

New Product Development



New Product Development

The life span of products are reducing.

Customers' need for newer models with more features is increasing.

As such the importance of good New Product Development (NPD) team, systems and Process cannot be over emphasized for any growing Company.



Expectations from a good NPD Process 1/2

- Designing and Developing based on established APQP systems

- Include Function Study, QFD, FMEA, Control Plans, Process Sheets etc.

- Handling and Completing more projects per unit of time.

- Right First Time
- Reduction in Time to Market

- Easy and seamless transfer of project to Production

- Include studies of Process Capability, Checking Aids, Calibration and MSA



Expectations from a good NPD Process 2/2

- Team Activity, wherein many members can work simultaneously

- Involve Cross Functional teams : QA, CAD, LAB, Production Purchase, PLM, Toolroom, HR

- Stage wise control of Design Documents

- Supply chain logistics, including Packing, Inspection & Movement

- Clarity in workload sharing with defined accountability / define skills required.

- All verification and Validation activities done and PPAP documentation made



G.A.P OSM NPD Module

- The New Product Development or the NPD module developed by us is based on practical hands on work experience of over 50 years.
- It is based on the requirements of APQP.
Advanced product quality planning (or APQP) is a framework of procedures and techniques used to develop products in industry, particularly the automotive industry. It is quite similar to the concept of Design for Six Sigma (DFSS).

G.A.P OSM NPD Module

- It has been developed and validated over many years based on learnings and guidance from some of the world best Companies like : Toyota, Honda, Mitsubishi, Denso, Asahi etc.
- It guides the User thru all the required steps and simultaneously creates all the required PPAP documentation.

Production Part Approval Process (PPAP) is used in the automotive supply chain for establishing confidence in the production processes and is often require to be submitted to the customer.

In the following slides, we shall share some of the activities performed by G.A.P-OSM NPD module by showing actual screen shots.




G.A.P-OSM NPD Module


The screenshot displays the G.A.P-OSM NPD Module web interface. At the top left, the logo 'GAP OSM' is shown with the tagline 'it's awesome!'. Below it, the text 'Gilard Electronics Pvt Ltd' and 'Self Diagnostics : TBC = 0.00' are visible. A central banner features a technical drawing of a mechanical part with the words 'new', 'product', and 'design' in orange boxes. To the right of the banner, the text 'Pending Approvals' and 'Sanjiv Singh [User]' are displayed, along with a 'signout' button. A navigation bar at the top contains links for Home, Sales, Finance, NPD (highlighted), Stores, QA, Purchase, HRD, PLM, e-CAPA, Dashboard, TPM, Mfg., IGI, FGI, TECH Support, Payroll, Doc Control, Tool Room, PCMD, and NBD. On the left side, a sidebar menu lists 'Reporting', 'User Functions', and 'Supervisor Options', each with a right-pointing arrow. The main content area is titled 'NPD' and features a large graphic of two hands holding a globe with a green plant growing from it, with the text 'Product Development' overlaid. At the bottom, a footer contains links for Sitemap, User, Administrator, Super Administrator, Main Module, Raise a Ticket, View Tickers, Data Exporter, a red 'Readme' button, Add Page to Favourite, Function file, Help [F2], and [Esc].




Project Initiation



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[Reporting](#) ➔
[User Functions](#) ➔
[Supervisor Options](#) ➔

NEW PROJECT INITIATION

[Review open projects](#)


Date:	16-11-2017	IDC No.:	--Select IDC NO-- ▾	
Product Description:				
Product Purpose:				
Customer Part No.	Enter cust. Part no.	Product No. allocated:		Verify if this product number already exist
Annual Qty:		Project Life Expected:		
Sale Price:		Target Cost:		
Target date of Completion:				
Project Designated to:	--select-- ▾			
Annual Revenue:	0	Lifetime Revenue:	0	
Development Charges		Advance(against PO) :		Balance(before bulk shipment) : <input type="text"/>

[Save and Exit](#) [Cancel](#)


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Projects Listing




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NPD | User Function | Work on projects

List of Projects


S.No.	Date	Customer	Product No.	Skill Matrix	Product Description	Status							
						BOM	Drg.	DRC	Tool Design	Tooling	Tool trial	Ver.	final
1	28-09-2016	C4415-LUCAS- TVS LIMITED	2519-RMS	NA	Regulator Moulding								
2	02-11-2016	C10056-NIDEC INDIA PVT. LTD	2214-03N	NA	RADIATOR RESISTOR								
3	02-11-2016	C7749-SUBROS LTD	2302-01S	NA	RESISTOR BLOWER								
4	02-11-2016	C2883-HONDA MOTOR INDIA PVT.LTD.	997-18S	NA	PLUG								
5	02-11-2016	C2883-HONDA MOTOR INDIA PVT.LTD.	995-07S	NA	RECEPTACLES (240V-6A)								
6	02-11-2016	C2883-HONDA MOTOR INDIA PVT.LTD.	997-08S	NA	RECEPTACLES (250V-15A)								
7	02-11-2016	C6146-PREET TRACTORS PVT. LTD.	762-03PR	NA	BRAKE LIGHT SWITCH								
8	02-11-2016	C10026-IFB AUTOMOTIVE PVT. LTD.	2214-01I	NA	RADIATOR RESISTOR								
9	02-11-2016	C10022-KINETIC ELECTRIC MOTOR CO PRIVATE LIMITED	2214-03K	NA	RADIATOR RESISTOR								

