

## SIZING UP TIRES

Occasionally, a customer will purchase a new car or truck and drive it straight to the local wheel and tire shop for an immediate "upgrade." This seemingly innocent act may be the beginning of a complicated experience for the owner, and before it's done, your service department may become involved.

Installing non-original equipment (OEM) tires constitutes a modification to the vehicle. How can this modification lead to unsatisfactory vehicle operation, and what can be done about it to satisfy the customer?

Here is some information to help you understand the process, and some guidelines to help you explain the situation to the customer.

### FITMENT

GM's tire engineers who develop OEM tires for GM cars and trucks must choose the best possible tires for the vehicle, with consideration to ride, handling, tread wear, wet traction, fuel economy, and initial cost. There's no magic way to improve any one of these characteristics without affecting the others.

GM's tires are developed using the Tire Performance Criteria (TPC) system, GM's performance standards for traction, endurance, dimension, noise, handling, rolling resistance and others. Only after these criteria are met is a tire released on a GM vehicle, with a TPC number molded onto the sidewall.



When OEM tires need to be replaced, General Motors recommends using a tire with the same TPC as the original. Installing replacement tires with the same TPC number as the originals is the best way to ensure that the new tires will perform the same as the originals.

### HOW OEM TIRES ARE SELECTED

Choosing a wheel and tire combination for a vehicle is called fitment. Fitment involves a series of choices:

- fit the vehicle mechanically
- fit the engineer's specifications

- fit the brand's image.

### Mechanical Fit

The wheel and tire must fit each other, and the combination of wheel and tire must fit the vehicle.

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## Techline News

The latest version of the Techline Information System (TIS), to be released in the first quarter of 2000, will offer a different response to technicians reprogramming a PCM/VCM using the same download files as those already present in the control module. That response, simply put, will say that it can't be done.

Service bulletin 99-06-04-053 outlines this reprogramming change for

1990-2000 passenger cars and trucks with reprogrammable PCM/VCMs. There is no technical reason why reprogramming using the same download files as those already present in the control module would be an effective repair. The files would never become corrupted and need to be reloaded if the control module has been successfully programmed. A P0601, Control Module Read Only Memory, DTC would be set in memory and the MIL would illuminate if the controller memory became corrupted.

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## Engineering Specifications

**Load Capacity** – The tire must be capable of supporting the vehicle and the vehicle's recommended load when inflated to the recommended pressure. The OEM tire will do this, with a wide safety margin. The load capacity is molded into the vehicle's sidewall.

**Rolling Radius** – The rolling radius of the tire is the distance from the center of the wheel to the road. The rolling radius determines revolutions per mile. Revolutions per mile is an important factor in calibrating the vehicle's powertrain control module, which in turn affects air/fuel mixture, fuel economy, tailpipe emissions, transmission shifting, speedometer, odometer, and cruise control. Anti-lock brake, traction control, and precision handling systems also use tire revolutions for proper operation.

**Tire Width** – Tire width is expressed as part of the tire's size code (see sidebar) and affects the clearance between the tire and vehicle components such as suspension and body structure. Width also plays a role in adhesion (cornering), handling (turn-in), ride quality and appearance. Increased tire width is associated with improved handling; "high performance" tires are almost always wider than base tires. The tire's profile is the cross section height expressed as a percent of the width. As this aspect ratio becomes smaller, the distance between the wheel rim and the road decreases.

**Tread Wear** – All tires, naturally, eventually wear out. Wear is affected by many things, including load, driving style, suspension alignment, inflation pressure, and tread compound. Choosing a tread compound calls for balancing between rate of wear and traction. A hard tread compound will last a long time but will offer a reduced grip on the pavement. A soft tread compound will grip aggressively, but will wear out quite quickly.

**Rolling Resistance** – A tire rolling on the pavement offers a measurable amount of resistance, when it is inflated to the recommended pressure. Tread compounds, carcass construction and materials, tire size and inflation pressure all contribute to the tire's rolling resistance. The lower the rolling resistance, the better the fuel economy.

**Noise** – Noise generated by the tire's contact with the pavement is a function of tread design and carcass construction, and

is also an important consideration. Aggressive tread lugs, such as those seen on snow tires or off-road tires, are likely to create a high level of noise when operated on normal pavement. Irregular tire wear, such as from misalignment, can lead to tire noise.

## Brand Image

Aggressive tread pattern, tire width, and sidewall appearance are tire features that bear on a vehicle's brand image. The adhesion of the tread compound, ability to shed water, and speed rating may also play a role. These considerations must not compromise load rating or sizing, however.

