TM 9-2320-242-34-1
T.O. 36A12-1A-2052-2-1

TECHNICAL MANUAL

VOLUME 1 OF 2

TROUBLESHOOTING

DIRECT SUPPORT AND GENERAL SUPPORT LEVEL

TRUCK, CARGO:

1-1/4-TON, 6x6, M561 (NSN 2320-00-873-5407)

TRUCK, AMBULANCE:

1-1/4-TON, 6x6, M792 (NSN 2310-00-832-9907)

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

JANUARY 1981

WARNING

EXHAUST GASES CAN BE DEADLY

Exposure to exhaust gases produces 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 or 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.

Dry cleaning solvent is flammable. Do not use near an open flame. Keep a fire extinguisher nearby when solvent is used. Use only in well-ventilated places. Failure to do this may result in injury to personnel and damage to equipment.

Eye shields must be worn when using compressed air. Eye injury can occur if eye shields are not used.

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 checking the blower with the engine running, keep your fingers and clothing away from the moving parts of the blower. Run the engine at idle speed only.

Smoking, flames, sparks and glowing or hot objects are not allowed within 50 feet of work area during maintenance of fuel system components. Fuel can explode, causing injury to personnel and damage to equipment.

*TM 9-2320-242-34-1
T.O. 36A12-1A-2052-2-1

TECHNICAL MANUAL
NO. 9-2320-242-34-1

TECHNICAL ORDER
NO. 36A12-1A-2052-2-1

DEPARTMENTS OF THE ARMY
AND
THE AIR FORCE
WASHINGTON, DC, 29 JANUARY 1981

TECHNICAL MANUAL

VOLUME 1 OF 2

TROUBLESHOOTING

DIRECT SUPPORT AND GENERAL SUPPORT LEVEL

TRUCK, CARGO:
1-1/4-TON, 6x6, M561 (NSN 2320-00-873-5407)
TRUCK, AMBULANCE:
1-1/4-TON, 6x6, M792 (NSN 2310-00-832-9907)

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 Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, Michigan 48090. A reply will be furnished to you.

TABLE OF CONTENTS

* This manual together with TM 9-2320-242-34-2-1, 29 January 1981 and TM 9-2320-242-2-2, 29 January 1981, supersedes TM 9-2320-242-34, 3 April 1970, including all changes.

TABLE OF CONTENTS-CONT

TABLE OF CONTENTS–CONT

VOLUME 2 OF 2

Part 1 of 2

(TM 9-2320-242-34-2-1)

TABLE OF CONTENTS-CONT

Part 2 of 2
(TM 9-2320-242-34-2-2)

CHAPTER 1

GENERAL INFORMATION

1-1. SCOPE. This volume shows you how to do troubleshooting at the direct support and general support 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 at your maintenance level.

1-2. ORGANIZATION. When you are told that a truck has something wrong or you must drive the truck to find what is wrong with it, 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.

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 system 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 (figure 3-1) is divided into five columns that list systems, troubleshooting roadmaps, fault symptom indexes, 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 direct support and general support 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		
2	FUEL	Figure 5-2	Table 6-2		
3	BILGE PUMP	Figure 5-3	Table 6-3		
4	TRANSMISSION	Figure 5-4	Table 6-4		
5	WINCH	Figure 5-5	Table 6-5		

Figure 3-1. Troubleshooting Index

TA 120791

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 tests.

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 tests in this manual.

TEST EQUIPMENT		TESTS	FIGURE
1	COMPRESSION GAGE	Engine Cylinder Compression	9-1
2		Fuel Injector	11-1
3			
4			
5			
6			
7			
8			

TA 120792

Figure 4-1. Test Equipment Procedures Index

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 5-5 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.

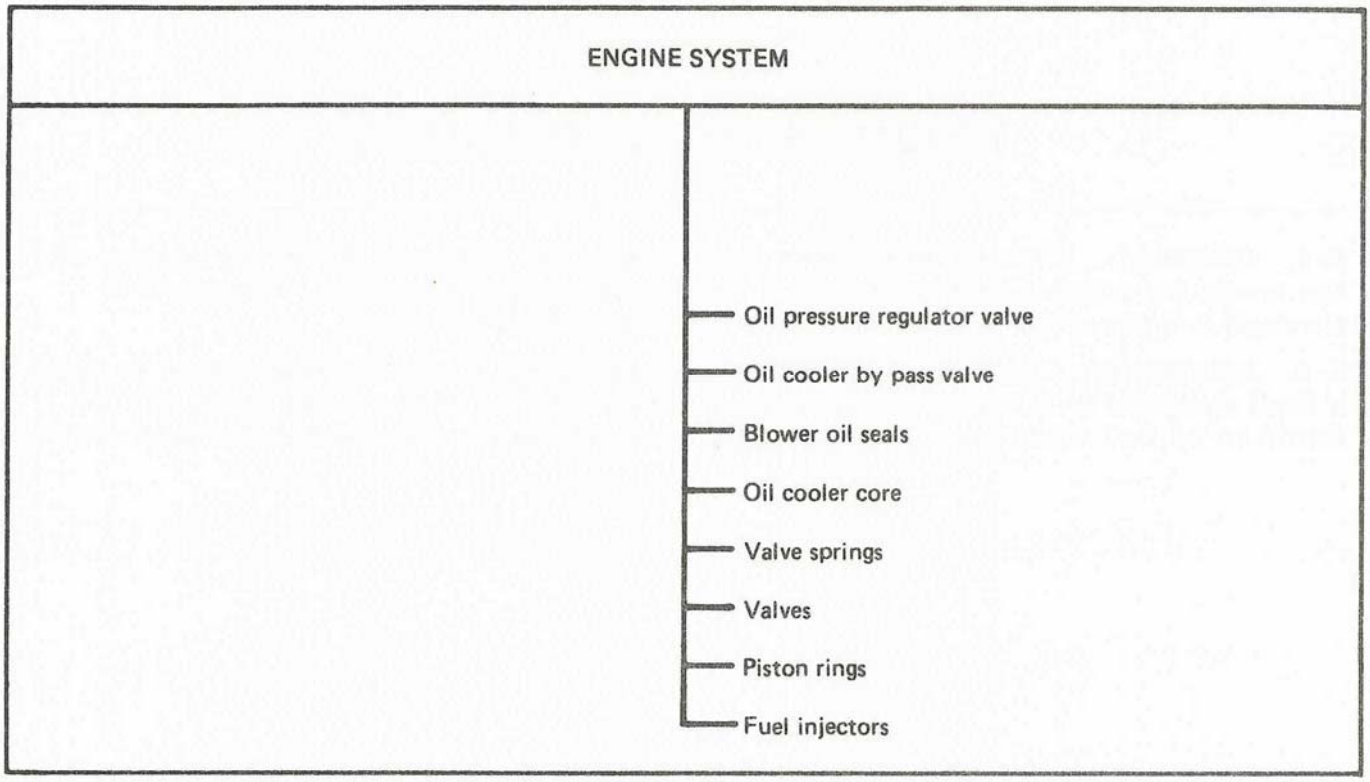
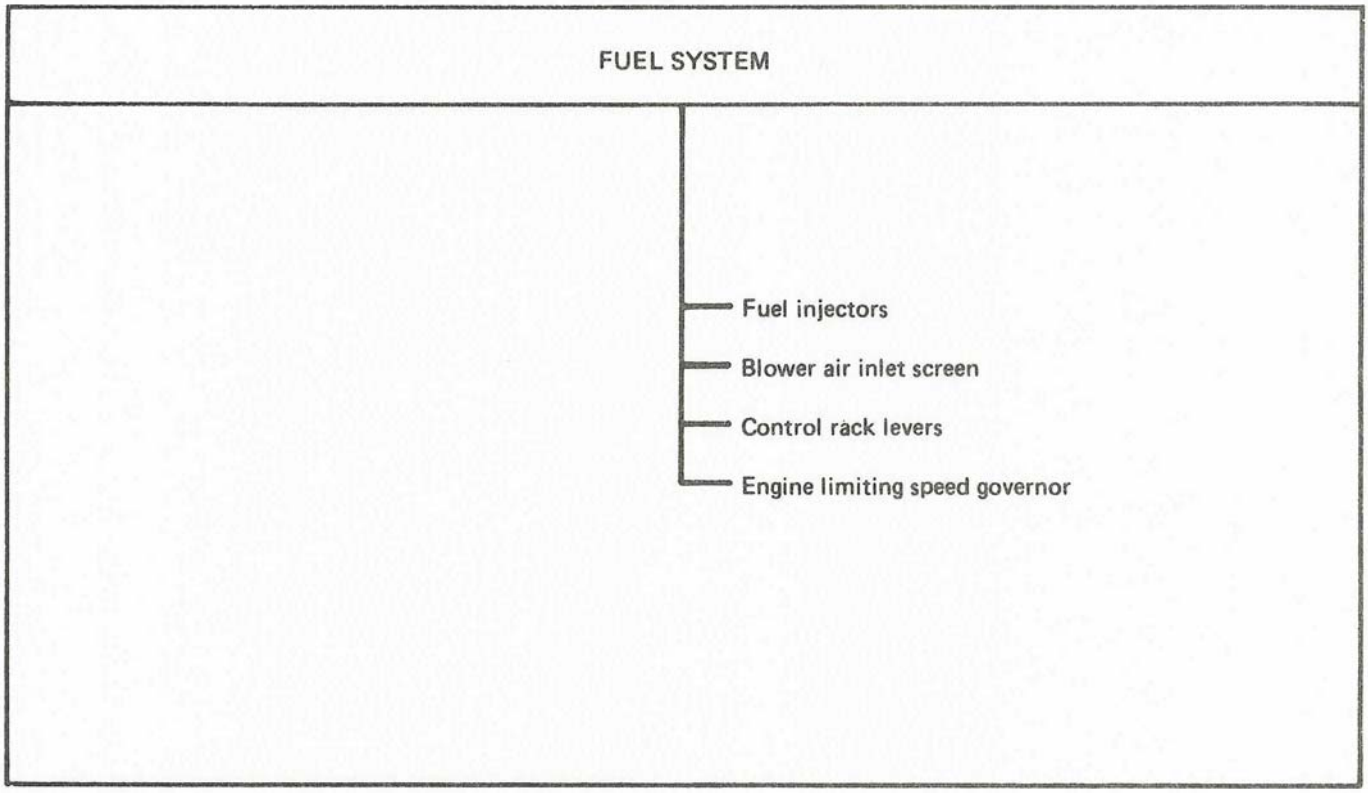
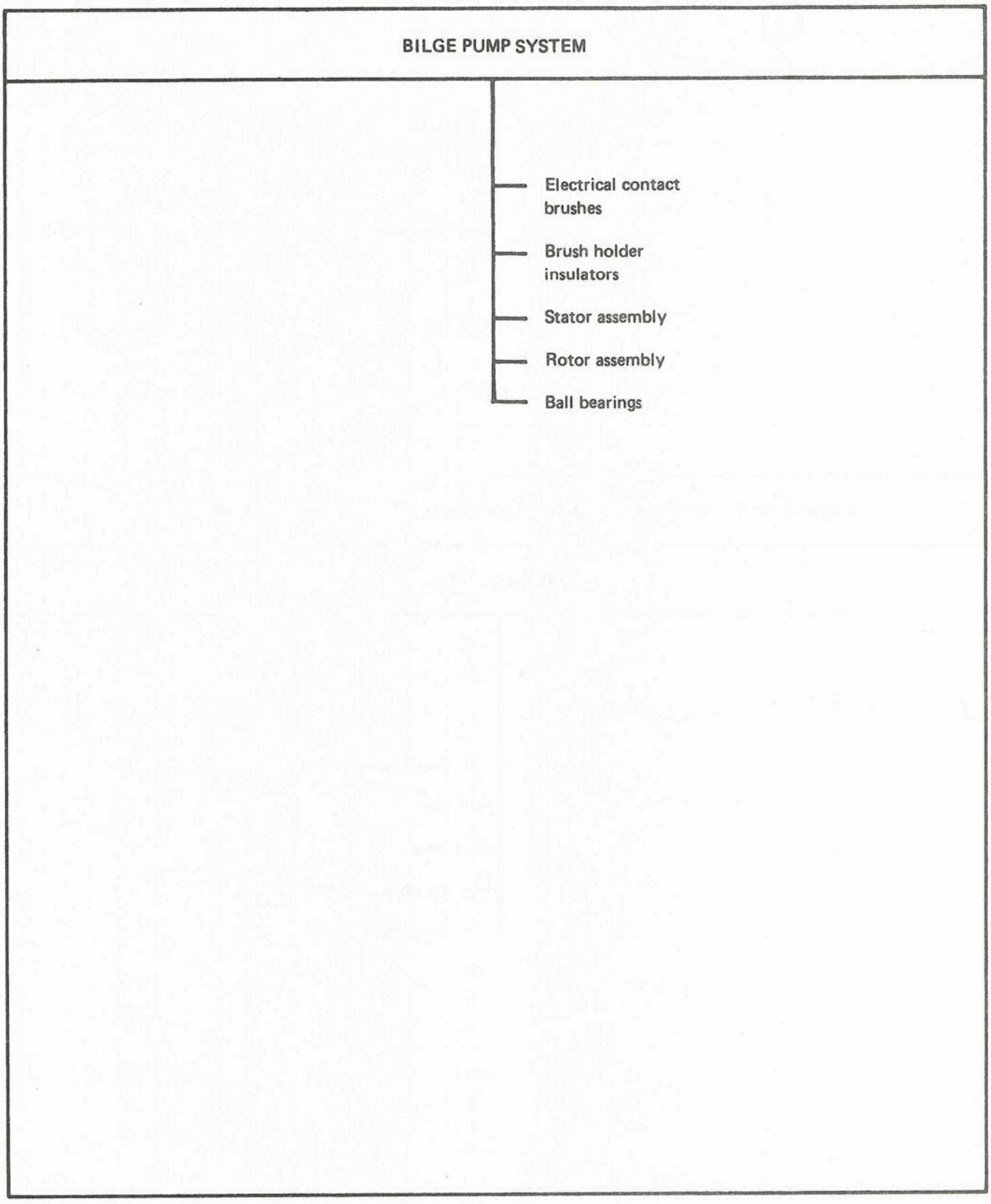


