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		REVISION : 1.4
		DATE OF ISSUE : 22/05/2008
QUALIFICATION REPORT	PREPARED BY:	KEVIN O'BRIEN
	AUTHORISED BY :	

Signatures:

Kevin O'Brien _____

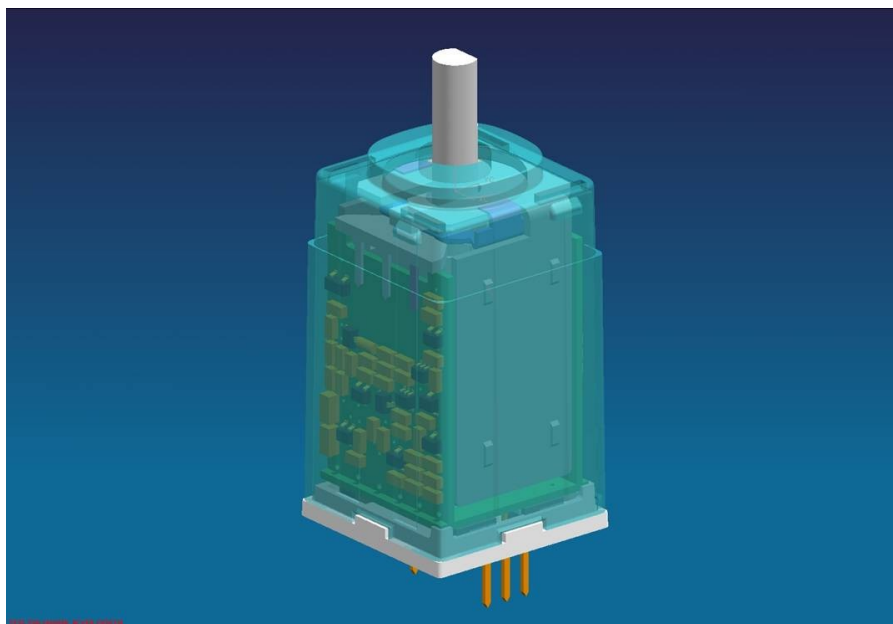
Date: _____

Benoit Anssems: _____


Date: _____

COMENTS:


Qualification of 30Mech Dimmer



Clipsal 30 MECH Dimmer

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1. Introduction

1.1. Scope

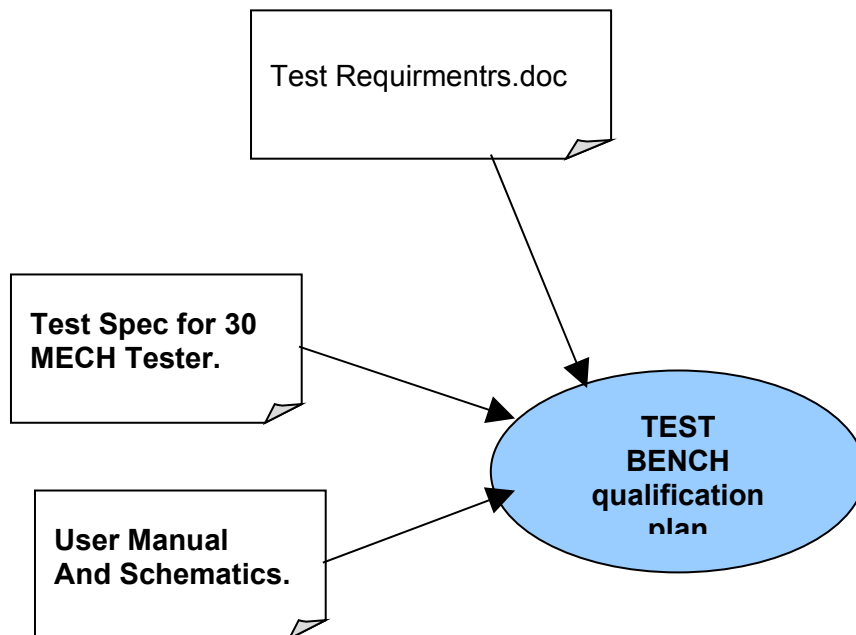
The purpose of this document is to set out some guidelines to qualify the 30MECH tester built by DayStar.

