

Compression Sense Ignition

An all-new 2.2L engine (RPO L61, VIN F) is used in Pontiac Sunfire and Grand Am, Oldsmobile Alero and Chevrolet Cavalier for 2002. This is an aluminum 4-cylinder engine with four valves per cylinder. It uses a speed density fuel injection system and a waste spark electronic ignition system.

Although waste spark ignition is familiar technology, the L61 gives it a new twist – L850 Compression Sense Ignition (CSI).

CSI enables the Powertrain Control Module to determine proper engine phasing (cam position) without the use of a separate camshaft position sensor.

Components

CSI's modular design is similar to the system used on the premium V6 and V-8 engines, covered in the January 2000 TechLink. Both systems house nearly all the major ignition system components in a single cassette, although only the L61 engine uses compression sense.

The ignition cassette is mounted directly over the spark plugs, requiring only a connector spring and insulating boot to transfer the ignition energy to the spark plugs. The cassette houses two ignition coils. Each coil sends ignition energy to two paired cylinders at the same time, one cylinder on its exhaust stroke and the other cylinder on its compression stroke. Cylinders 1 and 4 are paired on one coil and cylinders 2 and 3 on the other.

Spark Polarities

One spark plug in each pair always fires from the center electrode to the side electrode. The other always fires from the side electrode to the center electrode.

One cylinder's firing voltage rises in a negative direction, relative to engine ground on the way to its final breakdown voltage. It then quickly breaks over in a positive direction back toward ground until the spark line is established. The other cylinder's firing voltage rises in a positive direction, relative



to engine ground, then quickly breaks over in a negative direction back toward engine ground until the spark line is established.

The polarity characteristics of the spark events are one part of the information reflected in the CSI signal.

continued on page 3

Techline News

Service Information: New and Improved

The next time you use your Techline CDs, or visit the Service and Parts Operations website, (<http://service.gm.com>), you will find a new appearance and some very useful, new features.

A new graphic design is used in common between the CD and the web, along with some new enhanced features. The redesign is in response to user feedback. The changes appear on CD version 12, issued in April 2002, and were added to the Internet website during the month of May.

The materials contained on the CDs, and the material found under the Service Information tab on the website, are identical in every way. The design is the same, and the way they perform is the same. Now, if you have to switch from one to the other, you won't be confused by two different formats.



The first change you need to be aware of is the name. Previously, it was SI 2000, which reflected the year it was introduced. To avoid having to change the name every year or so, it will now be known simply as SI, or Service Information. The types of service materials available are essentially unchanged, however.

The new SI application has been streamlined. You may notice the CD version no longer has a choice between Enhanced and Basic versions. There is only one version, and it's extremely user friendly.

continued on page 2

Contents

Compression Sense Ignition	1
Service Information: New and Improved	1
Class 2 Corner	2
Corvette Magnetic Selective Ride Control	4
Theft Deterrent Application Update	4
Airbag Zoning	5
Tech Tips	
Carpet Separates from Sill Molding	5
A/C Liquid Line Rubbing	5
Wheel Speed Sensor Clips	6
Cardan Joint Lubrication	6
Mildew Odor or Wet Carpet	6
Pontiac Vibe Service Tips	7
Third Door Handle	7
Bulletins	8

The website home page is shown here. You can make your choices from the thumbtabs at the top of the screen or from the bulleted list below.

Whether you are accessing the application from the CD or the web, you will see the page shown here.

The top half of the page allows you to "build" the vehicle for which you want information. The major change is that you can now do this on one page instead of three separate pages. In some cases, you may also want to click the Optional Vehicle Information button to further describe the vehicle you're working on.

If you choose to view Bulletins, Campaigns and Preliminary Information, the release date is now listed.

TIP: Dashes are not required when searching directly for a bulletin or campaign.

The buttons in the bottom half of the page look and perform exactly as they always have, with one exception. There is a new button marked **Y+P+K**. This button allows you to search for bulletins by specifying a year range, the vehicle platform, and a keyword. This is handy if you remember a bulletin, but are not sure

of the exact year it was issued. If it falls within the range you specify, you'll find it quickly.

And finally, document printouts will now include the year, make and model of the vehicle specified.

New Features Being Added

Once the vehicle has been "built," you will have the opportunity to choose from the available service information. For now, the first choice is Service Manual and Bulletins. As 2003 vehicles are added, you will also be able to view the warranty book, owner's manual and supplements.

Although much of this information is taken from owner literature, it is reformatted for the web. This means you can select just the page(s) you need, and they will load quickly.

The Labor Time Guide will be integrated into SI by the 4th quarter of 2002. Because the new version will be presented in service manual style, there is no longer a need for a separate PDF version. And it will include a keyword search capability.

Update Schedule

SI, Owners Manuals, and Labor Time Guide will be updated on a regular basis as a package.

Currently SI (web) is updated once a week. SI updates to the GM ACCESS server will occur every second Monday. If there are updates to the LTG or the Owners Manual, they will be included with SI updates.

