SERVICE BULLETIN REVISION NOTICE

ENGINE — HIGH PRESSURE (HP) COMPRESSOR STAGE 6 STATOR VANES — ONE-OFF IN-SHOP INSPECTION PROCEDURE — NON-MODIFICATION SERVICE BULLETIN

Turbojet Engine Service Bulletin No. V2500-ENG-72-0528 Revision No. 3 dated May 14, 2021.

Revision History

Original Issue August 8, 2006

Revision 1 dated October 20, 2006

Revision 2 dated January 10, 2007

Revision 3 dated May 14, 2021

Reason for the Revision

Cancellation of this Non-Modification Service Bulletin.

This is a Complete Revision (Not Applicable to the SGML version)

The format of this Service Bulletin has been changed from previous versions. This revision shows flow bars and the revision date on the bottom of every page. Technical changes incorporated in this revision are marked with revision bars. The contents are in accordance with the list of effective pages.

MODEL APPLICATION

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5

BULLETIN ISSUE SEQUENCE

V2500 Series 72-0528

Page	Revision No.	Date
1 thru 19	3	May 14/21

A copy of this Revision Notice and any future revision notices must be filed as a permanent record with your copy of the subject bulletin.

SERVICE BULLETIN

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MODEL APPLICATION

V2522-A5, V2524-A5, V2527-A5, V2527E-A5, V2527M-A5, V2530-A5, V2533-A5, V2525-D5, V2528-D5

BULLETIN ISSUE SEQUENCE

V2500 Series 72-0528

ATA NUMBER

72-41-22

Compliance Category

4

IAE Distribution Code

V2500

Summary

The purpose of this Non-Modification Service Bulletin (NMSB) is to introduce a high sensitivity Fluorescent Penetrant Inspection (FPI) for HP compressor stage 6 stator vanes which has to be done in addition to the inspection in Reference 4 or 5, Engine Manual, Chapter 72-41-22, Task 72-41-22-200-006-B00.

The content of this NMSB is hereby cancelled. This NMSB has been complied with 146 engines out of 194 affected active engines. The remaining 48 engines have not conclusively complied with this NMSB. The remaining suspect vanes population is not serialized, therefore they are not traceable. It has now been determined that the instructions to do a high sensitivity Fluorescent Penetrant Inspection (FPI) for all engines in addition to the inspection in Reference 4 or 5, Engine Manual, Chapter/Section 72-41-22, Task 72-41-22-200-006-B00 is not mandatory.

Planning Information

Effectivity Data

Engine Models Applicable

1. V2500-A5 Engines

   A. For the affected engine serial numbers refer to the tables in item 3 below.

2. V2500-D5 Engines

   A. For the affected engine serial numbers refer to the tables in item 3 below.

3. Affected engine serial numbers:

   POPULATION A ENGINES

Engine Serial Numbers:

V11786	V11806	V11821
V11788	V11807	V11823
V11790	V11808	V11825
V11792	V11809	V11827
V11794	V11810	V11828
V11796	V11811	V11829
V11798	V11812	V11830
V11800	V11813	V11831
V11802	V11815	V11832
V11804	V11817	V11833
V11805	V11819	

POPULATION B ENGINES

Engine Serial Numbers:

V10374	V11929	V12014
V11814	V11931	V12015
V11824	V11941	V12019
V11841	V11943	V12021
V11847	V11944	V12023
V11850	V11947	V12025
V11858	V11948	V12028
V11860	V11950	V12029
V11861	V11961	V12032
V11866	V11967	V12035
V11868	V11969	V12041
V11869	V11970	V12042
V11871	V11971	V12043
V11872	V11972	V12045
V11877	V11979	V12047
V11884	V11981	V12050
V11885	V11983	V12051
V11887	V11984	V12053
V11900	V11986	V12057
V11901	V11987	V12060
V11902	V11990	V12064
V11903	V11994	V12065
V11904	V11996	V12066
V11907	V11998	V12073
V11908	V11999	V12075
V11913	V12001	V12079
V11916	V12003	V12081
V11917	V12005	V12085
V11918	V12006	V12087
V11919	V12008	V12089
V11922	V12010	V12093
V11924	V12011	
V11926	V12012	

AFTERMARKET POPULATION ENGINES

Engine Serial Numbers:

