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   - Operator Testimonial
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1. Welcome to the Family!!
1. Welcome to the Family !!

This **Quick Reference Guide** outlines the policies and programs we have in place to ensure that your Honeywell propulsion, air frame systems and aircraft investments are protected through the strength of our customer service organization.

We as a team are committed to delighting you as a customer by providing proactive, responsive, knowledgeable customer support, and ensuring that we deliver on our commitments.

The information provided to you in this handbook is meant to introduce you to the HTF7000 and GTCP36-150[BD] APU programs, and provide you with enough knowledge on key aspects of the program to aid in your daily operation of this new system. You will be introduced to a wide variety of information within this binder, and we have purposely used loose-fitting removable inserts that will be updated as necessary to keep you informed, up to date, and confident that this reference guide is a valuable source of information to you today and in the future.

On behalf of the entire HTF7000 Propulsion and Air Frame System team, thank you for the confidence you have placed in Honeywell through the selection of your Challenger 300 aircraft powered by our propulsion system and auxiliary power systems. We want to assure you of our dedication to meet your expectations.

**The entire Honeywell Support Team !!**
2. Program Overview
Honeywell received both FAA type certification and JAA validation in 2002 for the AS907-1-1A engine. The AS907 propulsion system design began prior to the merger of AlliedSignal and Honeywell, which is reflected within the original AS specification model nomenclature.

We recently embarked on an engine naming strategy that reflects Honeywell’s continued commitment to business aviation propulsion engines.

The engine is now referred to as the HTF7000 but you will notice that the AS907 name remains with reference to FAA certified documentation such as maintenance manuals and service bulletins.

The new name represents Honeywell TurboFan, 7000-pound takeoff thrust class, propulsion system. All future new development engines will utilize this naming convention.

Revised naming convention for all new propulsion engines
- HTF = engine type (Honeywell TurboFan)
- 7000 = power class (7,000 lb thrust)
Program Overview

Voice of the Customer

In 1997, before Honeywell launched this family of engines, we completed a very detailed Voice of the Customer Process with many operators to determine what they were looking for in the next propulsion system. Honeywell listened and incorporated many key features ... well before we finalized the design. And, we continue to use the Voice of the Customer today, listening to you and making changes and improvements throughout the life of the program.

Key features of operators: Cost of ownership, Reliability, Customer Support, and Propulsion System Performance. Our goals with respect to these attributes:

- MSP rates and cost of operation on a per hour basis 30 % below that of current engines in this class.
- Task oriented maintenance and higher schedule maintenance intervals, in conjunction with minimum 15,000 cycle disk life.
- Performance, which is as good as the best in this thrust class.

Honeywell is pleased to report we have achieved all three. The HTF7000 represents a new standard in propulsion system value.

The HTF7000 program utilized both Operator and Maintenance advisory boards to guide the design, maintainability, and customer support aspects of the program. Membership included key industry personnel associated with maintenance, operations, and our service centers. When all was said and done, multiple meetings were accomplished with an overwhelming percentage of the suggestions included into the relevant aspects of the Propulsion System.

Honeywell appreciates the inputs of our customers and is listening !!

Honeywell Confidential
Program Overview

Voice of the Customer

Honeywell appreciates the inputs of our customers!!

Operator and Maintenance Advisory Board guided the design, maintainability and support aspects of program

Membership:
- Maintenance
- Pilots
- Service centers

Ten meetings held

20 Mechanics from 7 Service Centers trained on Engine

90 % of Suggestions Incorporated!!
Program Overview

Voice of the Customer – What the customer wants

Low Cost of Ownership and Direct Maintenance Costs
- Low parts count
- “On-condition”/ MSG-3 Task Oriented Maintenance (TOM)
  - or 3,500-hour MPI / 7000-hour CZI
- 15,000-cycle disk lives (all)
- R&R times for LRUs <20 minutes avg.
- Time limited dispatch

Proven Reliability
- Extensive LRU testing
- 30,000+ hours of testing
- Over 10,000 hours on flight test A/C
- Six Sigma design and test approach

Competitive Performance
- State-of-the-art fan & compressor design
- Industry leading mixer nozzle
- Optimized tip clearance control

Honeywell Confidential
Program Overview

Propulsion System Overview

The HTF7000 is an all new centerline integrated powerplant system. The engine is rated at 7,000 pounds of takeoff thrust out to ISA + 15 degrees C for our first application, the Bombardier Challenger 300. It incorporates a simplistic design philosophy with two primary spools, and no fan gearbox. The bypass ratio is a moderate 4.3 with competitive performance within it’s thrust class. The engine exhibits low noise characteristics enabling it to be airport friendly and meet the latest stringent noise criteria.

Operators have the option of either an MSG-3 based “On-Condition”, task oriented maintenance program or 3,500 hour MPI / 7000 hour CZI scheduled maintenance intervals.

Honeywell not only produces the HTF7000, but is also the total nacelle / thrust reverser and Engine Build-up (EBU) provider. This comprises the total propulsion system outboard of the aircraft pylon. For all airframe installations, the nacelle has been designed for ease of maintenance, simplicity, and durability. For the Bombardier Challenger 300 application, a conventional design supplied by our partner GKN Aerospace Services Ltd., is utilized and includes a target type thrust reverser installation. GKN designed and manufactures the nacelle for the HTF7000 fully Integrated Power Propulsion System (IPPS), and the system has been totally integrated with the HTF7000 engine.

HTF7000 includes the engine, nacelle, and thrust reverser
Program Overview

Propulsion System Overview

HTF7000 Integrated Powerplant System (IPPS)

* Bombardier supplies engine driven pump and generator

Honeywell supplies and supports entire Propulsion System, the Auxiliary Power Unit (APU), and Air Frame Systems:

- Engine, Nacelle, and Thrust Reverser
- APU
Program Overview

Propulsion System Overview

Beginning at the front of the engine; a wide-chord, low blade count damperless fan improves airflow efficiency, particularly at high altitude climb and cruise conditions. Combining this with the replaceable full span fan stator, makes for a highly efficient and maintainable fan module. Additionally, a conical spinner is used to shed ice without the need for spinner anti icing.

Due to the design of the core inlet, ample airflow can move through the engine core, but the possibility of foreign objects entering the core is extremely remote.

The oil tank is integral to the accessory gearbox, and its design includes a “race track” oil sight gage making servicing a breeze and reducing parts count.

The engine has active inlet and compressor variable guide vanes controlled by a dual channel Full Authority Digital Engine Control (FADEC) to ensure surge free operation. The axial compressor uses integral bladed-disk or “blisk” technology in conjunction with an impeller. Highly efficient high and low pressure turbines round out the rest of the engine.

One of the major changes for the engine is the placement of the bearing sumps. They are located in the forward and aft modules of the engine and not in the hot section, resulting in cooler, coke free oil carbon seal operation.

HTF7000 is a robust design
HTF7000 is a robust design

- High-Efficiency, Wide-Chord Fan
- Hidden Core Entry
- Composite Full-Span Fan Stator
- 39 Borescope Ports
- AGB With Integral Oil Tank
- VGV + SBV Active Surge Control
- Dual Engine Control Unit, Fadec System
- Two Cool Zone Bearing Sumps
- Two-Stage HPT + Three-Stage LPT
- Mixer
- Four-Stage Axial Blisks + Impeller

15,000-Cycle Disk Lives
Program Overview

Propulsion System Overview

The HTF7000 utilizes a modern dual channel FADEC control system with no manual mode backup.

The HTF7000 control system represents the latest and greatest in technology, backed up by hours of testing to demonstrate its dependability.

Engine operation is based on N1 power setting with idle, climb and takeoff detents. Not only is it easy to set power, but it also provides auto protection for surge, flameout, and over-speed.

The FADEC system is the heart of a dual and triple redundant system architecture that goes beyond the traditional manual mode capability and allows operators to take advantage of short and long term Time Limited Dispatch (TLD), explained later in this document.

The FADEC system also provides the digital link to integrate the entire propulsion system outboard of the pylon with the heart of the airframe.

Lastly, the HTF7000 Engine Control Units (ECU) have a “self-contained” Engine Condition and Fault Reporting (ECFR) capability without having a separate external unit. Just connect a laptop computer and two to four minutes later both ECU’s are downloaded.

HTF7000.....not only a robust design.....but easier to maintain
HTF7000 is a robust design…..and easier to maintain

- Ease of engine operation
  - PLA detents
  - N1 power set
  - Start / shutdown
- Time Limited Dispatch

- Auto Protection
  - Surge / Flameout / Overspeed
- Propulsion System / Airframe Integration
- Maintenance
  - Integrated ECFR
**Program Overview**

*Service Entry*

- FAA Certification: June 25, 2002
- JAA Validation: October 27, 2002
- C300 EIS: December 22, 2003
- 100 engines in service: September 30, 2005
Operator Testimonial

Dean and Dee Phillips – Town and Country Bank

Dean and Dee Phillips took delivery of their first Challenger 300 last April and they have been extremely pleased with the overall performance of both the aircraft and propulsion system. As a showing of their satisfaction, they recently participated in a very positive HTF7000 program testimonial for Honeywell with a photo of them posing with their stylishly painted Challenger in Las Vegas.

Thanks again, Dean and Dee!!
3. Interesting Facts
Interesting Facts

- Time Limited Dispatch (TLD) capability
- Task Oriented Maintenance (TOM) Program
- MSP program that enhances aircraft value
  - No scheduled SOAP (oil analysis)
- Lubrication sumps (2) located in cool zones
  - 5 year / 3,000 hour warranty on engine and APU
- Challenger 300 powered by HTF7000: 5 world records for its class
- On-wing & On-site maintenance for over 90% of engine
- 15,000 cycle disk lives and 15,000 hour LPT/HPT blade lives
- Free Honeywell Training slots for new customers during first year
- Worldwide rapid response support teams
- 50% fewer parts than TFE731
- Engine trend monitoring available via Jet-Care
- Quick ECU data downloading and diagnostics via e-Engine Interface (EEI)
- 4,000 hour digital video borescope inspection interval
- Integral compressor/blade disks (blisk)
- 39 borescope ports to facilitate on-wing inspections
4. Support
Support

Support Organization

Our support team is here to serve you - the operator - in every aspect of support, from our front line of specialized Field Service Engineers and service centers to our rental engines and tech pubs specialists.

We have a well rounded team of experienced members. Our primary goals are plain and simple:

“Delight our customers by being proactive, responsive, knowledgeable, and delivering on our commitments.”
Honeywell strives to be responsive to customer needs. The following chart provides operators with guidelines for the recommended sources of information and problem resolution paths.

