

**Doc.-Number:** B-34-1-002

**Rev. No.:** 11  
 Date: 28.10.2019

**CLH Issue:** 01  
 Date: 22.01.2020

**Title:** CAT III Verfahren für Technik und Flugbetrieb  
 Low Visibility Operation (LVO) Procedures

**Type:** Technical Order

☐ **Mandated by AD:**
**Reason for Alteration:** CAT placards are no b-34-longer used and removed from the procedure.

**Description:** Handling and operation of LVO relevant equipment.

**Reason for Issue:** Corrected flow diagram and point 6.

**Effectivity:**

Aircraft Type: CRJ 900

No. of affected A/C: ALL

Component P/N:

Refer to CAS:

☐ Customer A/C affected

Refer to CRAL:

**Planning Data:**
☐ Absolut: End-date: FH: FC:

☐ Relativ: Start Date: Days: FH: FC:

☐ Repetitive Insp. at: Days: FH: FC:

Suggested Qualification: CAT-B2

☒ **Special Quali.:** CAT III/RVSM authorization

Estimated A/C Downtime:

Labor-Hours:

 Component Mod.: ☐ temp. removal from LHT Pool ☐ shop visit ☐ on wing ☐ on attrition

**Special action required by:**
☐ TO/E-MS ☐ Material required ☐ Tools required ☐ Warranty / Casco

**Costs per unit or A/C:**
**Total Costs:**
☐ Refer to WiRe / GF-Vorlage

**Attached Documents:**

Type	Doc. Number	Rev.	Date	Pages

**prepared by:**  
 Name/Signature:

**directed by:**  
 Name/Signature:

**verified by:**  
 Name/Signature:

**granted BT/GF:**  
 Name/Signature:

 T. Langenegger  
 Date: 24.10.2019

Date:

Date:

Date:



## **Table of content**

- 1 CAT II/III Philosophy on CRJ 900
- 2 Downgrading of CAT status
  - 2.1. Downgrading by the cockpit crew
  - 2.2. Downgrading by maintenance personnel
  - 2.3. Differentiation of CAT I/III status
  - 2.4. Differentiation of CAT II status
  - 2.5. RVSM
  - 2.6. Documentation of CAT status
- 3 Maintenance
  - 3.1. Simulated CAT II/III approach
  - 3.2. Special repairs
- 4 Qualification of personnel
- 5 Testing equipment
- 6 Upgrading to CAT II or CAT III status
- 7 CAT II/III Components
- 8 Documentation and identification of CAT II/III equipment (cancelled)
- 9 References



## **1. CAT II/III Philosophy on CRJ 900**

On the CRJ 900 there are two systems for low visibility operation (LVO):

### Automatic Flight Control System AFCS

- Automatic CAT II Approach, DH 100ft

### Head up guidance system HGS

- Manual "head up" CAT IIIa Approach, DH 50ft
- Manual "head up" CAT II Approach

If there is any defect on AFCS or HGS the Aircraft must be assumed as "CAT I only".

A partially downgrading like:

- CAT II/III "NO A/P APPROACH"
- CAT II "NO HGS APPROACH"

is only allowed in special cases defined under 2.3 and 2.4.

## **2. Downgrading of CAT status**

### **2.1. Downgrading by the cockpit crew**

On other stations than CLH maintenance stations proceed as follows:

When there is any fault with systems listed under AFM Chapter 07-04 (or CLH OM Part B, 1.4 Low Visibility Operation):

- Open a Workorder with failure description and an additional comment:

"A/C downgraded to CAT I only"

- Set CLASS to H (Handicap)

**2.2. Downgrading by maintenance personnel (CLH maintenance stations)**

CLH Maintenance personnel (or trained external personnel) must downgrade the aircraft if:

- A complaint within the CATII/III systems could not be fixed and must be transferred
- There is nobody with a CAT III/RVSM authorization available
- There is a simulated CAT II or CAT III approach necessary (section 6)

**2.3. Differentiation of CAT I/III status**

On defects with auto pilot system (AFCS) where the AP servo is clearly detected as the reason, it is still possible to do manual HGS CAT III approaches and take offs.

