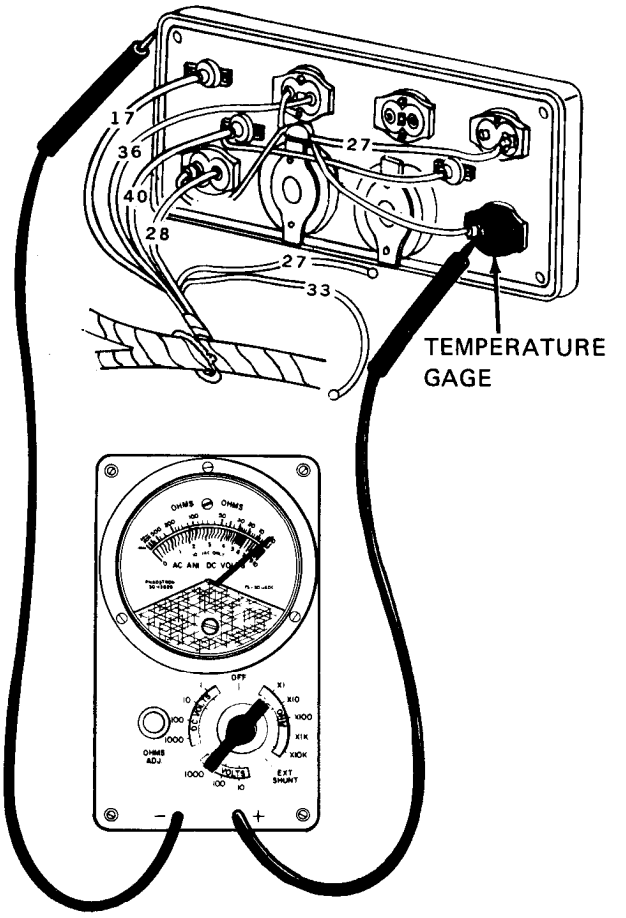
7

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

8

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

Does multimeter measure more than 1 ohm?



YES

NO

9

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

GO

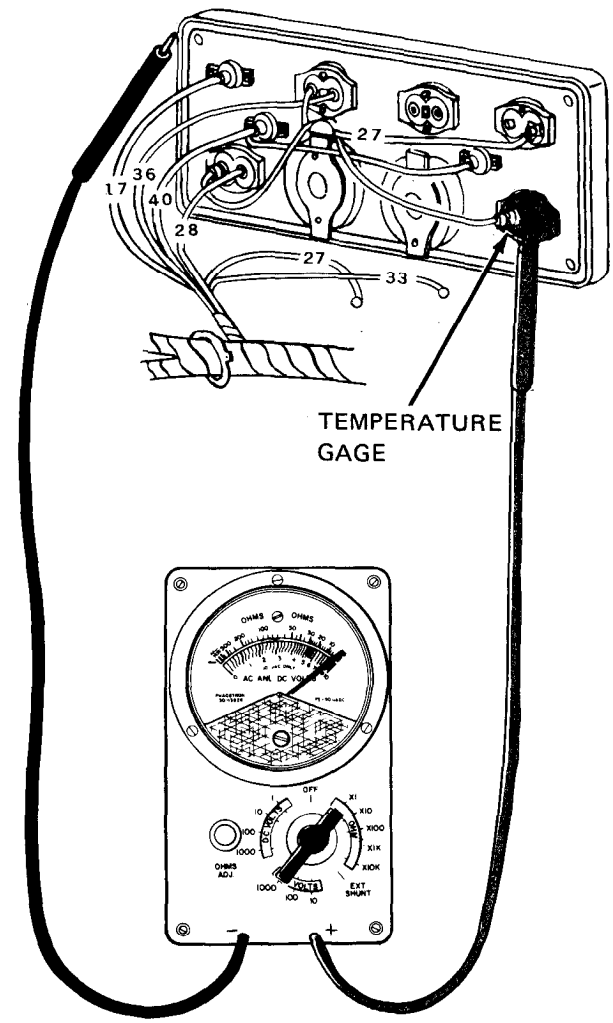
TA 115919

Figure 26-28 (Sheet 4 of 6)

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

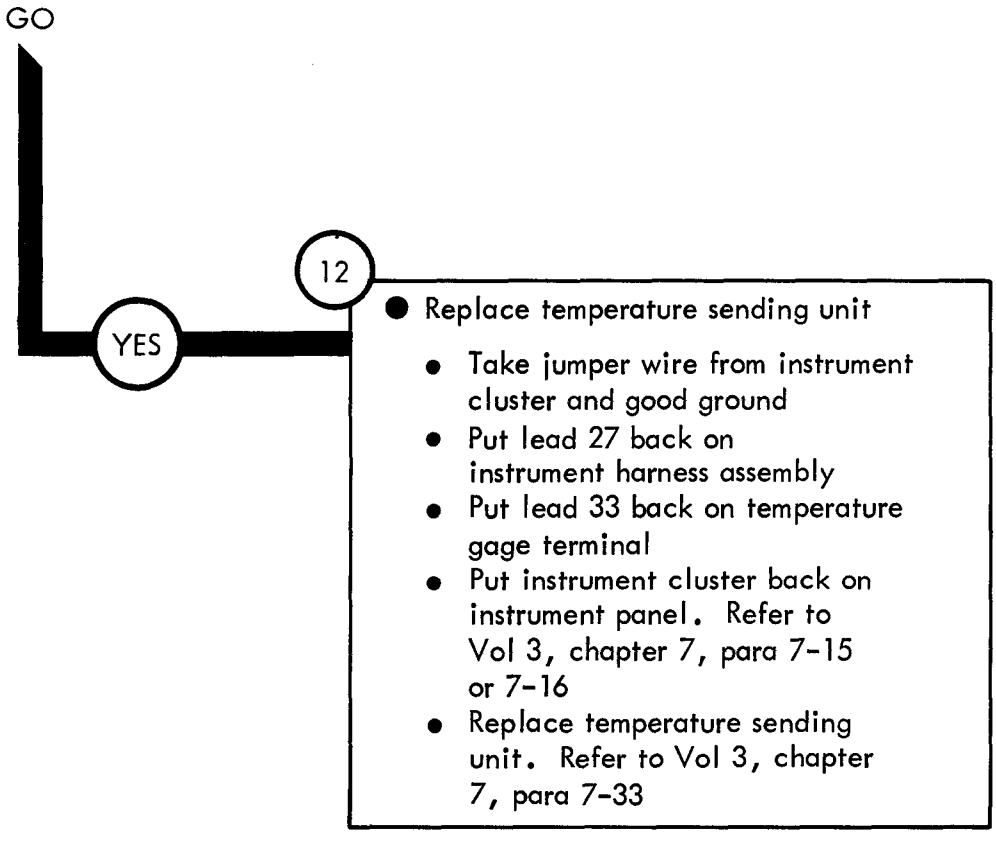
11

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

GO

TA 115920

Figure 26-28 (Sheet 5 of 6)



TA 115921

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

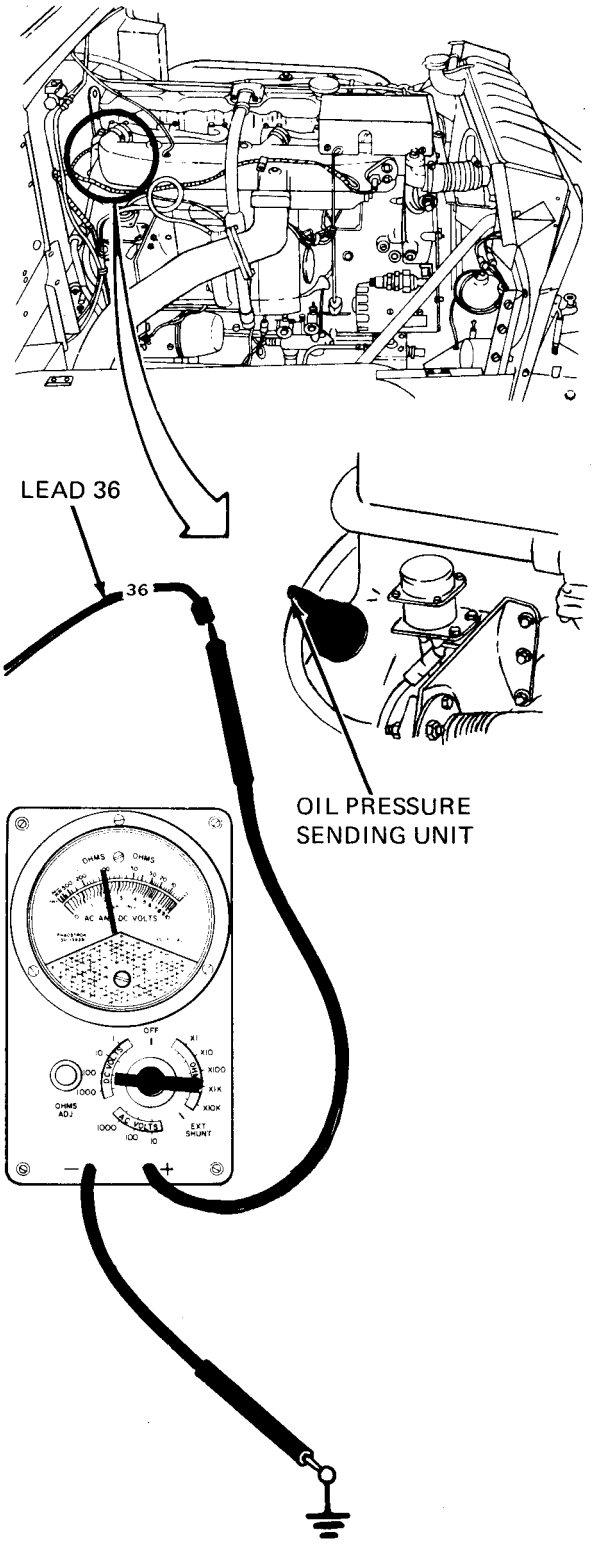
2

- 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



TA 115922

Figure 26-29 (Sheet 1 of 7)

GO

YES

NO

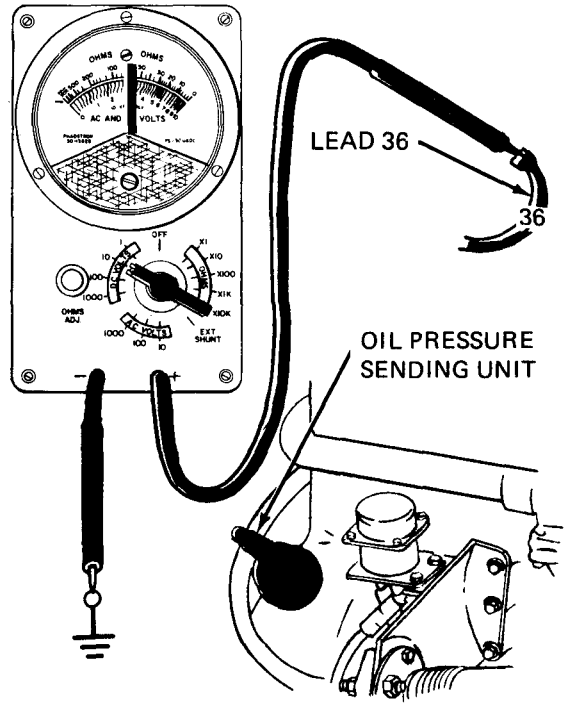
3

- Replace oil pressure gage
  - Set BATTERY switch to OFF
  - Put lead 36 contact back on oil sending unit
  - Replace oil pressure gage.
  - Refer to Vol 3, chapter 7, para 7-14

4

- Set multimeter to read volts in units
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on lead 36 lead contact
  - Set multimeter to 10 volts DC position, and read multimeter

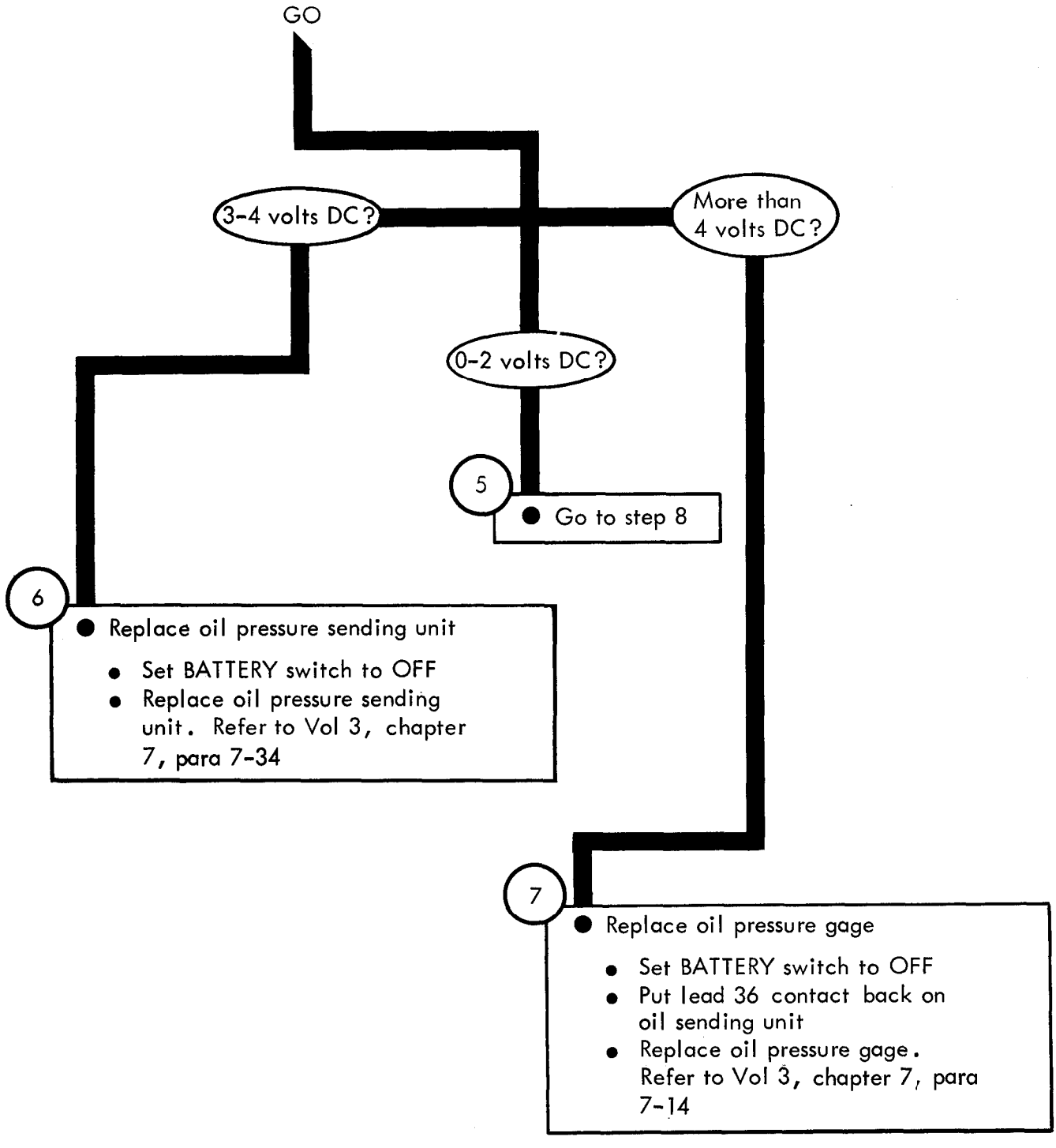
Does multimeter read



GO

TA 115923

Figure 26-29 (Sheet 2 of 7)



TA 115924

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?

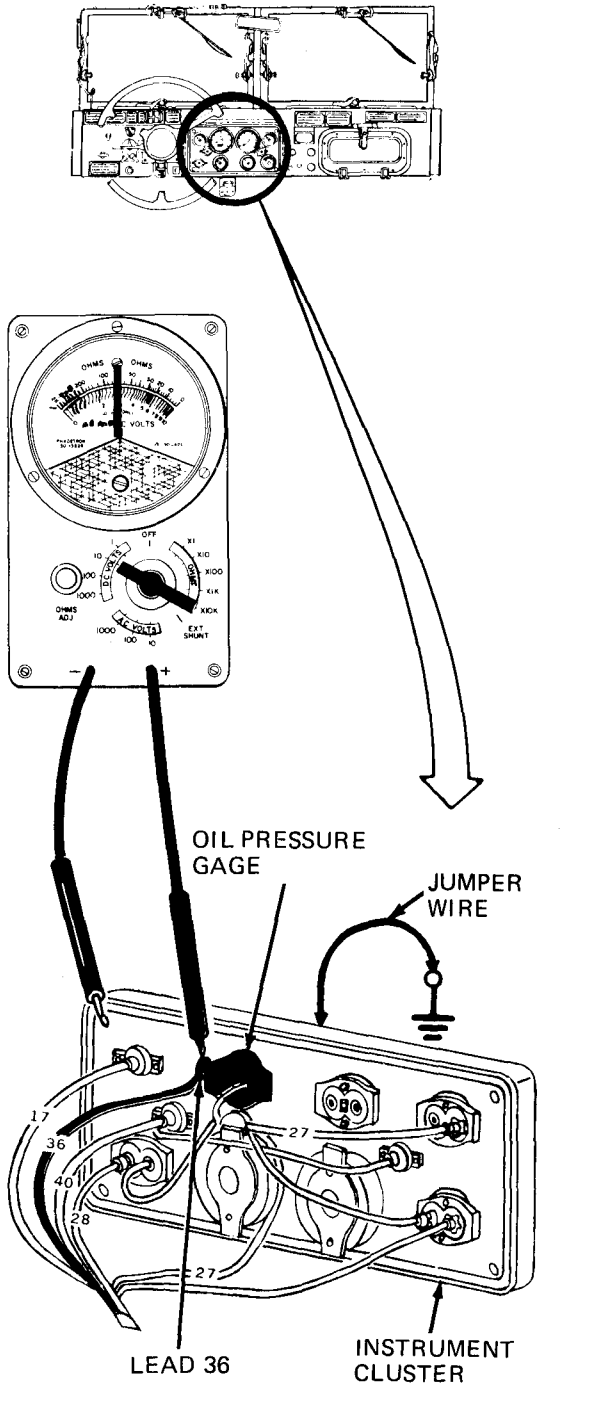
YES

GO

NO

10

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



TA 115925

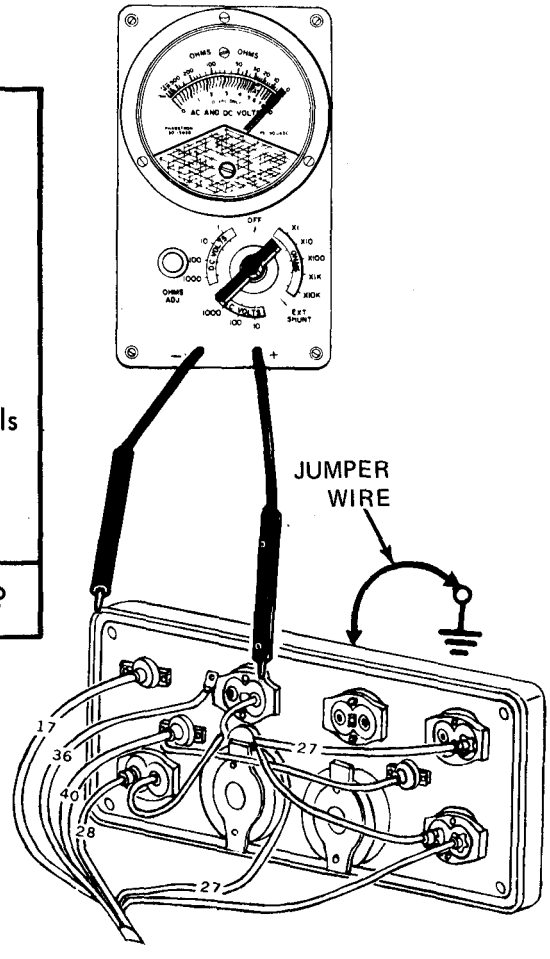
Figure 26-29 (Sheet 4 of 7)

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

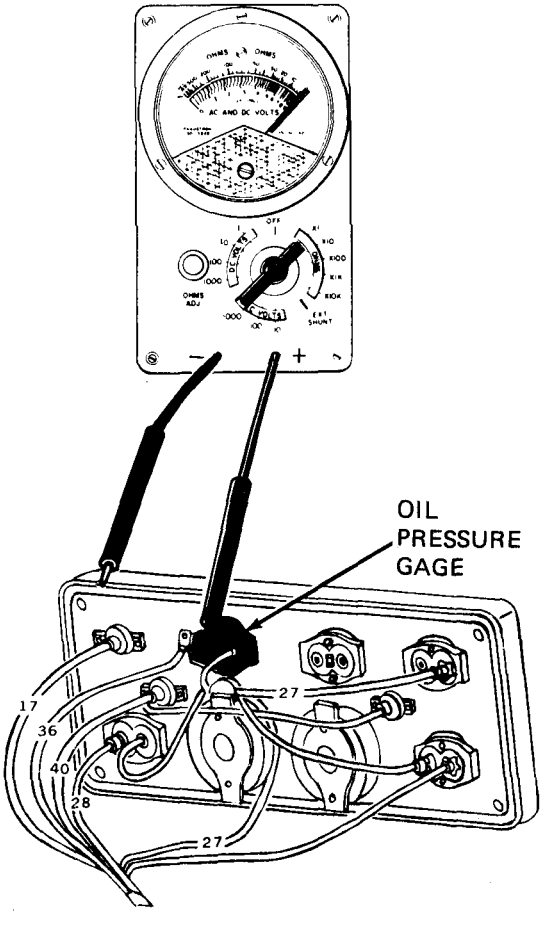
TA 115926

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



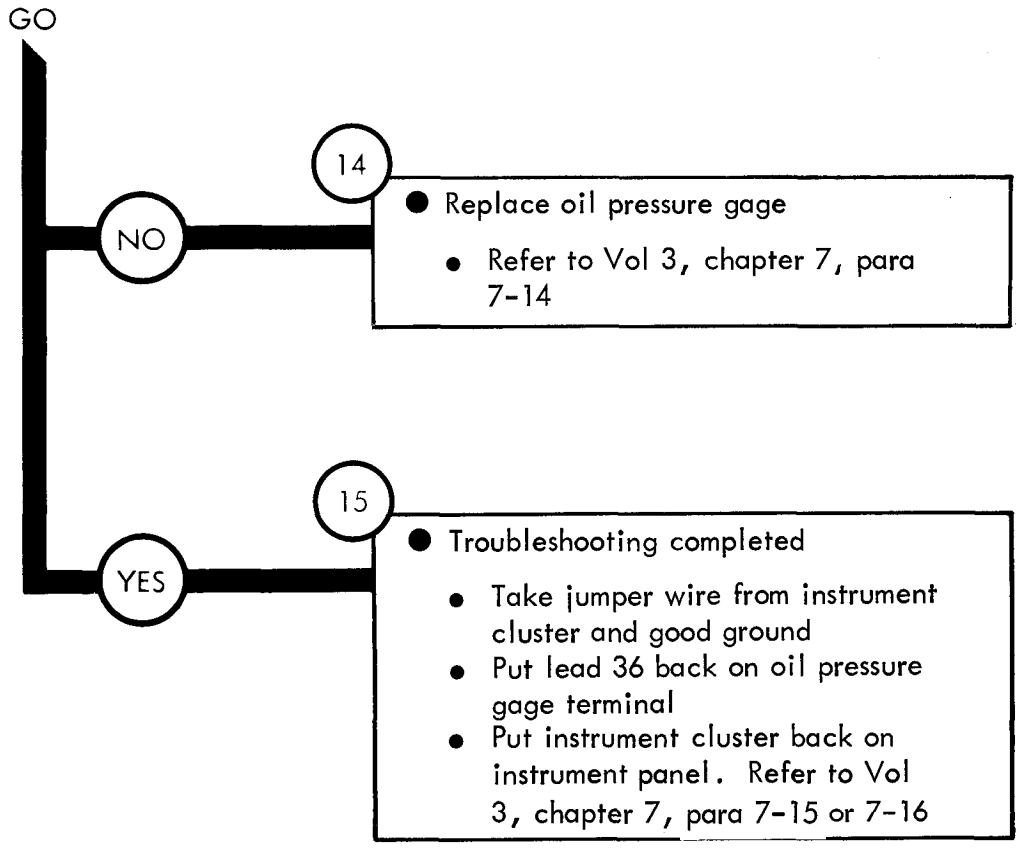
- Put multimeter - lead on a good ground
- Put multimeter + lead on oil pressure gage lead 36 terminal
- Read multimeter. Multimeter should measure less than 1 ohm

Does multimeter measure less than 1 ohm?

GO

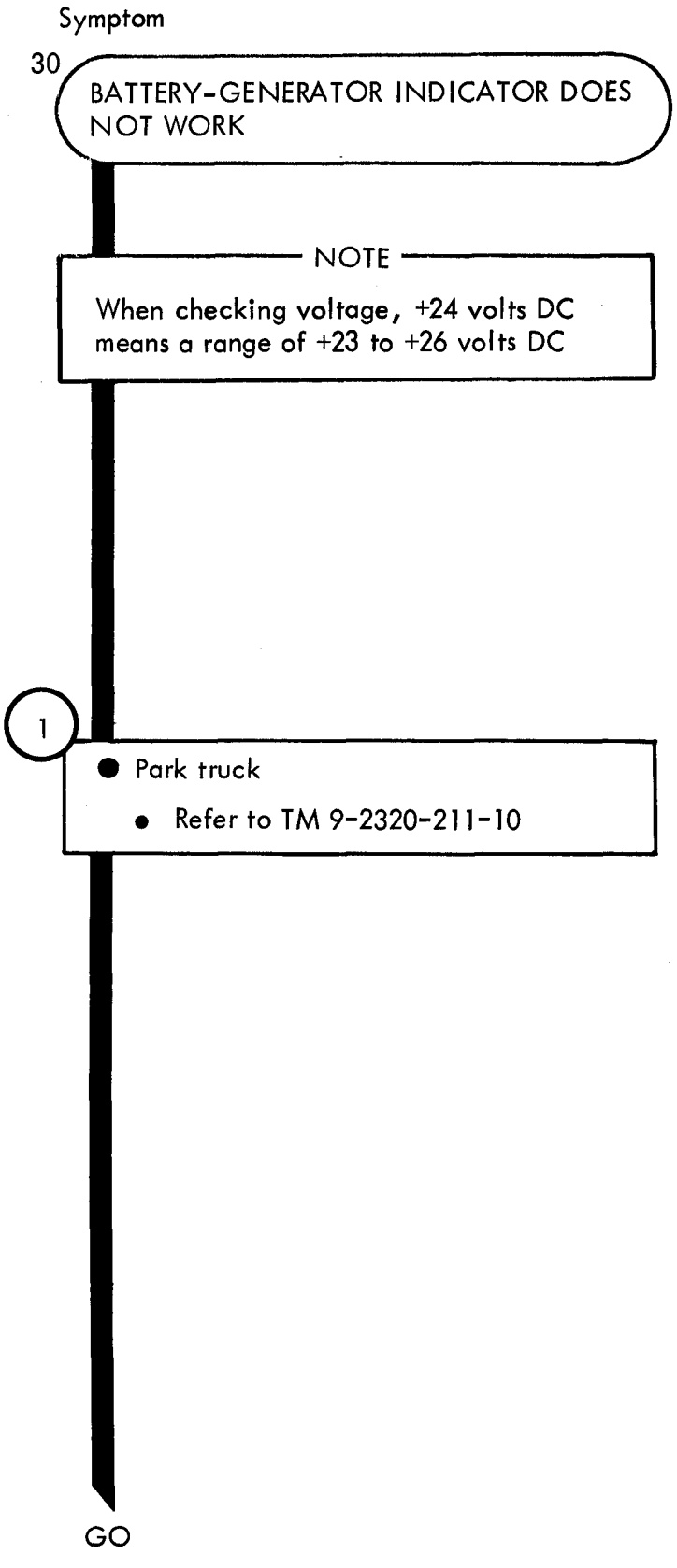
TA 115927

Figure 26-29 (Sheet 6 of 7)



TA 115928

Figure 26-29 (Sheet 7 of 7)



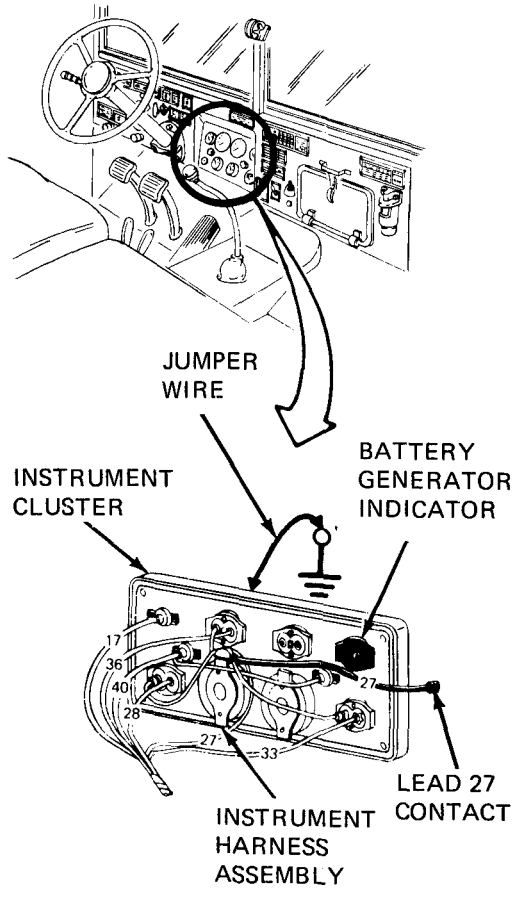
TA 115929

Figure 26-30 (Sheet 1 of 5)

GO

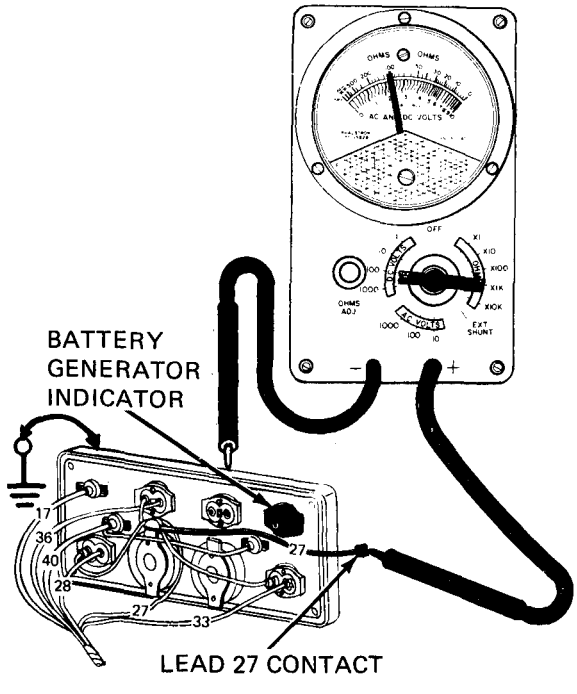
2

- 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

TA 115930

Figure 26-30 (Sheet 2 of 5)

GO

YES

NO

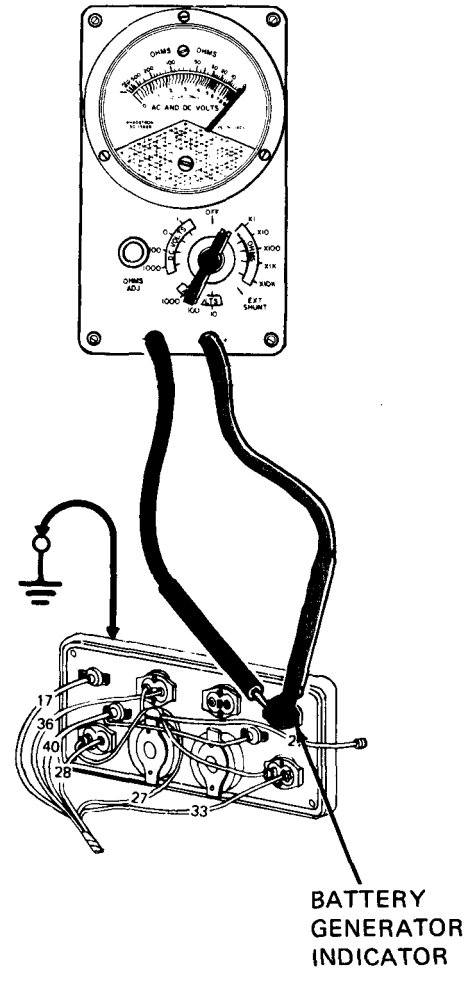
3

- Repair or replace instrument harness assembly
  - Set ACCESSORY switch to OFF
  - Repair or replace instrument harness assembly. Tell direct support maintnenance

4

- Check battery indicator 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 other terminal of battery indicator, not on lead 27 terminal
  - Read multimeter. Multimeter should measure 1 ohm or less

Does multimeter measure more than 1 ohm (continuity)?



