



# Technical Presentation

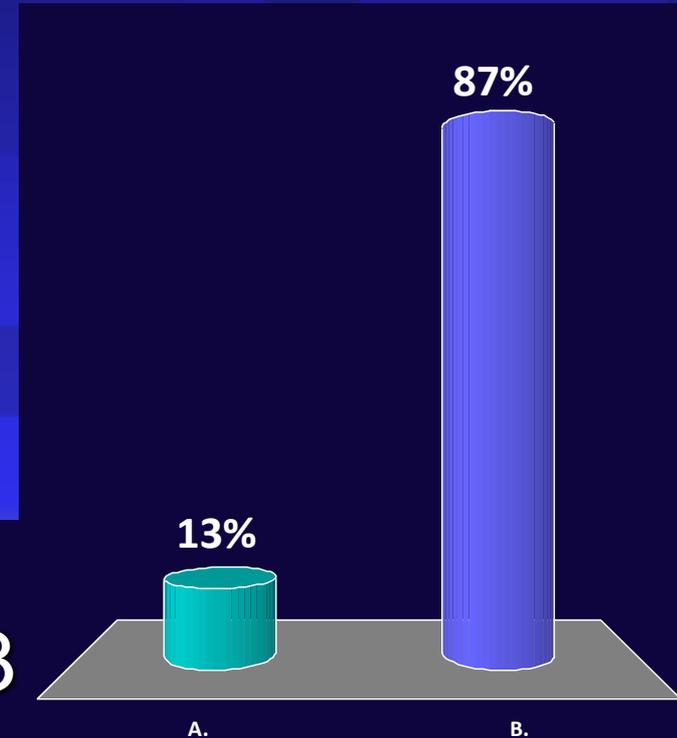
Advanced Vehicle Technologies

April 2013      Phoenix, AZ

# Do you know what the term “Express Up” means?



- A. Yes
- B. No

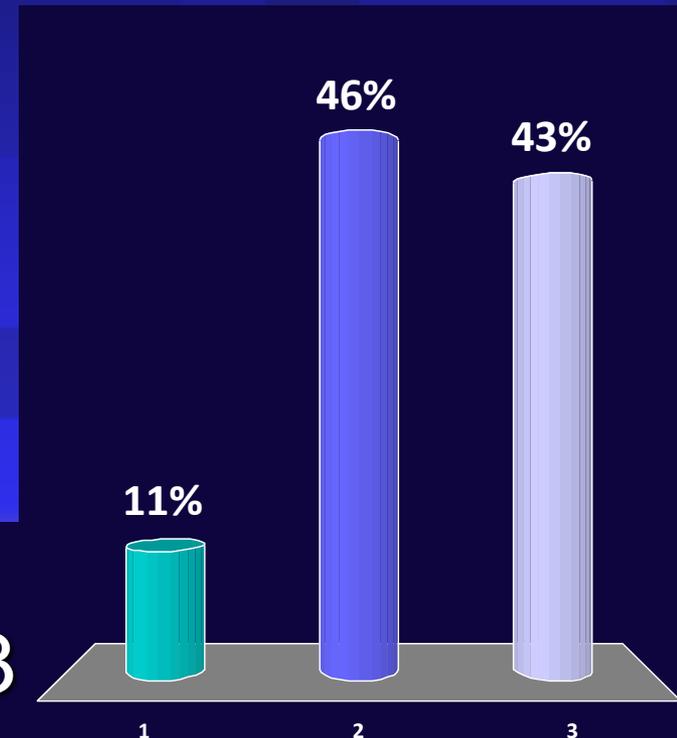


Human Resources 2013

# Electronic Stability Control is



- A. An added option
- B. Mandated by government in 2012 for all vehicles
- C. Mandated for cars in 2012 & trucks and SUV's in 2014

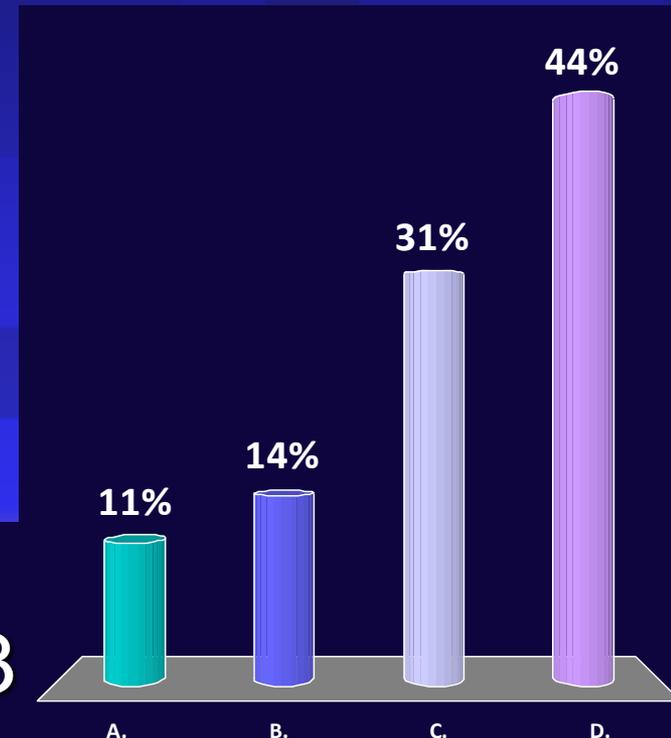


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# Which part is not part of the Electronic Stability Control?



