



**Mercury Switch Removal from Motor
Vehicles in Maine**

Fourth Annual Report

**Maine Department of Environmental Protection
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I. Introduction

This is the fourth annual report on the effectiveness of the mercury switch removal program established under Title 38, section 1665-A of the Maine Revised Statutes Annotated [38 MRSA §1665-A]. A copy of the law is attached as Appendix A.

Section 1665-A requires mercury switches to be removed from motor vehicles before they are crushed and shredded for the scrap metals market. The purpose of this requirement is to reduce mercury emissions from steel mills that use automobile scrap. If the switches are not removed, the mercury is vaporized and released to the air when the scrap metal is melted in furnaces to make new steel.

The most significant historic use of mercury in motor vehicles was in tilt switches used to operate convenience lighting in the engine or luggage compartments. Motor vehicle manufacturers ended their use of mercury switches in new motor vehicles beginning with model year 2003. Many older vehicles still have these switches, and they remain a potential source of mercury emissions when the vehicles are scrapped.

Under section 1665-A, responsibility for removal and recycling of mercury switches is shared as follows:

- Yard operators, auto dismantlers and others in the business of processing end-of-life vehicles (ELVs) must remove the switches and deliver them with a signed log sheet to a participating consolidation facility¹;
- Motor vehicle manufacturers must establish the consolidation facilities to accept delivery of switches from ELV handlers, pay a bounty of at least \$4 for each switch delivered together with the vehicle identification number (VIN) of the vehicle from which the switch was removed and arrange for the switches to be recycled; and
- The Department of Environmental Protection (DEP) must provide guidance on the removal and proper handling of the switches.

The DEP also is required to file this annual status report with the Mercury Products Advisory Committee (MPAC). The MPAC ceased to exist August 1, 2006 when the section establishing the committee, 38 MRSA § 1670, was repealed. The DEP has proposed a statutory change to redirect this reporting requirement to the joint standing committee of the Legislature having jurisdiction over natural resource matters.

¹ The term "consolidation facility" as used in the Maine Hazardous Waste Management Rules means a facility where mercury switches or other "universal wastes" are collected and temporarily stored while awaiting shipment to a recycling, treatment or disposal facility. See rules of the Department of Environmental Protection, Chapter 850(3)(A)(13)(a).

II. Number of switches collected

In past reports, the DEP consulted with the Clean Car Campaign (herein "CCC")² and the Alliance for Automobile Manufacturers (herein "Alliance")³ to estimate the number of switches available for removal per calendar year. These estimates have been updated by both the CCC and Alliance in the past year. In August 2006, an agreement on a national voluntary program to collect mercury switches from automobiles was reached between several environmental groups, vehicle dismantlers, vehicle shredders, steelmakers, states, the auto industry and the U. S. Environmental Protection Agency (EPA). As part of National Vehicle Mercury Switch Removal Program (NVMSRP) agreement, the CCC and the End of Life Vehicle Solutions Corporation (ELVS) are working to better define a single data set of number of switches that are available for removal. Those numbers are not yet available. Using the most recent estimates provided to the DEP by the CCC and ELVS to calculate a percent recovery rate, the estimated number of mercury vehicle switches expected from Maine dismantling operations are as follows:

Estimated number of mercury switches in motor vehicles dismantled in Maine

Calendar Year	Clean Car Campaign	ELVS ⁴
2003	29,230	25,701
2004	28,592	24,066
2005	28,100	22,431
2006	27,505	19,664
2007	26,655	17,641
2008	25,670	15,716
2009	24,143	13,756
2010	22,635	13,694
2011	21,085	12,014
2012	19,593	10,439
2013	18,159	8,949
2014	15,605	7,596
2015	15,062	5,210
2016	13,381	4,213
2017	11,683	3,397

² The Clean Car Campaign is a national campaign promoting the development and sale of motor vehicles that meet a high standard of environmental performance. The campaign is coordinated by environmental organizations including the American Council for an Energy Efficient Economy, Ecology Center, Environmental Defense, Great Lakes United and the Union of Concerned Scientists. The campaign website is: <http://www.cleancarcampaign.org>.

