L/G GRAVITY EXTENSION

- MAX SPEED ..... 200 KT
- L / G GRVTY EXTN ..... DOWN

CAUTION
Both selector guards have to be open before selecting DOWN.

- L / G LEVER ..... DOWN
- GEAR DOWN indications ..... CHECK

CTR GEAR remains retracted in case of GRAVITY extension.

CAUTION
N/W STRG is lost.

■ **If successfull :**

The free fall system should not be reset to avoid undesirable effect such as further fluid loss in the event of a leak possible L/G unlocking in the event of a gear selector valve jammed in UP position.

NOTE : The free fall system may be reset in flight after use for training.

Provided the green hydraulic system is available resetting the free fall system may permit to restore L / G doors closure and nose wheel steering operation.

■ **If unsuccessfull :**

- Refer to "LDG WITH ABNORMAL L/G" procedure.

NOTE : In all cases the free fall system should not be reset by flight crew on the ground following free fall extension.

LANDING GEAR GRAVITY EXTENSION
QRH PROCEDURE

APPENDIX 1
EW/C96/11/1
G-VSKY

LDG WITH ABNORMAL L/G

PREPARATION

- CABIN CREW ..... NOTIFY
- ATC ..... NOTIFY
R - JETTISON ..... ON
- OXYGEN CREW SUPPLY ..... OFF
- GPWS SYS ..... OFF
- SEAT BELTS/NO SMOKING ..... ON
- COMMERCIAL ..... OFF
- CABIN and COCKPIT ..... PREPARE
  - *loose equipment secured*
  - *survival equipment prepared*
  - *belts and shoulder harness locked*

● **if NOSE L/G abnormal**

- CG location (if possible) ..... AFT
  10 PAX from front to rear ≃ + 2 %
- T TANK FEED ..... ISOL

● **if one MAIN L/G abnormal**

- FUEL IMBALANCE ..... CONSIDER
  - *Open all the X FEED and switch off the PUMPS on the side with L/G normally extended.*
- GROUND SPOILERS ..... DO NOT ARM

APPROACH

- L / G LEVER ..... CHECK DOWN
- L / G GRVTY EXTN ..... CHECK DOWN
- CABIN REPORT ..... OBTAIN
- JETTISON ..... OFF

BEFORE LANDING

- RAM AIR ..... ON
- BRACE FOR IMPACT ..... ORDER

JUST BEFORE TOUCH DOWN

- ENG MASTER (all) ..... OFF

● **if NOSE L/G abnormal**

- NOSE ..... MAINTAIN UP
  After touch down keep the nose off the runway by use of elevator.
- BRAKES (compatible with elevator efficiency) ..... APPLY

● **if one MAIN L/G abnormal**

- FAILURE SIDE WING ..... MAINTAIN UP
  Use roll control as necessary to maintain the unsupported wing up as long as possible.
- DIRECTIONAL CONTROL ..... MAINTAIN
  Use rudder and brakes to maintain runway axis as long as possible.

Cont'd

LDG WITH ABNORMAL L/G (Cont'd)

- **if both MAIN L/G abnormal**

– PITCH ATTITUDE (at touch down) ..... NOT LESS THAN 6°

AFTER TOUCH DOWN

– ENG (all) and APU FIRE pb ..... PUSH

- **when A/C stopped**

– ENG (all) and APU AGENT ..... DISCH
– EVACUATION ..... INITIATE

If NOSE L/G abnormal, aft passengers doors should preferably not be used for evacuation.

LDG WITH ABNORMAL L/G

The procedure is intended for use when nose or main L/G fail to extend or/and lockdown following the application of L/G GRVTY EXTN procedure.
It is considered preferable to use all available gears locked down rather than carry out a belly landing.
Under these circumstances, a hard surface runway landing is recommended.
Full advantage should be taken of any foam spread on the runway

PREPARATION

- CABIN CREW ..... NOTIFY
  Notify the cabin crew of the nature of emergency encountered and state intention. Specify the available time.
- ATC ..... NOTIFY
  Notify ATC of the nature of emergency encountered and state intention.
- JETTISON ..... ON
  Consider fuel reduction to safe minimum. This reduces VREF and as a consequence the load factor at impact and the energy to be dissipated.
- OXYGEN CREW SUPPLY ..... OFF
- GPWS SYS ..... OFF
  to avoid nuisance warning.
- SEAT BELTS/NO SMOKING ..... ON
- COMMERCIAL ..... OFF
- CABIN and COCKPIT ..... PREPARE
  - *loose equipment secured*
  - *survival equipment prepared*
  - *belts and shoulder harness locked*

● **if NOSE L/G abnormal**

- CG location (if possible) ..... AFT
  - *10 PAX from front to rear ~ + 2 %*
- T TANK FEED ..... ISOL

● **if one MAIN L/G abnormal**

- FUEL IMBALANCE ..... CONSIDER
  Reduce fuel on side of failed L/G by opening all X-FEED and by switching off the pumps on the non affected side.
- GROUND SPOILERS ..... DO NOT ARM
  Spoilers must not be armed to keep full roll control.

LDG WITH ABNORMAL L/G (CONT'D)

APPROACH

- L/G LEVER ..... CHECK DOWN
- L/G GRVTY EXTN ..... CHECK DOWN

Resetting of the free fall system with the L/G lever selected DOWN and one gear not locked down would result in extension of centre gear. This L/G configuration is not acceptable for landing.

- CABIN REPORT ..... OBTAIN
- JETTISON ..... OFF

Note : Depress the EMER CANCEL pb when the L/G GEAR NOT DOWN warning occurs.

BEFORE LANDING

- RAM AIR ..... ON

to ensure full depressurisation of A/C before impact.

- BRACE FOR IMPACT ..... ORDER

JUST BEFORE TOUCH DOWN

- ENG MASTER (all) ..... OFF

● **if NOSE L/G abnormal**

- NOSE ..... MAINTAIN UP

After touch down keep the nose off the runway by use of elevator.

- BRAKES (compatible with elevator efficiency) . . . APPLY

● **if one MAIN L/G abnormal**

- FAILURE SIDE WING ..... MAINTAIN UP

Use roll control as necessary to maintain the unsupported wing up as long as possible.

- DIRECTIONAL CONTROL ..... MAINTAIN

Use rudder and brakes to maintain runway axis as long as possible.

● **if both MAIN L/G abnormal**

- PITCH ATTITUDE (at touch down) . . NOT LESS THAN 6°

Pitch attitude at touch down must not be less than 6° to ensure that the tail section impacts first.

LDG WITH ABNORMAL L/G (CONT'D)

AFTER TOUCH DOWN

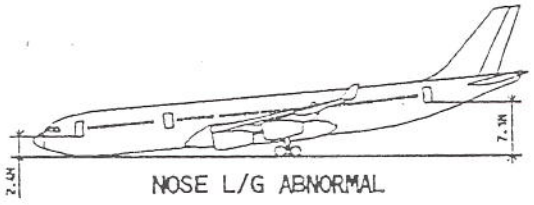
– ENG (all) and APU FIRE pb ..... PUSH

● **when A/C stopped**

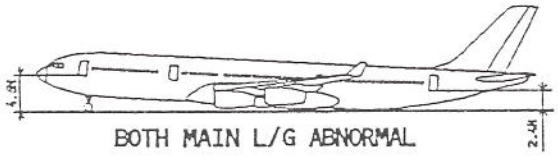
– ALL ENG and APU AGENT ..... DISCH

– EVACUATION ..... INITIATE

- *Announce through PA "PASSENGER EVACUATION EVACUATE THROUGH L or R DOORS" and press EVAC COMMAND pb.*
- *Be aware that forward passengers door evacuation rates (if abnormal NOSE L/G) or aft passengers door evacuation rates (if abnormal MAIN L/G) are considerably reduced due to abnormal slide inclination.*
- *Aft passengers doors should preferably not be used for evacuation if NOSE L/G abnormal.*



NOSE L/G ABNORMAL



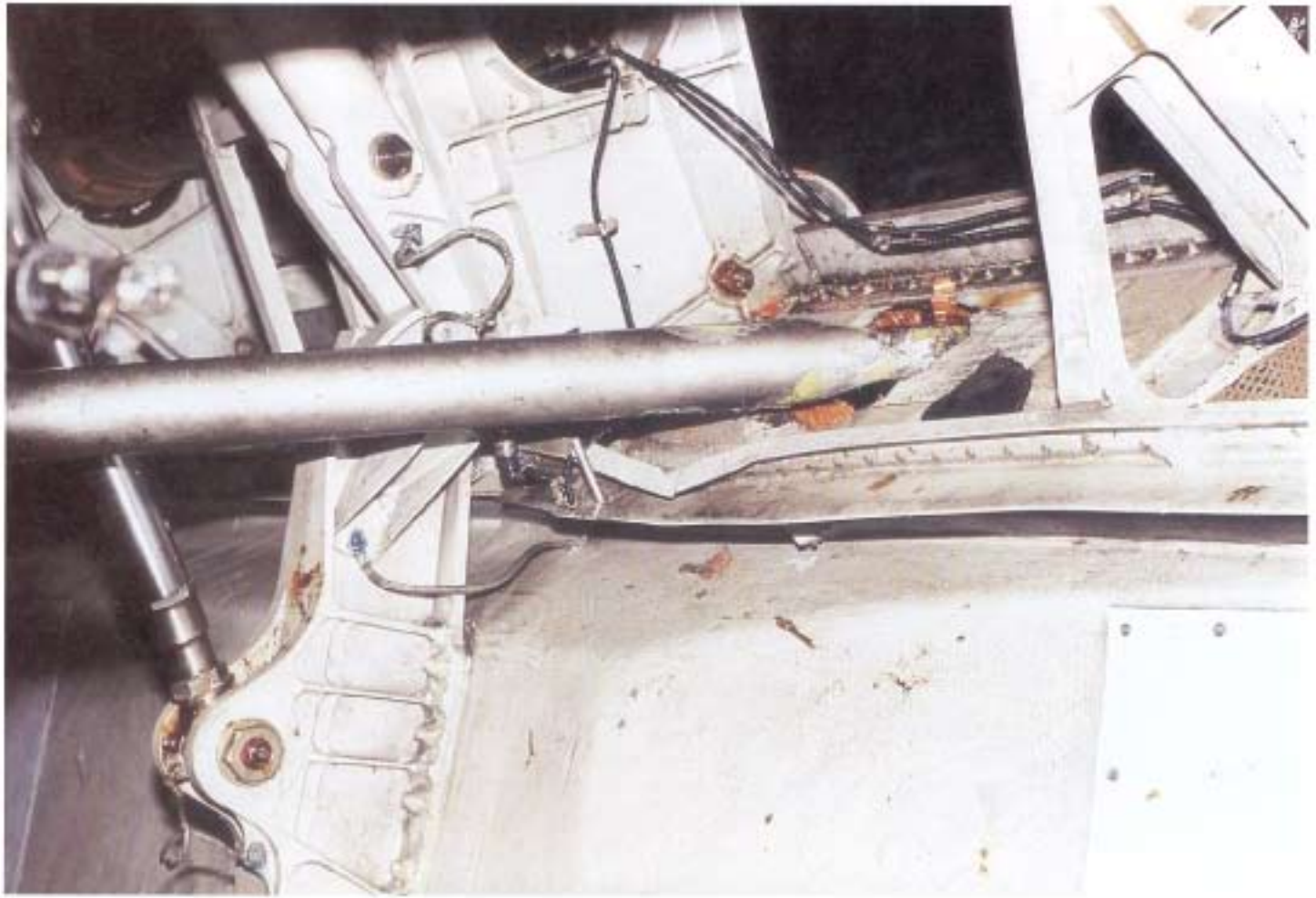
BOTH MAIN L/G ABNORMAL

FFCS-03-0232-008-A001AB

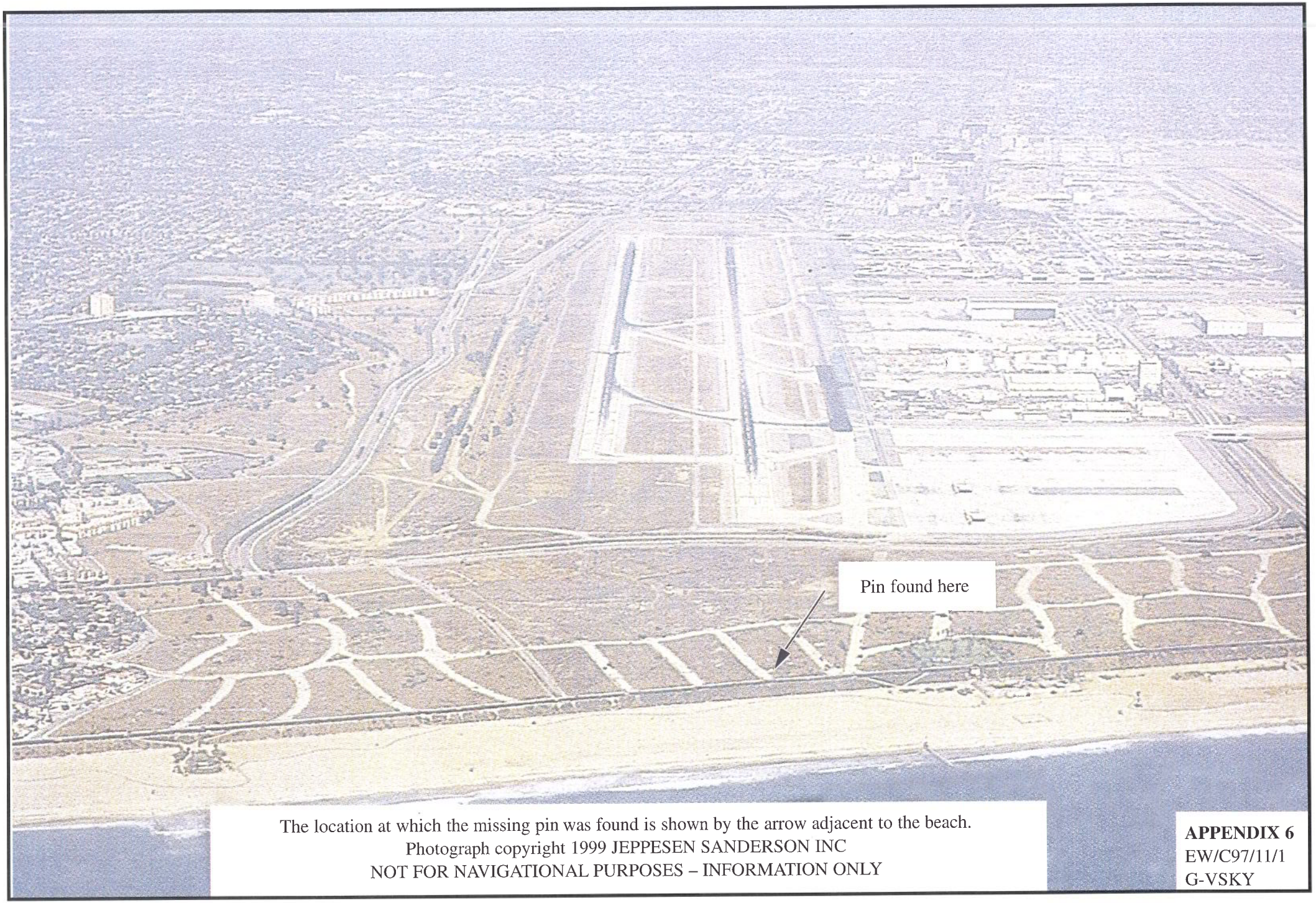
This photograph, taken the following morning, shows the aircraft after jacking and prior to moving. Note the runway centreline markings and aircraft heading. The runway had been repaired by the time this photograph was taken

