



KÖZLEKEDÉSBIZTONSÁGI  
SZERVEZET  
TRANSPORTATION SAFETY  
BUREAU

**FINAL REPORT**  
**2008-315-4**  
**SERIOUS INCIDENT**  
**Krakow**  
**11 October 2008**  
**Fokker F28 Mk 0070**  
**HA-LME**

The sole objective of the technical investigation is to reveal the causes and circumstances of aviation accidents, incidents or irregularities and to initiate the necessary technical measures and make recommendations in order to prevent similar cases in the future. It is not the purpose of this activity to investigate or apportion blame or liability.

## **The present investigation was carried out by the Transportation Safety Bureau of Hungary on the basis of**

- Act XCVII of 1995 on aviation,
- Annex 13 identified in the Appendix of Act XLVI. of 2007 on the declaration of the annexes of the Convention on International Civil Aviation signed in Chicago on 7th December 1944 and in the Appendix to Decree no. 20/1997. (X. 21.) of the Ministry of Transport, Communications and Water,
- Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbv.),
- MET Decree 123/2005 (XII. 29.) on the regulations of the technical investigation of aviation accidents, incidents and irregularities;
- In absence of other related regulation of the Kbv., in accordance with Act CXL of 2004 on the general rules of administrative authority procedure and service

The Kbv. and the MET Decree 123/2005 (XII. 29.) jointly serve the compliance with the following EU acts:

- a) Council Directive 94/56/EC of 21 November 1994 establishing the fundamental principles governing the investigation of civil aviation accidents and incidents,
- b) Directive 2003/42/EC of the European Parliament and of the Council of 13 June 2003 on occurrence reporting in civil aviation.

The competence of the Transportation Safety Bureau of Hungary is based on Government Decree 278/2006 (XII. 23.).

## **Under the aforementioned regulations**

- The Transportation Safety Bureau of Hungary shall investigate the aviation accidents and the serious aviation incidents.
- The Transportation Safety Bureau of Hungary may investigate aviation incidents and irregularities which - in its judgement - would have resulted in accidents under other circumstances.
- The technical investigation is independent of any administrative, infringement or criminal procedures initiated in connection with the transport accident or incident
- In addition to the aforementioned laws, throughout the technical investigation ICAO DOC 6920 Manual of Aircraft Accident Investigation is applicable.
- The present final report shall not be binding, nor shall an appeal be lodged against it.

No conflict of interest has arisen in connection with any member of the investigating committee. Persons participating in the technical investigation shall not act as experts in other procedures concerning the same case.

The IC shall safe keep the data having come to their knowledge in the course of the technical investigation. Furthermore the IC shall not be obliged to make the data – regarding which its owner could have refused the disclosure of the data pursuant to the relevant act – available to other authorities.

## **The present final report**

was completed based on the draft report compiled by the IC and approved by the Director-General of TSB and sent to the concerned parties and organisations – defined by law – for reflections.

At the same time, the Director-General of TSB informed the interested parties about the date and time of the closing discussion of the final report and invited the concerned persons and organizations to participate.

The following organizations were represented at the closing discussion held on 08 September 2009:

- Malév Zrt.
- NTA AD

## DEFINITIONS AND ABBREVIATIONS

AMM	Aircraft Maintenance Manual
CAA	Civil Aviation Authority (until 31 December 2005)
CAME	Continuing Airworthiness Management Exposition
CAMO	Continuing Airworthiness Management Organisation
CMP	Component Management Programme
EMP	Engine Management Programme
F/O	First Officer
FMC	Flight Management Computer
GECS	Goodrich Engine Control Systems
IC	Investigating Committee
ICAO	International Civil Aviation Organization
Kbvt.	Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents
MAA	Military Aviation Authority
MET	Ministry of Economy and Transport (Gazdasági és Közlekedési Minisztérium, GKM)
MFDS	Multifunction Display System
MPD	Maintenance Planning Data
MTCW	Ministry of Transport, Communications and Water (Közlekedési, Hírközlési és Vízügyi Minisztérium, KHVM)
NKH PLI	National Transport Authority Civil Aviation Directorate (until 30 June 2007)
NTA AD	National Transport Authority, Aviation Directorate
NTO	Notice to Operators
PIC	Pilot In Command
QRH	Quick Reference Handbook
SCAAI	State Commission of the Aircraft Accident Investigation
TCH	Type Certificate Holder
TGT	Total Gas Temperature
TSB	Transportation Safety Bureau
UTC	Universal Time Coordinated