V10017	V10470	V20007
V10019	V10488	V20037
V10020	V10494	V20040
V10025	V10499	V20043
V10044	V10501	V20056
V10049	V10564	V20058
V10058	V10592	V20067
V10060	V10602	V20096
V10061	V10611	V20104
V10064	V10621	V20129
V10065	V10644	V20150
V10090	V10660	V20151
V10113	V10666	V20154
V10115	V10672	V20165
V10117	V10701	V20171
V10134	V10712	V20184
V10145	V10726	V20188
V10146	V10746	V20212
V10147	V10748	V20218
V10165	V10763	V20228
V10169	V10798	V20239
V10216	V10814	V20249
V10272	V10844	V20262
V10281	V10866	V20265
V10295	V10873	V20268
V10305	V10879	V20270
V10307	V10927	V20273
V10311	V10978	V20275
V10326	V10992	
V10403	V11296	

Concurrent Requirements

There are no concurrent requirements.

Reason

1. Five High Pressure (HP) compressor stage 6 stator vane fractures have occurred leading to five engine events. Following an extensive quality investigation it has been determined that a certain number of HP compressor stage 6 stator vanes produced in August/September 2004 have been affected during manufacture. The defect manifests itself as a crack or feature on the Trailing Edge (TE) of the HP compressor stage 6 stator vane.

   The affected engines listed in Effectivity item 3 have been categorized into three populations as follows:

   A. POPULATION A ENGINES

      HP compressor stage 6 stator vanes packed as kits and sent to module build to support production engines. These engines have the highest likelihood of an event since all the vanes were produced in the suspect period. All the engine events related to the fracture of HP compressor state 6 stator vane belong to this population. All the engines from this population have had or will have the HP compressor stage 6 stator vanes removed.

   B. POPULATION B ENGINES

      This population includes new production engines that received a limited number of HP compressor stage 6 stator vanes from the suspect batch, in order to meet the circumferential gap requirements. IAE does not recommend the removal of population B engines due to the low calculated likelihood of an event in this population. IAE recommends the engines in this category remain in-service until the next scheduled overhaul shop visit.

   C. AFTERMARKET POPULATION ENGINES

      A specific number of HP compressor stage 6 stator vanes were sold as spare parts to the aftermarket. Engines that received HP compressor stage 6 stator vanes from the suspect batch have been traced.

Description

The purpose of this Non-Modification Service Bulletin is to introduce a high sensitivity Fluorescent Penetrant Inspection (FPI) for HP compressor stage 6 stator vanes which has to be done in addition to the inspection in Reference 4 or 5, Engine Manual, Chapter 72-41-22, Task 72-41-22-200-006-B00.

Compliance

Category 4

Accomplish the FPI in addition to the inspection in Reference 4 or 5, Engine Manual, Chapter 72-41-22, Task 72-41-22-200-006-B00 on the affected engines listed in Effectivity item 3 at the next overhaul shop visit.

Engines listed in Effectivity item 3 that have already been at overhaul and the suspect HP compressor stage 6 stator vanes have been re-installed following the inspection instructed in this NMSB or have been replaced with new HP compressor stage 6 stator vanes comply with this NMSB. In this case, this Non-Modification Service Bulletin has to be recorded into the engine log book.

NOTE: The FPI must only be performed by suitably qualified persons who have received specialist training in the use of this technique and to the appropriate national standard (EN4179, NAS 410 or equivalent) at level 2 or higher. The inspector must have inspected a test set of HP compressor stage 6 stator vanes, issued by IAE, and successfully identified the cracked HP compressor stage 6 stator vanes.

The content of this NMSB is hereby cancelled. This NMSB has been complied with 146 engines out of 194 affected active engines. The remaining 48 engines have not conclusively complied with this NMSB. The remaining suspect vanes population is not serialized, therefore they are not traceable. It has now been determined that the instructions to do a high sensitivity Fluorescent Penetrant Inspection (FPI) for all engines in addition to the inspection in Reference 4 or 5, Engine Manual, Chapter/Section 72-41-22, Task 72-41-22-200-006-B00 is not mandatory.

Approval Data

The compliance statement in the Compliance Section and the inspection instructions in the Accomplishment Instructions Section of this NMSB comply with the Federal Aviation Regulations and are FAA-approved for the engine model listed.

