



GE Aircraft Engines



SERVICE BULLETIN

ENGINE - High Pressure Turbine Module Assembly (72-50-00) - Stage 2 Blade Replacement

1. PLANNING INFORMATION

A. Effectivity

GE90-76B, -77B, -85B, -90B

High pressure turbine (HPT) stage 2 blades 1708M21P13/P15/P16/P18 installed on GE90 engines or stocked as spares are affected.

B. Concurrent Requirements

None.

C. Description

This Service Bulletin defines a maximum allowable time on-wing for HPT stage 2 blades 1708M21P13/P15/P16/P18 with shank crossover holes. HPT stage 2 blades 1708M21P19, without crossover holes, were previously released by GE90 S/B 72-362.

D. Compliance

Category 2

This is a campaign change.

- (1) For engines with HPT stage 2 blades 1708M21P18 (engine serial numbers 900-182 thru -191):

GE recommends you replace the HPT stage 2 blades as soon as possible without effect on revenue service but before the blades reach 1,100 cycles since new (CSN).

- (2) For GE90-76B rated engines:

GE recommends you replace the HPT stage 2 blades as soon as possible without effect on revenue service but before the blades reach 2,300 CSN.

- (3) For GE90-77B, -85B, and -90B engines:

GE recommends you replace the HPT stage 2 blades as soon as possible without effect on revenue service but before the blades reach 2,000 CSN.

NOTE 1: For engines that have operated at more than one rating, refer to the GE90 Engine Manual, 05-11-00, LIFE LIMITS, method A or B to calculate equivalent cycles.

NOTE 2: The change in this Service Bulletin can be accomplished in-shop.



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E. Reason

(1) Objective:

PREVENT SIGNIFICANT EVENTS

Introduce field program to remove HPT stage 2 blades manufactured with shank crossover holes.

(2) Condition:

Low cycle fatigue cracks on the convex side of the shank have been identified on HPT stage 2 blades removed from development and field engines.

(3) Cause:

The cracks are caused by high stress concentration associated with the crossover hole in the middle shank rib.

(4) Improvement / Inspection:

The HPT stage 2 blade 1708M21P19 does not have the shank rib crossover hole, thus eliminating the high concentrated shank stress.

(5) Substantiation:

Analysis has verified that elimination of the shank crossover hole reduces stress to an acceptable level.

F. Approval

The FAA has approved the technical content of this Service Bulletin.

G. Manpower

Manpower allowances are provided. Refer to paragraph 2.B. Industry Support Information, for manpower allowances.

H. Weight and Balance

A complete set of HPT stage 2 blades increases weight by 0.40 lbs (0,18 kg) at approximate Engine Station 261 inches (6629 mm).

I. References

GE90 Engine Manual, GEK 100700

GE90 Illustrated Parts Catalog (IPC), GEK 100701-1

GE90 S/B 72-362, ENGINE - Spare Parts Release of GE90 Engines

GEAE internal use only: CID 452534, 452534-4



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TIO internal use only: E2

J. Publications Affected

GE90 Illustrated Parts Catalog (IPC), GEK 100701-1

K. Interchangeability

Replace the old HPT stage 2 blades with the new blades as a set. Do not replace the new HTP stage 2 blades with the old blades.

2. MATERIAL INFORMATION

A. Material - Price and Availability

(1) Parts necessary to do this Service Bulletin:

Parts Necessary

<u>Part Number</u>	<u>Qty/Eng</u>	<u>Part Name</u>	<u>Unit Price (\$)</u>	<u>Pkg Qty</u>	<u>Lead time Days</u>
1708M21P19	(68)	Blade - HPT Stage 2	5509.00	(1)	30

(2) Other spare parts:

None.

(3) Consumables:

None.

B. Industry Support Information

(1) Labor support:

GE Aircraft Engines will give you the man-hour allowances provided below depending on the amount of additional work required to replace the HPT stage 2 blades for each engine if this Service Bulletin is done per the recommended technical compliance. Refer to Campaign-Change Warranty Terms and Conditions. All Claims must be submitted before December 31, 2001 to receive credit. To get the allowance, send a Claim (make sure the Claim contains the number of this Service Bulletin) to:

GE Engines Services Distribution, L.L.C. Warranty and Guarantee Programs
One Neumann Way, Room 444 Cincinnati, OH 45215 USA

(a) With the propulsor split from the fan, 275 man-hours are required to complete this Service Bulletin.

(b) With the LPT module removed, 203 man-hours are required to complete this Service Bulletin.



