

* This publication supersedes TM 9-2320-260-34-1, TM 9-2320-260-34-2-1, TM 9-2320-260-34-2-2, TM 9-2320-260-34-2-3, TM 9-2320-260-34-2-4, and TM 9-2320-260-34-2-5, 31 December 1980, for M809 series vehicles.

**TECHNICAL MANUAL
VOLUME 1 OF 2
DIRECT SUPPORT AND
GENERAL SUPPORT MAINTENANCE
FOR
5-TON, 6X6, M809 SERIES TRUCKS
(DIESEL)**

TRUCK, CARGO: 5-TON, 6X6,
M813 (2320-00-050-8902) (EIC:BSB);
(2320-00-050-8890) (EIC:BSA)
M813A1 (2320-00-050-891 3) (EIC: BSD);
(2320-00-050-8905) (EIC:BSC)
M814 (2320-00-050-8988) (EIC:BSK);
(2320-00-050-8987) (EIC:BSJ)

TRUCK, BOLSTER, LOGGING: 5-TON, 6X6
M815 (2320-00-050-8927) (EIC:BSE)

TRUCK, WRECKER, MEDIUM: 5-TON, 6X6
M816 (2320-00-05 1-0489) (EIC:BSQ)

TRUCK, DUMP: 5-TON, 6X6
M817 (2320-00-050-8970) (EIC:BSF);
(2320-00-05 1-0589) (EIC:BSR)

TRUCK, TRACTOR: 5-TON, 6X6
M818 (2320-00-050-8984) (EIC:BSH);
(2320-00-050-8978) (EIC:BSG)

TRUCK, TRACTOR, WRECKER: 5-TON, 6X6
M819 (2320-00-050-9004) (EIC:BSL)

TRUCK, VAN, EXPANSIBLE: 5-TON, 6X6
M820 (2320-00-050-9006) (EIC:BSM)
M820A1 (2320-00-050-9007)
M820A2 (2320-00-050-9010) (EIC:BSN)

TRUCK, STAKE, BRIDGE TRANSPORTING: 5-TON, 6X6
M821 (2320-00-050-9015) (EIC:BSP)

DISTRIBUTION STATEMENT A. Approved for public release:
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TECHNICAL MANUAL
NO. 9-2320-260-34-1

TECHNICAL ORDER
NO. 36A12-1C-1122-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 25 July 1994

TECHNICAL MANUAL
VOLUME 1 OF 2
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
FOR
5-TON, 6X6, M809 SERIES TRUCKS
(DIESEL)

Model	NSN Without Winch (EIC)			NSN With Winch (EIC)	
Truck, Cargo	M813	2320-00-050-8902	(BSB)	2320-00-050-8890	(BSA)
	M813A1	2320-00-050-8913	(BSD)	2320-00-050-8905	(BSC)
	M814	2320-00-050-8988	(BSK)	2320-00-050-8987	(BSJ)
Truck, Bolster, Logging	M815			2320-00-050-8927	(BSE)
Truck, Wrecker, Medium	M816			2320-00-051-0489	(BSQ)
Truck, Dump	M817	2320-00-050-8970	(BSF)	2320-00-051-0589	(BSR)
Truck, Tractor	M818	2320-00-050-8984	(BSH)	2320-00-050-8978	(BSG)
Truck, Tractor, Wrecker	M819			2320-00-050-9004	(BSL)
Truck, Van, Expansible	M820	2320-00-050-9006	(BSM)		
	M820A1	2320-00-050-9007			
	M820A2	2320-00-050-9010	(BSN)		
Truck, Stake, Bridge Transporting	M821			2320-00-050-9015	(BSP)

This manual is published in two parts. TM 9-2320-260-34-1 contains Chapters 1 through 11, and TM 9-2320-260-34-2 contains Chapters 12 through 17 and Appendices A, B, C, D, E, and F.

This manual contains a table of contents and an alphabetized index for Chapters 1 through 11.

* This publication supersedes TM 9-2320-260-34-1, TM 9-2320-260-34-2-1, TM 9-2320-260-34-2-2, TM 9-2320-260-34-2-3, TM 9-2320-260-34-2-4, and TM 9-2320-260-34-2-5, dated 31 December 1980, for M809 series vehicles.

