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1) Depending on effectivity.

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RECORD OF REVISIONS

Revision Number	Date of Revision	Date Inserted	By	Revision Number	Date of Revision	Date Inserted	By
A.01	30.04.13						
A.02	26.08.13						
A.03	24.10.13						
A.04	02.03.15						
A.05	20.08.15						
A.06	29.02.16						
A.07	10.06.16						
A.08	09.10.18						
A.09	28.02.20						
A.10	05.03.21						
A.11	01.06.22						
A.12	01.02.23						

RECORD OF TEMPORARY REVISIONS

Temp. Revision Number	Page	Date of Revision	By	Date Removed	By
01	05-10-00 p.1 & 3	11.06.14		20.08.15	
02	05-20-00 p.7 76-00-00 p.203 & 204	14.08.14		20.08.15	

HIGHLIGHTS OF REVISIONS

Revision Number	Date of Revision	Reason for Revision	Revision Number	Date of Revision	Reason for Revision
A.01	30.04.13	Initial issue.	A.11	01.06.22	New Beringer and Rotax manuals; Whelen Orion 660
A.02	26.08.13	SB-AT01-027	A.12	01.02.23	New variant AT01-200A; Garmin G3X autopilot
A.03	24.10.13	FAA validation (airworthiness limitations, wire routing diagrams); lubrication revised; standard torque ROTAX engine mount revised			
A.04	02.03.15	Life time limit, 6000 hour inspection			
A.05	20.08.15	Fuel quantity indicating system calibration procedures added; TBO's and maintenance checklist revised; Temporary revisons 1 & 2 incorporated			
A.06	29.02.16	Control surface ply lay-up added; repair procedures revised			
A.07	10.06.16	6000h check & TBOs added; battery check; wing bolts safetying			
A.08	09.10.18	Beringer: new axle and new wheels; Rotax: new spark plugs			
A.09	28.02.20	New model AT01-200			
A.10	05.03.21	Garmin GFC 500 autopilot			

INTRODUCTION

1. General

This maintenance manual provides to maintenance personnel all information necessary for the maintenance of the aircraft. It contains detailed descriptions of the systems, troubleshooting and maintenance practices. This handbook only contains maintenance practices to be carried out on the aircraft, e.g. removal and installation of components.
Maintenance, repairs and inspections must be accomplished in accordance with the instructions given in this maintenance manual (MM).

2. List of Technical Publications

A. Use the MM in conjunction with the latest revisions of the technical publications listed in table 1.

NOTE: Due to the multiplicity of equipment coming onto the market the following list may be incomplete. If there is no information given on a certain component, use the documentation provided by the manufacturer of this component.

Table 1 - List of Technical Publications

No.	Title	Manual No. / Part No.	Supplier
1.	AQUILA AT01-100A/B/C Airplane Flight Manual	FM-AT01-1010-101/102/103	AQUILA Aviation International GmbH
2.	AQUILA AT01-200A/C Airplane Flight Manual	FM-AT01-1010-104/106	AQUILA Aviation International GmbH
3.	AQUILA AT01-100/200 Illustrated Parts Catalog	PC-AT01-1030-110	AQUILA Aviation International GmbH
4.	Maintenance Manual (Line) for ROTAX 912 Series	MML-912 899196	BRP-Powertrain GmbH & Co KG
5.	Maintenance Manual (Line) for ROTAX 914 Series	MML-914 899608	BRP-Powertrain GmbH & Co KG
6.	Maintenance Manual (Heavy) for ROTAX 912 and 914 Series	MMH-912 / MMH-914 899603	BRP-Powertrain GmbH & Co KG
7.	Operator's Manual for ROTAX 912 Series	OM-912 899700	BRP-Powertrain GmbH & Co KG
8.	Operator's Manual for ROTAX 914 Series	OM-914 899706	BRP-Powertrain GmbH & Co KG
9.	Illustrated Parts Catalog for ROTAX 912 and 914 Series	IPC-912 / IPC-914 899473	BRP-Powertrain GmbH & Co KG
10.	Hydraulically Controlled Variable Pitch Prop. Operation & Installation Manual	E-124	MT-Propeller Entwicklung GmbH

Table 1 - List of Technical Publications (Cont.)

No.	Title	Manual No. / Part No.	Supplier
11.	Operation & Installation Manual Hydraulic Constant Speed Governor P-8()()-()	E-1048	MT-Propeller Entwicklung GmbH
12.	Beringer Products - Maintenance Guide Beringer Brake - Servicing Manual Beringer Wheels - Servicing Manual	SM-00 SM-01 SM-02	Beringer Aero
13.	Cleveland Wheels and Brakes Maintenance Manual	AWBCMM0001	Parker Hannifin Corp.
14.	Garmin G500 PFD/MFD System AML STC Installation Manual Instructions for Continued Airworthiness	 190-01102-06 190-01102-00	Garmin International Inc.
15.	Garmin G500/G600 TXi Part 23 AML STC Installation Manual Part 23 AML STC Maintenance Manual	 190-01717-B3 190-01717-B1	Garmin International Inc.
16.	EFD1000 and EFD500 Installation Manual Instructions for Continued Airworthiness	 900-00003-001 900-00012-001	Aspen Avionics Inc.
17.	Garmin GMA 340 Audio Panel Installation Manual Pilot's Guide	 190-00149-01 190-00149-10	Garmin International Inc.
18.	Garmin GMA 350/350H Installation Manual Pilot's Guide	 190-01134-11 190-01134-12	Garmin International Inc.
19.	Garmin GTX 328 Transponder Installation Manual	190-00420-04	Garmin International Inc.
20.	Garmin GTX 330 Transponder Installation Manual	190-00207-02	Garmin International Inc.
21.	Garmin 400W Series Installation Manual	190-00356-02	Garmin International Inc.
22.	Garmin GTN 6xx/7xx (Xi) GTN 6XX/7XX System Maintenance Manual GTN Xi Series Maintenance Manual	 190-01007-A1 190-02327-01	Garmin International Inc.
23.	Flymap L Installation Manual	500-301	Stauff Systec GmbH
24.	Model SL30 NAV/COMM Installation Manual Pilot's Guide	 560-0404-03 560-0403-01	Garmin AT Inc.
25.	Model SL40 VHF COMM Installation Manual Pilot's Guide	 560-0956-03 560-0954-02	Garmin AT Inc.
26.	Kannad 406 AF Compact Installation Manual / Operation Manual	DOC 08038 Ref. 0145599	Kannad Aviation Enquiries Orolia SAS

Table 1 - List of Technical Publications (Cont.)

No.	Title	Manual No. / Part No.	Supplier
27.	Kannad AF Integra Operation Manual	DOC 09078 Ref. 0146257	Kannad Aviation Enquiries Orolia SAS
28.	VT-01 Transponder Installation Manual	01.0200.11E	Garrecht Avionik GmbH
29.	VT-02 Transponder Installation Manual	02.0200.11E	Garrecht Avionik GmbH
30.	Glass Panel Engine Monitor MVP-50P-AQ Operating Instructions Component Replacement Considerations	 OI 06031301 06201301	Electronics International Inc.
31.	Acceptable Methods, Techniques and Practices - Aircraft Inspection and Repair	AC 43.13-1B	Federal Aviation Administration (FAA)
32.	Garmin GTR 225 / GNC 255 TSO Installation Manual	190-01182-02	Garmin International Inc.
33.	Garmin GTR 225/225A/225B Pilot's Guide	190-01182-00	Garmin International Inc.
34.	Garmin GNC 255A/255B Pilot's Guide	190-01182-01	Garmin International Inc.
35.	Restraint Systems Model 1-10-() Component Maintenance Manual	CMM 25-22-13	Schroth Safety Products GmbH
36.	Garmin G5 Pilot's Guide Part 23 AML STC Maintenance Manual	 190-01112-12 190-01112-11	Garmin International Inc.
37.	Garmin G3X Touch Pilot's Guide Part 23 AML STC Maintenance Manual	 190-02472-00 190-02472-02	Garmin International Inc.
38.	Sandia SAI-340 Installation Manual	306181-00	Sandia Aerospace Inc.
39.	Bendix King KI 300 Electronic Attitude Indicator Installation Manual	89000004-101	Bendix King Honeywell International Inc.
40.	Andromeda Aurora Installation Manual		Aveo Engineering
41.	Ultra Galactica Installation Manual	AVE-WPST-54G-IM	Aveo Engineering
42.	Parmetheus PAR-36 Plus LED Landing Light STC Manual	14793	Whelen Engineering Company
43.	Garmin GFC500 Autopilot Part 23 AML STC Maintenance Manual	190-02291-01	Garmin International Inc.
44.	Garmin GTX 33X and GTX 3X5 ADS-B Maintenance Manual	190-00734-11	Garmin International Inc.

3. Structure of the Maintenance Manual

The MM has been prepared in accordance with the Air Transport Association (ATA) Specification Number 100 for Manufacturer's Technical Data.

A. Classification of Subject Matter

The MM is divided into 5 major sections. Each of these sections is sub-divided into chapters. A table of contents is provided at the beginning of each MM chapter.

(1)	General	Ch. 05 - 12
(2)	Airframe Systems	Ch. 20 - 37
(3)	Structures	Ch. 51 - 57
(4)	Propeller	Ch. 61
(5)	Power Plant	Ch. 71 - 80

Each chapter is identified by a separator sheet with the chapter number and the title.

B. Page Numbering System

(1) The page numbering system consists of three-element numbers separated by dashes.

The first element identifies a system:
e.g. 27 Flight Controls (a chapter)

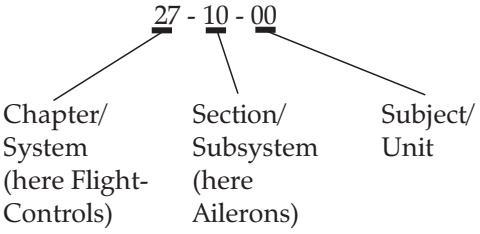
The second element identifis a subsystem in the system:

e.g. 27-30 Elevator (a section)

If the system comprises several subsystems, further sections are added:
e.g. 27 - 31 Elevator Trim Control (a further section)

The last number permits the identification of the individual units in a system or subsystem. However, this number is only used when detailed description of such individual units is required.

Example:



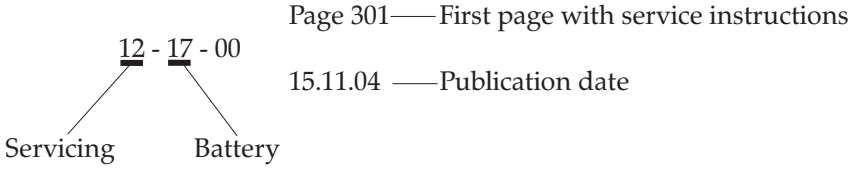
(2) When the chapter/system element number is followed by zeros in the section/subsystem and subject/unit element number (28-00-00), the information is applicable to the entire system.
(3) When the section/subsystem element number is followed by zeros in the subject/unit element number (28-20-00), the information is applicable to subsystem within the system.
(4) The subject/unit element number is used to identify information applicable to units within the subsystems.

This breakdown of the chapters provides a good overview and facilitates the exchange of revised pages. Since most of the systems are relatively simple, the third element is used only in the more complex systems, i.e. if it appears necessary to describe a unit or device in greater detail.

(5) All maintenance data given in the MM is divided into specific types of information. This facilitates work with the manual. For this purpose, page number blocks are reserved depending on type of information.

Page 1 - 99	Description and Operation
Page 101 - 199	Troubleshooting
Page 201 - 299	Maintenance Practices
Page 301 - 399	Servicing
Page 401 - 499	Removal/Installation
Page 501 - 599	Adjustment/Test
Page 601 - 699	Inspection/Check
Page 701 - 799	Cleaning/Painting
Page 801 - 899	Repairs

Example page number:



(6) Figures are numbered consecutively within each topic.

Example:	Fig. 201	1. Illustration for maintenance
	Fig. 202	2. Illustration for maintenance etc.

C. Page Order

(1) In the front of the manual:

Title
Table of Contents
Record of Revisions

Record of Temporary Revisions
Highlights of Revisions
Introduction
List of Effective Chapters

(2) Each chapter begins with:

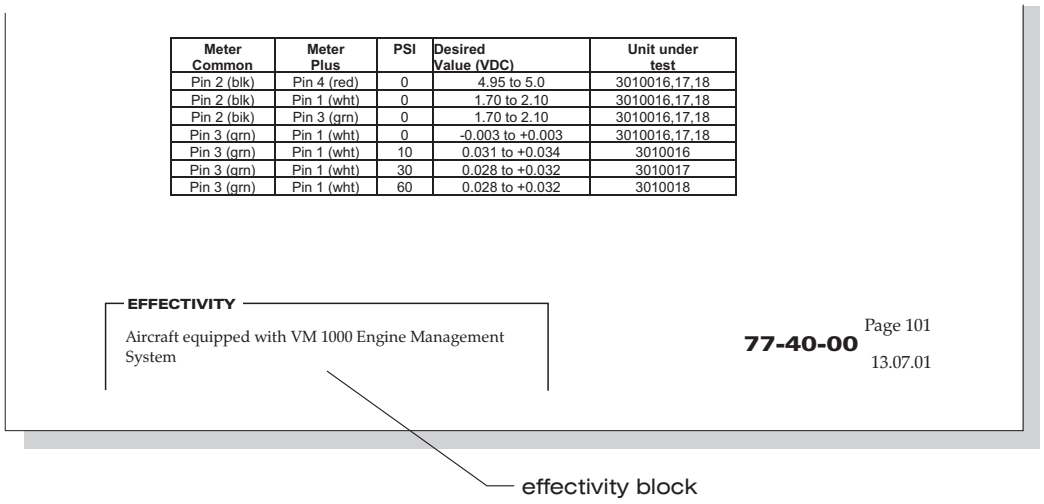
Title
Table of Contents

D. Figures

The figures within the sections of a chapter are numbered in accordance with the appropriate page number block. Numbering begins with one (1) and is continuous.

4. Using the Maintenance Manual

A. To obtain information about a specific system, refer to the list of effective chapters in the front of the manual to find the corresponding chapter number.
In the table of contents of the respective chapter, one then finds more detailed information about the arrangement of material.



Effectivity Block
Figure 1

B. Effectivity

This maintenance manual is "customized". It includes the following effectivity identification system to show modification and/or configuration differences.

(1) The MM starts with a list of effective chapters. Each chapter is listed with date of issue or revision.

(2) To identify the aircraft an effectivity statement (i.e. Garmin Avionics) or a six-digit numeric indicator is shown in the effectivity column in the table of contents if applicable.
(a) The six-digit numeric indicator begins with the last three digits of the lowest assigned number, to indicate first effectivity, and ends with the last three digits of the highest assigned number, to indicate last effectivity, of an unbroken sequence of assigned numbers. A hyphen is shown between the numbers. Open ended effectivity is indicated by "999" in the last effectivity if applicable. For example: 023-999 indicates aircraft 023 and subsequent.

(3) Effectivity Block
The system provides further direct annotation of applicability on the pages. On pages not applicable for all aircraft, an effectivity block appears at the bottom left-hand corner. Effectivity identification may be a six-digit numeric indicator (ref. to (2)(a)) or an effectivity statement (refer to figure 1).
The information on that page applies only to the aircraft noted in the effectivity block.

NOTE: Pages with no effectivity block may be followed by pages with effectivity blocks and vice versa and have identical page numbers.

C. Revisions

(1) Maintenance manual revisions, caused by variety of reasons (regulation changes, technical changes, typographical errors, etc.), will be published regularly.

Revision notification contains a note explaining the revision along with:

- the revised manual chapters
- the reason of revision
- the affected aircraft serial numbers

(2) Should a revision be urgently required between regular updating, a temporary revision will be issued. The relevant pages are yellow and will usually be incorporated in the next scheduled revision of the maintenance manual.

(3) Identifying revised material
(a) Revisions and/or additions will be identified by a vertical black line (revision bar) in the outer margin of the page opposite the text/illustration that has been changed.
(b) When technical changes result in unaltered texts slipping on to a different page, a revision bar will be placed in the outside margin, opposite the chapter/section/subject, page number and date of all affected pages, providing no other revision bar appears on the page.

(4) Incorporating revisions into the manual

(a) In order to keep track of revisions and to facilitate the use of the manual, a revision always affects the entire chapter, i.e. all pages of a chapter have the same date of issue or revision and the entire chapter is replaced during a revision.

(b) MM revisions contain an effectivity page. Chapters to be removed or inserted are listed in sequence and assigned with the respective action.
Incorporation of revisions into the manual must be documented in the record of revisions at the front of the MM.

(c) Temporary revisions are issued as single pages and must be incorporated according to the notes on the effectivity page delivered with the revision. They become invalid and must be removed when the corresponding permanent revision is issued.

D. WARNINGS, CAUTIONS and NOTES

When carrying out maintenance on the aircraft, general safety and maintenance rules should always be observed.
In addition, the MM contains warnings, cautions and notes to highlight or emphasize important and critical instructions.

WARNING:

Hazard for maintenance personnel!

CAUTION:

Hazard for systems and equipment!

NOTE:

Specific information

E. Abbreviations

Where it appears reasonable, abbreviations are used. They conform to recognized standards.

LIST OF EFFECTIVE CHAPTERS

Chapter	Title	Date*
	GENERAL	
	Table of Contents	01.02.23
	Introduction	01.02.23
04	Airworthiness Limitations	28.02.20
05	Time Limits / Maintenance Checks	01.02.23
06	Dimensions and Areas	05.03.21
07	Lifting & Shoring	28.02.20
08	Leveling and Weighing	28.02.20
09	Towing and Taxiing	28.02.20
10	Parking, Mooring, Storage & Return to Service	30.04.13
11	Placards and Markings	01.02.23
12	Servicing	01.06.22
	AIRFRAME SYSTEMS	
20	Standard Practices Airframe	09.10.18
21	Ventilation and Heating	30.04.13
22	Auto Flight	01.02.23
23	Communications	30.04.13
24	Electrical Power	01.02.23
25	Equipment and Furnishings	28.02.20
27	Flight Controls	05.03.21
28	Fuel	01.02.23
31	Indicating/Recording Systems	01.02.23
32	Landing Gear	01.06.22
33	Lights	01.06.22
34	Navigation	01.02.23
	STRUCTURES	
51	Structures	29.02.16
52	Doors	30.04.13
53	Fuselage	30.04.13
55	Stabilizers	30.04.13
56	Windows	30.04.13
57	Wings	10.06.16
	PROPELLER	
61	Propeller	28.02.20

LIST OF EFFECTIVE CHAPTERS

Chapter	Title	Date*
POWER PLANT		
71	Power Plant	28.02.20
74	Ignition	09.10.18
75	Cooling System	28.02.20
76	Engine Controls	28.02.20
77	Engine Indicating	01.02.23
78	Exhaust	28.02.20
79	Oil	28.02.20
80	Starting	30.04.13
91	Charts and Wiring Diagrams	24.10.13

* The date refers to the issue / revision date of the respective chapter.

The technical content of this document (revision A.12) is approved under the authority of the DOA ref. EASA.21J.025.

01.02.23 AQUILA Head of Airworthiness

Date, Signature Office of Airworthiness

CHAPTER 5

TIME LIMITS / MAINTENANCE CHECKS

TABLE OF CONTENTS

TIME LIMITS / MAINTENANCE CHECKS - GENERAL

1. Introduction

   A. This chapter provides scheduled and unscheduled maintenance checks and inspections, recommended by the type certificate holder as well as the time limits for service life limited components and parts.

2. General Description

   In the following, a brief description and intended purpose of each section of this chapter is given.

   A. Section 05-00-00 - Time limits / Maintenance Checks - General. This section provides a general overview of the content and purpose of this chapter.

   B. Section 05-10-00 – Component Time Limits. This section contains the time limits of all service life limited components and parts and recommended time between overhaul (TBO) for components.

   C. Section 05-20-00 - Scheduled Maintenance Checks. This section contains information about recommended scheduled maintenance and inspections. The recommended maintenance and inspection program for the systems and components as well as the relevant intervals are embodied in a checklist included in this section.

   D. Section 05-30-00 - Daily Inspections. In this section pre-flight and post-flight checks are described, that have to be carried out every day the aircraft is in operation.

   E. Section 05-50-00 - Unscheduled Maintenance Checks. This section specifies checks, which have to be conducted after unusual events and incidences such as hard landings.

COMPONENT TIME LIMITS

1. General

A. Different components and parts of the aircraft are certified for specific service life. When reaching this time limit, the respective item must be replaced or overhauled.
In order to monitor permissible service life the installation or removal of each item must be recorded in the aircraft logbook.
Where an interval is given in both flight time and calendar time, the limit which is reached first must be applied.

2. Component Time Limits

A. Under certain circumstances the replacement or overhaul of components may be required before the time limits listed below are reached.

B. Replacement or overhaul time limits, recommended by the type certificate holder:

Chapter	Component / Part	Replacement Time	Overhaul
24	Ignition lock	6000 h	no
24	Starter relais	2000 h	no
24	Battery BAT 2[4)]	1 year	no
27	Elevator control rods incl. rod ends	6000 h	no
27	Rudder control cables	6000 h	no
27	Control surface plain bearing bushings	6000 h	no
28	Electrical AUX fuel pump	3000 h or 10 years	no
28	Flexible rubber hoses of the fuel pump assembly[4)]	5 years	no
32	Nose landing gear spring package rubber elements	5 years	no
32	Main landing gear struts	no	6000h
32	Flexible teflon hoses of the brake system[1)]	2000 h or 15 years	no

1) Beringer wheel and brake system only
4) AT01-200 only

Chapter	Component / Part	Replacement Time	Overhaul
32	Flexible rubber hoses of the brake system[2)]	10 years	no
55	Lower rudder hinge bracket	6000 h	no
57	Wing attachment bolts	6000 h	no
71	Flexible teflon hoses of the oil / fuel system[5)]	2000 h or 15 years	no
71	Flexible hoses of the cooling system	5 years	no
71	Flexible silicone hoses of the air intake system[4)]	2000 h or 15 years	no
71	AQUILA engine mount and attachment bolts	6000 h	no
71	Engine shock mounts and attachment bolts	with engine overhaul	no
76	Wastegate control Bowden cable wire[4)]	2000 h	no
76	Engine / propeller control Bowden cable wires	2000 h	no

C. Vendor Established Component Time Limits

Chapter	Component / Part	Replacement Time	Overhaul
25	ELT battery	Note 1	no
25	Fire extinguisher Air Total	10 years	Note 4
25	Fire extinguisher H3R	12 years	no
32	Brake caliper pistons and rubber seals[1)]	3000 h or 5 years	no
34	WINTER instruments	no	Note 5
34	ASPEN internal battery	2200 h or 4 years	no

1) Beringer wheel and brake system only
2) Cleveland / Grove wheel and brake system only
4) AT01-200 only
5) Hoses that are not covered by the engine type certificate (TC)

Chapter	Component / Part	Replacement Time	Overhaul
61	Propeller MTV-21-A/170-05[3)] MTV-21-A/175-05[4)]	no	2000 h or 6 years Note 2
61	Propeller governor P-850-12	no	2400 h or 6 years Note 2
71	Engine ROTAX 912S[3)]	no	2000 h or 15 years Note 3
71	Engine ROTAX 914F[4)] (incl. TCU, wiring harness, wastegate motor)	no	2000 h or 15 years Note 3
71	ROTAX 912S mechanical MAIN fuel pump[3)]	5 years Note 3	no
71	ROTAX 914F electrical MAIN fuel pump[4)]	1000 h or 5 years	no
71	ROTAX flexible teflon hoses of the fuel system	with engine overhaul Note 3	no
71	ROTAX rubber parts of the engine (V-belt, hoses, carburetor parts)	5 years Note 3	no
71	Spark plugs	400 h[3)] / 200 h[4)] Note 3	no

NOTES:

Note 1: Refer to manufacturer instructions for battery replacement time limits.

Note 2: Refer to latest issue of the mt-propeller Service Bulletin No. 1.-( ), and to the mt-Propeller E-124 Operation and Installation Manual.

Note 3: Refer to the latest issues of BRP-Rotax, i.e. Service Bulletins, Service Information and to the ROTAX Aircraft Engines Maintenance Manual for ROTAX Engine Type 912 Series respectively Type 914 Series.

Note 4: Refer to manufacturer instruction for overhauling.

Note 5: Though there is no TBO for these instruments, the manufacturer Gebr. Winter GmbH & Co. KG recommends that airspeed indicators and altimeters are subjected to retesting after 5 years.

3) AT01-100 only
4) AT01-200 only

SCHEDULED MAINTENANCE CHECKS

1. General

   A. The inspection time intervals chart contained in this chapter shows the recommended intervals at which maintenance and maintenance checks should be carried out on the aircraft.

   Annual inspections and 100 hour inspections on the AQUILA AT01 must include all inspection items as required by FAR 43, Appendix D, "Scope and detail of annual/100h inspections". Chapter 4 "Airworthiness Limitations" of this manual defines the inspection intervals for continued airworthiness.

   B. If an aircraft is being operated under unusual environmental conditions, maintenance intervals may be reduced.

2. Inspection Time Intervals Chart

   A. The maintenance and checks listed are to be carried out at the specified intervals and documented appropriately.

   NOTE: For new aircraft and new engines the first check is carried out after 25 hours and should be of the extent of a 100-hour inspection. For new engines only an engine ground run and the checks listed in the "Engine" section have to be carried out.

   NOTE: If more than 30% of operation hours have been flown with leaded fuel (e.g. AVGAS 100LL), an additional 50-hour inspection is necessary (refer to ROTAX Aircraft Engines SI-912-016 respectively SI-914-019).

   NOTE: Where an interval is given in both flight time and calendar time, the limit which is reached first must be applied. The next interval starts with the flight time and calendar time of the latest performed maintenance check.

   B. For intervals between maintenance work, the following tolerances must not be exceeded:

Interval	**Tolerance**
up to and including 100 h	10% of interval
>100 h up to and including 1000 h	5% of interval
>1000 h	50 h
calendar time limits	30 days

   These tolerances must not be added up. For example: if the 100-hour inspection was done at 107 h, the next inspection must be done at 200±10 h, not 207±10 h.

   If an inspection is carried out earlier than allowed by the specified tolerance, all subsequent inspection intervals are counted from that inspection. For example: If the 100 h inspection was done at 87 h, the next inspection must be done at 187±10 h.

C. Due to recent ROTAX publications the maintenance checks given for the ROTAX engine may not be up to date. Refer to the latest revisions of ROTAX Engine Type 912 Series respectively Type 914 Series Maintenance Manual and Service Bulletins.

D. Due to the multiplicity of equipment coming onto the market, no maintenance instructions are given for electronic equipment. For information on a certain component use the documentation provided by the manufacturer of this component.

NOTES:
R912* Maintenance Manual for ROTAX Engine Type 912 Series
R914* Maintenance Manual for ROTAX Engine Type 914 Series
MT* mt-Propeller E-124 Operation and Installation Manual
TTSN Total Time Since New
TTSO Total Time Since Overhaul

E. Inspection Time Intervals Chart:

Aircraft S/N		Operating Hours		Registration Number	
Engine S/N		Operating Hours TTSN / TTSO:		Date	
Propeller S/N		Operating Hours TTSN / TTSO:		Type of Inspection	

No.	Pre-Inspection / Engine Ground Test	Reference	Interval 100h	other	Initials
1.	Check that the following documents are up-to-date and available upon request: - AT01-100/200 Maintenance Manual - AT01-100/200 Airplane Flight Manual - Aircraft Log Book and required certificates - Engine and Propeller Log Books - Equipment List and Weight and Balance Record - Airworthiness Directives - Service Bulletins and Service Information - Services Time Record	AT01-100/200 Maintenance Manual, AT01-100/200 Airplane Flight Manual	X		
2.	Airworthiness Directives - Verify all Airworthiness Directives have been complied with.		X		
3.	Service Letters, Service Bulletins, and Service Information - Verify all AQUILA GmbH and suppliers Service Letters, Service Bulletins and Service Information have been complied with.		X		
4.	Service time records, equipment list and weight and balance records - Check. Update if necessary.		X		
5.	Aircraft file and technical documentation - Verify complete and in proper order.		X		

No.	Pre-Inspection / Engine Ground Test (Cont.)	Reference	Interval 100h	Interval other	Initials
6.	Engine and engine compartment - Clean for leakage check.	R912* 12-20-00 R914* 12-20-00	X[6]		
7.	Perform an engine test run as follows: Start engine and warm-up at 820 RPM for approx. 2 minutes, continue at 1030 RPM, duration depends on ambient temperature until oil temperature reaches 50° C. Rudder pedal brakes and parking brake - Check for proper operation. Propeller governor - Set 1700 RPM and monitor manifold pressure. Reduce engine speed by moving the propeller control by 200 RPM. Note the RPM drop and manifold pressure. Increase RPM to 1700 RPM. Repeat three times. RPM drop: _____RPM / Man. press :_____in. Hg Engine instruments - Check engine parameters. Magneto RPM drop - Set 1700 RPM. Check that RPM drop is less than 120 RPM[3] / 210 RPM[4] while operating on one magneto and no more than a 50 RPM[3] / 65 RPM[4] drop difference between left and right magnetos. RPM drop left magneto :_____RPM RPM drop right magneto:_____RPM Carburetor heat - Pull knob at 1700 RPM. Engine RPM should show a drop of at least 20 RPM[3]. Carburetor temperature should show a rise of at least 2 °C[4]. RPM drop[3]:_____RPM / Temperature rise[4]:_____°C Alternator ALT2 check[4] - Switch ALT1 OFF. Ammeter ALT2 should show more than 5A. Battery BAT2 check[4] - Switch ALT1/BAT OFF. Voltmeter should be stable at 13,0 - 13,9V. Alternator ALT1 check[4] - Switch ALT1/BAT ON again. Ammeter ALT1 should show more than 5A. Ammeter ALT2 should show 0A. Engine full power - Advance throttle to full forward. Tachometer should read 2350 ±15 RPM. Full power RPM:_____RPM Engine idle - Move throttle control lever to full aft. Tachometer should read 750 +50 RPM. Idle RPM:_____RPM Cool down engine below 1000 RPM (at least 2 min[4]). Shut down engine, set the ignition switch and the master switch to the OFF position. Remove ignition key from aircraft.	R912* 12-20-00 R914* 12-20-00 32-40-00 MT* SI-914-034	X[6]		

[3] AT01-100 only
[4] AT01-200 only
[6] Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.

No.	Pre-Inspection / Engine Ground Test (Cont.)	Reference	Interval 100h	Interval other	Initials
8.	Airframe, power plant, propeller - Do a walk around to detect damages, fluid leaks or other abnormalities.		X[6)]		
9.	Fuselage and empennage - Clean.		X		
10.	Aircraft interior - Clean and vacuum.		X		
11.	Record all malfunctions and abnormalities.		X		
12.	TCU protocol - Read out TCU via Rotax communication program. Check alarm records. TCU S/N:_____Hours of Operation:_____	76-00-00 Rotax Heavy MM 76-00-00 3.1.1)	X[4)]		

4) AT01-200 only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.

No.	Engine	Reference	Interval 100h	Interval other	Initials
1.	Engine cowling - Remove engine cowling. Check for cracks, overheated areas, deformation, loose or missing fasteners. Check condition of fire protect paint and heat resistance shielding.		X		
2.	Engine oil change - Remove oil drain screw from oil tank. Drain old oil and dispose in accordance with environmental regulations.	12-12-00 R912* 12-20-00 R914* 12-20-00	X[6)]	50 h[7)]	
3.	Oil tank - Check oil tank and clean if contaminated.	R912* 12-20-00 R914* 12-20-00	X[6)]	50 h[7)]	
4.	Oil filter - Remove old oil filter from engine and install new oil filter. Lubricate mating sealing ring of new oil filter with engine oil. Tighten new oil filter by hand. Cut open old oil filter without producing any metal chips and inspect filter mat, filter cover, sealing lip, spring of bypass valve (small) and positioning spring (large) for particles, wear and missing material. Findings:_____	12-12-00 R912* 12-20-00 R914* 12-20-00	X[6)]	50 h[7)]	
5.	Turbocharger oil sump - If SI-914-039 / SB-AT01-043 has been carried out: Inspect and clean screen in turbo oil sump. Else: Remove turbocharger oil return line and oil sump. Check for build-up of oil carbon. Clean if necessary. Reinstall oil line and sump.	R914* 12-20-00 SI-914-039 SB-AT01-043 Rotax Heavy MM 78-00-00 / 79-00-00	X[4,6)]	50 h[4,7)]	
6.	Oil change - Renew gasket ring of drain screw on oil tank. Tighten drain screw to 25 Nm (221 in.lbs). Refill oil tank with approx. 3 liters of oil. For oil quality, see Operators Manual and SI-912-016 respectively SI-914-019. Refilled:_____Quantity:_____L CAUTION: DO NOT USE AIRCRAFT ENGINE OIL. Due to the friction clutch and the high stresses in the reduction gear 4-stroke motor cycle oils are recommended. For suitable lubricants and oil change intervals, see ROTAX Operators Manual and latest appropriate ROTAX publications.	12-12-00 R912* 12-10-00 R914* 12-10-00 R912* 12-20-00 R914* 12-20-00 SI-912-010 SI-914-011 SB-912-040 SB-914-026	X[6)]	50 h[7)]	
7.	Visual inspection of the magnetic plug for accumulation of chips	R912* 12-20-00 R914* 12-20-00	X[6)]		
8.	Check compression by differential pressure method. Test pressure: 6 bar (appr. 6000 hPa / 87 psi) Pressure drop: max. 25% Cyl. 1 2 3 4 Pressure drop: ____ ____ ____ ____	R912* 12-20-00 R914* 12-20-00	X[7)]	200 h	

4) AT01-200 only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.
7) If more than 30% of operation hours have been flown with leaded fuel e.g.: AVGAS 100LL

No.	Engine (Cont.)	Reference	Interval 100h	Interval other	Initials
9.	Cooling air ducts, engine baffling and cylinder cooling fins - Check for obstructions, cracks, wear and general condition. Check for signs of abnormal temperatures. Check crankcase for cracks.	R912* 12-20-00 R914* 12-20-00 SB-912-029 SB-914-018	X[6)]		
10.	Leakage bore at the base of the water pump - Check for signs of leakage.	R912* 12-20-00 R914* 12-20-00	X[6)]		
11.	Cooling system - Renew coolant. Flush the cooling system.	12-14-00 R912* 12-20-00 R914* 12-20-00		3 years	
12.	Coolant hoses and lines - Check for damage, leakage, hardening due to heat, porosity, loose connections and secure attachments. Check routing for kinks and narrow bends.	75-00-00 R912* 12-20-00 R914* 12-20-00	X[6)]		
13.	Coolant expansion tank - Check for damage and abnormalities. Inspect rubber protection plate on tank base for secure fit. Check coolant level, replenish as necessary. Check gasket of tank cap, inspect pressure control valve, and return valve. The pressure control valve opens at 1,2 bar (18 psi). Check coolant with densimeter or glycol tester.	75-00-00 R912* 12-10-00 R914* 12-10-00 R912* 12-20-00 R914* 12-20-00 SB-912-043 SB-914-029	X[6)]		
14.	Overflow bottle - Inspect for damage and abnormalities. Verify coolant level, replenish as necessary. Inspect venting bore in cap of overflow bottle for clear passage. Check line from exp. tank to overflow bottle for damage, leakage and clear passage.	75-00-00 R912* 12-10-00 R914* 12-10-00 R912* 12-20-00 R914* 12-20-00	X[6)]		
15.	Oil and coolant radiator - Check for obstructions, leaks and security of attachment. If necessary, clean cooling fins and do a pressure leakage test.	75-00-00 79-20-00	X[6)]		
16.	Oil lines - Inspect for damage, leakage, hardening due to heat, porosity, security of connections and attachments. Check routing for kinks or narrow bends. Check fire protection shielding. Check steel oil lines for cracks and scuffing marks.	R912* 12-20-00 R914* 12-20-00	X[6)]		
17.	Oil tank vent line - Check for proper routing, for obstructions and clear passage		X[6)]		
18.	Fuel lines - Check for damage, leakage, hardening due to heat, porosity, secure connections and attachments. Check routing for kinks or narrow bends. Check metal fuel lines for cracks and scuffing marks.	R912* 12-20-00 R914* 12-20-00	X[6)]		
19.	Fuel selector / shut-off valve - Check for security of attachment. Check that the valve engages noticeable into the positions LEFT, RIGHT and OFF.		X[6)]		
20.	Fuel filter - Inspect and clean.	28-20-00	X[6)]		
21.	Electric fuel pumps - Check the electric fuel pumps. Replace MAIN fuel pump.	28-20-00 Rotax Heavy MM 73-00-00 3.4.6)		1000 h[4)] 5 years[4)]	

4) AT01-200 only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.

No.	Engine (Cont.)	Reference	Interval 100h	Interval other	Initials
22.	Battery - Clean. Check charge. Measure residual capacity. Residual capacity (C10) must be at least 19,2 Ah [3,8] / 25,6 Ah [4]. If necessary, charge/replace battery.	12-17-00 24-30-00	X[6]		
23.	Battery BAT 2 - Replace additional alternator 2 battery (BAT 2).	SI-AT01-018		annual[4]	
24.	Battery BAT 2 - Check fuses of rectifier-regulator installation.	24-20-00	X[4]		
25.	Battery tray, terminals and cables - Check for security, corrosion and general condition. Grease battery terminals.	12-22-00	X[6]		
26.	Starter - Check security of attachment and electrical connections.		X[6]		
27.	Alternator - Check attachment and V-belt tension. Inspect electrical connections.	R912* 12-20-00 R914* 12-20-00	X[6]		
28.	Spark plugs - Remove all spark plugs, check for spark plug defects (deposits, excessive wear, melting). Clean spark plugs and check electrode gap. Replace as required.	R912* 12-20-00 R914* 12-20-00 SI-912-027 SI-914-028	X[6]		
29.	Spark plug connectors - Check that resistance spark plug connectors fit tightly on the spark plugs. Minimum pull-off force is 30 N (7 lb).	R912* 12-20-00 R914* 12-20-00 SI-912-027 SI-914-028		200h	
30.	Spark plugs - Replace spark plugs		Rotax 912: 200h[7] / 400h Rotax 914: 100h[7] / 200h		
31.	Sensors - Check for tight fit, condition and security of attachment.		X[6]		
32.	Exhaust system - Check attachment screws and springs for security and fit. Inspect system for damage and missing parts. Visual inspection of the muffler, turbo charger[4], exaust pipes and mounting flanges for cracks, corrosion and leakage. Check heat shielding for condition.		X[6]		
33.	Cabin heat - Check heat shroud and heat ducts for damage and security of attachment. Check heat control function.		X[6]		
34.	Exhaust muffler - Remove heat shroud from muffler and inspect muffler for condition, corrosion and leakage. WARNING: FAILURE TO INSPECT MUFFLER FOR LEAKS COULD RESULT IN CARBON MONOXIDE ENTERING THE CABIN, LEADING TO SERIOUS INJURY OR DEATH!	78-10-00		200h	
35.	Wastegate flap - Check the wastegate flap for free running and correct position. Check wastegate Bowden cable for free movement and damage. Lubricate wastegate flap axle.	R914* 12-20-00	X[4,6]		

3) AT01-100 only
4) AT01-200 only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.
7) If more than 30% of operation hours have been flown with leaded fuel e.g.: AVGAS 100LL
8) N/VFR equipped aircraft only

No.	Engine (Cont.)	Reference	Interval 100h	Interval other	Initials
36.	Propeller gear box - Check the friction torque in free rotation. Actual friction torque is measured: _____Nm	R912* 12-20-00 R914* 12-20-00	X[6)]		
37.	Propeller gear box - Inspect overload clutch.	R912* 05-50-00 R914* 05-50-00		600h[7,13)] 1000h	
38.	Propeller gear box - Check the propeller gearbox. Check gear set (pittings). Check wear on tooth of overload clutch.	R912* 12-20-00 R914* 12-20-00 Rotax Heavy MM 72-00-00		1000h	
39.	Carburetors - Check carburetor synchronization. Mechanical and pneumatic synchronization.	R912* 12-20-00 R914* 12-20-00	X[6)]		
40.	Carburetors - Inspect the float chamber assy for contamination and corrosion. Check float weight. CAUTION (Rotax 914 only): High torques on the float chamber attachment screw may damage the float chamber gasket and cause rough engine run.	R912* 12-20-00 R914* 12-20-00 SI-912-021 SI-914-023		200h annual	
41.	Carburetors - Check the ventilation of the float chambers. Any trouble with float chamber ventilation impairs engine and carburetor function and must therefore be avoided. Check that the passage of the ventilation lines is free and that no kinks can arise.			200h	
42.	Carburetors - Removal/assembly of the two carburetors for carburetor inspection.	Rotax Heavy MM 73-00-00 3.1)		200h	
43.	Carburetors - Check the free movement of the carburetor actuation (throttle lever and starting carburetor). Check that the Bowden cable allows full travel of the throttle lever from stop to stop. Check Bowden cables for bulging with control lever in the full throttle position. Adjust throttle control if necessary. Lubricate carburetor throttle shaft.	R912* 12-20-00 R914* 12-20-00 76-00-00 12-22-00	X[6)]		
44.	Carburetor sockets and drip tray - Inspect the carburetor sockets for damage and abnormalities, check for cracks, wear and good condition. Take note of any changes caused by temperature.	Rotax Heavy MM 73-00-00 3.4.3) SB-912-030 SB-914-019		200h	
45.	Airbox assy - Check for damage, security of attachment and condition. Inspect connected air hoses for condition and leakage. Check that the flaps can be moved through their full arc of travel for hot and filtered ram air. [3)]		X[6)]		
46.	Air filter - Inspect and clean. Renew if necessary. Clean air filter casing. Check the drain hole at the bottom of casing for obstructions or blockage.	R912* 12-20-00 R914* 12-20-00	X[6)]		

3) AT01-100 only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.
7) If more than 30% of operation hours have been flown with leaded fuel e.g.: AVGAS 100LL
13) Overload clutch without lead drain holes (P/N 996886) only

No.	Engine (Cont.)	Reference	Interval 100h	Interval other	Initials
47.	Intercooler and turbo-charging system - Check intercooler for condition, obstructions, leaks and security of attachment. Check hoses and lines for damage, leakage, hardening due to heat, porosity, loose connections and secure attachments. Check drain line for clear passage, kinks and narrow bends.		X[4,6)]		
48.	Carburetor heat valve and intercooler cover - Check valve and intercooler cover for correct function and condition.		X[4,6)]		
49.	Other external engine accessories - Inspect screws and nuts of all other external engine parts and accessories for tight fit. Inspect safety wiring if applicable, replace as necessary.		X[6)]		
50.	Engine mounts (manufactured by ROTAX and AQUILA) - Check mounts for deformation, cracks, corrosion, security and damage from heat. Check mounting bolts for condition and correct torque value. At shock mounts (4 bolts M10): 25 Nm (221 in.lbs) At firewall (4 bolts M10): 30 Nm (266 in.lbs) Inspect shock mounts for deterioration.	R912* 12-20-00 R914* 12-20-00 SB-912-028 SB-914-016 SB-AT01-022	X[6)]		
51.	Engine test run - Attach cowling and perform an engine test run as described above. After engine test run, re-tighten oil filter by hand and examine engine and engine compartment for signs of leakage. Compare results with first engine test run. Check oil level, replenish as necessary.	05-20-00 R912* 12-20-00 R914* 12-20-00	X[6)]	50h[7)]	

4) AT01-200 only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.
7) If more than 30% of operation hours have been flown with leaded fuel e.g.: AVGAS 100LL

No.	Propeller	Reference	Interval 100h	Interval other	Initials
1.	Spinner - Remove from aircraft and check for delamination and cracks.	61-10-00	X		
2.	Spinner plate - Check for cracks and fit.		X		
3.	Blade root and hub area - Examine for oil and grease leaks.		X		
4.	Propeller blades - Check blade play (up to 3 mm [1/8 in.] allowed).		X		
5.	Propeller blades - Check blade angle play. (max. 2°)		X		
6.	Hub - Inspect outside condition of the hub and parts for cracks, corrosion and deterioration.		X		
7.	Check nuts for low pitch - Inspect for tightness and safety wire.		X		
8.	Propeller assy - Check safetying.		X		
9.	Propeller flange stop nuts - Check correct torque value (45 - 47 Nm [398 - 416 in.lbs]).		X		
10.	Propeller blades - Visual inspection for damage, repair if necessary. Attach spinner.	MT* 6.2) - 6.10)	X		
11.	Propeller governor - Visually inspect for signs of oil leakage. Check bolts and nuts are tightened properly and safety wired. Check governor actuation for free movement and bulging.	61-20-00	X		

No.	Fuselage / Cabin	Reference	Interval 100h	Interval other	Initials
1.	Prepare aircraft for visual checks: Remove cabin carpets and floorboards; Remove glare shield; Remove baggage compartment floorboard; Remove access panel of the baggage compartment bulkhead; Remove access panels 210AB and 210BB[4].	06-30-00	X		
2.	Fuselage shell / structure - Visual inspection for paint coat damage, dents, cracks, holes, distortion and other evidence of failure. All unpainted parts for delamination (white spots). Check frames for delamination, cracks and disbonding.	SB-AT01-038	X		
3.	Lower fin - Inspect fin and lower rudder for signs of breakage. Check skid plate for wear.		X		
4.	Canopy - Examine the acrylic glass for cracking, crazing and general condition. Inspect tubular canopy hinge frame and brackets for cracks, distortion, corrosion, wear, and security of attachment. Check the gas spring strut for sufficient power and evidence of leakage.		X		
5.	Canopy locking - Check the canopy locking mechanism operates correctly. Check wear of parts. Check existence of the locking pin. The pin has to protrude the cover by approx. 2 mm. Cases of lacking locking pins have to be reported to the type certificate holder (contact information: see cover sheet). Check function of the locking pin. The canopy locking mechanism must not be too smooth-running. In the locked position of the latch, a smooth running release of the latch due to in-flight vibrations must not be possible. If necessary, readjust locking pin.	52-10-00	X		
6.	Lubricate canopy lock assembly.	12-22-00		annual	
7.	Baggage door - Check door seal, door latching mechanism, and door hinge for defects and condition. Lubricate if needed. Inspect door structure for cracks or other damage.	12-22-00	X		
8.	ELT - Perform ELT inspection. Check ELT mount and Velcro strap for security of attachment. Replace strap if necessary.	25-62-00		annual	
9.	Seat belts/harnesses for pilot / co-pilot - Check components for completeness of the label, deformation, cracks, fractures, functioning of moveable parts, corrosion, surface finish condition and security of attachment. Check textile components for damaged stitching, injurious marks, broken fabric threads, chafe marks and fusing. Perform functional check of buckle and inertia reel.		X		
10.	Seats - Check security of attachment of the seat assy to aircraft structure. Check operation of seat adjustment mechanism and seat stops. Inspect gas spring struts for oil leakage or other damage.		X		
11.	Seats - Check ease of movement - if required remove seats, clean and lubricate seat rails.	25-10-00		annual	

