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Servicing Notes

1. The following abbreviations may be encountered in the techniques to define type of test, direction of test and orientation of defects sought:

CF	Denotes a Current Flow test.
MF	Denotes a Magnetic Flow test.
TB	Denotes a Threader Bar test.
C	Denotes a Coil test.
L	Denotes that the test is applied, or defects are sought, through the Longitudinal (major) axis of the component. To avoid confusion the bore axis on a tube or a ring is always considered as the longitudinal direction. On a disc the longitudinal direction is considered to be at right angles to the flat faces.
T	Denotes that the test is applied, or defects are sought, Transversely (at right angles to the major axis direction). On non round components the longer transverse direction is implied. On round components a diametrical test is implied.
ST	Denotes that the test is applied, or defects are sought, in the Shorter Transverse direction on non round objects. On round components, a diametrical test is implied at 90 degrees to the "T" test.
T(60°)	Denotes a further transverse test on a round component spaced at the quoted degrees position from the first transverse test.
X	Denotes an unusual direction for which descriptive details are added.

Note: Unless otherwise stated, operations are to be repeated to ensure complete coverage of the inspection area.

2. When a Magnetic Flow test is specified in a technique no test figures will be given. The optimum magnetic flux in the component is to determined by increasing the magnetizing force until saturation point is reached (ie until the area of inspection of the component has an overall coating of magnetic particles on its surface), and then reducing the magnetizing force to a value that just avoids this condition. When a permanent magnetic is to be used, a particular magnet will be specified in the technique.

3. Magnetic particle techniques are to be carried out complying with the basic principles laid down in AP 119-0104-1. The following are some of the more important points that are to be observed during magnetic particle testing:

a. General

(1) The component or area to be examined is to be thoroughly cleaned before testing.

Continued overleaf

3. a. (2) The component is to be demagnetized before any magnetic particle test is started and also during the test before a change in flux direction made.

(3) Care is to be exercised while handling components during inspection to avoid possible removal of flaw indications.

(4) The solid content of detecting ink is to be checked prior to its use; the content is to be approximately 0.2 per cent for 'Lumor K' fluorescent magnetic ink and between 0.8 and 3.2 per cent for Black magnetic ink.

(5) Magnetic ink is to be thoroughly agitated before applying to component.

(6) Magnetic ink is to be applied to the component with a flow that will enable the particles to adhere to any defect indication without being washed off. After inking, the component is to be allowed to drain in order to remove surplus ink which would otherwise give a disturbing background.

(7) Viewing for flaws when using Black magnetic ink is to be carried out in daylight or if this is not practicable under fluorescent strip lighting. When using fluorescent ink, view for flaws with an Ultra-Violet lamp in a darkened area.

(8) Components are to be thoroughly cleaned after testing to remove all traces of magnetic particles.

(9) Ensure components are demagnetized after the completion of a magnetic particle test.

b. Electro Magnetics.

(1) When using current flow method, to avoid burning or overheating of component, ensure that contact area between the electrodes and the component is as large as possible.

(2) Do not exceed a current density of 2850 amperes per square inch of cross sectional area, otherwise the possibility of burning can occur.

(3) Paint is to be removed from components in areas of electrical contact.

(4) Do not apply a current whilst fitting probes or contacts to a component.

(5) Short bursts of current not exceeding 3 seconds are to be used. A continuous flow of current does not improve results.

(6) Apply detecting ink only when current is switched on.

Continued

Servicing Notes (Contd)

3. b. (7) Normally components are to be examined for cracks after current is switched off allowing sufficient time, not less than 3 seconds, for indications to build up. Painted components on which the adherence of magnetic particles is poor are to be viewed while the current is being applied.

(8) When using the coil method, the inside diamter of the coil is to be just large enough to accommodate the component. If a larger coil only is available, the component under test is to be positioned against the inside wall of the coil.

(9) Coils are to be insulated to prevent arcing and burning of the component.

(10) When carrying out in situ inspections it is essential that all current carrying equipment is adequately insulated to prevent damage to aircraft structure.

c. Permanent Magnets. Check permanent magnets before use to ensure that their magnetic field strength has not deteriorated. (Technique will specify the minimum lifting capacity of magnet).

4. When using the Radalloyd demagnetizing unit (4X/4501), angulation of the demagnetizer probes may be necessary to obtain the optimum position for demagnetization. The sphere of demagnetizing influence is limited to that area within the demagnetizer probes. Instructions for use of the demagnetizer unit are as follows:

a. Connect demagnetizer to control box.

b. Connect control box to mains supply.

c. Turn control knob fully clockwise.

d. Place demagnetizer on component.

e. Switch on.

f. Rotate control knob slowly in an even movement to the zero position (max time 3 seconds).

g. Slowly withdraw demagnetizer from component.

h. Switch off.