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- (c) With the core removed from the fan module, 117 man-hours are required to complete this Service Bulletin.
 - (d) With the HPT module removed, 67 man-hours are required to complete this Service Bulletin.
 - (e) With the turbine center frame (TCF) removed, 49 man-hours are required to complete this Service Bulletin.
 - (f) With the stage 2 nozzle assembly removed, 13 man-hours are required to complete this Service Bulletin.
 - (g) With the HPT rotor removed, 8 man-hours are required to complete this Service Bulletin.
- (2) Material support:

Submit purchase orders, Charge or No-Charge, based on the time since new (TSN) hours of the blade. If the blade has less than 6,000 hours TSN, submit a No-Charge Purchase Order for replacement parts as specified below. If the blade has more than 6,000 hours TSN, submit a Charge Purchase Order for replacement parts as specified below.

For No-Charge purchase orders only, GE Aircraft Engines will supply the parts at no charge if this Service Bulletin is done per the recommended technical compliance. Refer to paragraph 2.A., Material - Price and Availability. Send a No-Charge Purchase Order before December 31, 2001 (the Purchase Order must include the list of parts and the number of this Service Bulletin) to:

Customer Account Manager
GE Engines Services Distribution, L.L.C.
One Neumann Way
Room 115
Cincinnati, OH 45215 USA

For Charge purchase orders only, GE Aircraft Engines will give you a parts credit allowance if this Service Bulletin is done per the recommended technical compliance. Refer to paragraph 2.A., Material - Price and Availability. Send a Charge Purchase Order (the Purchase Order must include the list of parts and the number of this Service Bulletin) to the address above.

For Charge purchase orders only, submit a Claim before December 31, 2001 to receive credit. To get the allowance, send a Claim (make sure the Claim contains the number of this Service Bulletin) to:

GE Engines Services Distribution, L.L.C.
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C. Configuration Chart



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Configuration chart

<u>New Part Number</u>	<u>Qty/Eng</u>	<u>Part Name</u>	<u>Old Part Number/IPC Location</u>	<u>Qty/Eng</u>	<u>Op Code</u>	<u>Chg/Sprt Code</u>
FIELD						
1650M57G01 /G02	(X)	Rotor Assembly, HPT	1650M57G01 /G02	(X)	RM	-/-
1708M21P19 S/B 72-362	(68)	Blade - HPT Stage 2	1708M21P13 /P15/P16/P18 72-53-00-01-091 72-53-00-01-090 72-53-00-01-090A 72-53-00-01-090B	(68)	RE	5/A

Change Codes

5 = Qualified interchangeability - Refer to paragraph 1.K., Interchangeability.

Spare Parts Support Code

A = Old parts will no longer be supplied.

Operation Codes

RM = Remains

RE = Replace

D. Parts Disposition

Discard old parts.

E. Tooling - Price and Availability

None.

3. ACCOMPLISHMENT INSTRUCTIONS

With the propulsor removed from the fan, complete the following:

NOTE: Some of the following steps may not be required depending upon the current level of engine disassembly.

- A. Remove the LPT module. Refer to the Engine Manual, 72-00-04, REMOVAL 001.
- B. Remove the core from the fan module. Refer to the Engine Manual, 72-00-02, REMOVAL 001.
- C. Remove the HPT module. Refer to the Engine Manual, 72-00-50, REMOVAL 001.
- D. Remove the TCF. Refer to the Engine Manual, 72-00-54, REMOVAL 001.



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- E. Remove the HPT stage 2 nozzle assembly. Refer to the Engine Manual, 72-00-52, REMOVAL 001.
- F. Remove the HPT rotor. Refer to the Engine Manual, 72-00-53, REMOVAL 001.
- G. Install the HPT stage 2 blades 1708M21P19. Refer to the Engine Manual, 72-53-00, INSTALLATION 001.
- H. Install the HPT rotor. Refer to the Engine Manual, 72-00-53, INSTALLATION 001.
- I. Install the HPT stage 2 nozzle assembly. Refer to the Engine Manual, 72-00-52, INSTALLATION 001.
- J. Install the TCF. Refer to the Engine Manual, 72-00-54, INSTALLATION 001.
- K. Install the HPT module. Refer to the Engine Manual, 72-00-50, INSTALLATION 001.
- L. Install the core to the fan module. Refer to the Engine Manual, 72-00-02, INSTALLATION 001.
- M. Install the LPT module. Refer to the Engine Manual, 72-00-04, INSTALLATION 001.

4. APPENDIX A - PARTS PROGRESSION CHART

Parts Progression Chart

<u>Part Number</u>	<u>Part Name and/or Characteristics</u>	<u>Identified ByService Bulletin No.</u>
1708M21P13	HPT Stage 2 Blade	Used on Engines 900-104 thru 900-111 Only
1708M21P15	HPT Stage 2 Blade	Baseline
1708M21P16	HPT Stage 2 Blade	S/B 72-240
1708M21P18	HPT Stage 2 Blade	S/B 72-337
1708M21P19	HPT Stage 2 Blade	S/B 72-362