



Volvo Trucks North America

November 7, 2008

VIA EXPRESS MAIL

Mr. Richard P. Boyd, Chief
Medium and Heavy Duty Vehicle Division
Office of Defects Investigation
U.S. Department of Transportation
National Highway Traffic Safety Administration
1200 New Jersey SE
Washington, D.C. 20590

Re: PE08-053
NVS- PHK214

Dear Mr. Boyd:

Please find below Volvo Truck North America's response to specific questions raised in your letter of September 18, 2008. In some areas, I have provided additional information, which I believe, may be helpful in conducting your evaluation. Additionally, the description used by our company in regards to the drag link is "sealed" and "greaseable" (see enclosed information in section 1 of the binder). Accordingly, I have referred to the drag link throughout this document using this nomenclature.

If you have any questions regarding this information, please don't hesitate to contact me.

Best Regards,

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1. State, by model and model year, drag link type (i.e. "sealed" vs. greasable) the number of subject and peer 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:

- a. Vehicle identification number (VIN);
- b. Make;
- c. Model;
- d. Model Year;
- e. Date of manufacture;
- f. Date Warranty Coverage commenced;
- g. The State in the United States where the vehicle was originally sold or leased (or delivered for sale or lease).

Answer:

Model	Model Year	Drag link type	Count
Subject vehicles:			
VNL	2005	Sealed	17,444
VNL	2005	Greasable	382
VNM	2005	Sealed	2,689
VNM	2005	Greasable	601
Peer vehicles:			
VNL	2006	Sealed	18,529
VNL	2006	Greasable	2,731
VNM	2006	Sealed	2,401
VNM	2006	Greasable	1,728

Source of information: Volvo's Sales and Warranty databases. The information was gathered on October 15, 2008.

Specific information on the subject vehicles (i.e. 2005 Model Year VNL and VNMs) is included in the enclosed CD under the heading of "PRODUCTION DATA".

2. By drag link type ("sealed" and greasable), state the number of each of the following, received by Volvo, or of which Volvo is otherwise aware, which relate to, or may relate to, the alleged defect in the subject and peer vehicles:

- a. Consumer complaints, including those from fleet operators;
- b. Field reports, including dealer field reports;
- 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;
- d. Property damage claims;
- e. Third-party arbitration proceedings where Volvo is or was a party to the arbitration; and
- f. Lawsuits, both pending and closed, in which Volvo is or was a defendant or codefendant.

For subparts "a" through "d" state the total number of each item (customer 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 customer 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 customer complaint).

In addition, for items "c" through "f" provide a summary description of the alleged problem and causal and contributing factors and Volvo's assessment of the problem, with a summary of significant underlying facts and evidence.

Type	Total Number/ sealed	Total Number/ greaseable
a. Consumer/ Fleet Complaints	16	0
b. Field Reports	57	0
c. Reports involving a crash, injury, or fatality	12	0
d. Property damage claims	9	0
e. Third- party arbitration proceedings	0	0
f. Lawsuits	2	0

Summary description for parts "c" through "f" is included in the enclosed CD under the heading of "REQUEST NUMBER TWO DATA".

Source of information: Volvo's Service Database and Legal Department. The information was gathered from the service database on October 16, 2008 and the Legal Department on November 4, 2008.

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, 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 property damage is alleged;*
- l. Number of alleged injuries if any; and*
- m. Number of alleged fatalities, if any.*

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Specific information is included in the enclosed CD under the heading of "REQUEST NUMBER TWO DATA".

Source of information: Volvo's Service Database and Legal Department. The information was gathered from the service database on October 16, 2008 and the Legal Department on November 4, 2008.

4. State, by model and model year, and drag link type, 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 and (subject components) for the subject and peer 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.

Answer:

Model Year 2005

VNL	Sealed	243
VNL	Greaseable	8
VNM	Sealed	4
VNM	Greaseable	0

Model Year 2006

VNL	Sealed	45
VNL	Greaseable	9
VNM	Sealed	2
VNM	Greaseable	0

Note:

- Only six of the claims stated that the drag link was broken. Of the six claims, only one indicated that the vehicle had to be towed; therefore, the other five claims likely did not involve a separation.
- Most cases involved replacement as a result of required inspection.
- There were no claims involving coincident repairs to secondary components as a result of a drag link fracture.

