

BAE SYSTEMS (Operations) Limited, Prestwick International Airport, Ayrshire,
KA9 2RW, Scotland.

INSPECTION SERVICE BULLETIN
BAe 146 SERIES/AVRO 146-RJ SERIES AIRCRAFT

TRANSMITTAL FOR INSPECTION SERVICE BULLETIN REVISION

SERVICE BULLETIN No.ASB.32-A189

ALERT

DATE: 16-SEP-2022

TITLE: LANDING GEAR - MAIN LANDING GEAR SIDESTAY - INSPECTION OF THE
OUTER LINK (LH AND RH) FOR CRACKS AND DIMENSIONAL CHECKS.

REVISION: 2

DATE: 03-AUG-2023

ACTIONS

- (1) Remove and discard Alert Service Bulletin (ASB) at revision 1.
- (2) Insert ASB at revision 2.

REASON FOR REVISION

- (1) Para.1.C. - Description, revised.
- (2) Para.1.D. - Compliance, revised.
- (3) Para.1.F. - Manpower, revised.
- (4) Para.1.J. - References, revised.
- (5) Para.2.A.(1). - General, abbreviations revised.
- (6) Para.2.B. - Preperation, revised.
- (7) Para.2.C.(1) - Inspection, Part 1, revised.
- (8) Para.2.E.(1) - Close up, revised.
- (9) Messier-Dowty SB 146-32-147 Appendix A attached.
- (10) Editorial.

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ALERT

TITLE: LANDING GEAR - MAIN LANDING GEAR SIDESTAY - INSPECTION OF THE
OUTER LINK (LH AND RH) FOR CRACKS AND DIMENSIONAL CHECKS.

1.Planning information

A.Effectivity

(1) Aircraft

Aircraft affected by this inspection are defined below:-

BAe 146-301

ALL BAe 146 100, 200, 300 Series

ALL AVRO 146-RJ70, RJ85, RJ100 Series

B.Reason

An operator recently reported, during routine maintenance,
cracking on the shoulders of the MLG sidestay outer link.

Failure of a MLG sidestay outer link could result in the collapse
of the MLG, which could lead to a runway departure with
corresponding aircraft damage and possible loss of life depending
on the operational environment.

C.Description

At Revision 1, it is necessary that operators carry out a repeat
detailed inspection of the MLG sidestay outer links (Part 1). A
revised one-off dimensional tolerance check is required. This
supersedes the data gathering dimensional tolerance check in the
Original Issue (Part 2). Finally, Revision 1 introduces a calendar
backstop on the Maintenance Review Board Report (MRBR) 32-8
(Maintenance Planning Document (MPD) 323100-LUB-10000-1)
lubrication task (Part 3).

ASB 32-A189 supersedes ISB 32-156, which will be cancelled.

At Revision 2, inspection accomplishment instructions are
introduced for operators using Abrasion Resistant paint embodied
on the MLG sidestay outer Links.

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D.Compliance

The technical content of this Alert Service Bulletin (ASB) is currently subject to mandatory action via UK CAA Airworthiness Directive (AD) G-2023-0004.

Accomplish the instructions of Part 1 (para 2.C.(1)(a)) within 500 flights or 6 months of last accomplishment of ASB 32-A189, Revision 1 Part 1 (para 2.C.(1)), whichever is the earlier. For operators using Abrasion Resistant paint embodied on the MLG sidestay outer links, prior accomplishment of Part 1 i.a.w. the instructions in CAA AD G-2023-G0004 satisfies the requirements of this inspection at Revision 2. Thereafter, repeat every 500 flights or 6 months, whichever is the earlier.

If the recommendations in BAE Systems Air Prestwick All Operator Message (AOM) 22-013V-2 have been satisfied, then the initial accomplishment of para 2.C.(1)(a) will have been met. Alternatively, accomplish the instructions of Part 1 (para 2.C.(1)(b)) within 1,200 flights or 12 months of last accomplishment of ASB 32-A189, Revision 1, whichever is the earlier. Thereafter, repeat every 1,200 flights or 12 months whichever is the earlier.

The Inspection regime can either be a Detailed Visual Inspection every 500 flights, or every 6 months, whichever is the earlier, as per Part 1 (para 2.C.(1)(a)), or a Detailed Visual and Special Detailed Inspection every 1,200 flights, or every 12 months, whichever is the earlier, as per Part 1 (para 2.C.(1)(b)).

NOTE: The Operator can alternate between Part 1 (para 2.C.(1)(a)) and Part 1 (para 2.C.(1)(b)), but the inspection interval must be rigorously controlled by the Maintenance Schedule based on the last accomplished inspection.

Accomplish the instructions of Part 2 (para 2.C.(2)) within 6 months of publication of Revision 1 of this ASB. For operators using Abrasion Resistant paint embodied on the MLG sidestay outer links, prior accomplishment of Part 2 i.a.w. the instructions in CAA AD G-2023-G0004 satisfies the requirements of this inspection at Revision 2.

Accomplish the instructions of Part 3 (para 2.C.(3)) within 6 months of publication of Revision 1 of this ASB. Thereafter, repeat every 500 flights or 6 months, whichever is the earlier.

It is recommended that accomplishment of Part 3 is aligned with accomplishment of Part 1.

