

TABLE OF CONTENTS

| <u>Cha/Sec/Sub</u> | <u>Title</u> | <u>Pages</u> |
|--------------------|---|--------------|
| | TABLE OF CONTENTS | 1-6 |
| | INTRODUCTION | 1-8 |
| | LIST OF EFFECTIVE CHAPTERS | 1-2 |
| 04 | AIRWORTHINESS LIMITATIONS | |
| 04-00-00 | Airworthiness Limitations - General | 1-2 |
| 05 | TIME LIMITS / MAINTENANCE CHECKS | |
| 05-00-00 | Time Limits / Maintenance Checks - General | 1 |
| 05-10-00 | Component Time Limits | 1-4 |
| 05-20-00 | Scheduled Maintenance Checks | 1-31 |
| 05-30-00 | Daily Inspections | 1 |
| 05-50-00 | Unscheduled Maintenance Checks | 1-2 |
| 06 | DIMENSIONS AND AREAS | |
| 06-00-00 | Dimensions and Areas - General | 1 |
| 06-10-00 | Aircraft Dimensions and Areas | 1-3 |
| 06-20-00 | Aircraft Zoning | 1-2 |
| 06-30-00 | Access/Inspection Plates | 1-2 |
| 07 | LIFTING AND SHORING | |
| 07-00-00 | Lifting and Shoring - General | 1 |
| 07-10-00 | Jacking | 201-202 |
| 08 | LEVELING AND WEIGHING | |
| 08-00-00 | Leveling and Weighing - General | 1 |
| 08-10-00 | Weighing | 201-203 |
| 08-20-00 | Leveling | 201-202 |
| 09 | TOWING AND TAXIING | |
| 09-00-00 | Towing and Taxiing - General | 1 |
| 09-10-00 | Towing | 201 |
| 09-20-00 | Taxiing | 201 |
| 10 | PARKING, MOORING, STORAGE AND RETURN TO SERVICE | |
| 10-00-00 | Parking, Mooring, Storage and Return to Service - General | 1 |
| 10-10-00 | Parking | 201 |
| 10-11-00 | Storage | 201 |
| 10-20-00 | Mooring | 201 |
| 10-30-00 | Return to Service | 201 |
| 10-40-00 | Transport | 201-202 |

TABLE OF CONTENTS (Cont.)

| Cha/Sec/Sub | <u>Title</u> | <u>Pages</u> |
|-------------|---|---------------------------|
| 11 | PLACARDS AND MARKINGS | |
| 11-00-00 | Placards and Markings - General | 1 |
| 11-20-00 | Exterior Placards and Markings | 201-207 |
| 11-30-00 | Interior Placards and Markings | 201-208 |
| 12 | SERVICING | |
| 12-00-00 | Servicing - General | 1 |
| 12-10-00 | Replenishing - Description | 1-2 |
| 12-11-00 | Fuel - Servicing | 301-302 |
| 12-12-00 | Engine Oil - Servicing | 301-302 |
| 12-13-00 | Induction Air Filter - Servicing | 301 |
| 12-14-00 | Cooling System - Servicing | 301-302 |
| 12-15-00 | Brake System - Servicing | 301 |
| 12-16-00 | Tires - Servicing | 301 |
| 12-17-00 | Battery - Servicing | 301 |
| 12-20-00 | Scheduled Servicing - Description | 1 |
| 12-21-00 | Lubricants - Description | 1-2 |
| 12-22-00 | Lubrication - Servicing | 301-303 |
| 12-23-00 | Aircraft Exterior - Cleaning and Care | 701-704 |
| 12-24-00 | Aircraft Interior - Cleaning and Care | 701-702 |
| 12-30-00 | Unscheduled Servicing | 301 |
| 20 | STANDARD PRACTICES AIRFRAME | |
| 20-00-00 | Standard Practices Airframe - General | 1 |
| 20-10-00 | Fastener Identification and Torque Data | 1-4 |
| 20-11-00 | Conversion Data | 1-3 |
| 21 | VENTILATION AND HEATING | |
| 21-00-00 | Ventilation and Heating - General | 1 |
| 21-20-00 | Fresh Air Distribution - Maintenance | 201-203 |
| 21-40-00 | Heating - Maintenance | 201 |
| 22 | AUTO FLIGHT | |
| 22-00-00 | Auto Flight - General | 1 |
| 22-10-00 | Autopilot - Maintenance | 201-208 |
| 23 | COMMUNICATIONS | |
| 23-00-00 | Communications - General | 1 |
| 23-10-00 | Speech Communications - Description | 1-2/2 ¹⁾ |
| 23-10-00 | Speech Communications - Maintenance | 201-202/202 ¹⁾ |
| 23-50-00 | Audio Integrating - Maintenance | 201-202/202 ¹⁾ |

¹⁾ Depending on effectivity.

TABLE OF CONTENTS (Cont.)

| Cha/Sec/Sub | <u>Title</u> | <u>Pages</u> |
|-------------|---|---------------------------|
| 24 | ELECTRICAL POWER | |
| 24-00-00 | Electrical Power - General | 1 |
| 24-00-00 | Electrical Power - Troubleshooting | 101-102 |
| 24-20-00 | Alternator System - Description | 1-3/3 ¹⁾ |
| 24-20-00 | Alternator System - Maintenance | 201-204/205 ¹⁾ |
| 24-30-00 | Main Battery System - Description | 1-2 |
| 24-30-00 | Main Battery System - Maintenance | 201-203 |
| 24-40-00 | External Power - Maintenance | 201-203 |
| 24-60-00 | Electrical Load Distribution - Description | 1 |
| 24-61-00 | Circuit Breaker - Maintenance | 201-203 |
| 24-97-00 | Electrical System Wiring - Maintenance | 201 |
| 25 | EQUIPMENT / FURNISHINGS | |
| 25-00-00 | Equipment / Furnishings - General | 1 |
| 25-10-00 | Seats - Maintenance | 201-203 |
| 25-11-00 | Restraint System - Maintenance | 201 |
| 25-12-00 | Cabin Interior - Maintenance | 201-203 |
| 25-50-00 | Cargo Tie Downs - Maintenance | 201 |
| 25-60-00 | Emergency Equipment - Description | 1-2 |
| 25-62-00 | Emergency Locator Transmitter - Maintenance | 201-202 |
| 25-66-00 | Fire Extinguisher - Maintenance | 201/201-202 ¹⁾ |
| 27 | FLIGHT CONTROLS | |
| 27-00-00 | Flight Controls - General | 1 |
| 27-10-00 | Aileron Control System - Description | 1-2 |
| 27-10-00 | Aileron Control System - Maintenance | 201-207 |
| 27-20-00 | Rudder Control System - Description | 1-2 |
| 27-20-00 | Rudder Control System - Maintenance | 201-205 |
| 27-30-00 | Elevator Control System - Description | 1-2 |
| 27-30-00 | Elevator Control System - Maintenance Practices | 201-205 |
| 27-31-00 | Elevator Trim Control System - Description | 1-2 |
| 27-31-00 | Elevator Trim Control System - Maintenance | 201-202 |
| 27-50-00 | Flap Control System - Description | 1-2 |
| 27-50-00 | Flap Control System - Maintenance | 201-205 |
| 28 | FUEL | |
| 28-00-00 | Fuel - General | 1-2/2 ¹⁾ |
| 28-10-00 | Fuel Storage - Maintenance | 201 |
| 28-20-00 | Fuel Distribution - Maintenance | 201-207 |
| 28-41-00 | Fuel Quantity Indication - Maintenance | 201-203/203 ¹⁾ |
| 28-44-00 | Fuel Pressure Indication - Maintenance | 201 |
| 28-45-00 | Fuel Flow Indication - Maintenance | 201-202 |

¹⁾ Depending on effectivity.

TABLE OF CONTENTS (Cont.)

| Cha/Sec/Sub | <u>Title</u> | <u>Pages</u> |
|-------------|--|---------------------------|
| 31 | INDICATING / RECORDING SYSTEMS | |
| 31-00-00 | Indicating / Recording Systems - General | 1-2/2/2 ¹⁾ |
| 31-10-00 | Instrument Panel - Maintenance | 201-202 |
| 32 | LANDING GEAR | |
| 32-00-00 | Landing Gear - General | 1 |
| 32-10-00 | Main Landing Gear - Description | 1 |
| 32-10-00 | Main Landing Gear - Maintenance | 201-202 |
| 32-20-00 | Nose Landing Gear - Description | 1 |
| 32-20-00 | Nose Landing Gear - Maintenance | 201-204 |
| 32-40-00 | Wheels and Brakes - Description | 1/1 ¹⁾ |
| 32-40-00 | Wheels and Brakes - Maintenance | 201-222/208 ¹⁾ |
| 33 | LIGHTS | |
| 33-00-00 | Lights - General | 1 |
| 33-10-00 | Interior Lights - Maintenance | 201-202 |
| 33-40-00 | Exterior Lights - Maintenance | 201-202 |
| 34 | NAVIGATION | |
| 34-00-00 | Navigation - General | 1 |
| 34-11-00 | Pitot / Static System - Description | 1-2 |
| 34-11-00 | Pitot / Static System - Maintenance | 201-204 |
| 34-18-00 | Stall Warning System - Description | 1 |
| 34-18-00 | Stall Warning System - Maintenance | 201 |
| 34-20-00 | Attitude and Direction - Maintenance | 201-203 |
| 34-25-00 | Integrated Flight System - Maintenance | 201-204/202 ¹⁾ |
| 34-40-00 | Independent Position Determining - Maintenance | 201-201/204 ¹⁾ |
| 34-50-00 | Dependent Position Determining - Maintenance | 201-203 |
| 51 | STRUCTURES | |
| 51-00-00 | Structures - General | 1-2 |
| 51-10-00 | Composite Damage Investigation | 201-203 |
| 51-20-00 | Composite Repair | 201-223 |
| 52 | DOORS | |
| 52-00-00 | Doors - General | 1 |
| 52-10-00 | Canopy - Maintenance | 201-204 |
| 52-30-00 | Baggage Door - Maintenance | 201 |
| 53 | FUSELAGE | |
| 53-00-00 | Fuselage - General | 1 |
| 53-10-00 | Fuselage Main Frame - Description | 1-4 |
| 53-10-00 | Fuselage Main Frame - Maintenance | 201 |
| 53-20-00 | Auxiliary Structure - Description | 1 |

¹⁾ Depending on effectivity.

TABLE OF CONTENTS (Cont.)

| Cha/Sec/Sub | <u>Title</u> | <u>Pages</u> |
|-------------|--|---------------------------|
| 55 | STABILIZERS | |
| 55-00-00 | Stabilizers - General | 1 |
| 55-10-00 | Horizontal Stabilizer - Maintenance | 201 |
| 55-20-00 | Elevator - Maintenance | 201-203 |
| 55-30-00 | Vertical Stabilizer - Maintenance | 201 |
| 55-40-00 | Rudder - Maintenance | 201-202 |
| 56 | WINDOWS | |
| 56-00-00 | Windows - General | 1 |
| 56-10-00 | Flight Compartment Windows - Maintenance | 201-203 |
| 57 | WINGS | |
| 57-00-00 | Wings - General | 1 |
| 57-00-00 | Wings - Maintenance | 201-206 |
| 57-50-00 | Control Surfaces - Maintenance | 201-207 |
| 61 | PROPELLER | |
| 61-00-00 | Propeller - General | 1 |
| 61-00-00 | Propeller - Troubleshooting | 101-103 |
| 61-10-00 | Propeller Assembly - Maintenance | 201-204 |
| 61-20-00 | Propeller Control - Maintenance | 201-205 |
| 71 | POWER PLANT | |
| 71-00-00 | Power Plant - General | 1-2/2 ¹⁾ |
| 71-00-00 | Power Plant - Troubleshooting | 101-104 |
| 71-00-00 | Power Plant - Maintenance | 201-202 |
| 71-10-00 | Cowling - Maintenance | 201-202 |
| 71-20-00 | Engine Mount - Maintenance | 201 |
| 71-60-00 | Air Induction System - Maintenance | 201/201 ¹⁾ |
| 74 | IGNITION SYSTEM | |
| 74-00-00 | Ignition System - General | 1-2 |
| 74-00-00 | Ignition System - Maintenance | 201-203 |
| 75 | COOLING SYSTEM | |
| 75-00-00 | Cooling System - General | 1-2 |
| 75-00-00 | Cooling System - Maintenance | 201-203/203 ¹⁾ |
| 76 | ENGINE CONTROLS | |
| 76-00-00 | Engine Controls - General | 1-2 |
| 76-00-00 | Engine Controls - Maintenance | 201-208 |

¹⁾ Depending on effectivity.

TABLE OF CONTENTS (Cont.)

| <u>Cha/Sec/Sub</u> | <u>Title</u> | <u>Pages</u> |
|--------------------|--|---------------------------|
| 77 | ENGINE INDICATING | |
| 77-00-00 | Engine Indicating - General | 1 |
| 77-10-00 | Power Indication - Maintenance | 201/201 ¹⁾ |
| 77-20-00 | Temperature Indication - Maintenance | 201-202/202 ¹⁾ |
| 77-40-00 | Engine Monitoring System - Maintenance | 201-202 |
| 78 | EXHAUST | |
| 78-00-00 | Exhaust System - General | 1 |
| 78-00-00 | Exhaust System - Maintenance | 201-204/203 ¹⁾ |
| 79 | OIL | |
| 79-00-00 | Oil - General | 1-2/2 ¹⁾ |
| 79-10-00 | Oil Tank - Maintenance | 201-202 |
| 79-20-00 | Oil Cooler - Maintenance | 201-202 |
| 79-31-00 | Oil Pressure Indication - Maintenance | 201-202/201 ¹⁾ |
| 79-33-00 | Oil Temperature Indication - Maintenance | 201/201 ¹⁾ |
| 80 | STARTING | |
| 80-00-00 | Starting - General | 1 |
| 80-11-00 | Starter - Maintenance | 201 |
| 91 | CHARTS AND DIAGRAMS | |
| 91-00-00 | Charts and Diagrams - General | 1-40 |

¹⁾ Depending on effectivity.



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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.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 revisions 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 AT01-200C Airplane Flight Manual | FM-AT01-1010-106 | 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(0)-0 | 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 Systemec 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)

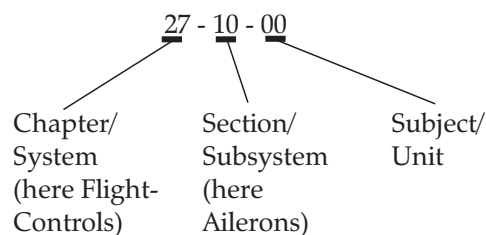
The second element identifies a subsystem in the system:

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:



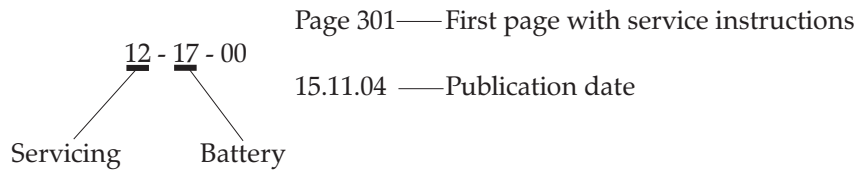
- (2) When the chapter/system element number is followed by zeros in the section/subsystem and subject/unit element number (28-00-00), the information is applicable to the entire system.
- (3) When the section/subsystem element number is followed by zeros in the subject/unit element number (28-20-00),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

| Meter Common | Meter Plus | PSI | Desired Value (VDC) | Unit under test |
|--------------|-------------|-----|---------------------|-----------------|
| Pin 2 (blk) | Pin 4 (red) | 0 | 4.95 to 5.0 | 3010016,17,18 |
| Pin 2 (blk) | Pin 1 (wht) | 0 | 1.70 to 2.10 | 3010016,17,18 |
| Pin 2 (blk) | Pin 3 (grn) | 0 | 1.70 to 2.10 | 3010016,17,18 |
| Pin 3 (grn) | Pin 1 (wht) | 0 | -0.003 to +0.003 | 3010016,17,18 |
| Pin 3 (grn) | Pin 1 (wht) | 10 | 0.031 to +0.034 | 3010016 |
| Pin 3 (grn) | Pin 1 (wht) | 30 | 0.028 to +0.032 | 3010017 |
| Pin 3 (grn) | Pin 1 (wht) | 60 | 0.028 to +0.032 | 3010018 |

EFFECTIVITY

Aircraft equipped with VM 1000 Engine Management System

77-40-00 Page 101
13.07.01

effectivity block

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 | 01.06.22 |
| Introduction | 01.06.22 |
| 04 Airworthiness Limitations | 28.02.20 |
| 05 Time Limits / Maintenance Checks | 01.06.22 |
| 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 | 05.03.21 |
| 12 Servicing | 01.06.22 |
| AIRFRAME SYSTEMS | |
| 20 Standard Practices Airframe | 09.10.18 |
| 21 Ventilation and Heating | 30.04.13 |
| 22 Auto Flight | 05.03.21 |
| 23 Communications | 30.04.13 |
| 24 Electrical Power | 28.02.20 |
| 25 Equipment and Furnishings | 28.02.20 |
| 27 Flight Controls | 05.03.21 |
| 28 Fuel | 28.02.20 |
| 31 Indicating/Recording Systems | 28.02.20 |
| 32 Landing Gear | 01.06.22 |
| 33 Lights | 01.06.22 |
| 34 Navigation | 05.03.21 |
| 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 | 28.02.20 |
| 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.11) is approved under the authority of the
DOA ref. EASA.21J.025.

01.06.22



Date, Signature Office of Airworthiness



CHAPTER 5
TIME LIMITS / MAINTENANCE CHECKS



TABLE OF CONTENTS

| <u>Title</u> | <u>Chapter Section Subject</u> | <u>Page</u> |
|--|--|-------------|
| TIME LIMITS / MAINTENANCE CHECKS - GENERAL | 05-00-00 | 1 |
| Introduction | 05-00-00 | 1 |
| General Description | 05-00-00 | 1 |
| COMPONENT TIME LIMITS | 05-10-00 | 1 |
| General | 05-10-00 | 1 |
| Component Time Limits | 05-10-00 | 1 |
| SCHEDULED MAINTENANCE CHECKS..... | 05-20-00 | 1 |
| General | 05-20-00 | 1 |
| Inspection Time Intervals Chart | 05-20-00 | 1 |
| 6000-Hour Inspection | 05-20-00 | 21 |
| DAILY INSPECTIONS | 05-30-00 | 1 |
| General | 05-30-00 | 1 |
| Pre-Flight Check | 05-30-00 | 1 |
| Post-Flight Check | 05-30-00 | 1 |
| UNSCHEDULED MAINTENANCE CHECKS | 05-50-00 | 1 |
| General | 05-50-00 | 1 |
| Special Checks | 05-50-00 | 1 |



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 attaching bolts | 6000 h | no |
| 71 | Engine shock mounts | 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 | 800 h or 3 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 |
|---------|---|---|------------------------------|
| 34 | Sandia SAI 340 / Bendix King KI 300 battery | 5 years | no |
| 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, 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.

³⁾ AT01-100 only

⁴⁾ AT01-200 only

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.

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 | | Initials |
|-----|---|--|----------|-------|----------|
| | | | 100h | other | |
| 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 other | Initials |
|-----|---|---|---------------------------|----------|
| 6. | Engine and engine compartment - Clean for leakage check. | R912* 12-20-00 R914* 12-20-00 | X ⁶⁾ | |
| 7. | <p>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.</p> <p>Rudder pedal brakes and parking brake - Check for proper operation.</p> <p>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.</p> <p>RPM drop: _____ RPM / Man. press : _____ in. Hg</p> <p>Engine instruments - Check engine parameters.</p> <p>Magneto RPM drop - Set 1700 RPM. Check that RPM drop is less than 120 RPM while operating on one magneto and no more than a 50 RPM drop difference between left and right magnetos.</p> <p>RPM drop left magneto : _____ RPM RPM drop right magneto: _____ RPM</p> <p>Carburetor heat - Pull knob at 1700 RPM. Engine RPM should show a drop of at least 20 RPM³⁾. Carburetor temperature should show a rise of at least 2 °C⁴⁾.</p> <p>RPM drop³⁾: _____ RPM / Temperature rise⁴⁾: _____ °C</p> <p>Alternator ALT2 check⁴⁾ - Switch ALT1 OFF. Ammeter ALT2 should show more than 5A.</p> <p>Battery BAT2 check⁴⁾ - Switch ALT1/BAT OFF. Voltmeter should be stable at 13,0 - 13,9V.</p> <p>Alternator ALT1 check⁴⁾ - Switch ALT1/BAT ON again. Ammeter ALT1 should show more than 5A. Ammeter ALT2 should show 0A.</p> <p>Engine full power - Advance throttle to full forward. Tachometer should read 2350 ±15 RPM.</p> <p>Full power RPM: _____ RPM</p> <p>Engine idle - Move throttle control lever to full aft. Tachometer should read 750 +50 RPM.</p> <p>Idle RPM: _____ RPM</p> <p>Cool down engine below 1000 RPM (at least 2 min⁴⁾). Shut down engine, set the ignition switch and the master switch to the OFF position. Remove ignition key from aircraft.</p> | <p>R912* 12-20-00 R914* 12-20-00</p> <p>32-40-00</p> <p>MT*</p> | 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 | | Initials |
|-----|---|---|-----------------|-------|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|---|--|-----------------|--------------------|----------|
| | | | 100h | other | |
| 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. | 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⁾ | |
| 6. | Visual inspection of the magnetic plug for accumulation of chips | R912* 12-20-00 R914* 12-20-00 | X ⁶⁾ | | |
| 7. | 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 | |
| 8. | 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⁾ | | |
| 9. | Leakage bore at the base of the water pump - Check for signs of leakage. | R912* 12-20-00 R914* 12-20-00 | X ⁶⁾ | | |

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 | | Initials |
|-----|--|--|-----------------|---|----------|
| | | | 100h | other | |
| 10. | Cooling system - Renew coolant. Flush the cooling system. | 12-14-00 R912* 12-20-00 R914* 12-20-00 | | 3 years | |
| 11. | 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⁾ | | |
| 12. | 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⁾ | | |
| 13. | 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⁾ | | |
| 14. | 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⁾ | | |
| 15. | 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⁾ | | |
| 16. | Oil tank vent line - Check for proper routing, for obstructions and clear passage | | X ⁶⁾ | | |
| 17. | 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⁾ | | |
| 18. | 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⁾ | | |
| 19. | Fuel filter - Inspect and clean. | 28-20-00 | X ⁶⁾ | | |
| 20. | 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⁾ | |
| 21. | 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⁾ | | |
| 22. | Battery BAT 2 - Replace additional alternator 2 battery (BAT 2). | | | annual ⁴⁾ | |
| 23. | Battery BAT 2 - Check fuses of rectifier-regulator installation. | 24-20-00 | X ⁴⁾ | | |

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.

⁸⁾ N/VFR equipped aircraft only

| No. | Engine (Cont.) | Reference | Interval | | Initials |
|-----|---|--|--|--------------------------------|----------|
| | | | 100h | other | |
| 24. | Battery tray, terminals and cables - Check for security, corrosion and general condition. Grease battery terminals. | 12-22-00 | X ⁶⁾ | | |
| 25. | Starter - Check security of attachment and electrical connections. | | X ⁶⁾ | | |
| 26. | Alternator - Check attachment and V-belt tension. Inspect electrical connections. | R912* 12-20-00 R914* 12-20-00 | X ⁶⁾ | | |
| 27. | 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⁾ | | |
| 28. | 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 | |
| 29. | Spark plugs - Replace spark plugs | | Rotax 912: 200h ⁷⁾ / 400h Rotax 914: 100h ⁷⁾ / 200h | | |
| 30. | Sensors - Check for tight fit, condition and security of attachment. | | X ⁶⁾ | | |
| 31. | 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⁾ , exhaust pipes and mounting flanges for cracks, corrosion and leakage. Check heat shielding for condition. | | X ⁶⁾ | | |
| 32. | Cabin heat - Check heat shroud and heat ducts for damage and security of attachment. Check heat control function. | | X ⁶⁾ | | |
| 33. | 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 | |
| 34. | 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)} | | |
| 35. | 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⁾ | | |
| 36. | Propeller gear box - Inspect overload clutch. | R912* 05-50-00 R914* 05-50-00 | | 600h ^{7,13)} 1000h | |
| 37. | 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 | |

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

13) Overload clutch without lead drain holes (P/N 996886) only

| No. | Engine (Cont.) | Reference | Interval | | Initials |
|-----|--|---|-------------------|----------------|----------|
| | | | 100h | other | |
| 38. | Carburetors - Check carburetor synchronization. Mechanical and pneumatic synchronization. | R912* 12-20-00 R914* 12-20-00 | X ⁶⁾ | | |
| 39. | Carburetors - Inspect the float chamber assy for contamination and corrosion. Check float weight. <u>CAUTION</u> (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 | |
| 40. | 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 | |
| 41. | Carburetors - Removal/assembly of the two carburetors for carburetor inspection. | Rotax Heavy MM 73-00-00 3.1) | | 200h | |
| 42. | 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⁾ | | |
| 43. | 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 | |
| 44. | 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⁾ | | |
| 45. | 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⁾ | | |
| 46. | 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)} | | |
| 47. | Carburetor heat valve and intercooler cover - Check valve and intercooler cover for correct function and condition. | | X ^{4,6)} | | |
| 48. | 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⁾ | | |

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. | Engine (Cont.) | Reference | Interval | | Initials |
|-----|--|---|-----------------|-------------------|----------|
| | | | 100h | other | |
| 49. | <p>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.</p> <p>At engine (4 bolts M10): 40 Nm (354 in.lbs) 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.</p> | R912* 12-20-00 R914* 12-20-00 SB-912-028 SB-914-016 SB-AT01-022 | X ⁶⁾ | | |
| 50. | <p>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.</p> | 17-10-00 05-20-00 R912* 12-20-00 R914* 12-20-00 | X ⁶⁾ | 50h ⁷⁾ | |

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 | | Initials |
|-----|---|------------------|----------|-------|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|--|-------------|----------|--------|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|--|-----------|-----------------|--------|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|---|----------------------|----------|--|----------|
| | | | 100h | other | |
| 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 GFC 500 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 | | Initials |
|-----|---|----------------------------------|----------|--------|----------|
| | | | 100h | other | |
| 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 $\pm 1,00$ mm (± 0.04 in.) - Radial $\pm 0,30$ 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 $\pm 0,30$ mm (± 0.01 in.) - Radial $\pm 0,30$ 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 | | Initials |
|-----|--|-------------|----------|-----------------------|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|--|----------------------|------------------|--------|----------|
| | | | 100h | other | |
| 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 $\pm 0,30$ mm (± 0.01 in.) - Radial $\pm 0,30$ 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 | | Initials |
|-----|--|-----------|-------------------|--|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|--|-----------|-----------------|-------|----------|
| | | | 100h | other | |
| 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 | | Initials |
|-----|--|----------------------------------|--------------------|--|----------|
| | | | 100h | other | |
| 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. | Tank inlet bonding wires - Check bonding wires at the airframe ground tube for yellow discoloration. | SB-AT01-027 | | annual ¹¹⁾ | |
| 12. | Garmin GFC 500 autopilot - Check bonding. | 22-10-00 | | 2000h ¹²⁾ 10years ¹²⁾ | |
| 13. | Garmin GFC 500 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

| No. | Return to Service | Reference | Interval | | Initials |
|-----|--|--------------------------------------|----------|-------|----------|
| | | | 100h | other | |
| 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 and 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 | | |



AQUILA AT01-100/200
MAINTENANCE MANUAL

Maintenance Checks

| 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 INSPECTIONS1. 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.