DISTRIBUTION STATEMENT A. Approved for public release;
distribution is unlimited.

REPORTING OF ERRORS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2, located in back of this manual, direct to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, Michigan 48397-5000. A reply will be furnished to you.

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HOW TO USE THIS MANUAL

ABOUT YOUR MANUAL

Spend some time looking through this manual. You'll find that it has a new look, different than most of the TM's you've been using.

New features added to improve the convenience of this manual and increase your efficiency are:

- a. Accessing Information** - These include features such as the bleed-to-edge locators on the cover and edge of the manual. Extensive troubleshooting guides for specific systems lead directly to step-by-step directions for problem solving and maintenance tasks.
- b. Illustrations** - A variety of methods are used to make locating and fixing components much easier. Locator illustrations with keyed text, exploded views, and cut-away diagrams make the information in this manual easier to understand and follow.
- c. Keying Text With Illustrations** - Illustrations/text are located on facing pages that show the specific task you are working on. In some cases, the task steps and illustrations are located side by side. Continue reading for an example of modular text and illustrations.
- d. General Features** - Your TM is the best source available for providing information and data critical to vehicle operation and maintenance:
 - Safety warning summary (pages a through c)
 - General information, equipment descriptions, and data (Chapter 1)
 - Mechanical troubleshooting (Chapter 2, Section II)
 - Detailed maintenance procedures (Chapters 3 through 17)
 - References (Appendix A)
 - Common and special tools list (Appendix B)
 - Expendable/durable supplies and materials list (Appendix C)
 - Mandatory replacement parts (Appendix D)
 - Illustrated list of manufactured items (Appendix E)
 - Torque limits (Appendix F)

A typical example of how to use this manual is provided on the following pages.

USING YOUR MANUAL: AN EXAMPLE

TASK: The direct and general support maintenance mechanic of an M809 series vehicle reports that the engine will not crank. The vehicle has been assigned to you for repair.

TROUBLESHOOTING STEPS:

1. Look at the cover of this manual. You'll see chapter/section titles listed from top to bottom on the right-hand side.
2. Look at the right edge of the manual. On some of the pages you'll see edge indicators (black bars) that are aligned with the chapter/section bars on the cover. These are the locations of the chapters/sections in the text.
3. Look for "SERVICE AND TROUBLESHOOTING INSTRUCTIONS" in the chapter list on the cover. This is where the troubleshooting information is located.
4. Turn to those pages with the edge indicator matching the black bar for service and troubleshooting instructions. Page numbers are also listed next to chapter/section titles.
5. One of the first pages having service and troubleshooting instructions edge indicators is the "MECHANICAL TROUBLESHOOTING INDEX."
6. Look down the list until you find "ENGINE." Beneath that heading you will find the symptoms noted by the maintenance mechanic: "Engine will not crank."
7. Turn to the page indicated: 2-5.
8. On page 2-5, steps/tests relating to resolving the problem of "Engine will not crank" are found.

You perform the inspections and find that the fuel pump must be replaced. Paragraph 5-13 is referenced.

The rest of the inspection shows no other cause for the problem.

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TECHNICAL MANUAL VOLUME 1 OF 2 DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE FOR 5-TON, 6X6, M809 SERIES TRUCKS (DIESEL)	
TRUCK, CARGO: 5-TON, 6X6 M813 (2320-00-050-8902) [EIC:BSB]; (2320-00-050-8890) [EIC:BSA]; M813A1 (2320-00-050-8913) [EIC:BSD]; (2320-00-050-8905) [EIC:BSG]; M814 (2320-00-050-8908) [EIC:BSK]; (2320-00-050-8987) [EIC:BSJ]	
TRUCK, BOLSTER, LOGGING: 5-TON, 6X6 M815 (2320-00-050-8927) [EIC:BSL]	
TRUCK, WRECKER, MEDIUM: 5-TON, 6X6 M816 (2320-00-051-0489) [EIC:BSQ]	
TRUCK, DUMP: 5-TON, 6X6 M817 (2320-00-050-8970) [EIC:BSF]; (2320-00-051-0589) [EIC:BSR]	
TRUCK, TRACTOR: 5-TON, 6X6 M818 (2320-00-050-8984) [EIC:BSH]; (2320-00-050-8978) [EIC:BSG]	
TRUCK, TRACTOR, WRECKER: 5-TON, 6X6 M819 (2320-00-050-9004) [EIC:BSL]	
TRUCK, VAN, EXPANSIBLE: 5-TON, 6X6 M820 (2320-00-050-9006) [EIC:BSM]; M820A1 (2320-00-050-9007); M820A2 (2320-00-050-9010) [EIC:BSN]	
TRUCK, STAKE, BRIDGE TRANSPORTING: 5-TON, 6X6 M821 (2320-00-050-9015) [EIC:BSF]	

