



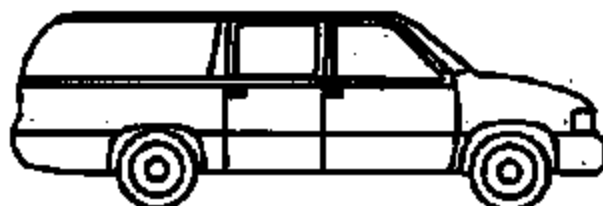
GMT 800 C/K Vehicle Line



Long Wheelbase SUV

- Fuel 33 gallon std.

Suburban / Yukon XL



All Long Utilities 130 in.

Short Wheelbase SUV

- Fuel 26 gallon std.

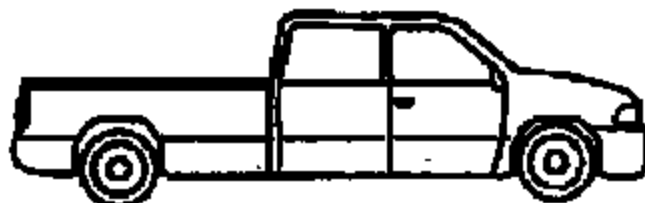
4-Door Utility, Tahoe/Yukon/Escalade



All Short Utilities 116 in.

Pickups

4-Door Crew Cab



4-Door Crew Cab - 157.5 in.

Fuel 34 gallon std.

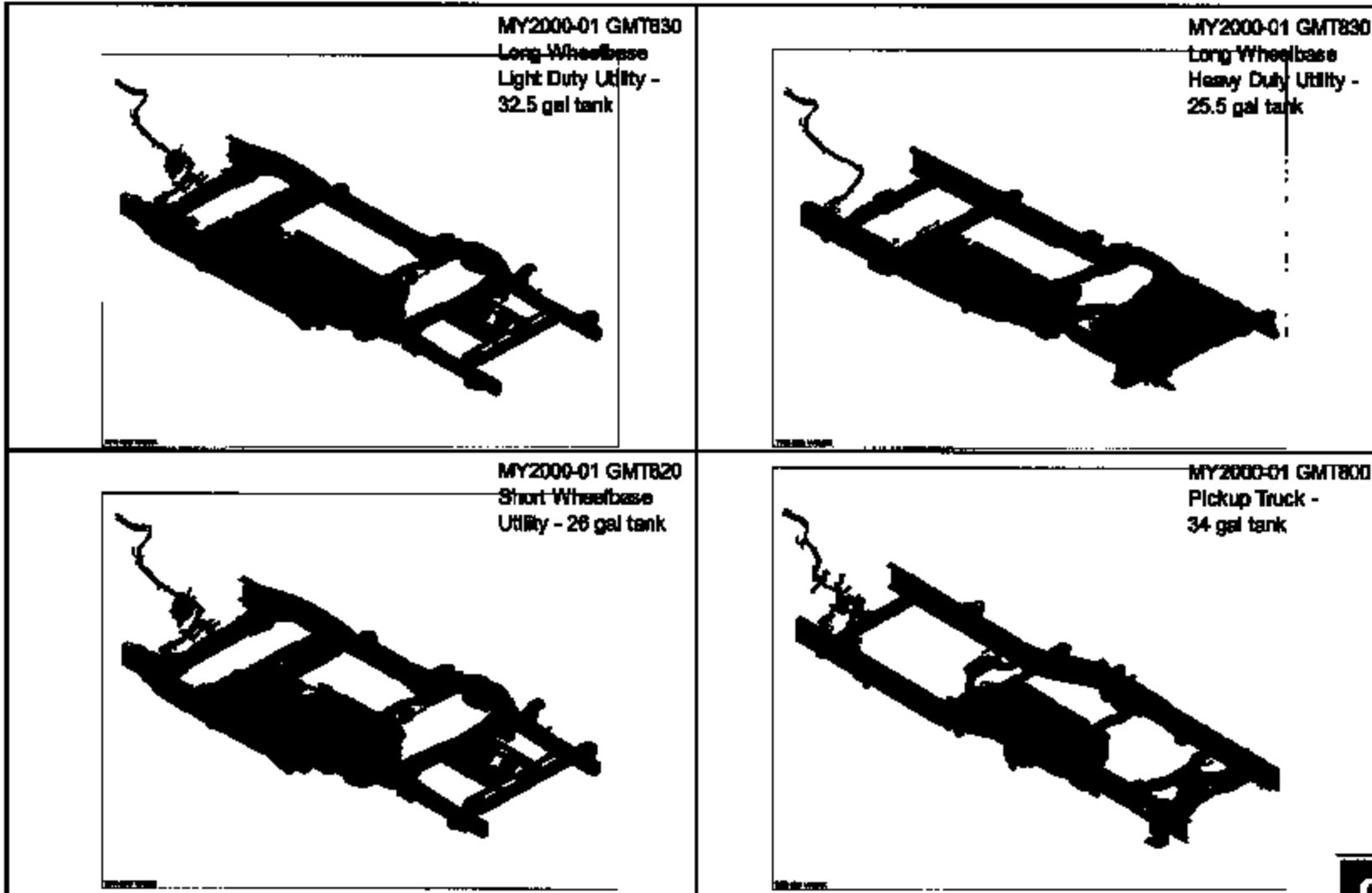
2-Door Pickup



2-Door regular cab 119 in.

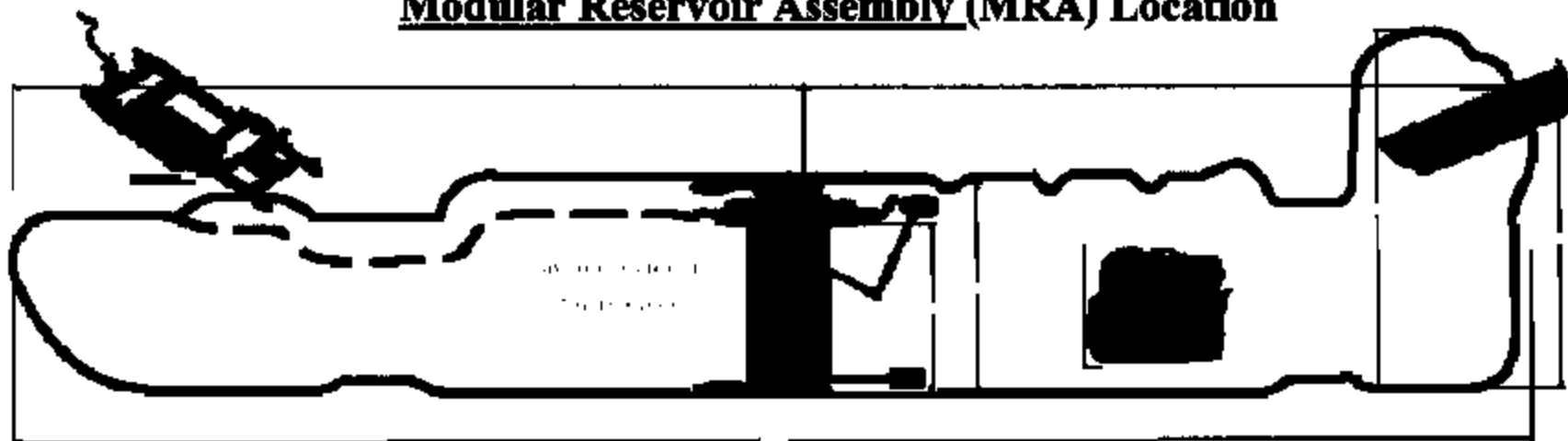
Fuel 26 gallon std.