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E.Approval

The technical content of this document is approved under the authority of the DOA Ref.UK.21J.0047.

The technical content of this document is approved under the authority of the UK CAA design organisation approval reference: AD/1852/05.

F.Manpower

To inspect as defined in para. 2

Part 1 (para 2.C.(1)(a)) 0.5 man-hours per MLG sidestay outer link.

Part 1 (para 2.C.(1)(b)) 1.0 man-hours per MLG sidestay outer link.

Part 2 (para 2.C.(2)) 1.0 man-hours per MLG sidestay outer link.

Part 3 (para 2.C.(3)) 0.5 man-hours per MLG sidestay outer link.

This man-hour estimate does not include time for gaining access to, or cleaning, the inspection area.

G.Materials - cost and availability

None.

H.Tooling - cost and availability

Not applicable.

I.Weight and balance

Not applicable.

J.References

AMM 12-20-21.

AOM 22-013V-2.

Maintenance Review Board Report, 32-8.

Maintenance Planning Document, 323100-LUB-10000-1.

Modification Service Bulletins 53-217-61122A, 53-223-60809G, 53-227-60877A, 53-232-60809H and 53-248-61147A.

Safran Landing Systems SB 146-32-179. (copy attached)

Safran Landing Systems CMM 32-10-36.

Safran Landing Systems CMM 32-10-65.

Safran Landing Systems CMM 32-10-73.

Messier-Dowty SB 146-32-147 Appendix A. (copy attached)

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K.Publications affected

Maintenance Review Board Report.
Maintenance Planning Document.

NOTE: The Maintenance Review Board Report and Maintenance Planning Document will be reviewed, for inclusion of a scheduled task.

L.Electrical load data

Not applicable.

M.Software Accomplishment Summary

Not applicable.

N.Aircraft Noise Levels

Not applicable.

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2. Accomplishment instructions

A. General

- (1) The following abbreviations are used within this document:-

AMM - Aircraft Maintenance Manual
ASB - Alert Service Bulletin
FDP - Fluorescent Dye Penetrant
MLG - Main Landing Gear
i.a.w. - in accordance with
MPD - Maintenance Planning Document
MRBR - Maintenance Review Board Report
NDT - Non-Destructive Testing
PCN - Personnel Certification in Non-Destructive Testing
SB - Service Bulletin
SLS - Safran Landing Systems

B. Preparation

- (1) Gain access to the LH and RH MLG.
- (2) For aircraft with BAE Systems Air Prestwick SB 53-217-61122A, 53-223-60809G, 53-227-60877A, 53-232-60809H or 53-248-61147A embodied, Abrasion Resistant paint local to the area of inspection is to be stripped in accordance with SLS CMM 32-10-36, 32-10-65 or 32-10-73, as appropriate.

C. Inspection

Part 1

- (1) Refer to Drawing 2. Perform an inspection of the areas indicated in Drawing 2 (view on arrow 'C') as follows:
- (a) Carry out a Detailed Visual Inspection in accordance with SLS SB 146-32-179 (copy attached). In the event that a crack is detected, record the findings in Appendix 1 and return to BAE Systems Air Prestwick.
- or
- (b) Carry out a fluorescent dye penetrant (FDP) inspection in accordance with Messier-Dowty SB 146-32-147 Appendix A (copy attached). Once the FDP inspection has been accomplished, reinstate the Abrasion Resistant paint in accordance with BAE Systems Air Prestwick SB 53-217-61122A, 53-223-60809G, 53-227-60877A, 53-232-60809H or 53-248-61147A, as appropriate. In the event that a crack is detected, record the findings in Appendix 1 and return to BAE Systems Air Prestwick.

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Part 2

(2) Perform dimensional checks as follows:

(a) Record/photograph of the MLG sidestay outer link only part number, serial number (located on the inboard side) and any markings relative to concessions/repairs performed on the part. Also, specify right hand/left hand. Record in accordance Appendix 2 of ASB 32-A189.

(b) Refer to Drawing 2. Measure the dimensions 'B1' and 'B2' in the area of inspection shown in Drawing 2. Measure each dimension at a minimum of at least 4 locations to ensure the minimum dimension is recorded.

NOTE: Dimensions (inches) to be recorded to 3 decimal places, using appropriate measurement equipment.

(c) Determine the status of the MLG sidestay outer link in accordance with the dimensional assessment flowchart in Drawing 3. Record in accordance Appendix 2 of ASB 32-A189.

(d) Return the data recorded in Appendix 2 of ASB 32-A189 to BAE Systems Air Prestwick.

Part 3

(3) Refer to AMM 12-20-21 (MRBR 32-8, MPD 323100-LUB-10000-1). Lubricate the MLG sidestay outer link pivots.

D.Test

Not applicable.

E.Close up

(1) If the surface finish has been removed and the sidestay outer link is to be returned to service, restoration of the finish is performed in accordance with the applicable Safran Landing Systems CMM 32-10-36 or 32-10-65 or 32-10-73 Repair paragraph 3.A. Where Abrasion Resistant paint is also required, it is additionally to be applied in accordance with BAE Systems SB 53-217-61122A, 53-223-60809G, 53-227-60877A, 53-232-60809H or 53-248-61147A, as applicable.