- Only the maintenance downgrades the aircraft to CAT III - NO A/P APPROACH.
- Make an additional remark "Manual HGS CAT III – Approach and take off only" in the complaint or action field.
- Limitation is set in AMOS according.

Manual HGS CAT II approaches can still be made in CAT IIIa mode with DH 100ft.

**Doc.-Number:** B-34-1-002**Rev. No.:** 11  
Date: 28.10.2019**CLH Issue:** 01  
Date: 22.01.2020

---

**2.4. Differentiation of CAT II status**

If there is a failure on HGS components, the A/C must be downgraded to CAT II.

**2.5. RVSM**

If a CAT relevant complaint is also RVSM relevant, a second Workorder "RVSM inop" must be opened. This is necessary because the RVSM procedure must be documented separately. See EO B-34-1-005 for further information.

**2.6. Documentation of CAT status**

When downgrading the A/C make a comment on the W/O "A/C DOWNGRADED TO CAT XX" and set CLASS to H (Handicap)

Doc.-Number: B-34-1-002

Rev. No.: 11  
Date: 28.10.2019

CLH Issue: 01  
Date: 22.01.2020

## 2.6.1. Downgrade im AMOS

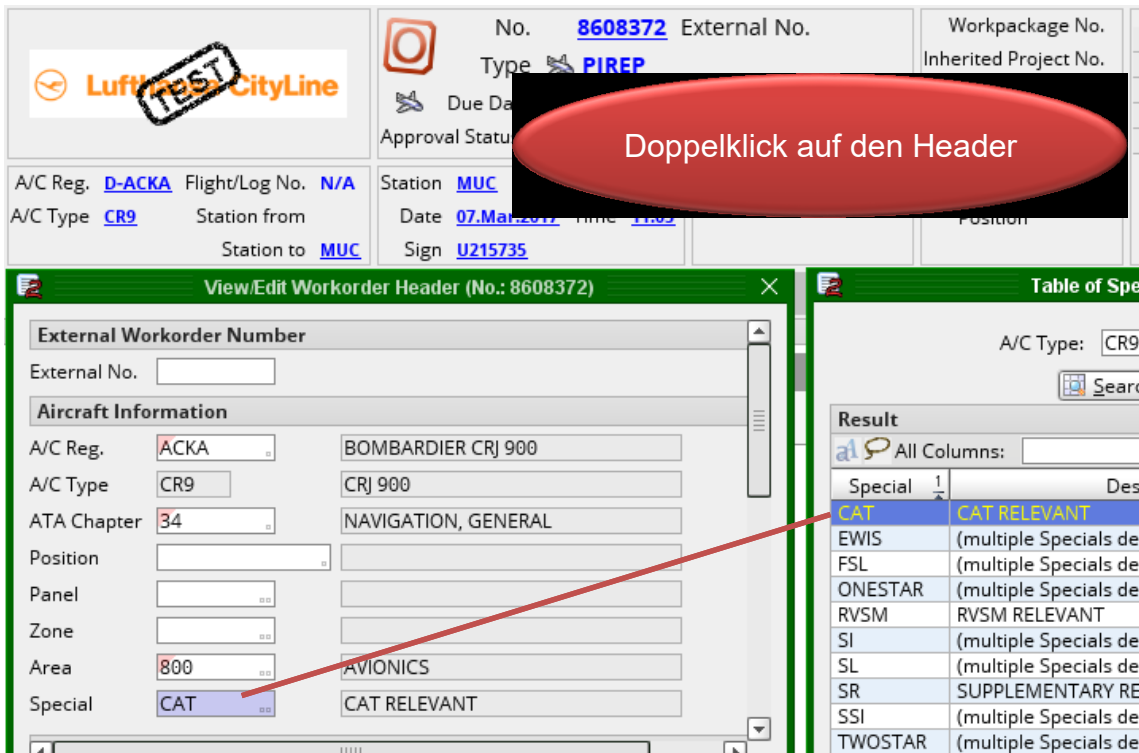
### 2.6.1.a) MAREP/PIREP

Make sure the ATA chapter and subchapter are correct.