Manpower

1. In Service

   ..... Not Applicable.

2. At Overhaul

   .....8 Hours.

Weight and Balance

1. Weight Change

   None.

2. Moment Arm

   No Effect.

3. Datum

   Engine Front Mount Centerline (Power Plant Station (PPS) 100)

Electrical Load Data

This Service Bulletin has no effect on the aircraft electrical load.

Software Accomplishment Summary

Not Applicable.

References

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received

new P&W part numbers. To facilitate the use of this Service Bulletin, a Technical Publications conversion table is provided in the Appendix.

1. ATA Locator — 72-41-22.
2. Internal Reference No. — Engineering Change No. 06VR897A and 06VR897B.
3. V2500 Standard Practices and Processes, P&W Ref. PN 2A4414, Chapter/Section 70-09-00, 70-11-16, 70-21-00, and 70-23-04.
4. V2500 A1/A5 Series Engine Manual, P&W Ref. PN 2A4407, Chapter/Section 72-41-22, Inspection/Check.
5. V2500-D5 Series Engine Manual, P&W Ref. PN 2A4416, Chapter/Section 72-41-22, Inspection/Check.
6. V2500 Overhaul Processes and Consumable Index, Section 06.

Other Publications Affected

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received new P&W part numbers. To facilitate the use of this Service Bulletin, a Technical Publications conversion table is provided in the Appendix.

1. V2500-A5 Series Illustrated Parts Catalog, P&W Ref. PN 2A4428, Chapter/Section 72-41-22.

Information in the Appendix

Alternate Accomplishment Instructions (No)

Progression Charts (No)

Added Data (Yes)

Revision to Table of Limits (No)

Inspection Procedures (No)

Interchangeability of Parts

None.

Material Information

Material — Price and Availability

1. The incorporation of this NMSB is free of charge.

Industry Support Program

Not Applicable.

The material data that follows is for each engine.

Parts to be replaced:

New PN	Qty	Estimate of Unit Price ($)	Keyword	Old PN	Instructions — Disposition
6A7424	4 A/R	*	HP COMPRESSOR STAGE 6 STATOR VANE, STOP	6A7424 (72-41-22-01-350)	(S1)
6A7423C01	60 A/R	*	HP COMPRESSOR STAGE 6 STATOR VANE, NOMINAL	6A7423C01 (72-41-22-01-400)	(S1)
			OR		
6A7423C01	60 A/R	*	HP COMPRESSOR STAGE 6 STATOR VANE, NOMINAL	6A7423C01 (72-41-22-01-448)	(S1)
6A7423C02	20 A/R	*	HP COMPRESSOR STAGE 6 STATOR VANE, UNDERSIZE	6A7423C02 (72-41-22-01-450)	(S1)

Modification and Spares Information

Parts Modification Conditions

Estimated part prices are provided when they are available at time of publication. The Estimate of Unit Price is only for planning purposes and does not constitute a firm quotation. An asterisk (*) is shown where part pricing information was unavailable. In either case, contact IAE Spares for firm quotations.

Spare Parts Availability

(S1) The required quantity of the part to be replace based upon the inspection results which have been found out during the inspection instructed in the Non-Modification Service Bulletin.

Tooling — Price and Availability

UV illumination from quartz or liquid light guide and high intensity UV source (UV light intensity to be a minimum of 5000 mWcm-2.

Other Material Information Data

Not Applicable.

Accomplishment Instructions

1. Inspection Instructions

NOTE: It is assumed that the High Pressure (HP) compressor is disassembled to have access to the HP compressor stage 6 stator vanes.

NOTE: The Fluorescent Penetrant Inspection (FPI) must only be performed by suitably qualified persons who have received specialist training in the use of this technique and to the appropriate national standard (EN4179, NAS 410 or equivalent) at level 2 or higher. The inspector must have inspected a test set of HP compressor stage 6 stator vanes, issued by IAE, and successfully identified the cracked HP compressor stage 6 stator vanes.

A. General

(1) Obey all the WARNINGS and CAUTIONS in the procedures that are referred to.

(2) Consumable Materials

(a) Refer to the table that follows:

COMAT NO.	DESIGNATION
06-022	Fluorescent Penetrant

(b) For the details of the consumable materials given in the table above refer to the Overhaul Processes and Consumables Index.

