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Rolls-Royce

P U B L I C A T I O N T R A N S M I T T A L

The technical information contained in this document has been approved under the authority of – See Planning Information, Approval.

Date Mar.22/16

RB211 TRENT 900 SERIES PROPULSION SYSTEMS SERVICE BULLETIN

Printed in Great Britain

This document transmits the Initial Issue of Service Bulletin RB211-72-J055 and the Initial Issue of the Supplement

Bulletin Initial Issue

Remove	Incorporate	Reason for change
	Pages 1 to 11 of the Service Bulletin	Initial Issue

Supplement Initial Issue

Remove	Incorporate	Reason for change
	Page 1	Initial Issue

CHECK THAT ALL PREVIOUS TRANSMITTALS HAVE BEEN INCORPORATED
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LIST OF EFFECTIVE PAGES

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1		Mar.22/16

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ENGINE - EXHAUST CASE - INTRODUCTION OF AN LP TURBINE EXHAUST CASE AND SUPPORT ASSEMBLY WITH INCREASED STRENGTH CAPABILITY - MOD.72-J055

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1. Planning Information

A. Effectivity

Airbus A380

RB211 TRENT970-84 Engines prior to Serial No.91409 excluding 91405 to 91407.

RB211 TRENT972-84 Engines prior to Serial No.91409 excluding 91405 to 91407.

RB211 TRENT900 SE100006, SE100444, SE100560, SE100562, SE100563, SE100577, SE100578, SE100767, SE100768, SE100802, SE100803, SE100804, SE100828, SE100829, SE100830, SE100831, SE100832, SE100885, SE100886, SE100887, SE100888, SE100889, SE100897, SE100898, SE100899, SE100900, SE100904, SE100905, SE100906, SE100907, SE100909, SE100910, SE100924 and SE100925 Core Engines.

RB211 TRENT900 M08100014, M08100443 and M08100911 M52 Modules.

B. Concurrent Requirements

None.

C. Reason

(1) Problem

The LP turbine exhaust case and support assembly can suffer premature cracking at the radius of the leading edge of vanes 1 and 14. The problem is attributed to Low Cycle Fatigue (LCF) as a result of the thermo-mechanical loads experienced during the flight cycle. Engineering analysis has established that there are differences between the actual loads compared to the predicted loads used during the original determination of fatigue life.

The Non Destructive Test (NDT) inspection process used at the manufacturer may not detect all cracks in the welds of the turbine exhaust case and support assembly. Cracks may subsequently be found during metallurgical analysis of the component.

The outer skin stiffeners, located on the top of the turbine exhaust case and support assembly, may be susceptible to cracking in the fillet weld. The problem is attributed to insufficient contact between the end corners of the stiffeners and the base material of the case assembly, during the welding process. Consequently, a lack of full weld penetration may occur.

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Design best practice is to minimise the risk of contaminating critical parts with silver residue. Engineering evaluation has determined that there is a possibility of cross-contamination of silver onto the LP turbine disc assembly, which is located forward of the baffle plate. The disc is a critical part. The problem is attributed to self-locking plate nuts, which contain silver plating, located on the front of the baffle plate on the front inner support cone of the exhaust case and support assembly. Cross-contamination may occur during assembly and overhaul activities.

(2) Evidence

The problem of cracking has been identified during in-service Fluorescent Penetrant Inspections (FPI) and subsequent laboratory examination of sample components.

(3) Substantiation

The changes introduced by this modification have been the subject of satisfactory engineering evaluation, including stress and thermal analysis, using revised modelling methods. Analysis of the revised design has shown that the outer skin stiffeners are not required to demonstrate the buckling capability of the LP turbine exhaust case and support assembly.

The results of the thermal modelling assessment verifies in-service and development engine testing data.

The results of new thermal analysis, conducted by specialists at the manufacturer, support the results of the stress analysis.

Furthermore, the accuracy of the revised modelling techniques has been cross-validated. Examination of in-service components, found to be cracked following the FPI, has taken place. Comparison with the predicted cracking from the revised modelling methods confirms the modelling reflects actual cracking experienced during in-service operations.

