[redacted] Component Review Team (CRT) Characteristics Agreement

Program:	2006 F Family
Part Number:	8U5A-99611172-AD with components 8U5A-99610A44-AD and 8U5A-99611E46-CC
Part Name:	Head Restraint Sub-Assembly (Tube Form with EPP Insert)
Prepared by:	John Orzelski
Date Prepared:	August 8, 2006
Revision Date:	November 16, 2006

Component	Gage Point	Characteristic Type	Nominal Value	Shown on Sec./View	Tolerance	Comments
Tube Form	1	CC	n/a	notes in CAD	n/a	Material: 050XLF HSLA STEEL TUBING, ASTM A513
Tube Form	2	SC	n/a	notes in CAD	n/a	No burrs permitted that will directly affect function, efforts and corrosion resistance
Tube Form	3	SC	12.70mm	notes in CAD	+/-0.10	Tube O.D.
Tube Form	4	SC	2.00mm	notes in CAD	+0.2/-0.1	Tube wall thickness
Tube Form	5	SC	1.02	GD&T details CEH	+/-0.20	depth of notches
Tube Form	6	HIC	1.15	GD&T details D	+/-0.20	depth of notches
Tube Form	7	SC	1.59	GD&T details F	+/-0.20	depth of notches
Tube Form	8	CC	90deg	Detail CEFH	+/-1.0	angle of notch
Tube Form	9	HIC	74.0deg	S.V.	+/-1.0	angle of notch
Tube Form	10	HIC	150.0mm	F.V.	+/-1.5	distance between posts (C/L to C/L)
Tube Form	11	SC	CAD	F.V.	1.6/100 mm/mm	parallelism between posts
Tube Form	12	HIC	CAD	F.V.	3	surface profile of tube form to datums A, B, C--Attribute Data Only
Tube Form	13	HIC	CAD	GD&T details CDEFH	0.5	true position of notches to datums A, B, C
Tube Form	14	SC	CAD	GD&T details CDEFH	+0/-.25	radius at bottom of notches
Tube Form	15	HIC	master SM300H--as reference only	notes in CAD	Borderline samples. See note #1.	Appearance of chrome. Ref: SM300H is a spec for chrome plated plastic.
Tube Form	16	HIC	20microns	notes in CAD	10-30 Microns	plating thickness
Tube Form	17	HIC	50 microns	notes in CAD	max	surface roughness Ra at broached surfaces measured perpendicular to broaching direction
EPP Insert	18	HIC	87.3	GD&T in CAD	+/-2.0	distance between trenches
EPP insert	19	SC	45kg/m3	notes in CAD	+15/-3 kg/m3	material density
EPP insert	20	SC	PP	notes in CAD	n/a	Material: EPP foam, WSS-M40B15-A1 Performance per WSS-M99P29-A
EPP Insert	21	HIC	0.0mm	notes in CAD	Max 3mm high, 1.5mm thick	Flash at parting lines

Note #1: Insert surface scratches and pitting that are noticeable from a 2ft distance in average room lighting are not acceptable. Boundry samples to be signed off by Ford Motor Company & Windsor Machine

[redacted]

Seat Complete Approval & Date	Seat Core Approval & Date
O&R Engr.:	D&R Engr.:
System Engr.:	Mfg. Engr.:
VO Engr.:	Quality Engr.:

Supplier Approval & Date
WM&S Quality:
WM&S Production:
WM&S Sales:
WM&S Program Mgt.:

2006 F Family CRT Agreement
Adjustable Guide Sleeves

Windsor Machine Group

Armature Process Flow Chart

Part Name: Head Rest stay ASM
Part Number: [illegible]
Blue Print Date:
Approval Signature: [illegible]

Prepared by: Lisa Bilbrey
Date Prepared: 4/3/2006
Date Revised: 11/16/2006
Page 1 of: 1

Item	OPERATION	MOVE	STORE	INSPECT	Operation Description	KPC	KCC
1					Receive Raw material Tube & Purchased EPP bun		<CC> ▽
					Inspect per receiving inspection sheet		
2					Cut down , verify length and inspect per Inprocess inspection sheet		
					Move to storage, document location, date received, quantity and batch number (when Stored in warehouse). When needed per customer requirements pull Material FIFO		
3					Move to forming area		
4					Set up forming operation, run and verify form of frame 100% per blue print		H/C
5					Set up chamfer, broaching & Scarf operation, run and verify form of frame 100% per blue print		<CC> ▽
6					Send out frames to plating		<CC> ▽
7					Receives frames from Platers		
					Inspect per Inprocess inspection sheets		
8					Assemble EPP		
9					Move to Foam LINE		