**AQUILA AT01-100/200
MAINTENANCE MANUAL**

**CHAPTER 12
SERVICING**



TABLE OF CONTENTS

| <u>Title</u> | <u>Chapter Section Subject</u> | <u>Page</u> |
|--|--|-------------|
| SERVICING - GENERAL..... | 12-00-00 | 1 |
| Introduction | 12-00-00 | 1 |
| General Description | 12-00-00 | 1 |
| REPLENISHING - DESCRIPTION..... | 12-10-00 | 1 |
| General | 12-10-00 | 1 |
| Fuel | 12-10-00 | 1 |
| Engine Oil | 12-10-00 | 2 |
| Hydraulic Fluid | 12-10-00 | 2 |
| FUEL - SERVICING..... | 12-11-00 | 301 |
| General | 12-11-00 | 301 |
| Safety and Maintenance Precautions | 12-11-00 | 301 |
| Fueling and Defueling | 12-11-00 | 302 |
| ENGINE OIL - SERVICING..... | 12-12-00 | 301 |
| General | 12-12-00 | 301 |
| Checking Engine Oil | 12-12-00 | 301 |
| Oil Change Intervals | 12-12-00 | 301 |
| Oil Changing | 12-12-00 | 302 |
| INDUCTION AIR FILTER - SERVICING | 12-13-00 | 301 |
| General | 12-13-00 | 301 |
| Air Filter Changing | 12-13-00 | 301 |
| Air Filter Cleaning | 12-13-00 | 301 |
| COOLING SYSTEM - SERVICING | 12-14-00 | 301 |
| General | 12-14-00 | 301 |
| Adding Coolant | 12-14-00 | 301 |
| Renewal of the Coolant | 12-14-00 | 302 |
| Flushing the Cooling System | 12-14-00 | 302 |
| BRAKE SYSTEM - SERVICING..... | 12-15-00 | 301 |
| General | 12-15-00 | 301 |
| Hydraulic Fluid Replenishing | 12-15-00 | 301 |
| TIRES - SERVICING..... | 12-16-00 | 301 |
| General | 12-16-00 | 301 |
| Tire Servicing | 12-16-00 | 301 |

TABLE OF CONTENTS (Cont.)

| <u>Title</u> | <u>Chapter Section Subject</u> | <u>Page</u> |
|--|--|-------------|
| BATTERY - SERVICING | 12-17-00 | 301 |
| General | 12-17-00 | 301 |
| Battery Servicing | 12-17-00 | 301 |
| SCHEDULED SERVICING - DESCRIPTION | 12-20-00 | 1 |
| General | 12-20-00 | 1 |
| LUBRICANTS - DESCRIPTION | 12-21-00 | 1 |
| General | 12-21-00 | 1 |
| Service Notes | 12-21-00 | 1 |
| Definition of „As Needed“ | 12-21-00 | 1 |
| Recommended Lubricants | 12-21-00 | 2 |
| LUBRICATION - SERVICING | 12-22-00 | 301 |
| General | 12-22-00 | 301 |
| Lubrication Chart | 12-22-00 | 301 |
| AIRCRAFT EXTERIOR - CLEANING AND CARE | 12-23-00 | 701 |
| General | 12-23-00 | 701 |
| Safety Precautions | 12-23-00 | 701 |
| Cleaning and Care of the Canopy | 12-23-00 | 701 |
| Cleaning and Care of the Aircraft Exterior Surfaces | 12-23-00 | 702 |
| Cleaning and Care of Navigation / Position / Anti-Collision Lights | 12-23-00 | 702 |
| Cleaning the Engine | 12-23-00 | 703 |
| Cleaning and Care of the Propeller | 12-23-00 | 704 |
| Cleaning the Landing Gear | 12-23-00 | 704 |
| AIRCRAFT INTERIOR - CLEANING AND CARE..... | 12-24-00 | 701 |
| General | 12-24-00 | 701 |
| Aircraft Interior Cleaning | 12-24-00 | 701 |
| Cleaning the Instrument Panel | 12-24-00 | 701 |
| Cleaning the Cabin Floor | 12-24-00 | 701 |
| Cleaning the Seats | 12-24-00 | 701 |
| UNSCHEDULED SERVICING..... | 12-30-00 | 301 |
| General | 12-30-00 | 301 |
| Removing Snow and Ice | 12-30-00 | 301 |

SERVICING - GENERAL

1. Introduction

- A. This chapter gives information on the replenishment of fluids and the lubrication of components. The chapter also contains instructions required to carry out scheduled servicing.

2. General Description

The chapter is designed to help authorized personnel to correctly service the aircraft. Below a brief description and intended purpose of each section of this chapter is given.

- A. Section 12-00-00 - Servicing - General. This section provides a general overview of content and purpose of the chapter.
- B. The subsequent sections are divided into 3 groups.
- (1) Replenishment Fluids
Provides information for the maintenance personnel to help them to correctly perform the necessary servicing during daily aircraft operation. This group begins with section 12-10-00 - Replenishing - Description. The section includes approved fluids specifications and information about tank and reservoir capacities.
 - (2) Scheduled Servicing
Provides information for the maintenance personnel to help them to correctly perform periodic servicing, such as lubricating components or cleaning the aircraft. This group begins with section 12-20-00 Scheduled Servicing Description.
 - (3) Unscheduled Servicing
Provides information for the maintenance personnel to help them to correctly perform servicing, which is carried out at irregular intervals, for example removing ice and snow.



REPLENISHING - DESCRIPTION1. General

A. This chapter provides information about fluids which must be replenished during operation.

2. Fuel

A. Fuel Capacity

| | Liters | U.S. Gallons |
|----------------|--------|--------------|
| Total Capacity | 120,0 | 31.7 |
| Usable Fuel | 109,6 | 29.0 |
| Unusable Fuel | 10,4 | 2.7 |

B. Fuel Specification

The following fuel is approved for use in the AQUILA AT01-100/200.
The minimum RON should be 95.

EN 228 Super (Premium)
EN 228 Super plus (Premium plus)
AVGAS 100 LL (Grade ASTM-D910, blue color)
AVGAS UL 91 (Grade ASTM-D7547)

WARNING: ONLY USE FUEL SUITABLE FOR THE RESPECTIVE CLIMATIC ZONE.

NOTES: For fuel specifications set down by the FAA, refer to standard spec. for automotive spark-ignition engine fuel ASTM D 4814.

There is a risk of vapor formation if winter fuel is used for summer operation.

Due to the higher lead content in AVGAS, wear of the valve sets and deposits in combustion chamber and lead sediments in the lubrication system will increase. It is, therefore, recommended to use AVGAS only if problems with vapor lock are experienced or if the other fuel types are not available.

3. Engine Oil

A. Engine Oil Capacity

| | Liters | U.S. Quarts |
|---------------------|--------|-------------|
| Engine oil capacity | 3,0 | 3.17 |
| Initial filling | 3,5 | 3.70 |
| Minimum | 2,5 | 2.64 |

B. Oil Specification

CAUTION: DO NOT USE AVIATION GRADE ENGINE OIL.

IF MORE THAN 30% OF OPERATION HOURS HAVE BEEN FLOWN WITH LEADED FUEL (E.G. AVGAS 100LL), AN OIL CHANGE SHOULD BE UNDERTAKEN EVERY 50 H (REFER TO ROTAX AIRCRAFT ENGINES SERVICE INFORMATION SI-912-016 / SI-914-019).

- (1) Only use oil with ROTAX Norm (RON) 424 classification.
- (2) Due to the high stresses in the reduction gears, oils with gear additives such as high performance motor cycle oils must be used.
- (3) Because of the incorporated friction clutch, oils with friction modifier additives are unsuitable as this could result in a slipping clutch during normal operation.
- (4) Heavy duty 4-stroke motor cycle oils meet all requirements. These oils are normally not mineral oils but semi- or full synthetic oils.
- (5) Diesel engine oils are generally unsuitable due to temperature properties and additives which favor clutch slipping.

NOTE: For more information on the necessary lubricants, refer to Rotax Aircraft Engines Service Information SI-912-016 / SI-914-019.

C. Recommended Oil Viscosity for various Air Temperatures:

| Mean ambient temperature | Multi grade oils | |
|---------------------------------|------------------|------------|
| 0°C (32 °F) to 40°C (104 °F) | SAE 20W-50 | SAE 20W-40 |
| -10°C (14 °F) to 40°C (104 °F) | SAE 15W-50 | SAE 15W-40 |
| -20°C (-4 °F) to 40°C (104 °F) | SAE 10W-40 | SAE 10W-30 |
| -30°C (-22 °F) to 40°C (104 °F) | SAE 5W-50 | SAE 5W-40 |

4. Hydraulic Fluid

- A. Only hydraulic fluid fulfilling the MIL-H-5606 specification should be used.

FUEL - SERVICING

1. General

A. Fuel Tanks

- (1) The aircraft is equipped with two integral wing fuel tanks.
The fuel tanks are located inside each wing between the front and rear spars. Each fuel tank has a filler cap on the top wing surface.

B. Drain System

- (1) The fuel system is equipped with drain valves to allow examination for contamination, water and for de-fueling. Each wing fuel tank has a drain valve at the bottom, inboard rear corner. A further drain valve is located at the lowest point of the fuel system; at the base of the electrical fuel pump (AT01-100) / at the base of the gascolator close to the electrical fuel pumps (AT01-200). The drain is accessible from outside the nose section.
The center of the fuel drains can be pushed inward with the fuel sampler to inspect for water and contamination.

NOTE: Chapter 28 (Fuel) contains more detailed information about the fuel system.

2. Safety and Maintenance Precautions

A. Safety Precautions

WARNING: SERVICEABLE FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE DURING ALL FUEL SYSTEM SERVICING PROCEDURES.

AIRCRAFT AND FILLING FITTINGS MUST BE GROUNDED.

ALL ELECTRICAL EQUIPMENT IN THE AIRCRAFT SHOULD BE TURNED OFF. THE ALT1/BAT AND ALT2/BAT2 (AT01-200 ONLY) SWITCHES SHOULD BE IN THE "OFF" POSITION AND THE IGNITION KEY REMOVED FROM THE AIRCRAFT.

NO SMOKING!

- (1) Before beginning maintenance, a serviceable fire extinguisher (at least foam extinguisher) must be positioned within easy access.
- (2) Do not wear clothing that has a tendency to generate static electricity (i.e. synthetic fabrics).
- (3) No metal tabs on footwear.
- (4) Carry out fuel system servicing procedures only in a designated fuel loading/unloading area.
- (5) Ground equipment near the aircraft must be turned off.
- (6) While filling do not turn on any electrical device.
- (7) Make sure that the aircraft and filling fittings are properly grounded:
 - (a) First ground the aircraft;
 - (b) If a mobile filling device is being used, ground the filling device (same potential as aircraft);
 - (c) Ground the mobile filling device with the aircraft.

B. Maintenance Precautions

- (1) Use designated equipment for fuel loading / unloading to prevent contamination.
- (2) Only use approved anti-icing additive.
- (3) Blend fuel in accordance with prescribed procedures.
- (4) Document all fuel blending.

3. Fueling and Defueling**A. Fueling**

- (1) Move aircraft to a designated fuel loading / fuel unloading area.
- (2) Make sure that the ALT1/BAT and ALT2/BAT2 (AT01-200) switches are in the OFF position.
- (3) Ground aircraft and filling device as described above.
- (4) Position a fire extinguisher near to the fuel tank to be serviced.
- (5) Remove fuel filler cap and fill fuel tank to desired level.
- (6) Remove fuel service nozzle and install fuel cap.
- (7) Move fire extinguisher and the fuel service nozzle to the other tank to be filled.
- (8) Remove fuel filler cap and fill fuel tank to desired level.
- (9) Remove fuel service nozzle and install fuel cap.
- (10) Check correct lock of both fuel filler caps. Remove excess fuel from the wing area using a cloth.
- (11) Remove ground cables.
- (12) Compare reading of fueled amount on filling device with readings on the fuel indicators in the aircraft.

B. Defueling

- (1) Move aircraft to a designated fuel loading / fuel unloading area.
- (2) Make sure you have enough fuel collectors.
- (3) Make sure that the ALT1/BAT and ALT2/BAT2 (AT01-200) switches are in the OFF position.
- (4) Ground aircraft and filling device as described above.
- (5) Position a fire extinguisher near to the fuel tank to be defueled.
- (6) Remove fuel cap and remove as much fuel as possible using a defueling nozzle.
- (7) Install fuel cap.
- (8) Move fire extinguisher and the defueling nozzle to the other tank to be defueled.
- (9) Remove fuel cap and remove as much fuel as possible using a defueling nozzle.
- (10) Install fuel cap.
- (11) Drain remaining fuel from each wing fuel tank.
- (12) Drain remaining fuel from the drain valve located at the base of the electrical fuel pump with the fuel selector valve in the position LEFT and then in the position RIGHT.
- (13) Make sure all drain valves are closed securely.
- (14) Remove ground cables.

ENGINE OIL - SERVICING

1. General

- A. This chapter provides information for checking and changing engine oil.
- B. The oil filler cap of the oil tank is located on the right side of the engine behind cylinder no. 3 (AT01-100) / on the left side of the engine behind cylinder no. 4 (AT01-200). It is accessible by opening the oil access plate on the upper cowling. The oil filler cap has a dipstick with min - max markings to check oil level.

WARNING: AVOID SKIN CONTACT WITH ENGINE OIL. USED OIL IN PARTICULAR CONTAINS MATERIALS DETRIMENTAL TO HEALTH.

WARNING: BEFORE ROTATING THE PROPELLER BY HAND, ENSURE IGNITION SWITCH IS OFF AND THE THROTTLE IS CLOSED.

CAUTION: DO NOT ROTATE THE PROPELLER CLOCKWISE.

2. Checking Engine Oil

A. Oil Checking Procedure

- (1) Turn the propeller several times by hand to transfer all the oil from the engine to the tank.

NOTE: The process is completed when air flows back to the oil tank. This flow of air can be perceived as gurgling sound when the cover of the tank is removed.

- (2) Open oil access plate on upper cowling.
(3) Remove oil filler cap and withdraw dipstick.
(4) Wipe oil dipstick dry with a cloth.
(5) Reinsert dipstick.
(6) Withdraw dipstick and read oil level on dipstick.
(7) If necessary, refill engine oil with correct grade and viscosity (refer to 12-10-00).

NOTE: For normal engine operation maintain the oil level between the two marks as an excessive oil level will allow oil to escape via the venting line.
For longer flights replenish oil to max. mark to warrant more oil reserve.

- (8) Reinsert oil dipstick, close filler cap, check for proper seating.
(9) Close oil access plate.

3. Oil Change Intervals

CAUTION: FOR ENGINE OPERATION WITH AVGAS, OIL SHOULD BE CHANGED EVERY 50 HOURS (REFER TO ROTAX AIRCRAFT ENGINES SI-912-016 / SI-914-019).

CAUTION: UNDER SEVERE OPERATING CONDITIONS, THE FREQUENCY OF OIL CHANGES MUST BE INCREASED REGARDLESS OF THE TYPE OF FUEL USED (MOGAS OR AVGAS).

A. Oil Change Intervals

- (1) Under normal operating conditions, oil must be changed every 100 hours.
- (2) For oil specifications, refer to 12-10-00 and to ROTAX Aircraft Engines SI-912-016 / SI-914-019, which contains further operating information for ROTAX engines.

4. Oil Changing

CAUTION: DRAINING THE OIL LINES AND OIL COOLER IS NOT NECESSARY AND MUST BE AVOIDED, AS IT RESULTS IN AIR ENTERING THE OIL SYSTEM. (REFER TO ROTAX AIRCRAFT ENGINES SI-912-018 / SI-914-020).

A. Oil Changing Procedure

- (1) Run engine until operating temperature is reached.
- (2) Shut down engine.

WARNING: HOT ENGINE COMPONENTS MAY CAUSE SKIN BURNS!

- (3) Turn the propeller several times by hand to transfer all the oil from the engine to the tank.

NOTE: The process is completed when air flows back to the oil tank. This flow of air can be perceived as gurgling sound when the cover of the tank is removed.

- (4) Remove engine cowling (refer to 71-10-00).
- (5) Cut safety wire on drain screw at oil tank base. Remove drain screw.
- (6) Drain oil and dispose of it as per environmental regulations.
- (7) Remove oil filter from engine.
- (8) Lubricate mating sealing ring of new oil filter with engine oil.
- (9) Install new oil filter. Screw on new oil filter by hand.
- (10) Cut oil filter out of its casing (without producing any metal chips) and inspect filter material.
- (11) Renew gasket ring of drain screw on oil tank. Fit drain screw and tighten to 25 Nm (220 in.lbs). Secure drain screw with safety wire.
- (12) Refill oil tank with approx. 3 liters (3.17 quarts) of oil. For oil specification, refer to 12-10-00 and to ROTAX Aircraft Engines SI-912-016 / SI-914-019.
- (13) Reinsert oil dipstick, close filler cap, check for proper seating.
- (14) Run engine until normal operating temperature is reached. Shut down engine.

WARNING: HOT ENGINE COMPONENTS MAY CAUSE SKIN BURNS!

- (15) Check oil system for leaks.
- (16) Tighten oil filter again by hand.
- (17) Reinstall cowling (refer to 71-10-00).
- (18) Document oil change as prescribed.

INDUCTION AIR FILTER - SERVICING

1. General

- A. The air filter in the air induction system keeps dust and dirt particles from entering the system. It is located in the air filter box on the left (AT01-100) / right (AT01-200) inside of the lower cowling. To increase its effectiveness, the filter element should be treated with filter oil.
- B. The condition of the air filter element will be determined primarily by engine operating conditions. Therefore, it should be regularly inspected, cleaned and replaced, if necessary, at least every 100 hours or once a year, whichever comes first.

2. Air Filter Changing

- A. Air Filter Changing Procedure
 - (1) Remove cowling (AT01-100: upper cowling only / refer to 71-10-00).
 - (2) AT01-100 only: Remove the cover of the air filter box.
 - (3) Remove air filter element from air filter box and replace by a new one.
 - (4) AT01-100 only: Install the cover of the air filter box.
 - (5) Reinstall cowling (refer to 71-10-00).

3. Air Filter Cleaning

- A. Cleaning Procedures
 - (1) Remove air filter element as described above.
 - (2) Inspect air filter element for damage. If necessary renew filter element.

CAUTION: NEVER USE GASOLINE, STEAM, CAUSTIC LIQUIDS, DETERGENTS OR HIGH PRESSURE CLEANING.

- (3) Lightly tap and brush off surface dirt.
- (4) Spray filter cleaner on to entire element and let it soak for approx. 10 min.

WARNING: DO NOT DRY OVER NAKED FLAME OR WITH HOT AIR GUN. EXCESSIVE HEAT WILL SHRINK THE PORES OF THE FILTER MATERIAL RESTRICTING ENGINE AIR FLOW.

- (5) Rinse filter element with water from the inside out and let it dry naturally.

CAUTION: NEVER USE GEAR OIL, DIESEL OIL OR MOTOR OIL AS THEY ATTRACT WATER.

- (6) After cleaning, lubricate filter element evenly with filter oil spray or filter oil according to the manufacturer's instructions.
- (7) Ensure air filter box is clean and free of debris.
- (8) Install air filter as described above, pay attention to correct fit.

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COOLING SYSTEM - SERVICING

1. General

- A. The cooling system of the engine is designed for liquid cooling of the cylinder heads and ram air cooling of the cylinders. The cooling system of the cylinder heads is a closed circuit with an expansion tank. For a more detailed description and related maintenance procedures of the cooling system, refer to 75-20-00.
- B. Coolant
- (1) 50% antifreeze concentrate with additives against corrosion and 50 % pure water, or use of an equivalent premixed coolant. Refer to the ROTAX Service Instruction SI-912-016 / SI-914-019, latest revision, for further information on suitable coolants.
The maximum coolant quantity is 2,5 liters (2.6 U.S. quarts).

CAUTION: ENSURE THAT ONLY ANTIFREEZE CONCENTRATE CONTAINING ADDITIVES AGAINST CORROSION FOR LIGHT METAL ENGINES IS USED.

USE ANTIFREEZE CONCENTRATE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

- (2) The coolant must be renewed every three years.

WARNING: NEVER OPEN PRESSURE CAP OR RADIATOR CAP WHEN THE COOLING SYSTEM IS HOT. FOR SAFETY REASONS, COVER CAP WITH A CLOTH AND OPEN SLOWLY. SUDDEN OPENING OF THE CAP COULD PROVOKE THE EXIT OF BOILING COOLANT AND RESULT IN SEVERE SCALDING.

2. Adding Coolant

- A. Prior to adding coolant, the reason for the loss of the liquid must be investigated and corrected.
- B. Servicing Procedure
- (1) Remove engine cowling (refer to 71-10-00).
 - (2) When engine is cold, open pressure cap of the expansion tank and fill up the expansion tank completely.
 - (3) Run engine to operating temperature and allow engine to cool down before checking coolant level again. Replenish as necessary.
 - (4) Close pressure cap, check the condition of the rubber sealing rings.
 - (5) Install engine cowling (refer to 71-10-00).

3. Renewal of the Coolant

A. Servicing Procedure

- (1) When engine is cold, open pressure cap of the expansion tank and lowest coolant hose on the radiator and drain the coolant.
- (2) Reconnect coolant hose.
- (3) Refill freshly mixed coolant into expansion tank (highest point of the cooling system).
- (4) Install radiator tester and apply air pressure of 2 bar (30 psi). After 30 minutes there should be no noticeable pressure drop.
- (5) Reinstall pressure cap of the expansion tank.
- (6) Run engine to operating temperature and allow engine to cool down. Check system for leaks. Check coolant level and replenish as necessary.

4. Flushing the Cooling System

A. Servicing Procedure

- (1) When engine is cold, open pressure cap of the expansion tank and lowest coolant hose on the radiator and drain the coolant.
- (2) Flush system with a water hose at a max. pressure of 2 bar (30 psi).
- (3) Reconnect coolant hose.
- (4) Refill freshly mixed coolant into expansion tank (highest point of the cooling system).
- (5) Install radiator tester and apply air pressure of 2 bar (30 psi). After 30 minutes there should be no noticeable pressure drop.
- (6) Reinstall pressure cap of the expansion tank.
- (7) Run engine to operating temperature and allow engine to cool down. Check system for leaks. Check coolant level and replenish as necessary.

BRAKE SYSTEM - SERVICING

1. General

- A. Ground service for the brake system is limited to the replenishment of brake fluid. The brake fluid reservoir is located at the upper left firewall in the engine compartment.
- B. Refer to 32-40-00 for brake system bleeding / brake fluid change procedures.

2. Replenishing Hydraulic Fluid

A. Hydraulic Fluid Replenishing

CAUTION: ONLY USE HYDRAULIC FLUID WHICH CONFORMS TO MIL-H-5606 SPECIFICATION.

- (1) Remove upper cowling (refer to 71-10-00).
- (2) Remove filler plug from hydraulic fluid reservoir.

CAUTION: REMOVE EXCESSIVE HYDRAULIC FLUID IMMEDIATELY FROM PAINT SURFACES TO PREVENT CHEMICAL ATTACK.

- (3) Refill hydraulic fluid.
- (4) Install filler plug.
- (5) Install upper cowling (refer to 71-10-00).



TIRES - SERVICING

1. General

- A. The landing gear is equipped with 5.00-5 tires. Depending on the wheel/brake system installed, either 8 or 10 PLY rated tubeless tires (Beringer wheels) or 6 PLY rated tube-type tires (Cleveland / Grove wheels) are mounted. Required tire pressure is:
- (a) Main gear tire: 2,5 bar (36 psi)
 - (b) Nose gear tire: 2,5 bar (36 psi) (Beringer)
2,0 bar (29 psi) (Cleveland/Grove)

Checking tire pressure regularly is the most important preventive measure in tire service. Improper tire pressure causes deterioration in the ground handling behavior of the aircraft and reduces the service life of the tire. For tubeless tires there is a risk of bed blow out at under-pressure. Under-pressure is indicated by excessive wear in the tire shoulder area, over-pressure by excessive wear in the center of tire.