YES

NO

5

- Replace battery indicator
  - Refer to Vol 3, chapter 7, para 7-14

GO

TA 115931

Figure 26-30 (Sheet 3 of 5)

GO

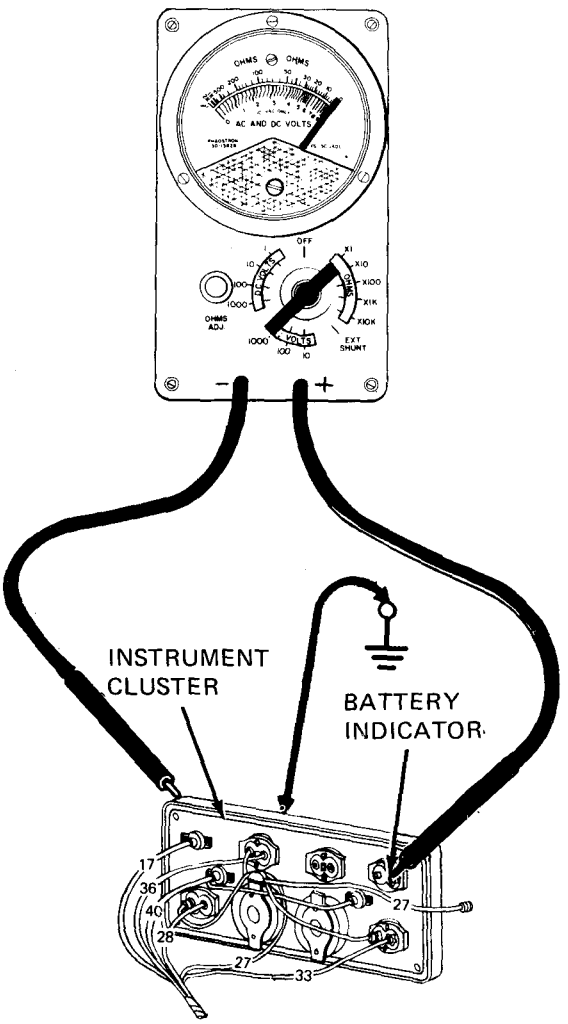
6

- 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

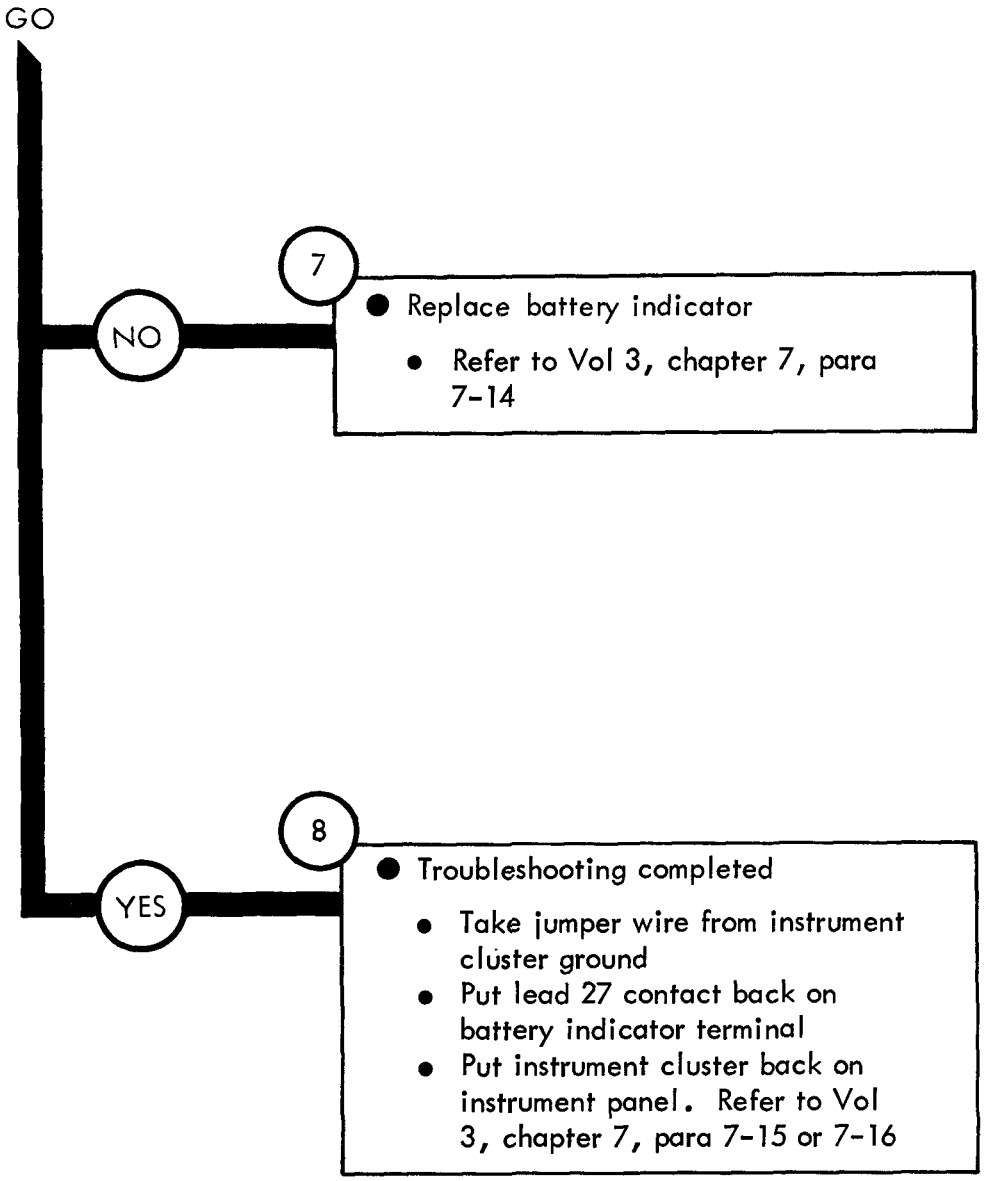
Does multimeter measure 1 ohm or less?

GO



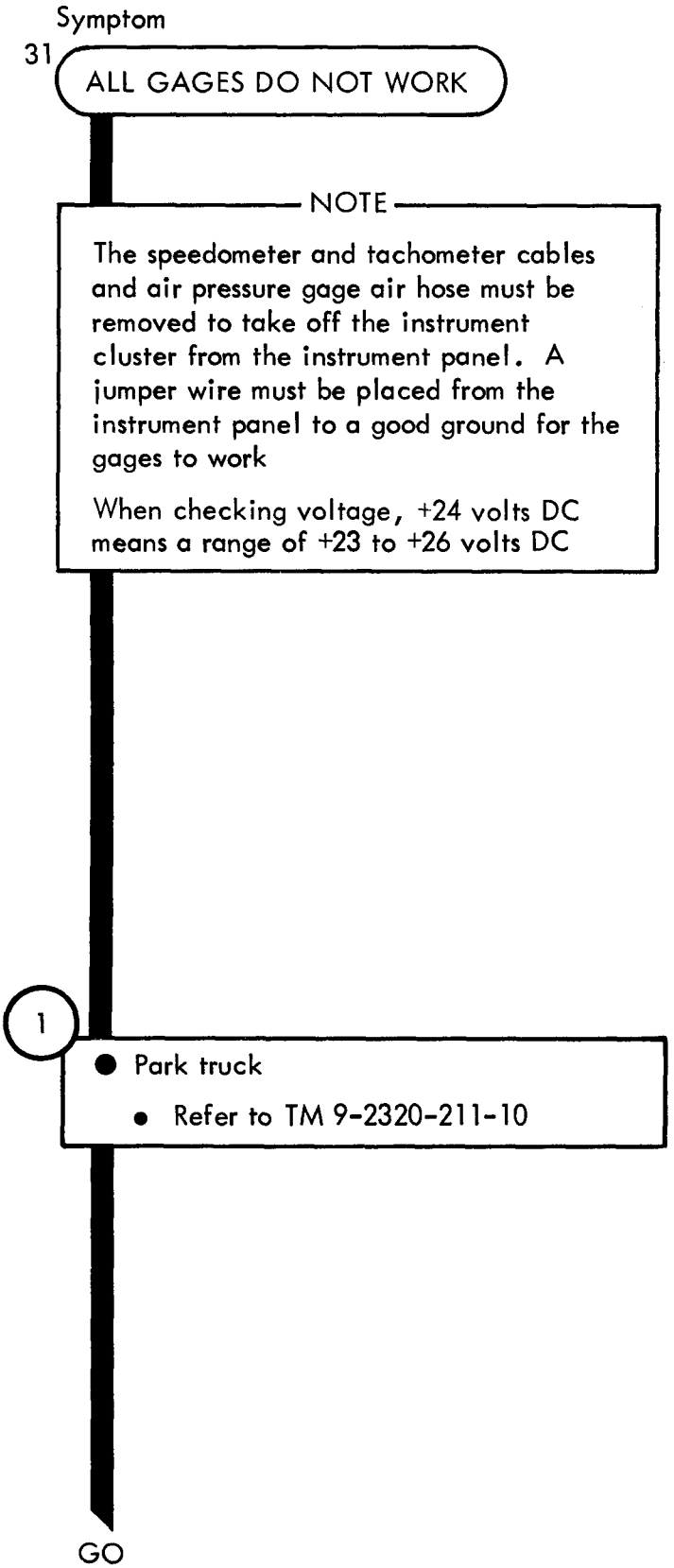
TA 115932

Figure 26-30 (Sheet 4 of 5)



TA 115933

Figure 26-30 (Sheet 5 of 5)



TA 115934

Figure 26-31 (Sheet 1 of 7)

GO

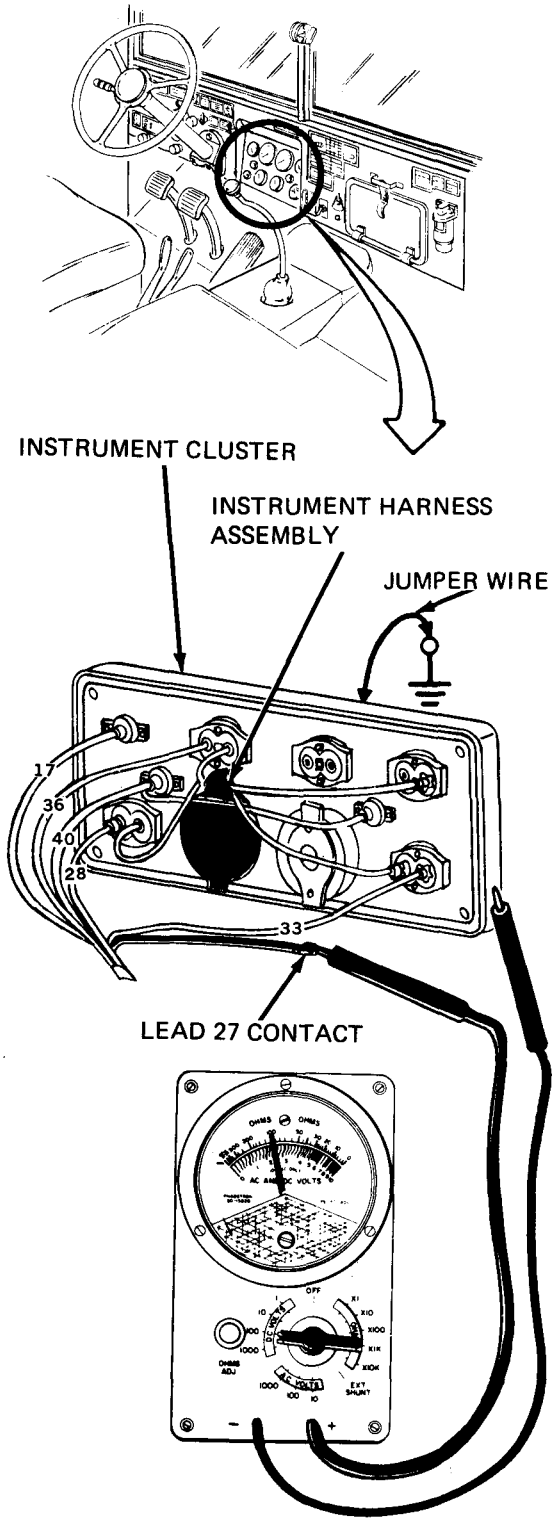
2

- 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



TA 115935

Figure 26-31 (Sheet 2 of 7)

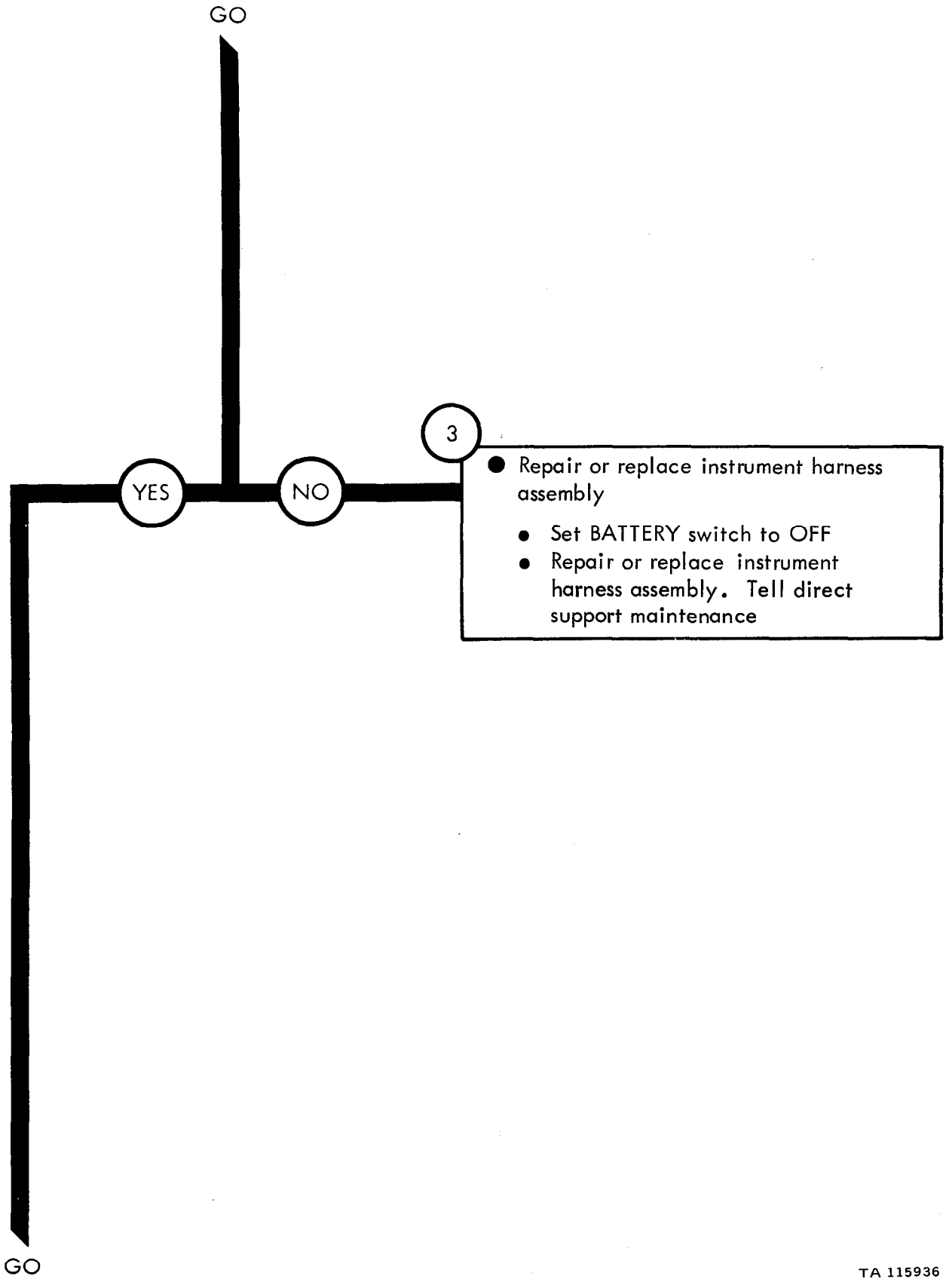


Figure 26-31 (Sheet 3 of 7)

GO

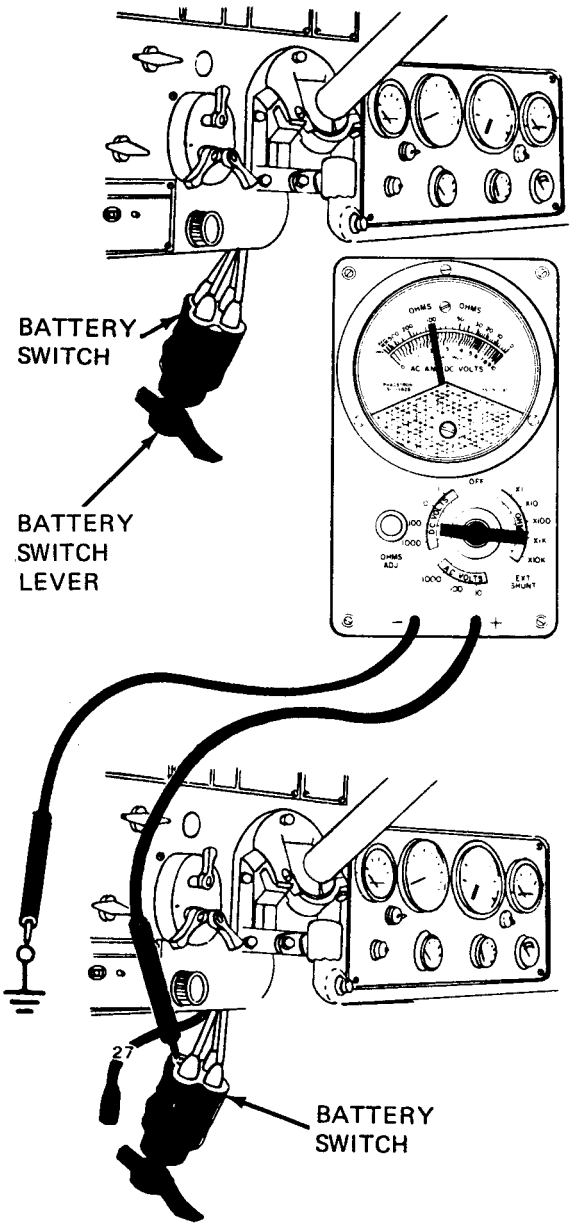
4

- Check for +24 volts through BATTERY switch
  - Set BATTERY switch to OFF
  - Take off BATTERY switch from instrument panel. Refer to Vol 3, chapter 7, para 7-9
  - Pull off lead 27 contact from BATTERY switch
  - Put BATTERY switch lever back on BATTERY switch. Refer to Vol 3, chapter 7, para 7-9
  - Set BATTERY switch to ON

- Put multimeter - lead on a good ground
- Put multimeter + lead on BATTERY switch connector for lead 75 contact
- Read multimeter. Multimeter should measure +24 volts DC

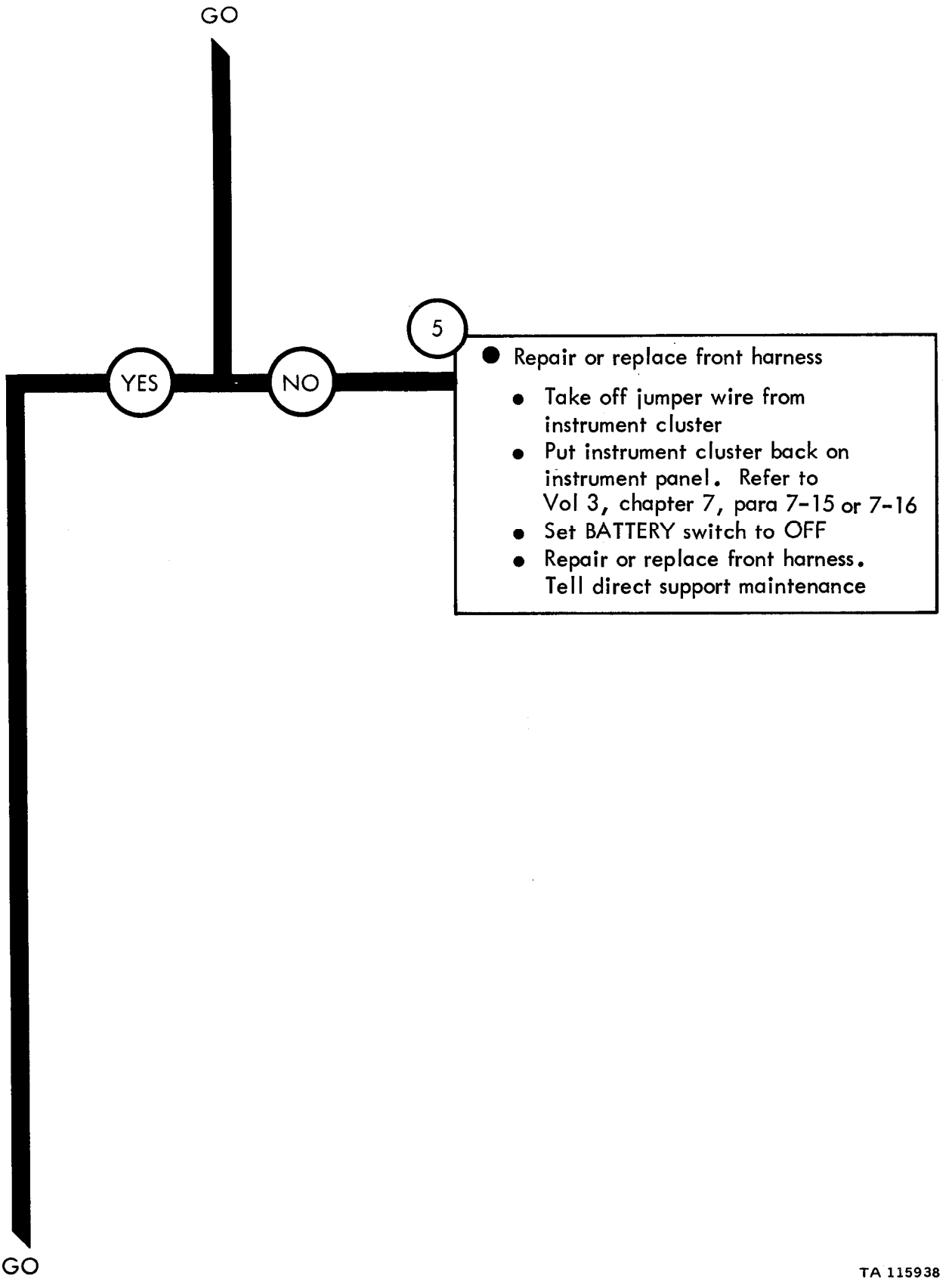
Does multimeter measure less than +24 volts DC?

GO



TA 115937

Figure 26-31 (Sheet 4 of 7)



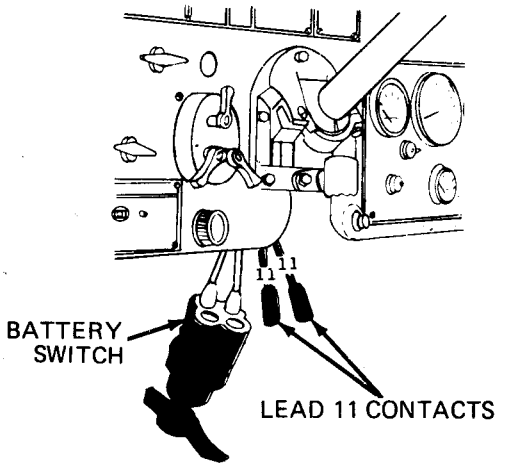
TA 115938

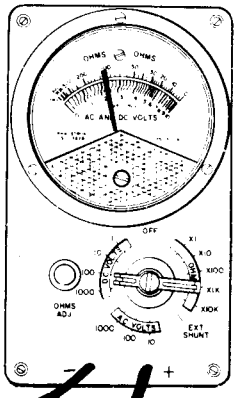
Figure 26-31 (Sheet 5 of 7)

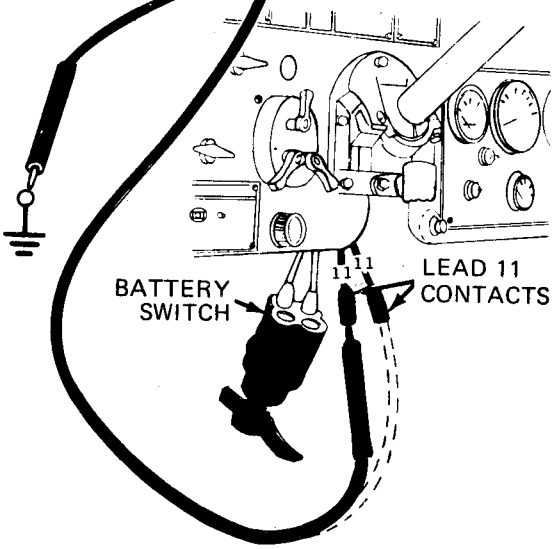
GO

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







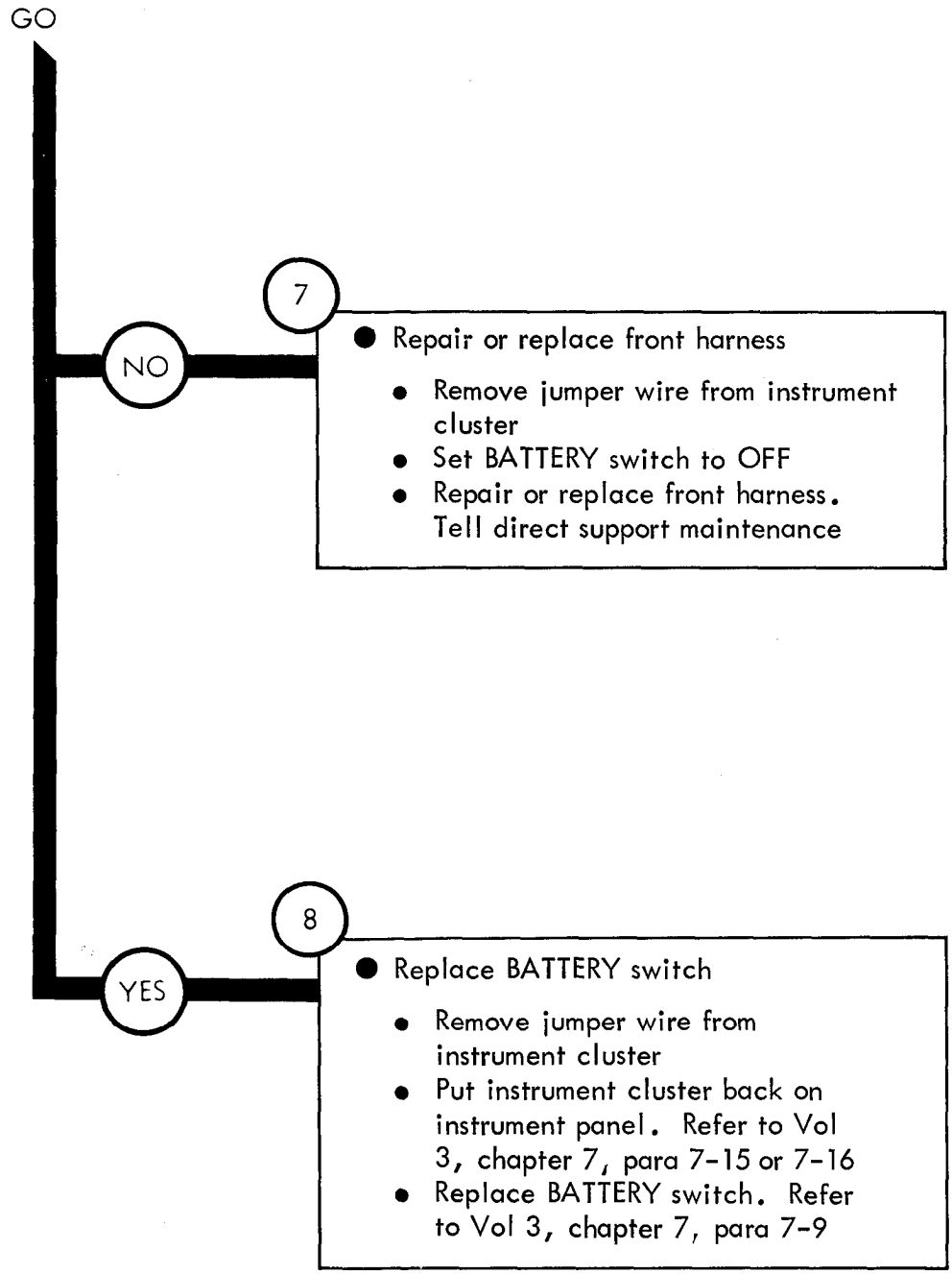
- Put multimeter - lead on a good ground
- Put multimeter + lead on one lead 11 contact. Read multimeter
- Put multimeter + lead on other lead 11 contact. Read multimeter. Multimeter should measure +24 volts DC for both tests

Does multimeter measure +24 volts DC for both tests?

GO

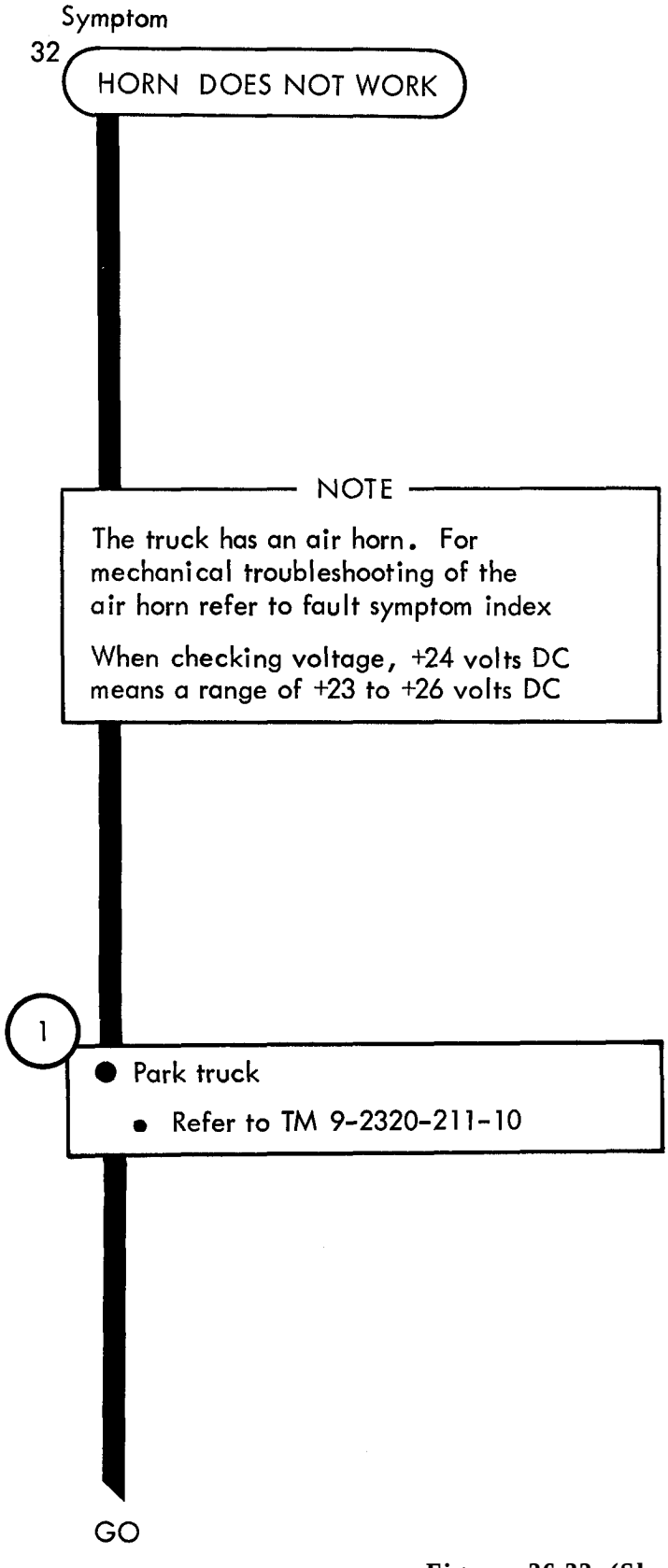
TA 115939

Figure 26-31 (Sheet 6 of 7)



TA 115940

Figure 26-31 (Sheet 7 of 7)



TA 115941

Figure 26-32 (Sheet 1 of 10)

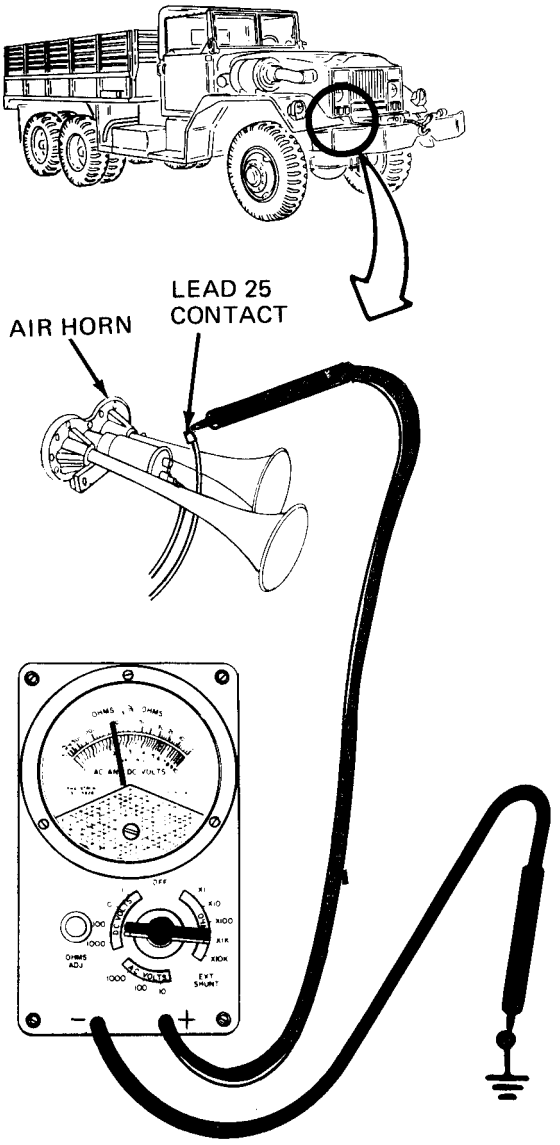
GO

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)

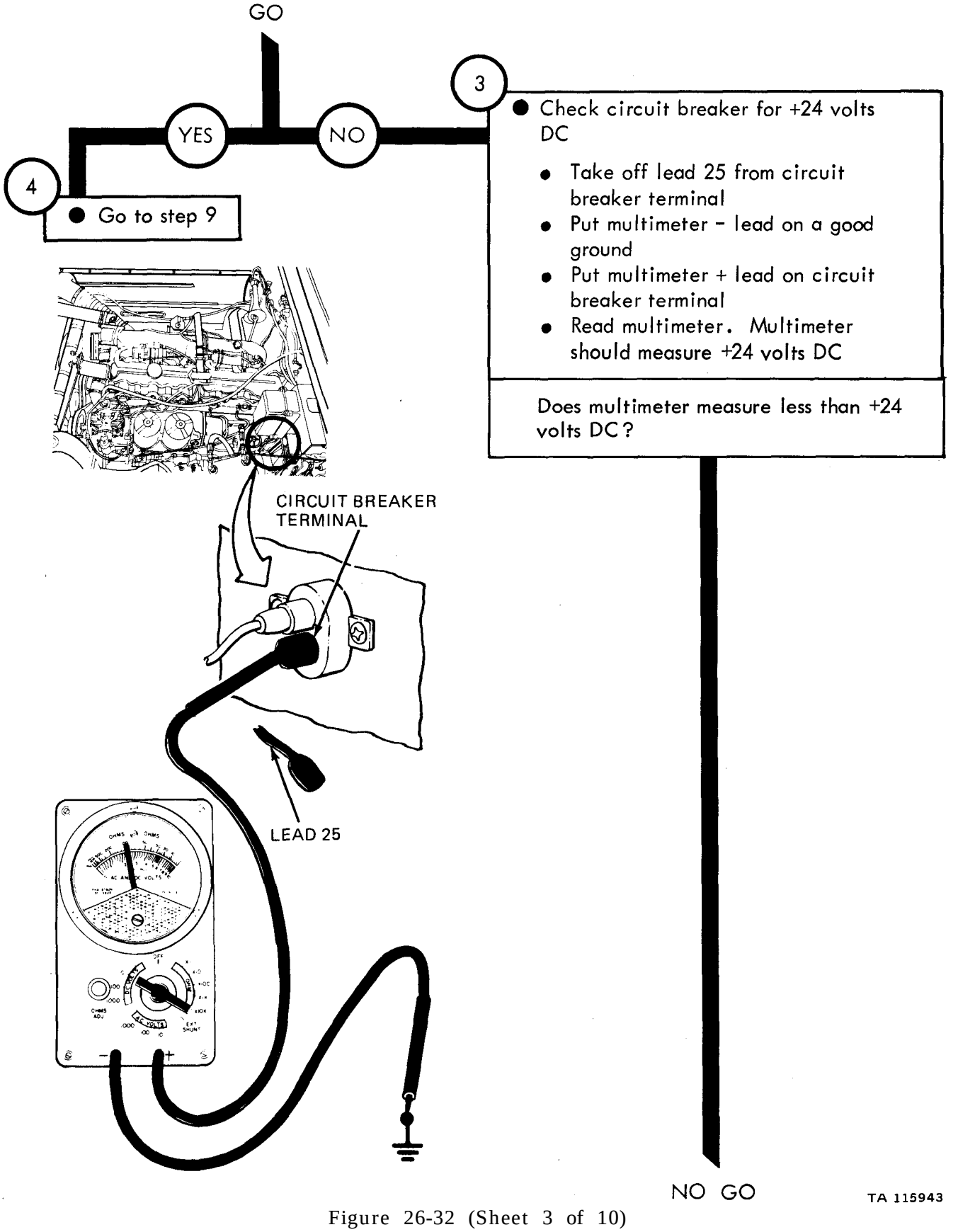


Figure 26-32 (Sheet 3 of 10)