Controlled Copy When in Red. May not be most revision if not controlled in red. Acceptance Criteria is Zero Defects

Windsor Machine Group

ARMATURE Preliminary/ Prototype Control Plan Number

X Prototype / Pre-Launch / Production	Key Contact/Phone: Michael Vicaro 519-736-0344 / Lisa Bibey 734-941-1520	Date (Orig): 3-Apr-06	Date (Rev): November 16, 2006
Control Plan Number: [redacted]	Core Team: Ellis, Caverly, WMPI; Kenny Grout, Evan Kayatura, Greg Potter, Phil Bryan, Eddie Wesen, Andy Flores; Lisa Lagrne, Monica Howe, Martya Clark	Customer Engineering Approval/Date (if req'd): -	
Part Number/Latest Change Level: [redacted] TBD		Customer Quality Approval/Date (if req'd):	
Part Name / Description: Front Rear Hood Restraint Assembly		2 Pages	
Supplier/ Plant: EPCIA	Supplier Code: EPCIA		

Part Process Number	Process Name/ Operation Description	Machine Device Jig, Tools for Mfg.	Characteristics NO	Product	Process	CLASS	Methods: Product/Process Specification/Tolerance	Evaluation Measurement Technique	Sample Size	Sample Frequency	Control Method	Reaction Plan
1.) Receiving Tube Blanks	Receiving Inspection		1	Material Type	RI	CC-1 ▽	Steel Tubing ASTM A513 TYPE 1 GRADE 1010 SAE J1040 1010 XT 28	Mill Certification	1	Shipment	Accreditation test lab	Do not use material return to sender
			2	Raw diameter	RI	SC-3	12.70 mm +/- 0.10 mm, wall thickness 2.0mm +/- 0.10mm	Micrometers	3	Per every 1000 pcs	calibration system	Do not use material return to sender
			3	Wall thickness	RI	SC-4	2.00 mm + 0.70 mm - 0.10 mm.	Micrometers	3	Per every 1000 pcs	calibration system	Do not use material return to sender
			4	Appearance	RI	HIC-15	Free from gouges, pits, tool marks, chattering or cracks in the tube	Visual	3	Per every 1000 pcs	Borderline Samples	Do not use material return to sender
Resistive EPP tube			5	Material Type	RI	SC-20	WSR-MT0016-A1	Material Certification	1	Shipment	Accreditation test lab	Do not use material return to sender
			6	Appearance, form	RI	HIC-18, 21	Max. Flash 3.0mm high and 1.6 inch thick, no voids/ short shots, fits secure to armature	Calipers and B, to an armature	3	Per every 1000 pcs	calibration system	Do not use material return to sender
2.) Cut Tube Length	Improves Cut to length	Cutters	7	Over all length	RI		7724.00 MM +/- .25 mm	Height Gage	3	Per every 1000 pcs	calibration system	If cut is short, recut new material
3.) FORMING Armature	Form	Bump Forming mandrel	8	Bends, Form	Forming	HIC-16 17, SC-11	As per Blue print	Final Form Fixture, Full scale print/CMM	ALL	100%	100% inspection	Reset dies, bend new material
		Guide pins Gage pins	9	Leg pitch	Forming	HIC-10	130.00 +/-1.50mm	Final Form Fixture	ALL	100%	100% Inspection	Adjust set up- re-inspect parts since last check.
3.) Chamfer, Broaching and Seat	Chamfer	Radius 18	10	Chamfer	Radius		Spherical Radius, Free from burr	Visual	ALL	100%	100% inspection	Change cutting tool for clean radius & re-inspect parts since last check
	Broaching, Notch	Horizontal mill machine, Sliding seat	11	Detail F Lock Notch Depth	Broach	SC-7	1.64 mm +/-0.25	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			12	Detail H Notch Depth	Broach	SC-5	1.67 mm +/-0.25	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			13	Detail O Notch Depth	Broach	HIC-9	1.15 mm +/-0.25	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			14	Angle of notches on Detail C,E, F H, (height retention ball)	Broach	CC-9 ▽	90.0 degrees +/- 1 degree	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			15	Shown in side view, Angle of notches in relation to the barrel	Broach	HIC-8	74 degrees +/- 1 degree.	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			16	Notch Location the positions to datum's A,B &C	Broach	HIC-13	0.50mm (A,B & C).	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			17	Radius at bottom of notches.	Broach	SC-14	CAD +/-0.25mm	CMM	ALL	Set up	Calibration system	Adjust set up- re-inspect parts since last check, broach new material
			18	Surface Roughness of broach surface.	Broach	HIC-17	50 Microns max.	Performer	3	Per every 1000 pcs	calibration system	Adjust set up- re-inspect parts since last check, broach new material

