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February 13, 2006

Jeffrey L. Quandt, Chief
Vehicle Control Division, Office of Defects Investigation (NHTSA)
National Highway Traffic Safety Administration
Room 5326
400 Seventh Street, S.W.
Washington, D.C. 20590

NVS-213dlr
PE05-057

Dear Mr. Quandt,

This letter and its enclosures comprise the response of Volvo Cars of North America, LLC (VCNA) to your request for information relating to Preliminary Evaluation PE05-057 received on December 1, 2005. VCNA was granted a request to answer PE05-057 by February 15, 2006.

In order to respond to PE05-057, Volvo undertook a thorough and diligent search. Volvo, in good faith, reviewed all available documentation within its control to answer NHTSA's questions pertaining to the alleged failure or malfunction of the positive battery cables and/or associated connectors on 2005MY Volvo XC90 vehicles which may have resulted in any of the following: (1) fire; (2) thermal failure of the positive battery cable; or (3) engine stall or (4) chafing/pinch/cutting condition. We consulted with a variety of affected persons both in the United States and Sweden, who in the course of their daily business are responsible for the items related to the request. They, in good faith, conducted a thorough search for the information. Our response is based upon this diligent and thorough search.

We have provided below and as separate enclosures (a combination of hardcopy and electronic documents) the answers to the questions raised by PE05-057. We have used the documentation and systems available to us that in the normal course of business contain the type of information relevant to this request. Please note that for the purpose of PE05-057 we are using data up through and including December 1, 2005; which is the date on which we began our search for this information.

1. State, by engine, the number of subject vehicles Volvo has manufactured for sale or lease in the United States. Separately, for each subject vehicle manufactured to date by Volvo, state the following:
 - Vehicle identification number (VIN);
 - Make;

- Model;
- Engine
- Model Year;
- Date of manufacture;
- Date warranty coverage commenced; and
- The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

Provide the table in Microsoft Access 2000, or a compatible format, entitled "PRODUCTION DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table that provides further details regarding this submission.

The table and the complete information for the "subject" vehicles is provided to NHTSA on the enclosed CD-ROM. Please note that for certain vehicles data may be missing. After a thorough and diligent search we were unable to obtain this data within Volvo's systems.

2. State the number of each of the following, received by Volvo, or of which Volvo are otherwise aware, which relate to, or may relate to, the alleged defect in the subject vehicles:
 - a. Consumer complaints, including those from fleet operators; (11)
 - b. Field reports, including dealer field reports; 22 (9 from Tech Hotline and 13 from TIE)
 - c. Reports involving a crash, injury, or fatality, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports; (0)
 - d. Reports involving a fire, based on claims against the manufacturer involving a death or injury, notices received by the manufacturer alleging or proving that a death or injury was caused by a possible defect in a subject vehicle, property damage claims, consumer complaints, or field reports; (7 from Customer Care, 6 from TIE, 1 from Tech Hotline)
 - e. Property damage claims; and, (0)
 - f. Third-party arbitration proceedings where Volvo is or was a party to the arbitration; (0)
 - g. Lawsuits in which Volvo is or was a defendant or codefendant (0)

For subparts "a" through "e" state the total number of each item (e.g., consumer complaints, field reports, etc.) separately. Multiple incidents involving the same vehicle are to be counted separately. Multiple reports of the same incident are also to be counted separately (i.e., a consumer complaint and a field report involving the same incident in which a crash occurred are to be counted as a crash report, a field report and a consumer complaint).

In addition, for items "c" through "g" provide a summary description of the alleged problem and causal and contributing factors and Volvo's assessment of the problem, with a summary of the significant underlying facts and evidence. For items f and g, identify the parties to the action, as well as the caption, court, docket number, and date on which the complaint or other document initiating the action was filed.

