



General Motors Overseas Distribution Corporation (Singapore)

Mr. Daniel C. Smith
Associate Administrator for Enforcement
National Highway Traffic Safety Administration
Recall Management Division (NVS-215)
1200 New Jersey Avenue, SE – Room W45-306
Washington, D.C. 20590

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DEFECTS INVESTIGATION
RECALL MGMT DIV.

1st Oct 2007

07V-482
(17 Pages)

Dear Mr. Smith:

Submission of Report 573

The following information is submitted in accordance with the defect reporting
Regulations in NHTSA 573 Report.

1. Name of Manufacturer and Import

Manufacturer: GM Daewoo Auto & Technology Company

Importer : General Motors Overseas Distribution Corporation (Singapore)

2. Identification of Vehicles Potentially Involved

*Affected vehicles are some 2005/2006 model year Chevrolet Optra passenger
vehicle which is manufactured from Oct. 14, 2004 to Jan. 5, 2006*

3. Total Number of Vehicles Potentially Containing the Defect

Chevrolet Optra : 144vehicles(Guam - 113veh., Saipan - 31veh.)

4. Percentage of Motor Vehicles Estimated to Contain the Defect

100 %

5. Description of Defect

Head lamp low beam or DRL(Daytime Running Light) function may inoperative due to melted Splice pack (S201) on IP Harness

6. Chronology of Principal Events

Nov. 18, 2005 - American Suzuki Motor Corporation first detected this defect by receiving a field technical report

Jan.18, 2006 - Applied improved part (Changed Splice type from Pack to Clip in low beam circuit)

Jul.20, 2006 - Closed this item due to low warranty (0.4 IPTV) at that time

Jul.24, 2007 - NHTSA started PE(Preliminary Evaluation) investigation according to receiving 4 VOQ(Vehicle Owner's Questionnaire)

Sep.19, 2007 - GMDAT EFADC decided a Product Safety Recall

7. Description of Corrective Action

Head lamp low beam splicing type was changed(Splice Pack → Splice Clip) and separated from Splice pack 201 to protect housing melting due to potential poor contact.

8. Copy of Notices

9. GM Campaign Number

Sincerely

Jimmy Ng

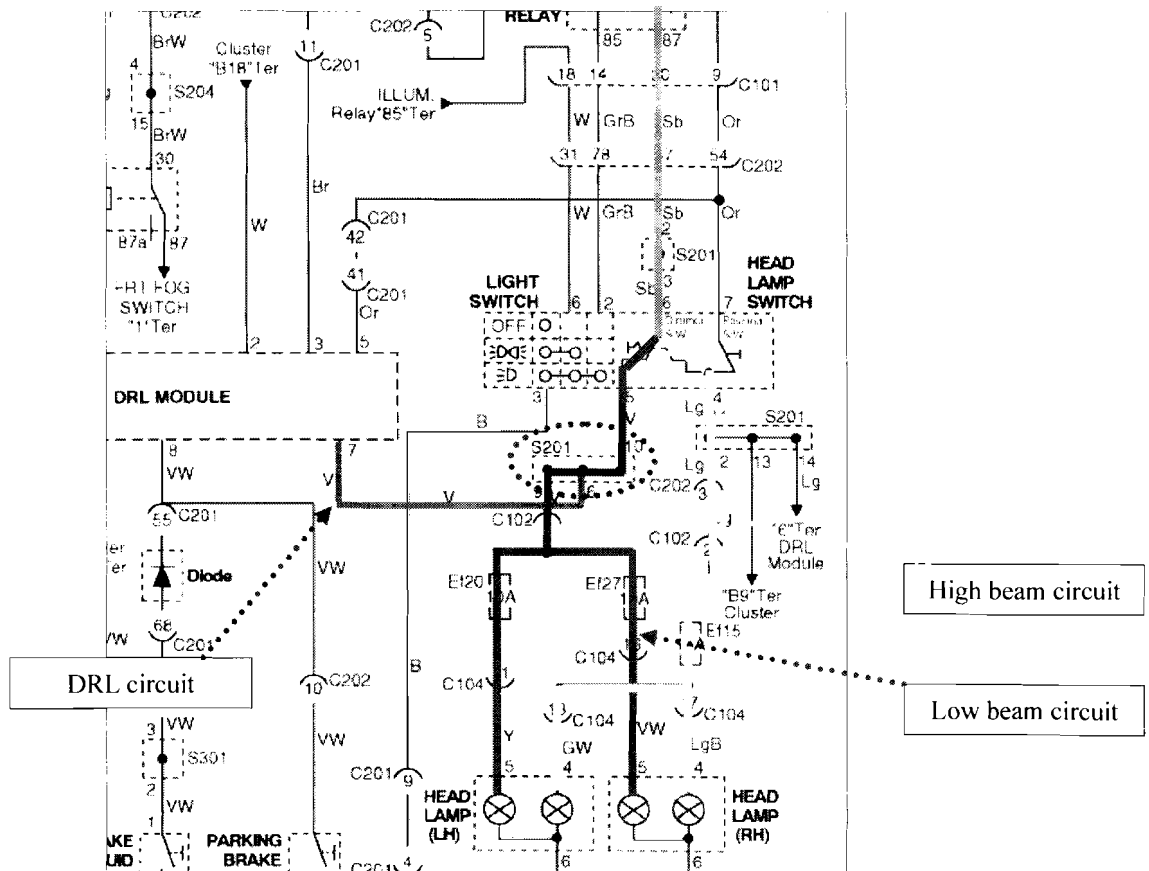
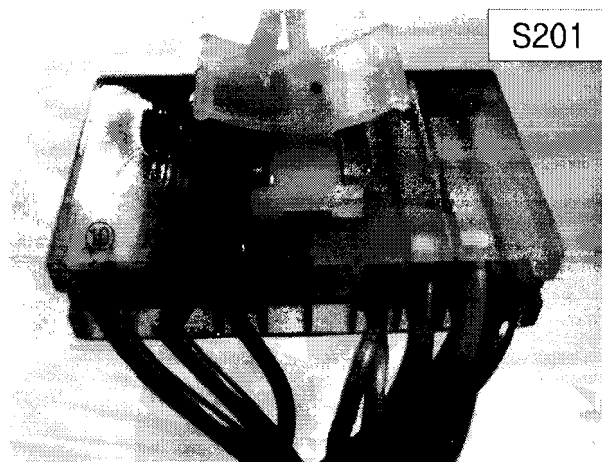
Aftersales Manager