5. The Ultra-Violet lamp (4X/4657570) in use for certain magnetic particle inspections is not flame proof, and is considered dangerous if used in confined areas. Personnel are to pay particular attention to fire safety aspects when engaged on any application using Ultra-Violet lighting.

Servicing Notes are to be complied with throughout the work detailed in this technique.

1. Technique. — Hunter/Mag/1.

2. Component to be Examined. — Fin rear attachment brackets

3. Area of Examination. — Lower surface of rear leg.

4. Purpose of Examination. — To detect cracking from bolt hole adjacent to attachment lug (Fig 1).

5. Equipment Required.

a. 4X/4589 Eclipse Magnet Cat No 811 capable of lifting a minimum weight of 3 lb mild steel.

b. 4X/4676 Magnaflux prepared bath type 7 ACM Black, or

c. 4X/4412 Ink magnetic 'Lumor K'.

d. 4X/2565 Ardox 380 White strippable laquer (for use with Black ink only), or

e. 4X/4657570 Lamp, ultra violet (for use with 'Lumor K' only).

f. Extension pieces local manufacture (Fig 1).

g. 4X/4501 Radalloyd Demagnetizer Unit.

h. 4X/3078 Field Indicator.

6. Preparation.

a. Aircraft. — Ensure fin removed.

b. Component. — Ensure bolts, excess sealant and flaking paint removed from examination area.

7. Examination Procedure. — Position magnet as shown in Fig 1 and carry out examination procedure in accordance with Servicing Notes.

8. Examination Standard. — Any defect indication renders component unserviceable.

9. Reporting Procedure. — In accordance with AP 3158 Vol 2 (2nd Edition) Leaflet C17 and relevant servicing instructions.

(Continued overleaf)

10. Estimated Technique Manhours. 1.

11. Additional Information. Nil.

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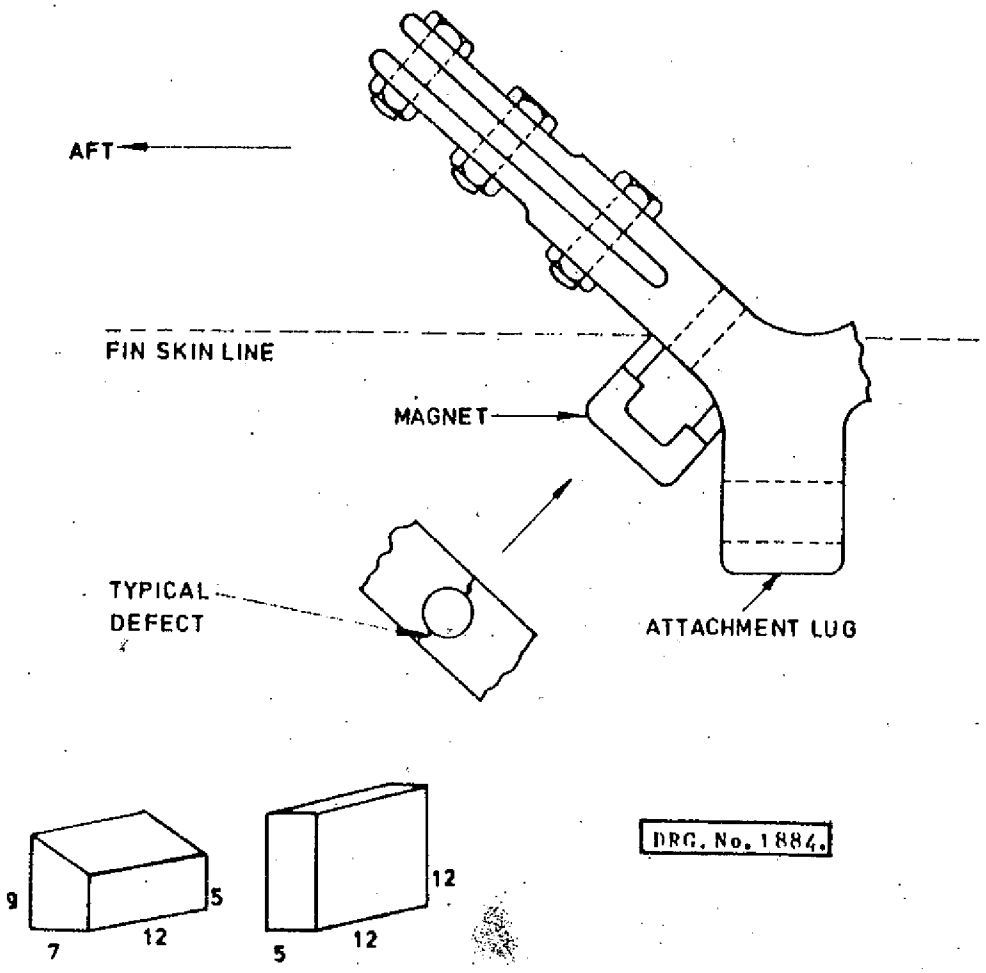
AFT
FIN SKIN LINE
MAGNET
TYPICAL
DEFECT
ATTACHMENT LUG
DRG. No. 1884.
9
5
7
12
12
5
12
EXTENSIONS PIECES
DIMENSIONS IN mm

FIG 1

Servicing Notes are to be complied with throughout the work detailed in this technique.

