

Safely Deploying Single-Stage and Two-Stage Air Bags in End-of-Life Vehicles

This Pamphlet Explains How To:

- Safely deploy single-stage and two-stage air bags inside vehicles and, if necessary, out of vehicles.
- Safely remove undeployed air bags from vehicles.
- Obtain more information.
- Safely handle partially deployed, two-stage air bags.

This report is intended to be used as a supplement to Vehicle Manufacturers' service manuals. All new vehicles and many older vehicles are equipped with air bags. Safety and environmental concerns require careful consideration and treatment of air bag system components when disposing of vehicles.

The information included in this pamphlet should be helpful to people who work for vehicle salvage yards, scrap metal recyclers, vehicle body shops, insurance companies, and anyone else involved in the disposal of vehicles equipped with air bags.



Why Air Bags Should Be Fully Deployed or Removed Prior to Disposal

Removing or deploying air bags before scrapping a vehicle eliminates the potential for hazardous exposures or reactions during processing. A live air bag initiator can potentially discharge even after it is separated from the air bag assembly during processing. Air bags that have not been fully deployed can cause human injury, damage to equipment, and contamination of air and water systems. If special handling procedures are followed, air bags can be safely deployed and then recycled with the rest of the vehicle or shipped separately to a recycling facility.

Important Warning

An air bag that has been removed from a vehicle should **never** be installed in another vehicle. Automobile manufacturers oppose any reuse of air bag components because:

- An air bag may not perform properly when installed in another vehicle, even when it is taken from a vehicle of the same make, model, and model year.
- Air bag modules are "tuned" to the specific vehicles in which they are installed; differences may exist even within the same make, model, and model year.
- The differences between air bag systems are much more than just the trim covers that enclose the air bags.
- Installation of the wrong air bag module or improper installation could increase the risk of serious injury or death in a vehicle collision.
- Any modification of the air bag module, such as incorrect mounting, air bag size, inflator module output, air bag vent size, air bag folding method, or painting the cover surface, could have an adverse effect on the protection offered by the air bag.

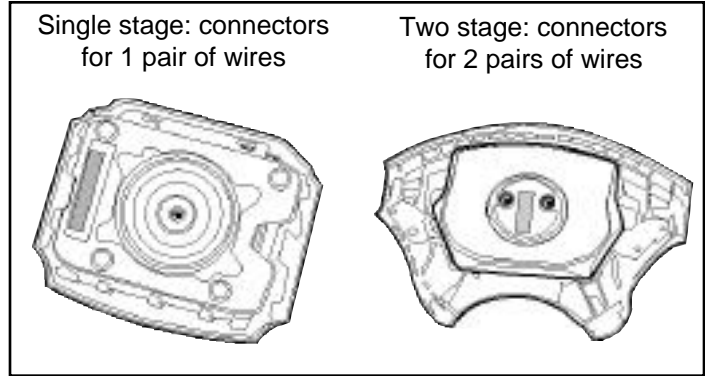
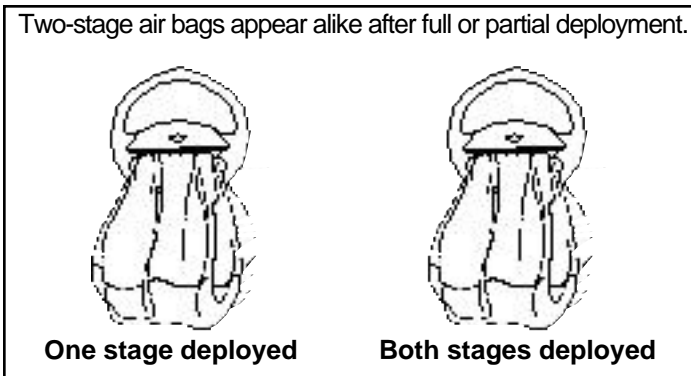
Air Bags

When a collision occurs, sensors in the vehicle determine whether the air bags should be deployed. In some vehicles involved in only moderate collisions, only Stage One of a two-stage air bag will deploy. If a deployment is needed, electric current passes through the initiator of the inflator module and deploys the air bag. Once an air bag is inflated, it quickly deflates through the air bag vent holes and/or the air bag fabric.

