

Rolls-Royce plc

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NOTICE TO SUPPLIERS

- NUMBER 162
- <u>ISSUE</u> 001
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- <u>To:</u> All suppliers of **finished gas turbine parts** receiving purchase orders through Rolls-Royce Plc. in the UK or Rolls-Royce Deutschland Ltd. & CO KG. A separate Notice (NTS 157) has been issued to cover Rolls-Royce Corporation (USA) requirements.
- **Subject:** Final Component Identification Marks Direct Part Marking. (Machine Readable Identification)

<u>Purpose</u>

- To communicate the detailed requirements for implementation and validation of Direct Part Marking.
- Previous notices issued for Direct Part Marking are NTS 103 and NTS145.

Applicable Requirements:

SABRe, Business Requirements, Section 2.7 JES 131, Identification, Marking Methods & Control (Rolls-Royce designed parts) AS 9132, Quality Requirements for 2D Data Matrix Identification (non Rolls-Royce designed parts)

ATA Spec. 2000, Chapter 9.

Applicability / Exceptions:

The requirements for Direct Part Marking are applicable to all finished parts with the following exceptions:

- Forgings and castings.
- Detail parts that are permanently fixed into higher level assemblies by processes such as welding, brazing, riveting etc.
- A part where space is limited and Direct Part Marking is not technically feasible.
- Standard Parts.
- Fasteners
- Repair & Overhaul parts (currently subject to review for potential / future incorporation).

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 Development parts which are subject to unique identification (i.e. via Development specific part numbers) which clearly distinguishes them from "production series part numbers".

Implementation Plans.

Suppliers are required to implement firm plans based upon Rolls-Royce Requirements and that of our Customers.

The general process for implementation is detailed in the DPM workbook in the attachment. Implementation plans must be submitted through your Operations Buyer. Please use the template in the attached workbook for this.

> The plan is required from all suppliers no later than 31st March 2005.

The workbook shall be used as a working tool and be regularly updated throughout the implementation phase (quarterly) to achieve timely close out.

To minimise disruption, the workbook should be managed by the supplier as a separate work stream for all parts parallel to production.

Please note, that a separate workbook will be required for parts delivered to Rolls-Royce Deutschland and for parts delivered to Rolls-Royce Plc.

Design/Make Parts

The requirement for Direct Part Marking is equally applicable to parts, where suppliers design and manufacture. The requirements apply to all Line Replaceable Units (LRUs) and all spares items.

The attached template was designed for Make to (RR)-Print parts and should be used as guidance for Design/Make parts. An implementation plan is therefore required taking into consideration the Quality and Specification System of the Design/Make supplier.

Changes to Drawing or Frozen Manufacturing Method:

Where Direct Part Marking cannot be implemented within the existing drawing requirements, e.g. location or method of marking Drawing Alteration Requests (DARs) shall be raised. Implementation may then only proceed after approval of the changed drawing.

For classified parts consideration shall be given to the need for a Manufacturing Change Request (MCR). MCR action is not required unless there is a change of method for the marking process e.g. from dot peen to laser that is not currently allowed for by the component definition.

Validation:

As part of the implementation of Direct Part Marking the part marking shall be inspected against:

- The criteria for "Geometry" in accordance with JES 131 / AS 9132, which you also find summarised in the workbook. All geometry inspection may be performed by manual inspection methods. Magnification of at least X10 is recommended.

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- The data content shall be checked with a reading device and shall be in line with ISO 15434 (as JES 131) syntax requirements

Good quality digital photos shall be used to provide evidence. To simplify the validation work, validation may be conducted for a family of parts as defined in the workbook.

Suppliers shall use the workbook also as the proof of quality acceptance. The columns for geometry and content must be filled in with "Yes" when the required level is achieved. The Rolls-Royce Product Technical Controller team will monitor the implementation plans and be responsible for any Rolls-Royce approvals.

When the implementation plan is completed then this must be submitted with a FAIR Front sheet as proof of quality acceptance across the complete range of parts listed. Please ensure that you use the correct MFR (Manufacturer) Code ; this code may be different depending where the design authority lies for a specific project. Consult Rolls-Royce for any details required.

Direct Part Marking is a Rolls-Royce Customer requirement and is therefore mandatory. Failure to comply with this requirement will seriously impact Rolls-Royce's ability to deliver to our customers.

Jeus Hopken

Jens Höepken Head of Supplier Quality Rolls-Royce Deutschland

Signatures: John Calder Director Supplier Quality & Product Technical Rolls-Royce Plc.

Attachment: Rolls-Royce Direct Part Marking Implementation Workbook

Comment or further clarification can be obtained from: Nat Russhard. Team Leader - Direct Part Marking. Manufacturing Technology. Tel +44 (0)1332 2 40209 Fax +44 (0)1332 2 43530 Mobile : 07788 497398 Mail Code : TBF-2 e-mail : nat.russhard@rolls-royce.com

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Direct Part Marking Implementation Workbook

specific to a supplier and specifc to a RR Customer area (either RR Deutschland or RR Plc.)