4) AT01-200 only

No.	Fuselage / Cabin (Cont.)	Reference	Interval 100h	Interval other	Initials
12.	Center Console - Visually examine the parts of the engine controls, lines and cables, located in the center console.			annual	
13.	Engine and propeller controls - Check for proper function, security of attachment and for evidence of wear. Check Bowden cables for bulging with control levers in the full throttle / high RPM position. Check Bowden cable clamp screws on control levers are freely rotatable.		X		
14.	Throttle control - Check displayed throttle valve position via Rotax communication program. Indication should be linear over the complete range (0-115%). Detent for max. continuous power should be noticeable at 100% (max. 103%). Adjust if necessary.	76-00-00	X[4)]		
15.	Parking brake valve - Check for evidence of leakage especially at the brake line connections. Check control assy for damage.		X		
16.	Rudder pedal bearing and Beringer brake master cylinder rod ends - Lubricate.	12-22-00		annual	
17.	Brake master cylinders and brake lines in the cabin area - Check for security, condition and signs of leakage.		X		
18.	Fuel lines - Check for leakage and security.		X		
19.	Main landing gear - Inspect fuselage structure at such points and areas where the main landing gear is attached. Check for stress marks, distortion, disbonding, and delamination. Inspect main landing gear strut brackets for distortion, cracks, corrosion, and security of attachment. Check wear and condition of the polyamide inserts. Check bolts for correct torque.		X		
20.	Flap actuator - Check for wear and damage, for secure mechanical connections and loose or missing lock devices. Check electrical wiring for wear, damage, and proper routing. Inspect electrical connections and switches for security, corrosion and poor condition. Check function of the limit switches and position indicator.		X		
21.	Elevator trim system - Check the actuator and the springs for security, wear and damage. Check safetying. Check electrical wiring for wear, insulation damage, and proper routing. Inspect electrical connections and switches for security, corrosion and poor condition. Perform system test and check the correct function of the position indicator.		X		
22.	Aileron and elevator control - Check the control sticks, the brackets and the control rods for distortion, cracks, chafing, corrosion and security. Examine all bearings for condition and secure fit. Check safetying. Check travel of control surfaces if the control stick is in the full forward /neutral/ aft, and full left /neutral/ right positions. Verify no binding or jumpy movement of the control sticks through their full range of travel.		X		

4) AT01-200 only

No.	Fuselage / Cabin (Cont.)	Reference	Interval 100h	Interval other	Initials
23.	Rudder control - Check rudder control weldment and rudder bellcrank for cracks, distortion, chafing and security. Examine rudder control support brackets, rudder pedal pivot brackets and connection of the rudder controls with the nose gear steering tubes for security, condition and correct splintering. Check centering of springs and cables. Inspect control cables, control cable guides, cable connections, turnbuckles and hardware for correct installation, corrosion, wear, safetying and proper operation.		X		
24.	Rudder / aileron control interconnection - Check condition and correct function.		X		
25.	Autopilot - Inspect all installed autopilot components. Check roll / pitch / yaw servo assembly for proper fastening and tightness.	22-10-00		annual[12)]	
26.	Brake reservoir - Check for leakage and system for trapped air. Inspect the vent valve in the filler cap of the brake reservoir for obstruction and blockage. Make sure the hydraulic brake fluid level is correct and replenish, if necessary. Only use hydraulic brake fluid of the required grade.		X		
27.	Hydraulic brake fluid - Renew.	32-40-00		3000h 5 years	
28.	Wing main bolts - Inspect for proper fit, condition and correct safetying.	57-10-00	X		
29.	Wing main bolts - Remove for visual inspection and lubrication. Lube type used: _____	57-10-00 12-22-00		500h[9)] 5years[9)] or annual[9)]	
30.	Exterior / interior placards and markings - Check presence, legibility, and security.	11-20-00 11-30-00	X		
31.	Fire extinguisher - Check for physical damage, corrosion, leakage or clogged nozzle. Weigh unit to determine fullness. Check for obstructions to access or visibility, safety seal is not broken or missing, HMIS label in place, instructions are legible.			annual	
32.	Elevator control cover - Check that edge protection profile is installed in the baggage compartment.	SB-AT01-039	X		

9) Interval depends on lube type. Refer to 12-22-00.
12) if installed

No.	Wings, Ailerons, Flaps	Reference	Interval 100h	Interval other	Initials
1.	Wings with winglets, ailerons, and flaps - Visual inspection for paint coat damage, dents, cracks, holes, distortion and other evidence of failure. Examine all unpainted parts for delamination (white spots).		X		
2.	Wing spars in the fuselage belly - Remove spar covering and perform visual inspection of spar web, the bonding between spar web and carbon fiber spar cap strip, as well as the attachment of the root ribs to the spars. Check security and function of control system brackets attached to the spars.			annual	
3.	Drain and vent holes - Check for blockage and suspect appearance of any liquid.		X		
4.	Ailerons - Check aileron hinges, bearings, and hinge brackets for security and excessive play. Check hinge bushings and replace if necessary. Check bolts and nuts for proper safetying. Examine aileron pushrod for correct installation with stop nuts. Check actuation assembly for suspect binding, excessive play.		X		
5.	Aileron hinges - Check play. Maximum play approx.: - Axial ± 1,00 mm (± 0.04 in.) - Radial ± 0,30 mm (± 0.01 in.)		X		
6.	Aileron control system - Measure the play in the aileron control system with the control surface locked. Apply a lateral force of 30 N (6.7 lb) to the control stick - the maximum play allowed on the top of the stick is 10 mm (0.4 in.) for both sides. The play should be measured for both control sticks. If excessive play is detected, investigate cause.		X		
7.	Flaps - Check hinge brackets for damaged paint, cracks and delamination. Check bearings for correct fit and excessive play. Check hinge bushings and replace if necessary. Check correct safetying of all hinge bolts and castle nuts with cotter pins.		X		
8.	Flap hinges - Check play. Maximum play approx.: - Axial ± 0,30 mm (± 0.01 in.) - Radial ± 0,30 mm (± 0.01 in.) Measure the play in the flap control system at the flap trailing edge, at the inboard flap end. Max. play allowed with flaps in take-off and landing positions: ± 5 mm (0.2 in.). No play with flaps retracted.		X		
9.	Flaps and ailerons - Check that the gap between fuselage and flaps, between flaps and ailerons, and at the outboard end of the ailerons is at least 2 mm (0.08 in.).		X		
10.	Stall warning system - Check for condition and proper operation.		X		
11.	Navigation / strobe lights - Check operation, condition of glass, and security of attachments.	33-40-00	X		
12.	Inner fuel tank ribs - Check connection of fuel and vent lines to the fuel tank and the flange gasket of the fuel level sensors for signs of leakage.	28-10-00 28-20-00 28-40-00		annual	

No.	Wings, Ailerons, Flaps (Cont.)	Reference	Interval 100h	Interval other	Initials
13.	Fuel vent lines - Check for blockage.		X		
14.	Fuel tank drain valves - Check for correct function and leakage.		X		
15.	Fuel tank outlet strainer - Check for damage. Clean if necessary.			1000h	
16.	Fuel filler caps - Check for proper function and leakage.		X		
17.	Upper wing shell in the fuel tank area - Check wing skin for bubble formation or bulging. Contact AQUILA Aviation if there are any findings.			annual	
18.	Tank inlet - Check sealing of the bore hole in the tank inlet.	SB-AT01-027		annual[10)]	
19.	Tie-down points - Check thread and structure around the tie-down attach points for any damage.	10-20-00	X		

10) AT01-100A/B/C-300 up to AT01-100A/B/C-312 only. Refer to SB-AT01-027, latest revision.

No.	Empennage, Elevator, Rudder	Reference	Interval 100h	Interval other	Initials
1.	Empennage - Inspect complete surface of the vertical and horizontal stabilizers, the elevator and the rudder for dents, cracks, holes and delamination.		X		
2.	Rudder hinge, elevator hinge and bellcranks - Check brackets and bellcranks for security of attachment and corrosion. Examine bearings for binding and excessive play. Check hinge bushings and replace if necessary. Check correct safetying of the lower rudder pivot pin with castellated nut and cotter pin.		X		
3.	Hinge play and control surface positioning - Verify clearance between horizontal stabilizer and elevator horns and clearance between vertical stabilizer and rudder horn is at least 1 mm (0.04 in.). Check elevator hinge and rudder hinge play. Maximum play approx.: - Axial ± 0,30 mm (± 0.01 in.) - Radial ± 0,30 mm (± 0.01 in.)			annual	
4.	Elevator control system - Measure the play in the elevator control system with the control surface locked. Apply a force of 50 N (11.2 lb) forwards and then backwards to the control stick - the maximum play allowed on the top of the stick is 10 mm (0.4 in.) for both sides.			annual	
5.	Rudder - Remove rudder if there is noticeable play. Examine the elevator actuation assembly inside the vertical stabilizer. Check for any damage, for correct installation and function and for security and wear. Inspect rudder hinge brackets, rudder yoke and control cable thimble-eyes for security, conditions and wear. Lubricate control cable thimble-eyes as required.	55-40-00		annual	
6.	Rudder rigging - Set rudder pedals in neutral position. Verify the rudder and the nose landing gear are also in neutral position. Set rudder pedals to fully left and then to full right. The rudder must hit the rudder travel stops and the distance from rudder pedal to firewall must be sufficient to apply the pedal brake. Adjust position of the rudder pedals by varying the length of nose wheel steering tubes. Adjust rudder neutral position and control cable tension by means of the turnbuckles in the cabin area.	27-20-00	X		
7.	Yaw damper - Check rudder control cable and servo bridle cable for correct pretension. Adjust pretension if necessary. Ensure integrity of PTFE tube around rudder control cable and that cable runs over the capstan cage, not beside it. Verify bridle cable ball is in the capstan groove on the opposite side of the rudder control cable.	22-10-00 27-20-00	X[12)]		

12) if installed

No.	Nose and Main Landing Gear	Reference	Interval 100h	Interval other	Initials
1.	Wheel fairings - Check condition and correct fit. Remove and clean. Check for paint coat damage, cracks, dents and delamination.		X[6)]		
2.	Fairing mounts - Inspect for cracks, distortion or other damage.		X[6)]		
3.	Wheel brakes - Apply brakes, examine system for leaks. Inspect brake fluid carrying lines at the main landing gear for condition, leakage and security of attachment.		X[6)]		
4.	Wheels - Remove and clean. Check tires for wear, cuts, foreign matter and deterioration. Check tire pressure and proper location of the red slide marks. Inspect rims for deformation, cracks, scratches, corrosion and other damage. Examine bearings for excessive play, corrosion and irregular operation.	32-40-00	X[6)]		
5.	Wheel halves - Disassemble. Visually inspect wheel flanges (and central spacer) for cracks, nicks, scratches, corrosion or other damage. Replace O-ring.	32-40-00		every[1)] tire change	
6.	Wheel bearings - Clean and lubricate.	12-22-00		500h[2)] annual[2)]	
7.	Brake disc clips - Check play between disc and wheel clips. Change clips and screws if play is above 0.5mm (0.02 in.).	32-40-00	X[1,6)]		
8.	Wheel axles - Clean. Visually inspect for cracks, nicks, scratches, corrosion or other damage.		X[6)]		
9.	Wheel brakes - Clean brake caliper housing and backplate. Visually inspect for cracks, nicks, corrosion or other damage. Check freedom of movement of pistons and pressure plates.		X[6)]		
10.	Wheel brakes - Replace brake caliper pistons and rubber seals.	32-40-00		3000h[1)] 5 years[1)]	
11.	Wheel brakes - Inspect brake discs for crazing, coning, corrosion and wear. Inspect brake pads for condition and wear. Replace brake discs if worn below: Beringer: 3.8mm (0.15 in.) Cleveland / Grove: 4.3mm (0.17 in.) Replace linings when worn to: Beringer: wear indicator groove nearly invisible Cleveland / Grove: 2.6mm (0.10 in.)	32-40-00	X[6)]		
12.	Main landing gear - Check main gear struts for deformation, cracks, damage to the paint coat, and corrosion. Inspect attachment of wheel axle for any damage.		X[6)]		
13.	Nose gear strut mount and wheel fork - Check for deformation, cracks and corrosion. Check nose gear strut journal bearing for proper operation, play and correct safetying.		X[6)]		

1) Beringer wheel and brake system only
2) Cleveland / Grove wheel and brake system only
6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.

No.	Nose and Main Landing Gear (Cont.)	Reference	Interval 100h	Interval other	Initials
14.	Nose gear strut and elastomer package - Check strut for deformation, stress marks, and cracks. Inspect correct installation of the nose wheel fork. Inspect elastomer package for wear, deterioration, cracks, correct fit and security. Check journal bearings of the elastomer package for play and condition.		X[6)]		
15.	Nose wheel steering - Inspect nose wheel steering tubes for condition, excessive play and correct safetying. Check return springs at nose gear strut for security and verify they are tension-free, when the nose wheel is in neutral position.		X[6)]		

6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.

No.	Electrical System / Avionics	Reference	Interval 100h	Interval other	Initials
1.	Electrical wiring system - Check the complete electrical wiring system for security, damage, wear and secure fit. Check all cable connections for tight fit, good contact, corrosion and condition.	R912* 12-20-00 R914* 12-20-00	X[6)]		
2.	Tank inlet bonding wires - Check bonding between electric ground (exhaust port) and tank inlet (max. 1Ω).			annual	
3.	Instruments - Check instrument panel mounting brackets for security and condition. Examine instruments for security of attachment. Check electrical cables, hoses and lines for correct installation, condition and proper routing.			annual	
4.	Pitot / static system - Perform pitot / static system leak test.	34-11-00		2 years	
5.	Pitot / static system - Check pitot tube for security of attachment, condition and obstructions. Check pitot and static pressure lines for correct installation, condition, water and proper routing. Check water traps for water.	34-11-00	X		
6.	Pitot heating system - Carefully check pitot tube for heating up with pitot heating switched ON. WARNING: RISK OF SKIN BURNS! DO NOT TOUCH PITOT TUBE WHEN HEATING IS SWITCHED ON!		X[12)]		
7.	Engine monitoring system - Check transducers and lines for leakage, loose fittings and proper installation. Check fittings for corrosion. Check electrical wires for chafing, breakage and loose connections. Check system for proper operation.		X[6,12)]		
8.	Integrated flight system - Check all components and wiring for damage, corrosion, proper operation and security of attachment.	34-25-00		annual[12)]	
9.	Integrated flight system - Check bonding.	34-25-00		2000h[12)] 10years[12)]	
10.	Aspen EFD1000 system - Perform bonding check.	34-25-00		annual[12)]	
11.	Aspen EFD1000 system / Garmin G5 - Perform capacity check of the internal back-up battery.	34-25-00		annual[12,14)]	
12.	Tank inlet bonding wires - Check bonding wires at the airframe ground tube for yellow discoloration.	SB-AT01-027		annual[11)]	
13.	Autopilot - Check bonding.	22-10-00		2000h[12)] 10years[12)]	
14.	Autopilot - Perform functional test of disconnect tone audio output (both disconnect switches).	22-10-00		annual[12)]	

6) Check has to be carried out every 100 hours of operation or 12 month, whichever comes first.
11) AT01-100A/B/C-300 up to AT01-100A/B/C-312 only. Refer to SB-AT01-027, latest revision.
12) if installed
14) Interval is reduced to 6 months after 3 years from date of battery installation (Aspen only).

No.	Return to Service	Reference	Interval 100h	Interval other	Initials
1.	Install wheels and wheel fairings. Install seats (if removed). Install cabin floor boards. Install baggage compartment floorboard. Install access panel of the baggage compartment bulkhead. Install access panel 210AB and 210BB[4].	32-40-00 06-30-00	X		
2.	Flight controls - Check for full range of travel and excessive friction.		X		
3.	Flaps - Operate through full extension and retraction for steady and complete deployment. Check correct limit switches operation at CRUISE, T/O and LDG flap positions. Verify the corresponding flap switch position and the corresponding flap position indicator reading.		X		
4.	Elevator trim - Check for full range of travel and excessive friction. Inspect proper operation of the trim control switch, limit switches, and the trim position indicator. Verify that elevator control forces decrease or increase when operating elevator trim. Measure control force to move stick rearward with full nose-down trim (40 ±5 N).	27-31-00	X		
5.	Engine and propeller controls - Check full range of motion without any obstruction or excessive friction to travel. Check throttle and propeller control levers friction lock.		X		
6.	Foreign items - Remove any foreign items from the aircraft.		X		

[4] AT01-200 only

The aircraft is airworthy and meets the condition specified in the aircraft data sheet. All maintenance required by Service Information and Airworthiness Directives and all prescribed scheduled maintenance checks have been carried out.

Service Station:

Next inspection when _____ hours of operation have been reached.

Place, Date

Name, Signature of Mechanic

Name, Signature of Inspector

Stamp

3. 6000-Hour Inspection

A. The airframe of the type AQUILA AT01 is limited to 6.000 hours of flight time (refer to 04-00-00). An inspection program to reach an extension of replacement time can be obtained from the type certificate holder on request.
For all S/N`s having performed the 6000-hour inspection and possible maintenance actions resulting thereof no further life time limit beyond 6000 operating hours will be established and the composite structure is then considered to have "Safe Life".

B. All inspection items listed in the following table "6000-Hour Inspection Checklist" must be performed within **every 6000 hours of flight time**. The inspection **must be performed in conjunction with a 100-hour inspection including all annual inspection items** listed for the airframe (refer to "Inspection Time Intervals Chart" above).
All items performed, all findings discovered and their follow up corrections have to be recorded in acc. with an approved quality procedures manual.

NOTE: The first 6000-hour inspection is replaced by an inspection program to reach an extension of life time (refer to 04-00-00). It can be obtained from the type certificate holder on request.

C. The inspection table shows three different types of inspections listed in the column "Method/Inspection":

V	Visual inspection
T	Tap test
F	Functional / fit check

Refer to 51-10-00 for a description of visual inspection and tap test methods.

D. Prior to inspection all aircraft log-books have to be checked to establish the aircraft data set and the repair history of the aircraft.

Before starting the 6000-hour inspection the following actions are required:
(1) Fix the fuselage on jacks (refer to 07-10-00).
(2) Remove wing (refer to 57-00-00).
(3) Remove rudder (refer to 55-40-00).
(4) Remove elevator (refer to 55-20-00).
(5) Remove ailerons (refer to 57-50-00).
(6) Remove flaps (refer to 57-50-00).
(7) Remove cowling (refer to 71-10-00).

E. 6000-Hour Inspection Checklist

Aircraft S/N		Operating Hours TTSN		Registration Number	
Engine S/N		Operating Hours TTSN / TTSO		Date	
Propeller S/N		Operating Hours TTSN / TTSO		Date	

No.	Inspection Items Left Wing	Inspection Method	Finding / Condition	Initials
Root Ribs (in front of and behind wing spar)				
1.	Bonding area of ribs to the wing shell - delamination, cracks.	V, T		
2.	Condition of rib laminate, delamination, cracks.	V, T		
3.	Bonding area at the main wing spar web.	V		
4.	Wing attachment bolt bushing - bonding in the rib.	V		
5.	Condition of bushing, wear of bearing area, corrosion.	V		
Inner Flap Hinge Support Rib				
6.	Bonding area of rib to the wing shell - delamination, cracks.	V, T		
7.	Condition of rib laminate, delamination, cracks.	V, T		
8.	Bonding area at the main wing spar web.	V		
9.	Areas around bushing - delamination, cracks.	V		
10.	Condition of ball bearing, wear, corrosion.	V		
Wing Main Spar				
11.	Spar cap between root ribs - bonding to shear web, cracks.	V		
12.	Shear web between root ribs - condition, cracks, delamination.	V		
13.	Spar cap - inspection through openings in root rib and inspection opening in lower wing shell. Bonding to the wing shell (cracks), condition of the main shear web (delamination).	V		
Upper and Lower Wing Shell				
14.	Wing shell - delamination, cracks, scratches in shell surfaces, chipping of paint, UV damage.	V, T		
15.	Wing shell - core damage and dents in sandwich, disbond of shell laminate from core material.	V, T		

No.	Inspection Items Left Wing (Cont.)	Inspection Method	Finding / Condition	Initials
16.	Areas around inspection openings - delamination, cracks.	V		
17.	Wing leading edge bonding area - disbonds, cracks.	V, T		
18.	Area around pitot-static tube opening - delamination, cracks.	V, T		
19.	Area around tie-down fixation point - delamination, cracks.	V, T		
20.	Area around NAV-light opening - delamination, cracks.	V		
21.	Area around winglet root upper wing shell - cracks.	V, T		
22.	Area around ring insert of the tank filler - cracks, disbonding.	V, T		
Trailing Edge Shear Web				
23.	Wing trailing edge, flap area - bonding lower to upper shell, disbond, cracks.	V, T		
24.	Wing trailing edge, flap area - laminate condition, cracks.	V		
25.	Wing trailing edge, aileron area - bonding area shear web to wing shell, disbonds, cracks.	V, T		
26.	Wing trailing edge, aileron area - laminate condition, cracks.	V		
27.	Bonding left an right of hinge levers for flap and aileron.	V, T		
28.	Aileron hinge levers - delamination at bolt area, bolt corrosion.	V		
29.	Flap hinge levers - delamination at bolt area, bolt corrosion.	V		
Tank Rib				
30.	Bonding area of rib to the wing shell - delamination, cracks.	V, T		
31.	Condition of rib laminate, delamination, cracks.	V, T		
32.	Bonding area at the main wing spar web.	V		

No.	Inspection Items Right Wing	Inspection Method	Finding / Condition	Initials
Root Ribs (in front of and behind wing spar)				
1.	Bonding area of ribs to the wing shell - delamination, cracks.	V, T		
2.	Condition of rib laminate, delamination, cracks.	V, T		
3.	Bonding area at the main wing spar web.	V		
4.	Wing attachment bolt bushing - bonding in the rib.	V		
5.	Condition of bushing, wear of bearing area, corrosion.	V		

No.	Inspection Items Right Wing (Cont.)	Inspection Method	Finding / Condition	Initials
Inner Flap Hinge Support Rib				
6.	Bonding area of rib to the wing shell - delamination, cracks.	V, T		
7.	Condition of rib laminate, delamination, cracks.	V, T		
8.	Bonding area at the main wing spar web.	V		
9.	Areas around bushing - delamination, cracks.	V		
10.	Condition of ball bearing, wear, corrosion.	V		
Wing Main Spar				
11.	Spar cap between root ribs - bonding to shear web, cracks.	V		
12.	Shear web between root ribs - condition, cracks, delamination.	V		
13.	Spar cap - inspection through openings in root rib and inspection opening in lower wing shell. Bonding to the wing shell (cracks), condition of the main shear web (delamination).	V		
Upper and Lower Wing Shell				
14.	Wing shell - delamination, cracks, scratches in shell surfaces, chipping of paint, UV damage.	V, T		
15.	Wing shell - core damage and dents in sandwich, disbond of shell laminate from core material.	V, T		
16.	Areas around inspection openings - delamination, cracks.	V		
17.	Wing leading edge bonding area - disbonds, cracks.	V, T		
18.	Area around tie-down fixation point - delamination, cracks.	V, T		
19.	Area around NAV-light opening - delamination, cracks.	V		
20.	Area around winglet root upper wing shell - cracks.	V, T		
21.	Area around ring insert of the tank filler - cracks, disbonding.	V, T		
Trailing Edge Shear Web				
22.	Wing trailing edge, flap area - bonding lower to upper shell, disbond, cracks.	V, T		
23.	Wing trailing edge, flap area - laminate condition, cracks.	V		
24.	Wing trailing edge, aileron area - bonding area shear web to wing shell, disbonds, cracks.	V, T		
25.	Wing trailing edge, aileron area - laminate condition, cracks.	V		
26.	Bonding left an right of hinge levers for flap and aileron.	V, T		
27.	Aileron hinge levers - delamination at bolt area, bolt corrosion.	V		

No.	Inspection Items Right Wing (Cont.)	Inspection Method	Finding / Condition	Initials
28.	Flap hinge levers - delamination at bolt area, bolt corrosion.	V		
Tank Rib				
29.	Bonding area of rib to the wing shell - delamination, cracks.	V, T		
30.	Condition of rib laminate - delamination, cracks.	V, T		
31.	Bonding area at the main wing spar web.	V		

No.	Inspection Items Control Surfaces	Inspection Method	Finding / Condition	Initials
Ailerons				
1.	Aileron surfaces - Check for delamination of shells, scratches.	V, T		
2.	Paint surfaces - Check for condition, scratches, UV damage, chipping of paint.	V		
3.	Damage of core, dents to core, disbond between core and skin.	V, T		
4.	Aileron trailing and leading edges - bonding delamination.	V, T		
5.	Inner and outer aileron ribs - bonding delamination with skin.	V, T		
6.	Check condition of drain holes in inner and outer ribs.	V		
7.	Areas around hinges and aileron control horn fasteners - delamination from skin, cracks.	V		
8.	Condition of control horn bearing, corrosion, play.	V		
9.	Condition of hinges (bushings), corrosion, play.	V		
10.	Inspect for previously performed repairs and repaintings. If so, check aileron mass and static moment to be within specified limits (refer to 57-50-00).	V		
Flaps				
11.	Flap surfaces - Check for delamination of shells, scratches.	V, T		
12.	Paint surfaces - Check for condition, scratches, UV damage, chipping of paint.	V		
13.	Damage of core, dents to core, disbond between core and skin.	V, T		
14.	Flap trailing and leading edges - bonding delamination.	V, T		
15.	Inner and outer flap ribs - bonding delamination with skin.	V, T		
16.	Check condition of drain holes in inner and outer ribs.	V		

No.	Inspection Items Control Surfaces (Cont.)	Inspection Method	Finding / Condition	Initials
17.	Areas around hinge fasteners - delamination from skin, cracks.	V		
18.	Condition of control horn bearing, corrosion, play.	V		
19.	Condition of hinges (bushings), corrosion, play.	V		
20.	Inspect for previously performed repairs and repaintings. If so, check flap mass and static moment to be within specified limits (refer to 57-50-00).	V		
Rudder				
21.	Rudder surfaces - Check for delamination of shells, scratches.	V, T		
22.	Paint surfaces - Check for condition, scratches, UV damage, chipping of paint.	V		
23.	Damage of core, dents to core, disbond between core and skin.	V, T		
24.	Rudder trailing and leading edges - bonding delamination.	V, T		
25.	Lower rudder hinge rib - bonding delamination with skin.	V, T		
26.	Check condition of drain hole in lower hinge rib.	V		
27.	Area around upper hinge - delamination from skin, cracks.	V		
28.	Mass balance horn - Check for cracks and delamination.	V, T		
29.	Condition of hinge (bushing), corrosion, play.	V		
30.	Inspect for previously performed repairs and repaintings. If so, check rudder mass and static moment to be within specified limits (refer to 55-40-00).	V		
31.	Bolts at lower hinge - Check for condition, cracks, corrosion, thread.	V		
Elevator				
32.	Elevator surfaces - Check for delamination of shells, scratches.	V, T		
33.	Paint surfaces - Check for condition, scratches, UV damage, chipping of paint.	V		
34.	Damage of core, dents in core, disbond between core and skin.	V, T		
35.	Elevator trailing and leading edges - bonding delamination.	V, T		
36.	Inner elevator ribs - bonding delamination with skin.	V, T		
37.	Check condition of drain holes in inner ribs.	V		
38.	Areas around hinges - delamination from skin, cracks.	V		
39.	Mass balance horn - Check for cracks and delamination.	V, T		

No.	Inspection Items Control Surfaces (Cont.)	Inspection Method	Finding / Condition	Initials
40.	Condition of hinges (bushings), corrosion, play.	V		
41.	Inspect for previously performed repairs and repaintings. If so, check elevator mass and static moment to be within specified limits (refer to 55-20-00).	V		
42.	Bolts at inner hinge - Check for condition, cracks, corrosion, thread.	V		

No.	Inspection Items Horizontal Stabilizer	Inspection Method	Finding / Condition	Initials
1.	Stabilizer surfaces - Check for delamination of shells, scratches.	V, T		
2.	Paint surfaces - Check for condition, scratches, UV damage, chipping of paint.	V		
3.	Damage of core, dents in core, disbond between core and skin.	V, T		
4.	Stabilizer leading edges - Check for bonding delamination.	V, T		
5.	Trailing edge spar - Check for cracks and bonding delamination with skin.	V, T		
6.	Areas around hinge supports in trailing edge spar - Check for cracks and delamination.	V		
7.	Condition of hinges (bushings), corrosion, play.	V		

No.	Inspection Items Fuselage	Inspection Method	Finding / Condition	Initials
Fuselage Skin Structure and Vertical Stabilizer Skin				
1.	Skin surfaces - Check for delamination of shells, scratches.	V, T		
2.	Paint surfaces - Check for condition, scratches, UV damage, chipping of paint.	V		
3.	Damage of core, dents in core, disbond between core and skin.	V, T		
4.	Areas near bonding seam at centerline on upper and lower fuselage surfaces - Inspect for cracks in paint.	V, T		
5.	Check condition of drain holes in lower fuselage.	V		
6.	Inspect for previously performed repairs and repaintings.	V		
7.	Areas near bonding seam at connection between horizontal and vertical stabilizer on upper and lower horizontal surfaces - Inspect for cracks in paint.	V		

No.	Inspection Items Fuselage (Cont.)	Inspection Method	Finding / Condition	Initials
Fuselage / Wing Interconnection				
8.	Root ribs and intersection to fuselage - Check for cracks in paint and structure.	V		
9.	Area around wing attachment bolt bushings - Check for cracks and disbonding.	V		
10.	Wing attachment bolt bushings - Check for wear, scratches, corrosion and tightness of fit with the bolt.	V		
11.	Seat bulkhead and forward landing gear bulkhead in spar bridge - Check condition of laminate and bonding areas with the fuselage shell.	V, T		
12.	Forward landing gear bulkhead - Check laminate around fasteners of landing gear supports for cracks and delamination.	V, T		
Bulkheads, Ribs and Hinges in Vertical Stabilizer				
13.	Upper and lower shear web in vertical stabilizer - Check for delamination and cracks.	V		
14.	Upper and lower shear web in vertical stabilizer - Check bonding to the stabilizer shell.	V, T		
15.	Upper hinge plate - check for delamination and cracks.	V		
16.	Bushing in upper hinge plate - wear, corrosion, fit/play.	V		
17.	Lower shear web around fasteners for lower hinge bracket - Check laminate.	V		
18.	Bushing in lower hinge bracket - wear, corrosion, fit/play.	V		
19.	Lower end of the stabilizer (bumper) - delamination, cracks.	V		
20.	Bumper plate at lower end of the stabilizer - Check fixation and condition.	V		
Firewall				
21.	Check firewall bulkhead (from cockpit side) for cracks in the laminate (around cut outs).	V		
22.	Firewall bulkhead - Check bonding to the fuselage skin.	V, T		
23.	Areas around engine brackets - delamination, cracks.	V, T		
24.	Firewall metal shield - condition, wear, corrosion.	V		
25.	Fire resistant firewall sealer around the fire shield - condition, corrosion.	V		
26.	Areas around Camloc fasteners at fuselage cowling support - Check laminate for cracks and delamination.	V		

No.	Inspection Items Fuselage (Cont.)	Inspection Method	Finding / Condition	Initials
27.	Area around pedal control brackets - delamination, cracks.	V		
Cockpit Area and Baggage Compartment				
28.	Front cockpit floor - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
29.	Front shear bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
30.	Front seat bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
31.	Seat elements and attachments - delamination, cracks.	V, T		
32.	Rear seat bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
33.	Front landing gear bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
34.	Rear landing gear bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
35.	Baggage bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V, T		
36.	Lower lap belt attachments - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
37.	Lower lap belt fitting - Check for wear and corrosion.	V		
38.	Upper lap belt attachments - Check for delamination and cracks at the baggage bulkhead.	V, T		
39.	Baggage compartment floor supports - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
40.	Gas spring supports - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
41.	Composite tube stiffener and attachments - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
42.	Baggage compartment door, doorframe and supports - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
43.	Tailboom bulkheads - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		

No.	Inspection Items Fuselage (Cont.)	Inspection Method	Finding / Condition	Initials
44.	Elevator control lever mounting supports on baggage bulkhead - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
45.	Flap actuator mounting supports in middle tunnel - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
46.	Canopy frame (at the fuselage) - Check for delamination and cracks.	V, T		
47.	Step supports - Check for delamination and cracks. Check bonding area to the fuselage structure for disbonding.	V		
48.	Check step component for wear and corrosion.	V		
Canopy				
49.	Canopy frame - Check for delamination and cracks. Check bonding area of Plexiglas to the canopy frame structure for disbonding.	V		
50.	Canopy latching components - corrosion, wear, damage.	V		
51.	Canopy pin and bushing components - Check for corrosion, wear and fit/play.	V		
52.	Canopy Plexiglas including side windows - cracks, damage.	V		

No.	Inspection Items Landing Gear	Inspection Method	Finding / Condition	Initials
Main Landing Gear				
1.	Main landing gear struts - Check condition (distortion, corrosion, wear and paint damages).	V		
2.	Remove main wheels from axles and check axles for distortion, corrosion, wear and damages.	V		
3.	Check inner and outer main brackets for fit of shims, cracks and wear.	V		
Nose Landing Gear and Engine Mount				
4.	Nose landing gear main strut and wheel fork - Check condition (cracks, distortion, corrosion, wear and paint damages).	V		
5.	Nose wheel steering tubes - Check condition (cracks and distortion).	V		
6.	Engine mount - Check the entire tube frame and all welded joints, in particular at the firewall and nose gear suspension, for distortion, wear and cracks.	V		

No.	Inspection Items Landing Gear (Cont.)	Inspection Method	Finding / Condition	Initials
7.	Engine mount attachment bolts - Check for cracks and wear.	V		
8.	Nose wheel axle - Check for cracks and distortion.	V		

The aircraft is airworthy and meets the condition specified in the aircraft data sheet.
All prescribed 6000-hour inspection items and maintenance actions resulting thereof have been carried out.

Service Station:

Place, Date

Name, Signature of Mechanic | Name, Signature of Inspector | Stamp

DAILY INSPECTIONS

1. General

   A. Pre-flight and post-flight checks must be carried out daily when the aircraft is in operation.

2. Pre-Flight Check

   A. This check must be carried out before the first flight of the day. In this way, the general condition of the aircraft and its engine can be ascertained. Pre-flight checks are essential for flight safety as numerous accidents can be traced back to inadequate pre-flight checks.

      The scope of the pre-flight check is listed in the AQUILA AT01-100/200 Airplane Flight Manual, section 4.

3. Post-Flight Check

   A. This check should be carried out after the final flight of the day. For the most part, it is a visual inspection.

   B. The check should contain all points of the pre-flight check.
      (1) Supplementary measures:
         (a) Re-fuel.
         (b) Check that the aircraft is properly parked (refer to 10-10-00).
         (c) Check the logbook entries for remarks about faults or defects, and for correct number of landings and flight hours.
         (d) If necessary, moor the aircraft (refer to 10-20-00).

UNSCHEDULED MAINTENANCE CHECKS

1. General

A. Special checks are to be carried out when an incident has occurred that may have caused damage to the aircraft or impaired airworthiness.

In addition, a 25-hour inspection must be carried out on new aircraft and its engine, on overhauled engines and after extensive airframe repairs.

2. Special Checks

A. 25-Hour Inspection
After the first 25 hours of operation of a new aircraft and its engine or an overhauled engine or after extensive airframe repairs, an inspection of the extent of a 100-hour inspection must be carried out (refer to 05-20-00).

After the first 25 hours of operation of a new or overhauled engine, the engine and the propeller must be inspected. Refer to ROTAX Aircraft Engines Maintenance Manual for ROTAX Engines Type 912 Series respectively Type 914 Series for detailed information on this inspection.

B. Hard Landing
After an excessively hard landing or other unusual loading of the landing gear a thorough inspection of the affected components and their attachments is required. Even if no obvious defects are detectable, a visual inspection must be carried out. Perform the following:

(1) Prepare aircraft for visual checks as follows:
  (a) Remove engine cowling (refer to 71-10-00).
  (b) Remove landing gear fairings.
  (c) Inside the cabin and baggage compartment - remove carpets and floorboards as required to gain access to the landing gear mounting brackets (refer to 25-12-00).

(2) Inspect main landing gear.
  (a) Check wheel fairings for cracks, dents and delamination.
  (b) Check fairing mounts for cracks, distortion and other damage.
  (c) Check fuselage structure visually at such points and areas where the main landing gear is attached. Check for stress marks, distortion, disbonding, and delamination. Check main landing gear strut brackets for distortion, cracks and security of attachment. Check condition of the polyamide inserts. Check bolts for correct torque.
  (d) Check main gear struts for deformation and cracks. Examine wheel axles for security of attachment to struts and for any damage.
  (e) Inspect tires for integrity and proper location of the red slide marks.
  (f) Inspect brake fluid carrying lines at the main landing gear for condition, leakage, and security of attachment.

(3) Inspect nose landing gear.
  (a) Check wheel fairing for cracks, dents and delamination.
  (b) Inspect fairing mounts for cracks, distortion and other damage.
  (c) Check nose gear strut mount for deformation and cracks. Check nose gear strut journal bearing for proper operation and play.
  (d) Check strut for deformation, stress marks, and cracks. Check elastomer package for deterioration, cracks, correct fit and security. Check journal bearings of the elastomer package for play and condition.
  (e) Inspect nose wheel steering tubes for condition and excessive play.
  (f) Inspect tire for integrity and proper location of the red slide marks.
(4) Re-mount all items removed during the inspection.
(5) Perform a brake and steering system operational test (refer to 32-40-00).

C. Engine Fire

After an engine fire, carry out the following:

WARNING: IF IT IS SUSPECTED THAT PARTS OF THE STRUCTURE OR COWLING COULD HAVE BEEN DAMAGED BY HIGH TEMPERATURES (INDICATED BY BLISTERING ON THE PROTECTIVE COATING), THE MANUFACTURER MUST BE CONTACTED FOR DEFECT APPRAISAL BEFORE THE AIRCRAFT IS FLOWN AGAIN.

(1) Remove engine cowling (refer to 71-10-00).
(2) Examine engine cowling. Check for signs of fire damage.
(3) Disconnect battery (refer to 24-30-00).
(4) Examine electrical cables for damaged insulation.
(5) Examine fuel lines for damage of the fire-protection sleeves.
(6) Check oil lines for damage of the fire-protection sleeves.
(7) Check air filter element for fire damage.
(8) Examine engine mount and shock mounts for any fire damage.
(9) Check all other hoses and pipes, as well as all gaskets and seals for fire damage.
(10) Replace damaged items.
(11) Re-mount engine cowling (refer to 71-10-00).
(12) Perform an engine test run (refer to 05-20-00).

D. Violent Stop of the Engine

In event that the propeller has touched the ground or the engine has been inadvertently stopped violently (shock loading), the propeller gear box must be disassembled and inspected by an authorized workshop. For further information on engine inspections necessary after a propeller ground strike and for more general information, refer to the relevant technical documents and the ROTAX Maintenance Manual.

CAUTION: ONLY QUALIFIED TECHNICIANS (AUTHORIZED BY THE NATIONAL AVIATION AUTHORITY AND AFTER SUCCESSFULLY COMPLETING THE RELEVANT ROTAX TRAINING COURSE) ARE AUTHORIZED TO PERFORM THIS WORK.

Check additional equipment (external alternator, hydraulic governor, ignition unit, coolant and oil hoses) for damage.

CHAPTER 11

PLACARDS AND MARKINGS

TABLE OF CONTENTS

PLACARDS AND MARKINGS - GENERAL

1. Introduction

   A. This chapter provides information about interior and exterior graphics, placards, labels and interior markings, their maintenance and repair.

2. General Description

   Below a brief description and intended purpose of each section of this chapter is given.

   A. Section 11-00-00 - Placards and Markings - General. This section provides a general overview of content and purpose of the chapter.

   B. Section 11-20-00 - Exterior Placards and Markings. This section gives maintenance and care instructions for external placards, graphics, markings etc. and contains information about the equipment and material required.

   C. Section 11-30-00 - Interior Placards and Markings. This section gives maintenance and care instructions for internal placards, graphics, markings etc. and contains information about the equipment and material required.

EXTERIOR PLACARDS AND MARKINGS

1. General

A. This section gives maintenance and care instructions for exterior graphics, markings, etc.. Figure 201 shows the locations of the exterior placards and markings.

2. Tools, Equipment and Material

	Quantity	Equipment	Parts No.	Manufacturer
3.A. and B.	1	heat gun	-	commercially available
3.A. and B.	as required	isopropyl alcohol	-	commercially available
3.B.	1	needle	-	commercially available
3.B.	1	handy, dense, closed cell foam block	-	commercially available

3. Removal/Installation

A. Remove Self-Adhesive Placards

NOTE: Reference marks should be made on aircraft before removing old graphics.

(1) Warm the placard a little using a heat gun (approx. 40-50°C).
(2) Carefully separate a corner of the placard from the aircraft and then pull off parallel to the surface to remove it.
(3) Remove all traces of old adhesive by using a cloth with isopropyl alcohol as required.

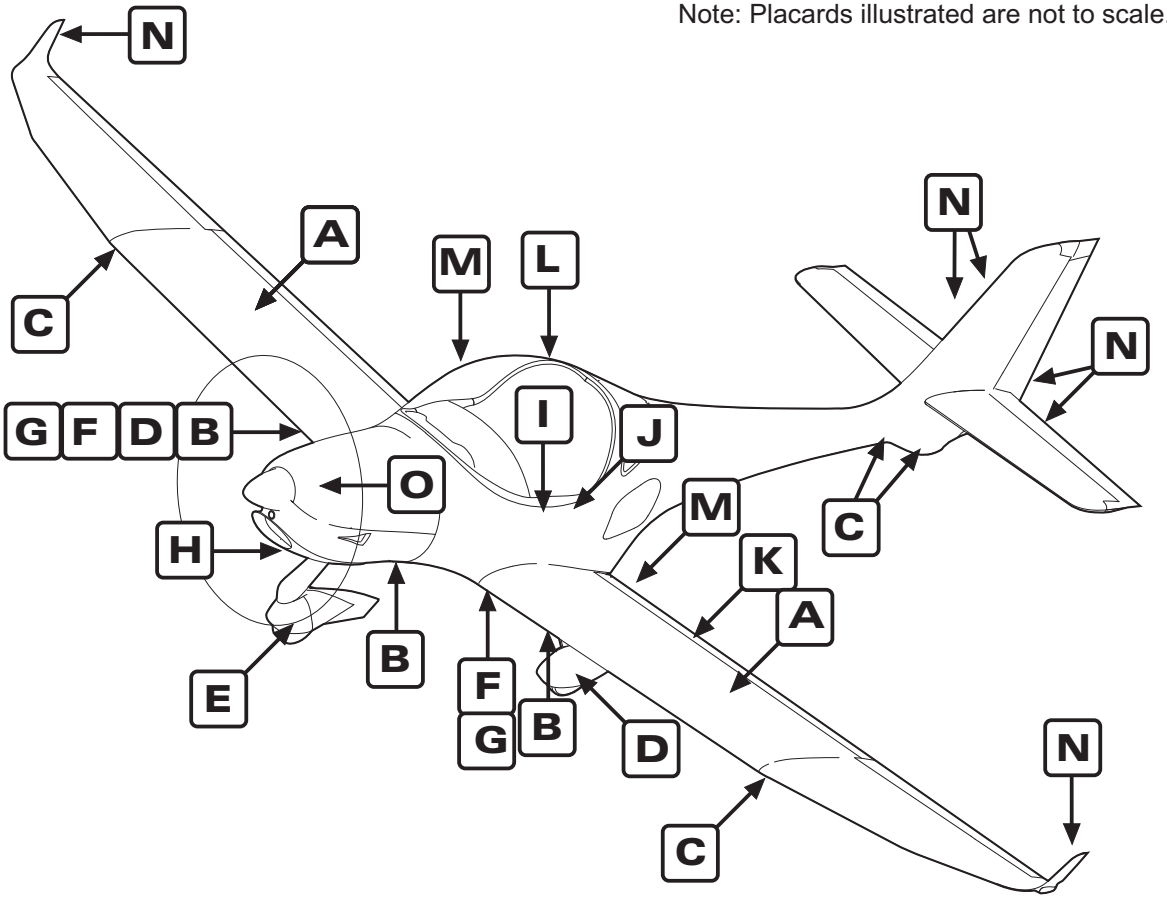
B. Placing Self-Adhesive Placards
(1) Clean aircraft surface carefully. Remove all old adhesive traces using isopropyl alcohol.
(2) Remove paperliner from backside of placard to expose adhesive.
(3) Position top edge of the placard precisely.
(4) Work uniformly downward and apply placard to aircraft with a dry, clean cloth.
(5) Remove the premask (outer protective film) from the placard.
(6) Remove air bubbles by perforating bubble with a small needle and then flattening.

4. Maintenance/Care

A. The following instructions should be followed to guarantee a maximum service life for the graphics:
(1) Clean aircraft exterior surface (refer to 12-23-00).
(2) Do not use any solvents to clean the graphics.
(3) Test other cleaning agents on a small inconspicuous part of the graphic.

(4) Do not allow fuel to spill on to graphics. If fuel spills on to graphics, wipe off with a cloth and rinse with water thoroughly.
(5) Do not remove snow and ice from surfaces using sharp-edged instruments.
(6) If a high-pressure washer is used, keep nozzle at least 0,5 m (approx. 1.6 ft) from edge of graphic.

Note: Placards illustrated are not to scale.



Detail-**A**

Exterior Placards and Markings
Figure 201 (1)

Note: Placards illustrated are not to scale.

KRAFTSTOFF ABLASS — Detail-**B** — FUEL DRAIN

VERZURRPUNKT — Detail-**C** — TIE DOWN

2,5 bar — Detail-**D** — 36 psi

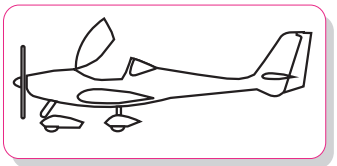
2,5 bar — Detail-**E** 1) — 36 psi

2,0 bar — Detail-**E** 2) — 29 psi

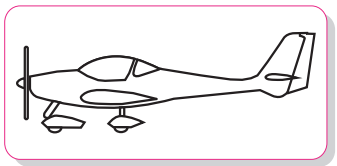
(red jack point markings) — Detail-**F**

Aufbockpunkt — Detail-**G** — Jack Point

Erdungspunkt Auspuffendrohr — Detail-**H** — Electric Ground Exhaust Port



Detail-**I**



Detail-**J**

Exterior Placards and Markings
Figure 201 (2)

1) Aircraft equipped with Beringer wheel/brake system only.
2) Aircraft equipped with Cleveland/Grove wheel/brake system only.