General Motors Overseas Distribution Corporation (Singapore)

J200 IP HARNESS SPLICE PACK (S201) MELTING

1. Condition Reported

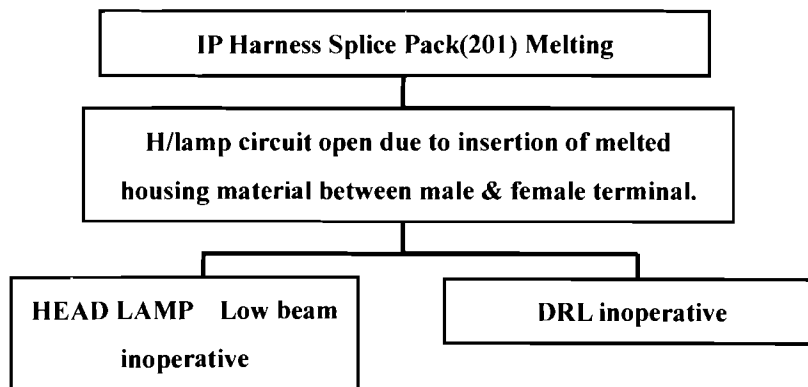
- Head lamp low beam or DRL(Daytime Running Light) function inoperative
 - 2 bulb type Head lamp circuit or DRL installed vehicles occurred on J200 LHD vehicles,
 - IP Harness Splice pack (S201) housing melted.
- ※ U.S.A NHTSA opened PE(Preliminary Evaluation) investigation(Jul.24) and requested IR(Information Request, Due date Sep.19)



2. Effects of the Condition

- Driver experiences trouble due to H/lamp low beam failure during night driving.
(available tail lamp lighting)
 - High beam & Fog lamp lighting are available by additional switch operation.
- Not meet Canada & north-Europe Regulation due to DRL inoperative.
 - Canada CMVSS 108 : daytime running lamps shall be on continuously when the engine is operating and the master lighting switch is not in the headlamps on position and Parking brake not applied and Gear lever not positioned Park or Neutral.
- Smell or smoke occurs behind cluster in case of serious melting.

< Condition Analysis Tree Chart >



3. Suspected or Known Cause of the Condition and Technical Explanation (Technical Root cause)

- On claimed splice pack, especially 9 pin terminal housing seriously melted and 6,10 pin terminal housing melted due to 9 pin terminal thermal source.
- Female terminal tongue deformed (max 0.78mm, male terminal thickness: 0.6mm)
- On the Terminal Tear down inspection, melted plastic material exist between female & male terminal, resulted H/Lamp inoperative occurred by circuit open.
- Poor contact by undefined factor on terminal causes electric arc and then housing melted.