2. Tire Servicing

WARNING: WHILE SERVICING, DO NOT STAND IN FRONT OF EITHER BEAD AREA OF THE TIRE BECAUSE BURSTING TIRES HAVE THE TENDENCY TO RUPTURE ALONG THE BEAD. ALWAYS STAND AT A 90° ANGLE TO THE AXLE ALONG THE TIRE CENTERLINE.

- A. Service Notes
- (1) If possible, do not expose the tires permanently to intensive solar radiation.
 - (2) Ensure tire pressure gauges used are accurate.
 - (3) While checking tire pressure, the aircraft should be on level ground and the tire cold.
 - (4) A freshly mounted and installed tube-type tire should be closely monitored during the first hours of operation. Air trapped between the tire and the tube at the time of mounting could seep out, resulting in under pressure in the tire.
- B. Tire servicing comprises the following items:
- (1) Check tire pressure regularly. If necessary inflate or drain air.
 - (2) Examine tires for wear, cuts, bruises, and foreign bodies in the tread.
 - (3) Check proper location of the red slide marks.
 - (4) Always remove oil, grease and mud from tires with soap and water.



BATTERY - SERVICING**1. General**

- A. The battery should be serviced every 100 hours. In the case of heavy-duty operation or operation in cold regions, service intervals should be shorter.
- B. On aircraft equipped with Rotax 914F engine, an additional battery (BAT2) is installed. This battery has to be replaced annually.
- C. For installation/removal procedures and a capacity check of the battery, refer to 24-30-00.

2. Battery Servicing

NOTE: The battery should be serviced only after it has been removed from the aircraft.

- A. Battery servicing involves the following:
 - (1) Check battery and battery tray for any corrosion and dirt. Clean with clear water and dry.
 - (2) Check battery charging using a battery tester. Recharge battery if required.
 - (3) Clean and grease battery terminals (refer to 12-22-00).
 - (4) If existent, test ventilation tube for condition and obstructions.



SCHEDULED SERVICING - DESCRIPTION

1. General

- A. This section provides instructions necessary to carry out scheduled servicing, such as the periodic lubrication of aircraft components; external and internal cleaning. Service intervals are also provided. This section does not include lubrication procedures required to complete maintenance measures.



LUBRICANTS - DESCRIPTION

1. General

- A. This section assists with the selection of proper lubricants used to maintain the aircraft. To ensure a long service life of the lubricated components, it is recommended to always use pure and authorized lubricants.

2. Service Notes

- A. Use of the lubricants
- (1) Cleanliness is essential to good lubrication. Lubricants and required equipment must be kept clean.
 - (2) Store the lubricants in a secure place and in accordance with the manufacturer's specifications.
 - (3) Wipe grease fittings and areas to be lubricated with clean dry cloths before lubricating.
 - (4) When lubricating bearings which are vented, force grease into fitting until old grease is expelled. Remove old grease.
 - (5) Control cables should not be lubricated, unless to prevent corrosion.

3. Definition of "As Needed"

- A. In the following sections, time requirements for lubrication are shown either by a specific time interval or by „as needed“. The latter means that no interval is determined for this item. The mechanic decides when lubrication is required.
- B. If one or several of the following conditions occurs simultaneously, the component must be lubricated:
- (1) The old lubricant has been removed.
 - (2) Dirt or wear residue are visible near the movement contact area.
 - (3) While moving squeaks, grinding or other abnormal sounds are audible.
 - (4) During movement by the hand, jerky or restricted movement occurs throughout portions of travel range.

4. Recommended Lubricants:

A. Categories of lubricants, their specifications and typical areas of application are provided below.

| Abbreviation | Specification | Description |
|--------------|------------------------------|--|
| GR | MIL-PRF-81322 | Grease, wide temperature range |
| GH | MIL-PRF-23827 | Grease, aircraft and instrument, Gear and actuator screw |
| OG | MIL-L-7870 | Oil, general purpose |
| PL | VV-P-236 | Technical petrolatum |
| PG | SS-G-659 | Powdered graphite |
| GL | MIL-G-21164 | Grease, molybdenum disulfide, for high and low temperatures |
| OL | VV-L-800 | Light oil |
| SG | MIL-S-8660 or SAE AS 8660 | Thick silicone grease (-50°C to 200°C), (liquid grease in spray is not allowed) |
| CP | MIL-C81309E Type II & III | Corrosion preventive compound (corrosion protection of metal parts) |

B. Recommended Lubricants

| Abbreviation | Product | Manufacturer |
|--------------|---------------------|--|
| GR | AeroShell Grease 22 | Shell Oil Company |
| GL | AeroShell Grease 64 | Shell Oil Company |
| PL | Royco 1 DC 4 | Royal Lubricants Co. Inc. Dow Corning |

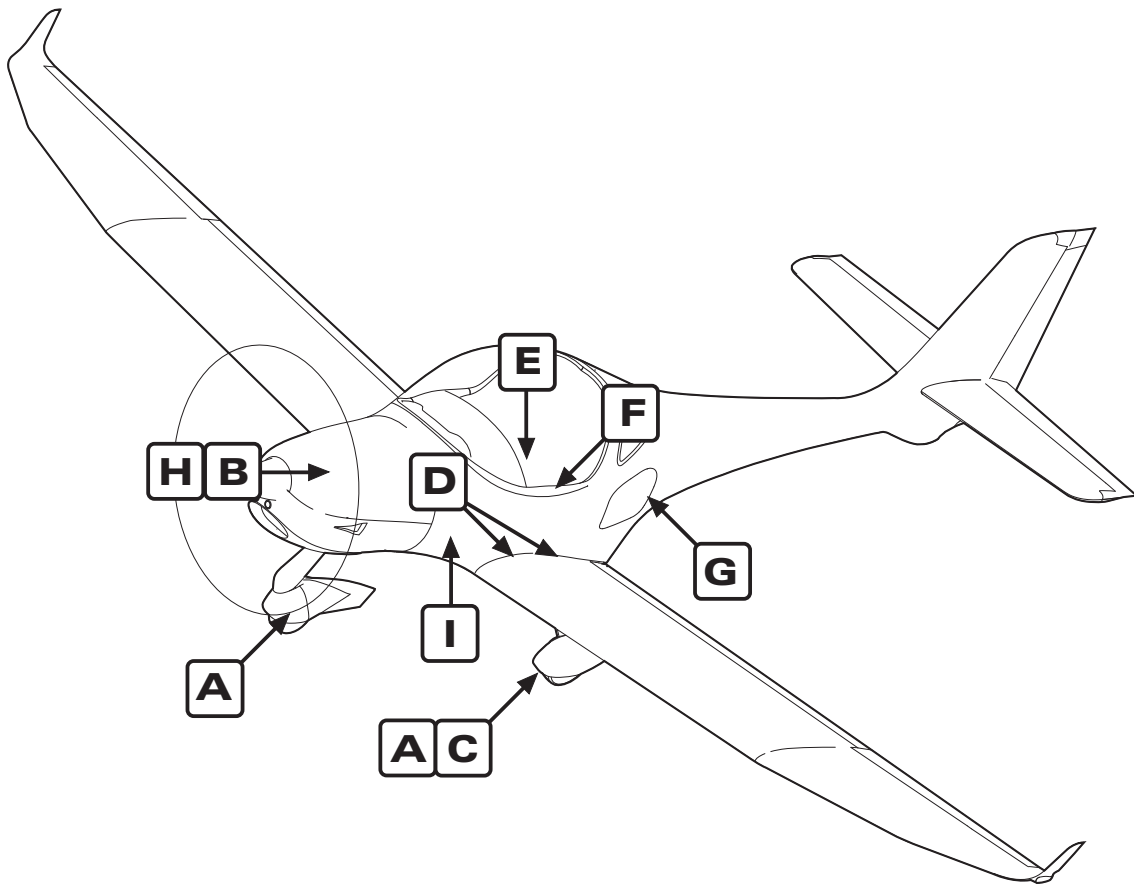
LUBRICATION - SERVICING

1. General

- A. This section contains information on lubrication intervals for components or parts.

2. Lubrication Chart

- A. Figure 201 shows the location of components or parts to be regularly lubricated. The following chart contains detailed information about the lubrication interval, the recommended lubricant and the dispensing equipment.



Lubrication Chart
Figure 301 (1)

| INDEX | ZONE | ACCESS PLATE | ITEM | LUBE TYPE (APPL.) | INTERVAL |
|----------|-----------------|--------------|--|--|---|
| A | 721, 722 720 | | Cleveland / Grove: Main wheel bearings Nose wheel bearings | GR (Hand) GR (Hand) | 500 h or annual |
| B | 120 | | Battery terminals | PL (Hand) | 100 h |
| C | 721 722 | | Cleveland / Grove: Brake anchor bolts Beringer: Brake caliper cylinder, seal groove, piston, piston seal | SG SG | annual or on assembly on assembly |
| D | 510 610 | | Wing attachment bolts | GL (Hand) or GR ¹⁾ (Hand) | 500 h / 5 years or on assembly |
| E | 211 | | Seat tracks | Grease | annual |
| F | 211 | | Canopy lock assembly | GR (Hand) | annual |
| G | 211 | | Cargo door lock | GR (Hand) | as needed |
| H | 120 | | Carburetor throttle shaft Engine / propeller control cables | Eng. oil (Oil can) OL, OG or Eng. oil | 100 h on assembly |
| I | 211 | | Rudder pedal bearing Beringer: Brake master cylinder rod ends | GR (Hand) GR (Grease gun) | annual annual |

¹⁾ If this type of lubricant is used the lubrication interval is reduced to annual.

Lubrication Chart
Figure 301 (2)



AIRCRAFT EXTERIOR - CLEANING AND CARE

1. General

- A. The good flight performance of the aircraft is achieved due to the modern construction and the use of specific materials. For efficient laminar flow, a clean surface is very important. Therefore, one should always keep the entire aircraft clean, but especially the leading edges of the wing.
- B. Information on preventive and protection measures, such as waxing specific surfaces, is also given.

2. Safety Precautions

- A. Read and adhere to all manufacturer's instructions, warnings and cautions on cleaning/solvent compounds used.
- B. Do not use silicone-based wax to polish the aircraft exterior.
- C. Do not clean the aircraft at ambient temperatures close to 0°C with water.
- D. Cover all lubricated parts during any cleaning process.
- E. During the application of cleaners containing solvents (e.g. cleaning the engine), the other surfaces must be covered carefully or otherwise protected.

3. Cleaning and Care of the Canopy

CAUTION: NEVER USE GASOLINE, BENZENE, ALCOHOL, ACETONE, CARBON TETRACHLORIDE, LACQUER THINNER OR GLASS CLEANER. THESE MATERIALS WILL SOFTEN THE PLASTIC AND MAY CAUSE IT TO CRAZE.

CAUTION: DO NOT USE CLEANERS WITH CHEMICAL SUPPLEMENTS WHOSE EFFECT ON THE ACRYLIC SURFACE IS UNKNOWN.

- A. Cleaning Canopy
 - (1) Park the aircraft in a hangar or in the shadows, avoid places with a lot of dust caused by wind or vehicles.
 - (2) To prevent scratches, wash the canopy carefully with plenty of mild soap and water, using the palm of the hand to feel and dislodge dirt and mud. A soft cloth, chamois leather or sponge should be used.
 - (3) Rinse thoroughly and then dry with a clean moist chamois.
- B. Care of the Canopy
 - (1) As a protection from mechanical and chemical actions and to cover slight cuts in the canopy, a polish or a wax for acrylic glass can be applied in accordance with the manufacturer's specifications.

NOTE: Clean surfaces before applying polish or wax.

4. Cleaning and Care of the Aircraft Exterior Surfaces

A. Procedure for cleaning the exterior surface of the aircraft

- (1) Park the aircraft in a hangar or in the shadows, avoid places with a lot of dust caused by wind or vehicles.
- (2) Close the canopy, close access / inspection doors.

CAUTION KEEP WATER AWAY FROM PITOT AND STATIC PORTS AND ELECTRICAL AND AVIONIC EQUIPMENT.

- (3) Flush away loose dirt with water.

CAUTION: DO NOT USE HARSH ABRASIVES, ALKALINE SOAPS OR DETERGENTS.

DO NOT USE CLEANING OR POLISHING AGENTS WHICH CONTAIN SILICONE.

- (4) Using a soft cleaning cloth or a sponge, wash with a mild, non-alkaline soap and water solution.
- (5) Rinse thoroughly with clean water and then dry with a soft cloth or chamois.

B. Care of the Aircraft Exterior Surface

- (1) To protect against corrosion, mechanical and chemical actions during operation, the exterior surfaces can be waxed with a good polish or aircraft wax in accordance with the manufacturer's instructions.

NOTE: Clean aircraft exterior before applying polish or wax.

- (2) After using cleaners containing any solvent or chemical, the relevant surfaces should always be waxed.
- (3) If the aircraft is operated in a coastal or other salt-water environment, it must be washed and waxed more frequently.
- (4) A heavier wax layer on the leading edges of the wings and tail and on the cowl nose and propeller spinner will reduce abrasion in these areas.

5. Cleaning and Care of Navigation / Position / Anti-Collision Lights

- A. Lights can be polished with a good wax and/or a liquid polishing compound. Refresh polish and hand buff once or twice a month.

- B. After using a polishing compound, the lights should be waxed.

CAUTION: UNDER NO CIRCUMSTANCES USE ANY PETROLEUM BASED PRODUCT TO CLEAN THE LIGHTS.

6. Cleaning the Engine

A. Safety and Maintenance Precautions

- (1) The engine should be cleaned during every 100-hour inspection.
- (2) Handle chemical cleaners and solvents with caution. Always read the manufacturer's instruction and follow them carefully.
- (3) Cleaning should be performed in the open air or in a well ventilated hangar.
- (4) Suitable fire fighting and safety equipment should be available.
- (5) If compressed air is used to apply solvents or to dry components, the lowest practical pressure level should be used.

B. Engine Cleaning Procedures

WARNING: DO NOT SMOKE OR EXPOSE A FLAME WITHIN 100 FEET OF THE CLEANING AREA.

- (1) Remove cowling (refer to 71-10-00).

WARNING: DO NOT USE GASOLINE OR OTHER HIGHLY FLAMMABLE SUBSTANCES.
DO NOT ATTEMPT TO WASH AN ENGINE WHEN IT IS STILL HOT OR RUNNING.

CAUTION: DO NOT DIRECT CLEANING SOLVENTS OR WATER STREAMS AT OPENINGS OF THE ALTERNATOR OR THE STARTER.

- (2) Carefully cover the openings of the alternator and the starter.
- (3) If the engine is contaminated with salt or corrosive chemicals, first flush engine compartment with water.
- (4) Apply a suitable solvent or cleaning agent to the engine compartment in accordance with the manufacturer's instructions.
- (5) Leave the solvent on the engine for approx. ten minutes.

CAUTION: CLEANING AGENTS SHOULD NEVER BE LEFT IN ENGINE COMPARTMENT. CLEANER OR SOLVENT RESIDUE MAY CAUSE DAMAGE TO COMPONENTS SUCH AS NEOPRENE SEALS AND SILICONE FIRE SLEEVES.

- (6) Rinse thoroughly with clean warm water.
- (7) Allow engine to dry or dry it using compressed air.
- (8) Remove all protection coverings.
- (9) Re-lubricate all control arms and moving parts as required.
- (10) Reinstall cowling (refer to 71-10-00).

WARNING: DO NOT OPERATE THE ENGINE UNTIL EXCESS SOLVENT HAS EVAPORATED OR OTHERWISE BEEN REMOVED.

BEFORE ROTATING THE PROPELLER BY HAND, ENSURE IGNITION SWITCH IS OFF AND THE THROTTLE IS CLOSED.

CAUTION: DO NOT ROTATE THE PROPELLER CLOCKWISE.

(11) Before starting the engine, rotate the propeller by hand no less than five complete revolutions.

7. Cleaning and Care of the Propeller

- A. Clean propeller if necessary with any car wash solution or equivalent. This should be done at least every 50 hours.
Remove grease and dirt with a commercial detergent, which is suitable for polyurethane-lacquers.

CAUTION: IT IS IMPORTANT TO AVOID MOISTURE PENETRATING INTO THE WOODEN CORE.

Small scratches and nicks should be dealt with during routine maintenance applying a coating of water-resistant varnish, preferably Polyurethane.
Replace damaged or missing PU strips on the propeller leading edge as soon as possible.

8. Cleaning the Landing Gear

- A. The landing gear struts and wheel fairings should be washed with clear water or with a mild detergent and water.
- B. Wheels, axles, spacers and brake parts are protected from corrosion with an anodizing coating. This thin coating does not protect against basic agent with pH > 9.

CAUTION: CLEANING THE WHEEL AND BRAKE PARTS WITH BASIC AGENT MAY REMOVE TOTALLY THE ANODIZING COATING. ACID AGENT MAY ALSO ATTACK THE ANODIZING.

Wheel and brake parts should be cleaned using water and soap or dry clothes only.

- C. After cleaning, the tires can be treated with standard tire protection.
- D. Protect the disc and pads from brake fluid contamination. Brake pads are porous and cannot be cleaned if contaminated by brake fluid, they must be replaced by new ones. Clean the disc separately from the brake calipers, using thinner directly on the brake caliper may cause damage to the seals.
- E. Depending on operating conditions, additional corrosion protection of wheels and brakes is recommended. Refer to Beringer Aero maintenance working card MM-00-004 for further information.

AIRCRAFT INTERIOR - CLEANING AND CARE

1. General

- A. This section provides the information required to clean the aircraft interior properly. Several recommended types of cleaning agents for different materials and the relevant cleaning and care procedures are also described below.

2. Aircraft Interior Cleaning

- A. Interior panels such as sidewalls, door panels etc. may be cleaned using a mild detergent solution. Stubborn deposits may be removed using a suitable material cleaner in accordance with manufacturer's instructions. If in doubt, apply a small amount of cleaner to a small unobtrusive part and test it for reaction.

3. Cleaning the Instrument Panel

- A. The instrument panel, center pedestal and instruments/displays can be cleaned with a soft cotton cloth dampened with clean water. Ensure that the ALT1/BAT switch is in OFF position. Switch on the electrical systems and components of the aircraft only after the instrument panel has dried completely.

CAUTION: DO NOT USE ANY CHEMICAL CLEANING AGENTS. CARE SHOULD BE TAKEN TO AVOID SCRATCHING THE SURFACE OF DISPLAYS.

4. Cleaning the Cabin Floor

- A. The floor area, the area under the seats and the baggage compartment should be cleaned regularly with a vacuum.
- B. The carpet is made of high-quality, dirt repellent material and usually requires only a minimum of maintenance. If it becomes soiled, a standard carpet cleaner can be used.

5. Cleaning the Seats

- A. Seat upholstery is made of a dirt repellent, hardwearing material. They should, however, be cleaned regularly to keep them in good condition. The following recommendations should be followed.
- B. To remove dust and loose dirt from the seats, first clean with a vacuum.

For cleaning and care use a foam type detergent, such as is available for car seats. Follow the manufacturer's instructions.

- C. Blot up any liquid spilled promptly with an absorbent tissue or cloth. Press the blotting material firmly against the upholstery and hold for several seconds. Continue blotting until no more liquid is absorbed.

Scrape off sticky materials cautiously with a dull knife, then clean area as required.

Oil spots may be removed with household spot removers. Before using, read the instructions, test it on an obscure place on the seat and use it sparingly.

UNSCHEDULED SERVICING

1. General

- A. This section contains those instructions necessary to carry out unscheduled servicing for example: removing ice and snow from a parked aircraft.

2. Removing Snow and Ice

CAUTION: DO NOT REMOVE SNOW AND ICE FROM SURFACES USING SHARP-EDGED INSTRUMENTS.

NEVER USE DE-ICING FLUIDS TO REMOVE SNOW OR ICE DEPOSITS FROM AIRCRAFT SURFACES.

HEATED DE-ICING FLUIDS CAN DAMAGE COMPOSITE STRUCTURES DUE TO EXTREME TEMPERATURE CHANGE. SOME DE-ICING FLUIDS MAY ALSO DAMAGE THE ACRYLIC GLASS OF THE CANOPY.

- A. After snowfall, the snow should be removed immediately from the surface of the aircraft to prevent it from refreezing on the surface and/or in slits and gaps after it has started to thaw.

B. Procedure

- (1) Remove loose snow from the wing surface with a broom, working outwards from the wing root.

NOTE: The areas between wings and ailerons and stabilizers and rudders must be treated particularly carefully.

CAUTION: DO NOT DAMAGE THE ANTENNAE.

- (2) Free canopy of snow.
(3) Remove snow from cowling, fuselage and empennage.
- C. In the case of ice, it is recommended to defrost the aircraft in a heated hangar. Allow all aircraft surfaces to completely dry prior to flight to prevent control surfaces from freezing.





**AQUILA AT01-100/200
MAINTENANCE MANUAL**

**CHAPTER 32
LANDING GEAR**



TABLE OF CONTENTS

| <u>Title</u> | <u>Chapter Section Subject</u> | <u>Page</u> | <u>Effectivity</u> |
|---|--|-------------|--------------------|
| LANDING GEAR - GENERAL | 32-00-00 | 1 | |
| Introduction | 32-00-00 | 1 | |
| General Description | 32-00-00 | 1 | |
| MAIN LANDING GEAR - DESCRIPTION..... | 32-10-00 | 1 | |
| Introduction | 32-10-00 | 1 | |
| Description and Operation | 32-10-00 | 1 | |
| MAIN LANDING GEAR - MAINTENANCE | 32-10-00 | 201 | |
| Main Gear Leg Removal/Installation | 32-10-00 | 201 | |
| NOSE LANDING GEAR - DESCRIPTION..... | 32-20-00 | 1 | |
| Introduction | 32-20-00 | 1 | |
| Description and Operation | 32-20-00 | 1 | |
| NOSE LANDING GEAR - MAINTENANCE | 32-20-00 | 201 | |
| Nose Gear Leg Removal/Installation | 32-20-00 | 201 | |
| Wheel Fairing "High Speed" Removal/Installation | 32-20-00 | 201 | |
| WHEELS AND BRAKES - DESCRIPTION..... | 32-40-00 | 1 | Beringer |
| Introduction | 32-40-00 | 1 | Beringer |
| Description and Operation | 32-40-00 | 1 | Beringer |
| WHEELS AND BRAKES - MAINTENANCE | 32-40-00 | 201 | Beringer |
| General | 32-40-00 | 201 | Beringer |
| Tools, Equipment and Material | 32-40-00 | 201 | Beringer |
| Main Gear Wheel Removal/Installation | 32-40-00 | 201 | Beringer |
| Nose Gear Wheel Removal/Installation | 32-40-00 | 201 | Beringer |
| Wheel Disassembly/Assembly/Tire Change | 32-40-00 | 208 | Beringer |
| Disc Clip Removal/Installation | 32-40-00 | 213 | Beringer |
| Wheel Bearing Removal/Installation | 32-40-00 | 214 | Beringer |
| Brake Pad Replacement | 32-40-00 | 214 | Beringer |
| Brake Disc Replacement | 32-40-00 | 216 | Beringer |
| Brake Master Cylinder Removal/Installation | 32-40-00 | 217 | Beringer |
| Brake Caliper Disassembly/Assembly | 32-40-00 | 217 | Beringer |
| Brake System Bleeding / Brake Fluid Change | 32-40-00 | 221 | Beringer |
| Brake System Adjustment/Test | 32-40-00 | 221 | Beringer |
| Brake System Conditioning | 32-40-00 | 222 | Beringer |
| WHEELS AND BRAKES - DESCRIPTION | 32-40-00 | 1 | Cleveland/Grove |
| Introduction | 32-40-00 | 1 | Cleveland/Grove |
| Description and Operation | 32-40-00 | 1 | Cleveland/Grove |



**AQUILA AT01-100/200
MAINTENANCE MANUAL**

TABLE OF CONTENTS - CONTINUED

| <u>Title</u> | <u>Chapter Section Subject</u> | <u>Page</u> | <u>Effectivity</u> |
|--|--|-------------|--------------------|
| WHEELS AND BRAKES - MAINTENANCE | 32-40-00 | 201 | Cleveland/Grove |
| Main Gear Wheel Removal/Installation | 32-40-00 | 201 | Cleveland/Grove |
| Main Gear Wheel Disassembly/Assembly | 32-40-00 | 201 | Cleveland/Grove |
| Nose Gear Wheel Removal/Installation | 32-40-00 | 203 | Cleveland/Grove |
| Nose Gear Wheel Disassembly/Assembly | 32-40-00 | 203 | Cleveland/Grove |
| Brake Master Cylinder Removal/Installation | 32-40-00 | 205 | Cleveland/Grove |
| Brake Caliper Removal/Installation | 32-40-00 | 205 | Cleveland/Grove |
| Brake Disc Removal/Installation | 32-40-00 | 207 | Cleveland/Grove |
| Brake Lining Replacement | 32-40-00 | 207 | Cleveland/Grove |
| Brake System Bleeding | 32-40-00 | 208 | Cleveland/Grove |
| Adjustment/Test | 32-40-00 | 208 | Cleveland/Grove |

LANDING GEAR - GENERAL

1. Introduction

- A. This chapter describes units and components which furnish a means of supporting and steering the aircraft on the ground, including the main and nose landing gears, brakes, wheels and tires.

2. General Description

- A. The aircraft has a fixed tricycle landing gear with a steerable nose gear. Its wheels are either manufactured by Beringer, Cleveland or Grove. The wheels are equipped with either "Highspeed" aerodynamic wheel fairings to decrease drag forces or "Softfield" wheel fairings to avoid soiling of the wing and fuselage.

The main gear struts are leaf springs which are attached to the center section of fuselage using two mounting brackets each. The nose gear is a tubular strut which is attached to the engine mount and linked through the rudder pedals to provide ground control. For shock absorption an elastomer package is installed between nose gear strut and nose wheel fork. Hydraulically actuated disc type brakes are installed on the inboard side of the main gear wheels.

