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Auto Repair Reference Center

The Auto Repair Reference Center (ARRC) database contains the most comprehensive collection of automobile repair reference information in the market. ARRC contains information on most major manufacturers of domestic and imported vehicles.

The database covers more than 35,000 vehicles from 1945 to present. Content includes nearly 857,000 drawings and step-by-step photographs, approximately 99,000 technical service bulletins & recalls issued by the original equipment vehicle manufacturer, over 158,600 enhanced wiring diagrams for easy viewing and printing, specifications & maintenance schedules, Labor Time Guide & Estimator, AutoIQ, Quick Tips (a complete guide to vehicle ownership & maintenance), Diagnostic information and much more. New repair procedures, TSBs and updates are continually added to the product. All of the content in Auto Repair Reference Center has been created by ASE certified technicians.

System Requirements

In order to effectively use all Auto Repair Reference Center features, the minimum browser requirements are Internet Explorer 7.0, Firefox 3.0, and Safari 3.0 (for Macintosh). You must also have Adobe ® Reader® installed to view the PDF Full Text files. If you are using Visual Search, you must also install Adobe ® Flash Player 8.0 or higher.

Searching Tips User Guide

Searching tools help you adjust the focus of a search when using EBSCO research databases and interfaces. The Searching Tips user guide explains how to use Boolean operators, Field Codes, Wildcards, and Truncation. Also covered is how to use proximity searches, including phrases in searches, and single vs. plural searching.

The Searching Tips User Guide is also available on the EBSCO Support Site.
Vehicle Search

Auto Repair Reference Center allows you to search for a vehicle for which you would like to access:

- Technical Bulletins and Recalls
- Diagnostic Information
- Diagrams
- Labor Times
- Maintenance Intervals
- Repair Information
- Specifications

To search for a vehicle:

1. Select the model year, make, and model for your desired vehicle from the **Year**, **Make**, and **Model** drop-down menus.
2. Click the green **Select** button of the sub-model of your desired vehicle from the displayed list.

3. Select from the list of available topics. Topics may include **Technical Bulletins & Recalls**, **Labor Times**, and **Repair Information**.
Repair Information

To search for Repair Information for your vehicle:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Repair Information from the list of available topics.
3. Search using the Find field on the left or select from the available Contents list below.

Before servicing any vehicle, please be sure to read all of the following precautions, which deal with personal safety, prevention of component damage, and important points to take into consideration when servicing a motor vehicle:

- Never open, service or drain the radiator or cooling system when the engine is hot; serious burns can occur from the steam and hot coolant.
- Observe all applicable safety precautions when working around fuel. Whenever servicing the fuel system, always work in a well-ventilated area. Do not allow fuel spray or vapors to come in contact with a spark, open flame, or excessive heat (a hot drop light, for example). Keep a dry chemical fire extinguisher near the work area. Always keep fuel in a container specifically designed for fuel storage; also, always properly seal fuel containers to avoid the possibility of fire or explosion. Refer to the additional fuel system precautions later in this section.
- Fuel injection systems often remain pressurized, even after the engine has been turned OFF. The fuel system pressure must be relieved before disconnecting any fuel lines. Failure to do so may result in fire and/or personal injury.
- Brake fluid often contains polyglycol ethers and polyglycols. Avoid contact with the eyes and wash your hands thoroughly after handling brake fluid. If you do get brake fluid in your eyes, flush your eyes with clear, running water for 15 minutes. If eye irritation persists, or if you have taken brake fluid internally, IMMEDIATELY seek medical assistance.
- The EPA warns that prolonged contact with used engine oil may cause a number of skin disorders, including cancer. You should make every effort to minimize your exposure to used engine oil.
4. Make selections until you get to the repair procedure you wish to read.

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Technical Bulletins & Recalls

To search for Technical Bulletins and Recalls:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Technical Bulletins & Recalls from the list of available topics.
3. Search using the Find field on the left or select from the available Contents list below.
4. Make selections until you get to the specific technical bulletin or recall you wish to read.

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Diagrams

To search for Diagrams:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Diagrams from the list of available topics.
3. Search using the Find field on the left or select from the available Contents list below.
4. Make selections until you get to the specific diagram you wish to view.

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Maintenance Intervals

To search for Maintenance Intervals:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Maintenance Intervals from the list of available topics.
3. Click the Maintenance Interval Charts link.
4. Enter your mileage in the field provided and click either Normal for normal wear or Severe for severe wear.

5. The chart is displayed for your mileage.

Note: A legend is available at the bottom of the chart for Service Type Descriptions and Note codes.
Specifications

To search for Specifications:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Specifications from the list of available topics.
3. Search using the Find field on the left or select from the available Contents list below.
4. Make selections until you get to the part specifications you wish to read.

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Labor Times

To search for Labor Times:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Labor Times from the list of available topics.

3. Search using the Find field on the left or click the Labor Times link below.
4. Make selections until you get to the specific labor times you wish to read.

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Diagnostic Information

To search for Diagnostic Information:

1. Search for your vehicle using the Find Your Vehicle tool on the Home screen.
2. Select Diagnostic Information from the list of available topics.
3. Search using the Find field on the left or select from the available Contents list below.

