

PART SUBMISSION WARRANT

Part Name <u>SLV ASY WIR CONN FEM</u>		Customer Part Number <u>FU5T-14A464-AVB(000)</u>	
Shown on Drawing No. <u>FU5T-14A464-AVB</u>		Supplier Part Number <u>60013508A01B(000)</u>	
Engineering Change Level <u>BX3 AELE-E-12035198-512</u>		Dated <u>20-May-20</u>	
Additional Engineering Changes <u>Na</u>		Dated <u>Na</u>	
Safety and/or Government Regulation <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Purchase Order No. <u>Na</u>	Weight (kg) <u>0.0772</u>	
Checking Aid No. <u>Na</u>	Checking Aid Engineering Change Level <u>Na</u>	Dated <u>Na</u>	

SUPPLIER MANUFACTURING INFORMATION Western Diversified Plastics / 609123190 <hr/> Supplier Name & Supplier/Vendor Code <hr/> 53150 N. Main St. <hr/> Street Address <hr/> Mattawan MI 49071 USA <hr/> City State Postal Code Country	CUSTOMER SUBMITTAL INFORMATION Nursan Otomotiv EOOD <hr/> Customer Name/Division <hr/> Buyer/Buyer Code <hr/> Ford <hr/> Application
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MATERIALS REPORTING
 Has customer-required Substances of Concern information been reported? ☒ Yes ☐ No ☐ Not Applicable

 IMDS- 455963908 / 9

 Are polymeric parts identified with appropriate ISO marking codes? ☒ Yes ☐ No ☐ Not Applicable

REASON FOR SUBMISSION (Check at least one)
☒ Initial Submission
☐ Engineering Change(s)
☐ Tooling: Transfer, Replacement, Refurbishment, or additional
☐ Correction of Discrepancy
☐ Tooling Inactive > than 1 year
☐ Change to Optional Construction or Material
☐ Supplier or Material Source Change
☐ Change in Part Processing
☐ Parts Produced at Additional Location
☐ Other - please specify below

REQUESTED SUBMISSION LEVEL (Check one)
☐ Level 1 - Warrant only (and for designated appearance items, an Appearance Approval Report) submitted to customer.
☐ Level 2 - Warrant with product samples and limited supporting data submitted to customer.
☒ Level 3 - Warrant with product samples and complete supporting data submitted to customer.
☐ Level 4 - Warrant and other requirements as defined by customer.
☐ Level 5 - Warrant with product samples and complete supporting data reviewed at organization's manufacturing location.

SUBMISSION RESULTS
 The results for ☒ dimensional measurements ☒ material and functional tests ☐ appearance criteria ☐ statistical process package
 These results meet all drawing and specification requirements: ☒ Yes ☐ No (If "No" - Explanation Required)
 Mold / Cavity / Production Process Assembly

DECLARATION
 I hereby affirm that the samples represented by this warrant are representative of our parts which were made by a process that meets all Production Part Approval Process Manual 4th Edition Requirements. I further affirm that these samples were produced at the production rate of 9440 / 8 hours.
 I also certify that documented evidence of such compliance is on file and available for review. I have noted any deviations from the declaration below.
 EXPLANATION / COMMENTS: Customer requested

 Is each Customer Tool properly tagged and numbered? ☐ Yes ☐ No ☒ n/a

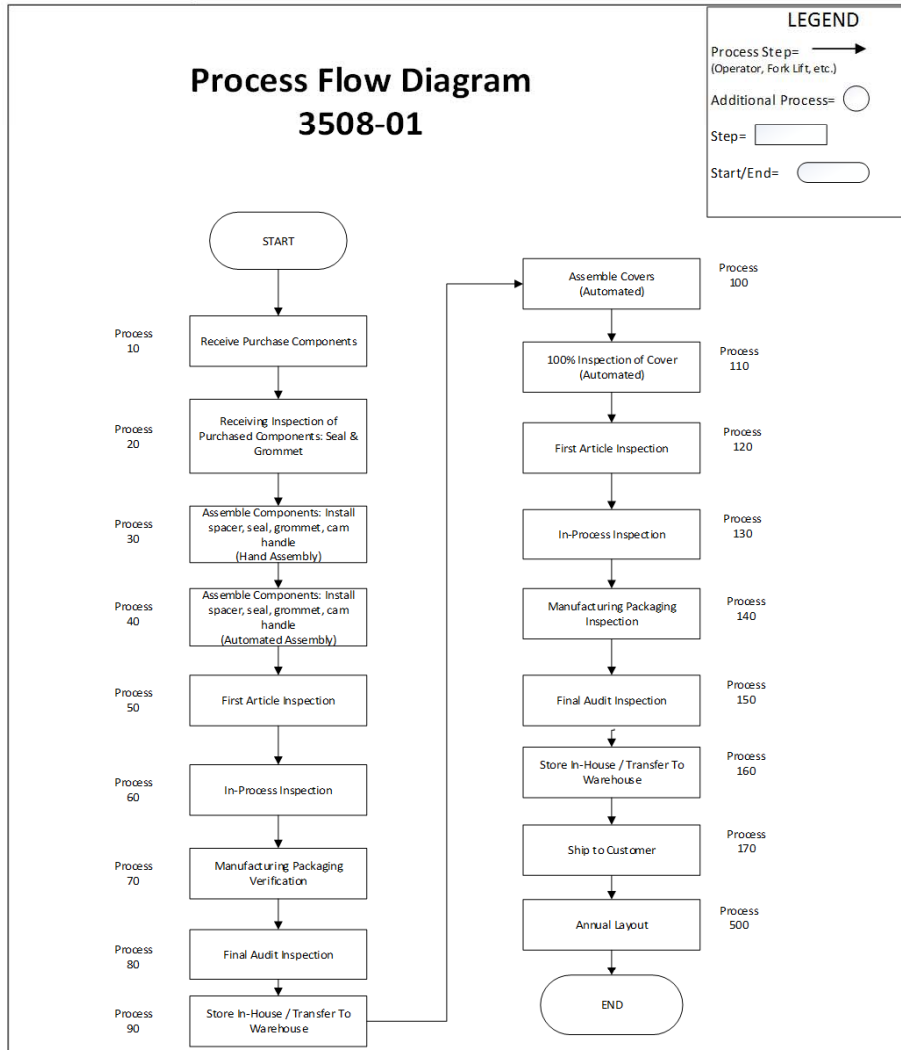
 Supplier Authorized Signature *Alice Lossie* Date 22-May-2020

 Print Name Alice Lossie Phone No. 269-668-3393 Fax No. 269-668-7143

 Title Quality Engineer E-mail Alice.Lossie@westerndp.com

 Part Warrant Disposition: ☐ Approved ☐ Rejected ☐ Other
 Customer Signature _____ Date _____
 Print Name _____ Customer Tracking Number (optional) _____

Process Flow #: 3508-01 (Revision BX3 / A18) Date (Orig.) 08/17/2007 Date Rev. 04/16/2020
Item / Part #: 3508x-01-001E / 60013508x01B / 80043508x01x Prepared By Alice Lossie / Dan Switzer
Program(s) / Part Name: 34 Way Female Hybrid Assembly



POTENTIAL FALILURE MODE AND EFFECTS ANALYSIS (Process FMEA)

53150 N. Main Street
Mattawan MI 49071
Phone: (269) 668-3393
Fax: (269) 668-4694

Process Responsibility: **WDP Mfg. Engineering**

FMEA Number: **3508-01 (Revision BX3 / A18)**

ITEM: **3508x-01-001E / 60013508x01B / 80043508x01x**

Key Date: **08/17/2007**

Prepared by: **Alice Lossie / Dan Switzer**

MODEL YEAR(S) / PROGRAM(S) **34 Way Female Hybrid Assembly**

FMEA Date (Orig.): **8/17/07**

FMEA Date (Rev): **4/16/20**

CORE TEAM **PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Molded Components in the Assembly Shell Cover Spacer Cam Handle	No molding defects, underfill, burn, warp, broken cores, etc	Inadequately molded part that will not comply with the print specifications	1. Dimensional inconsistency 2. Physical properties inadequate for design requirements 3. Part incomplete or deformed 4. Broken / chipped core	8		1. Machine parameters set up incorrectly on the molding machine 2. Tooling Failures 3. Machine Failures 4. Operational failures	2	1. See Individual pFMEA for the component. 2. See Systems pFMEA for molding	1. See Individual pFMEA for the component. 2. Final audit inspections of the individual parts documented in the database.	5	80	Reviewed for 8D WDP1446, underfill on the shell. Gate sizes are being reviewed & adjusted as required for better material flow. No changes to RPN. AL 8D WDP2217 underfill on cover. Tool had flash issues so tried processing flash got underfill. Sent cavs 1-4 for flash repair TMR 21236. 8D WDP2599, damaged terminal wall on shell, no root cause found at WDP, it appears customer removed spacer & possibly damaged terminal. No changes required. AL 8D WDP3049 broken terminal core, send tool for repair. 8D WDP3074, chipped core by locking tab, send tool for repair. 8D WDP3510, 3499, short shot on shell, valve gates not functioning properly, send for repair. 8D WDP3593, short shot on shell, valve gate issue, send	3/24/17, sent cavs 1-4, TMR 21236 for flash repairs. JH 8/29/18 JH / 11/21/18 JH 2/2019 JH 2/6/19	TMR 21236, completed on 3/29/17, flash repairs verified at first article on 4/12/17. No changes to RPN. AL 8D WDP3049, tool sent for repair TMR27492. No change to RPN. AL 8D WDP3074, tool sent for repair TMR28685, verified first article 11/29/18. No change to RPN. AL 8D WDP3510, 3499, sent frame for valve gate repair TMR 29584. Increased final audit to 10 parts per carton. No changes to RPN. AL 8/1/19 WDP3593, tool sent for repair, replaced 4 pins, 4 gate seals & all				
Process 10 Receive material & purchased components	Material is labeled correctly with the correct quantity	Incorrectly labeled material or components from supplier Incorrect quantity of material or components	1. Inaccurate inventory 2. Possible line shut down	8		1. Supplier system failure 2. Labels not properly bar coded	3	1. Warehouse scanning system 2. Supplier is minimum ISO 9001 certified 3. Receiving inspection	1. Warehouse scanning system 2. Receiving inspection	2	48	None						
Process 20 Receiving Inspection Of Material	Material certification on file Material correctly labeled	No material certification on file Material labeled wrong	1. Inaccurate inventory 2. Possible line shut down	8		1. Error in raw material handling or processing at supplier. 2. Error in labeling product in house	2	1. Suppliers are ISO 9001 certified at minimum. 2. External Audits of the Suppliers by WDP.. 3. Receiving Inspection Instructions QWI022 4. Training of the Receiving Inspector to the work Instructions.	1. Receiving inspection 2. Material certification with each shipment	3	48	None						
Process 20 Receiving Inspection Of Purchased Components Seal Grommet	PPAP on file, no defects, all parts meet drawing specifications	No PPAP on file Components not made to print specifications Components damaged, tears, plugged holes etc.	1. Possible line shut down 2. Unable to assemble components 3. Customer reject 4. Product on hold until PPAP is completed	8		1. Error in suppliers manufacturing process 2. Inadequate receiving inspection 3. Customer reject 3. Receiving inspection does not detect defects	2	1. Suppliers process controls 2. Suppliers submit PPAP package to WDP 3. Suppliers are ISO 9001 certified at minimum 4. Receiving inspection instructions QWI022	1. Receiving inspection QWI022 2. AQL sampling plan	5	80	None						
Process 30 Assembly of Grommet to Connector Hand Assembly	Grommet present & seated properly	Grommet missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunctions pulling grommet back out	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixture reviewed daily for operational use 4. Operator inspection	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

3508-01 (Revision BX3 / A18)

MODEL YEAR(S) / PROGRAM(S) 34 Way Female Hybrid Assembly

Key Date:

08/17/2007

Prepared by:

Alice Lossie / Dan Switzer

CORE TEAM: PM - Mike Davidson, ME - Dan Switzer, QE - Alice Lossie, Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales

FMEA Date (Orig.):

8/17/07

FMEA Date (Rev): 4/16/20

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Grommet miss orientated	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	1	1. Part design allows grommet assembly symmetrical 180° 2. Fixtures have been Pokey-Yoke to assemble to the proper orientation 3. Operator training on work instruction 4. Fixture reviewed daily for operational use 5. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	6	48	None						
		Grommet Underfilled / Torn, plugged holes	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Unable to install terminal wire	8		1. Underfilled / Damaged Grommet received from supplier 2. Grommet damaged during assembly	2	1. Supplier process controls 2. Operator inspection prior to assembling	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. Receiving inspection QW1022 using keyence device.	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						
Process 30 Assemble Interfacial seal to connector Hand Assembly	No defects, one seal present & seated properly	Interfacial Seal missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						
		Double Interfacial seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection 4. Fixture will not allow 2 seals	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. Fixture in use will not allow 2 seals	5	80	None						
		Twisted Interfacial Seal	1. Connector leak causing open circuit 2. Customer rejection 3. Validation sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixtures reviewed daily for operational use 4. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. Fixture in use will detect twisted seal	5	80	None						
		Interfacial Seal Underfilled / Damaged	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Underfilled / Damaged Seal received from supplier 2. Seal damaged during assembly	2	1. Supplier process controls 2. Operator Training to the procedures 3. Operator Inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. Receiving inspection using keyence device	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

3508-01 (Revision BX3 / A18)

MODEL YEAR(S) / PROGRAM(S) 34 Way Female Hybrid Assembly

Key Date:

08/17/2007

Prepared by:

Alice Lossie / Dan Switzer

CORE TEAM: PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales

FMEA Date (Orig.):

8/17/07

FMEA Date (Rev): 4/16/20

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Process 30 Assembly Of Spacer To Connector Hand Assembly	No molding defects, spacer present & seated properly	Spacer missing	1. Open circuit in the finished application 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						
		Spacer misoriented	1. Open circuit in the finished application 2. Customer Rejection 3. Product Verification Sorting	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Fixtures have been Pokey-Yoke to assemble to the pre- locked position and proper orientation 2. Operator training on work instruction 3. Floor operator training on assembly set up 4. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. Fixture in use does not allow mis-oriented spacer	5	80	None						
		Spacer damaged / broken	1. Not capture the terminals 2. Customer Rejection 3. Product Verification Sorting	8		1. Part broken from molding process 2. Operator error during assembly 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						
		Spacer fully engaged from prestaged position (seated)	1. Requires wire harness assembler to pull spacer out to prestage position prior to assembling terminals 2. Customer Rejection 3. Product Verification Sorting	3		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Fixtures have been Pokey-Yoke to assemble to the pre- locked position and proper orientation 2. Operator training on work instruction 3. Floor operator training on assembly set up 4. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	42	None						
Process 30 Assembly of Cam Handle to Connector Hand Assembly	No molding defects, cam handle present & seated in the proper location	Cam handle missing	1. Wire harness Customer Rejection, Unable to lock mating part	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						
		Cam Handle misonientated	1. Wire harness Customer Rejection, Unable to lock mating part	8		1. Operator Error 2. Operator not following hand assembly instructions 3. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixtures reviewed daily for operational use 4. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly						
		Cam Handle Broken or Damaged	1. Wire harness Customer Rejection, Unable to lock mating part.	8		1. Broken or Damaged received from molding process. 2. Operator error 3. Operator not following hand assembly instructions 4. Fixture malfunction	2	1. Operator training on work instruction 2. Floor operator training on assembly set up 3. Fixtures reviewed daily for operational use 4. Operator inspection	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection, no other controls at this time for hand assembly	Alice Lossie 1-23-2013	Re-work instructions updated to include picture of defect. No changes to RPN number.				

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

3508-01 (Revision BX3 / A18)

MODEL YEAR(S) / PROGRAM(S) 34 Way Female Hybrid Assembly

Key Date:

08/17/2007

Prepared by:

Alice Lossie / Dan Switzer

CORE TEAM: PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales

FMEA Date (Orig.):

8/17/07

FMEA Date (Rev): 4/16/20

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Process 30 Assemble Spacer To Connector Automated Assembly	No molding defects, spacer present & seated properly	Spacer missing	1. Open circuit in the finished application 2. Customer rejection 3. Product verification sorting	7		1. Machine misfed 2. Part detection sensor failure	2	1. Master sample error proof verification 2. Machine logic does not cycle without part presence detection 3. Inspector and operator training to the procedures 4. 100% vision system inspection at dedicated stations 5. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	42	None						
		Spacer mis-oriented	1. Open circuit in the finished application 2. Customer rejection 3. Product verification sorting	7		1. Machine misfed 2. Part detection sensor failure	2	1. Part design allows spacer assembly symmetrical 180° 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning ofe each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	42	None						
		Spacer damaged / broken	1. Not capture the terminals 2. Customer rejection 3. Product verification sorting	7		1. Machine misfed 2. Molding issues	2	1. Camera is in line to verify that spacers are not broken 2. Cylinder stroke have been designed to assemble to locked position - positive stop in equipment 3. Inspector and operator training to the procedures 4. Individual PFMEA/Control Plan to verify the molding process to make sure components are not broken or damaged in the molding process	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	42	WDP 1240 Review for Customer Concern	BL 11/10/2014	pFMEA was reviewed and the root cause was determined. To be 11/10/14 - W3509 cavities 1-8 perform better with no fully seated lock feature breakage. Tool out to have 0.2 mm radii increased to 0.5 mm. DB No RPN change required.				
		Spacer fully engaged from prestaged position (seated)	1. Requires wire harness assembler to pull spacer out to prestage position prior to assembling terminals 2. Customer rejection 3. Product verification sorting	3		1. Machine cylinder over stroke	2	1. Cylinder stroke position sensor 2. Cylinder stroke have been designed to assemble to locked position - positive stop in equipment 3. Inspector and Operator Training to the procedures 4. 100% vision system inspection at dedicated stations 5. Verification test parts the beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	18	None						

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **3508x-01-001E / 60013508x01B / 80043508x01x**
MODEL YEAR(S) / PROGRAM(S): **34 Way Female Hybrid Assembly**
CORE TEAM: **PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales**

Process Responsibility: **WDP Mfg. Engineering**
Key Date: **08/17/2007**

FMEA Number: **3508-01 (Revision BX3 / A18)**
Prepared by: **Alice Lossie / Dan Switzer**
FMEA Date (Orig.): **8/17/07** FMEA Date (Rev): **4/16/20**

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Process 30 Assemble Seal To Connector Automated Assembly	No defects, one seal present & seated properly	Seal missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Master sample error proof verification 2. Machine logic does not cycle without part presence detection 3. Inspector and operator training to the procedures 4. 100% vision system inspection at dedicated stations 5. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	8D WDP3844, missing seal, parts failed checkhead verification but did not notify QC to reject product. Update MW1000-F005.	BR / JH 1/4/20	8D WDP3844, Updated MW1000-F005, added to notify QC of any work done on machine or if any test parts fail or are missing. Held operator reviews on 1/14/20. No change to RPN. AL				
		Interfacial Seal Underfilled / Tom	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Underfilled / Damaged Seal received from supplier 2. Seal damaged during assembly	2	1. Supplier process controls 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift 7. Receiving inspection using AQL sampling plan / Keyence measuring 8. Supplier controls	3	48	None						
		Double Interfacial Seal	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Unable to mate to mating part	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Inspector and operator training to the procedures 2. 100% vision system inspection at dedicated stations 3. Test verification parts beginning of each shift 4. Sensors on seal mandrel head stop machine & give error message that 2 seals are present.	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

3508-01 (Revision BX3 / A18)

MODEL YEAR(S) / PROGRAM(S) 34 Way Female Hybrid Assembly

Key Date:

08/17/2007

Prepared by:

Alice Lossie / Dan Switzer

CORE TEAM: PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales

FMEA Date (Orig.):

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Seal Rolled/Twisted	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Unable to mate to mating part	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Inspector and operator training to the procedures 2. 100% vision system inspection at dedicated stations 3. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	8D WDP2157 twisted seal, reviewed camera inspection & detected it was out of alignment on 1/10/17. 8D WDP2659, twisted out of position seal, no root cause found, camera inspections working fine to detect defect. No changes required. AL 8D WDP2697, twisted seal, did not leave WDP in this condition, continue to monitor camera checks. No changes required at this time. AL	Re-align seal camera. CH / JH	1/10/17, camera re-aligned, tested verification parts to assure they were rejecting. No changes to RPN. AL				
Process 30 Assemble Grommet To Connector Automated Assembly	No defects, grommet present & seated properly	Grommet missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Machine logic does not cycle without part presence detection 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						
		Grommet miss orientated	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Part design allows grommet assembly symmetrical 180° 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

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MODEL YEAR(s) / PROGRAM(s) 34 Way Female Hybrid Assembly

Key Date:

08/17/2007

Prepared by:

Alice Lossie / Dan Switzer

CORE TEAM: PM - Mike Davidson, ME - Dan Switzer, QE - Alice Lossie, Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales

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8/17/07

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PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Grommet Underfilled / Torn, plugged holes	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Underfilled / Damaged Grommet received from supplier 2. Grommet damaged during assembly	2	1. Supplier process controls 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift 7. Receiving inspection using AQL sampling plan / Keyence measuring 8. Supplier controls	3	48	8D WDP2137, tom grommet produced 11-16-15.	11/2015, Re-pin grommet tool with .008" pins. TT	11-16-15, grommet tool re-pinned with .008" hole pins to prevent tearing. No change to RPN. AL				
Process 30 Assemble Cam handle To Connector Automated Assembly	No molding defects cam handle present & seated properly	Cam handle missing	1. Wire harness Customer Rejection, Unable to lock mating part	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Machine logic does not cycle without part presence detection 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						
		Cam handle misoriented	1. Wire harness Customer Rejection, Unable to lock mating part	8		1. Machine miss feed 2. Part detection sensor failure	2	1. In-line sensors detect position of cam handle, causes machine stoppage fault failure 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						
		Cam Handle Broken or Damaged	1. Wire harness Customer Rejection, Unable to lock mating part	8		1. Broken or damages received from molding process. 2. Misalignment of the gripper heads when picking the part. 3. Damaged during assembly 4. Cylinder over stroke	2	1. Cylinder stroke position sensor 2. PM program on the machine which includes gripper heads 3. Molding pfmea for cam handle	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	Update Re-work instructions to include picture of defect	Alice Lossie 1-23-2013	Re-work instructions updated to include picture of defect. No changes to RPN number.				