ATA-Chapter	<input type="text" value="34-42"/>	<input type="text" value="RADIO ALTIMETER"/>
-------------	------------------------------------	--

select "CAT" in the field Special.

Double click on the header → double click field Special → choose "CAT"



**View/Edit Workorder Header (No.: 8608372)**

External Workorder Number  
External No.

**Aircraft Information**

A/C Reg.	<input type="text" value="ACKA"/>	<input type="text" value="BOMBARDIER CRJ 900"/>
A/C Type	<input type="text" value="CR9"/>	<input type="text" value="CRJ 900"/>
ATA Chapter	<input type="text" value="34"/>	<input type="text" value="NAVIGATION, GENERAL"/>
Position	<input type="text"/>	<input type="text"/>
Panel	<input type="text"/>	<input type="text"/>
Zone	<input type="text"/>	<input type="text"/>
Area	<input type="text" value="800"/>	<input type="text" value="AVIONICS"/>
Special	<input type="text" value="CAT"/>	<input type="text" value="CAT RELEVANT"/>

**Table of Specials**

A/C Type: CR9

Result

Special	Description
CAT	CAT RELEVANT
EWIS	(multiple Specials de
FSL	(multiple Specials de
ONESTAR	(multiple Specials de
RVSM	RVSM RELEVANT
SI	(multiple Specials de
SL	(multiple Specials de
SR	SUPPLEMENTARY RE
SSI	(multiple Specials de
TWOSTAR	(multiple Specials de

**Doc.-Number:** B-34-1-002**Rev. No.:** 11  
Date: 28.10.2019**CLH Issue:** 01  
Date: 22.01.2020**2.6.1.b) Transfer workorder**

If it is not possible to fix the defect, it could be transferred ACC MEL. In this case the limitations must be set under Transfer/Downgrades. Now the CAT status of the A/C is shown in the Module Fleet Tracker (APN: 1466) and printed on the HIL.

Wizard - Transfer for Pirep W/O 6007325 A/C Reg. D-ACKA ATA-Chapter

**Steps**

1. Action
2. Add Time Entry
3. Action Details
- 4. Transfer**

**Transfer**

Action performed by on 20.Apr 2015 08:52  
DEFECT ACC MEL 34-XX-XX DEFERRED  
Performed Sign

**Defer Defect / Configuration Deviation List / Minimum Equipment List**

☐ N/A  
☐ DD  
☐ CDL  
☒ MEL Ref. 34-11-11 ☐ SLA

CAT ☐ A ☐ B ☒ C ☐ D

**Transfer**

Type New Limits  
Station MUC MUENCHEN  
Transfer Date 20.Apr.2015 Time 08:46  
Flight/Log No. Current TAH/TAC Arr. Date 20.Apr 2015 08:55 Dep. Airport Arr. Airport

First / Later ☒ First ☐ Later  
Input Type ☒ To Go ☐ Due  
Days 10 Due Date 30.Apr.2015  
Hours Due TAH  
Cycles Due TAC  
Reason SLA SERVICE LEVEL AGREEMENT  
Prio 2 Urgent  
Transfer Sign

**Downgrades**

A/C Limitations  
APU US  
AUTOLAND N  
RVSM N

W/O Limitations  
CAT 1

**Doc.-Number:** B-34-1-002

**Rev. No.:** 11  
**Date:** 28.10.2019

**CLH Issue:** 01  
**Date:** 22.01.2020


## 2.6.1.c) Closing Workorder

By closing the workorder the A/C will automatically be set to CAT III, as long as no other workorder limits the CAT status. Therefore CAT relevant workorders must only be closed with a "CAT III/RVSM authorization".