1.2. Revision control

Version	Date	Author	Description
1.0	28-Feb-2008	Kevin O'Brien	Created
1.1	7-March-08	Kevin O'Brien	Acceptance at DayStar
1.2	21-March-08	Kevin O'Brien	Acceptance at Jabil
1.3	30-April-08	Kevin O'Brien	Latest status, product on hold because of design issues. So never got the chance to run big numbers through tester
1.4	21-May-08	Kevin O'Brien	Added a section to sign signature


1.3. Documents Referred to

The following is a list of documents used to develop and carry out the qualification plan.



1.4. Qualification by reference

Reference	Product	Status	Remark
30Mech Clipsal	Universal dimmer Mechanism Clipsal	Passed	Acceptance at Contractor site But would like to run bigger numbers, but products on hold.
30Mech PDL	Universal dimmer Mechanism PDL	Passed	Acceptance at Contractor site

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1.5. Qualification Check List

This table will help ensure that all checks are done and verified to ensure the tester is accepted correctly.


All of these items are discussed later in this document.

Item	Description	Status	Comment	By	Date
1	Safety Check	OK			
2	Hardware Check	OK		KOB	7-Mar-08
3	Document Check				
4	Calibration and Certs	OK	AC source only	KOB	7-Mar-08
5	Training	OK	Me it's OK, but Jabil need training		
6	Test Times	OK	50 sec TT, & 60 sec CT	KOB	7-Mar-8
7	Reliability Testing	OK	Two units failed on Trailing edge Max conduction	KOB	7-Mar-08
8	Validating Each Step	OK	Did CP & CPK on each step		
9	Detecting Faulty Product	OK	Put some faults in, seems OK	KOB	7-Mar-08
10	Initial Acceptance at Daystar	OK	Tested 10 PCBAs 10 times		
11	Final Acceptance at Daystar	OK		KOB	7-Mar-8
12	EMS Reliability (Gage RnR)	OK	100% FPY		20-Mar-08
12	EMS Acceptance	OK	Jabil are not happy with material fixture is made of, but tester is OK.	KOB	1-April-08
13	TARs files	OK	Seems OK, but check in Jabil		
14	Out of Box Audit		Product on hold, because of design issue		
15	Action Plan				

1.6. Not Checked by Tester

This table shows what not tested by the tester

Item	Description	Status	Comment
1	Difference between Clipsal & PDL	OK	Only difference we can do is make them different serial numbers
2			
3			
4			

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2. General Tester Checks

2.1. Safety Checks

Item	Description	Result	Comments
1	Emergency Stop	OK	No power to the DUT, tester still running
2	Keys Working	OK	

Item 1: Emergency Stop

Method: During a product being tested hit the "EMERGENCY STOP" button.

Expected Result: a) The test may fail.
b) Testing should stop (not ask for another serial number)

Item 2: Keys Working


Method: Locate all of the keys, and ensure all are working.

Expected Result: Verify that they are all working correct.

2.2. Hardware Checks

The following are checks to be carried out on the Hardware.

Hardware Type	Description	Status	Comment	Date
Cabling neat?	All cables tied up and not likely to get caught in anything	OK		6-March-08
Metal Work OK	Verify no dangerous metal in tester	OK		6-March-08
Fixture interface	Remove and connect fixture 3 time to make sure all is good	OK		6-March-08
All instruments secure	Are all instruments bolted onto something? No move in transit	OK	Check in Jabil and its OK	17-March-08
Nut and Bolts tight	Check Hardware put together good.	OK		6-March-08

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2.3. Documentation check

The following documents are expected from the contractor:

Doc Ref	Description	Status	Comment	Date
User Manual	Description on how to use the tester from operator point.	OK	In Chinese	17-Mar-08
30MECH Bench Drawing	Mechanical drawing of tester and fixtures.	OK		
30MECH wiring diagram	Schematic of Tester, and schematic of fixture.	OK		
Wear parts list	A list of suspect wear parts, part numbers and source	OK		
Maintenance Manual	Description of how technical person can debug the tester.	OK		


2.4. Training

Level 2 maintenance training
 Troubleshooting trainings

2.5. Calibration & Certificates

This section is to verify that all instruments have calibration certs, and that the software on the tester is all legal.