## BRIEF DESCRIPTION OF THE OCCURENCE

<b>Occurrence category</b>		Serious incident
<b>Aircraft</b>	<b>Manufacturer</b>	Fokker aircraft B.V., The Netherlands
	<b>Type</b>	Fokker F28 Mk 0070
	<b>Registration</b>	HA-LME
	<b>Serial number</b>	11575
	<b>Owner</b>	MALÉV Zrt.
	<b>Operator</b>	MALÉV Zrt.
	<b>Lessee</b>	
<b>Occurrence</b>	<b>Date and time</b>	11 October 2008 14:18:20 (UTC)
	<b>Location</b>	EPWW FIR – Krakow-Balice (EPKK)
<b>Number of injured persons</b>	<b>fatal</b>	0
	<b>serious</b>	0
<b>Aircraft damage</b>		Not damaged
<b>State of registry</b>		Hungary
<b>Registering authority</b>		NTA AD
<b>Authority supervising manufacturing</b>		Directorate General of Civil Aviation and Freight Transport (DGTL) The Netherlands
<b>Competent investigating organization</b>		<b>TSB</b>

### Reports and notifications

The occurrence was reported to the TSB officer on duty at 17:05 (LT), 11 October 2008 by the personnel on duty at MALÉV Flight Safety Department.

### **THE TSB OFFICER ON DUTY**

- reported to the head TSB officer on duty at 17:08, 11 October 2008, and then
- notified the NTA AD officer on duty at 17:15, 11 October 2008.

### Investigating committee

On 18 October 2008, the Director-General of the TSB assigned investigator László STORCZER to the investigation of the serious incident.

### Overview of the investigation process

First, TSB designated the operator to investigate the occurrence. Since the occurrence happened in Polish airspace, the Polish investigative body was primarily competent to investigate it in accordance with ICAO Annex 13. However, SCAAI, the Polish investigative body informed TSB in a notification sent by email on 13 October 2008 that the Polish authority did not intend to investigate the occurrence. Then, since the occurrence was a serious incident, TSB took over its investigation. The process did not involve field investigation; the technical investigation was based on documentation collected in connection with the occurrence, on their analysis and evaluation.

As a response to the request of TSB, the operator sent the Fuel Flow Regulator S/N B2693 for a shop visit to Goodrich Engine Control Systems (GECS).

## 1. FACTUAL INFORMATION

### 1.1 History of the flight

On 11 October 2008 the airplane of Malév Zrt. registered HA-LME, type Fokker 070 carried out the scheduled passenger flight MAH873 between GOT and BUD. It was an IFR flight. The personnel did not observe technical malfunction either on leg BUD-GOT or during ground check by the personnel. The aircraft took off from Goteborg airport at 13:09 (UTC). Climb to cruise level and more than one hour of flying ensued without any anomaly. Then, at 14:18 (UTC) without any preceding sign the left throttle lever (with automatic thrust on) started towards the idle position and some seconds later the following indicators switched on regarding the left engine: „N1 OVERSPEED”; „N2 OVERSPEED”; „HIGH TGT”. „MASTER WARNING” turned on as well. Consistent with the warnings, the engine parameters showed high values, thus, at 14:18:50(UTC), the crew shut down engine #1 in accordance with the relevant chapter of QRH EMERGENCY PROCEDURES, declared emergency to air traffic control and directed the aircraft towards the nearest suitable airport, Krakow. During descent, the crew tried to restart engine #1, but even at the beginning of the inflight start, gas temperature and revolution increased so intensely, that the restart of the engine was interrupted.