4. Investigations and Analyses

- Discovery
 - Received PIR from GMCL (1 case, by E-Mail) : Sep.27, 2005
- Investigations and Analyses
 - Analysis result of claimed part shows that terminal tongue deformation and erosion caused by arc on terminal contact area(Delphi Packard, USA) : Nov.14, 2005
 - Test result for evaluation on terminal tongue deviation and vibration shows below
 - . No problem found for normal dimension(0.2~0.4mm) but duplicated melting in case of forcibly over depressed tongue terminal (0.7mm) : Apr.20, 2006
 - . Problem duplicated on normal dimension (0.2~0.4mm) in case of severe vibration condition : Feb.11, 2006
 - Test result for evaluation on current load shows that only discoloration occurred when supplied 22[A] (Head lamp current load on vehicle : 9[A]) : Jan.2, 2006
 - Confirmed no trouble found on temperature increasing test under condition of vehicle current load 9[A] contrasting with terminal's acceptable current 10[A] : May.4, 2007
 - When the supplier's manufacturing process is checked for tongue deformation,

it would be some possibility of one or two case per month by their rework process but there is no possibility of high frequency. : May.14, 2007

- Under investigation whether terminal meets spec(10A) or not and tongue deformation possibility on various circumstance condition (Heat, vibration, durability etc.) : Sep.3 ~ Oct.1, 2007

5. Number of Documented Reports

- 5 cases

Source	Received date	Country
Field Product Report(FPR)	2005.11.3	Canada
Field Technical Information Report(FTIR)	2005.11.21	U.S.A
Claim Countermeasure Request Report(CCRR)	2005.12.1	U.S.A
Field Technical Report(FTR)	2005.12.20	Swiss
Field Technical Report(FTR)	2007.1.8	Domestic

- **Determination of condition frequency**

- IPTV comparison by Head lamp system / Market

Region	2 Bulb type Head lamp circuit		4 Bulb type Head lamp circuit	
	DRL	Non DRL	DRL	Non DRL
N/A		N/A	N/A	N/A
W/Europe(*)		1.5	2.6	0
Domestic	N/A	1.5	N/A	0

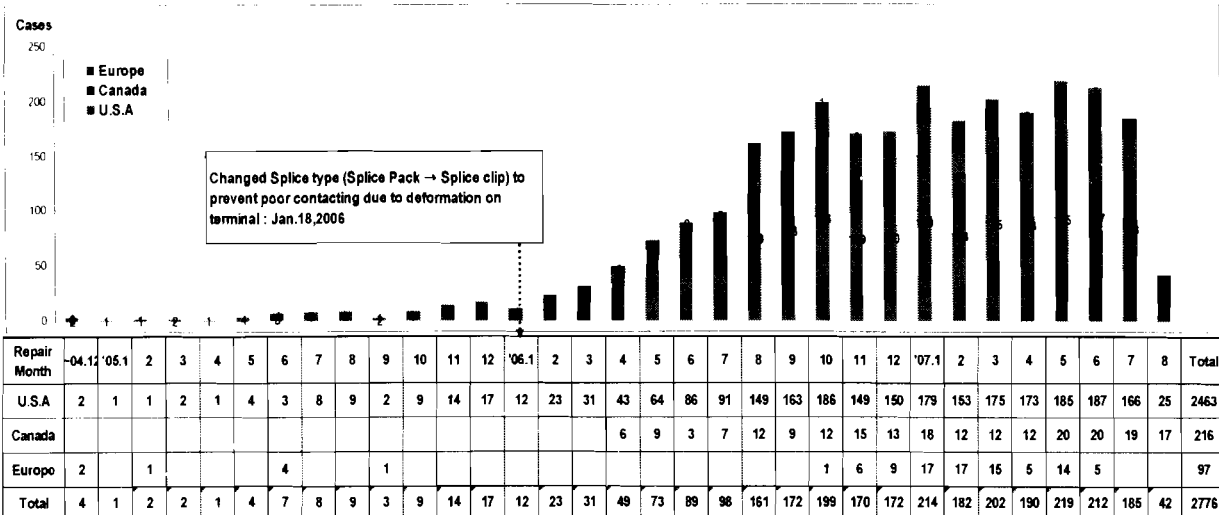
(*) WSRS(Warranty Status Reporting System) unscreened data based