Windsor Machine Group

ARMATURE Preliminary/ Prototype Control Plan Number

X Prototype / Pre-Launch / Production	Key Contact/Phone: Michael Vecera 519-738-0504 / Lisa Bilbray 734-941-7210	Date (Orig) 3-Apr-06	Date (Rev) November 16, 2006
Control Plan Number [redacted]	Core Team: Ella, Cenroy, WMP, Kenny Gipson, Evan Kayhart, Greg Potter, Phil Bryan, Eddie Warren, Andy Pinkel, Lisa Lagers, Monica Howe, Marilyn Clark	Customer Engineering Approval/Date (if req'd)	
Part Number/Latest Change Level [redacted] 780		Customer Quality Approval/Date (if req'd)	
Part Name / Description: Aspirt Rear Hood Restraint Assembly		1 Pages	
Supplier Plant: EPKJA / Supplier Code: EPKJA			

Part/Process Number	Process Name/ Operation Description	Machine Device Jig, Tools for Mfg	No	Product	Process	Class	Product/Process Specification/Tolerance	Evaluation/Measurement Technique	Sample Size	Sample Frequency	Control Method	Reaction Plan
			19	Scarf notch burrs	Scarf	SC-2	No burrs allowed - Can not catch on finger nail	Ring gage	ALL	100%	100% inspection	Unpowered ship gage to inspect the burr off & re-inspect parts since last check
4) Bent Frame out for plating. Handle from Plating	Receiving Inspection		20	Plating thickness	Plating	HO-14	17.5 +/- 7.5micro	Inspection Certification	1	1/Normal	Accreditation Test Lab	Do not use material, notify supplier
			21	Appearance	Plating	HO-15	Borderline samples - surface scratches and pitting that are noticeable from a 2ft. Distance in average room lighting are not acceptable.	Visual	ALL	100%	Borderline samples	Do not use material, notify supplier
EPP Assembly				ASM of EPP	Assembly		Must be present & fully seated correctly	EPP ASM Fixture	ALL	100%	Sensors	
MOVE TO FOAM LINE: SEE FOAM LINE APQP												

Approved by : Lisa Bilbray
Corrected Copy when in Red

ACCEPTANCE CRITERIA ZERO DEFECTS

May not be the latest revision if not in Red. Check with master copy

Michael Vecera
Lisa Bilbray

Item: Front Head Rest Assy

Armature Potential Failure Mode and Effects Analysis

(Process FMEA)

Item: Front Head Rest Assy — FORM[illegible]-13

Model Years/Vehicle(s): Key Date:

Core Team: St. Dept. Ella, Cantrey, WMPs — Kenny Grove, Evan Keyshere, Scott Berto, Eddie Warren, Andy Pinard, Marilyn Clark, Lisa Lagore, Monica Howe, Lisa Bibey, Phil Green, Greg Peller, Michael Vacera

