EVRAZ

General Procedure for Removing Mercury Switches from Vehicles

Responsibilities of Auto Crushers/Recyclers

- Inspect all vehicles and remove any mercury switches prior to delivery to our facility
- Spray paint the letters "mfr" or "mf" on all vehicle hulks to identify that the vehicles are mercury-free.
- Bring mercury switches and deposit them gently in the containers provided at our facility.

Introduction

Mercury switches have been used in the automotive industry in various switching applications. They are very commonly used for the underhood light and trunk light fixtures. More recently these switches are also used in anti-lock brake system (ABS). In addition to switches, mercury may also be found in HID headlamps, instrument panels, navigational displays and family entertainment systems.

According to the Society of Automotive Engineers, mercury-containing switches account for more than 99% of mercury used in automobiles, with each switch containing approximately 0.8 – 1.0 grams (0.03 oz) of mercury.

Mercury is a highly toxic substance – only one gram (the amount in one mercury switch) can contaminate a 20-acre lake for one year to the point where fish cannot be eaten. Hg is the scientific symbol for mercury and is the abbreviation for the Latin *Hydrargyrum*.

All auto hulks and/or vehicles arriving at our facility must have the word "mfr" or "mf" painted on the bodies to identify that mercury switches have been removed and/or they are mercury-free.

Mercury Switches in Vehicles

1) Basically, all vehicles made prior to 1995 and all North American vehicles made up to and including 2003 will have and must be checked for mercury switches under the hood lid and/or in trunk convenience lighting assemblies and anti-lock brake systems (ABS).

2) Removal of a lighting fixture takes only a few seconds, and can be done at the same time as the removal of other fluids and wastes. Removal of ABS sensors will take more time.

3) A hood and/or trunk convenience light fixture is made up of the following components: two wires, a housing containing a capsule, a capsule/switch containing a drop of liquid mercury, a light bulb and a fastener. The fastener secures the housing to the hood and/or trunk.

4) Depending on the make of the vehicle, an ABS sensor may contain either two or three 1-gram mercury switch capsules embedded in a solid plastic component. The sensor is either bolted (usually two bolts) to the interior floor of the vehicle or to the frame on the underside of the vehicle. The sensor is connected to a wiring harness.

5) The capsules are the switches and the capsule shells are usually made of steel. (Some capsules in lighting fixtures from Volvo and Audi are made of glass.) Within a capsule are two contact points and a drop (1 gram) of liquid mercury. When a hood or trunk is opened, the housing/capsule is tilted and the mercury within the capsule completes the electrical circuit by submerging the two contact points in a continuous pool of mercury, allowing the electricity to travel to and illuminate the bulb.

   Similar logics are employed in the ABS sensors.

6) Mercury containing components should be removed from scrapped vehicles prior to crushing or shredding in order to recover the mercury and eliminate potential mercury release to the environment.

Locating and Removing Light Fixtures Containing Mercury Switches

1) In most vehicles, the convenience lighting fixtures are located on the inner panels of hood lids and/or trunks. The mercury switches/capsules themselves may be in the bases of the lighting fixtures or along the wiring harnesses leading to points where the harnesses flex.

2) The drop of mercury is usually hermetically contained in a sealed steel capsule, so there is no risk of breakage from removal of the light fixtures from vehicles or removal of the capsules/switches from the housing assemblies. The mercury is contained in a sealed, metal capsule. EXCEPTION: Volvos and Audis have glass capsule switches; therefore proper care must be taken not to break the glass and thereby release the mercury.

3) Locate the small mercury lighting fixture and cut the one or two wire harness leading to the device. Remove any fasteners required to separate the fixtures from vehicles. Remove any lenses or bulbs as necessary. Repeat the process for each mercury- containing light fixture or switch in the vehicle.

Locating and Removing Anti Lock Sensors Containing Mercury Switches

1) Depending on the make of the vehicle, an ABS sensor/module may contain one to three 1-gram mercury switch capsules embedded in a plastic component. The sensor is either bolted (usually two bolts) to the interior floor of the vehicle or to the frame on the underside of the vehicle. The sensor is connected to a wiring harness.

2) Consult the owner's manual and locate the sensor. If it is located inside the vehicle, remove the seat and carpet to access the sensor.

3) Release the clips to disconnect wiring harness.

4) Remove the bolts to release the sensor.

Disassembly of Mercury Switches

Removing the capsule/switch from the light fixture housing reduces the amount of space required for storage prior to transport to a recycling facility. Mercury capsules may be removed from the light fixture housing as follows:

1) Remove capsules from the housings only at a properly designed workstation. Proper workstation design requires a secondary containment bowl or container made of heavy plastic in a well-lit and vented area.

2) Exercise caution when cutting any electrical leads emanating from the housing in order to avoid rupturing the capsule.