- A. Steering Angle Sensor
- B. Yaw Rate Sensor
- C. ABS system
- D. Steering Correction Computer

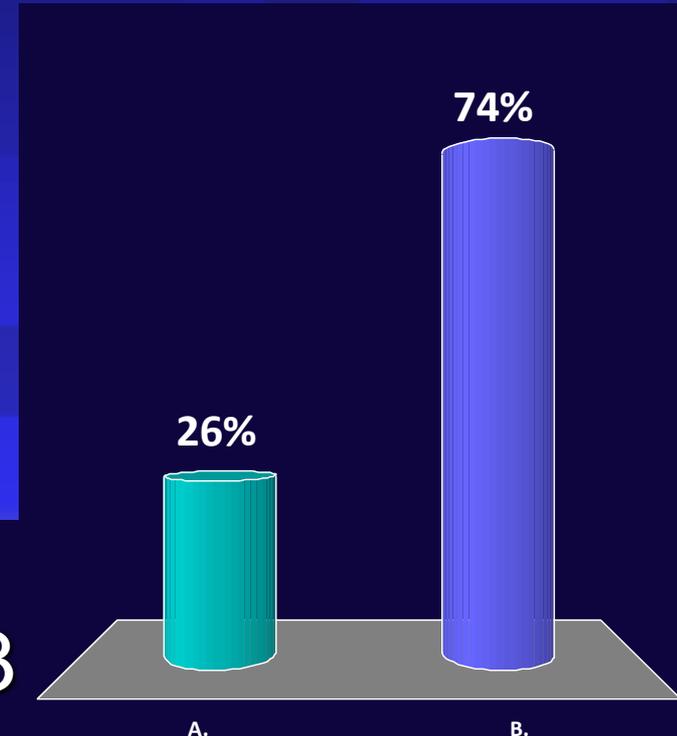


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# Traction Control is Another Term For Electronic Stability Control



- A. True
- B. False



Human Resources 2013



But one more tool that is a must, is a



Minimum  
For Tool



ments  
Center



# SCAN TOOL

Question: Why is it necessary to have a SCAN tool in a collision center?

*Answer: To properly diagnosis and repair the Advanced Automotive Technologies that are standard on Today's Automobiles*

# Typical Malfunction Lights on Today's Automobiles





## Why Worry About No Lights on the Dash?

- Dash warning lights alert drivers to safety issues and maintenance intervals. The dash lights are not diagnostic. As a result their presence or absence cannot be relied upon to determine repair estimates.
- Examples of problems that do not always turn on a warning light: Passenger Seat Occupant Sensor and the effect of low battery voltage on body control functions.
- Disabled systems
- Warning light can be cleared for a certain number of key strokes. Stored history codes cannot.
- Warning lights may not trigger until the vehicle is driven a specified distance.
- **WHAT'S THE RISK OF KNOWING VS. NOT KNOWING.**