Type	Description	Number	Status	Comment	Date
XP software SP 2	License Agreement	76487-OEM 0069274 45608	OK	Disk in Jabil	21-Mar-08
Lab View	Run Time Engine	7.1 to 8.5	OK		6-Mar-08
DAQ MX	Data Acquisition Version	8.6.0f6	OK		6-Mar-08
NI-VISA	National Instruments	4.2	OK		
AC source	Agilent HP6812B	MY41001176	OK	6812BMY410 01176	6-Mar-08

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3. Initial Acceptance at Contractor Site

3.1. Products Tested

Verify that each product is actually functioning correctly before beginning the Qualification Process.

Five of each of the two different power variants is to be used for the qualification process.

All units should be Known Good Units, (KGU)

The following is a list and description of each product type.

The products are to be labelled with special numbering so they can be traced if there is a problem, use the table below to label each product using column "Unit Number".

Qty	Product Type	Description	Unit Number
5	30MECH Clipsal	30MECH Dimmer Clipsal	1.1 to 1.5
5	30MECH PDL	30MECH Dimmer DDL	2.1 to 2.5

Note: The Clipsal & PDL product are very similar, only difference is the shaft of the trim pot.

3.2. Test Time

Each variant to be tested 10 times in row, this will give 50 results for 30MECH Clipsal & 50 results for 30MECH PDL.

Test one variant at a time, so prepare the 5 of whichever variant is being tested.

For Example: Test DUT 1.1 first, record results, then DUT 1.2, DUT, 1.2, 1.4 & 1.5. Then start testing DUT 1.1 again, 1.2, 1.3, 1.4 & 1.5..etc..

Each test time & cycle time is to be recorded. Times can be got from either using a stopwatch or else the CT (Cycle Time) & TT (Test Time) from the GUI and be recorded each time.

After the first variant has been completed, do all of the other 5 variants the same as the first.

Fig 1 shows a portion of the GUI, which the operator will use while testing the DUTs.

Prod Times	30MECH Clipsa (Seconds)	30MECH PDL (Seconds)
No 20 sec burn in	30	30
Test Time	50	50
Cycle Time	60	60

3.3. Recycle And Repeatable


This section is to determine how many "No Fault Founds", NFF, the tester generates, and ideally it should be 100% yield because all products are known to be good.

Prod Yields	30MECH Clipsal	30MECH PDL
Expected yield	97%	97%
Actual Yields	100%	100%

Conclusion: All seems good.

Test times are extended by a small burn of 20 seconds where we read the temperature in the beginning of the test, and then after testing a 600 watt load is put on it for 20 seconds, where the temperature is again read after burn in, and if all is good then it should have risen by a definite amount (2deg to 4 deg), any variation outside of that and the product is deemed to be a fail.

This burn in time can be varied, along with the temperature range, to allow for more flexible test times.


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3.4. Validating Each Step

This section verifies that each step is doing what it is supposed to be doing. The results file of each product to be used to get the results. A histogram will be made for each measurement that is numeric, to get the CP & CPK values.

Conclusion:


Two of the samples from Australia had very low Trailing Edge Max conduction angles, below 7.5mSec. It's a product problem as opposed to a tester problem. Product has been put on hold, until design issues solved.