(2) Make sure work area is clean, and clear of tools and miscellaneous equipment.

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F.Documentation

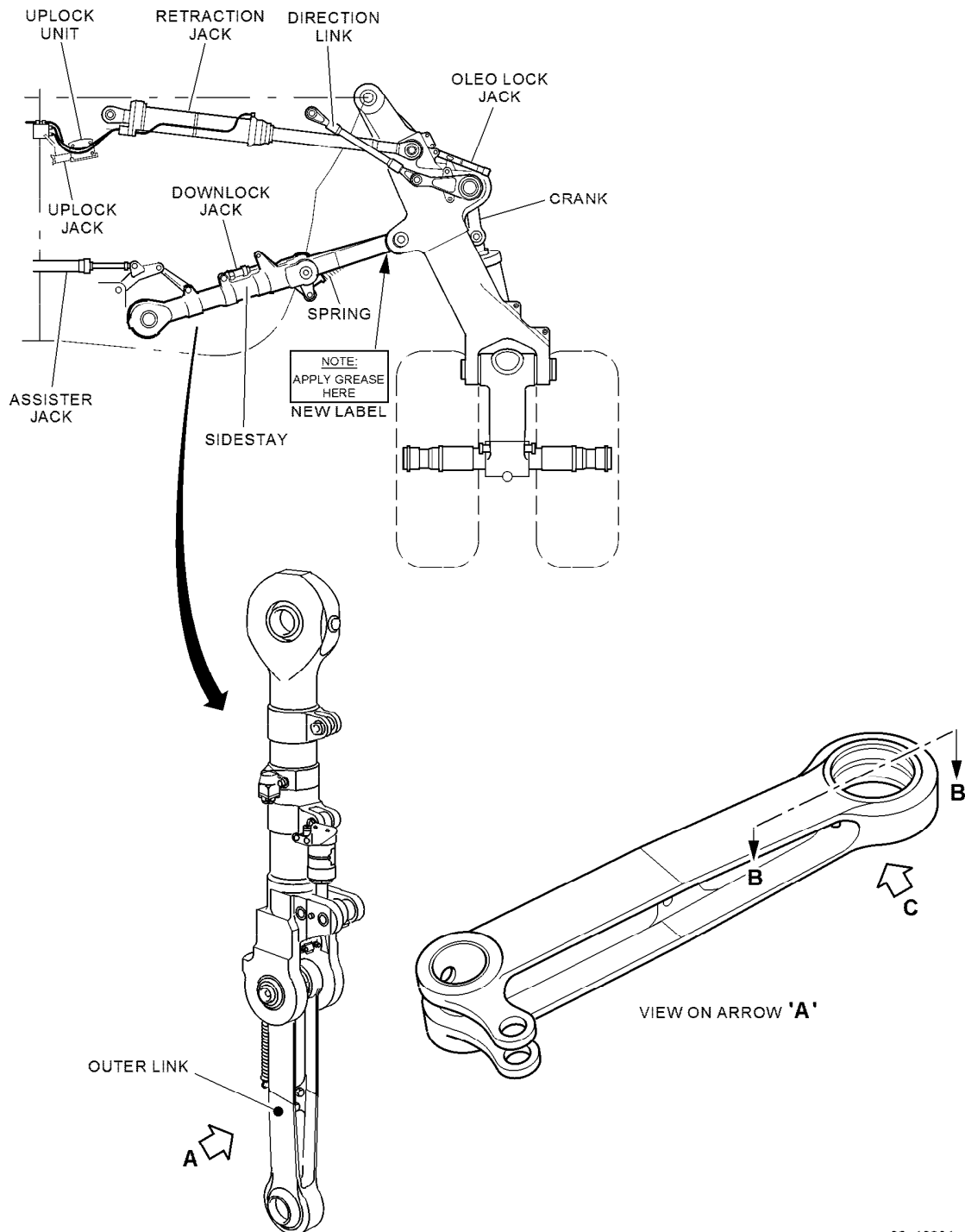
Return all required Inspection Report details (see Appendices 1 and 2) via e-mail to raengliaison@baesystems.com

G.Terminating action

(1) None.

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n32a18901

INSPECTION OF MLG SIDESTAY OUTER LINK
DRAWING 1.