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Working on Individual Product



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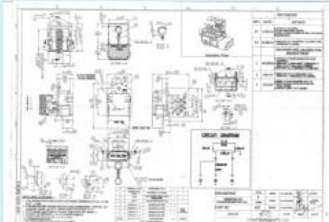





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NPD | User Function | Work on projects


Product Code	2014000	Description	RADIATOR RESISTOR	Project I/C	E2167(Ankush Dhiman)/E1366(Gurjinder Singh)/E2242(Atul Vashisth)	+ -
Customer Code	01005	Customer Name	NOES INDIA PVT LTD	Customer Part No.		
Purpose	RESISTOR FOR RADIATOR FAN TO CONTROL FAN SPEED.					
Target Date	30-11-2016	Sale Cost	Rs. 000	Target Cost:	Rs. 000	Tentative Cost till now
Annual Qty.	60000 Nos	Project Life Expected	5	Annual Revenue	Rs. Lacs 000	Lifetime Revenue
Drawing			Picture			
 <p> <input type="radio"/> Medium <input type="radio"/> Large <input type="radio"/> Extra Large </p>			 <p> <input type="radio"/> Medium <input type="radio"/> Large <input type="radio"/> Extra Large </p>			
Choose File No file chosen Upload drawing			Choose File No file chosen Upload Picture			
Part list	Costed BOM	Functions	DFMEA	Assy Process and skill development	PFC	PFMEA
Inspection Sheet	PDI	Layout Inspection Sheet	DVP	Performance Test	SCM	PND
		Status	Project Sign Off			

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Functions Identification & Study



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Product Functions of 750-02(Door Switch)

Sr.No	Main Function	Specific Needs																
		<input type="text" value="Enter new function based specific need"/> 																
1.	Air Tightness: Cut off the wire at the front of the connector and joint the tube at the section and then measure the air tightness with pressure from the tube in the water. Measurement: The door switch should be placed at 10cm Depth from the water surface and the compressed air of 9.8 Mpa (0.1 kgf/cm ²) should be added for 30 sec. If the air is not leaked for 30 sec, Another compressed air of 9.8 Mpa (0.1 kgf/cm ²) should be added and repeat the above steps. The air tightness should be more then 98 Mpa (0.1 kgf/cm ²)	QFD																
2.	Contact point shall be coated with EL-363 Grease.	QFD																
3.	Continuous Activation : Shall withstand rated load for at least 48 Hrs.	QFD																
		<table border="1"> <thead> <tr> <th>Depends on</th> <th>Raw Material</th> <th>Process</th> <th>Dimension</th> </tr> </thead> <tbody> <tr> <td>0750-00-01-WIRE HARNESS</td> <td>AVS 0.5 Wire-</td> <td></td> <td></td> </tr> <tr> <td>0750-27-12-STOPPER TERMINAL</td> <td>-</td> <td></td> <td>Silver Plating 2 Micron</td> </tr> <tr> <td>0750-27-14-FLOATING TERMINAL</td> <td>-</td> <td></td> <td>Silver Plating 2 Micron</td> </tr> </tbody> </table>	Depends on	Raw Material	Process	Dimension	0750-00-01-WIRE HARNESS	AVS 0.5 Wire-			0750-27-12-STOPPER TERMINAL	-		Silver Plating 2 Micron	0750-27-14-FLOATING TERMINAL	-		Silver Plating 2 Micron
Depends on	Raw Material	Process	Dimension															
0750-00-01-WIRE HARNESS	AVS 0.5 Wire-																	
0750-27-12-STOPPER TERMINAL	-		Silver Plating 2 Micron															
0750-27-14-FLOATING TERMINAL	-		Silver Plating 2 Micron															
4.	DURABILITY: Requirement of items 1,2 & 4 shall be met after 40,000 cyce operation at 12V,2A under the following conditions: Stroke: 8 mm, Operation cycle Rate:15/Min.	QFD																
		<table border="1"> <thead> <tr> <th>Depends on</th> <th>Raw Material</th> <th>Process</th> <th>Dimension</th> </tr> </thead> <tbody> <tr> <td>0750-02-15-SPRING</td> <td>-</td> <td></td> <td>Spring Constant 394±10% N/M</td> </tr> <tr> <td>0750-27-12-STOPPER TERMINAL</td> <td>Vicker Hardness 110 VPN Min.-</td> <td></td> <td>Silver Plating 2 Micron</td> </tr> <tr> <td>0750-27-14-FLOATING TERMINAL</td> <td>Vicker Hardness 110 VPN Min.-</td> <td></td> <td>Silver Plating 2 Micron</td> </tr> </tbody> </table>	Depends on	Raw Material	Process	Dimension	0750-02-15-SPRING	-		Spring Constant 394±10% N/M	0750-27-12-STOPPER TERMINAL	Vicker Hardness 110 VPN Min.-		Silver Plating 2 Micron	0750-27-14-FLOATING TERMINAL	Vicker Hardness 110 VPN Min.-		Silver Plating 2 Micron
Depends on	Raw Material	Process	Dimension															
0750-02-15-SPRING	-		Spring Constant 394±10% N/M															
0750-27-12-STOPPER TERMINAL	Vicker Hardness 110 VPN Min.-		Silver Plating 2 Micron															
0750-27-14-FLOATING TERMINAL	Vicker Hardness 110 VPN Min.-		Silver Plating 2 Micron															