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Step	0_1 6812B Outout Current	0_2 STB 6812B Outout Voltage	0_5 DUT start test temperature	1_1_1 P Trailing Current Min Conduction Angle	1_1_2 N Trailing Current Min Conduction Angle	1_1_3 Load Current relative to Line Voltage Zero-Crossing	1_3_1 P Trailing Current Max Conduction Angle	1_3_2 N Trailing Current Max Conduction Angle	1_2_1 P Trailing Current Transition Time	1_2_2 N Trailing Current Transition Time
Units	Amps	Volts	Deg C	mSec	mSec	mSec	mSec	mSec	mSec	mSec
Min Limit	0.2	220	15	1.5	1.5	-0.3	7.5	7.3	0.02	0.02
Average	0.5	230	32.5	2	2	0	8	7.9	0.03	0.03
Max Limit	0.8	240	50	2.5	2.5	0.3	8.5	8.5	0.04	0.04
Real Min	0.292	229.953	24.348	1.945	1.935	0.062	7.408	7.256	0.022	0.022
Real Average	0.544	229.968	27.690	2.195	2.192	0.089	7.881	7.748	0.026	0.026
Real Max	0.571	229.974	40.885	2.399	2.409	0.093	8.198	8.105	0.029	0.03
STDEV	0.0367	0.0028	2.8844	0.1197	0.1204	0.0073	0.1964	0.2006	0.0014	0.0018
CP	2.321	1205.136	1.466	0.849	0.852	9.657	0.646	0.744	1.411	1.208
CPK	2.723	1209.002	2.022	1.393	1.384	13.714	0.849	0.997	2.434	1.862

2_1 Short Circuit Outout Current	3_1_1 P Leading Current Min Conduction Angle	3_1_2 N Leading Current Min Conduction Angle	3_2_1 P Leading Current Transition Time	3_2_2 N Leading Current Transition Time	3_3_1 P Trailing Current Max Conduction Angle	3_3_2 N Trailing Current Max Conduction Angle	4_0 Line DC Current	4_1 DUT start temperature	4_2 DUT end temperature	4_3 DUT temperature change
mA	mSec	mSec	mSec	mSec	mSec	mSec	mAmps	Deg C	Deg C	Deg C
-10	1.5	1.5	0.03	0.03	7.5	7.5	0	20	20	2
0	2	2	0.045	0.045	8	8	3.5	40	40	4.5
10	2.5	2.5	0.06	0.06	8.5	8.5	7	60	60	7
-9.659	1.56	1.563	0.04	0.041	7.748	7.749	2.927	24.888	27.891	2.309
0.587	1.885	1.884	0.044	0.044	7.895	7.879	4.621	28.365	31.627	3.261
9.692	2.147	2.149	0.048	0.048	7.936	7.923	5.713	39.533	43.556	6.601
4.6687	0.1544	0.1544	0.0018	0.0017	0.0202	0.0189	0.5072	2.5582	2.9782	0.9145
0.672	0.831	0.829	2.702	2.765	6.518	6.695	1.563	1.090	1.301	0.460
0.714	1.080	1.080	2.839	2.961	8.257	8.838	2.300	2.606	2.238	0.911

CP & CPK Results

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4. Detecting Faults Product at Contractor Site.

4.1. Detecting Faulty Product


This section attempts to simulate faults in product & to verify if the tester will detect each fault.

Fault	Prod	Product	Description	Step Failed	Comment
1		Clipsal	Heatsink no rivet	21 Temper	
2		Same	Remove MOV	15 Leading Edge conduction angle	No need to do Over voltage testing
3		Same	D404 missing	4 Min conduction	
4		Same	D404 reversed	4 min conduction	
5		Same	D402 Removed	4 min conduction	
6		Same	Short between D&S	4, min conduction	
7		Same	Short between G&S	4, Min	
8		Same	One leg of POT missing	4, min conduction	
9		Same	C405 missing	4, min conduction	No signal
10		Same	V+ to 0	1, o/p current	First step
11		Same	SNS1 to SNS2	12, Leading Edge	No Leading Edge
12		Same	OV to Gate	4, min conduction	Dimmed but signal bad
13		Same	LED & SNS1	4, min conduction	Signal crappy
14		Same	VCB to 0V	4, min	
15		Same	0v to Drive	1, o/p current	
16		Same	Drive & SNS2	4, min conduction	
17		Same	Gate & Drive	1, o/p current	
18		Same	Gate to ENLE	4, min conduction	
15					
16					
17					

4.2. Conclusion

All seems good, no blow ups.

Not all steps were tested for failure catch, because of the complexity of the DUT.

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5. Final Acceptance at Contractor Site

5.1. Products Tested

Verify that each product is actually functioning correctly before beginning the Qualification Process, KGU.. Fifteen (15) of each 30MECH variants is to be used for the qualification process.