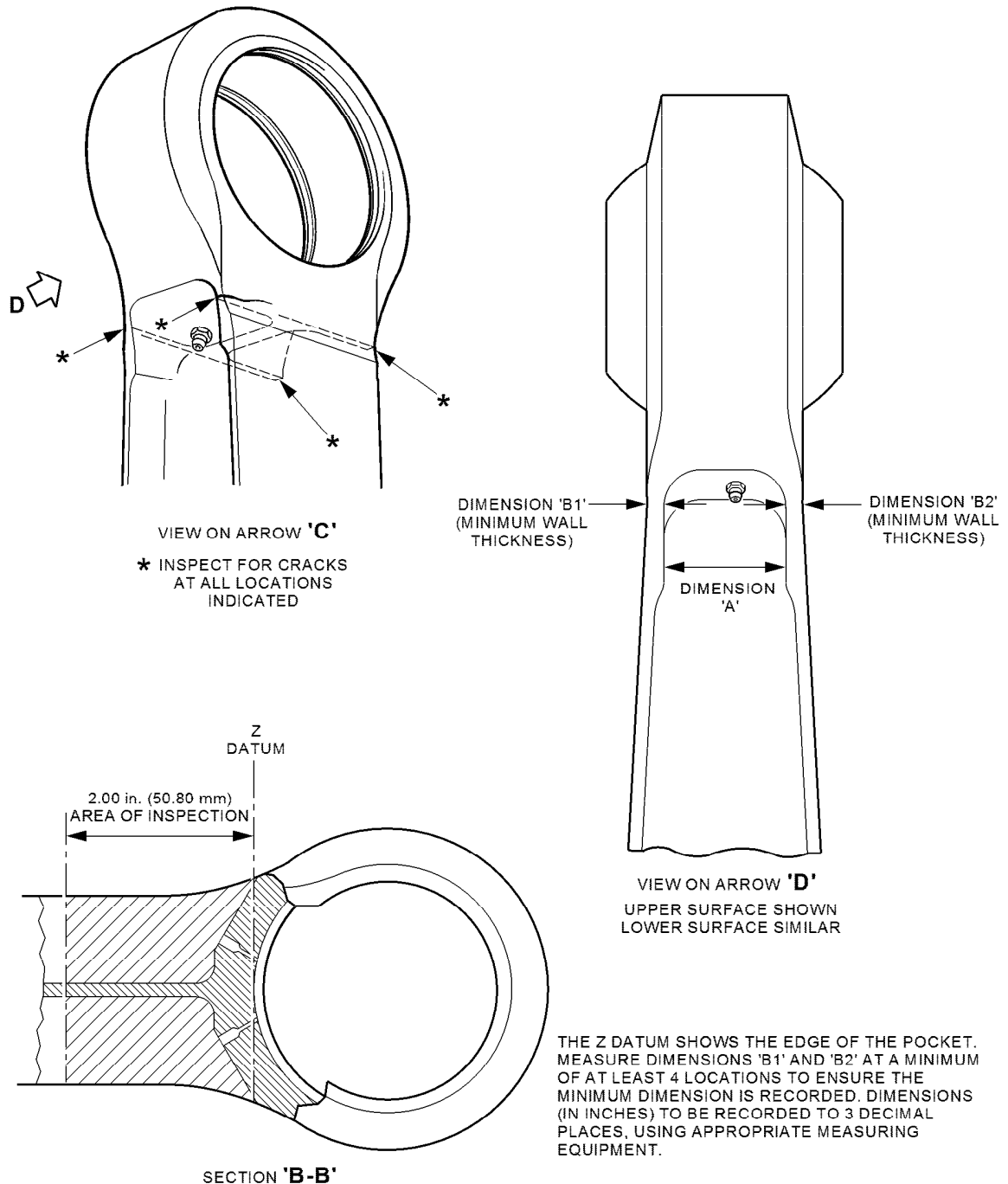
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n32a018902

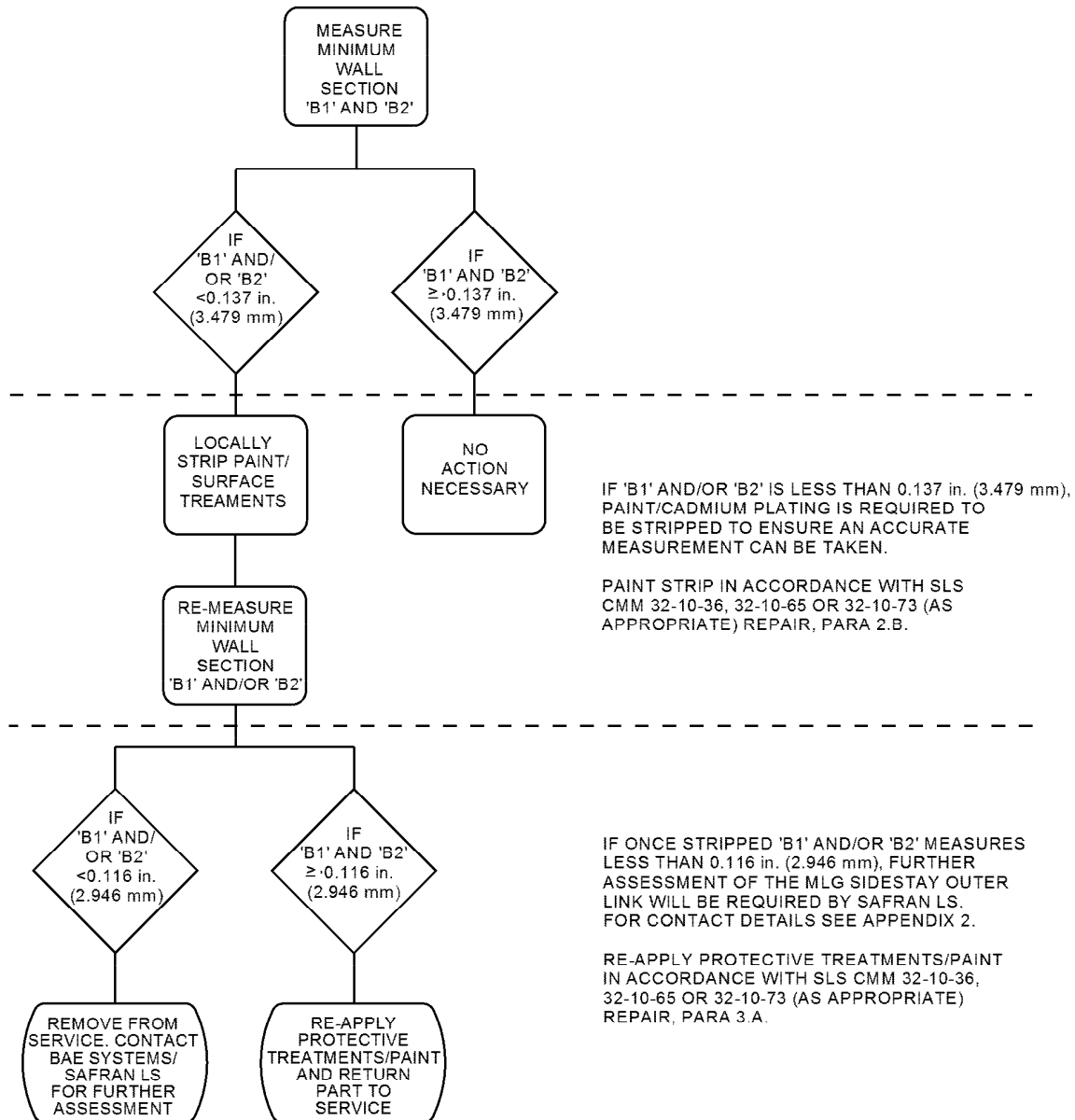
INSPECTION OF MLG SIDESTAY OUTER LINK DRAWING 2.