This technique is suitable for delegation to non-Q-A-NDT personnel holding a certificate of competence for magnetic particle inspection.

1. Technique. (Category B) — HUNTER/MAG/2A.

2. Component to be Examined. — Fin rear attachment brackets.

3. Area of Examination. — Lower surface of rear leg between bolt washer and inboard edge of fitting.

4. Purpose of Examination. — To detect fatigue cracking emanating from bolt hole and extending beyond washer towards edge of fitting. See Fig 1.

▶ 5. Equipment Required.

a. 4XM/11 Magnet special. ◀

b. 4X/2086540 Magnet, catalogue No 812.

c. 4X/2248518 Magnaflux prepared bath type 7ACM black.

d. 5A/5214855 Torch hand electric.

e. 6E/275 Hand magnifier 3 inch.

f. 4X/NIV Sample cracked bracket.

g. 4X/2565 White strippable lacquer.

6. Preparation.

a. Aircraft — Ensure access panels to fin rear attachment brackets removed.

b. Component

(1) Ensure sealant obstructing face end edge of fitting removed.

(2) Apply a coat of white strippable lacquer to the inspection area.

Continued overleaf

7. Examination Procedure.

a. Standard Aircraft Structure. see Additional Information

(1) Check field strength of special magnet by ensuring it will detect crack in sample bracket.

(2) Refer to Fig 1 and position special magnet as shown, with Red end upwards for Port side bracket and green end upwards for Starboard side bracket.

(3) Apply magnetic ink. See Additional Information.

(4) Examine inspection area using torch and hand magnifier.

b. Non-Standard Aircraft Structure, see Additional Information

(1) Using Magnet Catalogue No 812, hold in position as shown in Fig 2 and apply magnetic ink to inspection area, see Additional Information.

(2) Examine inspection area after allowing at least 30 seconds for any particle build-up.

(3) Repeat inspection procedure on opposite bracket.

8. Examination Standard.

Any defect indication renders the component unserviceable.

▶ 9. Reporting Procedure.

In accordance with AP 100B-01 Order 0770 ◀

10. Estimated Technique Manhours

1.00

11. Additional Information.

a. Due to structural variations of the web adjacent to the inspection area, cases have been encountered where it has not been possible to correctly locate the magnet (special). For the purpose of this technique, aircraft which fall into this category are classified as Non-Standard Aircraft Structure and the rear attachment brackets are to be inspected using Magnet Cat No 812 and the relevant part of the examination procedure.

b. Care should be exercised when applying the magnetic ink, to avoid destroying defect indications through use of too high an application pressure.