Quality Function Deployment

 <div style="float: right; text-align: right;"> Date : 17th of November 2017 Time : 10:01:45 AM User : Sanjiv Singh </div>																								
<div style="text-align: center;"> Quality Function Deployment of 781-01-NEUTRAL SAFETY SWITCH (NC TYPE) </div>																								
Part List	Random Vibration Test according to ISO 16750-3:2003 for 32 hours	Low Temperature Test for Storage at -40°C for 24 hours	Control the Switching Point and Operating Stroke	Operating Force 16 N +/- 20 % for Contact breaking and 25 N +/- 20 % for Full Stroke	Overload Forces, 100 N applied 10 mm from the tip of the switch in any direction.	Mounting	Terminal Fitting with Coupler at customer end	Corrosion Resistance: ISO 16750-4 for 250 hours	Tightening Torque: 50 Nm (max)	RoHS compliant	Contact Bounce	Insulation Resistance (Minimum 10 M Ohms initially and 1 M Ohms after Any Test)	High Voltage Flash 0.5 KV RMS for 60 secs	Voltage Drop (max 100 mw initial and max 250 mw after tests)	Endurance test: Total 75 lac cycles First 3, 40 lacs at room temperature , then 50000 at (+) 90° C, and then 10000 at (-) 40° C. Cycle time 1 sec ON and 3 Sec OFF.	Slow Decrease of Supply Voltage from 32 V to 0 V and Slow Increase of Supply Voltage from 0 V to 32 V, applying at change rate of 0.5+/-0.1 V/min.	Leak Test @ 1 Bar , no leakage is allowed.	Visual (There should be no burrs and Sharp edges)	IP69K	Free Fall Test	Low Temperature Test for Operation at -40°C for 24 hours	High Temperature Test for Storage at 90°C for 48 hours	High Temperature Test for Operation at 90°C for 96 hours	
0781-01-01-PLUNGER			D					R															SS410	
0781-21-10-ADAPTOR			D		D	PD		R												RP				Hardness of Material
0781-52-08-ASSEMBLY TERMINAL			D				PD					R	D											0052-00-14
0781-21-07-PIN			D																					
0781-02-03-SPRING COMPRESSION (BIG)				D																				
0781-02-16-SPRING COMPRESSION (SMALL)				D							D		D											
0781-42-02-HOLDER					RP																			Nylon (Stanyl TW371 Natural), No regrind!


Design Validation Plan



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Design Validation Plan of 750-02(Door Switch)

Performance

GAP it

Test	Method	Specification		Checked By	Instrument	Time for testing	No. of Samples	Select to del.
		Initial	Final					
Rating	<input style="width: 100%;" type="text"/>	12 Volts, 2An	12 Volts, 2An	Self ▼	--Select instrument ▼	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>
Insulation Rasistance	<input style="width: 100%;" type="text"/>	1M Ohms	1M Ohms	Self ▼	IT-INSULATION TE ▼	1Day	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>
Voltage Drop	<input style="width: 100%;" type="text"/>	0.1 V	0.25 V	Self ▼	--Select instrument ▼	1Day	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>
Operating Force	<input style="width: 100%;" type="text"/>	300(-150)G	500(+200)G	Self ▼	--Select instrument ▼	1Day	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>


Endurance

GAP it

Test	Method	Specification		Checked By	Instrument	Time for testing	No. of Samples	Select to del.
		Initial	Final					
Durability	<input style="width: 100%;" type="text"/>	12 Volts, 2An	12 Volts, 2An	Self ▼	--Select instrument ▼	4Day	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>
Vibration Resistance	<input style="width: 100%;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	Customer ▼	--Select instrument ▼	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>
Continuous Activation	<input style="width: 100%;" type="text"/>	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text"/>	Self ▼	--Select instrument ▼	3 Days	<input style="width: 50px;" type="text"/>	<input type="checkbox"/>




Performance Test Sheet


		DVP-Performance Testing of 750-02		Date: 16-11-2017		
		(Door Switch)		Time 04:48:30pm		
Part Name:	750-02-Door Switch	Customer:	C7453-SML ISUZU LIMITED	Rectangular Snip		
Performance Test(Initial)						
S.no.	Test	Method	Equipment	Specification		
				Specified	Observed	Result
1	Rating	12Volts,2Amperes		12 Volts,2Amperes		
2	Insulation Rasistance	1M Ohms	IT006-INSULATION TESTER	1M Ohms		
3	Voltage Drop	0.1 V Max (Before Test) & 0.25 V Max (After Test)		0.1 V		
4	Operating Force	300(-150) gf Intial Force , 500 (+200) gf After 8 mm Stroke		300(-150)Gf		
Climatic/Endurance Test						
1.Durability						
Test: Durability						
Method: Shall Fullfill Above Sr. No.2,3,4 after 40000 cycles, Conditions: 12V,2A Stroke 8 mm Operation Cycle Rate-15 SPM						
Equipment :						
Performance(Final)						
S.no.	Test	Method	Equipment	Specification		
				Specified	Observed	Result
1	Rating	12Volts,2Amperes		12 Volts,2Amperes		
2	Insulation Rasistance	1M Ohms	IT006-INSULATION TESTER	1M Ohms		




