From: Coniff, John B
Sent: Wednesday, November 16, 2005 4:38 PM
To: 'raymond.degiorgio[redacted]
Subject: FW: Work Request Number:051959
Attach: GM Delta ADVP&R DV Only 1-10-02.pdf

Ray, here's the information you requested Ray about the short circuit testing back in 2002.

Jack

-----Original Message-----
From: Svoboda, Thomas E
Sent: Wednesday, November 16, 2005 3:31 PM
To: Coniff, John B
Cc: Lin, George J; 'Lance.Wegner[redacted]
Subject: RE: Work Request Number:051959

See line item 48 of this ADVP&R. Short circuit testing was only performed in the DV. I am certain that a 10amp fuse was used in the test circuit, per CTS direction. That means a direct short to ground resulted in a blown fuse and NO circuit damage. That means a 14amp circuit current resulted in a blown fuse almost immediately upon circuit closure, and NO circuit damage. That means a 10amp circuit current was maintained with no fuse failure for the full 60 minutes, or until the switch circuit burned up. No flame ever occurred, just smoke, a bad odor, and circuit failure. I think Ray signed off on this result because he determined that the actual vehicle uses a 5amp fuse in the ignition circuit feed. That is why we did not have to redesign and retest in PV.

Thomas Svoboda

Customer Specialist

Delphi Mechatronic Systems

[redacted]

-----Original Message-----
From: Coniff, John B
Sent: Wednesday, November 16, 2005 12:57 PM
To: Svoboda, Thomas E
Cc: Lin, George J; 'Lance.Wegner[redacted]
Subject: RE: Work Request Number:051959

Sounds good to me Tom. By the way, Ray called asking if we have the short circuit test done on the Delta switch a few years ago. He needs a copy of the test results. Sounds like there might have been an issue somewhere.

Thanks

Jack

-----Original Message-----
From: Svoboda, Thomas E
Sent: Wednesday, November 16, 2005 11:55 AM
To: Coniff, John B
Cc: Lin, George J; 'Lance.Wegner[redacted]
Subject: RE: Work Request Number:051959

Prescribed test flow for 05-418:

1. Torque Angle
Room Temp
2. Contact Bounce
Room Temp
-40C
3. Simple Function
Room Temp
-40C
+85C
4. 1x life cycling (75,000 cycles)

5. Contact Bounce
Room Temp
-40C
6. Simple Function
Room Temp
-40C
+85C

This is per the ADVP&R. Does engineering concur? Change as desired, and email back.

Thomas Svoboda

Customer Specialist

Delphi Mechatronic Systems

[redacted]

ANALYSIS/DEVELOPMENT/VALIDATION PLAN & REPORT (ADVP&R) FOR SUPPLIERS

SECTION II – PLAN AND REPORT DATA

PLAN # Delta Z Ignition Switch	PLAN DATE 9-24-2001
AUTHOR'S NAME Thomas Svoboda	AUTHOR'S PHONE # [redacted]
SUPPLIER APPROVAL	GM APPROVAL
REPORTING ENGR NAME Erik Mattson	
PHONE # [redacted]	REPORT DATE 1-10-2002

SECTION I -- DESIGN EVALUATED

PART NAME Delta Z Ignition Switch	PART # 12450250	UPC # 12	REVISION DATE / LEVEL Various
MODEL YEAR 2003	PLATFORM GMX357	MODEL # Delta Z	SUPPLIER NAME Delphi Mechatronic Systems

SECTION VI - D F ME A APPROVAL

APPROVED: _____ NOT APPROVED:

GM VALIDATION ENGINEER SIGNATURE: DATE:

SECTION V - VALIDATION RESULTS APPROVAL

APPROVED: _____ NOT APPROVED: _____

VALIDATION PHASE: _____

GM VALIDATION ENGINEER SIGNATURE DATE:

SECTION III -- VALIDATION PLAN / **SEC IV -- VALIDATION REPORT** / **NOTES**

ITEM #	PROCEDURE #	PROCEDURE TITLE	REQUIREMENT # & TITLE	REQMT VALUE	RESPONSIBILITY	EVALUATION PHASE	SAMPLE QTY	SAMPLE TYPE	TIMING START	TIMING COMPL	SAMPLES TESTED QTY	SAMPLES TESTED TYPE	SAMPLES TESTED STAGE	RESULTS	NOTES
1	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	12	D	10-6-2001	10-6-2001	0	D	Beta	Not Req'd	Delphi Lab Number 01-289 [CTS Rev 3-22-2001] Test Leg #3 Initial Perf Tests Initial Simple Function was discovered to not be required in the GM CTS.
2	3.2.1.4	Contact Resistance	Measured Resistance	100 mOhms Max	Delphi	DV	12	D	10-6-2001	10-6-2001	12	D	Beta	OK	
3	3.1.2.3	Voltage Drop	Measured Voltage Drop	350 mV Max	Delphi	DV	12	D	10-6-2001	10-6-2001	12	D	Beta	OK	
4	3.2.1.5	Open Circuit Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D	10-6-2001	10-6-2001	12	D	Beta	OK	
5	3.2.1.6	Isolation Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D	10-6-2001	10-6-2001	12	D	Beta	OK	
6	3.2.2.3	Torque-Angle	Actuation Torque Off-ACC	All In N-cm 25/15	Delphi	DV	12	D	10-6-2001	10-6-2001	12	D	Beta	Not OK	See PPAP for Measured values. Torques- 12/5 N-cm

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REQUIREMENT VALUE Enter cycles, miles, volts, minimum value, no loss of function.

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E = PPAP (Initial Production)
F = Full volume production

HARDWARE STAGE
M = Mule
α = Alpha
β = Beta
Prot = Prototype
Pil = Pilot
Prod = Production

SAMPLES TESTED Enter quantity tested, sample type and hardware stage.

RESULTS Enter actual results.

NOTES Describe unique criteria or results. Use to describe interim status of evaluations.

			ACC-RUN Max Travel Return Torque RUN-ACC ACC-OFF Displacement ACC Make Key-In Break RC Make KRC Make Diff KRC-RC ACC Break KRC Resist Diff ACC-KRC KRC NonResist Diff ACC-KRC ACC Make RC Break KRC Break Diff KRC-RC Key-In Make ACC Break	25/15 65/55 15 Min 25/15 25/15 All In Deg 33/27 40/34 67/61 61/55 10/2 99/93 95/82 2 Min 95/82 2 Min 99/93 67/61 61/55 10/2 40/34 33/27										Not OK Not OK OK Not OK Not OK OK Not OK OK OK OK OK Not OK Not OK Not OK Not OK Not OK Not OK OK Not OK Not OK Not OK	21/12 N-cm 70/44 N-cm 20/15 N-cm 19/10 N-cm 17/11 N-cm Displacements- 31/29 Deg 41/39 Deg 65/63 Deg 60/59 Deg 5/4 Deg 99/98 Deg, #12 Contact Bounce 98/97 Deg 2/0 Deg 97/86 Deg 5/1 Deg 99/91 Deg 110/61 Deg, #5, #10 Cont Bnc 59/57 Deg 52/3 Deg, #5, #10 Cont Bounce 40/30 Deg 30/25 Deg
7	3.2.1.8	Contact Bounce	Measure Number of Bounces and Duration	5 Max 1.0 mSec Max None 10mSec Post Make-Break	Delphi	DV	12	D	10-6-2001	10-6-2001	12	D	Beta	OK	No Bounces Detected
8	3.1.5.1	Durability to 100% Life	R98 at C50 for One Life.	50000 Cycles	Delphi	DV	12	D	10-7-2001	10-19-2001	12	D	Beta	No Judgment	All circuits of all samples were properly open when in the OFF position throughout testing. The Key-In circuits of samples 1-3 and 6-12 were properly functional with voltage drop

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															values at 350mV or below throughout testing. The Key-In circuit of sample 4 did not open when released, possibly due to a short Key-In make point displacement resulting in a fixture interference condition. The Key-In circuit of sample 5 was properly functional with voltage drops at 860mV or below throughout testing. The ACC circuits of samples 1 and 4-8, were functional in the ACC switch position, with voltage drop values at 350mV or below throughout testing. The ACC circuits of samples 2, 3, and 9-12 were functional in the ACC switch position, with voltage drops at 471mV or below throughout testing. The ACC circuits of samples 1-12 were functional in the RUN switch position, with voltage drops at 563mV or below throughout testing. The RUN-CRANK circuits of samples 1-12 were functional in the RUN switch position, with voltage drops at 1434mV or below throughout testing. The KEY-RUN-CRANK circuits of all samples were functional in the RUN switch position, with voltage drop values at 350mV or below throughout testing. The RUN-CRANK circuits of samples 1-7, 9, and 12, were

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Enter quantity tested, sample type and hardware stage.