(3) Tools and Equipment

(a) Refer to the table that follows:

REFERENCE	DESIGNATION
No Specific	UV illumination from quartz or liquid light guide and high intensity UV source (UV light intensity to be minimum of 5000 mWcm-2)

(b) For further tools and equipment refer also to the related Manual tasks given in the instructions.

(4) Refer to Reference 3, Standard Practices/Processes Manual, Chapter 70-11-16, Task 70-11-16-300-503 to clean engine parts.

B. Do the FPI of the HP compressor stage 6 stator vanes (Refer to Reference 3, Standard Practices/Processes Manual, Chapter 70-23-04, Task 70-23-04-230-501).

NOTE: The FPI must be done in addition to the inspection given in Reference 4 or 5, Engine Manual, Chapter 72-41-22, Task 72-41-22-200-006-B00.

NOTE: Oven dry the HP compressor stage 6 stator vanes at 248 deg F (120 deg C).

NOTE: The fluorescent penetrant (CoMat 06-022) contact time must be 30 minutes while the emulsification must be one minute. This is important as some cracks may be small and will need longer for the fluorescent penetrant (CoMat 06-022) to enter the crack. Longer than one minute could result in removing most of the fluorescent penetrant (CoMat 06–022) in bigger cracks. To achieve the tightened process parameters care must be taken to ensure the processing times are met.

C. Do a visual inspection of the HP compressor 6 stator vanes. See Figure 1.

(1) Visually examine with 20x magnification each HP compressor stage 6 stator vane up to 0.4 in. (10.16 mm) from the platform radius directly down onto the Trailing Edge (TE) using an UV illumination from quartz or liquid light guide and high sensitivity UV source. The area to be inspected must be also viewed from the concave and convex flank of the HP compressor stage 6 stator vane.

NOTE: The UV light source must be directed to the area of the HP compressor stage 6 stator vanes to be inspected and held stable. The light intensity must meet the minimum requirements as specified. The direction of illumination must be such that the inspection area is fully illuminated.

NOTE: The inspection area for the FPI must have protection from white light. White light must not be more than 2 footcandles (20 Lux) at the inspection area. For local inspection, the inspection area can be darkened with a black sheet.

(a) If too much background fluorescent penetrant (CoMat 06-022) is present, repeat the FPI (step 1.B) with two minutes emulsification time.

(b) If the repeated FPI with two minutes emulsification time does not improve the inspectability, notify IAE for further proceeding.

(2) Replace any HP compressor stage 6 stator vane found with cracks or any indications of a crack by a new or inspected HP compressor stage 6 stator vane.

NOTE: The inspected replacement HP compressor stage 6 stator vane must be inspected in accordance with Reference 4 or 5, Engine Manual, Chapter 72-41-22, Task 72-41-22-200-006-B00 or in accordance with this NMSB.

D. Do a visual inspection of the HP compressor 6 stator vanes. See Figure 1.

(1) Visually examine with 20x magnification each HP compressor stage 6 stator vane up to 0.4 in (10.16 mm) from the platform radius directly down onto the TE in accordance with Reference 3, Standard Practices/Processes Manual, Chapter 70-21-00, Task 70-21-00-220-501. The area to be inspected must be also viewed from the concave and convex flank of the HP compressor stage 6 stator vane.

(2) Replace any HP compressor stage 6 stator vane found with cracks or any indications of a crack by a new or an inspected HP compressor stage 6 stator vane.

NOTE: The inspected replacement HP compressor stage 6 stator vane must be inspected in accordance with Reference 4 or 5, Engine Manual, Chapter 72-41-22, Task 72-41-22-200-006-B00 or in accordance with this NMSB.

E. Identify the inspected HP compressor stage 6 stator vanes (Refer to Reference 3, Standard Practices/Processes Manual, Chapter 70-09-00).

(1) Use vibropeen equipment to identify the inspected HP compressor stage 6 stator vanes.

(2) Vibropeen ‘NMSB 72-0528’ on every inspected HP compressor stage 6 stator vane that is satisfactory next to the part number.

F. Complete the feedback form at the end of this NMSB.

2. Recording Instructions

A. A record of accomplishment is necessary.

B. Inform the IAE local office that this NMSB has been accomplished by sending the feedback form at the end of this NMSB.

