

ENGINEERING REPORT

SUBJECT:

**Preliminary Report of Noticeable
4.84G in Vertical Acceleration of
PK-WGS, Registered MSN 1134, at
Sumbawa Besar (SWQ) Airport
on 20 April 2015**

No.	: ATR72-ER-05-034
Date	: May 4, 2015
Reference	: <i>See References</i>
A/C Type	: ATR72-212A
Effectivity	: PK-WGS
Attention	: QA, LM, SM, SSQ, OEM

BACKGROUND

The Wings Air **ATR72-600 PK-WGS (registration MSN 1134, version IW3)** under EASA Type Certificate Number **EASA A.084 ATR72, 17 October 2012**, with Captain Firman, one Flight Officer and two Flight Attendants on board, was operating as Wings Air **Flight IW1882 on 20 April 2015** en route from **Ngurah Rai International Airport, Denpasar, Bali (DPS/WADD: -8.7481699 Latitude, 115.1669998 Longitude)** to **Sultan Muhammad Kaharuddin III Airport, Sumbawa Besar (SWQ/WADS: -8.4890404 Latitude, 117.4120026 Longitude)**. At **10:10 h**, Pilot finally decided after lengthy deliberations, requested for return to base (RTB) to **LOP** by reason of bad weather and heavily bouncing. Furthermore, at **10:50 h**, PK-WGS landed at Lombok International Airport (**LOP/WADL: -8.757322 Latitude, 116.276675 Longitude**).

Just prior before touchdown at SWQ/WADS, in **undesirable meteorological conditions** at **Sumbawa Besar Airport (SWQ) on 20 April 2015**, the term derives from counting the number of **5 knots wind speed**, the crew deliberately flew the aircraft with unbalanced downward force made downward acceleration that led to downward velocity caused angle of attack become greater.

At **10:10:13 h, in flight, the increase in angle of attacks 4.8° and 3.7° on the L/H and R/H AOA sensor** which located on Zone 211, Frame 9 through 10, STA4897 direct to STA5147, respectively, resulted in an increase in coefficient of lift. In a particular state, the crew and passengers perceived consciously that **PK-WGS** was **bounced**.

At **10:10:14 h, on ground**, balance is restored so quickly but no sudden change in the weight of PK-WGS, relative to the lift. During the second, the vertical acceleration of PK-WGS aircraft was varying approximately from **0.88G to 1.03G**.

At **10:10:24 h**, pilot requested and announced for return to base (RTB) heading **134.91°** to reach Lombok International Airport (LOP/WADL).

Prepared by

Renni Ekaputri

Distribution :	QA	LM	SM	SSQ	OEM	FILE
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Afterwards, on **MCDU with 10:49 GMT**, the selected ACMS submenu of MCDU main menu shown as depicted **G-Meter** submenu resulted minimum vertical acceleration **in flight** was **0.64G**; maximum vertical acceleration **in flight** was **1.49G**; and maximum vertical acceleration at **landing** was **4.84G**.

Additionally, the Auxiliary Flight Data Acquisition and Management Unit **MPC-ED36 (P/N 261065723-1000; S/N 2610657230335)** comprehensively at **10:10:13 h** around coordinate **-8.483 Latitude, 117.465 Longitude (8°28'58.8"S, 117°27'54.0"E)** during **in flight** with **full air landing gear status** has described the minimum corrected vertical acceleration was **1.21G**, and the maximum corrected vertical acceleration was **4.82G**.

Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) has reported weather condition at **SWQ/WADS** during approach or landing with a common mnemonic **QNH** for atmospheric pressure at sea-level was on **1008.4 millibar (or hectopascal)**. The Query Field Elevation **QFE** was on **1008.0 millibar (or hectopascal)** refers to altitude relative to an aerodrome.

DESCRIPTION

This initial engineering report is intended to provide details and describe concurrent problem and investigation on **Wings Air's ATR72-600 PK-WGS (MSN 1134)** with unexpected high vertical acceleration during in flight, on 20 April 2015. The leadoff assessment in PK-WGS incident investigation report is divided into two major sections of classification: Landing Gear and Structural Inspection. On using **ATR72 AMM JIC 05-51-10 DVI 10000 002, Revision 8, December 1, 2014** as a basis for inspection after hard landing and exceeding VLE, VLO.

The investigation has been performed on **21 April 2015 through 27 April 2015** at **Lombok International Airport (LOP/WADL)**. Preliminary analysis of Structure and Landing gear for the PK-WGS and pertinent systems has been conducted. Initial indications are that the PK-WGS (MSN 1134) met relevant airworthiness requirements, with several exception of adjudications based on evidence presented: **definite physical sealant deterioration; and leakage on L/H and R/H Main Landing Gear Shock Absorber**.

Presently, the ad-hoc teams are still doing the investigation to scrutinize and verify the incident effect until we affirm solemnly all conclusions to fulfill the **Civil Aviation Safety Regulation CASR Part 35**, Airworthiness Standards: Propellers.

REFERENCES

- [1]. ATR72 AMM JIC 05-51-10 DVI 10000 002, Revision 8, December 1, 2014.
- [2]. ATR72 AMM JIC 45-12-00 RDG 10030 002, Revision 8, December 1, 2014.
- [3]. ATR72 AMM JIC 45-00-00 PRO 10010 001, Revision 8, December 1, 2014.

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INFORMATION

General Information

Aircraft Type	: ATR72-212A (600 Model)
Serial Number	: MSN 1134
Year of Manufacture	: 20 February 2014
Registration	: PK-WGS (Wings Air)
Past Historical Registration	: HS-LFH (Thai Lion Air)
Departure Point	: Denpasar (DPS/WADD)
Destination	: Sumbawa Besar (SWQ/WADS)
Destination (Base)	: Lombok (LOP/WADL)
Certificate of Registration	: Type Certificate EASA A.084
TSN / TSO	: 1412 FH
CSN / CSO	: 1362 FC
Weighing Execution Date	: 17 February 2014 (Toulouse)
Weight and Balance Number	: ATR72-600-WB-08-001
Empty Weight	: 13,245.650 Kg
Empty C.G from Datum Line	: 14.048 m
MAC %	: 19.29 % MAC

Engine Details

Manufacturer	: Pratt & Whitney Canada Corp.
Engine Model	: PW127M
Engine N°1 Serial Number	: PCE-EDO787
Engine N°1 Build Spec	: 1237
Installation Date	: 29 December 2013 (Position 1)
Engine N°2 Serial Number	: PCE-EDO786
Engine N°2 Build Spec	: 1237
Installation Date	: 29 December 2013 (Position 2)
Type Certificate Data Sheet Number	: E039, Revision 2, June 13, 2008
Maximum Take-Off (Equiv.Shaft)	: 2880 HP (2148 kW)
Maximum Take-Off (Shaft)	: 2750 HP (2051 kW)
Maximum Take-Off (Jet Thrust)	: 325 Lbs (1446 N)
Normal Take-Off (Equiv.Shaft)	: 2593 HP (1934 kW)
Normal Take-Off (Shaft)	: 2475 HP (1846 kW)
Normal Take-Off (Jet Thrust)	: 297 Lbs (1321 N)

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Landing Gear Details

Manufacturer	: Messier Dowty Cooperation
R/H MLG Leg Assy Part Number	: D23190000-24/C
R/H MLG Leg Assy Serial Number	: MN730
L/H MLG Leg Assy Part Number	: D23189000-24/C
L/H MLG Leg Assy Serial Number	: MN730
NLG Leg Assy Part Number	: D22698500-7/B
NLG Leg Assy Serial Number	: 13B20017
TSN / TSO of MLG and NLG	: 1412 FH
CSN / CSO of MLG and NLG	: 1362 FC

AFDAMU Details

Manufacturer	: Safran - Sagem
Model	: MPC-ED36 (dedicated to 600 Series)
Part Number	: 261065723-1000
Serial Number	: 2610657230335
Power	: 28V DC
FDR Output	: Up to 1024 words/sec
FDR Data Frames	: Up to 10 FDR Data Frame
Quick Access Recorder	: PCMCIA or SD Cards
Regulation	: Mandatory by EASA AD No.2009-0170

Airport Details

1. Ngurah Rai International Airport, Bali

IATA/ICAO Code	: DPS/WADD
Latitude, Longitude	: -8.7481699, 115.1669998
Elevation AMSL	: 14 ft / 4 m
Runway Length	: 9,790 ft
2. Sultan Muhammad Kaharuddin III Airport, Sumbawa Besar

IATA/ICAO Code	: SWQ/WADS
Latitude, Longitude	: -8.4890404, 117.4120026
Elevation AMSL	: 19 ft / 5.79 m
Runway Length	: 4,754 ft

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3. Lombok International Airport

IATA/ICAO Code : LOP/WADL
 Latitude, Longitude : -8.757322, 116.276675
 Elevation AMSL : 319 ft / 97 m
 Runway Length : 9,000 ft

Meteorological Information

Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) confirmed weather condition at **SWQ/WADS** on **20 April 2015**: surface wind direction, speed and significant variation 160/1 knot; horizontal visibility 1 km; weather leaned with thunderstorms and rain (TSRA); air temperature 26°C and dew point temperature 25°C; QNH 1008.4 mbs; QFE 1008.0 mbs.