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																functional in the START switch position, with voltage drop values at 350mV or below throughout testing. Page 4of 15 The RUN-CRANK circuits of samples 8, 10, and 11 were functional in the START switch position, with voltage drops at 882mV or below throughout testing. The KEY-RUN-CRANK circuits of all samples were functional in the START switch position, with voltage drop values at 350mV or below throughout testing.
PROCEDURE # Enter the 4 digit standard procedure number, If not standard, enter 0000.	**PROCEDURE TITLE** Enter the full name of the standard evaluation procedure. If not standard, create a brief, descriptive title.	**REQUIREMENT # & TITLE** Enter number and title of corresponding VTS, SSTS and/or CTS requirements being evaluated.	**REQUIREMENT VALUE** Enter cycles, miles, volts, minimum value, no loss of function.	**EVALUATION PHASE** D = Development DV = Design Validation PV = Product Validation PVA = Post Validation Audit		**SAMPLE TYPE** A = Analysis B = Hand made C = Soft tooled D = Hard tooled E = PPAP (Initial Production) F = Full volume production		**HARDWARE STAGE** M = Mule α = Alpha β = Beta Prot = Prototype Pil = Pilot Prod = Production		**SAMPLES TESTED** Enter quantity tested, sample type and hardware stage.	**RESULTS** Enter actual results.	**NOTES** Describe unique criteria or results. Use to describe interim status of evaluations.

9	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	12	D	10-19-2001	10-19-2001	0	D	Beta	Not Req'd	Simple Function was discovered to not be required in the GM CTS.
10	3.2.1.4	Contact Resistance	Measured Resistance	100 mOhms Max START 6-5: 9K/ 300 Ohms	Delphi	DV	12	D	10-19-2001	10-19-2001	12	D	Beta	Not OK	Max Measured Values ACC 2-4: 308mOhms RUN 2-4: 147mOhms RUN 2-3: 264mOhms RUN 6-5: 154mOhms START 2-3: 56mOhms START 6-5: 8831Ohms KEY-IN 2-5: 92mOhms
11	3.1.2.3	Voltage Drop	Measured Voltage Drop	350 mV Max	Delphi	DV	12	D	10-19-2001	10-19-2001	12	D	Beta	OK	
12	3.2.1.5	Open Circuit Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D	10-19-2001	10-19-2001	12	D	Beta	OK	
13	3.2.1.6	Isolation Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D	10-19-2001	10-19-2001	12	D	Beta	OK	
14	3.2.2.3	Torque-Angle	Actuation Torque Off-ACC ACC-RUN Max Travel Return Torque RUN-ACC ACC-OFF Displacement ACC Make Key-In Break RC Make KRC Make Diff KRC-RC ACC Break KRC Resist Diff ACC-KRC	All In N-cm 25/15 25/15 65/55 15 Min 25/15 25/15 All In Deg 33/27 40/34 67/61 61/55 10/2 99/93 95/82 2 Min	Delphi	DV	12	D	10-19-2001	10-19-2001	12	D	Beta	 Not OK Not OK Not OK OK Not OK Not OK Not OK Not OK Not OK OK OK Not OK Not OK Not OK	See PPAP for Measured values. Torques- 10/3 N-cm 40/17 N-cm 49/41 N-cm 19/15 N-cm 33/13 N-cm 31/14 N-cm Displacements- 35/26 Deg 44/40 Deg 69/64 Deg 60/56 Deg 10/5 Deg 105/98 Deg 99/95 Deg 8/1 Deg

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Enter quantity tested, sample type and hardware stage.

RESULTS
Enter actual results.