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n32a018903

MLG SIDESTAY OUTER LINK DIMENSIONAL ASSESSMENT DRAWING 3.

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3. Material information

Not applicable.

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APPENDIX 1

1.INSPECTION REPORT

A.Complete and return this form as detailed

OPERATOR: _____

AIRCRAFT REGISTRATION: _____

CONSTRUCTOR'S NUMBER: _____

FLIGHT HOURS: _____

LANDINGS: _____

DATE INSPECTION PERFORMED: _____

FINDINGS: _____

To: Customer Technical Support (Building 37),
BAE SYSTEMS (Operations) Limited,
Prestwick International Airport,
Ayrshire,
KA9 2RW,
SCOTLAND.

e-mail raengliaison@baesystems.com

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APPENDIX 2

1. DIMENSIONAL INSPECTION REPORT

MLG SIDESTAY OUTER LINK	
Aircraft Type	
Operator	
Constructor's Number	
Part Number	
Serial Number	
Special Marking (Concession/Repair)	

	UPPER SURFACE		LOWER SURFACE	
Dimension (Inches) as per Drawing 2.	LH	RH	LH	RH
Dimensions (in inches) to be recorded to 3 decimal places, using appropriate measurement equipment.	B1 =	B1 =	B1 =	B1 =
	B2 =	B2 =	B2 =	B2 =
<p>If B1 and B2 are ≥ 0.116 inches with protective treatments removed, then no further action required.</p> <p>If B1 and/or B2 are < 0.116 inches with protective treatments removed, then contact Safran Landing Systems before return to service.</p> <p>Safran Landing Systems UK Ltd. Cheltenham Road East, Gloucester, GL2 9QH, United Kingdom. Tel: +44(0) 1452 712424 Web: safran-landing-systems.com</p>				

Return this form to:-

Customer Technical Support (Building 37),
BAE Systems Air Prestwick,
Prestwick International Airport,
Ayrshire,
KA9 2RW,
United Kingdom.

e-mail: raenglai@baesystems.com

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APPENDIX A

MESSIER-DOWTY LIMITED GLOUCESTER

PROCESS DEPARTMENT - NON-DESTRUCTIVE TEST DIVISION

PRODUCT SUPPORT TECHNIQUE NO. 273/P

Penetrant Inspection of the BAe146 Main Landing Gear Side Stay Outer Link outboard webs

1. Scope

- 1.1. This technique is designed for the detection of cracks associated with the BAe146 Main Landing Gear Side Stay Outer Link outboard webs adjacent to the Main Fitting lower lugs.
- 1.2. All four webs on each unit must be inspected.
- 1.3. This technique is designed for in-situ inspection on the aircraft using fluorescent penetrant, remover and developer materials of the same family in accordance with MIL-1-25135 QPL 25135 Type 1, Method B Level IV.
- 1.4. This technique is only valid when carried out by skilled NDT penetrant practitioners qualified to PCN Level 2 or equivalent.
- 1.5. This technique is based on Messier-Dowty Limited M-DLNDT8 standard procedure.

2. Equipment

- 2.1. A high sensitivity post emulsified thixotropic fluorescent penetrant such as Ardrex 985 P 14 or equivalent.
- 2.2. Penetrant remover Ardrex 9 PR 3 or equivalent.
- 2.3. Non-aqueous wet developer Ardrex 9 D 6 or equivalent.
- 2.4. Clean lint free cloths or tissues.
- 2.5. Clean water.
- 2.6. Cold hydrocarbon or chlorinated hydrocarbon cleaning fluid.
- 2.7. An ultraviolet black light inspection lamp to M-DLNDT8 requirements to BS4489.

