

# ELVS end of life vehicle solutions

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Farmington Hills, MI. 48333-3292

September 25, 2006

Ms. Theresa Stiner  
Planning, Permitting, and Engineering Section  
Iowa Department of Natural Resources  
Wallace Building, 502 East 9<sup>th</sup> Street  
Des Moines, Iowa 50219-0034

Dear Ms. Stiner:

The Mercury Minimization Plan presented here represents the efforts of the End of Life Vehicle Solutions Corporation (ELVS) to satisfy the requirements of Chapter 455B.801 - 809, requiring the removal of mercury switches from end-of-life vehicles. Members of the End-Of-Life Vehicle Solutions Corporation (ELVS) are BMW of North America, LLC; DaimlerChrysler Corporation; Ford Motor Company; General Motors Corporation; International Truck & Engine; Mack Trucks, Inc; Mitsubishi Motors North America, Inc.; Nissan North America, Inc.; Subaru of America, Inc.; Volkswagen of America, Inc.; and Volvo Trucks North America. This plan will be made available to the general public via the ELVS' website, [www.elvsolutions.org](http://www.elvsolutions.org) and also will be provided to the IDNR electronically for publishing on the IDNR website.

Division 1 Sec. 4 NEW SECTION 455B.803 requires automobile manufacturers to submit a mercury-added vehicle switch recovery program to the Commissioner of the Iowa Department of Natural Resources for review and approval no later than September 28, 2006. ELVS' mercury switch recovery program is as follows:

The specific requirements detailed in Division 1, Sec. 4.1 through 4.4 of the File will be met through the following Plan components:

1. *The manufacturer shall implement a system to remove, collect, and recover mercury added switches from end of life vehicles within 90 days of publication of this plan.*
  - a. Mercury Collection and Storage: Upon receipt of a list of Iowa vehicle recyclers and scrap recycling facilities identified by the Department, buckets and collection materials will be promptly sent to all facilities on the list. Mercury switches will be stored at the vehicle recyclers and scrap recycling facilities as Universal Waste. The container will include a Universal Waste label. The vehicle recycler or scrap recycling facility is to indicate on the label the date when the first mercury switch is placed in the container ("start date"). Specific instruction will indicate that containers may not be stored on or used at the location beyond one year from the start date indicated by the vehicle recycler or scrap recycling facility. Mercury switches will be stored and shipped in a 3.5 gallon container (other container sizes may be used as well) with a sufficiently tight, sealable lid. The containers will be designed to meet the shipping requirements of the Department of Transportation (DOT), the contracted recycler and the carrier selected to transport mercury switches to the recycling facility. ELVS will provide these storage containers at no cost to the program participants. Individual vehicle recyclers are to remove automotive mercury switches as per the educational materials provided.

- b. Transportation: A recycler whose container is nearly full of mercury switches or who has a container with a retention period that is about to expire under universal waste rules will notify the ELVS contractor. The ELVS contractor will ship an empty container to the recycler as well as provide for the transportation of the full container.
  - c. Mercury Recovery/Recycling: The ELVS contractor will be responsible for the recovery, recycling and or disposal of mercury collected from automotive mercury switches. All mercury switches will be recycled. In the rare case when the mercury from a switch cannot be recycled the entire assembly will be properly disposed as a hazardous material.
2. *Educational materials about the program to inform the public and stakeholders about the purpose of the collection program and how to participate in the program.*

Education Program: The following education and training materials, which include information on mercury hazards and handling, will be included with the shipment of collection materials to vehicle recyclers and scrap recycling facilities. A multi-media approach for education and training of the safe and environmentally sound removal of mercury switches from end-of-life vehicles is recommended, including:

- a. A cover letter introducing the program and thanking recyclers and scrap facilities for participating in the program.
  - b. A brochure (attached) that identifies why mercury switches should be removed, where they can be found in automobiles, how to properly collect and manage them, and how to contact the administrators of the program should questions arise.
  - c. A DVD (enclosed) that provides an overview of automotive mercury collection, and methods of mercury switch removal.
  - d. A website ([www.elvsolutions.org](http://www.elvsolutions.org)) that provides an overview and the specifics of the Iowa Program and links to other related sites.
  - e. Detailed instructions (attached) for shipping the collection containers for recycling of the switches.
  - f. A list (attached) of vehicles that may contain mercury convenience light switches and a list of ABS G-Force sensors including removal instructions.
  - g. Additionally, ELVS will make these materials available to IDNR for use in any education or outreach programs they may conduct.
3. *A method for implementing, operating, maintaining and monitoring the system.*