— Thanks to Bob Savo and Tom Tippen



ClassCorner TIP OF THE MONTH

The Class 2 bus can be wired in one of two ways, Star configuration and Loop configuration. Both have their advantages and disadvantages.

The Star configuration connects each controller using a single wire from each computer. The wires are spliced together at a single location using a Splice Pack (also called a Star Connector). A splice pack is a connector-like component that uses a removable bus bar that connects all of the controllers together. The advantage of the Star configuration lies in its relative ease of diagnosis. The splice pack provides a convenient location in which to diagnose electrical problems associated with the Class 2 bus. The disadvantage is that there is no built-in redundancy to the system. If an open occurs on one of these wires, the controller

will no longer be able to communicate on the bus.

The Loop configuration uses two wires connected to each controller. One of the wires will connect to the next controller on the loop while the second wire connects to the previous one. This creates a loop of controllers all holding hands, as it were. Each wire carries identical information, so there is no specific "input" or "output" wire. The advantage is that with two wires, there is redundancy built into the system. If an open occurs on one wire, the message can still be sent via the second one. The disadvantage is in the relative difficulty of diagnosis. Because there is no central location where the bus comes together, you must isolate sections of the bus to do electrical checks.

— Thanks to Mark Harris

GM TechLink is a monthly magazine for all GM retail technicians and service consultants providing timely information to help increase knowledge about GM products and improve the performance of the service department. This magazine is a companion to the GM Edge publication.

Publisher & Editor:

Mark Stesney
GM Service Operations
Mark.Stesney@GM.com

Technical Editor:

Jim Horner
Jim.Horner@SandyCorp.com
1-248-816-3641

Production Manager:

Marie Meredith

Desktop Publishing:

Greg Szpaichler, MediaWurks
spake@mediawurks.com

FAX number:

1-248-649-5465

Write to:

TechLink
PO Box 500
Troy, MI 48007-0500

GM TechLink on the Web:

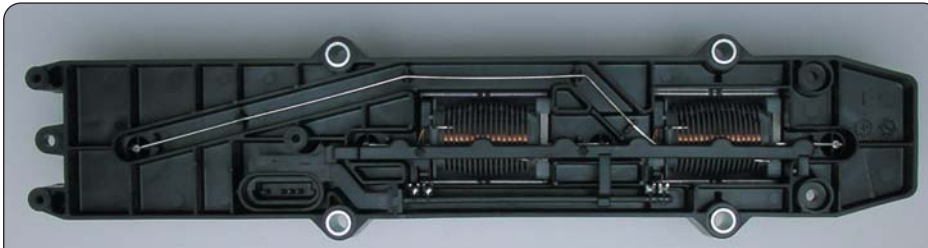
<http://service.gm.com>

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.

Inclusion in this publication is not necessarily an endorsement of the individual or the company.

Copyright© 2002 General Motors Corporation

All rights reserved.



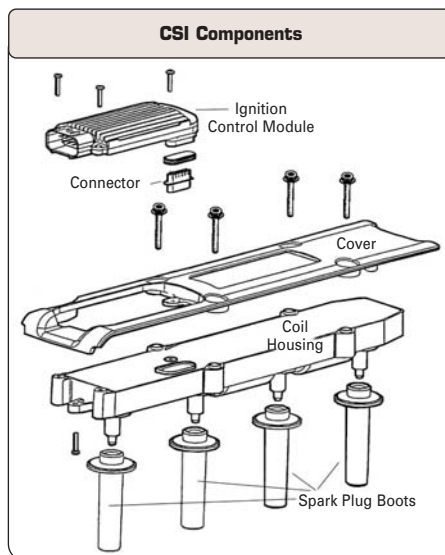
Ignition Cassette Disassembled to Reveal Components



Ignition Control Module

Compression Sense

At the moment an ignition coil fires, a growing voltage potential is created across the gap of both plugs. After about 10 microseconds, the voltage reaches each plug's breakdown voltage level. Breakdown is the point at which the air gap ionizes and conducts current, causing the spark to occur. The breakdown voltage level is determined in part by the pressure within the cylinder. More voltage is required at a higher cylinder pressure.



A cylinder on its exhaust stroke has less in-cylinder pressure than a cylinder on its compression stroke. Because of these uneven pressures, the spark plug of the cylinder on its exhaust stroke will break down first (by a few microseconds), and will spark first.

The order of the spark plug gap breakdown events for the paired cylinders is yet another characteristic that is reflected in the CSI signal.

The CSI Sensor

The L850 utilizes a unique Compression Sense Ignition sensor to detect the polarity events and the breakdown events in the secondary ignition circuits of each pair of cylinders.

This is accomplished by creating virtual capacitors between the secondary coils and the EI module's electronics. One side of

these capacitor plates is connected to the ignition secondary outputs. The other side is connected to a resistor network. As current flows on the capacitor plates, a voltage is created on this resistor. The voltage pattern measured across this resistor is what makes up the information in the CSI signal.