Approach and landing was carried out by the first officer with one engine operative in AUTO APPROACH and MANUAL LAND mode without any occurrence on Krakow airport.

### 1.2 Personal injuries

Injuries	Crew		Passengers	Other
	Cockpit	Cabin		
Fatal	-	-	-	-
Serious	-	-	-	-
Minor	-	-	-	-
None	2	2	44	-

### 1.3 Damage to aircraft

The incident did not cause financially relevant damage in the given aircraft.

### 1.4 Other damage

The IC did not receive any information on further damage by the completion of the investigation.

## 1.5 Information on the personnel

### 1.5.1 The commander of the aircraft

Age, gender		39 year old man
Type of the licence		ATPL
Type ratings		Fokker 70 PIC
Validity of the licence	Professional	Valid
	Medical	Valid without limitation
	Ratings	Valid
Hours flown in total		4304.10
Hours flown on the given type		319.54
Hours flown	In the previous 30 days	64.23
	In the previous 7 days	17.38
	In the previous 24 hours	1.57

### 1.5.2 The first officer

Age, gender		37 year old man
Type of the licence		ATPL
Type ratings		Fokker 70 F/O
Validity of the licence	Professional	Valid
	Medical	Valid without limitation
	Ratings	Valid
Hours flown in total		3149
Hours flown on the given type		3149
Hours flown	In the previous 30 days	60.11
	In the previous 7 days	15.15
	In the previous 24 hours	5.16

## 1.6 Aircraft data

### 1.6.1 Validity of the airworthiness certificate: valid

#### 1.6.2 General

Manufacturer	Fokker Aircraft B.V., The Netherlands
Type	Fokker F28 Mk 0070
Serial number	11575
Date of manufacturing	1996
Hours flown (TSN) / Landings (CSN)	TSN: 29913 / CSN:21801
State of registry	Hungary
Registration	HA-LME
Validity of the Airworthiness Review Certificate	Valid
Operator	Malév Zrt.
Owner	Malév Zrt.

### 1.6.3 Aircraft engine data

<b>Number and type of engines</b>		2 RR TAY 620-15
<b>Serial number of the engines</b>	<b>No. 1</b>	S/N 17164
	<b>No. 2</b>	S/N 17151
<b>Hours flown and cycle data of the engines</b>	<b>No. 1</b>	TSN: 27036 CSN: 17599
	<b>No. 2</b>	TSN: 29049 CSN: 21191

### 1.6.4 Data of the failed equipment

<b>Type of equipment</b>	CASC512
<b>Name of equipment</b>	Fuel Flow Regulator
<b>Date of manufacturing</b>	19 December 1995
<b>Serial number</b>	B2693
<b>Date of instalment</b>	24 January 2008
<b>Date of last overhaul</b>	There has been no overhaul yet.
<b>Hours flown/number of cycles since manufacture (TSN/CSN)</b>	23219/16668
<b>Date of last repair</b>	24 January 2003

### 1.6.5 Aircraft loading data

Type of the fuel used: **JET A1**

The aircraft loading data had no effect on the course of events, therefore their analysis was not required.

### 1.7 Meteorological data

METAR EPKK 111430Z 24006KT CAVOK 17/10 Q1031

The meteorological conditions had no effect on the course of events, their analysis was not required.

### 1.8 Aids to navigation

The navigational instruments had no effect on the course of events therefore their analysis was not required.

### 1.9 Communication

The equipment recorded in the type certificate was installed onto the aircraft, they operated properly.

### 1.10 Aerodrome information

The parameters of the aerodrome had no effect on the course of events therefore their analysis was not required.