## 2.6.2. Simulated CAT approach

A simulated CAT approach must be requested on a new page in the TLB. Use the complaint field and make a reference to the original workorder. Additionally add the comment "NO CRS REQUIRED". The action field stays empty. This space is used to document the successful simulated approach.

Set the special "CAT" in AMOS and transfer the W/O for 10 days as described under 2.6.1.b). It is not necessary to make a CRS in this case.

Lufthansa CityLine TECHNICAL LOG BOOK										A/C REGISTRATION				
										D -	A	C	K	A
SCHEDULED MAINTENANCE / WORKPACKAGE RELEASE										SIGN AND STAMP				
FOR CRS REFER TO WORKPACKAGE SUMMARY										DATE				
WORK PACKAGE REFERENCE										TIME (UTC)				
										STATION				
										PK N°				
DATE		TIME (UTC)		FLIGHT N°		FROM		TO / STM		ATA CODE		WORK ORDER N°		
2 6 1 2 1 4		1 2 0 0		LH1256		MUC		AMS		2 2 -				
COMPLAINT		REPORTED BY		<input type="checkbox"/> FLIGHT CREW		<input checked="" type="checkbox"/> MAINTENANCE		<input type="checkbox"/> CABIN CREW						
<p>AFTER REPLACEMENT OF RADIO ALTIMETER TRANSCEIVER (W/O 1234567),</p> <p>PLS PERFORM A SIMULATED CAT II APPROACH. A/C DOWNGRADED TO CAT I NO CRS REQUIRED</p> <p>NO CRS REQUIRED</p>														
										PIC OR MEC SIGN AND STAMP				
										PK N°				
										U081523				
TRANSFER IN ACCORDANCE WITH										MEL CATEGORY				
MEL 9-1 / NON-ESSENTIAL EQUIPMENT <input type="checkbox"/> MEL/CDL <input type="checkbox"/>										A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> H <input checked="" type="checkbox"/> I <input type="checkbox"/> P <input type="checkbox"/> G <input type="checkbox"/>				
CAMO NOTED										NO IMMEDIATE MAINTENANCE ACTION REQUIRED <input type="checkbox"/>				
REMARKS										APPROVED BY MAINTENANCE CONTROL				
										MC ON DUTY PK N°				
										PK N°				
ACTION										WORK PERFORMED / SIGN AND STAMP				
SIMULATED CAT II APPROACH SUCCESSFUL PERFORMED. A/C UPGRADED										U_PILOT				

Perform the simulated approach as described in CLH OM Part B for CRJ 900. If the simulated CAT approach was successful the pilot fills out the action field of the W/O. CAT restrictions corresponding to this W/O are now canceled. The technician closes the workorder in AMOS. There is also no CRS required.

In case of an unsuccessful simulated approach, a new entry must be made in the TLB. The maintenance technician closes the W/O for the simulated approach with reference to the new complaint. Nevertheless at least a simulated CAT approach in the same category as the last one must be done before closing the issue.



**Doc.-Number:** B-34-1-002**Rev. No.:** 11  
Date: 28.10.2019**CLH Issue:** 01  
Date: 22.01.2020

### 2.6.3. Workorder Information System (APN: 1)

Use the Workorder Information System to find Workorders marked with the Special "CAT" or ones that were transferred with a relevant limitation.

## **3. Maintenance**

All maintenance actions must be performed according to a valid revision of the Aircraft Maintenance Manual (AMM).

Additional work, necessary to release the A/C for CAT II/III operation, is specified in the CAT II/III components lists under chapter 7.

### **3.1. Simulated CAT II/III approach**

After maintenance work performed refer to chapter 6 to find out if a simulated CAT approach is necessary. The type of simulated CAT approach depends on the replaced equipment. Either a

- simulated AFCS CAT II approach
- or**
- simulated Head Up Guidance (HGS) CAT III approach

is required.

After a C-Check a test in form of a

- AFCS: simulated CAT II approach
- and a**
- HGS: simulated CAT III approach

must be done. This is due to the high number of removed/reinstalled parts.