³ The Alliance of Automobile Manufacturers is a trade association of motor vehicle manufacturers including BMW Group, DaimlerChrysler, Ford Motor Company, General Motors, Mazda, Mitsubishi Motors, Porsche, Toyota and Volkswagen. The Alliance's website is: <http://www.autoalliance.org>.

⁴ ELVS was created by vehicle manufacturers to jointly manage end-of-life mercury switch collection. The auto manufacturers' model only estimates convenience light switch populations and not ABS G-sensors. It is estimated that over time ABS G-sensors will result in an additional 10% more switches available for removal.

The downward trend in the number of switches available for collection reflects the fact that the auto industry's usage of mercury switches declined steadily after 1989 and ended altogether with model year 2003. Accordingly, the number of switches available for collection in future years also can be expected to steadily decline as older vehicles disappear from the fleet.

Alliance manufacturers report that their in-state agent, Wesco Distribution, Inc. (herein "Wesco"), took delivery of the following number of switches since the program began:

Year:	2003	2004	2005	2006	Total to date:
Number of switches collected ¹ :	1613	3831	4520	17746	27710
Pounds of mercury collected ² :	4	8	10	39	61
% of estimated switches available:	5 to 6%	13 to 16%	16 to 20%	65 to 90%	24 to 30%

1. The data used includes all Alliance member motor vehicle makes of automobiles and light trucks.
2. Using an average of one gram per switch.

Subaru is not an Alliance member and they have filed an independent plan for recycling their very limited use of ABS G-sensors with mercury switches. To date, Subaru has reported that their in-state agent, Wesco, received no switches, most likely due to the fact that the model years of use, 1990 to 1995 depending on make and model, are still on the road.

Separate switch collection plans also were filed by the Truck Manufacturers Association (TMA) and the Recreational Vehicle Industry Association (RVIA). The TMA plan targets medium and heavy duty trucks that used mercury switches in idle controls and some luggage compartment convenience lights; the RVIA plan targets mercury switches in motor homes and other recreational vehicles that used mercury switches in gas ovens, satellite equipment, automatic leveling jacks and some convenience light switches. To date, TMA's in-state agent, White & Bradstreet Inc of Augusta, has collected 55 and RVIA's in-state agent, Wesco, has received no switches from RVIA members. Because of the limited number of medium and heavy duty trucks and recreational vehicles that are dismantled in Maine, the low number of switches turned in over the four year period was expected.

III. Bounty payments

Wesco accepts delivery of mercury switches at facilities in Bangor and Portland. It is the responsibility of those removing the switches to transport them to one of these two locations. Wesco will accept the switches with or without the "vehicle identification number" (VIN)⁵ from the source vehicle, but will not pay the switch bounty unless VINs are provided.

⁵ Motor vehicle manufacturers began stamping each vehicle with a unique identification number in the 1950's. The practice became standardized in 1981 when the U.S. Department of Transportation required all vehicles to have a 17 character VIN. Each character or digit conveys specific information. The second and third digits specify the manufacturer, e.g. Ford (F), General Motors (G), and Honda (H). The VIN can be obtained from vehicle documents

The switch bounty, set at \$1 when section 1665-A was enacted in 2002, was increased effective September 17, 2005 to more fairly compensate ELV handlers for the cost of removing the switches and recording the VIN a requirement set as a condition in the Alliance's plan. Specifically, section 1665-A(5)(B) was amended as follows:

"[Manufacturers of motor vehicles shall pay] a minimum of ~~\$3~~ \$4 for each mercury switch brought to the consolidation facilities as partial compensation for the removal, storage and transport of the switches, and a minimum of \$4 if the vehicle identification number of the source vehicle must be provided to receive this payment;"⁶

The DEP and motor vehicle manufacturers agreed that the effect of this language was to require motor vehicle manufacturers to pay \$4 for switches delivered to Wesco if the VIN of the source vehicle is provided. There was disagreement, however, as to the auto industry's obligation when switches were delivered without VINs. Motor vehicle manufacturers took the position that no bounty was owed in that case. The DEP and the regulated community interpreted the language to require motor vehicle manufacturers to pay at least \$3 per switch whether or not the VIN is provided.

