



الهيئة العامة للطيران المدني  
GENERAL CIVIL AVIATION AUTHORITY

# Air Accident Investigation Sector

Accident

- Final Report -

AIFN/0015/2012

## Loss of Control Inflight [LOC-I]

Operator: Horizon International Flight Academy

Type: Agusta Bell 206-3B

Registration: A6-FTB

Location: Al Ain Training Area Six

Date of Occurrence: September 04, 2012



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Air Accident Investigation Sector  
General Civil Aviation Authority  
The United Arab Emirates

## Incident Brief

<b>GCAA AAI Report No:</b>	AIFN/0015/2012
<b>Operator:</b>	Horizon International Flight Academy
<b>Aircraft Type</b>	AB206-3B
<b>Registration</b>	A6-FTB
<b>Engine [s]</b>	One Rolls Royce M250
<b>Location</b>	Al Ain Training Area Six
<b>Category</b>	Air Transport
<b>Persons on Board</b>	Two Crew
<b>Injuries</b>	None

## Investigation Objective

This Investigation is performed pursuant to the United Arab Emirates (UAE) Federal Act 20 of 1991, promulgating the Civil Aviation Law, Chapter VII, Aircraft Accidents and Article 48.

It is in compliance with Part VI, Chapter 3 of the UAE Civil Aviation Regulations, in conformity with *Annex 13 to the Convention on International Civil Aviation* and in adherence to the *Air Accidents and Incidents Investigation Manual*.

*The sole objective of this Investigation is to prevent aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.*

## Investigation Process

The Accident was notified to the General Civil Aviation Authority (GCAA) Air Accident Duty Investigator on the 4<sup>th</sup> September 2012.

An Investigation Team was immediately dispatched to the accident site.

The team coordinated with all authorities on site by initiating the accident investigation process according to prepared and previously exercised plans.

In accordance with ICAO Annex 13, the ANSV<sup>1</sup> (Agenzia Nazionale per la Sicurezza del Volo) were notified and appointed an Accredited Representative [AR] to the investigation and nominated Technical Advisors from the Original Equipment Manufacturer [OEM] of the airframe. Rolls Royce, the engine manufacturer, appointed a Technical Advisor [TA] who travelled to the site.

The Air Accident Investigation Sector (AAIS) of the GCAA is lead the investigation, as the United Arab Emirates (UAE) is the State of Occurrence.

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<sup>1</sup> The ANSV [Agenzia Nazionale per la Sicurezza del Volo ] is the Italian authority responsible for safety investigations into accidents or incidents in civil aviation.

## ADREP Classification

Primary	Abnormal Runway Contact [ARC]
Secondary	Loss of Control - Ground [LOC-G]

Note:

The Accident/Incident Data Reporting (ADREP) system is operated and maintained by ICAO. The ADREP reporting system is based on the use of a common reporting taxonomy, States use this taxonomy in their national reporting to achieve international harmonisation and thereby enable the exchange and aggregation of occurrence information.

## Aircraft Data

The AB206-B3 is a single pilot, five place, light helicopter with a two-blade semi-rigid main rotor, and a tail rotor that provides directional control.

The airframe is a semi-monocoque<sup>2</sup> fuselage with an aluminium alloy and fiber glass aerodynamic fairings, an aluminium alloy monocoque tail boom supporting the vertical fin, fixed horizontal stabiliser, tail rotor assembly and tail rotor drive train.

The primary load carrying structures are two built in cabin bulkheads, a vertical control tunnel from the floor to the cabin roof and a pair of longitudinal beams in the cabin roof.

The landing gear is tubular aluminium skids mounted laterally.



Figure 1: Augusta Bell [AB] 206B [exemplar]

<sup>2</sup> In design engineering, stressed skin is a type of rigid construction, intermediate between monocoque and a rigid frame with a non-loaded covering. A stressed skin structure has its compression-taking elements localized and its tension-taking elements distributed.



## Accident Synopsis

During a training flight from Al Ain International Airport [OMAL], an Agusta-Bell 206-3B helicopter operating in the north western training area with an instructor and a student pilot were completing a training flight involving practice autorotation onto the training area six heliport, northwest of Al Ain International Airport.

During the second autorotation exercise, an unstable condition developed in close proximity to the ground due to a loss of control. This resulted in the instructor taking control of the aircraft and attempting to recover the situation and re-stabilise the aircraft to a level flight attitude and arrest the sink rate.

The aircraft contacted the ground with a high rate of descent and minimal forward speed resulting in significant deformation of the primary structure, a rotor strike on the aft of the tail boom, followed by the separation of major primary structural components and the transmission/rotor assembly from the aircraft.

There was no post-accident fire.

# 1. Factual Information

## 1.1 History of the Flight

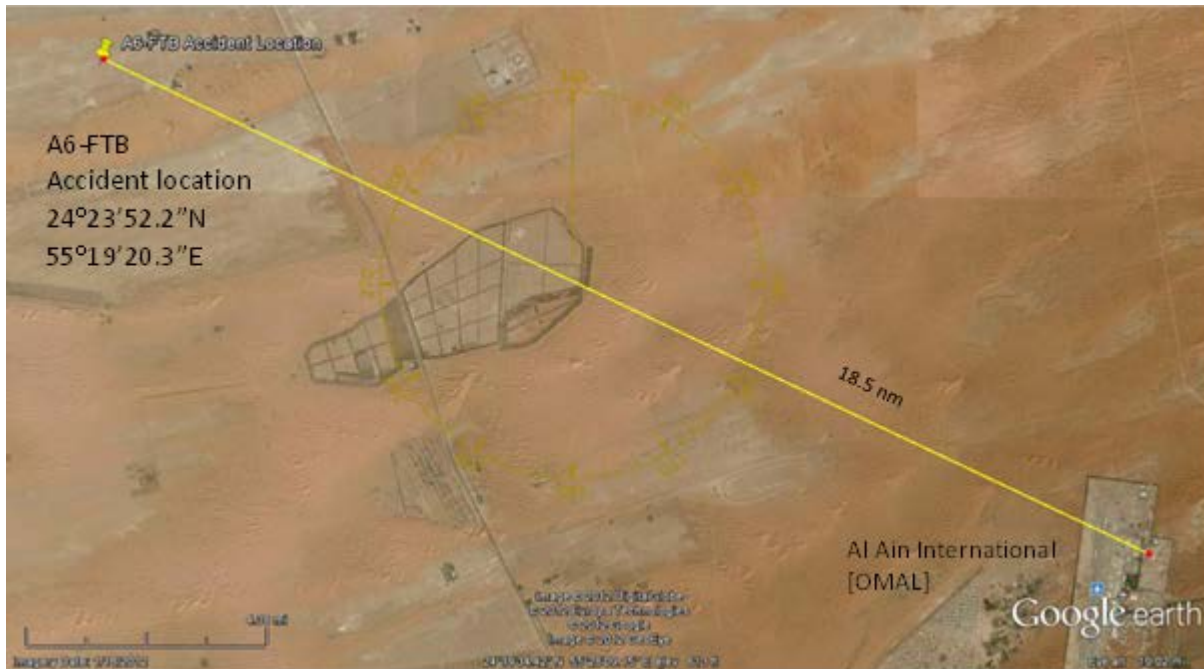


Figure 2 - Google Earth Overview - Accident location/airport proximity

The Instructor briefed the student pilot for a revision exercise involving Engine-Out Landing [EOL] autorotation exercises to a fixed point on the ground.

The student was the handling pilot for the departure from the fixed operating base at Al Ain International Airport [OMAL] to the training area to the northwest of the airport designated as Training Area 6 [TA6]; engine start was at 0715 UTC.

Upon arrival at TA6, the instructor demonstrated several procedures relating to the training flight and the revision exercises.

Due to passing IFR traffic, the training flight was height restricted to 1500 ft for the majority of the training session up until the time that a limited five minute window was available to operate to 2500 ft or below; this time at approximately 0722 UTC when the clearance to operate up to 2500 ft was acknowledged.

The student executed the first of two planned 360° autorotation exercises successfully.

During the second autorotation exercise, an unstable condition developed in close proximity to the ground resulting in the instructor taking control of the aircraft and attempting to recover the situation and return the aircraft to a stable, level flight attitude and arrest the sink rate.

The aircraft contacted the ground with a high rate of descent and minimal forward speed resulting in significant deformation of the primary structure, a rotor strike on the aft tail boom, followed by the separation of major primary structural components and the transmission/rotor assembly from the aircraft.

There was no post-accident fire.

## 1.2 Injuries to Persons

Both crewmembers were uninjured and the egress from the habitable occupied space was without incident.

Further information on the type of injury, crew protection and the cabin survivability is detailed later in this report.

<i>Injuries</i>	<i>Crew</i>	<i>Passengers</i>	<i>Others</i>
Fatal	0	0	0
Serious	0	0	0
Minor	2	0	0

Table 1: Injuries to Persons

## 1.3 Damage to the Aircraft

The aircraft was substantially damaged due to the rapid descent and abnormal contact with the training area followed by the uncontrolled rotation of the helicopter on the training area circumference.



Figure 3: Accident Site Overview

## 1.4 Other Damage

No additional damage was evidenced or recorded. The TA6 area is an unmonitored training site.

## 1.5 Personnel Information

The Instructor was licensed and current on type. GCAA CPL [H] #31529





## 1.6 Aircraft Information

### Aircraft Data

- Type: Agusta-Bell AB206-3B
- Registration: A6-FTB
- Manufactured: 1983
- Engine: 1 x Rolls Royce M250

The aircraft was airworthy at the time of the accident. GCAA Airworthiness certificate was revalidated on 29 April 2012.

## 1.7 Meteorological Information

### OMAL AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA

1	ARP coordinates and site at AD	241542N 0553633E, Mid - point of RWY, on CL
2	Direction and distance from (city)	8 NM WNW of Al Ain
3	Elevation/Reference temperature	866 FT / 39° C
4	Geoid undulation at AD ELEV PSN	-104 FT

Table 2: Aerodrome Data

Meteorological data for Al Ain International Airport [OMAL] 04 September 2012 was as follows:

In summary: light variable winds, no significant clouds, good visibility.

METAR/SPECI/Al Ain/OMAL/04th September 2012	
201209040100	METAR OMAL 040100Z 32003KT 8000 NSC 31/23 Q1002 A2959=
201209040200	METAR OMAL 040200Z 03003KT 340V060 6000 NSC 30/24 Q1002 A2960=
201209040300	METAR OMAL 040300Z 05004KT 6000 NSC 30/24 Q1002 A2961=
201209040400	METAR OMAL 040400Z 15010KT 7000 NSC 32/21 Q1003 A2962=
201209040500	METAR OMAL 040500Z 16010KT 7000 NSC 34/20 Q1003 A2963=
201209040600	METAR OMAL 040600Z 16009KT 8000 NSC 36/19 Q1003 A2963=
201209040700	METAR OMAL 040700Z 17006KT 110V220 8000 NSC 38/19 Q1003 A2962=
201209040800	METAR OMAL 040800Z 12003KT 030V200 8000 NSC 40/16 Q1002 A2960=
201209040900	METAR OMAL 040900Z 21004KT 160V260 CAVOK 42/14 Q1001 A2957=

OMAA LOW LEVEL WINDS for 0000UTC on 04 <sup>th</sup> September 2012
Surface WIND: 27004KT TEMP: 33.0 C
0500FT WIND: 24503KT TEMP: 32.1 C
1000FT WIND: 30505KT TEMP: 30.6 C
2000FT WIND; 30506KT TEMP: 32.7 C
3000FT WIND: 25502KT TEMP: 31.6 C
4000FT WIND: 20002KT TEMP: 29.5 C
5000FT WIND: 14005KT TEMP: 28.4 C
6000FT WIND: 17504KT TEMP: 26.9 C
7000FT WIND: 17506KT TEMP: 24.7 C
8000FT WIND: 19508KT TEMP: 22.1 C
9000FT WIND: 17506KT TEMP: 19.5 C
10000FT WIND: 13504KT TEMP: 16.6 C
TAF OMAL 032300Z 0400/0506 29006KT CAVOK/04th September 2012
BECMG 0402/0404 16010KT
BECMG 0409/0411 35011KT
PROB30 TEMPO 0412/0415 VRB18G30KT 3000 BLDU FEW045TCU
BECMG 0417/0419 05005KT
BECMG 0502/0504 16007KT

Table 3: Meteorological Information OMAL 04 September 2012

During the high temperature months the operator limits the flying during the peak temperature times around mid-day and early afternoon to avoid the performance limitations imposed by the high ambient temperatures.

The accident occurred at 07:59 UTC, or 11:59 Local time, so at the limit of the high ambient temperature zone. The high ambient temperature and the reduced density altitude will affect the helicopter power and aerodynamic performance.

#### Fixed Base Meteorological Station [FBMS]:

There is no portable or fixed meteorological station at the unmonitored training areas<sup>3</sup>, subsequently the wind strength and direction is determined by the handling pilot for each operation.

There are no windsocks or other visual aids to indicate to the pilot the local areas conditions.

### 1.8 Aids to Navigation

Not required

<sup>3</sup> There is no GCAA requirement for a fixed meteorological station



## 1.9 Communications

### VHF Communication

The radio communications were standard. All transmissions between the accident aircraft and OMAL Approach were recorded.

The accident aircraft [H0] contacted OMAL Radar at 0721:58 requesting clearance to operate at 2500 ft and below.

Another aircraft [H1] operating in the same training area contacted OMAL Radar at 07:59:22 to advise the accident aircraft was damaged and that the crew of the accident aircraft had been collected from the accident site.

Time [UTC]	Freq	Aircraft/Grnd Stn	Text
7:22:19	133.55	H0	Alright ah no problem, two thousand five hundred and below
7:45:53	133.55	H1	Approach ah H1
7:59:20	133.55	Al Ain Radar	H1 go ahead
7:59:22	133.55	H1	H1 completed [inaudible] and sir I'd like to inform you that H0 aircraft alpha six foxtrot tango bravo, ahh he had emergency landing, eleven forty five local time, area six, the cause sir aircraft damage.
7:59:22	133.55	Al Ain Radar	H1, report X-ray, I understand H0 on the ground

Table 4 - VHF Radio Communication – abridged transcript

### 1.10 Aerodrome Information

The training area is an unmonitored heliport, used for training purposes only.

The training area is defined by a circle of tyres and there are no fixed visual aids or fire fight/rescue facilities available.

- The accident location is in a defined training area 18.25nm north west of the aerodrome
- The GPS location for the accident in OMAL Training Area 6 [TA6]:
- LAT 24° 23' 52.2" N/ LONG 55° 19' 20.3" E
- TA6 is 500 ft above sea level
- Landing Site Density Altitude [DA]<sup>4</sup>

Elevation/Reference temperatures 866ft/39°C<sup>5</sup>, with the Geoid undulation at -104ft, at 1003 hPa, gives a corrected value of 1062ft. Based on the observed actual temperatures at the time of the accident [39°C], the DA for the T6 area elevation was approximately 4000ft.

<sup>4</sup> Density Altitude

Density altitude represents the combined effect of pressure altitude and temperature. It is defined as the height in the standard atmosphere that has a density corresponding to the density at the particular location (on the ground or in the air) at which the density altitude is being measured

<sup>5</sup> AERODROME REFERENCE TEMPERATURE

An aerodrome reference temperature shall be determined for an aerodrome in degrees Celsius.

The aerodrome reference temperature should be the monthly mean of the daily maximum temperatures for the hottest month of the year (the hottest month being that which has the highest monthly mean temperature). This temperature should be averaged over a period of 2 years.

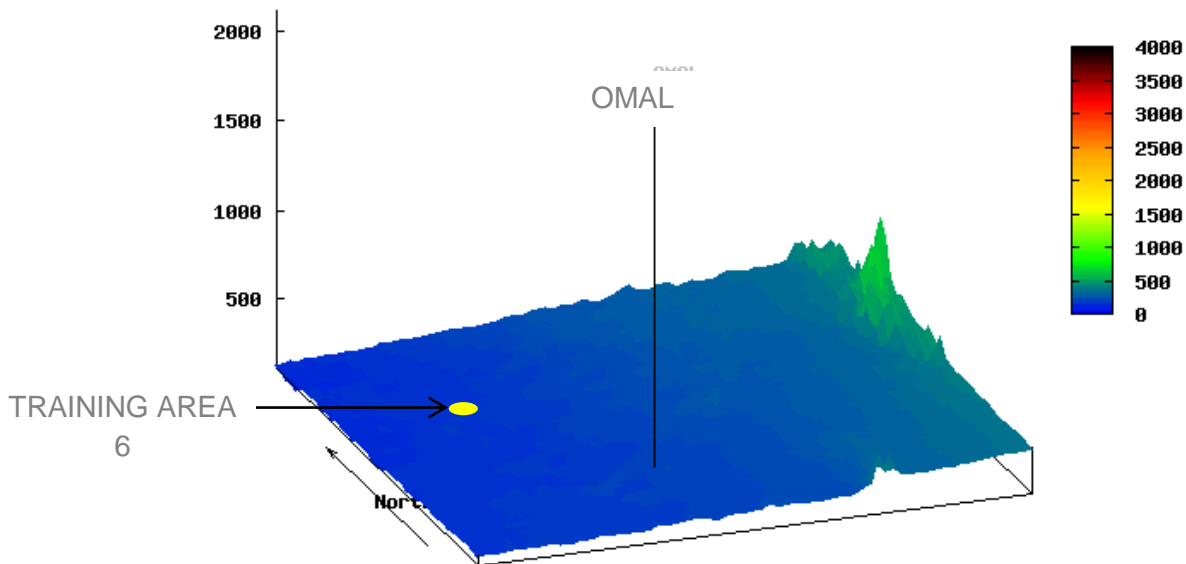


Figure 4 - OMAL Aerodrome Elevation and High Ground Training Area 6 Location and Elevation/Obstacle Clearance

The training area is an unmonitored training area, northwest of OMAL. The area is level, with firm impacted sand, a circular arrangement of tyres indicate the landing area and there are no wind socks or other obstacles present.