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VIN	Affected problem	Causal and contribution factors	VOC assessment	VCC summary
	Caught fire when driving, was driving at with was about 28 mph and it rained from house when car suddenly lost power and shut down. Tried to start car back up while on side of the road, on the 3rd attempt, was able to re-start car, drove about 1 minute when discovered smoke entering back cabin of vehicle. Got out of the car when smoke began to envelope car.	Jack handle contacting B+ at battery and body.	Caused by misplaced jack handle	(1) VCC has identified production variations between the week of June 14 2004 up to the week of August 18 2005, leading to potential mispositioning of the jack handle. All reported cases except one fall within this period. Based upon available knowledge VCC is able to draw the conclusion that the condition occurs in a very early stage when using the vehicle. This is due to the fact that the condition may not occur unless the jack handle is initially mispositioned, i.e. in contact with the B+ probe. The concerned population vehicles should already have searched engine wiring. Furthermore no additional cases have been reported. VCC does therefore not see any defect trend.
YV1G2P1125	Vehicle was parked and they observed smoke coming from under front end	Short between-starter motor solenoid and B+ cable	Short at starter solenoid.	(2) Recall 180 launched (05/2-02/0)
YV1G2P1184	CD player making a noise, seatbelt light flashed, all lights on dash and car stalled and restarted itself. Then car stopped and no lights. Smelled smoke, saw smoke in bottom left area of bumper.	The vehicle was subjected to a short circuit in battery area	Caused by misplaced jack handle	Refer to (1) above.
YV1G2P1185	Driving on highway and car shut off. Restarted car and pulled into gas station 200 yards down the road. While getting gas 9 year old daughter in car smelled smoke. Daughter got out of car and directed attendant to rear area of vehicle. Mother pulled up carport in battery area. Attendant put out fire with extinguisher.	Fire was started by jack handle	Caused by misplaced jack handle	Refer to (1) above.
YV1G2P1144	Car stalled on highway in shoulder. 3 children in rear seat, one rolled around in seat. All occupants exited car. Passes shut up and car blew up.	NA	Caused by misplaced jack handle	Refer to (1) above.
YV1G2P1291	Parked in lot for approximately 3 hrs. walked over to car, heard alarm and alarm off by time she got to car. went to driver's side noticed white stuff all over driver's window opened door, smell overwhelming and white haze fire extinguished itself before car opened door	Found jack handle lying on top of the positive battery cable.	Caused by misplaced jack handle	Refer to (1) above.
YV1G2P1178	Tech states the starter cable cover in contact with the starter body and alerted out to the location. Tech states that the car has several codes stored. Tech states the customer complains that smoke comes from under the hood and car stalled. Tech states the car was towed in and he checked the area and he did not see signs of deterioration. Tech has found the B+ cable chafing by starter solenoid	Short between-starter motor solenoid and B+ cable	Short at starter solenoid.	Refer to (2) above.
YV1G2P1153	Tech states vehicle was issued in for no immediate response. Tech could not duplicate the concern but he did find 81 codes in 7 different modules.	Found loose cable at starter, repaired	V8 null	(3) Scanlon Campaign 183 launched.
YV1G2P1281	Tech says vehicle came for a no crank/no start. Tech found the TNN 27-24 and he says it looks like the repair was already performed but he did find the starter cable loose and it did not have a self locking nut on it. Tech says when he moved the cable the engine started.	replaced battery and B+ nut	V8 null	Refer to (2) above.
YV1G2P1283	Tech states customer concern is it does not start. Asked tech if no alarm and no crank. Tech not sure. Advised tech if no crank, check nut on battery cable on starter solenoid.	replaced starter motor and tightened nut on starter motor	V8 null	Refer to (2) above.
YV1G2P1281	Tech states at three engine will not crank. Tech states go back to car later, engine starts right up. Tech states no codes. Advised tech to check battery cable at starter solenoid, nut maybe loose	found loose degeneration at starter	V8 null	Refer to (2) above.

3. Separately, for each item (complaint, report, claim, notice, or matter) within the scope of your response to Request No. 2, state the following information:
 - a. Volvo's file number or other identifier used;
 - b. The category of the item, as identified in Request No. 2 (i.e., consumer complaint, field report, etc.);
 - c. Vehicle owner or fleet name (and fleet contact person), address, and telephone number;
 - d. Vehicle's VIN;
 - e. Vehicle's make, model and model year;
 - f. Vehicle's mileage at time of incident;
 - g. Incident date;
 - h. Report or claim date;
 - i. Whether a crash is alleged;
 - j. Whether a fire is alleged;
 - k. Whether an engine stall incident is alleged;
 - l. Whether property damage is alleged;
 - m. Number of alleged injuries, if any; and
 - n. Number of alleged fatalities, if any.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "REQUEST NUMBER TWO DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table that provides further details regarding this submission.