Before servicing any vehicle, please be sure to read all of the following precautions, which deal with personal safety, prevention of component damage, and important points to take into consideration when servicing a motor vehicle:

- Never open, service or drain the radiator or cooling system when the engine is hot; serious burns can occur from the steam and hot coolant.
- Observe all applicable safety precautions when working around fuel. Whenever servicing the fuel system, always work in a well-ventilated area. Do not allow fuel spray or vapors to come in contact with a spark, open flame, or excessive heat (a hot spark or light, for example). Keep a dry chemical fire extinguisher near the work area. Always keep fuel in a container specifically designed for fuel storage; also, always properly seal fuel containers to avoid the possibility of fire or explosion. Refer to the additional fuel system precautions later in this section.
- Fuel injection systems often remain pressurized, even after the engine has been turned off. The fuel system pressure must be relieved before disconnecting any fuel lines. Failure to do so may result in fire and/or personal injury.
- Brake fluid often contains polyglycol ethers and polyglycols. Avoid contact with the eyes and wash your hands thoroughly after handling brake fluid. If you do get brake fluid in your eyes, flush your eyes with clean, running water for 15 minutes. If eye irritation persists, or if you have taken brake fluid internally, IMMEDIATELY seek medical assistance.
- The EPA warns that prolonged contact with used engine oil may cause a number of skin disorders, including canker. You should make every effort to minimize your exposure to used engine oil. Protective gloves should be worn when changing oil. Wash your hands and any other exposed skin areas as soon as possible after exposure to used engine oil. Soap and water, or waterless hand cleaner should be used.
- All new vehicles are now equipped with an air bag system, often referred to as a Supplemental
4. Make selections until you get to the specific diagnostic information you wish to read.

![Data Link Connector Diagram]

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AutoIQ

AutoIQ can be used to demonstrate the purpose, functionality and service requirements of a given vehicle system. By following clearly defined links to all major vehicle systems, the user can specify the area about which they would like more information. Designed as an interactive learning aid, AutoIQ features:

- Detailed content
- Full-motion video
- Animated technical diagrams

To use AutoIQ:

1. Click AutoIQ in the top toolbar.
   AutoIQ is displayed in a new window.

2. Select AutoIQ either With Audio or Without Audio.
3. Select an area of the vehicle you would like to view information about in the top selection area.

4. Select a topic from the lower selection area. As your hover the mouse over the topics, a glowing circle will indicate the area of the car on the map.
5. Click on a topic to view a description as well as any available video clips, images, or audio clips.

6. Click the CLOSE IMAGE or CLOSE VIDEO link to close the pop-up window displaying the image or video.
Care & Repair Tips

To browse Care & Repair Tips:

1. Click the Care & Repair Tips link in the top toolbar
   The Care & Repair Tips opens in a new window.
2. Choose a subject from the menu on the left.
3. Choose a topic of the subject you have chosen.

Safety Systems and Safety Check

Automotive Safety

Automotive safety is not a recent invention of Washington legislators. Safety has always been a concern of automakers, even before Federal standards were initiated.

As far back as 1900, when vehicles were still "horseless carriages," the steering wheel replaced the rudder-like steering stick, adding safety as well as convenience to the vehicle.

In the next decade, the industry introduced the all-steel body, rearview mirror, shock absorbers and the electric horn.

Automobiles of the 1920s were revolutionized by steel wheels, twin-beam headlights, laminated windshield glass, hydraulic brakes on all four wheels, bumper guards and windshield wipers.

The 1930s brought improved steering gears, power brakes, defrosters and sealed-beam headlights.

In the 1940s double hood latches, padded instrument panels, and self-adjusting brakes were first used, in addition to one of the most important safety innovations—the turn signal.

In the post-war 1950s, the population of automobiles increased dramatically and safety became even more important. Seat belts, head restraints, energy-absorbing steering wheels and impact-resistant door latches were added to most new vehicles.

The '60s and '70s saw the advent of dual braking systems, collapsible steering columns, wear indicators for various parts of the vehicle, side impact door beams, warning lights and buzzers, seatbelt interlock systems and energy-absorbing bumper systems.
4. Select a subtopic to read.

5. You can also navigate the subtopics using the left and right arrows at the top of the page.
Troubleshooting

To browse Troubleshooting information:

1. Click the Troubleshooting link in the top toolbar
   Troubleshooting opens in a new window.

2. Choose a subject from the menu on the left.

3. Choose a topic of the subject you have chosen.

ESSENTIAL NOTES BEFORE PROCEEDING

Safety Notice

Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles, as well as the personal safety of those performing repairs. This information outlines procedures for servicing and repairing vehicles using safe, effective methods. The procedures contain many NOTES, CAUTIONS and WARNINGS which should be followed, along with standard procedures, to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

It is important to note that repair procedures and techniques, tools and parts for servicing motor vehicles, as well as the skill and experience of the individual performing the work, vary widely. It is not possible to anticipate all of the conceivable ways or conditions under which vehicles may be serviced, or to provide cautions as to all possible hazards that may result. Standard and accepted safety precautions and equipment should be used during cutting, grinding, chiseling, piercing, or any other process that can cause material removal or projectiles.

Some procedures require the use of tools specially designed for a specific purpose. Before substituting another tool or procedure, you must be completely satisfied that neither your personal safety, nor the performance of the vehicle, will be endangered.

Although information in the data is based on industry sources and is complete as possible at the time of publication, the possibility exists that some vehicle manufacturers made later changes which could not be included here. While striving for total accuracy, the Publisher cannot assume responsibility for any errors, changes or omissions that may occur in the compilation of this data.

Part Numbers

Part numbers listed in this reference are not recommendations by the Publisher for any product brand name. They are references that can be used with interchange manuals and aftermarket supplier catalogs to locate each brand supplier's discrete part number.

ELECTRICAL ACCESSORIES

Headlights

One headlight only works on high or low beam

1. Check for battery voltage at headlight electrical connector. If battery voltage is present, replace the headlight assembly or bulb if available separately. If battery voltage is not present, refer to the headlight wiring diagram to troubleshoot.
4. Select a subtopic to read.

5. You can also navigate the subtopics using the left and right arrows at the top of the page.
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