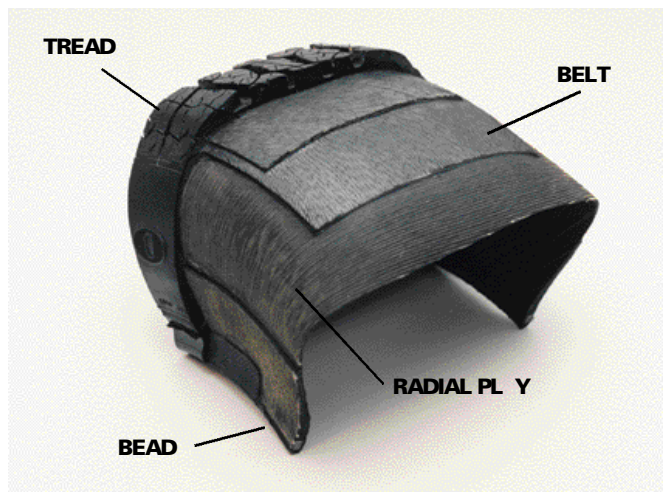
## WHAT HAPPENS WHEN TIRE SIZE IS CHANGED?

Replacement tires should be the same size, load range, and construction as the OEM tires. Replace the original tires with tires that have the same TPC specification number.

There are four dimensions that may be affected if a customer installs a non-OEM tire to a vehicle – fit to the wheel, width, profile, and rolling radius. Any one of these can alter the vehicle's behavior enough to cause customer dissatisfaction.

**Fit to the Wheel** – The wheel diameter is part of the tire's size code (see sidebar), and they run in one-inch increments. So, determining the correct wheel diameter is fairly straightforward; either the tire fits or it doesn't. Rim width is another matter. Tire manufacturers publish an acceptable range of wheel widths for each tire size. Any wheel whose width falls into this range is an acceptable fit. An incorrect wheel width - either too wide or too narrow - will cause the sidewall of the tire to distort, which affects ride, handling, and potentially, tire life.

**Width** – A wider tire causes more aerodynamic drag, which can decrease fuel economy. The increased width of the



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General Motors service tips are intended for use by professional technicians, not a "do-it-yourselfer." They are written to inform those technicians of conditions that may occur on some vehicles, or to provide information that could assist in the proper service of a vehicle. Properly trained technicians have the equipment, tools, safety instructions and know-how to do a job properly and safely. If a condition is described, do not assume that the bulletin applies to your vehicle or that your vehicle will have that condition. See a General Motors dealer servicing your brand of General Motors vehicle for information on whether your vehicle may benefit from the information.

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tread may reduce water dispersion, affecting wet traction. A wider tire may also require a wider wheel, and the resulting combination may not fit the wheel opening of the vehicle. Wide tires put more tread on the road, for improved dry traction and handling.

**Profile** – The tire’s profile is the cross section height expressed as a percent of the width and is part of the tire’s size code (see sidebar). As this aspect ratio becomes smaller, the distance between the wheel rim and the road decreases. Generally a low profile contributes to improved handling, at the expense of ride comfort. The shorter, stiffer sidewall transfers more road shock to the wheel and onward to the occupants of the vehicle.

**Rolling Radius** – The vehicle speed sensor counts the revolutions of the transmission output shaft. For a given vehicle, the powertrain control module considers a certain number of revolutions to equal a mile. Changing the tire size can either increase or decrease wheel revolutions per mile, which also changes transmission output shaft revolutions per mile. The result is that the PCM thinks the vehicle is running at a speed different from what it’s actually doing. The first thing most customers notice is an error in the odometer and speedometer. This can also affect the perceived miles per gallon of fuel. They may also comment

on changes in the shift patterns of the automatic transmission.

## OTHER CONSIDERATIONS

Wheel offset should match that of the original wheel to avoid compromises to bearings and contact with structural components. Excessive offset can also adversely affect the steering and handling.

Installing tires on the front that are different from the size of the tires on the rear can affect the operation of the ABS and traction control systems, except when equipped this way originally, such as the Corvette.

Installing tires with a different rolling radius than the OEM tires will affect trim height (distance the vehicle sits from the ground), headlamp aim, and of course, speedometer calibration.

On vehicles with prop shafts (RWD or 4WD), changing the size of the tires on the drive wheels can affect driveline angles, which can lead to U-joint induced vibrations.

Some customers may choose an extremely high-performance tire with a high speed rating (see sidebar). Tires of this type are suitable for driving conditions found on a racetrack, not on public roads in the United States. They will wear out relatively quickly because the tread depth is thin to prevent overheating and chunking at high speeds.