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

- Volvo's claim number;*
- Vehicle owner or fleet name (and fleet contact person) and telephone number;*
- VIN;*
- Repair date;*
- Vehicle mileage at time of repair;*
- Repairing dealer's or facility's name, telephone number, city and state or zip code;*
- Labor operation number;*
- Problem code;*
- Replaced part number(s) and description(s);*
- Whether the vehicle was towed to the dealer for the repair (y/n);*

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- k. *Secondary component damage (y/n) - Whether there were coincident repairs to secondary components that can be damaged when a drag link fracture occurs. For example, repairs to the following components at the same front wheel position as the subject component on or about the same date as the subject component (± 2 days): brake rotor, brake hose, body damage, tie rod, etc. (state the specific criteria used by Volvo);*
- l. *Concern stated by customer; and*
- m. *Comment, if any, by dealer/technician relating to claim and/or repair.*

Specific information is included in the enclosed CD under the heading of "WARRANTY DATA"

Source of information: Volvo's Warranty Database. The information was gathered on October 10, 2008.

5. *Describe in detail the search criteria used by Volvo to identify the claims identified in response to Request No. 4, 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 and all labor operations Volvo used to identify vehicles that had been towed and/or vehicles with secondary component damage.*

Answer:

Warranty records were searched for the following words and combinations of words: 1)"drag", 2)"crash", 3)"accident", 4)"steer" and "control" 5)"steer" and "loss", and 6)"steer" and "separate". Records were further reviewed to remove those dealing with issues such as starter dragging etc. that are not associated with drag links.

The remaining records were read to determine relevance to this investigation. Determination of towing and secondary damage was made by reading the text of each claim and reviewing the replaced parts and labor to determine relevance to this investigation.

State, by make and model year, the terms of 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).

Answer:

Standard Warranty

Volvo Truck Warranty			
	Normal Duty	Heavy Duty	Severe Duty
Basic Coverage	12 months or 100,000 miles or 3,250 operating hours	12 months or 100,000 miles or 3,250 operating hours	12 months or 100,000 miles or 3,250 operating hours
Air Conditioning	Air Conditioning (sealed system) 12 months with no mileage limit		
Engine	Not covered, see respective engine manufacturer's		
	36 months or 350,000 miles or 9,000 operating hours		
Transmission, Driveline, Rear Axle, Front non-drive steer Axle	Covered Components are Manual transmission a - Transmission assembly Rear Axle - Differential assembly and Axle housing Front Non-Drive Steer Axle - Axle beam, steering Knuckle & tie rod Driveline - Bearings, hangers and shafts Allison Automatic Transmissions are not covered under this warranty		12 months or 100,000 miles or 3,250 operating hours
Cab Structure	72 months or 750,000 miles or 15,000 operating hours	60 months or 500,000 miles or 12,500 operating hours	36 months or 250,000 miles or 9,000 operating hours
Internal Cab Corrosion	96 months or 1,000,000 miles or 18,000 operating hours	72 months or 650,000 miles or 15,000 operating hours	48 months or 350,000 miles or 10,800 operating hours
Frame Rail / Cross members	72 months or 750,000 miles or 15,000 operating hours	60 months or 500,000 miles or 12,500 operating hours	36 months or 250,000 miles or 9,000 operating hours
Cummins Engine - not covered by Volvo Truck Warranty - See Cummins engine			
Volvo Engine			
	All Applications		
Basic Engine	24 months or 250,000 miles or 6250 operating hours		
Emission Components	60 months or 250,000 miles or 6,250 operating hours		
Major Components	60 months or 500,000 miles or 12,500 hours		
Note: The standard warranty is summarized on this page, see pertinent Warranty Certificate for details.			

Note: The warranty for the drag link would be covered under the basic coverage provisions (i.e. 12 months, 100,000 miles, or 3,250 operating hours (whatever comes first)). Extended coverage can be purchased by the customer. For example, Volvo's Premium Truck coverage would extend the basic coverage to 36 months, 350,000 miles, or 9,000 operating hours (whatever comes first).

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Describe any extended warranty coverage option(s) 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.

