

## Contents

### **Welcome to the on-line help system for Popular Mechanics - New Car Buyers Guide: 1995!**

This system is designed to get you started using *Car Buyers Guide* and to serve as a reference once you are familiar with the program. First time users can read through this help system as if it were a manual by using the ">>" button to go to the next page, and the "<<" button to go the previous page. If you're looking for help with a particular problem, click the "Search" button.

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## Overview of *Car Buyers Guide*

There are two main sections in the *Car Buyers Guide*:

**Showroom:** A "virtual auto mall" of more than 800 cars, trucks and vans. Here you can create a personalized list of vehicles to review and compare based on what you want in your new vehicle.

For each vehicle on your list, you can view it, learn about its features and options, and compare dealer's costs to retail costs. Comparing costs is an invaluable tool when negotiating your purchase price. You can also create a comparison chart of the vehicles which most interest you.

**Strategies:** Provides information and practical advice from Popular Mechanics on nearly all aspects of purchasing a car. Strategies helps you estimate how much you can afford to spend, presents you with vehicle critiques and summaries of owners satisfaction surveys, includes a directory of automotive resources and a glossary of automotive terms.

[Showroom](#)

[Strategies](#)

## Showroom

*To access the Showroom Screen from the Introduction Screen, click on "Showroom".*

*From the Strategies Screen, click on the Showroom button in the upper right-hand corner.*

In the Showroom you can search for the car, truck, sport utility vehicle, or van you want, review the vehicles that meet your requirements, estimate the costs, and compare the finalists.

### Summary of steps for using the Showroom:

- **Search for an initial list** of vehicles to browse. Select one of the Stock Searches for a pre-defined vehicle list, or select Design Your Own Search for a search based on the criteria you choose. Add and remove cars as you desire.
- **View individual vehicles** to determine which ones interest you. You can look at pictures, research consumer and safety information, review Owners Reports, select the features and options you want, and compare dealer's costs to retail costs. You can also estimate fuel costs for the car, and calculate loan and lease payments. Add vehicles that interest you to the Compare list.
- **Create a comparison chart** of the vehicles you selected for the compare list.
- **Save your personalized list** for future use.

For detailed instructions, see:

### Searching for an initial list:

[Stock Searches](#)

[Custom Searches](#)

[Vehicle List Screen](#)

### Viewing individual vehicles:

[Vehicle Information Screen](#)

[Estimators](#)

### Creating a Comparison Chart

[Comparing Vehicles](#)

### Saving Your Vehicle List

[Saving Your List](#)

**NOTE:** To go to the Strategies Screen from the Showroom Screen, click on the Strategies button in the upper right-hand corner. (See [Strategies](#) for more information.) To Exit *Car Buyers Guide*, click on the Exit button.

## Stock Searches

*The Stock Searches are located on the Showroom Screen.*

*To access the Showroom Screen from the Introduction Screen, click on "Showroom".*

*From the Strategies Screen, click on the Showroom button in the upper right-hand corner.*

The Showroom Screen lists the following Stock Searches:

- Economy Cars
- Sports Cars
- Sport Utility Vehicles
- Luxury Cars
- All Vehicles

If you want to look at the vehicles in one of these lists, click on the name of the list in the Showroom Screen.

For example, if you want to see a list of all the sports cars in the Showroom, click on "Sports Cars," and the Vehicle List Screen will appear displaying a list of sport cars.

You can then look at the individual cars and compare them. See [Vehicle List Screen](#) for more information.

You can also add vehicles to and remove vehicles from this list in the Vehicle List Screen, the same way you can modify a custom search list.

See also:

[Custom Searches](#)

[Vehicle List Screen](#)

For general information about the Showroom, see [Showroom](#).

## Custom Searches

*"Design Your Own Search" is located on the Showroom Screen.*

*To access the Showroom Screen from the Introduction Screen, click on "Showroom".*

*From the Strategies Screen, click on the Showroom button in the upper right-hand corner.*

Use the Search Criteria Screen to create your own personalized list of vehicles based on what is most important to you. If you want a 4-door sedan in a certain price range with antilock brakes, the program will search for vehicles that meet your criteria and display them in the Vehicle List Screen.

You can get to this screen either by clicking on Design Your Own Search on the Showroom Screen, or by clicking on the Search Criteria button in the Vehicle List Screen.

**NOTE:** If you came from the Vehicle List Screen, you can modify your existing search criteria or start over with a completely new search. For more information, see [Running Another Search](#).

### Creating the Criteria List

First, you need to create a list of requirements for your vehicle. These will be displayed in the Master Selection List on the left.

- To add a requirement to the Master Selection List, click on one of the nine Preference buttons. A Search Criteria window corresponding to that button will appear. You can click on your required characteristics, then click on OK. You can also select several requirements at once. These will be displayed in the Master Selection List. For more information about the Search Criteria Windows, see:

[Type & Style Search Criteria Window](#)

[Make Search Criteria Window](#)

[Retail Price Range Search Criteria Window](#)

[Mechanics Search Criteria Window](#)

[Dimensions Search Criteria Window](#)

[MPG Search Criteria Window](#)

[Features & Options Search Criteria Window](#)

[Safety Search Criteria Window](#)

[Favorites Search Criteria Window](#)

- To change or remove a requirement from the Master Selection List, double click on it. The Search Criteria window where the requirement is located will appear. You can click on the requirement to deselect it, and add or remove other requirements in that window, then click on OK.
- To remove all requirements from the Master Selection List, click on Clear All.

For help with designing searches, see:

[Tips for Creating a Search](#).

### Running the Search

After you have created your list of criteria, click on Search to start the search. Some searches may take several minutes to complete.

### Blank Vehicle List Screen--No Vehicles Found

Sometimes the Showroom does not contain any vehicles which match the criteria you specified. In this situation, the Vehicle List Screen will appear with no vehicles listed. You can click on Search Criteria to simplify your search. For information on modifying your search, see [Running Another](#)

[Search](#). For information on and examples of searching with several criteria, see [Tips for Creating a Search](#).

#### **Blank Vehicle List Screen--Clicking on Cancel**

If you click on "Design Your Own Search" in the Showroom Screen, then press Cancel when the Search Criteria appears, you will not go back to the Showroom Screen. Instead, the Vehicle List Screen will appear with no vehicles listed.

If you want to return to the Showroom, click on Go to Contents. If you want to create a search, click on Search Criteria.

Sometimes, however, you may want to start with a blank Vehicle List Screen. For example, you may want to create a list of vehicles that you add individually with the Add Specific Model button. (See [Adding a Specific Model](#)).

Also, if you want to open a file containing a list of cars you saved earlier, the fastest way to do so is to get to a blank Vehicle List Screen. See [Opening a Saved List](#) for more information.

For general information about the Showroom, see [Showroom](#).

## Running Another Search

To access the Search Criteria Screen from the Vehicle List Screen, click on:



When you click on the Search Criteria button in the Vehicle List Screen, the Search Criteria Screen appears. You can then change your criteria, or clear all the criteria and create a new set, then run another search by clicking on Search.

To clear all criteria, click on Clear All.

Running another search will replace your previous vehicle list with a new one meeting the new criteria. Any vehicles which had been selected for comparison and are still on the new list will remain selected for comparison. Any vehicles which were added with the Add Specific Model button will remain on the new list, whether or not they meet the criteria. These changes to the Vehicle List will remain in effect until you change them again or until you exit the Showroom.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Tips for Creating a Search

By learning a few simple rules, you can design searches to help you find the vehicles you want in the Showroom.

Each of the nine Preference buttons corresponds to a Search Criteria window. Most Search Criteria windows contain selection boxes displaying groups of choices. For example, the Type & Style Search Criteria window has three selection boxes: one for Body Type, one for Body Style, and one for Number of Doors. You can select more than one choice from inside each selection box, from different selection boxes, and from different Search Criteria windows.

**Suggestion:** At first, try creating searches with a small number of criteria. If you run the search and the program finds too many vehicles, you can add more criteria and re-run the search. (See [Running Another Search](#).)

### Multiple Requirements in the Same Selection Box

In general, when you select more than one choice inside a single selection box, the program will search for vehicles that meet any one of the requirements in that box. For example, if you select both "Subcompact" and "Compact" from the Body Type box in the Type & Style window, the program will search for vehicles that are either subcompact or compact.

Exceptions:

- **Retail Price Range Search Criteria Window:** If you select both a minimum and a maximum price, the program will search for vehicles within the price range.
- **MPG Search Criteria Window:** If you select both a minimum city MPG (miles per gallon) and a minimum highway MPG, the program will search for vehicles which meet **both** minimums.
- **Features & Options Search Criteria Window:** If you select more than one choice in the Features box (top box), the program will search for vehicles that meet **all** the requirements you selected. For example, if you select "Airbag" in the Safety box, and both "Air Conditioning" and "Cassette Player" in the Creature Comforts box, the program will search for vehicles that have all three features, not just one of the three.
- **Safety Search Criteria Window:** If you select more than one choice in the Features box (left box), the program will search for vehicles that meet **all** the requirements you selected. For example, if you select "Passenger Airbag" and "Traction Control", the program will search for vehicles that have both features.

### Multiple Requirements in Different Selection Boxes

The program searches for vehicles which meet the requirements of each box in every search criteria window. For example, if you select the following requirements:

- In the Type & Style window, "Subcompact" and "Compact" in the Body Type box
- In the Retail Price Range window, a price range of \$15,000 to \$20,000
- In the Mechanics window, "4-Speed" and "5-Speed" in the Transmission box and Turbo in the Special Type box

the program will search for vehicles that are either subcompact or compact, cost between \$15,000 and \$20,000, have either 4-speed or 5-speed transmissions, and have turbo engines.

### Standard and optional features:

The program will include vehicles in your search that meet your requirements either as standard features or as optional features. In many screens only the standard features are displayed, and therefore you may see vehicles listed that don't appear to meet your requirements. For example, if you require an engine with a minimum horsepower, some of the resulting vehicles may show a horsepower lower than your minimum. When you look at the Features & Options window for one of



those vehicles, you will usually find that the vehicle has optional engine with a horsepower that meets your requirements.

See also:

[Running Another Search](#)

For general information about the Showroom, see [Showroom](#).

