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## **Severe service conditions**

This brochure is intended to aid the operators of police or fleet vehicles (used in severe duty, high mileage operations) in understanding the required maintenance services for such vehicles. It covers maintenance services for vehicles equipped with Heavy Duty packages. However, other vehicles operated under the conditions listed below are also considered “severe service” vehicles and should be serviced and maintained as prescribed in this brochure. This brochure applies to rear wheel drive passenger cars only.

### **CONTACT US**

Ford Fleet Hotline - The Ford Fleet Hotline provides police and fleet customers with direct access to Ford Motor Company for fleet sales or service information. The hotline number is (800) 34-FLEET.

Ford Fleet Website - Additionally, Ford maintains a website for police and other fleet vehicles. The Ford Fleet website is located at [www.fleet.ford.com](http://www.fleet.ford.com).

## **Maintenance recommendations**

Police and fleet vehicles are manufactured with heavy-duty parts that are designed specifically for the varying demands and unique requirements under which they are operated. Components that are part of the option packages are listed below and on the following pages with a brief outline of their major features and their contribution to overall vehicle performance, handling and usage.

Failure to maintain your vehicle(s) properly may restrict your warranty coverage, reduce vehicle performance and operational capabilities and adversely affect driver-passenger safety. The severe duty maintenance intervals are listed in the "Service Guide."

The descriptions, specifications and material described in this publication were in effect at the time the publication was approved for printing. Ford Motor Company reserves the right to discontinue models at any time, or change specifications, design or testing procedures without notice and without incurring obligation.

## Severe duty equipment

### POWERTRAIN OVERSPEED PROTECTION

The powertrain control module (PCM) includes logic to electronically prevent powertrain overspeed in any transmission selector position.

### TRANSMISSION

The police vehicle has a unique high-performance powertrain including transmission and an aluminum driveshaft, which is designed for maximum vehicle performance. Due to the nature of this powertrain, some powertrain noise may be present.

Driving in the overdrive cancel mode for prolonged periods at high speeds will deteriorate performance and may cause extensive engine damage.

Crown Victoria police vehicles are designed to operate in the **D** (Overdrive) gear selector position while in pursuit. Optimum performance will be obtained in **D** (Overdrive). Operation in the overdrive cancel mode should only be used in situations noted in the "Owner Guide."



Under no circumstances should the aluminum driveshaft be replaced with a steel driveshaft. Doing so will adversely affect vehicle operation which could lead to personal injury.

### LUBRICANT SPECIFICATIONS

Item	Ford part name	Ford part number	Ford specification
Rear Axle Lubricant	Motorcraft SAE 75W-140 High Performance Synthetic Rear Axle Lubricant	F1TZ-19580-B	WSL-MZC192-A

### ELECTRICAL

#### Battery — Police

The Motorcraft maintenance-free battery normally does not require additional water during its life. However, for severe service usage or in high temperature climates, the electrolyte level should be checked at least every five months or 8 000 km (5 000 miles). If the electrolyte level

## Severe duty equipment

is below the level indicator in any cell, add enough pure water to bring the level up to the indicator. Never add electrolyte ("battery acid") to the battery as this could shorten battery life.

### **Generator — Police**

The high-output generator provides 200 amperes of current to support the high power requirements of modern police equipment. Output at idle is approximately 130 amperes. Current demand by both the vehicle and all energized police equipment in excess of this amount during vehicle idling will place the electrical system into a discharge condition. Electrical power management systems should be applied if necessary to avoid discharging the battery.

### **Rear Power Point — Police**

The Rear Power Point is a battery access port for Police auxiliary equipment mounted in the trunk. It is capable of supplying 80 amps of battery power. The Front Power Distribution Box (PDB) contains two fifty amp fuses, which protects the Power Point. Battery access is via two studs contained in an enclosure, mounted in the trunk, on the right side fender support. The terminal with the red wires is the battery positive, and the terminal with the black wire is the ground. Remove both fuses in the Front PDB before removing the cover to the rear power point. Ensure load devices can be turned off, and are switched off when reinserting fuses.