This information is provided to NHTSA on the enclosed CD-ROM, in Microsoft Access format. To protect the privacy of the individuals please treat these VINs confidentially.

Volvo searched source systems (Customer Complaints – Marketing Database, Field Reports – TIE system, Tech Hotline system) and the files of those that could possibly have any of the requested records. The source systems were searched using the following criteria:

FUNCTION GROUPS TO BE SEARCHED:

FG 37 wiring, 31 battery, alternator 32, starter motor 33.

TEXT TO BE SEARCHED:

Fire, smoke, over heat, heat, melt, short circuit, battery cable; engine stall, stall, no crank.

CUSTOMER CARE TEXT SEARCH TO ALSO INCLUDE:

Words for no crank

No start

Did not start

Would not turnover

Unable to start

We believe that the above mentioned criteria clearly apply to the NHTSA request.

Please note:

- ◆ *The Volvo identifier for the Customer Care cases (Consumer Concerns) in this submission is the customer name.*
- ◆ *In many of the Customer Care cases we do not have "vehicle mileage at the time of the incident" or "incident date". When available, this information has been provided.*

Otherwise, the report date that has been provided is the date that Volvo was made aware of the alleged occurrence.

◆ Faxes from retailers to Customer Care associates about the closings (results of repair or request for assistance etc.) from the retailer were and are transcribed into the electronic record of the complaint.

There are no alleged property damage claims, injuries or fatalities within the scope of Request Numbers two and three above.

4. Produce copies of all documents related to each item within the scope of Request No. 2. Organize the documents separately by category (i.e., consumer complaints, field reports, etc.) and describe the method Volvo used for organizing the documents.

We have conducted a thorough and diligent search of our records for this PE submission and found no associated documents beyond the reports text provided in the database.

5. State, by engine, a total count for all of the following categories of claims, collectively, that have been paid by Volvo to date that relate to, or may relate to, the alleged defect in the subject vehicles: warranty claims; extended warranty claims; claims for good will services that were provided; field, zone, or similar adjustments and reimbursements; and warranty claims or repairs made in accordance with a procedure specified in a technical service bulletin or customer satisfaction campaign.

Separately, for each such claim, state the following information:

- a. Volvo's claim number;
- b. Vehicle owner or fleet name (and fleet contact person) and telephone number;
- c. VIN;
- d. Repair date;
- e. Vehicle mileage at time of repair;
- f. Repairing dealer's or facility's name, telephone number, city and state or ZIP code;
- g. Labor operation number;
- h. Problem code;
- i. Replacement part number(s) and description(s);
- j. Concern stated by customer; and
- k. Comment, if any, by dealer/technician relating to claim and/or repair.

Provide this information in Microsoft Access 2000, or a compatible format, entitled "WARRANTY DATA." See Enclosure 1, Data Collection Disc, for a pre-formatted table that provides further details regarding this submission.

The table and complete information is provided to NHTSA on the enclosed CD-ROM. In some cases the phone number of the facility is not provided. These phone numbers can be provided upon request.

6. Describe in detail the search criteria used by Volvo to identify the claims identified in response to Request No. 5, including the labor operations, problem codes, part numbers and any other pertinent parameters used. Provide a list of all labor operations, labor operation descriptions, problem codes, and problem code descriptions applicable to the alleged defect

in the subject vehicles. State, by make and model year, the terms of the new vehicle warranty coverage offered by Volvo on the subject vehicles (i.e., the number of months and mileage for which coverage is provided and the vehicle systems that are covered). Describe any extended warranty coverage option(s) related to the alleged defect that Volvo offered for the subject vehicles and state by option, model, and model year, the number of vehicles that are covered under each such extended warranty.

The claim search was based on the part numbers listed in this document. Reports that included the part numbers associated with the alleged defect were generated from the Volvo QW90 system. The following part numbers were used in the search:

30724664, 30712073, 30667445, 8688673, 30667446, 30720127, 30712080, 30667447, 30712085, 30667448, 30712087

Fewer of these parts were sold than the amount of claims that were submitted. We believe that this is due to our retailer's use of a generic assortment of nuts provided by local suppliers.