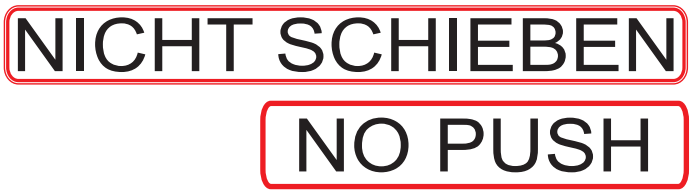
Note: Placards illustrated are not to scale.

Detail-**K**

(flap position markings)

Detail-**L**

Detail-**M**

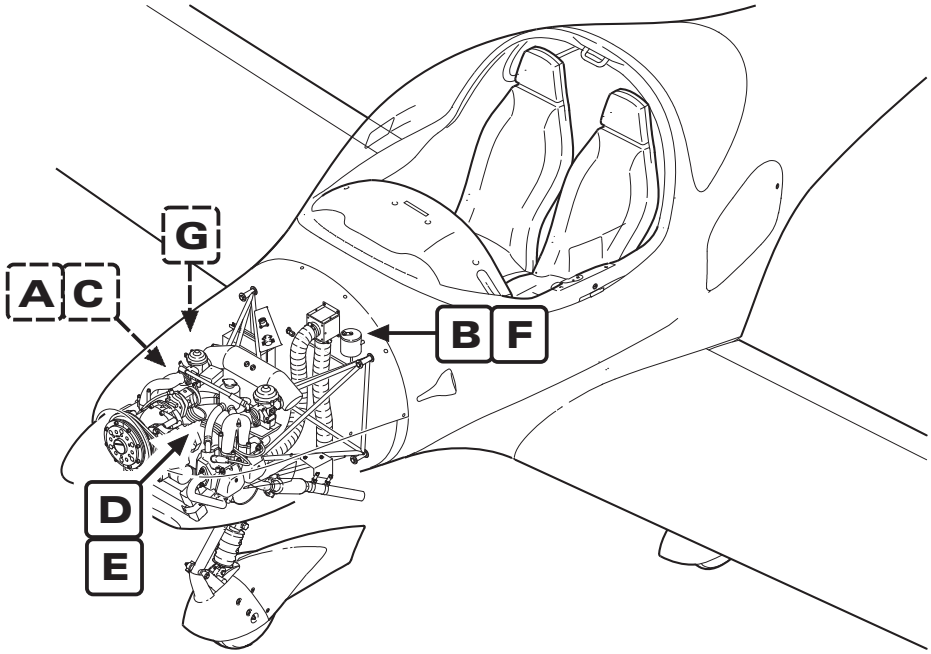


Detail-**N**

Detail-**O**

Exterior Placards and Markings
Figure 201 (3)

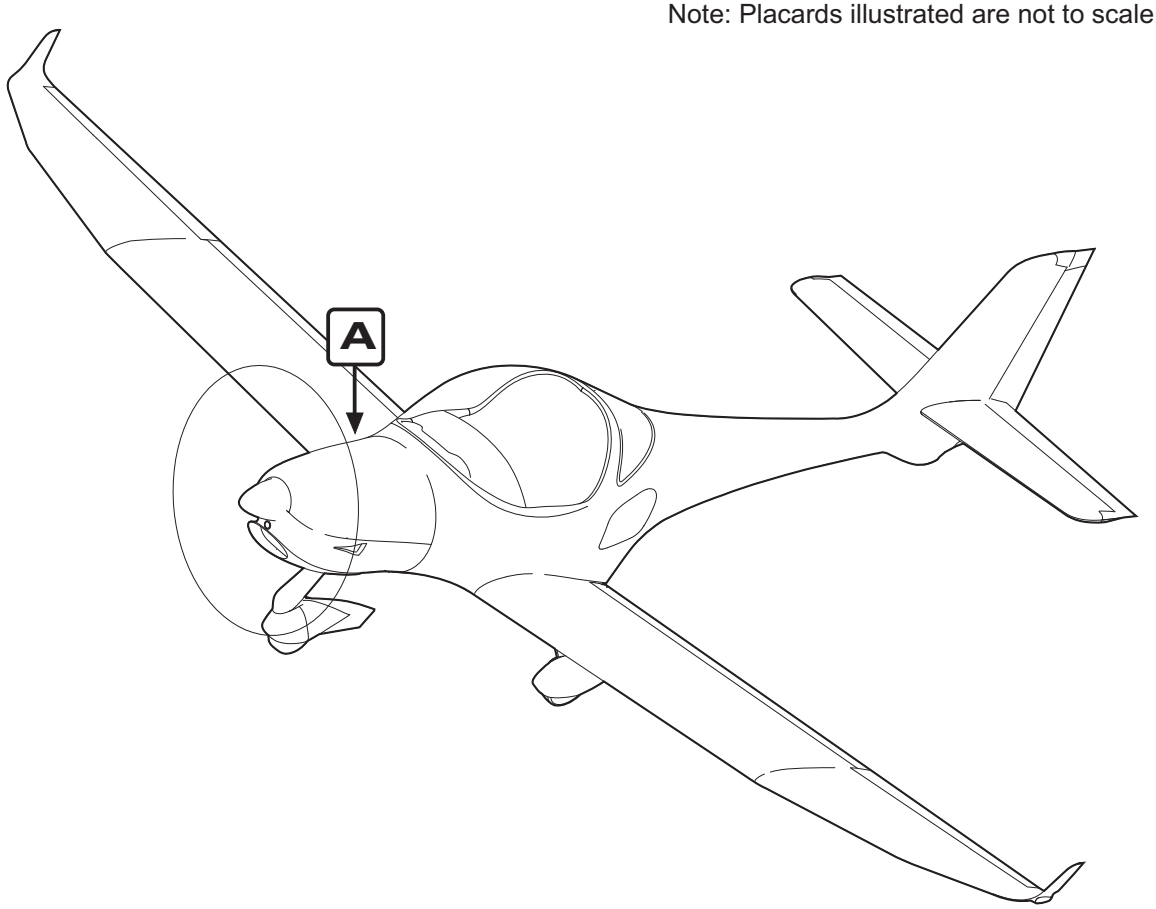
Note: Placards illustrated not in scale.



! ACHTUNG ! Kein Flugmotorenöl einfüllen. Siehe Flughandbuch	Detail-**A**	! CAUTION ! DO NOT use aviation grade oil Refer to POH
! ACHTUNG ! Keine Automobilbremsflüssigkeit verwenden. Siehe Flughandbuch	Detail-**B**	! CAUTION ! DO NOT use automotive brake fluid Refer to POH
ÖLFÜLLUNG 3,0 Liter SIEHE FLUGHANDBUCH	Detail-**C**	**OIL CAPACITY 3.17 US quarts, 3,0 Liter REFER to POH**
KÜHLMITTEL- AUSGLEICHSGEFÄSS **BEI HEISSEM TRIEBWERK NICHT ÖFFNEN!**	Detail-**D**	COOLANT **DO NOT OPEN IF ENGINE IS HOT!**
KÜHLWASSERFÜLLUNG 2,3 Liter SIEHE FLUGHANDBUCH	Detail-**E**	**COOLANT CAPACITY 2.43 US quarts, 2,3 Liter REFER to POH**
HYDRAULIKÖL FLUID 4	Detail-**F**	HYD. BRAKE FLUID (FLUID 4)
KÜHLMITTEL	Detail-**G**	COOLANT

Exterior Placards and Markings
Figure 201 (4)

Note: Placards illustrated are not to scale.



Externe Stromversorgung 12 V DC	Detail-A	GROUND POWER 12 VDC

Exterior Placards and Markings
Figure 201 (5)

EFFECTIVITY

Aircraft equipped with external power receptacle

INTERIOR PLACARDS AND MARKINGS

1. General

   A. This section gives information about removal and installation of interior placards, markings etc.. Figure 201 shows the aircraft interior placards and markings.

   B. If the information on the placard is no longer legible or the placard is partially destroyed or is no longer in place, it must be replaced.

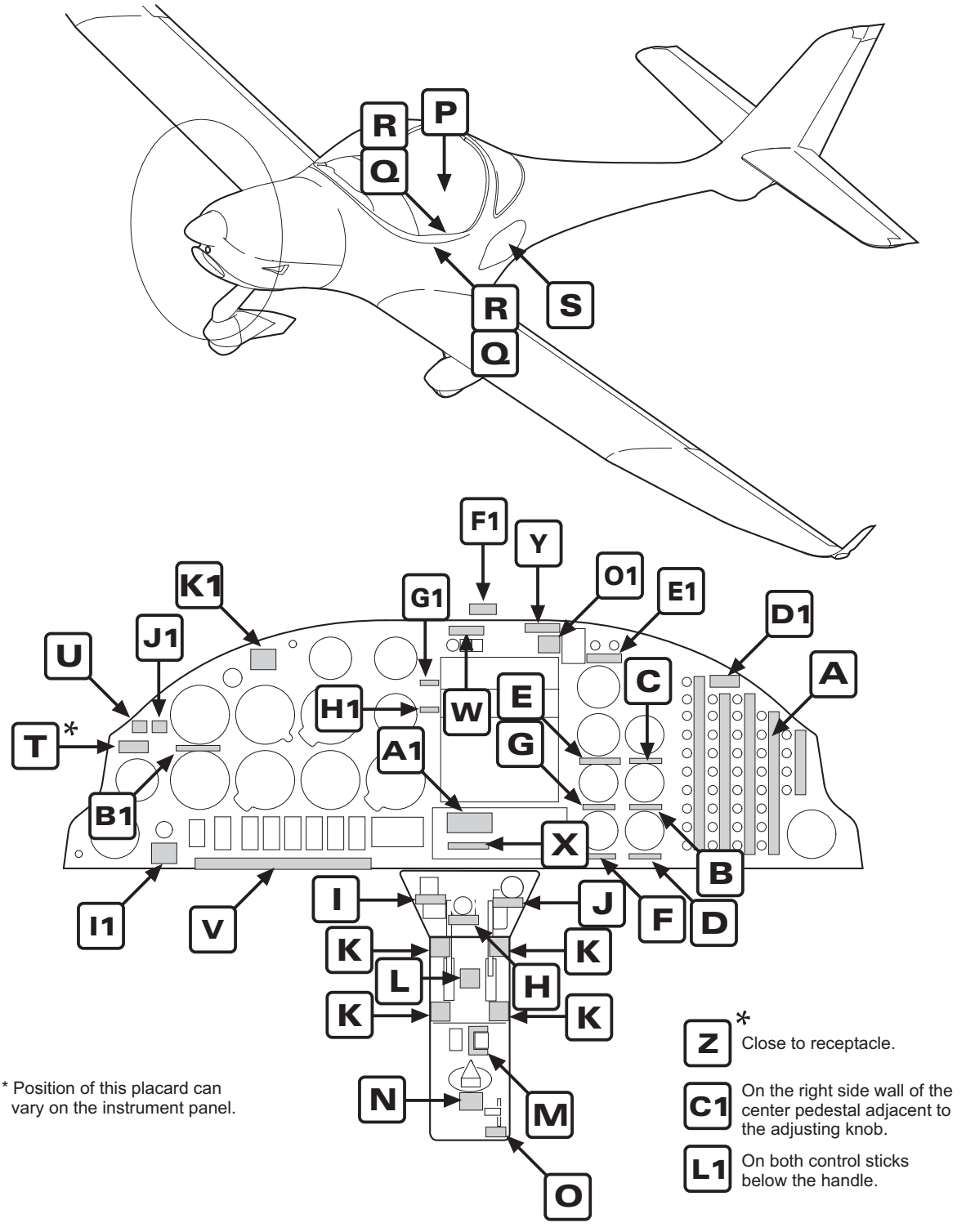
2. Tools, Equipment and Material

	Quantity	Equipment	Parts No.	Manufacturer
3.A	1	heat gun	-	commercially available
3.A	as required	isopropyl alcohol	-	commercially available
3.B	1	needle	-	commercially available

3. Removal/Installation

   A. Remove Self-Adhesive Placards
      (1) Warm the placard a little using a heat gun (approx. 40-50°C).
      (2) Carefully separate a corner of the placard from the aircraft and then pull off parallel to the surface to remove it.
      (3) Remove all traces of old adhesive by using a cloth with isopropyl alcohol as required.

   B. Placing Self-Adhesive Placards
      (1) Remove protective film from backside of placard to expose adhesive.
      (2) Position top edge of the placard precisely.
      (3) Apply placard by rubbing with a dry, clean cloth.
      (4) Remove air bubbles by perforating bubble with a small needle and then flattening.



Interior Placards and Markings
Figure 201 (1)

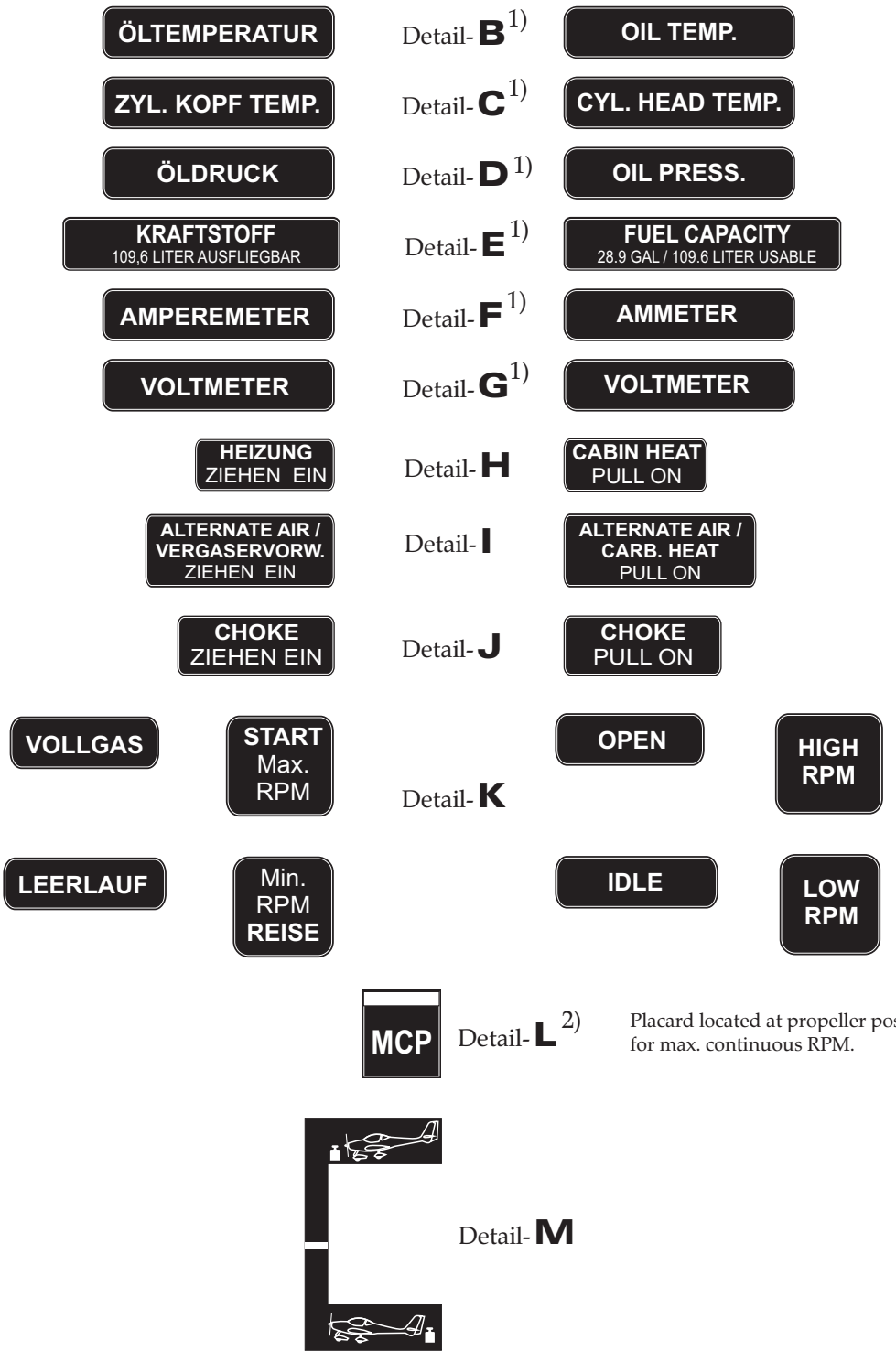
Note: Placards illustrated are not to scale.

Detail-A

NOTE: Depending on equipment and serial number of the aircraft the placards shown may vary in presence and arrangement.

Interior Placards and Markings
Figure 201 (2)

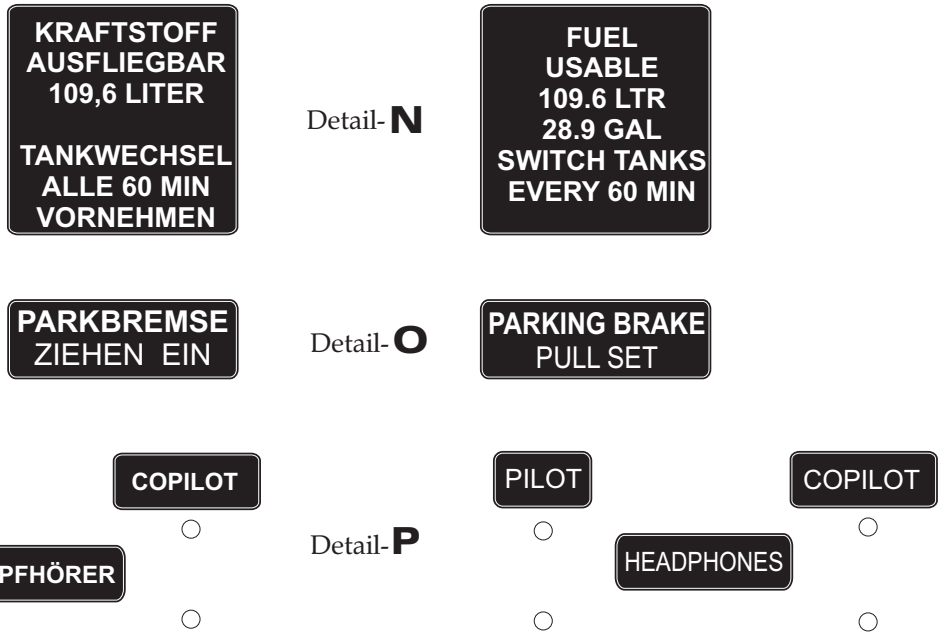
Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (3)

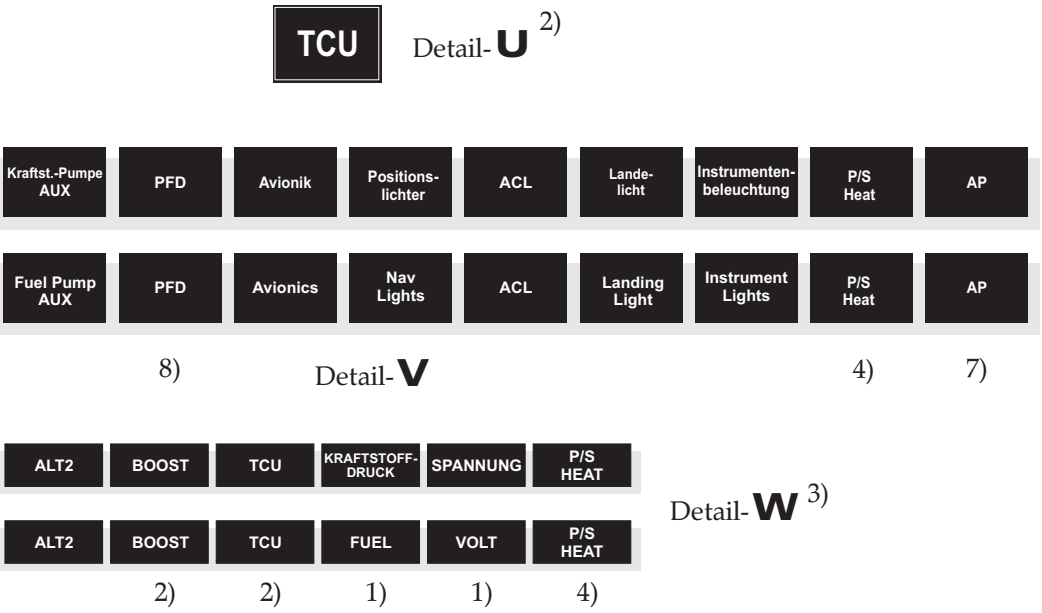
1) Aircraft equipped with analog engine instruments only.
2) Aircraft equipped with MVP-50 or Garmin G3X Touch only.

Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (4)

Note: Placards illustrated are not to scale.



Interior Placards and Markings
Figure 201 (5)

1) AT01-100 only.
2) AT01-200 only.
3) Aircraft equipped with analog engine instruments or Garmin G3X Touch only.
4) Aircraft equipped with pitot heating system only.
5) Aircraft equipped with non-(E)TSO'd GPS-receiver only.
6) Aircraft equipped for Night-VFR only.
7) Aircraft equipped with autopilot only.
8) Aircraft equipped with Aspen avionics only.

Note: Placards illustrated are not to scale.

Manövergeschwindigkeit
VA = 112 kts

Detail-**B1**

Maneuvering Speed
VA = 112 kts

REIBVERSTELLUNG
Leistung / Propeller

Detail-**C1**

FRICTION LOCK
Power / Prop

ELT und Feuerlöscher
hinter dem Copilotensitz

Detail-**D1**

ELT and Fire-Extinguisher
behind Copilot seat

0 I-BRETT-BELEUCHTUNG DIMM POSTLIGHTS INSTRUMENTE

Detail-**E1**

0 PANEL LIGHT DIM POSTLIGHTS INSTRUMENTS

DIMM I-BRETT-BELEUCHTUNG INSTRUMENTE / POSTLIGHTS

Detail-**E1** 2)

DIM PANEL LIGHT INSTRUMENTS / POSTLIGHTS

FOR	N	30	60	E	120	150
STEER						
FOR	S	210	240	W	300	330
STEER						
DATE:					AIRPATH C2300	

Detail-**F1**

COM/NAV 1

Detail-**G1**

COM/NAV 2

Detail-**H1**

VORSICHT
Elektrische Hauptkraft-
stoffpumpe
BAT2 AN im Flug
AUS am Boden

Detail-**I1** 1)

CAUTION
Electric Main Fuel Pump
BAT2 ON for Flight
OFF for Parking

ALT1 AMPS ALT2

Detail-**J1** 1,2)

Interior Placards and Markings
Figure 201 (6)

1) AT01-200 only.
2) Aircraft equipped with Garmin G3X Touch only.

Detail-**K1** 1)

AP operation restricted to ≥ 2000ft AGL

Speed range 60 KIAS to 150 KIAS with Flaps up (cruise) only

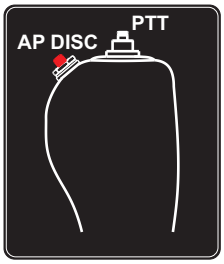
if indicated	↓ Trim ELE DN / FWD ↑ Trim ELE UP / AFT	in intervals of max. 2 sec.

AP-Betrieb beschränkt auf ≥ 2000ft AGL

Geschwindigkeitsbereich 60 - 150 KIAS, ausschließlich mit Klappen in Reisestellung

wenn angezeigt	↓ ELE DN / VORNE trimmen ↑ ELE UP / HINTEN trimmen	in Intervallen von max. 2 Sek.

Detail-**L1** 1)



Placard located on both control sticks.

Detail-**M1** 1)

ROLL
PITCH

Placard located on roll / pitch servo pushrod.

Detail-**N1** 1)

YAW SERVO
ROLL SERVO
PITCH SERVO

Placard located on yaw / roll / pitch servo.

"Direct-to"-Knopf auf NAV/GPS 1 drücken und halten um Smart Glide zu aktivieren

Detail-**O1** 2)

Press & hold "Direct-to" button on NAV/GPS 1 to activate Smart Glide

Interior Placards and Markings
Figure 201 (7)

1) Aircraft equipped with autopilot only.
2) Aircraft equipped with Garmin GTN 650 Xi only.

CHAPTER 22

AUTO FLIGHT

TABLE OF CONTENTS

AUTO FLIGHT - GENERAL

1. Introduction

A. This chapter contains information on the Garmin GFC 500 autopilot system available for the AQUILA AT01-100 and AT01-200.

The GFC 500 autopilot system consists of the following major components:
- G5 (autopilot computer; refer to 34-25-00 for inspection/maintenance)
- GMC 507 mode controller
- 2x (or 3x) GSA 28 servos (roll, pitch and optionally yaw control)
- 2x disconnect buttons (one on each control stick)

For further information refer to the applicable Garmin manuals.

2. General Description

A. The GMC 507 mode controller is the main interface of the GFC 500 autopilot. The switches allow controlling all available autopilot functions.

B. The G5 instrument is the main autopilot computer and furthermore displays active and preselected modes as well as trim requests and warnings. Software updates of the GSA 28 servos, the GMC 507 and the G5 itself are conducted via the G5.

C. Two AP disconnect switches (one on each control stick) disconnect the autopilot system.

D. Two Garmin GSA 28 servos drive the aileron and pitch control, respectively. Optionally, a third servo drives the rudder control for yaw damper function.

E. Autopilot operation requires manual actuation of the trim switch in accordance with trim advices.

F. Aural warnings are issued via the intercom. Visual annunciations are displayed on the G5 and on the G500 TXi.

AUTO FLIGHT - GENERAL

1. Introduction

A. This chapter contains information on the Garmin G3X autopilot system available for the AQUILA AT01-100 and AT01-200.

The G3X autopilot system consists of the following major components:
- G3X Touch (autopilot computer; refer to 34-25-00 for inspection/maintenance)
- GMC 507 (certified version) mode controller
- 2x (or 3x) GSA 28 servos (certified version; roll, pitch and optionally yaw control)
- 2x disconnect buttons (one on each control stick)

For further information refer to the applicable Garmin manuals.

2. General Description

A. The GMC 507 mode controller is the main interface of the G3X autopilot. The switches allow controlling all available autopilot functions.

B. The G3X Touch is the main autopilot computer and furthermore displays active and preselected modes as well as trim requests and warnings. Software updates of the GSA 28 servos and the GMC 507 are conducted via the G3X Touch.

C. Two AP disconnect switches (one on each control stick) disconnect the autopilot system.

D. Two Garmin GSA 28 servos drive the aileron and pitch control, respectively. Optionally, a third servo drives the rudder control for yaw damper function.

E. Autopilot operation requires manual actuation of the trim switch in accordance with trim advices.

F. Aural warnings are issued via the intercom. Visual annunciations are displayed on the G3X Touch and on the G5.

AUTOPILOT - MAINTENANCE

1. General

A. This section provides instructions necessary for authorized personnel to inspect and maintain the Garmin GFC 500 / G3X autopilot system. The system consists of the following major components:
- G5 / G3X Touch (autopilot computer; refer to 34-25-00 for inspection/maintenance)
- GMC 507 mode controller
- 2x (or 3x) GSA 28 servos (roll, pitch and optionally yaw control)
- 2x disconnect buttons (one on each control stick)

B. Maintenance of the GFC 500 / G3X autopilot system has to be carried out in accordance with the Garmin GFC 500 Part 23 AML STC Maintenance Manual (P/N 190-02291-01).

C. The operation of the GFC 500 / G3X autopilot requires the software versions given in the corresponding AQUILA Flight Manual Supplement.

The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

All service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

D. For bonding checks on the AQUILA AT01-100/200 no procedures or equipment are necessary other than that which are commonly expected for bonding measurements on small aircraft.
Refer to AC 43.13-1B, chapter 11, section 15 “Grounding and Bonding” for further information on bonding check procedures and equipment.

E. Following any removal, repair or exchange of equipment, perform the return to service procedure per GFC 500 maintenance manual, section 9.

2. Inspection/Check

A. Servicing of the GFC 500 / G3X autopilot equipment is 'on condition' only. 'On condition' replacement and/or servicing should occur when an item exhibits conditions, symptoms, and/or abnormalities defined in section 5 of the Garmin GFC 500 Part 23 AML STC Maintenance Manual.

B. See the following table for necessary tests or checks and the specific intervals for the GFC 500 / G3X autopilot:

No.	Garmin GFC 500	Reference	Interval	Initials
1.	Visual inspection - Complete visual inspection of all installed GFC 500 / G3X autopilot components and wiring harnesses must be performed.		12 months	
2.	Electrical bonding check - Perform an electrical bonding check for each component of the GFC 500 / G3X autopilot system in accordance with the GFC 500 maintenance manual.	GFC 500 MM	2000h 10 years	
3.	Disconnect tone - Functional test of audio output has to be performed (both disconnect switches).	GFC 500 MM	12 months	

3. GMC 507 Removal/Installation

A. Remove GMC 507
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from GMC 507.
(5) Use a 3/32" hex drive tool to loosen left and right mounting screw.
(6) Pull the unit from the instrument panel.

B. Install GMC 507
(1) Position the unit on the instrument panel.
(2) Tighten the mounting screws with a 3/32" hex drive tool (max. 2,3Nm / 20 in.lbs).
(3) Reconnect electrical connector to GMC 507.
(4) Install glare shield (refer to 31-10-00).
(5) Reconnect battery (refer to 24-30-00).
(6) Perform a functional check and further procedures per GFC 500 MM, section 7.1.

4. Roll Servo Removal/Installation/Inspection (Ref. Fig. 201)

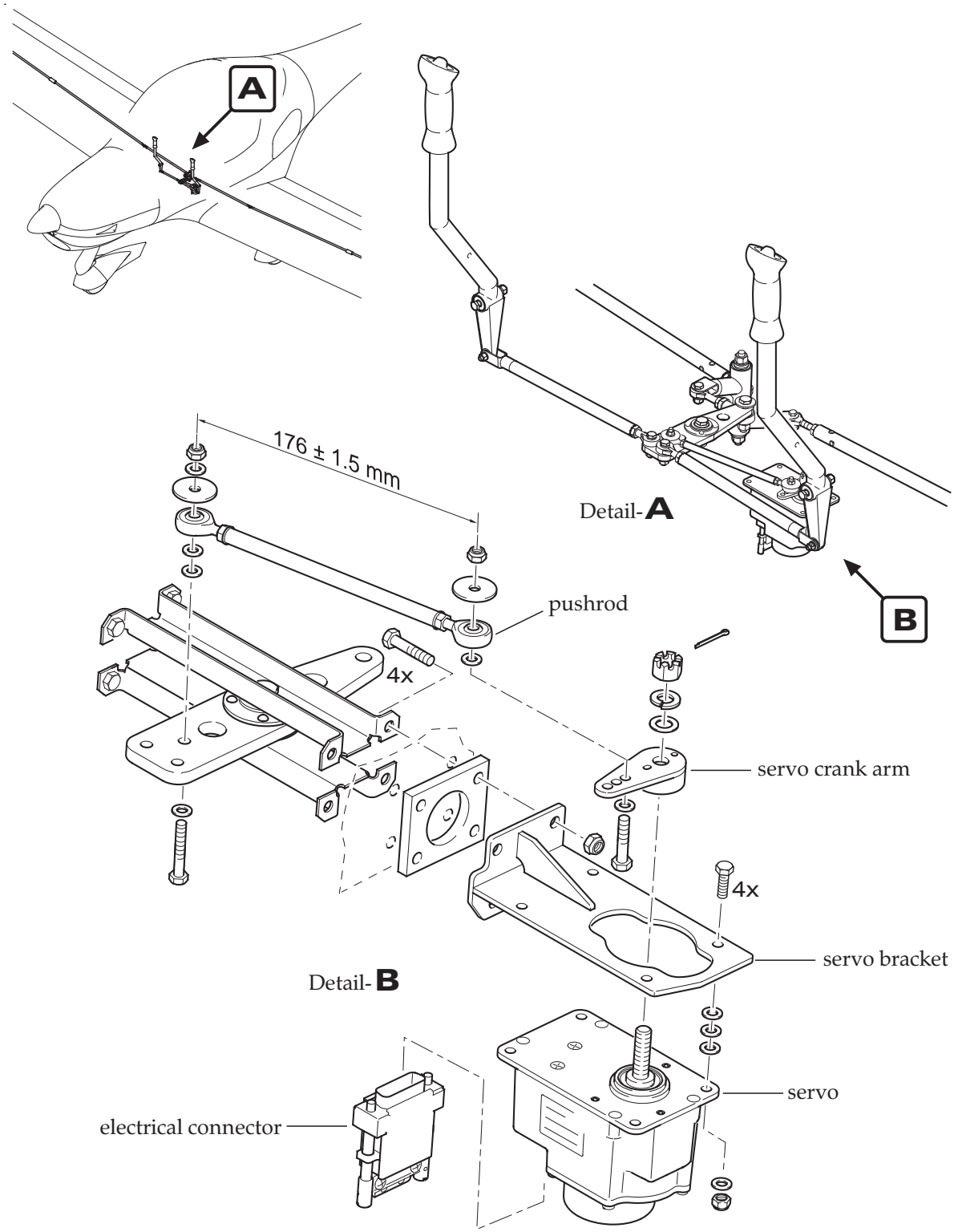
A. Remove Roll Servo
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Remove access panel 210 AB (refer to 06-30-00).
(3) Remove access panels 211BB, 211HL and 211HR (refer to 25-12-00).
(4) Disconnect pushrod at bell crank.
(5) Disconnect electrical connector from servo.
(6) Remove the 4 nuts holding the servo bracket in place and detach the servo bracket.
(7) Disconnect servo crank arm from servo.
(8) Disconnect pushrod from servo crank arm.
(9) Detach servo from servo bracket.

B. Install Roll Servo
(1) Mount servo to servo bracket.
(2) Verify length of pushrod (refer to "Roll Servo Inspection/Check" below).
(3) Connect pushrod to servo crank arm. Verify placard "ROLL" on pushrod.
(4) Mount servo crank arm onto servo. Tighten castle nut until lock washer is fully compressed, but do not exceed 2,2 Nm (20 in.lbs). Then loosen until adjacent castellation lines up with hole in output shaft and install cotter pin.
(5) Position and connect servo bracket to the 4 bolts.
(6) Reconnect electrical connector to servo.
(7) Connect pushrod to bell crank.
(8) Perform a functional check of the aileron control system and verify free movement from stop to stop.
(9) In case new servo has been installed and software is not updated automatically load correct software to the servo (via G5 / G3X update).
(10) Perform a functional check and further procedures per GFC 500 MM, section 7.2.
(11) Reinstall access panel 210 AB (refer to 06-30-00).
(12) Reinstall access panels 211BB, 211HL and 211HR (refer to 25-12-00).

C. Roll Servo Inspection/Check
(1) Perform visual inspection of the roll servo assembly. Check all components for proper fastening and tightness.

NOTE: In case of excessive play of the hinges replace joint heads.

(2) Verify correct length of pushrod (measure from joint head centre to joint head centre: 176 ± 1.5 mm; refer to fig. 201).
(3) Verify similar rod end thread engagement on both sides.
(4) Verify the aileron control can be manually moved smoothly from stop to stop. No grinding audible.
(5) Reinstall all items removed for access.



Roll Servo Installation
Figure 201

5. Pitch Servo Removal/Installation/Inspection (Ref. Fig. 202)

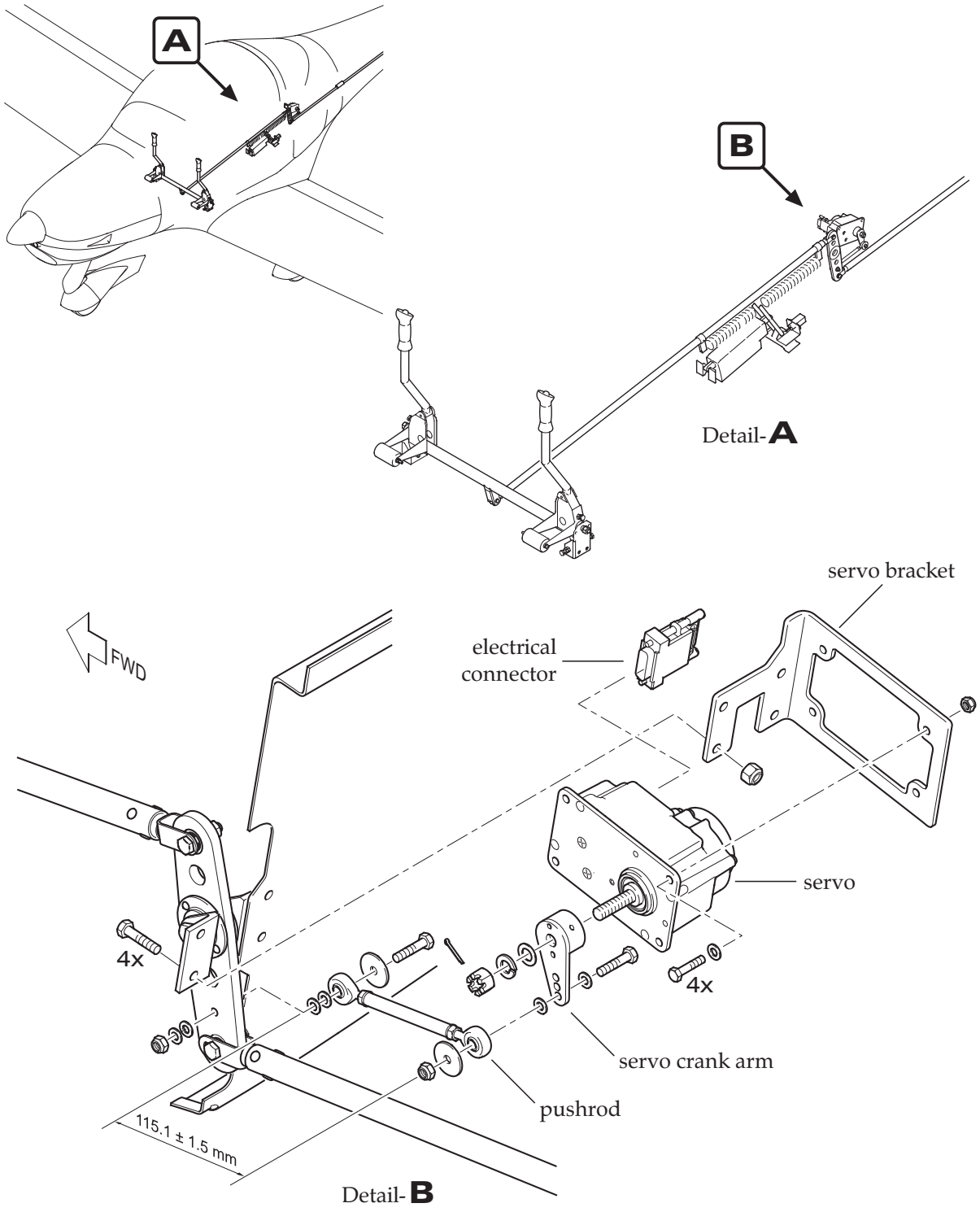
A. Remove Pitch Servo
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Remove access panel 211KC (refer to 25-12-00).
(3) Disconnect pushrod at bell crank.
(4) Disconnect electrical connector from servo.
(5) Detach servo from servo bracket.
(6) Disconnect servo crank arm from servo.
(7) Disconnect pushrod from servo crank arm.

B. Install Pitch Servo
(1) Verify length of pushrod (refer to "Pitch Servo Inspection/Check" below).
(2) Connect pushrod to servo crank arm. Verify placard "PITCH" on pushrod.
(3) Mount servo crank arm onto servo. Tighten castle nut until lock washer is fully compressed, but do not exceed 2,2 Nm (20 in.lbs). Then loosen until adjacent castellation lines up with hole in output shaft and install cotter pin.
(4) Mount servo to servo bracket.
(5) Reconnect the electrical connector to the servo.
(6) Connect pushrod to bell crank.
(7) Perform a functional check of the elevator control system and verify free movement from stop to stop.
(8) In case new servo has been installed and software is not updated automatically load correct software to the servo (via G5 / G3X update).
(9) Perform a functional check and further procedures per GFC 500 MM, section 7.2.
(10) Reinstall access panel 211 KC (refer to 25-12-00).

C. Pitch Servo Inspection/Check
(1) Perform visual inspection of the pitch servo assembly. Check all components for proper fastening and tightness.

NOTE: In case of excessive play of the hinges replace joint heads.

(2) Verify correct length of pushrod (measure from joint head centre to joint head centre: 115.1 ± 1.5 mm; refer to fig. 202).
(3) Verify similar rod end thread engagement on both sides.
(4) Verify the elevator control can be manually moved smoothly from stop to stop. No grinding audible.
(5) Reinstall all items removed for access.



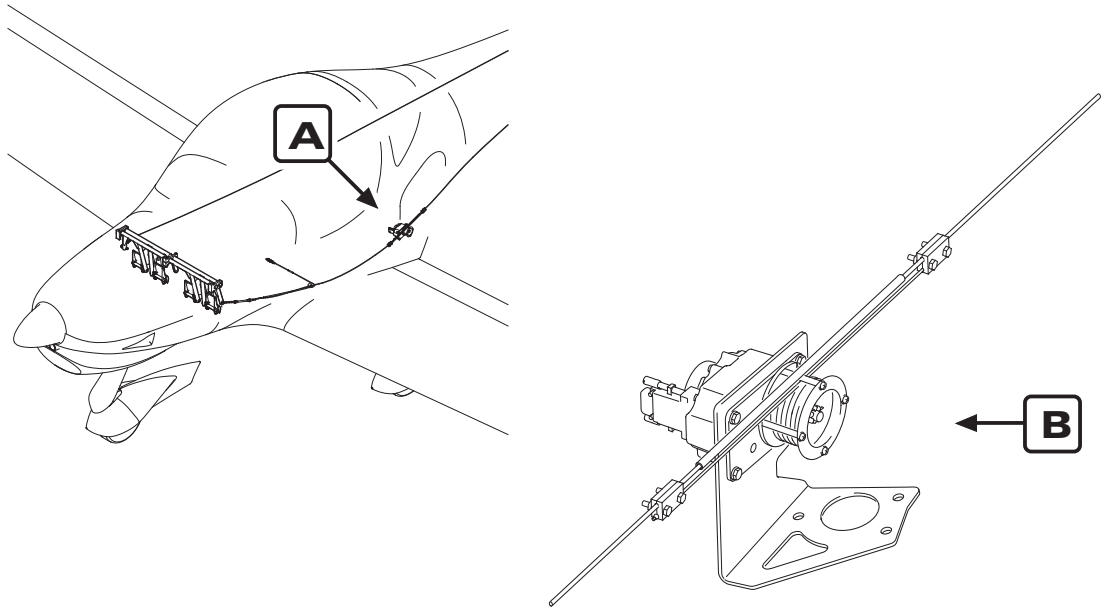
Pitch Servo Installation
Figure 202

6. Yaw Servo Removal/Installation/Inspection (Ref. Fig. 203 / Optional)

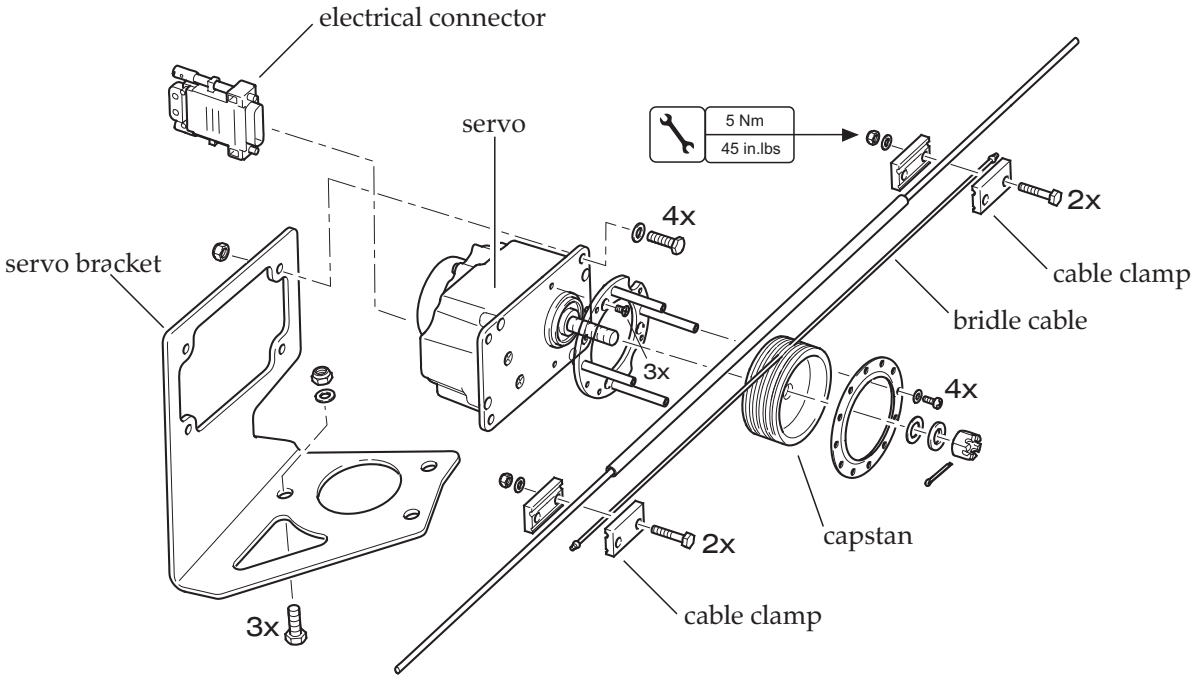
A. Remove Yaw Servo
(1) Ensure electrical power to aircraft and AP main switch are OFF.
(2) Remove access panel 211 JB (refer to 25-12-00).
(3) Remove 2x cable clamps.
(4) Pull out cable from capstan.
(5) Disconnect electrical connector from servo.
(6) Detach servo from servo bracket.