Wind direction and speed judgement was at the discretion of the handling pilot.

### 1.11 Flight Recorders

For this category of transport aircraft flight data recorders and cockpit voice recorders are not mandatory.

The requirement for cockpit cameras, under current international regulations also do not require video recording of the crew area.

### 1.12 Wreckage and Impact Information

The location of the accident was in TA6.

The accident site was 18.25 nm from OMAL on a radial of 295° from the operators fixed base.

The accident site surface is level compacted sand, with an estimated CBR<sup>6</sup> of 3-4, with a blown and drift sand accumulations scattered locally.

The wreckage is localised to the immediate area of impact in an approximate 70x70 meter grid. Various structural parts and components were found up to 70 meters from the accident site; the majority of the wreckage is localised in one location.

There was pooling of leaking fuel from fuel tank with large areas of hydraulic fluid scattered or pooling around the engine and detached transmission/rotor blade assembly.

The LH aft skid stay of the LH skid had failed under the high induced loads during the heavy landing puncturing the fuel bladder tank.

<sup>6</sup> California Bearing Ratio (CBR) is a test for evaluation of the compressive/mechanical properties of terrain substrata material.



### 1.13 Medical and Pathological Information

Both crewmembers were conscious and mobile following the accident.

Both the instructor and the student pilot were transported to a hospital.

GCAA CAR Ops requires that all crew are to provide an alcohol and drug test following an accident or incident. This was completed following the hospitalisation.

### 1.14 Fire

There was no fire.

### 1.15 Survival Aspects

Both crew survived the impact and deceleration loads with minor injuries.

The available living space in the cockpit remained intact with significant buckling of the support structure immediately aft of the two crew seats.

There was limited deformation of the floor structure, seat retention fasteners, console, seat structure and overhead panel.

The crew seats remained intact as did the crew restraints/harnesses and support fittings.

Neither crewmembers was wearing Aviation Life Support Equipment [ALSE] such as a combined communications systems and cranial protective helmet.

The left hand (LH) landing skids deformed during the heavy landing.

The Skid puncturing the LH side of the fuel bladder resulting in fuel spillage.

The Emergency Locator Transmitter (ELT) did not trigger.

### 1.16 Test and Research

The engine was sent to the manufacturer's test and repair facility for detailed analysis<sup>7</sup>.

High temperature operational limitations have been analysed with the manufacturer to determine if there is a requirement to add an addendum to the performance limitations criteria.

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<sup>7</sup> The engine function report is attached in the appendix to this report



## 1.17 Organizational and Management Information

### 1.17.1 Horizon International Flight Academy

Horizon International Flight Academy [HIFA] is an approved Flying Training School [FTS] in accordance with CAR Part IV/Section A – *Approved Flying Schools*.

The operator is based at OMAL in the United Arab Emirates. The academy provides both fixed wing and rotary wing training utilizing a fixed wing fleet of Cessna 172SP, Diamond DA42, and a rotary Bell 206 and Bell 407 aircraft.

The training courses cover the scope of flight crew licensing<sup>8</sup> from Private Pilot to Airline Transport Pilot License and Flight Instructor Ratings. The academy also provides training to the military and police sectors. Since its establishment, the academy has trained more than 800 pilot and instructor graduates.

The training programs follow the European Aviation Safety Agency (EASA) syllabus. The training courses for both fixed wing and rotary wing are approved by the UAE General Civil Aviation Authority (GCAA), and the fixed wing training courses are also approved by EASA.

At the time of the accident, HIFA had a complex organizational structure involved in training both civilian and military cadet pilots in rotary and fixed wing flying utilizing four different aircraft types.

### 1.17.2 HIFA Safety Management System

#### Safety Manual Review

The HIFA Safety Manual was accepted by the GCAA in 2011 and it formed the basis for the Safety Management System. Based on the documentary evidence, a gap analysis was not undertaken by HIFA's accountable managers prior to producing the Safety Manual. The manual was not complete at the time of its acceptance by the GCAA as the safety management procedures had not been included in the initial version and these were to be developed and implemented gradually by the organization.

#### Emergency Response Plan Review

The HIFA Emergency Response Plan (ERP), sent to the GCAA in January 2013, but issued prior to its approval, is a generic ERP designed to an Occupational Health and Safety instruction manual standard, and not an integrated ERP plan as defined by ICAO.

### 1.17.3 GCAA Oversight of the Operator

Regulatory oversight by the GCAA is conducted by Safety Affairs.

As of December 31<sup>st</sup> 2011, a UAE based flight training organisation which is certified under CAR PART IV- *Special Purpose operations*, Section "A", shall show a complete compliance with this regulation by establishing a safety management system that is acceptable to the GCAA, maintaining it and completing its implementation by establishing and complying with the requirements of this Part.

The operator is required under CAR Part X to have a functioning and proficient Safety Management System. See below:

*Safety Management Systems*

*CAR Part X- Safety Management System Requirements*

<sup>8</sup> Per CAR Part IV/SUB-SECTION 1.0 – GENERAL/1.4

(d) An Air Operator/Private Operator that holds a certificate issued under CAR OPS 1 or CAR OPS 3, or a flight training organisation certificate and at the same time holds a Maintenance Organisation Approval issued under CAR 145 shall establish an integrated Safety Management System.

The operator is required under CAR Part X/Section 8 to develop and maintain an ERP.

8. EMERGENCY RESPONSE PLAN: The Organisation shall develop and maintain, or coordinate, as appropriate, an emergency response plan (ERP) that outlines what actions are to be taken following an accident or an emergency situation. The overall objective of Emergency response Plans is the safe continuation of operations or the return to normal operations as soon as possible. Where it is not reasonably practical for an Organisation to establish an ERP, the GCAA may accept removal of this requirement on a case by case basis.

### 1.18 Additional Information

#### Civil Aviation Advisory Publication – CAAP 70

CAAP 70 - *Heliports: Air Service and Private Use/(Not Air Service): Standards, Guidance and Information Regarding Heliports* (Issued June 2014), was published as a result of the ICAO adoption of Amendment 6 to Annex 14 Volume II. This amendment was effective on 14<sup>th</sup> July 2014 and will become applicable as of 13<sup>th</sup> November 2014.

CAAP 70 makes reference to guidance and information regarding helicopter operations, in particular reference should be made to Landing Area Acceptance [LAA] and the self-assessment risk matrix referred to in the CAAP.

#### Accidents and Incidents

Over the period from October 2011 to January 2013 there was an increase in the accident and incident rate with the operator.

The operator had an increasing number of incidents/accidents during the period from 2010 to 2013.

The figure below illustrates a summary of the incidents/accidents for this operator.

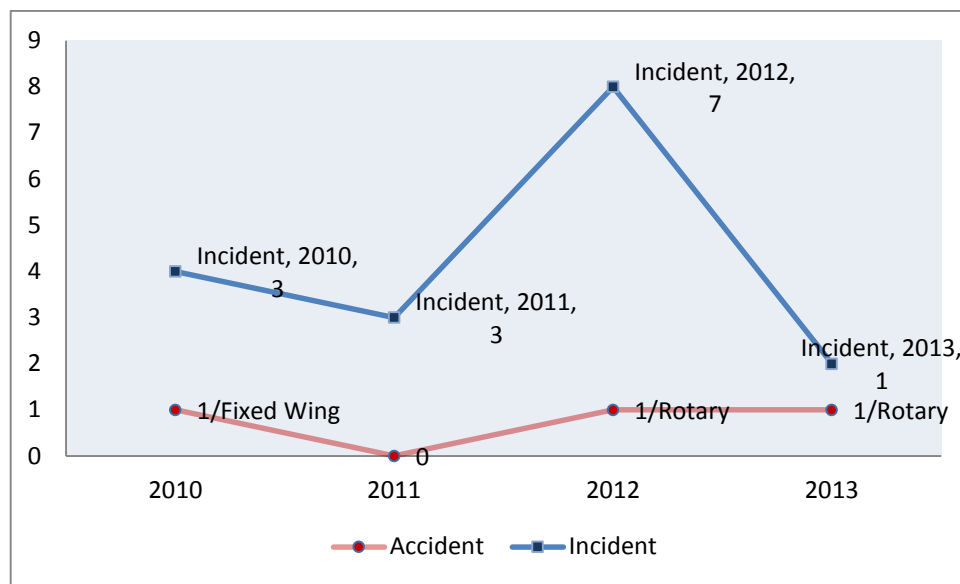


Figure 5 - Accident Rate 2010 – 2013



The time interval between the occurrence of this accident and the publication of the report was delayed as the operator was in the process of implementing various organisational and safety initiatives.

The aircraft used by the training school are not equipped with GPS location devices.

The aircraft are not equipped with radar altimeters [RADALT]<sup>9</sup>. All height above ground calculations are determined by the handling pilot based on the altimeter barometric setting and mentally deriving the height through a process of subtracting the height above sea level from the indicated altimeter setting.

### **1.19 Useful or Effective Investigation Techniques**

Standard investigative techniques were used.

The GCAA completed an organisational audit of the operator to determine the safety standards and accepted best practice.

The investigation reviewed the Adoption of the International Helicopter Safety Team [IHST] and Gulf Flight Safety Committee [GFSC] initiatives to reduce accidents, including the following: Manoeuvre Initiation Envelope [MIE].

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<sup>9</sup> A radar altimeter, electronic altimeter, reflection altimeter, radio altimeter (RADALT), low range radio altimeter (LRRR) or simply RA, used on aircraft, measures altitude above the terrain presently beneath an aircraft or spacecraft by timing how long it takes a beam of radio waves to reflect from the ground and return to the plane. This type of altimeter provides the distance between the antenna and the ground directly below it, in contrast to a barometric altimeter which provides the distance above a defined datum, usually mean sea level.





## 2. Analysis

### Safety Manual

The Safety Manual had not been through an implementation and validation process from the initial submission and acceptance by the GCAA.

The acceptance of a partially completed Safety Manual by the GCAA did not encourage the operator to produce a manual that met the requirements of the regulator.

The review of the safety manual resulted in a finding resulting from the content clarity and the SMS format and purpose.

It is recommended practice to undertake a gap analysis of the existing safety system versus the documented SMS requirements before writing the SMS Manual prior to devising a plan to implement an SMS. There is no documentary information available from the operator indicating a gap analysis was performed.

The end result was a dysfunctional SMS that lacked coherence and direction and was incapable of fostering a reasonable safety culture.

The operators SMS was not considered sufficient for the purpose of safety management and accident prevention when reviewed against international best practice.

### Change Management

The academy has grown significantly since its foundation in 2009. It has been subjected to the stresses associated with a fast growing aviation business in ensuring its ability to offer services which meet the needs of the training Industry and also comply with regulations and maintain the highest level of safety.

During this period, there have been a number of organizational changes which have added to the constant state of change. This has led to inconsistency and uncertainty across the organization.

From 2009, there have been three Accountable Managers, two Heads of Training for the Fixed Wing Division, two Chief Flight Instructors for the Fixed Wing Division, two Chief Operating Officers, and a number of instructor level changes. With each change among the Post Holder and senior management body there were operational, procedural and organizational cultural changes. Since the organization has little or no change management processes in place this has led to corporate identity confusion. The establishment of a safety culture in this environment was problematic.

### Regulatory Audits

The GCAA audits from 2009 to 2013 indicate insufficient focus on Standardization and Change Management. The audit findings indicated that the training manuals were to be updated to meet regulatory requirements.

One manual was approved in a format acceptable to the GCAA. This was the Integrated Airline Transport Pilot License (ATPL) Manual for the Fixed Wing Division, which was accomplished in 2011. Up to the time of the accident, no further manuals have been submitted to the GCAA that meet the regulators standard, either in content or format.

Regulatory audits findings highlighting non-compliance with the operators Standard Operating Procedures [SOP's] with reference to GCAA guidance. Failure to close audit findings by the operator resulted with a warning being issued to the organization by the GCAA. A number of the findings, year-



on-year, were repetitive in nature, and the corrective actions implemented by operator failed to prevent repeated occurrences.

## Emergency Response Plan

The operator's Emergency Response Plan (ERP), provided to the GCAA in January 2013, and issued by the operator prior to GCAA approval was a generic corporate ERP designed to an Occupational Health and Safety instruction manual standard, and not an integrated ERP plan as defined by ICAO suitable for aviation regulatory approval.

No gap analysis was performed prior to the drafting and formulation of the ERP. The result of this approach to drafting the ERP is a document that is not sufficiently detailed to effectively manage a dynamic situation such as an aircraft accident or serious incident.

The operators ERP is not integrated into the aerodrome ERP plan. Although the plan contains some references to the provision of ERP training for the operator's personnel these functions are not specified or allocated.

All aviation ERP's include checklists and contact lists. The checklists are coordinated with each other and are essential to allow correct execution of the plan. The operators ERP contains no checklists or contact lists or any reference to these items.

The operators ERP states that a single integrated emergency response plan has been developed. This plan is intended to be implemented for any emergency affecting the operator. The plan does not specifically deal with the response to an aircraft accident or serious incident in sufficient detail. There is no reference to ICAO Annex 13 nor is it included as an appendix.

The ERP contains no definition of aircraft accident. The operator has redefined an aircraft accident as an incident in their ERP terminology. To avoid ambiguity standardized ICAO definitions shall be used for all ERP documents.

The review indicated that the ERP does not have detailed policies, procedures or a coordinated response action plan. In the event of an aircraft accident this could cause confusion regarding the initial notification and vital actions required to coordinate, respond and execute a workable response to a significant event.

## Accident Sequence Analysis

- A. AB206 designation 'H Zero' [H0] was cleared to climb then to vacate 2500 ft due to traffic.
- B. H0 completed two 360° turns then set up a 180° turn for the entry into the practice auto rotation onto TA6..
- C. The AB206 is in the descent to the TA6 landing zone, the student is the handling pilot.
- D. The SOP is to open the throttle at 500ft Above Ground Level (AGL).
- E. Flare initiated at 250ft AGL. Pilot report states 'Low RRPM and Warning Light on'.
- F. Instructor assumes command and pushes the cyclic forward at 50ft.
- G. Throttle opened to the Flight indent.
- H. Aircraft attitude in nose high, the tail guard and skids contact the ground the same time as the throttle is opened. The rotor blades deflected down due the hard landing and contact the tail boom, the tail boom then separates.
- I. Aircraft becomes airborne while yawing clockwise, sever vibration results from the damaged rotor. The aircraft contacts the ground as the throttle is closed
- J. The rotor assembly and gear box separate from the top of the fuselage.

- K. Aircraft is then at a full stop position, upright.
- L. The crew evacuate the aircraft.

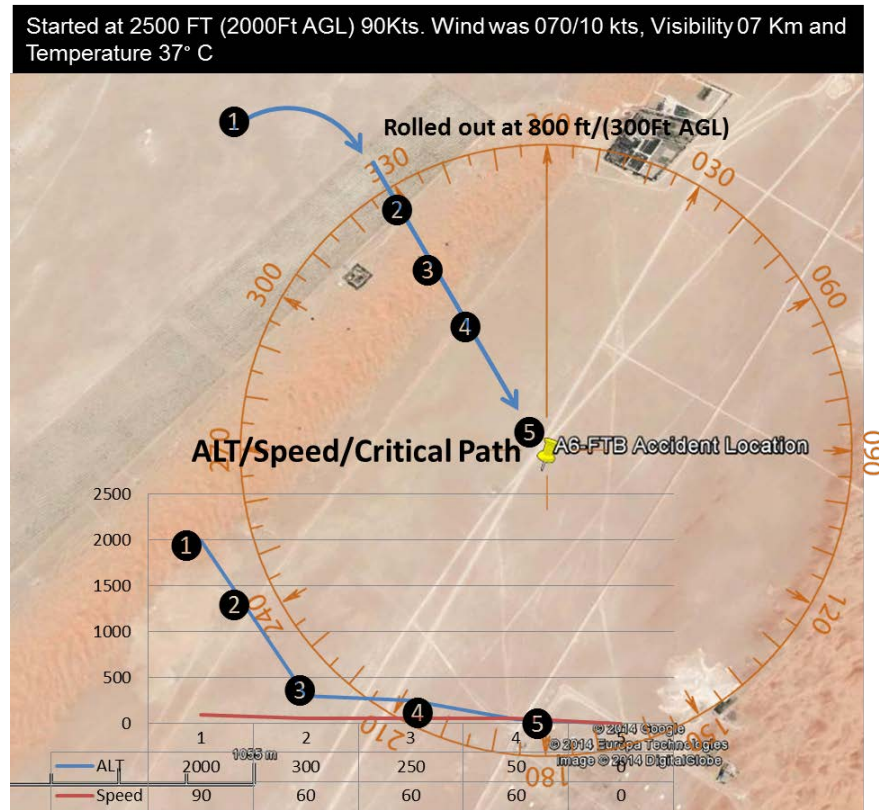


Figure 6 - Accident Event Sequence and Descent Profile

## Safety Elements

The Manoeuvre Initiation Envelope [MIE] identifies seven safety elements pilots should consider prior to initiating any performance based manoeuvre.