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Process 40 100% Inspection Of Assembly Automated Assembly	All components one of each, spacer, seal, grommet, cam handle present & seated properly	Parts mis-assembled (wrong or missing components)	1. Cause loss of designed functionality	8		1. Vision system not detecting mis-assembled parts 2. Parts not going into reject chute	2	1. Training on setup of equipment. 2. Computer controlled system. 3. 100% vision system inspection at dedicated stations 4. PM on machine 5. Verification tests beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						
Process 50 First Article Inspection	All In-process steps completed, no molding defects, all components- seal, spacer, grommet, cam handle present & seated properly, proper carton indentification	Inspection process does not detect defects	1. Dimensional inconsistency 2. Poor fit to mating part causing an open or incomplete circuit 3. Missing or incomplete features 4. Validation sorting 5. Customer reject	8		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training for all inspectors to the work instructions 2. Cross functional team creates inspection instructions	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection	5	80	None						
		Inspection process not completed	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	8		1. Inspection instructions not followed 2. Operator error	2	1. Work instruction QWI010 First Last Article Inspection 2. Work Instruction QWI026 In-process inspection 3. Supervisor review of In-process inspections being performed 4. Work instruction QWI016 Final Audit inspection 5. Cross functional team creates inspection instructions 6. Training to all work instructions	1. Inspection entry into the WDP Database 2. Evidence of parts on First Article board 3. Work instruction QWI016 Final Audit Inspection	5	80	None						
		Inspection process not effective	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	8		1. Inspection Instructions not adequate 2. Inspection instructions not completed correctly 3. Operator error	2	1. Work instruction QWI010 First Last Article Inspection 2. Work Instruction QWI026 In-process inspection 3. Supervisor review of In-process inspections being performed 4. Work instruction QWI016 Final Audit inspection 5. Cross functional team creates inspection instructions 6. Training to all work instructions	1. Non-conforming pictures in WDP Database 2. Alerts in WDP Database 3. Cross functional team creates inspection instructions 4. Work instruction QWI016 Final Audit inspection 5. Work instruction QWI026 In-process inspection	5	80	None						

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PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Label printing not completed per procedure (Wrong labels)	1. Internal customer reject 2. Possibly wrong product shipped 3. Potential customer manufacturing shut down	8		1. Operator not following label printing instructions 2. Error with label maker 3. Inspector failure to verify correct labels	2	1. Work instruction MWI025 Printing Production Labels 2. Work instruction QWI010 First Last Article Inspection 3. Work instruction QWI026 In-process inspection 4. Work instruction MWI004 Label ID & Use 5. Work instruction QWI016 Final Audit inspection 6. Training to all work instructions	1. Label Verification Master 2. Work instruction QWI010 First Last Article inspection 3. Work instruction QWI026 In-process inspection 4. Work instruction QWI016 Final Audit inspection 5. Work instruction MWI004 Label ID & Use	5	80	None						
Process 60 In-Process Inspection	All In-process steps completed, no molding defects, all components- seal, spacer, grommet, cam handle present & seated properly, proper carton identification	See First Article Inspection See control plan in database	See First Article Inspection See control plan in database	8		See First Article Inspection See control plan in database	2	See First Article Inspection See control plan in database	See First Article Inspection See control plan in database	5	80	None						
Process 70 Manufacturing Packaging Verification	Correct quantity, labels & parts must be packaged	Incorrect quantity packaged	1. Customer rejection 2. Potential customer line shut down 3. Component damaged during shipment	6		1. Packaging instructions not clear 2. Packaging instructions not available 3. Packaging instructions not followed 4. Audit scale APW number not calculated correctly	2	1. Detailed packaging instructions developed for each product 2. Training of operators on packaging instructions 3. Using the scale at final audit work instruction	1. First piece inspection 2. In-process inspection 3. Final audit	7	84	None					0	
		Incorrect label affixed to packaging	1. Customer rejection 2. Potential customer line shut down	7		1. Label verification not available 2. Label verification not used 3. Labels made and affixed to container ahead of time 4. Wrong labels printed at first article	2	1. Molding label verification work instructions 2. Training to all work instructions 3. Each part number assigned a label job number to print labels	1. Training matrix 2. First and Last Article inspection 3. In-process inspection 4. Operator inspection 5. Final audit inspection 6. Molding Label Verification Card	7	98	None					0	
		Wrong or mixed parts in the package	1. Customer rejection 2. Potential customer manufacturer shut down	6		1. Packages sitting open and unsealed 2. Operators not cleaning out job setups from run to run 3. Filling a partial carton with wrong product	2	1. Packaging plan 2. Housekeeping and Line clearance from previous run. 3. Inspector and Operator Training to the inspection and scanning procedures.	1. First article inspection QWI010 2. In Process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection MWI004 Label ID & Use / Label verification card	7	84	None						
Process 80 Final Audit Inspection	Visual inspection of parts, no molding defects, no missing or mis-seated components, correct carton label	Inspection process does not detect defects	1. Dimensional inconsistency 2. Poor fit to mating part causing an open or incomplete circuit 3. Missing or incomplete features 4. Validation sorting 5. Customer reject	8		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training for all inspectors to the work instructions 2. Cross functional team creates inspection instructions	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection						

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Visual Inspection not 100% effective	1. Visual Defects go undetected	8		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training to all work instructions 2. Past defective boundary sample pictures in the database	1. Internal audits 2. Work instruction QW1016 Final Audit Inspection 3. Work instruction QW1026 In-process inspection 4. Work instruction QW1010 First Last Article inspection 5. Operator inspection	7	112	RPN high because it is all a visual inspection						
Process 90 Store In-House / Transfer To Warehouse	Correct product stored in correct location	Incorrect product stored in right location	1. Unable to locate product 2. May need to remake product	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning from Plant to Warehouse work instructions 2. Scanning from Warehouse to Plant work instructions 3. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Month end inventory audit	3	48	None						0
		Correct product stored in wrong location	1. Unable to locate product 2. May need to remake product	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning from Plant to Warehouse work instructions 2. Scanning from Warehouse to Plant work instructions 3. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Month end inventory audit	3	48	None						0
Process 100 Assemble Cover to connector Automated Assembly	No molding defects, correct orientation & engraving on cover, cover present & fully seated	Cover missing	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine miss feed 2. Part detection sensor failure	2	1. Machine logic does not cycle without part presence detection 2. Inspector and operator training to the procedures 3. 100% vision system inspection at dedicated stations 4. Test verification parts beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						
		cover not fully engaged	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting 4. Potential for cover to fall off during shipping	8		1. Machine miss feed 2. Part detection sensor failure 3. Machine cylinder stroke failure	2	1. Inspector & operator training to the work instructions 2. Cylinder positive stop 3. PM program on machine covers cylinders 4. Verification tests beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	3	48	None						

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Cover grill between pegs is damaged	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine cylinder malfunction. 2. Machine miss feed 3. Vision system failure	2	1. Inspector & operator training to the work instructions 2. Cylinder positive stop 3. PM program on machine covers cylinders	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations	5	80	8D WDP1981, adding instructions to control plan to review cover grill during all inprocess & final audit inspections. Adding manufacturing verification of cover punch with in-process inspection verifying it's completed.	AL 8/26/16 AL / BR 1/2017	8/25/16, Updated control plans to add cover grill inspections. No changes to RPN. AL 1/5/17, added manufacturing verification of cover punch with quality verification it's completed. No change to RPN. AL	8	2	3	48
		Cover pegs broken and or bent	1. Connector leak causing open circuit 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine cylinder malfunction. 2. Machine miss feed 3. Vision system failure	2	1. Inspector & operator training to the work instructions 2. Cylinder positive stop 3. PM program on machine covers cylinders 4. Verification tests beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	5	80	Verify the RPN are as low as possible for WDP 1155.	Alice Lossie 08/12/2014 Steven Taylor 08/13/2014 Will revisit the end of September.	Reviewed for 8D WDP1155 no There is an Assembly machine on order and will be on line in Sept. / 2014. The new machine will have a final inspection camera to verify the pin-out condition. Will continue to monitor.	8	2	3	48
		Cover peg holes not punched clean. (Chads)	1. Possibly unable to install terminal wire 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine cylinder malfunction. 2. Machine miss feed 3. Vision system failure	2	1. Inspector & operator training to the work instructions 2. Cylinder positive stop 3. PM program on machine cover cylinders 4. Verification tests beginning of each shift	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	5	80	Per the Customer Commnorm WDP 1220 - 1233 Debris in the cover nest not allowing the cover to sit flat causing the punch to leave a flash in the cover. Reviewed WDP 1267 same condition as reported before, part produced prior to last corrective action. 8D WDP2858, excessive plastic in the terminal hole opening caused by plastic stuck between punch pins. Update operator instruction to check block, update camera vision system to detect defect.	Marge Geat 10/17/2014 Alice Lossie 12/18/14 BR / JH 8/30/18	Additional training of the operators and pictures were placed at the machine keeping them aware of the issue.Design in the new machine places air jet to blow out the machine nests. - ST No change to RPN. New machine operational does have air jets, but old machine is still in use also. PM was increased for punch block, prior to this 8D, parts were produced prior to this, corrective action. AL No change of RPN 8D WDP2858, Operator instructions updated to check block every 30mins. Camera vision system updated to detect the defect. No change to RPN. AL				

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								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N				
		Cover peg holes not punched correctly (wrong pin configuration)	1. Unable to install terminal wire 2. Customer Rejection 3. Product Verification Sorting	8		1. Machine cylinder malfunction. 2. Machine miss feed 3. Vision system failure 4. Broken punch pin on machine 5. Inspector error verifying punch set up	2	1. Inspector & operator training to the work instructions 2. Cylinder positive stop 3. PM program on machine cover cylinders 4. Verification tests beginning of each shift	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Test verification parts beginning of each shift	7	112	Per the Customer Concern WDP 1366 - 1371, wrong pin configuration. Adding card templates to set FW0127 up correctly 5-5-17, 8D WDP2213, 1 part with wrong punch configuration. No root cause was truly found, all inspections & operations were verified to be working properly, could not re-create defect. No change to RPN. AL 9-27-17 8D WDP2328, wrong pin configuration, update checkhead verification log to remove cartons from under chute. 8D WDP3766, missing cover peg, no root cause truly found. Review defect with personnel.	Alice Lossie 2/20/15 BR / 9/29/17 JH / 11/2019	Added card templates to set FW0127 pin configuration verification correctly. Reduce RPN number. 2/23/15 AL 9-27-17, checkhead verification log updated to remove carton from under the chute. No change to RPN. AL 11/8/19 reviews took place with all personnel for missing cover pegs. No change to RPN. AL	8	2	5	80				
		Wrong laser engraved part number	1. Not engraved correctly 2. Wrong number will have customer to assemble the wrong product in the application 3. Customer rejection 4. Validation sorting	8		1. Laser machine malfunction 2. Improper programing 3. Inspector error verifying laser engraved part number at first article	2	1. Inspector and Operator Training to the work instructions 2. PM program on the machine includes laser engraver 3. Final Audit inspection QWI0022 Inspection 4. Scanning of production label to set the laser engraved part number	1. First article inspection QWI010 2. In process Inspection QWI026 3. Machine PM to maintain optimal function. 4. Scanning of production label to set the laser engravaed part number	5	80	8D WDP2286 wrong configuration for box label. No root cause truly determined. No change to RPN. AL										
		Laser engraving not legible (to deep or not deep enough)		8		1. Laser machine malfunction 2. Improper programing 3. Inspector error verifying laser engraved part number at first article	2	1. Inspector and Operator Training to the work instructions 2. PM program on the machine includes laser engraver 3. Final Audit inspection QWI0022 Inspection 4. Scanning of production label to set the laser engraved part number	1. First article inspection QWI010 2. In process Inspection QWI026 3. Machine PM to maintain optimal function. 4. Scanning of production label to set the laser engravaed part number	5	80	None										
Process 110 100% Inspection Of Assembly Automated Assembly	No molding defects, correct orientation & engraving on cover, cover present & fully seated	Parts mis-assembled, wrong orientation, missing or wrong laser engraving	1. Unable to install terminal wire 2. Customer Rejection 3. Product Verification Sorting 4. Wrong number will have customer to assemble the wrong product in the application	8		1. Vision system not detecting mis-assembled parts 2. Parts not going into reject chute 3. Laser machine malfunction 4. Machine set up in-correctly by operator	2	1. Inspector and Operator Training to the work instructions 2. PM program on the machine includes laser engraver 3. Final Audit inspection QWI0022 Inspection 4. Scanning of production label to set the laser engraved part number	1. First article inspection QWI010 2. In-process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection 5. 100% vision system inspection at dedicated stations 6. Machine PM to maintain optimal function	3	48	None										

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PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Process 120 First Article Inspection	No molding defects, correct orientation & engraving on cover, cover present & fully seated	Inspection process does not detect defects	1. Dimensional inconsistency 2. Poor fit to mating part causing an open or incomplete circuit 3. Missing or incomplete features 4. Validation sorting 5. Customer reject	8		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training for all inspectors to the work instructions 2. Cross functional team creates inspection instructions	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	112	RPN high because it is all a visual inspection						
		Inspection process not completed	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	8		1. Inspection instructions not followed 2. Operator error	2	1. Work instruction QW1010 First Last Article Inspection 2. Work Instruction QW1026 In-process inspection 3. Supervisor review of In-process inspections being performed 4. Work instruction QW1016 Final Audit inspection 5. Cross functional team creates inspection instructions 6. Training to all work instructions 7. Gaging guides	1. Inspection entry into the WDP Database 2. Evidence of parts on First Article board 3. Work instruction QW1016 Final Audit Inspection	5	80	None						
		Inspection process not effective	1. Potential nonconforming part will be produced 2. Possible customer reject & line shut down	8		1. Inspection Instructions not adequate 2. Inspection instructions not completed correctly 3. Operator error	2	1. Work instruction QW1010 First Last Article Inspection 2. Work Instruction QW1026 In-process inspection 3. Supervisor review of In-process inspections being performed 4. Work instruction QW1016 Final Audit inspection 5. Cross functional team creates inspection instructions 6. Training to all work instructions 7. Gaging guides	1. Non-conforming pictures in WDP Database 2. Alerts in WDP Database 3. Cross functional team creates inspection instructions 4. Work instruction QW1016 Final Audit inspection 5. Work instruction QW1026 In-process inspection	5	80	None						
		Label printing not completed per procedure (Wrong labels)	1. Internal customer reject 2. Possibly wrong product shipped 3. Potential customer manufacturing shut down	8		1. Operator not following label printing instructions 2. Error with label maker 3. Inspector failure to verify correct labels at first article & in-process inspections	2	1. Work instruction MW1025 Printing Production Labels 2. Work instruction QW1010 First Last Article Inspection 3. Work instruction QW1026 In-process inspection 4. Work instruction MW1004 Label ID & Use 5. Work instruction QW1016 Final Audit inspection 6. Training to all work instructions	1. Label Verification Master 2. Work instruction QW1010 First Last Article inspection 3. Work instruction QW1026 In-process inspection 4. Work instruction QW1016 Final Audit inspection 5. Work instruction MW1004 Label ID & Use	5	80	None						

**POTENTIAL
FALILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x

Process Responsibility:

WDP Mfg. Engineering

FMEA Number:

3508-01 (Revision BX3 / A18)

MODEL YEAR(S) / PROGRAM(S) 34 Way Female Hybrid Assembly

Key Date:

08/17/2007

Prepared by:

Alice Lossie / Dan Switzer

CORE TEAM: PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales

FMEA Date (Orig.):

8/17/07

FMEA Date (Rev): 4/16/20

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS					
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N	
Process 130 In-Process Inspection	No molding defects, correct orientation & engraving on cover, cover present & fully seated	See First Article Inspection See control plan in database	See First Article Inspection See control plan in database	8		See First Article Inspection See control plan in database	2	See First Article Inspection See control plan in database	See First Article Inspection See control plan in database	5	80	None							
Process 140 Manufacturing Packaging Verification	Correct quantity, labels & parts must be packaged	Incorrect quantity packaged	1. Customer rejection 2. Potential customer line shut down 3. Component damaged during shipment	6		1. Packaging instructions not clear 2. Packaging instructions not available 3. Packaging instructions not followed 4. Audit scale APW number not calculated correctly	2	1. Detailed packaging instructions developed for each product 2. Training of operators on packaging instructions 3. Using the scale at final audit work instruction	1. First piece inspection 2. In-process inspection 3. Final audit	7	84	None						0	
		Incorrect label affixed to packaging	1. Customer rejection 2. Potential customer line shut down	7		1. Label verification not available 2. Label verification not used 3. Labels made and affixed to container ahead of time 4. Wrong labels printed at first article	2	1. Molding label verification work instructions 2. Training to all work instructions 3. Each part number assigned a label job number to print labels	1. Training matrix 2. First and Last Article inspection 3. In-process inspection 4. Operator inspection 5. Final audit inspection 6. Molding Label Verification Card	7	98	Systemic update for 8D WDP2486, wrong product shipped, product labeled wrong. Update QWI016 final audit instruction & update 3508 Assy operator instruction to use box stop feature on last box produced. 8D WDP2597, wrong product shipped, wrong label applied. Update QWI010 First/Last article inspection to return labels after verification.	BR / JH 2/15/18 TL 3/2/18	8D WDP2486, on 1/4/18 QWI016 Final Audit work instruction was updated to complete one box at a time from start to finish. On 2/13/18, 3508 assay operator instructions were updated to use the box stop feature on the machine for last box produced for an order. No change to RPN. AL 8D WDP2597, QWI010 was updated to return labels to operator, then complete remaining first article process. No change to RPN. AL					0
		Wrong or mixed parts in the package	1. Customer rejection 2. Potential customer manufacturer shut down	6		1. Packages sitting open and unsealed 2. Operators not cleaning out job setups from run to run 3. Filling a partial carton with wrong product	2	1. Packaging plan 2. Housekeeping and Line clearance from previous run. 3. Inspector and Operator Training to the inspection and scanning procedures.	1. First article inspection QWI010 2. In Process inspection QWI026 3. Final Audit inspection QWI016 4. Operator Inspection MWI004 Label ID & Use / Label verification card	7	84	8D WDP2325, mixed pin configuration 866 with 867, no root cause. Reviewed concern & change over instructions with operators. No actions required. No change to RPN. AL Systemic update for 8D WDP2955, mixed parts. Machine indexing program was updated to clear all parts from table before being able to put into Place parts		8	2	4	64		

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: **3508x-01-001E / 60013508x01B / 80043508x01x**
MODEL YEAR(S) / PROGRAM(S): **34 Way Female Hybrid Assembly**
CORE TEAM: **PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales**

Process Responsibility: **WDP Mfg. Engineering**
Key Date: **08/17/2007**

FMEA Number: **3508-01 (Revision BX3 / A18)**
Prepared by: **Alice Lossie / Dan Switzer**
FMEA Date (Orig.): **8/17/07** FMEA Date (Rev): **4/16/20**

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
Process 150 Final Audit Inspection	No molding defects, correct orientation & engraving on cover, cover present & fully seated	Inspection process does not detect defects	1. Dimensional inconsistency 2. Poor fit to mating part causing an open or incomplete circuit 3. Missing or incomplete features 4. Validation sorting 5. Customer reject	7		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training for all inspectors to the work instructions 2. Cross functional team creates inspection instructions	1. First article inspection QW1010 2. In-process inspection QW1026 3. Final Audit inspection QW1016 4. Operator Inspection	7	98	None						
		Visual Inspection not 100% effective	1. Visual Defects go undetected	7		1. Inspection Instructions not adequate 2. Inspection instructions not followed 3. Operator error	2	1. Training to all work instructions 2. Past defective boundary sample pictures in the database	1. Internal audits 2. Work instruction QW1016 Final Audit Inspection 3. Work instruction QW1026 In-process inspection 4. Work instruction QW1010 First Last Article inspection 5. Operator inspection	7	98	None						
Process 160 Store In-House / Transfer To Warehouse	Correct product stored in correct location	Incorrect product stored in right location	1. Unable to locate product 2. May need to remake product	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning from Plant to Warehouse work instructions 2. Scanning from Warehouse to Plant work instructions 3. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Month end inventory audit	3	48	None						0
		Correct product stored in wrong location	1. Unable to locate product 2. May need to remake product	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning from Plant to Warehouse work instructions 2. Scanning from Warehouse to Plant work instructions 3. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Month end inventory audit	3	48	None						0
Process 170 Ship To Customer	Correct product shipped to customer	Incorrect product shipped to customer	1. Customer rejection 2. Potential customer manufacturing shut down 3. Product non-functional for the application	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning Product for Shipment work instructions 2. Printing Production Labels work instruction 3. Customer specific label work instruction 4. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Label ID & Use 4. Inventory audits- monthly/quarterly 5. Pick process by WHS utility 6. Shipping clerk matches packing list with order and applies BOL & Packing List if they agree 7. WHS utility verifies load to paper work, physically loads it and stamps/initials paper work for accountability	3	48	None						0

**POTENTIAL
FAILURE MODE AND EFFECTS ANALYSIS
(Process FMEA)**

ITEM: 3508x-01-001E / 60013508x01B / 80043508x01x	Process Responsibility: WDP Mfg. Engineering	FMEA Number: 3508-01 (Revision BX3 / A18)
MODEL YEAR(s) / PROGRAM(s): 34 Way Female Hybrid Assembly	Key Date: 08/17/2007	Prepared by: Alice Lossie / Dan Switzer
CORE TEAM: PM - Mike Davidson , ME - Dan Switzer , QE - Alice Lossie , Plant Super. - Jim Hendrixson, QC Super. - Brandy Rosales		FMEA Date (Orig.): 8/17/07 FMEA Date (Rev): 4/16/20

PROCESS STEP FUNCTION	REQUIREMENTS	POTENTIAL FAILURE MODE	POTENTIAL EFFECTS OF FAILURE	S E V	C L A S S	POTENTIAL CAUSE(S)/ MECHANISM OF FAILURE	O C C	Current Control		D E T	R P N	RECOMMENDED ACTION(S)	RESPONSIBILITY & TARGET COMPLETION DATE	ACTION RESULTS				
								CURRENT DESIGN /PROCESS CONTROL PREVENTION	CURRENT DESIGN /PROCESS CONTROL DETECTION					ACTION TAKEN	S E V	O C C	D E T	R P N
		Correct product shipped to incorrect customer	1. Customer rejection 2. Potential customer manufacturing shut down 3. Product non-functional for the application	8		1. Mis-labeled cartons 2. Scanning instructions not followed 3. Scanning instructions not available	2	1. Scanning Product for Shipment work instructions 2. Printing Production Labels work instruction 3. Customer specific label work instruction 4. Training to all relevant work instructions	1. Training matrix 2. Barcode ERP system 3. Label ID & Use 4. Inventory audits-monthly/quarterly 5. Pick process by WHS utility 6. Shipping clerk matches packing list with order and applies BOL & Packing List if they agree 7. WHS utility verifies load to paper work, physically loads it and stamps/initials paper work for accountability	3	48	None					0	

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<input type="checkbox"/> Pre-Launch	<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Assembly	<input type="checkbox"/> Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 3508A Part				Alice Lossie 269.668.3393					08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01		Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales			Customer Engineering Approval / Date (If Req'd)			
Part Name / Description 34 W F SHELL (BLK)						Quality Engineering			Customer Quality Approval / Date (If Req'd)			
Supplier / Plant WDP			Supplier Code 609123190			Quality Control			Other Approval / Date (If Req'd)			

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods					Reaction Plan
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample		Control Method	
									Size	Freq.		
1	10	Receiving	Purchased Components	Components Received			3508-50-001, 3508-50-002, 3508-51-001	Visually Verify Correct Quantity Received		Each Lot / Shipment	WHI007 Warehouse Receiving Instructions	Reject Per QWI001 / Notify Supervisor / Adjust Process
2	20	Receiving Inspection	Supplier	Purchased Seal 3508-50-001			Verify PPAP is on file and not more than 1 year old	Supplier Database - Purchased Components		Each Lot / Each Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Notify Supervisor / Request PPAP From Supplier
3	20	Receiving Inspection	Supplier	Purchased Seal 3508-50-001			Inspect for any defects, underfill, flash, tears, etc.	Visual	Sampling Plan AQL 1	Per Lot / Per Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Request RMA & 8D From Supplier / Reduce Sampling Plan T
4	20	Receiving Inspection	Supplier	Purchased Seal 3508-50-001			Verify parts have sufficient silicone	Visual / Verify Not Dry	Sampling Plan AQL 1	Per Lot / Per Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Request RMA & 8D From Supplier / Reduce Sampling Plan T
5	20	Receiving Inspection	Supplier	Purchased Seal 3508-50-001			Place OK TO USE on acceptable cartons	Use OK TO USE stamp	Each Acceptable Carton	Each carton per shipment	QWI022 / Receiving Inspection	Re-inspect cartons with no label
6	20	Receiving Inspection	Supplier	Purchased Grommet 3508-51-001, 3508-51-002			Verify PPAP is on file and not more than 1 year old	Supplier Database - Purchased Components		Each Lot / Each Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Notify Supervisor / Request PPAP From Supplier
7	20	Receiving Inspection	Supplier	Purchased Grommet 3508-51-001, 3508-51-002			Inspect for any defects, underfill, flash, tears, etc.	Visual	Sampling Plan AQL 1	Per Lot / Per Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Request RMA & 8D From Supplier / Reduce Sampling Plan T
8	20	Receiving Inspection	Supplier	Purchased Grommet 3508-51-001, 3508-51-002			Verify parts have sufficient silicone	Visual / Verify Not Dry	Sampling Plan AQL 1	Per Lot / Per Shipment	QWI022 / Receiving Inspection	Reject Per QWI001 / Request RMA & 8D From Supplier / Reduce Sampling Plan T
9	20	Receiving Inspection	Supplier	Purchased Grommet 3508-51-001, 3508-51-002			Place OK TO USE on acceptable cartons	Use OK TO USE stamp	Each Acceptable Carton	Each carton per shipment	QWI022 / Receiving Inspection	Re-inspect cartons with no label
10	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #1 (Hand Assembly)			Cam Handle Placement	Manual Placement FW0012	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
11	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #2 (Hand Assembly)			Lock Cam Handle Into Position	Manual Placement	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
12	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #3 (Hand Assembly)			Place Seal	Manual Placement FW0011	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
13	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #4 (Hand Assembly)			Seal Verification	Manual Paddle Fixture	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
14	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #5 (Hand Assembly)			Grommet Placement	Manual Placement	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions

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<input type="checkbox"/> Pre-Launch	<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Assembly	<input type="checkbox"/> Safe Launch	Key Contact / Phone				Date (Orig.)		Date (Rev.)	
Job Number 3508A		Part		Alice Lossie 269.668.3393				08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01	Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 34 W F SHELL (BLK)					Quality Engineering				Customer Quality Approval / Date (If Req'd)		
Supplier / Plant WDP			Supplier Code 609123190		Quality Control				Other Approval / Date (If Req'd)		

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods				Reaction Plan	
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample			Control Method
									Size	Freq.		
15	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #6 (Hand Assembly)			Grommet Installment Verification	Manual FW-265	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
16	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #7 (Hand Assembly)			Spacer Placement	Manual Placement FW-260	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
17	30	Hand Assembly	Sub Assembly Manual	Sub Assembly Step #8 (Hand Assembly)			Presences & Location Inspection	Visually Inspect Part	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
18	30	Automated Assembly	Sub Assembly Machine Station #1	Sub Assembly Step #1 (7-28)			Shell Placement	Fiber Optice Eye Station #1	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
19	30	Automated Assembly	Sub Assembly Machine Station #2	Sub Assembly Step #2 (7-28)			Cam Handle Placement	Vision System Station #6	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
20	30	Automated Assembly	Sub Assembly Machine Station #3	Sub Assembly Step #3 (7-28)			Seal Placement / Lock Cam Handle	Vision System Station #4	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
21	30	Automated Assembly	Sub Assembly Machine Station #4	Sub Assembly Step #4 (7-28)			Spacer Placement	Vision System Station #4	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
22	30	Automated Assembly	Sub Assembly Machine Station #5	Sub Assembly Step #5 (7-28)			Grommet Placement	Vision System Station #6	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
23	30	Automated Assembly	Sub Assembly Machine Station #7	Sub Assembly Step #6 (7-28)			Good Part Eject In Production Carton / Bad Part Eject in Reject Bin	Vision System Stations 4 & 6	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
24	30	Automated Assembly	Sub Assembly Machine Station #1	Sub Assembly Step #1 (7-37)			Shell Placement	Fiber Optic Eye Station #2	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify System
25	30	Automated Assembly	Sub Assembly Machine Station #3	Sub Assembly Step #2 (7-37)			Cam Handle Placement	Vision System Station #5	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
26	30	Automated Assembly	Sub Assembly Machine Station #4	Sub Assembly Step #3 (7-37)			Seat Cam Handle	Vision System Station #5	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
27	30	Automated Assembly	Sub Assembly Machine Station #5	Sub Assembly Step #4 (7-37)			Verify Presence & Placement Of Cam Handle	Vision System Station #5	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
28	30	Automated Assembly	Sub Assembly Machine Station #6	Sub Assembly Step #5 (7-37)			Seal Placement	Vision System Station #7	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst

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Job Number 3508A Part				Alice Lossie 269.668.3393					08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01		Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 34 W F SHELL (BLK)					Quality Engineering				Customer Quality Approval / Date (If Req'd)			
Supplier / Plant WDP			Supplier Code 609123190		Quality Control				Other Approval / Date (If Req'd)			

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods				Reaction Plan	
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample			Control Method
									Size	Freq.		
29	30	Automated Assembly	Sub Assembly Machine Station #7	Sub Assembly Step #6 (7-37)			Verify Presence/Placement Of Seal & Shell Polarity	Vision System Station #7	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
30	30	Automated Assembly	Sub Assembly Machine Station #8	Sub Assembly Step #7 (7-37)			Spacer Placement	Vision System Station #9	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
31	30	Automated Assembly	Sub Assembly Machine Station #9	Sub Assembly Step #8 (7-37)			Verify Presence & Placement Of Spacer	Vision System Station #9	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
32	30	Automated Assembly	Sub Assembly Machine Station #10	Sub Assembly Step #9 (7-37)			Grommet Placement	Mechanical Check Station #11 / Vision System Station #12	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
33	30	Automated Assembly	Sub Assembly Machine Station #11 & 12	Sub Assembly Step #10 (7-37)			Verify Presence/Placement & Color Of Grommet	Mechanical Check Station #11 / Vision System Station #12	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
34	30	Automated Assembly	Sub Assembly Machine Station #15	Sub Assembly Step #11 (7-37)			Eject Good Assembly To Production Carton	Vision Systems Stations #5,7,9,12 / Mechanical Check Station #11	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
35	30	Automated Assembly	Sub Assembly Machine Station #16	Sub Assembly Step #12 (7-37)			Eject Bad Assembly To Reject Bin	Vision Systems Stations #5,7,9,12 / Mechanical Check Station #11	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
36	40	100% Inspection	Sub Assembly Manual	Sub Assembly (Hand Assembly)			Verify Component Presence & Proper Placement	Visually Inspect	Each Part	Each Assembly	Operator Instructions	Place In Reject Bin Per Instructions
37	40	100% Inspection Automated Assembly	Sub Assembly Machine	Sub Assembly (7-28)			Verify Component Presence & Proper Placement	Vision System Stations # 3, 4, 6	Each Assembly	Each Cycle	Verification Test Parts Beginning Of Each Shift	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
38	40	100% Inspection Automated Assembly	Sub Assembly Machine	Sub Assembly (7-37)			Verify Component Presence & Proper Placement	Vision Systems Stations #5,7,9,12 / Mechanical Check Station #11	Each Assembly	Each Cycle	Verification Test Parts Beginning Of Each Shift	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
39	50	First / Last Piece Inspection	Sub Assembly Machine / Manual	Sub Assembly (7-28) (7-37) (Hand Assembly)			All Control Plan In-Process Inspection steps listed	See steps listed	2 Parts	At start up	QWI010 First / Last Article	Reject Per QWI001 / Notify Supervisor / Adjust Process
40	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) Hand Assembly			Verify Part Matches Picture In Upper Right Hand Corner	Visual Part To Picture	5 Parts	At start up / Every 4 Hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
41	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Proper assembly	Visual	5 Parts	At start up / Every 4 Hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process

Control Plan

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<input type="checkbox"/> Pre-Launch	<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Assembly	<input type="checkbox"/> Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 3508A Part				Alice Lossie 269.668.3393					08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01		Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 34 W F SHELL (BLK)						Quality Engineering				Customer Quality Approval / Date (If Req'd)		
Supplier / Plant WDP			Supplier Code 609123190			Quality Control				Other Approval / Date (If Req'd)		

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods					Reaction Plan
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample		Control Method	
									Size	Freq.		
42	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Review Machine Table For Any Plastic Chips	Visually Review Machine Table		Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
43	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Fully Seat Spacer Into Part / Verify No Breakage	Manual Placement / Visual	2 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
44	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Verify No Molding Defects, Flash, Underfill, Burn, Warp, etc.	Visual Parts From Assembly Hopper	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
45	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Verify No Purchased Component Defects, Flash, underfill, Plugged holes, etc.	Visual Parts From Assembly Hoppers	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
46	60	In-Process Inspection	Automated Assembly	Sub Assembly (7-37)			Verify Acceptable Bee Sting On Parts	Visual Parts / See Conforming Picture In Database	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
47	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Verify Operator Is Following Instructions & Aware Of Any Alerts	Verbally Verify With The Operator	Each Operator	At start up / Once A Shift	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
48	60	In-Process Inspection	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Carton Identification / Proper Label	Visual	All Labels At Point Of Use	At start up / Once A Shift	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
49	60	In-Process Inspection	Assembly Machine	Sub Assembly (7-28) (7-37)			Verify Check Head Verifications Have Been Completed & Documented	Visual Verification Log / Look For No Failures		Beginning of each shift equipment is used	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
50	70	Manufacturing Packaging Verification	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Carton Identification / Proper Label	Visual	Each Label	Each Carton	MWI004 Label ID & Use	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
51	80	Final Audit	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Proper assembly / Final Audit Graphics	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
52	80	Final Audit	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Verify No Molding Defects, Flash, Underfill, Burn, Warp, etc.	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process

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<input type="checkbox"/> Pre-Launch	<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Assembly	<input type="checkbox"/> Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 3508A Part				Alice Lossie 269.668.3393					08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01		Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 34 W F SHELL (BLK)						Quality Engineering				Customer Quality Approval / Date (If Req'd)		
Supplier / Plant WDP			Supplier Code 609123190			Quality Control				Other Approval / Date (If Req'd)		

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods					Reaction Plan
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample		Control Method	
									Size	Freq.		
53	80	Final Audit	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Verify No Purchased Component Defects, Flash, Underfill, Plugged Holes, etc	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
54	80	Final Audit	Automated Assembly	Sub Assembly (7-37)			Verify Acceptable Bee Sting On Parts	Visual Parts / See Conforming Picture In Database	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
55	80	Final Audit	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)			Carton Identification / Proper Label	Visual Part To Picture	Each Label	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
56	90	Store In-House	Assembly Machine / Manual Assembly	Sub Assembly (7-28) (7-37) (Hand Assembly)	Transfer To Warehouse		Forklift Truck / Scanning System	WHI008	Each Carton	Each Skid	WHI008 Scanning From Plant To Warehouse	Notify Final Audit To Scan Product Into System
57	100	Automated Assembly	Assembly Machine Station #1	Final Assembly Step #1 (7-27)			Place Cover	Fiber Optice Eye Station #1	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
58	100	Automated Assembly	Assembly Machine Station #2	Final Assembly Step #2 (7-27)			Punch Cover Configuration	Vision System Station #3	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
59	100	Automated Assembly	Assembly Machine Station #3	Final Assembly Step #3 (7-27)			Verify Cover Punch Configuration	Vision System Station #3	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
60	100	Automated Assembly	Assembly Machine Station #4	Final Assembly Step #4 (7-27)			Laser Etch Part Number	Visual Inspection At Start Up / Train Computer	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
61	100	Automated Assembly	Assembly Machine Station #5	Final Assembly Step #5 (7-27)			Place Cover On Shell	Vision System Station #3	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
62	100	Automated Assembly	Assembly Machine Station #6	Final Assembly Step #6 (7-27)			Eject Good Part In Production Carton / Eject Bad Cover In Reject Bin	Vision System Station #3	Each Part	Each Assembly	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
63	100	Automated Assembly	Assembly Machine Station # 1	Final Assembly Step #1 (7-35)			Place Cover	Station #2 Fiber Optic Eye	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify System
64	100	Automated Assembly	Assembly Machine Station #2	Final Assembly Step #2 (7-35)			Verify Cover Presence / Correct Location / Verify Shell Cleared Off	Fiber Optic Eye	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify System
65	100	Automated Assembly	Assembly Machine Station #3	Final Assembly Step #3 (7-35)			Punch Cover From Top Down	Label Scanning / Vision System At Station #6	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify System

Control Plan

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<input type="checkbox"/> Pre-Launch	<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Assembly	<input type="checkbox"/> Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 3508A Part				Alice Lossie 269.668.3393					08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01		Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 34 W F SHELL (BLK)					Quality Engineering				Customer Quality Approval / Date (If Req'd)			
Supplier / Plant WDP			Supplier Code 609123190		Quality Control				Other Approval / Date (If Req'd)			

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods				Reaction Plan	
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample			Control Method
									Size	Freq.		
66	100	Automated Assembly	Assembly Machine Station #4	Final Assembly Step #4 (7-35)			Punch Cover From Bottom Up	Label Scanning / Vision System At Station #6	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify System
67	100	Automated Assembly	Assembly Machine Station #5	Final Assembly Step #5 (7-35)			Air Blow Off / Ionized No Static	Fiber Optic Eye Station #5	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify System
68	100	Automated Assembly	Assembly Machine Station #6	Final Assembly Step #6 (7-35)			Train Cover Punch / Verify Bent Pins & Chad	Vision System Camera Station #6	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
69	100	Automated Assembly	Assembly Machine Station #7	Final Assembly Step #7 (7-35)			Shell Placement / Grommet Color Verified	Fiber Optic Eyes / Vision System	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
70	100	Automated Assembly	Assembly Machine Station #8	Final Assembly Step #8 (7-35)			Cover Placement	Station #9 Vision System	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
71	100	Automated Assembly	Assembly Machine Station #9	Final Assembly Step #9 (7-35)			Verify Spacer Presences / Inspect Laser Print	Vision System Station #9	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
72	100	Automated Assembly	Assembly Machine Station #10	Final Assembly Step #10 (7-35)			Verify Shell Polarity / Bent Pins	Vision System Station #10	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
73	100	Automated Assembly	Assembly Machine Station #11	Final Assembly Step #11 (7-35)			Good Eject Chute	Vision Systems Stations 6,7,9,10	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
74	100	Automated Assembly	Assembly Machine Station #12	Final Assembly Step #12 (7-35)			Reject Eject Chute	Vision Systems Stations 6,7,9,10	Each Assembly	Each Cycle	Operator Instructions	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
75	110	100% Inspection Automated Assembly	Automated Assembly	Assembly (7-27) (7-35)			Verify No Missing Components & Proper Component Placement	Vision System Stations (7-27) #2 & 5, (7-35)#6,7,9,10	Each Assembly	Each Cycle	Verification Test Parts Beginning Of Each Shift	Reject Per QWI001 / Notify Supervisor / Re-Program / Re-Qualify Vision Syst
76	110	100% Inspection	Automated Assembly	Assembly (7-27) (7-35)			Verify No Damage/Issues To Cover Grill From Punch Press	Visual Inspection	3 Assemblies	Every Hour	MWI000-F004	Fix Punch / Notify Quality
77	120	First / Last Piece Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			All Control Plan In-Process Inspection steps listed	See steps listed	2 Parts	At start up	QWI010 First / Last Article	Reject Per QWI001 / Notify Supervisor / Adjust Process
78	120	First / Last Piece Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify Production Labels First & Return To Operator	Visually Verify Correct Labels / Manually Return Labels	All Labels At Point Of Use	First Article	QWI010 First / Last Article - QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
79	130	In-Process Inspection	Automated Assembly	Assembly (7-27) (7-35)			Verify Part Matches Picture In Upper Right Hand Corner	Visual Part To Picture	5 Parts	At start up / Every 4 Hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process

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<input type="checkbox"/> Pre-Launch	<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Assembly	<input type="checkbox"/> Safe Launch	Key Contact / Phone					Date (Orig.)		Date (Rev.)	
Job Number 3508A Part				Alice Lossie 269.668.3393					08/17/2007		04/16/2020	
Part Number 600x3508x01x/80043508		Rev. BX3/A18	Engineering Number 3508-01		Rev. BX3/A18	Core Team A. Lossie, D. Switzer, J. Hendrixson, M. Davidson, B. Rosales				Customer Engineering Approval / Date (If Req'd)		
Part Name / Description 34 W F SHELL (BLK)						Quality Engineering				Customer Quality Approval / Date (If Req'd)		
Supplier / Plant WDP			Supplier Code 609123190			Quality Control				Other Approval / Date (If Req'd)		

Step No.	Process No.	Process Name Operation / Description	Machine, Device, Jig, or Tool for Manufacturing	Characteristics		Special Char. Class.	Methods				Reaction Plan	
				Product	Process		Product/Process Specification/ Tolerance	Evaluation Measurement Technique	Sample			Control Method
									Size	Freq.		
80	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify Correct Pin Configuration / Pass/Fail	FW0127 Fixture Template Instructions / Measuring Guide	2 Covers	At start up / Every 4 Hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
81	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify Correct Laser Part Number On Cover	Visually Verify Correct Letters & Numbers	2 Parts	At start up / Every 4 Hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
82	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Supervisor Must Approve Cover First Articles	Supervisors Sign Off On First Article Tag		When First Article Is Issued	QWI026 In-Process Inspection	Get Supervisor Approval
83	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Proper assembly	Visual	5 Parts	At start up / Every 4 Hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
84	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Review Machine Table For Any Plastic Chips	Visually Review Machine Table		Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
85	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify No Molding Defects, underfill, flash, burn, warp, etc.	Visual Parts From Assembly Hoppers	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
86	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify No Ejector Pin Flash On Inside Of Covers	Visual Covers / Measuring Guide - Ejector Pin Guide	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
87	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify No Purchased Component Defects, Tears, Voids, Etc..	Visual Parts From Assembly Hoppers	5 Parts	Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
88	130	In-Process Inspection	Automated Assembly	Final Assembly (7-35)			Verify Operators Are Completing Cover Check Form MWI000-F-004	Visual Log Sheet Completed		Every 4 hours	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
89	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify Operators Are Following Instructions & Aware Of Any Alerts	Verbally Verify With Operator	Each Operator	At start up / Once A Shift	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
90	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify Proper Labels	Visual	All Labels At Point Of Use	At start up / Once A Shift	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
91	130	In-Process Inspection	Automated Assembly	Final Assembly (7-27) (7-35)			Verify Check Head Verifications Are Completed & Documented	Visual Verification Log / Look For No Failures		Beginning of each shift equipment is used	QWI026 In-Process Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process
92	140	Manufacturing Packaging Verification	Assembly Machine	Final Assembly (7-27) (7-35)			Carton Identification / Proper Label	Visual	Each Label	Each Carton	MWI004 Label ID & Use	Reject Per QWI001 / Notify Supervisor / Re-Print Labels
93	150	Final Audit	Assembly Machine	Final Assembly (7-27) (7-35)			Proper assembly / Final Audit Graphics	Visual Parts From Top, Middle & Bottom Of Carton	10 Parts	Each Carton	QWI016 Final Audit Inspection	Reject Per QWI001 / Notify Supervisor / Adjust Process

This assembly is processed on automated assembly equipment. The process includes the use of machine vision which verifies each step of the assembly process. The equipment is verified each shift to ensure it's continues to detect any defects. Because of the nature of the process we do not have a CPK or Gage study for this assembly.

Dimensional Layout Inspection Report

W-No. **W-3508**
 Part No. **See below**
 Part Name **34-Way Female Hybrid Assembly**

Run Date **03/13/20**
 Print No. **FU5T-14A464-AVB**
 Revision / Date **BX3 (AELE-E-12035198-512) 4/14/20**

Material **See list of parts**
 Insp. Date **04/28/20**
 Insp. By **GH**

					Sample Number									
Dim.	Specification	Tol. ±	Lo Lim	Hi Lim	1	2	3	4	5					
FU5T-14A464-AVB, 60013508A01B (Sealed)														
1	(84.0)	---	0.00	999.00	84.06	84.01	84.10	83.89	84.11					
2	(68.0)	---	0.00	999.00	68.01	67.97	68.04	67.99	68.04					
3	(53.5)	---	0.00	999.00	53.28	53.40	53.42	53.30	53.38					
4	(50.7)	---	0.00	999.00	50.76	50.79	50.66	50.69	50.69					
5	(R42.1)	---	0.00	999.00	42.17	42.03	42.16	42.06	42.16					
6	(61.5)	---	0.00	999.00	61.36	61.50	61.48	61.36	61.41					
7	Material ID Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
8	R0.3 Max	---	0.00	0.30	0.30	0.30	0.30	0.30	0.30					
9	R0.5	0.3	0.20	0.80	0.50	0.50	0.50	0.50	0.50					
10	Parts to be free of...Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
FU5T-14A464-AUB, 60013508B01B (Sealed)														
1	(84.0)	---	0.00	999.00	83.90	83.84	83.82	83.83	83.89					
2	(68.0)	---	0.00	999.00	68.09	67.98	68.05	68.09	68.00					
3	(53.5)	---	0.00	999.00	53.32	53.32	53.46	53.49	53.45					
4	(50.7)	---	0.00	999.00	50.71	50.71	50.70	50.71	50.71					
5	(R42.1)	---	0.00	999.00	42.05	42.03	42.02	42.02	42.01					
6	(61.5)	---	0.00	999.00	61.21	61.22	61.21	61.23	61.21					
7	Material ID Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
8	R0.3 Max	---	0.00	0.30	0.30	0.30	0.30	0.30	0.30					
9	R0.5	0.3	0.20	0.80	0.50	0.50	0.50	0.50	0.50					
10	Parts to be free of...Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
FU5T-14A464-YB, 60013508C01B (Sealed)														
1	(84.0)	---	0.00	999.00	83.81	83.87	83.88	83.90	83.84					
2	(68.0)	---	0.00	999.00	68.00	68.01	68.07	68.05	68.06					
3	(53.5)	---	0.00	999.00	53.31	53.32	53.34	53.34	53.29					
4	(50.7)	---	0.00	999.00	50.72	50.71	50.72	50.64	50.64					
5	(R42.1)	---	0.00	999.00	42.03	42.03	42.05	42.06	42.07					
6	(61.5)	---	0.00	999.00	61.22	61.29	61.28	61.21	61.23					
7	Material ID Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
8	R0.3 Max	---	0.00	0.30	0.30	0.30	0.30	0.30	0.30					
9	R0.5	0.3	0.20	0.80	0.50	0.50	0.50	0.50	0.50					
10	Parts to be free of...Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					

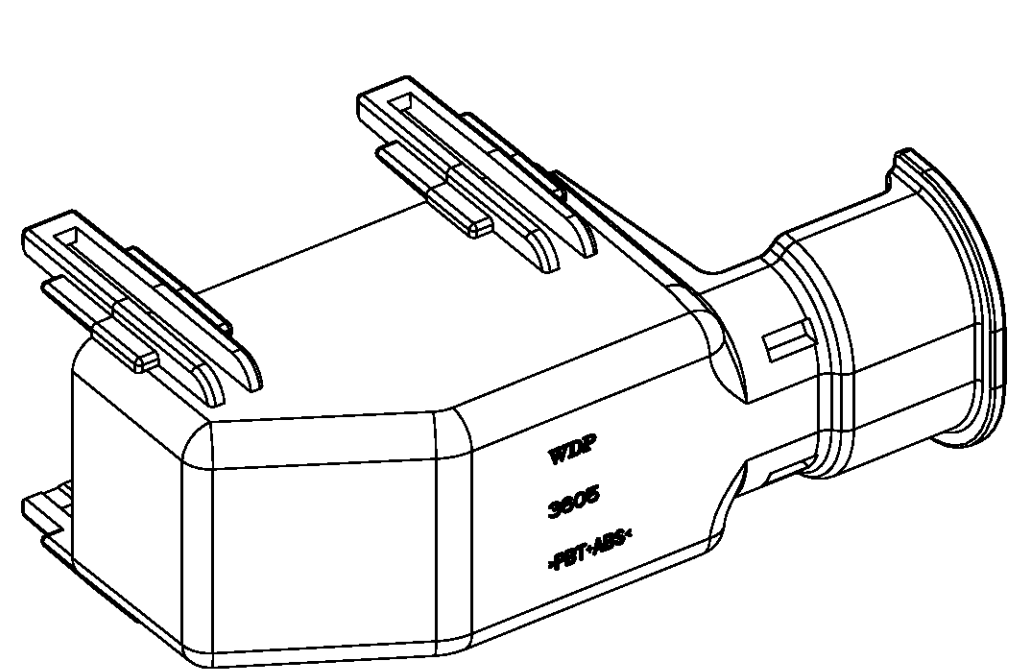
Dimensional Layout Inspection Report

W-No. **W-3508**
 Part No. **See below**
 Part Name **34-Way Female Hybrid Assembly**