## HOW TO DETERMINE WHAT TIRE SIZES ARE SUPPORTED

Although GM recommends that replacement tires match the OEM tires, it is possible to install tires that match factory optional tires for the vehicle in question. If this is done, it may be necessary to reprogram the vehicle’s PCM to recognize the size of the tire installed (remember, the rolling radius may vary on tires of different sizes). Reprogramming for this purpose is not chargeable to warranty; the dealer must obtain any required reimbursement from the customer.

Here’s how to determine which tires are supported for a particular VIN:

- In TIS 2000, select SPS.
- Select Information Only.
- Enter the VIN.
- Click Next.
- Select PCM/VCM.
- Select the Reconfigure box.
- Click Next.
- The tire size chart will appear.

– Dick Gratz, Milford Proving Ground



## Tire Sizing Code Numbers

**P 225/60 R 16 98 H**

**P** Passenger car tire

**225** Tire section width in mm

**60** Section height/width ratio in %

**R** Radial tire construction

**16** Rim diameter in inches

**98** Load index

**H** Speed rating

## Speed Rating Interpretation

**S\*** up to 112 mph

**T** up to 118 mph

**H** up to 130 mph

**V** up to 149 mph

**ZZ** over 149 mph

\* Most base all-season tires and touring tires used by GM are S-rated.

## Techline News

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Now, when attempting to reprogram using the same download files, the TIS 2000 PC will display, "The calibration selected is already the current calibration in the control module. Reprogramming with the same download file is not allowed."

It is possible that the engine or transmission might temporarily operate differently after a reprogramming event until certain values are re-learned, such as fuel trim, IAC learned position, various OBDII diagnostic thresholds and automatic transmission shift adapts. However, any changes noticed in engine or transmission operation will likely disappear in a short amount of time or driving distance once these parameters are re-learned.

In the long run, instead of reprogramming the control module, additional diagnosis is needed to determine the exact cause of the vehicle's condition. After proper diagnosis, the cause can be addressed and the appropriate repairs can be made.

– Dave Puzzuoli

# GM Oil Life System Reset Procedures

To reset the oil life monitor after the oil has been changed in 1999 and 2000 model year GM vehicles, follow these procedures:

## **2000 Buick Century**

## **1999 Buick Century**

## **2000 Buick Regal**

## **1999 Buick Regal**

## **2000 Chevrolet Lumina**

## **1999 Chevrolet Lumina**

## **2000 Oldsmobile Intrigue**

## **1999 Oldsmobile Intrigue**

## **1999 Chevrolet Monte Carlo**

## **2000 Chevrolet Tahoe and Suburban**

## **2000 GMC Yukon and Yukon XL**

## **2000 Chevrolet Venture**

## **2000 Oldsmobile Silhouette**

## **2000 Pontiac Montana**

## **2000 Chevrolet Silverado**

## **1999 Chevrolet Silverado**

## **2000 GMC Sierra (800)**

## **1999 GMC Sierra (800)**

1. Turn the ignition to Run but with the engine off.
2. Fully push and release the accelerator pedal slowly three times within five seconds.
3. If the Change Oil Soon light flashes, the system is resetting.
4. Turn the key to Off.
5. Start the vehicle.
6. The oil life will change to 100%.
7. If the Change Oil Soon light comes back on, the system has not reset. Repeat the procedure.

## **2000 Buick LeSabre**

## **2000 Buick Park Avenue**

## **1999 Buick Park Avenue**

## **2000 Pontiac Bonneville**

1. Turn the ignition to On.
2. Display the Oil Life Index
3. Press and hold the Reset button on the DIC for more than five seconds. The oil life will change to 100%.

## **1999 Buick LeSabre**

1. Turn the ignition to Run but with the engine off.
2. Press and hold the Oil Reset button (located in the glove box) for at least five seconds, but not more than 60 seconds.
3. After five seconds, the Change Oil Soon light will flash four times and then go off. This indicates that the Engine Oil Life Monitor System has been reset.

## **2000 Cadillac DeVille**

## **2000 Cadillac Seville**

## **1999 Cadillac Seville**

1. Turn the ignition to Run but with the engine off.
2. Display the Oil Life message by pressing the Info button.
3. Press and hold the Reset button until the display shows 100% Engine Oil Life. This resets the oil life index.

## **2000 Cadillac Eldorado**

## **1999 Cadillac Eldorado**

## **1999 Cadillac DeVille**

1. Turn the ignition to Run but with the engine off.
2. Press the Trip button on the DIC to view various menu choices, stop on the Oil Life Remaining message.
3. Press and hold the Reset button until the display shows 99% Engine Oil Life. This resets the oil life index.

## **2000 Chevrolet Corvette**

## **1999 Chevrolet Corvette**

1. Turn the ignition to Run but with the engine off.
2. Press the Trip button so the Oil Life percentage is displayed.
3. Press Reset and hold for two seconds. Oil Life Remain 100% will appear.