### 1.11 Flight recorders

The aircraft was equipped with the flight recorders indicated in the type certificate. They operated in accordance with the requirements and provided useful data for the analysis of the occurrence.



## **1.12 Wreckage and impact information**

The incident did not result in a wreckage.

## **1.13 Data of the medical investigations**

There are no data available about the psychophysical state of the crew before and during the flight.

## **1.14 Fire**

There was no fire.

## **1.15 Chances of survival**

There were no personal injuries.

## **1.16 Tests and research**

Tests and researches were not initiated by the IC.

## **1.17 Organisational and management information**

The maintenance of the airline's aircrafts have been carried out since 2005 by the contracted partner of the airline, ACE Kft. under the control and management of Malév Zrt.' CAMO (Continuing Airworthiness Management Organisation) in accordance with the requirements of Annex-Part M of (EC) regulation No. 2042/2003. In fact, ACE Kft. is in the possession of Malév Zrt. The operations principles of the CAMO organization are laid down by the CAME (Continuing Airworthiness Management Exposition) document approved by the Hungarian NTA AD. Continuing airworthiness of the aircrafts operated by Malév Zrt. shall be assured according to these principles. The changes in the organizational structure and the lay-offs at the two organizations prior to the occurrence had affected the engineering divisions as well. Due to fluctuation, continuance could not be ensured in specific areas at the two companies. The specialist area of powerplant engineers was also one of these.

## **1.18 Additional information**

The IC does not find any other data than the factual data described above relevant to making the conclusions and developing the safety recommendations.

## **1.19 Useful or effective investigation techniques**

The investigation did not require techniques differing from the traditional approach.

## 2. ANALYSIS

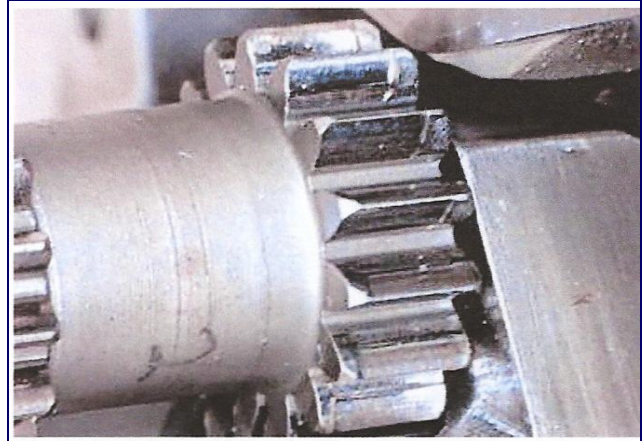
The crew disposed of the necessary certificates to carry out the flight, their medical licence was valid and they had rested enough. The rest period before the flight was adequate, time spent in service was within the limit relevant to hours flown as laid down by the company procedures. After take-off from Goteborg, during climb to cruise level (FL350) and the ensuing approx. 1 hour flight, FMC controlled the throttle levers via the automatic thrust as based on the inputted data. As based on data recorded by the flight data recorder, the first sign indicating the occurrence was the following: automatic thrust started to direct the throttle lever of engine #1 towards the idle position (14:18:09). 5 seconds later the amount of fuel fed into the engine grew extremely, nearly to its double (from 851 kg/hour to 1510 kg/hour). Parallel with that the revolution of both rotating assemblies in the engine and also the turbine gas temperature increased. At 14:18:20 they reached their operational limit and the pilots received the following warnings at the MFDS display: „N1 OVERSPEED”; „N2 OVERSPEED”; „TGT HIGH”. At the same time, accompanied by an acoustic alarm, the warning sign „MASTER WARNING” switched on. The crew tried to change the parameters by moving the throttle lever but the parameters did not respond to the movement of the throttle. When the throttle was placed in the idle position, the engine parameters still remained above the normally authorized values but they did not surpass the technically feasible maximum values (the TGT did not supersede 820 °C, its highest value was 812 °C). The crew shut down engine #1 at 14:18:48. They reported this fact to air traffic control, declared emergency and announced that they would land at the closest airport, in Krakow. Having read out QRH and since the relevant paragraphs of EMERGENCY PROCEDURES do not prohibit the restart of the engine, the captain decided to try and restart the shut down engine. This decision of the captain was also motivated by the fact that after engine shut down, the indicator EMUX went also off on the MFDS display which may as well refer to the faulty indication of the engine parameters. The inflight start of the shut down engine was initiated at 14:24:40 but as the engine parameters reached the authorized values, the crew interrupted the restart. Then, approach and landing was carried out by the first officer with one engine operative in AUTO APPROACH and MANUAL LAND mode without any occurrence at Krakow airport.