Firing Order 1/4 - 3/2 - 4/1 - 2/3

Cylinder on Exhaust (waste spark) fires first	Cylinder on Compression fires second
4 - voltage	1 + voltage
2 - voltage	3 + voltage
1 + voltage	4 - voltage
3 + voltage	2 - voltage

The resistor network allows only the high frequency edge of the plug gap breakdown voltage to pass through for measurement.

We know that cylinders fire in pairs, and from the earlier study on polarity, we know that the voltage of one plug moves toward positive while its pair moves toward negative. And from the breakdown discussion, we know that the plug in the cylinder on the exhaust stroke fires slightly before the one on the compression stroke. These relationships can be seen in the accompanying chart.

The CSI signal will reflect the polarity and timing of each cylinder's spark plug breakdown voltage event.

Now that we have seen all the various pieces of information contained in the CSI signal, as well as the method in which it is acquired, let's pull it all together and see how it is processed.

The CSTO

The EI module houses the CSI input signal logic electronics called the Compression Sense Time Out (CSTO) chip. The CSTO electronics are responsible for interpreting the CSI input signal and creating a 5V square wave output called a CAMOUT signal.

Here's how the CSTO chip logic works. The first EST rise of either cylinder pair alerts the CSTO circuitry, and the CSTO chip looks for the CSI input signal. The CSTO chip

recognizes unique characteristics of the CSI input signal, then decides whether to send a CAMOUT high or CAMOUT low signal to the PCM.

As the chart above shows, when the 1/4 coil fires, as cylinder 1 is on compression, the event will generate a negative, then positive CSI signal. This negative then positive CSI signal will cause the CSTO chip inside the EI module to send a CAMOUT high signal.

When the 1/4 coil fires, as cylinder 4 is on compression, the event will generate a positive, then negative CSI signal. This positive to negative CSI signal will cause the CSTO to send a CAMOUT low signal.

The 2/3 cylinder pair works the same way.

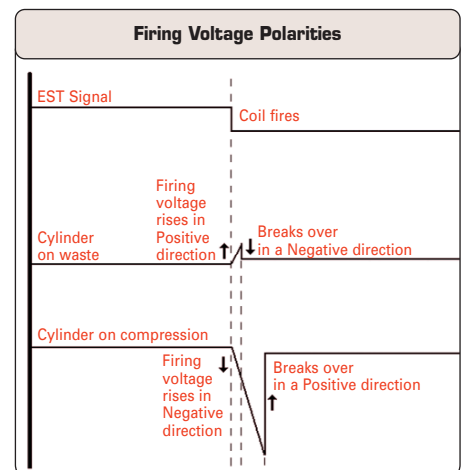
PCM Logic

A variable reluctance crankshaft position (CKP) sensor is mounted in the engine block near the crankshaft. The crankshaft has seven machined notches, six of which are evenly spaced. The 7th notch is positioned at 50 degrees ATDC of cylinder 1/4 and is used by the PCM as a sync pulse.

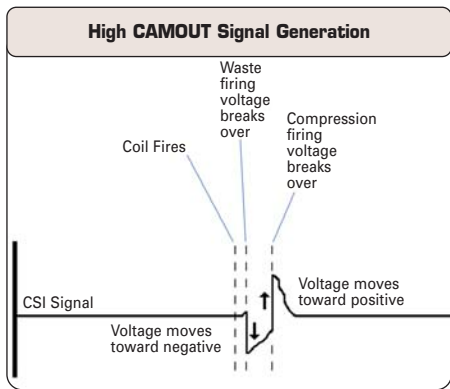
The engine always starts firing the 2/3 coil first during cranking. Charging of the 2/3 coil always begins near the 2nd crank notch. Charging of the 1/4 coil always begins near the 5th crank notch.

Once the ignition process has started with the 2/3 coil, the PCM will look for the sequence of CAMOUT signals from the EI module to determine engine phasing. After 2 crankshaft revolutions, all four cylinders will have fired and generated the 4 CAM ID bits.

continued on page 4



These sequences of high and low CAMOUT signals are read by the PCM as a series of 4 data bits – a 1 bit if CAM is high and a 0 bit if CAM is low. The bits will be in the order of 1001 if cylinder 3 came up on



compression first, or 0110 if cylinder 2 came up on compression first, upon initiation of ignition during cranking.

The Tech 2 scan tool displays these bits as a parameter (Saturn only) using the following path: / Powertrain / Data Display / Engine Data Display / Misfire Data / Calculated Compression Output (CCO).

The Tech 2 will actually display 8 bits, but only the lower 4 bits are used. The first 4 bits always remain as zeros.

Special Conditions

The PCM needs to take into account engine operating conditions during which the in-cylinder pressures for the pairs can be nearly equal. During deceleration, the pressure of the compressing cylinder can be as low as, or lower than, that of the cylinder on its waste stroke. This condition would of

course render the CSI signal information invalid. For this reason, the PCM will consider the CSI signal valid only during certain MAP ranges.