## No Vehicles Appear

When the Vehicle List Screen is blank, there are usually two explanations:

- You have chosen search criteria that are too restrictive, resulting in no vehicles which match your criteria. If so, click on the Search Criteria button and deselect or re-examine your requirements for the search. Usually, the more criteria you select, the fewer vehicles appear. See [Custom Searches](#) and [Tips for Creating a Search](#) for more help.
- You clicked on Cancel in the Search Criteria Screen. You can individually add vehicles of your choice by clicking on the Add Specific Models button (see [Adding a Specific Model](#)), or you can go back to the Search Criteria Screen by clicking on the Search Criteria button and search for vehicles (see [Custom Searches](#)).

For general information about the Showroom, see [Showroom](#).

## Type & Style Search Criteria Window

To access this window from the Search Criteria Screen, click on:



Perhaps you want to buy a sport coupe. Or maybe you prefer a 4-door luxury sedan. In this window, choose the body types, body styles and number of doors you want for your vehicle. If you don't have an exact idea of what you want, you can make more than one choice in each selection box, or you can leave the selection boxes blank.

Click on requirements you would like to add. To deselect a selected item, click on it. To clear all selections, click on Clear.

When you have finished, click on OK to add the requirements to the Master Selection List.

### Multiple Requirements

When the program searches for vehicles which meet the requirements you have selected, it includes the cars which have any of the body types you have chosen, any of the body styles you have chosen, and any of the number of doors you have chosen.

For example, if you select "Compact" in the Body Type box, "Sedan" in the Body Type box, and both "2" and "4" in the Number of Doors box, the program will search for all compact sedans which come with either 2 doors or 4 doors.

**Be careful** not to create impossible searches. For example, if you select "Wagon" and 2-door, your vehicle list will be empty, because there are no 2-door station wagons.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Make Search Criteria Window

To access this window from the Search Criteria Screen, click on:



If you want to restrict your vehicle list to specific makes, or you want to list vehicles manufactured in particular countries, use this window.

Click on requirements you would like to add. To deselect a selected item, click on it. To clear all selections, click on Clear.

Click OK to add the requirements to the Master Selection List.

### Multiple Requirements

When the program searches for vehicles which meet the requirements you have selected, it includes any makes you have selected that are also manufactured in any of the countries that you have selected. For example, if you select "Nissan" and "Toyota" in the Individual Companies box, and you select "United States" in the Country box, the program will search for Nissans and Toyotas manufactured in the United States.

**Be careful** not to create impossible searches. For example, if you select "Mercedes-Benz" and "Japan", your vehicle list will be empty, because there are no Mercedes manufactured in Japan.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Retail Price Range Search Criteria Window

To access this window from the Search Criteria Screen, click on:



If you want the program to search for vehicles within a certain price range, enter the minimum price in the top box and the maximum price in the bottom box.

Click OK to add the required price range to the Master Selection List.

**NOTE:** When you list a retail price range, the values correspond to the retail price of a vehicle without the shipping charge. In other screens, such as the Vehicle List Screen, the retail price will include shipping cost. If the Vehicle List Screen lists a vehicle with a retail price higher than your maximum, the discrepancy is due to the shipping charge.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Mechanics Search Criteria Window

To access this window from the Search Criteria Screen, click on:



Specify any mechanical requirements for your vehicle in this window. You can determine the type of drive (front-wheel, rear-wheel, four-wheel), the type of transmission, the type of brakes, and engine characteristics.

Click on requirements you would like to add. To deselect a selected item, click on it. To clear all selections, click on Clear.

Click OK to add the requirements to the Master Selection List.

### Minimum Engine Size and Horsepower:

You can set the minimum engine size and the minimum horsepower by clicking on the up arrow to increase the minimum size, or the down arrow to decrease the minimum size. To deselect the minimum size after it has been set, click on the check mark in the corresponding box. If you set both a minimum engine size and a minimum horsepower size, the program will search for vehicles that meets at least one of the two requirements.

### Transmission:

If you want manual transmission with any number of speeds, select "manual." If you want to specify the exact number of speeds (4, 5 or 6), select them individually, but do not choose "Manual" as well. Selecting "Manual" has the same effect as selecting "4-Speed", "5-Speed", and "6-Speed".

### Multiple Requirements

When the program searches for vehicles which meet your requirements, it includes cars that meet at least one requirement that you have selected from each box. For example, if you select "4-Speed" and "5-Speed" transmission in the Transmission box, a minimum engine size of 3.0 liters and a minimum horsepower of 300 in the Engine box, and "Turbo" in the Special type box, the program will search for all cars that have either 4- or 5-speed transmission, have either a minimum engine size of 3.0 liters or a minimum horsepower of 300, and have a turbo engine.

### Standard and optional features:

The program will include vehicles in your search that meet your requirements either as standard features or as optional features. In many screens only the standard features are displayed, and therefore you may see vehicles listed that don't appear to meet your requirements. For example, if you require an engine with a minimum horsepower, some of the resulting vehicles may show a horsepower lower than your minimum. When you look at the Features & Options window for one of those vehicles, you will usually find that the vehicle has optional engine with a horsepower that meets your requirements.

**Be careful** not to create impossible searches. For example, if you select 3-cylinder and a minimum horsepower of 400, your vehicle list will be empty, because there are 3-cylinder 400 hp engines.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Dimensions Search Criteria Window

To access this window from the Search Criteria Screen, click on:



In this window, you can specify minimum requirements for any of the following:

- seating capacity
- headroom and legroom
- wheelbase
- cargo and towing capacity
- curb weight
- ground clearance

Type the minimum value you would like for any dimension. To remove an item you have entered, click on the corresponding check box to remove it. To clear all selections, click on Clear.

Click OK to add the requirements to the Master Selection List.

When you select more than one dimension requirement, the resulting vehicle list will include vehicles that meet all of the requirements you have selected. For example, if you select a minimum seating capacity of 4 and a minimum wheel base capacity of 100 inches, the program will search for vehicles with a minimum seating capacity of 4 and a minimum wheel base capacity of 100 inches.

**NOTE:** Not all data were reported for all vehicles. When the program searches for vehicles that meet your requirements, it will exclude any vehicle that is missing a value in any dimension for which you have set a minimum requirement.

See also:

[Custom Searches](#)

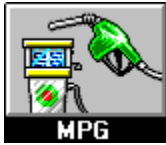
[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).



## MPG Search Criteria Window

To access this window from the Search Criteria Screen, click on:



In this window, you can specify the city and highway minimum MPG (miles per gallon) ratings you want for your vehicle.

Enter the minimum desired city MPG in the top box.

Enter the minimum desired highway MPG in the bottom box.

Click OK to add these requirements to the Master Selection List.

**NOTE:** The program will search for vehicles that meet **both** of the MPG requirements you specified.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Features & Options Search Criteria Window

To access this window from the Search Criteria Screen, click on:



In this window, choose the exterior, interior, safety and comfort features you want in your vehicle. You can also specify the minimum length of the warranty, in months or miles.

### Features

Click on the features you would like to add. To deselect a selected item, click on it. To clear all selections, click on Clear.

### Warranty

Type in the minimum number of months or minimum number of miles you want for the warranty. If you specify minimums for month and miles, the program will search for cars that meet either minimum, but not necessarily both. To deselect a minimum after it has been set, select the value you entered and delete it with the delete key.

Click OK to add the requirements to the Master Selection List.

### Multiple Requirements

When the program searches for vehicles which meet the requirements you have selected, it includes vehicles that have **all** the features you have selected **and** meet your warranty requirements. For example, if you select "Roof Rack," "Spoiler" and "Air Bag" in the Features window, and select a minimum warranty of 36 months, the program will search for all cars that come with a roof rack, a spoiler, an air bag, and have at least a 36 month warranty.

### Standard and optional features:

The program will include vehicles in your search that meet your requirements either as standard features or as optional features. In many screens only the standard features are displayed, and therefore you may see vehicles listed that don't appear to meet your requirements. Say for example, you require a vehicle with air conditioning. When you look at the Features & Options Window, air conditioning may not be standard, but it may be available as an option.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Safety Search Criteria Window

*To access this window from the Search Criteria Screen, click on:*



To select the safety features and minimum crash test rating you want for your vehicle, use this window.

Click on safety features you would like to add. To deselect a selected item, click on it. To clear all selections, click on Clear.

Click on a minimum crash test rating to select it. To deselect the minimum rating after it has been set, click on the check mark next to "Overall Crash Test Rating."

Click OK to add the requirements to the Master Selection List.

### **Multiple Requirements**

When the program searches for vehicles which meet the requirements you have selected, it includes vehicles which meet the safety features you have selected and have the minimum crash test rating you selected. For example, if you select "Passenger Airbag" and "Antilock Brakes" in the Features box, and you select a minimum crash test rating of "Above Average," the program will search for all cars that have passenger airbags, antilock brakes, and a minimum crash test rating of Above Average.

### **Standard and optional features:**

The program will include vehicles in your search that meet your requirements either as standard features or as optional features. In many screens only the standard features are displayed, and therefore you may see vehicles listed that don't appear to meet your requirements. Say for example, you require a vehicle with antilock brakes. When you look at the Features & Options Window, antilock brakes may not be standard, but may be available as an option.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Favorites Search Criteria Window

To access this window from the Search Criteria Screen, click on:



Add vehicles to the Always List that you always want to appear in your vehicle list, regardless of whether they meet your other search criteria.

Add vehicles to the Never List that you never want to appear in your vehicle list, even if they meet your other search criteria.

### To Add a Vehicle to a List:

Click on the Add button under the appropriate list. A window will appear containing a list of all the vehicles in the Showroom. You can choose any of the vehicles to add to your vehicle list by either:

- selecting a vehicle (clicking on it) and clicking on the Add button, or
- double clicking on the vehicle.

**Windows Tip:** To quickly locate a vehicle in the list, begin typing the vehicle name in the window. As you type each letter, the window displays vehicles that start with the letters you have typed. Usually after a few letters, the name of the vehicle you want will appear on the screen.

### To Remove a Vehicle from a List:

Click on the vehicle name to select it, then click on Remove.

You can also click on Clear to remove all the vehicles in a list.

See also:

[Custom Searches](#)

[Tips for Creating a Search](#)

For general information about the Showroom, see [Showroom](#).

