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Via Email: RMD.ODI@dot.gov

To: Defects and Recall Information Analysis Division
Associate Administrator for Safety Assurance
National Highway Traffic Safety Administration
400 7th Street, SW
Washington DC 20590

PART 573 Defect and Noncompliance AMENDED Report

Report Date: June 8, 2012
Amended Report Date: June 29, 2012

On February 21, 2012, Vermeer Manufacturing Company, d/b/a Vermeer Corporation, determined that there is a defect which relates to motor vehicle safety with respect to certain motor vehicles listed below, and is furnishing notification to the National Highway Traffic Safety Administration in accordance with 49 CFR Part 573 Defect and Noncompliance Reports.

1. **Fabricating Manufacturer:**
Vermeer Manufacturing Company, d/b/a Vermeer Corporation
1210 Vermeer Road East
Pella, IA 50219
Telephone: 641-628-3141 **Fax:** 641-621-7739

Contact Name and Title:	Lois Slings Product Liability Risk Manager
Name and Title of Person Who Prepared Report:	Tom Haley Product Safety Engineering Manager

Signed: _____ **Date:** 6/29/12

President's E Star Award

PART 573 Defect and Noncompliance Report

Report Date: June 8, 2012
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I. Identify the Vehicle Models Involved in the Recall

2. **Manufacturer's Identification Code:** IK00-1712

3. **Vehicle Identification:**

Make:	Vermeer	**Model Years Involved:**	2007-2012	
Model(s):	BC1500			
Production Dates:	Beginning:	01/26/07	Ending:	05/31/12
VIN Range:	Beginning:	1VR2161V671	Ending:	1VR2161VX91
	Beginning:	1VR2161V781	Ending:	1VR2161VXC1
	Beginning:	1VR2161V1C1	Ending:	1VR2161V9C1
Vehicle Type:	Trailer – Single axle brush chipper			

Description which characterizes/distinguishes the recalled vehicles from those model vehicles not included in the recall: The VIN Ranges include 1770 units.

Identify the approximate percentage of the production of all the recalled models manufactured by your company between the inclusive dates of manufacture provided above, that the recalled model population represents. For example, if the recall involved Widgets equipped with certain items of equipment from January 1, 1996 through April 1, 1997, then what was the percentage of the recalled Widgets of all Widgets manufactured during that time period. 100%

II. Identify the Recall Population

4. **Total Number of Vehicles Recalled Potentially containing the defect or noncompliance:**

Model	Year	Number of Vehicles Potentially Involved
BC1500	2007	260
BC1500	2008	334
BC1500	2009	296
BC1500	2010	241
BC1500	2011	277
BC1500	2012	362
Total Number Potentially Affected by the Recall:		1770

5. **Approximate percentage of Total Number of Vehicles Estimated to actually contact the defect or noncompliance:** 100%

Identify and describe how the recall population was determined, in particular how the recalled models were selected and the basis for the beginning and final dates of manufacture of the recalled vehicles: From manufacturing records, we were able to determine the 1770 units were built with the same frame and inner tongue configuration

III. Describe the Defect or Noncompliance

6. **Describe the defect or noncompliance. The description should address the nature and physical location of the defect or noncompliance. Illustrations should be provided as appropriate.**

Model BC1500 brush chipper units, S/N 2082 - 2852, were equipped with a mainframe weldment, Item number 163677071 (Exhibit A). At the location where the Tube-Outer Tongue (Item 4, Exhibit A) intersects the Saddle-Tank (Item 5, Exhibit A) was incorrectly welded across the bottom of the Tube-Outer Tongue (Item 4, Exhibit A). A Finite Element Analysis (FEA) was undertaken to determine the stress levels at the location of the incorrectly welded joint to compare to the as designed mainframe weldment. The comparison analysis indicated that the material stresses in the Tube-Outer Tongue (Item 4, Exhibit A) at the toe of the weld could result in bending and/or fatigue fractures (cracks) which can eventually result in the failure of the tube at the Saddle-Tank (Item 5, Exhibit A) of the mainframe weldment.