ELVS will:

- a. Contract with a qualified waste manager who will perform the day-to-day operations, maintain all appropriate records. These records will be maintained in a database and made available to the agency upon request. ELVS' present contractor for this program is The Environmental Quality Company (EQ). The point of contact for Iowa recyclers is Judie Zaborowski (734/547-2511).
- b. Submit the Mercury Minimization Plan to IDNR.
- c. Receive the list of vehicle recyclers and scrap recycling facilities from IDNR.
- d. Verify that the recyclers identified by IDNR are operational businesses and collect current contact information.
- e. Ship the collection containers and educational materials to the vehicle recycler.
- f. Include additional vehicle and scrap recyclers in the program as they are identified throughout program implementation, a collection bucket and educational materials will be sent to them as well. Recyclers can also self-elect participation through the website or by contacting our contractor.
- g. Monitor the progress of the system by reviewing, independently and in conjunction with IDNR, the number of participants, the amount of mercury collected, and providing reports as required.

4. *Information about mercury added switches identifying potential make, model, model year, location of switch, and removal method.*

See Section 2 Education Program above.

5. *A method to arrange and pay for the transportation, and recycling of collected mercury added switches*

Program Costs

- a. All program costs related to the collection, transportation and recycling of automotive mercury switches from automakers which are members of ELVS will be paid by ELVS.
- b. All bounty payments due to automobile recyclers for switches from automakers which are members of ELVS will be paid by ELVS through their designated contractor.

Bounty Payments

Upon verification of properly recorded Vehicle Identification Numbers (VINS) ELVS will authorize a payment of \$5.00 per switch collected. Switches which cannot be directly linked to eligible vehicles, i.e. from vehicles with invalid or incomplete VINs, with VINs from vehicles which are known not to contain mercury switches, and with VINs from automobile manufacturers who are not members of ELVS will not be paid.

6. *A method to track participation, confirm participation in the program, and publish the progress of the mercury added switch collection.*

ELVS will, through its contractor, track the following performance measures:

- a. The number of participating vehicle recyclers and scrap recycling facilities, including their contact information.
  - b. When collection containers are received at the ELVS contractor by each participant.
  - c. The number of mercury switches submitted by each participant.
  - d. The total number of mercury switches collected from dismantlers in Iowa.
  - e. The amount of mercury recovered.
7. *A description of additional or alternate actions that shall be implemented by the manufacturer to improve the system and its operation in the event that the target is not met.*

Additional/Alternate Plans if Target Capture Rate is not Achieved:

If the 90% capture rate is not achieved:

- a. ELVS will work with the IDNR to improve the estimate of the number of switches available for recovery which may be the cause for inflated expectations of the number of switches expected.
  - b. INDR will examine the list of participants and initiate site visits for automobile recyclers who are thought to be underperforming or not participating in the mercury switch recovery program.
  - c. INDR may choose to initiate enforcement actions against suppliers not participating in the mercury switch recovery program under the requirements of Section 5 of the statute.
8. Orphan Switches: Orphan switches, i.e. switches from invalid or incomplete VINs, switches with VINs from vehicles which are known not to contain mercury switches, and switches with VINs from automobile manufacturers who are not members of ELVS, will be recycled however no bounty will be paid.

Respectfully submitted,

  
Mary J. Bills

## **COLLECTION AND NO COST SHIPPING PROCEDURES FOR MERCURY SWITCHES**

*Note: Please make sure you are handling the switches in accordance with your state's waste handling requirements. These requirements are available from your state's environmental quality department and at the End of Life Vehicle Solutions Web site at [www.elvsolutions.org](http://www.elvsolutions.org).*

In order to participate in this program, please use the following procedure:

- Immediately attach the Universal Waste label to the outside of the bucket and record the date you started accumulating switches. Please be sure not to exceed your state's time limit for the retention of mercury switches under their Universal Waste rule.
- Keep the lid on the bucket and store the bucket out of the weather. If possible, place the bucket in a locked cabinet. If your bucket arrived in a box, please be sure to keep the box for the return shipment.
- **Please do not exceed 450 automotive mercury switches per bucket.**
- Once the bucket is full, or if you have met the 450 switch count or your state's retention deadline, tightly seal the container. **Place the bucket in a cardboard box for shipping.**
- **To conform to federal and state laws, no free mercury, no switches that are broken or corroded enough to leak in transport, or any other hazardous materials, should be placed in the bucket before shipment.**
- If glass switches are removed from assemblies, please separate them from the metal switches by putting them in a plastic ziplock bag or disposable plastic food storage container along with a protected packing material (sawdust, cat litter, bubble wrap). Place the bag or container on top of the metal switches in the bucket when you are ready to return.
- All buckets must be sealed in a cardboard box and shipped **UPS GROUND** to ELVS contractor:

EQ Industrial Services Inc.  
Attention Judie Zaborowski  
2701 North I-94 Service Drive  
Ypsilanti, MI 48198  
(734)547-2511 (direct line)  
(800) 839-3975 (toll free-ask for Judie)

- To schedule your UPS pickup, visit UPS on the web at [www.ups.com](http://www.ups.com) to order a shipping label. You will need the above contact & address information, the approximate weight of the bucket, the dimensions of the box (15x15x15), and the freight collect account number **R58V16** (which is associated with the company name and address above). UPS will provide you with a shipment pick-up date. ***If you do not have web access, please call Judie Zaborowski to schedule your pick-up***
- Should you have any questions regarding the return shipment instructions, please contact Judie Zaborowski at 734/547-2511.

NEED A REPLACEMENT BUCKET —Contact Judie Zaborowski at 734/547-2511

**(Please allow 5-7 days for the arrival of a new bucket and shipping box)**

## VEHICLES CONTAINING MERCURY CONVENIENCE SWITCHES

MAKE / MODEL		MODEL YEAR	SWITCH LOCATION	
<b>AUDI</b> Audi				
Audi 100		1977-1988	✓ Hood	Trunk
Audi 200		1980-1988	✓ Hood	Trunk
<b>DAIMLERCHRYSLER</b> Dodge, Chrysler, Jeep, Plymouth, Eagle				
All		1998 and prior	✓ Hood	✓ Trunk
<b>FORD</b> Ford, Lincoln, Mercury, Mazda, Merkur, Volvo				
Ford Mustang		2000 and prior	✓ Hood	✓ Trunk
Ford Crown Victoria		2000 and prior	✓ Hood	✓ Trunk
Mercury Grand Marquis		2000 and prior	✓ Hood	✓ Trunk
Lincoln Town Car		2000 and prior	✓ Hood	✓ Trunk
Ford, Lincoln, Mercury, and Merkur Cars		1996 and prior	✓ Hood	✓ Trunk
Ford, Lincoln, and Mercury Trucks, SUV's, and Vans		2001 and prior	✓ Hood	Trunk
* Excludes: 1999 and newer model year Ford Ecoline, Ford Windstar, Ford Ranger, and Mercury Villager				
Mazda Navajo		1993-1997	✓ Hood	Trunk
Mazda B-Series Pick-Up		1995-1999	✓ Hood	Trunk
* Ranger/B-Series phased out of mercury switches with 1999 model year.				
Volvo		1991 and prior	✓ Hood	Trunk
* Volvo convenience switches may contain glass mercury capsules. Use care when removing convenience switches from these vehicles.				
<b>GENERAL MOTORS</b> Chevrolet, GMC, Cadillac, Buick, Oldsmobile, Pontiac, Saturn, Saab				
All Vehicles		1999 and prior	✓ Hood	✓ Trunk
* Excludes: 1999 model year Chevrolet Astro, Chevrolet Silverado, GMC Safari, GMC Sierra				
Cadillac Escalade		2000	✓ Hood	Trunk
Chevrolet Blazer		2000, 2001, 2002	✓ Hood	Trunk
Chevrolet Cavalier		2000, 2001	Hood	✓ Trunk
Chevrolet Corvette		2000	✓ Hood	Trunk
Chevrolet Express		2000, 2001, 2002	✓ Hood	Trunk
Chevrolet S-10 Crew cab		2002	✓ Hood	Trunk
GMC Denali		2000	✓ Hood	Trunk
GMC Envoy		2000, 2001	✓ Hood	Trunk
GMC Jimmy		2000, 2001	✓ Hood	Trunk
GMC Savana		2000, 2001, 2002	✓ Hood	Trunk
GMC Sonoma Crew cab		2002	✓ Hood	Trunk
Luxury G-Van		2001, 2002	✓ Hood	Trunk
Oldsmobile Bravada		2000, 2001, 2002	✓ Hood	Trunk
Pontiac Sunfire		2000, 2001	Hood	✓ Trunk

- **BMW, MITSUBISHI, NISSAN, SUBARU**, and **VOLKSWAGEN** vehicles DO NOT contain mercury convenience switches.
- Vehicles manufactured 2003 Model Year and beyond DO NOT contain mercury convenience switches.
- Vehicles without trunks including SUVs, station wagons, and hatchbacks DO NOT contain a mercury convenience switch in the "Trunk" or rear of the vehicle.