3. Send any HP compressor stage 6 vanes with a feature or crack indication to the following address:

IAE International Aero Engines AG

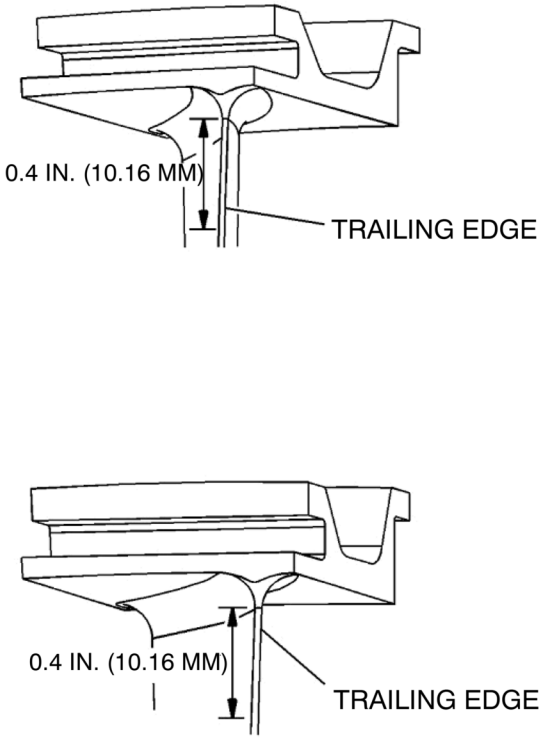
c/o Rolls-Royce Deutschland Ltd & Co KG

Technical Services

Eschenweg 11,Dahlewitz

D-15827 Blankenfelde-Mahlow

Germany



VIEW ON THE TRAILING EDGE OF THE VANE

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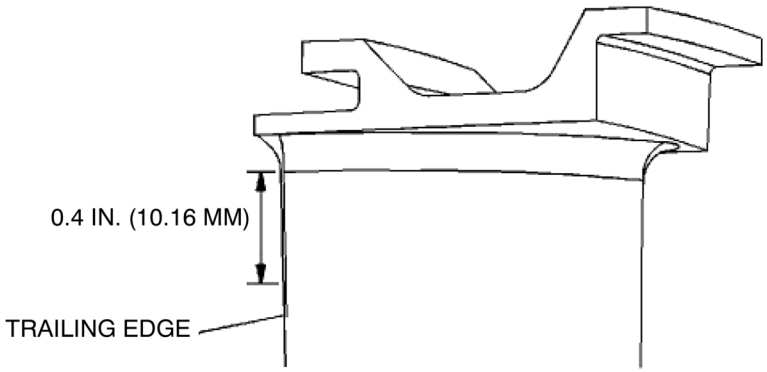
FIGURE 1, SHEET 1



VIEW ON CONVEX SIDE (90°) TRAILING EDGE

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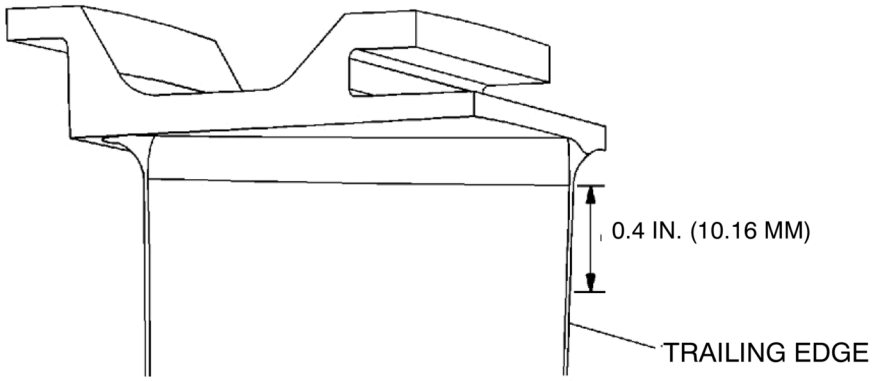
FIGURE 1, SHEET 2



VIEW ON CONCAVE SIDE (90°)TRAILING EDGE

B529846

FIGURE 1, SHEET 3

Appendix

Added Data

Internal Reference Information

Revision No.	Reference Document	Origination
Original thru 2	EC06VR897A EC06VR897B	
3	EA20VG214	MP/SG

Number values shown in parentheses adjacent to U.S. values are International System of units (SI) equivalents.