NO GO

NO

5

● Repair or replace front harness

- Repair or replace front harness. Tell direct support maintenance

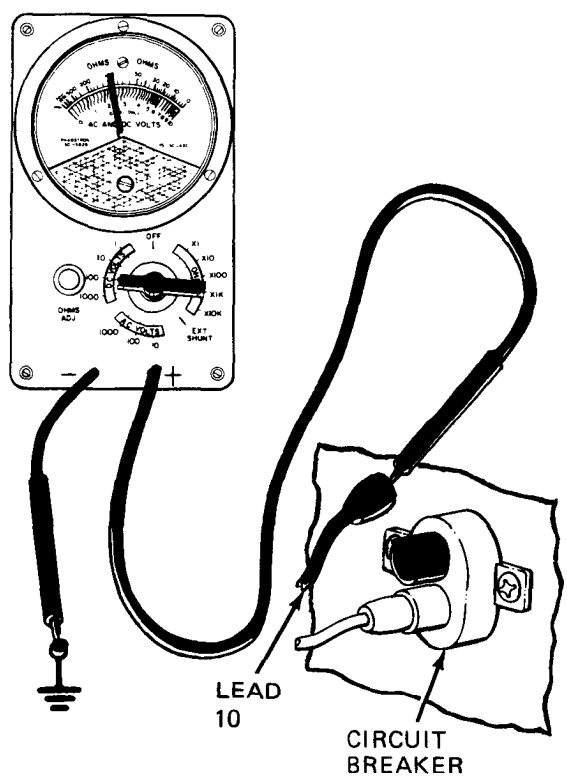
YES

6

● Check lead 10 for +24 volts DC

- Remove lead 10 from circuit breaker
- Put multimeter - lead to a good ground
- Put multimeter + lead to lead 10 contact
- Read multimeter. Multimeter should measure +24 volts DC

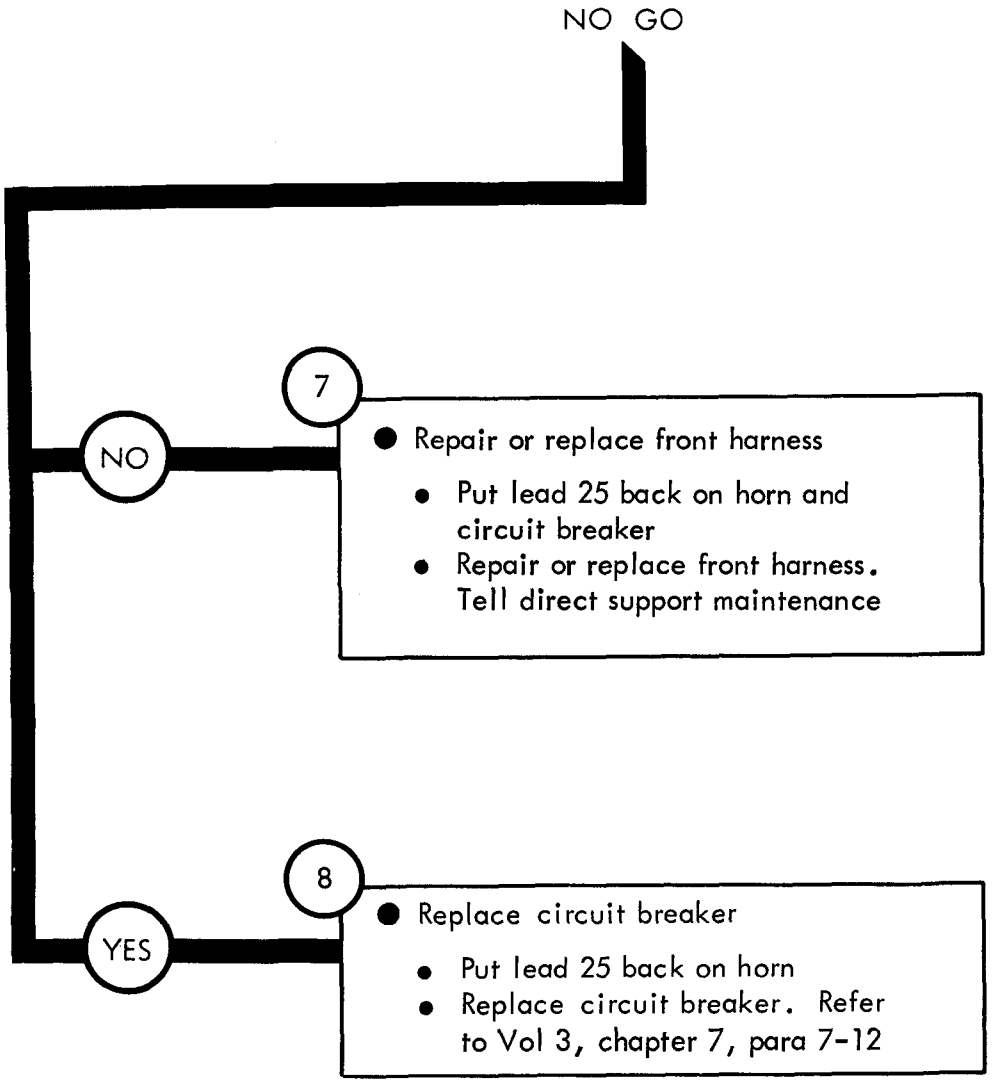
Does multimeter measure +24 volts DC?



NO GO

TA 115944

Figure 26-32 (Sheet 4 of 10)



TA 115945

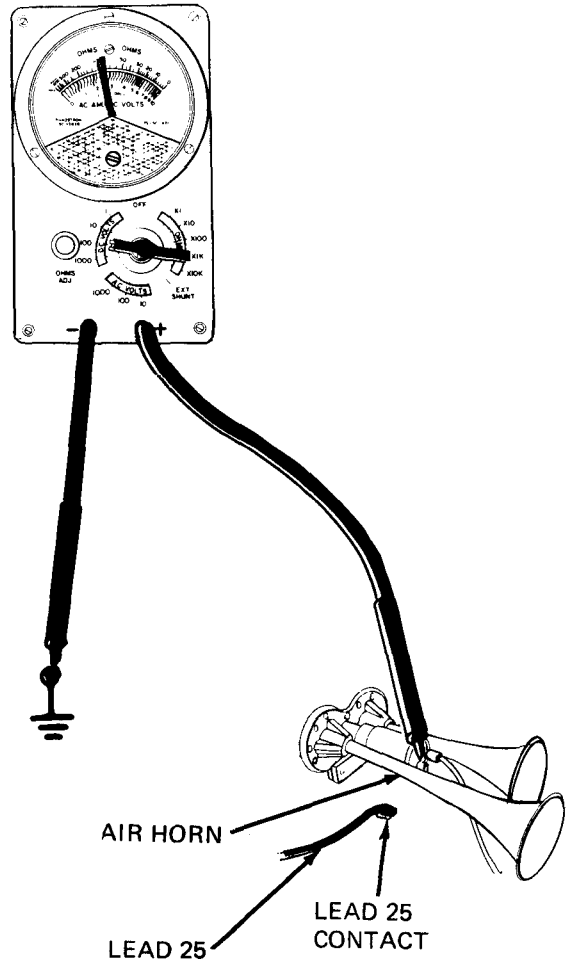
Figure 26-32 (Sheet 5 of 10)

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

TA 115946

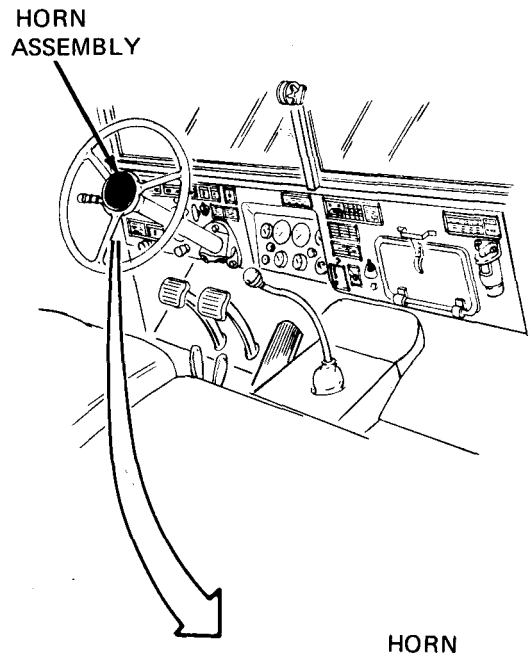
Figure 26-32 (Sheet 6 of 10)

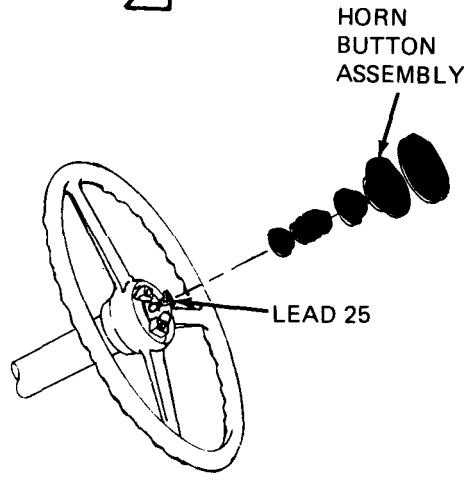
GO

11

- Check lead 25 for +24 volts DC
  - Put lead 25 back on horn terminal
  - Take horn button assembly apart until lead 25 terminal can be seen. Refer to Vol 3, chapter 7, para 7-38
  - Put multimeter - lead on good ground
  - Put multimeter + lead on lead 25 terminal
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?





YES

NO

12

- Repair or replace front harness
  - Repair or replace front harness. Tell direct support maintenance

GO

TA 115947

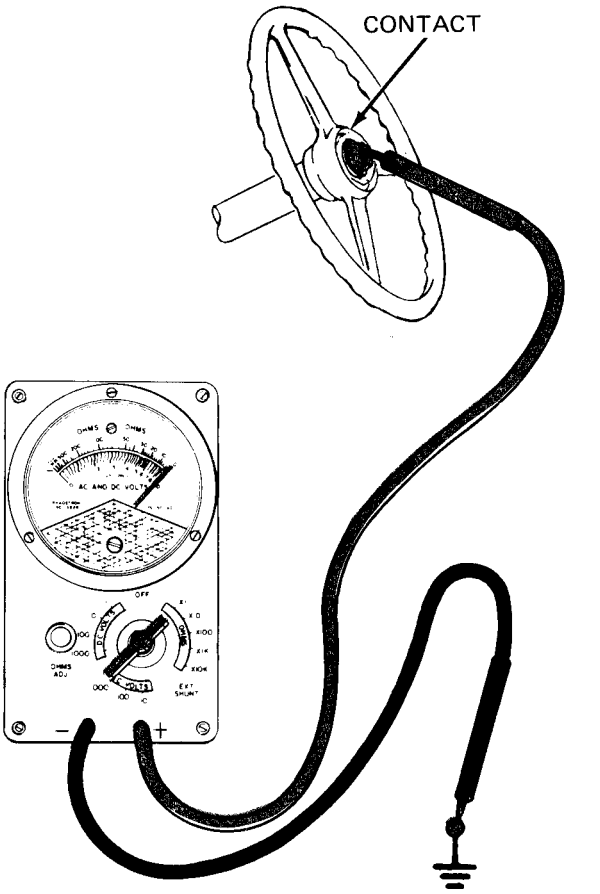
Figure 26-32 (Sheet 7 of 10)

GO

13

- Check horn button for continuity
  - Put horn button cap, spring, and contact back in place
  - Set multimeter to measure continuity. Refer to test equipment procedures index
  - 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?



YES

NO

14

- If continuity is OK (0 ohms) and horn still does not work, replace horn button assembly
  - Refer to Vol 3, chapter 7, para 7-38

GO

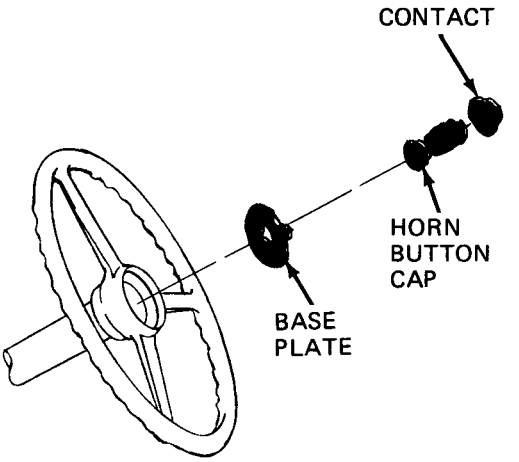
TA 115948

Figure 26-32 (Sheet 8 of 10)

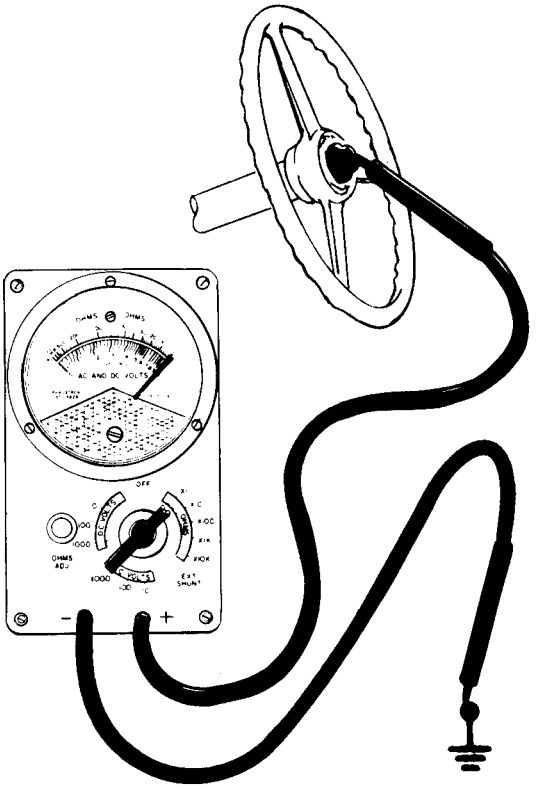
GO

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

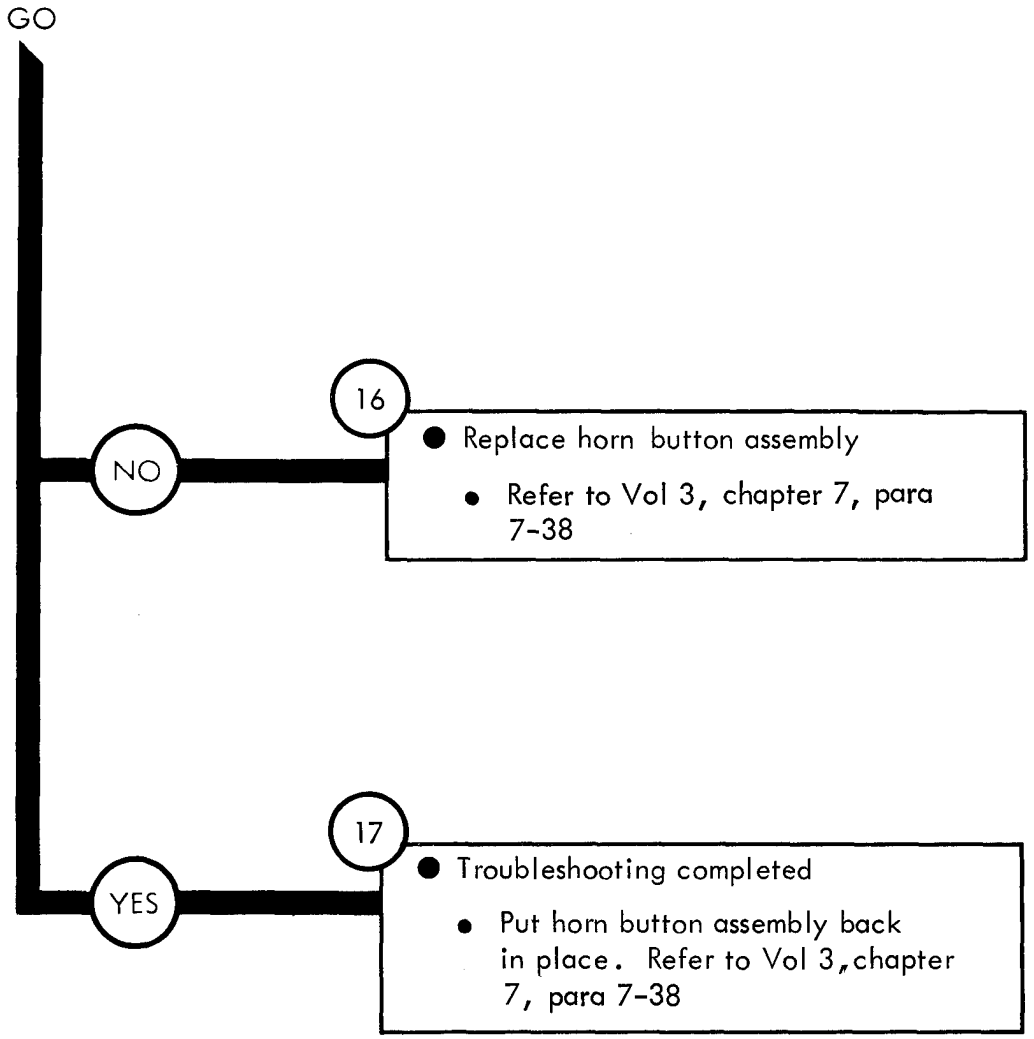


Does multimeter measure zero ohms?

GO

TA 115949

Figure 26-32 (Sheet 9 of 10)



TA 115950

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

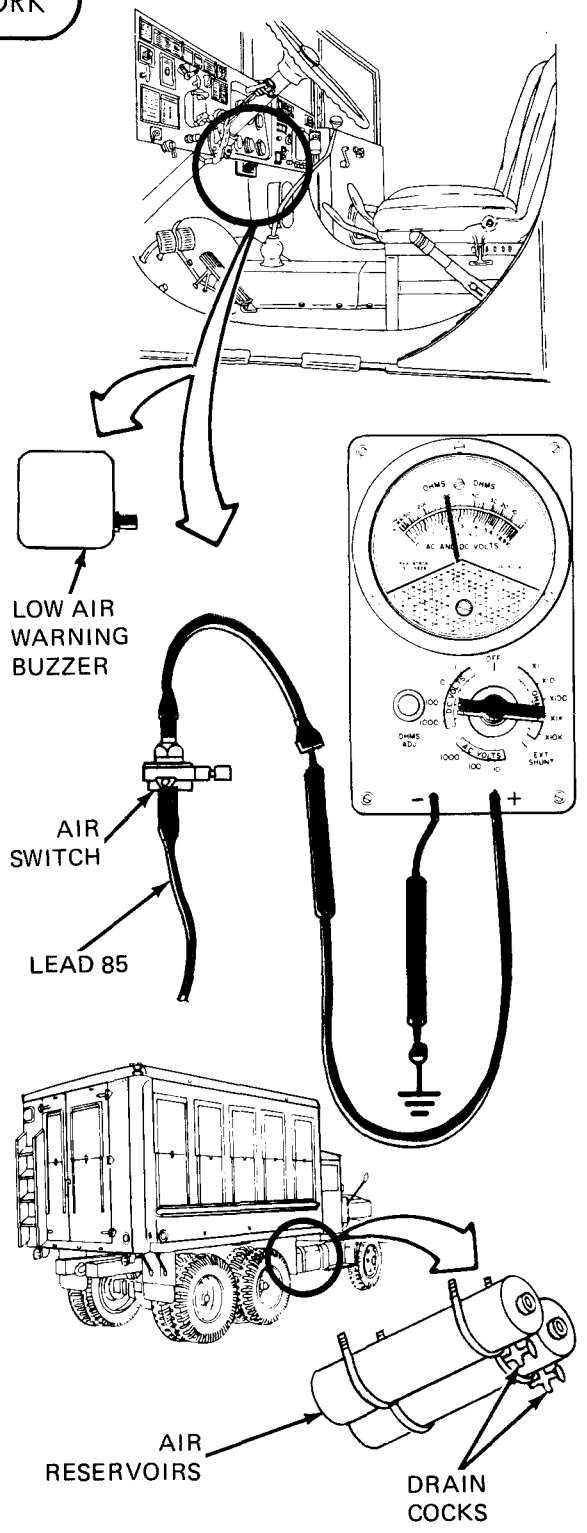


Figure 26-33 (Sheet 1 of 4)

GO

YES

NO

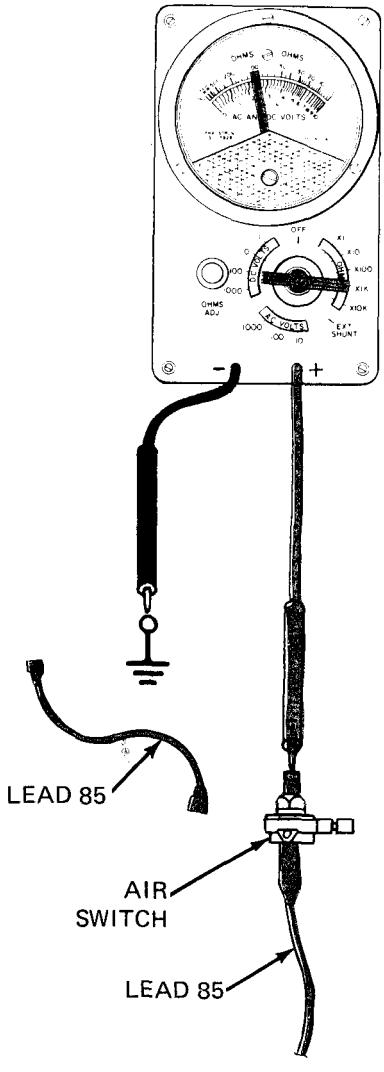
3

- Replace low air warning buzzer
  - Set BATTERY switch to OFF
  - Remove and replace low air warning buzzer. Refer to Vol 3, chapter 7, para 7-36

4

- Check for +24 volts DC at air switch input
  - Take off lead 85 from air switch
  - Put multimeter - lead on a good ground
  - Put multimeter + lead in air switch contact
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

5

- Repair or replace lead 85
  - Set BATTERY switch to OFF
  - Repair or replace lead 85. Tell direct support maintenance

GO

TA 115952

Figure 26-33 (Sheet 2 of 4)

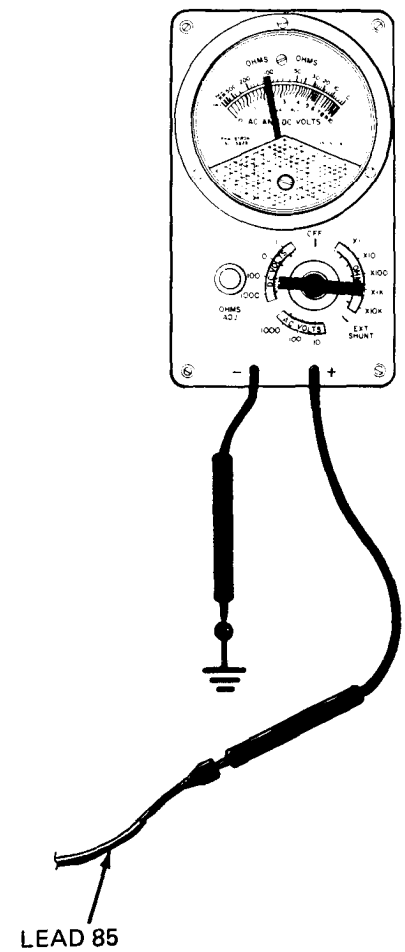
GO

6

- Check for +24 volts DC to air switch
  - Put back circuit 85 lead on air switch and low air warning buzzer
  - Take off lead 85 (from front harness to air switch) at air switch
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on lead 85 contact
  - Read multimeter. Multimeter should measure +24 volts DC

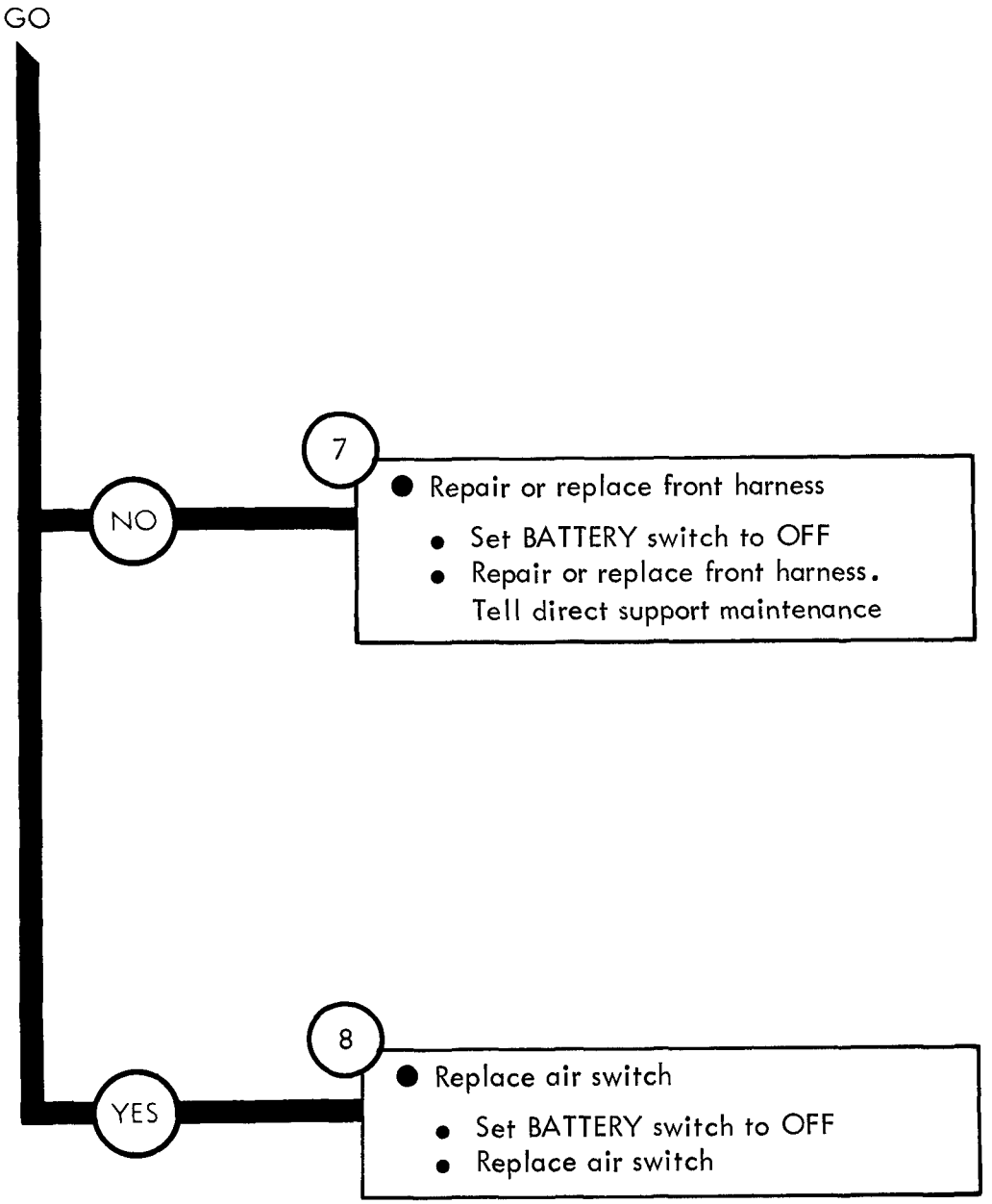
Does multimeter measure +24 volts DC?

GO



TA 115953

Figure 26-33 (Sheet 3 of 4)



TA 115954

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

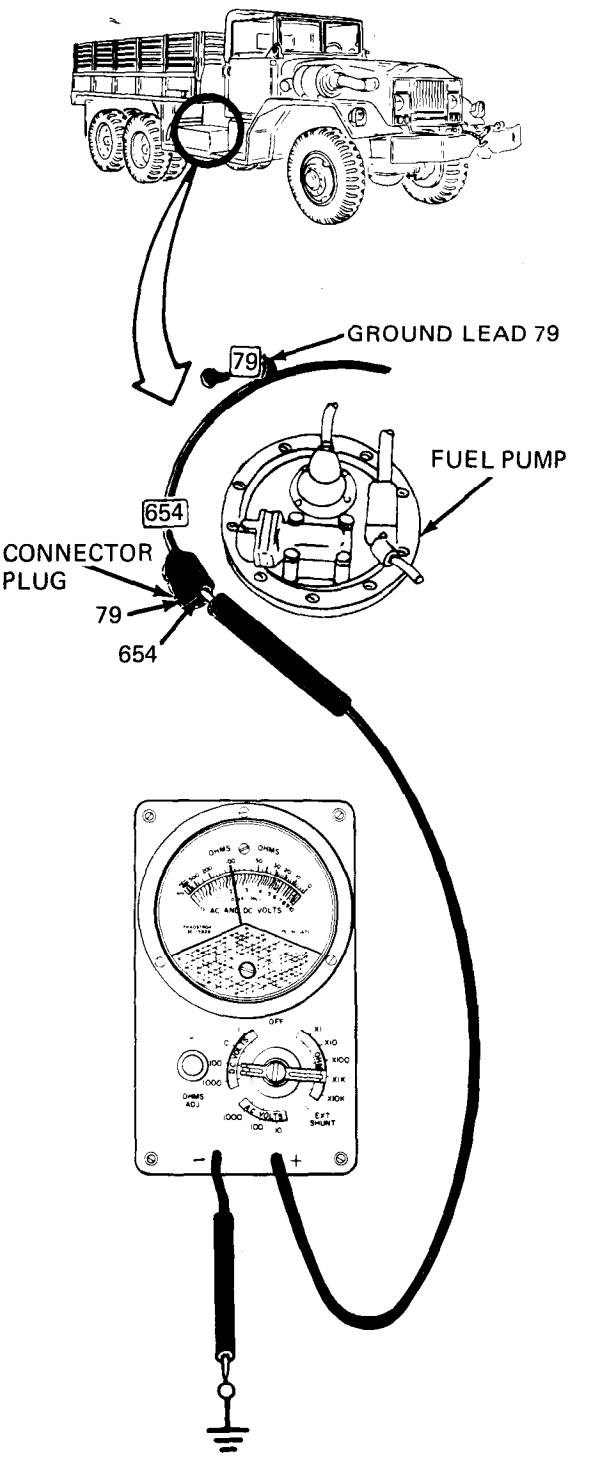
- Park truck
  - Refer to TM 9-2320-211-10

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

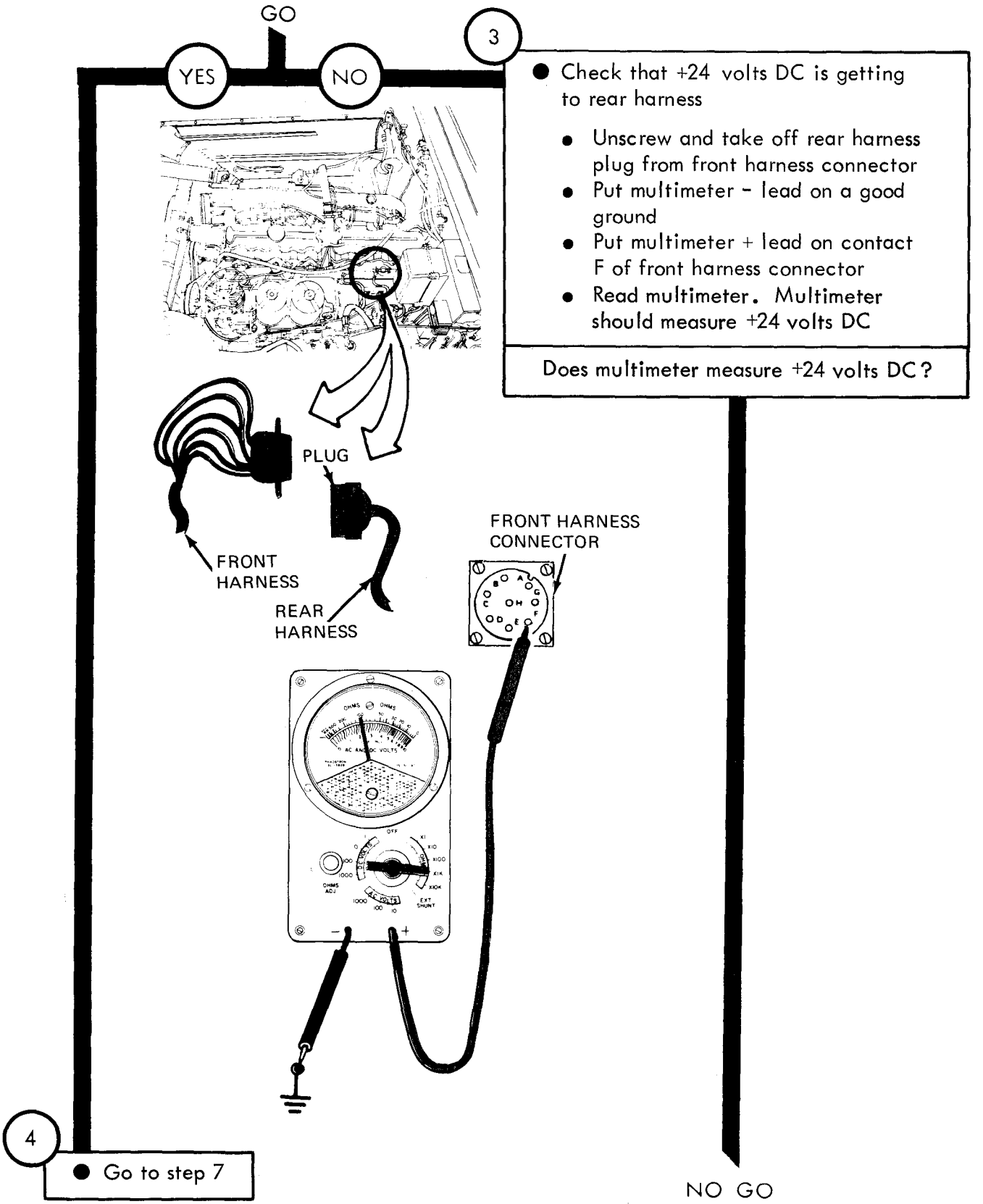
Does multimeter measure +24 volts DC?