Product Cost Sheet



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BILL AND COST OF MATERIAL

Cat No. : 750-02
Description : Door Switch
Sub Assy : N
Team :
Production per Man Day : 0

S.No.	Part No.	Description	Source	Qty Per Piece	Unit	Is it a Sub Assy	Purchase Cost	Raw Material Cost	Process Cost	Finishing Cost	Total Cost	Amount
6	0750-02-15	SPRING	Purchase	1	NOS	N	0.45	0	0	0	0.45	0.45
7	0750-60-19	GLUED FOAM	Purchase	1	NOS	N	0	0	0	0.00	0	0
	0060-03-01	SELF ADHESIVE GLUED FOAM (G)	Purchase	0	MTR		0	0	0	0	0	
8	0016-02-01	Solder Wire (1.0mm dia) lead free	Purchase	0.05	GMS	N	1.68	0	0	0	1.68	0.084
9	0016-01-01	HYBRID#6633 SOLDER CONDITIONER	Purchase	0.02	MLT	N	0.2025	0	0	0	0.2025	0.00405
10	0750-00-01	WIRE HARNESS	Purchase	1	NOS	N	0	0	0	0	0	0
11	0080-04-22	ARALDITE (HARDENER & RESIN)	Purchase	1.5	GMS	N	0	0	0	0	0	0
TOTAL							0.54	0.57	0.16	1.31		

1. TOTAL RMC COST : 0.54 + 0.57 1.11

ICC COST @ 7.0000 % OF RMC COST 0.08

2. TOTAL PROCESSING COST 0.16 + 1.31 + 0 1.47

O.H @ 20.0000 % PROCESS COST 0.29

PROFIT @ 20.0000 % OF PROCESS COST 0.29

TOTAL : 3.24


Assembly Cost : 0

SELLING PRICE LIST


CUSTOMER CODE	RATE	REALIZABLE RATE
C7453	67.00	3.3 ✓




Part List with details



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
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Part List


Item Description: NEUTRAL SAFETY SWITCH (NC TYPE) Item No.: 781-01 Drawing available: Y Design Plan No.: Prepared by: Sanjiv Singh-D0003

Customer: PRICOL LIMITED Action Required: Sub Assy: Prod. per MAN day: Assy. Cost: [save](#)


S.No.	Part No.		Description	Qty/Pc.	Sub Assy (Y/N)?	Item Source	Cost	Drawing/SPCN no.	Drawing Available	Click to Del.
1	0781-42-02	Design Review	HOLDER	1	N	Inhouse	0	07814202.jpg	Y	
2	0781-02-03	Design Review	SPRING COMPRESSION (BIG)	1	N	Purchase	0	07810203.jpg	Y	
3	0781-70-04	Design Review	O-RING (BIG)	1	N	Purchase	0	07817004.jpg	Y	
4	0781-42-05	Design Review	HOLDER BUSH	1	N	Inhouse	0	07814205.jpg	Y	
5	0781-70-06	Design Review	O-RING (SMALL)	1	N	Purchase	0	07817006.jpg	Y	
6	0781-21-07	Design Review	PIN	1	N	Inhouse	0	07812107.jpg	Y	
7	0781-52-08	Design Review	ASSEMBLY TERMINAL	1	N	Inhouse	0	07815208.jpg	Y	
8	0781-21-09	Design Review	TERMINAL	2	N	Inhouse	0	07812109.jpg	Y	
9	0781-21-10	Design Review	ADAPTOR	1	N	Purchase	0	07812110.jpg	Y	
10	0781-52-11	Design Review	BUSH COVER	1	N	Inhouse	0	07815211.jpg	Y	
11	0781-27-12	Design Review	FLAT CONTACT TERMINAL	2	N	Inhouse	0	07812712.jpg	Y	




Development Status Review



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Status of 2197-2124 (BATTERY SWITCH DPDT 24 V)
R-Required, S-Submitted, A-Approved

[Progressive Log](#)