Under no circumstance should the cover be removed without first pulling the two fuses in the Front Power Distribution Box. Removing cover without pulling fuses could result in an electrical hazard, and result in personal injury. Shut off load devices before inserting fuses.

## **HEAVY-DUTY SUSPENSION-POLICE**

This option includes heavy-duty components that contribute to the vehicle's stability and road handling capability under extremes of operation. The police vehicle has a heavy duty steering gear, extra control shock absorbers and heavy-duty front and rear stabilizer bars.

## **COOLERS**

### **Extra oil cooler-Police**

It is strongly recommended that auxiliary devices such as lights not be installed at the grille. Such devices will reduce airflow through the grille and could potentially impact the cooling system performance.

## Severe duty equipment

The 4.6L engine has an engine oil cooler mounted below the radiator fan to maintain safe engine oil temperatures.

### WHEELS/TIRES/BRAKES

#### Wheel rims-Police

To withstand the demands placed on vehicles driven under heavy-duty service conditions, Ford Motor Company installs heavy-duty steel wheels.

#### Tires — Police

Tires (including the spare) are speed-rated radials for police use. Use only the recommended tire size and speed ratings.

In regions with snow and ice during the winter months, installation of snow tires may be desirable. Snow tires will usually exhibit a drop in dry pavement handling, but many show an increase in snow and ice traction. When snow tires are used, they should be installed on all four wheels, never on the drive wheels only.

#### Long term storage

Most high performance tires are made with a nylon overlay.

As such, the following steps should be taken to avoid flatspotting when the vehicles are not used for a period of time.

- Fleets should store the vehicles with 44 PSI in the tires.
- If the vehicle is stored for periods longer than 30 days, it should be moved several feet at least once during each 30-day period, so that a different portion of the tread contacts the ground.
- Tire pressure should be reduced to the recommended pressure shown on the vehicle certification label before the vehicle is placed back into service.

#### ***Use of Goodyear Eagle RS-A Plus Tires in Law Enforcement Applications***

Your vehicle may be equipped with Goodyear Eagle RS-A Plus tires. This tire contains an aramid overlay for improved handling, puncture resistance, and resistance to flatspotting when compared to the Eagle RS-A offered in previous years. The tire also has deeper non-skid in the shoulder for improved front tire tread wear.

Eagle RS-A Plus tires, however, should only be used in sets of four. The Eagle RS-A tire will still perform well on your vehicle, but all four tires should always be of the same make and model.

## Severe duty equipment



Use of aramid belted Eagle RS-A Plus tires on the front axle, and different tires on the rear axle, creates a higher risk of loss of control in operations involving high speed or aggressive maneuvers.

### Brakes-Police

The police vehicle is equipped with heavy-duty front disc brake pads to meet the varying demands of different police service for fade resistance and other performance requirements.

The police vehicle has standard ABS anti-lock brakes and may be equipped with traction control; refer to the “Owner Guide” for operation of these systems.

### INTERIOR

#### Heavy-duty seats-Police

The front seat assemblies, including the seat adjustment mechanisms and supports, are ruggedly designed and ensure working comfort.

#### Calibrated speedometer-Police

Deviations from true road speeds are minimized by a calibrated speedometer head which gives both miles-per-hour (0–140 mph) and kilometer-per-hour (0–222 km/h) readings. The speedometer head assembly accuracy is +2 mph (+3 km/h) over the entire range (at 21°C [70°F]). The “certified calibration” applies to the head assembly only and does not apply to the indicated speed of the system, which is affected by variations in vehicle loading, tire inflation pressures, tire rolling radii and driveline ratios.

#### Mobile communication systems

The Federal Communications Commission regulates the use of mobile communication systems (such as two-way radios, telephones and theft alarms) that are equipped with radio transmitters. If you install this equipment in your vehicle, you should comply with those rules and a qualified technician should install the equipment. Ford Motor Company vehicles are in compliance with FCC regulations (CFR 47 Part 15) and SAE J551d for radiated electromagnetic emissions.

