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RICHARD D. MARTIN
FUEL TANK PROPOSAL
GMC
CHEVROLET & GMC C-K TRUCK
PICKUPS & CHASSIS-CABS
1983 PRODUCTION

PURSUANT TO PROTECTIVE ORDER
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GM425/DP92-016
QUESTION 4
00950

E13-A4

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C-X PICKUP FUEL TANK

• DESCRIBE FUEL SYSTEM

• A SERIES OF TESTS WERE RUN BETWEEN SEPTEMBER, 1981 AND MAY, 1982 TO DETERMINE COLLISION PERFORMANCE

SUMMARY: ADDED EXTERNAL TANK SHIELD
- PERFORMS SATISFACTORILY AT 50 MPH
- DOES NOT PREVENT TANK FAILURE AT 50 MPH DUE TO DISTORTION

INTERNAL TANK LINER

- HAS POTENTIAL TO PREVENT FAILURES AT 50 MPH
A. J. K. MILLER-15, GNC

• ALTERNATE TANK LOCATIONS WERE CONSIDERED

BEHIND THE REAR AXLE OVER THE SPARE TIRE

AHEAD OF THE REAR AXLE INSIDE OF THE FRAME

SIDE MEMBER

SUMMARY: LONG LEAD TIME

• PROPOSAL FOR MORE EFFECTIVE EXTERNAL PROTECTION

TO PREVENT PUNCTURE

TO PREVENT DISTORTION FAILURE

TO PREVENT SEPARATION FROM TANK MTG.

SUMMARY: FURTHER TESTING WILL PROCEED

HIGHEST DEGREE OF PROTECTION WILL BE ATTAINED

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15 JL 82

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REAR FUEL TANKS

65ACHAL

PASS TANK

RECEIVED

RECEIVED

K. MILLER VS. GM

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BASE REAR TANK

BASE REAR TANK AUXILIARY TANK SIDE

MILLER 16

AUX. TANK

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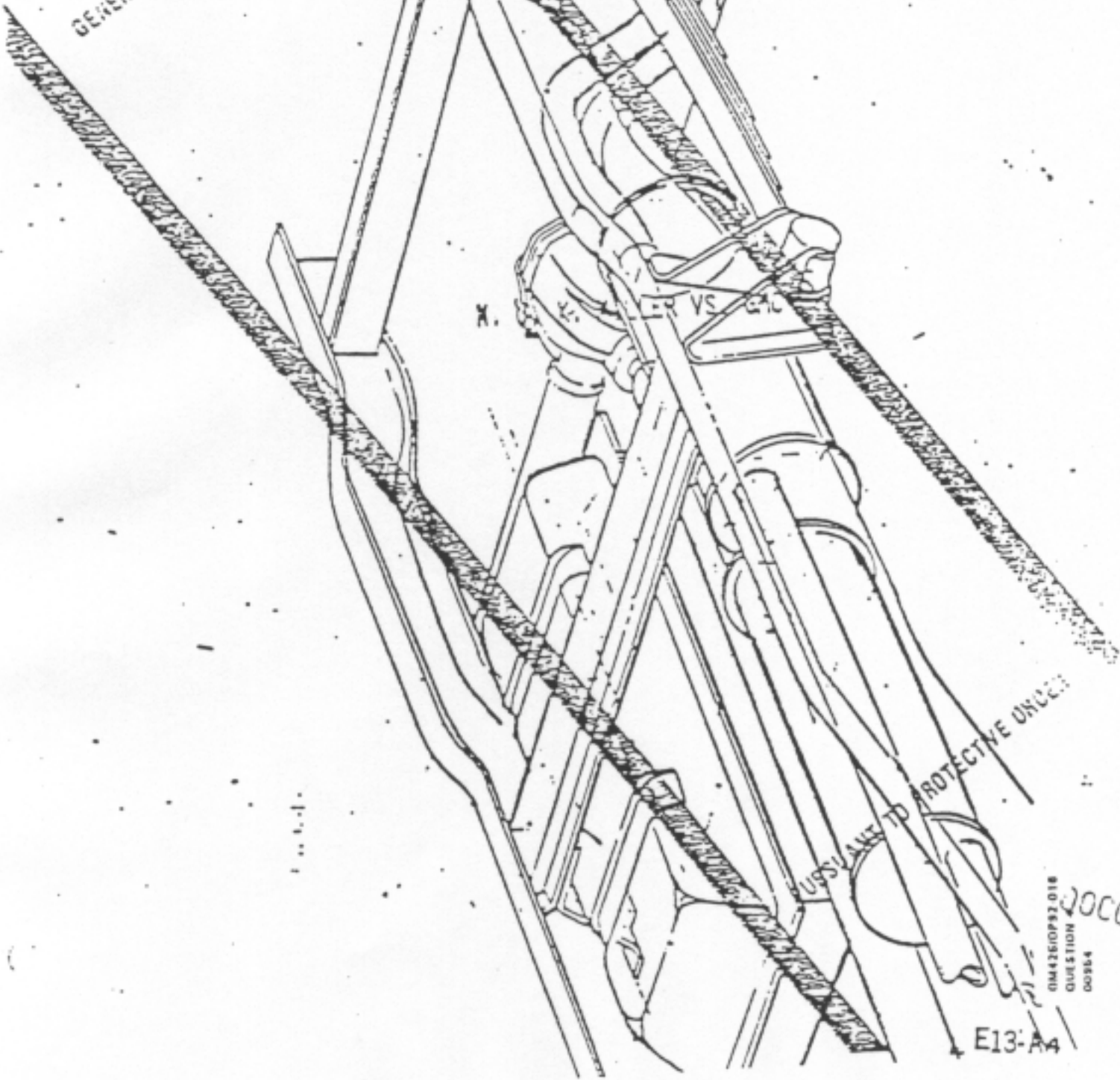
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SUBMIT TO PROTECTIVE UNCL