## MERCURY ABS G-FORCE SENSORS

Check the following vehicles for mercury ABS G-Force Sensors.

### **Audi**

1987-1993	Audi 80/90
1987-1993	Audi 100/Avant
1989-1995	Audi V8
1987-1991	Audi 200
1987-1992	Audi Coupe quattro

### **DaimlerChrysler**

1992-1996	4WD Dodge Stealth
1992-2001	Jeep Cherokee
1992-2001	Jeep Grand Cherokee
1992-2003	Jeep Wrangler

### **Ford Motor Company/Mercury/ Mazda**

1993-97	Ford Bronco
1993-2002	Ford Explorer & Mazda Navajo
1995-2001	4x4 Ford Ranger & Mazda B-Series Pick-Up
1997-2002	AWD Mercury Mountaineer

### **Mitsubishi**

1991-1994	3000 GT 4WD
1990-1992	Galant 4WD
1991-1993	Expo 4WD
1991-1993	Expo LVR 4WD
1991-1993	Eclipse 4WD

### **Nissan**

1996	Pathfinder 4x4
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### **Subaru**

1990-1995	Subaru Legacy with 5MT AWD
1993-1996	Subaru Impreza with 5MT AWD

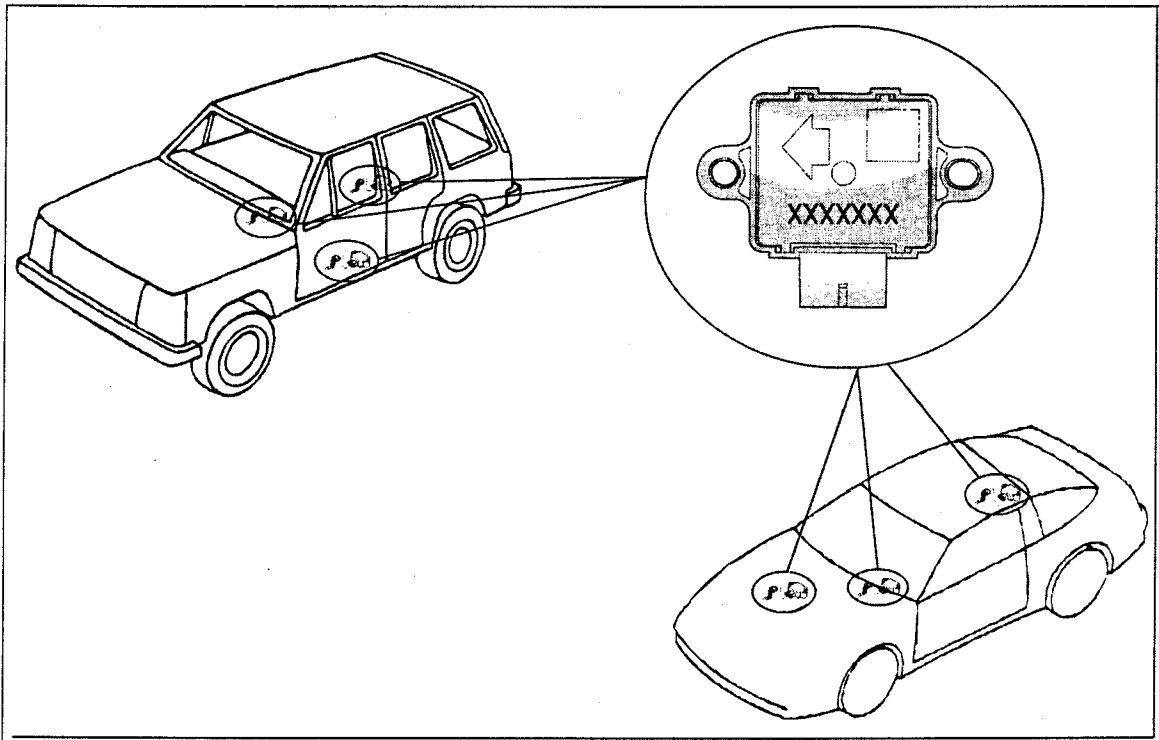
## ABS G-Force Sensor Removal Procedure

### Description:

The ABS G-Force Sensor contains either two or three mercury switch capsules embedded in the assembly.

