S.A.
19, rue de l'Aviation 21121 DAROIS FRANCE ✆: (33) 03 80 35 60 62 Fax: (33) 03 80 35 60 63

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MCR 4S Maintenance manual

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0. TABLE OF CONTENTS

1. USE OF MAINTANCE MANUAL

The maintenance manual has been divided into three main parts :

1.1. GENERAL

This document introduces you to the technical specifications of the MCR 4S.
Besides, based on the regulation of light Aircraft maintenance, it defines the maintenance inspections relevant to the MCR 4S.

1.2. INSPECTION PROGRAMME

This programme defines for each type of inspection (refer to "GENERAL"), the associated maintenance tasks.

1.3. MAINTENANCE PRACTICES

This section presents the list of maintenance or technical cards, that describes the operations to carry out for each maintenance task.

2. WARNING

2.1. AIRCRAFT TYPE APPLICABILITY

The inspection tasks described in this document are for a standard *MCR 4S* with standard equipment, it must be adapted to each particular configuration of your *MCR 4S.*

2.2. INFORMATION FROM MANUFACTURER

In case of maintenance problems for your *MCR 4S* or for any particular questions, do not hesitate to contact us, we will provide you with advice.
A service bulletin will be issued to update this inspection programme if necessary.

3. MAINTENANCE SCHEDULE

3.1. PRE-FLIGHT CHECK

This must be done by the pilot before each flight.
The detailed operations are given in the flight manual.

3.2. ROUTINE INSPECTIONS

50 hours inspection ("VI 1")

(or 6 months service life inspection) whichever comes first :

- ✓ either after 50 hours of operation.
- ✓ or past a 6 months period, if 50 hours of operation have not been logged.

Margin : 10 hours or 1 month

100 hours inspection ("VI 2")

(or 1 year service life inspection) whichever comes first :

- ✓ either after 100 hours of operation.
- ✓ or past a 1 year period, if 100 hours of operation have not been logged.

Margin : 10 hours or 1 month

1. Logged hours and operating time are counted either from the brand new aircraft was released, or from the last 100, 1000 or 2000 hours inspection that has been carried out.
2. Margins cannot be added together, and thus do not allow to skip a scheduled inspection task : for instance a 100 hours inspection between two 1000 hours inspection.

3.3. DETAILED INSPECTIONS

1000 hours / 2 years inspection.

It must be carried out whenever 1000 hours of operation have been logged (i.e. independent from any calendar deadline + possible margin), or past 2 years of service life.

2000 hours/6 years inspection.

It must be carried out whenever 2000 hours of operation have been logged (i.e. independant from any calendar deadline + possible margin), or past 6 years of service life..

3.4. COMMENTS

1. When a given operation is to be done during many inspections (for instance if there is a ticked box for 50, 100, 1000 and 2000 inspections), you shall consider that it is to be carried out exactly the same way for each inspection.;
   If otherwise, i.e. if a more thorough check must be done, it is stated by a different symbol at the next occurrence, and using a different terminology..
2. Hours are accounted for since the aircraft was released "brand-new", or since the last 2000 hours detailed inspection. The time slot between the 1000 hours and 2000 hours inspection must not exceed 1000 h (+ possible margin, see below).
3. Margins
   You may want to carry out at the same time both an inspection concerned with time in operation and another concerned with a calendar deadline, so as to avoid two down time periods.
   This may lead to postpone, within reasonable limits one of the two deadlines.:
   - ✓ either 100 hours on the deadline concerned with operating time (1000/2000 hours inspections).
   - ✓ or 3 months on the calendar deadline (2/6 years).

   But in any case, not simultaneously.
4. Documents to be used as a complement to the maintenance operation board :
   - ✓ Inspection programme concerned with special equipment and/or particular modifications.,
   - ✓ Engine user's manual,
   - ✓ Service bulletins and instructions from *Dyn'Aéro.*
   - ✓ You may refer in some cases to the Flight Manual and/or the Airworthiness Card (ex : instruments markings, warning placards).

4. TERMINOLOGY (FRENCH REGULATION)

4.1. ROUTINE INSPECTION

March 17th 1978 decree- entry # 15

Consists in an overall visual check, or system test operation . It allows to check the (correct) state of an aircraft sub-assembly, without the need to disassemble anything.

