

**TM 9-2320-209-20-2-1**  
**T.O. 36A12-1B-1092-1-2**

---

**TECHNICAL MANUAL**  
**VOLUME 2 OF 3**  
**PART 1 OF 2**  
**TROUBLESHOOTING**  
**ORGANIZATIONAL LEVEL**  
**2½-TON, 6X6, M44A1 AND M44A2 SERIES TRUCKS**  
**(MULTIFUEL)**

**TRUCK, CARGO: M35A1,**  
**M35A2, M35A2C, M36A2; TRUCK,**  
**TANK, FUEL: M49A1C, M49A2C; TRUCK, TANK,**  
**WATER: M50A1, M50A2, M50A3; TRUCK, VAN,**  
**SHOP: M109A2, M109A3; TRUCK, REPAIR SHOP:**  
**M185A2, M185A3; TRUCK, TRACTOR: M275A1,**  
**M275A2; TRUCK, DUMP: M342A2; TRUCK,**  
**MAINTENANCE, PIPELINE CONSTRUCTION:**  
**M756A2; TRUCK, MAINTENANCE,**  
**EARTH BORING AND POLESETTING: M764**

**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**  
**MAY 1981**

**\*TM 9-2320-209-20-2-1**  
**T.O. 36A12-1B-1092-1-2**

**TECHNICAL MANUAL**  
**NO. 9-2320-209-20-2-1**  
**TECHNICAL ORDER**  
**NO. 36A12-1B-1092-1-2**

**DEPARTMENTS OF THE ARMY**

**AND**

**THE AIR FORCE**

Washington, DC, 27 May 1981

**TECHNICAL MANUAL**

**VOLUME 2 OF 3**

**PART 1 OF 2**

**TROUBLESHOOTING**

**ORGANIZATIONAL LEVEL**

**2½-TON, 6x6, M44A1 AND M44A2 SERIES TRUCKS**

**(MULTIFUEL)**

| Model                                            |        | NSN without Winch | NSN with Winch   |
|--------------------------------------------------|--------|-------------------|------------------|
| Truck, Cargo                                     | M35A1  | 2320-00-542-5633  | 2320-00-542-5634 |
|                                                  | M35A2  | 2320-00-077-1616  | 2320-00-077-1617 |
|                                                  | M35A2C | 2320-00-926-0873  | 2320-00-926-0875 |
|                                                  | M36A2  | 2320-00-077-1618  | 2320-00-077-1619 |
| Truck, Tank, Fuel                                | M49A1C | 2320-00-440-3349  | 2320-00-440-3346 |
|                                                  | M49A2C | 2320-00-077-1631  | 2320-00-077-1632 |
| Truck, Tank, Water                               | M50A1  | 2320-00-440-8307  | 2320-00-440-8305 |
|                                                  | M50A2  | 2320-00-077-1633  | 2320-00-077-1634 |
|                                                  | M50A3  | 2320-00-937-4036  | 2320-00-937-5264 |
| Truck, Van, Shop                                 | M109A2 | 2320-00-440-8313  | 2320-00-440-8308 |
|                                                  | M109A3 | 2320-00-077-1636  | 2320-00-077-1637 |
| Truck, Repair Shop                               | M185A2 | 4940-00-987-8799  |                  |
|                                                  | M185A3 | 4940-00-077-1638  | 4940-00-077-1639 |
| Truck, Tractor                                   | M275A1 | 2320-00-446-2479  |                  |
|                                                  | M275A2 | 2320-00-077-1640  | 2320-00-077-1641 |
| Truck, Dump                                      | M342A2 | 2320-00-077-1643  | 2320-00-077-1644 |
| Truck, Maintenance, Pipeline Construction        | M756A2 |                   | 2320-00-904-3277 |
| Truck, Maintenance, Earth Boring and Polesetting | M764   |                   | 2320-00-937-5980 |

\*This manual, together with TM 9-2320-209-20-1, 27 May 1981; TM 9-2320-209-20-2, 27 May 1981; TM 9-2320-209-20-3-1, 27 May 1981; TM 9-2320-209-20-3-2, 27 May 1981; TM 9-2320-209-20-3-3, 27 May 1981; and TM 9-2320-209-20-3-4, 27 May 1981, supersedes TM 9-2320-209-20-1, 31 August 1978.

## REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake 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-MBT, Warren, Michigan 48090. A reply will be furnished to you.

## TABLE OF CONTENTS

|                                                        | Paragraph | Page |
|--------------------------------------------------------|-----------|------|
| CHAPTER 1. GENERAL INFORMATION                         |           |      |
| Scope.....                                             | 1-1       | 1-1  |
| Organization.....                                      | 1-2       | 1-1  |
| Troubleshooting Approach.....                          | 1-3       | 1-1  |
| CHAPTER 2. TROUBLESHOOTING APPROACH                    |           |      |
| General Approach.....                                  | 2-1       | 2-1  |
| Troubleshooting Index . . . . .                        | 2-2       | 2-1  |
| Test Equipment Procedures Index.....                   | 2-3       | 2-1  |
| Troubleshooting Roadmaps.....                          | 2-4       | 2-1  |
| Fault Symptom Index.....                               | 2-5       | 2-1  |
| Sample Troubleshooting Procedure . . . . .             | 2-6       | 2-1  |
| CHAPTER 3. TROUBLESHOOTING INDEX                       |           |      |
| General . . . . .                                      | 3-1       | 3-1  |
| Index . . . . .                                        | 3-2       | 3-1  |
| CHAPTER 4. TEST EQUIPMENT PROCEDURES INDEX             |           |      |
| General . . . . .                                      | 4-1       | 4-1  |
| Index . . . . .                                        | 4-2       | 4-1  |
| CHAPTER 5. TROUBLESHOOTING ROADMAPS                    |           |      |
| General . . . . .                                      | 5-1       | 5-1  |
| Roadmaps . . . . .                                     | 5-2       | 5-1  |
| CHAPTER 6. FAULT SYMPTOM INDEXES                       |           |      |
| General . . . . .                                      | 6-1       | 6-1  |
| Indexes . . . . .                                      | 6-2       | 6-1  |
| CHAPTER 7. SAMPLE TROUBLESHOOTING PROCEDURE            |           |      |
| General . . . . .                                      | 7-1       | 7-1  |
| Sample Detailed Procedure . . . . .                    | 7-2       | 7-1  |
| Sample Test Equipment Procedure.....                   | 7-3       | 7-1  |
| Sample Summary Troubleshooting<br>Procedures . . . . . | 7-4       | 7-2  |
| CHAPTER 8. ENGINE SYSTEM TROUBLESHOOTING               |           |      |
| Equipment Items Covered . . . . .                      | 8-1       | 8-1  |
| Equipment Items Not Covered . . . . .                  | 8-2       | 8-1  |
| CHAPTER 9. ENGINE SYSTEM TROUBLESHOOTING<br>SUMMARY    |           |      |
| General . . . . .                                      | 9-1       | 9-1  |
| Procedures . . . . .                                   | 9-2       | 9-1  |