Having evaluated the data of the flight data recorder, the contracted maintenance partner of the operator established that the parameters remained within limit throughout the occurrence. Only N1 surpassed the 20 s limit by 6 s. The engineering division provided for the investigation of the engine by boroscope in accordance with paragraph 71-00-00-701-845-A of the AMM. The check by boroscope did not reveal any discrepancy which would have made the replacement of the engine necessary. The Fuel Flow Regulator (P/N CASC512, S/N B2693) was replaced and having checked the engine, the aircraft was declared airworthy.

As a response to the request of TSB, the operator sent the Fuel Flow Regulator S/N B2693 for shop visit to Goodrich Engine Control Systems (GECS) in order to reveal the cause of malfunction. In the reports from the shop visit it was established that the gear ring (P/N 771333983) of the fuel control unit was so much worn that the mechanical contact through the driving gear between the pressure drop governor and the speed control governor had been lost.



**Fig. 1.** The worn gear ring



**Fig. 2.** The planet gear

Thus the control unit got into such a boundary condition where the fuel gushed uncontrolled, in big quantities into the engine, independently of the position of the throttle lever, generating the high engine parameters due to which the engine had to be shut down and emergency landing had to be carried out. Figures 1 and 2 show the photos taken during the investigation by GECS. The investigation established that the cause of high degree wearing was the fact that the equipment was operated much longer without “midlife reworks” and overhaul than the operating time recommended by the manufacturer.

**Maintenance History of Fuel Flow Regulator P/N: CASC512 S/N: B2693**

Original received Feb.26.96 with engine S/N:17153

Removed from engine Mar.19.99 at TT:4874 TC:3406

Installed on engine Mar.19.99 S/N:17144

Removed from engine Aug.17.2001 at TT:9514 TC:6648

**Repaired Dec.20.2001**

Installed on engine Jan.13.2002 S/N:17144

Removed from engine Jan.22.2003 at TT:11732,5 TC.8339

**Repaired Feb.20.2003**

Installed on engine Nov.19.2003 S/N:17164

Removed from engine Oct.15.2008 at **TT.23219,3 TC:16668**

As it can be seen from the table above, CASC512 FFR (Fuel Flow Regulator) with serial number B2693 was repaired twice at the maintenance facility of Goodrich. First in December 2011 (TSN 9514 hours flown), then in February 2003 (TSN 11732 hours flown) when it was sent for repair with the comment “revolution at idle run unreliable” (the filter was replaced). The tasks included in the “midlife rework” did not feature among the works carried out on the equipment as listed on the issued airworthiness certificates. According to the CMP (Component Management Programme) relevant to CASC512, a “midlife rework” work package is to be executed on the equipment between 10000 and 13000 hours flown and then, at 20000 hours flown an overhaul has to take place in order to keep the reliability indexes of the engines within the normal range. If the “midlife rework” is skipped, Goodrich recommends to carry out the overhaul after 16000 hours flown at the latest. However, at the time of the occurrence