## **2000 Chevrolet Impala**

## **2000 Chevrolet Monte Carlo**

1. Turn the ignition to Acc or On and the radio off.
2. Press and hold the Disp button on the radio for at least five seconds until Settings is displayed.
3. Press the Seek up or down arrow to scroll through the main menu.
4. Scroll until Oil Life appears on the display.
5. Press the Prev or Next button to enter the submenu. Reset will be displayed.
6. Press the Disp button to reset. A chime will be heard to verify the new setting and Done will be displayed for one second.
7. Once the message has been reset, scroll until Exit appears on the display.
8. Press the Disp button to exit programming. A chime will be heard to verify the exit.

## **2000 Chevrolet Camaro**

## **1999 Chevrolet Camaro**

## **2000 Pontiac Firebird**

## **1999 Pontiac Firebird**

1. Turn the ignition to Run but with the engine off.
2. Push the Trip/Oil Reset button located on the instrument panel for 12 seconds. The Oil Change light will start to flash to confirm that the system is reset. The reset is complete when the Oil Change light goes out.

## **2000 Pontiac Grand Prix (with DIC)**

1. Turn the ignition to Run but with the engine off.
2. Fully push and release the accelerator pedal slowly three times within five seconds
3. If the Change Oil Soon light flashes, the system is resetting.
4. Turn the key to Off after the light has finished flashing, then start the vehicle.

NOTE: If the Change Oil Soon light comes back on, the engine oil life monitor has not reset. Repeat the procedure.

## **2000 Pontiac Grand Prix (with Trip Computer)**

## **1999 Pontiac Grand Prix**

1. Turn the ignition to Run but with the engine off.
2. Press the Mode button until the light appears lit next to Oil Life.
3. Press and hold the Reset button for three seconds. The oil life percentage should change to 100%.

## **2000 Pontiac Grand Am**

## **1999 Pontiac Grand Am**

## **2000 Oldsmobile Alero**

## **1999 Oldsmobile Alero**

1. Turn the ignition to On.
2. Push the Reset button located in the driver's side instrument panel fuse block. The Change Oil light will start to flash.
3. Press and hold the Reset button again. The reset is complete when you hear the chimes sound and the Change Oil light goes out.

## **1999 Oldsmobile Aurora**

1. Turn the ignition to On.
2. Press the Eng button so the Oil Life percentage is displayed.
3. Press Reset and hold for five seconds. The word Reset will appear, then Oil Life 100% will be displayed.

## **2000 Chevrolet C "5500, 6500, 7500, 8500" Series**

## **1999 Chevrolet C "5500, 6500, 7500, 8500" Series**

## **1999 Chevrolet P12 Chassis**

## **2000 GMC C "5500, 6500, 7500, 8500" Series**

## **1999 GMC C "5500, 6500, 7500, 8500" Series**

## **2000 Chevrolet B7 Chassis Medium Duty**

## **2000 GMC B7 Chassis Medium Duty**

1. Turn the ignition to Run but with the engine off.
2. Fully press and release the accelerator pedal three times within 10 seconds.
3. If the Change Oil light flashes for five seconds, the system is reset.
4. If the light does not display for five seconds, you will need to reset the system again.

– Mark Stesney

## TAC Tips

### 2001 Aurora New Electrical Features

There are a number of new electrical features on the 2001 Oldsmobile Aurora. Dealership personnel should be aware of these features and explain their operation to new Aurora customers.

#### Interior Lamp Function

The interior lamps do not activate by opening a door if it is light outside. There is an OFF-AUTO-ON switch for the interior lamps in the overhead console that works as follows:

OFF (Left Position) – Only the IP lower hush panel lamps activate when a door is open at night. Note that the IP lower lamps do not have theater diming.

AUTO (Center Position) – All lamps activate when a door is open at night. The lamps also have theater diming in this position.

ON (Right Position) – All lamps turn on. All interior lamps will turn off approximately 10 minutes after activation as part of the battery guard feature.

#### Low Tire Pressure Warning

This feature compares the diameters of all the tires at the time of reset and looks for a change to determine if a tire has low pressure. Resetting the system provides the computer with a starting point for the diameter comparison. Therefore, whatever the tire pressure is at the moment it is reset is the pressure, and tire diameter, that it will use to determine any change.

The tire pressure monitor must be reset when the compact spare is installed and when the full size tire is reinstalled. Once reset, the tire pressure monitor will then take readings as the car is driven and look for changes from the time the reset was done.

A low battery (below 9 volts) or a disconnected battery will cause the system to display a Check Tire Pressure message on the DIC, requiring a reset. Please ensure that this message is not present due to a battery disconnect prior to delivery to a customer.