**Maintenance**
- Unscheduled Maintenance Events and All Technical Issues
  - Field Service Engineer or Authorized Service Center
    - Customer Support Team Phoenix, AZ

**Spares**
- Scheduled Maintenance Events
  - Authorized Service Center
    - Customer Support Team Phoenix, AZ

**Rentals**
- Parts Requirement
  - Honeywell Customer Operations Group or Authorized Service Center
    - Customer Support Team Phoenix, AZ

**MSP**
- Rental Engine or Nacelle
  - Authorized Service Center or Field Service Engineer
    - Customer Support Team Phoenix, AZ

**Tech Pubs**
- MSP Issue
  - Honeywell MSP Group
    - c-hamps.honeywell.com

- Technical Publications
  - Authorized Service Center or Field Service Engineer
    - Customer Support Team Phoenix, AZ
Support

Support Team - Headquarters

Honeywell and our authorized service centers are responsible for providing technical support to operators for the engine and nacelle system. The following contact information is provided for the Honeywell support team headquarters.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Office</th>
<th>Mobile</th>
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<tbody>
<tr>
<td>Dave Coleman</td>
<td>Bombardier Programs Support Team Lead</td>
<td>602-436-2579</td>
<td>602-432-1147</td>
</tr>
<tr>
<td>Joe Hough</td>
<td>Customer Support Program Manager</td>
<td>602-231-7207</td>
<td>602-738-8777</td>
</tr>
<tr>
<td>John Cornwall</td>
<td>Customer Support Engineer</td>
<td>602-231-2682</td>
<td>602-363-2275</td>
</tr>
<tr>
<td>Giovanni Spitale</td>
<td>Customer Support Engineer</td>
<td>602-231-2947</td>
<td>602-229-9432</td>
</tr>
<tr>
<td>Lucy Martinez</td>
<td>Maintenance Service Plan (MSP) Program Manager</td>
<td>602-365-2024</td>
<td></td>
</tr>
<tr>
<td>Bernard Guillot</td>
<td>Maintenance Service Plan (MSP) Program Manager (European)</td>
<td>33 (0) 1 5563 1628/1626</td>
<td>33 (0) 6 3255 0608</td>
</tr>
<tr>
<td>AOG/COG Team</td>
<td>Rental Engine Service and Spare Parts</td>
<td>800-601-3099 International 602-365-3099</td>
<td></td>
</tr>
<tr>
<td>Joe Forbes</td>
<td>Customer Support Program Manager (APU)</td>
<td>602-231-4678</td>
<td></td>
</tr>
<tr>
<td>Geoff Harris (GKN)</td>
<td>Nacelle Support Engineering - UK</td>
<td>44 -1983 - 283507</td>
<td>44 - 7747 - 780688</td>
</tr>
<tr>
<td>Steve Bowen (GKN)</td>
<td>Nacelle Support Engineering &amp; South America - Ft Worth, Texas</td>
<td>817-921-2220</td>
<td>817-296-4938</td>
</tr>
</tbody>
</table>

Honeywell Confidential
Support

**Support Team – Field Service Engineers, Core Team Specialists**

The following contact information is provided for the Honeywell core field support team, globally located for our customers.

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<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Coverage</th>
<th>Office</th>
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<th>Types of Issues</th>
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<tr>
<td>Paul Lim sirichai</td>
<td>Customer Service Engine and Nacelle</td>
<td>Midwest and Production</td>
<td>316-945-8707</td>
<td>316-841-0423</td>
<td>Technical Issues from Customer or Honeywell</td>
</tr>
<tr>
<td>Mark Paquette</td>
<td>Field Service Engine and Nacelle</td>
<td>Western US and Delivery Center</td>
<td>520-434-7519</td>
<td>520-548-8184</td>
<td>Technical Issues from Customer or Honeywell</td>
</tr>
<tr>
<td>Dave Heilman</td>
<td>Field Service Engine and Nacelle</td>
<td>Eastern US</td>
<td>914-949-1277</td>
<td>914-282-1100</td>
<td>Technical Issues from Customer or Honeywell</td>
</tr>
<tr>
<td>Gianni Pivetta</td>
<td>Field Service Engine and Nacelle</td>
<td>Europe, Middle East, South Africa</td>
<td>33 3 89 07 31 00</td>
<td>33 6 08 23 32 04</td>
<td>Technical Issues from Customer or Honeywell</td>
</tr>
<tr>
<td>Pat Ello</td>
<td>Field Service Engine and Nacelle</td>
<td>FlexJet, Southern US &amp; Mexico</td>
<td>972-720-2464</td>
<td>817-437-1506</td>
<td>Technical Issues from Customer or Honeywell</td>
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<tr>
<td>Didier Portela</td>
<td>Field Service Engine and Nacelle</td>
<td>Canada</td>
<td>514-355-5000</td>
<td>514-606-1767</td>
<td>Technical Issues from Customer or Honeywell</td>
</tr>
<tr>
<td>Yvan Lajoie</td>
<td>Field Service Engine and Nacelle</td>
<td>Canada</td>
<td>514-355-8448</td>
<td>514-235-6368</td>
<td>Technical Issues from Customer or Honeywell</td>
</tr>
</tbody>
</table>

Honeywell Confidential
Support

Field Service Engineers – Map
Core Team Specialists

1.  Mark Paquette
    Arizona

2.  Paul Limsirichai
    Wichita

3.  Pat Etie
    Dallas

4.  Dave Heilman
    White Plains

5.  Didier Portela
    Montreal
    (OEM and Finishing)

6.  Gianni Pivetta
    Basel

7.  Yvan Lajoie
    Montreal
    (OEM and Finishing)
# Support

## Support Team – Local Field Service Engineers

<table>
<thead>
<tr>
<th>Region</th>
<th>Name</th>
<th>Location</th>
<th>Office</th>
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<tbody>
<tr>
<td>The America</td>
<td>Bob McCurry</td>
<td>Dulles, VA</td>
<td>703-980-5914</td>
<td>703-980-6070</td>
</tr>
<tr>
<td></td>
<td>Ed Leadley (APU)</td>
<td>Chicago, IL</td>
<td>847-487-8229</td>
<td>847-612-6340</td>
</tr>
<tr>
<td></td>
<td>Russ Formica</td>
<td>Chicago, IL</td>
<td>847-599-8400</td>
<td>847-770-0405</td>
</tr>
<tr>
<td></td>
<td>Steve Cook</td>
<td>Cincinnati, OH</td>
<td>502-523-7171</td>
<td>502-523-7171</td>
</tr>
<tr>
<td>Southeast</td>
<td>Rodrigo San Martin</td>
<td>South America</td>
<td>(56) 2-515-0074</td>
<td>(56) 9-825-8143</td>
</tr>
<tr>
<td></td>
<td>Rick Stanley</td>
<td>West Palm Beact, FL</td>
<td>772-344-3860</td>
<td>772-486-8471</td>
</tr>
<tr>
<td>Central</td>
<td>John Garrard</td>
<td>Springfield, IL</td>
<td>217-535-3646</td>
<td>217-299-0113</td>
</tr>
<tr>
<td></td>
<td>Jack Wolf</td>
<td>Lakeville, MN</td>
<td>612-794-9482</td>
<td>612-812-9415</td>
</tr>
<tr>
<td></td>
<td>Jerry Palyash</td>
<td>Wichita, KS</td>
<td>316-858-5517</td>
<td>316-708-3023</td>
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<tr>
<td></td>
<td>Jim Beasley</td>
<td>Wichita, KS</td>
<td>316-676-4652</td>
<td>316-841-0998</td>
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<tr>
<td></td>
<td>Clark Rodger</td>
<td>Dallas, TX</td>
<td>972-720-2620</td>
<td>972-567-4085</td>
</tr>
<tr>
<td></td>
<td>Art Ramirez (APU)</td>
<td>Houston, TX</td>
<td>915-872-3364</td>
<td>713-409-5964</td>
</tr>
<tr>
<td></td>
<td>Hal Martin (APU)</td>
<td>Wichita, KS</td>
<td>316-858-5520</td>
<td>316-371-8169</td>
</tr>
<tr>
<td>Western</td>
<td>Homer Shiroma</td>
<td>Los Angeles, CA</td>
<td>310-568-3823</td>
<td>310-503-4796</td>
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<tr>
<td></td>
<td>Gerrit DeVries</td>
<td>Harrison, BC</td>
<td>604-796-3906</td>
<td>604-703-3885</td>
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<tr>
<td></td>
<td>Mike Thomas</td>
<td>Denver, CO</td>
<td>303-749-0220</td>
<td>303-749-0220</td>
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<tr>
<td></td>
<td>Dave Fox (APU)</td>
<td>Seattle, WA</td>
<td>425-379-8758</td>
<td>425-985-0947</td>
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### Support Team – Local Field Service Engineers (Cont.)

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<tr>
<th>Location</th>
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<tr>
<td></td>
<td>Jean-Pierre Matanowski</td>
<td>LeBourget, France</td>
<td>33-1-4934-2287</td>
<td>33-607-556-103</td>
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<tr>
<td></td>
<td>Fernando Castrodeza</td>
<td>Madrid, Spain</td>
<td>34-913-136-122</td>
<td>34-639-196-885</td>
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<tr>
<td></td>
<td>John Parsons</td>
<td>Hants, UK</td>
<td>44-12567-22329</td>
<td>44-7785-298228</td>
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<td></td>
<td>Phil Thacker</td>
<td>Chester, UK</td>
<td>44-1244-523-766</td>
<td>44-7768-150652</td>
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<tr>
<td><strong>SOUTH AMERICA</strong></td>
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<td></td>
<td>Artires Henares (APU)</td>
<td>Sao Paulo, Brazil</td>
<td>55-11-5031-1697</td>
<td>55-11-9123-8053</td>
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<td><strong>AUSTRALASIA</strong></td>
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<tr>
<td></td>
<td>Reg Marratt</td>
<td>Flagstaff Hill, Australia</td>
<td>61-8-8270-4424</td>
<td>61-418-861-784</td>
</tr>
<tr>
<td></td>
<td>Ching Chung Lai</td>
<td>Kaohsiung, Taiwan</td>
<td>886-7-803-6946</td>
<td>886-9-3270-0279</td>
</tr>
</tbody>
</table>
Support

Local Field Service Engineers – Map
(Propulsion and APU)

Additional FSE’s introduced as fleet grows
Service Centers

**Worldwide Support**

The HTF7000 program utilizes four levels of service center support:

1) **Flight Line**: perform troubleshooting, routine fault diagnostics and servicing.

2) **Line**: perform LRU and propulsion system removal and replacement, borescoping and ECU software reprogramming.