MY 2000-01 Fuel Tank Configurations



Suburban Tank GMT830, 33 gal

Modular Reservoir Assembly (MRA) Location



- Other GMT800 series similar
- Short Wheelbase (Tahoe/Yukon and PUs are Shorter and Taller)

MRA Connector Melt – Pass Through Connector

Outer Connector Housing

Melt Through

Spring Block Conn.



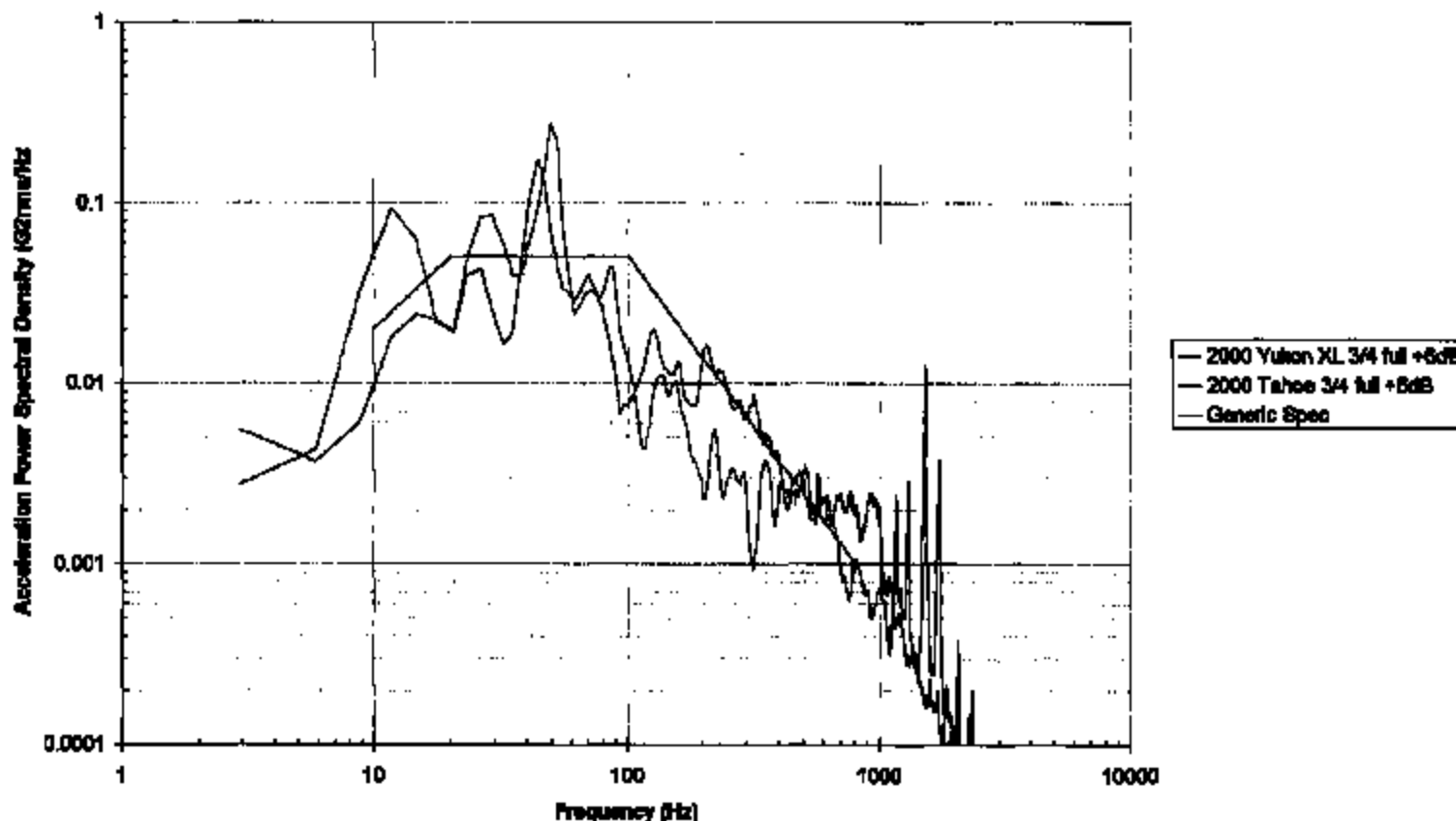
Melt-thru causes leak

Delphi "RED X" Conclusions

- **The fuel tank resonates near the frequency of max amplitude of road input.**
- **Design of tank Size and Shape generates large vibration at 11.7 Hz
Results in large amplitude motion and loss of MRA contact with tank bottom**
- **This motion produces a large shock pulse when MRA strikes tank bottom**
- **In addition 49.8 Hz vibration caused by MRA mounting ring at tank top**
- **Combined, these abnormally large vibrations cause connector terminal "Fretting"**
- **Fret corrosion causes high resistance and high current draw
(>20 amps in some cases, normal current <10 amps)**
- **This level of vibration is not present in Pickups.**