B. Install Yaw Servo
(1) Mount servo to servo bracket.
(2) Reconnect the electrical connector to the servo.
(3) Ensure pre-tension of rudder control cable is 95 ± 3 N (21.4 ± 0.7 lbs). Adjust if necessary.
(4) Wrap bridle cable around capstan; one full wrap is required.
Ball should be on opposite side of rudder flight control cable in the capstan groove.
(5) Pre-position cable clamps and bridle cable.
(6) Pre-tension bridle cable to 85 ± 3 N (19.1 ± 0.7 lbs).
(7) Tighten clamp-kit nuts to 5,1 Nm (45 in.lbs)
(8) Perform a functional check of the rudder control system and verify free movement from stop to stop.
(9) In case new servo has been installed and software is not updated automatically load correct software to the servo (via G5 / G3X update).
(10) Perform a functional check and further procedures per GFC 500 MM, section 7.2.
(11) Reinstall access panel 211 JB (refer to 25-12-00).

C. Yaw Servo Inspection/Check
(1) Perform visual inspection of the yaw servo assembly. Check all components for proper fastening and tightness.
(2) Ensure the integrity of the PTFE tube around the rudder flight control cable.
(3) Ensure the PTFE enclosed rudder control cable runs over the capstan cage, not beside it.
(4) Check bridle cable and rudder primary control cable for fraying, corrosion or other damage.
(5) Verify a rudder flight control cable tension of 95 ± 3 N (21.4 ± 0.7 lbs); lift nose wheel off the ground for measurement.
(6) Verify a bridle cable tension of 85 ± 3 N (19.1 ± 0.7 lbs).
(7) Verify ball on the cable centre is on the opposite side of the rudder flight control cable.
(8) Move rudder control from stop to stop and ensure the bridle cable moves properly on the capstan.
(9) Reinstall all items removed for access.



Detail-**A**



Detail-**B**

Yaw Servo Installation
Figure 203

CHAPTER 24

ELECTRICAL POWER

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

ELECTRICAL POWER - GENERAL

1. Introduction

   A. This chapter describes the units and components, which generate, control and supply AC and DC electrical power for other systems.

2. General Description

   A. The aircraft is equipped with a 12V DC electrical system. It is powered by a belt driven 600W alternator (ALT 1) and a 12V battery which is installed on the front-right side of the firewall.
   All essential electrical accessories in the system are protected by circuit breakers. These are to be found on the right side of the instrument panel.
   Electrical power distribution to the various accessories is characterized through functionality and safety. It is accomplished by two main bus bars - the aircraft bus bar and the avionics bus bar.

   On aircraft equipped for Night-VFR or with a Rotax 914 engine, the internal alternator (ALT 2) integrated in the engine is activated in order to provide a second independent power source. To supply DC to the electrical system, this permanent magnet generator is used in combination with a Rotax specified rectifier-regulator, which is installed at the front-left side of the firewall.

   On aircraft equipped with a Rotax 914 engine, the internal alternator is used as an emergency power supply for the electrical main fuel pump. It is therefore possible to disconnect the internal alternator from the rest of the aircraft's electrical system and to feed the main fuel pump exclusively. As a safety measure, an additional battery (BAT 2) is installed at the front-left side of the firewall to stabilize the voltage on control pin "C" of the rectifier-regulator. This prevents the regulator from switching off the internal alternator in case of severe voltage drops.

   As an option, the aircraft may be equipped with an external power receptacle mounted on the right side of fuselage just forward of the firewall. The receptacle permits the use of an external power source for cold weather starting and maintenance procedures requiring reliable power for an extended period.

ELECTRICAL POWER - TROUBLESHOOTING

1. Troubleshooting

   A. If a power problem or a complete blackout occurs, first check all connections to the components and the circuit breakers.

   B. Troubleshooting Chart:

TROUBLE	POSSIBLE CAUSE	REMEDY
No alternator output, voltmeter indicates 12 V, ammeter indicates discharge	ALT1 switch OFF Defective alternator Circuit breaker activated (open)	Turn switch ON. Replace alternator. Troubleshoot circuit and reset circuit breaker.
Battery will not supply power or is incapable of cranking engine.	Battery is discharged	Step 1: Place BAT switch and LDG LIGHT switch in ON Position. Measure battery voltage. A normally charged battery will indicate 12,5 volts or more. If . voltage is low, proceed to step 2. If voltage is normal proceed to step 3.
	Defective battery	Step 2: Charge battery approx. 30 minutes. If the battery tester indicates a good battery, the cause was a discharged battery. If the tester indicates a defective battery, replace the battery.
	Defective wiring or electrical connection between battery terminal and battery relay.	Step 3: With switch BAT in ON position, measure voltage between battery terminal and battery relay. Correct value would be 0 V. If voltage reads 0 V, proceed to step 4. If a voltage reading is obtained, check wiring between battery terminal and battery relay.
	Defective battery relay.	Step 4: With switch BAT in ON position, measure voltage between relay terminals. Correct value would be 0 V. If voltage reads 0 V, proceed to step 5.

TROUBLE	POSSIBLE CAUSE	REMEDY
		If a voltage reading is obtained, replace battery relay.
	Defective wiring or electrical connection between battery relay and starter relay.	Step 5: With switch BAT in ON position, measure voltage between starter side relay terminal, and starter relay. Correct value would be 0 V. If a voltage reading is obtained, check wiring between starter side relay terminal and starter relay
No internal alternator output (ammeter ALT2 indicates 0A with ALT1 switched OFF)	ALT2/BAT2 switch OFF	Turn switches ON.
	Defective ALT2	Refer to applicable ROTAX publications.
	Circuit breaker activated (open)	Troubleshoot circuit and reset circuit breaker.
	Defective ALT2 regulator	Replace ALT2 regulator.
	Defective ALT2 disconnect relay	With switches BAT and ALT2/BAT2 in ON position, measure voltage between disconnect relay terminals. Correct value would be 0V. If a voltage reading is obtained, check the wiring at the coil of the disconnect relay and it's circuit breaker. Measure the voltage between the coil terminals of the disconnect relay, if a voltage above 12V is obtained, replace the disconnect relay.

ALTERNATOR SYSTEM - DESCRIPTION

1. Introduction

A. The alternator system supplies the electrical equipment with electrical power when the engine is running and is the main current source in the power supply design.

B. The alternator system consists of the following components:

- external alternator (ALT 1)
- internal alternator (ALT 2 / only Night-VFR or Rotax 914 equipped aircraft)
- rectifier-regulator unit (only Night-VFR or Rotax 914 equipped aircraft)
- additional battery (BAT 2 / only Rotax 914 equipped aircraft)
- alternator circuit breaker(s)
- alternator warning light(s)
- alternator switch(es)
- Schottky diodes, ALT 2 disconnect relay, resistor, fuses (only Rotax 914 equipped aircraft)

2. Description and Operation

A. The external alternator (ALT 1) is installed on the forward left side of the engine, to the left of the gearbox. It is belt-driven and incorporates an internal voltage regulator. The external alternator is supplied with an excitation voltage by the battery when the ALT1/BAT switch is turned ON. When the engine is running, the alternator generates a three-phase current that is rectified and regulated by the internal voltage regulator. The voltage regulator supplies a 14 V DC voltage to the aircraft bus when engine speed is at or above 800 rpm. The maximum current load is approx. 45 A.
The alternator circuit breaker is installed in the circuit breaker panel on the far right side of the instrument panel and it protects the system from overloading. The red ALT 1 warning light is located in the row of annunciator lights on the instrument panel and indicates undervoltage.

B. Aircraft equipped for Night-VFR or with a Rotax 914 engine additionally use the internal alternator (ALT 2) integrated in the ROTAX engine as a second independent power source. This permanent magnet alternator (250W) does not need any external voltage supply for excitation. To supply DC to the aircraft electrical system it is used in combination with a ROTAX specified rectifier-regulator unit, which is installed on the front-left side of the firewall. The red ALT 2 warning light is located in the row of annunciator lights on the instrument panel. It is controlled by the rectifier-regulator unit and indicates undervoltage.

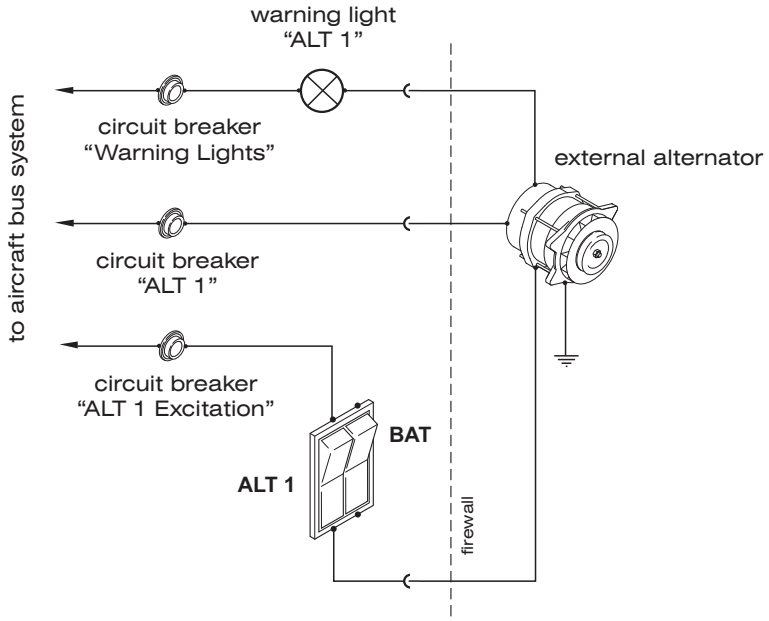
C. On aircraft equipped with a Rotax 914 engine, the internal alternator is used as an emergency power supply for the electrical main fuel pump. It is therefore possible to disconnect the internal alternator from the rest of the aircraft's electrical system by switching OFF the ALT2 switch.
A voltage drop or short in the aircraft's electrical system will automatically disconnect the internal alternator's output from the rest of the system. In all of these cases, the internal alternator feeds the main fuel pump exclusively.
As a safety measure, an additional battery (BAT 2) is installed at the front-left side of the firewall to stabilize the voltage on control pin "C" of the rectifier-regulator. This prevents the regulator from switching off the internal alternator in case of severe voltage drops.

BAT 2 is protected from loads (incl. the main fuel pump) by a Schottky diode and charged by the internal alternator with charging overcurrent protection. The battery is switched OFF via the ALT2/BAT2 switch whenever the aircraft is parked to prevent discharge of the battery.
For wiring protection two 10A fuses are installed together with the Schottky diodes under a separate cover on the front left side of the firewall in the engine compartment.
BAT 2 has to be replaced annually.

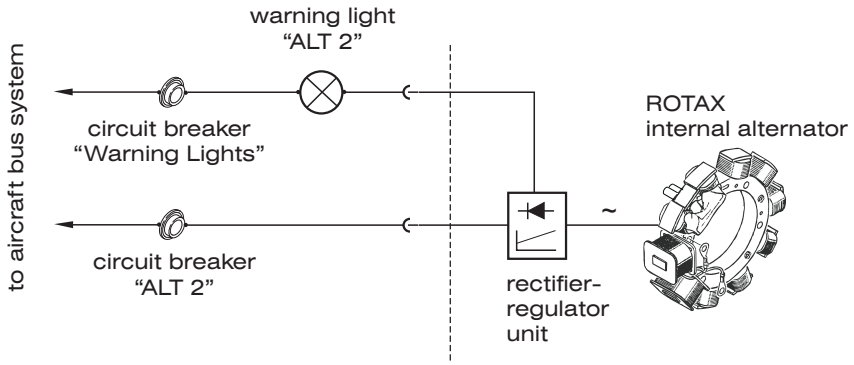
D. An ammeter measures the charge or discharge current to/from the main battery. On aircraft equipped with Rotax 914 engine additional ammeters are provided for the external and internal alternator. The voltmeter is connected with the aircraft bus bar. All instruments are found on the right side of the instrument panel in the instrument cluster or in the digital engine monitor.

E. The alternator warning lights and ammeter discharge indication may illuminate during low rpm with an electrical load on the system, for example during low rpm taxi. The lights will extinguish at higher rpm.

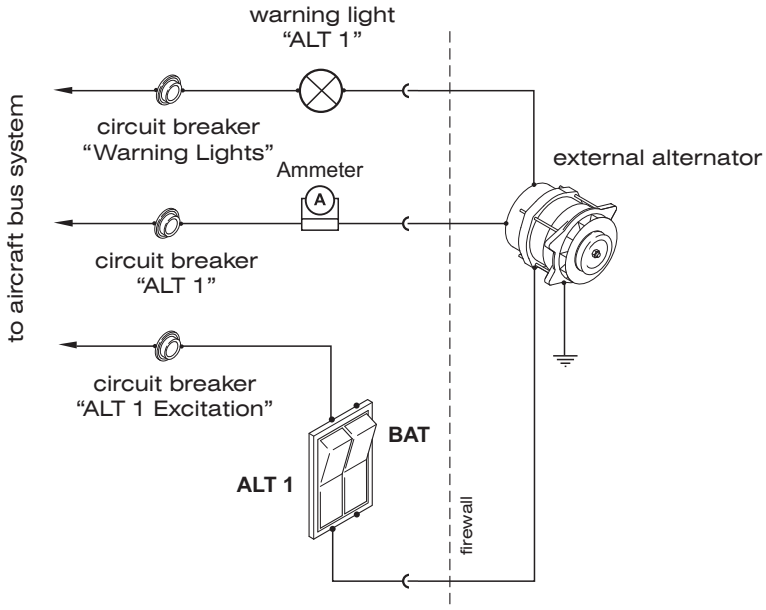
F. Refer to applicable ROTAX publications for more information on the external and internal alternators and the rectifier-regulator unit.



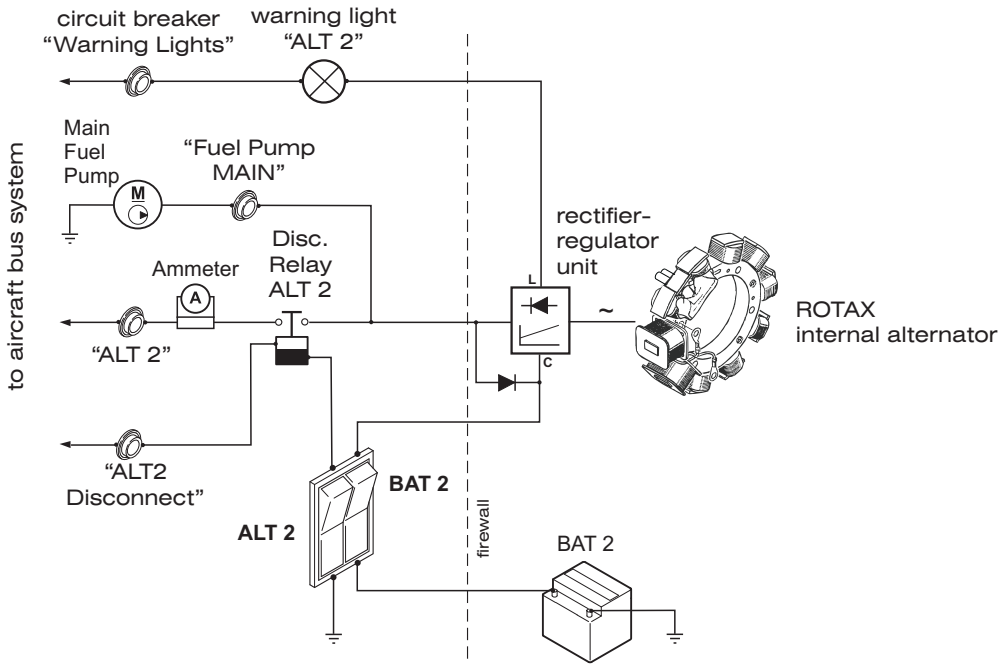
External Alternator System (Schematic)
Figure 1



ROTAX Internal Alternator System (Schematic, Night-VFR equipped aircraft only)
Figure 2



External Alternator System (Schematic)
Figure 1



ROTAX Internal Alternator System (Schematic)
Figure 2

ALTERNATOR SYSTEM - MAINTENANCE

1. General

   A. Maintenance is limited to the removal and installation of the (external) alternator, drive belt and rectifier-regulator unit (only Night-VFR or Rotax 914 equipped aircraft). Refer to the appropriate ROTAX publications for maintenance procedures on the internal alternator.

2. External Alternator Removal/Installation

   A. Remove External Alternator
      (1) Ensure electrical power to aircraft and ignition switch is OFF. Remove key.
      (2) Remove cowling (refer to 71-10-00).
      (3) Disconnect battery (refer to 24-30-00).
      (4) Disconnect electrical cables (include ground cable) from alternator.
      (5) Cut safety wire and loosen adjusting bolt and alternator mounting bolts.
      (6) Slip drive belt off alternator pulley.
      (7) Remove mounting bolts securing alternator to engine. Remove alternator from engine.

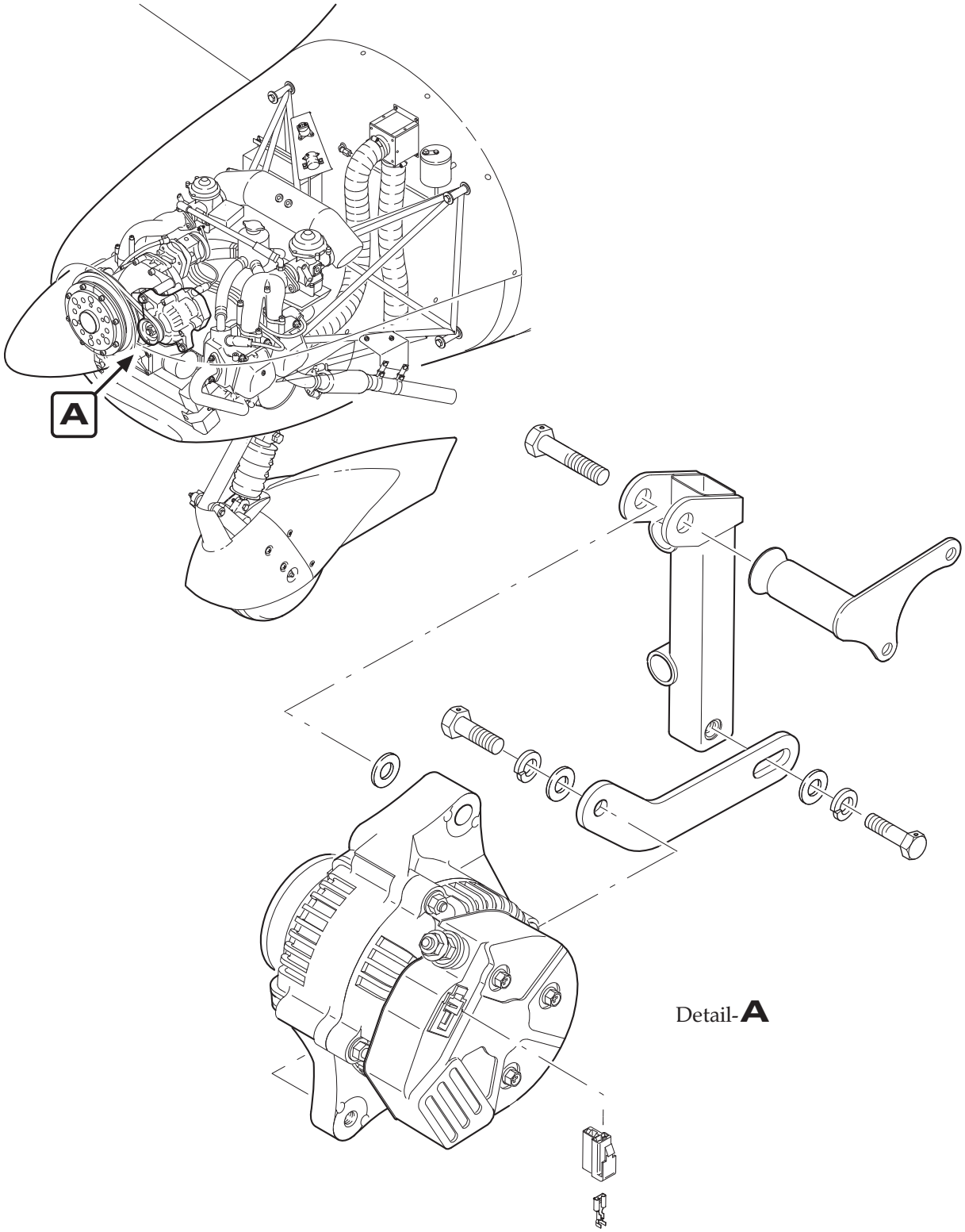
   B. Install External Alternator
      (1) Position alternator into mounting bracket.
      (2) Install shim and mounting bolt as shown in figure 201. Do not tighten yet.
      (3) Loosely secure lower alternator mounting boss to adjustment cam using washers and bolt (refer to figure 201).
      (4) Place drive belt on alternator pulley. Verify pulleys are aligned.

      CAUTION: IF A NEW DRIVE BELT IS INSTALLED: THE ENGINE BELT TENSION SHOULD BE RECHECKED WITHIN THE FIRST 15 TO 20 HOURS OF OPERATION.

      (5) Apply a torque wrench to the alternator pulley nut and adjust belt tension so the belt slips at:
         (a) 10 - 12 Nm (88 - 106 in.lbs) of torque with a used belt;
         (b) 15 - 18 Nm (133 - 159 in.lbs) of torque with a new belt
      (6) Tighten adjusting bolt. Torque to 22 Nm (195 in.lbs).
      (7) Tighten alternator mounting bolts.
         (a) Torque M10 bolt (upper alternator mounting bracket) to 40 Nm (355 in.lbs).
         (b) Torque M8 bolt to 22 Nm (195 in.lbs).
      (8) Safety wire all bolts.
      (9) Reconnect electrical cables including the ground cable.
      (10) Reconnect battery (refer to 24-30-00).
      (11) Install cowling (refer to 71-10-00).

3. External Alternator Drive Belt Removal/Installation

   A. Remove Alternator Drive Belt
      (1) Ensure electrical power to aircraft and ignition switch is OFF. Remove key.
      (2) Remove engine cowling (refer to 71-10-00).
      (3) Disconnect battery (refer to 24-30-00).



External Alternator Installation
Figure 201

(4) Cut safety wire and loosen adjusting bolt and alternator mounting bolts.
(5) Slip drive belt off alternator pulley.
(6) Remove propeller (refer to 61-10-00).
(7) Remove alternator drive belt.

B. Install Alternator Drive Belt
(1) Install alternator drive belt around drive pulley.
(2) Install propeller (refer to 61-10-00).
(3) Place drive belt on alternator pulley. Verify pulleys are aligned.

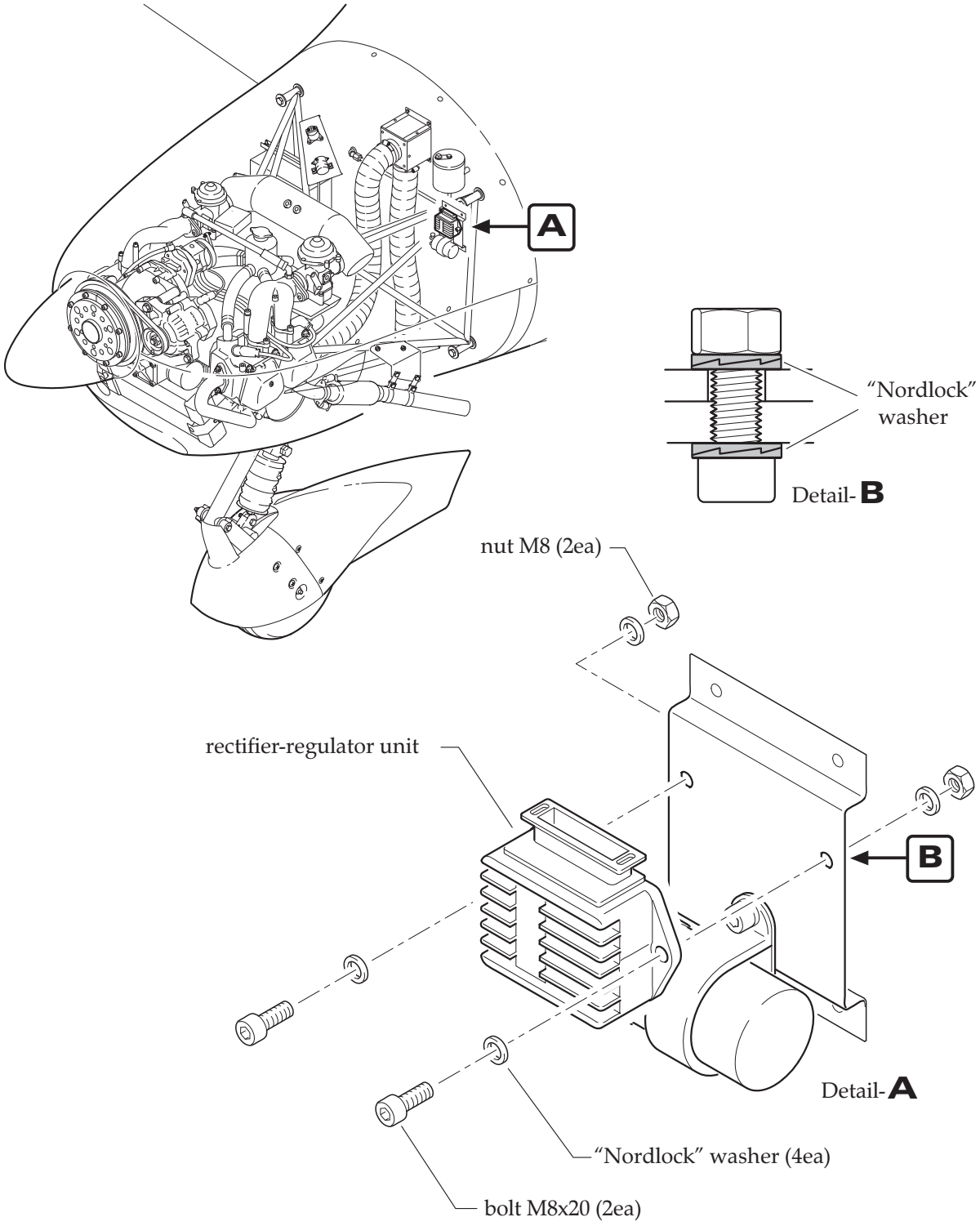
CAUTION: IF A NEW DRIVE BELT IS INSTALLED: THE ENGINE BELT TENSION SHOULD BE RECHECKED WITHIN THE FIRST 15 TO 20 HOURS OF OPERATION.

(4) Apply a torque wrench to the alternator pulley nut and adjust the belt tension so the belt slips at:
(a) 10 - 12 Nm (88 - 106 in.lbs) of torque with a used belt;
(b) 15 - 18 Nm (133 - 159 in.lbs) of torque with a new belt
(5) Tighten adjusting bolt. Torque to 22 Nm (195 in.lbs).
(6) Tighten alternator mounting bolts.
(a) Torque M10 bolt (upper alternator mounting bracket) to 40 Nm (355 in.lbs).
(b) Torque M8 bolt to 22 Nm (195 in.lbs).
(7) Safety wire all bolts.
(8) Reconnect battery (refer to 24-30-00).
(9) Install engine cowling (refer to 71-10-00).

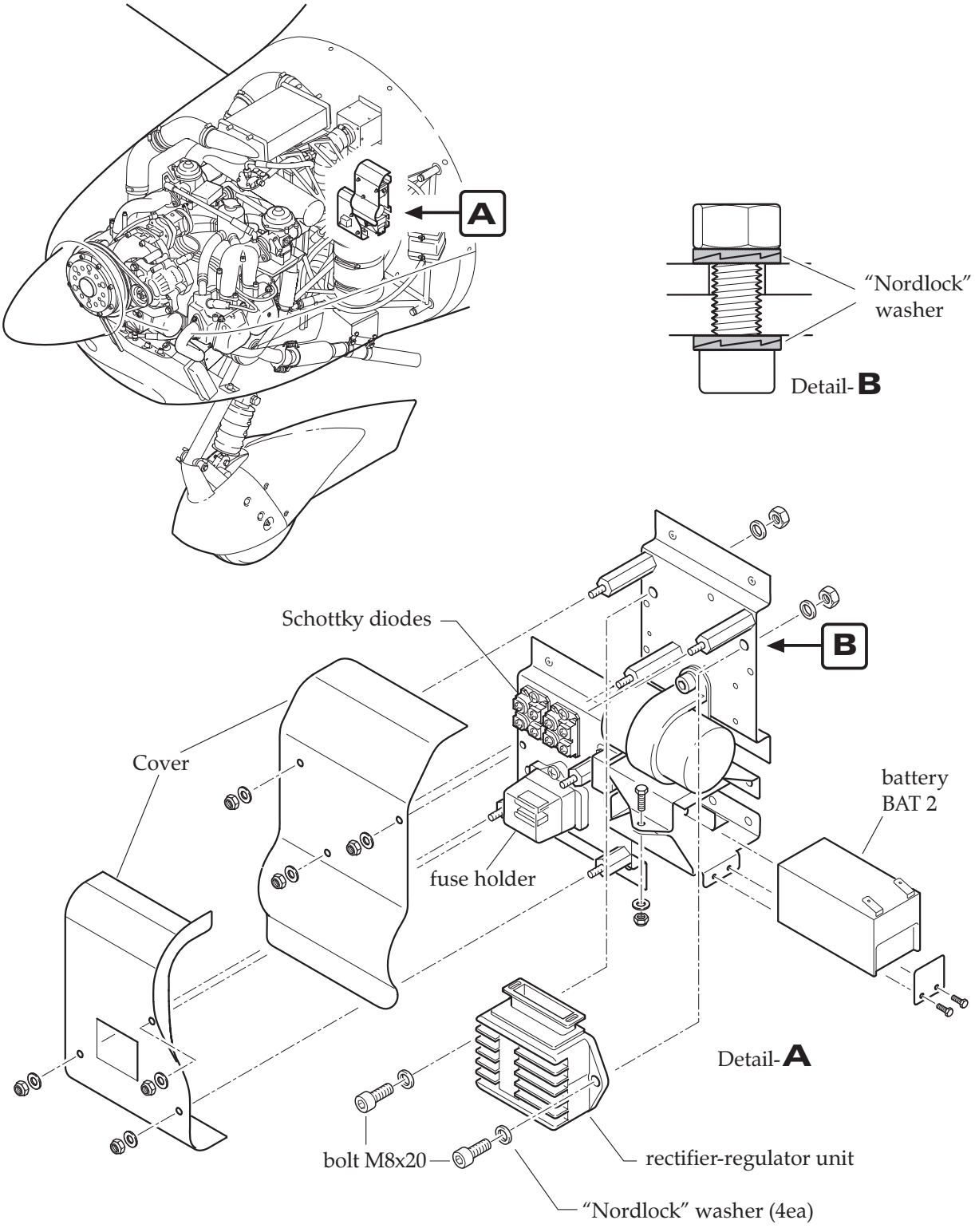
4. Rectifier-Regulator Unit Removal/Installation (Ref. Fig. 202, N/VFR or Rotax 914 equipped aircraft only)

A. Remove Rectifier-Regulator Unit
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Remove cover from rectifier-regulator unit (Rotax 914 only).
(5) Disconnect all wires from rectifier-regulator unit.
(6) Remove the attachment bolt and the nuts from the mounting plate and rectifier-regulator unit. Attend to the "Nordlock" washers.

B. Install Rectifier-Regulator Unit
(1) Install the rectifier-regulator unit with two screws M8x20 (DIN ISO 4762), four "Nordlock" washers and two nuts M8 (DIN ISO 934) on the mounting plate. Attend to the various washers and their installation sequence.
(2) Connect the wire to the rectifier-regulator unit.
(3) Install rectifier-regulator unit cover (Rotax 914 only).
(4) Reconnect battery (refer to 24-30-00).
(5) Install engine cowling (refer to 71-10-00).



Rectifier-Regulator Unit Installation (Night-VFR equipped aircraft only)
Figure 202



Rectifier-Regulator Unit Installation
Figure 202

5. BAT 2 Battery Removal/Installation (Ref. Fig. 202)

A. Remove BAT 2 Battery
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect main battery (refer to 24-30-00).
(4) Disconnect BAT 2 battery cables.
(5) Remove clamp screw connecting upper and lower BAT 2 mounting bracket.
(6) Remove 2 screws fixing closing plate to lower BAT 2 bracket. Remove closing plate.
(7) Pull out BAT 2 battery sidewards from mounting bracket.

B. Install BAT 2 Battery
(1) Place battery into mounting bracket.
(2) Reinstall closing plate to lower BAT 2 mounting bracket using 2 screws.
(3) Reinstall clamp screw connecting upper and lower BAT 2 mounting bracket.

CAUTION: EXCESSIVELY HIGH TORQUES COULD RESULT IN DAMAGE TO THE BATTERY AND ESCAPING BATTERY ACID.

(4) Reconnect BAT 2 battery cables.
(5) Reconnect main battery (refer to 24-30-00).
(6) Reinstall engine cowling (refer to 71-10-00).

MAIN BATTERY SYSTEM - DESCRIPTION

1. Introduction

A. The battery system supplies power to the electrical equipment if the alternator fails. It represents the auxiliary electrical power source.

B. The battery system consists of the following components:

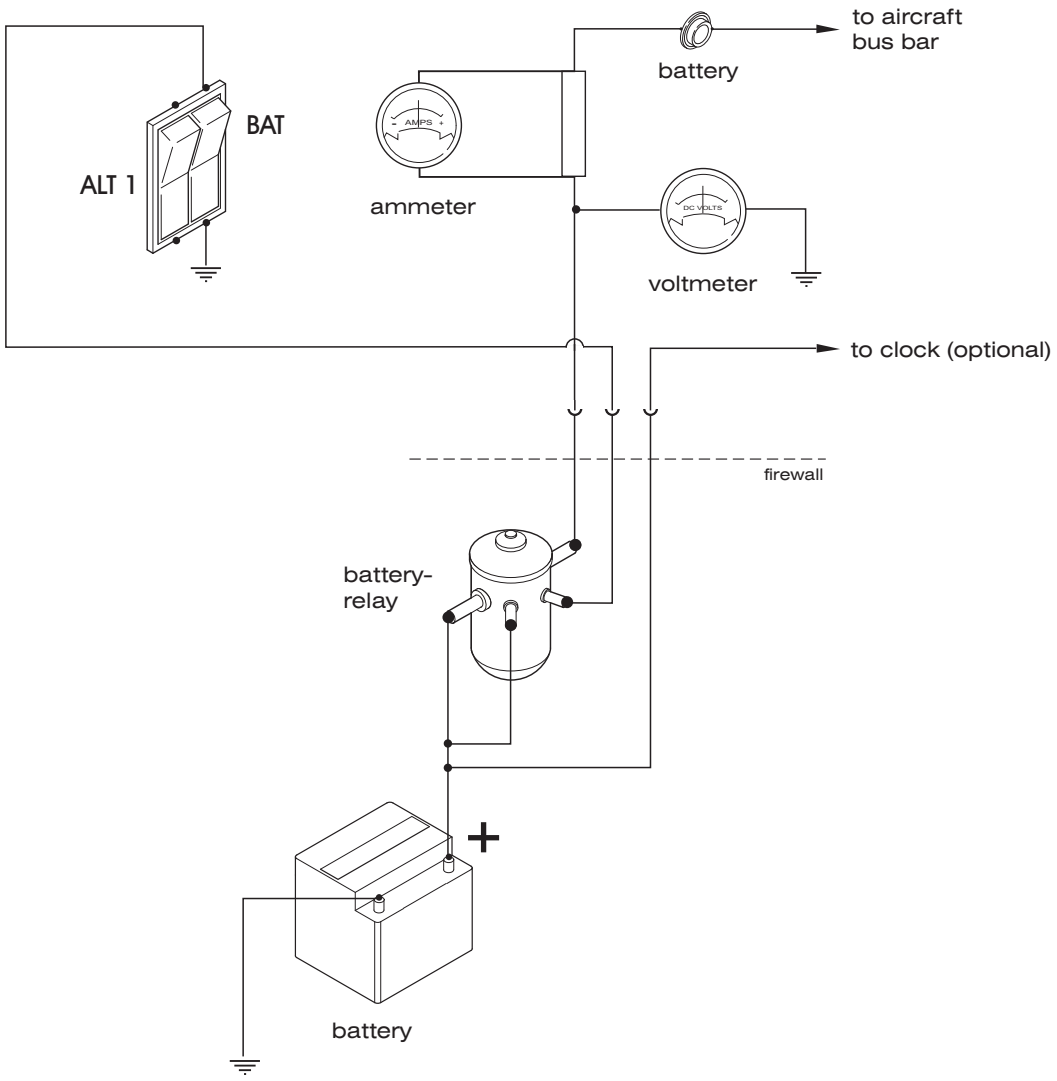
- battery
- battery relay
- BAT switch
- voltmeter
- ammeter

2. Description and Operation

A. The aircraft has a 12-volt, lead-acid battery, which is installed in a battery tray on the front-right side of the firewall. It is accessible by removing the upper engine cowling.
The battery relay is fixed above the battery at the engine mount.

B. To connect the battery to the aircraft bus the BAT switch, located on the lower left instrument panel, must be in the ON position, thus connecting one battery relay terminal to aircraft ground. The other relay terminal is permanently supplied with a positive voltage by the battery. In this way the aircraft bus bar is supplied with current via the battery relay.
The voltmeter is connected with the aircraft bus bar. The ammeter measures the charge or discharge current to/from the battery via a shunt. Both instruments are located on the right side of the instrument panel in the instrument cluster or in the digital engine monitor.

BATTERY SYSTEM (SCHEMATIC)



Battery System (Schematic)
Figure 1

MAIN BATTERY SYSTEM - MAINTENANCE

1. General

CAUTION: ALWAYS DISCONNECT THE BATTERY BEFORE DOING ANY MAINTENANCE ON THE ELECTRICAL SYSTEM. DISCONNECT THE NEGATIVE LEAD FIRST. RECONNECT THE NEGATIVE LEAD LAST. SECURE THE BATTERY LEADS FROM ACCIDENTAL CONNECTION DURING MAINTENANCE WORKS.
ROTAX 914 EQUIPPED AIRCRAFT: DISCONNECT ALSO THE BAT 2 BATTERY BY REMOVING THE TWO 10 A FUSES FROM RECTIFIER-REGULATOR UNIT INSTALLATION (REFER TO 24-20-00, FIGURE 202).

NOTE: It is recommended to remove the battery from the aircraft before doing any maintenance on the electrical system to avoid the risk of accidental connection.

A. Maintenance is limited to the removal and installation of the battery and the battery relay and a battery condition check. For information on the regular servicing required, refer to 12-17-00.

2. Battery Removal/Installation

A. Remove Battery
(1) Ensure BAT switch is in OFF position.
(2) Remove upper engine cowling (refer to 71-10-00).
(3) Remove battery hold down strap.
(4) Disconnect battery cables.
(5) Remove battery from mounting tray.

B. Install Battery
(1) Place battery into mounting tray and secure with battery hold down strap. Torque nuts to max. 2 Nm (18 in.lbs).

CAUTION: EXCESSIVELY HIGH TORQUES COULD RESULT IN DAMAGE TO THE BATTERY AND ESCAPING BATTERY ACID.

(2) Reconnect battery cables. Torque nuts to
- Exide Sprinter P12V600: 6 Nm (53 in.lbs)
- Hawker Odyssey PC950: max. 3,9 Nm (35 in.lbs)
(3) Install engine cowling (refer to 71-10-00).

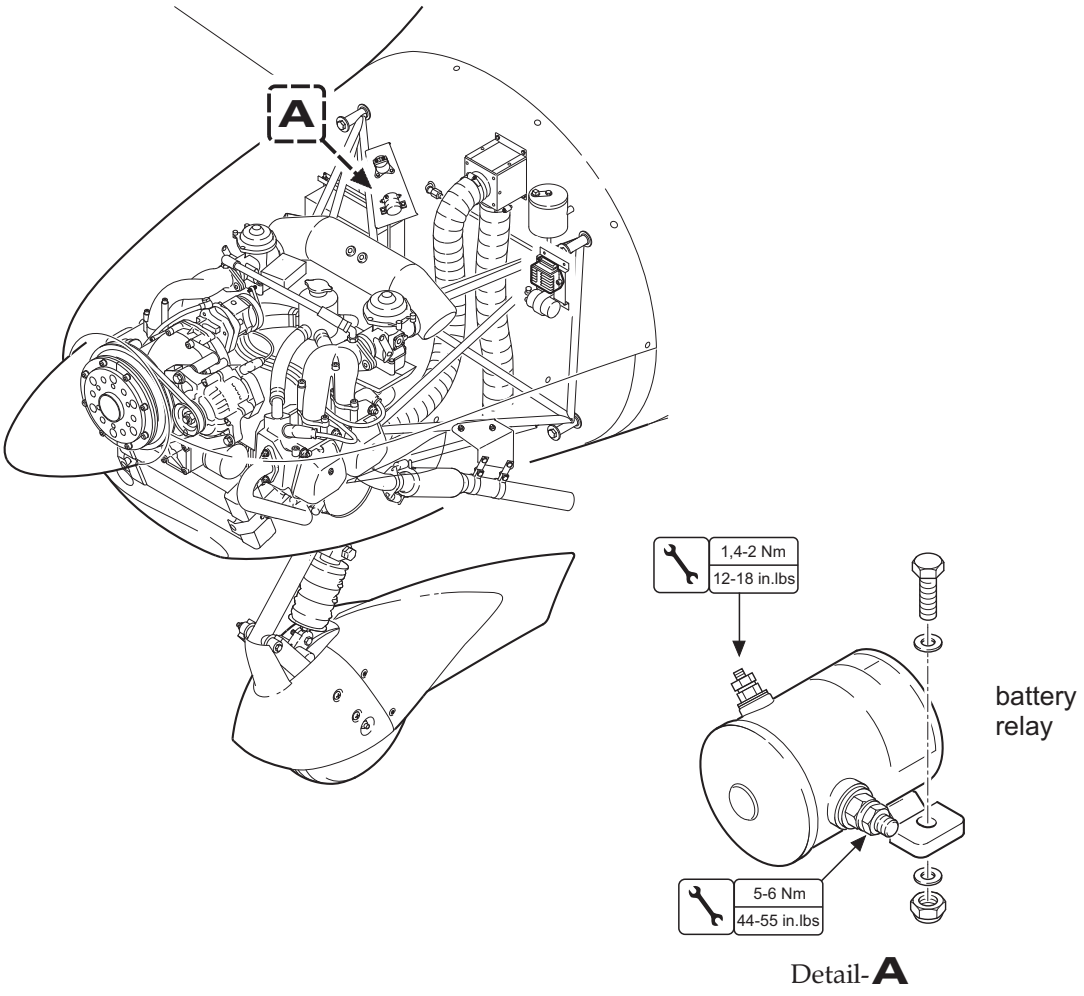
3. Battery Relay Removal/Installation (Ref. Fig. 201)

A. Remove Battery Relay
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Identify and disconnect wires at battery relay.
(5) Remove nuts, washers and bolts securing relay to engine mount and remove relay from aircraft.

B. Install Battery Relay
(1) Position and secure battery relay to engine mount using bolts, washers and nuts.
(2) Identify and reconnect wires to relay.

CAUTION: DO NOT REMOVE INNER NUT WHEN ASSEMBLING. USE WRENCH TO HOLD INNER NUT IN PLACE WHEN APPLYING OUTER NUT.

(3) Reconnect battery (refer to 24-30-00).
(4) Install engine cowling (refer to 71-10-00).



Battery Relay Installation
Figure 201

4. Battery Condition Check

For Night-VFR equipped aircraft or aircraft equipped with Rotax 914F engine, check the battery condition according to one of the following methods:

A. Measure „state of health“ (SOH) according to SAE using specialized test equipment (Schumacher PTI900X or similar). The battery is airworthy if the tester displays a SOH of at least 80%.

Battery P/N	Battery description	Ah (C10)	Effectivity
AT01-8210-128	Exide Sprinter P12V600	24 Ah	Rotax 912S
AT01-8210-129	Hawker Odyssey PC950	32 Ah	Rotax 914F

B. Measure capacity by discharging the battery with a current of approximately 10% (C10) of the battery capacity. Use automated test equipment that stops discharging at a voltage not lower than 11,0 Volts. The battery is airworthy if the measured capacity is at least:
- 19,2 Ampere-hours for aircraft equipped with Rotax 912S engine and for Night-VFR
- 25,6 Ampere-hours for aircraft equipped with Rotax 914F engine.

NOTE: Method B is harder on the battery and takes more time, but is more accurate.
Test only fully charged batteries and re-charge battery immediately after test.

NOTE: Select battery type „AGM“, „SLA“ or „VRLA“ if a setting is available in the test equipment.

EXTERNAL POWER - MAINTENANCE

1. General

   A. This section covers that portion of the system which connects external electrical power to the aircraft's electrical systems. It includes items such as external power receptacle and relays.

   B. As an option the aircraft may be equipped with an external power receptacle mounted on the right side of the engine mount, just below the battery. The standard, oval shaped, 3-pin receptacle is accessible through an hinged access plate in the right side of the engine cowling. Furthermore, the system includes an external power relay attached to the engine mount and a relay behind the instrument panel. For wiring refer to 91-00-00.
   When a 12 V DC power supply is connected to the external power receptacle the shorter, third connector engages the external power relay, which connects the external power to the aircraft main bus. Simultaneously, the battery switch will be disconnected from the ground terminal by the second relay behind the instrument panel. This prevents an energizing of the battery relay while an external power supply is being used.
   The signal power to the external power relay contains an isolation diode to prevent reverse polarity.

   C. Maintenance is limited to the removal and installation of components.

2. External Power Receptacle Removal/Installation (Ref. Fig. 201)

   A. Remove External Power Receptacle
      (1) Ensure electrical power to aircraft is OFF.
      (2) Remove engine cowling (refer to 71-10-00).
      (3) Disconnect battery (refer to 24-30-00).
      (4) Identify and disconnect all wires at EPU receptacle.
      (5) Remove nuts, washers and bolts securing receptacle to engine mount and remove receptacle.

