



TYPE-CERTIFICATE DATA SHEET

No. **IM.E.054**

for Engine

GE Honda Aero Engines HF120 Series Engine

Type Certificate Holder

GE Honda Aero Engines, LLC
9050 Centre Pointe Dr
Suite 200
West Chester, OH 45069
Unites States of America

For Models:
HF120



Intentionally left blank



TABLE OF CONTENTS

I. General	4
1. Type / Models	4
2. Type Certificate Holder	4
3. Manufacturer	4
4. Date of Application	4
5. EASA Type Certification Date	4
II. Certification Basis	4
1. State of Design Authority Certification Basis	4
2. Reference Date for determining the applicable airworthiness requirements	5
3. EASA Certification Basis	5
3.1. Airworthiness Standards	5
3.2. Special Conditions (SC)	5
3.3. Equivalent Safety Findings (ESF)	5
3.4. Deviations	5
3.5. Environmental Protection	5
III. Technical Characteristics	5
1. Type Design Definition	5
2. Description	5
3. Equipment	6
4. Dimensions	6
5. Dry Weight	6
6. Ratings	6
7. Control System	6
8. Fluids (Fuel, Oil, Coolant, Additives)	6
9. Aircraft Accessory Drives	7
10. Maximum Permissible Air Bleed Extraction	7
IV. Operating Limitations	8
1. Temperature Limits	8
2. Speed Limits	8
3. Torque Limits	8
4. Pressure Limits	8
4.1 Fuel Pressure	8
4.2 Oil Pressure	9
5. Time Limited Dispatch (TLD)	9
6. ETOPS Capability	9
V. Operating and Service Instructions	9
VI. Notes	10
SECTION: ADMINISTRATIVE	11
I. Acronyms and Abbreviations	11
II. Type Certificate Holder Record	11
III. Change Record	11



I. General

1. Type / Models

GE Honda Aero HF120 Series Engine

Model
HF120

2. Type Certificate Holder

GE Honda Aero Engines, LLC
9050 Centre Pointe Dr
Suite 200
West Chester, OH 45069
Unites States of America

3. Manufacturers

PC108:
General Electric Company
One Neumann Way
Cincinnati, OH 45216-6301
USA

PC347CE:
Honda Aero Inc.
2989 Tucker St.
Burlington, NC 27215
USA

4. Date of Application

Model	Application Date
HF120	25 January 2012

5. EASA Type Certification Date

Model	EASA Certification Date
HF120	20 April 2016

II. Certification Basis

1. State of Design Authority Certification Basis

Model	State of Design Authority Certification Basis
HF120	See FAA TCDS E00085EN



2. Reference Date for determining the applicable airworthiness requirements

Model	Reference Date for Applicable Airworthiness Requirements
HF120	21 August 2011

3. EASA Certification Basis

3.1. Airworthiness Standards

Model	EASA Airworthiness Standards
HF120	CS-E Amendment 3, dated 23 December 2010 - including CS-E 1030 Time Limited Dispatch

3.2. Special Conditions (SC)

None.

3.3. Equivalent Safety Findings (ESF)

None.

3.4. Deviations

None.

3.5. Environmental Protection

Model	Environmental Protection Requirements
HF120	CS-34 Amendment 2, dated 12 January 2016, including: ICAO Annex 16 Volume II, third edition, July 2008, including Amendment 8, July 2014, as applicable to turbofan engines.

III. Technical Characteristics

1. Type Design Definition

Model	Type Design Definition (Approved Part List)
HF120	HF120-H1A

2. Description

The HF120 engine is a dual rotor, medium bypass ratio turbofan with a single stage fan, 2-stage low pressure compressor, single stage radial flow high pressure compressor, single annular reverse flow combustor, single stage high pressure turbine, 2-stage low pressure turbine, lobed exhaust mixer, and a Full Authority Digital Engine Control (FADEC).



3. Equipment

Refer to the engine part list.
See Note 2.