During the investigation of the design fix for the incorrectly welded joint, reports of field failures at the first cross member (Item 3, Exhibit A) behind the Saddle-Tank were received. With the inner tongue tube placed in its extended position, the FEA indicated a stress level at the second cross member that could result in a bending fatigue fracture at the toe of the weld.

The failure will result in mainframe sag/droop at the location of the failure but would not result in total separation of the Tube-Outer Tongue (Item 4, Exhibit A) due to the bolted joints in the mainframe.

A copy of a product brochure for Vermeer Model BC1500 (Exhibit B) is attached for your reference.

Describe the cause(s) of the defect or noncompliance condition.

Incorrect welding during manufacturing process.

High stress levels with the inner tongue tube placed in its extended position.

Describe the consequence(s) of the defect or noncompliance condition.

Development of bending and/or fatigue cracks in the Tube-Outer Tongue which can result in a frame failure

Identify any warning which can (a) precede or (b) occur.

(a) Visible bending and/or fatigue cracks can develop at the high stress site prior to failure.

If the defect or noncompliance is in a component or assembly purchased from a supplier, identify the supplier by corporate name and address.

Not applicable.

Identify the name and title of the chief executive officer or knowledgeable representative of the supplier.

Not applicable.

IV. Provide the Chronology in Determining the Defect/Noncompliance

If the recall is for a defect, complete item 6, otherwise item 7.

7. **With respect to a defect, furnish a chronological summary (including dates) of all the principle events that were the basis for the determination of the defect. The summary should include, but not be limited to, the number of reports, accidents, injuries, fatalities, and warranty claims.**

02-NOV-2011 **First field notification** – Vermeer factory Environmental Division Service Department received a notification from the dealership, Vermeer Northend Machinery, Richmond, Australia regarding a crack found in the Tube-Outer Tongue of the mainframe on BC1500 Brush Chipper, VIN 1VR2161V8A1002464. Photo of the frame section is attached as Exhibit C.

15-NOV-2011 **Second field notification** – Vermeer factory Environmental Division Service Department received a notification from the dealership, Vermeer Northend Machinery, Campbellfield, Australia regarding a crack found in the Tube-Outer Tongue of the mainframe on BC1500 Brush Chipper, VIN 1VR2161V4B1002608. Photo of the frame section is attached as Exhibit D.

8-FEB-2012 **Third field notification** - Vermeer factory Environmental Division Service Department received notification from the dealership Vermeer Wisconsin, West Salem, WI regarding a crack found in the Tube-Outer Tongue at the second cross-member of the mainframe on the BC1500 Brush Chipper, VIN 1VR2161V681001582. Photo of the frame section is attached as Exhibit E.

15-FEB-2012 **Fourth field notification** – Vermeer factory Environmental Division Service Department received a notification from the dealership, Vermeer Northend Machinery, Richlands, Australia regarding a crack found in the Tube-Outer Tongue of the mainframe on BC1500 Brush Chipper, VIN 1VR2161V7B1002568.

21-FEB-2012 Vermeer Product Safety Department met with Environmental Service and Engineering Departments to discuss the frame issue. It was determined that Environmental Engineering would develop a frame reinforcement design to reduce the high stresses that resulted from the incorrectly welded mainframe on the BC1500.

06-MAR-2012 A Finite Element Analysis (FEA) review of the original design, the as-built design and the proposed field repair was completed.

21-MAR-2012 **Fifth field notification** – Vermeer factory Environmental Division Service Department received notification from the dealership Vermeer Canada Inc. regarding a crack found in the Tube-Outer Tongue of the mainframe on the BC1500 Brush Chipper, VIN 1VR2161VXB1002662. Photo of the frame section is attached as Exhibit F.

13-APR-2012 Strain gauge road test on correctly manufactured mainframe was conducted.

26-APR-2012 **Sixth field notification** – Vermeer factory Environmental Division Service Department received notification from the dealership Vermeer Wisconsin, West Salem, WI regarding a crack found in the Tube-Outer Tongue at the second cross-member of the mainframe on the BC1500 Brush Chipper, VIN 1VR2161V471001062.