## TABLE OF CONTENTS-CONT

|                                                        | Paragraph | Page |
|--------------------------------------------------------|-----------|------|
| CHAPTER 10. ENGINE DRIVELINE SUBSYSTEM TROUBLESHOOTING |           |      |
| Equipment Items Covered . . . . .                      |           | 10-1 |
| Equipment Items Not Covered . . . . .                  | 10-2      | 10-1 |
| CHAPTER 11. CLUTCH SYSTEM TROUBLESHOOTING              |           |      |
| Equipment Items Covered . . . . .                      | 11-1      | 11-1 |
| Equipment Items Not Covered . . . . .                  | 11-2      | 11-1 |
| CHAPTER 12. CLUTCH SYSTEM TROUBLESHOOTING SUMMARY      |           |      |
| General . . . . .                                      | 12-1      | 12-1 |
| Procedures . . . . .                                   | 12-2      | 12-1 |
| CHAPTER 13. FUEL SYSTEM TROUBLESHOOTING                |           |      |
| Equipment Items Covered . . . . .                      | 13-1      | 13-1 |
| Equipment Items Not Covered . . . . .                  | 13-2      | 13-1 |
| CHAPTER 14. FUEL SYSTEM TROUBLESHOOTING SUMMARY        |           |      |
| General . . . . .                                      | 14-1      | 14-1 |
| Procedures . . . . .                                   | 14-2      | 14-1 |
| CHAPTER 15. FUEL SYSTEM SUPPORT DIAGRAMS               |           |      |
| General . . . . .                                      | 15-1      | 15-1 |
| CHAPTER 16. FUEL SYSTEM TEST PROCEDURES                |           |      |
| General . . . . .                                      | 16-1      | 16-1 |
| Test Set-up . . . . .                                  | 16-2      | 16-1 |
| Test Procedure . . . . .                               | 16-3      | 16-1 |
| CHAPTER 17. EXHAUST SYSTEM TROUBLESHOOTING             |           |      |
| Equipment Items Covered . . . . .                      | 17-1      | 17-1 |
| Equipment Items Not Covered . . . . .                  | 17-2      | 17-1 |
| CHAPTER 18. EXHAUST SYSTEM TROUBLESHOOTING SUMMARY     |           |      |
| General . . . . .                                      | 18-1      | 18-1 |
| Procedures . . . . .                                   | 18-2      | 18-1 |
| CHAPTER 19. EXHAUST SYSTEM SUPPORT DIAGRAMS            |           |      |
| General . . . . .                                      | 19-1      | 19-1 |
| CHAPTER 20. COOLING SYSTEM TROUBLESHOOTING             |           |      |
| Equipment Items Covered . . . . .                      | 20-1      | 20-1 |
| Equipment Items Not Covered . . . . .                  | 20-2      | 20-1 |
| CHAPTER 21. COOLING SYSTEM TROUBLESHOOTING SUMMARY     |           |      |
| General . . . . .                                      | 21-1      | 21-1 |
| Procedures . . . . .                                   | 21-2      | 21-1 |
| CHAPTER 22. COOLING SYSTEM SUPPORT DIAGRAMS            |           |      |
| General . . . . .                                      | 22-1      | 22-1 |
| CHAPTER 23. COOLING SYSTEM TEST PROCEDURES             |           |      |
| General . . . . .                                      | 23-1      | 23-1 |
| Test Set-Up . . . . .                                  | 23-2      | 23-1 |
| Test Procedure . . . . .                               | 23-3      | 23-1 |

**TABLE OF CONTENTS-CONT**

|             |                                       | Paragraph | Page |
|-------------|---------------------------------------|-----------|------|
| CHAPTER 24. | COOLING SYSTEM CHECKOUT PROCEDURES    |           |      |
|             | General . . . . .                     | 24-1      | 24-1 |
| CHAPTER 25. | ELECTRICAL SYSTEM TROUBLESHOOTING     |           |      |
|             | Equipment Items Covered . . . . .     | 25-1      | 25-1 |
|             | Equipment Items Not Covered . . . . . | 25-2      | 25-1 |
|             | PART 2 OF 2                           |           |      |
|             | (TM 9-2320-209-20-2-2)                |           |      |
| CHAPTER 26. | ELECTRICAL SYSTEM TROUBLESHOOTING     |           |      |
|             | SUMMARY                               |           |      |
|             | General . . . . .                     | 26-1      | 26-1 |
|             | Procedures . . . . .                  | 26-2      | 26-1 |
| CHAPTER 27. | ELECTRICAL SYSTEM SUPPORT DIAGRAMS    |           |      |
|             | General . . . . .                     | 27-1      | 27-1 |
| CHAPTER 28. | MULTIMETER TEST PROCEDURES            |           |      |
|             | General . . . . .                     | 28-1      | 28-1 |
|             | Test Set-Up . . . . .                 | 28-2      | 28-1 |
|             | Test Procedure . . . . .              | 28-3      | 28-1 |
| CHAPTER 29. | OPERATING AND PRELIMINARY PROCEDURES  |           |      |
|             | Equipment Items Covered . . . . .     | 29-1      | 29-1 |
|             | Equipment Items Not Covered . . . . . | 29-2      | 29-1 |
| CHAPTER 30. | ELECTRICAL SYSTEM CHECKOUT            |           |      |
|             | PROCEDURES                            |           |      |
|             | General . . . . .                     | 30-1      | 30-1 |
| CHAPTER 31. | TRANSMISSION SYSTEM TROUBLESHOOTING   |           |      |
|             | Equipment Items Covered . . . . .     | 31-1      | 31-1 |
|             | Equipment Items Not Covered . . . . . | 31-2      | 31-1 |
| CHAPTER 32. | TRANSMISSION SYSTEM TROUBLESHOOTING   |           |      |
|             | SUMMARY                               |           |      |
|             | General . . . . .                     | 32-1      | 32-1 |
|             | Procedures . . . . .                  | 32-2      | 32-1 |
| CHAPTER 33. | TRANSFER SYSTEM TROUBLESHOOTING       |           |      |
|             | Equipment Items Covered . . . . .     | 33-1      | 33-1 |
|             | Equipment Items Not Covered . . . . . | 33-2      | 33-1 |
| CHAPTER 34. | TRANSFER SYSTEM TROUBLESHOOTING       |           |      |
|             | SUMMARY                               |           |      |
|             | General . . . . .                     | 34-1      | 34-1 |
|             | Procedures . . . . .                  | 34-2      | 34-1 |
| CHAPTER 35. | TRANSFER SYSTEM CHECKOUT PROCEDURES   |           |      |
|             | General . . . . .                     | 35-1      | 35-1 |
| CHAPTER 36. | PROPELLER SHAFT SYSTEM                |           |      |
|             | TROUBLESHOOTING                       |           |      |
|             | Equipment Items Covered . . . . .     | 36-1      | 36-1 |
|             | Equipment Items Not Covered . . . . . | 36-2      | 36-1 |
| CHAPTER 37. | PROPELLER SHAFT SYSTEM TROUBLE-       |           |      |
|             | SHOOTING SUMMARY                      |           |      |
|             | General . . . . .                     | 37-1      | 37-1 |
|             | Procedures . . . . .                  | 37-2      | 37-1 |