Figure 5-1. Troubleshooting Roadmap, Engine System



TA 120793

Figure 5-2. Troubleshooting Roadmap, Fuel System



TA 120794

Figure 5-3. Troubleshooting Roadmap, Bilge Pump System

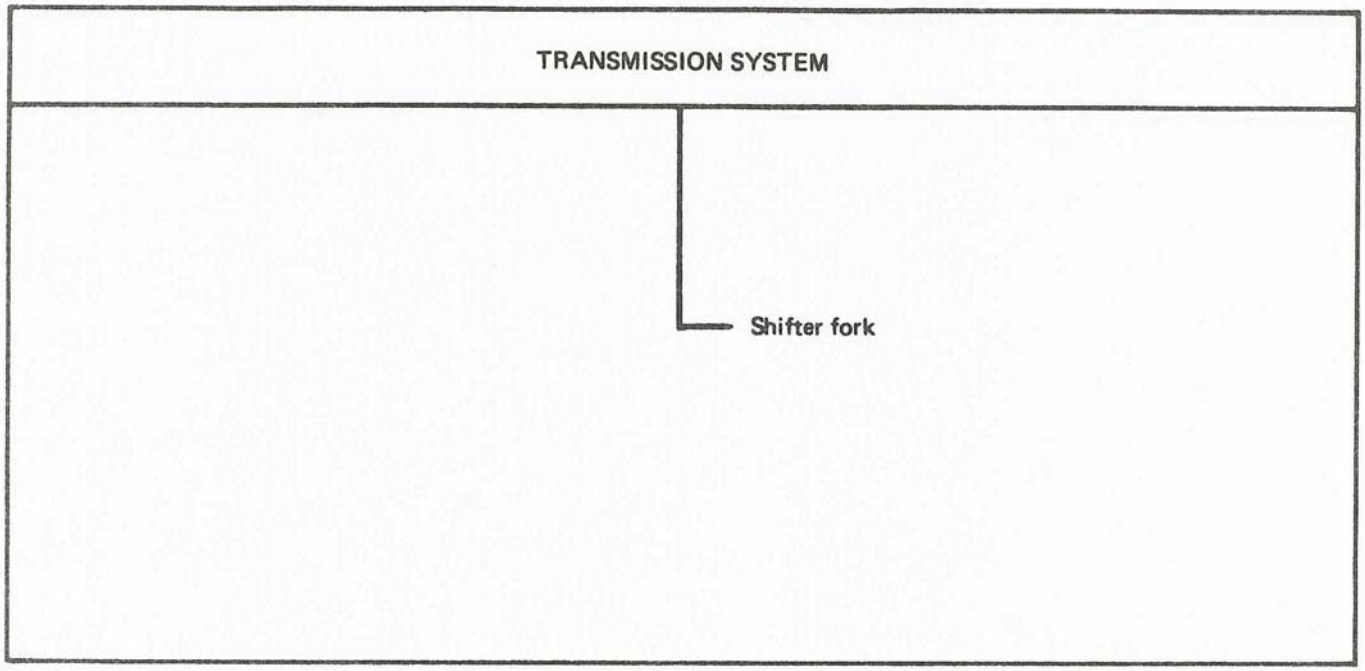
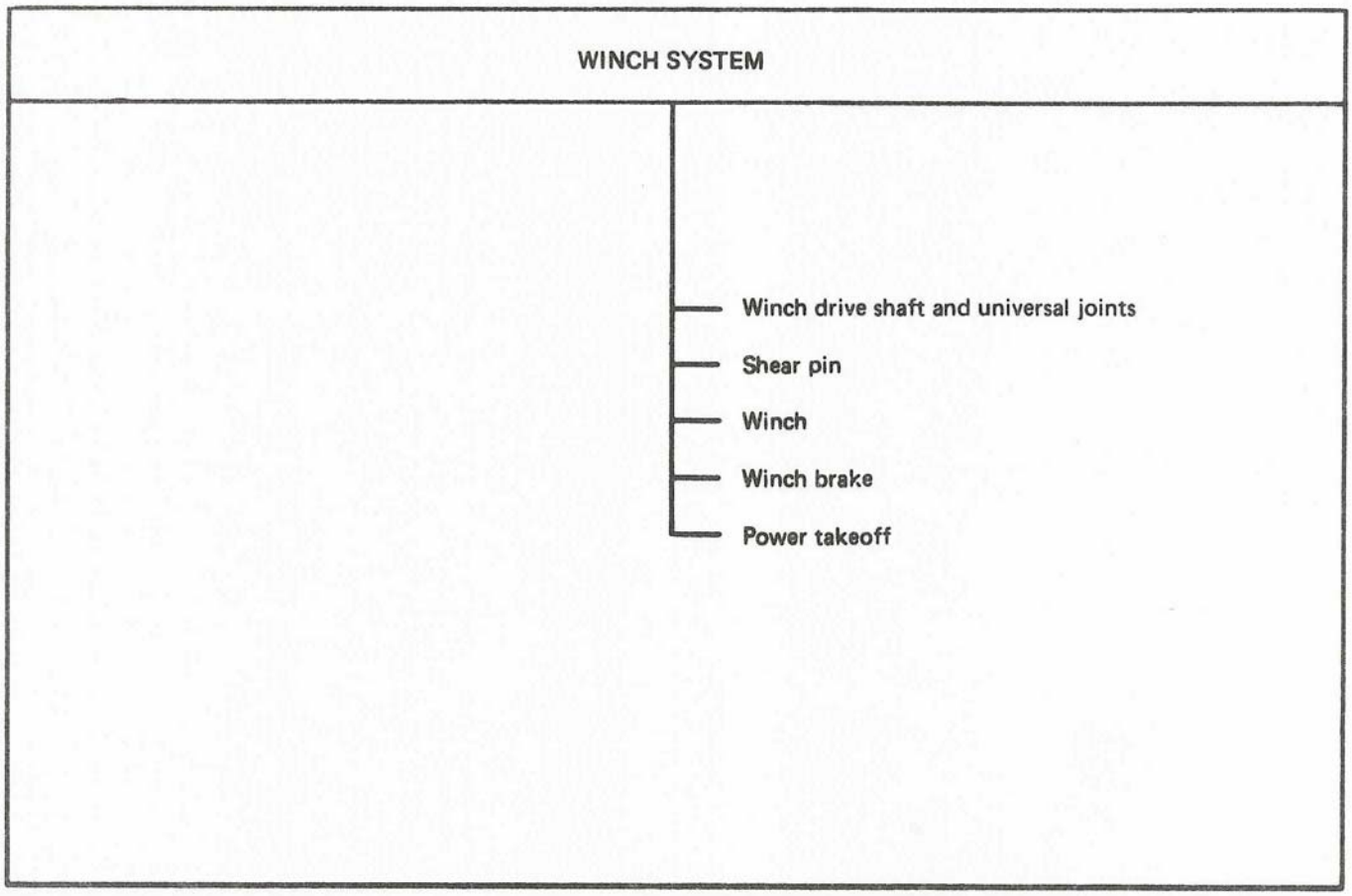


Figure 5-4. Troubleshooting Roadmap, Transmission System



TA 120795

Figure 5-5. Troubleshooting Roadmap, Winch System

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 6-5) 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.

FAULT SYMPTOM INDEX

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
—	1. Low oil pressure	—	Figure 8-1	1	—	•		
—	2. Engine uses too much oil	—	Figure 8-2	1	—	•		
—	3. Engine runs rough	—	Figure 8-3	1	Compression gage	•		
—	4. Engine puts out white smoke	—	Figure 8-4	1	Compression gage	•		

FAULT SYMPTOM INDEX

TABLE 6-2. FUEL SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
—	1. Engine runs rough and lacks power	—	Figure 10-1	1	—	•		
—	2. Poor fuel mileage	—	Figure 10-2	1	—	•		
—	3. Engine runs after being shut off	—	Figure 10-3	1	—	•		
—	4. Engine puts out black or gray smoke	—	Figure 10-4	1	—	•		

TA 120796

FAULT SYMPTOM INDEX

TABLE 6-3. BILGE PUMP SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
———	1. Bilge pump will not operate	———	Figure 12-1	1	———	•		
———	2. Bilge pump will not discharge water	———	Figure 12-2	1	———	•		
———	3. Bilge pump output is below normal	———	Figure 12-3	1	———	•		

FAULT SYMPTOM INDEX

TABLE 6-4. TRANSMISSION SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
		SUMMARY	DETAILED	PERSONS	TEST EQUIPMENT: SPECIAL TOOLS	TEST EQUIPMENT: STANDARD TOOLS	MATERIALS	TIME
———	1. Transmission is hard to put in gear	———	Figure 13-1	1	———	•		

TA 120797

TABLE 6-5. WINCH SYSTEM

SUBSYSTEM	SYMPTOM	TS PROCEDURE		RESOURCES REQ'D				
					TEST EQUIPMENT			
		SUMMARY	DETAILED	PERSONS	SPECIAL TOOLS	STANDARD TOOLS	MATERIALS	TIME
—	1. Winch will not pull load	—	Figure 14-1	1	—	•		
—	2. Winch will not hold load	—	Figure 14-2	1	—	•		

TA 120798

CHAPTER 7

SAMPLE TROUBLESHOOTING PROCEDURE

7-1. GENERAL. This chapter gives a sample troubleshooting procedure. The purpose of the sample procedure 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. (See figure 7-1.) The sample detailed procedure given is the starter 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 starting system circuit for loose, burned, or broken leads and connections. These 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 starter system is not okay, 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 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 leads or connectors. If the engine still doesn't start after you do this, it could mean that there are other faults in the 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 4 is an example of this.

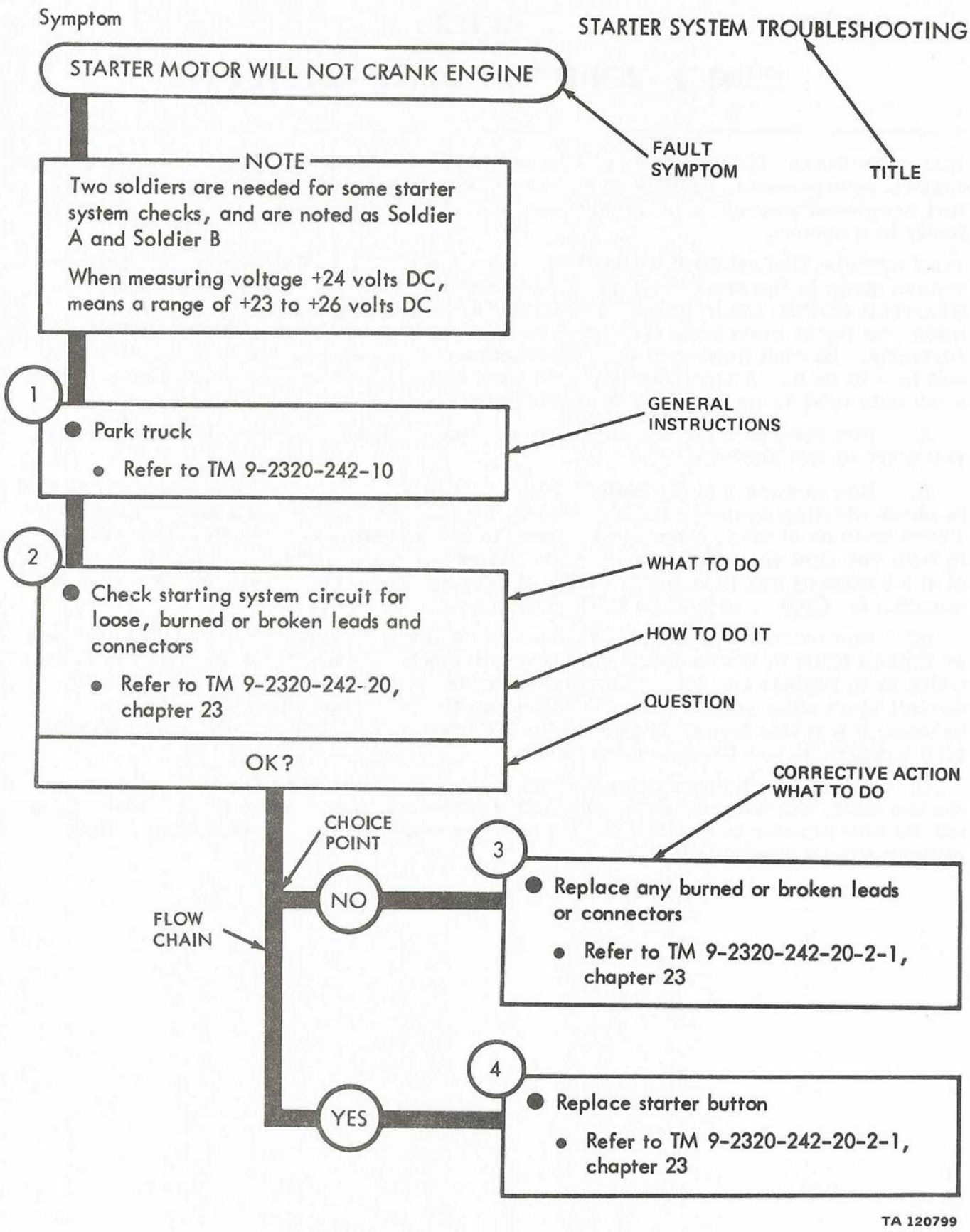


Figure 7-1. Sample Detailed Procedure

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 direct support and general support maintenance level.