4. Dimensions

Overall dimensions:

Model	Length ^(*) (mm)	Width ^(*) (mm)	Height ^(*) (mm)
HF120	1511	655	775

^(*) Length is taken from fan duct front flange to aft end of rear fan duct; width and height are maximum envelopes

Center of gravity location (Engine only):

Model	Station (axial) (mm)	Waterline (mm)	Buttline (mm)
HF120	5273	2537	2476

5. Dry Weight

Model	Weight ^(*) (kg)
HF120	211.3

^(*) Weight includes basic engine, basic engine accessories, and optional equipment as listed in the manufacturer's engine specifications

6. Ratings

Static thrust, at sea level - see Notes 3, 4 and 5 -:

Model	Configuration	Take-off (5 minutes) - see Note 4 - (daN)	Maximum Continuous (daN)	Flat Rating Ambient Temperature ^(*) (°C)
HF120	-	932	915	25
	-H1A	906	855	25

^(*) For Take-off and Maximum Continuous

7. Control System

Model	FPMU Motive Flow ^(*)	FADEC Hardware	FADEC Software OS	FADEC Software AS
HF120	24100-Q0A	34100-Q0A	34211-Q0A	34221-Q0A

^(*) Fuel Pump Metering Unit (FPMU) Motive Flow - see Note 6 -

8. Fluids (Fuel, Oil, Coolant, Additives)

Fuel:

Refer to HF120 Service Bulletin 73-0001 and its latest revision for detailed information pertaining to fuels and additives. This Service Bulletin lists the eligible fuels and additives conforming to GE Aviation Specification D50TF2 (Class A and C only).



Oil:

Refer to HF120 Service Bulletin 79-0001 and its latest revision for detailed information pertaining to Type 2 oils. This Service Bulletin lists the approved oils conforming to GE Aviation Specification D50TF1.

9. Aircraft Accessory Drives

Accessory	Rotating Facing Gearbox Pad	Gear Ratio to Core Rotor	Maximum Steady State Drive Shaft (rpm)	Maximum Weight (kg)	Maximum Overhung Moment (Nm)	Shear Torque (Nm)	Maximum Continuous Torque ^(*) (Nm)
Starter / Generator (SG)	CW	0.2511	12354	20.4	29.9	180.8	25.1

Maximum core engine speed is 49200 rpm

Maximum power extraction at the SG pad is 18.1 kW

^(*) Maximum continuous overload torque for the SG is 34.2 Nm at 6001 rpm for 5 seconds (21.5 kW) and maximum transient overload torque for the SG is 40.7 Nm at 6001 rpm for 5 seconds (25.6 kW)

10. Maximum Permissible Air Bleed Extraction

Engine Bleed Air Extraction Limits:

	Pressure Altitude (m)	CDP Bleed Flow kg/min (% of W25)
HP Bleed	-305	18.6 (17.0%)
	-305 to 14020	Linear transition between -305 m and 14020 m altitude
	14020	10.1 (15.0%)

	Pressure Altitude (m)	Fan Bleed Flow % of W2
Fan Bleed	All altitudes	1.0%

HP Bleed Air Extraction Limits above 7925 m^(*):

	Pressure Altitude (m)	CDP Bleed Flow kg/min (% of W25)
HP Bleed	7925	7.8 (10.0%)
	7925 to 14020	Linear transition between 7925 m and 14020 m altitude
	14020	5.8 (12.0%)



HP Bleed Air Extraction Limits below 26700 rpm core speed^(*)&^(**):

	Core Speed (rpm)	CDP Bleed Flow kg/min (% of W25)
HP Bleed	23900	16.3 (19.0%)
	23900 to 26700	Linear transition between 23900 rpm and 26700 rpm core speed
	26700	18.6 (19.0%)

^(*) Bleed extraction limit details are described in GHAE HF120 Installation Manual GEK 112115

^(**) Bleed extraction below 26700 rpm applies to the whole environmental envelope at ground idle

IV. Operating Limitations

1. Temperature Limits

Model	Maximum Permissible Temperature^(*)				
	Take-off (5 minutes) - see Note 4 -	2-minute Maximum Transient	Maximum Continuous	Ground Starts (manual or auto)	Inflight Starts (manual or auto)
	(°C)	(°C)	(°C)	(°C)	(°C)
HF120	860	885	854	556	556

^(*) Synthesized Inter-stage Turbine Temperature (ITT)

Model	Oil Temperature Limits	
	Continuous	Transient (15 minutes)
	(°C)	(°C)
HF120	143	165

2. Speed Limits

Model	Maximum Permissible Engine Rotor Speeds	
	Low Pressure Rotor (N1) (rpm)	High Pressure Rotor (N2) (rpm)
	HF120	19055 (100.0%)

^(*) 100% N2 rotor speed is 48777 rpm

3. Torque Limits

Not applicable

4. Pressure Limits

4.1 Fuel Pressure

Fuel Pressure Limits at the Engine Pump Inlet:

See section 0.4.3.2 of GHAE HF120 Engine Installation Manual, GEK 112115, for definition of minimum and maximum fuel pressures.