Answer:

Model Yr	Model Series	Count of VINS	TITLE
2005	VNL	28	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 24 MONTHS OR 200,000 MILES - NO BATTERIES
2005	VNL	163	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 24 MONTHS OR 250,000 MILES - NO BATTERIES
2005	VNL	2	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 24 MONTHS OR 400,000 MILES - NO BATTERIES
2005	VNL	6	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 24 MONTHS OR 500,000 MILES - NO BATTERIES
2005	VNL	2	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 36 MONTHS OR 350,000 MILES - NO BATTERIES
2005	VNL	385	VOLVO - EXTENDED PREMIUM PURCHASED COVERAGE - 36 MONTHS OR 400,000 MILES - NO BATTERIES
2005	VNL	21	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 36 MONTHS OR 500,000 MILES - NO BATTERIES
2005	VNL	3174	VOLVO - EXTENDED PREMIUM COVERAGE - 38 MONTHS OR 450,000 MILES - NO BATTERIES
2005	VNL	1	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 42 MONTHS OR 500,000 MILES - NO BATTERIES
2005	VNL	1	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 48 MONTHS OR 480,000 MILES - NO BATTERIES
2005	VNL	45	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 48 MONTHS OR 500,000 MILES - NO BATTERIES
2005	VNL	132	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 48 MONTHS OR 550,000 MILES - NO BATTERIES
2005	VNL	2	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 60 MONTHS OR 400,000 MILES - NO BATTERIES
2005	VNL	25	VOLVO - EXTENDED PURCHASE PREMIUM COVERAGE - 39 MONTHS OR 450,000 MILES - COVENANT TRANSP.
2005	VNL	24	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 60 MONTH OR 500,000 MILES
2005	VNL	24	VOLVO - EXTENDED PREMIUM 44/525,000/10,800 NO TRANS OR REAR AXLE
2005	VNL	368	VOLVO - EXTENDED MAJOR COMPONENT PURCHASED COVERAGE - 72 MONTH OR 600,000 MILES
2005	VNL	5768	VOLVO - PREMIUM NORMAL DUTY COVERAGE (36 MONTHS OR 350,000 MILES)
2005	VNL	2	VOLVO - EXTENDED PREMIUM COVERAGE - 48MO/500K MILES - NO REAR AXLE(S) OR TRANS CLAIMS
2005	VNL	46	VOLVO - SPECIAL PREMIUM CHASSIS COVERAGE 24 MONTH OR 400,000 MILES - SEE PV771-016B
2005	VNL	3	VOLVO - PREMIUM COVERAGE SPECIAL - LESS CLUTCH - 36 MONTHS AND 350,000 MILES
2005	VNL	7	(LESS CLUTCH) PREMIUM BASIC CHASSIS 36/350 NORMAL DUTY - VOLVO
2005	VNL	1	(LESS STARTER) PREMIUM BASIC CHASSIS 36/350 NORMAL DUTY - VOLVO
2005	VNL	14	VOLVO - EXTENDED PURCHASE PREMIUM COVERAGE - 60 MONTHS OR 500,000 MILES
2005	VNL	7	VOLVO - EXTENDED PREMIUM COVERAGE - 36 MONTHS OR 500,000 MILES
2005	VNL	21	VOLVO - EXTENDED PREMIUM COVERAGE - 48 MONTHS OR 500,000 MILES
2005	VNL	165	VOLVO - EXTENDED PREMIUM NORMAL DUTY COVERAGE (48 MONTHS OR 550,000 MILES)
2005	VNL	12	VOLVO - EXTENDED PLAN 2 (72M/600K) AND EXTENDED MAJOR COMPONENTS (84M/700K)
2005	VNL	2	VOLVO - PREMIUM NORMAL DUTY COVERAGE 36MO/400,000 MILES
2005	VNM	109	VOLVO - NO CHASSIS WARRANTY - SEE INDIVIDUAL STARTER AND ALTERNATOR COVERAGE
2005	VNM	34	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 24 MONTHS OR 100,000 MILES - NO BATTERIES
2005	VNM	38	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 24 MONTHS OR 200,000 MILES - NO BATTERIES
2005	VNM	14	VOLVO - EXTENDED BASIC PURCHASED COVERAGE - 60 MONTHS OR 400,000 MILES - NO BATTERIES
2005	VNM	55	VOLVO - EXTENDED MAJOR COMPONENT PURCHASED COVERAGE - 72 MONTH OR 600,000 MILES
2005	VNM	251	VOLVO - PREMIUM NORMAL DUTY COVERAGE (36 MONTHS OR 350,000 MILES)
2005	VNM	5	VOLVO - PREMIUM COVERAGE SPECIAL - LESS CLUTCH - 36 MONTHS AND 350,000 MILES
2005	VNM	1	(LESS CLUTCH) PREMIUM BASIC CHASSIS 36/350 NORMAL DUTY - VOLVO

Source of information: Volvo's Warranty Department. The information was gathered on October 20, 2008.