Mobile communication systems may harm the operation of your vehicle, particularly if they are not properly designed for automotive use or not properly installed. For example, when operated, such systems may cause the engine to stumble or stall and may affect 4R70W transmission

## Severe duty equipment

operation. In addition, such systems may themselves be damaged or their operation affected by operating your vehicle. (Citizen band [CB] transceivers, garage door openers and other transmitters whose power output is 5 watts or less will not ordinarily affect your vehicle's operation.)

Because we have no control over the installation, design or manufacture of such systems, Ford cannot assume responsibility for any adverse effects or damage that may result if you use this equipment.

Malfunction of aftermarket electronic equipment should be resolved by the equipment manufacturer.

### Aftermarket equipment installation

Ford has developed a Police Interceptor Modifier Guide to assist the vehicle modifier in safely installing police equipment into the vehicle. The guide provides detailed information on the location of key vehicle components that must be untouched and warnings for other areas where caution must be exercised. Call the Ford Fleet Hotline at (800) 34-FLEET for information on how to obtain a copy.

When installing aftermarket equipment, avoid using fasteners that are too long for the application or are in an area which might damage vehicle components, including wiring, brake lines, fuel tank and lines, powertrain components, exhaust system and suspension.

Also, do not make electrical connections to vehicle electrical systems not specifically designed for aftermarket equipment installations. Refer to the "Electrical and Vacuum Troubleshooting Manual" for electrical system information.

Do not install any components into the Powertrain Control Module (PCM) or PCM harness. Connecting into this system may affect engine and transmission operation.

As an example: connection of aftermarket electrical equipment into the brake light circuit or any other circuit which is connected to the PCM, anti-lock brake computer, air bag system or any other vehicle system which will cause vehicle malfunction.



Contact during a crash with aftermarket equipment in a vehicle can result in a personal injury.





Installation of prisoner barriers may increase the risk of injury to front seat occupants if the vehicle is impacted from the rear at high speeds. This risk should be balanced, by the law enforcement agency, against the risk of injury to the Officer associated with prisoner transport.



## Severe duty equipment

### **Trunk Pack™ and trunk loading**

 Ford recommends that police equipment be both secured and laterally aligned. Hard, stiff or sharp objects, especially when not secured or properly located, pose a risk to the fuel tank and back seat occupants. After-market organizers that do not adequately deform in rear-impacts can themselves become injury-producing objects. When locating, securing and mounting police equipment, please review the "Trunk Equipment Mounting Guide," available on the [www.cvpi.com](http://www.cvpi.com) website, which provides recommended fastener mounting types and locations.

 Following the trunk packing recommendations, also on the [www.cvpi.com](http://www.cvpi.com) website, is the most meaningful method of reducing risk. If your department practice is inconsistent with the trunk packing recommendations, then Ford suggests that you consider purchasing an optional drop-in Trunk Pack™ to further reduce the risk of injury resulting from police equipment pushing forward into the back seat and/or fuel tank in the event of a high-speed rear impact. The Trunk Pack™ provides more flexibility to officers transporting police equipment than the truck packing recommendations.

To improve trunk packing by police agencies, Ford has made the following items available:

- Trunk Pack™ – a drop-in box with a tough plastic shell made of High Density Polyethylene (HDPE). It both aligns police equipment laterally in the trunk and utilizes a Dupont KEVLAR® lining on the fore side of the box to reduce the risk of police equipment penetrating into the fuel tank and/or back seat in high-speed rear impacts.
- Trunk Equipment Mounting Guide – an outline pattern with recommended fastener mounting locations in the trunk. The guide can be found in the Police Interceptor Modifier Guide and on the Internet at [www.cvpi.com](http://www.cvpi.com).
- Trunk Packing Considerations – the following guidelines are offered to reduce the risk of unique police equipment items pushing through the fuel tank and/or back seat (see our [www.cvpi.com](http://www.cvpi.com) website for more details).

### **Trunk Packing Considerations**

A slogan has been developed to increase police agency awareness of the importance of trunk packing.

## Severe duty equipment

### 'LOAD SAFE'

**L-Lateral**

**O-Orientation**

**A-and**

**D-Direction**

**S-Soft**

**A-and**

**F-Fixed**

**E-Equipment**

### ***Equipment Categories and Placement***

It is recognized that a wide variety of equipment is carried in the trunks of police vehicles as noted above. This section addresses the inherent risks of various types of equipment in the event of a high-speed rear impact.