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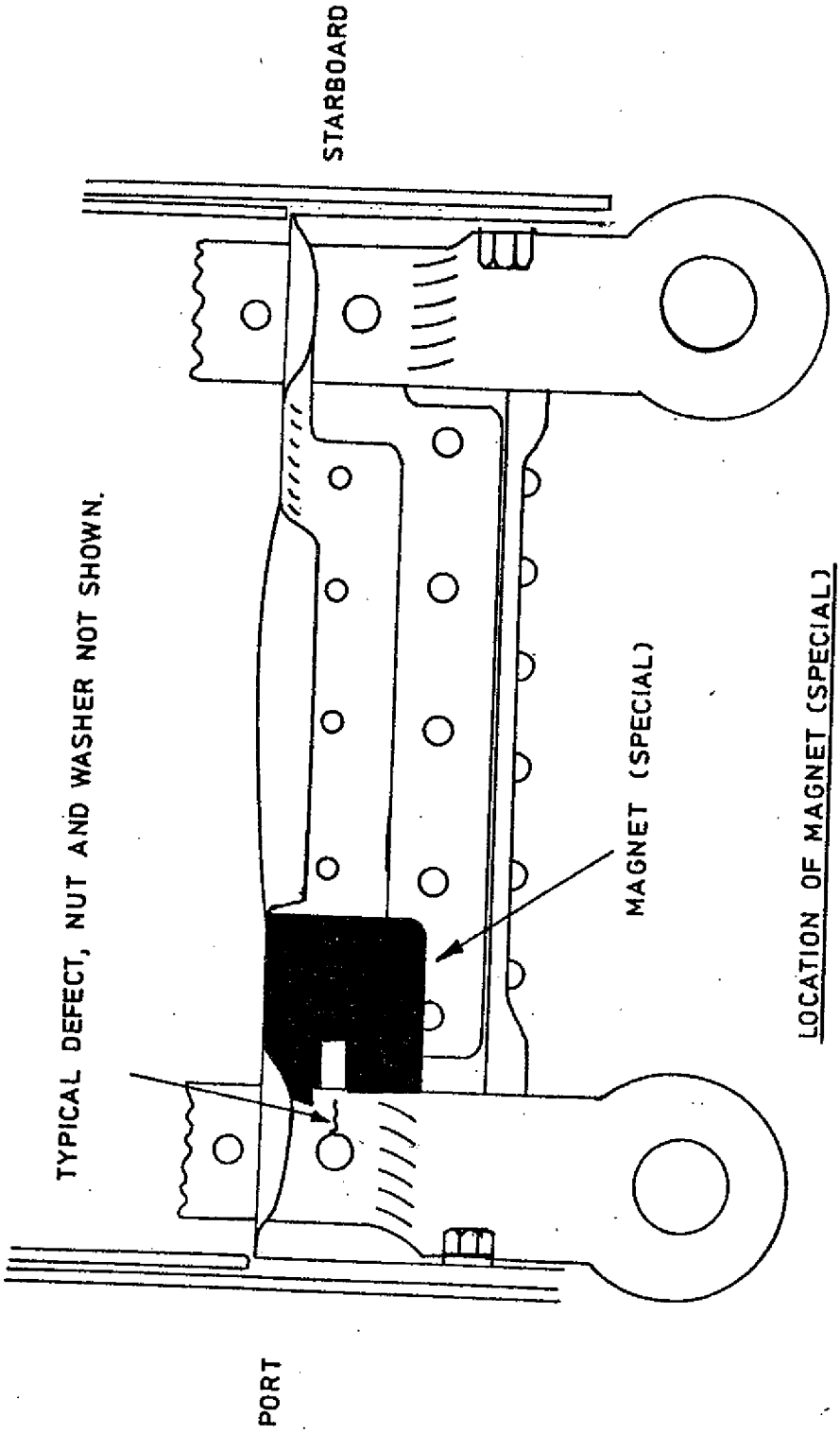
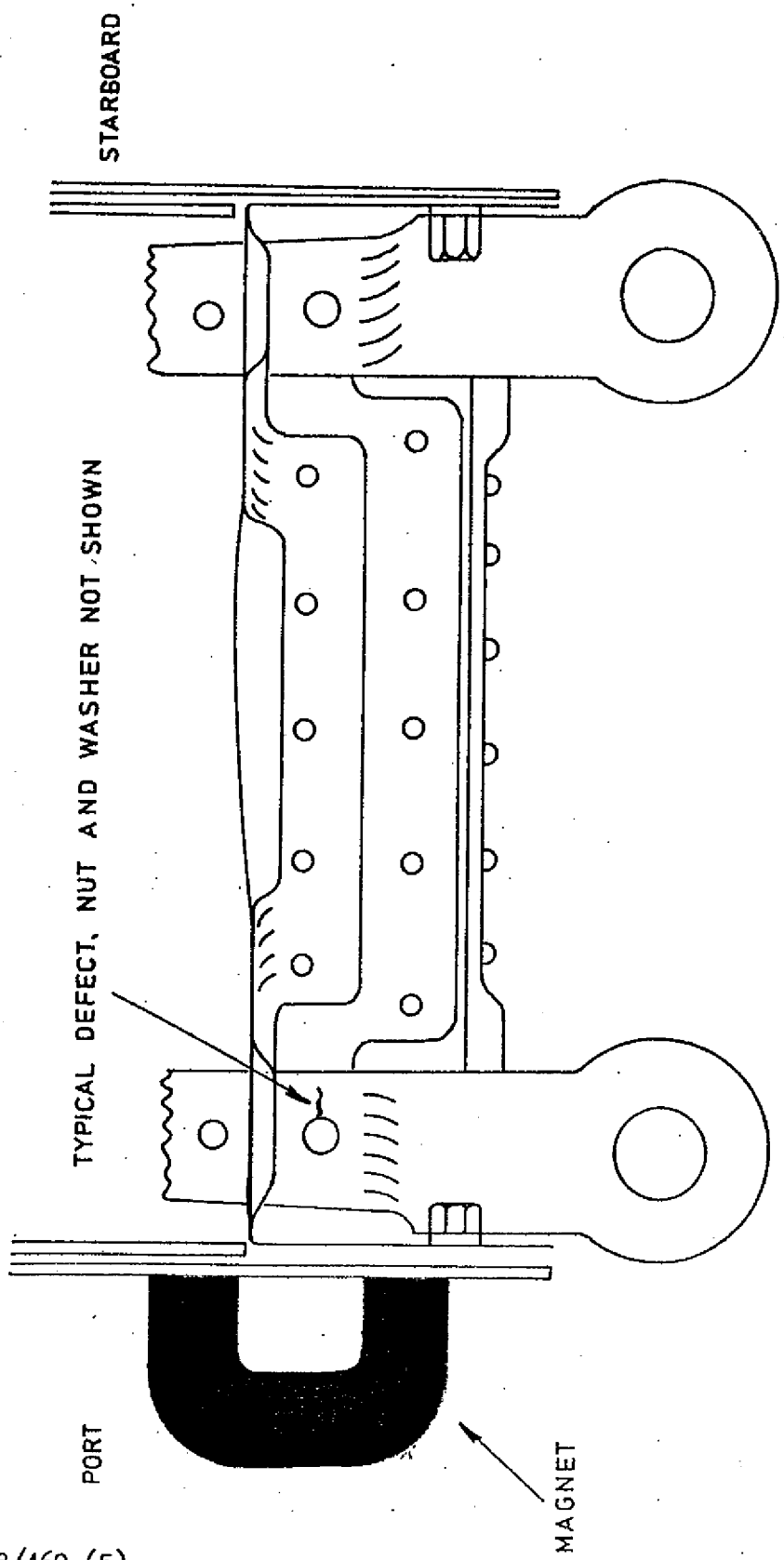


