Modern Automotive Technology
Chapter 7

Using Service Information
Chapter 7

Using Service Information

- Describe the different types of service manuals
- Find and use the service manual index
- Explain the different kinds of information and illustrations used in a service manual
- Describe the basic types of trouble shooting charts found in service manuals
- Explain how to use computer based service information
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1. Manufacturer's manuals, also known as FACTORY MANUALS, cover each vehicle produced by a particular company, usually for a one year period.

2. A(n) OWNER’S MANUAL is given to the purchaser of a new vehicle.
Service Manual Sections

INTRODUCTION

How to Use this Manual

This manual is divided into 16 sections. The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on the front and back covers. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Each section includes:
1. A table of contents, or an exploded view index showing:
   - Parts disassembly sequence.
   - Bolt torques and thread sizes.
   - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
5. Repair.
6. Adjustments.

Special Information

GENERAL: Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information to make the job easier.

CAUTION: Detailed descriptions of standard workshops procedures, safety principles, and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways.

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VIN Locations and Decoding

Located on the door, on the dashboard, or in the engine compartment.
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3. Pictures, symbols, and words are all used in an ILLUSTRATED DIAGNOSIS CHARTS.

4. Vehicle identification, basic maintenance, etc., are all found in the GENERAL INFORMATION section of a shop manual.
Illustrated Diagnosis Chart

1. Observe gauge with engine running
   - If the gauge does not indicate, disconnect sending wire and connect wire to ground.
   - If the gauge indicates maximum pressure, replace sending unit.
   - If the gauge indicates maximum pressure, stop.
   - If the gauge indicates maximum pressure, refer to diagnosis in chapter 1A.

2. If the gauge indicates too high or too low, install direct-reading mechanical gauge and compare with car gauge.
   - If the readings agree ± 7 PSI, refer to chapter 1A.
   - If the readings do not agree ± 7 PSI, stop.
Operational Illustration

Shows how parts function
5. HYDRAULIC DIAGRAMS show how fluid flows in a circuit or a part.

6. Technicians can stay up-to-date with recent technical changes, repair problems, and other service-related information by reading TECHNICAL BULLETINS.
Vacuum Diagram

Shows how hoses connect to the engine and vacuum-operated devices
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7. A technician needs a FLAT-RATE MANUAL to calculate how much labor to charge a customer for a repair.

8. A TREE DIAGNOSTIC CHART gives a logical sequence for testing and inspecting when trying to solve a repair problem.
Strategy-Based (Tree) Diagnostic Flow Chart

1. Verify customer concern
2. Preliminary checks (Visual, Operational and Hints)
3. Perform published Diagnostic system checks
4. Check for bulletins (Printed/ICS techline equipment)

- Stored dtc(s)
  - Follow published DTC diagnostics

- Symptom no dtc(s)
  - Follow published SYMPTOM diagnostics

- No published diagnostics
  - Analyze and develop diagnostics or Call technical assistance

- Intermittent
  - See diagnostic details

- Operating as designed
  - Customer misunderstanding of system: refer customer to management or zone
  - Product problem: call technical assistance

- Isolate the root cause?
  - YES
    - Repair and verify fix
  - NO
    - Reexamine the concern
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9. DIAGRAMS are drawings that represent how wires, hoses, passages, and parts connect.

10. Conditions, causes, and corrections are all listed in a BLOCK DIAGNOSTIC CHART.
Wiring Diagram

Shows how wires connect to components
Component Location Chart

- Engine Control Module (ECM) - C1
- Data Link Connector (DLC) - C2
- Malfunction Indicator Lamp (MIL) - C3
- Electronic Ignition diagnostic connector - C4
- ECM harness grounds - C5
- I/P fuse panel - C6
- Underhood fuse block - C7A
- Underhood fuse block - C7B
- Fuel pump test connector - C8
- TP sensor interface module - C9

- Control HARNESS

- Information Sensor
  - Manifold Absolute Pressure (MAP) sensor - A
  - Heated Oxygen Sensor (HO2S) - B
  - Throttle Position (TP) sensor - C
  - Camshaft Position sensor - E
  - Vehicle Speed Sensor (VSS) (mounted on transmission, not shown) - F
  - Intake Air Temperature (IAT) sensor - G
  - Camshaft Position Sensor - H
  - Knock Sensor (KS) - J
  - Oil pressure sensor gauge - L
  - A/C pressure cycling switch - N7
  - A/C high pressure cycling switch - N13
  - A/C pressure cycling switch - N12
  - Primary cooling fan (FAN 1) - N15
  - Secondary cooling fan (FAN 2) - N14
  - Secondary air inlet valve electric vacuum pump - N18
  - A/C cooling fan switch - U
  - A/C cooling fan switch - X

- SIR System Components. Refer to section 6J of the Service Manual for "Cautions" and information on SIR System Components.

- Controls Devices
  - Idle Air Control (IAC) valve - 1
  - Fuel Pump (FP) relay (primary) - 3
  - Fuel Pump (FP) relay (secondary) - 4
  - Cooling fan relay(s) - 8
  - Secondary Air Injection (AIR) pump - 9
  - Air pump relay - 9A
  - Air bypass valve - 10
  - 2nd & 3rd gear block out solenoid - 11
  - A/C clutch relay - 13
  - A/C relay - 14
  - 2nd & 3rd gear block out solenoid - 15
  - Secondary SFI control module #1 - 16
  - Secondary SFI control module #2 - 17
  - Linear EGR valve - 19
Block Diagnostic Flow Chart
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