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			KRC NonResist Diff ACC-KRC ACC Make RC Break KRC Break Diff KRC-RC Key-In Make ACC Break	95/82 2 Min 99/93 67/61 61/55 10/2 40/34 33/27										Not OK OK Not OK OK OK OK OK Not OK	98/94 Deg 9/2 Deg 105/97 Deg 64/62 Deg 57/55 Deg 9/4 39/37 Deg 31/24 Deg
15	3.2.1.8	Contact Bounce	Measure Number of Bounces and Duration	5 Max 1.0 mSec Max None 10mSec Post Make-Break	Delphi	DV	12	D	10-19-2001	10-19-2001	12	D	Beta	OK	No Contact Bounces
16	3.1.5.1	Durability to 150% Life	R98 at C50 for One Life.	25000 Cycles	Delphi	DV	12	D	10-19-2001	10-26-2001	12	D	Beta	No Judg-ment	All circuits of all samples were properly open when in the OFF position throughout testing. The Key-In circuits of samples 3-12 were properly functional with voltage drop values at 350mV or below throughout testing. The Key-In circuit of sample 1 randomly did not open when released, only during the first 4620 cycles of 100-150% life testing. The Key-In circuit of sample 2 consistently did not open when released, only during the first 4795 cycles of 100-150% life testing. The ACC circuits of samples 1, 3-5, and 7-12, were functional in the ACC switch position, with voltage drop values at 350mV or below throughout testing. The ACC circuits of

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RESULTS
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															samples 2 and 6 were functional in the ACC switch position, with voltage drops at 471mV or below throughout testing. The ACC circuits of samples 4, 5, 7-10, and 12, were functional in the RUN switch position, with voltage drop values at 350mV or below throughout testing. The ACC circuits of samples 1-3, 6, and 11 were functional in the RUN switch position, with voltage drops at 519mV or below throughout testing. The RUN-CRANK circuits of samples 1, 2, 4, 5, 6, 8-10, and 12, were functional in the RUN switch position, with voltage drop values at 350mV or below throughout testing. The RUN-CRANK circuits of samples 3, 7, and 11 were functional in the RUN switch position, with voltage drops at 559mV or below throughout testing. The KEY-RUN-CRANK circuits of all samples were functional in the RUN switch position, with voltage drop values at 350mV or below throughout testing. The RUN-CRANK circuits of samples 1-6, and 8-11, were functional in the START switch position, with voltage drop values at 350mV or below throughout testing.

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															The RUN-CRANK circuit of sample 7 was functional in the START switch position, with voltage drops at 543mV or below throughout testing. The RUN-CRANK circuit of sample 12 was functional in the START switch position throughout testing, with the exception of one open circuit incident at 67599 cycles, 85C. The KEY-RUN-CRANK circuits of all samples were functional in the START switch position, with voltage drop values at 350mV or below throughout testing. Testing terminated at 75000 total cycles per GM Engineering due to the de-rating of the ACC electrical load to 1 AMP from 2 AMPS. NOTE: SAMPLES 3, 10, AND 11 EXHIBITED MECHANICAL BINDING CONDITIONS AT COLD TEST TEMPS THAT PREVENTED ACTUATION INTO THE RUN AND START SWITCH POSITIONS NEAR THE END OF TESTING. THIS WAS TRACED TO MECHANICAL WEAR OF THE DETENT POSITION.
17	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	12	D	10-26-2001	10-31-2001	0	D	Beta	Not Req'd	Simple Function was discovered to not be required in the GM CTS.

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18	3.2.1.4	Contact Resistance	Measured Resistance	100 mOhms Max	Delphi	DV	12	D	10-26-2001	10-31-2001	12	D	Beta	Not OK	Max Measured Values ACC 2-4: 515mOhms RUN 2-4: 119mOhms RUN 2-3: 239mOhms RUN 6-5: 195mOhms START 2-3: 66mOhms START 6-5: 8832Ohms KEY-IN 2-5: 142mOhms
19	3.1.2.3	Voltage Drop	Measured Voltage Drop	350 mV Max	Delphi	DV	12	D	10-26-2001	10-31-2001	12	D	Beta	OK	
20	3.2.1.5	Open Circuit Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D	10-26-2001	10-31-2001	12	D	Beta	OK	
21	3.2.1.6	Isolation Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D	10-26-2001	10-31-2001	12	D	Beta	OK	
22	3.2.2.3	Torque-Angle	Actuation Torque Off-ACC ACC-RUN Max Travel Return Torque RUN-ACC ACC-OFF Displacement ACC Make Key-In Break RC Make KRC Make Diff KRC-RC ACC Break KRC Resist Diff ACC-KRC KRC NonResist Diff ACC-KRC ACC Make	All In N-cm 25/15 25/15 65/55 15 Min 25/15 25/15 All In Deg 33/27 40/34 67/61 61/55 10/2 99/93 95/82 2 Min 95/82 2 Min 99/93	Delphi	DV	12	D	10-26-2001	10-31-2001	12	D	Beta	 Not OK Not OK Not OK OK Not OK Not OK Not OK Not OK Not OK OK OK Not OK Not OK Not OK Not OK Not OK Not OK	See PPAP for Measured values. Torques- 8/5 N-cm 59/18 N-cm 50/42 N-cm 19/17 N-cm 26/12 N-cm 25/12 N-cm Displacements- 34/31 Deg 43/40 Deg 68/64 Deg 61/58 Deg 8/5 Deg 106/98 Deg 99/96 Deg 8/1 Deg 98/96 Deg 14/2 Deg 110/97 Deg