During the simulated CAT approach all function of the repaired systems must be checked.



### **3.2. Special repairs**

#### **3.2.1. Antenna cables**

After working on antenna cables and connectors, the same tests are necessary as on the appropriate antenna, except the bonding test.

All repairs must be performed acc. valid documents (ESPM, AMM). Special attention should be paid to length sensitive cables. They could not be repaired.

#### **3.2.2. Intermittent Faults**

In the case of intermittent faults in the CAT system, only CAT I approaches are allowed. Additionally a technician B2 with CAT III/RVSM authorization must be informed to

- evaluate the fault
- and
- find appropriate solutions

## **4. Qualification of personnel**

Maintenance on the CAT II/III systems must only be performed by qualified CLH personnel or according CLH trained foreign personnel. On CLH internal license the CAT III/RVSM authorization will be added after the required training.

All trainings are valid for two years. After two years a recurrent training must be done.

To avoid AOGs it could be necessary that technicians without CAT II/III authorization work on CAT II/III units. The qualification must be a B2 or a B1 including Avionics LRU qualification. The A/C must be downgraded to CAT I ONLY until a qualified B2 technician performs the required tests und upgrades the A/C.

## **5. Testing equipment**

Pitot static test set ADTS 405 F and Marchiori MPS-31B must be calibrated every 12 month.

The IFR 4000 must be calibrated every 12 month.