WARNING : THE PENETRANT INSPECTION MUST BE CARRIED OUT IN A SAFE, CLEAN, DARKENED, WELL VENTILATED AREA SUITABLE FOR ULTRAVIOLET INSPECTION. OBSERVE ALL NECESSARY SITE SAFETY PRECAUTIONS - EYE PROTECTION, BREATHING MASKS AND GLOVES MUST BE WORN AS NECESSARY.

3. Procedure

- 3.1. Following chemical and Scotchbrite local removal of paint and cadmium, thoroughly pre-clean the areas shown in Figure 2 using cold hydrocarbon or chlorinated hydrocarbon cleaning fluid.
- 3.2. Visually inspect the test areas to ensure a suitably smooth surface finish for high sensitivity fluorescent penetrant inspection and freedom from grease, corrosion, debris, metal smearing or mechanical damage which could interfere with the inspection.
- 3.3. Carefully apply thixotropic penetrant to the test area by brush and allow a contact time of 25 minutes. Use only enough penetrant for the area being inspected to avoid over application.
- 3.4. Wipe off surplus penetrant with clean dry cloths or tissues.

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- 3.5. View under ultraviolet light to ensure removal of penetrant.
- 3.6. Rapidly remove final traces of penetrant using cloths sprayed with penetrant remover followed by wiping with clean damp cloths or tissues and secondly with clean dry cloths or tissues.
- 3.7. Further view under ultraviolet light to ensure removal of final traces of visible penetrant, penetrant remover and water. Test areas must be in a clean dry state free from all penetrant or penetrant remover residue before applying developer.
- 3.8. Sparingly apply non-aqueous wet developer ensuring a thin even coating throughout the area being inspected.
- 3.9. View instantly and periodically up to 20 minutes developer dwell time using ultraviolet light in a suitably darkened environment during the development period.
- 3.10. Record and investigate all relevant findings.
- 3.11. Clean the area with a suitable cleaning agent.
- 4. Inspection Standard
 - 4.1. All cracking which may be cause for rejection shall be reported to the Technical Manager of the regional Messier Services Customer Support Centre.

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MAIN LANDING GEAR - INSPECTION OF THE OUTER LINK

1. Planning Information

A. Effectivity

Aircraft affected: BAe 146 All Series

AVRO 146-RJ All Series

Unit affected: Outer Link

Part/Type Nos.: 200884304
200884305
200884346
200884347
201105300
201105301
201105308
201105309
201299300
201299301
201299305
201299306

Serial Number: All Outer Links

B. Concurrent Requirements

(1) None.

C. Reason

(1) Introduction of a repetitive inspection for cracks in the outer link, as cracks on the shoulder of outer links have been identified.

D. Description

(1) Safran Landing Systems tells operators that it will be necessary to do this Service Bulletin on all BAe 146 and AVRO 146-RJ outer link part numbers listed in Para 1.A above.

E. Compliance

(1) Recommended

(a) Recommended within 500 Flight Cycles or 6 months (whichever occurs soonest) from the issue date of this SB.

(b) This inspection is to be repeated at intervals of 500 Flight Cycles or 6 months (whichever occurs soonest).

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F. Approval

- (1) The inspection procedures described in this SB are reviewed and technically accepted by BAe Systems to apply to all BAe 146 and AVRO 146-RJ fleet aircraft. This SB does not contain any change information that revises the equipment definition.

G. Manpower

- (1) Safran Landing Systems makes an estimate that it will take approximately 1 man-hour to do this Service Bulletin for each outer link.

H. Weight and Balance

- (1) None.

I. References

- (1) Safran Landing Systems UK Ltd Component Maintenance Manual 32-10-36
- (2) Safran Landing Systems UK Ltd Component Maintenance Manual 32-10-65
- (3) Safran Landing Systems UK Ltd Component Maintenance Manual 32-10-73

J. Other Publications Affected

- (1) None.

2. Material Information**A. None****B. Tooling**

- (1) None

3. Accomplishment Instructions

The figure/item numbers in parentheses in the text agree with those used in the illustrated parts list. Only the primary numbers are used.