TIP: This brief explanation shows how the Compression Sense Ignition system works, as well as the inherent information the CSI signal provides. A full-length version of the story is available on the internet at www.mat1424.com. This site is sponsored by GM Marketing Area Team 1424 in Phoenix, AZ. In the left menu, select Downloads. Then select Compression Sense Ignition Part 1. You can then select the article, plus the illustrations. There are plans to offer Parts 2 and 3 on the website at a later date.

– Thanks to Jim Garrido, member of International Automotive Technicians Network, and Kevin Schmidt, Delphi

New Vehicle Preparation – Corvette Magnetic Selective Ride Control

For 2003, Magnetic Selective Ride Control will be available on the Chevrolet Corvette. Briefly, when the vehicle is being driven, various sensors pick up data which is processed by a control module. Using pulse-width modulation, the control module varies an electromagnetic field in each damper, which affects the thickening of the magneto-rheological fluid, within a millisecond. A similar Cadillac system was described in the January 2002 TechLink.

When the ignition is turned off, the dampers offer very little damping. So, the cars are shipped from the factory with the suspension snugged down until the jounce bumper contacts a temporary plastic stuffer in each damper.



TIP: The stuffers must be removed during new vehicle prep. Failure to do so will result in customer dissatisfaction with the vehicle's ride quality.

To remove the stuffers, lift the vehicle, allowing the wheels to hang free. This will extend the dampers.

At the front, steer the wheel in the direction away from the side you're working on. Reach up from below, behind the tire.

At the rear, reach up from below, behind the tire.

At each wheel, compress the rubber dust boot. Pull the yellow tab to remove the stuffer, then discard.

TIP: After removing the stuffer, be sure to pull the dust boot down to cover the upper end of the damper tube, to avoid damage.

TIP: The stuffers should not be reinserted for temporary transport, such as on a flatbed hauler. The stuffer is effective only if the suspension can be snugged down enough for the jounce bumper to contact the stuffer.



This is generally not possible on a flatbed hauler.

– Thanks to Brad Thacher and Dave Peacy

Theft Deterrent Application Update

Please add Camaro models for years 1998-1993 to the Theft Deterrent Application chart on page 4 of your April 2002 TechLink.

	86/87	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chevrolet Camaro																	*	*	*

	No system available for model
*	Vehicle line is not in use
?	System is undetermined
	Opel Immobilizer
	Passlock

	Passkey II (PK2) or VATS, PASS-Key
	Passkey III (PK3)
	Passkey III+ (PK3+)
	Easykey

Airbag Zoning

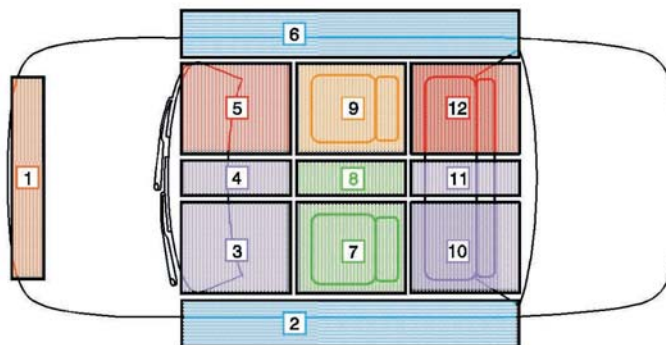
Early airbag systems consisted of a steering wheel airbag, a control module, several sensors and a wiring harness to tie them together. When one of the airbag system components or another vehicle component in the general area needed service, it was necessary to disarm the entire airbag system, to prevent unwanted deployment.

Now, airbag systems have grown to include (on the 2003 Cadillac CTS, for example) a steering wheel airbag, an IP airbag, two side airbags, two roof rail airbags, two seat belt pretensioners, up to four sensors including a sensing and diagnostic module, and numerous wiring harnesses, spread widely throughout the vehicle.

Because the chances are greater than ever that you will encounter an airbag component when performing a service procedure, vehicles are now divided into as many as a dozen different SIR Disabling and Enabling zones. By following the proper procedure, you can easily disable only those airbag components that are in the area where you're working. And when you are finished, you can just as easily enable the zone. Depending on the complexity of the vehicle, this can amount to a considerable time savings.

TIP: The 2003 Cadillac CTS was the first vehicle to reach the market with the zone system; all 2003 GM cars and trucks will be included when they arrive in the upcoming months.

Typical airbag zones



TIP: Because vehicle platforms are not all laid out similarly, the number of zones will vary from vehicle to vehicle, but they all follow the same naming/numbering scheme for sake of consistency.

To learn more about airbag zones in SI 2000, follow this path:

- "Build" the vehicle
- Restraints
- SIR
- Diagnostic Information and Procedures
- SIR Disabling and Enabling Zones

For specific procedures, follow this path:

- "Build" the vehicle
- Restraints
- SIR
- Repair Instructions
- SIR Disabling and Enabling Zone 1

You will find separate instructions for each zone included on the vehicle you're servicing.

TIP: The service information for all vehicles follows the same organization, so the paths are all identical.

Dealing with Codes

Disabling a zone will cause a Current diagnostic code to set. Enabling the zone will move the code to History. Before returning the vehicle to the customer, you should clear all History codes.

