

## Table of contents

<b>Severe service conditions</b>	<b>2</b>
<b>Maintenance recommendations</b>	<b>3</b>
<b>Severe duty equipment</b>	<b>4</b>

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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.

## 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.

### 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 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.

### HEAVY-DUTY FRAME

Extra reinforcements in the frame on the police vehicle are designed to strengthen structural members so that they can withstand severe duty use.

#### 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.

## Severe duty equipment

### 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.

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.

#### 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 may be equipped with anti-lock brakes and a traction control system; 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

## Severe duty equipment

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 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

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.

## Severe duty equipment

### AIR BAGS

Dual driver/passenger 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.

Some approximate dimensions for air bags, at full inflation, are provided in Figures 1 through 3. These dimensions are somewhat flexible and represent “free form” deployments without the loading of occupants. The shaded areas in Figures 4 through 6 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 4 through 6 are approximate and will vary with the loading of occupants in the seats.

## Severe duty equipment

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

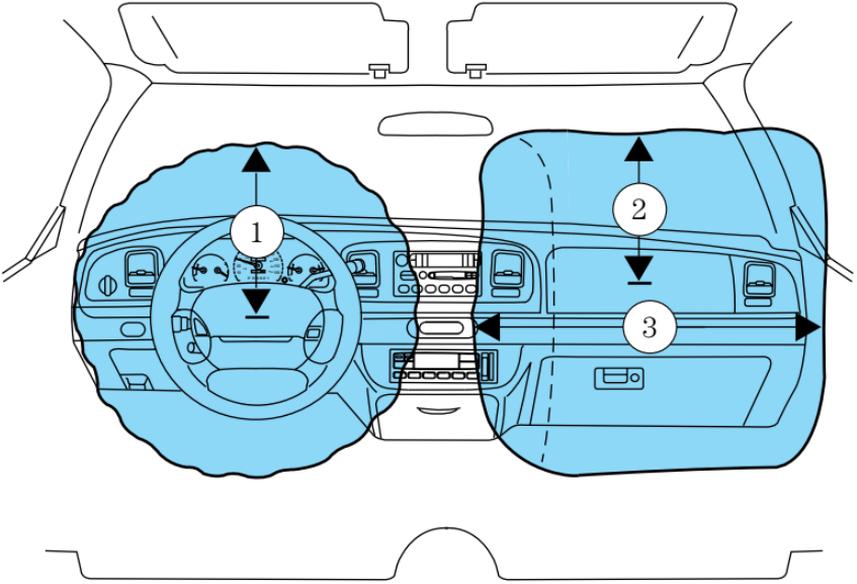


Figure 1

1. 325 mm (12.5 inches) from center of air bag door
2. 375 mm (15 inches) from center of air bag door
3. 700 mm (27.5 inches)

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

## Severe duty equipment

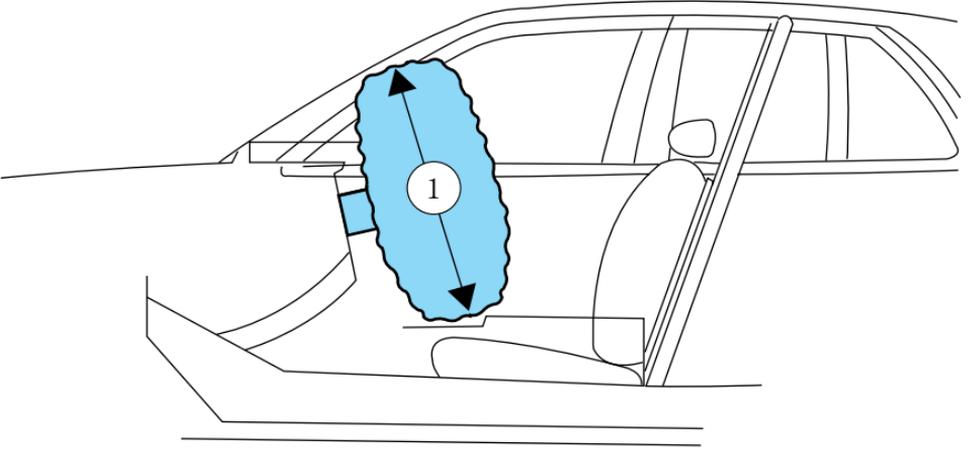


Figure 2

1. 650 mm (25.5 inches). Cross section through center of vehicle (passenger side shown)