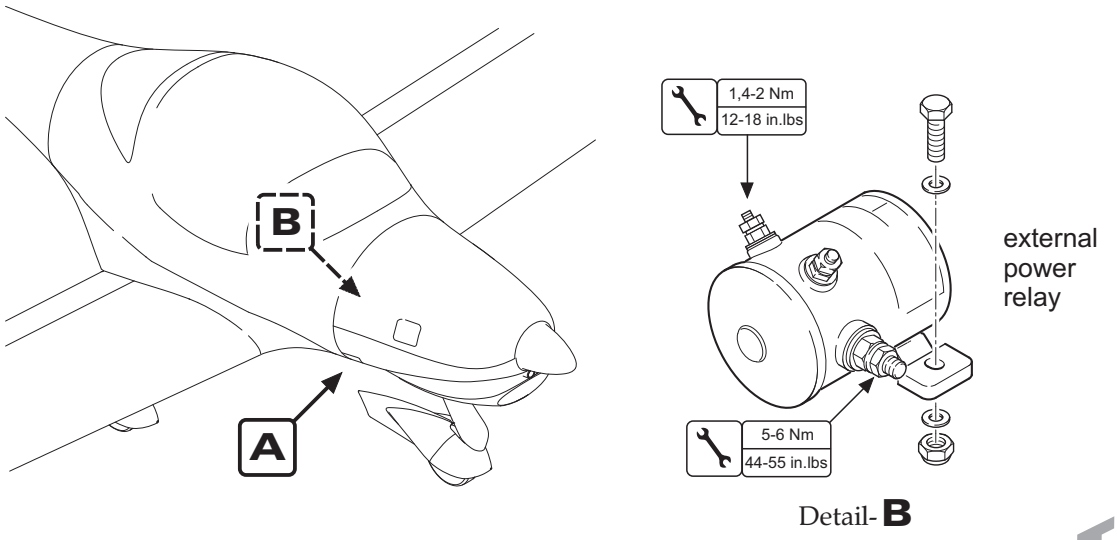
   B. Install External Power Receptacle
      (1) Position and secure EPU receptacle to engine mount using bolts, washers and nuts.
      (2) Identify and reconnect wires to EPU receptacle.
      (3) Reconnect battery (refer to 24-30-00).
      (4) Install engine cowling (refer to 71-10-00).
      (5) Perform an external power system functional check (refer to “Adjustment/Test” below).

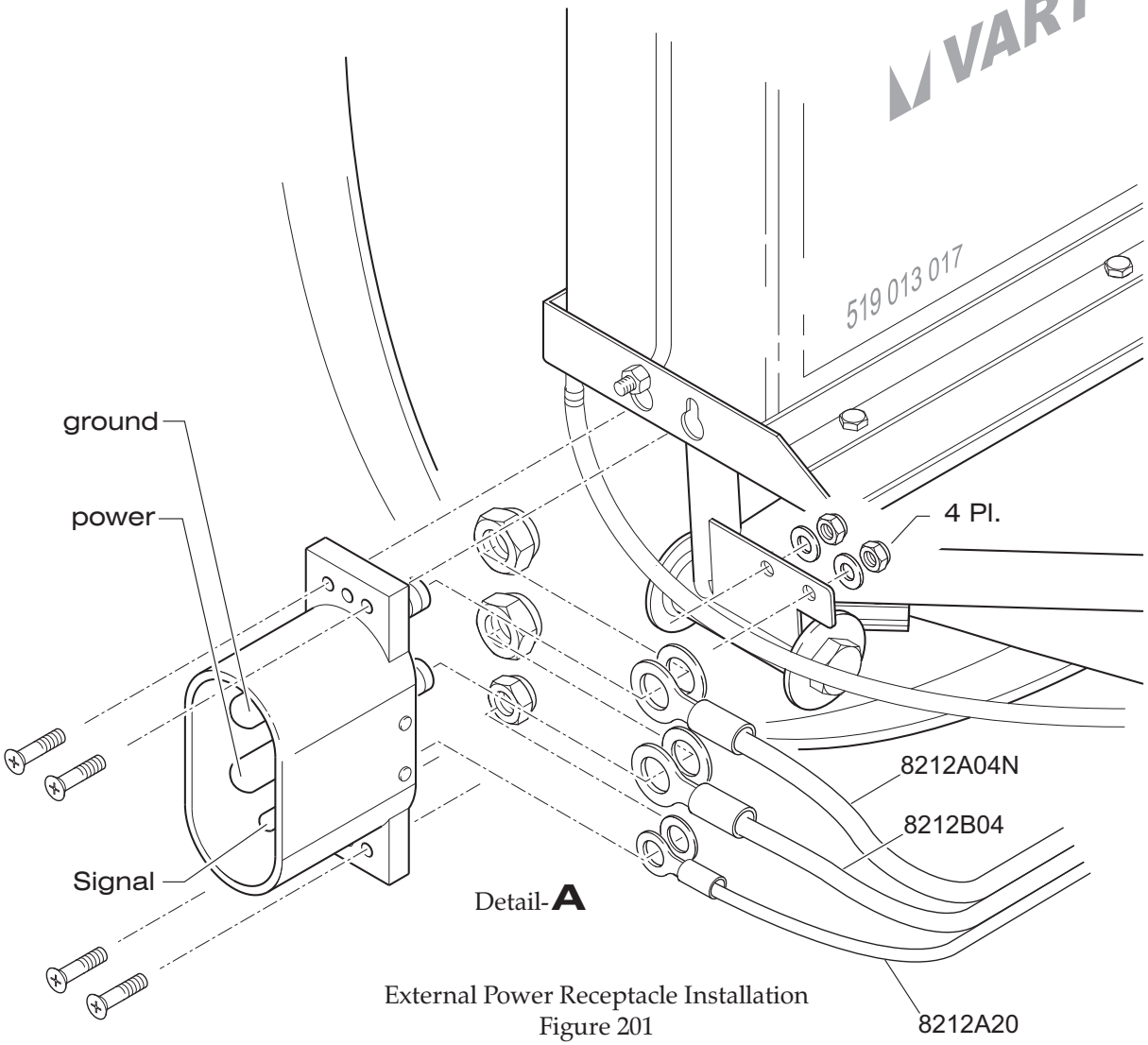
3. External Power Relay Removal/Installation (Ref. Fig. 201)

   A. Remove External Power Relay
      (1) Ensure electrical power to aircraft is OFF.
      (2) Remove engine cowling (refer to 71-10-00).
      (3) Disconnect battery (refer to 24-30-00).
      (4) Identify and disconnect wires at external power relay.
      (5) Remove nuts, washers and bolts securing relay to engine mount and remove relay.

EFFECTIVITY

Aircraft equipped with an external power receptacle





External Power Receptacle Installation
Figure 201

B. Install External Power Relay
(1) Position and secure external power relay to engine mount using bolts, washers and nuts.
(2) Identify and reconnect wires to external power relay.

CAUTION: DO NOT REMOVE INNER NUT WHEN ASSEMBLING. USE WRENCH TO HOLD INNER NUT IN PLACE WHEN APPLYING OUTER NUT.

(3) Reconnect battery (refer to 24-30-00).
(4) Install engine cowling (refer to 71-10-00).
(5) Perform an external power system functional check (refer to "Adjustment/Test below).

4. Adjustment/Test

A. External Power System Functional Check
(1) Connect an 14 V DC external power supply to aircraft.
(2) Place the BAT switch to the ON position.
(3) Verify the voltmeter shows 14 V.
(4) Disconnect external power supply from aircraft.
(5) The voltmeter must show 12 V.
(6) Place the BAT switch in OFF position.

5. Inspection/Check

A. External Power System Inspection/Check
(1) Check latching mechanism and hinge of the external power access plate for integrity and condition.
(2) Remove engine cowling (refer to 71-10-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Check external power receptacle for security.
(5) Check system relays for condition and security.
(6) Inspect electrical cables of the system for proper routing, chafing, broken or loose terminals, general condition, and sharp bends in wiring.
(7) Verify the external power placard is firmly in place and legible.
(8) Install glare shield (refer to 31-10-00).
(9) Install engine cowling (refer to 71-10-00).

ELECTRICAL LOAD DISTRIBUTION - DESCRIPTION

1. Introduction

   A. Distribution of electrical power supplied by the external and optional the internal alternator and the battery is accomplished by bus bars. The bus architecture allows power to be routed to the essential circuitry if any one of the main power sources fails.
   All essential electrical accessories in the system are protected by push pull type circuit breakers which can be reset in flight. The circuit breaker panel is on the far right of the instrument panel and each circuit breaker is labeled. All circuit breakers have their rated values identified on the top of the shaft.

   B. For power routing throughout the aircraft, refer to wiring diagrams shown in 91-00-00.

2. Description and Operation

   A. The electrical system has two main bus bars: the aircraft bus bar and the avionics bus bar. All systems are connected to the aircraft bus bar which are essentially for aircraft operation. The avionics bus bar supplies the avionics equipment with power.

   B. The external alternator output and the battery are connected with the aircraft bus via circuit breakers. Optional the internal alternator is connected with the aircraft bus via a rectifier-regulator unit and a circuit breaker (and a disconnect relay on Rotax 914 equipped aircraft). The circuit breakers are located on the right side of the instrument panel in the circuit breaker panel.

      The current is distributed from the aircraft bus bar via circuit breakers to the electrical circuits of several systems and components and via the AVIONICS switch to the avionics bus bar. From there, it is further distributed to the several components of the avionics equipment via circuit breakers. The AVIONICS switch allows avionics equipment to be removed separately from the residual electrical system.

CIRCUIT BREAKER - MAINTENANCE

1. General

A. The circuit breaker panel is equipped with circuit breakers of the "push to reset" type. One terminal of each switch/breaker is directly connected to the appropriate bus bar, the other is wired to the component/system it protects.

2. Circuit Breaker Removal/Installation

A. Remove Circuit Breaker
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glareshield (refer to 31-10-00).
(4) Disconnect wire(s) and bus to the selected circuit breaker.
(5) Remove retaining ring and washer from circuit breaker on the front of instrument panel.
(6) Remove circuit breaker.

NOTE: It may be necessary to loosen more than one circuit breaker to remove the selected circuit breaker.

B. Install Circuit Breaker
(1) Place circuit breaker(s) into position on the instrument panel and secure.
(2) Identify and connect wire(s) and bus to the selected circuit breaker.
(3) Reinstall glareshield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).

3. Circuit Breaker Current Ratings

A. Refer to table 201 for circuit breaker current ratings.

Table 201: Circuit Breaker Current Ratings

Current Rating	Circuit Breaker	Effectivity
50A	ALT1 BAT	
30A	Switch Panel	
25A	ALT2	Rotax 912 (N/VFR)
20A	ALT2	Rotax 914
10A	Flap Actuator COM1 & 2 Landing Light PFD GAD PWR	 GTN 650, GNS 430W, GTR 225, GNC 255 G500 Txi GAD27 (G3X)

Table 201: Circuit Breaker Current Ratings (Cont.)

Current Rating	Circuit Breaker	Effectivity
7.5A (8A)	MFD	Aspen EFD1000
	NAV/GPS 1 & 2	GTN 650
	PFD	G500
	AP	Autopilot (GMC507 & servos)
5A	Elevator Trim	from S/N 327
	Trim Actuator	up to S/N 326
	ALT1 Excitation	
	AHRS	G500
	ADC	G500
	12V Receptacle	
	12V / USB	
	Audio	GMA 340, GMA 350
	GPS	GPS Map 69X, Aera 79X
	TXP	GTX 328, GTX 330
	COM1 & 2	SL30, SL40
	MFD	Flymap + AHRS, G3X
	NAV/GPS1 & 2	GNS 430W
	PFD	G3X
	G5 GAD	G5HSI
	Engine Instr. 1	MVP-50
	P/S Heat	Pitot Heating
	Nav Lights	
	ACL	
	Fuel Pump MAIN	Rotax 914
	Fuel Pump AUX	Rotax 914
	Attitude Indicator	G5ATT
	Turn Coordin.	G5HSI
4A	NAV/GPS1 & 2	GNC 255
3A	Dome Light	
	Attitude Indicator	
	Turn Coordin.	
	Directional Gyro	
	TXP	TT-22, VT-02, VT2000, GTX3x5
	Traffic Monitor	AT-1
	Instrument Lights	
	Fuel Pump AUX	Rotax 912
2A	Warning Lights	
	Trim Control	up to S/N 326
	Flap Control	
	Starter Relay	
	Stall Warning	
	CHT (OAT)	
	Fuel Gauge	
	Instruments 1	
	Instruments 2	
	Panel Light	

Table 201: Circuit Breaker Current Ratings (Cont.)

Current Rating	Circuit Breaker	Effectivity
2A	Avionic Blower	
	Traffic Monitor	TRX 1500, TRX 2000
	Blind Encoder	ACK-A30
	Audio	PM 501, PM 500EX
	NAV/GPS1	SL30, CDI1
	NAV/GPS2	SL30, CDI2
	GPS	GPS Map 495, GPS Map 496, Aera 5XX
	ADAHRS1 & 2	ADAHRS (G3X)
	ENG SNSR	GEA24 (G3X)
	Flood Lights	
	TCU	Rotax 914
	ALT2 Disc.	Rotax 914
	GAD GTN	G3X w/ GTN650

ELECTRICAL SYSTEM WIRING - MAINTENANCE

1. General

   A. Repairs of the electrical system wiring are limited to the replacement and splicing of electrical wires. In general all repairs have to be carried out by certified repair stations or properly certified and trained persons.

   B. Carry out a complete functional check of the concerned equipment after every repair.

   C. Refer to 91-00-00 for wiring diagrams and wire routing diagrams.

2. Splicing

   A. Splicing is permitted on wiring as long as it does not affect the reliability and the electromechanical characteristics of the wiring. Splicing of power wires, coaxial cables, shielded wires or wire sizes above AWG 18 is not permitted. There should not be more than one splice in any one wire segment between any two connectors or other disconnect points. Refer to AC 43.13-1B, chapter 11, section 13 “Splicing” for further information on splicing procedures and equipment.

3. Wire Replacement

   A. If wires are replaced, they have to be replaced by identical ones (same MIL specification and AWG). New wires have to be routed, fixed and protected in the same manner as the old wires.

CHAPTER 28

FUEL

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

FUEL - GENERAL

1. Introduction

A. This chapter covers those units and components which are not part of the engine but store or deliver fuel to the engine or indicate fuel quantity and pressure. For further information on the internal engine fuel system components, refer to applicable ROTAX publications.

2. General Description

A. The fuel system consists of two main fuel tanks which are integral parts of the wings, a fuel selector / shut-off valve on the center console, an auxiliary fuel pump with an integrated fuel filter, an engine driven fuel pump and two single-barrel float type carburetors in the engine compartment as well as flexible hoses and metal fuel-lines. Fuel quantities are:

Total fuel:	120 liters (31.7 gallons)
Usable fuel:	109,6 liters (28.9 gallons)
Unusable fuel:	10,4 liters (2.8 gallons)

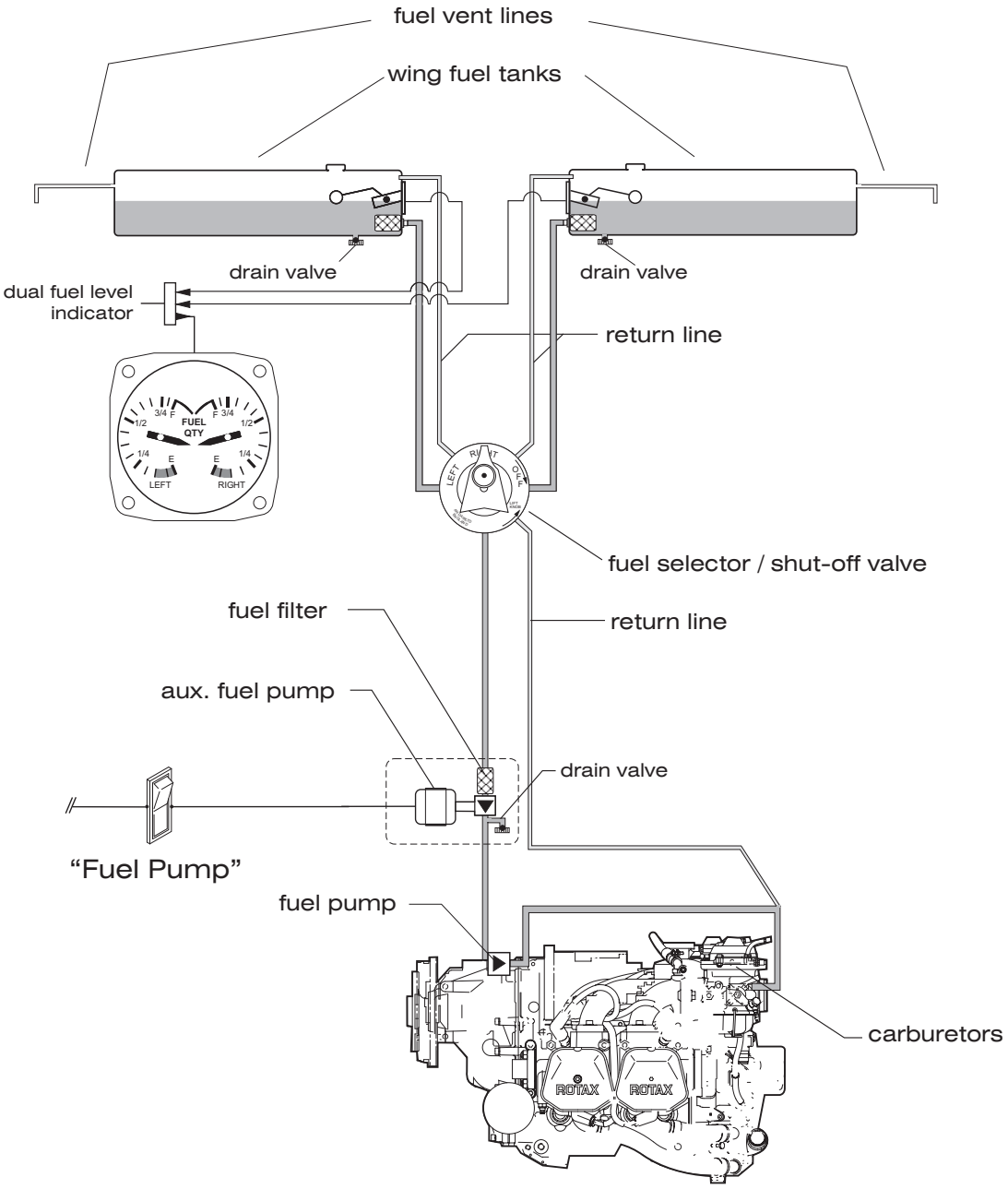
B. Fuel Supply
Fuel is delivered to the carburetors by the engine driven fuel pump from the fuel tank that is pre-selected by the fuel selector / shut-off valve. An electrical fuel pump is provided in case of failure of the engine driven fuel pump. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.

C. Fuel Indication
Fuel quantity is measured by resistive float type fuel level sensors located on the inboard fuel tank rib. Fuel pressure is measured at the engine and indicated either by a warning light or the optional engine monitoring system.

D. Fuel System Ventilation
The fuel tanks are vented from the top of each fuel tank through a vent line, connected at the outboard fuel tank rib, to a vent located on the winglets.

E. Fuel Drain System
Each tank has a manually operated drain at the bottom, inboard rear corner. A further drain valve is installed at the fuel system's lowest point, namely at the base of electrical fuel pump.

F. Fuel Lines
Fuel lines are made of aluminum tubing behind the firewall and stainless steel in the engine compartment. Flexible hoses are made of Teflon with steel fittings and silicone-coated fire sleeves.



Fuel System (Schematic)
Figure 1

FUEL - GENERAL

1. Introduction

A. This chapter covers those units and components which are not part of the engine but store or deliver fuel to the engine or indicate fuel quantity and pressure. For further information on the internal engine fuel system components, refer to applicable ROTAX publications.

2. General Description

A. The fuel system consists of two main fuel tanks which are integral parts of the wings, a fuel selector / shut-off valve on the center console, two redundant electric fuel pumps that are bypassed with check valves and a combined fuel filter / water trap (gascolator) in the fuselage, a fuel pressure regulator and two single-barrel float type carburetors on the engine as well as flexible hoses and metal fuel-lines. Fuel quantities are:

Total fuel:	120 liters (31.7 gallons)
Usable fuel:	109,6 liters (28.9 gallons)
Unusable fuel:	10,4 liters (2.8 gallons)

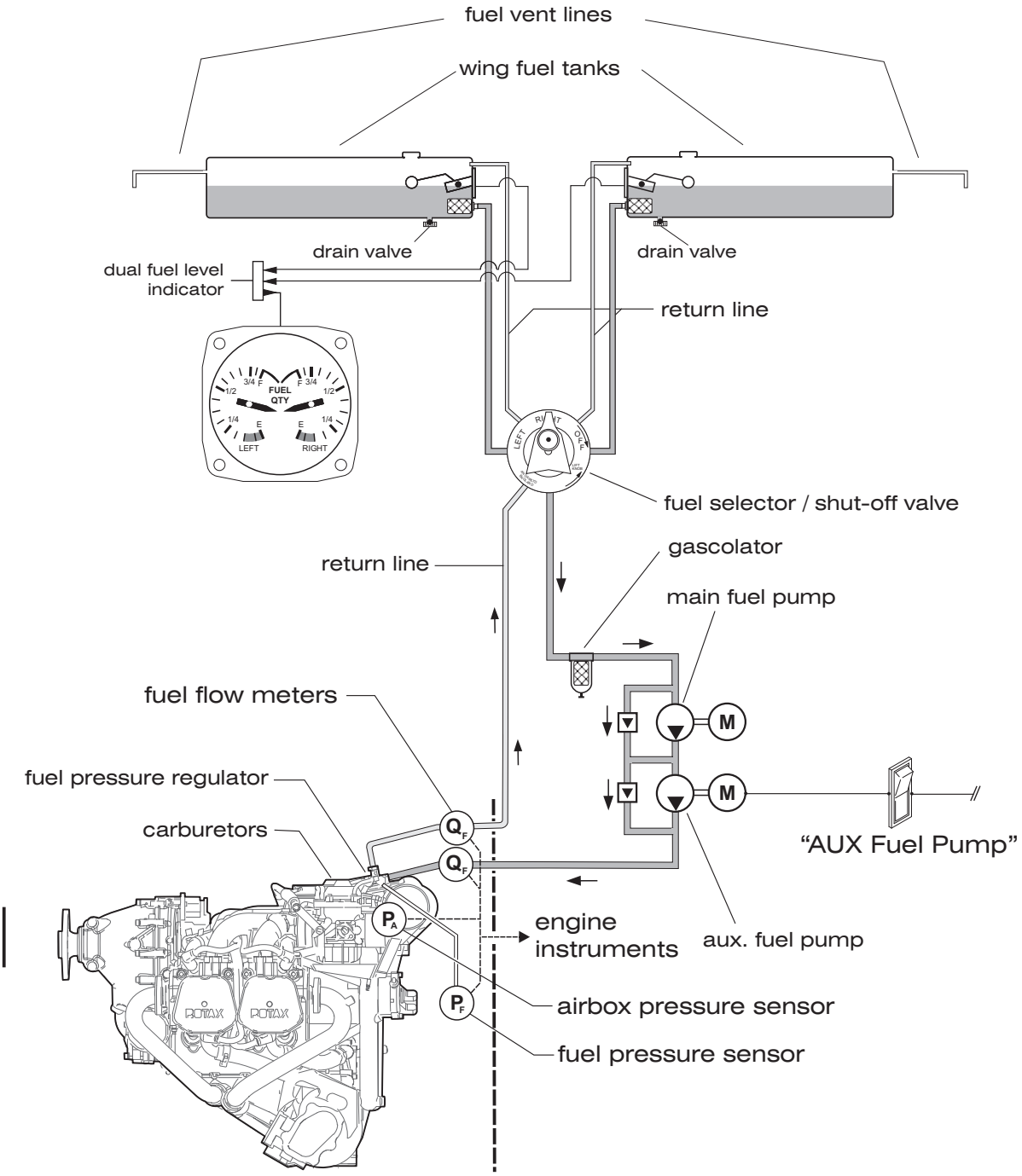
B. Fuel Supply
Fuel is delivered to the carburetors by the electric MAIN fuel pump from the fuel tank that is pre-selected by the fuel selector / shut-off valve. An electric AUX fuel pump is provided in case of failure of the MAIN fuel pump. Fuel pressure is maintained by a pressure regulator on the engine. Excessive fuel flows through return lines and the fuel selector valve back to the same tank.

C. Fuel Indication
Fuel quantity is measured by resistive float type fuel level sensors located on the inboard fuel tank rib. Fuel flow is measured by transducers in the fuel supply and return lines. Both transducers are installed on a bracket in the engine compartment. Fuel pressure is indicated as difference between the absolute fuel pressure at the pressure regulator and the boost pressure in the airbox. Both pressures are measured either by a differential pressure sensor or by two separate sensors and the differential pressure is calculated / indicated by the engine monitoring system (MVP-50 only).

D. Fuel System Ventilation
The fuel tanks are vented from the top of each fuel tank through a vent line, connected at the outboard fuel tank rib, to a vent located on the winglets.

E. Fuel Drain System
Each tank has a manually operated drain at the bottom, inboard rear corner. A further drain valve is installed at the fuel system's lowest point, namely at the gascolator on the bottom side of the fuselage.

F. Fuel Lines
Fuel lines are made of aluminum tubing behind the firewall and stainless steel in the engine compartment. Flexible hoses are made of Teflon with steel fittings and silicone-coated fire sleeves.



Fuel System (Schematic)
Figure 1

FUEL STORAGE - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. The fuel storage system consists of two integral fuel tanks, located at the inboard portion of each wing in front of the main spar. They are bounded by the upper and lower wing skins which are reinforced in this area, the main spar web, and the inboard and outboard fuel tank ribs.
Each fuel tank has a lockable fuel filler cap which is grounded to the airframe. The inner surfaces of the composite integral tanks are sealed with a special fuel tank sealing material to protect the composite fiber structure. A fuel baffle rib is provided to reduce fuel slosh in the fuel outlet and the fuel quantity sensor areas. The fuel tanks are vented from the top of each fuel tank through a vent line connected at the outboard fuel tank rib to a vent located on the winglets. Each inboard fuel tank rib has an outlet over the sump level that is equipped with a removable mesh strainer.

The inboard fuel tank ribs are easily accessible for maintenance work through access panel 610 BB / 510 BB in the lower wing skin.

B. The wing fuel tanks are maintenance-free. However, if a leak is suspected, AQUILA Aviation should be consulted.

2. Wing Fuel Tank Leakage Test

A. The following procedure should be used to check a wing fuel tank for leakage.
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Drain fuel from wing fuel tank.
(4) Open access plate 610 BB (510 BB).
(5) Disconnect fuel outlet line from fuel tank.
(6) Disconnect fuel return line from fuel tank.
(7) Cap fuel tank vent line.
(8) Attach a suitable manometer (water manometer) to fuel tank outlet fitting.

WARNING: NEVER APPLY REGULATED OR UNREGULATED AIR FROM AN AIR COMPRESSOR TO THE FUEL SYSTEM OR COMPONENTS.

CAUTION: DO NOT PRESSURIZE THE FUEL TANKS TO MORE THAN 1.0 PSI. STRUCTURAL DAMAGE MAY OCCUR TO THE FUEL TANK IF MORE THAN 1.0 PSI IS APPLIED.

(9) Connect a well-regulated supply of air (1.0 psi maximum) to the return line fitting.
(10) Make sure filler cap is installed and sealed.
(11) Apply pressure slowly until 1.0 psi is obtained.
(12) Shut off air supply.
(13) If fuel tank holds pressure for 15 minutes, the tank with vent line is sealed.

FUEL DISTRIBUTION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

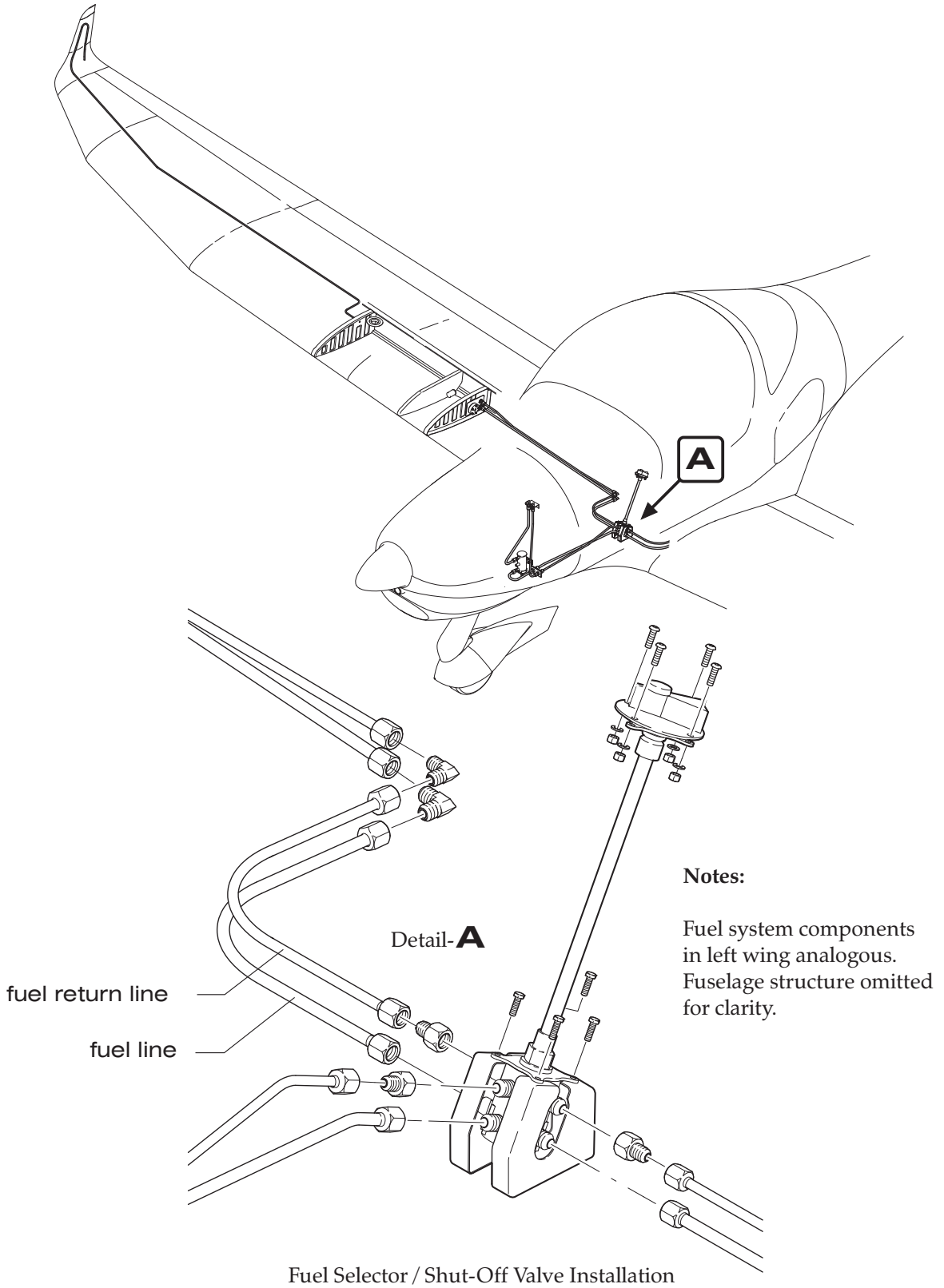
A. The fuel distribution system consists primarily of the fuel selector / shut-off valve, electrical fuel pump(s), fuel filter, fuel lines and the AUX fuel pump switch.

The fuel selector handle is located in the center console between the seats. The red, arrow shaped handle has a LEFT, RIGHT and OFF position. To switch the valve to the OFF position a knob located at the top of the handle must be pulled while the handle is rotated simultaneously. With the valve in this position fuel flow from and to the tanks is stopped. In both operating positions the fuel supply / return lines of the selected fuel tank are open while the fuel supply / return lines of the other one are closed.

Rotax 912S:
The electrical fuel pump is incorporated into the system without a bypass. In this way fuel flows through a fuel strainer which is integral of the fuel pump even if the pump is off. The electrical fuel pump is mounted in the engine compartment at the lower right firewall.

Rotax 914F:
The electrical fuel pumps are located in a separate compartment below the cockpit floor. Both pumps are connected in series to offer maximum reserves against vapor lock at high altitudes and temperatures. Separate check valves are installed parallel to the fuel pumps to allow operation with only one pump. Fuel flows from the tanks via a combined fuel filter / water trap (gascolator) to the electric fuel pumps and from there to the pressure regulator on the engine. The gascolator is accessible via inspection cover from outside the fuselage, whereas the inspection cover for the fuel pump package is located under the cockpit floor.

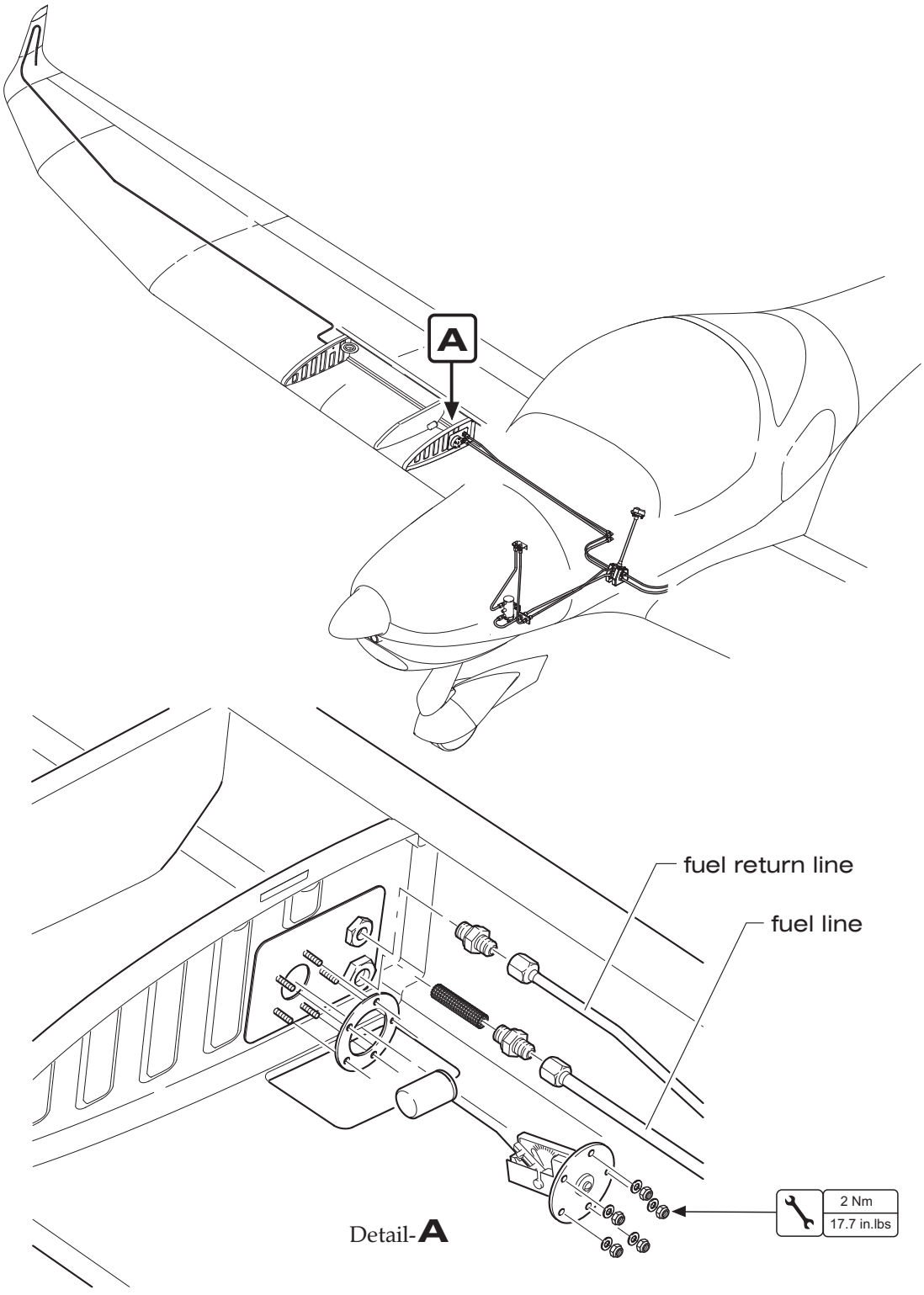
B. A clean fuel distribution system is very important for the secure and continuous supply of fuel to the engine. The fuel system is equipped with drain valves with which fuel in the system can be examined for contamination and grade.
   (1) The electrical fuel pump (Rotax 912S) / gascolator (Rotax 914F) has a filter screen which must be cleaned regularly. The filter screen can be removed for maintenance.
   (2) A mesh strainer is installed on the fuel outlet in each fuel tank. The strainer is accessible by opening the fuel tank rib access panel 610 BB / 510 BB. The strainer is brazed to a fitting that is installed in the fuel tank port. The fuel strainers in the fuel tanks should always be cleaned after aircraft has been in storage. If any damage or restrictions are noted, the strainer should be replaced.
   (3) The fuel system has a drain valve at it's lowest point, namely at the base of the electrical fuel pump (Rotax 912S) / gascolator (Rotax 914F). The drain valve is accessible from outside the nose section without removing any component. It should be used regularly to check fuel for water and contamination.
   (4) Each wing fuel tank has a drain-valve at it's base. The drain valves are accessible from outside at the bottom of the wings in the wing root area. They should be used regularly to check fuel for water and contamination.



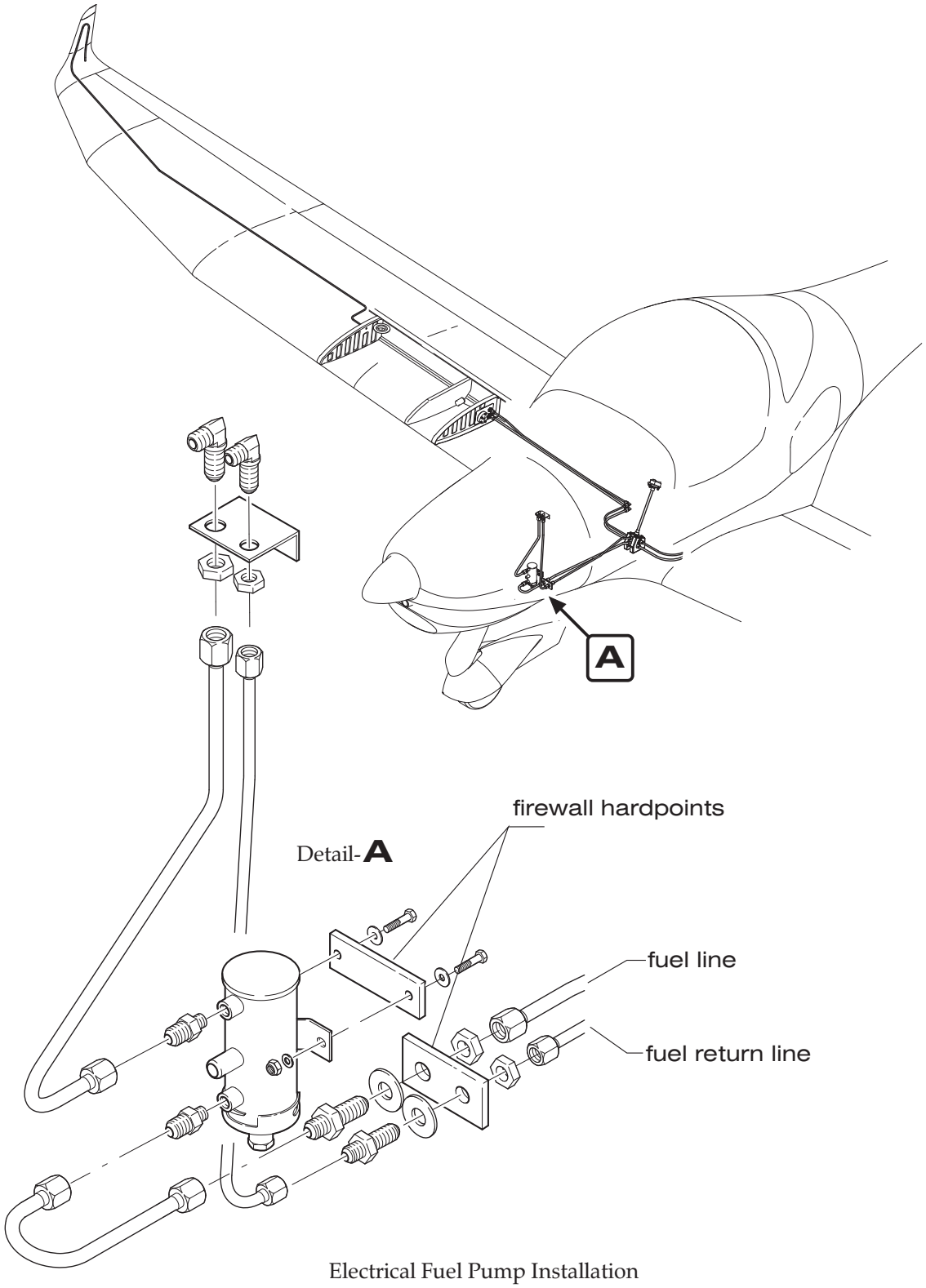
Notes:

Fuel system components in left wing analogous. Fuselage structure omitted for clarity.

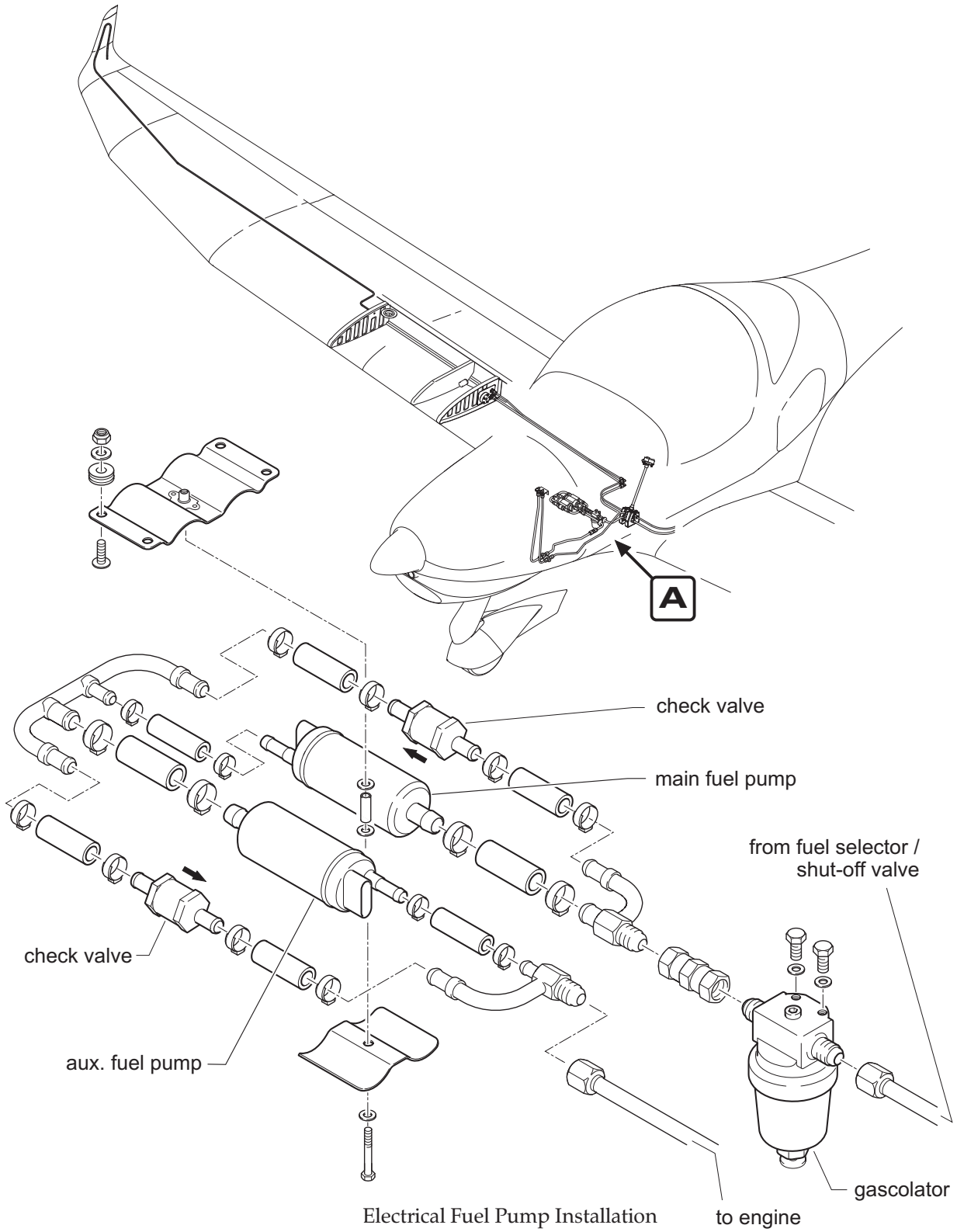
Fuel Selector / Shut-Off Valve Installation
Figure 201



Fuel Level Sensor / Fuel Tank Outlet Strainer Installation
Figure 202



Electrical Fuel Pump Installation
Figure 203



Electrical Fuel Pump Installation
Figure 203

2. Fuel Selector / Shut-Off Valve Removal/Installation

A. Remove Fuel Selector / Shut-Off Valve
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Drain fuel from fuel system completely using the wing fuel tank drains and the drain at the electrical fuel pump (Rotax 912) / gascolator (Rotax 914).
(4) Remove access panels 211 BB and 211 HL/HR in the cabin (refer to 25-12-00).
(5) Remove access panel 211 GT with fuel selector / shut-off valve control lever and connecting shaft (refer to 25-12-00).
(6) Disconnect the fuel supply and return lines at valve.
(7) Remove bolts securing valve to mounting bracket and remove the fuel selector / shut-off valve assembly from aircraft.

B. Install Fuel Selector / Shut-Off Valve
(1) Verify battery is disconnected and electrical power to aircraft is OFF.
(2) Place fuel selector / shut-off valve in position and secure using washers and bolts.
(3) Connect all fuel supply and return lines at valve.
(4) Connect the fuel selector / shut-off valve control lever. Make sure that both the valve and the valve control lever are set to OFF and install access panel 211 GT with fuel selector / shut-off valve control lever and connecting shaft (refer to 25-12-00).
(5) Refuel the aircraft.
(6) Pressure check complete fuel system (refer to "Fuel System Pressure Test" below).
(7) Inspect fuel selector / shut-off valve and enclosure for any signs of fuel leakage.
(8) Reconnect battery (refer to 24-30-00).
(9) Perform operational check of the fuel distribution system.
(10) Install all items removed for access.

3. Electrical Fuel Pump Removal/Installation (Rotax 912S only)

A. Remove Electrical Fuel Pump
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Close fuel selector / shut-off valve.
(5) Disconnect the pump wires.
(6) Disconnect fuel lines at electrical fuel pump. Drain fuel from line.
(7) Remove bolts, washers and nuts securing electrical fuel pump to firewall and remove electrical fuel pump.

B. Install Electrical Fuel Pump
(1) Verify battery is disconnected and electrical power to aircraft is OFF.
(2) Secure electrical fuel pump to firewall using bolts, washers and nuts.
(3) Reconnect fuel lines to electrical fuel pump.
(4) Reconnect the pump electrical wires.
(5) Reconnect battery (refer to 24-30-00).