Perform the following procedure to reset the system and clear a Check Tire Pressure message:

1. Scroll to the Gage menu on the Driver's Information Center (DIC)
2. Scroll down to the Tire Pressure Low menu item
3. Press and hold the DIC Reset button for five seconds until the DIC reads Tire Pressure Reset.

This procedure is outlined in the owner's manual.

#### AUTO Headlamps Function

AUTO headlamps turn the lights on when it gets dark, similar to the Twilight Sentinel feature. However, this system does not have a delay of lamps turn off feature after turning the key off. Unlike the Twilight Sentinel feature, there is a fixed, non-adjustable, zero second delay for headlamp turn-off. This feature is enabled by turning the headlamp switch on the turn signal stalk to the AUTO position.

#### Rear Foglamp Feature

When the foglamp switch (left hand steering column stalk) is in the third, or rear foglamp, position the following lamps will be on when the key is on: parklamps, headlamps, front foglamps, and rear foglamps.

#### Wiper Activated Headlamps

Six seconds after the wipers are activated the parklamps and headlamps will be turned on if the headlamp switch is in the AUTO position. When the headlamp switch is in any other position the lamps will not be turned on; however a Headlamps Suggested message will appear on the DIC.

If the wiper switch is left in the Delay or Rainsense position on vehicles equipped with the rainsense wipers feature, the Headlamps Suggested message will be displayed on every ignition cycle.

#### Personalization

Personalization is a very good feature that offers different drivers many ways to set individual settings on various functions. If a customer does not understand many of these personaliza-

tion functions, however, it can be a big dissatisfier. It is recommended that the salesperson go through all of the personalization features with the customer prior to vehicle delivery.

The personalization features include automatic door locks, window lockout, security feedback, delayed locking, perimeter lighting, memory seats and mirrors, parallel park assist mirror and driver identification. All of the personalization features and programming are explained in the owner's manual.

### Low Tire Warning Light On

The low tire warning light may illuminate while driving on bumpy roads – such as washboard type dirt roads – on some 2000 Buick Century and Regal models as well as some 2000 Chevrolet Impala and Monte Carlo models equipped with the tire inflation monitoring system.

No repair is recommended. This condition is due to the sensitivity of the EBTCM algorithm. This algorithm is not configurable and the tire inflation monitoring system cannot and should not be disabled. Dealership personnel should educate customers on how to reset the light. There are several methods to accomplish this, with the easiest being to cycle the headlamp switch from off to park lamps three times with the key on.

### Radio Rear Control Headset Not Supplied With the Vehicle

The radio rear control headset is not supplied with the vehicle on 1997-2000 Chevrolet Astro vans (2WD and 4WD) and GMC Safari vans (2WD and 4WD)

As a special promotion for the 1997-98 Chevrolet Astro van model, the headset was mailed to the original retail customer shortly after delivery. GMC did not participate in this promotion. Chevrolet discontinued this activity at the beginning of the 1999 calendar year.

The headset is a standard type and can be purchased at most all retail stores.

– GM Technical Assistance

## Tools

# Next-Generation A/C Recovery/ Charging Cart

## ACR2000

In mid-January, Kent-Moore announced the release of the next generation of Robinair A/C recovery recycling service equipment. One of these J-43600 units will be arriving at your dealership soon.

GM selected the ACR2000 after an intensive 2-year development process that focused on reduced operating time, reduced equipment maintenance, improved customer satisfaction through reduced comebacks, and reduced warranty costs, particularly compressor replacement with no trouble found.

## Features of the ACR2000

When compared with the ACR3 and ACR4, with add-on PureGuard and Flow Control, the new ACR2000 has improved on essentially every feature. It's easier to use, easier to care for, and provides more precise refrigerant handling.

The refrigerant identifier is built-in, and it now requires no warmup time.

Oil is diverted and purged before it can reach the identifier, so there's no oil damage. Oil is measured precisely, and there's a reminder to check the amount.

The vacuum pump is oil-less, so it requires no maintenance and no oil changes. This pump provides a strong vacuum for improved evacuation.

Refrigerant is stored in a built-in vessel, and is replenished from a standard 30 pound tank. The vessel is attached to a new, more robust scale. This feature, along with the revised electronics, improves the charging precision by 600%. This greatly reduces the likelihood of over- or under-charging, which will improve customer satisfaction.

The menu-driven control panel is extremely easy to use, and it provides

help screens to guide you if you need it.

A flashing red light on the top of the unit alerts you when a process is completed, so you don't have to listen for an audible signal.

Air purge is automatic and continuous whenever the machine is not in use.