**Bosch UDC / Mercedes ESP Stability Control**

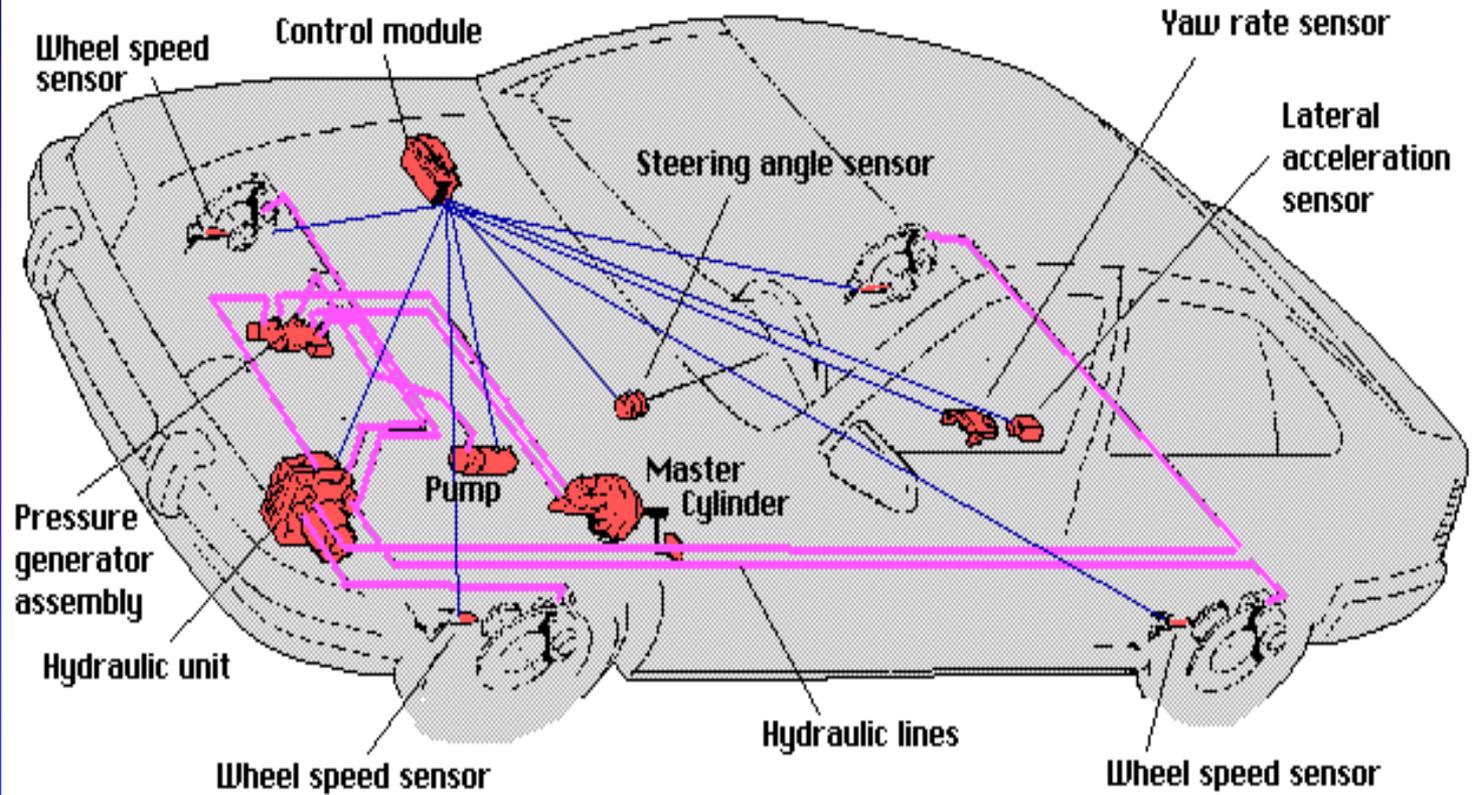


Photo Courtesy of AA1CAR.com

# What is Electronic Stability Control?

ESC constantly monitoring how the vehicle is responding to the driver and road conditions. If a problem starts to develop, it takes whatever measures that are necessary to bring the vehicle under control. The engine power is reduced letting off of the throttle, retarding the timing and simultaneously applying the brake. All these processes coupled together will counter the forces that are causing the vehicle to lose traction or control. This whole process is accomplished without the driver's input.

# Vehicle Without ESC



# Vehicle With ESC



What is this part?



Answer—It is a steering angle sensor



As the steering wheel moves in either direction, the speed and number of Revolutions are transmitted to the vehicle's computer.

# Insurance Institute Highway Safety

Vehicle ratings | News | Consumer brochures & videos | Research & stats | Laws & regs | Status Report

## Electronic stability control

**Vehicle test results**  
ESC availability by make and model

**Q&As**  
Electronic stability control  
Rollover and roof strength  
Crash avoidance technologies

**International video**  
Electronic stability control

**Research paper**  
Effects of electronic stability control on total crash risk, Oka

**Selected research bibliography**  
Highlights from the Institute's research since 1989

**News releases**  
June 13, 2010 Electronic stability control could prevent two rollover risk by as much as 30%, effect is found on single-vehicle crashes  
October 20, 2010 Electronic stability control found effective risk, including the risk of total single-vehicle crashes

**Status Report newsletter articles**  
Vol. 47, No. 8, August 14, 2010: Truck loadings, buses crash  
Vol. 46, No. 8, September 28, 2010: Electronic stability control government study confirms  
Vol. 46, No. 5, June 9, 2011: ESC is making an intended new passenger vehicles  
Vol. 45, No. 6, June 22, 2010: Electronic stability control is  
Vol. 43, No. 2, March 15, 2008: ESC helps keep vehicles & people in the rollover crashes that still occur  
Vol. 42, No. 10, October 13, 2007: Federal study of ESC is  
Vol. 41, No. 10, December 19, 2006: Proposal to require ESC  
Vol. 41, No. 9, November 21, 2006: ESC is a new requirement

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## Vehicles equipped with electronic stability control (ESC)

About half of the total passenger vehicle crashes that occur each year involve a single vehicle. Equipping vehicles with ESC can reduce the risk of involvement in these crashes by more than 50 percent.

The government requires ESC on all passenger vehicles as of the 2012 model year. To find out if an earlier model is equipped with ESC, use the drop-down menus below:

Choose a vehicle:

Consumer note: Electronic stability control is marketed by a variety of brand names.

**How electronic stability control (ESC) works**



How ESC helps drivers maintain control: explanation with graph  
ESC research topics page (includes Institute study findings)

**Percent ESC availability by vehicle type**

		2011	2010	2009	2008	2007	2006
Cars	Standard	80	50	74	65	55	40
	Optional	5	7	14	16	17	16
	Not available	9	9	12	17	27	34
SUVs	Standard	100	100	100	96	89	66

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**2011 Chevrolet**

Model name	ESC availability	Vehicle history
Anchorage 1500 4dr	Standard	<a href="#">Vehicle history</a>
Anchorage 1500 4dr 4WD	Standard	<a href="#">Vehicle history</a>
Aveo 4dr	Not available	<a href="#">Vehicle history</a>
Aveo station wagon	Not available	<a href="#">Vehicle history</a>
Camaro 2dr	Standard	<a href="#">Vehicle history</a>
Camaro convertible	Standard	<a href="#">Vehicle history</a>
Colorado crew cab pickup	Standard	<a href="#">Vehicle history</a>
Colorado crew cab pickup 4WD	Standard	<a href="#">Vehicle history</a>
Colorado ext. cab pickup	Standard	<a href="#">Vehicle history</a>
Colorado ext. cab pickup 4WD	Standard	<a href="#">Vehicle history</a>
Colorado pickup	Standard	<a href="#">Vehicle history</a>
Colorado pickup 4WD	Standard	<a href="#">Vehicle history</a>
Corvette 2dr	Standard	<a href="#">Vehicle history</a>
Corvette convertible	Standard	<a href="#">Vehicle history</a>
Corvette 206 2dr	Standard	<a href="#">Vehicle history</a>
Corvette ZR1 2dr	Standard	<a href="#">Vehicle history</a>
Cruze 4dr	Standard	<a href="#">Vehicle history</a>
Equinox 4dr	Standard	<a href="#">Vehicle history</a>
Equinox 4dr 4WD	Standard	<a href="#">Vehicle history</a>

# Traction Control System



TCS is a device that maximizes accelerating and climbing abilities by preventing wheel slippage when the car accelerates or moves forward from a stopped position.