Part No.	Drawing			Make/Buy	Source/RM source			Process	DRC			Tool No.	Tool Design			Tooling			Trial			Verification		
	R	S	A		R	S	A		R	S	A		R	S	A	R	S	A	R	S	A			
Start Date	27-01-2018								27-01-2018				01-02-2018			05-02-2018			15-02-2018			15-02-2018		
EDC	11-02-2018								28-01-2018				03-03-2018			22-03-2018			06-04-2018			06-04-2018		
0016-02-01	✓	✓	✓	Buy	✓	✓	✓		✓	✓	✓		Not required	Not Required	Not Required	✓	✓	✓	✓	✓	✓	✓	✓	
	15-12	29-12			01-12	01-12			01-12	01-12									01-12					
0074-00-29	✓	✓	✓	Buy	✓	✓	✓		✓	✓	✓		Not required	Not Required	Not Required	✓	✓	✓	✓	✓	✓	✓		
	22-05	22-05			22-05	22-05			22-05	22-05									22-05					
0074-00-33	✓	✓	✓	Buy	✓	✓	✓		✓	✓	✓		Not required	Not Required	Not Required	✓	✓	✓	✓	✓	✓	✓		
	22-05	22-05			22-05	22-05			22-05	22-05									22-05					
0080-01-52	✓	✗	✗	Buy	✗	✗	✗		✗	✗	✗		Not required	Not Required	Not Required	✓	✗	✗	✗	✗	✗	✗		
0080-02-28	✓	✓	✓	Buy	✓	✓	✓		✓	✓	✓		Not required	Not Required	Not Required	✓	✓	✓	✓	✓	✓	✓		
	26-03	26-03			22-03	26-03			22-03	09-02									26-03					
0080-02-29	✓	✓	✓	Buy	✓	✓	✓		✓	✓	✓		Not required	Not Required	Not Required	✓	✓	✓	✓	✓	✓	✓		
	26-03	26-03			22-03	26-03			22-03	09-02									26-03					



Defining the Process

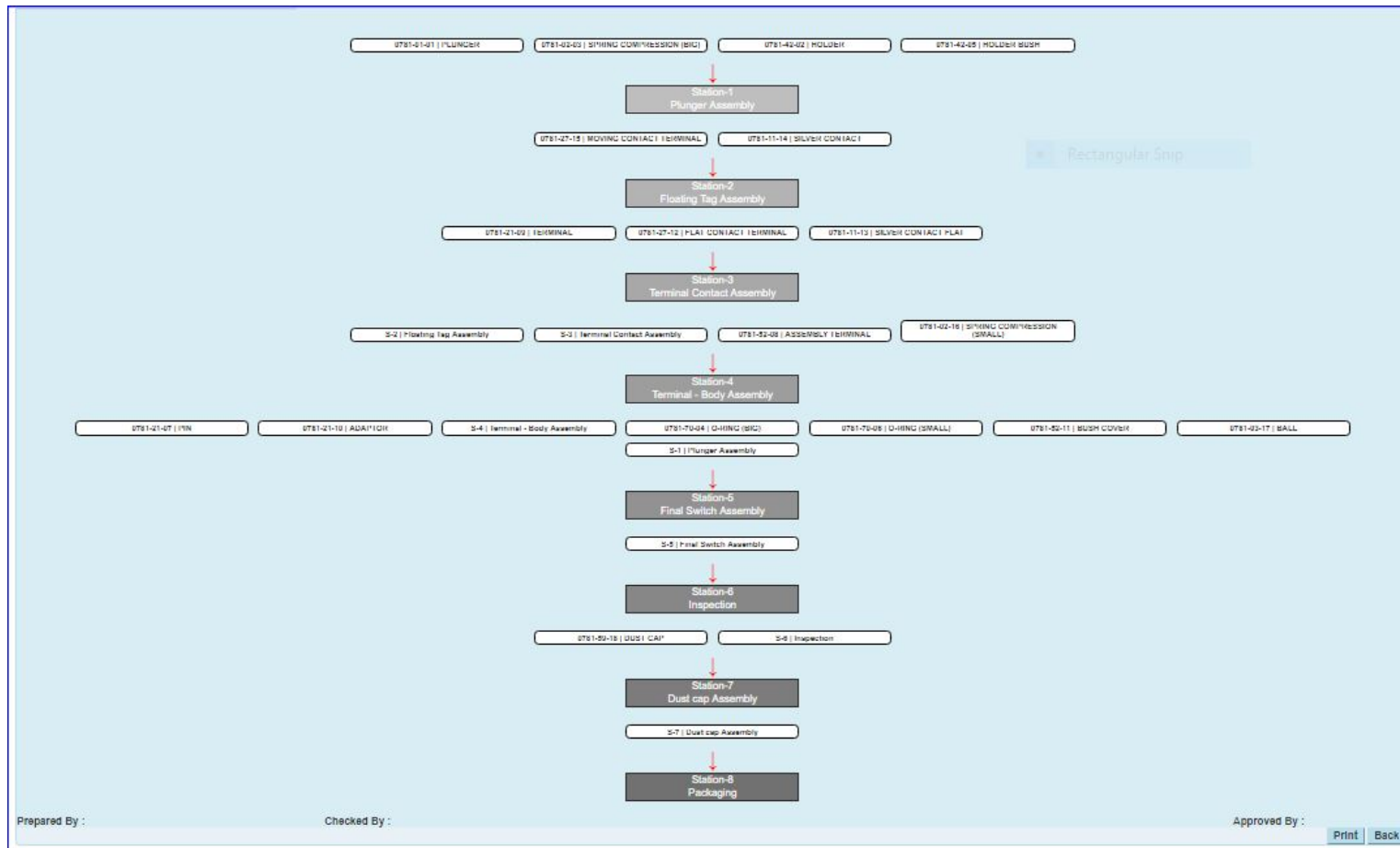
NPD | User Function | Work on Projects | PFC

Process Flow Chart Of 781-01-NEUTRAL SAFETY SWITCH (NC TYPE)