Single-stage air bags have one initiator and a single charge of gas-generating material. *Single-stage air bags have one pair of wires that connects to the air bag module.*

Two-stage air bags are generally found in vehicles from the 2000 model year or later. Having two initiators and two charges of gas-generating material, *two-stage air bags have two pairs of wires (total of four wires) that connect to the air bag module.*

Caution: A two-stage air bag may appear to be fully deployed when only its first stage has deployed. Care must be taken to make sure that two-stage air bags have been fully deployed before scrapping. Always assume that any deployed two-stage air bag has an active Stage Two. Improper handling or servicing can activate the inflator module and cause personal injury. Always follow the manufacturer's recommended handling procedures.



Important Safety Information

- The removal, handling, and storage of undeployed air bags require special care. Air bags deploy with great force and can kill or seriously injure workers or bystanders in your facility if they are not handled properly at all times.
- Only trained technicians should perform this work. Personnel performing these operations should wear appropriate protection, including eye and ear protection, during air bag deployment.
- If a two-stage air bag was previously deployed, there is no way to visually determine if both stages were activated. Always assume that a deployed, two-stage air bag still has an active stage two.
- Do not dispose of a live (undeployed or partially deployed) air bag through normal disposal channels until after it has been fully deployed.

Removing Live Air Bags

1. Disconnect cables from the vehicle's battery(ies).
2. Remove the trim cover to allow access to the mounting bolts.
3. Locate and disconnect the wiring harness leading to the air bag. Static electricity can deploy air bags; always disconnect wires before cutting them. For out-of-vehicle deployment, leave at least 4 inches of wire for splicing.
4. Remove the mounting bolts.
5. Carefully lift out the module. Disconnect the wires leading to the initiator.
6. Remove the inflator module.

Safe Handling of Live Air Bags

1. Handle all two-stage air bags as if both stages are live until deployment of both stages has been verified.
2. Do not carry an air bag module so that the bag or cover plate could strike your body or anyone else in the event of an unplanned deployment.
3. Always carry an air bag module securely with both hands.
4. Do not carry the assembly by the attached lead wires or connectors.
5. Do not store an air bag module on a surface with the cover facing down.
6. Do not place anything on top of an air bag module.
7. Keep air bag modules away from sources of heat such as space heaters, welders, fires, furnaces, etc.
8. Keep air bag modules away from water and other liquids.

Deploying Air Bags

Situations may arise that require the disposal of a live (undeployed or partially deployed) air bag. If the entire vehicle is to be scrapped, the air bag should be deployed within the vehicle. If the vehicle is to be used again, the air bag may be removed from the vehicle and then fully deployed outside of the vehicle following the recommended procedures.

Deployment Procedures

The following steps are general procedures for deploying air bags inside and outside of a vehicle. For more complete information on deploying the air bags in a specific vehicle, consult the vehicle manufacturer's service manual.

Caution – Before beginning either of the deployment procedures outlined below, disconnect and isolate the cables from the vehicle's battery(ies). Failure to perform this important preliminary step could result in unintended deployment and possible personal injury.

"In-Vehicle" Deployment (recommended procedure)

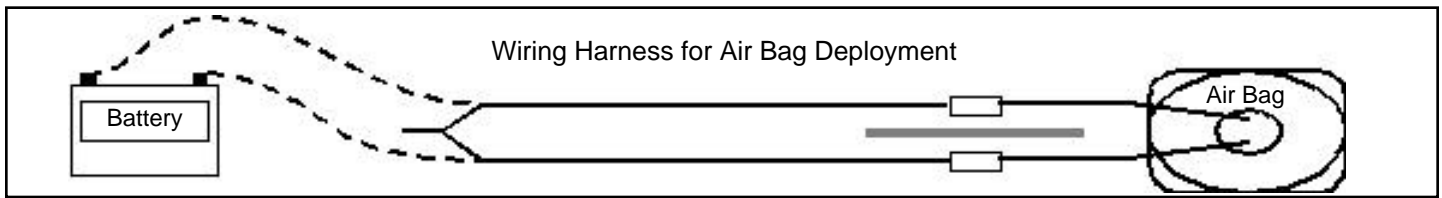
Whenever possible, full deployment of all air bags should take place in the vehicle prior to vehicle recycling and disposal.