Tank Vibration Comparison

Tank Vertical Acceleration PSD Comparison
 2000 GMT830 vs 2000 GMT820



MY 2000-01 C/K Fuel Tanks – Rear View

MY2000-01 GMT800

Long Wheelbase
Light Duty Utility
32.5 gal tank



MY2000-01 GMT830

Long Wheelbase
Heavy Duty Utility -
25.5 gal tank



MY2000-01 GMT820

Short Wheelbase
Utility - 29 gal tank



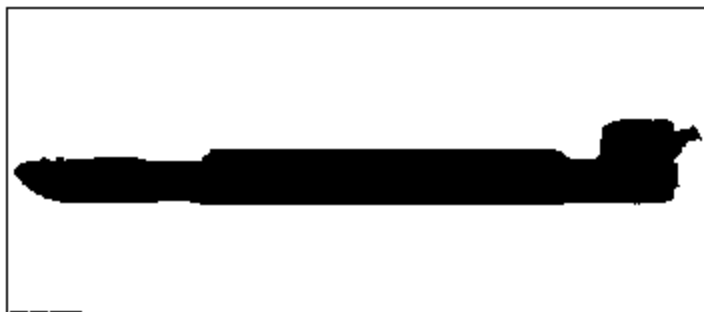
MY2000-01 GMT800

Pickup Truck -
34 gal tank

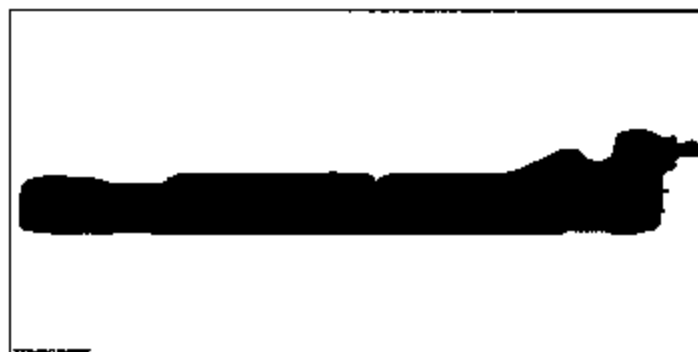


MY 2000-01 C/K Fuel Tanks – Side View

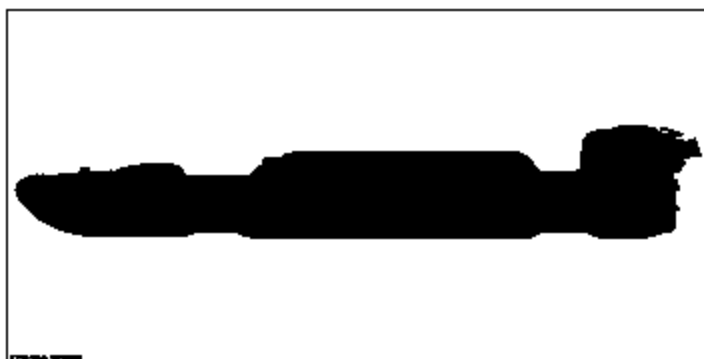
MY2000-01 GMT830
Long Wheelbase
Light Duty Utility -
32.5 gal tank



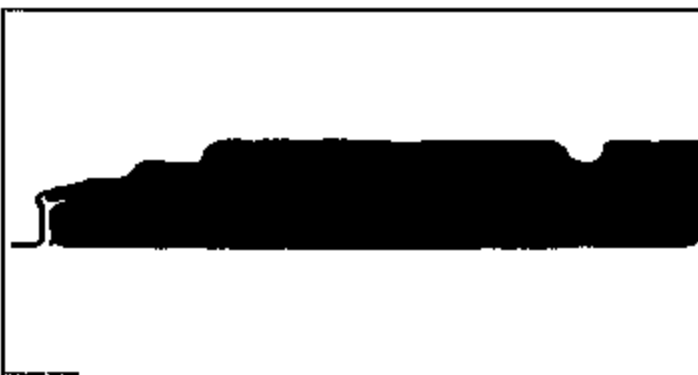
MY2000-01 GMT830
Long Wheelbase
Heavy Duty Utility -
25.5 gal tank



MY2000-01 GMT820
Short Wheelbase
Utility - 26 gal tank



MY2000-01 GMT800
Pickup Truck -
34 gal tank



MY00-02 Suburban/Yukon XL MRA Fluid Interface



Production tanks 2000-2002, MRA & Fluid Interface										
Model code	Year	Fuel tank cap.	Tank Assy. p/n:	Tank shell p/n:	Alpha-numeric p/n:	30% nose-up	30% nose-down	Horizontal	30% left side up	30% right side up
GMT820	2000-02	28 gal.	15758638	15758656	ana80513	S	S	P	P	P
GMT830	2000	33 gal.	15785224	15758657	ana80538	S	S	S	S	S
	2001	33 gal.	15785172	15758657	same					
	2002	30.9 gal.	15174087	15174088	ana80545	S	S	S	P	S
GMT830-25 series	2000-2001, flt	25.5 gal.	15786225	15752023	ana80553	S	S	S	S	S
	2002, flt.&K53	25.5 gal.	15070514	15070538	ana80848	S	S	S	S	S
	2002, flt.&K53	25.5 gal.	15168010	same	same					
	2002 flt. -K53	25.5 gal.	15070518	afh53212	ana80582	S	S	S	S	S
	2001, rr	13 gal.	15788724	15772879	ana80557	P	S	S	S	S
	2002 rr	13 gal.	15168008	15070528	ana80560	D	S	S	D	D
		13 gal.	15109858	same	same					

S = Submerged
 P = Partially in liquid
 D = Dry (Vapor space)

Submerged MRA, Gas above connector interface when tank is full, most likely to leak.



Fuel Level Grade Lines: (Leak Estimate) – 33 Gal. Tank

Right side up:
(2.6 gallons)
expansion line
& liquid line

Left side up:
(1.2 gallons)
expansion line
& liquid line

Horizontal:
(1.8 gallons)
Expansion line
& Liquid line

Nose up:
(5.25 gallons)
expansion line
& liquid line

Rear up:
(9.1 gallons)
expansion line
& liquid line



Rear view



Side view

GM - Grade Line Summary Possible Leak

Production tanks 2000-2003, MRA & Fluid Interface

Model code	Year	Fuel tank cap.	Tank Assy. p/n:	Tank shell p/n:	Alpha-numbered p/n:	Table:	Submerged, Partially in liquid	30% grade nose-up, est.vol. above sensor	30% grade nose-down, est.vol. above sensor	Horizontal, est.vol. above sensor	30% grade left side up, est.vol. above sensor	30% grade right side up, est.vol. above sensor
							All est. vol. in gallons					
GM1830	2000	33 gal.	15768224	15759657	ana80538		8,525	8,81	8,1.8	8,1.2	8,2.6	
	2001	33 gal.	15765172	15759657	same		"	"	"	"	"	
GM1830-25 series	2000-2001, fr	25.5 gal.	15765225	15752023	ana80553		9,3.5	9,6.8	9,8.8	P,0.0	8,3.7	
	2001, rr	13 gal.	15766724	15772879	ana80667		P,0.0	8,5.28	P,0.0	8,1.26	8,4.8	
GM1830LD 2000 & 2002 MRA					ana87207							