## Vehicle List Screen

**To access this screen from the Showroom, click on one of the Stock Searches; or click on "Design Your Own Search," complete a list of search criteria, and start the search.**

The Vehicle List Screen allows you to modify your list, view individual vehicles, create a comparison chart, and save your list. You can:

- sort the list by clicking on the Sort By drop-down menu and clicking on one of the choices
- remove a vehicle by selecting it (clicking on it), then clicking on the Remove button.
- add a vehicle by clicking on Add Specific Models.
- further restrict your list or start over with a new list by clicking on the Search Criteria button.
- view the Vehicle Information Screen for any vehicle by double clicking on the vehicle or by clicking on the View Vehicles button.
- create a comparison chart of vehicles you have selected for comparison by clicking on the Compare Spec button. Before you can compare vehicles, go to the Vehicle Information Screen and select "Add to Compare List" for each vehicle. Vehicles added with Add Specific Model, however, are automatically selected for comparison.
- save the list for future use by selecting Save As from the File menu and entering a file name.

### Further Instructions:

[Sorting the Vehicle List](#)

[Adding a Specific Model](#)

[Comparing Vehicles](#)

[Running Another Search](#)

[Saving Your List](#)

[Opening a Saved List](#)

[Vehicle Information Screen](#)

### Buttons



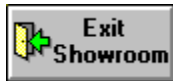
Deletes a vehicle you have selected (clicked on) from the list.



Displays a list of all vehicles in the Showroom; you can click on one to add it to your list. See [Adding a Specific Model](#).



Prints the vehicle list.



Exits the program. If your list has not been saved to a file, you will be asked whether you want to save it. See [Saving Your List](#).



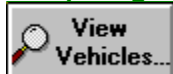
Will display the Showroom Screen.

- Allows you to modify your criteria or start a new search. See [Running Another Search](#).



Creates a comparison chart for vehicles you have selected to compare. See

[Comparing Vehicles](#).



Displays the Vehicle Information Screen for selected vehicle. See [Vehicle Information](#)

[Screen](#).

**Menu Items:**

[File](#)

[Tools](#)

[Estimators](#)

For general information about the Showroom, see [Showroom](#).

## Sorting the Vehicle List

You may find that sorting the vehicle list by an attribute, such as retail price, makes the vehicle list more helpful to you.

To sort the vehicle list by a different attribute, click on the Sort By drop-down menu and click on one of the choices.

To return the list to its original order, choose "Make, Model, and Style".

For general information about the Showroom, see [Showroom](#).

## Adding a Specific Model

To access the Add Specific Vehicle Window from the Vehicle List Screen, click on:



If there is a particular vehicle you always want to see on the list, regardless of the search criteria, you can add it yourself.

When you click on this button in the Vehicle List Screen, a window appears containing a list of all the vehicles in the showroom. You can choose any of the vehicles to add to your vehicle list by either:

- selecting a vehicle (clicking on it) and clicking on the Add button, or
- double clicking on the vehicle.

**Windows Tip:** To quickly locate a vehicle in the list, begin typing the vehicle name in the window. As you type each letter, the window displays vehicles that start with the letters you have typed. Usually after a few letters, the name of the vehicle you want will appear on the screen.

### Keeping Vehicles for Successive Searches

When you add a vehicle using the Add Specific Models button, the vehicle name will be displayed in blue text and have a check mark next to it. The blue text indicates it will be kept in the vehicle list for future searches--that is, it will remain in the vehicle list even if you click on the Search Criteria button and run a new search. Once you exit the Showroom, the vehicle will stop appearing in future searches.

### Compare List

The red check mark indicates the vehicle is on the Compare list. See [Comparing Vehicles](#). If you do not want the vehicle to be included for comparison, double click on the vehicle to bring up the Vehicle Information Screen, and click on the check mark next to "Add to compare list" to deselect it.

For general information about the Showroom, see [Showroom](#).



## Print

In *Car Buyers Guide*, you can:

- print the vehicle list from the Vehicle List Screen by clicking on Print List.
- print the features and options information from the Features & Options Window by clicking on Print.
- print the vehicle comparison chart in the Vehicle Comparison Screen by clicking on Print.

When you click on the print button, a window appears displaying print options. Choose the options you want and click on OK to print.

You can also click on Print Setup to change your printer setup. See [Print Setup](#) for more information.

For general information about the Showroom, see [Showroom](#).

## **Print Setup**

In Print Setup, you can change the choice of printer, the paper orientation, the paper source, and the paper size. Click on OK when you have finished making your choices.

You can modify options specific to your printer by clicking on Options.

For general information about the Showroom, see [Showroom](#).

## Comparing Vehicles

To access the Vehicle Comparison Screen from the Vehicle List Screen, click on:



Once you have identified the vehicles that most interest you, you can create a comparison chart of their various specifications.

The red check mark on the Vehicle List Screen indicates the vehicle is on the Compare list. If you do not want the vehicle to be included for comparison, double click on the vehicle to bring up the Vehicle Information Screen, and click on the check mark next to "Add to compare list" to deselect it.

### Adding Vehicles to the Comparison List

To add vehicles to the comparison, double click on the vehicle name to display its Vehicle Information Screen, and click on the "Add to compare list" check box. Click on Done to return to the Vehicle List Screen. Vehicles can be removed from the comparison list by clicking on the check mark next to "Add to compare list" to deselect it.

Click on the Compare Specs button in the Vehicle List Screen. A green window appears displaying a chart of vehicles on the comparison list. These are identified by check marks to the left of their names. You may need to scroll horizontally as well as vertically to see the entire chart.

**NOTE:** Before you can create a comparison chart, you must *add vehicles to the compare list*. (If no vehicles are selected for comparison, the Compare Spec button will be grayed-out and unusable.)

### Buttons



Changes the list of specifications displayed. See [Customizing the Specifications List](#).



Print the comparison chart.

For general information about the Showroom, see [Showroom](#).

## Saving Your List

After you have created a search and customized your vehicle list, you may want to save your vehicle list in a file for future use. To save the list,

- Choose Save As from the File menu from the Vehicles List Screen. (If you have already saved the list in a file previously, you can choose Save from the File menu.)
- Change to the directory where you want to save the file.
- Change to the directory where you want to save the file and type its name. The filename must end with the ".cat" extension.
- Click on OK.

The file will store the search criteria you used and any vehicles you added. It will also record which vehicles are in the comparison list (indicated by a check mark next to their name), which vehicles should be kept in successive searches (indicated by blue text), and how the vehicles were sorted.

Whenever you exit the Showroom, you will be prompted to save the list if your list has not yet been saved to a file.

For information about opening a file containing a saved list, see [Opening a Saved List](#).

For general information about the Showroom, see [Showroom](#).

## Opening a Saved List

To open a list of vehicles you have previously saved in a file, you must go to the Vehicle List Screen. If you have not yet searched for a vehicle list since entering the Showroom, the fastest way to get to the Vehicle List Screen is to create an "empty list".

- Click on Design Your Own Search in the Showroom Screen.
- When the Search Criteria Screen appears, click on Cancel.
- A warning will appear telling you that the list is empty. Click on OK.

In the Vehicle List Screen, select Open from the File menu. Locate the file you want to open and click on OK.

The Vehicle List screen will appear displaying your saved list. If you click on Search Criteria, you will see the criteria you used to create the list.

**NOTE:** If there is an unsaved list in the Vehicle List screen when you try to open a file, you will be prompted to save the existing list before the file is opened.

For general information about the Showroom, see [Showroom](#).

## Vehicle Information Screen

To access this screen from the Vehicle List Screen, click on:

- 

The vehicle information screen provides you with a wealth of information about each vehicle. From this screen, you can look at different views of the vehicle, research consumer and safety information, review Owners Reports, and determine the cost of the vehicle with the options you choose. You can also estimate fuel costs for the car, and calculate loan and lease payments.

### Dealer Invoice vs. Retail Costs

The ability to compare dealer invoice costs and retail costs, for both the base cost of the vehicle and the options you choose, provides you with a powerful negotiating tool when you want to purchase your vehicle. You will know how much the dealer will actually pay for the vehicle, so you will be able to calculate the profit for any proposed price. See [Features & Options Window](#) for more information.

The following are descriptions of different areas of the Vehicle Information Screen.

### Views of the vehicle

Click on any of the view buttons to see a different view of the vehicle. (Buttons only appear when the corresponding picture or video is available.)



Shows an external view of the vehicle.



Shows another external view.



Shows a front view of the vehicle.



Shows a side view of the vehicle.



Shows a rear view of the vehicle.



Shows an interior view of the vehicle.



Shows a view of the vehicle's dashboard.



Allows you to change the color of the vehicle. See [Changing the Vehicle Color](#).



Plays a video of the vehicle.

### Specification List

To the right of the Vehicle View area is a list of specifications for the vehicle. The retail price always appears at the top of the list. If you add options in the Features & Options Window, the retail price will include those items.

- Allows you to change the list of specifications displayed. See [Customizing the Specifications List](#).

### Comments

Additional comments about the vehicle appear under the Vehicle View area.

### Add to Compare List box

To add a vehicle to the compare list, click on the "Add to compare list" check box. To remove a vehicle from the list, click on the "Add to compare list" check box to remove the check mark.

You can view the comparison chart of vehicles on the compare list by clicking on the Compare Specs

button in the Vehicle List Screen. See [Comparing Vehicles](#).

### Other Information Windows



Displays lists of standard and optional equipment, as well as dealer invoice and retail costs for the base vehicle and options. Once you have selected your options, the total vehicle price will be updated in the Vehicle Information Screen, and the Lease Payment and Loan estimators will enter that number automatically when you use them to do calculations (see [Estimators](#)). See [Features & Options Window](#).



Displays insurance cost, maintenance cost, and warranty information; also contains buttons which access the Loan vs. Lease, Loan, and Fuel Cost estimators (see [Estimators](#)). See [Purchase Information Window](#).



Displays information about crash test results; insurance, theft, and complaint data; and available safety features. See [Safety & Consumer Window](#).



Displays the Owners Report, which provides a summary of owners satisfaction surveys for the vehicle. If no Owners Report is available, the button will be grayed-out and unusable. See [Popular Mechanics Owners Reports](#).