This information is divided into three categories:

- Carrying Not Recommended
- Carry With Caution
- Low Risk Items

**Carrying not recommended – The following items have been observed in police vehicles and should not be transported in a vehicle trunk** – containers with gasoline, loose ammunition, loose flares, loose fire extinguisher(s), loose 4-point lug wrench, loose crowbars, loose axes and other loose equipment with potential puncture capability in high speed rear end collisions.



Gasoline should not be stored in the trunk at any time, regardless of container.

**Carry with caution** – These items will require special packing or mounting consideration and possibly use of the Trunk Pack<sup>™</sup> as an additional level of safety. Examples include (with proposed orientation): fire extinguisher (fixed), lug wrench 4 point (fixed - vertical), rototape measuring wheel (fixed - vertical), safety flares (lateral orientation – in a container), Stop Stick (lateral - mount on deck lid inner panel), shovel (lateral - place at rear of trunk), shotgun and rifle (lateral - store in case), baton (lateral - place at rear of trunk), ammunition (container). Flares should be placed in a protective storage container (preferably soft sided plastic). Flares with spikes attached should be laterally oriented in the trunk area.

## Severe duty equipment

1. **Spare Tire Special Considerations** – The safest location for the spare tire, jack and lug wrench is the production location on the forward package shelf above the rear axle. If unable to mount there, the next safest location for the spare tire is mounted vertically inside the Trunk Pack™ using the J-bolt attachment device provided with the Trunk Pack™. The jack and lug wrench should be stored in the rearward compartment of the Trunk Pack™.

2. **Electronic Equipment** – The safest location for the electronic equipment is on the trunk forward package shelf. Some equipment can be mounted in the side shelf areas, but it must not protrude into the fuel tank area in a crash (noted in Trunk Equipment Mounting Guide). The optional Complete Police Prep Package is available to facilitate packaging of electronic components with a sliding tray for the forward package shelf and side compartments in the right and left shelf area. All equipment should be located and mounted using the "Trunk Equipment Mounting Guide" for proper positioning of fasteners. This guide can be accessed on the [www.cvpi.com](http://www.cvpi.com) website. The sliding tray can also be used, depending on size, to properly store parts with rigid and sharp edges.

3. **Ammunition** – The safest location for ammunition is the forward package shelf and on the side shelves. It is recommended that a plastic storage container be utilized and mounted using the "Trunk Mounting Equipment Guide" for proper fastener locations. It is also recommended that ammunition remain in the purchased container and be placed in a safe storage container .

**Low risk items** – These items are soft in feel and pose a low risk of trunk wall, rear seat area, and fuel tank puncture. Examples are: a soft camera case, biohazard kit in plastic boxes, gloves, safety rope, tow strap, traffic cones & sleeves, rain gear, riot gear (soft), emergency blankets, bullet resistant vest, tie straps, cloth tape, garment bags, first responder kit, Res-Q-Flo mask (placed in garment bag), fuses (plastic container), briefcase, notebooks, spray bottles, helmet, and jumper cables. It is not essential but recommended that the Trunk Pack™ can be considered for organization of low risk items, especially if mixed with "Carry With Caution" items.

## Air Bag Information

### AIR BAGS

Dual driver/passenger air bags and (if equipped) with side air bags affect the way police equipment can be mounted in police vehicles.

Any surfaces that could come into contact with an air bag, once it has deployed, must not damage the air bag or alter its deployment path.

Once the air bag has fully deployed, any peripheral equipment surfaces that could come into contact with the air bag (such as when the air bag deflates with the loading of an occupant) must not damage the air bag or alter its deployment path. Sharp edges, corners or protrusions could damage the nylon air bag material and reduce the effectiveness of the air bag.



Do not place objects or mount equipment in front of the air bag module cover or in front of the seat areas that may come in contact with a deploying air bag. Failure to follow this instruction could result in personal injury.