APPENDIX 4
EW/C97/11/1
G-VSKY

Left main gear jammed in partly extended position



No, 6 brake torque rod jammed in keel beam structure



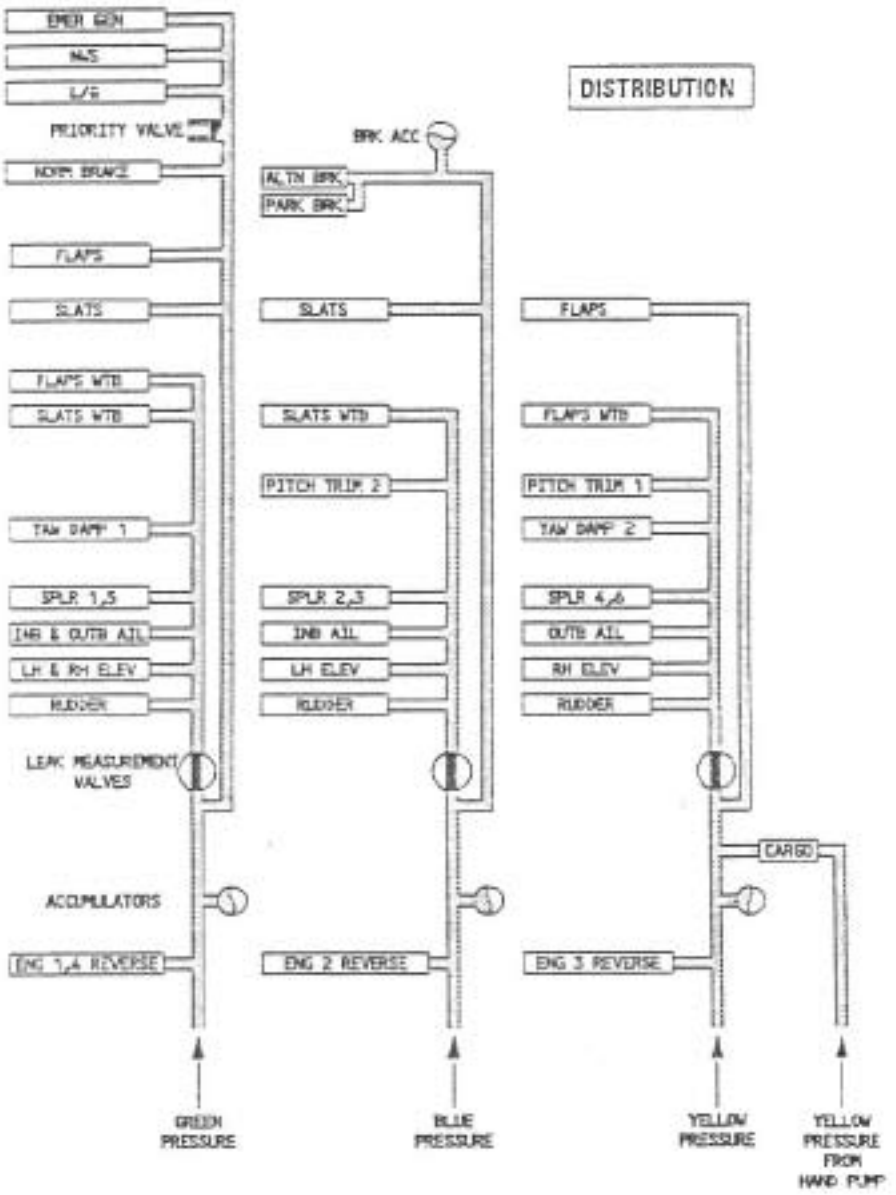
The location at which the missing pin was found is shown by the arrow adjacent to the beach.

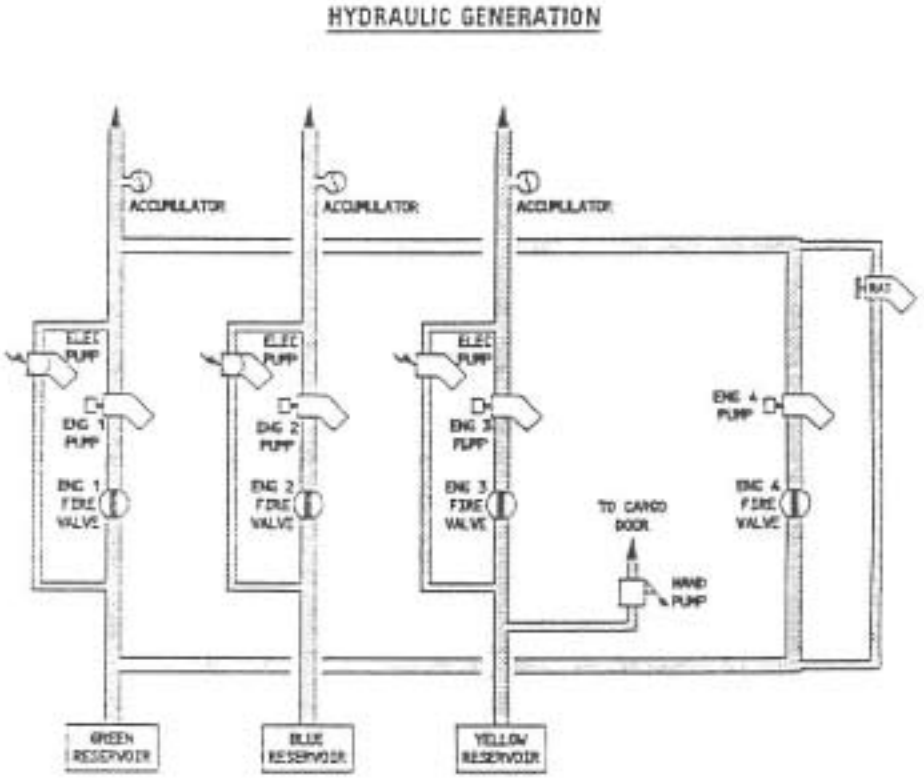
APPENDIX 6
EW/C97/11/1
G-VSKY

The No. 6 torque pin recovered from the departure end of runway 24L at Los Angeles Airport

APPENDIX 7
EW/C97/11/1
G-VSKY

View of the damage to the keel beam area. Note the damage to the honeycomb panel and distortion of the nearer edge member at the bottom of the picture

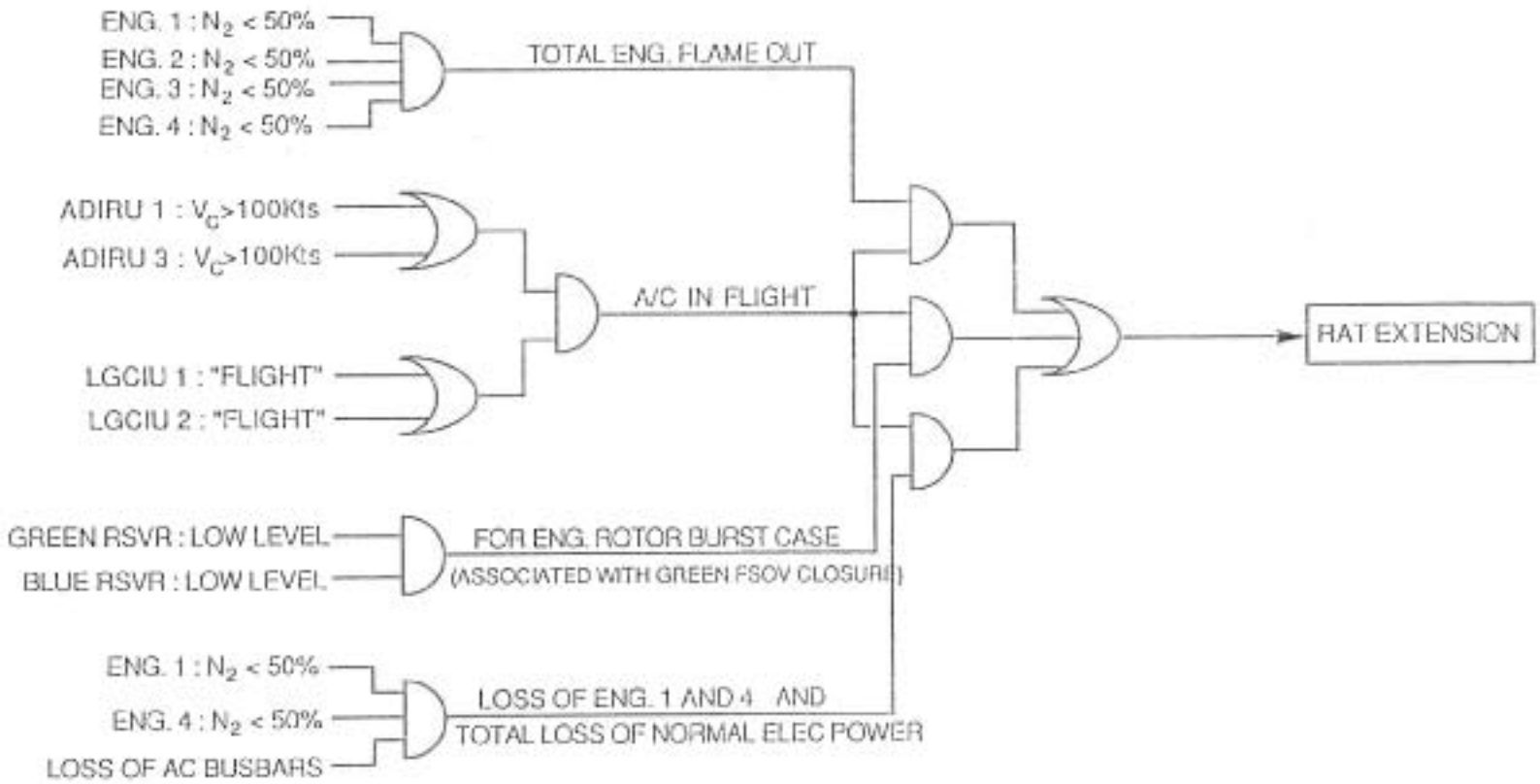




SCHEMATIC DIAGRAM OF THE
A340 HYDRAULIC SYSTEM

APPENDIX 9
EW/C97/11/1
G-VSKY

VIR – A340 G-VSKY landing incident



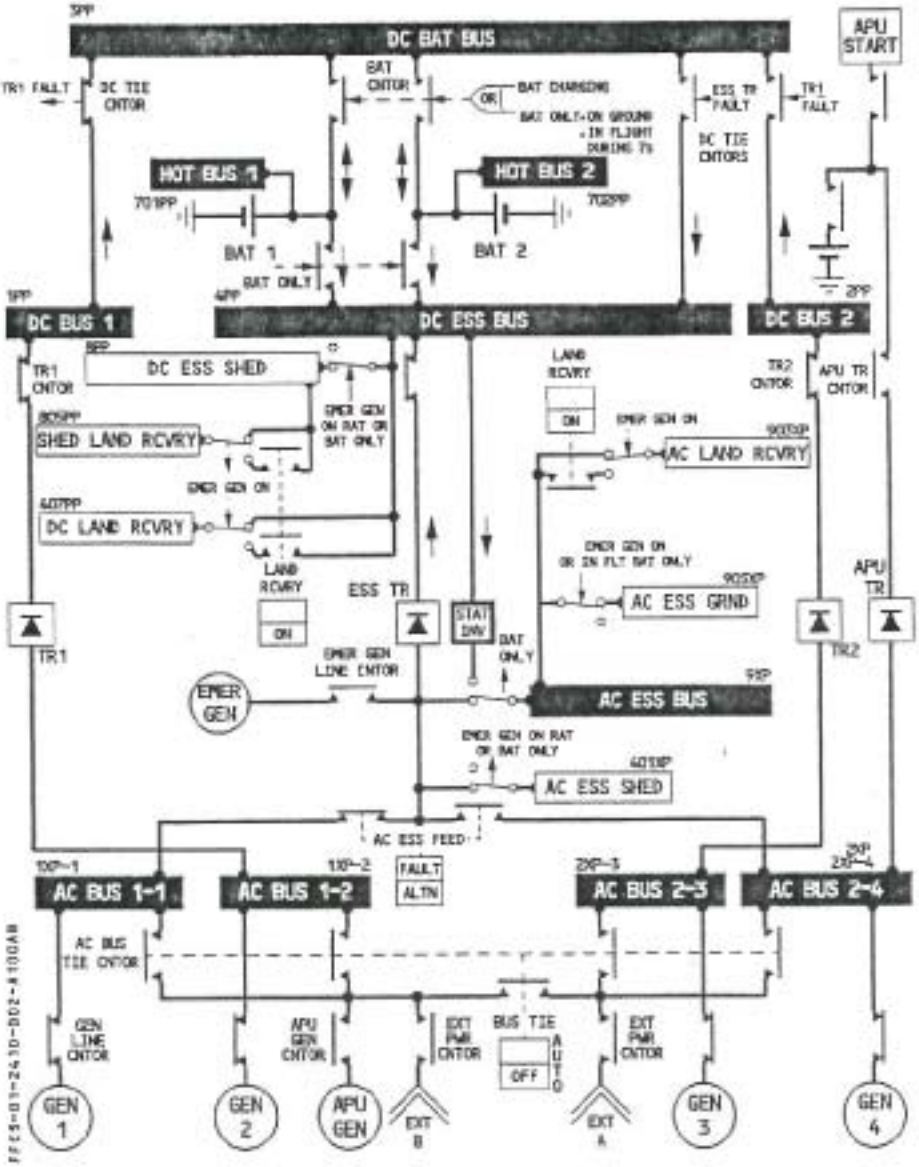
A340 RAT - AUTOMATIC DEPLOYMENT CONTROL (PRINCIPLE)

VIR – A340 G-VSKY landing incident

Rate limitation on GREEN hydraulic surfaces

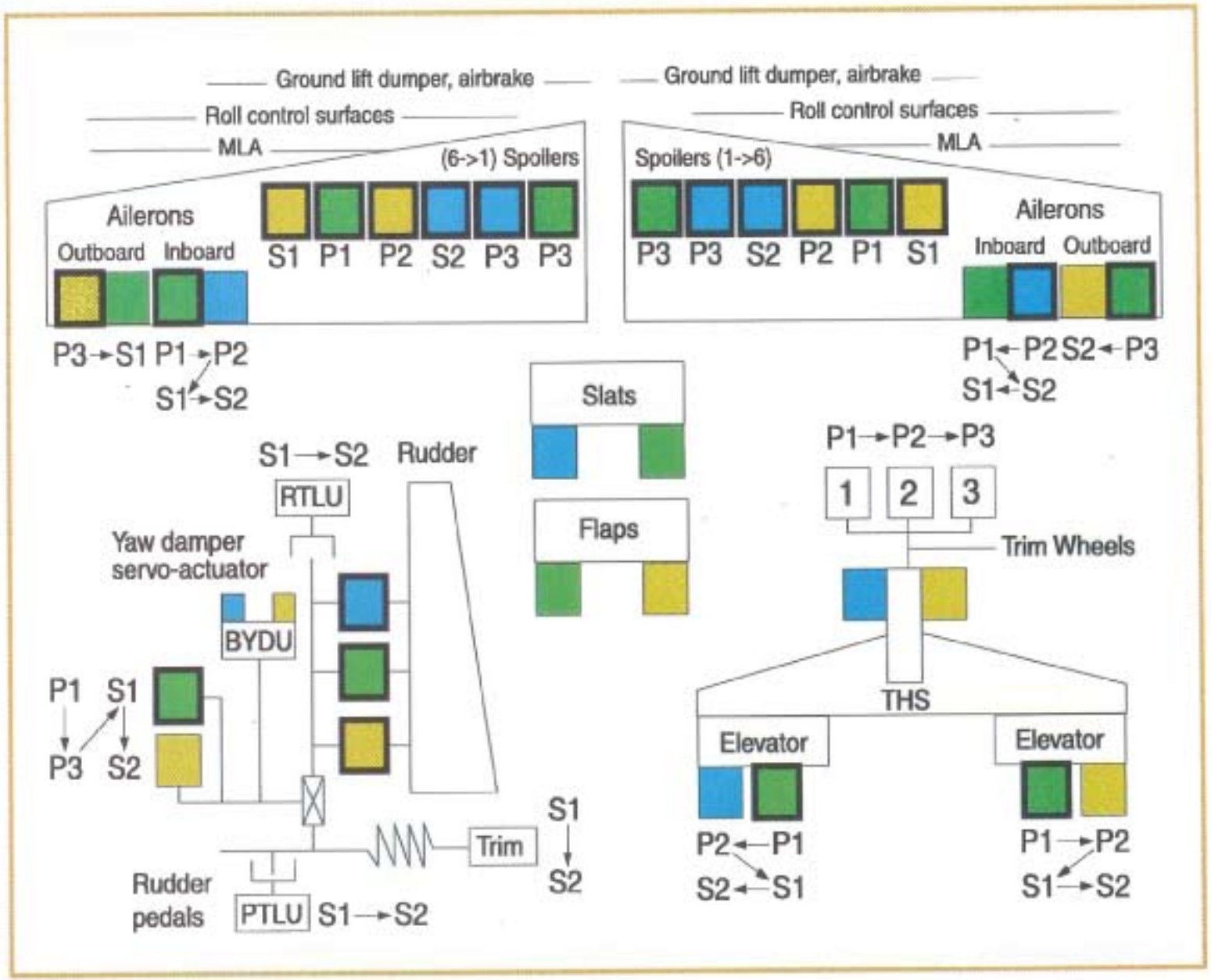
- The objective is to keep the GREEN hydraulic flow demand consistent with the RAT performance