(4) Objective

Incorporation of this Service Bulletin (Modification) is designed to maintain reliability.

(5) Effect of Bulletin on:

(a) Operation

Not affected.

(b) Maintenance

Not affected.

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(c) Overhaul

Affected (See 1.L Other Publications Affected).

(d) Repair Schemes

Affected (affected Repair Schemes will be revised to include the part(s) introduced by this Service Bulletin).

(e) Interchangeability

Affected (See 1.M. Interchangeability of Parts).

D. Description

(1) This Service Bulletin introduces a revised LP Turbine exhaust case and support assembly with changes to increase strength capability:

The changes are:

(a) A revised LP turbine exhaust case and support assembly is introduced similar to the existing item except for:

(i) A revised machined profile in the engine mounting lugs.

(ii) The forward outer annulus is thickened locally over a sector spanning the mount lugs and run outs.

(iii) A chamfer is included on the male catcher in order to increase axial clearance with the aircraft mounting system.

(iv) Deletion of the four stiffener ribs on the outer skin.

(v) Standard rivets are introduced as an alternative option for attaching the floating nuts of the tail bearing housing snubber flange to facilate supply.

(vi) Scalloping is introduced on the rear inner flange, that provides support for the exhaust cone.

(vii) Inspection capability has been improved at the manufacturer for detectability of welding defects.

(viii) A revised orientation of scallops on the inner ring cone to reduce local stress.

(b) A revised air baffle is introduced similar to the existing item except for the deletion of sixteen anchor nut plates and thirty-two rivets.

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(c) The orientation of the existing sixteen air baffle attaching bolts is reversed such that the bolt head is located in the LP turbine disc cavity, in the forward engine axis attitude.

(d) Sixteen self-locking bi-hexagonal nuts and washers are introduced to replace the deleted anchor nuts as described in (b) above.

(2) This Service Bulletin is in two parts as follows:

(a) Part 1

New production and in service applications.

(b) Part 2

Reserved for possible future use.

E. Compliance

(1) ON-WING

Not applicable

(2) IN-SHOP

OPTIONAL

This Service Bulletin introduces new parts that should be used when stocks of the pre-Service Bulletin parts have been used up and/or when the part involved requires renewal because of its condition.

F. Approval

The technical content of Modification 72-J055 was approved by a representative of the European Aviation Safety Agency (EASA) on Jan.13/16, EASA certificate No.EASA.C.10056268.

The technical content under the JAR 25 regulation of this document is approved under the authority of DOA ref. EASA.21J.031.

G. Manpower

(1) On-wing

Not applicable

(2) In-shop

Not affected

NOTE: The parts affected by this Service Bulletin are accessible in-shop.

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H. Material Price and Availability

Modification kit not required; parts supplied as single line items.

For prices and availability of future spares see supplement to this bulletin.

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I. Tooling Price and Availability

Special tools are not required.

J. Weight and Balance

(1) Weight change:

Plus 3,67 kg (8.1 lb)

(2) Moment arm:

2786 mm (109.7 in.) rearwards

(3) Datum:

Power Plant Station (PPS) 100

K. References

(1) This Service Bulletin is subject to aircraft Modification No. 75654 T85541 (classified minor).

(2) Engine Manual, 72-52-50, Assembly and Disassembly.

L. Other Publications Affected

(1) For effect on Illustrated Parts Catalogue (IPC) see 2. Material Information.

(2) Engine Manual, 72-52-50, Assembly and Disassembly.

(3) Cleaning, Inspection and Repair Manual, 72-52-51, Clean and Examine the Remaining Parts.

M. Interchangeability of Parts

It is essential that items within Part 1 are fitted as a set.