MY00-02 Pickup/Short SUV MRA Fluid Interface

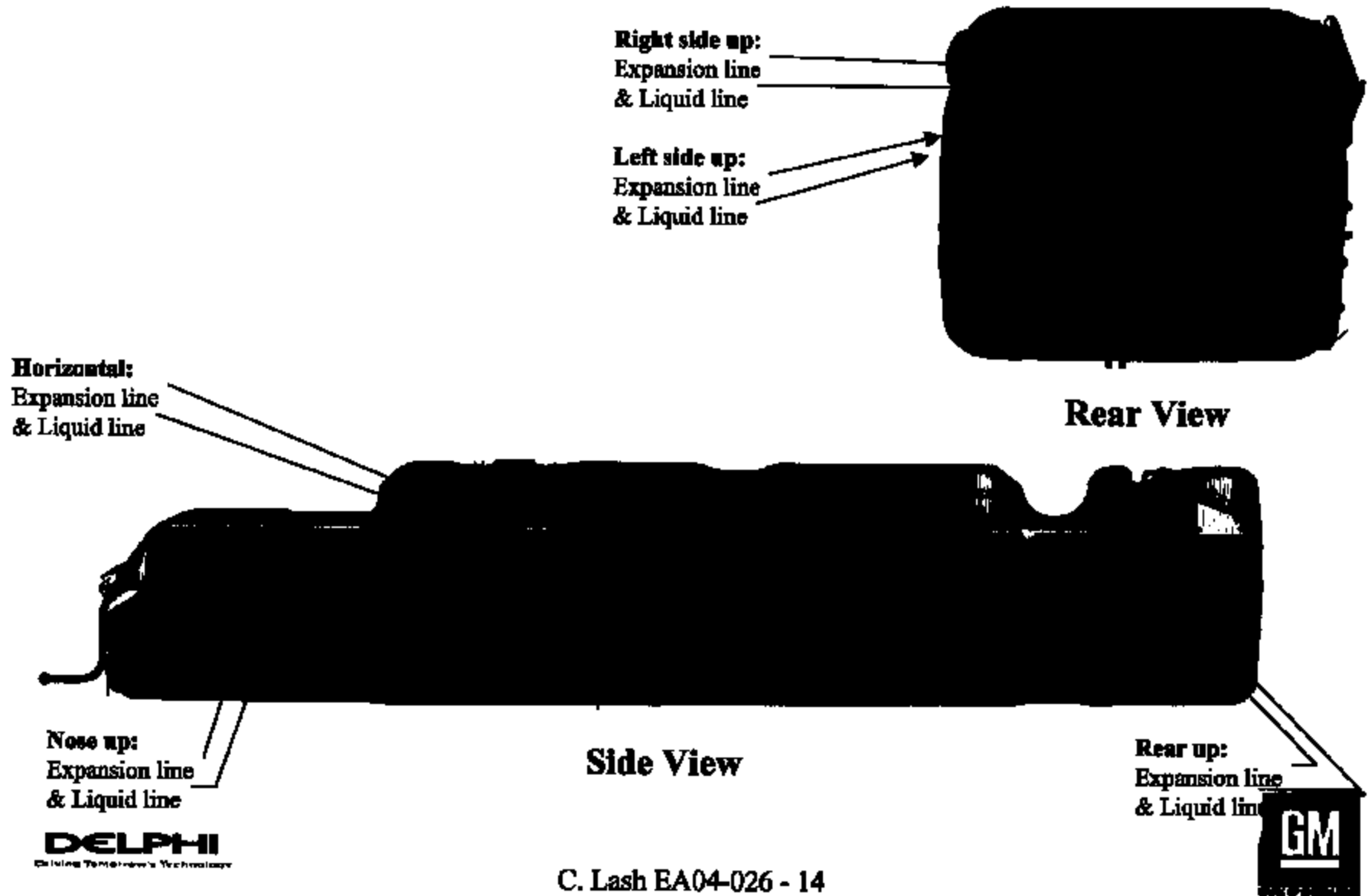
Production tanks 2000-2002, MRA & Fluid interface										
Model code	Year	Fuel tank cap.	Tank Assy. p/n:	Tank shell p/n:	Alpha-numeric p/n:	30% nose-up	30% nose-down	Horizontal	30% left side up	30% right side up
GMT800-short box	2000	26 gal.	15744395	same	same					
	2001	26 gal.	15772864	15772878	ana80634	D	S	D	D	D
	2002	25.5 gal.	15081268	same	ana86163	D	P	D	D	D
	2001-HVY.	26 gal.	15772869	15772878	ana80577	D	S	D	D	D
	2002 HVY	25.5 gal.	15081267	same	ana86165	D	S	D	D	D
GMT800-long box	2000	34 gal.	15761874	same	same					
		34 gal.	15744400	same	same					
	2001	34 gal.	15772870	15772880	ana80620	D	S	D	D	D
	2002	32.7 gal.	15183198	same	ana87073	D	S	D	D	D

S = Submerged
 P = Partially in liquid
 D = Dry (Vapor space)

Most Pickup MRA connector interfaces
 Are always above Gas when tank is full.



Fuel Level Grade Lines – 34 Gal. Tank



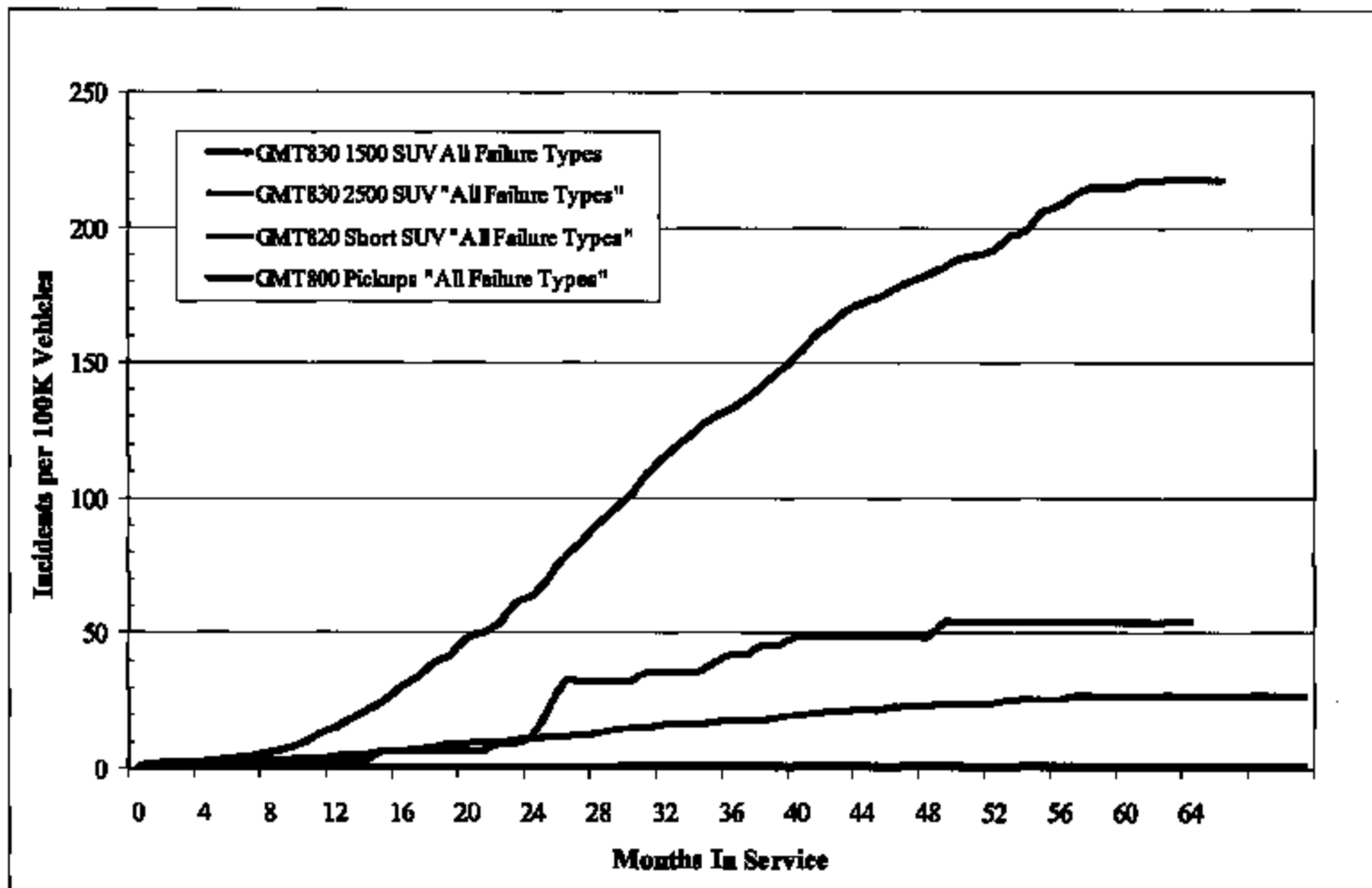
Complaints

GMT830 LD-Utilities	2000-01	05V-155	316,508	588	185.1	63	19.9	253	79.9
GMT830 HD-Utilities	2000-01	-	33,239	14	42.1	3	9.0	6	18.1
GMT820 Utilities	2000-01	-	388,260	132	34.0	8	2.1	39	10.0
GMT800 Pickups	2000-01	-	916,198	36	3.9	13	1.4	3	0.3
GMT430 LD-Utilities	1999	-	273,888	40	14.6	3	1.1	15	5.5
GMT830 LD-Utilities	2002	-	25,620	4	15.6	0	0.0	1	3.9