## **BTCS (Brake Traction Control System)**

If the wheels begin to spin when accelerating, or moving from a stopped position, this brake control system decreases torque and minimises the slip by activating the brake - improving acceleration and climbing ability. The operating principles are the same as those of ABS. In simple terms, the ABS operates when brake pressure is applied, and TCS operates when using the accelerator

# Tire Monitoring System



A **tire pressure monitoring system (TPMS)** is an electronic system designed to monitor the air pressure inside the pneumatic tires on various types of vehicles. TPMS report real-time tire-pressure information to the driver of the vehicle, either via a gauge, a pictogram display, or a simple low-pressure warning light. TPMS can be divided into two different types — direct (dTPMS) and indirect (iTPMS). TPMS are provided both at an OEM (factory) level as well as an aftermarket solution

# Hill Start Technology



The **hill-start assist** is a variant of hill-holder used by some semi-automatic, clutchless transmissions. The system prevents the car from rolling away when trying to pull away on an up or down gradient, simulating a "handbrake hill start" manual drivers will be familiar with. The system engages automatically when a gradient of 3% or more is detected; it then acts to hold the car stationary for two seconds after the brake is released giving the driver time to apply the throttle

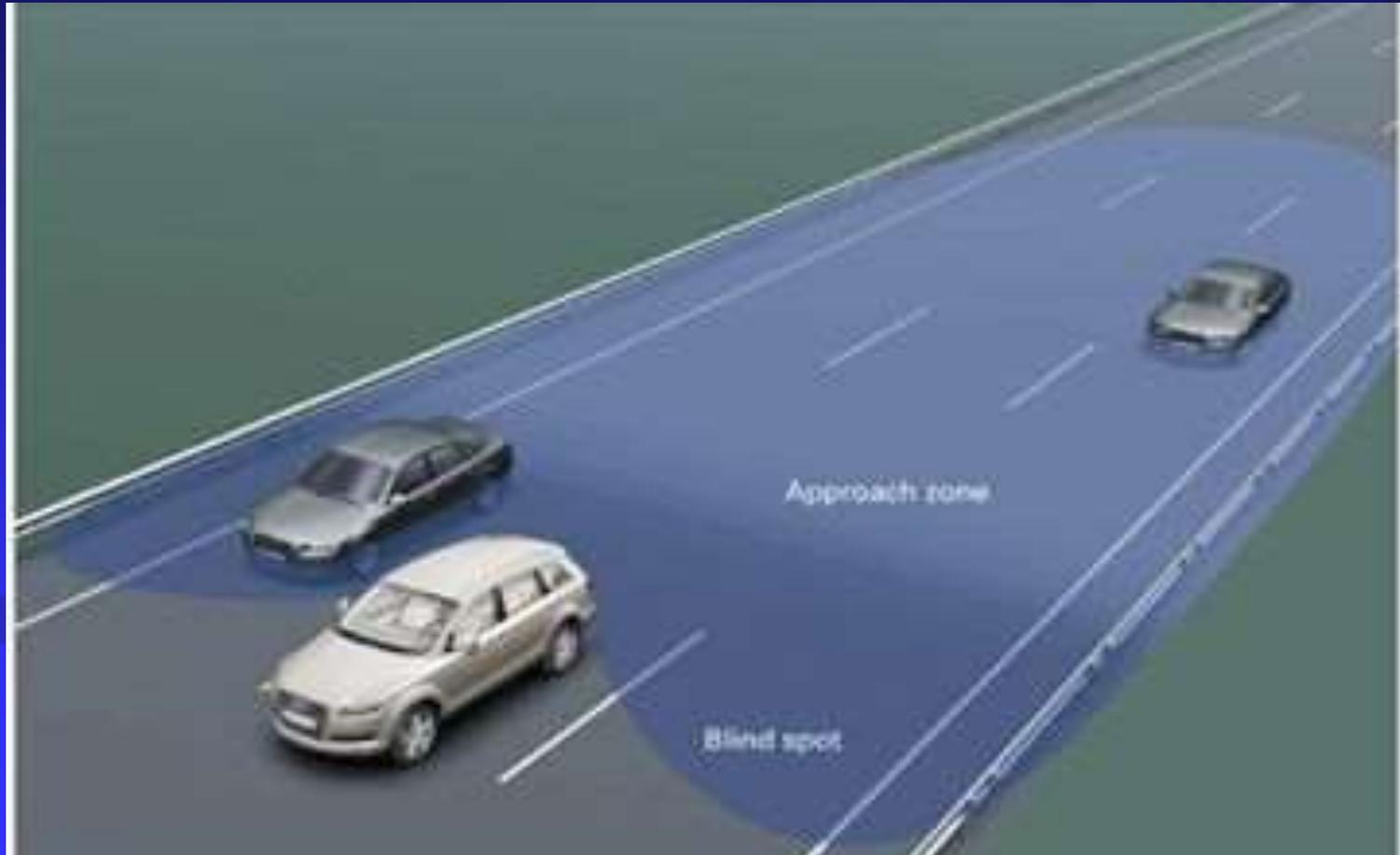
# Hill Decent Technology



Hill Descent Control (HDC) allows a smooth and controlled hill descent in rough terrain without the driver needing to touch the brake pedal. When on, the vehicle will descend using the ABS brake system to control each wheel's speed. If the vehicle accelerates without driver input, the system will automatically apply the brakes to slow down to the desired vehicle speed. Cruise control buttons can adjust the speed to a comfortable level. Applying pressure to the accelerator or brake pedal will override the HDC system when the driver requires. The other name for this is Hill Mode Descent Control.