## Severe duty equipment

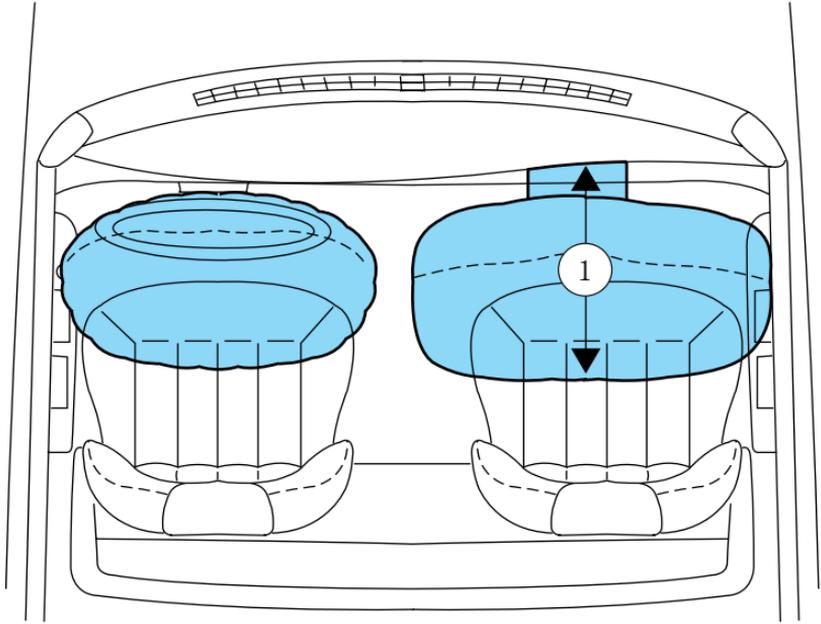


Figure 3

1. 580 mm (23 inches). Front passenger compartment

## Severe duty equipment

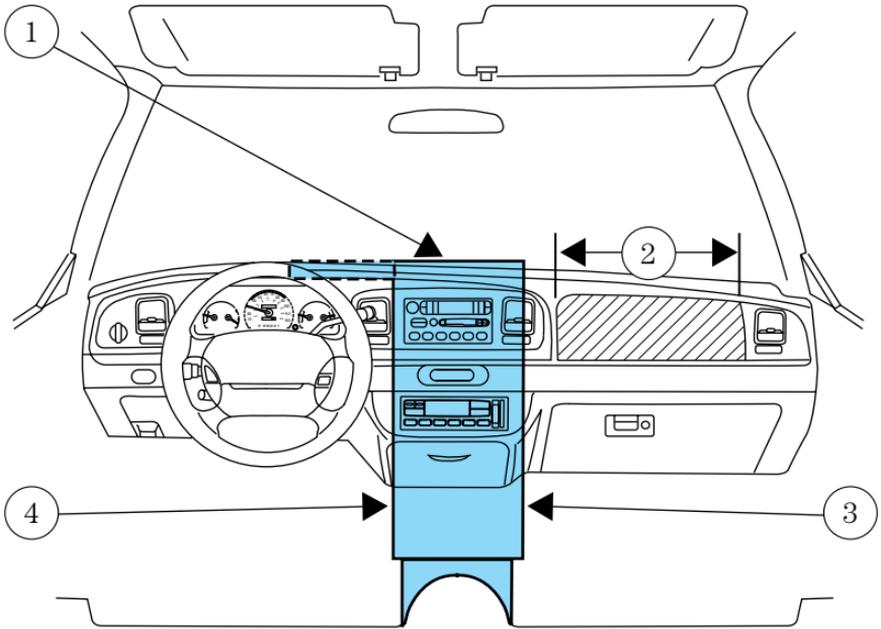


Figure 4

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.