• Warranty Trend

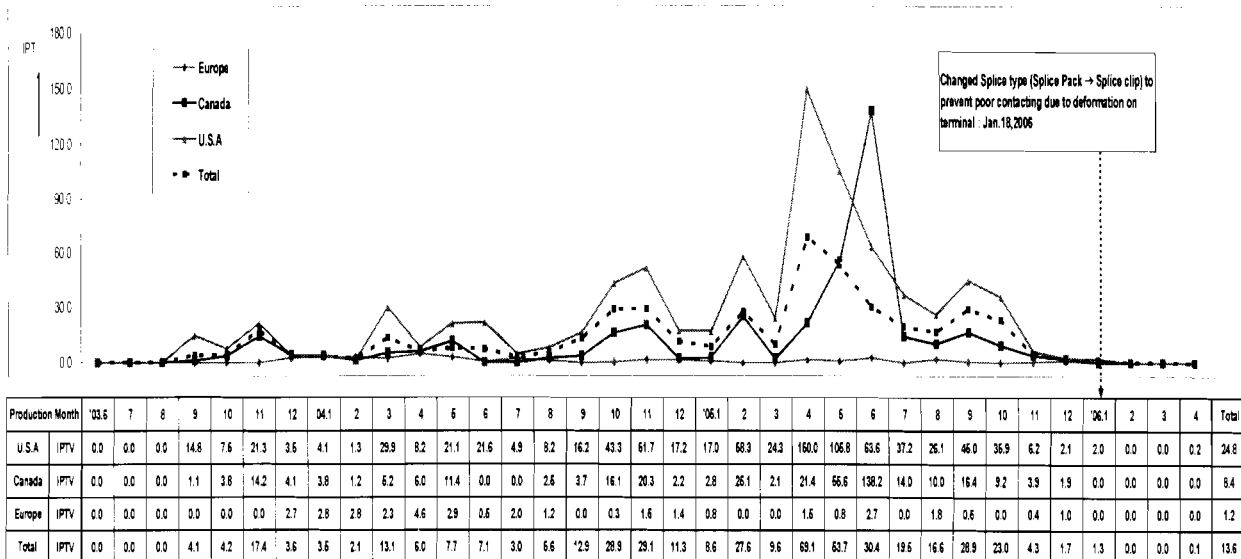
Weibull chart

생산물 공과물	2003												2004												2005												2006				Total
	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4						
1		1																										3		1						5					
2																																				3					
3																																				7					
4							2																												1	7					
5																1	1	3							1	1				1	4	3	1			16					
6						1												1	3	1							2	1		5	2	6	1		1	24					
7	1					1		1								1	2	1	1																	39					
8											1							3	1								4	5		6	6	11	8	1	1		48				
9							1						1			2	1	4	1	2			1	1	8	6	3	7	8	8	12	3	1	1		71					
10											2							5	6	1	1	3			16	10	3	10	8	16	7	3		3		95					
11											1	1					2	16	5	1		3	2	15	15	2	13	2	19	15	1					113					
12											1		1				6	5	8	4		5	2	30	19	4	10	4	22	8	1	2				132					
13											1		2					11	3	1	2	2	3	27	12	7	6	7	10	8	3	3				109					
14							1				2					1	2	11	11	4	4	5	5	32	22	6	8	7	8	17	4	2	3			155					
15						1	1	1		1		7	1		1		5	18	13	4	2	4	6	36	18	11	6	9	22	13	4	1				186					
16											1		2				4	18	11	3	5	10	2	26	18	7	8	6	14	12	2					151					
17						2		4				3				1	3	16	16	6	3	5	5	28	12	5	8	5	12	15	2					151					
18							1	1	1		2		2	1		2	2	7	9	6	1	8	4	26	20	6	6	2	15	9	2	1				134					
19							2					3	1		2		9	9	18	2	7	7	4	32	27	6	5	6	12	9	1					162					
20												3		1		6	2	6	15	9	2	3	13	2	28	21	7		4	4	6	1				136					
21							1	1	3			4	2	1	1	1	5	6	12	9	9	2	9	3	29	27	8	5	3	2						143					
22							1		4			1	4	1	3	4		3	5	15	11	10	2	2	5	15	11	9	5	1	2					114					
23							1	1	1		1	1	6	1		2		1	8	21	6	5	5	7	1	27	10	5	2	1						113					
24							1	1	4	2		1	7	1		2		8	14	8	6	5	5	3	14	26	3	2								113					
25							2	4	1			4	1	1	2	2	3	6	20	21	5	4	3	2	14	5	3									102					
26							2	6	1			5	3	3			3	9	21	7	4	2	7	2	1	4	1									81					
27							1				1	6		1	1	4	4	2	4	2	2	6	14	6		2	4		1	1						62					
28							1				6	1		2	5	2	7	3	3	2	3	8	6	1												50					
29								3			7	1	1		4	3	2	1		2	2	6		1												33					
30											1	8		1	4	4	2		1	2	2	3	1		1											30					
31											2	1	7	2	2		7	3	5	4																38					
32											1	2	8	2	5	1	1	4	3	1	1															35					
33												4	6		2	1	4	2	3	1	1															25					
34												1	1	5			4	3	2		2	1														20					
35												3	8	3			1	3	3		3	1	1													26					
36													8	2				2	1	1																14					
37												1	1			1	5		1		1															10					
38													3	3																						6					
39												1	1	2			1																			5					
40													2	1																						3					
41													2																							2					
42												1																								1					
43													1																							1					
44														1																						1					
45												4																								4					
Total	1	1	1	1	18	32	110	28	21	14	94	41	39	45	14	35	101	282	195	78	52	104	53	416	295	95	115	86	199	156	32	15	7	0	0	1	2776				

