

INSPECTION REQUIREMENTS

1. General

The inspection requirements contained in this manual have been designed to provide the operators with inspection programs which will maintain the aircraft in a continuous state of airworthiness. Pre-established reconditioning or overhaul time limits for complete aircraft have been eliminated, thus preventing lengthy out-of-service periods.

Part 3 of this manual contains supplementary information and procedures relating to recommended structural components service life limits. The actual limits are, however, specified in the separate Airframe Airworthiness Limitations Manual PSM 1-6-11.

2. Basis for Requirements

The inspection requirements detailed in this manual are based on the combined results of fatigue and systems reliability test performed at the manufacturer's facilities and service experience with the aircraft under varying operational and environmental conditions.

The requirements will be amended on a continuous basis as further test results and service experience dictate.

With respect to the main landing gear, it is important that the total time and cycles be tracked as this information is vital for future maintenance schedule adjustments based on service experience.

The prescribed frequencies at which the inspections are performed assumes an aircraft utilization of approximately 1200 hours annually with average state lengths of 50 minutes.

3. Scope

The purpose of this manual is to establish "What" and "When" to inspect and conditions to be sought. In general, the objective of the requirements is to direct the attention of maintenance personnel to components and areas where defects may result from normal usage. The requirements are not designed to lead to the detection of isolated discrepancies that may occur on a one time basis, nor discrepancies resulting from abuse or poor maintenance practices.

When performing the inspections prescribed by this manual, the inspection personnel must examine both the specified item and the components and parts in the surrounding area for irregularities or defects.

It is the operator's responsibility to comply with any additional inspections (one time or recurring) as recommended by the airframe, engine or component manufacturers, or as defined by airworthiness directives, operational rules, or other conditions of Airworthiness issued by the controlling airworthiness authority.

Note For particular inspection task, when establishing the inspection requirements for a particular aircraft, refer to the Statement of Conformities for the aircraft to determine the MOD applicability.

4. Contents of Manual

A. Basic Inspection Requirements - Part 1

These requirements are for normal operations for paved runways under moderate climatic conditions, and provide a series of visual inspection checks (Routine and A through D) which terminate at 6000 hours.

B. Special Inspections - Part 2

This part contains the inspection requirements which supplement the Basic Inspection Requirements, and provides coverage for special operating and environmental conditions, calendar timed inspections, heavy landing inspection, wing structural integrity check, hot end inspection, lightning strike inspection, volcanic ash inspection, and alternative landing gear requirements.

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C. Structural Components Service Life Limits - Part 3

This part contains the manufacturer's background information on how the service life limits of structural components, contained in PSM 1-6-11, are determined. A procedure is included for the wing main spar Fail-Safe inspection, with some illustrations provided for crack detection on critical fittings which have been subjected to abnormal conditions.

D. Corrosion Prevention and Control Manual

The Corrosion Prevention and Control Manual, PSM 1-6-5, provides mandatory supplementary inspections that are required to maintain the integrity of an aging aircraft.

The relationship between the Inspections Requirements Manual, PSM 1-6-7 and the Corrosion Prevention and Control Manual, PSM 1-6-5, is that PSM 1-6-7 provides overall coverage of the inspections programs considered necessary to maintain the aircraft in a continuous state of airworthiness. PSM 1-6-5 provides supplementary structural inspections that may be required to maintain the integrity of structures of aircraft approaching their originally intended economic design life.

5. Supporting Reference Documents

Information on "How" to perform the tests, adjustments or calibrations and "How" to establish performance tolerances, wear limits, and other inspection criteria will be found in the following:

PSM 1-6-2	Maintenance Manual, DHC-6	Series 100/200
PSM 1-63-2	Maintenance Manual, DHC-6	Series 300
PSM 1-64-2	Maintenance Manual, DHC-6	Series 400
PSM 1-6-3	Structural Repair Manual, DHC-6	ALL Series
PSM 1-6-5	Corrosion Prevention and Control Manual	ALL Series
PSM 1-GEN-5	Corrosion Prevention and Control Manual	ALL Series
PSM 1-6-11	Airframe Airworthiness Limitations Manual, DHC-6	ALL Series
PT6A-20	Engine Maintenance Manual	Series 100/200
PT6A-27	Engine Maintenance Manual	Series 300
PT6A-34	Engine Maintenance Manual	Series 400
118-A	Propeller Handbook	ALL Series
139	Propeller Owner's Manual	ALL Series
DHC-6	Service Bulletins	ALL Series
DHC-6	Technical Advisory Bulletins	ALL Series

6. Definitions

Unless otherwise stated, all prescribed inspections are performed by visual means, which may require a lamp, mirror, and 5-10 power magnifying glass.