- It is activated when:
  - RAT deployed and BLUE hydraulic low pressure
  - RAT deployed and YELLOW hydraulic low pressure
  - RAT deployed and ENG 1 and ENG 4 out



ELECTRICAL POWER SCHEMATIC DIAGRAM

APPENDIX 11
EW/C97/11/1
G-VSKY



PRIM & SEC Computer Command Paths and Flying Control Hydraulic Supplies

Blue, Green, Yellow
Hydraulic circuits

P
Primary computer

S
Secondary computer

shaded area indicates priority of servo controls

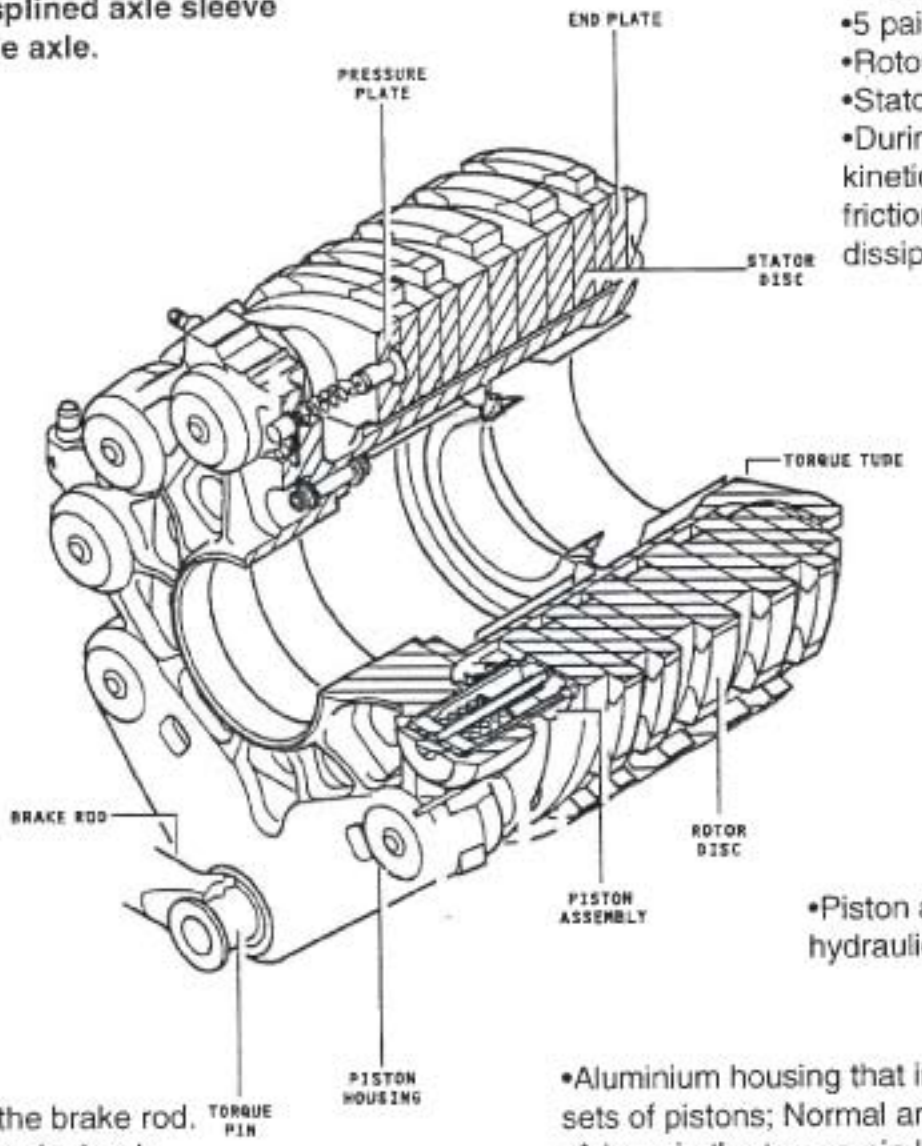
RTLU
Rudder Travel Limitation Unit

PTLU
Pedal Tavel Limitation Unit

BYDU
Back up Yaw Damper Unit

MLA
Manoeuvre Load Alleviation

The brake is mounted on a splined axle sleeve that extends the length of the axle.



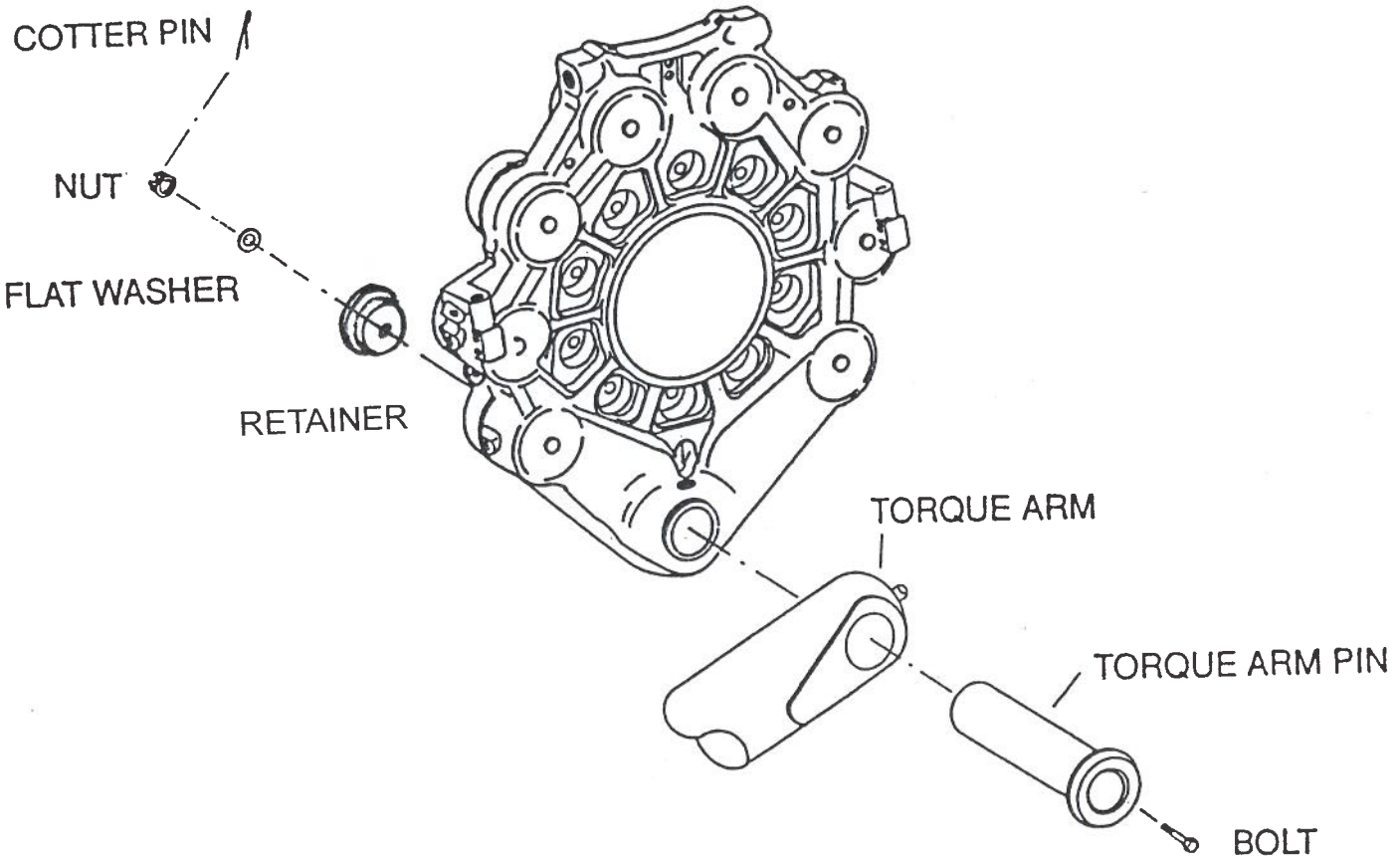
Heat Pack:-
- 5 pair carbon heat pack
- Rotors are engaged to the wheel
- Stators are engaged to the torque tube.
- During braking the heat pack transfers kinetic energy to heat energy due to the friction at each interface and subsequently dissipates the heat energy to the surrounding structure

- Steel torque tube that holds the stator discs stable in the heat pack.
- Transmits the brake torque from the stator discs to the piston housing.
- Leg supports tube on axle sleeve.

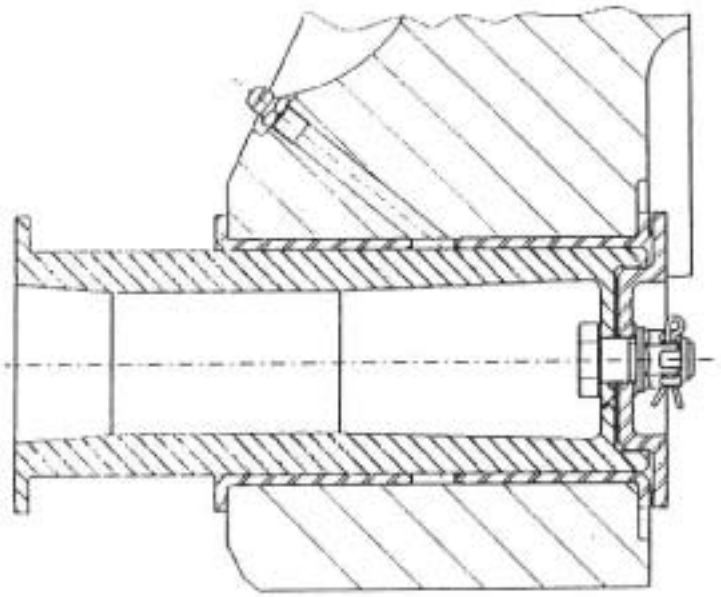
- Piston assemblies compress heat pack when hydraulic pressure is supplied.

- Connects the piston housing to the brake rod.
- Transmits all torque generated brake loads.

- Aluminium housing that incorporates two independent sets of pistons; Normal and Alternate.
- A bore in the torque pin lug is bushed to house the torque pin.

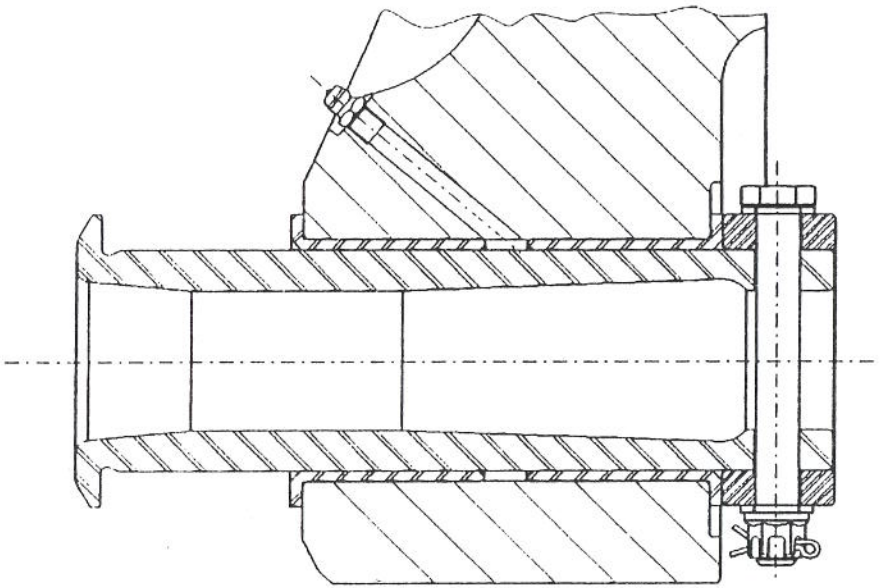


PISTON HOUSING AND TORQUE PIN ASSEMBLY FITTED TO G-VSKY



IGW pin assembly drawn. EIS standard as fitted to G-VSKY was similar except for a reduced wall thickness within the pin, and the use of smaller 1/4 inch diameter fasteners.