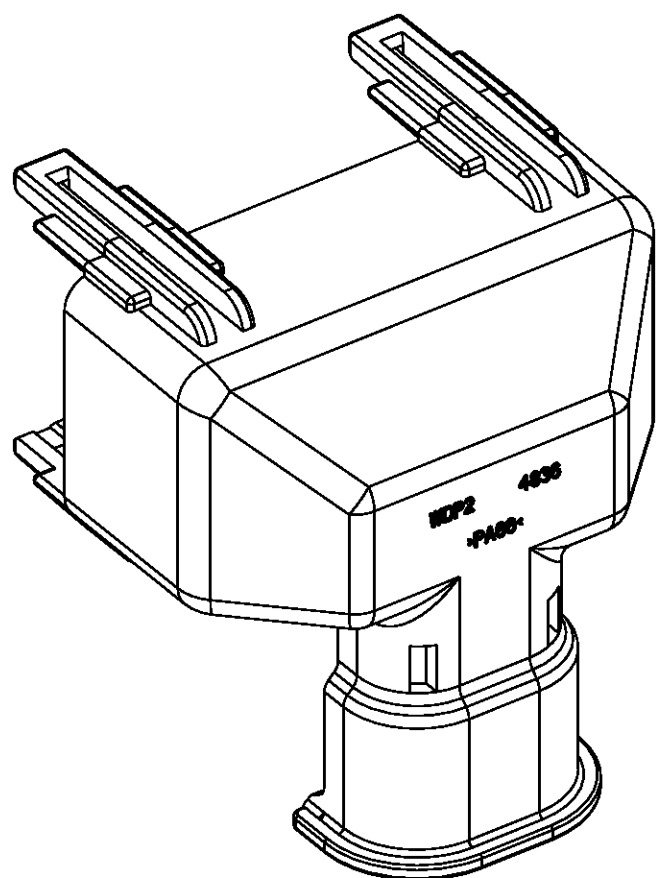
Run Date **03/13/20**
 Print No. **FU5T-14A464-AVB**
 Revision / Date **BX3 (AELE-E-12035198-512) 4/14/20**

Material **See list of parts**
 Insp. Date **04/28/20**
 Insp. By **GH**

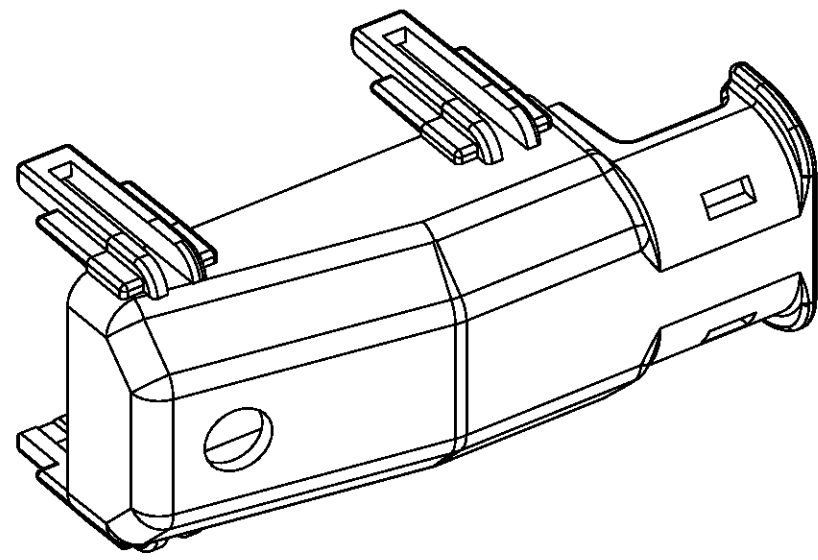
					Sample Number									
Dim.	Specification	Tol. ±	Lo Lim	Hi Lim	1	2	3	4	5					
HU5T-14A464-CA, 60013508D01A (Sealed)														
1	(84.0)	---	0.00	999.00	83.81	83.82	83.81	83.84	83.86					
2	(68.0)	---	0.00	999.00	68.08	68.08	68.10	68.07	68.07					
3	(53.5)	---	0.00	999.00	53.26	53.29	53.26	53.25	53.27					
4	(50.7)	---	0.00	999.00	50.78	50.78	50.77	50.72	50.80					
5	(R42.1)	---	0.00	999.00	41.89	41.95	41.92	41.93	41.93					
6	(61.5)	---	0.00	999.00	61.26	61.27	61.30	61.32	61.26					
7	Material ID Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
8	R0.3 Max	---	0.00	0.30	0.30	0.30	0.30	0.30	0.30					
9	R0.5	0.3	0.20	0.80	0.50	0.50	0.50	0.50	0.50					
10	Parts to be free of...Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
AU5T-14489-AE, 60023508A01E (Unsealed)														
1	(84.0)	---	0.00	999.00	83.85	83.86	83.81	83.81	83.83					
2	(68.0)	---	0.00	999.00	68.11	68.05	68.06	68.11	68.11					
3	(53.5)	---	0.00	999.00	53.22	53.26	53.20	53.21	53.22					
4	(50.7)	---	0.00	999.00	50.83	50.73	50.83	50.82	50.71					
5	(R42.1)	---	0.00	999.00	42.02	42.02	41.99	41.98	42.03					
6	(61.5)	---	0.00	999.00	61.26	61.20	61.24	61.27	61.22					
7	Material ID Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
8	R0.3 Max	---	0.00	0.30	0.30	0.30	0.30	0.30	0.30					
9	R0.5	0.3	0.20	0.80	0.50	0.50	0.50	0.50	0.50					
10	Parts to be free of...Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
AU5T-14489-BE, 60023508B01E (Unsealed)														
1	(84.0)	---	0.00	999.00	83.89	83.82	83.86	83.87	83.85					
2	(68.0)	---	0.00	999.00	67.98	67.95	67.98	67.95	68.06					
3	(53.5)	---	0.00	999.00	53.24	53.22	53.23	53.22	53.22					
4	(50.7)	---	0.00	999.00	50.63	50.61	50.61	50.71	50.67					
5	(R42.1)	---	0.00	999.00	42.05	42.02	42.06	42.02	42.06					
6	(61.5)	---	0.00	999.00	61.27	61.24	61.23	61.22	61.21					
7	Material ID Note	---	---	---	Conforms	Conforms	Conforms	Conforms	Conforms					
8	R0.3 Max	---	0.00	0.30	0.30	0.30	0.30	0.30	0.30					
9	R0.5	0.3	0.20	0.80	0.50	0.50	0.50	0.50	0.50					



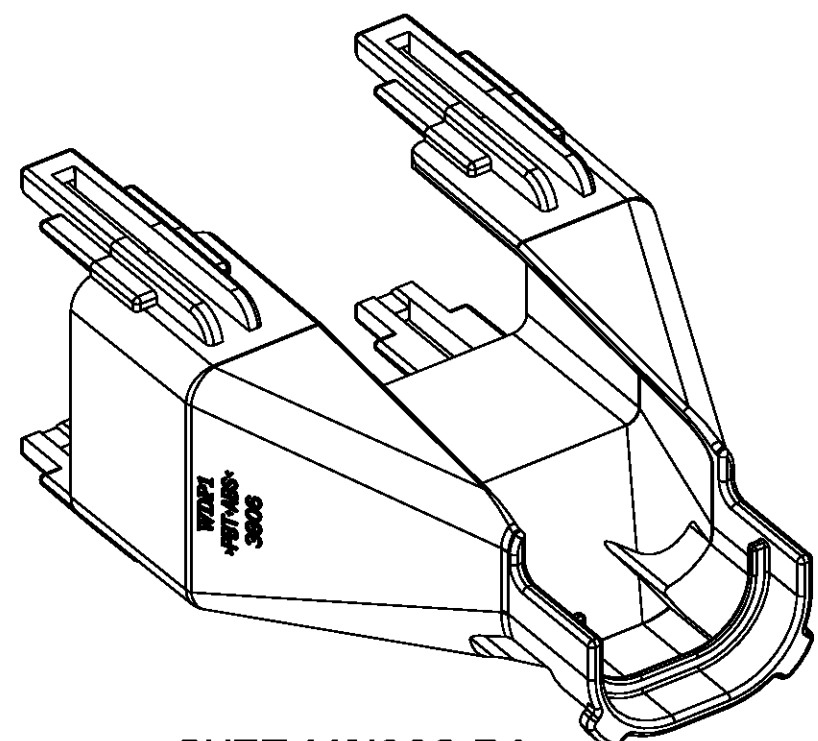
9U5T-14N003-KA
OPTIONAL WIRE DRESS
FOR REFERENCE ONLY



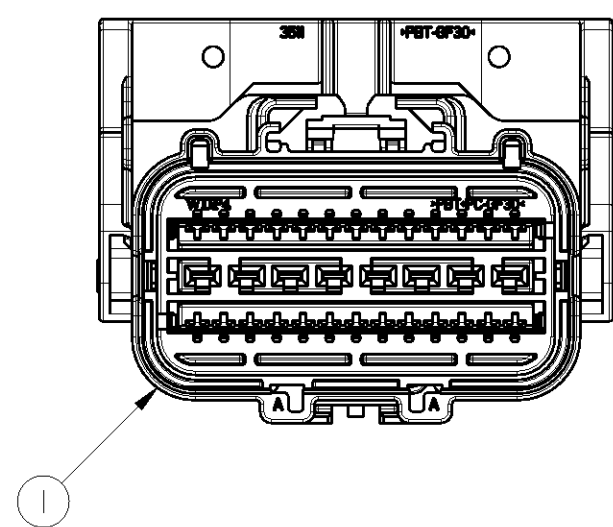
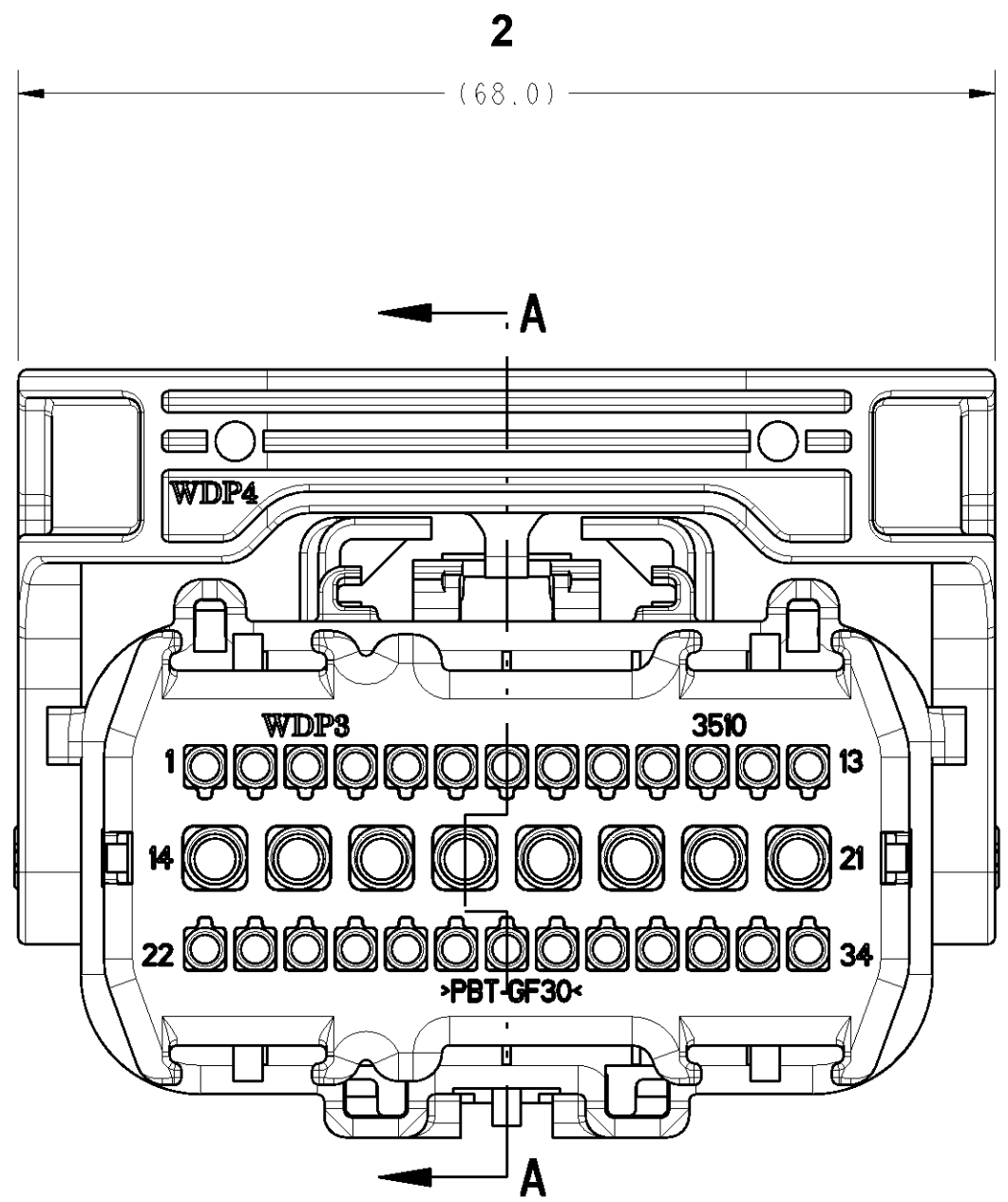
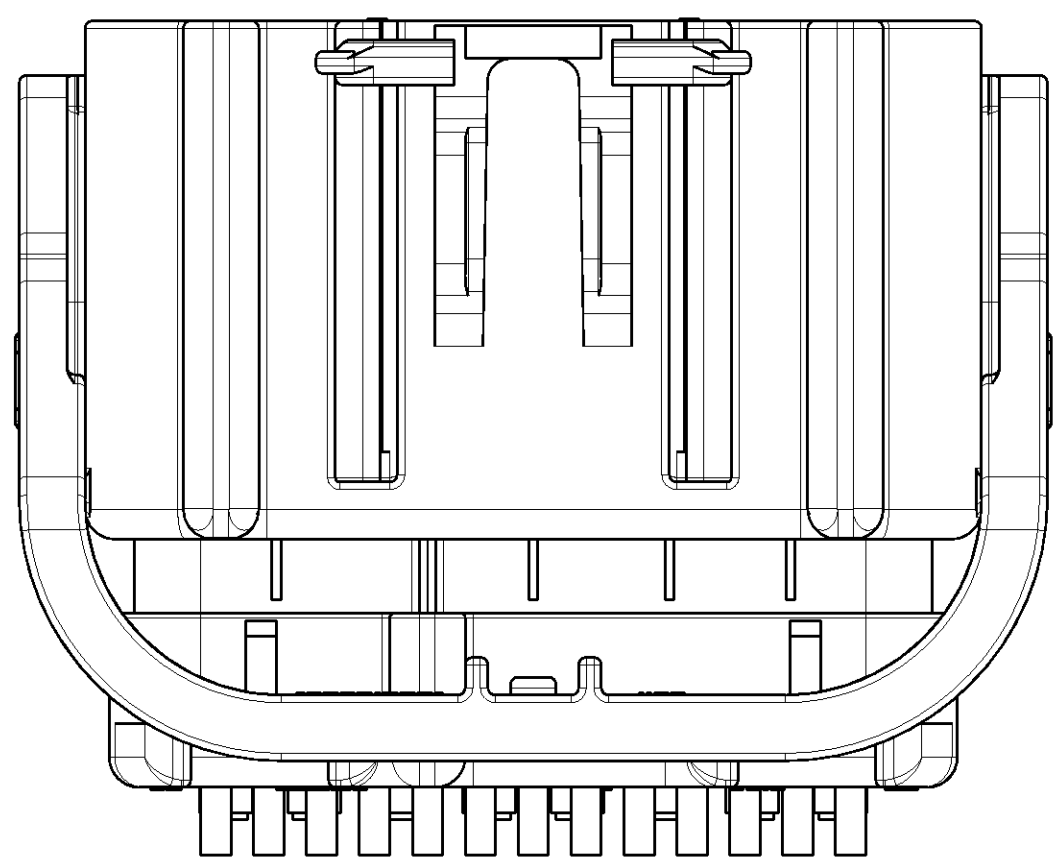
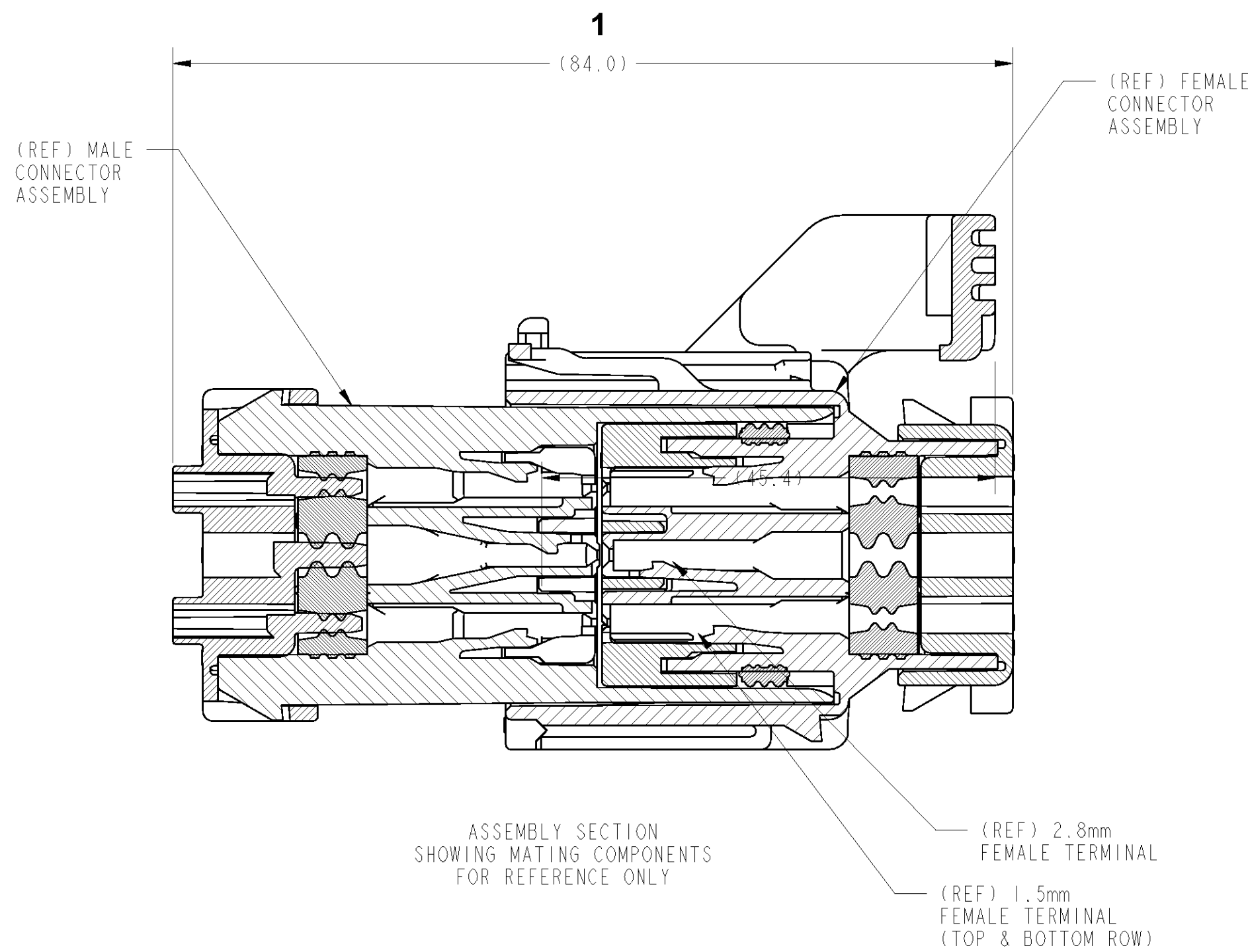
GU5T-14N003-FA
OPTIONAL WIRE DRESS
FOR REFERENCE ONLY



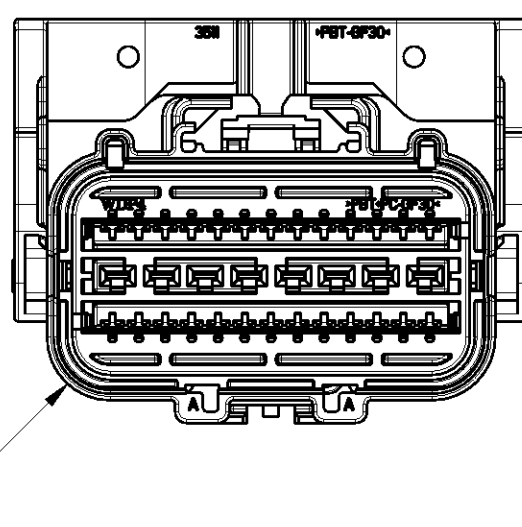
CU5T-14N003-GA
OPTIONAL WIRE DRESS
FOR REFERENCE ONLY



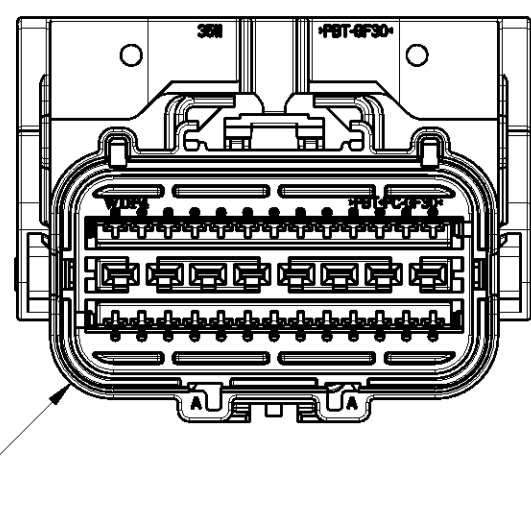
GU5T-14N003-DA
OPTIONAL WIRE DRESS
FOR REFERENCE ONLY