1. Disconnect the cables from the vehicle's battery(ies).
2. Wait at least 20 minutes for the energy-reserve capacitor to discharge.
3. Make a jumper-wiring harness of two wires 30 feet or longer for remote deployment of the air bag. If the vehicle is equipped with two-stage air bags, additional harnesses will be required.
4. At one end of the harness, connect the two leads together to reduce the chance of unwanted deployment.
5. Locate and disconnect the wires leading to all air bags. Static electricity can deploy air bags; always disconnect wires before cutting.
6. Cut the wires leading to the air bags, leaving at least 4 inches to splice into the jumper.
7. Connect the ends of the jumper-wiring harness to the ends of the wires leading to the air bag modules. Alligator clips may be used. Use tape or other insulating material to make sure that the two leads do not make contact with each other. Both stages of a two-stage air bag may be deployed at the same time by twisting together the corresponding wires from each stage, or the two stages may be wired and deployed separately.
8. Make sure that all air bag modules are properly mounted and secure.
9. Clear all loose items from the path of the air bag's deployment (for example, clear the front seat for driver air bag deployment).
10. Notify all the people in the area that air bag deployment is about to occur, and move everyone at least 30 feet from the vehicle.
11. Separate the leads on the wiring harness (from step 4) and touch the leads to the terminals of a 12-volt automotive battery. Once the contact is made, air bag deployment will occur. Make certain that both stages of a two-stage air bag have deployed.
12. Leave the fully deployed air bag(s) in the vehicle, or remove for separate recycling.
13. Some air bag modules may be hot. Allow the air bag to cool and the dust to settle before approaching the vehicle. Keep water and other liquids away from the air bags. If powder from the air bag contacts the skin, wash with water.

"Out-of-Vehicle" Deployment (to be used only when in-vehicle deployment is not possible)

Caution – Never attempt "out of vehicle" deployment inside a building or with the air bag's trim cover facing down. Clear the area of all people within 30 feet of the air bag module before it is deployed. See "Removing Live Air Bags" and "Safe Handling of Air Bags," opposite.

1. Disconnect the cables from the vehicle's battery(ies).
2. Wait at least 20 minutes for the energy-reserve capacitor to discharge.
3. Make a jumper-wiring harness of two wires 30 feet or longer for remotely deploying the air bag. If the vehicle is equipped with two-stage air bags, additional harnesses will be required.
4. At one end of the harness, connect the two leads together to reduce the chance of unwanted deployment.
5. Disconnect and remove the air bag module from the vehicle. Static electricity can deploy air bags; always disconnect wires before cutting. Cut the wire between the air bag and the vehicle, leaving at least 4 inches of wire for splicing.
6. Connect the ends of the jumper-wiring harness to the ends of the wires leading to the air bag modules. Alligator clips may be used. Use tape or other insulating material to make sure that the two leads do not make contact with each other. Both stages of a two-stage air bag may be deployed at the same time by twisting together the corresponding wires from each stage, or the two stages may be wired and deployed separately.
7. Position the DRIVER AIR BAG on the ground in a clear, well ventilated area with the trim cover facing straight up, or use a deployment fixture specified by the manufacturer or the "Container Method Using Tires" (next page). OTHER AIR BAGS should be securely mounted: use the deployment fixture tool specified by the manufacturer or use the "Container Method Using Tires" (next page) to secure the air bags.
8. Notify all the people in the area that air bag deployment is about to occur, and move everyone at least 30 feet from the air bag module.
9. Disconnect the leads on the wiring harness (from step 4) and touch the leads to the terminals of a 12-volt automotive battery. Once the contact is made, air bag deployment will occur. Make certain that both stages of a two-stage air bag have deployed.
10. Wear gloves and protective clothing. Allow the module to cool before handling.
11. After the module is cool, it can be recycled or disposed of as metal scrap. Keep water and other liquids away from the air bags. If powder from the air bag contacts the skin, wash with water.