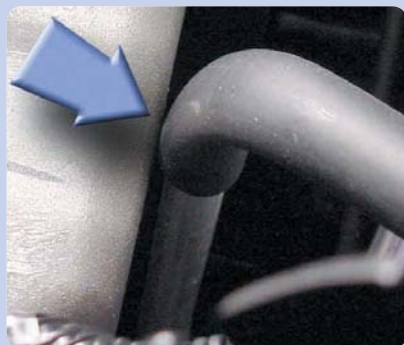
Other Information

Airbag zoning was discussed in a recent IDL broadcast. For a replay of it, look for course number 10260.14D in the broadcast schedule.

– Thanks to Ken McLaughlin

A/C Liquid Line Rubbing

On some 2002 Buick Century and Regal vehicles, the A/C liquid line may rub through at the transaxle side cover pan. This may not occur until the vehicle has 20,000 miles (32,200 km) on it.



TIP: To avoid this condition, check this area during new vehicle predelivery inspection.

– Thanks to Wayne Zigler

Carpet Separates from Sill Plate Molding

On some 1997-2001 Buick Centurys or Regals, the carpet may pull out from under the rear door sill plate molding.

The repair procedure is explained in depth in bulletin 01-08-110-004. These are the highlights.

Part number 10414280 includes two plastic retainers, one for each side. With the sill exposed, position a retainer over the sill plate retaining clip with the wide portion of the retainer toward the center of the vehicle.

Mark the retainer's location on the carpet. Then, use an auto trim stapler to attach the retainer to the carpet. Use three 12 mm (1/2 in.) galvanized staples.

TIP: The bulletin recommends auto trim staples. If you substitute short trim screws or rivets, file the excess off the back side to avoid creating noise.

Hook the retainer over the clip to retain the carpet in place. Install the weatherstrip and sill plate to complete the repair.

– Thanks to Wayne Zigler

Retainer Positioned on Clip



Retainer Stapled to Carpet



Carpet Held by Retainer



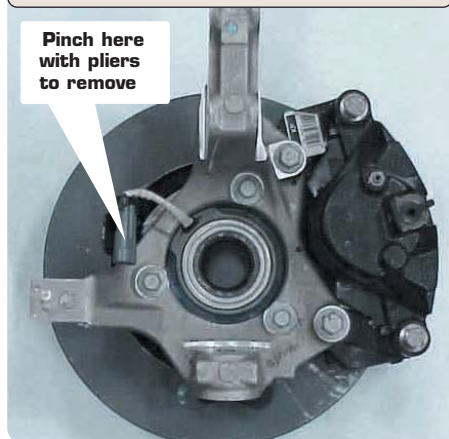
Wheel Speed Sensor Clips

This affects Buick Century and Regal, Oldsmobile Intrigue, Pontiac Grand Prix and Montana, and Chevrolet Monte Carlo, Impala and Venture.

The wiring from the wheel speed sensor is a pigtail, about 4 inches (100 mm) long, terminated with a connector. The connector clips to a bracket on the steering knuckle. During the 2001 model year, the sensors were changed.

Connector clipped to bracket

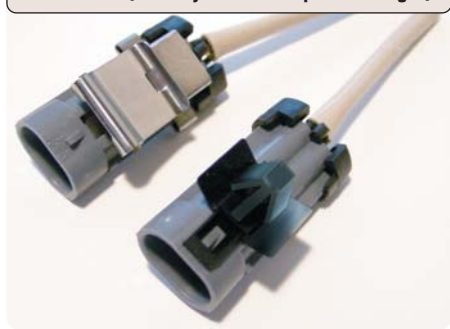
Pinch here with pliers to remove



Early production used a stainless steel (SS) clip on the wiring connector, which could be removed from the bracket simply by pulling. Later production uses a plastic W-clip, which requires ordinary pliers for removal.

TIP: Do not replace either style of clip with the other. They are not interchangeable.

12429204 (old style with SS clip-top left) and 12429205 (new style with W-clip-bottom right)



New bearing assembly on left, old on right

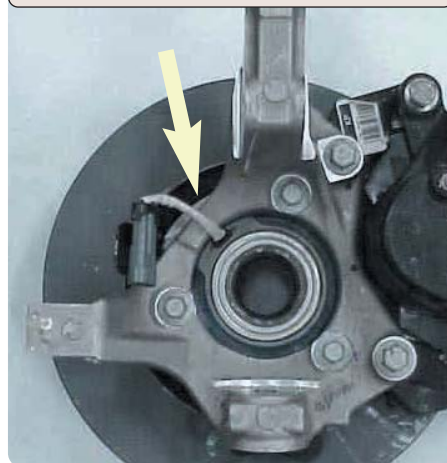


When you replace a wheel speed sensor/wheel bearing assembly (for bearing noise, WSS code, etc.), you must determine which type of sensor is on the vehicle and replace it with the same kind. Check the parts book for details.