Other techniques, for example: X-ray and dye penetrant, may be used if there are reasons to suspect that a part has been subjected to abnormal loads.

In addition to the visual inspections, the schedule prescribes the following tests:

A. Operational Test

This test is used to ascertain that a system or component is in operable condition. It can be performed with the facilities installed in the aircraft.

B. Functional Test

This test is used to ascertain that a system or unit is functioning properly in all aspects in conformance with minimum acceptable design specifications. This test may require supplemental ground support or test equipment.

C. Bench Test

This requires removal of the item from the aircraft; a visual inspection for general condition, impending failure, need for lubrication, repair or replacement of parts and adjustment or calibration to proper specifications.

7. Inspection Programs

To facilitate effective utilization of the aircraft compatible with operational requirements the operator may choose between two standard inspection programs. These inspection programs contain the detailed requirements for performance of the scheduled aircraft inspections. The frequencies at which the inspections are performed are expressed in flying hours, calendar times and cycles, or flights, as applicable.

Both programs are described more fully in Para 8. and Para 9.

8. Inspection Programs (Standard)

This Inspection Program incorporates the Basic Inspection Requirements (Part 1) and Special Inspection Requirements (Part 2) as applicable. These requirements detail the routine and regular frequency inspections between 125 and 6000 hours. Testing of operating components to determine continued serviceability is performed at various periods up to 6000 hours; removal for bench testing or internal examination is the general requirement. The types of checks with related frequencies and scope are detailed as follows:

A. 'Routine' Check: Performed at Least Every Seven Days

This is a visual inspection for obvious damage and leaks, general security and system pressures. Some access doors and engine cowlings are to be opened for this inspection.

B. 'A' Check: Performed Every 125 Flying Hours

This visual check includes the requirements for removal of the engine fuel and oil filters.

C. 'B' Check: Performed Every 250 Flying Hours

This visual check is performed together with the 'A' check and includes requirements for main fuel filter inspection and detailed wheel and brake inspections.

D. 'C' Check: Performed Every 500 Flying Hours

This is a comprehensive, thorough and searching visual inspection of all items which are subject to adjustment, discrepancies, or failure. Included in these requirements are operational and functional tests. Some items are inspected at intervals that are multiples of 500 hours, example 1000, 1500, 2000, 3000 and 6000 hours. Under 'C' check x 500 heading are twelve columns numbered 1 to 12; each numbered inspection will be performed 500 hours after completion of the last numbered inspection. A detailed breakdown of the inspection cycle is as follows:

Flying Time (Hours)	Check	Flying Time (Hours)	Check
125	A Check	3125	A Check
250	A and B Checks	3250	A and B Checks
375	A Check	3375	A Check
500	A, B and C1 Checks	3500	A, B and C7 Checks
625	A Check	3625	A Check
750	A and B Checks	3750	A and B Checks
875	A Check	3875	A Check
1000	A, B and C2 Checks	4000	A, B and C8 Checks
1125	A Check	4125	A Check
1250	A and B Checks	4250	A and B Checks
1375	A Check	4375	A Check
1500	A, B and C3 Checks	4500	A, B and C9 Checks
1625	A Check	4675	A Check
1750	A and B Checks	4750	A and B Checks
1875	A Check	4875	A Check
2000	A, B and C4 Checks	5000	A, B and C10 Checks
2125	A Check	5125	A Check
2250	A and B Checks	5250	A and B Checks
2375	A Check	5375	A Check
2500	A, B and C5 Checks	5500	A, B and C11 Checks
2625	A Check	5625	A Check
2750	A and B Checks	5750	A and B Checks
2875	A Check	5875	A Check
3000	A, B and C6 Checks	6000	A, B and C12 Checks

E. 'D' Check: Performed Every 6000 Flying Hours

This is a meticulous inspection usually requiring disassembly of the component and/or a bench or calibration test.