These safety elements address both internal and external factors effecting the safety of flight.

The seven elements are the following:

1. Aircraft Limitations.
2. Operational Limitations.
3. Weather.
4. Air Traffic Control (ATC) Goodwill.
5. Practical Test Standards (PTS).
6. Human Factors (HF).
7. Terrain.

These safety elements are dynamic and constantly challenge pilots to maintain a keen sense of situational awareness at all times. It is critical for pilots to always be aware of situations that can change any of these safety elements, whereby breaching the safety confines of the MIE.



## Flight Planning

The tasking for the flight was straight forward, the session lasted up until the flying limitation period restriction which is imposed due to the ambient heat conditions and aircraft performance limitations.

Due to the 2500ft altitude limitation and the necessity to complete the dual session, the time pressure limitation may have been contributory.

The Instructor's monitoring of the aircraft performance and the student entry into the autorotation and the subsequent corrective action, when the low RRPM audible signal was heard, was a contributing factor to this event.

## Performance Management – Engine Power Checks

The operator's current SOP does not require a power check prior to commencing operations or periodically during the training operations on a daily basis.

Conditions at take-off/landing sites differ from what has been allowed for during Flight Manual [FM] performance calculations.

In order to take this into account and to confirm the amount of excess power available, the pilot should make an operational assessment by conducting a power check before committing to a take-off or a landing at the training location, in particular if the ambient heat conditions are reaching the outer limits of the performance tables.

All flights should be verified with an actual power check under the ambient conditions that exist at the point of intended operation.

Accident prevention relies on thorough pre-flight preparation, of which the FM performance chart calculations are an integral part.

Because the ambient conditions at the intended point of operation can be quite different from those planned for, , calculated values must always be verified with an actual power check under the ambient conditions that exist at the operating site.

The AB206 FM/Section IV/4.1- Performance, provides the pilot with the power check procedures for reference during operations and should be considered in the operators SOP prior to commencing operations in high ambient temperatures where the high temperatures could affect the helicopters aerodynamic and engine performance.



## 3 Conclusions

### 3.1 Findings

The findings are statements of all significant conditions, events or circumstances in the [occurrence: accident, serious incident or incident] sequence. The findings are significant steps in the accident sequence, but they are not always causal or indicate deficiencies.

- The flight crew were licensed, medically fit and qualified for the flight in accordance with existing regulations.
- The aircraft had a valid Certificate of Airworthiness [CofA] and had been maintained in compliance with the regulations.
- The aircraft was airworthy when dispatched for the flight.
- There was no evidence of airframe failure, system or engine malfunction prior to the accident.
- The flight planning was conducted in accordance with the procedures in the company Operations Manual.
- The flight exercise was not conducted in accordance with the SOP, i.e. the throttle was not opened at the hard ceiling altitude limitation.
- There is no requirement in the operators SOP for an engine power performance check.
- Limited time at the required height [2500ft] to complete the required tasks/actions.
- The performance limitation for hot weather operations was proximate given the time of the event and the ambient weather conditions.
- There was insufficient altitude available to effect a recovery from the mismanaged power off approach.
- The ELT did not transmit through the SAR Cospas-Sarsat System following the impact.
- No Wind Direction Indicator [WDI] is installed at the training areas, in accordance with CAR Part IX/Appendix 17/17.1- Wind Direction Indicator.
- Student to Instructor ratios requires course planning that contributes to high instructor utilisation.
- The instructor failed to intervene with sufficient time prior to the event sequence developing.
- The operator's Emergency Response Plan [ERP] was inadequately planned and organised.

### 3.2 Causes

Are actions, omissions, events, conditions, or a combination thereof, which led to this (occurrence: accident, serious incident or incident).

The air Accident Investigation Sector determines that the causes of the accident are:

- Instructor monitoring of the developing flight condition was insufficient to plan an effective recovery.
- The throttle remained in the retarded position below the SOP requirement of 500ft AGL.
- The instructor intervened at the point on the critical path where an effective recovery was not possible from the intervention decision altitude.



### 3.3 Contributing Factors

These are actions, omissions, events, conditions, or a combination thereof, which, if eliminated, avoided or absent, would have reduced the probability of the accident occurring, or mitigated the severity of the consequences of the accident. The identification of contributing factors does not imply the assignment of fault or the determination of administrative, civil or criminal liability.

- The Standard Operating Procedure for opening the throttle at 500ft AGL was not followed.
- The student pilot allowed the rotor RPM to decay
- The Standard Operating Procedure for the non-handling pilot to monitor the progress of the approach was not effective in preventing the pilot flying from descending below the recommended approach profile.
- The Instructor's monitoring of the student and the delayed intervention beyond the point where a recovery was possible.
- There was insufficient time and height above the ground to complete all of the tasked actions
- The positioning of the throttle in the 'Flight' indent position just prior to the uncontrolled landing resulted in the aircraft entering an uncontrolled yawing motion following the separation of the tail boom and the complete loss of tail rotor effectiveness.
- Possibility to confuse the decision height using barometric altimeters which are set to QNH where the altimeter will read altitude above mean sea level, not above ground level. The additional workload associated with cross referencing the QNH altimeter setting with the TA6 elevation altitude of 500ft ASL requires constant cognitive mental calculation.

### 3.4 Non Contributing Safety Factors

These are the actions, omissions, events, conditions, or a combination thereof, which had no direct contribution to this accident, but are risks in their nature, that were identified during this Investigation. List the findings, causes and contributing factors established in the investigation. The list of causes should include both the immediate and the deeper systemic causes:

- Mixed Military and Civil Students and Instructors with differing operational requirements, instruction methodology and institutional behaviour.
- An aging fleet of AB/BHT 206 helicopters (radar altimeter installation)
- No air-conditioning equipment in the helicopters.





## 4. Safety Recommendations

### 4.1. General Information

The safety recommendations listed in this Report are proposed according to paragraph 6.8 of Annex 13 to the Convention on International Civil Aviation<sup>6</sup>, and are based on the conclusions listed in section 3 of this Report; the General Civil Aviation Authority (GCAA) expects that all safety issues identified by the Investigation are addressed by the receiving States and organizations.

### 4.2. Safety Actions Taken

Safety Actions Taken by the operator include the following. The following safety actions were implemented by the operator following the accident that is the subject of this report:

- a) The operator engaged consultants to evaluate the Safety Management System and provide recommendations for safety management improvements.
- b) An additional Safety Officer will be employed to assist the Safety Manager.
- c) The operator's Safety Manual was re-written and re-issued in June 2013.
- d) The Emergency Planning Manual was re-written and re-issued in June 2013.
- e) A full emergency exercise was held in September 2013 to verify the new ERP.
- f) All management and staff have received SMS training. This program includes recurrent training.
- g) Training manual updated on 1<sup>st</sup> February 2014 to include the following in the Autorotation exercise and EOL exercise: Throttle Open by 1500 QNH; no Engine Off Landings [EOL].
- h) Introduction to power checks has been implemented while doing the HASEL checks.
- i) The operator has installed a form of Wind Direction Indicator [WDI] as per CAR Part IX, Appendix 17/ Appendix Indicators and Signalling Devices/17.1- *Wind Direction Indicator*.
- j) Crew Resource Management (CRM) training has been implemented.
- k) The ratio of instructors to students has been set at  $1 \leq 3$ .
- l) Improvements to safety briefings have been implemented.
- m) The operator is installing air-conditioning in the rotary wing AB and BHT 206 training fleets.
- n) Staffing level in the Safety Officers department has been reviewed. It is in the process to recruit one employee to assist in the Safety office.
- o) CRM courses provided for students. HIFA conducted four courses for students in 2013. Although CRM training for pilots and students is not required for FTO according to the GCAA regulation, HIFA planned to conduct the CRM course for pilots and students.



### 4.3. Final Report Safety Recommendations

The Air Accident Investigation Sector recommends the following:

#### To The Operator

##### SR 04/2015

Install GPS or a Satellite Tracking System [STS] onto the aircraft with the ability to monitor and record aircraft position in real time.

##### SR 05/2015

Assure that for practice autorotation the hard floor limitation in the SOP shall be 1500' QNH, this action shall also require the throttle is set to 'Flight' indent position prior to continuation of the descent and no EOL, with an exercise performance power check if required.

##### SR 06/2015

It is recommended in line with industry best practice, that the operator adopt the International Helicopter Safety Team [IHST] Safety Management System Toolkit, and Gulf Flight Safety Committee initiatives to reduce accidents, including the adoption of the IHST and Gulf Flight Safety Committee initiatives to reduce accidents, to include the following:

- Manoeuvre Initiation Envelope (MIE) philosophy,
- Integrating current international best practice into a comprehensive SMS based training environment.

#### The General Civil Aviation Authority of the United Arab Emirates

##### SR 07/2015

Examine its SMS acceptance process to ensure that appropriate standards are applied from the inception of an operators SMS until final acceptance and that the GCAA should ensure that audits of operator SMS are audited with sufficient frequency and in a robust manner.

##### SR 08/2015

Consider mandating that Flight Training Organisations [FTO] incorporate CRM training into the core flight training syllabus for all pilots and students.

##### SR 09/2015

GCAA to confirm the Emergency Location Transmitter [ELT] satellite interface with the UAE Mission Control Center (AEMCC Cospas-Sarsat Sytem] is functioning for civil ELT transmission on the following frequencies 406.025 MHz  $\pm$ 2 kHz, 121.5 MHz  $\pm$ 6 kHz or 243.0 MHz  $\pm$ 12 kHz.

## 5. Appendices

### Rolls Royce Engine Test and Performance Evaluation

Engine Investigation Report – Rolls Royce



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**Rolls-Royce**

# Engine Investigation



Model 250-C20B/J

**Allison**  
**M 250-C20J**  
**Engine CAE 270185**

**Agusta/Bell 206BIII**  
**Registration: A6-FTB**

**Horizon International Training**  
**Academy**  
**Omal Area 6**  
**United Arab Emirates**

*David W. Riser*

**David W. Riser**  
**Air Safety Investigator**

**Accident date: September 4, 2012**  
**Investigation date: September 18-20, 2012**  
**Rolls-Royce, Indianapolis, Indiana: November 27, 2012**  
**Report date: November 28, 2012**

**Report Enclosures:**

**Report Narrative**

**Appendix A, Photographs at Recovery, Horizon, UAE**

**Appendix B, Engine Records and Test Log**

## **Background Information:**

On September 4, 2012 an Agusta/ Bell 206BII helicopter, registration A6-FTB was involved in an accident in Omal Area 6, United Arab Emirates. The helicopter was owned and operated by Horizon International Training Academy and was on a local training flight. The helicopter was occupied by a student pilot and a flight instructor. Day visual meteorological conditions prevailed. The student pilot and instructor had been practicing auto rotations when on the accident approach the helicopter landed hard resulting in the separation of the tail boom, separation of the main transmission along with the main rotor head and main rotor blades from the airframe. Following touchdown the pilot reported the engine was still running. No injuries were reported.

## **Airframe/Engine Observations at Recovery:**

On September 18, 2012 an investigation was conducted at the helicopters maintenance hangar located in Al Ain under the auspices of the GACC IIC. The helicopter was positioned upright on its landing skids which were slightly spread. With the exception of both front wind screens being broken, the fuselage exhibited little damage. The main transmission had been torn from its mounts during the accident sequence resulting in damage to the left side transmission cowling and transmission mounts. (Fig 1) One main rotor blade had fractured approximately eighteen inches inboard from the tip with the balance of the blade having been manually cut just outboard of the doublers for transport purposes. The second blade fractured just outboard of the doublers. Both blades exhibited chord wise scratches and striations across the leading edges and blades surfaces.(Fig 2) The tail boom had separated at the fuselage with a second separation just forward of the tail rotor gearbox. The left side horizontal stabilizer sustained crush damage. Both tail rotor blades remained in position and exhibited no damage. (Fig 3)

The engine which was being operated with inlet barrier filters installed, remained in position and securely attached to the airframe. No visible impact damage was noted to the engine. (Fig 4) A visual and tactile examination of all engine pneumatic, fuel and oil lines was conducted where all "B" nuts and connectors were found to be at least finger tight. Oil and fuel line interface connections between the engine and airframe were examined where all were found at least finger tight. The engine was then removed from the airframe. Manual rotation the N1 drive train was free and continuous from the starter generator pad to the compressor. Manual rotation of the N2 drive train revealed it to be free and continuous from the power take off gear to the #4 power turbine wheel. The IIC requested the engine be sent to Rolls-Royce Indianapolis for run as received testing of the engine.

## Engine Investigation at Rolls-Royce:

On November 27, 2012 “Run as Received” testing was conducted on the subject engine at Rolls-Royce Indianapolis, Indiana to new engine specifications set forth in Rolls-Royce Production Test Standards 788 Rev K. Testing was conducted under the auspices of the NTSB accredited representative on behalf of the GCAA IIC.

The engine was removed from the container and placed onto an engine stand where preparation and pre run examination of the engine was conducted during which nothing was discovered which would preclude operational testing. (Fig 5) The engine was then placed into the test cell where the engine was started within specification time and temperature. Following engine warm up and with vibration scans being within specification, the engine was accelerated to a flight idle power. The engine was then taken through a series of timed accelerations; decelerations and a governor droop check where the engine performed within specification. A five point power calibration was conducted where the engine met specification for Take Off Power, Cruise A and Cruise B power settings. At Cruise C and Normal Cruise setting the engine was slightly low at -10.3% and -8.6% respectively. Testing resulted in a total engine run time of 1 hour and twenty five minutes where at completion of the testing the engine was shut down normally.

## Engine Information:

An Allison M250-C20J gas turbine engine, S/N CAE 270185, powered the helicopter. The engine was installed on the helicopter May 21, 2012 at 4015.4 ETT.

Manufacturer	Allison
Engine Model	250-C20J
Rating:	420 Shaft Horsepower
Serial Number	CAE 270185
Engine Total Hours	4157.7
Last 100-Hour Inspection	4141.8
Last 300-Hour inspection	4141.8

Component	Serial Number	Part Number	TSO	Total Time
<b>Engine</b>	CAE 270185	6899400	New	4157.7
<b>Gearbox</b>	CAG 27187	23001923	New	4167.5
<b>Compressor</b>	CAC 24077	6890550	2785.5	4151.6
<b>Turbine</b>	CAT 22773	23038241	142.3	3637.7
<b>Fuel Control</b>	322476	23070606	109.6	3889.2
<b>Governor</b>	HR46774	23086749	New	975.7
<b>Fuel Pump</b>	T101422	6899253	335.2	Unknown
<b>Fuel Nozzle</b>	0463	6890917	1627.8	3229.0
<b>Bleed Valve</b>	FF33005	23053176	499.7	Unknown

\*All times taken from engine log records or daily status sheets.

## **Summary of Findings:**

Testing of the engine to Rolls-Royce new engine production test specification revealed the engine to meet specification power for Maximum Take Off and all cruise settings with the exception of a slightly low Cruise C and Normal Cruise power points where the engine produced -10.3% and -8.6% respectively as compared to new engine performance specification. Nothing was discovered during testing which would preclude the engine from normal operation.