4. Electrical Fuel Pump Removal/Installation (Rotax 914F only)

A. Remove Electrical Fuel Pump
(1) Ensure electrical power to aircraft is OFF.
(2) Close fuel selector / shut-off valve.
(3) Disconnect battery (refer to 24-30-00).
(4) Drain fuel from system with drainer at bottom of gascolator.
(5) Remove access panels 210BB (refer to 06-30-00) and 211BB (refer to 25-12-00).
(6) Disconnect electrical wires to fuel pump package at connector inside the fuselage.
(7) Disconnect fuel lines to/from fuel pump package through access panel 210BB from below the fuselage.
(8) Remove screws securing access panel 211LT to fuselage (refer to 25-12-00). Don't remove the 4 nuts attaching the fuel pump package to the access panel.
(9) Remove access panel 211LT from fuselage together with the fuel pump package.
(10) Remove clamp screw and clamp attaching fuel pump package to access panel.
(11) Disconnect electrical wires, fuel hoses and circuit board with interference-suppression capacitor from fuel pump and remove fuel pump.

B. Install Electrical Fuel Pump
(1) Verify battery is disconnected and electrical power to aircraft is OFF.
(2) Reconnect electrical wires, fuel hoses and circuit board with interference-suppression capacitor to fuel pump.
(3) Attach electrical fuel pump to access panel 211LT using clamp screw and clamp.
(4) Position access panel 211LT in fuselage together with the fuel pump package and secure with screws.
(5) Reconnect fuel lines to/from fuel pump package through access panel 210BB.
(6) Reconnect electrical wires to fuel pump package at connector inside the fuselage.
(7) Pressure check complete fuel system (refer to "Fuel System Pressure Test" below).
(8) Inspect fuel pump package for any signs of fuel leakage.
(9) Reconnect battery (refer to 24-30-00).
(10) Perform operational check of the fuel distribution system.
(11) Install all items removed for access.

5. Fuel Filter Maintenance (Rotax 912S only)

A. Maintenance is accomplished by the following procedure:
(1) Ensure electrical power to aircraft is OFF.
(2) Close fuel selector / shut-off valve.
(3) Disconnect battery (refer to 24-30-00).
(4) Drain fuel from system with drainer at bottom of electrical fuel pump.
(5) Remove engine cowling (refer to 71-10-00).
(6) Remove locking wire at lower fuel pump cap.
(7) Remove lower fuel pump cap.
(8) Remove filter element and clean by washing.
(9) Check disk magnet for metal particles.
(10) Reassemble filter and cap.
(11) Secure cap using locking wire.
(12) Reconnect battery (refer to 24-30-00).

(13) Perform operational check of the fuel distribution system.
(14) Inspect system for any signs of fuel leakage.
(15) Install all items removed for access.

6. Fuel Filter Maintenance (Rotax 914F only)

A. Maintenance is accomplished by the following procedure:
(1) Ensure electrical power to aircraft is OFF.
(2) Close fuel selector / shut-off valve.
(3) Disconnect battery (refer to 24-30-00).
(4) Drain fuel from system with drainer at bottom of gascolator.
(5) Remove access panel 210BB (refer to 06-30-00).
(6) Remove locking wire from black retaining ring at gascolator.
(7) Remove gascolator sediment bowl by gripping the black retaining ring and unscrewing until it is free of the bowls threads.
(8) Inspect bowl and clean if required.
(9) Gently grip at the top of the filter element and unscrew to remove.
(10) Clean filter element by washing in fuel or blowing off contaminant with air.
(11) Reinstall filter element. Gently grip at the top of the filter element and screw to hand tight.
(12) Fit new O-ring to the bowl.
(13) Line up arrow on sediment bowl and engraved line on the gascolator body. Carefully push bowl into gascolator body and tighten the retaining ring.
(14) Secure retaining ring using locking wire.
(15) Reconnect battery (refer to 24-30-00).
(16) Perform operational check of the fuel distribution system.
(17) Inspect system for any signs of fuel leakage.
(18) Install all items removed for access.

FUEL QUANTITY INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. The fuel quantity indicating system consists of two resistive float type fuel quantity sensors, one in each tank, a dual fuel quantity indicator and wiring connecting the components.
The fuel quantity indicator is located on the right side of the instrument panel and has been calibrated during installation.
The fuel quantity sensors are easily accessible for maintenance or replacement through access panels in the lower wing skin.

B. Maintenance is limited to the removal and installation of the system components.

2. Fuel Quantity Indicator Removal/Installation

A. Check SI-AT01-018 (annex 1) when installing a new indicator. The pin assignment of the indicator may have changed.

B. Remove Fuel Quantity Indicator
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Remove cable connector from back of indicator.
(5) While supporting indicator, remove screws attaching indicator to instrument panel.
(6) Remove indicator from aircraft.

C. Install Fuel Quantity Indicator.
(1) Position indicator to instrument panel hole and secure with screws.
(2) Install cable connector at back of indicator.
(3) Reconnect battery (refer to 24-30-00).
(4) Perform a fuel quantity indicating system test / calibration (refer to “Test/Calibration” below).
(5) Install glare shield (refer to 31-10-00).

3. Fuel Quantity Sensor Removal/Installation

A. Remove Fuel Quantity Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Drain wing fuel tank with sensor that is to be removed (refer to 12-11-00).
(4) Open access / inspection plate 510 BB / 610 BB to gain access to sensor (refer to 06-30-00).
(5) Remove nuts securing sensor to inboard fuel tank rib.
(6) Disconnect electrical cables from sensor.
(7) Carefully withdraw sensor from wing tank.

B. Install Fuel Quantity Sensor
(1) Verify battery is disconnected and electrical power to aircraft is OFF.
(2) Check ease of movement of the float arm before installing the sensor.
(3) Place sensor with new gasket on to the threaded studs at inboard fuel tank rib.

CAUTION: THE FUEL QUANTITY SENSOR SHOULD BE FED CAREFULLY INTO THE FUEL TANK. A BENT FLOAT ARM MAY CAUSE ERRONEOUS READINGS.

(4) Connect electrical cables to sensor.
(5) Secure sensor with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lbs).
(6) Reconnect battery (refer to 24-30-00).
(7) Perform a fuel quantity indicating system calibration (refer to "Test/Calibration" below).

4. Fuel Quantity Indicating System Test/Calibration

NOTE: When a fuel quantity sensor is replaced, the fuel quantity indicating system must be calibrated. When a fuel quantity indicator is replaced, the system must be at least functionally tested and recalibrated as necessary.

NOTE: Due to the dihedral angle of the wing and the position of the fuel quantity sensor (total) fuel levels above approx. 50 liters (13.21 gallons) are not gaugeable.

A. Fuel Quantity Indicating System Test
(1) Prepare aircraft
(a) Drain fuel from wing tanks (refer to 12-11-00).
(b) Verify fuel selector / shut-off valve is in OFF position.
(c) Level the aircraft laterally and longitudinally (refer to 08-10-00).
(2) Ensure ALT1 / BAT switch is in the OFF position.
(3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
(4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(5) Turn BAT switch to the ON position.
(6) Wait until pointer settles in it's final position. Check that fuel quantity indicator reads empty for both tanks (<"E" up to S/N AT01-100A/B-326).
(7) Turn BAT switch to the OFF position.
(8) Add 13,7 liters (3.62 gallons) of fuel to each wing fuel tank.
(9) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(10) Turn BAT switch to the ON position.
(11) Wait until pointer settles in it's final position. Check that fuel quantity indicator reads "1/4" ±1/2 scale line for both tanks.
(12) Turn BAT switch to the OFF position.
(13) Add 41,1 liters (10.86 gallons) of fuel to LH wing fuel tank.
(14) Turn BAT switch to the ON position.
(15) Wait until pointer settles in it's final position.
Check that LH fuel quantity indicator reads full (>"3/4" from S/N AT01-100A/B-327).
(16) Turn BAT switch to the OFF position.
(17) Repeat steps (13) thru (16) for RH wing fuel tank.

B. Fuel Quantity Indicating System Calibration

NOTE: A calibration module is necessary to perform the steps described below.
The calibration module is installed at the back of the fuel quantity indicator.
For further information on fuel tank calibration or if no calibration module is installed refer to SI-AT01-018, latest revision.

(1) Prepare aircraft
  (a) Drain fuel from wing tanks (refer to 12-11-00).
  (b) Verify fuel selector / shut-off valve is in OFF position.
  (c) Level the aircraft laterally and longitudinally (refer to 08-10-00).
  (d) Remove glare shield (refer to 31-10-00).
(2) Ensure ALT1 / BAT switch is in the OFF position.

Up to S/N AT01-100A/B-326:
(3) Fill 18,9 liters (4.99 gallons) of fuel into each wing fuel tank.
(4) Gently shake wing to assure fuel quantity sensors settle in their final position.
(5) Turn BAT switch to the ON position.
(6) Use the two potentiometers of the calibration module at the back of the fuel quantity gauge to set the pointers of the gauge to “1/4”. Pay attention to the delayed indication of the gauge.
(7) Turn BAT switch to the OFF position and drain fuel from wing tanks (refer to 12-11-00).
(8) Perform fuel quantity indicating system test as described above.
(9) Reinstall glare shield (refer to 31-10-00).

From S/N AT01-100A/B-327:
(3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
(4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(5) Turn BAT switch to the ON position.
(6) Use the two potentiometers of the calibration module at the back of the fuel quantity gauge to set the pointers of the gauge to “E”. Pay attention to the delayed indication of the gauge.
(7) Turn BAT switch to the OFF position and drain fuel from wing tanks (refer to 12-11-00).
(8) Perform fuel quantity indicating system test as described above.
(9) Reinstall glare shield (refer to 31-10-00).

FUEL QUANTITY INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. Fuel quantity indication is included in the Garmin G3X Touch system.
Fuel quantity is measured by two resistive type fuel quantity sensors, one in each tank, electrically connected to the GEA 24 engine interface at the back of the instrument panel. The fuel quantity sensors are easily accessible for maintenance or replacement through access panels in the lower wing skin.

B. Maintenance is limited to the removal and installation of the system components.
Refer to 34-25-00 for further information on maintenance of the Garmin G3X Touch system.

2. Fuel Quantity Sensor Removal/Installation

A. Remove Fuel Quantity Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Drain wing fuel tank with sensor that is to be removed (refer to 12-11-00).
(4) Open access / inspection plate 510 BB / 610 BB to gain access to sensor (refer to 06-30-00).
(5) Remove nuts securing sensor to inboard fuel tank rib.
(6) Disconnect electrical cables from sensor.
(7) Carefully withdraw sensor from wing tank.

B. Install Fuel Quantity Sensor
(1) Verify battery is disconnected and electrical power to aircraft is OFF.
(2) Check ease of movement of the float arm before installing the sensor.
(3) Place sensor with new gasket on to the threaded studs at inboard fuel tank rib.

CAUTION: THE FUEL QUANTITY SENSOR SHOULD BE FED CAREFULLY INTO THE FUEL TANK. A BENT FLOAT ARM MAY CAUSE ERRONEOUS READINGS.

(4) Connect electrical cables to sensor.
(5) Secure sensor with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lbs).
(6) Reconnect battery (refer to 24-30-00).
(7) Perform a fuel quantity indicating system calibration (refer to “Test/Calibration” below).

3. Fuel Quantity Indicating System Test/Calibration

NOTE: When a fuel quantity sensor is replaced, the fuel quantity indicating system must be calibrated.

NOTE: Due to the dihedral angle of the wing and the position of the fuel quantity sensor (total) fuel levels above approx. 50 liters (13.21 gallons) are not gaugeable.

A. Fuel Quantity Indicating System Test
   (1) Prepare aircraft
      (a) Drain fuel from wing tanks (refer to 12-11-00).
      (b) Verify fuel selector / shut-off valve is in OFF position.
      (c) Level the aircraft laterally and longitudinally (refer to 08-10-00).
   (2) Ensure ALT1 / BAT switch is in the OFF position.
   (3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
   (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
   (5) Turn BAT switch to the ON position.
   (6) Check that G3X fuel level indication reads 0 liters (0 gallons) for both tanks.
   (7) Turn BAT switch to the OFF position.
   (8) Add 27,4 liters (7.23 gallons) of fuel to each wing fuel tank.
   (9) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
   (10) Turn BAT switch to the ON position.
   (11) Check that G3X fuel level indication reads 27±3 liters (7.2±0.8 gallons) for both tanks.
   (12) Turn BAT switch to the OFF position.
   (13) Add 27,4 liters (7.23 gallons) of fuel to LH wing fuel tank.
   (14) Turn BAT switch to the ON position.
   (15) Check that G3X fuel level indication reads > 52 liters (13.7 gallons) for LH fuel tank.
   (16) Turn BAT switch to the OFF position.
   (17) Repeat steps (13) thru (16) for RH wing fuel tank.

B. Fuel Quantity Indicating System Calibration

NOTE: Refer to Garmin G3X Touch EFIS Part 23 AML STC Maintenance Manual for further information on the fuel tank calibration procedure.

   (1) Prepare aircraft
      (a) Drain fuel from wing tanks (refer to 12-11-00).
      (b) Verify fuel selector / shut-off valve is in OFF position.
      (c) Level the aircraft laterally and longitudinally (refer to 08-10-00).
   (2) Ensure ALT1 / BAT switch is in the OFF position.
   (3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
   (4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
   (5) Turn BAT switch to the ON position.
   (6) Call up the G3X fuel quantity calibration page.
   (7) Select “Fuel Quantity 1/L”, “Calibrate”, “Flight”. Enter 0,0 liters (0.0 gallons) in the “Actual Fuel Quantity” field. Select “Store Calibration Point” to save the first point.

(8) Select "Fuel Quantity 2/R", "Calibrate", "Flight" and repeat step (7) for the RH wing fuel tank.
(9) Add 13,7 liters (3.62 gallons) of fuel to each wing fuel tank.
(10) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(11) Select "Fuel Quantity 1/L", "Calibrate", "Flight". Enter 13,7 liters (3.6 gallons) in the "Actual Fuel Quantity" field. Select "Store Calibration Point" to save the second point.
(The sensor value displayed in the "Input Voltage" field should change when fuel is added.)
(12) Select "Fuel Quantity 2/R", "Calibrate", "Flight" and repeat step (11) for the RH wing fuel tank.
(13) Repeat steps (9) thru (12) for the remaining 3 calibration points:

Calibration Point	**Actual Fuel Qty.** [liters (gallons)]	**Total Fuel** [liters (gallons)]	**Usable Fuel** [liters (gallons)]
1	0,0 (0.0)	5,2 (1.37)	0,0 (0.00)
2	13,7 (3.6)	18,9 (4.99)	13,7 (3.62)
3	27,4 (7.2)	32,6 (8.61)	27,4 (7.24)
4	41,1 (10.9)	46,3 (12.23)	41,1 (10.86)
5	54,8 (14.5)	60,0 (15.85)	54,8 (14.48)

FUEL QUANTITY INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. Fuel quantity indication is included in the engine monitoring system.
Fuel quantity is measured by two resistive type fuel quantity sensors, one in each tank, electrically connected to the engine data converter (EDC) via an interface module (RFLM-4) at the back of the instrument panel. The fuel quantity sensors are easily accessible for maintenance or replacement through access panels in the lower wing skin.

B. Maintenance is limited to the removal and installation of the system components.
Refer to 77-40-00 for further information on maintenance of the engine monitoring system.

2. Fuel Quantity Sensor Removal/Installation

A. Remove Fuel Quantity Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Drain wing fuel tank with sensor that is to be removed (refer to 12-11-00).
(4) Open access / inspection plate 510 BB / 610 BB to gain access to sensor (refer to 06-30-00).
(5) Remove nuts securing sensor to inboard fuel tank rib.
(6) Disconnect electrical cables from sensor.
(7) Carefully withdraw sensor from wing tank.

B. Install Fuel Quantity Sensor
(1) Verify battery is disconnected and electrical power to aircraft is OFF.
(2) Check ease of movement of the float arm before installing the sensor.
(3) Place sensor with new gasket on to the threaded studs at inboard fuel tank rib.

CAUTION: THE FUEL QUANTITY SENSOR SHOULD BE FED CAREFULLY INTO THE FUEL TANK. A BENT FLOAT ARM MAY CAUSE ERRONEOUS READINGS.

(4) Connect electrical cables to sensor.
(5) Secure sensor with washers and nuts. Torque nuts crosswise to 2 Nm (17.7 in.lbs).
(6) Reconnect battery (refer to 24-30-00).
(7) Perform a fuel quantity indicating system calibration (refer to “Test/Calibration” below).

3. Resistive Fuel Module Removal/Installation

A. Remove Resistive Fuel Module
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connectors from back of module.
(5) While supporting the module, remove screws securing module to instrument panel.
(6) Remove module from aircraft.

B. Install Resistive Fuel Module
(1) Position module at back of instrument panel and attach with screws.
(2) Connect electrical connectors to module.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Perform a fuel quantity indicating system test (refer to "Test/Calibration" below).

4. Fuel Quantity Indicating System Test/Calibration

NOTE: When a fuel quantity sensor is replaced, the fuel quantity indicating system must be calibrated. When a resistive fuel module is replaced, the system must be functionally tested.

NOTE: Due to the dihedral angle of the wing and the position of the fuel quantity sensor (total) fuel levels above approx. 50 liters (13.21 gallons) are not gaugeable.

A. Fuel Quantity Indicating System Test
(1) Prepare aircraft
(a) Drain fuel from wing tanks (refer to 12-11-00).
(b) Verify fuel selector / shut-off valve is in OFF position.
(c) Level the aircraft laterally and longitudinally (refer to 08-10-00).
(2) Ensure ALT1 / BAT switch is in the OFF position.
(3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
(4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(5) Turn BAT switch to the ON position.
(6) Check that engine monitoring system reads 0 liters (0 gallons) for both tanks.
(7) Turn BAT switch to the OFF position.
(8) Add 27,4 liters (7.23 gallons) of fuel to each wing fuel tank.
(9) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(10) Turn BAT switch to the ON position.
(11) Check that engine monitoring system reads 27±3 liters (7.2±0.8 gallons) for both tanks.
(12) Turn BAT switch to the OFF position.
(13) Add 27,4 liters (7.23 gallons) of fuel to LH wing fuel tank.
(14) Turn BAT switch to the ON position.
(15) Check that engine monitoring system reads > 52 liters (13.7 gallons) for LH fuel tank.
(16) Turn BAT switch to the OFF position.
(17) Repeat steps (13) thru (16) for RH wing fuel tank.

B. Fuel Quantity Indicating System Calibration

NOTE: Refer to Electronics International MVP-50 operating instructions for further information on the fuel tank calibration procedure. The necessary password can be obtained from AQUILA Aviation on request.

(1) Prepare aircraft
  (a) Drain fuel from wing tanks (refer to 12-11-00).
  (b) Verify fuel selector / shut-off valve is in OFF position.
  (c) Level the aircraft laterally and longitudinally (refer to 08-10-00).
(2) Ensure ALT1 / BAT switch is in the OFF position.
(3) Fill 5,2 liters (1.37 gallons) of fuel into each wing fuel tank.
(4) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(5) Turn BAT switch to the ON position.
(6) Call up the MVP-50 "Fuel Tank Calibration Screen" (level 1 password required).
(7) Select "Fuel Tank" - "FUEL L", "Calibration Point" - "Empty" and "Use Current Count" - "Yes" to transfer the current sensor count to the sensor count field of this calibration point.
(8) Select "Fuel Tank" - "FUEL R" and repeat step (7) for the RH wing fuel tank.
(9) Add 13,7 liters (3.62 gallons) of fuel to each wing fuel tank.
(10) Wait approx. 30 seconds. Then gently shake wing to assure fuel quantity sensors settle in their final position.
(11) Select "Fuel Tank" - "FUEL L" and "Calibration Point" - "2".
Set "Qty" to "3.6 GAL" and select "Use Current Count" - "Yes" for this calibration point.
(The tanks must be calibrated in U.S. gallons.)
(12) Select "Fuel Tank" - "FUEL R" and repeat step (11) for the RH wing fuel tank.
(13) Repeat steps (9) thru (12) for the remaining 3 calibration points:

Calibration Point	**Qty.** [gallons]	**Total Fuel** [liters (gallons)]	**Usable Fuel** [liters (gallons)]
Empty	0.0	5,2 (1.37)	0,0 (0.00)
2	3.6	18,9 (4.99)	13,7 (3.62)
3	7.2	32,6 (8.61)	27,4 (7.24)
4	10.9	46,3 (12.23)	41,1 (10.86)
Full	14.5	60,0 (15.85)	54,8 (14.48)

FUEL PRESSURE INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

   A. Low fuel pressure is indicated by a warning light.

   B. Fuel pressure is measured by a pressure switch at the fuel manifold on top of the engine.

   C. Maintenance is limited to the removal and installation of the fuel pressure switch.

2. Fuel Pressure Switch Removal/Installation

   A. Remove Fuel Pressure Switch
      (1) Ensure electrical power to aircraft is OFF.
      (2) Close fuel selector / shut-off valve.
      (3) Remove engine cowling (refer to 71-10-00).
      (4) Disconnect battery (refer to 24-30-00).
      (5) Disconnect electrical connector from pressure switch.
      (6) Unscrew pressure switch from fuel manifold.
      (7) Plug fuel manifold port to avoid entry of any material.

   B. Install Fuel Pressure Switch
      (1) Ensure battery is disconnected and electrical power to aircraft is OFF.
      (2) Clean all parts carefully. Apply Loctite (medium strength) on pressure switch thread.
      (3) Install pressure switch to fuel manifold (1/2 turn past hand tight).
      (4) Reconnect electrical connector to pressure switch.
      (5) Reconnect battery (refer to 24-30-00).
      (6) Run AUX fuel pump and check system for leaks and fuel pressure warning.
      Warning light should be OFF with fuel pump running and ON without fuel pressure.
      (7) Install engine cowling (refer to 71-10-00).

FUEL PRESSURE INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. Fuel pressure indication is included in the Garmin G3X Touch. It is indicated as difference between the absolute fuel pressure and the boost pressure in the airbox.

B. Fuel pressure is measured by a differential pressure transducer electrically connected to the GEA 24 engine interface. To avoid damages caused by vibrations, the pressure transducer is not mounted directly on the engine but on an intercooler strut. On the wet side it is connected to the fuel pressure regulator via a flexible fuel hose and a restricting orifice. On the dry side it is connected to the airbox via a flexible fuel hose.

C. Maintenance is limited to the removal and installation of the fuel pressure transducer. Refer to 34-25-00 for further information on maintenance of the Garmin G3X Touch system.

2. Fuel Pressure Transducer Removal/Installation

A. Remove Fuel Pressure Transducer
(1) Ensure electrical power to aircraft is OFF.
(2) Close fuel selector / shut-off valve.
(3) Remove engine cowling (refer to 71-10-00).
(4) Disconnect battery (refer to 24-30-00).
(5) Disconnect electrical connector from transducer.
(6) Remove clamp and fuel hose from dry side of transducer.
(7) Remove fuel hose from wet side of transducer.
(8) Unscrew nut and remove transducer from intercooler strut.
(9) Unscrew fittings from transducer
(10) Plug transducer ports and fuel hoses to avoid entry of any material.

B. Install Fuel Pressure Transducer
(1) Ensure battery is disconnected and electrical power to aircraft is OFF.
(2) Clean all parts carefully. Apply Loctite (medium strength) on fitting threads.
(3) Install fittings to both sides of transducer (max. torque 10 Nm [89 in.lbs.] or two full turns past hand tight, whichever happens first).
(4) Install transducer on intercooler strut and secure with nut.
(5) Reconnect fuel hose to wet side transducer fitting (max. torque 15 Nm [133 in.lbs]).
(6) Reconnect fuel hose to dry side transducer fitting and secure with clamp.
(7) Reconnect electrical connector to transducer.
(8) Reconnect battery (refer to 24-30-00).
(9) Run both fuel pumps and check system for leaks and fuel pressure indication.
(10) Install engine cowling (refer to 71-10-00).

FUEL PRESSURE INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. Fuel pressure indication is included in the engine monitoring system.
Fuel pressure is measured by a pressure transducer (PT-30GA) electrically connected to the engine data converter (EDC). To avoid damages caused by vibrations, the pressure transducer is not mounted directly on the engine. It is installed on the engine mount and connected via a flexible fuel hose. The fuel hose is connected to the fuel system via a restricting orifice.
Fuel pressure is measured at the fuel manifold (Rotax 912S) / fuel pressure regulator (Rotax 914F) on top of the engine. With the Rotax 914F fuel pressure is indicated as difference between the absolute fuel pressure and the boost pressure in the airbox. Therefore an additional pressure sensor (PT-30GA) for airbox pressure is needed. The difference is calculated / indicated by the engine monitoring system.

B. Maintenance is limited to the removal and installation of the fuel pressure transducer. Refer to 77-40-00 for further information on maintenance of the engine monitoring system.

2. Fuel Pressure Transducer Removal/Installation

A. Remove Fuel Pressure Transducer
(1) Ensure electrical power to aircraft is OFF.
(2) Close fuel selector / shut-off valve.
(3) Remove engine cowling (refer to 71-10-00).
(4) Disconnect battery (refer to 24-30-00).
(5) Disconnect electrical connector from transducer.
(6) Remove fuel hose from transducer fitting.
(7) Open clamp and remove transducer from engine mount.
(8) Unscrew fitting from transducer.
(9) Plug transducer ports and fuel hoses to avoid entry of any material.

B. Install Fuel Pressure Transducer
(1) Ensure battery is disconnected and electrical power to aircraft is OFF.
(2) Clean all parts carefully. Apply Loctite (medium strength) on transducer thread.
(3) Install fitting to transducer (max. torque 10 Nm [89 in.lbs.] or two full turns past hand tight, whichever happens first).
(4) Reconnect fuel hose to transducer fitting (max. torque 15 Nm [133 in.lbs]).
(5) Install transducer on engine mount with clamp.
(6) Reconnect electrical connector to transducer.
(7) Reconnect battery (refer to 24-30-00).
(8) Run electrical fuel pump(s) and check system for leaks and fuel pressure indication.
(9) Install engine cowling (refer to 71-10-00).

FUEL FLOW INDICATION - MAINTENANCE

WARNING: PERFORM ALL FUEL SYSTEM MAINTENANCE IN ACCORDANCE WITH SAFETY PRECAUTIONS CONTAINED IN 12-11-00!

1. General

A. Fuel flow is measured by two FT-60 fuel flow trancducers: One installed in the fuel supply line, the other one in the return line. Both transducers are mounted on a bracket located on the engine side of the firewall. Fuel flow indication is included in the engine monitoring system.
MVP-50: Both fuel flow transducers are electrically connected to a FFDM-1 fuel flow differential module, located in the instrument panel. The differential module is electrically connected to the engine data converter (EDC). G3X: Both fuel flow transducers are electrically connected to the GEA 24 engine interface.

B. Maintenance is limited to the removal and installation of the fuel flow transducer and the fuel flow differential module. Refer to 77-40-00 for further information on maintenance of the engine monitoring system.

2. Fuel Flow Transducer Removal/Installation

A. Remove Fuel Flow Transducer
(1) Ensure electrical power to aircraft is OFF.
(2) Close fuel selector / shut-off valve.
(3) Remove engine cowling (refer to 71-10-00).
(4) Disconnect battery (refer to 24-30-00).
(5) Disconnect electrical connector from transducer.
(6) Remove fuel hose from transducer fitting.
(7) Remove 2 screws securing transducer to mounting bracket.
(8) Remove elbow fitting from transducer fitting.
(9) Remove transducer from aircraft and unscrew fittings from transducer.
(10) Plug transducer ports and fuel lines to avoid entry of any material.

B. Install Fuel Flow Transducer
(1) Ensure battery is disconnected and electrical power to aircraft is OFF.
(2) Ensure hoses and fittings are free of any loose material. If required, clean them. Remove caps from transducer and fuel lines immediately before installation.

CAUTION: DO NOT ALLOW HIGH AIR PRESSURE TO PASS THROUGH THE FLOW TRANSDUCER!

(3) Install fittings to transducer (max. torque 20 Nm [177 in.lbs.] or two full turns past hand tight, whichever happens first).
(4) Position transducer on mounting bracket and connect transducer fitting to fuel line elbow fitting (max. torque supply line 30 Nm [266 in.lbs] / return line 20 Nm [177 in.lbs]).
(5) Secure transducer to mounting bracket using 2 screws, washers and nuts.
(6) Reconnect fuel hoses to transducer fittings (max. torque 30 Nm [266 in.lbs]).

(7) Reconnect electrical connector to transducer.
(8) Reconnect battery (refer to 24-30-00).
(9) Run both fuel pumps and check system for leaks and fuel flow indication. Fuel flow indication should read zero with fuel pumps running and the engine switched OFF.

NOTE: Fuel flow transducers are calibrated by a K-factor. The K-factor represents the number of electrical pulses output by the fuel flow transducer per gallon of fuel. If readings are inaccurate, the K-factor may need to be adjusted (K-factor initial value is 68.000).

(10) Install engine cowling (refer to 71-10-00).
(11) Perform ground run and check fuel flow indication is proper for engine operation.
(12) Check transducer and connections for leaks, loose fittings, security of attachment and other damage.

3. Fuel Flow Differential Module Removal/Installation (MVP-50 only)

A. Remove Fuel Flow Differential Module
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from differential module.
(5) Remove screws securing differential module to instrument panel.
(6) Remove differential module from aircraft.

B. Install Fuel Flow Differential Module
(1) Position differential module on instrument panel and attach with screws.
(2) Connect electrical connector to differential module.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Run both fuel pumps and check fuel flow indication. Fuel flow indication should read zero with fuel pumps running and the engine switched OFF.
(6) Perform ground run and check fuel flow indication is proper for engine operation.

CHAPTER 31

INDICATING / RECORDING SYSTEMS

TABLE OF CONTENTS

INDICATING / RECORDING SYSTEMS - GENERAL

1. Introduction

   A. Basically the instruments and avionic equipment can be chosen by the customer, but it cannot be installed in any arbitrary combination. Before removing or installing equipment the aircraft manufacturer AQUILA Aviation must be contacted, with the exception of replacing a unit by an identical one.

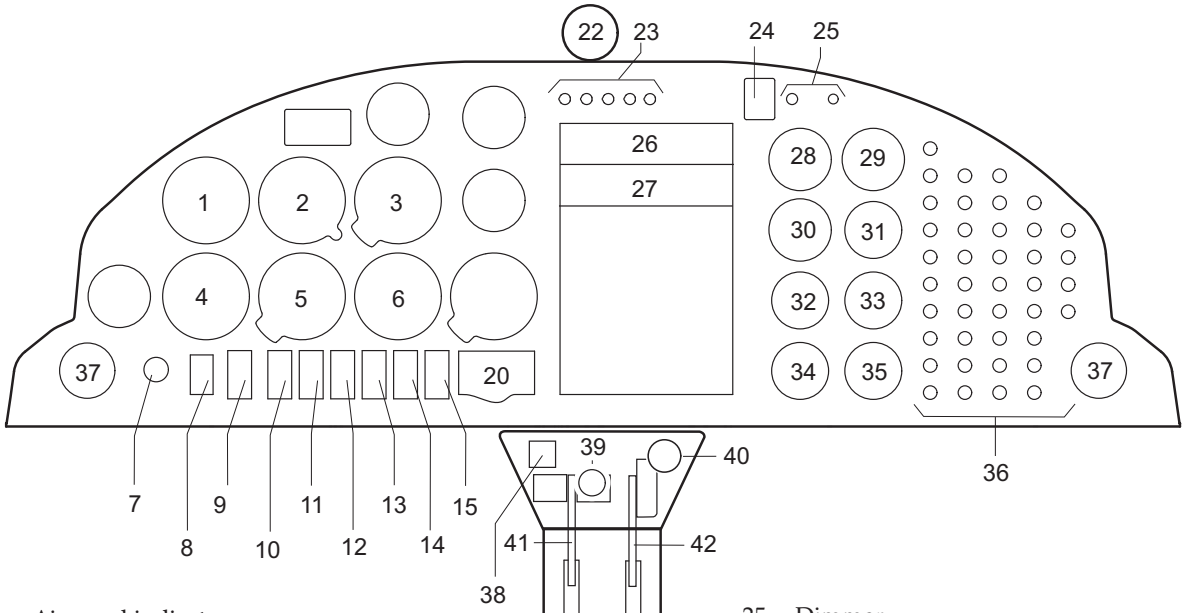
2. General Description

   A. For easy and quick reference, the instruments and controls are clearly divided in groups. The group of flight instruments is directly in front of the pilot. Below the flight instruments is a row of switches. The middle section of the panel contains the avionics equipment including the NAV/COM transceiver and the transponder. On the right side of the avionics column the power gauges, the tachometer and the manifold pressure indicator, are mounted. A group of instruments for monitoring engine and system conditions is located below. These gauges show the fuel level in each tank, cylinder head temperature, oil temperature, oil pressure as well as amperes and volts of the electrical system. The circuit breaker panel is located in front of the co-pilot.

   B. A center console contains the control knobs for the carburetor heat, the choke, cabin heating, the throttle and rpm control levers, the fuel selector / shut-off valve, the parking brake control knob, and the trim control switch and indicator.

   C. The description, function and maintenance of the several specific instruments is contained in the appropriate section of this manual.

   D. For an overview of the position of the various instruments, devices and controls on the instrument panel and center pedestal, refer to figure 1.



1 Airspeed indicator
2 Attitude gyro
3 Altimeter
4 Turn coordinator
5 Directional gyro
6 Vertical speed indicator
7 Ignition switch
8 ALT1 / BAT switch
9 AUX fuel pump switch
10 Avionic master switch
11 NAV light switch
12 Anti-collision light switch
13 Landing light switch
14 Instrument light switch (optional)
15 Pitot heat switch (optional)

20 Flap control switch / position indicator
21 Elevator trim position indicator
22 Magnetic compass
23 Warning lights
24 ELT remote control
25 Dimmer
26 COM/NAV
27 Transponder
28 Manifold pressure indicator
29 Tachometer
30 Fuel level indicator
31 CHT indicator
32 Voltmeter
33 Oil temperature indicator
34 Ammeter
35 Oil pressure indicator
36 Circuit breaker panel
37 Fresh air ventilator
38 Carburetor heat control
39 Cabin heat control
40 Choke control
41 Throttle lever
42 Propeller control lever
43 Elevator trim switch
44 Fuel selector / shut-off valve
45 Parking brake control lever

Note: Arrangement of instruments may be different due to varying equipment.

Instrument Panel Basic Configuration for Day & Night VFR
Figure 1

EFFECTIVITY

Aircraft equipped with analog instruments

INDICATING / RECORDING SYSTEMS - GENERAL

1. Introduction

   A. Basically the instruments and avionic equipment can be chosen by the customer, but it cannot be installed in any arbitrary combination. Before removing or installing equipment the aircraft manufacturer AQUILA Aviation must be contacted, with the exception of replacing a unit by an identical one.

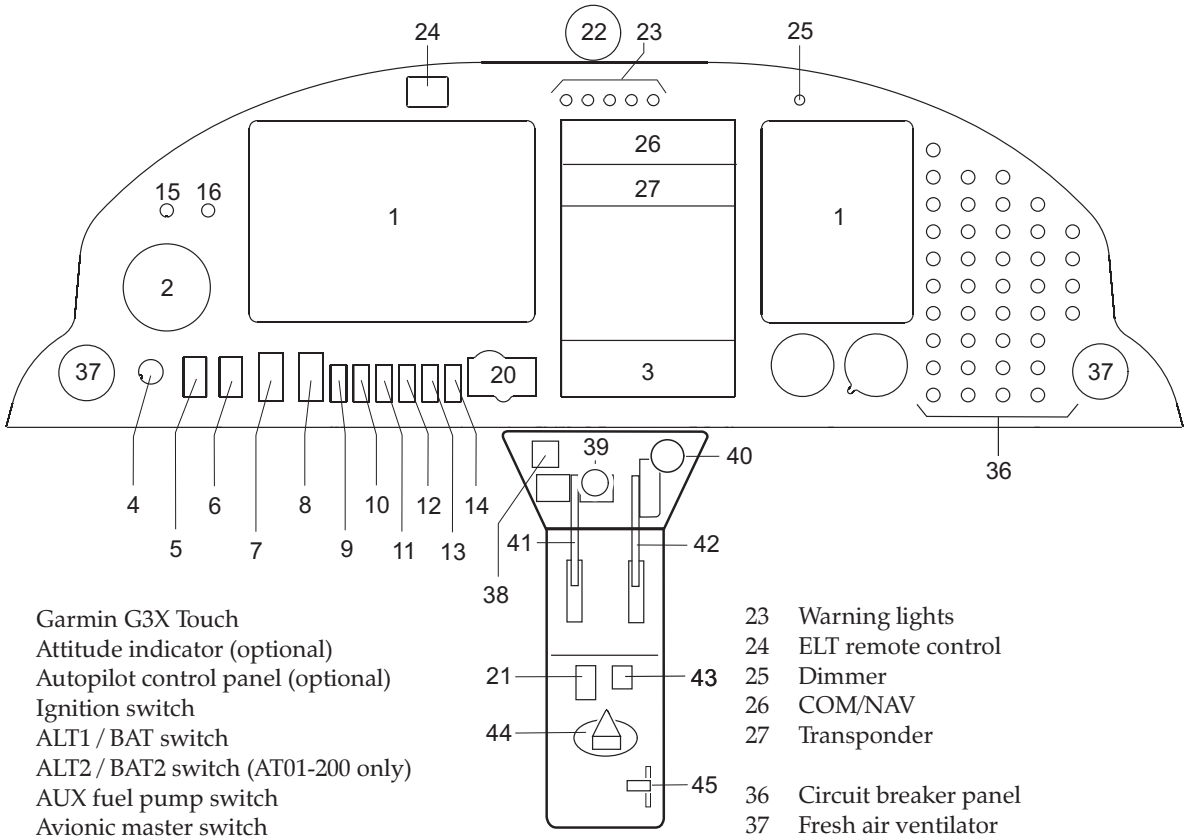
2. General Description

   A. For easy and quick reference, the instruments and controls are clearly divided in groups. The Garmin G3X as the primary flight display is directly in front of the pilot. The back-up attitude indicator for NVFR is installed close to the Garmin G3X. Below the G3X is a row of switches. The middle section of the panel contains the avionics equipment including the NAV/COM transceiver and the transponder. On the right side of the avionics column a second G3X display is mounted. Both G3X displays may be used for monitoring engine and system conditions, including manifold pressure, propeller speed, fuel quantity and pressure (Rotax 914 only), cylinder head temperature, oil temperature and pressure as well as amperes and volts of the electrical system. The circuit breaker panel is located in front of the co-pilot.

   B. A center console contains the control knobs for the carburetor heat, the choke, cabin heating, the throttle and rpm control levers, the fuel selector / shut-off valve, the parking brake control knob, and the trim control switch and indicator.

   C. The description, function and maintenance of the several specific instruments is contained in the appropriate section of this manual.

   D. For an overview of the position of the various instruments, devices and controls on the instrument panel and center pedestal, refer to figure 1.



1 Garmin G3X Touch
2 Attitude indicator (optional)
3 Autopilot control panel (optional)
4 Ignition switch
5 ALT1 / BAT switch
6 ALT2 / BAT2 switch (AT01-200 only)
7 AUX fuel pump switch
8 Avionic master switch
9 NAV light switch
10 Anti-collision light switch
11 Landing light switch
12 Instrument light switch (optional)
13 Pitot heat switch (optional)
14 Autopilot switch (optional)
15 TCU switch (AT01-200 only)
16 Ammeter switch (AT01-200 only)

20 Flap control switch / position indicator
21 Elevator trim position indicator
22 Magnetic compass

23 Warning lights
24 ELT remote control
25 Dimmer
26 COM/NAV
27 Transponder

36 Circuit breaker panel
37 Fresh air ventilator
38 Carburetor heat control
39 Cabin heat control
40 Choke control
41 Throttle lever
42 Propeller control lever
43 Elevator trim switch
44 Fuel selector / shut-off valve
45 Parking brake control lever

Note: Arrangement of instruments may be different due to varying equipment.

Instrument Panel Basic Configuration for Day & Night VFR
Figure 1

INDICATING / RECORDING SYSTEMS - GENERAL

1. Introduction

   A. Basically the instruments and avionic equipment can be chosen by the customer, but it cannot be installed in any arbitrary combination. Before removing or installing equipment the aircraft manufacturer AQUILA Aviation must be contacted, with the exception of replacing a unit by an identical one.

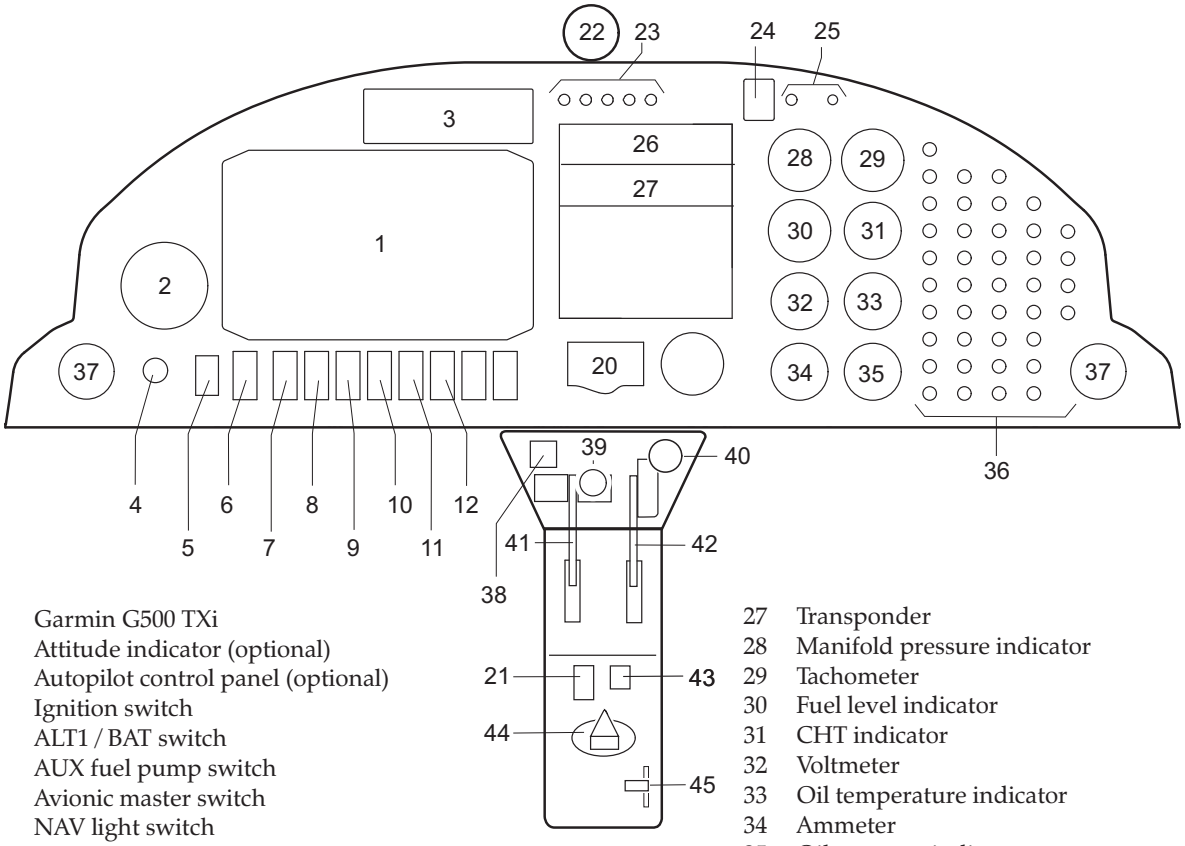
2. General Description

   A. For easy and quick reference, the instruments and controls are clearly divided in groups.
   The Garmin G500 / G500 TXi as the primary flight display is directly in front of the pilot.
   The back-up attitude indicator for NVFR is installed close to the Garmin G500 / G500 TXi.
   Below the G500 / G500 TXi is a row of switches.
   The middle section of the panel contains the avionics equipment including the NAV/COM transceiver and the transponder. On the right side of the avionics column the power gauges, the tachometer and the manifold pressure indicator, are mounted. A group of instruments for monitoring engine and system conditions is located below. These gauges show the fuel level in each tank, cylinder head temperature, oil temperature, oil pressure as well as amperes and volts of the electrical system. The circuit breaker panel is located in front of the co-pilot.

   B. A center console contains the control knobs for the carburetor heat, the choke, cabin heating, the throttle and rpm control levers, the fuel selector / shut-off valve, the parking brake control knob, and the trim control switch and indicator.

   C. The description, function and maintenance of the several specific instruments is contained in the appropriate section of this manual.

   D. For an overview of the position of the various instruments, devices and controls on the instrument panel and center pedestal, refer to figure 1.



1 Garmin G500 TXi
2 Attitude indicator (optional)
3 Autopilot control panel (optional)
4 Ignition switch
5 ALT1 / BAT switch
6 AUX fuel pump switch
7 Avionic master switch
8 NAV light switch
9 Anti-collision light switch
10 Landing light switch
11 Instrument light switch (optional)
12 Pitot heat switch (optional)

20 Flap control switch / position indicator
21 Elevator trim position indicator
22 Magnetic compass
23 Warning lights
24 ELT remote control
25 Dimmer

27 Transponder
28 Manifold pressure indicator
29 Tachometer
30 Fuel level indicator
31 CHT indicator
32 Voltmeter
33 Oil temperature indicator
34 Ammeter
35 Oil pressure indicator
36 Circuit breaker panel
37 Fresh air ventilator
38 Carburetor heat control
39 Cabin heat control
40 Choke control
41 Throttle lever
42 Propeller control lever
43 Elevator trim switch
44 Fuel selector / shut-off valve
45 Parking brake control lever

Note: Arrangement of instruments may be different due to varying equipment.

Instrument Panel Basic Configuration for Day & Night VFR
Figure 1

INDICATING / RECORDING SYSTEMS - GENERAL

1. Introduction

   A. Basically the instruments and avionic equipment can be chosen by the customer, but it cannot be installed in any arbitrary combination. Before removing or installing equipment the aircraft manufacturer AQUILA Aviation must be contacted, with the exception of replacing a unit by an identical one.

2. General Description

   A. For easy and quick reference, the instruments and controls are clearly divided in groups.
   The Garmin G500 / G500 TXi as the primary flight display is directly in front of the pilot.
   The back-up attitude indicator for NVFR is installed close to the Garmin G500 / G500 TXi.
   Below the G500 / G500 TXi is a row of switches.
   The middle section of the panel contains the avionics equipment including the NAV/COM transceiver and the transponder. On the right side of the avionics column the engine monitoring system is mounted. This system is used for monitoring engine and system conditions, including manifold pressure, propeller speed, fuel quantity and pressure, cylinder head temperature, oil temperature and pressure as well as amperes and volts of the electrical system. The circuit breaker panel is located in front of the co-pilot.