### Navigation



Displays the Vehicle Information screen for the previous vehicle on the vehicle list.



Displays the Vehicle Information screen for the next vehicle car on the vehicle list.



Returns to the Vehicle List Screen.

For general information about the Showroom, see [Showroom](#).

## Changing the Vehicle Color

*To access the Color Selection Window from the Vehicle Information Screen, click on:*



In the Vehicle Information Screen, you can view the photo of any vehicle in the Showroom . If you want to see the vehicle with a different color, use the Change Color button.

When you click on the Change Color button in the Vehicle Information screen, a small window appears displaying colors for you to choose. This window does not necessarily contain the colors provided by the manufacturer. Contact a dealer to learn what colors are actually available for a particular vehicle.

Click on the color you want to see on the vehicle. (For some vehicles, the program will display a different but similar model to display color changes.)

Click on Done to close the Color Change window and return the car to its original color.

### Buttons



Changes the picture of the vehicle back to the original color.



Allows you to choose other possible colors for the vehicle. (See the Windows Manual regarding Windows standard Color Picker for more information.)

For general information about the Showroom, see [Showroom](#).



## Customizing the Specifications List

*To access the Customize Specifications Window from the Vehicle Information Screen or the Vehicle Comparison Screen, click on:*

- 

You can decide which specifications you want displayed for the vehicles you review, both in the Vehicle Information Screen and in the Vehicle Comparison Screen. When you customize the specifications list to your needs, the changes affect both screens.

To customize the specifications list, either:

- click on the Customize button in the Vehicle Information Screen, or
- click on the Customize button in the Vehicle Comparison Screen.

The Selected Specifications box contains the specifications that are currently displayed. The Available Specifications box contains specifications you can add.

To add a specification to the list, click on its name in the Available Specifications box and click on Add.

To remove a specification from the list, click on its name in the Selected Specifications box, and click on Remove.

(You can add or remove several specifications at once by clicking on each of their names before clicking on the appropriate button.)

If you want to move a specification to a different position on the list, use the mouse to drag it where you want it to go.

When you have finished your changes, click on OK. The changes you make are stored on your hard drive and will remain in effect until you change them again, even when you exit and restart the program.

For general information about the Showroom, see [Showroom](#).

## Features & Options Window

*To access this window from the Vehicle Information Screen, click on:*

- 

When you click on the Features & Options button in the Vehicle Information Screen, a window appears listing:

- Standard features of the vehicle
- Optional equipment available for the vehicle
- Dealer's invoice and retail costs for the base vehicle, options, and the price of the vehicle with options.

To select options, click on the equipment box for each option. If you can't read all the information about the option in the box, double click on it to see more. As you add options, the invoice and retail costs for the options are updated, as well as the total invoice and retail costs. Once you know the dealer's invoice cost of the vehicle, equipped the way you want it, you have the information to negotiate the best possible price.

To deselect a selected option, click on it. You can get additional information about any option by double clicking on it.

Once you have selected your options, the total retail vehicle price will be updated in the Vehicle Information Screen, and the Lease vs. Buy and Loan estimators (see [Estimators](#)). It will not, however, be updated in the Vehicle Comparison Screen.

To return to the Vehicle Information Screen, click on OK.

For general information about the Showroom, see [Showroom](#).

## Purchase Information Window

To access this window from the Vehicle Information Screen, click on:



The Purchase Information Window provides you with information about the other costs associated with having a car: insurance, maintenance, lease or loan interest, and fuel. Data and calculations are based on the vehicle displayed in the Vehicle Information Screen.

The top portion of the screen displays the general insurance category, the maintenance cost category, and warranty information.

**NOTE:** The Overall Warranty Rating for each vehicle was determined by IntelliChoice, Inc., and was based on the duration in miles and the chronological time for the various warranted items (powertrain, corrosion, etc.)



Estimates the initial and monthly cost of leasing the vehicle. See [Lease vs. Buy](#)

[Estimator.](#)



Estimates the initial, monthly, and overall cost of a loan to purchase the vehicle. See

[Loan Estimator.](#)



Estimates the weekly, monthly and yearly cost of purchasing fuel for the vehicle. See

[Fuel Cost Estimator.](#)

**NOTE:** To estimate costs based on a complete price of a vehicle, first add the options to the vehicle shown in the Features & Options Window. The total retail cost of the vehicle will be updated to reflect your choices in the Lease vs. Buy and Loan estimators. See [Features & Options Window.](#)

For general information about the Showroom, see [Showroom.](#)

## Safety & Consumer Window

*To access this window from the Vehicle Information Screen, click on:*



The Safety & Consumer Window contains crash test ratings; insurance, theft, and consumer information; and available safety features.

Click on any of the following to see its definition:

[Injury Frequency Rating](#)

[Insurance Collision Rating](#)

[Theft Rating](#)

[Insurance Premium Category](#)

[Customer Complaint](#)

For general information about the Showroom, see [Showroom](#).

## **Injury Frequency Rating**

Average means that one out of every 50 insured vehicles will have an injury claim.

## **Insurance Collision Rating**

Average represents the amount it will cost an insurance company to repair a collision to this vehicle. Average is estimated to be \$200 per year.

## **Theft Rating**

Average represents the amount it will cost an insurance company to compensate you for theft.  
Average is estimated to be \$20 per year.

## **Insurance Premium Category**

Premium means an insurance company will expect higher collision losses on this vehicle; discount means this vehicle will have a better than average collision rating.



## **Customer Complaint**

The Consumer Complaint Rating comes from the US Department of Transportation. Ratings are based on a percentage of consumer complaints as compared to vehicles on the road.

## Estimators

To access the Estimators from the Vehicle List Screen, click on:

- then click on the Estimator you want to use.

The Lease vs. Buy, Loan, and Fuel Cost estimators help you estimate the costs of leasing vs. borrowing to buy a vehicle, and how much you might spend on fuel for the vehicle. Click on the Instructions buttons to hear steps for using each Estimator.

[Lease vs. Buy Estimator](#)

[Loan Estimator](#)

[Fuel Cost Estimator](#)

For general information about the Showroom, see [Showroom](#).

## Lease vs. Buy Estimator

To access this Estimator from the Vehicle Information Screen, click on:

- *then click on*



This estimator helps you evaluate the cost of leasing a vehicle so that you can compare the cost of leasing with that of buying. Click on the Instructions button to hear the instructions.

### Instructions

- The estimated final value of your vehicle at the end of the lease includes a 10% average depreciation per year. Use this amount or enter your own. Call your dealer for an exact figure.
- Click on the arrow keys to adjust up or down:
- the sales tax
- the length of the lease
- Enter the best interest rate you can find.
- Use the estimator's 20% money down value, or enter your own value.

The bottom box gives you your minimum possible monthly lease payment.

For general information about the Showroom, see [Showroom](#).

## Loan Estimator

To access this Estimator from the Vehicle Information Screen, click on:

- then click on



This estimator calculates your loan amount and monthly payment. It also gives you the total cost of your loan once you've fully paid for your vehicle. Click on the Instructions button to hear the instructions.

The program automatically calculates any luxury tax.

### Instructions

- Enter any other taxes or expenses (besides sales tax) for your vehicle.
- Click on the arrow keys to adjust up or down:
  - the sales tax
  - the length of the loan
- Enter the interest rate.
- Enter your down payment, or use the estimator's 20% down payment figure.

The bottom box calculates your loan amount, your monthly payment, and the total cost.

**NOTE:** For the most accurate results, you should enter the Annualized Percentage Rate (APR) for the loan into the interest rate.

### APR

Because loans are compounded for different periods, the same interest rate may mean different payments. For example, one bank may say it charges 8% for loans, compounding daily, and another bank may also say it charges 8% for loans, but compounding monthly. You will be paying more for the loan from the first bank.

To help you, the federal government requires all financial institutions to disclose the APR. It will look just like the interest rate number, and it will probably appear in small print. The APR equivalent tells you how much you are paying on a yearly basis. The estimator performs its calculations based on the assumption that the interest rate entered is the APR.

For general information about the Showroom, see [Showroom](#).

## Fuel Cost Estimator

To access this Estimator from the Vehicle Information Screen, click on:

- then click on



This estimator helps predict how much you will spend annually on fuel for the vehicle you plan to purchase, based on the city and highway MPG (Miles Per Gallon) and on your driving habits. Click on the Instructions button to hear the instructions.

### Instructions

- Use the estimator's average price per gallon figure, or enter your own.
- Click on the arrow keys to adjust up or down:
- the number of miles you drive each week
- the percentage of time you spend driving in the city.

Your answer appears in the lower box.

For general information about the Showroom, see [Showroom](#).

## Vehicle List Screen Menus

For more information about the Vehicle List Screen, see [Vehicle List Screen](#).

### File Menu:

New	Creates a new, empty list of vehicles in the Vehicle Information Screen.
Open	Opens a file containing a previously saved list of vehicles. See <a href="#">Opening a Saved List</a> .
Save	Saves the current vehicle list in a file. See <a href="#">Saving Your List</a> .
Save As	Prompts the user for a new file name and saves the current vehicle list in a file. See <a href="#">Saving Your List</a> .
Print	Prints the vehicle list.
Print Setup	Allows the user to change the setup of the printer.
Exit	Exits the program.

**NOTE:** You may also see the names of any files you have recently used. Such files may include any stock searches that you ran or your own files that you saved

### Tools Menu:

Compare Vehicle	Creates a comparison chart of vehicles on the compare list. See <a href="#">Comparing Vehicles</a> .
View Details	Displays Vehicle Information Screen for selected vehicle, or first vehicle if none are selected. See <a href="#">Vehicle Information Screen</a> .
Search Criteria	Starts a new search. See <a href="#">Running Another Search</a>
Remove	Deletes a vehicle you have selected (clicked on) from the list.
Add Vehicle	Displays a list of all vehicles in the Showroom; you can click on one to add it to your list. See <a href="#">Adding a Specific Model</a> .

### Estimators Menu:

Loan	Displays the Loan Estimator, which estimates loan amount, monthly loan payment and total loan cost for a vehicle.
Lease/Buy	Displays the Lease vs. Buy Estimator, which estimates the monthly lease payment for a vehicle.
Fuel Cost	Displays the Fuel Cost Estimator, which estimates the weekly, monthly, and yearly costs of fuel for a vehicle.