Dash, tunnel or console-mounted equipment should not be placed outside of the specified zone. Failure to follow this instruction could result in personal injury.



Do not mount equipment between the side of front seat to the door trim to block deployment of the side air bag. Failure to follow this instruction could result in personal injury.

Some approximate dimensions for air bags, at full inflation, are provided in Figures 1 through 5. These dimensions are somewhat flexible and represent “free form” deployments without the loading of occupants. The shaded areas in Figures 6 through 8 represent available police equipment mounting zones. These zones are shown for police vehicles equipped with standard bucket seats. While bench seats are optional and still appropriate for vehicles with certain limited police equipment requirements, the standard bucket seats are recommended for vehicles that require maximum available space for police equipment mounting. The zone dimensions provided in Figures 6 through 8 are approximate and will vary with the loading of occupants in the seats.

All air bag and equipment mounting zone dimensions are approximate due to different air bag deployment characteristics.

No equipment will mount between the side of the front seat and the door trim to block deployment of the side air bag.

## Air Bag Information

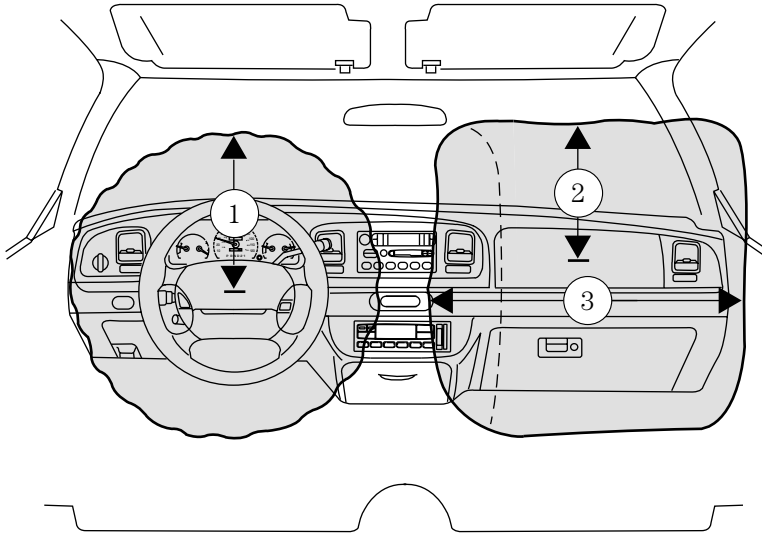


Figure 1

1. 240 mm (9.5 inches) from center of air bag door
2. 375 mm (15 inches) from center of air bag door
3. 750 mm (29.5 inches)

No objects should be placed between the air bags due to air bag variability.

## Air Bag Information

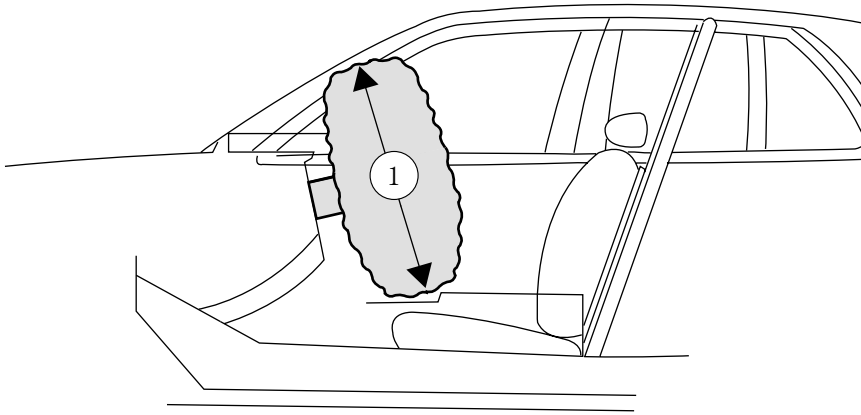


Figure 2

1. 660 mm (26 inches). Cross section through center of vehicle (passenger side shown)