## Severe duty equipment

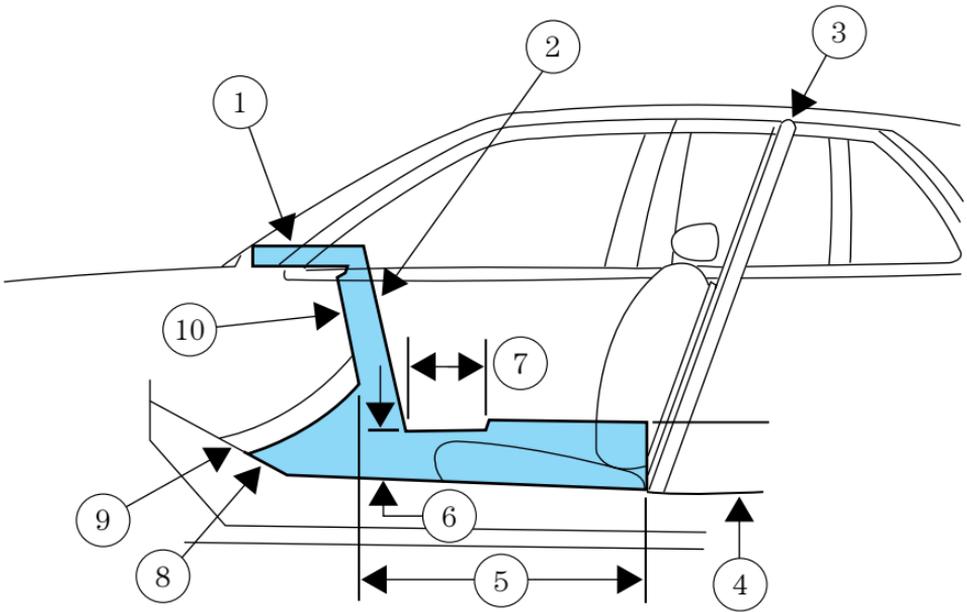


Figure 5

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)

## Severe duty equipment

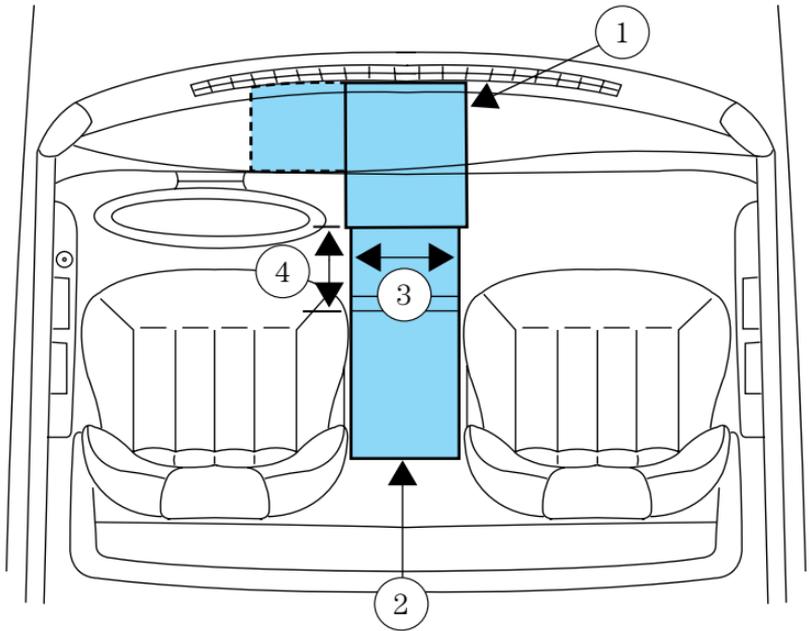


Figure 6

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)

## Severe duty equipment

### 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 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.

**Do 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

## Severe duty equipment

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.

### **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.