**Appendix A,  
Photographs at Recovery  
Horizon, Al Ain UAE**

Fig 1



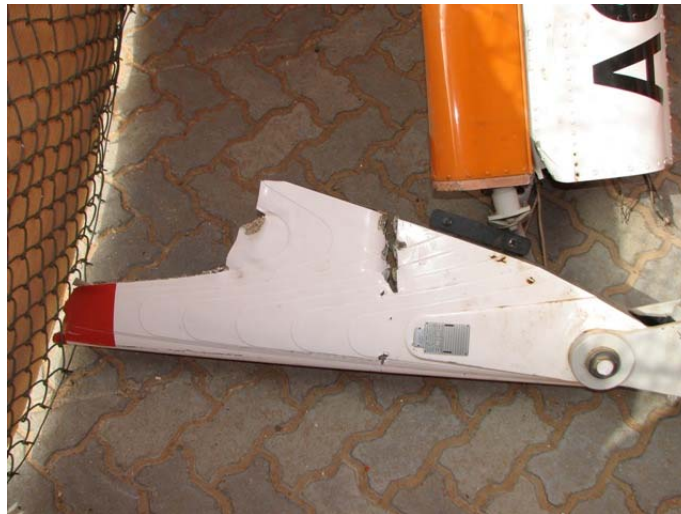
Airframe as Recovered



(Return)



Fig 2



(Return)



Fig 3



Tail boom as Recovered



(Return)

Fig 4



Left side engine as recovered



Right side engine as recovered.  
[\(Return\)](#)



**Appendix B,  
Photographs at Rolls-Royce  
Indianapolis, Indiana**

Fig 5



Engine as received - Rolls-Royce



(Return)

**Appendix C,  
Engine Test Log  
Engine Log Records**







POLICE WING and THIRD PARTY

Date: 24/08/04  
Time: 12:33:26

Description	Part No	Serial No	TSN	TSO	Fitted To		
ENGINE ASSY - MODULAR	6899400	CAE-270185	1357.10	1357.10	FTG		
Sub Components Installed:-						Life	
Description	Part No	Serial No	TSN	TSO	Type	Hours	Remaining
COMPRESSOR CASE INSPECT.	300HR/6MTH-COMPRESS.	CAC-23931.	0.00	0.00	IN	300	300.00
FUEL CONTROL STRAINER	1500HR/FCU STRAINER	336496.	1326.10	1326.10	IN	1500	173.90
.GEARBOX MODULE	23001923	CAG-27185	1357.10	1357.10	CO	0	0.00
.COMPRESSOR MODULE	6890550	CAC-23931	1357.10	0.00	OH	3500	3500.00
.IMPELLOR - COMPRESSOR	23058147	KR-101122	0.00	0.00	RT	3550	3550.00
.TURBINE MODULE -HWI	6898735 HWI	CAT-23236.	1357.10	0.00	IN	1750	1750.00
.TURBINE MODULE	6898735	CAT-23236	1357.10	1357.10	OH	3500	2142.90
.1ST STAGE WHEEL	6886407	X-150023	0.00	0.00	RT	1775	1775.00
.2ND STAGE WHEEL	6898782	HX-131004	0.00	0.00	RT	1775	1775.00
.3RD STAGE WHEEL	23001967	HX-95498	0.00	0.00	RT	4550	4550.00
.4TH STAGE WHEEL	6853279	HX-51260	1357.10	1357.10	RT	4550	3192.90
.FUEL PUMP	6899253	T-104000	1124.80	1124.80	OH	4000	2875.20
.FCU BENDIX	23007857	336496	1326.10	1326.10	OH	2500	1173.90
.PT GOVERNOR - BENDIX	23007506	29250	1357.10	1357.10	OH	2000	642.90
.FUEL NOZZLE	6890917	1010 AG-93444	1272.50	1272.50	OH	2500	1227.50
.BLEED VALVE	23036668	FP-45028	1297.00	1297.00	OH	1500	203.00
ENERGY ABSORBING RING	CEB A-1253	CAT-23236.	0.00	0.00	RT	1750	1750.00
ENERGY ABSORBING RING	CEB A-1254	CAT-23236.	0.00	0.00	RT	1750	1750.00
<del>INLET OF NEW FUEL NOZZLE</del>	<del>CEB A-1394</del>	<del>AG-93441.</del>	<del>0.00</del>	<del>0.00</del>	<del>RT</del>	<del>0</del>	<del>0.00</del>
1ST STAGE NOZZLE SHIELD	CEB A-1370 REV 2	CAT-23236.	1673.10	1673.10	IN	0	0.00

\*\*\* End of Report \*\*\*



**CERTIFICATE OF CONFORMANCE**

Detroit Diesel Allison certifies that the 250 Series Turboshift Engine shipped herewith was manufactured in accordance with all applicable specifications, drawings and procedures. This certificate shall be of no force or effect upon expiration of the warranty provision applicable to this purchase order.

Engine Serial No. CAE-270185  
 Purchase Order No. \_\_\_\_\_

H. E. Osburn  
 Quality Assurance Department

January 21, 1983  
 Date

F-9538  
(12-79)

**HORIZON AIRCRAFT COMPLIANCE STATUS**

<p><b>1. Technical Records Department - ISSUE</b></p> <p>Subject: <u>DETROIT DIESEL TURBOSHAFT ENGINE</u></p> <p>Aircraft Type: <u>M250-C20J</u> Engine Type: _____</p> <p>CLASSIFICATION: <input type="checkbox"/> MANDATORY <input type="checkbox"/> DISTRIBUTION  <input type="checkbox"/> RECOMMENDED <input type="checkbox"/> OPTIONAL</p> <p>Name: <u>Mr. H. Osburn</u> Signature: _____ Date: <u>24-03-85</u></p>	<p>TIS File No: <u>0205</u></p> <p>Directive / Bulletin No: <u>CEBA-1392 R3</u></p>
--	---

**2. Head of Department:**

**MAINTENANCE SYSTEM REVISIONS:**

a. Revision to Maintenance System / Worksheets required?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, comment and details on page 2 and 3.
b. Impact on flight operations?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, advise Operations Manager. Copy to CE, OIA, TS.
c. Revision to maintenance procedures required?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, state requirements on page 2, 3008.1.
d. Spares or special tools / equipment required?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, state requirements on page 2.
e. Are external control aircraft affected?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, advise Operations Manager. Copy to CE, OIA, TS.
f. Read and Sign the entry or advice to engineers required?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	If yes, attach copy for distribution.

Additional Comments: \_\_\_\_\_

Name: P. VERT Signature: \_\_\_\_\_ Date: 17/4/83

**3. Quality Engineer/Chief Engineer**

Inspection/Assess: YES  NO

System / Tool / Equipment appropriate/assess: YES  NO

Additional comments: \_\_\_\_\_

Name: P. VERT Signature: \_\_\_\_\_ Date: 18/4/83

**4. Technical Records**

a. Incorporation of changes to affected master system completed.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Name: _____ Signature: _____ Date: _____
b. Necessary worksheets filed.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Name: <u>M. A. Foltz</u> Signature: <u>MAF</u> Date: _____
c. Necessary logbook / computer entry made.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Name: _____ Signature: _____ Date: _____

**5. Technical Records Department - Completion**

a. Engineers advised. Read and Sign file, memo etc.	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Name: _____ Signature: _____ Date: _____
---	---	--

Additional comments: \_\_\_\_\_

Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Authority: \_\_\_\_\_ Date: \_\_\_\_\_

Certified that the attached bulletin has been controlled to completion. This bulletin control is filed for reference.

HORIZON INT'N Page 1 of 3  
Rev 0 April 87

**SERVICE RECORD**  
**ENGINE ASSEMBLY**

Part I  
Page No. \_\_\_\_\_

FORM 2782A-1 (4-79)

Engine Serial Number CAE- 270185 Engine Model 250- C20J

INSTALLED					REMOVED			Reason
Date	Owner	A/C or Eng. S/N	Engine Time		Date	Engine Time		
			Since OH	Total		Since OH	Total	
6-6-86	U.A.E.	8685 (164)	00.00	00.00				
<del>4-1-88</del>	<del>U.A.E.</del>	<del>8685</del>			4-1-88	00:00	341:35	LOW POWER HIGH T.F. SAND BUILDUP ON TURBINE AREA.
13-3-89	UAE AIR FORCE	8683 (162)		341:35	1-12-90	-	704:25	To SERVICE AC 173
6-12-90	UAE AIR FORCE	8675 (173)		704:25	3-8-91		767:55	ENGINE UNDER POWER
3-12-90	UAE AIR FORCE	8687 (166)		767:55	10-4-99	0050:05	1357:05	LOW POWER HIGH T.O.F. SAND BUILDUP ON TURBINE AREA. ENG. START CYCLE 1924
26-JAN-04	HORIZON	01673.1 TAT A6-FTG	1357.1	1357.1	07/5/09	-	4015.8	
21/5/12	HORIZON	A6-FTG	-	4015.4				

**TRANSFER RECORD**

Part II  
Page No. \_\_\_\_\_

FORM 2782A-1 (4-79)

Engine Serial Number CAE - 270185 Engine Model 250- C20J

SHIPPED					RECEIVED	
Date	From	To	Engine Time		Date	By
			Since OH	Total		
1-21-83	DDA-GMC	AGUSTA	NEW	0.0	-	ELICOTTERI MERIDIONALI
22-7-86	ELICOTTERI MERIDIONALI Frosinone - Italia	U.A.E.	-	8:10		Frosinone - Italia
4-1-88	AL-DHAIRA U.A.E	AGUSTA	-	341:35	10-8-86	AL-DHAIRA (UAE)
15-Nov-88	ELICOTTERI MERIDIONALI Frosinone - Italia	ABU-DHABI	-	341:35	4-1-88	AL-DHAIRA (UAE)
13-8-91	AL-DHAIRA UAE	AGUSTA	-	767:55	21-2-89	AL-DHAIRA UAE
9-JUN-92	ELICOTTERI MERIDIONALI Frosinone - Italia	UAE AIR FORCE	-	767:55	20-MAR-92	ELICOTTERI MERIDIONALI Frosinone - Italia
4-5-99	AL-AIN UAE	AGUSTA	-	1357:05	3-11-92	AL-DHAIRA AIR BASE AGUSTA
11-12-00	AGUSTA S. b. bilimento di Frosinone	U.A.E.	-	1357:05	14-4-00	S. b. bilimento di Frosinone



**Allison 250-C20 series** Engine SN. CAE 270185  
 MANDATORY ALLISON CEB'S and Installed in A/C A6-FTG  
 FAA AD's (Regarding Engine) COMPLIED WITH: 1 OF 6

ALLISON CEB'S								
DATE	ENG TAT	BT REF	ISSUE DATE	PART C/WITH	DESCRIPTION / COMMENTS	Rept	LAE SIGN	AUTH DATE
27-Jul-04	1357.05	CEB-A-1040 Rev2	1-Sep-94	N/A NOT INSTALLED	FUEL SYSTEM CLAMP CECO	NO	<i>Wj Maw</i> 27/07/04	
27-Jul-04	1357.05	CEB-A-1049 Rev 2	10-Feb-82	FE Ref Engine Mod Record	G/BOX ASSY oil filter housing assy All CEB's Carried out up to 6-Jun-86	NO		
27-Jul-04	1357.05	CEB-A-1051 Rev 3	1-May-89	N/A By Fuel Pump PN	DUAL ELEMENT FUEL PUMP	NO		
27-Jul-04	1357.05	CEB-A-1095 Rev 3	15-Apr-82	N/A CECO NOT INSTALLED	FUEL SYSTEM HP FUEL FILTER ASSY CECO	NO		
27-Jul-04	1357.05	CEB-A-1144 Rev 5	1-Sep-94	N/A CECO NOT INSTALLED	FUEL SYSTEM HP FUEL ELEMENT AND BYPASS VALVE CECO, FAA AD 82-13-03	NO		
27-Jul-04	1357.05	CEB-A-1173	15-Apr-81	N/A BY ENG MODEL #	P T SHAFT REPLACEMENT INNER AND OUTER	NO		
27-Jul-04	1357.05	CEB-A-1174 Rev 6	1-Aug-89	N/A BY ENG MODEL #	THIRD STAGE WHEEL REPLACE FAA AD-83-03-02R1	NO		
27-Jul-04	1357.05	CEB-A-1206	15-Oct-82	N/A BY FCU + PTG PN	FCU,PTG inspection bushing assy, FAA AD 82-24-05	NO		
27-Jul-04	1357.05	CEB-A-1211 Rev 3	15-Oct-96	N/A PART NOT INSTALLED	QUICK DISCONNECT CHIP PLUGS	NO		
27-Jul-04	1357.05	CEB-A-1224 Rev 2	30-Nov-91	FE Ref Mod Record Turbine	P T SHAFT INNER AND OUTER nickel plate	NO		
27-Jul-04	1357.05	CEB-A-1226 Rev 4	12-Aug-99	N/A at this time	G/BOX through bolt retention of Idler gears C/O @ NEXT REPAIR or O/H	NO		

I hereby certify that the work recorded above has been carried out in accordance with the requirements of the UAE Federal Civil Aviation Law, and that in that respect the Aircraft/Aircraft Equipment is considered fit for release to service.  
 U.A.E. G.C.A.A. Approval No.: EM/ADA/89

Part C/With N/A - Not Applicable E - Embodied FE - Found Embodied

file form 140 R0 page 1 of 1 rev 0 oct 03

**Allison 250-C20 series** Engine SN. CAE 270185  
 MANDATORY ALLISON CEB'S and Installed in A/C A6-FTG  
 FAA AD's (Regarding Engine) COMPLIED WITH: 2 OF 6

ALLISON CEB'S								
DATE	ENG TAT	BT REF	ISSUE DATE	PART C/WITH	DESCRIPTION / COMMENTS	Rept	LAE SIGN	AUTH DATE
27-Jul-04	1357.05	CEB-A-1233 Rev 2	1-Aug-91	FE Ref MWO SOC/03/A/013	IMPROVED STRENGTH Pc FILTER HOUSING	NO	<i>Wj Maw</i> 27/07/04	
27-Jul-04	1357.05	CEB-A-1234 Rev 3	15-Apr-92	FE REF MWO SOC/03/A/014	INSPECT PC SCROLL TO PC FILTER TUBE ASSY	NO		
27-Jul-04	1357.05	CEB-A-1253 Rev 4	21-May-04	N/A at this time	ENGINE TURBINE ASSY MOD. TO INCORPORATE INTERNAL ENERGY ABSORBING RING DUE COMPLIANCE AT NEXT DISSASSEMBLY OR NO LATER THAN 1750 TSO/TSN	NO		
27-Jul-04	1357.05	CEB-A-1254 Rev 3	21-May-04	N/A at this time	ENGINE TURBINE ASSY MOD. TO INCORPORATE INTERNAL ENERGY ABSORBING RING DUE COMPLIANCE AT NEXT DISSASSEMBLY OR NO LATER THAN 1750 TSO/TSN	NO		
27-Jul-04	1357.05	CEB-A-1255 Rev 3	21-May-04	N/A at this time	ENGINE TURBINE ASSY MOD. TO INCORPORATE INTERNAL ENERGY ABSORBING RING DUE COMPLIANCE AT NEXT DISSASSEMBLY OR NO LATER THAN 1750 TSO/TSN	NO		
27-Jul-04	1357.05	CEB-A-1269	1-Oct-88	N/A BY ENGINE MODEL #	ENGINE COMPRESSOR IMPROPER CLAMPING OF #1 BRNG PRES OIL TUBE ASSY C20S ONLY	NO		
27-Jul-04	1357.05	CEB-A-1272 Rev 2	1-Sep-94	N/A BY FCU PN	FCU BELLOWS INSP FAA AD 88-17-01	NO		

I hereby certify that the work recorded above has been carried out in accordance with the requirements of the UAE Federal Civil Aviation Law, and that in that respect the Aircraft/Aircraft Equipment is considered fit for release to service.  
 U.A.E. G.C.A.A. Approval No.: EM/ADA/89

Part C/With N/A - Not Applicable E - Embodied FE - Found Embodied

rev 0 oct 03

Engine SN. CAE 270185  
Installed in A/C A6-FTG  
3 OF 6

### Allison 250-C20 series

MANDATORY ALLISON CEB'S and  
FAA AD's (Regarding Engine) COMPLIED WITH:

DATE	ENG TAT	ALLISON CEB'S		PART C/WITH	DESCRIPTION / COMMENTS	Rept	LAE SIGN	AUTH DATE
		BT REF	ISSUE DATE					
27-Jul-04	1357.05	CEB-A-1281 Rev 3	15-Apr-92	N/A Ref CEB-A-1289 and Eng Assy Mod Record	PTG Py CASTING AREA ASB 206-89-45	NO	<i>By Mary</i> 27/10/104	
27-Jul-04	1357.05	CEB-A-1283 Rev 7	29-Feb-96	FE REF TURBINE ASSY MOD RECORD	P T INNER AND OUTER SHAFT ALSEAL COATING Rev 5 EMBODIED	NO		
27-Jul-04	1357.05	CEB-A-1289	15-Apr-92	FE REF ENG ASSY MOD RECORD	PTG REMOVAL OF Py ACCUMULATOR ASB 206-89-45	NO		
27-Jul-04	1357.05	CEB-A-1292 Rev 1	15-Jul-91	N/A AT THIS TIME	SPLINE ADAPTER Pn 6898784 replace certain adapters C/O @ NEXT REPAIR or O/H	NO		
27-Jul-04	1357.05	CEB-A-1294 Rev 2	31-Oct-96	FE REF ENG ASSY MOD RECORD	FCU TUBE ASSY 6848471 AND 23051141 REPLACEMENT	NO		
27-Jul-04	1357.05	CEB-A-1295 Rev 2	15-Feb-92	N/A BY FCU SN	FCU THROTTLE SPRING	NO		
27-Jul-04	1357.05	CEB-A-1304	15-Oct-91	N/A BY BLEED VALVE SN	REMOVAL OF BLEED VALVE PLASMA SPRAYED COATING ASB 206-91-65 AVIAL O/H only	NO		
27-Jul-04	1357.05	CEB-A-1305 Rev 1	15-Feb-92	N/A BY FCU SN	FCU MAX FUEL FLOW SETTINGS ASB 206-91-63	NO		
27-Jul-04	1357.05	CEB-A-1319	30-Jul-92	N/A BY MANF. DATE	FUEL HOSE 23005205 REPLACEMENT	NO		
27-Jul-04	1357.05	CEB-A-1323 Rev 3	15-Jun-97	N/A BY ENG MODEL #	FCU TUBE ASSY PN 6848471 REPLACEMENT C20F only	NO		

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U.A.E. G.C.A.A. Approval No.: EM/ADA/89

Part C/With    N/A - Not Applicable                      E - Embodied                      FE - Found Embodied

rev 0 oct 03

Engine SN. CAE 2701  
Installed in A/C A6-FT  
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### Allison 250-C20 series

MANDATORY ALLISON CEB'S and  
FAA AD's (Regarding Engine) COMPLIED WITH:

DATE	ENG TAT	ALLISON CEB'S		PART C/WITH	DESCRIPTION / COMMENTS	Rept	LAE SIGN	AUTH DATE
		BT REF	ISSUE DATE					
27-Jul-04	1357.05	CEB-A-1327	30-Oct-93	N/A BY ENG MODEL #	FIRE SHIELD RETAINING NUTS TQ C20S only	NO	<i>By Mary</i> 27/10/104	
27-Jul-04	1357.05	CEB-A-1328	31-Mar-93	N/A BY ENGINE SN	SPUR ADAPTER GEARSHAFT ASSY PN 23034784 INSPECTION	NO		
27-Jul-04	1357.05	CEB-A-1329 Rev 4	9-Oct-01	FE REF FCU MOD RECORD	ENGINE FUEL CONTROL BELLOWS REPLACEMENT FAA AD 98-24-28	NO		
27-Jul-04	1357.05	CEB-A-1336	15-Aug-94	N/A BY ENG MODEL #	FCU MAX FUEL FLOW SETTINGS C20C only	NO		
27-Jul-04	1357.05	CEB-A-1340 Rev 1	30-Nov-95	N/A BY ENG & G/BOX SN	G/BOX PINON GEAR REMOVAL	NO		
27-Jul-04	1357.05	CEB-A-1341 Rev 2	15-Oct-97	N/A BY BUILD DATE or record of Replacement	1st NOZZLE DOME SHIELD insp condition	NO		
27-Jul-04	1357.05	CEB-A-1342 Rev 2	12-May-99	N/A BY BUILD DATE or record of Replacement	1st NOZZLE DOME SHIELD	NO		
27-Jul-04	1357.05	CEB-A-1349	30-May-97	N/A PART NOT INSTALLED REF MWO SOC/03/A/013	TURBINE PRESSURE LUBE CHECK VALVE 23062087 POSITION, CLAMPING	NO		
27-Jul-04	1357.05	CEB-A-1351 Rev 2	2-Feb-04	N/A AT THIS TIME	G/BOX OIL DELIVERY TUBE REPLACE TO BE CARRIED OUT NEXT TIME G/B OPENED	NO		
27-Jul-04	1357.05	CEB-A-1352	21-Aug-97	N/A CECO FUEL PUMP NOT INSTALLED	CECO FUEL PUMP SPLINE INSP ASB 206-97-91	NO		

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U.A.E. G.C.A.A. Approval No.: EM/ADA/89

Part C/With    N/A - Not Applicable                      E - Embodied                      FE - Found Embodied



ALLISON C20-C20 series Engine SN. CAE 270185  
 MANDATORY ALLISON CEB'S and FAA AD's (Regarding Engine) COMPLIED WITH:  
 5 OF 1

ALLISON CEB'S								Rept	LAE SIGN	AUTH DATE
DATE	ENG TAT	BT REF	ISSUE DATE	PART C/WITH	DESCRIPTION / COMMENTS					
27-Jul-04	1357.05	CEB-A-1353 Rev 2	28-Jun-00	N/A by SN	FUEL CONTROL UNIT INSPECTION OF CAM FOLLOWER LEVER		NO	<i>Wk Mins 22/07/06</i>		
27-Jul-04	1357.05	CEB-A-1371	9-May-00	N/A at this time	Replace Turbine Tie Bolt Due for compliance 3-31-2005		NO			
27-Jul-04	1357.05	CEB-A-1372	15-Feb-00	N/A BY ENG + G/BOX SN	ENGINE GEARBOX INSPECTION FOR INST. OF TORQUEMETER RETAINING RING		NO			
27-Jul-04	1357.05	CEB-A-1374 Rev 1	2-Aug-00	FE REF AGUSTA WORK REPORT 240023/1	COMPRESSOR SCROLL PROBE EIBOW INSP		NO			
27-Jul-04	1357.05	CEB-A-1361 Rev 2	29-Aug-01	FE REFER FCU HIST RECORD	FCU AND PTG INTERNAL SPRING REPLACEMENT ASB 206-98-92		NO			
27-Jul-04	1357.05	CEB-A-1370 Rev 1	26-Sep-00	E REF W/C Z0500T011	1st NOZZLE DOME SHIELD insp		NO			
27-Jul-04	1357.05	CEB-A-1375	24-Oct-00	N/A at this time	2nd STAGE NOZZLE DIAPHRAGM REPLACEMENT C/O @ NEXT REPAIR or O/H		NO			
27-Jul-04	1357.05	CEB-1382	13-May-02	FE REF MWO SOC/03/A/013	ONE TIME SCREW INSPECTION FOR FCU		NO			
27-Jul-04	1357.05	CEB-1384	13-Jun-01	N/A BY PN & SN	TEE FILTER INSPECTION		NO			
27-Jul-04	1357.05	CEB-A-1386 Rev 1	16-Jan-02	N/A BY HRS IN SERVICE	TQ meter Gearshaft insp FAA AD 2001-24-12		NO			

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 U.A.E. G.C.A.A. Approval No.: EM/ADA/89

Part C/With N/A - Not Applicable E - Embodied FE - Found Embodied

ALLISON C20-C20 series Engine SN. CAE 270185  
 MANDATORY ALLISON CEB'S and FAA AD's (Regarding Engine) COMPLIED WITH:  
 5 OF 1

ALLISON CEB'S								Rept	LAE SIGN	AUTH DATE
DATE	ENG TAT	BT REF	ISSUE DATE	PART C/WITH	DESCRIPTION / COMMENTS					
27-Jul-04	1357.05	CEB-A-1392	9-Sep-03	N/A at this time	ENGINE COMPRESSOR ADAPTER COUPLING TO BE CARRIED OUT AT NEXT REPAIR OR O/H		NO	<i>Wk Mins 22/07/06</i>		
27-Jul-04	1357.05	CEB-A-1394	4-Sep-03	N/A at this time	ENGINE FUEL NOZZLE CHANGE DUE BY 31-AUGUST 2004		NO			
27-Jul-04	1357.05	06 JUNE 1986 ENGINE UP TO DATE WITH ALL MANDATORY BULLETINS REFER MOD RECORD ENGINE ASSEMBLY								
27-Jul-04	1357.05	FAA 88-17-01	15-Aug-88	N/A BY FCU PN	FCU BELLOWS INSPECTION REF CEB-A-1272		NO			
27-Jul-04	1357.05	FAA 96-19-01	26-Sep-96	E INCORPORATED IN AMS REF MWO SOC/03/A/013	NO 8 BEARING REPLACEMENT SUPERIOR REPT EVERY 100 HRS		YES			
27-Jul-04	1357.05	FAA 98-24-28	7-Jan-99	FE REFER FCU HIST RECORD	FCU BELLOWS ASSY LEAKAGE CEB-A-1329		NO			
27-Jul-04	1357.05	FAA2001-24-12	19-Dec-01	N/A BY G/BOX HRS	TQ meter Gearshaft insp		NO			

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 U.A.E. G.C.A.A. Approval No.: EM/ADA/89

Part C/With N/A - Not Applicable E - Embodied FE - Found Embodied



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## MODIFICATION RECORD

### ENGINE ASSEMBLY

FORM 2783A-1(4-79)

Engine Serial Number CAE - 270185 Engine Model 250- C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
6-5-83	CEB A1206	ENGINE FUEL AND CONTROL BENDIX P.C. ASSEMBLIES AND P.T.G. ASSY. INSPECT RUSHING ASSEMBLY	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia
6-6-86	--	Engine up to date with all mandatory bulletins.	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia
21.7.86	CEB A 1234	Engine fuel lube and air system Pc scroll to Pc filter tube assy inspect.	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia
15-NOV.88	CEB 1260	ENGINE AIR SYSTEM, BLEED VALVE IMPROVED VALVE STEM BUSHING INSTALL	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia
7-6-89	CEB A1281	Engine control system Bendix Power turbine Governor, inspect PY Port Area	<i>[Signature]</i>	CAE AIR FORCE
9.JUN.92	CEB A1294	ENG. FUEL AND CONTROL REPLACE P/N 6848471 AND 23051141 TUBE ASSEMBLIES	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia
9.JUN.92	CEB 1299	ENGINE TURBINE ASS.COMBUSTION LINER REWORK.	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia
9.JUN.92	CEB A1294	ENGINE FUEL CONTROL BENDIX P.T.G. REMOVAL OF PY ACCUMUL. OR.	<i>[Signature]</i>	ELICOTTERI MERIDIONALI Frosinone - Italia

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## MODIFICATION RECORD

### ENGINE ASSEMBLY

FORM 2783A-1(4-79)

Engine Serial Number CAE - 270185 Engine Model 250- C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
12-DEC. 2000	CEB 1311	ENGINE FUEL LUBE AND AIR SYSTEM RELEASE OF NEW ANTI ICING VALVE MODIFY.	<i>[Signature]</i>	AGUSTA S.P.A. Stabilimento di Frosinone
12-DEC. 2000	CEB 1321	ENGINE COMPRESSOR ASS. RELEASE OF NEW. COMP. PORT ASS. MODIFY.	<i>[Signature]</i>	AGUSTA S.P.A. Stabilimento di Frosinone
12-DEC. 2000	CEB A1374	ENG. COMPRESSOR ASS. VISUAL INSPECTION OF COMPRESSOR SCROLL PRESSURE TUBE FLOW	<i>[Signature]</i>	AGUSTA S.P.A. Stabilimento di Frosinone
14-05-2002	CEB A 1386	NOT AFFECTED.	<i>[Signature]</i>	Stabilimento di Frosinone S.p.A. CAE D/142 B
27 JUL 2004	CEB-A-1233 R.2	IMPROVED STRENGTH Pc FILTER HOUSING	<i>[Signature]</i>	
27 JUL 2004	CEB-A-1234 R.3	INSPECT Pc SCROLL TO pc FILTER TUBE ASSY	<i>[Signature]</i>	
27 JUL 2004	CEB-A-1349	N/A PART NOT INSTALLED.	<i>[Signature]</i>	
27 JUL 2004	CEB-A-1340	N/A BY BUILD.	<i>[Signature]</i>	WS SOC/03/A/013
27 JUL 2004	CEB-A-1370	1st NOZZLE DOME SHIELD INSPECTION	<i>[Signature]</i>	

**Alison** **MODIFICATION RECORD** **ENGINE ASSEMBLY** Part III  
Page No. 3

Engine Serial Number CAE-270185 Engine Model 250-C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
27 JUL 2004	CEB-A-1382	ONE TIME SCREW INSPECTION FOR FCU	<i>[Signature]</i>	SOC/03/A/013
24 Sep 04	CEB-A-136TR3	FCU & PTG Internap Spring repl. PCW. (FCU S/N 336496 & PTG S/N 336496).	<i>[Signature]</i>	TSF C20/020
15 Aug 04	CEB A-1394	Fuel Nozzle Replacement.	<i>[Signature]</i>	SOC/03/A/013
15 DEC 04	AD2004-24-09	Fuel Nozzle Inspection & Replacement. Previously complied with Ref. CEB-A-1394.	<i>[Signature]</i>	TSF C20/022
20 DEC 04	CEB-A-1394 Rev.1	Previously complied with.	<i>[Signature]</i>	TS File C20/023
07 Dec 04	FAA AD 96-19-01	#5 & #8 Bearing Serviceability check.	<i>[Signature]</i>	WS FTG00030
01 FEB 05	FAA AD 96-19-01	#5 & #8 BEARING SERVICEABILITY CHECK.	<i>[Signature]</i>	WS FTG00057
15 MAR 05	FAA AD 96-19-01	#5 & #8 BEARING SERVICEABILITY CHECK.	<i>[Signature]</i>	WS FTG00089
14 MAY 05	FAA AD 96-19-01	#5 & #8 BEARING SERVICEABILITY CHECK.	<i>[Signature]</i>	WS FTG00121
28 JUN 05	FAA AD 96-19-01	#5 & #8 BEARING SERVICEABILITY CHECK.	<i>[Signature]</i>	WS FTG00157
12 AUG 05	FAA AD 96-19-01	#5 & #8 BEARING SERVICEABILITY CHECK.	<i>[Signature]</i>	WS FTG00186
19 AUG 06	FAA AD 2006-16-01	FUEL NOZZLE INSPECTION & REPLACEMENT	<i>[Signature]</i>	WS FTG00221
27 JUN 06	FAA AD 2006-13-06	TURBINE TIE ROD REPLACEMENT. N/A	<i>[Signature]</i>	WS FTG00301

**Alison** **MODIFICATION RECORD** **ENGINE ASSEMBLY** Part III  
Page No. 4

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
30 MAY 06	CEB 1391	POWER TURBINE GOVERNOR INCREASED DURABILITY DESIGN.	<i>[Signature]</i>	SAL-L515000



Part IV  
Page No. 1

## INSPECTION — MAINTENANCE — OVERHAUL RECORD ENGINE ASSEMBLY

FORM 2784A-1 (4-79)  
 Engine Serial Number CAE - 270185 Engine Model 250- C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
1-21-83	NEW	0.0	FUEL SYSTEM PRESERVED WITH MIL-0-6081 OIL.	<i>[Signature]</i>	DDA-GMC
<u>1 AUG. 1986</u>	-	-	Preservation checked and condition found satisfactory. Engine considered airworthy.	<i>[Signature]</i>	ELICOTTERI ME Frosinone
27-10-86	-	101:50	100 HRS INSP PERFORMED M.M. TABLE 10-7 SA-2 F700	<i>[Signature]</i>	AL-DHAIFA
18-1-87	-	200:40	200 HRS INSP PERFORMED M.M. TABLE 10-7 SA-2 F700	<i>[Signature]</i>	"
8-6-87	-	296:00	300 HRS INSP PERFORMED AS PER M.M. TABLE 10-7 SA-2	<i>[Signature]</i>	"
3-11-87	-	341:35	LOW POWER - HIGH T.O.T. 780°C ON HOWER	<i>[Signature]</i>	AL-DHAIFA
19-11-87	-	341:35	ENGINE COMPRESSOR PRESERVED	<i>[Signature]</i>	AL-DHAIFA
19-11-87	-	341:35	ENGINE FUEL SYSTEM PRESERVED WITH OIL NATO-0-133.	<i>[Signature]</i>	AL-DHAIFA

Part IV  
Page No. 2

## INSPECTION — MAINTENANCE — OVERHAUL RECORD ENGINE ASSEMBLY

FORM 2784A-1 (4-79)  
 Engine Serial Number CAE- 270185 Engine Model 250- C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
4.1.88	-	341:35	ENGINE BEING DESPATCH FOR REPAIR AS NECESSARY LATEST MODIFICATION AND ADDITION ARE TO COMPLIED WITH.	<i>[Signature]</i>	AL-DHAIFA VAE
15 NOV 88	-	341:35	ENGINE REPAIRED, PRESERVED WITH OIL MIL-C-23611 AND MIL-L-6081-6 GRADE 1010	<i>[Signature]</i>	AL-DHAIFA VAE
30-9-89	-	451:05	100 HRS INSPECTION PERFORMED PER MM. TABLE 10-7 SA-2	<i>[Signature]</i>	AL-DHAIFA VAE
18-6-90	-	551:05	300 HRS INSPECTION PERFORMED PER MM. TABLE 10-7 SA-2	<i>[Signature]</i>	AL-DHAIFA VAE
8-10-90	-	651:00	100 HRS INSPECTION PERFORMED AS PER MM. TABLE 10-7 SA-2	<i>[Signature]</i>	AL-DHAIFA VAE
11-12-90	-	704:25	300 HRS INSPECTION C/W AS PER MM. TABLE 10-7 SA-2	<i>[Signature]</i>	AL-DHAIFA VAE
31-7-91	-	767:20	100 HRS INSPECTION C/W AS PER MM. TABLE 10-7 SA-2	<i>[Signature]</i>	AL-DHAIFA VAE
13-8-91	-	767:55	ENGINE FUEL, OIL SYSTEM AND COMPRESSOR PRESERVED WITH OIL NATO-0-133.	<i>[Signature]</i>	AL-DHAIFA VAE

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Page No. 113

## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A(11-77)

Engine Serial Number CAE 270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
13-8-91	—	767:55	ENGINE LOW POWER, ENGINE DESPATCH FOR REPAIR. NO OF STARTS: 1127-	CAP: RASHED A. AL AWADHI Q-C. TECH CENTRAL	JET RANGER SQDN UAE AIR FORCE
9. JUN. 92	----	767:55	ENGINE REPAIRED, PRESERVED WITH OIL: MIL-L-6081-GRADE 1010, AND MIL-C-23411.		
13-1-93	—	822:35	100 HRS INSPECTION C/W AS PER MM 10W2		JET RANGER SQDN
11-9-93	—	911:30	300 HRS INSP C/W AS PER MM 10W2		JR SQDN
16-4-94	—	1010:55	100 HRS INSP 9W AS PER MM 10W2		JR SQDN
31-7-94	—	1110:45	100 HRS INSP 9W AS PER MM 10W2		JR SQDN
25-9-94	—	1152:55	300 HRS INSP 9W AS PER MM 10W2		JR SQDN
15.4.98	—	1157:00	100-HRS INSPECTION C/OUT		
28-9-98	—	1259:20	100 HRS INSPECTION C/OUT		

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Page No. 4

## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A(11-77)