Labor operations and descriptions applicable to the alleged defect in the subject vehicles include Labor Operation Numbers:

- *33118 Starter motor remove-install/replace,*
- *37206 Control module / relay box passenger,*
- *37309 Cable harness engine repair,*
- *32102 Alternator remove-install/replace,*
- *37119 Wiring harness, complete,*
- *99272 Cable harness CEM-engine compartment,*
- *37219 Fusebox, cover,*
- *25102 Gasket Inlet manifold replace,*
- *32002 Battery charge test in vehicle,*
- *37205 Main fuse in engine compartment replace,*
- *36004 Software control module downloading,*
- *21019 Engine complete petrol,*
- *37319 Cable harness front replace.*

Problem codes and descriptions applicable to the alleged defect in the subject vehicles include 4F, 5D, 5H, 5M, 5N, 5P, 5Q, 5S, 6A.

- *Problem codes at Volvo are used for very specific uses, not for all uses.*

Model year 2005 subject vehicles were covered by a new vehicle warranty of four (4) years or 50,000 miles whichever comes first. Volvo did not provide extended warranty coverage options for the subject vehicles.

It is important to note that the claim text is written by non-technical people.

7. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject vehicles, that Volvo has issued to any dealers, regional or zone offices, field offices, fleet purchasers, or other entities. This includes, but is not limited to, bulletins, advisories, informational documents, training documents, or other documents or

communications, with the exception of standard shop manuals. Also include the latest draft copy of any communication that Volvo is planning to issue within the next 120 days.

The following documents have been released for Service Use and are provided electronically on the enclosed CD-ROM:

- *TNN 37-31*
- *TNN 89-07*
- *Recall 150 Package*
- *Service Campaign 152 Package*

8. Describe all assessments, analyses, tests, test results, studies, surveys, simulations, investigations, inquiries and/or evaluations (collectively, "actions") that relate to, or may relate to, the alleged defect in the subject vehicles that have been conducted, are being conducted, are planned, or are being planned by, or for, Volvo. This should include all white papers and other briefing/presentation materials associated with Volvo's recent recall of subject vehicles equipped with six cylinder engines to correct a defect condition concerning the battery positive cable terminal and all documents relating to Volvo's issuance of a technical service bulletin providing a service repair procedure for a loose battery positive cable attachment nut condition in subject vehicles with eight cylinder engines. For each such action, provide the following information:
- a. Action title or identifier;
 - b. The actual or planned start date;
 - c. The actual or expected end date;
 - d. Brief summary of the subject and objective of the action;
 - e. Engineering group(s)/supplier(s) responsible for designing and for conducting the action; and
 - f. A brief summary of the findings and/or conclusions resulting from the action.

For each action identified, provide copies of all documents related to the action, regardless of whether the documents are in interim, draft, or final form. Organize the documents chronologically by action.

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Reference #	Description	Responsible dealer	Responsible action	Start date	End date	VCC Status	Brief summary
Q2-053852	Loose nut, Battery Positive cable (B+) to starter, V8 B64448, B+ cable starter angle	Spill Yamaha, VCC Electrical	Program first, then Plant Vehicle Team (PVT) Electrical	8-Dec-04	4-Jul-05	Service Campaign 152	No indication throughout the program and in test vehicles. Found in early production cars. Action on built cars according to "limitations". Several steps introduced but not fully resolved until root cause found may 2005.
Q2-065262		VCC Powertrain	PVT Powertrain	22-Apr-05	24-May-05	Solution checked	Administrative task for powertrain since harness managed by powertrain.
Q2-085182	B+ short circuit to starter solenoid, 6-cylinder B+Cable between battery and main fuse box (rear) chafing against bracket	Manufacturing engineering	PVT Electrical	30-May-05	9-Jun-05	Recall 150	One case in Malaysia locally produced car, second case in May, immediate action in factory and parts. Correction of assembly instructions. 1 report from part, material deviation found. Deviation corrected. Engineering judgement by Plant Vehicle Team to be non critical.
Q2-095462		VCC Electrical	PVT Electrical	17-Aug-05	28-Aug-05	Solution decided	

Test reports related to the V8 engine are provided electronically on the enclosed CD-ROM:

- *Vibrationstest1_noteringar.doc*
- *Test Report 507718 "Investigation of Low Residual Torque for the B+ Connection"*

9. Describe all modifications or changes made by, or on behalf of, Volvo in the design, material composition, manufacture, quality control, supply, or installation of the subject components from the start of production to date, which relate to, or may relate to, the alleged defect in the subject vehicles. Provide separate responses to this request for each version of the subject components used in the subject vehicles with brief descriptions of the respective vehicle applications. For each such modification or change, provide the following information:
- a. The date or approximate date on which the modification or change was incorporated into vehicle production;
 - b. A detailed description of the modification or change;
 - c. The reason(s) for the modification or change;
 - d. The part numbers (service and engineering) of the original component;
 - e. The part number (service and engineering) of the modified component;
 - f. Whether the original unmodified component was withdrawn from production and/or sale, and if so, when;
 - g. When the modified component was made available as a service component; and
 - h. Whether the modified component can be interchanged with earlier production components.

Also, provide the above information for any modification or change that Volvo is aware of which may be incorporated into vehicle production within the next 120 days.

Two tables with the above information are provided below, one for the V8 engine and one for the 6-cylinder engine. Referenced documents are provided on the enclosed CD-ROM. No further changes are planned by Volvo.

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Item	Date	Description of Modification / Reason for Modification (RFP)	Part No. Original	Part No. Modified	Part No. Available in Service	Part No. Interchangeability	Reference	Info. Available	
1	1/25/2004	Geop Cable in factory with standard r.t.l. Reworked to lock r.t.l.	000000	000000			Original part is used elsewhere	Revised part was available	Yes
2	2/20/2004	Built with lock nut from ECT, as-is (original) otherwise replace VCT.	NA	NA	NA	NA	NA	NA	NA
4	2/19/2004	Built with lock nut from ECT, as-is (original) otherwise replace VCT.	NA	NA	NA	NA	NA	NA	NA
5	2/20/2004	Built with lock nut from ECT, as-is (original) otherwise replace VCT with alternative regarding cable pipes.	NA	NA	NA	NA	NA	NA	NA
6	5/20/2004	Yam from cheap to Yamaha cables for cable to alternator cable and in ECT before final assembly	NA	NA	NA	NA	NA	NA	NA
7	4/15/2004	NA Yamaha to VCT cables.	NA	NA	NA	NA	NA	NA	NA
8	6/27/2004	Cable length increased from harness- engine supplier in Japan (028-8821 (3 month old))	NA	NA	NA	NA	NA	NA	NA
9	5/20/2004	Cable length increased on remark & introduced upper limit of cable in in ECT/Service center.	000000 (P1) S-B (Yamaha part)	NA	NA	NA	NA	NA	Yes
10	6/17/2004	Revised r.t.l. introduction of ECT.	000000	000000	000000	000000	000000	000000	000000
11	7/20/2004	NA Torque in ECT (original) (Motor torque wrench)	NA	NA	NA	NA	NA	NA	NA
12	1/15/2005	New starter motor with new schedule, lower nut removed and increased length of lower section of B cable, function B+ cables and others.	00000004	00000004	NA	NA	NA	NA	Yes
13	10/30/2005	Lower cable introduced from harness- engine supplier from engine 0000	00000004	00000004	NA	NA	NA	NA	Yes
14	11/17/2005	NA without C14 from country (black and silver electrical connectors)	000000	000000	NA	NA	NA	NA	Yes
15	1/23/2006	Revised plug harness, angle torque with +44 degree angle, introduced at power station ECT Geop. 12/24/05, assembly order 00000000.	NA	NA	NA	NA	NA	NA	NA

Notes / Status: bold text show the key status items
 ECT = Engine Control Technology
 VCT = Valve Control Technology
 PKI = Process Instruction

Description of Change / Reason for Change (B-cylinder)	Part No. Original	Part No. Modified	Part No. Introduction	Part No. Available in Service	Part No. Interchangeability	Reference
Production start MY-06 with "faulty" Process Instruction (PKI) for assembly of B+ connection to starter. PKI from 0461 (end of January 2004) referenced.	NA	NA	NA	NA	NA	1. Process Instruction (PKI) folder 0461_Beginning (B-cyl) 2. CableHarness_DWGS folder XCS0 B-cyl Motor-Prod-30667448-001
Process Instruction (PKI) corrected. Production re-started. PKI from 0522 (end of May) referenced.	NA	NA	NA	NA	NA	Process Instruction (PKI) folder 0522 (B-cyl)