Each unit to be tested 10 times

Qty	Product Type	Description	Unit Number
15	30MECHClipsal	30MECH Clipsal	1.1 to 1.15
15	30MECH PDL	30MECH PDL	1.16 to 1.30

Note:

5.2. Test Time

Each variant to be tested 10 times in row, this will give 150 results for 30MECH Clipsal & 150 results for 30MECH PDL.

Test one variant at a time, so prepare the 15 of whichever variant is being tested.

For Example:

Each test time & cycle time is to be recorded. Times can be got from either using a stopwatch or else the CT (Cycle Time) & TT (Test Time) from the GUI and be recorded each time.

Prod	30MEC Clipsal	30MECH PDL
Times		
Test Time	50	50
Cycle Time	60	60


Conclusion: As expected.

5.3. Recycle And Repeatable

This section is to determine how many "No Fault Finds", NFF, the tester generates, and ideally it should be 100% yield because all products are known to be good.

Prod	30MECH Clipsal	30MECH PDL
Times		
Expected yield	97%	97%
Actual yields	100%	100%

Conclusion: Two of the products failed for Max conduction angle on Trailing Edge, need to confirm if this is OK or not.

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5.4. Gage R&R First Run

D:\KOB\PROJECTS\
UniversalDimmerMe

6. Final Acceptance at JABIL

6.1. Products Tested

Verify that each product is actually functioning correctly before beginning the Qualification Process, KGU.. Fifteen (15) of each 30MECH variants is to be used for the qualification process. Each unit to be tested 10 times

Qty	Product Type	Description	Unit Number
15	30MECHClipsal	30MECH Clipsal	1.1 to 1.15
15	30MECH PDL	30MECH PDL	1.16 to 1.30

Note:

6.2. Test Time

Each variant to be tested 10 times in row, this will give 150 results for 30MECH Clipsal & 150 results for 30MECH PDL.

Test one variant at a time, so prepare the 15 of whichever variant is being tested.

For Example:

Each test time & cycle time is to be recorded. Times can be got from either using a stopwatch or else the CT (Cycle Time) & TT (Test Time) from the GUI and be recorded each time.

Prod Times	30MEC Clipsal	30MECH PDL
Test Time	50	50
Cycle Time	60	60


Conclusion:

Test times are acceptable, times can be reduced if need be, by reducing the burn in time to

6.3. Recycle And Repeatable

This section is to determine how many "No Fault Founds", NFF, the tester generates, and ideally it should be 100% yield because all products are known to be good.

Prod Times	30MECH Clipsal	30MECH PDL
Expected yield	96%	96%
	100%	100%

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7. Other Checks

This section is for other test that does not fit into the above system

7.1. TARs Files

The 30MECH tester while in Jabil it will generate a TARs file, this file is only for Jabil's use, for doing analysis of the performance of the tester.


Take a copy of a TARs file for products that PASSED & for a product that failed, and past both of them in here for review with Jabil Test Team.

Verify that for every product tested it generates a TARS file, and stores it in the C:\TARS\ drive under & C:\TarsBackUP\xx...xxx.TARS folder, twice.

The TARs file for each UUT takes the format of serial NO then date & time tested & finally an extension on .tars, e.g: 00123456789_080225_103035.TARS.

S150080900001# CCLIPSAL B?? NSYSTEM1 P?? s0 D?? R3.2 n?? r?? OJABIL L2 p0 W?? [03/06/08 17:03:50]03/06/08 17:04:49 TP	S1500809000040# CCLIPSAL B?? NSYSTEM1 P?? s0 D?? R3.2 n?? r?? OJABIL L2 p0 W?? [03/06/08 19:29:38]03/06/08 19:29:52 TF F1_1_1 P Trailing Current Min Conduction Angle >Failure occurred in function call:1_1_1 P Trailing Current Min Conduction Angle >Test P Trailing Current Min Conduction Angle >>2.699(1.5 >= && <= 2.5)
Passed TARs result	Failed TARs result

Note: That all of the ??? parameters can be loaded from the program when we get the information from Jabil

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7.2. Test Results.MDB file.