## Air Bag Information

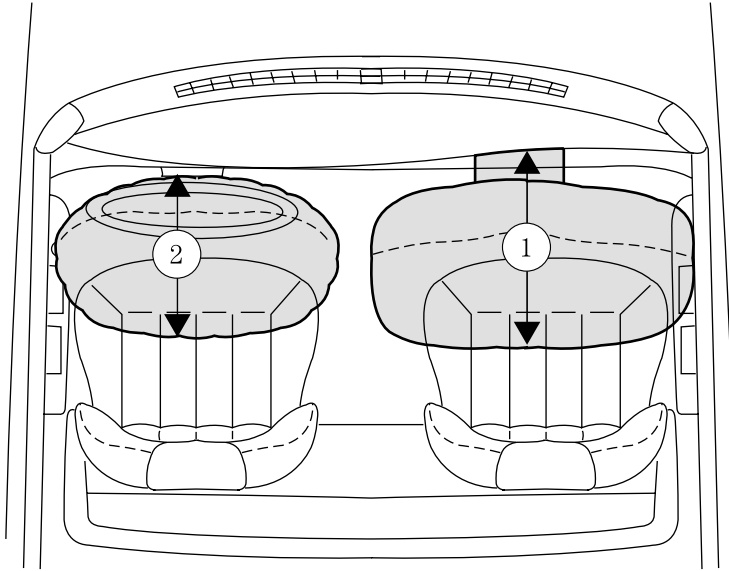


Figure 3

- 1. 650 mm (25.5 inches). Front passenger compartment
- 2. 430 mm (17 inches). Front driver

## Air Bag Information

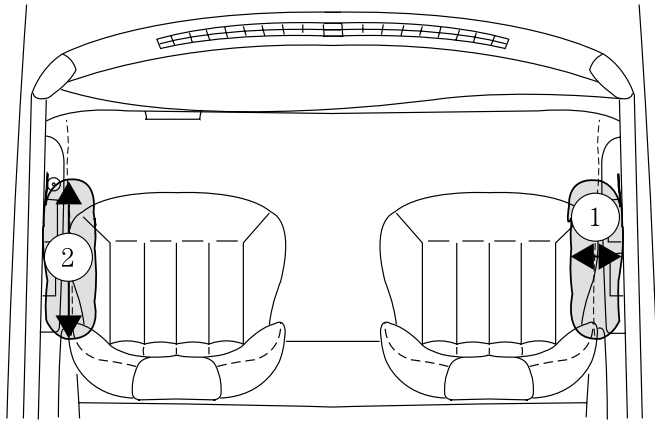


Figure 4 (if equipped)

1. 200 mm (8 inches). From out board side of seat
2. 380 mm (15 inches). Forward of seat back

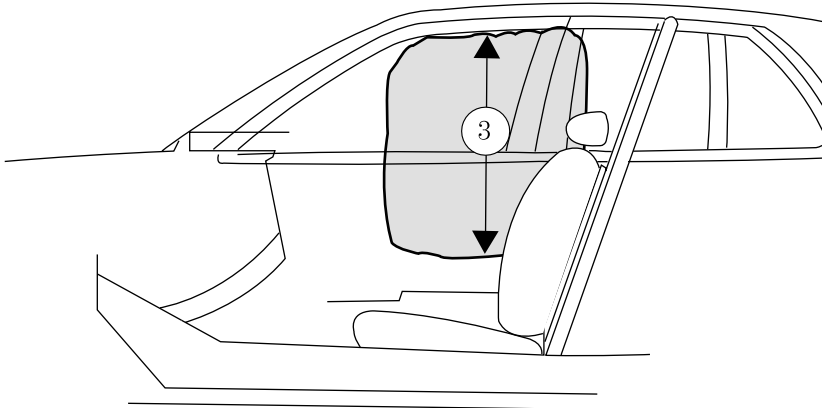


Figure 5 (if equipped)