Weather History (SWQ/WADS) on 20 April 2015:

Time (WITA)	Temp.	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Events	Conditions
2:00 AM	24 °C	23 °C	91%	1009 hPa	10 km	SSE	5.6 km/h	-	Scattered Clouds
5:00 AM	24 °C	22 °C	87%	1008 hPa	10 km	ESE	5.6 km/h	-	Scattered Clouds
8:00 AM	27 °C	24 °C	80%	1009 hPa	10 km	Calm	Calm	-	Partly Cloudy
11:00 AM	30 °C	25 °C	71%	1010 hPa	8 km	NW	13.0 km/h	-	Partly Cloudy
2:00 PM	30 °C	25 °C	64%	1008 hPa	14 km	NNW	13.0 km/h	-	Partly Cloudy
5:00 PM	28 °C	24 °C	76%	1008 hPa	2.0 km	North	3.7 km/h	-	Mostly Cloudy
8:00 PM	24 °C	24 °C	99%	1010 hPa	7 km	Calm	Calm	Rain , Thunderstorm	Thunderstorms and Rain
11:00 PM	24 °C	24 °C	96%	1011 hPa	4.0 km	North	1.9 km/h	Rain	Light Rain

Table 1. Sumbawa Besar Historical Weather on 20 April 2015

Weather History (DPS/WADD) on 20 April 2015:

Time (WITA)	Temp .	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Events	Conditions
12:00 AM	27 °C	25 °C	89%	1011 hPa	10.0 km	Variable	3.7 km/h	-	Partly Cloudy
12:30 AM	27 °C	25 °C	89%	1010 hPa	10.0 km	ESE	3.7 km/h	-	Partly Cloudy
1:00 AM	27 °C	25 °C	89%	1010 hPa	10.0 km	Variable	3.7 km/h	-	Partly Cloudy
1:30 AM	27 °C	24 °C	84%	1010 hPa	10.0 km	Variable	1.9 km/h	-	Partly Cloudy
2:00 AM	27 °C	24 °C	84%	1009 hPa	10.0 km	NE	3.7 km/h	-	Partly Cloudy
5:30 AM	25 °C	24 °C	94%	1008 hPa	10.0 km	NNE	3.7 km/h	-	Partly Cloudy
6:00 AM	25 °C	23 °C	89%	1008 hPa	10.0 km	North	7.4 km/h	-	Partly Cloudy
6:30 AM	25 °C	23 °C	89%	1009 hPa	10.0 km	North	7.4 km/h	-	Partly Cloudy
7:00 AM	26 °C	24 °C	89%	1009 hPa	10.0 km	NNE	9.3 km/h	-	Partly Cloudy
7:30 AM	27 °C	23 °C	79%	1009 hPa	10.0 km	North	7.4 km/h	-	Partly Cloudy
8:00 AM	29 °C	24 °C	74%	1009 hPa	10.0 km	North	7.4 km/h	-	Partly Cloudy
8:30 AM	29 °C	25 °C	79%	1009 hPa	10.0 km	North	5.6 km/h	-	Partly Cloudy
9:00 AM	29 °C	25 °C	79%	1009 hPa	10.0 km	North	9.3 km/h	-	Partly Cloudy
9:30 AM	29 °C	24 °C	74%	1010 hPa	10.0 km	NW	9.3 km/h	-	Partly Cloudy
10:00 AM	30 °C	24 °C	70%	1009 hPa	10.0 km	West	13.0 km/h	-	Partly Cloudy
10:30 AM	30 °C	25 °C	74%	1009 hPa	10.0 km	WNW	16.7 km/h	-	Partly Cloudy
11:00 AM	30 °C	25 °C	74%	1009 hPa	10.0 km	West	14.8 km/h	-	Partly Cloudy
11:30 AM	30 °C	26 °C	79%	1009 hPa	10.0 km	West	14.8 km/h	-	Partly Cloudy
12:00 PM	30 °C	25 °C	74%	1009 hPa	10.0 km	West	14.8 km/h	-	Partly Cloudy
12:30 PM	30 °C	26 °C	79%	1008 hPa	10.0 km	West	16.7 km/h	-	Partly Cloudy
1:00 PM	30 °C	25 °C	74%	1008 hPa	10.0 km	WSW	16.7 km/h	-	Partly Cloudy

Table 2. Denpasar Historical Weather on 20 April 2015 (Sheet 1 of 2)

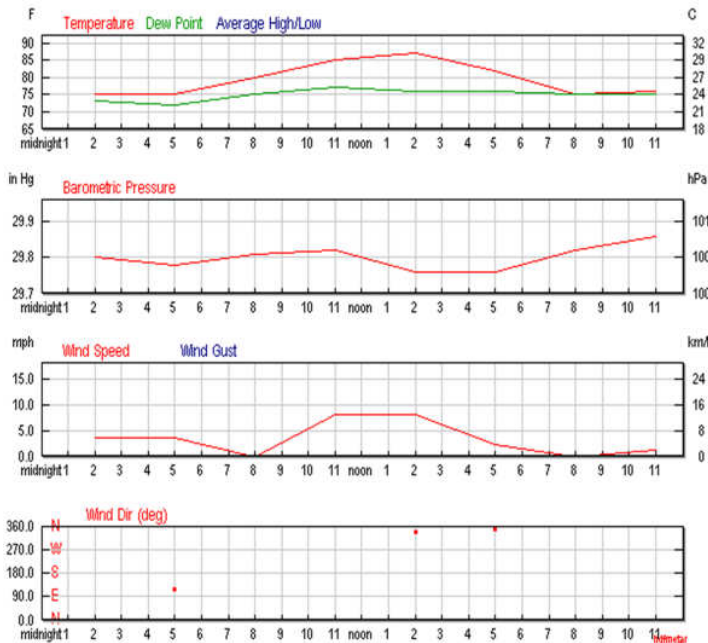
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Time (WITA)	Temp	Dew Point	Humidity	Pressure	Visibility	Wind Dir	Wind Speed	Events	Conditions
1:30 PM	30 °C	25 °C	74%	1008 hPa	10.0 km	West	18.5 km/h		Partly Cloudy
2:00 PM	30 °C	26 °C	79%	1008 hPa	10.0 km	West	18.5 km/h		Partly Cloudy
2:30 PM	30 °C	26 °C	79%	1007 hPa	10.0 km	West	16.7 km/h		Partly Cloudy
3:00 PM	30 °C	26 °C	79%	1007 hPa	10.0 km	West	14.8 km/h		Partly Cloudy
3:30 PM	30 °C	26 °C	79%	1007 hPa	10.0 km	West	14.8 km/h		Partly Cloudy
4:00 PM	30 °C	25 °C	74%	1007 hPa	10.0 km	West	14.8 km/h		Partly Cloudy
4:30 PM	30 °C	25 °C	74%	1007 hPa	10.0 km	West	13.0 km/h		Partly Cloudy
5:00 PM	30 °C	25 °C	74%	1007 hPa	10.0 km	West	13.0 km/h		Partly Cloudy
5:30 PM	29 °C	25 °C	79%	1007 hPa	10.0 km	West	7.4 km/h		Partly Cloudy
6:00 PM	29 °C	25 °C	79%	1008 hPa	10.0 km	NE	9.3 km/h		Mostly Cloudy
6:30 PM	29 °C	25 °C	79%	1008 hPa	10.0 km	Variable	3.7 km/h		Scattered Clouds
7:00 PM	28 °C	25 °C	84%	1008 hPa	10.0 km	SE	5.6 km/h		Partly Cloudy
7:30 PM	28 °C	25 °C	84%	1009 hPa	10.0 km	Variable	5.6 km/h		Mostly Cloudy
8:00 PM	28 °C	24 °C	79%	1009 hPa	10.0 km	ENE	11.1 km/h		Mostly Cloudy
8:30 PM	28 °C	24 °C	79%	1009 hPa	10.0 km	ENE	7.4 km/h	Thunderstorm	Thunderstorm
9:00 PM	27 °C	24 °C	84%	1010 hPa	6.0 km	West	25.9 km/h	Rain , Thunderstorm	Light Thunderstorms and Rain
9:30 PM	26 °C	24 °C	89%	1010 hPa	6.0 km	West	11.1 km/h	Rain , Thunderstorm	Light Thunderstorms and Rain
10:00 PM	26 °C	24 °C	89%	1010 hPa	10.0 km	Variable	3.7 km/h	Rain , Thunderstorm	Light Thunderstorms and Rain
10:30 PM	26 °C	23 °C	83%	1010 hPa	10.0 km	Variable	3.7 km/h	Thunderstorm	Thunderstorm
11:00 PM	26 °C	24 °C	89%	1010 hPa	10.0 km	Variable	1.9 km/h	Thunderstorm	Thunderstorm
11:30 PM	26 °C	25 °C	94%	1010 hPa	10.0 km	Variable	3.7 km/h		Partly Cloudy

Table 2. Denpasar Historical Weather on 20 April 2015 (Sheet 2 of 2)



Graph A. Sumbawa Besar Historical Weather on 20 April 2015

The information presented on the graph gives detailed historical daily average weather conditions along with exceptional weather occurrences.

The climate data profile is taken from closest available data source to Sumbawa Besar (SWQ/WADS).

On 20 April 2015, Sumbawa besar scattered thunderstorms in the morning, then mainly cloudy during afternoon with thunderstorms likely. Winds light and variable changed.