For general information about the Showroom, see [Showroom](#).

## Strategies

*To access the Strategies Screen from the Introduction Screen, click on "Strategies".*

*From the Showroom Screen, click on the Strategies button in the upper right-hand corner.*

The Strategies Screen gives you access to:

- inside tips for all aspects of buying a new car
- a calculator to help you determine how much you can afford to spend
- Owners Reports summarizing owners satisfaction surveys
- a directory of automotive companies and agencies
- a glossary of automotive terms

For more detailed instructions, see:

[Inside Tips](#)

[Resources](#)

[Affordability Calculator](#)

[Popular Mechanics Owners Reports](#)

[Telephone Survival Guide](#)

[Glossary](#)

**NOTE:** To go to the Showroom Screen from the Strategies Screen, click on the Showroom button in the upper right-hand corner. (See [Showroom](#) for more information.) To Exit *Car Buyers Guide*, click on the Exit button.

## Inside Tips

To access the *Inside Tips* topics from the *Strategies Screen*, click on the name of the set of topics you want to read.

The *Inside Tips* provide you with strategies for buying a new car, talking to dealers, deciding whether to lease or buy, and selling your current car. You can click on any of the four collections of topics and browse through them.

After you have finished reading one collection, click on *Return* to select another set of topics.

### Buttons



Indicates the current topic.



Goes to the corresponding topic.



Goes to the next page. This symbol indicates the first page of a series.



Goes to the previous page. This symbol indicates the last page of a series.



Goes to the next page.



Goes to the previous page.



Goes to the Glossary of automotive terms.



Returns you to the *Strategies Screen*.

For more information about the *Strategies Screen*, see [Strategies](#).



## Resources

*The Resources are located on the Strategies Screen.*

[Affordability Calculator](#)

[Popular Mechanics Owners Reports](#)

[Telephone Survival Guide](#)

[Glossary \(description\)](#)

For more information about the Strategies Screen, see [Strategies](#).

## **Affordability Calculator: What Can You Afford?**

The affordability calculator helps you calculate the largest monthly car payment you can afford and the maximum amount you can borrow.

You can get to the Affordability Calculator:

- from the Strategies Screen, by clicking on "Calculator: What Can You Afford", or
- from the How to Buy a New Car Screen, by clicking on "Calculating the Cost".

You can read the instructions, then click on the calculator icon to access the calculator.

For more information about the Strategies Screen, see [Strategies](#).

## Popular Mechanics Owners Reports

To access the Owners Reports Introduction Screen from the Strategies Screen, click on "Popular Mechanics Owners Reports".

From the Vehicle Information Screen, click on:

- 

From this screen, you can view the Owners Reports for nearly 50 of the most popular cars, vans and trucks on the market. Based on owner satisfaction surveys conducted by Popular Mechanics, the reports cover what the owners see as the strengths and weaknesses of each vehicle. The reports also include critiques written by the editors of Popular Mechanics.

When you click on Popular Mechanics Owners Reports in the Strategy Screen, the Owners Reports Introduction Screen appears with a list of available vehicles. To select a report, double click on the name of the vehicle.

From the Owners Report Introduction Screen, you can return to the Strategy Screen by clicking on the Return button.

### Navigation and Buttons for the Owners Reports:

Views of Vehicle: You can click on any of the small vehicle photos to enlarge it and obtain additional information.



Summary Goes to the Summary, a written summary of survey results.



Editor's Report Goes to the Editor's Report, a critique written by a Popular Mechanics editor.



Survey Results Goes to the Survey Results, a table of questionnaire results.



Goes to the previous page.

- Goes to the next page.
- Goes to the Glossary of automotive terms.



Returns you to the Owners Reports Introduction Screen.

For more information about the Strategies Screen, see [Strategies](#).

## Telephone Survival Guide

*To access the Telephone Survival Guide from the Strategies Screen, click on "Telephone Survival Guide".*

The Telephone Survival Guide provides you with a way to locate and contact many automotive-related companies and agencies.

Click on one of the Categories, then click on one of the Specialties to display a list of appropriate resources.

The Copy button copies the displayed list of resources into the Windows Clipboard. You can then paste it into another application, such as a word processing program.

For more information about the Strategies Screen, see [Strategies](#).

## Glossary (description)

*To access the Glossary from the Strategies Screen, click on "Glossary".*

*From the Owners Reports or the Inside Tips topics, click on:*

- 

The Glossary contains definitions of automotive jargon, abbreviations, and technical terms. You can access the Glossary from several locations in the program, including the Strategies Screen, the Inside Tips topics, and the Owners Reports.

To see the Glossary, click on: [Glossary](#)

For more information about the Strategies Screen, see [Strategies](#).

## About This Release

*Popular Mechanics - New Car Buyers Guide: 1995* is a co-production of Books That Work and Hearst New Media. The information contained in this product comes from *Popular Mechanics* Magazine, a Hearst Publication; and IntelliChoice Inc., a leading vehicle research firm.

A few vehicles in this product contain 1994 information. When you look at the specifications for a vehicle model, click on the Features & Options button, or click on the Purchase Info button. Last year's data will always be marked as such. To be absolutely certain about prices and specifications, contact your local dealer. You might even find out that the price of your dream car was reduced for 1995.

## **System Information**

[System Requirements](#)

[Troubleshooting](#)

[Recommended Video Display](#)

[Sound](#)

## **System Requirements**

- 386 or higher IBM or compatible PC
- Windows™ 3.1 or higher
- 4 MB RAM (8 MB recommended)
- 4 MB Hard Disk Space
- VGA or higher graphics capabilities (256 color recommended)
- CD-ROM Drive



## Troubleshooting

With its many advanced features, *Car Buyers Guide* will require more memory than some computers can provide. If your hardware runs short of memory, you may notice one or more of these symptoms:

- Parts of the application do not start or display.
- The display shows an inappropriate color scheme.
- Print-outs appear as if created on a typewriter.
- The computer stops responding to keyboard or mouse commands.

If you encounter such difficulties, several techniques can help you overcome memory shortfalls:

- Close other applications while running *Car Buyers Guide*. Please note that some programs may be started automatically when you launch Windows. You'll find these in your Windows Startup group.
- Increase the size of your virtual memory. You can control this from the Windows Control Panel in 386 Enhanced Mode.
- Reboot your computer.
- Increase the amount of random access memory in your system. *Car Buyers Guide* requires 4 MB of RAM. Its performance will be enhanced if you have 8 MB.

### Technical Support

For technical support with this software, please call **415-843-4440**, or you can contact Books That Work via e-mail.

For CompuServe users, our e-mail address is  
**INTERNET:support@btw.com**

For Internet users our e-mail address is  
**support@btw.com**

## **Recommended Video Display**

*Car Buyers Guide* displays videos, photographs and other color graphics. For best results in viewing these, you'll want to use at least an 8-bit video card capable of displaying 256 colors.

You may occasionally see the *Car Buyers Guide* screen become discolored for a moment. This phenomenon, known as a palette shift, is normal and will not harm your system.

## **Sound**

*Car Buyers Guide* includes sound effects. To hear these, you'll need a Windows-compatible sound card. If you don't hear sound as you enter Windows, then you don't have Windows sound.

## About Our Ads

*Car Buyers Guide* contains interactive advertisements produced by sponsors, who pay to advertise in the program much the same way that companies purchase ads in traditional magazines. The ads are found in the Showroom. You can also run the Cadillac and Toyota ads from the Program Manager, by clicking on their respective icons in the Books That Work program group, but you must first exit the program or your computer may freeze.

### Notes about the Cadillac Ad

- To Exit immediately from the ad, press ALT-F4.
- You may get an error message if you run the ad without a sound card.
- You must be running your monitor using Small Fonts to read the ad's text.

### Note about the Toyota & Tread Lightly Ads

- To Exit immediately from the ad press ESC.

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## **Glossary**

**Click on phrase for definition:**

**1-ton truck**

**1/2-ton truck**

**2-point seat belt**

**2-speed**

**2-wheel drive (2wd)**

**2wd**

**3-point seat belt**

**3-speed**

**3/4-ton truck**

**4-cylinder**

**4-speed**

**4-wheel drive**

**4wd**

**4 x 4 (4-by-4)**

**5-speed**

**6-cylinder**

**6-speed**

**A-arm suspension**

**ABS**

**active belt**

**active suspension system**

**adjustable shock absorbers**

**adjustable suspension**

**air-cooled engine**

**air-spring suspension**

**airdam**

**all-wheel drive**

**alloy wheel**

**alloy**

**analog gauges/instrumentation**

**anti-sway bar**

**antilock brake system (ABS, antiskid brakes)**

**antiroll bar (stabilizer bar, anti-sway bar)**

**ASE certified automobile technician**

**awd**

**backlight**  
**badging**  
**balance Shaft**  
**basic warranty**  
**beam axle (dead axle, rigid axle)**  
**big-block engine**  
**bimini-style half top**  
**block (cylinder block)**  
**body-on-frame construction**  
**brake-transmission shift interlock**  
**cam**  
**camshaft (cam)**  
**carbureted**  
**cargo capacity**  
**cast-aluminum wheels**  
**center high-mounted stoplight**  
**CFC-free air conditioning**  
**chassis**  
**cladding (lower-body side)**  
**close-ratio transmission**  
**clutch-starter interlock**  
**coefficient of drag**  
**coil-spring**  
**computer-aided gear selection**  
**continuously variable transmission (CVT)**  
**CVT**  
**cylinder (bore, barrel)**  
**dashboard**  
**daytime running lights**  
**differential**  
**digital gauges/instrument cluster**  
**direct cylinder fuel injection**  
**direct ignition**  
**disc brakes**  
**displacement**  
**distributorless ignition**  
**dohc**