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

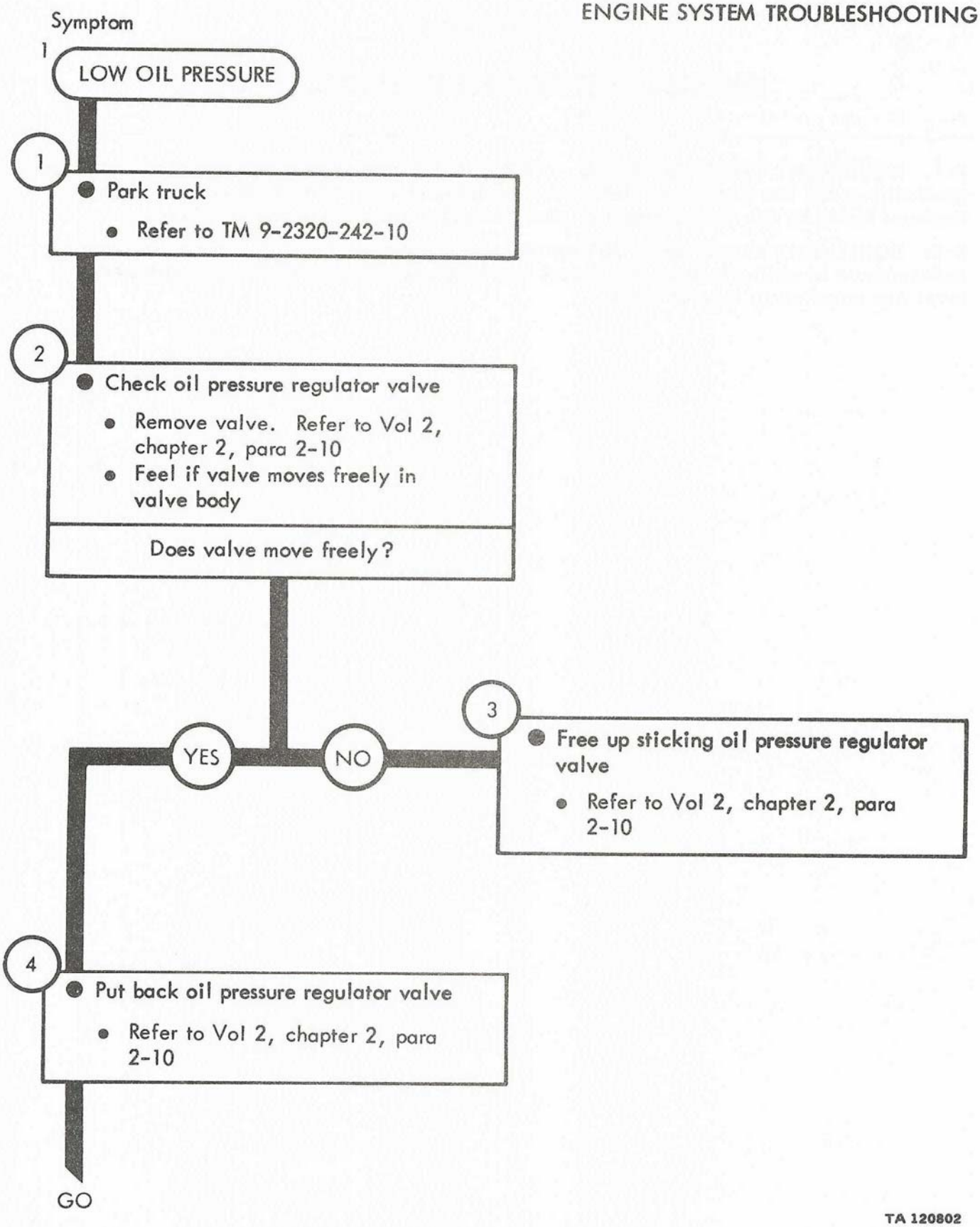
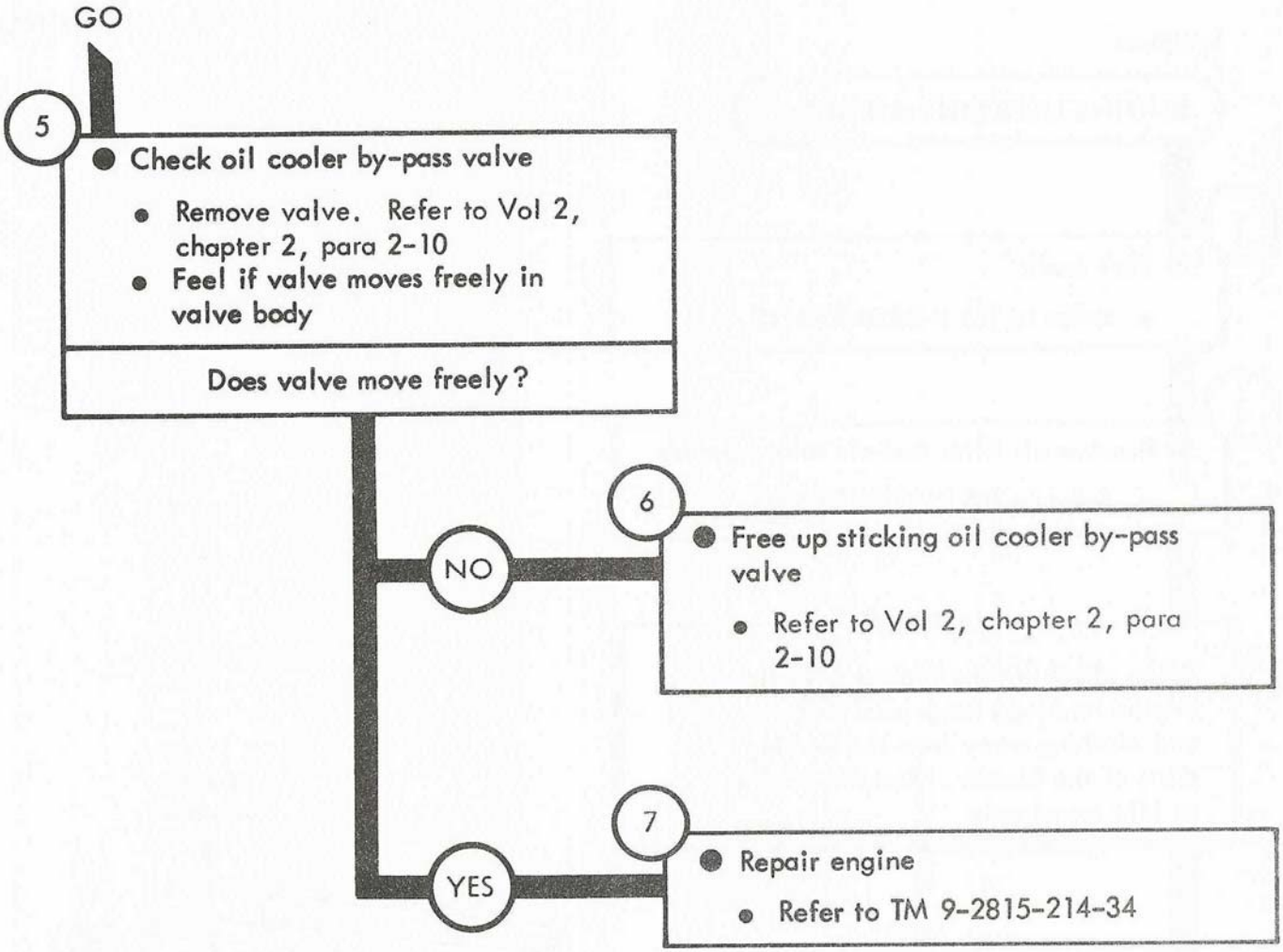


Figure 8-1 (Sheet 1 of 2)



TA 120803

Figure 8-1 (Sheet 2 of 2)

Symptom 2

ENGINE USES TOO MUCH OIL

1. ● Park truck
   - Refer to TM 9-2320-242-10

2. ● Remove air filter and air inlet housing
   - Refer to TM 9-2320-242-20

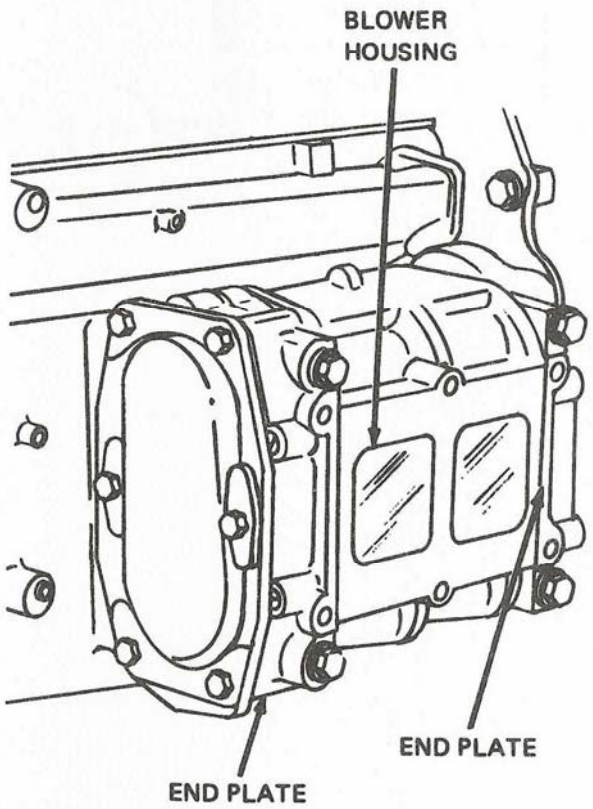
WARNING

When checking the blower with the engine running, keep your fingers and clothing away from the moving parts of the blower. Run the engine at idle speed only

3. ● Start engine
   - Refer to TM 9-2320-242-10
   ● Check blower for leaky oil seals
   - Using flashlight, look inside blower housing toward each endplate
   - See if film of oil is coming from center of end plate