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J. K. MILLER VS. EAC

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COST ESTIMATE

NO ASSEMBLY PLANT TOOLING INCLUDED

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PROPOSAL SIDE MOUNTED FUEL TANK (BETWEEN FRAME RAILS)

EXHAUST SYSTEM OUTSIDE OF FRAME RAILS

TOOLING

• (2) NEW FUEL TANKS	\$2,000,000
• MUFFLER & TAILPIPE (MUFFLER NOT CHANGED)	200,000
• SUPPORTS (3 REQUIRED)	175,000
• FILLER NECKS (8 REQUIRED)	50,000
• CROSS MEMBERS	125,000
• FUEL PETER M. J. K. MILLER VS. ETC	200,000
• SIDE PANELS NOT CHANGED	----
• FILLER NECK LOCATION NOT CHANGED	----
	2,750,000

GAK:12MY82

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Steel Shield (Main Design)

	<u>Weight</u>	<u>Cost</u>
(2) Piece Shield (Side)	25#	\$15.00
(Top)	14#	\$ 8.00
Total Weight and Cost	39#	\$23.00

Approximate Tooling Cost \$500,000.00

Disadvantages:

- High weight
- Clearance problems between body, cab and steel shield.
- Shield retention problems - bolted to frame rail.
- Fuel tank service problems - difficult to service tank without removing shield.

Advantages:

- Positive barrier - border plate protection.

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Steel Shield

	GMC		<u>Cost</u>
(20) Gallon (474955) (.0835 thick)	15.00		\$ 7.64
(2) P. Shield (Side & Bottom)	25.00		\$12.50
(Top)			\$ 7.00
			\$19.50

Cost of Corvette steel bladder to Chevrolet

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Thermostamping (Buick Company)

Prototype
Piece Cost

\$9400.00

\$ 20.00/Tank

7 Weeks

Both halves (Re assembly) to Chevrolet

\$ 12.25

Lead

Weeks

RICHARD MARTIN VS. GMC

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	Blow Molding Nominal 100 mil Wall	Thermosetting Nominal 100 mil Wall
Tank weight, lbs.	10.00	10.00
Cycle time, min.	2.0	1.30
Tanks/hours*	60	90
Tanks/years**	306,000	408,000
Mold required/vehicle	1.14	0.90
Total mold cost (2 molds)		\$75,000
Resin cost (960c/lb.)		1.00
/Tank (950c/lb.)	\$4.75	
Mold cost/tank	\$0.08	\$0.17
Total resin and mold costs/tank	\$4.83	\$6.17
Labor & burden \$25.00/hour/tank	\$.42	\$.29
	\$5.25	\$6.46

- * Each process assumed to have two-cavity mold which produced two shields.
- ** Based on 6000 hours/year at 85% efficiency for both processes.
- *** Amortized over 3 years.
- © One mold may be used - estimated value 350,000.

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Plastic Bladder Fuel Tank

Cost of plastic bladder	\$20.00
New sending unit - 8 screw attachment (additional part and labor cost)	4.00
New design and attachment of fuel fill and vent lines	4.00

Disadvantages:

New fuel tanks

Barrier tests will be necessary.

Advantages:

No exterior clearance problems.

Looks like a clean cut design from the exterior.

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Two Piece Plastic Shield

Advantages:

- Light weight
- Excellent impact strength
- Thermostamping has better dimensional uniformity.
- Can be retrofited
- Lower cost
- Ease of assembly compared to liner.

Disadvantages:

- Some creep
- Must be retained securely to reduce effect of creep.

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