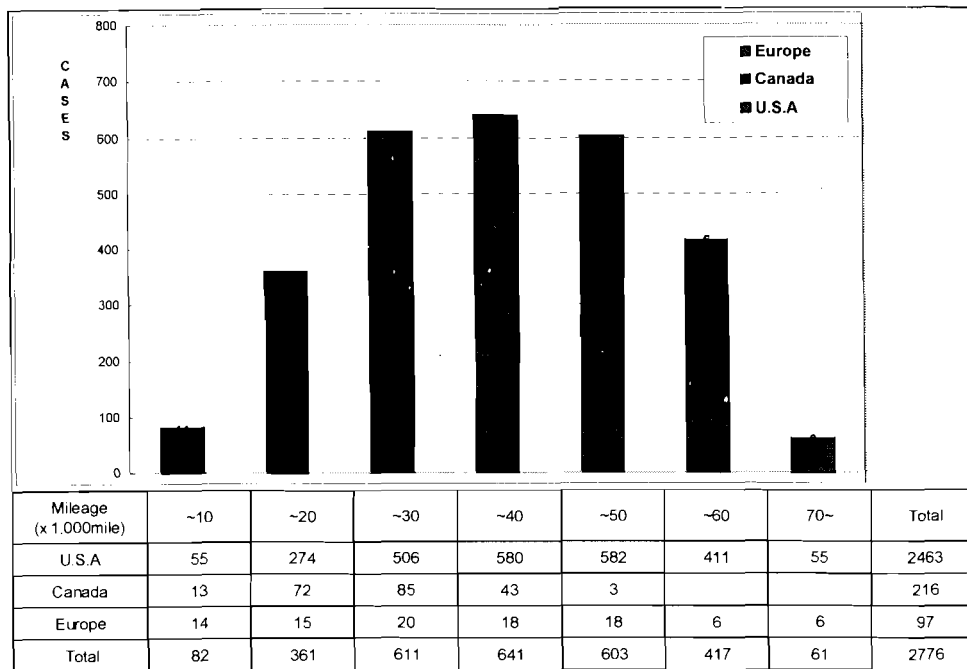
Warranty trend by repair month



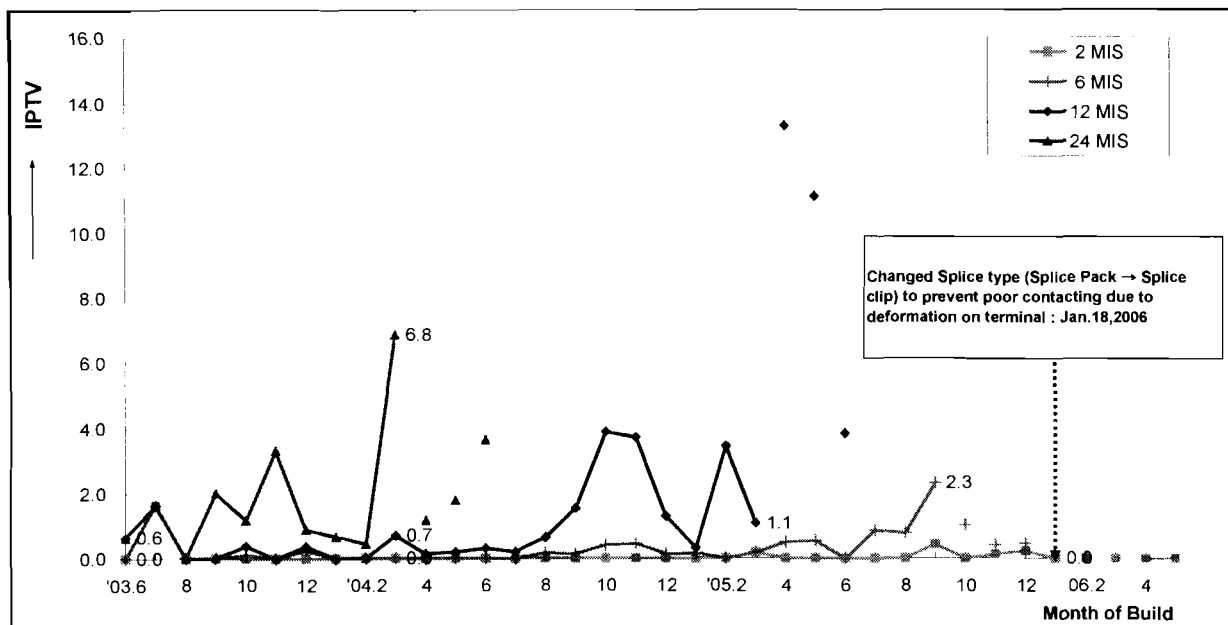
Warranty Trend by production month



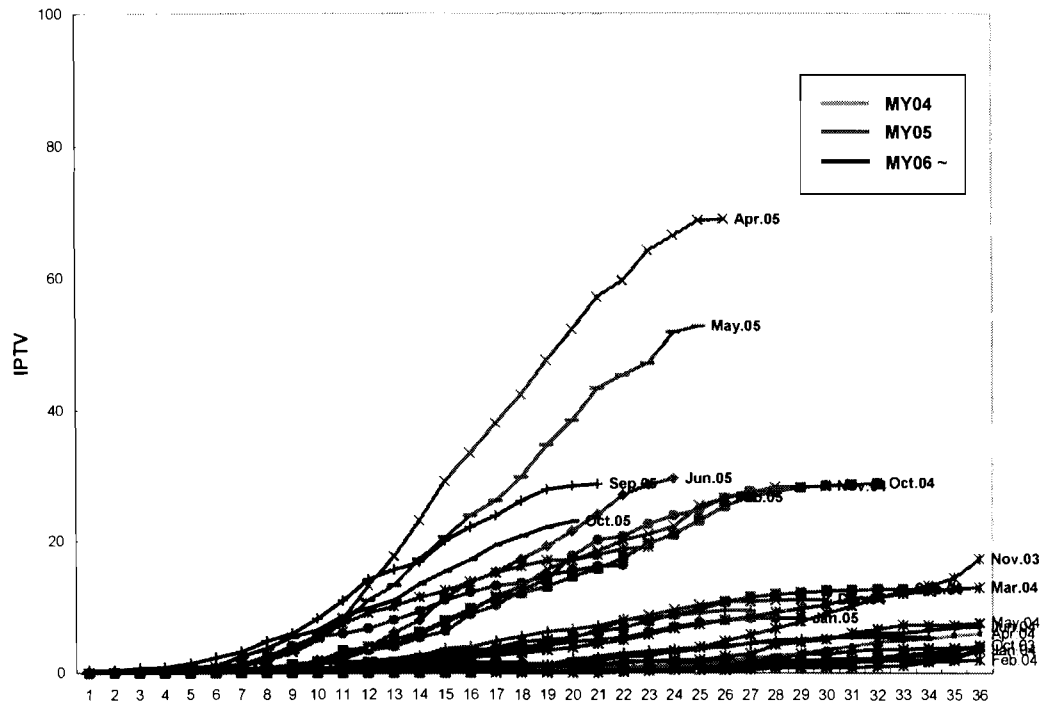
Warranty trend by Mileage



MIS IPTV trend



Accumulated warranty IPTV by production month



6. Scope of the Condition