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2. Material Information

A. The kit required consists of the following parts:

None

B. Parts to be reworked:

None

C. New production parts:

The following parts will be made available as future spares:

All Engines, Core Engines and Modules

72-52-51

Part 1 of SB

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
03140	KH52692	1	Baffle, air	QRW	FW25495	(1)
03143	AS12944	16	Washer, flat, csk (0.250 in. dia)	EBY	-	(2)
03144	AS20625	16	Nut, self-locking, bihex (0.250 in. dia)	EAR ECL		(2)
03300	KH45091	1	Case and Support Assy		FW51434	(1)
03523	NAS1399C3A3	56	Rivet, blind, 100 deg csk		-	(3) (5)

D. Redundant parts:

All Engines, Core Engines and Modules

72-52-51

Part 1 of SB

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FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
03148	AS46726	16	Nut, self-locking, plate (0.250 in. dia)	EAR		(6) (7)
03146	AS16646	32	Rivet, solid, csk head		-	(6) (7)

E. Other affected parts:

All Engines, Core Engines and Modules

72-52-51

Part 1 of SB

FIG ITEM NO.	NEW PART NO.	QTY	PART TITLE	MAT	OLD PART NO.	INSTR DISP
03141	AS48512	16	Bolt, bihex hd	QZK	AS48512	(4)

F. Instruction disposition codes:

(1) Not Interchangeable. The new part must not be replaced by the old part in isolation, and the old part must not be replaced by the new part in isolation.

(2) Additional.

(3) Alternative to part number CR2672-3-03 and AS16648.

(4) Part re-orientated.

(5) Sub assembly item, part of case and support assy located at 72-52-51-03-300

(6) Old part may be used up on other applications.

(7) Redundant sub-assembly item, previously part of case, and support assy located at 72-52-51-03-300.

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3. Accomplishment Instructions

A. The revised LP turbine exhaust case and support assembly and the revised air baffle introduced by this Service Bulletin are interchangeable with the existing items only as a complete modification set (see 1.M. Interchangeability of Parts). Remove the existing items in accordance with part B. of these Accomplishment Instructions. Install the new items in accordance with part C. of these Accomplishment Instructions.

B. Disassemble the LP turbine exhaust case and support assembly in accordance with Engine Manual Task 72-52-50-040-801

C. Assemble the LP turbine exhaust case and support assembly in accordance with Engine Manual Task 72-52-50-440-801, except use the following procedure to assemble the air baffle (72-52-51,03-140) in the LP turbine exhaust case and support assembly, in place of Subtask 72-52-50-440-020

(1) Refer to Fig.3

(2) Put the air baffle (72-52-51, 03-140) in the correct position in the LP turbine exhaust case and support assembly (72-52-51, Fig./Item 03-300), aligning the offset attachment holes in each component, see Note, below.

NOTE: The offset attachment holes (positioning features) are located at the 6 o'clock (BDC) position

(3) Install the bolts (72-52-51, 03-142), 28 off and install the washers (72-52-51, 03-143) 16 off, the bolts (72-52-51, 03-141) 16 off and the nuts (72-52-51, Fig./Item 31-144) 16 off, to attach the air baffle (72-52-51, 03-140) to the LP turbine exhaust case and support assembly (72-52-51, 03-300).

(4) Torque tighten the bolts (72-52-51, Fig./Item 03-142) 28 off, to 4,5 Nm (40 lbf.in.).