Servicing the ACR2000 requires only that you wipe it clean occasionally and change the spin-on dryer when needed.



No special tools are needed for this.

As for other time savings, recovery time has been reduced almost 30 percent, evacuation time is reduced 62 percent and recharging time is reduced by 50 percent.

The engineers even listened to technicians when they designed the cabinet. It has two large pneumatic tires so it rolls over hoses and other obstructions easily. The two casters are extra-wide so they won't get stuck in floor grates. And, there's a cord-wrapping device to help store the cord neatly.

The low and high side pressure gauges are much larger, for better readability, and both of them have follower needles to help you keep track of pressure changes.

A built-in voltage drop detector won't let the ACR2000 run if the extension cord is too small.

If you've ever forgotten to write down the vehicle system's data before making a repair, you'll appreciate the built-in automatic recording capabilities:

- Date and time
- Ambient temperature and humidity
- Outlet temperatures (two probes)

- High and low side pressures
- Refrigerant purity
- Percentage of air

After recovering the refrigerant, the unit will also record:

- Weight of recovered refrigerant

This data is useful not only in performing proper diagnosis but also in communicating system conditions to the customer.

## GM Warranty Requirements

Beginning April 1, 2000, it's going to be necessary to use the new ACR 2000 Recovery/Charging Cart on any R-134a A/C system repairs under warranty. And GM recommends using it on customer-pay repairs as well.

When the repair is completed and the system is recharged, you will run a snapshot of A/C system operating data, as outlined above. You will get a paper printout to attach to the shop copy of the repair order and a warranty code to submit on the warranty claim.

## Uses for Existing ACR4 Units

Because the ACR 2000 must be used on warranty jobs, the question arises – what to do with the old ACR4 unit? There are a number of possibilities.

- Use it for customer pay recovery jobs, such as in the collision shop.
- Use it as a scavenger unit for contaminated systems.
- Sell it to a repair facility outside the GM network.
- Donate it to a technical school.
- Scrap the unit if repair costs exceed the value of the equipment.

– Jim Resutek, Delphi Thermal Systems



Robinair, the manufacturer of the ACR2000, is offering a one-year educational membership to the Mobil Air Conditioning Society (MACS), at a cost of \$55. It includes:

- MACS Service Report
- MACS Action! newsletter
- Informational mailings
- Discounts on MACS programs, convention, trade shows and training
- Access to MACS staff for information

Look for an application to be shipped with your ACR2000.

# Cramming for the ASE Tests

It's about that time of year again. The Automotive Service Excellence (ASE) tests will be held in May at over 750 test centers around the country. And if you want to receive GM certification, you'll need to have ASE certification. The ASE tests are part of the GM requirements along with certification in the new GM Service Technical College.

The National Institute for Automotive Service Excellence, established in 1972, currently certifies more than 390,000 technicians. To keep up with automotive technology, technicians must complete the tests every five years to remain ASE certified.

The ASE automobile tests are offered in eight specialty areas:

## A1 Engine Repair

## A2 Automatic Transmission/Transaxle

## A3 Manual Drive Train and Axles

## A4 Suspension and Steering

## A5 Brakes

## A6 Electrical/Electronic Systems

## A7 Heating and Air Conditioning

## A8 Engine Performance

ASE also offers certification in Medium/Heavy Truck, School Bus, Collision Repair/Refinish, Engine Machinist and Advanced Level specialties.

ASE certification is granted to those who pass one or more of the tests and have at least two years of automotive repair experience. Those who pass all eight automobile tests and meet the experience requirement earn Master Automobile Technician certification. For technicians just starting out, appropriate vocational training may be substituted for up to one year of work experience.

Technicians who have

earned ASE certification may take the recertification test if their ASE certification is about to expire (after five years) or if it already has expired. The recertification tests are about one-half the length of the regular tests.

## Writing Test Questions

Service industry experts familiar with all aspects of automotive repair develop the ASE test questions. The questions are designed to test the skills technicians need to know in servicing and repairing vehicles. They test basic technical knowledge, correction or repair knowledge and skill, and testing and diagnostic knowledge and skill. The questions do not test theoretical knowledge.

Each ASE test question is based on an idea and topic discussed during "item writing" workshops where ASE brings together service representatives from domestic and import automotive manufacturers, aftermarket parts and equipment manufacturers, working technicians and vocational educators. Representatives from GM Service Operations and GM dealership technicians have attended these workshops.

Each question is reviewed by this group to ensure that it

deals with practical problems of diagnosis and repair that are commonly seen by technicians. In addition, all questions are pre-tested and checked by a national sample of technicians.

## Preparing For the Tests

To prepare for the ASE tests, study guides are available that highlight the contents of each test.