With Hill Descent Control drivers can be confident that even the ride down hills with slippery or rough terrain will be smooth and controlled, and that they will be able to maintain control as long as sufficient traction exists. Four-wheel-drive (4WD) and All Wheel Drive (AWD) vehicles, such as Ford Territory, may have a Hill Descent Control system installed, using the ABS braking to control the car's motion downhill, initially developed by Bosch for Land Rover. The system can be controlled, usually by the Cruise Control buttons near or on the steering wheel

# Blind Spot Detection Technology

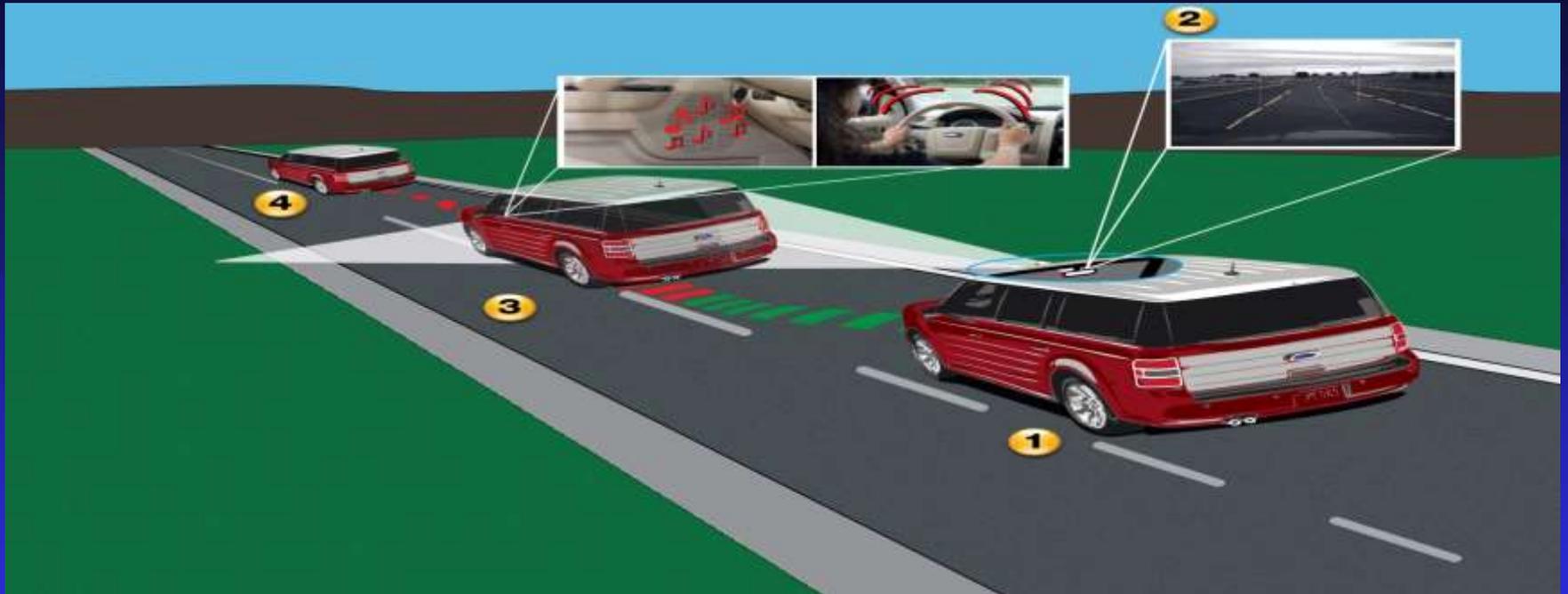


# Adaptive Cruise Control Technology

**Autonomous cruise control** is an optional cruise control system for road vehicles that automatically adjusts the vehicle speed to maintain a safe distance from vehicles ahead. It makes no use of satellite or roadside infrastructures nor of any cooperative support from other vehicles. Hence control is imposed based on sensor information from on-board sensors only. The extension to cooperative cruise control requires either fixed infrastructure as with satellites, roadside beacons or mobile infrastructures as reflectors or transmitters on the back of other vehicles ahead. *[citation needed]*

Such systems go under many different trade names according to the manufacturer. These systems use either a radar or laser sensor setup allowing the vehicle to slow when approaching another vehicle ahead and accelerate again to the preset speed when traffic allows - example video. ACC technology is widely regarded as a key component of any future generations of intelligent cars. The impact is equally on driver safety as on economising capacity *[disambiguation needed]* of roads by adjusting the distance between vehicles according to the conditions

# Lane Departure Technology



In road-transport terminology, a **lane departure warning system** is a mechanism designed to warn a driver when the vehicle begins to move out of its lane (unless a turn signal is on in that direction) on freeways and arterial roads. These systems are designed to minimize accidents by addressing the main causes of collisions: driver error, distractions and drowsiness. In 2009 the U.S. National Highway Traffic Safety Administration (NHTSA) began studying whether to mandate lane departure warning systems and frontal collision warning systems on automobiles

# Adaptive Headlamps



Adaptive Headlights automatically swivel in the direction of the road ahead, even up hills and around curves. Sensors measure the vehicle's velocity, direction and yaw. This information, combined with the movements of the steering wheel, is fed into an on-board computer. Based on this data, the system calculates the direction in which the vehicle is heading, and automatically points the headlights in that direction