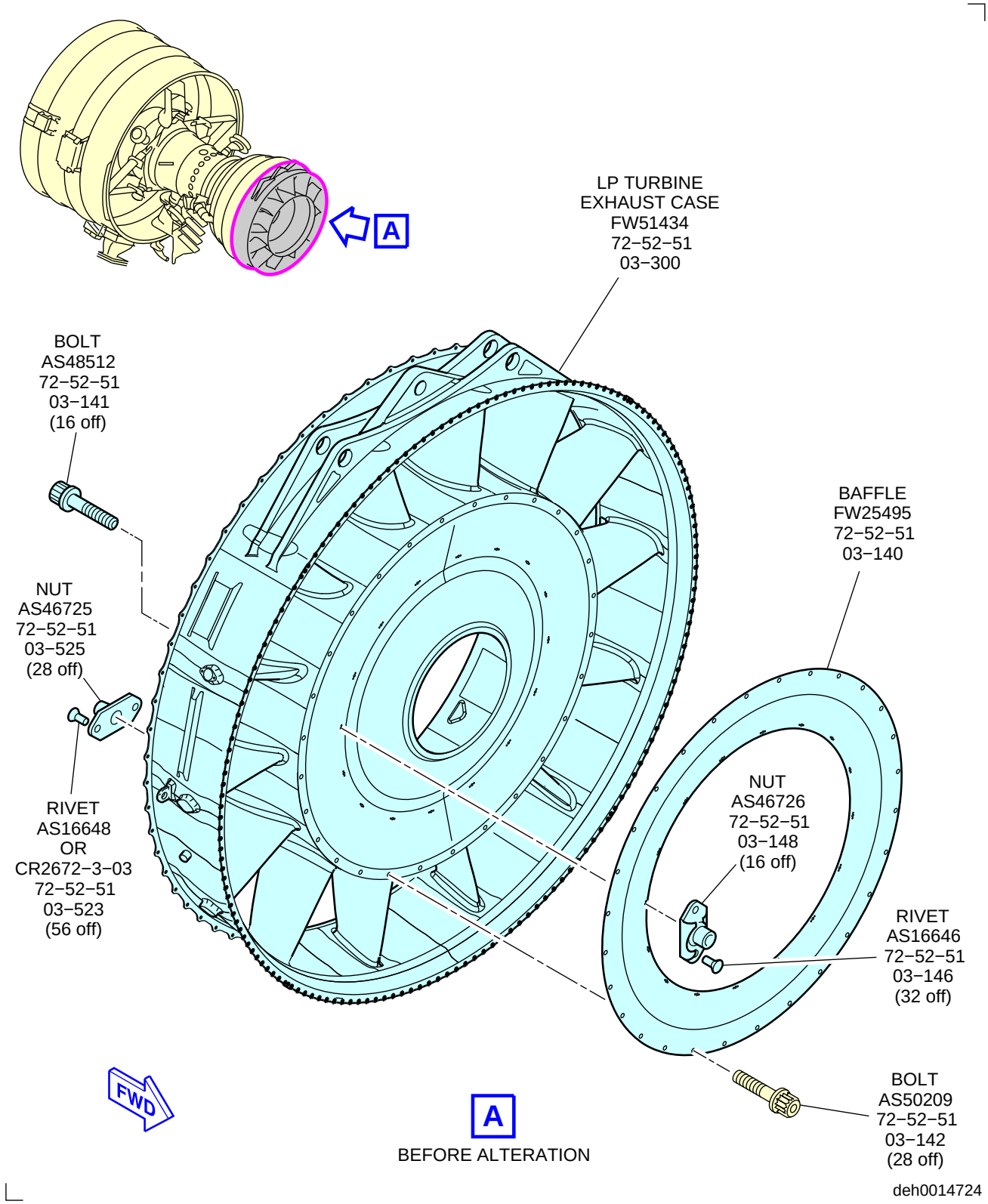
(5) Torque tighten the nuts (72-52-51, Fig./Item 03-144) 16 off to 11,5 Nm (100 lbf.in.).

D. A record of accomplishment is required when this modification has been embodied. The modification number and relevant modification part(s) shall be recorded in the engine log book when the modification part is fitted in its entirety.