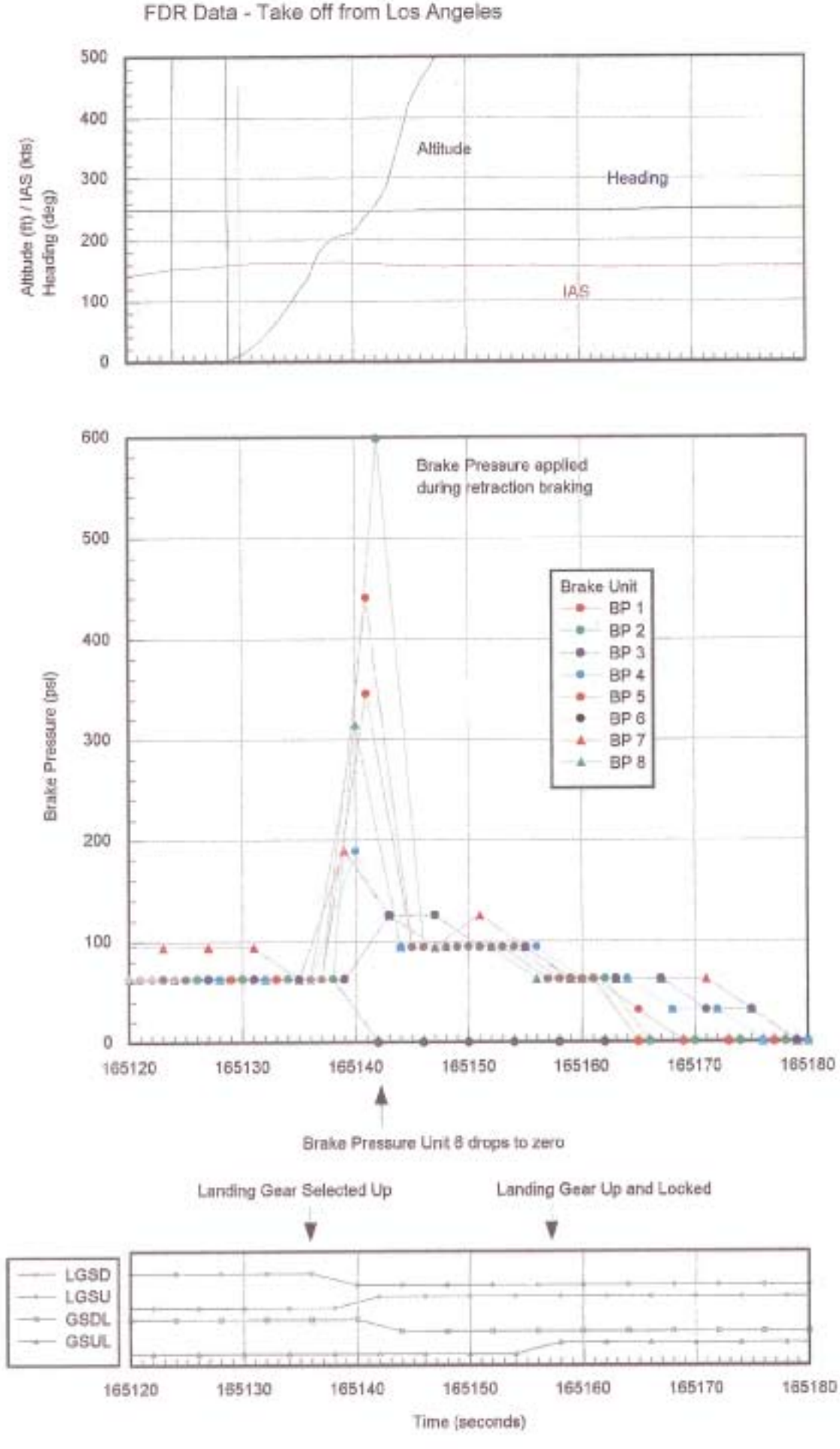
EIS (ENTRY INTO SERVICE) AND IGW
(INCREASED GROSS WEIGHT) TORQUE PINS



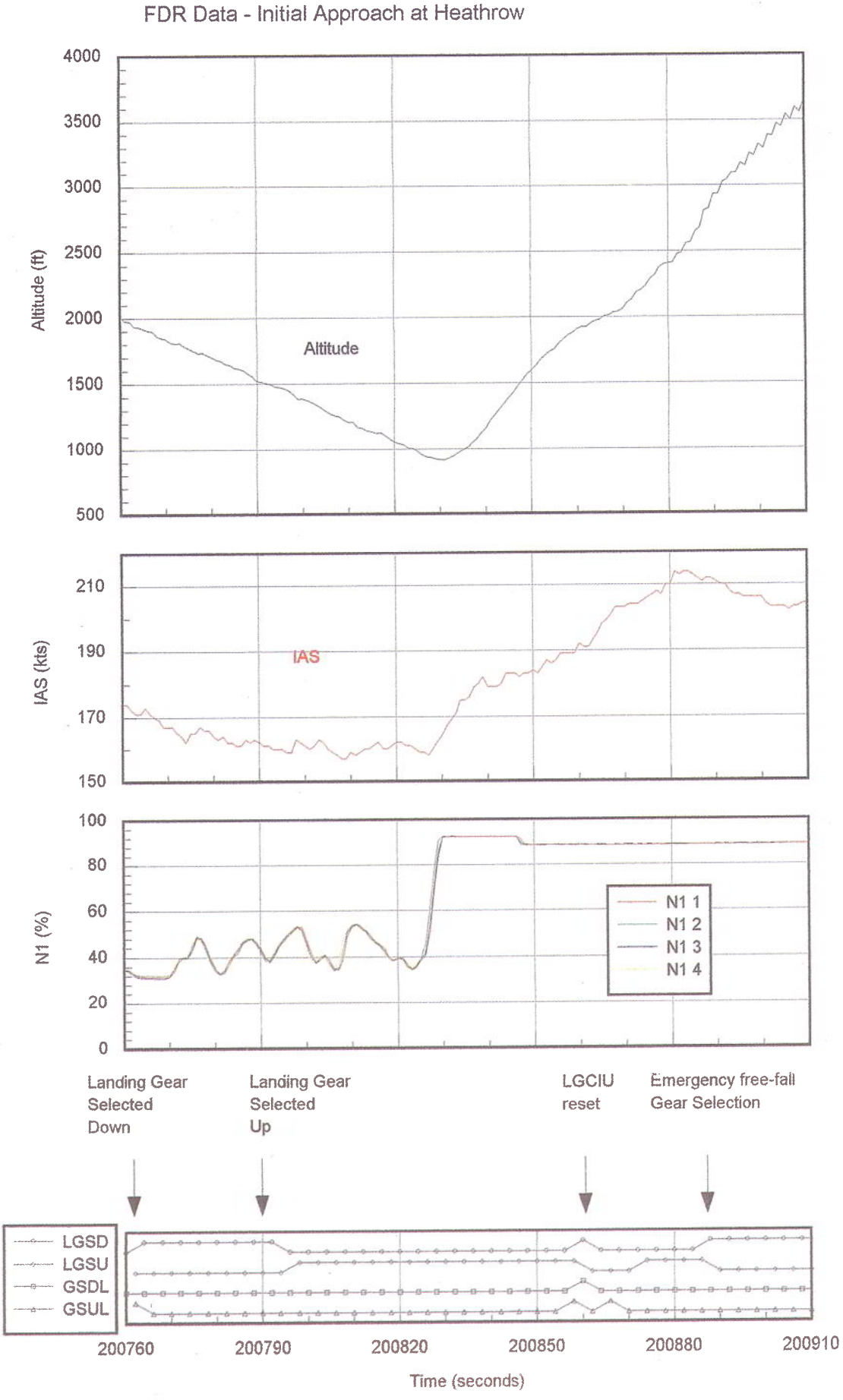
REDESIGNED PIN ASSEMBLY EMPLOYING STRONGER PIN
AND COLLAR TYPE RETENTION DEVICE

TORQUE PIN ASSEMBLIES

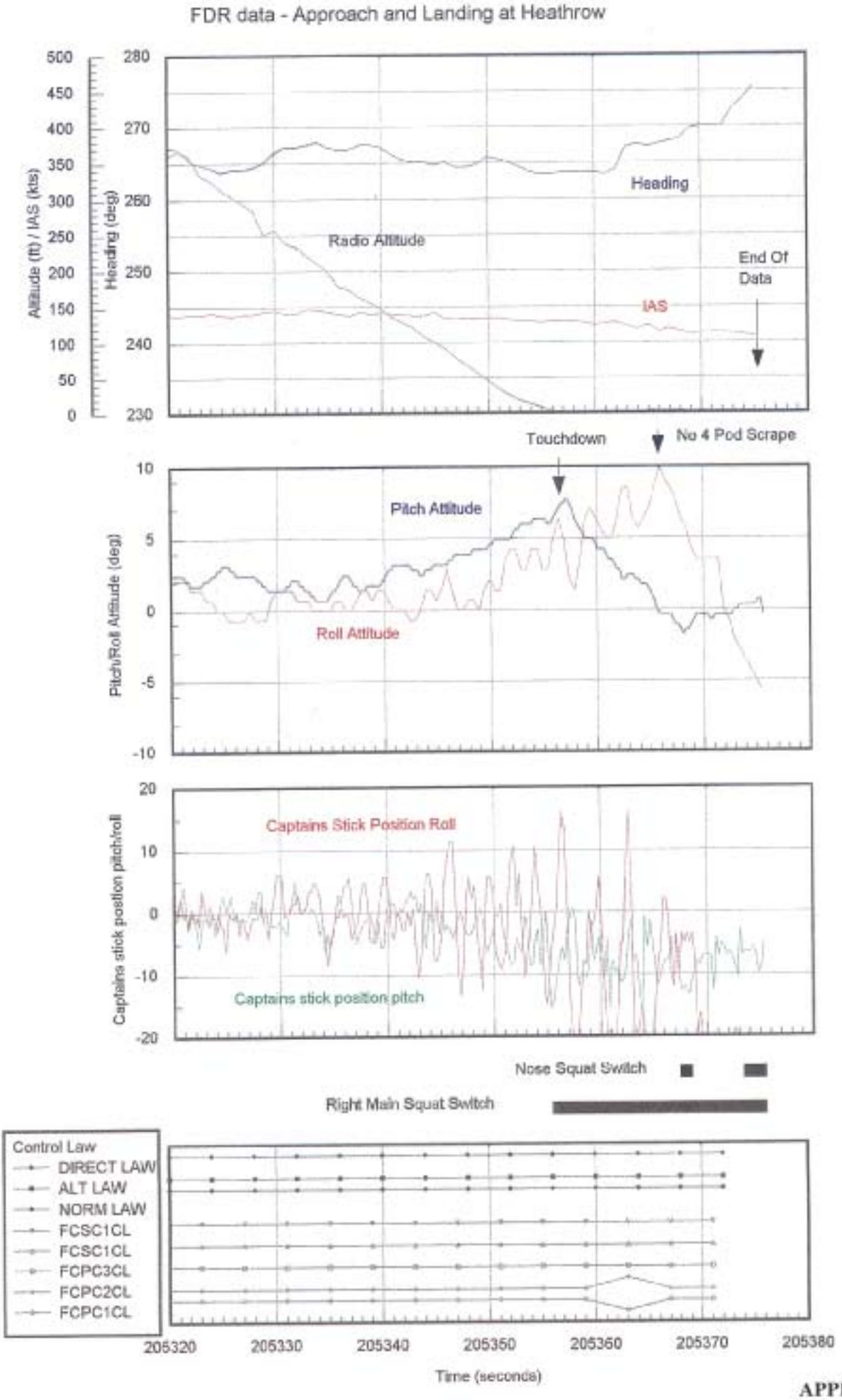
Left	The redesigned pin, collar and retaining parts
Centre	The increased Gross Weight Standard
Right	The Entry Into Service Standard



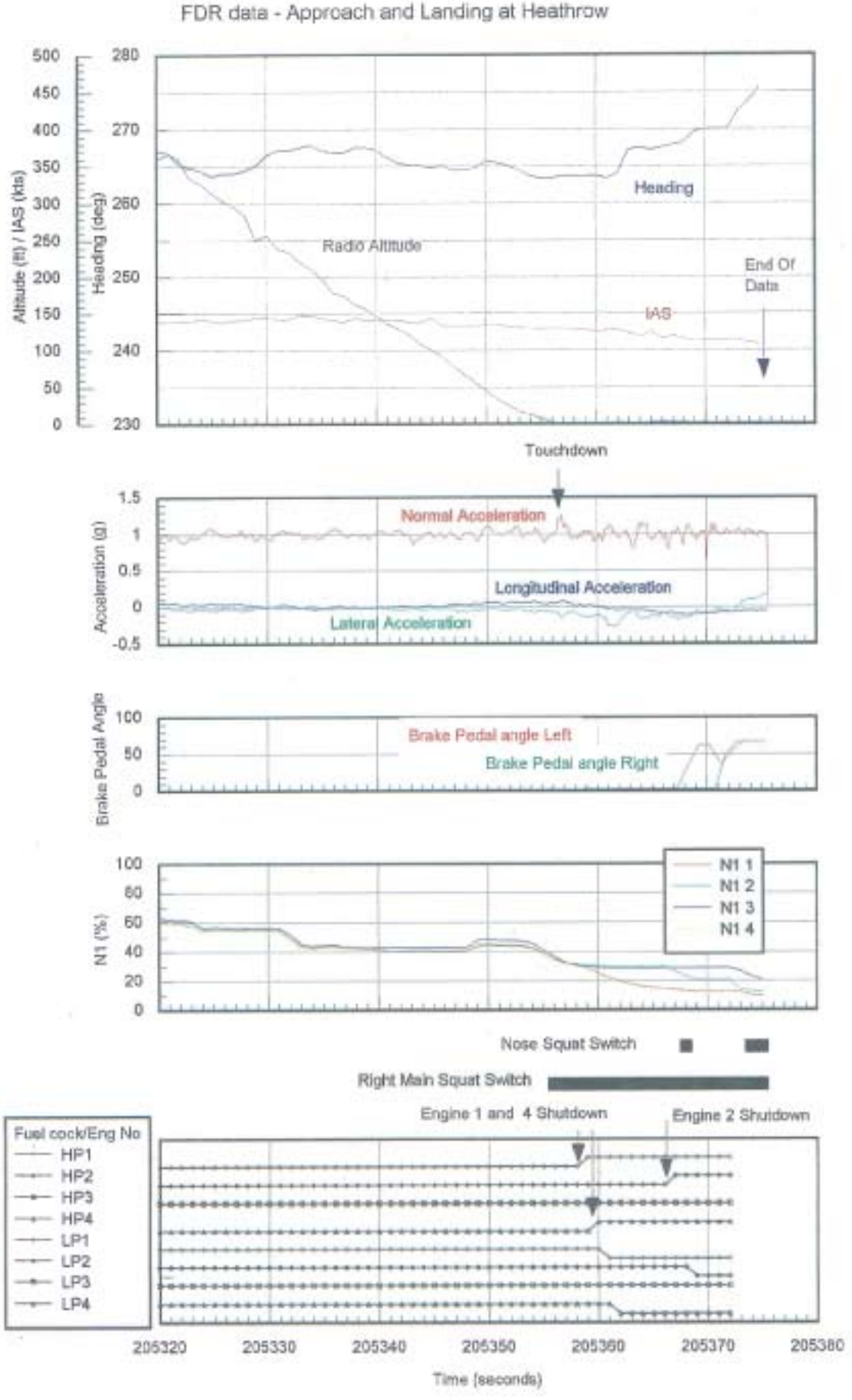
APPENDIX 15
FIGURE 1
EW/C97/11/1
G-VSKY



APPENDIX 15
FIGURE 2
EW/C97/11/1
G-VSKY



APPENDIX 15
FIGURE 3
EW/C97/11/I
G-VSKY



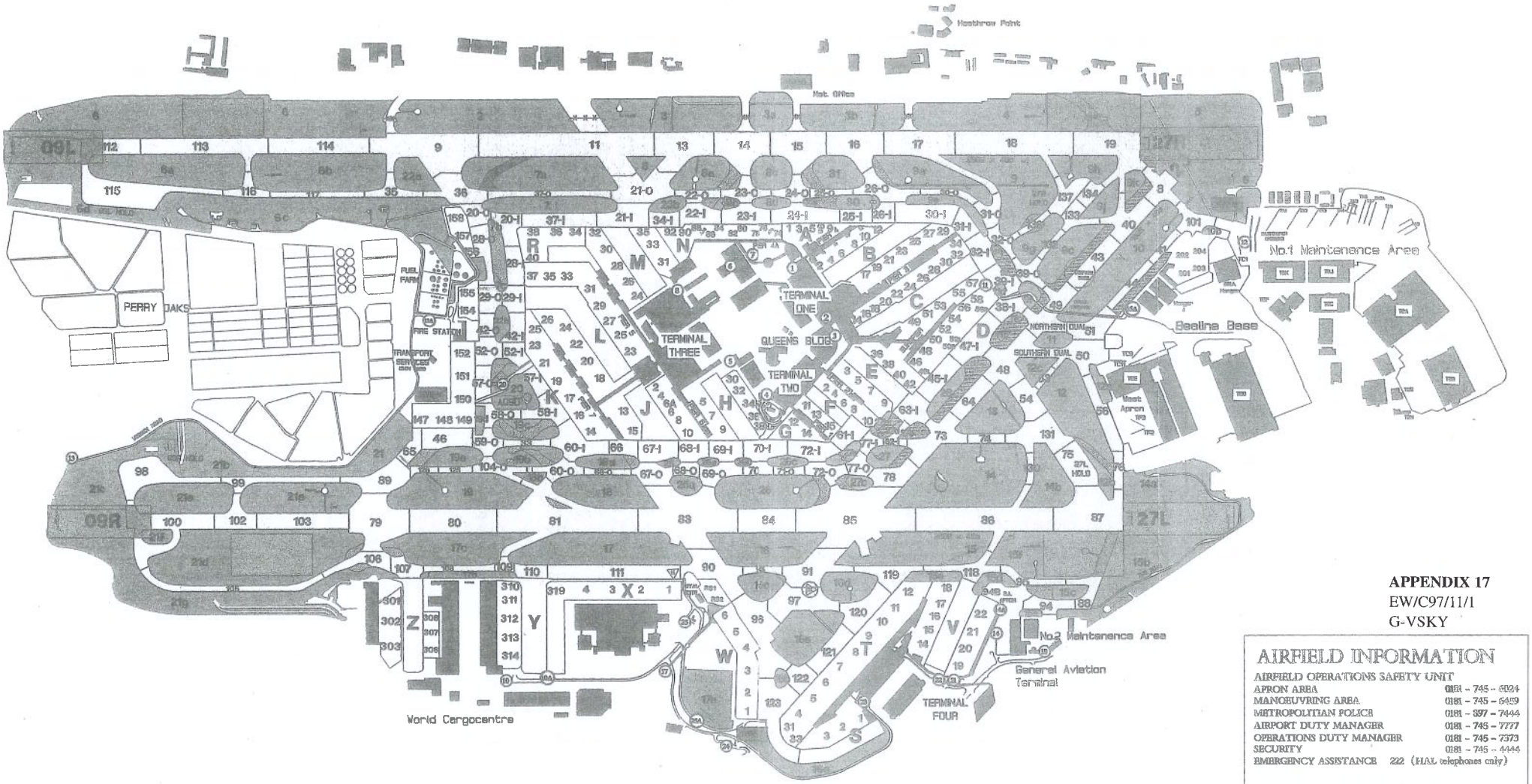
APPENDIX 15
FIGURE 4
EW/C97/11/1
G-VSKY

UTC	FDR Time to End	FDR Indications	PFR CMC System Fault/Operation (Only relevant warnings included)
0502		**Recorded Aircraft Weight 233540 Kg**	ENGINE START
0509	11:10:40	Gear selected 14 seconds after take off from LAX No brake pressure recorded on Brake 6 on retraction braking	L/G DOORS NOT CLOSED Warning triggered if landing gear doors are not closed within 30 seconds SNSR BRK TEMP (6GW2) Fault from the brake temp sensor on Brake 6
0510			L/G SYS DISAGREE Centre Landing Gear uplock sensors disagreement for more than 2s but less than 5s
1504	1:16:54	Initial Approach Gear Selected Down Height 1973 ft, CAS 172 kts	LANDING GEAR NOT DOWN LOCKED triggered when all landing gear not locked down SERVOVALVE-NORM BRK (12GG1) no pressure seen at Brake 6 during pre-land test
	1:16:18	Gear Selected Up Height 1400 ft, CAS 163 kts	LANDING GEAR NOT UPLOCKED triggered after gear up selection – brake rod jam
	1:15:46	Go-around min altitude 900 ft **Recorded Aircraft Weight 166886 Kg**	prevented gear from uplocking or downlocking
1505 1506	1:15:18	LGCIU system reset by crew Alt 2600 ft, CAS 190 kts	L/G LGCIU 1+2 FAULT L/G LGCIU 2 FAULT generated by system resets