Warranty

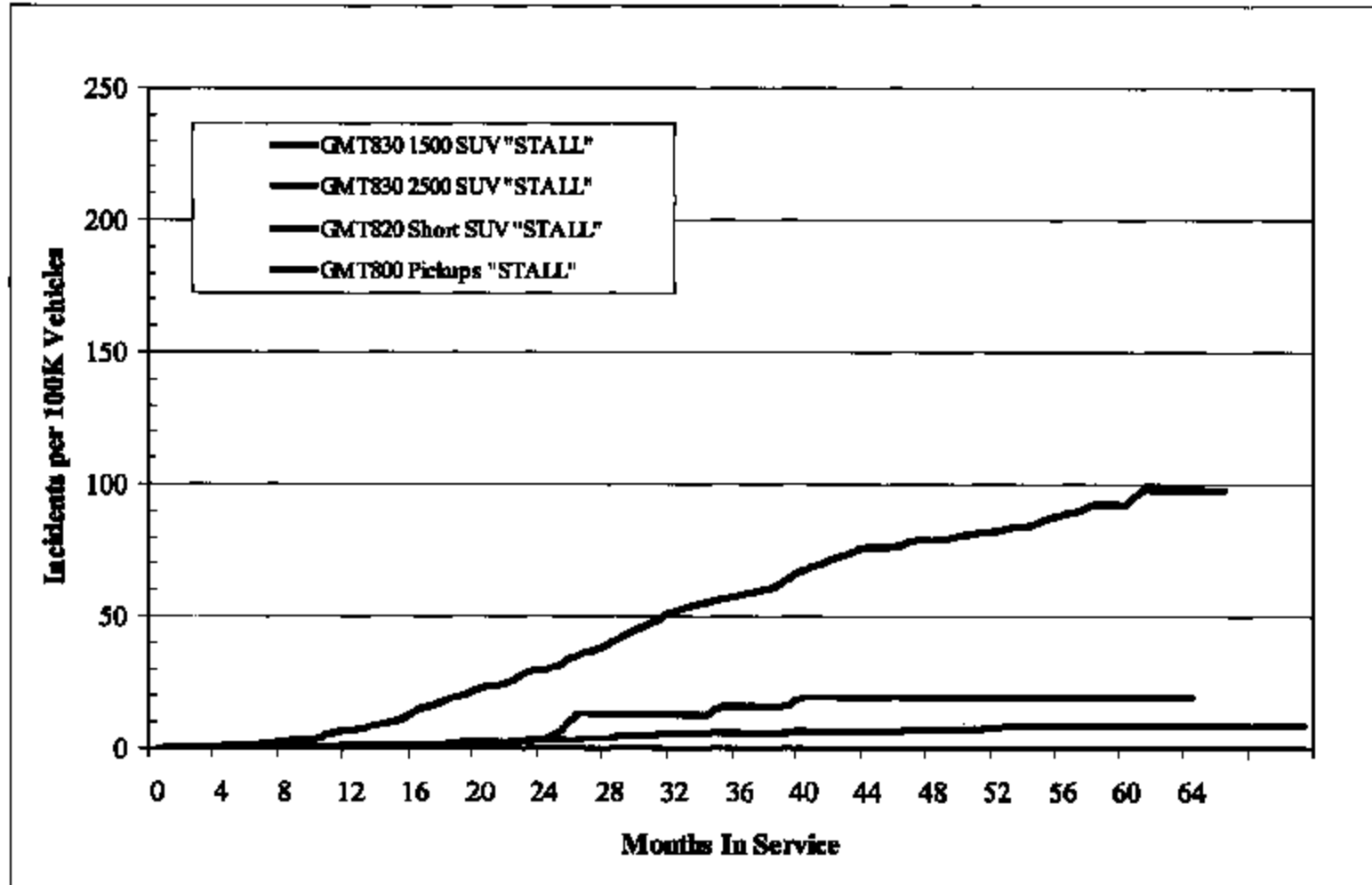
GMT830 LD-Utilities	2000-01	05V-165	316,508	32,226	101.8	1,286	4.1	1,150	3.6
GMT830 HD-Utilities	2000-01	-	33,239	3,459	104.1	196	5.9	104	3.1
GMT820 Utilities	2000-01	-	388,260	19,739	50.8	356	0.9	786	2.0
GMT800 Pickups	2000-01	-	916,198	42,582	46.5	118	0.1	408	0.4
GMT430 LD-Utilities	1999	-	273,888	43,328	158.2	242	0.9	467	1.7
GMT830 LD-Utilities	2002	-	25,620	2,102	82.0	14	0.5	60	2.3