Engine Serial Number CAE 270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
23-5-99	—	1357:05	ENG PRESERVED WITH OIL MIL 6081 GRADE 1010.		UAE AIR FORCE
4-5-99	—	1357:05	Low Power AND HIGH T.O.T. ENG. BEING DESPATCHED TO FACTORY FOR REPAIR. AS NECESSARY LATEST BULLITONS ARE TO BE COMPLIED WITH.		UAE AIR FORCE AL-AIN
12-DEC-00	—	1357:05	ENGINE REPAIRED, 300 HRS. INSPECTION PERFORMED, PRESERVED WITH OIL: MIL-L-6081 GRADE 1010 AND MIL-C-23411		UAE AIR FORCE AL-AIN
22 AUG 04	—	1357.1	100H/124, 200H/6M (OIL CHG), 300H AND 300H/6M (CHFR INSP) CARRIED OUT.		AGUSTA S.P.A. Stabilimento di Frosinone ADA TR3 WS SOC/03/A/013



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Page No. 4

## INSPECTION — MAINTENANCE — OVERHAUL RECORD


### ENGINE ASSEMBLY

2784A(11-77)

Engine Serial Number CAE 270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
03.5.99	-	1357:05	ENG PRESERVED WITH OIL MIL 6081 GRADE 1010.	Agust	UAE AIR FORCE
4.5.99	-	1357:05	Low Power AND HIGH T.O.T. ENG. BEING DESPATCHED TO FACTORY FOR REPAIR. AS NECESSARY LATEST BULLTIONS ARE TO BE COMPLIED WITH.		UAE AIR FORCE AL-AIN
12 DEC 00	-	1357:05	ENGINE REPAIRED, 300 HRS. INSPECTION PERFORMED, PRESERVED WITH OIL: MIL-C-6081 GRADE 1010 AND MIL-C-23411		UAE AIR FORCE AL-AIN
22 AUG 04	-	1357.1	100H/12M, 200H/6M (OIL CHG), 300H AND 300H/6M (CMR INSP) CARRIED OUT.	AGUSTA S.P.A. Stabilimento di Frosinone ADA TR3	ADA WS SOC/03/01/013

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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### ENGINE ASSEMBLY

CAE - 270185 Engine Model 250-C20J

Engine Serial Number CAE - 270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
15 Aug 04	-	1359.6	Fuel Nozzle AG-93441 Replaced by S/N 1010	M 082	Abu Dhabi Aviatio
05 DEC 04	-	1452.9	100H/12M, 200H/6M INSP. CARRIED OUT. Post eng. installation torque check. ENTERED IN BIRMO.	M 086 M 070	Abu Dhabi Aviatio WS FTG00030
07 DEC 04	-	1452.9	FAA AD 96-19-01 #5 & #8 Eng Serv. chk. c/out.	M 053	WS FTG00030
09 JAN 05	-	1525.1	1500hr FCU strainer replaced. @1841.1TAT	M 024	ADA TR3 WS FTG00053
01 FEB 05	-	1549.9	FAA AD 96-19-01 #5 & #8 B2G. SERV. CHK. C/O	M 082	ADA TR3 WS FTG00057
01 FEB 05	-	1549.9	BLEED VALVE FF46028 REPLACED BY S/N FF47516	M 082	ADA TR3 WS FTG00057
01 FEB 05	-	1549.9	100HR/6MTH, 100HR/12MTH & 300HR/6MTH INSP. C/O	M 082	ADA TR3 WS FTG00057
19 MAR 05	-	1649.5	100HR/6MTH, 100HR/12MTH & 300HR INSP. C/O	M 082	ADA TR3 WS FTG00057
30 MAR 05	-	1667.1	TURBINE REPLACED S/N OFF CAT13236. S/N ON - CAT 22811. FF 2470-5-30 TAT 19851. TAC 1671.	M 082	ADA TR3 WS FTG00057
04 APR 05	-	1549.9	300HR/6MTH (COMP. INSP) CARRIED OUT.	M 082	ADA TR3 WS FTG00057
27 APR 05	-	1718.9	P.T. GOVERNOR REPLACED. S/N OFF 23047506. S/N ON 24250. S/N ON 23000092. S/N ON BR36360.	M 082	ADA TR3 WS FTG00057



Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
17 MAY 05	-	1748.6	100HR/6MTH, 100HR/12MTH & FAA AD 96-19-01 #5 & #8 BEARING SERVICEABILITY CHK. C/O.	ADA TR5	WS FTG 00121
17 MAY 05	-	1748.6	ENGINE CHIP DETECTORS INSPECTION C/O.	ADA TR5	WS FTG 00123
23 MAY 05	-	1769.9	ENGINE CHIP DETECTORS INSPECTION C/O.	ADA	WS FTG 00130
26 JUN 05	-	1840.3	ENGINE CHIP DETECTORS INSPECTION C/O.	ADA TR5	WS FTG 00155
27 JUN 05	-	1847.0	FAA AD 96-19-01 #5 & #8 BEARING CHK. C/O.	ADA TR5	WS FTG 00157
09 JULY 05	-	1851.8	100HR/6MTH, 100HR/12MTH & COMPRESSOR CASE INSP. C/O. @ TAT 2167.8	ADA TR5	WS FTG 00161
28 JUN 05	-	1847.0	10% EXTENSION ON 100HR/6MTH, 100HR/12MTH & COMPRESSOR CASE INSP. @ TAT 2163.0	ADA TR5	WS FTG 00157
16 AUG 05	-	1955.8	100HR/6MTH, 100HR/12MTH & 300 HR INSP. C/O. @ TAT 2181.8	HOR 008	WS FTG 00170
27 SEPT 05 07 OCT 05	-	2097.0 2127.0	2-7% EXTENSION ON 100HR/6MTH & 100HR/12MTH @ TAT 2363.0	HOR 008	WS FTG 00222

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
09 OCT 05	-	2051.3	100HR/6MTH & 100HR/12MTH INSP. C/O. @ TAT 2567.3.	HOR 008	WS FTG 00220
09 DEC 05	-	2143.3	100HR/6MTH, 100HR/12MTH & COMPRESSOR CASE INSPECTIONS C/O. @ TAT 2459.3.	HOR 008	WS FTG 00249
09 FEB 06	-	2286.6	100HR/6MTH, 100HR/12MTH & 300HR INSP. C/O. @ @ TAT 2552.6.	HOR 008	WS FTG 00265
11 APR 06	-	2330.1	100HR/6MTH & 100HR/12MTH INSP. C/O. @ TAT 2646.1.	HOR 008	WS FTG 00277
03 MAY 06	-	2364.8	FUEL CONTROL S/N 336496 REPLACED BY S/N 336477 @ TAT 2680.8.	HOR 008	WS FTG 00282
10 JUN 06	-	2422.7	100HR/6MTH, 100HR/12MTH & COMPRESSOR CASE INSP. C/O. @ TAT 2738.7	HOR 008	WS FTG 00291

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## INSPECTION - MAINTENANCE - OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A (11-77)

Engine Serial Number CAE-270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
11 JUN 06	—	2423.2	BLEED VALVE S/N FF37516 REPLACED BY S/N FF31777 @ TAT 3739.2	[Signature]	WS FTG 00296
27 JUN 06	—	2439.8	RD 2000-13-06 TURBINE TIG BOLT. N/A	[Signature]	WS FTG 00301
19 AUG 06	—	2499.9	RD 2000-16-02 FUEL NOZZLE INSP. N/A	[Signature]	WS FTG 00321
03 SEPT 06	—	2520.6	100HR/12MTH & 300HR INSP. C/PWT @ TAT 2836.2.	[Signature]	WS FTG 00324
14 NOV 06	—	2619.7	100HR/12MTH, 200HR/6MTH & COMPRESSOR CASE HALVES REPLACEMENT C/PWT @ TAT 2933.7	[Signature]	WS FTG 00332
06 JAN 07	—	2774.2	100HR/12MTH & FCU S/N 336477 REPLACED BY S/N 330341 @ TAT 3033.3	[Signature]	WS FTG 00353
4 JAN 07	—	2781.0	CMB 0-1400 ENG. STEADY STATE OPS. AVOIDANCE RANGE IS NOT AFFECTED @ TAT 3097.0.	[Signature]	WS FTG 00366

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## INSPECTION - MAINTENANCE - OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A (11-77)

Engine Serial Number CAE-270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
19 FEB 07	—	2815.2	100HR/12MTH, 200HR/6MTH, 300HR & CEB A-1398 REV P. C/P @ TAT 3131.2	[Signature]	FTG 00372
20 FEB 07	—	2821.7 2817.2	TURBINE ASSY CAT-22911 REPLACED WITH TURBINE ASSY - CAT-24635 @ TAT 3137.7	[Signature]	FTG 00373
29 MAR 07	—	2911.9	100HR/12MTH & COMPRESSOR CASE INSP C/PWT @ TAT 3227.9.	[Signature]	FTG 00381
09 MAY 07	—	3012.7	100HR/12MTH & 200HR/6MTH INSP. C/PWT @ TAT 3328.7.	[Signature]	FTG 00390
01 MAY 07	—	3005.5	VARIATION GRANTED FOR 100HR/12MTH & 200HR/6MTH INSP @ TAT 3321.5	[Signature]	FTG 00391
22 JUN 07	—	3110.5	100HR/12MTH & 300HR INSPECTIONS C/PWT @ TAT 3426.5.	[Signature]	FTG 00406



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## INSPECTION - MAINTENANCE - OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A (11-77)

Engine Serial Number CAE-270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
14 SEPT 04	-	3203.3	100HR/12MTH, 200HR/6MTH & COMPRESSOR CASE INSP. C/OUT @ TAT 3524.3:		FTG00427
2 SEPT 07	-	3213.1	P.T. GOVERNOR S/N BR36366 REPLACED BY S/N HR46774 @ TAT 3529.1.		FTG00428
23 DEC 07	-	3290.9	100HR/12MTH INSP. C/OUT @ TAT 3606.9		FTG00436
25 FEB 08	-	3377.3	100HR/12MTH, 200HR/6MTH, 300HR & COMPRESSOR CASE INSP. C/OUT @ TAT 3693.5.		FTG00454
29 APR 08	-	3473.6	100HR/12MTH INSP. C/OUT @ TAT 3789.6		FTG00465
26 JUN 08	-	3564.1	100HR/12MTH & 200HR/6MTH INSP. C/OUT @ TAT 3880.1.		FTG00494
24-AUG-08	-	3640.9	300HR/6MTH Compressor case Insp. C/OUT @ TAT 3956.4		FTG00490

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## INSPECTION - MAINTENANCE - OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A (11-77)

Engine Serial Number CAE-270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
13-SEP-08	-	3657.4	100HR/12MTH, 300HR INSP. C/OUT @ TAT: 3973.4		FTG00489
13-SEP-08	-	3658.0	TURBINE ASSY. S/N CAT-24635 REPLACED BY S/N CAT-25722 @ TAT 3974.0		FTG00492
13-SEP-08	-	3658.0	BLEED VALVE S/N FF-32777 REPLACED BY S/N FF-33005 @ TAT 3974.0		FTG00492
09 NOV 08	-	3752.5	100HR/12MTH & 200HR/6MTH INSP. C/OUT @ TAT 4063.5.		FTG00497
15 FEB. 09	-		100HR/12MTH & COMPRESSOR CASE INSP. C/OUT AT TAT 4161.7		FTG00508
09/15/09	-	4015.8	ENGINE REMOVED FROM A/C S/N 8661 (REG. A6-FTG) AT 4371.4 TAT.		FTG00508

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## INSPECTION - MAINTENANCE - OVERHAUL RECORD

### ENGINE ASSEMBLY

2784A (11-77)

Engine Serial Number CAE-270185 Engine Model 250-C20J

Date	Engine Time		Remarks	Signature	Organization
	Since OH	Total			
21/5/12	-	4015.4	ENH. S/N CAE-270185 INSTALLED ON A6-FTB @ 5629.4 TAT.		FTB00823
18/6/12	-	4039.3	100HR/12M ENH. INSPECTION CARRIED OUT @ 5653.3 TAT.		FTB00825
18/6/12	-	4039.6	BLEED VALVE S/N FF28036 REPLD BY S/N FF33005 @ 5653.6 TAT.		FTB500091
26/6/12	-	4048.1	FCU S/N 333779 REPLACED BY S/N 322476 @ 5662.1 TAT.		FTB500093
29/8/12	-	4138.9	100HR/12M + 300HR ENH. INST 600HR FACET FILTER BYPASS TEST CIVT @ 5752.9 TAT.		FTB00834

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## ASSEMBLY RECORD

### ENGINE ASSEMBLY

FORM 2785A-1(4-79)

Engine Serial Number CAE - 270185 Engine Model 250-C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Engine Total Time	TSO This Item	Date	Engine Total Time	TSO This Item	
GEARBOX	23001923	27185	1-21-83	0.0	NEW	9/5/09	4015.4	NEW 4015.4	FTB500015
COMPRESSOR	6890550	23931	"	"	"	12 DEC 00	1357.0	1357.0	OVERHAUL
TURBINE	6898735	23236	"	"	"	30 MAR 05	1669.1	TSN 1669.1 TSN 1669.1	CAB 1371
CONTROL	23001794	336496	"	"	"	02 FEB 99	1326.05	1326.05	TENDENCY TO HANG START
GOVERNOR	<del>23005493</del> 23005493	29250	"	"	"	27 APR 05	1718.9	TSN 1718.9 TSN 1718.9	CUTTER PIN WORN
PUMP	6899253	T100865	"	"	"	8-4-99	1357.05	1357.05	TO SERVICE ENS. 270342
NOZZLE	6890917	AG74933	"	"	"	13-8-91	767.55	TSN 767.55	
BLEED VALVE	6899115	FF38066	"	"	"	8-12-87	341.35	341.35	TO SERVICE A/C 162 ENCL 100- CAE 270185
BLEED VALVE	6899115	FF38433	9-12-87	341.35	354.45	30-12-87	341.35	TSN 354.35	TO SERVICE ENGINE 270340
BLEED VALVE	<del>2303668</del> 2303668	FF45028	31-12-87	341.35	281.30	15-11-88	341.35	TSN 281.30	UNSERVICABLE REPAIRABLE INSTALLED 270340
BLEED VALVE	2303668	FF45028	15-11-88	341.35	281.30	21 JAN 05	1549.9	1487.8	OVERHAUL



**ASSEMBLY RECORD**  
**ENGINE ASSEMBLY**

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FORM 2785A-1(4-79)

Engine Serial Number CAE - 270185 Engine Model 250- C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason	
			Date	Engine Total Time	TSO This Item	Date	Engine Total Time	TSO This Item		
NOZZLE	6890917	AG 9344	13-8-91	767:55	683:20	(U/S)			FOR REPAIR.	
NOZZLE	6890917	AG 9344	9-6-92	767:55	683:20		15Aug04	1359.6	1275.0	CEB A-1394 Due
CONTROL	23007869	86240511	2-2-99	1326:05	1124:50		8-4-99	1357:05	1155:50	TO SERVICE ENG. NO 270342
CONTROL	23001744	336496	8-4-99	1357:05	1326:05	(U/S)				TENDENCY TO HANG START.
PUMP	689253	T10400	8-4-99	1357:05	1124:50	(U/S)				B.F. AND SEAL DRAIN PORTS CROSS THREADED.
EXCITER	6895573	08977	10-4-99	1357:05	1122:40	(U/S)				NO IGNITION.
COMPRESSOR	6890550	28931	12-22-00	1357:05	01357:05		9/5/09	4015.4	4015.4	FTN 500015
FUEL CONTROL	23007857	336496	12-12-00	1357:05	1326:05					
FUEL PUMP	6899253	T-104000	12-12-00	1357:05	1124:50		03 MAY 06	2364.8	2335.8	ENG SHUT DOWN
Fuel Nozzle	23077068	1010	15Aug04	1359.6	0.0		13/02/09	3845.7	2486.1	Due of stall.
BLEED VALVE	23053176	FF37516	31 JAN 05	1544.9	0.0		11 JUN 06	2423.2	423.3	AIR FILTER COKE INLET
TURBINE	23037241	22811	30 MAR 05	1664.1	-		20-FEB-07	2821.7	3423.1	II <sup>ND</sup> STAGE WHEEL CR

**ASSEMBLY RECORD**  
**ENGINE ASSEMBLY**

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2785A (11-77)

Engine Serial Number CAE - 270185 Engine Model 250- C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Engine Total Time	TSO This Item	Date	Engine Total Time	TSO This Item	
GOVERNOR	23007832	6236366	27 APR 05	1418.9	NEW	22 SEPT 07	3213.1	1494.2	DUE O/H
FUEL CONTROL	23007869	336477	03 MAY 06	2364.8	TSN 212.7	06 JAN 07	2717.2	2475.2	DUE O/H
BLEED VALVE	23053176	FF32777	11 JUN 06	2423.2	Ø	13-SEP-08	3658.0	1234.8	MANUAL P.A FRAMES
FUEL CONTROL	23070606	330371	06 JAN 07	2475.2	Ø				
TURBINE	6898735	CAT-24635	20-FEB-07	2821.7	TSN-1491.9	13-SEP-08	3658.0	2318.2	FAILED POWER ASSURANCE
GOVERNOR	23076061	4124474	22 SEPT 07	3213.1	Ø	11/5/09	4015.4	802.3	CEB H402 DUE REF. FTN 500015
TURBINE	23037241	CAT-25722	13-SEP-08	3658.0	TSN 2085.4				
BLEED VALVE	23053176	FF-33005	13-SEP-08	3658.0	0.0				
STARTER GEN.	23032-048	24191	29 DEC 08	2761.2	0.0				
FUEL NOZZLE	23077068	0499	12 FEB 09	3845.7	375.7				
COMPRESSOR	6890550	CAC-24077	21/5/12	4015.4	2643.2				
GEAR BOX	23007823	CAM-27187	21/5/12	4015.4	0.0				
BLEED VALVE	23053176	FF26786	21/5/12	4015.4	0.0	ENTERED IN ERROR.			