UTC	FDR Time to End	FDR Indications	PFR CMC System Fault/Operation (Only relevant warnings included)
1507	1:14:46	Alt 4000 ft, CAS 212 kts Gear selected down – emergency system lowering	LGCIU 1 FAULT SELCTOR VALVE – NWS L/G FREE FALL BSCU fault - loss of Nose Wheel Steering as no hydraulic pressure available. Hydraulic pressure is supplied by Nose Landing Gear doors closed Hydraulic line. Doors not closed after gear free fall
	1:08:46	Gear Selected up Aircraft entered holding pattern at Alt 8000 ft, 190-200 kts	
1510			PROX SNSRS LGCIU detects disagreement between status of LH gear doors
1517	1:03:26	LGCIU system reset by crew	LGCIU 2 (05GA2) BUS 2/ LGCIU 1 (05GA1)
1520	59:49	LGCIU system reset by crew	
	59:03	Gear selected down	
	56:50	Gear selected up	
	54:17	LGCIU system reset by crew	
1528			PROX SNSRS LGCIU detects disagreement between status of RH gear doors
	51:31	LGCIU system reset by crew	
	45:54	Gear selected down	
1535		**Recorded Aircraft Weight 162727 Kg**	
1538			BSCU CH 1 FAULT – no relevance to brake rod disconnect. Power interrupt with steering inactive suspected
	42:20	Gear selected up	

UTC	FDR Time to End	FDR Indications	PFR CMC System Fault/Operation (Only relevant warnings included)
	26:18	Gear selected down	
	20:03 19:38	Fly past of Tower Minimum Height 220ft, 155 kts **Recorded Aircraft Weight 162052 Kg** Power increased to Go-around	
1601			FUEL L WING TK LO LVL FUEL L+ R WING TK LO LVL Fuel Low Level Warnings
	15:20	Aircraft performed steep turn to right up to 50° Roll right/ 1.46 Normal G Alt 2000ft, 160 kts	
1605		**Recorded Aircraft Weight 158946 Kg**	FUEL L+ R CTR TK LO PR Fuel Low Pressure Warning
1607			FUEL R CTR PUMP LO PR Fuel Pump Low Pressure Warning
	10:10	Gear selected up Level at Alt 3500ft, 160 kts Aircraft orbit to right	
	9:02	Alt 3500 ft 156 kts Gear selected down – emergency system lowering	
1615			FUEL PUMPS 2+STBY LO PR FUEL PUMPS 3+STBY LO PR Fuel Pumps Low Pressure Warning

UTC	FDR Time to End	FDR Indications	PFR CMC System Fault/Operation (Only relevant warnings included)
	3:30	Final approach	
	19s	Touchdown G 1.262 Pitch Attitude 7.4°, Roll Attitude +4.9° RWD 129 kts CAS, Heading 264° RH Squat compressed	
1620	18s 17s	Engine 1 shutdown (from HP fuel Valve Indication) Engine 4 shutdown	ENG 1 SHUT DOWN ENG 4 SHUT DOWN
	10s	Pitch 1.1°, Roll 9.8° RWD 120 kts CAS, Heading 268° Engine 4 pod scrape Engine 2 shutdown (from HP Cock Indication)	
	8s	Indication of Nose Squat Switch Compressed for one second Pitch –1.76°, Roll 6.32° RWD, 115 kts CAS, Heading 268°	
	4s	Engine 3 shutdown (from HP Cock Indication)	
	3s	Pitch 0.35°, Roll –2.81° LWD 110kts CAS, Heading 272° Nose Landing gear compressed Indication of brake pedal angle deflection.	
	0s	End of recording Pitch 0.35°, Roll –4.21° LWD 107kts CAS, Heading 276° No hydraulic low pressure discretes showing hydraulic systems still pressurised. Flight Control Computer 1 discrete switched to FCC2 (PRIM 1 not operative) **Recorded Aircraft Weight 157992 Kg**	



APPENDIX 17
EW/C97/11/1
G-VSKY

AIRFIELD INFORMATION

AIRFIELD OPERATIONS SAFETY UNIT

APRON AREA	0181 – 745 – 6024
MANOEUVRING AREA	0181 – 745 – 6459
METROPOLITAN POLICE	0181 – 397 – 7444
AIRPORT DUTY MANAGER	0181 – 745 – 7777
OPERATIONS DUTY MANAGER	0181 – 745 – 7373
SECURITY	0181 – 745 – 4444
EMERGENCY ASSISTANCE	222 (HAL telephones only)

SPEED RESTRICTIONS

ALL AIRSIDE ROADS 20mph

CARGO TUNNEL, LINK ROADS AND CONTROLLED CROSSINGS 30mph

WORKS PERMITS

All contractors working on the airfield, airside roads, aircraft stands and the manoeuvring area MUST be in possession of a valid works permit.

Produced by D &TS, Bldg 216, HAL.

The information shown is the most up to date and accurate available from records at the time of print.
Updates are carried out on a continual basis. To help in this process please notify HAL D&TS on XXXX of any change or inaccuracy.
While every effort is made to ensure the accuracy of the data, HAL D&TS cannot accept the checking of data before use.

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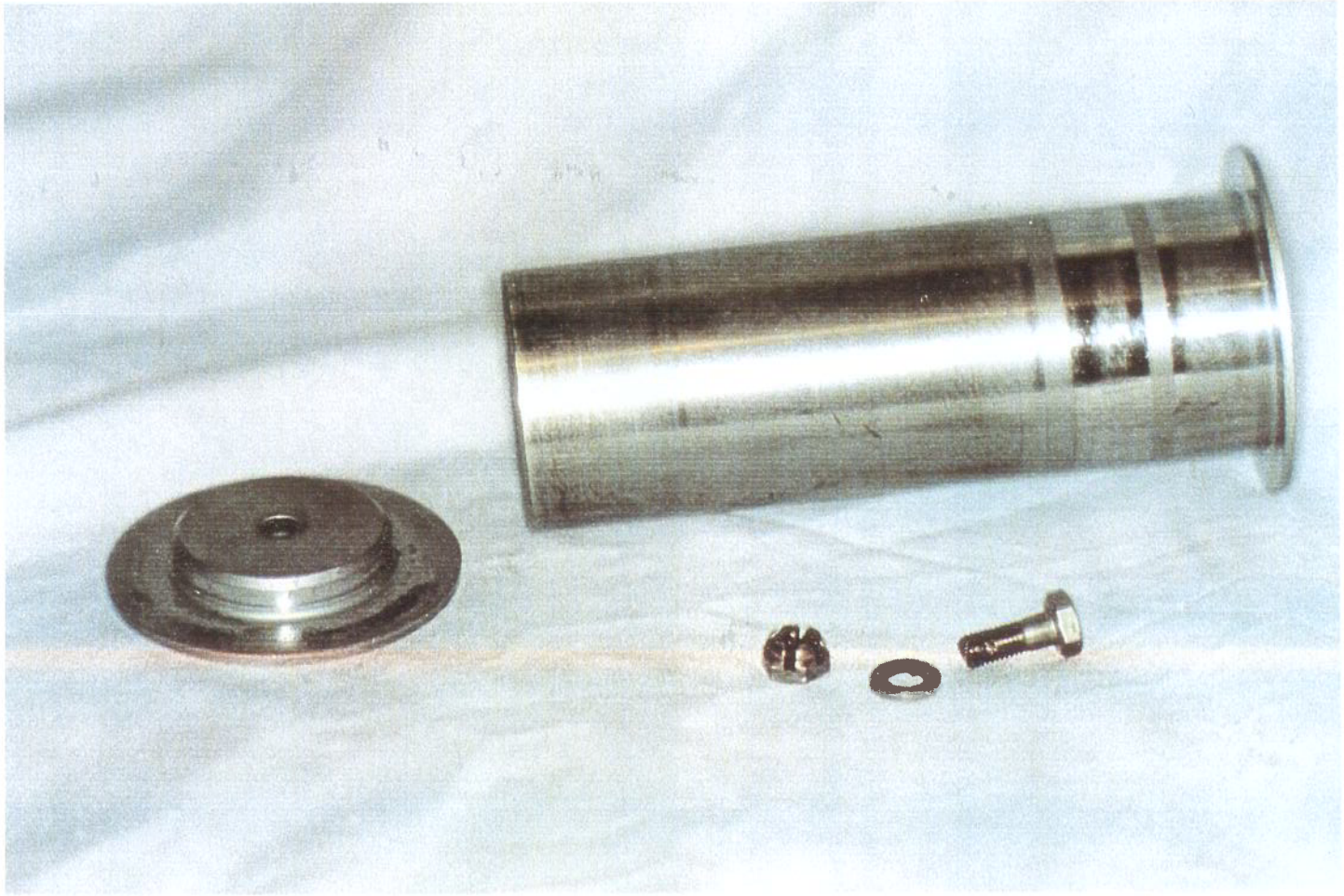
KEY

- ILS Restricted Areas
- Emergency Vehicle Rendezvous Meeting Point
- To be Constructed in 1995
- Disused Areas
- Provisional Location of Helicopter Aiming Point
- Airfield Operations Safety Unit
- Control Post



Pin, retainer and fasteners removed from No. 5 position,
adjacent to missing parts at No. 6 brake position

Plate A1

X1.24

View on the outer end of the pin and the inner end of the end cap from the No. 5 position on Virgin A340 Airbus registration G-VAEL showing extensive interface corrosion. The position of the radial crack is marked in black ink

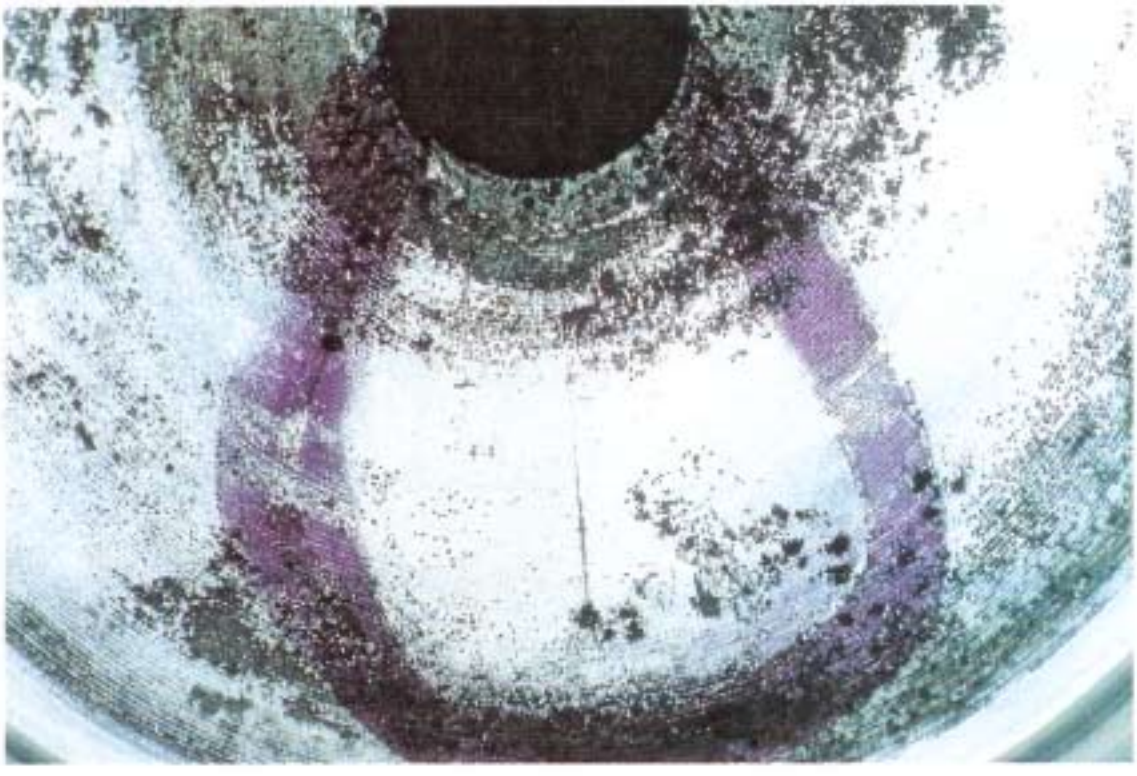


Plate A2

X6.43

Close up of the radial crack marked on Plate 1

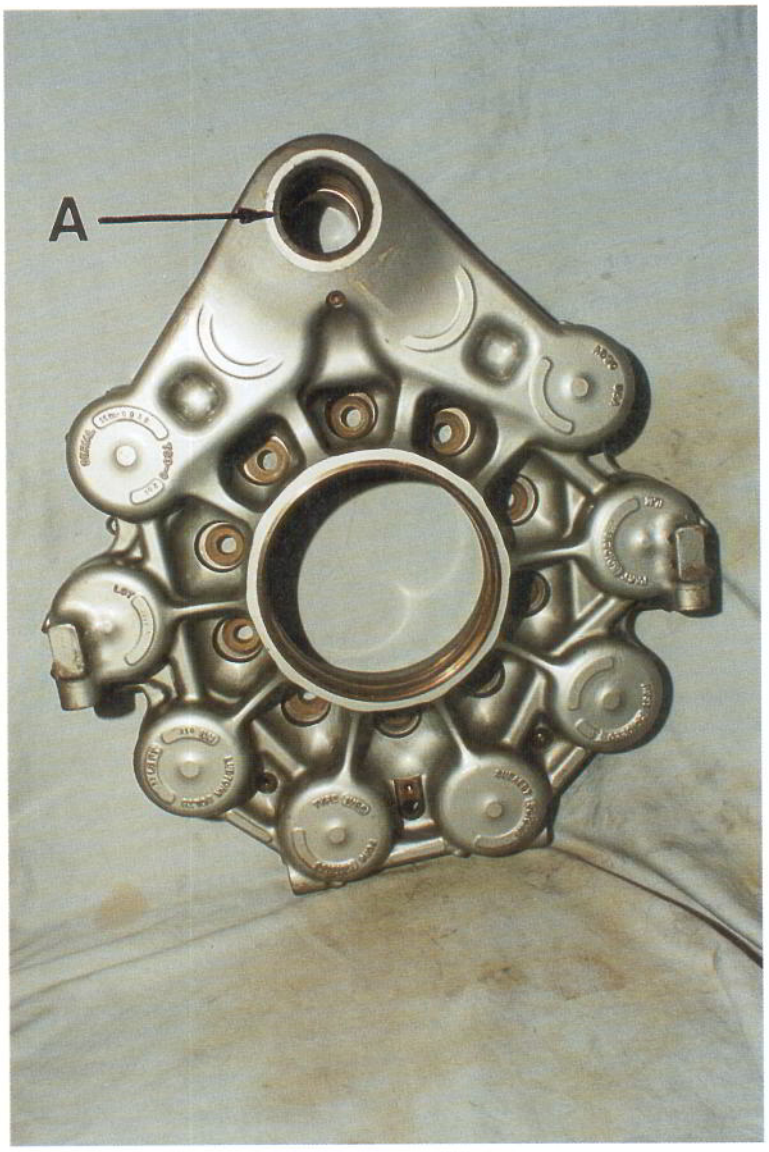


Plate 1

X0.17

Brake plate reported to be from the position on the left hand main undercarriage on Virgin Airbus G-VSKY from which the brake reaction rod became detached. The plate was identified Part 5010218-1 ILM, SUBASSY 5010219-1, Serial No. SEP91-0039, TSO-0 26C, AB80-USA, TYPE IVBQ FORG 5010169

Plate 2

X1.48

Plate 3

X1.48

Two views on the bush from position A on Plate 1. The pattern of the debris and marking conforms to the general pattern of the marking within the hole shown on Plates 4 & 5. The marking in the hole is positioned where arrowed on Plate 1.