## TABLE OF CONTENTS-CONT

|                                                       | Paragraph | Page |
|-------------------------------------------------------|-----------|------|
| CHAPTER 38. PROPELLER SHAFT SYSTEM SUPPORT DIAGRAMS   |           |      |
| General .....                                         | 38-1      | 38-1 |
| CHAPTER 39. FRONT AXLE SYSTEM TROUBLESHOOTING         |           |      |
| Equipment Items Covered .....                         | 39-1      | 39-1 |
| Equipment Items Not Covered .....                     | 39-2      | 39-1 |
| CHAPTER 40. FRONT AXLE SYSTEM TROUBLESHOOTING SUMMARY |           |      |
| General .....                                         | 40-1      | 40-1 |
| Procedures .....                                      | 40-2      | 40-1 |
| CHAPTER 41. FRONT AXLE SYSTEM CHECKOUT PROCEDURES     |           |      |
| General .....                                         | 41-1      | 41-1 |
| CHAPTER 42. REAR AXLE SYSTEM TROUBLESHOOTING          |           |      |
| Equipment Items Covered .....                         | 42-1      | 42-1 |
| Equipment Items Not Covered .....                     | 42-2      | 42-1 |
| CHAPTER 43. REAR AXLE SYSTEM SUPPORT DIAGRAMS         |           |      |
| General .....                                         | 43-1      | 43-1 |
| CHAPTER 44. BRAKE SYSTEM TROUBLESHOOTING              |           |      |
| Equipment Items Covered .....                         | 44-1      | 44-1 |
| Equipment Items Not Covered .....                     | 44-2      | 44-1 |
| CHAPTER 45. BRAKE SYSTEM TROUBLESHOOTING SUMMARY      |           |      |
| General .....                                         | 45-1      | 45-1 |
| Procedures .....                                      | 45-2      | 45-1 |
| CHAPTER 46. BRAKE SYSTEM SUPPORT DIAGRAMS             |           |      |
| General .....                                         | 46-1      | 46-1 |
| CHAPTER 47. HANDBRAKE SUBSYSTEM TROUBLESHOOTING       |           |      |
| Equipment Items Covered .....                         | 47-1      | 47-1 |
| Equipment Items Not Covered .....                     | 47-2      | 47-1 |
| CHAPTER 48. COMPRESSED AIR SUBSYSTEM TROUBLESHOOTING  |           |      |
| Equipment Items Covered .....                         | 48-1      | 48-1 |
| Equipment Items Not Covered .....                     | 48-2      | 48-1 |
| CHAPTER 49. BRAKE SYSTEM TEST PROCEDURES              |           |      |
| General .....                                         | 49-1      | 49-1 |
| Test Set-Up .....                                     | 49-2      | 49-1 |
| Test Procedure .....                                  | 49-3      | 49-1 |
| CHAPTER 50. BRAKE SYSTEM CHECKOUT PROCEDURES          |           |      |
| General .....                                         | 50-1      | 50-1 |
| CHAPTER 51. WHEEL SYSTEM TROUBLESHOOTING              |           |      |
| Equipment Items Covered .....                         | 51-1      | 51-1 |
| Equipment Items Not Covered .....                     | 51-2      | 51-1 |
| CHAPTER 52. STEERING SYSTEM TROUBLESHOOTING           |           |      |
| Equipment Items Covered .....                         | 52-1      | 52-1 |
| Equipment Items Not Covered .....                     | 52-2      | 52-1 |
| CHAPTER 53. STEERING SYSTEM TROUBLESHOOTING SUMMARY   |           |      |
| General .....                                         | 53-1      | 53-1 |
| Procedures .....                                      | 53-2      | 53-1 |
| CHAPTER 54. STEERING SYSTEM SUPPORT DIAGRAMS          |           |      |
| General .....                                         | 54-1      | 54-1 |