   B. A center console contains the control knobs for the carburetor heat, the choke, cabin heating, the throttle and rpm control levers, the fuel selector / shut-off valve, the parking brake control knob, and the trim control switch and indicator.

   C. The description, function and maintenance of the several specific instruments is contained in the appropriate section of this manual.

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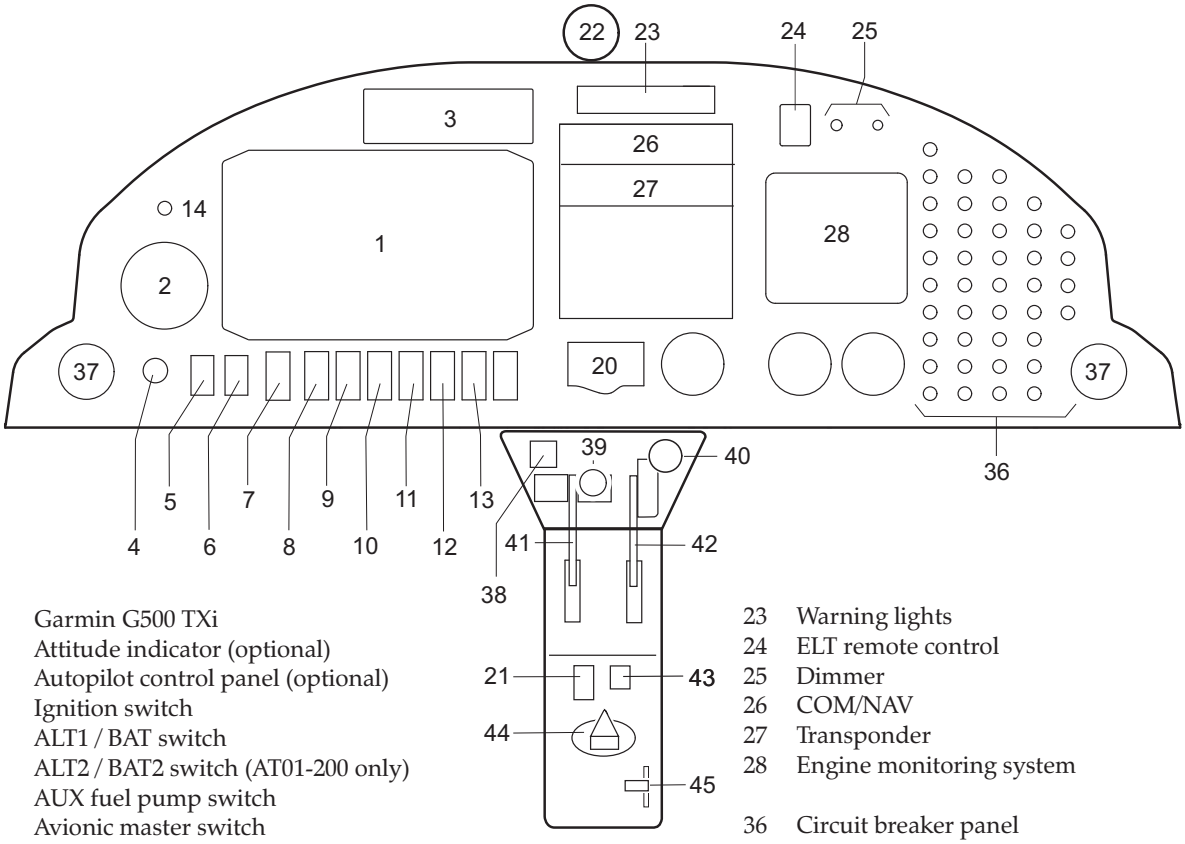


1 Garmin G500 TXi
2 Attitude indicator (optional)
3 Autopilot control panel (optional)
4 Ignition switch
5 ALT1 / BAT switch
6 ALT2 / BAT2 switch (AT01-200 only)
7 AUX fuel pump switch
8 Avionic master switch
9 NAV light switch
10 Anti-collision light switch
11 Landing light switch
12 Instrument light switch (optional)
13 Pitot heat switch (optional)
14 TCU switch (AT01-200 only)

20 Flap control switch / position indicator
21 Elevator trim position indicator
22 Magnetic compass
23 Warning lights
24 ELT remote control
25 Dimmer
26 COM/NAV
27 Transponder
28 Engine monitoring system

36 Circuit breaker panel
37 Fresh air ventilator
38 Carburetor heat control
39 Cabin heat control
40 Choke control
41 Throttle lever
42 Propeller control lever
43 Elevator trim switch
44 Fuel selector / shut-off valve
45 Parking brake control lever

Note: Arrangement of instruments may be different due to varying equipment.

Instrument Panel Basic Configuration for Day & Night VFR
Figure 1

INSTRUMENT PANEL - MAINTENANCE

1. General

   A. The instrument panel is made from aluminum alloy and is formed in one piece with a shelf. The shelf fits between the panel and the firewall. The panel shelf is attached on the left and right sides to support consoles and secured to the fuselage with bolts. The equipment is mounted in cut-outs and can be easily accessed from the rear of the panel when the glareshield is removed.
   If required, e.g. during maintenance on the fuselage structure, the instrument panel assembly can be removed completely.

2. Glare Shield Removal/Installation

   A. Remove Glare Shield
      (1) Ensure electrical power to aircraft is OFF.
      (2) Remove 4 screws on top of glare shield securing glare shield to instrument panel.
      (3) Remove 3 screws on each side of glare shield securing glare shield to fuselage.
      (4) Disconnect electrical connectors to allow removal of the glare shield.
      (5) Remove glare shield.

   B. Install Glare Shield
      (1) Check all connections, wires, electrical connectors and hoses on rear side of instrument panel.
      (2) Put glare shield in position and connect electrical connectors to glare shield.
      (3) Secure glare shield to fuselage and instrument panel using screws.

3. Instrument Panel Removal/Installation

   A. Remove Instrument Panel
      (1) Disconnect battery (refer to 24-30-00).
      (2) Remove glare shield (refer to "Glare Shield Removal/Installation" above).

      NOTE: It is recommended to label wires, hoses and plugs which must be disconnected to ensure correct reinstallation of the instrument panel.

      Refer to 91-00-00 for wiring diagrams. Refer to 34-10-00 (system schematic) for proper connecting components of the pitot-static system.

      (3) Identify all electrical connectors, hoses, and associated wiring.
      (4) Disconnect all electrical connectors, hoses, and associated wiring to allow removal of the instrument panel assembly.
      (5) Remove nuts, bolts, washers and spacers securing instrument panel to center console.
      (6) Remove nuts, bolts, washers and spacers securing instrument panel to fuselage. Remove instrument panel assembly from aircraft.

B. Install Instrument Panel
   (1) Put instrument panel assembly in position and secure to fuselage using bolts, spacers, washers and nuts.
   (2) Secure instrument panel to center console using bolts, spacers, washers, and nuts.
   (3) Connect all electrical connectors, hoses, and associated wiring that have been disconnected during disassembly procedure.
   (4) Install glare shield (refer to "Glare Shield Removal/Installation" above).
   (5) Reconnect battery (refer to 24-30-00).
   (6) Perform instrument panel inspection/check as described below.

C. Instrument Panel Inspection/Check
   (1) Perform pitot system leakage test (refer to 34-10-00).
   (2) Perform static system leakage test (refer to 34-10-00).
   (3) Perform functional test for all instruments and systems to assure proper operation.

   NOTE: A flight test is recommended after instrument panel installation to ensure the proper functioning of all instruments and systems.

CHAPTER 34

NAVIGATION

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

NAVIGATION - GENERAL

1. Introduction

   A. This chapter describes units and components that provide aircraft navigational information.

2. General Description

   A. Different instruments and devices offer a means of determining flight conditions, aircraft attitude and position of the aircraft over the ground.
   The following groups can be separated according to way data is sourced:

      (1) Devices which use magnetic, gyroscopic and inertia forces to supply data to determine aircraft attitude and heading, including:
         (a) Attitude indicator
         (b) Directional gyro
         (c) Turn coordinator
         (d) Magnetic compass

      (2) Devices which sense environmental conditions and use the data to influence navigation, including:
         (a) Airspeed indicator
         (b) Altimeter
         (c) Vertical speed indicator
         (d) Stall warning system

      (3) Devices which provide information to determine position and are mainly independent of ground installations, including:
         (a) GPS receiver

      (4) Devices which provide information to determine position and are mainly dependent on ground installations. That includes:
         (a) VOR/LOC receiver
         (b) Transponder

PITOT/STATIC SYSTEM - DESCRIPTION

1. Introduction

   A. Depending on the aircraft configuration, the static and pitot pressure system supplies static and pitot pressure for the airspeed indicator, altimeter, vertical speed indicator and air data computer.

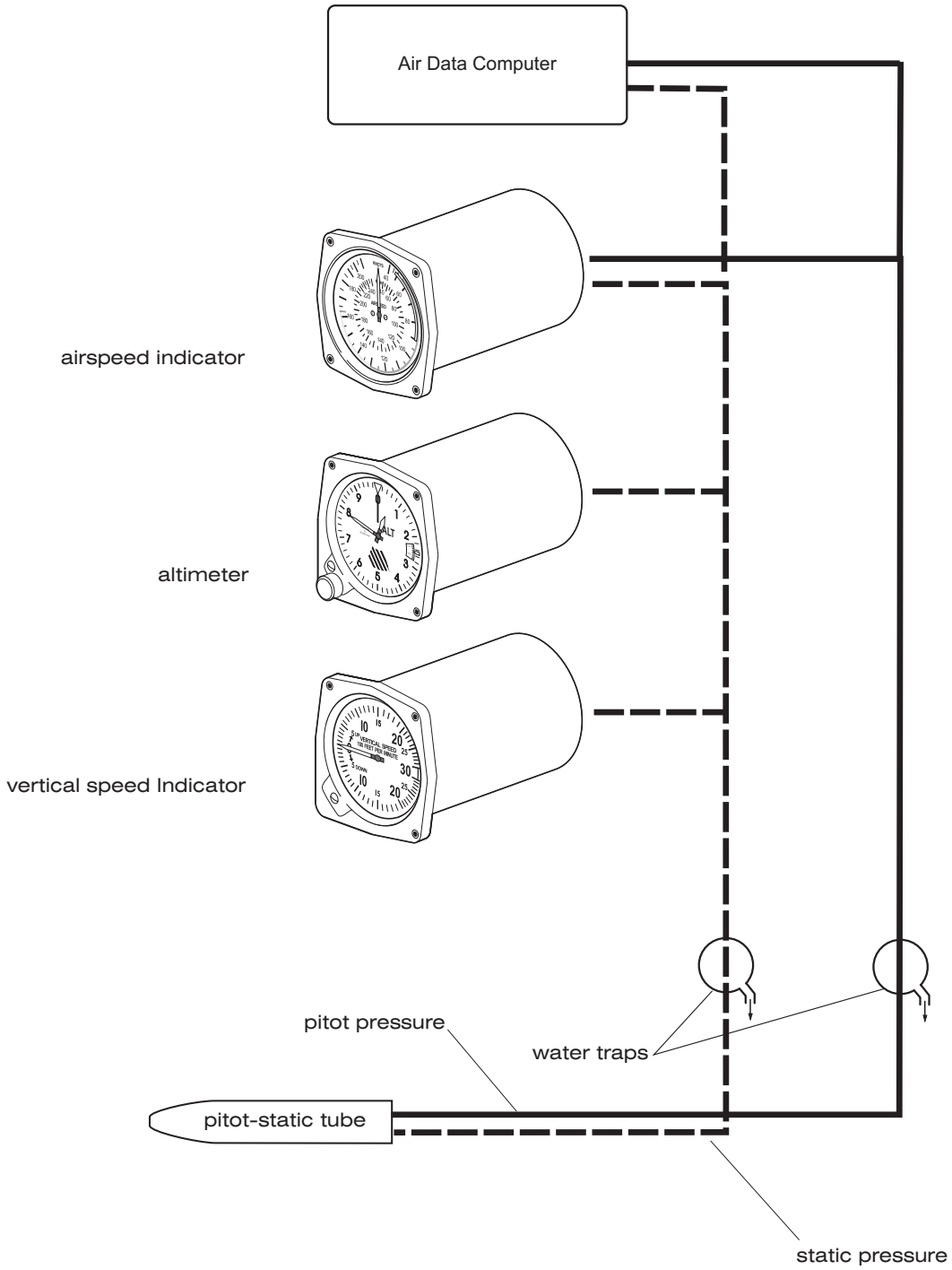
2. Description and Operation

   A. Pitot-Static Tube and Lines
   Pitot and static pressures are picked up by the pitot-static tube installed on the underside of the left wing, and carried through lines inside the wing and fuselage to the gauges on the instrument panel. The pitot and static pressure lines have water traps to prevent water entering the flight instruments. These water traps are located on the wing spar inside the fuselage and accessible for maintenance via an access panel.

   B. Pitot Heating
   Optional the aircraft is equipped with a heated pitot tube to prevent icing. It consists of a heating coil and a temperature sensor inside the pitot tube and a control box installed on the bottom of the instrument panel (left-hand side). Both are connected by electrical wires. Additionally there is an amber warning light in the instrument panel that indicates if the pitot heat is either switched OFF or if it is switched ON and there is no heating current although the temperature inside the pitot tube is below 155°C (311°F) ± 5%.

   C. Figure 1 shows the pitot/static system schematically.

NOTE: Equipment installed may vary depending on aircraft configuration.



Pitot-Static System Schematic
Figure 1

PITOT/STATIC SYSTEM - MAINTENANCE

1. General

CAUTION: NEVER BLOW COMPRESSED AIR THROUGH PITOT OR STATIC LINES TOWARD INSTRUMENTS AS THIS CAN CAUSE DAMAGE TO INSTRUMENTS.

A. Proper maintenance of the pitot/static system is essential for proper altimeter, airspeed and vertical speed indications. Moisture, obstructions and leaks in the system will result in erroneous, erratic or zero readings on the associated instruments.
Water traps should be regularly inspected.

B. A cover should be placed over the pitot-static tube when the aircraft is parked, to prevent insects and water from entering the pitot orifice.

2. Tools, Equipment and Material

	Quantity	Equipment	Parts No.	Manufacturer
7.B. / 7.C.	1	Sphygmo-manometer pressure bulb with check valve	-	commercially available
7.B. / 7.C.	1	Surgical hose		commercially available

3. Pitot-Static Tube Removal/Installation

CAUTION: ENSURE THE PITOT HEAT (OPTIONAL) IS SWITCHED OFF AND THE TUBE HAS COOLED DOWN BEFORE TOUCHING THE TUBE. A HEATED PITOT TUBE CAN GET EXTREMELY HOT DURING OPERATION.

A. Remove Pitot-Static Tube
(1) Ensure electrical power to aircraft is OFF.
(2) Remove screws securing pitot-static tube to wing skin.
(3) Identify and disconnect pitot / static lines and electrical connector (optional) at pitot tube.
(4) Remove pitot-static tube from aircraft.

B. Install Pitot-Static Tube
(1) Connect pitot / static lines and electrical connector (optional) at pitot-static tube
(2) Put pitot-static tube in position on the wing and secure using screws.
(3) Perform a pitot-static system functional test (refer to “Inspection/Check” below).
(4) Carry out a functional test of the P/S heating (if installed / Pitot-static tube must get warm with P/S heating switched ON and cool down when switched OFF again).

4. P/S Heat Control Box Removal/Installation (optional)

CAUTION: NEVER OPERATE PITOT HEATING WITHOUT THE CONTROL BOX AS THIS CAN DESTROY THE PITOT TUBE.

A. Remove the Control Box
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from control box.
(5) Remove cable ties securing control box to instrument panel.
(6) Remove control box from aircraft.

B. Install the Control Box
(1) Put control box in position in instrument panel and secure using cable ties.
(2) Reconnect electrical connector to control box.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Carry out a functional test of the P/S heating (Pitot-static tube must get warm with P/S heating switched ON and cool down when switched OFF again).

5. Instruments Removal/Installation

A. Remove an Instrument

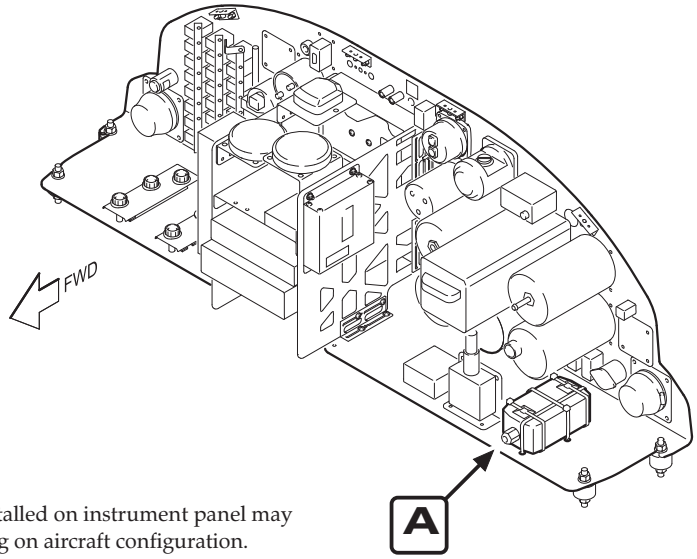
CAUTION: PLUG OR CAP INSTRUMENT PORTS IMMEDIATELY AFTER DISCONNECTING PITOT OR STATIC LINES TO PREVENT DIRT OR FOREIGN MATERIAL FROM ENTERING.

(1) Gain access to the back of instrument and disconnect static/pitot hose from instrument.
(2) While supporting the instrument, remove screws securing instrument to instrument panel.
(3) Remove instrument.

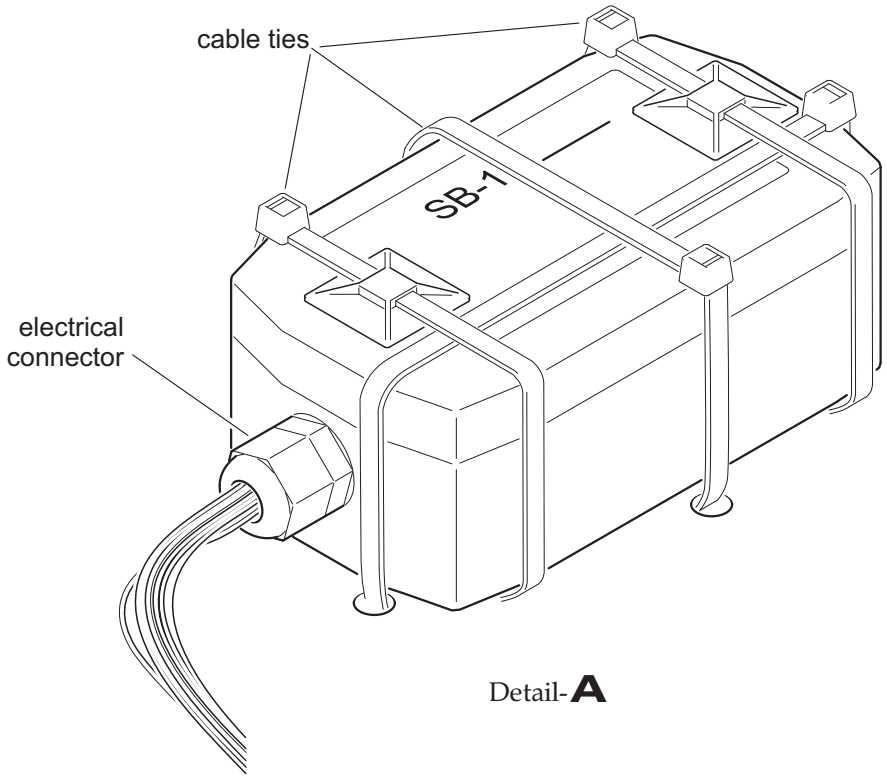
B. Install an Instrument
(1) Place instrument to instrument panel and secure with screws.
(2) Reconnect static/pitot hose to instrument.
(3) Perform a pitot-static system functional test (refer to “Inspection/Check” below).

6. Water Trap Inspection/Draining

A. Inspect/Drain the Water Traps
(1) Remove access plate 210AB (refer to 06-30-00).
(2) Inspect water traps in the pitot/static lines for water.
(3) Drain if necessary by removing the water trap. Remove cable ties and pitot/static lines.
(4) If removed, reinstall the water trap using cable ties. Reconnect pitot/static lines.
(5) If a water trap has been removed, perform a pitot-static system functional test (refer to “Inspection/Check” below).
(6) Reinstall access plate 210AB (refer to 06-30-00).



NOTE: Example View!
Equipment installed on instrument panel may vary depending on aircraft configuration.



P/S Heat Control Box
Figure 202

7. Inspection/Check

A. After any component replacement or repair, the system should be checked for proper function and a leakage test should be performed.

B. Pitot System Leak Test
(1) Fasten surgical hose and sphygmomanometer bulb over pitot head.
(2) Pump bulb until airspeed indicator registers 150 KIAS.
(3) Close check valve.
(4) Wait 15 seconds for airspeed indicator to stabilize.
(5) Observe airspeed indicator for one minute.
(6) The airspeed should drop no more than 10 KIAS.
(7) Slowly release check valve so pressure is reduced gradually to prevent instrument damage.
(8) If test reveals a leak in system, check all connections for tightness and repair faulty components.

C. Static System Leak Test
(1) Tape over static ports at pitot-static tube.
(2) Insert a "T" in a static pressure line.
(3) Squeeze sphygmomanometer bulb and close check valve to establish a vacuum inside bulb.
(4) Connect sphygmomanometer to the static pressure line.
(5) Slowly open air bulb check valve until altimeter indicates a 1000 ft increase in altitude then close check valve to trap suction in system.
(6) While increasing suction and altimeter indicating 1000 ft, ensure that the airspeed indicator shows an increase and the vertical speed indicator shows a climb indication.
(7) Leakage must not exceed 100 ft/min of altitude loss as indicated on the altimeter.
(8) If leakage rate is below the maximum allowable, the leak test is finished. Remove tape, sphygmomanometer assembly and "T" and reconnect static pressure line.
(9) If leakage rate exceeds the maximum allowable, check all fittings and hoses for condition and tightness and repeat leak test.
(10) If leakage rate still exceeds the maximum allowable, undertake the following:
(11) Disconnect static pressure lines from airspeed indicator, vertical speed indicator and altitude encoder.
(12) Connect lines together using suitable fittings so altimeter is the only instrument still connected to static pressure system.
(13) Repeat leak test to ascertain whether the static pressure system or the bypassed instruments are causing the leakage. If instruments are at fault, they must be repaired by an approved repair station or replaced. If static pressure system is faulty, proceed as follows:

CAUTION: DO NOT APPLY POSITIVE PRESSURE WITH AIRSPEED INDICATOR OR VERTICAL SPEED INDICATOR CONNECTED TO STATIC PRESSURE SYSTEM.

(14) Remove sphygmomanometer assembly.
(15) Attach hose to "T" and slowly apply positive pressure until altimeter indicates a 500 ft decrease in altitude. Maintain this altimeter indication while checking for leaks.
(16) Coat line with a solution of mild soap and water, watching for bubbles to locate leaks.
(17) Tighten leaking connections. Repair or replace defective components.
(18) Reconnect airspeed, vertical speed indicator and altitude encoder. Repeat static system leak test.

STALL WARNING SYSTEM - DESCRIPTION

1. Introduction

   A. The aircraft is equipped in with a stall warning system. It signals an approaching stall to the pilot by an audible alarm in the cockpit.

2. Description and Operation

   A. The stall warning system consists of a mechanical transmitter, located in the leading edge of the left wing and a warning buzzer behind the instrument panel. Both are connected by electrical wires.

   B. As the aircraft approaches a stall, the low pressure on the upper surface of the wings moves forward around the leading edge of the wings. As a result, a microplate at the transmitter is deflected upwards. A mechanical contact is made which sends an electrical signal to the warning buzzer in the cockpit. The warning buzzer gives off a 2 kHz alerting tone.

STALL WARNING SYSTEM - MAINTENANCE

1. General

   A. Maintenance is limited to the removal/installation of system components. In wintry conditions, make sure that the system transmitter microplate is always clear of ice and snow.

2. Transmitter Removal/Installation

   A. Remove Transmitter
      (1) Ensure electrical power to aircraft is OFF.
      (2) Remove three screws securing transmitter covering with transmitter to wing structure.
      (3) Carefully remove transmitter with covering through opening from wing.
      (4) Label and disconnect electrical connectors.
      (5) Remove two screws securing transmitter covering to transmitter and remove covering.

   B. Install Transmitter
      (1) Install transmitter covering to transmitter using two screws.
      (2) Reconnect electrical connectors.
      (3) Put transmitter and covering in position and secure with three screws to wing structure.
      (4) Perform a flight test to functionally check the stall warning system (refer to "Adjustment" below).

3. Warning Buzzer Removal/Installation

   A. Remove Warning Buzzer
      (1) Ensure electrical power to aircraft is OFF.
      (2) Disconnect battery (refer to 24-30-00).
      (3) Remove glare shield (refer to 31-10-00).
      (4) Disconnect electrical connector.
      (5) Remove nuts securing buzzer to instrument panel and remove buzzer.

   B. Install Warning Buzzer
      (1) Put buzzer in position at back of instrument panel and secure using two nuts.
      (2) Connect electrical connector.
      (3) Install glare shield (refer to 31-10-00).
      (4) Reconnect battery (refer to 24-30-00).
      (5) Perform a functional check of the stall warning system.

4. Adjustment

   A. The stall warning system is so adjusted that the system will come into action approx. 10 – 15 km/h (6 - 8kts) before the aircraft stalls. If these values are not achieved, it is possible to modify the system behavior by shortening the microplate by a few millimeters. This will lower the speed the system is activated. A test for proper system operation is only possible in flight. Repeat the procedure until the microplate has the correct length.

ATTITUDE AND DIRECTION - MAINTENANCE

1. General

CAUTION: GYROS ARE DELICATE AND CAN NOT WITHSTAND THE SHOCK OF BEING DROPPED, JARRED OR STRUCK BY PIECES OF EQUIPMENT. DO NOT PLACE GYROS ON ANY HARD SURFACE. PAD WITH GENEROUS FOAM.

A. The construction and function of the magnetic compass, turn coordinator, attitude indicator and directional gyro is conventional, with no special features.

B. Maintenance is limited to component removal and re-installation.

2. Magnetic Compass Removal/Installation

A. Remove Magnetic Compass
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical wires from compass.
(5) Remove screws securing compass to glare shield and remove compass from aircraft.

B. Install Magnetic Compass
(1) Put compass in position on glare shield and secure using screws.
(2) Connect electrical wires to magnetic compass.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Do a compass swing (refer to “Adjustment/Test” below).

3. Turn Coordinator Removal/Installation

A. Remove Turn Coordinator
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from turn coordinator.
(5) While supporting the turn coordinator, remove screws securing turn coordinator to instrument panel.
(6) Remove turn coordinator from aircraft.

B. Install Turn Coordinator
(1) Put turn coordinator in position in instrument panel and secure using screws.
(2) Reconnect electrical connector to turn coordinator.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Conduct a functional test of the unit.

4. Attitude Indicator Removal/Installation

A. Remove Attitude Indicator
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from attitude indicator.
(5) While supporting the indicator, remove screws securing indicator to instrument panel.
(6) Remove attitude indicator from aircraft.

B. Install Attitude Indicator
(1) Put attitude indicator in position in instrument panel and secure with screws.
(2) Connect electrical connector to the instrument.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Conduct a functional test of the unit.

5. Directional Gyro Removal/Installation

A. Remove Directional Gyro
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from back of the instrument.
(5) While supporting the gyro, remove screws securing directional gyro to instrument panel.
(6) Remove directional gyro from aircraft.

B. Install Directional Gyro
(1) Put directional gyro in position in instrument panel and secure with screws.
(2) Connect electrical connector to the instrument.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Conduct a functional test of the unit.

6. Adjustment / Test

A. Magnetic Compass Calibration
(1) Prior to calibrating the compass, the aircraft should be in a flight environment which is as realistic as possible.
(a) Place aircraft in level flight attitude
(b) Check the canopy is closed.
(c) Check flaps are retracted.
(d) Start engine and turn ON all electrical equipment that is usually used at cruise (refer to airplane flight manual).

CAUTION: DUE TO INSUFFICIENT ENGINE COOLING ON THE GROUND, DO NOT CONTINUOUSLY OPERATE THE ENGINE AT CRUISE RPM FOR MORE THAN 3 MIN.

(e) Run engine and set throttle at cruise position.

NOTE: When performing maintenance on the magnetic compass, use a non-magnetic or plastic screwdriver.

(2) Remove screws securing access plate to compass casing to reveal adjustment screws.
(3) Set adjustment screws of compensator to zero. Zero position is indicated when dot of screw is aligned with dot on compass frame.
(4) Taxi aircraft to compass rose.
(5) Align centerline of aircraft on magnetic North heading. Adjust N - S set screw until compass reads North.
(6) Align centerline of aircraft on magnetic East heading. Adjust E - W set screw until compass reads East.
(7) Align centerline of aircraft on magnetic South heading and note resulting South error.
(8) Adjust N - S set screw until half of error is removed.
(9) Align centerline of aircraft on magnetic West heading and note resulting West error.
(10) Adjust E - W set screw until half of error is removed.
(11) Align centerline of aircraft in successive magnetic 30-degree headings and record compass readings on appropriate compass correction (deviation) card. Deviations must not exceed 10 degrees on any heading.

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

A. This section provides instructions necessary for authorized personnel to inspect and maintain the Aspen EFD1000 system. The system consists of the following major components:
- primary flight display (PFD)
- remote sensor module (RSM)
- configuration module (CM)

B. Maintenance of the EFD1000 system has to be carried out in accordance with the Aspen EFD1000 and EFD500 Installation Manual (P/N 900-00003-001) and the Aspen EFD1000 and EFD500 Instructions for Continued Airworthiness (P/N 900-00012-001).

C. No special tools are required for the removal and replacement of any system LRUs. If a LRU is found to be defective it should be removed and returned to a properly rated facility for repair or replacement. If fasteners are deformed in any way, they must be replaced.

D. The operation of the Aspen EFD1000 requires the software version given in the AQUILA Service Information SI-AT01-012.

The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

All Service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

E. For bonding checks on the AQUILA AT01-100/200 no procedures or equipment are necessary other than that which are commonly expected for bonding measurements on small aircraft. Refer to AC 43.13-1B, chapter 11, section 15 “Grounding and Bonding” for further information on bonding check procedures and equipment.

2. EFD Removal/Installation

A. Remove EFD
(1) Verify electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Carefully insert a flat blade screw driver into the locking mechanism on the top center of the EFD.
(4) While gently prying pull back the top of the EFD and extract from bracket.
(5) Remove nut securing braided ground strap to EFD.
(6) Remove pitot and static quick connectors (EFD1000 only) by pulling back outer spring loaded locking sleeve while unplugging connectors. To remove 44 pin D-sub connector unscrew both jackscrews fully and pull connector straight back.

B. Install EFD
(1) Verify electrical power to aircraft is OFF.
(2) Install 44 pin D-sub connector and tighten jacks crews until connector is fully seated.
(3) Install pitot and static lines (EFD1000 only) to back of EFD by firmly pressing the fitting until fully seated (pitot and static quick connectors are keyed and cannot be crossed).
(4) Gently pull on connector to ensure proper connection.
(5) Connect braided bonding strap to EFD with nut.
(6) Insert bottom of EFD into bracket and pivot top forward until it locks into place on bracket.
(7) Reconnect battery (refer to 24-30-00).
(8) Verify all system interfaces are functional (refer to section 10.6 of the Aspen EFD1000 and EFD500 Installation Manual) and the correct software version is installed.
(9) Verify proper bonding per section 10.1.2 of the Aspen EFD1000 and EFD500 Installation Manual.
(10) Perform a system leak test (refer to 34-11-00).

3. EFD Battery Replacement

A. Replace EFD Battery

NOTE: EFD battery replacement must only be performed by a properly certified individual or facility.

(1) Remove EFD (refer to "EFD Removal/Installation" above).
(2) Remove two screws on each end of the oval-shaped cover plate on backside of the EFD.
(3) Unplug electrical connector and slide battery out of EFD.
(4) Install new battery into EFD, then connect battery plug.
(5) Position cover plate and tighten the cover screws. Tighten to 1,4 Nm (12 in.lbs).
(6) Re-install and test EFD (refer to "EFD Removal/Installation" above).

4. Remote Sensor Module (RSM) Removal/Installation

A. Remove RSM
(1) Verify electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Gain access to the underside of the RSM mounting location.
(4) Unplug the RSM connector. Unscrew RSM electrical connector from inside and undo shield ground wire from ground stud.
(5) Remove sealant from around base of RSM and on mounting screws.
(6) Remove four 8-32 non-ferrous mounting screws from RSM and remove RSM from aircraft taking care to guide 24 inch "pigtail" connector out through ½ inch hole in aircraft skin.

B. Install RSM
(1) Verify electrical power to aircraft is OFF.
(2) Replace the O-ring on the RSM. Contact Aspen Avionics for O-ring replacement (256-00001-001).
(3) Verify RSM shim is installed between aircraft skin and RSM if required.
(4) Feed circular connector down through ½ inch hole in aircraft skin and mount RSM (vent hole faces aft) with four 8-32 non-ferrous screws. Tighten to 1,4-1,7 Nm (12-15 in.lbs).

NOTE: It is critical that the screws are non-ferrous to avoid compass errors.

(5) Connect the circular electrical connector and cable tie harness to prevent chafing and interference.
(6) Connect shield ground wire to ground stud.
(7) Seal around base and on top of four mounting screws of the RSM using a good quality electrical sealant (Sikaflex-221 or equivalent, silicone-free).
(8) Reconnect battery (refer to 24-30-00).
(9) Verify proper bonding per section 10.1.2 and perform RSM calibration per section 10.5 of the Aspen EFD1000 and EFD500 Installation Manual.
(10) Check OAT operation per section 10.6.4 and check RSM GPS operation per section 10.6.6 of the Aspen EFD1000 and EFD500 Installation Manual.

5. Configuration Module (CM) Removal/Installation

A. Remove CM
(1) Verify electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Cut the two cable ties affixing the CM to the PFD wiring harness.
(4) Unplug the Molex connector by pressing down on the locking tab and gently pulling the connector from the module.

B. Install CM
(1) Verify electrical power to aircraft is OFF.
(2) Plug the Molex connector into the module until it clicks.
(3) Cable tie the module to the PFD wiring harness..
(4) Reconnect battery (refer to 24-30-00).
(5) Perform the installation menu unit configuration per section 10.4.5 of the Aspen EFD1000 and EFD500 Installation Manual.
(6) Perform RSM calibration per section 10.5 of the Aspen EFD1000 and EFD500 Installation Manual.

6. Inspection/Check

A. All units, brackets, installation hardware and wiring of the EFD1000 system should be checked as defined below during annual inspection. Items found to be defective should be repaired or replaced prior to returning the aircraft to service. The performance of this inspection should not create the need for additional protective treatment (Alodine, paint, etc) of surfaces within the aircraft.

B. EFD Inspection
(1) Inspect the EFD(s) for damage and verify proper operation using the documents identified in section 1 of the Aspen EFD1000 and EFD500 Instructions for Continued Airworthiness.
(2) Check the EFD wiring, pneumatic tubing and quick disconnects for integrity, damage, chafing or excessive wear.
(3) Check EFD braided bonding strap for proper termination at the EFD and aircraft grounding point to maintain HIRF and lightning compliance.
(4) Verify the resistance is 3 mΩ or less from EFD ground stud to airframe ground.
(5) Inspect the installation of the EFD for corrosion on the EFD and the mounting structure.
(6) Inspect the fasteners for tightness and general condition.

C. RSM Inspection
(1) Inspect the RSM(s) visually for damage and wear on the lightning strip.
(2) Check RSM wiring for damage, chafing or excessive wear.
(3) Verify the RSM doubler plate bonding resistance from the ground stud to airframe ground is 3 mO or less to maintain HIRF and lightning compliance.
(4) Inspect the RSM installation incl. doubler for corrosion on the RSM, the RSM shim (optional), the fuselage skin and the doubler.
(5) Inspect the installation for cracks in the fuselage and loose or damaged fasteners.

D. Configuration Module
(1) Check the configuration module(s) for damage.
(2) Check the configuration module wiring for damage, chafing or excessive wear.

E. EFD Internal Battery
Perform operational test as described in section 11 of the Aspen EFD1000 and EFD500 Instructions for Continued Airworthiness. This test must be run at room temperature approximately 25º C.
(1) Turn on the EFD1000.
(2) Press MENU key.
(3) Select POWER SETTINGS page from the main menu.
(4) Press the BATTERY line select key.
(5) BAT LEVEL IN --.-- will be displayed for a short period of time.
(6) Once the capacity is measured ON BAT XX% REM will be displayed. The ON BAT indication must read a minimum of 80% to continue. If the battery capacity is below 80%, the battery should be charged by returning the EFD to aircraft power.
(7) With the battery displaying greater than 80% charge set a timer for 30 minutes. After the 30 minute time has elapsed the EFD must still be operating on battery. If the internal battery will not supply the minimum 30 minutes operating time or fails to charge above 80%, replace the battery and return the failed battery to Aspen Avionics.
(8) Switch the EFD back to aircraft power and recharge the internal battery to 80% or greater prior to release to service.

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

   A. This section provides instructions necessary for authorized personnel to inspect and maintain the Garmin G500 system. The system consists of the following major components:
   - GDU 620 display
   - GRS 77 AHRS
   - GDC 74A ADC
   - GMU 44 magnetometer
   - GTP 59 outside air temperature probe

   B. Maintenance of the G500 system has to be carried out in accordance with the Garmin G500 AML STC Installation Manual (P/N 190-01102-06) and the G500 PFD/MFD System Instructions for Continued Airworthiness (P/N 190-01102-00).

   C. Maintenance is "on condition" only. Refer to "Inspection/Check" below for necessary tests or checks and the specific intervals for the G500 system.

   D. The operation of the Garmin G500 requires the software versions given in the corresponding AQUILA Flight Manual Supplement.

   The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

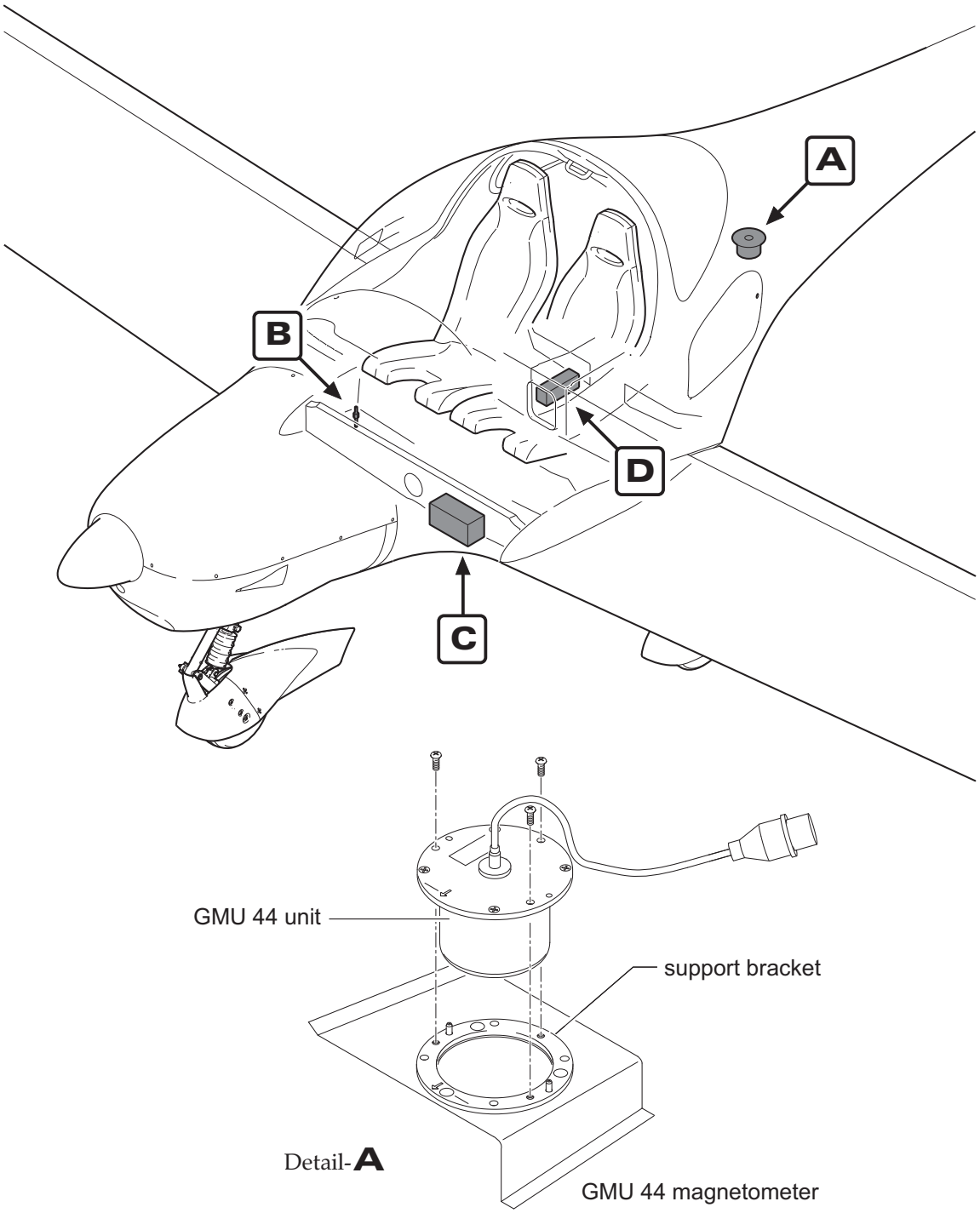
   All service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

   E. For bonding checks on the AQUILA AT01-100/200 no procedures or equipment are necessary other than that which are commonly expected for bonding measurements on small aircraft. Refer to AC 43.13-1B, chapter 11, section 15 "Grounding and Bonding" for further information on bonding check procedures and equipment.

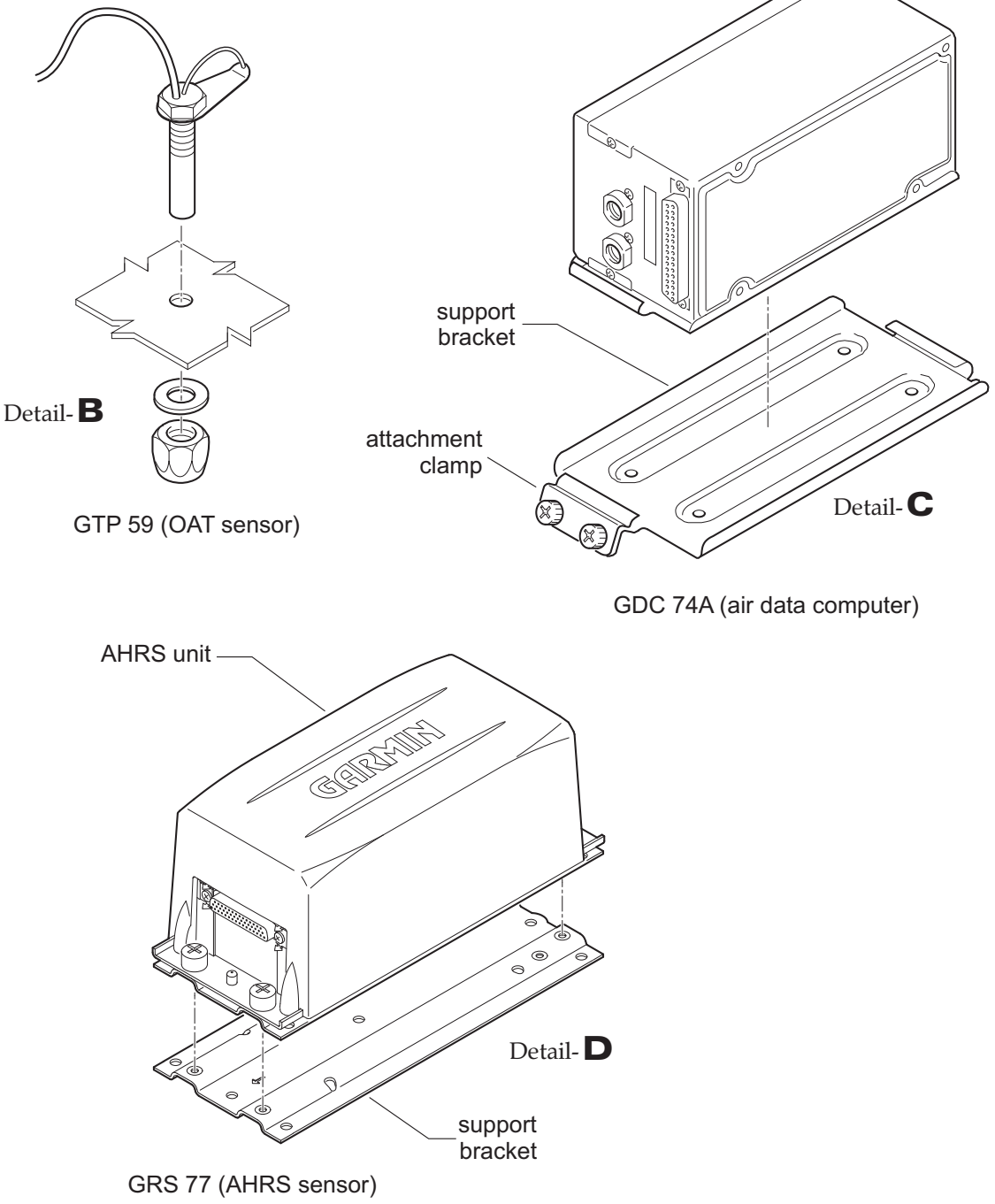
2. G500 Removal/Installation (Ref. Fig. 201)

   A. For removal/installation and configuration/testing of G500 LRUs, refer to the procedures in sections 3 and 5 of the G500 AML STC Installation Manual.

   B. If any work has been done on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the G500 system unit power-up self-test sequence is successfully completed and no failure messages are annunciated on the GDU 620 display. Refer to the checkout procedures in section 5 of the G500 AML STC Installation Manual.



G500 System Components
Figure 201 (1)



G500 System Components
Figure 201 (2)

3. Inspection/Check

A. All G500 system LRUs are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in tests are continuously executed. Detected errors are indicated on the GDU 620 display via failure annunciations.