Plate 4

X2.63

Plate 5

X3.5

The marking within the hole where arrowed on Plate 1 shown at two different magnifications. It can be seen that the original machining marks have not been removed even though the hole was 0.009 ins oval. The maximum diameter was at this position

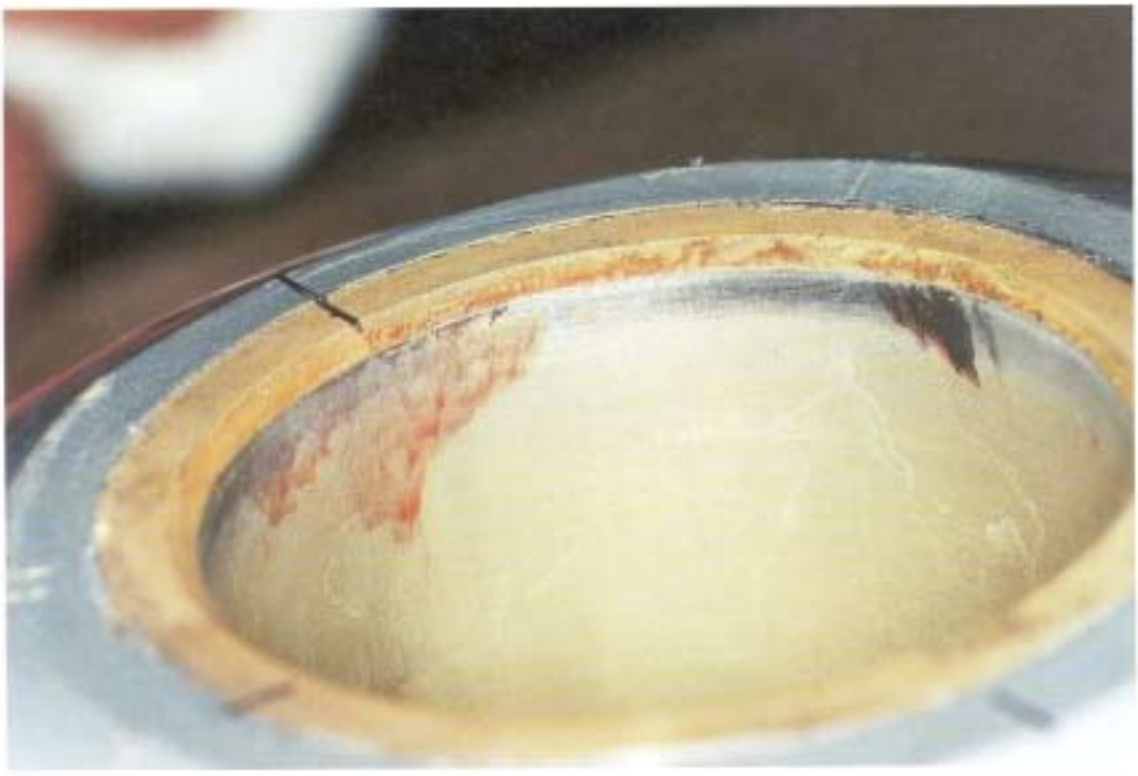


Plate 6

X2.21

Brake Plate Serial No. 0111 – April '94 – Hong Kong incident – end of hole remote from brake pack – start of 'compression' mark around rim.
Photograph taken at ABS, Slough immediately after removal of bush

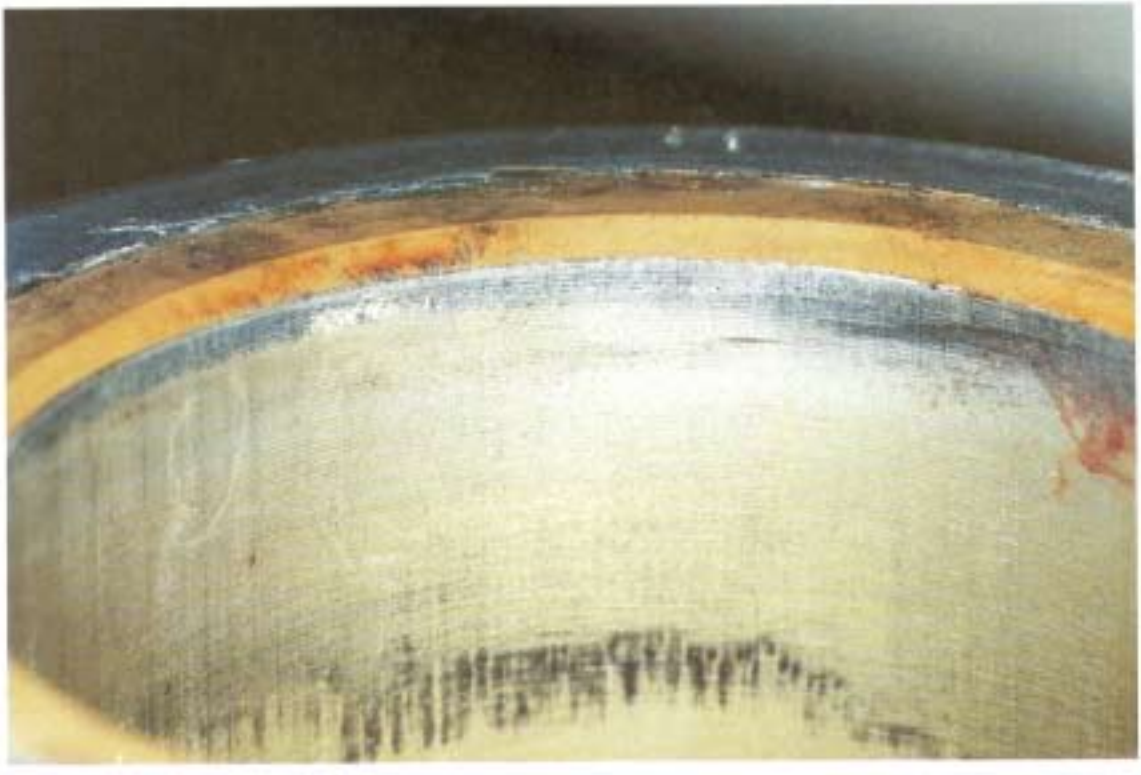
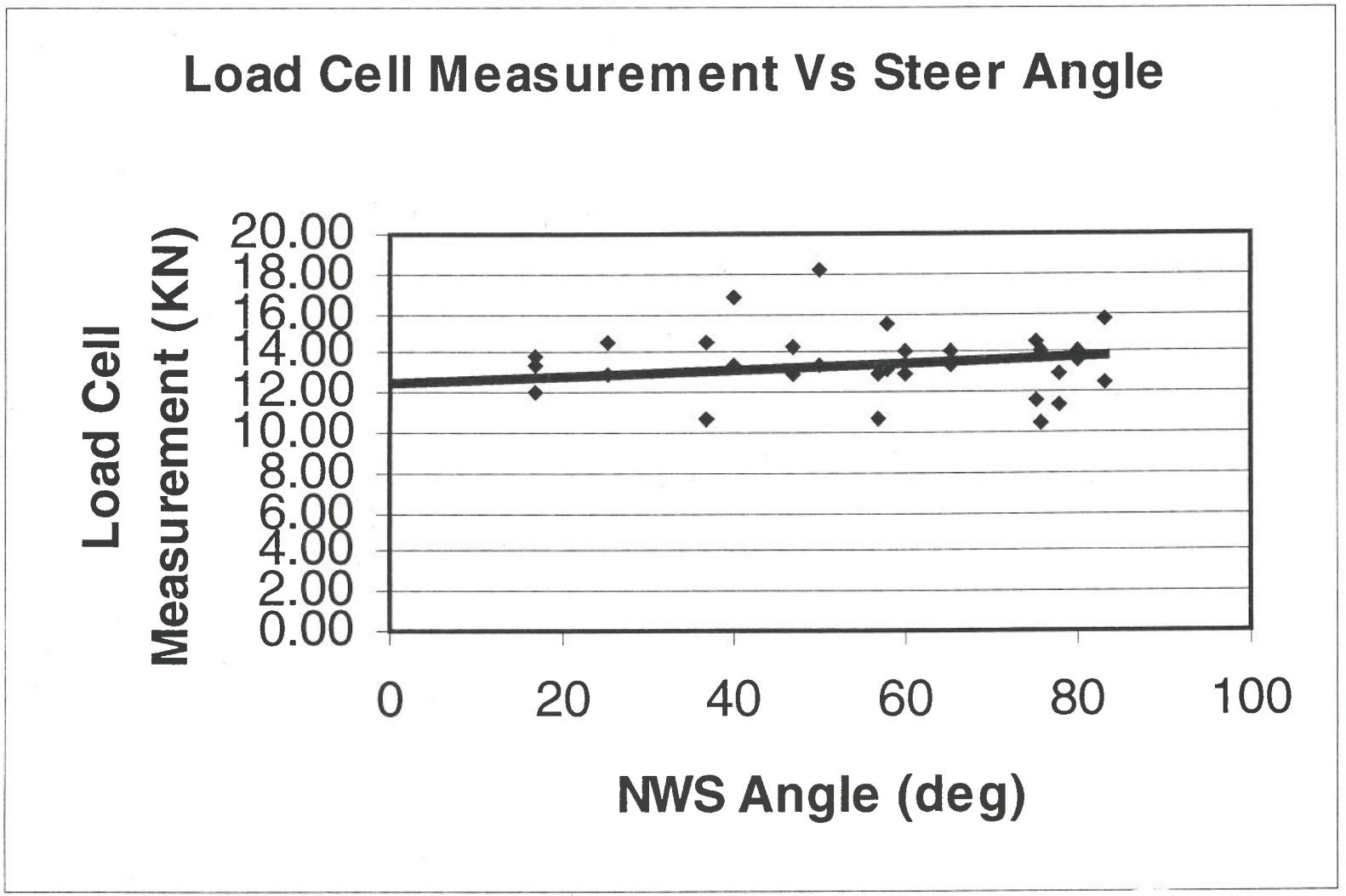


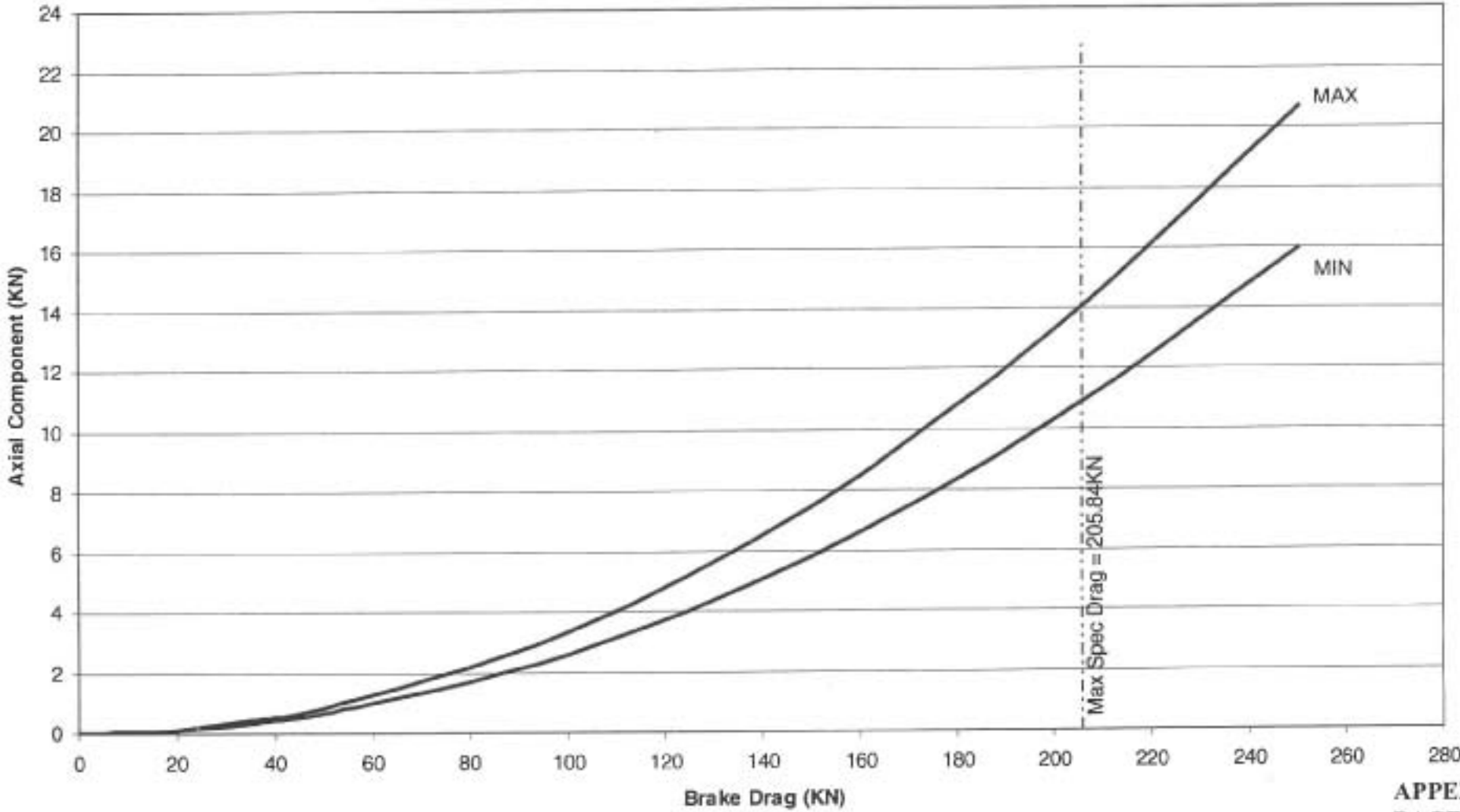
Plate 7

X2.82

As Plate 6 but further round hole


Load Cell Measurement Vs Steer Angle
Load Cell Measurement (KN)
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0
20
40
60
80
100
NWS Angle (deg)