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			RC Break KRC Break Diff KRC-RC Key-In Make ACC Break 33/27 40/34 67/61 61/55 10/2 99/93 95/82 2 Min 95/82 2 Min 99/93 67/61 61/55 10/2 40/34 33/27	25/15 25/15 All In Deg										Not OK Not OK Not OK Not OK Not OK OK OK Not OK Not OK Not OK Not OK Not OK Not OK OK OK OK OK OK	26/12 N-cm 25/12 N-cm Displacements- 34/31 Deg 43/40 Deg 68/64 Deg 61/58 Deg 8/5 Deg 106/98 Deg 99/96 Deg 8/1 Deg 98/96 Deg 14/2 Deg 110/97 Deg 63/62 Deg 58/56 Deg 7/4 39/38 Deg 31/29 Deg
23	3.2.1.8	Contact Bounce	Measure Number of Bounces and Duration	5 Max 1.0 mSec Max None 10mSec Post Make-Break	Delphi	DV	12	D	10-26-2001	10-31-2001	12	D	Beta	OK	No Contact Bounces
24	3.1.5.1	Durability to 300% Life	R98 at C50 for One Life.	25000 Cycles	Delphi	DV	12	D			0	D	Beta		Testing terminated at 75000 total cycles per GM Engineering due to the de-rating of the ACC electrical load to 1 AMP from 2 AMPS.
25	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	12	D			0	D	Beta		
26	3.2.1.4	Contact Resistance	Measured Resistance	100 mOhm	Delphi	DV	12	D			0	D	Beta		

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RESULTS
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				s Max											
27	3.1.2.3	Voltage Drop	Measured Voltage Drop	350 mV Max	Delphi	DV	12	D			0	D	Beta		
28	3.2.1.5	Open Circuit Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D			0	D	Beta		
29	3.2.1.6	Isolation Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	12	D			0	D	Beta		
30	3.2.2.3	Torque-Angle	Actuation Torque Off-ACC ACC-RUN Max Travel Return Torque RUN-ACC ACC-OFF Displacement (Per 3.2.2.3, Figure B)	All In N-cm 25/15 25/15 65/55 15 Min 25/15 25/15 Displ.-Refer to CTS Section 3.2.2.3 Figure B	Delphi	DV	12	D			0	D	Beta		
31	3.2.1.8	Contact Bounce	Measure Number of Bounces and Duration	5 Max 1.0 mSec Max None 10mSec Post Make-Break	Delphi	DV	12	D			0	D	Beta		
32	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	6	D	10-9-2001	10-9-2001	6	D	Beta	OK	
33	3.2.1.12	1000 Hour	Meet	N/A	Delp	DV	6	D	10-9-	11-26-	6	D	Beta	OK	No Functional Failures