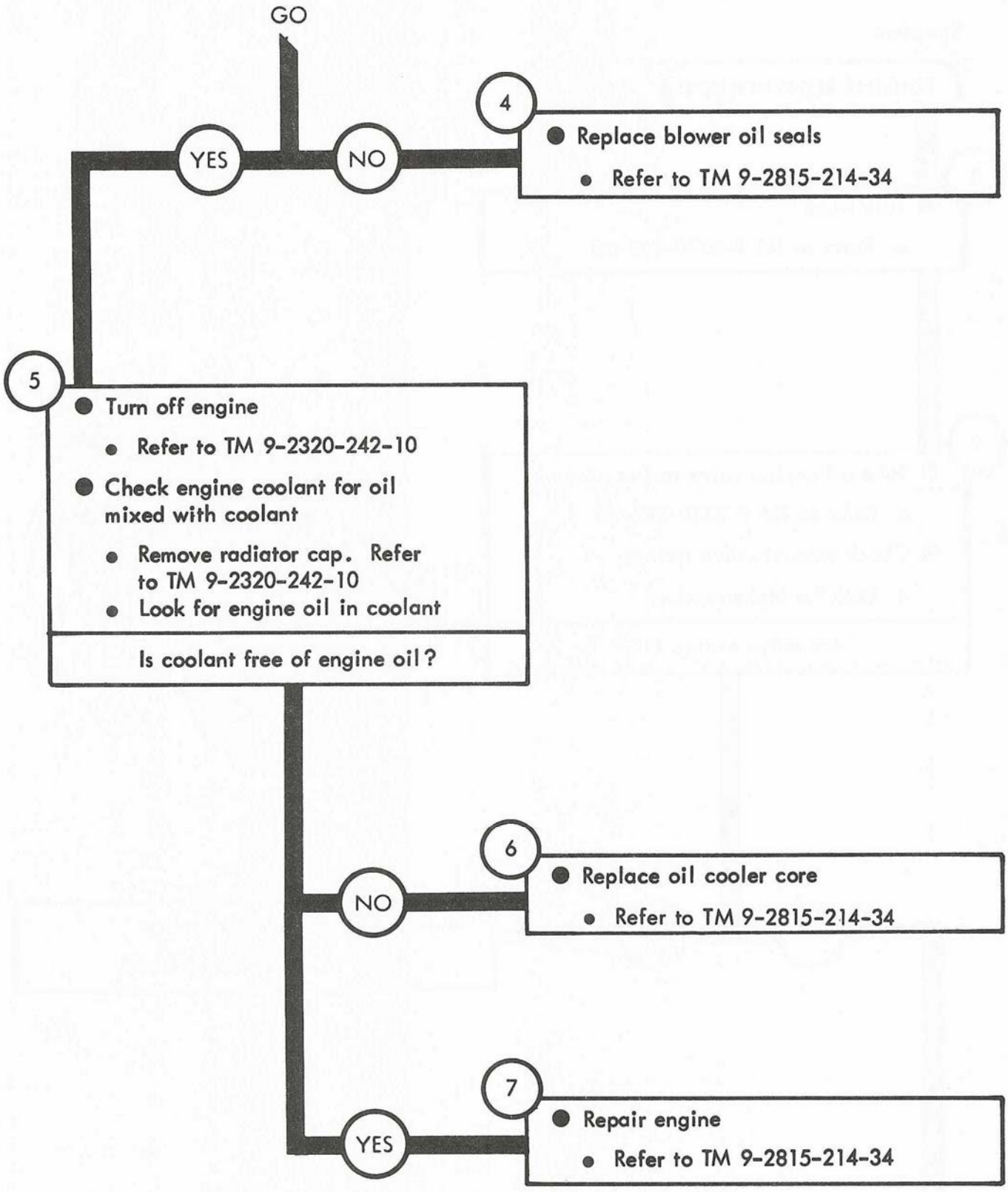
Are end plates free of oil film?

GO



TA 120804

Figure 8-2 (Sheet 1 of 2)



TA 120805

Figure 8-2 (Sheet 2 of 2)

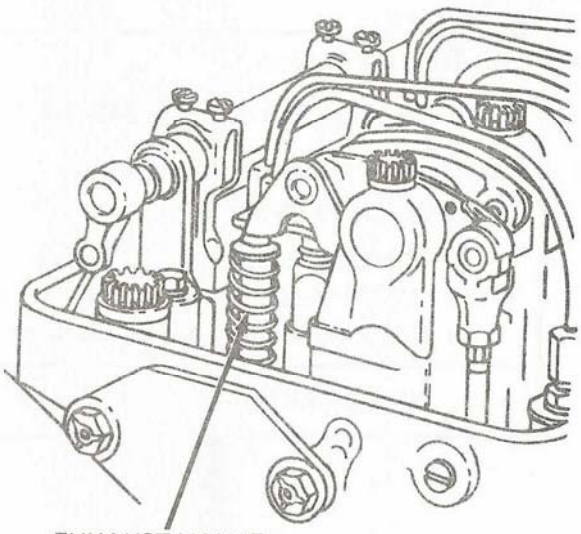
Symptom

3 ENGINE RUNS ROUGH

1
- Park truck
  - Refer to TM 9-2320-242-10

2
- Take off engine valve rocker cover
  - Refer to TM 9-2320-242-20
- Check exhaust valve springs
  - Look for broken springs

Are valve springs OK?



YES

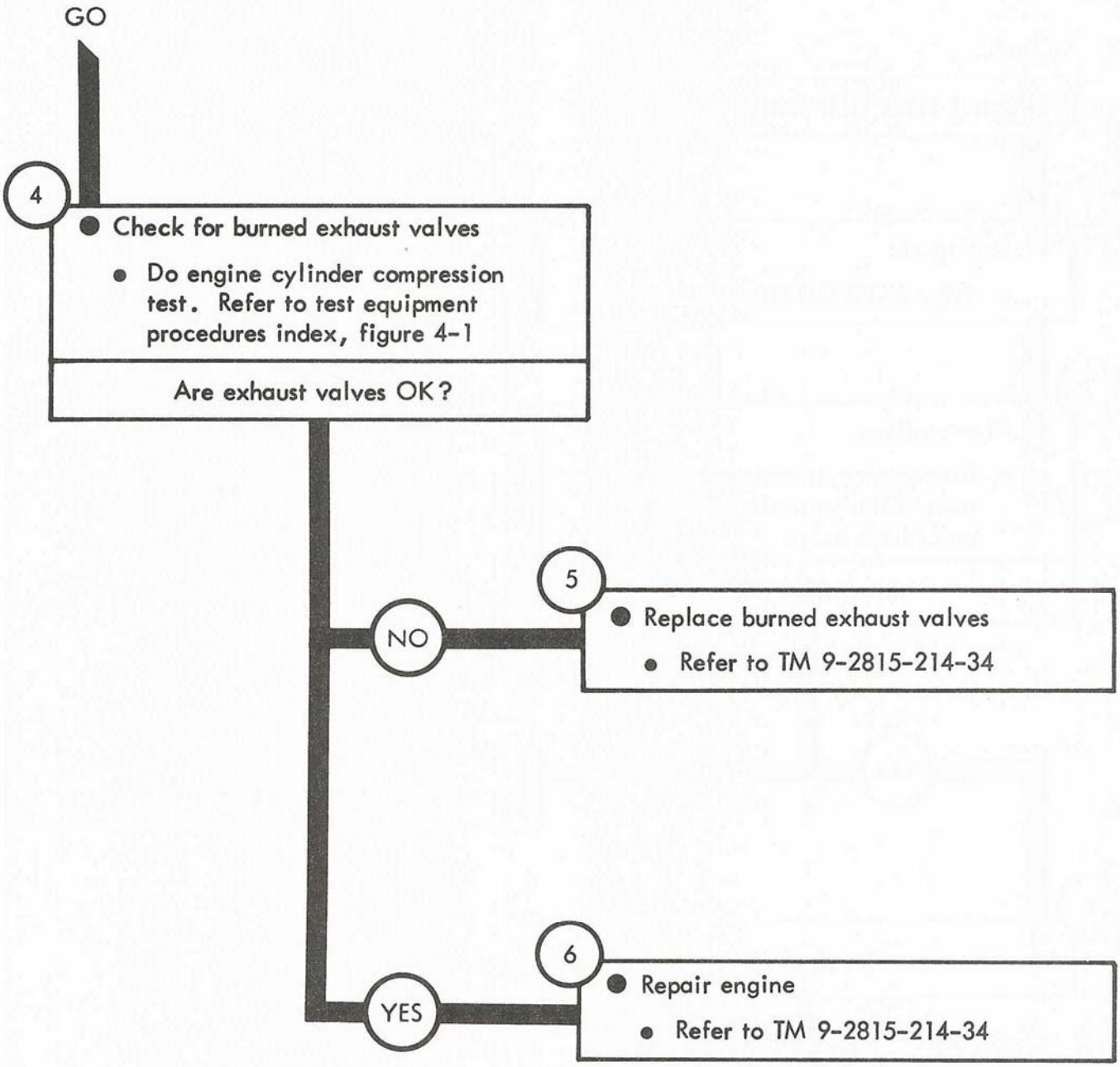
NO

3
- Replace broken valve springs
  - Refer to TM 9-2815-214-34

GO

TA 120806

Figure 8-3 (Sheet 1 of 2)



TA 120807

Figure 8-3 (Sheet 2 of 2)

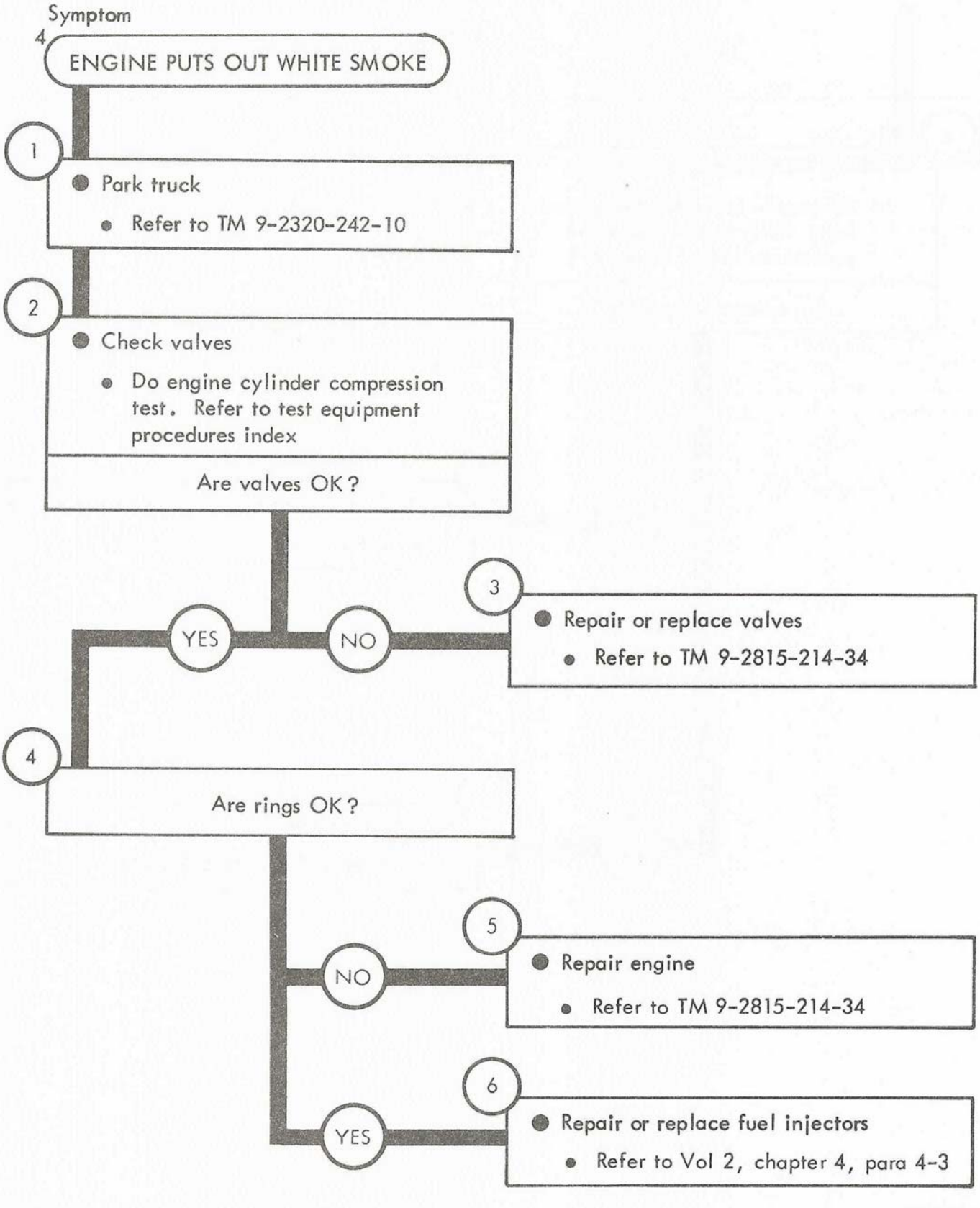

Symptom
4
ENGINE PUTS OUT WHITE SMOKE
1
Park truck
Refer to TM 9-2320-242-10
2
Check valves
Do engine cylinder compression test. Refer to test equipment procedures index
Are valves OK?
YES
NO
3
Repair or replace valves
Refer to TM 9-2815-214-34
4
Are rings OK?
NO
5
Repair engine
Refer to TM 9-2815-214-34
YES
6
Repair or replace fuel injectors
Refer to Vol 2, chapter 4, para 4-3
TA 120808

Figure 8-4

CHAPTER 9

ENGINE SYSTEM TEST PROCEDURE

9-1. GENERAL. This chapter gives test procedures for the tests given in chapter 8, for the Engine System troubleshooting.

9-2. 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.

9-3. 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.