B. Descriptive Data

| | |
|---|--|
| Tire type: | 8 ply or 10 ply tubeless (Beringer) 6 ply tube-type (Cleveland / Grove) |
| Wheelbase: | 1,685 m (5,53 ft) |
| Track width (max. fuel, no persons on board): | 1,938 m (6,36 ft) |
| Main tire size: | 5.00x5 |
| Nose tire size: | 5.00x5 |
| Main tire pressure: | 2,5 bar (36 psi) |
| Nose tire pressure: | 2,5 bar (36 psi) (Beringer) 2,0 bar (29 psi) (Cleveland / Grove) |
| Max. nose gear wheel fork deflection: | +/- 20° |
| Max. brake system operating pressure: | 60 bar (870 psi) (Beringer) 69 bar (1000 psi) (Cleveland / Grove) |



MAIN LANDING GEAR - DESCRIPTION

1. Introduction

- A. The main landing gear consists of the main landing gear struts, the wheels with brakes and the wheel fairings. The wheel fairings are standard equipment. The main gear struts are cantilever spring legs made of spring steel and carry the landing loads. The aircraft is serially equipped with disc type brakes.

2. Description and Operation

- A. Each main landing gear strut is attached to the fuselage structure by means of two aluminum mounting brackets. These brackets are bolted to the main landing gear ribs, which are bonded into the fuselage belly.
- The struts are mounted to the inner bracket with a special single bolt. The outer mounting bracket consists of two parts; the upper part on top of the main strut and the lower retaining bar below the main strut. The retaining bar is attached to the upper part of the bracket with two bolts. This arrangement ensures correct absorption of the landing loads, similar to a rocker plate.
- To prevent chafing damage and to allow angular movement of the struts, synthetic rubber inserts have been installed between the contact surfaces.
- The wheel axle is attached to the lower end of the landing gear strut with four bolts.
- A mounting plate for the wheel fairing is installed on the inboard side of the lower end of each main landing gear strut using the bolts to secure the wheel axle to strut.



MAIN LANDING GEAR - MAINTENANCE

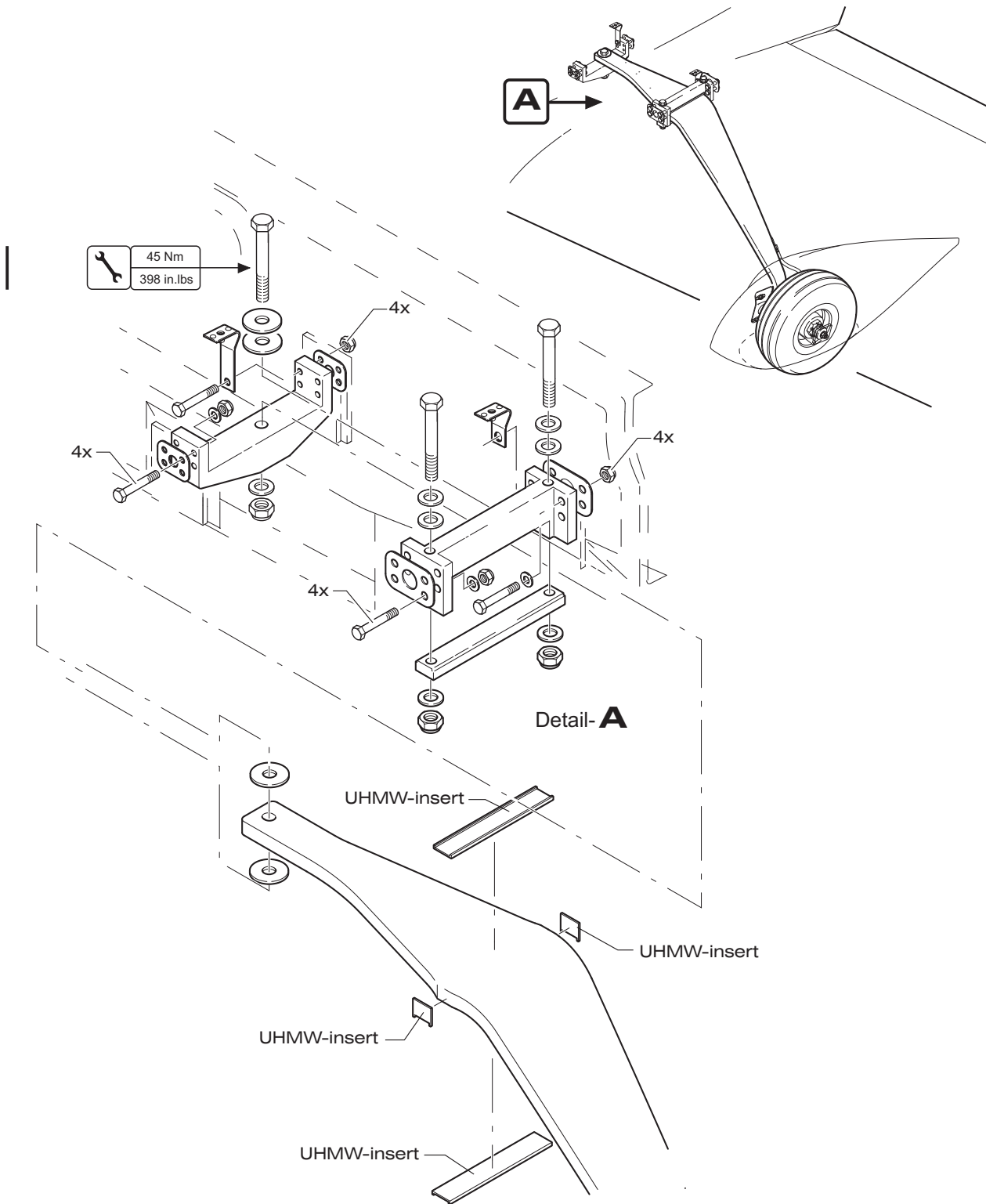
1. Main Gear Leg Removal/Installation

A. Remove a Main Gear Leg

- (1) Gain access to the appropriate landing gear mounting brackets (refer to 25-00-00).
- (2) Lift aircraft (refer to 07-10-00).
- (3) Remove screws/nut securing wheel fairing to wheel assembly and remove fairing.
- (4) Remove brake line and brake caliper from main gear leg (refer to 32-40-00).
- (5) Remove grounding connection from inboard end of the main gear leg.
- (6) Remove bolt and nut attaching inboard end of main gear leg to inner mounting bracket.
- (7) Loosen two bolts securing main gear leg retainer clamp to outer mounting bracket.
- (8) Pull main gear leg from fuselage.

B. Install a Main Gear Leg

- (1) Slide main gear leg into place so the leg retainer clamp is supporting the leg.
- (2) Install bolt attaching inboard end of main gear leg to inner mounting bracket in the fuselage belly. Ensure flexible washers and washers are in correct position. Torque to to 45 Nm (398 in.lbs).
- (3) Tighten two bolts securing main gear leg retainer clamp to outer mounting bracket.
- (4) Reconnect grounding connection to inboard end of the main gear leg.
- (5) Reinstall brake caliper, brake line and wheel (refer to 32-40-00).
- (6) Reinstall wheel fairing.
- (7) Test brake system and ensure brakes are operating properly (refer to 32-40-00).



Main Gear Leg Installation
Figure 201

NOSE LANDING GEAR - DESCRIPTION

1. Introduction

- A. The aircraft has a steerable nose landing gear which is equipped with a shock absorber and wheel fairing.

2. Description and Operation

- A. The nose gear consists of a welded tubular steel strut pivotally attached to the engine mount. The forward bottom end of the nose gear strut has a horizontal pivot for the nose wheel fork. The nose wheel fork with the nose gear wheel can thus only move up and down. Shock absorption is provided by a shock absorber unit equipped with stacked rubber disks, which is installed between nose wheel fork and nose gear strut. Nose wheel steering is accomplished through use of the rudder pedals. Spring loaded steering rod assemblies connect the nose gear steering arm at the upper end of the nose gear strut to arms on the rudder pedals. Steering is afforded up to approximately 20 degrees each side of neutral.



NOSE LANDING GEAR - MAINTENANCE

1. Nose Gear Leg Removal/Installation (Figure 201)

A. Remove Nose Gear Leg

- (1) Jack aircraft or weight tail of aircraft to raise nose wheel (refer to 07-00-00).
- (2) Remove engine cowling (refer to 71-10-00).
- (3) Disconnect retaining springs at the nose gear steering arm.
- (4) Disconnect steering rod assemblies at nose gear steering arm.
- (5) Remove nut securing upper end of the nose gear strut to engine mount.
- (6) Remove pivot bolt securing nose gear strut assembly to the engine mount at the bracket.
- (7) Remove nose gear leg from the aircraft downwards.

B. Install Nose Gear Leg

- (1) Place nose gear leg in position.
- (2) Install pivot bolt securing nose gear strut assembly to the engine mount at the bracket.
- (3) Install nut securing upper end of the nose gear strut to engine mount.
- (4) Connect steering rod assemblies to the nose gear steering arm.
- (5) Connect retaining springs to the nose gear steering arm.
- (6) Install engine cowling (refer to 71-10-00)

2. Wheel Fairing "High Speed" Removal/Installation

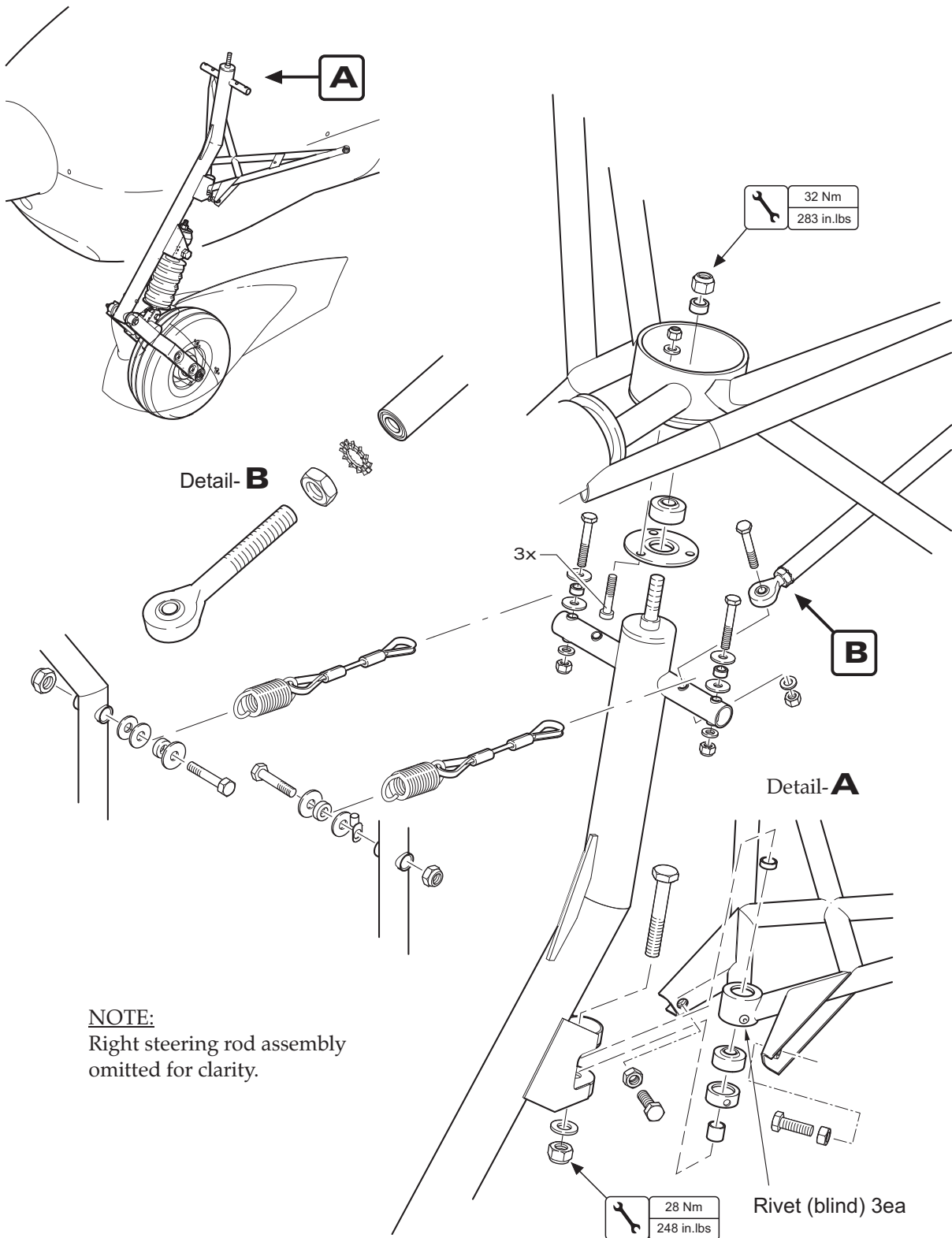
NOTE: The threaded pins are secured to the nose wheel fork with high strength threadlocker (Loctite 648 or equivalent) and should protrude the nose wheel for by approx. 13 mm (upper pins) resp. 16 mm (lower pins). The threaded pins don't need to be removed for wheel fairing removal/installation.

A. Remove Wheel Fairing

- (1) Remove nuts and washers securing wheel fairing to nose wheel fork.
- (2) Carefully bend apart and remove front part of the wheel fairing over threaded pins.
- (3) Carefully bend apart and remove rear part of the wheel fairing over threaded pins.

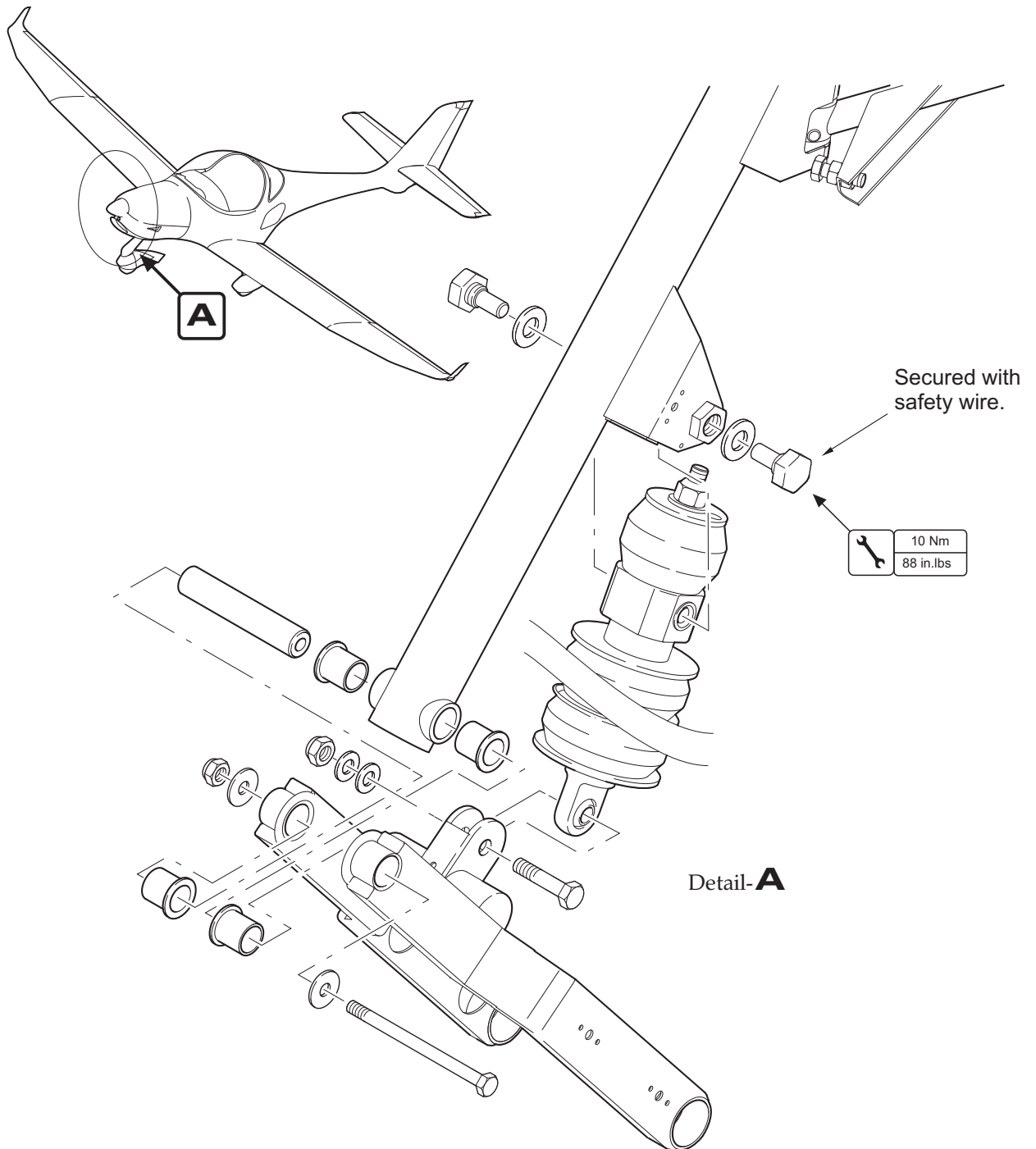
B. Install Wheel Fairing

- (1) Place rear part of the wheel fairing in position. Carefully bend apart wheel fairing and install over threaded pins.
- (2) Place front part of the wheel fairing in position. Carefully bend apart wheel fairing and install over threaded pins.
- (3) Secure wheel fairing using washers and nuts.

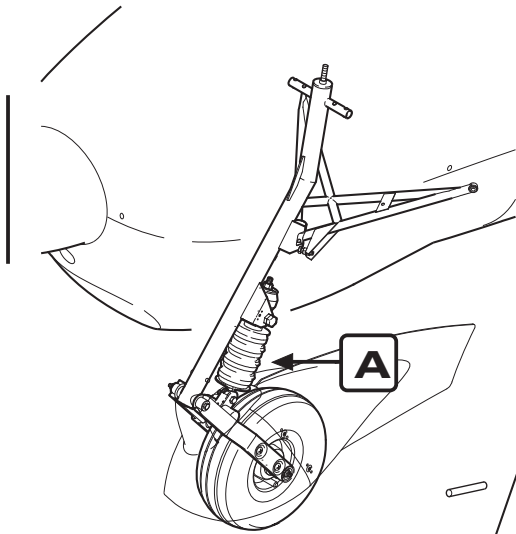


NOTE:
Right steering rod assembly omitted for clarity.

Nose Gear Leg Installation
Figure 201

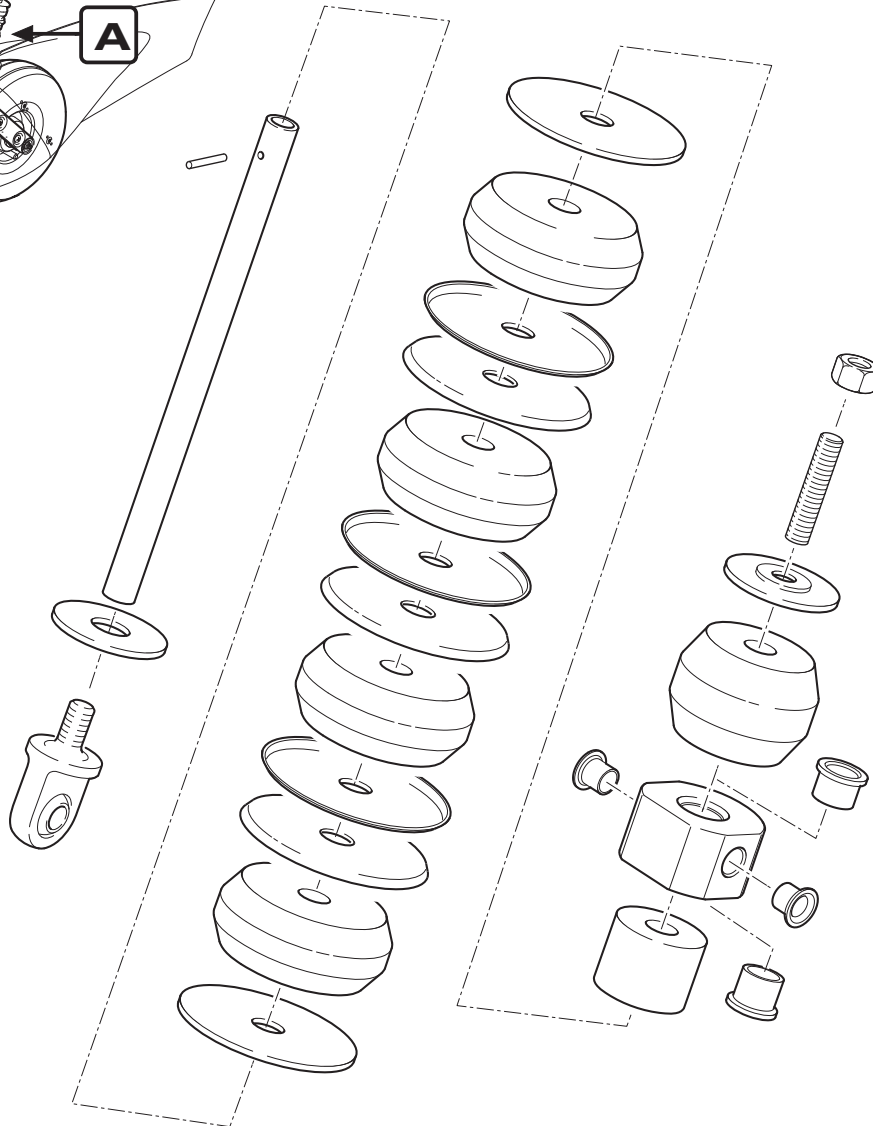


Damper Assy and Nose Wheel
Fork Installation
Figure 202



NOTE:

Damper assembly with 4 rubber elements shown.
If a reinforced nose wheel fork is installed, a damper assembly with 3 rubber elements has to be used (refer to SB-AT01-037).



Detail-**A**

Damper Assembly
Figure 203

WHEELS AND BRAKES - DESCRIPTION

1. Introduction

- A. This section describes components and maintenance of the wheels and the brake system.
- B. For tire specifications, refer to "Landing Gear - General".
- C. For more detailed information on the installed wheels and brakes, refer to the maintenance guide for Beringer products, P/N SM-00, latest revision (www.beringer-aero.com).

2. Description and Operation

- A. The wheels are made of aluminium alloy and consist of two wheel halves. RF-005 and RA-002 wheels also consist of a separate central spacer. Inner and outer wheel flanges are held together by screws secured by threadlocker. A thin anodizing coating protects aluminium from corrosion. The wheels are designed for tubeless tires using large O-rings between the parts. Bearings are factory greased and sealed.
The main wheels are made to be used together with a brake assembly and disc.

- B. The aircraft has two separate brake circuits operated by pushing the upper part of the rudder pedals. The pilot's and co-pilot's left toe brake pedals operate the left circuit by supplying pressure to the brake caliper on the left main landing gear wheel. The right toe brake pedals operate the right caliper. Pressing both the pilot's and co-pilot's brake pedal will increase brake pressure.

The parking brake valve is located in the center console. It contains two valves which can seal the brake pressure into the calipers. This keeps the brakes ON. The pressure will reduce in time and the brakes will slowly release.

The brake fluid reservoir is located on the left hand side in front of the firewall. It is connected to the inlets of the pilot's master brake cylinders. Their outlets are connected to the inlets of the master brake cylinders on the co-pilot's rudder pedals, the outlets of which are connected to the parking brake valve. The parking brake valve connects to the brake calipers. All brake lines are stainless steel braided with PTFE inner tube and stainless fittings.

The brake caliper is made of aluminium alloy and protected against corrosion by a thin anodizing coating. Calipers consist of two separate parts bolted together: the casing with pistons and the back plate. To assure equal pressure on both brake pads, disc is floating and brake pads can slide on 2 of the 3 assembly screws. Brake casing is equipped with the same inlet port on each side to be used on left or right strut of the aircraft. The unused port is sealed by a bleeding screw.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system



WHEELS AND BRAKES - MAINTENANCE

1. General

- A. This section gives basic maintenance instructions for Beringer wheels and brakes. For further information refer to the Beringer products maintenance guide, P/N SM-00, latest revision, and the referenced documents (www.beringer-aero.com).

2. Tools, Equipment and Material

| | Quantity | Equipment | Parts No. | Manufacturer |
|---------------|----------|-----------------------------------|-----------|------------------------|
| 3.B. and 4.B. | - | waterproof grease | - | commercially available |
| 5.B. | 1 | plywood tool with conical bushing | OT-002 | Beringer Aero / AQUILA |
| 5.A. and B. | - | tire lubricant (silicone free) | - | commercially available |
| 12.A. and B. | 1 | brake bleeding kit | ONC01 | Beringer Aero / AQUILA |

3. Main Gear Wheel Removal/Installation (Figure 201)

A. Remove a Main Gear Wheel

- (1) Jack aircraft or appropriate main gear wheel (refer to 07-00-00).
- (2) Remove screws/nuts securing wheel fairing and remove wheel fairing.
- (3) Remove cotter pin and axle nut. Cut and remove disc safety wire.
- (4) Pull off wheel from axle.

B. Install a Main Gear Wheel

- (1) Position brake disc in the brake caliper (same orientation as before).
- (2) Greasing the axle on the bearing surfaces (e.g. Bel-Ray waterproof grease) is recommended for corrosion protection. Do not contaminate braking surfaces such as pads and discs.
- (3) Slide wheel on to axle while placing brake disc ears in wheel slots.
- (4) Torque axle nut to 30 Nm (265 in.lbs) and secure with new cotter pin.
- (5) Install new brake disc safety wire.
- (6) Install wheel fairing.