6. Produce copies of all service, warranty, and other documents that relate to, or may relate to, the alleged defect in the subject and peer 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, and state the date on which Volvo plans to issue the communication.

Answer: Copies of the reports are provided in section 2 of the binder. There are no plans to issue any communications within the next 120 days

Source of information: Volvo's service manual and Product Reliability Department. The information was gathered on November 4, 2008.

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7. *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. 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.

Answer:

TRW 8D Report 262-2000, dated November 29, 2000

- Summary of the subject and objective of the actions: Review of separated ball socket from an 8079525 drag link to determine root cause of the separation.
- Group responsible for conducting the action: TRW
- Findings/ conclusions: Contamination of the socket led to corrosion and wear of the ball stud resulting in separation.

TRW 8D Report 274-2000, dated December 11, 2000

- Summary of the subject and objective of the actions: Review of separated ball socket from an 8079525 drag link to determine root cause of the separation.
- Group responsible for conducting the action: TRW
- Findings/ conclusions: Contamination of the socket led to corrosion and wear of the ball stud resulting in separation.

TRW Materials Engineering Report 52-03, dated November 11, 2003

- Summary of the subject and objective of the actions: Review of separated ball socket from an 8079525 drag link to determine root cause of the separation.
- Group responsible for conducting the action: TRW
- Findings/ conclusions: Contamination of the socket led to corrosion and wear of the ball stud resulting in separation. Materials analysis of the ball stud and socket housing conform to material and heat treatment specifications.

TRW Engineering Analysis Report EA-27-03, dated December 10, 2003

- Summary of the subject and objective of the actions: Fleet request for analysis of TRW drag link (8079525) due to reported excessive wear on adjustable end.
- Group responsible for conducting the action: TRW
- Findings/ conclusions: Socket wear is due to contamination. The rate of wear is increased when contamination is introduced in the socket cavity. TRW recommends a review of maintenance procedures and intervals to ensure timely wear detection and proper seal inspections.

TRW Engineering Analysis Report EA-1-08A, dated March 24, 2008

- Summary of the subject and objective of the actions: Review of separated ball socket from an 8079525 drag link to determine root cause of the separation.
- Group responsible for conducting the action: TRW
- Findings/ conclusions: Contamination of the socket led to corrosion and wear of the ball stud resulting in separation.

Copies of the reports are provided in section 3 of the binder.

Source of information: Volvo's Product Reliability Department. The information was gathered on November 4, 2008.

8. *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 component, from the start of production to date, which relate to, or may relate to, the alleged defect in the subject and peer vehicles. 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 number(s) (service and engineering) of the original component;*
 - e. The part number(s) (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.

Answer: There were no modifications or changes made by or on behalf of Volvo for the subject component that relate to the alleged defect and no changes are planned.

Source of information: Volvo's Product Development Department. The information was gathered on October 31, 2008.

9. *State the number of each of the following that Volvo has sold that may be used in the subject and/or peer vehicles by component name, part number (both service and engineering/ production), model and model year of the vehicle in which it is used and month/year of sale (including the cut-off date for sales, if applicable):*
- Subject component (both sealed and greaseable drag-link assembly(s) if the subject components are not sold/serviced separately); and*
 - Any kits that have been released, or developed, by Volvo for use in service repairs to the subject component assembly.*

For each component part number, provide the supplier's name and appropriate point of contact (Name, title, and telephone number). Also, identify by make, model, and model year, any other vehicles of which Volvo is aware that contain the identical component, whether installed in production or in service, and state the applicable dates of production or service usage.

Answer (a): Both sealed and greasable drag-links are sold and serviced separately in the aftermarket; therefore, the information provided is on the "subject component" that may have been used in the subject and/or peer vehicles; (b) The drag link part numbers below are used in service repairs and are not available in kits.