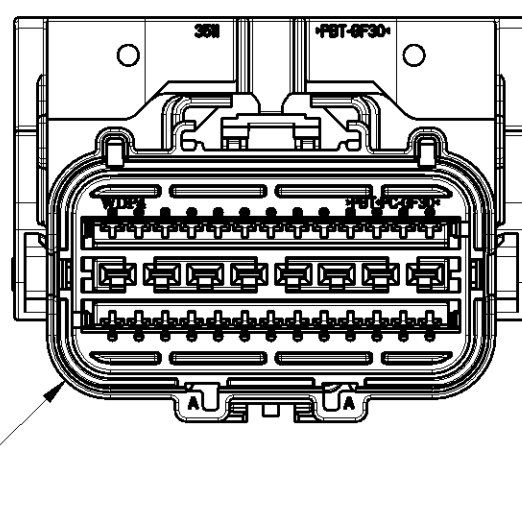
"A" POLARIZATION



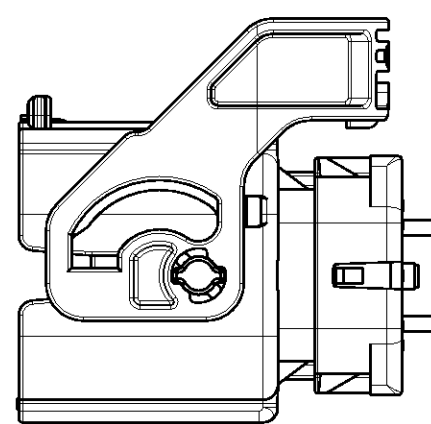
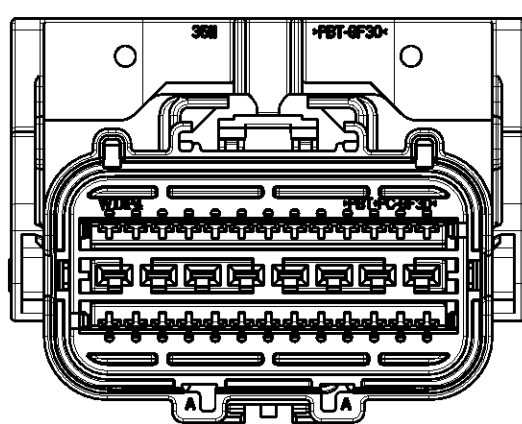
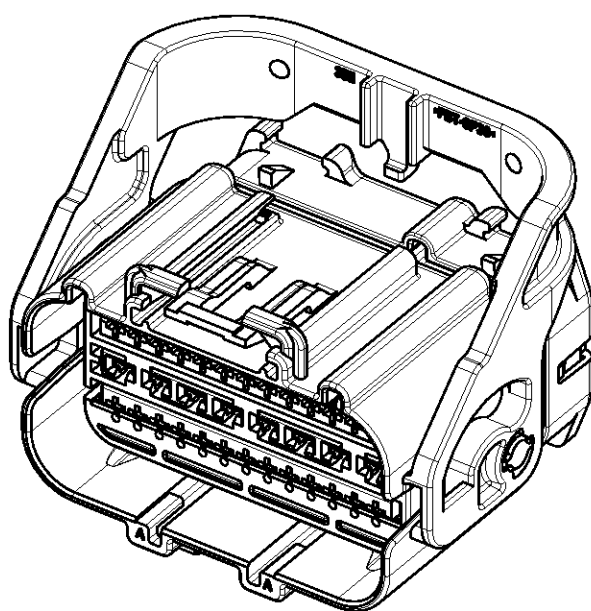
"B" POLARIZATION



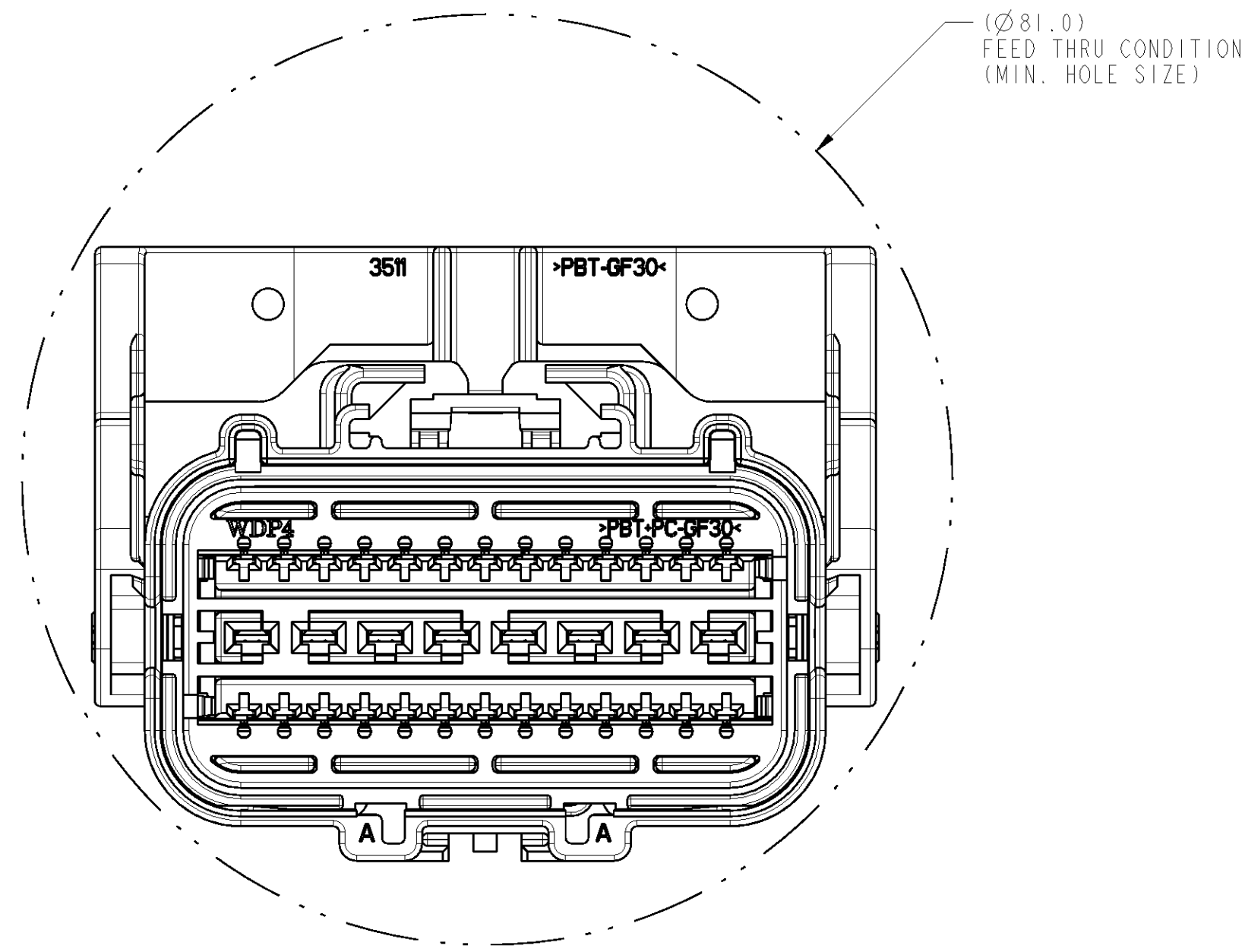
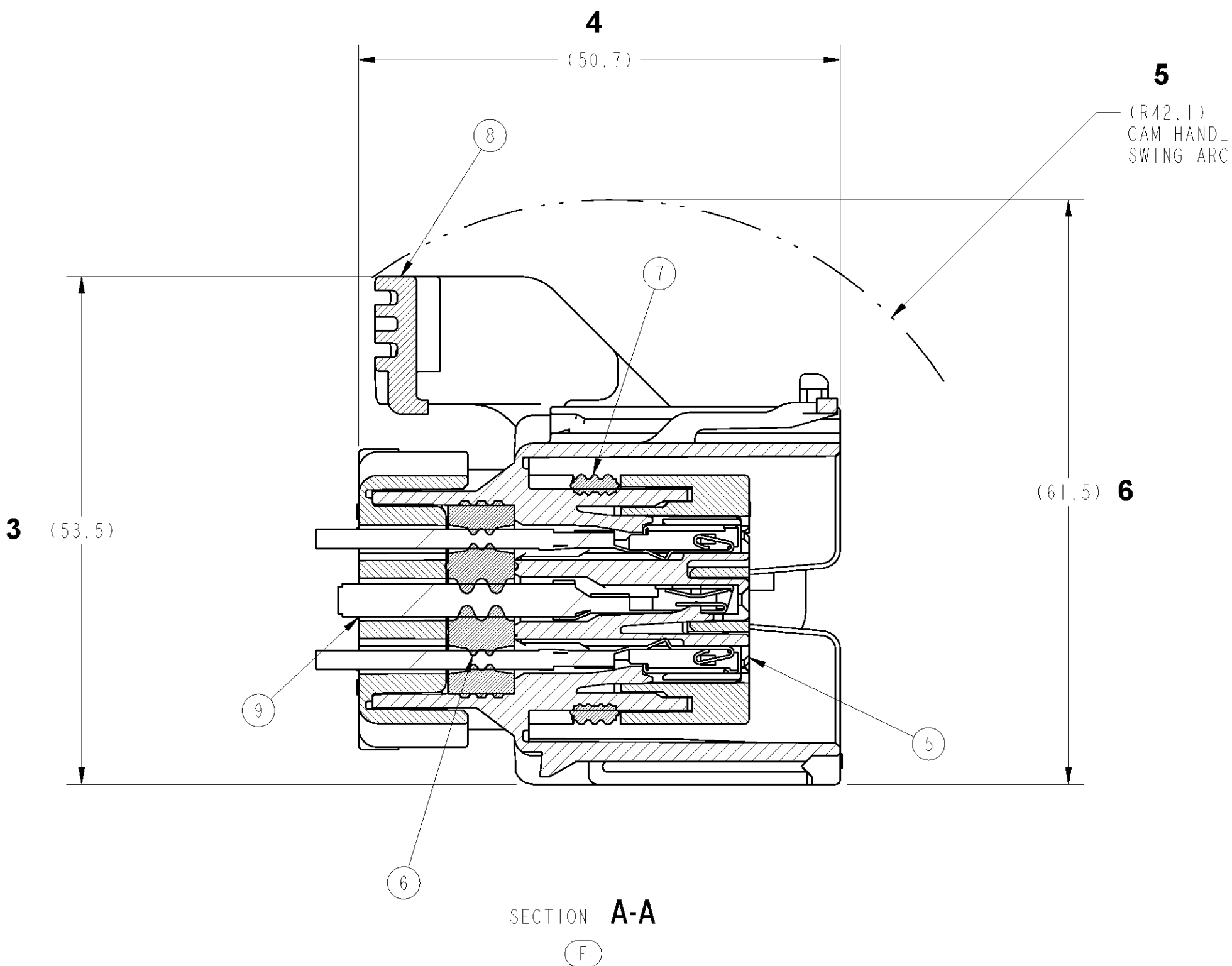
"C" POLARIZATION



"D" POLARIZATION



FULL SIZE VIEWS



- NOTES: UNLESS OTHERWISE SPECIFIED
- PART MUST CONFORM TO THE ELECTRICAL CONNECTION DESIGN SPECIFICATION (SDS), (REV. 14/26-MAR-07) WITH THE FOLLOWING EXCEPTIONS:
SAL/USCAR-2, 5.4, 8 GROMMET COVER WIRE DRESS FEATURES DISTORTED
EL-0172 #4 CONNECTOR PRE-LOCK INSERTION FORCE = 12 N MAX
- PART MUST CONFORM TO THE LATEST LEVEL OF USCAR REFERENCED IN THE SDS.
- MAXIMUM INSERTION FORCE FULLY POPULATED WITH TIN TERMINALS = 70 N.
- 7 ALL PLASTIC PARTS MUST HAVE MATERIAL IDENTIFICATION SYMBOLS CLEARLY MARKED, WHEREVER PACKAGE SIZE PERMITS.
- FOR ENGINEERING APPROVED SOURCE, SEE ENGINEERING RELEASE.
- GENERAL TOLERANCE:
±0.3 ALL ONE PLACE DIMENSIONS
±0.10 ALL TWO PLACE DIMENSIONS
±1°00' ALL ANGULAR DIMENSIONS
- FEED THROUGH CONDITION (I.E. MIN HOLE SIZE) TO GIVE 2MM TOTAL CLEARANCE ACROSS THE MAXIMUM DIAMETER.
- 8 0.3mm MAXIMUM RADIUS PERMISSIBLE ON EDGES SHOWN AS SHARP
- 9 ALL RADIUS R0.5.
- 10 PARTS ARE TO BE FREE OF SCRATCHES, DISCOLORATION, SALT RESIDUE OR OTHER IMPERFECTIONS THAT MAY AFFECT FUNCTION OR FIT OF PART.
- DRAWING CONFORMS TO AYP-(T404/T406)-001 REVISION C DATED 8-8-03.

WDP RECEIVED
By Mike Davidson at 3:11 pm, Apr 15, 2020

TEMPERATURE RANGE -40°C TO 125°C (CLASS #3)				FORD ASSEMBLY NUMBER		WDP ASSEMBLY NUMBER		FORD MATING COMPONENT		WDP MATING COMPONENT	
ITEM	DESCRIPTION	COLOR	WDP COMPONENT PART NUMBER	MATERIAL I.D. SYMBOL	NUMBER OF ITEMS REQUIRED	1	2	3	4	5	6
1	HOUSING (A POL.)	BLACK	3508A-00-001	>PBT-GF30<	1						
2	HOUSING (B POL.)	GRAY	3508B-00-001	>PBT-GF30<	1						
3	HOUSING (C POL.)	BROWN	3508C-00-001	>PBT-GF30<	1						
4	HOUSING (D POL.)	GREEN	3508D-00-001	>PBT-GF30<	1						
5	SPACER	NATURAL	3509-00-001	>PBT+PC-GF30<	1	1	1	1	1	1	1
6	GROMMET	GREEN	3508-SI-002	>VMO<	1	1	1	1	1	1	1
7	INTERFACIAL SEAL	GREEN	3508-50-001	>VMO<	1	1	1	1	1	1	1
8	CAM	GRAY	3511A-00-001	>PBT-GF30<	1	1	1	1	1	1	1
9	GROMMET COVER	GRAY	3510B-00-001	>PBT-GF30<	1	1	1	1	1	1	1

UNSEALED	B	60023508B01E	AU5T-14489-BE
UNSEALED	A	60023508A01E	AU5T-14489-AE
SEALED	D	60013508D01A	HU5T-14A464-CA
SEALED	C	60013508C01B	FU5T-14A464-YB
SEALED	B	60013508B01B	FU5T-14A464-AUB
SEALED	A	60013508A01B	FU5T-14A464-AVB
SEALING	POLARIZATION	WDP ASSEMBLY NO.	FORD ASSEMBLY NO.

WDP
Western Diversified Plastics
Phone: (269) 668-3393

REFERENCE

PART MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT.

DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 28.1

3RD ANGLE PROJ. DIMENSIONS ARE IN MILLIMETERS

CAD TYPE	CAD LOC.	CAD FILE	DTMC
X-PROE	TCE		IS MASTER

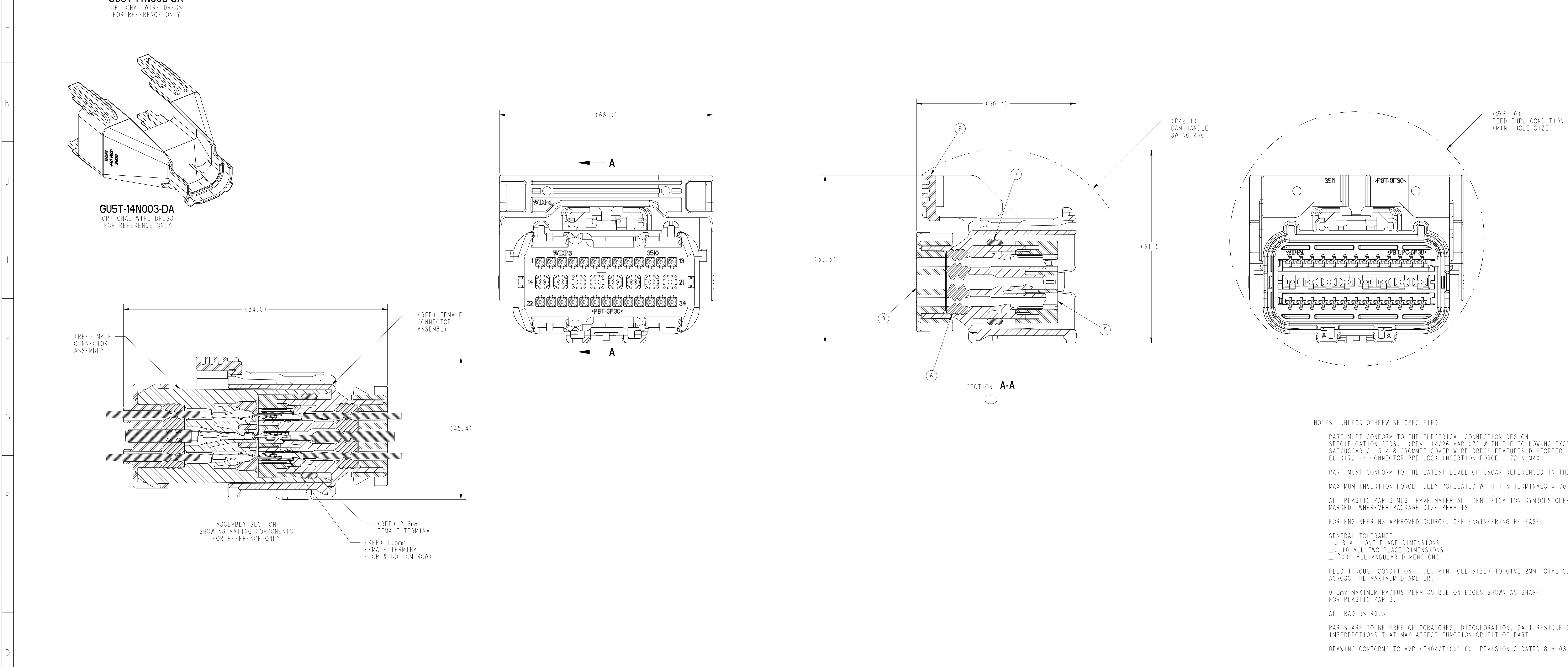
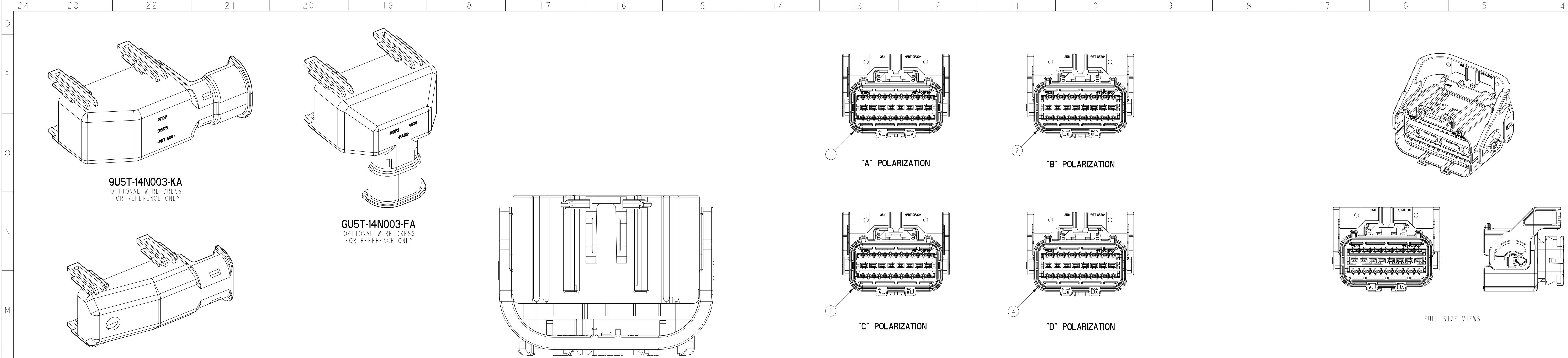
OPER. NO.	UNIT	DRAWING	FU5T-14A464-AVB
DESIGN	DETAIL	TITLE	SLV ASY WIR CONN FEM
CHECKED	SAFETY		
ENSING			
SCALE	DATE	DIVISION	
2:1	20130114	PLANT	

FORD MOTOR COMPANY

Layout Rev Level

Note: Print revisions after current layout were part number related. Does not effect dimensional data.

Note: This print shows the location of the ballooned dimensions.



APPLICABLE COMPONENTS						
ITEM	DESCRIPTION	MANDATORY (YES/NO)	TERMINAL CAVITY MIN/MAX OD	PLATING / MATERIAL	FORD COMPONENT PART NO.	SUPPLIER COMPONENT PART NO.
1	B541 MOLEX 1.5mm FEMALE TERMINAL	NO	1.20/2.34	N/A	N/A	N/A
2	B970 DELPHI 2.8mm FEMALE TERMINAL	NO	1.90/4.20	N/A	N/A	N/A
3	WIRE DRESS (LEFT OR RIGHT ROUTE)	NO	N/A	>PBT+ABS<	9U5T-14N003-KA	6001360502A
4	WIRE DRESS (LEFT OR RIGHT ROUTE)	NO	N/A	>PBT+ABS<	CU5T-14N003-GA	6001401802A
5	WIRE DRESS (STRAIT ROUTE)	NO	N/A	>PBT+ABS<	GU5T-14N003-DA	6001380602A
6	WIRE DRESS (UP OR DOWN ROUTE)	NO	N/A	>PA66<	GU5T-14N003-FA	6001483602A

LIST OF PARTS						
TEMPERATURE RANGE -40°C TO 125°C (CLASS #3)						
ITEM	DESCRIPTION	COLOR	WDP COMPONENT PART NUMBER	MATERIAL I.D. SYMBOL	NUMBER OF ITEMS REQUIRED	
1	HOUSING (A POL.)	BLACK	3508A-00-001	>PBT-GF30<	1	1
2	HOUSING (B POL.)	GRAY	3508B-00-001	>PBT-GF30<	1	1
3	HOUSING (C POL.)	BROWN	3508C-00-001	>PBT-GF30<	1	1
4	HOUSING (D POL.)	GREEN	3508D-00-001	>PBT-GF30<	1	1
5	SPACER	NATURAL	3509-00-001	>PBT+PC-GF30<	1	1
6	GROMMET	GREEN	3508-51-002	>VMO<	1	1
7	INTERFACIAL SEAL	GREEN	3508-50-001	>VMO<	1	1
8	CAM	GRAY	3511A-00-001	>PBT-GF30<	1	1
9	GROMMET COVER	GRAY	3510B-00-001	>PBT-GF30<	1	1

FORD ASSEMBLY NUMBER	WDP ASSEMBLY NUMBER	FORD MATING COMPONENT	WDP MATING COMPONENT
FU5T-14A464-AVB	60013508A01B	FU5T-14A624-C*	60013512A01*
FU5T-14A464-AUB	60013508B01B	FU5T-14A624-D*	60013512B01*
FU5T-14A464-YB	60013508C01B	FU5T-14A624-B*	60013512C01*
HU5T-14A464-CA	60013508D01A	HU5T-14A624-A*	60013512D01*
AU5T-14489-AE	60023508A01E	AU5T-14A459-A*	60023512A01*
AU5T-14489-BE	60023508B01E	AU5T-14A459-B*	60023512B01*

UNSEALED	B	60023508B01E	AU5T-14489-BE
UNSEALED	A	60023508A01E	AU5T-14489-AE
SEALED	D	60013508D01A	HU5T-14A464-CA
SEALED	C	60013508C01B	FU5T-14A464-YB
SEALED	B	60013508B01B	FU5T-14A464-AUB
SEALED	A	60013508A01B	FU5T-14A464-AVB
SEALING	POLARIZATION	WDP ASSEMBLY NO.	FORD ASSEMBLY NO.

LTBS

REVISIONS

ORIGINATOR	CHECKER	ENGR APP	MAT'L APP
RELEASED	AELE E 12035198 231	20130118	
S.FINSTRM	S.ENSING	MSALANTA	WDP
REDRAWN AFTER REVISION BN2			
BP1 ADDED FUST-14A464-AVB (D45 THRU D63)	AELE E 12035198 482	20190115	
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON
BR1 ADDED FUST-14A464-AVB (D64 THRU D88)			
BR2 ADDED FUST-14A464-YB (D83 THRU D85)	BR3 ADDED FUST-14A464-AUB (D48 THRU D49)	AELE E 12035198 491	20190328
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON
BS1 ADDED FUST-14A464-AVB (D89 THRU D98)			
BS2 ADDED FUST-14A464-AUB (D50 THRU D51)	BS3 ADDED HUST-14A464-CA (D08)	AELE E 12035198 494	20190508
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON
BT1 ADDED FUST-14A464-AVB (E09 THRU E23)			
AELE E 12035198 497	20190702		
R.KLINSKE	S.FINSTRM	KLAZARI	M.DAVIDSON
BU1 ADDED FUST-14A464-AVB (E24 THRU E49)			
BU2 ADDED FUST-14A464-YB (D86 THRU D89)	AELE E 12035198 504	20190819	
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON
BV1 ADDED FUST-14A464-AVB (E50 THRU E70)			
AELE E 12035198 505	20190927		
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON
BW1 ADDED FUST-14A464-AVB (E71 THRU E96)			
BW2 ADDED FUST-14A464-AUB (D52)	BW3 ADDED HUST-14A464-CA (D09)	BW4 UPDATED FORMAT ON APPLICABLE COMPONENTS CHART	AELE E 12035198 506
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON
BX1 ADDED FUST-14A464-AVB (E97 THRU F85)			
BX2 ADDED FUST-14A464-AUB (D53)	BX3 ADDED FUST-14A464-YB (D90)	AELE E 12035198 512	20200520
B.BURNETTE	S.FINSTRM	KLAZARI	M.DAVIDSON

WDP RECEIVED

By Mike Davidson at 1:40 pm, May 21, 2020

REFERENCE

PART MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT

DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 28.1

CAD TYPE X-PROE

CAD LOC. TCE

CAD FILE

DTMC IS MASTER

OPER. NO.