ASE provides a Specifications Task List that describes the actual work technicians should be able to perform in each specialty area. This provides technicians with a checklist of the technical aspects of each specialty area as well as what to study for the test in each specialty area.

ASE also provides Test Specifications, which list the main categories covered on a particular test along with the number of questions and the percentage of the test devoted to each category. By reviewing the Task List, technicians can determine if they know how to perform each task listed, and if they'll be able to answer questions about those tasks on the test.

There are five types of multiple-choice questions on the tests. Each has different instructions. When taking the test, it's important that it's understood exactly what is

being asked.

ASE recommends taking the following steps when preparing for a test:

1. Study the specifications list for each test that will be taken.
2. Carefully read the task list for each area.
3. Go over the sample questions in the study guides to become familiar with each question type.
4. Review steps 1 through 3 to identify the skill areas where additional study may be needed.

The ASE Preparation Guides are available on the Web at [www.asecert.org](http://www.asecert.org).

Study guides for the ASE tests also may be purchased from several sources. Each company offers various study materials for the ASE tests. For more information about the available study guides, contact:



### ASE

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1-877-ASE-TECH

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ASE Study Guides  
1-800-662-6277

### Delmar Publishers

ASE Test Preparation Series  
1-800-347-7707

### Mitchell Repair Information Company

Mitchell ASE Test Preparation Series  
1-888-724-6742



— Mark Stesney



## Vehicle Data Recorder Update

The 2000 model year software update, revision 3.0, for the J-42598

Vehicle Data Recorder was recently released to dealerships. However, the software update does not include transmission data.

The recently released CD supports 1995.5 to 2000 model year GM Enhanced OBDII Engine Systems. As more information regarding the Vehicle Data

Recorder's support of transmission data and the timing of the next software update becomes available, we'll bring it to you.

— Ed.

Reprogramming  
PCM PASS THRU;  
99-06-04-060.

## GENERAL INFORMATION:

1994-2001 Passenger Cars And Trucks;  
January, 2000 Labor Time Guide Updates;  
99-00-89-023.

## HVAC:

1993-2000 Passenger Cars And Light  
Trucks With R-134a Refrigerant; J-43600  
ACR 2000 Essential Refrigerant  
Recovery/Recharge Equipment; 99-01-38-  
006

## DRIVELINE AXLE:

2000 And Prior Chevrolet And GMC  
Light Duty Truck Models; Driveline Clunk;  
Revised 56-44-01A; 99-04-20-002.

## ENGINE/PROPULSION SYSTEM:

1990-2000 Chevrolet And GMC C6-7  
Conventional Models, 1993-2000 Chevrolet  
And GMC B7 Bus Models, 1997-2000  
Chevrolet And GMC F6-7 Tilt Cab Models  
With 3116 Or 3126 CAT® Diesel Engine  
And 37-MT Heavy Duty Starter Motor;  
Release Of New 41-MT Heavy Duty Starter  
Motors (RPO K67); 99-06-03-013.

1999-2000 Chevrolet Tracker;

## TRANSMISSION/TRANSAXLE:

1999-2000 Chevrolet Cavalier, Malibu,  
1999 Oldsmobile Cutlass, 1999-2000  
Oldsmobile Alero, 1999-2000 Pontiac Grand  
AM, Sunfire With Hydra-Matic 4T40-E, 4T45-E  
Transaxle (RPOs MN4, MN5) And 2.2L, 2.4L,  
3.0L, 3.1L Or 3.4L Engine (VINs 4, F, T, R, M,  
E, - RPOs LN2, L61, LD9, L81, L82, LA1); 99-  
07-30-031; No Third And Fourth Gear (Replace  
Direct Clutch Piston Assembly); 99-07-30-031.

## BODY AND ACCESSORIES:

1999-2000 Chevrolet Camaro, 1999-2000  
Pontiac Firebird with UA6 Theft Deterrent  
Alarm; Vehicle Content Theft Alarm Sounds  
When Arming Or Is Too Sensitive (Replace  
Shock Sensor); 99-08-56-002

## RESTRAINTS:

2000 Chevrolet Monte Carlo; Front Seat  
Shoulder Belt Is Uncomfortable (Replace  
Both Front Seat Shoulder Belt Retractors,  
Shoulder Belt Guides And Push-On Nuts);  
99-09-40-007.