LOCATION OF MAGNET (SPECIAL)

VIEW LOOKING FORWARD OF FRAME 55 OF FIN REAR ATTACHMENT FITTINGS

FIG 1



DRG No 4147

LOCATION OF MAGNET (CAT No 812)

VIEW LOOKING FORWARD ON FRAME 55 OF FIN
REAR ATTACHMENT FITTINGS

FIG 2

SM 78/460 (5)

Servicing Notes are to be complied with throughout the work detailed in this technique.

This technique is NOT suitable for delegation to non-Q-A-NDT personnel.

1. Technique. (Category A) HUNTER/MAG/3.

2. Component to be Examined. Fin rear attachment brackets.

3. Area of Examination. Inboard corner of upper leg of top lugs. See Fig 1.

4. Purpose of Examination. To detect cracking in the area of the inboard corner of the upper leg.

5. Equipment Required.

a. 4X/2086539 Eclipse Magnet CAT 811.

b. Extension piece, local manufacture, see Fig 1.

c. 4X/2248518 Magnaflux prepared bath type 7ACM Black.

d. 4X/4671257 Endoprobe 8/33/70F/TS.

6. Preparation.

a. Aircraft

(1) Ensure fairing panels removed to give access to rear fin fittings.

(2) Ensure access provided for endoprobe, and lower web is cut back to facilitate cleaning of fitting.

b. Component

Ensure inspection area is as clean as possibe. Although access to inspection area is limited, every effort is to be made to remove excess sealant and flaking paint from corner of the bracket.

7. Examination Procedure.

a. Position magnet and extension piece as shown in Fig 1.

NOTE: Use of the endoprobe may be required to check for correct positioning of the magnet and extension piece.

b. Working through access hole provided in the fin:

Continued overleaf

7. b. (Contd)

(1) Apply magnetic ink to inspection area.

(2) View the area, using endoprobe for any signs of cracking.

NOTE: Access and viewing of Port fitting is from Starboard side access hole and vice versa.

c. Repeat Operations a and b on opposite fitting.

d. Check fittings for residual magnetism and de-magnetizing as necessary.

8. Examination Standard. Any crack indication renders the compoent unserviceable.

9. Reporting Procedure. In accordance with AP 3158 Vol 2 (2nd Edition) Leaflet C17 and current servicing instructions.

10. Estimated Technique Manhours. 1.00.

11. Additional Information. a. Due to slight structural variations, it may sometimes be necessary to remove the top tailplane hinge access panels to facilitate positioning of the magnet and extension piece.

b. A loose article hazard exists in this area and care should be taken to temporarily blank off any apertures in the immediate vicinity of the rear fittings.