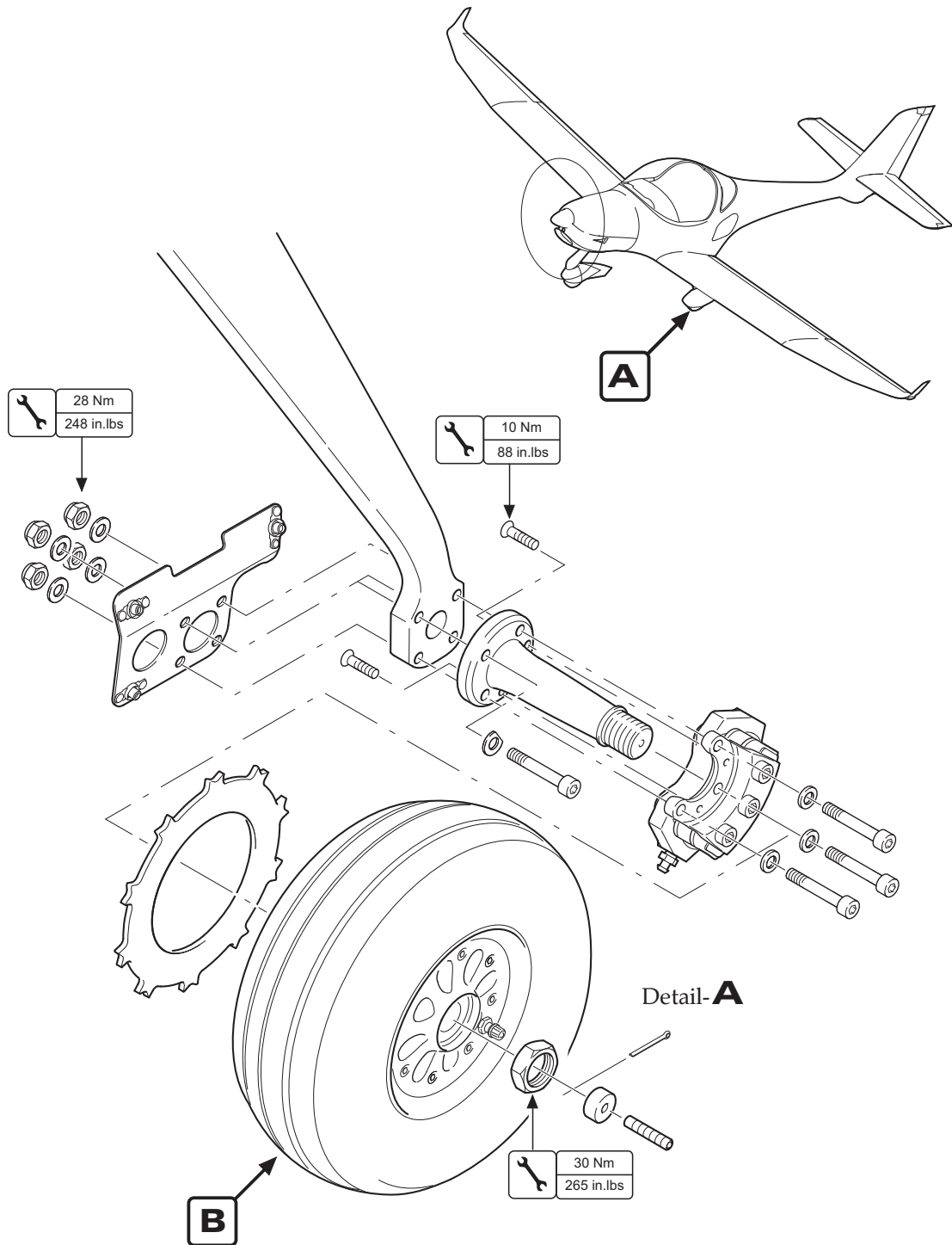
4. Nose Gear Wheel Removal/Installation (Figure 202)

A. Remove Nose Gear Wheel

- (1) Jack aircraft or weight tail of aircraft to raise nose wheel (refer to 07-00-00).
- (2) Remove screws/nuts securing wheel fairing and remove wheel fairing.
- (3) Remove axle bolt from wheel fork.
- (4) Remove cap bushings from wheel fork arms.
- (5) Remove nose wheel assembly from wheel fork.
- (6) Remove axle and spacer sleeve from wheel.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

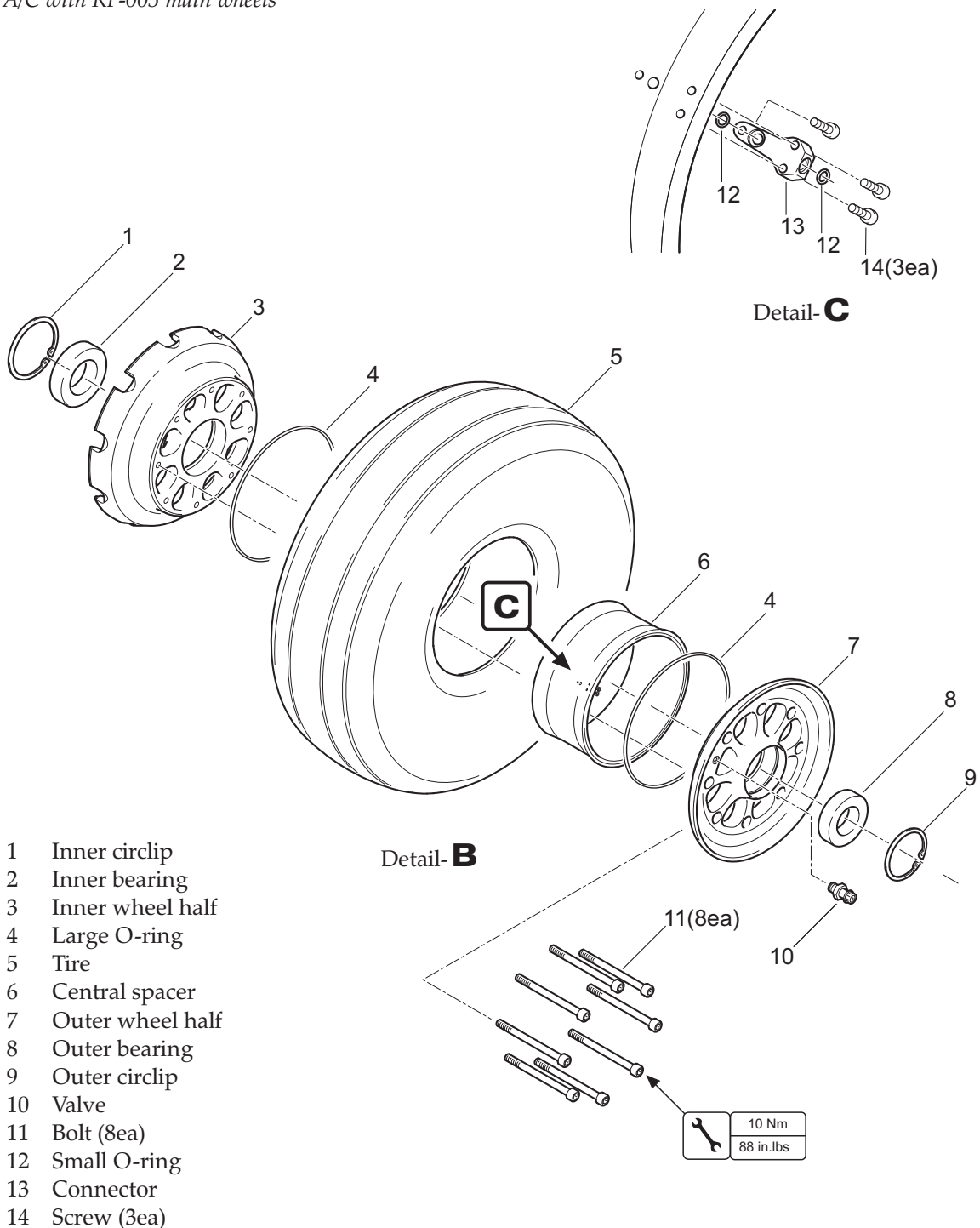


Main Gear Wheel Installation / Disassembly
Figure 201 (1)

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

***On A/C with RF-005 main wheels*



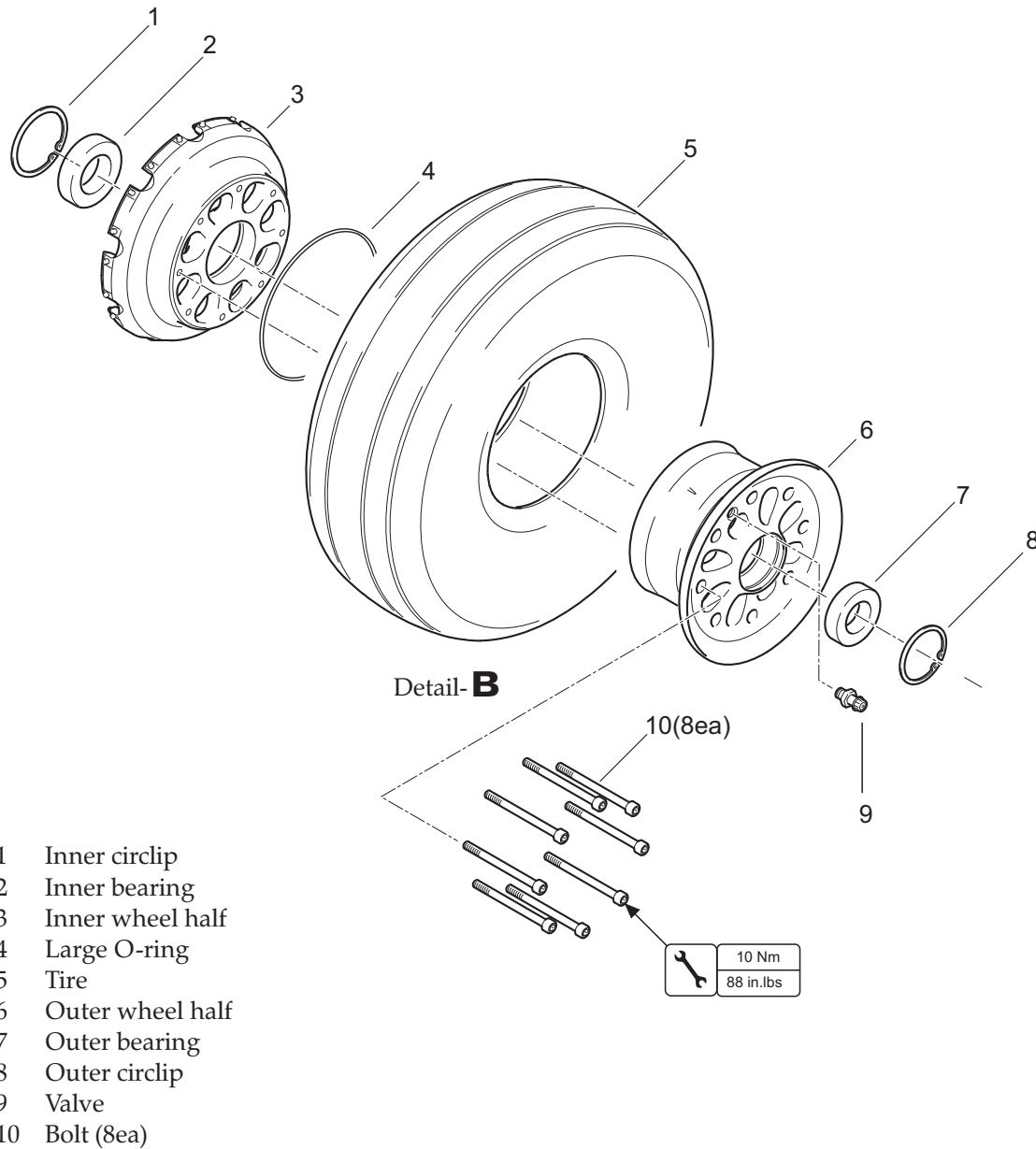
- 1 Inner circlip
- 2 Inner bearing
- 3 Inner wheel half
- 4 Large O-ring
- 5 Tire
- 6 Central spacer
- 7 Outer wheel half
- 8 Outer bearing
- 9 Outer circlip
- 10 Valve
- 11 Bolt (8ea)
- 12 Small O-ring
- 13 Connector
- 14 Screw (3ea)

Main Gear Wheel Installation / Disassembly
Figure 201 (2)

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

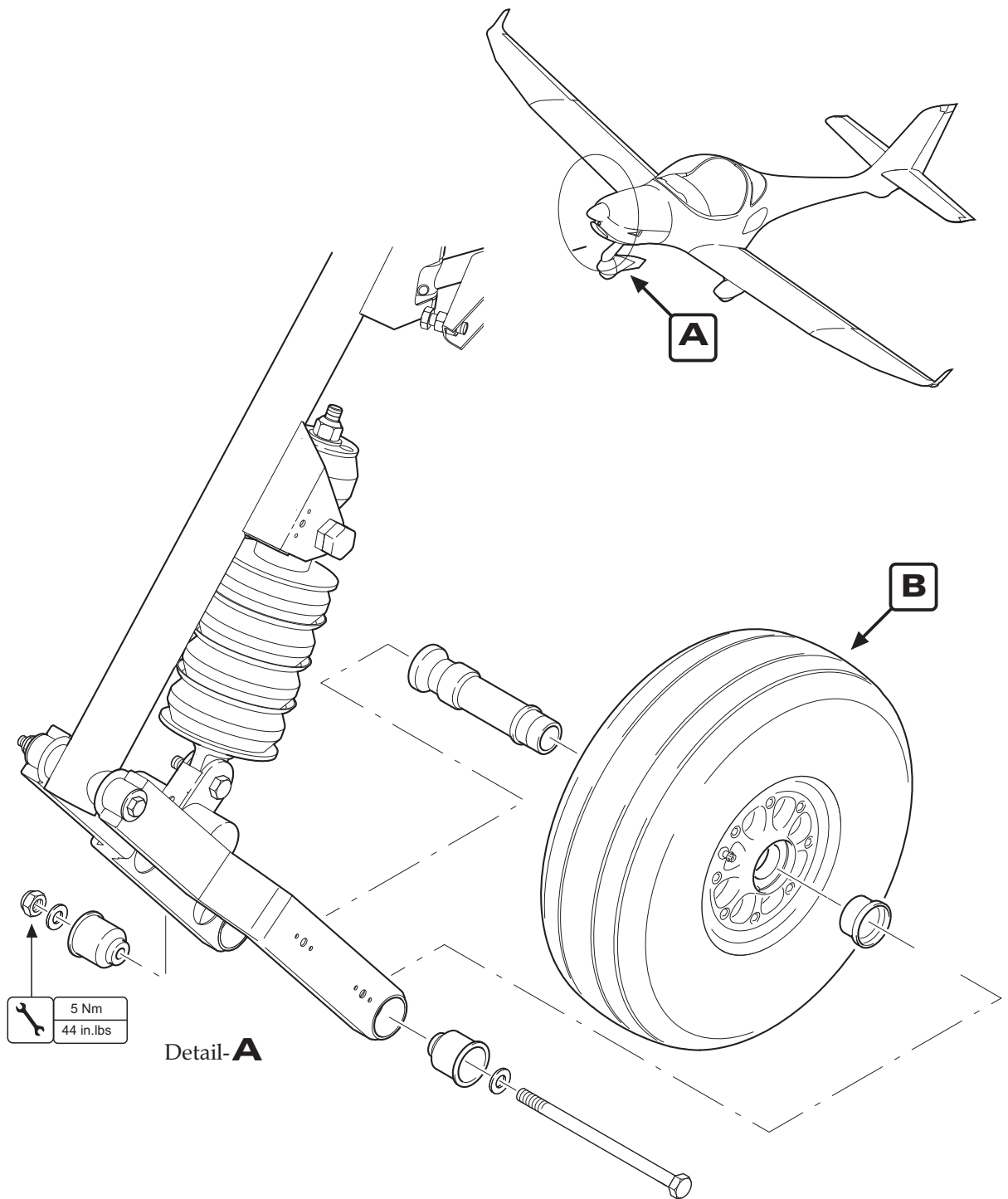
***On A/C with RF-018 main wheels*



Main Gear Wheel Installation / Disassembly
 Figure 201(3)

EFFECTIVITY

Aircraft equipped with Beringer wheel / brake system

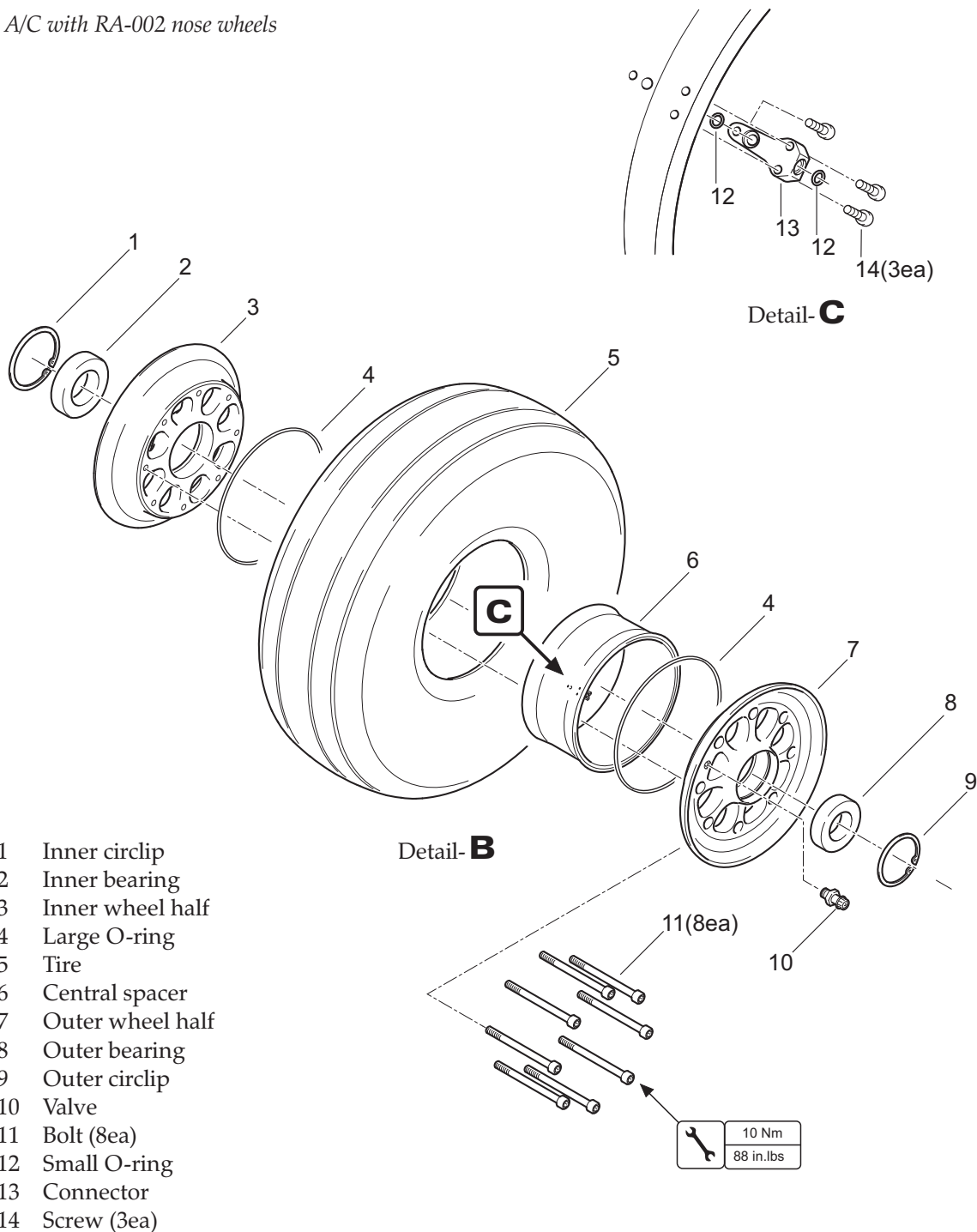


Nose Gear Wheel Installation / Disassembly
Figure 202(1)

EFFECTIVITY

Aircraft equipped with Beringer wheel / brake system

***On A/C with RA-002 nose wheels*



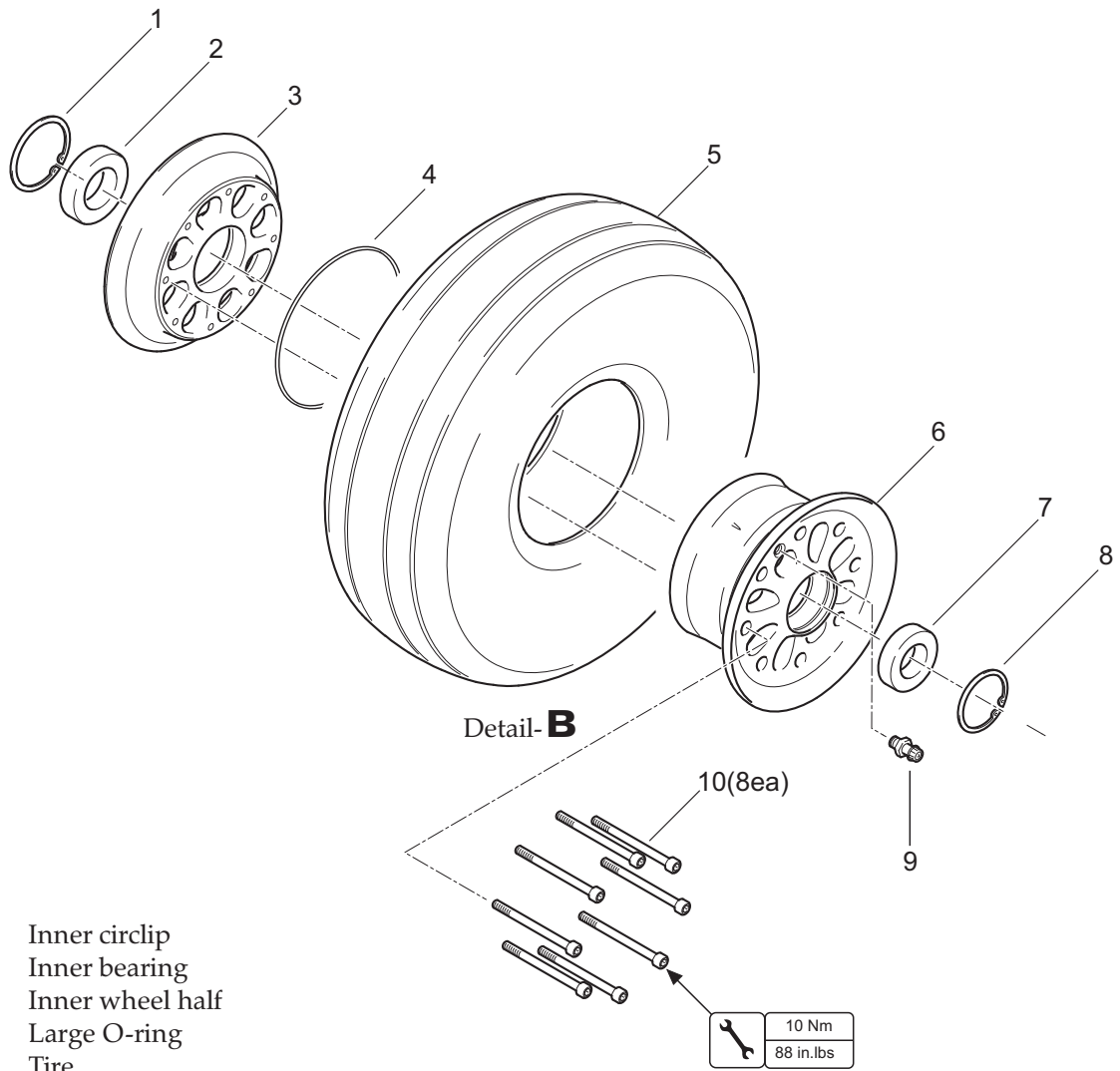
- 1 Inner circlip
- 2 Inner bearing
- 3 Inner wheel half
- 4 Large O-ring
- 5 Tire
- 6 Central spacer
- 7 Outer wheel half
- 8 Outer bearing
- 9 Outer circlip
- 10 Valve
- 11 Bolt (8ea)
- 12 Small O-ring
- 13 Connector
- 14 Screw (3ea)

Nose Gear Wheel Installation / Disassembly
 Figure 202(2)

EFFECTIVITY

Aircraft equipped with Beringer wheel / brake system

***On A/C with RA-014 nose wheels*



- 1 Inner circlip
- 2 Inner bearing
- 3 Inner wheel half
- 4 Large O-ring
- 5 Tire
- 6 Outer wheel half
- 7 Outer bearing
- 8 Outer circlip
- 9 Valve
- 10 Bolt (8ea)

Nose Gear Wheel Installation / Disassembly
 Figure 202(3)

EFFECTIVITY

Aircraft equipped with Beringer wheel / brake system

B. Install Nose Gear Wheel

- (1) Greasing the axle on the bearing surfaces (e.g. Bel-Ray waterproof grease) is recommended for corrosion protection.
- (2) Slide axle into wheel and spacer sleeve onto axle.
- (3) Slide the whole wheel assembly between wheel fork arms.
- (4) Insert cap bushings into wheel fork arms.
- (5) Insert axle bolt and washers and torque nut to 5 Nm (44 in.lbs).
- (6) Install wheel fairing.

5. Wheel Disassembly/Assembly/Tire Change

A. Disassemble a Wheel

WARNING: DO NOT ATTEMPT TO DISASSEMBLE A WHEEL UNTIL TIRE HAS BEEN COMPLETELY DEFLATED.

WARNING: DO NOT ATTEMPT TO REMOVE VALVE CORE UNTIL TIRE HAS BEEN COMPLETELY DEFLATED. VALVE CORE WILL BE EJECTED AT HIGH VELOCITIES IF UNSCREWED BEFORE AIR PRESSURE HAS BEEN RELEASED.