At the time the clips were changed, the mounting orientation of the sensor was also changed. Sensors with the old SS clip were mounted with the wire lead near the 6:00 o'clock position. New sensors with the W-clip are mounted with the wire lead near the 2:00 or 10:00 o'clock position, depending on which side of the vehicle it's mounted. This moves the lead away from the lower ball joint attachment, as shown in the accompanying photo.

– Thanks to Wayne Zigler

Sensor wire lead location with the new W-clip



Cardan Joint Lubrication

Some 1994-2002 trucks, such as the Chevrolet S-10 and GMC Sonoma extended cab with L35 V-6, use a propeller shaft that has double cardan type U-joints. A similar shaft is used as a service replacement on 1999-2002 2-wheel drive, automatic, extended cab Sierra and Silverado trucks. Premature wear of the cardan joint ball and socket can result in noise and vibration at road speeds.

Premature wear may be caused by inadequate lubrication. A grease passage in each cross yoke should be lubricated at normal chassis lubrication intervals.

You will need a needle-type grease gun adapter such as Plew's/Stant 99-009 or 05-025, available locally. Use Chassis Lubricant, P/N 12377985 (88901242 in Canada) or equivalent. The slip yoke should also be

Cardan Joint Cross Yoke Grease Fitting and Needle-Type Applicator



greased at the zerk fitting. SI 2000 will be updated to include propshaft lubrication service.

– Thanks to Dan Oden

Mildew Odor or Wet Carpet

Owners of some S/T pickups and utilities and Bravada may comment on mildew odor or wet carpet in the front passenger area. There are three common causes.

plenum for possible voids in the seam sealer. Seal any voids following instructions in the service manual.

Water Backing Up at Plenum Drain

Too much sealer at the plenum drain area can act as a dam, allowing water to back up in the plenum. It seeps around the air box seal or around the lower right air box mounting screw. Reduce the ridge of sealer to a height of 1/4-inch (6.3 mm) or less with a utility knife.

Voids in Plenum Seam Sealer

Use a mirror to examine the inside of the

HVAC Recirculation (Air Box) Door Left Open

With the HVAC controls set to MAX A/C, the recirc door opens upward. In extreme conditions, water can pool on top of this door and spill into the vehicle. If the ignition is turned off with the controls set in MAX A/C, the door remains up. Locate an intermittent entry point for the water. Inform customers to turn the HVAC to regular A/C or OFF before turning the ignition off.

– Thanks to Monica Pruett

Pontiac Vibe Service Tips

The 2003 Pontiac Vibe has several unique service features you should be aware of.

Automatic Transmission Fluid

Use only ATF T-IV transmission fluid, not Dexron III. Using the wrong fluid can cause harsh shifting.

Power Steering System

Use only Dexron® III transmission fluid, not power steering fluid. Failure to use the proper fluid can cause leaks and damage to the power steering system.

Coolant

Although the Vibe's coolant is tinted red, it is conventional ethylene glycol, not Dex-Cool. The cooling system is filled at the factory with a 50/50 mixture of water and ethylene glycol antifreeze. This coolant solution provides freezing protection to -36°C (-33°F). Add Dex-Cool coolant to the coolant reservoir when the coolant level is low. (Mixing green ethylene glycol to the factory red ethylene glycol results in brown coolant, which may be a customer dissatisfier.) When the system is flushed at



the recommended intervals, fill the system with green-colored ethylene glycol coolant.

EVAP Testing

If you use the J-41413-200 Evaporative Emission System Tester (EEST) (December 2001 TechLink), to locate a leak, you will notice smoke coming from the drain hose. This is a normal condition. In order to check the system for leaks, you must

connect the EEST to the EVAP service port. Bend the drain hose double, while crimping it with locking pliers or equivalent before testing.

TIP: Because the Vibe EVAP system is similar to the Prizm, this EVAP testing information applies to the Prizm as well.

– Thanks to Jeff Strausser
and Russ Dobson

Third Door Handle

Owners of some 1996-2002 extended cab S-10 and Sonoma pickups may comment on excessive effort or breaking of the third door handle. This may be caused by improper placement of the attachment clips and/or binding at the top latch.

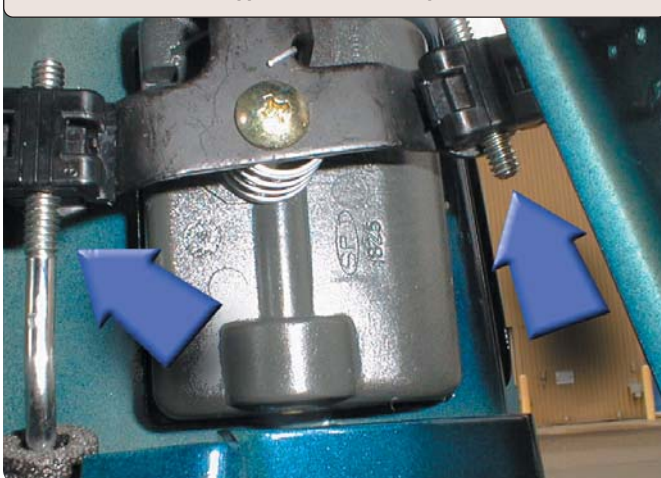
Remove the door trim panel and release both lock-rod clips. Secure the upper rod

clip (on the right side of the door handle) first. Position the upper rod clip 10.5-12.0 mm (approximately 11-12 threads showing) from the end of the rod and lock it in place. Position the lower lock-rod clip (left) where it falls after the upper clip is in place, usually 5.0-6.0 mm (5-6 threads showing) from the end of the rod. Make sure the upper striker

is not bound against the latch. If it is, you must push the door inboard to release the latch. To correct a bound latch, adjust the striker by loosening two bolts at the top, so the striker is centered in the latch. Do not bend the striker.