# Adaptive Headlamps

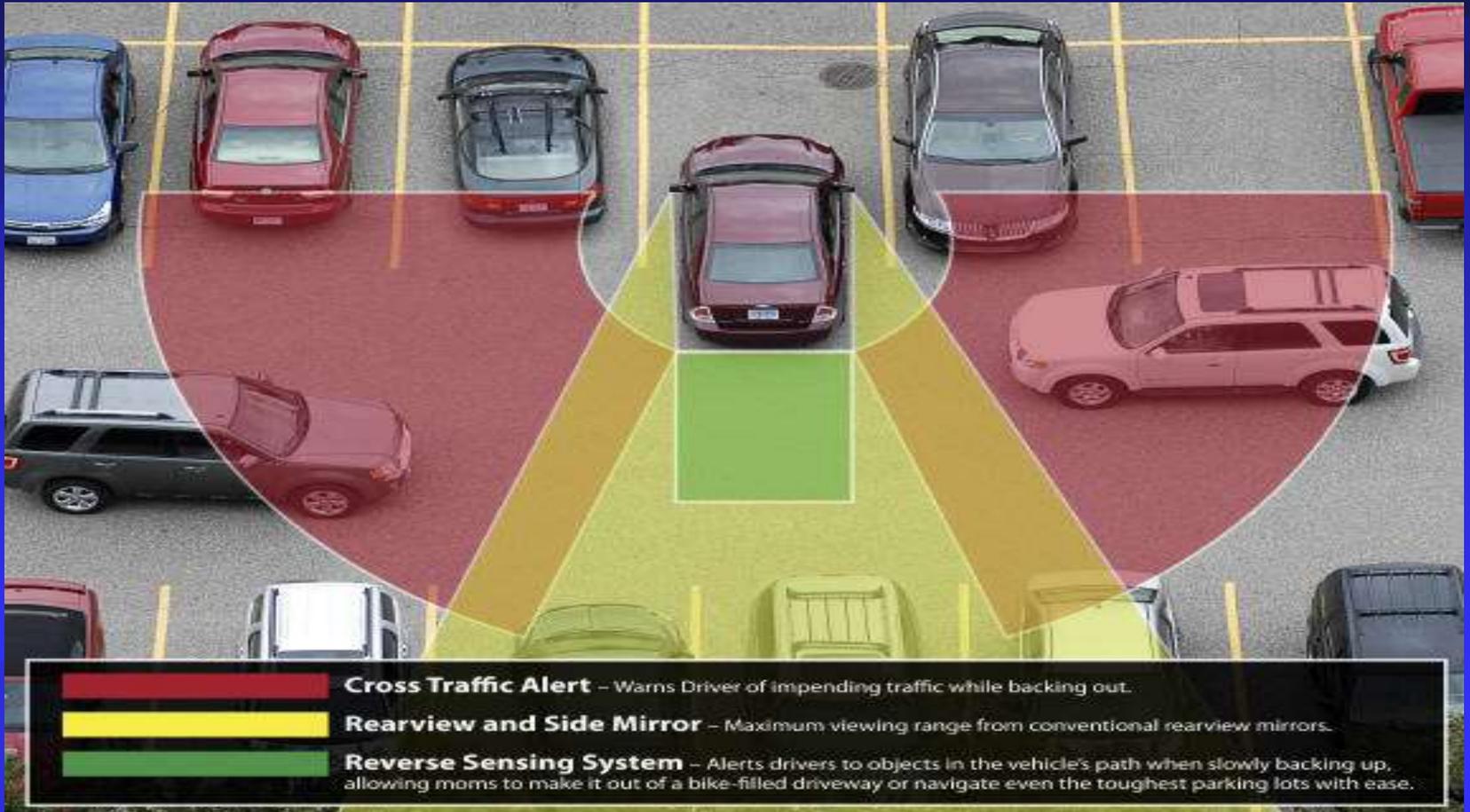
General maintenance wheel alignments are check the air pressure then set the tow and let it go. Collision damaged vehicles require an ALL WHEEL alignment. The rear wheels (uni-body) or thrust angle (on BOF if applicable) are first set then the front wheels are aligned off the rear wheels. Additionally, on some of the rear camera equipped vehicles it is required to align some and/or all of the following during the wheel alignment:

1. The camera to the steering angle sensor
2. The headlamps to the steering angle or yaw rate sensor
3. The distronic/adaptive cruise control camera
4. The automatic load leveling air ride suspension
5. The lane departure system
6. The pre-collision/pre-safe system

# Crash Avoidance Technology

A **collision avoidance system** is a system of sensors that is placed within a car to warn its driver of any dangers that may lie ahead on the road. Some of the dangers that these sensors can pick up on include how close the car is to other cars surrounding it, how much its speed needs to be reduced while going around a curve, and how close the car is to going off the road. The system uses sensors that send and receive signals from things like other cars, obstacles in the road, traffic lights, and even a central database are placed within the car and tell it of any weather or traffic precautions. Depending on the system they may warn the driver, precharge the brakes, inflate seats for extra support, move the passenger seat, position head rests to avoid whip lash, tension seat belts and automatically apply partial or full braking to minimize impact. A situation that provides a good example of how the system works is when a driver is about to change lanes, and there is a car in his blind spot. The sensors will detect that car and inform the driver before he starts turning, preventing him from potentially getting into a serious accident

# Cross Traffic Alert



## **Blind Spot Information System (BLIS) with Cross-Traffic Alert**

Ford's Blind Spot Information System (BLIS®) with cross-traffic alert is a driver assist feature that helps detect vehicles in blind spots during normal driving and traffic approaching from the sides when reversing out of parking spots.

### **Blind Spot Information System**

#### **How it works**

- The feature uses two multiple-beam radar modules, the same used with cross-traffic alert, which are packaged in the rear quarter panels – one per side.
- The radar identifies when a vehicle enters the defined blind spot zone and illuminates an indicator light on the corresponding sideview mirror, providing a warning that a vehicle is approaching.