UNIT

DRAWING FU5T-14A464-AVB

SHT 1 OF 10

DESIGN FINSTRM

CHECKED ENSING

SCALE 2:1

DETAIL FINSTRM

SAFETY

DATE 20130114

DIVISION PLANT

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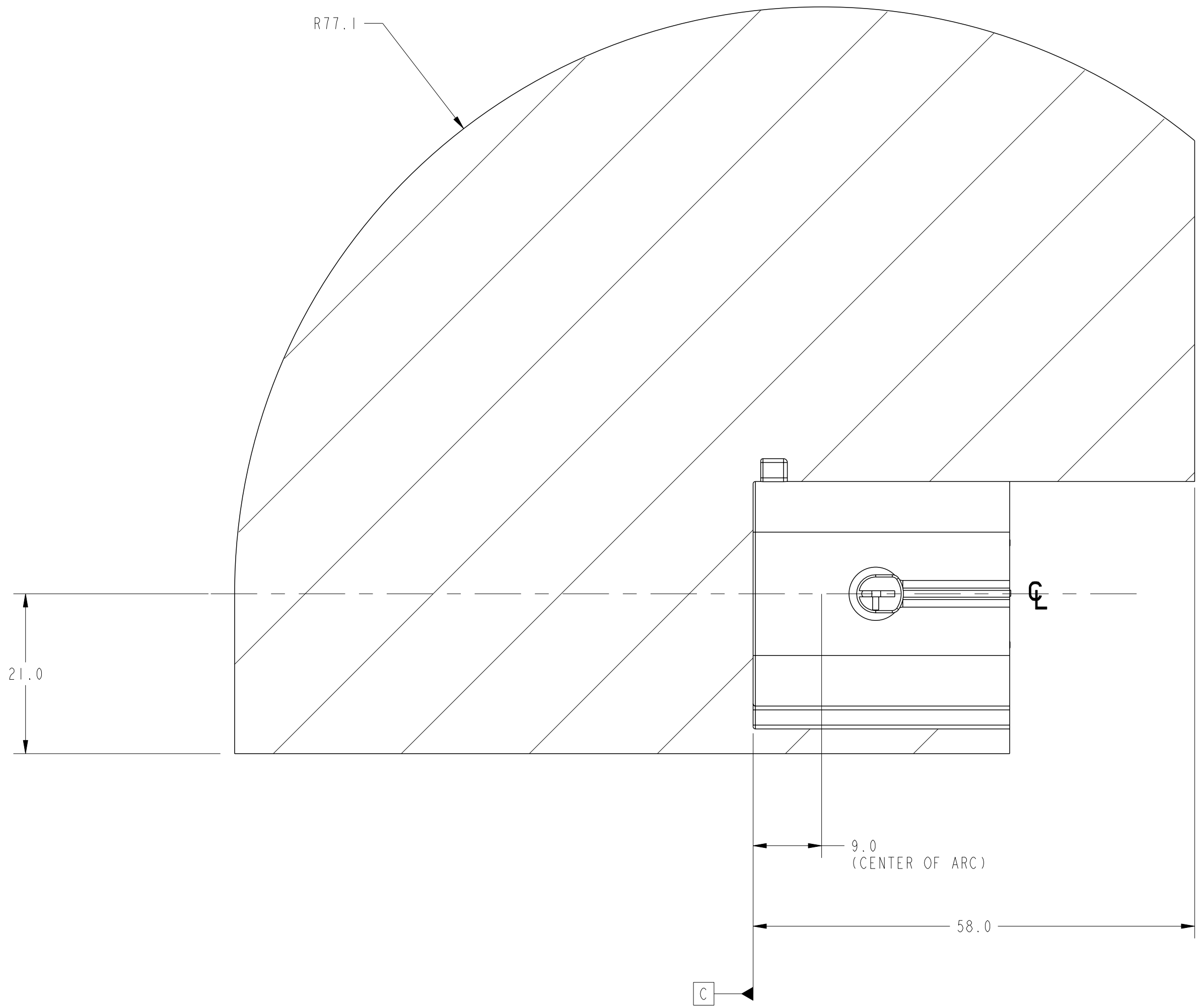
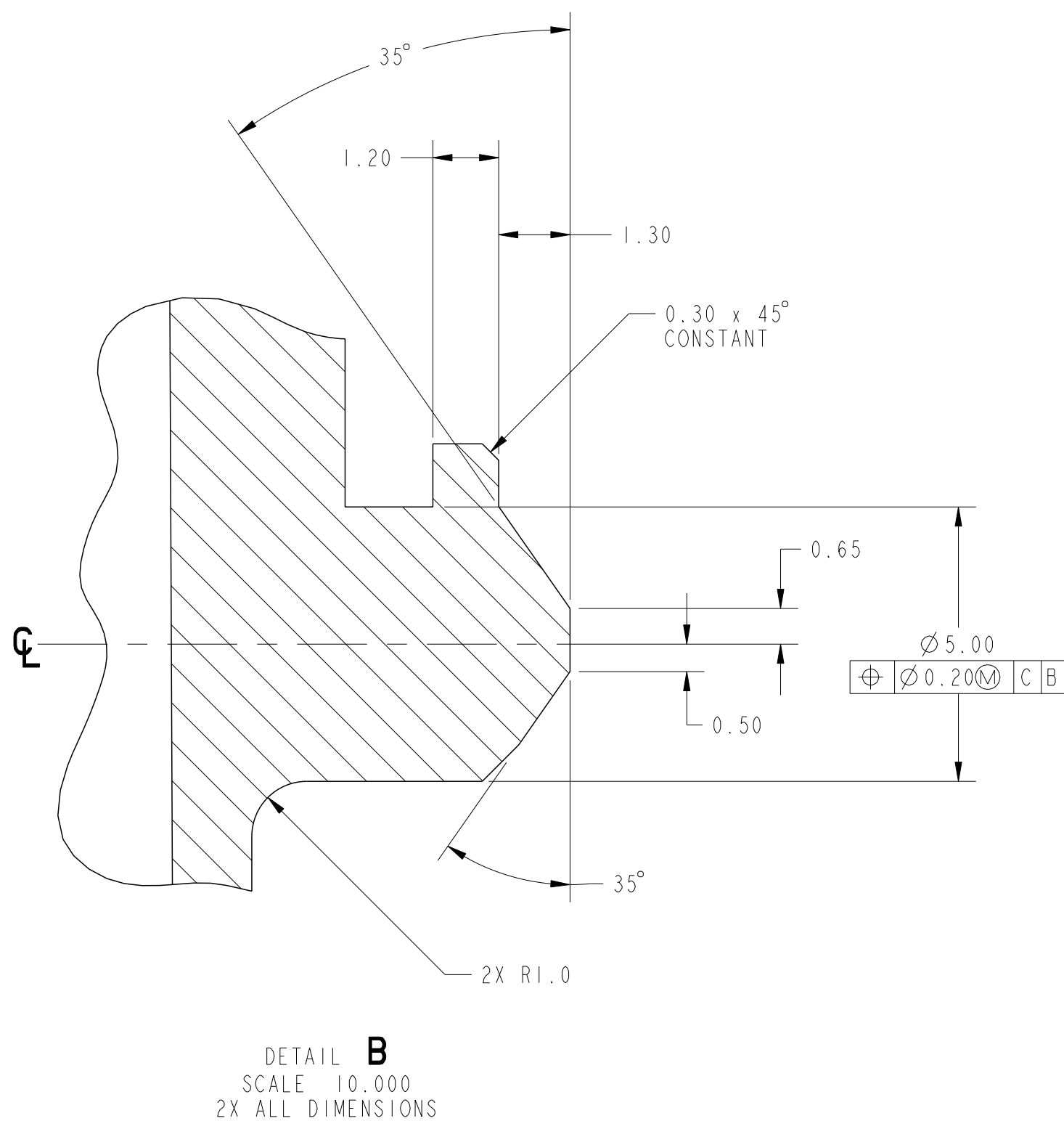
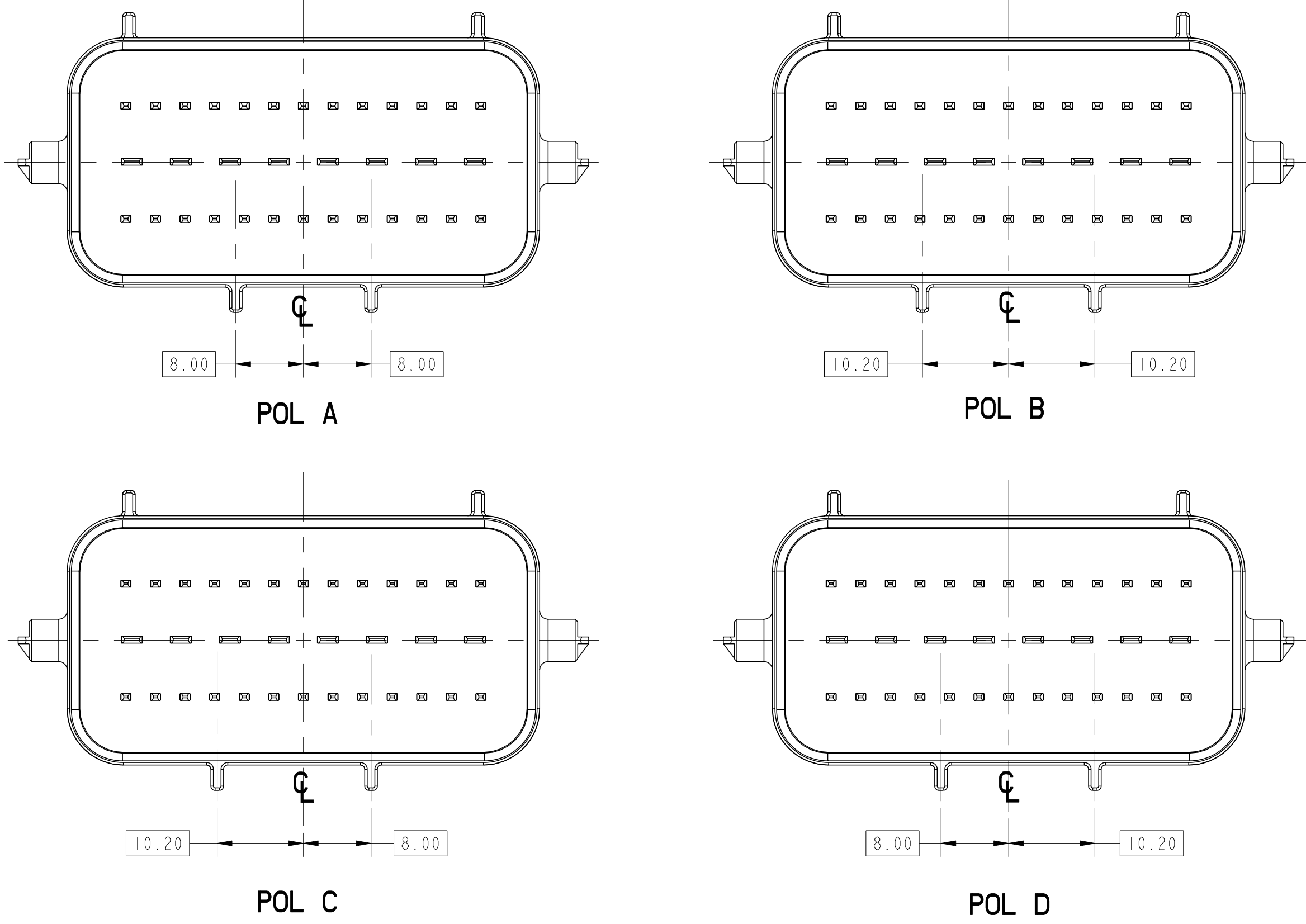
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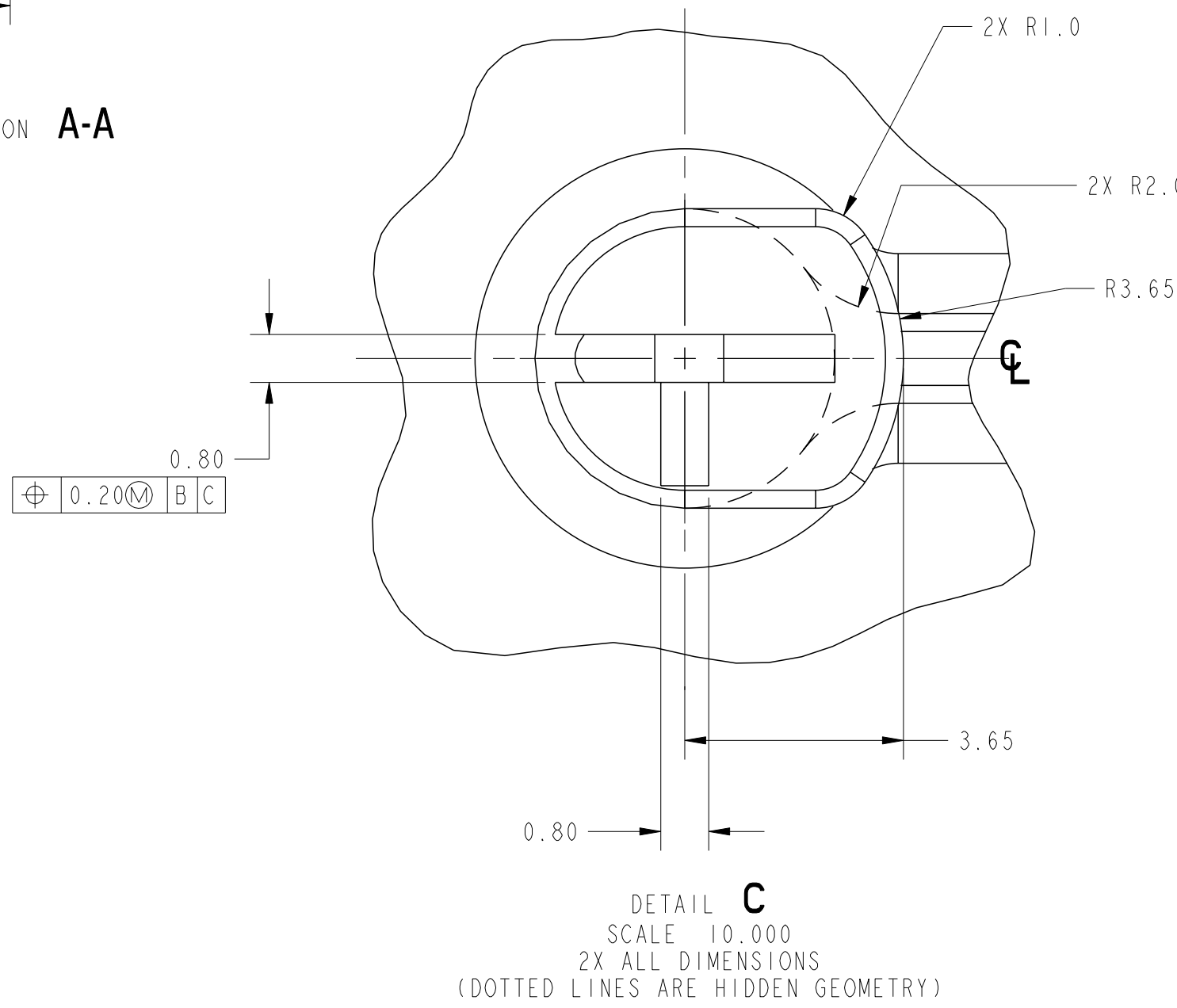
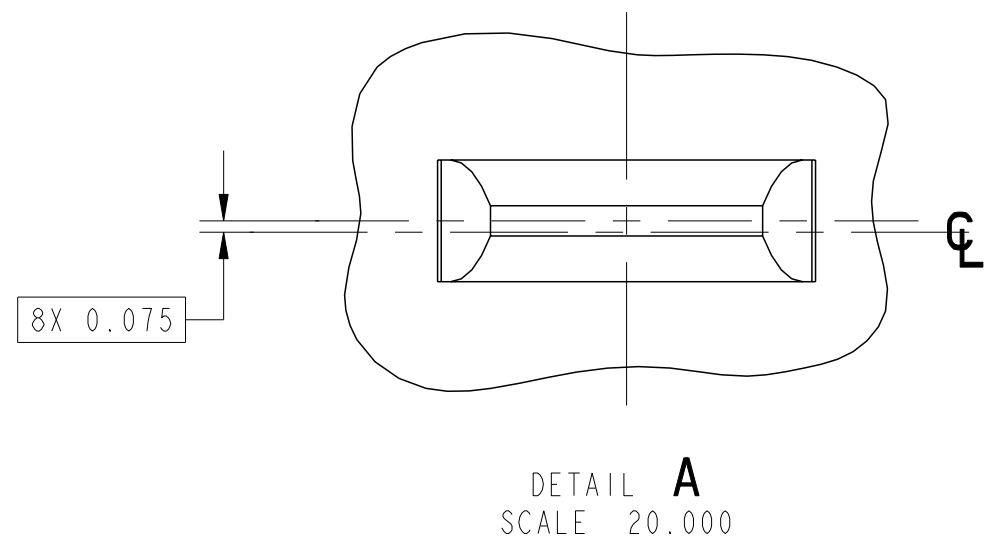
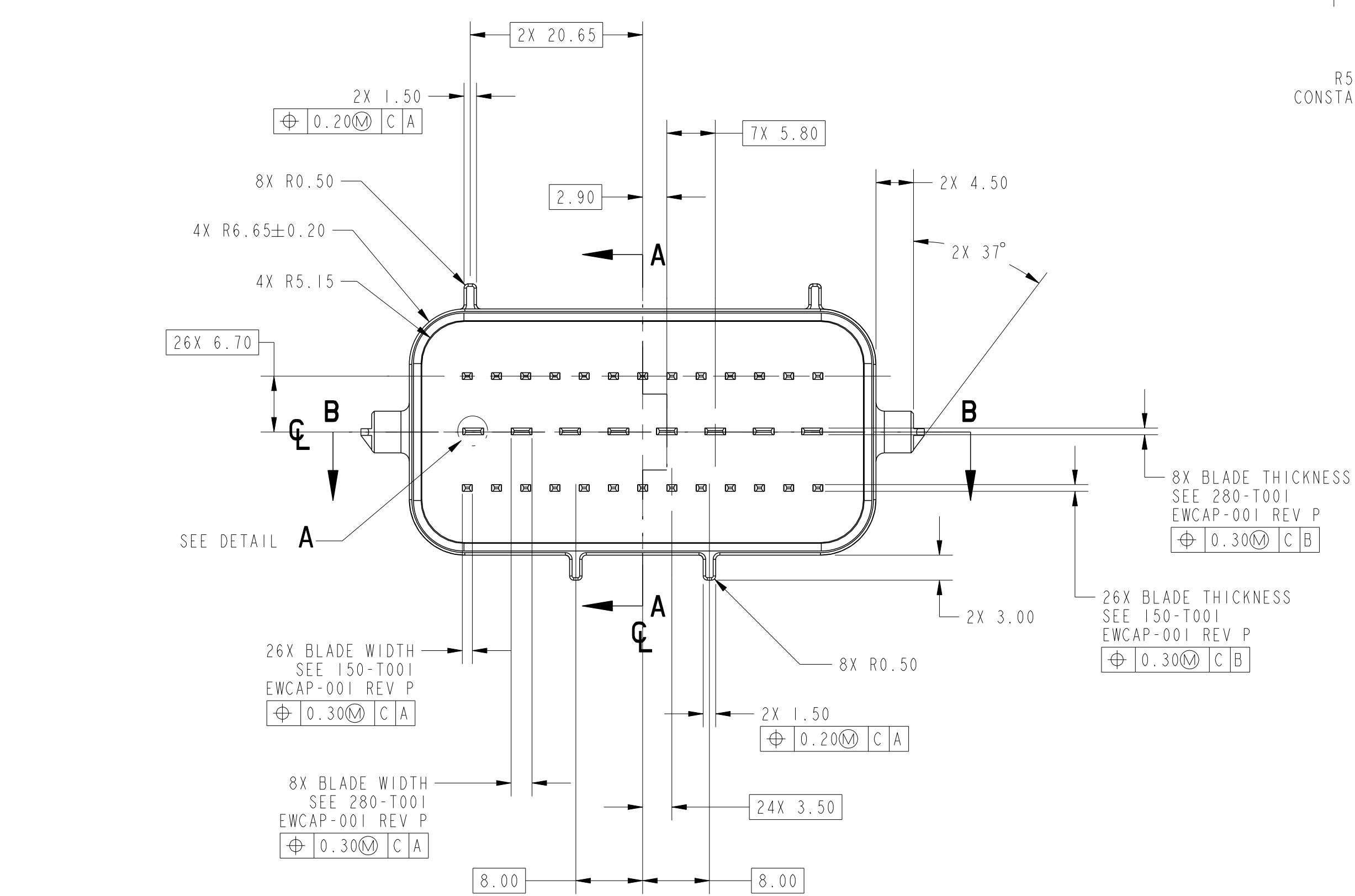
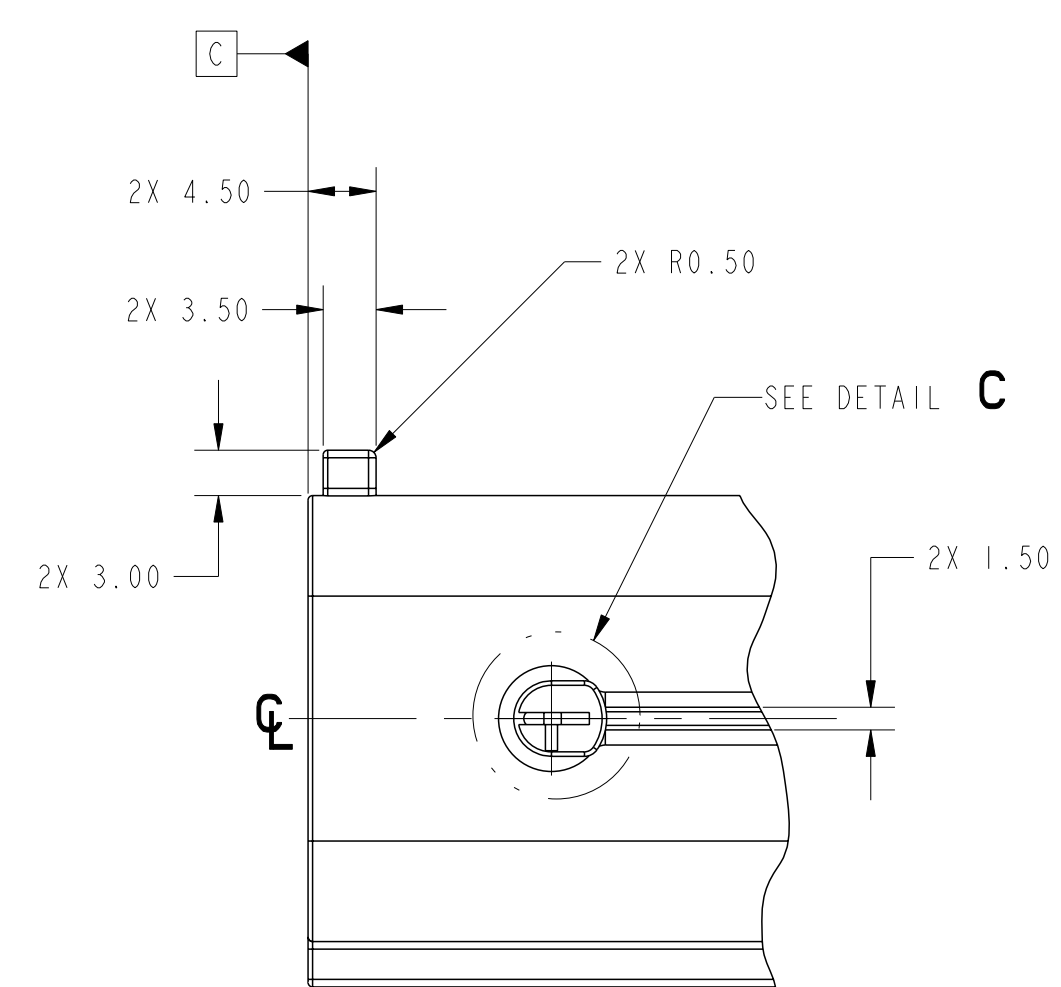
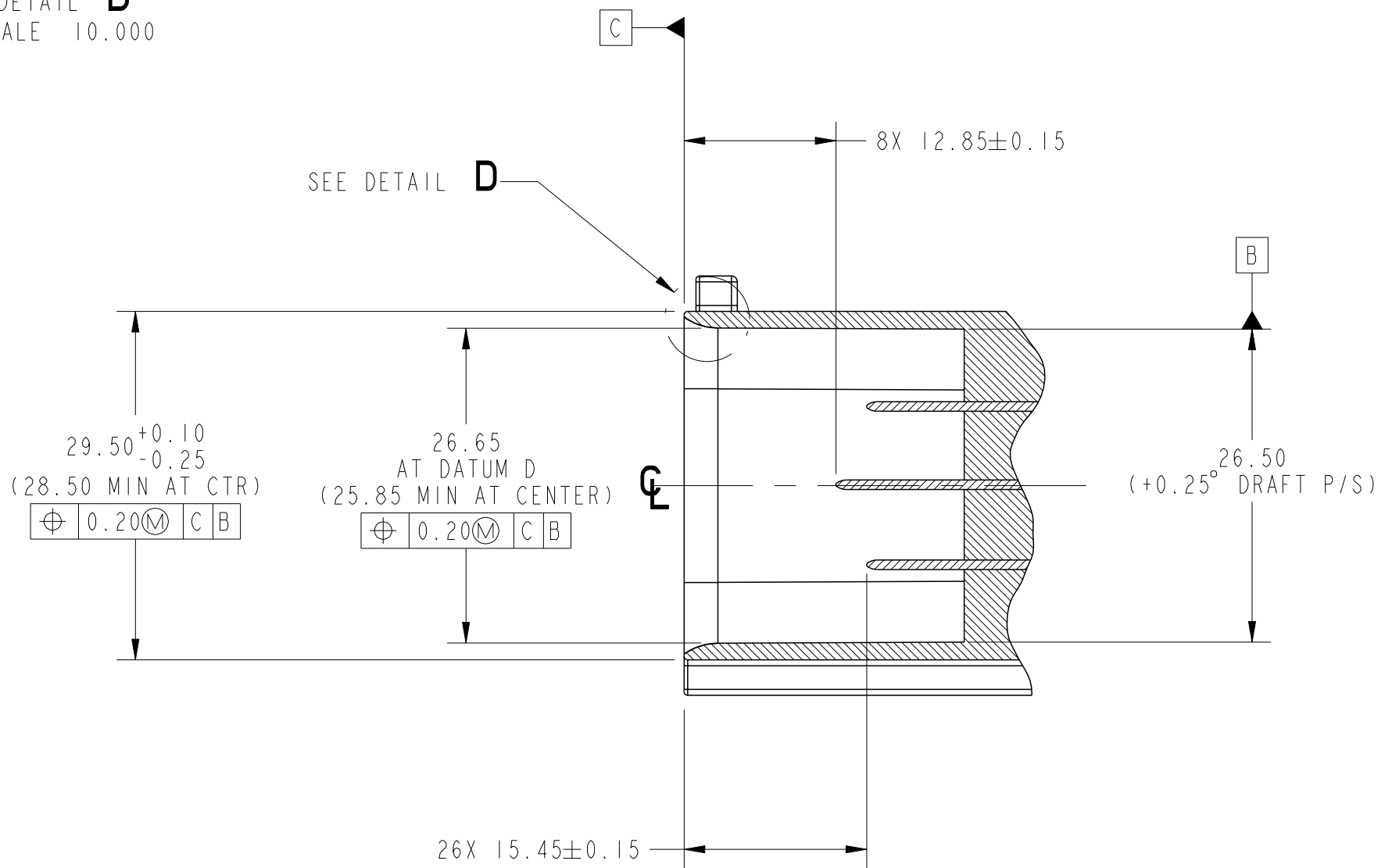
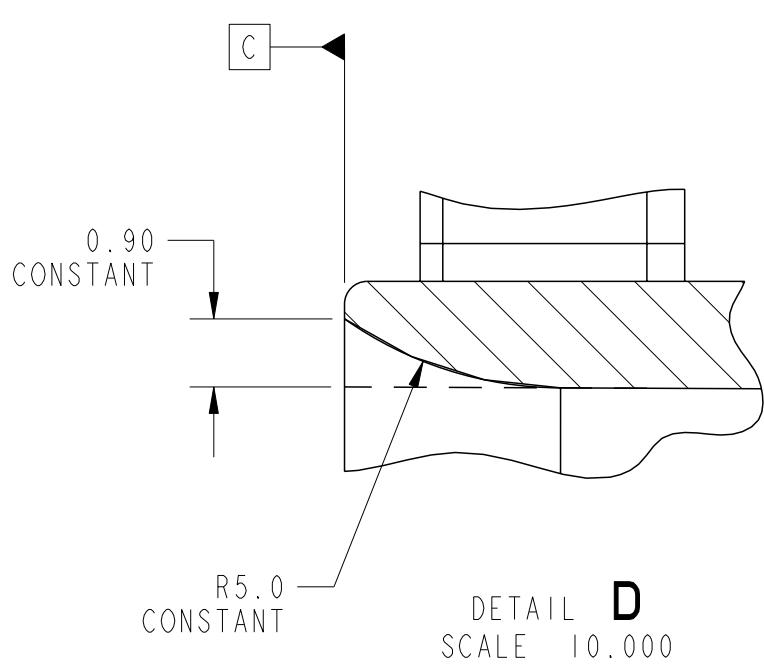
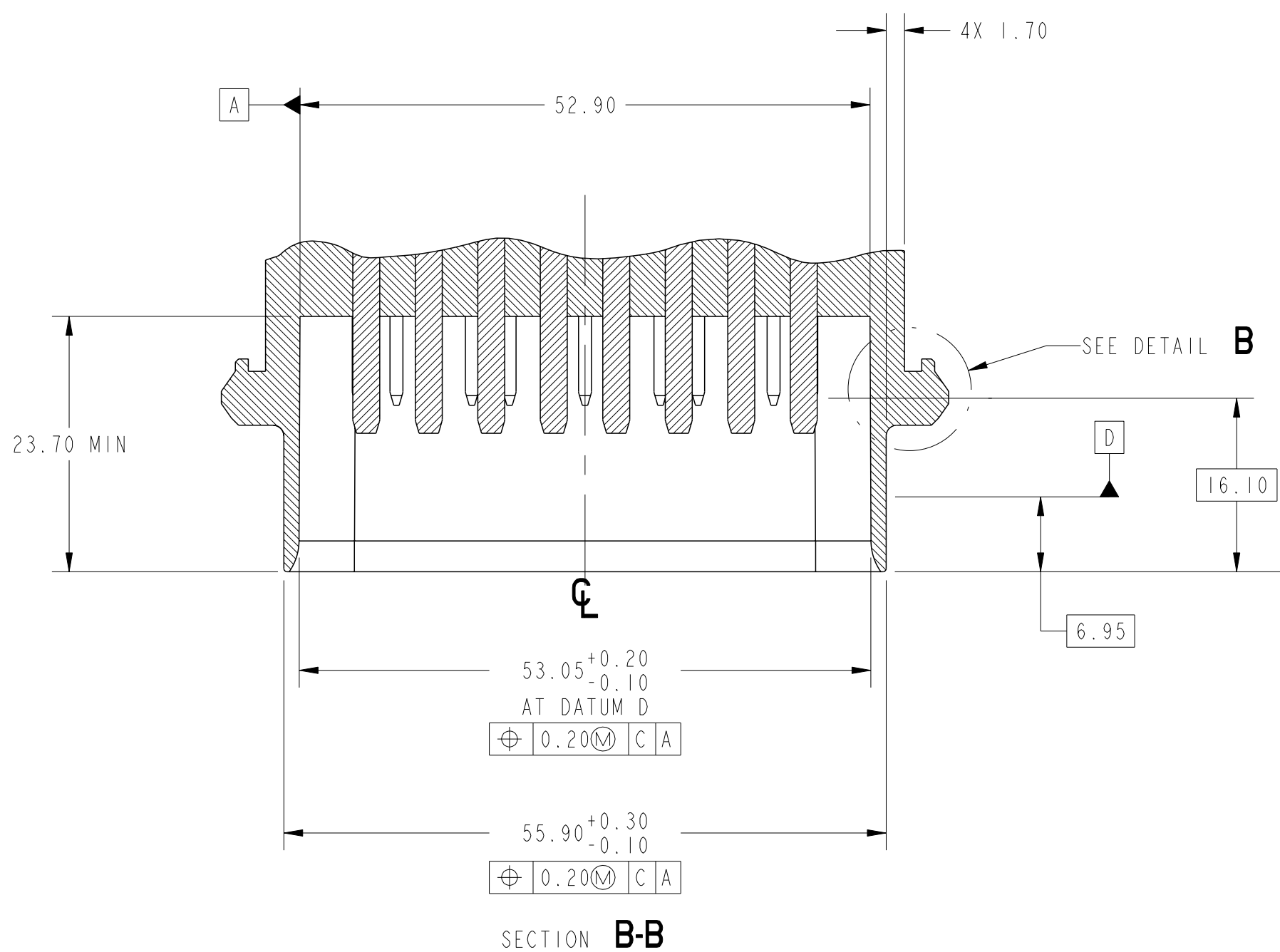
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CLEARANCE ZONE FOR CAM HANDLE
AND HAND ACCESS TO CAM HANDLE
ALL DIMENSIONS REFERENCE ONLY