Estimate of Axial Component due to Brake Drag



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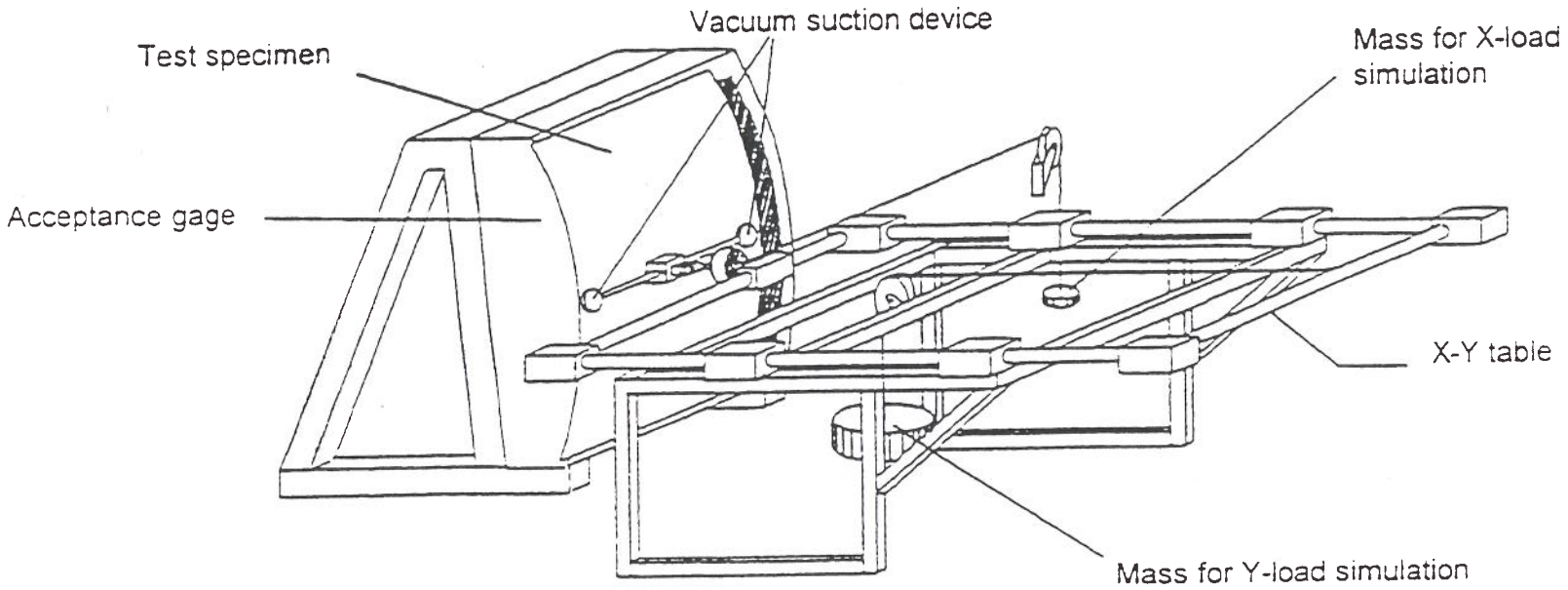
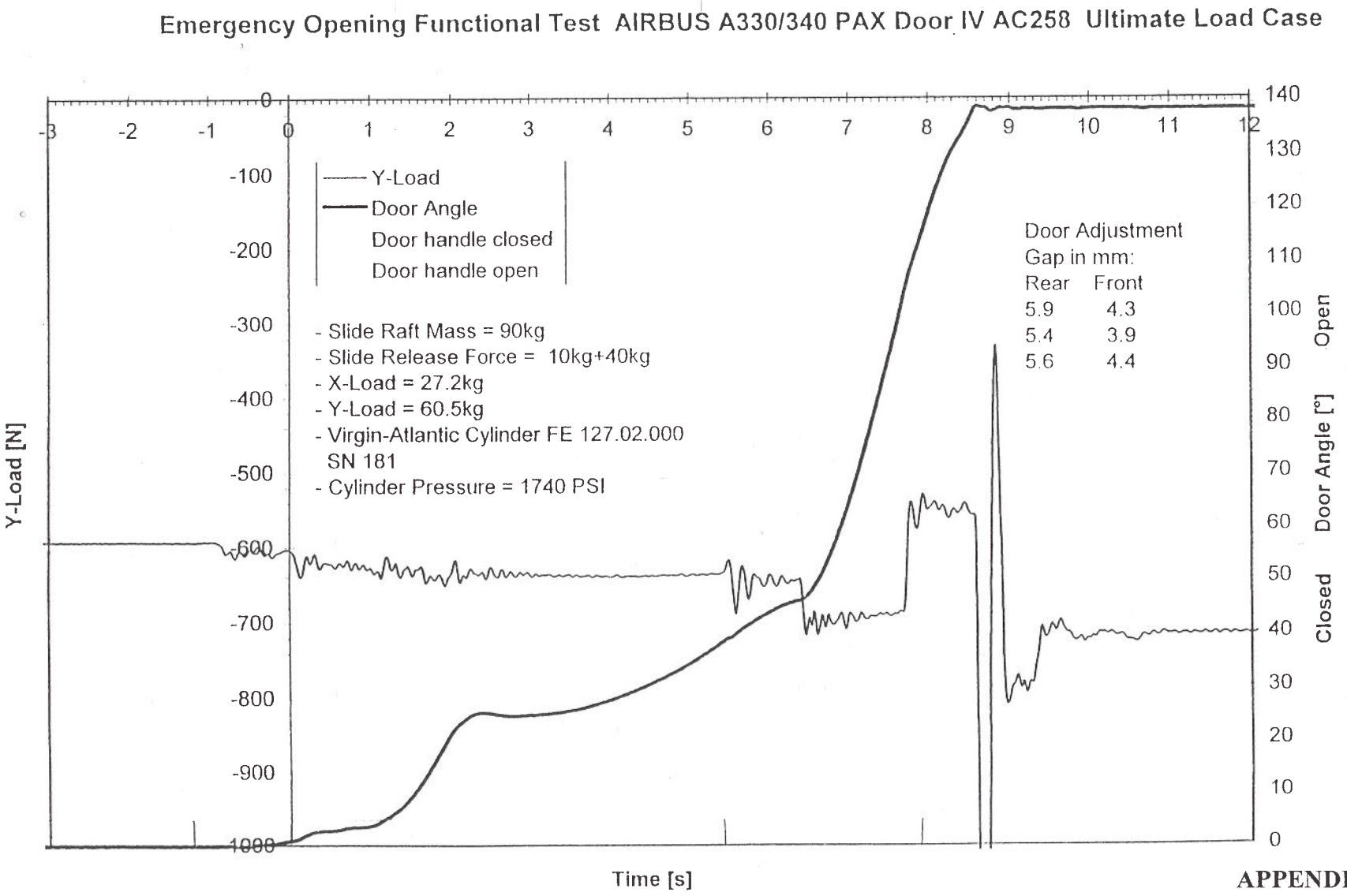


DOOR TEST RIG

Test No.	Y-Load [daN]	X-Load [daN]	Opening Time [s]	Load Case	Diagram No.	Door locked?	Remarks
02	0	0	2.4	Zero Load	1	Yes	„Virgin-Atlantic" Cylinder SN 181
05	60.5	24.2	7.8		2	Yes	„Virgin-Atlantic" Cylinder SN 181
07	60.5	27.2	9.2	Ultimate Load	3	Yes	„Virgin-Atlantic" Cylinder SN 181
08	60.5	27.2	9.2	Ultimate Load	4	Yes	„Virgin-Atlantic" Cylinder SN 181
09	60.5	27.2	8.1	Ultimate Load	5	Yes	„Virgin-Atlantic" Cylinder SN 181
10	60.5	27.2	8.6	Ultimate Load	6	Yes	„Virgin-Atlantic" Cylinder SN 181
12	22.1	2.3	4.0	„Virgin Load"	7	Yes	„Virgin-Atlantic" Cylinder SN 181
13	22.1	2.3	4.1	„Virgin Load"	8	Yes	„Virgin-Atlantic" Cylinder SN 181
14	22.1	2.3	4.1	„Virgin Load"	9	Yes	„Virgin-Atlantic" Cylinder SN 181
15	22.1	2.3	4.2	„Virgin Load"	10	Yes	„Virgin-Atlantic" Cylinder SN 181
16	22.1	2.3	4.4	„Virgin Load"	11	Yes	„Virgin-Atlantic" Cylinder SN 181
17	60.5	27.2	6.7	Ultimate Load	12	Yes	Ratier Cylinder FE 256 S/N 569
18	60.5	27.2	6.3	Ultimate Load	13	Yes	Ratier Cylinder FE 256 S/N 569
19	60.5	27.2	8.0	Ultimate Load	14	Yes	Ratier Cylinder FE 127.900.N1 (A300)
20	60.5	27.2	7.9	Ultimate Load	15	Yes	Ratier Cylinder FE 127.900.N1 (A300)
21	60.5	27.2	8.6	Ultimate Load	16	Yes	Ratier Cylinder FE 256.000 Protorype1
22	60.5	27.2	8.3	Ultimate Load	17	Yes	Ratier Cylinder FE 256.000 Protorype1

TEST RESULTS



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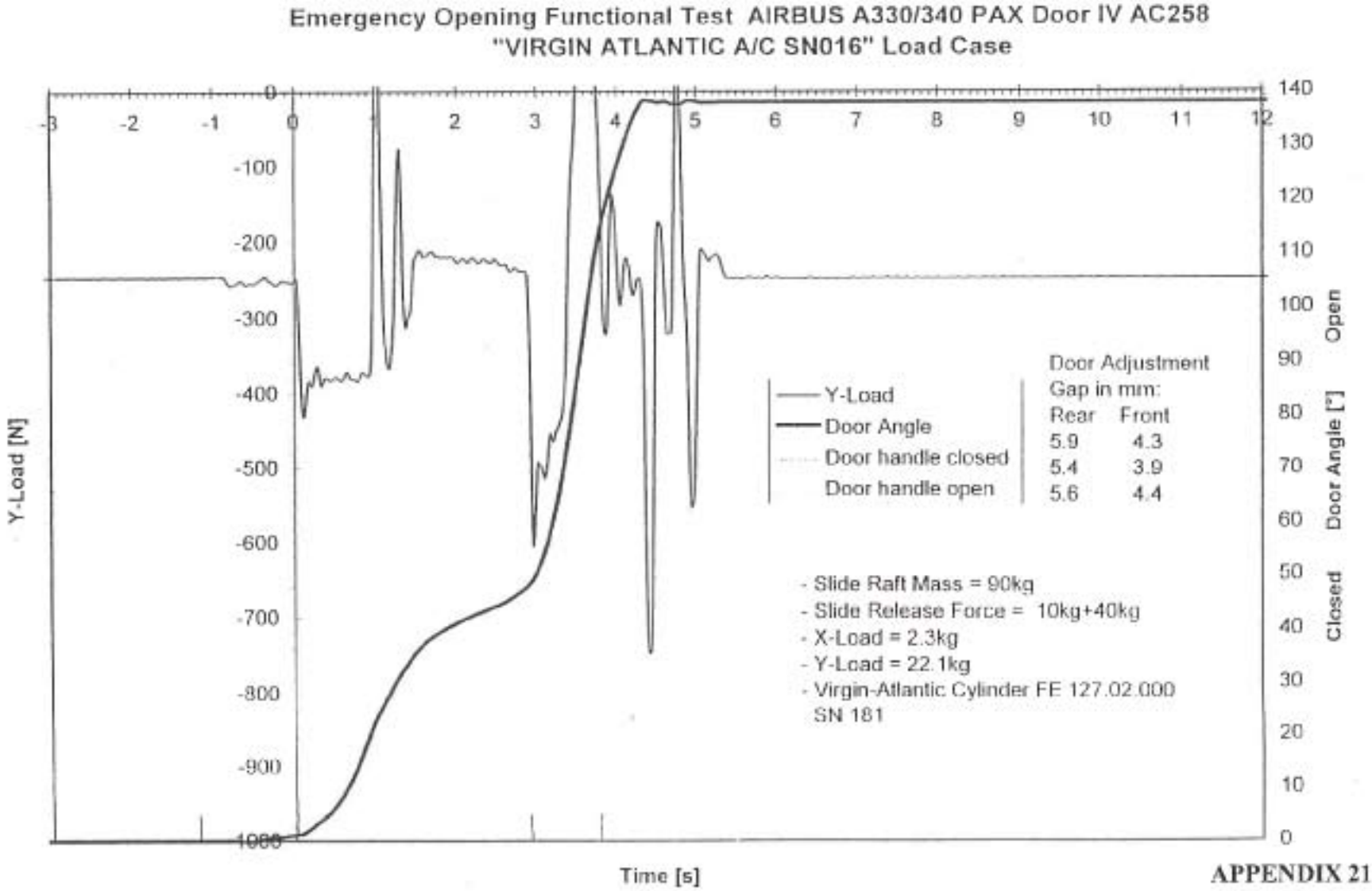
TEST No. 10 - Typical plot, worst case test conditions i.e. maximum adverse wind force and roll angle, using pneumatic cylinder taken from G-VSKY door 4R



TEST No. 16 - Typical plot, accident test conditions, using pneumatic cylinder taken from G-VSKY door 4R

AD 1.2 – RESCUE AND FIRE FIGHTING SERVICES AND SNOW PLAN

AD 1.2.1 – RESCUE AND FIRE FIGHTING SERVICES

1 The categories of fire and rescue equipment given at AD 2.6, their relevance to individual aircraft, and the minimum scales of equipment required to meet the respective categories are contained in Civil Aviation Publication - 'Licensing of Aerodromes' - CAP 168. They approximate closely to those contained in the relevant ICAO publications.

2 For the convenience of aircraft operators the relationship of the fire and rescue equipment categories to individual aircraft is summarised as follows:

Aerodrome Fire and Rescue Category	Aircraft Overall Length (m)	Maximum Fuselage Width (m)
‡Special	0 up to but not including 9	2
1	0 up to but not including 9	2
2	9 up to but not including 12	2
3	12 up to but not including 18	3
4	18 up to but not including 24	4
5	24 up to but not including 28	4
6	28 up to but not including 39	5
7	39 up to but not including 49	5
8	49 up to but not including 61	7
9	61 up to but not including 76	7

‡Aerodromes which are generally licensed solely in order that flying instruction may take place.

3 Category of land based helicopter landing sites for Rescue and Fire Fighting purposes is as follows:

Site Category	†Aircraft Overall Length (m)
‡Special	0 up to but not including 15
H1	0 up to but not including 15
H2	15 up to but not including 24
H3	24 up to but not including 35

†Overall length includes rotors and tail boom
‡Aerodromes which are licensed solely in order that flying instruction may take place.

4 It should be noted that aircraft requiring ONE Category of fire and rescue equipment higher than that given at AD 2.6 are not automatically precluded from using the aerodrome. Operators of such aircraft should first consult with the aerodrome management.

5 Two tables have been produced to assist with determination of adequacy when comparing military and civil RFF categories. Each table uses different criteria in forming a comparison and commanders should only use the table appropriate to their flight details.

6 The following table compares ICAO minimum standards with those likely to be available at Government aerodromes. It is to be used by civil pilots wishing to use Government facilities

CAA Category	RAF Equivalent
1	2
2	4
3	4
4	4
5	6
6	7
7	No Equivalent
8	No Equivalent
9	No Equivalent

6.1 The above table compares minimum standards recommended by ICAO with those valid at Government aerodromes. Whilst compliance with these minimum standards is desirable, the Authority accepts that the slight shortfall in the facilities provided at RAF Category Two and Three aerodromes has been compensated for by significant over provision of facilities in some other areas. Therefore, operators may undertake, as a minimum, operation of Civil Category Two and Three aircraft from RAF Category Two and Three aerodromes respectively.

AIP EXTRACT
COMPARISON OF RFF CATEGORIES

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7 The following table compares crash/fire requirements for Government aircraft with those facilities likely to be available at Civil aerodromes. It is to be used by pilots of Government aircraft wishing to use civil facilities.

RAF Category	Civil/ICAO Equivalent
Nil	1
1	2
2	3
3	5
4	5
5	6
6	7
7	8
–	8
–	9

7.1 Although no direct comparison can be made between RAF and the other fire categories, the above table is an approximation of the relationship between the categories.