4.2 Oil Pressure

Oil Pressure Limits:

See Fig. 8.3 of GHAE HF120 Operating Instructions, GEK 112115, for definition of minimum and maximum oil pressures.

5. Time Limited Dispatch (TLD)

The engine is approved for Time Limited Dispatch in accordance with CS-E 1030. The maximum rectification periods and maintenance requirements for each dispatchable state are specified in the HF120-H1A FADEC Control System Summary Document GEK112118-H1A and the Airworthiness Limitations Section of the GHAE HF120 Line Maintenance Manual GEK 112112-H1.

6. ETOPS Capability

The engine is not approved for ETOPS capability in accordance with CS-E 1040.

V. Operating and Service Instructions

Manuals	HF120
Engine Installation Manual	GEK 112115
Engine Operating Instructions	GEK 112116

Instructions for Continued Airworthiness (ICA)	HF120
Line Maintenance Manual	GEK 112112-H1
Fault Isolation Manual (FIM)	See Line Maintenance Manual
Overhaul Manual (OHM)	GEK112114-H1
Standard Practices Manual (SPM)	GEK119336
Consumable Products Manual (CPM)	See Standard Practices Manual
Non Destructive Test Manual (NDTM)	See Standard Practices Manual
Components Maintenance Manuals (CMM)	As published by GHAE
Service Bulletins (SB)	As published by GHAE



VI. Notes

Note 1. The EASA approved Airworthiness Limitation Section of the Instructions for Continued Airworthiness is published in the Chapter 5 of the GHAE Line Maintenance Manual, GEK 112112-H1.

Note 2. The engine starter is not part of the engine type design.

Note 3. Engine ratings are based on calibrated test stand performance operating in test cell mode (engine capabilities), which disables the FADEC power management functions. For installed thrust ratings see Note 4:

1. Sea level static, standard pressure (101.3 kPa), 15°C
2. No customer bleed or customer power extraction
3. Ideal inlet, 100% ram recovery
4. Fuel lower heating value of 43208 kJ/kg
5. 0% humidity
6. Power extraction from motive flow set to zero

Note 4. Take-off time Limit:

The normal 5-minute take-off time limit may be extended to 10 minutes for engine out contingency.

Note 5. A suffix may be added to the HF120 basic engine model number on the engine name plate to identify minor variations in the engine configuration, installation components or de-rated thrust peculiar to the aircraft installation requirements.

Configuration H120-H1A: Features reduced thrust ratings to accommodate HA420 power management. There are minor hardware differences to accommodate different aircraft installation positions (left hand, right hand) and/or additional/optional equipment.

Note 6. Motive Flow:

Fuel from the motive flow port on the FPMU may be extracted to the drive jet or turbine pumps in the airplane fuel system. See paragraph 7.2.8 of the GHAE HF120 Installation Manual GEK 112115 for flow characteristics.



SECTION: ADMINISTRATIVE

I. Acronyms and Abbreviations

AS	Application Software
CS-E	Certification Specifications for Engines
ESF	Equivalent Safety Finding
FAA	Federal Aviation Administration
FADEC	Full Authority Digital Engine Control
FPMU	Fuel Pump Metering Unit
GHAE	GE Honda Aero Engines
HP	High Pressure
OS	Operating Software
SC	Special Condition
SG	Starter Generator
TCDS	Type Certificate Data Sheet
TLD	Time Limited Dispatch

II. Type Certificate Holder Record

Not applicable

III. Change Record

Issue	Date	Changes	TC issue
Issue 01	20 April 2016	Initial Issue	Initial Issue, 20 April 2016

-END-