#### **How it works**

- Working in conjunction with Blind Spot Information System (BLIS), cross-traffic alert warns the driver of impending traffic while backing out of a parking spot.
- Cross-traffic alert utilizes the blind spot system's two multiple-beam radar modules.
- It can pick up a vehicle moving at least 5 mph within a 45-foot range – or five parking spaces – from either the left or right side of the vehicle.
- When cross traffic is approaching, three warnings are given: an indicator lights up in the corresponding outside mirror, an audible alert is sounded and a message center warning is displayed.
- The radar also works when backing out of angled parking spaces because its view is wider than just strictly sensing traffic coming at a 90-degree angle.

#### **Availability**

Available on Ford Fusion and Fusion Hybrid, Ford Taurus, Ford Explorer, Ford Edge, Lincoln MKZ, Lincoln MKZ Hybrid, Lincoln MKT and Lincoln MKX.

Cross-traffic alert – Warns drivers of impending traffic while backing out

Rearview and side mirror – Maximum viewing range from conventional rearview and side mirrors

Reverse sensing system – Alerts drivers to objects in the vehicle's path when slowly backing up

# Night Vision Technology





## **Automotive Electronic Solutions**

Presents



# Automotive Electronic Solutions



**ASTech**™ provides an **ON-DEMAND** service to program, with an OEM scan tool, any module on any vehicle while the vehicle remains in YOUR shop.

# Does Your Shop Have a Black Box?



## SHOP BENEFITS

- Vehicle and employees stay at the shop
- No need to buy expensive scan tools or hire techs to operate
- Eliminate one of the largest "cycle time bandits" in a collision center
- Increase shop revenue by keeping diagnostic work in house
- Reduce the number of supplements and potential delays due to insurance approvals
- Easy, quick connection and setup for body shop employees
- Eliminates towing costs to and from the dealership
- Convenience of On-Demand Service (No downtime at the dealer)
- Increase CSI by delivering vehicles ahead of schedule and properly repaired
- Liability protection
- Fraud protection
- Tool of measurement for inspecting and repairing a vehicle's diagnostic network
- Faster insurance payment for supplements
- Reduce the number of comebacks



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ASTech provides ON-DEMAND dealership level diagnostic services while the vehicle remains in YOUR shop!



An ASTech is all you need to give your shop on-demand remote access to OEM scan tools, operated by our certified Master Technicians, at a fraction of the cost. As a subscriber, your shop will now have its own library of automotive data, analytics, and technical service bulletins, with expert diagnostics.

- No scan tools required
- No towing to dealership
- Reduced job turnaround time (faster bay cycle time)
- Certified Master Technicians perform diagnostic services
- No more "hanging parts" to find vehicle problems
- Enables your shop to expand services to more makes/models\*

\* Please refer to the Services section of the website for further details on current and future make/model coverage of the ASTech.

CUSTOMER REQUEST  
FOR SERVICE

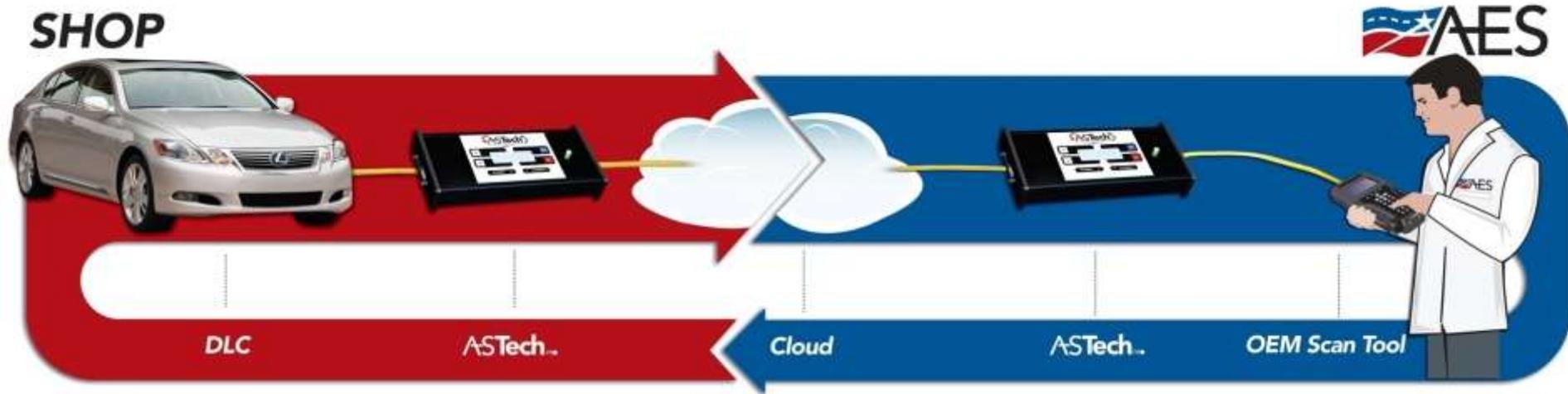


ASTech Coverage (by Make/Year)

Make	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Acura																		
Audi																		
BMW																		
Buick																		*
Cadillac																		*
Chevrolet																		*
Chrysler																		
Dodge																		
Ford																		
GMC																		*
Honda																		
Hummer																		
Hyundai																		
Infiniti																		
Jaguar																		
Jeep																		
Kia																		
Land Rover																		
Lexus																		
Lincoln																		
Mazda																		
Mercedes-Benz																		
Mercury																		
Mini																		
Mitsubishi																		
Nissan																		
Oldsmobile																		
Plymouth																		
Pontiac																		
Porsche																		
Ram																		
Saturn																		
Scion																		
Smart																		
Subaru																		
Suzuki																		
Toyota																		
Volkswagen																		
Volvo																		