**Doc.-Number:** B-34-1-002**Rev. No.:** 11  
Date: 28.10.2019**CLH Issue:** 01  
Date: 22.01.2020

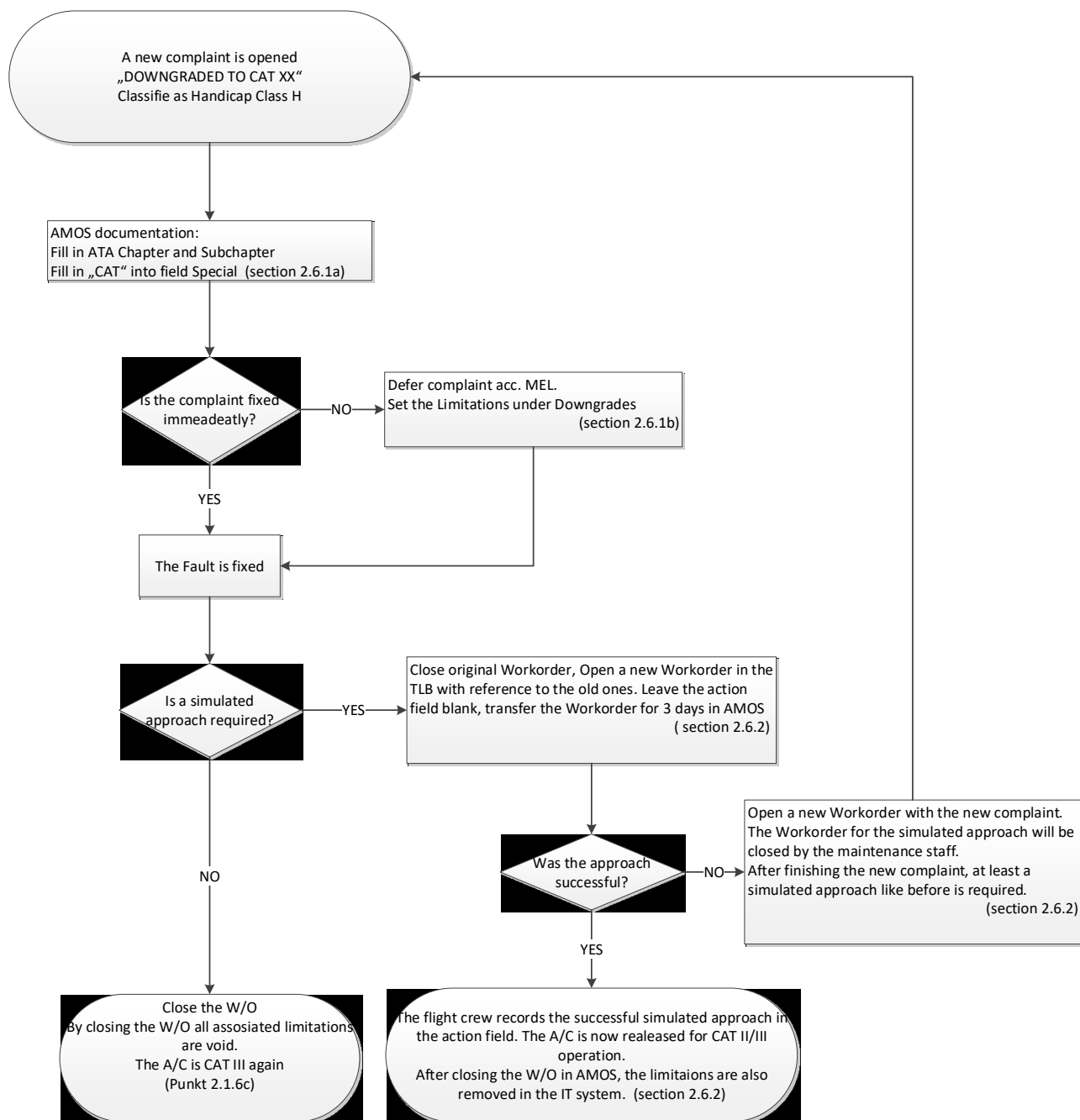
---

## **6. Upgrading to CAT II or CAT III status**

Releasing the A/C for CAT II or CAT III operation is only allowed by qualified CLH maintenance staff or foreign employees with CLH CAT II/III license. (Chapter 4)

Upgrading after a ground test is only acceptable if the fault was confirmed before maintenance actions and verified removed by the repair/part change.

In the CAT II/III component list under chapter 7 is specified for which systems a simulated CAT II or CAT III approach is required. The upgrade to the relevant CAT status is done after the successful simulated approach by the pilot.