- (1) Remove wheel from aircraft (refer to "Wheel Removal" above).
- (2) Remove valve cap and deflate tire completely. Then remove valve core.
- (3) Break tire beads away from wheel flanges by applying pressure by hand or using a wood or plastic tool as close to the tire bead as possible. Tire lubricant may be used to help. Repeat operation every 90° on both sides.

CAUTION: DO NOT PRY BETWEEN TIRE BEAD AND WHEEL FLANGE AS THIS MAY DESTROY STRUCTURAL AND SEALING PROPERTIES OF WHEEL AND TIRE.

- (4) Remove all screws holding wheel halves together.

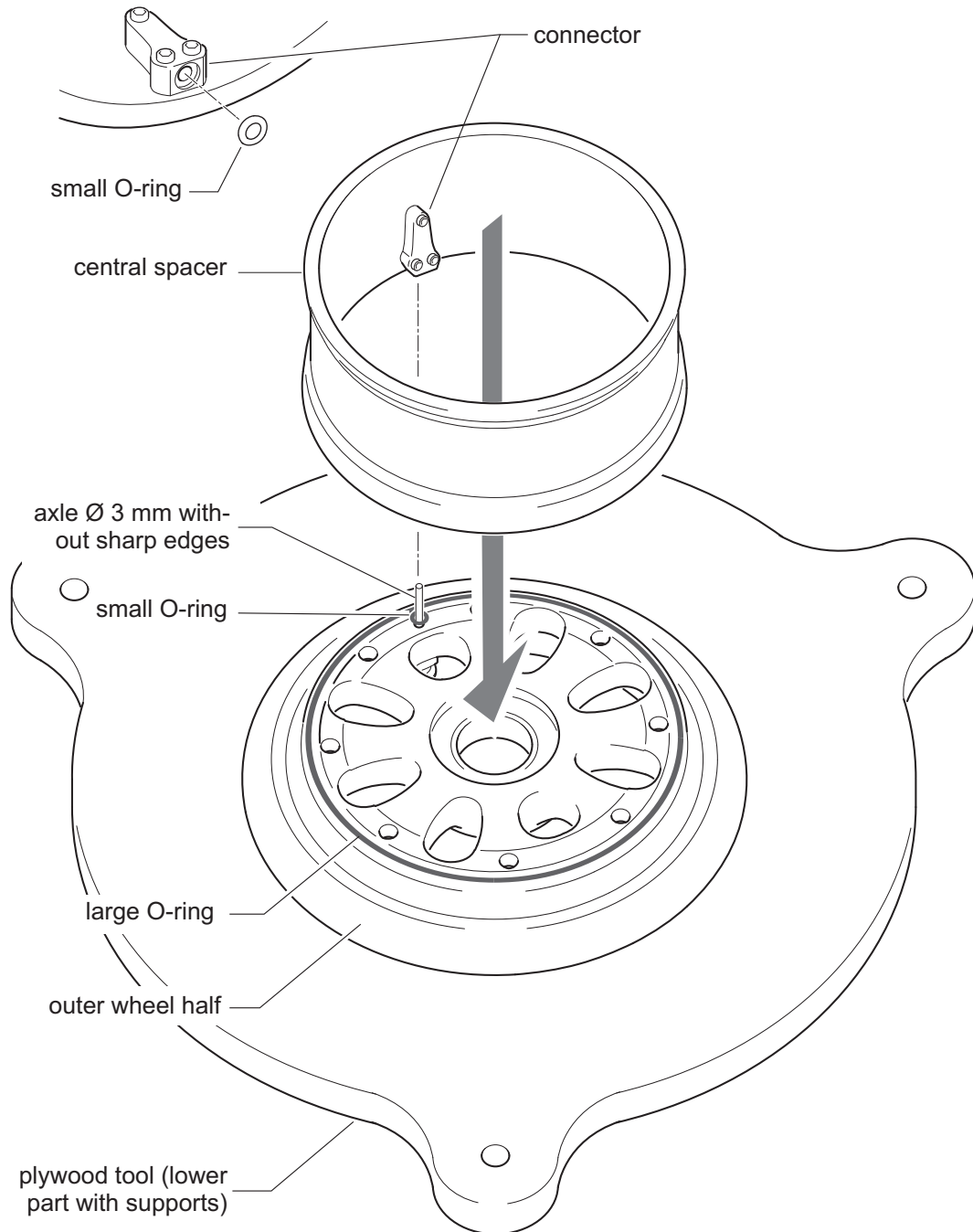
CAUTION: DO NOT USE IMPACT OR POWER WRENCHES.
DO NOT REMOVE ASSEMBLY SCREWS BEFORE THE TIRE BEADS ARE FULLY FREE FROM THE WHEEL.

- (5) Separate wheel halves (and central spacer for RF-005 / RA-002 wheels). Remove tire and O-rings.
- (6) Carefully lay wheel halves (and central spacer) on a flat clean bench.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

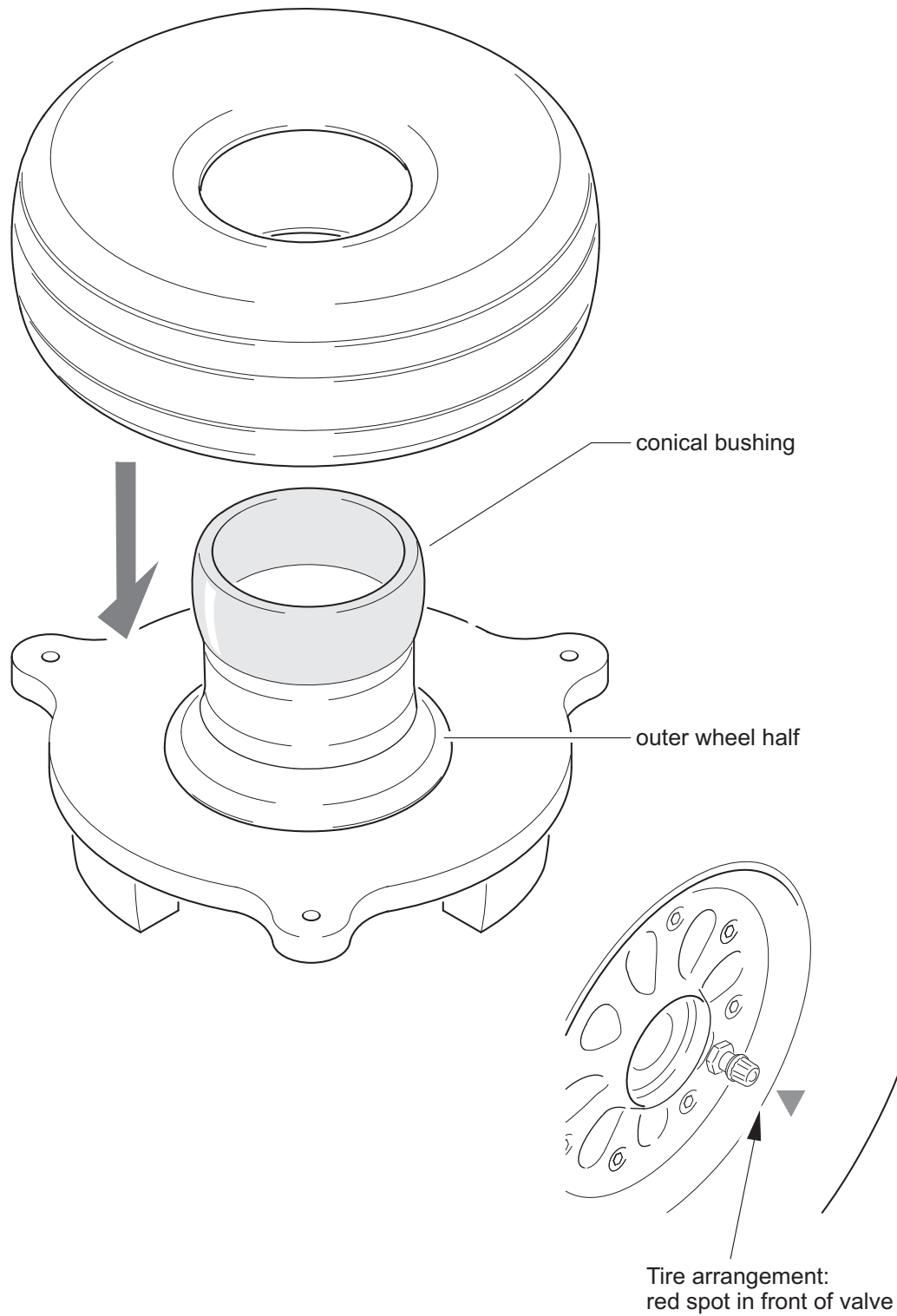
***On A/C with RF-005 and RA-002 wheels*



Wheel Assembly
Figure 203 (1)

EFFECTIVITY

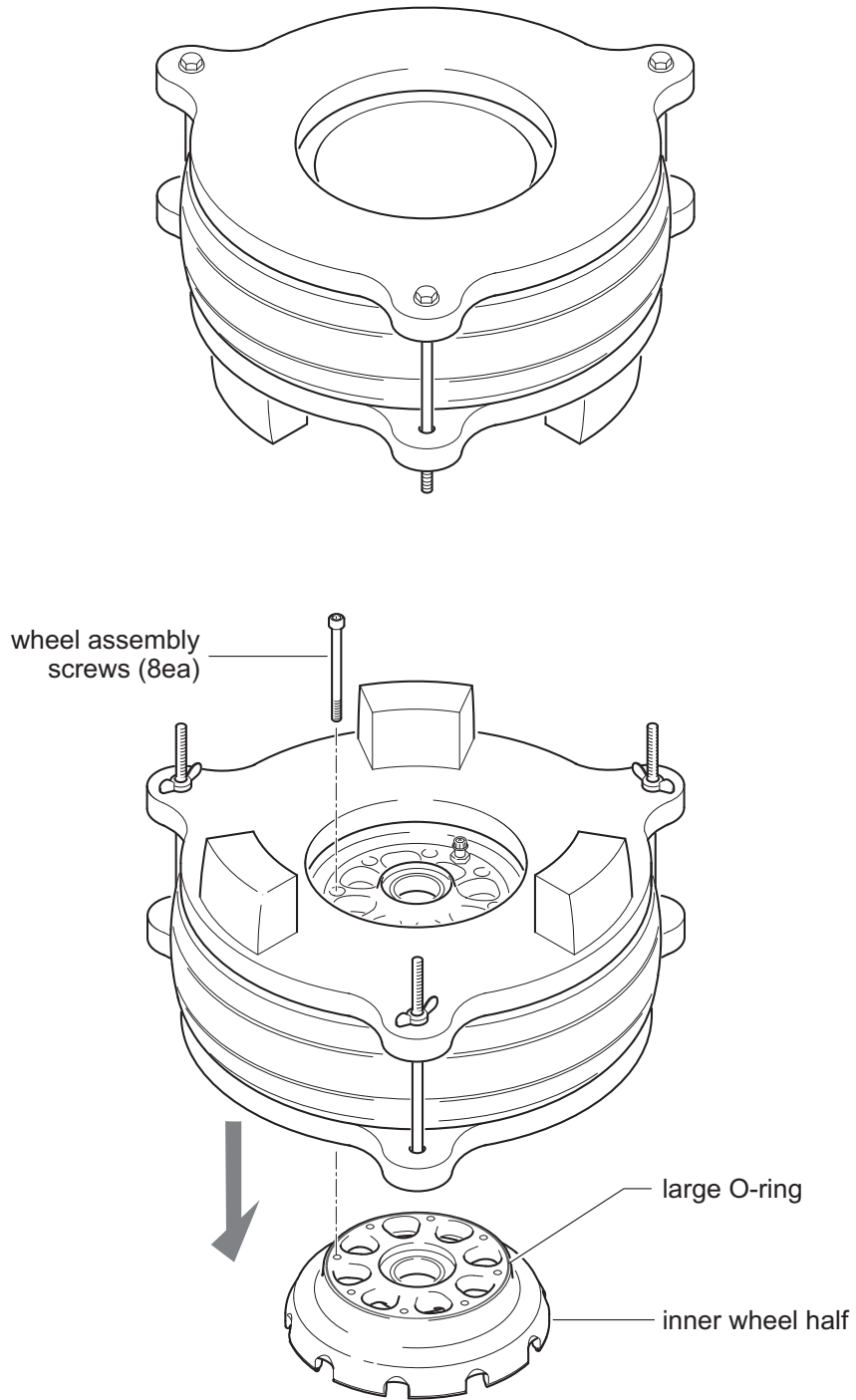
Aircraft equipped with Beringer wheel/brake system



Wheel Assembly
Figure 203 (2)

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system



Wheel Assembly
Figure 203 (3)

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

B. Assemble a Wheel

NOTE: Plywood tool with conical bushing made from polished aluminium required for wheel assembly. Additionally an axle with diameter 3 mm (3/32 in.) without sharp edges is required for positioning the central spacer on RF-005 / RA-002 wheels.

NOTE: Make sure the seal grooves are perfectly clean. Any foreign object debris may cause loss of airtightness. Take care O-rings are in place when assembling wheel halves. Replace O-rings and valves with new ones after uninstallation.

- (1) Make sure that inside of tire is clean and dry. Clean tire bead seat with a cloth impregnated with dry-cleaning solvent as to remove residual grease or wax.

CAUTION: OILY SOLVENT MUST NOT BE USED ON TIRE BEAD SEAT BECAUSE TIRE WILL NOT STICK PROPERLY ON THE WHEEL.

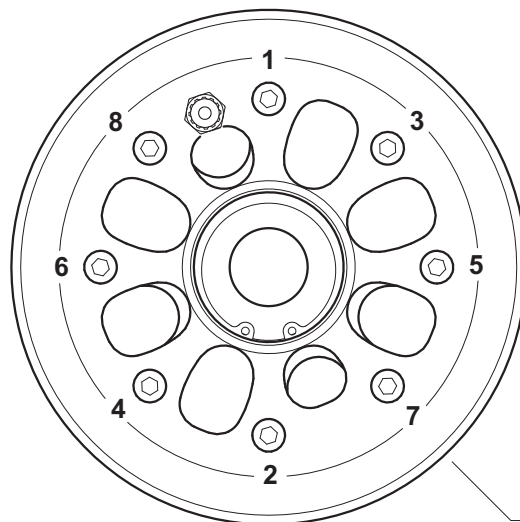
- (2) Place outer wheel half on plywood tool.

***Steps (3) and (4) only for A/C with RF-005 and RA-002 wheels*

- (3) Position large O-ring in the groove. Before placing the small O-ring remove valve core and insert an axle with diameter 3 mm (3/32 in.) through valve to position small O-ring.
- (4) Insert central spacer with connector in front of valve. The axle helps positioning the central spacer.

NOTE: If the connector is not in front of the valve there may be a leakage.

- (5) Insert conical bushing on outer wheel half / central spacer.
- (6) Spray tire lubricant on tire beads and on conical bushing.
- (7) Insert tire on assembly with red spot in front of valve.
- (8) Place second part of plywood tool on assembly and screw the three butterfly nuts. Press tire till conical bushing can be removed.
- (9) Place inner wheel half on table and position large O-ring in the groove.
- (10) Return plywood tool with assembly on to the inner wheel half. Position assembly so that bolt holes are aligned.



tightening order of
wheel assembly screws

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

- (11) Install wheel assembly screws. Secure screws using medium strength threadlocker (Loctite 243 recommended). Screw to contact and torque tighten to 10 Nm (88 in.lbs). Respect order when torque tightening. Torque all screws to 10 Nm (88 in.lbs) a second time.

CAUTION: USING A WRONG THREADLOCKER MAY CAUSE LOOSE OF SCREWS OR REMOVAL PROBLEM.

CAUTION: DO NOT USE IMPACT OR POWER WRENCHES.

- (12) Screw valve core.
 (13) Inflate the tire to 2/3 of the maximum rated pressure. Measure inflation pressure 24h later and check that pressure drop is not more than 10%. A higher pressure drop means there is a leakage. The wheel must be disassembled to check for eventual defect.
 (14) Adjust tire pressure as required (refer to "Landing Gear General").

6. Disc Clip Removal/Installation

A. Removal of Clips and Clip Screws (main wheels only)

- (1) Remove screws and clips if they are out of tolerance. Max. play allowed is 0.5 mm (0.02 in.).

CAUTION: CLIP SCREWS HAVE BEEN MOUNTED WITH THREADLOCKER: DO NOT FORCE WHILE SCREWING OUT THE SCREWS OTHERWISE YOU MAY BRAKE THE SCREW.

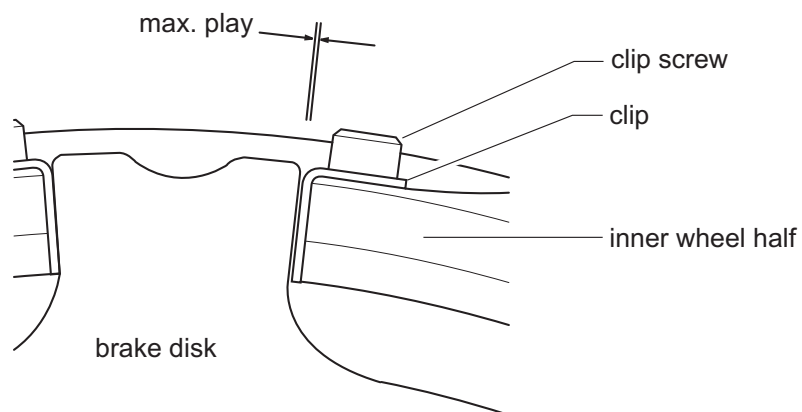
B. Installation of Clips and Clip Screws (main wheels only)

- (1) If clips have been removed install new clips and new screws. Secure screws using high strength threadlocker (Loctite 271 recommended).

CAUTION: USING A WRONG THREADLOCKER MAY CAUSE LOOSE OF SCREWS OR REMOVAL PROBLEM.

- (2) Torque tighten to 1.5 Nm (13 in.lbs) while pressing the clip onto the rim with a grip.
 (3) Check that disc slides in wheel slots without effort.

NOTE: If disc cannot slide in the slots, remove concerning clip and install again.



EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

7. Wheel Bearing Removal/Installation

A. Removal of Wheel Bearings

- (1) Disassemble wheel (refer to "Wheel Disassembly" above).
- (2) Remove circlips on wheel half with a snap-ring plier.
- (3) Place wheel flange in an oven at 110°C to 120°C for 30 minutes (never exceed 150°C).
- (4) Remove wheel half from heat source and immediately remove bearing. If bearing does not fall out by itself: tap it evenly with a fiber drift pin or use a press with a suitable interface.

B. Installation of Wheel bearings

- (1) Place wheel flange in an oven at 110°C to 120°C for 30 minutes (never exceed 150°C).

CAUTION: DO NOT ATTEMPT TO INSTALL BEARING WITHOUT HEATING THE WHEEL FLANGE, IT WILL DAMAGE BEARING BORE.

- (2) Install ball bearing into bearing bore of heated wheel flange using appropriate tool. Tap gently into place with a fiber drift making sure cup is evenly seated against shoulder of wheel half.

CAUTION: DO NOT REUSE A BALL BEARING THAT HAS ALREADY BEEN MOUNTED, EVEN IF IN NEW CONDITION.

CAUTION: USE ONLY A BALL BEARING APPROVED BY BERINGER. THERE ARE MANY DIFFERENT QUALITIES IN BALL BEARINGS AND MOST OF THEM ARE NOT COMPLIANT WITH BERINGER REQUIREMENTS.

CAUTION: DO NOT USE A HAMMER TO PRESS BEARING, IT WILL DAMAGE BALLS AND CAUSE FAILURE OF BALL BEARING.

- (3) Install new circlips after cooling down period. Check that circlips are in place.

CAUTION: CIRCLIPS MAINTAIN BALL BEARINGS, IF CIRCLIPS ARE NOT IN PLACE BEARING CAN SLIDE OUT AND CAUSE BLOCKING OF THE WHEEL.

8. Brake Pad Replacement (Figure 204)

Brake pads have to be changed before the groove in the friction material becomes invisible.

A. On Aircraft Pads Change

- (1) Remove main gear wheel from main gear strut (refer to "Main Gear Wheel Removal" above).
- (2) Remove the 2 outer caliper assembly screws. The middle screw does not need to be removed.

NOTE: Do not remove the caliper back plate from the axle.
Do not disconnect the hydraulic fitting.

CAUTION: DO NOT APPLY BRAKE PRESSURE WHILE THE CALIPER CASING IS SEPARATED.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

- (3) Remove the old brake pads.

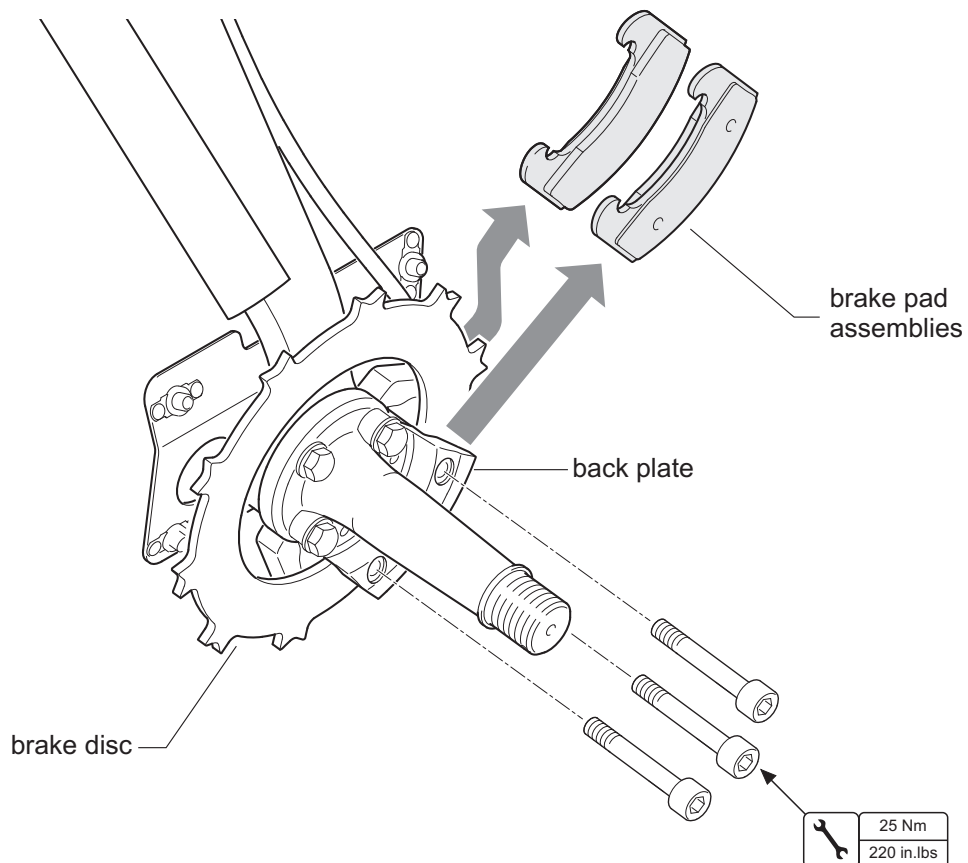
NOTE: The disc has not to be removed during the pad change. It is recommended to leave the disc in place.

- (4) Clean all around pistons with a dry cloth to remove dust.

CAUTION: DO NOT USE SOLVENT OF ANY TYPE TO CLEAN CALIPER HOUSING AND PISTONS. SOLVENT WILL PENETRATE TO PISTON SEALS AND MAY DAMAGE THEM. USE ONLY A DRY CLOTH.

- (5) Grease around piston. Push back the pistons with fingers and wipe excess grease.

CAUTION: IF PUSHING BACK WITH HANDS IS TOO HARD THEN PISTONS AND SEALS ARE STICKING OR MAY BE BLOCKED FOR OTHER REASON. MAINTENANCE IS REQUIRED WITH CHANGE OF SEALS AND EVENTUAL CHANGE OF OTHER PARTS.



Brake Pad Replacement
 Figure 204

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

- (6) Insert new brake pads.

CAUTION: NEVER MIX OLD AND NEW PADS. ALL 4 PADS MUST BE REPLACED AT THE SAME TIME.

NOTE: Pad insulator and grid should not be reused, they come together with new brake pads.

- (7) Reinstall caliper assembly screws. Secure screws using medium strength threadlocker (Loctite 243 recommended). Screw to contact and torque tighten to 25 Nm (220 in.lbs). Torque all screws to 25 Nm (220 in-lbs) a second time.

CAUTION: USING A WRONG THREADLOCKER MAY CAUSE LOOSE OF SCREWS OR REMOVAL PROBLEM.

CAUTION: CHECK THAT BRAKE PADS CAN SLIDE WITHOUT EFFORT.

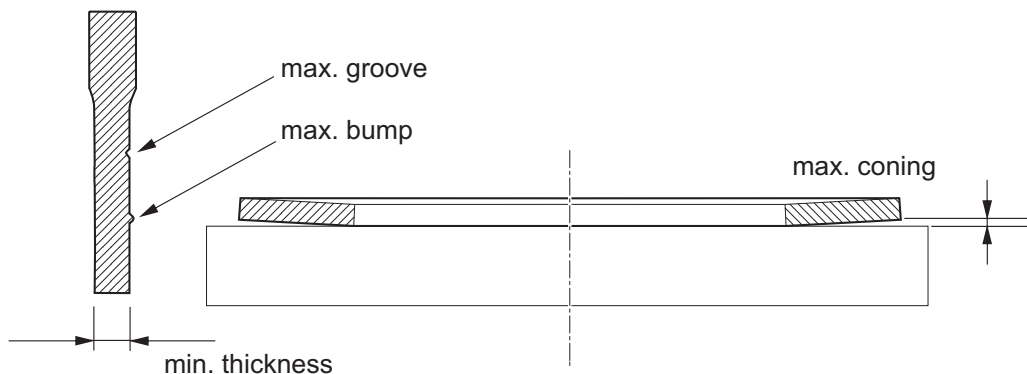
- (8) Reinstall main gear wheel (refer to "Main Landing Gear Wheel Installation" above).
(9) Apply brake pressure 5-10 times and check brake fluid level in the reservoir.
(10) Check brake efficiency and also the residual drag on the wheel.