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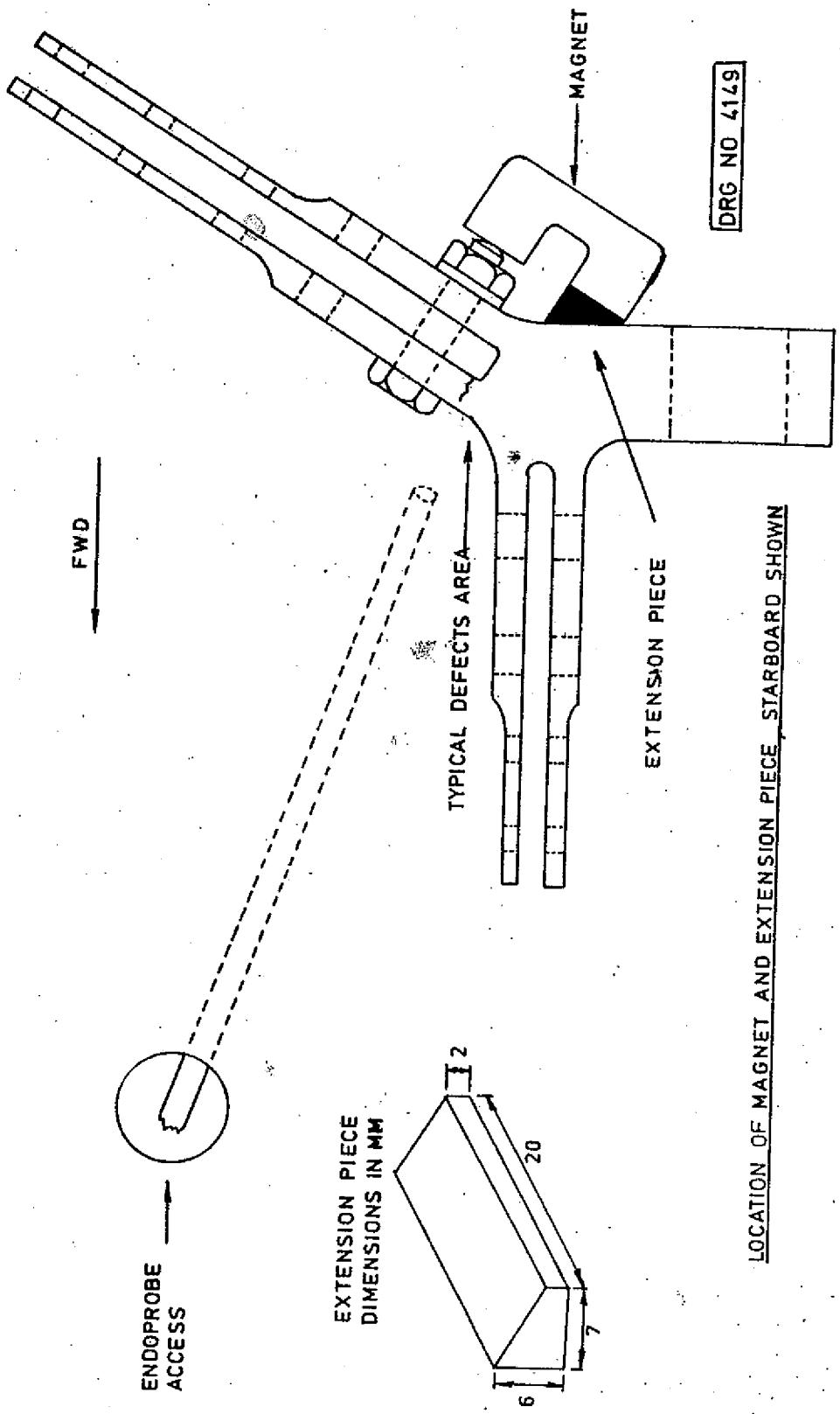

LOCATION OF MAGNET AND EXTENSION PIECE, STARBOARD SHOWN

FIG 1

Safety precautions and Maintenance Notes are to be complied with throughout the work detailed in this technique.

1.	Technique	HUNTER/MAG/4 (Category A).
2.	Component to be Examined	Mainplane front spar lower boom, attachment to centre section (Issue 1 spars only). (Fig.1).
3.	Area of Examination	Lower and fore and aft side faces in area of change of section. (Fig.1).
4.	Purpose of Examination	To detect fatigue cracking.
5.	Equipment Required	(i) Magnet Cat 815 capable of lifting 11.3 Kg (25 1b) 4XM/2086543. (ii) White strippable lacquer 33C/2565. (iii) Black magnetic ink 33C/2248518. (iv) Ardrox 9PR551 remover 33C/2241603. (v) Magnetic field indicator 4XM/2143104.
6.	Preparation	
6.1	Aircraft.	Ensure prepared in accordance with relevant maintenance instructions.
6.2	Component.	Ensure clean and free from flaking paint.
7.	Examination Procedure	
7.1	Procedure.	(i) Ensure area demagnetized. (ii) Apply a thin even coat of white strippable lacquer over examination area. (Fig.1). (iii) Position magnet. (Fig.1). (iv) Apply magnetic ink to examination area. (v) Allow 20 seconds for particle migration and examine lower and fore and aft side faces of the spar in the examination area (Fig.1) using good white light.
7.2	Examination standard.	All faults to be reported.
7.3	Completion.	(i) Remove magnet. (ii) Demagnetize. (iii) Clean all traces of magnetic ink and white strippable lacquer from spar joint area using Ardrox 9PR551 remover.
8.	Reporting Procedure	AP100B-01 Order No.0770 and relevant maintenance instructions.

9.	Estimated Technique Manhours	1 per spar.
10.	Additional Information	As this technique is for Issue 1 spars it may only be applicable to one mainplane per aircraft.

