

*Ford Motor Company*

James P. Vondra, Director  
Automotive Safety Office  
Environmental & Safety Engineering

February 6, 2004

Ms. Kathleen C. DeMeter, Director  
Office of Defects Investigation Safety Assurance  
National Highway Traffic Safety Administration  
400 Seventh Street, S.W.  
Washington, DC 20590

Dear Ms. DeMeter:

Subject: EA03-004:NVS213cla - Request for update

In a December 22, 2003 e-mail, Chris Lash of your office requested that Ford Motor Company (Ford) provide an update of claims and reports for EA03-004, concerning alleged wheel stud breakage on 1987-2000 Ford Windstar vehicles, and any further information concerning testing and analysis being performed by Ford. Ford last responded to EA03-004 on August 27, 2003.

The requested updated data (owner reports, field reports, warranty claims, UDB claims, and lawsuits and claims) is provided on the enclosed CD as Appendix A (file: 2004-02-07\_Appendix\_A). Files for this update were searched and reviewed in the same manner as described in Appendix B of Ford's August 27, 2003 response, but include reports dated from July 1, 2003 through December 22, 2003, the date of your request.

Ford has attempted to gather additional information concerning the 11 claims and reports (including three VOQ's) that allege wheel separation caused by wheel stud fracture (category A1) or alleged wheel separation for an unknown cause (category B1) located in preparation of this update. A summary of the additional information obtained is provided in Appendix B (file: 2004-02-07\_Appendix\_B) on the enclosed CD. Nine of the eleven reports contained enough information for possible customer contact. (Two of the VOQ's did not include vehicle identification numbers, thus we are not able to contact owners. Ford notes that the third VOQ was submitted nearly four years after the alleged incident and two years after the vehicle had been sold.) We were able to actually contact seven of the nine owners to obtain additional information, and we are currently attempting to obtain parts from these vehicles, where available. All seven of the contacted customers reported having had service that involved wheel removal, including new tire installation or tire rotation, performed prior to the alleged incident - three used an independent service facility, and three performed their own service on a regular basis. The remaining vehicle may have been serviced at a Ford dealership. All of the customers that were contacted indicated that there was some type of warning prior to the

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alleged wheel separation, either in the form of vibration or unusual noise coming from the front end of the vehicle. None of the alleged incidents resulted in a vehicle-to-vehicle collision or injuries; only minor damage to the subject vehicle as a result of the incident is alleged. The lack of injuries and the absence of car-to-car incidents indicate that if a wheel does come off a vehicle, an operator is able to control the vehicle and avoid any other contacts.

As part of its investigation in response to EA03-004, Ford conducted extensive testing and analyses to verify that the subject parts were designed properly and compared the Ford components to similar components in peer vehicles. The initial results of this testing show that the subject vehicle components perform equal to or better than peer vehicle components. In addition, dimensional and material comparisons show that the component design is equivalent to those used on peer vehicles.

To further evaluate the design of the Windstar wheel joint as part of this investigation, Ford has recently completed a "Junker's Test." This test, developed in Germany and based on a German standard (DIN 65151), was used to evaluate performance of the wheel attachment on Ford and peer competitor vehicles. During the "Junker's Test," the fastened joint is subjected to a transverse load that promotes joint loosening. Joint tension (preload) is recorded throughout the duration of the test. Amplitude and frequency of the vibrations are assigned conditions and are computer controlled. The force required to generate the desired transverse movement changes as the test progresses. The Ford Windstar joint performance surpassed that of the competition. The results indicate that the Ford joint had a more gradual reduction in tension than the peer competitor vehicles.

Ford has recently developed a Key Life Test, (Accelerated Road Wheel Attachment Test: DVM-0004-TY) to validate wheel attachment joint performance over the life of a vehicle. This test simulates the usage of a vehicle over 150,000 miles through an accelerated set of on-offs, rough road, spike stops and figure 8's maneuvers, all at maximum front GAWR. The initial torque is set at the minimum specification. Torque is then measured before and after the test, and the joint must exhibit no greater than a 30% drop in torque to pass. Ford is currently performing this test using a Windstar with wheels, hubs, studs, and nuts from the 1999 model year. The results will be available by February 20, 2003. Ford personnel will be available to further review the test results if NHTSA desires.

Based on extensive testing and analyses, Ford does not believe the reported events indicate the presence of a defect trend in the design, manufacture, or assembly of the wheel attachment on the subject vehicles. Rather, we believe that the reported loose attachments and stud failures are likely due to 1) improper tightening of the fasteners to the specified torque of 100 ft-lbs during the vehicle servicing that typically has occurred by the vehicle mileages at which these incidents have been alleged, or 2) other improper service, such as assembling the wheel to the vehicle with excessive dirt or corrosion present. Wheel separation due to stud fractures

typically is preceded by adequate warnings of noise or vibration during vehicle operation or from visual observation that a lug nut is missing or a stud is broken during other vehicle maintenance, such as brake inspection or tire rotation, or during vehicle cleaning or checking of tire pressure. For these reasons, Ford believes that reported wheel stud breakage on the subject vehicles does not demonstrate the existence of a defect in the wheel attachment or describe an unreasonable risk to motor vehicle safety.

If you have any further questions, please contact me.

Sincerely,



James P. Vondale

Attachment