3) **Major**: engine mid point inspection capabilities in addition to those mentioned above.

4) **Heavy**: engine overhaul type inspections and repairs.

Service centers will grow as the fleet grows, both in quantity and strategic global positioning based on the needs of our operators. We have taken the initiative to train and utilize several mechanics from our service centers to date to assist with assembly and disassembly of engines.

To further meet the needs of our customers, we also have “Rapid Response” service center teams that are ready to launch in AOG situations.

*For up to date service center directory*

Visit [www.e-engines.honeywell.com](http://www.e-engines.honeywell.com/)
# Service Centers

Africa, Australia, Middle East, Europe

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<td>Lider-Signature, S.A. Belo Horizonte, MG</td>
<td></td>
</tr>
<tr>
<td>Lider-Signature, S.A. Sao Paulo, SP</td>
<td></td>
</tr>
<tr>
<td>TAM-Taxi Aereoc Marilla SA Sao Paulo, SP</td>
<td></td>
</tr>
<tr>
<td>Target Aviacao, Ltd. Sao Paulo, SP</td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td></td>
</tr>
<tr>
<td>Hangar Uno de Colombia Ltda Sannte, Bogota</td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td></td>
</tr>
<tr>
<td>Aerocentro De Servicios CA Chuao, Caracas</td>
<td></td>
</tr>
</tbody>
</table>

Honeywell Confidential
Ground Support Equipment / Tooling

Honeywell Authorized
Ground Support Equipment (GSE)
Tooling and Test Equipment Vendors:

APUs, ATF3, TFE731 and TPE331 Engines

Axxiflex
Kamerlingh Omnesweg 33
3316 GJ Dordrecht
The Netherlands
Ad Corthals
aeroengineTooling@axxiflex.com
or
axxiflex@axxiflex.com
+31-78 652 1717
Fax +31-78 652 1710

JeTool
305 S Fourth Street
PO Box 186
Chesaning,
Michigan 48616, USA
Becky Henning
mailbox@jetool.com
989-845-2070
Fax 989-845-2073

Marsh Aviation
5060 E Falcon Drive
Mesa, Arizona
85215-2590, USA
Clay Clark
or Anita Schuler
480-832-3770
Fax 480-985-2840

APUs, ATF3, TFE731 and TPE331 Engines
HTF7000 and ALF502L Series Engines

<table>
<thead>
<tr>
<th>Honeywell Regional GSE Manager</th>
<th>Phone Number</th>
<th>FAX Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia, Pacific Rim, Australia</td>
<td>574-231-3964</td>
<td>574-231-3961</td>
</tr>
<tr>
<td>Middle East, Europe and Africa &amp; OEM's</td>
<td>574-231-3752</td>
<td>574-231-3961</td>
</tr>
<tr>
<td>South &amp; Central America and Mexico</td>
<td>602-365-3919</td>
<td>602-365-7974</td>
</tr>
<tr>
<td>USA, Canada &amp; Distributors</td>
<td>602-365-2916</td>
<td>602-365-7974</td>
</tr>
</tbody>
</table>
Spare Parts

Support

Honeywell provides service and spares support for all engine, nacelle, and thrust reverser components for the Propulsion System, Auxiliary Power and Environmental Control Systems with the exception of the aircraft hydraulic pump and generator.

Operators and service providers are encouraged to use the Honeywell Customers Operations Group (COG) and AOG call centers. The AOG center is chartered to provide AOG coverage 24 hours a day, 7 days a week, 365 days a year. In our efforts to assist you with your AOG request, the AOG center requires the following information to process an AOG order:

- Aircraft Tail Number
- Engine Serial Number, Hours and Cycles
- Next Scheduled Flight
- Location of Aircraft
- MSP Contract Number for engines (As Applicable)
- Purchase order (if not on MSP or a Fractional Management Program)

Customers requiring replacement parts for their nacelle system can also call the Honeywell parts order phone center or authorized service providers. You will be transferred to our nacelle supplier GKN’s parts ordering department.

Honeywell AOG HOTLINE (24 hours a day)
U.S. 1-800-601-3099
International 602-365-3099
Fax 602-365-2823
Spare Parts

Support...continued

Operators also have the option of establishing contact with dedicated Honeywell Customer Support Specialists for their AOG and non-AOG needs. While these specialists are only available during normal working hours Monday through Friday, some operators prefer to work with a single point contact at Honeywell for their spares needs. The AOG hotline is always available for their off hours support.

Listed below are the many Customer Support Specialists available to provide spares assistance. Please do not hesitate to establish contact as our goal is to make sure all operators are comfortable and confident their spares support needs are being met by Honeywell!! Please do not hesitate to call your core or local Honeywell Field Service Engineer if you have questions, need assistance, or have an issue with this very important aspect of Honeywell support.

<table>
<thead>
<tr>
<th>Specialist</th>
<th>Phone</th>
<th>FAX</th>
<th>Pager</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAETHKE, JEFF</td>
<td>602-365-5441</td>
<td>602-365-2823</td>
<td>602/599-5828</td>
</tr>
<tr>
<td>CARPENTER, DAVID</td>
<td>602-365-4215</td>
<td>602-365-2823</td>
<td></td>
</tr>
<tr>
<td>DORAN, CATHY</td>
<td>602-365-5211</td>
<td>602-365-2823</td>
<td></td>
</tr>
<tr>
<td>GIDLEY, JOHN</td>
<td>602-365-3263/3158</td>
<td>602-365-2823</td>
<td></td>
</tr>
<tr>
<td>MATHES, GABY</td>
<td>602-365-5774</td>
<td>602-365-2823</td>
<td></td>
</tr>
<tr>
<td>MONTANEZ, BUDDY</td>
<td>602-365-3336</td>
<td>602-365-2823</td>
<td></td>
</tr>
<tr>
<td>PEREZ, MIGUEL</td>
<td>602-365-2052</td>
<td>602-365-2874</td>
<td>602/779-8445</td>
</tr>
<tr>
<td>PORTILLO, JULIE</td>
<td>602-365-3445</td>
<td>602-365-2823</td>
<td>602/779-8445</td>
</tr>
<tr>
<td>ROYBAL, LOUELLA</td>
<td>602-365-3395</td>
<td>602-365-2823</td>
<td>602/205-3134</td>
</tr>
<tr>
<td>SCHIAVO, KASSI</td>
<td>602-365-4125</td>
<td>602-365-2874</td>
<td></td>
</tr>
<tr>
<td>TARABORI, DESIREE</td>
<td>602-365-2111</td>
<td>602-365-2823</td>
<td></td>
</tr>
</tbody>
</table>
Spare Parts

Support

- Engine and Nacelle spare parts are positioned globally at Honeywell and GKN Facilities:
  - Phoenix, Luton (UK), Teterboro, Ft Worth, and Cowes (UK)

- Service Centers are also provisioned with key spares!!
5. Propulsion System Maintenance
Propulsion System Maintenance

*Maintenance aligned with aircraft intervals*

HTF7000 engine inspections and maintenance activities have been aligned with the aircraft inspections, in particular, with nacelle and Integrated Power Plant System (IPPS) inspections. Further, both engine and IPPS maintenance activities and inspections were determined using Maintenance Steering Group (MSG3) standards.

Honeywell provides two maintenance plan options for the HTF7000 allowing the customer to select the plan to best meet operational needs.

**Option 1** is a “Task Oriented Maintenance” program via MSG3 analysis that involves periodic digital imaging (borescope) inspections. The first borescope inspection occurs at 4,000 hours. The results of these inspections are then used to extend service operation of the engine to the next inspection interval (8,000 hours) without any disassembly of the engine compressor or turbine until the component lives have been reached.

Option 2 is a hard-time inspection program in which a hot-section inspection (HSI) and a compressor zone inspection (CZI) are conducted at specific time intervals. These major inspection intervals are currently approved to 3,500/7,000 hours, respectively.

From initial concept to servicing the fleet, the HTF7000 team has listened, learned, and then designed, validated, and supported a propulsion system that would be accepted as the best in its class.....a design that enabled a step improvement in direct operating cost.....a design that would be easy and fun to maintain…a design that gives the operator flexibility and is there, ready to fly, when needed!!!!
Propulsion System Maintenance

Maintenance aligned with aircraft intervals

Option 1 vs Option 2

• Primary difference is at hot section and core zone inspection
  - Borescope inspection of engine is accomplished on wing vs. removal for engine teardown inspection

• Task Oriented Maintenance (TOM), On-condition approach
  - 8 man-hours for hot section borescope / 16 man-hours for cold section borescope
  - Maintenance Manual provide inspection and continued operation criteria

• Traditional scheduled hard time Inspection approach
  - 32 man-hours for R and R at scheduled HSI / CZI + shop time
Propulsion System Maintenance

Maintainability

- MSG3 Integrated with airframe
- Task Oriented Maintenance
  - On wing borescope 4,000 / 8,000 hrs
- Scheduled maintenance option
  - Traditional approach to HSI / CZI
- Designed for & with mechanics
  - No lockwire / no adjustments
  - LRU R&R avg less than 20 minutes
  - Standard fittings for all LRUs
  - 39 borescope ports
- Engine Condition and Fault Monitoring (ECFR)
  - Self contained & User friendly
  - quick download
  - Maintenance Faults
  - Lube System / Chips Zapper
  - Vibration
  - Event records - FADEC & Pilot Initiated
  - Performance Data and Trends
  - Links to Maintenance Manual
Propulsion System Maintenance

Maintainability in the design

- Hidden Core
- No Magnesium
- Built in Water Wash - Optional
- Independent fan blade replacement on wing
- No moisture collection "pockets" in external structures

90% of engine hot-section & core maintenance can be accomplished on wing or on site !!

- Modular design
- 39 Borescope ports
- Video borescope capability
- Fadec BIT testing
- No lockwire on engine components
- Extensive QAD technology used
- EGT sensors aft of “hot” section

- Dual Channel FADEC control system
- Engine Control Units with self contained trend monitoring feature
- Quick dual ECU download to laptop

- Self draining oil filter
- Drive point for N2 rotation
- Electrical Connectors Position preclude water entrapment

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Propulsion System Maintenance

Maintenance Process and Contacts

Honeywell is proceeding with a plan that will enable 90% of all propulsion system maintenance to be accomplished with the engine remaining on-wing and/or on-site. Recall that Honeywell authorized **Line and Flight Line service centers** perform basic system troubleshooting, fault diagnostics, LRU replacement, but not mid-point inspection capability.

Mid-point inspection (Hot section, fan/fan stator, and accessory gearbox) maintenance is accomplished with support from Honeywell authorized **Major service centers**, with remaining core access maintenance accomplished by **Heavy service centers**.