- Number of vehicles potentially involved

- Alt 1 : 133,006 vehicles

. J200 LHD & DRL & 2 bulb type Head lamp circuit Vehicle
produced from SORP(Nov.4, 2002) to Jan.18, 2006

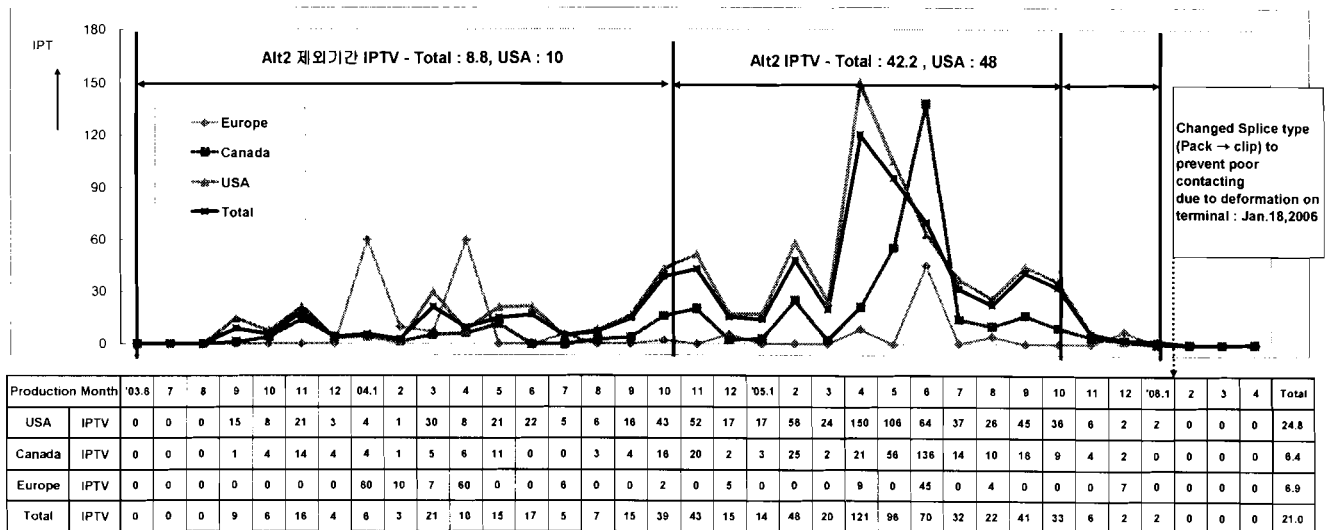
+ J221(Diesel) LHD & DRL & 2 bulb type Head lamp circuit vehicle
produced from Nov.15, 2006 to Sep.5, 2007