AIP EXTRACT
COMPARISON OF RFF CATEGORIES

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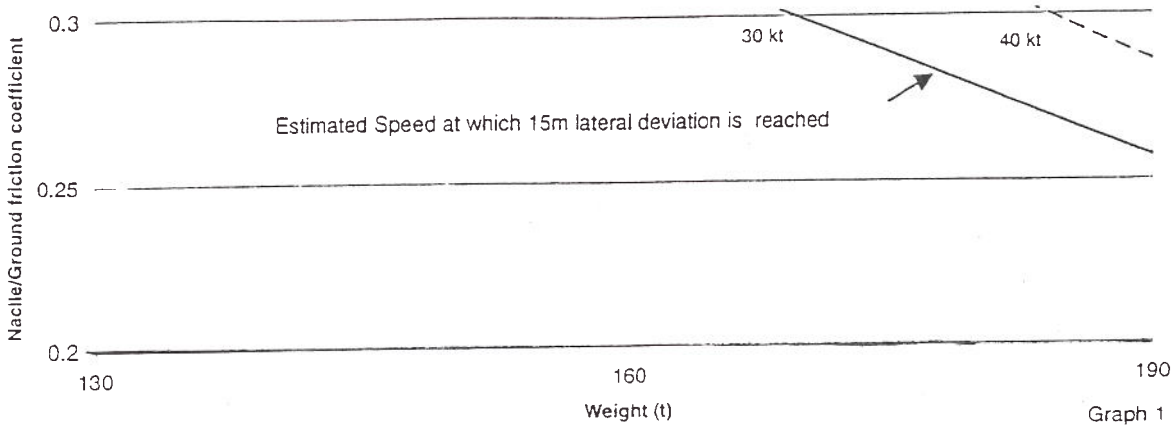
NACELLES on GROUND CONTROL SPEED

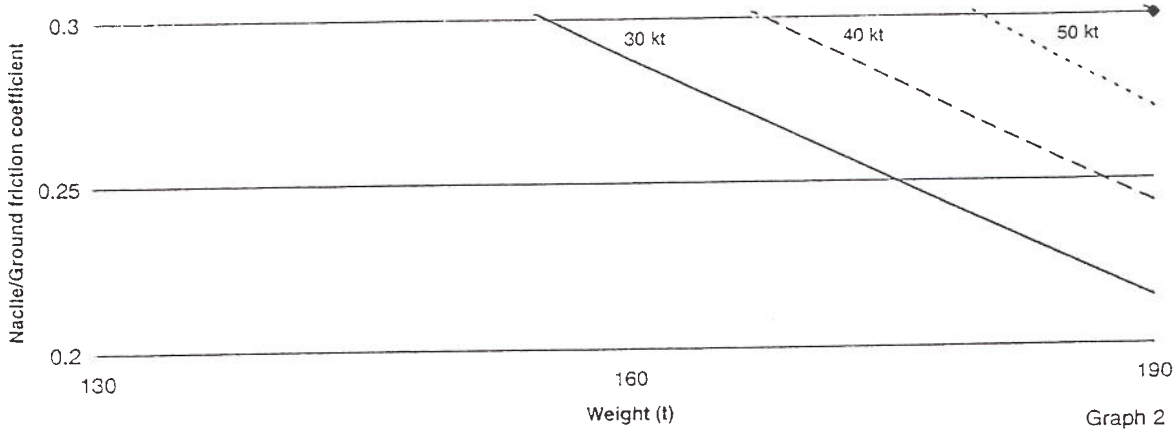
No CrossWind



Graph 1

NACELLES on GROUND CONTROL SPEED

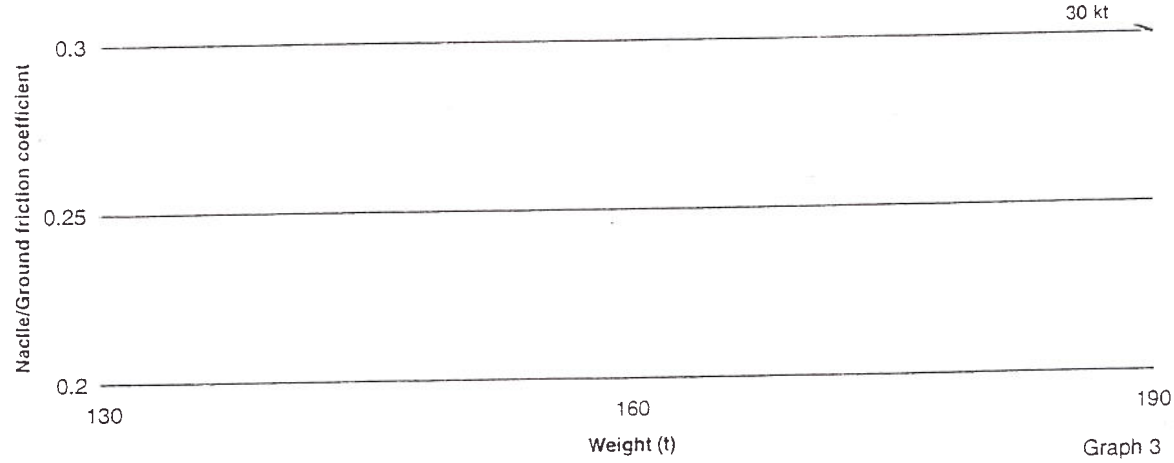
CrossWind -25 kt



Graph 2

NACELLES on GROUND CONTROL SPEED

CrossWind + 25 kt



Graph 3

EFFECT OF CROSSWIND ON
DIRECTIONAL CONTROL

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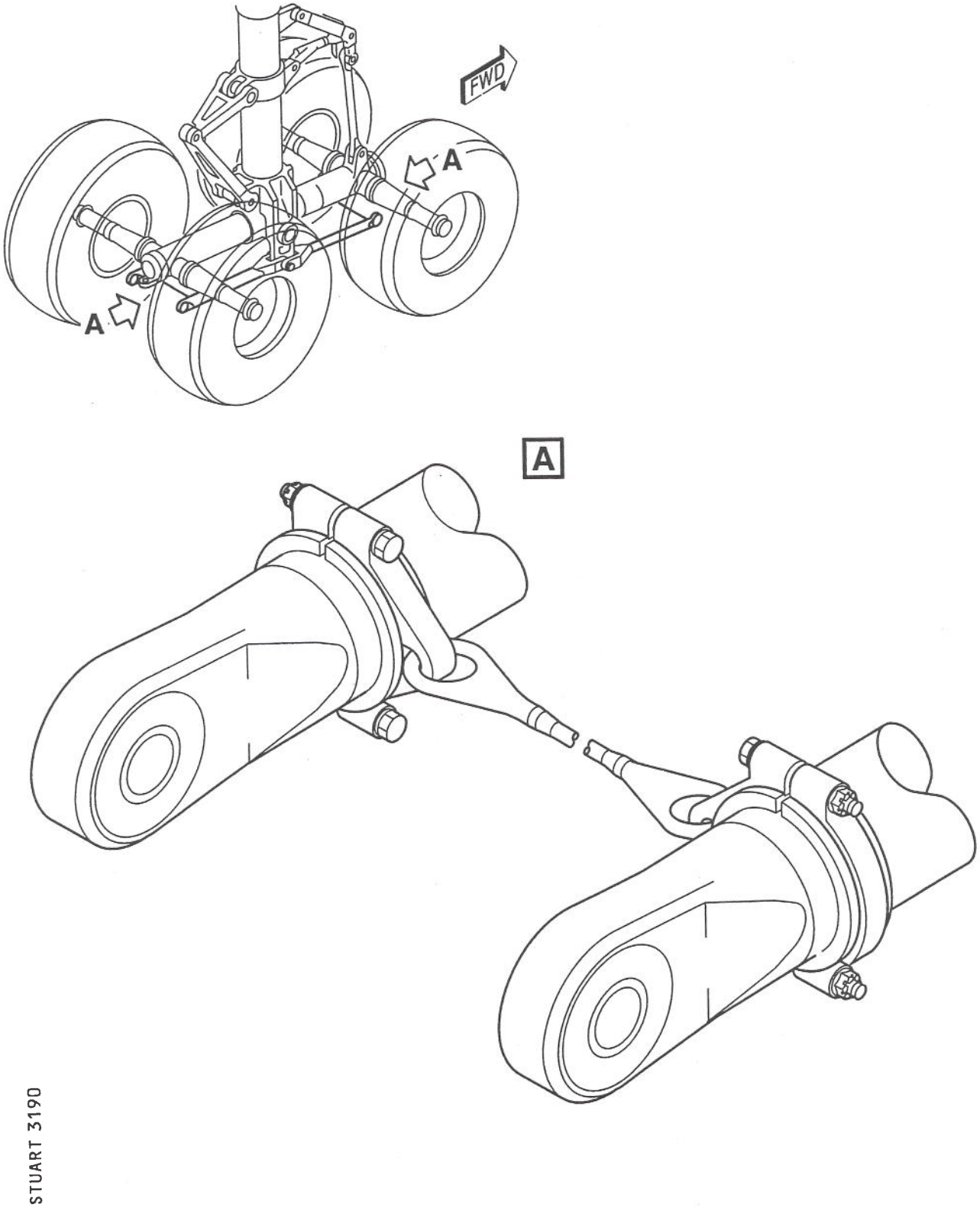

BRAKE ROD RETRAINT

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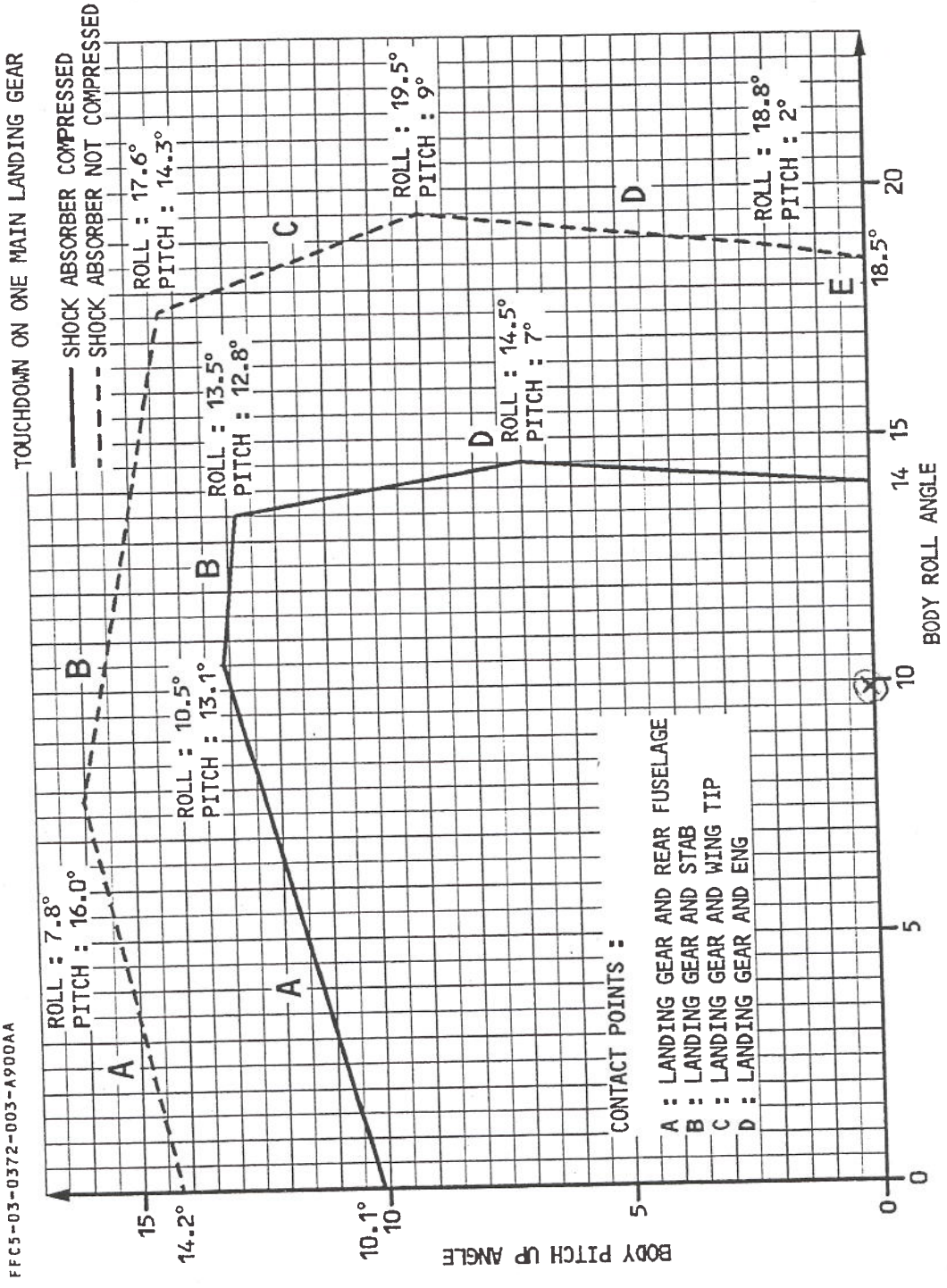
GROUND CLEARANCE DIAGRAM



ALL

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GROUND CLEARANCE DIAGRAM

Aircraft Movements 1997	Total	Air Transport	Landing Dist Available (ft)	Runway Orientation	ILS 1/2	RFF
HEATHROW	440631	430706	11801	09/27	2	9
GATWICK	238836	229665	9075	08/26	2	9
MANCHESTER	168314	147404	8599	06/24	2	9
ABERDEEN	112540	86741	6001	16/34	2	7
STANSTED	104704	84333	10000	05/23	2	7
GLASGOW	98204	81609	7720	05/23	2	8
BIRMINGHAM	100721	79880	7477	15/33	2	8
EDINBURGH	99352	71884	7700	07/25	2	8
JERSEY	84975	49776	5098	09/27	2	6
NEWCASTLE	81279	42376	6972	07/25	2	8
EAST MIDLANDS	69958	40968	7480	09/27	2	7
LUTON	63586	40287	6808	08/26	2	7
BELFAST INTERNATIONAL	95009	35070	9111	07/25	1+1	8
BRISTOL	59547	31546	6155	09/27	2	6
LIVERPOOL	83354	28521	7300	09/27	2	6
LEEDS BRADFORD	57927	26123	5912	14/32	2	6
SOUTHAMPTON	55169	25703	5266	02/20	1	6
CARDIFF WALES	60724	18171	7001	12/30	2	7
TEESSIDE	66073	10970	7516	05/23	2	6
PRESTWICK	63166	10230	9800	13/31	2	6

UK AIRPORT MOVEMENT STATISTICS 1997 WITH DETAILS OF RUNWAY, PRECISION APPROACH AID AND NORMAL RFF CATEGORY

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G-VSKY

LDG WITH ABNORMAL L/G

PREPARATION

- CABIN CREW ..... NOTIFY
- ATC ..... NOTIFY
- JETTISON ..... CONSIDER

● **If NOSE L/G abnormal**

- CG location (if possible) ..... AFT
  . *10 PAX from front to rear = 2 %*

● **If one MAIN L/G abnormal**

- FUEL IMBALANCE ..... CONSIDER
  . *Open all the X FEED and switch off the pumps on the side with landing gear normally extended.*

- OXYGEN CREW SUPPLY ..... OFF
- SEAT BELTS/NO SMOKING ..... ON
- CABIN and COCKPIT ..... PREPARE

. *Loose equipment secured*
. *Survival equipment prepared*
. *Belts and shoulder harness locked*

APPROACH

- GPWS SYS ..... OFF
- L / G GRVTY EXTN ..... CHECK DOWN

Resetting of the free fall system with the landing gear lever selected down and one main gear not locked down would result in extension of center gear. This landing configuration is not acceptable for landing.

- L/G LEVER ..... CHECK DOWN
- AUTOBRAKE ..... DO NOT ARM
- EMER EXIT LT ..... ON
- COMMERCIAL ..... OFF
- CABIN REPORT ..... OBTAIN
- JETTISON ..... OFF
- T TANK FEED ..... ISOL

● **If one or both MAIN L/G abnormal**

- A/SKID & N/S STRG ..... OFF
- MAX BRAKE PR 1000PSI
- GROUND SPOILERS ..... DO NOT ARM

BEFORE LANDING

- RAM AIR ..... ON
- BRACE FOR IMPACT ..... ORDER

Cont'd

REVISED QRH LANDING WITH
ABNORMAL GEAR PROCEDURE

LDG WITH ABNORMAL L/G

FLARE, TOUCH DOWN AND ROLL OUT

Engines should be shut down sufficiently early to ensure fuel is shut off before the nacelles impact, but sufficiently late to ensure adequate hydraulic supplies for the flight controls.
Engine pumps continue to supply adequate hydraulic pressure for 30 seconds after first engine shutdown.

– REVERSE ..... DO NOT USE

- **If NOSE L/G abnormal**
  - NOSE ..... MAINTAIN UP
    After touch down keep the nose off the runway by use of elevator.
    Then, lower nose on to the runway before elevator control is lost.
  - BRAKES (compatible with elevator efficiency) ..... APPLY
  - ENG MASTERS ..... OFF
    Shutdown the engines before nose impact.

- **If one MAIN L/G abnormal**
  - ENG MASTERS (in sequence) ..... OFF
    After main gear touch down, shudown the outboard engines first, then inboard engines (failure side first) before nacelle touchdown.
  - FAILURE SIDE WING ..... MAINTAIN UP
    Use roll control as necessary to maintain the unsupported wing up as long as possible.
  - DIRECTIONAL CONTROL ..... MAINTAIN
    use rudder and brakes (maximum 1000 psi) to maintain runway axis as long as possible.

- **If both MAIN L/G abnormal**
  - ENG MASTERS ..... OFF
    Shutdown the engines in the flare, before touch down.
  - PITCH ATTITUDE (at touch down) .... NOT LESS THAN 6°

WHEN A/C STOPPED

R – ENG (all) and APU FIRE pb ..... PUSH
R *Pressing the ENG FIRE pb shuts off the related hydraulic pressure within a short time.*
– ENG (all) and APU AGENT ..... DISCH
– EVACUATION ..... INITIATE
If nose L/G abnormal, aft passengers doors should preferably not be used for evacuation due to their height.

REVISED QRH LANDING WITH
ABNORMAL GEAR PROCEDURE

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