**Major service centers and Heavy service centers are in operation today.** They are only located in the continental United States, but a minimum of two service centers provide “worldwide rapid response” support. As the fleet continues to grow, additional service centers will be positioned outside the continental United States.

Please feel free to contact the Honeywell Customer Support office for the most current status.
Propulsion System Maintenance

Schedule

Light Maintenance Manual
Section 05-20-00
Manufacturers Inspections
Propulsion System Maintenance

Schedule

Honeywell

ENGINE LIGHT MAINTENANCE MANUAL
AS901-1-1A

GENERAL - MANUFACTURER’S INSPECTIONS

TASK 5-20-00-200-001

1. Manufacturer’s Inspection Program

SUBTASK 5-20-03-99G-005

A. General

(1) There are two inspection program options for the engine.

(a) Option 1 is an inspection program using scheduled digital video imaging inspections (high resolution electronic borescope) of internal engine components and other inspections/maintenance tasks that may be accomplished without engine removal (“on-wing”).

(b) Option 2 is an inspection program with scheduled hot- and cold-section teardown inspection intervals.

(2) Pre-Part Inspections at Opportunity will be conducted of critical rotating components as described in Chapter-Section 5-10-00.

(3) Components whose failure would result in a situation which is still in compliance with FAR 0.79 are defined as non-critical components. Failure of non-critical components may result in significant engine damage or inflight shutdown. Therefore, it is important to maintain part record cards on these components.

SUBTASK 5-20-03-200-001

B. Manufacturer’s Replacement Recommendations

(1) Part Replacement Intervals, Engine Operating Hours

(a) In addition to the engine parts in Chapter-Section 5-10-00 with life cycle or hour limits, certain non-critical engine parts have a finite service life. (Table 801, Page 802 lists these parts and defines the recommended replacement intervals in engine operating hours.

(b) Turbine Blade Record cards (Form No. SS9020A) are provided for the HPT and LPT assemblies. The turbine blades are recorded on the cards by serial or life tracking numbers.

(c) Component Maintenance/Modification Record Cards (Form No. PX-3107-78) are provided for the main fuel injection nozzles.

(d) Replace each part in Table 801, Page 802 prior to that part reaching the noted interval in engine operating hours.

EFFECTIVITY: ALL

05-20-00 MANUFACTURER’S INSPECTIONS Page 801

Oct 05/04
# Propulsion System Maintenance

## Schedule

**Table 801. Recommended Replacement Intervals in Engine Operating Hours**

<table>
<thead>
<tr>
<th>Component</th>
<th>Part No.</th>
<th>Replacement Interval (Operating Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Main) Hi Torq Fuel Injection Nozzle</td>
<td>3004006-6</td>
<td>4,000</td>
</tr>
<tr>
<td>HPT1 Blade</td>
<td>3005114-3</td>
<td>15,000</td>
</tr>
<tr>
<td>HPT2 Blade</td>
<td>3005049-5</td>
<td>15,000</td>
</tr>
<tr>
<td>LPT1 Blade</td>
<td>3005686-1</td>
<td>15,000</td>
</tr>
<tr>
<td>LPT2 Blade</td>
<td>3005682-1</td>
<td>15,000</td>
</tr>
<tr>
<td>LPT3 Blade</td>
<td>3005685-1</td>
<td>15,000</td>
</tr>
</tbody>
</table>

**SUITASK 5-20-00-200-002**

C. **Past History Reports**

1. Certain component parts of the engine do not have life limits given, but could fail as a result of not seen abuse and not known conditions.

2. A Component Maintenance/Modification Record Card (Form No. PX-3107-78) is provided for the listed components and kept in the engine logbook.
   - Accessory Gearbox Assembly
   - Air Turbine Starter
   - Electronic Control Unit
   - Main Fuel Nozzles
   - Starter Fuel Nozzles
   - Fuel Pump
   - Ignition Exciter
   - Main Turbine Engine Fuel Control Unit
   - Oil Pump
   - Combustion Chamber Case
   - Diffuser Case
   - LPT1 Nozzle Assembly

   **NOTE:** It is necessary that Repair Station/Service Centers record all maintenance, repairs, changes and service bulletins compliance on the Component Maintenance/Modification Record Card (Form No. PX-3107-78).

3. When the components listed above are removed from the engine, enter the component operating hours and maintenance history, if applicable, on a

**EFFECTIVITY: ALL**

05-20-00 MANUFACTURER'S INSPECTIONS

Page 802 Oct 05/04

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Honeywell Confidential
Propulsion System Maintenance

Schedule

For reference only

D. Periodic Inspections

Do the following periodic inspections at the intervals shown. Unless noted, the inspections apply to both Option 1 and Option 2 inspection programs.

Recommended inspections of engine controls and accessory components are included in the following periodic inspections. Components not scheduled need not be serviced unless indicated by engine faults (refer to Chapter-Section 72-00-00, Fault Isolation), or the component does not satisfy checks conducted during engine testing (refer to Chapter-Section 72-00-00, Testing.)

NOTE: Tracking of Engine Operating Hours is defined as 1 Flight Hour - 1 Engine Hour and is from weight off wheels to weight on wheels.

NOTE: An additional 10% or 40 hours (whichever is less) is allowed to provide operators schedule flexibility beyond the specific inspection interval given in engine operating hours.

NOTE: An additional 10% or 60 cycles (whichever is less) is allowed to provide operators schedule flexibility beyond the specific inspection interval given in cycles.

NOTE: Deleted.

(1) 400 Engine Operating Hours Inspections

Table 802. Inspections (Every 400 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Detailed Inspection of Engine Fault and Diagnostic Data</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00-00, Inspection)</td>
</tr>
<tr>
<td>Detailed Inspection of the No. 1 and No. 3 Witness Drains</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00-00, Inspection)</td>
</tr>
<tr>
<td>Detailed Inspection of the Fan Blades</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00-00, Inspection)</td>
</tr>
<tr>
<td>Detailed Inspection of the Fan Stator Assembly</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00-00, Inspection)</td>
</tr>
<tr>
<td>General Visual Inspection of the Accessory Gearbox (AGB) Assembly</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00-00, Inspection)</td>
</tr>
</tbody>
</table>

EFFECTIVITY: ALL 05-20-00 MANUFACTURER'S INSPECTIONS Page 803 Oct 05/04

Honeywell Confidential
## Propulsion System Maintenance

### Schedule

#### Table 802. Inspections (Every 400 Engine Operating Hours) (Cont)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Visual Inspection of the Air Turbine Starter (ATS).</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Exhaust Mixer Nozzle Area.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Fan Module.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Servicing of the Air Turbine Starter (ATS).</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Visual Check of the Fuel Filter Mechanical Differential Pressure Indicator (DPI).</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

(2) 800 Engine Operating Hours Inspections

#### Table 803. Inspections (Every 800 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed Inspection of the ATS Magnetic Drain Plug.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Discard the Air Turbine Starter (ATS) Oil.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Discard the Engine Oil Filter Element.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

(3) 1600 Engine Operating Hours Inspections

#### Table 804. Inspections (Every 1600 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discard the Engine Oil.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

(4) 2000 Engine Operating Hours Inspections

#### Table 805. Inspections (Every 2000 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Visual Inspection of the LP Turbine Cooling Tubes and Attachment Hardware.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Restoration of the Start Fuel Nozzles on the Engine.</td>
<td>(Refer to SUSTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

Effective: 05-20-00

**For reference only**

Honeywell Confidential
# Propulsion System Maintenance

## Schedule

### 5. 2400 Engine Operating Hours Inspections

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Visual Inspection of the Rear Engine Mount</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Strut Seals</td>
<td></td>
</tr>
</tbody>
</table>

### 6. 3600 Engine Operating Hours Hot Section Inspections (Option 2 Inspection Program Only)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove the engine for complete detailed inspection</td>
<td>(Refer to SUBTASK 72-00-00-209-029 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>of the uninstalled combustion chamber assembly, HPT</td>
<td></td>
</tr>
<tr>
<td>and LPT. The engine hot section includes removal of</td>
<td></td>
</tr>
<tr>
<td>the LPT, HPT and the combustion chamber assembly and</td>
<td></td>
</tr>
<tr>
<td>detailed inspection of the assembled LP turbine</td>
<td></td>
</tr>
<tr>
<td>rotor assemblies and the HP turbine rotor assemblies.</td>
<td></td>
</tr>
</tbody>
</table>

### 7. 4000 Engine Operating Hours Inspections

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed Inspection of the ATS</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Detailed Inspection of the Engine Mount Points.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Detailed Inspection of the Fan Rotor Assembly.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Detailed Inspection of the Ignition Lead Assembly.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Detailed Inspection of the P3 Sensor Line.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Functional Check of the Fan Stub Shaft and Fan</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Retention Hardware.</td>
<td></td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Wiring</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Harnesses.</td>
<td></td>
</tr>
<tr>
<td>General Visual Inspection of the Oil System</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>External Plumbing.</td>
<td></td>
</tr>
</tbody>
</table>

**Effectivity:** All 05-20-00

**Manufacturer’s Inspections** Page 805

Oct 05/04

Honeywell Confidential
# Propulsion System Maintenance

## Schedule

**Table 008: Inspections (Every 4000 Engine Operating Hours) (Cont)**

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Visual Inspection of the Compressor Case.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Drain System/Attachment Fittings.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Fuel System Components and Tubing.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Fan Comartment Housing.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Front Frame Assembly.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Fuel Manifold Splash Shield.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the HP and LP Bleed Air and ATS Ducts.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the N2 Speed Sensor.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Permanent Magnet Alternator (PMA).</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Operational Check of the Exhaust Gas Temperature (EGT) Probes.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Functional Test of the Cooling Tube Check Valves.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Buffer Air Tubes on the Engine.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Compressor Guide Vane Actuator System on the Engine.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Compressor Case.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Exit Guide Vane (EGV) Assembly.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Fan Bypass Outer Duct and Systems (LRU) Attachments (external).</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine LP Turbine Case.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Mixer Nozzle and the Center Body.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>General Visual Inspection of the Engine Inner Fan Bypass Ducts.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Discard the (Main) Hi-Temp Fuel injection Nozzles.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

**Effectivity: All 05-20-00**

**Manufacturer’s Inspections**

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Honeywell Confidential
# Propulsion System Maintenance

## Schedule

### Table 806. Inspections (Every 4000 Engine Operating Hours) (Cont)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discard the Engine Fuel Filter.</td>
<td>(Refer to SUBTASK 72-00-00-208-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