The matter was resolved by the 122nd Legislature when it repealed section 1665-A(5)(B) and enacted the following in its place:

"[Manufacturers of motor vehicles shall] pay for each mercury switch brought to the consolidation facilities as partial compensation for the removal, storage and transport of the switches a minimum of \$4 if the vehicle identification number of the source vehicle is provided. If the vehicle identification number of the source vehicle is not provided, no payment is required."⁷

To encourage ELV handlers to turn in mercury switches they had collected without recording VINs, the legislation further provided that:

"...until 45 days after the effective date of this Act, an automobile manufacturer shall pay for each mercury switch brought to a consolidation facility as partial compensation for the removal, storage and transport of the switch a minimum of \$3 if the vehicle identification number of the source vehicle is not provided as long as the switch is accompanied by signed certification that the switch was removed from a vehicle dismantled in Maine."⁸

(e.g. the registration form or owner's manual) or from the vehicle chassis. The most common chassis location is the driver side interior dash. On some vehicles, the VIN may be stamped on the front of the engine block or frame.

⁶ See *An Act to Amend the Law on Mercury-added Products*, PL 2005, c. 148, sec. 5. The case for raising the bounty is made in the DEP's February 2005 report *Mercury Switch Removal from Motor Vehicles in Maine*, available at: http://www.maine.gov/dep/rwm/mercury/switch_removal_report.htm.

⁷ See *An Act to Amend certain Laws Administered by the Department of Environmental Protection*, PL 2005, c. 561, sec. 9, <http://www.mainelegislature.org/legis/bills/chapters/PUBLIC561-1.asp>.

⁸ *Id.*, sec. 12.

Following the enactment of this latest version of the bounty language, motor vehicle manufacturers affirmed that they instructed Wesco to continue to take delivery of mercury switches free of charge provided the delivery is accompanied by signed log sheets certifying that the switches were removed from vehicles dismantled in Maine. For each mercury switch delivered together with the VIN of the source vehicle, Wesco paid a \$4 bounty. For each mercury switch delivered without a VIN, Wesco paid a bounty of \$3 if the switch was delivered during the 45-day period commencing on the effective date of the new bounty language (August 23, 2006 to October 3, 2006).⁹ No bounty is to be paid on VIN-less switches delivered to Wesco after that 45-day period.

The DEP sent three separate mailings to Maine's ELV handlers concerning the 45 day turn-in period and fielded several telephone calls explaining the need to turn in any switches without VINs during this time period to receive the \$3 bounty payment.

The Alliance reported that for this 45 day collection and the year end totals were:

	45 day period		Remainder of switches collected in 2006	2006 Total	Recovery rate per CCC estimates	Recovery rate per Alliance estimates
	With VIN	Without VIN				
Portland	3733	2991	2022	8746		
Bangor	7059	867	1074	9000		
Totals:	10792	3858	3096	17746	64.5%	90.2%
% of Total	60.8%	21.7%	17.4%			

IV. Compliance and enforcement

The DEP has continued to make a concerted effort to ensure that all DEP enforcement staff members are aware of the switch removal law and inspect for compliance when they visit yards in response to citizen complaints, whether or not the complaint is specifically related to mercury switches. During calendar year 2006, the DEP Industrial Stormwater Program staff visited 67 facilities where they reviewed all waste handling procedures including removal and handling of mercury switches. In addition, the inspectors provided 10 of these facilities with training material and/or storage buckets to use to collect mercury switches (the others already had these materials).

Compliance and enforcement efforts have been facilitated by passage of *An Act to Require That Hazardous Waste Be Removed From Junked Vehicles*, PL 2005, c. 247, effective September 17, 2005. This Act amended both the municipally-administered junkyard and automobile graveyard law and the DEP-administered waste law to require that all fluids, refrigerant, batteries and mercury switches be removed from inoperable vehicles within 180 days of acquisition by a yard.