Page

Prepared By: Lisa Bibey

FMEA Date (Orig): April 03, 2006 — Rev. 11/16/2006

Process Function Requirements	Potential Failure Mode	Potential Effects(s) of Failure	SEV	CLASS	Potential Cause(s) Mechanism(s) of Failure	OCCUR	Current Process Controls Prevention	Current Process Controls Detection	DETEC	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	SEV	OCCUR	DETEC	RPN
1 Receiving Material — TUBE	Wrong Tube Material	Cannot be Processed, May fail under load requirements	9	SC-1 ▽	Supplier Error	2	(P) Material Certification	(D) Receiving Inspection	7	126	None						
	Incorrect Tube Diameter	Excessive installation efforts into seat back / BSR issue	5	SC-3	Supplier Error	1	(P) Material Certification	(D) Receiving Inspection	8	40	None						
	Incorrect Tube Wall thickness	May fail load requirements	7	SC-4	Supplier Error	1	(P) Material Certification	(D) Receiving Inspection	8	56	None						
	Poor Quality Steel Appearance (Rust), Rough or pitted Surface	Customer Dis-Satisfaction on appearance, may cause cosmetic effects	8	HC-10	Improper Storage	2	(P) Borescope samples signed off by customer	(D) Receiving Inspection	7	112	None						
1 Receiving Material — EPP	Wrong EPP Material / Density	May not meet height retention or pocket requirements.	9	SC-10, 19	Supplier Error	2	(P) Certification with shipment	(D) Receiving Inspection	7	126	None						
	Incorrect form	May not meet height retention or pocket requirements. May not assembly properly to armature	9	HC-18	Supplier Error	2	(P) Certification with shipment	(D) Receiving Inspection	7	126	None						
	Poor appearance, flash	Customer Dis-Satisfaction, may feel flash through the polyurethane foam and trim cover	8	HC-11	Supplier Error	2	(P) Certification with shipment	(D) Receiving Inspection	7	126	None						
2 Cut Tube Length	Wire cut to incorrect length	May not draw properly	7		Supplier Error	1	(P) Material Certification	(D) Receiving Inspection	8	56	None						
3,4 Receive Blanks & Form	Deformed Part	Potential assembly problems	7		Worn / broken tooling	2	(P) Preventative Maintenance	(D) First-off / Inproc. Insp.	7	98	None						
3 Radius Bends & Notch	Missing Chamfer	Excessive installation effort into the seat back/ May not install into the seat back	8		Missed Operation	2	(P) Set- up Instructions (P) Process Flow	(D) First-off / Inproc. Insp.	7	112	None						
	Breach Wrong Depth	May not pass pull out requirements	7	SC-6,7 HC-9	Improper Set-Up Worn or broken Tooling	2	(P) Preventative Maint.	(D) First-off / Inproc. Insp.	8	112	None						
	Breach Wrong Location & Angles	May not meet BPS requirements	9	CC-4 HC-8, 13 ▽	Improper Set-Up	5	(P) Set- up Instructions	(D) First-off / Inproc. Insp.	7	315	Updated by ID [illegible] Add [illegible] (Implemented on 10-27-2006)			9	4	7	[illegible]
	Breach with incorrect geometry	May not meet pull out or height retention tests.		SC-14	Improper set up, Worn tooling		(P) Set- up Instructions, Preventative Maint.	(D) First-off / Inproc. Insp.			None						

Item: Front Head Rest Assy

Armature Potential Failure Mode and Effects Analysis

(Process FMEA)

Item: Front Head Rest Assy — FORMULA[illegible]

Model Years/Vehicles(s): Key Date:

Core Team: St. Clair, Ellis, Cantrey, WMP; Kenny Brous, Evan Kayshore, Scott Berka, Eddie Warren, Andy Pinard; Marilyn Clark, Lisa Legree, Monica Howe, Lisa Bilbray, Phil Bryan, Greg Peltier, Michael Vecera

Page:

Prepared By: Lisa Bilbray

FMEA Date (Orig): April 03, 2006 Rev. 11/16/2006

Process Function Requirements	Potential Failure Mode	Potential Effects(s) of Failure	SEV	CLASS	Potential Cause(s) Mechanism(s) of Failure	OCCUR	Current Process Controls Prevention	Current Process Controls Detection	DETEC	RPN	Recommended Actions	Responsibility & Target Completion Date	Actions Taken	SEV	OCCUR	DETT	RPN
	Excessive rough surface on breaches	May cause premature wear on guide sleeve spring		HO-17	Worn Tooling		(P) Preventative Maint.	(D) First-off / Inspec. Insp.			None						
	Burr on Breaches	Potential Assembly Problem / Safety	7	NC-J	Worn Tooling	2	(P) Preventative Maint.	(D) First-off / Inspec. Insp.	7	98	None						
	Missing Breaches	May not meet BHS requirements	9		Improper set up	2	(P) Set-up Instructions	(D) First-off / Inspec. Insp.	7	126	None						
4 & 7 Plating	Not enough plating thickness	Parts may rust / corrode prematurely / Customer Dis-Satisfaction	8	HO-18	Plating thickness under spec.	2	(P) Supplier Certs. & Cap. Studies	(D) Receiving Inspection	4	128	None						
	Poor Appearance of plating	Customer Dis-Satisfaction on appearance, may cause excessive efforts or premature corrosion		HO-18	Supplier Error		(P) Borderline samples signed off by customer, SM300 H as a guide for reference	(D) Receiving Inspection			None						
8 EPP Assembly	Installed Backwards	Will not meet backset requirements	9		Installed not using ASM Fixture	3	(P) Work Instructions (P) Process Flow	(D) Sensors -Will not allow foam tool to close-line stoppage	3	81							
	Not fully seated	Will not meet backset requirements	9		Installed not using ASM Fixture	3	(P) Racking System-part nested in direction of ASM	(D) Sensors-Will not allow foam tool to close-line stoppage	3	81	If needed, consider hot melt to secure frame in EPP.						
	Not Present	Will not meet backset requirements	9		Missed operation	3	(P) Work Instructions (P) Process Flow	(D) Sensors-Will not allow foam tool to close-line stoppage	3	81							

9 MOVE TO FOAM LINE

Note: Occur=Occurrence Sev=Severity Detec=Detection RPN=Risk Priority Number

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Approval Signature: Marilyn Clark, Lisa Bilbray