## TABLE OF CONTENTS-CONT

|                                                                          | Paragraph | Page |
|--------------------------------------------------------------------------|-----------|------|
| CHAPTER 55. SPRING AND SHOCK ABSORBERS<br>SYSTEM TROUBLESHOOTING         |           |      |
| Equipment Items Covered .....                                            | 55-1      | 55-1 |
| Equipment Items Not Covered .....                                        | 55-2      | 55-1 |
| CHAPTER 56. SPRING AND SHOCK ABSORBERS<br>SYSTEM TROUBLESHOOTING SUMMARY |           |      |
| General .....                                                            | 56-1      | 56-1 |
| Procedures .....                                                         | 56-2      | 56-1 |
| CHAPTER 57. DUMP BODY TROUBLESHOOTING                                    |           |      |
| Equipment Items Covered .....                                            | 57-1      | 57-1 |
| Equipment Items Not Covered .....                                        | 57-2      | 57-1 |
| CHAPTER 58. DUMP BODY TROUBLESHOOTING<br>SUMMARY                         |           |      |
| General .....                                                            | 58-1      | 58-1 |
| Procedures .....                                                         | 58-2      | 58-1 |
| CHAPTER 59. DUMP BODY SUPPORT DIAGRAMS                                   |           |      |
| General .....                                                            | 59-1      | 59-1 |
| CHAPTER 60. DUMP BODY CHECKOUT PROCEDURES                                |           |      |
| General .....                                                            | 60-1      | 60-1 |
| CHAPTER 61. WATER TANK BODY TROUBLESHOOTING                              |           |      |
| Equipment Items Covered .....                                            | 61-1      | 61-1 |
| Equipment Items Not Covered .....                                        | 61-2      | 61-1 |
| CHAPTER 62. WATER TANK BODY TROUBLESHOOTING<br>SUMMARY                   |           |      |
| General .....                                                            | 62-1      | 62-1 |
| Procedures .....                                                         | 62-2      | 62-1 |
| CHAPTER 63. WATER TANK BODY SUPPORT DIAGRAMS                             |           |      |
| General .....                                                            | 63-1      | 63-1 |
| CHAPTER 64. WATER TANK BODY CHECKOUT PROCEDURES                          |           |      |
| General .....                                                            | 64-1      | 64-1 |
| CHAPTER 65. FUEL TANK BODY (TRUCK M49A1C)<br>TROUBLESHOOTING             |           |      |
| Equipment Items Covered .....                                            | 65-1      | 65-1 |
| Equipment Items Not Covered .....                                        | 65-2      | 65-1 |
| CHAPTER 66. FUEL TANK BODY (TRUCK M49A1C)<br>TROUBLESHOOTING SUMMARY     |           |      |
| General .....                                                            | 66-1      | 66-1 |
| Procedures .....                                                         | 66-2      | 66-1 |
| CHAPTER 67. FUEL TANK BODY (TRUCK M49A1C)<br>SUPPORT DIAGRAMS            |           |      |
| General .....                                                            | 67-1      | 67-1 |
| CHAPTER 68. FUEL TANK BODY (TRUCK M49A1C)<br>CHECKOUT PROCEDURES         |           |      |
| General .....                                                            | 68-1      | 68-1 |