Component name: Sealed (i.e. non-greaseable) drag links

- Part Number: 8079525 (Standard)
 - Models used in: VNL and VNM
 - Model years used in: 1996 through 2006
 - Month/ year of sale: 1995 (inception of VN) through June 2005
 - Manufactured by: TRW
 - Superseded by: 20371221
- Part Number: 20371221 (Standard)
 - Models used in: VNL and VNM
 - Model years used in: 2005 through 2009
 - Month/ year of sale: June 2005 through July 2008
 - Manufactured by: Lemforder
 - Superseded by: 21128332
- Part Number: 21128332 (Standard)
 - Models used in: VNL and VNM
 - Model years used in: 2009 and later
 - Month/ year of sale: July 2008 and later
 - Manufactured by: USK
 - Current drag link sold as service part for Subject and Peer vehicles

- Part Number: 8083227 (used with TAS85 Steering gear)
 - Models used in: VNL and VNM
 - Model years used in: 1998 through 2005
 - Month/ year of sale: 1997 through March 2005
 - Manufactured by: TRW
 - Superseded by: 20588242
- Part Number: 20588242 (used with TAS85 Steering gear)
 - Models used in: VNL and VNM
 - Model years used in: 2005 through 2009
 - Month/ year of sale: March 2005 through July 2008
 - Manufactured by: Lemforder
 - Superseded by: 21128334
- Part Number: 21128334 (used with TAS85 Steering gear)
 - Models used in: VNL and VNM
 - Model years used in: 2009 and later
 - Month/ year of sale: July 2008 and later
 - Manufactured by: USK
 - Superseded by: Current drag link sold as service part for Subject and Peer vehicles with TAS85 Steering gears
- Part Number: 8073373 (limited use with certain axle and steering gear configurations)
 - Models used in: VNL
 - Model years used in: 1996 through 2005
 - Month/ year of sale: 1995 and later
 - Manufactured by: TRW
 - Current drag link sold as service part for Subject and Peer vehicles for use with certain axles/ steering gear configurations

Sales numbers on the above listed components can be found in section 4 of the binder. Database goes back to 2005. Sales prior to 2005 are unknown.

Address and contact information for suppliers:

TRW FAHRWERKSYSTEME GMBH & CO. KG.
POSTFACH 110350
DE-40503 DUSSELDORF GERMANY
Contact Name: David Hobson
Title: Manager, Quality Systems
Phone number: (765) 429-1768

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LEMFORDER CORPORATION
946 QUALITY DRIVE
LANCASTER, SC 29721
Contact Name: Bob Miller
Title: Director, Sales
Phone number: (803) 416-8969

USK International S.A. de C.V.
KM 42.5 AUTOPISTA
MEXICO QUERETAQRO
Contact Name: Jorge Sylvester
Title: Sales
Phone number: (440) 205-9982

Source of information: Volvo's Parts Department and Product Department. The information was gathered on November 5, 2008.

10. *Provide the following for the subject vehicles:*

- a. *State the design life for the subject components (sealed and greaseable);*

Answer:

- Urban use: 500,000 km (310,686 miles) based on 5 maneuvers /km
- Long Range use:
 - 800,000 km (497,097 miles) based on 4 maneuvers/km
 - 1,000,000 km (621,371 miles) based on 1 maneuver/ km

See page 8 in Volvo Tech. Reg. 6850661, which is located in section 5 of the binder)

- b. *State the service replacement specifications for the subject components;*

Answer: Any motion such as axial movement of greater than 3 mm (1/8 in) requires replacement.

See TRW service literature "LNK -105" and page 113 of Operator's manual, which is located in section 5 of the binder)

- c. *State the material composition of the subject component;*

Answer: Supplier controlled, will request information.

- d. *State the hardness specifications for the ball and housing socket for the subject component;*

Answer: Supplier controlled, will request information.

- e. *State the surface finish specification of the ball;*

Answer: Supplier controlled, will request information.

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- f. *Provide a procedure for measuring the end play of the subject component, and state the nominal dimensions and design tolerances of the ball and socket arrangement; and*

Answer: See TRW service literature LNK-105 and page 113 of operator's manual located in section 5 of binder. The nominal dimensions and design tolerances of the ball and socket arrangement are supplier controlled; I will request information.

- g. *State the frequency and provide a copy of any maintenance and inspection procedure which is recommended by Volvo concerning the steering linkage on subject and peer trucks.*

See TRW service literature LNK-105 and page 113 of operator's manual located in section 5 of binder.

Source of information: Volvo's Product Department. The information was gathered on November 5, 2008.