### Table 800. Digital Video Imaging Inspection (Every 4000 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Detailed Inspection of the Engine Combustor Module.</td>
<td>(Refer to SUBTASK 72-00-00-208-028 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Special Detailed Inspection of the Engine HP Turbine Module.</td>
<td>(Refer to SUBTASK 72-00-00-208-028 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Special Detailed Inspection of the Engine LP Turbine Module.</td>
<td>(Refer to SUBTASK 72-00-00-208-028 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

### Table 810. Engine Core Zone Inspections (Every 7000 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do a complete engine core zone inspection; inspect carbon seals, check compressor and HPT clearances. The engine core zone inspection includes removal, disassembly, cleaning, lubrication and detailed inspection of the combustor chamber assembly, HPT, LPT, fan rotor assembly, No. 1 bearing and fan stub shaft assembly, compressor case, combustion case and diffuser case, compressor rotor assembly and the accessory gearbox assembly. The scope of the task is determined by on-wing or test cell performance data prior to tear down.</td>
<td>(Refer to SUBTASK 72-00-00-209-030 in 72-00-00, Inspection, and the Engine Heavy Maintenance Manual, Report No. 72-05-13.)</td>
</tr>
</tbody>
</table>

### Table 811. Engine 7000 Engine Operating Hours Component Inspection

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>7000 Engine Operating Hours Component Inspection</td>
<td></td>
</tr>
</tbody>
</table>

**EFFECTIVITY:** ALL

**05-20-00**

**MANUFACTURER’S INSPECTIONS**

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# Propulsion System Maintenance

## Schedule

### Table 811. Component Inspection (Every 7000 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do a complete inspection of the hydraulic unit. The inspection includes</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection and Component Maintenance Manual, Report No. 73-20-31.)</td>
</tr>
<tr>
<td>the component disassembly, cleaning, inspection, assembly and test.</td>
<td></td>
</tr>
<tr>
<td>Do a complete inspection of the fuel pump. The inspection includes the</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection and Component Maintenance Manual, Report No. 73-10-43.)</td>
</tr>
<tr>
<td>component disassembly, cleaning, inspection, assembly and test.</td>
<td></td>
</tr>
</tbody>
</table>

(11) 80000 Engine Operating Hours Digital Video Imaging Inspection (Option 1 Inspection Program Only)

### Table 812. Digital Video Imaging Inspection (Every 8000 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Detailed Inspection of the Engine Compressor Module.</td>
<td>(Refer to SUBTASK 72-00-00-208-028 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

(12) 15000 Cycles Inspection

### Table 813. Inspection (Every 15000 Cycles)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Detailed Inspection of the Fan Blades.</td>
<td>(Refer to SUBTASK 72-00-00-208-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

(13) 25000 Engine Operating Hours Inspections

### Table 814. Inspection (Every 25000 Engine Operating Hours)

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Detailed Inspection of the HP Turbine Shroud Support Assembly.</td>
<td>(Refer to SUBTASK 72-00-00-202-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Special Detailed Inspection of the LP Turbine Case.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
<tr>
<td>Special Detailed Inspection of the Exit Guide Vane Assembly.</td>
<td>(Refer to SUBTASK 72-00-00-209-027 in 72-00-00, Inspection.)</td>
</tr>
</tbody>
</table>

EFFECTIVITY: ALL

05-20-00 MANUFACTURER’S INSPECTIONS

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Propulsion System Maintenance

.intent{19}{19}Schedule

OVERHAUL - OVERHAUL

TASK 5-20-01-200-001

1. Overhaul

SUBTASK 5-20-01-99G-005

A. General

(1) This task gives the overhaul inspection requirements.

SUBTASK 5-20-01-200-001

B. Overhaul Inspection Requirements

(1) Accomplishing the Option 2 Engine Hot Section Inspection and Engine Core Zone Inspection and repairs in accordance with the Light Maintenance Manual (LMM) and the Heavy Maintenance Manual (HMM), as necessary, constitutes an engine "overhaul" as that term is described in FAR Part 43.2(a).

(2) For engine components, accomplishing full disassembly, inspections and repairs, as necessary, in accordance with the applicable component maintenance manuals, constitutes a component "overhaul" as that term is described in FAR Part 43.2(a).
Propulsion System Maintenance

**EEI (e-Engine Interface)**

The e-Engine Interface (EEI) is a propulsion system maintenance tool that provides aircraft maintenance personnel with an integrated platform from which they can perform troubleshooting, data collection, analysis and test of the aircraft propulsion system. EEI has been designed for use by aircraft maintenance personnel, service centers, and private aircraft owners.

EEI allows the user to interface with HTF7000 Electronic Control Units (ECU’s) via a data download kit. EEI is used to download data from the ECU’s, and view and print the resulting data files. EEI also allows data files to be uploaded to the e-Engines website with a computer and an Internet connection. A list of EEI functions with descriptions is shown below:

- **Download Function**: The Download Function allows you to transfer stored data from the ECU to the PC for storage and analysis.
- **Review Function**: The Review function allows you to review and analyze the downloaded/stored data from the ECU’s.
- **Upload Function**: The Upload function allows you to transfer files from the PC to the e-Engine website.
- **Initialize Engine**: The Initialize Engine function allows you to transfer new engine part number, model number, and serial number to the ECU’s when the ECU’s are replaced.
- **MC Monitor Functions**: Allows you to view and reset Maintenance Conditions from a selected engine.
- **Realtime Function**: Allows you to monitor or record engine data under operating conditions
**Propulsion System Maintenance**

**EEI Data Download Kit**

A complete EEI Data Download Kit (P/N 5837831-2) has been created for Flight Line and Line service centers. This –2 kit part number includes the Quatech PCMCIA card and cable as shown in the picture below.

For those that have already purchased the EEI Data Download Kit P/N 5837831-1 and are interested in upgrading to the -2 kit configuration, the PCMCIA card and cable can be purchased through Quatech (www.quatech.com) part number QSP-200/300-BA (which includes cable P/N 920-0093-01A). Approximate cost of the PCMCIA card and cable is <$400.00 US.

Honeywell recommends anyone purchasing the QSP-200/300-BA PCMCIA card from Quatech directly to specify that cable P/N 920-0093-01A is required to avoid receiving an incorrect cable.

*EEI Data Download Kit (P/N 5837831-2) includes Quatech PC card, cable 902-0093-01A, maintenance panel interface cable 5837831-12, and EEI software version V1.05.08.*
**Propulsion System Maintenance**

**ECFR (Engine Condition Fault Reporting)**

In order to assist the operator in obtaining maintenance data, the engine ECU incorporates ECFR software that automatically stores operational data that can be downloaded and used by the operator.

To download and view data, a personal computer with EEI software is required. EEI also facilitates that the transfer of the data to the Honeywell e-engine web application that is customized and secure for each operator. The e-engine web application also provides the operator with advanced maintenance tracking and trending features. The ECU continuously monitors the necessary parameters and periodically stores them in data buffers located within the ECU. The data buffers are then downloaded for evaluation of engine use, updating of the engine logbook, and determination of required maintenance actions.

By reviewing these data records, a maintenance crew is capable of evaluating vital engine and aircraft operational statistics, troubleshooting engine anomalies, and capturing actual engine indication alerts or exceedance values for proper logbook entries and follow-up maintenance.

**Engine maintenance and troubleshooting information**
- Automatic interpretation of faults to LRU maintenance conditions (MCs)
- Current and historic MCs
- Engine exceedance records of N1, N2, ITT, vibration, and other parameters
- Automatic and pilot-initiated engine event records

**Engine logbook information**
- Operating and flight time
- Component life-cycle counts

**Other features**
- Engine and aircraft statistics tracking
- Data integrity provisions
- Enhanced A/C maintenance page
- Automatic calculation and annunciation of system TLD status

**Engine operational information**
- LP / HP rotor speed profiles
- ITT profiles
- Performance and vibration data
- Lubrication system data
- Start quality

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HTF7000 EEI
Quick Reference Tutorial
Downloading & Reviewing Data

(18 pages)
Contents

- Introduction
- Downloading Data
  - Download configuration
  - Date and Time
  - Backup data
  - Cable connections
  - Connecting to the FADEC
- Reviewing Data
  - Data review folder
  - File sorting
  - Selecting ESN
  - Review engine summary
    - Maintenance conditions (MCID’s)
Introduction

After opening the EEI program and logging in you will see the EEI **Main Screen**. From the Main Screen there are two ways access the functions in EEI...the **Main Menu** and the **Function Buttons**. The Main Menu has the same functions as the **Function Buttons** plus some additional ones...
To download the FADEC, select the **Download** function button (CTRL-D) from the EEI main screen...
EEI will guide you through the steps required to download the FADEC. The first step is to select the download configuration. The default is **Aircraft**. Just click **Next** or press **Enter** to go to the next step.
Downloading Step 2

Next, check the time and date displayed and check the **Verify GMT Time and Date** box. Then click **Next** or press **Enter**...you can’t proceed if you don’t do this...

Check the GMT time and date then ‘check the box’
Next, decide if you want to backup the data or not, and if so, to where. The download will be automatically saved on your hard drive in the ‘C:\EEI\DOWNLOAD’ folder regardless. Click Next or press Enter to move on...

Decide if you want to backup or not, and if so, to where...

Ignore the Incident Recorder option...
Next EEI will prompt you to connect your cables. Do that. Make sure the FADEC is powered (breakers in and battery or ground power ON). Click **Next** or press **Enter**...
Next, EEI will attempt to contact the FADEC. If it can’t, you will see something like the following screen…this is usually a connector or power problem…

Select View Details to find out what’s wrong
Reviewing Data

To review data, select the **Review** function button from the EEI main screen...
EEI will default to allow review of data in the ‘C:\EEI\Download’ download folder…EEI will default to sorting data available by aircraft…from the download folder…
Reviewing Data Step 2

Usually, it is easier to have EEI display data available by engine S/N (by sorting files by engine S/N) as shown below...just select **Sort Files By | Engine Serial Number** as shown below...
Suppose you are only interested in engine S/N 118145...just click on this engine S/N and the download files available for review will be listed...

Select the desired engine S/N...

...and the download files available for review will be displayed...

Then click the Add button...
Reviewing Data Step 4

The selected download file will be selected for review as shown below......

...the selected file is now available for review...

...repeat as required for other engine S/Ns and then select OK or press Enter to continue...
Reviewing Data Step 5

The selected download file will be displayed for review as shown below...the first screen displayed is the **Engine Summary** tab...this screen flags any Maintenance Conditions, Type 1 or Type 2 Exceedances, Event Records, Chip or Impending Oil Filter Bypass recorded (since the last download) as shown below...