### ASSEMBLY RECORD ENGINE ASSEMBLY

Part V  
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Engine Serial Number CAE-270185 Engine Model 250-C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Engine Total Time	TSO This Item	Date	Engine Total Time	TSO This Item	
TURBINE	23038241	CAT-22773	21/5/12	4015.4	0.0				
FCU	23070606	333779	21/5/12	4015.4	1836.8	26/6/12	4048.1	1869.5	TOT FLUCTUATE
PTG	2308749	HP-46774	21/5/12	4015.4	TSN 833.4				
FUEL PUMP	6899253	T101422	21/5/12	4015.4	192.9				
FUEL NOZZLE	6890917	0463	21/5/12	4015.4	1485.5				
BLEED VALVE	23053176	FF28036	21/5/12	4015.4	387.4	18/6/12	4039.6	411.6	TOT HIGH
BLEED VALVE	23053176	FF33005	18/6/12	4039.6	562.4				
FCU	23070606	322476	26/6/12	4048.1	0.0				

### SERVICE RECORD TURBINE ASSEMBLY

Part I  
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FORM 2782D-1 (4-79)

Turbine Serial Number CAT- 22773 Engine Model 250-C20B

INSTALLED					REMOVED			
Date	Owner	A/C or Eng. S/N	Turbine Time		Date	Turbine Time		Reason
			Since OH	Total		Since OH	Total	
5-26-82		834984	NEW	0.0	17-3-05	1745.7	1745.7	HMI → CEBS
19-JUN-07		CAE 270178	-	1745.7	4/4/11	-	3495.4	1ST END STN G.WHEEL RETIRE CYC: 3471
21/5/12	HORIZON	CAE-270185	0.0	3495.4 CYC 3471				

### TRANSFER RECORD

Part II  
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FORM 2782D-1 (4-79)

Turbine Serial Number CAT - 22773 Engine Model 250- C20B

Date	From	To	SHIPPED		RECEIVED	
			Turbine Time		Date	By
			Since OH	Total		
5-26-82	DDA-GMC	<b>AGUSTA</b>	NEW	0.0		
	<i>Horizon Int.</i>	<i>H/S Aviation</i>	NEW	1745.42	21-3-05	<i>H/S Aviation</i>
12-4-05	<i>H/S Aviation</i>	<i>Horizon International</i>	NEW	1745.42		
	<i>HORIZON INT'L</i>	<i>STANDARD AERO</i>	NEW	3495.4	29 AUG 2011	<i>STANDARD AERO</i>
14 FEB 2012	<i>STANDARD AERO</i>	<i>HORIZON INT'L</i>	0.0	3495.4		







### MODIFICATION RECORD

#### TURBINE ASSEMBLY

Part III  
Page No. 1

FORM 2783D-1(4-79)

Turbine Serial Number CAT - 22773 Engine Model 250- C20B

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
5.NOV.91	CEB 1155	ENG.P.T.SUPPORT AND SEAL ASS.EXTEND INNER CROSS SECTION OF SCAVANGE OIL DRAIN STRUTT.		ALCOTER INTERNATIONAL Firenze - Italia
5.NOV.91	CEB 1183	ENGINE G.P.TURB.SUPPORT ASSY ANTI ROTATION PIN REPLACE.		ALCOTER INTERNATIONAL Firenze - Italia
5.NOV.91	CEB 1185	ENG.G.P.TURB.SUPPORT P.T.SUPPORT AND SEAL ASSY BREAK EDGE.		ALCOTER INTERNATIONAL Firenze - Italia
5.NOV.91	CEB 1204	ENG.TURBINE RETAINING RING N°6 AND 7 BEARINGS REPLACE.		ALCOTER INTERNATIONAL Firenze - Italia
5.NOV.91	CEB 1212	ENG.TURB.ASS.GAS PRODUCER ROTOR ASS. REPLACE TIE BOLT BY TIE BOLT OF IMPROVED STRENGTH.		ALCOTER INTERNATIONAL Firenze - Italia
5.NOV.91	CEB 1223	TURBINE ASS.TURBINE NOZZLE SHIELD POSITIONING PLUG MODIFY.		ALCOTER INTERNATIONAL Firenze - Italia



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### MODIFICATION RECORD TURBINE ASSEMBLY

FORM 2783D-1(4-79)

Turbine Serial Number CAT- 22773 Engine Model 250- C20B

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
5.NOV.91	CEB A1224	ENG.TURBINE ASS.INNER AND OUTER P.T. SHAFTS THICKER ELECTROLESS NIKEL PLATE.	EM 8	ALCOTTER MERIDIONAL
5.NOV.91	CEB 1239	ENG.TURBINE ASSEMBLY "U" RING GASKET REINSPECTION.	EM 8	ALCOTTER MERIDIONAL
5.NOV.91	CEB 1267	ENG.TURB.ASS.SECOND STAGE TURB.WHEEL REDUCED DIAMETER BALANCE PISTON SEAL KNIFE.	EM 8	ALCOTTER MERIDIONAL
5.NOV.91	CEB 1251	ENG.TURBINE ASS.NEW OPTIMIZED P.T. SUMP CLEARANCES.	EM 8	ALCOTTER MERIDIONAL
5.NOV.91	CEB A1283	ENG.TURB.ASS.ALSEAL COATING OF P.T. INNER AND OUTER SHAFTS.	EM 8	ALCOTTER MERIDIONAL
3644002 (M) 01Nov93	FAA AD 96-19-01	#5 & #8 Bearing Serviceability check.	ADA VRI	ADA WO SOC/03/A/002
01Apr03	CEB-A-1341 & 1370	1st STG Nozzle Dome Shield - N/A by P/N. P/N 6890040 AC	ADA VRI	ADA WO SOC/03/A/002

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### MODIFICATION RECORD TURBINE ASSEMBLY

FORM 2783D(11-77)

Turbine Serial Number CAT-22773 Engine Model 250-C20B

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
01Nov03	FAA AD 77-15-12 CEB-A-1060	PT Coupling Nut P/N 684627B. - N/A by P/N	ADA VRI	ADA WO SOC/03/A/002
29Aug04	CEB A-1370R2	1st STG Nozz Shield insp. c/out.	TR I ADA	WS FTA 00078
12-4-05	PRPL 1-43	Overhaul Inspection 1, 2, 3 stage nozzles.	TR I	H & S AVATION LTD.
12-4-05	A1253 R4	1st + 2nd Stg. Nozzles - Modify for Internal Energy Absorbing Ring.	H & S 1028	
	A1254 R3	CP Support - Modify L Snop. Internal Energy Absorbing Ring.		
	A1255 R4	External Energy Absorbing Ring - Add		
	1276 R3	CP Support - Addition of Brazed or-Welded Wear Pads.		
	A1292 R1	Turbine Splined Hapter 6898784. Replace Certain Suspect Hapters.		
	A1342 R2	Inspection of 1st Stg. Nozzle Shield Dome Detail for HNI or Overhaul.		H & S AVATION LTD.

FORM 2783D (11-77) Part III  
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### MODIFICATION RECORD TURBINE ASSEMBLY

Turbine Serial Number CAT22773 Engine Model 250-C20B

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
	A1370R2	Inspection & Replacement of 1st Stage Nozzle Shield. (C890040 refitted).		
	1371R0	C/P Rotor Assembly - Replace Tie Bolt.		
	A1375R0	Replacement of 2nd Stage Nozzle Diaphragm.		
27 DEC 2007	AD 2005-10-13	ENERGY ABSORBING RING FOUND P.C.W. DURING INCORPORATION OF CEB A1255 RA BY H & S AVIATION.	HOR 008	FTE00479
30 JAN 08	CEBA140 R1	ENGINE STEADY STATE OPERATION AFFECT DUE P/W. PLACARD FITTED.	HOR 008	FTE00491
30 JAN 08	CEB A 1398 R2	POWER TURBINE OUTER SWAFT. NOT AFFECTED.	HOR 008	FTE00490
30 JAN 09	CEB A1402 R2	PTG INCREASED RELIABILITY.	HOR 008 M DXX	FTE00594

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### MODIFICATION RECORD TURBINE ASSEMBLY

Turbine Serial Number CAT-22773 Engine Model \_\_\_\_\_

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
04/01/10	CEBA1375R2	COMPLIANCE CHECK C/D. FOUND EMBODIED.	HOR 022	FTE00623
04/01/10	CEBA-1375R3	COMPLIANCE CHECK C/D. FOUND EMBODIED.	HOR 022	FTE00621
03/5/10	CEB-1038R1	FIRST STG NOZZLE SHIELD ASBY REWORK / NOT C/D OUT AT THIS TIME. TO BE C/D OUT @ NEXT O/H.	HOR 022	FTE00643
03/05/10	CEB-1360	RECOATING OF POWER TURBINE INNER SHAFT. NOT C/D OUT AT THIS TIME. TO BE C/D OUT @ NEXT MAINT/O/H.	M. P. 99%	FTE00645
14 FEB 2012	CEB 1326	RELEASE OF NO. 8 BRG & RETNG PLATE		STANDARD AERO
14 FEB 2012	CEB 1333R6	REIDENTIFY SEMI-FINISHED 2ND STG NOZZLES		
14 FEB 2012	CEB 1360R2	RECOATING OF PT INNER SHAFT.		

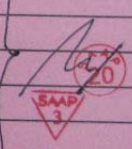


### MODIFICATION RECORD TURBINE ASSEMBLY

Part III  
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GT 2783D (9-84)

Turbine Serial Number CAT 22773 Engine Model 250-C20B

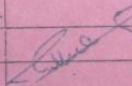

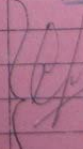
Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
14 FEB 2012	CEB 1399R1	INSPECTION OF SUMP ASSY, OIL - GAS FIER	 SAAP 3	STANDARD AEROSPACE
		TURB BRG SUPPORT. (MEASURED WALL THICKNESS : 0.018")		
14 FEB 2012	CEB 1406R1	REPLACEMENT OF TURB GIP FORWARD CABY SEAL.		
14 FEB 2012	CEB-A-1370R6	INSPECTION OF 1ST STG NOZZLE DOME		
14 FEB 2012	CEB-A-1375R3	REPLACEMENT OF 2ND STG NOZZLE DIAPHRAGM		

### INSPECTION — MAINTENANCE — OVERHAUL RECORD TURBINE ASSEMBLY

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FORM 2784D-1 (4-79)

Turbine Serial Number CAT - 22773 Engine Model 250-C20B

Date	Turbine Time		Remarks	Signature	Organization
	Since OH	Total			
24.10.85	40:47	40:47	DURING STARTING TOT LIGHT CAME AT 850R (HOT START INSP CARRIED OUT I.A.W. M/M)		AMPI GUARD AIR WING SV
5. NOV. 91	-----	851:20	TURBINE ASSY HAS BEEN VISUAL INSPECTED AND REPAIRED.		HORIZON INTERNATIONAL
12-4-05	New	1745:42	1750 hour HMI carried out in accordance with PRPH-25 and related. Tie Bolt NIM 896 86965 free length 6.882" 1st. Stg. Nozzle Shield 6890040 fitted, 1000 cycles available. H/S Aviation Project 6201770 R/so.		H & S AVIATION LTD.

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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### TURBINE ASSEMBLY

FORM 2784D-1 (4-79)  
 Turbine Serial Number CAT - 22773 Engine Model 250-C20B

Date	Turbine Time		Remarks	Signature	Organization
	Since OH	Total			
05/10/08	✓	2341.0	SPECIAL INSPECTION (out TAN RR HM CHAP. 72-00-00 page 020-TAB-E C44 (EXCEEDED) 927C FOR MORE THAN 1500) Q TAN 3718.5.		FTE00001
11/10/09	✓	2986.6	CEB1370 REV 6 (1st STAGE NOZZ.) SHIELD DOME INSP.) (LOUT.		FTE00602
04/01/10	✓	3081.0	CEB A-1400R3 COMPLIANCE CHECK (LOUT. FOUND N/A BY P/N.		FTE00616
04/01/10	✓	3081.0	CEB-1365R3 COMPLIANCE CHECK (LO. FOUND OPTIMAL. NOT RECALC'D		FTE00624
4/1/11	-	3495.4	DATED AT THIS TIME. TURBINE ASSY S/N CAT-22773 REMOVED FROM ENR CAE-270185.		FTE00685

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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### TURBINE ASSEMBLY

2784D(11-77)  
 Turbine Serial Number CAT 22773 Engine Model 250-C20B

Date	Turbine Time		Remarks	Signature	Organization
	Since OH	Total			
14 FEB 2012	0.0	3495.4 CYC 3471	OVERHAULED & MODIFIED IAW RR250- C20 SERIES OHM, 10W3, EDTN 4, REV 7 DTD AUG 15/11. (REFERENCE WORK ORDER 66257470)		STANDARD AERO



**ASSEMBLY RECORD**  
**TURBINE ASSEMBLY**

Part V  
Page No. 1

FORM 2785D-1(4-79)

Turbine Serial Number CAT - 22773 Engine Model 250- C20B

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Turbine Total Time	This Item TT Cycles	Date	Turbine Total Time	This Item TT Cycles	
1ST STG.WHL.	6886407	X78750	5-26-82	0.0	0.0	5-Nov-91	C. 982 851:20	851:20 982	
2ND STG.WHL.	6898782	HX60813	"	0.0	0.0	5-Nov-91	C. 982 851:20	851:20 982	
3RD STG.WHL.	6899373	HX58514	"	0.0	0.0	29 AUG 2011	3495.4	3495.4 3471	
4TH STG.WHL.	6853279	HX50949	"	0.0	0.0	29 AUG 2011	3495.4	3495.4 3471	
1 <sup>st</sup> STG. whl.	6886407	X119942	5-NOV-91	C. 982 851:20	00:00 00:00	12-4-05	1745:42	1022 894:22	HPI
2 <sup>nd</sup> STG whl.	6898782	HX 103597	5-NOV-91	C. 982 851:20	00:00 00:00	12-4-05	1745:42	1022 1749.7	HPI
1st Stg whl	23073853	50615	12-4-05	1745:42	NEW	29 AUG 2011	3495.4	1467	
2nd Stg whl	23073854	511807	12-4-05	1745:42	NEW	29 AUG 2011	3495.4	1467	

**ASSEMBLY RECORD**  
**TURBINE ASSEMBLY**

Part V  
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FORM 2785D-1(4-79)

Turbine Serial Number CAT - 22773 Engine Model 250-C20B

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Turbine Total Time	This Item TT Cycles	Date	Turbine Total Time	This Item TT Cycles	
Tie Bolt	23068265	NM 86965	12-4-05	1745:42	0.0 NEW	29 AUG 2011	3495.4	1749.7 1467	
1ST STG WHL	M250-10223	607162	14-FEB-2012	3495.4	0.0 0				
2ND STG WHL	23073854	600885	14-FEB-2012	3495.4	0.0 0				
3RD STG WHL	6899373	HX 58514	14-FEB-2012	3495.4	3495.4 3471				
4TH STG WHL	6853279	HX 50949	14-FEB-2012	3495.4	3495.4 3471				
TIE BOLT	23068265	NC 85857	14-FEB-2012	3495.4	0.0 0				
1ST STG NOZZLE SHIELD	23084382	NO SER	14-FEB-2012	3495.4	0.0 0				


**CYCLE RECORD  
TURBINE ASSEMBLY**

FORM 9386-1(4-79) Part VI  
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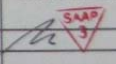
(Refer to Life Limiting CSL)

Turbine Serial Number CAT - 22773 Engine Model 250- C20B

Date	Owner	Installed		Do Not Exceed Cycle Counter Reading	Removed		Cycles This Installation
		Eng S/N	Cycle Counter Reading		Date	Cycle Counter Reading	
5-26-82		834984			5/11/91	-	982 TOTAL
					7/3/05	-	1082 (2004 TOTAL)
19 Jun 07		CAE 270185	2004 23244		4/4/11	-	1467 (3471 TOTAL)

 **Rolls-Royce**

**LIFE LIMITED PART LOG CARD**

LIFE LIMITED PART NAME <u>2ND STG NOZZLE DIAPHRAGM</u>		PART NUMBER <u>23084419</u>			SERIAL NUMBER <u>YG15351</u>			
Date Installed	Date Removed	Engine and Module S/N	Engine Model	Hours	Cycles	Overspeed Events* (as app)	Comments	Signature And Certificate #
14 FEB 2012		CAT 22773	C20B	0.0	0	-	-	

\*For PT Wheel Overspeed Cycles, record event date and event maximum % no the Comments Line.  
 \*This card should accompany the part when removed from engine or module.  
 GT-12017 (4-05)