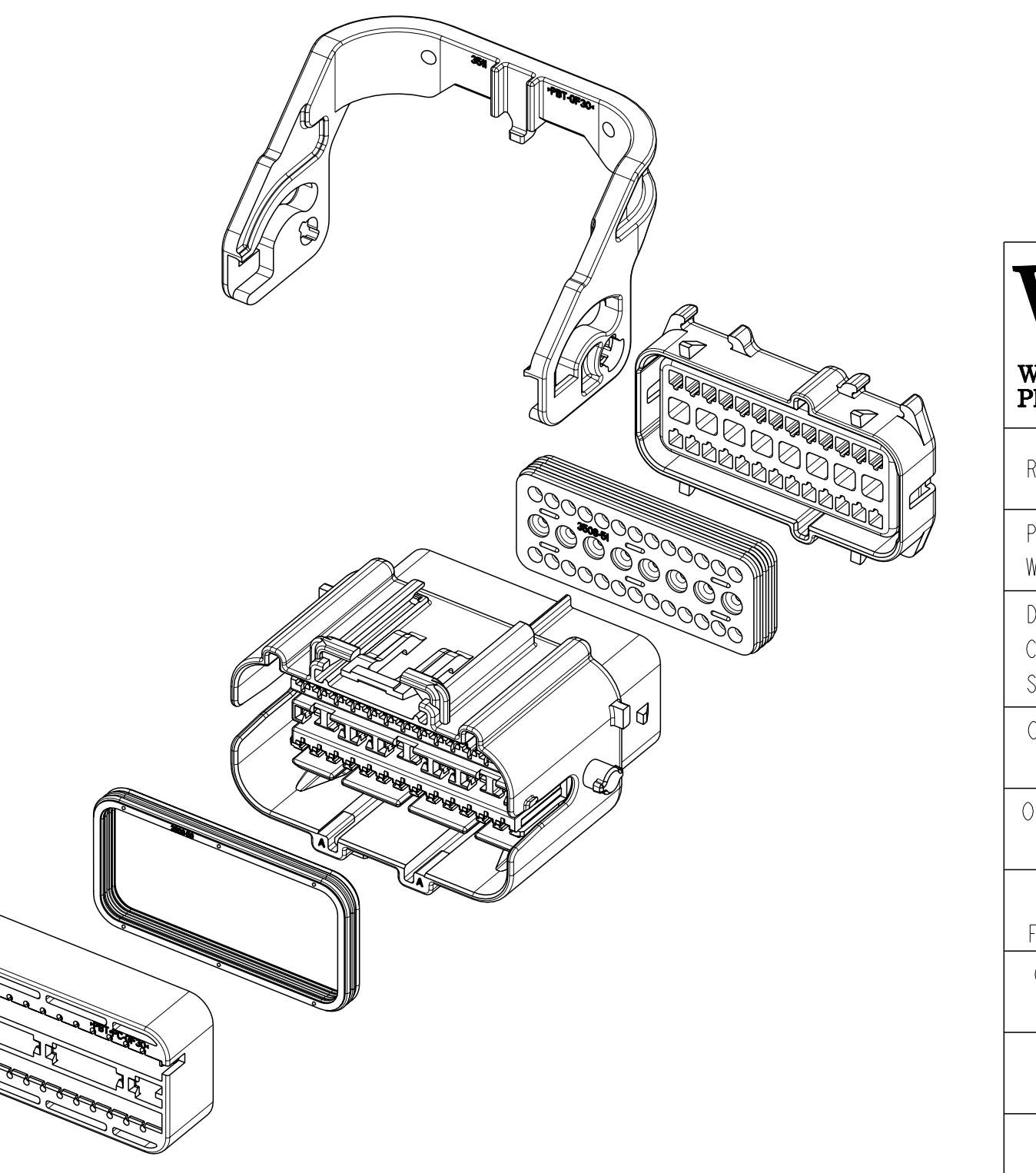



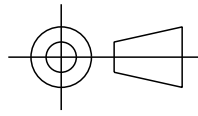

NOTES: UNLESS OTHERWISE SPECIFIED
GENERAL TOLERANCES
±0.3 ALL ONE PLACE DIMENSIONS
±0.10 ALL TWO PLACE DIMENSIONS
±1°00' ALL ANGULAR DIMENSIONS
DRAFT ANGLE PERMISSIBLE ONLY
WITHIN DRAWING TOLERANCE
0°30' MAXIMUM DRAFT ANGLE
ALL UNSPECIFIED RADII: 0.30
0.3 MAXIMUM RADIUS PERMISSIBLE
ON EDGES SHOWN AS SHARP
PART MUST MATE WITH FEMALE CONNECTOR
ASSEMBLIES WITH LIKE POLARIZATION SHOWN
ON THIS DRAWING FU5T-14A464-AVB

WDP RECEIVED
By Mike Davidson at 1:40 pm, May 21, 2020

WDP Western Diversified Plastics Phone: (269) 668-3393			
REFERENCE			
PART MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT			
DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 28-L			
CAD TYPE X-PROE	CAD LOC. TCE	CAD FILE DRAWING	DTMC IS MASTER
OPER. NO.	UNIT	FU5T-14A464-AVB	
DESIGN FINSTROM	DETAIL FINSTROM	TITLE SLV ASY WIR CONN FEM	SHT 2 OF 10
CHECKED ENSING	SAFETY		
SCALE 2:1	DATE 20130114	DIVISION PLANT	
FORD MOTOR COMPANY			

<

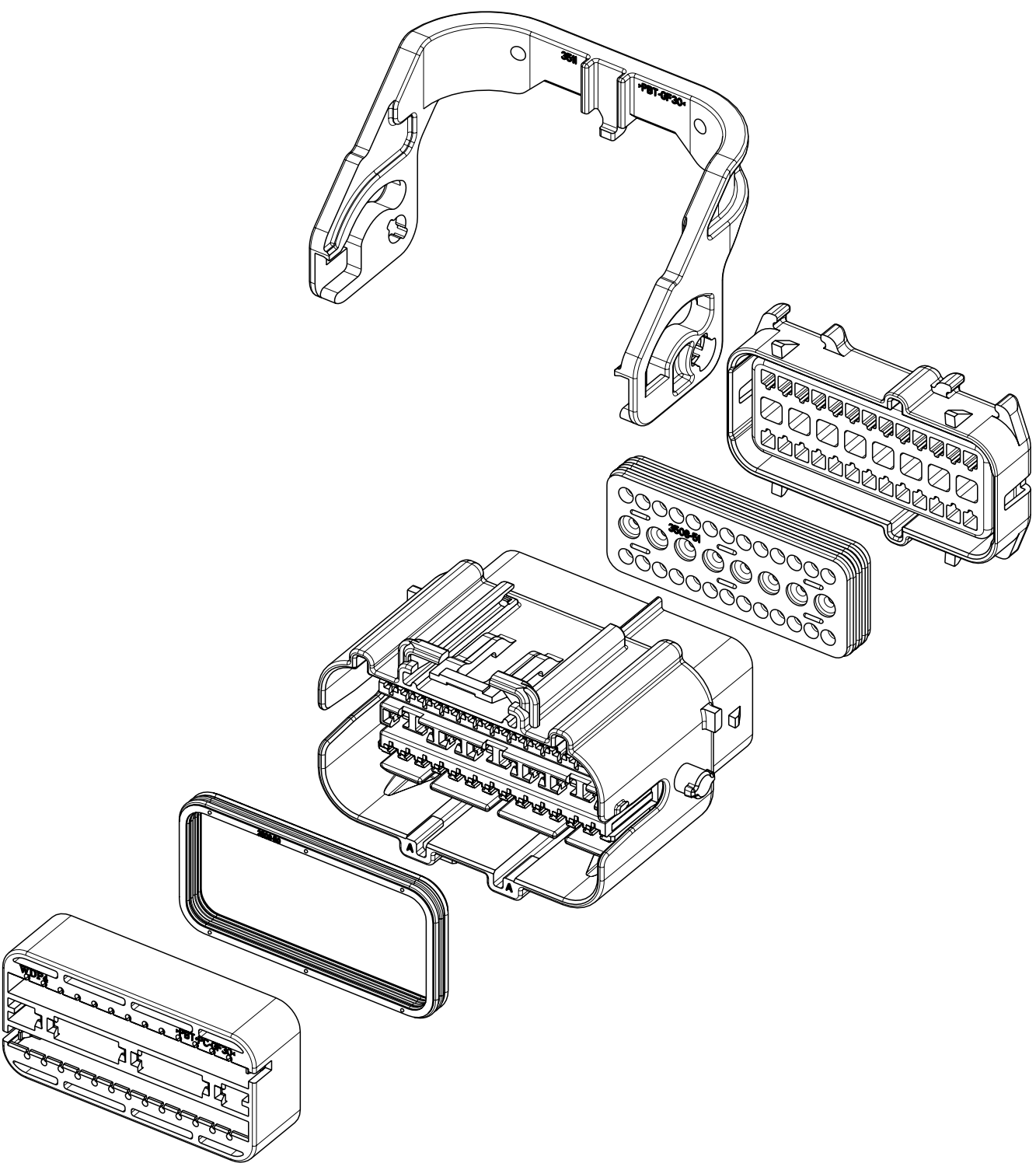


		<h1>WDP RECEIVED</h1> <p><i>By Mike Davidson at 1:40 pm, May 21, 2020</i></p>					
<h1>WDP</h1> <p>Diversified Plastics (269) 668-3393</p>							
<p>NCE</p>							
<p>MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD 9P99999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT</p>							
<p>D IN ACCORDANCE WITH FORD MOTOR V ENGINEERING CAD AND DRAFTING RDS VERSION 28.1</p>		 <p>3RD ANGLE PROJ DIMENSIONS ARE IN MILLIMETERS</p>					
<p>TYPE</p> <p>DATE</p> <p>NO.</p>	<p>CAD LOC. TCE</p> <p>UNIT</p>	<p>CAD FILE</p> <p>DRAWING</p>	<table border="1"> <tr> <td colspan="2"> <p>DTMC</p> </td> </tr> <tr> <td colspan="2"> <p>IS MASTER</p> </td> </tr> </table>	<p>DTMC</p>		<p>IS MASTER</p>	
<p>DTMC</p>							
<p>IS MASTER</p>							
<p>DETAIL FINSTRON SAFETY</p>		<p>TITLE</p> <p>SLV ASY WIR CONN FEM</p>					
<p>DATE</p> <p>20130114</p>		<p>DIVISION</p> <p>PLANT</p>					
 <p>FORD MOTOR COMPANY</p>							

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CONN. ASS'Y NO.		TOTAL OPEN HOLES		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	WDP PART NUMBER		CONN. ASS'Y NO.		TOTAL OPEN HOLES		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	WDP PART NUMBER																																																																																																																																															
FUST-1A4A64-AV*(T27)		15		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T27)		FUST-1A4A64-AV*(860)		23		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(860)																																																																																																																																																	
FUST-1A4A64-AV*(T28)		26		18	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T28)		FUST-1A4A64-AV*(861)		19		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(861)																																																																																																																																																						
FUST-1A4A64-AV*(T29)		23		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T29)		FUST-1A4A64-AV*(862)		20		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(862)																																																																																																																																																						
FUST-1A4A64-AV*(T30)		17		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T30)		FUST-1A4A64-AV*(863)		25		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(863)																																																																																																																																																							
FUST-1A4A64-AV*(T31)		25		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T31)		FUST-1A4A64-AV*(864)		27		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(864)																																																																																																																																																															
FUST-1A4A64-AV*(T32)		21		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T32)		FUST-1A4A64-AV*(865)		19		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(865)																																																																																																																																																		
FUST-1A4A64-AV*(T33)		21		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T33)		FUST-1A4A64-AV*(866)		21		4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(866)																																																																																																																																																			
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FUST-1A4A64-AV*(T35)		30		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T35)		FUST-1A4A64-AV*(868)		20		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(868)																																																																																																																																																																	
FUST-1A4A64-AV*(T36)		29		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T36)		FUST-1A4A64-AV*(869)		3		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(869)																																																																																																																																																										
FUST-1A4A64-AV*(T37)		26		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T37)		FUST-1A4A64-AV*(870)		14		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(870)																																																																																																																																																											
FUST-1A4A64-AV*(T38)		25		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T38)		FUST-1A4A64-AV*(871)		7		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(871)																																																																																																																																																
FUST-1A4A64-AV*(T39)		22		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T39)		FUST-1A4A64-AV*(872)		8		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(872)																																																																																																																																																						
FUST-1A4A64-AV*(T40)		22		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T40)		FUST-1A4A64-AV*(873)		16		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(873)																																																																																																																																																							
FUST-1A4A64-AV*(T41)		26		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(T41)		FUST-1A4A64-AV*(874)		17		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	60013508A01*(874)																																																																																																																																																
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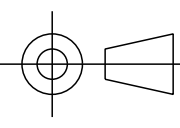

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	CONN. ASS'Y NO.		TOTAL OPEN HOLES		TERMINAL CAVITY NUMBER DENOTES SEALING PIN POSITION																				WDP PART NUMBER																				
	TBD		34		THIS ASSEMBLY DOES NOT INCLUDE GROMMET																				TBD																				
P	HUST-14A464-C*(000)		34																							60013508D01*(000)																			
	HUST-14A464-C*(001)		25																							32	33	34	60013508D01*(001)																
	HUST-14A464-C*(002)		15																								25	26	27	28	29	30	31	32	33	34	60013508D01*(002)								
	HUST-14A464-C*(003)		17																										32	33	34	60013508D01*(003)													
	HUST-14A464-C*(004)		23																											30	31	32	33	34	60013508D01*(004)										
	HUST-14A464-C*(005)		23																												30	31	32	33	34	60013508D01*(005)									
	HUST-14A464-C*(006)		25																													32	33	34	60013508D01*(006)										
	HUST-14A464-C*(007)		28																														31		60013508D01*(007)										
	HUST-14A464-C*(008)		20																															25	26	27	28	29	30	31		60013508D01*(008)			
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 **WDP RECEIVED**
By Mike Davidson at 1:39 pm, May 21, 2020

WDP 
Western Diversified Plastics
Phone: (269) 668-3393

REFERENCE			
PART MUST COMPLY WITH RESTRICTED SUBSTANCE MANAGEMENT STANDARD WSS-M99P9999-A1 TO SAFEGUARD HEALTH, SAFETY AND THE ENVIRONMENT			
DRAFTED IN ACCORDANCE WITH FORD MOTOR COMPANY ENGINEERING CAD AND DRAFTING STANDARDS VERSION 28.L			 3RD ANGLE PROJ DIMENSIONS ARE IN MILLIMETERS
CAD TYPE X-PROE	CAD LOC. TCE	CAD FILE	DTMC IS MASTER
OPER. NO.	UNIT	DRAWING FU5T-14A464-ABV	
DESIGN FINSTROM	DETAIL FINSTROM	TITLE SLV ASY WIR CONN FEM	SHT 10 OF 10
CHECKED ENSING	SAFETY		
SCALE 1:1	DATE 20130114	DIVISION PLANT	
 FORD MOTOR COMPANY			

Polyram Plastic Industries LTD

Moshav Ram On

M.P Gilboa 1920500

Israel

Tel.: 972-4-6599900, Fax: 972-4-6499763

Company Number: 515251593

VAT Number: 515251593

Withheld Tax File: 902248582

URL: <https://www.polyram-group.com>E-mail: mail@polyram-group.com

Certificate of Analysis

acc. to ASTM D5927-03 TPES011G30

Grade Name: RAMSTER 620 BLK
Customer PN#: MAT-089-BLK
Description: PBT I GF30 HR BLACK
LOT Number: 20010014
LOT Date: 22/01/20
Color: BLACK 401
Customer: WESTERN DIVERSIFIED PLASTICS
Polyram Name: RAMSTER PF312G6BK401

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
HDT 1.8MPa	ISO-75	°C	200.0000	---	206.2000
SPIRAL FLOW	INTERNAL	in	35.0000	42.0000	37.6250
Determination of ASH	ISO 3451-1	%	28.0000	32.0000	29.7600
MFI (250/2.16kg)	ISO 1133	g/10min	12.0000	35.0000	18.3900
TENSILE STRENGTH	ISO 527-2/1A	MPa	115.0000	---	134.6000
TENSILE MODULUS	ISO 527-2/1A	MPa	7,500.0000	---	9,562.5000
NOTCHED CHARPY IMPACT	ISO179-1/1eA	kJ/m ²	7.0000	---	12.0800

Grade RemarksLayout inspection data:

HDT @1.8 MPa ISO-75 200C

This lot meets the mechanical requirements of FCA MS50103 CPN 4615 and Ford WSK-M4D725-B1 specification

No. 86 Version A

The test values reported are means of individual test values determined on samples taken in accordance with the testing plan of the day of production.