...this engine has recorded eleven (11) Maintenance Conditions (MCIDs) since it’s last download...

...but no exceedances, event records, chip or impending oil filter bypass records...
To review these Maintenance Conditions (MCIDs) in more detail, select the **Detail Data** tab...
Reviewing Data Step 6

EEI will first display the **Detail Data | Engine Statistics** tab…from this you can confirm the engine S/N and position (LH or RH). Select the **Maintenance Conditions** tab as shown...

![Image of EEI software with Maintenance Condition tab highlighted]

- Maintenance Condition tab...
- ...engine S/N and position
EEI will display the **Detail Data | Maintenance Conditions** tab as shown...you can scroll up and down through the MCIDs recorded since the last download. The **Maintenance Conditions** tab displays data associated with the first and last time the MCID was recorded...

...for MCID 1517...

...the first time it was recorded was 01-19-04, and the last time it was recorded was 01-29-04

...the first time it was recorded N1 was 15.20%, and the last time it was recorded N1 was 15.73%
Reviewing Data Step 7.5…MCIDs

...you can scroll up and down through the list of MCIDs recorded since the last download. Select each MCID to display data associated with the first and last time each MCID was recorded...

...for MCID 1813...

...the first time it was recorded was 01-27-04, and the last time it was recorded was 01-29-04

...the first time it was recorded CAS was 204.56 KCAS and the last time it was recorded KCAS was 249.81 KCAS
End EEI Tutorial
SpotLight – Maintenance Troubleshooting Tool

“SpotLight” is an experience-based diagnostic engine troubleshooting system available via e-Engines, or remotely on your personal computer – at an additional fee.

Honeywell, in partnership with Casebank Technologies, has developed a line maintenance troubleshooting and diagnostics tool specifically for operators and service centers to improve aircraft dispatchability. SpotLight is a diagnostic decision support tool that utilizes field service reports, maintenance manuals, and past troubleshooting experience. This service is part of Honeywell’s continuous effort to reduce maintenance and repair turn times, reduce cost of ownership, and provide expert system applications to field personnel.

SpotLight is available in two formats; 1) SpotLight Internet only available through the e-Engine website at www.e-engine.honeywell.com, or 2) ordered separately as SpotLight Remote, a stand-alone database for laptop computers that does not require an Internet connection to run a troubleshooting session. This option is available for an additional fee.

SpotLight is a no-charge service to operators with engines or APU’s that are either in warranty, or covered under an existing MSP/FMP contract with Honeywell. Operators with engines or APU’s that are out of warranty and not covered under an existing MSP/CSP contract can purchase SpotLight Internet for $5.00 per aircraft flight hour calculated annually in advance. SpotLight Remote is available directly from CaseBank for $7.50 per flight hour calculated annually in advance.

For more information on SpotLight, please reference SIL AS907-2 located in this binder.
Propulsion System Maintenance

SpotLight – Maintenance Troubleshooting Tool

Case-based reasoning system

- Utilizes field service reports, maintenance manuals, and troubleshooting experience
- 1900 + cases entered to date
Propulsion System Maintenance

Trend Monitoring – Jet-Care

The HTF7000 Propulsion system has a sophisticated, user friendly Engine Condition Fault Reporting and Trend Monitoring system contained within the Engine Control Unit. Performance trend data can be easily downloaded by the operator utilizing a laptop computer with EEI software installed. Jet-Care is conducting performance trend analysis for the Honeywell HTF7000 family of engines. This service – with over two decades of successful support of the Honeywell TFE731 fleet of engines – will be invaluable for tracking engine health over the course of engine operation.

A number of potentially expensive and time-consuming repairs have been avoided by identifying shifts in engine performance trends Jet-Care evaluates and analyzes trends in the performance-snapshot data using proprietary methods that normalize such factors as altitude, Mach number, and ambient temperatures. This normalization allows for smooth trend characterization, facilitating better and more accurate trend evaluation. Operators can initiate preventive actions based on Jet-Care’s evaluation of the takeoff and cruise data, reducing engine damage, additional maintenance costs, and aircraft downtime.

www.jet-care.com
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Propulsion System Maintenance

*Trend Monitoring – Jet-Care*

Honeywell has made enrollment into the Jet-Care program a requirement for MSP operators. As such, Honeywell is providing the Jet-Care program to all operators under MSP at no additional cost.

MSP operators not currently enrolled will need to complete an enrollment form. Enrollment into Jet-Care can be accomplished by completing the enrollment form, see SIL AS907-3, or contact Jet-Care at:


and faxing it to USA 973-292-3030 Attn: Josh Wagner or UK Alan Baker: +44(0)1256 393507.

Non-MSP operators may subscribe to the program at a reasonable annual fee. Non-MSP operators should contact Jet-Care International direct at one of the provided addresses or telephone numbers concerning the cost and/or enrollment process.

For more information on Jet-Care, please visit Jet-Care online at [www.jet-care.com](http://www.jet-care.com) or reference SIL AS907-3 located in this binder.
Propulsion System Maintenance

**Oil Analysis – “SOAP”**

Although there is no SOAP / oil analysis requirement for the HTF7000, operators may be required to perform SOAP’s as part of engine maintenance troubleshooting. Three locations are available for oil analysis:

1) Honeywell Oil Analysis Laboratory  
   1944 East Sky Harbor Circle  
   Phoenix, AZ 85034-3440

2) Europe / Asia / Africa / Middle East Spectro - Palace Gate  
   Odiham  
   Hampshire  
   RG29 1NP  
   UK  
   Contact: [www.spectro-oil.com](http://www.spectro-oil.com)

3) Wearcheck Africa  
   PO Box 15108  
   Westmead  
   3608  
   South Africa  
   Tel +27 31 700 5460  
   Fax +27 31 700 5471

---

1. Remove the oil filter element. (Refer to TASK 79-20-01-040-801, Disassembly.)
   - **NOTE:** Your eyes cannot see the contamination in a 3-micron oil filter. This contamination can have sufficient assembly grease or other unwanted particles to prevent the flow of oil.

2. Send the filter to this address for a laboratory analysis.  
   Honeywell Oil Analysis Laboratory  
   1944 East Sky Harbor Circle  
   Phoenix, AZ 85034-3440
   - **WARNING:** MAKE SURE THAT YOU CORRECTLY INSTALL THE FILTER CAP ON THE OIL FILTER. INCORRECT INSTALLATION OF THE FILTER CAP CAN CAUSE THE OIL LEVEL TO DECREASE. LOW ENGINE OIL CAN CAUSE THE ENGINE TO STOP IN FLIGHT.

3. Install a new oil filter element. (Refer to TASK 79-20-01-440-801, Assembly.)

4. Do an engine start and check for oil leaks. (Refer to SUBTASK 72-00-00-790-001, Testing.)
**Propulsion System Maintenance**

**Time Limited Dispatch (TLD)**

The FADEC control system is designed to meet the FAA reliability and integrity requirements under TLD operation. The HTF7000 is certified for 125 hour short-term and 500 hour long-term TLD. The FADEC system provides the capability to assess control system faults and determine overall system dispatch status. The four TLD categories are:

- **NO DISPATCH (ND):** faults that require CAS indication (FADEC FAIL status indication) logbook entry, and/or repaired prior to next dispatch.

- **SHORT-TERM DISPATCH (STD):** faults that require indication (FADEC FAULT status indication) logbook entry, and are dispatchable within a maximum operating ST interval, as defined in the Airworthiness Limitations section of the engine LMM.

- **LONG-TERM DISPATCH (LTD):** faults that do not require crew indication and are dispatchable within a maximum operating LTD interval, as defined in the Airworthiness Limitations section of the engine LMM, which also defines periodic inspection and repair of LTD faults.

- **NO IMPACT (N):** faults that do not require crew indication and do not fall into any of the other three categories (ie ND, STD, LTD). The repair interval is agreed upon between the engine and aircraft manufacturer and/or the operator.
6. Cost of Ownership
Cost of Ownership

Overview

Lower cost of ownership has been and will continue to be a major goal of the HTF7000 program team. Long maintenance intervals for the hot section as well as the cold section are in place today (4,000 / 8,000 hours) for the “on-condition” maintenance approach. Combining this with high cyclic life disks (15,000 cycles) and long HPT and LPT blade lives (15,000 hours) provides a winning combination when it comes to saving operators in maintenance costs.

We also have digital imaging video borescope capability with 39 borescope ports installed on the engine making the on-condition hot section and cold section inspections commonplace with the engine installed on the aircraft. Furthermore, the HTF7000 was designed for and with mechanics in mind. There is no lockwire or major adjustments on the engine and all primary LRU’s can be removed and replaced in an average of 20 minutes or less, as witnessed by our Advisory Board during the development phase of the engine.

Add all of this together with efficient diagnostics, troubleshooting, and trending tools such as EEI, ECFR, SpotLight, and Jet-Care all help to reduce aircraft downtime and help maintenance crews select the best maintenance path, eliminating “shotgunning” of parts.

Reliable + Durable + Maintainable + Repairable

= Low Cost of Ownership
Cost of Ownership

*C-hamps – Customer Homebase for Aftermarket Maintenance Programs System*

C-hamps provides the easy to use, electronic interface to submit MSP usage, invoicing and claims as well as warranty information.

All MSP operators are encouraged to utilize the C-HAMPS website to file monthly utilization reports and claims. Additionally, operators and service centers are requested to utilize the system to submit all warranty claims for the powerplant, including the nacelle system.

www.c-hamps.com

MSP usage

MSP reporting

MPS invoicing and claims

Warranty information
7. Warranty
Cost of Ownership

Warranty

The HTF7000 Warranty is designed to ensure maximum in-service operation for your propulsion system. The Warranty is in effect for five years and includes the following new powerplant coverage. For more warranty information, contact Honeywell at U.S. 1-800-601-3099, International 602-365-3099, or visit www.c-hamps.com.