**SERVICE RECORD**  
**COMPRESSOR ASSEMBLY**

Part I  
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FORM 2782B-1 (F) (4-79)

Compressor Serial Number CAC - 24077 Engine Model 250- C20J

INSTALLED					REMOVED			
Date	Owner	A/C or Eng. S/N	Compressor Time		Date	Compressor Time		Reason
			Since OH	Total		Since OH	Total	
3-27-83		270187	NEW	0.0	06/11/00	1382:00	1382:00	CRACK
21/12/00	MTU-München	270187	00:00	1382:00				
21/08/04	HORIZON	270187	00:00	1382:0	05/11/11	2643:2	4025:2	FOR W/S # HORIZON 02705
21/5/12	HORIZON	270185	2643:2	4025:2				

**TRANSFER RECORD**

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Page No. \_\_\_\_\_

FORM 2782B-1 (D) (4-79)

Compressor Serial Number CAC - 24077 Engine Model 250- C20J

SHIPPED					RECEIVED	
Date	From	To	Compressor Time		Date	By
			Since OH	Total		
3-27-83	DDA-GMC	AGUSTA	NEW	0.0		

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## MODIFICATION RECORD COMPRESSOR ASSEMBLY

FORM 2783B-1 (4-79)

Compressor Serial Number CAC - 24077 Engine Model 250- C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
17 DEC 87	CEB A1234	ENGINE FUEL LUBE AND AIR SYSTEM PC SCROLL TO PC FILTER TUBE ASSY INSPECTION.	Siddi	ELCOTTEI MERIDIONALE Frascati - Italia
28 MAY 90	CEB A1234	ENGINE FUEL LUBE AND AIR SYSTEM PC SCROLL TO PC FILTER TUBE ASSY INSPECTION.	[Stamp]	ELCOTTEI MERIDIONALE Frascati - Italia
28 MAY 90	CEB A1233 (PART. 1a)	ENG. FUEL LUBE AND AIR SYSTEM IMPROVED STRENGTH PC FILTER HOUSING	[Stamp]	ELCOTTEI MERIDIONALE Frascati - Italia
4 OCT 93	CEB A1234	ENGINE FUEL LUBE AND AIR SYSTEM PC SCROLL TO PC FILTER TUBE ASSY INSPECTION.	[Stamp]	ELCOTTEI MERIDIONALE Frascati - Italia
21.12.00	CEB 1321	New Compressor Rotor Assy.	[Stamp]	MTU - München
21.12.00	CEB 1325	New Compressor Coupling Adapter	[Stamp]	MTU - München
21.12.00	CEB 1317	Compressor Case, New Material Plastic Add.	[Stamp]	MTU - München

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## MODIFICATION RECORD COMPRESSOR ASSEMBLY

FORM 2783B-1 (4-79)

Compressor Serial Number CAC - 24077 Engine Model 250-C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
30 JAN 2008	CSL 117223	COMPRESSOR CASE EROSION/CORROSION INSPECTION. P.C.W UNDER R2.	[Signature]	PTB 26619



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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### COMPRESSOR ASSEMBLY

FORM 2784B-1(4-79)  
Compressor Serial Number CAC - 24077 Engine Model 250- C20J

Date	Compressor Time		Remarks	Signature	Organization
	Since OH	Total ENG HRS			
26 APR 87	NEW	299:55	COMP. CASE P. NO 6877410 REPLACED WITH <sup>NEW</sup> S. NO 20226 (PLASTIC EROSION - <sup>RRR</sup> U.A.E. ALDHAFRA OLD CASE NO 15-29146)		
17 DEC 87	-	302:55	THE COMPRESSOR ASSY HAS BEEN VISUAL INSPECTED.	Gizzi	ELICOTTERI MERIDIONALI Frosinone - Italia
22-2-89	NEW	503:15	COMP CASE S. NO 20226 REPLACED WITH NEW CASE S. NO 26981 CASE HRS 1:25.	Amg...	UAE ALDHAFRA
28 MAY 90	-	575:15	COMPRESSOR ASSY HAS BEEN VISUAL INSPECTED AND REPAIRED.		ELICOTTERI MERIDIONALI Frosinone - Italia
4. OCT. 93	-----	1110:40	COMPRESSOR ASSY HAS BEEN VISUAL INSPECTED AND REPAIRED.		ELICOTTERI MERIDIONALI Frosinone - Italia

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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### COMPRESSOR ASSEMBLY

FORM 2784B-1(4-79)  
Compressor Serial Number CAC - 24077 Engine Model 250- C20J

Date	Compressor Time		Remarks	Signature	Organization
	Since OH	Total			
21.04.00	-	175:10	COMP CASE ASSY S. NO SET 20701 ERODED INSTALLED. 'U/S'		JR. MANN. SEC
21.12.00	00:00	1382:00	Compressor Overhauled in acc. with Pub. 10W3.3. Edit. 6. Rev. 7197		MTW - München
27 AUG 05	211:5 <del>144:50</del>	1593:0 <del>1444:50</del>	COMPRESSOR CASE INSPECTION @ TAT 3213.9		NSFTB00073
17 FEB 06	499.9	1881.9	COMPRESSOR CASE INSPECTION @ TAT 3502.3.		NSFTB00044
13 AUG 06	750.4	2182.4	VARIATION GRANTED FOR COMPRESSOR CASE INSPECTION @ TAT 3753.1		NSFTB00078

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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### COMPRESSOR ASSEMBLY

2704B(11-77)

Compressor Serial Number CAC-24077 Engine Model 250-C20J

Date	Compressor Time		Remarks	Signature	Organization
	Since OH	Total			
28 AUG 06	755.4	2137.4	COMPRESSOR CASE INSPECTION C/OUT @ TAT 3957.8.		US FTB00483
14 FEB 07	997.7	2379.7	COMPRESSOR CASE INSPECTION C/OUT @ TAT 4000.1.		FTB00530
17 JUL 07	1277.4	2659.4	COMPRESSOR CASE INSPECTION C/OUT @ TAT 4279.8 FOUND U/S CASE HALVES REPLACED. S/N OFF SET 2070. S/N ON SET 31040.		FTB00571
14 JAN 08	1505.7	2887.7	COMPRESSOR CASE INSPECTION C/OUT @ TAT 4508.1.		FTB00617
10 JUL 08	1700.4	3082.4	COMPRESSOR CASE INSPECTION C/OUT @ TAT 4702.8.		FTB00667

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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### COMPRESSOR ASSEMBLY

2784B(11-77)

Compressor Serial Number CAC-24077 Engine Model 250-C20J

Date	Compressor Time		Remarks	Signature	Organization
	Since OH	Total			
19 AUG 08	1742.2	3120.2	COMPRESSOR CASE INSPECTION C/OUT @ TAT 4744.6.		FTB00675
09/21/09	1901.0	3283.0	COMPRESSOR CASE INSP. C/OUT AT 4903.4 TAT.		FTB00694
09/08/09	2154.9	3536.9	COMP. CASE INSPECTION C/OUT AT 5157.3 TAT.		FTB00718
27/6/10	2397.0	3779.0	COMPRESSOR CASE S/N SET 31040 REPLACED BY S/N SET 28607 @ 4119.5 TAT.		FTF00420
12/12/10	2550.4	3932.4	COMPRESSOR CASE INSP C/OUT @ 4282.9 T.A.T.		FTF00443



**ASSEMBLY RECORD**  
**COMPRESSOR ASSEMBLY**

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FORM 2785B-1(4-79)

Compressor Serial Number CAC - 24077 Engine Model 250- C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Comp. Total Time	This Item TT Cycles	Date	Comp. Total Time	This Item TT Cycles	
1ST STG. WHL.	6890501	KR61905	3-27-83	0.0	0.0	17 DEC 87	302:55	302:55	
2-3 STG. WHL.	6890502	C44790	"	0.0	0.0	28 MAY 90	575:15	575:15	
4TH STG. WHL.	6876654	C43689	"	0.0	0.0	28 MAY 90	575:15	575:15	
5TH STG. WHL.	6876655	ER34798	"	0.0	0.0	17 DEC 87	302:55	302:55	
6TH STG. WHL.	6876656	KR28941	"	0.0	0.0	28 MAY 90	575:15	575:15	
IMPELLER	6876873	KR58409	"	0.0	0.0	06 11 00	1382:00	1382:00	erosion
ADAPTER	6891625	TH63009	"	0.0	0.0	06 11 00	1382:00	1382:00	modify
TIE BOLT	6871259	39181	"	0.0	0.0	06 11 00	1382:00	1382:00	corrosion
1 <sup>ST</sup> STG. WHL.	6890501	KR-68306	17 DEC 87	302:55	00:00	28 MAY 90	575:15	272:20	

**ASSEMBLY RECORD**  
**COMPRESSOR ASSEMBLY**

Part V  
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FORM 2785B-1(4-79)

Compressor Serial Number CAC - 24077 Engine Model 250- C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Comp. Total Time	This Item TT Cycles	Date	Comp. Total Time	This Item TT Cycles	
5 <sup>th</sup> STG. whl.	6876655	C-23165	17 DEC 87	302:55	302:55	28 MAY 90	575:15	272:20	
COMPRESSOR CASE	6877410	29345	28 MAY 90	575:15	T.S. 0:00:00	12-10-91	833:45	258:30	ERODED.
1 <sup>st</sup> STG. whl.	23033721	KR-71609	28 MAY 90	575:15	00:00	4 DEC 93	1110:40	535:15	
2-3 STG. whl.	23033722	KR-60568	28 MAY 90	575:15	00:00	4 DEC 93	1110:40	535:15	
4 <sup>th</sup> STG. whl.	6876654	ER-58387	28 MAY 90	575:15	00:00	06 11 00	1382:00	806:45	erosion
5 <sup>th</sup> STG. whl.	23033725	ER-45680	28 MAY 90	575:15	00:00	06 11 00	1382:00	806:45	erosion
6 <sup>th</sup> STG. whl.	6876656	KR-28683	28 MAY 90	575:15	00:00	06 11 00	1382:00	806:45	erosion
COMPRESSOR CASE	6877410	17085	12-10-91	833:30	00:00	4 DEC 93	1110:40	272:10	

**ASSEMBLY RECORD**  
**COMPRESSOR ASSEMBLY**

Part V  
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FORM 2785B (11-77)

Compressor Serial Number CAE-26077 Engine Model 250C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Comp. Total Time	This Item TT Cycles	Date	Comp. Total Time	This Item TT Cycles	
COMPRESSOR CASE	6877410	26181	4 OCT 93	1110:40	1382:00	22-3-99	1278:25	167:45	ERRODED
1 <sup>ST</sup> STG. WHL	23033721	KR8586	4 OCT 93	1110:40	00:00	06.11.00	1382:00	271:20	EROSION
2-3 STG. WHL	6893612	KR70526	4 OCT 93	1110:40	00:00	06.11.00	1382:00	271:20	EROSION
COMP. CASE	23057142	29626	22-3-99	1278:25	0:00	21-6-99	52:50	52:50	ERRODED
COMP. CASE	23057142	42906	21-6-99	1331:15	0:00	22-8-00	50:45	50:50	TO SERVICE AN OTHER ENGINE.
COMP. CASE	23057142	3622804	27/6/10	3779:0	TCN: (WIK) TSP: 0:0				

**ASSEMBLY RECORD**  
**COMPRESSOR ASSEMBLY**

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FORM 2785B (11-77)

Compressor Serial Number CAC 24077 Engine Model 250-C20J

Nomenclature	Part Number	Serial Number	INSTALLED			REMOVED			Reason
			Date	Comp. Total Time	This Item TT Cycles	Date	Comp. Total Time	This Item TT Cycles	
1 <sup>ST</sup> STG. WHL	23057111	KR 87935	21.12.00	1382:00	New 0000				
2-3 STG. WHL	23057112	E 78719	21.12.00	1382:00	New 0000				
4 <sup>TH</sup> STG. WHL	23057114	E 81572	21.12.00	1382:00	New 0000				
5 <sup>TH</sup> STG. WHL	23057115	KR 59488	21.12.00	1382:00	New 0000				
6 <sup>TH</sup> STG. WHL	23057116	KR 57932	21.12.00	1382:00	New 0000				
Impeller	23058777	KR 101724	21.12.00	1382:00	New 0000				



**CYCLE RECORD**  
**COMPRESSOR ASSEMBLY**

Part VI  
Page No. \_\_\_\_\_

FORM 9387-1(4-79) (Refer to Life Limiting CSL)

Compressor Serial Number CAC - 24077 Engine Model 250- C20J

Installed				Do Not Exceed	Removed		Cycles This Installation
Date	Owner	Eng S/N	Cycle Counter Reading	Cycle Counter Reading	Date	Cycle Counter Reading	
3-27-83		270187					

**SERVICE RECORD**  
**GEARBOX ASSEMBLY**

Part I  
Page No. 1

FORM 2782C-1 (F)(4-79)

Gearbox Serial Number CAG - 27187 Engine Model 250- C20J

INSTALLED					REMOVED			Reason
Date	Owner	A/C or Eng. S/N	Gearbox Time		Date	Gearbox Time		
			Since OH	Total		Since OH	Total	
3-27-83		270187	NEW	0.0	06.11.00	1382:00	1382:00	modify
21.12.00	MTU-München	270187	1382:00	1382:00				
21/08/01	HORIZON	270187	1382:00	1382:00	31/01/11	-	4025.2	HorwS e0705
21/15/12	HORIZON	270185	NEW	4025.2				

**TRANSFER RECORD**

FORM 2782C-1 (B) (4-79) Part II  
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Gearbox Serial Number CAG - 27187 Engine Model 250-C20J

SHIPPED			Gearbox Time		RECEIVED	
Date	From	To	Since OH	Total	Date	By
			3-27-83	DDA-GMC		
	HORIZON	STANDARD AERO	NEW	4025.2	17 JUN 2011	STANDARD AERO
7 DEC 2011	STANDARD AERO	HORIZON	NEW	4025.2		

**MODIFICATION RECORD**

GEARBOX ASSEMBLY

FORM 2783C-1 (4-79) Part III  
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Gearbox Serial Number CAG - 27187 Engine Model 250-C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
21.12.00		CEB-A-1211, A1340, A1351 A1372 not applicable.		MTU-München
21.12.00		CEB 1073, 1182, 1118, 1122, 1131, 1132, 1135, 1165, 1166, 1177 1193, 1218, 1241. Previously Complied		MTU-München
21.12.00	CEB-A 1226	Through Bolt Retention of Idler Gears		MTU-München
21.12.00	CEB 1274	Installation of new Sand & Paper Bearings		MTU-München
21.12.00	CEB 1288	New Pressure Oil Tube		MTU-München



Part III  
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### MODIFICATION RECORD GEARBOX ASSEMBLY

FORM 2783C-1(4-79)

Gearbox Serial Number CAG - 27187 Engine Model 250- C20J

Compliance Date	Bulletin or Directive No.	Title	Signature	Organization
21.12.00	CEB 1307	Inspection of Oil Filter Tube		MTU-München
21.12.00	CEB 1201	Inspect Bearing		MTU-München
04/05/10	CEB 1363 R2	RELEASE OF NEW HELICAL TORQUE GEAR SHAFT ASY. FOUND OPTIONAL NOT REQUIRED AT THIS TIME.		FF00412
04/5/10	CEB-1226 R5	RETENTION OF IDLER GEARS. COMPLIANCE CHECK C/OUT. FOUND PREVIOUSLY COMPLIED WITH.		04/5/10 FF00414

### AD NOTE COMPLIANCE AND CEB MODIFICATION RECORD GEARBOX ASSEMBLY

Part III  
Page No. 3

GT-2787

Gearbox Serial Number CAG- 27187 Engine Model 250- C20J




AD #	Applicable CEB #	Date	Method of Compliance	One Time	Recurring	Next Comp. Date Next Comp. @ Hrs	Signature and Certificate Number
		Hours @ Comp.					
—	CEB 1218	7 DEC 2011 4025.2	EMBODIED		X	NEXT REMOVAL —	 STANDARD AERO
—	CEB 1395	7 DEC 2011 4025.2	EMBODIED		X	NEXT REMOVAL —	
—	CSL 1238 R1	7 DEC 2011 4025.2	EMBODIED		X	NEXT ACCESS —	

Part IV  
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## INSPECTION — MAINTENANCE — OVERHAUL RECORD

### GEARBOX ASSEMBLY

FORM 2784C-1(4-79)  
Gearbox Serial Number CAG - 27187 Engine Model 250- C20J

Date	Gearbox Time		Remarks	Signature	Organization
	Since OH	Total			
21.12.00	1382:00	1382:00	Gearbox repaired in acc. O.M.M. 10W2 G. Edit. 4. Rev. 8100		MTU-München
07 NOV 07		2807.4	VENT ORIFICE CHANGED TO SIZE-3 DIAMETER & VENT BREATHER TUBE REPLACED @ TAT 44278		FTB 00599
7 DEC 2011	NEW	4025.2	INSPECTED (INCLUDING 3500 HR MPI OF GEARS), REPAIRED & MODIFIED IAW RR250-C20 SERIES O.M.M. 10W3, EDTN A, REV 7 DTD AUG 15/11. (REFERENCE WORK ORDER LG 254110)		STANDARD ALIRO