

Special Characteristics Communication and Agreement

1. DFMEA and potential special characteristics	Type ONLY in Yellow Boxes	1A. PFMEA & Special Characteristics Agreement	Type ONLY in Green Boxes
Lead / Support roles and timing for each stage	Ford PD engineer / Supplier	Supplier/ Ford PD	

Special Characteristics for:

2018 2.7L Nano	Eaton / Kearney NE	JT4E-6507-AA
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Special Characteristics Approvals required at UNV2 / UPV2 / PA as per FAP 03-111

Program: 2018 2.7L Nano	Part Number: JT4E-6507-AA
Supplier Name/Plant: Eaton / Kearney NE	Engineering Release Number: NE01-E-13035355-025
Supplier SIM Code: E304C	Design Lead Brand: Ford
Part / System Name: INT VALVE	Ford Customer Plant: Lima Engine Plant

Ford D & R Engineer Approval/Date: /s/ John Carter	Name: John Carter	E-mail: JCARTER7@ford.com	Date: 10/20/2016
Ford STA Engineer Approval/Date: /s/ Alfredo Gutierrez	Name: Alfredo Gutierrez	E-mail: agutierrez7@ford.com	Date: 11/02/16
Ford Craftsmanship/Sys Engr'g Approval/Date: /s/ V. Woodwiss	Name: Vanessa Woodwiss	E-mail: vwoodwiss2@ford.com	Date: 10/24/16
Supplier Plant Quality Manager Approval/Date: /s/ [REDACTED]			Date: 10/21/16

Note: approvals may be electronic: complete the approval block above to identify the approvers, and include "/s/" ahead of the name typed into the "signature" box to indicate electronic approval and approve in e-mail with this file as an attachment.

Key: For Special Characteristics definitions refer to Ford FMEA Handbook.	From DFMEA: YC Sev 9-10. Potential CC YS Sev 5-8 and may require special control to maintain process capability. Potential SC.	From PFMEA: CC Sev 9-10 (Part). Critical Characteristic. OS Sev 9-10 (Process). Operator Safety.	SC Sev 5-8 AND Occ 4-10. Significant Characteristic	HI Sev 5-8 AND Occ 4-10. High Impact Characteristic
Special Characteristic Totals: Note 1: Automatic calculation of totals (for guidance only). Note 2: Count of SCs may be less than count of YSs	YC 0	YS 32	CC 0	OS 0
			SC 7	HI 1

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Stage 1. DFMEA

No.	Characteristic Description	Specification & Tolerance	DFMEA Class	PFMEA Class	Process Control Method
1	cup runout	1mm to A	YS	Other	Operator checks at set-up and in process
2	keeper groove, stem thickness at bottom of groove	4.08 - 4.28 mm	YS	Other	Gage 1 per hour and record in data log at operation and check xbar and R on 10 pieces per pallet at pre audit
3	keeper groove chamfer	0.05 - 0.25 mm x 43 - 47 deg	YS	Other	Tool controlled with keeper groove depth, checked at change over by quality with automated optical comparator
4	Keeper Groove Spacing	3.975 - 4.025 mm	YS	Other	Checked by quality lab at change over with an automated optical comparator, tooling controlled
5	Keeper Groove Spacing	1.975 - 2.025 mm	YS	Other	Checked by quality lab at change over with an automated optical comparator program, tooling controlled
6	Back Angle1 Gage Height	3.22 - 3.62 mm	YS	Other	Evidence log, record gage reading every two hours
7	Back Angle2 Gage Height	4.0 - 4.5 mm	YS	Other	Evidence log, record gage reading every two hours
8	Tip Chamfer, Upper Angle	58 - 62 deg	YS	Other	Tool controlled, checked at change over by quality with automated optical comparator
9	Tip Chamfer, Lower Angle	13 - 17 deg	YS	Other	Tool controlled, checked at change over by quality with automated optical comparator
10	Tip Chamfer, Length	0.13 - 0.63 mm	YS	Other	Tool controlled, checked at change over by quality with automated optical comparator