CAUTION: WHEN THE BRAKES ARE RELEASED YOU MUST BE ABLE TO TURN THE WHEEL EASILY BY HAND.

- (11) Condition brake pads (refer to "Brake System Conditioning" below).

9. Brake Disc Replacement

The minimum allowable brake disc thickness is 3.8 mm (0.15 in.). Maximum coning allowed is 0.3 mm (0.012 in.). The maximum values for grooves and bumps are 0.2 mm (0.008 in.). The maximum value for inner diameter variation (ovalization) is 0.2 mm (0.008 in.).



A. Change a Brake Disc

CAUTION: BRAKE DISCS HAVE TO BE CHANGED BY PAIR ON BOTH LEFT AND RIGHT SIDE AT THE SAME TIME.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

CAUTION: WHEN NEW BRAKE DISCS ARE INSTALLED BRAKE PADS MUST BE CHANGED TO NEW ONES EVEN IF NOT WORN OUT.

- (1) Follow brake pad change procedure (refer to "Brake Pad Replacement" above).
- (2) Degrease new brake disc prior to installation.
- (3) Replace brake disc.
- (4) Continue brake pad change procedure and condition new brake pads/disc (refer to "Brake System Conditioning" below).

10. Brake Master Cylinder Removal/Installation (Figure 205)

WARNING: CONTACT WITH HYDRAULIC FLUID CAN CAUSE SKIN IRRITATIONS.

CAUTION: EXCESSIVE HYDRAULIC FLUID WILL ATTACK THE SURFACE OF VARIOUS MATERIALS. READ AND ADHERE TO ALL MANUFACTURERS INSTRUCTIONS. PROVIDE A SUITABLE COLLECTING VESSEL FOR HYDRAULIC FLUID.

- A. Remove a Brake Master Cylinder
 - (1) Remove bleeder fitting at wheel brake caliper and drain hydraulic fluid from master brake cylinders.
 - (2) Disconnect brake master cylinder from rudder pedal assembly.
 - (3) Disconnect hydraulic brake line hoses from master cylinder and remove brake master cylinder.
 - (4) Plug or cap hydraulic fittings, hoses and lines to prevent the entry of contaminants.
- B. Install a Brake Master Cylinder
 - (1) Connect hydraulic hoses to brake master cylinder.
 - (2) Place brake master cylinder into position and connect brake master cylinder to rudder pedal assembly.
 - (3) Install bleeder fitting at wheel brake caliper.
 - (4) Refill and bleed brake system (refer to "Brake System Bleeding" below).
 - (5) Test brake system and ensure brakes are operating properly (refer to "Adjustment/Test" below).

11. Brake Caliper Disassembly/Assembly (Figures 201 & 206)

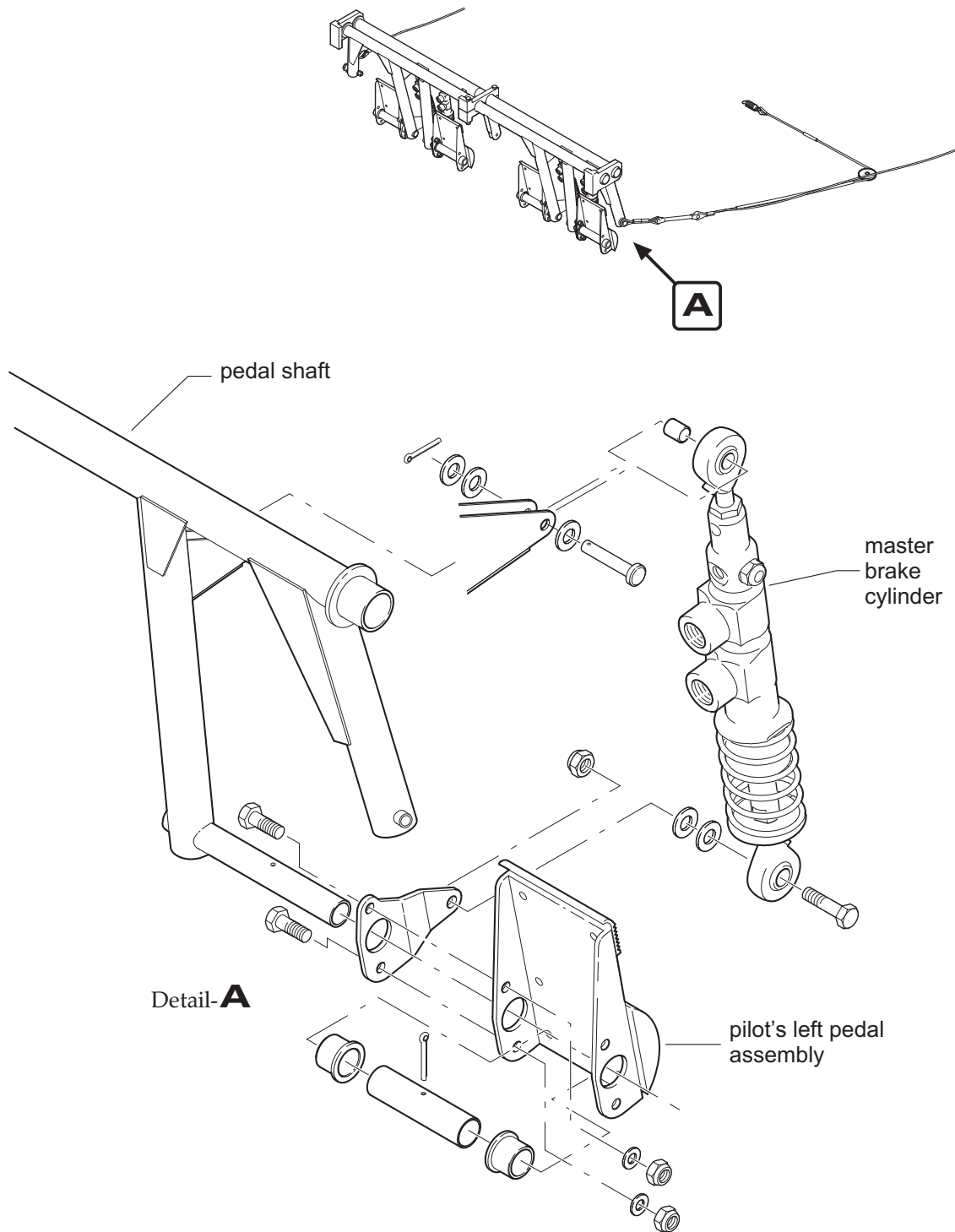
WARNING: CONTACT WITH HYDRAULIC FLUID CAN CAUSE SKIN IRRITATIONS.

CAUTION: EXCESSIVE HYDRAULIC FLUID WILL ATTACK THE SURFACE OF VARIOUS MATERIALS. READ AND ADHERE TO ALL MANUFACTURERS INSTRUCTIONS. PROVIDE A SUITABLE COLLECTING VESSEL FOR HYDRAULIC FLUID.

- A. Disassembly of Brake Caliper
 - (1) Remove main gear wheel from main gear strut (refer to "Main Gear Wheel Removal" above).
 - (2) Remove bleeder fitting at wheel brake caliper and drain hydraulic fluid.
 - (3) Disconnect brake hose from caliper. Plug or cap openings to prevent entry of contaminants.
 - (4) Remove the 3 caliper assembly screws and remove pads, brake disc and brake caliper.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system



Master Brake Cylinder Installation
Figure 205

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

- (5) Dismantle the wheel axle to loosen the back plate. Remove 2 screws securing backplate to axle and remove backplate.
- (6) Remove pistons.

NOTE: Air pressure can be used to remove pistons. Replace caliper back plate and blow air pressure into inlet.

WARNING: PISTONS WILL BE EJECTED AT HIGH VELOCITIES. SERIOUS INJURY TO PERSONNEL CAN RESULT IF PRECAUTIONARY MEASURES ARE IGNORED.

- (7) Remove seals with a plastic clamp or a thin plastic plate.

CAUTION: DO NOT USE A SCREW DRIVER. DO NOT USE A METAL PLATE OR TOOL EVEN FROM SOFT METAL LIKE ALUMINIUM, IT WILL SCRATCH THE SEAL GROOVE AND CAUSE FLUID LEAKAGE.

B. Assembly of Brake Caliper

- (1) Lubricate new seals, piston bore and piston cylinder with a thin coat of thick silicone grease.

CAUTION: NEVER REUSE A PISTON SEAL THAT HAS ALREADY BEEN REMOVED FROM HIS GROOVE.

NOTE: Use silicone grease (-50°C to 200°C) per MIL-S-8660 or SAE AS 8660 or compliant with FDA CFR art. 178.3570 (liquid grease in spray is not allowed).

- (2) Insert seals in their groove only by hand.
- (3) Insert new pistons into caliper housing only by hands. One or two fingers should be enough to push the piston.

CAUTION: DO NOT USE ANY TOOL FOR THESE OPERATIONS.

CAUTION: NEVER PUSH BACK THE PISTONS USING A TOOL OR A PRESS. IF PISTONS DON'T SLIDE WITH HANDS THEY WILL BE STICKING. THIS CAN CAUSE BRAKING TROUBLES AND OVERHEATING.

NOTE: Do not try to sand or polish the pistons, they must be replaced by new ones with perfect polishing and controlled surface.

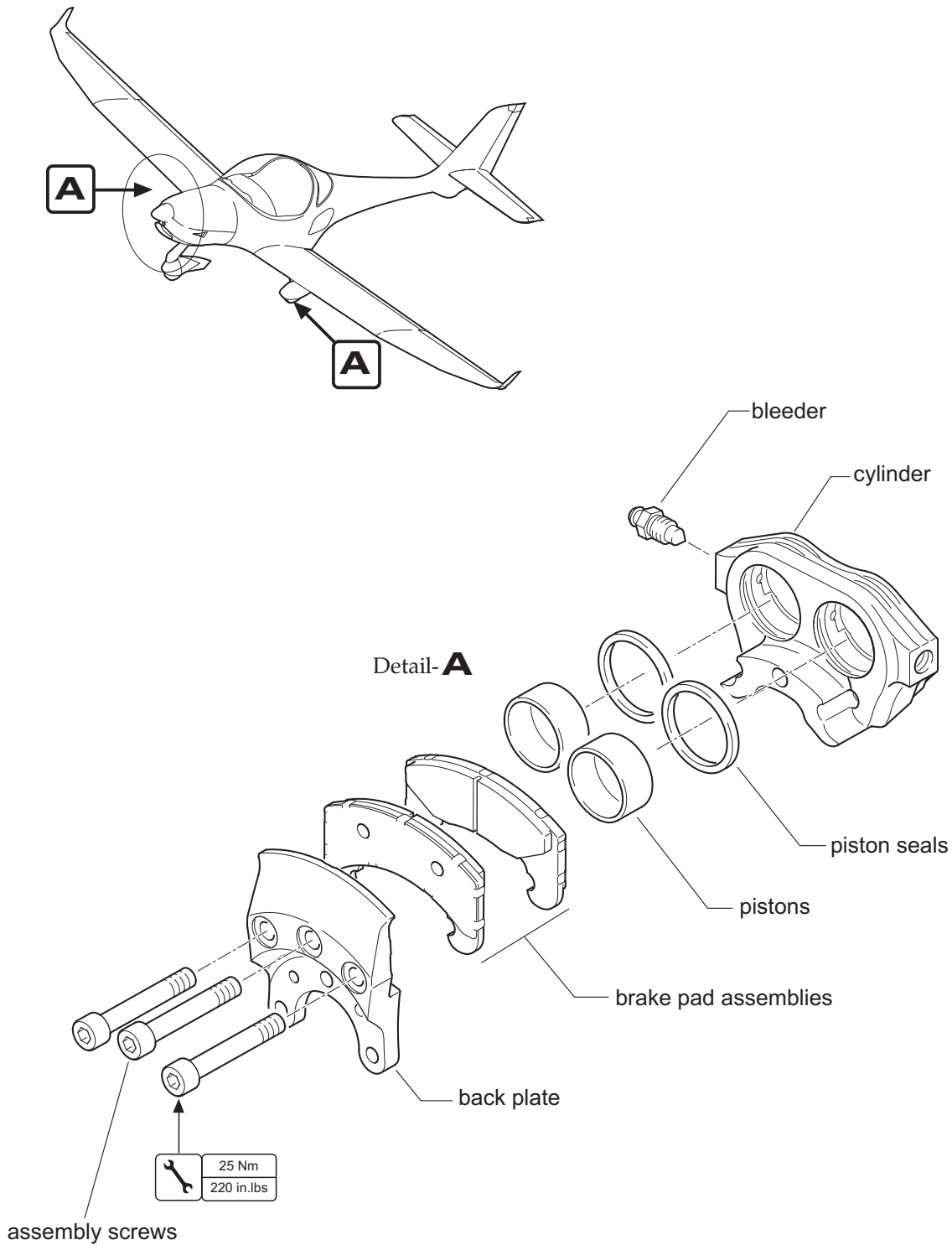
- (4) Attach backplate to wheel axle. Torque 2 screws to 10 Nm (88 in.lbs).
- (5) Reinstall wheel axle to landing gear leg. Torque 4 nuts to 28 Nm (248 in.lbs).
- (6) Position brake caliper on back plate and insert brake pads and disc.
- (7) Install caliper assembly screws. Secure screws using medium strength threadlocker (Loctite 243 recommended). Screw to contact and torque tighten to 25 Nm (220 in.lbs). Torque all screws to 25 Nm (220 in.lbs) a second time.

CAUTION: USING A WRONG THREADLOCKER MAY CAUSE LOOSE OF SCREWS OR REMOVAL PROBLEM.

CAUTION: CHECK THAT BRAKE PADS CAN SLIDE WITHOUT EFFORT.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system



Brake Caliper Assembly
Figure 206

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

- (8) Install bleeding screw and reconnect brake line to caliper.

CAUTION: COPPER SEALS MUST BE CHANGED AT EACH REMOVAL OF THE HYDRAULIC FITTING.

- (9) Reinstall main gear wheel (refer to "Main Landing Gear Wheel Installation" above).
- (10) Refill and bleed brake system (refer to "Brake System Bleeding" below).
- (11) Test and condition brake system (refer to "Brake System Conditioning" below).

12. Brake System Bleeding / Brake Fluid Change

To bleed the brakes or change the brake fluid, use a fluid pump, a clear tube, and a collecting container. Only hydraulic fluid fulfilling the MIL-H-5606 specification should be used.

WARNING: CONTACT WITH HYDRAULIC FLUID CAN CAUSE SKIN IRRITATIONS.

CAUTION: EXCESSIVE HYDRAULIC FLUID WILL ATTACK THE SURFACE OF VARIOUS MATERIALS. READ AND ADHERE TO ALL MANUFACTURERS INSTRUCTIONS. PROVIDE A SUITABLE COLLECTING VESSEL FOR HYDRAULIC FLUID.

CAUTION: PROTECT THE DISC AND PADS FROM BRAKE FLUID CONTAMINATION. BRAKE PADS ARE POROUS AND CANNOT BE CLEANED IF CONTAMINATED, THEY MUST BE REPLACED BY NEW ONES.

A. Bleeding Procedure

- (1) Connect fluid pump to the brake caliper bleeder fitting. Use a zip-tie to secure the hose to the bleeding screw. Make sure the bottle is filled with at least 400ml of brake fluid.
- (2) Connect collecting container with clear tube to brake fluid reservoir.
- (3) Open the bleeder by 3/4 to 1 turn and pump fluid from the caliper through the master cylinders to the reservoir until no air bubbles are evident in the reservoir (clear tube). Then, tighten the bleeder fitting.
- (4) Repeat for both brake calipers.
- (5) Test brake system and ensure brakes are operating properly (refer to "Adjustment/Test" below).

B. Brake Fluid Change Procedure

- (1) Remove bleeder fitting at wheel brake caliper and drain hydraulic fluid.
- (2) Operate the pilot's brake pedal to remove remaining brake fluid from the system.
- (3) Refill and bleed brake system as described above.
- (4) Repeat for both brake calipers.

13. Brake System Adjustment/Test

- A. There is no need to adjust the brakes since the brake pistons and disc move to compensate for brake and wear.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

- B. After component replacement or repair:
- (1) Check the brakes for firm pedal pressure and bleed the system if either brake feels spongy.
 - (2) Perform a minimum of six stops from a speed of between 25 and 40 knots, using light pedal effort and letting the brakes cool partially (about one minute) between stops. Check the aircraft is not turning from centerline while apply left and right brakes uniformly.
 - (3) Check all fittings and hoses for any leakage.

14. Brake System Conditioning

When new brake pads have been installed, it is important to condition them properly to obtain the service life designed into them. Rated brake torque value is reached only after a full conditioning of brake pads and disc.

CAUTION: BRAKE TORQUE VALUE CAN BE ONLY 50% OF RATED BRAKE TORQUE BEFORE THE CONDITIONING. PILOT MUST TAKE INTO CONSIDERATION THIS PARAMETER TO AVOID LOOSE OF AIRCRAFT CONTROL DURING THE CONDITIONING PROCEDURE.

A. Conditioning Procedure

- (1) Taxi aircraft for 500 m (1500 ft) with light brake effort.
- (2) Perform two consecutive stops from 30 – 35 knots down to 5 knots. Apply light brake effort during these two stops. Do not try to apply full brake effort.
- (3) Allow the brakes to cool down for 10 to 15 minutes.
- (4) Apply brakes and check for restraint at high static throttle. If brakes hold, conditioning is complete. If brakes cannot hold aircraft during static run-up, allow the brakes to cool completely and repeat steps 1 through 4.

This conditioning procedure will wear off high spots and prepare pads and disc friction surfaces. A visual inspection of disc will indicate the pads condition: a smooth surface with light and regular grooves indicates that pads and disc are properly conditioned.

NOTE: A rough surface of disc with deep grooves and isolated bumps indicates that an excessive brake effort has been applied during conditioning. In this case, bumps must be sanded and conditioning procedure repeated.

CAUTION: A WRONG CONDITIONING MAY AFFECT BRAKE PERFORMANCES AND INCREASE WEAR OF PADS AND DISC.

EFFECTIVITY

Aircraft equipped with Beringer wheel/brake system

WHEELS AND BRAKES - DESCRIPTION

1. Introduction

- A. Nose and main landing gear wheels are of conventional design. The wheels of the main landing gear are each equipped with a single brake disc, floating cylinder brake assembly.
- B. For tire specifications, refer to "Landing Gear - General".
- C. For more detailed information on Cleveland wheels and brakes, refer to Cleveland Wheels & Brakes component maintenance manual, P/N AWBCMM0001, latest revision.

2. Description and Operation

- A. The main gear wheels consist of the two wheel halves, the tubing, and the tire. The brake disc is bolted to the inboard wheel side. The tire valve is on the outboard wheel side. There are two sets of roller bearings in each wheel, one on the inboard wheel half and one on the outboard wheel half. The nose gear wheel construction is the same as that of the main gear wheels but without a brake disc.
- B. The brake system comprises single disc, hydraulically actuated brakes on each main landing gear wheel, four master cylinders, linked with the rudder pedals, a brake fluid reservoir on the left cabin wall in front of the firewall, and brake fluid lines and hoses.

The brakes are operated by pushing the upper part of either the left or right rudder pedal- in either pilot position. Each set of rudder pedals is interconnected. This motion is mechanically transmitted to the respective brake master cylinder, and through brake fluid lines and hoses out to the respective hydraulic brake assembly.

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system



WHEELS AND BRAKES - MAINTENANCE

1. Main Gear Wheel Removal/Installation

A. Remove a Main Gear Wheel

- (1) Jack aircraft or appropriate main gear wheel (refer to 7-00-00).
- (2) Remove screws securing wheel fairing and remove wheel fairing.
- (3) Remove bolts securing brake back plate to brake caliper. Remove back plate.
- (4) Remove wheel axle nut.
- (5) Pull wheel from axle.

B. Install a Main Gear Wheel

- (1) Slide the wheel assembly on to the axle, with the brake disc inboard and the valve stem outboard.
- (2) Install axle nut and finger-tighten. Then, while slowly continuing to tighten with a wrench, simultaneously rotate the wheel assembly by hand. Tighten until a slight resistance in the wheel bearings is obvious. Back off nut to nearest castellation and install cotter pin.

NOTE: When the axle nut is set in its final position, there should be no resistance to rotation and no side-to-side play in the wheel bearings.

- (4) Position brake back plate between brake disc and inboard wheel hub and secure using bolts and washers.
- (5) Install wheel fairing.

2. Main Gear Wheel Disassembly/Assembly

A. Disassemble a Main Gear Wheel

WARNING: DO NOT ATTEMPT TO SEPARATE WHEEL HALVES BEFORE WHEEL AND TUBE ARE COMPLETELY DEFLATED.

- (1) Completely deflate tire and tube, and break loose tire bead.
- (2) Remove bolts to separate wheel halves and brake disc.
- (3) Remove wheel halves and brake disc from tire.
- (4) Remove tube from tire.
- (5) If necessary remove wheel bearing assembly from wheel halves.

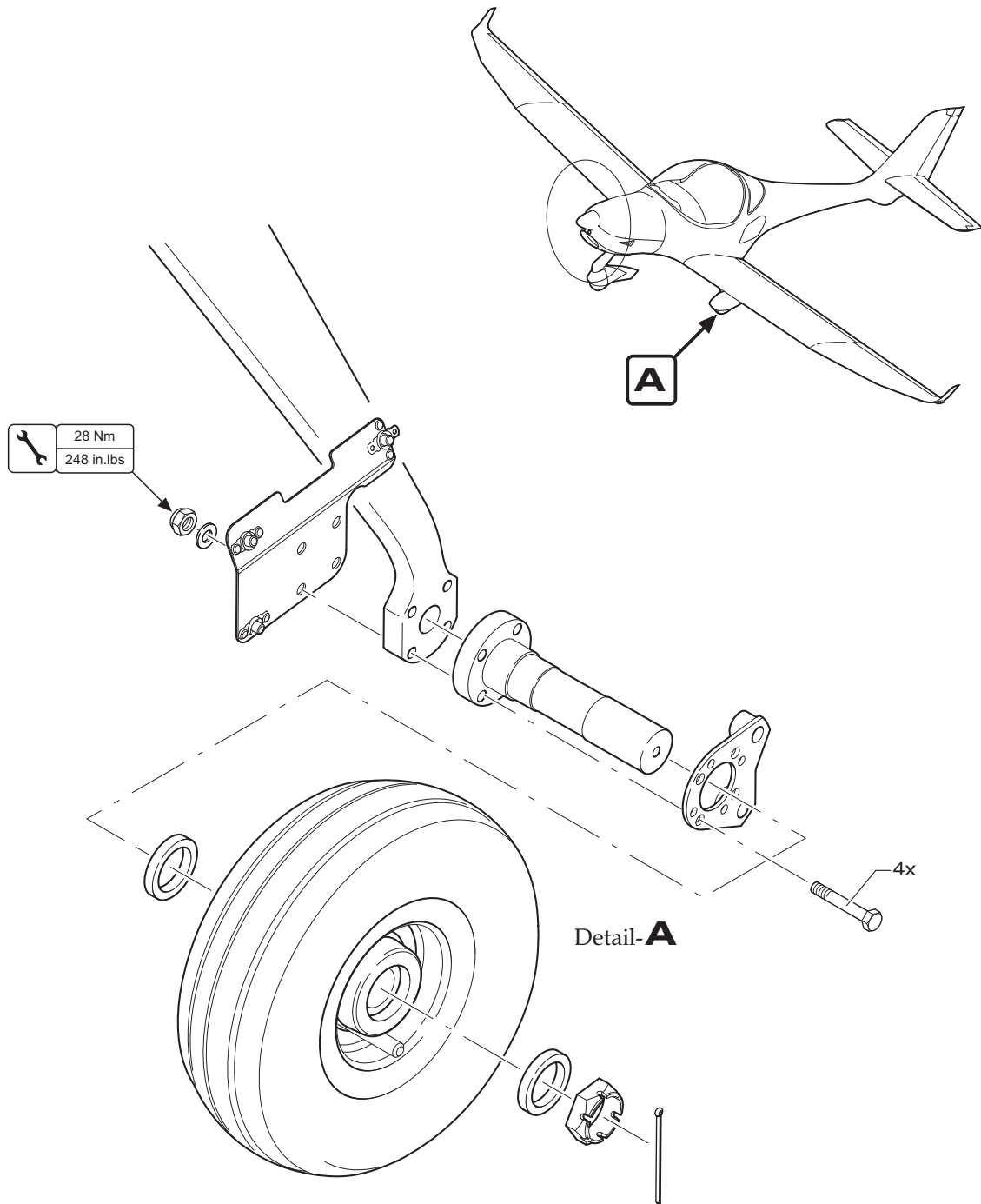
B. Assemble a Main Gear Wheel

- (1) If removed, install wheel bearing assembly to wheel halves.
- (2) Insert tube into tire with the valve stem aligned with the painted reference mark on the tire. Inflate the tube with just enough pressure to give it shape inside the tire.
- (3) Insert the two wheel halves into the tire, taking care to avoid pinching the tube between them. Guide the valve stem through the rubber-grommeted hole in the outboard wheel half while bringing the halves together.

NOTE: When the wheel halves are joined, it is recommended to double check that the tube isn't pinched, using an inspection mirror and a flashlight.

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system



Main Gear Wheel Installation
 Figure 201

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system

- (4) Reassemble the wheel unit, including the brake disc, with bolts, washers, and nuts. Torque to 10 - 12 Nm (89 - 106 in.lbs.).
- (5) Inflate the tire as required (refer to "Landing Gear - General").