3. 700 mm (27.5 inches). Up from SAB module



## Air Bag Information

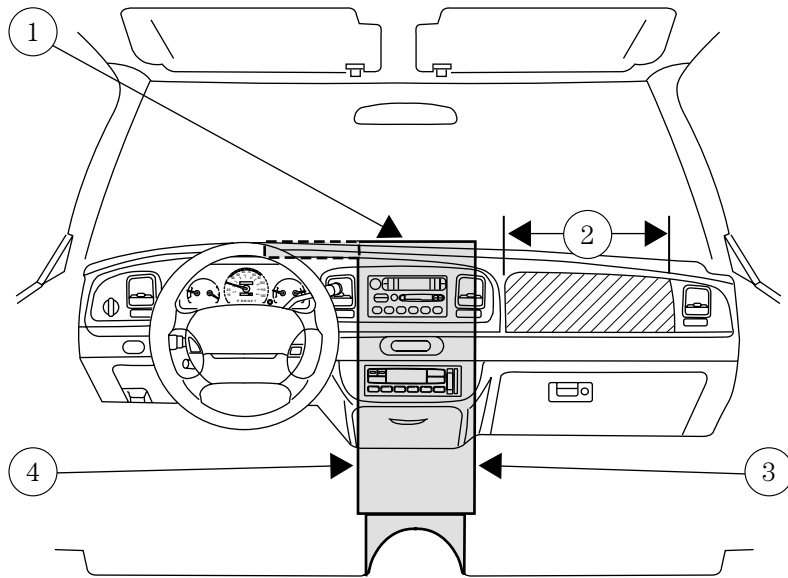


Figure 6

1. Area on top of instrument panel. **Equipment must not interfere with driver visibility.**
2. The air bag door must be kept clear for deployment of air bag
3. Area in front of center console from bottom of ashtray to top of instrument panel (see Figure 2 for dimensions)
4. 279 mm (11 inches) width horizontally centered on ashtray door.

## Air Bag Information

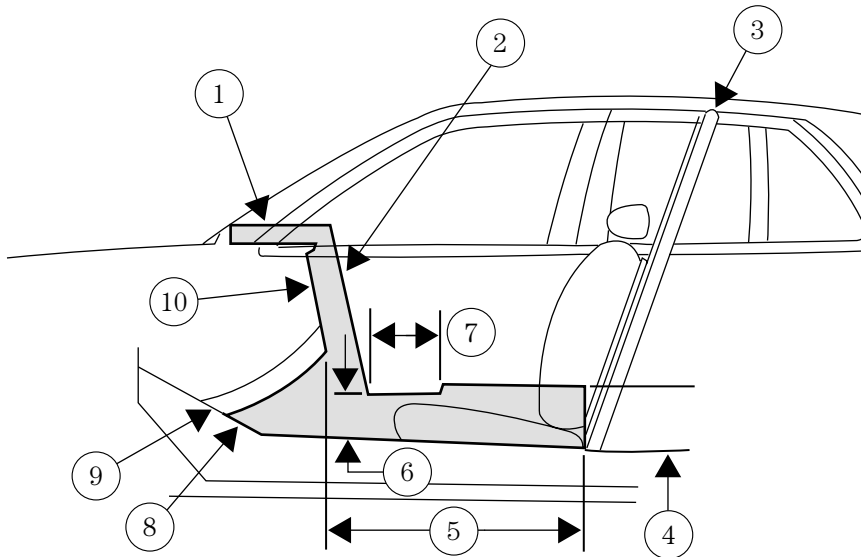


Figure 7

1. Area on top of instrument panel
2. Area in front of center console from tunnel up to instrument panel
3. Prisoner screen
4. 254 mm (10 inches)
5. Area on tunnel between seats
6. Height: 216 mm (8.5 inches)
7. 305 mm (12 inches)
8. Area on tunnel beneath center console
9. Tunnel
10. Depth: 38 mm (1.5 inches)