NOTE: In 2014 IAE converted the V2500 Technical Publications to a new system. As a result of the conversion, some manuals were consolidated. All manuals received new P&W part numbers. To facilitate the use of this Service Bulletin, the following Technical Publications cross reference table is provided.

Technical Publications Cross Reference Table

Publication	Engine Model(s)	IAE IETM Pub Ref	P&W Part Number
ENGINE MANUAL — A1, A5	All	E-V2500-1IA	2A4407
CMM-EHC — A1, A5	All	EHC-V2500-1IA	2A4409
CMM-FN — A1, A5	All	FN-V2500-1IA	2A4410
CMM-MMC — A1, A5	All	MECH-V2500-1IA	2A4411
CMM-THD — A1, A5	All	THD-V2500-1IA	2A4412
TLM — A1, A5	All	T-V2500-1IA	2A4408
ENGINE MANUAL — D5	All	E-V2500-3IA	2A4416
CMM-EHC — D5	All	EHC-V2500-31A	2A4418
CMM-FN — D5	All	FN-V2500-3IA	2A4419
CMM-MMC — D5	All	MECH-V2500-3IA	2A4420
CMM-THD — D5	All	THD-V2500-3IA	2A4423
TLM — D5	All	T-V2500-3IA	2A4417
SPPM (SPM) — A1, A5, D5	All	SPP-V2500-1IA	2A4414

Publication	Engine Model(s)	IAE IETM Pub Ref	P&W Part Number
EIPC — A5	V2522/V2524/V2527M-AQ02	S-V2500-6IA	2A4428
	V2522/V2524/V2527M-AQ03	S-V2500-6IB	
	V2522/V2524/V2527M-SQ02	S-V2500-6SA	
	V2522/V2524/V2527M-SQ03	S-V2500-6SB	
	V2522/V2524/V2527M-SQ04	S-V2500-6NA	
	V2522/V2524/V2527M-SQ05	S-V2500-6NB	
	V2527/V2527E-AQ02	S-V2500-7IA	
	V2527/V2527E-AQ03	S-V2500-7IB	
	V2527/V2527E-SQ02	S-V2500-7SA	
	V2527/V2527E-SQ03	S-V2500-7SB	
	V2527/V2527E-SQ04	S-V2500-7NA	
	V2527/V2527E-SQ05	S-V2500-7NB	
	V2530-AQ02	S-V2500-2IA	
	V2530-AQ03	S-V2500-2IB	
	V2530-SQ02	S-V2500-2SA	
	V2530-SQ03	S-V2500-2SB	
	V2530-SQ04	S-V2500-2NA	
	V2530-SQ05	S-V2500-2NB	
	V2533-AQ02	S-V2500-5IA	
	V2533-AQ03	S-V2500-5IB	
	V2533-SQ02	S-V2500-5SA	
	V2533-SQ03	S-V2500-5SB	
	V2533-SQ04	S-V2500-5NA	
	V2533-SQ05	S-V2500-5NB	
EIPC — D5	V2525/V2528-AQ02	S-V2500-3IA	2A4426
	V2525/V2528-AQ03	S-V2500-3IB	
	V2525/V2528-AQ04	S-V2500-3IC	

STAGE 6 INSPECTION FEEDBACK FORM

DATE_____ INSPECTED_____

ENGINE DETAILS

ENGINE NUMBERS: _____

HOURS: _____ CYCLES: _____

INSPECTION DETAILS

VANE NO.	PASS	REJECT	VANE NO.	PASS	REJECT	VANE NO.	PASS	REJECT
1			29			57		
2			30			58		
3			31			59		
4			32			60		
5			33			61		
6			34			62		
7			35			63		
8			36			64		
9			37			65		
10			38			66		
11			39			67		
12			40			68		
13			41			69		
14			42			70		
15			43			71		
16			44			72		
17			45			73		
18			46			74		
19			47			75		
20			48			76		
21			49			77		
22			50			78		
23			51			79		
24			52			80		

25			53			81		
26			54			82		
27			55			83		
28			56			84		

NOTE: IN CASE OF A REJECT AND A CRACK HAS INITIATED, RECORD CRACK LENGTH AND PART NUMBER IN THE APPLICABLE TABLE.

Inspection Results — Feedback Form