4.2. DETAILED INSPECTION

March 17th 1978 decree- entry # 15

Consists in an thorough check of an aircraft sub-assembly, with the required disassembly carried out, so as to detect any defect and forecast those possibly leading to catastrophic consequences.

4.3. VISUAL CHECK

This is one of the features of the routine inspection defined above. Its aim is to visually ensure ("in-situ") that a given item is in good state.

Example :
Seeking Cracks or corroded parts.

4.4. THOROUGH CHECK

This is one of the features of the detailed check, as defined above. It consists in a thorough and comprehensive examination of a given item, either visually after it has been removed from the aircraft, or using a magnifying glass or any other mean of investigation (penetrant inspection, magnetoscopy…).

4.5. CONTROL

This is a feature of both routine and detailed inspections, by which one ensures of the correctness of a situation or a state, implying a measuring action, possibly with an instrument.

Example :
Check of the cable tension of the aileron controls.

4.6. TESTING

This is also one of the components of both routine and detailed inspections. Its aim is to ensure the proper operation of an item or equipment, with possibly a performance check with or without a measuring instrument.

Example :
Altimeter bench testing.

4.7. ACCEPTANCE / CHECK FLIGHTS

These flights must be done in accordance with the requirements defined in the Appendix 4 of the July 24th 1991 decree concerned with the general aviation rules for civil aircraft.

5. CONTROL SURFACES DEFLECTION

5.1. AILERONS

- 20° $^{(\pm 1)}$ trailing edge upwards
+10° $^{(\pm 1)}$ trailing edge downwards

5.2. FLAPS

0-30° $^{(+0-1)}$

5.3. HORIZONTAL PLANE

- 13.5° $^{(-0+1)}$ trailing edge upwards
+3.5° $^{(-0+1)}$ trailing edge downwards

5.4. RUDDER

20° $^{(-0+5)}$ in both directions (left and right)

6. MCR 4S MAINTENANCE OPERATIONS BOARD.

6.1. MAINTENANCE OPERATION BOARD

Inspection	Hours	Margin	Calendar	Margin
VI1	50h	+/- 5H	6 months	1 month
VI2	100 H	+/- 5H	1 year	1 month
VP	1 000H	+/- 50H	2 years	3 months
GV	2 000H	+/- 50H	6 years	3 months
Greasing	50h	+/- 5H	3 months	1 months

7. INSPECTION PROGRAMME

OPERATION	*50h*	*100h*	*1000h*	*2000h*	*2 years*	*6 years*	*Others*
PRELIMINARY CHECKS AND FINISHING	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Acceptance / Check flight (* If required)			X	X	X	X	*
Vital checks	X	X	X	X	X	X	
Post hard landing check (* if required)							*
Engine start and warm-up	X	X	X	X	X	X	
Engine ground run and stop	X	X	X	X	X	X	
Engine pre-lubrication	X	X	X	X	X	X	
Beginning of maintenance	X	X	X	X	X	X	
Final ground engine run	X	X	X	X	X	X	
JACKING	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Aircraft Jacking (* if required)			X	X	X	X	*
LEVELLING AND WEIGHING	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Aircraft flight line levelling				X		X	
Triangulation check				X		X	
Weight and Balance assessment				X		X	
SERVICING	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Greasing shedule * 3 months	X	X	X	X	X	X	*
AIR CONDITIONING	**X**	**X**	**X**	**X**	**X**	**X**	**X**
N.A.C.A. vents check		X	X	X	X	X	
COMMUNICATIONS	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Radio equipment check	X	X	X	X	X	X	
ELECTRICAL POWER	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Electrical system and motor connection check		X	X	X	X	X	
Static and electrical systems inspection			X	X	X	X	
Battery check (* every 3 months)	X	X	X	X	X	X	*
Generator check			X	X	X	X	
Generator repair (* if required)							*
INTERIOR ARRANGEMENT	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Rudder pedal check	X	X	X	X	X	X	
Composite seat and floor checks	X	X	X	X	X	X	
Harnesses check	X	X	X	X	X	X	
Luggage compartment check	X	X	X	X	X	X	
FLIGHT CONTROLS	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Aileron articulation check	X	X	X	X	X	X	
Flap articulation check	X	X	X	X	X	X	
Aileron lever and rod inspection		X	X	X	X	X	
Flap lever and rod inspection		X	X	X	X	X	
Aileron control system control				X	X	X	
Flap control system check	X	X	X	X	X	X	
Tailplane control system check	X	X	X	X	X	X	*
Tailplane control rod check				X	X	X	
Rudder control system check	X	X	X	X	X	X	
Tailplane control system setting				X	X	X	
Rudder control setting				X	X	X	
Elevator and rudder hinges check	X	X	X	X	X	X	
Tab control rod detailed inspection	X	X	X	X	X	X	