S.No.	Station No.	Process Name	Inputs	Add	Delete
1	S-1	Plunger Assembly	0781-01-01 (PLUNGER) 0781-02-03 (SPRING COMPRESSION (BIG)) 0781-42-02 (HOLDER) 0781-42-05 (HOLDER BUSH)	-Add- ▼	-Del- ▼
2	S-2	Floating Tag Assembly	0781-27-15 (MOVING CONTACT TERMINAL) 0781-11-14 (SILVER CONTACT)	-Add- ▼	-Del- ▼
3	S-3	Terminal Contact Assembly	0781-21-09 (TERMINAL) 0781-27-12 (FLAT CONTACT TERMINAL) 0781-11-13 (SILVER CONTACT FLAT)	-Add- ▼	-Del- ▼
4	S-4	Terminal - Body Assembly	S-2 (Floating Tag Assembly) S-3 (Terminal Contact Assembly) 0781-52-08 (ASSEMBLY TERMINAL) 0781-02-16 (SPRING COMPRESSION (SMALL))	-Add- ▼	-Del- ▼
5	S-5	Final Switch Assembly	0781-21-07 (PIN) 0781-21-10 (ADAPTOR) S-4 (Terminal - Body Assembly) 0781-70-04 (O-RING (BIG)) 0781-70-06 (O-RING (SMALL)) 0781-52-11 (BUSH COVER) 0781-03-17 (BALL) S-1 (Plunger Assembly)	-Add- ▼	-Del- ▼
6	S-6	Inspection	S-5 (Final Switch Assembly)	-Add- ▼	-Del- ▼
7	S-7	Dust cap Assembly	0781-59-18 (DUST CAP) S-6 (Inspection)	-Add- ▼	-Del- ▼
8	S-8	Packaging	S-7 (Dust cap Assembly)	-Add- ▼	-Del- ▼




Process Flow Chart




Process FMEA work sheet



Gilard Electronics Pvt Ltd
Self Diagnostics : TBC = 0.00





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NPD | User Function | Work on projects | Partlist | Child part detail | DFMEA

Process Failure Mode And Effects Analysis (PFMEA) [Child Part PFMEA](#)

Item No.:	781-01	FMEA Number:	781-01	Description	NEUTRAL SAFETY SWITCH (NC TYPE)
Process Responsibility	E2336(Talwinder Singh)	Date (Orig.):	17-11-2017	Date (Rev.):	17-11-2017
Core Team:	Maninderjit Singh-E2324(DES)		Manvinder Kaur-E2227(HRD)		Prepared by
Add core team member					E2336(Talwinder Singh)

If RPN >100,improvement is required. If SEVERITY=9 and RPN >36,improvement is required. If SEVERITY=8 and RPN >72,improvement is required.
 [Save](#)


Function	Potential Failure Mode	Potential Effects of Failure	Current Control		S	O	D	RPN	Improve RPN	Select to delete
			Occurrence	Detection						
Terminal - Body Assembly	Terminal not resting properly on its original position	Change in pre travel and over travel of the component	1. Length of terminal head is more	1. Inspection of Terminal by IGI	8	2	5	80	<input type="checkbox"/>	<input type="checkbox"/>
Plunger Assembly	1. Pre travel changes 2. Holder and Holder	Components gets dis-assembled and does not work	1. Length of plunger is less or more	1. 5 samples are approved	8	2	6	96	<input type="checkbox"/>	<input type="checkbox"/>
Final Switch Assembly	1. Flaring of adaptor is not proper	assembled piece will get dis-assembled on	1. Stroke length of press is not proper	1. 5 samples approval 2. Inspection of 10	8	2	5	80	<input type="checkbox"/>	<input type="checkbox"/>
Inspection	1. Pre travel and over	1. Does not work properly	1. Fatigue of Worker	1. Inspection of 10	8	2	5	80	<input type="checkbox"/>	<input type="checkbox"/>

Process FMEA print-out

Item no.		Description	NEUTRAL SAFETY SWITCH (NC TYPE)	Design Responsibility	Talwinder Singh(E2336)	Prepared By	Sanjiv Singh	
Date(Revision)		Date(Original)	17-11-2017	Core Team	Maninderjit Singh-E2324(DES)	Manvinder Kaur-E2227(HRD)		
Function	Potential Failure Mode	Potential Effects of failure	Current Control	S	O	D	RPN	
Terminal - Body Assembly	Terminal not resting properly on its original position	Change in pre travel and over travel of the component	1. Length of terminal head is more 2. Stroke length of press is not proper	1. Inspection of Terminal by IGI 2. 5 samples are approved 3. Gauge provided	8	2	5	80
Plunger Assembly	1. Pre travel changes 2. Holder and Holder bush cracks	Components gets dis-assembled and does not work	1. Length of plunger is less or more 2. Material is not as per specification 3. Material gets over heated	1. 5 samples are approved 2. Specification sheet of material is provided.	8	2	6	96
Final Switch Assembly	1. Flaring of adaptor is not proper	assembled piece will get dis-assembled on pressing of plunger with force	1. Stroke length of press is not proper	1. 5 samples approval 2. Inspection of 10 Pieces by inspector every AWO	8	2	5	80
			1. Fatigue of	1. Inspection of 10 samples by				