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DEPARTMENTS OF THE ARMY AND THE AIR FORCE

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- c. Repeat coolant system pressure test. Cylinder liner or block is cracked if coolant leak is still present. Replace engine (para. 3-24).
- Step 4. Check for fuel liquid lock.
- a. Shut off fuel at fuel inlet to fuel pump (TM 9-2320-260-10).
- b. Remove rocker lever housing covers (para. 3-14); turn engine, and observe for proper injector arm movement.
- (1) Replace fuel injectors (para. 5-6) if injector arm movement is correct.
- (2) Remove cam follower housing (para. 3-19); rotate engine, and check cams and mechanical linkage to injectors if injector arm movement is not correct. Install cam follower housing (para. 3-19).
- Step 5. Check for mechanical lockup.
- a. Remove fuel pump (para. 5-13).
- (1) Replace fuel pump if engine rotates.
- (2) Proceed to b. if engine does not rotate.
- b. Remove air compressor (para. 11-3).
- (1) Replace air compressor if engine rotates.
- (2) Proceed to c. if engine does not rotate.
- c. Remove accessory drive (para. 3-9).
- (1) Replace accessory drive if engine rotates.
- (2) Replace engine if engine still does not rotate (para. 3-24).
- END OF TESTING**

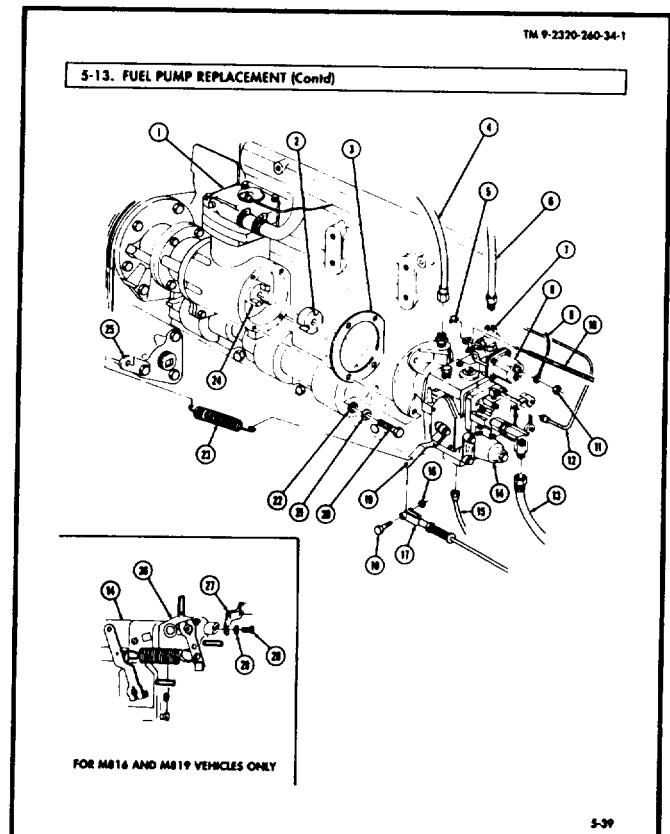
9. To locate paragraph 5-13 refer to the first page of Chapter 5. You find that fuel pump maintenance is in section III (page 5-37). Turn to page 5-37 and find "Fuel Pump Replacement" in the "Fuel Pump Maintenance Index." You are directed to page 5-38.