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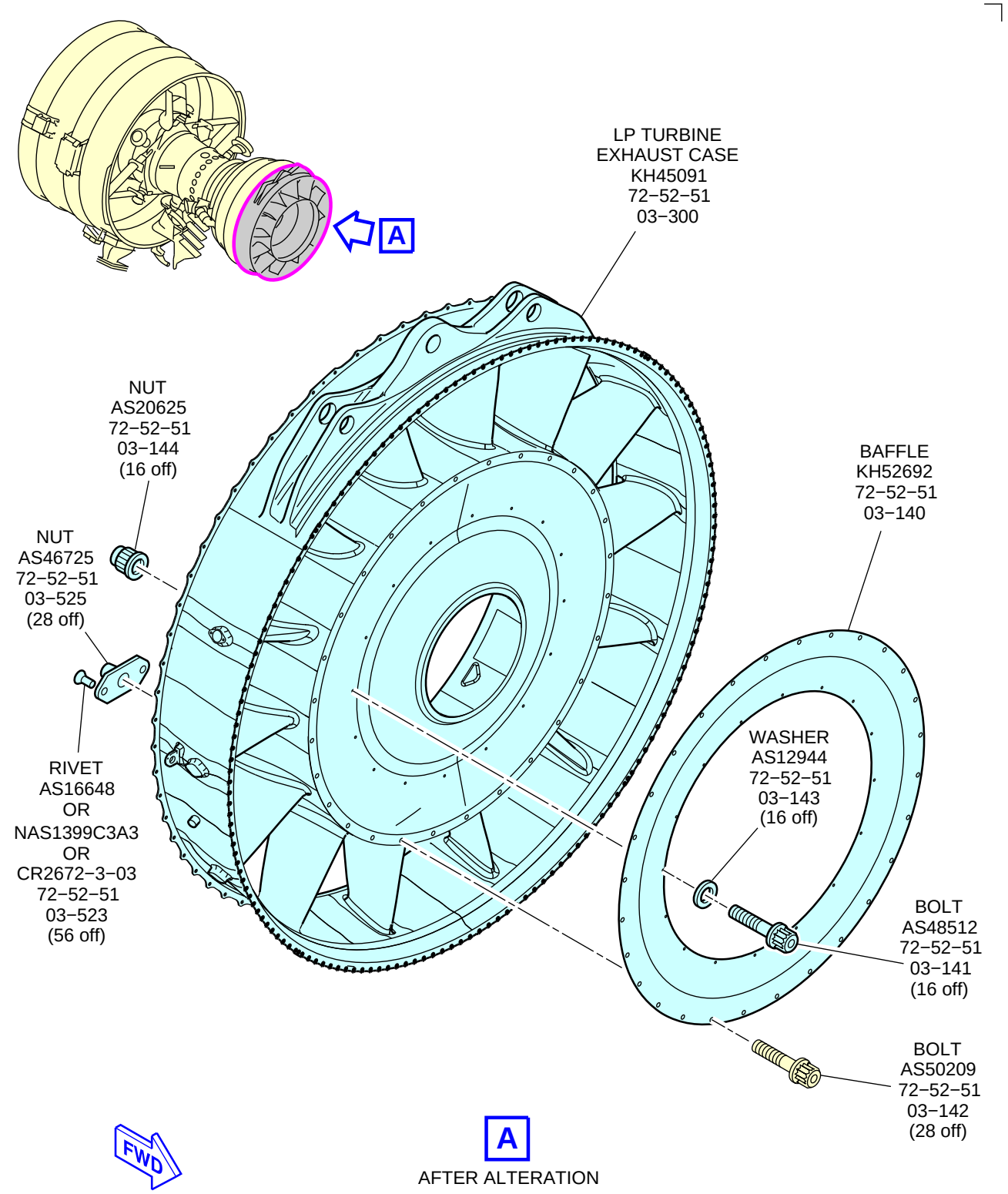
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LP turbine exhaust case and support assembly - Before alteration
Fig.1