## TABLE OF CONTENTS-CONT

|                                              | Paragraph | Page |
|----------------------------------------------|-----------|------|
| CHAPTER 69. FUEL TANK BODY (TRUCK M49A2C)    |           |      |
| TROUBLESHOOTING                              |           |      |
| Equipment Items Covered . . . . .            | 69-1      | 69-1 |
| Equipment Items Not Covered . . . . .        | 69-2      | 69-1 |
| CHAPTER 70. FUEL TANK BODY (TRUCK M49A2C)    |           |      |
| TROUBLESHOOTING SUMMARY                      |           |      |
| General . . . . .                            | 70-1      | 70-1 |
| Procedures . . . . .                         | 70-2      | 70-1 |
| CHAPTER 71. FUEL TANK BODY (TRUCK M49A2C)    |           |      |
| SUPPORT DIAGRAMS                             |           |      |
| General . . . . .                            | 71-1      | 71-1 |
| CHAPTER 72. FUEL TANK BODY (TRUCK M49A2C)    |           |      |
| CHECKOUT PROCEDURES                          |           |      |
| General . . . . .                            | 72-1      | 72-1 |
| CHAPTER 73. EARTH BORING MACHINE             |           |      |
| TROUBLESHOOTING                              |           |      |
| Equipment Items Covered . . . . .            | 73-1      | 73-1 |
| Equipment Items Not Covered . . . . .        | 73-2      | 73-1 |
| CHAPTER 74. EARTH BORING MACHINE TROUBLE-    |           |      |
| SHOOTING SUMMARY                             |           |      |
| General . . . . .                            | 74-1      | 74-1 |
| Procedures . . . . .                         | 74-2      | 74-1 |
| CHAPTER 75. EARTH BORING MACHINE SUPPORT     |           |      |
| DIAGRAMS                                     |           |      |
| General . . . . .                            | 75-1      | 75-1 |
| CHAPTER 76. EARTH BORING MACHINE CHECKOUT    |           |      |
| PROCEDURES                                   |           |      |
| General . . . . .                            | 76-1      | 76-1 |
| CHAPTER 77. FRONT WINCH TROUBLESHOOTING      |           |      |
| Equipment Items Covered . . . . .            | 77-1      | 77-1 |
| Equipment Items Not Covered . . . . .        | 77-2      | 77-1 |
| CHAPTER 78. FRONT WINCH TROUBLESHOOTING      |           |      |
| SUMMARY                                      |           |      |
| General . . . . .                            | 78-1      | 78-1 |
| Procedures . . . . .                         | 78-2      | 78-1 |
| CHAPTER 79. FRONT WINCH CHECKOUT PROCEDURES  |           |      |
| General . . . . .                            | 79-1      | 79-1 |
| CHAPTER 80. EARTH BORING MACHINE REAR WINCH  |           |      |
| TROUBLESHOOTING                              |           |      |
| Equipment Items Covered . . . . .            | 80-1      | 80-1 |
| Equipment Items Not Covered . . . . .        | 80-2      | 80-1 |
| CHAPTER 81. PIPELINE CONSTRUCTION TRUCK REAR |           |      |
| WINCH TROUBLESHOOTING                        |           |      |
| Equipment Items Covered . . . . .            | 81-1      | 81-1 |
| Equipment Items Not Covered . . . . .        | 81-2      | 81-1 |