F. Figure 1 shows a typical Basic Inspection page with explanation of the column headings and codes used.

9. Inspection Programs (EMMA Controlled)

This program consists of 48 equalized checks performed at 125 hour intervals. The total inspection effort prescribed by the Basic Inspection Requirements has been pre-scheduled so as to provide an approximately equal manhour requirement for each check. This prevents peak workloads with resulting extended downtime, thus providing maximum continuous aircraft availability.

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D Check or C12 Check. Every 6000 hours _____

C Check. Every 3000 hours _____

C Check. Every 1500 hours _____

C Check. Every 500 hours _____

B Check. Every 250 hours _____

A Check. Every 125 hours _____

C CHECK X 500													
A	B	1	2	3	4	5	6	7	8	9	10	11	D 12
X													
	X												
		X	X	X	X	X	X	X	X	X	X	X	X
				X			X			X			X
		X	X	X	X	X	X	X	X	X	X	X	X
							X						X
		X	X	X	X	X	X	X	X	X	X	X	X
		X	X	X	X	X	X	X	X	X	X	X	X

Explanation of Basic Inspection Form
Figure 1

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Each check contains inspection items for each of the five work areas to provide a basis for task allocation if inspection teams are used.

The program checks are allotted in the following manner:

Flying Time (Hours)	EMMA Check No.	Note	If the EMMA controlled Inspection Program is introduced during the Standard Inspection Program, certain additional items must be performed to bring the EMMA program into phase.
125	1		
250	2		
375	3	<u>Note</u>	If the EMMA controlled Inspection Program is introduced during the Standard Inspection Program, certain additional items must be performed to bring the EMMA program into phase.
through			
6000	48		

The program is available on special order as a package, designated EMMA (Equalized Maintenance for Maximum Availability) and comes complete with convenient 11 x 8 1/2 inch size work cards, work area reference diagrams, and forms for the recording of inspection work, discrepancies and replacements.

The recording forms are designed to provide the operator with a convenient and effective system by which to maintain continuing analysis and surveillance of his inspection and maintenance programs.

The inspection Program (EMMA) consists of the following documents:

Item	Part Number
Complete Package (EMMA)	PSM 1-6-7 (E)
Inspection Work Cards	PSM 1-6-7 (IC)
Area Diagram	PSM 1-6-7 (D1)
Access and Insp Panels Diagram	PSM 1-6-7 (D2)
Lubrication Diagram	PSM 1-6-7 (D3)
Servicing Diagram	PSM 1-6-7 (D4)
Torque Values Diagram	PSM 1-6-7 (D5)
Inspection Log	PSM 1-6-7 (F1)
Discrepancy Report	PSM 1-6-7 (F2)
Replacement Record	PSM 1-6-7 (F3)
Servicing Diagram (400 Series)	PSM 1-6-7 (D6)
Torque Diagram (400 Series)	PSM 1-6-7 (D7)

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10. Low Utilization Maintenance Program

A. Recommended Low Utilization Maintenance Program (LUMP).

For aircraft operating less than 875 flight hours per year, it is recommended that the operator follow the EMMA program, with checks spaced at two-month (60 day) intervals (6 per year), with a maximum of 125 flight hours between any two checks (to compensate for peak season flying).

The calendar based EMMA, plus the applicable items in the Para 10.B Rules applicable to LUMP, listed below, become the Low Utilization Maintenance Program.

Using this format, even for operators flying less than 875 flight hours per year, the EMMA program would be completed at the maximum, every 8 years.

The implementation of the LUMP ensures the level of maintenance is comparable to aircraft operating at the nominal annual utilization rate and maintains using the limitations in the Inspection Requirement Manual.

B. Rules applicable to LUMP:

- 1) The PSM 1-6-7 Inspection Requirements Manual; the 'Routine Check' remains unchanged; to be performed at least every seven (7) days.
- 2) The PSM 1-6-7 Inspection Requirements Manual Part 2 'Special Inspection Requirements', apply as appropriate.
- 3) In PSM 1-6-7 and PSM 1-6-11, all programs/checks based on Calendar or Cycles are to be adhered to.
- 4) The requirements of the Corrosion Inspection Program must be adhered to verbatim; EMMA 'Aircraft Corrosion Card No. Corr' and 'Year'.
- 5) Limitations mandated by ADs are to be adhered to.
- 6) Long/Short-term storage requirements should be followed if applicable.
- 7) Additional tasks or frequency of tasks, as determined by the local operating conditions, should be performed.
- 8) The operator's local regulatory authority, prior to implementation, must approve all programs.