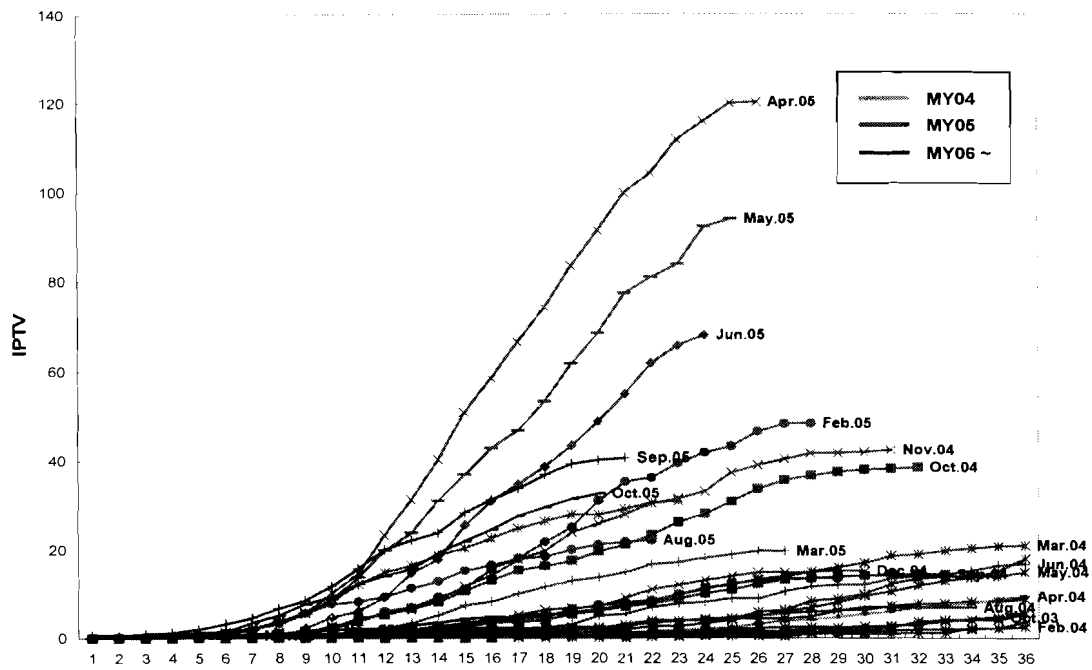
- Alt 2 : 60,397 vehicles

. J200 LHD & DRL & 2 bulb type Head lamp circuit vehicle

Produced from Oct.1, 2004 to Oct.31, 2005 (High IPTV range)

* IPTV comparison between Alt2 affected period and except period
(LHD & DRL & 2 bulb only)





- Alt 3 : 201,879 vehicles

. J200 LHD & DRL or 2 bulb type Head lamp circuit vehicle

produced from SORP(Nov.4, 2002) to Jan.18, 2006

+ J221(Diesel) LHD & DRL or 2 bulb type Head lamp circuit vehicle

produced from Nov.15, 2006 ~ Sep.5, 2007

Alternative	Function	Period of condition	Domestic	Europe(*) /Others	N/A	Total	Cost (Mil/USD)
Alt 1	2 bulb & DRL	2002.11.4 ~ 2006.1.18	-	4,759	128,247	133,006	7.9
Alt 2	2 bulb & DRL	2004.10.1 ~ 2005.10.31	-	2,039	58,358	60,397	3.6
Alt 3	2bulb or DRL	2002.11.4 ~ 2006.1.18	3,284	70,348	128,247	201,879	11.2

* N/Europe DRL Application Country

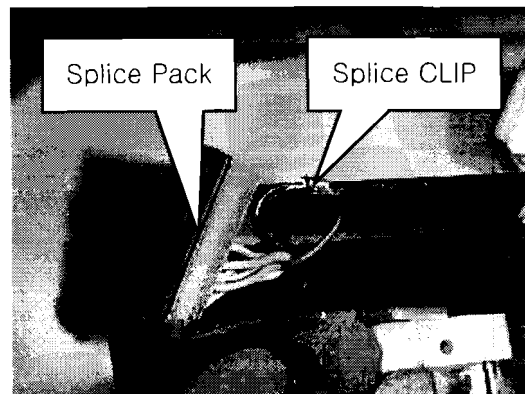
- AUSTRIA, DENMARK, FINLAND, ICELAND, NORWAY, SWEDEN, SWISS

7. Description of Vehicles Potentially Involved

- J200 MY04~06 Forenza, Optra LHD & 2 bulb type Head lamp circuit & DRL function produced from SORP(Nov.4, 2002) to Jan.18, 2006
- J221(Diesel) MY07~08 Optra LHD & 2 bulb type Head lamp circuit & DRL function produced from Nov.15, 2006 to Sep.5, 2007
 - * RHD vehicle does not adapt Splice pack(S201)
 - * This affected range only applied in case of Alt 1