Rolls-Royce

Comment Review NTS & DPM workbook Create or update implementation plan as per DPM workbook with regular updates to RR (quarterly) Identify in the plan per P/N if DAR or MCR action is required. Submit plan to RR also if DAR required Wait for RR approval before implementation for affected P/Ns RR approval of plan is trigger to implement DPM Where plan is approved and any required DARs or MCRs are approved parts shall be marked with DPM Supplier will inspect DPM to JES131 for geometry and content (Consult RR for correct MFR code) Ship parts with DPM marking (waiting for Step 9 is not required) RR will review and approve the supplier's DPM workbook on a part number level. When the DPM activity for the supplier is complete a Summary Partial FAIR sheet shall be signed by both the supplier and RR with the workbook as supporting evidence.

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Direct Part Marking Template

		<u>Sup</u>	plier:										Rolls-Roy	<u>/ce:</u>				
Supplier Name	e:]			
RR Supplier Code	e:								Telephone:									
DPM Owner at su	ipplier:								e-mail:]				
Telephone:									PTC / SQE]			
e-mail:									Telephone:]		
RR Customer Are	a								e-mail:]			
RR Authorisation	n to proceed with the	implemen	itation	of Direct	part Mar	king as pe	er the plan belo	w.				Last	undat	od by				
	RR Authorisation to proceed with the implementation of Direct part Marking as per the plan below. Note: Where MCR or DAR activity is required, the marking method may only be changed after RR									Last updated by Comments:								
approval of the M RR PTC / SQE:	MCR or the drawing.	Name:				Date:				Name:		Date:						
This plan shall be	kept up to date for the Initial Agreement:			implemer 1st up		a supplier. June 05	Regular updates	s are essential to 2nd update:	manage the pro Sep-05		effectively to 3rd update:		load at the	e end of the year.				
											Verification & Approval							
					Plan													
Part No.	Part Discription	DPM applicable	Part family	Part classific	MCR	Source Change	Method of current ident	Method for DPM	DPM to DWG requirement	DAR action	planned date	Supplier V Confire		Verification & Verification Reference	Approval RR Final APP	ROVAL		
Part No.		applicable		classific	MCR action	Change			requirement	action		Confire Geometry check ok	mation Content check ok	Verification		ROVAL Date		
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Part No. XYZ	Discription	applicable Y/N	family	classific C/S/U	MCR action Y/N	Change Y/N	current ident	DPM	requirement Y/N	action Y/N	date	Confirm Geometry check ok (Y/N)	mation Content check ok (Y / N)	Verification Reference e.g. Photo	RR Final APP Name	Date		
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Provide a sample of the DPM Content in man readable format, including MFR Code, Serial Number where applicable and the SPL code: (Note: the MFR code shall represent the relevant type certificate holder for the part/project. Please take advice from RR for correct code, which may be different per project)

Applicability

Machine Readable Identification will apply to engine items across all
Gas Turbine applications.
Exceptions to this are:
 Castings, forgings and raw material. This product will normally undergo further manufacturing processes and will change part number.
2) National Standard parts.
3) Fasteners.
4) Detailed parts, permanently fixed into assemblies
5) Parts that by the nature of their geometry do not allow for machine readable identification. It is important to review the drawing alteration route and study the identification abreviations provided in JES 131.
6) Repair & Overhaul parts (currently subject to review for potential / future incorporation).
7) Development parts which are subject to unique identification (i.e. via Development specific part numbers), which clearly distinguishes them from "production series part numbers".

DPM Part Families

Approval by parts family should be sought to minimise unnecessary validation Part families can be formed around the following criteria

1) Marking equipment is the same.

2) Holding equipment or fixture are the same.

3) Marking content is similar. Part number will vary but layout and format should be the same.

4) Electrolyte fluid is the same. (ECE only)

5) Parameters / settings are the same. Includes power, time, force, set off distance etc.

6) Component material is the same or similar.

7) Similar Geometry.

8) Similar Hardness.

Quality Acceptance Criteria

The following criteria must be met for quality acceptance for each part family.
The controlling document is JES 131 or AS9132.
 Angle of Distortion. Angular deviation between row and column must not exceed 7 degrees.
Alignment The alignment of rows, columns and dots must not exceed 20% of the module / cell size.
Dot Geometry / module fill The size of dot or module fill must be within the range of 60% to 110% of module size.
Contrast Surface contrast must be minimised wherever possible. Staining must be reduced or removed. On laser and electro chemi etch marking the foreground and background must not exceed 20% as a grey scale density.
Data Content Data content can only be checked with a reading device. Data content must be in line with ISO 15434 (as JES 131) syntax requirements.
All geometry inspection may be performed by manual inspection methods. Magnification of at least X10 is recommended.
Compliance to the above is mandatory to satisfy the quality acceptance

for machine-readable identification.

Help and Guidance

on any issues related to Direct Part Marking

e.g. methods, applicability, suppliers of equipment, technical solutions etc.

can be obtained from the central Rolls-Royce Direct Part Marking Team:

Nat Russhard.

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