3) Inspect the capsule housing to determine the manner in which it was constructed. Locate a snap latch, clip, mechanical stake, etc., which when removed will allow disassembly. If disassembly is not straight forward, then recycle the entire assembly.

4) Remove or open the snap latch, clip, mechanical stake, etc., using hand tools and open the housings to expose the mercury capsule. Mercury capsules are generally metal (glass in Volvos and Audis) and are cylindrical or bullet shaped.

Storage of Recovered Mercury Switches

1) Mercury is a hazardous material – adhere to proper procedures for storage.

2) You may store mercury light fixtures in a 205L steel drum lined with a layer of vermiculite and away from the general work area in a dry, cool, well-ventilated place.

3) For mercury capsules/switches, the container should be made of a high-density plastic and should be stored away from the general work area in a cool, dry and well-ventilated area.

4) The container holding the mercury light fixtures or capsules/switches must be clearly labeled according to the Transportation of Dangerous Goods Regulations.

Disposal of Recovered Mercury Switches

1) Mercury is a hazardous material – adhere to proper procedures for transport. Licensed waste haulers are required.

2) Mercury light fixtures and/or capsules must be securely packaged in such a way that they will not be damaged or ruptured during transport.

Responsibilities of Auto Crushers/Recyclers

1) Inspect all vehicles and remove any mercury switches from all vehicles prior to delivery to our facility.

2) Spray paint the letters “mfr” or “mf” on all vehicle hulks to identify that the vehicles are mercury-free.

3) Bring mercury switches and deposit them gently in the containers provided at our facility.

Responsibilities of Our Company

1) Supply auto crushers/recyclers with the following:
   - Containers at its facility for auto crushers/recyclers to deposit the mercury switches.
   - Written materials on locations (may not be possible due to the fact that most of the mercury switches were optional packages and thus are not necessarily found in vehicles of the same make and year) and procedures for removal of lighting fixtures.

2) Issue receipts to auto crushers/recyclers who bring in and deposit mercury switches in the container provided.

3) Work with the responsible regulatory agencies to ensure that all procedures and collection infrastructures follow pertinent waste and transportation regulations.

4) Dispose of mercury switches/lighting fixtures/ABS sensors through proper channels according to pertinent waste and transportation regulations.

5) Be available to answer questions.

Mercury switches under hoods, in trunks, in interior and in ABS


98 Ford F-150 XL hood

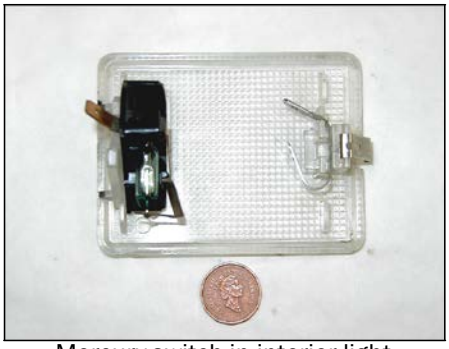

Mercury switch under hood


Mercury switch under hood


Mercury switch under hood

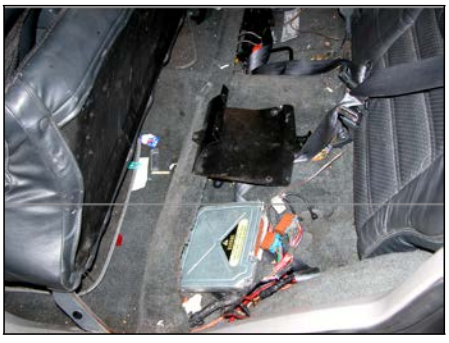

94 Chrysler Intrepid Trunk

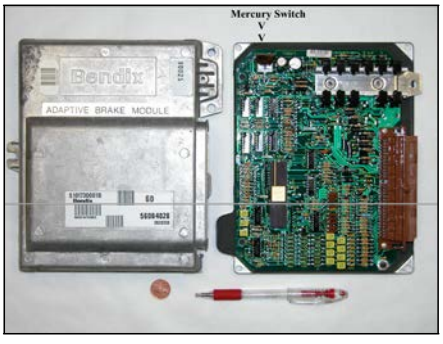
Mercury switch in trunk


Mercury switch in interior light

Mercury-containing ABS switch located on the chassis on the underside of Ford Explorer

Mercury-containing ABS switches


1990 Jeep Cherokee mercury-containing Adaptive Brake Module located under the back seat



1990 Jeep Cherokee mercury-containing Adaptive Brake Module


Mercury switches from vehicles

Mercury Switches from Vehicles

Mercury switches may be found in hood and trunk convenient lights, in interior lights, and in certain anti-lock brake systems

Identification

Acceptable: Each and every vehicle must be labeled with your specific customer number and marked "mfr" or "mf"– mercury-free–prior to delivery to the facility.