## Air Bag Information

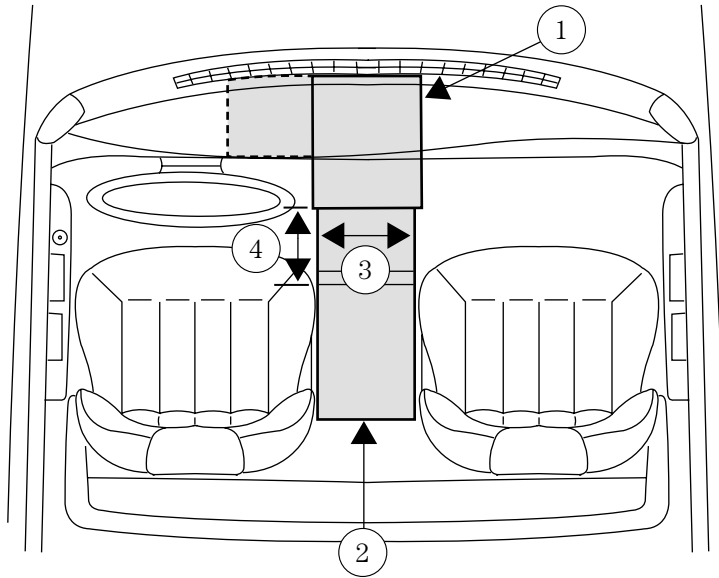


Figure 8

1. Area on top of instrument panel. **Equipment must not interfere with driver visibility.**
2. Area on tunnel between seats
3. 229 mm (9 inches)
4. 305 mm (12 inches)

### IMPORTANT AIR BAG DO'S AND DON'TS



Do not attempt to tamper with, disconnect or deactivate the air bag system.

Tampering with an air bag system could cause the bag to inflate or become inoperative. The air bag system should not be disconnected or deactivated.



Do not mount or place any objects in the deployment path of an air bag.

## Air Bag Information

Air bags must be allowed to fully deploy without restriction. The deployment of air bags is not compatible with any configuration of police equipment mounting that places objects in the air bag deployment path. Equipment mounted or placed in the deployment path area of an air bag will reduce the effectiveness of the air bag, damage the air bag and potentially damage or dislodge the equipment. Further such items could become projectiles in the event of an air bag deployment.



Always use safety belts with the air bag supplemental restraint system.

There are four very important reasons to always use seat belts with the air bag system. Safety belts:

- help restrain the occupant to increase the effectiveness of the air bag when it inflates.
- reduce the risk of injury in rollover, side or rear impact accidents for which air bags are not designed to inflate.
- reduce the risk of injury in frontal collisions that are not severe enough to activate the air bag.
- reduce the risk of passengers being thrown from the vehicle.

### **SOME COMMON POLICE QUESTIONS AND ANSWERS ABOUT AIR BAGS**

#### **Will there be any way to special order police vehicles without the air bag systems?**

No. Based on the federal law (FMVSS #208), after August 31, 1993, the Original Equipment Manufacturers (OEMs) will not be able to sell passenger cars that do not contain passive restraint systems.

#### **Can the installation of push bumpers on the front end of the vehicle affect the deployment of an air bag?**

Different push bumper designs may each have different deformation characteristics in a crash situation that may or may not affect the deployment of air bags. Without the benefit of crash tests on vehicles equipped with push bumpers (there are a number of different styles available), it is Ford's opinion that installation of some push bumpers could affect the timing of the air bag deployment. Use of a push bumper that mounts solely to the vehicles bumper should not have a significant effect upon air bag deployment.

## Air Bag Information

### **Is there a problem with transporting a front seat passenger who has their hands restrained behind their body?**

This is not a normal riding position for an occupant. The effectiveness of the passenger air bag will depend, in part, upon the occupant's seated position. It is recommended that the seat should be adjusted as far rearward as possible for this situation, and that the occupant sit as upright as possible and be properly safety belted. It is recommended that such passengers be properly restrained in the rear seat if at all possible.

### **Can conditions encountered in aggressive pursuit driving situations (e.g., high speed braking, uneven road surfaces) cause inadvertent inflation of an air bag that might result in loss of vehicle control?**

Air bags are designed to deploy in moderate to major frontal crashes based on the detection of sudden deceleration by sensors in the vehicle. The air bag system is designed to activate in a frontal collision equivalent to hitting a solid barrier (such as a wall) at about 23 km/h (14 mph) or more, or, roughly speaking, a parked car of similar size at 45 km/h (28 mph) or more. When activated, the air bag fully deploys in about 50 milliseconds (1/20th of a second). Following inflation, the air bag begins to vent almost immediately and is deflated in about one second.