GO



TA 115955

Figure 26-34 (Sheet 1 of 5)



TA 115956

Figure 26-34 (Sheet 2 of 5)

NO GO

5

NO

- Repair or replace front harness
  - Tell direct support maintenance

6

YES

- Repair or replace rear harness
  - Tell direct support maintenance

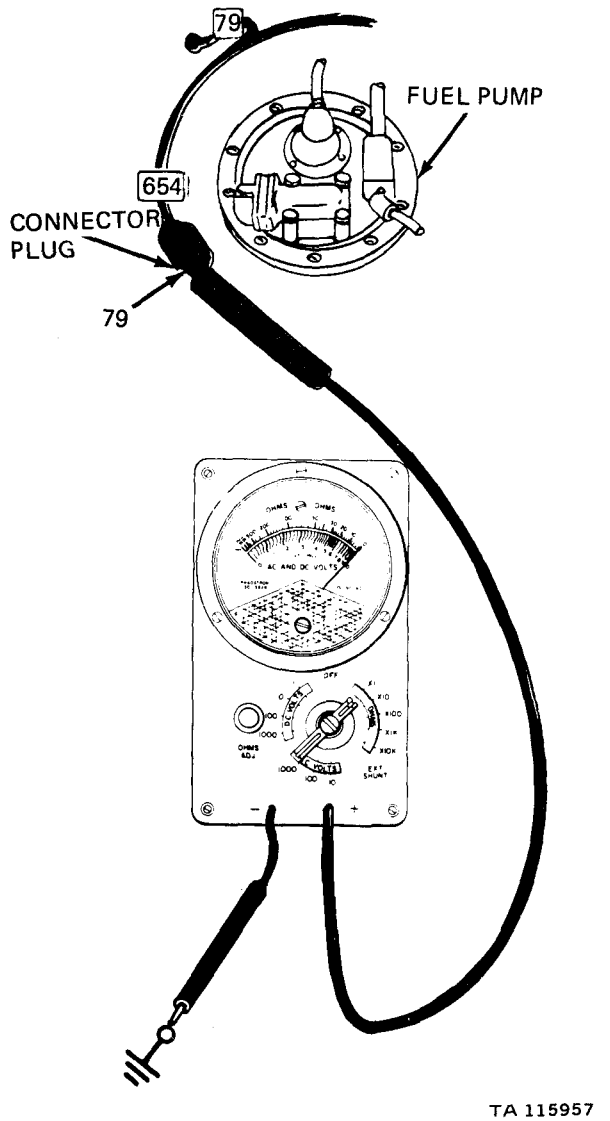
From step 4

7

- Check continuity through fuel pump connector harness ground
  - 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 lead 79 contact in plug
  - Read multimeter. Multimeter should measure zero ohms

Does multimeter measure zero ohms?

GO



TA 115957

Figure 26-34 (Sheet 3 of 5)

GO

YES

NO

8

- Repair or replace rear harness
  - Tell direct support maintenance

9

- Check fuel pump for short between circuits 654 and 79 pump contacts
  - Put multimeter - lead on fuel pump contact 79
  - Put multimeter + lead on fuel pump contact 654
  - Read multimeter. Multimeter pointer should not move

Did multimeter pointer move to the right?

GO

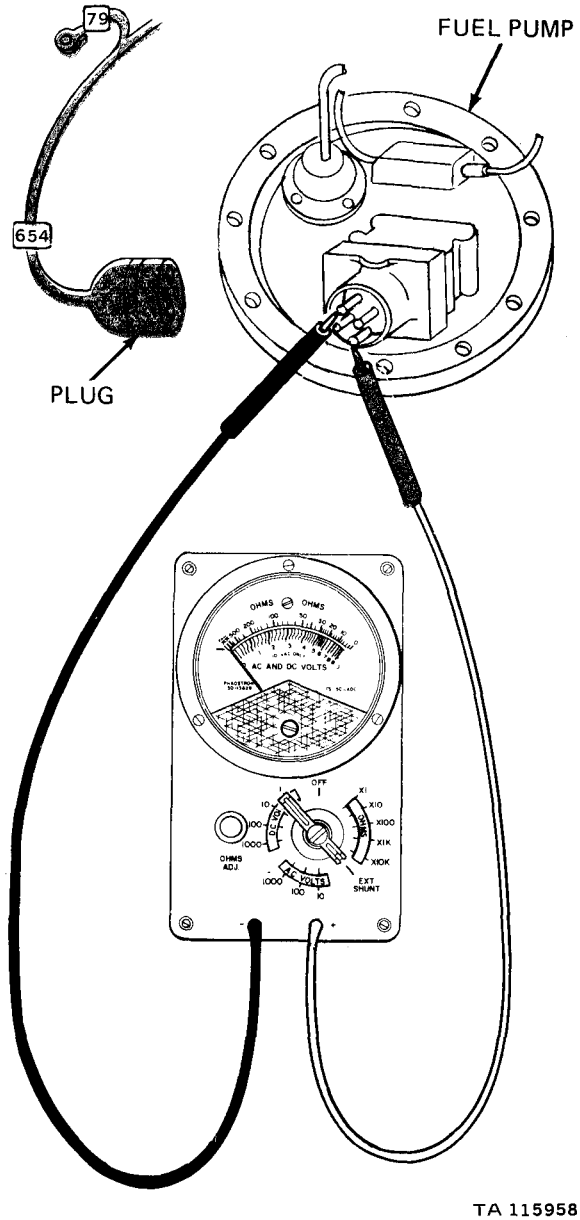


Figure 26-34 (Sheet 4 of 5)

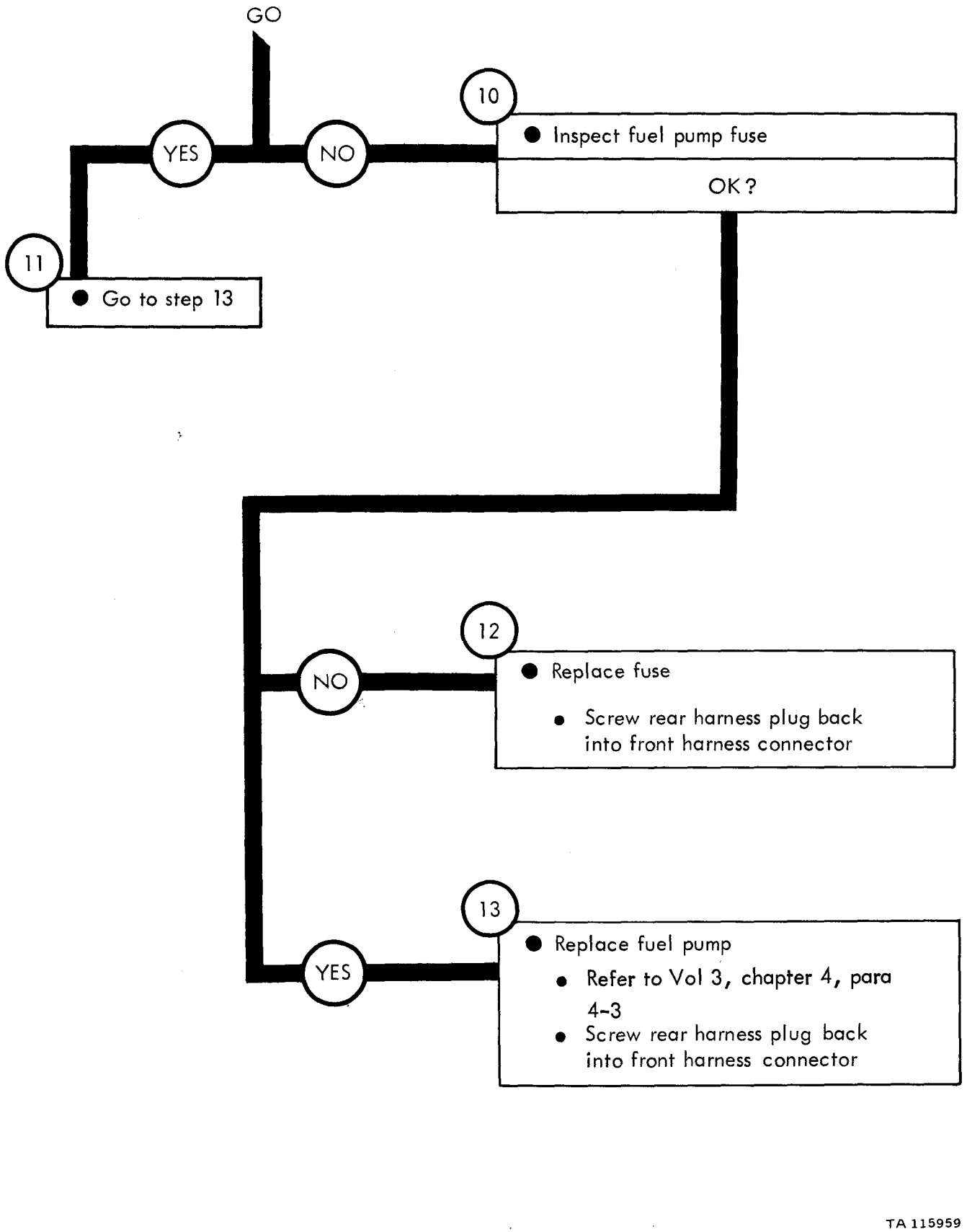


Figure 26-34 (Sheet 5 of 5)

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

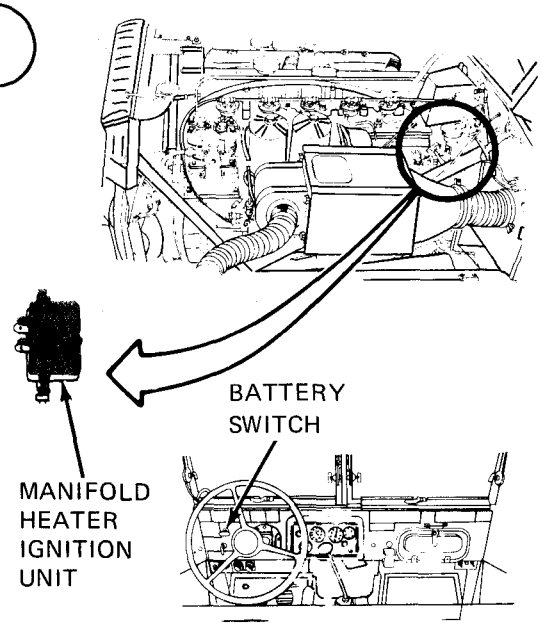
2

- 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



TA 115960

Figure 26-35 (Sheet 1 of 6)

GO

YES

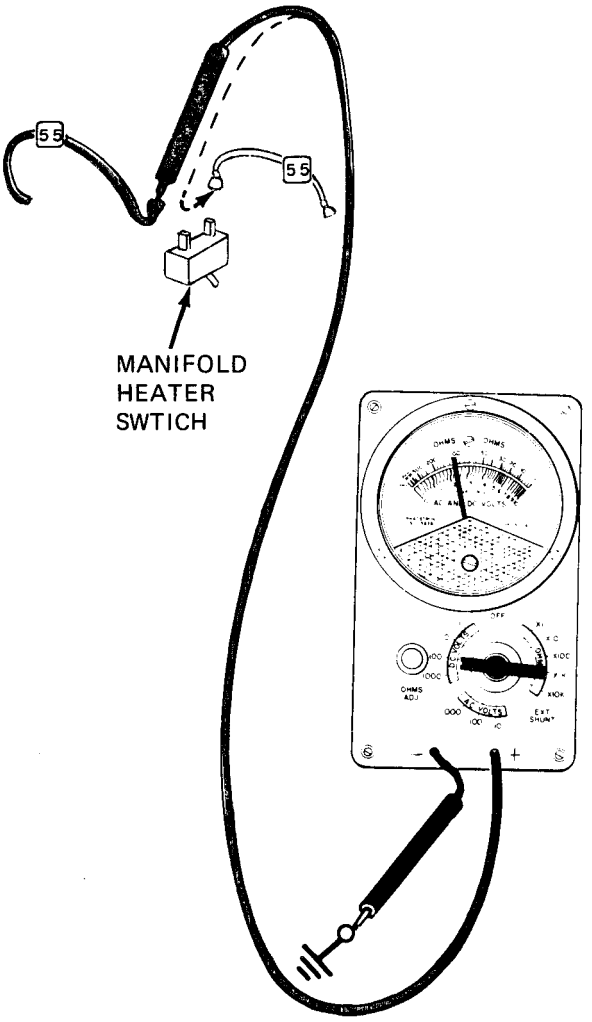
NO

3

- Repair or replace manifold heater switch
  - Refer to Vol 3, chapter 7, para 7-19

4

- Check for +24 volts DC to manifold heater switch
  - Put lead 55 back on manifold heater ignition unit
  - Take off both leads 55 from manifold heater switch



- Put multimeter - lead on a good ground
- Put multimeter + lead on one lead 55 contact. Read multimeter
- Put multimeter + lead on other lead 55 contact. Read multimeter
- If multimeter measures +24 volts on one lead 55 and 0 volts on other lead 55 go to step 5
- If multimeter measures 0 volts on both leads 55 go to step 8

GO

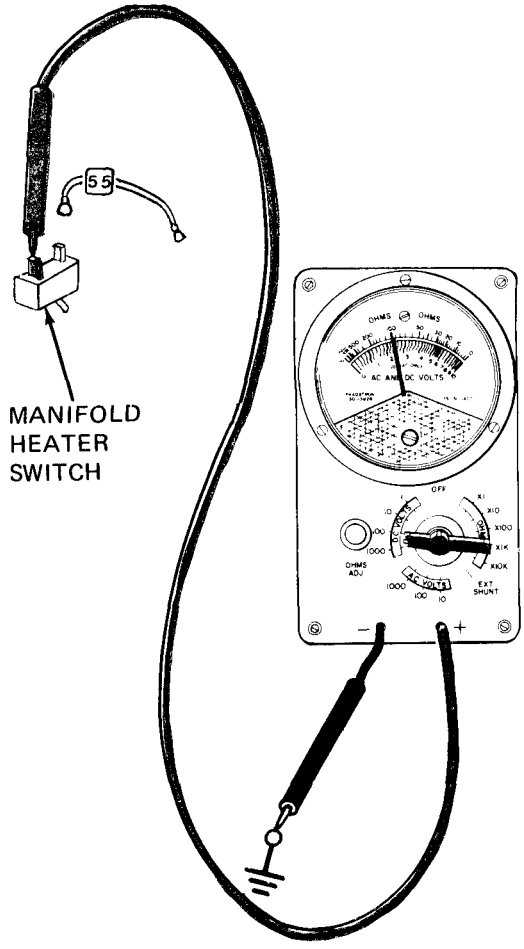
TA 115961

Figure 26-35 (Sheet 2 of 6)

GO

5

- Check for +24 volts DC through manifold heater switch
  - Put lead 55 that has +24 volts DC back on manifold heater switch terminal



- Put multimeter - lead on a good ground
- Put multimeter + lead on other manifold heater switch terminal
- Read multimeter

Does multimeter measure +24 volts DC?

NO

6

- Replace manifold heater switch
  - Refer to Vol 3, chapter 7, para 7-19

YES

7

- Repair or replace lead 55 between manifold heater switch and manifold heater ignition unit
  - Tell direct support maintenance

TA 115962

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?

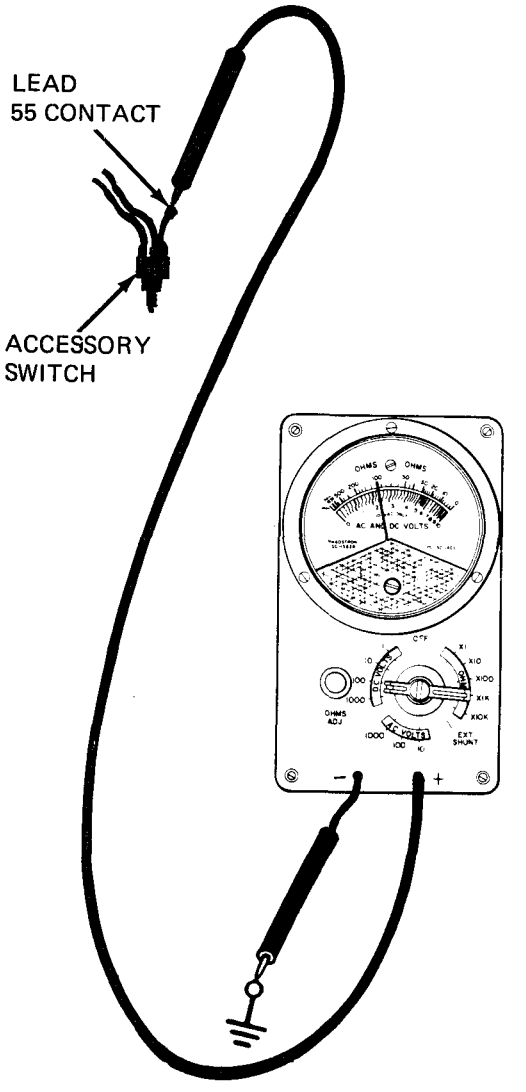
YES

NO

9

- Repair or replace front harness
  - Tell direct support maintenance

GO



TA 115963

Figure 26-35 (Sheet 4 of 6)

GO

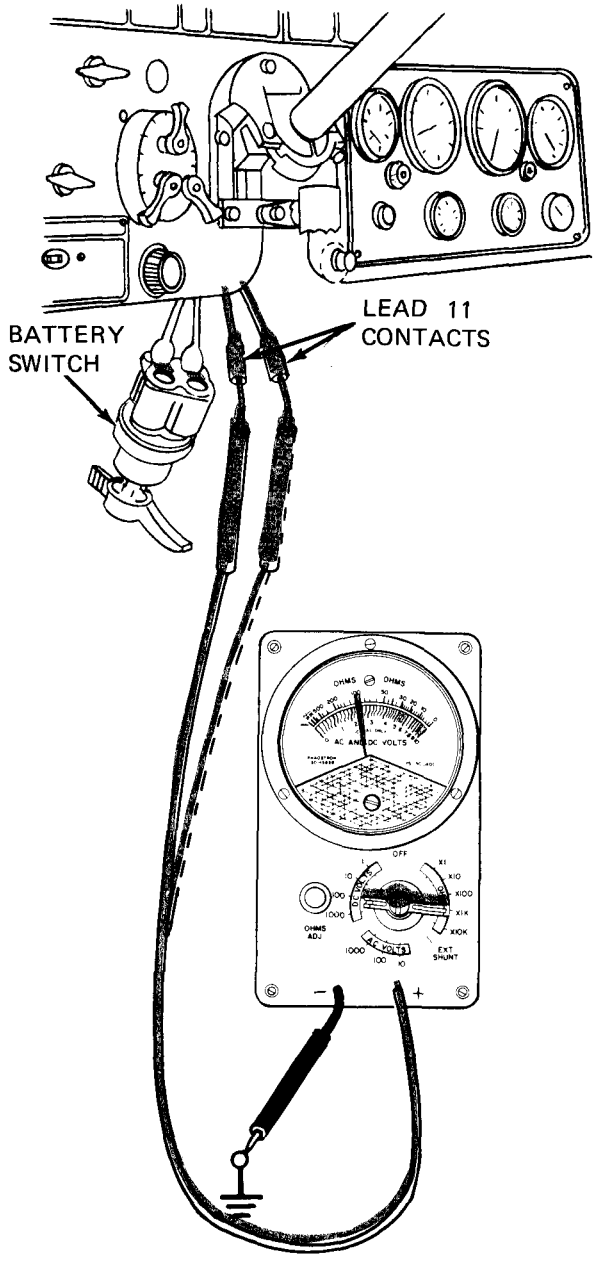
10

- Check both leads 11 for +24 volts DC
  - Put lead 55 back on BATTERY switch
  - Take off both leads 11 from BATTERY switch

- Put multimeter - lead on a good ground
- Put multimeter + lead on BATTERY switch lead 55 contact
- Read multimeter

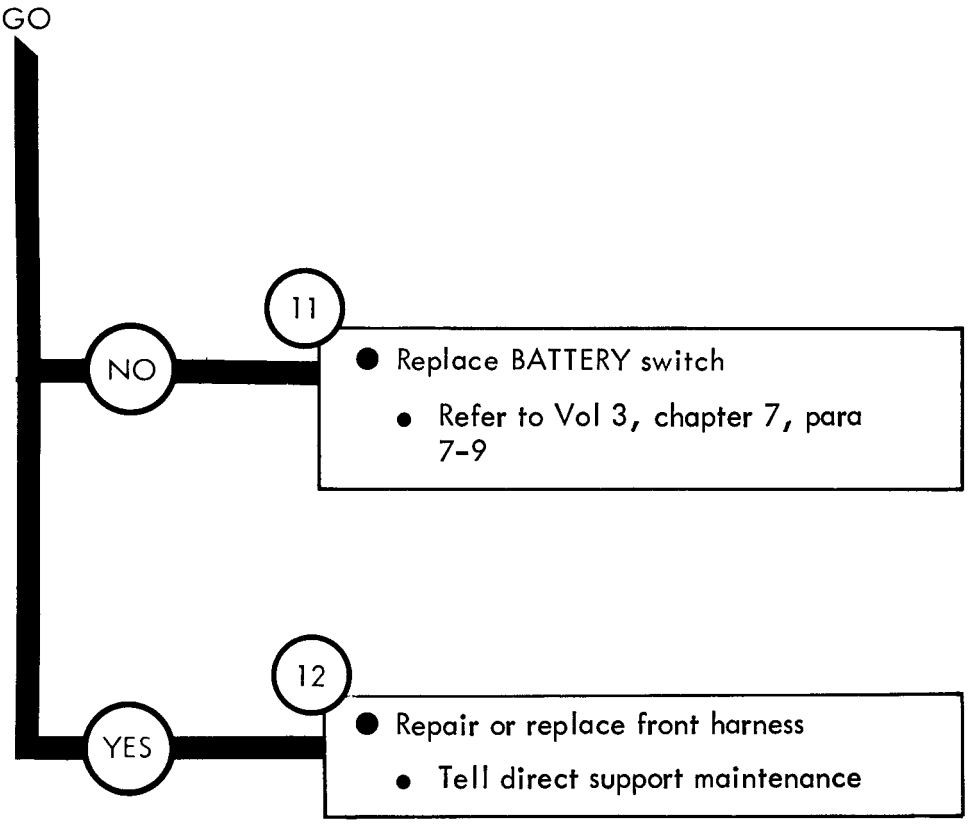
Does multimeter measure less than +24 volts DC?

GO



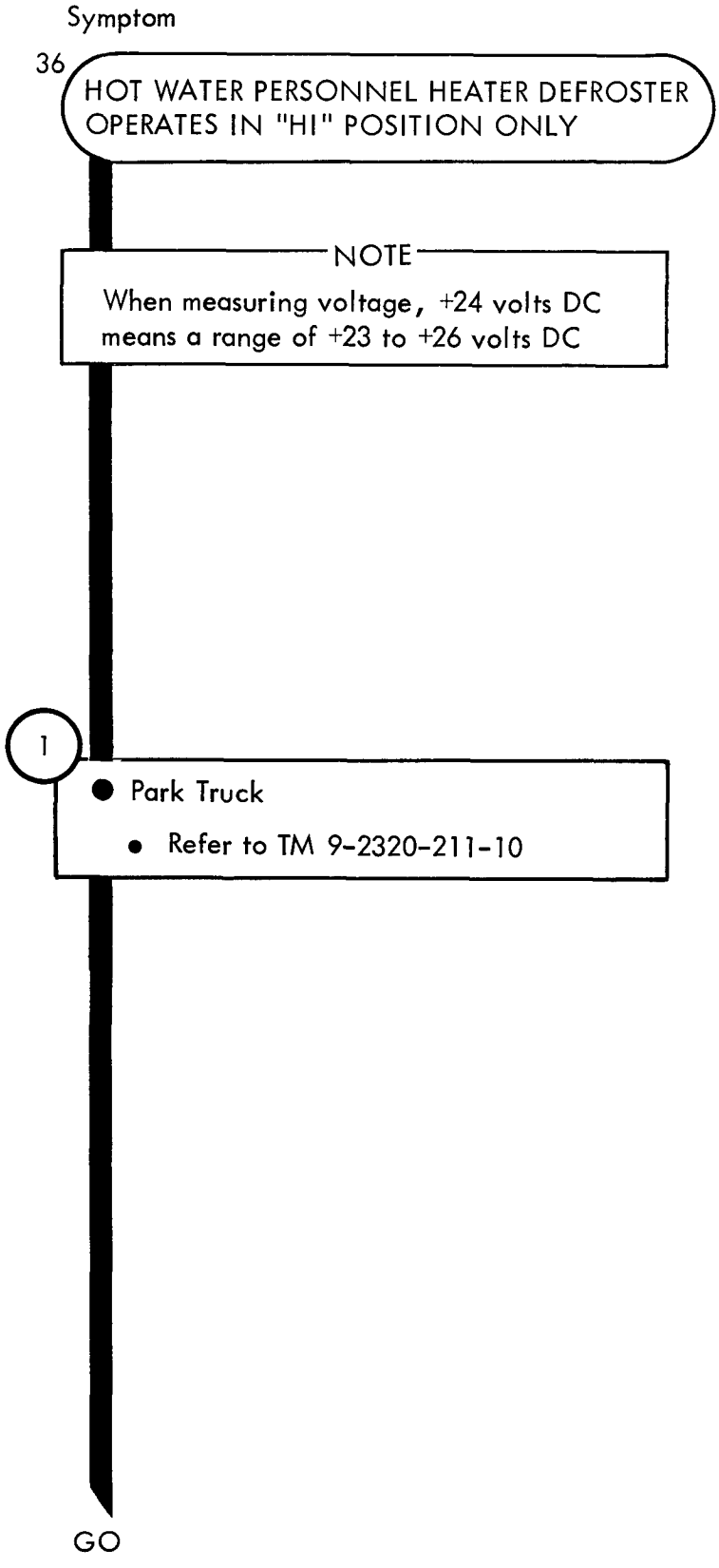
TA 115964

Figure 26-35 (Sheet 5 of 6)



TA 115965

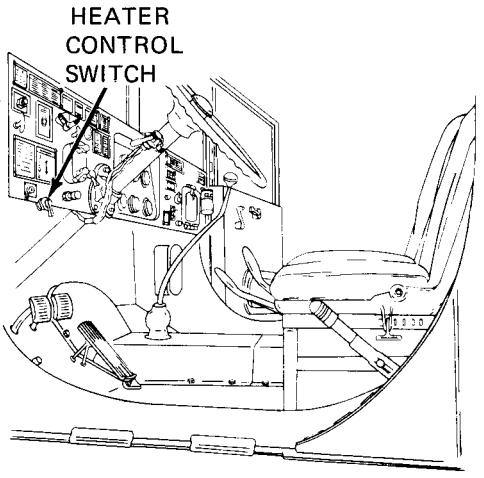
Figure 26-35 (Sheet 6 of 6)



TA 115966

Figure 26-36 (Sheet 1 of 14)

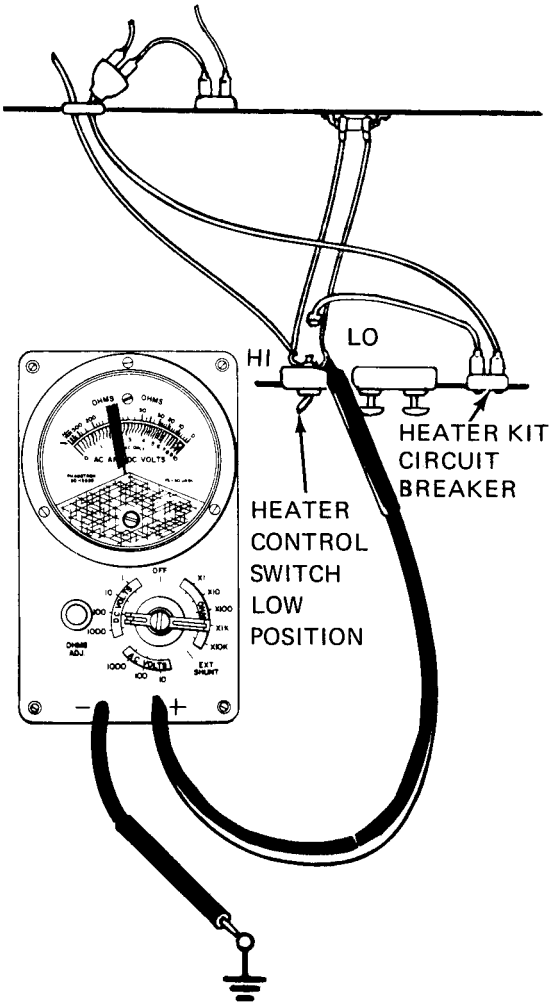
GO



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

TA 115967

Figure 26-36 (Sheet 2 of 14)

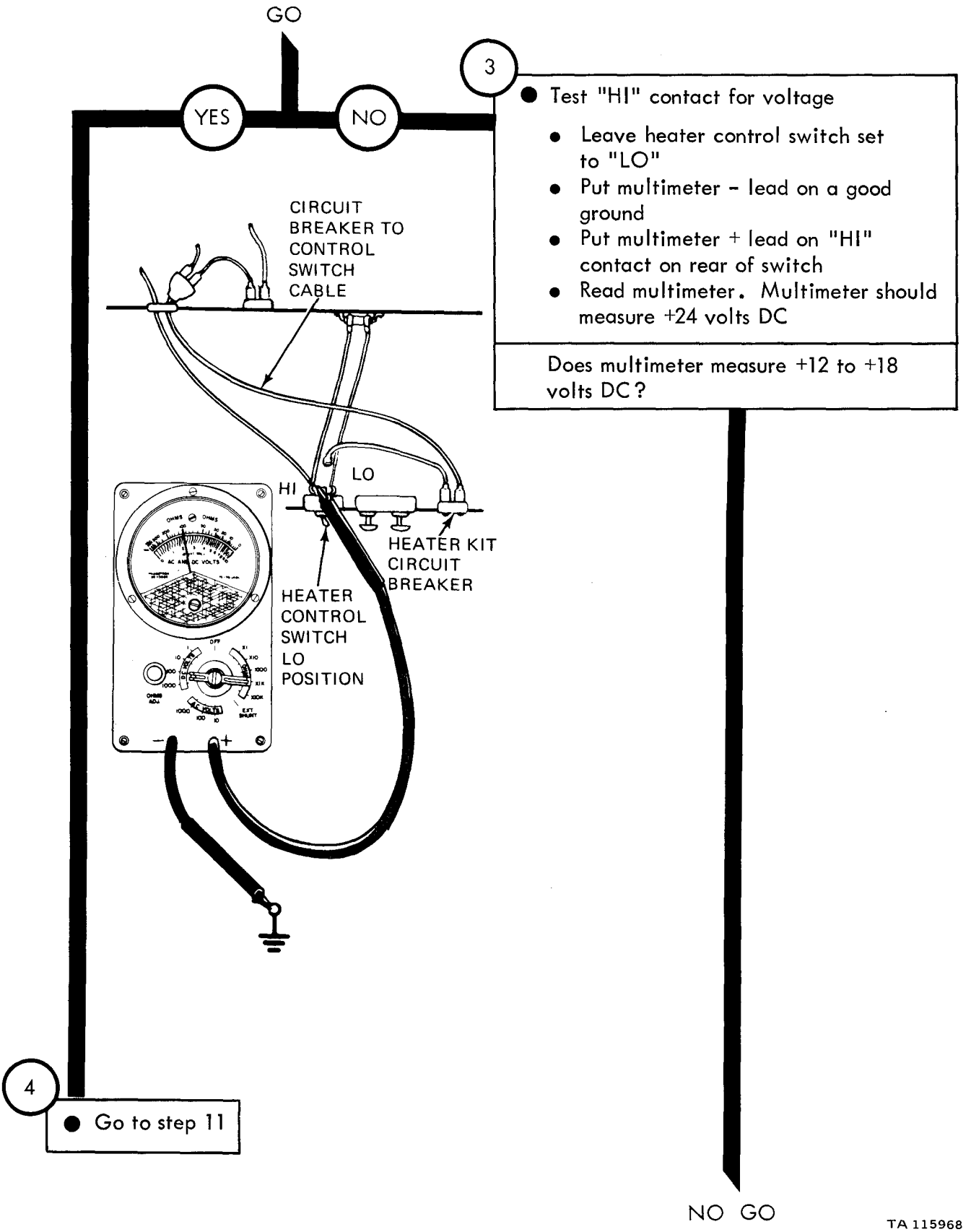


Figure 26-36 (Sheet 3 of 14)