The 30 Mech tester also loads an Access Data Base file with all of the units tested & their respective results. This file can be found under the C drive in directory results/Test Results.mbd. First, verify they the results are being loaded in here, then once all of the qualification has been completed, take a copy of this file and this can be used for later analysis. This will tell us things like test times & yields, with the aid of some simple SQL statements.


PRODUCTRESULT											
Product Type	Product SN	Test Date	Test Time	Test Result	Test Stage	Test Value	Operator Number	MO Number	TTime	Time_Stamp	Tester_Name
30 MECH	150080900040#	03-07-2008	49	PASS	NA	NA	DAYSTAR	SS	09:32:49	3287755970	SYSTEM3
30 MECH	150080900040#	03-07-2008	45	FAIL	4_3 DUT temperature change	<0.363	DAYSTAR	SS	09:31:11	3287755871	SYSTEM3
30 MECH	150080900040#	03-07-2008	49	PASS	NA	NA	DAYSTAR	SS	09:39:34	3287756375	SYSTEM3
30 MECH	150080900005#	03-06-2008	59	PASS	NA	NA	JABIL	TEST 10	16:57:30	3287696251	SYSTEM3
30 MECH	150080900005#	03-06-2008	49	PASS	NA	NA	JABIL	10*10	17:12:18	3287697139	SYSTEM3
30 MECH	150080900004#	03-06-2008	49	PASS	NA	NA	JABIL	10*10	17:11:16	3287697077	SYSTEM3
30 MECH	150080900003#	03-06-2008	49	PASS	NA	NA	JABIL	10*10	17:10:14	3287697014	SYSTEM3

Example of MDB

Given Jabil a tool to enable them to analyse the data easily, in JAVA

7.3. Auto Pass Mark & Pot shave is good.

Verify that the Auto Pass Mark is not causing any damage to the Heat sink. The trim pot turned does not appear to be causing any trouble to the pots shafts. Conclusion: The mark was in the middle of the Heat sink in the beginning, and was causing some slight damage to the Heat sink, so DayStar moved it down closer to where the heatsink metal was stronger. Now all seems okay.

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7.4. Out of Box Audit

Method: Get someone who knows how the product should arrive at the customer to do an out of box audit. This test is not there necessary to verify that all of the correct bits are in the box, because production might not have all of the bits, it's just to check that the configuration is what the customer would expect. Not all products have to be done, only a sample of the variants.

Expected Result: It should pass this test

Test	Expected result	Result
1. Connect a lamp load and mains Via a current Sense Transformer	Load turns ON	
Rotate Trim POT	The Load should turn off	
Verify correct serial number	Same serial numbers as on DUT	


Conclusion:

This product was put on hold for a few months until some problems are fixed. So Qualification on bench is finished, but need to run some product through to make sure it is stable.

7.5. Australian Verification

Method: The entire pilot builds to be sent to Australia for verification.

7.6. Failures from Verification Process

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8. Appendix

8.1. Conventions used

DUT → Device Under Test.
 UUT → Unit Under Test.
 DMM → Digital Multi Meter.
 mSec → milliseconds.
 TT → TestTime (Run time of program)
 CT → CycleTime (Time it takes to load, run sequence & unload DUT).
 LL → Lower Limit.
 UL → Upper Limit.
 NFF → No Fault Found.
 GPO → General Purpose Output

9. Action Plan

This lists the open actions.

	Action	Level	Owner	Date planed	Status	Date close
1	Instruments loose	High	DS	10-Mar-08	Closed	17-Mar-08
2	Move the Auto Pass mark down	High	DS	07-Mar-08	Closed	7- Mar-08
3	Remove Lab view	High	DS	10-Mar-08	Closed	17-Mar-08
4	Load Box loose	Medium	DS	10-Mar-08	Closed	17-Mar-08
5	Documentation, none	High	DS	10-Mar-08	Closed	20-Mar-08
6	Locking on Back doors	High	DS	10-Mar-08	Closed	20-Mar-08
7	Bar code reader not there	High	DS	10-Mar-08	Closed	17-Mar-08
8						
9						