26-APR-2012 Vermeer Product Safety Department met with Environmental Service and Engineering Departments to discuss the frame issue. It was determined the Environmental Engineering would travel to the Wisconsin dealership to review the VIN 1VR2161V471001062 failure.

1-MAY-2012 Environmental Engineering personnel traveled to Wisconsin to review the reported failure at the second cross member of VIN 1VR2161V471001062. A portion of the failed Tube-Outer Tongue was removed from the frame for evaluation.

4-MAY-2012 Completed an FEA review of the proposed design fix based on the strain gauge results of April 13, 2012.

16-MAY-2012 Completed second round of strain gauge road tests of current inner tongue design in retracted position and a new proposed longer inner tongue in the extended position.

24-MAY-2012 Metallurgical analysis of the failed frame from VIN 1VR2161V471001062 was completed. Material analysis met the requirements of the material specifications of the tubing and gussets.

With respect to a noncompliance, identify and provide the test results or other data (in chronological order and including dates) on which the noncompliance was determined.

Not applicable.

Furnish a description of the manufacturer's remedy for the defect or noncompliance. Clearly describe the differences between the recall condition and the remedy.

The engineering team has completed a frame reinforcement design that FEA analysis that confirms that the distribution of loading will produce satisfactory fatigue life. The new design reinforcement will increase the mainframe weldment cross-section by a factor of 4.8 along with eliminating the high bending stresses at the location of the incorrect weld. See Item Number 163677823 drawing attached as Exhibit G. With the addition of the reinforcement, our analysis shows that the peak stresses will be reduced by 90 percent.

The engineering team has completed an inner tube tongue design that FEA analysis that confirms that the distribution of loading will produce satisfactory fatigue life with the tongue in the extended position. The new design will increase the inner tube length by 16" moving the high stress loads beyond the first cross member of the mainframe. See Item Number 163677866 drawing attached as Exhibit H. With the additional length of the inner tube, our analysis shows that the peak stresses will be reduced by 40 percent.

Clearly describe the distinguishing characteristics of the remedy component/assembly versus the recalled component/assembly.

Field kit modifications are currently under development. The new mainframe reinforcement shows adequate service life.

Identify and describe how and when the recall condition was corrected in production. If the production remedy was identical to the recall remedy in the field, so state. If the product was discontinued, so state.

Various separate serial number (S/N) ranges are affected by this campaign.

- S/N range 2082 – 2852 is included due to an incorrect manufacturing weld procedure. The weld procedure was corrected with S/N 2853 and above. The issue did not exist on S/N ranges 1001 – 1599 and 2000 – 2081.

- S/N ranges 1001 – 1599, 2000 – 3165 and 5001 – 5005 are included due to the stress levels at the second cross-member as itemized in section 4 of this report. The interruptions in serial number ranges indicate that major enhancements have occurred with Model 1500, such as a tier emission engine enhancement. The high stress level at the second cross-member issue was corrected at S/N 3166 and above, as well as S/N 5006 and above with the increase in the inner tube tongue length.

VI. Identify the Recall Schedule

Furnish a schedule or agenda (with specific dates) for notification to other manufacturers, dealers/retailers, and purchasers. Please, identify any foreseeable problems with implementing the recall.

14-JUL-2012: Complete development of field modification kit, including fabrication of replacement parts and installation instructions.

16-JUL-2012: Factory will publish Service Bulletin and Kit Instructions to dealers introducing field modification kit via company-to-dealer website.

16-JUL-2012: Factory will provide listing of affected units in their area to dealers via fax and/or email.

30-JUL-2012: Factory will notify owners of mandatory field modification via certified/registered US mail.

VII. Furnish Recall Communications

11. Furnish a final copy of all notices, bulletins, and other communications that relate directly to the defect or noncompliance and which are sent to more than one manufacturer, distributor, or purchaser. This includes all communications (including both original and follow-up) concerning this recall from the time your company determines the defect or noncompliance condition on, not just the initial notification. ***A DRAFT copy of the notification documents should be submitted to this office by Fax (202-366-7882) or by E-Mail to RMD.ODI@dot.gov for review prior to mailing.***
Note that these documents are to be submitted separately from those provided in accordance with Part 579.5 requirements.