the failed equipment CASC512 had flown more than 23000 hours without overhaul! The occurrence of the aircraft registered HA-LME was the third IFSD (In Flight Shut Down) in the history of the Fokker 70/100 family and the common cause of all the three occurrences was the longer than authorized operation of equipment CASC512 without overhaul. After the first such occurrence Rolls-Royce Deutschland issued on 02 August 2005 the NTO (NOTICE TO OPERATORS TAY ENGINES) warning circular No.:67 in which it advised the operators to adhere to the recommendations of the manufacturer of equipment CASC512 regarding its maintenance deadlines. The Rolls-Royce Deutschland EMP (Engine Management Programme) which should be a basic instruction manual for the operators of TAY engines, in its paragraph 4.3.1 deals especially with Accessory Management Policy and recommends options practically similar to those in CMP 052 for the maintenance of the equipment. In paragraph 6.3 it lists those equipment which are not "hard time" equipment but which can be managed "soft time" and complementary tasks have to be carried out on them during operation. In paragraph 8.2.1 "soft time" is defined. "Soft time" means a more flexible deadline for the operator than "hard time" and it makes so-called "maintenance when appropriate" possible. This may be more favourable for the operator but it does not mean that the recommendations of the manufacturer regarding maintenance after certain hours flown are not to be adhered to. The operator has to agree about this with the manufacturer of the engine within its own EMP (Engine Management Programme). At the Fokker operators' conference, in January 2008, after the second Fokker IFSD it was announced that CMM was to be modified and in CASC512 the so-called sun gear and planet gear units were to be obligatorily replaced within the framework of "midlife rework". Goodrich CMP 052 already includes the mandatory replacement. It is the responsibility of the operator to ensure that the given equipment is sent in time to Goodrich for "midlife rework"! The biggest obstacle to this is the fact that CASC512 is not "hard time" equipment and thus it is not included in Part 2.1. Component Limitation of Malév Fokker 70 Maintenance Program and so it also does not feature in the monitoring software (ARMS) based on that. This was one of the main reasons why the required maintenance was not carried out on the equipment in time. According to paragraph 1.2 of CAME, revision, supplementation and development of the Malév Fokker 70 Maintenance Program, taking into consideration the recommendations relying on the overhaul experience of the type certificate owner, is the responsibility of CAMO.

### 3. CONCLUSIONS

- The aircraft disposed of a valid Airworthiness Certificate and of a valid Airworthiness Review Certificate.
- The crew disposed of the required certificates, their medical licence was valid and they had rested enough. The operator adhered to the limitations regarding the flying hours and the rest periods. After the occurrence, the crew followed the relevant procedures without a fault and resolved the situation impeccably.

#### 3.1 Direct causes of the occurrence

- Direct cause of emergency landing was that engine #1's Fuel Flow Regulator (P/N CASB512) serial number (S/N) B2693 failed in flight. Failure of the Fuel Flow Regulator led to the high values of the engine parameters (TGT, N1, N2) which in turn necessitated the shut down of engine #1 and the need of landing at the nearest suitable airport.
- The investigative report issued by GECS (Goodrich Engine Control Systems) established that the gear ring (P/N 771333983) of the fuel control unit was so much worn that the mechanical contact through the driving gear between the

pressure drop governor and the speed control governor had been lost. At the same time the report established the fact which was also verified by the investigation of TSB that neither a “midlife rework” nor an overhaul was carried out on equipment CASC512 (serial number B2693) at the given flying hours recommended by the TCH (Type Certificate Holder) but it operated more than 23000 hours without an overhaul. Without a “midlife rework”, the equipment should have been sent to overhaul after 16000 hours flown! The equipment operated 8000 flying hours longer than authorized as based on TCH recommendations!

- The aircraft was maintained in accordance with the requirements of the Malév Fokker Maintenance Program approved by NTA AD. The Malév Fokker Maintenance Program does not include a limitation regarding the operation of equipment CASC512.