MY00-01 Hazard GMT800s All Failure Types



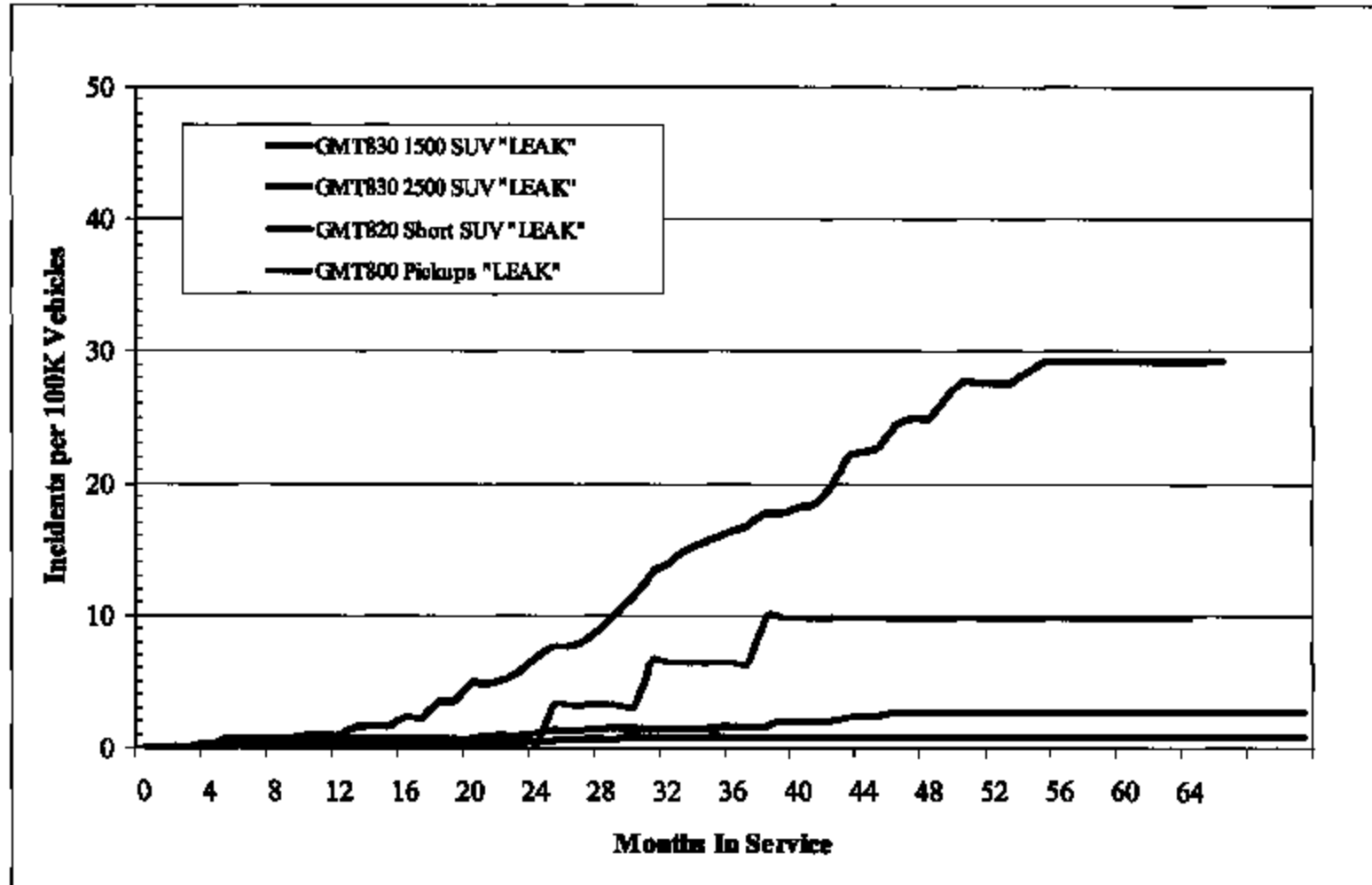
Failure Types Include - Leak , Stall, No Start

MY00-01 Hazard GMT800s "STALL"



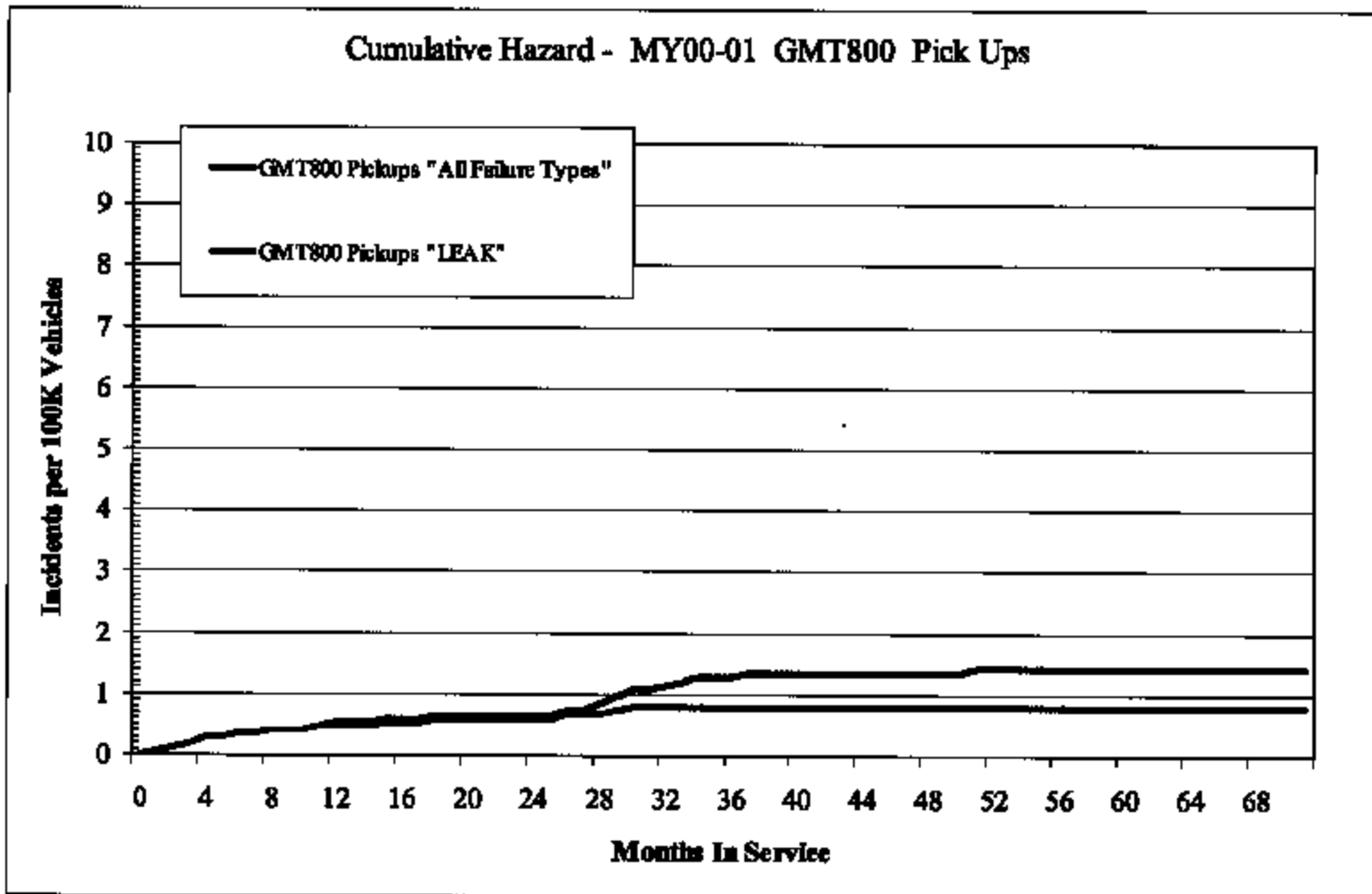
Failure Types Include – Leak , Stall, No Start

MY00-01 Hazard GMT800S Short "LEAK"