3. Nose Gear Wheel Removal/Installation

A. Remove Nose Gear Wheel

- (1) Jack aircraft or weight tail of aircraft to raise nose wheel (refer to 07-00-00).
- (2) Remove screws securing wheel fairing and remove wheel fairing.
- (3) Remove axle bolt from wheel fork.
- (4) Remove cap bushings from wheel fork arms.
- (5) Remove nose wheel assembly backwards from wheel fork.

B. Install Nose Gear Wheel

- (1) Slide the whole wheel assembly (with axle, spacers, and washers in position) between wheel fork arms.
- (2) Insert cap bushings into wheel fork arms.
- (3) Insert axle bolt and torque nut until slight bearing drag, when the wheel is rotated. Then, turn back nut to nearest castellation and install pin.

NOTE: When the axle bolt nut is set in its final position, there should be no resistance to rotation and no side-to-side play in the wheel bearings.

- (4) Install wheel fairing.

4. Nose Gear Wheel Disassembly/Assembly

A. Disassemble Nose Gear Wheel

- (1) Remove spacers, washers, and axle from wheel.

WARNING: DO NOT ATTEMPT TO SEPARATE WHEEL HALVES UNTIL WHEEL AND TUBE ARE COMPLETELY DEFLATED.

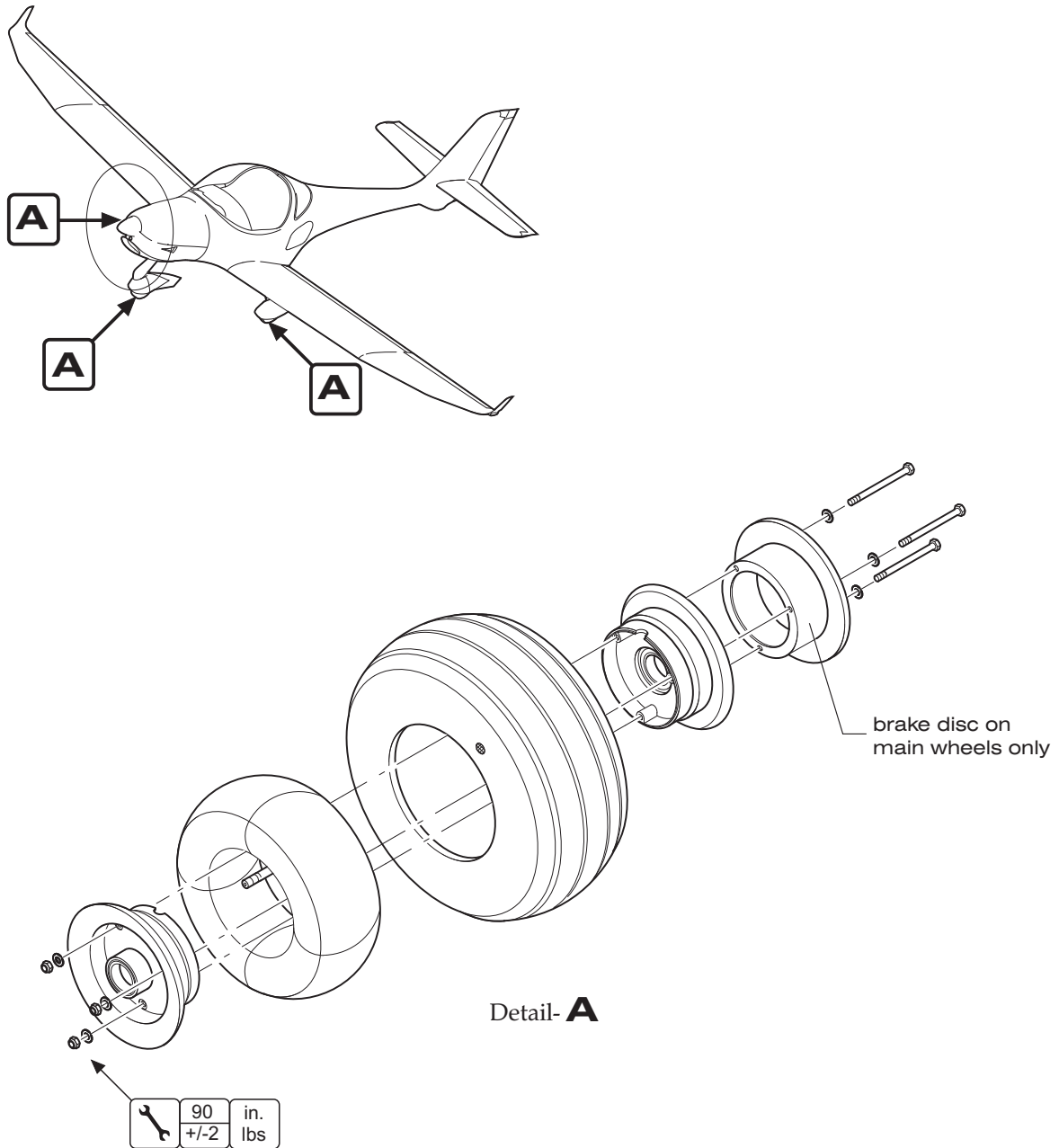
- (2) Completely deflate tire and tube and break loose tire bead.
- (3) Remove bolts to separate wheel halves.
- (4) Remove wheel halves from tire.
- (5) Remove tube from tire.
- (6) If necessary remove wheel bearing assembly from wheel halves.

B. Assemble Nose Gear Wheel

- (1) If removed, install wheel bearing assembly to wheel halves.
- (2) Insert tube into tire with the valve stem aligned with the painted reference mark on the tire. Inflate the tube with just enough pressure to give it shape inside the tire.
- (3) Insert the two wheel halves into the tire, taking care to avoid pinching the tube between them. Guide the valve stem through the rubber-grommeted hole in the outboard wheel half while bringing the halves together.

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system



Wheel Assembly
 Figure 202

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system

NOTE: When the wheel halves are joined, it is recommended to double check that the tube isn't pinched, using an inspection mirror and a flashlight.

- (4) Reassemble the wheel unit with bolts, washers, and nuts. Torque to 10 - 12 Nm.
- (5) Inflate the tire as required (refer to "Landing Gear General").
- (6) Insert wheel axle and place washers and spacers onto the axle.

5. Brake Master Cylinder Removal/Installation

WARNING: CONTACT WITH HYDRAULIC FLUID CAN CAUSE SKIN IRRITATIONS.

CAUTION: EXCESSIVE HYDRAULIC FLUID WILL ATTACK THE SURFACE OF VARIOUS MATERIALS. READ AND ADHERE TO ALL MANUFACTURER'S INSTRUCTIONS. PROVIDE A SUITABLE COLLECTING VESSEL FOR HYDRAULIC FLUID.

A. Remove a Brake Master Cylinder

- (1) Remove bleeder fitting at wheel brake caliper and drain hydraulic fluid from brake cylinder.
- (2) Disconnect brake cylinder from rudder pedal assembly.
- (3) Disconnect hydraulic brake line hoses from cylinder and remove brake cylinder.
- (4) Plug or cap hydraulic fittings, hoses and lines to prevent contaminants entering.

NOTE: Brake master cylinder repair should be accomplished according to manufacturer's specifications.

B. Install a Brake Master Cylinder

- (1) Connect hydraulic hoses to brake master cylinder.
- (2) Put brake master cylinder in position and connect cylinder to rudder pedal assembly.
- (3) Install bleeder fitting at wheel brake caliper.
- (4) Refill and bleed brake system (refer to "Brake System Bleeding" below).
- (5) Test brake system and ensure brakes are operating properly (refer to "Adjustment/Test").

6. Brake Caliper Removal/Installation

WARNING: CONTACT WITH HYDRAULIC FLUID CAN CAUSE SKIN IRRITATIONS.

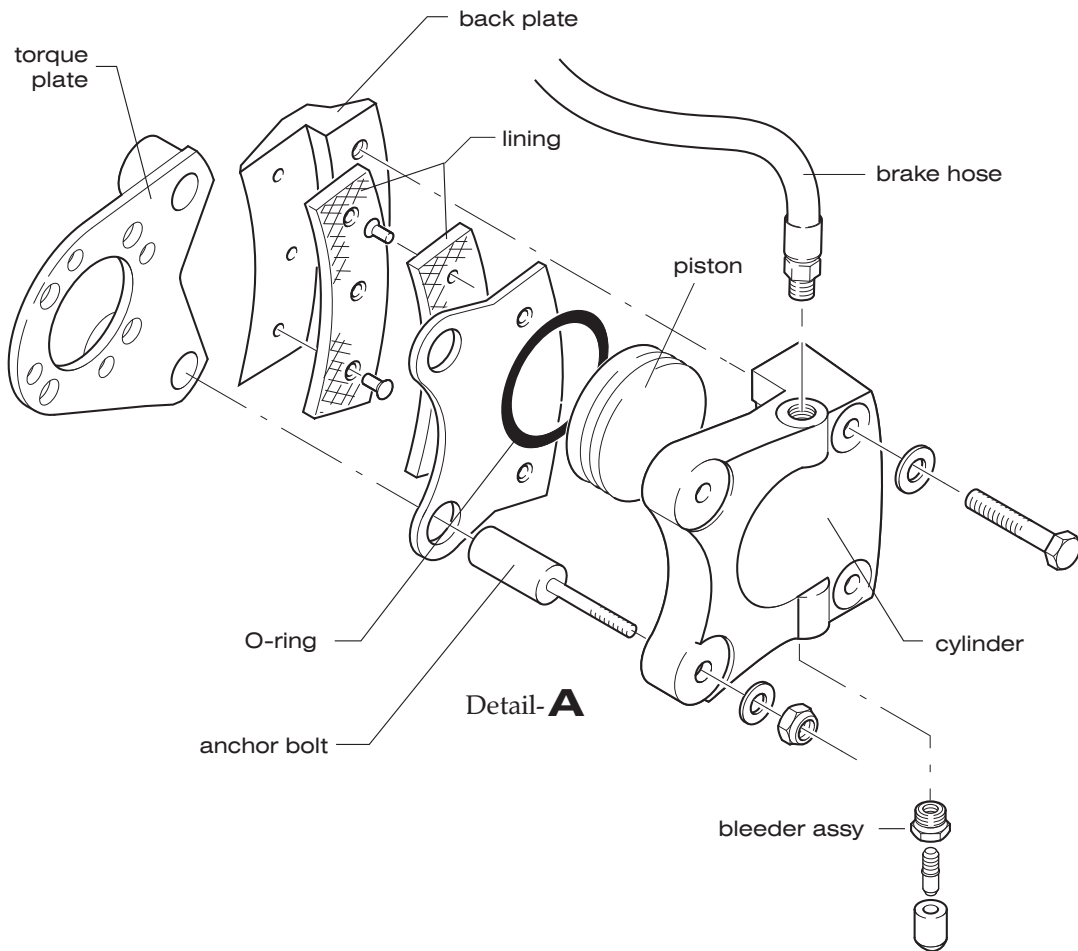
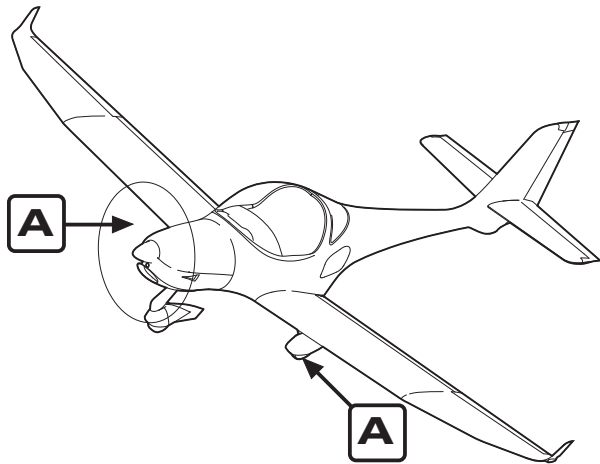
CAUTION: EXCESSIVE HYDRAULIC FLUID WILL ATTACK THE SURFACE OF VARIOUS MATERIALS. READ AND ADHERE TO ALL MANUFACTURER'S INSTRUCTIONS. PROVIDE A SUITABLE COLLECTING VESSEL FOR HYDRAULIC FLUID.

A. Remove a Caliper

- (1) Disconnect brake line at brake caliper and immediately plug or cap hydraulic fitting and brake line.
- (2) Remove bolts securing the back plate to caliper casing.
- (3) Remove back plate and slide caliper casing with pressure plate away from the wheel.

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system



Brake Caliper Assembly
Figure 203

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system

B. Install a Caliper

- (1) Slide the caliper casing anchor pins into the torque plate bushings until the lining on the pressure plate contacts the brake disc.
- (2) Position the back plate against the other side of the disc and thread the two caliper casing bolts with their washers into the back plate from opposite side of the caliper casing. Tighten bolts to 90 in.lbs..
- (3) Safety-wire the bolts.
- (4) Reconnect brake line to caliper.
- (5) Refill if necessary, and bleed brake system (refer to "Brake System Bleeding" below).
- (6) Test brake system and ensure brakes are operating properly (refer to "Adjustment/Test").

7. Brake Disc Removal/Installation

A. Remove a Brake Disc

- (1) Remove main gear wheel from main gear strut (refer to "Main Gear Wheel Removal/Installation" above).
- (2) Disassemble main gear wheel (refer to "Main Gear Wheel Disassembly/Assembly" above).
- (3) Remove brake disc.

B. Install a Brake Disc

NOTE: Before re-installing the brake disc, inspect it for camber and excessive scoring. Scoring should not deeper than 0,5 mm (0.02 in.).

- (1) Install brake disc (refer to "Main Gear Wheel Disassembly/Assembly" above).

8. Brake Lining Replacement

Minimum permissible brake lining thickness is 2,5 mm (3/32 in.).

A. Remove Brake Linings

- (1) Remove caliper from main gear wheel (refer to "Brake Caliper Removal/Installation" above).
- (2) Slide pressure plate off anchor pins of the brake caliper casing assembly.
- (3) Place the back plate or pressure plate on a vice with the lining material down and with the rivets positioned over gap between the vice jaws. Drive the rivets out using a hammer and a punch.

B. Install Brake Lining

- (1) Position the new lining material against the back plate or the pressure plate, making sure that the counter-bores on both pieces are facing outward (away from each other).
- (2) Insert a rivet into each of the holes in the lining material with the head of the rivet fitting into the counter-bore in the lining.
- (3) Place the plate and lining into a brake lining installation fixture with the head of the rivet down against the bucking anvil of the tool. Insert the rivet setting mandrel into the fixture with the mandrel contacting the rivet tail.
- (4) Support the plate and the lining in the installation fixture with one hand while tapping the mandrel with a hammer. Proceed slowly and rotate the assembly while driving the rivet so that the tail is evenly formed.

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system

NOTE: Before setting the first rivet fully, start the other rivets to keep the lining aligned properly with the plate.

- (5) Set all the rivets fully.
- (6) Slide the pressure plate with its new lining material over the caliper casing anchor pins.
- (7) Re-install caliper from main gear wheel (refer to "Brake Caliper Removal/Installation" above).

9. Brake System Bleeding / Brake Fluid Change

To bleed the brakes or change the brake fluid, use a fluid pump, a clear tube, and a collecting container. Only hydraulic fluid fulfilling the MIL-H-5606 specification should be used.

WARNING: CONTACT WITH HYDRAULIC FLUID CAN CAUSE SKIN IRRITATIONS.

CAUTION: EXCESSIVE HYDRAULIC FLUID WILL ATTACK THE SURFACE OF VARIOUS MATERIALS. READ AND ADHERE TO ALL MANUFACTURERS INSTRUCTIONS. PROVIDE A SUITABLE COLLECTING VESSEL FOR HYDRAULIC FLUID.

CAUTION: PROTECT THE DISC AND PADS FROM BRAKE FLUID CONTAMINATION. BRAKE PADS ARE POROUS AND CANNOT BE CLEANED IF CONTAMINATED, THEY MUST BE REPLACED BY NEW ONES.

A. Bleeding Procedure

- (1) Connect fluid pump to the brake caliper bleeder fitting.
- (2) Connect collecting container with clear tube to brake fluid reservoir.
- (3) Open the bleeder and pump fluid from the caliper through the master cylinders to the reservoir until no air bubbles are evident in the reservoir (clear tube). Then, tighten the bleeder fitting.
- (4) Repeat for both brake calipers.
- (5) Test brake system and ensure brakes are operating properly (refer to "Adjustment/Test" below).

B. Brake Fluid Change Procedure

- (1) Remove bleeder fitting at wheel brake caliper and drain hydraulic fluid.
- (2) Operate the pilot's brake pedal to remove remaining brake fluid from the system.
- (3) Refill and bleed brake system as described above.
- (4) Repeat for both brake calipers.

10. Adjustment/Test

A. There is no need to adjust the brakes as the brake pistons move to compensate for brake and wear.

B. After component replacement or repair:

- (1) Check the brakes for firm pedal pressure and bleed the system if either brake feels spongy.
- (2) Perform a minimum of six stops from a speed of between 25 and 40 knots, using light pedal effort and letting the brakes cool partially (about one minute) between stops. Check the aircraft is not turning from centerline while apply left and right brakes uniformly.
- (3) Check all fittings and hoses for any leakage.

EFFECTIVITY

Aircraft equipped with Cleveland/Grove wheel/brake system



**AQUILA AT01-100/200
MAINTENANCE MANUAL**

CHAPTER 33

LIGHTS



TABLE OF CONTENTS

| <u>Title</u> | <u>Chapter Section Subject</u> | <u>Page</u> | <u>Effectivity</u> |
|--|--|-------------|--------------------|
| LIGHTS - GENERAL..... | 33-00-00 | 1 | |
| Introduction | 33-00-00 | 1 | |
| General Description | 33-00-00 | 1 | |
| INTERIOR LIGHTS - MAINTENANCE | 33-10-00 | 201 | |
| General | 33-10-00 | 201 | |
| Post Light Removal/Installation | 33-10-00 | 201 | |
| Nulite Removal/Installation | 33-10-00 | 201 | |
| Cockpit Light Removal/Installation | 33-10-00 | 202 | |
| EXTERIOR LIGHTS - MAINTENANCE | 33-40-00 | 201 | |
| General | 33-40-00 | 201 | |
| Landing Light Removal/Installation/Check | 33-40-00 | 201 | |
| Navigation/Position/Anti-Collision Light Removal/Installation/Check | 33-40-00 | 202 | |



LIGHTS - GENERAL

1. Introduction

- A. This chapter describes interior and exterior lighting systems used on the aircraft, including removal and installation procedures of components and light bulb replacement instructions.

2. General Description

- A. A cockpit light is installed for general cabin lighting, for emergency instrument panel lighting and as a reading light. The dimmable and swivel cockpit light is located in the roof of the cabin just behind the seats. The light is controlled through a dimmer switch on the light.

The voltmeter, the ammeter, the oil temperature, the oil pressure and the cylinder head temperature indicators as well as most of the avionic equipment are internally lighted. Refer to appropriate manufacturer's publications for maintenance instructions.

In aircraft equipped for Night-VFR additional instrument and panel lighting is installed:

If instruments do not have internal lighting they are illuminated by post lights or Nulites. As a second source of light a LED row is integrated into the instrument panel cover. Both, LED row and Nulites / post lights are controlled by a separate dimmer.

To avoid shadowing on placards there is a placard bar below the switches on the bottom of the instrument panel. For emergency lighting there are flashlights and all placards are luminescent.

- B. Exterior lighting consists of wing tip navigation lights with integral anti-collision strobe lights and position lights and a single landing light.



INTERIOR LIGHTS - MAINTENANCE

1. General

- A. If instruments do not have internal lighting, they are illuminated by post lights or Nulites. Post lights are LED lights that illuminate the instrument panel and function as instrument mounting bolts. Nulites are installed between the instrument and the instrument panel. They have a special bezel that focuses the light toward the instrument. Maintenance of post lights and Nulites is limited to their removal and installation.
- B. In Night-VFR equipped aircraft a LED row is integrated into the instrument panel cover. The row is bonded to the instrument panel cover and therefore cannot be replaced or removed. Refer to 31-10-00 for glare shield removal/installation procedures.
- C. A cockpit light is installed in the roof of the cabin just behind the seats. Maintenance is limited to the removal/installation of the light.

2. Post Light Removal/Installation

- A. Remove Post Light
 - (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 at back of post light.
 - (5) Remove washer and nut securing post light to instrument panel and remove cable shoe and post light.
- B. Install Post Light
 - (1) Put post light and cable shoe in position and secure using washer and nut.
 - (2) Connect electrical connector at back of post light.
 - (3) Install glare shield (refer to 31-10-00).
 - (4) Reconnect battery (refer to 24-30-00).
 - (5) Perform functional check.

3. Nulite Removal/Installation

- A. Remove Nulite
 - (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) Cut electrical wires to Nulite .
 - (5) Remove affected instrument as described in the appropriate chapter of this manual.
 - (6) Remove Nulite.

B. Install Nulite

- (1) Put Nulite in position between the instrument panel and the instrument with the wires coming out of the top.
- (2) Install affected instrument as described in the appropriate chapter of this manual.
- (3) Reconnect wires to Nulite using crimp seal butt connector. Secure with cable ties.
- (4) Install glare shield (refer to 31-10-00).
- (5) Reconnect battery (refer to 24-30-00).
- (6) Perform functional check.

4. Cockpit Light Removal/Installation

A. Remove Cockpit Light

- (1) Ensure electrical power to aircraft is OFF.
- (2) Disconnect electrical wires at connector.
- (3) Remove screws securing light to headset bracket and remove light.

B. Install Cockpit Light

- (1) Put light in position and secure to the headset bracket using screws, washers and nuts.
- (2) Reconnect electrical wires at connector.
- (3) Perform functional check.

EXTERIOR LIGHTS - MAINTENANCE

1. General

- A. The aircraft is equipped with Aveo Engineering Andromeda Aurora (up to S/N AT01-326) / Ultra Galactica (from S/N AT01-327 or SI-AT01-018, annex 19) or Whelen Orion 660 (SI-AT01-026) navigation/position/anti-collision lights and a Hella 90mm module halogen / Whelen Parmetheus PAR-36 Plus LED landing light.
- B. The maintenance of exterior lights is limited to the removal and installation of components and light bulb replacement (halogen light only). Refer to manufacturer instructions for further information on maintenance of the lights.
- C. The illumination unit of the navigation/position/anti-collision lights cannot be repaired. If one LED of the cluster has failed the complete illumination unit has to be replaced.

2. Landing Light Removal/Installation/Check

- A. Remove Landing Light
 - (1) Remove upper cowling (refer to 71-10-00)
 - (2) Disconnect landing light electrical wires at connector.
 - (3) Remove screws securing landing light to cowling and remove landing light from aircraft.
- B. Install Landing Light
 - (1) Put landing light in position in the cowling and secure using screws.
 - (2) Connect landing light electrical wires at connector.
 - (3) Perform functional check, adjust landing light if necessary (refer to "Inspection/Check" below).
 - (4) Install upper cowling (refer to 71-10-00).
- C. Landing Light Inspection/Check
 - (1) Turn BAT switch ON.
 - (2) Turn LDG light ON.
 - (3) Verify the landing light works properly.
 - (4) Turn OFF all switches.
 - (5) Inspect lens for abrasion, crazing or cracking.
 - (6) Inspect mounting, connections and wire integrity.

3. Navigation/Position/Anti-Collision Light Removal/Installation/Check

A. Remove Aveo Engineering Navigation/Position/Anti-Collision Light

- (1) Ensure BAT, NAV light and ACL light switches are in OFF position.
- (2) Remove screw(s) securing base plate to wing tip fairing. Carefully remove light.
- (3) Disconnect wires at connector.

B. Install Aveo Engineering Navigation/Position/Anti-Collision Light

- (1) Ensure BAT, NAV light and ACL light switches are in OFF position.
- (2) Connect wires at connector.
- (3) Position gasket and base plate on wing tip fairing and secure with screw(s). Torque screw(s) to 1 Nm (9 in.lbs).
- (4) Perform a navigation / position / anti-collision light functional test (refer to "Inspection/Check" below).

C. Remove Whelen Navigation/Position/Anti-Collision Light

- (1) Ensure BAT, NAV light and ACL light switches are in OFF position.
- (2) Carefully remove the #4 Phillips head screw and lens retainer. Remove the lens from the light assembly by lifting the rear of the lens.
- (3) Slide the lens rearward and lift upwards to remove.

CAUTION: DO NOT TOUCH THE LEDS WITH EITHER FINGERS OR SHARP OBJECTS.

- (4) Remove the 3 Phillips head screws securing the baseplate to the light assembly. Carefully remove light assembly.
- (5) Disconnect wires at connector.

D. Install Whelen Navigation/Position/Anti-Collision Light

- (1) Ensure BAT, NAV light and ACL light switches are in OFF position.
- (2) Connect wires at connector.
- (3) Reinstall light assembly on baseplate. Note that proper orientation is achieved with the drain hole down.

CAUTION: DO NOT TOUCH THE LEDS WITH EITHER FINGERS OR SHARP OBJECTS.

- (4) Install lens in the reverse order as removal and return the lens retainer to its installed location. Visually confirm that the lens and retainer are fully and properly seated.
- (5) Reinsert #4 phillips head screw and tighten firmly.
- (6) Perform a navigation / position / anti-collision light functional test (refer to "Inspection/Check" below).

E. Navigation/Position/Anti-Collision Light Inspection/Check

NOTE: To reduce eye strain, use an optical filter such as dark glasses or a blue covering dome during LED inspection.

- (1) Inspect light for excessive scratching, pitting, discoloration or cracking. Replace if required.
- (2) Turn NAV light switch ON and verify that the navigation / position light works properly.
- (3) Turn ACL light switch ON and verify that the anti-collision strobe light works properly.
- (7) Turn OFF all switches.