11. *By vehicle application (model, model year) identify by part number and manufacturer any drag link installed by Volvo as the standard drag link or as an optional drag link on the subject and peer vehicles. Describe the differences between all drag links listed.*

Answer:

Model Year 2005:

Part #	Model(s)	Manufacturer	Differences
8079525	VNL/ VNM	TRW	Standard sealed
20371221	VNL/VNM	Lemforder	Standard sealed (superseded 8079525; difference – New supplier/ increased diameter of socket from 35 mm to 40 mm)
8083227	VNL/VNM	TRW	Sealed/ used with TAS85 steering gear
20588242	VNL	Lemforder	Sealed/ used with TAS85 steering gear (superseded 8083227; difference – supplier/increased diameter of socket from 35 mm to 40 mm)
8073373	VNL/VNM	TRW	Sealed (same drag link as 8079525 with dimensional differences for use with certain axles/ steering gear configurations)
20407667	VNL/VNM	TRW	Standard greasable

Bold indicates baseline

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Model Year 2006:

Part #	Model(s)	Manufacturer	Differences
8079525	VNL/ VNM	TRW	Standard sealed
20371221	VNL/VNM	Lemforder	Standard sealed (superseded 8079525; difference – New supplier/ increased diameter of socket from 35 mm to 40 mm)
20588242	VNL	Lemforder	Sealed/ used with TAS85 steering gear (superseded 8083227; difference – supplier/increased diameter of socket from 35 mm to 40 mm)
8073373	VNL/VNM	TRW	Sealed (same drag link as 8079525 with dimensional differences for use with certain axles/ steering gear configurations)
20407667	VNL/VNM	TRW	Standard greasable

Bold indicates baseline

Source of information: Volvo's Parts Department and Product Department. The information was gathered on November 5, 2008.

12. *Provide the name of the component manufacturer for both subject and peer vehicles. For each manufacturer identified, provide copies of ANY communications (including, but not limited to testing, durability, maintenance requirements, field visits, and engineering changes), that relate or may relate to the alleged defect on the subject and peer vehicles. Organize all such communications in chronological order and if the provided document does not identify the individuals in the communications, please provide the name and title of such officials as well as the date of communication.*

Answer:

- TRW FAHRWERKSYSTEME GMBH & CO. KG. ("TRW")
- LEMFORDER CORPORATION

See documents located in section 6 of binder.

Source of information: Volvo's Product Reliability and Regulatory Affairs Departments. The information was gathered on November 5, 2008.

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13. *Furnish Volvo's detailed assessment of the alleged defect in the subject vehicle, including:*

a. *The causal or contributory factor(s);*

Answer: Damage of seal/ boot resulting in contamination of the ball and ball socket in conjunction with lack of inspection and replacement as specified in service and operator manuals.

b. *The failure mechanism(s);*

Answer: Damaged seal/ boot resulting in water and debris ingress, which results in washing the grease out and rusting the ball and socket over time. The introduction of rust and debris causes the ball stud and socket to wear diminishing the ball stud's diameter.

c. *The failure mode(s);*

Answer: Looseness in the ball socket joint. If not addressed, the ball stud can wear to a point where separation can occur.

d. *The risk to motor vehicle safety that it poses;*

Answer: See summary below.

e. *What warnings, if any, the operator and other persons both inside and outside the vehicle would have that the alleged defect was occurring or subject component was malfunctioning; and*

Answer:

- Looseness in ball socket assembly when performing required inspections
- Loose feeling in steering ("play")
- Possible noise ("popping")

Looseness in the ball socket assembly found by inspection as required in the TRW LNK-105 and the operator's manual was stated in the majority of the warranty claims. Loose feeling in steering and noise was also stated in a number of warranty claims.

f. *The reports included with this inquiry.*

Answer: Regarding the alleged incident involving 4V4NC9TH65N [REDACTED] Volvo is unable to make a fact based assessment without access to the failed component and vehicle. However, according to state registration records, the owner of record is Volvo Financial Service (see document in section 7 of the binder). After contacting Volvo Financial Services, it was found that the lessee terminated the lease in March of this year because the vehicle had been totaled. The incident date reported to ODI was July 3rd, 2008. Of course, this brings into question whether the prior accident involving the vehicle had a bearing on the incident reported to ODI.

November 7, 2008

Summary and conclusion: No assessment can be made regarding the incident involving 4V4NC9TH65N [REDACTED] without physical examination of the component and vehicle; however, the fact that the vehicle was reported as being totaled to Volvo in March brings into question the validity of the claim.

Volvo's experience with the alleged defect is that there would not be a separation without prior warning and that basic preventive maintenance by the driver/owner as required in Federal requirements and Volvo and TRW's literature mitigates the risk to motor vehicle safety. This is substantiated by the supplied information contained in the binder.