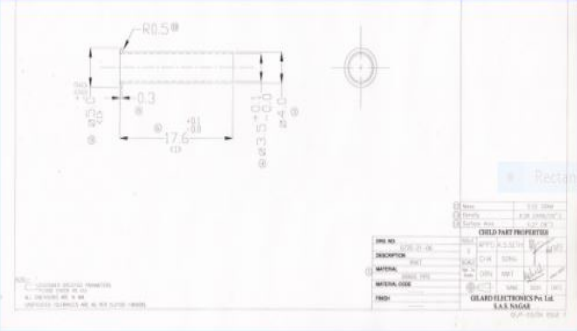


Special Characteristics Matrix

 Gilard <small>explore more...</small> Gilard Electronics Pvt Ltd		Special Characteristics Matrix		Date : 8th of June 2018 Time : 11:48:15 AM User : Sanjiv Singh					
<p>Special characteristics is a product characteristics that can affect safety or compliance with Regulation, fit function, performance or subsequent process of product.</p> <p>Special characteristic can be classified as :</p> <p>(1) Safety Characteristics (S) : Are those which affects the product safety, operator safety and compliance with regulatory requirements.</p> <p>(2) Product Characteristics (A) : Are those which affect the aesthetics of product.</p> <p>(3) Fit and Function characteristics (F) : Are those which affect fit and function of product.</p> <p>(4) Environmental characteristics (E) : Are those which are affected by the environment.</p>									
Item number	750-02	Description	Door Switch	Customer	C7453-SML ISUZU LIMITED				
Date(Original)	27-12-2017	Date(Revision)	24-03-2018	Responsibility:	Atul Vashisth (E2242)				
Core Team	Amandeep Singh Mann (E2244), NPD Neeraj Chand (E2317), NPD								
S.No.	Part No.	Dimension with Tolerance	SPL.CHR	Source Of SPL. CHAR.	Control of SPL. CHAR.				Action
					Marking in Drawing	Put in Control Plan	Put in Process Sheet	Conduct (cp / cpk)	
1.	0750-02-15	30.8±0.3	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL
2.		Wire Dia. 0.5 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL
3.		No. of Turns-17	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL
4.		Spring Constant- 420N/M	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL
5.		5.0±0.1 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL
6.	0750-27-12	5.5±0.1 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL
7.		2.3±0.1 mm	<F>	CAPA ▼	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DEL
8.		7.8±0.2 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DEL
9.		2.7±0.1 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DEL
10.		1.8±0.1 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DEL
11.		5.2±0.1 mm	<F>	Function Study ▼	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DEL



Inspection Sheet

IGI User Function Inspection Sheet																	
		Gilard Electronics Pvt Ltd Full Layout Inspection						Date : 8th of June 2018 Day : Friday Time : 11:53:50 AM									
Item No : 0770-21-06		Description : RIVET										Batch Quantity :					
																	
Attribute Inspection																	
S.No	Attribute	Defective pcs.	Remarks														
Total Defectives :		0															
Observations																	
S.No.	Specification	Range	Key	Location on Drg.	1	2	3	4	5	6	7	8	9	10	Range	Disposal	
1	DIA 4 (+) 0.1 (-) 0.1	3.9 to 4.1		3	3.95	4	3.95	4	4.05	3.95	3.95	3.95	4	4	3.95 to 4.05	✓	
2	DIAENSION 3.5 (+) 0.1 (-) 0	3.5 to 3.6		4	3.53	3.55	3.58	3.58	3.55	3.53	3.55	3.5	3.53	3.5	3.5 to 3.58	✓	
3	DIMENSION 17.6 (+) 0.1 (-) 0	17.6 to 17.7	I	6	17.65	17.65	17.63	17.68	17.68	17.68	17.63	17.63	17.65	17.65	17.63 to 17.68	✓	
4	DIMENSION 0.3 (+) 0.05 (-) 0.05	0.25 to 0.35		8	0.28	0.25	0.23	0.33	0.23	0.2	0.23	0.2	0.25	0.23	0.2 to 0.33	Δ	
5	DIA 5 (+) 0.2 (-) 0	5 to 5.2	I	9	5.05	5.1	5.05	5.1	5.15	5.05	5.1	5.1	5.05	5.05	5.05 to 5.15	✓	
6	RADIUS 0.5 (+) 0.1 (-) 0.1	0.4 to 0.6		10	0.3	0.3	0.35	0.3	0.35	0.35	0.35	0.3	0.3	0.3	0.3 to 0.35	Δ	
					Status : <input checked="" type="radio"/> Acceptable <input type="radio"/> Not Acceptable <input type="radio"/> Non Conforming but Acceptable												
Inspected By : Sanjay Kumar					Date : 08-06-2018					Approved By : Rishi Singla							

PDI Sheet



		POI of 781-01		Date: 17-11-2017	
		(NEUTRAL SAFETY SWITCH (NC TYPE))		Time: 10:32:40am	
GE Part:	781-01	Customer:	C1005247600L LIMITED		
Part Name:	NEUTRAL SAFETY SWITCH (NC TYPE)				

