



RECEIVED  
NV-210

2003 JAN 29 P 2:12

UNITED STATES DEPARTMENT OF TRANSPORTATION

January 27, 2003

Ms. Kathleen DeMeter, Director  
Office of Defects Investigation  
National Highway Traffic Safety Administration  
400 Seventh Street S.W. Room 5326  
Washington, D.C. 20590

03E-003 (1/2)

RE: EA02-004

Dear Ms. DeMeter:

This letter is submitted pursuant to Part 573 of Title 49 of the Code of Federal Regulations, Defect and Non-Compliance Reports. Electronic Mobility Controls LLC (EMC) submits this to resolve NHTSA's concerns resulting from its investigation of the DS-2000 Primary Driving Control System. This investigation focused on allegations that vehicles equipped with the system reportedly drifted or veered off course and did not respond to driver's steering efforts to correct the reported drifting. During its investigation, NHTSA was able to artificially cause the system to drift or veer off line by deliberately inducing failures in certain components in the system. These artificially induced problems appear very similar to those reported by some owners.

The DS-2000 system was designed during the early 1990's and EMC started manufacturing and selling the system in 1995. The DS-2000 featured two redundant microprocessors, as well as dual redundant steering input potentiometers. The life expectancies of the functional components far exceeded the ten-year service life, which we assigned to the system. EMC designed a later system, the AEVIT, which replaced the DS-2000 in 2001. The replacement AEVIT system is very similar to the DS-2000 system, but with increased redundancy of the microprocessors and steering potentiometers (Pots).

Based on the results of NHTSA testing and the continuing EMC research done during the development of the AEVIT system, EMC has developed safety upgrades for the DS-2000 to improve system redundancy and reliability. This campaign is designed to address safety concerns discussed in our recent meeting. To resolve the NHTSA investigation, EMC will conduct a safety recall campaign to initiate these safety upgrades as described below:

EMC has identified approximately 400 affected DS-2000 systems in the U.S. and EMC will request that all units be returned immediately according to a Safety Recall Campaign. EMC believes that all 400 units should be modified per this safety campaign. EMC will bring each returned unit to the current upgraded revision of Hardware and Software. Customers will be re-notified of required routine maintenance procedures.

EMC has developed a modification that frees up the A2D converter and feeds it with 1/2 the encoder reference voltage through a resistive divider. The software will be changed to monitor that voltage at startup to make sure it is in an acceptable range. If during operation it changes from its start up value, the system will give an error, switch slides and go into open loop mode of operation. This effectively tests all three references in the system (2 input pots, 1 output pot).

EMC will require that all dealers perform necessary routine maintenance on the vehicle while the system is in their shop.

EMC will require that dealers review the power connection for the DS-2000/EGB. We will include instructions for proper connection that will secure the harness wires in the connector. Dealers will be required to complete a checklist and return it to EMC to document these modifications.

EMC will provide each user with an updated DS-2000 Owner's Manual and an accompanying instructional videotape. Additionally, the new Owner's Manual will be available for state agencies, evaluators, instructors and dealers in PDF format via the EMC website. The new manual will feature the following:

- Detail relating to failure modes and errors, including the error log features
- Explanation of Emergency Mode / Open Loop
- Expanded Engage / Disengage procedure as well as Boot Up / Boot Down
- Boot Up procedure to include checking side one pot position vs. side two pot position
- Warning about errors and how to proceed
- Warning about Cable Connection as a single point failure
- Expanded Routine Maintenance Information
- Instruction on how to check primary and backup microprocessors using the controller wheel during boot up
- Instruction to test the AuxBat on a regular basis, at a minimum once per week
- For dealers and instructors using the evaluator console, a warning to engage both override buttons when switching from the student console to evaluator console will be included

EMC will check and possibly adjust the rate limit threshold to maximize system safety

All of the above listed actions will be performed at no cost to the owner.

EMC understands that NHTSA will refer to this as a safety recall. However, EMC believes that neither NHTSA nor EMC has established the necessary technical basis to make a determination that the subject steering systems contain a safety-related defect and therefore, EMC is taking this action to improve the safety of the product and not to remedy a safety-related defect.

EMC does not plan to issue a public statement concerning this action, since the names and addresses of all owners are available from EMC records. Copies of the notification letters to dealers and owners will be forwarded when available.

Respectfully,



Ric Reulet, Jr. P.E.  
VP Operations