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330 Town Center Drive
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April 20, 2006

Mr. Jeffrey Quandt, Chief
Vehicle Control Division
Office of Defects Investigation Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington D.C. 20590

Dear Mr. Quandt:

Subject: EA04-034:NVS-213dsy

In a letter dated March 17, 2006, Ford stated that wheel assessment data from wheels gathered from police fleets in Ohio, Colorado, and Pennsylvania would be forwarded to the agency as they became available. Ford has now received uniformity data, dunk tank testing results, and dye penetrant evaluation results from Hayes Lemmerz (HL) for those wheels. This data, and representative photos, is provided electronically (directory: 2006-04-20 Appendix A) on the enclosed CD. As described in our March 17, 2006, letter, and consistent with information already provided for wheels from Massachusetts, analysis of each wheel includes balance information, as-received tire pressure, wheel map drawings indicating notable visible damage, Akron Standard uniformity measurements, and CMM plots. HL also provided photographs of any notable wheel damage.

Pennsylvania Wheels

The Pennsylvania State Police provided 15 wheels (identified as PA1 through PA15 in Appendix A), including one 3W73-1007-CD, eleven 3W73-1007-CF, one 4W73-1007-AA, and two 3W73-1007-CG wheels. A small crack was detected in wheel PA7 by both the dunk tank and dye penetrant methods. Wheels PA2, PA8, and PA14 do not meet the original specification for run-out and show indications of impact on the CMM plots. Wheel PA15 shows no signs of being mounted on a vehicle. All of the wheels were received with tires mounted; pressures were measured for each assembly as-received and were found to range from 29 psi to 36 psi. The pressure in each tire was adjusted to 35 psi and left overnight in an unloaded condition; all tires maintained 35 psi pressure.

Ohio Wheels

The Cleveland Police provided 12 wheels (identified as OH1 through OH12 in Appendix A), including one 3W73-1007-CF and eleven 4W73-1007-AA wheels. Two wheels (OH9 and OH11) had a single crack; one (OH4) had two cracks. Wheels OH1, OH7, and OH8 do not meet the original specification for run-out. Wheels OH1, OH4, OH7, OH8, OH9, OH10, OH11, and OH12 show indications of deformation from impact on the CMM plots. All of the wheels were received

with tires mounted; pressures were measured for each assembly as-received and were found to range from 18 psi to 53 psi except wheel OH5 which was completely deflated due to a nail in the tire. The pressure in each tire (except OH5) was adjusted to 35 psi and left overnight in an unloaded condition; all tires maintained 35 psi pressure.

Colorado Wheels

The Douglas County Sheriff office in Colorado provided 12 wheels (identified as CO1 through CO12 in Appendix A), including five 3W73-1007-CD and seven 4W73-1007-AA wheels. None of the wheels were cracked and none had notable visible damage. Wheel CO8 did not meet the original specification for run-out. All of the wheels were received with tires mounted; pressures were measured for each assembly as-received, and were found to range from 28.5 psi to 38 psi. The pressure in each tire was adjusted to 35 psi and left overnight in an unloaded condition; all tires maintained 35 psi pressure.

Crack Propagation Lab Testing

As previously discussed, in March, HL conducted radial fatigue testing on a warranty return wheel (VIN 2FAFP71W13[redacted] that contained two cracks. The test was conducted to evaluate whether the cracks would propagate and join. The test was conducted on a radial fatigue fixture; the tire was inflated to 35 psi, loaded to ½ the GAWR (the maximum intended load of 1,611 lbs.), and cycled at 45 mph. The test was suspended every 500,000 cycles to dismount the tire and measure and record the crack length. The tire was then re-mounted, re-inflated to 35 psi and the test continued. The series of wheel maps showing the crack location and length at the start of the test, at each half million cycle interval, and at the end of the test is provided electronically in Appendix B (directory: 2006-04-20 Appendix B) on the enclosed CD. Testing was terminated after 2.75 million cycles when the distance between the wheel/tire assembly and the test fixture met a pre-determined limit due to loss of tire pressure. Post–test photos showing the crack fracture surface are also provided in Appendix B. HL was not able to measure the rate of air loss, or the rate of crack propagation just prior to the end of the test.

Ford is conducting similar crack propagation testing on a radial fatigue lab fixture while continually monitoring air pressure and strain in the heat affected zone on the rim. That testing is ongoing; over seven million cycles have accumulated. Cold tire pressure was set at 35 psi at the start of testing, the tire pressure increased to 40.2 psi hot early in the test. The hot tire pressure decreased to 33.8 psi after approximately five million cycles. Results of this testing will be provided as they become available.

If you have questions, please contact me.

Sincerely,

R. A. Nevi

R. A. Nevi
Assistant Director
Global Automotive Safety and Compliance

Attachments