ENGINE CYLINDER COMPRESSION TEST

1

- Start engine and warm up to operating temperature
  - Refer to TM 9-2320-242-10

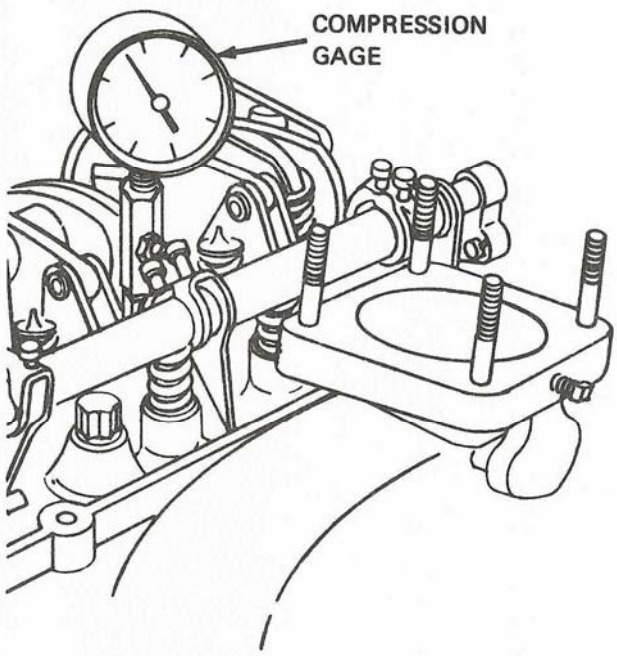
2

- Turn off engine
  - Refer to TM 9-2320-242-10
- Take off number one fuel injector. Refer to Vol 2, chapter 4, para 4-3
- Connect fuel inlet passage to fuel return passage
  - Using spare fuel pipe, make connection

3

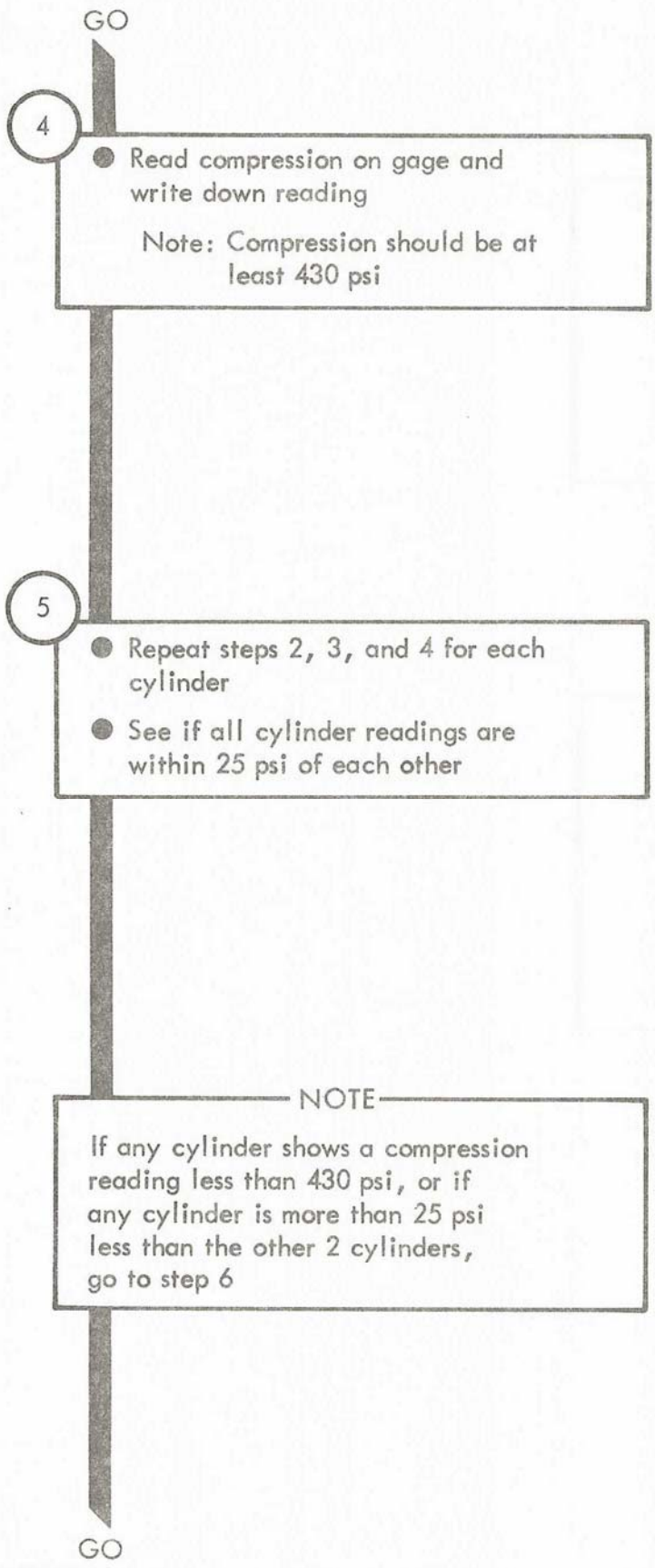
- Put in compression gage in number one injector hole
- Start engine and run at 600 RPM
  - Refer to TM 9-2320-242-10

GO



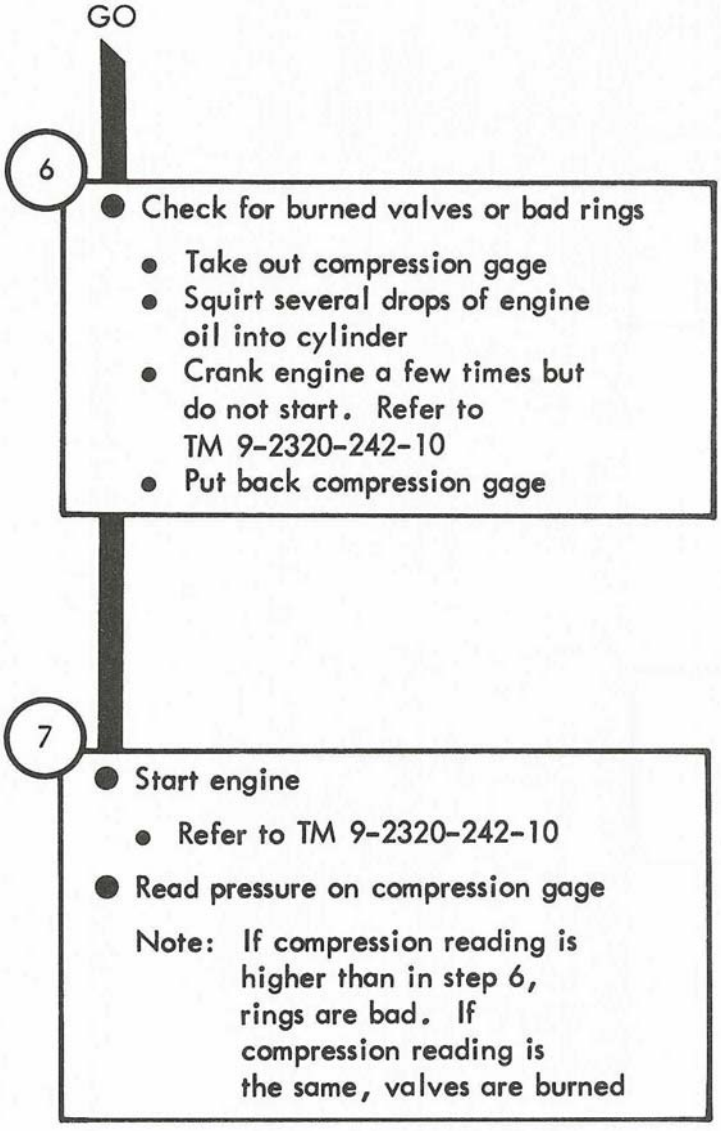
TA 120809

Figure 9-1 (Sheet 1 of 3)



TA 120810

Figure 9-1 (Sheet 2 of 3)



TA 120811

Figure 9-1 (Sheet 3 of 3)

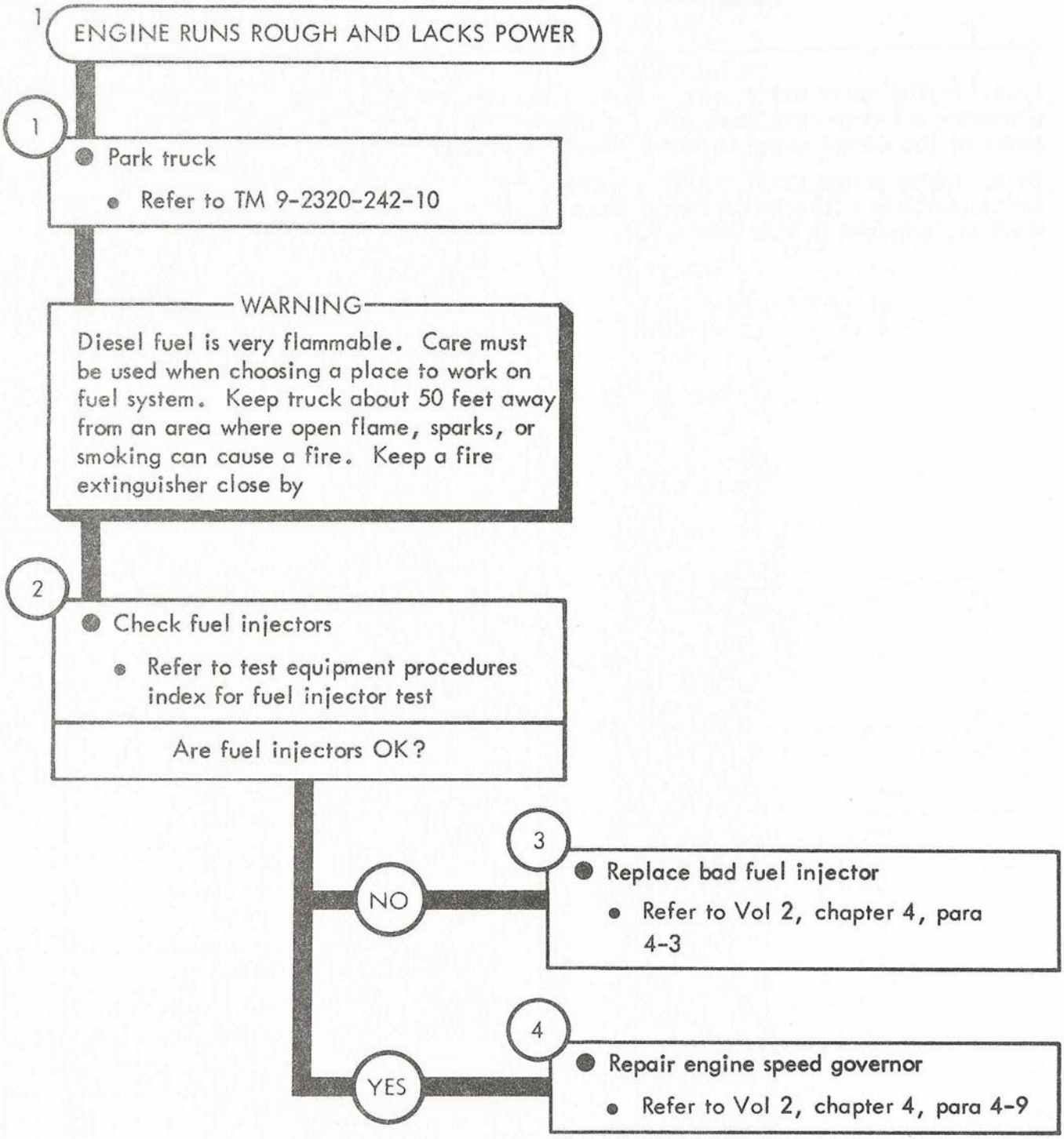
CHAPTER 10

FUEL SYSTEM TROUBLESHOOTING

10-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the Fuel System, for which there are authorized corrective maintenance tasks at the direct support and general support maintenance level.

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

Symptom



TA 120812

Figure 10-1

Symptom 2

POOR FUEL MILEAGE

1

- Check for clogged blower air inlet screen
  - Take off air cleaner assembly. Refer to TM 9-2320-242-20
  - See if blower air inlet screen is clogged

Is blower air inlet screen OK?

YES

NO

2

- Clean blower air inlet screen
  - Take off screen. Refer to Vol 2, chapter 4, para 4-7
  - Using compressed air, clean screen

3

- Check fuel injector timing
  - Refer to TM 9-2815-214-34

Is fuel injector timing OK?