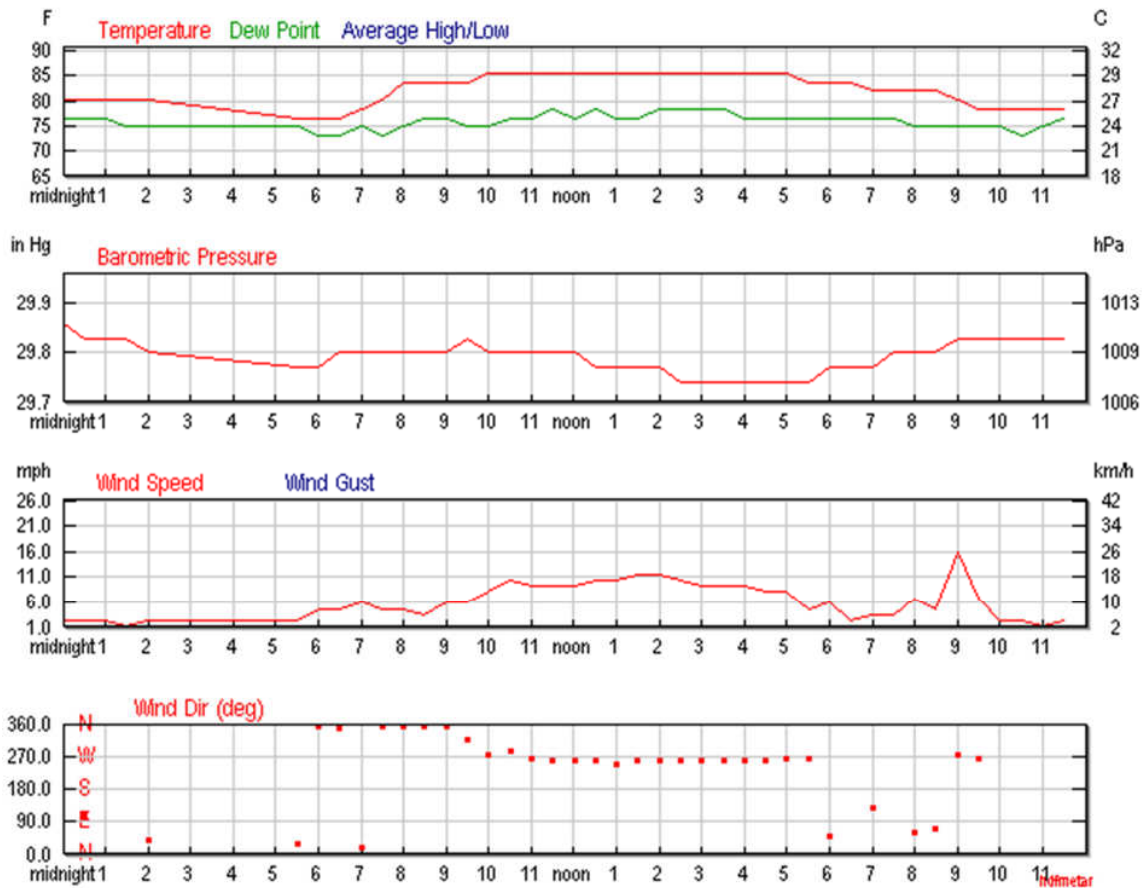
Throughout the daytime temperatures would generally reach high of around 30° C that is about 86° F. At afternoon the average minimum temperature drops down to around 24° C, which is 75.2° F.

The average daily relative humidity for 20 April 2015 was around 83%, with the highest humidity has reached 99%. The average daily wind speed in April has been around 7.13 km/h, which is the equivalent to about 4.43 mph, or 3.85 knots.

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Graph B. Denpasar Historical Weather on 20 April 2015

Denpasar on 20 April 2015

Mean Temperature : 28° C
 Max Temperature : 30° C
 Min Temperature : 25° C
 Dew Point : 25° C
 Average Humidity : 81%
 Maximum Humidity : 94%
 Minimum Humidity : 70%
 Sea Level Pressure : 1008.74 hPa
 Max Wind Speed : 26 km/h
 Visibility : 9.8 km

Above weather data profile is taken from closest available data source to Ngurah Rai International Airport (DPS/WADD) on **20 April 2015**.

On Monday, partly cloudy in the morning and slowly thunderstorms developing in the evening. The highest temperature in daily was 30° C (86° F).

Winds East-Northeast (ENE) in early evening at 7.4 km/h (2.1 m/s) followed by thunderstorm.

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INITIAL INVESTIGATION RESULT

Section A – Completed By Structural Engineering

On 20 April 2015, **PK-WGS** have experienced with swift on vertical acceleration increment at the aircraft center of gravity that might be reported by the flight crew and confirmed by the G-Meter submenu that compelled Wings Air to investigate this incident.

PURPOSE

Assign to a post hard landing, this initial assessment was organized to review damage of structural severity for further required action.

OBJECTIVE

Structural Engineering and System Engineering have been performed the evaluation for possible structural and landing gear damage. Investigation carried out an official examination in the area as specified for hard landing occurrence on ATR72-600 series. This initial assessment has been purposely limited to the aircraft structures and verified visible damage as stated by **ATR72 AMM JIC 05-51-10 DVI 10000 002, Revision 8, December 1, 2014**. For landing gear special occurrence will be explained on **Section B**. This preliminary investigation provides instruction to perform several general inspections, as follows:

1. General Visual Inspection GVI (Wing - Lower Area)
2. General Visual Inspection GVI (Wing - Upper Area)
3. General Visual Inspection GVI (Wing - Rear Spar)
4. General Visual Inspection GVI (Wing - Front Spar)
5. General Visual Inspection GVI (Fuselage - Zones 200 through 300)
6. General Visual Inspection GVI (Stabilizer - Zone 300)
7. General Visual Inspection GVI (Main Landing Gear Wheel Well - Frame 25 through 27)
8. General Visual Inspection GVI (Landing Gear - Zone 700)
9. General Visual Inspection GVI (Wing - Control Surfaces)
10. General Visual Inspection GVI (Wing - Upper Area)
11. General Visual Inspection GVI (Wing - Upper Area)
12. General Visual Inspection GVI (Wing - Upper Area)
13. NDT Inspection (Eddy Current and Dye Penetrant)
14. Engine N°1 and N°2 Boroscope Inspection (KNKT/NTSC Inquiry)

INITIAL PROGNOSIS

By cause of the initial investigation did not find any critical structural damage along the aircraft during inspection except for several sealant areas are broken, it is confirmed the structure is safe.

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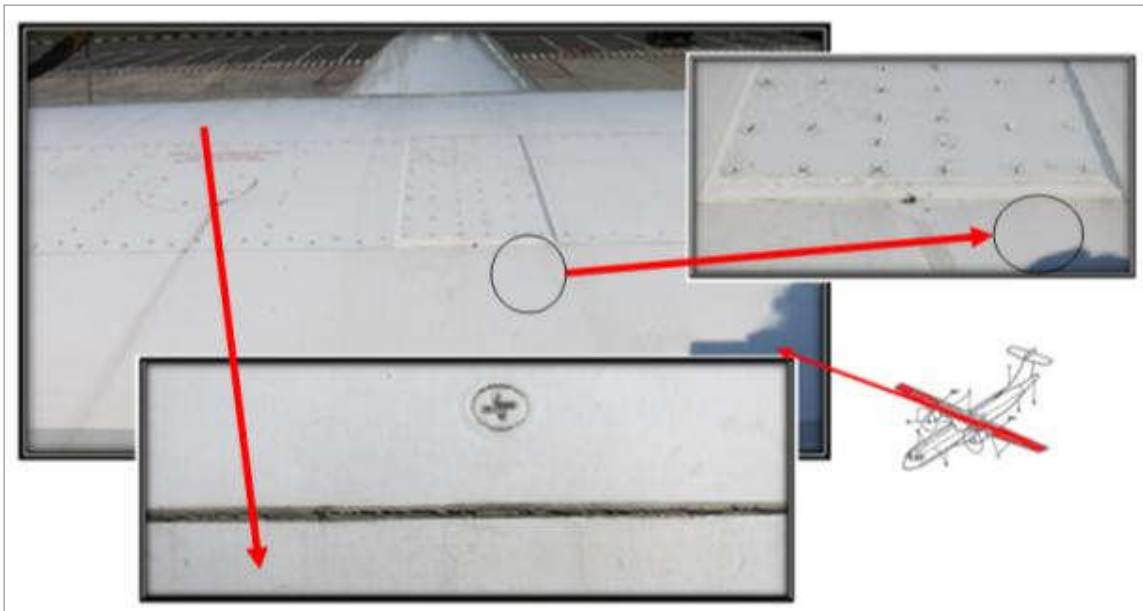
Date : May 4, 2015

General Visual Inspection GVI (Wing - Zones 500 through 600)

Examination:

Check the center wing upper surface and lower surface skin panels are free from wrinkling and check for loose screws and rivet, check the wing-to-fuselage fairing are not damage and check for fuel leaks on wing lower surface.

Wing - Upper Surface



Denouement:

1. No damage (wrinkle, loose screws, loose rivets) observed on the upper surface.
2. Sealant broke out in the middle of center wing.