Failure Types Include - Leak , Stall, No Start

MY00-01 Hazard GMT800 Pick Ups

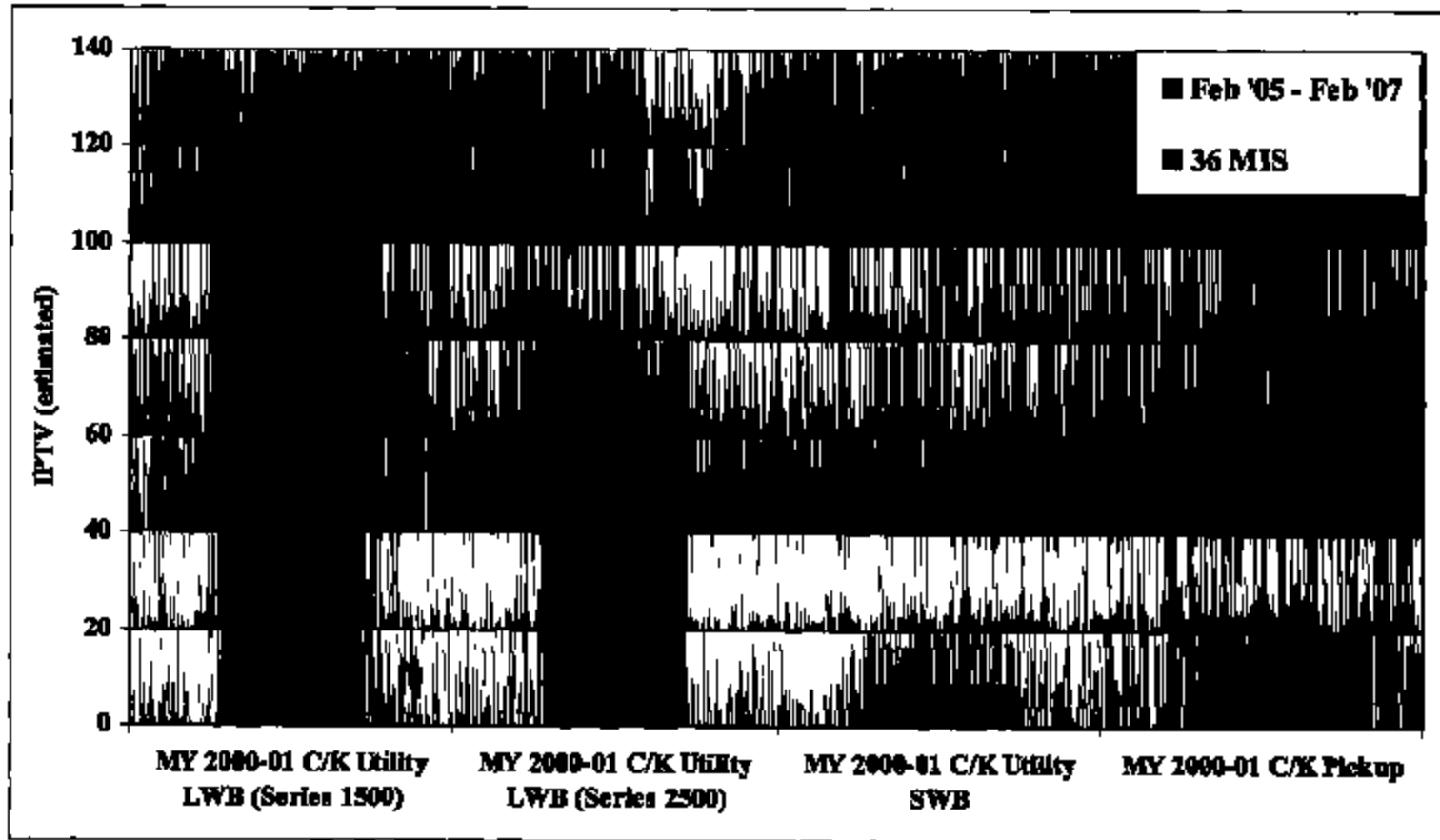


Failure Types Include - Leak, Stall, No Start

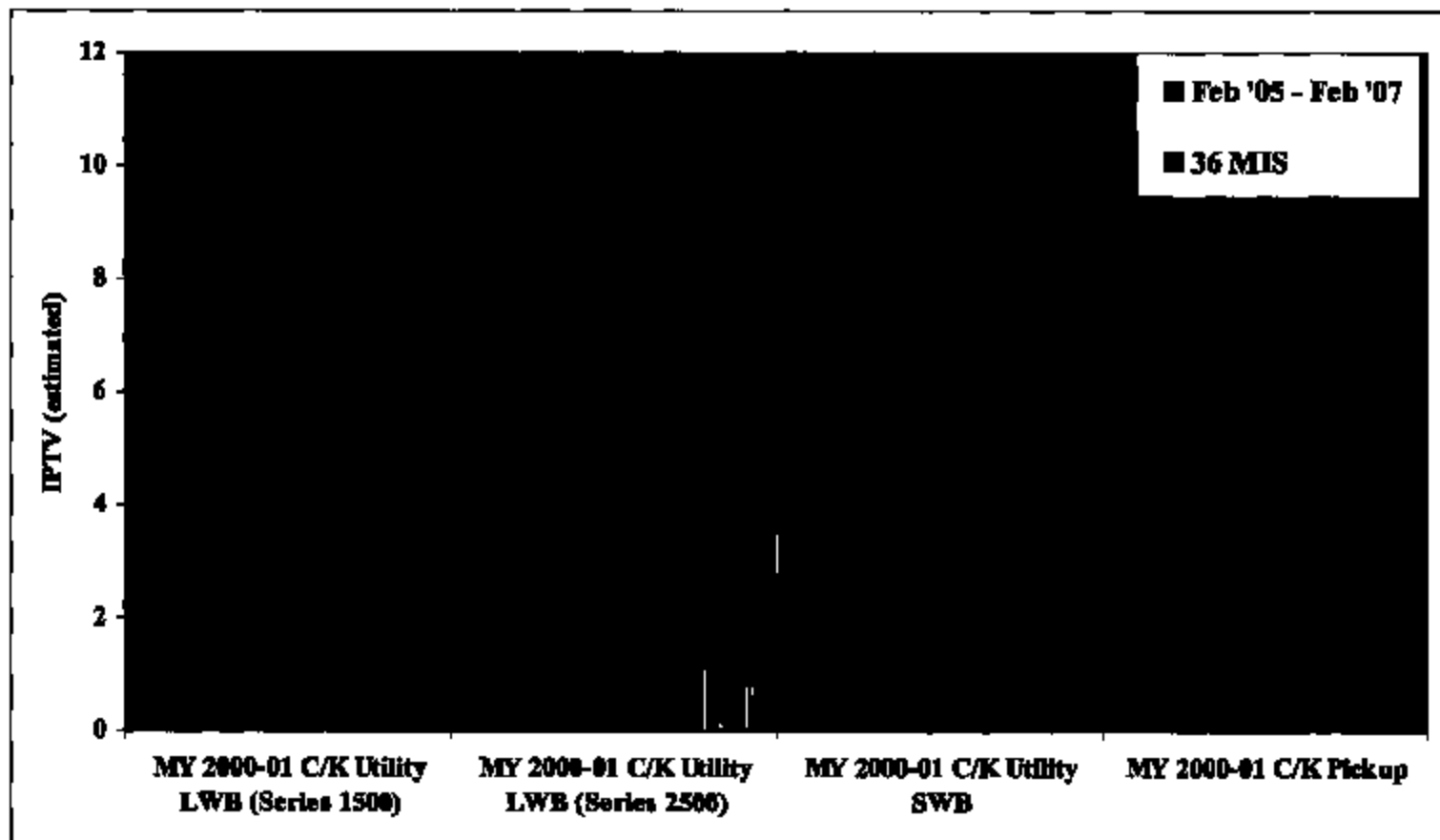
GM's Recent Analysis

GMT830 LD-Utilities	2000-01	05V-155	318,508	20	25	80.0%	35	107	32.7%	55	132	41.7%
GMT830 HD-Utilities	2000-01	-	33,239	0	0		0	4	0.0%	0	4	0.0%
GMT820 Utilities	2000-01	-	368,260	1	10	10.0%	4	85	4.7%	6	96	5.3%
GMT800 Pickups	2000-01	-	916,198	0	25	0.0%	0	27	0.0%	0	52	0.0%
GMT430 LD-Utilities	1999	-	273,888	0	8	0.0%	0	5	0.0%	0	13	0.0%
GMT830 LD-Utilities	2002	-	25,620									