**6.1. CAT II/III Down- and Upgrading procedure**



Doc.-Number: B-34-1-002

Rev. No.: 11  
Date: 28.10.2019CLH Issue: 01  
Date: 22.01.2020

## 7. CAT II/III Components

AFCS Approach (CATII) - Geräteliste CRJ900						
LRU	Modell	Hersteller	Anz.	Partnummer	AMM - Test	Freigabe-Tests (zusätzlich zu Test gem. AMM)
Aileron Servo	SVO-55A	Collins	1	622-4404-101	22-11-21	sim. AFCS CAT II Anflug
Aileron Servo Mount (Aileron)	SMT-87A	Collins	1	822-0259-001	22-11-21, 27-11-00	sim. AFCS CAT II Anflug
Air Data Computer	ADC-850A	Collins	2	822-0372-697	34-13-01	
Air Data Computer	ADC-850A	Collins	2	822-0372-497	34-13-01	
Air Data Computer	ADC-850A	Collins	2	822-0372-436	34-13-01	
Air Data Computer	ADC-850A	Collins	2	822-0372-636	34-13-01	
Air Data Ref. Panel	ARP-4000	Collins	2	622-9819-104	34-13-04	
Air Data Ref. Panel	ARP-4000	Collins	2	622-9819-204	34-13-04	
Display Control Panel	DCP-4000	Collins	2	622-9812-006	34-25-04	
Elevator Servo	SVO-85B	Collins	1	622-5027-101	22-11-24	sim. AFCS CAT II Anflug
Elevator Servo Mount (Elev.)	SMT-87B	Collins	1	822-0260-001	22-11-24, 27-31-00	sim. AFCS CAT II Anflug
Flight Control Computer	FCC-4000	Collins	2	822-1308-027	22-11-00	
Flight Control Panel	FCP-4000	Collins	1	822-0044-001	22-11-07	
Glideslope Antenne		Sensor	1	S41422-2	34-51-00	sim. AFCS CAT II Anflug
EGPWS Computer	Mark 5	Sundstrand	1	965-0976-003-XXX-XXX	34-42-01	
Motor Control Unit		THALES	1	7074-4	27-40-00, 27-41-00	
Motor Control Unit		THALES	1	7074-5	27-40-00, 27-41-00	
Horizontal Stab Trim Actuator		THALES	1	8489-7R	27-40-00, 27-41-00	
Horizontal Stab Trim Actuator		THALES	1	8489-7	27-40-00, 27-41-00	
SSCU		THALES	2	C13045BA05	27-40-00, 27-41-01	
I/O Concentrator	IOC-4001	Collins	4	822-1362-065	22-12-05	
Inertial Reference Unit	Flagship	Litton	2	465020-04000402	34-45-01	
IRS Mode Selector Panel		Litton	2	465630-02	34-45-04	
Marker Antenne		Sensor	1	S35-1000-2	34-51-00	
NAV Control Panel	RTU-4000	Collins	2	622-9852-208	23-81-00	
NAV Receiver	VIR-433	Collins	2	822-0393-001	34-51-00	
Pitch Trim Engage Panel		Canadair	1	CC670-51115-1	27-41-15, 27-41-20	
Primary Flight Display	EFD-4000	Collins	2	622-9810-302	34-25-00	
Radio Altim. Converter	RAC-870	Collins	2	622-7209-002	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Converter	RAC-870	Collins	2	622-7209-005	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Transceiver	ALT-55B	Collins	2	622-2855-011	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Transceiver	ALT-1000	Collins	2	822-1939-001	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Transceiver	ALT-1000	Collins	2	822-1939-005	34-44-01	sim. AFCS CAT II Anflug
Radio Altimeter Antenna		Sensor	4	S67-2002	34-44-01	sim. AFCS CAT II Anflug
Rudder Linear Actuator	SVL-4000	Collins	2	622-9968-001	22-22-01	sim. AFCS CAT II Anflug
Rudder Linear Actuator	SVL-4000	Collins	2	622-9968-101	22-22-01	sim. AFCS CAT II Anflug
VOR/LOC Ant. Coupler			1	SSPD113-38	34-51-00	sim. AFCS CAT II Anflug
VOR/LOC Antenne			2	S65-247170-7	34-51-00	sim. AFCS CAT II Anflug
VOR/LOC Antenne			2	S65-247170-7YL	34-51-00	sim. AFCS CAT II Anflug
Yaw Damper Panel		Canadair	1	CC670-51106-1	22-22-04	