OPERATION	***50h***	***100h***	***1000h***	***2000h***	***2 years***	***6 years***	***Others***
FUEL	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Oil and fuel lines, manifold pressure checks	X	X	X	X	X	X	
Fuel filter check		X	X	X	X	X	
Mechanical fuel pump replacement (* if required)							*
Wing fuel tank cover removal				X		X	
Fuel line check (* every 90 days)	X	X	X	X	X	X	
INSTRUMENTS	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Anemometre check (* after a down time period)				X		X	*
Altimetre check (* after a downtime period)				X		X	*
Dashboard silent-blocs check		X	X	X	X	X	
Static and electrical systems inspection		X	X	X	X	X	
Magnetic compass compensation		X	X	X	X	X	
Overall and on-board radio systems check, and removal and bench testing (* every 6 years only if a sole VHF radio is mounted only).						X	*
LANDING GEAR	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Wheels removal / mounting			X	X	X	X	
Wheel fairing inspection	X	X	X	X	X	X	
Attach fitting tightening check			X	X		X	
Brake discs check and replacement	X	X	X	X	X	X	
Fork and nosewheel supporting structure check		X	X	X	X	X	
Tyre replacement (* if required)							*
Main gear wheel bearing replacement (* if required)							*
Nose wheel wheel bearing replacement (* if required)							*
Braking system check	X	X	X	X	X	X	
LIGHTINGS	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Navigation and Strobe light check (* if required)	X	X	X	X	X	X	
CANOPY	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Canopy removal				X		X	
Canopy check	X	X	X	X	X	X	
FUSELAGE	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Back shelf check				X		X	
Fuselage skin inspection	X	X	X	X	X	X	
TAIL	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Tailplane removal and re-installation				X	X	X	
Rudder removal and re-installation				X	X	X	
WINGS	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Wing removal and re-attachment				X		X	
Aileron removal				X	X	X	
Flap removal				X	X	X	
Wing attach fitting control			X	X	X	X	
Wing and control surface skin inspections	X	X	X	X	X	X	

OPERATION	***50h***	***100h***	***1000h***	***2000h***	***2 years***	***6 years***	***Others***
PROPELLER	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Propeller removal				X			
Propeller attachment check	X	X	X	X	X	X	
Propeller and tie-bolts check				X			
Tie-bolts check				X			
Propeller spinner check	X	X	X	X	X	X	
PROPULSIVE UNIT	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Cylinders and deflectors check		X	X	X	X	X	
Engine frame and silent-block check		X	X	X	X	X	
Engine frame attachment bolt tightening check		X	X	X	X	X	
Engine silent-block replacement (* 600 h)			X	X		X	
Engine frame control				X		X	
Engine cowl and spinner inspection	X	X	X	X	X	X	
ENGINE	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Engine removal / re-installation				X		X	
Cylinder compression ratio check		X	X	X	X	X	
Refer to the maintenance manual of engine manufacturer	X	X	X	X	X	X	X
FUEL	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Oil and fuel lines, manifold pressure checks	X	X	X	X	X	X	
Carburettor check		X	X	X	X	X	
Engine control check	X	X	X	X	X	X	
Air filter check	X	X	X	X	X	X	
Throttle control check		X	X	X	X	X	
IGNITION	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Ignition system removal / re-installation				X		X	
Spark plugs : removal / inversion / re-installation		X	X	X	X	X	
Spark plugs : check	X	X	X	X	X	X	
Ignition test		X	X	X	X	X	
Ignition harness isolation check			X	X	X	X	
EXHAUST	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Intake and exhaust pipe check	X	X	X	X	X	X	
LUBRICATION	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Engine oil scavenging and filter check	X	X	X	X	X	X	
Oil cooler separator check	X	X	X	X	X	X	
Oil and fuel lines, manifold pressure checks	X	X	X	X	X	X	
Item checking and replacement following a lubrication system contamination (* if required)							*
STARTING	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Starter check	X	X	X	X	X	X	
Starter repair (* if required)							*