10. Provide the following information regarding the subject components:
- a. A description of the positive battery cable routing and connecting hardware by engine and cable part numbers (service and engineering);
 - *Reference Cable Harness Drawings on enclosed CD-ROM.*
 - *Reference Harness Routing on enclosed CD-ROM*
 - b. The specified fastener torques;
 - *Reference Process Control Instruction (PKI) on enclosed CD-ROM*
 - c. One sample of each positive battery cable connector (with approximately three inches of positive battery cable for each sample), used in the subject vehicles;
 - *PN 30720127 is for V8 and has already been provided to NHTSA.*
 - *PN 30712073 is for 6 cylinder and has already been provided to NHTSA.*
 - *PN 30724664 extends throughout vehicle (for both) and has already been provided to NHTSA.*
 - d. One sample of a starter and the attaching nut for the positive battery cable. Include the nut used in production prior to TSB 37-3 and the nut used as described in TSB 37-3.
 - *The requested samples have already been provided to NHTSA.*
 - e. Two samples of subject components exhibiting the most severe thermal degradation due to loose cable connections that Volvo has observed in warranty return parts or other field analysis or part collection programs;
 - *Only one sample has been collected thus far and this has already been provided to NHTSA.*
 - f. The minimum specified clearances between the positive battery cable connections and surrounding components;
 - *Volvo does not specify a general minimum clearance between the positive battery cable connections and surrounding components. Volvo uses peer review and engineering judgement for wiring clearances.*
 - g. The material compositions of the positive battery cable insulation materials and any other components that could be directly or indirectly affected by heat generated from a loose positive battery cable connection (by material supplier, supplier trade name and product number/code, and the plastic common name and abbreviation) with the melting, smoking, and ignition (flash ignition and self ignition) temperatures of each;
 - *The above data is on the enclosed CD-ROM within electronic folders labeled:*
 - *Material Specifications/XC90 V8*
 - *Material Specifications/XC90 6 cylinder*
 - h. Copies of all material specifications for the subject component insulation materials and any other components that could be directly or indirectly affected by heat generated from a loose positive battery cable connection;
 - *The above data is on the enclosed CD-ROM within electronic folders labeled:*
 - *Material Specifications/XC90 V8*
 - *Material Specifications/XC90 6 cylinder*
 - i. The conditions necessary for the alleged defect to result in an engine stall incident, all symptoms that may precede a stall incident, and the ability of the engine to be restarted following such a stall;

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6-cylinder:

In a certain very few vehicles, due to a now corrected issue in the factory assembly instruction, the B+ terminal may be in conflict with the starter motor solenoid. If this occurs, in rare cases, the conflict between the B+ terminal and the starter motor solenoid may develop into a short circuit of the B+ battery cable to ground. This scenario can be noticed by the customer in different ways. If the vehicle is parked, smoke may appear from under the hood and/or it may be impossible to start the car. If the short circuit happens during driving, electrical power could be lost, resulting in warning lamps being deactivated.

8 cylinder

The B+ cable joint at the starter motor may be relaxed or may not have been properly torqued at the factory. If this joint is not properly torqued at the starter motor, the starter motor may not crank and the battery may have a low charging status. In case these conditions occur while driving the driver will get very clear warnings, primarily in the Driver Information Module (DIM) but later also shown as a reduction of engine torque, enabling the driver to handle the vehicle to a safe stop

- j. The number of positive battery cables sold by Volvo for use in the subject vehicles by service part number and year and month of sale.
 - Refer to spreadsheet on enclosed CD-ROM.
11. For each engine and positive battery cable routing/connecting configuration used in the subject vehicles, furnish Volvo's assessment of the alleged defect, including:
- a. The causal or contributory factor(s);
 - b. The failure mechanism(s);
 - c. The failure mode(s);
 - d. The risk to motor vehicle safety that it poses;
 - e. What warnings, if any, the operator and the other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and
 - f. The reports included with this inquiry.