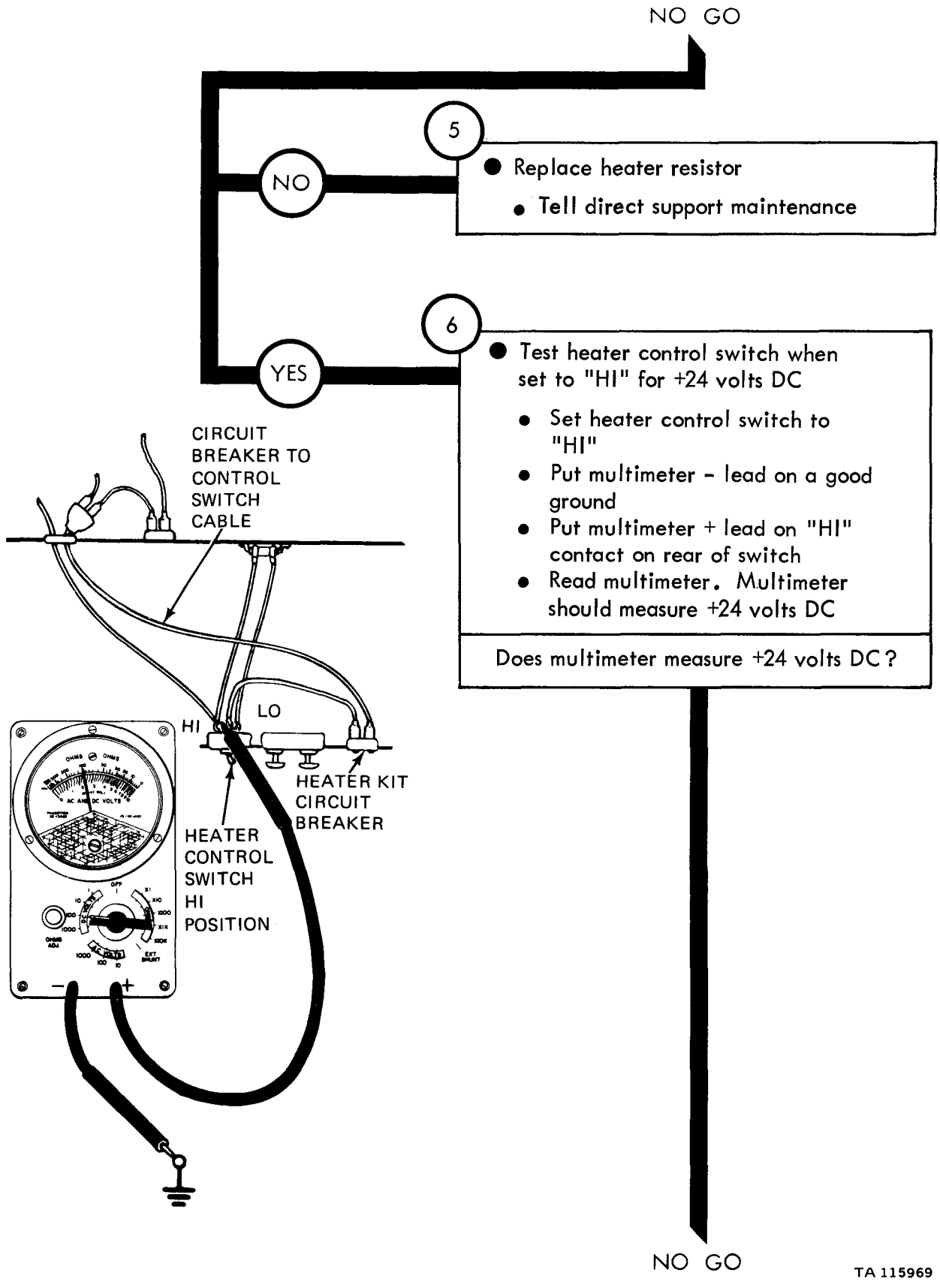
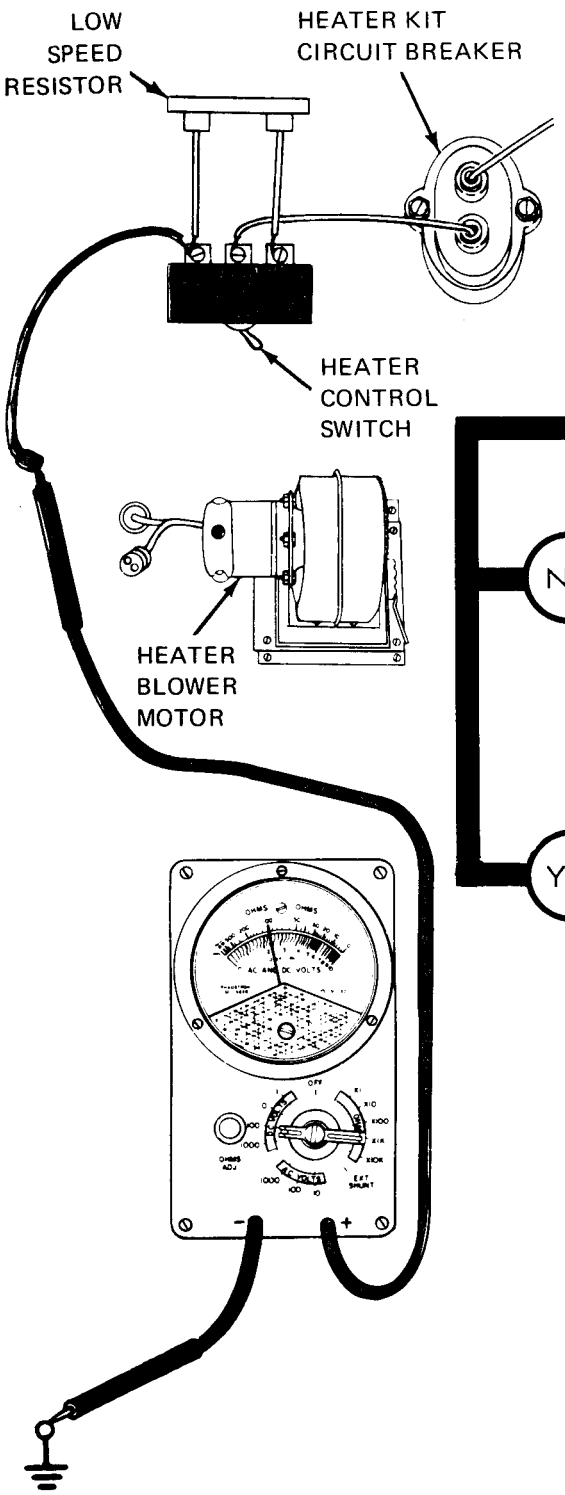


Figure 26-36 (Sheet 4 of 14)



NO GO

NO

7

- Replace heater control switch
- Tell direct support maintenance

YES

8

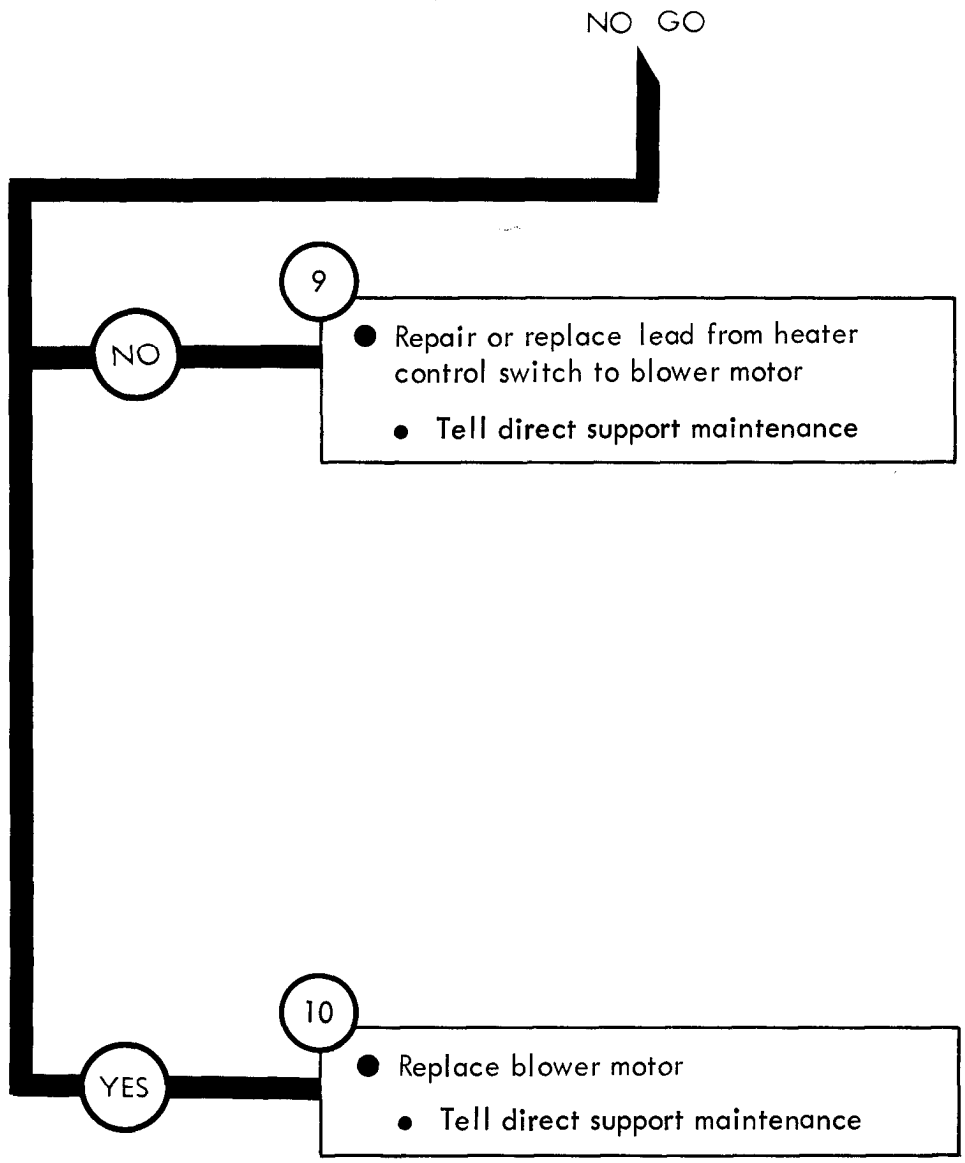
- Test blower motor
  - Take off lead from heater control switch at the blower motor
  - Set heater control switch to "LO"
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on contact of lead removed from blower motor
  - Read multimeter. Multimeter should measure +12 to +18 volts DC

Does multimeter measure +12 to +18 volts DC?

NO GO

TA 115970

Figure 26-36 (Sheet 5 of 14)



TA 115971

Figure 26-36 (Sheet 6 of 14)

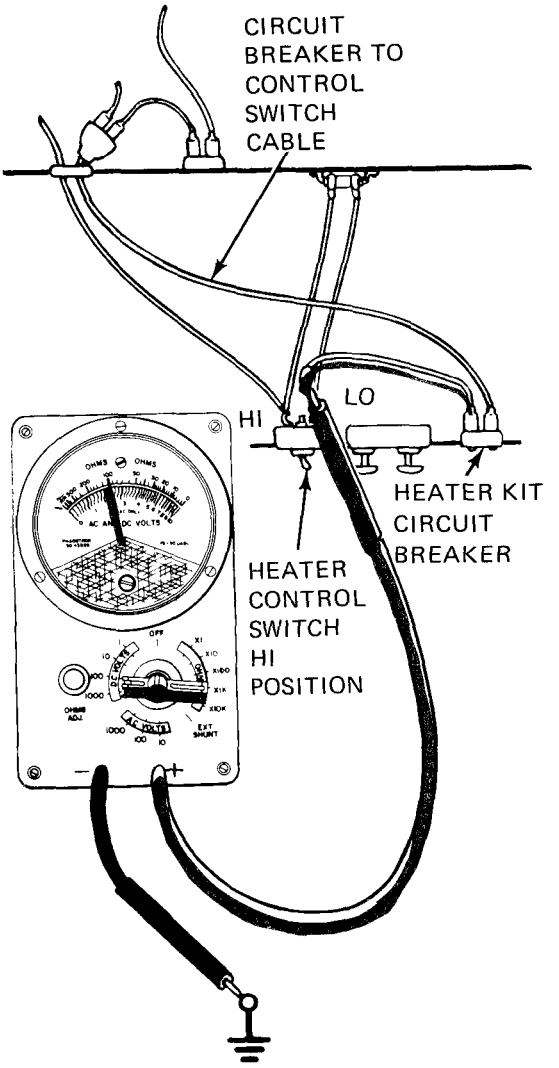
From step 4

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



TA 115972

Figure 26-36 (Sheet 7 of 14)

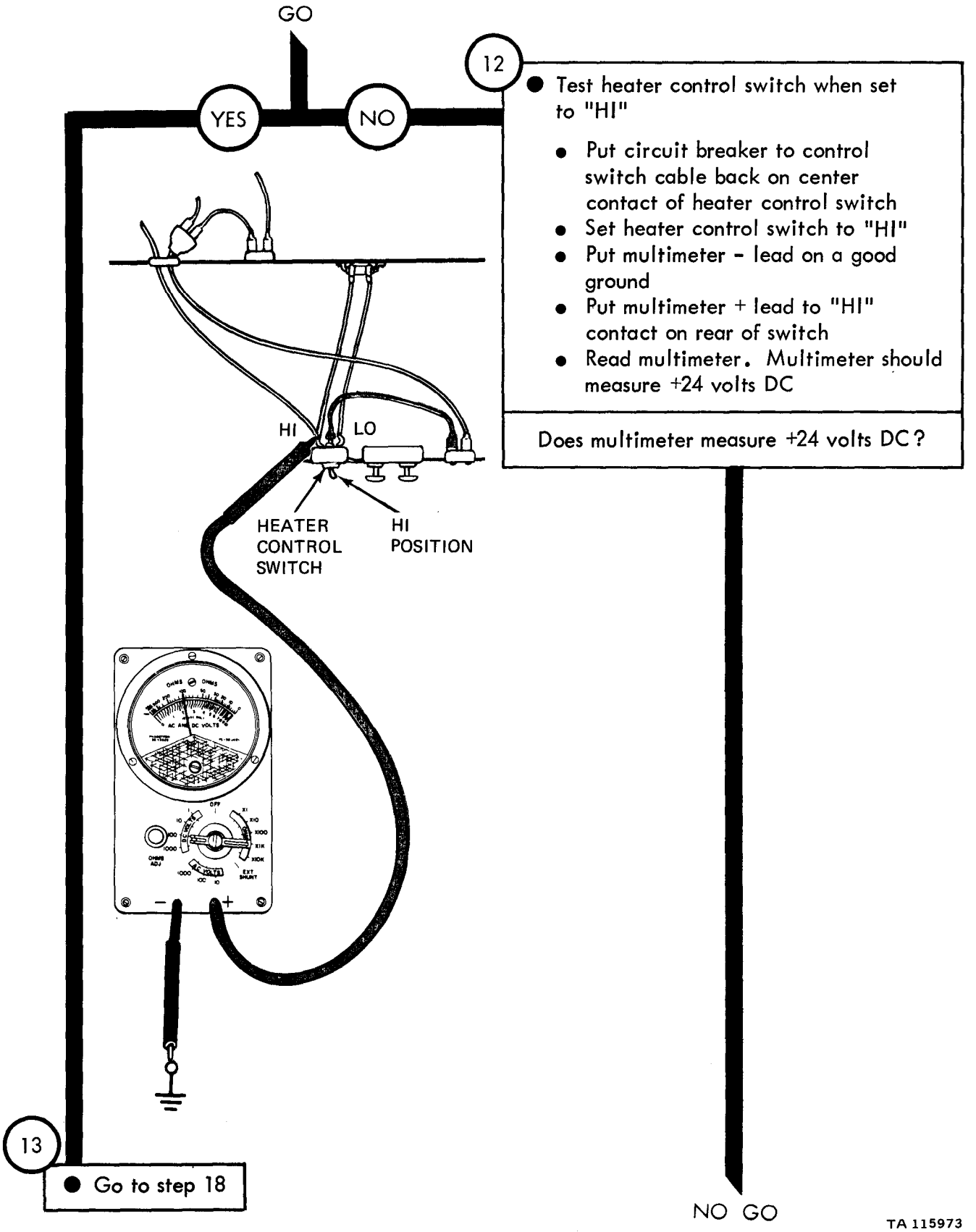
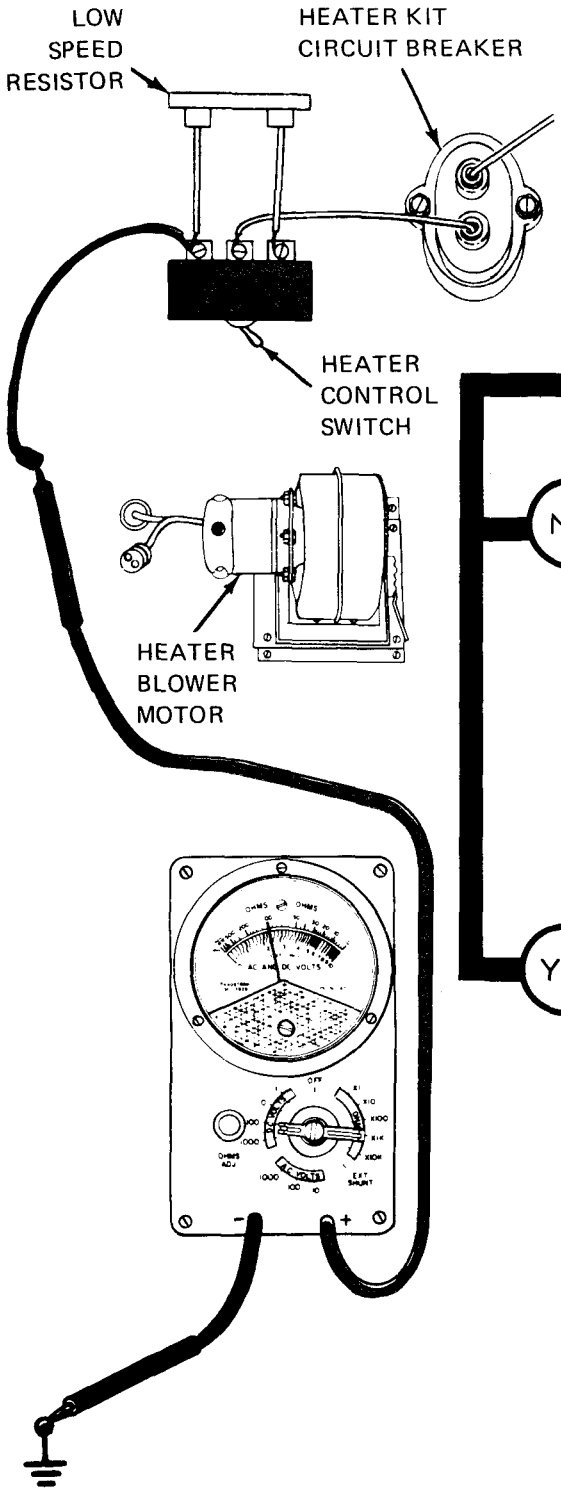


Figure 26-36 (Sheet 8 of 14)



NO GO

14

NO

- Replace heater control switch
  - Tell direct support maintenance

15

YES

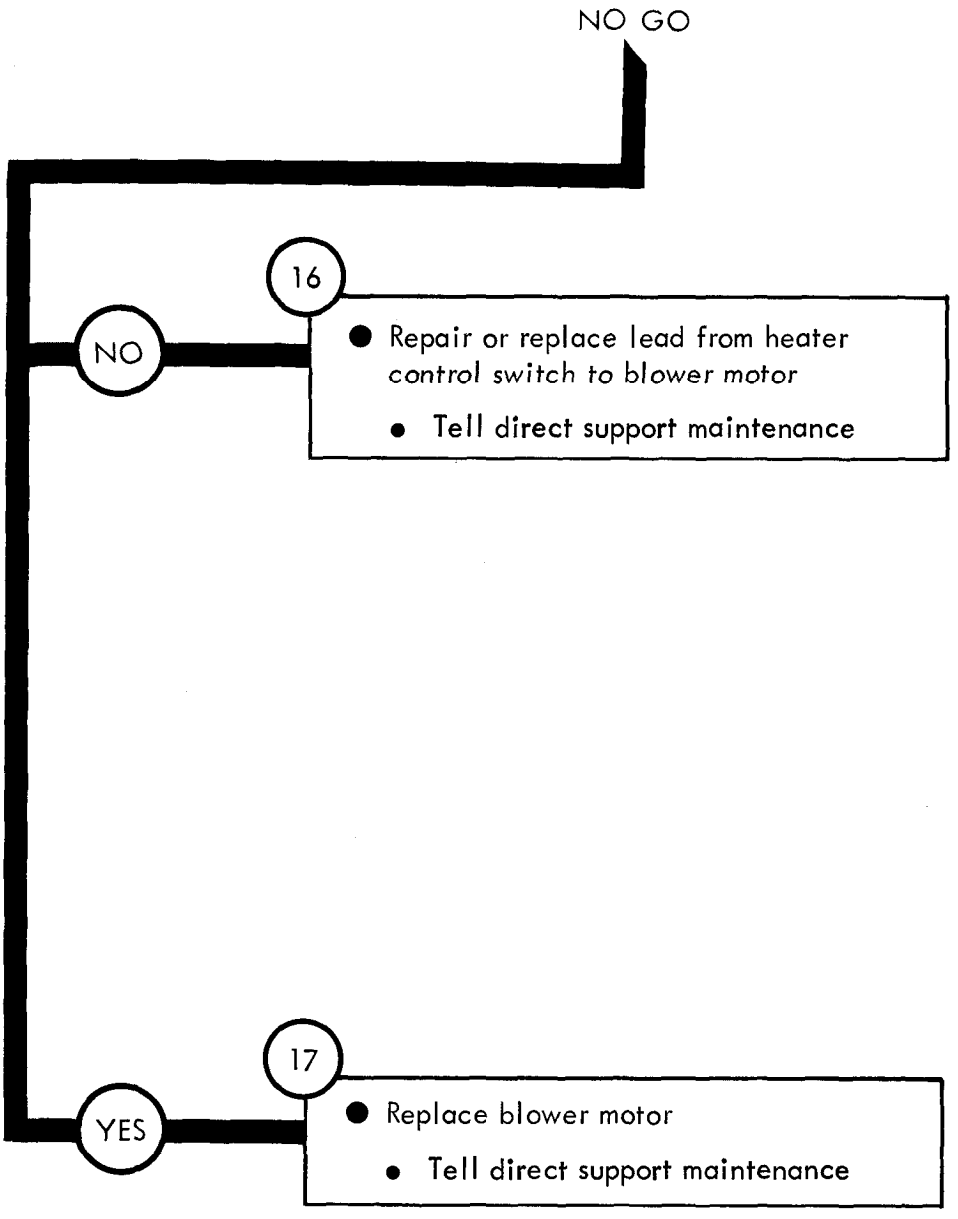
- Test blower motor
  - Take off lead from heater control switch to blower motor at blower motor
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on contact of lead removed from blower motor
  - Read multimeter. Multimeter should measure +24 volts DC

Did multimeter measure +24 volts DC?

NO GO

TA 115974

Figure 26-36 (Sheet 9 of 14)



TA 115975

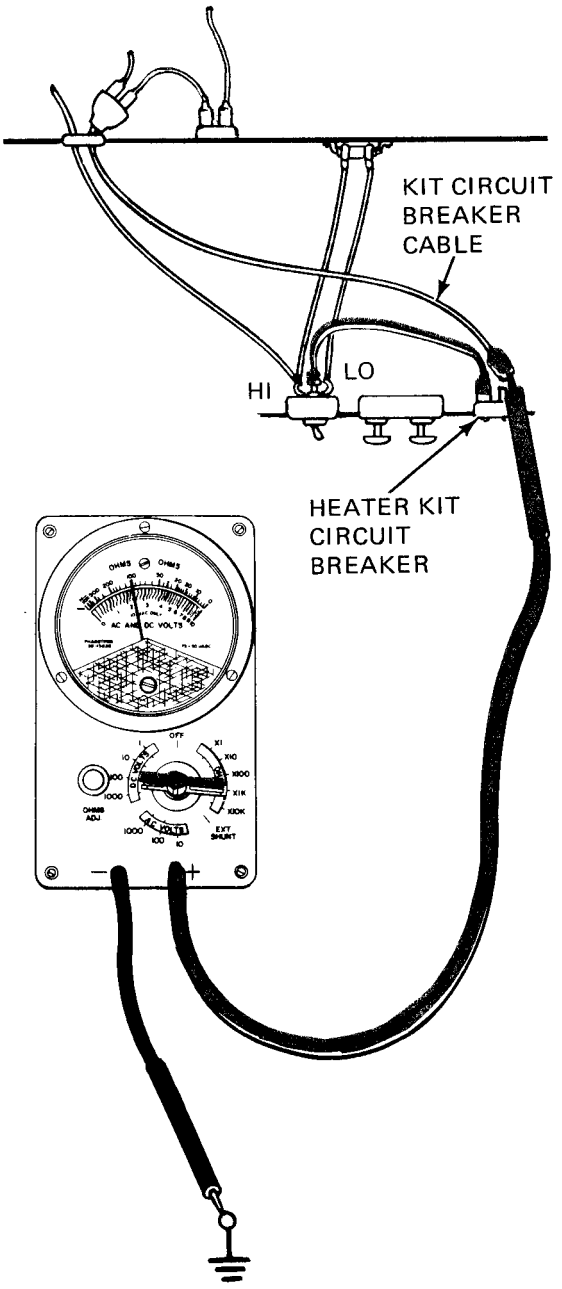
Figure 26-36 (Sheet 10 of 14)

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

TA 115976

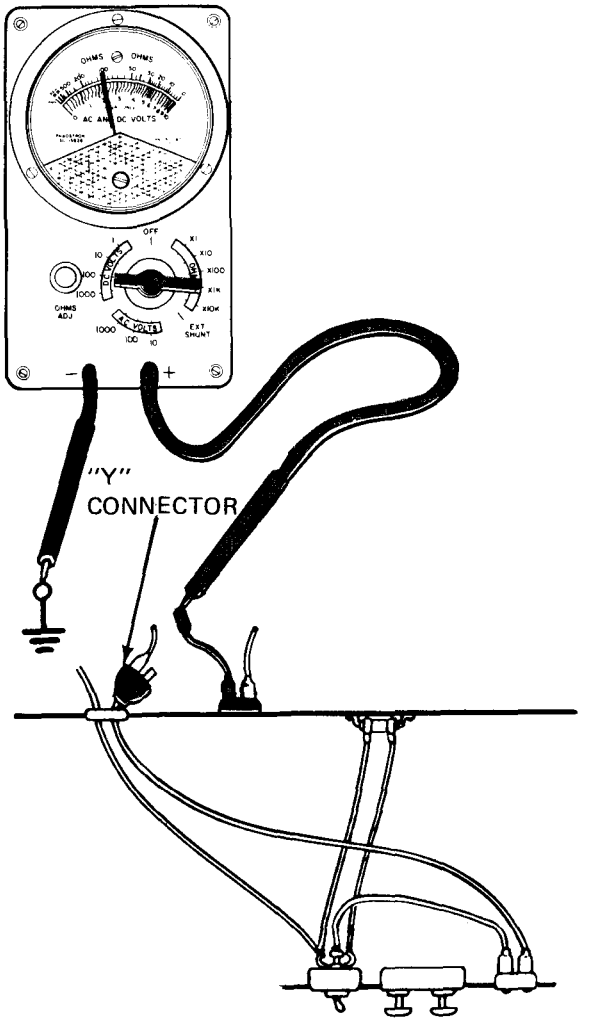
Figure 26-36 (Sheet 11 of 14)

GO

20

- Check lead from truck circuit breaker to "Y" connector
  - On engine side of firewall take off lead from truck circuit breaker to "Y" connector
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on contact of lead from truck circuit breaker
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

21

- Repair or replace "Y" connector lead
  - Tell direct support maintenance

GO

TA 115977

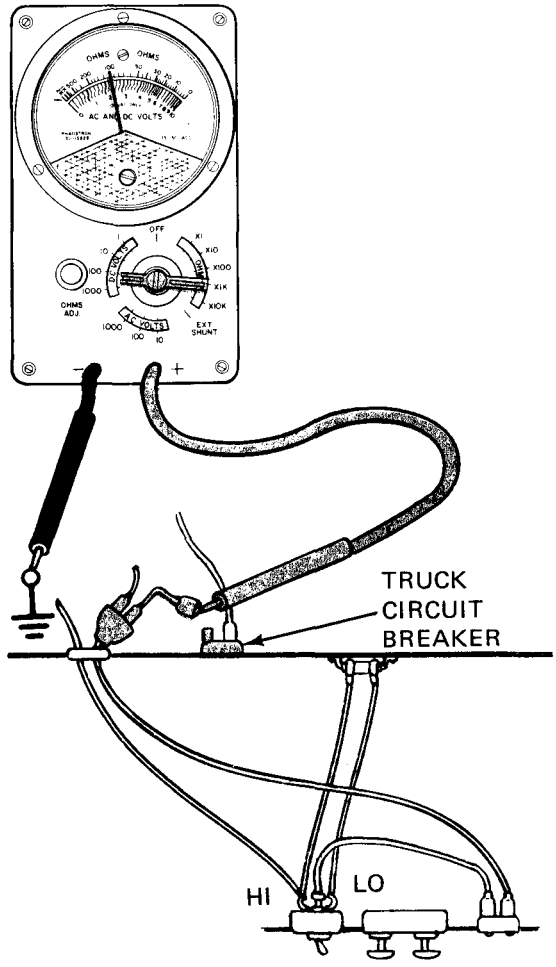
Figure 26-36 (Sheet 12 of 14)

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

TA 115978

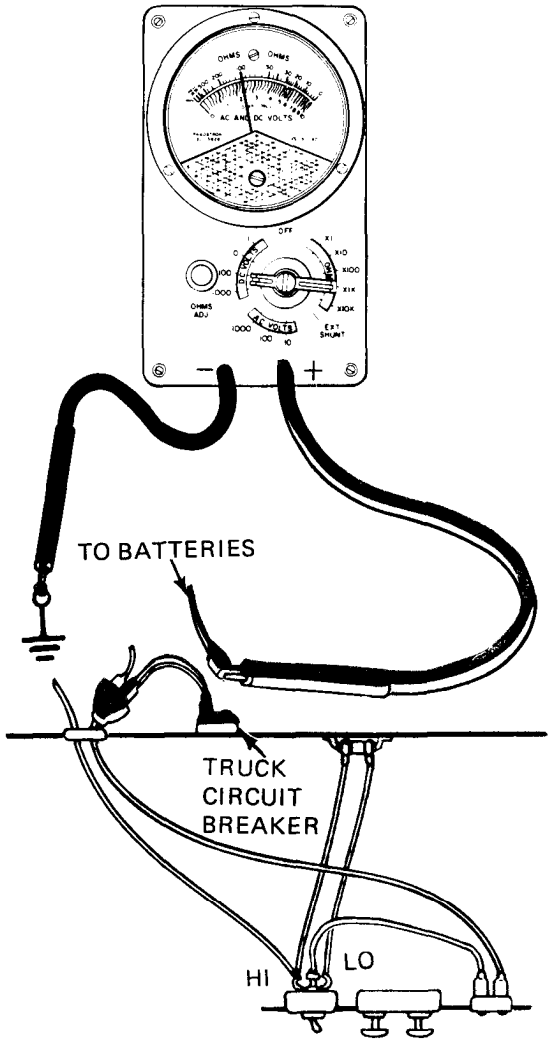
Figure 26-36 (Sheet 13 of 14)

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

TA 115979

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

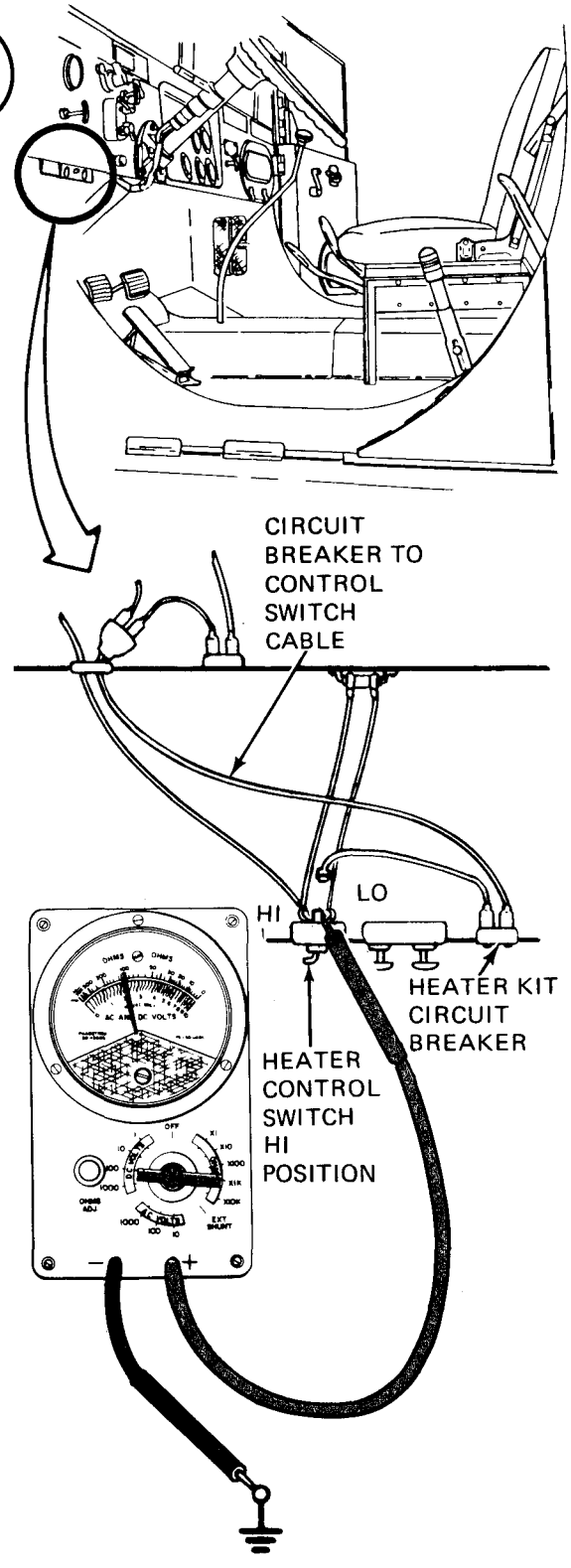
- Park truck
  - Refer to TM 9-2320-211-10

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



TA 115980

Figure 26-37 (Sheet 1 of 10)