<table>
<thead>
<tr>
<th>IPPS Component</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Structural Nacelle Components</td>
<td>5 years or 5,000 hours</td>
</tr>
<tr>
<td>Moveable Structural Nacelle Components</td>
<td>5 years</td>
</tr>
<tr>
<td>Non-Structural Nacelle Components</td>
<td>5 years of 3,000 hours</td>
</tr>
<tr>
<td>Engine Components</td>
<td>5 years or 3,000 hours</td>
</tr>
</tbody>
</table>

See next page for detailed component coverage descriptions
## Cost of Ownership

### Warranty

<table>
<thead>
<tr>
<th>IPPS Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Structural Nacelle Components</td>
<td>Fixed structure only such as inlet: Attachment flange, inner and outer skins and bulkhead, Not including: TAI provisions, brackets, hinges, latches, door lands, seals, attachment features and fasteners.</td>
</tr>
<tr>
<td></td>
<td>Thrust reverser: Attachment flange, inner and outer skins, bulkheads and components, plumbing, harness, hoses, brackets, latches, locks, hinges, attachment features and fasteners.</td>
</tr>
<tr>
<td>Moveable Structural Nacelle Components</td>
<td>Such as Access doors, hinges and latches. Fan cowl door: main upper and lower door structure, tie rods, latches, pins, hinges and access doors.</td>
</tr>
<tr>
<td>Non-Structural Nacelle Components</td>
<td>Such as EBU system: Pneumatic, electrical, hydraulic, fire detection, fuel, ATS etc. All other items not specifically noted in other categories.</td>
</tr>
</tbody>
</table>
8. Maintenance Service Plan (MSP)
Cost of Ownership

Maintenance Service Plan (MSP)

For nearly 30 years, Honeywell’s Maintenance Service Plan (MSP) has been saving customers valuable time and maintenance costs while providing world’s best service and support. MSP is an efficient and cost effective program offering a practical alternative for managing future engine maintenance expenses. A list of MSP benefits is provided in the charts that follow.

Honeywell’s MSP and MSP Gold programs are the most widely used engine maintenance programs in general aviation today. Scheduled and unscheduled maintenance activities, service bulletins, life limited parts replacement, and rental and exchange engine units are all covered. MSP members also enjoy significantly enhanced aircraft resale value. Of all the engine maintenance programs available today, MSP is the only one officially recognized/rated for its aircraft appreciation in the Aircraft Bluebook-Price Digest.

For more information on MSP and MSP Gold, please contact Lucy Martinez at 602-365-2024, or by email at lucy.martinez@honeywell.com
MSP Benefits

- Efficient and Predictable engine maintenance cost
  - Increases accuracy of aviation department annual budgeting
  - Eliminates cost impact of unscheduled engine repair
  - Covers replacement costs of cycle life limited hardware

- Continuous financial coverage for HTF7000 service and repair
  - Scheduled or on-condition Major engine maintenance
  - Unscheduled engine maintenance
  - Latest SB status update automatic
  - Rental engine supplied during CZI’s and unscheduled heavy maintenance

- Enhanced aircraft resale value
  - Accrued engine value transferable to new owner
  - Aircraft value not reduced due to engine times
  - Enhanced aircraft value offsets program cost

- Worldwide Authorized Service Centers Network
  - Strategically located service facilities authorized to perform HTF7000 maintenance

- Offered by Honeywell, the engine manufacturer
  - backed by a Fortune 50 company
## Coverage Comparison
### New Engine Warranty, MSP & MSP Gold

<table>
<thead>
<tr>
<th>Coverage Area</th>
<th>Warranty</th>
<th>MSP</th>
<th>MSP GOLD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scheduled Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine inspection Parts</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Jet-Care Engine Condition Trend Monitoring (ECTM) Program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Routine Inspection labor by an Authorized Service Center</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Major Periodic Inspection (MPI) by an Authorized Major Service Center** | | | |
| Inspection labor | X | X | |
| Consumable parts | X | X | |
| Other required parts | X | X | |
| Component repair labor (if required) | X | X | |
| Cycle life-limited parts | X | | |
| Engine removal and reinstallation and/or access time | X | | |
| Transportation of engine | | | |

| **Compressor Zone Inspection (CZI) by an Authorized Heavy Maintenance Facility** | | | |
| Inspection labor | X | X | |
| Consumable parts | X | X | |
| Other required parts | X | X | |
| Component repair labor (if required) | X | X | |
| Cycle life-limited parts | X | | |
| Rental engine (from Honeywell engine bank at special MSP rates) | X | | |
| Engine removal and reinstallation and/or access time | X | | |
| Transportation of engine | | | |

| **Unscheduled Maintenance** | | | |
| Troubleshooting labor allowance | YES | X | |
| Consumable parts | YES | X | |
| Other required parts | YES | X | |
| Component repair labor (if required) | YES | X | |
| Exchange engine/module/line replaceable unit (LRU) | YES | X | |
| Labor for module replacement or repair | YES | X | |
| Rental engine (from Honeywell engine bank at special MSP rates) | YES | X | |
| Engine and LRU removal and reinstallation and/or access time | YES | | |
| Logistical support for road trips (engine AOG only) | YES | | |
| Transportation of unserviceable engine or LRU | YES | | |

| **Engine Modernization Programs** | | | |
| Alert Service Bulletins (Category 1) | X | X | |
| Recommended Service Bulletins (Category 2) | X | X | |
| Optional Service Bulletins (Category 3) as designated in SB | X | X | |

| **Miscellaneous** | | | |
| Aircraft Resale Added Value | X | X | |
| No charge on the Honeywell APU during the first five (5) years of the new airplane | X | X | |

---

1. Per MSP standard business practices
2. Labor will be covered by MSP when bulletins are incorporated in conjunction with other MSP covered maintenance activities providing convenient access to the applicable engine area; otherwise, labor expenses will be the operator’s responsibility.

**NOTE:** Service bulletins identified as a Category 1, 2, or 3 will be incorporated into MSP engines according to the Compliance Section of the bulletin.

3. MSP up to 10 hours... MSP GOLD up to 20 (more than 20 requires approval and/or justification...Warranty up to 10 hours (more than 10 requires approval and/or justification)

4. Warranty covers engine transportation only

---

Honeywell Confidential
New Aircraft Buyer – MSP Incentive Program

- Customer has two incentive options for engines
  - Reduced rates
  - Free hours
- APU option also available
- Reimbursement provisions
Option 1

- Reduced first term rate (5 years)
  - $128.10 (2006 rate subject to annual escalation)
  - Best choice if annual utilization will exceed 600 hours

Option 2

- 400 flight hours of free MSP in the initial five year term
  - $147.70 (2006 rate subject to annual escalation)
  - Best choice if annual utilization will be less than 600 hours

Note: Either option includes APU and a minimum of 150 hours (yearly from enrollment date)
APU Option

- If operator enrolls HTF7000 engines in MSP, first term of APU MSP is free for 2000 APU operating hours or five (5) years whichever occurs first

- The 2006 standard rate for 36-150BD is $40.00
  *(2006 rate subject to annual escalation)*
New Aircraft Buyer – MSP Incentive Program

- New Aircraft receives 25 gratis hours
- Operator has 30 days from delivery date to enroll
- Special rate subject to normal escalation
- Special rates/hours not transferable if aircraft is sold
- During initial contract term, should original operator elect to prematurely terminate MSP, 80% of the net reserves will be credited to the operator or 50% in cash refunded.
MSP Gold Program

- Conversion to *Gold*
  - Anytime
  - No buy-in

- Option 1. The special MSP hourly rate plus $6.91 per hour per engine

- Option 2. 400 gratis hours the Standard MSP hourly rate plus $ 9.25 per hour per engine

- Consider conversion to *Gold* at time of warranty expiration
MSP Summary

- MSP provides:
  - Predictable engine maintenance costs
  - Continuous financial coverage for engine service and repair
  - Enhanced aircraft resale value

- You will be contacted personally

  North America/South America
  Honeywell
  1999 E. Sky Harbor Circle
  P. O. Box 29003
  Phoenix, Arizona 85038-9003
  Attn: Lucy Martinez
  Telephone: 602-365-2024 or 602-365-3181
  Fax: (602) 365-5313

  Europe, Middle East and Africa
  Honeywell
  44, Avenue Georges-Pompidou
  B. P. 328
  92307 Levallois-Perret Cedex
  France
  Attn: Bernard Guillot
  Telephone: 33 (0) 1 5563 1628/1626
  Fax: 33 (0) 1 5563 1593
  Mobile: 33 (0) 6 3255 0608

MSP Continues To Meet The Needs Of The Customer
9. Technical Publications
Technical Publications

Sign up

Honeywell provides accurate, up-to-date Technical Publications to ensure optimum propulsion system performance and maintenance. Using leading-edge computer technologies, these publications are created with fully automated data management and computer-aided illustration systems. All AS907 publications are produced to ATA specifications. Propulsion system maintenance manuals will be on a 90 day revision cycle. Manuals are available in CD-ROM, Internet format, or paper. Additional sets or individual manuals will be quoted and charged.

The following engine Technical Publications are provided to all operators free of charge at initial aircraft delivery for a period of one year:

- Illustrated Parts Catalog (IPC) (72-05-11)
- Light Maintenance Manual (LMM) (72-05-12)
- Service Bulletins and Spare Parts Bulletins
- Applicable APU publications (LMM delivered as part of the aircraft AMM)

One set of manuals are FREE of charge for each aircraft delivery. Revision service is available for outgoing years.

For more information, please visit http://www.honeywell.com/sites/aero/Services_Support.htm, or contact your Honeywell Field Service Engineer, or call Jeff Tormanen at 602-365-2493 (fax 602-365-5577).

Note: All nacelle and thrust reverser maintenance is covered as part of the aircraft manufacturer’s technical publications.
Technical Publications Available On-line

www.honeywell.com/esource

(6 pages)
Simple Process to Get Started Using eSource

- Register on Honeywell eSource website
- Access Technical Publications, eDocs
eSource Provides On-Line Support for Aerospace Customers

Visit eSource at: www.honeywell.com/esource
...For eDocs (Technical Publications), Catalog Pricing, Repair Capabilities, and much more...
How do I access eSource?

Visit eSource Today and Register at  www.honeywell.com/esource

1. Step one: Access URL

2. Step two: Click on “New User Sign-Up” link

2a. ...then click on “Register For Account”

1a. ...and Select application

3. Step three: Complete Application and click on the “Submit” button

Registration is simple... Access granted within 48 hours!!!
How do I complete a Registration form?

A user may not register as a “Company” account. Account valid for a specific user only.

Need company e-mail account not judy@hotmail.com.

Customers setup their own User ID and initial password.

NOTE: Username and password are case sensitive. Password must be at least 6 characters, no special characters (i.e. ‘, -, &…) no spaces between characters. Please note your password and logon ID as submitted.

NO abbreviation of company name (i.e. RJAF, FDX…) will be acceptable. You must type your company’s complete name. For example: “Royal Jordanian Air Force” is a complete company name.

Complete Business address is required to include city, country zip code.

- Complete the Profile
- Click submit button
- Approval Granted in 48 hours under normal circumstances.

Helpful tips to ensure a pleasant customer experience!
How do I add an Application?