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		Load Soak	Performance Requirements		hi				2001	2001					Max Measured Voltage Drop: 212mV.
34	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
35	3.2.1.4	Contact Resistance	Measured Resistance	100 mOhms Max	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
36	3.1.2.3	Voltage Drop	Measured Voltage Drop	350 mV Max	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
37	3.2.1.5	Open Circuit Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
38	3.2.1.6	Isolation Resistance	Measured Resistance	20 Mohm Min	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
39	3.2.2.3	Torque-Angle	Actuation Torque	All In N-cm	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta		See PPAP for Measured values. Torques-
			Off-ACC	25/15										Not OK	9/5 N-cm
			ACC-RUN	25/15										Not OK	17/10 N-cm
			Max Travel	65/55										Not OK	50/39 N-cm
			Return Torque	15 Min										OK	20/17 N-cm
			RUN-ACC	25/15										Not OK	15/10 N-cm
			ACC-OFF	25/15										Not OK	15/11 N-cm
			Displacement	All In Deg											Displacements-
			ACC Make	33/27										OK	30/29 Deg
			Key-In Break	40/34										Not OK	41/39 Deg
			RC Make	67/61										OK	64/63 Deg
			KRC Make	61/55										OK	59/58 Deg
			Diff KRC-RC	10/2										OK	7/5 Deg
			ACC Break	99/93										Not OK	99/47 Deg, #13, #18 Cont Bnc
			KRC Resist	95/82										Not OK	97/95 Deg
			Diff ACC-KRC	2 Min										Not OK	3/-49 Deg
			KRC NonResist	95/82										Not OK	96/94 Deg
			Diff ACC-KRC	2 Min										Not OK	4/1 Deg
			ACC Make	99/93										Not OK	99/97 Deg

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			RC Break KRC Break Diff KRC-RC Key-In Make ACC Break	67/61 61/55 10/2 40/34 33/27										OK OK OK OK OK	62/61 Deg 57/56 Deg 6/5 39/37 Deg 29/28 Deg
40	3.2.2.5	Rattle Evaluation	No Rattle, Squeak, or Undesirable Noise	N/A	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
41	3.1.1	Appearance	No Objectionable Appearance	N/A	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	
42	3.2.1.8	Contact Bounce	Measure Number of Bounces and Duration	5 Max 1.0 mSec Max None 10mSec Post Make-Break	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	No Contact Bounces
43	3.2.2.4	Audible Sound	Measured Sound Value	50dB Max	Delphi	DV	6	D	11-26-2001	12-3-2001	6	D	Beta	OK	50dB Max Measured Value
44	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	2	D	10-25-2001	10-25-2001	2	D	Beta	OK	
45	3.2.2.13	Over Torque	Torsional Key Rotation	4 N-m Min	Delphi	DV	2	D	10-25-2001	10-25-2001	2	D	Beta	OK	No damage at 6N-m applied torque, CW and CCW.
46	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	2	D	10-25-2001	10-25-2001	2	D	Beta	OK	
47	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	12	D	10-25-2001	10-25-2001	11	D	Beta	OK	#30 Not Tested Initially
48	3.2.1.7.1	Short Circuit Test	Sustain Short Circuit-Circuit	N/A	Delphi	DV	12	D	10-26-	10-26-2001	12	D	Beta	14 Amp, Direct	Samples tested with 14 Ampere circuit current and direct short

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			Protection Adequate						2001					Short to GND: OK 10 Amp Not OK	to ground sustained failure of the protective circuit fuse with no damage to the switches. This is an acceptable mode of failure. All samples were verified to be functional after the fuse failures. All samples tested with 10 Ampere circuit current sustained PC board failure between 48.5 and 60 minutes of testing. All samples were non-functional after the switch PC board failures.
49	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	12	D	10-30-2001	10-30-2001	12	D	Beta	Not OK	Samples 19, 20, 21, and 28 did not function properly.
50	3.2.2.15	Theft Deterrence	Integral Theft Resistor Shall Be Destroyed	40N to 300N 5mm Max	Delphi	DV	3	D	12/3/01	12/3/01	3	D	Beta	OK	Delphi Lab Number 01-381 [CTS Rev 3-22-2001] 144N to 156N, 3.77mm to 4.28mm.
51	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	4	D	11/26/01	11/26/01	4	D	Beta	OK	
52	GM DRE Instructions	Short Circuit Test	Sustain Short Circuit-Circuit Protection Adequate	N/A	Delphi	DV	4	D	11/26/01	11/26/01	4	D	Beta	OK	Delphi Lab Number 01-346 [GM DRE Test Instructions] All circuits tested with 2Amp fuse protection. ACC circuit at 2.7Amp load current; fuse opened at 4 seconds, acceptable fail safe mode. RUN-CRANK, KEY-RUN-CRANK, KEY-IN circuits tested at 1.96Amp load current; circuit sustained for 2 hours, no switch circuit failure.
53	3.1.2.2	Simple Function	Circuit Make Circuit Break	N/A	Delphi	DV	4	D	11/26/01	11/26/01	4	D	Beta	OK	

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