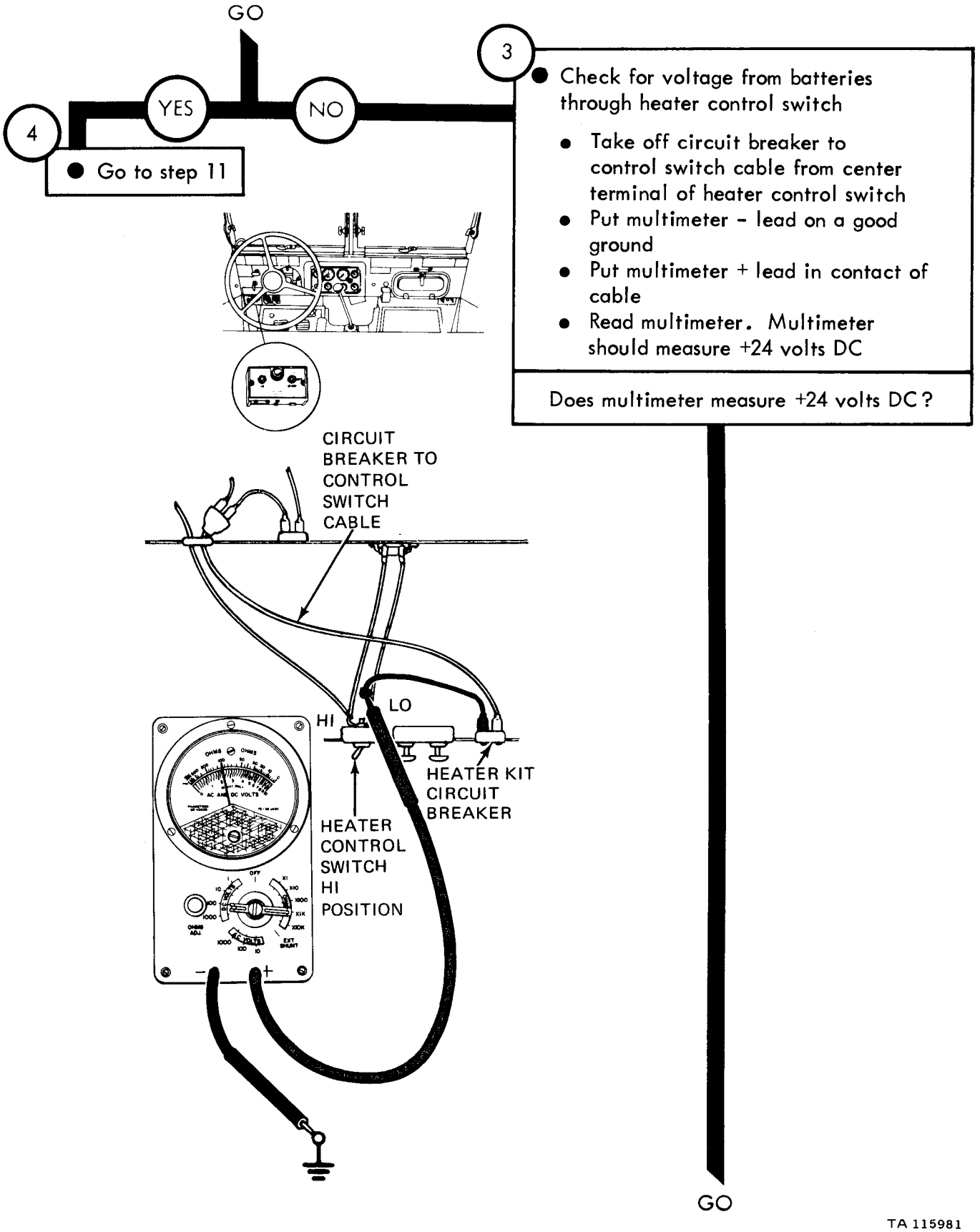


Figure 26-37 (Sheet 2 of 10)

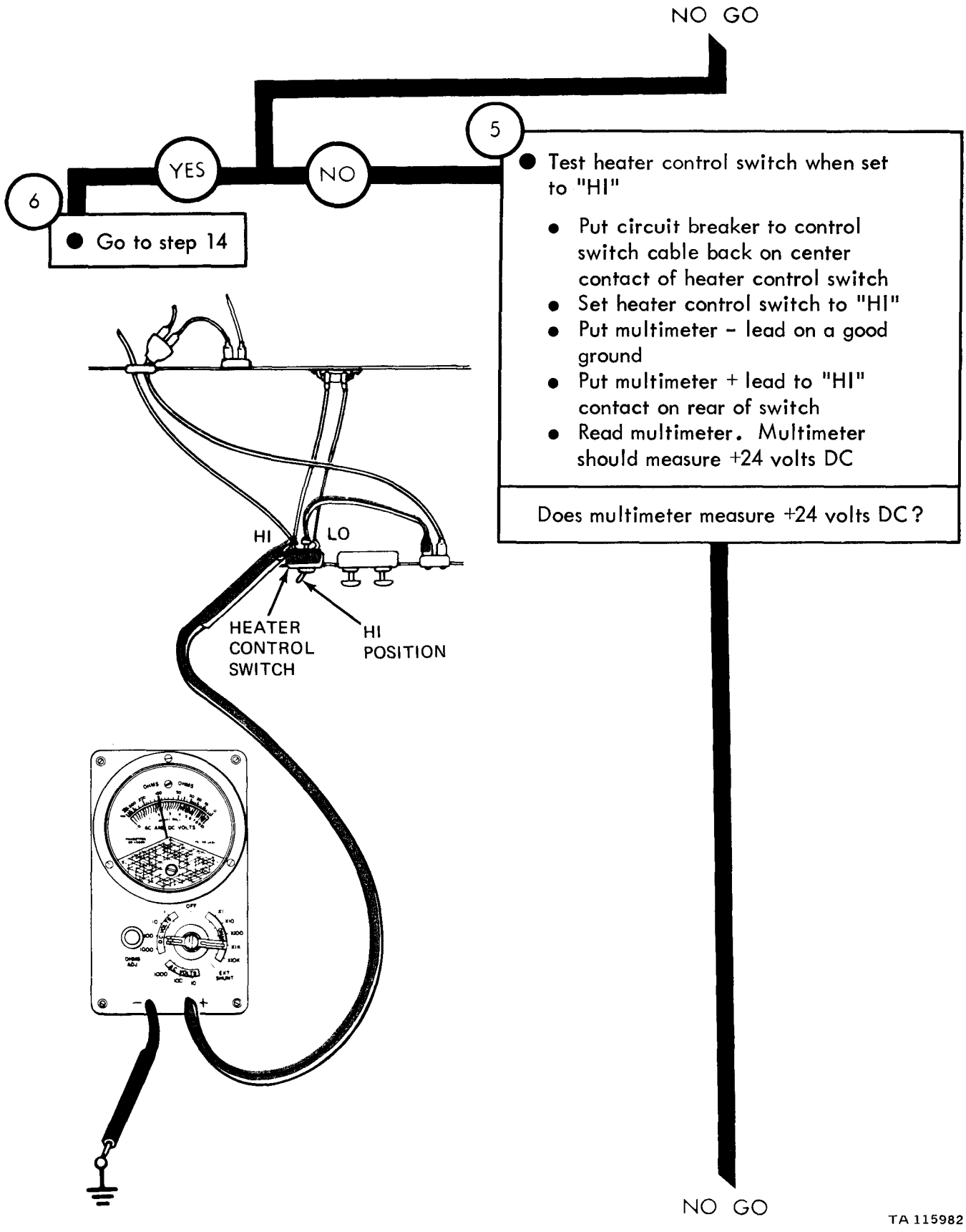


Figure 26-37 (Sheet 3 of 10)

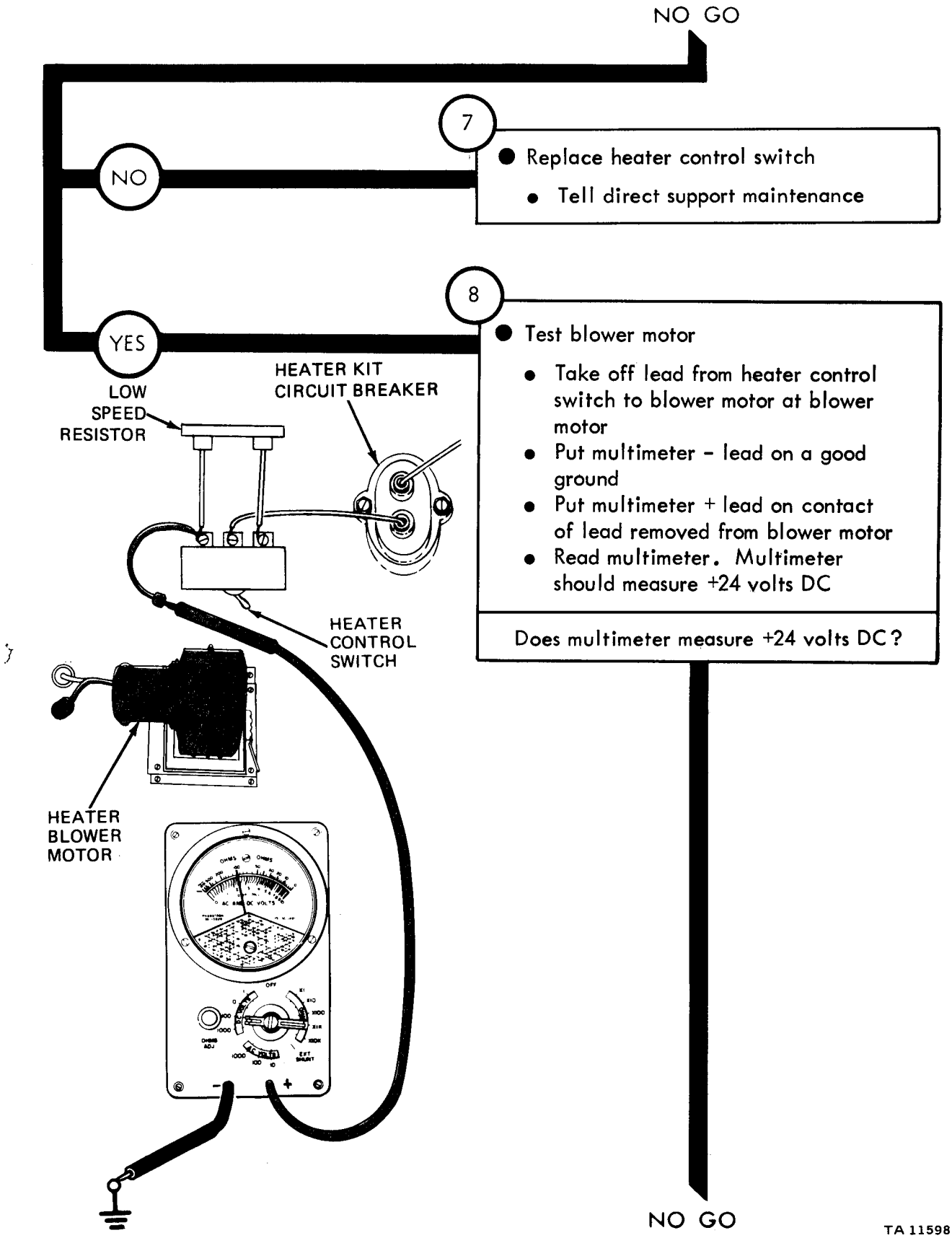
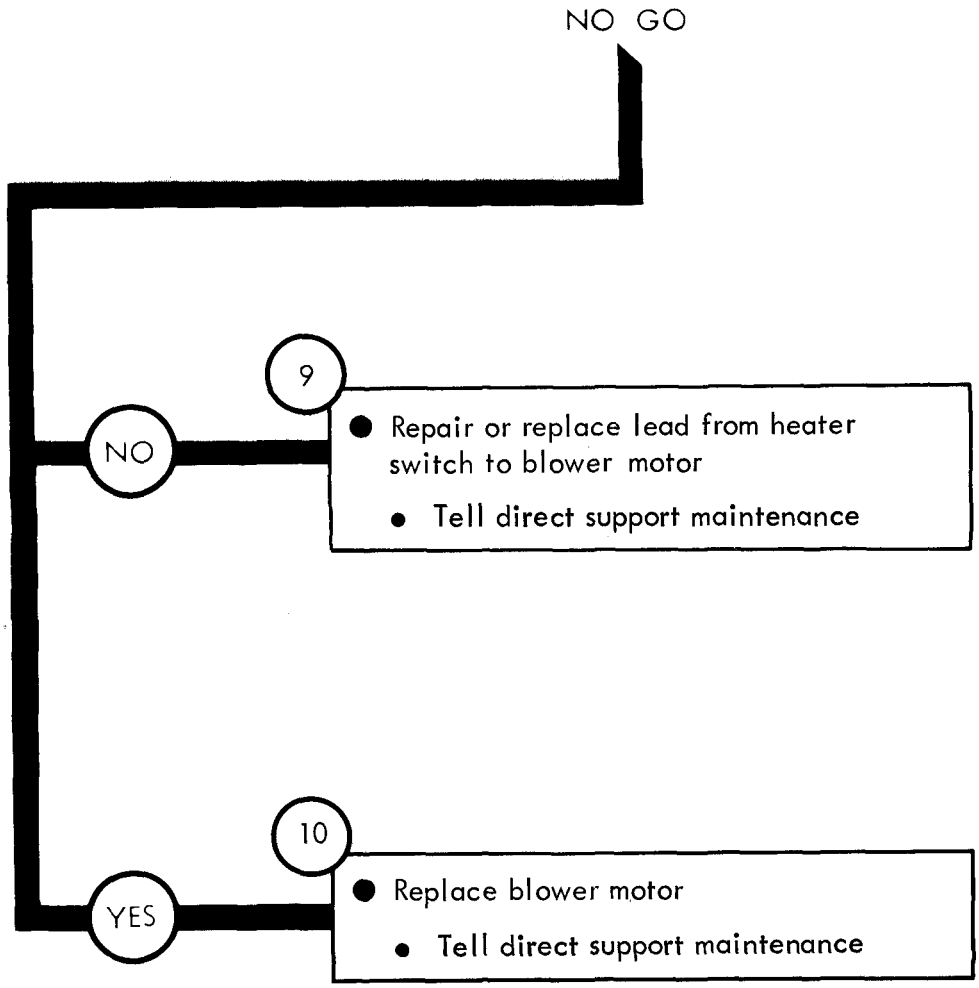


Figure 26-37 (Sheet 4 of 10)



TA 115984

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?

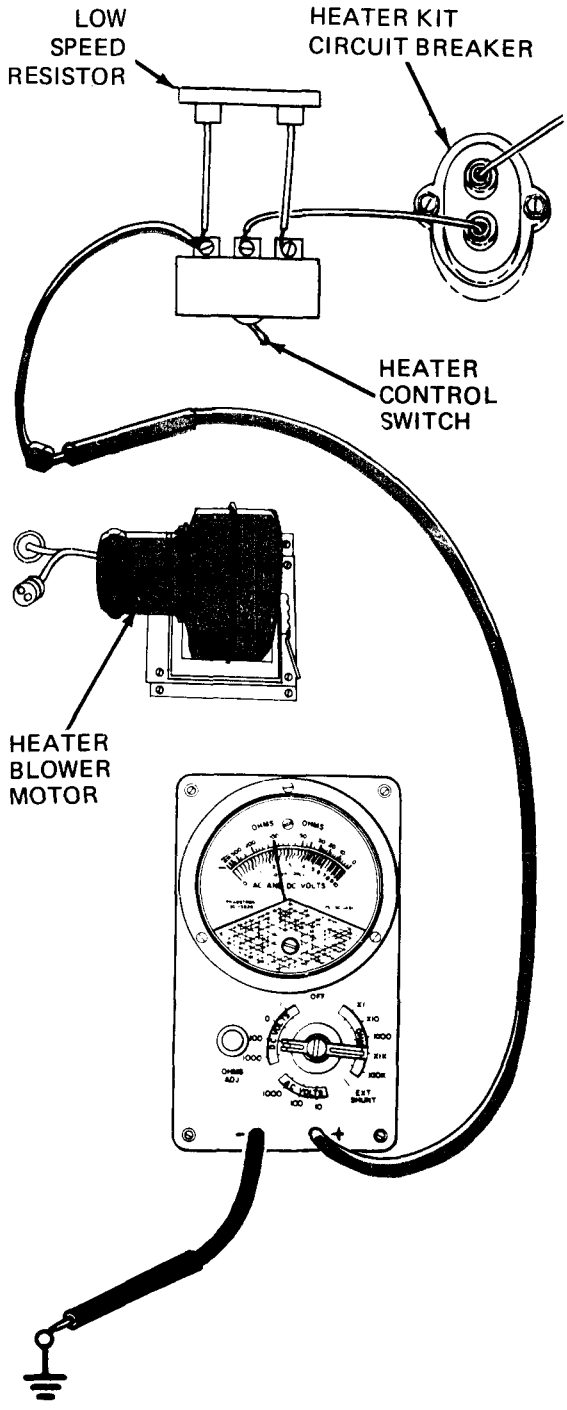
YES

GO

NO

12

- Repair or replace lead from heater control switch to blower motor
  - Tell direct support maintenance



TA 114985

Figure 26-37 (Sheet 6 of 10)

From step 6

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

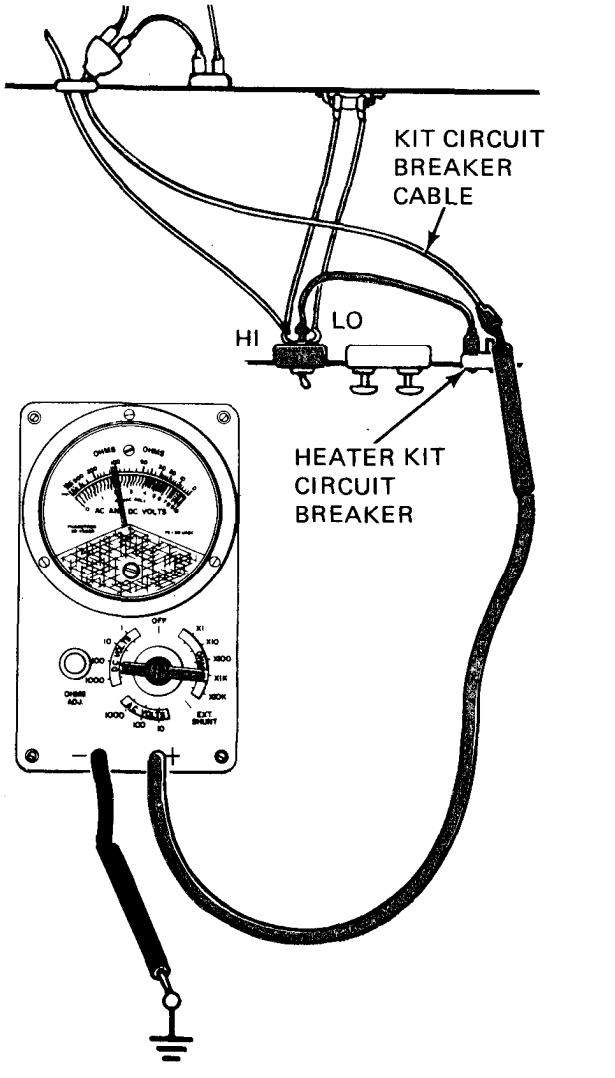
GO

NO

GO

13

- Replace blower motor
  - Tell direct support maintenance



- Replace heater kit circuit breaker
  - Tell direct support maintenance

TA 115986

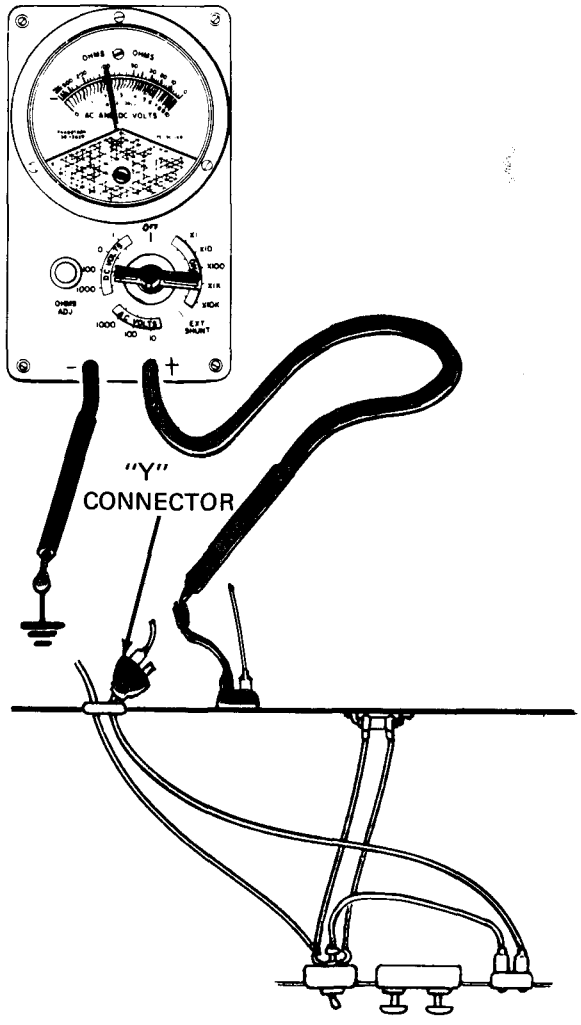
Figure 26-37 (Sheet 7 of 10)

GO

16

- Check lead from truck circuit breaker to "Y" connector
  - On engine side of firewall take off lead from truck circuit breaker to "Y" connector at "Y" connector
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on terminal of lead from truck circuit breaker
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

17

- Repair or replace "Y" connector lead
  - Tell direct support maintenance

GO

TA 115987

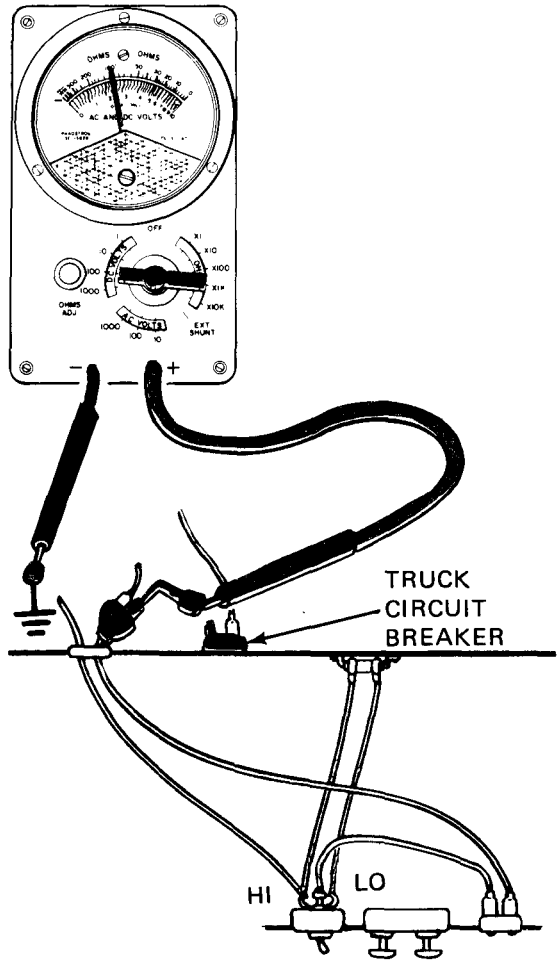
Figure 26-37 (Sheet 8 of 10)

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

TA 115988

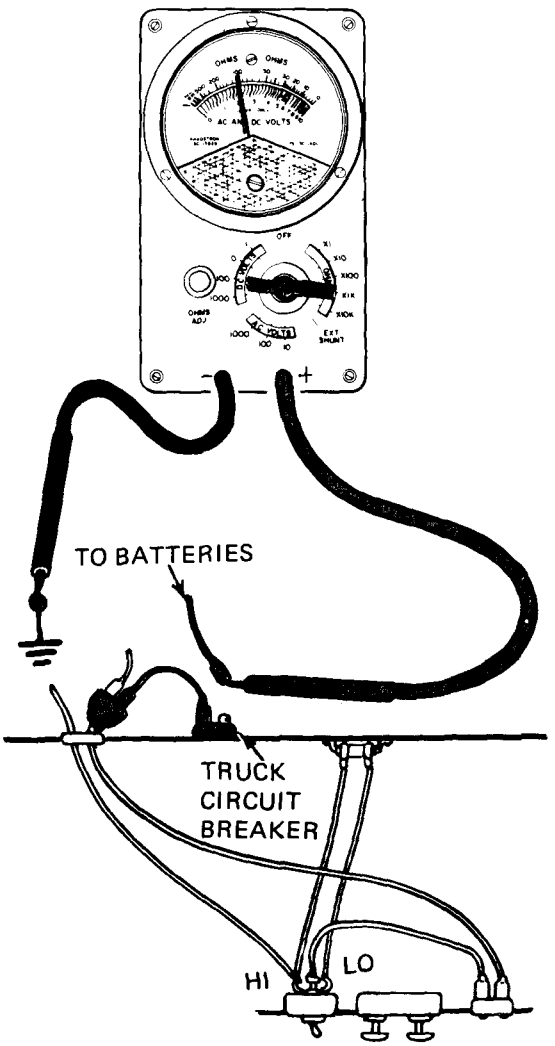
Figure 26-37 (Sheet 9 of 10)

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

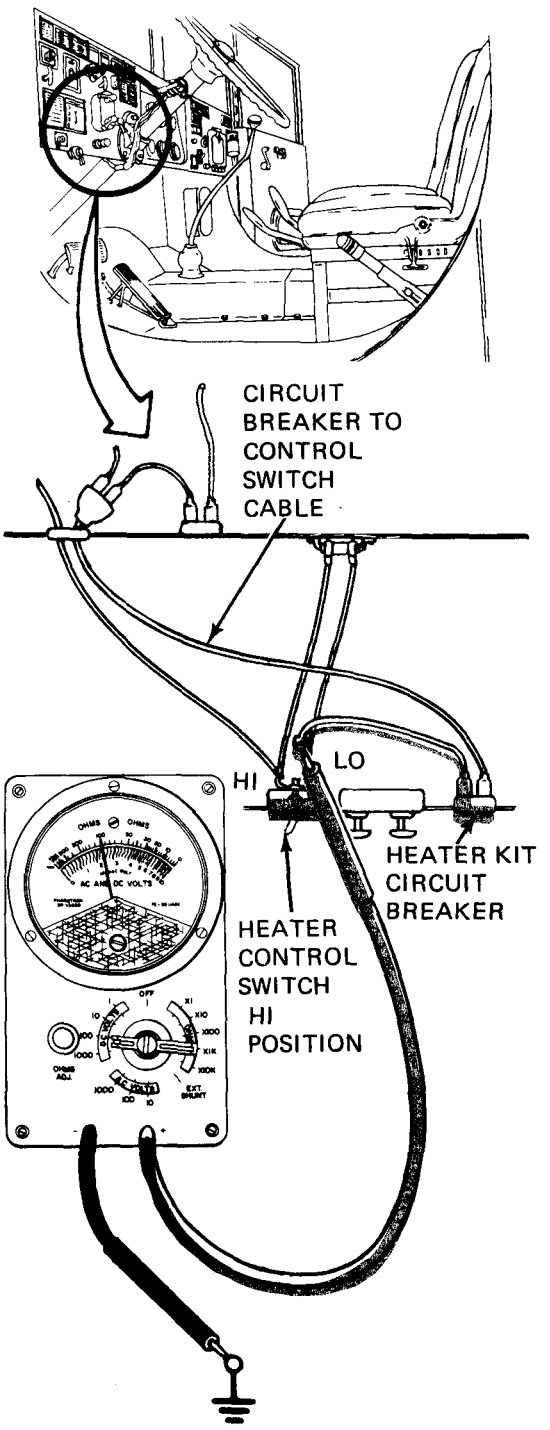
- Park truck
  - Refer to TM 9-2320-211-10

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)

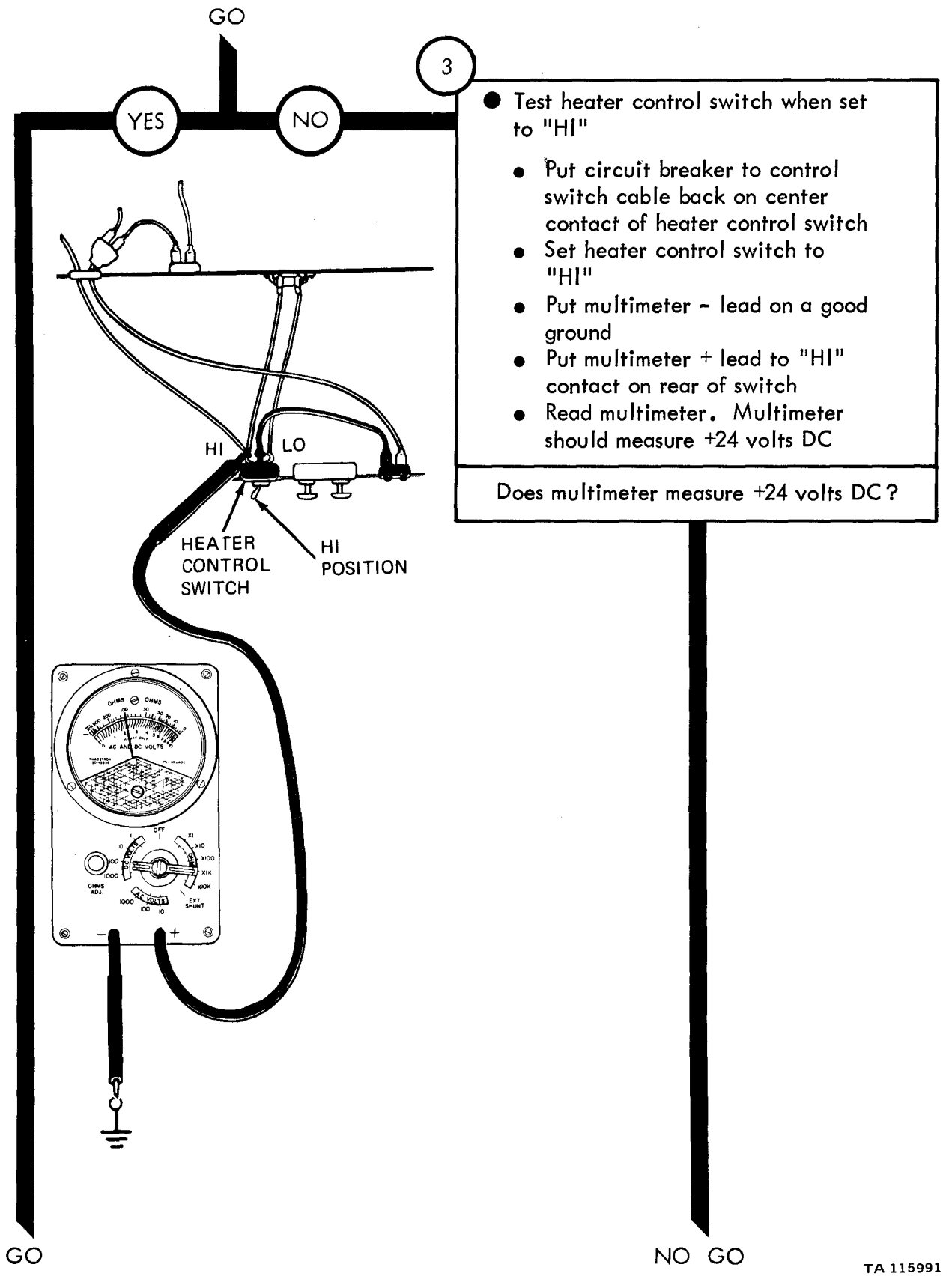


Figure 26-38 (Sheet 2 of 7)

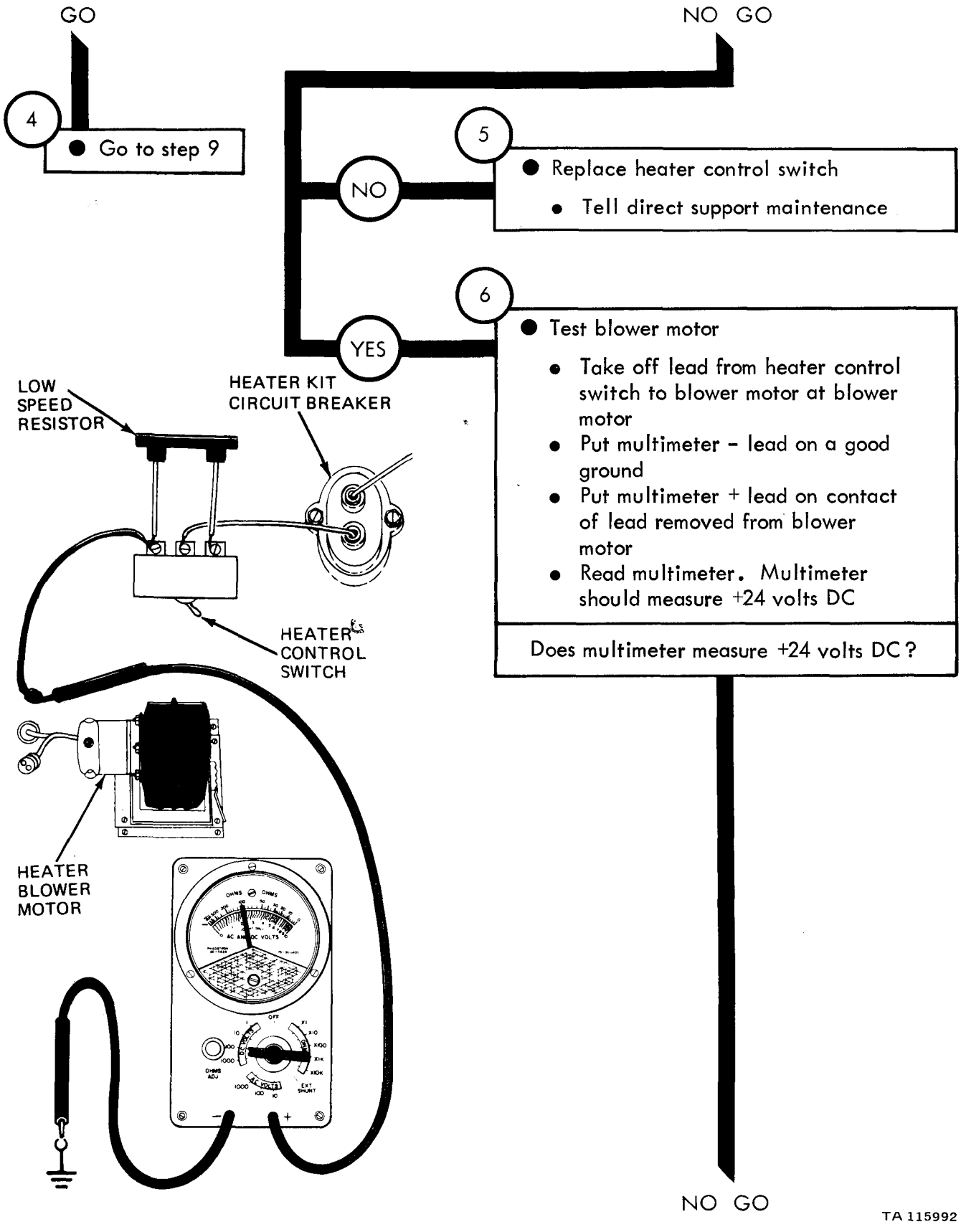


Figure 26-38 (Sheet 3 of 7)

NO GO

7

NO

- Repair or replace lead from heater control switch to blower motor
  - Tell direct support maintenance

8

YES

- Replace blower motor
  - Tell direct support maintenance

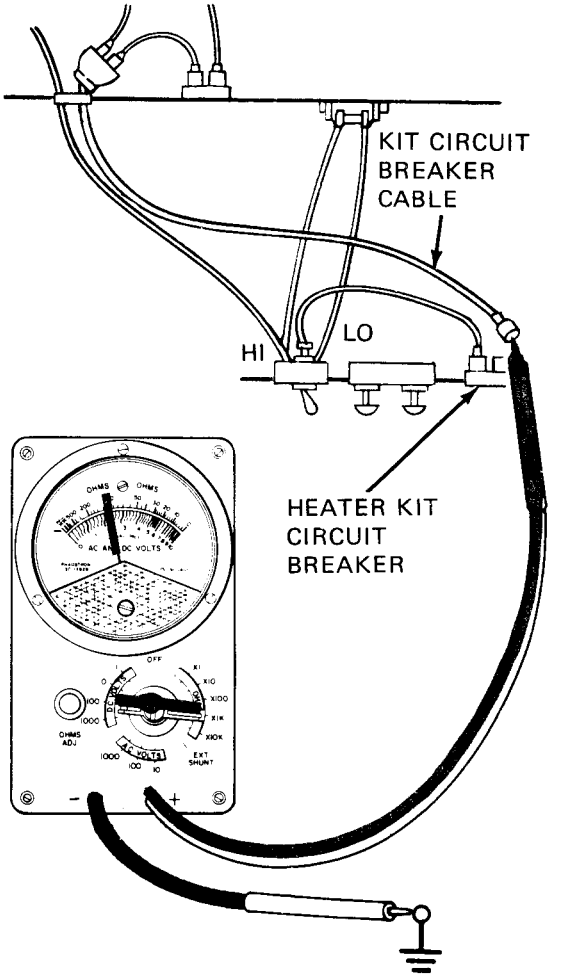
From step 4

9

- Check for +24 volts DC to heater kit circuit breaker
  - Put circuit braeker 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)

GO

YES

NO

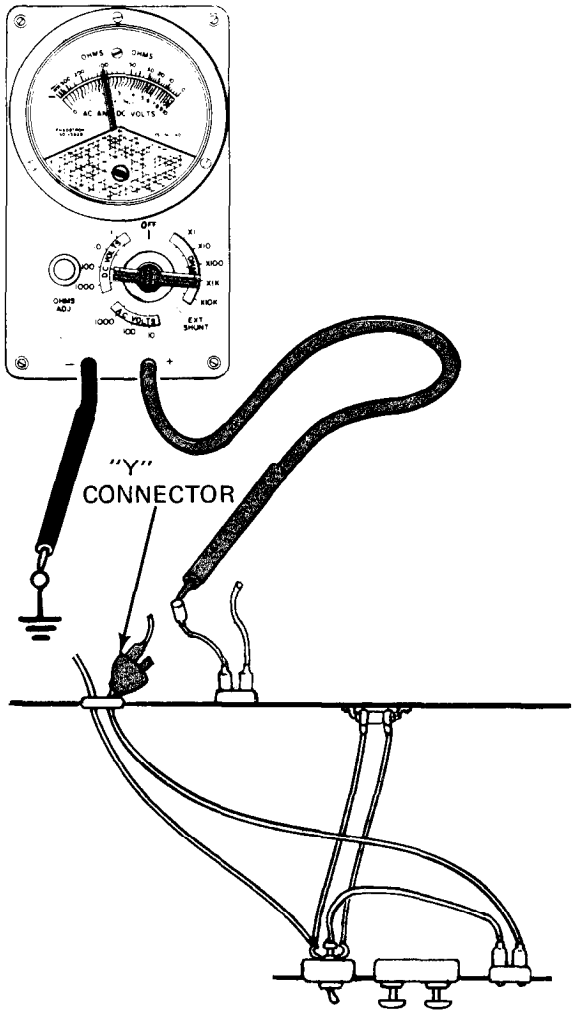
10

- Replace heater kit circuit breaker
  - Tell direct support maintenance

11

- Check lead from truck circuit breaker to "Y" connector
  - On engine side of firewall take off lead from truck circuit breaker to "Y" connector at "Y" connector
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on terminal of lead from truck circuit breaker
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?