**double-wishbone suspension**  
**double overhead camshaft**  
**drivability**  
**driveline**  
**drivetrain (powertrain)**  
**drum brakes**  
**dual overhead cams**  
**dual-exhaust system**  
**dual-stage intake manifold**  
**ECVT**  
**electronic damping suspension**  
**electronic ignition**  
**electronically controlled shock absorbers**  
**engine management system**  
**extended cab**  
**fascia**  
**final-drive ratio**  
**five**  
**flat engine (horizontally opposed)**  
**flex-fuel**  
**flexible-fuel (flex-fuel)**  
**forged alloy wheels**  
**four**  
**front-wheel drive**  
**ft.-lb. of torque (lb.-ft. of torque)**  
**fuel economy**  
**fuel-injection**  
**full instrumentation**  
**full-time 4-wheel drive**  
**fuzzy logic shift/transmission control**  
**gearbox (transmission)**  
**h-arm suspension**  
**head-up display/instrumentation**  
**heavy-duty**  
**high-performance**  
**high-range 4wd**  
**horizontally opposed engine**

horsepower (hp)  
hp  
independent suspension  
induction System  
inline engine  
intake manifold  
intake ports  
intercooled  
level control  
limited-slip differential  
liter  
live axle  
locking center differential  
locking hubs  
lockup torque converter  
longitudinally mounted engine  
low-range 4wd  
maximum towing capacity  
mesh-alloy wheels  
midengine  
minimum curb weight  
mpg (miles per gallon)  
MSRP  
multilink suspension  
multipoint fuel injection  
narrow-angle V engine  
normally aspirated engine  
ohc  
ohv  
on-demand awd  
overdrive transmission  
overhead camshaft (ohc)  
overhead valves (ohv)  
oversteer  
part-time awd  
passive belt  
payload

**polycast steel wheels**  
**port fuel injection**  
**port-injection**  
**power brakes**  
**power-assist steering**  
**power-to-weight ratio**  
**powerband**  
**powerplant**  
**powerteam**  
**powertrain**  
**progressive-rate springs**  
**pushrod engine**  
**quick-ratio steering**  
**rack-and-pinion steering**  
**rear engine**  
**rear-wheel drive**  
**reverse lock-out**  
**ride-control computer**  
**rollbar**  
**rotary engine (Wankel engine)**  
**rpm**  
**self-adapting shift logic**  
**self-leveling suspension**  
**semi-trailing arm suspension**  
**sequential port fuel injection**  
**shift-on-the-fly**  
**side skirts**  
**single overhead camshaft (sohc)**  
**six**  
**skidplate**  
**sliding pillar suspension**  
**small-block engine**  
**sohc**  
**solid axle suspension**  
**speed rating**  
**speed-sensitive power steering**  
**spoiler**

**sport-tuned suspension**  
**spring rates**  
**stabilizer bar**  
**standard cab**  
**steel ladder chassis**  
**steering ratio**  
**straight engine**  
**strut suspension**  
**subframe suspension**  
**supercharged**  
**suspension tuning**  
**sway bar**  
**throttle-body fuel injection**  
**timed fuel injection**  
**tonneau cover**  
**torque converter**  
**torque**  
**torsion bar**  
**torsion beam suspension**  
**torsional rigidity**  
**towing capacity**  
**track**  
**traction control**  
**trailing arm suspension**  
**transaxle**  
**transfer case**  
**transversely mounted engine**  
**turbocharger**  
**turbodiesel**  
**twin I-beam suspension**  
**twin-cam engine**  
**twin-sequential turbochargers**  
**twin-turbo**  
**twist-beam axle**  
**understeer**  
**unibody**  
**V engine**



**V-rated tires**

**valve**

**variable-assist power steering**

**variable-assist steering**

**variable-valve timing**

**vented or ventilated disc brakes**

**VIN**

**viscous coupling**

**viscous limited-slip differential**

**wheelbase**

**Z-rated tires**

\\Definitions follow\\

1-ton truck

A truck that can carry a payload of 2000 pounds.

1/2-ton truck

A truck that can carry a payload of 1000 pounds.

## 2-point seat belt

A seat belt that extends across the user's lap only.

2-speed

A transmission with one reverse and two forward speeds.

## 2-wheel drive

Engine power drives either the front or back wheels, never all four. Also called 2wd.

2wd

Engine power drives either the front or back wheels, never all four.



### 3-point seat belt

A seat belt with both a lap belt and a shoulder harness.

**3-speed**

A transmission with one reverse and three forward speeds.

3/4-ton truck

A truck that can carry a payload of 1500 pounds.

4-cylinder

An engine with four pistons and cylinders.

## 4-speed

A transmission with one reverse and four forward speeds.

#### 4-wheel drive

A transmission system in which driving power is delivered to all wheels simultaneously. Also called all-wheel drive or awd.

4wd

A transmission system in which driving power is delivered to all wheels simultaneously.  
Also called all-wheel drive or awd.

**4 x 4**

A transmission system in which driving power is delivered to all wheels simultaneously. Also called all-wheel drive, awd or 4-by-4..



5-speed

A transmission with one reverse and five forward speeds.

## 6-cylinder

A gas or diesel engine with six pistons and cylinders set in a single line or in a double line V-shaped pattern.

**6-speed**

A transmission with one reverse and six forward speeds.

## A-arm suspension

A common layout for front suspensions. This design uses A-shaped upper and lower control arms that attach the wheel assemblies to the chassis.

## ABS

An antilock brake system automatically prevents skidding under heavy braking and allows driver to steer. A computer "pumps" the brakes to prevent wheel lockup and skid.

active belt

A seat belt you must manually buckle.

### active suspension system

A computer-controlled suspension system that adapts automatically to road conditions or driving style.

### adjustable shock absorbers

Shocks that can be set to be stiffer or softer either to compensate for wear or to fine-tune a suspension for particular driving conditions, such as rough roads or heavy loads.



### adjustable suspension

Suspension that allows adjusting shocks to be stiffer or softer either to compensate for wear or for particular driving conditions, such as rough roads or heavy loads.

### air-cooled engine

An engine cooled by the passage of air around the cylinders rather than by the passage of liquid through internal water jackets.

### air-spring suspension

Suspension that uses air or gas as a cushioning medium (rather than metal springs) to react against varying loads. Pressure can be increased for heavy loads or decreased for light loads, while keeping the vehicle's ride level.

airdam

An aerodynamic spoiler below the front bumper which reduces lift at high speeds.

### all-wheel drive

A transmission system in which driving power is delivered to all wheels simultaneously. Also called all-wheel drive (awd).

**alloy wheel**

A non-steel road wheel, usually aluminum or magnesium.

alloy

A metal which is made up of two or more elements, changing the metal's properties, such as strength, flexibility, etc.

analog gauges/instrumentation

The traditional fixed dial-and pointer, meter-type gauges. See also [digital instruments](#)



**anti-sway bar**

A transverse suspension bar that reduces vehicle roll for smoother cornering.

### antilock brake system

Automatically prevents skidding under heavy braking and allows driver to steer. A computer "pumps" the brakes to prevent wheel lockup and skid. Also called ABS or antiskid brakes.

### antiroll bar

A transverse suspension bar that reduces vehicle roll for smoother cornering. Also called an anti-sway, sway or stabilizer bar.

**ASE certified automobile technician**

A mechanic who has passed the voluntary competence test(s) administered by the National Institute for Automotive Service Excellence (ASE for short).

awd

A transmission system in which driving power is delivered to all wheels simultaneously. Also called all-wheel drive (awd).

## backlight

Car company jargon for the rearmost window glass. The term is used to avoid confusion with the pair of rear side windows.

badging  
The nameplates on a car.

**balance shaft**

A rotating shaft that reduces vibration in the engine.



**basic warranty**

The manufacturer's warranty that covers the entire vehicle (often called a bumper-to-bumper warranty).

### beam axle

A solid transverse beam that supports the wheels, rather than driving them. Often used at the rear of a front-wheel-drive vehicle. Also called dead or rigid axle.

**big-block engine**

An engine with a large cylinder block.

### bimini-style half top

A small canvas roof used as a sun screen on some utility vehicles. Sometimes called a "bikini" top.

**block**

The main part of the engine that houses the cylinders, pistons and camshaft. Also called cylinder block.

**body-on-frame construction**

Vehicles with a separate body and frame, as opposed to unibody construction.

brake-transmission shift interlock

A safety feature that prevents shifting an automatic transmission out of "park" and/or "neutral" unless the brake pedal is depressed.

## cam

In automotive terms, "cam" is used two ways. First, to indicate an egg-shaped mechanism (on a camshaft, it is called a lobe) that converts the rotating movement of one part to the up-and-down movement of another part. Cam design is always a compromise between efficiency and quiet operation. Second, "cam" is often used as an abbreviation for camshaft.



## camshaft

The shaft in the engine driven by gears, belts or chain from the crankshaft which times the opening and closing of the intake/exhaust valves in the cylinders. Also called cam.

carbureted  
Using a carburetor.

### cargo capacity

This can mean the interior volume or cargo space of a truck or station wagon or the maximum cargo weight, which is usually called the "payload."

**cast-aluminum wheels**

A non-steel road wheel, usually aluminum or magnesium.

### center high-mounted stoplight

A third brake light, required by law, that is mounted above the two standard brake lights, either on the upper edge of the trunk lid, on a spoiler, inside the backlight or at the rear edge of the roof.

### CFC-free air conditioning

Refrigerant used in the air conditioning system is not chlorofluorocarbon (CFC or "Freon"), a chemical which has been reported to destroy the earth's ozone layer.

## chassis

The lower framework or platform of the vehicle to which the running gear suspension and wheels are attached. Stiffening or increased rigidity of the chassis can improve handling.

## cladding

Protective panels (usually plastic) attached to the lower part of the bodywork. Also called lower-body side.



### close-ratio transmission

Gear ratio gaps are smaller between low and high gears, which keeps the engine working in the upper part of its powerband at all times.

### clutch-starter interlock

A safety feature that prevents operating the starter on vehicles with standard transmission unless the clutch pedal is depressed.

**coefficient of drag**

This value expresses the resistance or drag on an object (the vehicle) moving through the air.

### coil-spring

Used in the suspension ( and elsewhere), an elastic spring that reacts to compressive loads. It is formed by twisting a metal rod into a cylindrical spiral.

### computer-aided gear selection

General Motors computer system that directs the transmission from first through fourth gears under light acceleration.

### continuously variable transmission (CVT)

Type of automatic transmission that uses belts and expandable pulleys rather than gears to change the drive ratio. This permits the ratio to be changed continuously, rather than in abrupt steps as it is on a conventional transmission with gears.