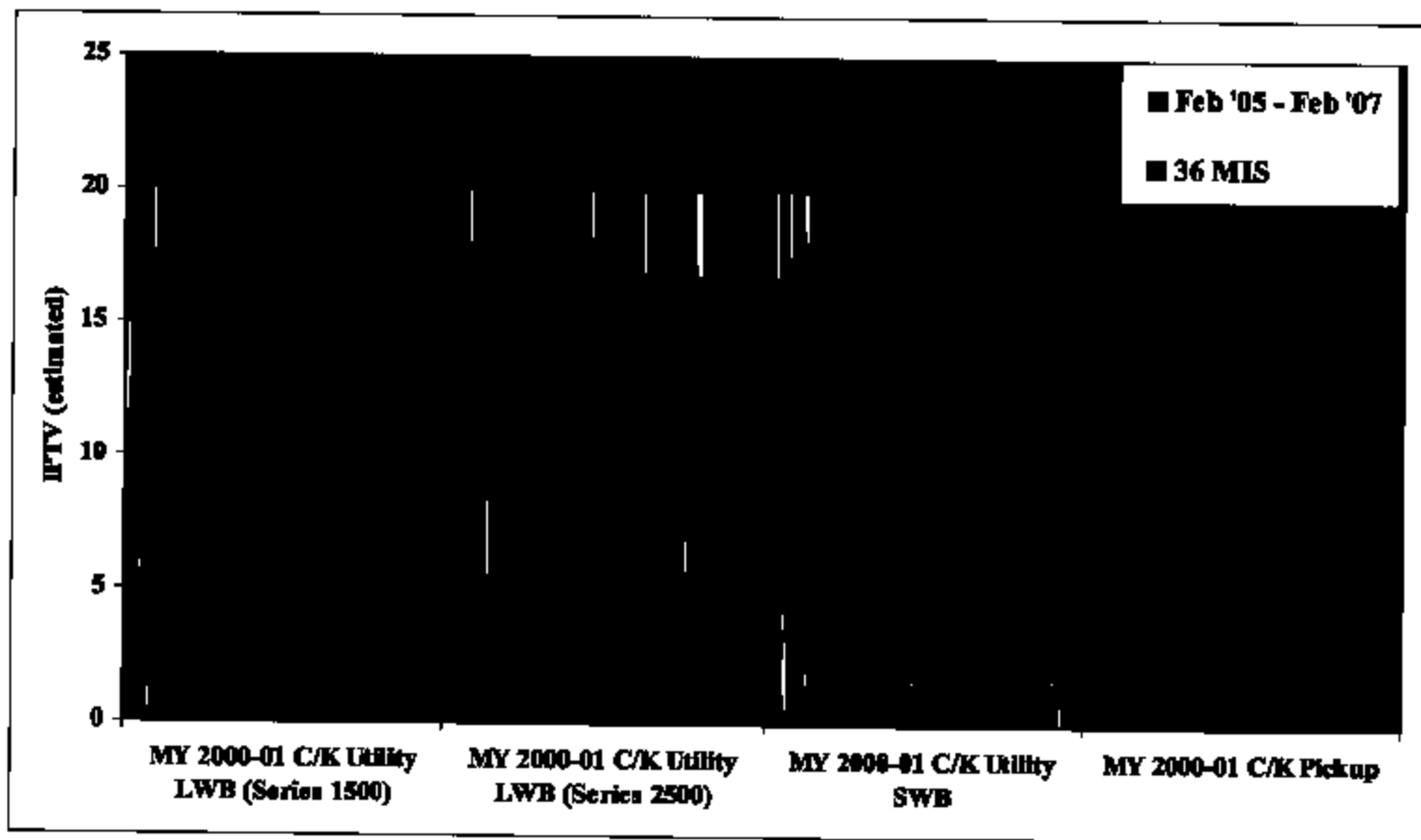
GM's Log Normal Model Estimates - Total



GM's Log Normal Model Estimates – Fuel Leak



GM's Log Normal Model Estimates – Stall



Recall 05V-155



- 573 Date – 14-Apr-05
- Recalled vehicles – 316,508 MY 2000-01 GMT830 (LWB) Light Duty Utility (Suburban, Yukon XL)
- Description of defect – fuel model reservoir assembly (MRA) wiring may overheat under certain operating conditions.
- Failure mechanism – fretting corrosion due to vibration inside the tank resulting in high resistance connection in MRA.
- Consequences of defect:
 - Fuel leak through hole in MRA connector
 - Stall/no-start if ignition circuit wire shorts to ground and causes fuel pump fuse to blow
 - Inaccurate fuel level readings if ignition circuit wire shorts to sender card
- Recall schedule:
 - May '05 - owner notification
 - Nov '05 – parts available

Fuel Tank Leakage Investigation History

PE02-008	GM	Trailblazer, Envoy	2002	1-2	Tank cracks at filler collar	38,787	80	244.6	2,874	7.3%	closed
PE07-010	Ford	Escort/Tracer	1999	5-6	Tank fatigue (plastic)	13,342	9	87.5	88	0.3%	closed
EA94-011	Saab	900	1990	5-6	Overheated pump wiring	14,577	4	27.4	23	0.2%	closed
EA94-008	DCC	Grand Cherokee	1993	2-3	Fuel sender gasket	223,362	66	26.1	624	0.4%	closed
EA92-015	Audi	4000/Quattro	1985-87	6-6	Tank corrosion	66,941	12	20.0	179	0.3%	closed
EAM-026	GM	GMT330 LWB LD Utility	2000-01	4-6	Overheated pump wiring	318,608	83	18.8	1,288	0.4%	05V-158
PE02-033	GM	Captiva	1991	1-2	Plastic tank blow pin hole	172,732	28	16.5	741	0.4%	closed
EA97-006	Toyota	Camry/ES250	1987-91	7-11	Filler neck solder joint	1,112,585	143	12.9			closed
PE02-011	Ford	Windstar	1995-98	7-9	Tank fatigue (plastic)	662,423	57	10.3			closed
EA04-026	GM	GMT330 LWB HD utility	2000-01	4-6	Overheated pump wiring	33,230	3	9.0	169	0.6%	-
EA90-015	GM	CK pickups	1984-88	6-8	Tank corrosion	1,700,000	106	6.4		0.0%	closed
EA04-025	GM	GMT320 SWB utility	2000-01	4-6	Overheated pump wiring	388,260	8	2.1	358	0.1%	-
EA04-025	GM	GMT300 pickup	2000-01	4-6	Overheated pump wiring	916,198	13	1.4	118	0.0%	-