NO

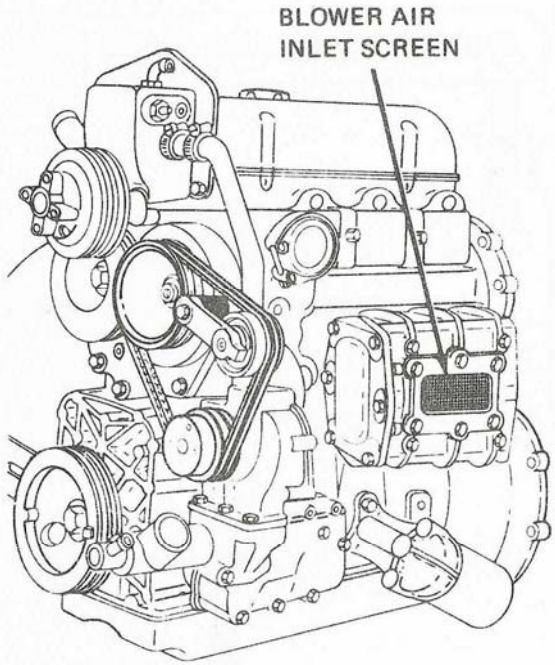
4

- Reset fuel injector timing
  - Refer to TM 9-2815-214-34

YES

5

- Replace fuel injectors
  - Refer to Vol 2, chapter 4, para 4-3



TA 120813

Figure 10-2

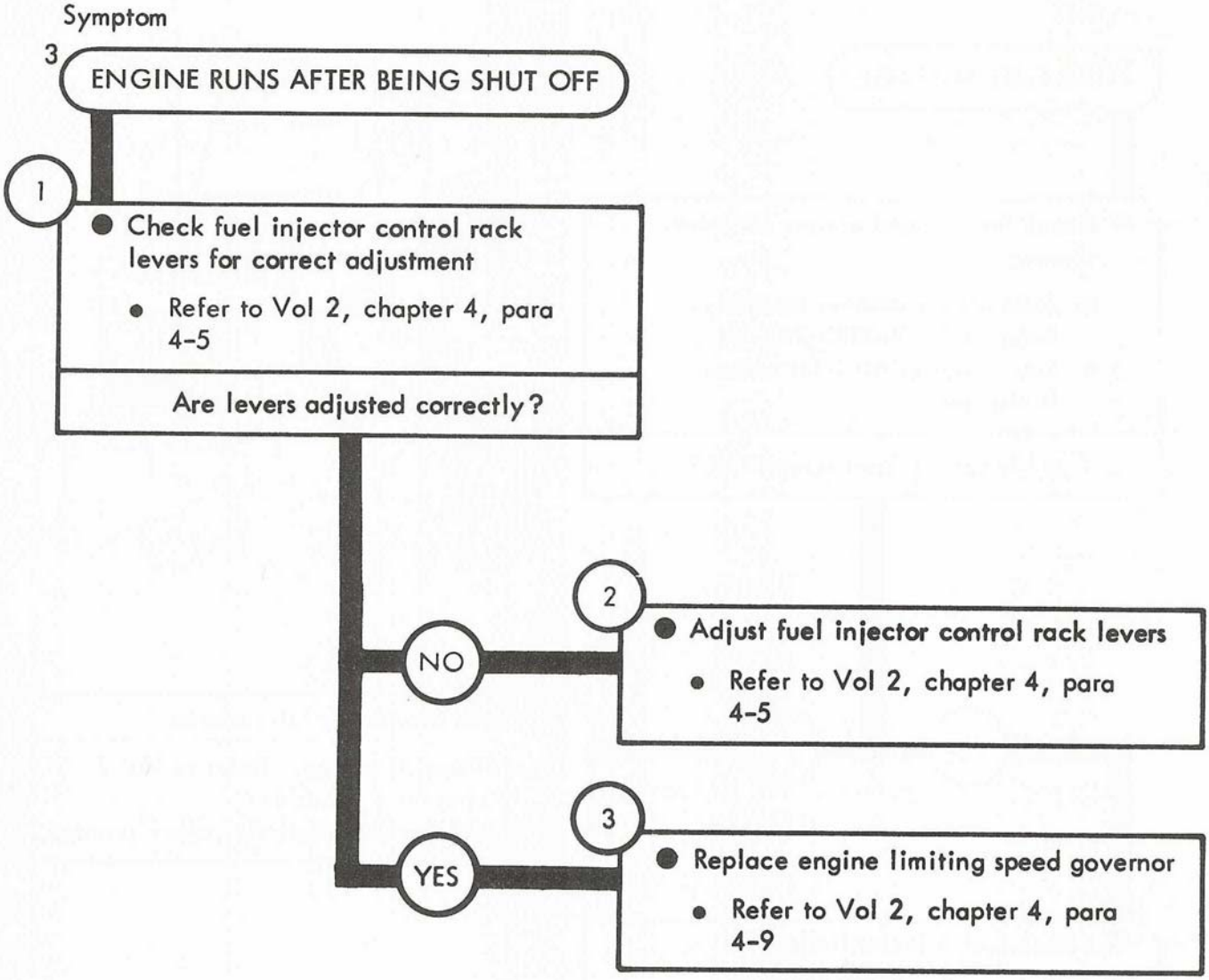

Symptom
3
ENGINE RUNS AFTER BEING SHUT OFF
1
● Check fuel injector control rack levers for correct adjustment
• Refer to Vol 2, chapter 4, para 4-5
Are levers adjusted correctly?
NO
2
● Adjust fuel injector control rack levers
• Refer to Vol 2, chapter 4, para 4-5
YES
3
● Replace engine limiting speed governor
• Refer to Vol 2, chapter 4, para 4-9
TA 120814

Figure 10-3

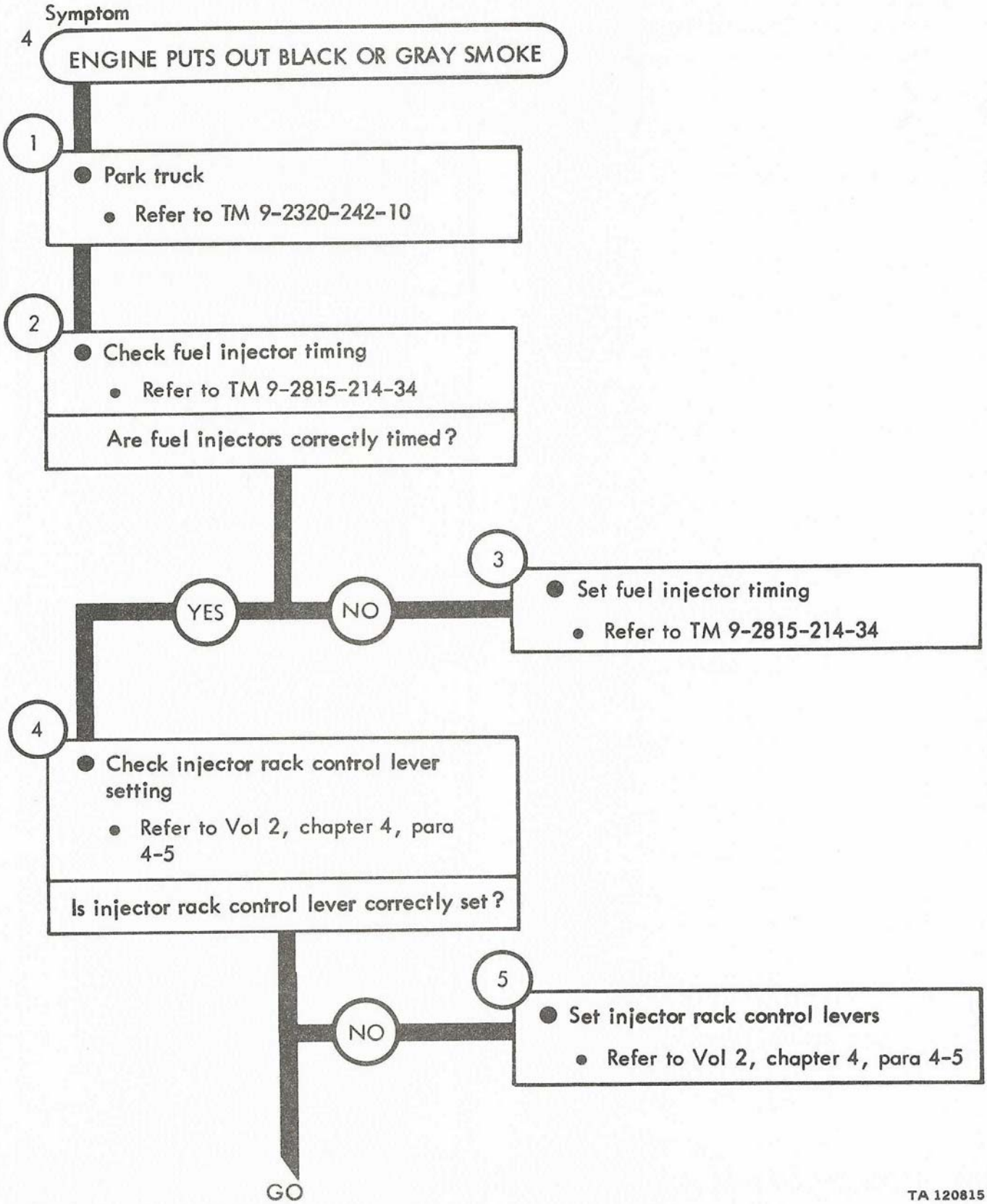
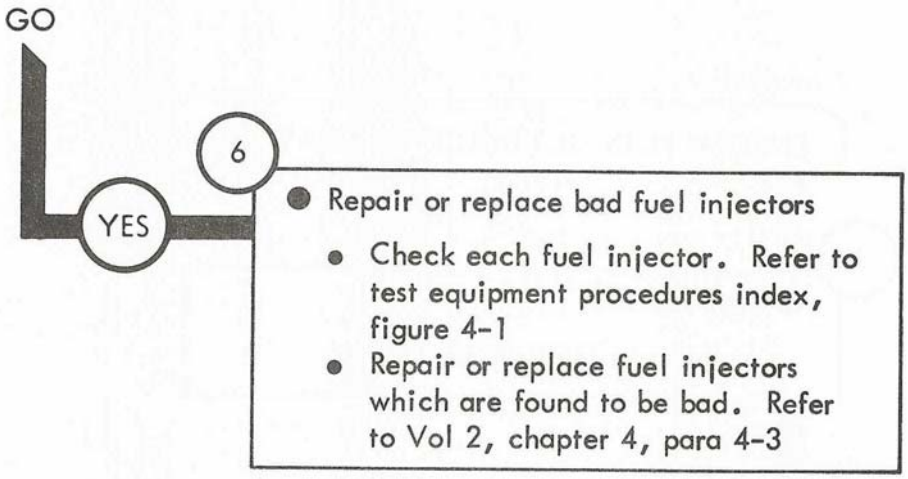


Figure 10-4 (Sheet 1 of 2)



TA 120816

Figure 10-4 (Sheet 2 of 2)

CHAPTER 11

FUEL SYSTEM TEST PROCEDURE

11-1. GENERAL. This chapter gives test procedures for the tests given in chapter 10, for the Fuel System troubleshooting.

11-2. 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.

11-3. 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.

FUEL INJECTOR TEST - To find out if any fuel injectors are not working

1

- Start and warm up engine
  - Refer to TM 9-2320-242-10
- Stop engine
  - Refer to TM 9-2320-242-10
- Take off valve rocker cover and throw away gasket
  - Refer to TM 9-2815-214-34
- Start engine
  - Refer to TM 9-2320-242-10

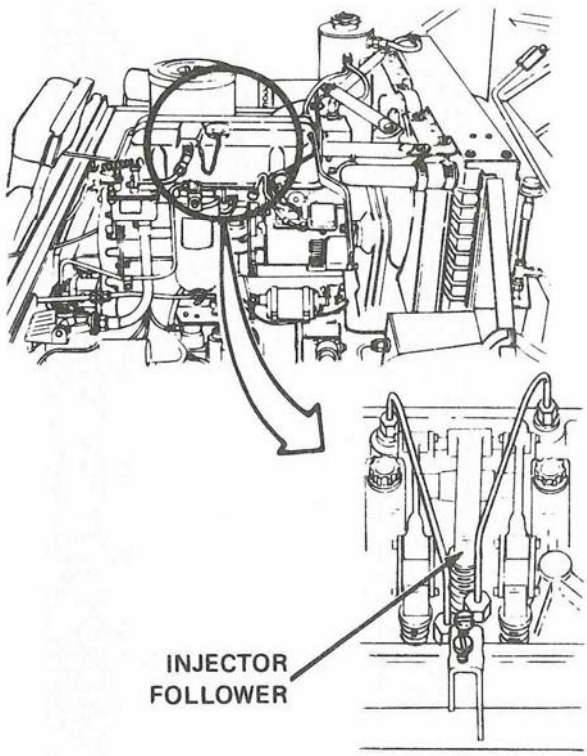
2

- Hold down injector follower of one cylinder with screwdriver so that fuel injector does not work

  Note: Check fuel injector of each cylinder. If an injector is OK, engine will run rougher when injector follower is held down

3

- Stop engine
  - Refer to TM 9-2320-242-10
- Put on new gasket and put back valve rocker cover
  - Refer to TM 9-2815-214-34



TA 120817

Figure 11-1

CHAPTER 12

BILGE PUMP SYSTEM TROUBLESHOOTING

12-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the Bilge Pump System, for which there are authorized corrective maintenance tasks at the direct support and general support maintenance level.