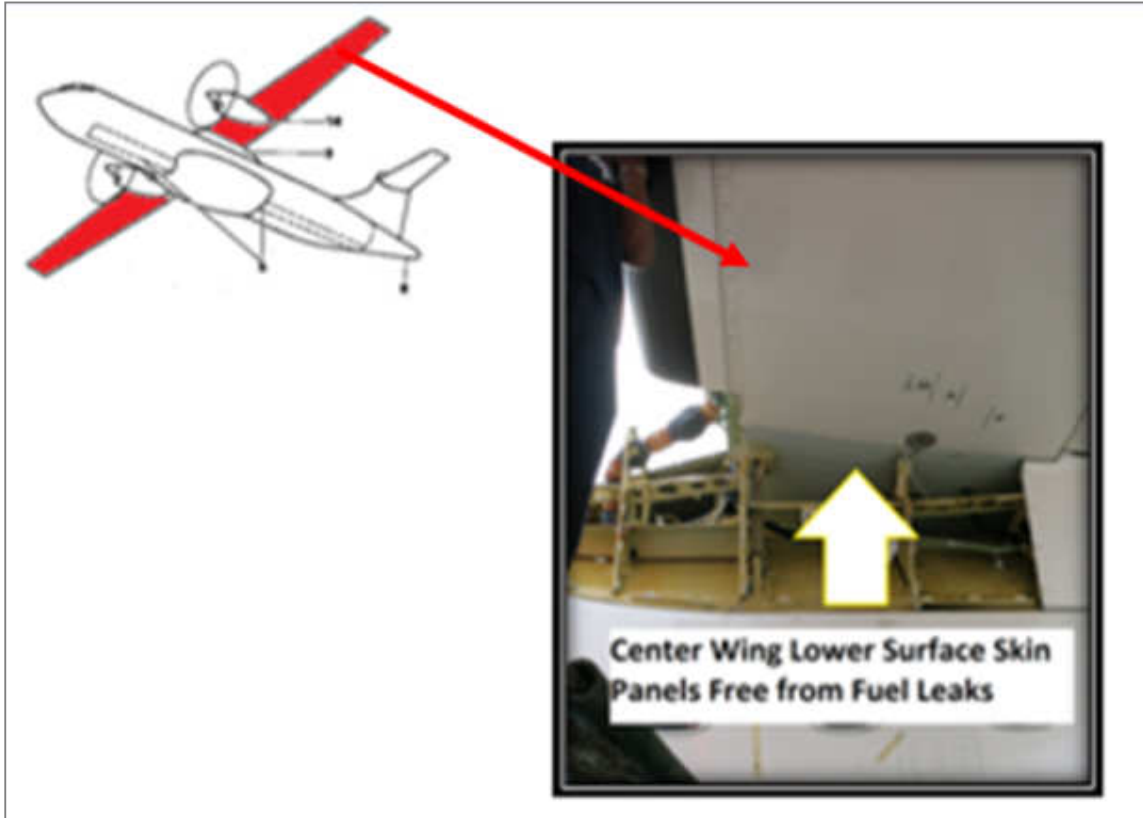
Structure	Normal	Abnormal
Upper Surface	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sealant	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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Wing - Lower Surface



Denouement:

1. No damage (wrinkle, loose screws, loose rivets and fuel leaks) observed on the lower surface.

Structure	Normal	Abnormal
Lower Surface	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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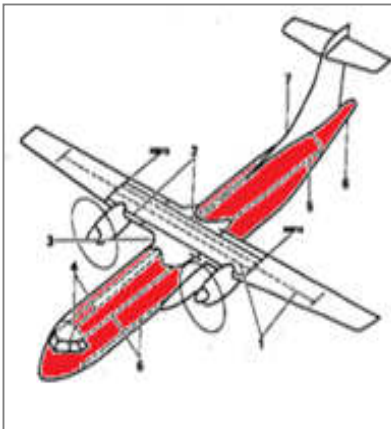
Date : May 4, 2015

General Visual Inspection GVI (Fuselage - Zones 200 through 300)

Examination:

Check the skin panels are free from crack and deformation, especially at fuselage upper section level. Check for loose rivets at longitudinal panel junction lines; pay attention to zone aft of bulkhead.

F u s e l a g e



Fuselage Skin Wrinkle (before Check)



Fuselage Skin Wrinkle (after check)

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Fuselage Skin Wrinkle Suspected (*from inside view*)

Denouement :

1. No found damage, good condition.
2. Suspected wrinkle is to be compared with other aircraft and it was normal condition when the aircraft on ground (with no pressurization).

Structure	Normal	Abnormal
Fuselage	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wrinkle Assessment	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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General Visual Inspection GVI (Stabilizer - Zone 300)

Examination:

Check skin panels are free from wrinkling and loose rivets. Check the Fairings are not damaged.

S t a b i l i z e r



Denouement:

1. No found damage on observed stabilizer; good condition.

Structure	Normal	Abnormal
Stabilizer	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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General Visual Inspection GVI (Control Surfaces)

Examination:

Check operation of all control surfaces and their controls. Check over full travel range for friction, binding and jamming.

Control Surfaces



Denouement:

1. No found damage, no friction, no binding and no jamming. Good Condition.

Structure	Normal	Abnormal
Control Surfaces	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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General Visual Inspection GVI (Landing Gear - Zone 700)

Main Landing Gear

Examination:

Check the Main Landing Gear which it is attached and not deformed.



Sealant Broke Out (L/H Side Brace Fitting)



Good Sealant (R/H Side Brace Fitting)

Denouement:

1. No found damage. Overall is on good condition except Sealant broke out found in Main Landing Gear Wheel Well.

Structure	Normal	Abnormal
MLG Structure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sealant	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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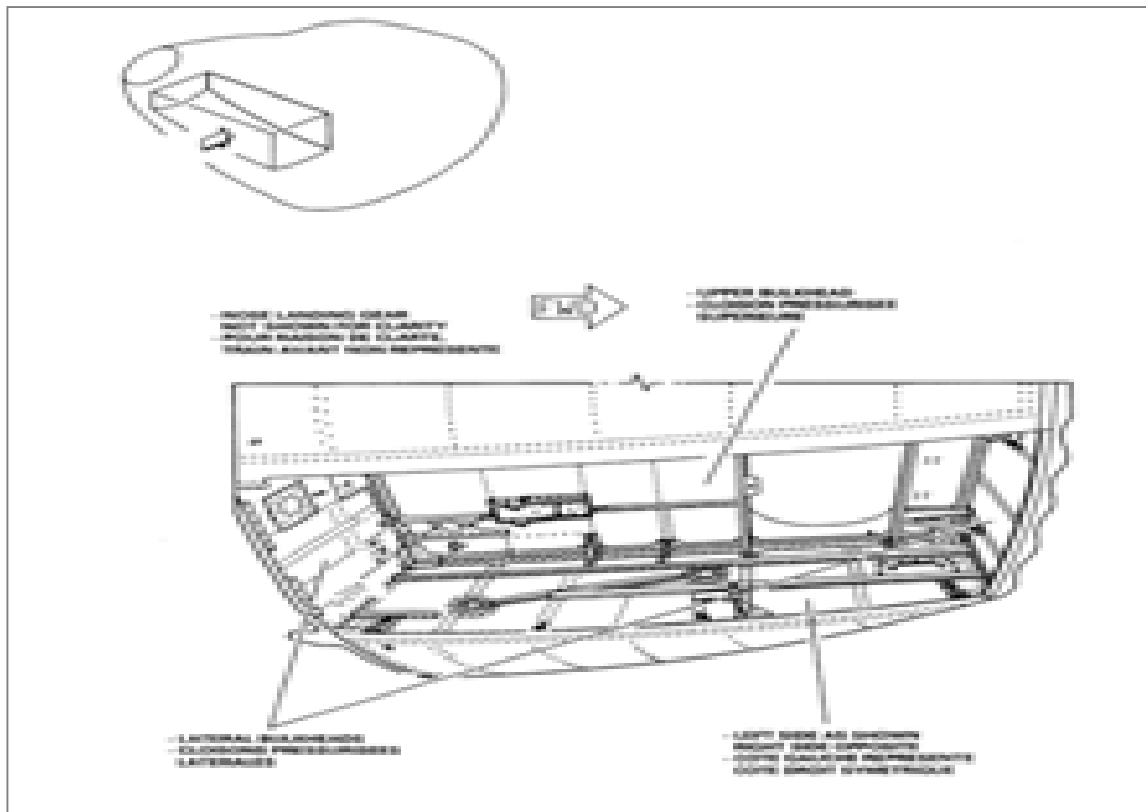
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Nose Landing Gear

Examination:

Check Nose Landing Gear Structure which it is attached and not deformed.



Denouement:

1. No found damage; good condition.

Structure	Normal	Abnormal
NLG Structure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sealant	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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General Visual Inspection GVI (MLG Wheel Well - Frames 25 through 27)

Examination:

Check detailed visual inspection of the external surface of frame 25 and frame 27 for crack detection.

MLG Wheel Well



Denouement:

No found damage; good condition.

Structure	Normal	Abnormal
MLG Frames 25-27	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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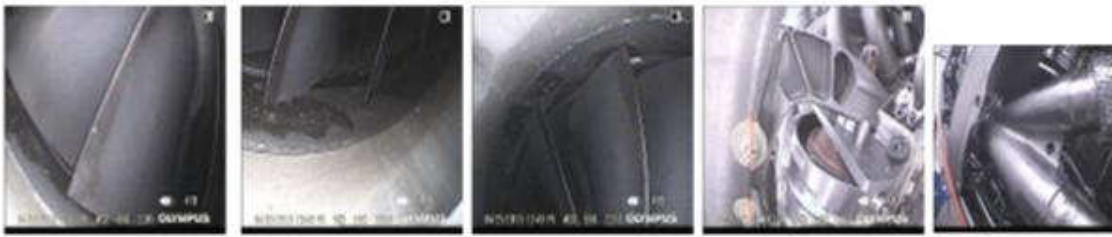
Additional Inspection

Engine Boroscope Inspection (KNKT/NTSC Inquiry)

Examination:

Check engine n° 1 and n° 2 boroscope inspection for damage occurrences.

Engine Boroscope Inspection



Denouement:

No found damage; good condition.