TM 9-2320-260-34-1		
CHAPTER 5		
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10. Turn to paragraph 5-13 on page 5-38. Here you will find the detailed procedure for removing the old fuel pump and replacing it with a new one.

TM 9-2320-260-34-1		
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TM 9-2320-260-34-1	
5-13. FUEL PUMP REPLACEMENT	
THIS TASK COVERS:	
a. Removal	b. Installation
INITIAL SETUP	
APPLICABLE MODELS	REFERENCES (TM)
All	TM 9-2320-260-10
	TM 9-2320-260-20
	TM 9-2320-260-34-P-1
TOOLS	EQUIPMENT CONDITION
General mechanic's tool kit (Appendix B, Item 1)	• Parking brake set (TM 9-2320-260-10)
MATERIALS/PARTS	• Hood raised and secured (TM 9-2320-260-10)
Two lock washers (Appendix D, Item 225)	• Fuel supply and return tubes removed (TM 9-2320-260-20)
Four lock washers (Appendix D, Item 217)	
Gasket (Appendix D, Item 119)	
GENERAL SAFETY INSTRUCTIONS	
Diesel fuel is flammable. Do not perform this task near open flame.	
WARNING	
Diesel fuel is flammable. Do not perform fuel system procedures near open flame. Injury to personnel may result.	
1. Disconnect tachometer driveshaft cable (4) from fuel pump (14).	
2. Remove nut (11) and emergency shutdown control wire (8) from emergency shutoff valve (8).	
3. Remove nut (5) and emergency control cable (10) from manual shutoff valve (7).	
4. Disconnect fuel supply tube (6) from manual shutoff valve (7).	
NOTE	
Perform step 5 for M816 and M819 vehicles.	
5. Remove two screws (26), lock washers (29), and air cylinder bracket (27) from VS governor (26). Discard lock washers (29).	
6. Disconnect primer pump fuel line (15) from fuel pump (14).	
7. Disconnect fuel inlet line (13) from fuel pump (14).	
8. Disconnect fuel return tube (12) from fuel pump (14).	
9. Remove spring (23) from accelerator lever (19) and bracket (25).	
10. Remove nut (16), screw (18), and accelerator rod (17) from accelerator lever (19).	
11. Remove four screws (20), washers (21), lock washers (22), fuel pump (14), and gasket (3) from air compressor (1). Discard lock washers (22) and gasket (3).	
12. Remove spider coupling (2) from coupling drive (24).	



DETAILED MAINTENANCE PROCEDURES:

11. Detailed procedures: Include everything you must do to accomplish a basic maintenance task.
 - a. Before beginning the maintenance task, look through the procedure. You must familiarize yourself with the entire maintenance procedure before beginning the maintenance task. The entire procedure of paragraph 5-13: "Fuel Pump Replacement" includes: a. Removal and b. Installation.
 - b. The eight basic headings listed under "INITIAL SETUP" outline special tools, materials, personnel requirements, and special conditions. Headings will not be listed if there are no entries. The headings are:
 - **APPLICABLE MODELS** Any model(s) that require that particular maintenance task.
 - **TEST EQUIPMENT** Test equipment needed to complete the task.
 - **SPECIAL TOOLS** Special tools needed to complete the task.
 - **TOOLS** Common tools, not in the General Mechanic's Tool Kit, needed to complete the task.
 - **MATERIAIS/PARTS** All parts or materials needed to complete the task.
 - **PERSONNEL REQUIRED** The number of personnel needed to perform the task. If only one mechanic is needed, this heading will not be used. If you think that you need more help to correctly or safely complete a task (perhaps as the result of unusual conditions, etc.), alert your supervisor and ask for help.
 - **REFERENCES (TM)** Additional manuals needed to complete the task.
 - **EQUIPMENT CONDITION** Notes the conditions that must exist before starting the task.
 - **GENERAL SAFETY INSTRUCTIONS** Summarizes all safety warnings for the maintenance task.
 - c. A step-by-step maintenance procedure follows the "INITIAL SETUP" and gives detailed instructions for the procedure. These instructions give part name and action performed. The numbers in parentheses correspond to the part's callout number in the accompanying illustration. Warnings, cautions, and notes give additional information.
 - **WARNINGS** - Indicate conditions, practices, or procedures which must be observed to avoid personnel injury, loss of life, or long-term health hazard.
 - **CAUTIONS** - Indicate conditions, practices, Or procedures which must be observed to avoid damage to equipment or destruction of equipment.
 - **NOTES** – Include essential information of special importance, interest, or aid in job performance.
 - d. At the end of a procedure, "FOLLOW-ON TASK(S)" will list the additional task(s) that must be performed to complete the procedure.
12. You can also use the Table of Contents (page ii) to find more information about the vehicle.
13. Refer to TM 9-2320-260-34P, Direct Support and General Support Maintenance Repair Parts and Special Tools List for Truck, 5-Ton, 6x6, M809 series, when requisitioning parts, special tools, and equipment for direct support and general support maintenance.
14. Your manual is easier to use once you understand its design. We hope it will encourage you to use it more often as an aid to maintenance support for M809 series vehicles.