## TABLE OF CONTENTS-CONT

|                                                   | Paragraph | Page |
|---------------------------------------------------|-----------|------|
| CHAPTER 82. ENGINE COOLANT HEATER TROUBLE-        |           |      |
| SHOOTING                                          |           |      |
| Equipment Items Covered .....                     | 82-1      | 82-1 |
| Equipment Items Not Covered. ....                 | 82-2      | 82-1 |
| CHAPTER 83. ENGINE COOLANT HEATER TROUBLE-        |           |      |
| SHOOTING SUMMARY                                  |           |      |
| General .....                                     | 83-1      | 83-1 |
| Procedures .....                                  | 83-2      | 83-1 |
| CHAPTER 84. ENGINE COOLANT HEATER SUPPORT         |           |      |
| DIAGRAMS                                          |           |      |
| General .....                                     | 84-1      | 84-1 |
| CHAPTER 85. ENGINE COOLANT HEATER TEST PROCEDURES |           |      |
| General .....                                     | 85-1      | 85-1 |
| Test Set-Up .....                                 | 85-2      | 85-1 |
| Test Procedure .....                              | 85-3      | 85-1 |
| CHAPTER 86. ENGINE COOLANT HEATER CHECKOUT        |           |      |
| PROCEDURES                                        |           |      |
| General .....                                     | 86-1      | 86-1 |
| CHAPTER 87. FUEL BURNING PERSONNEL HEATER         |           |      |
| TROUBLESHOOTING                                   |           |      |
| Equipment Items Covered .....                     | 87-1      | 87-1 |
| Equipment Items Not Covered .....                 | 87-2      | 87-1 |
| CHAPTER 88. FUEL BURNING PERSONNEL HEATER         |           |      |
| TROUBLESHOOTING SUMMARY                           |           |      |
| General .....                                     | 88-1      | 88-1 |
| Procedures .....                                  | 88-2      | 88-1 |
| CHAPTER 89. FUEL BURNING PERSONNEL HEATER         |           |      |
| SUPPORT DIAGRAMS                                  |           |      |
| General .....                                     | 89-1      | 89-1 |
| CHAPTER 90. FUEL BURNING PERSONNEL HEATER         |           |      |
| CHECKOUT PROCEDURES                               |           |      |
| General .....                                     | 90-1      | 90-1 |
| CHAPTER 91. HOT WATER HEATER TROUBLESHOOTING      |           |      |
| Equipment Items Covered .....                     | 91-1      | 91-1 |
| Equipment Items Not Covered .....                 | 91-2      | 91-1 |
| CHAPTER 92. HOT WATER HEATER TROUBLESHOOTING      |           |      |
| SUMMARY                                           |           |      |
| General .....                                     | 92-1      | 92-1 |
| Procedures .....                                  | 92-2      | 92-1 |
| CHAPTER 93. HOT WATER HEATER CHECKOUT             |           |      |
| PROCEDURES                                        |           |      |
| General .....                                     | 93-1      | 93-1 |
| CHAPTER 94. DEEP WATER FORDING KIT TROUBLE-       |           |      |
| SHOOTING                                          |           |      |
| Equipment Items Covered .....                     | 94-1      | 94-1 |
| Equipment Items Not Covered .....                 | 94-2      | 94-1 |

**TABLE OF CONTENTS-CONT**

|                                                             | Paragraph | Page  |
|-------------------------------------------------------------|-----------|-------|
| CHAPTER 95. DEEP WATER FORDING KIT TROUBLE-SHOOTING SUMMARY |           |       |
| General .....                                               | 95-1      | 95-1  |
| Procedures .....                                            | 95-2      | 95-1  |
| CHAPTER 96. DEEP WATER FORDING KIT SUPPORT DIAGRAMS         |           |       |
| General .....                                               | 96-1      | 96-1  |
| CHAPTER 97. DEEP WATER FORDING KIT CHECKOUT PROCEDURES      |           |       |
| General .....                                               | 97-1      | 97-1  |
| CHAPTER 98. NONELECTRICAL GAGES TROUBLESHOOTING             |           |       |
| Equipment Items Covered .....                               | 98-1      | 98-1  |
| Equipment Items Not Covered .....                           | 98-2      | 98-1  |
| CHAPTER 99. NONELECTRICAL GAGES TROUBLESHOOTING SUMMARY     |           |       |
| General .....                                               | 98-1      | 98-1  |
| Procedures .....                                            | 99-2      | 99-1  |
| CHAPTER 100. NONELECTRICAL GAGES SUPPORT DIAGRAMS           |           |       |
| General .....                                               | 100-1     | 100-1 |

## CHAPTER 1

### GENERAL INFORMATION

---

1-1. SCOPE. This volume tells 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. This volume has the information you will need to troubleshoot the truck. Chapter 2 tells you how to use the information in the other chapters of this volume to find what is wrong with the truck, and what you must do to fix it. Chapter 7 has a procedure that takes you step-by-step through a sample troubleshooting procedure and shows you how to use the information to find the trouble 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 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.