**Doc.-Number:** B-34-1-002

**Rev. No.:** 11  
**Date:** 28.10.2019

**CLH Issue:** 01  
**Date:** 22.01.2020

<b>AFCS Approach (CATIIa) - Geräteliste CRJ 900</b>						
<b>LRU</b>	<b>Modell</b>	<b>Hersteller</b>	<b>Anz.</b>	<b>Partnummer</b>	<b>AMM - Test</b>	<b>Freigabe-Tests (zusätzlich zu Test gem. AMM)</b>
Air Data Computer	ADC-850A	Collins	2	822-0372-697	34-13-01	
Air Data Computer	ADC-850A	Collins	2	822-0372-497	34-13-01	
Air Data Computer	ADC-850A	Collins	2	822-0372-436	34-13-01	
Air Data Computer	ADC-850A	Collins	2	822-0372-636	34-13-01	
Air Data Ref. Panel	ARP-4000	Collins	2	622-9819-104	34-13-04	
Air Data Ref. Panel	ARP-4000	Collins	2	622-9819-204	34-13-04	
Display Control Panel	DCP-4000	Collins	2	622-9812-006	34-25-04	
Flight Control Computer	FCC-4000	Collins	2	822-1308-320	22-11-00	
Flight Control Computer	FCC-4001	Collins	3	822-1308-027	22-11-01	
Flight Control Panel	FCP-4000	Collins	1	822-0044-001	22-11-07	
Glideslope Antenne		Sensor	1	S41422-2	34-51-00	sim. AFCS CAT II Anflug
EGPWS Computer	Mark 5	Sundstrand	1	965-0976-003-XXX-XXX	34-42-01	
Motor Control Unit		THALES	1	7074-5	27-40-00, 27-41-00	
Motor Control Unit		THALES	1	7074-4	27-40-00, 27-41-00	
Horizontal Stab Trim Actuator		THALES	1	8489-7R	27-40-00, 27-41-00	
Horizontal Stab Trim Actuator		THALES	1	8489-7	27-40-00, 27-41-00	
HUGS Computer	HGS 4200	Collins	1	1500-3050-004	TR CLH 34-004	
HUGS Computer	HGS 4200	Collins	1	1500-3250-004	TR CLH 34-004	
HUGS Control Panel	HGS 4201	Collins	1	1500-1470-502	TR CLH 34-004	
HUGS Overhead Unit	HGS 4202	Collins	1	1500-2140-001	TR CLH 34-004	sim. HGS CAT IIIa Anflug
HUGS Combiner	HGS 4203	Collins	1	1500-2230-001	TR CLH 34-004	sim. HGS CAT IIIa Anflug
SSCU		THALES	2	C13045BA05	27-40-00, 27-41-00	
I/O Concentrator	IOC-4000	Collins	4	822-1362-065	22-12-04	
Inertial Reference Unit	Flagship	Litton	2	465020-04000402	34-45-01	
IRS Mode Selector Panel		Litton	2	465630-02	34-45-04	
Marker Antenne		Sensor	1	S35-1000-2	34-51-00	
NAV Control Panel	RTU-4000	Collins	2	622-9852-208	23-81-00	
NAV Receiver	VIR-433	Collins	2	822-0393-001	34-51-00	
Pitch Trim Engage Panel		Canandair	1	CC670-51115-1	27-41-15, 27-41-20	
Primary Flight Display	EFD-4000	Collins	2	622-9810-302	34-25-00	
Radio Altim. Converter	RAC-870	Collins	2	622-7209-002	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Converter	RAC-870	Collins	2	622-7209-005	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Transceiver	ALT-55B	Collins	2	622-2855-011	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Transceiver	ALT-1000	Collins	2	822-1939-001	34-44-01	sim. AFCS CAT II Anflug
Radio Altim. Transceiver	ALT-1000	Collins	2	822-1939-005	34-44-01	sim. AFCS CAT II Anflug
Radio Altimeter Antenna		Sensor	4	S67-2002	34-44-01	sim. AFCS CAT II Anflug
Rudder Linear Actuator	SVL-4000	Collins	2	622-9968-001	22-22-01	sim. AFCS CAT II Anflug
Rudder Linear Actuator	SVL-4000	Collins	2	622-9968-101	22-22-01	sim. AFCS CAT II Anflug
VOR/LOC Ant. Coupler			1	SSPD113-38	34-51-00	sim. AFCS CAT II Anflug
VOR/LOC Antenne			2	S65-247170-7	34-51-00	sim. AFCS CAT II Anflug
VOR/LOC Antenne			2	S65-247170-7YL	34-51-00	AFCS CAT II Anflug
Yaw Damper Panel		Canadair	1	CC670-51106-1	22-22-04	



## **8. Documentation and identification of CAT II/III equipment (canceled)**

Marking of CAT II/III Units are no longer necessary due revision 10 of CAME M.2.9. The corresponding CLH EO B-34-1-008 is cancelled. The CAT II/III Unit placard is no longer needed.

## **9. References**

Richtlinien für den Allwetterflugbetrieb vom 13. November 1998

AIR OPERATION 965\_2012, Subpart E

CRJ 900 Kennblatt, last revision

Aircraft Maintenance Manual (AMM), last revision

Aircraft Flight Manual CSP B-012 Kap. 07-04, last revision  
bzw. CLH OM Part B, Part 1.4, last revision  
AFM amendment HGS

Training Manuals der betroffenen Anlagen (für Schulungszwecke)