8. Improvements Implemented and Proposed

- Product improvements
 - Head lamp low beam splicing type changed to protect housing melting due to potential poor contact. (Pack → Clip) and separated from Splice pack 201 : Jan.18, 2006



- Field Action proposal : Safety Recall
 - Rationale
 - High IPTV(21 IPTV) of Head lamp low beam inoperative related to Splice Pack 201 in North America. And MY05 vehicle warranty trend continuously increasing.
 - In North America, Usually used the Low beam for night driving and driver can not recognize the symptom before the problem. Therefore Head lamp operation failure have safety risk especially night driving.
 - Not meet Canada & north-Europe Regulation due to DRL inoperative.
 - NHTSA PE(Preliminary Evaluation) is under investigation and Suzuki strongly request Safety Recall.
 - * GMNA PI Recommendation
 - Considering that North America regard sudden Head lamp failure while driving as a Safety issue and High warranty IPTV(21 IPTV) , It is need to Safety recall

action.

9. Preventive Action Analysis

- System root cause (Process(es) Nonexistent, Inadequate, or Missed)
 - Root cause Category : 4 , Power circuit combined by splice clip.

Category		Business Root Cause of the Condition
1	Design Issues	Design failure mode analysis , investigate , description unsuitableness
2		Technical specification (VTS, SSTS, MTS) Error
3		Technical specification (VTS, SSTS, MTS) Omission
4		Optimal design incongruence
5		Drawing spec no record / Gap error, omission / Engineering change error
6		Software issues
7	Vehicle/ Component Integration Issues	Validation test procedure or Result verification unsuitableness
8		Validation test procedure omission or incompleteness
9		The others (Related Test Specification omission etc)
10	Process/ Manufacturing Systemic Issues	Process failure mode analysis study, description
11		Process / tooling capacity insufficiency
12		Process do not observance (work method, work point)
13		Others (Process voluntary change, employers decision etc)

- Responsibility
 - Not decided yet.
- Preventive Action
 - Design Proof Flow improvement
 - . To update ECL(Engineering Check List) to apply splice clip to power circuit
 - : Sep.21, 2007

10. Chronology

Date	Activity
2005.9.27	Received E-mail from GMCL initially
2005.9.30	Checked circuit & allowable current of wire related to Splice pack 201 and found no trouble
2005.10.27	Received claimed part
2005.11.03	Received FPR from GMCL
2005.11.10	Issued on PRTS+
2005.11.14	Analysis result (Draft) shows Terminal was deformed by external force
2005.11.21	Received FTIR from Suzuki
2005.11.22~12.6	Complex environment(Thermal, Vibration, Current load) test (1st)
2005.11.24	Report on Gunsan Plant CPIT(1st)
2005.12.1	Received CCRR from Suzuki
2005.12.1	Received additional claimed part from ASMC
2005.12.15	Report on Gunsan Plant CPIT(2nd)
2005.12.16~1.2	Complex environment test (2nd)
2005.12.20	Received FTR from Western Europe (4 cases)
2005.12.20	PE considering to changing splice type (Splice pack → Splice Clip)
2005.12.27	Containment action (Enhanced incoming inspection from 5pcs to 10pcs for Terminal. Trained worker for rework method)
2005.12.29	Report on Gunsan Plant CPIT(3rd)
2006.01.04	Changed Splice type(Splice Pack → Splice Clip) ECR Released (PBE 1007J2)
2006.01.04	Request to analysis of claimed part (Delphi USA)
2006.01.18	Applied changing Splice type firstly (Splice Pack → Splice Clip)
2006.01.24	Received analysis result from Delphi USA
2006.02.01	Received same cases by E-mail (Chevy 2cases, Suzuki 7cases)
2006.02.23	Informed Repair method to ASMC
2006.07.20	Closed at CPIT - Low warranty (0.4 IPTV) at that time
2007.01.08	Received FTR on Domestic market
2007.04.20	Received Field action request from GMCL due to case increasing (132 cases) after releasing repair method
2007.07.24	U.S.A NHTSA started PE(Preliminary Evaluation) investigation
2007.08.07	NHTSA IR(Information Request) received (Due date : 9/19)

11. Potential Use of Parts, Systems, and Design in Global Application

- CKD countries are not involved because DRL function not applied in those countries.

12. Estimated Cost of Field Action

- Total field action vehicle & requirement cost

Alternative	Domestic	Europe/Others	N/A	Total	Cost (Mil/USD)
Alt 1	-	4,759	128,247	133,006	7.9
Alt 2	-	2,039	58,358	60,397	3.6
Alt 3	3,284	70,348	128,247	201,879	11.2

13. Business Reasons for Field Action

- This issue could affect on customer safety due to Head lamp low beam or DRL function failure. And U.S.A NHTSA in under investigation on this issue, which could influence to our company's image. Therefore we need to resolve this issue.