2000 And Prior Passenger Cars and  
Trucks; Seat Belt Extender Availability; 99-  
09-40-005

1988 And Prior Passenger Cars And  
Light Duty Trucks; Dealer Installed Rear  
Seat Lap/Shoulder Belt Kits; 99-09-40-006

1996 And Prior Passenger Cars With Door  
Mounted Lap/Shoulder Belts; Auxiliary Seat  
Belt For Securing Child Restraint; 99-09-40-  
008

1989-1999 Passenger Cars, Light Duty  
Trucks And Multi-Purpose Passenger Vehicles  
(Except EV1 and Prizm); Top Tether Hardware  
Package For Child Restraint Seats; Revised  
73-16-11; 99-09-40-004

1988-2000 Passenger Cars And Trucks;  
Frontal Supplemental Inflatable Restraints  
(SIR) On-Off Switch Kits, New Parts And  
Procedures; Revised 73-90-23; 99-09-41-004

1990-2000 Passenger Cars With Rear  
Compartments Except: 1990-1991 Buick  
Reatta; 2000 Buick LeSabre; 1990-1993  
Cadillac Allante, Fleetwood Brougham; 1997-  
2000 Cadillac Seville; 2000 Cadillac DeVille;  
1990 Chevrolet Caprice; 1990-1991 Chevrolet  
Cavalier; 1990-1996 Chevrolet Beretta; 1990-  
2000 Chevrolet Metro, Prizm; 1998-2000  
Chevrolet Corvette; 2000 Chevrolet Impala;  
1990-1992 Oldsmobile Toronado/Trofeo; 1990-  
1991 Pontiac Sunbird; 1990-1993 Pontiac  
LeMans; 2000 Pontiac Bonneville; Trap  
Resistant Rear Compartment (Trunk) Kit;  
Revised 99-08-66-002; 99-08-66-002A

## GM Product Safety Programs

General Motors recently sent a package  
of six bulletins to dealerships regarding GM's  
Product Safety Programs.

These programs involve additional  
devices designed to help enhance  
existing vehicle occupant protec-  
tion. It's important that dealership  
service department personnel are  
familiar with these new programs  
in order to respond to any cus-  
tomer questions.

The six service bulletins cover  
the following subjects:

- Frontal Supplemental Inflatable Restraints (SIR) On-Off Switch Kits
- Seat Belt Extender Availability
- Top Tether Hardware Package for Child Restraint Seats
- Dealer Installed Rear Seat Lap/Shoulder Belt Kits
- Auxiliary Seat Belt for Securing Child Restraint Seat
- Trap Resistant Rear Compartment (Trunk) Kit.

Bulletin 99-09-41-004, Frontal Supplemental Inflatable Restraints (SIR) On-Off Switch Kits, New Parts and Procedures, provides information regarding switches to turn off and on frontal air bags for 1988-2000 model year passenger cars and trucks. The bulletin also covers additional switch/display light diagnosis, switch installation kit content

descriptions and ordering directions for spe-  
cial parts.

Bulletin 99-09-40-005, Seat Belt Extender Availability, explains that belt extensions are available in two different lengths, 23 cm (9 in.) and 38 cm (15 in.), for 2000 and prior model year passenger cars and trucks. The



Chevrolet donated 51 Venture minivans to the National SAFE KIDS Campaign

extenders are designed to be coupled with  
the existing belts in each vehicle.

Bulletin 99-09-40-004, Top Tether Hardware Package for Child Restraint Seats, explains that child restraint seat top tether hardware packages are available for 1989-99 model year passenger cars, light duty trucks and multi-purpose passenger vehicles (except EV1 and Prizm). One child restraint seat top tether hardware package is provided per vehicle to customers at no charge for installation. The package contains the necessary hardware for anchoring a forward facing child

restraint seat top tether.

Bulletin 99-09-40-006, Dealer Installed Rear Seat Lap/Shoulder Belt Kits, covers the availability of certain belt kits for 1988 and prior passenger cars and light duty trucks.

Bulletin 99-09-40-008, Auxiliary Seat Belt for Securing Child Restraint, discusses using an auxiliary seat belt that is specifically designed for securing a child seat in the right front seat position in 1996 and prior passenger cars with door mounted lap/shoulder belts.

Bulletin 99-08-66-002A, Trap Resistant Rear Compartment (Trunk) Kit, covers information about the trap resistant rear compartment kit, including the system function, necessary vehicle modifications and part numbers required to install the kit. The kit, which is designed for most 1990-2000 passenger cars with rear compartments, has three main system components: an illuminated interior release handle, a trap resistant latch and a rear seat tether (which may or may not be needed depending on the vehicle being retrofitted).

GM also encourages correct child restraint seat and safety belt usage. For example, in a joint effort with the National SAFE KIDS Campaign®, "Car Seat Check Up Events" are being conducted at dealerships by more than 260 State and local SAFE KIDS Coalitions. For more information about this program, contact the National SAFE KIDS Campaign at 1-888-999-6752.

– Loren Rusk