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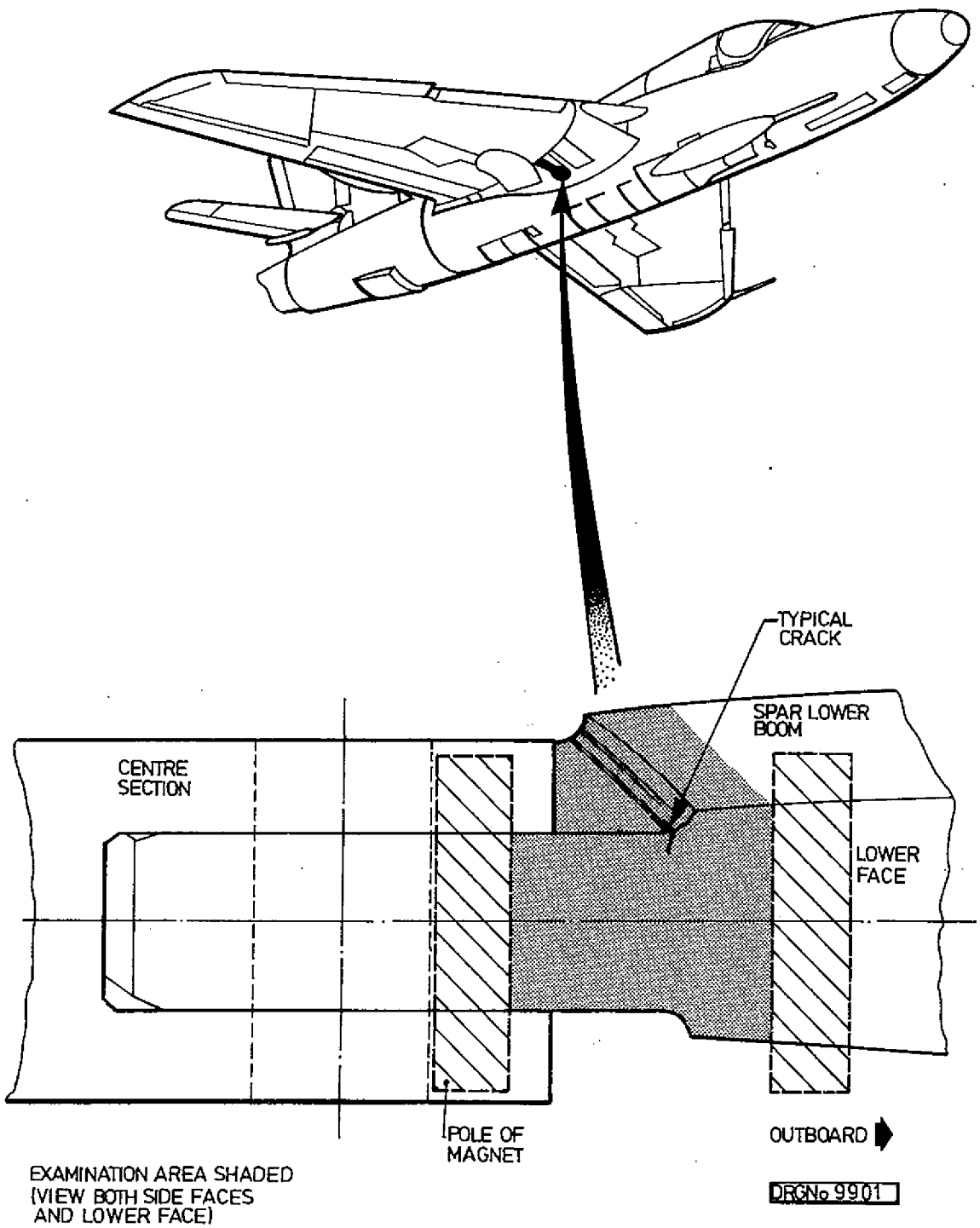

Fig.1 View of mainplane front spar lower boom to centre section joint showing examination area and magnet position

Warnings, Cautions and Maintenance Notes are to be complied with throughout the work detailed in this technique.

1.	Technique	HUNTER/MAG/6 (Category A).
2.	Component to be Examined	Mainplane forward locating spigot on fuelage port and starboard (Fig. 1).
3.	Area of Examination	Spigot to block radius (Fig. 1).
4.	Purpose of Examination	To detect cracks around radius.
5.	Equipment Required	(i) Magnet 812-4XM/2086540 capable of lifting 4.5 Kg (10 lbs). (ii) APMI black magnetic ink 33C/8300039. (iii) White background lacquer 33C/2565. (iv) Magnetic field indicator 4XM/2143014.