12-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the direct support and general support maintenance level are covered in this chapter.

BILGE PUMP SYSTEM TROUBLESHOOTING

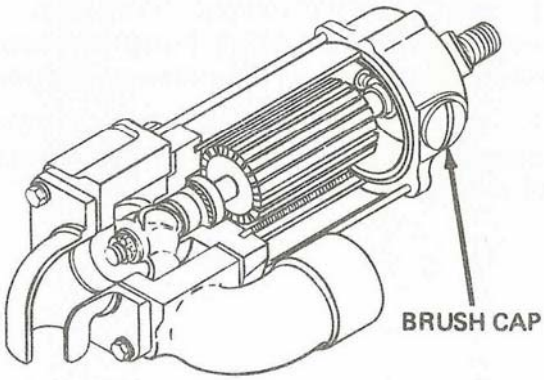
Symptom 1

BILGE PUMP WILL NOT OPERATE

1

- Check bilge pump electrical contact brushes
  - Take off brush cap
  - Look for worn electrical contact brushes

Are electrical contact brushes OK?



YES

NO

2

- Replace bilge pump electrical contact brushes
  - Refer to Vol 2, chapter 16, para 16-15

3

- Check bilge pump brush holder insulators
  - Look for broken or worn brush holder insulators

Are brush holder insulators OK?

GO

TA 120818

Figure 12-1 (Sheet 1 of 4)

GO

YES

NO

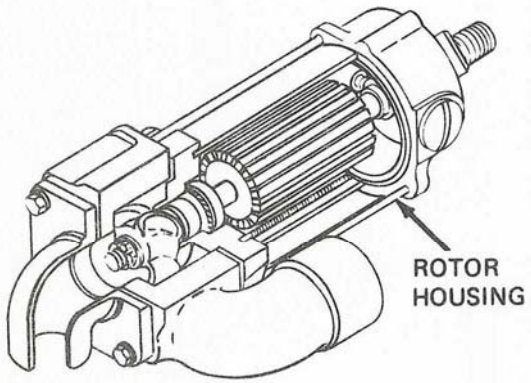
4

- Replace bilge pump brush holder insulators
  - Refer to Vol 2, chapter 16, para 16-15

5

- Check bilge pump rotor housing
  - Look for burned or broken field windings

Is bilge pump rotor housing OK?



YES

NO

6

- Replace bilge pump rotor housing
  - Refer to Vol 2, chapter 16, para 16-15

GO

TA 120819

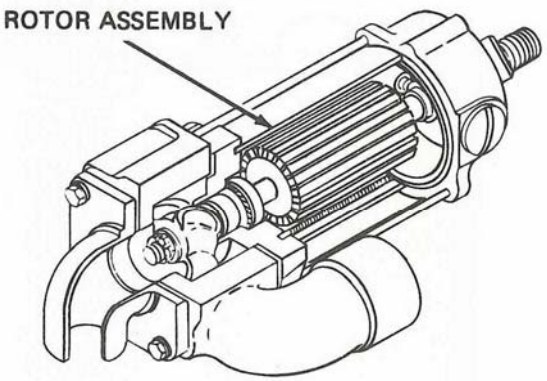
Figure 12-1 (Sheet 2 of 4)

GO

7

- Check bilge pump rotor assembly for burns or pits
  - Take out rotor assembly. Refer to Vol 2, chapter 16, para 16-15
  - Look for burned or pitted rotor assembly

Is rotor assembly OK?



YES

NO

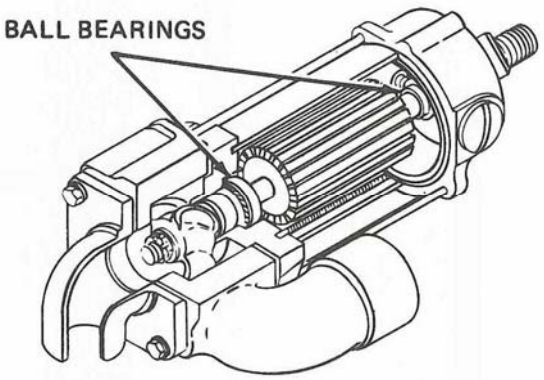
8

- Replace bilge pump rotor assembly
  - Refer to Vol 2, chapter 16, para 16-15

9

- Check bilge pump ball bearings
  - Look for worn or broken ball bearings
  - Look to see if ball bearings turn freely

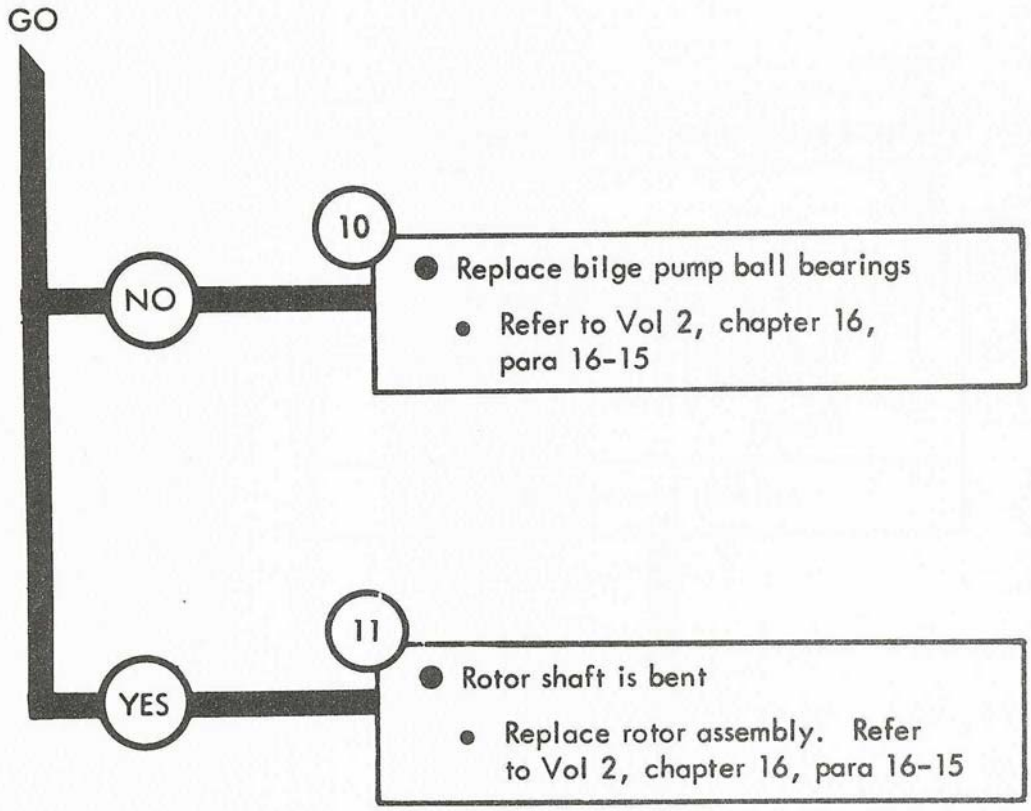
Are ball bearings OK?



GO

TA 120820

Figure 12-1 (Sheet 3 of 4)



TA 120821

Figure 12-1 (Sheet 4 of 4)

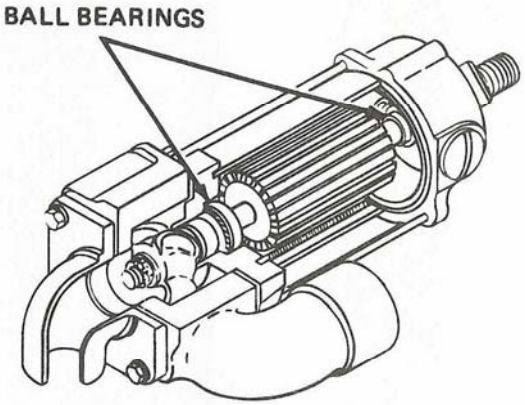
Symptom

2 BILGE PUMP WILL NOT DISCHARGE WATER

1

- Check bilge pump ball bearings
  - Look for worn or broken ball bearings
  - Look to see if ball bearings turn freely

Are ball bearings OK?



NO

2

- Replace bilge pump ball bearings
  - Refer to Vol 2, chapter 16, para 16-15

YES

3

- Rotor assembly shaft is bent
  - Replace rotor assembly. Refer to Vol 2, chapter 16, para 16-15

TA 120822

Figure 12-2

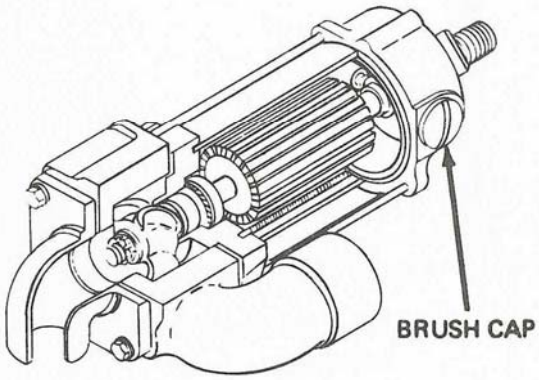
Symptom

3 BILGE PUMP OUTPUT IS BELOW NORMAL

1

- Check bilge pump electrical contact brushes
  - Take off brush cap
  - Look for worn electrical contact brushes

Are electrical contact brushes OK?



YES

NO

2

- Replace bilge pump electrical contact brushes
  - Refer to Vol 2, chapter 16, para 16-15

3

- Check bilge pump brush holder insulators
  - Look for worn or broken brush holder insulators

Are brush holder insulators OK?

GO

TA 120823

Figure 12-3 (Sheet 1 of 2)

GO

YES

NO

4

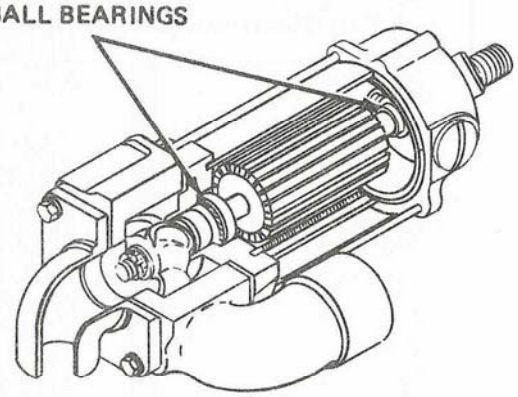
- Replace bilge pump brush holder insulators
  - Refer to Vol 2, chapter 16, para 16-15

5

- Check bilge pump ball bearings
  - Look for worn or broken ball bearings
  - Look to see if ball bearings turn freely

Are ball bearings OK?

BALL BEARINGS



NO

6

- Replace bilge pump ball bearings
  - Refer to Vol 2, chapter 16, para 16-15

YES

7

- Rotor assembly shaft is bent
  - Replace rotor assembly. Refer to Vol 2, chapter 16, para 16-15

TA 120824

Figure 12-3 (Sheet 2 of 2)

CHAPTER 13

TRANSMISSION SYSTEM TROUBLESHOOTING

13-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the Transmission System, for which there are authorized corrective maintenance tasks at the direct support and general support maintenance level.

13-2. EQUIPMENT ITEMS NOT COVERED. All equipment items for which corrective maintenance is authorized at the direct support and general support maintenance level are covered in this chapter.

TRANSMISSION SYSTEM TROUBLESHOOTING

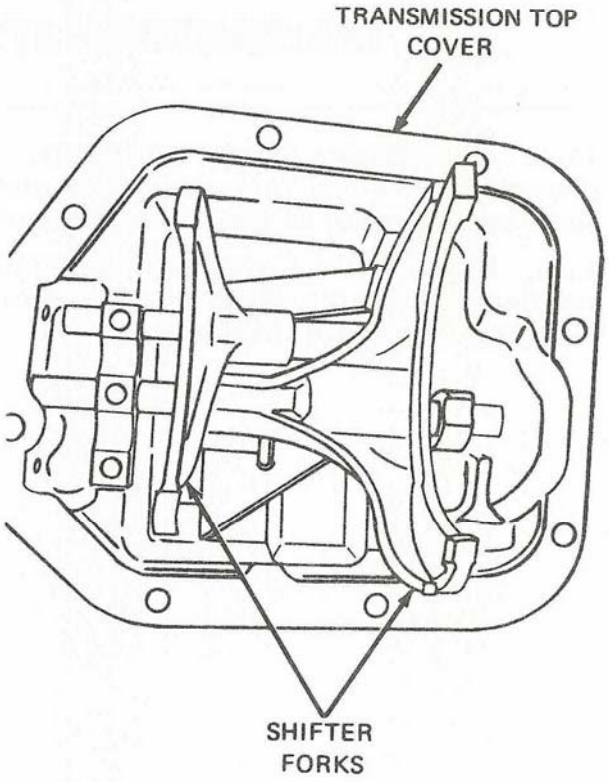
Symptom 1

TRANSMISSION IS HARD TO PUT IN GEAR

1

- Check transmission for bent shifter forks
  - Take off transmission top cover. Refer to Vol 2, chapter 7, para 7-5
  - Look for bent forks

Are shifter forks OK?