### General Procedure for removing ABS G-Force Sensor:

1. Confirm vehicle is equipped with ABS.
2. Disconnect the battery.
3. Locate the ABS G-Force sensor on the vehicle (varies on different vehicles).
4. Remove the sensor.
5. Collect and recycle the sensor with care. NOTE: Please do not attempt to remove the pellets from the sensor.



The locations where the ABS G-Force Sensor is commonly found are on the drive tunnel, below the rear seat on the floor pan, on the right front wheel apron, rear seat center, and on the left frame rail, right below the driver.

## ABS G-Force Sensor Removal Procedure

### AUDI

#### **Removal Procedure for 1987-1993 Audi 80/90, 1987-1993 Audi 100/Avant, 1989-1995 Audi V8, 1987-1991 Audi 200, 1987-1992 Audi Coupe Quattro**

1. Remove rear seat bottom and locate ABS Sensor mounted in the middle under seat on seat support.
2. Disconnect wire harness connector from switch mounting hardware,
3. Remove securing nuts

### **BMW (no removal procedures)**

### DAIMLERCHRYLSER

#### **Removal Procedure for 1992-96 4WD Dodge Stealth:**

1. Locate the ABS G-Force Sensor under the center floor console.
2. Remove center floor console.
3. Disconnect the harness connector.
4. Remove the two bolts to release the sensor.

#### **Removal Procedure for 1992-2001 Jeep Cherokee:**

1. Fold the rear seat assembly forward for access to the sensor.
2. Locate the ABS G-Force Sensor.
3. Disconnect the harness connector.
4. Remove the two bolts to release the sensor.

#### **Removal Procedure for 1993-2001 Jeep Grand Cherokee:**

1. Fold the rear seat assembly forward and roll back the carpeting to gain access to the sensor.
2. Locate the ABS G-Force Sensor.
3. Disconnect the harness connector.
4. Remove the two bolts to release the sensor.

#### **Removal Procedure for 1992-2003 Jeep Wrangler:**

1. From the driver's side, lift carpet back in front of console/shifter.
2. Locate the ABS G-Force Sensor in front of the console/shifter mounted to a bracket on the floor pan.
3. Disconnect the harness connector.
4. Remove the two bolts to release the sensor.



## ABS G-Force Sensor Removal Procedure

### **FORD/ MAZDA/ MERCURY**

**Removal Procedure for 1993-97 Ford Bronco/1993-2002 Ford Explorer & Mazda Navajo/1995-2001 4x4 Ford Ranger & Mazda B-Series Pick-Up/1997-2002 AWD Mercury Mountaineer:**

1. Raise and support the vehicle.
2. Locate the ABS G-Force Sensor on the left frame rail, right below the driver.
3. Remove the two nuts.
4. Unclip the fuel filter from the vehicle frame (on some models).
5. Disconnect the harness connector.
6. Remove ABS G-Force Sensor.

**GENERAL MOTORS (has no models with Hg ABS G-sensors)**

### **MITSUBISHI**

**Removal Procedure for 1990 Galant 4WD; 1991 3000GT 4WD, Expo 4WD/Expo LVR 4WD, Eclipse 4WD, Galant 4WD; 1992 3000GT 4WD, Expo 4WD/Expo LVR 4WD, Eclipse 4WD, Galant 4WD; 1993 3000 GT 4WD, Expo4WD/Expo LVR 4WD, 1994 3000 GT 4WD**

***1995 Model Year and beyond DO NOT contain mercury ABS switch assemblies***

1. Locate the ABS G-Force Sensor under the center floor console.
2. Remove center floor console.
3. Disconnect the harness connector.
4. Remove the two bolts to release the sensor.

### **NISSAN**

**Removal Procedure 1996 Nissan Pathfinder 4X4:**

1. Locate the ABS G-Force Sensor under the center floor console.
2. Remove center floor console.
3. Disconnect the harness connector.
4. Remove the two bolts to release the sensor.

## ABS G-Force Sensor Removal Procedure

### **SUBARU**

**Removal Procedure for 1990-1995 Subaru Legacy with 5MT AWD, 1993-1996 Subaru Impreza with 5MT AWD:**

1. Locate the ABS G-sensor switch on the right front wheel apron.
2. Disconnect the wire harness connector from the switch and mounting hardware (two screws).

**VOLKSWAGEN (has no models with Hg ABS G-sensors)**