– Thanks to Monica Pruett

Upper and lower rod clips



Latch and striker



Bulletins – May 2002

This review of service bulletins released through mid-May lists the bulletin number, superseded bulletin number (if applicable), subject and models.

GENERAL INFORMATION:

99-00-84-021C; replaces 99-00-84-021B; Expediting Parts; 2003 and Prior Passenger Cars and Trucks

02-00-89-002; Information for Dealers on How to Submit a Field Product Report; 2003 and Prior Passenger Cars and Trucks

02-00-89-002A; replaces 02-00-89-002; Information for Dealers on How to Submit a Field Product Report; 2003 and Prior Passenger Cars and Trucks

02-00-89-003; Priority Access Service System (P.A.S.S.); 2003 Chevrolet and GMC MD Conventional Cab Models

02-00-89-004; Revisions to Courtesy Transportation Program; 2002 and Prior Passenger Cars and Trucks

02-00-89-005; Dealer Disclosure Requirements; 2003 and Prior Passenger Cars and Trucks

02-00-90-002; Lubrication of Propeller Shaft Double Cardan CV Type U-Joint Centering Ball and Seat; 1994-2002 Chevrolet and GMC S Extended Cab Pickup with V6 Engine, C Extended Cab Pickup with Automatic Transmission (RPO M30)

HVAC:

00-01-38-011A; replaces 00-01-38-011; Poor Heat with Cold Outside Temperatures at Low Engine RPM (Install Auxiliary Coolant Pump); 1997-1999 Chevrolet Venture, Oldsmobile Silhouette, Pontiac Trans Sport, 1999 Pontiac Montana

00-01-38-011B; replaces 00-01-38-011A; Poor Heat with Cold Outside Temperatures at Low Engine RPM (Install Auxiliary Coolant Pump); 1997-1999 Chevrolet Venture, Oldsmobile Silhouette, Pontiac Trans Sport, 1999 Pontiac Montana

STEERING:

01-02-118-001A; replaces 01-02-118-001; Parts Restriction/Exchange Program for QuadraSteer™ Components; 2002 Chevrolet and GMC Vehicles with Rear Wheel Steer (QuadraSteer) (RPO NYS)

02-02-32-005A; replaces 02-02-32-005; Excessive Noise from Power Steering System While Turning or Under Light Braking (Replace Power Brake Booster Inlet Hose); 1999-2002 Chevrolet and GMC M/L Van Models

DRIVELINE AXLE:

02-04-21-003; Revised DTC B2725; 1999-2002 Chevrolet and GMC C/K Pickup and Utility Models, 1999-2000 Cadillac Escalade, 2002 Cadillac Escalade, Escalade EXT with NVG 236/246 Transfer Case (RPO NP8)

02-04-21-004; "Service 4WD" Indicator Illuminated, DTC B2725 Set (Replace Transfer

Case Shift Control Switch); 1999-2002 Chevrolet and GMC C/K Pickup and Utility

BRAKES:

02-05-22-001; Revised Brake Specifications; 1997-2002 Chevrolet Malibu, Oldsmobile Cutlass and Alero, Pontiac Grand Am

02-05-23-001A; replaces 02-05-23-001; Uneven Brake Pad Wear (Replace Caliper Mounting Plate and Install New Rear Brake Shield); specified 1995-2001 Chevrolet and GMC MD Trucks with Four-Piston Rear Disc Brakes (RPO JNC)

02-05-25-001; Yaw Rate Sensor/Lateral Accelerometer Replacement; 2002 Cadillac Escalade EXT with Stabilitrak® (RPO JL4)

ENGINE/PROPULSION SYSTEM:

99-06-02-012D; replaces 99-06-02-012C; Rust in Cooling System, Heater Inoperative, Blows Cold Air, Engine Overheats (Flush Cooling System); 1996-2000 Chevrolet and GMC S/T, Oldsmobile Bravada, 1998-2000 GMC Envoy with 4.3 L V6 (VINs W, X – RPOs L35, LF6)

00-06-01-006B; replaces 00-06-01-006A; Engine Tick Noise (Purge Air from Valve Lifters); 1999-2002 Chevrolet Tracker with 2.0L or 2.5L Engine (VINs C, 4 – RPOs L34, LE8)