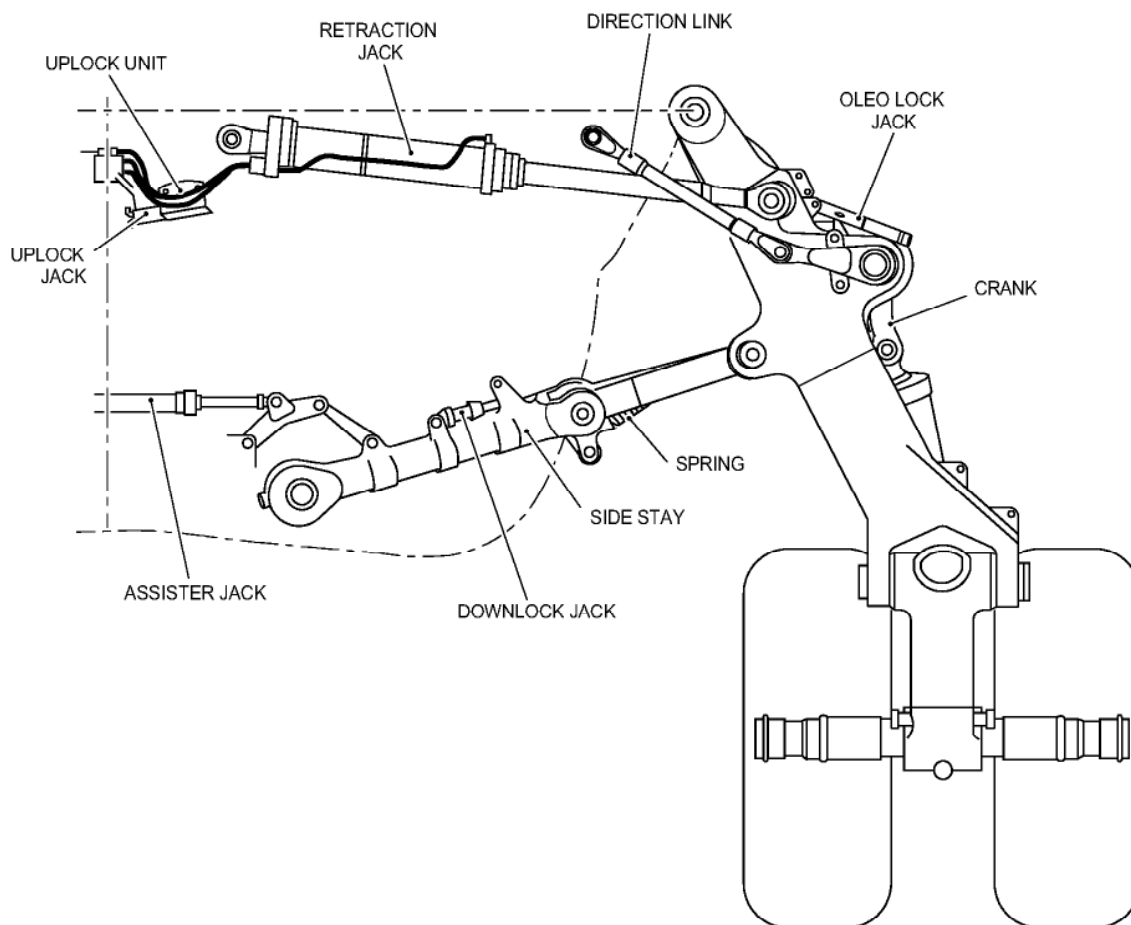
A. Procedure

- (1) To inspect the outer link (Refer to CMM 32-10-36, 32-10-65, 32-10-73 and Figures 1 and 2 of this Service Bulletin)
- (2) Clean the outer link (4-150 or 4-160, CMM 32-10-36) or (4-150 or 4-160, CMM 32-10-65) or (4-150 or 4-160, CMM 32-10-73); refer to CLEANING in the applicable CMM.
- (3) Perform a detailed visual inspection (using 10x magnification) of the outer link (4-150 or 4-160, CMM 32-10-36) or (4-150 or 4-160, CMM 32-10-65) or (4-150 or 4-160, CMM 32-10-73) to check for any signs of cracks, with specific focus on the four areas defined in Figure 2.
- (4) If there is any indication of cracking, remove the outer link (4-150 or 4-160, CMM 32-10-36) or (4-150 or 4-160, CMM 32-10-65) or (4-150 or 4-160, CMM 32-10-73) and contact Safran Landing Systems for further advice.

B. Identification

- (1) After you have done this Service Bulletin, write the Service Bulletin number 146-32-179 in the applicable aircraft and landing gear records.