## CVT

A continuously variable transmission uses belts and expandable pulleys rather than gears to change the drive ratio. This permits the ratio to be changed continuously, rather than in abrupt steps as it is on a conventional transmission with gears.

## cylinder

The tubular holes in the engine block where the piston travels and combustion takes place. Also called bore or barrel.



## dashboard

The panel or molding below the windshield inside the vehicle that contains the instruments, air vents and controls.

### daytime running lights

Headlights that automatically turn on when the engine is started. Since the headlights are always on when the vehicle is moving, it's easier to see, reducing the likelihood of some types of accidents. Required in Canada, some U.S. models now offer this feature.

## differential

A gear cluster that allows two wheels on the same axle to travel different distances ( at different speeds), which is necessary when rounding a corner.

### digital gauges/instrument cluster

Like a digital watch, digital instruments display information in a series of illuminated digits and letters (or liquid crystal display [LCD]), rather than the pointer and fixed dial of an analog instrument cluster.

### direct cylinder fuel injection

A form of port injection in which fuel is sprayed into the intake port of each cylinder continuously at a controlled rate.

direct ignition

Design uses a separate coil for igniting each spark plug.

## disc brakes

Friction pads press on a disc attached to the wheel. These brakes are less prone to fading than are drum brakes..

## displacement

The volume of air moved by a piston traveling in a cylinder. In a multi-cylinder engine, this is the sum of the volume of all cylinders.



## distributorless ignition

Design uses a separate coil for igniting each spark plug.

**dohc**

A double overhead camshaft is an engine with two camshafts in each cylinder head; one actuates the intake valves, the other, the exhaust valves of the cylinders.

double-wishbone suspension

A form of independent suspension using upper and lower, wishbone- or A-shaped control arms for each wheel.

### double overhead camshaft

An engine with two camshafts in each cylinder head; one actuates the intake valves, the other, the exhaust valves of the cylinders.

## drivability

Measured by standards such as poor or good, drivability refers to the ease of control, the smoothness at idle, the acceleration, the ease of starting and other aspects of a vehicle or engine.

## driveline

The parts that transmit power from the transmission to the differential.

## drivetrain

The parts that propel the vehicle--the engine, transmission, driveshaft and drive axles.  
Also called powertrain.

## drum brakes

Friction from two brake shoes bears on the inside of a drum or cylinder attached to the wheel.



### dual overhead cams

An engine with two camshafts in each cylinder head; one actuates the intake valves, the other, the exhaust valves of the cylinders. Also called double overhead camshaft.

### dual-exhaust system

Two separate exhaust systems each attached to a separate cylinder head on a V-type engine.

### dual-stage intake manifold

Allows the engine to produce more torque throughout its operating range by routing the intake air through one of two passages, depending on engine speed.

## ECVT

An electronically controlled continuously variable transmission uses belts and expandable pulleys rather than gears to change the drive ratio. This permits the ratio to be changed continuously, rather than in abrupt steps as it is on a conventional transmission with gears.

### electronic damping suspension

Electronic damping suspensions are controlled by electric motors or solenoids rather than manual adjusters. They can be adjusted while the vehicle is in motion, either by a computer or a driver-activated switch. Also called electronically controlled shock absorbers.

## electronic ignition

An ignition system in which transistors, rather than mechanical contacts, break the low-voltage circuit to fire the spark plugs..

### electronically controlled shock absorbers

Adjustable shock absorbers that are controlled by electric motors or solenoids rather than manual adjusters. They can be adjusted while the vehicle is in motion, either by a computer or a driver-activated switch. Also called electronic damping suspension.

**engine management system**

A computer-controlled network of sensors and electro-mechanical actuators for controlling engine operation.



extended cab

A pickup truck cab with extra space behind the front seats.

## fascia

A panel that fills the gap between the bumper and the bodywork. On many new cars, the fascia has grown into a large plastic piece that not only covers the bumper, but may also incorporate fog lights, a spoiler and a grille surround.

**final-drive ratio**

Indicates the ratio between the driveshaft or transmission output shaft's rpm and the drive-wheel rpm.

five

A five-cylinder engine.

## flat engine

As in flat-six (the number indicating how many cylinders in the engine), an engine where each bank of cylinders is opposed 180 degrees from the other. Also called a "boxer" or "horizontally opposed" engine.

## flex-fuel

An engine designed to run on gasoline, M85 (a gasoline/methanol mix), propane or any other combination of fuels.

flexible-fuel (flex-fuel)

An engine designed to run on gasoline, M85 (a gasoline/methanol mix), propane or any other combination of fuels.

**forged alloy wheels**

A non-steel road wheel, usually aluminum or magnesium.



four

A four-cylinder engine.

### front-wheel drive

A transmission system that delivers driving power to the front wheels only. Also called "front-drive" and "fwd."

ft.-lb. of torque (lb.-ft. of torque)

The work done when a constant force of 1 pound is exerted on a body which then moves 1 foot in the direction of the force.

**fuel economy**

The rating, expressed in miles per gallon, for a vehicle's fuel consumption..

## fuel-injection

Uses a pump and individual injectors to put fuel directly into the intake ports of the cylinders or the cylinder pre-chamber, instead of a carburetor, to meter fuel input.

### full instrumentation

Relative term for the number of instruments (gauges) on the dashboard. Usually, six or more are considered to be "full" instrumentation.

full-time 4-wheel drive

Driving power is directed to all four wheels at all times.

fuzzy logic shift/transmission control

A form of electronically controlled automatic transmission in which the computer adapts the gear shifts to suit road conditions or driving style.



## gearbox

The device in a drivetrain that multiplies engine torque, especially a manual transmission. Also called the transmission.

### h-arm suspension

A type of independent suspension in which the control arms between the chassis and wheel assembly are H-shaped.

### head-up display/instrumentation

A display of essential instrumentation (such as the speedometer) reflected in the windshield so driver can keep eyes and head up.

## heavy-duty

Heavy-duty parts can last longer and are often safer, plus they can save you money on replacements and maintenance.

high-performance

Vehicle or part is built to exceed standard performance characteristics.

high-range 4wd

Many 4-wheel drivetrains incorporate an additional 2-speed gearbox with a high gear (high range) and a low gear (low range).

horizontally opposed engine

An engine where each bank of cylinders is opposed 180 degrees from the other. Also called a "boxer, "flat" or "flat six" (the number indicating how many cylinders) engine.

horsepower (hp)

A measure of the engine's ability to do work. See [power-to-weight ratio](#) for rating a vehicle's horsepower versus its weight.



hp

Horse power. A measure of the engine's ability to do work. See [power-to-weight ratio](#) for rating a vehicle's horsepower versus its weight.

### independent suspension

Each wheel is sprung separately, so bumps in the road that affect one wheel do not affect another. This means improved ride and handling over rough terrain.

induction system

Delivers the air-fuel mix to the cylinders.

**inline engine**

Cylinders are set in a row along the axis of the crankshaft.

### intake manifold

Tubes or passages through which the air-fuel mix flows between the carburetor or throttle plate and intake ports.

### intake ports

Passages in the cylinder head through which the air-fuel mixture passes to the intake valves of the engine.

intercooled

Cooling of pressurized air from a supercharger or turbocharger before it enters the cylinder. This increases the mass of air entering the engine.

## level control

A suspension system that adjusts the front and/or rear ride heights to compensate for variations in the load within the vehicle, to keep the vehicle level at all times.



### limited-slip differential

Prevents wheelspin on difficult terrain (off-road or on snow and ice) by mechanically limiting the rotational speed differential between the output shafts and therefore, the drive wheels.

**liter**

A metric measure of engine cylinder displacement. One liter is equal to 61 cubic inches.

**live axle**

Axle that transmits driving power to wheels, as in a front-engine, rear-drive car.

### locking center differential

To help in rough or low-friction terrain, this feature sends equal torque to both the front- and rear-driven wheels of a 4-wheel drivetrain so that the differential action is no longer functioning.

### locking hubs

On 4wd vehicles, wheel hubs on the ends of the front axles that can connect and disconnect driving power to the wheels. On some vehicles, this can be done automatically from within the vehicle. On others, it must be done manually by physically turning dials on the wheel hubs.

lockup torque converter

A direct drive mode on an automatic transmission which helps increase fuel economy.

**longitudinally mounted engine**

An engine that is mounted front-to-back (not sideways) in the vehicle.

### low-range 4wd

In high range 4wds, an additional 2-speed gearbox is incorporated with a high gear (high range) and a low gear (low range).



maximum towing capacity

The amount in pounds that a vehicle set up for towing can pull.

mesh-alloy wheels  
A style of alloy wheels.

## midengine

The engine is located immediately behind the passenger compartment, but ahead of the rear axles.

minimum curb weight

The minimum weight of the lightest version of a vehicle.

mpg

Miles per gallon. The number of miles a vehicle can travel on one U.S. gallon of fuel.

## MSRP

The manufacturer's suggested retail price (plus transportation charges) listed at the bottom of the window sticker, is the most you should expect to pay for the vehicle. Rebates and negotiated discounts can lower the actual purchase price considerably.

## multilink suspension

A type of independent suspension with multiple links between the wheel and chassis.

### **multipoint fuel injection**

Fuel is injected directly into each individual cylinder or intake port rather than into a central location in the intake manifold.



narrow-angle V engine

The axes of the cylinders are at less than 60 degrees to each other.

normally aspirated engine

The engine draws in air at the ambient pressure, without super- or turbocharging.

ohc

Overhead camshaft. An engine with the camshaft in the cylinder head, which operates the valves from above

ohv

Overhead valves. An engine with the valves located at the cylinder head, above the pistons, and operated by pushrods and rocker arms from a camshaft located lower in the engine block.

### on-demand awd

The driver can select four-wheel drive or rear-wheel drive only by disengaging power to one axle.

### overdrive transmission

An auxiliary gear or transmission, electronically or mechanically controlled, which reduces engine speed for fuel-efficient cruising at higher speeds.

overhead camshaft (ohc)

An engine with the camshaft in the cylinder head, which operates the valves from above.

### overhead valves (ohv)

An engine with the valves located at the cylinder head, above the pistons, and operated by pushrods and rocker arms from a camshaft located lower in the engine block.