Legend

	Complete
	In Development
	Model Dependent
	Future
	N/A



1. The shop or estimator requests a service (phone, website, fax)
2. AES Master Tech sets up the service and notifies shop or estimator that service is about to begin. Shop or estimator role is done
3. AES Master Tech performs the service
4. AES Master Tech creates report and sends to shop or estimator

Process takes approximately 5 minutes of shop or estimator's time and 15 minutes of AES Master Tech time. Shop or estimator can go on to another task while AES works.



al Motors

ASTech

D3

D1

D2

D4



**2007 Toyota Corolla**  
**RO#14332**  
**1NXBR32Exxxxxxx**  
**23,399 Miles**  
**“Borderline Total loss”**  
**Airbag light is on,**  
**driver’s bag deployed.**

**WITHOUT ASTech SUPPORT:**

- Origin of dashboard lights are unknown to the shop.
- Supplements are likely, due to wire harness damage and hidden damage within airbag network.
- Vehicle will need to be towed to the dealer for airbag system diagnosis.
- Vehicle may not repair due to excessive costs and hidden damage.

**Scan report found multiple codes in vehicle SRS module.**

**WITH ASTech SUPPORT:**

- Damage identified in DA stage of repair process
- Shop provides both insurance company and vehicle owner with a accurate damage appraisal.
- No dealer visit necessary, vehicle and employees stay at the shop.
- Low mileage , high NADA value, accurate estimate, vehicle will likely repair
- Potential of \$5,000 in savings, shop determined that vehicle may be a total loss.**



**2009 Toyota Tacoma**  
**3TNJU62M4xxxxxxxxxx**  
**34,246 Miles**  
**Light impact to front**  
**bumper.**  
**No lights present on**  
**dashboard.**

#### **WITHOUT ASTech SUPPORT:**

- Damage goes unnoticed by repair facility.
- Vehicle has hidden damage the shop that will trigger a light on the dash and disable the Traction Control once vehicle is driven a specified distance.
- If the vehicle is not test driven before handing it back to the customer it has potential to become a comeback.
- Once the vehicle “comes back” a visit to the dealer would be required.

**Scan report found a current code within the Traction control Module for a Steering angle sensor out of calibration.**

#### **WITH ASTech SUPPORT:**

- Damage is identified in DA stage of repair process
- Shop has the opportunity to inspect the vehicle for further related damage.
- Shop does not release a vehicle that is not safe.
- If the Insurance company finds the damage is not related, the shop could upsell the repair to the customer.
- **See attached ROI analysis for this vehicle.**



2007 Audi Q7

WA1BV74L0xxxxxxxxxx

122,204 Miles

No lights on dashboard

Navigation unit not

working.

Impact to right rear of  
car.

#### **WITHOUT AS Tech SUPPORT:**

- Shop is unable to handle customer's concern on Navigation error.
- Vehicle would have to go to the dealer for diagnostic inspection.
- Dealer found navigation MMI (Multi-Media Interface) unit located in right rear of vehicle, had no communication.
- Dealership would have likely replaced the module for no communication error and would have no reason to analyze freeze frame data.
- High probability insurance carrier pays for unknown electrical failure in control module, because of close proximity to vehicle impact zone.

**Scan results found lost communication with Navigation MMI unit. Further inspection found open TSB for sunroof leak.**

#### **WITH AS Tech SUPPORT:**

- AESP identifies the navigation faults on the first day of the repair.
- AESP found in the freeze frame data that navigation faults were recorded 8,954 miles and 7 months prior to date of loss.
- AESP also found Audi has an open TSB for this exact problem on the Q7 model range.
- *Savings to insurance carrier over \$1500.00*

[Vehicle](#) » [Restraints and Safety Systems](#) » [Repairs and Inspections Required After a Collision](#) » [Service and Repair](#) » Procedures

**SEARCH** [Advanced](#)

2010 Toyota Avalon V6-3.5L (2GR-FE)

Save Article  Select Print Option ▾

**SUPPLEMENTAL RESTRAINT SYSTEM: OCCUPANT CLASSIFICATION SYSTEM: PRECAUTION**

**NOTICE:**

When disconnecting the negative (-) battery cable, initialize the following systems after the cable is reconnected.

Zoom and Print Options

System Name	See Procedure
Power Window Control System	[ INTRODUCTION: REPAIR INSTRUCTION: INITIALIZATION ]
Sliding Roof System	

**1. INSPECTION PROCEDURE FOR VEHICLE INVOLVED IN ACCIDENT**

(a) Perform the zero point calibration and sensitivity check if any of the following conditions occur.

- \* The occupant classification ECU is replaced.
- \* Accessories (seatback tray and seat cover, etc.) are installed.
- \* The front passenger seat is removed from the vehicle.
- \* The passenger airbag ON/OFF indicator ("OFF") comes on when the front passenger seat is not occupied.
- \* The vehicle is brought to the workshop for repair due to an accident or a collision.

**NOTICE:**

When an accident vehicle is brought into the workshop for repair, check the flatness of the body side that is equipped with the passenger seat. If the flatness is not within +/- 3.0 mm (0.118 in.), adjust it to the specified range.

**2. EXPRESSIONS OF IGNITION SWITCH**

The type of ignition switch used on this model differs according to the specifications of the vehicle.

The expressions listed in the table below are used in this section.

Zoom and Print Options

	Switch Type	Ignition Switch (position)	Engine Switch (condition)
Expression	Ignition Switch off	LOCK	Off
	Ignition Switch on (IG)	ON	On (IG)
	Ignition Switch on(ACC)	ACC	On (ACC)
	Engine Start	START	Start

0  
S  
A  
V  
E  
D  
A  
R  
T  
I  
C  
L  
E  
S