CHAPTER 1

INTRODUCTION

Section I. General Information (page 1-1)

Section II. Equipment Description and Data (page 1-2)

Section I. GENERAL INFORMATION

1-1. SCOPE

a. This technical manual contains instructions for direct support and general support maintenance of 5-ton, 6x6, diesel, M809 series vehicles.

b. The vehicle model numbers and equipment names are:

- (1) M813 Cargo Truck, W/W and WO/W
- (2) M813A1 Cargo Truck, W/W and WO/W
- (3) M814 Cargo Truck, W/W and WO/W
- (4) M815 Bolster Logging Truck, W/W
- (5) M816 Medium Wrecker Truck, W/W
- (6) M817 Dump Truck, W/W and WO/W
- (7) M818 Tractor Truck, W/W and WO/W
- (8) M819 Tractor Wrecker Truck, W/W
- (9) M820 Expansible Van Truck, WO/W
- (10) M820A1 Expansible Van Truck, WO/W
- (11) M820A2 Expansible Van Truck, WO/W
- (12) M821 Bridge Transporting Stake Truck, W/W

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, The Army Maintenance Management System (TAMMS).

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Procedures for destruction of Army materiel to prevent enemy use can be found in TM 750-244-6.

1-4. PREPARATION FOR STORAGE OR SHIPMENT

Storage and shipment instructions are in TM 9-2320-260-20. Additional information can be found in TM 746-10, Marking, Packaging, and Shipment of Supplies and Equipment: General Packaging Instructions for Field Use.

1-5. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS

The nomenclature, names, and designations used in this manual are in accordance with MIL-HDBK-63038-2.

1-6. EQUIPMENT REQUIRING CALIBRATION

Calibration requirements in this manual cover the fuel pump and fuel injectors and can be found in Chapter 5 of this manual.

1-7. REPORTING QUALITY DEFICIENCIES, IDEAS, AND EQUIPMENT IMPROVEMENT RECOMMENDATIONS

If your 5-ton, 6x6, M809 series vehicle needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail in accordance with DA PAM 738-750.

1-8. EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

The quarterly Equipment Improvement Report and Maintenance Digest (EIR MD), TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-39 series is compiled from some of the Equipment Improvement Reports (EIR) that you prepared on the vehicles covered in this manual. Many of these articles resulted from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO's), warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also, refer to DA PAM 25-30, Consolidated Index of Army Publications and Blank Forms, and Appendix A, References, in this manual.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-9. EQUIPMENT DESCRIPTION AND DATA

Detailed descriptions covering the 5-ton, 6x6, M809 series vehicles are in TM 9-2320-260-10 and TM 9-2320-260-20.

1-10. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Detailed descriptions and data covering the 5-ton, 6x6, M809 series vehicles are described in TM 9-2320-260-20. Equipment configurations with dimensions and weights (tabulated data) follow.

CHAPTER 2

SERVICE AND TROUBLESHOOTING INSTRUCTIONS

Section I. Repair Parts, Special Tools, TMDE, and Support Equipment (page 2-1)

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Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

2-1. COMMON TOOLS AND EQUIPMENT

Refer to Modified Table of Organization and Equipment (MTOE) for authorized common tools and equipment applicable to your unit.