NO

2

- Replace bent shifter forks
  - Refer to Vol 2, chapter 7, para 7-3

YES

3

- Repair transmission
  - Refer to Vol 2, chapter 7, para 7-3

TA 120825

Figure 13-1

CHAPTER 14

WINCH SYSTEM TROUBLESHOOTING

14-1. EQUIPMENT ITEMS COVERED. This chapter gives equipment troubleshooting procedures for the Winch System, for which there are authorized corrective maintenance tasks at the direct support and general support maintenance level.

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

WINCH SYSTEM TROUBLESHOOTING

Symptom 1

WINCH WILL NOT PULL LOAD

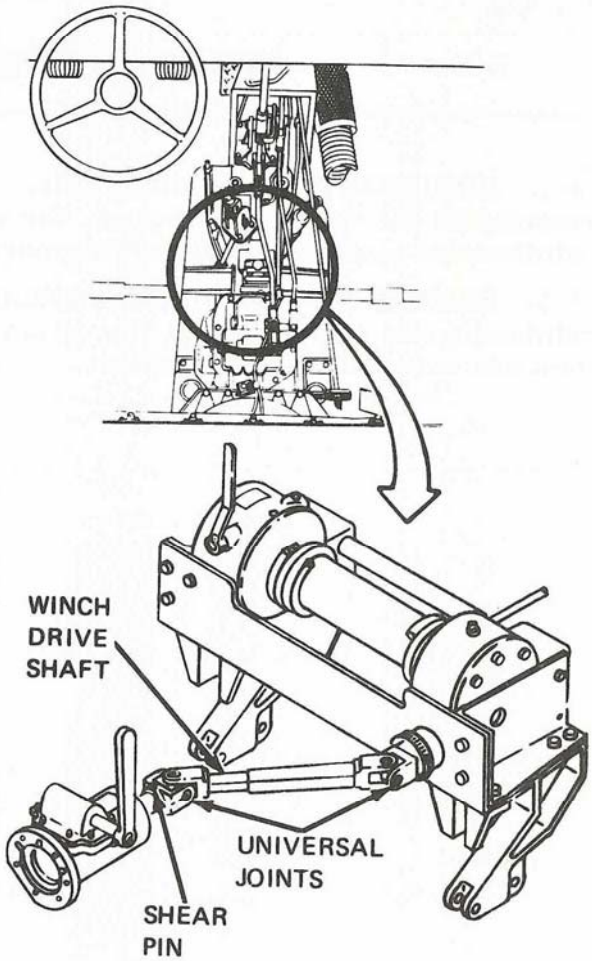
1
- Park truck
  - Refer to TM 9-2320-242-10

2
- Check winch drive shaft and shear pin
  - Take out tractor seats and console. Refer to TM 9-2320-242-20
  - Look for broken winch drive shaft or universal joints
  - Look for broken or missing shear pin

Are winch drive shaft and shear pin OK?

YES → GO

NO → 3
- Replace broken driveshaft or universal joints
  - Refer to Vol 2, chapter 17, para 17-31
  - Put back tractor seats and console. Refer to TM 9-2320-242-20
- Replace broken or missing shear pin
  - Refer to Vol 2, chapter 17, para 17-31
  - Put back tractor seats and console. Refer to TM 9-2320-242-20



TA 120826

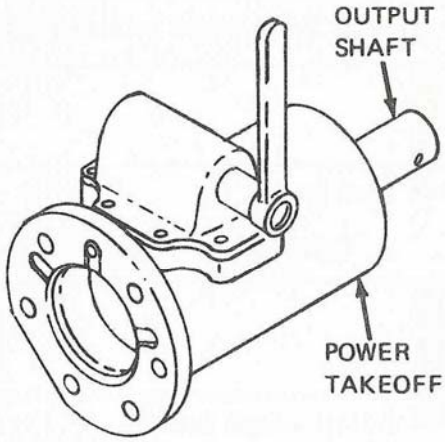
Figure 14-1 (Sheet 1 of 2)

GO

4

- Check power takeoff
  - Take off winch drive shaft. Refer to Vol 2, chapter 17, para 17-31
  - Start engine. Refer to TM 9-2320-242-10
  - Engage power takeoff. Refer to TM 9-2320-242-10

Does output shaft of power takeoff turn?



NO

5

- Repair or replace broken power takeoff
  - Turn off power takeoff and engine. Refer to TM 9-2320-242-10
  - Repair or replace power takeoff. Refer to Vol 2, chapter 17, para 17-31
  - Put back winch drive shaft. Refer to Vol 2, chapter 17, para 17-31
  - Put back tractor seats and console. Refer to TM 9-2320-242-20

YES

6

- Repair or replace broken winch
  - Turn off power takeoff and engine. Refer to TM 9-2320-242-10
  - Repair or replace winch. Refer to Vol 2, chapter 17, para 17-31
  - Put back winch drive shaft. Refer to Vol 2, chapter 17, para 17-31
  - Put back tractor seats and console. Refer to TM 9-2320-242-20

TA 120827

Figure 14-1 (Sheet 2 of 2)

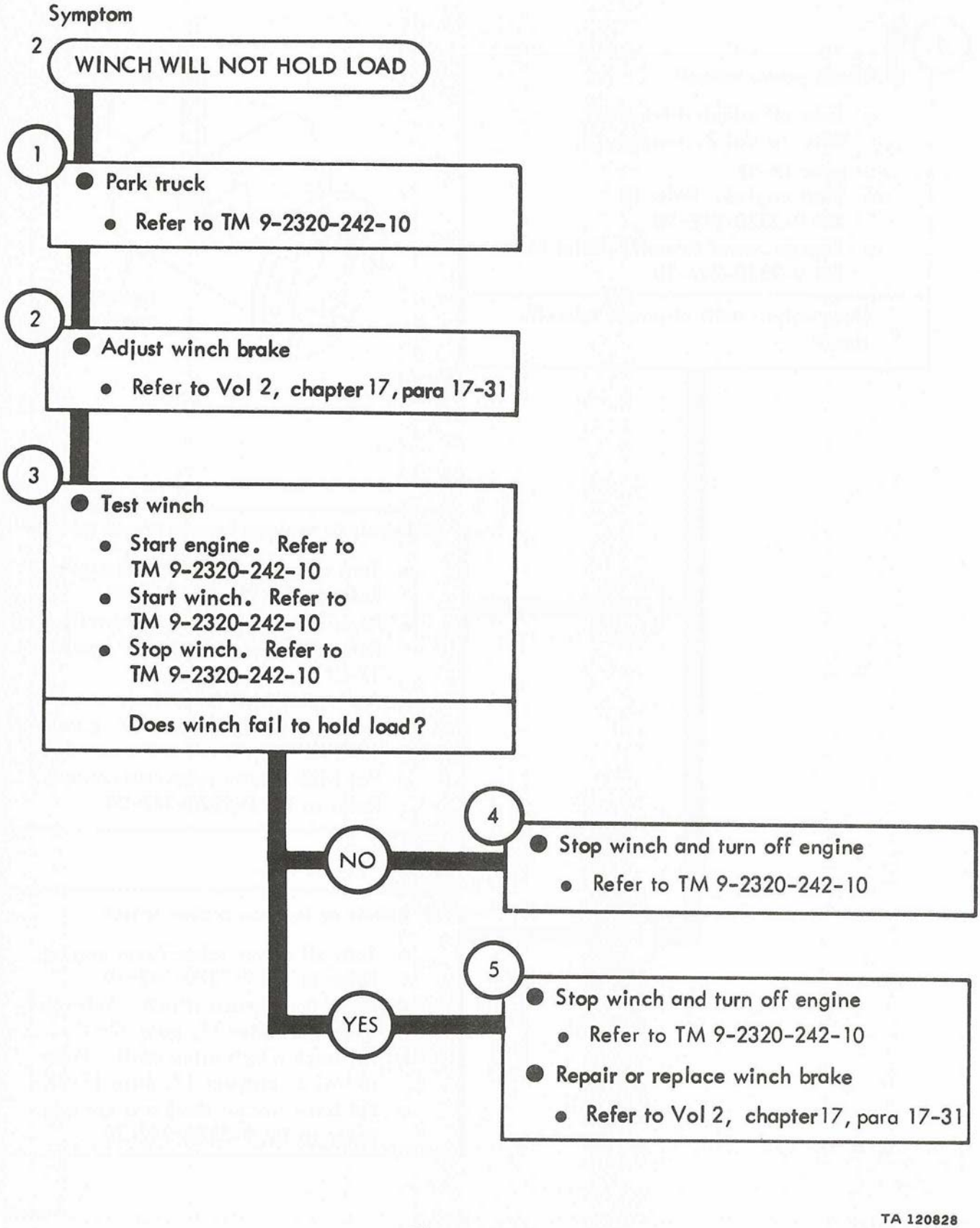

Symptom
2
WINCH WILL NOT HOLD LOAD
1
Park truck
Refer to TM 9-2320-242-10
2
Adjust winch brake
Refer to Vol 2, chapter 17, para 17-31
3
Test winch
Start engine. Refer to TM 9-2320-242-10
Start winch. Refer to TM 9-2320-242-10
Stop winch. Refer to TM 9-2320-242-10
Does winch fail to hold load?
NO
4
Stop winch and turn off engine
Refer to TM 9-2320-242-10
YES
5
Stop winch and turn off engine
Refer to TM 9-2320-242-10
Repair or replace winch brake
Refer to Vol 2, chapter 17, para 17-31
TA 120828

Figure 14-2

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
CDR, 1st Bn, 65th ADA
Attn: SP4 Jane Idone
Key West, FL 33040

DATE SENT
27 July 1980

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-2320-242-34-1	15 June 1980	DIR. & GEN. SUPPORT TROUBLESHOOTING MANUAL

BE EXACT .PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
6-3			6-4
9-2		9-1 (Sheet 1 of 3)	
13-2		13-1	

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

Symptom 1, detailed procedure refers to figure 13-4. Should refer to figure 13-1.

Box (3), second sentence reads "Start engine and let it run." Should read "Start engine and run at 600 RPM"

Change illustration callouts.
Reason: callouts for TRANSMISSION COVER and SHIFTER FORKS are reversed.

SAMPLE

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
SP4 Jane Idone Autovon 222-2224

SIGN HERE
Jane Idone

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $.

SAMPLE

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S.MAIL

TEAR ALONG PERFORATED LINE

Commander
U.S. Army Tank-Automotive Command
ATTN: DRSTA-MB
Warren. MI 48090

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-2320-242-34-1	29 JAN. 1981	DIR. & GEN. SUPPORT TROUBLESHOOTING MANUAL

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:

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S.MAIL

TEAR ALONG PERFORATED LINE

Commander
U.S. Army Tank-Automotive Command
ATTN: DRSTA-MB
Warren. MI 48090

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-2320-242-34-1	29 JAN. 1981	DIR. & GEN. SUPPORT TROUBLESHOOTING MANUAL

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:

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S.MAIL

TEAR ALONG PERFORATED LINE

Commander
U.S. Army Tank-Automotive Command
ATTN: DRSTA-MB
Warren, MI 48090

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 9-2320-242-34-1	29 Jan 81	DIR. & GEN. SUPPORT TROUBLESHOOTING MANUAL

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO

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

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S.MAIL

TEAR ALONG PERFORATED LINE

Commander
U.S. Army Tank-Automotive Command
ATTN: DRSTA-MB
Warren, MI 48090

By Order of the Secretaries of the Army and the Air Force:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

LEW ALLEN, JR., General, USAF
Chief of Staff

Official:

VAN L. CRAWFORD, JR., Colonel, USAF
Director of Administration

Distribution:

To be distributed in accordance with DA Form 12-38, Direct Support and General Support Maintenance requirements for Truck, Cargo: 1-1/4 ton, 6x6, M561 and Ambulance, M792.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1984—421-302/10373

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

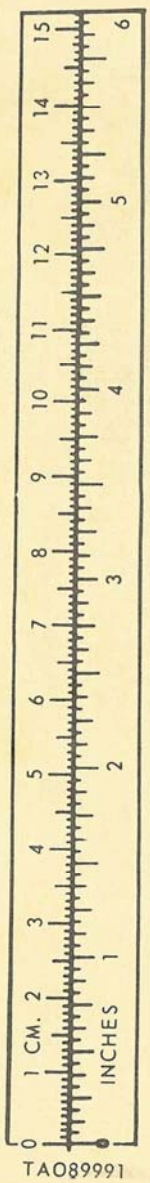
TEMPERATURE

$5/9\ (^0F - 32) = {}^0C$
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**



TA089991