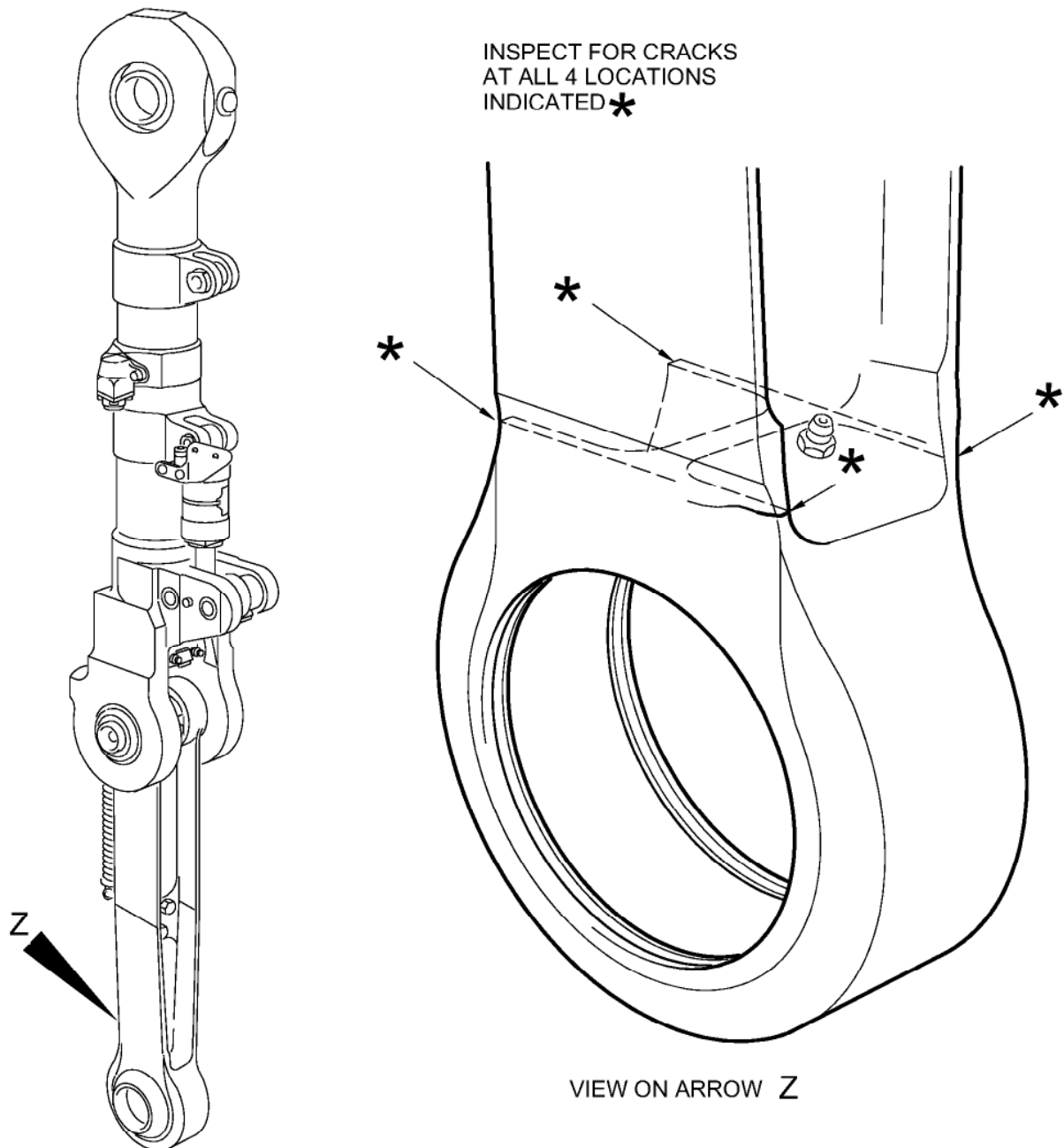
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Figure 1 - Side Stay Location

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B1469838-1

Figure 2 - Location of Inspection

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4. Safran Landing Systems and Safran Landing Systems Services Contacts

- A. Refer to the Safran Landing Systems website (safrangroup.com) for the latest list of contact names, addresses and numbers.

Original Equipment Manufacturers		
Safran Landing Systems Canada Inc. 574 Monarch Avenue Ajax, Ontario L1S 2G8 CANADA <u>Tel:</u> 905-683-3100 <u>Fax:</u> 905-683-6936	Safran Landing Systems UK Ltd Cheltenham Road Gloucester GL2 9QH ENGLAND <u>Tel:</u> +44(0)1452 712424 <u>Fax:</u> +44(0)1452 713821	Safran Landing Systems SAS Site Jean-Paul Béchat Inovel Parc Sud 7, rue Général Valérie André 78140 Vélizy - Villacoublay FRANCE <u>Tel:</u> +33 146 29 81 00 <u>Fax:</u> +33 146 29 8770
Customer Support Centers (CSC)		
For AOG (commercial and technical): aogcsc.sls@safrangroup.com		
For Europe - Africa - Middle East customers: eamecsc.sls@safrangroup.com Tel: +33 1 5521 2590		
For Americas customers: americascsc.sls@safrangroup.com Tel: +1 404 305 2626		
For Asia-Pacific customers: asiacsc.sls@safrangroup.com Tel: +65 6245 5688		
Repair and Overhaul Facilities		
Safran Landing Systems Canada Inc. 574 Monarch Avenue Ajax, Ontario L1S 2G8 CANADA <u>Tel:</u> 905-683-3100 <u>Fax:</u> 905-683-0378	Safran Landing Systems Services UK Ltd Meteor Business Park Cheltenham Road Gloucester GL2 9QL ENGLAND <u>Tel:</u> +44(0)1452 713111 <u>Fax:</u> +44(0)1452 716500	Safran Landing Systems SAS 3, rue Antoine de St Exupery, BP110 67124 Molsheim Cedex FRANCE <u>Tel:</u> (33) 38838 9200 <u>Fax:</u> (33) 38838 9399
Safran Landing Systems Services Singapore Pte Ltd 21 Loyang Crescent, Loyang Industrial Estate SINGAPORE 508985 <u>Tel:</u> (65) 6545 9455 <u>Fax:</u> (65) 6542 3936	Safran Landing Systems Services Americas SA de CV Av. La Noria Parque Industrial Querétaro Carretera QRO-SLP, Km. 28.5 Querétaro, QRO 76220 MEXICO <u>Tel:</u> +52 (442) 19 25 800 <u>Fax:</u> +52 (442) 19 25 801	HYDREP Aéroport de Dinard-Pleurtuit-Saint-Malo Bâtiment 20 BP90154 35801 DINARD Cedex FRANCE <u>Tel:</u> (33) 2 99 82 79 79 <u>Fax:</u> (33) 2 99 82 79 97