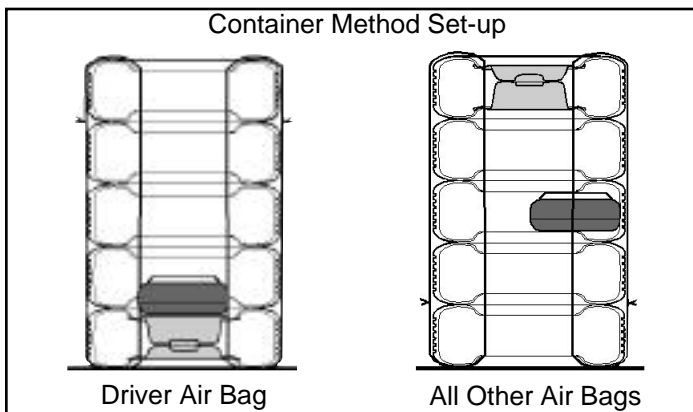
Container Method Using Tires for Out-of-Vehicle Deployment

Requirements (all tires must be the same size):

- 1 tire with wheel
- 4 or more tires without wheels
- Wire or other material to securely tie the stacked tires together.

Stack the tires as directed:

- Place the one tire with wheel on the bottom.
- Stack four or more tires without wheels on top of first tire.
- Securely tie all of the tires together.



Driver air bag:

Place the secured stack of tires upright with the wheel on the bottom. With the trim cover facing straight up, place the driver air bag on the wheel in the tire on the bottom of the securely tied stack of tires. (See illustration.)

All other air bags:

Tip the stack on its side and place the air bag inside one of the tires, making sure that there will be at least two tires beneath the tire containing the air bag and at least two tires (including the tire with wheel) above the tire containing the air bag. (See illustration.)

Place the tire stack upright, with the wheel on top.

Deployment:

Proceed as directed for "Out of Vehicle" Deployment on the previous page.

Special Situations

Seat belt systems:

Seat belt pretensioners and emergency tensioning retractors (ETRs) are present in some vehicles. These systems use initiators and gas generators to reduce seat belt slack in a collision.

- Seat belt pretensioner: hold by the round tube with the open end pointing down and the buckle directed away from you.
- ETR: hold by gripping the end caps or side of the retractor.

Follow the guidelines for air bag deployment, or consult the vehicle manufacturer's service manual.

Air bags operating on alternating current (AC):

Some vehicles are equipped with air bag systems that operate on alternating current. These air bags will not deploy when connected to an automobile battery as described in the Deployment Procedures. Vehicles equipped with AC air bag systems include the Ford Focus, all model years. Refer to the appropriate vehicle manufacturer's service manual for air bag deployment procedures for these systems.

Impact-fired air bag systems:

Some vehicles contain air bag systems that use an impact-activated firing mechanism. The deployment procedures outlined previously will not work for these systems. Vehicles equipped with impact-fired air bag systems include the 1995 and 1996 Jeep Cherokees, 1993 and 1994 Jaguar XJ6, and 1990-1996 Jaguar XJS. Refer to the appropriate vehicle manufacturer's service manual for air bag deployment procedures for these systems.

Customer Service numbers

The following is a list of customer service numbers for the major automobile manufacturers:

DaimlerChrysler	800-334-9200
Ford Motor Company	800-521-4140
Ford Motor Company(Canada)	800-565-3673
General Motors	800-268-6800
Honda	800-880-1072
Mazda	800-222-5500
Mitsubishi	800-222-0037
Nissan	800-647-7261
Saab	800-582-7222
Toyota	800-331-4331
Volkswagen	800-822-8987

Refer to www.aorc.org for information from safety-device manufacturers.

National Highway
Traffic Safety Administration

800-424-9393



www.uscar.org

1000 Town Center, Suite 300
Southfield, Michigan 48075

Originator: USCAR
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