6-cylinder:

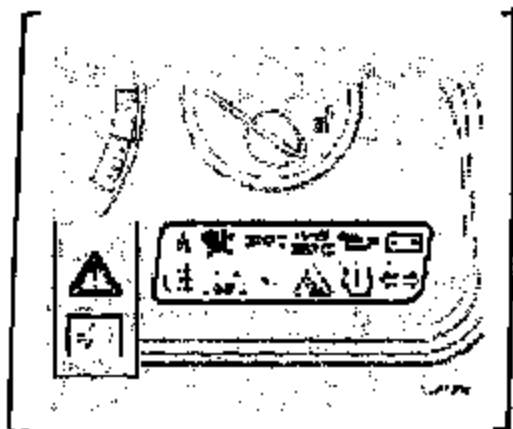
There was an error in the factory assembly instruction. The B+ terminal may be in conflict with the starter motor solenoid. If this occurs, the conflict between the B+ terminal and the starter motor solenoid may develop into a short circuit of the battery cable to ground. This can be noticed by the customer in different ways. If the vehicle is parked, smoke may appear from under the hood and/or it may be impossible to start the car. If the short circuit happens during driving, electrical power could be lost, resulting in warning lamps being deactivated. Volvo has decided to have a recall for this (Recall 150, NHTSA Recall 05V-529 per Defect Notification Letter dated November 18, 2005 enclosed.)

This can be noticed by the customer in different ways. If the vehicle is parked, smoke may appear from under the hood and/or it may be impossible to start the car. If the short circuit happens during driving, electrical power could be lost, resulting in warning lamps being deactivated.

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8 cylinder

The B+ cable joint at the starter motor may be relaxed or may not have been properly torqued at the factory. The joint is not correctly tightened at the starter motor. The starter motor may not crank and the battery may have low charging status. If this condition were to occur while driving, the driver will get very clear warnings, primarily in the DIM (Driver Information Module) but later also shown as reduction of engine torque, enabling the driver to handle the vehicle to a safe stop. Refer to the picture below for the warning that will be seen in the DIM:



Volvo has decided to have a customer satisfaction campaign (Service Campaign 152) for this condition for the following reasons:

- *There have been no reported fires.*
- *If this condition were to occur while driving, the driver will get very clear warnings, primarily in the DIM (as shown above) but later also shown as a reduction of engine torque, enabling the driver to handle the vehicle to a safe stop*

With these conditions and warnings Volvo deeply believes the Service Campaign is the appropriate solution for this issue.

Additional information request from NHTSA received December 12, 2005:

- A description of the positive battery cable routing (in the engine compartment and the battery compartment rearward of the 2nd row seats) and connecting hardware by engine and cable part numbers (service and engineering);
 - *Provided on enclosed CD-ROM.*
- Copies of all engineering specifications relating to the packaging, routing and protection of the battery cable wiring as it relates to the proximity to surrounding components with sharp edges. Including material specifications of the wiring protection material.
 - *Provided on enclosed CD-ROM.*
- Volvo's assessment of the alleged chafing/pinching/cutting condition of the positive battery cable to the battery compartment sheet metal flange including:
 - The causal or contributory factor(s);
 - The failure mechanism(s);
 - The failure mode(s); and
 - The risk to motor vehicle safety that it poses;

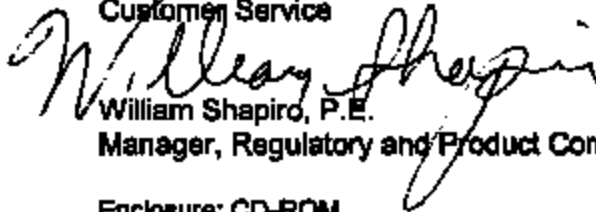
Conclusion to PE05-057:

Volvo has already decided on one Recall (R150) and one Service Campaign (SC152) to correct this issue. In the other two situations our analysis shows there is no significant issue as we explained above. Based on the above actions and clear conclusions this PE should clearly be closed.

Sincerely yours,

VOLVO CARS OF NORTH AMERICA, LLC

Customer Service

A handwritten signature in cursive script, appearing to read "William Shapiro".

William Shapiro, P.E.

Manager, Regulatory and Product Compliance

Enclosure: CD-ROM