WARNING: WHITE BACKGROUND LACQUER IS A HAZARDOUS SUBSTANCE

6.	Preparation	
6.1	Aircraft.	Ensure prepared in accordance with relevant maintenance instructions. The mainplanes should be removed.
6.2	Component.	Ensure clean and free from grease.
7.	Examination Procedure	
7.1	Procedure.	(i) Ensure component is demagnetized. (ii) Apply light coat of white background lacquer to examination area (Fig. 1). (iii) Place magnet on top of spigot (Fig. 1). (iv) Apply black magnetic ink to full circumference of spigot to boss radius, allow 20 seconds for particle migration and examine for crack indications. (v) Reapeat operation (iv) with magnet on bottom of spigot.
7.2	Completion.	Demagnetize and remove all traces of detecting ink and background lacquer.
7.3	Examination Standard.	All fault indications are to be reported.

8.	Reporting Procedure	In accordance with AP 100B-01 Order No. 0770 and relevant maintenance instructions.
9.	Estimated Technique Manhours	0.5.
10.	Additional Information	Nil.

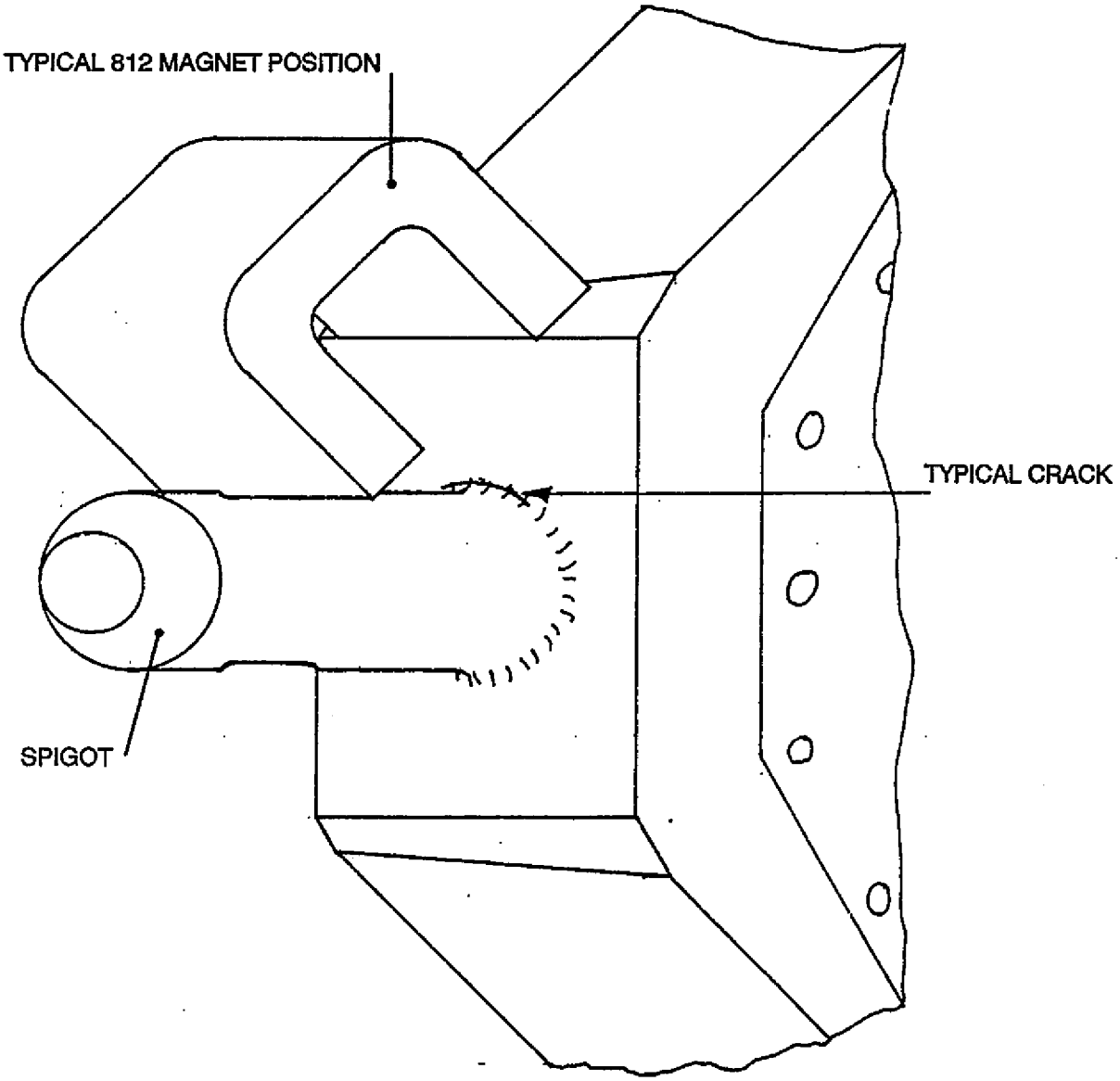

Fig. 1 Mainplane forward locating spigot on fuselage