## oversteer

A handling characteristic (called loose handling by oval track racers) in which the rear wheels lose traction before the fronts, causing the vehicle to make a sharper turn than its driver intended. In extreme cases, the rear end will skid out of control and the vehicle will spin out.

part-time awd

The driver can select four-wheel drive or rear-wheel drive only by disengaging power to one axle.

### passive belt

A seat belt that does not require any action on the rider's part to be effective. Typically, the seat belt is motor-driven and wraps around the driver or passenger when the engine is started. Another type is attached to the door and wraps around the occupant when the door is closed.

payload

The weight of the cargo and passengers a truck or station wagon can carry. See [cargo capacity](#).

**polycast steel wheels**

A type of cast (rather than stamped) steel wheel.

### port fuel injection

Fuel is injected directly into each individual cylinder or intake port rather than into a central location in the intake manifold.

### port-injection

A form of fuel injection in which a nozzle sprays fuel into the intake port of each cylinder, using either timed or continuous fueling methods.

**power brakes**

Brakes operated by hydraulic or pneumatic power rather than solely driver effort.



power-assist steering

Steering by the driver is augmented by hydraulic or other types of power.

### power-to-weight ratio

This value indicates a vehicle's performance. Divide the vehicle's weight by the horsepower; a typical vehicle has a ratio below 20, a high performance car 10 or less.

powerband

The useful rpm range of the engine.

powerplant  
The engine.

powerteam

A combination of the engine, transmission and drive axle ratio.

powertrain

The parts that propel the vehicle--the engine, transmission, driveshaft and drive axles.

progressive-rate springs

As more force is exerted on these springs, the spring resistance increases.

### pushrod engine

An ohv engine in which the valve mechanism is actuated by pushrods, rather than directly by the camshaft (as in an ohc engine).



### quick-ratio steering

A steering ration that requires few turns of the steering wheel (but more effort) to turn the front wheels from side to side.

### rack-and-pinion steering

Offering tight, responsive steering, this system gears the steering wheel's input shaft (pinion) directly to the output shaft (rack), which turns the wheels.

## rear engine

The engine is located behind or above the rear axle of the vehicle.

rear-wheel drive

Driving power is sent to the rear wheels.

**reverse lock-out**

Transmission feature that eliminates the possibility of accidentally shifting into reverse instead of a forward gear.

ride-control computer

The computer that controls an active suspension or electronically controlled shock absorbers.

**rollbar**

Transverse metal bar that protects occupants if the vehicle rolls over.

### rotary engine

Engine design that uses a triangular rotor rather than pistons to produce power. Rotary engines run smoothly, though usually with lower fuel efficiency than a piston-driven engine. Also called the Wankel engine.



rpm

Revolutions per minute; a measurement of rotational speed.

### self-adapting shift logic

Also called fuzzy logic. A form of electronically controlled automatic transmission in which the computer adapts the gear shifts to suit road conditions or driving style.

### self-leveling suspension

A suspension system that maintains constant ground clearance or compensates for unequal loading of the axles, as when the trunk of a passenger car is heavily loaded.

### semi-trailing arm suspension

Usually in an independent rear suspension with multiple links between the wheels and chassis, one of which runs forward from the wheel at an angle.

### sequential port fuel injection

A type of multipoint fuel injection in which the injectors pulse in sequence, rather than all at once or continuously.

### shift-on-the-fly

Used with part-time 4wd vehicles when driver can automatically shift into 4wd rather than having to exit the vehicle to manually lock the hubs.

## side skirts

A downward extension of the body which helps control air flow.

single overhead camshaft (sohc)

An engine in which a single camshaft, mounted over each cylinder head, operates both the cylinder's intake and exhaust valves.



six

A six-cylinder engine.

## skidplate

A metal protective plate under the vehicle to shield, for example, the oil pan from harm on rough terrain.

sliding pillar suspension

An antiquated front suspension design rarely seen today

**small-block engine**

An engine with a small cylinder block.

**sohc**

An engine in which a single camshaft, mounted over each cylinder head, operates both the cylinder's intake and exhaust valves.

### solid axle suspension

The opposite of independent suspension, using a rigid beam axle, or live axle, the motion of one wheel is therefore transmitted to the other.

### speed rating

A system that uses letters of the alphabet to designate safe maximum sustained speed for tires. Inexpensive passenger car tires, for example, are rated H. The highest performance tires, safe for up to 149-plus mph, are rated Z.

### speed-sensitive power steering

Power steering system in which the amount of power assist decreases as vehicle speed increases. This makes the vehicle less twitchy at highway speeds and provides maximum power assist when parking.



**spoiler**

Any aerodynamic device that modifies air flow around the vehicle.

### sport-tuned suspension

A suspension with relatively stiff springs that emphasizes sporty handling at the expense of a smooth ride.

### spring rates

A measure of the firmness of the suspension springs. Softer springs give a smooth ride, stiffer springs give better handling.

### stabilizer bar

A transverse suspension bar that reduces vehicle roll for smoother cornering. Also called an antiroll bar or sway bar.

## standard cab

The standard pickup truck cab, with little storage room behind the seats.

**steel ladder chassis**

A-frame design with long side rails connected by shorter cross members, vaguely resembling a ladder.

### steering ratio

The ratio of the gears in the steering gearbox, often expressed by the number of turns of the steering wheel required to turn the front wheels from lock-to-lock (side to side).

**straight engine**

An inline engine, usually expressed with the number of cylinders, as in a straight six.



### strut suspension

Designed to take up less space, this suspension system combines the coil springs and shock absorbers into one assembly. Used frequently in smaller cars. Often called MacPherson struts after their inventor.

## subframe suspension

The suspension is mounted on the removable chassis sub-structure.

## supercharged

An engine in which the pressure of the intake air or fuel is artificially increased by a pump to generate more engine power.

## suspension tuning

The adjusting of spring and shock absorber rates by engineers to achieve some goal, usually a desired combination of ride and handling characteristics.

## sway bar

A transverse suspension bar that reduces vehicle roll for smoother cornering. Also called an antiroll bar or stabilizer bar.

throttle-body fuel injection

Injectors within the throttle body spray fuel into the intake manifold.

### timed fuel injection

A form of port injection in which fuel is sprayed into the intake port of each cylinder for controlled-time intervals rather than continuously.

tonneau cover

A detachable cover for the passenger compartment of a convertible. Sometimes used to describe a cover designed to fit over the retracted convertible top.



torque converter

A fluid coupling that transfers engine torque to an automatic transmission.

torque

Measured in foot-pound or inch-pound, torque is the force created by a twisting or turning effort.

torsion bar

A type of spring that is actually a straight rod that provides spring action when it is twisted.

torsion beam suspension

A suspension system employing torsion beams instead of springs.

### torsional rigidity

The amount of stiffness or resistance to twisting in a chassis. A rigid chassis makes it easier for engineers to tune the suspension. A more flexible chassis makes it more difficult to achieve consistent handling.

towing capacity

The amount in pounds that a vehicle set up for towing can pull.

track

This can refer to the straightness with which a car moves down the road or the transverse distance between the centers of the left and right tires on an axle.

### traction control

An electronic system that prevents excessive wheelspin by reducing engine power and/or pumping the brakes when wheelspin is detected.



trailing arm suspension

A form of suspension that supports the wheel assembly on links that run backward from pivot points on the chassis.

transaxle

A transmission which combines the transmission and drive axle (differential) functions.

transfer case

In a 4wd vehicle, a gear system that apportions driving power between the front and rear axles.

**transversely mounted engine**

Engine is mounted sideways in the vehicle (common on front-drive cars).

## turbocharger

A type of supercharger in which the air brought into the engine is pressurized generating more engine power. Unlike a supercharger, a turbo is driven by the exhaust gases and does not pull its driving energy from the engine.

turbodiesel

A turbocharged diesel engine.

### twin I-beam suspension

A type of front suspension used on some Ford trucks, consisting of two beam axles, one pivoted on each side of the truck.

### twin-cam engine

An engine in which there are two camshafts per bank of cylinders; one actuates the intake valves, the other the exhaust valves. Also called a double or dual overhead cam engine.



twin-sequential turbochargers  
Two turbochargers that work in sequence.

twin-turbo

Two turbochargers that work together, usually one for each bank of cylinders on a V-type engine.

### twist-beam axle

Rear axle used on some front-drive cars; the beam-shaped axle twists when one wheel goes over a bump or pothole.

## understeer

A handling characteristic (called push by oval track racers) in which the front wheels lose traction before the rear, causing the vehicle to make a wider turn than the driver intended. In extreme cases, the vehicle will skid straight ahead instead of turning.

## unibody

The body, floor and roof are all one unit on which the suspension is mounted, creating a lighter, more rigid structure. There is no separate frame.

## V engine

An engine where the cylinders are set at an angle to each other, so their axes form a V shape. The number following (i.e. V6, V8, etc.) is the number of cylinders.

### V-rated tires

A speed-safety designation for tires. V tires are rated for continuous use at speeds up to 149 mph.

valve

A device that controls, restricts or interrupts the flow of air or fluid in an engine, such as the gases into and out of a cylinder.



### variable-assist power steering

Power steering system in which the amount of power assist decreases as vehicle speed increases. This makes the vehicle less twitchy at highway speeds and provides maximum power assist when parking.

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### variable-valve timing

An engine in which the timing or duration of the valve opening can be changed, usually applied only to the intake valves.

**vented or ventilated disc brakes**

Discs are separated by ribs which allow cooling air to flow between the discs and help keep brakes from overheating.

## VIN

Vehicle Identification Number. A serial number assigned to each vehicle by its manufacturer for identification and registration.

viscous coupling

A drive which uses the properties of fluid friction in an oil to transmit power.

### viscous limited-slip differential

A limited-slip differential prevents wheelspin on difficult terrain (off-road or on snow and ice) by mechanically limiting the rotational speed differential between the output shafts and therefore, the drive wheels. A viscous type uses a viscous coupling to limit rotation, rather than clutches or other mechanical means.

**wheelbase**

The distance between the centers of the front and rear axles of the vehicle.



### Z-rated tires

A speed-safety designation for tires. Z tires are rated for continuous use at more than 149-plus mph.