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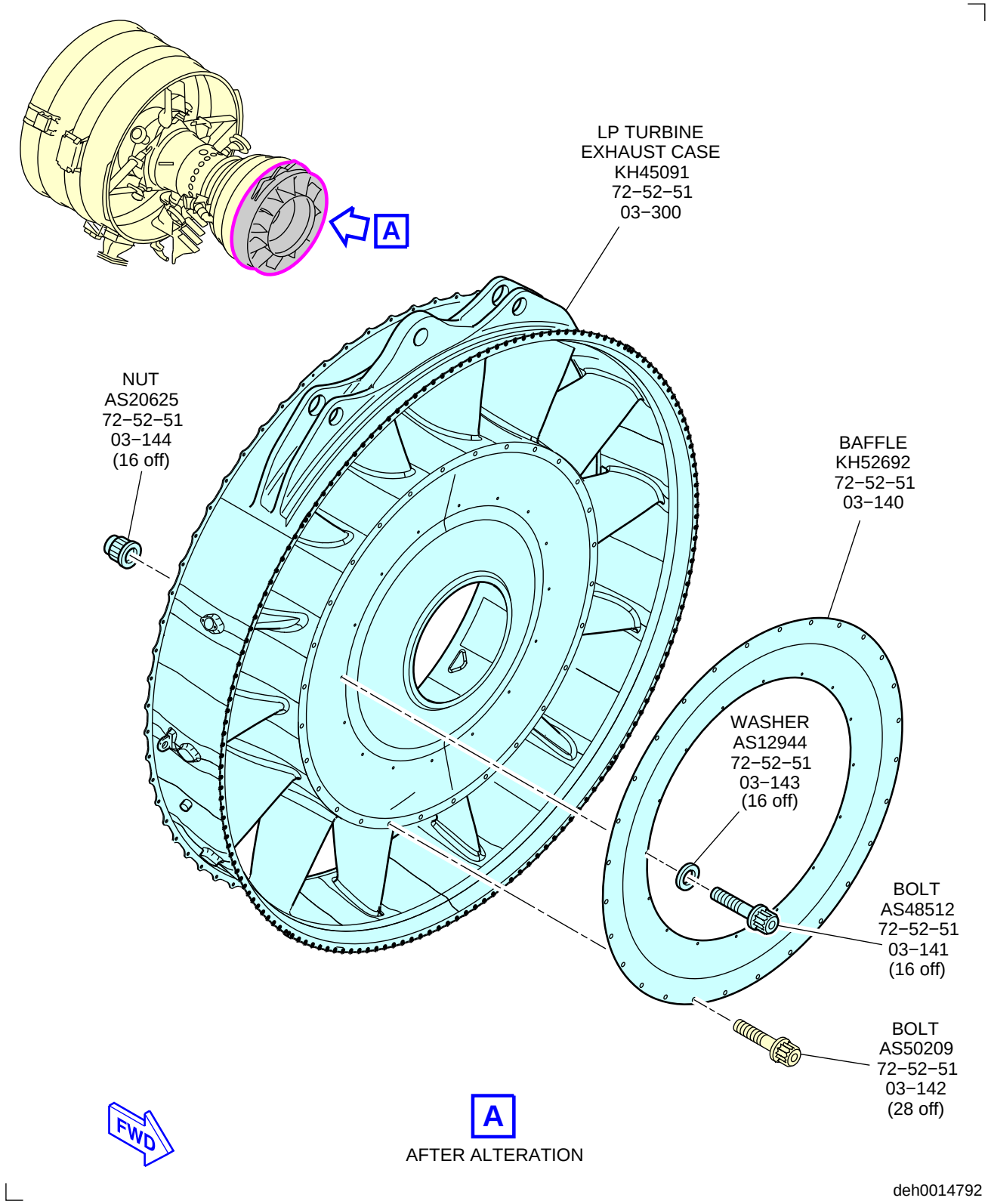


LP turbine exhaust case and support assembly - After alteration
Fig.2

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LP turbine exhaust case and support assembly - Install air baffle
Fig.3

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SUPPLEMENT - PRICES AND AVAILABILITY

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This is a technical document not a quotation; any prices and delivery given are in good faith without engagement.

Alternative parts may be supplied instead of parts listed. See Material Information disposition instructions.

1. Modification Kit

Modification kit is not required; parts supplied as single line items.

2. Parts required to accomplish this Service Bulletin:

Part No	Qty	Unit Price U.S. Dollars
AS12944	16	Price to be supplied on request
AS20625	16	Price to be supplied on request
KH45091	1	Price to be supplied on request
KH52692	1	Price to be supplied on request
NAS1399C3A3	56	Price to be supplied on request (see Note)

NOTE: NAS1399C3A3 is an alternative to existing part AS16648

3. Tools:

None

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