2-2. SPECIAL TOOLS AND SUPPORT EQUIPMENT

Special tools and support equipment are listed and illustrated in TM 9-2320-260-34P.

2-3. TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE)

Calibrate all measuring and test equipment used to determine equipment conformance in accordance with MIL-STD-120, MIL-C-45662, MIL-L-45607, and TB 43-180.

2-4. FABRICATED TOOLS

Fabricated tools needed to maintain the equipment mentioned in this manual can be found in Appendix E. These tools are not available for issue; therefore, each one must be fabricated locally and applied by direct and general support personnel.

2-5. REPAIR PARTS

Repair parts are listed and illustrated in TM 9-2320-260-34P,

Section II. TROUBLESHOOTING

2-6. GENERAL TROUBLESHOOTING INSTRUCTIONS

a. Troubleshooting procedures in this section cannot give all the answers or correct all vehicle malfunctions encountered. However, these procedures are an organized step-by-step approach to a problem that directs tests and inspections toward the source of a problem and successful solution.

Information in this section is for use by support maintenance personnel in conjunction with, and as a supplement to, the troubleshooting procedures in TM 9-2320-260-20.

WARNING

- Do not operate a deadlined vehicle without preliminary inspection. Failure to do so may cause further damage to a disabled component and possible injury to personnel.
- Do not operate vehicle in an enclosed area without adequate ventilation. Failure to do so may result in injury to personnel.
- Hearing protection is required for driver, co-driver, and mechanic when engine is running. Noise levels produced by this vehicle exceed 85dB, which may cause injury to personnel.

2-6. GENERAL TROUBLESHOOTING INSTRUCTIONS (Contd)

b. Perform the easiest and most obvious troubleshooting tasks and corrections first. Most malfunctions are easily corrected. For example:

(1) Low power problems are generally caused by loose throttle linkage or dirty fuel or air filters.

(2) Excessive oil consumption is generally caused by leaky gaskets or loose line connections.

c. Double check before disassembly. The source of most engine problems can be traced to more than one part in a system. For example:

(1) Excessive fuel consumption may not be caused by the fuel pump alone. Instead, the trouble could be a clogged air cleaner reducing air inflow or a restricted passage causing abnormally high back pressure.

(2) Engines very often are disassembled in search of a complaint and the real evidence of the problem is destroyed. Check again to be sure an easier solution to the problem has not been overlooked.

(3) Check all tags, service request forms, and vehicle logbook for repair history. This may help lead to the source of problems.

d. Before attempting to correct a problem, diagnose the cause of the problem. Do not allow the same malfunction to reoccur.

MECHANICAL SYSTEMS TROUBLESHOOTING SYMPTOM INDEX

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ENGINE		
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2.	Engine cranks slowly	2-6
3.	Engine cranks but will not start	2-6
4.	Engine starts, won't run	2-6
5.	Engine stops when throttle is returned to idle position	2-6
6.	Engine has poor acceleration and/or lack of power	2-6
7.	Black exhaust smoke at idle	2-7
8.	Engine surges	2-7
9.	Engine misfires during normal operation	2-7
10.	Engine stops during normal operation (engine restarts)	2-7
11.	Engine stops during normal operation (engine does not restart).	2-7
12.	Exhaust color blue during normal operation	2-8
13.	Exhaust color white during normal operation and idle	2-9
14.	Engine oil pressure low at normal engine operating temperature.	2-9
15.	Engine oil pressure extremely high at normal operating temperature	2-9
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18.	Engine noise abnormal	2-10
19.	Engine vibration abnormal	2-11
FUEL SYSTEM		
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25.	Engine lubricating oil diluted by fuel	2-13
26.	Engine knocks	2-13

MECHANICAL SYSTEMS TROUBLESHOOTING SYMPTOM INDEX (Contd)

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30.	Burning odor evident with clutch engaged.	2-15
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39.	Transfer case will not operate rear differentials	2-17
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42.	Transfer case grinds or pops out of gear during normal vehicle operation	2-18
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MECHANICAL SYSTEMS TROUBLESHOOTING SYMPTOM INDEX (Contd)

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