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	Ford PD engineer / Supplier	Supplier/ Ford PD	2018 2.7L Nano			Eaton / Kearney NE	JT4E-6507-AA													
Program: 2018 2.7L Nano	Part Number: JT4E-6507-AA	Supplier Name/Plant: Eaton / Kearney NE	Engineering Release Number: NE01-E-13035355-025	Design Lead Brand: Ford	Ford D & R Engineer Approval/Date: Signature: <i>[Redacted]</i> Name: John Carter Date: 10/20/2016	Ford STA Engineer Approval/Date: Signature: <i>[Redacted]</i> Name: Alfredo Gutierrez Date: 11/02/16	Ford Craftsmanship/Sys Engrg Approval/Date: Signature: <i>[Redacted]</i> Name: Vanessa Woodwiss Date: 10/24/16													
Supplier SIM Code: E304C	Ford Customer Plant: Lima Engine Plant	Supplier Plant Quality Manager Approval/Date: Signature: <i>[Redacted]</i> Name: <i>[Redacted]</i> Date: <i>[Redacted]</i>	Special Characteristics Approvals required at UNV2 / UPV2 / PA as per FAP 03-111																	
Part / System Name: INT VALVE	Note: approvals may be electronic: complete the approval block above to identify the approvers, and include "/s/" ahead of the name typed into the "signature" box to indicate electronic approval and approve in e-mail with this file as an attachment.																			
Key: For Special Characteristic definitions refer to Ford FMEA Handbook.		From DFMEA:	From PFMEA:																	
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No.	Characteristic Description	Specification & Tolerance		DFMEA Class	PFMEA Class	Process Control Method														
11	Tip Flat Dia	5.09 mm min		YS	Other	Tool controlled, checked at change over by quality with automated optical comparator														
12	Seat Face - Angle	45.50 - 46.00 deg		YS	Other	Inspect each chuck at 1st hour of shift, at wheel change and change over and track in data log CHECK LAST PIECE AT TOOL CHANGE AND CHANGE OVER														
13	Seat Face - Runout	0.050 mm to A		YS	SC	Inspect 3 consecutive pieces at the operation and xbar and R, once per shift														
14	Seat Face - Roundness	0.008 mm		YS	Other	Inspect one piece on each chuck every 2 hours and at wheel changes and change overs collected in metrology data log														
15	Head Dia	32.38 - 32.62 mm		YS	Other	Audit 10 pieces per pallet xbar and R, measuring devices at operation for operators to monitor the process, form is checked on comparator at change over and is recorded in changeover log														
16	Underhead Runout	0.28 mm to A		YS	Other	Gage evidence log, record 1 every two hours														
17	Underhead Thickness- gage line to face	1.57 - 1.83 mm		YS	SC	Inspect 3 consecutive pieces at the operation and xbar and R, once per shift														
18	Head Fillet Radius	5.35 - 7.35 mm		YS	Other	Tooling controlled, inspected at set up														
19	Head Back Angle 1	23 - 27 deg		YS	Other	Tooling controlled, inspected at set up														

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No	Characteristic Description	Specification & Tolerance		DFMEA Class	PFMEA Class	Process Control Method														
20	Head Back Angle 2	10 -14 deg		YS	Other	Tooling controlled, inspected at set up														
21	Stem Dia	5.430 - 5.448 mm		YS	SC	Inspect 3 consecutive pieces at the operation and xbar and R, once per shift and ring gaged 100%														
22	Stem Straightness	0.01 mm		YS	Other	Audit 15 pieces recorded in audit log														
23	Keeper Groove Location- gage line to undercut	93.79 - 94.09 mm		YS	SC	Overall length, tip to keeper groove, face to gageline will be measured at the process and recorded on xbar and R, once per shift (3 consecutive pieces). The variation of these three operations will contribute to the capability of the gage line to keeper groove. Gage line to keeper groove dimension will be measured at audit (10 pieces per pallet) and recorded on xbar and R														
24	Surface Finish	Ra 0.3 max		YS	SC	Inspect at audit 10 pieces per hour and record data														
25	Surface Finish	Rpm 1.0 max		YS	SC	Inspect at audit 10 pieces per hour and record data														
26	Tip Surface Finish	Ra 0.8 max, 0.25 cutoff		YS	Other	1 piece at 1st hour of shift record in data log														
27	Tip Runout	0.018 mm to A		YS	Other	X bar and r 10 pieces done at pre audit, record pass/fail 1 piece every hour, 5 piece set-up inspection approval														
28	Material	SAE J775 - UNSS65007		YS	Other	Material verification stem material at eddy current before tip harden op														

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Part / System Name:	INT VALVE	Ford Customer Plant:	Lima Engine Plant

Ford D & R Engineer	Signature <i>John Carter</i>	Name John Carter	e-mail JCARTER7@ford.com	Date 10/20/2016
Ford STA Engineer	Signature <i>Alfredo Gutierrez</i>	Name Alfredo Gutierrez	e-mail agutierrez87@ford.com	Date 11/02/15
Ford Craftsmanship/Sys Eng'g	Signature <i>V. Woodiwiss</i>	Name Vanessa Woodiwiss	e-mail vwoodiwiss2@ford.com	Date 10/24/15
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