Thank you for deciding on Polyram product.

Yaara Avrahami
Quality Manager
Polyram Plastic Industries LTD

Polyram Plastic Industries LTD

Moshav Ram On

M.P Gilboa 1920500

Israel

Tel.: 972-4-6599900, Fax: 972-4-6499763

Company Number: 515251593

VAT Number: 515251593

Withheld Tax File: 902248582

URL: <https://www.polyram-group.com>E-mail: mail@polyram-group.com**Certificate of Analysis**

acc. to ASTM D5927-03 TPES011G30

Grade Name: RAMSTER 620 GRAY
Customer PN#: MAT-089-GRY
Description: PBT I GF30 HR GREY
LOT Number: 20010015
LOT Date: 14/01/20
Color: GREY 402
Customer: WESTERN DIVERSIFIED PLASTICS
Polyram Name: RAMSTER PF312G6GR402

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
Determination of ASH	ISO 3451-1	%	28.0000	32.0000	30.0000
SPIRAL FLOW	INTERNAL	in	35.0000	42.0000	37.7222
MFI (250/2.16kg)	ISO 1133	g/10min	12.0000	35.0000	22.1200
TENSILE STRENGTH	ISO 527-2/1A	MPa	115.0000	---	127.7500
TENSILE MODULUS	ISO 527-2/1A	MPa	7,500.0000	---	9,470.0000
NOTCHED CHARPY IMPACT	ISO179-1/1eA	kJ/m ²	7.0000	---	9.3625

Grade RemarksLayout inspection data:

HDT @1.8 MPa ISO-75 200C

This lot meets the mechanical requirements of FCA MS50103 CPN 4615 and Ford WSK-M4D725-B1 specification

No. 86 Version A

The test values reported are means of individual test values determined on samples taken in accordance with the testing plan of the day of production.

Thank you for deciding on Polyram product.

Yaara Avrahami
Quality Manager
Polyram Plastic Industries LTD

Polyram Plastic Industries LTD

Moshav Ram On

M.P Gilboa 1920500

Israel

Tel.: 972-4-6599900, Fax: 972-4-6499763

Company Number: 515251593

VAT Number: 515251593

Withheld Tax File: 902248582

URL: <https://www.polyram-group.com>E-mail: mail@polyram-group.com**Certificate of Analysis****acc. to ASTM D5927-03 TPES051G30**

Grade Name: RAMLLOY 304 NAT
Customer PN#: MAT-102-NAT
Description: PBT/PC GF30 Natural
LOT Number: 19090049
LOT Date: 24/09/19
Color: NATURAL
Customer: WESTERN DIVERSIFIED PLASTICS
Polyram Name: RAMLLOY PZF304G6NT

Properties	Test Method	Units	Designated Min	Designated Max	AVG RESULTS
Determination of ASH	ISO 3451-1	%	28.0000	32.0000	30.5000
MFI (250/2.16kg)	ISO 1133	g/10min	12.5000	17.0000	13.5000
NOTCHED IZOD IMPACT	ISO 180	kJ/m ²	4.4000	---	10.2000
TENSILE STRENGTH	ISO 527-2/1A	MPa	95.0000	---	145.3333
TENSILE MODULUS	ISO 527-2/1A	MPa	5,800.0000	---	10,533.3333

Grade RemarksLayout inspection data:

HDT @1.8 MPa ISO-75 170C

The test results presented on this COA comply with Ford WSK-M4D790-A specification
*** MFI SPEC maximum per WDP agreement**

No. 86 Version A

The test values reported are means of individual test values
determined on samples taken in accordance with the testing plan
of the day of production.

Thank you for deciding on Polyram product.

Yaara Avrahami
Quality Manager
Polyram Plastic Industries LTD



Certificate of Registration

This certificate has been awarded to

Polyram Plastic Industries Ltd

Ram-On, 1920500, Israel

In recognition of the organization's Quality Management System which complies with

IATF 16949:2016

The scope of activities covered by this certificate is defined below

Design and Manufacture of Thermoplastic Raw Material Compounds

Certificate Number:

61487/B/0001/SM/En

Date of Issue of Certification Cycle:

04 July 2017

Date of Issue:

06 July 2017

Issue No:

3

Expiry Date:

03 July 2020

IATF No:

0268648

Issued by:

On behalf of the Schemes Manager






FOREST CITY
TECHNOLOGIES, INC.
 INNOVATION BY DESIGN

Print Rev.: A4

MATERIAL: SAE J200 M5FE 508 A19 B37 EA14
 Z1 = MATERIAL SHALL BE INHERENTLY LUBRICATED AND EXHIBIT
 LUBRICANT BLEED 24 HOURS AFTER VULCANIZATION
 DUROMETER - SHORE A 50±5
 POST CURE - 3 HOURS AT 400° F
 COLOR: GREEN

DaimlerChrysler Ford General Motors

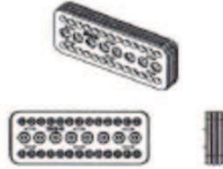
SUPPLIER FOREST CITY TECHNOLOGIES		PART NUMBER 3508-50-001					
NAME OF LABORATORY FOREST CITY TECHNOLOGIES		PART NAME Interfacial Seal - 34 Way Hybrid			JS#:16-0254		
Test	MATERIAL SPECIFICATION SAE J200 M5FE 508 A19 B37 EA14 Z1	FCMS# 794			UOM	OK	NOT OK
		SPEC MIN.	SPEC MAX.	TEST RESULTS			
(FE 50)	DUROMETER ASTM-D2240, SHORE A	45	55	50	points	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(FE 8)	TENSILE ASTM-D412	7		7.7	Mpa	<input checked="" type="checkbox"/>	<input type="checkbox"/>
(FE 500)	ULTIMATE ELONGATION ASTM-D412, DIE C	400		407	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B37	COMPRESSION SET ASTM-D395, 22 hrs @ 175°C	0	25	13	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A19 (Grade5)	HEAT AGED ASTM D537 70HRS. @ 225DEG. C.						
	TENSILE	-50		-0.166	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	ELONGATION	-50		-33	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	HARDNESS	0	10	8	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Z1	LUBRICANT BLEED	Evident Within 24 Hours		Pass		<input checked="" type="checkbox"/>	<input type="checkbox"/>
EA14 (Grade5)	FLUID RESISTANCE ASTM D 471 WATER 70HRS @ 100°C						
	HARDNESS	-5	5	5	points	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	CHANGE IN VOLUME	-5	5	0.1	%	<input checked="" type="checkbox"/>	<input type="checkbox"/>
IMDS # 4967887		Signature  Date 8/21/2019					
Reported by/Tilte: Tyler Vegh, Quality Engineer							



FOREST CITY TECHNOLOGIES, INC.

INNOVATION BY DESIGN

Print Rev.: A



MATERIAL: SELF LUBRICATED SILICONE
ORIGINAL PROPERTIES, ASTM D2240-91, D412-92
HARDNESS, SHORE A = 13-22
TENSILE STRENGTH, DIE-C, MPa = 2.0 MIN.
ELONGATION, % = 500 MIN.
TEAR STRENGTH, DIE-C, KN/m = 3.0 MIN.
HEAT AGING, ASTM D-573-88, 168h @ 150°C
HARDNESS CHANGE, pts. = -5 TO +10
TENSILE STRENGTH CHANGE, % = -30 MAX.
ELONGATION CHANGE, % = -30 MAX.
COMPRESSION SET, ASTM D-395-89, METHOD B, 70h @ 150°C
SET, % = 25 MAX.
FLUID RESISTANCE, ASTM D-471-95, 70h @ 150°C ASTM #1 OIL
HARDNESS CHANGE, pts. = 0 TO -12
TENSILE STRENGTH CHANGE, % = -30 MAX.
ELONGATION CHANGE, % = -30 MAX.
VOLUME CHANGE, % = 0 TO +15
(A4) COLOR: GREEN

DaimlerChrysler Ford General Motors

SUPPLIER FOREST CITY TECHNOLOGIES		PART NUMBER 3508-51-002					
NAME OF LABORATORY FOREST CITY TECHNOLOGIES		PART NAME Grommet - 34 Way Female Hybrid					
Test	MATERIAL SPECIFICATION Print Callout	FCMS# 808			UOM	OK	NOT OK
		SPEC MIN.	SPEC MAX.	TEST RESULTS			
DUROMETER ASTM-D2240, SHORE A		13	22	17.5	points	<input checked="" type="checkbox"/>	
TENSILE ASTM-D412		2		3	MPa	<input checked="" type="checkbox"/>	
ULTIMATE ELONGATION ASTM-D412, DIE C		500		780	%	<input checked="" type="checkbox"/>	
TEAR STRENGTH DIE C		3		9.8	KN/m	<input checked="" type="checkbox"/>	
HEAT AGED ASTM D 537-04(15) 70HRS. @ 302°F ASTM D-573-88, 168h @ 150°C							
	TENSILE	-30		1.1	%	<input checked="" type="checkbox"/>	
	ELONGATION	-30		0.33	%	<input checked="" type="checkbox"/>	
	HARDNESS	-5	10	0.98	%	<input checked="" type="checkbox"/>	
COMPRESSION SET ASTM-D395, 70 hrs @ 150°C		0	25	21.0	%	<input checked="" type="checkbox"/>	
FLUID RESISTANCE ASTM D 471-16, 70HRS @ 302°F in IRM 901 oil ASTM D-471-95, 70HRS @ 150°C ASTM #1 Oil							
	HARDNESS	-12		-2	points	<input checked="" type="checkbox"/>	
	TENSILE	-30		-9.4	%	<input checked="" type="checkbox"/>	
	ELONGATION	-30		-3.3	%	<input checked="" type="checkbox"/>	
	CHANGE IN VOLUME	0	15	5.3	%	<input checked="" type="checkbox"/>	
COLOR		GREEN		Pass		<input checked="" type="checkbox"/>	
LUBRICANT BLEED		Evident Within 24 Hours		Pass		<input checked="" type="checkbox"/>	
IMDS # 329151039		Signature			Date 7/29/2019		
		Reported by/Tilte: Tyler Vegh, Quality Engineer					



SMITHERS
QUALITY ASSESSMENTS

CERTIFICATE OF APPROVAL

This is to Certify that the Quality Management System of:

Forest City Technologies, Inc.
299 Clay Street
Wellington, OH 44090

(Page 1 of 2; see Appendix)

has been assessed and approved by Smithers Quality Assessments, Inc., to
the following quality management system standards and requirements:

ISO 9001:2015 without Design

The Quality Management System is Applicable to:

The manufacture of sealing devices and molded products and the application of
sealants, coatings tapes and related services to both such as sorting/packing, and
delivery for the fastener, automotive, infant care and other industries

Approval
Certificate Number: 97.127.1

Original Approval: May 7, 1997

Current Certificate: April 24, 2018

Certificate Expires: April 23, 2021



*The use of the accreditation mark indicates
accreditation in respect of those activities
covered by the above certificate number.*


on behalf of SQA - J. Michael Hochschwender, CEO

The approval is subject to the company maintaining its system to the required standards which will be monitored by
Smithers Quality Assessments, Inc., 121 S. Main St. Suite 300, Akron, Ohio 44308, USA



APPENDIX A
TO THE CERTIFICATE
OF REGISTRATION NO. 97.127.1



Page 2 of 2

SMITHERS QUALITY ASSESSMENTS, INC.

Forest City Technologies, Inc.

299 Clay Street
Wellington, OH 44090

is certified by Smithers Quality Assessments, Inc. with regard to ISO 9001:2015 without design

In addition to the corporate office in Wellington, OH, the following sites have been assessed and found to be in compliance with the applicable requirements of ISO 9001:2015 without design utilizing a multi-site sampling approach.

Locations:

232 Maple Street
Wellington, OH 44090

Scope of services for this site: Manufacturing

Forest City Technologies

892 Southbrook Drive
Rockford, IL 61102

Scope of services for this site: Manufacturing

Forest City Technologies

401 Magyar Street
Wellington, OH 44090

Scope of services for this site: Manufacturing

Forest City Technologies

22069 Fairgrounds Roads
Wellington, OH 44090

Scope of services for this site: Manufacturing

Forest City Technologies - Novathane

228 TWP RD 931
Nova, OH 44859

Scope of service for theis site: Manufacturing

This appendix applies only to those sites listed above. As other sites are assessed and approved, or as sites already approved are removed from active services, this appendix will be amended to show the current status. Sites not listed on this appendix shall not be viewed as approved.



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Western Diversified Plastics, LLC

53150 North Main Street, Mattawan, MI, 49071, USA

has been registered by Intertek as conforming to the requirements of:

IATF 16949:2016

The management system is applicable to:

Design and Manufacture of Plastic Components and Assemblies

Permissible exclusions include: None

IATF Certificate Number
0312892

Certificate Number:
2007-0124

Certificate Issue Date:
28 June 2018

Certificate Expiry Date:
27 June 2021



Calin Moldovean
President, Business Assurance

Intertek – 4700 Broadmoor, Suite200
Kentwood MI 49512, USA



APPENDIX TO CERTIFICATE OF REGISTRATION

This is to certify that the quality management system of:

Western Diversified Plastics, LLC

53150 North Main Street, Mattawan, MI, 49071, USA

has been registered by Intertek as conforming to the requirements of:

IATF 16949:2016

Including the Following Support Functions:

53196 N. Main Street,
Mattawan, MI, 49071, USA

After-Sales, Calibration,
Contract Review, Laboratory,
Process Design, Product
Design, Sales

IATF Certificate Number
0312892

Certificate Number:
2007-0124

Certificate Issue Date:
28 June 2018

Certificate Expiry Date:
27 June 2021



Calin Moldoveanu
President, Business Assurance

Intertek – 4700 Broadmoor, Suite200
Kentwood MI 49512, USA



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Western Diversified Plastics, LLC

53150 North Main Street, Mattawan, MI, 49071, USA

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Design and Manufacture of Plastic Components and Assemblies

Certificate Number:

06-058e-01

Initial Certification Date:

02 June 2006

Date of Certification Decision:

28 June 2018

Issuing Date:

28 June 2018

Valid Until:

27 June 2021



A handwritten signature in black ink, appearing to read "Calin Moldoveanu", written over a horizontal line.

Calin Moldoveanu

President Business Assurance

Intertek Testing Services NA, Inc. dba Intertek
900 Chelmsford Street, Lowell, MA, USA



INTERNAL TEST LAB SCOPE

Field of Test	Products or Items Tested	Specified Tests or Properties Measured	Specification, Standard, or Method Used	Equipment / Range
Mechanical	Electrical and Mechanical Components	Force - Tension & Compression	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 25 FCA PF90012 WDP PS-001	Instron 3342 5 to 500N Instron 3366 5 to 10KN
Mechanical	Electrical and Mechanical Components	Torque	ES-GU5T-14A067-AB Ford Connector SDS WDP PS-001	Jetco ED-2501 Stanley E231b-16 Stanley E33LA18-46 .5 to 46 Nm
Mechanical	Electrical and Mechanical Components	Environmental Exposure – Temperature, Humidity Salt Fog Dust	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 CETP 00.00L/E-412 WDP PS-001	Humboldt H30135E Thermotron SM-32& 4 Thermotron SE-600 Singleton SCCH 22 ESPEC EDC-27 Control Co 4040 Fluke 54 T/C Monitor -70C to 500C
Mechanical	Electrical and Mechanical Components	Environmental Exposure - Vibration – Sine, Random, Sine on Random, & Transient	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 SAE/USCAR-20 FCA PF90012 WDP PS-001	Thermotron DSX-8000 Vib 5 to 3000 Hz, 8000 force lb 11ms 100g half sine shock 2.54 mps, 3" displacement Endevco 7251A Accel Dytran 3215 Accel ±500g max
Mechanical	Electrical and Mechanical Components	Environmental Exposure - Thermal Shock	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Thermotron ATS-320 H/V Fluke 54 T/C Meter -70C to 175C
Mechanical	Electrical and Mechanical Components	Sealing Integrity	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 FCA PF90012 ISO 2653 IPX3,4	Weiss DUGY2-015 ±15psi Fluke 700RG07 -14 - 500psi 29.9 in Hg to 350 psi ESPEC ETH-37 Water chbr Up to 1500 psi - 4 gpm IPX3/4 Spray Head Ashcroft 5000 psig gage 100, 2000, 4000ml Grad Cyl Control Co 1042 Stopwatch - 1/100 th sec
Temperature	Electrical Components	Thermal Imaging	ES-GU5T-14A067-AB WDP PS-001	FLIR T620 Up to 500°C

Distribution List:	Quality Director, Test Lab Manager, Test Lab Technicians, Quality Engineering, Program Managers, Manufacturing Engineer		
TLI002 Internal Test Lab Scope		Page 1 of 2	Revision Date 03/25/20
Printed Copies are for Reference Only			

Field of Test	Products or Items Tested	Specified Tests or Properties Measured	Specification, Standard, or Method Used	Equipment / Range
Sound	Mechanical Components	Sound Level Audible noise	Ford Connector SDS SAE/USCAR-2	Extech 407768 dB A&C scale to 140dB
AC Electrical	Electrical and Mechanical Components	Dielectric	ES-GU5T-14A067-AB WDP PS-001	Vitrek V63 100V to 5KV AC
Dimensional	Electrical and Mechanical Components	Distance / Length Height/Width	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 SAE/USCAR-20	Mitutoyo 0- 6" Caliper GEI SS 1000mm ruler Wixey WR300 Angle Gage
DC Electrical	Electrical and Mechanical Components	Insulation Resistance Dielectric Resistance	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2 FCA PF90012 WDP PS-001	Vitrek V63 IR from 1 to 10Gohm Dielectric 100V to 6KV DC
DC Electrical	Electrical and Mechanical Components	Amperage	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Fluke 87, 287, 289 Keysight 34450A Extech 380941, 380947 .01 micro to 400A DC
DC Electrical	Electrical and Mechanical Components	Voltage	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Fluke 87, 287, 289 Keysight 34450A HP 44701A HP 44702B Rigol DS1104Z O-scope 1 micro to 1000 Volts DC
DC Electrical	Electrical and Mechanical Components	Resistance	ES-GU5T-14A067-AB Ford Connector SDS SAE/USCAR-2, 20, 21 FCA PF90012 WDP PS-001	Keithley 580 Keysight 34450A 10micro to 200Kohm
Mechanical / DC Electrical	Electrical and Mechanical Components	Combined Environment Durability/Life Test	Various as Listed Above	Various as Listed Above

1.1 WDP test lab performs testing relative to the internal scope using the Test Request, DVP&R, and the Test Specification.

1.2 Capabilities may include tests related to the test technologies listed which utilize equipment and properties listed.

1.3 Any required conditions, or deviations, are communicated to the customer as identified in the DVP&R and/or Test data sheet.

Distribution List:	Quality Director, Test Lab Manager, Test Lab Technicians, Quality Engineering, Program Managers, Manufacturing Engineer		
TLI002 Internal Test Lab Scope		Page 2 of 2	Revision Date 03/25/20
Printed Copies are for Reference Only			

Dimensional Measurement 2D	X (0-100mm) Y (0-30mm.)	Quality Lab	Res. 1 Micron	Keyence Image Dimension Measuring System
Temperature	Ambient +5 degree C to 200Degree C	Quality Lab	2.0 degree C @ 100degreeC Sensitive to 1.0 degree C	VWR 1410 Vacuum Oven
Force	0-1000N	Quality Lab	0.25 % of the full scale 0.1lbf	Chatillon 200LBF/1000N
Torque	2-18 lbf.ft	Quality Lab	+/- 0.625% of reading, from 10-100%FS	Mountz Torque Analyzer and Transducer
Dimensional Measurement	0-100 Microns ±0.5	Quality Lab	Accuracy ± 0.43 Microns	PosiTector
Dimensional Measurement 1D	0-1 In.	Quality Lab	Res. 0.001 In.	Mitutoyo Blade Micrometers

1.0 Metrology Lab - Located in the Mol-Son building

- 1.1 WDP metrology lab performs and reports dimensional measurements to determine acceptability to engineering drawing specifications and tolerances.
- 1.2 Capabilities may include tests related to the test technologies listed which utilizes equipment and properties listed.
- 1.3 Any required conditions, or deviations, are communicated to the customer.

2.0 Quality Labs – Located in the WDP building in work center locations

- 2.1 WDP quality labs determine acceptability to engineering drawing specifications and tolerances.

Distribution List:	Quality Director, Quality Engineering, Metrology Lab, Program Managers, Manufacturing Engineering, Quality Technicians, Quality Supervisors		
QWI033 WDP METROLOGY AND QUALITY LAB SCOPE		Approval	Quality Director
Printed Copies are for Reference Only	Page 3 of 3	Revision Date	12/02/19