B. Operation of the G500 system is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. See the following table for necessary tests or checks and the specific intervals for the G500 system:

No.	Garmin G500	Reference	Interval	Initials
1.	Visual inspection - Complete visual inspection of all installed G500 system LRUs incl. supporting structures and wiring harnesses must be performed to ensure continued integrity of the installation.	G500 ICA 2.5	12 months	
2.	Pitot-static and airspeed checks - Perform an altimeter and a pitot-static and airspeed check every 24 month or when the GDC 74A is removed and reinstalled/replaced or the pitot and static system connectors are disturbed.	34-11-00 G500 IM 5.8	24 months[1)]	
3.	Electrical bonding check - Perform an electrical bonding check of the G500 system LRUs in accordance with Garmin G500 Instructions for Continued Airworthiness..	G500 IM 3.8 G500 ICA 2.5	2000h 10 years	
4.	GRS 77 AHRS - Update AHRS magnetic field model.		when available (5 year cycle)	
5.	GMU 44 - Perform magnetometer interference test and magnetometer calibration procedure in accordance with Garmin G500 Part 23 AML STC Installation Manual.	G500 IM 5.6	other[2)]	

1) National regulation may require shorter interval.
2) After adding, replacing or servicing components that are ferrous or electrical changes to the installation that affect components within 3m of the GMU 44 location.

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

   A. This section provides instructions necessary for authorized personnel to inspect and maintain the Garmin G500 TXi system. The system consists of the following major components:
   - GDU 1060 display (with integrated ADAHRS)
   - GMU 44 magnetometer
   - GTP 59 outside air temperature probe

   B. Maintenance of the G500 TXi system has to be carried out in accordance with the Garmin G500 TXi Part 23 AML STC Maintenance Manual (P/N 190-01717-B1).

   C. Maintenance is "on condition" only. Refer to "Inspection/Check" below for necessary tests or checks and the specific intervals for the G500 TXi system.

   D. The operation of the Garmin G500 TXi requires the software versions given in the corresponding AQUILA Flight Manual Supplement.

   The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

   All service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

   E. For bonding checks on the AQUILA AT01-100/200 no procedures or equipment are necessary other than that which are commonly expected for bonding measurements on small aircraft. Refer to AC 43.13-1B, chapter 11, section 15 "Grounding and Bonding" for further information on bonding check procedures and equipment.

2. G500 TXi Removal/Installation

   A. For removal/installation and configuration/testing of G500 TXi LRUs, refer to the procedures in section 5 of the G500 TXi Part 23 AML STC Maintenance Manual.

   B. If any work has been done on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the G500 TXi system unit power-up self-test sequence is successfully completed and no failure messages are annunciated on the GDU 1060 display. Refer to the checkout procedures in section 5.15 of the G500 TXi Part 23 AML STC Maintenance Manual.

3. Inspection/Check

A. All G500 TXi system LRUs are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in tests are continuously executed. Detected errors are indicated on the GDU 1060 display via failure annunciations, system messages, or a combination of the two. A list of reported errors for the system can be printed in the form of a maintenance log using the instructions provided in section 4.1 of the Garmin G500 TXi Part 23 AML STC Maintenance Manual.

B. Operation of the G500 TXi system is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. See the following table for necessary tests or checks and the specific intervals for the G500 TXi system:

No.	Garmin G500 TXi	Reference	Interval	Initials
1.	Visual inspection - Complete visual inspection of all installed G500 TXi system LRUs and wiring harnesses must be performed to ensure continued integrity of the installation.	G500TXi MM 3.4	12 months	
2.	Pitot-static and airspeed checks - Perform an altimeter and a pitot-static and airspeed check every 24 month or when the ADC is removed and reinstalled/replaced or the pitot and static system connectors are disturbed.	34-11-00 G500TXi MM 5.15	24 months[1)]	
3.	Electrical bonding check - Perform an electrical bonding check of the G500 TXi system LRUs in accordance with Garmin G500 TXi maintenance manual.	G500TXi MM 3.5	2000h 10 years	
4.	GDU 1060 ADAHRS - Update AHRS magnetic field model.		when available (5 year cycle)	
5.	GMU 44 - Perform magnetometer interference test and magnetometer calibration procedure in accordance with Garmin G500 TXi Part 23 AML STC Installation Manual.	G500TXi IM 6.6	other[2)]	
6.	GDU 1060 cooling fan - Replace cooling fan on the GDU 1060 every 3000 fan operating hours. The number of hours the fan has been operating can be viewed in configuration mode.	G500TXi MM 5.1	3000h recommended	

1) National regulation may require shorter interval.
2) After adding, replacing or servicing components that are ferrous or electrical changes to the installation that affect components within 3m of the GMU 44 location.

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

   A. This section provides instructions necessary for authorized personnel to inspect and maintain the Garmin G3X Touch system. The system consists of the following major components:
   - GDU 460 display (pilot side)
   - GDU 470 display (co-pilot side)
   - GSU 25C ADAHRS
   - GEA 24 engine interface
   - GAD 27 electronic adapter unit
   - GMU 11 magnetometer
   - GTP 59 outside air temperature probe

   B. Maintenance of the G3X Touch system has to be carried out in accordance with the Garmin G3X Touch EFIS Part 23 AML STC Maintenance Manual (P/N 190-02472-02).

   C. Maintenance is "on condition" only. Refer to "Inspection/Check" below for necessary tests or checks and the specific intervals for the G3X Touch system.

   D. The operation of the Garmin G3X Touch system requires the software versions given in the corresponding AQUILA Flight Manual Supplement.

   The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

   All service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

   E. For bonding checks on the AQUILA AT01-100/200 no procedures or equipment are necessary other than that which are commonly expected for bonding measurements on small aircraft. Refer to AC 43.13-1B, chapter 11, section 15 "Grounding and Bonding" for further information on bonding check procedures and equipment.

2. G3X Removal/Installation

   A. For removal/installation of G3X LRUs, refer to the unit replacement procedures in section 6 of the G3X Touch EFIS Part 23 AML STC Maintenance Manual. For configuration and testing of reinstalled or replaced G3X units, refer to section 7 of the G3X Touch EFIS Part 23 AML STC Maintenance Manual.

   B. If G3X LRUs are removed and reinstalled or if any work has been done on the aircraft that could affect the system wiring, antenna cables, or any interconnected equipment, the checkout and return to service procedures in section 8 of the G3X Touch EFIS Part 23 AML STC Maintenance Manual have to be completed.

   C. If a Garmin G3X autopilot is installed: Refer to 22-10-00 and to the Garmin GFC 500 Part 23 AML STC Maintenance Manual, section 9, for autopilot configuration and return to service-procedures

after G3X removal, installation or replacement. For autopilot settings refer to SB-AT01-042 and referenced documents.

3. Inspection/Check

A. G3X Touch EFIS LRUs maintenance is "on condition" only. No component-level overhaul is required the G3X Touch. "On Condition" replacement and/or servicing should occur when an item exhibits conditions, symptoms, and/or abnormalities defined in section 5 of the G3X Touch EFIS Part 23 AML STC Maintenance Manual.

B. Operation of the G3X system is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. See the following table for necessary tests or checks and the specific intervals for the G3X system:

No.	Garmin G3X Touch	Reference	Interval	Initials
1.	Visual inspection - Complete visual inspection of all installed G3X system LRUs and wiring harnesses must be performed to ensure continued integrity of the installation.	G3X MM 4.4	12 months	
2.	Pitot-static and airspeed checks - Perform an altimeter and a pitot-static and airspeed check every 24 month or when the GSU 25 is removed and reinstalled/replaced or the pitot and static system connectors are disturbed.	34-11-00	24 months[1)]	
3.	Electrical bonding check - Perform an electrical bonding check of the G3X Touch system LRUs in accordance with Garmin G3X Touch maintenance manual.	G3X MM 4.5	2000h 10 years	
4.	GSU 25C - Update AHRS magnetic field model.	G3X MM 4.6	when available (5 year cycle)	
5.	GMU 11 - Perform magnetometer interference test and magnetometer calibration procedure in accordance with Garmin G3X Touch maintenance manual.	G3X MM 5.4.4 G3X MM 7.2.1.2 G3X MM 8.13.3	other[2)]	

1) National regulation may require shorter interval.
2) After adding, replacing or servicing components that are ferrous or electrical changes to the installation that affect components within 3m of the GMU 11 location.

INTEGRATED FLIGHT SYSTEM - MAINTENANCE

1. General

A. This section provides instructions necessary for authorized personnel to inspect and maintain the Garmin G5. The system consists of the following major components:
- G5 electronic flight instrument
- G5 battery pack
- GAD 29B data bus converter (optional)
- GMU 11 magnetometer (optional)

B. Maintenance of the G5 has to be carried out in accordance with the Garmin G5 Electronic Flight Instrument Part 23 AML STC Maintenance Manual (P/N 190-01112-11).

C. Maintenance is "on condition" only. Refer to "Inspection/Check" below for necessary tests or checks and the specific intervals for the G5 system.

D. The operation of the Garmin G5 requires the software versions given in the corresponding AQUILA Flight Manual Supplement.

The actual software version is documented in the aircraft equipment list, located in chapter 6 of the airplane flight manual.

All service information released from AQUILA and related to software versions has to be attached to this maintenance manual for continuing airworthiness!

E. For bonding checks on the AQUILA AT01-100/200 no procedures or equipment are necessary other than that which are commonly expected for bonding measurements on small aircraft. Refer to AC 43.13-1B, chapter 11, section 15 "Grounding and Bonding" for further information on bonding check procedures and equipment.

2. G5 Removal/Installation

A. For removal/installation of G5 LRUs, refer to the unit replacement procedures in section 6 of the G5 Electronic Flight Instrument Part 23 AML STC Maintenance Manual. For configuration and testing of reinstalled or replaced G5 units, refer to section 7 of the G5 Electronic Flight Instrument Part 23 AML STC Maintenance Manual.

B. If G5 LRUs are removed and reinstalled or if any work has been done on the aircraft that could affect the system wiring, antenna cables, or any interconnected equipment, the checkout and return to service procedures in section 8 of the G5 Electronic Flight Instrument Part 23 AML STC Maintenance Manual have to be completed.

C. If Garmin GFC 500 autopilot is installed: Refer to 22-10-00 and to the Garmin GFC 500 Part 23 AML STC Maintenance Manual, section 9, for autopilot configuration and return to service-procedures after G5 removal, installation or replacement. For autopilot settings refer to SB-AT01-034 and referenced documents.

3. Inspection/Check

A. G5 LRUs maintenance is "on condition" only. No component-level overhaul is required the G5. "On Condition" replacement and/or servicing should occur when an item exhibits conditions, symptoms, and/or abnormalities defined in section 5 of the Garmin G5 Electronic Flight Instrument Part 23 AML STC Maintenance Manual.

B. Operation of the G5 system is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. See the following table for necessary tests or checks and the specific intervals for the G5 system:

No.	Garmin G5	Reference	Interval	Initials
1.	Visual inspection - Complete visual inspection of all installed G5 system LRUs and wiring harnesses must be performed to ensure continued integrity of the installation.		12 months	
2.	Pitot-static and airspeed checks - Perform an altimeter and a pitot-static and airspeed check every 24 month or when the G5 is removed and reinstalled/replaced or the pitot and static system connectors are disturbed.	34-11-00	24 months[1)]	
3.	Electrical bonding check - Perform an electrical bonding check of the G5 system LRUs in accordance with Garmin G5 maintenance manual.	G5 MM 4.3	2000h 10 years	
4.	G5 battery - Perform battery capacity check: - Without power applied to the aircraft, turn on the G5 by pressing the power button in the lower left corner of the unit. - Note the remaining battery capacity (%) at the top left corner of the display. - After about a minute, the remaining capacity will change from (%) to time (hour:min). - If the remaining capacity is less than one hour (1:00), allow the battery to charge until the capacity shows greater than 95% and repeat the check. - If the remaining capacity is less than one hour (1:00) after charging, the battery must be replaced.	G5 MM 4.2.7	12 months	
5.	GMU 11 - Perform magnetometer interference test and magnetometer calibration procedure in accordance with Garmin G5 maintenance manual.	G5 MM 7.8.1 G5 MM 7.5.3 G5 MM 7.6	other[2)]	

1) National regulation may require shorter interval.
2) After adding, replacing or servicing components that are ferrous or electrical changes to the installation that affect components within 3m of the GMU 11 location.

INDEPENDENT POSITION DETERMINING – MAINTENANCE

1. General

A. This section covers that portion of the system which provides information to determine position and is mainly independent of ground installations. This includes the GPS portion of the GNS 430W or GTN 650 (Xi) navigation management system (NMS). The scope of maintenance is limited to the removal and installation of the components. For removal and installation procedures for the GNS 430W / GTN 650 (Xi), refer to 23-10-00.

B. Garmin GNS 430W / GTN 650 (Xi) System
The GNS 430W / GTN 650 (Xi) system is a fully integrated, panel-mounted instrument which contains a VHF communications transceiver, a VOR/ILS receiver and GPS navigation computer. The primary function of the GPS portion of the system is to acquire signals from the GPS system satellites, recover orbital data, make range and Doppler measurements and process this information in real-time to obtain the user's position, velocity and time. GPS signals are received by an antenna mounted on top of fuselage behind the cabin.

C. Refer to Garmin 400W Series Installation Manual, P/N 190-00356-02, latest revision for additional maintenance information on the GNS 430W system, or to Garmin GTN 6XX/7XX AML STC Installation Manual, P/N 190-01007-A3, latest revision for the GTN 650 system, or to Garmin GTN Xi Part 23 AML STC Maintenance Manual, P/N 190-01007-C1, latest revision for the GTN 650 Xi system.

2. GPS Antenna Removal/Installation

A. Remove GPS Antenna
(1) Open baggage compartment door and remove access / inspection plate 211 KC (refer to 25-12-00).
(2) Disconnect antenna cable from antenna.
(3) Remove nuts and washers securing antenna to fuselage.
(4) Remove antenna from aircraft.

B. Install GPS Antenna
(1) Put gasket and antenna from outside, and backing plate from inside in position in fuselage.
(2) Install washers and nuts securing antenna to fuselage. Simultaneously connect ground cable to backing plate.
(3) Seal the antenna and gasket to fuselage using a good quality electrical sealant (Sikaflex-221 or equivalent, silicone-free).
(4) Connect antenna cable.
(5) Close baggage compartment door and install access / inspection plate 211 KC (refer to 25-12-00).

INDEPENDENT POSITION DETERMINING – MAINTENANCE

1. General

A. This section covers that portion of the system which provides information to determine position and is mainly independent of ground installations. This includes the FlymapL multifunctional display/GPS.

B. The scope of maintenance is limited to the removal and installation of the components. For further information on the FlymapL, refer to the FlymapL Installation Manual, doc. no. 500-310, latest revision, or its operator's manual. For overhaul and repair, the manufacturer of the equipment has to be consulted.

C. FlymapL Multifunction Display/GPS
The FlymapL multifunctional display is a panel-mounted, multi-functional system with an internal GPS receiver providing GPS navigation planning and the display of a great variety of navigation, airspace and warning information. The FlymapL system enables the display of GPS navigation information in Jeppesen® aeronautical and standard ICAO cartographic maps: Its database contains an elevation model for terrain proximity warning. Interfaces to other sensors and aircraft systems allow the display of additional information (weather information, NOTAMs/METAR/TAF, positions of and collision warnings with other aircraft), if the necessary subsystems are installed. The FlymapL multifunctional display system is approved for VFR operation only and is not intended to be used as the primary source for flight parameters and navigation data. For more information, refer to the operator's manual of the FlymapL.

The FlymapL is installed in a mounting frame located in the avionics rack in the mid section of the instrument panel. GPS signals are received by an antenna mounted on a bracket that is attached to the RH side support plate of the instrument panel.

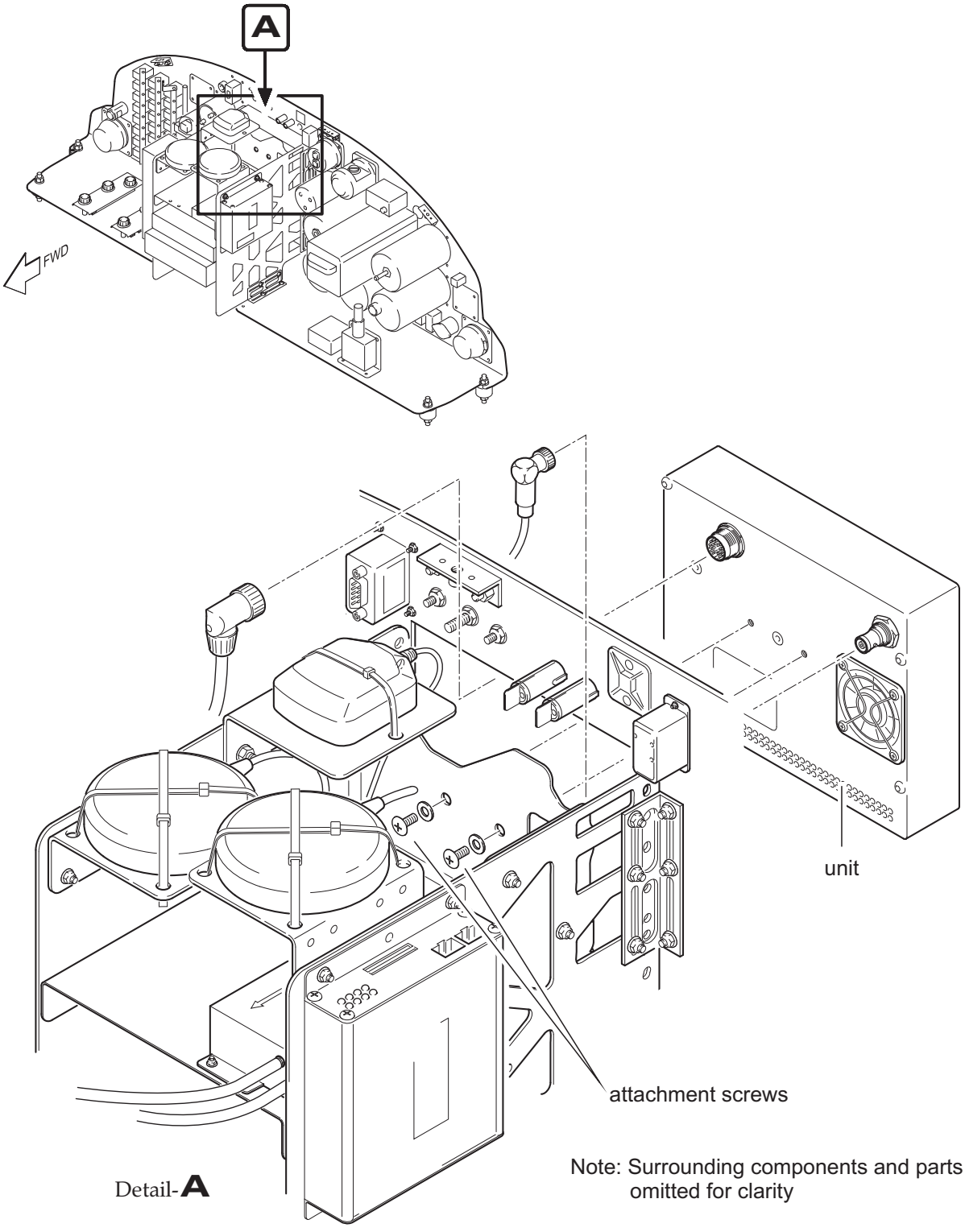
2. FlymapL Unit Removal/Installation (Ref. Fig. 201)

A. Remove FlymapL Unit
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect all plug connectors and cables. Mark the removed cables as required.
(5) Remove both Philips-head screws of the FlymapL attachment on the rear side of the unit.
(6) Carefully pull out the unit from the rack.

B. Install FlymapL Unit

CAUTION: WHEN MOUNTING THE UNIT, DO NOT PRESS ON THE DISPLAY WINDOW AS DAMAGE MAY RESULT.

(1) Insert the unit carefully in the rack until it is in its final installation position.
(2) Install both Philips-head screws on the rear side of the unit to fix the FlymapL to its installation bracket.
(3) Connect all required plug connectors and cables to the rear side of the unit. Make sure that all plugs and cables are properly connected.



FlymapL Unit Installation
Figure 201

(4) Install glare shield (refer to 31-10-00).
(5) Reconnect battery (refer to 24-30-00).
(6) Conduct a functional test of the installed unit.

3. GPS Antenna Removal/Installation (Ref. Fig. 202)

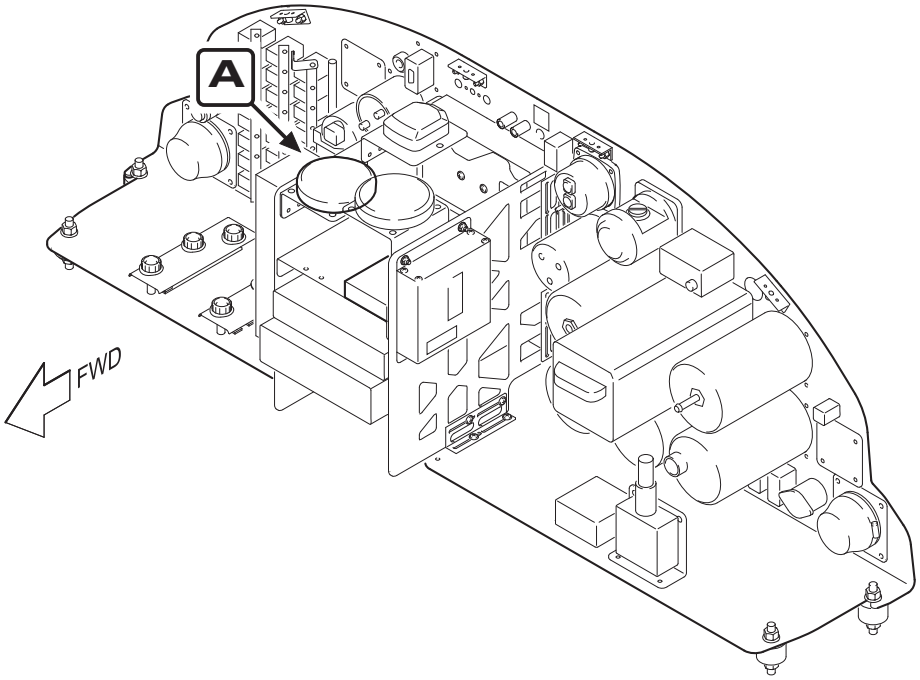
A. Remove FlymapL GPS Antenna
(1) Ensure electrical power to aircraft is OFF.
(2) Remove glare shield (refer to 31-10-00).
(3) Disconnect antenna cable from FlymapL unit and remove cable ties.
(4) Mark installation position and remove cable ties of the antenna attachment.
(5) Carefully remove antenna which is additionally secured to its installation bracket by double-sided adhesive tape. Remove tape and adhesive residue with acetone.

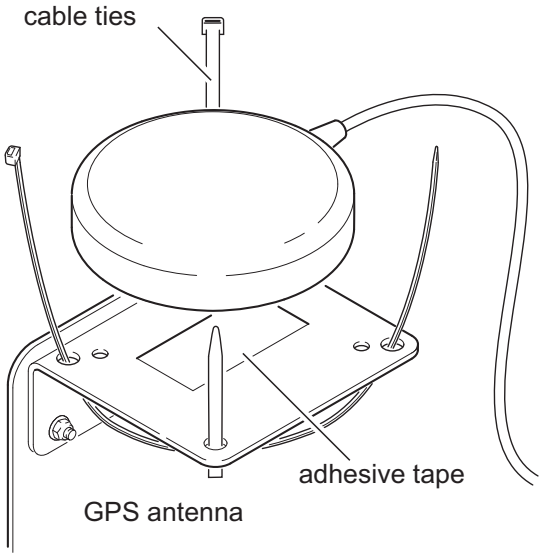
B. Install FlymapL GPS Antenna
(1) Install double-sided adhesive tape on the installation bracket of the GPS antenna and remove the protective film from the adhesive tape.
(2) Attach the antenna to the installation bracket in its correct installation position as previously marked and press it on the installation bracket. Secure the GPS-antenna with 2 cross-wise mounted cable ties.
(3) Install antenna cable properly and connect it to the FlymapL unit.
(4) Install glare shield (refer to 31-10-00).
(5) Perform a functional check of the unit.

4. Inspection/Check

A. When the power is connected to the FlymapL it will automatically switch on. After a short startup period the map will appear. If in the centre of the screen a red cross appears together with the word GPS, no GPS signal is detected. Check GPS antenna connection and make sure that the GPS antenna has full view to the open sky without any obstacles.

If an aircraft symbol is displayed on the screen at the current location and the map is automatically align either with the aircraft in the centre (for North Up display) or with the aircraft near to the bottom of the screen (for Course Up display), the system is working properly (refer to the FlymapL operating manual for additional functions of the FlymapL display system).





Detail-**A**

FlymapL GPS Antenna Installation
Figure 202

DEPENDENT POSITIONING DETERMINING - MAINTENANCE

1. General

A. This section covers that portion of the system which provides information to determine position and is mainly dependent on ground installations. This includes the VOR/ILS receiver portion of the GNS 430W / GTN 650 (Xi) navigation management system (NMS), the VOR/ILS receiver portion of the SL30 COM/NAV transceiver as well as the Garmin GTX 328, GTX 330, GTX 335 and GTX 345 mode S transponders.

B. Garmin GNS 430W / GTN 650 (Xi) System
The GNS 430W / GTN 650 (Xi) system is a fully integrated, panel mounted instrument, which contains a VHF communications transceiver, a VOR/ILS receiver and a GPS navigation computer. The primary function of the VOR/ILS receiver portion of the equipment is to receive and demodulate VOR, localizer and glideslope signals. NAV/LOC/GS signals are received by the VOR/LOC antenna located in the fuselage belly behind the baggage compartment. This antenna is embedded in the fuselage shell structure and is therefore maintenance-free. However, if any maintenance should be required, contact the manufacturer.
For further information on the GNS 430W / GTN 650 (Xi) unit, refer to 23-10-00 and 34-40-00.

C. Garmin SL30 COM/NAV Transceiver
The SL30 is a combination of a VHF communications transceiver and a VHF navigation receiver which includes VOR, localizer and glideslope receiver, a built-in course deviation indicator and an independent voice-activated intercom.
The VOR, localizer and glideslope receivers provide 200 channels with a frequency range of 108 to 117.95 MHz for VOR, 108 to 111.95 for localizer and 329.15 to 335 MHz for glideslope reception. VOR/LOC/GS signals are received by the VOR/LOC antenna which is integrated into the lower fuselage shell structure behind the baggage compartment. This antenna is maintenance free and cannot be removed. However, if any maintenance or repair is necessary, contact the manufacturer.
For further information on the SL30 unit, refer to 23-10-00.

D. Garmin GTX 328, GTX 330, GTX 335 and GTX 345 Mode S Transponder
The GTX 328, GTX 330, GTX 335 and GTX 345 transponders are radio transmitters and receivers that operate on radar frequencies, receiving ground radar or TCAS interrogations. The GTX transmits a coded response of pulses to ground based radar on a frequency of 1090 MHz. Each unit has IDENT capability and replies to mode A, mode C and mode S all-call interrogation.

The electrical circuit of the GTX is protected by a circuit breaker labeled "TXP". The transponder antenna is installed on the bottom of the cabin, below the co-pilot's seat.

For a complete description of the GTX, refer to:
- GTX 328 Pilot's Guide, P/N 190-00420-03, latest revision
- GTX 328 Installation Manual, P/N 190-00420-04, latest revision
- GTX 330 Pilot's Guide, P/N 190-00207-00, latest revision
- GTX 330 Installation Manual, P/N 190-00207-02, latest revision
- GTX 335/345 Series Pilot's Guide, P/N 190-01499-00, latest revision
- GTX 3X5 Installation Manual, P/N 190-01499-02, latest revision

2. Transponder Removal/Installation

A. Remove Garmin GTX Transponder
(1) Ensure electrical power to aircraft is OFF.
(2) Insert a 3/32 hex wrench into the access hole at the unit face and engage hex bolt.
(3) Turn wrench counterclockwise until the unit is forced out about 3/8″ and can be freely pulled from the rack.
(4) Pull unit from rack.

B. Install Garmin GTX Transponder

CAUTION: BE SURE NOT TO OVERTIGHTEN THE UNIT INTO THE RACK. APPLICATION OF HEX WRENCH TORQUE EXCEEDING 15 IN.LBS CAN DAMAGE THE LOCKING MECHANISM.

NOTE: It may be necessary to insert the hex wrench into the access hole on the unit face and rotate the mechanism 90° counterclockwise to ensure correct position prior to placing the unit in the rack.

(1) Slide unit carefully straight in the rack until it stops, about 1 inch short of the final position.
(2) Insert a 3/32 hex wrench into the access hole at the bottom of the unit face and engage hex bolt.
(3) Turn wrench clockwise until the unit is secured in the rack.
(4) Carry out return to service procedures and a functional test of the installed unit in accordance with the corresponding Garmin manual.

3. Transponder Antenna Removal/Installation

A. Remove Transponder Antenna
(1) Ensure electrical power to aircraft is OFF.
(2) Remove access/inspection plate 211 BB (refer to 25-12-00) to gain access to the transponder antenna.
(3) Remove nuts and washers securing transponder antenna to fuselage.

NOTE: The connected antenna cable prevents the antenna from falling away from the aircraft.

(4) From outside the aircraft, disconnect antenna cable at connector and remove antenna from aircraft.

B. Install Transponder Antenna
(1) From outside the aircraft, connect antenna cable to the transponder antenna.
(2) From inside the fuselage, insert antenna studs through mounting holes and position the backing plate.
(3) Install washers and nuts securing transponder antenna to fuselage skin.
(4) Seal the antenna to fuselage using a good quality electrical sealant (Sikaflex-221 or equivalent, silicone-free).
(5) Install access/inspection plate 211 BB (refer to 25-12-00).
(6) Carry out a functional test of the transponder.

4. Inspection/Check

A. Maintenance of the GTX has to be carried out in accordance with:
- GTX 328 Transponder Maintenance Manual, P/N 190-00420-05, latest revision
- Garmin GTX 33X and GTX 3X5 ADS-B Maintenance Manual, P/N 190-00734-11, latest revision

B. Garmin GTX transponder maintenance is “on condition” only. No component-level overhaul is required. “On Condition” replacement and/or servicing should occur when an item exhibits conditions, symptoms, and/or abnormalities defined in the corresponding Garmin maintenance manual.

C. Refer to the corresponding Garmin maintenance manual for necessary tests or checks and the specific maintenance intervals for the GTX transponder.

CHAPTER 77

ENGINE INDICATING

TABLE OF CONTENTS

ENGINE INDICATING - GENERAL

1. Introduction

   A. This chapter describes those systems and components which indicate engine operation.

   B. Refer to 28-00-00 for further information on fuel pressure, fuel quantity and fuel flow measuring systems.

   C. Refer to 79-00-00 for further information on oil pressure and oil temperature measuring systems.

2. General Description

   A. Engine parameters are either indicated by analog instruments, an engine monitoring system or the G3X Touch system. Engine instruments are placed on the right side of the instrument panel.

   B. The following parameters of engine output and condition are measured and indicated:
      (1) Propeller speed
      (2) Manifold pressure
      (3) Oil pressure
      (4) Oil temperature
      (5) Cylinder head temperature
      (6) Fuel pressure (optional)
      (7) Fuel flow (optional)
      (8) Carburetor temperature (optional)
      (9) Exhaust gas temperature (optional)

   C. Excepting the analog manifold pressure indicator, all parameters are measured with sensors which transform engine parameters in equivalent electrical signals. The signals are then transmitted to the indicator and translated into readings. The analog manifold pressure indicator is a mechanical pressure gauge connected to the engine via a rubber hose.

POWER INDICATION - MAINTENANCE

1. General

A. Propeller speed is indicated by a tachometer which is mounted on the instrument panel. The tachometer receives an electrical signal from a sensor mounted on the internal alternator casing at the rear end of the engine. Additionally the tachometer generates a 12V output signal above a propeller speed of approx. 400 rpm. This signal is used to control the engine hourmeter.

B. Manifold pressure is measured mechanically by a pressure gauge which is connected through a rubber hose to the compensating tube located on top of the engine.

C. Maintenance is limited to the removal and installation of the indicators. For further information on maintenance of the RPM sensor, refer to the applicable ROTAX publications. If the manifold pressure rubber hose is damaged or in bad condition it must be replaced.

2. Tachometer Removal/Installation

A. Remove Tachometer
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Remove cable connector from back of tachometer.
(5) While supporting the tachometer, remove screws securing tachometer to instrument panel.
(6) Remove tachometer from aircraft.

B. Install Tachometer
(1) Position tachometer to instrument panel hole and secure with screws.
(2) Install cable connector at back of tachometer.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).

3. Manifold Pressure Gauge Removal/Installation

A. Remove Manifold Pressure Gauge
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Remove rubber hose from back of gauge.
(5) While supporting the gauge, remove screws securing gauge to instrument panel.
(6) Remove gauge from aircraft.

B. Install Manifold Pressure Gauge
(1) Position gauge to instrument panel hole and secure with four screws.
(2) Install rubber hose at back of gauge.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).

POWER INDICATION - MAINTENANCE

1. General

A. Propeller speed indication is included in the Garmin G3X Touch system.
Propeller/engine speed is measured by a sensor mounted on the internal alternator casing at the rear end of the engine and electrically connected to the GEA 24 engine interface at the back of the instrument panel.

B. Manifold pressure indication is included in the Garmin G3X Touch system.
Manifold pressure is measured by a pressure transducer installed at the back of the instrument panel (Rotax 912) / on the right side of the intercooler (Rotax 914). It is connected to the compensating tube on top of the engine through a rubber hose. The transducer is electrically connected to the GEA 24 engine interface at the back of the instrument panel.

C. Maintenance is limited to the removal and installation of the manifold pressure transducer. Refer to 34-25-00 for further information on maintenance of the Garmin G3X Touch system. For further information on maintenance of the RPM sensor, refer to the applicable ROTAX publications. If the manifold pressure rubber hose is damaged or in bad condition it must be replaced.

2. Manifold Pressure Transducer Removal/Installation

A. Remove Manifold Pressure Transducer
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Rotax 912: Remove glare shield (refer to 31-10-00).
Rotax 914: Remove upper engine cowling (refer to 71-10-00).
(4) Disconnect electrical connector from transducer.
(5) Unscrew transducer from manifold block at the back of the instrument panel (Rotax 912) / on the right side of the intercooler (Rotax 914) and remove transducer from aircraft.

B. Install Manifold Pressure Transducer
(1) Apply thread sealant to manifold pressure transducer. To reduce the risk of system contamination, minimal amount of sealant should be applied leaving at least 2 threads at the end of the fitting clear of sealant.
(2) Install transducer to manifold block at the back of the instrument panel (Rotax 912) / on the right side of the intercooler (Rotax 914)
(3) Connect electrical connector to transducer.
(4) Rotax 912: Install glare shield (refer to 31-10-00).
Rotax 914: Install upper engine cowling (refer to 71-10-00).
(5) Reconnect battery (refer to 24-30-00).
(6) Check manifold pressure indication:
- Verify that the manifold pressure gauge does not have a red or amber X on it.
- Verify that the gauge reads ambient pressure +/-1 inHg.

POWER INDICATION - MAINTENANCE

1. General

A. Propeller speed indication is included in the engine monitoring system.
Propeller/engine speed is measured by a sensor mounted on the internal alternator casing at the rear end of the engine and electrically connected to the engine data converter (EDC).

B. Manifold pressure indication is included in the engine monitoring system.
Manifold pressure is measured by a pressure transducer installed at the back of the instrument panel and connected to the compensating tube on top of the engine through a rubber hose. The transducer is electrically connected to the engine data converter (EDC).

C. Maintenance is limited to the removal and installation of the manifold pressure transducer. Refer to 77-40-00 for further information on maintenance of the engine monitoring system. For further information on maintenance of the RPM sensor, refer to the applicable ROTAX publications. If the manifold pressure rubber hose is damaged or in bad condition it must be replaced.

D. The MVP-50 system is designed for a specific aircraft and engine. When built, the system is put together with various transducers and necessary calibrations are performed. Some components are not interchangeable and require a specific calibration.
If the manifold pressure transducer is replaced, the new calibration offset for the new transducer will need to be stored in the MVP-50. This offset is noted on the yellow sticker on its side, and in the paper in the box it came in. Contact AQUILA Aviation for the password required.

2. Manifold Pressure Transducer Removal/Installation

A. Remove Manifold Pressure Transducer
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connector from transducer.
(5) Disconnect hose at hose nozzle on firewall.
(6) While supporting the transducer, remove screws securing transducer to instrument panel.
(7) Remove transducer from aircraft.

B. Install Manifold Pressure Transducer
(1) Position transducer at back of instrument panel and attach with screws.
(2) Connect electrical connector to transducer.
(3) Connect hose to hose nozzle on firewall.
(4) Install glare shield (refer to 31-10-00).
(5) Reconnect battery (refer to 24-30-00).
(6) Store calibration offset of the new transducer in the MVP-50 (maintenance password required).
(7) Check manifold pressure indication: Verify the displayed pressure is within +/-1 inHg of the ambient pressure.

TEMPERATURE INDICATION - MAINTENANCE

1. General

   A. Cylinder head temperature is measured by a temperature-sensitive sensor that is mounted in the no. 3 cylinder head. The indicator is located in the cluster of engine gauges on the right side of the instrument panel. It translates the electrical signal from the sensor into the relevant reading.

   B. Optional a type K thermocouple carburetor temperature sensor is installed in the intake manifold directly in front of the carburetor. The indicator is located in the cluster of engine gauges on the right instrument panel.

   C. Maintenance of the temperature measuring system is limited to the removal and installation of the sensors and indicators.

2. Temperature Indicator Removal/Installation

   A. Remove Temperature Indicator
      (1) Ensure electrical power to aircraft is OFF.
      (2) Disconnect battery (refer to 24-30-00).
      (3) Remove glare shield (refer to 31-10-00).
      (4) Disconnect electrical connector from back of indicator.
      (5) While supporting the indicator, remove screws securing indicator to instrument panel.
      (6) Remove indicator from aircraft.

   B. Install Temperature Indicator
      (1) Position indicator in instrument panel and attach with screws.
      (2) Connect electrical connector at back of indicator.
      (3) Install glare shield (refer to 31-10-00).
      (4) Reconnect battery (refer to 24-30-00).

3. CHT Sensor Removal/Installation

   A. Remove CHT Sensor
      (1) Ensure electrical power to aircraft is OFF.
      (2) Remove engine cowling (refer to 71-10-00).
      (3) Disconnect battery (refer to 24-30-00).
      (4) Disconnect electrical lead to sensor.
      (5) Unscrew and remove sensor from engine.

      CAUTION: COOLANT MAY LEAK THROUGH SENSOR OPENING.

   B. Install CHT Sensor
      (1) Clean all parts carefully. Apply Loctite (medium strength) on sensor thread.
      (2) Install sensor to engine. Torque to 7 Nm (62 in.lbs).
      (3) Check coolant level. Replenish as necessary.

(4) Connect electrical connector to sensor.
(5) Reconnect battery (refer to 24-30-00).
(6) Install engine cowling (refer to 71-10-00).

4. Carburetor Temperature Sensor Removal/Installation (optional)

A. Remove Carburetor Temperature Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Disconnect electrical lead to sensor.
(5) Unscrew and remove sensor from engine.

B. Install Carburetor Temperature Sensor
(1) Install sensor head and new copper sealing washer. Secure with Loctite (medium strength).

CAUTION: TIGHTEN THE SENSOR HEAD CAREFULLY TO AVOID STRIPPING THE THREAD.

(2) Connect electrical connector to sensor.
(3) Reconnect battery (refer to 24-30-00).
(4) Install engine cowling (refer to 71-10-00).

TEMPERATURE INDICATION - MAINTENANCE

1. General

A. Cylinder head temperature (CHT) indication is included in the MVP-50 engine monitoring system / G3X Touch system. Temperature is measured by a temperature-sensitive sensor electrically connected to the engine data converter (MVP-50) / GEA 24 engine interface (G3X). The cylinder head temperature is measured in the head of the no. 3 cylinder.

B. Carburetor temperature indication is included in the MVP-50 engine monitoring system / G3X Touch system. Temperature is measured by a type K thermocouple electrically connected to the engine data converter (MVP-50) / GEA 24 engine interface (G3X). The carburetor temperature is measured in the intake manifold directly in front of the carburetor. The sensor may be installed either left or right hand side, depending on mounting conditions.

C. Exhaust gas temperature (EGT) indication is optionally included in the G3X Touch system. Temperature is measured by type K thermocouples electrically connected to the GEA 24 engine interface. The exhaust gas temperature is measured in the exhaust manifolds approx. 100mm (4 in.) from the exhaust flange connections.

D. Maintenance is limited to the removal and installation of the temperature sensors.
Refer to 77-40-00 for further information on maintenance of the engine monitoring system.
Refer to 34-25-00 for further information on maintenance of the Garmin G3X Touch system.

2. CHT Sensor Removal/Installation

A. Remove CHT Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Disconnect electrical lead to sensor.
(5) Unscrew and remove sensor from engine.

CAUTION: COOLANT MAY LEAK THROUGH SENSOR OPENING.

B. Install CHT Sensor
(1) Clean all parts carefully. Apply Loctite (medium strength) on sensor thread.
(2) Install sensor and new sealing washer (MVP-50 only) to engine. Torque to 7 Nm (62 in.lbs).
(3) Check coolant level. Replenish as necessary.
(4) Connect electrical connector to sensor.
(5) Reconnect battery (refer to 24-30-00).
(6) Install engine cowling (refer to 71-10-00).
(7) Check CHT indication: Verify the displayed temperature is within +/- 2°C of the ambient temperature (engine needs sufficient time to reach ambient temperature).

3. Carburetor Temperature Sensor Removal/Installation

A. Remove Carburetor Temperature Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Disconnect electrical lead to sensor.
(5) Unscrew and remove sensor from engine.

B. Install Carburetor Temperature Sensor
(1) Install sensor head and new copper sealing washer. Secure with Loctite (medium strength).

CAUTION: TIGHTEN THE SENSOR HEAD CAREFULLY TO AVOID STRIPPING THE THREAD.

(2) Connect electrical connector to sensor.
(3) Reconnect battery (refer to 24-30-00).
(4) Install engine cowling (refer to 71-10-00).
(5) Check carburetor temperature indication: Verify displayed temperature is within +/- 2°C of the ambient temperature (engine needs sufficient time to reach ambient temperature).

4. Exhaust Gas Temperature Sensor Removal/Installation (optional)

A. Remove Exhaust Gas Temperature Sensor
(1) Ensure electrical power to aircraft is OFF.
(2) Remove engine cowling (refer to 71-10-00).
(3) Disconnect battery (refer to 24-30-00).
(4) Disconnect electrical lead to sensor.
(5) Unscrew and remove sensor from engine.

B. Install Exhaust Gas Temperature Sensor

(1) Clean all parts carefully. Apply Loctite (Anti Seize 8151) on sensor thread.
(2) Install sensor and new copper sealing washer to exhaust manifold. Torque to 10 Nm (89 in.lbs).
(3) Connect electrical connector to sensor.
(4) Reconnect battery (refer to 24-30-00).
(5) Install engine cowling (refer to 71-10-00).
(6) Check EGT indication: Verify the displayed temperatures are within +/- 10°C of the ambient temperature (engine needs sufficient time to reach ambient temperature).

ENGINE MONITORING SYSTEM - MAINTENANCE

1. General

A. The aircraft is equipped with an Electronics International MVP-50 glass panel engine monitor. The system consists of four major components:
- the MVP display,
- the EDC-33 engine data converter,
- the probes and transducers and
- the wiring and extension cables.

B. Maintenance is limited to the removal and installation of system components. For overhaul and repair the manufacturer of the equipment has to be consulted. For further information on the engine monitoring system refer to Electronics International MVP-50 installation instructions and MVP-50 operating instructions.

C. The MVP-50 system is designed for a specific aircraft and engine. When built, the system is put together with various transducers and necessary calibrations are performed. Some components are not interchangeable and require a specific calibration.

D. For instructions on maintenance of the probes and transducers refer to the corresponding chapters of this manual.

2. Display Removal/Installation

A. The MVP-50 display stores information vital to the functionality of the system. This information includes:
- Configuration (layout of the screens and limits for each function)
- Manifold pressure calibration (offset)
- Temperature compensation calibration (offset)
- Fuel tank calibration
- Identification (aircraft tail number and engine specifics)
- Timer status (tach time, engine hours, cycles)

Any replacement display will need to be reconfigured identically to the original. The first step in preparing a replacement is to perform a backup of all config files on the orignal MVP-50 to a USB stick. This backup will include the fuel tank calibration. Record engine hours and tach time. Ideally, the config backup should be performed immediately after fuel tank calibration, and stored until needed.

To prevent accidental installation of an incorrect configuration it is not possible to simply retrieve all backup config files into another MVP-50 display; instead the config files need to be emailed to Electronics International for processing. Zipping the config directory on the USB stick simplifies this process. The configuration will be returned ready to be retrieved to the new MVP-50 display.

AQUILA Aviation or Electronics International support will provide the necessary level 2 password to allow this process. The unit and tracking IDs are needed for password generation.

The engine hours and tach time can be restored to the new MVP-50 display using the maintenance password. Contact AQUILA Aviation for the password required to change the tail number.

B. Remove Display
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connectors from back of display.
(5) While supporting the display, remove screws securing display to instrument panel.
(6) Remove display from aircraft.

C. Install Diplay
(1) Position display in instrument panel hole and attach with screws.
(2) Connect electrical connectors at back of display.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Perform ground run. Check functionality of the system. Check that engine limits in the system correspond to the airplane flight manual.

3. Engine Data Converter (EDC) Removal/Installation

NOTE: When replacing an EDC it is important that it be replaced with the same model. The EDC can be replaced without affecting the calibration of other functions.

A. Remove Engine Data Converter
(1) Ensure electrical power to aircraft is OFF.
(2) Disconnect battery (refer to 24-30-00).
(3) Remove glare shield (refer to 31-10-00).
(4) Disconnect electrical connectors from back of EDC.
(5) While supporting the EDC, remove screws securing EDC to instrument panel.
(6) Remove EDC from aircraft.

B. Install Engine Data Converter
(1) Position EDC at back of instrument panel and attach with screws.
(2) Connect electrical connectors to EDC.
(3) Install glare shield (refer to 31-10-00).
(4) Reconnect battery (refer to 24-30-00).
(5) Perform ground run. Check functionality of the system.