00-06-05-049A; replaces 00-06-05-049; Various Driveability Symptoms – MIL Illuminates Intermittently, DTCs Set, Engine Will Not Start (Repair Wires);

1997-2001 Buick Century, Regal, 2000-2002 Chevrolet Impala, Monte Carlo, 1999-2001 Pontiac Grand Prix

01-06-04-049A; replaces 01-06-04-049; White Exhaust Smoke During Start-Up (Replace Engine Coolant Sensor ECT); specified 2000-02 Chevrolet and GMC MD Trucks

02-06-01-010; Serpentine Belt Identification and Diagnosis; 2001-02 Chevrolet and GMC C/K HD Pickup Models with 6.6L Duramax™ Diesel Engine (VIN 1 – RPO LB7)

02-06-01-012; Revised Harmonic Balancer; 2002 Chevrolet and GMC S/T Utility, Oldsmobile Bravada

02-06-01-014; Revised Lower Intake Manifold Installation; specified vehicles 1996-2002 with 3.1L or 3.4L Engine (VINs J, M, E – RPOs LG8, L82, LA1)

02-06-01-015; Low Oil Pressure and New Oil Level Indicator; 2001-02 Chevrolet and GMC C/K, G, C6-7 MD, B7 MD School Bus Models with 8.1L Engine (VINs E, G – RPO L18)

TRANSMISSION/TRANSAXLE:

01-07-30-023B; replaces 01-07-30-023A; Harsh 1-2 Upshift, SES, MIL, or CEL Illuminated, DTC P1870 Set (Replace Valve Body); 1996 Buick Roadmaster, Cadillac Fleetwood, 1996-2000 Chevrolet Camaro, Corvette, LD Trucks, Pontiac Firebird, GMC LD Trucks, Oldsmobile Bravada, 1999-2000 Cadillac Escalade with 4L60-E Automatic Transmission (RPO M30)

02-07-30-013; Incorrect Transmission Shifts, Poor Performance of Engine, Transmission Slipping, SES Lamp Illuminated; DTC P0756, P0757 (Clean Transaxle Valve Body and Case Oil Passages of Debris); specified 2001-02 Vehicles with 4T65E Transmission (RPOs M15, MN3, MN7, M15, M76)

02-07-30-014; Servicing 4T65-E Transaxle Spacer Plate and Gaskets; specified vehicles 1997-2002 with 4T65-E Transaxle (RPOs MN3, MN7, M15, M76)

02-07-30-015; Revised DTC P0713; 2002 Buick Century, Regal, LeSabre, Chevrolet Impala, Monte Carlo, Venture, Oldsmobile Aurora, Intrigue, Silhouette, Pontiac Bonneville, Grand Prix, Montana with 4T65-E Automatic Transaxle

02-07-31-002; Intermittent Engine No Crank (Repair Wiring and Install Wiring Protector); specified Chevrolet and GMC MD Trucks

BODY AND ACCESSORIES:

01-08-57-007A; replaces 01-08-57-007; General Waterleak Diagnosis Guide; 1999-2002 Chevrolet Malibu, Oldsmobile Alero, Pontiac Grand Am

02-08-42-002; Headlamp Condensation; 2002 Chevrolet Avalanche

02-08-42-004; PRNDL Display Reduced Visibility for Approximately One Minute; 2002 and Prior Passenger Cars and Trucks with Auto Headlamp Control and Vacuum Fluorescent PRNDL Indicator Instrument Cluster

02-08-46-004; Cellular Error Messages Received When Trying to Connect to OnStar®; 2000-02 Passenger Cars and LD Trucks with Factory Installed OnStar®

02-08-50-002; Driver Seat Movement During Acceleration and Braking (Replace Adjuster Assembly); 1997-2002 Chevrolet Corvette with Power Seats (RPO AG1 or AG2) built prior to breakpoint

02-08-59-002; Rattle Type Noise Coming from Center of Dash (Remove Cowl Insulator Clip and Insulate Mounting Stud); 2002 Chevrolet and GMC C/K Pickup and Utility, Cadillac Escalade with Gas Engine

02-08-61-001; Clicking/Creaking Noise from Front of Vehicle (Apply Penetrating Threadlocker); 2000-02 Chevrolet Impala, Monte Carlo

02-08-64-007; Third Door Hard to Open and/or Handle Breakage (Adjust Lock Rods); 1996-2002 Chevrolet and GMC S/T Extended Cab Pickup Models

02-08-64-008; Uncommanded Movement of Outside Rearview Mirrors (Replace Mirror Actuator); 2002 Chevrolet and GMC S/T Utility Models, Oldsmobile Bravada, with Memory Mirrors (RPO D25)

02-08-66-004; Paint Rub Through on Liftgate Around Edge of License Plate Housing/Pocket (Install Insulating Seal/Gasket); 2002 Chevrolet and GMC S/T Utility, Oldsmobile Bravada

02-08-67-002; Headliner or Roof Rattle (Replace Roof Drain Channel with New Design Channel); 2002 Cadillac Escalade, Chevrolet and GMC C/K Utility Models