⁹ The enacting legislation—PL 2005 c. 561—became effective August 23, 2006.

ELV handlers are informed of this requirement by DEP staff whenever they visit a yard to conduct a routine inspection or investigate a citizen complaint.

V. Conclusion

Maine's program to remove mercury switches from motor vehicles enjoyed much improved success during 2006, its fourth year of existence. Nearly 18,000 mercury switches, collectively containing nearly 40 pounds of mercury, were recovered. This represents a 400% increase in the number of switches recovered in 2005.

The main contributing factor to this improvement likely were our informational mailings reminding ELV handlers that, under the DEP Hazardous Waste Management Rules, switches must be redeemed within 3 years of the date they are placed in the storage container after removal. The 45-day window established by the Legislature, during which switches unaccompanied by the VIN could be redeemed for \$3, also appears to have been a factor as 75% of the switches redeemed in 2006 were turned in during this period. Somewhat incongruously, most of the switches turned in during that 45-day period were associated with a VIN, perhaps reflecting the fact that the collection buckets typically contain a mixture of switches with and without the VIN of the source vehicle.

In all likelihood, the switch recovery rate will drop in 2007 because those who redeemed switches in 2006 will not have to redeem their switches again until 2009. Nevertheless, we continue to believe the collection program is worth the effort. Thousands of these switches remain in the vehicle fleet and are available for capture when the vehicles are junked. The switches are relatively easy to remove and, if we fail to remove them, the mercury in all likelihood will be emitted to the environment and contribute to our mercury pollution problem.

ELV handlers are continuing to remove the switches and the overall program capture rate continues to improve steadily. The work by the NVMSRP to refine the number of switches available for removal will improve the accuracy of determining the state's capture rate.

The DEP does not at this time recommend adjusting the partial reimbursement payment or adding other motor vehicle components to the state's program. As additional states implement vehicle mercury switch collection programs through the NVMSRP agreement or through separate legislation, the DEP will review these programs and collection results to determine if improvements to Maine's program are indicated.

APPENDIX A

38 MRSA §1665-A. Motor vehicle components

Notwithstanding sections 1663 and 1664, this section applies to a mercury-added product that is motor vehicle component.

1. Prohibition on sale of a new motor vehicle with mercury switches. A person may not sell a motor vehicle manufactured on or after January 1, 2003 if it contains a mercury switch. A motor vehicle manufacturer may apply to the commissioner for an exemption from this prohibition. The commissioner may grant an exemption upon finding that:

A. The manufacturer has provided assurance that a system exists for the proper removal and recycling of the mercury switch; and

B. Either of the following applies:

(1) Use of the mercury switch is necessary to protect public health or safety; or

(2) There are no technically feasible alternatives to the mercury switch at comparable cost.

2. Prohibition on replacement mercury light switches. Effective January 1, 2003, a person may not sell or distribute a mercury light switch for installation in a motor vehicle.

3. Removal of certain mercury components when vehicle use ends. A person may not flatten, crush or bale a motor vehicle for the purpose of sending it to a scrap recycling facility, or arrange for a motor vehicle to be flattened, baled or crushed for that purpose, without first removing all mercury switches and mercury headlamps, except that a scrap recycling facility may agree to accept a motor vehicle that has not been flattened, crushed or baled. If a scrap recycling facility accepts such a motor vehicle, the scrap recycling facility is responsible for removing the mercury switches and mercury headlamps before the vehicle is flattened, crushed, baled or shredded. Upon removal, the components must be collected, stored, transported and otherwise handled in accordance with the universal waste rules adopted by the board under subsection 8.