1. Log on to www.honeywell.com/esource
2. From the Parts and Order Management listing click on the application you would like to add to your profile
3. Type your Login ID and Password
4. Click on the “Login” button
5. A window will open advising you that you do not have access to the application and will ask you if you would like to request an account
6. Click on the “OK” button

New window will open advising you that your request has been sent and that a response will be provided to you within 48 hours.

Repeat process to add additional applications to your profile

Adding additional applications requires registration first…
eSource Applications: eDocs

A. Click on “eDocs”

B. Follow “Login” Process

C. Select Product Family “Propulsion AS907”

D. Select “Heavy” (HMM) or “Light” (LMM)
10. Training Academy
Training

Programs

HTF7000 line and flight line and GTCP36-150[BD] training courses are all currently available through the Aerospace Training Academy. For maintenance personnel who would like to make one stop and learn about engines, nacelles, APU’s, avionics, and the interface between the engine and the aircraft, please check out the Honeywell website to secure a position in an upcoming class.

HTF7000 Line Maintenance Course
This course is designed to provide technicians with training to meet the demands of flight line and line maintenance activities. Course content involves both classroom and practical activities. Course material includes fault isolation/troubleshooting procedures, engine, nacelle, and thrust reverser construction and system operation. Activities involve compliance with engine borescope procedures. Emphasis is placed on the use of technical publications and electronic troubleshooting tools in the classroom and during practical activities.

HTF7000 Flight Line Maintenance Course
Similar course to the Line Maintenance, however, less detail provided on Thrust Reverser and Borescoping processes.

GTCP36-150 APU Course
If you are interested in attending the 2-day APU course, it is typically offered the week before the Line Maintenance course.

For further information concerning these classes, please contact the Registrar at 602-365-2667.
Entitlements for new owners and contact info

- **New engine**
  - 2 free training slots per engine for the first year (4 slots per aircraft)

- **New APU training**
  - 2 free training slots for the first year

- **Training Center Contacts and help information**
  - **Website:**
    - http://www.honeywelltraining.com
  - **Manager:**
    - Andy Akers: (602)365-2688
    - andrew.akers@honeywell.com
  - **General information:**
    - trainingsolutions@honeywell.com
  - **Help and Questions:**
    - phone: (602)365-2833
    - fax: (602)365-2832
  - **Training school location:**
    Aerospace Training Solutions
    1944 E. Sky Harbor Circle
    Phoenix, AZ 85034
## Upcoming Training Schedule - 2006

<table>
<thead>
<tr>
<th>Course</th>
<th>Class</th>
<th>Location</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
</table>
11. Rental Engines & Nacelles
Rental Engines

- Rental engines currently positioned worldwide
  - Additional units introduced as fleet grows

- Nacelle and TR rental units currently positioned and ready at GKN / Ft Worth, Texas

Europe (Brussels Emery Hub)
# Nacelle Components - Rental & Repair

**Programs**

Honeywell’s propulsion system partner, GKN Aerospace, stocks major nacelle components such as inlets, cowl doors, and thrust reverser assemblies for rental / lease to operators requiring repair of their components.

Service support for the Propulsion System nacelle components is handled by the Honeywell Authorized service center network.

These assemblies are positioned in Dallas, Texas for Western Hemisphere operators and the Isle of Wight, United Kingdom for Eastern Hemisphere. Operators and service center can contact Honeywell / GKN to request components utilizing the contact information provided below.

<table>
<thead>
<tr>
<th>Nacelle components are to be returned to:</th>
<th>GKN Aerospace Services Ltd (Eastern Hemisphere):</th>
</tr>
</thead>
<tbody>
<tr>
<td>GKN ACT Inc. (Western Hemisphere)</td>
<td>Ferry Road</td>
</tr>
<tr>
<td>3220 South Grove Street</td>
<td>East Cowes</td>
</tr>
<tr>
<td>Fort Worth, Texas 76110 USA</td>
<td>Isle of Wight</td>
</tr>
<tr>
<td>Phone: 1-817-921-2220</td>
<td>PO32 6RA</td>
</tr>
<tr>
<td>Fax: 1-817-921-2264</td>
<td>United Kingdom</td>
</tr>
<tr>
<td></td>
<td>Phone: 44-0-1983-283507</td>
</tr>
<tr>
<td></td>
<td>Fax: 44-0-1983-283499</td>
</tr>
</tbody>
</table>
12. Communication

Honeywell
HTF7000
Welcome to the Family !!

Contents:
- Customer Support Handbook
- MSP Brochure & Briefing
- e-Engines Brochure
- Quick Reference Support Wallet Card
- SpotLight Information and Signup
- Technical Publications Ordering
- HTF7000 Cross-Section
- Pilot Tips Handbook
- Warranty Brochure
- eSource Brochure
- Service Information Letters
- Jet-Care Information and Signup
- Customer Support Newsletters
- ...all this and more on CD!

Honeywell
Proactive Communication

Programs

Our communication plan within the Customer Support team to the customer is frequent and proactive. Outbound communication means include:

**Operator Information Wires (OIWs)** and **Service Information Letters (SIL’s)** providing quick information on key program and technical aspects affecting the operator. Typically, they are faxed or e-mailed to the operators and service centers and also reside on the e-engines website. Please make sure we have your correct mailing and email contact information.

Honeywell also publishes a **Customer Support Newsletter** to our operators, covering general program information and status, program maintenance and operational tips, and status of specific product improvements and upgrades that we highlight for your awareness, all to help make life easier and keep you informed.

Our **Pilot Advisor Group** has prepared a **HTF7000 Pilot Tips** guide which provides operators with the inside track on how to operate the engine safely and economically and is a supplement to the AFM.

All of the previously mentioned documents will also be published in the communications section of e-Engine™. As with other programs, we use **Service Bulletins** and **Spare Parts Bulletins** on a regular basis.

**A comprehensive, proactive plan to maintain communication with our operators and service providers.**

Honeywell Confidential
13. Pilot Tips
14. Quarterly Newsletters

Honeywell HTF7000 Customer Support Newsletter

Volume 2, Issue 2 2nd Quarter 2004

HTF7000 Fleet Passes 6,000 Hour Mark In June

Just over six months ago the first Challenger 300 aircraft entered service, and today the fleet has surpassed 6,000 total engine operating hours with very good success! A total of 11 aircraft are now in revenue service with several flying distant routes to Australia and Europe on a regular basis. The HTF7000 is performing very well in all key aspects of the program:

- Performance and Reliability
- Cost of Ownership
- Customer Support Responsiveness, and
- Service Center and Rapid Response Team Satisfaction

As most of the fleet hours have been accumulated on the Bombardier FlexJet fractional fleet, FlexJet Engine Services Manager was able to share with you some critical operational information. The engine performance has been excellent.

Honeywell
15. Operator Information Wires (OIW’s)

Honeywell

Operator Information Wire

HTF7000

Date: September 21, 2004

Refer to: Operator Information Wire AS900-2004-OIW-006

To: HTF7000 (AS907) Operators and Authorized Service Providers

Subject: HTF7000 Program Update and NBAA M and O Schedule

Applications: HTF7000 (AS907-1-1A)

The HTF7000 fleet has recently crossed over the 8,000 engine fleet hour milestone, well on our way to a projected 10,000 engine fleet hour by year’s end. Entry into Service for the HTF7000 propulsion system is exceeding our goals and expectations from a design reliability standpoint and support team execution strategy. Additionally, we want to ensure that the HTF7000 system and support teams are meeting and exceeding your expectations as well. Honeywell would like to extend our many thanks to our operators for making these milestones occur.

We have just completed the low pressure turbine stage 1 nozzle support upgrade program for all our engines, which is now complete with Remanufactured and new stock for support.
16. Service Information Letters (SIL’s)

**Honeywell**

**SERVICE INFORMATION LETTER**

**Engine, Systems & Services - Phoenix, Arizona**

**Applicable To:** AS907 Turbofan Engines

**Subject:** PRICING AND AVAILABILITY FOR ALL AS907 PROPULSION ENGINES PUBLICATIONS EFFECTIVE AUGUST 1, 2003

**Purpose:** To provide current information on the availability, format, and pricing of engine publications for the AS907 Propulsion Engines.

**Discussion:** Honeywell Engines Systems & Services offer a number of engine publications for the AS907 engine family. These publications are available in a wide variety of formats to meet individual user preferences and requirements. The various formats include:

- Hard copy (paper)
- CD-ROM (electronic)
- Web-based** (http://honeywell.com/issuse, then select Technical Publications under Aerospace Quick Links)

*Please Note:* This site requires user login ID and password. To obtain these, log on to http://honeywell.com/issuse, and click on Technical Publications under Aerospace Quick Links. Click on "Log in" on the left navigation bar. Next, select "No, I don't have access" and fill out the appropriate information. A login ID and password will be e-mailed in 1-2 business days.

Pricing for the technical documents will vary depending on such factors as:
- Type of Document
- Format requested (Hard Copy, CD-ROM, or Web)
17. Key Honeywell Websites
www.honeywellaerospace.com
Websites

Key aerospace websites can all be accessed by visiting www.honeywellaerospace.com

**e-Engine**
This secure website provides a platform for our customers (operators and service centers) focusing on four major features: 1) Engine trend monitoring, diagnostics, and training, 2) Technical publications and software downloads, 3) Electronic logbook, and 4) Communications (warranty, MSP, c-hamps, Honeywell support team members, service provider directory, and more)

**eSource**
Provides a portal to all Aerospace Support for Production & Aftermarket Parts and Services. Single touch access to 1) training academy, 2) technical publications via eDocs, 3) e-Engine 4) spares pricing catalogues, 5) engine and spare parts repair status and findings, and quick links to all your Honeywell Aerospace needs (Avionics, wheels and brakes, aircraft lighting and electronics, Space systems, and more.....)
Websites

e-Engine Registration

Step 1): Select “Register” and “Register for Account”
e-Engine Registration


Welcome to the e-Engine Maintenance Network. Congratulations on your interest in joining the e-Engine Aviation Community.

Step 1 - Determine Your Access Requirements

- Your Contact Information
- Your Site Administrator’s Contact Information (If different from you)
- Your Company Information (Name, Address, etc.)
- Your Fleet Information - This is Optional but highly recommended to get the most from the e-Engine site. You need identification information for aircraft and engines.

If you would like to add your company’s fleet to e-Engine then please click button above. You should have the following information at hand before beginning.

- Your Contact Information
- Your Site Administrator’s Contact Information (If different from you)
Websites

e-Engine Registration

Step 3): Fill out the information pages (five) as requested (* indicates required fields)
Websites

e-Engine Registration

Step 4): An email will be sent to you with login information and general instructions on how to use the site.