YES

NO

12

- Repair or replace "Y" connector lead
  - Tell direct support maintenance

GO

TA 115994

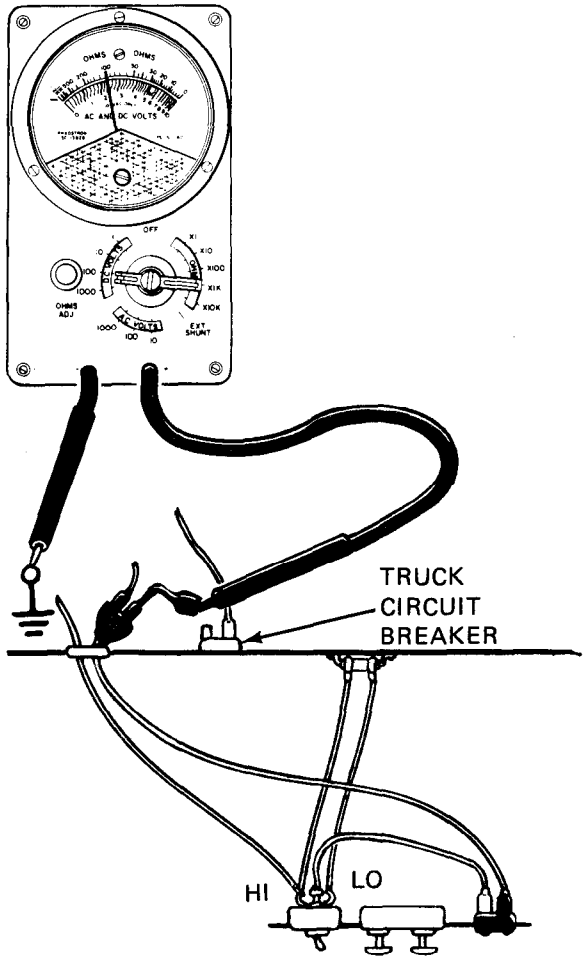
Figure 26-38 (Sheet 5 of 7)

GO

13

- Check lead from vehicle 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 vehicle 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

14

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

GO

TA 115995

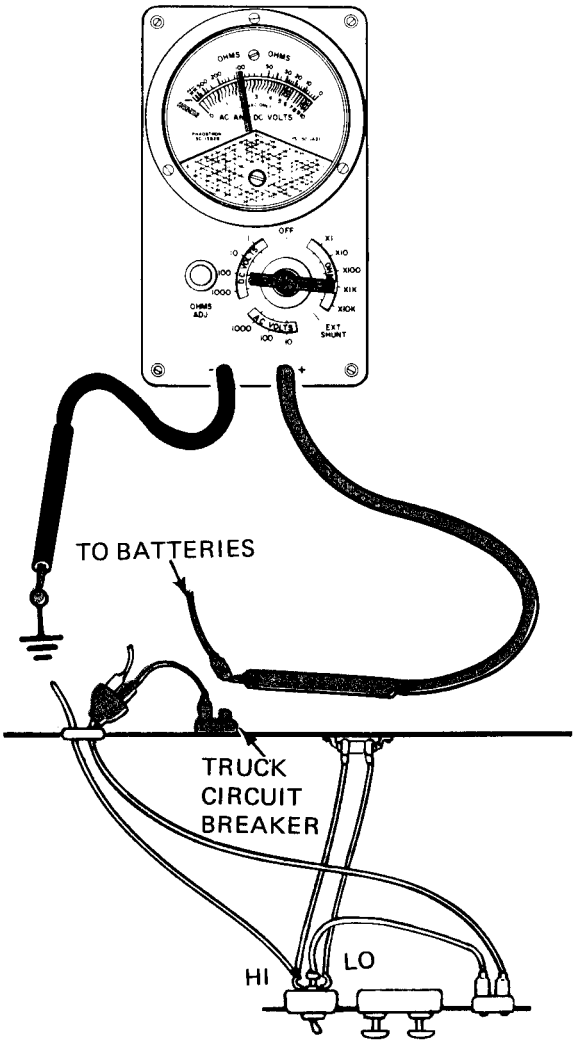
Figure 26-38 (Sheet 6 of 7)

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?



NO

16

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

YES

17

- Replace truck circuit breaker
  - Tell direct support maintenance

TA 115996

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

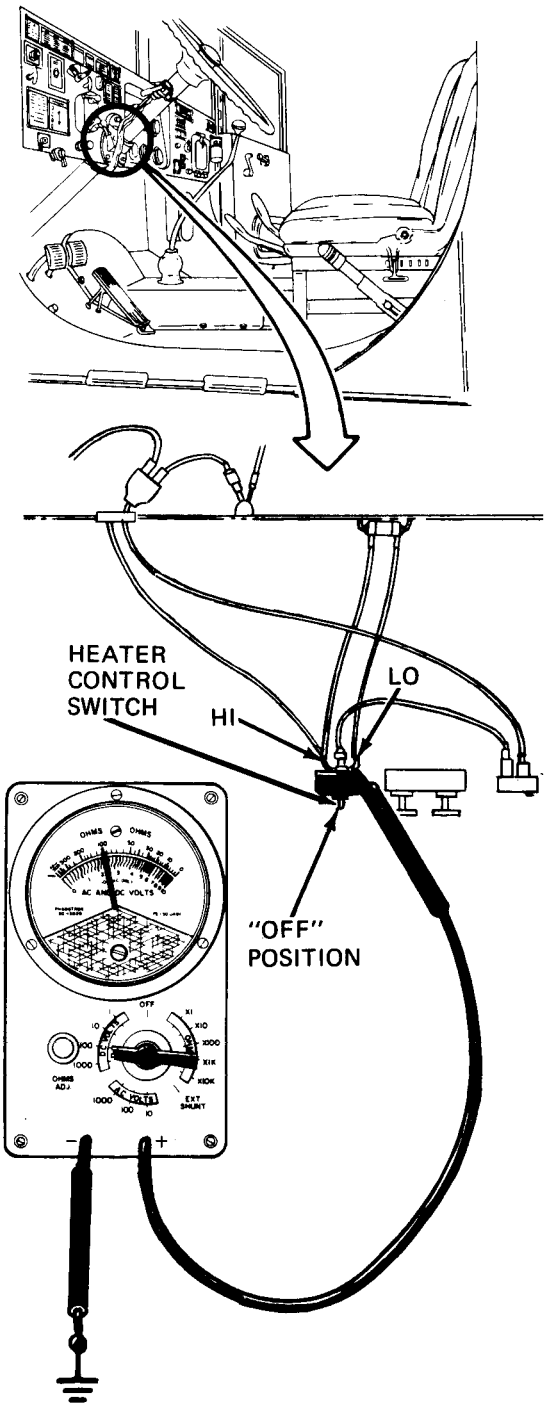
- Park truck
  - Refer to TM 9-2320-211-10

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

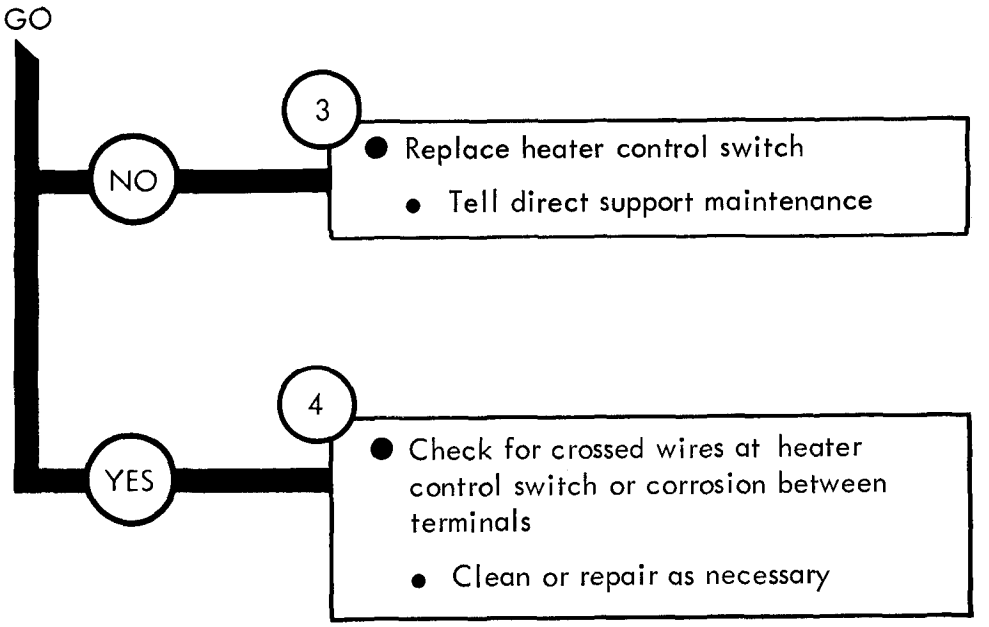
Did multimeter measure +24 volts DC on either contact?

GO



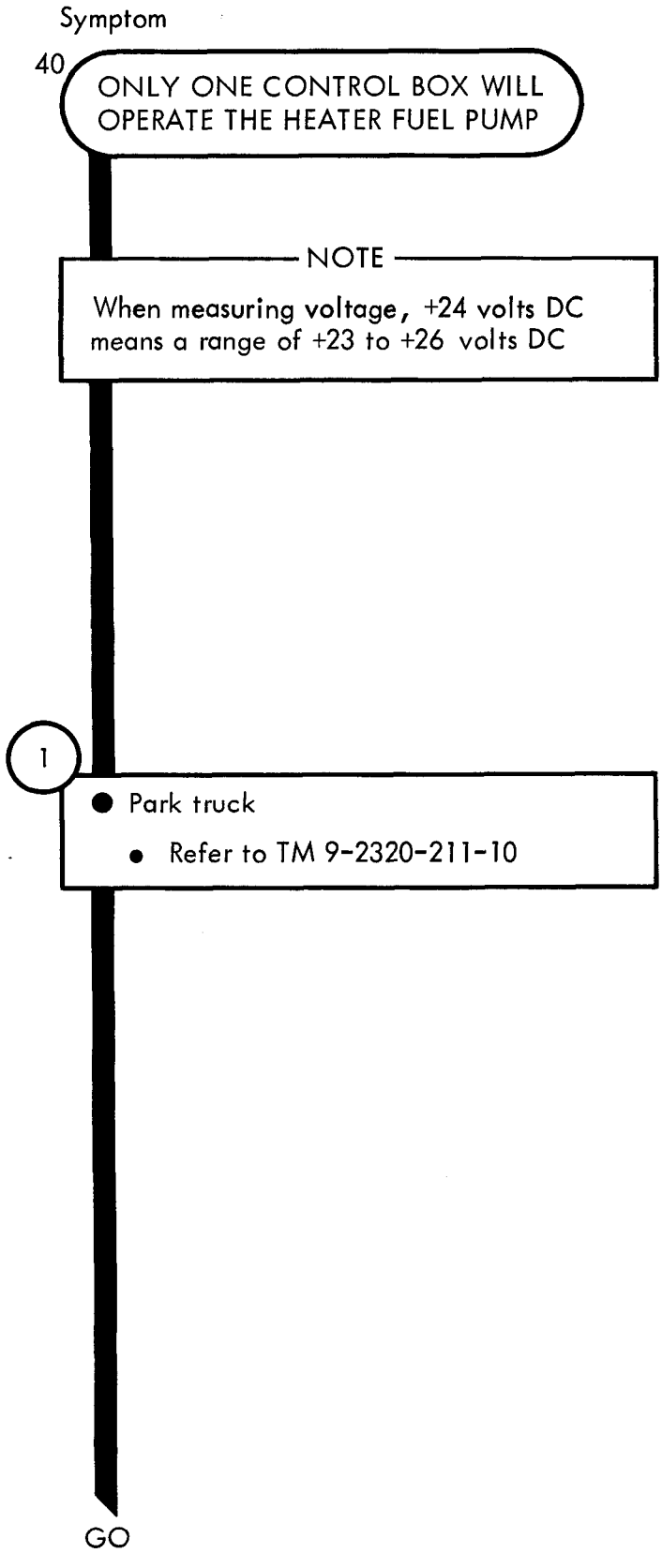
TA 115997

Figure 26-39 (Sheet 1 of 2)



TA 115998

Figure 26-39 (Sheet 2 of 2)



TA 115999

Figure 26-40 (Sheet 1 of 9)

GO

2

- Check voltage from power plant heater control box
  - Make sure lead 654 from power plant heater control box to fuel pump is clean and tightly connected
  - Turn on control box
  - If control box still won't work shut it off
  - Take off lead 654 from control box to fuel pump at power plant heater control box

- Turn on heater control box
- Set multimeter to measure +24 volts DC. Refer to test equipment procedures index
- Put multimeter - lead on a good ground
- Put multimeter + lead on terminal "A" of control box connector
- Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

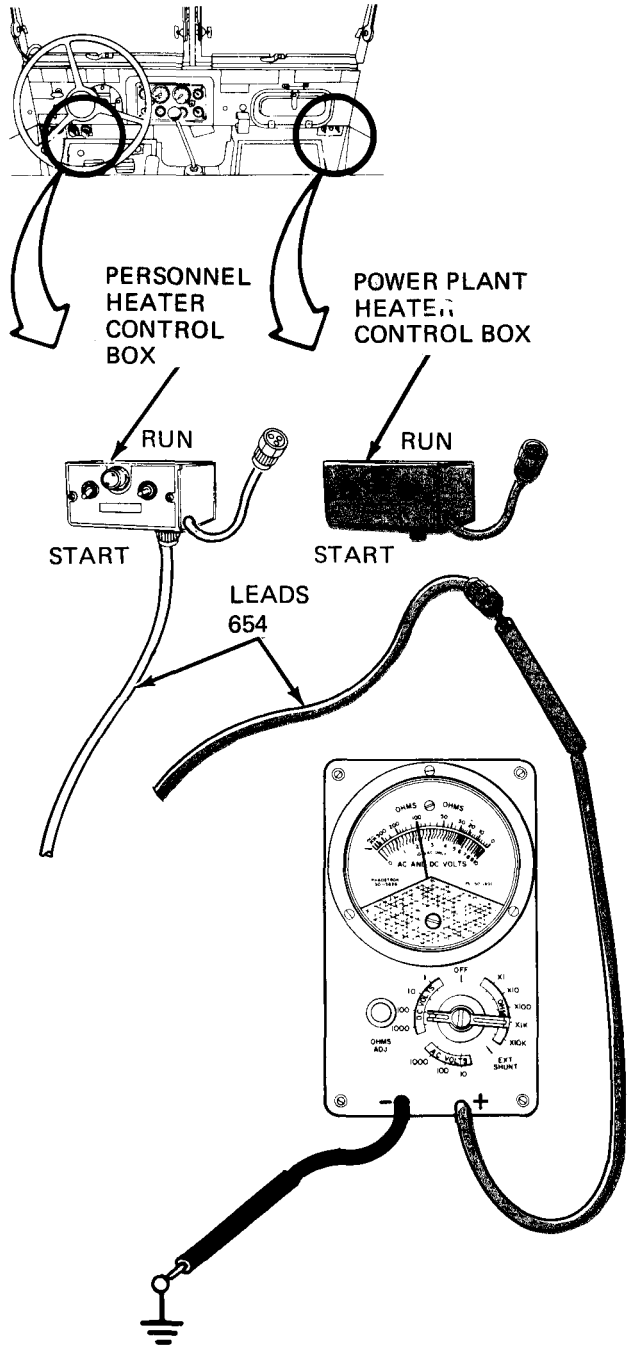
YES

NO

3

- Repair or replace lead between power plant heater control box and fuel pump
  - Tell direct support maintenance

GO



TA 116000

Figure 26-40 (Sheet 2 of 9)

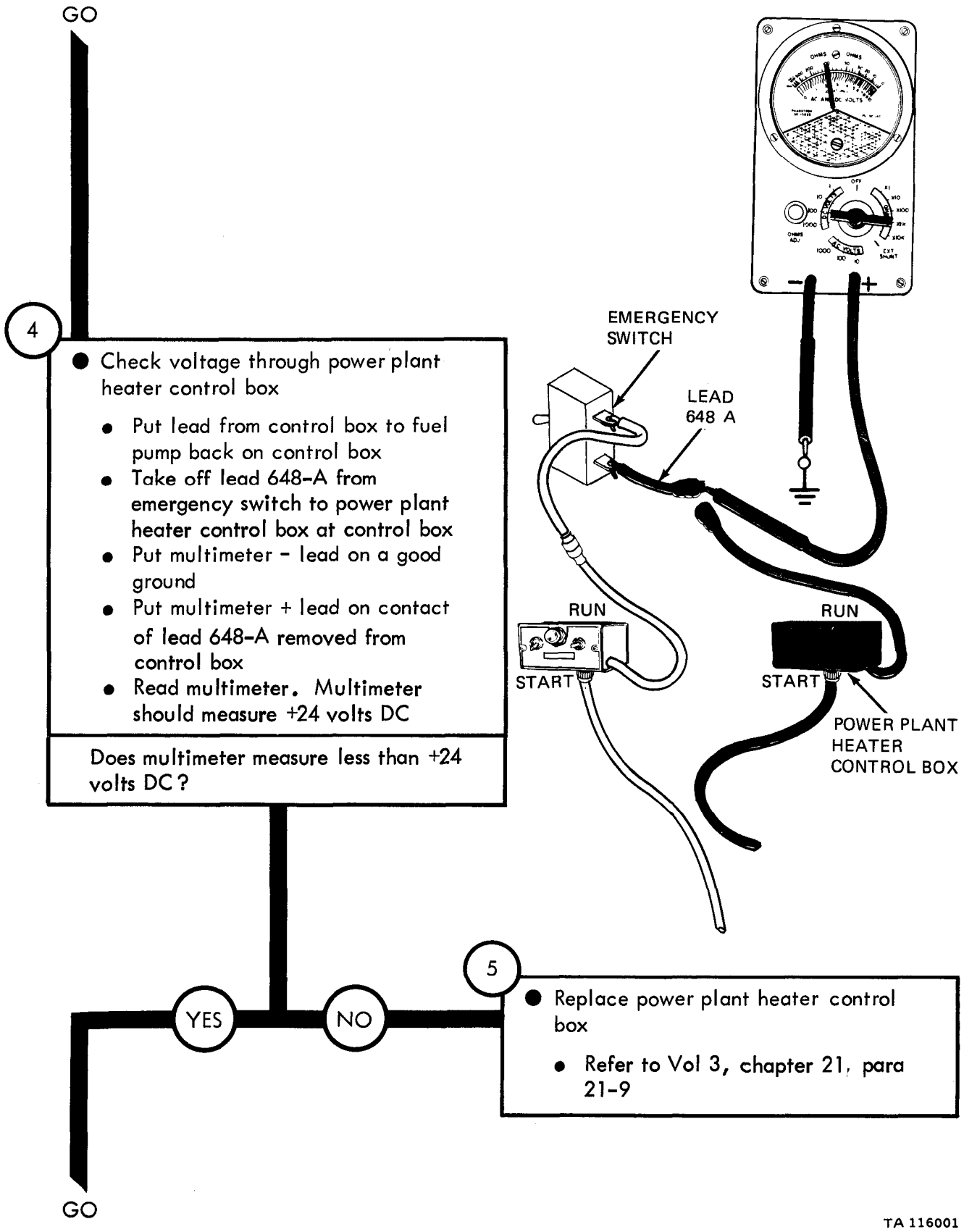


Figure 26-40 (Sheet 3 of 9)

GO

6

- Check lead 648-A from emergency switch to power plant heater control box for +24 volts DC
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on emergency switch terminal for lead 648-A
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

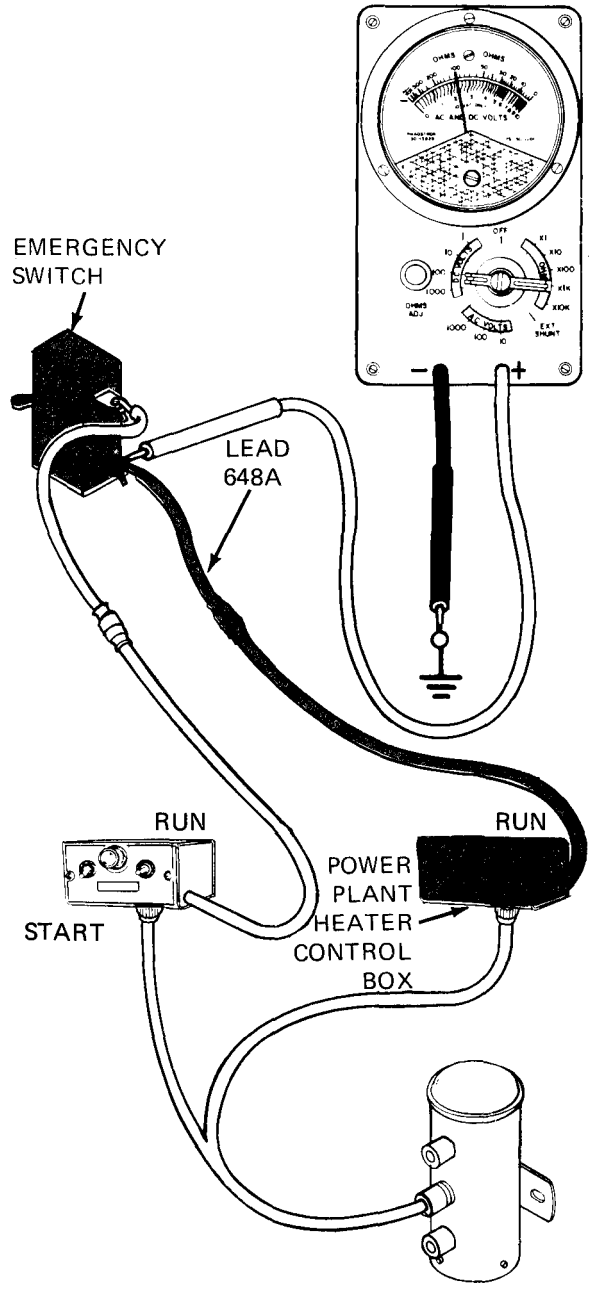
YES

NO

7

- Repair or replace lead 648-A from emergency switch to power plant heater control box
  - Tell direct support maintenance

GO



TA 116002

Figure 26-40 (Sheet 4 of 9)

GO

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?

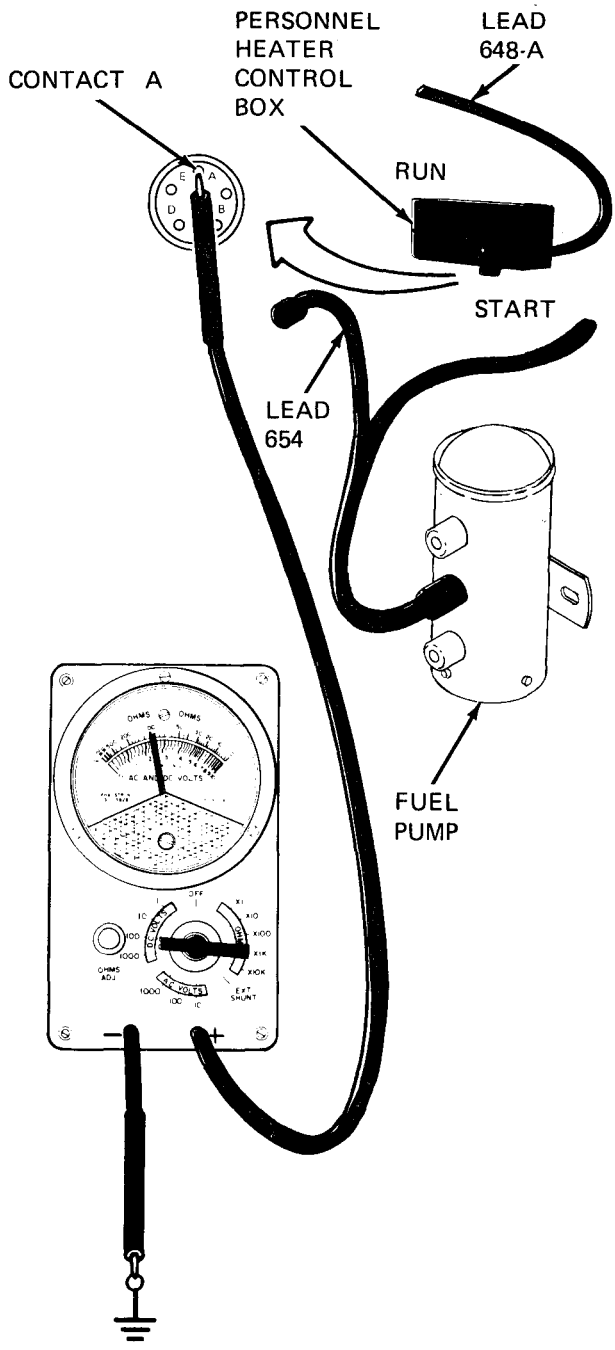
YES

NO

9

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

GO



TA 116003

Figure 26-40 (Sheet 5 of 9)

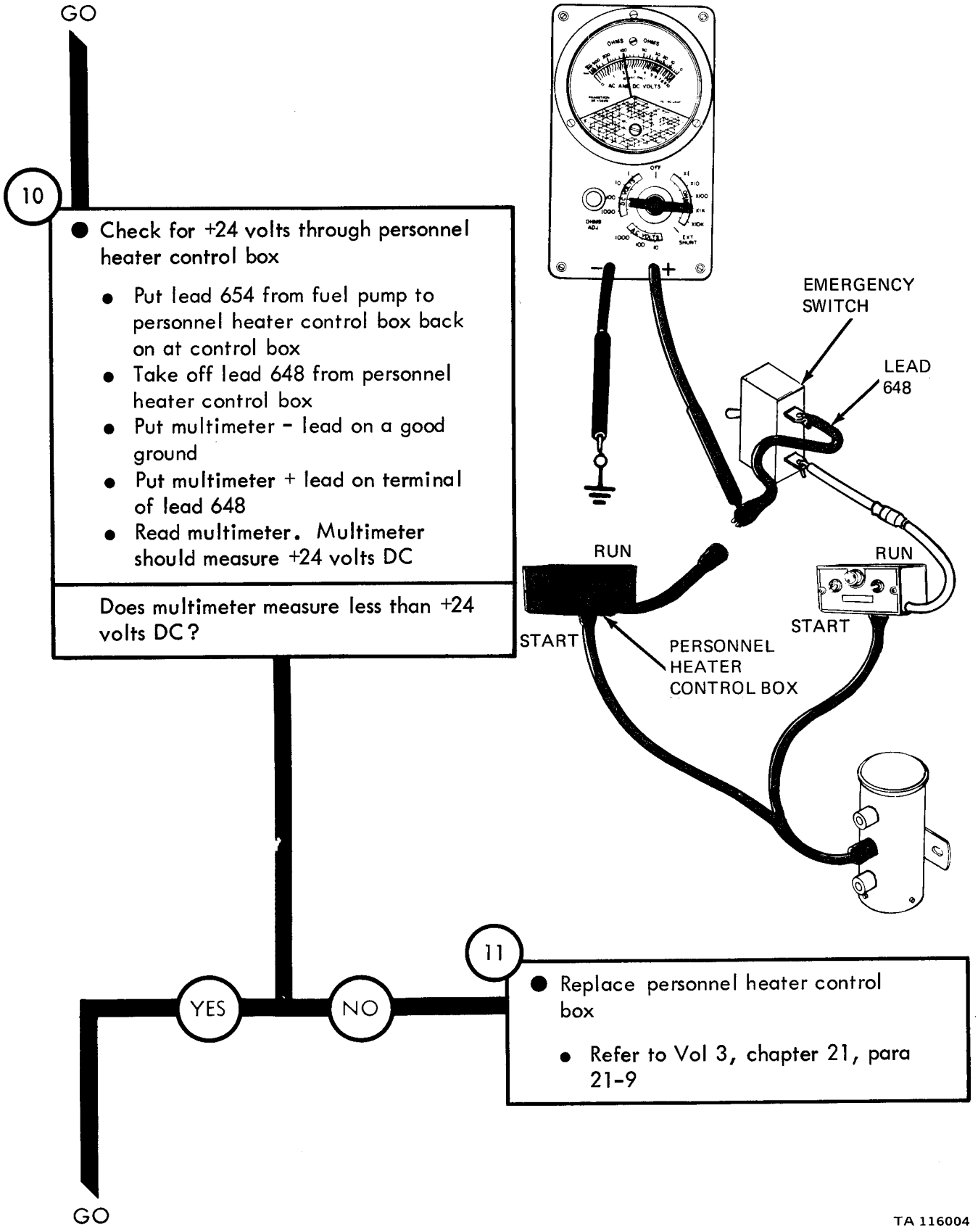


Figure 26-40 (Sheet 6 of 9)

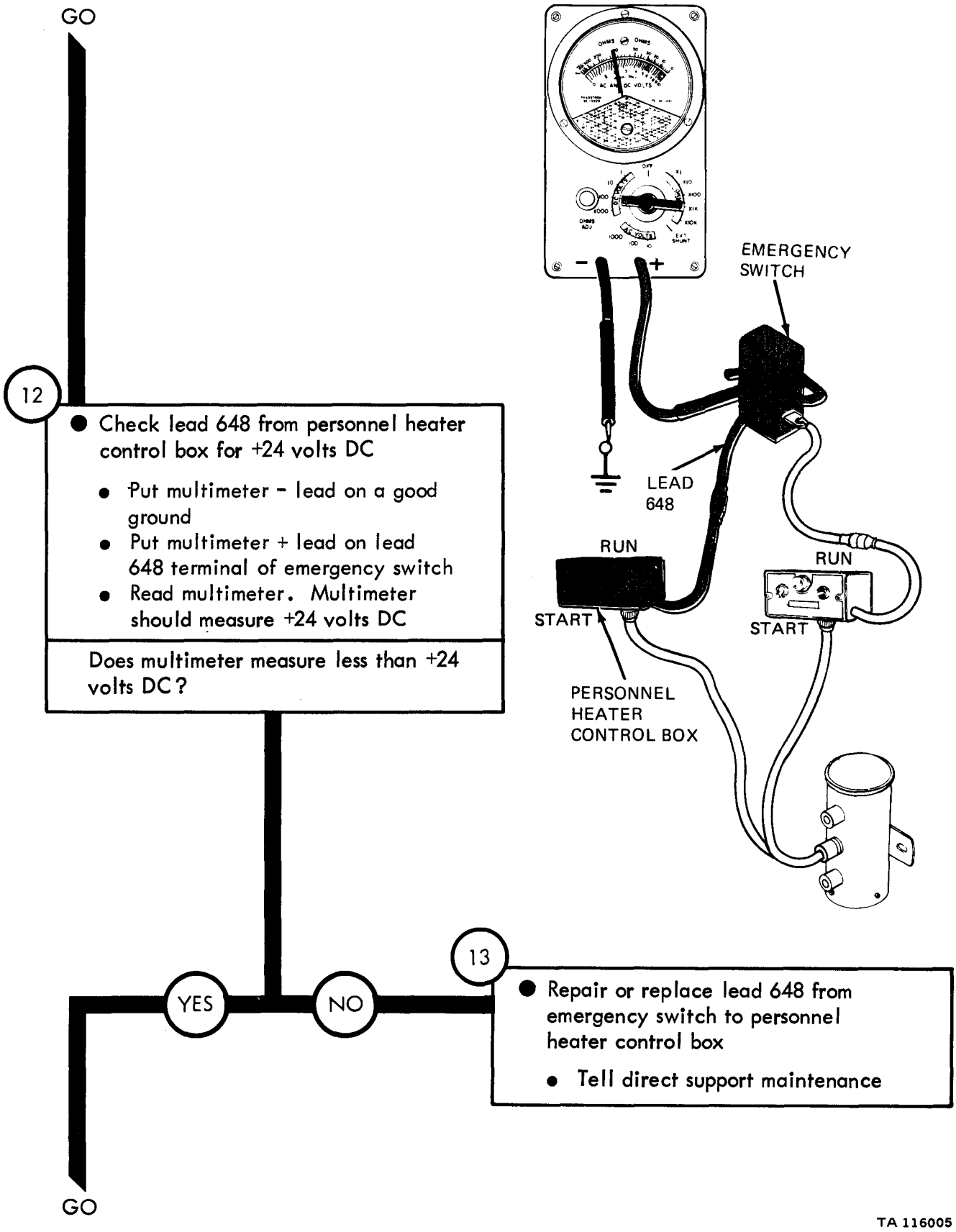


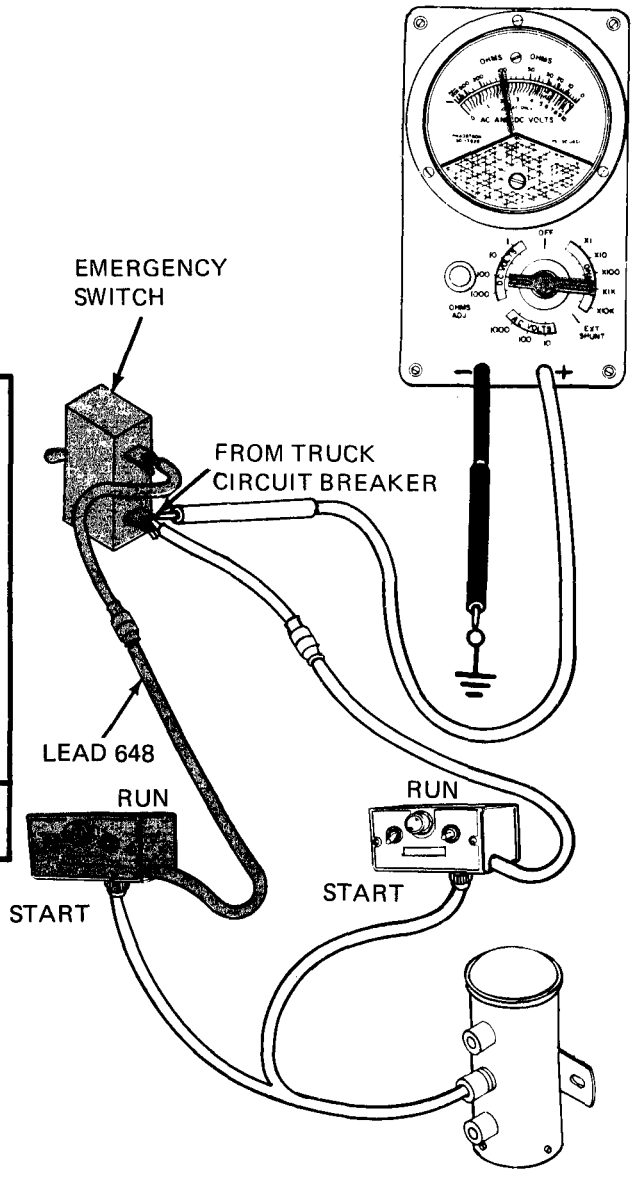
Figure 26-40 (Sheet 7 of 9)

GO

14

- Check voltage through heater control box
  - Put lead 648 back on personnel heater control box
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on terminal of emergency switch that contains lead from front harness
  - Read multimeter

Does multimeter measure +24 volts DC?