### 3.2 Indirect causes of the occurrence

- Neither the CAMO organization of the operator, nor its contracted partner disposed of the document “Rolls-Royce Engine Management Programme (EMP) Tay 620-15” which should be a basic instruction manual for the operators of Fokker 70 type airplanes to be used for planning engine maintenance just as much as the document Fokker 70/100 MPD (Maintenance Planning Data)! All of these documents are published at the website of Rolls-Royce Deutschland ([www.aeromanager.com](http://www.aeromanager.com)). This Rolls-Royce document contains numerous supplementary jobs not included in Fokker 70/100 MPD but which have to be planned in the so-called **On-Wing** maintenance in order to achieve the targeted reliability level during engine operation. The recommendations in the EMP are a result of evaluating the immense information gathered by TCH in the course of operating, maintaining and overhauling Tay engines worldwide.
- Neither the CAMO organization of the operator, nor its contracted maintenance partner knew the Notice To Operators (NTO) No. 67 issued by Rolls-Royce Deutschland in August 2005. Thus neither the recommendations of the EMP nor those of NTO were incorporated in Malév Fokker Maintenance Programme. Regular review and modification of the Maintenance Programme by the CAMO organization of the operator is required by Chapter 1.2 of CAME (Continuing Airworthiness Management Exposition) approved by NTA AD.

## 4. SAFETY RECOMMENDATIONS

Safety recommendations issued during the technical investigation on 20 January 2009:

- **BA 2008-315-4\_01:** The IC recommends NTA AD to control, using its powers of authority, whether the flying hours data of the CASC512 Fuel Flow Regulators mounted on the TAY 620-15/20 engines of Fokker 70 type airplanes operated by Malév Zrt. fulfil the requirements of document GOODRICH CMP 052.
- **BA 2008-315-4\_02:** The IC recommends NTA AD in possession of the data resulting from the control described in paragraph BA 2008-315\_01, to carry out the measures necessary to terminate the situation endangering flight safety without delay.

Comment: executed by NTA AD on 26 February 2009.

- **BA 2008-315-4\_03:** In accordance with Chapter 1.2 of CAME approved by NTA AD, the IC recommends Malév Zrt. to review and modify the „Malév Fokker 70

Maintenance Programme” in line with the recommendations of document „EMP Tay 620-15 for Fokker 70 & 100 Operators” (RM 1581 issue 6. 26 November 2007) issued by Rolls-Royce Deutschland Ltd & Co KG. Regarding Chapter 4. ”ON-WING MAINTENANCE” of the above mentioned document, besides the jobs required by Fokker MPD, the modification shall extend to the so-called „RR tasks” as well. The modified „Malév Fokker 70 Maintenance Programme” shall be submitted to NTA AD for approval.

- **BA 2008-315-4\_04:** The IC recommends Malév Zrt. to include in Chapter “Component Limitation” of “Malév Fokker 70 Maintenance Programme” the “soft time” engine auxiliary equipment and maintenance tasks from document RR „EMP Tay 620-15 for Fokker 70 & 100 Operators” together with their from/until “soft time” values.
- **BA 2008-315-4\_05:** The IC recommends Malév Zrt. to develop together with its contracted partner a computer based monitoring system which is able to follow the maintenance deadlines of “soft time” auxiliary equipment even when the auxiliary equipment is dismantled from the engine before the engine’s shop visit.
- **BA 2008-315-4\_06:** The IC recommends NTA AD to use its powers ensured by legislation and facilitate and require execution and continuous adherence to safety recommendations **BA 2008-315-4\_03**, **BA 2008-315-4\_04** and **2008-315-4\_05**, complementary to the safety recommendation **BA 2008-315-4\_02** issued on 20 January 2009.

Budapest, 12 September 2009.

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László STORCZER  
Investigator-in-Charge

**NOTE:**

*The present document is the translation of the Hungarian version of the Final Report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur.  
In this case, the Hungarian is the authentic, official version.*