Structure

Normal

Abnormal

Engine n°1 and n°2



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Additional Inspection

Attached Wing Rod on Wing-to-Fuselage Frame

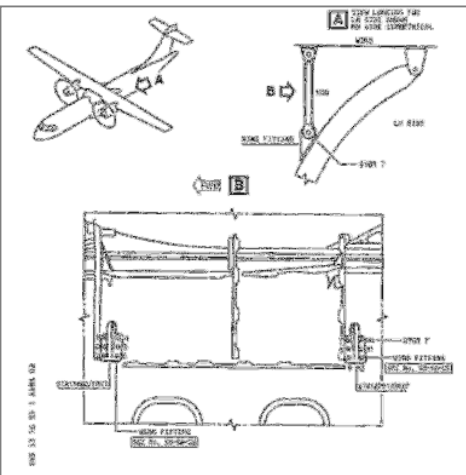
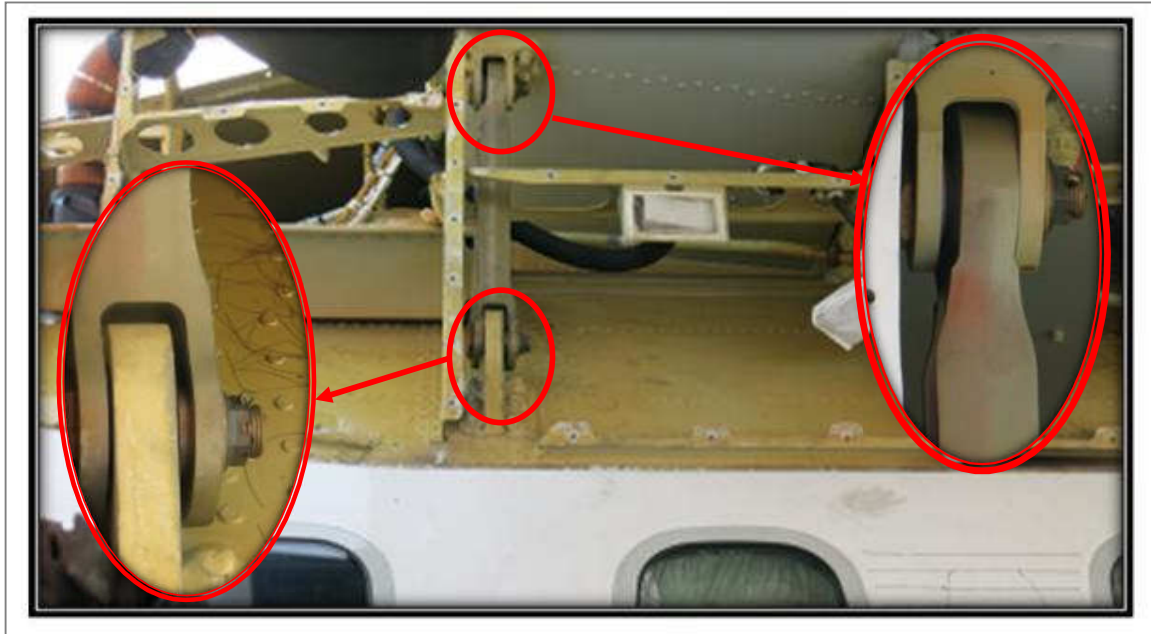
Examination:

Determine the gap of wing rod on wing-to-fuselage frame.

Examination:

Determine the gap of wing rod on wing-to-fuselage frame.

W i n g R o d





Denouement:

The attached position of wing rod is not aligned.

Denouement:

The attached position of wing rod is not aligned.

Structure	Normal	Abnormal
Wing Rod Alignment		

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Additional Inspection

Fittings on L/H MLG Wheel Well (Frames 25 through 27)

Examination:

Several suspicious scratches on L/H MLG Wheel Well (Frame 25 - 27) have been investigated with NDT-Eddy Current.

F i t t i n g s



N°1 Fitting Crack Suspected



N°2 Fitting Crack Suspected



N°3 Fitting Crack Suspected



N°4 Fitting Crack Suspected

Denouement:

Has been stated on NDT Report No.141/IV/15/NDT those suspected crossing cut is not a crack.







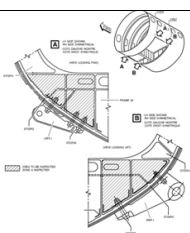
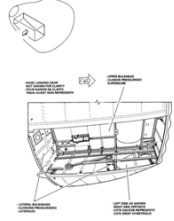
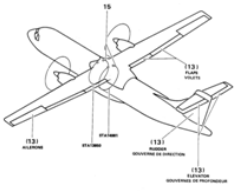
Structure	Normal	Abnormal
L/H MLG Fittings	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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TYPICAL INSPECTIONS

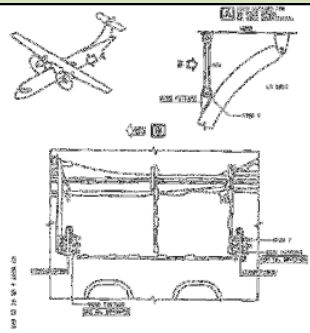
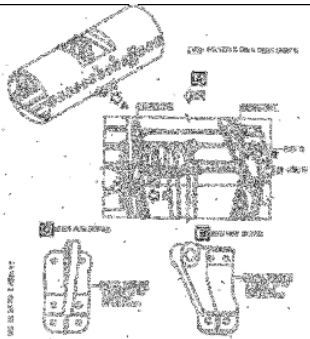



Task	Main Structural Component	Damage Occurrence		Remark	Figure
		Yes	No		
GVI	Wing – Lower Area		√	No damage found	
GVI	Wing – Upper Area		√	No damage found Note: Sealant broke out (on center wing)	
GVI	Rear Spar		√	No damage found	
GVI	Wing Front Spar		√	No damage found	
GVI	Fuselage – Zones 200-300		√	No damage found	
GVI	Stabilizer – Zone 300		√	No damage found Note: Sealant broke out (on between horizontal stabilizer and vertical stabilizer)	
GVI	Frame 25 and Frame 27 (Access from MLG Wheel Well)		√	No damage found	
GVI	Landing Gear – Zone 700 Nose Landing Gear (NLG)		√	No damage found	
GVI	Control Surfaces – Check for over full travel range from friction, binding and jamming		√	No friction, No binding, No Jamming	

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SPECIFIC INSPECTIONS

Main Structural Component	Damage Occurrence		Damage Description	Figure
	Yes	No		
Eddy Current Inspection on Wing-To-Fuselage Fitting on FR 25 and FR 27 STR 7 LH and RH		✓	No damage found NDT Report No. 140/IV/15/NDT	
Eddy Current Inspection on MLG Attach Fitting FWD and Rear LH and RH		✓	No damage found NDT Report No. 141/IV/15/NDT	
Eddy Current Inspection on MLG Side Brace RH		✓	No damage found NDT Report No. 142/IV/15/NDT	
Eddy Current Inspection on MLG Lever Assy LH		✓	No damage found NDT Report No. 143/IV/15/NDT	
Dye Penetrant Inspection on MLG Axle LH and RH		✓	No damage found NDT Report No. 143/IV/15/NDT	

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INQUIRING INSPECTIONS

Main Structural Component	Possible Damage Description	Reason for Inspection	Further Action to Plan
Inspection After Hard Landing (<i>AMM JIC 05-51-10 DVI 10000 002</i>)	DFDR reported several parameters (unexpectedly high vertical acceleration) of aircraft performance monitoring during the incident.		
Engine N°1 and N°2 Boroscope Inspection (<i>LT-FF-ME-BOR-PW127 LH and RH and WO 403678</i>)	No found damage	KNKT (Indonesian NTSC) inquiry	

Note:

All Non-Destructive Testing that has been used for those inspections was performed by **NDT Level II Certified Inspector**; equipped with Eddy Current Tester and Dye Penetrant.

Equipment – Eddy Current Inspection

Calibration Date : 6 May 2015
Model/Type : Portable ZETEC MIZ 21B
P/N : MIZ-21B
S/N : 045
Reference Standard : Aluminium Block/EDM
P/N : SB09530016-5
S/N : 06062065
Probe Type : High Frequency – Pencil Probe
P/N : MP905-60
S/N : T13070
Phase/Angle (in use) : 326 Degree
Frequency (in use) : 500 kHz
Gain : 82 dB

Equipment – Dye Penetrant Inspection

Equipment : Black Light Karl Deutsch
Model/Type : Large/Portable
P/N : 3815.110
S/N : 10131

Notice:

Mainly, there are no major visible damages; but unspecified components might be subjected to hidden damage which can provide evidence to final investigation or assessment.

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Section B – Completed By System Engineering

Landing Gear Leg Assembly structure consists of the following items:

A. Leg Structure

This is the main component of the leg; it is attached on the aircraft structure by means of two pins.

The cylinder of the barrel accommodates the attachment pins of an actuating cylinder, a free fall assister, a drag brace and a landing gear door. It also holds the uplock roller.

The barrel is hinged with a swinging lever provided with two debogging fittings, (The front debogging fitting is also used as a jacking point, the second jacking point is located at the lower part of the swinging lever), two torque axles and one jacking pad adaptor. The swinging lever holds the wheel axle.

B. Shock Absorber

The shock absorber is independent and hinges with the barrel on an eye fitting provided with a ball and with the swinging lever on a universal joint.

C. Swivel Fittings

Three swivel fittings ensure the continuity of the brake supply hydraulic system. They are located at the barrel/aircraft structure attachment point.

D. Electrical Harnesses

They allow two proximity switches to be electrically connected to two generators housed in the axle. They are broken down into four harnesses, upper and lower on the one hand, external and internal on the other hand.

E. Proximity Switch Assemblies

They are carried by the barrel at the barrel/swinging lever attachment point. They indicate electrically whether the shock absorber is compressed or extended, depending on the position of the targets installed to the swinging lever.

