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FACSIMILE COVER SHEET

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TO: Don Maertens

AT: Toch Center

PHONE NO.: 947-9373

FAX NO.: 947-6467

FROM: CARY P. YOSH

TELEPHONE: (313) 974-1720 (GM NETWORK 2-564-1720)

ADDRESS: GM LEGAL STAFF - PRODUCT & SYSTEMS ANALYSIS  
3051 WEST GRAND BOULEVARD  
PO BOX 13122  
NEW CENTER ONE BUILDING  
DETROIT, MICHIGAN 48223

FAX NO.: (313) 974-0622 (GM NETWORK 2-564-0622)

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Don,

Please give me a call if you have any questions regarding the attached.

Cary

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THE PROBLEM

LACK OF "DUE CARE" ANALYSIS AND DOCUMENTATION TO SUPPORT THE  
DESIGN OF "YIELDING" SEATS WHICH CAN RESULT IN OCCUPANT EJECTIONS  
AND THE RISK OF SEVERE HEAD AND/OR NECK INJURY IN REAR COLLISIONS.

HILL, LINDA  
1845-267241

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THE CONSEQUENCES

- o DIFFICULTY IN DEFENDING "YIELDING" SEATS IN LITIGATION --  
ESPECIALLY IN CASES INVOLVING THE EJECTION OF BELTED  
OCCUPANTS.
  - SHOWING THAT WE COMPLIED WITH FMVSS 207 (OR EVEN TWICE  
THE REAR MOMENT REQUIREMENT OF FMVSS 207) IS  
UNPERSUASIVE -- FMVSS 207 IS A "STATIC" TEST WITHOUT ANY  
DEMONSTRATED RELATIONSHIP TO DYNAMIC "REAL-WORLD"  
PERFORMANCE.
  - REAR BARRIER TEST FILMS SHOWING SEAT PERFORMANCE HAVE  
BEEN USED EFFECTIVELY BY PLAINTIFFS' ATTORNEYS.
  - NO GH TESTS OR DATA TO SUPPORT ASSERTIONS OF REDUCED  
NECK LOADING AND HEAD IMPACT POTENTIAL WITH "YIELDING"  
SEATS.
  - NO GH TESTS OR DATA TO SUPPORT ASSERTIONS THAT MORE  
RIGID SEATS CAN ENHANCE INJURIES.

HILL, LINDA  
1845-267242

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CONSEQUENCES CONTINUED...

- SOCIETAL HARM ANALYSES SHOWING THE RELATIVE INFREQUENCY OF SEVERE INJURIES IN REAR COLLISIONS ARE INSUFFICIENT FOR PURPOSES OF SHOWING THAT OUR CURRENT SEAT DESIGNS MEET THE LEGAL DUTY OF A MANUFACTURER UNDER LARSEN TO DESIGN A CRASHWORTHY VEHICLE.
- MANY SEAT DESIGNERS ARE UNAWARE OF HOW THEIR SEATS PERFORM IN THE FIELD, OR EVEN IN REAR BARRIER TESTS, AND, THOSE WHO ARE AWARE ARE UNABLE TO RELATE THAT PERFORMANCE TO "REAL-WORLD" INJURY PERFORMANCE.
- THE "YIELDING" SEAT DESIGN PHILOSOPHY IMPLIES THAT SEATS YIELD IN A "CONTROLLED" MANNER; HOWEVER, THERE IS AN INSUFFICIENT UNDERSTANDING OF OCCUPANT KINEMATICS AND INJURY MECHANISMS IN REAR COLLISIONS, AND THE TRADE-OFFS BETWEEN "YIELD" AND "RIGIDITY," TO ESTABLISH THAT YIELD IS BEING CONTROLLED TO MINIMIZE INJURY POTENTIAL IN ALL ACCIDENTS.
- o MOST IMPORTANTLY, WE ARE UNABLE TO EFFECTIVELY DEMONSTRATE THAT WE EXERCISED "REASONABLE CARE" AS A CARING CORPORATION TO DESIGN SEATS WHICH WILL REDUCE THE RISK OF INJURY OR INJURY ENHANCEMENT TO OUR CUSTOMERS IN REAR COLLISIONS.

HILL, LINDA  
1845-267243

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SEAT PERFORMANCE

NEEDS

1. NEED MORE INFORMATION ON EFFECT OF SEAT STIFFNESS AND STRENGTH ON OCCUPANT KINEMATICS AND POTENTIAL INJURY MECHANISMS IN REAR COLLISIONS.
2. NEED TO DEFINE AN APPROPRIATE LEVEL OF DYNAMIC SEAT PERFORMANCE WITHIN GM.
3. NEED TO UTILIZE THIS INFORMATION AND PERFORMANCE OBJECTIVE IN THE DESIGN OF ALL GM SEATS.
4. NEED TO DOCUMENT THE USE OF THIS INFORMATION AND THE RATIONALE FOR THE PERFORMANCE LEVEL OF GM SEAT DESIGNS.

HILL, LINDA  
1845-267244

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RECOMMENDATION

- o DEVELOP A CORPORATE PRODUCT PERFORMANCE OBJECTIVE (CPPO) FOR SEAT PERFORMANCE BASED ON AN ANALYSIS OF OCCUPANT KINEMATICS AND POTENTIAL INJURY MECHANISMS IN REAR COLLISIONS.
  - MINIMIZE THE POTENTIAL FOR OCCUPANT EJECTIONS AND HEAD CONTACT DUE TO SEAT BACK DEFORMATION IN REAR COLLISIONS.
  - OBTAIN APPROPRIATE TEST DATA TO SUPPORT ANY PROPOSED DYNAMIC OR STATIC TEST CONDITIONS AND ANY SEAT BACK DEFORMATION LIMITS.
  - CONSIDER THE EVALUATION OF OVERALL SEAT PERFORMANCE DURING SCHEDULED REAR MOVING BARRIER AND VEHICLE-TO-VEHICLE TESTS.
  - CONSIDER RESEARCH TO DEFINE APPROPRIATE INJURY CRITERIA BASED ON INJURY TOLERANCE LEVELS FOR A VARIETY OF REAR END IMPACT SITUATIONS AND SEAT RESPONSES.

HILL, LINDA  
1845-267245

OLESZ23582