4. Voluntary removal of mercury light switches prior to end of vehicle use. A motor vehicle dealer or any person engaged in motor vehicle repair or maintenance may participate in the mercury light switch removal and collection effort pursuant to subsection 5, as long as the person notifies the department before commencing removal and receives such training as may be required by the department. Any person who removes a mercury light switch from a motor vehicle before the motor vehicle is removed from service shall affix an official sticker to the motor vehicle to indicate that the switch has been removed. The stickers may be obtained from the department and must be affixed to the doorpost or other location specified by the department. A person may not install a mercury light switch into a motor vehicle to which the sticker is affixed.

5. Motor vehicle manufacturer responsibility. Manufacturers of motor vehicles sold in this State that contain mercury switches or mercury headlamps shall, individually or collectively, do the following:

A. By January 1, 2003, establish and maintain consolidation facilities geographically located to serve all areas of the State to which mercury switches removed pursuant to this section may be transported

by the persons performing the removal. A consolidation facility may not be a facility that is licensed in the State as a new or used automobile dealership;

B. Pay for each mercury switch brought to the consolidation facilities as partial compensation for the removal, storage and transport of the switches a minimum of \$4 if the vehicle identification number of the source vehicle is provided. If the vehicle identification number of the source vehicle is not provided, no payment is required;

C. Ensure that mercury switches redeemed at the consolidation centers are managed in accordance with the universal waste rules adopted by the board under subsection 8; and

D. Provide the department and persons who remove motor vehicle components under this section with information, training and other technical assistance required to facilitate removal and recycling of the components in accordance with the universal waste rules adopted by the board under subsection 8, including, but not limited to, information identifying the motor vehicle models that contain or may contain mercury switches or mercury headlamps.

The goal of this collection and recycling effort is to collect and recycle at least 90 pounds of mercury per year from mercury switches removed from motor vehicles. By September 30, 2002, motor vehicle manufacturers shall provide the department with a plan as to how they intend to comply with the requirements of this subsection.

In complying with the requirements of this subsection, manufacturers of motor vehicles shall establish a system that does not require a person who removes a mercury switch to segregate switches separately according to each manufacturer of motor vehicles from which the switches are removed.

6. Department responsibility. The department shall:

A. Assist those subject to the source separation requirements of this section by providing training on the universal waste rules adopted by the board under subsection 8 and by taking other steps as deemed appropriate to provide for the safe removal and proper handling of motor vehicle components;

B. Design and distribute stickers required under subsection 4; and

C. Make available to the public information concerning services to remove mercury light switches in motor vehicles.

7. Labeling. Effective July 15, 2002, the labeling requirements of section 1662 apply to motor vehicles components. In approving an alternative compliance plan for labeling motor vehicles under section 1662, the commissioner shall require a motor vehicle manufacturer to apply a doorpost label listing the mercury added products that may be components in the motor vehicle. The commissioner may not require a manufacturer to affix a label to each mercury-added component.

8. Rulemaking. The board shall revise the universal waste rules adopted pursuant to section 1319-O, subsection 1, paragraph F as necessary to establish standards by which mercury switches in motor vehicles may be handled as universal waste.

9. Reporting. Before January 1, 2003, and annually thereafter, motor vehicle manufacturers doing business in the State shall report to the joint standing committee of the Legislature having jurisdiction over natural resource matters on any fee or other charge collected on the sale of new motor vehicles for the purpose of paying the cost of carrying out the manufacturer responsibilities under subsection 5. The report must specify the amount of the fee or charge collected and how it was determined. Before July 1, 2004 and annually thereafter, motor vehicle manufacturers shall report in writing to the department on the

results of the source separation required under this section. The report must include, at a minimum, the number of mercury switches removed and recycled from motor vehicles during the previous calendar year; the estimated total amount of mercury contained in the components; and any recommendations to improve the future collection and recycling of motor vehicle components. Before January 1, 2004, and annually thereafter, the department shall report to the Mercury Products Advisory Committee on the effectiveness of the source separation required under this section, whether the partial reimbursement payment under subsection 5, paragraph B should be adjusted to increase the number of switches brought to consolidation facilities, whether other motor vehicle components should be added to the source separation efforts and whether the program should be terminated and, if so, when.