REVISIONS


REV	DATE	DETAILS
1	17/11/2017	1. NEW DRAFTING 2. CHANGED DIM. 11 (A) TO 11.5 3. CHANGED DIM. 11 (A) TO 11.5 4. CHANGED DIM. 11 (A) TO 11.5 5. CHANGED DIM. 11 (A) TO 11.5 6. CHANGED DIM. 11 (A) TO 11.5 7. CHANGED DIM. 11 (A) TO 11.5 8. CHANGED DIM. 11 (A) TO 11.5 9. CHANGED DIM. 11 (A) TO 11.5 10. CHANGED DIM. 11 (A) TO 11.5

DESCRIPTION	REV	DATE	BY	CHKD	APPV
NEUTRAL SAFETY SWITCH (NC TYPE)	02	17/11/2017	g.a.p	g.a.p	g.a.p
PART NO	03	17/11/2017	g.a.p	g.a.p	g.a.p
781-01					


Gilard Electronics Pvt. Ltd.
B-4, 2nd Floor

S.No.	Parameter	Test method	Equipment	Acceptance	Samples				
					S1	S2	S3	S4	S5
Appearance									
18	MARKING DETAILS								
Layout									
1	OUTER DIA	EC		20(+0.5)(-0.5)					
2	DIMENSION			11(+0.2)(-0.2)					
3	DIMENSION			10.00(+0.2)(-0.2)					
11	DIMENSION (A1)			27(+0.33)					
12	DIMENSION (M18 X 1.5 -BG)								
14	DIMENSION (M27 X1 -BG)								
15	DIMENSION			8.00(+0.2)(-0.2)					
Performance									
8	DIMENSION (SWITCHING POINT ON)			18.4(+0.5)(-0.3)					
9	DIMENSION (OPERATING STROKE)			13(-1)					


Skills Required / G.a.p review



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NPD | User Functions | Work on Projects

Define Process, Stations & Skills for : 781-01 NEUTRAL SAFETY SWITCH (NC TYPE) --Select item to copy ▾

☐ Unskilled
 ☐ Medium Sikilled
 ☒ High Skilled
 ☐ Critical

Contact HRD Department to create team for this item.

Sr.No.	Station No.	Process Name	Skill Required
1.	S-1	Terminal - Body Assembly	<input checked="" type="radio"/>
2.	S-1	Plunger Assembly	<input type="radio"/>
3.	S-2	Final Switch Assembly	<input checked="" type="radio"/>
4.	S-3	Inspection	<input type="radio"/>
5.	S-4	Dust cap Assembly	<input type="radio"/>
6.	S-5	Packaging	<input type="radio"/>

Sr.No	Ecode	Name	Dep	Sec.	Skill
1.	E0103	Neelam Devi	ASS	TEAM B	High Skill ▾
2.	E0923	Amarjit Kaur	ASS	TEAM B	High Skill ▾
3.	E0982	Bhavana	ASS	TEAM B	High Skill ▾
4.	E1253	Bhupinder Kaur	ASS	TEAM B	High Skill ▾
5.	E1734	Gursharan Kaur	ASS	TEAM B	Medium S ▾
6.	E0980	Karamjeet Kaur	ASS	TEAM B	High Skill ▾
7.	E1310	Pratima Gupta	ASS	TEAM B	Unskilled ▾
8.	E1658	Rajni	ASS	TEAM B	Medium S ▾
9.	E1512	Roshani	ASS	TEAM B	Medium S ▾
10.	E1378	Sapna Devi	ASS	TEAM B	Medium S ▾
11.	E1965	Sheetal Kumari	ASS	TEAM B	Unskilled ▾

[Update Skills](#)




Skill Development Plan

				Skill Level PLanning Sheet For Series 781-01					Date:17-11-2017	
Sr.No	E-Code	Name	As Is	Terminal - Body	Plunger Assembly	Final Switch	Inspection	Dual cap	Packaging	
1	E0103	Neelam Devi	H							
2	E0923	Amarjit Kaur	H							
3	E0980	Karamjeet Kaur	H							
4	E0982	Bhavana	H							
5	E1253	Bhupinder Kaur	H							
6	E1310	Pratima Gupta	U							
7	E1378	Sapna Devi	M							
8	E1512	Roshani	M							
9	E1658	Rajni	M							
10	E1734	Gursharan Kaur	M							
11	E1965	Sheetal Kumari	U							


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PPAP documentation



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NPD | User function | Work on projects | PPAP

PPAP Index

1 PPAP Checksheet	2 PSW	3 Checking Aids (Instruments, Equipment and Gauges)	4 Process Capability Studies	5 Raw Material Suppliers	6 Child Part Suppliers	7 In-House Produced Parts	8 Process Control Documents (LPA, Patrol Card, Process Sheet)
9 Packing Standard	10 Appearance Approval Report	11 Photo BOM	12 Technical Sheet	13 Raise Indents			

Part list	Costed BOM	Functions	DFMEA	Assy Process and skill development	PFC	PFMEA	Control Plan	PPAP
Inspection Sheet	PDI	Layout Inspection Sheet	DVP	Performance Test	SCM	PND	Status	Project Sign Off



Thank you for your interest

- Please drop in an e-mail at :

sanjiv@gaposm.com or

Call us at :

+91-9888111773

and talk to Mr.Sanjiv Singh to discuss the steps forward.