YES

NO

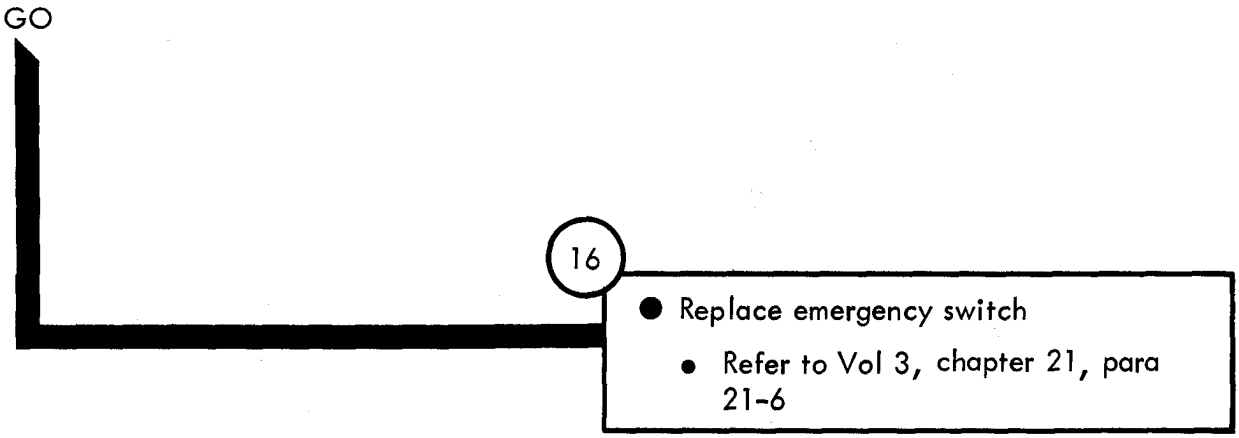
15

- Repair or replace harness from batteries to emergency switch
  - Tell direct support maintenance

GO

TA 116006

Figure 26-40 (Sheet 8 of 9)



TA 116007

Figure 26-40 (Sheet 9 of 9)

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

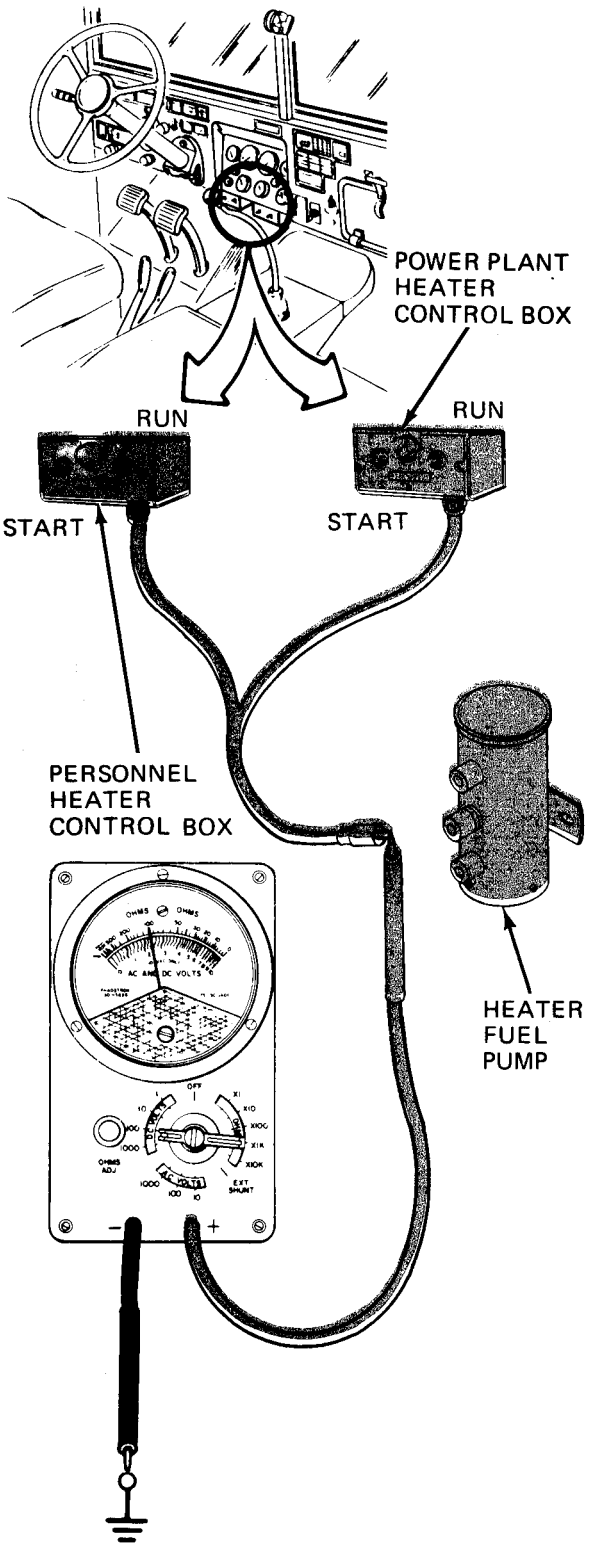
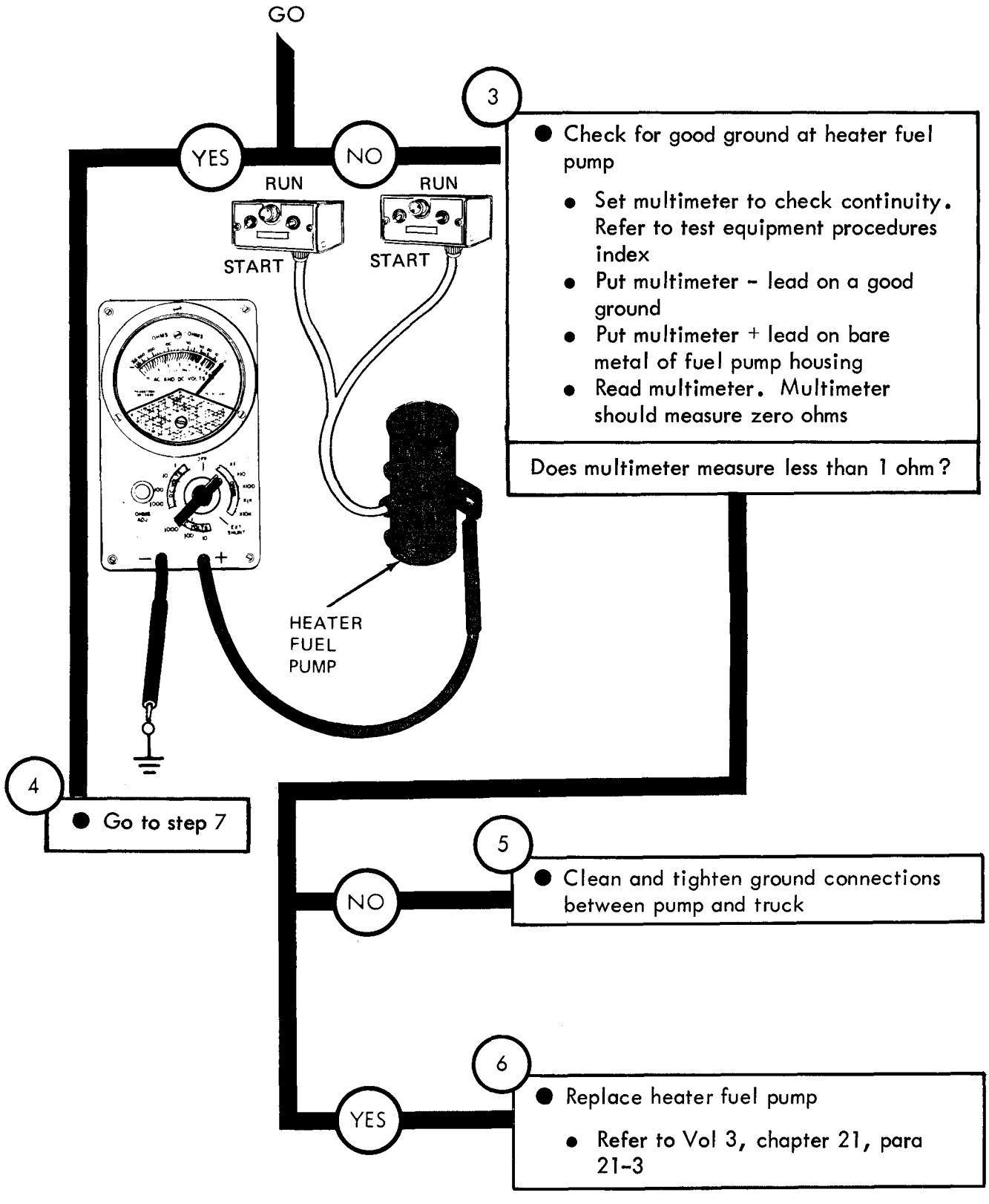


Figure 26-41 (Sheet 1 of 9)



TA 116011

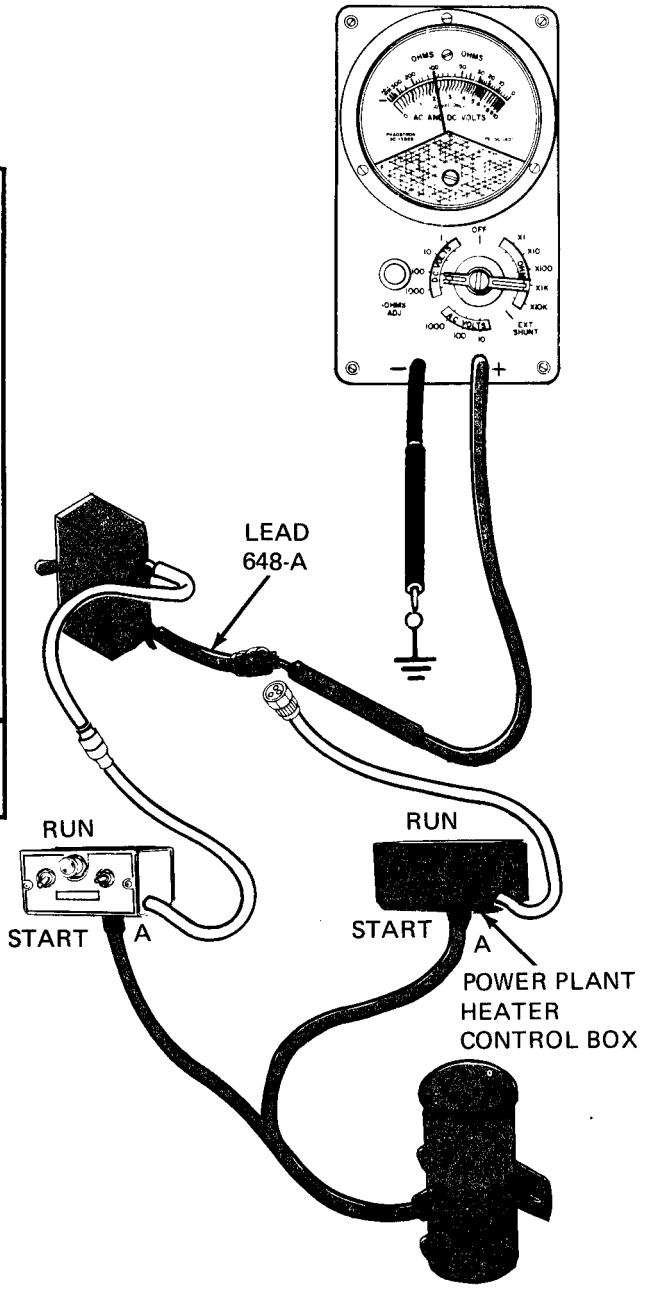
Figure 26-41 (Sheet 2 of 9)

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?



YES

NO

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)

GO

9

- Check lead 648-A from emergency switch to power plant heater control box for +24-volts DC
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on emergency switch terminal for lead 648-A
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter read less than +24 volts DC?

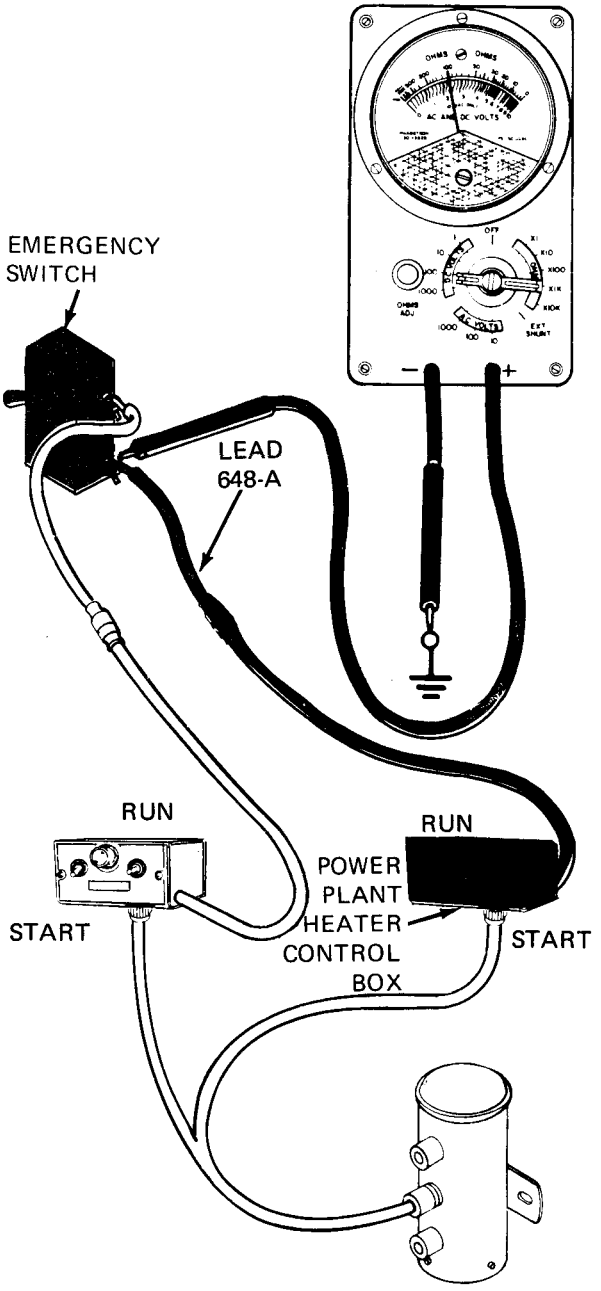
YES

NO

10

- Repair or replace lead 648-A from emergency switch to power plant heater control box
  - Tell direct support maintenance

GO



TA 116013

Figure 26-41 (Sheet 4 of 9)

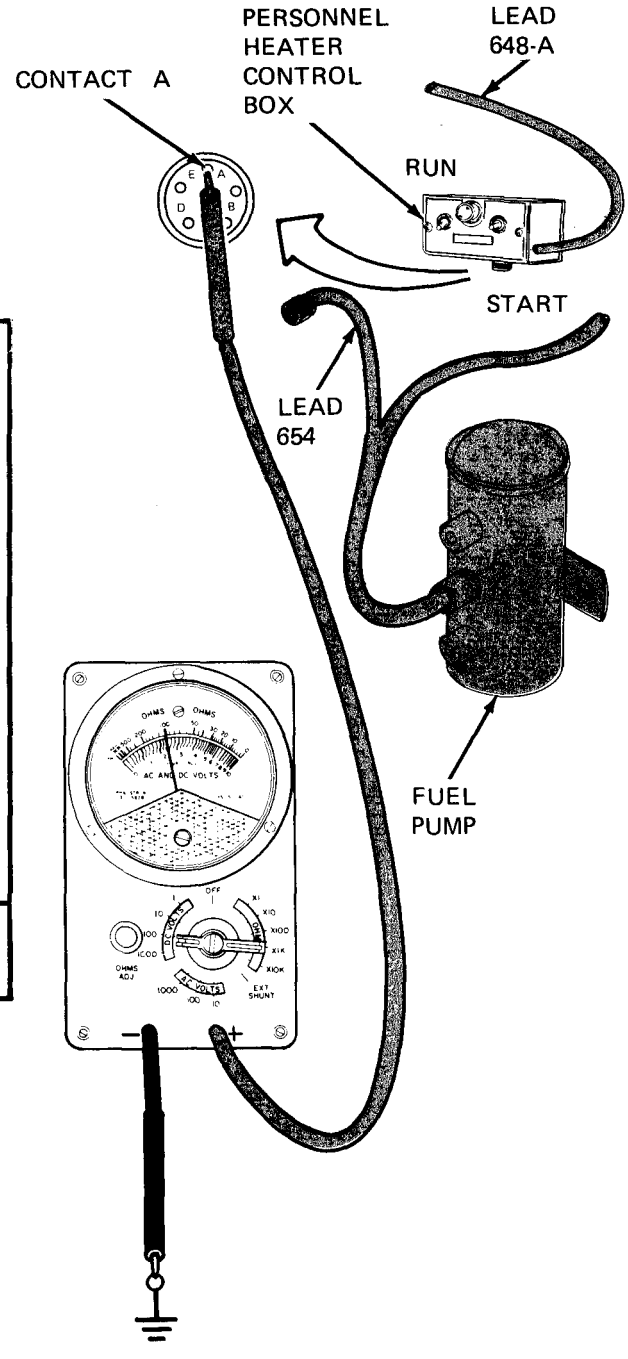
GO

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)

GO

YES

NO

12

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

13

- Check for +24 volts through personnel heater control box
  - Put lead 654 from fuel pump to personnel heater control box back on at control box
  - Take off lead 400 from personnel heater control box
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on terminal of lead 648
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO

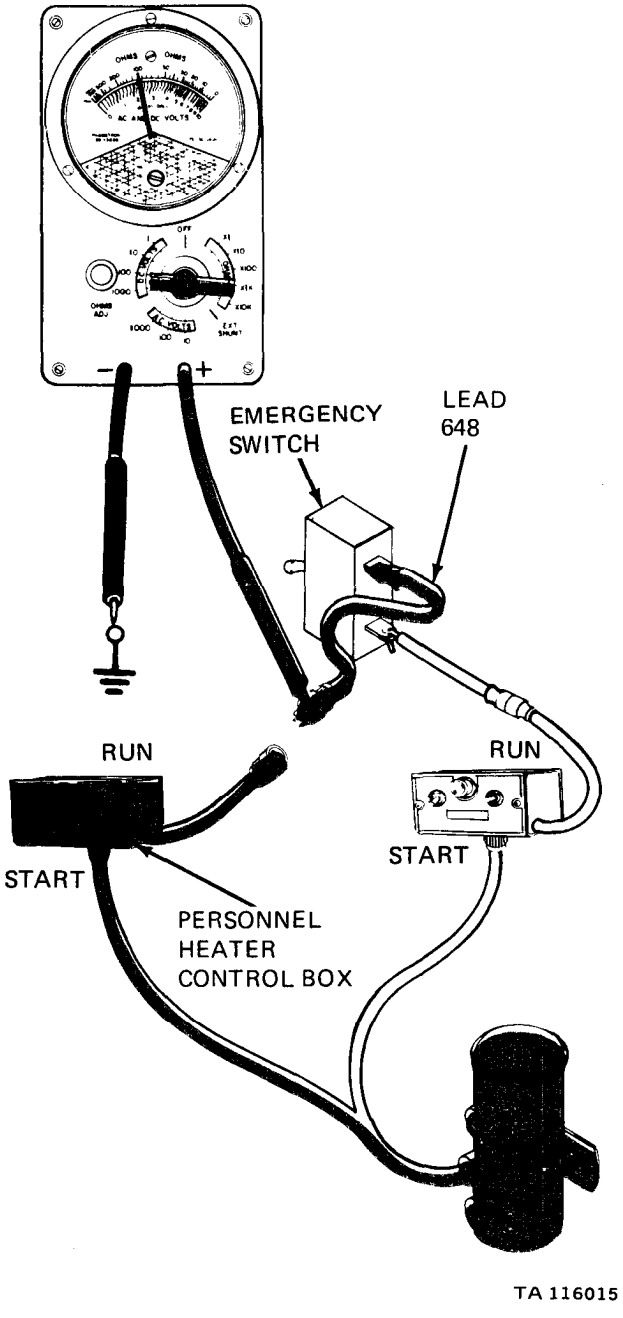


Figure 26-41 (Sheet 6 of 9)

GO

YES

NO

14

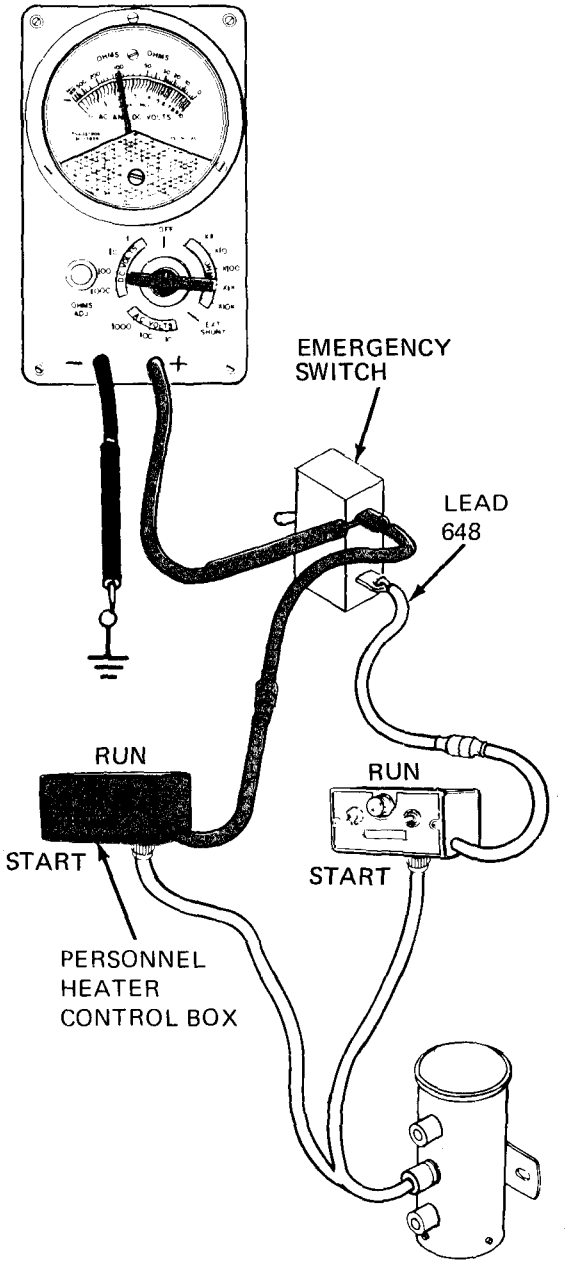
- Replace personnel heater control box
  - Refer to Vol 3, chapter 21, para 21-9

15

- Check lead 648 from personnel heater control box for +24 volts DC
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on lead 400 terminal of emergency switch. (See picture)
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure less than +24 volts DC?

GO



TA 116016

Figure 26-41 (Sheet 7 of 9)

GO

YES

NO

16

- Repair or replace lead 648 from emergency switch to personnel heater control box
  - Tell direct support maintenance

17

- Check voltage through heater control box
  - Put lead 648 back on personnel heater control box
  - Put multimeter - lead on a good ground
  - Put multimeter + lead on terminal of emergency switch that contains lead from front harness
  - Read multimeter. Multimeter should measure +24 volts DC

Does multimeter measure +24 volts DC?

GO

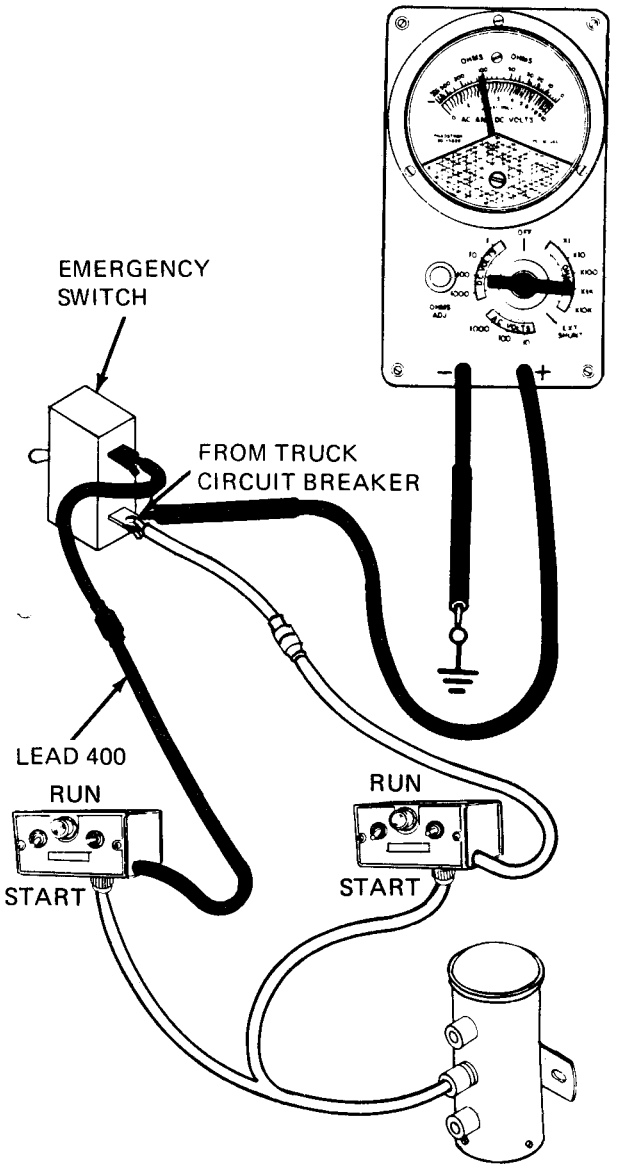
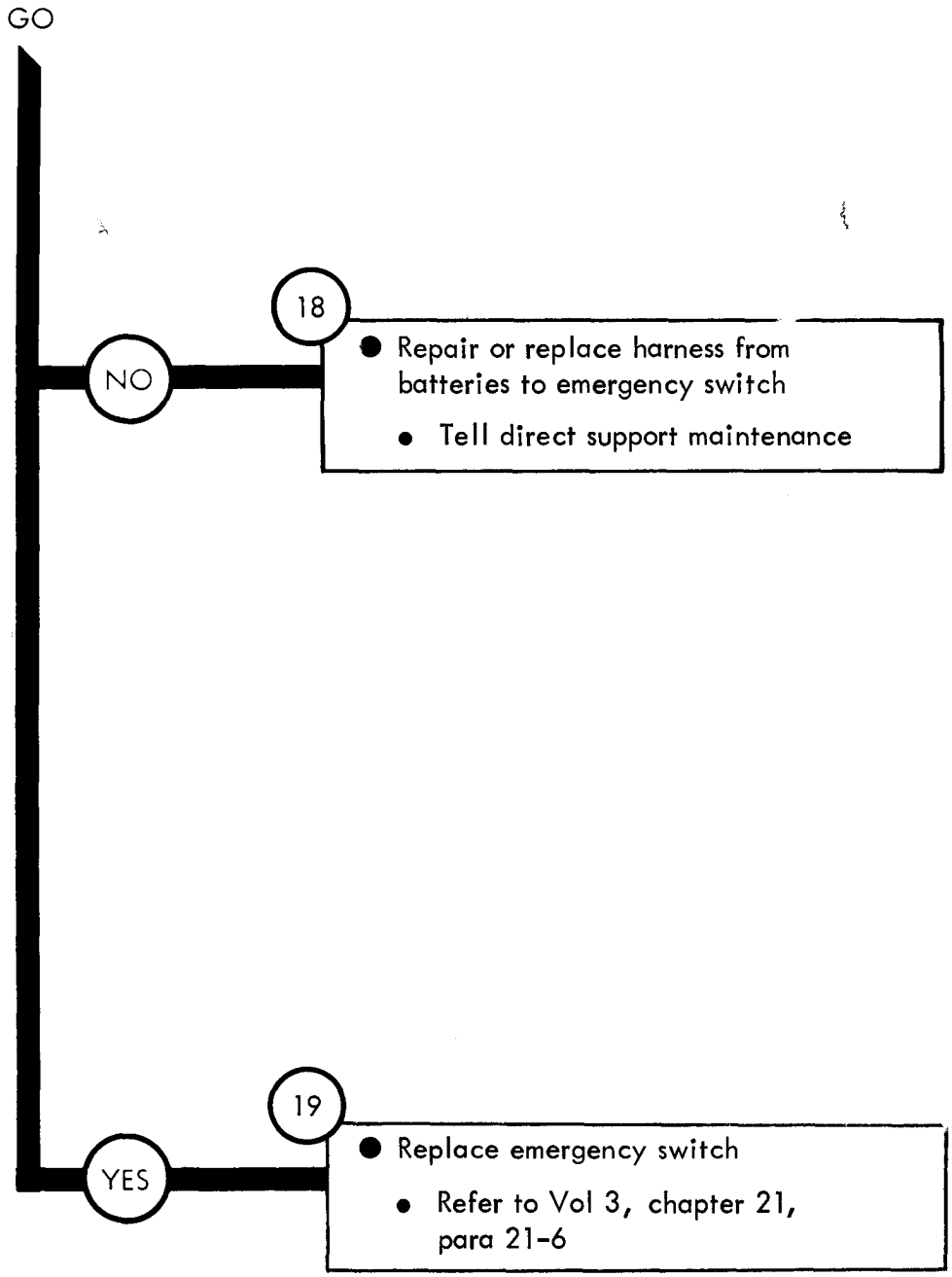


Figure 26-41 (Sheet 8 of 9)



TA 116018

Figure 26-41 (Sheet 9 of 9)

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PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.
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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FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-2320-211-20-2-1	10 Dec 1980	TROUBLESHOOTING, ORGANIZATIONAL LEVEL

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

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

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US Army Tank-Automotive Materiel
Readiness Command
ATTN: DRSTA-MB
Warren, MI 48090

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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

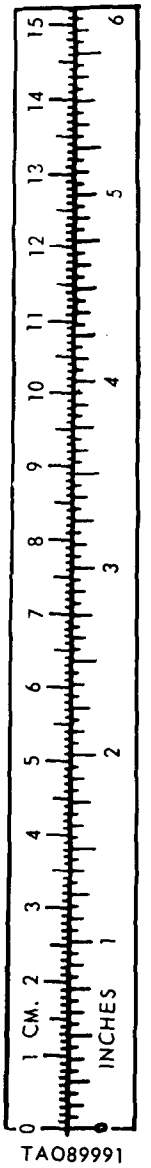
TEMPERATURE

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

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
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

TO CHANGE	TO	MULTIPLY BY
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



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