F. Hydraulic Supply Pipes Of Brakes

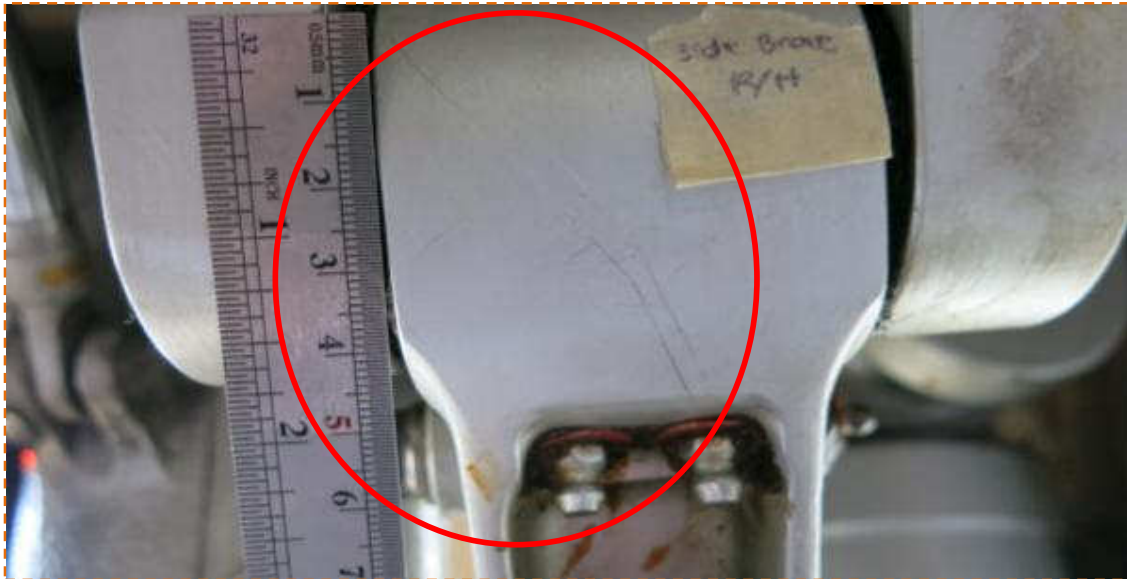
G. Barrel Fittings Including The Targets

H. Casing Assy

ENGINEERING REPORT

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General Visual Inspection of Landing Gears — Side Brace

Prognosis:

After performed NDT-Eddy Current inspection insisting on R/H Side Brace by NDT Level II Certified Inspector no crack found. Reference: NDT Report No. 142/IV/15/NDT.

No improper clearance between Side Brace connection.

L/H Side Brace

P/N : D23219000-5/C

S/N : MN733

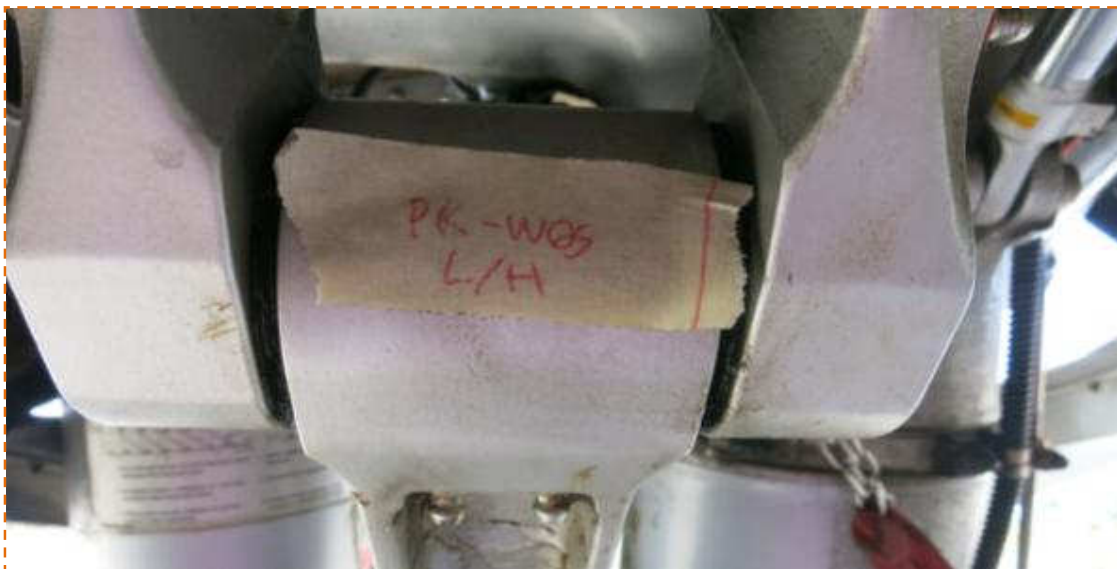
R/H Side Brace

P/N : D23220000-5/C

S/N : MN738

TSN/TSO : 1,412 FH

CSN/SO : 1,362 FC



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General Visual Inspection of Landing Gears — Lever Assy

Prognosis:

After performed NDT-Eddy Current inspection insisting on L/H Lever Assy by NDT Level II Certified Inspector no crack found.
Reference: NDT Report No. 143/IV/15/NDT.

L/H Lever Assy

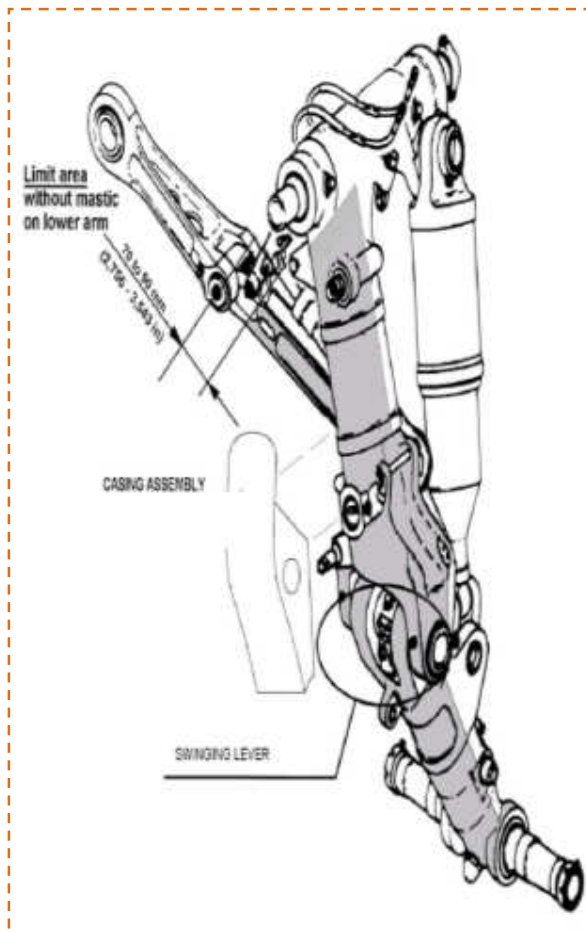
P/N : C24769000

S/N : Y00199

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General Visual Inspection of Landing Gears — Wheel Axle

Prognosis:

After performed NDT-Dye Penetrant inspection insisting on L/H and R/H Main Wheel Axle by NDT Level II Certified Inspector no crack found. Reference: NDT Report No. 143/IV/15/NDT.

No corrosion in area of wheel axle/jacking pad of the swinging lever.

Slightly less of protector coating on the axle surfaces in contact with the wheel.

Rubber sealing compound PR1826B2 of Swinging Lever was still in good condition.

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General Visual Inspection of Landing Gears — Shock Absorber

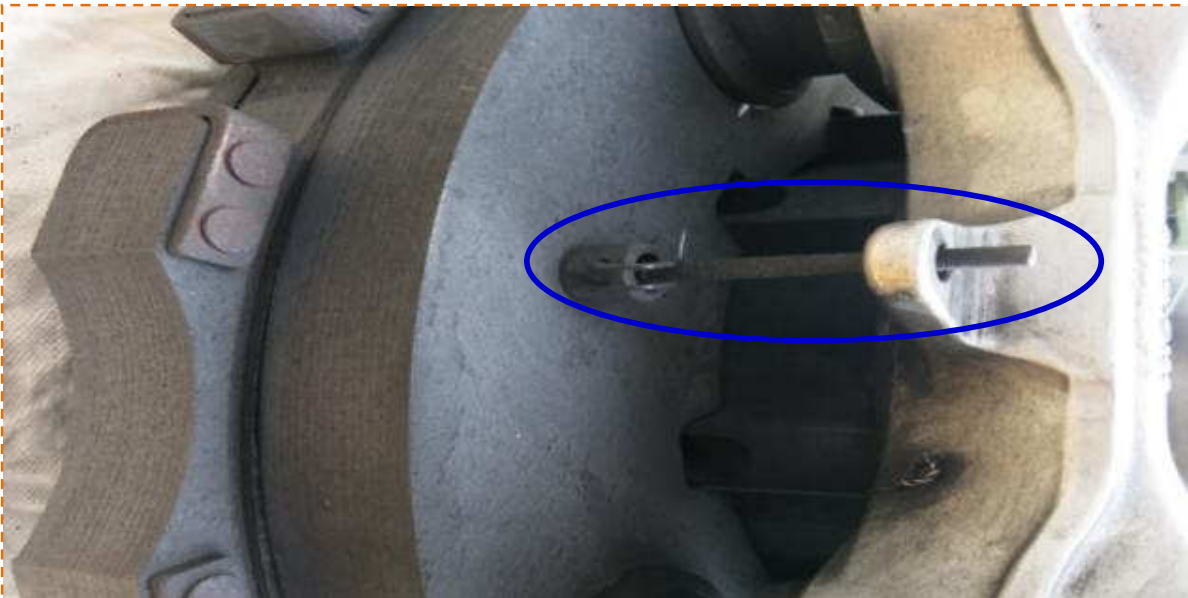
Prognosis:

L/H Shock Absorber Pressure	: 1,350 Psi
L/H Chrome Height	: 4.8 cm
R/H Shock Absorber Pressure	: 1,400 Psi
R/H Chrome Height	: 5.9 cm

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L/H Brake N° 1 Outboard

P/N : C20585711

S/N : 02684

R/H Brake N° 3 Inboard

P/N : C20585711

S/N : 02876

L/H Brake N° 2 Inboard

P/N : C20585711

S/N : 02885

R/H Brake N° 4 Outboard

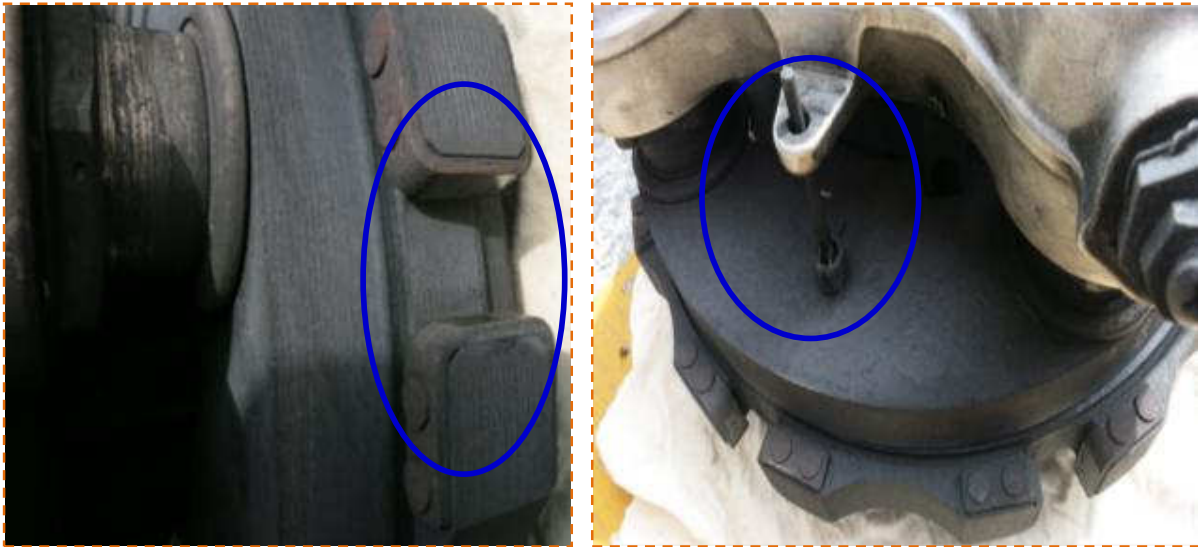
P/N : C20585711

S/N : 02877

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Date : May 4, 2015



General Visual Inspection of Brake Assembly

Procedures:

- Screw
Visually inspect for crack, corrosion, or stripped threads.
- Piston Housing
Visually inspect for condition of the plugs, of the reducer, of the bleeder valve. Visually inspect the piston housing for cracks or evidence of warping due to overheat conditions. Visually inspect the piston housing for corrosion or worn/damaged paint.
- Brake
Inspect carbon material for oxidation. Visually inspect for cracks on rivets and rotor clips of the rotor assembly. Inspect for looseness of the rotor clips of the rotor assembly.
- Pin
Inspect for flushing.

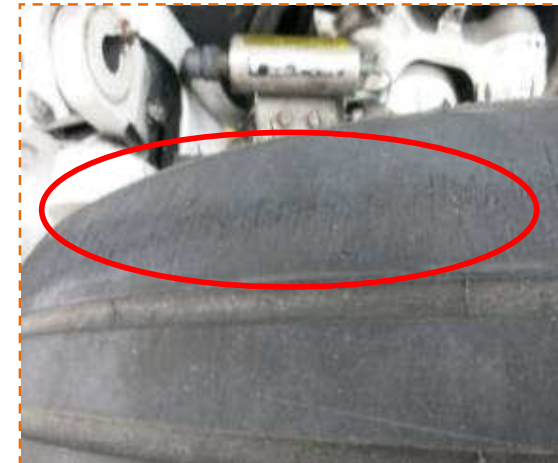
Prognosis:

After performed the inspection of Brake Assembly inboard and outboard no defective screw was found, no major signs of overheating on piston housing, no warping was found on piston housing, no signs of overheating on carbon brake material, no brittle effect on carbon brake material, no flush indication on wearing pin. Minor signs of overheating on L/H and R/H rotor clip of brake assembly.

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L/H Main Wheel N° 1 Outboard
P/N: C20586120
S/N: 02611

L/H Main Wheel N° 2 Inboard
P/N: C20586120
S/N: 01855

R/H Main Wheel N° 3 Inboard
P/N: C20586120
S/N: 01571

R/H Main Wheel N° 4 Outboard
P/N: C20586120
S/N: 01450

Prognosis:

- After performed NDT-Eddy Current inspection insisting on L/H and R/H Main Wheel Rim Bead, no found crack was confirmed.
- L/H Tire N° 1 outboard was found chevron marking and blister.
- L/H Tire N° 2 inboard was found chevron marking and blister.
- R/H Tire N° 3 inboard was found thread damage.
- R/H Tire N° 4 outboard was found deep cut.

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Date : May 4, 2015

This initial report is a technical document that reflects the point of view of the **Structural and System Engineering of Batam Aero Technic – Continuous Airworthiness Management** regarding the circumstances in which happened the event being investigated, with its causes and its consequences.

In accordance with the provisions of:

- Law 21/2003 (Act of Air Safety)
- Annex 13 (Aircraft Accident and Incident Investigation) to the Convention on International Civil Aviation
- The Indonesian Aviation Act (UU No.1/2009)
-

The investigation that performed on **21 April 2015 through 27 April 2015** has exclusively a technical nature, **without** having been targeted at the declaration or assignment of **blame or liability**. The investigation has been carried out without having necessarily used legal evidence procedures and with no other basic aim than preventing future accidents. Consequently, any use of this report for purposes other than that of preventing future accidents **may lead to erroneous conclusions or interpretations**.

ENGINEERING REPORT

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Date : May 4, 2015

APPENDIX A NON-DESTRUCTIVE TESTING INSPECTION

NDT - EDDY CURRENT INSPECTION REPORT	
NDT REPORT NUMBER	: 140 / IV / 15 / NDT
INSPECTION DATE	: Thursday, April 23, 2015
TASK CARD	
WORK ORDER NUMBER	: WO. 402977
JOB CARD NO. / REFERENCE NO.	: JIC 05-51-10
MANUAL REFERENCE	: NDTM 53-56-03
REV.NO / DATE	: 35 / MAR 2012
AIRCRAFT DATA	
CUSTOMER / OWNER	: WINGS AIR
AIRCRAFT REG / TYPE	: PK- WGS / ATR 72-600
LOCATION / STATION	: STA LOP
OBJECT TO BE INSPECTED	: WING-TO-FUSELAGE FITTING ON FR 25 AND FR 27 AT STR 7
COMPONENT INSPECTION	
COMPONENT DESCRIPTION	: -
PART NUMBER	: -
SERIAL NUMBER	: -
MANUFACTURE	: -
OUTER	: -
INNER	: -
EQUIPMENT	
EQUIPMENT DESCRIPTION	: EDDY CURRENT TESTER
MODEL / TYPE OF EQUIPMENT	: PORTABLE ZETEC MIZ 21B
REFERENCE STANDARD	: ALUMINIUM BLOK / EDM
PROBE TYPE	: HIGH FREQUENCY - PENCIL PROBE
CALIBRATION DATE	: 6 May 2015
P/N : MIZ-21B	S/N : 045
P/N : SB09530016-S	S/N : 06062065
P/N : MP905-60	S/N : T13070
INSTRUMENT PARAMETER	
PHASE / ANGLE	: 326 Degree
FREQUENCY	: 500 KHz
GAIN	: 82 dB
INSPECTION RESULT	
NO CRACK	
REMARK	
NIL	
MANHOURS USED	: 1 Mhrs
INSPECTION PERSONNEL	
PERFORMED & CERTIFIED BY	
STAMP	
DISTRIBUTION INFORMATION	
DISTRIBUTION TO	:

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ENGINEERING REPORT

No. ATR72-ER-05-034

Date : May 4, 2015

NDT - EDDY CURRENT INSPECTION REPORT	
R1 / IV / 15 / NDT	
INSPECTION DATE	: Thursday, April 23, 2015
TASK CARD	
WORK ORDER NUMBER	: WO: 402977
JOB CARD NO. / REFERENCE NO.	: JIC 05-51-10
MANUAL REFERENCE	: NDTM 53-51-36
REV.NO / DATE	: 35 / MAR 2012
AIRCRAFT DATA	
CUSTOMER / OWNER	: WINGS AIR
AIRCRAFT REG / TYPE	: PK- WGS / ATR 72-600
LOCATION / STATION	: STA LOP
OBJECT TO BE INSPECTED	: MAIN LANDING GEAR ATTACH FITTING FWD AND REAR LH - RH
COMPONENT INSPECTION	
COMPONENT DESCRIPTION	: -
PART NUMBER	: -
SERIAL NUMBER	: -
MANUFACTURE	: -
OUTER	: -
INNER	: -
EQUIPMENT	
EQUIPMENT DESCRIPTION	: EDDY CURRENT TESTER
MODEL / TYPE OF EQUIPMENT	: PORTABLE ZETEC MIZ 21B
REFERENCE STANDARD	: ALUMINIUM BLOK / EDM
PROBE TYPE	: HIGH FREQUENCY - PENCIL PROBE
CALIBRATION DATE	: 6 May 2015
P/N : MIZ-21B	S/N : 045
P/N : SB09530016-5	S/N : 06062065
P/N : MP905-60	S/N : T13070
INSTRUMENT PARAMETER	
PHASE / ANGLE	: 326 Degree
FREQUENCY	: 500 kHz
GAIN	: 82 dB
INSPECTION RESULT	
NO CRACK	
REMARK	
NIL	
MANHOURS USED	: 1 Mhrs
INSPECTION PERSONNEL	
PERFORMED & CERTIFIED BY	ASWIN. SAMI
STAMP	
013	
DISTRIBUTION INFORMATION	
DISTRIBUTION TO	:


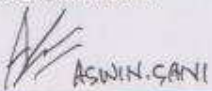

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Date : May 4, 2015

		NDT - EDDY CURRENT INSPECTION REPORT	
42 / IV / 15 / NDT			
INSPECTION DATE		: Thursday, April 23, 2015	
TASK CARD			
WORK ORDER NUMBER		: WO. 402977	
JOB CARD NO. / REFERENCE NO.		: JIC 05-51-10	
MANUAL REFERENCE		: NDTM 51-60-00	
REV.NO / DATE		: 35 / MAR 2012	
AIRCRAFT DATA			
CUSTOMER / OWNER		: WINGS AIR	
AIRCRAFT REG / TYPE		: PK- WGS / ATR 72-600	
LOCATION / STATION		: STA LOP	
OBJECT TO BE INSPECTED		: SIDE BRACE MAIN LANDING GEAR RH	
COMPONENT INSPECTION			
COMPONENT DESCRIPTION		: -	
PART NUMBER		: -	
SERIAL NUMBER		: -	
MANUFACTURE		: -	
OUTER :		INNER :	
EQUIPMENT			
EQUIPMENT DESCRIPTION		: EDDY CURRENT TESTER	
MODEL / TYPE OF EQUIPMENT		: PORTABLE ZETEC MIZ 21B	
REFERENCE STANDARD		: ALUMINIUM BLOK / EDM	
PROBE TYPE		: HIGH FREQUENCY - PENCIL PROBE	
CALIBRATION DATE		: 6 May 2015	
P/N : MIZ-21B		S/N : 045	
P/N : SB09530016-5		S/N : 06062065	
P/N : MP905-60		S/N : T13070	
INSTRUMENT PARAMETER			
PHASE / ANGLE		: 326 Degree	
FREQUENCY		: 500 KHz	
GAIN		: 82 dB	
INSPECTION RESULT			
NO CRACK			
REMARK			
NIL			
MANHOURS USED		: 1 Mhrs	
INSPECTION PERSONNEL			
PERFORMED & CERTIFIED BY		STAMP	
 ASWIN GANI			
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Date : May 4, 2015

NDT - EDDY CURRENT INSPECTION REPORT	
143 / TV / 15 / NDT	
INSPECTION DATE	: Thursday, April 23, 2015
TASK CARD	
WORK ORDER NUMBER	: WO. 402977
JOB CARD NO. / REFERENCE NO.	: JIC 05-51-10
MANUAL REFERENCE	: NDTM 51-60-00
REV.NO / DATE	: 35 / MAR 2012
AIRCRAFT DATA	
CUSTOMER / OWNER	: WINGS AIR
AIRCRAFT REG / TYPE	: PK- WGS / ATR 72-600
LOCATION / STATION	: STA LOP
OBJECT TO BE INSPECTED	: LEVER ASSY MAIN LANDING GEAR LH
COMPONENT INSPECTION	
COMPONENT DESCRIPTION	: -
PART NUMBER	: -
SERIAL NUMBER	: -
MANUFACTURE	: -
OUTER :	-
INNER :	-
EQUIPMENT	
EQUIPMENT DESCRIPTION	: EDDY CURRENT TESTER
MODEL / TYPE OF EQUIPMENT	: PORTABLE ZETEC MIZ 21B
REFERENCE STANDARD	: ALUMINIUM BLOK / EDM
PROBE TYPE	: HIGH FREQUENCY - PENCIL PROBE
CALIBRATION DATE	: 6 May 2015
P/N : MIZ-21B	S/N : 045
P/N : SB09530016-5	S/N : 06062065
P/N : MP905-60	S/N : T13070
INSTRUMENT PARAMETER	
PHASE / ANGLE	: 326 Degree
FREQUENCY	: 500 MHz KHz
GAIN	: 82 dB
INSPECTION RESULT	
NO CRACK	
REMARK	
NIL	
MANHOURS USED	: 1 Mhrs
INSPECTION PERSONNEL	
PERFORMED & CERTIFIED BY	ASWIN. SANTI
STAMP	
013	
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Date : May 4, 2015

NDT - PENETRANT INSPECTION REPORT			
NDT REPORT NUMBER		: 144 / IV / 15 / NDT	
INSPECTION DATE		: Friday, April 24, 2015	
TASK CARD			
WORK ORDER NUMBER		: WO. 402977	
JOB CARD NO. / REFERENCE NO.		: JIC 05-51-10	
MANUAL REFERENCE		: NDTM 51-70-00	
		REV.NO / DATE : 35 / MAR 2012	
AIRCRAFT DATA			
CUSTOMER / OWNER		: WINGS AIR	
AIRCRAFT REG / TYPE		: PK - WGS / ATR 72-600	
LOCATION / STATION		: STA LOP	
OBJECT TO BE INSPECTED		: MAIN LANDING GEAR AXLE LH AND RH	
COMPONENT INSPECTION			
COMPONENT DESCRIPTION		: -	NHA DESC : -
PART NUMBER		: -	NHA P/N : -
SERIAL NUMBER		: -	NHA S/N : -
MANUFACTURE		: -	
QUANTITY INSPECTED			
QUANTITY ACCEPTED		: 2	EA
QUANTITY REJECTED		: -	EA
TOTAL QUANTITY		: 2	EA
EQUIPMENT			
EQUIPMENT DESCRIPTION		: BLACK LIGHT KARI, DEUTSCH	
MODEL / TYPE OF EQUIPMENT		: LARGE/PORTABLE	P/N : 3815.110 S/N : 10131
DEVELOPER METHOD APPLICATION			
<input type="checkbox"/> WET		<input checked="" type="checkbox"/> DRY	
PROCESS			
<input type="checkbox"/> WATER WASHABLE		<input checked="" type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIER
INSPECTION RESULT			
NO CRACK			
REMARK			
NIL			
MANHOURS USED		: 2 Mhrs.	
INSPECTION PERSONNEL			
INSPECTED & CERTIFIED BY		STAMP	
 TOMMY			
DISTRIBUTION INFORMATION			
DISTRIBUTION TO		:	

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No. ATR72-ER-05-034

Date : May 4, 2015

BADAN METEOROLOGI KLIMATOLOGI DAN GEOFISIKA METEOROLOGI REPORT FOR TAKE OFF AND LANDING

Aerodrome Identification	:	WADS
Meteorological obs. at	:	Sumbawa Besar
Date	:	April 28 th , 2015
Time	:	10.00 (GMT)
Surface Wind Direction, Speed and Significant Variation	:	165 / 1
	:	KNOT
Horizontal Visibility	:	1
	:	(KM)
Runway Visual Range	:	—
Present Weather	:	TS RA
Amount and Height of Base of Low Cloud	:	few at base 400
	:	(Okta)
Air Temperature and Dew Point Temperature	:	T 26 DP 25
	:	°C
QNH	:	1008.4
	:	29.78
	:	Mbs
	:	INCHS *)
	:	MM HG
QFE	:	1008.0
	:	29.77
	:	Mbs
	:	INCHS *)
	:	MM HG
Supplementary Information	:	few ab over the field.
Time of Issue :	: GMT
*) on Request.		
Contoh Me. 37 a		


Observer

ENGINEERING REPORT

No. ATR72-ER-05-034

Date : May 4, 2015

APPENDIX B AFML AND CHRONOLOGY REPORT

AIRCRAFT FLIGHT & MAINTENANCE LOG
(Mandatory ATR 72-600)

FLIGHT DETAILS

DATE	TIME	FROM	TO	TYPE	STATUS
05/04/15	08:30	ATL	MDW	REG	OK

MAINTENANCE ACTIONS

NO.	DESCRIPTION	STATUS
1	Check oil level before start of flight	OK
2	Check oil level after start of flight	OK
3	Check oil level after landing	OK

SIGNATURES

Pilot: [Signature]
Engineer: [Signature]

CHRONOLOGY

TIME	EVENT
08:30	A/C BLOCK ON FROM OPS
08:45	CHECK AFML NO FOUND DEFECT
09:00	AIRCRAFT BLOCK OFF TO SWG
09:10	AIRCRAFT TOUCHDOWN AT SWG WITH HARD LANDING AND BOUNCING. NO PILOT DECIDE TO GO AROUND AND RETRY TO LOP
09:20	AIRCRAFT LANDING AT LOP
09:30	CHECK AFML FOUND DEFECT RETRY TO LOP DUE TO WIR AT SWG AND BOUNCING GO AROUND AT SWG THX # 10
10:00	CHECK AT 0-METER REPORT SHOWS SAME
10:10	PERFORMED INSPECTION AFTER HARD LANDING STILL IN PROGRESS SWG AND GO TO ENG 1000
10:30	AIRCRAFT DECLARE AOG

Signature: [Signature]
Engineer in Charge: [Signature]