11. Other Than Assumed Utilization

For utilization other than that specified in Para 2. Basis for Requirements or Para 10. Low Utilization Maintenance Program (e.g. high utilization and/or high cycle/hour ration operations), consult with your Regulatory Authorities to obtain guidance on establishing an appropriate maintenance program.

12. High Intensity Radiated Fields (HIRF)

Inspection of this aircraft system or airframe area is intended to maintain protection features in the installation and airframe design that are essential to minimizing adverse effects from High Intensity Radiated Field (HIRF) and from the direct and indirect effects of lightning strike (IEL/DEL). If an alternate procedure is to be used for conducting the inspection, contact Viking Air Limited, or the local airworthiness authority, for approval prior to implementing the alternate procedure.

13. Permitted Tolerances

The basic inspection requirements per Part 1 may have a maximum 10% non-cumulative tolerance applied to the inspection interval. An inspection or maintenance interval may be extended up to 10%, except where noted. Thereafter, a subsequent inspection interval will need to be shortened by the same amount to re-establish the permissible tolerance. The opposite is also possible.

The permitted tolerances apply only to the Standard Inspection Program as follows:

- 1 'A' Check: ± 12.5 Flying Hours
- 2 'B' Check: ± 25.0 Flying Hours
- 3 'C' Check: ± 50.0 Flying Hours
- 4 'D' Check: ± 50.0 Flying Hours

Note The 'D' Check is considered to be a 12 'C' Check

The EMMA Controlled Inspection Program (CARD 1 to 47), as described in Para 9., the tolerance is ± 12.5 Flying Hours.

The Low Utilization Maintenance Program (LUMP), as described in Para 10., the tolerance is ± 12.5 Flying Hours. Also there is a calendar tolerance of ± 6 days (on 60 days), but a minimum of 6 inspections must occur within a year from use of calendar tolerance.

The permitted tolerances do **not** apply to:

- 1 'Routine' check
- 2 Calendar Time Limits (except for LUMP as described above)
- 3 Equipment Manufacturer's Instructions
- 4 Overhaul (including replacement or exchange)
- 5 Special Inspection Requirements as per Part 2
- 6 Inspections and Limits Mandated by an Airworthiness Directive
- 7 Inspections and Limits as per PSM 1-6-5
- 8 Inspections and Limits as per PSM 1-6-11
- 9 Inspections and Limits as per PSM 1-6-13

Example 1: Task 54-03a requires checking the condition, corrosion, and fasteners for security on the forward engine mount fittings. This occurs at every 'C' Check. An inspection interval can be extended to 550 flight hours. The subsequent inspection interval must be at 500 flight hours or less. If a subsequent inspection interval occurs at 450 flight hours, the tolerance is re-established for future use. That means a subsequent inspection interval can now occur again at 550 flight hours.

For example, the following inspections are possible:

Interval (Flight Hours)	Total (Flight Hours)	Check
500	500	C
+500	1000	C
+550	1550	C+10%
+500	2050	C
+500	2550	C
+450	3000	C-10%
+550	3550	C+10%
+500	4050	C
+450	4500	C-10%
+500	5000	C
and continued.		

Example 2: Task 54-03b requires inspecting the lower longeron aft of the forward fittings for condition, buckling, corrosion, and fasteners for security. The inspection does **not** have a permissible tolerance since it is mandated by an Airworthiness Directive.

Example 3: Task 57-05 requires examination of the wing strut and link attachment bolts. The inspection interval is a 6 'C' Check or at 2.5 years, whichever comes first. The calendar time limitation may **not** be extended. The first inspection may be extended by 50 flight hours to 3050 flight hours. The next inspection occurs at 6050 flight hours or earlier.

Example 4: Task 71-08 requires an inspection for condition, corrosion, and security of the engine mount; a 50 flight hour tolerance is permissible. Whereas Task 71-08a(2), which requires replacement of bolts at each engine change, does **not** have a permissible tolerance, since it is considered part of an overhaul.

If further clarity is required, consult with Viking Air Limited to obtain guidance.

14. Revisions

This manual and the EMMA inspection package will be updated by Temporary Revision if and when needed.

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